START

Title: OFFICIAL GAZETTE OF THE UNITED STATES PATENT AND TRADEMARK OFFICE. PATENTS.

Volume: 1180

Issues: 1-4
PATENTS: 5,463,779-5,471,677

Date: NOVEMBER 7 - 28, 1995

UMI Number: 10426.00

Note:

REEL: 15

UMI
300 North Zeeb Road
Ann Arbor, MI 48103

Vol. 1180 Number 1

OFFICIAL GAZETTE

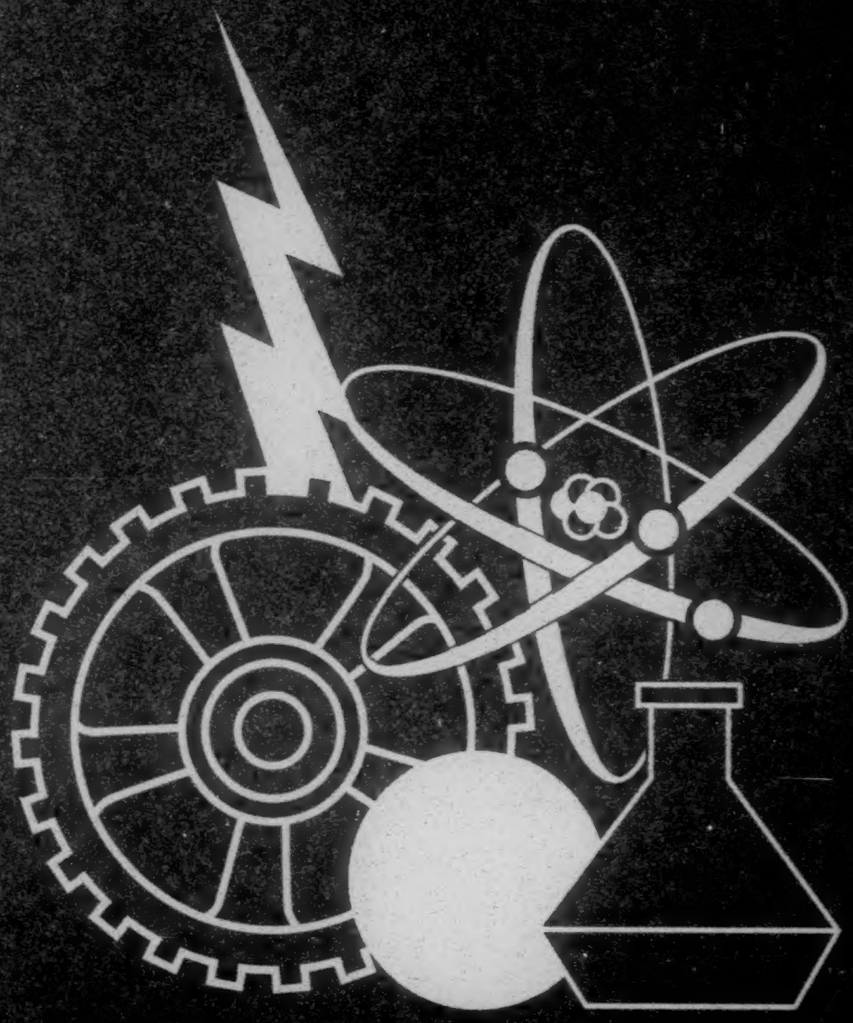
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

ute to:

PATENTS

November 7, 1995



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

November 7, 1995 Volume 1180 Number 1

CONTENTS

			Page
Patent and Trademark Office Notices			
Patent Cooperation Treaty (PCT) Information	1180	OG	3
Notice of Maintenance Fees Payable	1180	OG	3
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee	1180	OG	4
Reissue Applications Filed	1180	OG	11
Requests for Reexaminations Filed	1180	OG	11
Notice of Expiration of Trademark Registrations Due To Failure to Renew	1180	OG	12
Registration to Practice	1180	OG	14
Legal Analysis to Support Proposed Examination Guidelines	1180	OG	14
Patent Certificates of Correction	1180	OG	28
Summary of Final Decisions Issued by the Trademark Trial and Appeal Board	1180	OG	29
Special Boxes for Mail	1180	OG	32
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1180	OG	34
Patent Examining Corps	1180	OG	36
Condition of Trademark Applications	1180	OG	37
Reexaminations			1
Statutory Invention Registrations			3
Reissue Patents Granted (35,079)			5
Plant Patents Granted (9,356)			7
Patents Granted			
General and Mechanical (5,463,779)			9
Chemical (5,464,451)			243
Electrical (5,464,946)			387
Design Patents Granted (363,811)			557
Index of Patentees		PI	1
Indices of Reissue, Reexaminations, Design and Plant Patents		PI	77
Classification of			
Patents (Including Reissues and Reexaminations)		PI	85
Designs and Plants Applications		PI	88
Statutory Invention Registrations		PI	89
Geographical Index of Residence of Inventors			
Patents (Including Reissues and Reexaminations)		PI	91
Designs and Plant Applications		PI	93
Statutory Invention Registrations		PI	93
Change of Address Form		PI	95
Subscription Order Form		PI	97

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, to whom all subscriptions should be made payable and all communications addressed. VISA or MasterCard may be used for telephone orders, (202) 512–1800.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly. Stock No. 703-033-00000-8
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly. Stock No. 703-034-00000-4
PATENT AND TRADEMARK OFFICE NOTICES, issued weekly. Stock No. 703-035-00000-1
GENERAL INFORMATION concerning PATENTS. Stock No. 003-004-00661-7

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $3.00 each; PLANT PATENTS in color, $12.00 each; copies of TRADEMARKS at $3.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S.P.T.O.

For sale by the U.S. Government Printing Office
Superintendent of Documents, Mail Stop: SSOP; Washington, DC 20402–9328

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1178 O.G. 29, on September 12, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1174 O.G. 57, on May 9, 1995.

International fees were changed, effective on January 1, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1168 O.G. 99, on November 29, 1994.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1995, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	660.00
—Corresponding prior U.S. national application filed	430.00
—Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1722.00
International fees	
Basic fee	604.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region	
—For the first 10 national or regional offices designated	147.00
—For each designation in excess of 10 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
—Designation fee	147.00
—Confirmation fee	73.50
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	185.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—USPTO was ISA in PCT Chapter I	470.00
—Additional examination fee, per additional invention (payable only upon invitation)	140.00
—USPTO was not ISA in PCT Chapter I	710.00
—Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
—All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
—All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
—Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
—Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
—For each independent claim in excess of 3	39.00	78.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	125.00	250.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l)	130.00	130.00

Sept. 11, 1995

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 3, 1992 for which maintenance fees due at 3 years

and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,159,715 through 5,161,256
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 1, 1988 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,780,911 through 4,782,533
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on October 30, 1984 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,479,267 through 4,480,338
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED August 30, 1995
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 33,577	07/383,315	04/23/91
(4,689,517)	(06/881,525)	(08/25/87)
Re. 34,210	07/347,430	04/06/93
(4,688,386)	(06/827,083)	(08/25/87)
4,400,833	06/272,134	08/30/83
4,400,838	06/271,302	08/30/83
4,400,845	06/265,691	08/30/83
4,400,846	06/307,850	08/30/83
4,400,848	06/236,551	08/30/83
4,400,856	06/357,088	08/30/83
4,400,868	06/351,707	08/30/83
4,400,869	06/233,728	08/30/83
4,400,872	06/292,526	08/30/83
4,400,875	06/264,734	08/30/83
4,400,876	06/315,013	08/30/83
4,400,877	06/338,431	08/30/83
4,400,882	06/288,722	08/30/83
4,400,887	06/284,456	08/30/83
4,400,888	06/308,535	08/30/83
4,400,893	06/300,515	08/30/83
4,400,898	06/292,454	08/30/83
4,400,903	06/255,293	08/30/83
4,400,914	06/287,762	08/30/83
4,400,920	06/254,924	08/30/83
4,400,923	06/298,694	08/30/83
4,400,938	06/238,527	08/30/83
4,400,942	06/253,416	08/30/83
4,400,949	06/352,874	08/30/83
4,400,951	06/312,802	08/30/83
4,400,952	06/329,139	08/30/83
4,400,958	06/284,996	08/30/83
4,400,960	06/263,140	08/30/83
4,400,971	06/268,279	08/30/83
4,400,980	06/297,913	08/30/83
4,400,986	06/227,244	08/30/83
4,400,988	06/288,703	08/30/83
4,400,993	06/276,802	08/30/83
4,400,994	06/335,834	08/30/83
4,400,996	06/306,833	08/30/83
4,401,008	06/293,817	08/30/83
4,401,012	06/270,731	08/30/83
4,401,020	06/331,153	08/30/83
4,401,021	06/279,621	08/30/83
4,401,022	06/274,064	08/30/83
4,401,023	06/281,345	08/30/83
4,401,024	06/366,119	08/30/83
4,401,025	06/375,212	08/30/83
4,401,026	06/340,213	08/30/83
4,401,031	06/334,933	08/30/83
4,401,032	06/368,266	08/30/83
4,401,036	06/230,994	08/30/83
4,401,040	06/313,468	08/30/83
4,401,041	06/256,043	08/30/83
4,401,042	06/245,671	08/30/83
4,401,063	06/251,688	08/30/83

Patent Number	Serial Number	Issue Date
4,401,067	06/282,655	08/30/83
4,401,071	06/223,123	08/30/83
4,401,074	06/285,145	08/30/83
4,401,076	06/369,028	08/30/83
4,401,089	06/232,693	08/30/83
4,401,093	06/386,565	08/30/83
4,401,107	06/370,099	08/30/83
4,401,114	06/252,263	08/30/83
4,401,118	06/267,690	08/30/83
4,401,120	06/292,066	08/30/83
4,401,121	06/231,921	08/30/83
4,401,125	06/304,395	08/30/83
4,401,126	06/237,157	08/30/83
4,401,127	06/231,130	08/30/83
4,401,131	06/264,097	08/30/83
4,401,134	06/240,875	08/30/83
4,401,138	06/288,489	08/30/83
4,401,140	06/315,217	08/30/83
4,401,145	06/320,824	08/30/83
4,401,149	06/315,256	08/30/83
4,401,155	06/234,258	08/30/83
4,401,160	06/284,747	08/30/83
4,401,161	06/339,972	08/30/83
4,401,162	06/310,786	08/30/83
4,401,163	06/220,645	08/30/83
4,401,166	06/298,103	08/30/83
4,401,174	06/267,740	08/30/83
4,401,175	06/283,773	08/30/83
4,401,192	06/309,281	08/30/83
4,401,199	06/243,672	08/30/83
4,401,204	06/228,421	08/30/83
4,401,220	06/262,989	08/30/83
4,401,227	06/293,158	08/30/83
4,401,233	06/245,662	08/30/83
4,401,247	06/243,930	08/30/83
4,401,249	06/335,421	08/30/83
4,401,256	06/329,478	08/30/83
4,401,263	06/265,599	08/30/83
4,401,274	06/240,287	08/30/83
4,401,275	06/221,444	08/30/83
4,401,281	06/275,364	08/30/83
4,401,283	06/323,472	08/30/83
4,401,285	06/256,252	08/30/83
4,401,288	06/243,614	08/30/83
4,401,291	06/231,492	08/30/83
4,401,301	06/265,280	08/30/83
4,401,304	06/222,707	08/30/83
4,401,305	06/258,582	08/30/83
4,401,323	06/271,040	08/30/83
4,401,326	06/331,111	08/30/83
4,401,327	06/361,525	08/30/83
4,401,328	06/341,150	08/30/83
4,401,334	06/290,779	08/30/83
4,401,336	06/235,037	08/30/83
4,401,339	06/216,375	08/30/83
4,401,340	06/326,856	08/30/83
4,401,344	06/308,654	08/30/83
4,401,348	06/233,333	08/30/83
4,401,349	06/314,457	08/30/83
4,401,355	06/279,459	08/30/83
4,401,366	06/259,009	08/30/83
4,401,369	06/312,678	08/30/83
4,401,382	06/298,952	08/30/83
4,401,389	06/339,806	08/30/83
4,401,391	06/257,133	08/30/83
4,401,392	06/425,255	08/30/83
4,401,393	06/439,009	08/30/83
4,401,399	06/278,034	08/30/83
4,401,401	06/299,778	08/30/83
4,401,402	06/273,558	08/30/83
4,401,426	06/238,878	08/30/83
4,401,429	06/238,551	08/30/83
4,401,432	06/382,290	08/30/83
4,401,439	06/336,222	08/30/83
4,401,444	06/297,061	08/30/83
4,401,445	06/244,718	08/30/83
4,401,449	06/373,054	08/30/83
4,401,452	06/361,179	08/30/83
4,401,456	06/258,489	08/30/83
4,401,460	06/295,301	08/30/83
4,401,464	06/367,794	08/30/83
4,401,468	06/461,855	08/30/83
4,401,470	06/249,050	08/30/83
4,401,478	06/373,564	08/30/83
4,401,485	06/285,788	08/30/83
4,401,488	06/370,691	08/30/83
4,401,490	06/447,135	08/30/83
4,401,491	06/255,026	08/30/83
4,401,497	06/323,035	08/30/83
4,401,510	06/297,400	08/30/83
4,401,511	06/263,933	08/30/83
4,401,513	06/335,109	08/30/83
4,401,514	06/245,076	08/30/83
4,401,523	06/379,962	08/30/83
4,401,542	06/267,712	08/30/83
4,401,544	06/268,742	08/30/83
4,401,548	06/233,993	08/30/83
4,401,549	06/322,335	08/30/83
4,401,550	06/338,737	08/30/83
4,401,552	06/253,473	08/30/83
4,401,554	06/396,977	08/30/83
4,401,558	06/318,554	08/30/83
4,401,559	06/370,237	08/30/83
4,401,561	06/333,085	08/30/83
4,401,563	06/401,530	08/30/83
4,401,566	06/283,518	08/30/83
4,401,570	06/382,018	08/30/83
4,401,572	06/274,971	08/30/83
4,401,573	06/261,885	08/30/83
4,401,578	06/407,520	08/30/83
4,401,581	06/358,344	08/30/83
4,401,585	06/341,390	08/30/83
4,401,587	06/331,448	08/30/83
4,401,588	06/401,309	08/30/83
4,401,590	06/247,316	08/30/83
4,401,593	06/348,472	08/30/83
4,401,594	06/300,443	08/30/83
4,401,596	06/317,584	08/30/83
4,401,598	06/312,979	08/30/83
4,401,605	06/377,880	08/30/83
4,401,609	06/322,802	08/30/83
4,401,611	06/320,290	08/30/83
4,401,613	06/289,812	08/30/83
4,401,615	06/268,343	08/30/83
4,401,616	06/294,084	08/30/83
4,401,619	06/219,560	08/30/83
4,401,628	06/226,336	08/30/83
4,401,629	06/242,410	08/30/83
4,401,633	06/343,647	08/30/83
4,401,634	06/343,648	08/30/83
4,401,638	06/333,257	08/30/83
4,401,640	06/420,779	08/30/83
4,401,652	06/290,175	08/30/83
4,401,657	06/328,996	08/30/83
4,401,658	06/331,593	08/30/83
4,401,661	06/369,048	08/30/83
4,401,664	06/328,995	08/30/83
4,401,666	06/344,666	08/30/83
4,401,675	06/308,137	08/30/83
4,401,677	06/310,192	08/30/83
4,401,681	06/304,356	08/30/83
4,401,682	06/256,022	08/30/83
4,401,686	06/346,941	08/30/83
4,401,687	06/320,451	08/30/83
4,401,690	06/344,906	08/30/83
4,401,692	06/288,694	08/30/83
4,401,713	06/300,754	08/30/83
4,401,716	06/410,118	08/30/83
4,401,718	06/437,772	08/30/83
4,401,727	06/391,217	08/30/83
4,401,731	06/293,951	08/30/83
4,401,734	06/297,374	08/30/83
4,401,739	06/365,089	08/30/83
4,401,755	06/229,483	08/30/83
4,401,756	06/249,905	08/30/83
4,401,759	06/366,593	08/30/83

Patent Number	Serial Number	Issue Date
4,401,770	06/364,551	08/30/83
4,401,772	06/368,614	08/30/83
4,401,778	06/303,159	08/30/83
4,401,781	06/414,825	08/30/83
4,401,790	06/281,349	08/30/83
4,401,793	06/299,390	08/30/83
4,401,795	06/223,441	08/30/83
4,401,797	06/265,304	08/30/83
4,401,802	06/224,077	08/30/83
4,401,803	06/342,007	08/30/83
4,401,804	06/381,128	08/30/83
4,401,805	06/353,715	08/30/83
4,401,808	06/317,282	08/30/83
4,401,813	06/331,299	08/30/83
4,401,814	06/331,034	08/30/83
4,401,816	06/244,173	08/30/83
4,401,819	06/360,567	08/30/83
4,401,820	06/337,322	08/30/83
4,401,823	06/260,865	08/30/83
4,401,826	06/416,577	08/30/83
4,401,829	06/300,920	08/30/83
4,401,830	06/222,155	08/30/83
4,401,832	06/291,896	08/30/83
4,401,835	06/303,229	08/30/83
4,401,850	06/237,320	08/30/83
4,401,851	06/239,647	08/30/83
4,401,854	06/289,835	08/30/83
4,401,857	06/323,093	08/30/83
4,401,866	06/267,481	08/30/83
4,401,871	06/339,308	08/30/83
4,401,872	06/377,030	08/30/83
4,401,874	06/240,816	08/30/83
4,401,877	06/337,921	08/30/83
4,401,879	06/236,389	08/30/83
4,401,881	06/244,796	08/30/83
4,401,886	06/246,439	08/30/83
4,401,893	06/288,010	08/30/83
4,401,895	06/420,598	08/30/83
4,401,896	06/266,714	08/30/83
4,401,906	06/242,205	08/30/83
4,401,910	06/325,679	08/30/83
4,401,915	06/251,546	08/30/83
4,401,921	06/326,638	08/30/83
4,401,929	06/281,378	08/30/83
4,401,942	06/265,453	08/30/83
4,401,945	06/259,257	08/30/83
4,401,953	06/284,290	08/30/83
4,401,955	06/283,604	08/30/83
4,401,957	06/230,323	08/30/83
4,401,962	06/438,425	08/30/83
4,401,963	06/330,251	08/30/83
4,401,964	06/254,378	08/30/83
4,401,969	06/309,735	08/30/83
4,401,977	06/222,942	08/30/83
4,401,980	06/297,806	08/30/83
4,402,003	06/224,078	08/30/83
4,402,014	06/286,232	08/30/83
4,402,017	06/304,462	08/30/83
4,402,018	06/270,592	08/30/83
4,402,020	06/236,836	08/30/83
4,402,023	06/239,541	08/30/83
4,402,027	06/293,984	08/30/83
4,402,028	06/293,531	08/30/83
4,402,030	06/350,498	08/30/83
4,402,052	06/253,127	08/30/83
4,402,055	06/229,029	08/30/83
4,402,059	06/252,685	08/30/83
4,402,064	06/324,686	08/30/83
4,402,068	06/297,662	08/30/83
4,402,069	06/270,061	08/30/83
4,402,077	06/219,546	08/30/83
4,402,078	06/242,304	08/30/83
4,402,086	06/237,897	08/30/83
4,402,088	06/252,556	08/30/83
4,688,270	06/935,749	08/25/87
4,688,272	06/721,634	08/25/87
4,688,273	06/794,922	08/25/87
4,688,274	06/806,295	08/25/87
4,688,276	06/836,828	08/25/87
4,688,278	06/796,794	08/25/87
4,688,282	06/890,320	08/25/87
4,688,285	06/910,079	08/25/87
4,688,286	06/861,299	08/25/87
4,688,291	06/840,142	08/25/87
4,688,294	06/857,074	08/25/87
4,688,298	06/757,848	08/25/87
4,688,299	06/817,092	08/25/87
4,688,304	06/792,242	08/25/87
4,688,308	06/769,541	08/25/87
4,688,317	06/766,778	08/25/87
4,688,319	06/652,206	08/25/87
4,688,320	06/908,922	08/25/87
4,688,326	06/900,647	08/25/87
4,688,328	06/939,143	08/25/87
4,688,329	06/774,417	08/25/87
4,688,334	06/865,140	08/25/87
4,688,347	06/794,655	08/25/87
4,688,348	06/890,781	08/25/87
4,688,352	06/715,472	08/25/87
4,688,361	06/860,045	08/25/87
4,688,362	06/846,262	08/25/87
4,688,366	06/889,242	08/25/87
4,688,369	06/756,934	08/25/87
4,688,370	06/830,033	08/25/87
4,688,371	06/841,525	08/25/87
4,688,372	06/881,452	08/25/87
4,688,373	06/876,172	08/25/87
4,688,375	06/875,924	08/25/87
4,688,376	06/863,355	08/25/87
4,688,380	06/893,015	08/25/87
4,688,381	06/794,237	08/25/87
4,688,382	06/781,879	08/25/87
4,688,391	06/942,759	08/25/87
4,688,397	06/804,294	08/25/87
4,688,399	06/883,860	08/25/87
4,688,401	06/625,516	08/25/87
4,688,403	06/929,086	08/25/87
4,688,407	06/779,820	08/25/87
4,688,412	06/836,375	08/25/87
4,688,415	06/877,576	08/25/87
4,688,416	06/797,337	08/25/87
4,688,418	06/788,286	08/25/87
4,688,423	06/722,570	08/25/87
4,688,426	06/800,046	08/25/87
4,688,427	06/850,991	08/25/87
4,688,429	06/837,031	08/25/87
4,688,431	06/743,442	08/25/87
4,688,438	06/797,416	08/25/87
4,688,441	06/848,307	08/25/87
4,688,442	06/870,668	08/25/87
4,688,452	06/740,561	08/25/87
4,688,454	06/759,658	08/25/87
4,688,455	06/825,928	08/25/87
4,688,462	06/888,055	08/25/87
4,688,465	06/703,572	08/25/87
4,688,467	06/932,627	08/25/87
4,688,468	06/818,983	08/25/87
4,688,470	06/887,586	08/25/87
4,688,471	06/856,839	08/25/87
4,688,473	06/770,873	08/25/87
4,688,474	06/808,425	08/25/87
4,688,482	06/824,614	08/25/87
4,688,485	06/711,377	08/25/87
4,688,486	06/685,780	08/25/87
4,688,490	06/783,943	08/25/87
4,688,498	07/002,453	08/25/87
4,688,500	06/834,549	08/25/87
4,688,502	06/854,254	08/25/87
4,688,511	06/761,289	08/25/87
4,688,515	06/841,894	08/25/87
4,688,516	06/682,224	08/25/87
4,688,522	06/877,142	08/25/87
4,688,528	06/812,081	08/25/87
4,688,534	06/893,010	08/25/87
4,688,538	06/688,036	08/25/87
4,688,541	06/888,879	08/25/87

Patent Number	Serial Number	Issue Date
4,688,548	06/841,592	08/25/87
4,688,552	06/893,107	08/25/87
4,688,554	06/850,173	08/25/87
4,688,559	06/856,190	08/25/87
4,688,560	06/814,914	08/25/87
4,688,564	06/898,791	08/25/87
4,688,569	06/872,166	08/25/87
4,688,570	06/483,510	08/25/87
4,688,574	06/744,938	08/25/87
4,688,575	06/357,568	08/25/87
4,688,588	06/844,180	08/25/87
4,688,599	06/798,308	08/25/87
4,688,600	06/833,365	08/25/87
4,688,601	06/853,711	08/25/87
4,688,604	06/680,522	08/25/87
4,688,607	06/758,598	08/25/87
4,688,610	06/713,697	08/25/87
4,688,612	06/890,108	08/25/87
4,688,614	06/731,309	08/25/87
4,688,616	06/775,004	08/25/87
4,688,619	06/858,522	08/25/87
4,688,627	06/804,769	08/25/87
4,688,628	06/805,686	08/25/87
4,688,638	06/866,859	08/25/87
4,688,639	06/946,746	08/25/87
4,688,640	06/876,580	08/25/87
4,688,643	06/851,131	08/25/87
4,688,644	06/851,105	08/25/87
4,688,645	06/783,754	08/25/87
4,688,646	06/474,424	08/25/87
4,688,650	06/801,469	08/25/87
4,688,654	06/841,578	08/25/87
4,688,659	06/947,877	08/25/87
4,688,662	06/734,494	08/25/87
4,688,663	06/629,109	08/25/87
4,688,664	06/782,967	08/25/87
4,688,667	06/791,059	08/25/87
4,688,669	06/702,697	08/25/87
4,688,673	06/765,350	08/25/87
4,688,676	06/939,048	08/25/87
4,688,680	06/713,305	08/25/87
4,688,681	06/820,164	08/25/87
4,688,685	06/803,301	08/25/87
4,688,687	06/910,318	08/25/87
4,688,702	06/811,431	08/25/87
4,688,705	06/886,004	08/25/87
4,688,708	06/908,893	08/25/87
4,688,719	06/684,145	08/25/87
4,688,720	06/853,776	08/25/87
4,688,727	06/677,217	08/25/87
4,688,735	06/919,627	08/25/87
4,688,738	06/922,461	08/25/87
4,688,740	06/817,494	08/25/87
4,688,742	06/705,881	08/25/87
4,688,750	06/825,261	08/25/87
4,688,751	06/620,189	08/25/87
4,688,758	06/669,832	08/25/87
4,688,765	06/827,494	08/25/87
4,688,771	06/812,946	08/25/87
4,688,788	06/826,767	08/25/87
4,688,790	06/790,057	08/25/87
4,688,794	06/865,456	08/25/87
4,688,800	06/887,621	08/25/87
4,688,805	06/913,239	08/25/87
4,688,806	06/849,376	08/25/87
4,688,810	06/850,556	08/25/87
4,688,812	06/902,219	08/25/87
4,688,814	06/857,137	08/25/87
4,688,818	06/604,628	08/25/87
4,688,821	06/808,922	08/25/87
4,688,823	06/832,549	08/25/87
4,688,834	06/870,166	08/25/87
4,688,839	06/845,962	08/25/87
4,688,840	06/855,357	08/25/87
4,688,849	06/819,263	08/25/87
4,688,851	06/826,963	08/25/87
4,688,854	06/749,802	08/25/87
4,688,860	06/774,056	08/25/87
4,688,861	06/905,464	08/25/87
4,688,863	06/702,320	08/25/87
4,688,864	06/845,653	08/25/87
4,688,872	06/891,406	08/25/87
4,688,877	06/807,164	08/25/87
4,688,883	06/736,112	08/25/87
4,688,887	06/722,895	08/25/87
4,688,888	06/612,098	08/25/87
4,688,906	06/814,549	08/25/87
4,688,908	06/780,677	08/25/87
4,688,910	06/822,908	08/25/87
4,688,911	06/892,244	08/25/87
4,688,915	06/867,470	08/25/87
4,688,917	06/911,003	08/25/87
4,688,927	06/813,572	08/25/87
4,688,934	06/863,654	08/25/87
4,688,941	06/743,609	08/25/87
4,688,942	06/777,474	08/25/87
4,688,946	06/669,150	08/25/87
4,688,947	06/829,772	08/25/87
4,688,949	06/880,819	08/25/87
4,688,954	06/916,480	08/25/87
4,688,955	06/418,033	08/25/87
4,688,969	06/847,540	08/25/87
4,688,974	06/811,256	08/25/87
4,688,977	06/816,825	08/25/87
4,688,980	06/821,595	08/25/87
4,688,983	06/612,352	08/25/87
4,688,991	06/807,487	08/25/87
4,688,998	06/926,872	08/25/87
4,689,000	06/827,468	08/25/87
4,689,008	06/894,024	08/25/87
4,689,010	06/820,138	08/25/87
4,689,016	06/812,316	08/25/87
4,689,017	06/831,274	08/25/87
4,689,021	06/918,849	08/25/87
4,689,024	06/752,143	08/25/87
4,689,040	06/728,493	08/25/87
4,689,045	06/809,048	08/25/87
4,689,048	06/845,685	08/25/87
4,689,053	06/835,516	08/25/87
4,689,059	06/903,251	08/25/87
4,689,062	06/832,206	08/25/87
4,689,066	06/835,483	08/25/87
4,689,069	06/748,642	08/25/87
4,689,070	06/736,950	08/25/87
4,689,073	06/834,420	08/25/87
4,689,074	06/752,215	08/25/87
4,689,075	06/784,304	08/25/87
4,689,076	06/733,510	08/25/87
4,689,080	06/910,334	08/25/87
4,689,081	06/692,320	08/25/87
4,689,084	06/817,122	08/25/87
4,689,086	06/790,797	08/25/87
4,689,087	06/796,514	08/25/87
4,689,094	06/813,305	08/25/87
4,689,095	06/741,334	08/25/87
4,689,096	07/023,680	08/25/87
4,689,098	06/786,573	08/25/87
4,689,100	06/773,989	08/25/87
4,689,102	06/812,144	08/25/87
4,689,105	06/832,860	08/25/87
4,689,107	06/788,491	08/25/87
4,689,108	06/794,881	08/25/87
4,689,120	06/744,836	08/25/87
4,689,122	06/854,443	08/25/87
4,689,123	06/945,729	08/25/87
4,689,124	06/926,690	08/25/87
4,689,129	06/755,393	08/25/87
4,689,147	06/780,928	08/25/87
4,689,148	06/770,288	08/25/87
4,689,151	06/736,323	08/25/87
4,689,155	06/586,908	08/25/87
4,689,164	06/890,970	08/25/87
4,689,166	06/886,776	08/25/87
4,689,170	06/856,891	08/25/87
4,689,172	06/863,109	08/25/87
4,689,178	06/798,075	08/25/87

Patent Number	Serial Number	Issue Date
4,689,179	06/756,028	08/25/87
4,689,182	06/811,567	08/25/87
4,689,185	06/889,688	08/25/87
4,689,188	06/886,149	08/25/87
4,689,191	06/739,206	08/25/87
4,689,194	06/780,260	08/25/87
4,689,199	06/812,982	08/25/87
4,689,201	06/708,303	08/25/87
4,689,205	06/824,473	08/25/87
4,689,206	06/787,195	08/25/87
4,689,210	06/829,960	08/25/87
4,689,212	06/863,160	08/25/87
4,689,213	06/790,408	08/25/87
4,689,217	06/747,240	08/25/87
4,689,229	06/759,280	08/25/87
4,689,236	06/795,717	08/25/87
4,689,237	06/637,212	08/25/87
4,689,240	06/883,387	08/25/87
4,689,245	06/736,315	08/25/87
4,689,250	06/795,317	08/25/87
4,689,252	06/845,190	08/25/87
4,689,261	06/720,305	08/25/87
4,689,267	06/759,308	08/25/87
4,689,268	06/891,927	08/25/87
4,689,271	06/759,015	08/25/87
4,689,273	06/872,978	08/25/87
4,689,275	06/773,332	08/25/87
4,689,281	06/840,396	08/25/87
4,689,286	06/848,650	08/25/87
4,689,288	06/777,611	08/25/87
4,689,291	06/771,089	08/25/87
4,689,298	06/643,290	08/25/87
4,689,300	06/778,828	08/25/87
4,689,303	06/832,997	08/25/87
4,689,305	06/844,547	08/25/87
4,689,306	06/551,981	08/25/87
4,689,309	06/781,905	08/25/87
4,689,311	06/782,206	08/25/87
4,689,315	06/716,695	08/25/87
4,689,317	06/841,185	08/25/87
4,689,321	06/633,108	08/25/87
4,689,326	06/788,200	08/25/87
4,689,328	06/815,337	08/25/87
4,689,334	06/856,782	08/25/87
4,689,350	06/874,935	08/25/87
4,689,352	06/930,076	08/25/87
4,689,355	06/875,131	08/25/87
4,689,357	06/741,836	08/25/87
4,689,358	06/762,876	08/25/87
4,689,372	06/866,645	08/25/87
4,689,379	07/006,404	08/25/87
4,689,382	06/832,394	08/25/87
4,689,384	06/842,531	08/25/87
4,689,394	06/809,663	08/25/87
4,689,404	06/831,441	08/25/87
4,689,407	06/585,643	08/25/87
4,689,409	06/835,704	08/25/87
4,689,410	06/787,657	08/25/87
4,689,412	06/919,466	08/25/87
4,689,415	06/826,401	08/25/87
4,689,423	06/846,695	08/25/87
4,689,427	06/798,510	08/25/87
4,689,433	06/872,484	08/25/87
4,689,434	06/880,395	08/25/87
4,689,446	06/768,942	08/25/87
4,689,452	06/896,494	08/25/87
4,689,459	06/774,058	08/25/87
4,689,460	06/812,961	08/25/87
4,689,465	06/733,229	08/25/87
4,689,470	06/829,943	08/25/87
4,689,483	06/727,354	08/25/87
4,689,484	06/735,321	08/25/87
4,689,490	06/720,731	08/25/87
4,689,493	06/824,809	08/25/87
4,689,501	06/821,106	08/25/87
4,689,502	06/938,342	08/25/87
4,689,509	06/888,649	08/25/87
4,689,534	06/540,092	08/25/87
4,689,539	06/939,303	08/25/87
4,689,541	06/888,313	08/25/87
4,689,558	06/516,601	08/25/87
4,689,565	06/748,241	08/25/87
4,689,569	06/682,081	08/25/87
4,689,576	06/762,082	08/25/87
4,689,578	06/845,675	08/25/87
4,689,583	06/579,732	08/25/87
4,689,586	06/869,979	08/25/87
4,689,588	06/881,258	08/25/87
4,689,593	06/770,554	08/25/87
4,689,595	06/893,956	08/25/87
4,689,604	06/471,665	08/25/87
4,689,605	06/765,289	08/25/87
4,689,616	06/759,765	08/25/87
4,689,621	06/846,426	08/25/87
4,689,622	06/683,562	08/25/87
4,689,638	06/712,713	08/25/87
4,689,641	06/902,709	08/25/87
4,689,643	06/923,923	08/25/87
4,689,648	06/868,900	08/25/87
4,689,654	06/853,017	08/25/87
4,689,657	06/754,007	08/25/87
4,689,664	06/772,078	08/25/87
4,689,680	06/756,142	08/25/87
4,689,683	06/840,947	08/25/87
4,689,693	06/861,587	08/25/87
4,689,695	06/810,095	08/25/87
4,689,698	06/629,163	08/25/87
4,689,701	06/658,252	08/25/87
4,689,703	06/696,184	08/25/87
4,689,704	06/781,424	08/25/87
4,689,707	06/867,161	08/25/87
4,689,711	06/797,144	08/25/87
4,689,716	06/881,899	08/25/87
4,689,717	06/846,124	08/25/87
4,689,728	06/808,682	08/25/87
4,689,735	06/826,549	08/25/87
4,689,744	06/691,254	08/25/87
4,689,752	06/484,681	08/25/87
4,689,755	06/689,143	08/25/87
4,689,758	06/689,700	08/25/87
4,689,759	06/628,283	08/25/87
4,689,766	06/672,307	08/25/87
4,689,767	06/790,631	08/25/87
4,689,769	06/697,577	08/25/87
4,689,773	06/748,751	08/25/87
4,689,776	06/859,095	08/25/87
4,689,781	06/705,305	08/25/87
4,689,789	06/753,977	08/25/87
4,689,790	06/802,288	08/25/87
4,689,793	06/751,707	08/25/87
4,689,796	06/779,539	08/25/87
4,689,799	06/781,062	08/25/87
4,689,801	06/540,220	08/25/87
4,689,803	06/742,744	08/25/87
4,689,817	06/821,112	08/25/87
4,689,822	06/823,533	08/25/87
4,689,823	06/568,026	08/25/87
4,689,827	06/784,145	08/25/87
5,042,087	07/446,974	08/27/91
5,042,091	07/515,823	08/27/91
5,042,093	07/425,555	08/27/91
5,042,095	07/116,380	08/27/91
5,042,096	07/492,842	08/27/91
5,042,097	07/487,970	08/27/91
5,042,098	07/346,548	08/27/91
5,042,112	07/496,934	08/27/91
5,042,113	07/591,709	08/27/91
5,042,118	07/473,931	08/27/91
5,042,127	07/475,924	08/27/91
5,042,128	07/620,848	08/27/91
5,042,141	07/483,269	08/27/91
5,042,149	07/400,573	08/27/91
5,042,151	07/573,396	08/27/91
5,042,154	07/435,378	08/27/91
5,042,158	07/387,334	08/27/91
5,042,159	07/441,943	08/27/91

Patent Number	Serial Number	Issue Date
5,042,160	07/375,259	08/27/91
5,042,167	07/609,821	08/27/91
5,042,168	07/597,551	08/27/91
5,042,173	07/475,701	08/27/91
5,042,186	07/562,661	08/27/91
5,042,188	07/454,699	08/27/91
5,042,190	07/477,044	08/27/91
5,042,192	07/500,690	08/27/91
5,042,193	07/503,305	08/27/91
5,042,195	07/446,678	08/27/91
5,042,196	07/371,733	08/27/91
5,042,203	07/428,723	08/27/91
5,042,215	07/307,784	08/27/91
5,042,218	07/411,830	08/27/91
5,042,225	07/364,424	08/27/91
5,042,240	07/426,855	08/27/91
5,042,242	07/539,621	08/27/91
5,042,252	07/482,972	08/27/91
5,042,257	07/345,727	08/27/91
5,042,260	07/456,733	08/27/91
5,042,266	07/523,821	08/27/91
5,042,268	07/561,925	08/27/91
5,042,275	07/243,447	08/27/91
5,042,277	07/481,622	08/27/91
5,042,280	07/507,222	08/27/91
5,042,281	07/582,242	08/27/91
5,042,298	07/466,274	08/27/91
5,042,302	07/500,916	08/27/91
5,042,304	07/460,277	08/27/91
5,042,310	07/353,599	08/27/91
5,042,315	07/415,045	08/27/91
5,042,316	07/498,588	08/27/91
5,042,317	07/528,480	08/27/91
5,042,318	07/337,458	08/27/91
5,042,335	07/464,353	08/27/91
5,042,337	07/396,341	08/27/91
5,042,340	07/520,809	08/27/91
5,042,341	07/485,440	08/27/91
5,042,345	07/418,385	08/27/91
5,042,346	07/448,444	08/27/91
5,042,347	07/419,762	08/27/91
5,042,357	07/502,373	08/27/91
5,042,365	06/523,479	08/27/91
5,042,366	07/518,148	08/27/91
5,042,367	07/576,267	08/27/91
5,042,370	07/553,990	08/27/91
5,042,371	07/529,334	08/27/91
5,042,374	07/417,646	08/27/91
5,042,377	07/409,423	08/27/91
5,042,378	07/378,174	08/27/91
5,042,385	06/460,682	08/27/91
5,042,387	07/522,894	08/27/91
5,042,391	07/493,485	08/27/91
5,042,401	07/532,821	08/27/91
5,042,402	07/568,279	08/27/91
5,042,406	07/443,326	08/27/91
5,042,412	07/568,774	08/27/91
5,042,415	07/481,824	08/27/91
5,042,417	07/422,622	08/27/91
5,042,421	07/557,578	08/27/91
5,042,426	07/552,570	08/27/91
5,042,430	07/549,735	08/27/91
5,042,434	07/519,469	08/27/91
5,042,439	07/494,993	08/27/91
5,042,443	07/563,318	08/27/91
5,042,446	07/429,545	08/27/91
5,042,447	07/595,912	08/27/91
5,042,476	07/392,016	08/27/91
5,042,487	07/435,562	08/27/91
5,042,490	07/405,549	08/27/91
5,042,499	07/561,575	08/27/91
5,042,511	07/453,773	08/27/91
5,042,513	07/482,697	08/27/91
5,042,514	07/461,430	08/27/91
5,042,516	07/588,950	08/27/91
5,042,517	07/514,113	08/27/91
5,042,526	06/880,388	08/27/91
5,042,528	07/548,865	08/27/91
5,042,529	07/631,498	08/27/91
5,042,531	07/537,042	08/27/91
5,042,532	07/387,818	08/27/91
5,042,542	07/578,191	08/27/91
5,042,547	07/602,667	08/27/91
5,042,550	07/340,202	08/27/91
5,042,551	07/583,201	08/27/91
5,042,563	07/503,863	08/27/91
5,042,580	07/551,226	08/27/91
5,042,581	07/478,110	08/27/91
5,042,587	07/493,205	08/27/91
5,042,589	07/574,889	08/27/91
5,042,591	07/408,911	08/27/91
5,042,598	07/539,721	08/27/91
5,042,600	07/498,864	08/27/91
5,042,605	07/448,111	08/27/91
5,042,608	07/402,412	08/27/91
5,042,611	07/526,201	08/27/91
5,042,616	07/512,024	08/27/91
5,042,620	07/406,290	08/27/91
5,042,622	07/526,658	08/27/91
5,042,630	07/453,772	08/27/91
5,042,633	07/474,351	08/27/91
5,042,634	07/473,728	08/27/91
5,042,642	07/498,963	08/27/91
5,042,649	07/544,750	08/27/91
5,042,651	07/360,384	08/27/91
5,042,657	07/577,197	08/27/91
5,042,666	07/652,653	08/27/91
5,042,670	07/609,772	08/27/91
5,042,681	07/463,366	08/27/91
5,042,682	07/664,745	08/27/91
5,042,683	07/529,109	08/27/91
5,042,686	07/379,772	08/27/91
5,042,689	07/175,930	08/27/91
5,042,694	07/456,110	08/27/91
5,042,696	07/575,432	08/27/91
5,042,698	07/487,288	08/27/91
5,042,699	07/469,148	08/27/91
5,042,701	07/599,684	08/27/91
5,042,702	07/442,381	08/27/91
5,042,709	07/542,271	08/27/91
5,042,714	07/394,890	08/27/91
5,042,720	07/526,439	08/27/91
5,042,726	07/434,702	08/27/91
5,042,727	07/604,648	08/27/91
5,042,730	07/525,882	08/27/91
5,042,733	07/563,290	08/27/91
5,042,737	07/563,958	08/27/91
5,042,744	07/579,922	08/27/91
5,042,746	07/357,141	08/27/91
5,042,747	07/328,195	08/27/91
5,042,749	07/506,821	08/27/91
5,042,756	07/496,385	08/27/91
5,042,761	07/501,949	08/27/91
5,042,762	07/516,308	08/27/91
5,042,763	07/461,260	08/27/91
5,042,767	07/395,230	08/27/91
5,042,768	07/538,723	08/27/91
5,042,769	07/561,936	08/27/91
5,042,771	07/605,670	08/27/91
5,042,772	07/505,576	08/27/91
5,042,773	07/460,296	08/27/91
5,042,778	07/493,695	08/27/91
5,042,782	07/370,693	08/27/91
5,042,787	07/325,906	08/27/91
5,042,794	07/488,672	08/27/91
5,042,796	07/636,185	08/27/91
5,042,798	07/445,265	08/27/91
5,042,802	07/578,681	08/27/91
5,042,803	07/276,941	08/27/91
5,042,813	07/480,305	08/27/91
5,042,815	07/668,236	08/27/91
5,042,816	07/607,721	08/27/91
5,042,818	07/444,634	08/27/91
5,042,819	07/580,145	08/27/91
5,042,820	07/054,238	08/27/91
5,042,826	07/572,570	08/27/91

Patent Number	Serial Number	Issue Date
5,042,828	07/406,055	08/27/91
5,042,829	07/469,191	08/27/91
5,042,836	07/542,805	08/27/91
5,042,839	07/499,560	08/27/91
5,042,840	07/470,143	08/27/91
5,042,846	07/351,805	08/27/91
5,042,847	07/382,367	08/27/91
5,042,849	07/594,361	08/27/91
5,042,858	07/317,534	08/27/91
5,042,860	07/490,196	08/27/91
5,042,861	07/511,120	08/27/91
5,042,866	07/597,560	08/27/91
5,042,868	07/517,822	08/27/91
5,042,875	07/561,980	08/27/91
5,042,883	07/489,181	08/27/91
5,042,885	07/438,174	08/27/91
5,042,887	07/429,204	08/27/91
5,042,890	07/483,867	08/27/91
5,042,892	07/562,892	08/27/91
5,042,894	07/488,110	08/27/91
5,042,932	07/552,036	08/27/91
5,042,942	07/559,109	08/27/91
5,042,955	07/124,995	08/27/91
5,042,956	07/426,222	08/27/91
5,042,958	07/522,733	08/27/91
5,042,961	07/366,584	08/27/91
5,042,962	07/187,863	08/27/91
5,042,963	07/331,490	08/27/91
5,042,969	07/297,243	08/27/91
5,042,970	07/443,245	08/27/91
5,042,971	07/510,465	08/27/91
5,042,980	07/358,443	08/27/91
5,043,004	07/574,668	08/27/91
5,043,005	07/158,567	08/27/91
5,043,009	07/358,391	08/27/91
5,043,010	07/261,767	08/27/91
5,043,020	07/460,343	08/27/91
5,043,024	07/446,789	08/27/91
5,043,027	07/279,902	08/27/91
5,043,033	07/646,288	08/27/91
5,043,034	07/450,744	08/27/91
5,043,045	07/349,823	08/27/91
5,043,050	07/569,637	08/27/91
5,043,052	07/436,054	08/27/91
5,043,056	07/314,867	08/27/91
5,043,057	07/542,499	08/27/91
5,043,059	07/449,855	08/27/91
5,043,060	07/594,115	08/27/91
5,043,064	07/455,522	08/27/91
5,043,066	07/596,015	08/27/91
5,043,067	07/631,590	08/27/91
5,043,078	07/401,142	08/27/91
5,043,084	07/358,778	08/27/91
5,043,091	07/369,538	08/27/91
5,043,095	07/465,473	08/27/91
5,043,103	07/328,020	08/27/91
5,043,110	07/468,051	08/27/91
5,043,133	07/435,130	08/27/91
5,043,134	07/503,653	08/27/91
5,043,137	07/651,554	08/27/91
5,043,140	07/545,116	08/27/91
5,043,141	07/267,163	08/27/91
5,043,145	07/126,252	08/27/91
5,043,153	07/339,003	08/27/91
5,043,156	07/275,343	08/27/91
5,043,162	07/577,699	08/27/91
5,043,167	07/293,670	08/27/91
5,043,169	07/530,769	08/27/91
5,043,171	07/535,394	08/27/91
5,043,189	07/390,654	08/27/91
5,043,193	07/553,665	08/27/91
5,043,202	07/458,941	08/27/91
5,043,204	07/278,201	08/27/91
5,043,213	07/561,779	08/27/91
5,043,215	07/515,363	08/27/91
5,043,218	07/625,448	08/27/91
5,043,222	07/513,396	08/27/91
5,043,227	07/355,723	08/27/91
5,043,230	07/521,877	08/27/91
5,043,232	07/521,481	08/27/91
5,043,236	07/456,802	08/27/91
5,043,249	07/287,278	08/27/91
5,043,269	07/156,210	08/27/91
5,043,285	07/071,445	08/27/91
5,043,287	07/353;138	08/27/91
5,043,288	07/208,984	08/27/91
5,043,294	07/574,106	08/27/91
5,043,301	07/554,387	08/27/91
5,043,306	07/508,599	08/27/91
5,043,308	07/330,418	08/27/91
5,043,309	07/457,220	08/27/91
5,043,319	07/609,136	08/27/91
5,043,321	07/217,237	08/27/91
5,043,324	07/510,549	08/27/91
5,043,325	06/829,285	08/27/91
5,043,334	07/441,612	08/27/91
5,043,344	07/330,042	08/27/91
5,043,348	07/485,277	08/27/91
5,043,351	07/343,673	08/27/91
5,043,353	07/420,508	08/27/91
5,043,354	07/520,061	08/27/91
5,043,356	07/467,794	08/27/91
5,043,367	07/288,214	08/27/91
5,043,375	07/614,888	08/27/91
5,043,385	07/546,699	08/27/91
5,043,395	07/439,953	08/27/91
5,043,396	07/458,422	08/27/91
5,043,397	07/363,760	08/27/91
5,043,398	07/350,811	08/27/91
5,043,400	07/644,864	08/27/91
5,043,409	07/439,267	08/27/91
5,043,411	07/522,839	08/27/91
5,043,414	07/399,650	08/27/91
5,043,426	07/214,346	08/27/91
5,043,435	07/484,517	08/27/91
5,043,437	07/425,197	08/27/91
5,043,440	07/107,050	08/27/91
5,043,445	07/596,550	08/27/91
5,043,459	07/473,154	08/27/91
5,043,462	07/516,099	08/27/91
5,043,463	07/569,099	08/27/91
5,043,467	07/489,780	08/27/91
5,043,473	07/193,306	08/27/91
5,043,478	07/340,510	08/27/91
5,043,482	07/535,202	08/27/91
5,043,484	07/478,292	08/27/91
5,043,485	07/464,606	08/27/91
5,043,489	07/529,747	08/27/91
5,043,494	07/421,938	08/27/91
5,043,518	07/387,162	08/27/91
5,043.528	07/330,772	08/27/91
5,043,535	07/322,593	08/27/91
5,043,546	07/552,497	08/27/91
5,043,552	07/465,338	08/27/91
5,043,553	07/417,083	08/27/91
5,043,554	07/495,701	08/27/91
5,043,567	07/525,734	08/27/91
5,043,570	07/550,971	08/27/91
5,043,573	07/366,610	08/27/91
5,043,574	07/574,979	08/27/91
5,043,575	07/480,472	08/27/91
5,043,588	07/540,041	08/27/91
5,043,589	07/525,946	08/27/91
5,043,590	07/472,114	08/27/91
5,043,607	07/540,637	08/27/91
5,043,612	07/512,350	08/27/91
5,043,619	07/498,692	08/27/91
5,043,622	07/531,742	08/27/91
5,043,629	07/568,410	08/27/91
5,043,630	07/475,303	08/27/91
5,043,631	07/235,143	08/27/91
5,043,641	07/337,482	08/27/91
5,043,647	07/445,618	08/27/91
5,043,648	07/527,756	08/27/91
5,043,653	07/466,653	08/27/91
5,043,655	07/323,938	08/27/91

Patent Number	Serial Number	Issue Date
5,043,658	07/425,210	08/27/91
5,043,661	07/365,119	08/27/91
5,043,664	07/430,742	08/27/91
5,043,667	07/341,863	08/27/91
5,043,684	07/429,540	08/27/91
5,043,689	07/592,135	08/27/91
5,043,691	07/454,573	08/27/91
5,043,693	07/565,781	08/27/91
5,043,696	07/574,163	08/27/91
5,043,697	07/586,175	08/27/91
5,043,702	07/592,378	08/27/91
5,043,704	07/491,723	08/27/91
5,043,705	07/434,210	08/27/91
5,043,710	07/361,122	08/27/91
5,043,720	07/513,081	08/27/91
5,043,749	07/458,940	08/27/91
5,043,751	07/534,964	08/27/91
5,043,759	07/419,527	08/27/91
5,043,771	07/355,485	08/27/91
5,043,791	07/526,212	08/27/91
5,043,796	07/475,550	08/27/91
5,043,798	07/406,164	08/27/91
5,043,834	07/486,634	08/27/91
5,043,839	07/357,299	08/27/91
5,043,852	07/483,754	08/27/91
5,043,855	07/481,298	08/27/91
5,043,857	07/507,489	08/27/91
5,043,888	07/507,860	08/27/91
5,043,889	07/303,123	08/27/91
5,043,895	07/374,551	08/27/91
5,043,911	07/455,271	08/27/91
5,043,925	07/393,186	08/27/91
5,043,927	07/409,179	08/27/91
5,043,936	07/262,694	08/27/91
5,043,939	07/366,737	08/27/91
5,043,950	07/467,662	08/27/91
5,043,956	07/539,724	08/27/91
5,043,991	07/458,155	08/27/91
5,043,995	07/373,947	08/27/91
5,043,996	07/332,232	08/27/91
5,043,998	07/598,513	08/27/91
5,044,001	07/541,261	08/27/91
5,044,003	07/579,909	08/27/91

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,878,195, Re. S.N. 08/359,005, Dec. 19, 1994, Cl. 364/900, INSTRUCTION SEQUENCER FOR NETWORK STRUCTURE MICROPRESSOR, Christian Bocquet, Owner of Record: *Thomson Semiconducteurs, Paris, France,* Attorney or Agent: Gregory M. Howison, Ex. Gp.: 2315

5,143,949, Re. S.N. 08/482,964, June 15, 1995, Cl. 523/334. AQUEOUS BASED, STRIPPABLE COATING COMPOSITION AND METHOD, George W. Grogan, et. al., Owner of Record: *Graco Specialty Coatings Co., Dallas, Tex.,* Attorney or Agent: Charles W. Gaines, Ex. Gp.: 1502

5,237,996, Re. S.N. 08/518,355, Aug. 23, 1995, Cl. 128/642, ENDOCARDIAL ELECTRICAL MAPPING CATHETER, Lewis K. Waldman, et. al., Owner of Record: *Cardiac Pathways Corp., Sunnyvale, Calif.,* Attorney or Agent: Edward N. Bachand, Ex. Gp.: 3305

5,241,905, Re. S.N. 08/523,997, Sept. 5, 1995, Cl. 101/216, PRINTING UNIT WITH RELEASABLE BEARING CLAMP, Glenn A. Guaraldi, et. al., Owner of Record: *Heidelberg Harris, Inc., Dover, N.H.,* Attorney or Agent: Cary S. Kappel, Ex. Gp.: 3307

5,281,757, Re. S.N. 08/522,979, Sept. 1, 1995, Cl. 174/23R, MULTI-LAYER POWER CABLE WITH METAL SHEATH FREE TO MOVE RELATIVE TO ADJACENT LAYERS, Carlo Marin, et. al., Owner of Record: *Pirelli Cable Corp., Lexington, S.C.,* Attorney or Agent: L.P. Brooks, Ex. Gp.: 2109

5,334,803, Re. S.N. 08/525,174, Sept. 8, 1995, Cl. 174/52.4, SEMICONDUCTOR DEVICE AND METHOD OF PRODUCING THE SAME, Kem Yamamura, et. al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Jeffrey A. Wyand, Ex. Gp.: 2103

5,337,267, Re. S.N. 08/509,981, Aug. 1, 1995, Cl. 364/753, SQUARING CIRCUIT FOR BINARY NUMBERS, Osvaldo Colavin, Owner of Record: *SGS-Thomson Microelectronics S.A., Gentilly, France,* Attorney or Agent: James H. Morris, Ex. Gp.: 2306

5,368,171, Re. S.N. 08/521,628, Aug. 31, 1995, Cl. 134/147, DENSE FLUID MICROWAVE CENTRIFUGE, David P. Jackson, Owner of Record: *Inventor,* Attorney or Agent: Janice A. Sharp, Ex. Gp.: 3405

5,403,909, Re. S.N. 08/518,341, Aug. 23, 1995, Cl. 528/20, CATALYST FOR POLYCONDENSATION AND REDISTRIBUTION OF ORGANOSILOXANE, Slawomir Rubinsztajn, Owner of Record: *General Electric Co., New York, N.Y.,* Attorney or Agent: Boris Haskell, Ex. Gp.: 1501

5,404,682, Re. S.N. 08/509,878, Aug. 1, 1995, Cl. 52/165, ADJUSTABLE MOUNTING FOR A POST SYSTEM, Ronald West, Owner of Record: *Inventor,* Attorney or Agent: Calvin E. Thorpe, Ex. Gp.: 3504

5,415,213, Re. S.N. 08/516,161, Aug. 17, 1995, Cl. 150/160, LOCKING MOLDED GOLF CLUB HEADCOVER, Lawrence R. Diener, et. al., Owner of Record: *Sinclair & Rush, Inc., St. Louis, Mo.,* Attorney or Agent: Michael Kovac, Ex. Gp.: 2401

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,777,066, Reexam. No. 90/003,951, Sept. 6, 1995, Cl. 375/106, METHOD AND SYSTEM FOR SYNCHRONIZING THE TRANSMISSION OF DIGITAL DATA WHILE PROVIDING VARIABLE LENGTH FILLER CODE, David C. Nicholas, Owner of Record: *Iowa State University Research Foundation, Ames, Iowa,* Attorney or Agent: James J. Hill, Dawson, Tilton, Fallon & Lungmus, Chicago, Ill., George M. Cooper, Jones Tullar & Cooper, Arlington, Va., Ex. Gp.: 2614, Requester: Murata Business Systems, c/o Loeb & Loeb, Ted R. Rittmaster, Los Angeles, Calif.

4,066,855, Reexam. No. 90/003,952, Sept. 12, 1995, Cl. 200/005A, VENTED MEMBRANE-TYPE TOUCH PANEL, George E. Zenk, Owner of Record: *St. Clair Intellectual Property Consultants, Inc., Grosse Pointe, Mich.,* Attorney or Agent: Thomas W. Baumgarten, Jr., Grosse Pointe, Mich., Ex. Gp.: 2109, Requester: Sharp Corp., Osaka, Japan; Gunze Ltd., Kyoto, Japan; Touch Panel Systems Corp., Tokyo, Japan, c/o Terrell C. Birch, Birch Stewart Kolasch & Birch, Falls Church, Va.

4,217,940, Reexam. No. 90/003,960, Sept. 18, 1995, Cl. 141/098, FUNNEL HAVING AN INTEGRAL POURING SPOUT, Markham L. Wheeler, Owner of Record: *Inventor,* Attorney

or Agent: Caesar Rivise Bernstein Cohen & Pokotilow, Philadelphia, Pa., Ex. Gp.: 3105, Requester: Owner

4,569,280, Reexam. No. 90/003,950, Aug. 21, 1995, Cl. 099/538, PRODUCE WEDGER, Dominic D'Ambro, et. al., Owner of Record: *Le-Jo Enterprises, Inc., Malvern, Pa.,* Attorney or Agent: Frank J. Benasutti, Benasutti PC, Wynnewood, Pa., Ex. Gp.: 3405, Requester: Lawrence A. Steward, Baker & Daniels, Indianapolis, Ind.

4,676,598, Reexam. No. 90/003,953, Sept. 11, 1995, Cl. 359/212, MULTIPLE REFERENCE LASER BEAM APPARATUS, Theodore J. Markley, et. al., Owner of Record: *Spectra-Physics Laserplane, Inc., Dayton, Ohio,* Attorney or Agent: James F. Gottman, Killworth, Gottman, Hagan & Schaeff, Dayton, Ohio, Ex. Gp.: 2507, Requester: Owner

4,757,689, Reexam. No. 90/003,962, Sept. 21, 1995, Cl. 062/55.5, CRYOPUMP, AND A METHOD FOR THE OPERATION THEREOF, Werner Bachler, et. al., Owner of Record: *Leybold Aktiengesellschaft, Koln, Germany,* Attorney or Agent: Felfe & Lynch, New York, N.Y., Ex. Gp.: 3404, Requester: Owner

4,804,053, Reexam. No. 90/003,959, Sept. 15, 1995, Cl. 177/211, ROCKER PIN LOAD CELL, Kjell H. Nordstrom, Owner of Record: *Flintab AG, Vasteras, Sweden,* Attorney or Agent: Staas & Halsey, Washington, D.C., Ex. Gp. 2111, Requester: Carl Schenck AG, Darmstadt, Germany, c/o W. G. Fasse, St. Albans, Me.

4,822,658, Reexam. No. 90/003,966, Sept. 26, 1995, Cl. 428/095, CARPET BACKING AND INSTALLATION SYSTEM, Joseph R. Pacione, Owner of Record: *Joseph R. Pacione, Thornhill, Canada,* Attorney or Agent: Brian W. Gray, Blake Cassels & Graydon, Toronto, Ontario, Canada, Ex. Gp.: 1504, Requester: Owner and Too-Fast Systems, Richmond Hill, Canada

4,861,972, Reexam. No. 90/003,963, Sept. 22, 1995, Cl. 235/462, BAR CODE SCANNER AND METHOD OF PROGRAMMING, Randy D. Elliott, et. al., Owner of Record: *Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.,* Attorney or Agent: John A. Rafter, Lyon & Lyon, Los Angeles, Calif., Ex. Gp.: 2514, Requester: Owner

4,866,257, Reexam. No. 90/003,964, Sept. 22, 1995, Cl. 235/436, BAR CODE SCANNER AND METHOD, Randy D. Elliott, et. al., Owner of Record: *Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.,* Attorney or Agent: John A. Rafter, Jr., Lyon & Lyon, Los Angeles, Calif., Ex. Gp.: 2514, Requester: Owner

4,966,280, Reexam. No. 90/003,961, Sept. 13, 1995, Cl. 206/721, MULTIPLE-PLY ANTI-STATIC PAPERBOARD, Judson A. Bradford, Owner of Record: *Bradford Company, Holland, Mich.,* Attorney or Agent: Thomas W. Humphrey, Wood Herron & Evans, Cincinnati, Ohio, Ex. Gp.: 3208, Requester: Owner

4,996,770, Reexam. No. 90/003,965, Sep. 22, 1995, Cl. 028/897.34, METHOD OF ASSEMBLING A CONCRETE FORM BRACE, L. Scott McCracken, Owner of Record: *Wilian Holding Co., Des Moines, Iowa,* Attorney or Agent: Kent A. Henrink, Davis Hockenberg Wine Brown Koehn & Shors, Des Moines, Iowa, Ex. Gp.: 3408, Requester: Symons Corp., Des Planes, Ill., c/o Jeffry W. Smith, Marshall O'Toole Gerstein Murray & Borlin, Chicago, Ill.

5,054,957, Reexam. No. 90/003,957, Sept. 15, 1996, Cl. 404/041, PAVING BLOCK, John V. Johnson, II, Owner of Record: *The Britlin Co., Westerville, Ohio,* Attorney or Agent: Daniel N. Daisak, Porter Wright Morris & Arthur, Columbus, Ohio, Ex. Gp.: 3506, Requester: Owner

5,243,879, Reexam. No. 90/003,954, Sept. 11, 1995, Cl. 074/594, CRANK AXLE UNIT FOR A BICYCLE, Masashi Nagano, Owner of Record: *Shimano, Inc., Osaka, Japan,* Attorney or Agent: J. Deland Law Office, San Ramon, Calif., Ex. Gp.: 3502, Requester: Owner

5,264,619, Reexam. No. 90/003,955, Sept. 12, 1995, Cl. 560/256, ANTI-ANDROGENIC CYCLO AND BICYCLO ALKENES, Larry C. Ford, Owner of Record: *Cosmos Pharmaceutical Corp., Newport Beach, Calif.,* Attorney or Agent: Gabor L. Szekeres, Klein & Szekeres, Irvine, Calif., Ex. Gp.: 1214, Requester: Owner

5,347,381, Reexam. No. 90/003,956, Sept. 13, 1995, Cl. 359/078, FERROELECTRIC LIQUID CRYSTAL DISPLAY DEVICE WITH MOLECULES BETWEEN HAIRPIN AND LIGHTNING DEFECTS FOLLOWING THE LIGHTNING DEFECTS, Owner of Record: *Sharp Kabushiki Kaisha, Osaka, Japan,* Attorney or Agent: Dike Bronstein Roberts & Cushman, Boston, Mass., Ex. Gp.: 2515, Requester: Robert H. Fischer, Fitzpatrick Cella Harper & Scinto, New York, N.Y.

5,351,055, Reexam. No. 90/003,958, Sept. 15, 1995, Cl. 342/184, RADAR APPARATUS, Takumi Fujikawa, et. al., Owner of Record: *Furuno Electric Company, Ltd., Nishinomiya-shi, Japan,* Attorney or Agent: Michael K. Mutter, Birch Stewart Kolasch & Birch, Falls Church, Va., Ex. Gp.: 2201, Requester: Owner

---

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED AUGUST 14, 1995
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
101,108	71/078,505	11/10/1914
318,770	71/333,038	11/06/1934
318,775	71/352,584	11/06/1934
318,780	71/353,385	11/06/1934
318,781	71/353,386	11/06/1934
318,782	71/353,387	11/06/1934
318,842	71/352,532	11/06/1934
318,851	71/352,416	11/06/1934
318,861	71/352,245	11/06/1934
318,867	71/341,432	11/06/1934
318,870	71/352,682	11/06/1934
318,875	71/352,683	11/06/1934
318,891	71/347,581	11/06/1934
318,894	71/346,281	11/06/1934
318,900	71/351,966	11/06/1934
318,905	71/354,607	11/06/1934
318,959	71/353,700	11/06/1934
582,036	71/642,352	11/03/1953
597,779	71/656,346	11/09/1954
597,787	71/658,825	11/09/1954
597,799	71/657,088	11/09/1954
597,804	71/660,877	11/09/1954
597,810	71/661,067	11/09/1954
597,814	71/661,303	11/09/1954
597,817	71/663,624	11/09/1954
597,820	71/664,150	11/09/1954
597,822	71/664,600	11/09/1954
597,823	71/664,826	11/09/1954

Reg. Number	Serial Number	Reg. Date
597,832	71/647,439	11/09/1954
597,833	71/647,652	11/09/1954
597,841	71/656,496	11/09/1954
597,843	71/657,364	11/09/1954
597,848	71/658,888	11/09/1954
597,849	71/661,770	11/09/1954
597,870	71/656,497	11/09/1954
597,877	71/583,991	11/09/1954
597,882	71/624,824	11/09/1954
597,885	71/642,432	11/09/1954
597,890	71/647,550	11/09/1954
597,891	71/648,221	11/09/1954
597,898	71/653,732	11/09/1954
597,899	71/654,112	11/09/1954
597,901	71/656,824	11/09/1954
597,908	71/649,515	11/09/1954
597,910	71/651,504	11/09/1954
597,911	71/664,696	11/09/1954
597,933	71/657,697	11/09/1954
597,938	71/627,928	11/09/1954
597,946	71/653,450	11/09/1954
597,964	71/615,153	11/09/1954
597,969	71/648,739	11/09/1954
597,985	71/662,421	11/09/1954
597,991	71/654,609	11/09/1954
597,993	71/627,885	11/09/1954
597,997	71/631,339	11/09/1954
598,011	71/646,649	11/09/1954
598,012	71/654,142	11/09/1954
598,013	71/658,477	11/09/1954
598,015	71/659,282	11/09/1954
598,018	71/591,136	11/09/1954
598,032	71/657,331	11/09/1954
598,039	71/632,374	11/09/1954
598,041	71/657,348	11/09/1954
598,044	71/637,213	11/09/1954
988,466	72/423,125	07/16/1974
997,185	73/000,001	11/05/1974
997,186	73/000,809	11/05/1974
997,187	73/001,026	11/05/1974
997,189	73/002,546	11/05/1974
997,192	73/005,257	11/05/1974
997,193	73/006,123	11/05/1974
997,195	73/006,563	11/05/1974
997,200	73/007,190	11/05/1974
997,202	73/007,484	11/05/1974
997,206	73/008,461	11/05/1974
997,216	73/003,355	11/05/1974
997,218	73/004,318	11/05/1974
997,219	73/004,319	11/05/1974
997,220	73/004,366	11/05/1974
997,222	73/007,053	11/05/1974
997,223	73/007,450	11/05/1974
997,224	73/007,483	11/05/1974
997,226	73/008,245	11/05/1974
997,227	73/003,638	11/05/1974
997,231	73/012,080	11/05/1974
997,232	73/001,438	11/05/1974
997,240	73/007,812	11/05/1974
997,258	73/009,578	11/05/1974
997,260	73/010,785	11/05/1974
997,265	73/011,249	11/05/1974
997,267	73/011,278	11/05/1974
997,269	73/011,945	11/05/1974
997,271	73/009,237	11/05/1974
997,276	73/004,883	11/05/1974
997,277	73/009,029	11/05/1974
997,279	73/012,115	11/05/1974
997,282	73/000,898	11/05/1974
997,284	73/006,804	11/05/1974
997,287	73/013,108	11/05/1974
997,296	73/012,215	11/05/1974
997,303	73/008,073	11/05/1974
997,304	73/009,741	11/05/1974
997,305	73/010,102	11/05/1974
997,307	73/018,811	11/05/1974
997,309	73/006,407	11/05/1974
997,310	73/016,087	11/05/1974
997,313	73/002,140	11/05/1974
997,314	73/002,142	11/05/1974
997,317	73/006,179	11/05/1974
997,318	73/008,382	11/05/1974
997,322	73/014,286	11/05/1974
997,326	73/001,211	11/05/1974
997,332	73/008,401	11/05/1974
997,336	73/011,760	11/05/1974
997,338	73/012,243	11/05/1974
997,343	73/003,622	11/05/1974
997,346	73/000,715	11/05/1974
997,348	73/007,000	11/05/1974
997,352	73/008,624	11/05/1974
997,353	73/008,674	11/05/1974
997,354	73/008,675	11/05/1974
997,355	73/009,493	11/05/1974
997,359	73/005,693	11/05/1974
997,362	73/013,438	11/05/1974
997,365	73/008,148	11/05/1974
997,367	73/013,612	11/05/1974
997,369	73/014,508	11/05/1974
997,372	73/002,689	11/05/1974
997,374	73/004,793	11/05/1974
997,375	73/005,822	11/05/1974
997,379	73/008,750	11/05/1974
997,380	73/009,164	11/05/1974
997,383	73/010,593	11/05/1974
997,392	73/005,697	11/05/1974
997,395	72/393,021	11/05/1974
997,396	72/427,032	11/05/1974
997,397	72/427,847	11/05/1974
997,400	72/451,752	11/05/1974
997,405	72/457,783	11/05/1974
997,406	72/444,854	11/05/1974
997,407	72/458,754	11/05/1974
997,409	72/415,896	11/05/1974
997,416	72/434,494	11/05/1974
997,421	72/449,431	11/05/1974
997,422	72/450,458	11/05/1974
997,423	72/455,669	11/05/1974
997,428	72/463,290	11/05/1974
997,432	72/465,241	11/05/1974
997,436	72/465,743	11/05/1974
997,437	72/317,107	11/05/1974
997,444	72/464,547	11/05/1974
997,445	72/406,061	11/05/1974
997,458	72/437,626	11/05/1974
997,461	72/458,267	11/05/1974
997,463	72/462,405	11/05/1974
997,464	72/353,346	11/05/1974
997,465	72/393,641	11/05/1974
997,468	72/434,037	11/05/1974
997,470	72/452,056	11/05/1974
997,471	72/457,166	11/05/1974
997,472	72/460,186	11/05/1974
997,473	72/460,551	11/05/1974
997,476	72/432,965	11/05/1974
997,477	72/432,970	11/05/1974
997,481	72/297,600	11/05/1974
997,483	72/402,787	11/05/1974
997,484	72/406,848	11/05/1974
997,485	72/406,953	11/05/1974
997,493	72/444,409	11/05/1974
997,494	72/446,748	11/05/1974
997,498	72/459,715	11/05/1974
997,499	72/460,457	11/05/1974
997,500	72/461,930	11/05/1974
997,502	72/466,292	11/05/1974
997,504	72/434,738	11/05/1974
997,507	72/455,886	11/05/1974
997,520	72/423,964	11/05/1974
997,524	72/453,197	11/05/1974
997,525	72/454,852	11/05/1974
997,526	72/455,228	11/05/1974
997,527	72/455,429	11/05/1974
997,530	72/459,810	11/05/1974
997,531	72/459,153	11/05/1974
997,532	72/461,586	11/05/1974

Reg. Number	Serial Number	Reg. Date
997,536	72/463,626	11/05/1974
997,541	72/465,737	11/05/1974
997,542	72/466,389	11/05/1974
997,548	72/410,542	11/05/1974
997,549	72/432,707	11/05/1974
997,552	72/443,916	11/05/1974
997,553	72/444,234	11/05/1974
997,554	72/444,375	11/05/1974
997,556	72/450,570	11/05/1974
997,558	72/454,427	11/05/1974
997,559	72/455,641	11/05/1974
997,561	72/465,702	11/05/1974
997,562	72/466,321	11/05/1974
997,564	72/433,899	11/05/1974
997,566	72/466,708	11/05/1974
997,581	72/432,964	11/05/1974
997,583	72/456,783	11/05/1974
997,588	72/443,823	11/05/1974
997,597	72/442,905	11/05/1974
997,598	72/446,028	11/05/1974
997,599	72/458,649	11/05/1974
997,600	72/458,887	11/05/1974
997,602	72/460,729	11/05/1974
997,603	72/465,068	11/05/1974
997,607	72/394,624	11/05/1974
997,608	72/403,258	11/05/1974
997,612	72/452,097	11/05/1974
997,613	72/454,057	11/05/1974
997,614	72/454,471	11/05/1974
997,625	72/410,128	11/05/1974
997,626	72/414,526	11/05/1974
997,628	72/440,801	11/05/1974
997,629	72/447,794	11/05/1974
997,635	72/440,775	11/05/1974
997,637	72/439,692	11/05/1974
997,638	72/446,702	11/05/1974
997,639	72/447,121	11/05/1974
997,642	72/450,729	11/05/1974
997,648	72/458,404	11/05/1974
997,654	72/465,878	11/05/1974
997,658	72/463,807	11/05/1974
997,659	72/464,723	11/05/1974
997,660	72/464,863	11/05/1974
997,664	72/466,501	11/05/1974
997,665	72/466,940	11/05/1974
997,668	72/461,741	11/05/1974
997,675	72/463,172	11/05/1974
997,676	72/465,242	11/05/1974
997,690	72/465,962	11/05/1974
997,691	72/392,942	11/05/1974
997,693	72/464,709	11/05/1974
997,694	72/464,711	11/05/1974
997,695	72/465,729	11/05/1974
997,696	72/423,855	11/05/1974
997,699	72/445,061	11/05/1974
997,706	72/460,060	11/05/1974
997,707	72/457,886	11/05/1974
997,708	72/463,335	11/05/1974
997,710	72/463,645	11/05/1974
997,711	72/463,664	11/05/1974
997,712	72/463,900	11/05/1974
997,713	72/464,290	11/05/1974
997,716	72/465,566	11/05/1974
997,717	72/465,826	11/05/1974
997,721	72/411,115	11/05/1974
997,725	72/437,207	11/05/1974
997,728	72/445,884	11/05/1974
997,732	72/456,372	11/05/1974
997,733	72/458,108	11/05/1974
997,734	72/459,941	11/05/1974
997,736	72/462,482	11/05/1974
997,743	72/464,293	11/05/1974
997,751	72/458,511	11/05/1974
997,755	72/464,621	11/05/1974
997,761	72/437,627	11/05/1974
997,764	72/442,372	11/05/1974
997,771	73/005,719	11/05/1974
997,772	73/008,597	11/05/1974
997,773	73/017,949	11/05/1974
997,775	73/003,005	11/05/1974
997,776	72/444,917	11/05/1974
997,780	72/414,245	11/05/1974
997,781	72/410,743	11/05/1974
997,785	72/460,425	11/05/1974
997,787	72/416,823	11/05/1974
997,790	72/435,296	11/05/1974
997,791	72/438,059	11/05/1974
997,796	72/458,387	11/05/1974
997,800	72/458,636	11/05/1974
997,805	72/458,502	11/05/1974
997,808	72/457,827	11/05/1974

Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office who have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before December 22, 1995.

Druzbick, Carol L., 1305 Belle View Blvd., Alexandria, Va. 22307
Edmonds, Warren S., 1944 Rainbow Ct., Woodbridge, Va. 22192
Edwards, Antony C., 1495 Appleridge Rd., Kelowna, B.C., V1Y 3A5, Canada

October 12, 1995 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Legal Analysis to Support Proposed Examination Guidelines for Computer-Implemented Inventions

October 3, 1995

Patent and Trademark Office
United States Department of Commerce

TABLE OF CONTENTS

I. Introduction [Guidelines § I.A.] .....

II. Determine What Applicant Has Invented and Is Seeking to Patent [Guidelines § I.B.1.] .....

A. Identify and Understand the Practical Utility Asserted for the Invention [Guidelines § I.B.1.(a)] .....

B. Review the Detailed Disclosure and Specific Embodiments of the Invention to Determine What the Applicant Has Invented [Guidelines § I.B.1(a)] .....

C. Analyze the Claims [Guidelines § I.B.1.(b)] .....

III. Assess Claimed Invention for Compliance with 35 U.S.C. § 101 [Guidelines § I.B.1.(c)] .....

A. Determine Whether The Invention is "Useful" .....

B. Classify the Invention as to Its Proper Statutory Category

1. Non-Statutory Subject Matter [Guidelines § I.B.1.(c)(i) & (ii)]

(a) "Data Structures" Per Se or Computer Programs Per Se

(b) Non-Functional Information

(c) Natural Phenomena Such as Electricity and Magnetism

2. Statutory Subject Matter

(a) Statutory Products

(i) Product Claims—Claims Directed to Machines and Manufactures

(ii) Claims that Encompass Any Machine or Manufacture Embodiment of a Process

(b) Statutory Processes [Guidelines § I.B.1.(c)(iii)]

(i) Appropriate Subject Matter for Manipulation Steps of a Process

(ii) Transformation or Reduction to a Different State or Thing

(iii) Examples of Statutory Computer-Implemented Processes

3. Non-Statutory Processes

(a) Mathematical Algorithm That Defines a Law of Nature or Natural Phenomenon or Describes an Abstract Idea

(b) Evaluation of Certain Language Related to Mathematical Operation Steps of a Process

(i) Intended Use or Field of Use Statements

(ii) Necessary Antecedent Step to Performance of A Mathematical Operation or Independent Limitation on a Claimed Process

(iii) Post-Mathematical Operation Step Uses Solution or Merely Conveys Result of Operation

(c) Manipulation of Abstract Ideas Without A Practical Application

IV. Issues Related to Compliance with Section 112, First and Second Paragraphs [Guidelines § I.B.2.]

A. Specification Fails to Show How to Make or Use Programmed Computer Element of Invention [Guidelines § I.B.2.(b)]

B. Programmed Computer Is Defined As Composite of Functional Elements

C. Elements of a Machine Defined Using Means Plus Function Language [Guidelines § I.B.2.(a) & (b)]

D. Claim Does Not Define Applicant's Invention [Guidelines § I.B.2.(a)]

E. Claim Defined Using Only Computer Program Code [Guidelines § I.B.2.(a)]

V. Issues Related to Compliance with § 103 [Guidelines § I.B.3.]

VI. Conclusion

Legal Analysis to Support Proposed Examination Guidelines for Computer-Implemented Inventions

I. Introduction [Guidelines § I.A.]

The Office has developed *Proposed Examination Guidelines for Computer-Implemented Inventions*[1] and this legal analysis (collectively, the "guidelines") to assist Office personnel in the examination of applications drawn to computer-implemented inventions. The guidelines are based on the Office's current understanding of the law, and represent the official policy of the Patent and Trademark Office. Office personnel are to rely on these guidelines in the event of any inconsistent treatment of issues between these guidelines and any earlier provided guidance from the Office.

The guidelines alter the procedures Office personnel shall employ to examine applications drawn to computer-implemented inventions.

The guidelines also clarify the Office's position on certain patentability standards related to this field of technology. The positions set forth in these guidelines are believed to be fully consistent with the binding precedent of the Supreme Court, and the Federal Circuit and its predecessor courts.

The Freeman-Walter-Abele[2] test, while of limited value, may still be relied upon in analyzing claims directed solely to a process for solving a mathematical algorithm. "Business methods" are to be analyzed the same way as any other process.

The appendix includes the proposed guidelines and a graphic overview of how Office personnel will conduct an examination to determine statutory subject matter.

II. Determine What Applicant Has Invented and Is Seeking to Patent [Guidelines § I.B.1.]

It is essential that patent applicants obtain a prompt yet complete examination of their applications. Thus, Office personnel must raise any issue that may affect patentability in the initial action on the merits. Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement of patentability in the initial review of the application, even if one or more claims is found to be deficient with respect to one statutory requirement. Deficiencies should be explained clearly, particularly when they serve as a basis for a rejection. Where possible, Office personnel should indicate how rejections may be overcome and problems resolved. A failure to follow this approach can lead to unnecessary delays in the prosecution of the application.

Prior to focusing on any specific statutory requirements, Office personnel must begin examination by determining what, precisely, the applicant has invented and is seeking to patent,[3] and how the claims relate to and define that invention. Consequently, Office personnel will no longer begin examination by determining if a claim recites a "mathematical algorithm." Rather, they will review the complete specification, including the detailed description of the invention, any specific embodiments that have been disclosed, the claims and the specific utility that has been asserted for the invention.

A. Identify and Understand the Practical Utility Asserted for the Invention [Guidelines § I.B.1.(a)]

The subject matter sought to be patented must be a "useful" process, machine, manufacture or composition of matter. Accordingly, a complete disclosure should contain some indication of why the applicant believes the claimed invention is "useful." This "usefulness" of the invention is called the "specific" or "practical" utility of the invention. Specific or practical utility is simply a shorthand way of attributing "real world" value to the claimed subject matter, i.e., assuring there is some benefit to the public.[4] An invention that has some practical application satisfies the utility requirement.[5]

The applicant is in the best position to explain why an invention is believed useful. Office personnel should therefore focus their efforts on identifying statements made in the specification that identify a practical application for the invention. Office personnel should rely on such statements throughout the examination when assessing the invention for compliance with all statutory criteria. Deficiencies under the utility requirement will be rare, however. Further guidance in evaluating an asserted specific utility for compliance with § 101 is provided below and in the Utility Examination Guidelines.[6] If the applicant asserts a practical utility for the invention, Office personnel should review the entire disclosure to determine the features necessary to accomplish the asserted practical utility.

B. Review the Detailed Disclosure and Specific Embodiments of the Invention to Determine What the Applicant Has Invented [Guidelines § I.B.1(a)]

The written description will provide the clearest explanation of the applicant's invention, by exemplifying the invention, explaining how it relates to the prior art and by explaining the relative significance of various features of the invention. Accordingly, Office personnel should begin their evaluation of a computer-implemented invention as follows:

— determine what the programmed computer does when it performs the processes dictated by the software (i.e., the *functionality* of the programmed computer);[7]

— determine how the computer is to be configured to provide that functionality (i.e., what elements constitute the programmed computer and how are those elements to be configured to provide the specified functionality); and

— if applicable, determine the *relationship* of the programmed computer to other subject matter that constitutes the invention (e.g., machines, devices, materials, or process steps other than those that are part of or performed by the programmed computer).[8]

Patent applicants can assist the Office by preparing applications that clearly set forth these aspects of a computer-implemented invention.

C. Analyze the Claims [Guidelines § I.B.1.(b)]

The claims define the property rights provided by a patent, and thus require careful scrutiny. The goal of claim analysis is to identify the boundaries of the protection sought by the applicant and to understand how the claims relate to and define what the applicant has indicated is the invention. Office personnel must analyze the language of a claim *before* determining if the claim complies with each statutory requirement for patentability.

Office personnel should begin claim analysis by identifying and evaluating each claim element. For processes, the claim elements will define steps or acts to be performed. For products, i.e., machines and articles of manufacture, the claim elements will define discrete physical structures. The discrete physical structures may be comprised of hardware or a combination of hardware and software.

As provided in the guidelines, Office personnel are to correlate each claim element to that portion of the disclosure that describes the claim element. This is to be done in all cases, i.e., whether or not the claimed invention is defined using means or step plus function language. The correlation step will ensure that Office personnel clearly understand the meaning and scope of each claim limitation.

The subject matter of a properly construed claim is defined by the terms that limit its scope, and it is this subject matter that must be examined. As a general matter, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. Language that *suggests or makes optional* but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim element.

Office personnel must rely on the applicant's disclosure to properly determine the meaning of terms used in the claims.[9] An applicant is entitled to be his or her own lexicographer, and in many instances will provide an explicit definition for certain terms used in the claims. Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. Office personnel should determine if the original disclosure provides a definition consistent with the applicant's assertions.[10] If the applicant asserts that a term has a meaning that conflicts with the term's art-accepted meaning, Office personnel should encourage the applicant to amend the claim to better reflect what applicant intends to claim as the invention.

Office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure.[11] With the exception of claim elements defined in means or step plus function terminology, positive limitations on the scope of a claim cannot be read into the claims based on comments or explanations provided in the disclosure.[12] While it is appropriate to use the specification to determine what applicant intended a term to mean, a positive limitation from the specification cannot be read into a claim that does not impose that limitation. A broad interpretation of the claims by the Office will reduce the possibility that the claim, when issued, will be interpreted more broadly than is justified or intended. An applicant always has the opportunity to amend the claims during prosecution to better reflect the intended scope of the claim.

Finally, when evaluating the scope of a claim, *every* limitation in the claim must be considered.[13] Office personnel may not dissect a claimed invention into discrete elements and then evaluate the elements *in isolation*. Instead, each claimed element of the invention must be considered in the context of the claim as a whole.

III. Assess Claimed Invention for Compliance with 35 U.S.C. § 101 [Guidelines § I.B.1.(c)]

As the Supreme Court has held, Congress chose the expansive language of § 101 so as to include "anything under the sun that is made by man." Accordingly, § 101 of title 35, United States Code, provides:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.[15]

As cast, § 101 defines four categories of inventions that Congress deemed to be the appropriate subject matter of a patent; namely, processes, machines, manufactures or compositions of matter. The latter three categories define "things" while the process category defines inventions that consist of "actions" (i.e., a series of steps or acts to be performed).[16]

Federal courts have held that § 101 does have certain limits. First, the phrase "anything under the sun that is made by man" is limited by the text of § 101, meaning that one may only patent something that is a machine, manufacture, composition of matter or a process.[17] Second, § 101 requires that the subject matter sought to be patented be a "useful" invention. Accordingly, a complete definition of the scope of § 101, reflecting Congressional intent, is that any new and useful process, machine, manufacture or composition of matter under the sun that is made by man is the proper subject matter of a patent. Subject matter *not* within one of the four statutory invention categories or which is not "useful" in a patent sense, accordingly, is not eligible to and cannot be patented.

The subject matter courts have found to be outside the four statutory categories of invention is limited to abstract ideas, laws of nature and natural phenomena. While this is easily stated, determining whether an applicant is seeking to patent an abstract idea, a law of nature or a natural phenomenon has proven to be challenging. These three exclusions recognize that subject matter that is not a *practical application or use* of an idea, a law of nature or a natural phenomenon is not patentable.[18]

Courts have expressed a concern over "preemption" of ideas, law of natures or natural phenomena.[19] The concern over preemption serves to bolster and justify the prohibition against the patenting of such subject matter. Such concerns are only relevant to claiming a scientific truth or principle. Thus, a claim to an "abstract" idea is non-statutory because it does not represent a practical application of the idea, not because it would preempt the idea.

A. Determine Whether The Invention is "Useful"

To be patentable, an invention must be "useful" (i.e., it must have a practical application). The purpose of this requirement is to limit patent protection to inventions that possess a certain level of "real world" value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research.[20] The utility of an invention must be within the "technological" arts.[21] This requirement can be discerned from the variously phrased prohibitions against the patenting of abstract ideas, laws of nature or natural phenomenon. Courts have indicated that any technological or utilitarian purpose may serve as an appropriate utility.[22]

Office personnel should confirm that the utility asserted for an invention is a practical application of the invention. If the utility of an "invention" is only as an object of philosophical

inquiry or to be appreciated in terms of its literary or artistic value, the claimed invention should be rejected under § 101.

Additionally, Office personnel have struggled with claims directed to methods of doing business. A method of doing business is to be treated like any other process.

B. Classify the Invention as to Its Proper Statutory Category

To properly assess compliance with the statutory invention requirements of § 101, Office personnel should classify each specifically claimed invention into *one* statutory or non-statutory category. If the subject matter falls into a non-statutory category, that should not preclude complete examination of the application for all other conditions of patentability. This classification is *only an initial finding* at this point in the examination process that will be again assessed after the examination for compliance with §§ 112, 102 and 103 and before issuance of any Office action.

1. Non-Statutory Subject Matter [Guidelines § I.B.1.(c)(i) & (ii)]

Claims that are clearly non-statutory are those that define:

— a "data structure" per se or computer program per se, i.e., information rather than a computer-implemented process or specific machine or computer readable memory manufacture;

— a compilation or arrangement of non-functional information or a known machine-readable storage medium that is encoded with such information;

— natural phenomena such as electricity and magnetism.

Claims in this form are indistinguishable from abstract ideas, laws of nature and natural phenomena and may not be patented. Claims to processes that do nothing more than solve mathematical problems or manipulate abstract ideas or concepts are more complex to analyze and are addressed below. See section 3.

(a) "Data Structures" Per Se or Computer Programs Per Se

Computers manage data by arranging the data in a particular order or sequence. The relationship that exists among the ordered data elements (i.e., the individual facts or data) is called a "data structure." Data structures in this sense are not statutory products because they are not physical "things" nor are they statutory processes, as they are not "acts" being performed.[23] In other words, when defined without any physical structure, a "data structure" is nothing more than *information* that explains a relationship that exists among ordered data, and therefore is non-statutory. In contrast, a memory circuit whose structure represents a *practical application or* use of a data structure is a statutory manufacture. Accordingly, it is important to distinguish claims that define information per se from claims that define statutory inventions that are based on or use non-statutory information.

Similarly, computer programs per se are not physical "things," nor are they statutory processes, as they are not "acts" being performed. In contrast, a computer process that is implemented using a computer program, a specific computer reconfigured by a computer program, or a memory circuit whose structure is defined by a computer program are statutory.

If a computer program is recited in a claim, Office personnel should determine if the computer program is being used to *describe* the physical structure of a manufacture or machine, or steps to be performed by a computer, or is intended to be the object of the patent, *per se*.

If it is clear that the claim uses the computer program elements to define actions to be performed by a computer, Office personnel should treat the claim as a process claim. If the computer program elements are recited in conjunction with a physical structure, such as a computer memory, the claim should be treated as a product claim. If the claimed subject matter cannot be treated as a process and does not have any *physical* structure, then it is non-statutory "information."

If an applicant challenges the Office's classification of a claim containing computer program elements without any physical structure as a process rather than a product, the claim should be rejected under § 101. Office personnel should also object to the specification under 37 CFR 1.71(b) if such an assertion is made, as the complete invention contemplated by the applicant has not been cast precisely as being an invention within one of the statutory categories.

(b) Non-Functional Information

The term "information" is the "communication of data." It is also used to mean signals representing data. It is the latter definition that is used in these guidelines.

Certain information, such as music, literature, art, and photographs, as well as mere facts or data,[24] cannot impart functionality to a computer. Such "information" is not a process, machine, manufacture or composition of matter.

The policy that precludes the patenting of non-functional data would be easily frustrated if the same data could be patented as an article of manufacture. For example, music is commonly sold to consumers in the format of a compact disc. In such cases, the known compact disc acts as nothing more than a carrier for non-functional data.

The non-functional content (e.g., words, images, or other information) cannot provide the practical utility for the manufacture. Function-imparting information is necessary to create a functional and useful physical manufacture (e.g., a computer memory encoded with data that causes a computer to function in a particular manner). If the utility for the encoded medium is dependent upon a human appreciating the artistic or other value of the information content, the claimed invention should be rejected under § 101.

(c) Natural Phenomena Such as Electricity and Magnetism

Claims that recite nothing but the physical characteristics of a form of energy, such as a specific radio frequency, voltage, or the strength of a magnetic field, define energy or magnetism, *per se*, and as such are non-statutory. A claim directed to a natural phenomenon such as energy or magnetism, which does not recite the practical application of that phenomenon in a process or a product, is to be rejected under § 101.

2. Statutory Subject Matter

(a) Statutory Products

If a claim defines a useful machine or manufacture by identifying the physical structure of the machine or manufacture in terms of its hardware or hardware and software combination, it defines a statutory product.[25]

(i) Product Claims—Claims Directed to Machines and Manufactures

Claims that define a computer-implemented invention as a specific machine or article of manufacture must define the physical structure of the machine or manufacture in terms of its hardware and associated functional software. The applicant may define the physical structure of a programmed computer or its hardware or software components in any manner that can be clearly understood by a person skilled in the relevant art. Generally a claim drawn to a particular programmed computer should identify the elements of the computer and indicate how those elements are configured in either hardware or a combination of hardware and software.

A computer-related "manufacture" will typically be a component of a specific computer, such as a logic circuit or a computer memory. A manufactured computer memory containing a physical structure representing encoded computer-readable instructions, such as a computer program, is a statutory article of manufacture because the encoded computer-readable instructions give the manufactured memory a new form or structure, and new qualities or properties (e.g., the ability to cause a computer to function in a particular, predefined manner).

To adequately define a computer memory with a particular functionality, the claim must identify the physical characteristics of the memory (e.g., a logic circuit or a storage medium), and the functionality of the memory. A computer memory may be defined in a claim as:

— a logic circuit that results when a programmed computer performs a series of steps dictated by a computer program;[26]

— a memory defined by its functional and/or structural characteristics;[27] or

— a memory whose physical structure is defined by the act of storing computer-executable program code on the memory.

(ii) Claims that Encompass Any Machine or Manufacture Embodiment of a Process

A claim cast in product claim format that, when read in light of the specification, encompasses *any* computer implementation of a process should be examined on the basis of the underlying process. Such a claim can be recognized as it will:

— define the physical characteristics of a computer or computer component exclusively as functions or steps to be performed on or by a computer, and

— encompass *any* product in the stated class (e.g., computer, computer-readable memory) *configured in any manner* to perform that process.

The following hypotheticals illustrate this distinction. Assume two applicants present a claim to the following process:

A process for determining and displaying the structure of a chemical compound comprising:

(a) solving the wavefunction parameters for the compound to determine the structure of a compound;

(b) displaying the structure of the compound determined in step (a).

In addition, each applicant claims an apparatus, and provides the noted disclosure to support the claims.

	Applicant A	*Applicant B*
Apparatus Claim	A computer system for determining the three dimen sional structure of a chemical compound comprising: (a) means for determining the three dimensional structure of a compound; (b) means for creating and displaying an image representing a three-dimensional perspective of the compound.	A computer system for determining the three dimen sional structure of a chemical compound comprising: (a) means for determining the three dimensional structure of a compound; (b) means for displaying the structure of the compound determined in step (a).
Disclosure	The disclosure describes computer program code segments that are to be employed in configuring a general purpose microprocessor to create specific logic circuits. These circuits are indicated to be the "means" corresponding to the claimed means elements.	This disclosure states that it would be a matter of routine skill to select an appropriate computer system and implement the claimed process on that computer system. No specific disclosure is made regarding the two "means" elements recited in the claim (i.e., no computer program or logic circuit is described that can perform the indicated functions). The disclosure does provide an explanation of how to solve the wavefunction equations of a chemical compound, and indicates that the solutions of those wavefunction equations can be employed to determine the physical structure of the corresponding compound.
Result	Claim defines specific computer, patentability stands independently from process claim.	Claim encompasses any computer embodiment of process claim; patent ability stands or falls with process claim.
Explanation	Disclosure identifies the specific machine capable of performing the indicated functions.	In this scenario, the applicant has not provided any information that can serve to distinguish the "implementation" of the process on a computer from the factors that will govern the patentability determination of the process per se. As such, the patentability of this apparatus claim will stand or fall with that of the process claim.

Office personnel are reminded that finding a product claim to encompass any product embodiment a "process" invention simply means that the Office will *presume* that the product claim encompasses any product in the stated class that performs the specified set of functions. Because this is *interpretive* and *nothing more*, it does not provide any information as to the *patentability* of the applicant's underlying invention or the product claim.

If a claim is found to encompass any product embodiment of the underlying process, and if the underlying process is statutory, the product claim should be classified as a statutory product. By the same token, if the underlying process invention is found to be non-statutory, Office personnel should classify the "product" claim as a "non-statutory product." If the product claim is classified as being a non-statutory product on the basis of the underlying process, Office personnel should emphasize that they have considered all claim limitations and are basing their finding on the analysis of the underlying process.

(b) Statutory Processes [Guidelines § I.B.1.(c)(iii)]

A claim that requires one or more acts to be performed defines a process. Not all processes, however, are processes that fall within the definition of a statutory process under § 101. A *statutory* process is a series of one or more acts that manipulate physical matter or energy resulting in some form of a physical transformation.[28] Accordingly, a claimed process is statutory if it:

— manipulates some form of physical matter or energy; and

— results in a transformation or reduction of the subject matter manipulated into a different state or into a different thing to achieve a practical application.

(i) Appropriate Subject Matter for Manipulation Steps of a Process

Consistent with the expansive Congressional intent behind § 101, Office personnel shall consider any form of physical "matter" or "energy" to be the appropriate subject matter of the manipulation steps of a process. Importantly, the subject matter manipulated by a process does not have to be a physical object; it may be "intangible subject matter representative of or constituting physical activity or objects."[29] Thus, an electrical signal representing data corresponding to a physical object or

physical activity is appropriate subject matter for manipulation by a process. If the "acts" of a process manipulate only numbers, abstract concepts or ideas, the acts are not being applied to appropriate subject matter. Thus, a process consisting solely of mathematical operations does not manipulate appropriate subject matter and thus cannot constitute a statutory process.

(ii) Transformation or Reduction to a Different State or Thing

To be statutory, the claimed process when practiced must *physically transform* the subject matter manipulated—something must happen other than manipulating concepts or converting numbers to different numbers. The required transformation can take place during any step of the process (e.g., if a process requires three "acts" and only the last "act" transforms the subject matter to a different state or thing, a sufficient transformation has occurred). If the process does not result in any physical transformation, it is not statutory.

(iii) Examples of Statutory Computer-Implemented Processes

Three exemplary computer-performed processes that fully satisfy the requirements of § 101:

— A process that requires physical acts to be performed independent of the steps to be performed by a programmed computer, where those acts involve the manipulation of tangible physical objects and result in the object having a different physical attributes or structure;[30]

— A process that requires acts to be performed *on* the physical components of a computer (i.e., the process manipulates the components of the computer rather than data representing something external to the computer system) and the effect of the process is that the computer *operates* differently (such as an operating system process); and

— A process that requires acts to be performed *by* a computer on data in the form of an electrical or magnetic signal, where the data represents a physical object or activities external to the computer system (e.g., physical characteristics of a chemical compound or a person's heart rate), and where the process causes some transformation of the physical but intangible representation of the physical object or activities.[31]

3. Non-Statutory Processes

In practical terms, claims define non-statutory processes if they:

— consist solely of mathematical operations (i.e., a "mathematical algorithm"); or

— simply manipulate abstract ideas without some practical application (e.g., a bid, a bubble hierarchy).

(a) Mathematical Algorithm That Defines a Law of Nature or Natural Phenomenon or Describes an Abstract Idea

A process that consists solely of mathematical operations is non-statutory. Mathematical algorithms do not manipulate physical matter and cannot cause a physical effect. Courts have, however, recognized a distinction between types of mathematical algorithms, namely, some *define* a "law of nature" in mathematical terms and others merely *describe* an "abstract idea."

Certain mathematical algorithms have been held non-statutory because they represent a mathematical definition of a law of nature or a natural phenomenon. For example, the formula $E=mc^2$ is a "law of nature"—it defines a "fundamental scientific truth" (i.e., the relationship between energy and mass). To comprehend how the law of nature relates to any object, one invariably has to perform certain steps (e.g., multiplying a number representing the mass of an object by the square of a number representing the speed of light). If an applicant defines a process to consist solely of those steps that one must follow to solve the mathematical representation of the law of nature, the "process" is indistinguishable from the law of nature and would "preempt" the law of nature. A patent cannot be granted on such a process.

Other mathematical algorithms have been held non-statutory because they merely describe an abstract idea. An "abstract idea" may simply be *any* sequence of mathematical operations that are combined to solve a mathematical problem. The concern addressed by holding such subject matter non-statutory is that the mathematical operations merely describe an idea and do not define a process that represents a practical application of the idea.

Accordingly, when a claim is found to define non-statutory subject matter because of a mathematical algorithm, it is important to determine whether the subject matter is a law of nature or natural phenomenon or abstract idea. A rejection under § 101 should indicate the type of deficiency relied upon to support the rejection.

(b) Evaluation of Certain Language Related to Mathematical Operation Steps of a Process

(i) Intended Use or Field of Use Statements

Claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim. Such language often will be presented in the preamble of claim, but may appear elsewhere in the body of the claim. Intended or field of use language appearing in the preamble will in most instances not limit the claim scope, and as such, Office personnel should be careful to properly interpret such language. For example, a claimed mathematical process "to be used in seismic prospecting..." is not limited by the seismic prospecting use statement (i.e., none of the steps were explicitly or implicitly limited to application to seismic prospecting activities).[33] In such a case, Office personnel should identify the claim language that constitutes the intended use or field of use statements and provide the basis for their findings. This will shift the burden to applicant to demonstrate otherwise.

(ii) Necessary Antecedent Step to Performance of A Mathematical Operation or Independent Limitation on a Claimed Process

In rare situations, certain acts of "collecting" or "selecting" data for use in a process consisting of one or more mathematical operations will not further limit a claim beyond the specified mathematical operation step(s). Such acts "merely determine values for the variables used in the mathematical operations used in making the calculations."[34] In other words, the acts are dictated by nothing other than the performance of a mathematical operation.[35]

If a claim requires acts to be performed to *create* data that will then be used in a process representing a *practical application* of one or more mathematical operations, those acts *must* be treated as further limiting the claim beyond the mathematical operation(s) per se. Such acts are data gathering steps not dictated by the algorithm but by other limitations which require certain antecedent steps and as such constitute an independent limitation on the claim.

Examples of acts that independently limit a claimed process involving mathematical operations include:

— a method of conducting seismic exploration which requires generating and manipulating signals from seismic energy waves *before* "summing" the values represented by the signals;[36] and

— a method of displaying X-ray attenuation data as a signed gray scale signal in a "field" using a particular anti-aliasing algorithm, where the antecedent steps require generating the data using a particular machine (e.g., a computed tomography scanner).[37]

Examples of steps that do not independently limit one or more mathematical operation steps include:

— "perturbing" the values of a set of process inputs, where the subject matter "perturbed" was a number and the act of "perturbing" consists of substituting the numerical values of variables;[38] and

— selecting a set of "arbitrary measurement point" values.[39] Such steps do not impose independent limitations on the scope of the claim beyond those required by the mathematical operation limitation.

(iii) Post-Mathematical Operation Step Uses Solution or Merely Conveys Result of Operation

In rare instances, certain kinds of post-solution "acts" will not further limit a process claim beyond the performance of the preceding mathematical operation step even if the acts are recited in the body of a claim. If, however, the claimed acts represent some *use* of the solution, those acts will invariably impose an independent limitation on the claim. Thus, if a claim requires that the direct result of a mathematical operation be evaluated and transformed into something else, Office personnel cannot treat the subsequent steps as being *indistinguishable* from the performance of the mathematical operation and thus not further limiting on the claim. For example, acts that require the conversion of a series of numbers representing values of a wavefunction equation for a chemical compound into values representing an image that conveys information about the three dimensional structure of the compound cannot be treated as being part of the mathematical operations that yield the wavefunction numbers. Office personnel should be especially careful when reviewing claim language that requires the performance of "post-solution" steps to ensure that actual claim limitations are not ignored.

Examples of steps found not to independently limit a process involving one or more mathematical operation steps include:

— step of "updating an alarm limit" found to constitute changing the number value of a variable to represent the result of the calculation;[40]

— final step of "magnetically recording" the result of a calculation;[41]

— final step of "equating" the process outputs to the values of the last set of process inputs found to constitute storing the result of calculations;[42]

— final step of displaying result of a calculation "as a shade of gray rather than as simply a number" found to not constitute distinct step where the data were numerical values that did not represent anything;[43] and

— step of "transmitting electrical signals representing" the result of calculations.[44]

Office personnel are reminded to rely on the applicant's characterization of the significance of the "acts" being assessed to resolve questions related to their relationship to the mathematical operations recited in the claim and the invention as a whole.[45]

(c) Manipulation of Abstract Ideas Without A Practical Application

A process that consists solely of the manipulation of an abstract idea without any limitation to a practical application is non-statutory.[46]

In order to determine whether the claim is limited to a practical application of an idea, Office personnel must analyze the claim as a whole, in light of the specification, to understand what subject matter is being manipulated and how it is being manipulated. During this procedure, Office personnel must evaluate any statements of intended use or field of use, any data gathering step and any post-manipulation activity. *See* section (b) above.

IV. Issues Related to Compliance with Section 112, First and Second Paragraphs [Guidelines § I.B.2.]

Section 112 serves to ensure that the claims are clearly defined and are fully supported by the disclosure. Office personnel should focus their assessment of applications for compliance with § 112 on determining if the disclosure and claims clearly convey what the applicant has invented, permit others to determine what rights have been provided to the patentee, and enable one skilled in the art to the practice the invention without undue experimentation.

When evaluating applications, Office personnel must always remember to use the perspective of one of ordinary skill in the art. Claims and disclosures are not to be evaluated in a vacuum. If elements of an invention are well known in the art, the applicant does not have to provide a disclosure that describes those elements.

Similarly, the applicant need not explicitly recite in the claims every feature of the invention. Rather, if the claims, interpreted in light of the disclosure reasonably apprise those of ordinary skill in the art what the invention is, they satisfy the requirements of § 112, second paragraph. For example, if an applicant indicates that the invention is a particular computer, the claim does not have to recite every element or feature of the computer. In fact, it is preferable for the claim to be drafted in a form that emphasizes what the applicant has invented (e.g., what is new rather than old).[47]

If deficiencies are discovered with respect to § 112, Office personnel must be careful to rely on the appropriate paragraph of § 112. Deficiencies under the second paragraph of § 112 exist if it is unclear what the claim defines (i.e., the claim fails to particularly point out and distinctly claim the invention),[48] or the claim as cast does not define what applicant has indicated to be the invention.[49] Deficiencies under the first paragraph of § 112 can arise where there is not an adequate written description that serves to identify what the applicant has invented, or the disclosure does not enable one skilled in the art to make and use the invention as claimed without undue experimentation. Deficiencies related to disclosure of the best mode for carrying out the claimed invention are not usually encountered during initial examination of an application.

A. Specification Fails to Show How to Make or Use Programmed Computer Element of Invention [Guidelines § I.B.2.(b)]

The disclosure must enable a person skilled in the art to configure the computer to possess the requisite functionality, and, if relevant, integrate the computer with other elements to yield the claimed invention, without the exercise of undue experimentation. If the specification fails to identify *how* to configure a computer to possess the requisite functionality or *how* to integrate the programmed computer with other elements of the invention, the claim is likely to be deficient under § 112, first paragraph.

For many computer-implemented inventions, it is not unusual for the claimed invention to involve more than one field of technology. For such inventions, the disclosure must satisfy the enablement standard for each aspect of the invention.[50] As such, the disclosure must teach a person skilled in each art how to make and use the relevant aspect of the invention without undue experimentation. For example, to enable a claim to a programmed computer that determines and displays the three-dimensional structure of a chemical compound, the disclosure must

— enable a person skilled in the art of molecular modeling to understand and practice the underlying molecular modeling processes; and

— enable a person skilled in the art of computer programming to create a program that directs a computer to create and display the image representing the three-dimensional structure of the compound.

In other words, the disclosure corresponding to each aspect of the invention must be enabling to a person skilled in each respective art.

B. Programmed Computer Is Defined As Composite of Functional Elements

In many instances, an applicant will describe a programmed computer by outlining the significant elements of the programmed computer using a functional block diagram. Office personnel should review the specification to ensure that along

with the functional block diagram the disclosure provides information that adequately describes each "element" in hardware or software. If the functionally labeled elements of a programmed computer are not described further in the specification and one skilled in the art would not know what the elements are or how to make or use them to yield the claimed invention, a claim defining an invention requiring the use of that programmed computer is likely to be deficient under one or more requirements of § 112.

C. Elements of a Machine Defined Using Means Plus Function Language [Guidelines § I.B.2.(a) & (b)]

Where means plus function language is used to define the characteristics of a machine or manufacture invention, claim elements must be interpreted to read on only the structures or materials disclosed in the specification, and "equivalents thereof."[51] Thus, at the outset Office personnel must attempt to correlate means elements to some description of the elements in the written specification and drawings.

As noted earlier, there are many appropriate ways of describing the elements of a programmed computer. If the description makes it clear that a means element corresponds to the physical structure of a computer or computer component, that description will sufficiently define the claimed means element. Thus, a means element may be defined to be:

— a programmed computer with a particular functionality;

— a logic circuit or other component of a programmed computer that performs a series of specifically identified operations dictated by a computer program; or

— a computer memory encoded with executable instructions representing a computer program that can cause a computer to function in a particular fashion.

A claim patterned after a functional block diagram and defined using means plus function language may fail to particularly point out and distinctly claim the invention if the disclosure does not describe the specific materials or structures that correspond to the means elements. The scope of a "means" element is defined as the corresponding structure or material (e.g., a specific logic circuit) set forth in the written description and its equivalents. Where no structure or material is disclosed, the claim fails to particularly point out and distinctly claim the invention. For example, if the applicant discloses only the function to be performed and provides no description of hardware or software that performs the function, the application has not disclosed any "structure" to correspond to the means. Such a claim should be rejected under § 112, second paragraph. In contrast, if the corresponding structure is disclosed to be a memory or logic circuit that has been configured in some manner to perform that function (e.g., using a computer program), the claim satisfies § 112, second paragraph.

Further guidance in interpreting the scope of equivalents of means elements is provided in the *Examination Guidelines For Claims Reciting A Means or Step Plus Function Limitation In Accordance With 35 U.S.C. 112, 6th Paragraph.*[52]

D. Claim Does Not Define Applicant's Invention [Guidelines § I.B.2.(a)]

To satisfy the second paragraph of § 112, the claims must define the invention in a manner consistent with the applicant's written description of the invention. If the applicant asserts a practical utility for the invention, Office personnel should review the entire disclosure to determine the features necessary to accomplish the asserted practical utility. When the claim recites a practical utility but fails to recite the necessary features to accomplish the asserted practical utility, the claim should be rejected under § 112, second paragraph. If a claim is so broad as to encompass non-statutory subject matter, the claim should be rejected under § 112 ¶ 2, as well as § 101. For example, if applicant has described the invention as a computer-implemented process, but the claim is broad enough to cover the mental performance of the process, then it should be rejected under both § 112 ¶ 2 and § 101.[53]

A claim *as a whole* that defines non-statutory subject matter is deficient under § 101, and under § 112, second paragraph. Determining the scope of a claim as a whole requires a clear understanding of what the applicant regards as the invention. If the invention as disclosed in the written description is statutory, but the claims define subject matter that is not, the deficiency can be corrected by an appropriate claim amendment. Therefore, reject the claims under §§ 101 and 112, second paragraph, but identify the features of the invention that, if recited in the claim, would render the claimed subject matter statutory.

E. Claim Defined Using Only Computer Program Code [Guidelines § I.B.2.(a)]

A claim defined *entirely* in computer program code, whether in source or object code format, may be deficient under § 112 ¶ 2 if one of ordinary skill in the art would not be able to ascertain the metes and bounds of the claimed invention. Such a claim should also be objected to under 37 CFR 1.52(a).[55] A computer programming language is not the English language, despite the fact that English words may be used in that language.

In certain circumstances, as where self-documenting programming code is employed, use of programming language in a claim would be permissible, since such program source code presents sufficiently high-level language and descriptive identifiers to make it universally understood to others in the art without the programmer having to insert any comments.[56]

Applicants should be encouraged to functionally define the steps the computer will perform rather than simply providing source or object code.

V. Issues Related to Compliance with § 103 [Guidelines § I.B.3.]

As is the case for inventions in any field of technology, assessment of a claimed computer-implemented invention for compliance with § 103 begins with a comparison of the claimed subject matter to what is known in the prior art. Once distinctions are identified between the claimed invention and the prior art, those distinctions must be assessed and resolved in light of the knowledge possessed by a person of ordinary skill in the art. Against this backdrop, one must determine whether the invention would have been obvious at the time the invention was made. If not, the claimed invention satisfies § 103. Factors and considerations dictated by law governing § 103 apply without modification to inventions in this field of technology.

If the difference between the prior art and the claimed invention is limited to information stored on or employed by a machine, one must determine what role the information plays with regard to the invention considered as a whole. Where the information imparts some degree of functionality to the claimed invention taken as a whole, it represents a critical element of the invention. As such, the information must be considered and addressed incident to application of § 103. Thus, a rejection of the claim as a whole under § 103 is inappropriate unless the functionality imparted by the information would have been suggested by the prior art. To establish a *prima facie* case of obviousness, Office personnel must explain *why* it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to impart the functionality of the programmed computer with that specific information.

However, where the information imparts no functionality to achieve the specific utility of the invention, it cannot serve to render the claimed invention, considered as a whole, non-obvious. Generally speaking, situations where information imparts no functionality will be limited to the following:

— a computer readable storage medium that differs from the prior art solely with respect to information encoded on the medium that does not alter its functionality considered as a whole,

— a computer that differs from the prior art solely with respect to information whose content does not alter how the machine functions (i.e., the information does not reconfigure the computer), or

— a process that differs from the prior art only with respect

to information that does not alter *how* the process steps are to be performed to achieve the utility of the invention.

Thus, if the prior art suggests storing a song on a disk, merely choosing a *particular* song to store on the disk would be presumed to have been obvious as being well within the level of ordinary skill in the art at the time the invention was made. Such a difference is simply a rearrangement of non-functional information.

VI. Conclusion

Once Office personnel have concluded an analysis of the claimed invention under all the statutory provisions, including §§ 101, 112, 102 and 103, when composing any Official action, they should review all the proposed rejections and their bases to confirm their correctness. Only then should any rejection be imposed.

[1] *See Request for Comments on Proposed Examination Guidelines for Computer-Implemented Inventions*, 60 Fed. Reg. 28,778 (June 2, 1995).

[2] *In re Freeman*, 573 F.2d 1237, 1245, 197 USPQ 464, 471 (CCPA 1978); *In re Walter*, 618 F.2d 758, 767, 205 USPQ 397, 406-07 (CCPA 1980); *In re Abele*, 684 F.2d 902, 905-07, 214 USP Q 682, 685-87 (CCPA 1982).

[3] As the courts have repeatedly reminded the Office: "The goal is to answer the question "'What did applicants invent?'" *In re Abele*, 684 F.2d at 907, 214 USPQ at 687 (CCPA 1982). *Accord, e.g., Arrhythmia Research Tech. v. Corazonix Corp.*, 958 F.2d 1053, 1059, 22 USPQ2d 1033, 1038 (Fed. Cir. 1992).

[4] *See Brenner v. Manson*, 383 U.S. 519, 534, 148 USPQ 689, 695 ("Whatever weight is attached to the value of encouraging disclosure and of inhibiting secrecy, we believe a more compelling consideration is that a process patent in the chemical field, which has not been developed and pointed to the degree of specific utility, creates a monopoly of knowledge which should be granted only if clearly commanded by the statute.")(emphasis added). *See also Nelson v. Bowler*, 626 F.2d 853, 856, 206 USPQ 881, 883 (CCPA 1980) (Specific utility is also called "practical utility.").

[5] *E.g., In re Alappat*, 33 F.3d 1526, 1543, 31 USPQ2d 1545, 1556-57 (Fed. Cir. 1994) (in banc) (quoting *Diamond v. Diehr*, 450 U.S. 175, 192, 209 USPQ 1, 10 (1981)). *See also id.* at 1579 (Newman, J., concurring) ("unpatentability of the principle does not defeat patentability of its practical applications") (citing *O'Reilly v. Morse*, 56 U.S. (15 How.) 62 (1854)); Arrhythmia 958 F.2d at 1057, 22 USPQ2d at 1036.

[6] 60 Fed. Reg. 36,263 (July 14, 1995).

[7] *Arrythmia*, 958 F.2d at 1057, 22 USPQ2d at 1036:

> It is of course true that a modern digital computer manipulates data, usually in binary form, by performing mathematical operations, such as addition, subtraction, multiplication, division, or bit shifting, on the data. But this is only how the computer does what it does. Of importance is the significance of the data and their manipulation in the real world, i.e., what the computer is doing.

[8] Many computer-implemented inventions do not consist solely of a computer. Thus, Office personnel should identify those claimed elements of the computer-implemented invention that are not part of the programmed computer, and determine how those elements relate to the programmed computer. Office personnel should look for specific information that explains the role of the programmed computer in the overall process or machine and how the programmed computer is to be integrated with the other elements of the apparatus or used in the process.

[9] *Markman v. Westview Instruments*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir. 1995) (in banc).

[10] *See, e.g., In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994) (inventor may define specific terms used to describe invention, but must do so "with reasonable clarity, deliberateness, and precision" and, if done, must "'set out his uncommon definition in some manner within the patent disclosure' so as to give one of ordinary skill in the art notice of the change" in meaning) (quoting *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387-1388, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992)).

[11] *See, e.g., In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow . . . . The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed. . . An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process.").

[12] *See, e.g., In re Paulsen*, 30 F.3d at 1480, 31 USPQ2d at 1674 (although specification can be used to interpret what the patentee meant by a word or phrase in the claim, cannot add extraneous limitation from the specification when limitation is not needed to interpret any particular words or phrases in the claim).

[13] *See, e.g., Diamond v. Diehr*, 450 U.S. at 188-89, 209 USPQ at 9 ("In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis. This is particularly true in a process claim because a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made.").

[14] *Diamond v. Chakrabarty*, 447 U.S. 303, 308-09, 206 USPQ 193, 196-97 (1980):

> In choosing such expansive terms as "manufacture" and "composition of matter," modified by the comprehensive "any," Congress plainly contemplated that the patent laws would be given wide scope. The relevant legislative history also supports a broad construction. The Patent Act of 1793, authored by Thomas Jefferson, defined statutory subject matter as "any new and useful art, machine, manufacture, or composition of matter, or any new or useful improvement [thereof]." Act of Feb. 21, 1793, § 1, 1 Stat. 319. The Act embodied Jefferson's philosophy that "ingenuity should receive a liberal encouragement." 5 Writings of Thomas Jefferson 75-76 (Washington ed. 1871). See *Graham v. John Deere Co.*, 383 U.S. 1, 7-10 (1966). Subsequent patent statutes in 1836, 1870, and 1874 employed this same broad language. In 1952, when the patent laws were recodified, Congress replaced the word "art" with "process," but otherwise left Jefferson's language intact. The Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to "include anything under the sun that is made by man." S. Rep. No. 1979, 82d Cong., 2d Sess. 5 (1952); H.R. Rep. No. 1923, 82d Cong., 2d Sess. 6 (1952).
>
> This perspective has been embraced by the Federal Circuit:
>
> The plain and unambiguous meaning of § 101 is that any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if it meets the requirements for patentability set forth in Title 35, such as those found in § 102, 103, and 112. The use of the expansive term "any" in § 101 represents Congress's intent not to place any restrictions on the subject matter for which a patent may be obtained beyond those specifically recited in § 101 and the other parts of Title 35 . . . . Thus, it is improper to read into § 101 limitations as to the subject matter that may be patented where the legislative history does not indicate that Congress clearly intended such limitations. [*In re Alappat*, 33 F.3d at 1542, 31USPQ2d at 1556.]

[15] 35 U.S.C. § 101 (1994).

[16] *See* 35 U.S.C. § 100(b) ("The term "process" means process, art, or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.").

[17] *E.g., In re Alappat*, 33 F.3d at 1542, 31USPQ2d at 1556; *In re Warmerdam*, 33 F.3d at 1358, 31USPQ2d at 1757.

[18] *See, e.g., Rubber-Tip Pencil v. Howard*, 87 U.S. 498, 507 (1874) ("idea of itself is not patentable, but a new device by which it may be made practically useful is"); *Mackay Radio & Telegraph Co. v. Radio Corp. of America*, 306 U.S. 86, 94 (1939) ("While a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be."); *In re Warmerdam*, 33 F.3d 1354, 1360, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994) ("steps of 'locating' a medial axis, and 'creating' a bubble hierarchy describe nothing more than the manipulation of basic mathematical constructs, the paradigmatic 'abstract idea'").

[19] The concern over preemption was expressed as early as 1852. *See Le Roy v. Tatham*, 55 U.S. 156, 175 (1852)("A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, as no one can claim in either of them an exclusive right."); *Funk Brothers Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127, 132, 76 USPQ 280, 282 (1988) (combination of six species of bacteria to be non-statutory subject matter).

[20] *In re Ziegler*, 992 F.2d 1197, 1200-03, 26 USPQ2d 1600, 1603-06 (Fed. Cir. 1993); *Brenner v. Manson*, 383 U.S. at 528-36, 148 USPQ at 693-696.

[21] *See, e.g., In re Musgrave*, 431 F.2d 882, 893, 167 USPQ 280, 289-90 (CCPA 1970), cited with approval in *In re Schrader*, 22 F3d 290, 297 (Fed. Cir. 1994) (Newman, J., dissenting). The definition of "technology" is the "application of science and engineering to the development of machines and procedures in order to enhance or improve human conditions, or at least to improve human efficiency in some respect." Computer Dictionary 384 (2d ed. Microsoft Press 1994).

[22] *E.g., In re Waldbaum*, 457 F.2d 997, 1003, 173 USPQ 430, 434 (CCPA 1972) ("The phrase "technological arts," as we have used it, is synonymous with the phrase "useful arts" as it appears in Article I, Section 8 of the Constitution.").

[23] *See, e.g., In re Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (holding non-statutory a claim to a data structure *per se*).

[24] Computer Dictionary 210 (2d ed. Microsoft Press 1994):

The meaning of data, as it is intended to be interpreted by people. Data consists of facts, which become information when they are seen in context and convey meaning to people. Computers process data without any understanding of what that data represents.

[25] *See, e.g., In re Lowry*, 32 F.3d 1579, 1583, 32 USPQ2d 1031, 1034-35 (Fed. Cir. 1994); *In re Warmerdam*, 33 F.3d at 1361-62, 31 USPQ2d at 17 60.

[26] *In re Warmerdam*, 33 F.3d at 1359, 31 USPQ2d at 1759 (claim to computer having specific memory defined using product-by-process format).

[27] *In re Lowry*, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

[28] *Diamond v. Diehr*, 450 U.S. at 183, 209 USPQ at 6 ("A statutory process is . . . a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing . . . The process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence.").

[29] *In re Schrader*, 22 F.3d 290, 295, 30 USPQ2d 1455, 1459 (Fed. Cir. 1994).

[30] *Diamond v. Diehr*, 450 U.S. at 187, 209 USPQ at 8.

[31] *Arrythmia*, 958 F.2d at 1058-59, 22 USPQ2d at 1037-38.

[32] *See, e.g., In re Meyer*, 688 F.2d 789, 794-95, 215 USPQ 193, 197 (CCPA 1982) ("Scientific principles, such as the relationship between mass and energy, and laws of nature, such as the acceleration of gravity, namely, a=32 ft/sec.^{2}, can be represented in mathematical format. However, some mathematical algorithms and formulae do not represent scientific principles or laws of nature; they represent ideas or mental processes and are simply logical vehicles for communicating possible solutions to complex problems. The presence of a mathematical algorithm or formula in a claim is merely an indication that a scientific principle, law of nature, idea or mental process may be the subject matter claimed and, thus, justify a rejection of that claim under 35 USC 101; but the presence of a mathematical algorithm or formula is only a signpost for further analysis."). *Cf. In re Alappat*, 33 F.3d at 1543 n.19, 31 USPQ2d at 1556 n.19 in which the Federal Circuit recognized the confusion:

The Supreme Court has not been clear . . . as to whether such subject matter is excluded from the scope of § 101 because it represents laws of nature, natural phenomena, or abstract ideas. *See Diehr*, 450 U.S. at 186 (viewed mathematicalalgorithm as a law of nature); *Benson*, 409 U.S. at 71-72 (treated mathematical algorithm as an "idea"). The Supreme Court also has not been clear as to exactly what kind of mathematical subject matter may not be patented. The Supreme Court has used, among others, the terms "mathematical algorithm," "mathematical formula," and "mathematical equation" to describe types of mathematical subject matter not entitled to patent protection standing alone. The Supreme Court has not set forth, however, any consistent or clear explanation of what it intended by such terms or how these terms are related, if at all.

[33] *In re Walter*, 618 F.2d at 769, 205 USPQ at 409 ("Although the claim preambles relate the claimed invention to the art of seismic prospecting, the claims themselves are not drawn to methods of or apparatus for seismic prospecting; they are drawn to improved mathematical methods for interpreting the results of seismic prospecting.").

[34] *In re Richman*, 563 F.2d 1026, 1030, 195 USPQ 340, 343 (CCPA 1977) ("In the present case too, notwithstanding that the antecedent steps are novel and unobvious, they merely determine values for the variables used in the mathematical formulae used in making the calculations. Thus, such antecedent steps do not suffice to render the claimed methods, considered as a whole, statutory subject matter.").

[35]In *In re Sarkar*, 588 F.2d 1330, 1335, 200 USPQ 132, 139 (CCPA the court explained why this approach must be followed:

No mathematical equation can be used, as a practical matter, without establishing and substituting values for the variables expressed therein. Substitution of values dictated by the formula has thus been viewed as a form of mathematical step. If the steps of gathering and substituting values were alone sufficient, every mathematical equation, formula, or algorithm having any practical use would be per se subject to parenting as a "process" under § 101. Consideration of whether the substitution of specific values is enough to convert the disembodied ideas present in the formula into an embodiment of those ideas, or into an application of the formula, is foreclosed by the current state of the law.

[36] *In re Taner*, 681 F.2d 787, 788, 214 USPQ 678, 679 (CCPA 1982).

[37] *In re Abele*, 684 F.2d at 908, 214 USPQ at 687 ("The specification indicates that such attenuation data is available only when an X-ray beam is produced by a CAT scanner, passed through an object, and detected upon its exit. Only after these steps have been completed is the algorithm performed, and the resultant modified data displayed in the required format.").

[38] *In re Gelnovatch*, 595 F.2d 32, 41 n.7, 201 USPQ 136, 145 n.7 (CCPA 1979) ("Appellants' claimed step of perturbing the values of a set of process inputs (step 3), in addition to being a mathematical operation, appears to be a data-gathering step of the type we have held insufficient to change a nonstatutory method of calculation into a statutory process . . . . In this instance, the perturbed process inputs are not even measured values of physical phenomena, but are instead derived by numerically changing the values in the previous set of process inputs.").

[39] *In re Sarkar*, 588 F.2d at 1331, 200 USPQ at 135.

[40] *Parker v. Flook*, 437 U.S. 584, 585, 198 USPQ 193, 195 (1978).

[41] *In re Walter*, 618 F.2d at 770, 205 USPQ at 409 ("If § 101 could be satisfied by the mere recordation of the results of a nonstatutory process on some record medium, even the most unskilled patent draftsman could provide for such a step.").

[42] *In re Gelnovatch*, 595 F.2d at 41 n.7, 201 USPQ at 145 n.7.

[43] *In re Abele*, 684 F.2d at 909, 214 USPQ at 688 ("This claim presents no more than the calculation of a number and display of the result, albeit in a particular format. The specification provides no greater meaning to "data in a field" than a matrix of numbers regardless of by what method generated. Thus, the algorithm is neither explicitly nor implicitly applied to any certain process. Moreover, that the result is displayed as a shade of gray rather than as simply a number provides no greater or better information, considering the broad range of applications encompassed by the claim.").

[44] *In re de Castelet*, 562 F.2d 1236, 1244, 195 USPQ 439, 446 (CCPA 1967) ("That the computer is instructed to transmit electrical signals, representing the results of its calculations, does not constitute the type of "post solution activity" found in Flook, supra, and does not transform the claim into one for a process merely *using* an algorithm. The final transmitting step constitutes nothing more than reading out the result of the calculations.").

[45] *See In re Sarkar*, 588 F.2d at 1332 n.6, 200 USPQ at 136 n.6 ("post-solution" construction that was being modeled by the mathematical process not considered in deciding § 101 question because applicant indicated that such construction was not a material element of the invention).

[46] *E.g., In re Warmerdam*, 33 F.3d at 1359, 31 USPQ2d at 1759. *See also Schrader*, 22 F.3d at 295, 30 USPQ2d at 1458-59 (although the court determined that the subject matter was simply a mathematical algorithm, Schrader's process mere manipulated an abstract idea).

[47] *See, e.g., Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 941-43, 15 USPQ 2d 1321, 1328-1330 (Fed. Cir. 1990) (judgment of invalidity reversed for clear error where expert testimony on both sides showed that a programer of reasonable skill could write a satisfactory program with ordinary effort based on the disclosure); *DeGeorge v. Bernier*, 768 F.2d 1318, 1334, 226 USPQ 758, 762-63 (Fed. Cir. 1985) (invention was adequately disclosed for purposes of enablement even though all of the circuitry of a word processor was not disclosed, since the undisclosed circuitry was deemed inconsequential because it did not pertain to the claimed circuit); *In re Phillips*, 608 F.2d 879, 882-83, 203 USPQ 971, 975 (CCPA 1979) (computerized method of generating printed architectural specifications dependent on use of glossary of predefined standard phrases and error-checking feature enabled by overall disclosure generally defining errors); *In re Donohue*, 550 F.2d 1269, 1271, 193 USPQ 136, 137 (CCPA 1977) ("Employment of block diagrams and descriptions of their functions is not fatal under 35 U.S.C. § 112, first paragraph, providing the represented structure is conventional and can be determined without undue experimentation."); *In re Knowlton*, 481 F.2d 1357, 1366-68, USPQ 486, 493-94 (CCPA 1973) (examiner's contention that a software invention needed a detailed description of all the circuitry in the complete hardware system reversed).

[48] *See Miles Labs v. Shandon, Inc.*, 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993) ("test for definiteness is whether one skilled in the art would understand the bounds of the claim when read in light of the specification").

[49] *In re Prater*, 415 F.2d 1393, 1404, 162 USPQ 541, 550 (CCPA 1969) (holding that claim did not comply with 35 U.S.C. § 112 ¶ 2 because it was admittedly beyond that which "applicant regard[ed] as his invention").

[50] *See In re Naquin*, 398 F.2d 86, 866, 158 USPQ 317, 319 (CCPA 1968) ("When an invention, in its different aspects, involves distinct arts, that specification is adequate which enables the adepts of each art, those who have the best chance of being enabled, to carry out the aspect proper to their specialty."). *See also Ex parte Zechnall*, 194 USPQ 461, 461 (Bd. App. 1973) ("appellants' disclosure must be held sufficient if it would enable a person skilled in the electronic computer art, in cooperation with a person skilled in the fuel injection art, to make and use appellants' invention").

[51] Two *in banc* decisions of the Federal Circuit have made clear that the Office is to interpret means plus function language according to 35 U.S.C. § 112 ¶ 6. In the first, *In re Donaldson*, F.3d 1189, 1193, 29 USPQ2d 1845, 1848 (Fed. Cir. 1994), the court held:

> The plain and unambiguous meaning of paragraph six is that one construing means-plus-function language in a claim must look to the specification and interpret that language in light of the corresponding structure, material, or acts described therein, and equivalents thereof, to the extent that the specification provides such disclosure. Paragraph six does not state or even suggest that the PTO is exempt from this mandate, and there is no legislative history indicating that Congress intended that the PTO should be. Thus, this court must accept the plain and precise language of paragraph six.

Consistent with *Donaldson*, in the second decision, *In re Alappat*, 33 F.3d at 1540, 31 USPQ2d at 1554, the Federal Circuit held:

> Given Alappat's disclosure, it was error for the Board majority to interpret each of the means clauses in claim 15 so broadly as to "read on any and every means for performing the function" recited, as it said it was doing, and then to conclude that claim 15 is nothing more than a process claim wherein each means clause represents a step in that process. Contrary to suggestions by the Commissioner, this court's precedents do not support the Board's view that the particular apparatus claims at issue in this case may be viewed as nothing more than process claims.

[52] 1162 O.G. 59 (May 17, 1994).

[53] For example, in *In re Prater*, 415 F.2d at 1403-04, 162 USPQ at 549-50, the court considered a claim that was found to encompass both the mental and physical performance of a series of calculations (i.e., the claim was not limited to performance of a calculation on a machine). The applicant had argued that the invention was to be practiced using a machine. *Id.* The court found that while the claims defined a statutory process, they were deficient under the second paragraph of § 112. *Id.* The court emphasized that:

> [W]hen read in the light of the specification, claim 9 does read on a mental process augmented by pencil and paper markings. We find no express limitation in claim 9 which, even when interpreted in the light of the specification, would support the conclusion that the claim is limited to a "machine process" or "machine-implemented process." This is particularly important in this case since the board noted that, in their brief before the board, appellants acknowledged that "[though] not practical for most of the needed applications, their method, theoretically, can be practiced by hand." . . . Inasmuch as claim 9, thus interpreted, reads on subject matter for which appellants do

not seek coverage, and therefore tacitly admit to be beyond that which "applicant regards as his invention," we feel that the claim fails to comply with 35 USC 112 which requires that "[the] specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." (Emphasis added.) This is true notwithstanding appellants' disclosure of a machine-implemented process. [Id.]

The basis of this type of rejection is that the claim, as cast, is incomplete.

[54] If the invention, both as disclosed and as claimed, is not statutory subject matter, reject the claims under § 101 for being drawn to non-statutory subject matter, and under § 112, second paragraph, for failing to particularly point out and distinctly claim an invention entitled to protection under U.S. patent law.

[55] *See* 37 CFR § 1.52(a) ("The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in § 1.69 and paragraph (d) of this section . . . . ").

[56] *See* Computer Dictionary 353 (Microsoft Press 1994).

APPENDIX

I. Guidelines for Examination of Computer-Implemented Inventions

(Proposed)

60 Fed. Reg. 28,778 (June 2, 1995)

A. General Considerations

The following guidelines have been developed to assist Office personnel in their review of applications drawn to computer-implemented inventions. These guidelines respond to recent changes in the law that governs the patentability of computer-implemented inventions, and set forth the official policy of the Office regarding inventions in this field of technology.

It is essential that patent applicants obtain a prompt yet complete examination of their applications. The Office can best achieve this goal by raising any issue that may affect patentability in the initial action on the merits. Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement of patentability in the initial review of the application, even if one or more claims is found to be deficient with respect to one statutory requirement. Deficiencies should be explained clearly, particularly when they serve as a basis of a rejection. Where possible, examiners should indicate how rejections may be overcome and problems resolved. A failure to follow this approach can lead to unnecessary delays in the prosecution of the application.

B. Procedures to be Followed When Evaluating Computer-Implemented Inventions

The following procedures should be used when reviewing applications drawn to computer-implemented inventions.

1. *Determine what the applicant has invented by reviewing the written description and the claims.*

(a) Identify any specific embodiments of the invention that have been disclosed, review the detailed description of the invention and note the specific utility that has been asserted for the invention.

(b) Analyze each claim carefully, correlating each claim element to the relevant portion of the written description that describes that element. Give claim elements their broadest reasonable interpretation that is consistent with the written description. If elements of a claimed invention are defined in means plus function format, review the written description to identify the specific structure, materials or acts that correspond to each such element.

(c) Considering each claim as a whole, classify the invention defined by each claim as to its statutory category (i.e., process, machine, manufacture or composition of matter). Rely on the following presumptions in making this classification.

(i) A computer or other programmable apparatus whose actions are directed by a computer program or other form of "software" is a statutory "machine."

(ii) A computer readable memory that can be used to direct a computer to function in a particular manner when used by the computer [1] is a statutory "article of manufacture".

(iii) A series of specific operational steps to be performed on or with the aid of a computer is a statutory "process".

A claim that clearly defines a computer-implemented process but is not cast as an element of a computer readable memory or as implemented on a computer should be classified as a statutory "process." [2] If an applicant responds to an action of the Office based on this classification by asserting that subject matter claimed in this format is a machine or an article of manufacture, reject the claim under 35 U.S.C. § 112, second paragraph, for failing to recite at least one physical element in the claims that would otherwise place the invention in either of these two "product" categories. The Examiner should also object to the specification under 37 CFR 1.71(b) if such an assertion is made, as the complete invention contemplated by the applicant has not been cast precisely as being an invention within one of the statutory categories.

A claim that defines an invention as any of the following subject matter should be classified as non-statutory:

— a compilation or arrangement of data, independent of any physical element;

— a known machine-readable storage medium that is encoded with data representing creative or artistic expression (e.g., a work of music, art or literature) [3], [4];

— a "data structure" independent of any physical element (i.e., not as implemented on a physical component of a computer such as a computer readable memory to render that component capable of causing a computer to operate in a particular manner); or

— a process that does nothing more than manipulate abstract ideas or concepts (e.g., a process consisting solely of the steps one would follow in solving a mathematical problem [5]).

Claims in this form are indistinguishable from abstract ideas, laws of nature and natural phenomena and may not be patented. Non-statutory claims should be handled in the manner described in section (2)(c) below.

2. *Analyze each claim to determine if it complies with § 112, second paragraph, and with § 112, first paragraph.*

(a) Determine if the claims particularly point out and distinctly claim the invention. To do this, compare the invention as claimed to the invention as it has been described in the specification. Pay particular attention to the specific utility contemplated for the invention—features or elements of the invention that are necessary to provide the specific utility contemplated for that invention must be reflected in the claims. If the claims fail to accurately define the invention, they should be rejected under § 112, second paragraph. A failure to limit the claim to reflect features of the invention that are necessary to impart the specific utility contemplated may also create a deficiency under § 112, first paragraph.

If elements of a claimed invention are defined using "means plus function" language, but it is unclear what structure, materials or acts are intended to correspond to those elements, reject the claim under § 112, second paragraph. A rejection imposed

on this basis shifts the burden to the applicant to describe the specific structure, material or acts that correspond to the means element in question, and to identify the precise location in the specification where a description of that means element can be found. Interpretation of means elements for § 112, second paragraph purposed must be consistent with interpretation of such elements for §§ 102 and 103 purposes.

Computer program-related elements of a computer-implemented [6] invention may serve as the specific structure, material or acts that correspond to an element of an invention defined using a means plus function limitation. For example, a series of operations performed by a computer under the direction of a computer program may serve as "specific acts" that correspond to a means element. Similarly, a computer-readable memory encoded with data representing a computer program that can cause a computer to function in a particular fashion, or a component of a computer that has been reconfigured with a computer program to operate in a particular fashion, can serve as the "specific structure" corresponding to a means element.

Claims must be defined using the English language. See, 37 CFR 1.52(a). A computer programming language is not the English language, despite the fact that English words may be used in that language. Thus, an applicant may not use computer program code, in either source or object format, to define the metes and bounds of a claim. A claim which attempts to define elements of an invention using computer program code, rather than the functional steps which are to be performed, should be rejected under § 112, second paragraph, and should be objected to under 37 CFR 1.52(a).

(b) Construe the scope of the claimed invention to determine if it is adequately supported by an enabling disclosure. Construe any element defined in means plus function language to encompass all reasonable equivalents of the specific structure, material or acts disclosed in the specification corresponding to that means element. Special care should be taken to ensure that each claim complies with the written description and enablement requirements of 35 U.S.C. § 112.

(c) A claim *as a whole* that defines non-statutory subject matter is deficient under § 101, and under § 112, second paragraph. Determining the scope of a claim as a whole requires a clear understanding of what the applicant regards as the invention. The review performed in step 1 should be used to gain this understanding.

(i) If the invention as disclosed in the written description is statutory, but the claims define subject matter that is not, the deficiency can be corrected by an appropriate claim amendment. Therefore, reject the claims under §§ 101 and 112, second paragraph, but identify the features of the invention that, if recited in the claim, would render the claimed subject matter statutory.

(ii) If the invention, both as disclosed and as claimed, is not statutory subject matter, reject the claims under § 101 for being drawn to non-statutory subject matter, and under § 112, second paragraph, for failing to particularly point out and distinctly claim an invention entitled to protection under U.S. patent law.

An invention is not statutory if it falls within any of the non-statutory claim categories outlined in section (1)(c) above. Also, in rare situations, a claim classified as a statutory machine or article of manufacture may define non-statutory subject matter. Non-statutory subject matter (i.e., abstract ideas, laws of nature and natural phenomena) does not become statutory merely through a different form of claim presentation. Such a claim will (a) define the "invention" not through characteristics of the machine or article of manufacture claimed but exclusively in terms of a non-statutory process that is to be performed on or using that machine or article of manufacture, and (b) encompass any product in the stated class (e.g., computer, computer readable memory) configured *in any manner* to perform that process.

3. *Determine if the claimed invention is novel and nonobvious under §§ 102 and 103.* When evaluating claims defined using "mean plus function" language, refer to the specific guidance provided in the *In re Donaldson* guidelines [1162 OG 59] and section (3)(a) above.

C. Notes on the Guidelines

[1] Articles of manufacture encompassed by this definition consist of two elements: (1) a computer readable storage medium, such as a memory device, a compact disc or a floppy disk, and (2) data encoded on that storage medium in such a way that the storage medium causes a computer to operate in a specific and predefined manner. The composite of the two elements is a storage medium with a particular physical structure and function (e.g., one that will impart the functionality represented by the data onto a computer).

[2] For example, a claim that is cast as "a computer program" but which then recites specific steps to be implemented on or using a computer should be classified as a "process." A claim to simply a "computer program" that does not define the invention in terms of specific steps to be performed on or using a computer should not be classified as a statutory process.

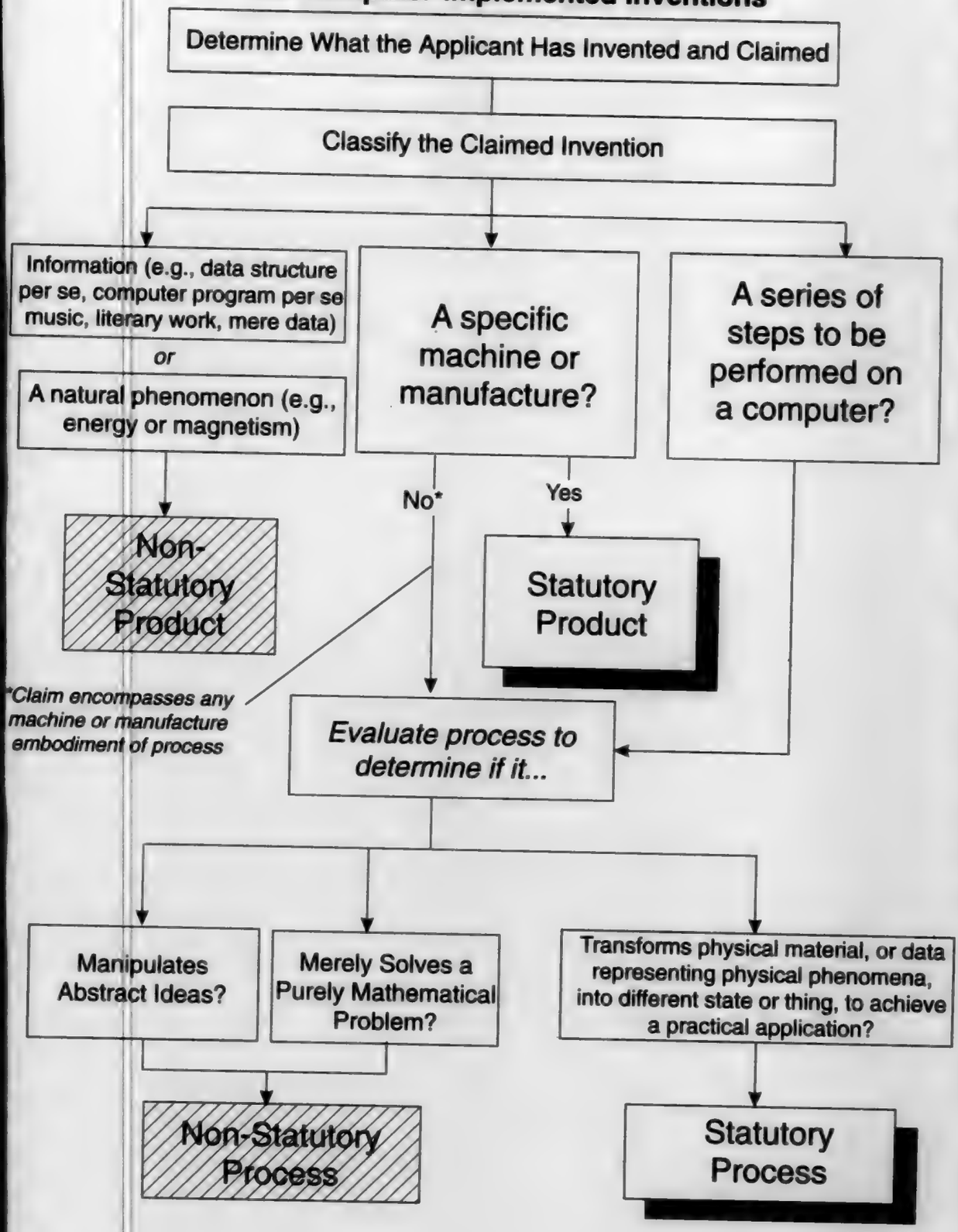
[3] The specific words or symbols that constitute a computer program represent the expression of the computer program and as such are a literary creation.

[4] A claim in this format should also be rejected under § 103, as being obvious over the known machine-readable storage medium standing alone.

[5] A claim to a method consisting solely of the steps necessary to converting one set of numbers to another set of numbers without reciting any computer-implemented steps would be a non-statutory claim under this definition.

[6] This includes the software and any associated computer hardware that is necessary to perform the functions directed by the software.

Outline of § 101 Evaluation Process for Computer-Implemented Inventions



Certificate of Correction
For Week of Nov. 7, 1995

B1 5,046,659
Re. 34,808
Re. 34,890
Re. 34,989
D. 360,718
D. 361,437
D. 361,690
D. 361,835
D. 362,129
4,847,093
4,883,669
4,896,260
4,964,470
4,968,604
5,037,115
5,042,155
5,089,688
5,129,269
5,149,529
5,167,670
5,171,685
5,179,350
5,179,884
5,205,643
5,217,576
5,217,705
5,218,519
5,219,251
5,222,937
5,223,623
5,238,459
5,244,038
5,252,767
5,254,823
5,258,774
5,278,119
5,280,047
5,282,252
5,288,163
5,290,809
5,294,388
5,296,279
5,298,676
5,300,461
5,302,919
5,308,916
5,311,974
5,313,786
5,314,875
5,315,555
5,317,202
5,319,069
5,320,842
5,321,479
5,322,691
5,325,682
5,330,490
5,332,463
5,335,065
5,335,931
5,337,151
5,337,186
5,338,672
5,340,881
5,341,421
5,342,910
5,344,985
5,345,585
5,347,792
5,347,950
5,349,762
5,352,108
5,355,747
5,357,153
5,361,707
5,362,420
5,365,597
5,366,214
5,372,013
5,375,499
5,380,302
5,382,052
5,382,320
5,385,679
5,385,965
5,386,405
5,386,776
5,387,247
5,388,012
5,388,771
5,389,770
5,392,438
5,394,333
5,394,376
5,394,865
5,395,371
5,398,611
5,398,862
5,399,298
5,399,701
5,400,394
5,401,656
5,401,731
5,403,149
5,403,273
5,403,719
5,404,973
5,405,481
5,405,525
5,405,878
5,406,132
5,406,155
5,406,613
5,408,247
5,408,322
5,408,994
5,409,636
5,409,784
5,410,004
5,410,303
5,411,157
5,411,203
5,411,232
5,411,607
5,411,730
5,411,751
5,412,066
5,412,694
5,413,046
5,414,074
5,414,392
5,414,526
5,414,959
5,415,691
5,415,852
5,416,094
5,416,958
5,418,007
5,418,219
5,418,634
5,419,035
5,419,773
5,420,176
5,420,679
5,420,982
5,421,223
5,421,308
5,421,377
5,421,477
5,422,084
5,422,479
5,422,662
5,423,271
5,423,363
5,423,594
5,424,174
5,424,734
5,424,765
5,424,979
5,425,085
5,425,620
5,426,461
5,426,518
5,426,623
5,426,723
5,426,789
5,427,497
5,427,589
5,427,720
5,427,749
5,427,795
5,427,820
5,427,845
5,427,849
5,428,159
5,428,260
5,428,430
5,429,679
5,429,895
5,430,017
5,430,119
5,430,459
5,430,531
5,430,559
5,431,204
5,431,473
5,431,545
5,431,941
5,432,041
5,432,069
5,432,655
5,432,719
5,432,765
5,433,034
5,433,085
5,433,300
5,434,286
5,434,549
5,434,588
5,434,775
5,434,984
5,434,995
5,436,108
5,436,151
5,436,169
5,436,405
5,436,539
5,436,840
5,436,997
5,437,006
5,437,033
5,437,898
5,437,936
5,438,831
5,439,721
5,440,351
5,441,106
5,441,402
5,442,004
5,442,110
5,442,186
5,442,508
5,442,535
5,442,700
5,442,883
5,442,920
5,443,324
5,443,905
5,445,668
5,445,881
5,446,988
5,447,378
5,447,544
5,447,602
5,447,843
5,448,482
5,449,271
5,449,279
5,449,878
5,450,190

Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

July 24-28, 1995

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
7-24	EX	74/209,287	Castle Guard Security, Inc.	2(d)	Refusal Affirmed		"CASTLE GUARD SECURITY SYSTEMS" (and castle design) [security system components, namely, motion detectors, door intrusion alerts, alarm sirens, control panels, digital communicators, and key pad consoles]	"KASTLE," "KASTLE SYSTEMS, INC." (and castle design) et al. [building security services, namely, electronically controlling access from a remote location and transmitting an electronic signal to unlock the building and admit authorized personnel thereto]	No
7-24	EX	74/027,702	Denticator Int'l, Inc.	whether the matter asserted for registration functions as a trademark for the goods or is, instead, mere ornamentation that has not become distinctive as a trademark	Refusal Reversed		the color green applied across the entire surface of applicant's goods [dental hygiene instruments, namely an angled prophylactic dental buffer]		No
7-24	EX	74/292,596	Allage Associates, Inc.	2(e)(1)	Refusal Affirmed		"UV_CLEAN" [cleaning apparatus, namely, apparatus using ultraviolet light for cleaning and surface modification of solids for scientific purposes]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case(1)	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
7-24	EX	74/254,571	Melville Corp.	2(d)	Refusal Affirmed		"AQUA SHOE" [water sport shoes sold in discount stores]	"AQUA GEAR" (and design) [footwear and clothing, namely, jackets, T-shirts, shorts and wet suits]	No
7-25	EX	74/375,629	Peter van der Voort	2(d)	Refusal Reversed		"THE COFFEE LOVER'S SUPREME CHOCOLATE BAR" [candy and ice cream]	"COFFEE LOVERS COFFEE" (and design of a coffee cup) [prepackaged coffee]	No
7-25	OPP	92,530	NBC Fourth Reality Corp. v. Product Code 31 Inc.	2(d)	Opposition Dismissed	"TJ MAXX," "GET THE MAXX FOR THE MINIMUM," and "THE MAXIMUM FOR THE MINIMUM" [retail department store services]	"MAXIMUM MAX" (and stick figure design) [clothing]		No
7-27	EX	74/359,024	Bethel College and Seminary.	2(d)	Refusal Affirmed		"PACE" (and design) [adult college education services, namely, providing classroom level courses for earning a B.A. degree]	"PACE" [providing self-improvement courses]	No
7-27	EX	74/030,142	Simmons Outdoor Corporation	2(d)	Refusal Reversed		"GOLD MEDAL" [rifle scopes]	"GOLD MEDAL" [shotgun shells]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
7-27	EX	74/225,044	Satin Doll Coiffures, Inc.	2(d); whether the mark shown in the drawing is in use in commerce (as evidenced by the specimens of record); whether the applicant's mark, as shown in its proposed amended drawing, is a material alteration of the mark as shown in the drawing as originally filed	Refusal Affirmed (on all three grounds)		"P-1000 SATIN DOLL COIFFURES, INC." (and design) [hair shampoos and conditioners]	"SATIN DOLL" [hair tints and moisturizing lotion for the hair]	No
7-28	EX	74/367,322	Cashmere Studio, Inc.	2(e)(1)	Refusal Reversed		"CASHMERE STUDIO" [clothing, namely, sweaters, scarves, shawls, dresses, pants and skirts, all made in whole or in part of cashmere wool]		No

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (R) = REQ. FOR RECONSIDERATION

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box _____
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or material related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box M Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filings of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

Please address mail as follows:

Box _____
FEE (or "NO FEE")
Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOU's), and extension requests.
Box TTAB FEE	Oppositions, Cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections, and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.
Please address mail as follows:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation*; papers relating to pending litigation shall be mailed only to the Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 17	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

State	*Name of Library*	*Telephone Contact*
	New York Public Library (The Research Libraries)	(212) 930-0917
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	Not Yet Operational
	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	Not Yet Operational
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy
J.O. THOMAS, JR., Deputy Assistant Commissioner for Patent Process Services

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	05/12/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	06/22/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	08/22/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	08/18/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	02/22/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	11/22/93
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	04/05/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	05/26/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	03/25/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	03/29/94
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	02/22/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	04/04/94
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	05/08/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	05/17/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	08/02/94
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	06/30/94
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	05/23/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

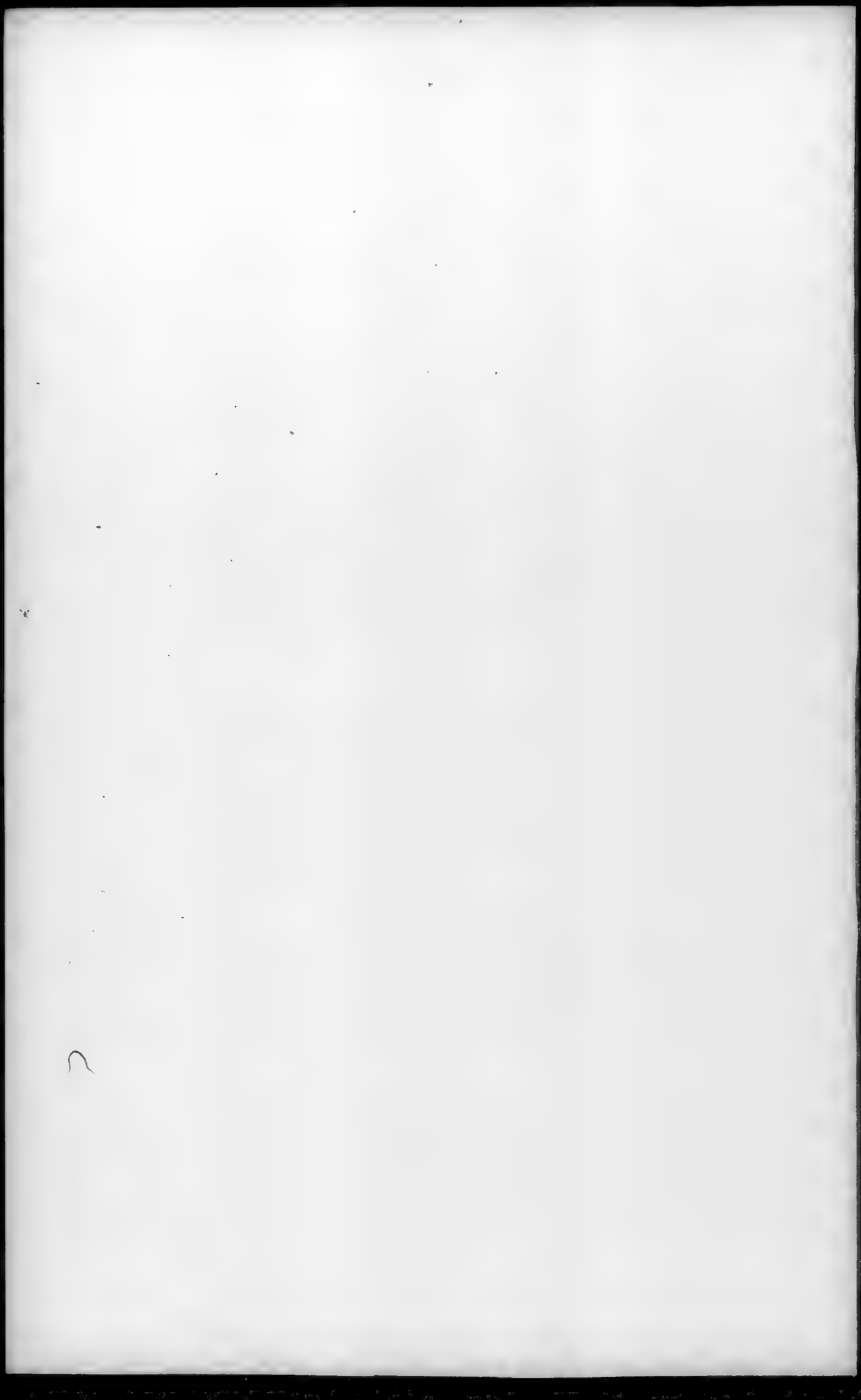
Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of October 1, 1995

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/23/95	05/25/95
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	07/03/95
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/26/95	08/21/95
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/06/95	08/14/95
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	05/01/95
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/14/95	07/03/95
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/02/95	07/24/95
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions– Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/15/95	06/17/95
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/30/95	05/30/95
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—John Walker, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	02/14/95	—0—
Renewals (All Classes)	07/25/95	—0—
Section 12(c) Publications (All Classes)	04/11/95	—0—

1. ** Assigned to all Law Office

2. Applicants with inquires concerning the status of their applications and a touch tone phone should call (703) 305–8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday thru Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquires concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.



REEXAMINATIONS

NOVEMBER 7, 1995

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,621,041 (2718th)

LITHOGRAPHIC PRINTING PLATE

Masahiko Saikawa, Nagoya; Eiji Kanada, and Kazunaka Endo, both of Nagaokakyo, all of, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Reexamination Request No. 90/003,473, Jun. 24, 1994.

Reexamination Certificate for Patent 4,621,041, issued Nov. 4, 1986, Ser. No. 629,971, Jul. 11, 1984.

Claims priority, application Japan, Jul. 14, 1983, 58-128217

The portion of the term of this patent subsequent to Feb. 26, 2002, has been disclaimed.

Int. Cl.[6] **G03C** *8/06;1/035;1/09;* **G03F** *7/07*

U.S. Cl. 430—204

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–10** and **13–16** is confirmed.

Claims **11**, **12** and **17** are determined to be patentable as amended.

1. A method for plate-making which comprises image-wise exposing by scanning flash exposure a lithographic printing plate comprising a support, a physical development nuclei containing surface layer and at least an unfogged silver halide emulsion layer containing at least 70 mol % of silver chloride and prepared with addition of a water soluble iridium compound during emulsification or physical ripening of the emulsion and a water soluble gold compound at any time before coating of the emulsion and thereafter subjecting the exposed emulsion to diffusion transfer development.

B1 4,815,318 (2719th)

BEARING-LESS POSITIVE DISPLACEMENT FLOW METER

William J. LoPresti, Lutz, Fla., assignor to Flowdata, Inc., Richardson, Tex.

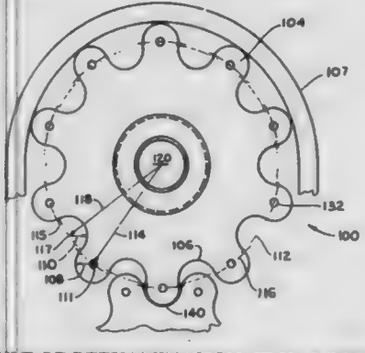
Reexamination Request No. 90/003,557, Aug. 30, 1994.

Reexamination Certificate for Patent 4,815,318, issued Mar. 28, 1989, Ser. No. 9,736, Feb. 2, 1987.

Continuation-in-part of Ser. No. 719,418, Apr. 3, 1985, Pat. No. 4,641,522.

Int. Cl.[6] **G01F** *3/10*

U.S. Cl. 73—261



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–7** is confirmed.

1. A bearing-less positive displacement flow meter apparatus comprising,

chamber means,

inlet and outlet means, connected to the chamber means, for communicating fluid through the chamber means,

first and second cover means, connected to opposite sides of the chamber means,

rotor means, rotatably mounted in the chamber means, for rotating in response to fluid flowing through the chamber means,

wherein the rotor means comprises two rotors having rotational axes that lie in a plane perpendicular to a longitudinal axis of the inlet and outlet means,

mounting means, connected to one of the first and second cover means, for mounting the rotor means,

spacing means for spacing the rotor means from the firs and second cover means,

signal generating means, connected to the rotor means, for generating a signal that varies in intensity with the speed of rotation of the rotor means, and

sensing means, disposed adjacent the rotor means, for picking up the signal and indicating a flow rate,

wherein each rotor has plural lobes, separated by valleys, and

wherein the signal generating means comprise magnets disposed centrally in each lobe.

B1 4,882,683 (2720th)

CELLULAR ADDRESSING PERMUTATION BIT MAP RASTER GRAPHICS ARCHITECTURE

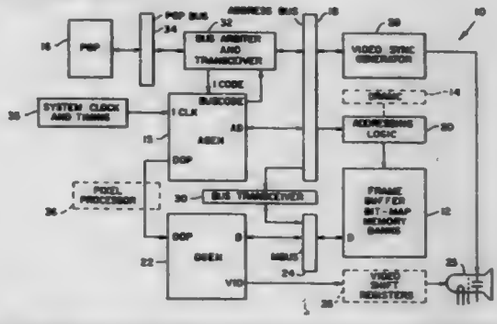
Charles R. Rupp, Bolton, and William R. Stronge, Tewksbury, both of Mass., assignors to Fairchild Semiconductor Corporation, Cupertino, Calif.

Reexamination Request No. 90/002,723, May 14, 1992.

Reexamination Certificate for Patent 4,882,683, issued Nov. 21, 1989, Ser. No. 26,041, Mar. 16, 1987.

Int. Cl.[6] **G06F** *12/00*

U.S. Cl. 395—165



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **59–61** is confirmed.

Claims **6**, **7**, **19**, **32**, **52**, **56**, **58** and **65** are cancelled.

Claims **1–5**, **8–13**, **18**, **21–23**, **29–31**, **33**, **37**, **41**, **49**, **51**, **53 54**, **57**, and **62–64** are determined to be patentable as amended.

Claims **14–17**, **20**, **24–28**, **34–36**, **38–40**, **42–48**, **50**, **55** and **59–61** dependent on an amended claim, are determined to be patentable.

1. A frame buffer address circuit for faster graphics machines having a frame buffer memory comprising a bit map for storing graphics image data at frame buffer memory addresses correlated with pixel positions of a faster display surface, said frame buffer address circuit comprising:

logical linear permutation network (LPN) **[**means**]** *comprising an exchange linear permutation network, E_p,* for transformation and linear permutation of the graphics image data frame buffer memory addresses to form a linear permutation bit map in the frame buffer memory addressable by the frame buffer address circuit **[**in at least two**]** *by greater than 3* different addressing mode configurations, **[**at least one**]** *a plurality* of said addressing mode cell configurations corresponding to **[**a**]** two-dimensional cells.

B1, 5,037,384 (2721th)

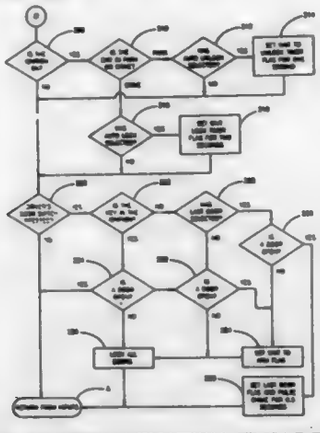
Patent Not Issued For This Number

B1 5,113,182 (2722th)

VEHICLE DOOR LOCKING SYSTEM DETECTING THAT ALL DOORS ARE CLOSED

Michael J. Suman, Holland, and Mark L. Zeinstra, Grandville, both of Mich., assignors to Prince Corporation, Holland, Mich.

Reexamination Request No. 90/003,613, Oct. 21, 1994.
Reexamination Certificate for Patent 5,113,182, issued May 12, 1992, Ser. No. 467,541, Jan. 19, 1990.
Int. Cl.[6] H04Q *1/00*
U.S. Cl. 340—825.31



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 2 are determined to be patentable as amended.

New claim 3 is added and determined to be patentable.

1. A vehicle door locking system comprising:

a plurality of electrically acutated vehicle door locks for a vehicle;

means for detecting the closure status of the vehicle doors, said means detecting that all the vehicle doors are closed;

input circuit means for controlling said door locks, *said input circuit means includes at least one operator manually actuated switch for generating an input signal*; and

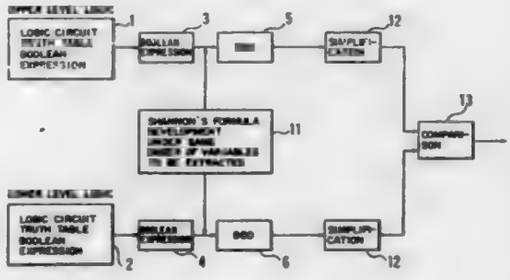
a microcontroller coupled to said door locks, to said detecting means and to said input circuit means, said microcontroller responsive to *said* input [signals] *signal* from said [input circuit means] *switch* for locking all doors of the vehicle *without delay when said input signal is received when none of said vehicle doors are open*, wherein *only* when [one of] said input [signals] *signal* is received from said [input circuit means] *switch* when at least one of said vehicle doors is open, said microcontroller is responsive to [said one of] said input [signals] *signal* to lock all doors of the vehicle a predetermined time period after said detecting means detects that all doors have been closed.

B1 5,243,538 (2723th)

COMPARISON AND VERIFICATION SYSTEM FOR LOGIC CIRCUITS AND METHOD THEREOF

Osamu Okuzawa, Hadano; Kazuhiko Matsumoto, Yokohama; Yukio Ikariya, Hiratsuka, and Hiroshi Mochizuki, Hadano, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Reexamination Request No. 90/003,556, Aug. 29, 1994.
Reexamination Certificate for Patent 5,243,538, issued Sep. 7, 1993, Ser. No. 563,492, Aug. 7, 1990.
Claims priority, application Japan, Aug. 9, 1989, 1-206090
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—489



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–10 are cancelled.

10. A method of comparing and verifying an equivalence between two logic circuits which are to have a same function and are designed by a plurality of methods or by a plurality of designers, said method comprising the steps of:

storing in a first storage device logics corresponding to said designed logics;

storing Boolean expressions of parameter forms corresponding to logic circuit elements of said two logic circuits in a second storage device;

producing Boolean expressions from said stored logics based on said stored Boolean expressions of parameter forms;

applying Shannon's formula to said produced Boolean expressions under a same order of variables to be extracted, to produce binary decision diagrams (BDDs);

simplifying said produced BDDs; and

comparing said simplified BDDs to provide a signal indicating said equivalence between said two logic circuits.

STATUTORY INVENTION REGISTRATIONS

PUBLISHED NOVEMBER 7, 1995

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1498

POLYGENIC TRAIT DETERMINANTS: MAIZE DWARF MOSAIC VIRUS

Michael G. Murray, 9 Grafton Cir., Madison, Wis. 53716; Jane H. Cramer, 4821 Woodburn Dr., Madison, Wis. 53711; Jeanne Romero-Severson, P.O. Box 157, Mazomainie, Wis. 53560; David West, 363 S. Warren, Prescott, Wis. 54021, and Yu Ma, 4118 St. Clair St., Madison, Wis. 53711

Division of Ser. No. 126,767, Nov. 30, 1987, abandoned. This application Apr. 21, 1993, Ser. No. 50,965

Int. Cl.[6] A01H *1/00*

U.S. Cl. 47—58 **1 Claim**

1. A nucleic acid probe designated gp144.

H1499

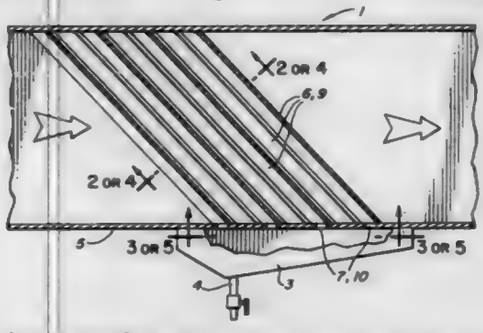
SLANTED BAFFLE MIST ELIMINATOR

Richard F. Vance, Orchard Park, N.Y., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Oct. 28, 1992, Ser. No. 967,463

Int. Cl.[6] B01D *45/00*

U.S. Cl. 55—446 **11 Claims**



1. An apparatus for the elimination of mist in off-gas during the vitrification of nuclear waste materials comprising:

a hollow tube having an inner and outer wall area;

a plurality of baffles having an inner surface, an outer surface, and a base end, disposed in said hollow tube at an angle at least 45° in the direction of said off-gas, and configured whereby when said off-gas pass said baffles said mist impinges on said inner surface of said baffles and with the assistance of gravity collects at said base of said baffles; and

means for collecting said impinged mist along the inner wall area of said hollow tube.

H1500

ULTRA-SENSITIVE CARBON FIBER DOSIMETER

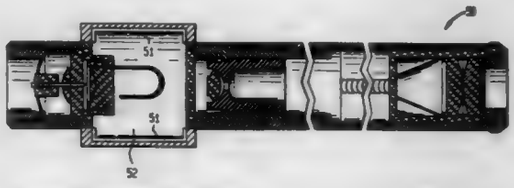
Stanley Kronenberg, Skillman, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 21,427, Feb. 23, 1993, abandoned. This application Dec. 15, 1993, Ser. No. 167,258

Int. Cl.[6] G01T *1/14;* **H01J** *47/04*

U.S. Cl. 250—376 **3 Claims**

1. (Amended) A highly sensitive carbon fiber dosimeter that provides real-time measurements of radiation exposure including gamma rays and neutrons, comprising:



a tubular plastic barrel having an ionization chamber that provides the dosimeter with 20 mR full scale sensitivity to the radiation exposure, said ionization chamber having a cylindrical shape with an inside diameter of at least 1 inch (2.54 cm), an outside diameter of at least 1.1 inches (2.794 cm), an inside height of at least 0.725 inch (1.8415 cm);

said ionization chamber having an inner wall composed of a predetermined material having a predetermined sensitivity to the gamma rays and the neutrons.

H1501

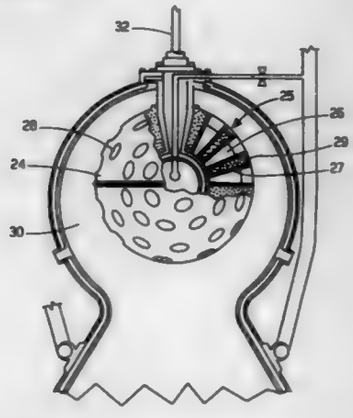
RADIAL FLOW NUCLEAR THERMAL ROCKET (RFNTR)

Carl F. Leyse, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1992, Ser. No. 970,888

Int. Cl.[6] G21C *23/00*

U.S. Cl. 376—318 **6 Claims**



1. A radial flow nuclear thermal rocket fuel assembly comprising:

a) a substantially conical fuel element having an inlet side and an outlet side;

b) a first annular channel disposed in the element for receiving a nuclear propellant;

c) a second channel disposed in the element for discharging the nuclear propellant, the annular channel being located radially outward from the second channel, and separated from the second channel by an annular fuel bed volume;

whereby the propellant enters the fuel assembly axially into the first channel at the inlet side of the element, flows axially across the fuel bed volume, and is discharged from

the assembly by flowing radially outward from the second channel at the outlet side of the element.

H1502

MELTBLOWN FIBERS AND WEBS PRODUCED FROM LIQUID CRYSTAL POLYMERS

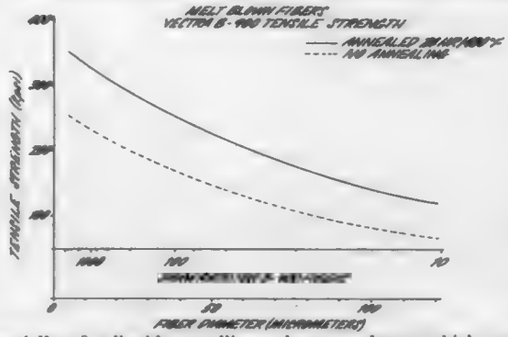
John L. Allan, Simpsonville, S.C.; Leon Katz, Stamford, Conn., and Jeffery J. Boettcher, Appleton, Wis., assignors to Fiberweb North America, Inc., Simpsonville, S.C.

Filed Aug. 17, 1993, Ser. No. 108,057

Int. Cl.[6] D04H *11/00*

U.S. Cl. 428—224 18 Claims

1. A nonwoven web formed of meltblown microfibers consisting



essentially of a liquid crystalline polyester polymer which comprises a wholly aromatic polyester amide wherein the polyester moieties are derived from p, p' biphenol, p-hydroxybenzoic acid and terephthalic acid.

REISSUES

NOVEMBER 7, 1995

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,079

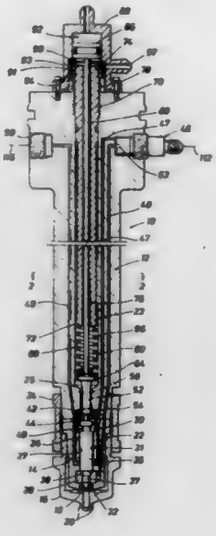
FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Anatoly Sverdlin, 1847 Raintree Cir., Seabrook, Tex. 77586

Original No. 4,957,085, dated Sep. 18, 1990, Ser. No. 311,626, Feb. 16, 1989. Application for reissue Sep. 11, 1992, Ser. No. 943,687

Int. Cl.[6] F02M *39/00*

U.S. Cl. 123—467 **53 Claims**



47. A fuel injector for an internal combustion engine, comprising:

a body having a bore extending therethrough defining a guideway for mounting a valve therein;

a fuel nozzle in said body for delivering fuel to a combustion chamber, a fuel chamber adjacent said fuel nozzle for holding pressurized fuel therein, and a valve seat between said fuel nozzle and fuel chamber;

a valve mounted within said guideway of said bore and movable between opened and closed positions relative to said valve seat, said valve communicating with pressurized fuel in said fuel chamber and being urged toward an open unseated position by said pressurized fuel to allow discharge of fuel through the fuel nozzle; and

a pressurized control fluid chamber within said body for holding pressurized control fluid, said control fluid communicating with said valve and urging said valve towards a closed position on said valve seat to block the discharge of fuel through said nozzle; and

an annular space between the needle valve and the guideway of the body, the space being in fluid communication with the control fluid chamber and said control fluid providing a fluid seal and lubrication between the guideway and the needle valve.

Re. 35,080

VEHICLE VISOR SUPPORTED INTERIOR CURTAIN

Frank S. Nemstiel, 6881 Septimo St., Long Beach, Calif. 90815

Original No. 5,253,695, dated Oct. 19, 1993, Ser. No. 961,493, Oct. 19, 1992. Continuation-in-part of Ser. No. 765,666, Sep. 26, 1991, abandoned. Application for reissue Feb. 14, 1994, Ser. No. 194,887

Int. Cl.[6] B60J *3/00*

U.S. Cl. 160—370.21 **12 Claims**

3. In combination, a light blocking interior curtain for a vehicle having a windshield, said curtain being formed of a light blocking flexible curtain material having inside and outside facing surfaces and a top portion and a bottom portion, and a visor mounted above said windshield, the improvement comprising a pocket on said inside facing surface of said material proximate said top portion, said pocket being formed as a laterally enclosing structure having an open end, whereby said visor fits into said open end of said pocket such that said pocket is releasably engagable with said visor to hold said curtain material suspended from said visor.

Re. 35,081

COMPOSITE STRUCTURAL MEMBER WITH HIGH BENDING STRENGTH

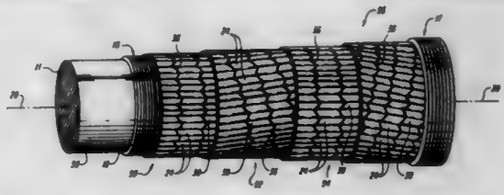
Peter A. Quigley, Cataumet, Mass., assignor to Fiberspar, Inc., West Wareham, Mass.

PCT No. PCT/US90/03439, § 371 Date Dec. 13, 1991, § 102(e) Date Dec. 13, 1991

Original No. 5,188,872, dated Feb. 23, 1993, Ser. No. 793,434, Jun. 14, 1990. Continuation-in-part of Ser. No. 366,464, Jun. 14, 1989, Pat. No. 5,048,441. This PCT application Jun. 14, 1990, Ser. No. 134,256

Int. Cl.[6] B32B *5/06*; **B29D** *22/00*; **B63B** *15/00*

U.S. Cl. 428—36.2 **25 Claims**



24. An elongated tubular composite member having the improvement comprising a ply having an axially extending first fiber component helically oriented relative to the elongation of the composite member and having a clockwise extending second fiber component interwoven with a counterclockwise extending third fiber component, both of which are helically oriented relative to the first fiber component.

Re. 35,082

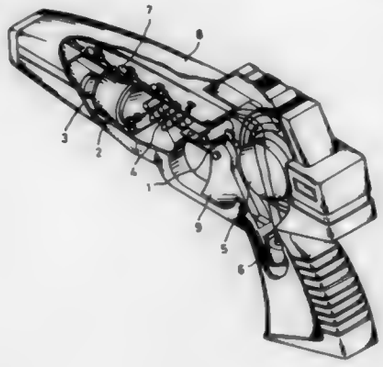
VIBRATING AND SONIC DEVICE FOR TOY GUN

Tien-Hsiang Kuo, Taipei, Taiwan, Prov. of China, assignor to S. R. Mickelberg Company, Inc., Jenkintown, Pa.

Original No. 5,059,150, dated Oct. 22, 1991, Ser. No. 617,682, Nov. 26, 1990. Application for reissue May 14, 1993, Ser. No. 62,508

Int. Cl.[6] A63H *5/04*

U.S. Cl. 446—405 **3 Claims**



1. A simulated toy gun comprising a gun body having a hollow handle and an elongated hollow gun barrel extending forwardly therefrom, said barrel having a longitudinal hollow side wall; a finger-operated trigger located in the gun body at the juncture of the handle and barrel; a rotary electric motor means mounted in the gun barrel remote from the trigger, said motor means having a rotary output shaft extending longitudinally within the barrel; and a weighted cam attached to said shaft so that the cam axis is eccentric to the shaft axis; said cam being attached only to the shaft so that the cam rotates free in space around the shaft axis without physical engagement with any structure other than the shaft; said cam having sufficient size to shake the barrel side wall during rotation of the shaft by the motor means; [battery means located in the hollow handle;] battery means located in the hollow handle; an electrical switch located within the gun body in near proximity to the trigger, said switch having an actuator operably connected to the trigger whereby hand actuation of the trigger electrically closes the switch; and electric connections between the battery means and switch and motor means, whereby manual finger pressure on the trigger energizes the motor means so that the cam [means] is rotated freely around the shaft axis to cause the hollow gun barrel to vibrate in directions transverse to the barrel longitudinal dimension.

Re. 35,083

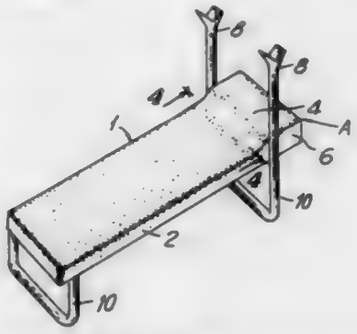
THORACIC WEIGHTLIFTING BENCH

Andrew Roosevelt, 235 E. 61st St., New York, N.Y. 10021

Original No. 5,147,260, dated Sep. 15, 1992, Ser. No. 745,735, Aug. 16, 1991. Continuation-in-part of Ser. No. 572,436, Aug. 27, 1990, Pat. No. 5,039,090. Application for reissue Feb. 8, 1993, Ser. No. 15,387

Int. Cl.[6] A63B *21/078*

U.S. Cl. 482—104 **4 Claims**



13. A weightlifting bench comprising:

an elongated padded bench having first and second longitudinal sides, the bench including:

a generally planar lower thoracic portion for supporting the lower thoracic region of an exerciser, the lower thoracic portion defining a base plane;

a generally planar head portion for supporting the head of the exerciser, the head portion being at a higher elevation than the lower thoracic portion as measured along a line normal to the base plane, the head portion being offset from the lower thoracic portion so that a projection of the head portion along a line normal to it does not intersect the lower thoracic portion;

an upper thoracic portion intersecting a first reference plane only along a first line and a second line, the first and second lines being parallel and defining the first reference plane, each line being continuous from the first side of the bench to the second side, and the first reference plane being slanted with respect to the vertical so as to have an upper side and a lower side, the upper thoracic portion comprising first and second sections for supporting the upper thoracic region of the exerciser, the first and second sections including the first and second lines, respectively, and a third section between the first and second sections, the first and second sections being located symmetrically with respect to each other about a second reference plane parallel to and midway between the first and second lines and perpendicular to the first reference plane, the third section being below the first reference plane and located asymmetrically with respect to the second reference plane;

the upper thoracic portion intersecting the lower thoracic portion along the first line and intersecting the head portion along the second line, the distance between the first and second lines being roughly 8.5 inches as measured in the first reference plane; and

the lower thoracic portion, upper thoracic portion, and the head portion being flat in cross section perpendicular to the long axis of the bench.

PLANT PATENTS

GRANTED NOVEMBER 7, 1995

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,356
CLIMBING MINIATURE ROSE PLANT NAMED 'CHEWIZZ'

Chris Warner, Greenfields, Brockton, Newport, Shropshire, England

Filed Sep. 30, 1994, Ser. No. 315,780
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—4 **1 Claim**

1. A new and distinct variety of climbing miniature rose plant substantially as described and illustrated, which is particularly characterized by being easy to propagate; vigorous, hardy, bushy and upright habit; having blooms borne singly or in sprays from 4 to 7 which open quickly to a flat form showing yellow stamens; as having petals of conspicuously bright orange with yellow at the base; and, the flowers being produced in abundance covering the lush red-toned and green foliage.

9,357
HYBRID TEA ROSE PLANT NAMED 'POULVUE'

Pernille Olesen, and Mogens N. Olesen, both of Fredensborg, Denmark, assignors to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Nov. 30, 1994, Ser. No. 346,621
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea rose class as shown and described.

9,358
NECTARINE TREE 'FIRE PEARL'

Lowell G. Bradford, 12439 E. Savana Rd., and Norman G. Bradford, 11875 E. Savana Rd., both of, Le Grand, Calif. 95333

Filed Feb. 6, 1995, Ser. No. 383,901
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—40.1 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, that is most similar to its pollen grandparent, the Bradcrim (U.S. Plant Pat. No. 8,461), by producing white flesh nectarines that are non-acidic in flavor and virtually free from red texture bleeding, but is distinguished therefrom and an improvement thereon by producing fruit that ripens thirty days later, that is much firmer in texture, that is much sweeter in flavor, and that is clingstone instead of freestone.

9,359
NECTARINE TREE 'BRIGHT PEARL'

Lowell G. Bradford, 12439 E. Savana Rd., and Norman G. Bradford, 11875 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Feb. 6, 1995, Ser. No. 383,905
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—40.1 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, that is most similar to its pollen grandparent, the Bradcrim (U.S. Plant Pat. No. 8,461) nectarine, by producing white flesh nectarines that are non-acidic in flavor and virtually free from red texture bleeding, but is distinguished therefrom and an improvement thereon by producing fruit that ripens twenty-three days later, that is larger in size, that is fuller red in skin color, that is much firmer in texture, that is much sweeter in flavor, and that is clingstone instead of freestone.

9,360
NECTARINE TREE 'JUNE PEARL'

Lowell G. Bradford, 12439 E. Savana Rd., and Norman G. Bradford, 11875 E. Savana Rd., both of Le Grand, Calif. 95333

Filed Feb. 6, 1995, Ser. No. 384,129
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—40.1 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, that is most similar to its seed grandparent, the Bradcrim (U.S. Plant Pat. No. 8,461), by producing white flesh nectarines that are non-acidic in flavor and virtually free from red texture bleeding, but is distinguished therefrom and an improvement thereon by producing fruit that ripens approximately fifteen days earlier, that is firmer in texture, that is fuller red in skin color, and that is clingstone in type, instead of freestone.

9,361
'GEORGE'S RED' PEACH TREE

George F. Smith, 37476 Colorado Rd., Avon, Ohio 44011

Filed Sep. 20, 1993, Ser. No. 123,795
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—43.2 **1 Claim**

1. A new and distinct variety of peach tree substantially as illustrated and described.

9,362
CLEMATIS NAMED EVITHREE

Raymond J. Evison, St. Sampson Guernsey, Great Britain, assignor to The Guernsey Clematis Nursery Limited, United Kingdom

Filed Oct. 28, 1994, Ser. No. 331,040
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—54.1 **1 Claim**

1. A new and distinct variety of clematis substantially as described and illustrated herein.

9,363
SPIRAEA PLANT NAMED 'WALBUMA'

David R. Tristram, Old Rectory, Binsted, Arundel, West Sussex, BN18 OLL, England

Filed Feb. 2, 1995, Ser. No. 382,431
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—54.1 **1 Claim**

1. A new and distinct cultivar of *Spiraea japonica* named Walbuma, as illustrated and described.

9,364
POINSETTIA PLANT NAMED 'FISCOR'

Katharina Zerr, Simmern, Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Oct. 24, 1994, Ser. No. 327,928
Claims priority, application Germany, Feb. 9, 1994, EUP 156
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—86.4 **1 Claim**

1. A new and distinct poinsettia plant named Fiscor, as illustrated and described.

9,365

POINSETTIA PLANT NAMED 'FISSON'

Katharina Zerr, Simmern, Germany, assignor to Floris AG, Benningen, Switzerland

Filed Oct. 24, 1994, Ser. No. 327,930
Claims priority, application Germany, Feb. 9, 1994, EUP 155
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—86.4 **1 Claim**

1. A new and distinct poinsettia plant named Fisson, as illustrated and described.

9,366

KALANCHOE PLANT NAMED 'PICO TICO BRIGHT PINK'

Claude Hope, Cartago, Costa Rica, assignor to Ball Seed Co., West Chicago, Ill.

Filed Jan. 27, 1995, Ser. No. 380,012
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.15 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant named Pico Tico Bright Pink, as illustrated and described.

9,367

KALANCHOE PLANT NAMED 'PICO TICO CHERRY'

Claude Hope, Cartago, Costa Rica, assignor to Ball Seed Co., a Division of Geo. J. Ball, Inc., West Chicago, Ill.

Filed Jan. 27, 1995, Ser. No. 380,013
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.15 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant named Pico Tico Cherry, as illustrated and described.

PATENTS

GRANTED NOV. 7, 1995

ERRATA

For CLASS	See PATENT NO.
004–661	5,463,782
108–059	5,463,945
600–144	5,464,007
600–157	5,464,008
600–157	5,464,008
404–075	5,464,303
404–075	5,464,304
416–093	5,464,321
623–001	5,464,438
623–016	5,464,439
623–016	5,464,440
623–027	5,464,442
623–027	5,464,443
623–065	5,464,444
008–094	5,464,451
008–495	5,464,452
216–071	5,464,499
216–034	5,464,500
202–181	5,464,531
422–034	5,464,580
422–082	5,464,581
425–532	5,464,635
430–272	5,464,686
429–030	5,464,700
429–053	5,464,701
536–023	5,464,774

ERRATA–CONTINUED

For CLASS	See PATENT NO.
514–300	5,464,781
514–252	5,464,788
514–312	5,464,796
512–013	5,464,824
355–285	5,465,146
358–498	5,465,172
358–534	5,465,173
365–149	5,465,249
395–700	5,465,258
364–500	5,465,349

PATENTS

GRANTED NOVEMBER 7, 1995

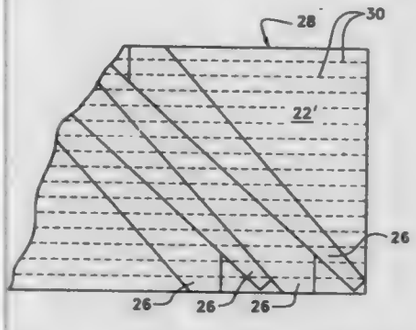
GENERAL AND MECHANICAL

5,463,779

MULTIPLE PLY TIE INTERLINING AND METHOD

Fred J. Pinkus, Yardley, Pa., assignor to Crown Textile Company, Blue Bell, Pa.

Filed Dec. 26, 1991, Ser. No. 814,396
Int. Cl.[6] A41D *25/00*
U.S. Cl. 2—144 **16 Claims**



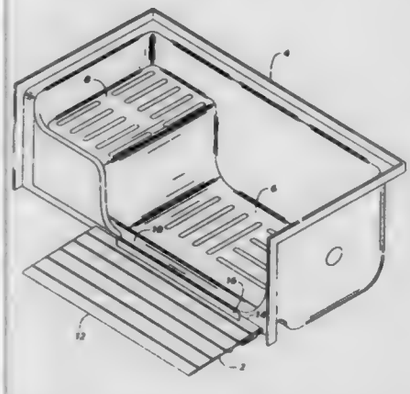
1. A method for making neckwear, comprising the steps of selecting a first ply of interlining fabric having desired mechanical properties, selecting a second ply of interlining fabric having desired mechanical properties, superimposing said plies one above the other, joining said plies by stitching therethrough to form a multiple ply fabric having composite properties, collecting the multiple ply fabric as roll goods having a running length, cutting the roll goods to form individual tie linings having respective lengths and widths, and forming around said tie linings a fabric casing.

5,463,780

RAMP FOR BARRIER-FREE SHOWERS

Donnie L. Harris, Fairview, and George P. McAllister, Jr., Franklin, both of Tenn., assignors to Aqua Bath Company, Inc., Nashville, Tenn.

Filed Aug. 1, 1994, Ser. No. 283,812
Int. Cl.[6] A47K *3/22*
U.S. Cl. 4—604 **12 Claims**



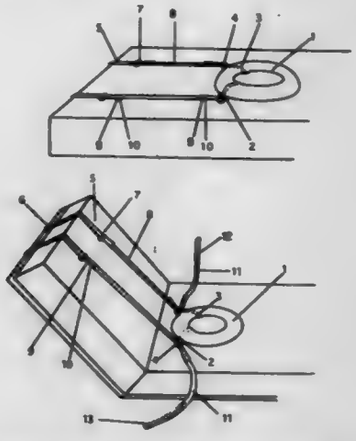
1. A ramp for use adjacent to a barrier free shower, comprising:
a ramp having a front edge and a rear edge, means for mounting said ramp on a floor adjacent a threshold of a shower so as to provide an inclined surface from said floor to said threshold, wherein when said ramp is in an open position, said inclined surface extends from said front edge to said rear edge, and said rear edge is positioned adjacent to a threshold of a shower;
a dam which extends generally perpendicular from said inclined surface near said rear edge of said ramp when said ramp is in said open position; and
means for pivoting said ramp from said open position to a closed position, wherein, when said ramp is in said closed position, said ramp is positioned generally vertically, and said dam covers substantially all of a gap between said ramp and said threshold of said shower.

5,463,781

ANTI-SLIDE SEAT FOR BED-PATIENTS

Hedi E. Jones, 2243 Westwood Ct., Pittsburg, Calif. 94565

Filed Mar. 6, 1995, Ser. No. 399,133
Int. Cl.[6] A47C *21/00;27/00*
U.S. Cl. 5—630 **4 Claims**



1. An anti-slide seat for bed patients comprising:
(a) a seat, having a covering material made in the shape of a ring and being cushioned or upholstered in a soft material;
(b) two straps running around the thickness of the seat on either side, but under the covering material, emerging at the outer periphery and forming with the covering material a loop;
(c) two unbreakable rings threaded through the loops;
(d) two squared-off metal hooks of a size to fit over the head of a mattress, their lower ends forming an opening in the shape of an oval slot;
(e) a pair of strong belts having hook and loop closing means on both ends, each of said belts adapted to be connected between an unbreakable ring and an opening in the shape of an oval slot; and
(f) lap belts attached to the rings on the seat by means of hook and loop closing.

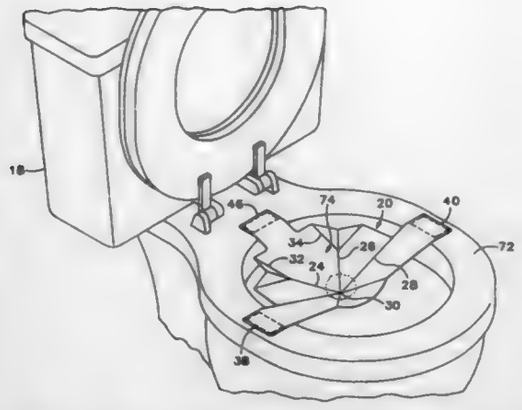
5,463,782

FOLDABLE STOOL SAMPLE COLLECTION DEVICE

Eric V. Carlson, 17170 Wall St., Lake Oswego, Oreg. 97034, and Iraj Nikzi, Beaverton, Oreg., assignors to Eric V. Carlson, Lake Oswego, Oreg.

Filed Nov. 21, 1994, Ser. No. 342,754
Int. Cl.[6] A47K *11/00*
U.S. Cl. 4—661 **16 Claims**

1. A stool sample collection apparatus comprising:
(a) a sheet having first and second diagonal fold lines, the first and second diagonal fold lines intersecting in a bottom half of the sheet;
(b) a longitudinal fold line generally intersecting the intersection of the first and second diagonal fold lines;



(c) left and right longitudinal extensions defined by and on opposite ends of a strip of the sheet between an edge of the sheet and the longitudinal fold line, the left and right longitudinal extensions having attachment apparatus;

(d) a support extension formed from the sheet, the support extension midway and perpendicular to the left and right longitudinal extensions, the support extension having attachment apparatus; and

(e) a cupping section in the sheet formed by the first and second diagonal fold lines and the longitudinal fold line, the cupping section generally between the left and right longitudinal extensions and the support extension;

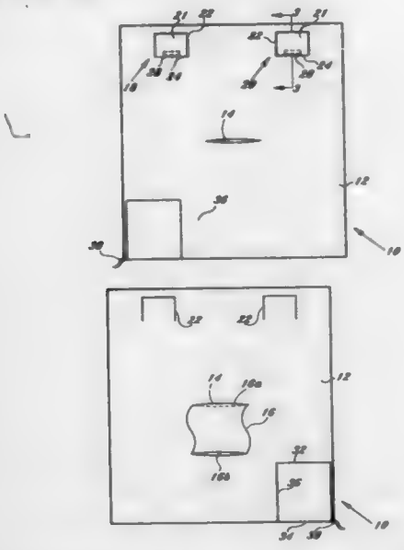
wherein the attachment apparatus on the left and right longitudinal extensions and the support extension are attachable to a rim of a toilet bowl so that the cupping section of the sheet depends into the toilet bowl.

5,463,783

COMBINATION BLANKET/CARRYING BAG/APPAREL

Brenda Pope, 8 E. 18th St., New York, N.Y. 10003

Filed Nov. 18, 1993, Ser. No. 154,310
Int. Cl.[6] A47G *9/06*
U.S. Cl. 5—417 **17 Claims**



1. A combination blanket/carrying bag/apparel comprising:

a continuous sheet of fabric having a substantially central opening therein, said sheet of fabric having a top surface and a bottom surface;

a tubular piece of flexible material having opposite open ends, with one said end being secured to the bottom surface of said sheet of fabric around said central opening thereof;

a flexible carrying bag secured to the bottom surface of said sheet of fabric adjacent a periphery thereof, said carrying bag having an opening through which said fabric can be inserted for carrying; and

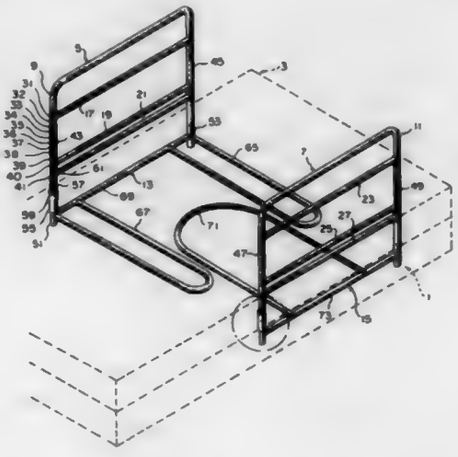
at least one pillow holder for receiving a removable pillow secured to the top surface of said sheet of fabric adjacent said periphery thereof, so as to overlie said sheet of fabric.

5,463,784

HAND RAIL ATTACHMENT FOR BEDS

Erwin A. Alpern, 5040 Fulton St., N.W., Washington, D.C. 20026

Filed Aug. 17, 1994, Ser. No. 291,850
Int. Cl.[6] A47C *21/08*
U.S. Cl. 5—430 **5 Claims**



1. A hand rail attachment for beds comprising an inverted U-shaped tubular member disposed in a vertical plane along the side of a bed and having a cross-member extending between and attached to the depending arms of the inverted U-shaped tubular member, said inverted U-shaped tubular member serving as both a guard rail and a hand-support rail for the bed occupant;

a base member adapted to be inserted in a horizontal plane between the bed mattress and the box spring for receiving and supporting the vertically depending arms of the inverted U-shaped tubular member;

said base member including upstanding end portions of cross-sectional shape similar to the ends of the inverted U-shaped tubular member, whereby the ends of the inverted U-shaped tubular member abut the upstanding end portions of the base member in flush relationship;

a pivot pin member fixedly mounted in the end of one of the depending arms of the inverted U-shaped tubular member and projecting therefrom to engage one of the upstanding end portions of the base member in telescopic relationship, thereby maintaining the depending arm and the upstanding end portion in vertical alignment while permitting pivotal movement between the respective members;

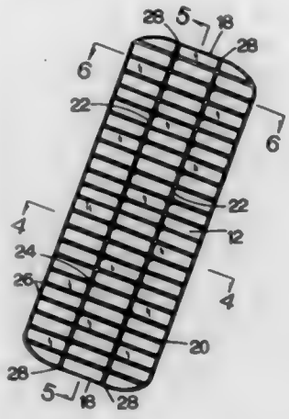
a tubular sleeve member slidably positioned on the other depending arm of the inverted U-shaped tubular member and adapted to slide over the other upstanding end portion of the base member while remaining partially in position on the inverted U-shaped tubular member, thereby securing the inverted U-shaped tubular member in an upstanding relationship with respect to the bed mattress;

whereby a stable hand rail is provided by the inverted U-shaped tubular member when the sleeve member is secured in said first position and the inverted U-shaped tubular can be pivoted away from the bed to permit easy access to and from the bed when the sleeve member is secured in said second position.

5,463,785
COMBINATION AIRFLOW INFANT PAD AND TODDLER PILLOW

William H. McKeel, Rte. 6 Box 595A, Springfield, Mo. 65803

Filed Jun. 27, 1994, Ser. No. 266,133
Int. Cl.[6] A47C 27/14;27/00
U.S. Cl. 5—655 4 Claims



1. A combination airflow infant pad and toddler pillow with the dimensions generally of a standard sized pad for an infant's bassinet or the like, comprised of a water impermeable closed cell foam of about ¾ of an inch thickness, comprising:

a generally rectangular pad with generally identical top and bottom surfaces and side edges and end edges;

a plurality of horizontal, lateral air channels extending on the top and bottom surfaces, between said side edges;

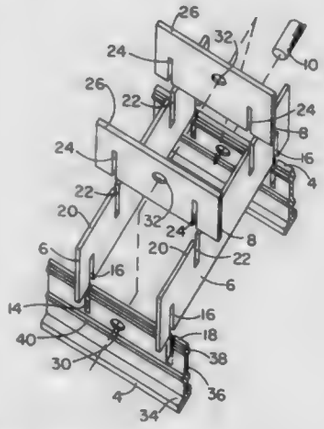
a plurality of horizontal, longitudinal air channels extending on the top and bottom surfaces, perpendicular to and intersecting said lateral air channels, and extending between said end edges; and

a plurality of air holes through said pad located at intersections of said lateral and longitudinal air channels, said air holes permitting fluid drainage and air circulation between the top and bottom surfaces.

5,463,786
WELDLESS GRATING FOR BRIDGE DECKS

Ronald W. Mangone, New Kensington, and Dennis Imm, Vandergrift, both of Pa., assignors to Grate-Lok Co., Inc., New Kensington, Pa.

Filed Sep. 12, 1994, Ser. No. 304,519
Int. Cl.[6] E04C 2/42; E01D 19/12
U.S. Cl. 14—73 20 Claims



1. A weldless grating comprising:

(a) a plurality of longitudinally extending primary load bearing members having a top portion and a bottom portion having a plurality of spaced-apart slots therein extending downwardly through the top portion, the slots in each of said primary load bearing members being aligned with the slots in adjacent primary load bearing members;

(b) a plurality of secondary load bearing members having a top portion, the secondary load bearing members positioned in the aligned slots in the primary load bearing members, the secondary load bearing members provided with slots extending downwardly through the top portion and located between said primary load bearing members;

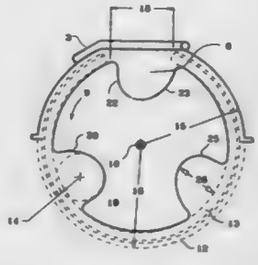
(c) a plurality of tertiary load bearing members positioned in the slots in the secondary load bearing members; and

(d) a rod extending through said tertiary load bearing members and said primary load bearing members locking said tertiary load bearing members in the slots in said secondary load bearing members and locking said secondary load bearing members in the slots in said primary load bearing members to form said weldless grating.

5,463,787
GAME-BALL CONDITIONER

Lawrence M. Burke, P.O. Box 1402, De Leon Springs, Fla. 32130, and Ronald L. Shalla, P.O. Box 3189, De Land, Fla. 32723

Filed Dec. 10, 1993, Ser. No. 165,227
Int. Cl.[6] A63B 47/04
U.S. Cl. 15—97.1 8 Claims



1. A manual-drive apparatus supported on an adjustable-height, permanent mounting post in an upright orientation above the ground for easy one-arm rotation of a crank lever by normal adults for cleaning and conditioning the external surfaces of soiled, spheroidal game balls having an actual or equivalent external radius R1, comprising:

(a) an impermeable spheroidal shield enclosure (2) consisting of upper and lower rigid, interlocked, sealed, arctuate component halves which form a spheroidal internal cavity of internal radius (15) with a lower sump zone, the internal radius of which falls in the range 8 R1 to 20 R1, and said sump zone containing a volume of liquid conditioning fluid sufficient for cleaning and conditioning a soiled game ball, said conditioning fluid consisting of a continuous phase and sufficient dispersed or dissolved amounts and forms of active agents to clean and impart desirable surface properties to said game ball, said enclosure lower half-shell being formed with an external mounting-post socket (8) appropriate for removable attachment to said mounting post,

(a1) said upper component of said enclosure having at least one closeable, resealable upward-facing access port (3) situated at its highest point for hand-insertion of soiled game balls into said enclosure,

(a2) said lower component of said enclosure having at least one closeable, resealable downward-facing sump-drain port (4) situated at its lowest point, and

wherein said access port and said sump-drain port are fitted with gasket means to prevent outward leakage of the liquid conditioning fluid and inward seepage of environmental contaminants;

(b) an elongated drive rod having first straight end and second crank-handle (7) ends separated by a straight, axiallysymmetric central zone having a midpoint and a length greater than the external diameter of said spheroidal shield enclosure and positioned within said shield such that said first and second ends protrude from the exterior of said enclosure and the central zone axis (10) extends diametrically in a generally horizontal direction across the internal cavity of said shield enclosure, said drive rod being supported adjacent to its ends by independent bearing sleeves fittingly secured into preformed recesses in each of the enclosure elements, said bearing sleeves being fitted with non-drip seals and adapted for leak-free rotation of said drive rod about said central zone axis (10) inside said enclosure by application of manual force to said crank handle (7) formed integral with said second end of said drive rod;

(c) a disc shaped member (5) of thickness (28) less than 1.2 R1 and external rim radius (24) less than said shell internal radius, fixed at its rotational center to said midpoint of said center zone of said drive rod, adapted for free revolution about said axis within said shield enclosure and at least partially immersed into said contained minimum volume of liquid conditioning fluid,

(c1) said disc shaped member having a set of least three spaced-apart peripheral notches (6) extending through the full thickness thereof, each said notch open to said external rim diameter, each having a maximum depth (26) less than 2 R1 as measured radially inward from said rim diameter, and a minimum width (27) greater than 2 R1,

(c1a) each said peripheral notch having a first curved, leading zone (19) of first surface texture and a second, curved trailing zone (20) of second different surface texture, said zones being located on opposite sides of said point of maximum notch depth and adapted to interact with game-ball surface during rotation of said disc shaped member, and

(c1b) each said peripheral notch being of shape and angular extent to encompass one of said soiled game balls placed in said notch and, upon rotation of the disc shaped member with said drive rod about said drive axis, to impart a plurality of irregular rotational and translational movements to said soiled game ball during each rotation of said disc shaped member;

(d) a pair of fixed, compliant, flat, opposing hispid shear pads (11) mounted on parallel, planar supports on opposite sides of said disc shaped member and spaced apart a distance (29) such that individual filaments of said shear pads exert controlled flexural and shear interactions with external surface features of said encompassed soiled game balls due to rotation of said disc shaped member around said drive axis and through said minimum contained volume of conditioning fluid, each said pad being prepared in the shape of a flat washer with an outer radius (32) smaller than said internal radius of the shell enclosure (15), an inner radius (31) larger than 0.5 R1 and a thickness (30) in the range 0.1–1.5 R1,

(e) a curved compliant, circumferential pad (13) of width (35) less than 3 R1 and thickness (34) in the range 0.1–1.0 R1 and composed of an array of encapsulated filaments mounted on a curved ring support band (12) extending approximately 80% around the outer periphery of said shear pads, having a gap of approximately 20% of the circumference of said shear pads the center of which is oriented to face the center of said top access port (3) and spaced apart a radial distance (33) from rotation axis of said disc shaped member such that a game ball encompassed in said notch will be subject to controlled flexural and shear interactions with said circumferential pad filament array due to rotation of said disc shaped member,

(f) wherein said free-surface spacing distance (29) between said hispid shear pads is set to produce at least 10% thickness compression of the free thickness of each of said pads by a game ball encompassed in said notch during rotation of said disc shaped member,

(g) wherein said radial free-surface spacing distance (33) between the circumferential ring and said rotation axis is set to produce at least 10% thickness compression of said circumferential pad free thickness by a game ball encompassed in said notch during rotation of said disc shaped member,

(h) wherein the radius (25) of curvature of said curved leading zone (19) is in the range 1.01 to 1.20 R1, and extends over an arc of approximately 90 deg. from the point of maximum notch depth toward said external rim, and said first surface texture is defined by a root-mean-square roughness of R1/90000 to R1/25,

(i) wherein the geometric form of said curved trailing zone (20) is defined by a polynomial equation of less than degree 4 which extends from said point of maximum notch depth (26), where it is tangent to said leading edge zone, in a generally radial direction toward said external rim, and said second surface texture is defined by a root-mean-square roughness of R1 /90000 to R1/25

(j) whereby during vigorous rotation of said crank handle, as user faces the apparatus and cranks in a clockwise direction with the right hand, said notch trailing surface zone follows behind said leading surface zone and said encompassed game ball is forced by cam actions into strong interaction with said curved trailing surface, hispid pads and circumferential pads which result in irregular, random-direction circulating movements within the notch,

(k) whereby upon charging at least one soiled game ball through the access port (3) and into one of said notches (6) and, after closing said access port, applying manual torques to said crank handle (7) in a sequence of continuous, reversing-or intermittent motions sufficient to accomplish repeated rotational interactions between the surface of the soiled balls and the wetted active filaments of said shear pads and circumferential pad, undesired surface soils and deposits are removed from the game ball and retained in the liquid sump zone of the enclosure lower half-shell until discharged with the contaminated conditioning fluid which is completely drainable by gravity from said drain-sump port (4),

(l) whereby upon completion of sufficient movements of the crank handle the cleaned game ball, including a thin film of liquid conditioning fluid, is manually removable by opening said top access port when said disc shaped member is positioned with one of said notches oriented toward said top access port and any excess of said liquid conditioning fluid film still remaining on said conditioned game ball is partially removed by brushing/wiping with an absorbent material and any still-remaining remnant allowed to evaporate into the air, and

(m) whereby highly desirable surface characteristics including freedom from original soil, and other attributes, particularly coefficients of surface friction for air flow around said game ball in flight and flat-face mechanical impacts, microhardness and wettability by aqueous solutions, as well as other remarkable surface qualities, which are all controllable and directly related to exposure to said sufficient levels of active agents contained in said conditioning fluid, are imparted to said game ball surface.

5,463,788

MECHANIZED AUTOMATED VEHICLE WASHING APPARATUS

G. Thomas Ennis, Inglewood, Calif., assignor to N/S Corporation, Inglewood, Calif.

Filed May 12, 1993, Ser. No. 63,229

Int. Cl.[6] **B60S** *3/04*

U.S. Cl. 15—97.3 **23 Claims**

1. A mechanized vehicle washing apparatus comprising:

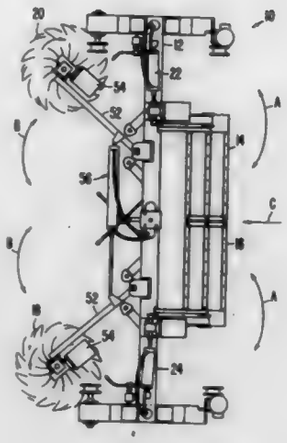
a frame,

a top scrubber curtain pivotally mounted to said frame;

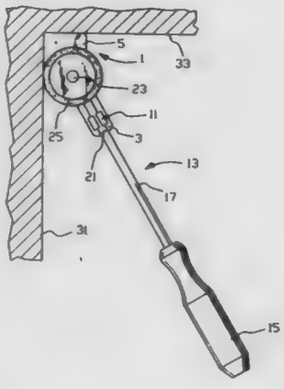
means for reciprocating said top scrubber curtain to scrub a surface of a vehicle;

and

means for pivoting said top scrubber curtain in a horizontal plane into and out of a path of a vehicle to be washed.



5,463,789
PAINT ROLLER BUMPER
Stanley H. Zilinski, 420 Porter St., Easton, Pa. 18042
Filed Nov. 12, 1993, Ser. No. 151,418
Int. Cl.[6] B44D 3/28
U.S. Cl. 15—248.2 18 Claims



1. A paint roller bumper for a paint roller device having a handle, an extended, curved rod extending from the handle with a lower portion extending directly away from said handle, a middle portion extending away from said lower portion, an upward portion extending from said middle portion in a direction which is a right angle from a roller, and a top portion of said rod, which comprises:

(a) a main bumper body having a lower section and an upper section and having adequate length so as to extend beyond a mounted roller in a direction away from said roller on a paint roller device when said bumper is mounted on an upward portion of a rod of a paint roller device; and,

(b) attachment means connected to said main bumper body and attaching said bumper to an upward portion of a rod of a paint roller device so as to establish an angle between the upper section of the main bumper body and the upward portion of the rod of at least 30 degrees.

5,463,790
WINDSHIELD WIPER WITH AN AUTOMATIC PRESSURE MEANS
Xian-Shun Chiou, 19 Ping-Yang Street, and Chih-Hsien Wong, 2F., 38, Lane 92 Hua-Ling Street, both of Taipei, Taiwan, Prov. of China
Filed May 31, 1994, Ser. No. 251,194
Int. Cl.[6] B60S 1/38;1/28
U.S. Cl. 15—250.29 16 Claims

8. A windshield wiper for wiping a windshield, said wiper comprising:

a master wiper arm;

a rubber blade operatively connected to the master wiper arm;

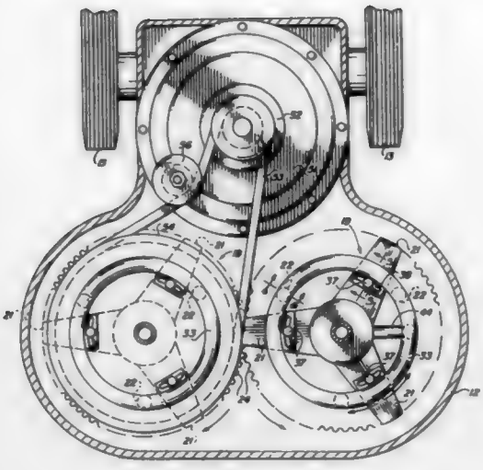
a pressure mechanism mounted at a top portion of said master wiper arm to press the rubber blade against the windshield, wherein said pressure mechanism includes a wing, a pivot pivotally connecting said wing to said master wiper arm, and a pivot gear connected to said pivot; and

a prestressing mechanism mounted on said master wiper arm and engaged with said pressure mechanism to rotatably bias said wing about said pivot; said prestressing mechanism including a prestress gear meshed with the pivot gear of said pressure mechanism, a threaded member fixed to said prestress gear and threadingly engaged with the master wiper arm, an adjusting screw threadingly engaged with the master wiper arm and an elastic element disposed between said threaded member and the adjusting screw; said adjusting screw exerting prestress force to the elastic element, such that the force is transmitted to said prestress gear of said prestressing mechanism via said threaded member.

5,463,791
SURFACE CLEANING APPLIANCE
Michael J. Roden, Gilbert, Ariz., assignor to Redfield Engineering, Gilbert, Ariz.
Filed Sep. 1, 1994, Ser. No. 299,276
Int. Cl.[6] A47L 5/30
U.S. Cl. 15—320 10 Claims

1. A surface cleaning appliance comprising a housing, a pair of rotatable head structures mounted for rotation about parallel vertical axes in said housing, each of said rotatable head structures comprising at least one spray nozzle for spraying cleaning fluid onto the surface to be cleaned and at least one vacuum nozzle for extracting cleaning liquid and debris from the surface, and means for rotating said head structures in opposite directions at the same speed, the spacing between the axes of rotation of said head structures being such that the vacuum pattern of the vacuum nozzle of one head structure overlaps the vacuum pattern of the vacuum nozzle of the other head structure.

5. A surface cleaning appliance comprising a housing, a rotatable head structure mounted for rotation about a vertical axis in said housing, means for rotating said head structure, said head structure comprising at least one spray nozzle for spraying cleaning fluid onto the surface to be cleaned and at least one vacuum nozzle for extracting cleaning fluid and debris from that surface,



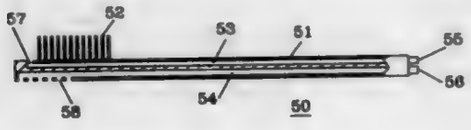
said spray nozzle and said vacuum nozzle being mounted on the head structure in a manner to permit the angular displacement between the two to be adjusted.

5,463,792

ASPIRATING TOOTH BRUSH

James E. Hogan, P.O. Box 101, Atlanta, Tex. 75551, and Mary A. Brown, 2505 Shadow La., McKinney, Tex. 75070

Filed Dec. 27, 1993, Ser. No. 173,121
Int. Cl.[6] A45D *44/18*
U.S. Cl. 15—322 13 Claims



1. An aspirating tooth brush, comprising:
an elongated handle having first and second ends;
a plurality of bristles on one side of the first end of said handle;
at least one opening in said handle near said first end on a side of said handle opposite from said one side;
a first channel inside said handle extending from said at least one opening to an outlet in the second end of said handle; and
a reduced portion on the second end for receiving a vacuum tube.

5,463,793

SASH SHOE SYSTEM FOR CURL SPRING WINDOW BALANCE

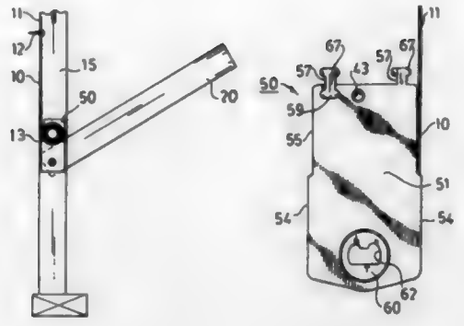
Norman R. Westfall, Rochester, N.Y., assignor to Caldwell Manufacturing Company, Rochester, N.Y.

Division of Ser. No. 40,457, Apr. 1, 1993, Pat. No. 5,353,548.
This application Jul. 26, 1994, Ser. No. 280,491
Int. Cl.[6] E05F *1/08*; E05D *13/00*
U.S. Cl. 16—197 43 Claims

1. A sash shoe configured for running in a shoe channel of a window jamb to transmit counterbalance lifting force to a sash, the sash shoe comprising:

a. a shoe body retaining a curled length of a curl spring having an uncurled length extending above the body; and

b. a free end region of the uncurled length of the curl spring being connected to a mount that is releasably retained on an upper region of the shoe body until the mount is fastened to a mounting surface.

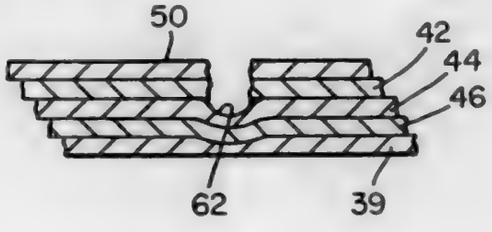


5,463,794

FIBER REINFORCED PLASTIC (FRP) COMPOSITE HINGE

Robert K. Erland, P.O. Box 575, Punta Gorda, Fla. 33951

Division of Ser. No. 972,294, Nov. 5, 1992, Pat. No. 5,318,422.
This application Jan. 14, 1994, Ser. No. 181,583
Int. Cl.[6] E05D *1/00*
U.S. Cl. 16—225 5 Claims



1. A fiber reinforced plastic (FRP) molded composite hinge comprising:

a fiber fabric impregnated with resin;

a hinge assembly secured by resin to the impregnated fiber fabric to form the FRP molded composite, the FRP molded composite having an inner surface adjacent the impregnated fiber fabric;

said hinge assembly comprising:

juxtaposed narrow strips of fabric impregnated with resin including (1) at least one strip of hinge fiber fabric comprised of flexible fibers which are of high tensile strength and capable of repeated flexing without substantial fatigue and which are arranged to form flexible elements extending across a hinge line in the FRP molded composite, and (2) at least one strip of reinforcing fiber fabric comprised of fibers which form reinforcing elements in the FRP molded composite adjacent the hinge line; and

a groove co-extensive with the hinge line in the FRP molded composite extending from the inner surface of the FRP molded composite through the reinforcing fiber fabric to the hinge fiber fabric;

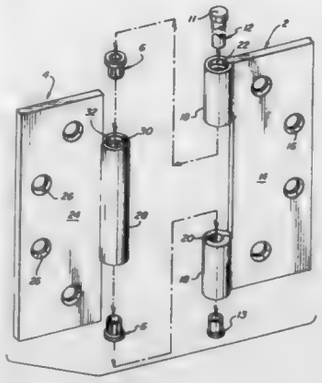
the groove separating two sections hinged relative to each other by the hinge fiber fabric which joins the two sections adjacent the hinge line and which has fibers that extend across the hinge line and flex to provide a molded-in hinge.

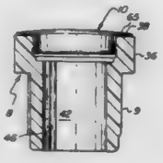
5,463,795

CONCEALED BEARING HINGE AND METHOD OF MAKING SAME

Thomas R. Carlson, Meriden, and Richard M. Davidian, Kensington, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Mar. 2, 1994, Ser. No. 204,652
Int. Cl.[6] E05D *11/02*
U.S. Cl. 16—273 15 Claims





1. A hinge comprising:

(a) a first hinge leaf having at least two axially spaced knuckles with an axial bore therethrough;

(b) a second hinge leaf having a knuckle extending between and axially aligned with said knuckles of said first hinge leaf, said knuckle having an axial bore therethrough with a counterbore at each end thereof;

(c) bearing assemblies seated at each axial end of said knuckle of said second hinge leaf and extending between said knuckle of said second hinge leaf and said knuckles of said first hinge leaf, each of said bearing assemblies having a generally cylindrical synthetic resin bushing extending axially within said bore of said knuckle of said second hinge leaf, and a collar portion thereon seated in said counterbore with its axially outer surface flush with the axial end of said knuckle, said bushing having an axial bore extending therethrough and a counterbore at its outer end, each bearing assembly also including a metallic thrust bearing with a generally axially extending body portion disposed in said counterbore of said bushing and a peripheral collar at its outer end overlying the outer end of said bushing and providing a thrust bearing surface for the adjacent knuckle of said first hinge leaf, said collar being relatively thin and having a portion projecting in spaced relationship above said axial outer surface of said bushing, said projecting portion being deflectable against said axially outer surface of said bushing by a load placed thereon, said thrust bearing being rotatable relative to said bushing together with the adjacent knuckle of said first hinge leaf; and

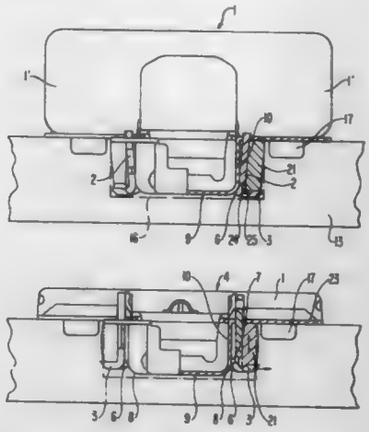
(d) a hinge pin extending through said axial bores of said knuckles and bushings to secure said first and second hinge leaves in assembly.

5,463,796

HINGE POT

Klaus Brüstle, Höchst, and Helmut Rupprechter, Lauterach, both of, Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Feb. 7, 1994, Ser. No. 192,828
Claims priority, application Austria, Feb. 8, 1993, 218/93; Sep. 10, 1993, 1834/93
Int. Cl.[6] E05D *7/12*
U.S. Cl. 16—383 14 Claims



1. A hinge pot assembly capable of being detachably connected to a furniture part, said assembly comprising:

a housing to be inserted into a bore in the furniture part;

clamping jaws insertable with said housing into the bore, said clamping jaws being formed of visco-elastic material and being capable of being clamped against a wall of the bore, each said clamping jaw having the shape of a segment of a cylinder;

a lever movable relative to said housing between an open, outer position and a closed, inner position;

metal expanding members arranged between said housing and respective said clamping jaws, each said expanding member having an inner free end having a hook directed away from said housing in a direction to be toward the wall of the bore, each said expanding member having an outer end connected to said lever at a position such that, as said lever is moved relative to said housing from said open, outer position to said closed, inner position, said expanding members are caused to move relative to said housing in a direction from an inner end thereof to an outer end thereof and to be outwardly of the bore, and said expanding members having structure to cause, upon said expanding members moving in said direction, said expanding members to impart to said clamping jaws an outward clamping force to be directed against the wall of the bore and moving said clamping jaws to clamping positions; and

said hook of each said expanding member projecting outwardly beyond the respective said clamping jaw when said clamping jaw is in said clamping position thereof.

5,463,797

LINE HOLDING STORAGE DEVICE AND PROCESS OF USING THE SAME

Tamara Laug, 4606 Greenbriar Ct., Boulder, Colo. 80303, and Robert Bromley, Louisville, Colo., assignors to Tamara Laug, Boulder, Colo.

Filed Mar. 24, 1994, Ser. No. 217,273
Int. Cl.[6] B65D *77/00*; F16G *11/00*
U.S. Cl. 24—115 G 17 Claims

1. A line holding device, having no moving pans for holding articles on a line in random fixed locations along such a line, comprising:

a support housing having a body;

a line receiving channel integral with said support housing;

securing means integral with said support housing and cooperating with said line receiving channel for releasably securing said line holding device to a line for release from such a line without moving said support housing relative to such a line;

catch mechanism means mounted on said support housing for holding articles, said catch mechanism means positioned in a manner such that the weight of any article carried by said catch mechanism means increases the attachment of said securing means of said line holding device to any associated line; and

said securing means further comprising a pair of opposing pincer arms integral to the body of the support housing defining a locking channel for the line.

5,463,798

SELF-LOCKING CARABINER

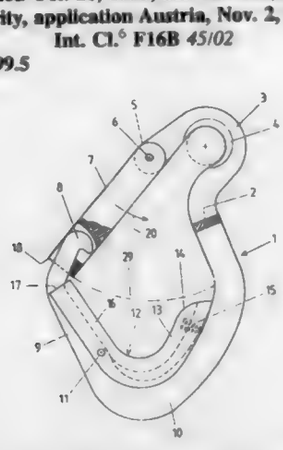
Franz Wurzer, Fachschulgasse 18, A-6166 Fulpmes/Tirol, Austria

Filed Oct. 26, 1993, Ser. No. 143,432

Claims priority, application Austria, Nov. 2, 1992, 2157/92

Int. Cl.[6] F16B *45/02*

U.S. Cl. 24—599.5 **8 Claims**



1. A carabiner comprising an essentially C-shaped load-bearing hook member extending in a plane and having a first end and a second free end, a closing member having a first free end and a second end attached to the first end of the hook member, the closing member being pivotable about the first end of the hook member in the plane of the hook member between an open position and a closing position, first spring means for biasing the closing member into the closing position in which the free end of the closing member rests against the free end of the hook member, the hook member comprising a hook portion at the free end thereof, the hook portion having an inner surface, a two-armed lever pivotally attached to the inner surface of the hook portion, the two-armed lever being pivotable about an axis extending perpendicularly to the plane of the hook member, the two-armed lever corresponding in shape essentially to the hook portion and comprising a first arm facing the free end of the hook member and a second arm facing away from the free end of the hook member, second spring means for biasing the lever into a first position in which the first arm of the lever rests against the inner surface of the hook portion and the second arm is spaced from the inner surface of the hook portion in the unloaded state of the carabiner, wherein, when the lever is pivoted against the force of the second spring means, an end face of the first arm of the two-armed lever projects into a pivoting range of the free end of the closing member when the closing member is in the closing position.

5,463,799

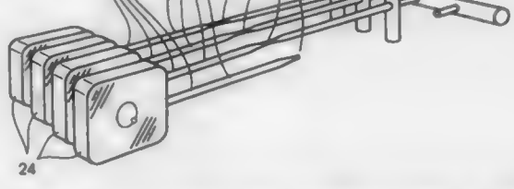
FASTENER FOR CONNECTING MATERIALS WITH WEAKENED PORTION

Robert W. Graham, Dayton, Ohio, assignor to R. William Graham, and Jerald E. Wiewandt, both of Dayton, Ohio

Filed Jul. 8, 1993, Ser. No. 88,776

Int. Cl.[6] A44B *9/00;* **F16B** *21/00*

U.S. Cl. 24—704.1 **6 Claims**



1. A fastening device for fastening articles of material together comprising:

a cross bar at one end, said bar of a cross section to permit axial insertion through said material producing hole surface of minimal size and relatively insubstantial damage to said material and of a length substantially greater than said cross section to prevent lengthwise passing of said cross bar through said hole surface;

a head portion of a size substantially greater than said cross section to prevent passing of said head portion through said hole surface; and

an intermediate portion joining said cross bar and said head portion wherein said intermediate portion includes a weakened portion such that when a pulling force is exerted on said cross bar and said head portion, said weakened portion readily breaks, and wherein said weakened portion is further characterized to include a perforated portion.

5,463,800

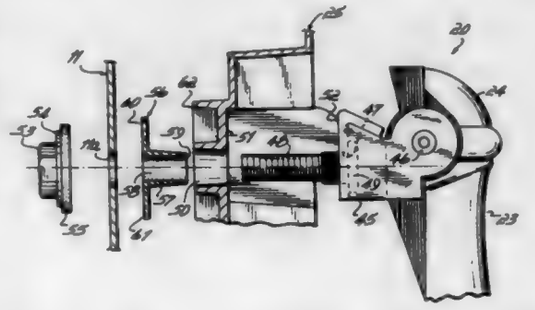
SEAL SUSTAINING HARDWARE FOR CASKETS

Ilija Rojdev, Cincinnati, Ohio, assignor to Batesville Casket Company, Inc., Batesville, Ind.

Filed Mar. 14, 1994, Ser. No. 212,268

Int. Cl.[6] A61G *17/00*

U.S. Cl. 27—1 **16 Claims**



1. Casket hardware in combination with a casket, said casket having an interior and a wall having inner and outer surfaces, said combination comprising:

a corrosive trim plate;

an arm adapted to support a casket handle bar, said arm having a bolt connected thereto, said bolt passing through said plate and said casket wall;

a nut threadably engaging said bolt within said interior of said casket;

a seal surrounding said bolt between said nut and said inner surface of said casket wall; and

a noncorrosive compressive load carrying member disposed between and contacting said casket wall and said arm for creating tension in said bolt as said nut is tightened against said seal;

said noncorrosive compressive load carrying member maintaining said bolt in tension thereby maintaining said seal in compression between said nut and said casket wall inner surface when said corrosive trim plate corrodes and falls away from between said arm and said casket wall.

5,463,801

ROLLING MILL COATING EQUIPMENT

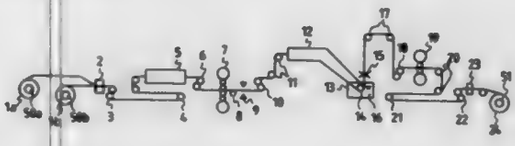
Toshiyuki Kajiwara, Tokyo; Teruo Yamagushi, Hitachi; Hitoshi Okoshi, Hitachi, and Tsuneo Nakamura, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 23, 1994, Ser. No. 200,668

Claims priority, application Japan, Feb. 26, 1993, 5-038135

Int. Cl.[6] B23P *23/04*; B05C *3/00*; B21B *15/00*

U.S. Cl. 26—33 Q **16 Claims**



1. A coating system for continuously coating hot rolled strip material comprising the following sequentially disposed system stations:

a hot rolling coil uncoiler station,

a pickling tank station,

a cold rolling mill station, including a cold rolling control system for effecting single pass rolling of the strip material with a predetermined thickness reduction during operation with strip material thicker than desired for coating and for effecting passage of the strip material through the cold rolling mill station without rolling during operation with strip material of a desired thickness for coating,

a heating and deoxidizing furnace station, and

a coating station.

5,463,802

DEVICE FOR REMOVING THE VALVES OF AN INTERNAL COMBUSTION ENGINE

André Vachoux, Collonge Sous Saleve, France, assignor to Serdi - Societe D'Etudes De Realisation Et De Diffusion Industrielles, Annecy, France

Filed Jan. 4, 1994, Ser. No. 177,518

Claims priority, application France, Jul. 29, 1993, 93 09580

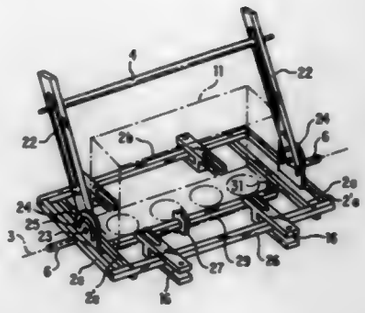
Int. Cl.[6] B23P *19/04*

U.S. Cl. 29—214 **16 Claims**

1. A device for removing valves of an internal combustion engine, comprising:

a planar cylinder head stand mounted so that it can pivot through at least 180° about a horizontal axis, capable of rigidly holding a cylinder head;

at least one valve lifter operably connected to said cylinder head stand and located and configured to be pressed against a thrust washer of a return spring of a valve of a cylinder head mounted on said cylinder head stand;



a support rod operably connected to said cylinder head stand on an opposite side of said cylinder head stand from said valve lifter; and

at least one block located to retain said valve while said valve lifter is pressed against said thrust washer, said block being mounted on said support rod and being made of a resilient, elastic and impact resistant material.

5,463,803

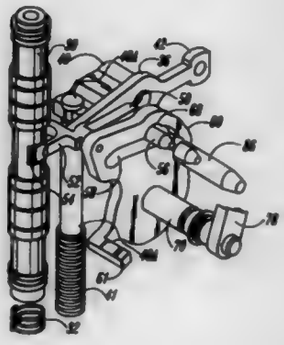
METHOD OF ASSEMBLING A CONTROL HAVING A BODY MEMBER AND A COVER MEMBER WITH AN ACCESS APERTURE THEREIN

William L. Welscher, Ames, Iowa, assignor to Sauer Inc., Ames, Iowa

Division of Ser. No. 49,988, Apr. 16, 1993, Pat. No. 5,378,127. This application Sep. 30, 1994, Ser. No. 315,547

Int. Cl.[6] B23P *15/00*

U.S. Cl. 29—467 **1 Claim**



1. A method of assembling a control assembly having a body member with a cover member securable to said body member, said cover member having an access aperture therein, said access aperture being in substantial alignment with a second upstanding pin on linkage means disposed within said body member the method comprising:

placing an elongated alignment tool on said second upstanding pin;

placing said cover member on said body member and extending said tool through said access aperture;

securing said cover member to said body member; and

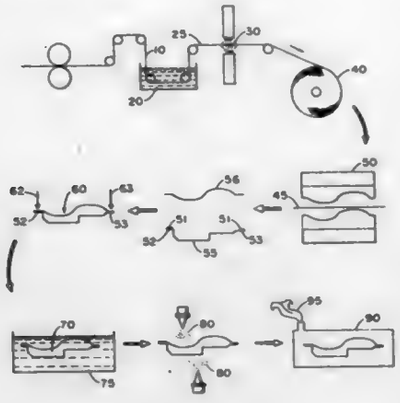
removing said alignment tool.

5,463,804

COATING ALUMINUM ALLOY SHEET TO PROMOTE ADHESIVE BONDING FOR VEHICLE ASSEMBLIES

Sherri F. McCleary, Apollo; Gary A. Nitowski, Lower Burrell; James M. Marinelli, Murrysville, and John T. Siemon, Cheswick, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 31, 1994, Ser. No. 299,055
Int. Cl.[6] B21D 39/00
U.S. Cl. 29—469.5 20 Claims



1. A process for making an assembly comprising an aluminum alloy sheet joined to a metal member adjacent said sheet, comprising:

(a) coating an aluminum alloy sheet with a phosphorus-containing organic acid selected from the group consisting of organophosphonic acids and organophosphinic acids, thereby to form a coated sheet having an organic, non-chromate surface coating thereon;

(b) applying a polymeric adhesive to the coated sheet; and

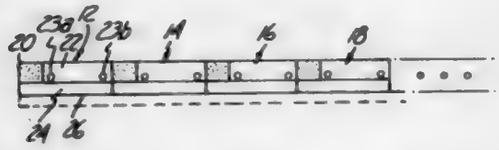
(c) joining said coated sheet to an adjacent metal member through said polymeric adhesive.

5,463,805

METHOD OF LAPPING MR. SENSORS

Gregory S. Mowry; Phillip E. Gorka, both of Burnsville; Brian D. Strayer, Minneapolis, and Alan G. Kracke, Minnetonka, all of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Feb. 7, 1994, Ser. No. 192,673
Int. Cl.[6] G11B 5/127
U.S. Cl. 29—603 11 Claims



1. A method of lapping a magnetoresistive sensor to a proper height, the method comprising:

simultaneously lapping a surface of a magnetoresistive lap monitor and a surface of the magnetoresistive sensor on a slider until a resistance of a variable resistor on the surface of the magnetoresistive lap monitor approximately equals a resistance of a target resistor within the magnetoresistive lap monitor; and

comparing a reference resistor within the magnetoresistive lap monitor to the target resistor and to the variable resistor to detect a lapping failure.

5,463,806

METHOD FOR COMPACTING ELECTRICAL WINDINGS EQUIPPING TRANSFORMERS

Michel Sacotte, Ronbas, France, assignor to France Transfo, Maizieres-les-Metz, France

Continuation of Ser. No. 961,618, Oct. 16, 1992, abandoned.
This application Nov. 8, 1993, Ser. No. 148,533
Claims priority, application France, Jan. 16, 1991, 91 12705
Int. Cl.[6] H01F 41/06
U.S. Cl. 29—605 5 Claims

1. A method of height compaction for an electrical winding equipping transformers and constituted by at least one electrically conducting wire coated with an electrically insulating material and wound in non-tightly coiled turns, according to a uniform direction of rotation, said method including the steps of:

(a) winding said wire in non-tightly coiled turns; and

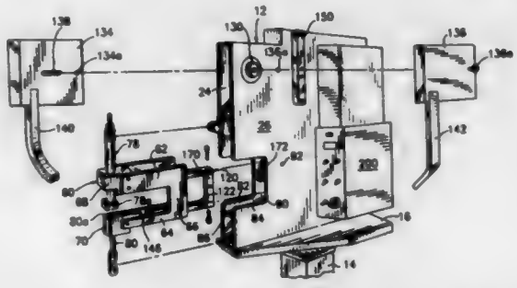
(b) generating an attractive force between said turns by passing a direct electrical current into said turns, for a period of about 1 to 5 seconds without interruption.

5,463,807

ATTACHING MACHINE FOR ATTACHING FASTENERS

Anton Hochhausl, Helen, N.C., assignor to Scovill Fasteners Inc., Clarkesville, Ga.

Filed Sep. 8, 1994, Ser. No. 303,208
Int. Cl.[6] B23Q 7/10
U.S. Cl. 29—809 12 Claims



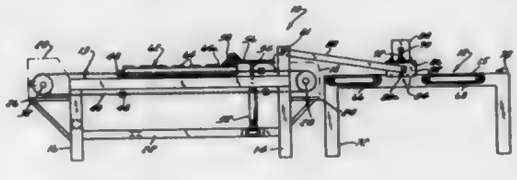
1. An attaching machine for attaching fastener parts to fabric comprising a frame having a horizontal opening in the front thereof, drive means on the frame, a separate vertically aligned plunger and die assembly having a horizontal rear portion selectively receivable into the horizontal opening for the purpose of supporting the assembly, and connection means on the drive means and the plunger and die assembly adapted to interengage when the rear portion of the plunger and die assembly is fully received in the opening.

5,463,808

DISCRETE PALLET DECK BOARD REMOVER MACHINE

Milton Harris, Rte. 1, Box 589, Palmyra, Ind. 47164

Filed Nov. 15, 1994, Ser. No. 340,280
Int. Cl.[6] B23P 19/00
U.S. Cl. 29—823 11 Claims



1. An apparatus for the removal of a preselected defective deck board from the stringers of a pallet comprising

(a) a frame structure defining a substantially horizontal bed for supporting a pallet;

(b) a plow assembly positioned above said bed and including

(i) a plow support member for mounting a plurality of spaced plow blades, said plow support member movably mounted to said frame structure, and

(iii) a power mechanism operatively connected to said plow support member for selectively moving said plow support member and said plow blades between lowered and raised positions;

(c) a pallet pusher assembly for moving said pallet in a predetermined direction along said support bed toward said plow assembly from a point where said pallet is placed on said bed to a defective board removal position below said plow support member and said plow blades in said raised position,

said spaced plow blades being held stationary and abutting respective stringers of said pallet between said preselected defective board and an adjacent board when in said lowered position and when said pallet is positioned at said defective board removal position, said pallet pusher urging said defective pallet board against said spaced plow blades being held stationary when in said lowered position whereby said preselected defective board is caused to be lifted away from said respective stringers.

5,463,809

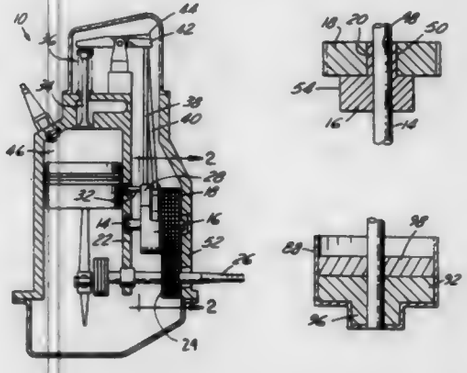
METHOD OF MAKING A POWDERED METAL CAMSHAFT ASSEMBLY

Ronald J. Hoffman, Phoenix, Ariz., and Jens K. Olsen, Tokyo, Japan, assignors to Ryobi Outdoor Products, Chandler, Ariz.

Division of Ser. No. 18,079, Feb. 16, 1993, Pat. No. 5,293,847. This application Dec. 30, 1993, Ser. No. 176,019

Int. Cl.[6] B23P *19/04*; B21K *1/08*; B22F *7/06*

U.S. Cl. 29—888.1 **5 Claims**



1. A method of making a camshaft component, the method comprising:

forming a first powdered metal preform, the first powdered metal preform having an outer portion and a boss portion;

compressing the first powdered metal preform so that the boss portion has a density less than the density of the outer portion;

forming a second powdered metal preform;

assembling the first powdered metal preform with the second powdered metal preform so that the boss portion cooperates with the second powdered metal preform to fix the first and second powdered metal preforms against rotation relative to each other; and

sintering the first and second powdered metal preforms to join them together.

5,463,810

METHOD OF MANUFACTURING PLUNGER BARREL

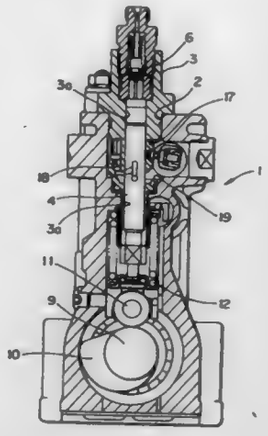
Toshihiro Nakagawa, Higashimatsuyama; Toshiaki Sakai, Oura, and Hiroaki Nozaki, Higashimatsuyama, all of, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Oct. 25, 1993, Ser. No. 140,490

Claims priority, application Japan, Jan. 30, 1992, 4-315937

Int. Cl.[6] B23P *15/00*

U.S. Cl. 29—888.4 **8 Claims**



1. A method of manufacturing a plunger barrel as a unitary member having a sliding bore in which a plunger is slid, a sleeve acceptor in the shape of a hole for a control sleeve which is formed in an intermediate portion of the sliding bore and a window portion which is opened in a wall defining the sleeve acceptor, the method comprising the steps of:

preparing a single blank having one end portion and an other end portion;

forming a first bore axially from the one end portion of the blank, so as to provide a diameter equal to that of the sleeve acceptor, to an intermediate portion of the blank;

drawing the one end portion of the blank so that a portion in which the sleeve acceptor is formed remains;

forming a second sliding bore in the blank so as to penetrate from the one end portion to the other end portion of the blank; and

forming a window portion in a wall of the sleeve acceptor.

5,463,811

SPHERICAL BEARING AND METHOD OF ASSEMBLING A SPHERICAL BEARING

William D. Aureli, Watertown, and Robert E. Furst, Griswold, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Continuation of Ser. No. 85,438, Jun. 30, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 331,199

Int. Cl.[6] B23P *15/00*

U.S. Cl. 29—898.046 **10 Claims**

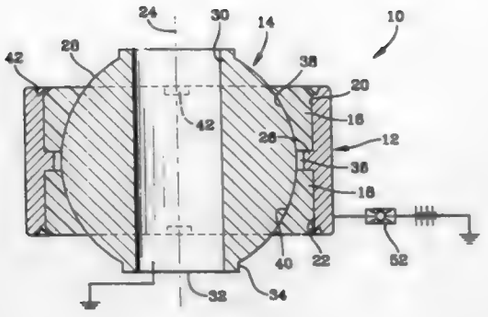
1. A method of making a spherical bearing, the method comprising the steps of:

forming an outer ring with counterbores at the ends thereof, disposed along a common axis and separated by a radially inwardly extending keel portion;

providing a ball part having a spherical diameter less than the inner diameter of the keel portion such that a clearance results between the ball part and the keel portion;

inserting a polymer liner into each end of the outer ring into abutment with the keel portion, the polymer liners having preformed spherically concave inner surfaces conforming to the ball part entrapped therebetween; and

deforming a portion of the outer ring over a portion of the polymer liners to lock the polymer liners in position.



5,463,812

PROCESS FOR TENSIONING AND LOOSENING TENSION RODS IN MULTICOMPONENT, ASSEMBLED GAS TURBINE ROTORS

Emil Aschenbruck, Duisburg; Reinhold Rohrbacher, Oberhausen, both of, Germany; Alain Moreau, Le Chesnay, and Michel Guillaux, Montigny les Cormeilles, both of, France, assignors to Man Gutehoffnungshutte AG, Oberhausen, Germany

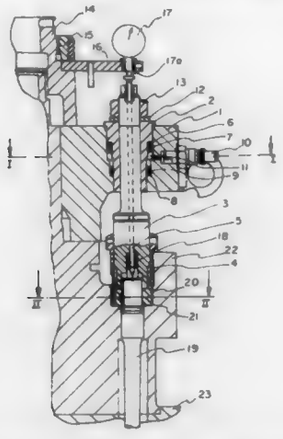
Filed Nov. 19, 1993, Ser. No. 155,581

Claims priority, application Germany, Nov. 19, 1992, 42 38 922.4

Int. Cl.[6] B23P *15/00*

U.S. Cl. 29—889.21 **2 Claims**

1. A process for tensioning and loosening tension rods of multi-



component, assembled gas turbine rotors with a hydraulic tensioning device including several tension rods arranged eccentrically on the gas turbine rotors, the tension rods having nuts the process comprising the steps of:

providing the hydraulic tensioning device with piston chambers within a solid cylindrical ring, said piston chambers being connected via cross holes;

providing a spring loaded measuring rod located in a catch pin connected to the tensioning rod, the measuring rod being connected to a dial gauge;

for final assembly of the gas turbine rotor, tensioning including:

elongation of the tension rods by building up pressure in the hydraulic tensioning device;

tightening the nuts of the tension rods; and

stressing the nuts of the tension rods by reduction of pressure in the hydraulic tensioning device;

disassembling the gas turbine rotor by a combined isochronic uniform loosening including elongation of the tension rods by means of pressure build-up;

loosening the nuts of the tension rods; and

tightening the tension rods by means of pressure reduction;

measuring elongation directly and isochronically on all tension rods via said spring loaded measuring rod, which measuring rod transfers a change in length directly to said dial gauge.

5,463,813

RECIPROCATORY DRY SHAVER

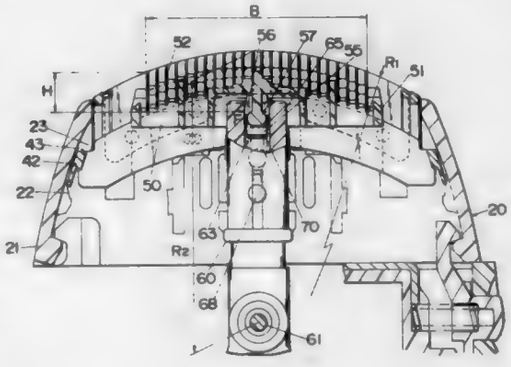
Kiyotaka Otsuka, Hikone, and Jyuzaemon Iwasaki, Nagahama, both of, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Nov. 8, 1993, Ser. No. 148,566

Claims priority, application Japan, Nov. 13, 1992, 4-303388

Int. Cl.[6] B26B *19/04;19/12*

U.S. Cl. 30—43.9 **7 Claims**



1. A dry shaver which comprises:

a housing mounting thereon a cutter head comprising a perforated outer shearing foil and an inner cutter, said outer shearing foil having a first axis and curved arcuately along said first axis, said inner cutter having a longitudinal axis and having an arcuate contour curved along said longitudinal axis in conformity with said outer shearing foil;

a drive arm extending from said housing and connected to reciprocate said inner cutter along a reciprocation path including said first axis and being in hair shearing engagement with said outer shearing foil so that said inner cutter moves to and fro past a neutral position between two opposite end positions which are spaced along said reciprocation path;

said drive arm connected at an upper end thereof to said inner cutter and pivotally supported at a portion downwardly of said upper end to define thereat a pivot axis extending perpendicular to said reciprocation path, said drive arm being connected at a lower end thereof to a drive source so as to oscillate about said pivot axis with said upper end tracing an arcuate path naving a curvature greater than the curvature of said outer shearing foil;

said inner cutter being connected to said drive arm to be slidable along a length of said drive arm as well as to be pivotable relative thereto within a limited angular range in a plane including said reciprocation path;

spring means floatingly supporting said inner cutter to said drive arm for biasing said inner cutter against said outer shearing foil;

said inner cutter being arranged to satisfy the following relation:

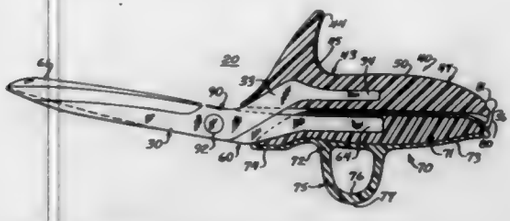
$$.5<R2/R1<1$$

wherein R1 is a radius of curvature of the outer shearing foil, and R2 is a distance between said pivot axis of said drive arm and a point at which an upper end of said inner cutter in said neutral position is in contact with said outer shearing foil, whereby said spring means exerts a lower biasing force to said inner cutter when said inner cutter moves toward said end position than at said neutral position.

5,463,814
SHEARS

Davin Stowell, New York, N.Y., and Daniel J. Formosa, Montvale, N.J., assignors to General Housewares Corp., Terre Haute, Ind.

Filed Sep. 19, 1994, Ser. No. 308,578
Int. Cl.[6] B26B 13/12
U.S. Cl. 30—232 17 Claims



8. In shears having two crossed pivotally interconnected levers, each having a blade end and a handle end, and being pivotally movable between open and closed conditions and normally biased to the open condition, the improvement comprising:

an upper handle connected to one of the lever handle ends and disposed for engagement in use with the thumb and palm of a user's hand, and

a lower handle connected to the other of the lever handle ends and disposed for engagement in use with the fingers of a user's hand,

said upper handle having a front portion projecting upwardly above the remainder of said upper handle for engagement with the thumb and the web between the thumb and forefinger of a user's hand to limit forward movement of the hand along said upper handle,

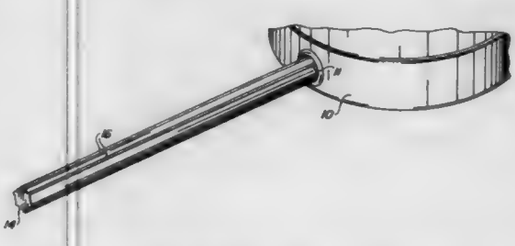
said lower handle having a loop depending therefrom rearwardly of said front portion of said upper handle and positioned and dimensioned to receive therethrough in use only the middle finger of a user's hand,

said loop being formed of a flexible and resilient material so as to be deformable to accommodate different size middle fingers and to cushion adjacent fingers of a user's hand.

5,463,815
RIBBED FLEXIBLE CUTTING LINE

John R. Fogle, Scottsdale, Ariz., assignor to Robert L. Phillips, Scottsdale, Ariz.

Filed Sep. 12, 1994, Ser. No. 304,155
Int. Cl.[6] B26B 27/00
U.S. Cl. 30—276 17 Claims



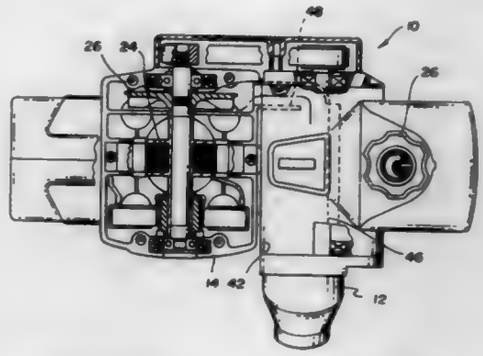
1. A line for a rotating string trimmer comprises an elongated flexible cutting element having a main body portion of circular cross section with a central axis and at least three spaced longitudinal outwardly-extending cutting edges on said main body portion, where the amount of extension of said cutting edges outwardly from said main body portion is selected to cause the cross-sectional area of said main body portion of said line to be between 70 percent and 90 percent of the area of a circular space circumscribing said cutting edges.

3. The line according to claim 1 wherein said elongated flexible cutting element is made of extruded material.

5,463,816
PORTABLE PLANER WITH ADJUSTABLE CHIP DEFLECTOR

William S. Bellew, Greer, and Carolyn G. Wilson, Easley, both of S.C., assignors to Ryobi North America, Easley, S.C.

Filed May 10, 1994, Ser. No. 240,251
Int. Cl.[6] B27C 1/10
U.S. Cl. 30—415 8 Claims



1. A portable planer for use by a user to plane chips of material from a workpiece, the planer comprising:

a housing having a first planing surface formed thereon for engaging a workpiece and having a planing chamber;

a motor supported by the housing;

a rotatable cutting blade assembly driven by the motor and positioned within the planing chamber, the blade assembly having at least one blade which is rotatable relative to the housing to engage and shave chips of material from the workpiece;

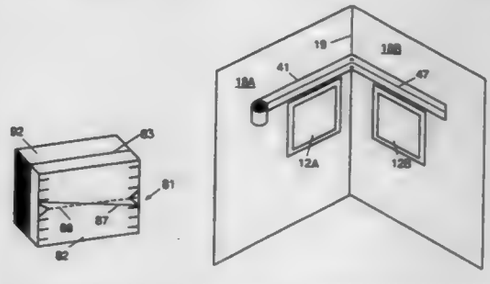
an exhaust port formed in the housing and in fluid communication with the planing chamber; and

a chip deflector attached to the housing and in fluid communication with the exhaust port, the chip deflector defining a nozzle which is selectively swiveably positionable relative to the planar housing to deflect chips expelled from the planing chamber in a plurality of predetermined directions relative to the housing.

5,463,817
PICTURE FRAME LEVELING DEVICE

Richard A. Leeds, 10907 SE. 23rd St., Bellevue, Wash. 98004

Continuation-in-part of Ser. No. 104,714, Aug. 11, 1993, abandoned. This application Jun. 20, 1994, Ser. No. 263,373
Int. Cl.[6] G01C 9/20
U.S. Cl. 33—371 8 Claims



1. A leveling device for assisting in adjusting the angular orientation of a plurality of articles, comprising:

a level indicator including a body having a rear surface; and

a pad of sheets attached to said body at said body rear surface, each of said sheets of said pad having a separate layer of adhesive with a predetermined capacity for removably attaching to a next rearward one of said sheets and a surface of one of the articles, said adhesive of a final sheet of said pad

located at a rearward end of said pad providing adhesive for removably attaching said body to one of the articles, said adhesive of said final sheet being removable from the article to which attached without marring the article, while retaining a substantial portion of said adhesive to be used in removably attaching said body to the same article or another one of the articles, upon said adhesive of said final sheet losing its capacity for removably attaching said body, said final sheet being removable from said pad, wherein said adhesive of a new final sheet of said pad is exposed for use in removably attaching said body to the same article or another one of the articles.

3. A leveling device for assisting in leveling an article to be mounted to a substantially vertical surface, comprising:

an elongated body having a longitudinal axis with first and second end portions separated along said longitudinal axis, said body having a front wall formed from an elongated strip of substantially flat flexible material with an elongated central portion extending between said first and second body end portions and a perimeter portion extending fully about said front wall central portion, and a rear wall formed from an elongated strip of substantially flat flexible material with an elongated central portion extending between said first and second body end portions and a perimeter portion extending fully about said rear wall central portion, said front and rear wall central portions being in face-to-face juxtaposition and extending substantially coextensive with each other, said front and rear wall central portions being spaced apart and said front and rear wall perimeter portions being sealably joined together fully about said front and rear wall central portions to define a single continuous, elongated fluid-tight chamber extending between said first and second body end portions, said front wall being substantially transparent and said body having a level indicator straight line extending between a position toward said first body end portion and a position toward said second body end portion;

a first fluid within said elongated body chamber; and

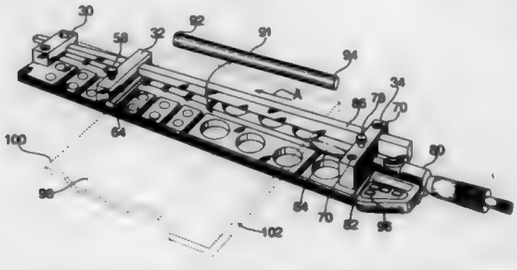
a second fluid within said elongated body chamber, said second fluid being immiscible with said first fluid to form a visible interface line between said first and second fluids extending between said first and second body end portions and which is in parallel alignment with said level indicator line when said rear wall is positioned flat against the surface and said level indicator line is horizontal.

5,463,818

WIDE-WIDTH MICROMETER AND METHOD OF USING THE SAME

Charles H. Hughes, Poland, Ohio, assignor to Cold Metal Products, Inc., Youngstown, Ohio

Filed Mar. 30, 1994, Ser. No. 220,059
Int. Cl.[6] G01B *3/18*
U.S. Cl. 33—813 **5 Claims**



1. A device for measuring the width of an elongated metal strip comprising:

a platform having a first and a second end;

a micrometer mounted on said first end;

a block having a contact surface;

clamping means for clamping said strip against said platform during measurement, said clamping means including a wedge, a first clamping member disposed at said first end and a second clamping member disposed at said second end, said first and second members cooperating to engage said wedge; and

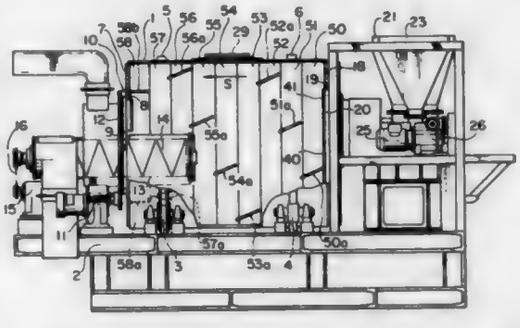
mounting means for mounting said block at a variable distance from said micrometer wherein said width is measured by placing said strip on said platform with one strip edge abutting said contact surface and a second strip edge in contact with said micrometer.

5,463,819

DEHYDRATION TREATMENT APPARATUS FOR SLUDGE

Yasumasa Komori, 5-17-19, Nagao, Tama-ku, Kawasaki-shi, Kanagawa, Japan

Filed Apr. 28, 1994, Ser. No. 234,732
Claims priority, application Japan, Mar. 4, 1994, 6-060255
Int. Cl.[6] F26B *11/02*
U.S. Cl. 34—135 **11 Claims**



1. A dehydration treatment apparatus for sludge comprising a rotating drum having an axis, said drum having an inside circumferential surface, said drum having one longitudinal end provided with sludge inlet means and the other longitudinal end provided with sludge outlet means, first blades disposed on the inside circumferential surface of said drum, said first blades being disposed at an acute angle relative to said axis such that upon rotation of said drum, said first blades engage said sludge to provide a component force which urges said sludge longitudinally toward said outlet means, second blades disposed on the inside circumferential surface of said drum, said second blades being disposed at an acute angle relative to said axis such that upon rotation of said drum, said second blades engage said sludge to provide a component force which urges said sludge longitudinally toward said outlet means, said second blades being upstream of said first blades, said drum having an end wall perpendicular to said axis, said end wall having a central opening, a fixed plate, means disposed over said central opening, said fixed plate means being perpendicular to said axis, said fixed plate means mounting a fixed scraping plate having one scraping surface which scrapes said end wall and another scraping surface which scrapes the inside circumferential surface of said drum which is juxtaposed to said end wall.

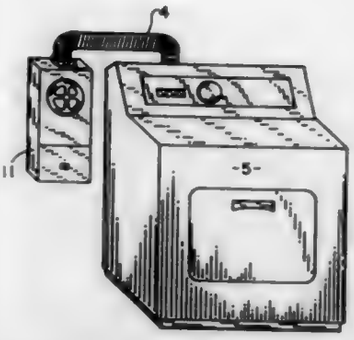
5,463,820

LINT FILTER

Len La Rue, 6970 Pembroke Dr., Reno, Nev. 89502

Continuation-in-part of Ser. No. 944,532, Sep. 14, 1992, Pat. No. 5,210,960. This application Mar. 16, 1993, Ser. No. 32,332
The portion of the term of this patent subsequent to May 18, 2010, has been disclaimed.
Int. Cl.[6] F26B *21/06*
U.S. Cl. 34—235 **6 Claims**

1. A lint filter in combination with a dryer having an air circulation system, said system having an exhaust blower and a discharge vent comprising; a chamber, said chamber having an



input vent, means to attach said input vent of said chamber to said discharge vent of said dryer, a baffle, said baffle being disposed within said chamber forming first and second compartments, said second compartment being located below said first compartment, said second compartment having means to remove accumulated materials, said first compartment having an exhaust vent, a disc filter, means to fixidly mount said disc filter with said exhaust vent, a wiper blade, said wiper blade having mounting means to affix to a shaft, said wiper blade being in communication and having a working relationship with said disc filter, means to rotate said shaft, whereby,

when exhaust air from said exhaust blower of said dryer is directed into said input vent of said chamber of said lint filter, said baffle directs said exhaust air thru substantially the top half of said disc filter and when said shaft is rotated, said wiper blade wipes material accumulated on said disc filter into said second compartment.

5,463,821

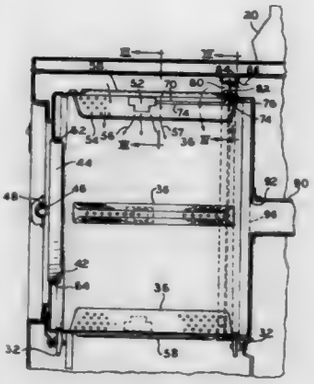
METHOD AND APPARATUS FOR OPERATING A MICROWAVE DRYER

Joseph A. Gauer, Buchanan Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 3, 1995, Ser. No. 367,836

Int. Cl.[6] F26B *3/34;* **H05B** *6/64*

U.S. Cl. 34—261 **18 Claims**



1. An appliance for conditioning articles with microwaves, comprising:

a drum for receiving articles;

a means for rotating the drum;

at least one magnetron tube mounted to said drum for emitting microwaves into said drum; and

means for conducting electric power to said rotating magnetron tube.

5,463,822

SHOE WITH A CENTRAL ROTARY CLOSURE AND SELF-ALIGNING COUPLING ELEMENTS

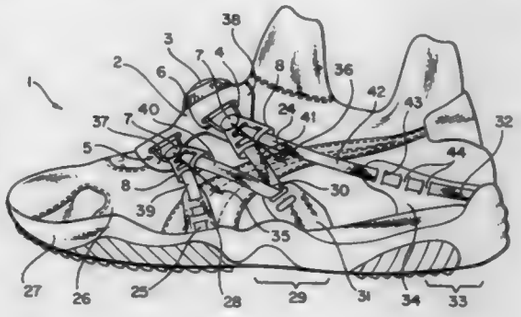
Dave Miller, Carver, Mass., assignor to Puma AG, Herzogenaurach, Germany

Filed May 27, 1994, Ser. No. 249,356

Claims priority, application Germany, May 28, 1993, 93 07 480.8

Int. Cl.[6] A43B *11/00*

U.S. Cl. 36—50.1 **14 Claims**



1. Shoe with an upper made of resiliently flexible materials, a central rotary closure, an instep cover on an instep area of the upper, said central rotary closure being provided on said instep cover, at least one tightening element connected to the central rotary closure, and guide elements at side parts of the upper, each of said guide elements having a deflecting element and said at least one tightening element being guided from the instep cover laterally in the form of loops at each side of the upper, each loop being guided over the deflecting element of a respective one of the guide elements at a respective one of the side parts of the upper, said central rotary closure forming a means for shortening the tightening element by rotating the central rotary closure to close the shoe and as a means for increasing a free length of the tightening element to open the shoe; wherein the deflecting element of each guide element is provided as a deflecting bar on a freely movable coupling element; wherein, at each side of the shoe, a first end portion of a pull strap is fastened to the shoe in an area at which a metatarsophalangeal joint portion of a wearer's foot is received; wherein the pull strap is guided from said first end portion, over the deflecting bar of a front one of the coupling elements, to a deflecting element located in an area of the metatarsus at a lateral side of the shoe and to a deflecting element located in an arch area at a medial side of the shoe, and is guided from the respective deflecting element, over the deflecting bar of a more rearward coupling element, rearwardly to an area at which the heel of the wearer's foot is received and at which a second end portion of the pull strap is fastened; wherein each of the coupling elements is free to move relative to the shoe upper, being carried only by a respective one of said loops of the at least one tightening element and by the pull strap.

5,463,823

SANDAL HAVING HEEL RETAINING MEANS FOR USE ON OTHER FOOTWEAR

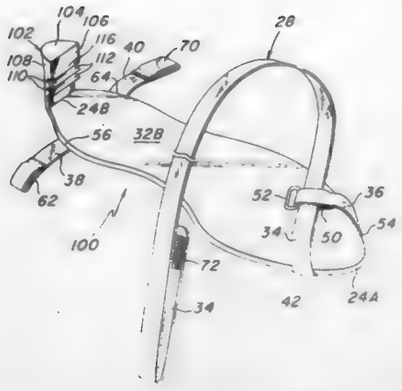
Michael Bell, 1705 Triumphe Way, Warrington, Pa. 18976, and Jonathan M. Bell, 1500 Locust St., Apartment 3313, Philadelphia, Pa. 19102

Continuation-in-part of Ser. No. 121,128, Sep. 14, 1993, Pat. No. 5,359,789. This application Apr. 25, 1994, Ser. No. 232,562

Int. Cl.[6] A43B *5/00*

U.S. Cl. 36—11.5 **6 Claims**

1. A sandal for use in combination with a primary footwear having a non-slip sole formed of a heel portion and a sole portion, the heel portion of the sole of the primary footwear having a generally vertically oriented rear surface, said sandal comprising a sole, heel retaining means, and sole attachment strap means, said



sole of said sandal having a ground engaging bottom surface, a top surface, and a rear end, said sandal being arranged to receive the primary footwear disposed on said top surface of said sole, said attachment strap means comprising plural flexible straps connected together so that they are arranged to hold the primary footwear on said sandal, said heel retaining means of said sandal comprising a member projecting upward from said top surface of said sole of said sandal at the rear end thereof and including surface portions shaped to frictionally engage a portion of the generally vertical rear surface of the heel portion of the sole of the primary footwear to provide additional means for retaining the heel portion of the primary footwear in engagement with the top surface of said sole of said sandal, said heel retaining member additionally comprising a flanged surface, arranged to be pressed on to hold the sandal in place while releasing the frictional engagement between said heel retaining member of said sandal and the heel of the primary footwear to facilitate the removal of said sandal from the primary footwear.

5,463,824

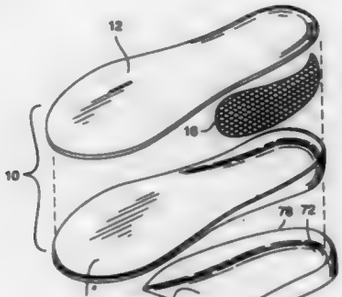
ARCH SUPPORT SYSTEM AND METHOD FOR MANUFACTURE AND USE

Randall S. Barna, 61548 W. Ridge Ave., Bend, Oreg. 97702

Filed Jun. 16, 1993, Ser. No. 78,744

Int. Cl.[6] A43B *13/38;13/41*

U.S. Cl. 36—44 **9 Claims**



1. A system for fitting an arch support to a user's foot comprising:

a plurality of arch supports, each arch support having one of three specific configuration types with defined upper surface contours to provide substantially continuous support, respectively, for a planus arch, neutral arch, or cavus arch, each said configuration type being provided in a plurality of sizes to accommodate a variety of potential users, each arch support having a heel portion and an arch portion forwardly of the heel portion, with an arch support for a planus arch having an arch portion of a first height, an arch support for a neutral arch having an arch portion of a second height greater than said first height, and an arch support for a cavus arch having an arch portion of a third height greater than said second height, and

each said arch support including an upper surface portion, a formed elastomeric lower cushion portion, and a stretch-resisting member integrally attached intermediate said upper surface and lower cushion portions to resist lateral and longitudinal stretching of said support in the region of said stretch-resisting member.

5,463,825

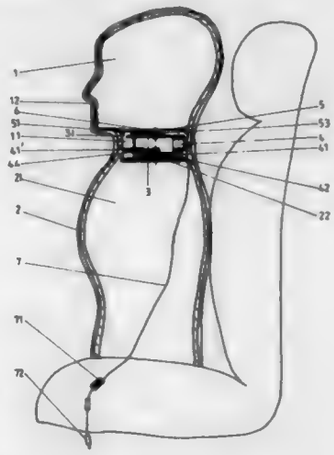
DUMMY PASSENGER

Hsin-Hsin Lo, 9,Alley 3,Lane 35,Weiato Rd., N. Dis Taichung, Taiwan, Prov. of China

Filed May 3, 1994, Ser. No. 239,021

Int. Cl.[6] G09F *19/08*

U.S. Cl. 40—414 **3 Claims**



1. A dummy passenger comprising a trunk having a hollow construction and including a neck at a top end of said trunk, a head connected to said neck, and a swivel mechanism positioned in said trunk, said swivel mechanism comprising:

a base seat;

a retaining gear disk fastened to said base seat;

a belted disk fastened to said base seat between said base seat and said retaining gear disk;

a motor mounted between said base seat and said retaining gear disk, said motor being linked to said belted disk by a first belt;

a belted wheel linked to said belted disk by a second belt;

a cam connected to said belted wheel by a connection rod for driving said cam;

a sectoral gear having one end fastened to said cam by a connection rod;

a second gear engaging said sectoral gear, said second gear having a shaft thereon; and

a fastening plate mounted on said shaft and fastened to a lower jaw of said head for moving said head rightwards and leftwards in a reciprocating manner with respect to said neck.

5,463,826

SWIMMING TOY FISH AQUARIUM HAVING MULTIPLE TOY FISH AND DIFFERENT MAGNET POSITIONS

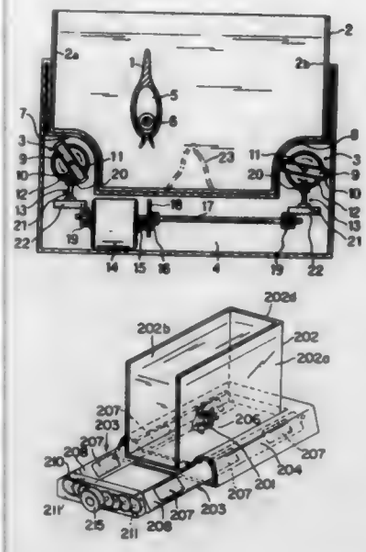
Shigeyuki Horiuchi, Koshigaya, Japan, assignor to Masudaya Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 41,566, Apr. 2, 1993, Pat. No. 5,301,444. This application Apr. 11, 1994, Ser. No. 226,022

Int. Cl.[6] G09F *19/00*

U.S. Cl. 40—426 **21 Claims**

1. A marine display device comprising a liquid vessel having opposed sidewalls, a bottom closure base and an open top, said



vessel containing at least one toy fish, said toy fish having an air chamber for imparting buoyancy to the toy fish, and comprising a magnetic member, a pair of spaced apart chambers projecting upward from the base of the vessel, a rotatable magnetic field-creating member in each of said chambers, a pair of rotatable shafts each connected to one rotatable magnetic field-creating member in each of said chambers, and means for simultaneously rotating each of said rotatable shafts.

5,463,827

DISPLAY DEVICE

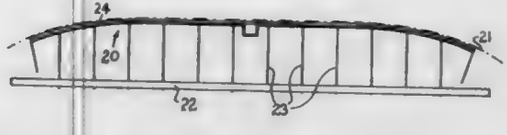
David G. Williams, Benenden, United Kingdom, assignor to Hanover Displays Limited, East Essex, United Kingdom

Filed Oct. 15, 1993, Ser. No. 138,124

Claims priority, application United Kingdom, Jan. 22, 1992, 9222165

Int. Cl.[6] G09F *9/00*

U.S. Cl. 40—449 **8 Claims**



1. A display device comprising a frame having a length and a width, a circuit board mounted on the frame and capable of being flexed, the circuit board having a front side and a rear side, the direction from the front side to the rear side of the circuit board being transverse to the length and width of the frame, movable electromagnetically controllable display elements arranged at the front side of the circuit board in a flexible array which extends in lengthwise and widthwise directions relative to the frame, each display element having at least two display surfaces respectively of different appearances, and electric circuit means provided on the circuit board for magnetically moving said display elements to present said surfaces selectively for display, wherein the frame is elongated in the direction of its length, and composed of lengthwise structural elements and widthwise structural elements, the lengthwise structural elements being more flexible than the widthwise structural elements, whereby the frame is able to flex more readily about an imaginary widthwise line than about an imaginary lengthwise line and the frame and the circuit board mounted thereon can be flexed to conform at least substantially to a range of differently shaped transparent fronting screens.

5,463,828

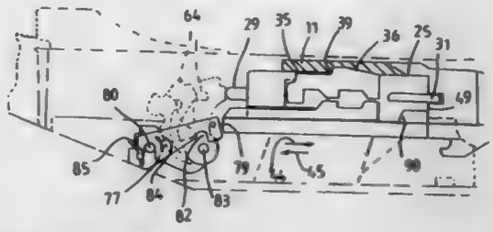
SHOT GUN

Ratomir Andrejevic, Johannesburg, South Africa, assignor to Techno Arms (PTY) Ltd., Johannesburg, South Africa

Filed Jan. 14, 1994, Ser. No. 181,054

Int. Cl.[6] F41A *3/52*

U.S. Cl. 42—20 **28 Claims**



1. A gun comprising:

a gun body having a firing chamber,

a firing pin carrying bolt reciprocally carried by said gun body and movable relative to said firing chamber thereof between a forward firing position enabling said firing pin for engagement with the rear end of a cartridge located in the firing chamber and a rearward reload position;

at least two locks for positively maintaining said bolt in said firing position while and after a shot has been fired and before the gun is reloaded, said locks comprising a first lock located rearwardly of and at a level above said firing chamber, and another lock located at a level below and in a position rearwardly of said firing chamber, the distance between the first lock and a line extending at the rear end of the firing chamber at right angles to the longitudinal axis of the barrel of the gun being substantially one-half the distance between said another lock and said line.

5,463,829

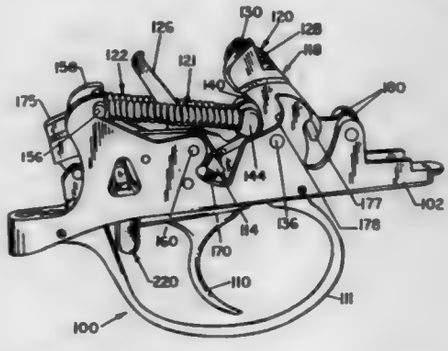
METHOD OF REMOVING A HAMMER FROM A SHOTGUN

Keith J. Sprangers, Racine, Wis., assignor to U.S. Competition Arms Inc., Racine, Wis.

Division of Ser. No. 928,117, Aug. 11, 1992, Pat. No. 5,349,773. This application Jun. 1, 1994, Ser. No. 252,590

Int. Cl.[6] F41A *19/14*

U.S. Cl. 42—42.01 **18 Claims**



1. A process comprising:

(A) providing a firearm having a trigger, a first hammer which is actuated by said trigger and which is mounted on said firearm by a single retainer, and a mainspring assembly;

(B) actuating said trigger to move said hammer from a cocked position in which said hammer is biased by said mainspring assembly into a released position in which neither said hammer nor said pivot pin is subjected to any biasing forces; then

(C) removing said retainer and said first hammer; and then

(D) mounting a second hammer on said firearm via said retainer.

5,463,830

VEGETATION-INHIBITING PRODUCT FOR YOUNG PLANTINGS

André L. J. Pien, Sint Genesius-Rode, and Carlo E. M. De Pauw, Overijse, both of, Belgium, assignors to Wetenschappelijk en Technisch Centrum voor het Bouwbedrijf, Belgium

Filed Dec. 15, 1992, Ser. No. 990,569
Claims priority, application Belgium, Dec. 16, 1991, 91.01141
Int. Cl.[6] A01G 7/00
U.S. Cl. 47—9 19 Claims

1. A form-retaining, sheet-like product which inhibits competing vegetation for young plantings comprising:

i) paper sludge in a quantity of 30–99% by weight;

ii) composted organic waste in a quantity of 0.5–70% by weight;

iii) fibre material in a quantity of 0.1–20% by weight, with said fibre material containing fibres having a fibre length of 0.5 mm to 50 mm; and

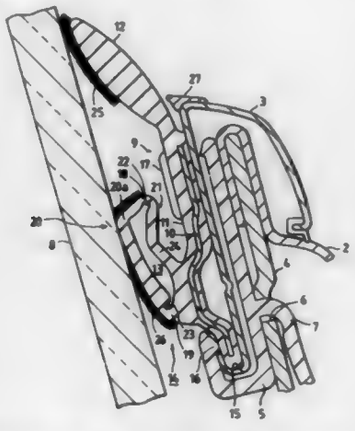
iv) wood particles present in a quantity up to 70% by weight and constituting a remainder of said product, with said wood particles having a high tannin content.

5,463,831

WEATHER STRIP FOR MOTOR VEHICLE

Masatoshi Shinagawa, and Hideyuki Hashimoto, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jun. 9, 1993, Ser. No. 73,502
Claims priority, application Japan, Jun. 11, 1992, 4-040058 U
Int. Cl.[6] B60J 1/16
U.S. Cl. 49—377 7 Claims



1. A weather strip for a motor vehicle comprising:

a base portion secured to a panel of a door of the vehicle at an upper edge of the panel;

a seal lip extending obliquely up from a top of said base portion; and

a hollow seal portion extending obliquely up from said base portion under said seal lip in such a manner that a window pane of the door can be slid up and down in contact with said seal lip and said hollow seal portion to seal a gap between the window pane and the upper edge of the panel;

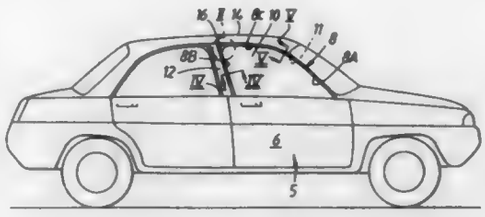
wherein said hollow seal portion includes a pane contact part disposed so as to face the pane, a pane non-contact part facing said base portion, a first bend point at a top of said seal portion, a second bend point at a bottom of said seal portion, said pane non-contact part having a third bend point between said first and second bend points permitting the pane non-contact part to bend toward the window pane even if said hollow seal portion is not in contact with the window pane, said pane contact part has a bent portion having a curved surface with which the pane comes into contact; and said pane contact part is higher in rigidity than said pane non-contact part.

5,463,832

SEALING OR GUIDING STRIP, WINDOW FRAME ASSEMBLY, AND METHOD OF MAKING WINDOW FRAME ASSEMBLY

Ralf Eckart, Viersen, Germany, assignor to Draftex Industries Limited, Edinburgh, Scotland

Filed Dec. 22, 1993, Ser. No. 173,700
Claims priority, application United Kingdom, Dec. 29, 1992, 9227039
Int. Cl.[6] E06B 7/16
U.S. Cl. 49—479.1 7 Claims



1. In combination, a rigid frame for a window opening, a window pane for the window opening, and a flexible sealing and guiding strip for mounting around the window opening on said frame,

the window pane defining a sharp corner having a fixed angle,

the rigid frame defining a smooth curve at and bridging across the sharp corner,

the sealing strip comprising flexible material defining two channels meeting at the fixed angle which are sized to receive the edges of the window pane meeting at the sharp corner, and a rigid support member secured to the flexible material where the two channels meet and having a sharp profile matching and aligned with the fixed angle and a smoothly curved inner profile bridging across the fixed angle and matching the smooth curve of the frame,

the rigid support member including locking means for lockably mounting the support member on the frame in the region of the smooth curve of the frame for supporting the flexible material at and projecting outside of the smooth curve so that the two meeting channels receive the sharp corner of the window pane.

5,463,833

PORTABLE FOLDING STRUCTURE

Augusto E. Banez, 1103 Del Rey Ave., Pasadena, Calif. 91107

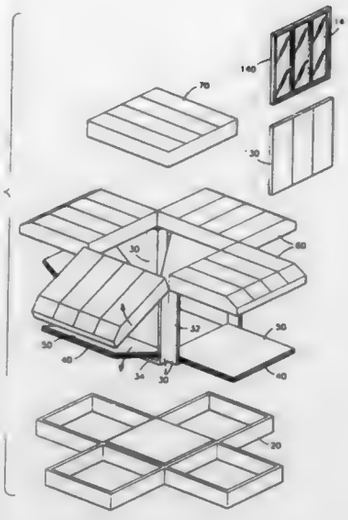
Filed Apr. 1, 1994, Ser. No. 222,116
Int. Cl.[6] E04B 1/344
U.S. Cl. 52—71 16 Claims

1. A structure capable of folding into a compact form for transporting, and for simple unfolding for use on a base, the structure comprising:

a set of four hingably interconnected wall box frames each having opposing pairs of vertical and horizontal structural members, the frames hingably interconnected at the vertical members for cooperating in folding into mutual, near coplanar juxtaposition;

a plurality of floor, wall and roof sections hingably interconnected with the frames for folding into near coplanar juxtaposition with each of the box frames and for unfolding from the box frames to form separate rooms;

whereby the structure, when unfolded comprises four rooms in cruciform layout, each of the rooms box shaped, the rooms positioned in corner adjacency around a box shaped open area defined by the frames.

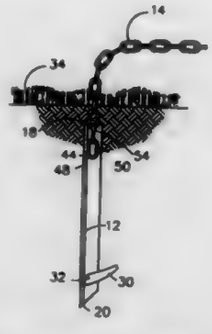


5,463,834

TETHERING STAKE

John M. Krieger, 4568 Lahm Dr., Akron, Ohio 44319

Filed Mar. 7, 1994, Ser. No. 207,372
Int. Cl.[6] E02D *5/80*; E04H *15/62*
U.S. Cl. 52—155 12 Claims



12. An article for securing an associated object to a certain location in the ground, said article comprising:

an elongated stake member having a penetrating end spaced from an impact end, said impact end having an impact surface for receiving blows from an associated pounding device, said stake member being adapted for being pounded until said impact end is just below the surface of the ground, said stake member having a cross-sectional shape with inward and outward surfaces, said cross-sectional shape being "V-shaped", said stake member being made of angle iron;

a securing line for securing said associated object to said article, said securing line being a chain comprised of a plurality of links, said securing line being fixedly attached to said article at an attachment position between said impact end and said penetrating end of said article, said attachment position being on said inward surface, said attachment position being spaced a distance from said impact end of said article thereby protecting said securing line from said blows by said associated pounding device, one of said links of said chain being fastened to said article at said attachment position and said distance said attachment position is spaced from said impact end is at least as long as the length of one link of said chain so that a portion of one link of said chain extends above said impact end of said article to form a pivotal connection about which the rest of said chain rotates, said chain comprising first, second and third links, said first link being interlocked with said second link and being welded to said article at said attachment position, said second link extending just above the ground and said impact end of said article, said third link being interlocked with said second link and freely rotating with the remainder of said chain about said impact end of said article; and,

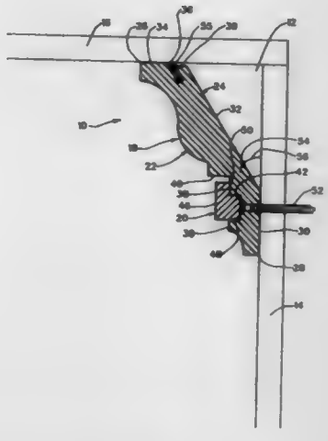
a barb, said barb being capable of locking said article into position in the ground, said barb swingably connected to said article near said penetrating end and swingable about an axis, said barb swinging inwardly toward said stake member when said stake member is being pounded into the ground and outwardly after said article has been mounted into the ground.

5,463,835

MOLDING ASSEMBLY

James Wood, Williamsport, Pa., assignor to D/P, Inc., Williamsport, Pa.

Filed May 19, 1994, Ser. No. 246,100
Int. Cl.[6] E04F *19/02*
U.S. Cl. 52—288.1 3 Claims



1. A molding assembly comprising,

A) a first elongate molding member of uniform transverse cross section, the member having an upper corner, a lower corner, an outer surface on one side of the member extending between the upper and lower corners, and an inner surface on the other side of the member extending between the upper and lower corners, the inner surface including a vertical support surface extending a vertical distance up from the lower corner to define a height and a diagonal surface joining the top of the support surface and extending away from the plane of the support surface at an acute angle above a trim mounting groove, the trim mounting groove formed in the outer surface and extending along the length of the member, the groove including an upper edge, a lower edge and a bottom, said groove bottom overlying the support surface with the center of the groove between the groove edges being located a distance above the lower corner equal to approximately 75 percent of the height of the support surface, and a recess extending into a support portion of the member, said support portion being located above the support surface and the groove, said recess including a generally horizontal surface located above the upper edge of the groove and an outer mounting surface extending between the horizontal surface and the groove upper edge; and

B) an elongate trim member extending along the length of the molding member and having a height greater than the width of the groove, the trim member including a rib fitted in said groove, a portion of the trim member extending above the groove and into said recess, said portion of the trim member having an inner mounting surface engaging the molding member outer surface.

5,463,836

Patent Not Issued For This Number

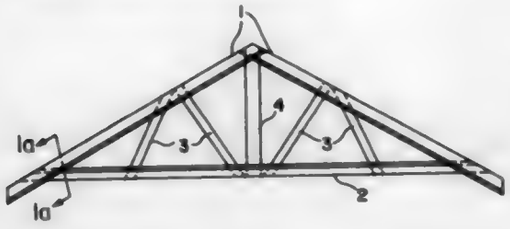
5,463,837

METAL ROOF TRUSS

Daniel J. Dry, 15823 S. 15th Pl., Phoenix, Ariz. 85045

Filed Jan. 13, 1994, Ser. No. 181,615
Int. Cl.[6] F04B *7/02*
U.S. Cl. 52—639 **17 Claims**

1. A metal building truss comprising:



a bottom chord member of lightweight material;

first and second top chord members each being of lightweight material;

said top chord members being coupled together at an upper end, and each end of said bottom chord member being coupled to a lower end of one of said first and second top chord members, each of said top chord members and said bottom chord members being of generally U-shaped cross-section formed by a web and two legs extending from said web, the top end of each leg terminating in a radiused hem to provide stiffening;

each radiused hem being formed by the corresponding leg having a first portion extending from said web and a second portion turned back toward said web, said second portion being spaced apart from said first portion at the ends of said first and second portions furthest from said web whereby the thickness of said hem furthest from said web is greater than twice the thickness of said material, said second portion at its end closest to said web being substantially in contact with said first portion and;

one of said ends of said bottom chord member with said radiused hem interfits between the legs of said lower end of said first top chord member and the other one of said ends of said bottom chord member with said radiused hem interfits between the legs of the lower end of said second top chord member.

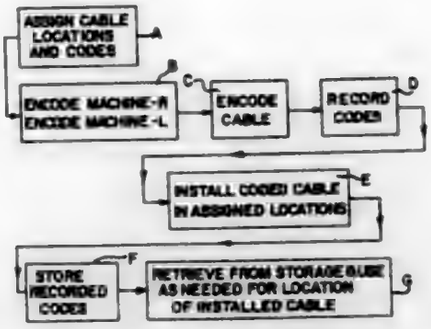
5,463,838

METHODS AND APPARATUS FOR INSTALLING CONDUCTOR CABLES IN RIGID BUILDING STRUCTURES

William R. Collier, 137 St. Pierre, Montreal, Quebec, Canada

Filed Nov. 9, 1993, Ser. No. 149,317
Int. Cl.[6] E04B *1/00*
U.S. Cl. 52—741.1 **14 Claims**

1. A method of emplacing a plurality of individual carrier elements within a building structure such that each of said individual carrier elements, when installed, will extend along a particular path expressible as a plurality of spatial coordinate waypoints collectively comprising a plan of the location of said particular individual carrier element, said method comprising establishing an identity and location plan for each individual carrier element, assigning a unique identity term to each of said carrier elements, formulating a code containing said identity term and terms corresponding to all of said waypoints, at which each of said carriers is located within said building, recording all of said individual plans in code form in means permitting ready storage and retrieval of said plans, and repeatedly reproducing at least the unique carrier



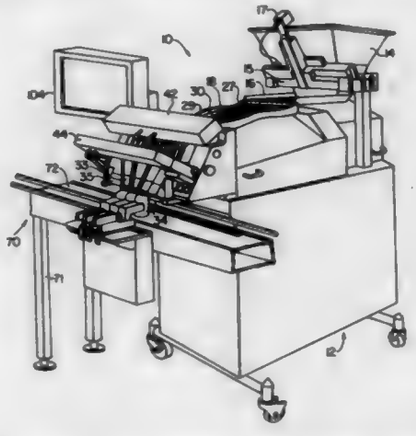
element identity term at plural spaced apart points on each of said individual carrier elements so as to render said identity code term recognizable from plural points along said carrier element, whereby said unique identity term of said carrier element code may be used to determine the location plan of all spatial coordinate points at which said carrier element is located.

5,463,839

APPARATUS FOR PACKAGING A PREDETERMINED QUANTITY OF OBJECTS AND A COUNTING DEVICE THEREFOR

Thomas C. Stange, Athol; James M. DiNanno, Wakefield; John P. Mallet, Jr., Boylston, and Richard N. Heino, Westminster, all of Mass., assignors to The Lakso Company, Leominster, Mass.

Filed Aug. 4, 1994, Ser. No. 285,806
Int. Cl.[6] B65B *5/10;35/56;57/10;57/20*
U.S. Cl. 53—54 **18 Claims**



9. An apparatus for packaging a predetermined quantity of objets, said apparatus comprising:

a feed tray defining an axis extending between an inlet portion and a discharge portion of the tray, the tray including at least one guide path extending along the axis for the passage and singularization of objects, the guide path including a plurality of segments, each of the segments defining a direction of movement along the axis, wherein the direction defined by at least some of the segments is oriented at an angle with respect to the axis, the angle becoming decreasingly oblique toward the outlet portion of the tray;

first means for advancing objects along the guide path from the inlet portion to the discharge portion of the tray, the guide path effecting a singularization of the objects as the objects are advanced thereon;

second means for counting the quantity of singularized objects received at the discharge portion of the tray;

third means for interrupting the advancement of objects along the guide path when the quantity of objects counted equals the predetermined quantity, and

control means connected to the second and third means for receiving data from the second means corresponding to the quantity of objects counted and for activating the third means to interrupt the advancement of objects when the data received corresponds to the predetermined quantity;

means for transferring objects from the discharge portion of the tray to a container to fill the container with the predetermined quantity of objects;

means for delivering at least one empty container to a fill position for receiving the predetermined quantity of objects from the transfer means, and

means for removing the filled container from the fill position.

5,463,840

SYSTEM FOR SUPPLYING LITERATURE INSERTS TO A CARTON-PACKING MACHINE

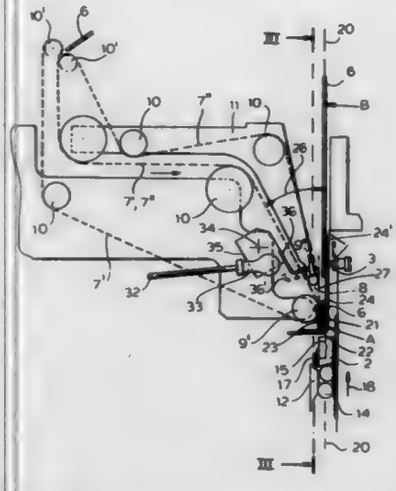
Rudolf Bafler, Laupheim, Germany, assignor to Uhlmann Pac-Systeme GmbH & Co. KG, Laupheim, Germany

Filed Apr. 18, 1994, Ser. No. 229,324

Claims priority, application Germany, May 4, 1993, 43 14 631.7

Int. Cl.[6] B65B *63/04*

U.S. Cl. 53—117 **7 Claims**



1. In combination:

a main conveyor for conveying a succession of orders in a main direction past a transfer location;

an upwardly open holder pocket at the transfer location defining a vertical transfer plane and formed by

an outer plate substantially lying on and parallel to the transfer plane and

an inner plate extending at a small acute angle to the transfer plane;

a plurality of openable transfer clips displaceable past the pocket with the clips moving vertically upward in the transfer plane as they pass the pocket;

a pair of rollers spaced to one side of the transfer plane immediately above the pocket, the inner plate having an upper edge generally at the rollers;

folding means including a pair of belts having juxtaposed stretches and spanned over the rollers for making folded literature packs, conveying the folded literature packs while compressed between the belts to the rollers, and dropping the folded literature packs one after the other from between the rollers and belts into the pocket while maintaining the packs compressed and preventing them from unfolding, the plates being sufficiently close to prevent the packs they hold from unfolding; and

control means for opening the clips as they approach the pocket and closing them generally when they reach the pocket for gripping the packs and lifting them out of the pocket.

5,463,841

UNWRAPPING APPARATUS FOR STRETCH-WRAPPED LOAD AND SHRINK-WRAPPED LOAD

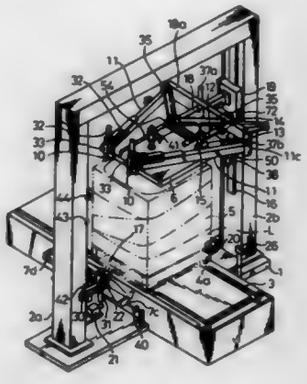
Katsumi Hayakawa, Tokyo; Masahiro Tsukuda, Takatsuki; Yukiyoshi Sato, Takatsuki; Junichi Tatewaki, Takatsuki, and Kazuya Yamasaka, Takatsuki, all of, Japan, assignors to Oji Seitai Kaisha, Ltd., Tokyo, Japan

Filed Jan. 19, 1995, Ser. No. 375,579

Claims priority, application Japan, Jul. 4, 1994, 6-173155

Int. Cl.[6] B65B *43/26*

U.S. Cl. 53—381.2 **9 Claims**



1. An unwrapping apparatus for unwrapping a load with articles and a film wrapping the articles, said unwrapping apparatus comprising:

front and rear upright frames arranged in a spaced relationship, said front and rear upright frames defining a first line extending therebetween and a second line perpendicular to the first line;

means for conveying a load to be unwrapped at an unwrapping position between the front and the rear upright frames;

lower grippers arranged on or near the front upright frame for gripping a lower edge of a film of the load;

means for supporting the lower grippers for movement along said second line;

a cutter unit arranged on the front upright frame for vertical movement along the front upright frame for cutting the film;

a carriage arranged on the rear upright frame for vertical movement along the rear upright frame and having a platen for stabilizing the load while being unwrapped the platen having a front side near the front upright frame and a rear side near the rear upright frame;

a suction groove arranged in said platen to retain the film on the top of a load, the suction groove having at least a first portion arranged near the front side thereof in pallalel to said second line and a second portion extending from the first portion toward the rear side thereof;

a heat cutter arranged in said platen along the suction groove to cut the top of the film held by the suction groove;

a pair of symmetrical swing arms arranged above the platen with pivot ends near the rear upright frame and free ends near the front upright frame;

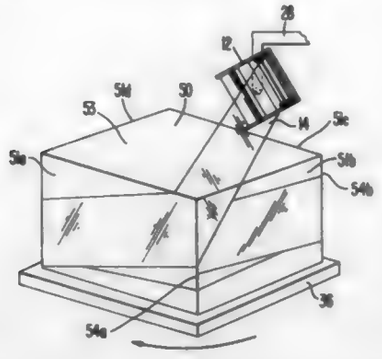
an upper gripper arranged on the free end of each of the swing arms for gripping an upper edge of the film, whereby the film that is cut by the cutter unit and gripped by the upper grippers is spread and separated from the load during a swing motion of the swing arms.

5,463,842

METHOD AND APPARATUS FOR STRETCH WRAPPING THE TOP AND SIDES OF A LOAD

William G. Lancaster, Louisville, Ky., assignor to Lantech, Inc., Louisville, Ky.

Filed Aug. 19, 1991, Ser. No. 747,309
Int. Cl.[6] B65B *11/04*
U.S. Cl. 53—399 **8 Claims**



1. A method of stretch wrapping the sides and top of a load, compromising the steps:

dispensing a web from a web dispenser, stretching the web along the dispensing direction, and wrapping the web around the sides of the load by rotating the load relative to the web dispenser while maintaining the web dispenser and web being dispensed in an orientation generally parallel to said sides of the load;

covering the top of the load with the web by rotating the load relative to the web dispenser and positioning the web dispenser and web being dispensed in an orientation generally parallel to the top of the load, and repeatedly performing the steps of raising the web dispenser above the load, dispensing the web to cover a portion of the top of the load with the web, and lowering the web dispenser relative to the load to catch the web on the sides of the load, to sequentially cover portions of the top of the load until the top of the load is covered; and

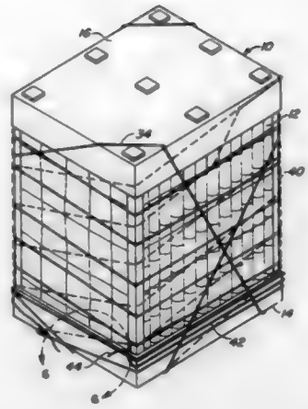
accumulating web in the web dispenser from a web supply when the web dispenser is in the orientation generally parallel to said sides of the load and releasing the accumulated web from the web dispenser without receiving web in the web dispenser from the web supply when the web dispenser is in an orientation other than the orientation generally parallel to the sides of the load.

5,463,843

BULK PACKAGE WRAPPING AND SECURING SYSTEM

Dennis Sharp, Albany, Oreg., assignor to James River Corporation of Virginia, Richmond, Va.

Continuation of Ser. No. 973,694, Nov. 9, 1992, abandoned.
This application Jul. 14, 1994, Ser. No. 275,295
Int. Cl.[6] B65B *13/02;53/00*
U.S. Cl. 53—399 **3 Claims**



1. A method of wrapping and securing together with an integral web of plastic material the components of a four-sided bulk package having opposed first and second bulk package ends, said bulk package including objects stacked in layers with each layer comprising a plurality of said objects disposed in rows, a bottom tray element at said first bulk package end disposed under the lowermost layer having four corners and a substantially rectangular configuration, and a top cap element at the second bulk package end disposed over the upper-most layer having four corners and a substantially rectangular configuration, and said top cap element and said bottom tray element being in substantial registry, said method comprising the steps of:

compressing a first segment of said web of plastic material into a rope-like configuration, said first segment having a free end;

wrapping said first web segment at least once about the outer periphery of said bulk package defined by the sides of said bulk package at the first bulk package end and about said bottom tray element;

during the step of wrapping said first web segment, securing said first web segment in place on said bulk package at the first bulk package end by joining the first web segment to itself at spaced locations thereon with said first web segment wrapped tightly over the first free end, about the outer periphery of said bulk package, and in frictional engagement with the bulk package outer periphery and first segment free end, the first segment free end being sandwiched between the first segment and the first bulk package end;

after said securing step, compressing a second segment of said web of plastic material into a rope-like configuration to form a second web segment looping under a corner of the bottom tray element and extending along a side of the bulk package to a predetermined corner of the top cap element at said second bulk package end;

looping said second web segment over said predetermined corner of said top cap element and directing said second web segment along adjacent sides of the bulk package and under a corner of said bottom tray element diagonally opposed to the predetermined corner of the top cap element;

continuing said looping step until the second web segment is looped about only a single pair of diagonally opposed corners of said top cap element and is looped about corners of said bottom tray element;

during said looping step, disposing said second web segment in a criss-cross pattern between said top cap element and said bottom tray element along only two sides of the bulk package, and maintaining said web of plastic material out of engagement with said single pair of diagonally opposed corners of said top cap element;

after the step of looping said second web segment, wrapping a third segment of said web around the sides of said bulk package with the web in a substantially uncompressed state to substantially cover the sides of the bulk package;

compressing a fourth segment of said web of plastic material into a rope-like configuration after the step of wrapping said third web segment; and

securing the web to itself by wrapping said fourth web segment about said bulk package, severing said fourth web segment to provide a fourth web segment terminal end, and positioning said fourth web segment terminal end between a portion of said fourth web segment wrapped about said bulk package and the bulk package, said securing step including forming a gap between said fourth web segment portion and said bulk package by applying tension to said fourth web segment portion prior to positioning said fourth web segment terminal end between said fourth web segment portion and said bulk package, said tension being released from said fourth web segment portion after positioning said fourth web segment terminal end between said fourth web segment portion and

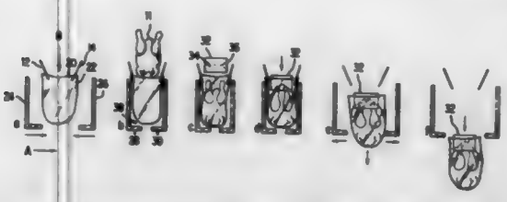
said bulk package to frictionally lock said fourth web segment terminal end between said fourth web segment portion and said bulk package.

5,463,844

MACHINE AND METHOD FOR PACKAGING POULTRY PRODUCTS

Andrew W. Moehlenbrock, Simpsonville; Joseph E. Owensby, Spartanburg, and Thomas H. Bagwell, Simpsonville, all of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Aug. 18, 1993, Ser. No. 108,370
Int. Cl.[6] B65B *1/24*
U.S. Cl. 53—436 7 Claims



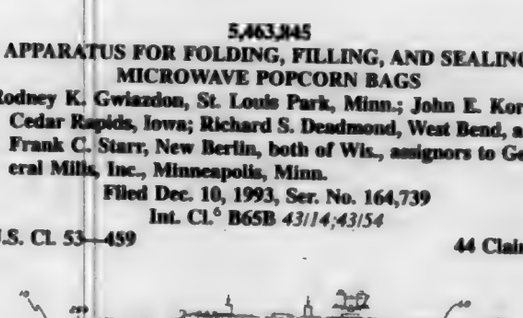
1. A machine for packaging poultry products which comprises:
a) means for providing a bag having an opening at one end;
b) means for dropping by gravity a poultry product with unbroken hocks downwardly along a vertical axis into said bag through said opening, said means for dropping including product guides at least partially inserted within said bag for guiding said dropped poultry product into said bag;
c) means for positioning said poultry product within said bag, said positioning means comprising two members located externally of said bag and movable towards and away from each other, the two members each substantially semi-cylindrical in shape and movable between an open position and a closed position, said members in said closed position acting as a hocking plate, and said members together defining, when in the closed position, a substantially cylindrical space in which said bag is positioned; and
d) means for breaking the hocks of said poultry product, said means comprising a plunger which at least partially enters said bag through said opening.

5,463,845

APPARATUS FOR FOLDING, FILLING, AND SEALING MICROWAVE POPCORN BAGS

Rodney K. Gwiazdon, St. Louis Park, Minn.; John E. Korte, Cedar Rapids, Iowa; Richard S. Deadmond, West Bend, and Frank C. Starr, New Berlin, both of Wis., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Dec. 10, 1993, Ser. No. 164,739
Int. Cl.[6] B65B *43/14;43/54*
U.S. Cl. 53—459 44 Claims



43. Method for filling a bag having an unsealed end, a top, and a bottom comprising the steps of:

moving a fixture for receipt of the bag at intermittent positions in an operation direction along a closed loop shape having a first, generally vertical portion terminating in a second, generally horizontal portion in turn terminating in a third, generally vertical portion terminating in a fourth portion in turn terminating in the first portion; loading the bag into the fixture in the first portion; filling the bag loaded in the fixture in the second portion; sealing the bag loaded in the fixture in the second portion; and ejecting the bag from the fixture in the third portion.

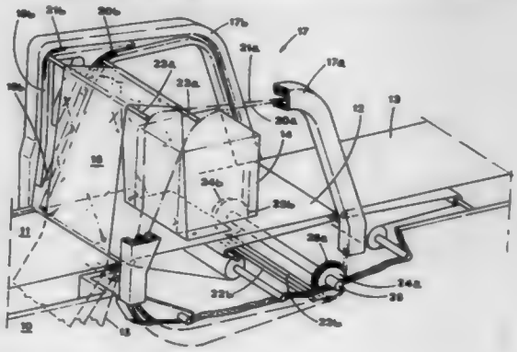
5,463,846

METHOD OF AND APPARATUS FOR WRAPPING AN ARTICLE

Mario Gambetti, Crevalcore, Italy, assignor to Baumer S.R.L., Castelfranco Emilia, Italy

Filed Jun. 17, 1994, Ser. No. 261,987
Claims priority, application Italy, Jun. 18, 1993, BO93A0279
Int. Cl.[6] B65B *11/00;49/00;13/04*
U.S. Cl. 53—465 7 Claims

1. A method of wrapping an article comprising the steps of:



(a) feeding a piece of wrapping material to an upstream end of a wrapping conveyor so that a leading end of said piece overlies a receiving surface of said wrapping conveyor;
(b) advancing an article onto said receiving surface and the leading end of said piece of wrapping material thereon from a feeding conveyor upstream of said wrapping conveyor, and displacing said wrapping conveyor to forward said article there-along;
(c) displacing a first supporting member in a first orbit around said wrapping conveyor in engagement with said piece of wrapping material over a stretch reaching from between said conveyors behind said article to a location ahead of said article to raise a free portion of said piece of wrapping material behind said article, along a top of said article and to a location ahead of said article in movement in a phase relationship with displacement of said wrapping conveyor;
(d) simultaneously with step (c) displacing a second supporting member in a second orbit around said wrapping conveyor in engagement with said piece of wrapping material over a stretch behind said first member and spaced rearwardly therefrom along a rear portion of said article and the top of said article and outwardly of said first orbit to said location ahead of said article in movement in a phase relationship with displacement of said wrapping conveyor and with movement of said first member, a spacing between said stretches initially increasing to enable another piece of wrapping material to be fed to said wrapping conveyor and another article to be fed onto said wrapping conveyor, and then decreasing toward said location;
(e) thereafter displacing said free portion of said wrapping material downwardly across a leading portion of the article by displacing both of said members downwardly along coincident stretches of both of said orbits to position a trailing end of said free portion below the leading end of said piece of wrapping material at a discharge end thereof; and

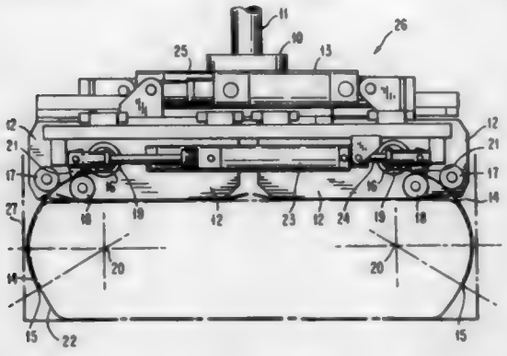
(f) displacing the article wrapped by the respective piece of wrapping material off said discharge end and onto a discharge conveyor thereby overlapping the respective trailing and leading ends of the piece of wrapping material around the wrapped article.

5,463,847

ROBOTIC EGG CARTON PICKUP HEAD

Robert J. Alexander, Manchester, and Daniel C. Stanglein, Hazelwood, both of Mo., assignors to FPS Food Processing Systems, Inc., Lancaster, Pa.

Filed Feb. 8, 1994, Ser. No. 193,491
Int. Cl.[6] B65B *23/02;5/04*
U.S. Cl. 53—473 **7 Claims**



1. A method of packing an item in a close fitting container comprising:

providing a pickup head which comprises a rigid frame; at least two wings slidably mounted to the frame for movement toward and away from each other; at least two guide wheels fixed to each wing; an arcuate arm positioned between the guide wheels on each wing, each arm comprising only a curved rigid sheet which, when extended or retracted, moves in an arcuate path defined by said guide wheels, each arm having an inner arcuate surface for directly engaging an item to be picked up; first means to actuate the wings forward and away from each other; and second means to actuate the arms to move in the respective arcuate path;

operating the first means to move the wings away from each other;

operating the second means to move the arms downwardly along the arcuate paths;

operating the first means to move the wings toward each other to engage an item between the arms;

moving the pickup head to move the item into the close fitting container; and

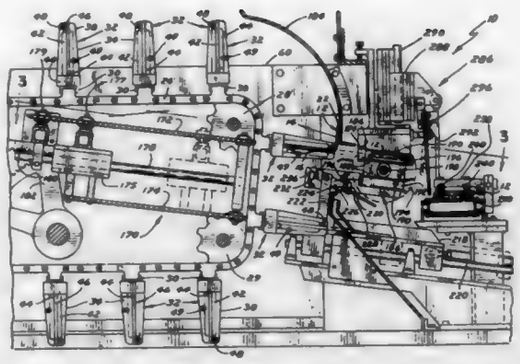
operating the second means to move the arms upwardly on the arcuate paths to release the item in the container.

5,463,848

APPARATUS FOR FOLDING AND EJECTING MICROWAVE POPCORN BAGS FROM A FIXTURE

Rodney K. Gwiazdon, St. Louis Park, Minn.; John E. Korte, Cedar Rapids, Iowa; Richard S. Deadmond, West Bend, Wis.; Frank C. Starr, New Berlin, Wis.; Robb W. Roloff, Pewaukee, Wis., and Robert D. Devlin, Milwaukee Wi, assignors to General Mills, Inc., Minneapolis, Minn.

Filed Dec. 10, 1993, Ser. No. 164,741
Int. Cl.[6] B65B *7/08;35/10*
U.S. Cl. 53—482 **40 Claims**



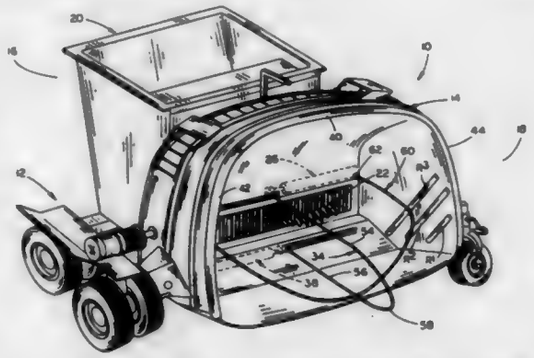
38. Method for ejecting a bag from a fixture movable in an operational direction from a first position to a second position, with the bag having a portion located in the fixture and a portion extending beyond the fixture, comprising the steps of: bending the portion of the bag extending beyond the fixture as the fixture moves from the first position to the second position to create a fold in the bag; holding the portion of the bag extending beyond the fixture at a nonlinear angle to the portion of the bag located in the fixture when the fixture is in the second position; and ejecting the bag from the fixture in the second position for folding the portion of the bag extending beyond the fixture about the fold in the bag to overlie the portion of the bag previously located in the fixture.

5,463,849

AGRICULTURAL FEED BAGGING MACHINE

Steven R. Cullen, Astoria, Oreg., assignor to Versa Corporation, Astoria, Oreg.

Continuation-in-part of Ser. No. 3,540, Jan. 13, 1993, Pat. No. 5,297,377, which is a continuation-in-part of Ser. No. 912,873, Jul. 13, 1992. This application Feb. 23, 1994, Ser. No. 200,756
The portion of the term of this patent subsequent to Mar. 29, 2011, has been disclaimed.
Int. Cl.[6] B65B *1/24*
U.S. Cl. 53—527 **1 Claim**



1. An agricultural bagging machine for bagging agricultural material into agricultural bags having a closed end and an open mouth comprising,

a frame means having rearward and forward ends;

a tunnel on said frame means and having an intake end for receiving the material to be bagged and an output end adapted to receive the open mouth of the agricultural bag;

said tunnel having a top wall and opposite side walls;

a hopper means on said frame means forwardly of said tunnel for receiving the material to be bagged;

a means at the intake end of said tunnel for forcing the material to be bagged from said hopper means into said tunnel and to flow therethrough and into said bag whereby the material will be compacted within said bag;

said tunnel side walls having inside and outside surfaces;

turbulence creating members on the inside surfaces of both of said tunnel side walls for creating turbulence in the flow of material passing through said tunnel thereby causing an increase in the compaction of the material within the agricultural bag;

said turbulence creating members comprising a plurality of spaced-apart, elongated ridges provided on the inside surface of each of said tunnel side walls;

and at least one U-shaped density control cable member positioned in said tunnel.

5,463,850

LONGITUDINAL SEALER FOR PACKAGING MACHINE

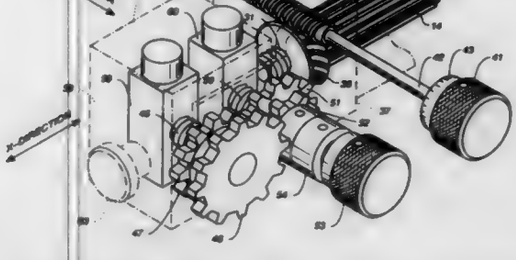
Masao Fukuda, Shiga, Japan, assignor to Ishida Co., Ltd., Japan

Filed Jan. 27, 1994, Ser. No. 189,025

Claims priority, application Japan, Feb. 15, 1993, 5-048660; Nov. 25, 1993, 5-319096

Int. Cl.[6] B65B *51/26;51/16;51/18;9/08*

U.S. Cl. 53—551 **18 Claims**



1. A longitudinal sealer for a packaging machine, comprising:

a sealing unit including a heater;

a mobile support member supporting said sealing unit; and

Y-θ adjusting means for selectably moving said support member linearly in a specified Y-direction or rotating said support member around a vertical axis through said sealing unit.

5,463,851

VERTICAL-TYPE FILLING AND PACKAGING MACHINE

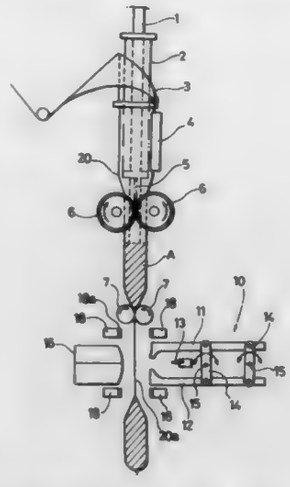
Katsumi Nagai, Gunma, Japan, assignor to Orihiro Co., Ltd., Tomioka, Japan

Filed Jul. 20, 1994, Ser. No. 272,396

Claims priority, application Japan, Dec. 20, 1993, 5-319708

Int. Cl.[6] B65B *9/08;51/30;51/14;* **B05B** *51/33*

U.S. Cl. 53—552 **19 Claims**



1. A vertical-type filling and packaging machine comprising:

a pair of squeezing rollers rotatably disposed one on each side of a tubular film of resin filled with a filling material for clamping and feeding the tubular film downwardly to create an unfilled region in the tubular film;

a heat sealing mechanism disposed downwardly of said squeezing rollers for heat-sealing and severing the unfilled region, said heat sealing mechanism comprising a heater bar for heat-sealing the unfilled region, a cooling bar for cooling a heat-sealed portion which is heat-sealed by said heater bar, said heater bar and said cooling bar being successively pressable against a portion of said unfilled region while said tubular film is being held at rest, and cutting means for severing said heat-sealed portion; and

first and second film support members, respectively disposed above and below said heat sealing mechanism and respectively including means for gripping and holding an upper end and a lower end of said unfilled region from the time the unfilled region is heat-sealed until the unfilled region is severed by said heat sealing mechanism.

5,463,852

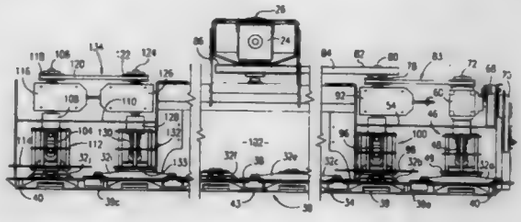
WIDE CUT HARVESTER HAVING ROTARY CUTTER BED

Michael L. O'Halloran, Hesston; Cecil L. Case, Newton; Martin E. Pruitt, Hesston, and David P. Fritz, Newton, all of Kans., assignors to Hay & Forage Industries, Hesston, Kans.

Filed Apr. 28, 1994, Ser. No. 234,232

Int. Cl.[6] A01D *34/66*

U.S. Cl. 56—6 **66 Claims**



1. In a machine for mowing crop materials, the improvement comprising:

a cutter bed including a series of rotary cutters extending across the path of travel of the machine and rotatable about individual, upright axes,

said series of cutters including a plurality of intermediate cutters and at least two outer cutters located outwardly beyond and at opposite ends of the plurality of intermediate cutters,

said intermediate cutters including a pair of drive cutters to which driving power is supplied for all of the intermediate cutters;

at least a pair of hydraulic motors operably coupled with respective ones of said drive cutters for supplying said driving power to the drive cutters for distribution to the remaining intermediate cutters;

power distribution means operably interconnecting all of the intermediate cutters with one another in an unbroken drive line to effect said distribution of driving power from the drive cutters to the remaining intermediate cutters;

means for supplying hydraulic fluid under pressure to said motors for operating the motors; and

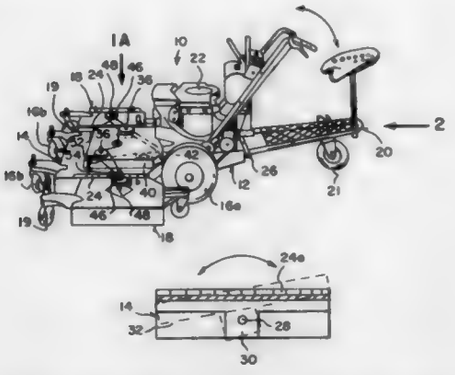
means operably coupling the outer cutters with the hydraulic motors for driving the outer cutters,

said means for supplying hydraulic fluid including conduit means communicating said motors with one another during the application of driving power to the drive cutters in a manner to cause the motors to share the load of driving all of the intermediate cutters and all of the outer cutters.

5,463,853
LAWNMOWER WITH ADJUSTABLE SIDE CUTTERS

Domenico Santoli, 2 Clark Pl., W. Harrison, N.Y. 10604, and George Spector, 233 Broadway Rm 702, New York, N.Y. 10279

Filed Aug. 22, 1994, Ser. No. 293,448
Int. Cl.[6] A01D *34/66;34/86*
U.S. Cl. 56—6 **1 Claim**



1. An improved industrial lawn mower which comprises:

a) a frame having a main cutting unit with large wheels connected to said frame and small wheels connected to said main cutting unit;

b) a pair of auxiliary cutting units, each having small wheels and extending from an opposite side of the main cutting unit in said frame to increase the cutting area;

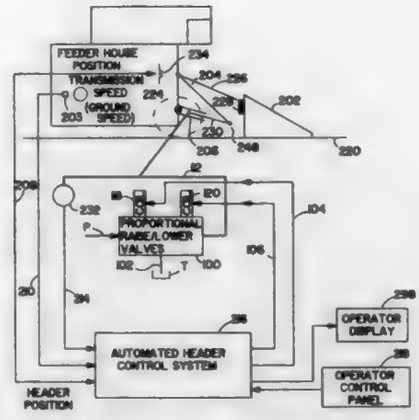
c) a seat assembly having a small wheel and extending from the rear of said frame; and

d) an engine in said frame to supply motive power to said large wheels, said main cutting unit in said frame and said auxiliary cutting units; further including a pair of auxiliary cutting unit hinges, each is mounted between one side of the main cutting unit in said frame and one said auxiliary cutting unit, so that said auxiliary cutting units can fold up for storage and to pass through narrow passages; further including a seat assembly hinge located between a rear side of said frame and a front side of said seat assembly, so that said seat assembly can fold up for storage; wherein each said auxiliary cutting unit hinge includes a pivot pin extending through the center of a leaf and the side of the main cutting unit, so that said auxiliary cutting unit can pivot over irregular terrain.

5,463,854
AGRICULTURAL HARVESTER WITH CLOSED LOOP GROUND TRACKING CONTROL

Thomas A. Chmielewski, Jr., Langhorne; Scott T. Demarest, Washington Crossing, and Leonard R. Colavito, Newtown, all of Pa., assignors to Control Concepts, Inc., Newtown, Pa.

Continuation-in-part of Ser. No. 12,000, Feb. 1, 1993, Pat. No. 5,359,836. This application Feb. 1, 1994, Ser. No. 190,344
Int. Cl.[6] A01D *75/28*
U.S. Cl. 56—10.2 E **12 Claims**



1. In an agricultural harvester having a cut crop receiving header having a weight and coupled by a linkage to a hydraulic cylinder, a method for causing the header to track the ground, comprising the steps of:

a) positioning the header on the ground as the harvester moves with respect to the ground;

b) providing first signals to control application of fluid to the cylinder at an electrical setpoint value representing fluid pressure applied to counterbalance a portion of the weight of the header;

c) detecting pressure in the cylinder as a measure of a force the header applies against the ground and producing a feedback signal therefrom for adjusting the first signals;

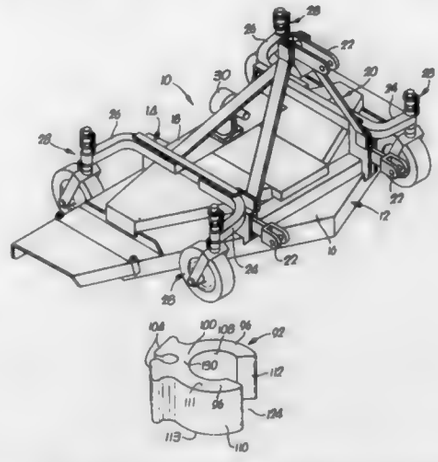
d) providing second signals to adjust the electrical setpoint value to a first value representing a first pressure value and maintaining the cylinder pressure at the first value while the header moves over increasingly lower ground; and

e) providing third signals to increase the electrical setpoint value to a second value representing a second pressure value and maintaining the cylinder pressure at the second value while the header moves over increasingly higher ground, thereby to overcome mechanical deadband in the cylinder and the linkage while the header tracks the ground.

5,463,855
SNAP-ON HEIGHT ADJUSTMENT SPACER CLIPS FOR MOWER DECK WHEEL SPINDLES AND THE LIKE

Eric Johnson, Salina; Gail A. Lloyd, Solomon, and R. Nathan Massey, Salina, all of Kans., assignors to Great Plains Manufacturing, Incorporated, Assaria, Kans.

Filed Feb. 16, 1994, Ser. No. 197,402
Int. Cl.[6] A01D *67/00*
U.S. Cl. 56—17.2 **19 Claims**



1. In a mobile device having a height-adjustable, wheeled frame, the improvement comprising:

at least one ground-engageable wheel assembly including an upright member received by the frame in a manner to permit selective up and down, height-adjusting movement of the frame relative to the member;

a lower shoulder on said member;

an upper shoulder on said frame moveable toward and away from said lower shoulder during height adjustment of the frame; and

at least one removable spacer clip on said member between the shoulders for holding the frame against downward movement below a selected height position,

said clip including a pair of mutually opposed, resiliently spreadable arms interconnected at one end and disconnected at an opposite end for embracing said member when the clip is installed thereon, yet permitting the arms to yieldably flex toward and away from one another as the clip is forced transversely off and on the member.

5,463,856

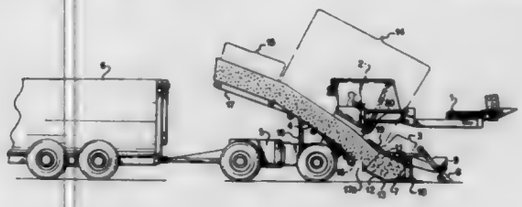
WHOLE STALK SUGAR CANE HARVESTER THAT TOPS, CUTS, CLEANS AND LOADS

Carlos A. Beckwith, Querétaro, Mexico, assignor to Centro de Investigacion Y Asistencia Tecnica del Estado de Wueretaro A.C., Queretaro, Mexico

Continuation of Ser. No. 968,075, Oct. 29, 1992, abandoned. This application May 19, 1994, Ser. No. 245,836

Int. Cl.[6] A01D *45/10*

U.S. Cl. 56—62 **20 Claims**



1. Apparatus for harvesting stalk-type crops such as sugar cane, the apparatus comprising:

an articulated prime mover having a front end, relative to the direction of travel, with

(a) a roller for bending the upper part of the stalks in the direction of travel,

(b) at least two cooperating base cutters for cutting the base of the stalks proximate the ground, the severed stalk ends extending to the rear relative to the direction of travel, and

(c) cooperative rollers for capturing the severed ends of the stalks and feeding the entire stalks rearwardly,

the apparatus further including a cleaner positioned at the rear of said prime mover and operatively connected to said capturing and feeding rollers to receive and clean the entire stalks.

5,463,857

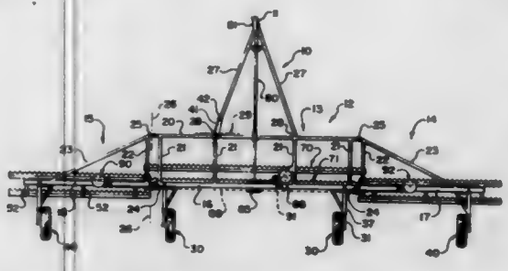
DOUBLE KNIFE STUBBEL CUTTER

Ken Blosser, Box 743, Kelvington, Saskatchewan, Canada

Filed Dec. 5, 1994, Ser. No. 352,708

Int. Cl.[6] A01D *34/07;34/30*

U.S. Cl. 56—238 **15 Claims**



1. Apparatus for cutting stubble comprising a frame having a width defining a working width of the apparatus, a plurality of ground wheels for supporting the frame in movement across ground carrying standing stubble to be cut, a hitch attached to the frame for applying a pulling force from a towing vehicle to the frame in a direction of working movement at right angles to the working width, a first sickle knife, a second sickle knife, a means mounting each of the first and second sickle knives on the frame so that each extends across the full working width, said mounting means mounting the first sickle knife upwardly of and forwardly of the second sickle such that the first sickle knife cuts a first upper stubble piece from the standing stubble as the frame is moved forwardly in the working direction and the second sickle knife cuts a second lower stubble piece from the standing stubble leaving a lower most standing piece, the frame defining an open area behind each of said first and second sickle knives arranged such that the upper stubble and the lower stubble piece fall to the ground behind the first and second sickle knives through the open areas at a position substantially aligned on the ground with the standing stubble piece.

5,463,858

MUSHROOM HARVESTER AND METHOD

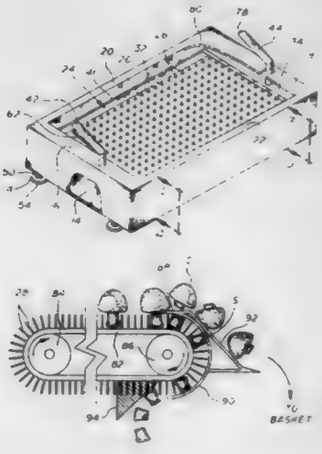
Andrew J. Ciuffetelli, 314 S. Guernsey Rd., West Grove, Pa. 19390

Filed Nov. 12, 1993, Ser. No. 151,265

Int. Cl.[6] A01D *46/00*

U.S. Cl. 56—327.1 **13 Claims**

1. A mushroom harvester comprising a frame having an open



top, a bottom wall and respective side walls; a plurality of product holding pins extending generally vertically upwardly from said bottom wall and having distal ends spaced therefrom, said pins being so spaced from one another as to be adapted to receive the stems of mushrooms to be harvested; a vertically movable bed within said frame and disposed generally parallel to said bottom wall, said bed having respective clearance openings therein adapted to receive said pins; a cutter mounted on said frame for movement relative to said frame in a plane generally parallel to said bed and above said distal ends of said pins, whereby said cutter is adapted to separate caps of harvested mushrooms from the stumps of their stems; and an actuator coupled to said bed for selectively moving said bed vertically with respect to said pins, operation of said actuator elevating said bed to eject the stumps from said pins.

5,463,859

FRUIT PICKING APPARATUS

Darwin L. Perry, 9823 Wrangler Dr., Sun City, Ariz. 85323

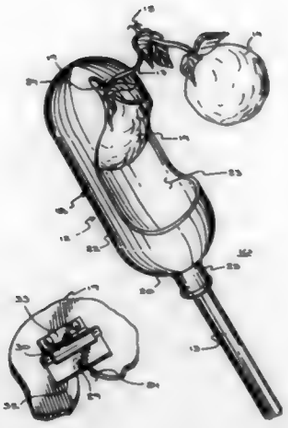
Filed Nov. 23, 1994, Ser. No. 344,500

Int. Cl.[6] A01D *46/24*

U.S. Cl. 56—332 **20 Claims**

1. A fruit picking apparatus for easily penetrating foliage to access fruit, and for removing fruit from a stem, said apparatus comprising:

a receptacle having a closed upper end and a closed lower end, said upper end and said lower end sloped to facilitate penetration of foliage;



an opening for receiving fruit formed in said receptacle intermediate said upper end and said lower end and terminating proximate said upper end with a convergent slot extending in the direction of said upper end;

a shaft; and

attachment means for attaching said receptacle to said shaft.

5,463,860

PROCESS AND DEVICE FOR PIECING AN OPEN-END SPINNING DEVICE

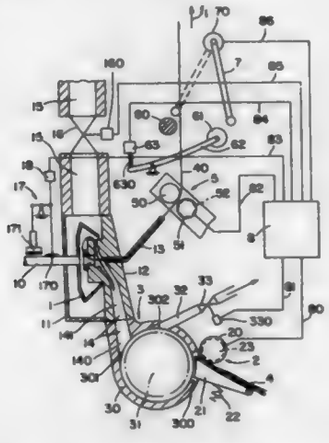
Jurgen Sauer, Ingolstadt, Germany, assignor to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Filed Dec. 9, 1993, Ser. No. 164,351

Claims priority, application Germany, Dec. 24, 1992, 42 44 061.5

Int. Cl.[6] D01H *4/50*

U.S. Cl. 57—263 **8 Claims**



1. A process for piecing in an open-end spinning device having a spinning rotor with a fiber collection surface, a yarn draw-off pipe extending from the area of the spinning rotor, a fiber feeding channel for conveying a stream of fibers from an opening device to the spinning rotor, a negative spinning pressure source and an auxiliary suction source, said process comprising the steps of:

stopping the spinning rotor;

conveying a yarn end to the end of the yarn draw-off pipe and sucking the yarn end through the yarn draw-off pipe, through the stopped spinning rotor, and into the fiber feeding channel, whereby the motion of the yarn end into the fiber feeding channel is supported by at least the auxiliary suction source taking effect through the fiber feeding channel and the stopped spinning rotor;

driving the spinning rotor to a piecing spinning speed;

producing a fiber stream and deflecting the fiber stream from the fiber feeding channel by way of the auxiliary suction source; and

switching on the negative spinning pressure source while simultaneously switching off the auxiliary pressure source wherein the yarn end is conveyed out of the fiber feeding channel to the fiber collection surface where it is combined with fibers which are again conveyed to the fiber collection surface through the fiber feeding channel.

5,463,861

FRICTION FALSE TWIST UNIT

Hellmut Lorenz, Remscheid, Germany, assignor to Barmag AG, Remscheid, Germany

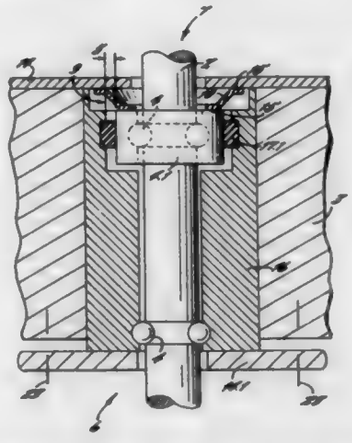
PCT No. PCT/DE92/01024, § 371 Date Aug. 9, 1993, § 102(e) Date Aug. 9, 1993, PCT Pub. No. WO93/12280, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 9, 1992, Ser. No. 98,374

Claims priority, application Germany, Dec. 12, 1991, 41 40 903.5; Mar. 25, 1992, 42 09 587.5; May 13, 1992, 42 15 762.5

Int. Cl.[6] D01H *7/92*

U.S. Cl. 57—339 **5 Claims**



1. An apparatus for friction false twisting an advancing yarn and comprising

a mounting bedplate, said bedplate including a pressure plate and a counter pressure plate which are axially spaced apart and parallel to each other,

a yarn twisting assembly comprising at least three spindles, and means mounting said spindles to said bedplate for rotation about fixed, parallel axes which are positioned at the corner points of an equilateral polygon having a number of sides corresponding to the number of spindles, and a plurality of circular disks mounted on each spindle for rotation therewith, and with the disks of the spindles overlapping at a point centrally between said spindles and defining an operative yarn path of travel extending axially therebetween, and means for concurrently rotating each of said spindles,

said mounting means including for each of said spindles a bore in said bedplate, at least two bearings mounted in said bore in an axially spaced apart arrangement between said bore and the associated spindle, with the one of said bearings located nearest the circular disks of the associated spindle including a non-rotating outer ring which includes a contact surface which is perpendicular to the axis of the associated spindle and faces the circular disks of the associated spindle, and an outer peripheral surface which is coaxial with the axis of the associated spindle, and the other of said at least two bearings including a non-rotating outer ring which is clamped between said pressure plate and said counter pressure plate of said bedplate,

a resilient radial damping ring disposed circumferentially between said outer peripheral surface of said outer ring of said one bearing and the outer ring of said other bearing, and

friction damping means mounted to said bedplate so as to frictionally engage said contact surface of said outer ring of said one bearing and bias the same toward said other bearing and to thereby dampen radial movement of the spindle during operation of said apparatus.

5,463,862

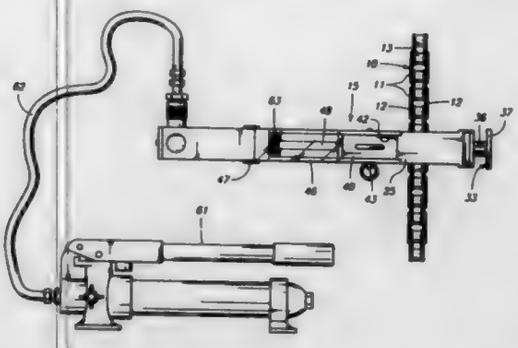
ROLLER CHAIN BREAKER

Theodore E. Reisenauer, Box 752, Tekoa, Wash. 99033

Filed Mar. 21, 1995, Ser. No. 408,025

Int. Cl.[6] B21L *21/00*

U.S. Cl. 59—7 **10 Claims**



1. A breaker for roller chains having multiple links formed of side plates joined by roller pins, comprising:

a rigid frame including a chain receiving opening defined therein between opposed first and second side;

a clamp member mounted to the rigid frame on the first side of the opening, for adjustment along an axis and including an open pin receiving bore positioned substantially coaxially with said axis;

a punch block releasably mounted to the rigid frame on the second side of the opening and defining an elongated open ended central bore;

a positioner on the frame releasably locating the punch block in position on the rigid frame with the central bore substantially coaxial with said axis;

wherein the punch block and clamp member include chain link engaging surfaces positioned relative to the opening to releasably receive a roller chain with a pin thereof aligned with said axis and with the link engaging surfaces in clamping engagement with chain side plates adjacent the pin;

a pin punch slidably received within the central bore of the punch block, having (a) a pin driving end movable through the opening and receivable axially within the pin receiving bore, and (b) a headed end;

a ram mounted to the frame and including a ram shaft selectively driven by the ram to move along said axis through a prescribed stroke toward and away from the-chain opening;

the ram shaft including an end having an axial socket substantially centered on said axis;

a saddle including a head and shank part, with the shank part being releasably received within the axial socket and the head projecting axially toward the chain opening;

a detent releasably securing the saddle axially within the socket and for permitting removal of the saddle from the socket without requiring rotation of the saddle relative to the ram shaft;

a cleat mounted to the saddle for relatively free rotation about said axis in relation to the saddle, and including a first laterally open recess for releasably receiving the headed end of the punch pin, thereby connecting the pin driver to the ram for axial movement along said stroke; and

wherein the ram is selectively operable to drive the punch pin through the chain opening along the axis to force the chain pin positioned between the punch block and clamp member axially into the pin receiving bore of the clamp member.

5,463,863

FUEL CONTROL SYSTEM

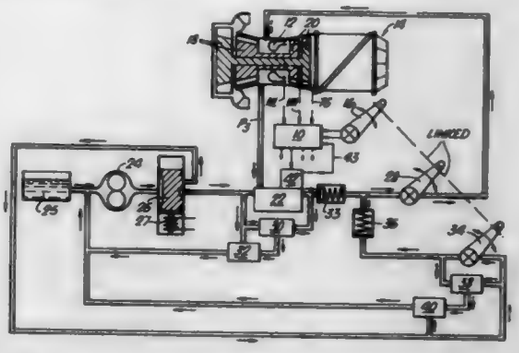
Michael J. Severn; Anthony J. Northcott, and Anne G. Rowlinson, all of Bristol, England, assignors to Rolls-Royce plc, Derby, England

Filed Sep. 19, 1984, Ser. No. 662,970

Claims priority, application United Kingdom, Jan. 6, 1983, 8326804; Jul. 27, 1984, 8419292

Int. Cl.[6] F02C *9/00*

U.S. Cl. 60—39.03 **5 Claims**



1. A fuel control system for regulating the flow of fuel to combustion equipment of a gas turbine engine, the fuel control system comprising flow metering means, an inlet of which, in operation, is connected to a source of pressurized fuel, and an outlet of which, in operation, is connected to the combustion equipment, and pressure regulator means operable to regulate the pressure drop across the inlet and outlet of the flow metering means, the flow metering means comprising, in flow series, a first valve which is controlled by a feed back loop and a second, manually operable valve which is not controlled by a feed back loop.

5,463,864

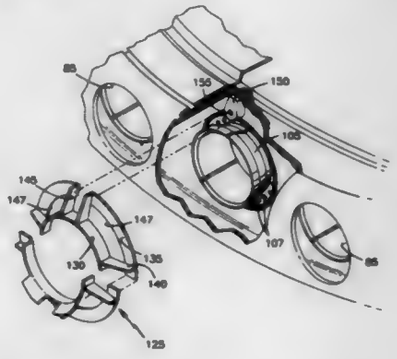
FUEL NOZZLE GUIDE FOR A GAS TURBINE ENGINE COMBUSTOR

Aaron S. Butler, Ledyard; Franklin J. Davis, Glastonbury, both of Conn., and Roger J. Comeau, Ware, Mass., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 27, 1993, Ser. No. 173,036

Int. Cl.[6] F23R *3/60*

U.S. Cl. 60—39.31 **3 Claims**



1. In a combustor for a gas turbine engine, said combustor comprising a combustion chamber defined at one end thereof by a bulkhead, said bulkhead including a fuel nozzle and guide structure therefor and a retainer for securing said fuel nozzle and guide structure to said bulkhead, said combustor further including means mounted on said bulkhead and extending through an opening in said retainer having a width and extending in a radial direction with respect to said retainer, for preventing relative rotational

movement between said retainer and guide structure and said bulkhead, said rotation preventing means being characterized by:

a detent having a length measured in said radial direction and being pivotally mounted at a location on said bulkhead, within said opening but unattached thereto, such that the length of said detent from said location at which said detent is mounted on said bulkhead, to one end thereof is substantially greater than said width of said opening;

whereby complete rotation of said detent within said opening is prevented, thereby preventing accelerated vibration and wear of said detent and said retainer attendant with said detent rotation, during operation of said gas turbine engine.

5,463,865

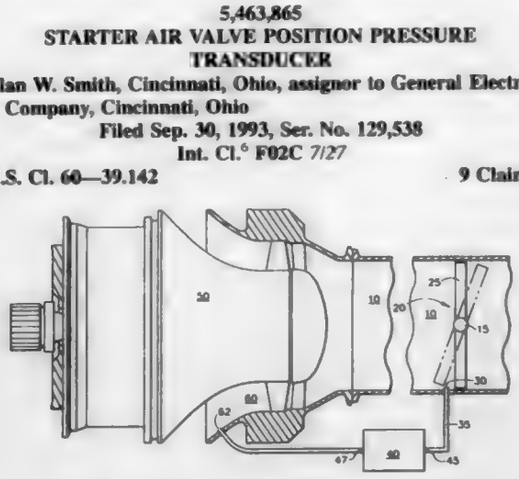
STARTER AIR VALVE POSITION PRESSURE TRANSDUCER

Alan W. Smith, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Sep. 30, 1993, Ser. No. 129,538

Int. Cl.[6] F02C *7/27*

U.S. Cl. 60—39.142 **9 Claims**



1. A pressure measurement system comprising:

a supply duct;

an air valve, including a restrictor mechanism adapted to close said supply duct;

a first measurement port at a first location such that a first pressure measured at said first measurement port when said restrictor mechanism is in a fully closed position is a pressure downstream of said restrictor mechanism and such that a second pressure measured at said first measurement port when said valve is at least partially opened is a pressure upstream of said restrictor mechanism;

a pneumaticly operated starter connected to said supply duct downstream of said first measurement port and including an exhaust port in fluid communication with said supply duct; and

a pressure transducer including an input from said first measurement port and an input from a second measurement port located at a second location at said exhaust port.

5,463,866

SUPERSONIC JET ENGINE INSTALLATION AND METHOD WITH SOUND SUPPRESSING NOZZLE

Garry W. Klees, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1993, Ser. No. 175,965

Int. Cl.[6] F02K *3/02*

U.S. Cl. 60—204 **20 Claims**

14. A method of operating a supersonic jet engine assembly in a mixed flow, noise suppressing mode where ambient air is mixed with engine exhaust for noise suppression, and also to operate the engine in a substantially non-mixed flow mode, said method comprising:

a. operating said assembly to receive air into an inlet end of an engine assembly nacelle, direct the air to a jet engine positioned in said nacelle, and discharge gaseous exhaust from an outlet end of said engine;

b. directing said gaseous exhaust from the engine to a nozzle section positioned which receives the gaseous exhaust from the engine;

c. to operate in a noise suppressing mode, moving ambient air door means to an open position to admit ambient air into a passageway mixing section of said nozzle section, having passageway defining wall means;

d. directing the gaseous exhaust from the engine to said passageway mixing section of the nozzle section and through a plurality of engine exhaust outlet segments, and also directing the ambient air through a plurality of ambient air outlet segments, interspersed with the engine exhaust outlet segments;

e. directing the engine exhaust and the ambient air flow from said outlet segments into a mixing chamber positioned downstream of said passageway mixing section, with mixing occurring in said mixing chamber for noise suppression;

f. directing said mixed flow into a variable area final nozzle portion positioned to provide a greater nozzle area cross section to accommodate volume of the mixed flow;

g. operating engine exhaust outlet segment modulating means in a first noise suppressing modulating mode where the modulating means is positioned to provide a convergent/divergent outlet area at the engine exhaust outlet segments, and to increase and decrease the outlet area to match engine requirements during the noise suppressing mode, where ambient air is directed into said mixing chamber;

h. for the non-mixed flow mode, closing the ambient air door means to a closed position to block flow of ambient air into the nozzle section;

i. positioning said engine exhaust outlet segment modulating means in a second open operating mode where the engine exhaust modulating means is positioned to permit substantially unrestricted flow from said engine exhaust outlet segments;

j. moving the variable area final nozzle portion to a convergent/divergent configuration to receive gaseous flow from said mixing chamber at subsonic velocity and discharge said gaseous flow at supersonic velocity.

5,463,867

SUPERCHARGED INTERNAL COMBUSTION ENGINE EXHAUST SYSTEM

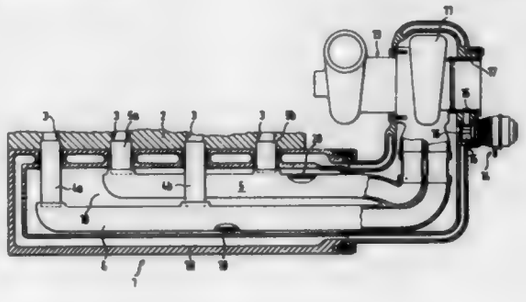
Georg Ruetz, Immenstaad, Germany, assignor to MTU Motoren-Und Turbinen-Union Friedrichshafen GmbH, Germany

Filed Dec. 14, 1994, Ser. No. 355,904

Claims priority, application Germany, Dec. 14, 1993, 43 42 572.0

Int. Cl.[6] F01N *5/04;7/10;* **F02D** *23/00*

U.S. Cl. 60—602 **11 Claims**



1. An exhaust system for a supercharged internal-combustion engine, comprising exhaust gas pipes each connecting a group of cylinders of the internal-combustion engine with a flow of one of a single-flow and multiflow turbine of an exhaust gas turbocharger, exhaust-gas-carrying components arranged in a gas-tight housing, and provided with openings to permit exhaust gas to reach a space between the exhaust-gas-carrying components and the housing, an outlet pipe arranged to discharge the exhaust gas flowing away from the turbine, a bypass pipe is arranged to connect the space with the outlet pipe, and a blow-off valve is arranged at the bypass pipe to control a quantity of the exhaust gas passing through the bypass pipe.

5,463,868

HEAT PUMPING METHOD AS WELL AS HEAT PUMP FOR GENERATING CRYOGENIC TEMPERATURES

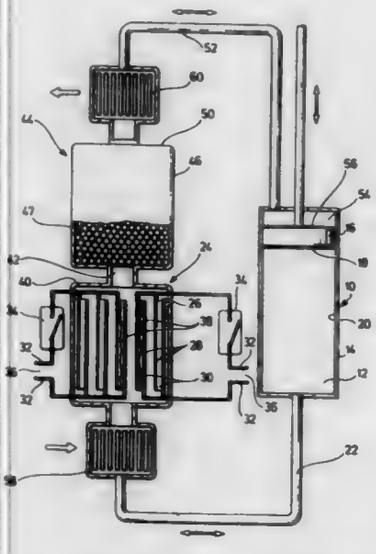
Walter Peschka, Sindelfingen, and Gottfried Schneider, Stuttgart, both of, Germany, assignors to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V, Bonn, Germany

Filed Dec. 14, 1993, Ser. No. 166,704

Claims priority, application Germany, Dec. 17, 1992, 42 42 642.1

Int. Cl.[6] F25B *21/00*

U.S. Cl. 62—6 **25 Claims**



1. A heat pumping method comprising the following, cyclically recurring steps:

(a) heating an electrically polarizable medium by applying thereto an electric field generated by a high voltage;

(b) cooling the heated, polarized medium by an operating medium received from a first chamber, the operating medium thereby being heated;

(c) heating the operating medium according to a temperature gradient within a regenerator element through which the operating medium flows;

(d) transferring at least part of the heat of the operating medium previously absorbed from the polarized medium to a warm-side heat exchanger and storing the operating medium in a second chamber;

(e) adiabatically terminating the action of the electric field on the polarized medium, whereby the polarized medium is cooled to a temperature below its temperature prior to application of the field;

(f) cooling the stored operating medium from the second chamber in accordance with the temperature gradient within the regenerator, whereby the heat previously absorbed from the regenerator is substantially returned thereto;

(g) further cooling the operating medium cooled by the regenerator to a temperature below its initial temperature by the cooled polarizable medium; and

(h) cooling a cold-side heat exchanger by the operating medium cooled by the polarizable medium and storing the operating medium in the first chamber.

5,463,869

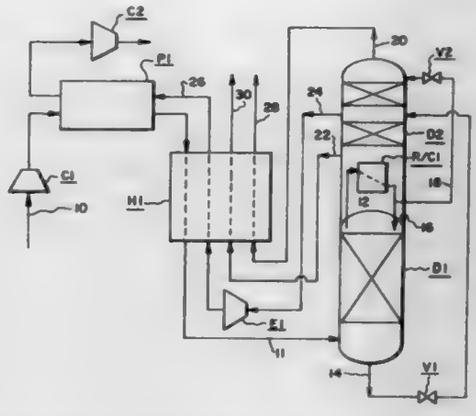
INTEGRATED ADSORPTION/CRYOGENIC DISTILLATION PROCESS FOR THE SEPARATION OF AN AIR FEED

Ravi Kumar, Allentown, and William T. Kleinberg, Breingsville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 12, 1994, Ser. No. 289,462

Int. Cl.[6] F25J *3/02*

U.S. Cl. 62—24 **4 Claims**



1. An integrated adsorption/cryogenic distillation process for the separation of an air feed comprising the steps of:

(a) compressing the air feed to an elevated pressure;

(b) pretreating the compressed air feed to remove impurities comprising carbon dioxide and water by an adsorption separation sequence which includes:

(i) an adsorption step consisting of passing the compressed air feed through an adsorption zone containing one or more adsorbents selective for the retention of the impurities to produce an impurity-saturated adsorption zone and an impurity-depleted air feed; and

(ii) a sub-ambient pressure purge step consisting of purging the impurities from the impurity-saturated adsorption zone at a sub-ambient pressure level with a purge gas;

(c) cooling the impurity-depleted air feed to near its dew point;

(d) introducing the cooled, impurity-depleted air feed into a cryogenic distillation column system in which the cooled, impurity-depleted air feed is rectified into a gaseous nitrogen overhead and a liquid oxygen bottoms;

(e) withdrawing a waste stream from the distillation column system;

(f) expanding the waste stream to approximately the sub-ambient pressure level in step (b)(ii);

(g) warming the expanded waste stream against the impurity-depleted air feed, thereby accomplishing at least a portion of step (c)'s cooling of the impurity-depleted air feed; and finally

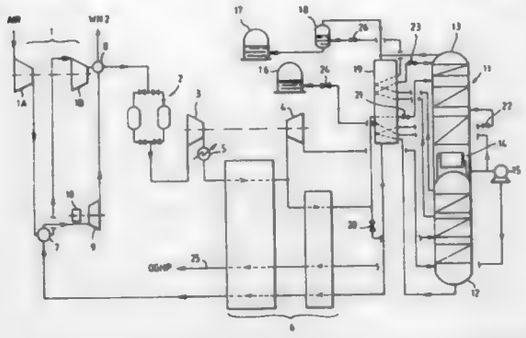
(h) recycling the warmed, expanded waste stream as the purge gas in step (b)(ii).

5,463,870

PROCESS AND INSTALLATION FOR THE PRODUCTION OF AT LEAST ONE GAS FROM AIR UNDER PRESSURE

Norbert Rieth, Paris, France, assignor to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed Aug. 29, 1994, Ser. No. 300,196
Claims priority, application France, Sep. 1, 1993, 93 10418
Int. Cl.[6] F25J 3/02
U.S. Cl. 62—25 11 Claims



1. In a process for the production of at least one of gaseous oxygen and gaseous nitrogen under pressure, wherein air is distilled in an installation comprising a principal air compressor, a double distillation column comprising a low pressure column operating under a low pressure, and a medium pressure column operating under a medium pressure, and a heat exchange line serving to cool the treated air; all the air to be distilled is compressed to at least one high air pressure substantially greater than the medium pressure; the compressed air is cooled to an intermediate temperature, and a portion thereof is expanded in a turbine to the medium pressure, before introducing it into the medium pressure column; the unexpanded air is liquified, and then introduced after expansion into the double column; and a liquid product is withdrawn from the double column and a portion of said liquid product is brought to the production pressure, and this portion of the liquid product is vaporized by heat exchange with the air; the improvement comprising operating the low pressure column under a pressure higher than atmospheric pressure; and expanding residual gas from the head of the low pressure column in a second turbine, after having been reheated to the warm end of the heat exchange line.

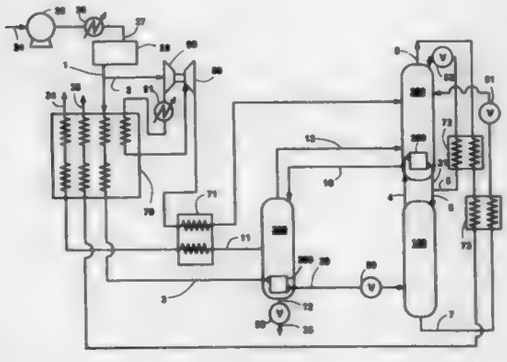
5,463,871

SIDE COLUMN CRYOGENIC RECTIFICATION SYSTEM FOR PRODUCING LOWER PURITY OXYGEN

Harry Cheung, Williamsville, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Filed Oct. 4, 1994, Ser. No. 317,973
Int. Cl.[6] F25J 3/02
U.S. Cl. 62—38 9 Claims

1. A cryogenic rectification method for producing lower purity oxygen comprising:



(A) compressing feed air;

(B) at least partially condensing compressed feed air and passing the resulting feed air into the higher pressure column of a double column which also includes a lower pressure column;

(C) passing crude liquid oxygen comprising from 50 to 88 mole percent oxygen from the lower pressure column into a side column;

(D) separating the crude liquid oxygen by cryogenic rectification within the side column into oxygen product fluid and remaining vapor;

(E) passing remaining vapor from the side column into the lower pressure column;

(F) at least partially vaporizing the oxygen product fluid by indirect heat exchange with the compressed feed air to carry out the said at least partial condensation of the compressed feed air; and

(G) recovering oxygen product fluid as product lower purity oxygen having an oxygen concentration which exceeds that of the crude liquid oxygen.

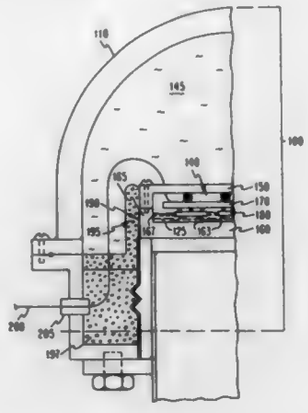
5,463,872

HIGH PERFORMANCE THERMAL INTERFACE FOR LOW TEMPERATURE ELECTRONIC MODULES

David T. Vader, Mechanicsburg, Pa., and Vincent C. Vasile, Marlboro, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 8, 1994, Ser. No. 303,254
Int. Cl.[6] F25B 19/00
U.S. Cl. 62—51.1 14 Claims

1. A cryogenic cooling device for cooling electronic compo-



nents, said device comprising:

a thermally insulative and sealed housing containing a gas mixture of a first gas and a second gas, said gas mixture being at a pressure equal to the partial pressure of said first gas and to the saturation pressure of said second gas, said first gas being non-condensible and said second gas being condensible within a desired operating temperature range for said electronic components;

an immersion chamber disposed within said insulative housing for holding said electronic components in contact with a condensed phase of said condensible second gas, said chamber being in gaseous flow communication with the interior of said insulative housing; and

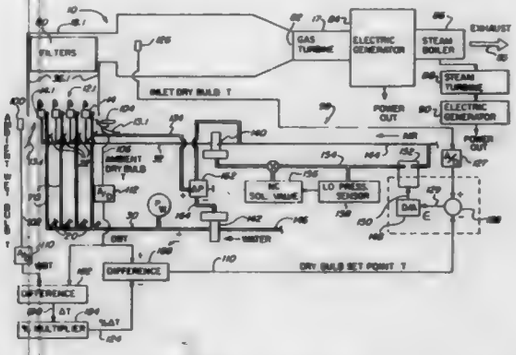
condensing means in thermal contact with said immersion chamber for condensing said second condensible gas to a liquid form, said condensed liquid collecting in said immersion chamber for cooling said electronic components.

5,463,873
METHOD AND APPARATUS FOR EVAPORATIVE COOLING OF AIR LEADING TO A GAS TURBINE ENGINE

Brian J. Early, Trumbull; Daniel J. Reens, Ridgefield, and Robert S. Karnoff, Monroe, all of Conn., assignors to Cool Fog Systems, Inc., Norwalk, Conn.

Filed Dec. 6, 1993, Ser. No. 163,115
Int. Cl.[6] F28C *1/00*; B01F *3/02*
U.S. Cl. 62—121 **8 Claims**

1. A system for evaporative cooling of an air stream leading to



the inlet of an internal combustion engine such as a gas turbine engine comprising:

fogger means for injecting fog into the air stream;

means for generating a control signal representative of the capacity of the airstream to absorb water vapor from fog produced by the fogger means; and

means responsive to the control signal for regulating the fogger means so as to cause the injection of fog into the airstream commensurate with its capacity to absorb water vapor, wherein the control signal generating means further comprises:

means for generating a first temperature signal representative of the dry bulb temperature of the air stream before being exposed to the fog;

means for generating a second temperature signal representative of the wet bulb temperature of the airstream before its exposure to the fog;

means responsive to the first and second temperature signals for generating a setpoint signal representative of an achievable temperature of the airstream at said gas turbine inlet.

5,463,874
INDUCTIVELY ACTIVATED CONTROL AND PROTECTION CIRCUIT FOR REFRIGERATION SYSTEMS

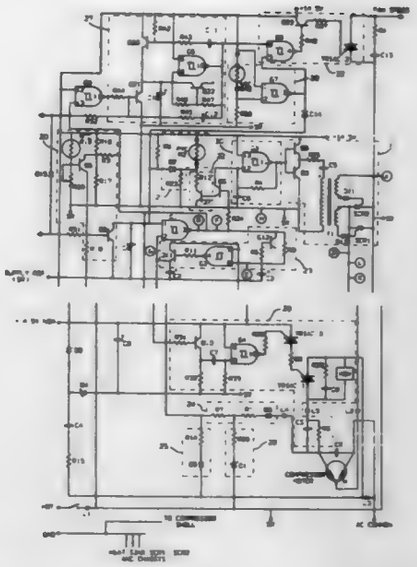
James B. Farr, Ann Arbor, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Oct. 4, 1993, Ser. No. 131,420
Int. Cl.[6] F25B *49/02*
U.S. Cl. 62—126 **24 Claims**

1. A refrigeration system for cooling a chamber, said refrigeration system comprising:

a compressor having a motor, said compressor motor adapted for connection to a power supply, said compressor motor including at least one winding;

a control circuit for controlling the activation of said compressor motor, said control circuit including a solid state switch for electrically coupling the power supply and said compressor motor, said solid state switch including an activation gate which opens and closes current flow through said solid state switch, and an inductive coupling adapted to induce a current on said activation gate of said solid state switch to actuate said activation gate and thereby provide power to said compressor motor; and

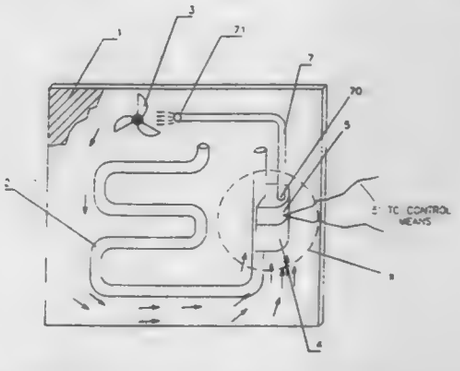


sensing means for sensing the operating condition of said compressor motor, said sensing means coupled to said control circuit for deactivating said inductive coupling when the loading of said compressor motor is sensed to be above a predetermined level, said sensing means including a reference branch and a sensing branch, said reference branch including a predetermined voltage source, and said sensing branch being operatively associated with said at least one winding.

5,463,875
DEFROST CONTROL SYSTEM

Jacob Shavit, Ramat Gan, Israel, assignor to Control & Regulation Circuits Meitav Ltd., Le-Tzion, Israel

Filed Jul. 6, 1994, Ser. No. 267,909
Claims priority, application Israel, Apr. 11, 1994, 109278
Int. Cl.[6] F25D *21/06*
U.S. Cl. 62—140 **4 Claims**



1. A defrost control system for use in refrigeration apparatus in which circulation of air over an evaporator cooling coil can result in frost formation thereon, comprising:

an aperture means formed as a tubular member having a recess within said tubular member so as to be in direct communication with an outside surface of said coil, provided with an opening therethrough extending along and defined by an inlet and outlet aperture thereof, said opening being capable of passing said air flow therethrough so as to enable the emergence of air from the outlet aperture thereof in a first, normal condition corresponding to an absence of frost therein and being capable of becoming blocked by the presence of frost

accumulating therein in a second condition so as to restrict the emergence of air from said outlet aperture;

a sensing means mounted in proximity to said outlet aperture and being capable of detecting the presence or absence of airflow therethrough and of generating signals related to such presence or absence of frost;

a control element capable of receiving said signals and of translating them; and

a heating means adapted to be energized or de-energized by said control element so as to initiate the thawing of said frost when energized;

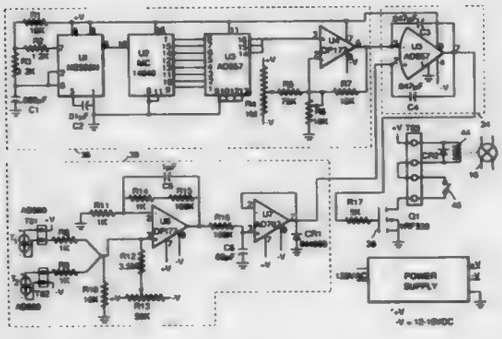
wherein said tubular member is located on an outside surface of said coil in such a manner that the direction of said opening coincides with the direction of movement of said circulating air circulating over said evaporator coil in said normal condition, corresponding to absence of frost, whereas at least part of said tubular member has a thermal conductivity characteristic which is lower than that of the coil so as to enable accumulation of frost within said opening substantially simultaneously with the appearance of frost on the outside surface of said coil.

5,463,876

CONTROL SYSTEM FOR REFRIGERANT METERING SOLENOID VALVE

Warren F. Bessler, Schenectady, and Frank J. Bowden, Latham, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1994, Ser. No. 222,051
Int. Cl.[6] F25B *49/00;41/04*
U.S. Cl. 62—223 **18 Claims**



1. A control system for controlling an expansion valve in a refrigeration system, said control system comprising:

a sensing circuit arranged to sense a condition of said refrigeration system and produce a sensor signal corresponding to said condition;

a ramp generator for producing a reference signal in the form of a ramp wave having a preselected height, slope, and frequency, and including a negative ramp offset in each ramp segment; and

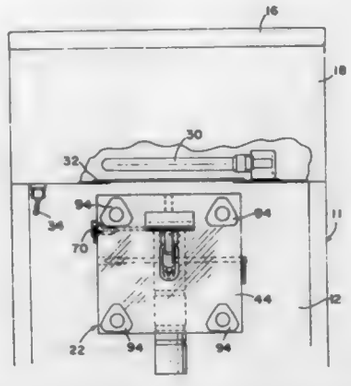
a pulse width modulator having inputs connected to said sensing circuit and said ramp generator and an output connected to said valve, said pulse width modulator comparing said sensor signal and said reference signal and producing a maximum voltage whenever said sensor signal exceeds said reference signal, and a minimum voltage when said sensor signal does not exceed said reference signal, with said negative ramp offset effecting a minimum non-zero duty cycle for said expansion valve.

5,463,877

DISPENSER HAVING EDGE-LIGHTED, TRANSPARENT VALVE FOR PRODUCT DISPLAY

William C. Young, and Kerwin Barngrover, both of Topeka, Kans., assignors to Wilch Manufacturing, Inc., Topeka, Kans.

Filed Jul. 14, 1994, Ser. No. 275,040
Int. Cl.[6] F25D *27/00*
U.S. Cl. 62—264 **5 Claims**



5. A frozen product dispenser apparatus comprising:

a housing presenting a front panel and including a freezing chamber extending rearward from the front panel;

a valve body positionable to close off the freezing chamber, the valve body including an edge wall extending around the body and a rear surface exposed to the freezing chamber, the rear surface including a concavity defining an extension of the chamber so that product stored in the tank fills the concavity, the valve body being substantially transparent so that the frozen product is visible through the body;

a fastening means for fastening the valve body to the housing;

a valve supported on the valve body for movement between a flow-preventing position and a flow-permitting position;

an actuating means for moving the valve between the flow-permitting and flow-preventing position; and

a lighting means for lighting the edge wall of the valve body to illuminate the frozen product for display,

wherein the housing includes a cover assembly extending over the valve body, the lighting means being disposed within the hood assembly and including a lamp, and a lens for directing light from the lamp onto the edge wall of the valve body.

5,463,878

CHILLED PRODUCT DISPENSING APPARATUS

Shafi Parekh, Irving; Bernard M. Geiger, Dallas; Alexander Tsimberg, Richardson; Zaya H. Malik, Dallas, and Reginald H. Fowler, Garland, all of Tex., assignors to Froezert USA, Inc., Dallas, Tex.

Filed Nov. 3, 1992, Ser. No. 973,800
Int. Cl.[6] B67D *5/62*
U.S. Cl. 62—394 **19 Claims**

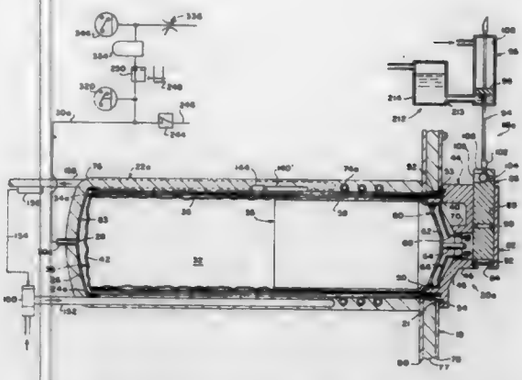
1. Apparatus for refrigerating containers of soft serve food products and for dispensing the soft serve products, each product container having an outlet, the apparatus comprising:

a plurality of product container receptacles each adapted to receive a product container inserted therein respectively;

refrigeration means, having respective cooling sections located adjacent each of the receptacles for cooling each of the receptacles and any product container contained therein;

dispensing means, connectable in communication with product containers inserted within the receptacles, respectively, for dispensing a quantity of the product disposed in the product containers, respectively; and

the refrigeration means further comprising means for conducting refrigerant to the respective cooling sections and for selec-



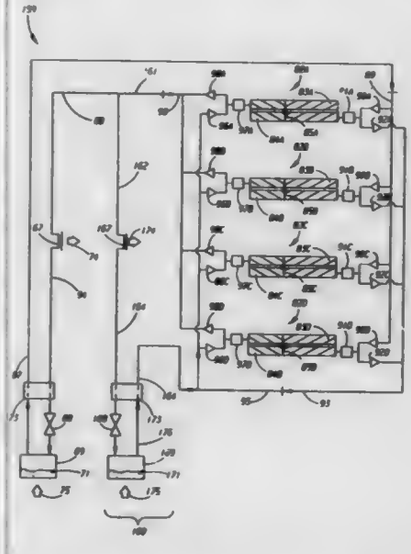
tively controlling the temperature within each receptacle controlling refrigerant flow to the respective cooling sections adjacent each receptacle for controlling the temperatures of the food product in the product containers, respectively, appropriate for different food products in the respective product containers.

5,463,879

HEAT CASCADING REGENERATIVE SORPTION HEAT PUMP

Jack A. Jones, Los Angeles, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jan. 4, 1994, Ser. No. 177,291
Int. Cl.[6] F17C *11/00*; F25B *17/08*
U.S. Cl. 62—480 **48 Claims**



1. A heat cascading regenerative sorption heat pump process with rejected heat from a higher temperature chemisorption circuit powering a lower temperature physical adsorption circuit, the process comprising:

(a) providing a higher temperature ammonia chemisorption circuit containing ammonia and a chemisorbent, the chemisorbent having a first chemical composition operable for chemisorbing and desorbing ammonia, the higher temperature ammonia chemisorption circuit comprising a plurality of canisters each containing the chemisorbent, first condensing means, first evaporating means for cooling a low temperature heat load, first heating means for heating the chemisorbent to a first upper temperature for desorption of ammonia, and first cooling means for cooling the chemisorbent, operatively connected together, and wherein each canister has a heat transfer element in thermal communication with, but not in fluid communication with the chemisorbent;

(b) providing a lower temperature ammonia physical adsorption circuit containing ammonia and a physical adsorbent, the physical adsorbent having a second chemical composition operable for physically adsorbing and desorbing ammonia, the second chemical composition being different than the first chemical composition, the lower temperature ammonia physical adsorption circuit comprising adsorption/desorption means containing the physical adsorbent, the adsorption/desorption means having a first part for desorbing ammonia and a second part for physically adsorbing ammonia, second condensing means, second evaporating means for cooling a low temperature heat load, second heating means for heating the first part of the adsorption/desorption means and the physical adsorbent therein to a second upper temperature for desorption of ammonia, and second cooling means for rejecting heat therefrom, operatively connected together;

providing at least one first closed heat transfer circuit containing a first heat transfer liquid, the first heat transfer liquid being different than the chemisorbent, the physical adsorbent and ammonia, the first closed heat transfer circuit comprising the heat transfer element of at least one canister, and heat exchange means in thermal communication with the first part of the adsorption/desorption means but not in fluid communication with the physical adsorbent; and

(d) wherein cooling the chemisorbent by the first cooling means is by flowing the first heat transfer liquid through the heat transfer element of the at least one canister, thereby cooling it, wherein heating the first part of the adsorption/desorption means and the physical adsorbent therein by the second heating means to a second upper temperature for desorption of ammonia is by flowing the first heat transfer liquid from the at least one canister through the heat exchange means thereby heating the first part, and thereby cascading heat from the higher temperature ammonia chemisorption circuit to the lower temperature ammonia physical adsorption circuit; and

(e) regenerating heat within the adsorption/desorption means by transferring heat from the first part thereof to the second part thereof.

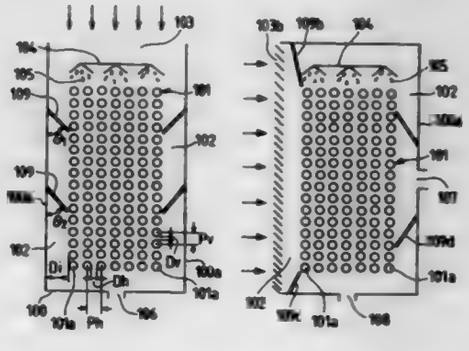
5,463,880

ABSORPTION REFRIGERATOR

Yoshitaka Nishino; Toshio Sawa, both of Hitachi; Takashi Nakao, Ami; Michihiko Aizawa, Ushiku, and Kenji Yokose, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 7, 1994, Ser. No. 192,830
Int. Cl.[6] F25B *15/00*
U.S. Cl. 62—484 **22 Claims**

1. An absorption refrigerator having an evaporator for evaporating liquid therein to generate a vapor; an absorber having a tube bank of heat-conductive tubes for absorbing vapor which has entered the absorber from the evaporator into an absorbent sup-



plied in said absorber, while rejecting absorption heat through the tube bank, wherein said absorber comprises:

a vapor flow passage between a side wall of said absorber and said tube bank opposite to said side wall, said side wall being separated from said tube bank in a radial direction of said heat-conductive tubes of said tube bank;

a gas extraction port disposed outside of said tube bank; and

at least one baffle plate disposed in said vapor flow passage for adjusting vapor in said tube bank so that uncondensed gas flows toward said gas extraction port.

5,463,881

DOUBLE-KNIT FABRIC HAVING NON-RUN AND STRETCHABILITY CHARACTERISTICS AND METHOD AND APPARATUS FOR KNITTING THE SAME

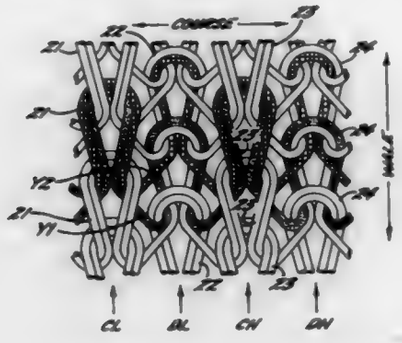
Yoshiaki Igarashi, and Yoshiro Ito, both of Hyogo, Japan, assignors to Precision Fukuhara Works, Ltd., Japan

Filed Jan. 14, 1994, Ser. No. 181,343

Claims priority, application Japan, Jan. 21, 1993, 5-027469

Int. Cl.[6] D04B *1/06;9/08*

U.S. Cl. 66—31 **13 Claims**



1. A double-knit fabric characterized by non-runability and by coursewise stretchability, said fabric comprising a plurality of yarns knit into stitch loops arranged in wales and courses, each stitch loop in each wale being formed of a first yarn of said plurality of yarns from a stitch loop in a same course in an immediately adjacent wale and a second yarn of said plurality of yarns from a stitch loop in an immediately adjacent course in an immediately adjacent wale.

5,463,882

CIRCULAR KNITTING MACHINE WITH CUT PILE MECHANISM

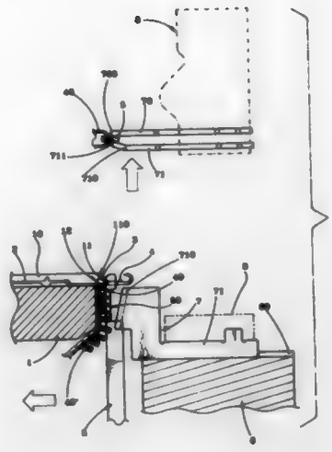
Tzu-Pin Yeh, Miao Li Hsien, Taiwan, Prov. of China, assignor to Pai Lung Machinery Mill Co., Ltd., Taipei, Taiwan, Prov. of China

Filed Apr. 26, 1994, Ser. No. 233,250

Int. Cl.[6] D04B *9/06*

U.S. Cl. 66—92 **1 Claim**

1. A circular knitting machine for producing cut pile fabric, comprising: a dial having a plurality of radial grooves; a cam; a plurality of dial needles reciprocated horizontally in the radial dial grooves on said dial by the cam; a plurality of cylinder needles reciprocated vertically to act with said dial needles to make yarns into loops; and a loop cutting mechanism moved to cut said loops, wherein each cylinder needle has a cut comprising a plain front side having two opposite symmetrical edges disposed at right angles to the front side; said loop cutting mechanism comprising a plurality of pairs of sinkers, each pair of sinkers comprising a first sinker and a second sinker reciprocated horizontally along two opposite sides of each cylinder needle, said first and second sinkers each having a respective front sloping end sloping outwardly in a downward direction, the front sloping end of said first sinker



having smooth surface moving along one side of the respective cylinder needle as the cylinder needle is lifted, the front sloping end of said second sinker being laterally bent into a plain edge facing said first sinker and disposed adjacent to the front side of the cut on the respective cylinder needle, the plain edge of the front sloping end of said second sinker moving along one side of the cut on the respective cylinder needle to cut the loop when the respective cylinder needle is lifted.

5,463,883

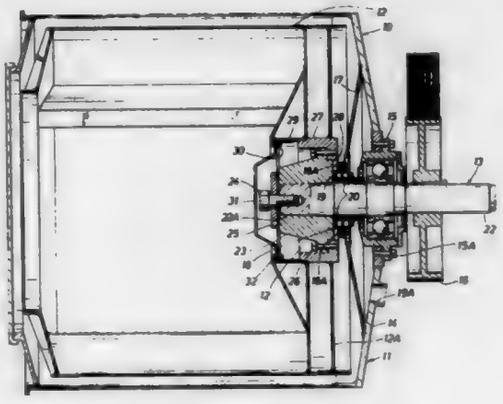
TEXTILE TREATING MACHINE

James W. Pellerin, Metairie; Russell H. Poy, Destrehan, and Edward J. Bradley, New Orleans, all of La., assignors to Pellerin Milnor Corporation, Kenner, La.

Filed Nov. 22, 1994, Ser. No. 344,352

Int. Cl.[6] D06F *37/22*

U.S. Cl. 68—140 **2 Claims**



1. A textile treating machine, comprising

a frame,

a drum for receiving textiles to be treated as well as treatment liquid and having a shaft,

a bearing assembly mounted on the frame and supporting the shaft for rotation,

means for so rotating the shaft and thus the drum to cause the liquid to be circulated through the textiles,

a seal assembly releasably connected to the frame and including at least one seal ring sealably surrounding the shaft inboard of the bearing assembly,

said drum having an opening in one end surrounding the shaft of a size to pass the seal assembly therethrough and an access opening in its other end,

said shaft including a main section which extends through the seal and bearing assemblies and a bushing releasably connected over a tapered inner end of the main section of the shaft and to the drum,

the connections of the bushing to the main shaft section and drum and the seal assembly to the frame being accessible from within the drum to permit them to be replaced through the access opening in the other end of the drum without removal of either of the bearing assembly or main shaft section.

5,463,884

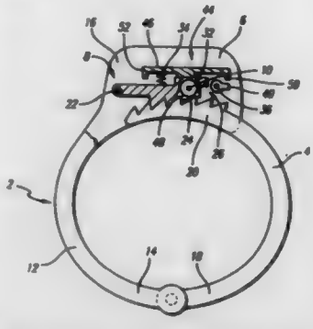
QUICK RELEASE HANDCUFF HAVING OVERRIDING MEANS FOR ENABLING DUAL USE AS A TRAINING AND A RESTRAINING DEVICE

Lansing S. Woo, 143 S. Saltair Ave., Los Angeles, Calif. 90049, and Ronnie J. Frigulti, 955 Thistlegate Rd., Agoura Hills, Calif. 91301

Filed Jul. 15, 1994, Ser. No. 276,093

Int. Cl.[6] E05B *75/00*

U.S. Cl. 70—16 **17 Claims**



1. Handcuff for dual use as a quick-release training device and an actual restraint device, the handcuff comprising:

a bail having parallel side plates extending between first and second ends of the bail, the bail comprising an arcuate ratchet member having a proximate end pivotally coupled to the first end of the bail and a distal end with teeth adapted for passage through the side plates of the bail upon pivotal movement of the ratchet member;

a locking assembly disposed within the side plates at the second end of the bail and comprising

a pawl having a first end pivotally coupled to the bail and a second end adapted with teeth, the second end of the pawl pivotal between a secured position in which the teeth of the pawl engage the teeth of the ratchet member and an unsecured position in which the second end of the pawl is separated from the ratchet member, the second end of the pawl further having a vertical shoulder for engagement with the flange of a key inserted within the locking assembly for manipulating the pawl between the secured and unsecured positions upon rotation of the key,

a spring for biasing the second end of the pawl towards the secured position,

a stop member disposed above the pawl movable in and out of contact with the pawl upon engagement with the key to prevent the pawl from being placed in the unsecured position when the stop member is in contact with the pawl, the stop member being movable rotating the key within the assembly to contact the stop member with the flange of the key, and

a shaft coupled to the second end of the pawl and protruding from the second end of the bail for placing the pawl in the unsecured position upon translation of the shaft in a direction generally away from the ratchet member; and

whereby when the handcuff is locked by insertion of the ratchet member within the bail and the stop member is not in contact with the pawl the handcuff is easily unlocked during training by movement of the shaft away from the ratchet member, and when the handcuff is locked by insertion of the ratchet member within the bail and the stop member is in contact with the pawl the handcuff cannot be unlocked by movement of the shaft away from the ratchet member.

5,463,885

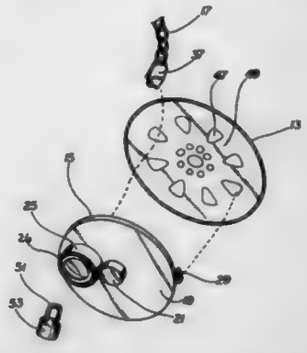
TRAILER WHEEL LOCK

Jerry D. Warren, Sr., P.O. Box 22, Franklinton, La. 70438

Filed Feb. 22, 1994, Ser. No. 199,849

Int. Cl.[6] E05B *73/00;* **B60R** *25/00*

U.S. Cl. 70—18 **11 Claims**



1. A trailer wheel lock for preventing theft of a trailer having a wheel on one end of an axle, wherein the trailer wheel lock comprises:

a cover plate covering an outer surface of the wheel on the axle;

a chain assembly having a chain with two ends, a first flange on one end of the chain, and a second flange on the other end of the chain, wherein the chain assembly extends through the wheel covered by the cover plate;

first locking means for securing the first flange to the cover plate, wherein the first flange extends through a cover plate slot in the cover plate, and wherein the first flange has a shoulder for preventing the first flange from passing completely through the cover plate slot; and

second locking means for causing the chain to go taut in response to rotation of the wheel.

5,463,886

METHOD AND APPARATUS FOR MANUFACTURING OF SOLDERING ROD CONTAINING COPPER

Reiner Seitz, Hetzs, Germany, assignor to Rothenberger Werkzeuge-Maschinen GmbH, Kelkheim/Taunus, Germany

PCT No. PCT/EP90/01453, § 371 Date May 6, 1991, § 102(e) Date May 6, 1991, PCT Pub. No. WO91/03356, PCT Pub. Date Mar. 21, 1991

PCT Filed Aug. 31, 1990, Ser. No. 690,942

Claims priority, application Germany, Sep. 4, 1989, 39 29 287.8

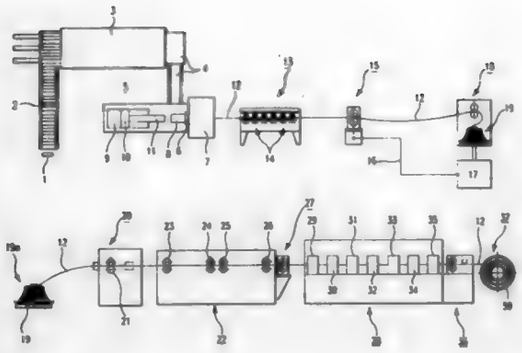
Int. Cl.[6] B21B *1/16;15/00;* **B21C** *23/08*

U.S. Cl. 72—13 **23 Claims**

1. Process for the manufacture of soldering rods containing at least 60 weight-% copper and at least one alloy component from the group phosphorus and silver by forming a block of corresponding copper alloy into a wire at temperatures below the eutectic temperature, characterized by the following process steps:

a. extruding said block at a block temperature of 540° to 680° C. into a wire with a maximum diameter of 10 mm, said extruding being done through a die by an extruder and imparting an exiting speed to the wire,

b. chilling the wire that emerges from the extruder to a temperature below 250° C.,



c. continuous feeding of the wire to a heating zone and heating the wire up to temperature between 200° and 280° C. as an intake temperature for an immediately following reducing mill,

d. continuous reduction of the wire to a desired cross section by rolling in at least three rolling steps with a 25% maximum reduction per rolling step,

e. cutting the wire into segments of individual soldering rods.

5,463,887

DEVICE FOR THE PREPARATION OF USED METAL BARRELS WITH A VIEW TO FACILITATING HANDLING AND RECYCLING THEREOF

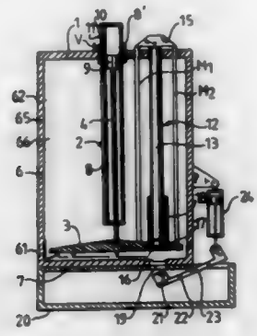
Jean-Claude Vasseur, Saint Witz, France, assignor to Sfanid Renov'cuves, Goussainville, France

Filed Jan. 18, 1994, Ser. No. 182,396

Claims priority, application France, Jan. 20, 1993, 93 00753

Int. Cl.[6] B21D *28/00;* **B30B** *9/32*

U.S. Cl. 72—39 **11 Claims**



1. A device for the preparation of used metal barrels having a cylindrical side as well as upper and lower sides, said device having a hydraulic press comprising

an enclosure intended to receive said barrels and comprising an upper support side,

a dual action hydraulic jack having a vertical body which is slidingly mounted through said support side and which comprises an actuating rod having a lower end which bears a crusher platen vertically mobile inside said enclosure,

a base located opposite said platen, on which said barrels are positioned to be crushed by said platen,

a perforating and cleaning mechanism comprising a cylindrical tube mounted vertically slidable through an opening in said platen and through an opening of said upper support side, said tube being ended at its lower part by a perforating head,

a vertical gantry mounted fixedly on said platen and supporting said perforating and cleaning mechanism by means of a jack, said gantry being mounted vertically slidable through said upper support side, and

means for locking said vertical body on said upper support side in the two following vertically spaced positions:

a retracted position in which said vertical body is largely contained inside said enclosure, and

an extended position in which said vertical body is largely outside said enclosure, and in which said device can be operated.

5,463,888

TUBE BENDING APPARATUS AND METHOD

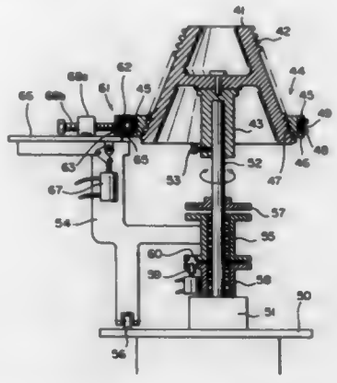
Masayuki Nagai, Suita, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 16, 1994, Ser. No. 214,147

Claims priority, application Japan, Feb. 15, 1994, 6-041983

Int. Cl.[6] B21D *7/04;7/02*

U.S. Cl. 72—157 **7 Claims**



4. A tube bending method comprising:

preparing a plurality of flexible dies of differing basic radius, each die each having a section missing in its periphery permitting radial elastic deformation and having a die groove extending in a circumferential direction of its outer periphery, the die groove having a cross-sectional shape corresponding to an external shape of a tube to be bent, the groove diameter decreasing as the basic radius of the ring dies increases;

deforming at least one of the ring dies to a plurality of different bending radii; and

bending a different tube around the deformed ring die at each bending radius to form a U-shaped portion in the tube, wherein the groove diameter is at least the nominal outer diameter D_0 of a tube being bent and at most D_0+0.1 mm when a bending radius R of the tube $\geqq D_0 \times 80$.

5,463,889

SEGMENTED SCRIBING ROLLER FOR REFINING THE DOMAIN STRUCTURE OF ELECTRICAL STEELS BY LOCAL MECHANICAL DEFORMATION

Ralph E. Snyder, Export; Dominic A. Sorace, Sarver, and James G. Benford, Pittsburgh, all of Pa., assignors to Allegheny Ludlum Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 978,204, Nov. 17, 1992, abandoned. This application Jan. 25, 1995, Ser. No. 378,891

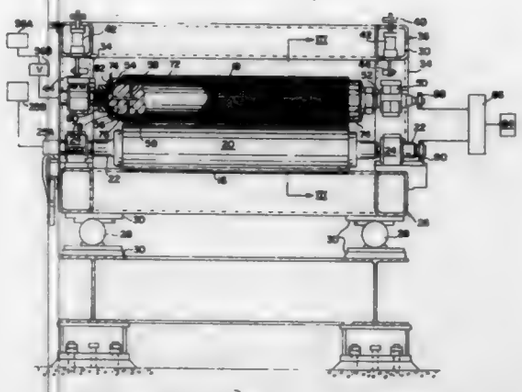
Int. Cl.[6] B21B *27/02*

U.S. Cl. 72—197 **22 Claims**

1. An apparatus for refining the magnetic domain wall spacing of grain-oriented silicon steel strip, said apparatus comprising:

an anvil roll means contacting one surface of said strip for support thereof;

a segmented scribing roller means including segments having scribing surfaces for engaging a surface of the strip opposite said one surface, said scribing roller means further including means resiliently supporting the segments for imposing a



uniform mechanical deformation in a general direction transversely to a rolling direction of the strip by said scribing segments;

means for arranging said scribing segments side-by-side under a clamping force sufficient to present scribing surfaces across the width of the strip and to permit relative positioning of said segments to accommodate crowning of the anvil roll means, and

means for controlling the position of said anvil roll means relative to said scribing roller means at opposite sides of said strip to establish a rolling pressure contact area wherein said strip is scribed.

5,463,890

AUTOMATIC BENDING APPARATUS AND MARKING DEVICE FOR BAND-SHAPED WORK

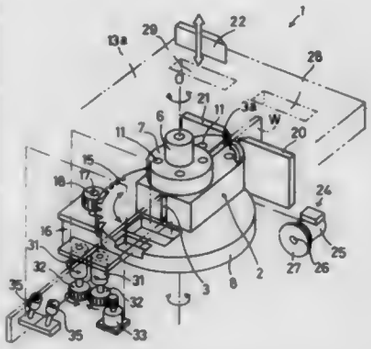
Hiroshi Tachibana, Tokyo, Japan, assignor to Kabushiki Kaisha Tachibana Seisakusho, Tokyo, Japan

Continuation of Ser. No. 65,911, May 25, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 320,832

Claims priority, application Japan, May 29, 1992, 4-163891; Apr. 27, 1993, 5-125101

Int. Cl.[6] B21D *5/01*

U.S. Cl. 72—294 **13 Claims**



1. An automatic bending apparatus for bending a band-shaped work adapted to be fed in a longitudinal direction of said work thereof, comprising:

a fixed bending jig removably provided so as to be opposed to a side surface of said work;

a movable work holder provided movably toward and away from said fixed bending jig in an oscillating motion within a small angle, said holder having a passage extending in said longitudinal direction for holding said work therein and permitting passing of said work therethrough, wherein said work is partially projected from an outlet of said passage and is struck against said jig by said motion of said holder, thereby effecting bending of said work;

a driving device for driving said movable work holder;

a work feeding device which intermittently feeds said work to project said work from said outlet of said passage of said holder after the completion of one step of said bending of said work, moves the bent portion of said work away from said outlet, and projects the non-bent portion of said work to locate said non-bent portion in a position opposite to said fixed bending jig; and

wherein while said work feeding device is intermittently feeding said work, different portions of said work are subsequently struck against said fixed bending jig by said movable work holder so that said work is bent in a designated shape.

5,463,891

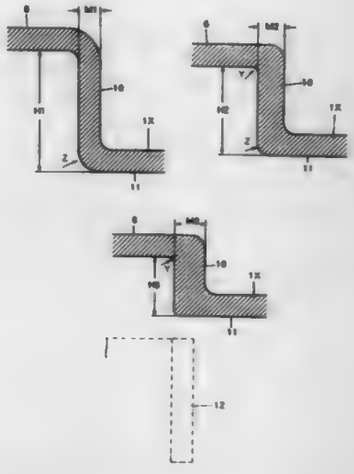
METHOD FOR PRODUCING RATCHET DEVICES

Isao Hasegawa, Nara, Japan, assignor to Kabushiki Kaisha Hasegawa Seiko, Osaka, and Maruei Kogyo Kabushiki Kaisha, Aichi, both of, Japan

Filed May 10, 1994, Ser. No. 240,361

Int. Cl.[6] B21D *53/28*

U.S. Cl. 72—340 **2 Claims**



1. A method for producing ratchet devices, the method comprising the steps of

forming a circular recess in a blank metal plate by drawing, the recess defined by a side wall and bottom wall with the side wall connected to the plate by a corner and the bottom wall connected to the side wall by a corner, the depth of the recess measured between a surface of the plate and the bottom wall,

compressing the metal plate sequentially in a plurality of pairs of dies so as to reduce the depth of the recess, thicken the side wall of the recess and reduce the curvature of each corner of the recess in a plurality of compression step, and

subsequentially forming ratchet teeth on and along the inner rim of the recess.

5,463,892

HYDRAULIC PRESS

Masao Nakagawa, Okazaki, Japan, assignor to Nisshinbo Industries, Inc., Tokyo, Japan

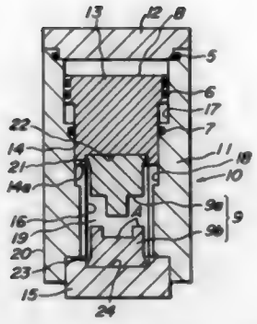
Filed Mar. 16, 1994, Ser. No. 213,571

Claims priority, application Japan, Mar. 18, 1993, 5-058215

Int. Cl.[6] B21J *9/12;13/04;* **B21D** *37/04*

U.S. Cl. 72—456 **2 Claims**

1. In a hydraulic press comprising a hydraulic cylinder including a cylinder tube and a piston slidable within the cylinder tube and having a piston rod extending from the piston and adapted for actuating a movable die of a metallic mold, said mold including a stationary die cooperating with the movable die, said cylinder tube



extending beyond the piston rod and being secured at one end to a base place, and an extended portion of the cylinder tube being provided with an opening for inserting the metal mold within the cylinder tube to set the movable die on an end of the piston rod and the stationary die on the base plate; the improvement wherein the movable die has a dovetail connection with said end of said piston and the stationary die has a dovetail connection with said base plate, said dovetail connections being so oriented relative to said opening that said stationary and movable dies are emplaceable within and removable form the cylinder tube by sliding movement along said dovetail connections into and out of said opening.

5,463,893

SENSOR MATCHING THROUGH REAL-TIME OUTPUT COMPENSATION

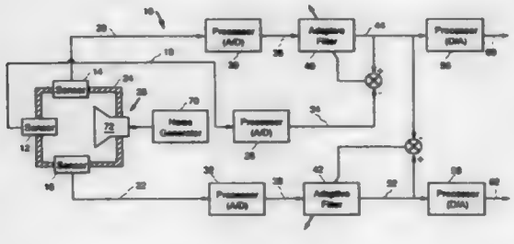
Frederic G. Pla, Schenectady, and Robert A. Hedeen, Clifton Park, both of N.Y., assignors to General ElectricCompany, Schenectady, N.Y.

Filed May 16, 1994, Ser. No. 243,343

The portion of the term of this patent subsequent to Apr. 4, 2012, has been disclaimed.

Int. Cl.[6] G01L *27/00*

U.S. Cl. 73—4 R **8 Claims**



1. A method for matching the second output of a second sensor to the first output of a first sensor, wherein said first and second sensors sense the same physical quantity, and wherein said method comprises the steps of:

a) generally identically and simultaneously exposing said first and second sensors to a source of said physical quantity;

b) presenting said first output of said first sensor as a sampled first digital output;

c) presenting said second output of said second sensor as a sampled second digital output; and

d) numerically adaptively filtering said second digital output with a second filter having adaptive second filtering coefficients until said second filtering coefficients are determined such that said filtered second digital output matches said first digital output to within a second predetermined value.

5,463,894

PROCESS AND DEVICE FOR SURVEYING THE PROPERTIES OF A PERMEABLE MATERIAL

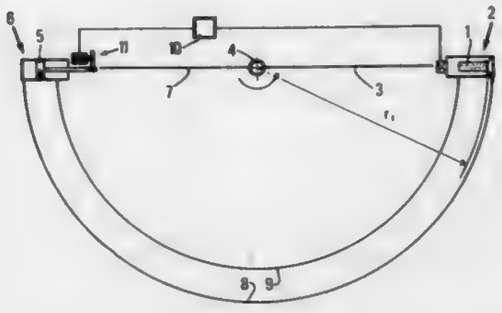
Marc Fleury, La Celle St Cloud; Roland Lenormand, Rueil Malmaison, and Gabriel Ringot, Courbevoie, all of, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Dec. 15, 1993, Ser. No. 166,967

Claims priority, application France, Dec. 15, 1992, 92 15215

Int. Cl.[6] G01N *15/08*

U.S. Cl. 73—38 **19 Claims**



1. A process for surveying the properties of a permeable or porous material, which comprises applying a centrifugal force on a sample of material containing at least two fluids of different densities, the centrifugal force having a phase of growth up to a maximum value and then a phase of decrease, and measuring, as a function of the intensity of the centrifugal force applied, movement of the at least two fluids outside the sample, said process further comprises keeping the sample in permanent contact with the at least two fluids at least during the phase of decrease of the centrifugal force and measuring movement of at least one fluid of the at least two fluids reentering the sample and displacing another fluid of the at least two fluids as a function of said centrifugal force.

5,463,895

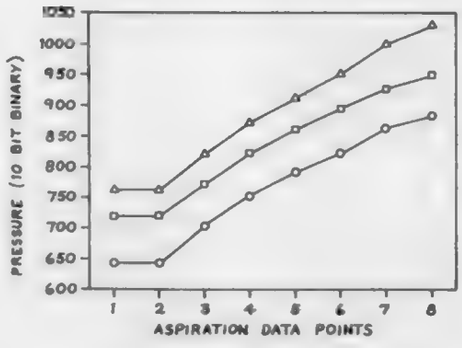
SAMPLE PIPETTING METHOD

Charles W. Brentz, Evanston, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 39,350, Apr. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 612,160, Nov. 9, 1990, abandoned. This application Apr. 4, 1994, Ser. No. 222,501

Int. Cl.[6] G01N *15/00*

U.S. Cl. 73—61.71 **5 Claims**



1. A method of detecting non-homogeneity in a fluid sample comprising:

a. determining ambient air pressure within a pipettor as a baseline pressure reading;

b. aspirating air into said pipettor as said pipettor is moving towards a fluid sample in a container;

c. monitoring the air pressure in said pipettor to indicate the surface level of said sample in said container by a change in said air pressure;

d. immersing the pipettor in said sample and aspirating a volume of said sample from the container into the pipettor;

e. measuring the air pressure within the pipettor immediately after said aspiration of step (d) and after the pressure reaches a steady state;

f. comparing the measured pressures of step (e) to predetermined aspiration pressure windows; and

g. observing pressure values falling outside said windows.

5,463,896

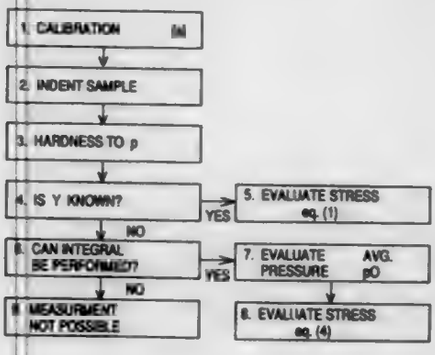
STRESS TESTER

Agostino Abbate, Clifton Park; Julius Frankel, Rensselaer; Wilfried Scholz, Latham; Vito J. Colangelo, Troy, and William J. Korman, Ballston Spa, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 29, 1993, Ser. No. 129,724

Int. Cl.[6] G01N *3/42;3/08*

U.S. Cl. 73—81 **5 Claims**



1. A stress tester comprising:

an indenter for applying a selective force on a specimen;

a hardness measurer connected to the indenter for measuring a hardness of the specimen;

a computer connected to the hardness measurer for receiving hardness data and having a selectively designed software for converting the hardness data to a corresponding stress data; and

a readout connected to the computer for outputting the stress data; said selectively designed software designed to convert hardness data into stress data in accordance with the formula:

$$\sigma = a \cdot [\sqrt{3 \cdot (12 \cdot Y)^2 - p^2)} - p]$$

where:

a=a constant which depends on the type of material under test and also on the type of indenter used, and such constant for the stress (σ) is measured in Kbar units, and for gun steel $a=9.08\times10^{-2}$(kbar·mm^2 /kg), and where the pressure p is measured in Kg/mm^2; and Y=the yield strength of the material, measured in Kg/mm^2.

5,463,897

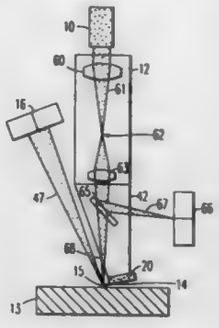
SCANNING STYLUS ATOMIC FORCE MICROSOPE WITH CANTILEVER TRACKING AND OPTICAL ACCESS

Craig B. Prater; James Massie; David A. Grigg; Virgil B. Elings; Paul K. Hansma, and Barney Drake, all of Santa Barbara, Calif., assignors to Digital Instruments, Inc., Santa Barbara, and The Regents of the University of California, Oakland, both of Calif.

Filed Aug. 17, 1993, Ser. No. 107,017

Int. Cl.[6] G01B *5/28*

U.S. Cl. 73—105 **41 Claims**



1. An atomic force microscope, comprising:

a scanning mechanism;

a light source;

a cantilever moved by said scanning mechanism so that said cantilever may be scanned over a fixed sample;

a stylus mounted on said cantilever;

an optical assembly comprising at leaat one steering lens, mounted on said scanning mechanism to guide a light beam emitted from said light source on the cantilever and to follow substantially a fixed point on said cantilever during movement of said scanning mechanism; and

a position detector which receives a reflected light beam from said cantilever and detects a deflection of said cantilever;

wherein said optical assembly comprises means for producing a point source of light between a fixed end and a free end of said scanning mechanism.

5,463,898

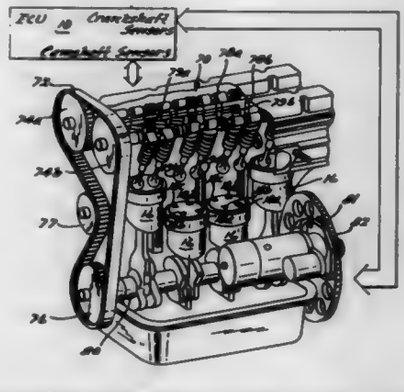
METHOD OF DETECTING TIMING APPARATUS MALFUNCTION IN AN ENGINE

Richard S. Blander, Ann Arbor; Kenneth J. Wenzel, Farmington Hills, and Venu G. Piska, Troy, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 30, 1994, Ser. No. 315,458

Int. Cl.[6] G01M *15/00*

U.S. Cl. 73—116 **11 Claims**



1. In an engine and associated control system, the engine comprising at least one camshaft having an angular position at a given

point in time, a crankshaft having an angular position at a given point in time, an ECU with corresponding memory, a method for detecting malfunction in an engine timing belt, the engine timing belt having a plurality of teeth, the method comprising the steps of:

measuring the angular position of the at least one camshaft;

measuring the angular position of the crankshaft;

determining if a misalignment between the at least one camshaft and the crankshaft has occurred by comparing a difference between the angular positions of the at least one camshaft and the crankshaft to a reference value; and

determining if the engine timing belt has malfunctioned given misalignment between the at least one camshaft and the crankshaft as a result of the engine timing belt skipping at least one tooth.

5,463,899

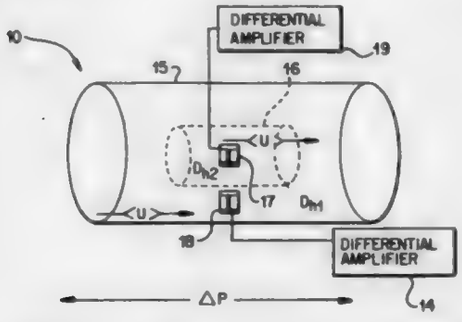
SIMULTANEOUS MEASUREMENT OF GAS THERMAL CONDUCTIVITY AND MASS FLOW

Jay N. Zemel, Jenkintown, and Hsin-Yi Hsieh, Drexel Hill, both of Pa., assignors to Gas Research Institute, Chicago, Ill.

Filed Aug. 12, 1994, Ser. No. 290,026

Int. Cl.[6] G01F *1/68*

U.S. Cl. 73—195 **11 Claims**



1. A system for simultaneous measurement of thermal conductivity and mass flow of a fluid comprising:

flow division means for forming two parallel flowing streams of said fluid;

thermal mass flow meter means for measuring the velocity of said fluid in each of said two parallel flowing streams, said thermal mass flow meter means disposed within said two parallel flowing streams; and

signal receiving means for receiving a signal from said thermal mass flow meter means.

5,463,900

BALANCING PROCESS AND BALANCED COMPONENT AFTER THIS PROCESS

Bernhard Schierling, Kürnach, and Hilmar Göbel, Grafenrheinfeld, both of, Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Mar. 31, 1994, Ser. No. 221,441

Claims priority, application Germany, Apr. 2, 1993, 43 10 828.8; Feb. 26, 1994, 44 06 292.3

Int. Cl.[6] G01M *1/16*

U.S. Cl. 73—469 **31 Claims**

1. A process for balancing a component, which is rotatable around an axis of rotation, in particular a component arranged in the drive train of a motor vehicle, comprising the following steps:

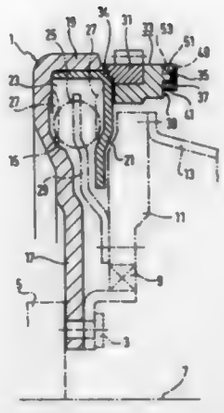
(a) measurement of the size and angle position of an imbalance in the component;

(b) provision of a balancing mass arrangement determined to compensate for the measured imbalance with at least one balancing body to be attached on the component at a predetermined effective distance from the axis of rotation, each balancing body having an elongated shape and a length which is greater than half the peripheral length and less than the entire peripheral length of a circle around the axis of rotation with a radius determining the predetermined effective distance;

(c) attachment of each balancing body provided in step b) at the predetermined effective distance from the axis of rotation and in an angle position on the component selected on the basis of the measured imbalance,

wherein step b) or step c) includes shaping of the balancing body into a mass ring, which is not closed in the peripheral direction and is interrupted by a gap, with a radius corresponding to the effective distance;

and wherein in step c) each balancing body is secured to the component concentrically to the axis of otation in such a way as to compensate the imbalance of the component through the gap.



5,463,901

STACKED PIEZOELECTRIC SURFACE ACOUSTIC WAVE DEVICE WITH A BORON NITRIDE LAYER IN THE STACK

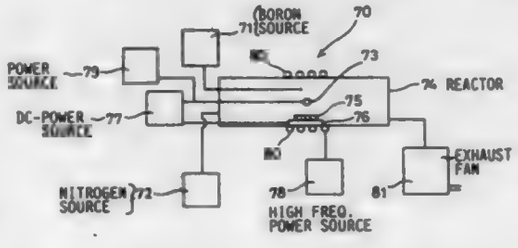
Akihiro Hachigo; Hideaki Nakahata; Shinichi Shikata, and Naoji Fujimori, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 940,483, Sep. 4, 1992, abandoned. This application Jul. 29, 1994, Ser. No. 283,251

Claims priority, application Japan, Sep. 27, 1991, 3-249744

Int. Cl.[6] G01L *9/00*; H04R *31/00*

U.S. Cl. 73—753 **20 Claims**



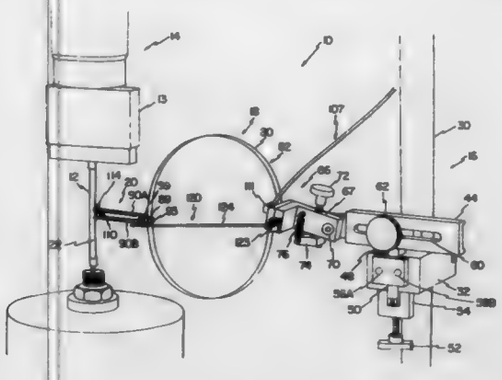
1. A surface acoustic wave device comprising a stacked structure, said stacked structure comprising: a pair of electrodes, said electrodes being adapted so as to perform conversion between an electrical signal and a surface acoustic wave; a piezoelectric layer being in close contact with said pair of electrodes, said piezoelectric layer being adapted so as to propagate a surface acoustic wave; and a boron nitride layer being in close contact with said piezoelectric layer, said boron nitride layer being adapted to be an insulating layer for improving the velocity of a surface acoustic wave.

5,463,902

SOFT TISSUE EXTENSOMETER

Nigel G. Shrive; Erich Damson, both of Calgary, Canada; Richard A. Meyer, Carver, and Scott P. Iversiie, Chanhassen, both of Minn., assignors to University Technologies International Inc., Canada

Filed Aug. 27, 1993, Ser. No. 112,841
Int. Cl.[6] G01B *5/30*
U.S. Cl. 73—781 **16 Claims**



1. An extensometer for measuring strain in a specimen, the extensometer comprising:

a flexible support loop

a pair of arms mounted to the flexible support loop, each arm having an end that is engagable with a portion of a surface of the specimen with an amount of contact force so as to move with the corresponding portion and provide an indication as to the strain in the specimen;

a frame joined to the flexible support loop at a position spaced apart from the pair of arms, the frame supporting the flexible support loop and the pair of arms and being adjustably securable to a stationary support surface so as to compress the flexible support loop and generate the contact force.

5,463,903

TORQUE FLOWMETER

Leroy C. Delatorre, Sugar Land, Tex., assignor to Panex Corporation, Sugar Land, Tex.

Filed Jan. 24, 1994, Ser. No. 191,341
Int. Cl.[5] G01F *1/78*
U.S. Cl. 73—861.02 **19 Claims**

1. A flowmeter for use in a flowing stream of fluid, said flowmeter including;

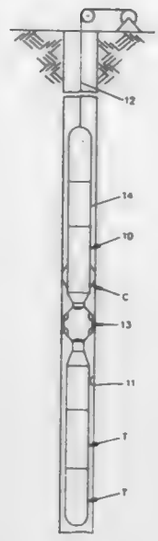
a housing;

torque force measuring means disposed in said housing;

torque shaft coupled to said force measuring means, said torque shaft having a longitudinal torque axis, said torque force measuring means being responsive to torque forces in said torque shaft about said longitudinal torque axis for developing an output response as a function of the torque forces;

a torque flow impeller for developing torque forces in response to fluid flow contacting said flow impeller; and

torque coupling means for coupling said torque shaft to said torque flow impeller and for supporting said torque shaft and said flow impeller while transmitting torque forces of said flow impeller to said torque shaft.



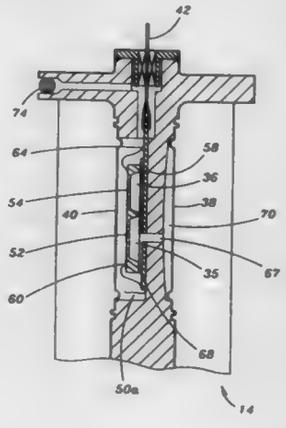
5,463,904

MULTIMEASUREMENT VORTEX SENSOR FOR A VORTEX-GENERATING PLATE

Richard W. Kalinoski, Rumford, R.I., assignor to The Foxboro Company, Foxboro, Mass.

Filed Feb. 4, 1994, Ser. No. 192,235
The portion of the term of this patent subsequent to Sep. 5, 2012, has been disclaimed.
Int. Cl.[6] G01F *1/32*
U.S. Cl. 73—861.24 **17 Claims**

1. A flow-metering apparatus of the vortex-generating type comprising:



a) a flow-pipe section adapted to be coupled into a fluid flow conduit;

b) a vortex-generating body mounted in the interior of said flow-pipe section perpendicular to the stream of flowing fluid, said vortex-generating body having side edges producing corresponding alternating vortices;

c) a mounting means for securing said vortex-generating body to the interior of said flow-pipe section;

d) a sensor housing mounted within said vortex-generating body located on an axis parallel to the direction of said fluid flow having sealed interior spaces, said sensor housing being fluidly connected to said fluid flow;

e) first and second process diaphragm means forming part of said sensor housing to contact the flowing fluid and to transmit into said sealed interior spaces pressure fluctuations of

vortices generated from said vortex-generating body and a fluid temperature of said flowing fluid;

f) sensor means located inside of said sensor housing and having opposite sides subjected respectively to said pressure fluctuations and temperature changes from said first and second process diaphragms, said sensor means detecting said pressure fluctuations and temperature changes of said fluid flow;

g) liquid fill in said sealed interior spaces surrounding said sensor means for transmitting within said sealed interior spaces said pressure fluctuations and fluid temperature applied through said process diaphragms;

h) electrical transmission means connected to said sensor means to conduct signals corresponding to changes in said pressure fluctuations and fluid temperature; and

i) computation means connected to said electrical transmission means used to process output signals transmitted from said electrical transmission means and used to produce electronic signals indicative of physical measurement quantities of the flow.

5,463,905

PORTABLE NON-INVASIVE FLOWMETER FOR PARTIALLY FILLED PIPE

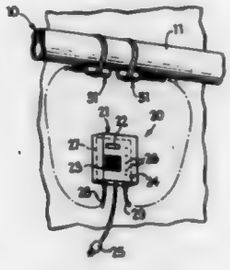
James D. Baird, 934 Cherry Hill La., Naperville, Ill. 60540

Filed Feb. 23, 1993, Ser. No. 21,188

Int. Cl.[6] G01F 1/66

U.S. Cl. 73—861.25 **9 Claims**

3. Apparatus for measuring the flow of fluid in a partially filled



generally horizontal pipe comprising: velocity sensor means including first transducer means associated with the pipe and means cooperating with said first transducer means for producing a velocity signal indicative of the velocity of the fluid flow in the pipe, level sensor means including second transducer means associated with the pipe and means cooperating with said second transducer means for producing a level signal indicative of the cross-sectional area of the filled portion of the pipe, timing means for alternately operating said velocity sensor means and said level sensor means, said timing means including means for preventing operation of either of said velocity sensor means and said level sensor means while the other is operating, processing means coupled to said velocity sensor means and to said level sensor means and responsive to said velocity signal and said level signal for generating a flow rate signal indicative of the rate of fluid flow in the pipe, and indicator means coupled to said processing means and responsive to said flow rate signal for indicating the magnitude thereof.

5,463,906

INTERCHANGEABLE DISPOSABLE ACOUSTIC FOR USE WITH AN ULTRASONIC FLOWMETER, PARTICULARLY DURING EXTRACORPOREAL MEASUREMENT OF BLOOD FLOW

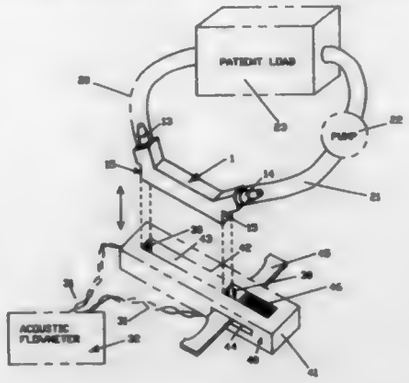
Wayne M. Spani, and William S. Kemper, both of San Diego, Calif., assignors to Triton Technology, Inc., San Diego, Calif.

Filed Jan. 24, 1994, Ser. No. 184,992

Int. Cl.[6] G01F 1/66

U.S. Cl. 73—861.27 **20 Claims**

1. A replaceable fluid flow chamber assembly for a transit time



ultrasonic flowmeter that determines fluid flow velocity by a detection of an arrival time shift on ultrasound that is passed through a flowing fluid between a pair of ultrasonic transducers, the assembly comprising:

a flow body having and defining

a smooth and featureless channel therethrough to flow fluid blood without any damaging of blood cells, the flow body and its channel flow connected at both ends of the channel to an external conduit flowing fluid, and

two substantially parallel exterior surfaces located oppositely to each other so that an imaginary line between them will pass through the channel, each of the two surfaces being of a complimentary shape and contour so as to mechanically engage an associated one of the pair of ultrasonic transducers, and each of the two surfaces also having an acoustic impedance suitable to acoustically couple the associated one of the pair of external ultrasonic transducer;

wherein at such times as (i) the flow body's channel is flow connected to the external conduit flowing fluid, and, concurrently, (ii) the flow body's two exterior surfaces mechanically engages and acoustically couples the pair of transducers, then an ultrasonic acoustic path is established between the transducers through the flow body and through the fluid flowing within the flow body's channel;

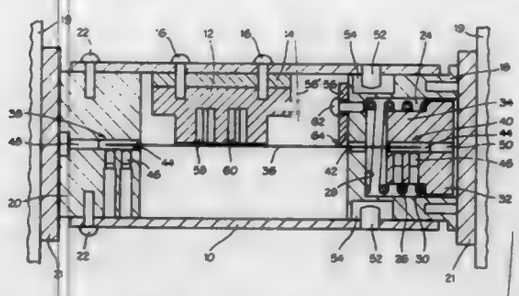
wherein, by the properties of the transit time ultrasonic flowmeter to determine fluid flow velocity by detecting an arrival time shift on ultrasound that is passed through a flowing fluid between the pair of ultrasonic transducers, the pair of ultrasonic transducers couples ultrasound into the ultrasonic acoustic path and, by detection of the effects on the ultrasound, the ultrasonic flowmeter determines a velocity of fluid flowing within the flow body's conduit, and in the ultrasonic acoustic path between the two transducers and that the channel through the flow body which flows fluid blood without any damaging of blood cells;

wherein fluid flow velocity in the channel of a flow-connected flow body is determinable while that the channel is simultaneously able to flow blood without any damaging of blood cells.

5,463,907
VIBRATING WIRE RANGE EXTENDER

Gerhard H. Herget, 85 Country Lane, Kanata, Ontario, Canada, and Ken J. Judge, R.R. #3, Kemptville, Ontario, Canada

Filed Apr. 26, 1994, Ser. No. 233,785
Int. Cl.[6] G01L 5/00
U.S. Cl. 73—862.392 29 Claims



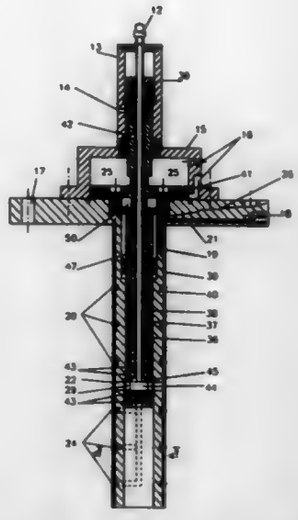
1. A vibrating wire strain monitor comprising:
a generally elongate housing having first and second ends;
first end block means fixed at said first end of said housing;
second end block means disposed at said second end of said housing, said second end block means being movable with respect to said first end block;
a wire having an elastic range of stretch, said wire connected longitudinally in series with a spring within the housing and between said first and second end block means to permit a range of displacement between said first and second end blocks greater than said elastic range of stretch of said wire, said end block means being anchorable between two points to be monitored whereby relative movement between said points results in a corresponding increase or decrease in the tension of said wire;
exciter means adjacent the wire for causing the wire to be vibrated;
means for detecting the frequency of vibration of the vibrating wire; and
means for substantially isolating the vibration of the wire from the spring so as to prevent the spring from delaying the detecting of the resonant frequency of the wire.

5,463,908
APPARATUS FOR SAMPLING AND REGISTERING FLUIDS IN PIPELINES

Antonio Rosolia, P.O. Box 80, Artois, Calif. 95913

Continuation-in-part of Ser. No. 37,350, Mar. 29, 1993, abandoned. This application May 20, 1994, Ser. No. 247,217
Int. Cl.[6] G01N 1/14
U.S. Cl. 73—863.83 11 Claims

1. An apparatus for sampling fluid flow in a conduit comprising:
probe means adapted to be removably mounted within the conduit for collecting at least one sample having a fixed volume of fluid and for simultaneously monitoring at least one fluid property, the single probe means comprising:
hollow housing means defining at least one passage therethrough;
hollow piston means mounted for reciprocation within the housing means and defining an aperture therethrough, alignment of the at least one passage and the aperture occurring at at compression position having the piston means extended to enable fluid in the conduit to pass through the probe means, retraction of the piston means during a decompression stage causing misalignment of the aperture and the at least one passage for isolating the fixed volume of sample in a sample chamber;
channel means communicating with the sample chamber and adapted to be connected to a collection device for delivery of the fixed column of sample thereto;



shutter means mounted within the hollow piston means, a pressure of the fluid flow through the at least one passage, together with continued decompression to continue retraction, opening the shutter means to enable the fixed volume of sample to flow from the sample chamber into the channel means and into the collection device.

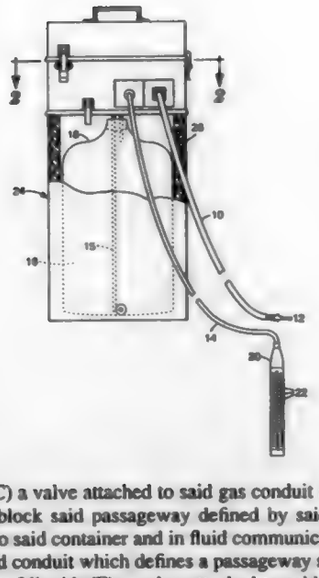
6. A device for collecting samples and data from a pipeline containing flowing fluids comprising:
hollow probe means adapted for removably connecting the device within the pipeline;
at least one sample aperture means for allowing fluid to flow through the probe means at a velocity substantially equal to a velocity of fluid flow in the pipeline;
piston means mounted within the hollow probe means and defining a passageway extending therethrough, reciprocation of the piston means within the hollow probe means opening and closing the sample aperture means, closing of the sample aperture means isolating a fixed volume of sample within a sample chamber;
sample channel means for carrying the fixed volume of sample from the sample chamber to probe outlet means adapted for connection to an external collection device;
at least one upstream and one downstream opening within the probe means communicating with, respectively, at least one upstream and one downstream channel means for carrying fluid flowing into the at least one upstream and downstream openings to a means for measuring differential pressure between the fluid in the upstream channel and the fluid in the downstream channel; and
sensor means communicating with fluid flowing through the probe means for measuring a physical property of the fluid, the measurement of the physical property, the collection of the sample, and the measurement of the differential pressure occurring substantially simultaneously and independently.

5,463,909
RUNOFF WATER SAMPLER

Jess S. Eldridge, Eden Prairie, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 15, 1994, Ser. No. 213,225
Int. Cl.[6] G01N 1/14
U.S. Cl. 73—864.52 9 Claims

1. A liquid collection device, comprising: (A) a cavity defined within a container, said cavity being capable of storing liquid and being able to withstand subatmospheric pressure of at least 20 mm Hg within said cavity; (B) attached to said container and in fluid communication with said cavity, a gas conduit which defines a passageway suitable for the transportation of gases and adapted to allow a means for reducing pressure to reduce the pressure within



said cavity; (C) a valve attached to said gas conduit and adapted to block and unblock said passageway defined by said gas conduit; (D) attached to said container and in fluid communication with said cavity, a liquid conduit which defines a passageway suitable for the transportation of liquid; (E) a valve attached to said liquid conduit and adapted to block and unblock said passageway defined by said liquid conduit, wherein said valve is adapted to be automatically controlled; (F) in communication with the valve that is attached to the liquid conduit, a control means to automatically open and shut the valve that is attached to the liquid conduit; and (G) outside of said cavity, a detection means for detecting the presence of water at a sampling site outside said device, connected to and in communication with said control means; wherein said device can be sealed such that the only access to the cavity by liquid or gas is through said passageways.

5,463,910

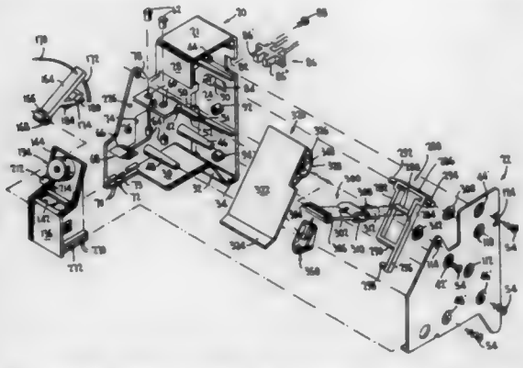
MULTI-FUNCTION ASPIRATING DEVICE

Rickey D. Burns, Alpharetta; Drew F. Meincke, and Bernhard H. Heitz, both of Woodstock, all of Ga., assignors to AVL Scientific Corporation, Roswell, Ga.

Filed May 16, 1994, Ser. No. 242,972

Int. Cl.[6] G01N *35/10*

U.S. Cl. 73—864.87 **27 Claims**



8. A multi-function aspirating device comprising a housing, a fillport module removably supported on said housing, retaining means for normally retaining said module on said housing, probe arm means pivotally supported on said module for pivotal movement about a pivot axis, hollow probe means supported on said probe arm means, a fillport mechanism removably supported on said module, said mechanism including fillport means having an opening formed therethrough and defining inner and outer ends, said opening tapering from a large dimension at said outer end to a smaller dimension in a direction toward said inner end, said probe means having an open outer end for receiving a fluid to be analyzed, said probe means being disposed within said opening and having an outer surface in fluid-tight sealing engagement with said fillport means adjacent said inner end of the opening at all times, and operating means supported by said housing for pivoting said probe arm means between a first position wherein said outer end of the probe means is in sealing engagement with said fillport means and a second position wherein said outer end of the probe means is disposed a substantial distance outwardly of said opening.

5,463,911

ACTUATION APPARATUS FOR A GEARSHIFT SLEEVE IN A STEPPED AUTOMOTIVE GEARBOX

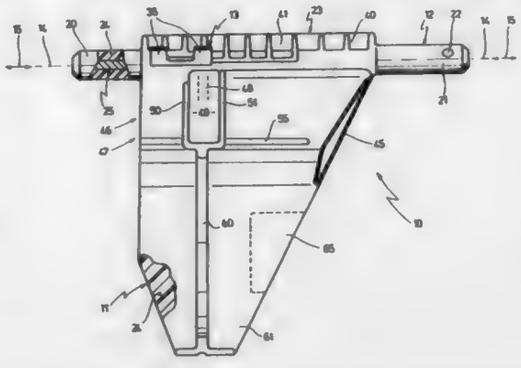
Gunter Knoedel, Muehlacker, and Reinhard Schaarschmidt, Illingen, both of, Germany, assignors to GETRAG Gestriebe-und Zahnradfabrik Hermann Hagenmeyer GmbH & Cie, Germany

Filed Jul. 7, 1994, Ser. No. 271,453

Claims priority, application Germany, Jul. 7, 1993, 43 22 586.1

Int. Cl.[6] F16H *63/32;* **G05G** *3/00*

U.S. Cl. 74—473 R **13 Claims**



1. A gearshift sleeve actuating apparatus for a stepped automotive gearbox, the apparatus comprising:

a gearshift rod having an axis and being adapted to be displaced along said axis, and having, further, an elongate axial reinforcing metallic core embedded in a plastic material;

a plastic material gearshift fork rigidly connected to said gearshift rod; and

a metallic engaging piece adapted to be engaged by a cam actuated by a gearshift lever of said gearbox, said engaging piece being rigidly connected to said gearshift rod,

wherein said apparatus is configured as a composite plastic/metal structure having a metallic component constituting said core and said engaging piece as an integral component and being embedded by injection molding in said plastic material, said gearshift fork being formed entirely of said plastic material.

5,463,912

LEVER-OPERATED CONNECTOR

Nori Inoue; Hitoshi Okumura, and Hiroyuki Nakata, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Mar. 24, 1994, Ser. No. 217,111

Claims priority, application Japan, Mar. 30, 1993, 5-097180

Int. Cl.[6] H01R *13/629*

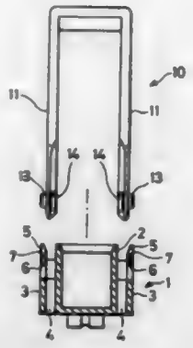
U.S. Cl. 74—519 **12 Claims**

1. A lever-operated connecter, comprising:

a connector housing including:

a hood portion having an outer surface,

an outer wall having an inner and outer surface, said outer wall in a spaced relation to the outer surface of said hood portion forming a lever insertion space therebetween,



a pair of positioning notches disposed coaxially with each other on said outer wall,

a pair of bearing holes, each bearing hole formed through the inner and outer surface of said outer wall and disposed beneath each positioning notch,

a pair of slanting guide surfaces, each slanting guide surface formed between each positioning notch and each bearing hole, said slanting guide surface extending from a lower edge of each positioning notch at the outer surface of said outer wall to an upper end of each bearing hole at the inner surface of said outer wall; and

a lever including:

a pair of arms, each arm having a proximal end portion and distal end portion with respect to said housing, and

a pair of pins, each pin formed on the outer surface of the proximal end portion of each arm and disposed coaxially with each other.

5,463,913

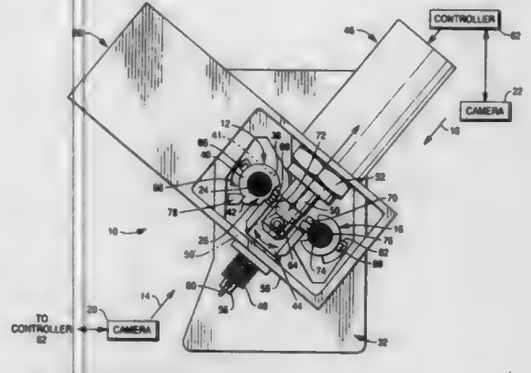
ACTUATOR MECHANISM FOR POSITIONING REFERENCE MEMBERS IN A DOCUMENT TRACK

George J. Hroch, Kitchener, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 31, 1993, Ser. No. 114,892

Int. Cl.[6] G05G *1/04*

U.S. Cl. 74—526 **3 Claims**



1. An apparatus comprising:

first and second members mounted for rotation relative to first and second reference axes;

an actuating mechanism for rotating said first and second members from a first position to a second position relative to said first and second reference axes, respectively, and comprising:

a resilient member;

a solenoid;

an actuator member having one end secured to said resilient member to bias said actuator member towards a first actuator position when said solenoid is deenergized;

said solenoid having an output member, with said actuator member pivotally mounted on said output member, and with said solenoid being effective to move said actuator member towards a second actuator position when said solenoid is energized;

first and second pins coupling said first and second members to said actuator member to move said first and second members toward the associated first and second positions; and

said actuator member pivoting on said output member to enable said first and second pins to complete the rotation of said first and second members into accurate alignment with said first and second axes at the associated first and second positions.

5,463,914

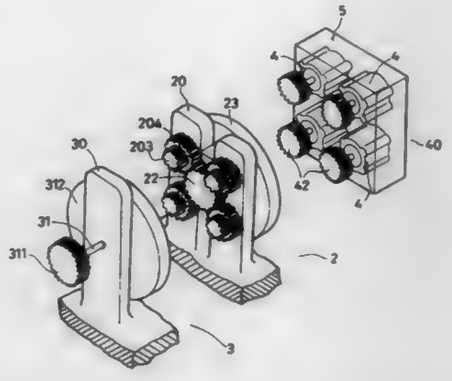
MULTI-FUNCTION ENERGY SAVING POWER TRANSMISSION MECHANISM

Li Yng Tyan, No. 4, Alley 31, Ln. 88, Kao Shuang Rd., Taoyuan Hsien, Taiwan, Prov. of China

Filed Feb. 2, 1994, Ser. No. 190,446

Int. Cl.[6] F16H *1/22;37/14*

U.S. Cl. 74—661 **19 Claims**



1. A multi-function energy saving power transmission mechanism, comprising:

at least one electric motor assembly having more than one motor mounted to a motor mounting block;

at least one down-speed gear set;

an output gear set having a main output shaft with a spur gear at one end and an annular gear at another end;

said electric motor assembly being engaged with said down-speed gear set; and said down-speed gear set being engaged with said output gear set which is then connected to a motor driven appliance;

wherein each said down-speed gear set further comprises:

a gear mounting block;

a main driving shaft having a first gear means at one end and a second gear means at an opposite end thereof being mounted at the center of said gear mounting block;

a plurality of symmetric gear mounting holes disposed about said central main driving shaft;

a plurality of minor driving shafts each having a first and second idle gear means disposed at one end thereof being mounted to said gear mounting holes;

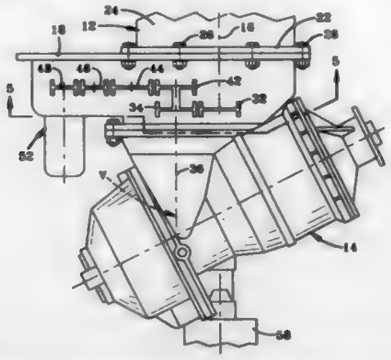
said second idle gear means being engaged with said first gear means disposed at the end of said main driving shaft of said down-speed gear set;

said first idle gear means being engaged with said annular gear means of said main output shaft of said output gear set.

5,463,915
DRIVE-REVERSING GEARING FOR AN ENGINE DRIVEN TRANSMISSION

Reece R. Fuehrer, Danville, and Roy K. Martin, Plainfield, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 21, 1993, Ser. No. 140,656
Int. Cl.[6] B60K *5/04;17/08;17/28;* **F16H** *1/12*
U.S. Cl. 74—665 H **2 Claims**



1. An improvement in angle drive power transmissions having a normal input rotational direction wherein the improvement comprises:
an adapter housing secured between an engine and a transmission;
said engine having an output shaft means;
said transmission having an input shaft means;
a first gear member disposed within said adapter and drivingly secured to said engine output shaft;
a cluster gear arrangement disposed within said adaptor;
said cluster gear arrangement having a first transfer gear meshing with the first gear member and a second transfer gear;
an input gear disposed within said adapter and being drivingly connected with said transmission input shaft whereby the rotational hand applied to the transmission input shaft is reversed from the rotational hand of the engine output shaft;
power take-off gear means disposed within said adapter;
said power take-off having a first and second idler gear means rotatably coupled with one of the transfer gears of the cluster gear; and,
accessory gear means meshing with the idler gear means and being disposed to transmit power to accessory means.

5,463,916
PROCESS FOR THE PREPARATION OF A SURFACE FOR THE SECUREMENT OF A COATING

Alain Coudurier, Albens, France, assignor to SEB S.A., Selongey, France

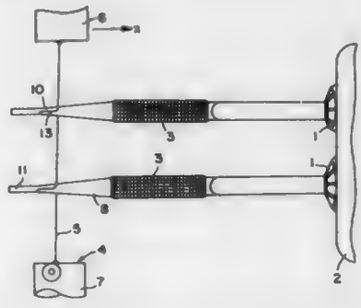
Filed Mar. 12, 1993, Ser. No. 31,297
Claims priority, application France, Mar. 13, 1992, 92 03029
Int. Cl.[6] B21K *5/20*
U.S. Cl. 76—107.1 **12 Claims**

1. Process for the preparation of a metallic surface (17) to permit securing a coating (20) on the metallic surface, which comprises:
a) etching on a hard metal matrix (11) a series of relief designs (12) having a flat top separated by empty spaces (13) having a rounded shape, said etching having the effect of creating microcavities (15) in the metal adjacent said empty spaces (13);
b) applying said matrix (11) under pressure on a plate (16) of softer metal than the matrix (11) to impress the relief designs (12) and the microcavities (15) on the surface (17) of said plate (16); and
c) applying a coating on the surface of said plate.

5,463,917
PROCESS FOR PRODUCING, IN PARTICULAR, TWO-PART SURGICAL INSTRUMENTS

Lutz Kothe, Bodmaner Str. 15, 78315 Radolfzell 14, Germany

Filed Sep. 30, 1993, Ser. No. 129,586
Claims priority, application Germany, Jan. 16, 1992, 42 34 884.6
Int. Cl.[6] B26F *3/00;3/16;* **B23H** *7/02;* **A61B** *17/06*
U.S. Cl. 76—119 **4 Claims**



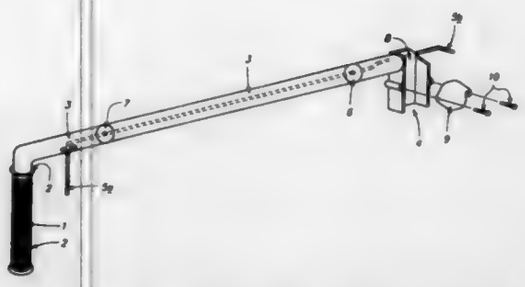
1. A process for producing a two part surgical instrument from a single blank comprising the steps of:
(a) mounting an elongated blank for rotational movement about a longitudinal axis A;
(b) mounting a cutting tool for axial movement along said axis A on a second longitudinal axis B substantially perpendicular to said axis A;
(c) moving said cutting tool a predetermined distance along said axis A for forming a first cut in said elongated blank of predetermined length;
(d) rotating said blank about said longitudinal axis A through a predetermined angle;
(e) further moving said cutting tool a further distance along said axis A for forming a second cut in said elongated blank of second predetermined length; and
(f) repeating steps (d) and (e) to form the desired mirror image mating parts from said elongated blank.

5,463,918
HAND TOOL EXTENSION HANDLE

Thomas Lemieux, N. 1204 Locust, Spokane, Wash. 99214, and Rod Nelson, E. 8804 Sinto, Spokane, Wash. 99212

Filed Jun. 11, 1993, Ser. No. 76,559
Int. Cl.[6] A47F *13/06*
U.S. Cl. 81—487 **1 Claim**

1. An extension handle and remote triggering mechanism for hand-power tools, which comprises:
a. A handle means;
b. An extension arm means, including a first end attached to said handle means;
c. A means to attach a second end of the extension arm means to a hand-power tool and which comprises a U-shaped channel attached to said extension arm means and an attachment plate which is releasably and adjustably attachable to said channel



such that the U-shaped channel and the attachment plate firmly attach to the handle of the hand-power tool; and

d. A means to remotely control a trigger means on the hand-power tool, a first end of which is located at or near the handle means so that an operator can easily engage it and a second end which is positioned relative to the trigger means of the hand-power tool such that when the first end is engaged by the operator, it causes the second end to actuate the trigger means on the hand-power tool.

5,463,919

APPARATUS FOR CUTTING WOUND COILS

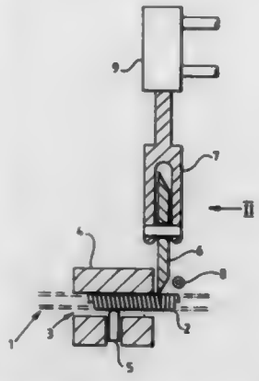
Ali Paybarah, and Joseph A. McWilliams, both of Droitwich, United Kingdom, assignors to Zortech International Limited, United Kingdom

Continuation-in-part of Ser. No. 968,208, Oct. 29, 1992, abandoned. This application Jan. 21, 1994, Ser. No. 183,841

Claims priority, application United Kingdom, Nov. 2, 1991, 9123298

Int. Cl.[6] **B26D** *07/06*

U.S. Cl. 82—92 **2 Claims**



1. Apparatus for cutting wound coils comprising:

a stationary member having an aperture extending axially therethrough, the surface defining the aperture providing a support for supporting wire in the form of a wound coil which is rotating about its axis and extends through the aperture with the axis of the coil substantially parallel to the axis of the aperture;

a circular cutting blade;

a support member movable toward and away from the stationary member, and including means for mounting the circular cutting blade for rotation about an axis of rotation substantially parallel to the aperture axis;

the circular cutting blade having a circular cutting edge, the cutting blade and the means for mounting being so constructed as to cause the cutting blade to be mounted for free rotation of the blade, relative to the means for mounting, about the axis of rotation, whereby the blade is rotated by engagement of the circular cutting edge with the rotating wound coil, and whereby the blade can operate to cut and sever the wire comprising the wound coil when moved thereagainst by the support member; and

roller means for limiting movement of cutting edge of the cutting blade in the axial direction of coil.

5,463,920

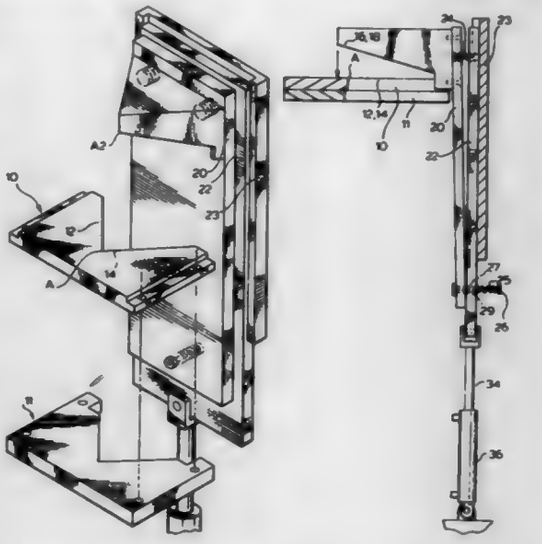
NOTCH CUTTER AND METHOD

Lothar Korb, 22 Burningham Cr., Ajax, Ontario, Canada

Filed Dec. 23, 1993, Ser. No. 172,173

Int. Cl.[6] **B26D** *1/09;3/14*

U.S. Cl. 83—56 **19 Claims**



1. Fabric notch cutter comprising:

a pair of inwardly facing shear edges defining a first median plane and continuously converging in a first direction to define a first entrance and a first apex when viewed transversely to said plane,

a pair of outwardly facing shear edges defining a second median plane and converging to a second apex at a slightly lesser angle than the inwardly facing edges,

said second median plane sloping away from said first median plane in said first direction,

means for bringing each of said outwardly facing shear edges into contact with a respective one of said inwardly facing shear edges at a respective contact point and for moving said pairs of shear edges relative to each other to cause said contact points to continuously progress toward said apices until said first and second apices contact each other, and

means for supporting the pair of outwardly facing shear edges to support movement of said outwardly facing shear edges in a second direction opposite said first direction during said relative movement of said pairs of shear edges and for resiliently biasing said outwardly facing shear edges toward said inwardly facing shear edges.

5,463,921

METHOD AND APPARATUS FOR AUTOMATED HANDLING OF CUT MATERIAL

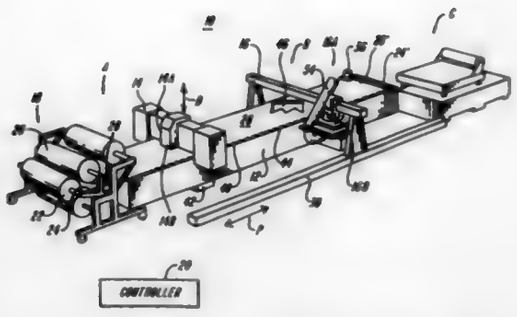
Stephen L. Bellio, West Roxbury; Edward Bernardon, Bedford; Mark J. Condon, Brighton; Robert S. Flory, Concord; Donald C. Fyler, Needham; Mitchell L. Hansberry, Framingham; Tommy W. Lee, Wilmington, and James F. Mueller, North Reading, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 5, 1993, Ser. No. 27,098

Int. Cl.[6] **B26D** *7/18;7/20*

U.S. Cl. 83—151 **9 Claims**

1. Apparatus for removing a cut workpiece segment of predetermined shape from a workpiece sheet, comprising:



A. dispenser means for dispensing on a support surface an assembly of materials to be cut, said assembly of materials including a cover sheet overlying a workpiece sheet,

B. cutting means, adjustably positionable over said support surface, for cutting said assembly of materials on said support surface and creating a cut cover sheet segment from said cover sheet, having said predetermined shape and a cut workpiece segment from said workpiece sheet having said predetermined shape, wherein said cut cover sheet segment overlies said cut workpiece segment,

C. cut cover segment pickup means, adjustably positionable over said work surface, for removing said cut cover sheet segment from said support surface while leaving said cut workpiece segment substantially non-distorted on said surface,

D. cut workpiece segment pickup means, adjustably positionable over said support surface, for picking up said cut workpiece segment from said support surface, said cut workpiece segment pickup means being substantially incapable of coupling to said cover sheet and being selectively effective to couple to said cut workpiece segment, and

E. controller means, for controlling, in sequence:

i) said dispenser means to dispense said assembly of materials on said support surface,

ii) said cutting means to cut said assembly of materials and create said cut workpiece segment and said cut cover sheet segment,

iii) said cut cover segment pickup means to remove said cut cover sheet segment from a remainder of said cover sheet to expose said cut workpiece segment, and

iv) said cut workpiece segment pickup means to remove said exposed workpiece segment without distorting said cut workpiece segment while maintaining the remainder of said cover sheet and said workpiece sheet non-disturbed on said support surface.

5,463,922

PUNCH FOR MAKING A MULTIPLICITY OF HOLES

Chuzo Mori, Tateishi, Japan, assignor to Carl Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1994, Ser. No. 294,994

Claims priority, application Japan, Aug. 25, 1993, 5-232533

Int. Cl.[6] B26D *5/08*

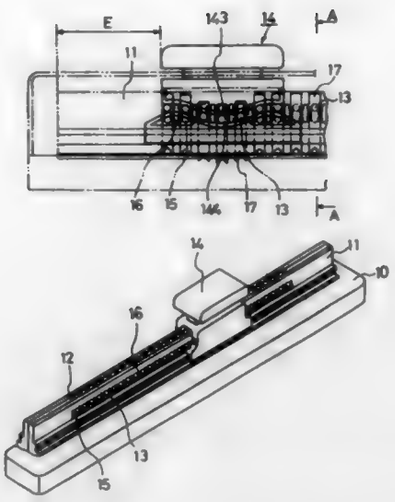
U.S. Cl. 83—622 **7 Claims**

1. A punch for making a multiplicity of holes comprising:

a slide rail having a plural number of vertical slots having A top and a bottom;

a plurality of punches, each having actuator pins mounted horizontally on and perpendicularly to the punch and being coupled slidably with said slots and means for resiliently urging said punches to the top of said slots;

a slider to move slidably along the slide rail in the longitudinal direction, the slider having at least one guide groove which is provided on an inner wall of the slider and engaged with the actuator pins of the punches while sliding on the configuration of the guide groove being arranged in a manner such that, during the sliding of the slider, said punches introduced in a preceding half of the groove in the sliding direction of the slider are forced vertically down to said bottom of said slot and in a trailing half of the groove in the sliding direction said punch is urged to the top of said slot.



5,463,923

ELECTRIC GUITAR HAVING A SOLID BODY MADE OF WOOD FIBER BOARD, AND METHOD OF MAKING THE SAME

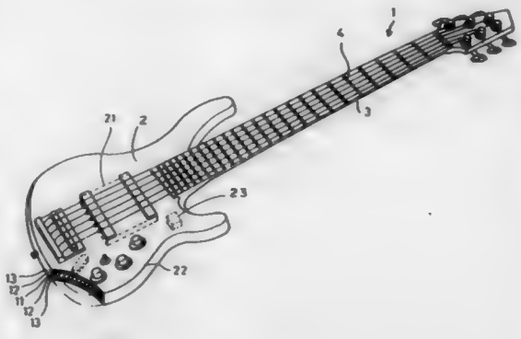
Yoshimochi Kamijyo, Nagano, Japan, assignor to Fujigen Inc., Nagano, Japan

Filed Oct. 19, 1993, Ser. No. 137,740

Claims priority, application Japan, Jun. 4, 1993, 5-160337

Int. Cl.[6] G10D *3/00;1/08*

U.S. Cl. 84—291 **8 Claims**



1. An electric guitar, comprising:

a main body part; and

a neck part;

said main body part is substantially solid; and said neck part and said main body part are comprised of fiberboard made from wood fibers and an adhesive.

5,463,924

REPOSITIONABLE TUNING PEG

Aldor E. Reuterfors, 1801 Wisteria, Rockford, Ill. 61107

Filed Nov. 16, 1994, Ser. No. 340,535

Int. Cl.[6] G10D *3/14*

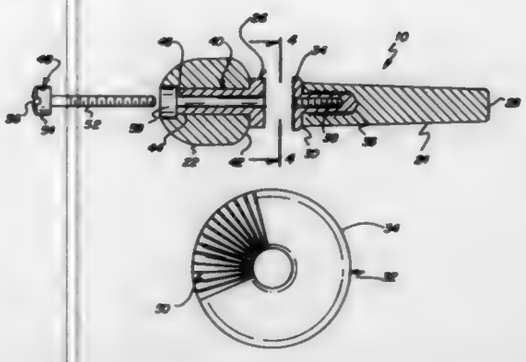
U.S. Cl. 84—304 **6 Claims**

1. A repositionable tuning peg comprising:

a tapered shaft having a first end spaced from a second end;

a thumbpiece;

and,



an adjustable angle coupling means for coupling said thumb-piece to said second end of said tapered shaft at a desired rotational angle relative to said tapered shaft;

wherein said adjustable angle coupling means comprises a shaft insert fixedly secured to said second end of said tapered shaft; a thumb piece insert fixedly secured to said thumb piece; and means to removably couple said shaft insert to said thumb piece insert;

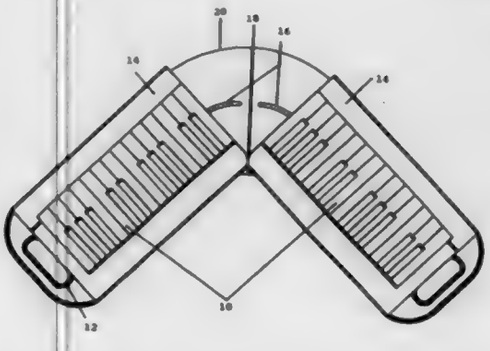
and further wherein said shaft insert comprises a first circular plate having an exposed exterior face and a covered interior face, with a first mounting stud projecting from said interior face of said first circular plate and into said second end of said tapered shaft, said first mounting stud including a threaded interior bore extending through a center of said first circular plate and along a longitudinal axis of said tapered shaft.

5,463,925

SPLIT-KEYBOARD MIDI CONTROLLER

Baran Galocy, 12171 Cinder Rd., Redding, Calif. 96003

Filed Nov. 2, 1993, Ser. No. 147,327
Int. Cl.[6] G10C *3/12*
U.S. Cl. 84—423 R **14 Claims**



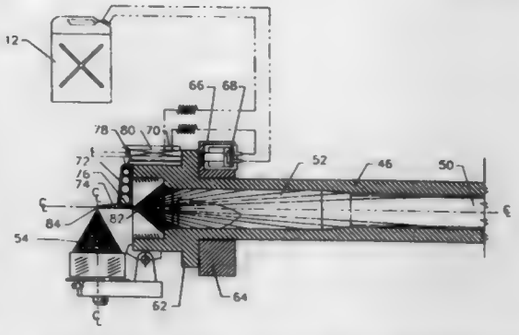
1. In a keyboard controller of the type comprising a set of keys which corresponds with a common piano and a means for translating pressure on said keys into meaningful control data, the improvement wherein said keyboard controller has means to pivot acutely in the center such that the playing surfaces that comprise the left and right halves of said keyboard controller may adjust from continuously linear to acutely parallel, away from an operator, forming a variable split-keyboard controller.

5,463,926

AUTOMATIC GUNTUBE EMBER EXTINGUISHER SYSTEM

Jim A. Faughn, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 9, 1993, Ser. No. 164,918
Int. Cl.[6] F41A *13/04*
U.S. Cl. 89—1.2 **13 Claims**



1. An automatic liquid spraying system for extinguishing burning embers and residue remaining in a cannon assembly after firing of a projectile, comprising in combination:

means for supplying a fire-extinguishing liquid medium to the rear powder section; the front projectile section; and onto the obturator axis;

the cannon assembly including an elongated chamber including a forward section and a rear section;

the forward section adapted for housing the projectile and having a forward open end for the exiting of the projectile; the rear section adapted for housing a propelling powder charge and having a rearward open end;

the cannon assembly including a pivotally mounted breechblock means for closing the rearward open end during firing;

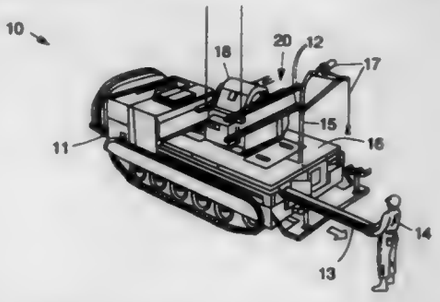
means operatively associated with the liquid supply means for periodically spraying the liquid medium into the cannon assembly after the firing of the projectile; and means for providing power to operate the system.

5,463,927

LOAD ASSIST APPARATUS FOR MISSLES

Richard S. Lewis, Chino Hills, Calif., assignor to Loral Aerospace Corp., New York, N.Y.

Filed Aug. 3, 1994, Ser. No. 285,339
Int. Cl.[6] F41F *5/00*
U.S. Cl. 89—1.801 **4 Claims**



1. A missile loading system for loading a missile onto a missile launcher disposed on a vehicle, wherein the missile comprises fore and aft missile hangers that each comprise upper and lower hooks that have a predetermined separation distance therebetween, wherein the improvement comprises:

a launch rail disposed on the missile launcher that comprises a plurality of cut-outs disposed a predetermined distance apart

that equals the separation distance between the fore and aft missile hangers disposed on the missile; and

a plurality of load detent mechanisms that each comprise:

a body having the shape of the launch rail, and having a lip by which the missile is secured, and having an opening disposed therein;

a plurality of holes disposed in the body that are used to secure the load detent mechanism in the cut-outs in the launch rail; and

a depressible rail member having the shape of the launch rail rotatably secured in the opening of the body of the load detent mechanism to permit a spring-loaded member to be depressed.

5,463,928

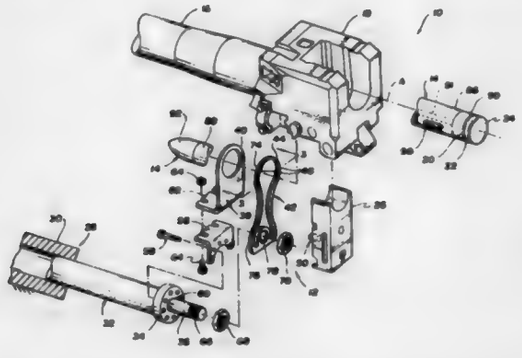
ELECTRICAL POWER FEED ASSEMBLY FOR ELECTROTHERMAL GUN

Rao L. Boggavarapu, Bloomfield Hills, Mich.; Yeshayahu S. A. Goldstein, Gaithersburg, Md.; Catherine M. Keogh, Harrison Township, Macomb County, Mich.; Anthony J. Suchocki, and Melvin M. Widner, both of Rochester Hills, Mich., assignors to General Dynamics Land Systems, Inc., Sterling Heights, Mich.

Filed Apr. 26, 1994, Ser. No. 233,347

Int. Cl.[6] F41B *6/00*

U.S. Cl. 89—8 **15 Claims**



1. In an electrothermal gun including an elongated gun tube, a breech through which an electrothermal cartridge having first and second side contacts is inserted into the gun tube, a breech closure movable between an open position where the cartridge is inserted through the breech into the gun tube and a closed position where the cartridge is fired, and an electrical recoil mechanism for conducting current upon recoil of the gun tube and breech, an electrical power feed assembly for supplying current on the order of tens of kiloamps and greater to supply electrical power to the cartridge for firing, comprising: a first electrical connector extending from the electrical recoil mechanism to the breech and having a contact portion for engaging and plastically deforming the first side contact of the cartridge to establish electrical contact therewith; and a second electrical connector that extends from the electrical recoil mechanism to the breech and includes a contact portion for engaging and plastically deforming the second side contact of the cartridge to establish electrical contact therewith such that an electrical current on the order of tens of kiloamps and greater flowing between the connectors through the cartridge provides firing of the cartridge with the plastically deformed contacts maintaining the electrical contact without any arcing.

5,463,929

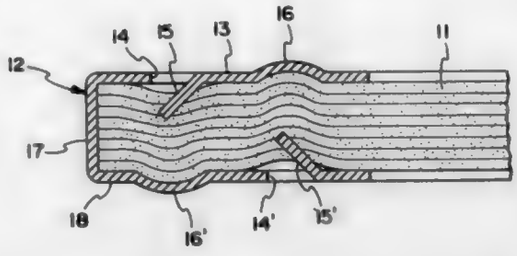
ARMORING MATERIAL MOUNTING ASSEMBLY

Santiago Mejia, P.O. Box 27657, Bogota, Colombia

Filed Jul. 20, 1994, Ser. No. 277,621

Int. Cl.[6] F41H *5/013*

U.S. Cl. 89—36.02 **18 Claims**



1. A reinforced mounting assembly for armoring material that is resistant to projectile damage or fracture or failure comprising:

a) a multi-layered armoring material for covering a given area of a structure to be protected and preventing projectiles from passing therethrough;

b) an edge reinforcing element comprising opposed first and second plates configured to receive therebetween an edge of said armoring material;

c) one of said first and second plates including at least one convex dimple structure projecting outwardly therefrom; and

d) the other of said first and second plates including at least one engaging member cooperating with and having a common axis with said at least one dimple structure, said at least one engaging member projecting into said armoring material and deforming said armoring material against said at least one convex dimple structure to thereby retain said armoring material in position within said edge reinforcing element at all times.

5,463,930

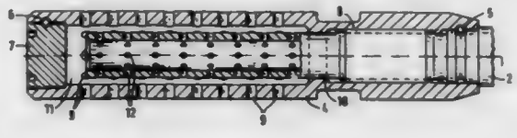
DEVICE FOR FIRING PRACTICE AMMUNITION

Bernhard Bisping, Ratingen, and Lothar Post, Müden/Fassberg, both of, Germany, assignors to Rheinmetall GmbH, Ratingen, Germany

Filed May 12, 1994, Ser. No. 241,861

Int. Cl.[6] F41A *21/26*

U.S. Cl. 89—29 **13 Claims**



1. A weapon for firing practice ammunition, comprising

(a) a barrel having

(1) a frontal length portion terminating in a muzzle;

(2) means for defining an ammunition loading chamber at a barrel end opposite said muzzle;

(3) a plurality of first gas outlet bores provided in said frontal length portion; said first gas outlet bores being arranged in a plurality of circumferentially spaced axial rows;

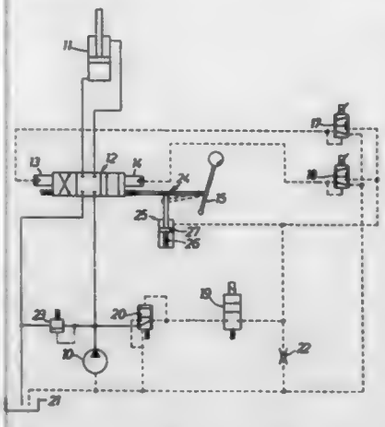
(b) a muzzle brake sleeve coaxially surrounding said frontal length portion and having a frontal end situated close to said muzzle; said muzzle brake sleeve including a plurality of second gas outlet bores; said second gas outlet bores being arranged in a plurality of circumferentially spaced axial rows; said first gas outlet bores being staggered with respect to said second gas outlet bores as viewed along said barrel; and

(c) plug means for closing off said frontal end of said muzzle brake sleeve.

5,463,931
CONTROLLER FOR A HYDRAULIC MOTOR

Hans B. Karlsson, Göteborg; Lennart E. Fellinger, Fritsla, and Axel T. Micael, Floda, all of, Sweden, assignors to Voac Hydraulics Boras AB, Boras, Sweden

Filed Jul. 5, 1994, Ser. No. 270,388
Claims priority, application Sweden, Jul. 7, 1993, 9302347-1
Int. Cl.[6] F15B *11/08;13/04*
U.S. Cl. 91—428 **5 Claims**



1. A controller for a hydraulic motor, comprising:

a directional (**12**) valve for communicating selectively pressure fluid from a pressure source (**10**) to a hydraulic motor;

pilot pressure operated activating means (**13, 14**) associated with said directional valve (**12**);

pilot valves (**17, 18**) connected to said activating means (**13, 14**);

a manually operable shifting device (**15**) mechanically connected to said directional valve (**12**) via a coupling means (**24, 55, 56**);

a pressure operated actuating means (**25, 47, 48**) for shifting said coupling means (**24, 55, 56**) between an engaged condition and a disengaged condition; and

a mode shifting valve (**19**) communicating with said pressure source (**10**) and also with said actuating means (**25, 47, 48**) and said pilot valves (**17, 18**), said mode shifting valve (**19**) being arranged to shift the controller from a first operation mode in which said actuating means (**25, 47, 48**) causes said coupling means (**24, 55, 56**) to occupy said engaged condition, and at the same time said pilot valves (**17, 18**) are disconnected from said pressure source (**10**), to a second operation mode wherein said coupling means (**24, 55, 56**) is shifted to said disengaged condition by said actuating means (**25, 47, 48**) and at the same time said pilot valves (**17, 18**) are connected to said pressure source (**10**).

5,463,932
COFFEE MAKER

Allen W. Olson, 14703 W. Lake Goodwin Rd., Stanwood, Wash. 98292

Filed Jan. 19, 1995, Ser. No. 374,855
Int. Cl.[6] A47J *31/42*
U.S. Cl. 99—280 **17 Claims**

1. A coffee maker for making coffee, comprising:

(a) a housing;

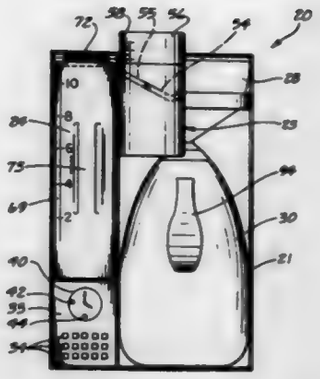
(b) a coffee grinder connected to the housing, the grinder receiving and grinding coffee beans and automatically discharging the ground beans;

(c) a brewer connected to the housing, the brewer including:

(i) a reservoir for holding water;

(ii) a filter basket for receiving ground coffee beans discharged from the coffee grinder and water from the reservoir;

(iii) a pump in fluid communication with the reservoir for pumping water from the reservoir to the filter basket; and



(iv) a heater for heating water from the reservoir before the water is received in the filter basket;

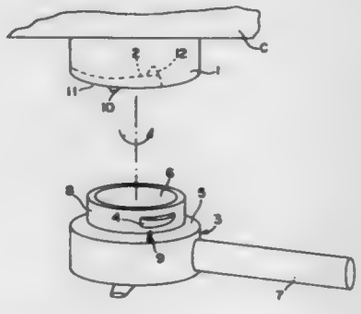
(d) a thermally insulated carafe, removably connected to the housing for receiving coffee from the filter basket of the brewer; and

(e) a central processing means having a timer and a memory and operably connected to the pump, heater, and grinder for causing coordinated operation of the coffee maker at desired times based on data stored in the memory of the central processing means.

5,463,933
DEVICE FOR LOCKING A FILTER CARRIER ON AN INFUSION HEAD OF AN ESPRESSO COFFEEMAKER

Joel Landais, Conde Sur Sarthe, France, assignor to Moulinex S.A., Bagnolet, France

Filed Apr. 29, 1994, Ser. No. 235,702
Claims priority, application France, Apr. 29, 1993, 93/05107
Int. Cl.[6] A47J *31/14;31/30*
U.S. Cl. 99—285 **7 Claims**



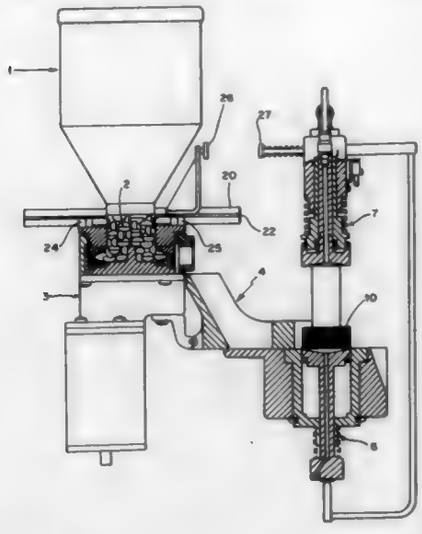
1. In a locking device for a filter carrier on an infusion head (**1**) of an espresso coffeemaker provided with a locking ramp (**2**) and adapted to receive a filter carrier (**3**) which comprises securement means (**4**) to said head (**1**), such that said filter carrier (**3**) can be engaged with the head (**1**) and be brought, by a movement of rotation, from a free position to a locked position; the improvement comprising sound means for indicating the passage of the filter carrier (**3**) from the free position to the locked position.

5,463,934

AUTOMATIC COFFEE MACHINE FOR DELIVERING COFFEE ALONE OR, COMBINED WITH MILK, IN THE FORM OF CAPPUCCINO

Santino Locati, Milan, Italy, assignor to Cimbali S.p.A., Binasco, Italy

Filed Jan. 26, 1994, Ser. No. 187,209
Claims priority, application Italy, Jan. 27, 1993, MI93A0130
Int. Cl.[6] A47J 31/42
U.S. Cl. 99—286 7 Claims



1. Automatic coffee machine comprising

a feeder containing coffee beans;

a grinder having a grinding chamber in which beans coming from the feeder are reduced to a powder in the grinding chamber of the grinder;

an infusion chamber into which the coffee powder is deposited;

an infuser piston and a filter piston, and in said infusion chamber, means for compressing the coffee powder between said infuser piston and said filter piston and from said infusion chamber the coffee exits as a beverage,

a grinding unit comprises said grinder, said grinding chamber adjacent to a channel chute; and

means for supporting said grinding unit for movement between an initial position in which the coffee beans can enter from the feeder into the grinding chamber and a final position in which the ground coffee can pass from the grinding chamber through the adjacent channel chute into said infusion chamber.

5,463,935

INFUSION MAKER

Gianfranco Zanarini, Ozzano Dell'Emilia, Italy, assignor to Biesse S.p.A., Collebeato, Italy

Filed May 19, 1994, Ser. No. 246,116
Claims priority, application Italy, Jun. 22, 1993, BS93A0073
Int. Cl.[6] A47J 31/04
U.S. Cl. 99—292 8 Claims

1. An infusion maker for making hot beverages based on material including herbs, coffee and tea, the infuser comprising:

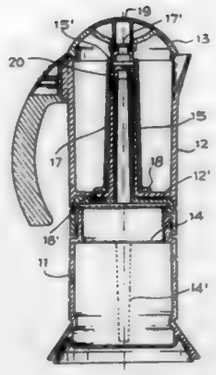
a lower container for receiving starting water, said lower container defining a boiler;

an upper container provided with a cover;

a cup positioned between said upper container and said lower container, said cup for holding the material from which the infusion is produced;

a cup suction conduit extending from said cup downwardly and ending in a proximity of a bottom of said lower container;

a chimney conduit extending upwardly through a bottom of said upper container, said chimney conduit being open at a bottom



for communication with said cup, said chimney conduit being closed at a top and having at least one radial hole providing communication for liquid in the lower container to run upwardly into said upper container, after flowing through the material in the cup, upon heating the infusion maker;

said bottom of said upper container defining an outlet connecting said upper container with said cup;

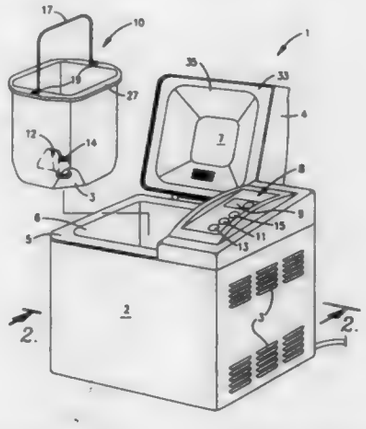
a movable sleeve connected to said chimney conduit, said sleeve including a sleeve opening, said sleeve being movable relative to said radial hole to define a radial hole open position, providing communication between an interior of said chimney conduit and said upper container and said sleeve being movable to cover said radial hole in a radial hole closed position, said sleeve including a closing element, said closing element being movable with said sleeve to an outlet closed position for closing said outlet and being movable to a outlet open position wherein liquid from said upper container pours into said cup, said radial hole open position of said sleeve corresponding with said outlet closed position of said sleeve and said radial hole closed position of said sleeve corresponding with said outlet open position of said sleeve.

5,463,936

COMBINED BREAD BAKER AND BUTTER CHURN

Robert H. Clark, Columbia, and Joel J. Terrell, III, Boonville, both of Mo., assignors to Toastmaster Inc., Columbia, Mo.

Filed Jan. 23, 1995, Ser. No. 376,934
Int. Cl.[6] A47J 27/00
U.S. Cl. 99—327 7 Claims



1. An apparatus for baking bread and for churning butter, comprising:

a pan for receiving ingredients to be processed when making bread and when churning butter, said pan including a paddle therein for stirring the contents of the pan;

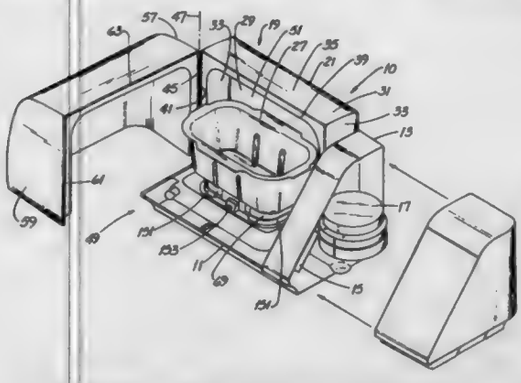
a processing chamber for releasably receiving said pan, said processing chamber having drive means mounted upon the base thereof for drivably engaging said paddle;
a motor for driving said drive means and said paddle;
bread baking control means for making bread;
a power supply for driving said bread baking control means and said motor; and
a selector switch for disconnecting said bread baking control means and for simultaneously directly connecting said power supply to said motor.

5,463,937

AUTOMATIC BREADMAKER WITH PLURAL KNEADING MEMBERS

David C. Belongia, West Bend, and Annette T. Klein, Jackson, both of Wis., assignors to The West Bend Company, West Bend, Wis.

Filed Oct. 25, 1994, Ser. No. 328,504
Int. Cl.[6] A47J *27/00*
U.S. Cl. 99—348 **22 Claims**



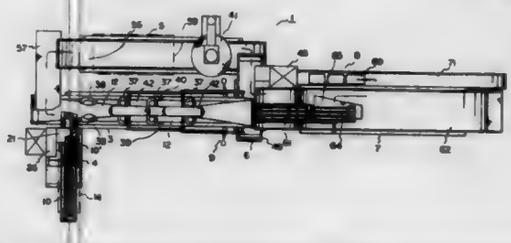
1. In an automatic single-loaf breadmaker having a drive mechanism, an oven chamber, a bread pan in the chamber, a kneading member in the pan and linked to the drive mechanism for mixing bread dough, and an automatic controller for energizing the drive mechanism and regulating the temperature in the chamber, the improvement wherein the pan has a single-loaf interior free of partitions and a spaced plurality of kneading members therein, thereby facilitating automatic preparation of a single loaf of bread having a risen topside extending along its length.

5,463,938

APPARATUS FOR POWDERING BATTER-COATED FOOD PIECES

Chuji Sarukawa, Machida; Sadaaki Ito, and Hiromi Ito, both of Hachioji, all of, Japan, assignors to Nippon Suisan Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1993, Ser. No. 139,161
Claims priority, application Japan, Jan. 22, 1992, 4-308038
Int. Cl.[6] A21C *9/04*
U.S. Cl. 99—352 **22 Claims**



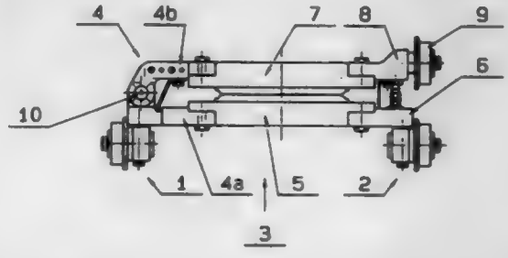
1. An apparatus for coating food pieces with grains powder, the food pieces to be fried, the apparatus comprising:
a buttering conveyor for accepting thereonto and conveying the pieces and including a buttering conveyor dropoff end, the buttering conveyor further comprising a first string conveyor;
a steamer, through which the buttering conveyor is disposed, for steaming the pieces;
a batter hopper;
a nozzle fed with batter from the batter hopper, the nozzle being disposed over the buttering conveyor such that the pieces are coated with the batter;
a covering conveyor, the covering conveyor having a covering conveyor discharge end and a stem portion disposed under the buttering conveyor dropoff end in such a position that the pieces fall from the buttering conveyor dropoff end onto the stem portion of the covering conveyor;
a conveyor urger disposed at an intermediate portion of the covering conveyor;
a sieving conveyor adjacent the covering conveyor discharge end, the sieving conveyor further comprising a second string conveyor;
a next-stage output conveyor for accepting the pieces from the sieving conveyor;
a grains powder supply conveyor coupled to the stem portion of the covering conveyor; and
a grains powder recovery coveyor extending between the covering conveyor and the sieving conveyor and coupled to the covering conveyor stem portion.

5,463,939

HINGE FOR PIVOTALLY CONNECTING TWO TONGS OF A PAIR OF BAKING TONGS

Erich Koletnik, Klosterneuburg-Kierling; Franz Haas, Vienna, and Johann Haas, Klosterneuburg, all of, Austria, assignors to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H., Vienna, Austria

Filed Oct. 3, 1994, Ser. No. 316,736
Claims priority, application Austria, Jan. 4, 1993, 1988/93
Int. Cl.[6] A21B *5/02;* **A47J** *37/01*
U.S. Cl. 99—353 **10 Claims**



1. A hinge for pivotally connecting first and second baking tongs parts, which comprises
(a) a first hinge member,
(b) a second hinge member,
(c) a hinge pin non-rotatably affixed to the first hinge member, and the second hinge member being rotatably mounted on the hinge pin for pivoting about a longitudinal axis of the hinge pin, and
(d) the hinge bolt and the second hinge member defining a sliding bearing therebetween, the sliding bearing comprising
(1) at least two cooperating sliding surfaces respectively formed on the hinge pin and on the second hinge member,
(2) one of the sliding surfaces comprising at least one sliding surface segment in sliding contact with a second one of the sliding surfaces, and openings adjoining each sliding surface segment and providing no sliding contact with the second sliding surface, and
(3) scraping edges on the sliding surface segment adjacent the openings, any movement of the second hinge member relative to the hinge pin causing the scraping edges to slide over the second sliding surface.

5,463,940

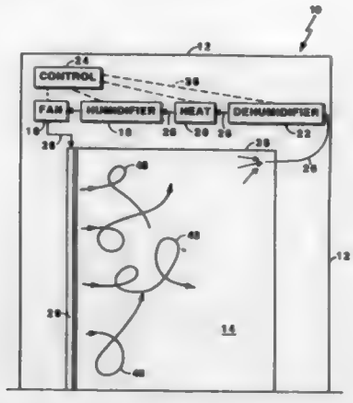
PROOFING OVEN

Michael D. Cataldo, Halifax, Mass., assignor to Dunkin' Donuts Incorporated, Randolph, Mass.

Filed May 25, 1994, Ser. No. 249,141

Int. Cl.[6] A21B *1/00;1/22;* **F27D** *11/00*

U.S. Cl. 99—476 **37 Claims**



1. A proofing oven, comprising:

a proofing chamber into which goods for proofing can be placed, said proofing chamber including an air inlet and an air outlet;

an air circulation system connected to said air inlet and said air outlet, which creates a gentle, uniform, turbulent air flow in said proofing chamber, and which establishes and maintains a desired proofing environment, said air circulation system comprising:

an air passage connecting said air inlet with said air outlet;

a heat source connected to said air passage, and which establishes and maintains a desired temperature of said air flow;

a humidifier connected to said air passage, and which establishes and maintains a desired relative humidity of said air flow;

a dehumidifier connected to said air passage, and which decrease the relative humidity of said air flow when the desired relative humidity level is exceeded; and

at least one fan connected to said air passage, and which move air between said air inlet and said air outlet to create said gentle, uniform, turbulent air flow in said proofing chamber.

5,463,941

GARLIC PRESS

Jeremy H. Gibson, Eastlake, Ohio, assignor to Faye Chen, Ann Arbor, Mich.

Filed Nov. 22, 1994, Ser. No. 343,132

Int. Cl.[6] A47J *19/06;* **B30B** *9/02;9/06;15/00*

U.S. Cl. 99—495 **18 Claims**

1. A garlic press, comprising:

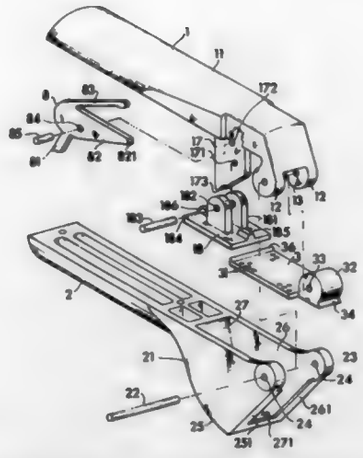
a presser unit having a downward connecting frame;

a bearing unit pivotally connected to said presser unit such that said garlic press can be opened and closed by pivoting said presser unit and said bearing unit;

a bearing plate having a plurality of open spaces therethrough and pivotally connected at the same pivot point to said presser unit and said bearing unit;

a presser plate pivotally connected to said downward connecting frame of said presser unit such that when said presser unit and said bearing unit are pivoted to close said garlic press said presser plate is forced to press against said bearing plate with said presser plate being maintained at a suitable angular position when operating said garlic press; and

a control device pivotally connected to said downward connecting frame of said presser unit such that when said presser unit and said bearing unit are pivoted to open said garlic press said



control device can turn said bearing plate outward and allow for cleaning of said garlic press.

5,463,942

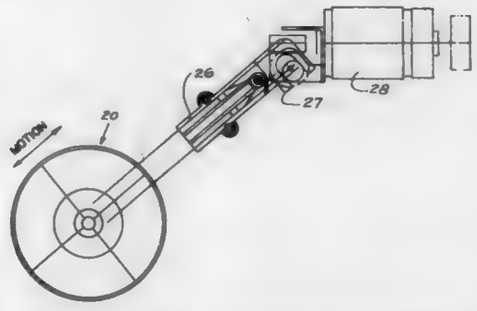
MOTORIZED TOOL FOR SLICING AND TENDERIZING FOODS AND METHOD

Charles J. Hupf, Cascade, and Jeffrey Rohrer, Kewaskum, both of Wis., assignors to Regal Ware, Inc., Kewaskum, Wis.

Filed Feb. 8, 1994, Ser. No. 193,311

Int. Cl.[6] B26B *7/00*

U.S. Cl. 99—537 **6 Claims**



1. A motorized tool for slicing food, the tool comprising:

a housing;

a motor;

a cutting disc;

a shaft;

the motor located and fixedly attached within the housing;

a connector having two ends, the first end removably coupled to the motor within the housing;

the second end connected to the shaft;

the connector capable of holding the shaft at any predetermined angle between 0 and 90 degrees with respect to the motor;

the cutting disc being fixedly mounted to the shaft.

5,463,943

FRUIT CUTTING AND CORING APPARATUS

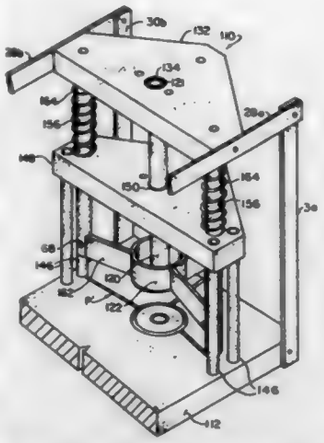
Susan M. Knasel, Kirkwood, Mo., assignor to Super Market Merchandising, St. Louis, Mo.

Continuation-in-part of Ser. No. 40,522, May 27, 1993, Pat. No. 5,373,781. This application Mar. 29, 1994, Ser. No. 219,676

Int. Cl.[6] A23N *4/20*

U.S. Cl. 99—542 **11 Claims**

1. A fruit cutting and coring apparatus comprising:



a base plate having an upper surface forming a cutting board for supporting a piece of fruit in a position in which said piece of fruit is cored and a skin of the fruit cut;

an inner cutting blade for separating a core of said fruit from a flesh of said fruit and an outer cutting blade for separating said skin from said flesh, the outer cutting blade being a circular blade to make a generally circular cut in said skin, and said inner and outer cutting blades being coaxially aligned;

at least three spaced apart skin cutting blades extending outwardly from said outer cutting blade to slice said skin;

guide means for guiding movement of said inner and outer cutting blades;

manually operable handle means for simultaneously moving said inner and outer cutting blades from a position above said cutting board toward said cutting board to cut said skin and core said piece of fruit; and

a cross-member to which said handle means is secured, said inner cutting blade depending from said cross-member, a plurality of rods depending from said cross-member, there being a rod for each skin cutting blade with one of said skin cutting blades being respectively removably secured to one of said rods for supporting said skin cutting skin, said rods each having a vertically extending slot in the base thereof in which one of said skin cutting blades is received, each skin cutting blade and its associated rod having aligned through-bores for receiving a fastener by which said skin cutting blades are removably secured to said apparatus.

5,463,944

ROTATABLE BALE RELEASE MECHANISM FOR A BALER MACHINE AND METHOD OF BALING

Robert J. Wolf, Waukesha, and Leroy J. W. Schuman, Wauwatosa, both of Wis., assignors to Logemann Brothers Co., Milwaukee, Wis.

Filed Oct. 17, 1994, Ser. No. 323,971
Int. Cl.[6] B30B *13/00;15/32*
U.S. Cl. 100—35 **7 Claims**

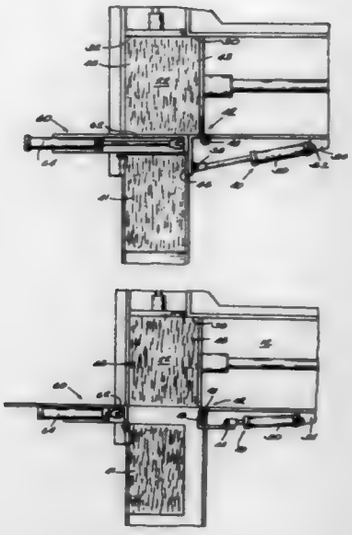
6. A method of forming bales comprising the steps of:

(a) loading material into a charging chamber;

(b) forcing the material in the charging chamber into a bale compression chamber to form a bale therein, said bale compression chamber having an exit passageway through which bales are ejected;

(c) a rotatably mounted gate member mounted adjacent said exit passageway, said gate member movable between a normal operating closed position and a retracted open position, moving said gate member from its closed position to its open position to thereby increase the size of the exit passageway to facilitate the ejection of an oversized bale from the charging chamber; and

(d) ejecting the oversized bale through the exit passageway of said baling compression chamber.

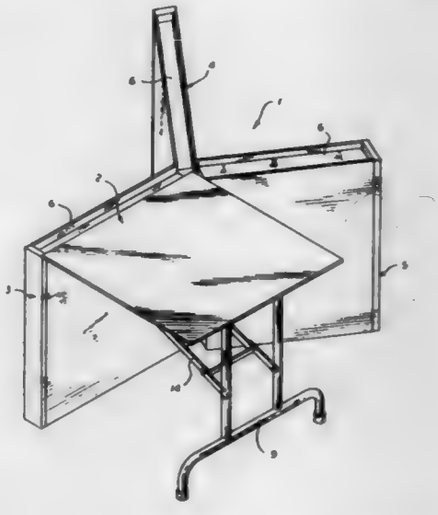


5,463,945

PORTABLE TRIPOD RISER

Charles S. Kendall, 6553 Kelsey Point Cir., Alexandria, Va. 22315

Filed Mar. 4, 1994, Ser. No. 205,545
Int. Cl.[6] A47B *57/00*
U.S. Cl. 108—59 **12 Claims**



1. A portable tripod support platform which is collapsible into a folded non-use position for transporting comprising:

a first vertical support leg having an upper longitudinal recess;

a second vertical support leg having an upper longitudinal recess and pivotally connected to said first vertical support leg;

a third vertical support leg having an upper longitudinal recess and pivotally connected to said second vertical support leg;

a horizontal support platform pivotally connected to said third vertical support leg;

wherein said first, second, third supports are operatively connected and are equidistantly separated from each other during use and fold consecutively and against the preceding vertical support leg during non-use.

5,463,946

CONTINUOUSLY OPERATING MATERIAL PRESS WITH LUBRICATING FILM FOR REDUCING FRICTION

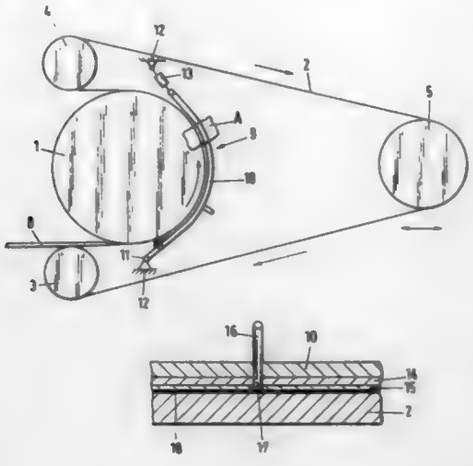
Manfred Krüger; Dieter Mayer, both of Hannover; Frierich-Otto Behrens, Garbsen, and Manfred Krohn, Ronnenberg, all of, Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hannover, Germany

Filed Jun. 14, 1994, Ser. No. 261,118

Claims priority, application Germany, Jun. 14, 1993, 43 19 663.2; Dec. 17, 1993, 43 43 223.9

Int. Cl.[6] B30B *3/00;15/34*

U.S. Cl. 100—93 RP **7 Claims**



1. A continuously operating material press for producing endless composite, particle, fiber, rubber and plastic sheets and paper or substances impregnated with synthetic resin, comprising:

a driven central drum having an outer shell surface, and means for heating and cooling the same,

reversing drums and a tensioning drum spaced from said central drum,

a circulating endless steel belt tensioned around and engaging a substantial portion of said central drum, and extending around said reversing and tensioning drums,

the material to be processed into sheet form being guided into the space between said endless belt and said shell surface of said central drum and pressed in the region of said shell surface tightly engaged by said tensioned steel belt, and

a stationary supplemental pressing device outwardly of said steel belt along a substantial portion of the arcuate length of said belt which engages the shell surface of said central drum, said supplemental pressing device comprising an elastic steel belt section having a pressing surface adapted to engage the adjacent surface of said endless belt, and means for mounting said pressing device in tension around said endless belt,

an opening formed in said steel belt section extending entirely therethrough, and

a pipe mounted in said opening, said pipe terminating at its inner end at the adjacent surface of said endless steel belt, and communicating at its outer end with a source of compressed fluid the delivery of which through said pipe results in the formation of a lubricating fluid film at the interface of the endless steel belt and the adjacent surface of said steel belt section, said film reducing the friction between said circulating endless steel belt and the stationary steel belt section.

5,463,947

PLATE FOR STENCIL PRINTING

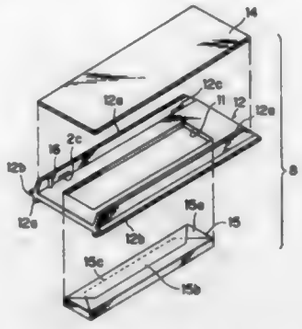
Hiroshi Taira, Ichinomiya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 7, 1994, Ser. No. 271,722

Claims priority, application Japan, Jul. 15, 1993, 5-175417

Int. Cl.[6] B41N *1/24*

U.S. Cl. 101—125 **11 Claims**



1. A stencil plate for stencil printing, the stencil plate comprising:

an ink-permeated body permeated with ink, the ink-permeated body having a periphery;

a heat-sensitive wrapping made from a thermoplastic film and a porous support adhered to each other, the thermoplastic film forming a thermoplastic film side of the heat-sensitive wrapping and the porous support forming a porous support side of the heat-sensitive wrapping, the heat-sensitive wrapping surrounding the ink-permeated body so that the heat-sensitive wrapping covers the entire periphery of the ink-permeated body with its porous support side in confrontation with the ink-permeated body; and

an ink-impermeable base material fixedly adhered by an adhesive to the thermoplastic film side of the heat-sensitive wrapping.

5,463,948

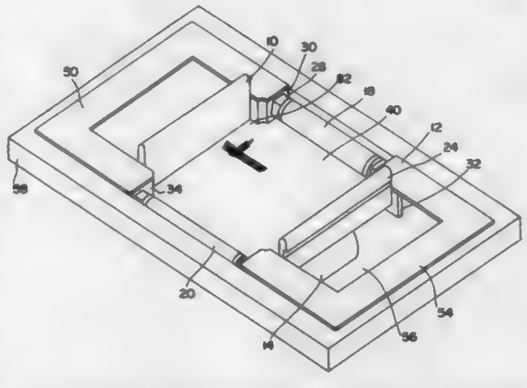
MUG IMPRINTING ROLLER FRAME

Donald E. Newman, Wyncote, Pa., assignor to Stretch Devices, Inc., Philadelphia, Pa.

Filed Oct. 26, 1993, Ser. No. 143,792

Int. Cl.[6] B41L *13/02*

U.S. Cl. 101—127.1 **11 Claims**



1. A curved item priming apparatus for receiving a screen fabric having a plurality of edge portions comprising: a screen tensioning and printing frame; the frame having a plurality of tensioning means coupled together by corner members which support the tensioning means, each tensioning means having a longitudinal axis, each tensioning means having means for rotating about the tensioning means' longitudinal axis; each tensioning means having

a screen retaining means for retaining one of the edge portions of the screen fabric; and at least one of the tensioning means having a screen engaging edge, a screen engaging surface for directing the fabric and a thin edge surface, the screen engaging surface and the thin edge surface converging at the screen engaging edge wherein the screen engaging edge is parallel to the longitudinal axis of the tensioning means and the perpendicular distance between the longitudinal axis and the thin edge surface is less than the distance between the longitudinal axis and the screen engaging edge.

5,463,949

GRAVURE PRESS WITH IMPROVED PRINTING DRUM ARRANGEMENT

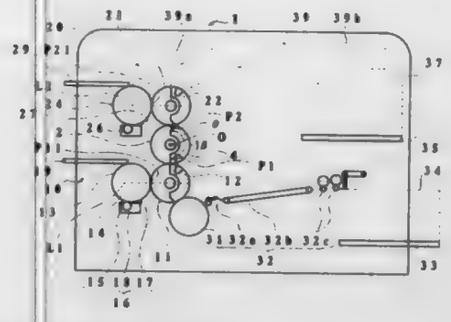
Kenso Machara, Hiroshima; Osamu Majima, and Shigeyoshi Hirashima, both of Tokyo, all of, Japan, assignors to Ryobi Ltd., and Sony Co., both of, Japan

Filed Aug. 31, 1994, Ser. No. 298,193

Claims priority, application Japan, Aug. 31, 1993, 5-215837

Int. Cl.[6] B41F *9/02*

U.S. Cl. 101—152 **12 Claims**



1. A gravure press comprising:

a group of units including at least adjacent first and second units, the second unit being above the first unit, said group of units including at least one unit positioned at an end of said group of units;

each of said group of units comprising a plate cylinder, an impression cylinder, ink feeder means, and a blade;

each of said plate cylinders having a plastic gravure plate wound thereon;

each of said impression cylinders having a radius equal to a radius of each of said plate cylinders and having a transfer gripper for transferring printing paper sheets;

each of said ink feeder means supplying ink to a respective gravure plate;

each said blade positioned to be in contact with a respective gravure plate for removing surplus ink adhering to said gravure plate;

a transfer drum between each of said impression cylinders of adjacent units and having a radius being an integer times the radius of said impression cylinders, said transfer drum having at least one transfer gripper device for transferring paper sheets for printing;

said plate cylinders and impression cylinders being arranged so that a first line vertically connecting the axes of the plate cylinder and the impression cylinder of said first unit is parallel to a second line vertically connecting the axes of the plate cylinder and the impression cylinder of the second unit;

said impression cylinder of said first unit, said impression cylinder of said second unit, and said transfer drum being positioned relative to one another such that a paper sheet transferred at a nearest point between said impression cylinder of said first unit and said transfer drum is transferred at a nearest point between said impression cylinder of said second unit and said transfer drum,

the paper sheet being transferred when said impression cylinder of said first unit rotates by a number of turns equal to the radius of said transfer drum divided by the radius of said impression cylinder of said first unit;

first receiving means for receiving paper sheets to be printed;

second receiving means for receiving printed paper sheets on which printing is performed, said second receiving means and said first receiving means being positioned on a same side of the gravure press;

means for feeding paper sheets received in said first receiving means to said one unit; and

means for transferring printed paper sheets from said one unit to said second receiving means.

5,463,950

PRINTING MACHINE COMPRISING AT LEAST ONE CYLINDER WITH DOUBLE DISPLACEMENT

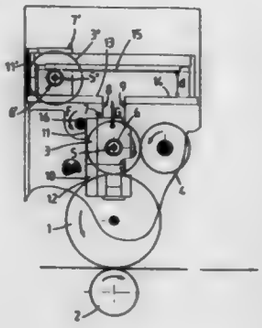
Jean-Pierre Cuir, 36 avenue de Brigode, 59650 Villeneuve D'Ascq, and Gérard Cuir, 23 allée des Grands Champs, 59650 Villeneuve D'Ascq, both of, France

Filed Jan. 28, 1994, Ser. No. 189,159

Claims priority, application France, Feb. 12, 1993, 93 01866

Int. Cl.[6] B41F *5/00*

U.S. Cl. 101—329 **15 Claims**



1. A printing machine comprising at least one cylinder with double displacement, first means for displacement of said cylinder from a first position corresponding to a work position to a second position, second means for displacement of said cylinder from said second position to a third position, and an individual drive motor and toothed wheels provided at both ends of a cylinder shaft of said double-displacement cylinder, wherein the second displacement means comprise a set of two racks in which the toothed wheels are able to mesh so that the displacement of said cylinder from the second position to the third position is obtained in response to the rotation of the drive motor of the cylinder shaft.

5,463,951

PRINTING MACHINE SPRAY DEVICE

Franz Waizmann, Gessertshausen; Jürgen Hillenbrand, Kirchheim, and Manfred Langenmayr, Biburg, all of, Germany, assignors to Baldwin-Gegenheimer GmbH, Augsburg, Germany

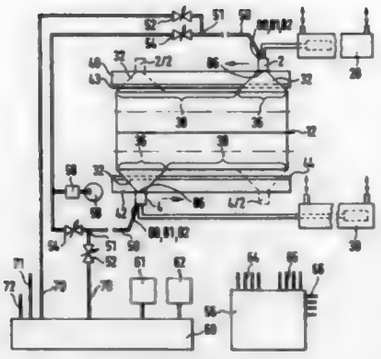
Filed Jan. 19, 1994, Ser. No. 184,222

Claims priority, application Germany, Jan. 20, 1993, 43 01 410.0

Int. Cl.[6] B41F *23/02*

U.S. Cl. 101—423 **24 Claims**

1. A spray device for a printing machine, wherein the printing machine has a moving surface to be sprayed by the spray device and wherein the moving surface is either a surface that moves in a longitudinal direction of the printing machine or that rotates around a transverse axis of the printing machine, and wherein the moving surface to be sprayed is a surface of a cylinder or a longitudinally moving printing material; the surface to be sprayed with liquid being arranged so as to extend in a transverse direction that is transverse to the longitudinal direction of the machine;



the spray device comprising:

a first and a second sprayer which do not move longitudinally with the printing material and which are directed so as to spray liquid on the moving surface, the first sprayer having a first start position at the start of the spray process, and the second sprayer having a second start position which is spaced in the transverse direction from the first start position;

respective first and second sprayer moving devices connected respectively with the first and second sprayers for moving the first and second sprayers in opposite transverse directions initially toward each other and then past and then away from each other, each of the first and second sprayer moving devices moving the respective sprayer in the traverse direction away from one machine side and toward an opposite machine side.

5,463,952

PLANOGRAPHIC PRINTING PLATE WITH ELECTROLYTICALLY ROUGHENED DESIGN PATTERN ON A BACK SURFACE THEREOF

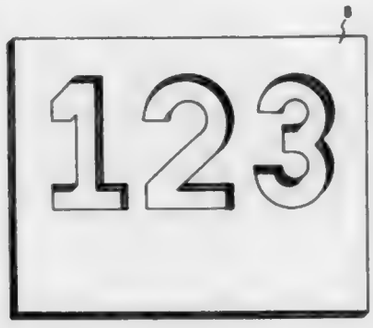
Seiji Kawasumi, and Yuzo Inukai, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 5, 1994, Ser. No. 222,914

Claims priority, application Japan, Apr. 5, 1993, 5-100118

Int. Cl.[6] B41N *1/08*

U.S. Cl. 101—454 **5 Claims**



1. A planographic printing plate, comprising:

a support having a front surface and a back surface; and

a photosensitive resin layer provided on said front surface of said support, only a portion of said back surface being provided with electrolytically roughened indicia for identifying the printing plate.

5,463,953

METHOD FOR PRINTING CARDS HAVING BLIND HOLE-SHAPED RECESSES AND AN APPARATUS FOR CARRYING OUT THE METHOD

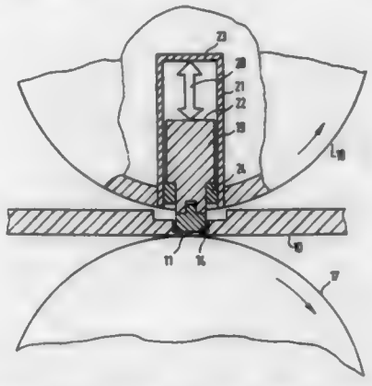
Norbert Kaspers, Kemnat am Buchberg; Karl-Heinz Lang, Nittenau; Helmut Baader, Nabburg; Herbert Grün, Vaterstetten, and Thomas Otto, Munich, all of, Germany, assignors to GAO Gesellschaft fur Automation und Organisation mbH, Munich, Germany

Continuation of Ser. No. 992,938, Dec. 18, 1992, abandoned. This application Apr. 5, 1994, Ser. No. 222,816

Claims priority, application Germany, Dec. 20, 1991, 41 42 409.3

Int. Cl.[6] B41F *13/24*

U.S. Cl. 101—485 **14 Claims**



1. A method of printing on cards having opposing parallel surfaces which are substantially planar, one of said opposing parallel surfaces including a blind hole-shaped recess with a membrane at a maximum depth of the recess, a printed pattern being transferred to the other of the opposing parallel surfaces by means of a printing plate which presses the card against a surface serving as a support during the printing operation, comprising the steps of:

introducing an element into the recess which at least partially fills the recess; and

holding the membrane in the printing plane with said element to stabilize said membrane against the pressure of the printing plate towards the support surface.

5,463,954

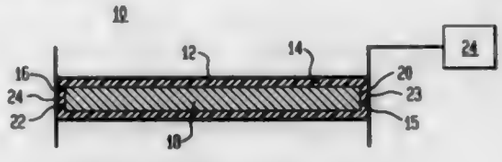
CONDUCTIVE POLYMER IGNITORS

David W. Blair, Princeton, N.J., assignor to Princeton Scientific Enterprises, Inc., Princton, N.J.

Filed Mar. 15, 1994, Ser. No. 213,616

Int. Cl.[6] F42C *19/12*

U.S. Cl. 102—202 **12 Claims**



1. An propellant system comprising:

a primary propellent;

a chemically insensitive conductive polymer coated on a surface of said primary propellent; and

means to supply current to said polymer,

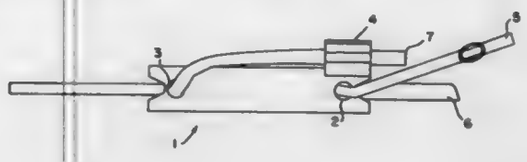
wherein said current heats said polymer to a temperature sufficient to ignite said primary propellant in contact with said polymer, the energy that causes the ignition being spread over said surface of said primary propellant at the rate at which electric current spreads through said polymer over said surface of said primary propellant.

5,463,955

TRANSMISSION TUBE CONNECTOR

Raymond Carriere, Brownsburg, Canada, assignor to ICI Canada Inc., Ontario, Canada

Filed Feb. 8, 1994, Ser. No. 193,332
Int. Cl.[6] C06C 5/04
U.S. Cl. 102—275.2 9 Claims



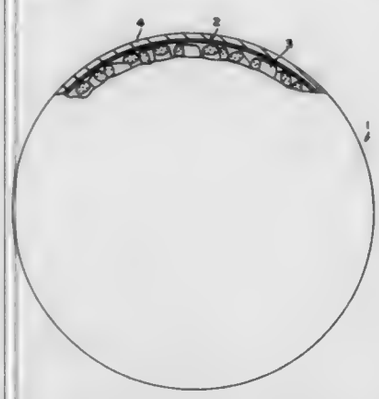
1. A tubular connector with an inside portion and an outside portion for connecting at least two nonelectric transmission tubes wherein said tubes are secured by a tubing holding means at both ends of said connector and a segment of each tube is substantially linearly juxtaposed one to the other within said inside portion which provides a means for the transfer of a signal from an initiated first transmission tube to a second transmission tube wherein said first tube signal terminates at said connector and said first tube is provided with a terminal end, said terminal end affixed to said outside portion of said connector to insure that said first tube terminal end does not transfer signal from said outside portion of said connector whereby said signal transfer occurs within said inside portion of said connector at the substantially linear juxtaposition.

5,463,956

WEAR DECOPPERING LINER

Darwin B. Harting, Pekin, Ind., assignor to ICI Americas Inc., Valley Forge, Pa.

Filed Feb. 8, 1994, Ser. No. 154,922
Int. Cl.[6] F42B 5/16
U.S. Cl. 102—282 3 Claims



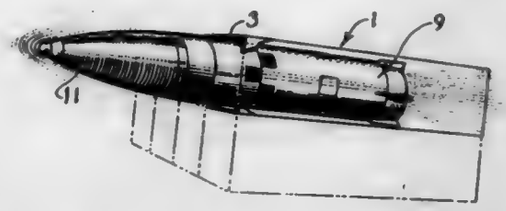
1. An additive for a liner proximate to a propellant for medium and large caliber guns wherein said additive is comprised of about 10 to 90 weight per cent bismuth trioxide, 5 to 40 weight per cent potassium salt of oxidized wax, 2 to 20 weight per cent oxidized microcrystalline wax, 2 to 20 weight per cent plasticizer, 1 to 10 weight per cent terpene resin, and less than 1 weight per cent residual solvent.

5,463,957

INFLATABLE NOSE FAIRING

Duane L. Jensen, Byron, and Rolla W. Allen, Santa Clara, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed May 26, 1994, Ser. No. 249,847
Int. Cl.[6] F42B 15/01
U.S. Cl. 102—293 8 Claims



1. An apparatus for use as an inflatable aerodynamic nose fairing for a length-constrained, canister launch missile having an elongated cylindrical shape with a uniformly wide circular cross section from rearward end to forward end, the apparatus comprising:

a) a primary structure comprising a filament-reinforced flexible membrane attached to the forward end of the missile and inflatable from a first stowed position to a second deployed position, said primary structure when in said stowed position is compactly folded in an axial direction of the missile to form closely spaced concentric folds to fit within a shallow planar disc-shaped volume of reduced height atop the forward ends of the missile thereby permitting the missile to be lengthened and the usable payload capacity of the missile to be expanded to its full wide circular cylindrical shaper said primary structure when in said deployed position is extended forwardly to form an aerodynamic shape for reduced drag and improve range and performance; and wherein the primary structure comprises:

i) an inner layer of elastomeric material forming a gaseous pressure membrane;

ii) a first ply layer of resin impregnated yarns overlying said inner layer, said first ply layer having fibers arranged in a single direction and oriented substantially in the axial direction of the missile;

iii) a second ply layer of circumferentially wound resin impregnated yarns overlying said first ply layer, said second ply layer having fibers arranged substantially transverse to the fibers of said first ply layer;

iv) said second ply layer having a thickness approximately twice as great as said first ply layer such that said inner layer, said first ply layer and said second ply layer define a laminate wherein the axially oriented fibers of said first ply layer are concentrated near a neutral axis of a cross section through an axial direction of said laminate thereby facilitating the compact concentric folding of the primary structure into the stowed position; and

b) means for rapidly inflating said primary structure into said deployed position upon broach of the missile canister.

5,463,958

MORTAR ADAPTOR

Karl-Axel Roheim, Skolgatan 2, Nynäshamn, Sweden

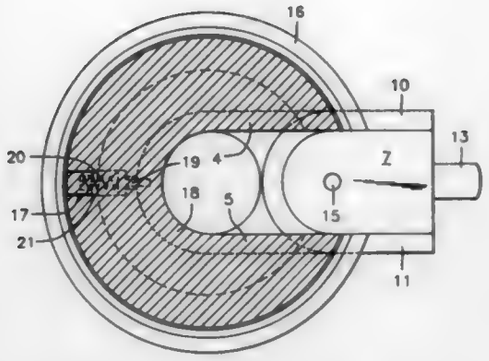
PCT No. PCT/SE93/00155, § 371 Date Aug. 25, 1994, § 102(e) Date Aug. 25, 1994, PCT Pub. No. WO93/17294, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 24, 1993, Ser. No. 295,634
Int. Cl.[6] F42B 8/00;30/10
U.S. Cl. 102—445 5 Claims

1. A mortar adaptor for insertion into a barrel of a firing pin-equipped mortar, said mortar adaptor comprising:

a substantially cylindrical adaptor body;

a central bore capable of accommodating a practice projectile of caliber smaller than that of the mortar;

a breech position defined in said central bore; and



diameter of said casing base	12.01 mm
diameter of said central region at a commencement of said transition region into said neck region	11.72 mm
diameter of said neck region	7.55 mm
diameter of said projectile	6.70 mm
total length of said casing	51.20 mm
length from said base to said transition region	40.96 mm
length of said transition region	2.49 mm
length of said neck region	7.75 mm
projectile overlap	variable.

an automatic safety mechanism including:

a breech block which is slidably received in the substantially cylindrical adaptor body at said breech position, said breech block having an inside end disposed inside said substantially cylindrical adaptor body and an outside end located opposite to the inside end;

resilient means for urging said breech block outwardly of the substantially cylindrical adaptor body toward a safety position wherein said outside end of the breech block protrudes from a lateral side of said substantially cylindrical adaptor body, said breech block being slidable against said resilient means, into said substantially cylindrical adaptor body toward a firing position wherein said outside end is flush with said lateral side;

guide means located at said breech position and arranged transversely to a longitudinal axis of the substantially cylindrical adaptor body, for guiding said breech block slidably through the substantially cylindrical adaptor body; and

an adaptor firing pin located in said breech block and arranged so that, when said breech block is in the firing position, said adaptor firing pin is aligned with the firing pin of the mortar to thereby facilitate firing of the practice projectile, and when said breech block is in the safety position, said breech block prevents firing by obstructing the firing pin of the mortar.

5,463,959

6.5 CALIBRE CARTRIDGE FOR RIFLES AND CARTRIDGE CHAMBER THEREFOR

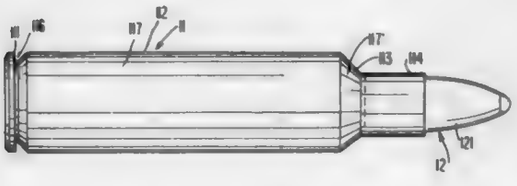
Thomas Kramer, Karl-Funke-Strasse 66, 4600 Dortmund 1, Germany

Continuation of Ser. No. 952,704, Nov. 13, 1992, abandoned. This application May 9, 1994, Ser. No. 239,618

Claims priority, application Germany, Mar. 15, 1991, 41 08 550.7

Int. Cl.[6] F42B *5/26*

U.S. Cl. 102—464 **8 Claims**



1. A cartridge for "6.5 mm" caliber rifles, comprising a casing having a base, a central region extending from said base and adapted to contain a propellant charge, a neck region, and a transition region located between said central region and said neck region; and a projectile supported in said neck region, said casing having the following dimensions:

5,463,960

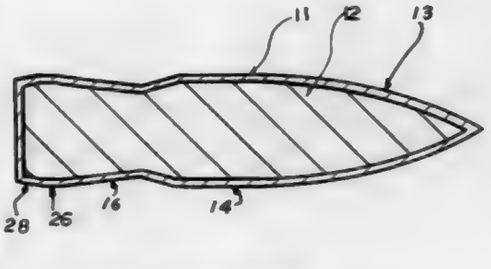
STREAMLINED BULLET

Charles P. Lowry, R.D. #1, Box 38, Cooperstown, Pa. 16317

Filed Jan. 26, 1995, Ser. No. 378,492

Int. Cl.[6] F42B *10/00*

U.S. Cl. 102—501 **1 Claim**



1. A bullet having a cylindrical body;

a nose attached to said cylindrical body;

a streamline surface attached to an end of said cylindrical body;

said streamline surface comprising a generally frustoconical front surface and a generally frustoconical rear surface;

said generally frustoconical front surface having a base connected to an end of said cylindrical body surface;

said generally frustoconical rear surface having a base and an apex attached to an apex end of said generally frustoconical front surface;

said bullet has a generally cylindrical rotating band surface attached to said base of said frustoconical rear surface;

said bullet has a frustoconical boat tail having a base; and,

and said generally cylindrical rotating band being connected to said base of said boat tail;

said generally frustoconical front surface and said generally frustoconical rear surface each having an axial length greater than the axial length of said rotating band;

said axial length of said frustoconical rear surface being greater than said axial length of said frustoconical front surface.

5,463,961

MOTORIZED TRACK GUIDED VEHICLE FOR INFANTS WITH SOOTHING TRACK BUMPS

Jodie B. Graves, 603 SE. 41st St., Apt. B, Lawton, Okla. 73501

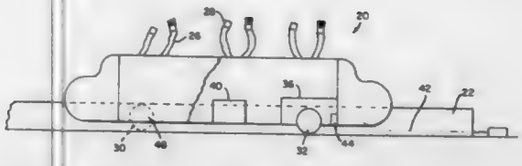
Filed Dec. 6, 1993, Ser. No. 161,413

Int. Cl.[6] A63G *31/02*

U.S. Cl. 104—53 **5 Claims**

1. A motorized vehicle assembly for infants comprising:

a Truck assembly having front and rear wheel assemblies extending downwardly therefrom, the front and rear wheel assemblies each having wheels connected thereto, said wheels



having radially extending rectangular projections thereon for imparting vibration to said truck assembly;

a track assembly having two parallel rails, each of said rails being adapted to guide and limit the movement of said wheels, said rails having a series of regularly spaced rectangular projections for imparting additional vibration to said truck assembly;

a motor contained within the truck assembly and adapted to impart rotation to the wheels connected to the rear wheel assembly thereby causing the truck assembly to move along said rails, said motor connected to a remote control by a spring loaded cord assembly, said cord assembly serving to provide control signals to said motor from said remote control;

the truck assembly having a longitudinally extending top surface having fastening means connected thereto, the fastening means secured to at least three points along the length of the top surface, the fastening means securing an infant support device to said surface.

5,463,962

ROLLER COASTER

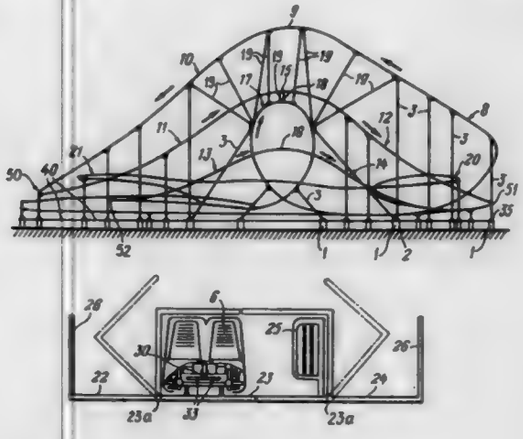
Vladimir A. Gnezdilov, Kastanaevskaia 60-179, Moscow, Russian Federation

Filed Nov. 18, 1993, Ser. No. 154,705

Claims priority, application Russian Federation, Jan. 19, 1993, 93048214

Int. Cl.[6] A63G *31/00*

U.S. Cl. 104—55 **18 Claims**



10. A roller coaster having

supporting elements (**1**, **35**) mounted on a base

main bearing posts (**3**) having one end coupled with said supporting elements (**1**, **35**);

a closed path track (**4**) for supporting passenger cars (**6**), said track being attached to the other ends of said posts (**3**),

said track forming a plurality of track sections,

wherein successive sections of said track present a spatial figure of varying curvature, some of said sections forming loading and unloading sections for passengers, other sections forming hoisting ascent sections (**8**), at least one of spiral section (**20**), S-shaped sections (**21**, **21'**), gravity descent sections (**10**, **12**, **14**), dynamic ascent sections (**11**, **13**) and braking sections (**46**);

wherein

at least one of said sections is an upright loop section (**17**) in which the loop is in an essentially vertical plane,

at least one of said other track sections (**10**, **11**, **12**, **13**, **14**) is located in the area between planes of entrance and exit of a respective upright loop section (**17**), and located at a level above the peak (**18**) of the loop of the upright loop section (**17**);

wherein additional stiff posts (**19**) are provided, coupled to and connecting said upright loop section (**17**) with said at least on of said other track sections (**8**, **9**, **10**, **11**, **12**, **13**, **14**) located above the upright loop section (**17**) and positioned at least in the area between the planes of entrance and exit of the loop; and

wherein at least one of:

said spiral section (**20**)

and said S-shaped section (**21**, **21'**) is located on one side of the loop and at least one of:

said spiral section (**20**);

and said S-shaped section (**21**, **21'**) is located on the other side of the loop;

wherein the spatial figure of the track (**4**) includes a plurality of peak points (**9**, **15**, **16**) of successively diminishing heights, located in the central portion of a projection of the track, in a vertical plane, said peak points being located one under another, and positioned in the area of the at least one upright loop section (**17**); and

wherein sections of dynamic ascent (**13**) and descent (**14**), located on respectively opposite sides of one said peak point (**16**) are connected to at least one of: said spiral section (**20**) and said S-shaped section (**21**, **21'**).

5,463,963

METHOD OF CENTERING STEERABLE AXLES OF A BOGIE

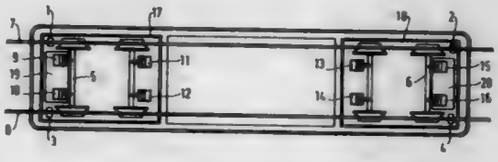
Roger Bernard, Essertenne, and Jacques Bevand, Le Creusot, both of, France, assignors to GEC Alsthom Transport SA, Paris, France

Filed Jul. 20, 1994, Ser. No. 277,586

Claims priority, application France, Jul. 30, 1993, 93 09423

Int. Cl.[6] B61F *5/00*

U.S. Cl. 105—168 **4 Claims**



1. A method of centering steerable axles of a bogie, comprising:

detecting a first magnetic axis of symmetry of a first rail by at least one first detector to obtain a first signal which is a function of a position of the at least one first detector and a position of the first magnetic axis,

detecting a second magnetic axis of symmetry of a second rail by at least one second detector to obtain a second signal which is a function of a position of the at least one second detector and a position of the second magnetic axis,

summing said first and second signals so as to obtain, for one of the axle, a resulting signal which is a function of an offset between the axle and at least one of the magnetic axis,

pivoting at least one axle in a direction for reducing the resulting signal,

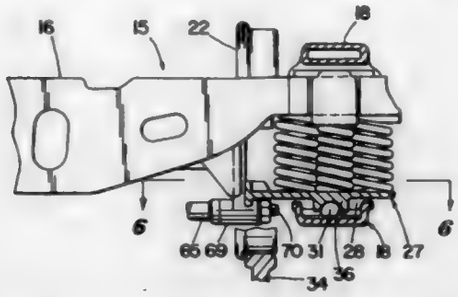
when one of the first and second signals does not lie in a predefined range of values, classifying said one of the first and second signals as being invalid, and extrapolating a resulting signal basing on a previous value of said one of the first and second signals and on the other one of the first and second signals.

5,463,964

ROCKER SEAT CONNECTION

Jack R. Long, St. Charles, Ill., and Hans B. Weber, Rotonda West, Fla., assignors to National Castings Incorporated, Lisle, Ill.

Filed May 12, 1994, Ser. No. 241,570
Int. Cl.[6] B61F 5/00
U.S. Cl. 105—187 21 Claims



1. A railroad car truck, comprising:

a) a pair of sideframes held in parallel relation by a bolster and at least one other member, which are separately coupled transversely between the sideframes, each of the sideframes including a U-shaped channel between opposing ends of the sideframe, the channels being open upwardly in a direction towards the bolster, when the truck is horizontally disposed, the at least one other member having a pair of opposing ends adjacent the open channels;

b) at least one upwardly facing socket formed in each of the channels;

c) a hardened steel bearing disposed in each one of the sockets for restricted movement therein, each one of the bearings including a pair of opposing sides and at least a parti-cylindrical head which is disposed between said sides and extends therefrom and the socket in a direction towards the bolster;

d) a rocker seat secured adjacent each of the opposing ends of the at least one member, the rocker seats covering the heads of the bearings and being supported thereon, each of the rocker seats, in cross-section, resembling a bridge having an arch between a pair of piers which extend from the arch in a direction away from the bolster and terminate alongside the bearing to engage the bearing and limit relative lateral movement between the bearing and rocker seat seated thereon, the arch including a matingly curved recess for receiving the at least parti-cylindrical head of an adjacent bearing, the radius of curvature of the recesses being greater than that of the heads to facilitate relative rocking motion between the rocker seats and bearings; and

e) means for limiting the relative rocking motion between the rocker seats and bearings.

5,463,965

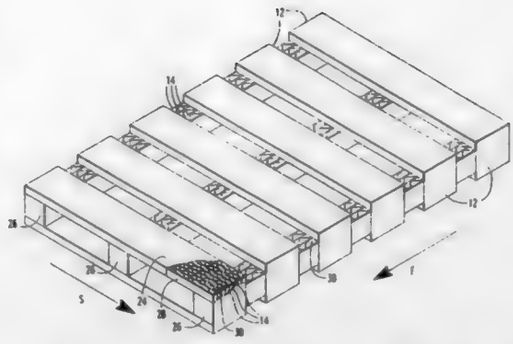
PAPERBOARD SUPPORT STRUCTURE FOR SUPPORTING A LOAD

Daniel Cordrey, Bedford, Tex., assignor to Lin Pac Inc., Atlanta, Ga.

Filed Feb. 2, 1994, Ser. No. 190,481
Int. Cl.[6] B65D 19/06
U.S. Cl. 108—513 40 Claims

1. A support structure for supporting a load comprising:

a plurality of individual cores of connected paper strips, each of said cores including spacer strips of corrugated paperboard and bent strips of laminated paper, said bent strips being disposed between opposing spacer strips and secured to opposing spacer strips at bend surfaces spaced apart along each of said bent strips, wherein any two of said bent strips are secured to opposite sides of at least one of said spacer strips;



said bent strips and said opposing spacer strips having edge surfaces for supporting the load, said edge surfaces defining a plane substantially perpendicular to said bend surfaces; and

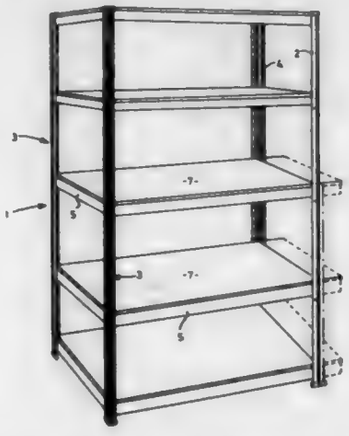
whereby two of said cores are interconnected by another one of said cores to provide a support surface therebetween.

5,463,966

FRAMEWORK FOR SHELVING UNIT

Finn Nilsson, Sharkston, Canada, assignor to Spacemaker Limited, Canada

Filed Apr. 1, 1993, Ser. No. 41,508
Claims priority, application Canada, Apr. 1, 1992, 2064656; Aug. 5, 1992, 2075320
Int. Cl.[6] A47B 9/00
U.S. Cl. 108—110 38 Claims



1. A framework comprising a plurality of post members mutually spaced from one another in generally parallel relationship and each including a pair of faces disposed perpendicular to one another, a plurality of support members extending between respective pairs of said post members, each of said support members including an abutment face and being delimited at opposite ends by an edge extending normal to a longitudinal axis of said support member, and attachment means for connecting said support members to said post members with portions of said abutment face of a support member and a face of an associated one of the post members being juxtaposed, said attachment means comprising an aperture in one of said juxtaposed faces and having a hole and a slot extending therefrom and a neck with a head portion extending therefrom projecting from the other of said juxtaposed faces, said head portion being cooperatively shaped to pass through said hole and said neck to slide within said slot, said neck portion and slot being configured to bring said edge of a support member into abutment with an abutment surface on an associated one of the post members upon relative sliding movement of said neck portion within said slot and thereby inhibiting further sliding of the neck portion within the slot, said abutment surface including a rib

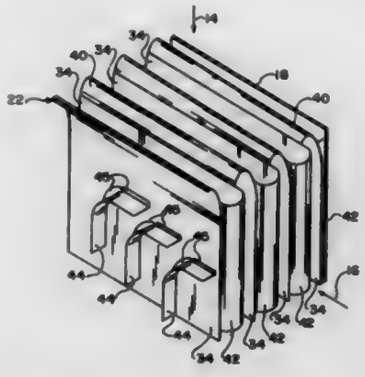
extending along a longitudinal axis of said post member and projecting between the faces of said post member to maintain said edges of the support members associated with respective ones of said faces in spaced relationship.

5,463,967

STATIC MIXER DEVICE FOR IMPROVING HOMOGENEITY OF A CHARACTERISTIC OF A MIXTURE STREAM CREATED FROM FLUID STREAMS SEPARATELY ENTERING THE DEVICE

Robert L. Gielow, and James C. Paul, both of Livonia, Mich., assignors to Airflow Sciences Corporation, Livonia, Mich.

Filed Jul. 21, 1994, Ser. No. 278,164
Int. Cl.[6] F23K *3/02*
U.S. Cl. 110—104 R **20 Claims**



11. A fluid mixer comprising a first inlet at which a first fluid stream enters the mixer, a second inlet at which a second fluid stream enters the mixer, and an outlet from which the two fluid streams exit the mixer to form a fluid mixture stream, said fluid mixer comprising a series of walls that are arranged in side-by-side, spaced apart relationship to each other to form a series of spaces each lying between consecutive ones of said walls and having a perimeter composed of plural sides, means closing alternate ones of said spaces along the same first one of said plural sides while leaving the remaining ones of said spaces open along said first of said plural sides to thereby form said first inlet, said remaining ones of said spaces forming a first group of said spaces and said alternate ones of said spaces forming a second group of said spaces, means closing the spaces of said first group of said spaces along the same second one of said plural sides while leaving the spaces of said second group of said spaces open along said second of said plural sides to thereby form said second inlet, and means closing the spaces of both of said groups of said spaces along the remainder of said plural sides except at one final side where the spaces of both of said groups of said spaces open along that one final side to thereby form said outlet.

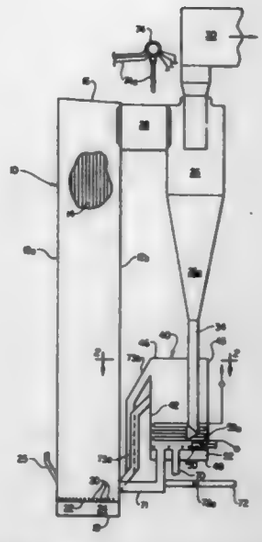
5,463,968

FLUIDIZED BED COMBUSTION SYSTEM AND METHOD HAVING A MULTICOMPARTMENT VARIABLE DUTY RECYCLE HEAT EXCHANGER

Iqbal F. Abdulally, Randolph, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Aug. 25, 1994, Ser. No. 295,573
Int. Cl.[6] F23D *1/00*
U.S. Cl. 110—347 **12 Claims**

10. A method of operating a fluidized bed combustion system, comprising the steps of supporting a fluidized bed of particulate material including fuel in an enclosure, combusting said fuel material in said enclosure, separating the entrained particulate material from the flue gases resulting from said combustion, passing the separated material to one compartment of a recycle heat



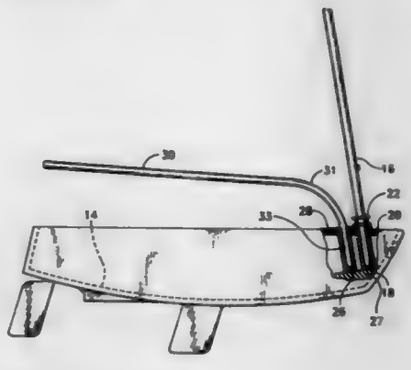
exchanger, selectively passing said material from said one compartment back to said enclosure or to two other compartments of said heat exchanger, cooling said material in said other compartments, passing said cooled material from both of said other compartments back to said enclosure, and introducing air to the flow of cooled material passing from one of said other compartments to said enclosure to promote the flow of said cooled material from said one other compartment to said enclosure, and varying said step of introducing to vary the rate of flow of said cooled material from said one other compartment to said furnace.

5,463,969

FREE STANDING BOOM WITH SUBSTANTIALLY CONSTANT LEECH TENSION

John G. Hoyt, Two Harbor View Dr., Newport, R.I. 02840

Continuation-in-part of Ser. No. 971,545, Nov. 5, 1992, abandoned, and Ser. No. 145,781, Oct. 29, 1993, abandoned. This application Jun. 15, 1994, Ser. No. 261,891
Int. Cl.[6] B63B *35/00*
U.S. Cl. 114—39.001 **5 Claims**



1. A sailboat having a deck,
a socket in the deck,
a mast mounted through the deck into the socket for swivel movement therein,
a second socket in the deck located immediately adjacent and aft of the first said socket as structurally permissible and having a bearing at the deck level for engaging a boom,
said first and second sockets fastened to a section of the sailboat hull and extending at the same rake angle greater than zero degrees,

a boom having an arcuate forward end received in the second socket,

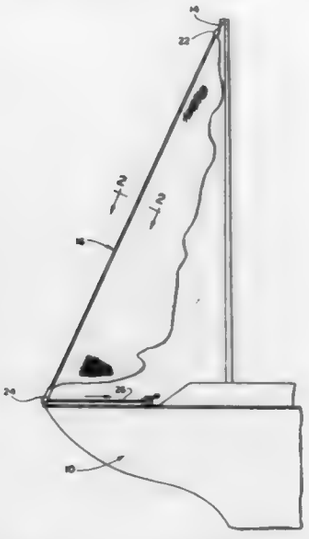
a mainsail connected by its luff to the mast and by its clew to the outer end of the boom and sheet means having one end fastened to the boom and the other end secured to the sailboat, whereby the leech of the sail has substantially constant tension throughout the boom travel.

5,463,970

FURLING FOIL FOR SAILING VESSEL

Greg W. Hartlmeier, Whitefish Bay, and Olaf T. Harken, Pewaukee, both of Wis., assignors to Harken, Inc., Pewaukee, Wis.

Filed Mar. 13, 1995, Ser. No. 402,919
Int. Cl.[6] B63H *9/04*
U.S. Cl. 114—105 **20 Claims**



1. A furling foil for furling a sail around its luff and around a stay of a sailing vessel, said furling foil comprising an elongate member, said member comprising an outer flexible portion of a first material having a longitudinal groove therein for supporting the luff of a sail, and an inner reinforcing portion of a second different material bonded to said outer portion, said inner portion having substantially greater torsional resistance than said outer portion, said furling foil being substantially bendable along its length without permanent distortion.

5,463,971

COLLAPSIBLE SEA ANCHOR OR DROGUE

William J. Abernethy, Woodville Lodge, RMB 128, Delegate, N.S.W., 2633, Australia

PCT No. PCT/AU92/00653, § 371 Date Jul. 7, 1994, § 102(e) Date Jul. 7, 1994, PCT Pub. No. WO93/11029, PCT Pub. Date Jun. 10, 1993
PCT Filed Dec. 4, 1992, Ser. No. 244,697
Claims priority, application Australia, Dec. 4, 1991, PK 9833
Int. Cl.[6] B63B *21/48*
U.S. Cl. 114—311 **22 Claims**

1. A collapsible sea anchor or drogue comprising:

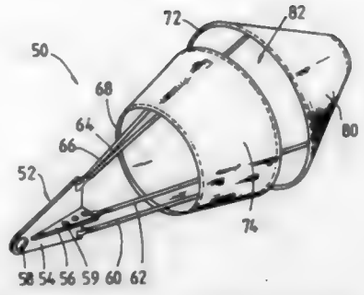
a first body portion which in an operative position has a hollow frusto-conical shape;

a second body portion which in an operative position has a hollow frusto-conical shape;

towing line coupling means for coupling a towing line thereto;

means for interconnecting the first body portion, the second body portion and the towing line coupling means such that the towing line coupling means is located forwardly of a narrower end of the first body portion and the second body portion is located adjacent to a wider end of the first body portion with a wider end of the second body located adjacent to said wider end of the first body;

characterised in that at least one of said first and second body portions is collapsible when in a non-operative position.

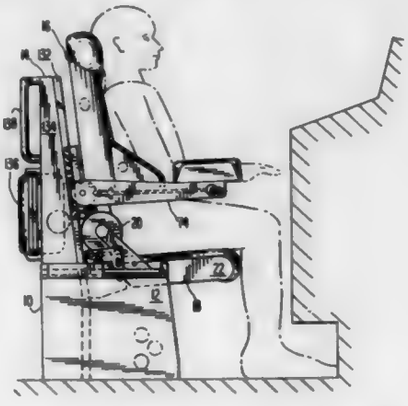


5,463,972

HIGH-PERFORMANCE SEATING/SUPPORT SYSTEM

Walter A. Gezari, Calverton, and Christopher J. Marotta, Riverhead, both of N.Y., assignors to Stidd Systems, Inc., Greenport, N.Y.

Filed Dec. 1, 1993, Ser. No. 160,394
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—363 **16 Claims**



1. An improved boat seating apparatus comprising an upright base adapted to be mounted to a deck and having an upper portion; a frame mounted to said upper portion; a track extending upwardly along said frame; adjustment means mounted to said frame and said base to permit fore and aft positioning of said frame with respect to said base; and back and seat supports, each mounted to said frame and individually positionable along said track.

5,463,973

DECORATIVE BANNER MOUNTING KIT

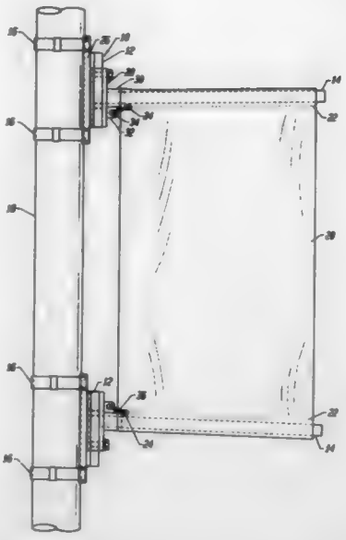
Thomas M. Tait, P.O. Box 160, Danville, Calif. 94526

Filed Oct. 29, 1993, Ser. No. 145,485
Int. Cl.[6] G09F *17/00;15/00;* **A47B** *96/06*
U.S. Cl. 116—173 **8 Claims**

1. A decorative banner mounting kit for mounting a decorative banner to a support structure with the decorative banner stretched between a pair of banner poles, the decorative banner mounting kit comprising:

a pair of bracket assemblies, each bracket assembly including:

an interconnection mechanism having a base unit and an arm unit,



the base unit having attachment means for attaching the base unit to the support structure, the base unit having a T-shaped slide rail of substantially uniform cross section,

the arm unit having a top side with a pole socket and an underside with a key slot that has a configuration complementary with the T-shaped slide rail, wherein the arm unit is slidably engageable with the base unit when the slide rail of the base unit is installed in the key slot of the arm unit,

the interconnection mechanism limiting bidirectional slide displacement of the arm unit on a linear axis when the arm unit is in slidable engagement with the base unit, the interconnection mechanism having fastening means for fastening the arm unit to the base unit; wherein on mounting of the bracket assemblies for display of the decorative banner, the bracket assemblies are positioned in a spaced above and below arrangement on the support structure with vertical alignment of the slide rails of the base units along the linear axis for slide displacement of the arm units with respect to the base units on the linear axis when engaged; wherein the interconnection mechanism of each bracket assembly prevents detachment of the arm unit from the base unit when the fastening means fails to fixedly fasten the arm unit to the base unit, wherein the adjustment means fastening means of the interconnection mechanism of each bracket assembly comprises a pair of elongated, laterally spaced bolt slots through the top side of the arm unit aligned in a direction parallel to the linear axis of the slide displacement of the arm unit on the base unit, complementary threaded bolt holes in the slide rail of the base unit, and threaded bolts which pass through the slots in the arm unit and threadably engage the bolt holes in the base unit wherein limited displacement of the arm unit on the base unit along the linear axis is permitted before tightening the bolts, wherein the arm unit is fixedly fastened to the base unit upon tightening the bolts.

5,463,974

MOUNT FOR A FLAG, DISPLAY AND THE LIKE

Lewis Seeder, 476 Greenglade Ave., Worthington, Ohio 43085

Filed May 19, 1994, Ser. No. 245,976

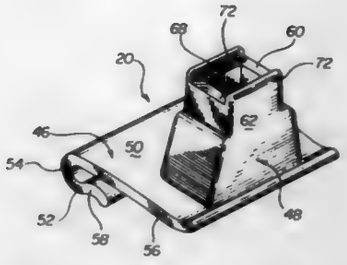
Int. Cl.[6] G09F *17/00*

U.S. Cl. 116—173 **20 Claims**

1. A display device in combination with a mount for supporting said display device on a surface,

said mount comprising:

a first leg and a second leg, said legs being integrally formed with each other, with said first leg of said mount generally abutting a face of said surface when said mount is placed thereon;



a holder body comprising a top wall and a solid side wall integrally formed with said first leg and projecting outwardly from said first leg, said holder body having a shaped cavity therein for accepting and securely holding said display device therein, said cavity extending through said first leg and forming an aperture in said first leg, said display device being releasable from said holder body upon removal of said mount from said surface; and

said display device comprising: at least one mast having opposing ends;

said mast including a connecting means at a first end of said mast for connecting said mast to the mount, said connecting means being releasably held within said shaped cavity, and

a display means connected to a second end of said mast for displaying an item.

5,463,975

PROCESS FOR PRODUCING CRYSTAL

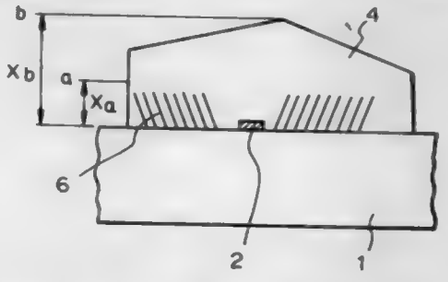
Takao Yonehara, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 742,483, Aug. 5, 1991, abandoned, which is a continuation of Ser. No. 598,821, Oct. 17, 1990, abandoned, which is a continuation of Ser. No. 162,259, Feb. 29, 1988, abandoned. This application Jul. 12, 1993, Ser. No. 90,626

Claims priority, application Japan, Mar. 2, 1987, 62-47033

Int. Cl.[6] C30B *1/08*

U.S. Cl. 117—9 **10 Claims**



1. A process for producing a crystal comprising the steps of:

providing a light-transmissive substrate having two sides, one of said two sides providing a free surface including non-nucleation surface and a nucleation surface being arranged adjacent thereto, said nucleation surface having an area sufficiently small to effect growth of said crystal from a single nucleus, said nucleation surface being formed of an amorphous material having a nucleation density greater than a nucleation density of the non-nucleation surface;

applying vapor deposition to form said single nucleus only at said nucleation surface; and

subjecting the other side of said substrate opposite to the side having the nucleation and non-nucleation surfaces to light irradiation to heat a region of the single crystal, said region having a vertical distance X_a measured from an interface between the single crystal and said nucleation surface, to melt the crystal in the vicinity of said interface to thereby reduce crystal defects, such that

$$X_a < \frac{X_b}{2} .$$

wherein X_a is a vertical distance measured from said interface to an uppermost point of the single crystal.

5,463,976

PRODUCTION OF CRYSTALS OF DIESTER PHOSPHATE MONOPOTASSIUM SALT

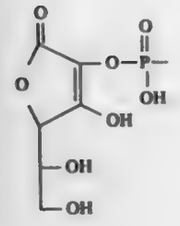
Nakamura Masayuki, Himeji, Japan, assignor to Senju Pharmaceutical Co., Ltd., Osaka, Japan

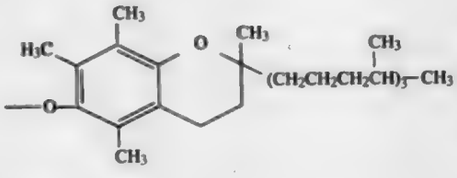
Filed Mar. 29, 1995, Ser. No. 412,886
Claims priority, application Japan, Apr. 1, 1994, 6-065133
Int. Cl.[6] C30B *29/54*
U.S. Cl. 117—68 **4 Claims**

1. A method for producing crystals of a diester phosphate monopotassium salt, comprising

(a) reacting a diester phosphate of the formula (I)

(I)





with potassium hydroxide in a solvent selected from the group consisting of isopropyl alcohol, methylene chloride and chloroform, and

(b) allowing crystals of the diester phosphate monopotassium salt to precipitate out.

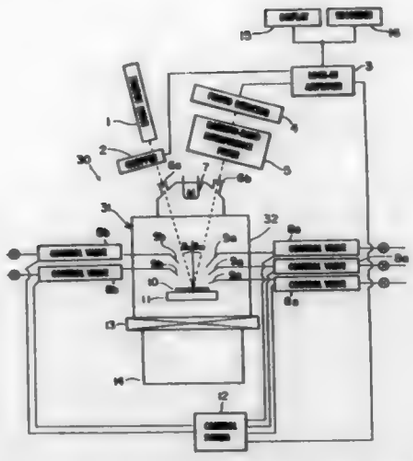
5,463,977

METHOD OF AND APPARATUS FOR EPITAXIALLY GROWING CHEMICAL COMPOUND CRYSTAL

Nobuaki Manada, 1-24, Yagiyamaminami 1-chome, Taihaku-ku, Sendai-shi, Miyagi-ken; Junji Ito, Miyagi; Toru Kurabayashi, 9-23, Yagiyamaminami 1-chome, Taihaku-ku, Sendai-shi, Miyagi-ken, and Jun-ichi Nishizawa, Sendai, all of, Japan, assignors to Research Development Corporation, Tokyo; Nobuaki Manada, Miyagi; Toru Kurabayashi, Miyagi, and Jun-ichi Nishizawa, Miyagi, all of, Japan

Continuation of Ser. No. 799,132, Nov. 27, 1991, abandoned, which is a division of Ser. No. 617,554, Nov. 26, 1990, abandoned. This application Jul. 15, 1993, Ser. No. 91,747
Claims priority, application Japan, Nov. 24, 1989, 1-305877
Int. Cl.[6] C30B *25/16*
U.S. Cl. 117—85 **6 Claims**

1. A method of epitaxially growing a chemical-compound crystal in order to generate adsorption and surface reaction per a single molecular layer alternately and independently of each other, said method comprising the steps of:



(a) alternately introducing raw-material gases into a crystal growing vacuum chamber to grow a crystal film monolayer by monolayer by using adsorption and surface reaction of said gases;

(b) during the growth of said crystal, emitting a light onto the growing crystal film of said crystal;

(c) measuring the intensity of a light reflected from the growing crystal film; and

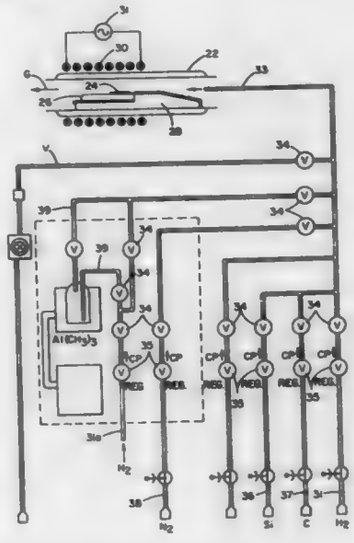
(d) controlling the adsorption amounts of the respective raw-material gases on the growing surface on the basis of a change in the reflected-light intensity, thereby controlling the growth rate of the growing film and the film thickness.

5,463,978

COMPOUND SEMICONDUCTOR AND CONTROLLED DOPING THEREOF

David J. Larkin, North Olmsted; Philip G. Neudeck, Strongsville; J. Anthony Powell, North Olmsted, and Lawrence G. Matus, Amherst, all of Ohio, assignors to Ohio Aerospace Institute, Brook Park, Ohio

Continuation of Ser. No. 8,650, Jan. 25, 1993. This application Jul. 18, 1994, Ser. No. 276,599
Int. Cl.[6] H01L *21/20*
U.S. Cl. 117—89 **59 Claims**



1. A method of controlling the amount of a selected element deposited in a given growth area of a crystal formed by Si and C as a SiC crystal is being grown at said area by a CVD process

conducted in a growth chamber, wherein said Si is deposited in Si growth sites and said C is deposited in C growth sites, said element being competitive for one of said growth sites, said method comprising the steps of:

a. flowing a first amount of a gaseous Si compound through said chamber;

b. flowing a second amount of a gaseous C compound through said chamber; and

c. varying the ratio of said first and second amounts during the growing of said crystal to regulate said amount of said element deposited in said crystal at said area.

5,463,979

ANIMAL-OPERATIVE, ANIMAL FEEDER

Victor Fasino, 62 Oneida Ave., Landing, N.J. 07850

Filed Jun. 9, 1994, Ser. No. 257,277

Int. Cl.[6] A01K *5/00*

U.S. Cl. 119—54 **13 Claims**

1. An animal-operative, animal feeder, comprising:

a housing; and

first means, within said housing, for subdividing said housing into a feed reservoir and a feeding chamber; wherein

said first means comprises gating means operative for opening said reservoir directly onto, and for closing off said reservoir from, said feeding chamber;

8 actuator means, housing mounted, for operating said gating means to cause said gating means to open said reservoir directly onto said feeding chamber; and

window means, fixed in said housing, for visually exposing an interior of said reservoir; wherein

said actuator means comprises a limb, external of said housing, disposed in adjacency to, and in transversely of said window means.

5,463,980

SOLAR ACTUATED ANIMAL FEEDER

Melvin A. Rasmussen, HCR 1 Box 59, Louise, Tex. 77455

Filed Oct. 26, 1994, Ser. No. 329,632

The portion of the term of this patent subsequent to Nov. 9, 2010, has been disclaimed.

Int. Cl.[6] A01K *5/00*

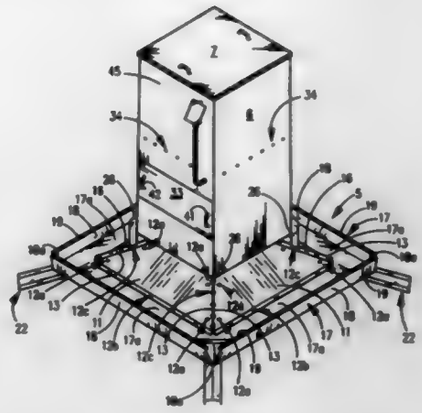
U.S. Cl. 119—57.1 **2 Claims**

2. An animal feeder comprising;

a feeding trough;

said feeding trough including;

downwardly inclined surfaces joined together at their adjacent edges;



said downwardly inclined surfaces terminating in lower edges;

a bottom surface secured to and projecting outwardly beyond said lower edges of said downwardly inclined surfaces; and

said bottom surface including an upwardly extending surface portion which portion terminates adjacent and above said lower edges of said downwardly inclined surfaces;

a container;

said container having an open lower end;

said container having a wall surface extending upwardly from said open lower end to form a receptacle for animal feed;

said open lower end spaced upwardly from said inclined surfaces;

legs secured to and extending upwardly from said inclined surfaces and engaged with said container to secure said container in position on said inclined surfaces of said trough;

a hopper secured in said container in spaced relation above said open lower container end;

said hopper having an open lower end for discharging animal feed from said hopper;

said open lower end of said hopper spaced above said inclined surfaces;

dispersing means for dispersing the animal feed discharged from said hopper onto the inclined surfaces of said feeding trough;

said dispersing means comprising:

a motor positioned beneath said hopper open lower end and aligned therewith;

a battery for supplying power to said motor;

a support secured to said hopper for supporting said motor and said battery in said container;

a solar actuated source for charging said battery;

said motor having an upwardly extending rotatable shaft aligned with the open lower end of said hopper;

a plate on said shaft aligned with said hopper open lower end; and

conductor means for transmitting power from said solar actuated source to said battery for supplying power to said motor to rotate said shaft and plate whereby animal feed discharged through said hopper open lower end onto said plate is dispersed within said container to fall on said inclined surfaces of said trough.

5,463,981

STUFFED ANIMAL NURSING MOM

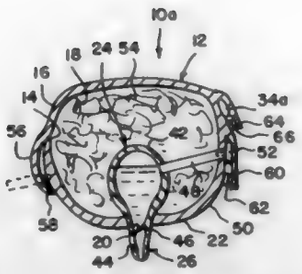
Kathleen Marcinke, 91 Newkirk Rd., Yonkers, N.Y. 10710; Maria Placente-Vitro, 96 Inwood Rd., Middletown, N.Y. 10940, and George Spector, 233 Broadway Rm 702, New York, N.Y. 10279

Filed Sep. 9, 1994, Ser. No. 303,722

Int. Cl.[6] A01K *9/00*

U.S. Cl. 119—71 **2 Claims**

1. A simulated animal nursing device which comprises:



a) a stuffed animal in a form and size to duplicate the actual mother, that will lie on its side upon a floor, said stuffed animal having an opening in a rear side, leading into an internal cavity with a plurality of apertures extending between the internal cavity and a bottom surface;

b) a plurality of nursing feeders positioned in inverted positions within the internal cavity wherein suckling portions of said feeders will extend through the apertures, so that newborn offsprings will have a nursing environment; wherein each said nursing feeder includes:

c) a collapsible container for holding nursing liquid therein;

d) a nipple integrally formed on said collapsible container, wherein said nipple is said suckling portion that extends through one aperture in said stuffed animal;

e) an internal flap valve within said nipple, which will open when the newborn offspring sucks on said nipple;

f) a filler tube extending between said collapsible container and a front side of said stuffed animal and

g) a filler cap to plug a free end of said filler tube at the front side of said stuffed animal.

5,463,982

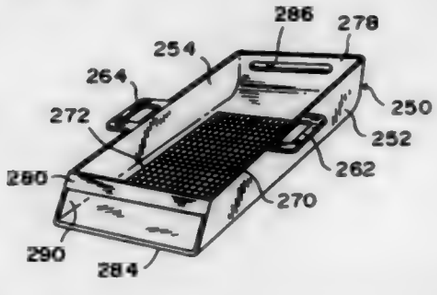
WASTE REMOVAL DEVICE

Edward J. Murphy, 3126 N. 81st St., Milwaukee, Wis. 53222

Filed Aug. 10, 1994, Ser. No. 288,933

Int. Cl.[6] A01K *29/00*

U.S. Cl. 119—166 **2 Claims**



1. A waste removal apparatus for removing animal waste from a mass of litter material, the apparatus comprising

a body member having two opposed spaced apart sides and an open end,

a bottom member interconnected between the two sides,

an end member interconnected between the two sides,

a reticulated structure in the bottom member,

an end of each side and an end of the bottom member defining the open end of the body member, the open end of the body member facilitating introduction of the apparatus into a mass of litter material,

the reticulated structure having openings sized so that the reticulated structure, upon removal from the mass of litter material, for retaining thereon waste-litter agglomerates while allowing non-agglomerated litter components to pass therethrough back into the mass of litter material,

an end support bar extending between the two sides at the open end of the body member,

the end support bar, two sides, and bottom member defining an end opening through which litter material can pass into the apparatus, and

at least one weight member attached to the body member to inhibit a tendency of the mass of litter material to push upwardly.

5,463,983

METHOD AND APPARATUS FOR TRANSPORTING LIVE FISH

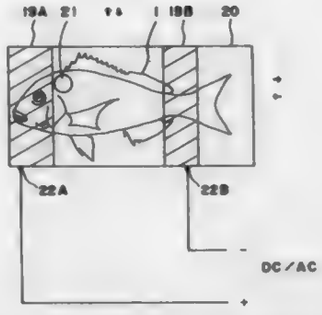
Yoshiaki Nagaura, 585-61, Ohaza-Futsukaichi, Chikushino-shi, Fukuoka-ken, Japan

Filed Oct. 1, 1993, Ser. No. 130,402

Claims priority, application Japan, Jan. 6, 1992, 4-319183; Jan. 6, 1992, 4-319184

Int. Cl.[6] A01K *63/02*

U.S. Cl. 119—203 **5 Claims**



5. A method of facilitating transportation of live fish to market, said fish having a spinal cord, comprising the step of cutting the spinal cord of the fish to immobilize said fish and thereafter maintaining the living state of said immobilized fish during transportation to market.

5,463,984

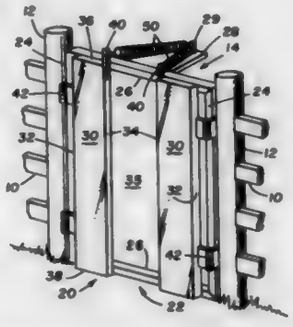
ONE WAY ANIMAL GATE

Leslie H. Hubbard, 480 Ashville Cir., Montevallo, Ala. 35115

Filed Aug. 29, 1994, Ser. No. 297,056

Int. Cl.[6] A61D *3/00;* **A01K** *29/00*

U.S. Cl. 119—840 **8 Claims**



1. A one way gate apparatus which permits passage of animals in one direction and prevents passage of animals in the opposite direction, said gate apparatus comprising:

a pair of spaced vertical support means including a pair of anchored posts for supporting a first upper, substantially horizontal bar therebetween;

a first generally rectangular door having first and second side edges, an upper edge and a lower edge;

first means for pivotally securing said first side edge of said first door to one of said pair of vertical support means;

a second generally rectangular door having first and second side edges, an upper edge and a lower edge;

second means for pivotally securing said first edge of said second door to the other of said pair of vertical support means;

said first and second doors being movable between closed and opened positions with a gap being positioned between said second side edges thereof when said doors are in their closed position, said gap defining a single unobstructed opening extending between said second sides of said first and second doors;

closure means for normally urging said first and second doors to their said closed positions, said closure means being secured between said doors and said first substantially horizontal member; and

said upper edge of said doors engageable with said first, upper substantially horizontal bar of said frame to prevent movement of said doors beyond their closed positions.

5,463,985

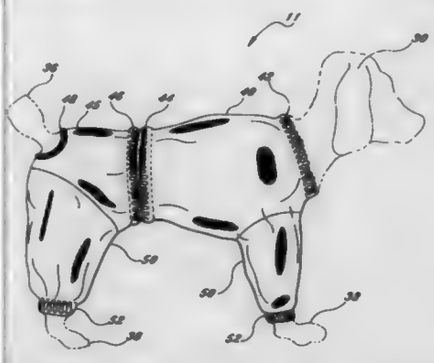
PROTECTIVE GARMENT FOR FEMALE CANINES

Stephanie A. Shover, 5231 NW. 53rd Ave., Coconut Creek, Fla. 33073

Continuation of Ser. No. 52,652, Apr. 26, 1993, abandoned. This application Jan. 23, 1995, Ser. No. 376,289

Int. Cl.[6] A01K *29/00;13/00*

U.S. Cl. 119—850 **4 Claims**



1. A garment for a canine or other animal, sized and shaped to fit around the body and legs of an animal, comprising:

a body encircling portion for completely covering the animal's torso or body;

a rear portion for completely covering the animal's rear torso, said rear portion being adjacent to and abutting said body encircling portion when both said rear and body portions are worn;

a plurality of leg portions coupled to said body encircling portion and coupled to said rear portion for covering the animal's front legs and back legs, respectively;

said body-encircling portion including a neck aperture and a first waist aperture, said rear portion including a second waist aperture and a tail aperture, wherein said second waist aperture of said rear portion and said first waist aperture of said body encircling portion are adjacent at the waist when said portions are worn;

said plurality of leg portions each including a paw aperture;

a neck securing means coupled to said neck aperture of said body encircling portion for securing said garment to the animal's neck;

a waist securing means coupled to said first waist aperture of said body encircling portion for securing said body portion to the animal's waist;

a waist securing means coupled to said second waist aperture of said rear portion for securing said rear portion to the waist of the animal; and

a leg securing means coupled to said paw apertures for securing said plurality of leg portions to the animal's legs.

5,463,986

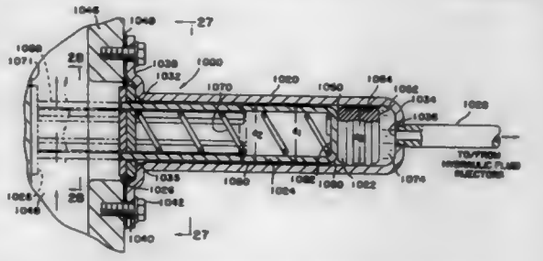
HYDRAULICALLY OPERATED RESTRICTOR/SHUTOFF FLOW CONTROL VALVE

Thomas J. Hollis, 5 Roxbury Dr., Medford, N.J. 08055

Filed Sep. 14, 1994, Ser. No. 306,281

Int. Cl.[6] F01P *7/14*

U.S. Cl. 123—41.1 **11 Claims**



1. A valve apparatus for controlling fluid flow comprising

(a) a housing;

(b) a piston member which reciprocates within the housing between a first position and a second position, the piston member including a piston shaft having a longitudinal axis, the piston shaft including

(i) a proximal portion which recesses into the housing when the piston member is in the first position and extends out of the housing when the piston member is in the second position, the proximal portion including a plurality of apertures formed therethrough, the apertures allowing a restricted flow of fluid to flow through the piston shaft in a direction perpendicular to the longitudinal axis of the shaft when the piston member is in the second position, and

(ii) a rear surface for receiving pressure thereagainst, the pressure causing the piston member to extend out of the housing; and

(c) a biasing member for biasing the piston member towards the first position as a result of a biasing force.

5,463,987

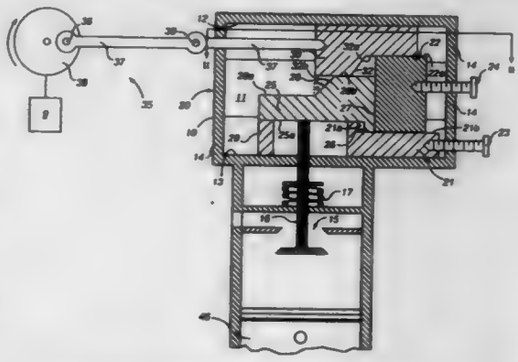
VARIABLE VALVE TIMING MECHANISM

Mark S. Cukovich, 335 Beacon Rd., Renfrow, Pa. 16053

Filed Jul. 13, 1994, Ser. No. 274,309

Int. Cl.[6] F01L *13/00*

U.S. Cl. 123—90.15 **23 Claims**



1. A variable valve timing mechanism for controlling at least one biased valve comprising

a. a guide assembly having a mounting surface and a spaced apart upper guide surface, said assembly including spaced apart longitudinal guides,

b. a closing stop positioned on said mounting surface and having a stop surface;

c. an opening stop positioned on said guide assembly and having a stop surface;

d. a valve activator movably positioned within said guide assembly and in operable contact with said biased valve, said valve

activator having first and second stop surfaces to contact a respective closing stop and opening stop, and an angled contact surface positioned thereon;

e. a drive ram movably positioned within said guide assembly and in contact with said upper guide surface and said valve activator, said drive ram having an angled drive surface positioned for contacting said contact surface of said valve activator, and

f. a drive connected to said drive ram for imparting reciprocating motion thereto, said drive being synchronized with the operation of said valve.

5,463,988

VALVE ACTUATING MECHANISM FOR AN INTERNAL COMBUSTION ENGINE

Michael Paul, Bad Friedrichshall, Germany, assignor to Audi AG, Ingolstadt, Germany

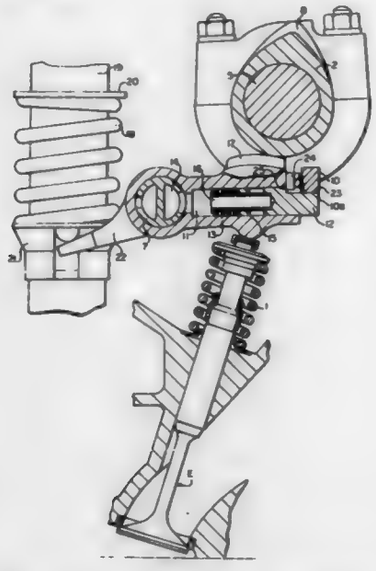
PCT No. PCT/EP93/00822, § 371 Date Oct. 13, 1994, § 102(e) Date Oct. 13, 1994, PCT Pub. No. WO93/21427, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 2, 1993, Ser. No. 318,757

Claims priority, application Germany, Apr. 16, 1992, 42 12 844.7

Int. Cl.[6] F01L *1/12;1/18;1/26*

U.S. Cl. 123—90.16 **4 Claims**



1. A valve actuating mechanism for an internal combustion engine including:

at least two inlet valves (E) per cylinder;

a first set of rocker arms (**6**) and a common shaft (**7**) for rotatively supporting said first set of rocker arms, a camshaft (**5**) including first cams (**2**, **3**, or **4**) and wherein each of said rocker arms of said first set operates in conjunction with an inlet valve and a first cam for a first engine speed range;

a second set of rocker arms (**9**) each of which is mounted between two adjacent rocker arms of said first set (**6**), said common shaft (**7**) rotatively supporting said rocker arms of said second set, second cams (**8**), and wherein each of said rocker arms of said second set operates in conjunction with said second cams for a second engine speed range;

a spring (**18**) for maintaining said second set of rocker arms against said second cams (**8**);

pistons (**12**) for coupling said first set of rocker arms to said second set of rocker arms in said second engine speed range;

said first set of rocker arms including a plurality of bores (**11**) for accommodating said pistons, said bores extending radially to said common shaft and said pistons being movable outward in said bores by oil pressure, and springs (**13**) for opposing said outward movement of said pistons;

said second set of rocker arms including free ends, and a crosspiece (**10**) for connecting together said free ends, said first set of rocker arms including free ends and said crosspiece being positioned in front of said first rocker arm free ends; and

said crosspiece including a flat bottom (**10***a*) for cooperating with said pistons when said pistons are displaced outward.

5,463,989

REINFORCED CYLINDER HEAD

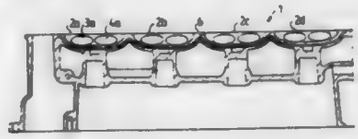
Lars Sääf, Södertälje, and Sven E. Stenfors, Enskede, both of, Sweden, assignors to Saab Automobile Aktiebolag, Sweden

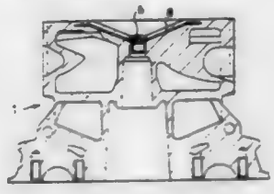
Filed Dec. 14, 1994, Ser. No. 355,674

Claims priority, application Sweden, Dec. 16, 1993, 930179

Int. Cl.[6] F02F *1/26*

U.S. Cl. 123—193.5 **14 Claims**





1. A multicylinder cylinder head for an internal combustion engine, wherein the cylinder head is comprised of a light metal, and combustion chambers in the cylinder head which are arranged in a pathway along the cylinder head;

a longitudinally extending reinforcing element extending along the cylinder head along the pathway of the combustion chambers, the reinforcing element being imbedded in the metal of the cylinder head and being of a mechanically stronger material than the light metal of the cylinder head.

5,463,990

OUTBOARD MOTOR WITH FOUR-STROKE ENGINE AND EXHAUST GAS DISCHARGE SYSTEM THEREFOR

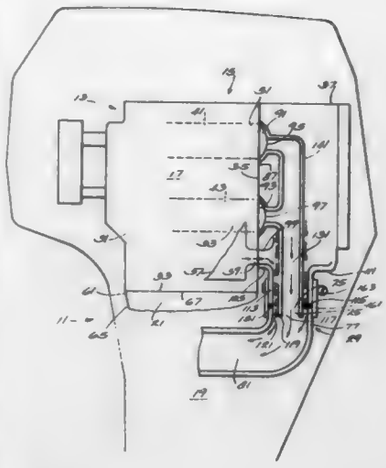
William B. Rush, II, Antioch; Martin J. Mondek, Wonder Lake, both of Ill.; Donald K. Sullivan, Ridgeland, S.C.; Mark A. Walter, Round Lake Beach, and Lawrence E. Zdanowicz, Sr., Waukegan, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 5, 1994, Ser. No. 318,368

Int. Cl.[6] F02F *7/00*

U.S. Cl. 123—195 P **18 Claims**

1. An outboard motor comprising a cylinder block including a lower horizontal drive shaft housing mounting surface, and a cylinder head mounting surface extending upwardly from said drive shaft housing mounting surface, a drive shaft housing including a peripheral outer surface including an upper end, a cylinder block mounting surface at said upper end, and a portion extending rearwardly from said cylinder block mounting surface and having therein a vertically open bore located forwardly of said outer surface, and a cylinder head comprising a cylinder block mounting surface fixed to said cylinder head mounting surface and including vertically spaced first and second recesses adapted to respectively form portions of first and second combustion chambers and respectively including first and second exhaust ports, a bottom surface extending transversely rearwardly from said cylinder block mount-



ing surface of said cylinder head, a projection extending downwardly from said bottom surface and into said bore, and including an end surface having therein an exhaust gas outlet, and an internal exhaust passage extending between said exhaust ports and said exhaust gas outlet.

5,463,991

CYLINDER HEAD THREADED CONNECTION ARRANGEMENT

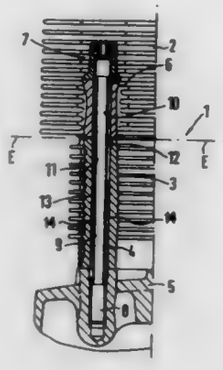
Peter Krotky, Simmozheim; Markus Bauhofer, Weissach, and Walter Heinzelmann, Reutlingen, all of, Germany, assignors to Ing. h.c.F. Porsche A G, Weissach, Germany

Filed Jul. 25, 1994, Ser. No. 279,649

Claims priority, application Germany, Jul. 23, 1993, 43 24 790.3

Int. Cl.[6] F02F *1/00*

U.S. Cl. 123—195 R **9 Claims**



1. Cylinder head bolted connection of an internal combustion engine, comprising:

cylinder head bolts designed as tie rods and including:

a head section,

a threaded section, and

a shaft section extending between said head section and threaded section,

said shaft section being disposed in use leaving an annular gap between the shaft section and engine housing walls,

and heat conducting material placed in the annular gap in direct contact with the shaft section and the housing walls,

wherein the heat-conducting material is a wire knit placed in the annular gap as a material that, under radial pressure, abuts the shaft section and the housing walls.

5,463,992

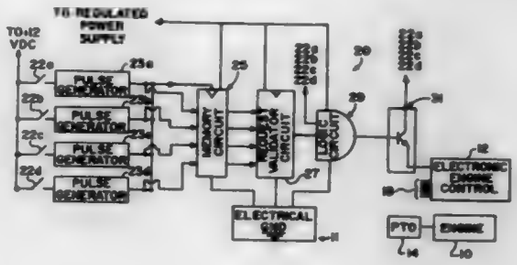
ELECTRONIC INTERLOCK FOR MULTIPLE PTO ENABLE SWITCHES

Eric T. Swenson, Fort Wayne, Ind.; Riley A. Thomas, III, Oakbrook Terrace, Ill.; Ronald L. Blanchard, and Brian P. Marshall, both of Fort Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Feb. 21, 1995, Ser. No. 395,370

Int. Cl.[6] F02B *77/00*

U.S. Cl. 123—198 R **18 Claims**



1. In an internal combustion engine comprising an electronic engine control for controlling various operational functions of the engine, plural control-enabling devices that are individually actuable for enabling one operational function of the engine to occur, and an interlock circuit for operatively coupling said control-enabling devices with said electronic engine control such that when one of said control-enabling devices has been actuated to enable that one operational function to occur, subsequent actuation of any of the remainder of said control-enabling devices terminates the enablement of that one operational function, the improvement in said interlock circuit which comprises:

A) memory circuit means having plural inputs and respective plural outputs and comprising memory for giving and maintaining an output signal at a respective output whenever an input signal is received at the respective input;

B) plural input circuits respectively operatively coupling respective ones of said control-enabling devices with respective ones of said inputs of said memory circuit means for providing respective input signals to respective ones of said inputs;

C) validation circuit means having plural inputs and an output means and comprising means for giving a validation signal at said output means only in response to any one of plural valid combinations of input signals to said validation circuit means' inputs;

D) plural coupling circuits respectively operatively coupling respective outputs of said memory circuit means with respective inputs of said validation circuit means for supplying respective output signals of said memory circuit means to respective inputs of said validation circuit means;

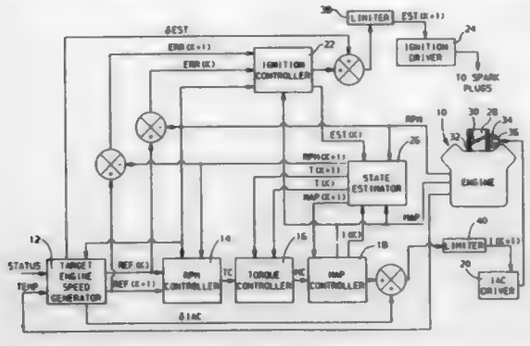
E) said validation circuit means comprising means for giving a validation signal at its output means in response to a first-to-be-actuated of said control-enabling devices and means for terminating the validation signal in response to a second-to-be-actuated of said control-enabling devices; and

F) means operatively coupling said output means of said validation circuit means with said electronic engine control for enabling that one operational function of the engine to occur when the validation signal is given and for terminating the enablement of that one operational function when the validation signal is terminated.

5,463,993
ENGINE SPEED CONTROL

Mikhail Livshits, Southfield; David J. Sanvido, Novi, and Charles H. Folkerts, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 28, 1994, Ser. No. 202,962
Int. Cl.[6] F02D *41/16;43/00*
U.S. Cl. 123—339.2 **11 Claims**



1. An internal combustion engine speed control system having a plurality of compensation loops arranged in a nested loop configuration, each of the plurality being dedicated to exclusively compensating at least one corresponding engine process, comprising:

an outside compensation loop responsive to an engine speed error to generate a desired engine torque to mitigate the engine speed error and to compensate for delays associated with engine rotation dynamics, wherein the engine speed error includes a present engine speed error and a future engine speed error, wherein the present engine speed error is generated as a difference between a measured present engine speed and a predetermined desired present engine speed, and wherein the future engine speed error is generated as a difference between a predicted engine speed and a predetermined desired future engine speed;

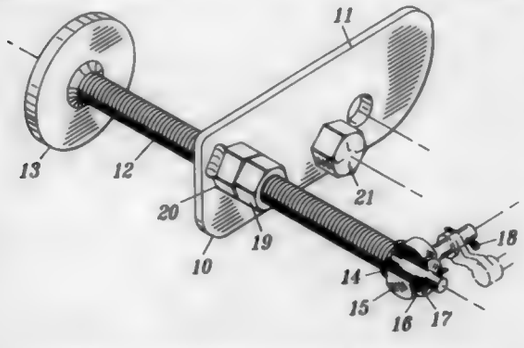
desired pressure generating means for generating a desired engine intake manifold pressure in response to the desired engine torque; and

an inside compensation loop nested within the outside compensation loop for generating at least one actuator command in response to a pressure difference between the desired engine intake manifold pressure and a predicted engine intake manifold pressure to mitigate the difference and to compensate for delays associated with engine intake manifold filling.

5,463,994
ENGINE CONTROL DEVICE

Lorance T. Underwood, P.O. Box 444, New Harmony, Ind. 47621

Filed Mar. 3, 1994, Ser. No. 205,075
Int. Cl.[6] F02D *7/00*
U.S. Cl. 123—398 **1 Claim**



1. An engine control device comprising in combination:

a bracket assembly with provisions for mounting to an engine and capable of holding a threaded rod with a freely rotating swivel-arm assembly;

a threaded rod assembly equipped with a turning means to provide longitudinal adjustment with respect to said bracket assembly holding the threaded rod assembly;

a means for locking said threaded rod assembly into a predetermined longitudinal position;

a swivel arm on one end of said threaded rod assembly, freely rotatable in a plane perpendicular to a central axis of said threaded rod assembly;

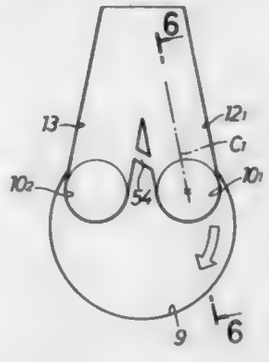
a means for securing said swivel-arm assembly onto said threaded rod assembly;

a means for securing a junction of said swivel-arm assembly rod to an engine throttle arm to provide control of said engine throttle arm such that the engine throttle arm can be held in a predetermined position required for a predetermined constant engine speed.

5,463,995
INTAKE SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hisao Sakai; Hiroo Shimada; Hiroshi Sono; Kenichi Nagahiro; Narutoshi Sugita; Hirotsugu Maeda; Masakatsu Miyao; Katsunori Nakamura; Yasunori Ogita, and Osamu Suzuki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1994, Ser. No. 181,744
Claims priority, application Japan, Jan. 22, 1993, 5-008937; Jun. 14, 1993, 5-141684
Int. Cl.[6] F02B *15/00*
U.S. Cl. 123—432 **31 Claims**



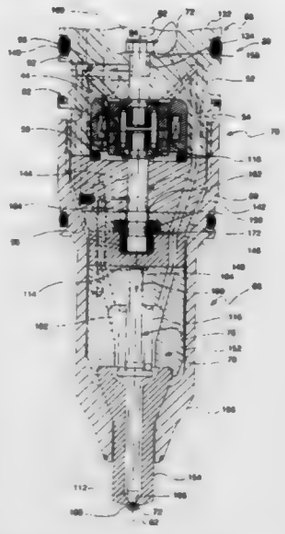
1. An intake system for an internal combustion engine, comprising first and second intake valve bores provided to face a combustion chamber and to be independently opened and closed by first and second intake valves, and first and second intake ports which are respectively connected to the first and second intake valve bores with a partition wall interposed therebetween and which communicate with a common intake passage, in which, in a particular operation range of the engine, an imbalance is produced in a concentration of an air-fuel mixture flowing through said first and second intake valve bores into the combustion chamber on the basis of a difference between the amounts of fresh air flowing into the first and second intake ports, wherein said system further includes a communication hole provided in the partition wall for putting the first and second intake ports into communication with each other, and where said communication hole is formed such that an area opening into the intake port where the concentration of the air-fuel mixture is higher in the particular operating range of the engine is larger than an area opening into the intake port where the concentration of the air-fuel mixture is lower.

5,463,996

HYDRAULICALLY-ACTUATED FLUID INJECTOR HAVING PRE-INJECTION PRESSURIZABLE FLUID STORAGE CHAMBER AND DIRECT-OPERATED CHECK

Dale C. Maley, Fairbury, and Ronald D. Shinogle, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jul. 29, 1994, Ser. No. 283,232
Int. Cl.[6] F02M 37/04;47/02
U.S. Cl. 123—446 20 Claims



1. A hydraulically-actuated electronically-controlled unit fluid injector comprising:

a housing portion defining a fluid control passage and a fluid storage chamber;

a first pressure control valve operable to selectively open and close fluid communication between the storage chamber and the control passage;

a nozzle portion defining a pressure control chamber and at least one fluid injection orifice;

a hydraulically-actuated fluid pressurization member selectively movable between a first position and a second position, when the first valve is opened said member operable during movement from its first to second positions for displacing fluid from the storage chamber to the control passage, when the first valve is closed said member operable during movement from its first to second positions for displacing fluid in the storage chamber thereby pressurizing such fluid to a selected pressure;

a movable direct-operated check operable to selectively close and open fluid communication between the storage chamber and the fluid injection orifice, said check having a first end portion and a second end portion, said first end portion defining a first effective area arranged in partial fluid communication with the storage chamber when the check is closed, said first effective area arranged in complete fluid communication with the storage chamber when the check is opened, said second end portion defining a second effective area arranged in fluid communication with the pressure control chamber; and

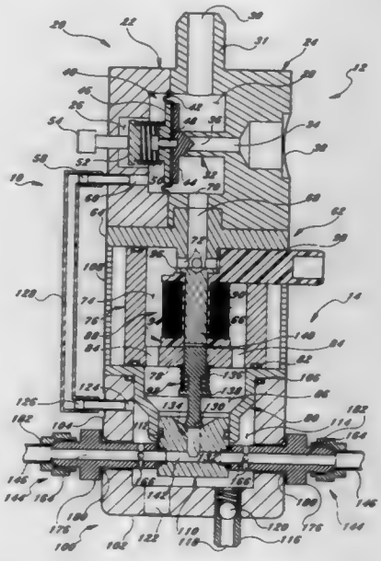
a second pressure control valve selectively movable between a first position and a second position, said second valve at its first position closing fluid communication between the pressure control chamber and the control passage and opening fluid communication between the pressure control chamber and the storage chamber, said second valve at its second position opening fluid communication between the pressure control chamber and the control passage and closing fluid communication between the pressure control chamber and the storage chamber, when the check is closed and the second valve is at its second position said first and second effective areas are operable for hydraulically opening the check, when the check is opened and the second valve is at its first position said first and second effective areas are operable for balancing opposing hydraulic forces acting on such effective areas.

5,463,997

SINGLE POINT FUEL INJECTION SYSTEM

David K. Cutler, Plantation, Fla., assignor to Cutler Induction Systems, Inc., North Miami Beach, Fla.

Filed Oct. 5, 1994, Ser. No. 318,279
Int. Cl.[6] F02M 51/06;25/00
U.S. Cl. 123—460 34 Claims



1. Apparatus for supplying an air-fuel mixture to the cylinders of an internal combustion engine, comprising:

an injector base formed with a bottom wall and a sidewall defining a hollow interior;

a fuel distribution block supported within said hollow interior of said injector base in position to form an air chamber on one side thereof and a fuel cavity on the opposite side thereof which is adapted to communicate with a source of fuel, said fuel distribution block being formed with a bore and a number of distribution passages connected to said bore;

a valve, carried at least partially within said fuel cavity, which is movable between an open position and a closed position with respect to said bore in said fuel distribution block;

a number of air-fuel nozzles each formed with a throughbore having an inlet and at least one air inlet port which intersects said throughbore, each of said air-fuel nozzles being mounted to said injector base so that said inlet of said throughbore thereof is connected to one of said distribution passages and said at least one air inlet port thereof is positioned within said air chamber, said distribution passages of said fuel distribution block each transmitting fuel into said throughbore of one of said air-fuel nozzles connected thereto wherein said fuel is intermixed with air entering said throughbore from said at least one air inlet port to form an air-fuel mixture.

5,463,998

METHOD AND ARRANGEMENT FOR CHECKING THE OPERABILITY OF A TANK-VENTING SYSTEM

Helmut Denz, Stuttgart, and Andreas Blumenstock, Ludwigsburg, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

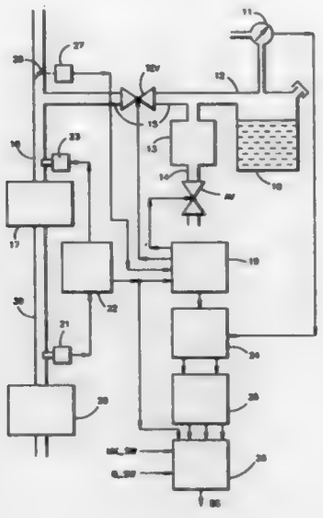
PCT No. PCT/DE93/00019, § 371 Date Oct. 4, 1993, § 102(e) Date Oct. 4, 1993, PCT Pub. No. WO93/15313, PCT Pub. Date Aug. 5, 1995

PCT Filed Jan. 14, 1993, Ser. No. 129,039

Claims priority, application Germany, Feb. 4, 1992, 42 03 100.1

Int. Cl.[6] F02M *33/02*

U.S. Cl. 123—520 **8 Claims**



1. A method for checking the operability of a tank-venting system in a vehicle having an internal combustion engine, the tank-venting system including a tank with a tank-pressure sensor, an adsorption filter connected to the tank via a tank-connecting line, and a tank-venting valve which is connected to the adsorption filter via a valve line, in which system the adsorption filter has a venting line which can be closed by means of a shut-off valve, the method comprising the steps of:

closing the shut-off valve;

opening the tank-venting valve;

determining a build-up gradient (ṗ+) of the underpressure building up in the tank;

closing the tank-venting valve;

determining a decay gradient (ṗ−) of the decaying underpressure in the tank;

mathematically combining the build-up and decay gradients so as to cause the fill level to have as little effect as possible on the evaluation variable (Q) formed by means of the combination; and,

comparing the value of the evaluation variable to a threshold value (Q_SW) and determining the system as non-operative if the value of the evaluation variable and the threshold value satisfy a pregiven relationship.

5,463,999

IGNITION COIL UNIT FOR AN INTERNAL COMBUSTION ENGINE AND MANUFACTURING METHOD OF THE SAME

Masaaki Taruya, and Mitsuru Koiwa, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

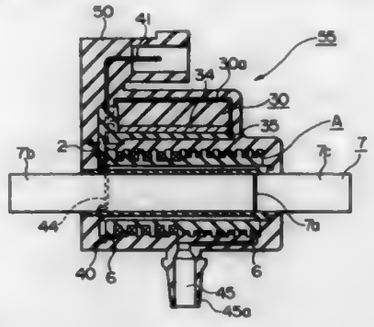
Filed Aug. 18, 1993, Ser. No. 107,571

Claims priority, application Japan, Aug. 21, 1992, 4-222809

Int. Cl.[6] F02P *3/00*

U.S. Cl. 123—647 **10 Claims**

1. An ignition coil unit for an internal combustion engine,



comprising:

a coil assembly having an ignition coil, a power switch circuit having a plurality of electric and electronic components therein for interrupting an electric current flowing through said ignition coil, and a terminal conductor for electrically connecting said coil assembly to an external circuit; and

an electrically insulating transfer-molded resin disposed around said coil assembly, said resin establishing a single outer casing for supporting and hermetically sealing therein said coil assembly.

5,464,000

FUEL CONTROLLER WITH AN ADAPTIVE ADDER

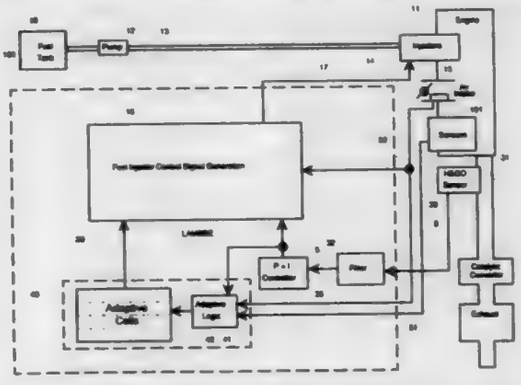
Ross D. Pursifull, Dearborn, and Allan J. Kotwicki, Sterling Heights, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 6, 1993, Ser. No. 132,419

Int. Cl.[6] F02D *41/14*

U.S. Cl. 123—674 **5 Claims**

1. The method of controlling the amount of fuel supplied to the



fuel intake of an internal combustion engine, the method comprising, in combination, the steps of:

during a closed loop method of operation, when the engine is subjected to a load greater than an idling load, detecting the angular velocity of said engine and the air mass flow rate into said engine, detecting the exhaust gas composition of the combustion products exhausted by said engine, generating an air/fuel signal from said detected exhaust gas composition,

comparing said air/fuel signal against a predetermined range, altering a correction term corresponding to said detected angular velocity and said air mass flow rate if said air/fuel signal is outside of said predetermined range, and storing said correction term in a memory which contains a plurality of correction terms indexed by angular velocity and mass air flow rate;

during at least said closed loop method of operation, when the engine is subjected to a load greater than an idling load, generating a nominal fuel injection pulsewidth as a function of said air/fuel signal, said detected angular velocity and said mass flow rate of air, generating a fuel correction factor corresponding to said detected angular velocity and said mass air flow rate, by retrieving one of said correction terms which corresponds to said angular velocity and mass air flow rate, and if a correction term corresponding to said angular velocity and mass air flow rate is not stored in said memory, then generating said fuel correction factor by interpolating said fuel correction factor from a correction term stored in the memory, said generated fuel correction factor related to said nominal fuel injection pulsewidth by an affine relationship; and

generating a fuel injection value which controls the amount of fuel supplied to the fuel intake of the engine by adding said correction factor to said nominal fuel injection pulsewidth.

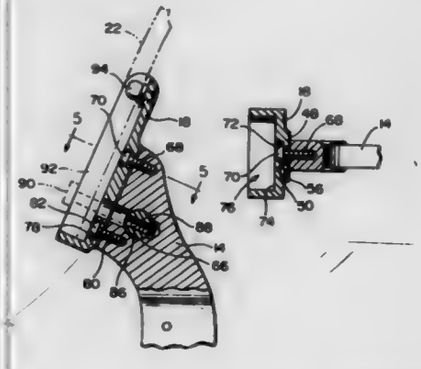
5,464,001

ADJUSTABLE COMPOUND BOW

Kenneth Peck, 1895 Jumpoff Joe Cr. Rd., Grants Pass, Oreg. 97526

Filed Dec. 17, 1993, Ser. No. 168,128
Int. Cl.[6] F41B *5/00*
U.S. Cl. 124—25.6 **12 Claims**

1. A compound bow comprising:



a handle portion having opposite ends and a longitudinal axis, two bow limbs, and

adjustment means connecting said two bow limbs to said opposite ends of said handle portion for lateral adjustable movement of said two bow limbs in a direction perpendicular to said longitudinal axis of said handle portion,

said adjustment means including complementary shaped grooves and serrations extending parallel to said longitudinal axis of said handle portion and located on said opposite ends of said handle portion and on two bow limb pockets secured to said opposite ends of said handle portion,

an end of each of said two bow limbs being secured in a respective one of said two bow limb pockets.

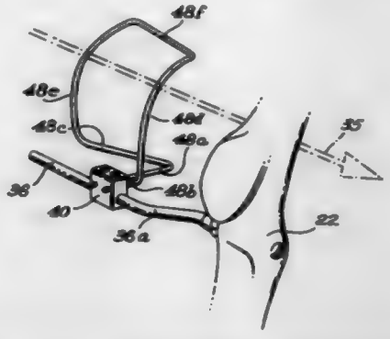
5,464,002

ARCHERY ARMGUARD DEVICE

Camillen Lavole, 582 Chemin des Voyageurs, and Pierre Hervieux, 561 du Progrés, both of St-Philippe, Canada

Filed Aug. 30, 1994, Ser. No. 298,166
Int. Cl.[6] F41B *5/14*
U.S. Cl. 124—86 **10 Claims**

1. An armguard device for use with an archer's compound bow,



the compound bow of the type including an arcuate frame tensioning a bowstring and from which transversely projects an elongated, elbowed stabilizer shaft, said armguard device consisting of:

(a) a slider member, slidingly engageable with said stabilizer shaft for lengthwise displacement therealong;

(b) first anchoring means, for releasably anchoring said slider member along said stabilizer shaft;

(c) a rigid shield member, for engaging the archer's forearm and for shielding same against bowstring release whiplash; and

(d) second anchoring means, for anchoring said shield member to said slider member, whereby a laterally offset positioning of the shield member is achieved relative to the stabilizer shaft, to slightly offset the shield member from the bowstring pathway to allow unhindered release thereof;

wherein the distance between said shield member and said bow frame is adjustable by displacing said slider member along said stabilizer shaft, to fit the arms of archers of different heights.

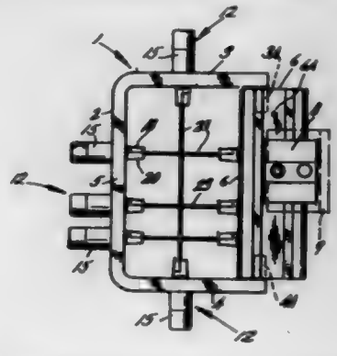
5,464,003

CROSSHAIR SUPPORT MEMBER FOR AN ARCHERY SIGHT

James R. Sherman, 710 B. Linden Ave., Lewiston, Id. 83501

Filed Feb. 7, 1994, Ser. No. 192,541
Int. Cl.[6] F41G *1/467*
U.S. Cl. 124—87 **6 Claims**

1. A crosshair support member for attaching a crosshair to a



sight having a ribbon shaped crosshair, the crosshair support member comprising,

a main body,

biasing means on said main body and engageable with said sight,

first and second crosshair grips spaced from each other to receive an end segment of a crosshair therebetween,

hinge means integral with each of said grips and said main body, and

surfaces on said grips each for biased contact with the sight, said surfaces when biased by said biasing means moving said grips about said hinge means toward one another to grip the end segment of the crosshair.

5,464,004

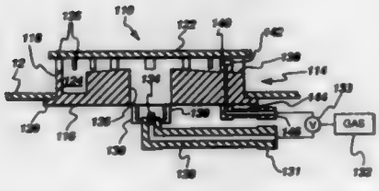
ATMOSPHERIC GAS BURNER HAVING DIFFUSION PILOT FOR IMPROVED DYNAMIC STABILITY

James R. Maughan, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 25, 1994, Ser. No. 217,833

Int. Cl.[6] F24C *3/00*

U.S. Cl. 126—39 E **18 Claims**



1. A gas burner assembly for connection to a source of gas, said gas burner assembly comprising:

a burner body having a plurality of primary burner ports formed therein;

first means joinable to said gas source for channeling primary gas to said primary burner ports;

a pilot port formed in said burner body adjacent to said primary ports for providing a reignition source therefor; and

second means joinable to said gas source for directly channeling secondary gas to said pilot port independently of said primary gas being channeled to said primary ports.

18. A method of reducing flame instability in a gas burner assembly having a plurality of burner ports and a pilot port, said method comprising:

independently channeling gas to said pilot port and to said plurality of burner ports; and

producing a pressure drop across said pilot port which is higher than the pressure drop across said burner ports.

5,464,005

STOVE

Zadok Mizrahi, 52 Samech Heh Street, Kfar Shalem, Israel

Filed Apr. 30, 1993, Ser. No. 55,704

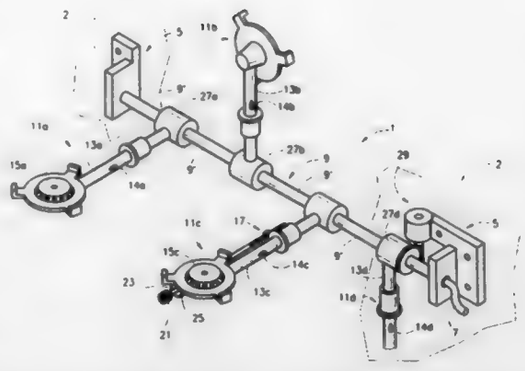
Int. Cl.[6] F24C *3/00*

U.S. Cl. 126—39 R **10 Claims**

1. In a domestic cooking stove, a gas burner assembly comprising:

a rigid gas conduit base pipe member for mounting onto a fixed object, said base pipe member having a longitudinal bore formed therein with one end connecting to a gas supply line and a transverse bore extending between said longitudinal bore and an exterior surface of said base pipe;

a collar member mounted on said base pipe member for axial pivoting thereabout;



at least one gas burner unit mounted on said collar member;

said collar member having a transverse bore with first and second ends, said first end adapted to communicate with said gas burner and said second end adapted for alignment with said transverse bore of said base pipe member when the burner unit is disposed horizontally and for unalignment when said gas burner unit is disposed vertically; and

a regulator associated with the gas burner unit for controlling the flow of gas to the burner unit from the gas conduit base pipe.

5,464,006

WATER HEATER

Konstantin Ledjeff, Bad Krozingen; Alexander Schuler, Freiburg, and Jurgen Gieshoff, Reute, all of, Germany, assignors to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V., Munich, Germany

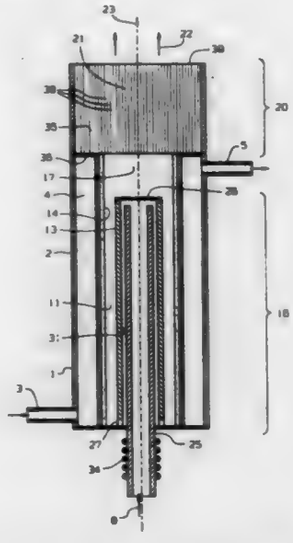
PCT No. PCT/DE93/00079, § 371 Date Jun. 30, 1994, § 102(e) Date Jun. 30, 1994, PCT Pub. No. WO93/16335, PCT Pub. Date Aug. 19, 1993

PCT Filed Jan. 27, 1993, Ser. No. 256,305

Claims priority, application Germany, Feb. 13, 1992, 42 04 320.4

Int. Cl.[6] F24H *1/12*

U.S. Cl. 126—361 **12 Claims**



1. A water heater with a gas inlet for a fuel gas/air mixture, said fuel gas in said fuel gas/air mixture having a flashback velocity, an inlet for a fluid to be heated, at least two combustion stages which are adapted to be traversed by the fuel gas/air mixture, each said combustion stage having a catalytic combustion chamber, a first said combustion chamber encircled by a fluid chamber, said fluid chamber adapted to be traversed by a said fluid, an exhaust gas

heat exchanger for exchanging heat between said fluid and exhaust gas escaping from said first combustion chamber, the second combustion stage defining a monolithic burner, the first combustion chamber defining a catalytic gap burner and including a combustion gap which is traversed by the fuel gas/air mixture, said first combustion chamber defined by a first wall which is lined with a ceramic layer on the side adjacent the fluid chamber, a second wall defining said first combustion chamber and coated with a catalytic coating the width of said combustion gap selected so that the flashback velocity of the fuel gas is lower than the flow velocity of the fuel gas/air mixture traversing said first combustion chamber.

5,464,007

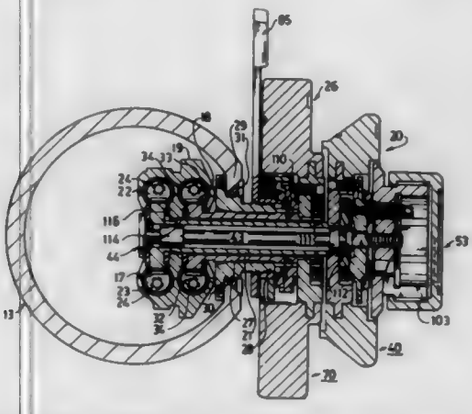
FLUID INSENSITIVE BRAKING FOR AN ENDOSCOPE

Allan I. Krauter, Syracuse; Robert L. Vivenzio, Auburn, and Michael P. Keboskie, Jordan, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Feb. 23, 1994, Ser. No. 200,383

Int. Cl.[6] A61B *1/00*

U.S. Cl. 600—144 **25 Claims**



1. A steering mechanism for a flexible insertion tube of an endoscope having an articulation section at its distal end and deflection cable means extending from the distal end to a proximal end thereof, said steering mechanism comprising;

a control housing operatively connected to the proximal end of said insertion tube;

a control wheel mounted for rotation on the exterior of said control housing;

connecting means for coupling said control wheel to a deflection cable for articulating the distal end of said insertion tube;

brake means movably mounted adjacent to said control wheel;

actuating means for moving the brake means between a first position wherein the brake means is out of engagement with said control wheel and a second position wherein said brake means is in braking engagement with said control wheel

coacting means in the control wheel and the brake means for rotationally incrementing said control wheel when the brake means is in said second position, and

biasing means for applying force against the brake means when said brake means is in said second position for applying a holding force against the control wheel.

5,464,008

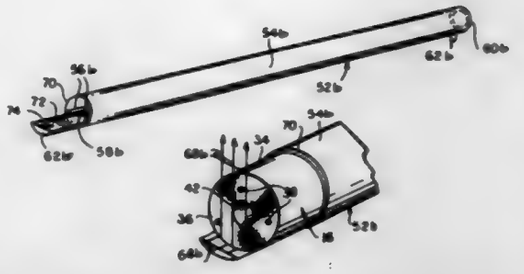
LAPAROSCOPE DEFOGGING

John H. Kim, 7411 Meandor Dr., Rockford, Ill. 61107

Filed Apr. 14, 1994, Ser. No. 227,388

Int. Cl.[6] A61B *1/00*

U.S. Cl. 600—157 **5 Claims**



1. The combination comprising a laparoscope having a predetermined length and a predetermined transverse dimension with an objective end having an objective lens and further having a remote viewing end, and an insufflator supplying an insufflating gas under pressure, a laparoscope defogger comprising a body, means for securing said body snugly against said laparoscope exteriorly thereof, said laparoscope defogger having a gas flow channel extending along said laparoscope in the direction of said objective end lens, means for connecting said gas flow channel to said insufflator for receiving insufflating gas under pressure therefrom, and means on said defogger body for directing insufflating gas from said flow channel across the objective lens of said laparoscope for defogging said objective lens, and further including means spacing said body transversely of said laparoscope and providing said gas flow channel, a pair of elongated spacers spacing said body eccentrically about said laparoscope with said gas flow channel being defined by said body, said pair of spacers, and said laparoscope.

5,464,009

VALVE FOR USE IN BREATHING APPARATUS

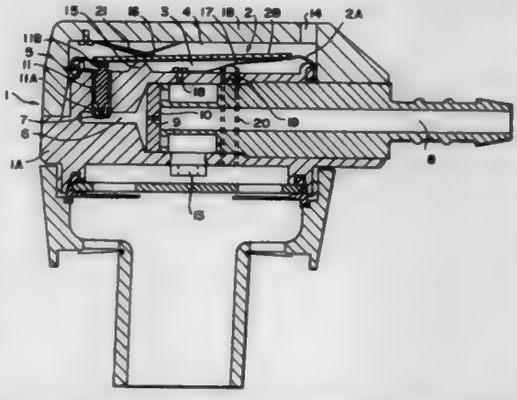
Andrew R. T. Tatarek-Gintowt, Aldershot, England, assignor to Sabre Safety Limited, Aldershot, England

Filed Feb. 1, 1994, Ser. No. 189,609

Claims priority, application United Kingdom, Feb. 1, 1993, 9301959

Int. Cl.[6] A62B *9/02*

U.S. Cl. 128—205.24 **18 Claims**



1. A valve for use in breathing apparatus comprising a housing, a diaphragm, having a center of gravity, mounted within the housing and, together with the housing, defining a first chamber on one side of the diaphragm and a second chamber on an opposing side of the diaphragm, a gas inlet to the first chamber, a gas outlet from the first chamber, vent means in the housing connecting the second chamber to ambient atmosphere, pivot means in the first chamber for engaging the diaphragm on a pivot axis between the center of gravity of the diaphragm and the gas inlet, first spring means mounted to the housing within the second chamber and extending into engagement with the opposing side of the diaphragm to the pivot means and applying to the diaphragm a force directed toward the pivot axis to maintain the diaphragm in engagement with the pivot means, and further spring means mounted to the housing and extending into the first chamber into

contact with the diaphragm at a position opposite the pivot means to the gas inlet and urging the diaphragm to pivot so that part of the diaphragm on the same side of the pivot means as the gas inlet is moved in a direction to close the gas inlet whereby the gas inlet is closed by the diaphragm at a pressure below atmospheric pressure.

5,464,010

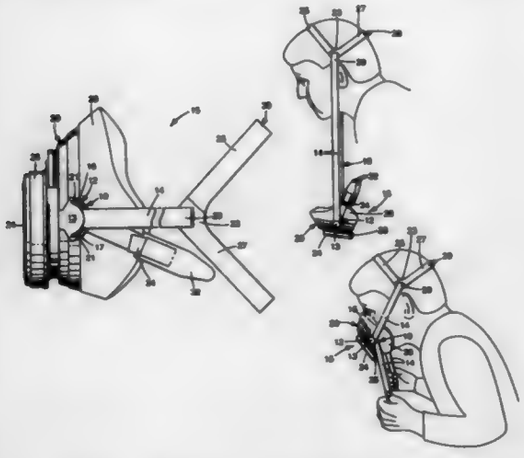
CONVENIENT "DROP-DOWN" RESPIRATOR HARNESS STRUCTURE AND METHOD OF USE

David C. Byram, River Falls, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 15, 1993, Ser. No. 121,697

Int. Cl.[6] A62B *18/08;19/00;* **A44B** *1/04;* **A42B** *3/00*

U.S. Cl. 128—207.11 **20 Claims**



18. A method of placing a respirator body having at least one flexible, substantially flat strap, a crown member adapted to pass over the head of a wearer, and at last one connecting element comprising a curved and elongated slot, wherein said curved and elongated slot has a size that frictionally engages said at least one strap upon insertion of said at least one strap into said curved and elongated slot, and wherein said respirator body, said at least one strap, said at least one connecting element, and said crown member form an assembly, in a desired position on a wearer, the method comprising the steps of:

placing said crown member over the head of a wearer;

pulling said at least one strap through said curved and elongated slot of said at least one element until said respirator body is frictionally held in a desired position either seated over the nose and mouth of a wearer or in a suspended position under the chin of a wearer; and

then releasing said at least one strap.

5,464,011

TRACHEOSTOMY TUBE

Robert S. Bridge, 25 E. LaMar Rd., Phoenix, Ariz. 85012

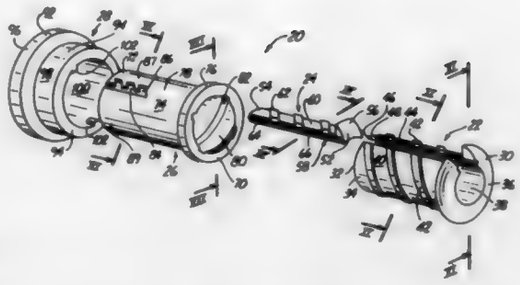
Filed Oct. 24, 1994, Ser. No. 327,617

Int. Cl.[6] A61M *16/00*

U.S. Cl. 128—207.14 **20 Claims**

1. A tracheostomy tube comprising:

an elongate inner tube having a distal end and a proximal end, the inner tube having a side wall with an outer surface having threads formed thereon, the distal end of the inner tube defining an annular collar having an inner diameter substantially equal to an inner diameter of the inner tube and an outer diameter exceeding an outer diameter of the inner tube, and the inner tube having a longitudinal slot extending through the side wall and the collar from the distal end to the proximal end of the inner tube;



an elongate insert slidably mountable in the slot of the inner tube and collar; and

an outer tube having an inner surface with grooves formed therein to threadingly engage the threads of the inner tube, the engaged outer tube securing the tracheostomy tube to a neck of a patient.

5,464,012

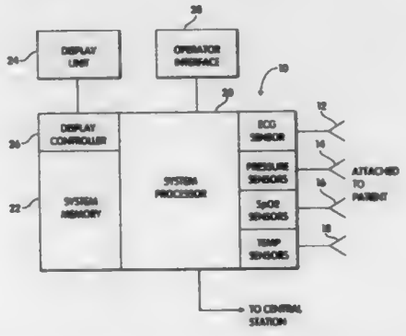
PATIENT ALARM DETECTION USING TARGET MODE

Ronald Falcone, Hudson, N.H., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 13, 1993, Ser. No. 120,490

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—630 **8 Claims**



1. A patient monitoring system comprising: a sensor for measuring values of a physiological parameter; and

a processor coupled to said sensor for processing said measured parameter values measured by said sensor, said processor comprising:

means for setting target limits of the physiological parameter in response to user selections;

means for initiating a target mode after setting of said target limits;

means for calculating time-varying dynamic limits based on the current value of the physiological parameter and on the target limits of the physiological parameter;

means for comparing said measured parameter values with said dynamic limits in said target mode; and

means for generating an alarm when any of said measured parameter values falls outside said dynamic limits.

5,464,013

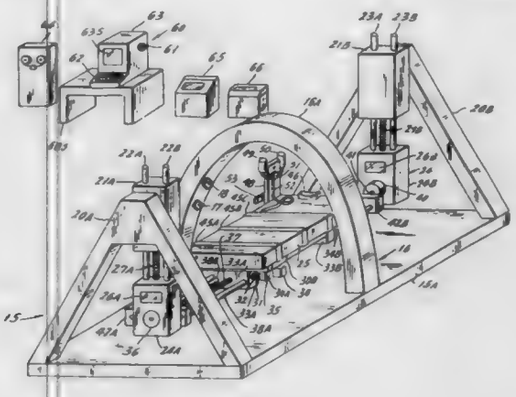
MEDICAL SCANNING AND TREATMENT SYSTEM AND METHOD

Jerome H. Lemelson, 868 Tyner Way, Incline Village, Nev. 89450

Continuation-in-part of Ser. No. 717,080, Jun. 18, 1991, which is a continuation-in-part of Ser. No. 54,277, Sep. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 614,021, May 25, 1984, Pat. No. 4,671,256, which is a continuation-in-part of Ser. No. 614,038, May 25, 1984, Pat. No. 4,665,897. This application Nov. 25, 1991, Ser. No. 799,428

Int. Cl.[6] A61B 6/00

U.S. Cl. 128—653.1 13 Claims



1. A method for effecting a controlled medical procedure with respect to a living being comprising:

a) predeterminately locating and retaining a living being on a first support,

b) generating first penetrating radiation by a first radiation generating means supported by a second support,

c) effecting controlled relative movement of said first support and said second support and directing said penetrating radiation at a select portion of the body of said living being on said first support during at least a portion of said controlled relative movement,

d) detecting a portion of said penetrating radiation after it penetrates and passes through select tissue of said living being and is modulated with information relating thereto and generating electrical signals containing said modulated information, wherein the radiation detected defines an image field which is generated when said penetrating radiation intersects and reacts on the select matter in the body of said living being,

e) computer processing and analyzing said information contained in said electrical signals and generating coded electrical signals, wherein said processing and analyzing of said information is effected by computer processing and analyzing said electrical signals, and wherein said electrical signals are generated by a plurality of electro-optical detectors supported by said second support, and

f) applying said coded electrical signals to control a means for performing a surgical operation to cause it to automatically perform the surgical operation with respect to select tissue of said living being supported on said first support.

5,464,014

DISPLAY DEVICE FOR BIOELECTRICAL AND BIOPHYSICAL PHENOMENA

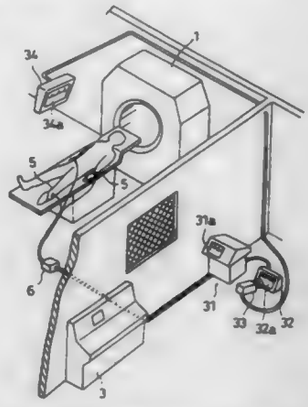
Tomio Sugahara, Minami-Morimachi, Japan, assignor to Sugan Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 826,890, Jan. 29, 1992, Pat. No. 5,239,265. This application May 7, 1993, Ser. No. 60,220

Claims priority, application Japan, Jan. 3, 1991, 3-283990; Mar. 18, 1993, 5-085747

Int. Cl.[6] A61B 5/044;5/055

U.S. Cl. 128—653.2 1 Claim



1. A display device for vital signs of a patient during magnetic resonance imaging of the patient with an MRI system which comprises:

means receiving signals representing the physiological status of the patient, said signal receiving means being in a location not subject to influences of the MRI system, said device including first display means which displays information which indicates time-serial changes in said signals and outputs transmission signals corresponding to the information so displayed, transmitting means which transmits said transmission signals to a location close to the patient, and second display means accommodated in a magnetically shielded housing located close to the patient which receives said transmission signals from said transmitting means, converting them to signals indicating the physiological condition of the patient, wherein said first display means which receives signals representing the physiological status of the patient in a location which is not subject to influences of said magnetic resonance imaging system and displays time-serial changes in said signals further includes a photographing means which photographs the images displayed on said first display means and outputs video signals.

5,464,015

REAL-TIME ULTRASONIC ENDOCARDIAL DISPLACEMENT DISPLAY

Albert F. Koch, III, Newburyport, and David M. Prater, Melrose, both of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

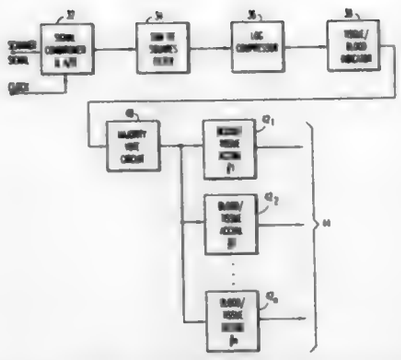
Continuation-in-part of Ser. No. 275,554, Jul. 15, 1994, abandoned. This application Sep. 19, 1994, Ser. No. 308,718

Int. Cl.[6] A61B 8/00

U.S. Cl. 128—660.07 12 Claims

1. An ultrasound display apparatus for providing a two-dimensional display of a fluid filled cavity and surrounding wall tissue, said apparatus including means for indicating wall tissue displacement on said display screen and comprising:

frame comparison means for determining which pixels change from one type pixel to another type pixel in a pair of succeeding image frames, and including pixel classification means for classifying pixels in each image frame into one of two types, i.e., tissue or fluid, to facilitate determination of pixel changes; and



mapping function assignment means for assigning to all changed classification pixels in a frame, a common mapping function which causes said changed classification pixels to be readily differentiated by a viewer of said display screen.

5,464,016

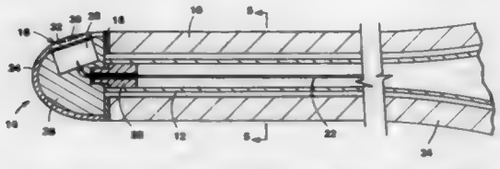
MEDICAL ACOUSTIC IMAGING CATHETER AND GUIDEWIRE

Peter M. Nicholas, South Dartmouth, and Robert J. Crowley, Wayland, both of Mass., assignors to Boston Scientific Corporation, Watertown, Mass.

Continuation of Ser. No. 67,348, May 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 66,990, May 24, 1993, abandoned. This application Dec. 13, 1994, Ser. No. 355,435

Int. Cl.[6] A61B *8/12*

U.S. Cl. 128—662.06 **25 Claims**



1. An ultrasound imaging device comprising a stationary, elongated flexible tubular body, a rotatable drive shaft extending through said body, and a nose member at least a portion of which is located entirely distally of said entire stationary tubular body, said nose member being mounted on the distal end of said drive shaft to rotate therewith relative to said stationary tubular body, said nose member being of rounded atraumatic form, being sized at its proximal end to substantially match the diameter of said body, and having an acoustic imaging instrument incorporated in said nose member for producing acoustic images of adjacent tissue as said drive shaft turns, said acoustic imaging instrument being located entirely distally of said entire stationary tubular body, there being an axial passage within said body for fluid flow from a proximal entry port to at least one fluid delivery port located distally of said entry port.

5,464,017

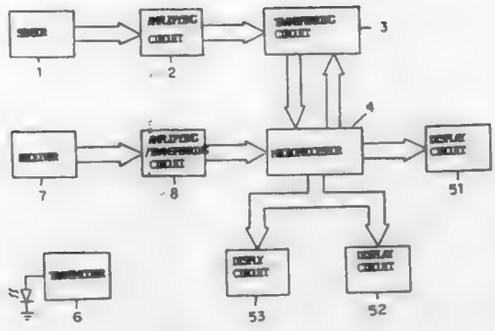
LED DISPLAY BLOOD PRESSURE METER

Jing-Song Juang, No. 236, Fu Teh 2 Rd., Hsichih, Taipei Hsien, Taiwan, Prov. of China

Filed Jun. 29, 1994, Ser. No. 267,549

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—672 **4 Claims**



1. In a blood pressure meter, including:

means including a sensor for sensing blood pressure values and generating blood pressure signals representative of the blood pressure values sensed by the sensor;

a display for displaying said blood pressure values; and

means including a microprocessor for digitally processing the sensor signals and for generating display control signals to cause said display to display the blood pressure values, said blood pressure values ascending and descending between a low value and a high value, the improvement comprising:

a latch connected between the microprocessor and the display; and

means including a receiver connected to the microprocessor and a transmitter having a switch for causing the latch to latch the high and low blood pressure values received from said sensor when a transmitter signal indicative of the switch having been switched is transmitted between the transmitter and the receiver, wherein

the display includes first display means made up of an array of light emitting elements for displaying an indication of whether said blood pressure values are increasing or decreasing and second display means for displaying high and low blood pressure values latched by said latch when said transmitter signal is received by said microprocessor.

5,464,018

EVALUATION OF SALT SENSITIVITY IN HYPERTENSION

Carlos H. Espinel, 3328 "O" St., N.W., Washington, D.C. 20007

Continuation of Ser. No. 157,262, Nov. 26, 1993, abandoned. This application Dec. 19, 1994, Ser. No. 358,994

Int. Cl.[6] A61B *5/021*

U.S. Cl. 128—672 **4 Claims**

1. A method of evaluating and treating hypertension due to salt sensitivity comprising the steps of:

(1) in a first phase, evaluating customary salt intake and deleting from the diet any substance other than salt that might influence blood pressure whilst feeding the patient a diet without restriction of salt and measuring blood pressure until blood pressure becomes stabilized at the hypertensive level or, if hypertension is not noted, for 90 days;

(2) after blood pressure has become stabilized at the hypertensive level, restricting the diet to provide a no-salt or low sodium diet; the

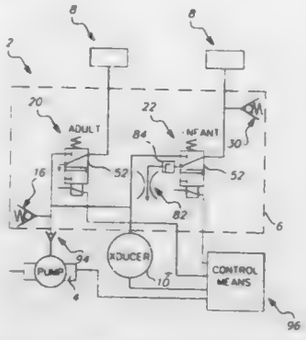
(3) gradually increasing the amount of salt in the diet, beginning with 0.5 gr. salt and incrementally increasing salt intake with each increment being maintained for at least 3 days and measuring blood pressure to determine at what level of salt intake the blood pressure rises to determine the salt hypertension threshold; and

(4) restricting salt in diet on the basis of salt hypertension threshold to more than 1 gram below the salt hypertension threshold.

5,464,019
AIRFLOW CONTROL MANIFOLD FOR AUTOMATIC BLOOD PRESSURE MONITORING DEVICE

R. Carver Anderson, Seattle, and Glen Eaton, Sultan, both of Wash., assignors to SpaceLabs, Inc., Redmond, Wash.

Filed Aug. 11, 1992, Ser. No. 929,188
Int. Cl.[6] A61B 5/00
U.S. Cl. 128—677 17 Claims



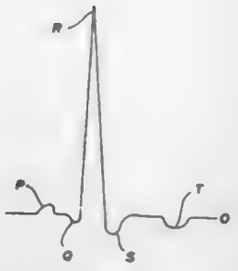
1. A blood pressure monitoring device comprising:
an air pump;
a manifold coupled to the air pump;
a blood pressure cuff coupled to the manifold;
a pressure transducer coupled to the manifold; and
wherein the manifold is provided with a first cuff port; a second cuff port; a first plenum chamber; a first distribution valve integrally seated in the manifold, the first distribution valve being in communication with the first plenum chamber and with the blood pressure cuff and with atmosphere, whereby the distribution valve selectively allows the blood pressure cuff to communicate with the first plenum chamber and with the atmosphere; a second distribution valve wherein the first distribution valve is a high-pressure distribution valve and the second distribution valve is a low-pressure distribution valve; the first plenum chamber having an air inlet port communicating with the air pump, a high-pressure relief valve seated in the manifold, the high-pressure distribution valve selectively allowing the first plenum chamber to communicate with the first cuff port, the low-pressure distribution valve selectively allowing the first plenum chamber to communicate with the second cuff port so that the blood pressure cuff can be coupled to either the first or the second cuff port to selectively communicate with the first plenum chamber, and a transducer port communicating with the pressure transducer; and a second plenum chamber communicating with the second cuff port, the second plenum chamber having a low-pressure relief valve, the low-pressure distribution valve selectively allowing the second plenum chamber to communicate with the first plenum chamber.

5,464,020
DIAGNOSING AND TREATING SUBACUTE CARDIAC DYSFUNCTION

Albert M. Lerner, 660 Woodland, Birmingham, Mich. 48009

Continuation-in-part of Ser. No. 938,439, Aug. 31, 1992, Pat. No. 5,357,968, which is a continuation-in-part of Ser. No. 675,542, Mar. 25, 1991, Pat. No. 5,213,106. This application Apr. 4, 1994, Ser. No. 222,118
The portion of the term of this patent subsequent to May 25, 2010, has been disclaimed.
Int. Cl.[6] A61B 5/0452
U.S. Cl. 128—696 18 Claims

1. A method for diagnosing subacute cardiac dysfunction in a patient whose sedentary electrocardiogram ST segment and T-wave do not indicate cardiac dysfunction, the method comprising:
electrocardiographically monitoring to detect T-waves of an ambulatory patient who has persistent unexplainable fatigue;

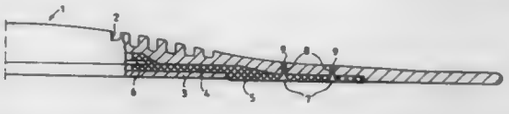


determining the T-wave frequency when the T-wave of the ambulatory patient is not positive; and
providing a diagnosis of subacute cardiac dysfunction that is selected from the group consisting of subacute myocarditis and a subacute cardiomyopathy based on the determination of T-wave frequency.

5,464,021
TELEMETRIC TRANSMITTER UNIT

Burton H. Birnbaum, Woodmere, N.Y., assignor to Polar Electro Oy, Kempele, Finland

Filed Oct. 14, 1994, Ser. No. 323,224
Int. Cl.[6] A61B 5/04
U.S. Cl. 128—696 4 Claims



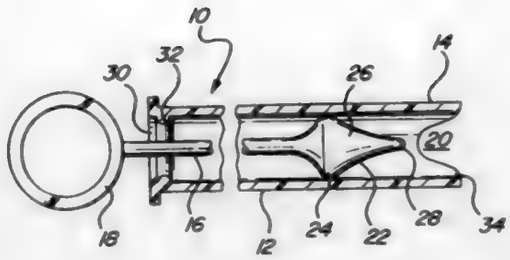
1. A telemetric transmitter unit comprising:
at least one electrode for placement against a part of the body of a person wearing said telemetric transmitter unit for detecting heartbeat signals from said person;
an electronic circuit electrically connected to said at least one electrodes to receive signals from the electrodes, and for processing said received signals electronically in order to generate a variable magnetic proximity field for telemetric transmission of the detected heartbeat signals of said person to a separate receiver;
one or more plastic members joining the transmitter and electrodes together so as to form an integrated casing for the transmitter unit having a bottom side exposing the surface of the said at least one electrodes, wherein at least one of the electrodes is provided with at least one hole, each hole being associated to at least one fluid channel leading to at least one opening in said casing, whereby fluid applied to said at least one opening in the casing is allowed to flow through said hole in the electrode, thus wetting, at least in the part of the body lying underneath the electrode, any cloth or garment on the wearer as well as the skin, in order to provide a conductive path for the heart beat signals between the skin of the wearer and the electrode through said cloth or garment.

5,464,022
ENDOMETRIAL SAMPLER

Reza S. Mohajer, 3115 W. Shore Dr., Orchard Lake, Mich. 48033

Filed Nov. 10, 1994, Ser. No. 336,923
Int. Cl.[6] A61B 10/00
U.S. Cl. 128—758 13 Claims

1. An endometrial aspirator comprising:
an aspirator tube configured as a hollow, cylindrical body, defining an internal bore, extending along the length thereof, said tube including a sampling distal end which is open, said tube further including a notch defined therethrough, said notch



commencing at the sampling distal end of the tube and extending proximally along a portion of the length thereof;

an aspirator piston having a sealing portion configured to sealingly engage the internal bore of said aspirator tube, said piston having a cervical dilator portion which includes a base corresponding to the cross-section of said bore, said base providing said sealing portion, said dilator portion tapering distally from said base to form a tip, said dilator portion and aspirator tube being configured so that the dilator portion is capable of being projected from the sampling distal end of the tube so as to facilitate insertion of the endometrial aspirator through a cervix and into a uterus; and

a piston rod coupled to the piston and operable to move the piston along said bore.

5,464,023

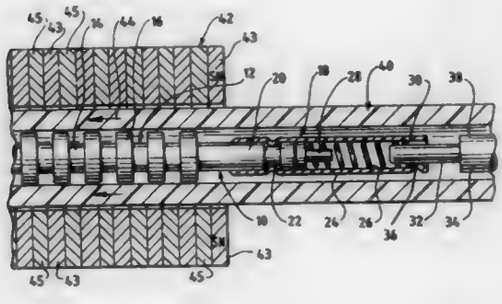
MAGNETIC EXCHANGE DEVICE FOR CATHETERS

Fernando M. Viera, Hialeah, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Jan. 31, 1994, Ser. No. 189,453

Int. Cl.[6] A61M *29/00*

U.S. Cl. 128—772 **19 Claims**



1. A guidewire and a magnetic retainer for facilitating the exchange of a catheter in the vascular system of a patient without displacing said guidewire, said guidewire having a distal end and a proximal end which occupies a lumen of said catheter, said guidewire carrying on its proximal end magnetic attraction means proportioned to fit into the catheter lumen, said magnetic attraction means comprising a ferromagnetic rod which defines a plurality of spaced, integral rings of ferromagnetic material distributed along said rod in substantially perpendicular relation to the axis of said rod; said magnetic retainer being positioned adjacent said ferromagnetic rod to hold said ferromagnetic rod and guidewire in a stationary position relative to said magnetic retainer by a magnetic force while permitting the catheter to slide along said guidewire, said magnetic retainer comprising a plurality of spaced magnets said plurality of magnets extending substantially parallel to said spaced, integral rings for magnetic retention thereof.

5,464,024

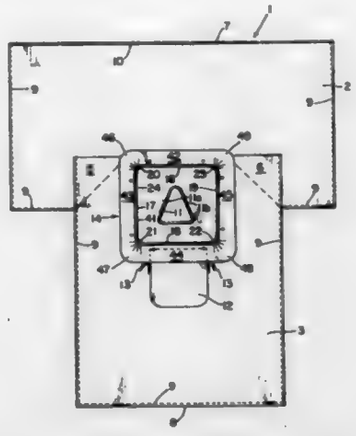
REUSABLE SURGICAL DRAPE WITH FLUID-RETAINING TROUGH

Veronica A. Mills, Cincinnati, and Bonnie F. Fazio, Morrow, both of Ohio, assignors to Standard Textile Co., Inc., Cincinnati, Ohio

Filed Jul. 5, 1994, Ser. No. 270,366

Int. Cl.[6] A61C *19/08*

U.S. Cl. 128—849 **13 Claims**



1. A fabric reusable and sterilizable surgical drape having a surgical site fenestration with a fluid-retaining trough extending at least partway thereabout, said trough comprising a panel of fluid-repellant fabric having an opening formed therein corresponding in size and shape to said drape fenestration and aligned therewith, said panel being attached to said drape about the peripheries of said panel opening and said drape fenestration, a part at least of the peripheral edge of said panel being folded inwardly toward said fenestration to form said trough, said trough having at least one portion wherein said trough is curved, said inwardly folded peripheral edge portion being gathered at said at least one curved trough portion, said trough being free of seams, folds, and multiple folded layers.

5,464,025

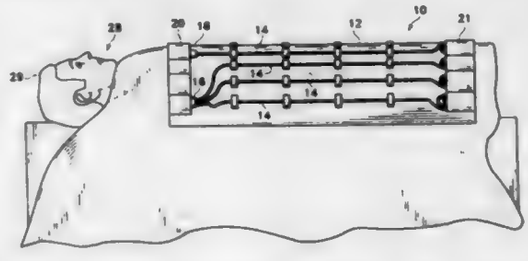
SELF-CONTAINED SURGICAL TUBING MANAGEMENT SYSTEM

Steven T. Charles, 3220 Oak Manor, Germantown, Tenn. 38138; John A. Ripley, 1233 Devon La., Newport Beach, Calif. 92660, and John C. Huculak, 29125 Abotsinch, Laguna Niguel, Calif. 92677

Filed Feb. 27, 1995, Ser. No. 395,403

Int. Cl.[6] A61B *19/00*

U.S. Cl. 128—849 **33 Claims**



1. A self-contained surgical tubing management system, comprising:

a) a substrate having a length;

b) at least one surgical instrument retained on the substrate at an end of the substrate placed near a head of a patient;

c) at least one line connected on one end to the surgical instrument, extending down the length of the substrate and terminating at a free end opposite the surgical instrument; and

d) a means for attaching the line to the substrate.

5,464,026

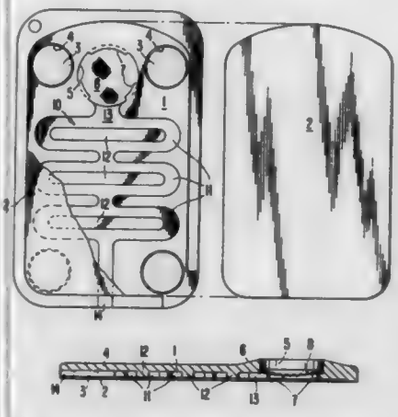
DEVICE FOR SMOKING TOBACCO AND THE LIKE

James H. Gardner, 11F, Hyde Park Mansions, London NW1 5BA, and Nicholas M. Crayson, 16, Palliser Road, Barons Court, London W14 9EE, both of, England

Filed Jan. 11, 1994, Ser. No. 179,630

Int. Cl.[6] A24F *1/16*

U.S. Cl. 131—216 **8 Claims**



8. A device for smoking tobacco, comprising:

a housing having an upper wall and a lower wall, the upper wall mounting an air-permeable membrane communicating with a channel formed between the walls, said channel being open at an end to the atmosphere;

wherein said channel comprises a plurality of interconnected depressions formed on the inside surface of the upper wall, each depression containing a lateral baffle formed therein.

5,464,027

HOPPER FOR ELONGATE ELEMENTS, IN PARTICULAR SMOKING ARTICLES

Roberto Bina; Andrea Nespoli, and Antonio Gamberini, all of Bologna, Italy, assignors to G.D Societa per Azioni, Bologna, Italy

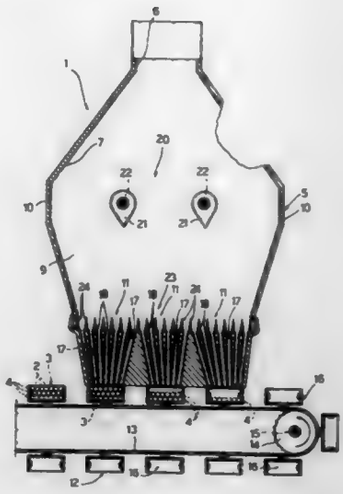
Filed Feb. 14, 1994, Ser. No. 195,273

Claims priority, application Italy, Mar. 5, 1993, BO93A0075

Int. Cl.[6] B65B *19/10*

U.S. Cl. 131—283 **14 Claims**

1. A hopper (5) for elongate elements (2) at a user machine (1), the hopper (5) comprising an entry chamber (6) for receiving a mass (M) of elongate elements (2) arranged in a substantially horizontal position; at least one exit (11) including a plurality of substantially vertical side-by-side channels (17), each channel (17) being defined by two substantially vertical baffles (18); and agitator means (23) positioned within said entry chamber (7) and associated with said channels (17) to facilitate the entry and descent of continuous rows (19) of elongate elements (2) along said channels (17); wherein for each channel (17), said agitator means (24) includes at least one agitator element (24) positioned above a respective said baffle (18) to oscillate about a respective substantially horizontal axis (25), said agitator element (24) including a bar (26) located parallel to the respective said substantially horizontal axis (25) and eccentric to said substantially horizontal axis (25), said bar (26) having a cross-sectional shape tapering towards the end distant from the relative said baffle (18).



5,464,028

CIGARETTE

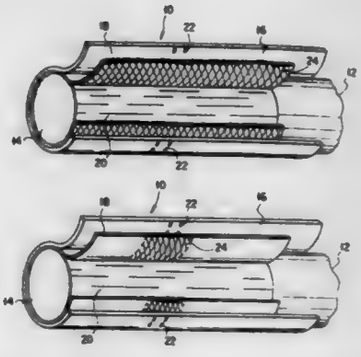
Kazuko Takeda; Motohiko Muramatsu, and Takashi Koyama, all of Yokohama, Japan, assignors to Japan Tobacco, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 98,781, Jul. 29, 1993, abandoned. This application Apr. 11, 1994, Ser. No. 226,117

Claims priority, application Japan, Jul. 29, 1992, 4-202202; Sep. 10, 1992, 4-242387

Int. Cl.[6] A24D *3/00*

U.S. Cl. 131—336 **11 Claims**



5. A vented filter cigarette comprising:

a filter having a fiber filter material and a permeable plug wrap paper wrapping the fiber filter material, the plug wrap paper having a Corseta permeability of 1000 or more;

a tobacco rod;

tipping paper having a plurality of pores and connecting the filter and the tobacco rod; and

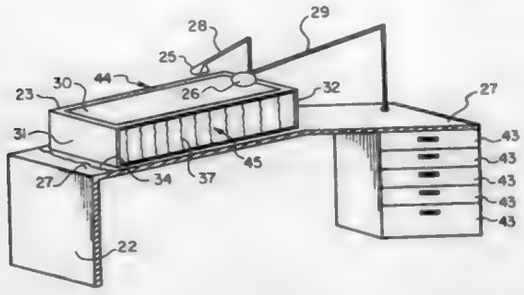
glue adhering the tipping paper to the plug wrap paper and to the tobacco rod, the glue being arranged between the plug wrap paper and the tipping paper to leave an annular region free of the glue so that the permeable plug wrap paper has a ventilation area which faces the pores and through which dilution air from the pores passes, and the annular region does not directly communicate through any gap between the tipping paper and the plug wrap paper with either end of the plug wrap paper;

wherein an embossment having grooves of a grid-pattern is formed on the plug wrap paper at least in the ventilation area in order to loosen and fix tightness between the tipping paper and the plug wrap paper in the ventilation area to control filter ventilation of the cigarette and to reduce variation in the filter ventilation.

5,464,029
MANICURE WORK STATION

Rosemary Rentz, 1818 Lashley St., Longmont, Colo. 80501

Filed Jul. 15, 1993, Ser. No. 92,240
Int. Cl.[6] A45D *29/18*
U.S. Cl. 132—73.5 **10 Claims**

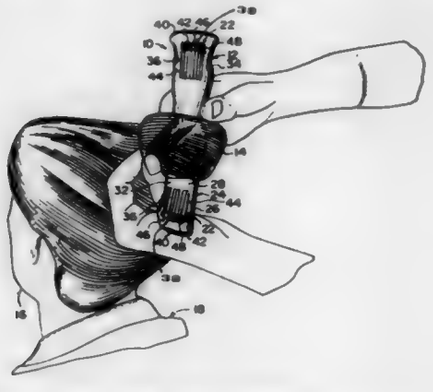


1. An environmental chamber and base unit for eliminating fumes and dust at a manicure work station, comprising:
a transparent cover;
a first and a second end wall having edges of the end walls connected to and supporting said transparent top;
a bottom means;
a first and a second access side each interposed between the end walls;
a first and a second closure means covering said first and said second access side, thereby forming an enclosure;
an exhaust means connected to said enclosure;
said base unit having a horizontal top which comprises part of the bottom means of the environmental chamber;
bottom means further comprises a removable member;
said first and second closure means further comprises a removable fastening means attachable to said transparent cover:
said removable fastening means further comprises a hook and loop fastener;
said first and second closure means further comprises a flexible construction;
said first end wall further comprise a resting means unattached to said base unit and capable of being lifted upwards away from the base unit; and
said second end wall further comprises a hinge attachment to said top of said base unit.

5,464,030
TWIST HAIRDO ROLLER

Marisol Avellanet, 419 E. 93rd St.; Apt. 14D, New York, N.Y. 10128

Filed Mar. 28, 1994, Ser. No. 218,250
Int. Cl.[6] A45D *2/02*
U.S. Cl. 132—245 **4 Claims**



1. A twist hairdo roller which comprises:
a) means for wrapping the hair on a head of a woman into a twist hairdo, said wrapping means comprising an elongated body in the shape of a generally cylindrical barrel, said barrel being fabricated out of pliable material, so that it can bend to conform to the shape of the head of the woman, said pliable material including a rubber core tube and a lightweight foam rubber sleeve which fits over said rubber core tube and which forms an undulating surface to better engage with the hair when the hair is being wrapped thereabout; and
b) means for retaining the hair in the twist hairdo by frictionally engaging the hair against said wrapping means, said retaining means comprising a pair of small combs fixing each of said combs to an opposite end of said foam rubber sleeve with the teeth of said combs extending toward each other to hold the hair in place.

5,464,031
METHOD OF CHAMBER CLEANING IN MOCVD APPLICATIONS

Todd W. Buley, and Gurtej S. Sandhu, both of Boise, Id., assignors to Micron Semiconductor, Inc., Boise, Id.

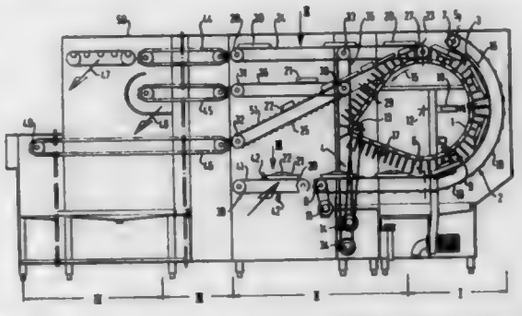
Filed Jun. 22, 1993, Ser. No. 81,735
Int. Cl.[6] B08B *3/00*
U.S. Cl. 134—1 **6 Claims**

1. A method for removing tetrakis dimethyl amino titanium from a work chamber, comprising the following steps:
a) flooding said chamber with ammonia;
b) combining the tetrakis dimethyl amino titanium and said ammonia;
c) forming a TiCxNy film with said ammonia and said tetrakis dimethyl amino titanium;
d) releasing a gas radical having an organic substance from said tetrakis dimethyl amino titanium;
e) removing said gas from said chamber;
f) introducing a plasma into said chamber;
g) etching said TiCxNy with said plasma; and
h) removing said TiCxNy and said plasma from said chamber.

5,464,032
DISH WASHING UNIT FOR TRAYS LOADED WITH DISHES

Jürgen Litterst, Offenburg, Germany, assignor to Premark FEG Corporation, Wilmington, Del.

Filed Dec. 23, 1993, Ser. No. 172,149
Claims priority, application Germany, Dec. 23, 1992, 42 43 892.6
Int. Cl.[6] B08B *3/02*
U.S. Cl. 134—72 **20 Claims**



15. A dish washing unit for trays loaded with dishes, comprising:
a separating stage with a turning device consisting of an inner conveyor belt equipped at its outer side with substantially radially directed finger members/conveying rods and an endless driven outer belt which surrounds the inner belt with its inner strand in the region of turning semicircle, the loaded trays being conveyed and turned between the inner and outer belts,

a delivery and removal stage comprising a supply conveyor for feeding items to be washed into the unit interior and a tray receiving conveyor belt which is led with its one end substantially tangentially to the turning semicircle of the inner belt and carries out a substantially horizontal removal of the trays, and

a washing stage comprising washing, rinsing and drying zones to which the items to be washed are led on transport conveyors, characterized in that

the supply conveyor is a transverse conveyor belt (37) with a right-angle deflector (39),

discharge belts (24, 25, 26) are present in the same number as items to be washed (20, 21, 22) of different outer transverse dimensions,

washing transport belts (44, 45, 46) are provided in the washing stage (III) in vertical superimposed parallel arrangement such that they respectively cooperate with one of the discharge belts (24, 25, 26) and further convey the flat lying items to be washed (20, 21, 22) through respective washing, rinsing and drying zones up to a separate items discharge in the discharge stage (IV),

the first discharge belt (24) extends substantially tangentially to the upper summit (23) of the turning semicircle and supplies the larger part/trays (20) substantially horizontally to the upper washing belt (44),

that a second discharge belt (25) leading away downwardly at an angle is provided and dimensioned such that it initially receives all further dishes (21, 22) of the items to be washed and cooperates with the lowest washing belt (46), and

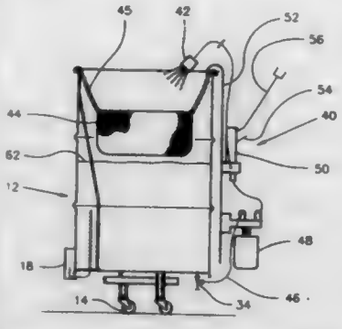
that in accordance with the further number of parts of items to be washed of various dimensions, a corresponding number of intermediate removing belts (26) are provided which are arranged to extend substantially horizontally and cooperate respectively with one of the parallel and vertically superimposed intermediate washing belts (45).

5,464,033

HOT SOLVENT CLEANING TANK

Dale Hartnell, Centralia, Ill., assignor to Major Industrial Technology, Inc., Centralia, Ill.

Filed May 20, 1994, Ser. No. 245,597
Int. Cl.[6] B08B *3/02*
U.S. Cl. 134—105 **6 Claims**



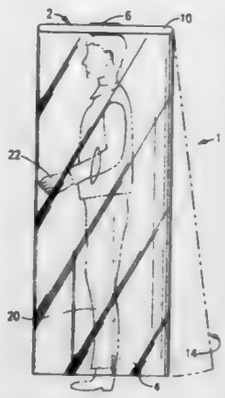
1. A hot solvent cleaning tank for cleaning objects, said tank being comprised of an upright barrel mounted on supporting castors for mobility, means for heating a biodegradable aqueous solvent in said tank comprising an electrical heating element supported within said tank for heating said solvent, a thermostat control means mounted on an exterior portion of the tank for maintaining a controlled temperature of the solvent, a drain valve, and solvent recirculating means for recirculating solvent through said drain valve to a flow directing means for directing a stream of solvent against objects supported at the top of the tank above a level of the solvent within the tank, said flow directing means comprising a pump, and a member connecting the pump to a flow through brush, a replaceable filter being connected between the pump and said drain valve.

5,464,034

POCKET-PORTABLE RAIN COVERING (UNBRELLA TM)

Hesh Kestin, 38 Halsey La., Remsenburg, N.Y. 11960

Filed Sep. 27, 1994, Ser. No. 313,013
Int. Cl.[6] E04H *15/04*
U.S. Cl. 135—90 **2 Claims**



1. A pocket-portable rain covering comprised of a:

an inflatable cap member receivable over a human head including a central cap receivable on the top of said head, an annular ring disposed around said central cap and a plurality of spokes extending radially outward from said central cap and to said annular ring, the cap, ring and spokes each forming an internal space therein, said internal spaces being interconnected to define a continuous air space within said cap member;

a transparent curtain being fixedly attached to and hanging freely from said annular ring; such that a cylinder extending downward from said cap member is provided within which a person may be completely covered and protected from the elements; and

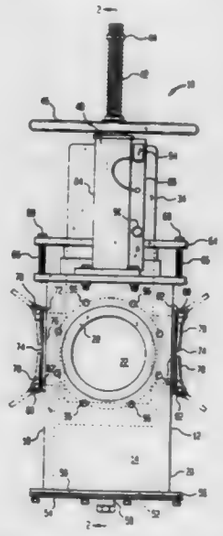
an inflatable tube in communication with said continuous air space for inflation and deflation of said cap member.

5,464,035

GATE-TYPE, SIDE-PORTED, LINE BLIND VALVE

Richard L. Heinecke, Belden, Miss., assignor to ITT Corporation, New York, N.Y.

Filed Jun. 21, 1994, Ser. No. 263,307
Int. Cl.[6] F16K *3/02;43/00*
U.S. Cl. 137—312 **12 Claims**



12. A gate-type, line blind valve, comprising:

a body having spaced-apart, front and rear walls, and side walls joined to said front and rear walls; wherein

all said walls comprise means for cooperatively defining a valve shell having an interior;

inlet and outlet fluid apertures in said front and rear walls;

resilient seats set in said apertures;

gating means interposed, and movable, between said front and rear walls, for (a) sealingly engaging said seats, and (b) exposing said apertures to, and occluding said apertures from, the ambient; and wherein

said side walls have porting means for exposing said interior of said shell to, and occluding said interior from, the ambient;

said porting means comprises openings in said side walls and being in substantial alignment with said apertures for allowing any fluid spillage within said interior of said shell to vent to the ambient, and closures removably fixed to said side walls;

said closures comprise plates and means for releasably fastening said plates over, and in closure of, said openings;

said fastening means comprises clamps (a) fixed to said side walls, and (b) engageable with said plates; and

said clamps are pivotably mounted to said side walls and have camming surfaces for forcing said plates fast against said side walls.

5,464,036

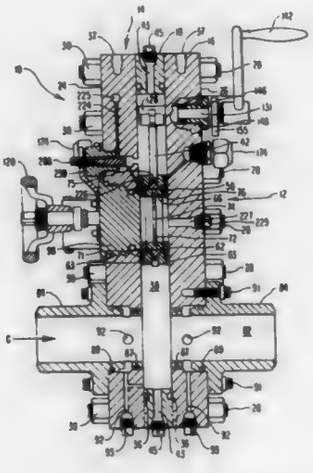
ORIFICE FITTING WITH VENTING PASSAGE AND INJECTION SEAL

Murray R. Tomkins, Ardrossan, and Andrew J. Patterson, Edmonton, both of, Canada, assignors to Valgro, Ltd., Edmonton, Canada

Filed Feb. 9, 1994, Ser. No. 193,934

Int. Cl.[6] **F15D** *1/08;* **G01F** *1/42*

U.S. Cl. 137—315 **21 Claims**



12. An orifice fining comprising:

(a) a body including a pair of opposing body plates, the body plates having an interior surface and an exterior surface, the interior surface defining a body chamber positioned within the body, the body plates also having an aligned flow passage therethrough;

(b) a carrier movably positioned within the body chamber between the pair of opposing body plates and having a carrier chamber;

(c) an orifice disk moveable positioned in the carrier chamber;

(d) an access opening through one of the body plates to the body chamber, the access opening being selectively covered and sealed by a hatch;

(e) means for moving the carrier between a first position wherein the carrier chamber is aligned with the flow passage and a second position wherein the carrier chamber is aligned with the access opening;

(f) a pair of seal rings positioned on opposing sides of the carrier and aligned with the carrier chamber so as to be disposed at opposing sides of the orifice disk, each of the seal rings having a sealing face biased against one of the body plates, an annular injection groove disposed on a portion Of the sealing face, and means for isolating the carrier chamber from the body chamber;

(g) an injection passage extending from each of the injection grooves when the carrier is in the second position to the exterior of the body;

(h) means for positioning and maintaining a sealant under pressure in the injection passages and the injection grooves, whereby the sealant assists in sealing the carrier chamber from the body chamber;

(i) a valve passageway through the one body plate to the body chamber;

(j) a venting passage extending from the valve passageway through the one body plate and exiting to the exterior of the body at a distance from the valve passageway;

(k) a transfer duct extending from the carrier chamber when the carrier is in the second position to the valve passageway; and

(l) a valve assembly selectively moveable in the valve passageway and operative in a first position to seal off the venting passage and open communication between the body chamber and the transfer duct, and in a second position to seal off the body chamber and open communication between the venting passage and the transfer duct.

5,464,037

LEVEL CONTROL VALVE ARRANGEMENT AND WATER CLOSET CISTERN

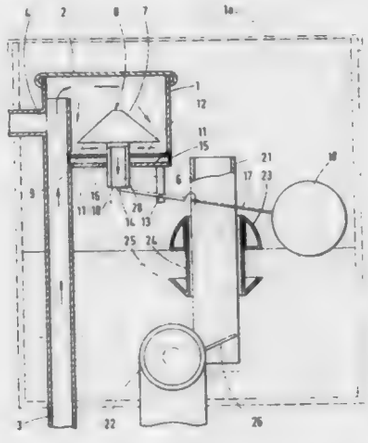
Abd El Rasoul M. Younes, Giza, Egypt, assignor to Dallah Water Saving, Giza, Egypt

Filed Oct. 16, 1992, Ser. No. 962,415

Claims priority, application European Pat. Off., Jan. 16, 1992, 91309542

Int. Cl.[6] **F16K** *31/26;33/00;* **E03B** *1/14*

U.S. Cl. 137—410 **23 Claims**



1. A level control valve arrangement for controlling the liquid level in a container, the arrangement comprising a valve housing in the container, a liquid inlet extending into the valve housing to define an intermediate wall portion therein, and a movable valve member mounted within the valve housing on a seating of an outlet aperture from the valve housing and being movable between an open position in which liquid can flow from the liquid inlet between the intermediate wall and the outlet aperture seating and through the outlet aperture into the container and a closed position in which liquid is prevented from flowing through the outlet aperture into the container, the movable valve member having a flow guide extending therefrom through the outlet aperture of the valve housing for directing liquid therethrough out of the valve housing and being provided with biasing means which biases the

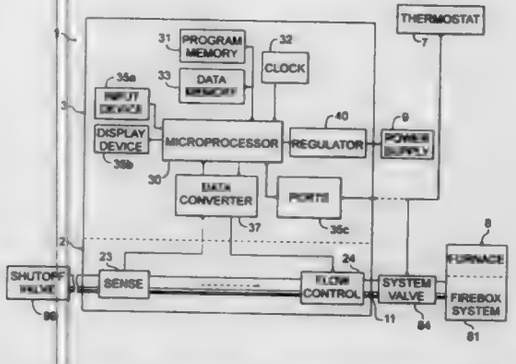
valve member into the closed position in response to liquid in the container rising to a predetermined level, said movable valve member being mounted in an inlet chamber within said valve housing, which chamber is in communication with said liquid inlet so that in the closed position of the valve liquid flows from the liquid inlet into the valve chamber to form a head of liquid in the inlet chamber which acts on the movable valve member to maintain the movable valve member in the closed position, wherein said movable valve member includes a sealing portion which has a planar sealing surface which in the open position of the valve member is exposed to liquid in the inlet chamber and in the closed position of the valve member seals against a planar seating surface disposed about the periphery of said outlet aperture and extends between the intermediate wall and an outer wall portion of the valve housing, the valve member planar surface extending over the area of the planar seating surface to provide an effective seal over substantially the entire area of the valve member planar sealing surface, and a conical surface on the side of the movable valve member remote from the planar sealing surface of the sealing portion upon which conical surface the head of liquid in the inlet chamber from the liquid inlet acts to sealingly force the planar sealing surface against the planar seating surface, and that the planar seating surface is provided by a layer of resilient material located between the planar seating surface and the planar sealing surface of the removable valve member.

5,464,038

FLUID FLOW CONTROL SYSTEM

Donald Kruto, 431 Easy St., Des Plaines, Ill. 60016

Filed Aug. 11, 1994, Ser. No. 289,622
Int. Cl.[6] G05D *7/06*
U.S. Cl. 137—486 **16 Claims**



1. An apparatus for providing a time scheduled sequence of fluid flow volumes to a fluid actuated host system and thereby delivering a minimal fluid volume per unit time within each normal host supply cycle and with minimal compromise of host system effectiveness comprising:

an electrically controllable fluid flow volume regulating subsystem having a conventional flow inlet and flow outlet, the flow inlet being connected to a supply outlet of a fluid supply line, the flow outlet being connected to a supply inlet of the host system, also having a conventional fluid flow sensing means and a normally-open control valve means connected such that while in an unpowered state, fluid entering the flow inlet passes, essentially unobstructed with respect to normal fluid flow volume supply to the host system, to the flow outlet, the fluid flow sensing means primarily providing for detection of fluid flow to the host system such that fluid flow volume scheduling is coincident with such flow, the fluid flow sensing means and control valve means being electrically connected to a fluid flow volume schedule subsystem: and

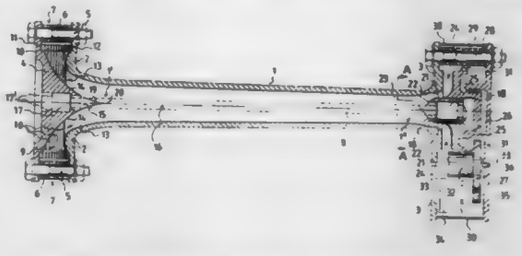
a microprocessor-based, fluid flow volume schedule subsystem for storing, recalling and implementing a use-effect optimizeable, multiple step sequence, time-based fluid flow volume schedule coincident with fluid flow detected and electrically reported by the fluid flow sensing means, such scheduling being accomplished by electrical aperture control of the control valve means, the fluid flow volume schedule system having a conventionally interconnected microprocessor, memory and support circuitry, the memory comprising data memory and program memory, the data memory having a plurality of memory locations for storing control and operational data, the program memory having a plurality of memory locations for storing a plurality of operational programs.

5,464,039

FLUID FLOWMETER-CONTROLLER

Giorgio Bergamini, Bari, Italy, assignor to Nuovopignone - Industrie Meccaniche E Fonderia S.p.A., Florence, Italy

Filed Apr. 20, 1994, Ser. No. 230,203
Claims priority, application Italy, Apr. 27, 1993, MI93A0818
Int. Cl.[6] F16K *37/00*; **G01F** *1/66*
U.S. Cl. 137—551 **7 Claims**



1. A fluid flowmeter-controller, which comprises;.

a rectilinear measurement tube having an inlet and an outlet for the fluid under examination and at least one pair of ultrasonic beam emitters cooperating with at least one corresponding pair of sensors or receivers to determine the time taken for said beam to pass from the emitters to the sensors both in the flow direction and in the opposite direction;

said pair of ultrasonic emitters-sensors being installed coaxially with the rectilinear measurement tube and said tube having a cross-section uniformly decreasing from said inlet, said inlet forming an annular radial extension symmetrical about said measurement tube axis;

a grid of annular structures resisting passage of the fluid under examination which increases from an outer end to an inner end of the grid, and being connected to the measurement tube by an annular inlet duct which forms a circular arc with a uniformly decreasing cross-section and includes a deflector ring facing the inlet emitter-sensor pair;

a valving member; and

an axial flow deflector provided in front of and coaxial with the outlet emitter-sensor pair, said flow detector conveying the fluid into an annular duct of decreasing cross-section, of which an exit port, of annular radial extension, constricted until total closure by said valving member.

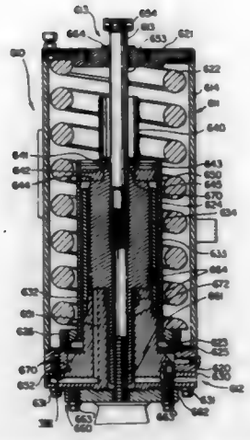
5,464,040

SAFETY VALVE ACTUATOR

Clarence W. Johnson, Calgary, Canada, assignor to Barber Industries Ltd., Calgary, Canada

Continuation of Ser. No. 805,493, Dec. 9, 1991, Pat. No. 5,291,918, which is a division of Ser. No. 513,054, Apr. 11, 1990, Pat. No. 5,070,900, which is a continuation of Ser. No. 153,259, Feb. 8, 1988, abandoned, which is a continuation-in-part of Ser. No. 43,336, Apr. 28, 1987, abandoned. This application Feb. 28, 1994, Ser. No. 202,577
Int. Cl.[6] F01B *31/12*
U.S. Cl. 137—556 **4 Claims**

1. Valve actuator apparatus comprising a piston movable within a housing and against the force of a spring within said housing, an



indicator rod connected to said piston, said indicator rod being adjustably mounted for relative axial movement relative to said piston and said spring, said spring and said piston remaining stationary during said relative axial movement of said indicator rod relative to said piston.

5,464,041

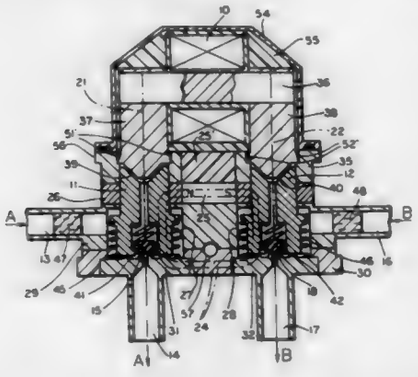
MAGNETICALLY LATCHED MULTI-VALVE SYSTEM

Robert H. Reinicke, Mission Viejo, Calif., assignor to Marotta Scientific Controls, Inc., Montville, N.J.

Filed Feb. 14, 1994, Ser. No. 194,836

Int. Cl.[6] F16K *11/00;31/08*

U.S. Cl. 137—595 **20 Claims**



1. A magnetically latched twin-valve system, comprising a body block of four relatively thick slabs vertically bonded to each other to the consolidated height of their combined thicknesses, the first and lowermost slab being of magnetic material, the second and next-adjacent slab being of non-magnetic material, the third and next-adjacent slab being of magnetic material, and the fourth and uppermost slab being of non-magnetic material, said second, third and fourth slabs being configured with two spaced upstanding and upwardly open guide bores on axes defining an upstanding vertical plane of symmetry, said first and second slabs being configured on each of said axes with a downwardly open valve-chamber wall of greater diameter than and communicating with one to the exclusion of the other of said guide bores, said second slab having an independent pressure-fluid inlet passage communicating with each of the respective valve-chamber walls, two valve members of magnetic material each of which has an upper cylindrical portion guided by one to the exclusion of the other of said guide bores, each of said valve members having a downwardly facing popper formation, separate outlet-port members of magnetic material fitted solely to said first slab to close the downwardly open valve-chamber wall at its lower end, each said outlet-port member in fitted position being configured with an upwardly facing valve-seat and a downwardly facing outlet passage on one to the exclusion of the other of said axes, said valve members being displaceable between a valve-open upper position and a valve-closed lower position of valve-seat engagement by said popper formation, means permanently and directionally magnetizing said third slab at least in the region between said axes and in a single direction from one to the other of said axes, and electromagnetic actuating means including a U-shaped core having spaced downward legs that present pole faces located in the guide bores of said fourth slab, said pole faces being in confronting relation with the upper cylindrical portion of each of said valve members.

5,464,042

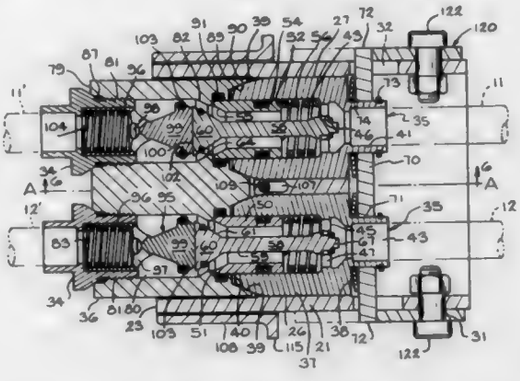
QUICK CONNECT AIR-CONDITIONING COUPLING

Gregory A. Haunhorst, Perrysburg, Ohio, assignor to Aeroquip Corporation, Maumee, Ohio

Continuation-in-part of Ser. No. 236,226, Apr. 29, 1994, abandoned. This application Jan. 26, 1995, Ser. No. 378,500

Int. Cl.[6] F16L *29/04*

U.S. Cl. 137—595 **46 Claims**



1. A coupling for joining together opposing ends of a pair of refrigerant flow lines comprising:

(a) a housing extending in an axial direction generally parallel to the joined flow lines from a first axial end to a second axial end, a web extending laterally across said housing, said web having first and second passageways aligned with said flow lines;

(b) a pair of first valve assemblies, one positioned in each of said first and second passageways, each of said first valve assemblies including,

(i) a body member slideably positioned in one of said first and second passageways for movement from a retracted position to a forward position closer to said housing first axial end, said body member having (1) a central passageway extending from an attachment end communicating with a refrigerant fluid flow line in the vicinity of said housing second axial end to a forward end, said central passageway having an internal cylindrical wall surface extending to said forward end and (2) an exterior sealing surface adjacent said central passageway forward end;

(ii) a sleeve having a first portion positioned in said body member forward end in contact with and axially slideable relative to said internal cylindrical wall surface and a second portion extending out of said body member, said second portion including an exterior cylindrical surface and an inwardly facing sealing surface tapering outwardly;

(iii) a stem valve positioned in said central passageway and extending from a rear end to a forward end having a face, said stem valve having a head with an outwardly facing sealing surface tapered for sealing engagement with said sleeve sealing surface, said stem valve mounted on said body member for movement therewith from said retracted position to said forward position; and

(iv) a spring within said central passageway yieldingly urging said sleeve away from said attachment end and into sealing engagement with said stem valve outwardly facing sealing surface; and

(c) a second valve assembly releasingly engageable with said housing at said first end, said second valve assembly including

(i) a support member having an inner end positioned within said housing when engaged thereto, a pair of flow passages axially aligned with said central passageways, said support member having, for each flow passage, an inwardly facing sealing surface adjacent said inner end positioned to be engaged by said body member exterior sealing surface when said body member is in said forward position, an annular shoulder positioned to be engaged by said sleeve second portion when said body member is in said forward position, an annular elastomeric sealing ring between said inwardly facing sealing surface and said shoulder, said elastomeric sealing ring sized to sealingly engage said sleeve exterior cylindrical surface; and

(ii) a pair of valves mounted on said second valve assembly, with one valve in each of said flow passages and aligned with one of said stem valves, said valves being yieldingly moveable from a closed position to an open position upon engagement by and movement of said stem valve to said forward position; and

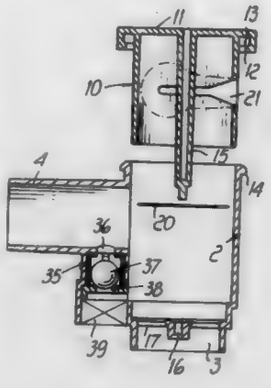
(d) means for causing said body members and their stem valves to move axially, said support member annular shoulders stopping axial movement of said sleeves while permitting movement of said body members and stem valves to thereby open said stem valves and said aligned pair of valves of said second valve assembly, each of said sleeve exterior surfaces sealingly engaging each of said annular elastomeric sealing rings and thereafter each of said body member exterior sealing surfaces engaging each of said support member inwardly facing sealing surfaces in metal-to-metal sealing relationship.

5,464,043

PRESSURE ADJUSTMENT VALVE FOR CIRCUITS FOR THE MANUAL ADMINSITRATION OF GAS MIXTURES IN THE MEDICAL FIELD

Giorgio Damia, Milan, Italy, assignor to Dar Societa' Per Azioni, Mirandola, Italy

Filed Apr. 8, 1994, Ser. No. 225,292
Int. Cl.[6] F16K *37/00*
U.S. Cl. 137—614.2 **7 Claims**



1. A Pressure adjustment valve for circuits for the manual administration of gas mixtures in the medical field, comprising

a body that can be interposed on the circuit of a manual respiration unit and having an inlet formed through a portion of a bottom wall of said body and a discharge port;

an adjustment element within said body which may be positioned relative to said body to vary the useful passage section of a gas stream passing through said adjustment valve and thereby modify resistance created by said adjustment valve to said gas stream;

wherein said adjustment element comprises a rotatable disk-like element which has an opening formed therethrough which runs along the circumference of said disk-like element,

wherein said opening interacts with said inlet of said body to vary the useful air passage section of said adjustment valve; and a plug-like element having lid for rotatable connection to said body and a axial stem extending from said lid for rigid connection to said disk-like element;

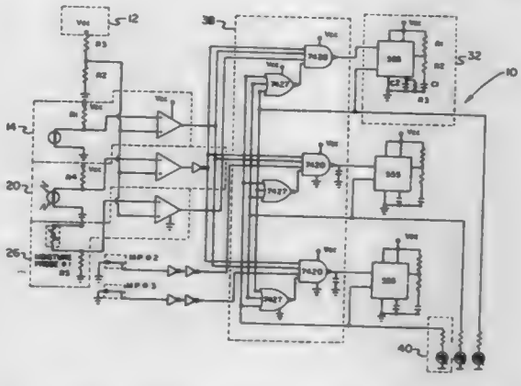
wherein rotation of said plug-like element results in corresponding rotation of said disk-like element to adjust the arrangement of said opening of said disk-like element with said inlet of said body.

5,464,044

SPRINKLER SYSTEM CONTROLLER

Joseph M. Brinkerhoff, 712 W. 200 South, Payson, Utah 84651

Filed Aug. 5, 1994, Ser. No. 286,418
Int. Cl.[6] F16K *17/36;* **A01G** *25/16*
U.S. Cl. 137—78.3 **1 Claim**



1. A sprinkler system controller for automatically allowing a sprinkler system to irrigate an area of ground comprising, in combination:

a power supply for supplying electrical energy;

a temperature sensor coupled to a power supply, the temperature sensor having a thermistor for monitoring air temperature in a ground area to be irrigated and a comparator coupled thereto for transmitting an affirmative temperature indication signal when a given preset temperature of about 40 degrees Fahrenheit as recognized by the thermistor is exceeded and a non-affirmative temperature indication signal otherwise;

a light sensor coupled to the power supply, the light sensor having a photodetector for monitoring light intensity in a ground area to be irrigated and a comparator with inverter coupled thereto for transmitting an affirmative illumination indication signal when a given preset intensity as recognized by the photodetector is not exceeded and a non-affirmative illumination indication signal otherwise;

a plurality of moisture probes, each in a form of a stainless steel tube filled with silicone, each coupled to the power supply, each having a variable resistor for monitoring moisture in a ground area to be irrigated and a comparator coupled thereto for transmitting an affirmative moisture indication signal when a given preset moisture level as recognized by the variable resistor is not exceeded and a non-affirmative moisture indication signal otherwise;

a plurality of timers each coupled to the power supply, each having an input and an output, each input adapted to receive an affirmative timer activation signal, each output transmitting an affirmative sprinkler valve activation signal for a preset period of time of between about 30 to 36 minutes upon receipt

of an affirmative timer activation signal, and each output transmitting and a non-affirmative sprinkler valve activation signal otherwise;

conjunctive means coupled to the power supply and further coupled to the temperature sensor, light sensor, moisture probes, and timers for transmitting an affirmative timer activation signal upon receipt of an affirmative temperature indication signal, an affirmative timer activation signal upon receipt of an affirmative illumination indication signal, and an affirmative timer activation signal upon receipt of an affirmative moisture indication signal with a constraint that no affirmative sprinkler valve activation signal is currently being received in a feedback type mode; and

a plurality of triacs, each triac coupled to the power supply and an output of a separate timer, each triac transmitting an affirmative sprinkler line activation signal when an affirmative sprinkler line activation signal is received and a non-affirmative sprinkler valve activation signal otherwise, with the affirmative sprinkler line activation signal adapted to open a solenoid water valve coupled to a sprinkler line, whereby allowing a sprinkler head coupled to the sprinkler line to disperse water for irrigating an area of ground, and with the non-affirmative sprinkler line activation signal adapted to close an opened solenoid water valve coupled to a sprinkler line, whereby preventing a sprinkler head coupled to the sprinkler line from dispersing water.

5,464,045

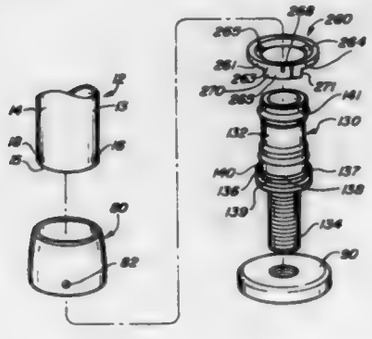
SPOUT MOUNTING SYSTEM

James E. Niemann, Noblesville, and Anthony G. Spangler, Greensburg, both of Ind., assignors to Masco Corporation of Indiana, Indianapolis, Ind.

Continuation-in-part of Ser. No. 182,888, Jan. 18, 1994, Pat. No. 5,381,830. This application Nov. 2, 1994, Ser. No. 333,446

Int. Cl.[6] **F16K** *21/00*

U.S. Cl. 137—801 **9 Claims**



1. Spout assembly for mounting a spout comprising:

centerbody having an annular retainer groove therein;

spout having at least one slot extending through the side wall thereof adjacent the bottom edge thereof, said spout being rotatably mounted over said centerbody with said slot aligned with said groove;

retaining member comprised of a split annular body portion having at least one radially inwardly extending lug mounted over said spout, said lug extending through said slot and into said annular groove to prevent axial movement of said spout relative to said centerbody but allow rotational movement of said spout on said centerbody;

bonnet slidably mounted on said spout disposed over said retaining member to secure said retaining member in place; and

first means on said centerbody cooperable with second means on said retaining member for limiting rotational movement of said spout on said centerbody.

5,464,046

ELECTRICALLY CONTROLLED JACQUARD SELECTION APPARATUS

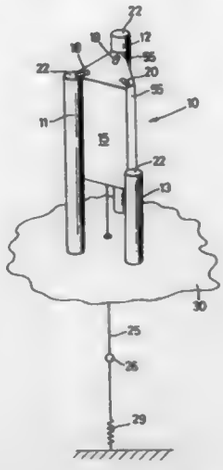
Jonathan F. McIntyre, Tyne & Wear; Malcolm G. B. Mahboubian-Jones, Newcastle-upon-Tyne, and Ian Turnbull, Sunderland, all of, England, assignors to Bonas Machine Company Limited, Gateshead, United Kingdom

Filed Dec. 5, 1994, Ser. No. 297,236

Claims priority, application United Kingdom, Apr. 19, 1994, 9407710

Int. Cl.[6] **D03C** *3/20*

U.S. Cl. 139—455 **11 Claims**



1. A jacquard mechanism for controlling shed selection of warp yarns, the mechanism including at least one selector body adapted for connection to a heald and mounted for movement between upper and lower shed positions, a plurality of elongate support members arranged side by side in a parallel relationship, the selector body being slidably mounted relative to said support members for longitudinal movement therealong, at least one of said plurality of support members being static and at least one other of the plurality of support members being mounted for longitudinal reciprocal movement, the selector body and support members including co-operable latch means operable between latch and unlatch positions causing selective engagement therebetween.

5,464,047

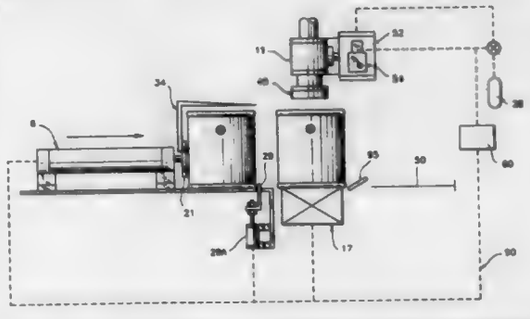
METHOD AND APPARATUS FOR DISPENSING PAINT INTO CONTAINERS

Dominic Muscara, Iselin, N.J., assignor to Benjamin Moore & Co., Montvale, N.J.

Filed Jan. 24, 1994, Ser. No. 185,030

Int. Cl.[6] **B65B** *3/28*

U.S. Cl. 141—1 **10 Claims**



1. A method of supplying a plurality of containers with liquid, the method comprising in combination, selecting a predetermined amount of liquid to be introduced into each of the containers,

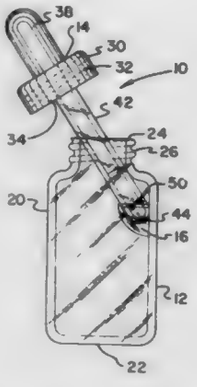
introducing into a first container a first percentage of said predetermined amount and subsequently introducing in steps additional liquid until said predetermined amount is reached, introducing into a second container a percentage of said predetermined amount greater than the initial percentage introduced into said first container and then introducing additional liquid into said second container in steps until said predetermined amount is reached, and continuously introducing into a third container an amount of liquid within a tolerance of said predetermined amount, and wherein the amounts of liquid introduced into the first container are measured and determined by weight.

5,464,048

LIQUID DISPENSER BOTTLES WITH RESERVOIRS FOR DROPPERS

Edward Allen, 16950 Jasmine St., #176, Victorville, Calif. 92392-5713

Filed Feb. 22, 1994, Ser. No. 199,808
Int. Cl.[6] B65D *47/18*
U.S. Cl. 141—24 **4 Claims**



2. A liquid dispenser bottle with a reservoir for droppers comprising:

a bottle having cylindrical side walls with a flat circular bottom and an open cylindrical top, the top being formed with external screw threads;

a dropper having a cylindrical cap with downwardly extending linear sidewalls with internal screw threads removably couplable with the exterior screw threads of the bottle, a squeeze ball operatively coupled to the cap thereabove, and a cylindrical tube therebelow terminating in a spherical end with an aperture at its lowermost point for receiving and dispensing liquid through the squeezing and releasing of the ball, the lower end of the cylinder having a diameter less than fifty percent of the diameter of the open cylindrical top of the bottle to allow insertion of the tube into the bottle at a predetermined angle; and

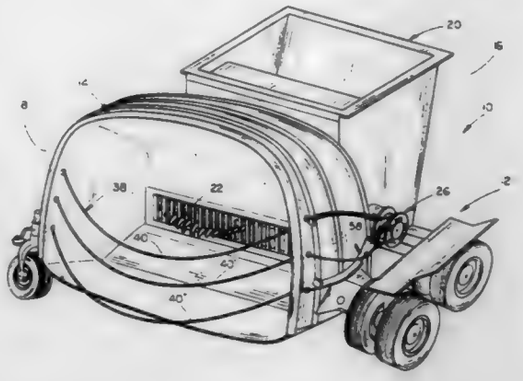
a reservoir formed into the interior of a cylindrical side wall of the bottle, the reservoir having an open upper edge of a diameter greater than the diameter of the dropper tube and with a spherical lowermost surface essentially the same shape as that of the exterior end of the dropper to retain fluid when the bottle is erect, the reservoir having an interior surface constituting less than half of a sphere, the length of the tube being less than the length of the cylinder but less than the distance between the open cylindrical top of the bottle and the reservoir.

5,464,049

AGRICULTURAL FEED BAGGING MACHINE INCLUDING A ROTOR WINCH

Steven R. Cullen, Astoria, Oreg., assignor to Versa Corporation, Astoria, Oreg.

Filed Mar. 10, 1994, Ser. No. 209,417
The portion of the term of this patent subsequent to Mar. 29, 2011, has been disclaimed.
Int. Cl.[6] B65B *1/24*
U.S. Cl. 141—114 **8 Claims**



1. An agricultural feed bagging machine for bagging agricultural feed material into agricultural bags having a closed end and an open mouth comprising:

a frame means having rearward and forward ends;

a hopper on said frame means for receiving the material to be bagged;

a horizontally disposed rotor rotatably mounted on said frame means, said rotor including a shaft end which is exposed at a position laterally of said machine;

said rotor being in communication with said hopper for forcing the material to be bagged rearwardly therefrom;

a cable rewind spool mounted on said shaft end for rotation therewith and including a vertically disposed flange;

said flange having at least one opening formed therein for receiving one end of a density control cable;

a tunnel on said frame means rearwardly of said hopper and said rotor for receiving the material being forced rearwardly from said rotor, said tunnel having an intake end which receives the material from said rotor and an output end adapted to receive the open mouth of the agricultural bag;

at least one substantially U-shaped density control cable positioned within said tunnel and having first and second ends positioned outwardly of said tunnel adjacent the forward end thereof;

said density control cable being positioned in the feed material as the feed material is being bagged into the agricultural bag;

first anchor means selectively securing said cable, adjacent said first end thereof, against movement;

second anchor means selectively securing said second end of said cable against movement;

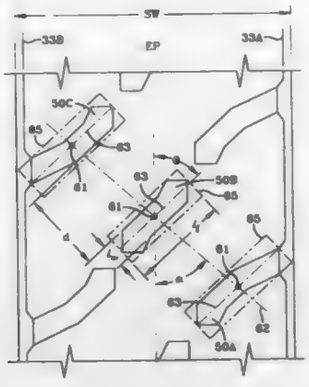
said cable having means on its said second end, for reception by said opening in said flange, so that rotation of said rotor will cause said cable to be wrapped around said cable rewind spool and pulled from said tunnel after said first end of said cable has been disconnected from said first anchor means.

5,464,050

NON-DIRECTIONAL PNEUMATIC TIRE FOR USE ON AGRICULTURAL TRACTORS AND OTHER LIKE VEHICLES

Mark L. Bonko, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jun. 20, 1994, Ser. No. 262,673
Int. Cl.[6] B60C *11/11*
U.S. Cl. 152—209 B **8 Claims**



1. A non-directional pneumatic agricultural tire having a maximum section width (W), an axis of rotation, an equatorial plane perpendicular to the axis, a casing having a carcass reinforced with rubber coated cord, a robber tread disposed radially outwardly of the carcass, the tread including an inner tread and a plurality of tread lugs, the lugs respectively having a surface with a length (l_L) and a width (l_w) wherein the length (l_L) is at least three times the width (l_w) and the length (l_L) of the lugs being respectively at least 10% of the maximum section width, each lug having a centerline defined by a line bisecting a rectangle encompassing the lug surface, the tread having a first and a second tread edge and a net-to-gross ratio of less than 40%, the net-to-gross ratio being defined as the ratio of the surface area of the normally loaded and normally inflated tire tread rubber that makes contact with a hard, flat surface, divided by the area of the tread, including non-contacting portions such as grooves as measured around the entire circumference of the tire, the tread comprising a set including at least three lugs having substantially parallel lug centerlines, the set being repeated a plurality of times circumferentially about the tread, the set extending along a line approximately through the lug centers in a substantially straight line across the tread from the first tread edge to the second tread edge, the centerline of each lug being substantially parallel and forming an acute angle θ with the equatorial plane of about 45°.

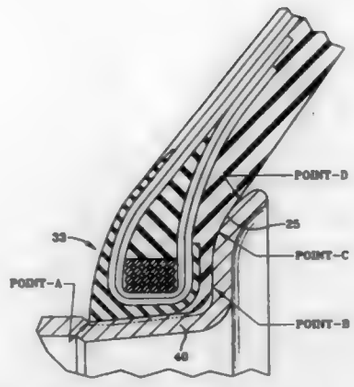
5,464,051

RADIAL PLY TIRE WITH SPECIFIED BEAD PORTION DESIGN

Richard C. Beard, Massillon, and Michael D. Kachner, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 5, 1993, Ser. No. 148,783
Int. Cl.[6] B60C *15/02;15/024;15/04*
U.S. Cl. 152—454 **13 Claims**

1. An improved radial-ply pneumatic tire having an axis or rotation, and a pair of axially-spaced beads respectively including annular tensile members, each annular tensile member having a radially inner flat surface prior to the tire being molded, and at least one radial ply extending between the annular tensile members of the respective beads, the beads each having a heel portion and a toe portion designed to engage a design rim having a bead seat and a design rim width D, the width D being defined as half of the quantity equal to the maximum recommended rim width plus the minimum recommended rim width, such rim widths being as specified by the industry standards in effect in the location in



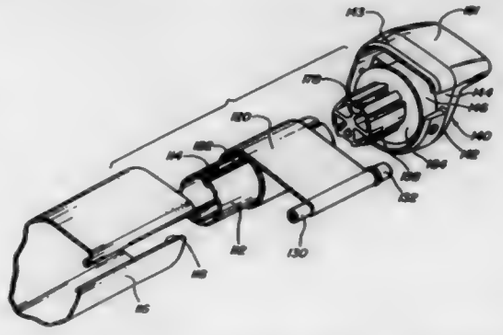
which the tire is manufactured, the improved tire being characterized by a first annular surface between the heel and toe of each bead and a second annular surface extending radially outwardly from each bead heel, the first annular surface being in contact with the bead seat of the design rim when the tire is mounted and inflated to normal pressure, the first annular surface, when the tire is unmounted, forming, with the axis of the tire, when the beads am axially spaced a distance equal to the design tire width D, an average angle β, that is in the range of one-half degree to less than three degrees greater than the angle formed between the mating bead seat of the design rim and the axis of the tire, and the second annular surface when the tire is unmounted is inclined at an angle a that is in the range of 0° to less than 3° relative to a plane P, the plane P being perpendicular to the axis of rotation, the second annular surface being in contact with an annular flange portion of the design rim when the tire is mounted and inflated to normal pressure and wherein the bead is generally uniformly radially compressed between the first annular surface and the annular tensile member as measured between an axially inner and an axially outer end of the radially inner flat surface of the annular tensile member, the compression being measured as a percentage of radial compression when the tire is mounted to its design rim.

5,464,052

SECURITY SHADE WITH A MOTOR SPRING SUBASSEMBLY

Joseph P. Wieczorek, Madison Heights; Eugene M. Halajian, Harrison Township, and Michael Trombley, Sterling Heights, all of Mich., assignors to Takata, Inc., Auburn Hills, Mich.

Filed Nov. 8, 1993, Ser. No. 148,931
Int. Cl.[6] E06B *9/08*
U.S. Cl. 160—23.1 **24 Claims**



1. A security shade support subassembly for a security shade having a roller tube onto which is mounted a flexible panel that can be deployed in a cargo area of a motor vehicle to obstruct the view into the cargo area, said support subassembly comprising:

a housing;

an outboard end wall;

an inboard end wall;

a skirt, said skirt extending generally between said outboard end wall and said inboard end wall and cooperating therewith to define a receiving cavity;

a coupler supported by said housing and adapted to couple said subassembly to said roller tube such that said receiving cavity is outboard relative to said roller tube, said coupler being supported for relative rotation with respect to said housing;

rotational biasing means secured to said housing and to said coupler and disposed within said receiving cavity for rotationally biasing said coupler, inducing rotation of said roller tube and causing said shade panel to be wrapped onto said roller tube in a stored position;

mounting means for mounting said security shade within the motor vehicle such that said shade panel can be deployed to obstruct the view into the cargo area of the motor vehicle; and

retention means for maintaining said subassembly in a fully assembled condition prior to said subassembly being mounted to said roller tube.

5,464,053

PROCESS FOR PRODUCING RHEOCAST INGOTS, PARTICULARLY FROM WHICH TO PRODUCE HIGH-MECHANICAL-PERFORMANCE DIE CASTINGS

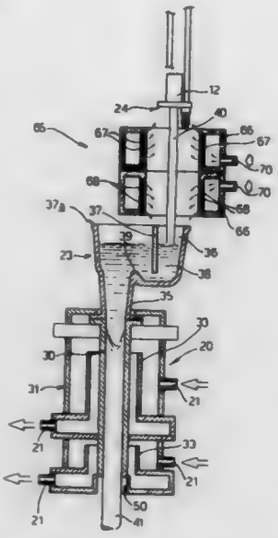
Renzo Moschini, Senigallia, Italy, assignor to Weber S.r.l., Torino, Italy

Filed Sep. 9, 1993, Ser. No. 118,965

Claims priority, application Italy, Sep. 29, 1992, TO92A0791

Int. Cl.[6] B22D *27/00;11/10*

U.S. Cl. 164—460 **8 Claims**



1. A process for producing rheocast ingots, particularly from which to produce high-mechanical-performance die castings, and comprising in stages:

smelting a metal alloy;

semiliquid casting said metal alloy, collected under stationary rheological conditions in a pressurized furnace, by feeding it at the solidification stage and under laminar flow conditions into a static mixer, so as to obtain a semiliquid rheocast material at an outlet of the static mixer;

collecting said rheocast material at the outlet of the static mixer, and through a cooled metal die, continuously solidifying the material into a single constant-section billet, said die having an outlet; and

feeding said billet past a cutter that cuts the billet into pieces;

the semiliquid rheocast material from the static mixer being collected in a tank and protected against the formation of oxides by guiding a continuous outflow stream of the material from the static mixer through a toroidal device for generating a protective atmosphere and located over the tank and at the outlet of the static mixer; the outflow stream being guided along the axis of symmetry of the toroidal device; and, simultaneously, two gas streams being injected inside the toroidal device and about the outflow stream by two respective series of nozzles oriented obliquely in relation to said axis of symmetry and in the opposite direction to each other.

5,464,054

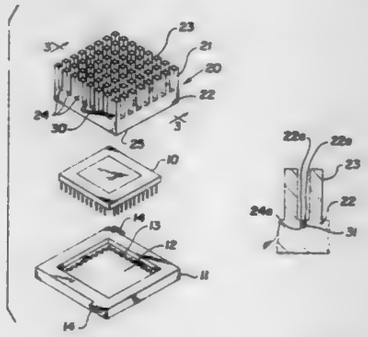
SPRING CLAMP AND HEAT SINK ASSEMBLY

Howard G. Hinshaw, Dallas; Keith R. Moulton, Argyle, and Donald L. Bland, Ft. Worth, all of Tex., assignors to Thermalloy, Inc., Dallas, Tex.

Continuation of Ser. No. 103,564, Aug. 9, 1993, abandoned. This application Aug. 1, 1994, Ser. No. 283,535

Int. Cl.[6] F28F *7/00;* **H05K** *7/20*

U.S. Cl. 165—80.3 **11 Claims**



1. In combination:

(a) a heat sink comprising a body of thermally conductive material having at least one substantially flat first major face and a second major face disposed substantially parallel with said first major face with fins extending from said second major face and a groove in said second major face between said fins and extending substantially parallel with said first major face; and

(b) a mounting device having an elongated central portion and first and second end portions, said central portion positioned and secured within said groove by tabs deformed from short sections of said body adjacent said groove which project over short portions of and entrap said elongated central portion of said mounting device in said groove with said end portions projecting from opposite ends thereof.

5,464,055

Patent Not Issued For This Number

5,464,056

HOUSINGLESS TYPE OIL COOLER AND METHOD FOR PRODUCING THE SAME

Makoto Tajima; Shinji Araki, and Kei Beppu, all of Tokyo, Japan, assignors to Calsonic Corporation, Tokyo, Japan

Filed Dec. 21, 1993, Ser. No. 170,803

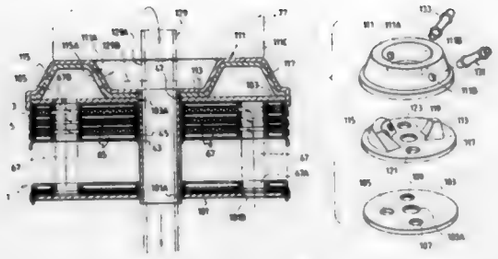
Claims priority, application Japan, Dec. 21, 1992, 4-340674; Mar. 15, 1993, 5-054172

Int. Cl.[6] F28F *3/08*

U.S. Cl. 165—167 **2 Claims**

1. A housingless type oil cooler comprising:

a core portion (1) constituted by a plurality of plates (3, 5) respectively having through-holes (43, 45) formed at their



center portions, said plates (3, 5) being alternately laminated on one another so that cooling water passages (65) and oil passages (67) are alternately formed between said plates (3, 5); and one of an oil filter (77) and a sealed flange (401) mounted on said core portion (1); wherein:

an upper tank (111) opened at its one side, donut-shaped and having a first communicating hole (111A) in its inner wall, is mounted on an upper portion of said core portion (1);

a partition plate (113) is disposed inside of said upper tank (111);

a through-hole (119), an inlet hole (121) and an outlet hole (123) are formed in a flat portion of said partition plate (113) so that said inlet hole (121) and said outlet hole (123) overlap an inlet (65A) and an outlet (65B) of said cooling water passages (65) respectively, and an oil-passing projection portion (115) and a projection-like partition portion (117) are formed on said flat portion of said partition plate (113) so that said oil-passing projection portion (115) has its inside communicated with an outlet (67B) of said oil passages (67) and has a second communicating hole (115A) formed in its inner wall so as to overlap said first communicating hole (111A) of said upper tank (111) and so that said projection-like partition portion (117) is attached at its surface onto an inner wall surface of a top portion (111C) of said upper tank (111) to thereby partition the inside of said upper tank (111) into an inlet tank chamber (125) and an outlet tank chamber (127); and

a cooling water inflow pipe (131) and a cooling water outflow pipe (133) are connected to said upper tank (111) so as to be communicated with said inlet and outlet tank chambers (125 and 127) of the upper tank (111) respectively.

5,464,057

QUENCH COOLER

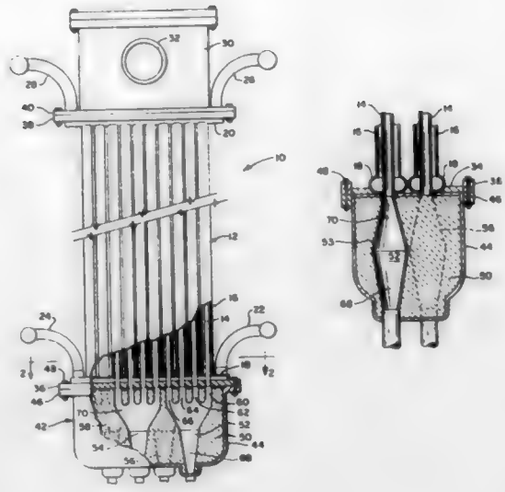
John V. Albano, 768 Glenside Court E., Oradell, N.J. 07649; Kandasamy M. Sundaram, 157-H Meriline Ave., West Patterson, N.J. 07424, and Hellmut A. Herrmann, Feerenstrasse 36, Kassel, Germany

Filed May 24, 1994, Ser. No. 248,337

Int. Cl.[6] F28F *9/02*

U.S. Cl. 165—173 **5 Claims**

1. Connecting means for feeding cracked gases from a cracking furnace coil into the heat exchange tubes of a quench cooler, said connecting means containing a plurality of flow passageways and each passageway comprising a diverging conical inlet diffuser passage followed by an outlet section which is furcated into a plurality of individual outlet passages with each of said outlet passages adapted to feed one of said heat exchange tubes, said outlet section having a configuration such that the cross sectional flow area uniformly decreases in the direction of flow thereby forming a generally converging outlet section.



5,464,058

METHOD OF USING A POLISHED ROD TRANSDUCER

James N. McCoy, Wichita Falls; Augusto L. Podio, Austin, and James W. Jennings, Hearne, all of Tex., assignors to James N. McCoy, Wichita Falls, Tex.

Continuation of Ser. No. 8,602, Jan. 25, 1993, abandoned.

This application Mar. 17, 1995, Ser. No. 405,736

Int. Cl.[6] E21B *47/00*

U.S. Cl. 166—250.01 **33 Claims**

1. A method for determining load or changes in axial load on a polished rod of a pumping system wherein the rod extends down a borehole to a downhole pump and the rod is reciprocated by a surface unit to cause the downhole pump to lift fluid up through the borehole, the method comprising the steps of:

coupling a transducer to opposite longitudinal sides of said rod by applying a compressive force to said rod by said transducer at a single point along the length of said rod wherein said compressive force is applied in a direction normal to the axis of said rod,

generating a signal by said transducer in response to applying said compressive force to said rod wherein said signal is a function of said compressive force on said rod,

digitizing said signal to produce a digital data set,

storing said digital data set, and

processing said digital data set in conjunction with a calibration factor for said transducer to determine the loads on said rod.

5,464,059

APPARATUS AND METHOD FOR SUPPLYING FLUID INTO DIFFERENT ZONES IN A FORMATION

Terje Kristiansen, Radal, Norway, assignor to Den Norske Stats Oljeselskap a.s, Stavanger, Norway

PCT No. PCT/NO94/00065, § 371 Date Nov. 25, 1994, § 102(e) Date Nov. 25, 1994

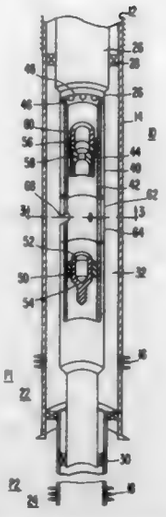
PCT Filed Mar. 25, 1994, Ser. No. 338,512

Claims priority, application Norway, Mar. 26, 1993, 931128

Int. Cl.[6] E21B *33/24;33/138*

U.S. Cl. 166—269 **23 Claims**

1. Apparatus for distributing a current of injection fluid to at least two separate zones (22,24) having higher and lower injectivity in a ground formation (10) which is penetrated by a well (12), the apparatus comprising a pipe element, which by means of upper and lower sealing bodies (28,30), defines a space (32) adjacent to a zone (22) having higher injectivity, the space having a connection to the zone, and where a fluid connection is established between an interior of the pipe element and the space via a nozzle (58) which regulates a flow pressure for a current of fluid into the zone having



the higher injectivity, the pipe element having a unit comprising an outer pipe section (**40**) and arranged internally relative to the latter, an inner pipe section (**42**), a lower portion of the inner pipe section comprising means (**54**) for closing off the passage of fluid such that a space between the inner (**42**) and the outer (**40**) pipe section forms a passage (**66**) for conveying fluid forward to formation zone (**24**) having a lower injectivity, the nozzle (**58**) being arranged in the inner pipe section (**42**), and downstream of the nozzle (**58**), the inner pipe section (**42**) being formed with means (**68**) for forming a fluid connection between the inner pipe section (**42**) and the annular space (**32**).

12. A method of distributing a current of injection fluid to at least two separate zones (**22,24**) having higher and lower injectivity in a ground formation, comprising the steps of:

providing a pipe element within the well, the pipe element having an inner and outer pipe section sections (**40,42**), the inner pipe section being internal of the outer pipe section and provided with a means (**54**) for closing off the passage of injection fluid;

creating a passage (**66**) for conveying injection fluid to the zone having the lower injectivity between the inner tube, inner and outer pipe sections;

defining a space in the wall adjacent the one with higher injectivity by placing upper and lower sealing bodies between the pipe element and the well;

providing passages means (**68**) in the inner pipe section to establish in fluid connection between an interior of the pipe element and space; and

regulating the flow of fluid in the fluid connection by a nozzle (**58**).

5,464,060

UNIVERSAL FLUIDS FOR DRILLING AND CEMENTING WELLS

Arthur H. Hale, Houston; Kenneth M. Cowan, Sugar Land, and James J. W. Nahm, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 886,533, May 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 751,399, Aug. 28, 1991, abandoned, and Ser. No. 691,905, Apr. 26, 1991, abandoned, said Ser. No. 751,399is a division of Ser. No. 671,627, Mar. 19, 1991, Pat. No. 5,085,679, which is a continuation-in-part of Ser. No. 641,794, Jan. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 457,429, Dec. 27, 1989, abandoned. This application Apr. 12, 1994, Ser. No. 266,748

Int. Cl.[6] **E21B** *33/138*

U.S. Cl. 166—293 **8 Claims**

1. A method for drilling and cementing a well comprising,

preparing a universal fluid by admixing a well fluid or drilling mud with Portland cement and pozzolan;

drilling a borehole with the universal fluid and laying down a settable filter cake on the walls of said borehole during drilling of the well; and

activating the filter cake to harden and set up.

7. A method for drilling and cementing a well comprising,

preparing a universal fluid by admixing a well fluid or drilling mud with blast furnace slag;

drilling a borehole with the universal fluid and laying down a settable filter cake on the walls of said borehole during drilling of the well; and

activating the filter cake to harden and set up.

5,464,061

CRYOGENIC COAL BED GAS WELL STIMULATION METHOD

Dennis R. Wilson; Robert M. Siebert, and Pat Lively, all of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Dec. 14, 1994, Ser. No. 356,593

Int. Cl.[6] **E21B** *43/25;43/263*

U.S. Cl. 166—302 **11 Claims**

1. A method for improving methane production from a cased wellbore extending into a subterranean coal seam comprising:

(a) providing a tubing in said wellbore for conveying liquid nitrogen from the surface to said coal seam;

(b) providing a heat transfer barrier between the wellbore casing and the interior of said tubing;

(c) injecting liquid nitrogen through said tubing to said coal seam whereby the face of said wellbore adjacent said coal seam is contacted with liquid nitrogen; and

(d) producing methane gas from said coal seam through said wellbore.

5,464,062

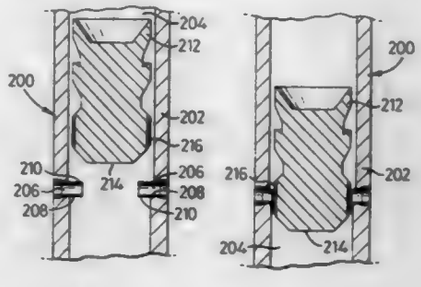
METAL-TO-METAL SEALABLE PORT

William A. Blizzard, Jr., Houston, Tex., assignor to Weatherford U.S., Inc., Houston, Tex.

Division of Ser. No. 82,256, Jun. 23, 1993, Pat. No. 5,368,098. This application Oct. 12, 1994, Ser. No. 321,557

Int. Cl.[6] **E21B** *29/00*

U.S. Cl. 166—376 **4 Claims**



1. A metal-to-metal sealing apparatus for sealing a port through a wall member, the apparatus comprising

at least one hollow port through the wall member for the passage of fluid from a first side of the wall member to a second opposite side of the wall member,

the at least one hollow port having a channel therethrough defined by a port interior surface, and

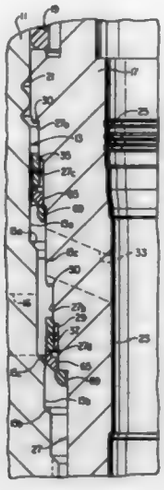
a hollow metal liner disposed within the channel of the at least one hollow port and lining the interior surface of the port, the fluid flowable through the hollow metal liner, the hollow metal liner having a hollow metal extending liner portion projecting beyond the at least one hollow port on one side of the wall member, the hollow metal extending liner portion being sealingly crushable so that upon crushing of the hollow

metal extending liner portion fluid flow through the channel of the at least one hollow port is prevented.

5,464,063
WELL ASSEMBLY METAL SEAL

Carl F. Boehm, Jr., Houston, Tex., assignor to ABB Vetco Gray Inc., Houston, Tex.

Filed Aug. 19, 1994, Ser. No. 292,986
Int. Cl.[6] E21B *33/04*
U.S. Cl. 166—382 **24 Claims**



1. In a well assembly having a tubular inner member located within a cylindrical axial bore of a tubular outer member, defining an annular pocket between a cylindrical outer wall of the inner member and the bore, an improved seal for sealing in the pocket, comprising:

an annular solid metal body having an inner wall with an inner seal surface and an outer wall with an outer seal surface;

the seal body having an initial radial dimension from its inner seal surface to its outer seal surface prior to locating in the pocket that is initially greater than a radial dimension of the pockets;

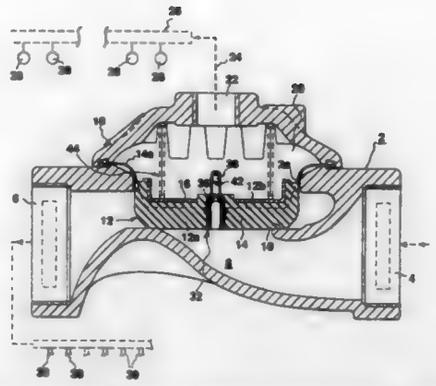
the seal body having an initial outer diameter at its outer seal surface prior to locating in the pocket that is initially smaller than an inner diameter of the bore;

the seal body having an initial inner diameter at its inner seal surface prior to locating in the pocket that is initially smaller than an outer diameter of the outer wall of the inner member, the seal body being deformable such that when positioned in the pocket, the seal body deforms in an interference fit causing the inner seal surface to sealingly engage the outer wall of the inner member and the outer seal surface to sealingly engage the bore.

5,464,064
VALVE PARTICULARLY USEFUL IN FIRE EXTINGUISHING SYSTEMS

Zvi Weingarten, Doar Na Oshrat, Israel, assignor to Bermad, Doar NA Oshrat, Israel

Filed Dec. 23, 1993, Ser. No. 172,351
Claims priority, application Israel, Dec. 25, 1992, 104235
Int. Cl.[6] A62C *35/68*
U.S. Cl. 169—22 **3 Claims**



1. A valve including a housing having an inlet, an outlet, a passageway connecting the inlet to the outlet, a valve seat in said passageway, a valve member comprising an elastomeric diaphragm movable to an open position or to a closed position with respect to said valve seat, and a control chamber on one side of said valve member for controlling the movements of said valve member; said valve member having:

a predetermined surface area on its inlet side exposed to the inlet pressure to produce a force tending to move the valve member to an open position;

a larger surface area on its opposite, control chamber side exposed to the inlet pressure to produce a larger force tending to move the valve member to its closed position;

a hollow stem embedded in said diaphragm and formed with a passageway through said valve member leading from its inlet side to said control chamber;

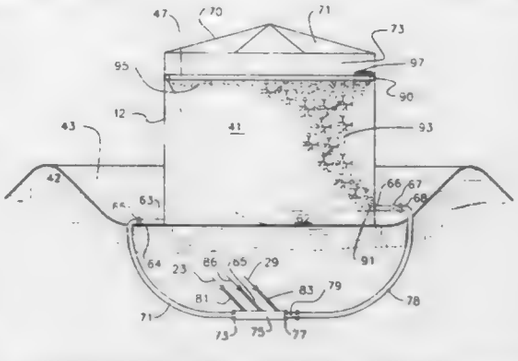
a restrictor orifice in said passageway of the hollow stem adjacent to said control chamber, said hollow stem including an extension extending from said restrictor orifice into said control chamber;

and a one-way valve in said extension permitting fluid flow only from said inlet side to said control side of the elastomeric diaphragm, to thereby prevent unintentional opening of the valve member in the event of a drop in the inlet pressure followed by the resumption of the inlet pressure.

5,464,065
METHOD FOR EXTINGUISHING TANK FIRES

Joseph B. Kaylor, Manassas, Va., assignor to Valkyrie Scientific Proprietary, L.C., Reston, Va.

Continuation-in-part of Ser. No. 21,014, Feb. 22, 1993, Pat. No. 5,377,765. This application Feb. 22, 1994, Ser. No. 199,645
Int. Cl.[6] A62C *3/06*
U.S. Cl. 169—44 **11 Claims**



1. A method for extinguishing a fire burning in a tank containing a flammable liquid comprising:

establishing a water layer at the bottom of the tank below said flammable liquid;

establishing a flow of inert gas into said tank at a first location that is below the surface of said flammable liquid;

removing a stream of water from said water layer at a second location adjacent the tank bottom, said first and second loca-

tions spaced apart one from the other, said first location being at a higher elevation than is said second location;

merging said flowing gas and said water stream and circulating the combined stream back to the tank at said first location, said circulation powered by the energy of said flowing gas;

adding a foam concentrate to said circulating gas and water stream while maintaining the flow of inert gas at a rate sufficient to power the circulation of said water stream, to form foam bubbles by interaction with said foam concentrate and water, and to lift liquid droplets and foam bubbles up through the flammable liquid to the surface thereby forming a fire extinguishing foam layer that spreads across the surface of the flammable liquid.

5,464,066

METHOD AND A MACHINE FOR REPAIRING A GROUND AREA PLANTED WITH GRASS FOR EXAMPLE A TURFED RACECOURSE OR EQUESTRIAN TRAINING GROUND

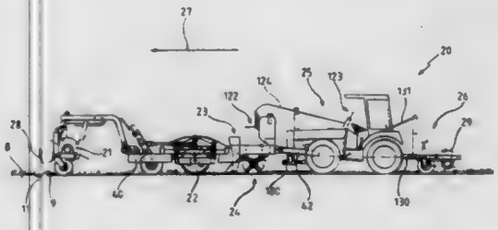
Bernard Doucet, Montmirail, France, assignor to Doucet Freres, France

Filed Mar. 10, 1993, Ser. No. 29,158

Claims priority, application France, Mar. 11, 1992, 92 02895

Int. Cl.[6] E02F *3/76*; E01C *19/00*

U.S. Cl. 172—1 **21 Claims**



1. A method of repairing divots and holes in a turf covered ground area, said method comprising the steps of:

determining a first predetermined direction of travel with respect to said turf covered ground area;

raking said turf covered ground area in a direction substantially the same as said first predetermined direction of travel with a vehicle having a rotary rake having a periphery that contacts said turf covered ground area, said rotary rake mounted to the extreme front end of said vehicle; and

rolling a drum mounted to said vehicle over said turf covered ground area to flatten and consolidate said turf covered ground area, said drum being mounted to said vehicle behind said rotary rake.

5,464,067

GOLF MARKER CLEANER AND GRASS REMOVER

Joseph O. Dulak, 252 E. Broadway, Owatonna, Minn. 55060

Filed Jan. 11, 1994, Ser. No. 180,055

Int. Cl.[6] A01B *45/04*

U.S. Cl. 172—13 **11 Claims**

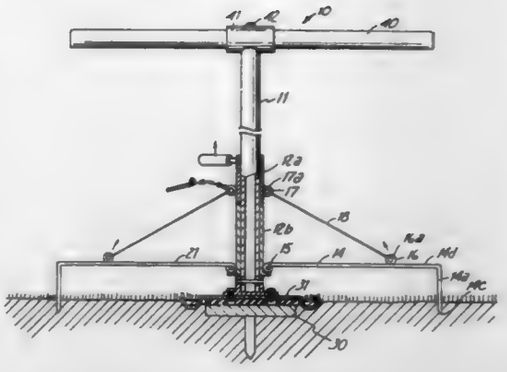
1. A golf marker cleaner comprising:

a housing having a central bore with a central axis therein:

a set of retractable soil-engaging arms, each of said set of retractable soil-engaging arms having a first end pivotally connected to said housing and a second end with a soil-engaging tine to prevent movement of said soil-engaging arm;

a shaft extending through the bore in said housing and rotatably journaled therein to permit rotation of said shaft about said central axis and with respect to said housing;

a resilient pad attached to said shaft, said resilient pad having a surface for rotatingly engaging a top surface of a marker on a golf course without marring the surface of the marker, said resilient pad limiting the axial displacement of said shaft;



a soil-cutting knife connected to said shaft said soil-cutting knife having U-shaped cutting blades located thereon to permit an operator to rotate said soil-cutting knife to cut free an annular portion of soil and grass located below said housing; and

a set of flexible linkages connected to said housing and to said set of retractable soil-engaging arms to limit the pivotal displacement of said set of soil-engaging arms.

5,464,068

DRILL BITS

Mohammad Najafi-Sani, 109 Lily Hill Road, Bracknell, Berkshire, RG12 2RY, United Kingdom

Filed Nov. 24, 1993, Ser. No. 157,968

Claims priority, application United Kingdom, Nov. 24, 1992, 9224627

Int. Cl.[6] E21B *10/46*

U.S. Cl. 175—374 **9 Claims**

1. A drill bit comprising a working end having a slot formed therein and an unbacked diamond insert consisting of a layer of CVD diamond located in the slot and bonded directly to the working end by a braze alloy, the diamond insert presenting a cutting edge or point for the bit.

5,464,069

GROUND EFFECT VEHICLE

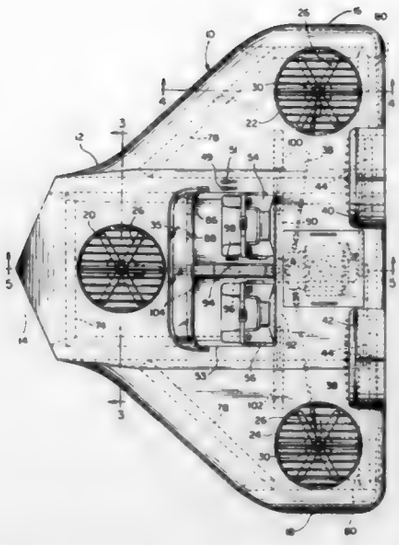
William J. Gifford, 335 W. Moss Mill Rd., Fog Harbor, N.J. 08215

Filed Aug. 4, 1994, Ser. No. 285,826

Int. Cl.[6] B60V *1/11*

U.S. Cl. 180—116 **21 Claims**

1. A ground effect vehicle including a generally delta wing form body defining a central, forward apex portion and a pair of opposite lateral side rear apex portions, said forward and rear apex portions defining forward and rear, respectively, generally vertical air ducts therethrough each having lift air flow thrust developing means operatively associated therewith for generating variable velocity air flow downwardly therethrough, and propulsion air flow



thrust developing means carried by said body for effecting a forward thrust to said body.

5,464,070

STANCHION ASSEMBLY

Cornelis J. Griek, and Anthony K. Mitchinson, both of Victoria, Australia, assignors to DGS Property Pty. Ltd., Australia

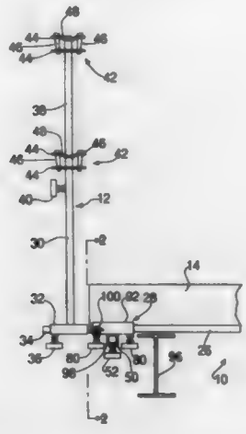
Continuation-in-part of Ser. No. 646,776, Mar. 1, 1991, Pat. No. 5,353,891. This application May 10, 1993, Ser. No. 60,096

Claims priority, application Australia, May 8, 1992, PL 2325/92

The portion of the term of this patent subsequent to Oct. 11, 2011, has been disclaimed.

Int. Cl.[6] B21F *27/00*

U.S. Cl. 182—45 **18 Claims**



1. An adjustable stanchion assembly for a frame building which has an elongated frame member, the elongated frame member having an elongated flange and a distal lip extending along the flange of the frame member to define an L-shaped section, the stanchion assembly comprising:

(A) a support post for a safety barrier;

(B) a clamping mechanism for clamping the support post to the frame building, the clamping mechanism comprising:

(B1) an elongated connection member of non-circular cross-sectional shape, and

(B2) a single clamp which is adapted to be clamped to the frame member of the frame building, the clamp comprising:

(B2a) a sleeve,

(B2ai) the connection member extending through the sleeve thereby making the clamp slidably mounted on the connection member and selectively relatively adjustable along the connection member, and

(B2aii) the sleeve having an internal configuration of a non-circular cross-sectional shape that, in combination with the non-circular cross-sectional shape of the connection member, makes the clamp non-rotatable relative to the connection member; and

(B2b) a pair of opposed longitudinally extensive open-ended jaws which are affixed to the sleeve, the jaws defining:

(B2bi) a mouth of restricted width, the distal lip of the elongated frame member having a greater height than the restricted width of the mouth; and

(B2bii) a throat portion behind the mouth having a height and a width substantially parallel to the width of the mouth and which is greater than the restricted width of the mouth and at least as high as the distal lip,

(B2biii) whereby the frame member can only be received in and removed from the jaws by relative rotation of the clamp around the distal lip of the flange;

(B2biv) the axis of the pair of jaws being substantially parallel to the axis of the sleeve; and

(C) means for securing the support post to the connection member such that the support post is supported in a cantilevered manner from the frame member by the clamping mechanism.

5,464,071

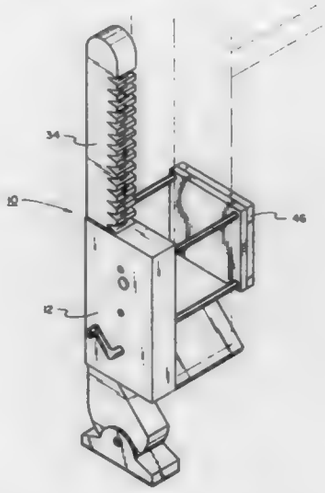
LADDER LEVELING DEVICE

Crispin J. Rice, 1093 Ballston Lake Rd., Ballston Lake, N.Y. 12019-2331, and William G. Hauprich, 249 Malta Ave., Ballston Spa, N.Y. 12020

Filed Jan. 17, 1995, Ser. No. 373,608

Int. Cl.[6] E06C *7/44*

U.S. Cl. 182—205 **3 Claims**



1. A new and improved ladder leveling device for adjusting the length of a ladder's leg to keep the ladder vertical on uneven ground comprising, in combination:

a gear box having an upper end, a lower end, a right wall and a left wall, a receiving aperture formed through the upper end and the lower end, three gears coupled to an interior of the gear box on shafts, the shaft of a lowest gear extending outwardly of the left wall, a crank coupling with the outwardly extending shaft of the lowest gear, the crank serving to rotate the lowest gear thereby collectively rotating the three gears, a pin selectively coupling with an uppermost gear and

extending outwardly of the left wall, the pin serving to selectively engage or disengage the three gears, a plate secured to the a lower portion of the right wall, the plate serving to support the ladder's leg;

a vertical rack having a first end, a second end, an intermediate extent therebetween, a front surface and a back surface, the front surface of the intermediate extent having a plurality of teeth thereon, the vertical rack secured within the receiving aperture formed through the upper end and the lower end of the gear box, the plurality of teeth engaging the three gears and optionally raised or lowered by the rotation of the three gears when the pin is disengaged, a foot pad pivotally coupled with the second end by a bolt and wing nut, the foot pad serving to lie flat on the ground and stabilize the device;

an adjustable clamp having an outer wall, the outer wall having four inwardly extending posts therefrom, the posts secured to the right wall of the gear box upwardly of the plate, the outer wall having a threaded aperture formed therethrough, a crank shaft rotatably coupled with the threaded aperture of the outer wall, the crank shaft having a first end and a second end, the first end having a crank handle theresecured, the adjustable clamp having a movable side wall, the movable side wall slidably coupled with the four inwardly extending posts, the movable side wall also secured to the second end of the crank shaft, the movable side wall serving to secure the ladder's leg against the gear box.

5,464,072

SELF-PROPELLED ELEVATOR SYSTEM

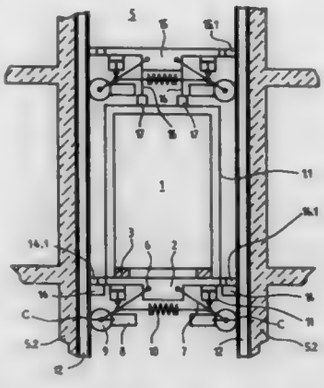
Wolfgang Müller, Meggen, Switzerland, assignor to Inventio AG, Hergiswil NW, Switzerland

Filed Oct. 27, 1993, Ser. No. 143,490

Claims priority, application Switzerland, Jan. 27, 1992, 0334/92

Int. Cl.[6] B66B *9/00*

U.S. Cl. 187—249 **19 Claims**



1. A self-propelled elevator car for vertical travel in a shaft includes a vertically acting friction wheel drive having friction wheels which project laterally beyond the sides of the car and are pressed in an approximately horizontal direction against an associated running surface on a wall of the shaft by a force applying device, the force applying device comprising:

a carriage attached to an elevator car which car travels in a shaft and exerts a load-dependent passive gravitational force on said carriage; and

a guide arm having one end pivotally attached to said carriage and extending downwardly and outwardly to an opposite free end, said opposite free end being connected to a friction wheel for applying the load-dependent passive gravitational force as a passive contact pressure pressing the friction wheel against a wall of the shaft, said opposite free end being positioned closer to the wall of the shaft than said one end, said guide arm extending at a predetermined angle between a horizontal axis of the car and a straight line extending from a point at which said one end of said guide arm is pivotally mounted to a point of contact between the friction wheel and the wall of the shaft, said predetermined angle being selected to apply said passive contact pressure at a magnitude (Fn passive) sufficient to exceed a minimum necessary contact pressure magnitude (Fn min) during at least a portion of an operation of the elevator car in the elevator shaft.

5,464,073

DEVICE FOR REMOVING THE RUBBISH GATHERING IN THE THRESHOLD OF AN ELEVATOR CAR

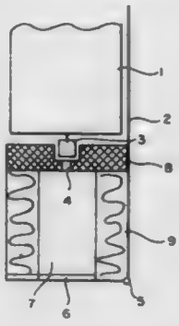
de Jong Johannes, Järvenpää, Finland, assignor to Kone Oy, Helsinki, Finland

Filed Dec. 14, 1993, Ser. No. 166,006

Claims priority, application Finland, Dec. 22, 1992, 925839

Int. Cl.[6] B66B *13/00*

U.S. Cl. 187—334 **9 Claims**



1. A device for removal of rubbish gathered in a threshold of an elevator car, said threshold being provided with one or more holes below a bottom guide of an elevator car door, the device comprising:

a rubbish collecting container fully enclosed on all sides and having an aperture on one side thereof, the aperture positioned below the one or more holes, in which the rubbish coming through the holes in the threshold passes through the aperture and is collected in the container.

5,464,074

DIFFERENTIAL SPRING-BACK ACTION BETWEEN BICYCLE BRAKE ARMS ALONG WITH SPRING-BACK STOPPER STRUCTURE

Kunihiko Yoshikawa, Saitama, Japan, assignor to Yoshikawa Mfg. Co., Ltd., Saitama, Japan

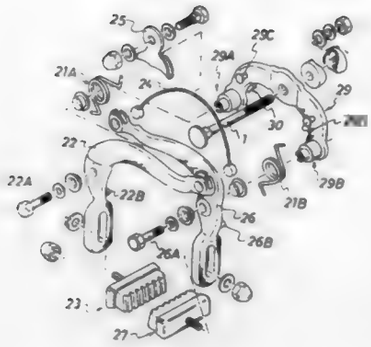
Division of Ser. No. 16,187, Feb. 11, 1993, Pat. No. 5,328,001, which is a continuation of Ser. No. 808,764, Dec. 17, 1991, abandoned. This application Dec. 30, 1993, Ser. No. 174,315

Claims priority, application Japan, Jul. 4, 1991, 3-190529; Jul. 15, 1991, 3-200108

Int. Cl.[6] B62L *3/02*

U.S. Cl. 188—24.22 **6 Claims**

1. A mechanism of a brake for a two-wheeler comprising a pair of left and right arms pivotally attached to a frame of the two-wheeler, each having on its distal end portion a brake shoe, and a spring for energizing each of said arms to move said respective arm in a brake releasing direction from an actuated state, wherein one of said arms is more strongly energized by said respective spring than the other of said arms, a stopper being provided to restrict the extent of the movement of said one of said arms towards said brake releasing direction so that, when one of said arms is set back to said brake releasing direction, said one of said arms is stopped by said stopper from further movement thereof before the setting-back movement of said other of said arms is completed, thereby allowing said other arm to be set back to the original position, wherein both of said arms are of the same



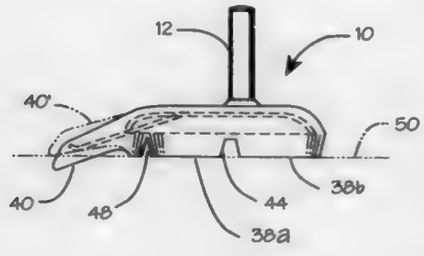
C-shaped structure, an intermediate portion thereof being pivotally attached to a frame of said two-wheeler by means of a center bolt, each proximal end portion of the C-shaped arms being connected to one end portion of a pulling wire, said pulling wire having a middle portion connected to a central brake wire thereby forming a center-pull type brake.

5,464,075

BICYCLE BRAKE SHOE WITH CLEANING PORTION

Richard C. Everett, 225 Sunshine La., West Linn, Oreg. 97068

Filed Jun. 20, 1994, Ser. No. 262,526
Int. Cl.[6] F16D *69/00;* **B62L** *1/10*
U.S. Cl. 188—24.12 **16 Claims**



1. A brake shoe for urging against a rim of a bicycle wheel, the brake shoe comprising:

a backbone support member including an elongate channel member;

said support member having a deflectable tongue portion extending axially from said channel member, said tongue portion being oriented at an angle relative to an axis of said channel member;

a fastener member secured substantially transverse to said support member;

a first brake pad molded about a free end of said tongue portion and a second brake pad molded about the remainder of said support member and;

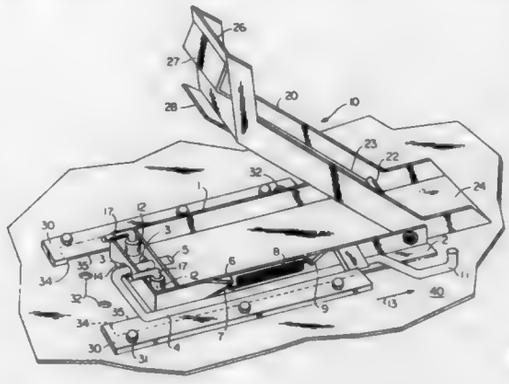
wherein upon movement of said brake shoe towards said rim of said bicycle wheel, said first brake pad is initially brought into contact with said rim for removal of debris from the rim, and upon continued movement of said brake shoe towards said rim, said first brake pad is deflected until said second brake pad is also brought into contact with said rim.

5,464,076

WHEEL SUPPORT FOR SECURING A WHEEL OF A WHEELED VEHICLE TO A TRANSPORT VEHICLE

Alfred P. Benedetto, Jr., 34 Beede Hill Rd., Fremont, N.H. 03044

Filed Jun. 2, 1994, Ser. No. 252,770
Int. Cl.[6] B60T *3/00*
U.S. Cl. 188—32 **6 Claims**



1. A device having a longitudinal axis for securing a wheel of a wheeled vehicle to a transport vehicle having a bed comprising:

a frame;

a wheel receiving channel pivotably attached to said frame and being substantially parallel to said longitudinal axis;

a locking means for releasably locking said channel to said frame;

a bed brace having an elongate recess mountable to said bed of said transport vehicle, said frame being removably slidable between said recess and said bed along said longitudinal axis, said longitudinal axis being substantially perpendicular to an axis of rotation of said wheel of said wheeled vehicle when said wheel is secured within said channel; and,

a fastening member to secure said frame relative to said bed brace and said transport vehicle.

5,464,077

FLOATING-CALIPER SPOT-TYPE DISC BRAKE FOR HIGH-POWERED VEHICLES

Rudolf Thiel; Andreas Doell, both of Frankfurt am Main, and Georg Halasy-Wimmer, Eschborn, all of, Germany, assignors to ITT Automotive Europe EmbH, Frankfurt am Main, Germany

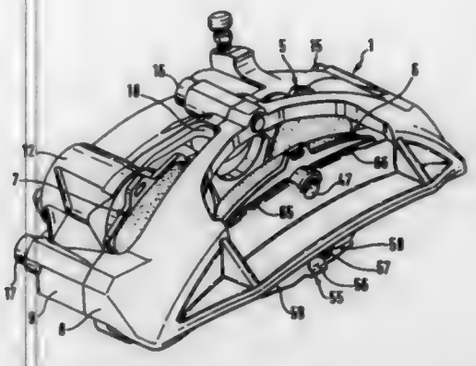
Division of Ser. No. 926,489, Aug. 7, 1992, Pat. No. 5,343,985.
This application Mar. 31, 1994, Ser. No. 221,195
Claims priority, application Germany, Aug. 9, 1991, 41 26 339.1
The portion of the term of this patent subsequent to Sep. 6, 2011, has been disclaimed.
Int. Cl.[6] F16D *65/092;55/227*
U.S. Cl. 188—72.5 **5 Claims**

1. A floating-caliper spot-type disc brake for an automotive vehicle having a brake disc and a steering knuckle, said disc brake including a brake carrier adapted to be fixed to said steering knuckle;

a floating caliper having a first part adapted to be located on an axially internal side of a brake disc and a second part adapted to be located on an axially external side of a brake disc;

two brake shoes mounted en said first part of said brake caliper and one brake shoe mounted on said second part thereof, said one brake shoe being centered between said two brake shoes;

a shell structure connecting said first and second parts together, said shell structure comprising a thin wall extending along the circumference of each of said caliper first and second parts, and also adapted to extend across a brake disc perimeter;



said shell structure having a plurality of openings formed therein, each located over a respective brake shoe and configured to allow withdrawal of said brake shoe through said opening, said openings in said shell structure thin wall defined by a series of webs extending above said brake shoes;

one of said openings located over said one brake shoe and partially defined by a pair of said series of webs, said pair of webs converging together, each web in said pair extending from a respective outside end of said second caliper part;

a pair of said openings each aligned over a respective one of said two brake shoes, and partially defined by one of said series of webs centrally located and extending axially to meet said pair of webs whereat said pair of webs converge;

means for axially slidingly guiding said floating caliper on a brake carrier;

said brake shoes each mounted on said caliper for limited axial movement towards and away from a brake disc to be engageable therewith, and to transmit the reaction force of said brake shoes engaging a brake disc into a brake carrier;

hydraulic actuating means adapted to urge one of said brake shoes into engagement with an axially internal side of a brake disc, said hydraulic actuating means mounted on said first part of said floating caliper on an axially internal side of a brake disc, said second part of said floating caliper engaging said other brake shoe to urge the other of said brake shoes into engagement with an axially external side of a brake disc upon operation of said hydraulic actuating means.

5,464,078

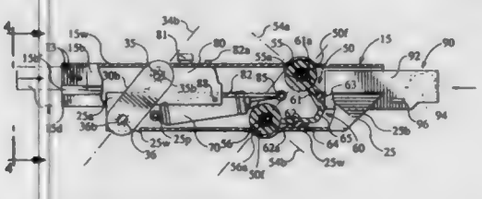
HYDRAULIC DISC BRAKE ACTUATOR

Jerry W. Pittman, P.O. Box 610149, Dallas, Tex. 75261

Filed Mar. 11, 1994, Ser. No. 209,771

Int. Cl.[6] B60T *7/20*

U.S. Cl. 188—112 R **17 Claims**



1. A brake actuator comprising:

a first generally channel-shaped connector member having a web portion and spaced downwardly extending flanges for securing the actuator to a towed vehicle;

a second generally channel-shaped connector member having a web portion and spaced upwardly extending flanges for securing the actuator to a towing vehicle, said web portions of said first and second connector members being mounted for relative movement;

a plurality of links in a parallel linkage assembly having first ends pivotally secured to said first connector member and second ends pivotally secured to said second connector member, at least one of said links having generally cylindrical shaped end portions, said web portions being embossed with a profile to match said generally cylindrical shaped end portions of said link to provide an area of contact between said generally cylindrical shaped end portions and said web portions for load distribution; and

a master cylinder having a body portion and a plunger portion, said body portion being connected to one of said first or second connectors, and said plunger portion being connected to at least one of said links such that the magnitude of force applied by said links to said master cylinder is greater than the magnitude of force tending to move said first connector relative to said second connector.

5,464,079

TWO-TUBE SHOCK ABSORBER

Peter Lohberg, Friedrichsdorf; Ronald Bayer, Mühlheim/Main2; Siegfried Halat, Frankfurt am Main; Dieter Kircher, Dortelweil; Diogenes Perez, Frankfurt am Main, and Stefan Sparschuh, Saulheim, all of, Germany, assignors to Alfred Teves GmbH, Germany

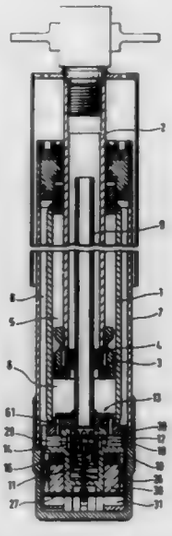
PCT No. PCT/EP92/00520, § 371 Date Sep. 13, 1993, § 102(e) Date Sep. 13, 1993, PCT Pub. No. WO92/16772, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 10, 1992, Ser. No. 117,137

Claims priority, application Germany, Mar. 13, 1991, 41 08 027.0; Nov. 14, 1991, 41 37 403.7

Int. Cl.[6] B60G *17/08;* **F16F** *9/46*

U.S. Cl. 188—315 **28 Claims**



1. A two-tube shock absorber with controllable variable shock absorbing power, comprising:

a power cylinder having interior space subdivided into a first and a second power chambers by a piston, said piston being slidable by a piston rod;

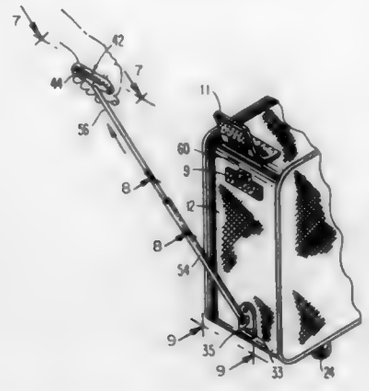
a storage tank partly filled with oil, said storage tank having a plurality of hydraulic connections which afford a compensation of volume between said power chambers and said storage tank,

a first and a second non-return valves, and a shock absorber valve, said shock absorber valve providing the variation of the cross-sectional area of flow of one of said hydraulic connections, said shock absorber valve forming a pilot control stage and a main stage,

wherein in a lower range of piston speed the shock absorbing power is exclusively determined by the variable flow cross-sectional area of said pilot control stage, said main stage remaining closed, and wherein in an upper range of piston speed the shock absorbing power is determined by the vari-

able flow cross-sectional areas both of said main stage and of said pilot control stage.

5,464,080
UNIVERSALLY PIVOTAL LUGGAGE STEERING APPARATUS
Joseph Liang, P.O. Box 1060, Alpine, N.J. 07620
Filed Jul. 29, 1993, Ser. No. 99,215
Int. Cl.[6] A45C *5/14;13/26*
U.S. Cl. 190—18 A **16 Claims**



8. An article of luggage having a steering apparatus for user-controlled steering of said article as the article is pulled on and along an underlying support surface, said article comprising:

a plurality of walls defining a closeable compartment for containing items, said walls including a front wall defining a direction of forward movement of the article, a bottom wall, and a top wall;

a plurality of rotatable wheels mounted on the bottom wall of said article in confronting opposition to an underlying support surface for enabling rolling movement of said article on and along the support surface;

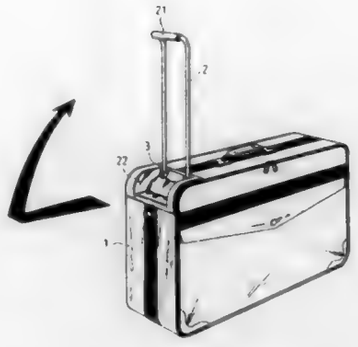
a socket on the front wall of said article, said socket being disposed proximate said bottom wall so that pull forces exerted by a user are applied to the article below a center of gravity of said article to thereby minimize tipping of the article when steered by the user along a directionally-varying path;

a ball disposed within said socket for omnidirectional rotation relative to said socket;

an elongated member extending outwardly from said ball; and

a handle carried on an end of said elongated member opposite said ball and graspable by a user for pulling the article of luggage along the underlying support surface while steering the article through selective manipulation of said handle so as to move said member and thereby rotate said ball in said socket and correspondingly redirect the article for movement in a desired new direction of travel along the support surface, at least one of said elongated member and said handle including means for rotation of said handle relative to at least a portion of said member about an axis defined by the elongation of said member.

5,464,081
CONCEALED TYPE RETRACTABLE SUITCASE HANDLE
Joy T. Zwanzig, 415, E. 37 St., Apt. 37K, New York, N.Y. 10016
Filed Jul. 6, 1994, Ser. No. 268,540
Int. Cl.[6] A45C *13/26*
U.S. Cl. 190—115 **5 Claims**



1. A concealed type retractable handle for a suitcase comprising:

a) an elongate U-shaped handle having a pair of rod bodies terminating in a pair of adjacent ends;

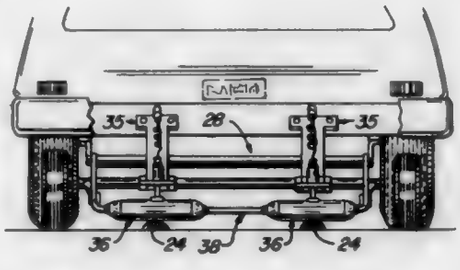
b) means defining a housing on the suitcase for receiving the pair of rod bodies when the handle is in a retracted position;

c) a pair of socket seats adjacent the housing means, each socket seat being of a cap configuration and including wing portion means having at least one hole therein for securing the seat to a side of a suitcase, an L-shaped slot extending along a lateral side and upper side of the seat and terminating in an upper hole, and a side hole on a lateral side opposite the slot, the slot and hole being dimensioned to slidably receive the rod body;

d) each socket seat further defining an internal ball socket in communication with the L-shape slot and side hole and a stepped opening at an upper side of the ball socket defining said upper hole, a ball disposed within each ball socket, each ball including a central hole therethrough being dimensioned for slidably receiving one of said rod bodies of the handle and means carried by each end of the rod bodies for retaining the handle to the balls when the handle is in a fully extended position; and

e) whereby when the handle is in its fully extended position, the retaining means engage the balls and the balls rotate in the socket seats with the rod bodies extending through the L-shaped slots, thereby permitting the handle to be pivoted vertically to a desired angle along the L-shaped slots for pulling or lifting the suitcase.

5,464,082
ELECTRICAL VEHICLE TRANSPORTATION SYSTEM
Peter Y. S. Young, 2968 Gainsborough Dr., San Marino, Calif. 91108
Filed Aug. 3, 1993, Ser. No. 101,042
Int. Cl.[6] B60L *9/00;* **B60M** *1/34*
U.S. Cl. 191—2 **20 Claims**



1. In an electrical vehicle transportation system, the combination comprising:

an electrified roadway having a surface, a traffic lane, and stationary electrical conductor means associated with the roadway within said traffic lane and extending along and coextensive with the roadway, said conductor means compris-

ing a pair of conductive rails extending along said roadway and projecting above said roadway surface,

a steerable electrically powered vehicle having wheels riding on said roadway for movement of said vehicle along and laterally of said roadway,

electrical pickup means on said vehicle including electrical contact means engaging said conductor means to provide an electrical circuit between said conductor means and said vehicle, said contact means comprising a pair of electrical contacts elongated laterally of said vehicle and engaging said rails, respectively, and wherein

said contact means are movable with said vehicle along said conductor means and laterally of said conductor means within certain limits while remaining in continuous electrical contact with said conductor means to permit limited movement of said vehicle laterally of said roadway during movement of the vehicle along the roadway without interruption of said circuit, and

said contacts comprise rotary cylindrical contact rollers having normally generally horizontal rotation axes normally extending laterally of said vehicle, said contact rollers comprising cylindrical plastic bodies and metal contact sleeves surrounding said bodies.

5,464,083

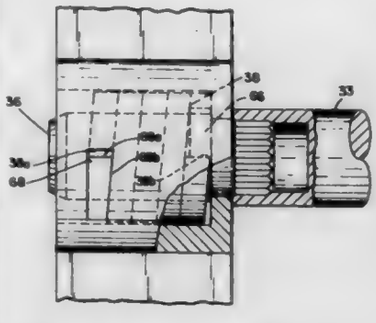
TORQUE LIMITING SPRING HINGE

Joseph E. Arnold, Linsdtrom, and David A. Wahlstedt, Minneapolis, both of Minn., assignors to Reell Precision Manufacturing Corporation, St. Paul, Minn.

Filed Aug. 31, 1993, Ser. No. 114,668

Int. Cl.[6] **E05F** *5/00*; **E05D** *11/08*; **E05C** *19/02*

U.S. Cl. 192—8 C **25 Claims**



1. A torque limiting apparatus, comprising:

a coil spring disposed coaxially about a shaft, the coil spring having a smaller inside diameter than the outside diameter of the shaft so as to provide an interference fit with the shaft, the coil spring having a plurality of coils defining a coil wrap path, ends of the coil spring lying in the coil wrap path; and

a housing having first and second ends, the housing supporting the spring and shaft, the housing having projections proximate both of the ends of the coil spring, whereby as the shaft is rotated in either direction one of the ends of the spring is engaged by the housing forcing the coil spring to expand into a "wrap open" condition whereby the shaft can rotate relative to the coil spring when a predetermined torque is applied to the shaft.

18. A spring hinge apparatus, comprising:

a coil spring disposed coaxially about a shaft, the coil spring having a smaller inside diameter than the outside diameter of the shaft so as to provide an interference fit with the shaft, the coil spring having a plurality of coils defining a coil wrap path, ends of the coil spring lying in the coil wrap path;

a housing supporting the spring and shaft and encircling the coils of the spring, the housing having projections proximate both of the ends of the coil spring, whereby as the shaft is rotated in either direction one of the ends of the spring is engaged by the housing forcing the coil spring, to expand into a "wrap open" condition whereby the shaft can rotate relative to the coil spring when a predetermined torque is applied to the shaft, the housing including bracket means for attachment of the housing to a base structure; and

a hinge extension attached to a hinge extension attachment portion of the shaft projecting from the housing, the hinge extension including means for attachment to a device so as to provide the device with angular movement relative to the base structure.

5,464,084

MAIN CLUTCH CONNECTING SYSTEM HAVING A PILOT CLUTCH

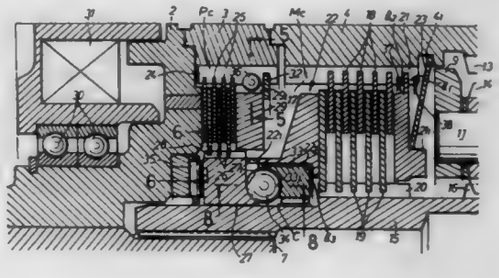
Jun Aoki; Katsuhiko Masuda, and Isamu Hashizume, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1994, Ser. No. 201,955

Claims priority, application Japan, Feb. 26, 1993, 5-038479; Feb. 26, 1993, 5-038480; Feb. 26, 1993, 5-038481

Int. Cl.[6] **F16D** *27/115*; **F16H** *48/24*

U.S. Cl. 192—35 **23 Claims**



1. A connecting system comprising a pilot clutch brought into an engaged state by an actuator, a cam means operated by an engaging force of the pilot clutch, an urging member driven and moved by the cam means, and a main clutch brought into an engaged state by a movement of the urging member, said cam means being comprised of a first cam ring restrained by the pilot clutch, a second cam ring provided on the urging member, and a rolling member interposed between the first and second cam rings for converting a relative rotation of both the cam rings into a thrust, said system further including a biasing means for biasing said urging member and said first cam ring toward an abutment against each other in order to generate a frictional force between said urging member and said first cam ring by said abutment, and means for providing a dead zone in an operation of said cam means.

5,464,085

SOLENOID OPERATED HYDRAULIC VALVE

Stephen J. Churchill, Basildon, England, assignor to New Holland North America, Inc., New Holland, Pa.

Filed Apr. 12, 1994, Ser. No. 226,745

Claims priority, application United Kingdom, Apr. 13, 1993, 9307537

Int. Cl.[6] **F16D** *25/12*

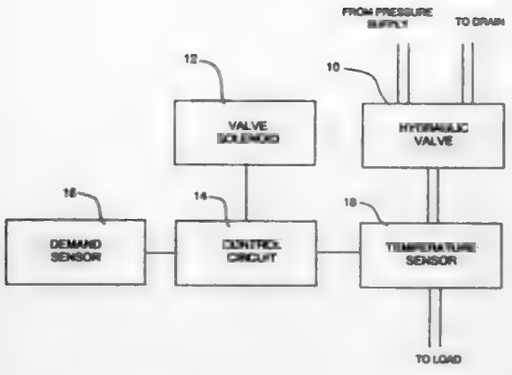
U.S. Cl. 192—85 R **5 Claims**

1. In a self-propelled agricultural vehicle having a clutch pedal and a solenoid operated hydraulic valve for supplying a regulated hydraulic pressure to a load in dependence upon an electrical demand signal applied to the valve, the improvement comprising:

a demand sensor generating said electrical demand signal having a value being proportional to the position of said clutch pedal;

means for sensing the temperature of the hydraulic fluid flowing through said valve; and

means for determining the current applied to the valve solenoid in dependence upon both said electrical demand signal and the sensed temperature such that the regulated pressure sup-



plied to the load is dependent only on said electrical demand signal and is substantially independent of the temperature of the hydraulic fluid.

5,464,086

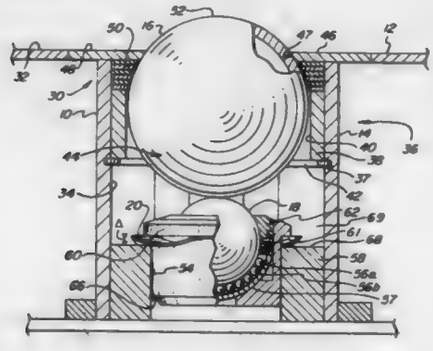
BALL TRANSFER UNIT

Axel Coelln, Stamford, Conn., assignor to Transact International Inc., Darien, Conn.

Filed Mar. 3, 1994, Ser. No. 205,832

Int. Cl.[6] B65G 13/00

U.S. Cl. 193—35 SS **16 Claims**



1. A ball deck having an upper surface, comprising: at least one ball transfer unit, each ball transfer unit having:

a first housing, the first housing having an upper end terminating adjacent the upper surface of the ball deck, and having a chamber therein;

a first load supporting ball rotably located in an upper section of the housing chamber, the first ball having a portion extending above the upper surface of the ball deck;

a second load supporting ball, the second ball having a lesser diameter than the first ball, the second ball being located below the first ball and providing a sole support for the first ball;

means for supporting the second ball, the supporting means having means for substantially frictionless rotation of the second ball;

a channel for collecting contaminants surrounding the means for supporting the second ball, whereby the contaminants are collected and prevented from contaminating the second ball;

a substantially frictionless means located in the upper section of the chamber for retaining the first ball; and

means for retaining the first ball in the housing.

5,464,087

TRANSACTION SYSTEMS

David J. Bounds, Fleet; John A. Weston, Reading; Anthony D. Johnson, Workingham, and Bernard J. Campbell, Sherfield-on-Loddon, all of, United Kingdom, assignors to Mars, Incorporated, McLean, Va.

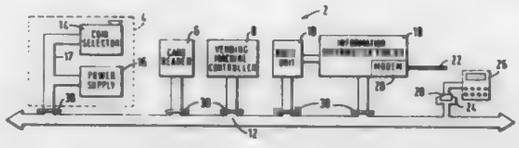
PCT No. PCT/GB92/00719, § 371 Date Nov. 15, 1993, § 102(e) Date Nov. 15, 1993, PCT Pub. No. WO92/20045, PCT Pub. Date Nov. 12, 1992.

PCT Filed Apr. 16, 1992, Ser. No. 137,099

Claims priority, application United Kingdom, Apr. 24, 1991, 9108737

Int. Cl.[6] G06F 15/177

U.S. Cl. 194—200 **13 Claims**



7. A transaction system for a vending machine that dispenses a product or service which includes two or more system components interconnected by a bus comprising a data conductor for carrying serial data and a usage conductor for carrying a signal indicating whether or not the data conductor is in use, each of the components being operable to initiate communications directly with another of the components by altering the potential on the usage line, and then transmitting data on the data line, the component being operable to vary the period between the altering of the potential on the usage line and the transmission of data in dependence upon the intended destination of the message.

5,464,088

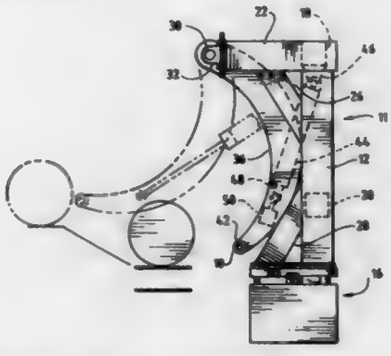
CONVEYOR DIVERTER SYSTEM

Gregory K. Koerber, Appleton, Wis., assignor to Valmet-Appleton, Inc., Appleton, Wis.

Filed Mar. 22, 1994, Ser. No. 216,058

Int. Cl.[6] B65G 47/46

U.S. Cl. 198—370.07 **14 Claims**



2. A conveyor diverter system, comprising:

(a) a first conveyor means for moving a plurality of articles in a first direction at a given speed, each article having a leading edge and a trailing edge;

(b) a second conveyor means located adjacent the first conveyor means for receiving articles from the first conveyor means; and

(c) means for diverting articles from the first conveyor means to said second conveyor means, comprising:

(i) a kicker for contacting the articles;

(ii) first means for moving said kicker parallel to the first conveyor means and at the same speed, but in a direction opposite to the first direction; and

(iii) second means for extending and retracting the kicker transversely to the first conveyor; and

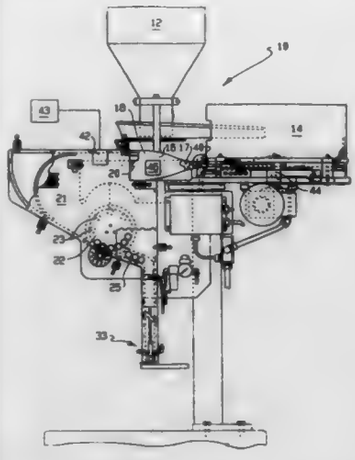
(d) means for controlling the means for diverting including a sensor mounted to said kicker for signalling said means for controlling when the leading and trailing edges of an article have been detected.

5,464,089

ELECTROMAGNET CROWN SORTING AND UN-JAMMING DEVICE

Michael Shapcott, Hometown, Pa., assignor to Zapata Technologies, Inc., Hazleton, Pa.

Filed Jun. 28, 1994, Ser. No. 267,078
Int. Cl.[6] B65G *47/24*
U.S. Cl. 198—392 **18 Claims**



1. An apparatus for feeding a stream of parts comprising:
a hopper bowl having an exit chute and capable of rotation for providing the stream of parts;
a sorting mechanism for orienting the stream of parts;
part motion sensing means located to detect whether the stream of parts has stopped moving through the sorting mechanism;
controlling means which receives input information from said sensing means and which provides information for rotating the hopper bowl, wherein the controlling means stops and then reverses the rotation of the hopper bowl when the sensing means detects that the stream of parts has stopped; and
means for removing jammed parts from the stream if a reversal of the stream of parts fails to alleviate the problem.

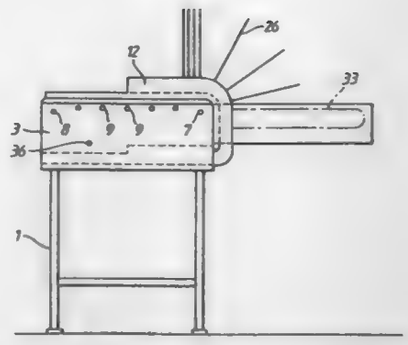
5,464,090

HANDLING SYSTEMS FOR LAMELLAE

Alan W. Lucas, Coombe Farm, Headcorn Road, Sutton Valence, Maidstone, Kent ME17 3AX, Great Britain

PCT No. PCT/GB92/00722, § 371 Date Oct. 28, 1993, § 102(e) Date Oct. 28, 1993, PCT Pub. No. WO92/18402, PCT Pub. Date Oct. 29, 1992
PCT Filed Apr. 21, 1992, Ser. No. 133,182
Claims priority, application United Kingdom, Apr. 18, 1991, 9108366
Int. Cl.[6] B65G *49/06*
U.S. Cl. 198—803.01 **22 Claims**

1. A system for handling lamellae to be arranged generally vertically in a parallel array, comprising:
a pair of parallel guides defining a non-linear path of predetermined length and forming a loading station and an unloading station spaced along said path from said loading station;
an individual rack of predetermined length less than the length of said path, said rack including a support structure including rigid links and pivot means for interconnecting said links defining a plurality of parallel transverse axes of flexure, said



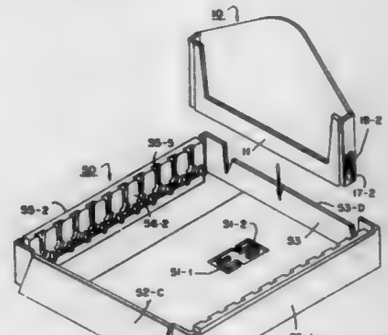
rack being extendable such that said axes define a plane with said support structure being bendable in a first direction out of the plane but being unbendable in an opposite direction out of the plane, said rack also including supporting means for supporting at least the lower edges of the lamellae extending upwardly from the support, said rack having engagement means for cooperating with said guides to guide said rack along said guides, said engagement means being engageable with said guides at said loading station and dis-engageable from said guides at said unloading station, said rack being readily removable from and re-engageable with said guides; and
advancing means for moving said rack along said non-linear path from said loading station to said, unloading station.

5,464,091

PROTECTIVE COVERS

Steven E. Callahan, Sutton, and Robert G. Petit, Phillipston, both of Mass., assignors to Micropins, Inc., Clinton, Mass.

Continuation-in-part of Ser. No. 833,140, Feb. 10, 1992, and a continuation-in-part of Ser. No. 55,724, Apr. 30, 1993. This application Oct. 26, 1993, Ser. No. 141,075
Int. Cl.[6] B65D *85/30;85/57*
U.S. Cl. 206—45.15 **2 Claims**



1. A protective cover for diskettes in combination with a storage tray, said protective cover comprising a front side with a low-profile frame proportioned to provide ready access to graphic materials accompanying diskettes for user identification; a back side connected to said front side by a sidewall; and means within said sidewall for engaging said diskette between said front side and said back side; thereby to avoid the obscuration of graphics, including identity of diskette type, that would otherwise make identifications of diskettes difficult and hinder the efficient use of data processing systems in which a multiplicity of different diskettes are employed requiring proper identification of the diskette before it can be suitably used in a system, wherein protective covers in said storage tray do not contact each other when fanned by hand stroking across the tops of diskettes in a manual search

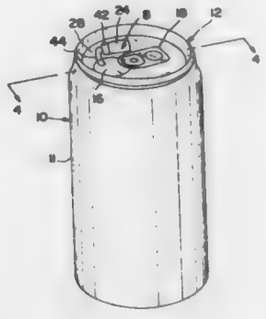
operation to identify a diskette of interest; thereby to allow a user to rapidly identify the appropriate diskette, wherein said storage tray is proportioned to have an inner side wall including arrowhead recesses to limit fanning travel during flip action by a user seeking a particular diskette of interest, wherein said arrowhead recess includes end stops to limit the travel of inserted covers during a fanning operation, while allowing dense storage of protective covers which can be retained in said storage tray, but also are easily removable to be carried portably.

5,464,092

CONTAINER HAVING AN AUDIBLE SIGNALING DEVICE

Dennis H. Seeley, 7 N. Delaware Ave., Pier 5, Unit 105, Philadelphia, Pa. 19106

Filed Jun. 6, 1994, Ser. No. 254,614
Int. Cl.[6] B65D *85/72;* **G09F** *25/00*
U.S. Cl. 206—217 **11 Claims**



1. A container for liquid products comprising:

a vessel for holding a liquid product having a closure means which is displaceable from a closed position, whereat the product is inaccessible, to an open position, whereat the product is accessible;

audible signal generating means responsive to the opening of said closure means comprising:

(a) a power source;

(b) electronic storage means for storing data corresponding to audible tones;

(c) an electronic sound generator connected to said electronic storage means for accessing and processing said stored data to generate audible tones; and

(d) switch means responsive to said closure means for connecting said electronic sound generator to said power source.

6. A package for liquid products comprising:

a container for receiving a liquid product and having a sealed portal;

means for opening said portal for accessing the product within said container;

signal generating means responsive to said opening means comprising:

(a) a power source;

(b) electronic storage means;

(c) an electronic sound generator connected to said electronic storage means; and

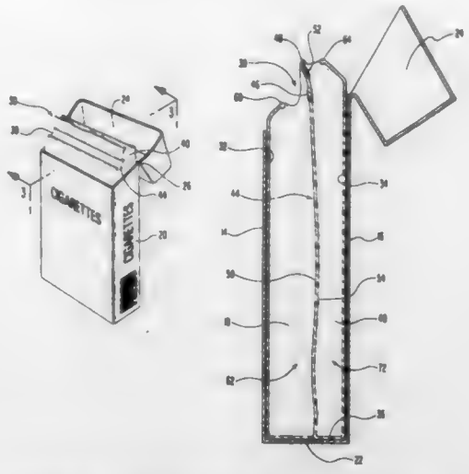
(d) a switch means for connecting said electronic sound generator to said power source responsive to the opening of said container.

5,464,093

TOBACCO PACKAGE WITH DISPOSAL POUCH

Sherman D. Hogan, 1882 S. West Temple, No. 150B, Salt lake City, Utah 84115

Filed Jan. 3, 1995, Ser. No. 367,898
Int. Cl.[6] A24F *15/00;* **B65D** *85/10*
U.S. Cl. 206—265 **5 Claims**



1. A package for cigarettes and the like comprising

an outer housing having spaced apart front and rear walls, a bottom interconnecting said front and rear walls and a pair of spaced apart end walls, and a lid connected to one of said walls and pivotable to fit over said other walls;

a pouch in said outer housing and having a bottom overlying said bottom of said outer housing, and front, rear and spaced apart end walls positioned respectively adjacent to said front, rear and end walls of said outer housing; and

a partition in said pouch separating said front and rear walls of said pouch and extending between said end walls of said pouch;

means for releasably sealing an upper edge of said front wall to one face of said partition;

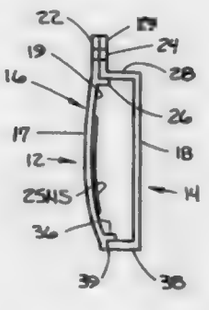
means for releasably sealing an upper edge of said rear wall to an opposite face of said partition.

5,464,094

PACKAGING CONTAINER FOR STICK-ON LENSES ENABLING TESTING THEREOF WITHOUT REMOVAL FROM CONTAINER

Peter G. La Haye, Medina, Wash., assignor to LaHaye Laboratories, Inc., Redmond, Wash.

Filed May 10, 1994, Ser. No. 240,276
Int. Cl.[6] A45C *11/04*
U.S. Cl. 206—316.1 **22 Claims**



1. A packaging container for stick-on lenses suitable for point-of-purchase display thereof which enables testing of the effective-

ness and suitability of the said stick-on lenses by a potential purchaser without removal of the stick-on lenses from the container, comprising

an at least partially transparent three-dimensional container having a set of opposed front and back panes, said front pane having an outward curvature and said back pane being planar, the container being adapted to contain a stick-on lens adhered to the interior surface of the curved pane, so as to enable viewing through a viewing area provided through said container extending from the planar pane through the curved pane and thus to enable testing of the efficacy of said stick-on lens when said stick-on lens is stuck in place on the surface of said curved pane, said container being transparent at least in said viewing area, and including a stick-on lens adhered in place on the interior surface of said curved pane.

5,464,095

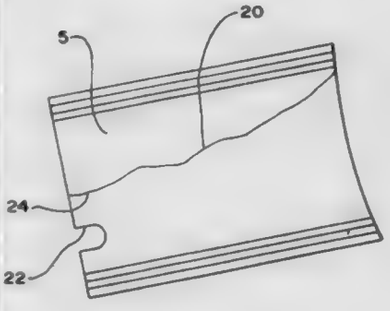
NEWSPAPER AND MAGAZINE PROTECTIVE CARRYING POUCH

Rodolfo W. Lacayo, 5841 Almond Valley Way, Quartz Hill, Calif. 93536

Continuation-in-part of Ser. No. 832,329, Feb. 7, 1992, abandoned. This application May 24, 1994, Ser. No. 248,549

Int. Cl.[6] **B65D** *65/08;* **A45C** *3/02*

U.S. Cl. 206—449 **8 Claims**



1. A carrying pouch for transport of magazines, newspapers and similar articles comprising: a planar member made of foldable material and having top and bottom edges of about 11½" and left and right side edges of about 7½", said planar member having a first and second series of scoring lines parallel to one another and extending across said member so as to divide said member into a lower, a middle and an upper panel, a securing means in connection with one of said panels for the temporary attachment of said lower panel to said upper panel, said top edge having a biased portion so that said biased portion is not parallel to said bottom edge, said top edge having a finger grip, said finger grip comprising a set of three curved portions in said top edge.

5,464,096

KIT FOR CLEANING RADIOLOGICAL CASSETTES

Robert Hurwitz, 2310 Tustin Ave., Newport Beach, Calif. 92660

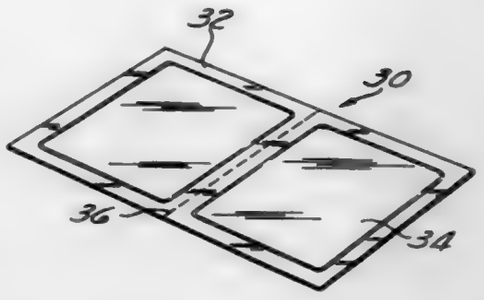
Continuation of Ser. No. 936,046, Aug. 25, 1992, abandoned. This application Jan. 7, 1994, Ser. No. 178,445

Int. Cl.[6] **B65D** *81/22;* **B08B** *1/00*

U.S. Cl. 206—494 **3 Claims**

1. A kit for cleaning the intensifying screen of a radiological cassette with minimal generation of static charge and minimal deposition of particles on said intensifying screen, said kit comprising:

a first air-tight pouch containing a first sheet of hydroentangled polyester fiber moistened with a mild surfactant comprising approximately 0.6% (w/w) sodium alkylarylpolyethoxysulfonate in 0.8% to 1.2% phosphoric acid; and



a second air-tight pouch containing a second sheet of dry non-particle generating non-woven natural and synthetic materials for drying said intensifying screen.

5,464,097

SHOCK PROTECTION PACKAGING FOR LIQUIDS

David B. Edwards; William J. McCarthy; Alan J. Aldred, all of Dagenham, and Anthony D. Jackman, Pyrford, all of, United Kingdom, assignors to May & Baker Limited, Dagenham, United Kingdom

Continuation of Ser. No. 179,878, Jan. 11, 1994, Pat. No. 5,394,990, which is a continuation of Ser. No. 920,026, Jul. 27, 1992, abandoned, which is a continuation of Ser. No. 825,417, Jan. 24, 1992, abandoned, which is a continuation of Ser. No. 623,997, Feb. 14, 1991, abandoned. This application Jan. 13, 1995, Ser. No. 372,553

Claims priority, application United Kingdom, Jun. 15, 1988, 8814158; Jun. 15, 1988, 8814159; Feb. 17, 1989, 8903707

The portion of the term of this patent subsequent to Mar. 7, 2012, has been disclaimed.

Int. Cl.[6] **B65D** *85/82;81/02*

U.S. Cl. 206—524.7 **32 Claims**

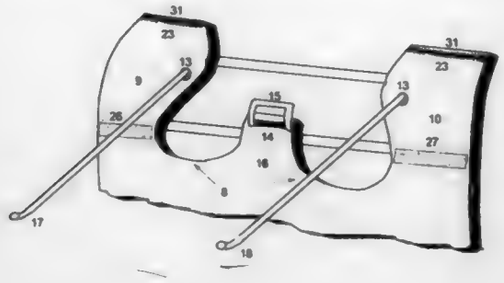
1. A package for a liquid comprising an outer container and a sealed water-soluble or water-dispersible envelope within the outer container, said sealed envelope containing the liquid, the liquid in the sealed envelope being potentially toxic or damaging or detrimental to health or to the environment, the outer container comprising a body-part portion surrounding the sealed envelope and a base-part including a shock-absorbing base, the outer container further comprising means for supporting the sealed envelope, said means being within the base-part portion on a side wall of the outer container and supporting the sealed envelope above a bottom of the outer container such that a space completely separates the sealed envelope from a bottom of the outer container.

5,464,098

METHOD FOR MANUFACTURING CONSECUTIVELY OPENED BAG AND BAGGING SYSTEM

Ben Tseng, East Brunswick, and Peter Chen, Livingston, both of N.J., assignors to Inteplast Corporation, Livingston, N.J.

Filed Sep. 22, 1994, Ser. No. 310,885
Int. Cl.[6] B65D *83/08*
U.S. Cl. 206—554 **20 Claims**



1. A bagging system to automatically open and dispense consecutive thermoplastic T-shirt-type bags while supporting said bags in an open position to facilitate loading and easy removal of the loaded bags, said system comprises:

a. a bag pack comprising a plurality of stacked T-shirt-type bags in approximate alignment, each bag comprising:

(i) a front and rear wall, the walls are integrally connected at sides, sealed at a bottom end and sealed at a top end, said walls have an open mouth region;

(ii) laterally spaced handles integrally and upwardly extending from each wall on opposite sides, each handle has a receiving aperture in its intermediate region;

(iii) a disconnectable central tab integrally and upwardly extending from each wall at a central area of said mouth region, said central tab has a crescent-like mounting aperture and detachable tab ties, said tab ties have a particular tensile strength;

(iv) disengageable adhesion regions connecting the rear wall of a bag to the front wall of the following bag in said bag pack, said adhesion regions form a disengageable link between consecutive bags of a predetermined peeling strength, said adhesion regions being located on each of said handles; and,

b. a mounting and dispensing rack for mounting said bag pack and dispensing of said bags.

12. A bag pack produced by the method of manufacturing automatic consecutively opened thermoplastic T-shirt bags for dispensing from a mounting and dispensing rack, which comprises:

a. providing a continuous flattened tube of thermoplastic film;

b. applying adhesive solution using a printing press to form adhesion regions on the outside of said tube in area to subsequently be formed into handles, as set forth below;

c. forming side gussets in said tube;

d. making traverse seals in said tube thereby dividing said tube into pillowcases, each seal defines a bottom end of a pillowcase and a top end of the following pillowcase;

e. separating said pillowcases at said seals to form a series of end-sealed gussetted pillowcases;

f. stacking said pillowcases in approximate alignment to form a bag pack;

g. clamping one end of said bag pack to maintain its approximate alignment and cutting through said bag pack along a bag-mouth contour to form a plurality of T-shirt bags, said bag-mouth contour forms a set of laterally spaced handles each having a receiving aperture, a central tab having a mounting aperture, and an open mouth region; and,

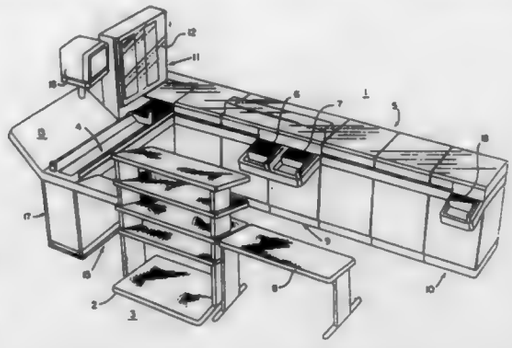
h. applying slight pressure to the proximate area of said adhesion regions of each bag in said bag pack to form a disengageable link between consecutive bags.

5,464,099

METHOD FOR THE AUTOMATED PROCESSING OF DOCUMENTS AND BULK MAIL

Albert F. Stevens, Moorestown; Robert R. DeWitt, Marlton; William R. Lile, Medford; Paul R. Mitchell, Hilltop, all of N.J., and Stephen Tentarelli, Fogelsville, Pa., assignors to Opex Corporation, Moorestown, N.J.

Continuation of Ser. No. 234,532, Apr. 28, 1994, which is a division of Ser. No. 887,621, May 22, 1992, Pat. No. 5,310,062, which is a continuation-in-part of Ser. No. 363,511, Jun. 8, 1989, Pat. No. 5,115,918, which is a division of Ser. No. 904,966, Sep. 5, 1986, Pat. No. 5,863,037. This application Dec. 7, 1994, Ser. No. 351,638
Int. Cl.[6] B07C *5/02;* **B65B** *69/00*
U.S. Cl. 209—3.1 **204 Claims**



1. A method for extracting contents from a plurality of envelopes containing paired, substantially parallel documents comprising:

a) conveying the envelopes serially along a transport path;

b) opening envelopes conveyed serially along the transport path;

c) extracting the paired, substantially parallel documents from opened envelopes;

d) singulating the paired, substantially parallel documents into paired, serial documents; and

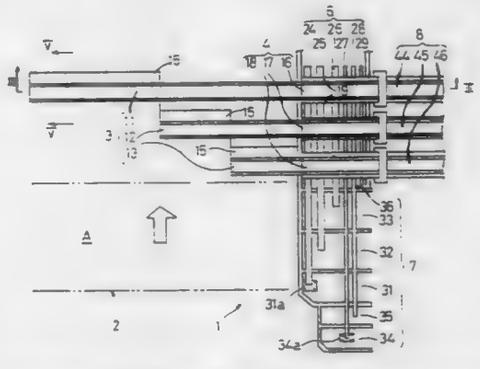
e) conveying the paired, serial documents along the transport path.

5,464,100

SORTING APPARATUS IN SOLID WASTE SORTING SYSTEM

Mitsuhiro Oka, Osaka, Japan, assignor to Okasan Corporation, Osaka, Japan

Filed Oct. 19, 1993, Ser. No. 139,183
Claims priority, application Japan, Jan. 20, 1992, 4-280401
Int. Cl.[6] B07B *9/00*
U.S. Cl. 209—31 **20 Claims**



1. Apparatus for solid waste input having a solid waste sorting section, comprising, in combination:

a storage section having a solid waste feed-out path, for removably storing solid waste; and

a conveyor section receiving solid waste removed from said storage section, for conveying the removed solid waste to the sorting section; said conveyor section including

a plurality of waste transport conveyors having upstream ends extending transversely into the solid waste feed-out path of said storage section, wherein waste transport conveyors lying successively further away from said storage section along said feed-out path are of successively longer upstream-end extension.

5,464,101

SCREENING ARRANGEMENT

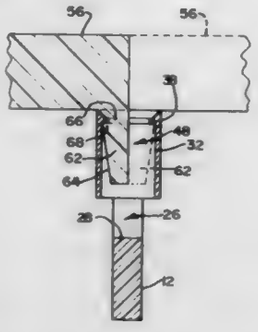
Manfred F. A. Freissle, P.O. Box 123771, Alrode, Alberton, Transvaal Province, South Africa

Filed Feb. 16, 1994, Ser. No. 195,685

Claims priority, application South Africa, Jun. 23, 1993, 93/4515; Jan. 21, 1994, 94/0452

Int. Cl.[6] B07B *1/49*

U.S. Cl. 209—405 **8 Claims**



1. A screen support frame component comprising an elongate bar having at least one tubular element affixed thereto, the tubular element having a tubular wall and two ends, one end being an open end, and further defining a socket in said tubular wall inwardly of said open end in which securing means for securing a screening panel is receivable, said socket having a longitudinal axis and said elongate bar having a rectangular cross-sectional profile forming a height and a width of said elongate bar, said height extending in the longitudinal direction of said profile and said width extending transversely to said height and being smaller than said height, said width of said elongate bar being small than the cross-sectional dimension of said socket in a direction transverse to said longitudinal axis of said socket and extending across said width of said elongate bar.

5,464,102

FOLDABLE APPARATUS FOR TRANSPORTING FILLED PLASTIC GROCERY BAGS

Wayne LeBlanc, and Janiene LeBlanc, both of 8805 Tanglewild Pl., River Ridge, La. 70123

Filed Aug. 10, 1994, Ser. No. 288,491

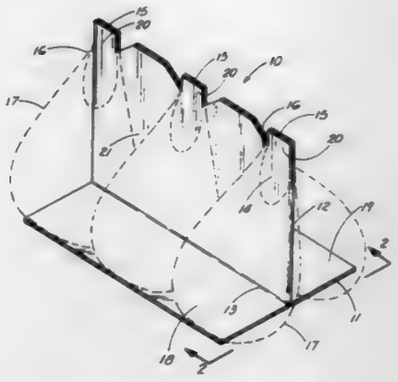
Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—12 **12 Claims**

1. An apparatus for transporting filled plastic grocery bags having loop handles, comprising:

a foldable platform having an open position for receiving and supporting two or more filled plastic grocery bags and a closed position for storage of said apparatus;

a bag positioning member secured to said foldable platform about the center thereof and extending substantially perpendicular therefrom when said foldable platform is in said open position; said bag positioning member having an upper section forming two or more bag retaining ends each adapted to receive and hold said loop handles of the filled plastic grocery bags.



5,464,103

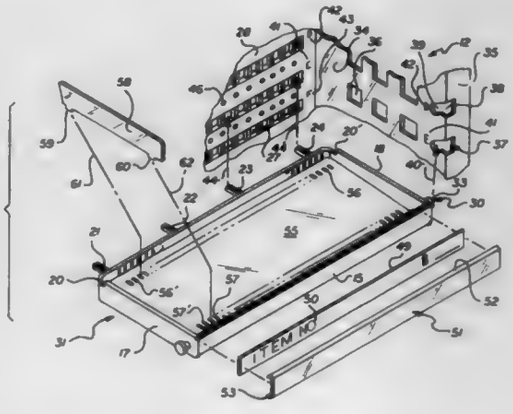
DISPLAY RACK

Paul O'Brien, Seal Beach, Calif., assignor to Side-Kik Corporation, Cypress, Calif.

Filed Aug. 9, 1993, Ser. No. 104,189

Int. Cl.[6] A47F *3/14*

U.S. Cl. 211—133 **28 Claims**



1. A display rack comprising:

a pair of upstanding side walls;

a rear wall disposed between said side walls interconnecting the same, said rear wall having a plurality of vertically spaced rows of horizontally aligned openings therein and a plurality of vertically spaced rows of horizontally aligned nubs protruding from said rear wall between said successive vertically spaced rows of openings, each of said nubs having an upper side and an underside, and

at least one tray having connecting means thereon removably connecting said tray to both said side walls and certain ones of said openings in said rear wall, said at least one tray having an upper edge abutting against the underside of said nubs.

5,464,104

MOBILE STORAGE RACK FOR CONTAINERS

Jim McArthur, 79 Mill Stone, San Jose, Calif. 95136

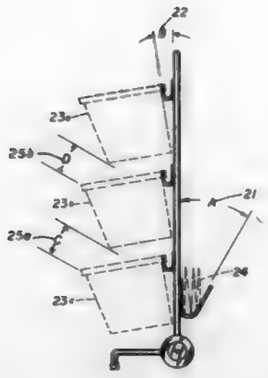
Filed Dec. 22, 1993, Ser. No. 171,700

Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—133 **2 Claims**

1. A mobile storage rack for containers comprising:

a vertical frame having two parallel vertical members with a cross member connecting the upper ends of the vertical members and forming a handle;



an axle extending between the lower most ends of said vertical members, said axle extending beyond each said vertical member a distance sufficient to mount a wheel on the ends of said axle;

a pair of stabilizing members, mounted to the lowermost ends of each vertical member and extending parallel to one another and at right angles to said axle and said vertical members, the distal ends of each said stabilizing member, being a predetermined distance from said vertical member and terminating in a downturned portion;

said vertical frame having a plurality of mounting devices, said mounting devices attached to said vertical frame in pairs at equal predetermined heights on each said vertical member and extending from said vertical members parallel to, and in the same direction as said stabilizing members;

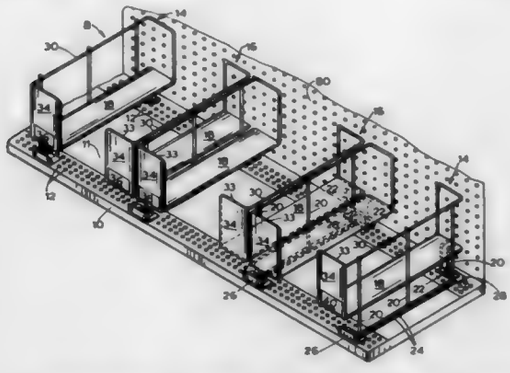
a pair of support brackets for holding and storing loose, rigid material, said support brackets attached to said frame member at equal predetermined heights on each said vertical member parallel to, and in the opposite direction from said stabilizing members.

5,464,105

MULTIPLE ITEM SHELVING DISPLAY SYSTEM

Stanley T. Mandeltort, Lincolnshire, Ill., assignor to Deluxe Craft Manufacturing Co., Chicago, Ill.

Filed Aug. 25, 1993, Ser. No. 111,652
Int. Cl.[6] A47F *5/00*
U.S. Cl. 211—184 **9 Claims**



1. A shelving system adapted for use with a flat shelf having a front edge, the shelving system comprising

a first shelving member and

a second shelving member,

said first and second shelving members being adapted to be disposed on the flat shelf in a spaced-apart manner in order to support an item therebetween by enabling the item to straddle the space above the flat shelf between said first and second shelving members, each of said first and second shelving members including,

a ledge adapted to be disposed perpendicularly to the front edge of the flat shelf,

a first support member rigidly attached to a first part of said ledge and extends between said ledge and flat shelf when the shelving member is attached to the flat shelf,

a second support member rigidly attached to a second part of said ledge and extends between said ledge and flat shelf when he shelving member is attached to the flat shelf, and which is movable with respect to said firs support member,

a first rigid connector attached to said first support member adapted to connect said first support member to the flat shelf and disposed at a first predetermined distance below said ledge when said shelving member is attached to the flat shelf, and

a second rigid connector attached to said second support member adapted to connect said second support member to the flat shelf and disposed at a second predetermined distance below said ledge when said shelving member is attached to the flat shelf,

wherein one of said first and second connectors comprises a peg extending therefrom and having a neck portion adjacent to the one of said connector for insertion into a hole of the flat shelf,

said first and second connectors being configured to transfer the weight of the item to the flat shelf, and

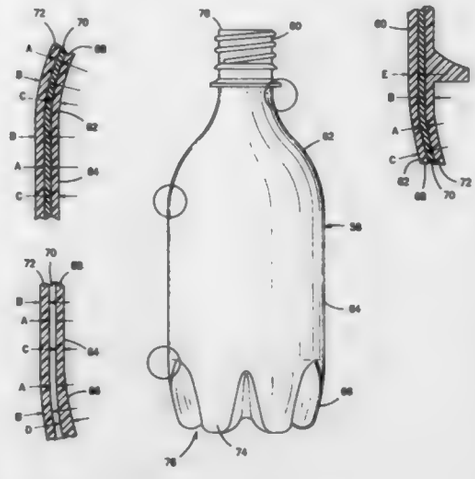
said first and second predetermined distances being configured to enable an additional item to be disposed between said ledge and the flat shelf when said shelving member is attached to the flat shelf.

5,464,106

MULTI-LAYER CONTAINERS

William A. Slat, Brooklyn, Mich., and Richard C. Darr, Seville, Ohio, assignors to Plastipak Packaging, Inc., Plymouth, Mich.

Filed Jul. 6, 1994, Ser. No. 271,088
Int. Cl.[6] B65D *23/02*
U.S. Cl. 215—12.1 **17 Claims**



1. A multilayer container, comprising:

an upper wall portion formed from at least an inner layer and an outer layer of material wherein the inner layer of material has a first thickness at the upper wall portion;

an intermediate sidewall wall portion formed from at least the inner and the outer layer of material, wherein the inner layer of material has a second thickness at the intermediate wall portion thinner than the first thickness at the upper wall portion, the intermediate wall portion positioned beneath the upper wall portion; and

a footed base wall portion formed from at least the inner layer and the outer layer of material, wherein the inner layer of material has a third thickness at the base wall portion thicker

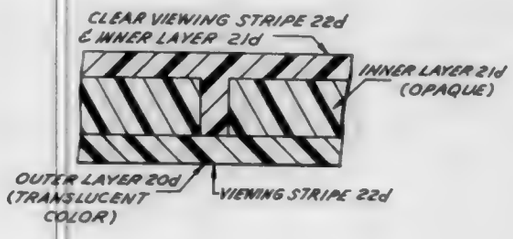
than the second thickness at the intermediate wall portion, the base wall portion positioned beneath to the intermediate wall portion and adapted to support the container.

5,464,107

HOLLOW PLASTIC CONTAINER WITH VIEWING STRIPE AND METHOD OF MAKING

Carl E. Koeniger, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Jun. 25, 1993, Ser. No. 83,127
Int. Cl.[6] B65D *23/00;* B29C *47/06*
U.S. Cl. 215—12.2 17 Claims



1. A hollow plastic container comprising

a coextruded translucent plastic outer layer and an opaque coextruded plastic inner layer, and

a coextruded viewing stripe of translucent plastic material behind said translucent outer layer extending longitudinally in said inner layer for viewing the level of the product in the container,

said coextruded stripe being made of the same translucent plastic material as said outer layer, and

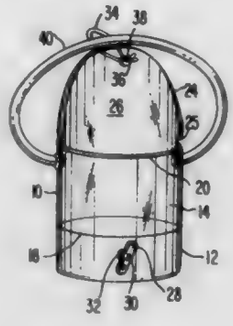
an additional coextruded inner layer of the same translucent plastic material.

5,464,108

CONTAINER MADE FROM RECYCLED PRODUCT

Judy Samelson, 75 Wilson's La., Needham, Mass. 02194

Filed Nov. 19, 1993, Ser. No. 154,820
Int. Cl.[6] B65D *23/00;23/10*
U.S. Cl. 215—386 13 Claims



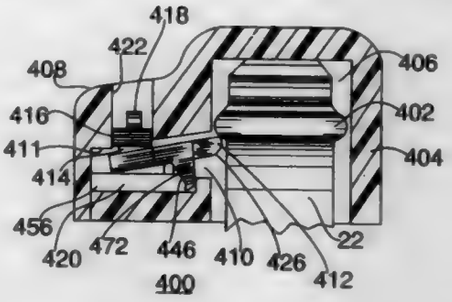
1. A container for articles comprising a recycled plastic bottle having a base defining an interior cavity section made from said plastic bottle and a closing mechanism formed from a side wall of said recycled plastic bottle for providing selective access to said interior cavity of said container, said closing mechanism formed from said plastic bottle by two cuts, the first cut being substantially horizontal and extending between two opposed points of a chord of the side wall of said bottle and the send cut being arc-like and extending toward said neck of said bottle and terminating at said opposed points.

5,464,109

LOCKABLE BOTTLE CAP RETAINER

Kenneth Greenwald, 135 Ocean Pkwy., Brooklyn, N.Y. 11218

Filed Aug. 15, 1994, Ser. No. 290,164
Int. Cl.[6] B65D *55/14;17/52*
U.S. Cl. 215—207 37 Claims



1. A device to prevent the unauthorized removal of a closure from the mouth of a bottle having an annular ting about its neck, said annular ring having a first face adjacent the mouth of the bottle and a second face spaced apart from said first face comprising:

a) a cap member having an open first end and a closed second end;

b) a bore within said cap member extending from said open first end towards said closed second end, said bore having a diameter in excess of the outside diameter of an annular ring of a bottle upon which said cap member is to be placed to permit such annular ring to enter said bore;

c) pawl means mounted adjacent said bore for engagement with the bottle neck adjacent said second face of an annular ring of a bottle upon which said cap member is placed to prevent the removal of said cap member from said bottle;

d) spring biasing means coupled to said pawl means to urge said pawl means into contact with said bottle neck adjacent said second face of said annular ring; and

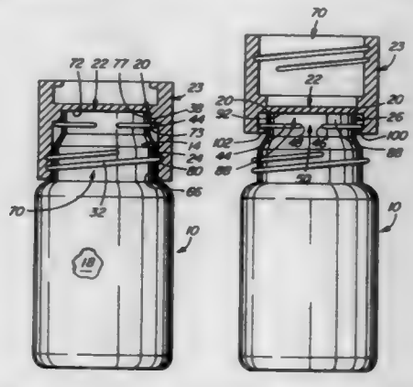
e) key means, selectively engageable with said pawl means, to move said pawl means out of engagement with said bottle neck adjacent said second face of said annular ring to per, nit the removal of said cap member from a bottle upon which said device is placed.

5,464,110

DOUBLE SIDED CONTAINER CLOSURE AND COOPERATING CONTAINER

Richard G. Heyworth, 115-2020 Comox Street, Vancouver, Canada

Filed Jul. 19, 1994, Ser. No. 277,091
Int. Cl.[6] B65D *41/04;41/18*
U.S. Cl. 215—223 27 Claims



1. A double-sided container closure apparatus comprising:

a) a body having an axis, the body having:

i) a first cylindrical wall extending in a first direction about said axis and having a first inner surface defining a first receptacle for receiving a portion of a container, said first inner surface having a groove therein said groove being operable to cooperate with a complementary bead on said container, to provide a first mode of holding said apparatus on said container;

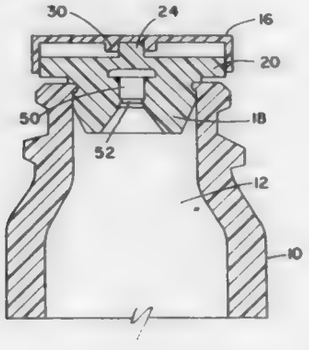
ii) a second cylindrical wall extending in a second direction about said axis, said second direction being opposite to said first direction, said second cylindrical wall having a second inner surface defining a second receptacle for receiving said portion of said container, said second cylindrical wall having first and second radially inwardly projecting tabs projecting inwardly from said second inner surface for cooperating with a tab cooperating portion of said container, to form a tab alignment closure to provide a second mode of holding said apparatus on said container such that in the second mode said first and second tabs must be oriented in alignment with said tab cooperating portion for removal of said closure from said container.

5,464,111

CLOSURE FOR MEDICATION CONTAINER

Ronald R. Vacek, Rochester; Bruce Semmler, Spencerport, and Edward Owens, Rochester, all of N.Y., assignors to Sterling Winthrop, Malvern, Pa.

Filed Mar. 3, 1993, Ser. No. 25,481
Int. Cl.[6] B65D *53/04*
U.S. Cl. 215—249 **2 Claims**



1. A closure arrangement for medication containers, said closure arrangement comprising:

a) an elastomeric stopper adapted to make a friction fit in an opening of the medication container, the stopper having an exterior surface, the exterior surface of the stopper comprising a tear-away member formed integrally with the stopper, the interior surface of the stopper having a blocked passageway which opens away from the exterior surface of the stopper and defines a conical taper, the passageway being blocked by the tear-away member, and

b) a cap comprising means for engaging the tear-away member, whereby said engaged tear-away member can be torn away by rotating the cap.

5,464,112

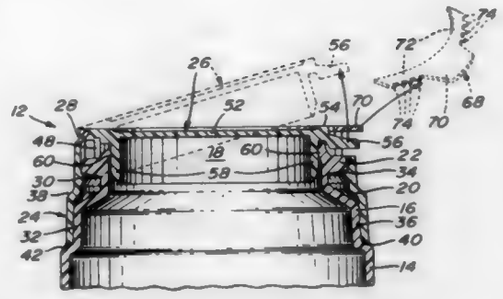
TAMPER-EVIDENT CLOSURE CAP FOR CONTAINERS

Christian Guillot, Maillat, France, assignor to Crealise Conditionnement Inc. - Crealise Packaging Inc., Rawdon, Canada

Filed Jul. 14, 1993, Ser. No. 91,033
Int. Cl.[6] B65D *41/32*
U.S. Cl. 215—254 **19 Claims**

1. A tamper-evident closure cap for a container having a neck and an opening defined in said neck, said closure cap comprising:

an annular skirt member;



means for securing said skirt member to the neck of said container to prevent removal of said closure cap from said container;

a closure member hingedly connected to said skirt member for pivotal movement between a closed position whereat said closure member closes the opening of said container and an open position whereat said closure member permits access to said opening, said closure member having a top planar portion extending in a first plane;

opening means for moving said closure member from said closed position to said open position; and

a tamper-indicating member removably connected to said skirt member in overlying relation with respect to said opening means for prohibiting initial opening of said closure member prior to removal of said tamper-indicating member, said tamper-indicating member comprising a manually graspable tongue portion, and at least one elongated attachment portion extending between said closure member and said skirt member and being detachably connected to said skirt member, said tongue portion and said at least one attachment portion being co-planar and extending generally in said first plane;

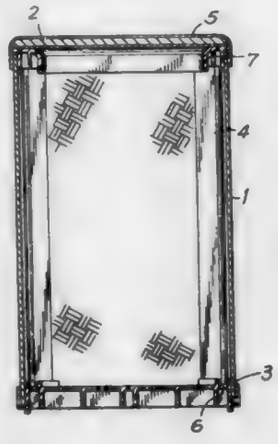
wherein unauthorized removal of said tamper-indicating member provides evidence of tampering or initial opening.

5,464,113

COLLAPSIBLE HAMPER FOR STORAGE OF LAUNDRY AND OTHER ITEMS

Stanley Ho, Warren, N.J., and Mark Ho, Taipei, Taiwan, Prov. of China, assignors to Allure Home Creation Co., Inc., Boonton, N.J.

Continuation of Ser. No. 921,236, Jul. 29, 1992, Pat. No. 5,356,024. This application Apr. 28, 1994, Ser. No. 234,069
Claims priority, application China, Mar. 26, 1992, 92205228
The portion of the term of this patent subsequent to Oct. 18, 2011, has been disclaimed.
Int. Cl.[6] B65D *6/26*
U.S. Cl. 220—9.2 **15 Claims**



1. A collapsible container comprising:

a side wall substantially fabricated of a sheet of flexible material,

an upper rigid frame having a first circumferential surface,

a lower rigid frame having a second circumferential surface,

a plurality of supporting rods removably secured and extending between said upper rigid frame and said lower rigid frame to define a three dimensional internal storage space,

the side wall having top and bottom edges which are secured about the first and second circumferential surfaces of said upper rigid frame and said lower rigid frame, respectively and enclose the plurality of supporting rods when the supporting rods extend between the upper rigid frame and the lower rigid frame.

5,464,114

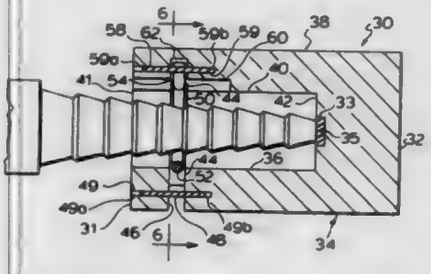
CAP FOR GAS OUTLET NOZZLES

Garrey D. Green, 31 Georgian Cres., Kitchener, Ontario, Canada

Filed Aug. 9, 1994, Ser. No. 288,240

Int. Cl.[6] B65D *55/14;45/00;* **F16L** *35/00*

U.S. Cl. 220—284 **17 Claims**



1. A cap member for fitment over a gas outlet nozzle having a plurality of serrations on the exterior thereof, said cap member comprising:

an open first end and a generally closed second end;

a peripherally disposed main body portion spanning between said first end and said second end, and having an outer surface defining the periphery of said cap member and an inner surface defining a nozzle receiving recess extending inwardly from a first end concurrent with said open first end of said cap member to a second end concurrent with said closed second end of said cap member;

a lock member operatively retained within said nozzle receiving recess, said lock member having a slender elongate arcuately shaped central portion terminating in opposed outwardly projecting first and second end tabs having a key-receiving gap therebetween;

wherein said lock member is resiliently deformable between a first locking configuration whereat, when said cap member is in place on said gas outlet nozzle, said central portion of said lock member is shaped and dimensioned to fit around a substantial portion of said gas outlet nozzle so as to be in interfering relation with a juxtaposed one of said serrations so as to thereby cause said cap member to be locked on said gas outlet nozzle, and a second unlocking configuration whereat when said cap member is in place on said gas outlet nozzle, said central portion of said lock member is shaped and dimensioned to be removable over the serrations of said gas outlet nozzle so as to thereby permit said cap member to be removed from said gas outlet nozzle;

an access passageway in said peripherally disposed main body portion, which access passageway is shaped and dimensioned to removably receive a co-operating key member therein, so as to permit said key member to be inserted into said gap between said opposed outwardly projecting first and second end tabs, said key member being shaped and dimensioned to urge said opposed outwardly projecting first and second end tabs from a first rest position corresponding to the first locking configuration of said lock member to a second biased position corresponding to the second unlocking configuration of said lock member, upon insertion of said key member into said gap between said opposed outwardly projecting first and second end tabs.

5,464,115

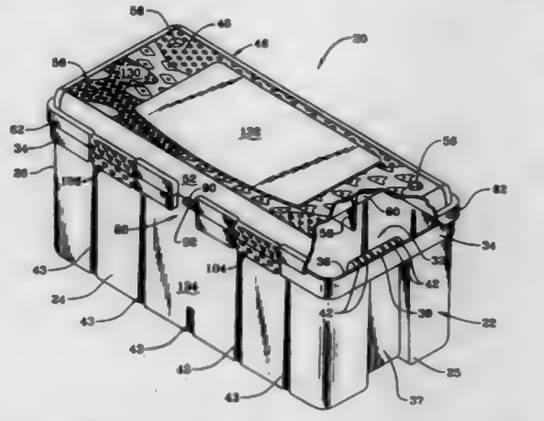
MOLDED PLASTIC FOOTLOCKER

Thomas A. Tisbo, Barrington Hills; Stephen P. Whitehead, Elgin, and Michael G. Uffner, Naperville, all of Ill., assignors to Suncast Corporation, Batavia, Ill.

Filed Aug. 3, 1994, Ser. No. 285,922

Int. Cl.[6] B65D *45/16*

U.S. Cl. 220—324 **16 Claims**



1. A molded plastic footlocker comprising:

a bin defined by a front surface, two side surfaces, a rear surface and a bottom surface forming a storage cavity with a first peripheral rim having an upper edge forming an opening to said storage cavity, said front surface comprising a first area for placement of personalized graphic indicia and a second area having graphic indicia molded therein, each of said side surfaces having a handle continuously molded therein adjacent to said first peripheral rim, the bottom surface of said bin having a plurality of continuously molded feet protruding there below;

a lid including a top surface, a front surface, a rear surface, two side surfaces, and a second peripheral rim, the top surface having a first area for placement of personalized graphic indicia molded therein and a second area having graphic indicia molded therein, said second peripheral rim having a groove to receive said upper edge of said bin when said lid is in a closed position;

a padlock hasp for enabling said lid to be locked in a closed position, said hasp including an upper bracket integrated into and protruding outwardly from said lid with a structural support rib formed there along, an outer perimeter edge having a side section, and a portion of the support rib of said upper bracket running along said side section being in the form of a U-shaped channel and a lower bracket integrated into and protruding outwardly from said bin, each said bracket having a hole formed therethrough, said brackets being in a juxtaposed relation suitable for allowing a shackle to be passed through each hole when said lid is in a closed relation above said bin;

a first and second hinge spaced apart, each hinge including a first hinge element formed from and protruding outwardly from the rear surface of said lid and a second hinge element formed from and protruding outwardly from a rear wall of said bin, said first and second hinge elements pivotally connected together with a hinge pin, said first and second hinge elements, respectively, being a continuously molded part of the rear surface of said lid and said bin; and

a first and second latch for securing said lid in a closed position, each of said latches including a face plate having a hinged end

pivotally connected to the front surface of said lid and a locking end engagable with a ridge formed in the front surface of said bin.

5,464,116

INSULATION STRUCTURE FOR LIQUEFIED GAS TANK

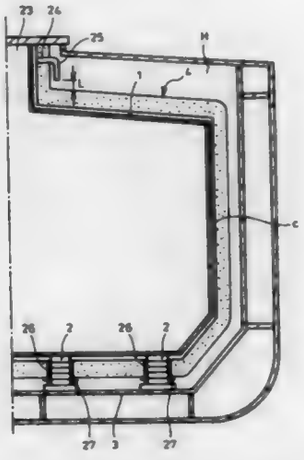
Eiji Aoki, Yokohama; Koichiro Yamada, Tokyo, and Tatsuhiko Yukitomo, Yokohama, all of, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1994, Ser. No. 240,624

Claims priority, application Japan, May 20, 1993, 5-118501; May 27, 1993, 5-126093; Jun. 3, 1993, 5-133516

Int. Cl.[6] B65D *87/24*

U.S. Cl. 220—586 10 Claims



1. In an insulation structure for a liquefied gas tank comprising a plurality of insulation panels to define together an insulation layer covering an outer surface of a tank body, an improvement which comprises a mounting member for each of said panels, said mounting member being fixed to the outer surface of the tank body at a position opposite to a stiffening member attached to an inner surface of the tank body, a support member protruded from said mounting member and passing through a central bore of said panel, said central bore being larger in diameter than the support member, a cylindrical member between said mounting member and the panel for protecting the panel, a pad narrower in width than the panel and longitudinally extending along said stiffening member, said pad being arranged between the outer surface of the tank body and the panel and a fastening member tightened on a tip end of said support member through a holding member, whereby each of the panels is mounted on the outer surface of said tank body with a clearance.

5,464,117

SEPARATION-SCIENCE MEMBRANE DISPENSER

William V. Balsimo, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 971,357, Nov. 4, 1992, Pat. No. 5,383,573. This application Dec. 1, 1994, Ser. No. 347,897

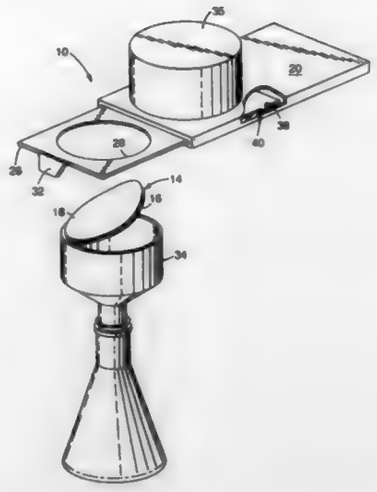
The portion of the term of this patent subsequent to Jan. 24, 2112, has been disclaimed.

Int. Cl.[6] B65G *59/06*; B65H *3/24*; B01D *39/18*

U.S. Cl. 221—1 2 Claims

2. A method of dispensing a separation-science membrane, which comprises:

(a) storing a separation-science membrane in an apparatus that comprises a storage chamber and a slidable member that has a cavity located therein, wherein the separation-science membrane is stored in the storage chamber and there is an opening at a base of the storage chamber which communicates with the cavity of the slidable member when the slidable member is in register with the opening; and



(b) dispensing the separation-science membrane from the storage chamber by moving the slidable member from the register position to a dispensing position.

5,464,118

APPARATUS FOR REMOVING SOLID MEDICATIONS FROM BLISTER PACKS

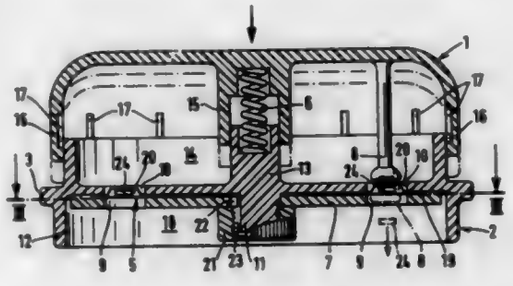
Ulrich Grau, Eschborn, and Günter Ziegert, Frankfurt am Main, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 9, 1994, Ser. No. 287,601

Claims priority, application Germany, Aug. 11, 1993, 43 26 931.1

Int. Cl.[6] B65D *83/04*

U.S. Cl. 221—5 4 Claims



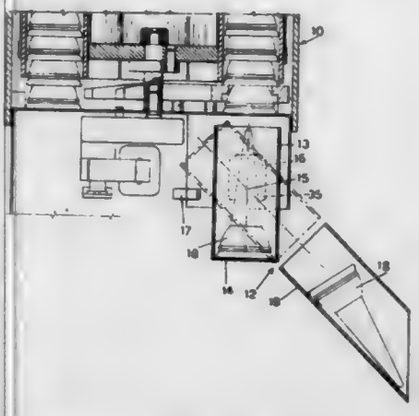
1. An apparatus for removing solid medications from blister packs, comprising a shell-shaped bottom part and a hood-shaped top part, the bottom part having an axle and including recesses, which are disposed concentrically to the axle, one end of the axle is configured as a rotational axis and translational guide for the top part, the top part extending over the bottom part and including a hub, which is supported on the axle by a spring, the top part further including a ram parallel to the hub which, given an appropriate setting of the top part relative to the bottom part, is aligned with respectively one of the recesses, the other end of the axle including a journal for receiving a bearing plate for the blister pack.

5,464,119

AUTOMATIC MACHINE FOR DISPENSING AN ICE-CREAM PORTION

Caccia Giuseppe, Romentino, and Airoldi Luigi, Galliate, both of, Italy, assignors to Universal Ice Cream Machines S.r.l., Italy

Filed Jun. 9, 1994, Ser. No. 255,639
Claims priority, application Italy, Jun. 10, 1993, MI93A1231
Int. Cl.[6] B65H 9/00
U.S. Cl. 221—156 4 Claims



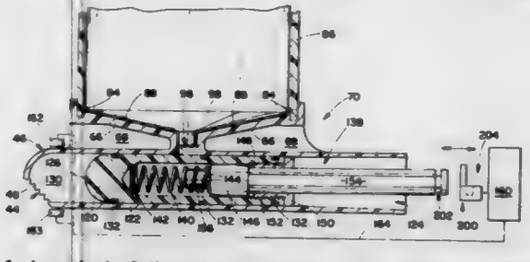
1. An automatic apparatus for dispensing an ice cream portion, said apparatus comprising an ice cream cone dispenser for dispensing cones in an inverted position, and a seat for receiving a cone in an upright position and for conveying said cone to an ice cream delivery mouth, a cone overturning and feeding device for receiving a cone in an inverted position, and for overturning said cone into an upright position and for feeding the overturned cone automatically into said seat, said cone overturning and feeding device being operably positioned between said cone dispenser and said seat.

5,464,120

METHOD AND APPARATUS FOR FROZEN DESSERT DISPENSING

Helmut A. Alpers, Gates Mills, Ohio, and Jon P. Russett, Beloit, Wis., assignors to Flurry International, Inc., Cleveland, Ohio

Filed May 27, 1994, Ser. No. 250,043
Int. Cl.[6] G01F 7/00
U.S. Cl. 222—1 16 Claims



1. A method of dispensing a material in a preselected volume greater than a predetermined minimum volume from a source of the material to a selected point comprising:

providing a chamber having a predetermined volume no greater than said minimum volume;

flowing material at a substantially constant first rate from the source of the material to the said chamber and determining the time period required to fill the chamber;

flowing material from the source into and through the chamber to the selected point for a total time that is a multiple of the determined time period, said multiple being substantially equal to one less than the ratio of the preselected volume to the chamber volume; and,

terminating the flow and discharging the entire volume of the chamber to the selected point at the end of the said total time.

9. Apparatus for dispensing a material in a preselected volume no less than a predetermined minimum volume comprising:

a source of material, said source having an outlet and discharge means for discharging the material from the source through the outlet at a generally constant rate;

a chamber connected to the outlet, said chamber having a volume at least as great as said predetermined minimum volume;

timing means for determining the time period required for material discharging from the source through the outlet to fill the chamber to the predetermined minimum volume; and,

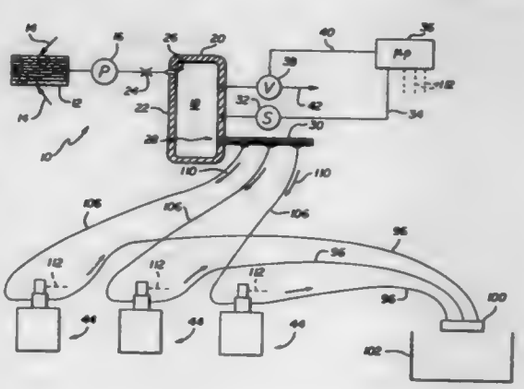
control means operatively connected with the timing means for terminating flow of material through the outlet to the chamber when the total time of discharge of material from the source to the chamber is a multiple of the time period required to fill the chamber to the predetermined minimum volume, the multiple being equal to the multiple which the preselected volume represents to the predetermined minimum volume.

5,464,121

PRECISION FLUID DISPERSING APPARATUS AND METHOD

Donald Jones, Sacramento, Calif., assignor to Dade International Inc., Deerfield, Ill.

Continuation of Ser. No. 89,131, Jul. 9, 1993, abandoned. This application Mar. 10, 1995, Ser. No. 402,412
Int. Cl.[6] B65D 83/00
U.S. Cl. 222—1 20 Claims



13. A method of precision fluid dispensing, said method including the steps of continuously pressurizing ambient air, flowing said pressurized air through a flow-through volume, utilizing said flow-through volume to abate any noncontinuous air flows and pressure flux of said continuously flowing pressurized air, sensing the pressure level of said pressurized air in said flow-through volume, producing a signal in response to said sensed air pressure level, using a controller to produce a venting control signal in response to said sensed air pressure signal and by reference to a calibration standard, using a duty cycle valve to vent pressurized air to ambient in response to said venting control signal to provide a precisely regulated dispensing air pressure level, and pressurizing fluid to be dispensed with said precisely regulated dispensing air pressure to dispense said fluid to ambient at a controlled rate.

5,464,122

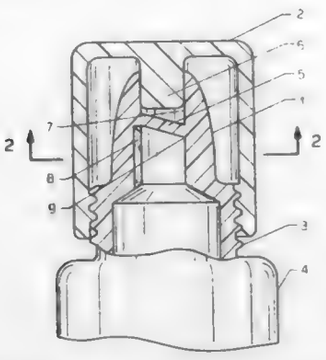
NON-STREAMING OPHTHALMIC TIP AND DELIVERY DEVICE

Arthur L. Lifsbey, East Brunswick, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 24, 1994, Ser. No. 265,351

Int. Cl.[6] B65D *47/18*; B67B *7/24*

U.S. Cl. 222—83 1 Claim



1. An ophthalmic tip and cap system providing non-streaming drop control, the tip having an internally molded dislodgeable barrier attached inside the channel of the tip at a slant, the higher point of attachment being above a side slot in said channel; and the lower point of attachment being opposite said slot; the cap having a stud shaped to fit inside said channel, so that the downward axial movement of the cap displaces the barrier downward from the higher point of attachment in said channel, said barrier remaining attached inside said channel at the lower point of attachment.

5,464,123

VIAL CONNECTOR SYSTEM

David Scarrow, Norton St Philip, Great Britain, assignor to DRG Medical Packaging Supplies Limited, Bristol, United Kingdom

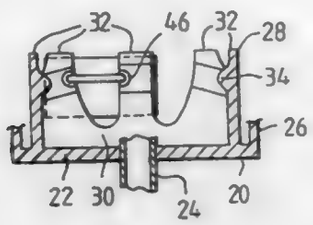
PCT No. PCT/GB93/01193, § 371 Date Jun. 9, 1994, § 102(e) Date Jun. 9, 1994, PCT Pub. No. WO93/24095, PCT Pub. Date Dec. 9, 1993

PCT Filed Jun. 4, 1993, Ser. No. 193,037

Claims priority, application United Kingdom, Jun. 4, 1992, 9211912

Int. Cl.[6] B67D *5/00*

U.S. Cl. 222—83.5 10 Claims



1. A vial connector for use in bringing the interior of a vial into fluid flow communication with a conduit, said connector comprising: a base portion; a tubular spike projecting from said base portion; means defining an encircling wall projecting from the base portion so as to substantially encircle the spike; a plurality of detent elements circumferentially distributed in relation to the wall means and formed separately from the wall means; and resilient means formed separately from the wall means and arranged to urge the detent elements radially inwardly of the wall means, so that a vial having an enlarged head with a mouth closed by a pierceable closure can be engaged with the connector by urging the closure against the spike so that the spike pierces the closure and the detent elements engage behind the head to resist disengagement of the vial.

5,464,124

APPARATUS FOR PREPARING AND DISPENSING POST-MIX BEVERAGES

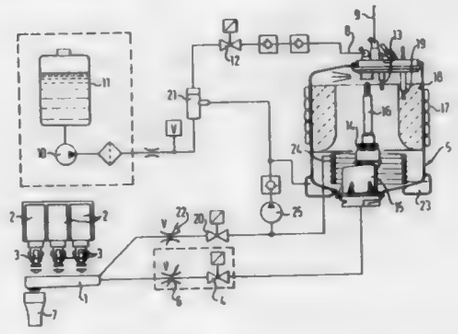
Werner Weyh, Knittlingen; Udo Schwander, Karlsruhe; Raimond Gatter, Bretten; Robert Notar, Knittlingen; Helmut Konopa, Leipheim, and Klaus Erdmann, Bretten, all of, Germany, assignors to The Coca-Cola Company, Atlanta, Ga., and Bosch-Siemens Hausgerate GmbH, Munich, Germany

Filed Apr. 28, 1994, Ser. No. 233,973

Claims priority, application Germany, Aug. 28, 1992, 42 28 770.7

Int. Cl.[6] B67D *1/00*

U.S. Cl. 222—129.1 15 Claims



1. Apparatus for preparing and dispensing postmix beverages, comprising:

a storage tank for holding water used in preparing postmix beverages and including first water cooling means located at an upper part of the tank and second water cooling means located at a lower part of the tank;

means for supplying fresh water under pressure to the storage tank;

means for introducing CO_2 into the storage tank;

branch circuit means coupled to said supplying means and including first water delivery means for selectively delivering fresh water to the storage tank for mixing with CO_2 therein to produce carbonated water and second water delivery means for delivering fresh water to said second water cooling means, said second cooling means being thermally coupled to the cooled storage tank for separately cooling only fresh water delivered from said water supply means;

third water delivery means for delivering a predetermined volume of said carbonated water from the storage tank to a mixing station when a carbonated beverage is desired;

fourth water delivery means coupled to said second water cooling means for delivering a predetermined volume of cooled fresh water to said mixing station when a non-carbonated beverage is desired;

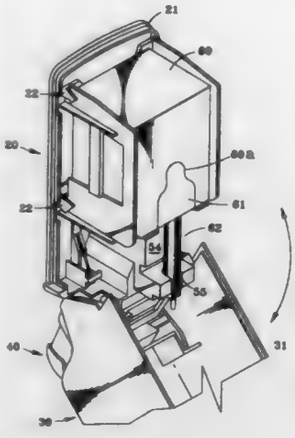
concentrate container means for holding and conveying a predetermined amount of at least one drink concentrate to said mixing station when a carbonated or a non-carbonated beverage is desired; and

fresh water recirculating means coupled between said second water delivery means and said fourth water delivery means for recirculating fresh water around said second water cooling means prior to delivery to said mixing station by way of said fourth water delivery means.

5,464,125
DISPENSING APPARATUS HAVING A PUMP TUBE

Warren S. Daansen, P.O. Box 614, Nashua, N.H. 03061

Continuation-in-part of Ser. No. 24,593, Jun. 16, 1994. This application Feb. 6, 1995, Ser. No. 384,413
Int. Cl.[6] B65D 35/28
U.S. Cl. 222—156 10 Claims



1. An improved dispenser for dispensing liquid, for use with liquid container of the type having a pump comprised of an upper fitment connected to a pump tube and hence to a pump tip, said improved dispenser comprising:

a back plate, back side thereof being attachable to a flat vertical surface, front side thereof having means for supporting said container, an upper fitment recess within which said upper fitment may be laterally installed in a closely-fitting relationship and which is configured to restrain longitudinal movement of said upper fitment, a vertical pressure support wall against which said pump tube may be positioned, and a lower fitment recess within which said pump tip may be laterally installed in a closely-fitting relationship and which is configured to restrain longitudinal movement of said pump tip;

a full cover attachable to said front side of said back plate at corresponding mating edge contours so as to form an interior cavity and substantially conceal and protect said back plate and said interior from spraying and falling water;

a pump lever bearing on said pump tube at rest and collapsing in a downward manner said pump tube against said vertical pressure support wall when said pump lever is actuated by a user, thereby expelling a unit portion of said liquid into said user's palm; and

means for closing said lower fitment recess;

said upper and lower fitment recesses, said means for closing said lower fitment recess, said vertical pressure support wall and said pump lever thereby collectively constraining said pump tube to a precise operating envelope.

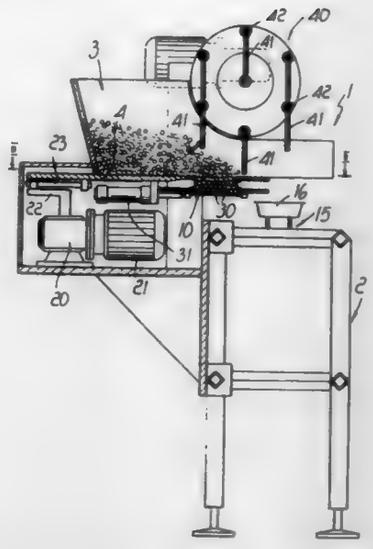
5,464,126
VOLUMETRIC DOSAGE MACHINE PARTICULARLY FOR GRANULATES, POWDERS AND LOOSE PRODUCTS IN GENERAL

Giovanni Mondini, Cologne Bresciano, Italy, assignor to G. Mondini S.p.A., Cologne Bresciano, Italy

Filed Jan. 21, 1994, Ser. No. 184,340
Claims priority, application Italy, Aug. 2, 1993, MI93A1760
Int. Cl.[6] B67D 5/64
U.S. Cl. 222—162 5 Claims

1. Volumetric dosage machine particularly for granulates, powders and loose products in general, including products that are not uniform or mutually compacted and have a very limited flow ability, comprising:

a supporting frame;



a hopper for loading product to be metered connected to said supporting frame;

a bottom downwardly closing said hopper;

a plurality of dosage chambers defined by said bottom, said dosage chambers being aligned in an alignment direction;

means for moving said bottom between a dosage chamber loading position and a dosage chamber discharge position, and;

a skimming unit located adjacent said hopper for removing excess products from said dosage chambers, and;

means for reciprocating movement of said bottom comprising:

guides extending perpendicular to said alignment direction and slideably supporting said bottom;

motor means connected to said supporting frame;

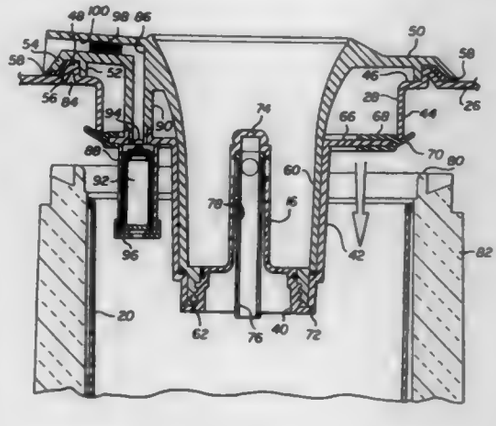
a link member pivotally connected to said bottom, and;

an eccentric element pivotally connected to said link member and rotatively driven by said motor means.

5,464,127
SEALED ACTUATOR PROBE ASSEMBLY FOR A BOTTLED WATER STATION

Bruce D. Burrows, Valencia, Calif., assignor to Ebtech, Inc., Ohio

Filed Feb. 28, 1994, Ser. No. 202,727
Int. Cl.[6] B67D 5/06
U.S. Cl. 222—181.5 22 Claims



1. A bottled water station for receiving and supporting a water bottle having a valved cap, said bottled water station comprising:

a station housing including an upwardly open water reservoir for receiving and storing a supply of water;

a cover plate for mounting onto said station housing in a position generally over said reservoir, said cover plate having a central opening formed therein; and

an actuator probe assembly for mounting onto said cover plate and including a support funnel having a radially enlarged upper rim supported upon an upper surface of said cover plate and joined to a generally cylindrical receiver extending from said upper rim in a downward direction through said central opening, a first seal interposed between said upper rim and the upper surface of said cover plate, a diaphragm member extending radially outwardly from said support funnel at a position below said cover plate, a second seal carried by said diaphragm member in engagement with an underside surface of said cover plate, and an actuator probe mounted generally at a lower end of said receiver and upstanding therein;

said second seal on said diaphragm member additionally and sealingly engaging said reservoir when said cover plate with said actuator probe assembly mounted thereon is mounted onto said station housing.

5,464,128

ELECTRICALLY OPERATED DISPENSING APPLIANCE HAVING TWO ELECTRIC MOTORS FOR ADVANCING AND RETRACTING THRUST RODS

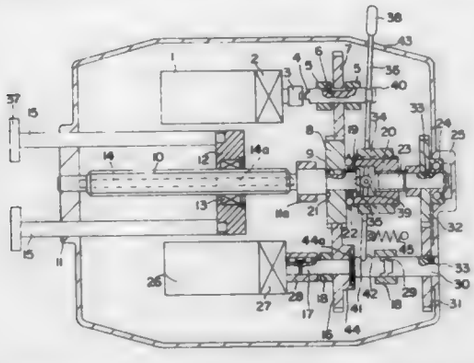
Wilhelm A. Keller, Obstgartenweg 9, CH-6402 Merlischachen, Switzerland

Filed Sep. 2, 1993, Ser. No. 114,824

Claims priority, application Switzerland, Sep. 2, 1992, 02759/92

Int. Cl.[6] B67D *5/42*

U.S. Cl. 222—333 **19 Claims**



3. An electrically operated dispensing appliance, in which an electric drive acts upon at least one thrust rod for a storage cylinder via a driving screw, wherein said electric drive comprises two electric motors, one of said electric motors acting upon said driving screw in order to rotate the driving screw in an advancing direction, and the other one of said electric motors acting upon said driving screw in order to retract the driving screw in a direction opposite to said advancing direction for discharging a pressure within a dispensing cartridge, and for exchanging said storage cylinder;

wherein a first reduction gear drive having a first reduction ratio is flange-mounted on said first motor and a second reduction gear drive having a second reduction ratio is flange-mounted on said second motor, said first reduction ratio being greater than said second reduction ratio, and wherein a first coupling member is arranged between the first gear drive and said driving screw, and a second coupling member is arranged between the second gear drive and said driving screw, the first and second coupling members being connected to each other by a pivoting lever in such a manner that all of said coupling members can be switched from an advancing position to a retracting position or vice versa by moving said pivoting lever.

5,464,129

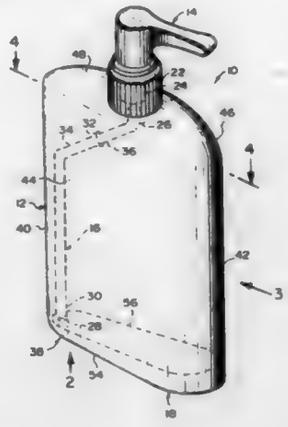
PUMP SPRAY BOTTLE

Richard K. Ho, P.O. Box 15925, Honolulu, HI. 96830-5925

Filed May 27, 1994, Ser. No. 249,337

Int. Cl.[6] B67D *5/60*

U.S. Cl. 222—377 **5 Claims**



1. A pump spray bottle comprising:

a) a container for holding liquid therein, said container having an externally threaded neck;

b) a pump head on said container, said pump head having an internally threaded cap to engage with said externally threaded neck of said container, said pump head including an accumulator built into said and a pipe extending from said accumulator;

c) a dip tube coupled to said pump head, said dip tube including a mouth formed on a lower end, and a funnel formed on an upper end to receive a free end of said pipe from said accumulator; and

d) means within said container for completely removing all of the liquid from within said container through said dip tube and out of said pump head, said container including a bottom wall, a first side wall and a second side wall, a front wall, a rear wall, and a top wall maintaining said externally threaded neck, said liquid removing means including said bottom wall of said container being tapered, and means for maintaining said dip tube at said first side wall of said container at the lowest end of said tapered bottom wall, so that said mouth on the lower end of said dip tube will be located right at the lowest end of said tapered bottom wall to receive all of the liquid held within said container.

5,464,130

PISTON OF PUMP SECTION OF TRIGGER-TYPE LIQUID DISPENSER

Takaharu Tasaki, Tokyo, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

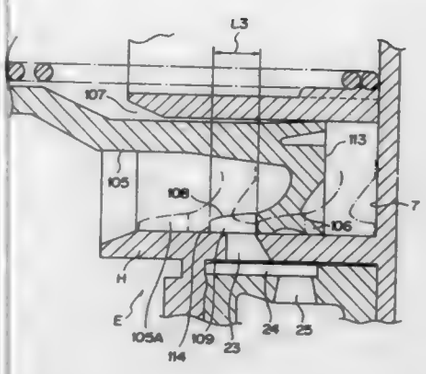
PCT No. PCT/JP92/01125, § 371 Date May 3, 1994, § 102(e) Date May 3, 1994, PCT Pub. No. WO94/05911, PCT Pub. Date Mar. 17, 1994

PCT Filed Sep. 3, 1992, Ser. No. 232,115

Int. Cl.[6] B67D *5/40*

U.S. Cl. 222—383.1 **2 Claims**

1. A piston of a pump section of a trigger-type liquid dispenser to be moved back and forth by a trigger, said piston having a first annular skirt extending at an approach end of the piston and a second annular skirt extending at a stroke end of the piston and formed integrally with the first annular skirt and forming a curved portion between said first annular skirt and said second annular skirt, said annular skirts being held in close contact with an inner wall surface of a cylinder of the pump section, an overall axial length of said first and second annular skirts being selected to close an air intake port provided on a peripheral wall of the cylinder of



the pump section when the trigger is in an unactuated position, and to open the air intake port when the trigger is moved from the unactuated position, said curved portion having an axial length smaller than an axial length of the air intake port.

5,464,131

MANUALLY OPERATED DISPENSING DEVICE FOR A DOUBLE DISPENSING CARTRIDGE

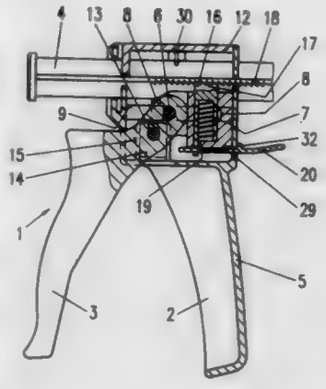
Wilhelm A. Keller, Obstgartenweg 9, CH-6402 Merlischachen, Switzerland

Filed Mar. 14, 1994, Ser. No. 209,739

Claims priority, application Switzerland, Mar. 17, 1993, 00803/93

Int. Cl.[6] B67D *5/42*; G01F *11/00*

U.S. Cl. 222—391 **11 Claims**



1. A manually operated dispensing device for double dispensing cartridges for delivering two-component compositions, comprising;

a housing;

a double thrust ram; and

drive means jointly acting upon the double thrust ram and being actuated by a trigger lever, said drive means comprising a thrust member driving said thrust ram via a toothing of the thrust ram, wherein said thrust member comprises a driving dog being under the action of a spring and having several teeth, said driving dog acting essentially perpendicularly on the toothing of said thrust ram, and means for moving said thrust member substantially only in the direction of the thrust ram upon actuation by said trigger lever.

5,464,132

Patent Not Issued For This Number

5,464,133

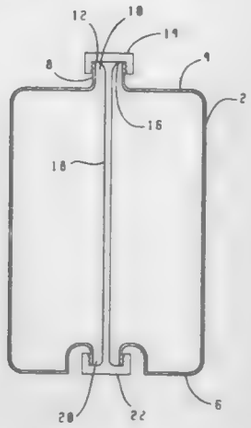
LIQUID CONTAINER HAVING A REMOTELY CLEAVABLE SEAL

James T. Drummond, 3007 Euclid Ave., San Diego, Calif. 92105

Filed Sep. 6, 1994, Ser. No. 301,498

Int. Cl.[6] B65D *47/10*

U.S. Cl. 222—484 **7 Claims**



1. A container for liquids comprising:

(a) shell means for containing the liquid;

(b) a mouth defined by the shell means from which liquid therein is poured;

(c) seal means for closing said mouth;

(d) means, when twisted, for cleaving the seal means; and

(e) means for twisting the means for cleaving from a place remote from the mouth.

5,464,134

SQUEEZE LUBE WITH A CLOSURE DEVICE RESILIENTLY URGED FORWARD CLOSED POSITION

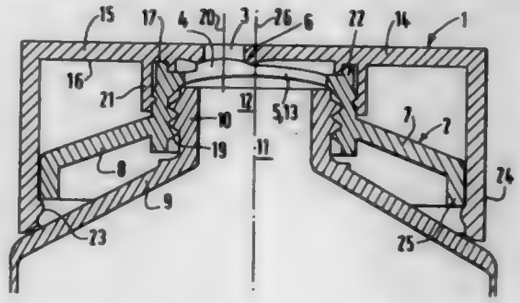
Patrick Rennie, Morristown Ship, N.J., assignor to Cosmoplast, Annecy, France

Filed Mar. 7, 1994, Ser. No. 206,258

Claims priority, application France, Mar. 5, 1993, 93 02593

Int. Cl.[6] B67D *3/00*

U.S. Cl. 222—507 **12 Claims**



1. A closure device for a squeeze tube enabling the contents of said tube to be expelled, the device being of the type comprising a first portion provided with a dispensing orifice, a second portion provided with a stud suitable for co-operating with the dispensing orifice for the purpose of closing it and also of opening it, the first and second portions being permanently associated one with the other while still being capable of being displaced relative to each other between a closed position and an open position in which, respectively, the stud is in a closed position where it closes the orifice and an open position where it opens it, a user being capable of causing the device to change between said two positions, the stud being urged continuously towards its closed position by a resilient member, wherein the first portion is substantially rigid and

includes sealed thrust means suitable for acting on the stud and the resilient member independently of the tube and against the resilient member, in the stud-opening direction, and the second portion being provided with a through opening such that in the closed position the stud closes the dispensing orifice under drive from the resilient member, the thrust means then being inactive, and in the open position, the stud and the resilient member are situated in the through opening and the stud opens the dispensing orifice under drive from the thrust means.

5,464,135

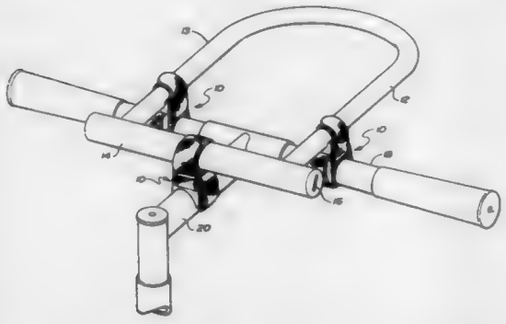
HIGH PERFORMANCE LOCK MOUNT AND METHOD

Robert D. Studdiford, Berkeley, Calif., assignor to Twofish Unlimited, Berkeley, Calif.

Division of Ser. No. 101,196, Aug. 3, 1993, Pat. No. 5,395,018. This application Jan. 4, 1995, Ser. No. 368,327

Int. Cl.[6] B62J *11/00*

U.S. Cl. 224—41 **2 Claims**



1. A method for releasably securing a lock comprised of a U-shaped shackle having an open end and a cross-bar connected across the open end thereof to a bicycle at the steering control portion thereof characterized by the intersection of a first frame member and a crossing second frame member, the method comprising the steps of:

releasably securing a first mounting block to the first frame member, said first mounting block having a first concave mounting surface of a predetermined first axial length in which a portion of the cross-bar is cradled and an opposing second concave mounting surface of a predetermined second axial length located below said first concave mounting surface in which a portion of the first frame member is cradled;

releasably securing second and a third mounting block to the second mounting block crossing frame member, on opposite sides of said intersection said second and third mounting blocks each having a first concave mounting surface of a predetermined first axial length in which a portion of the shackle is cradled and an opposing second concave mounting surface of a predetermined second axial length located below said first concave mounting surface of each of said second and third mounting blocks, respectively, in which a portion of the second frame member is cradled;

said first and second concave mounting surfaces of said first, second and third mounting blocks each being positioned relative to each other so that the direction of said first axial length is transverse to said second axial length for each of said first, second and third mounting blocks, respectively;

releasably securing the cross-bar to said first mounting block; and

releasably securing the shackle to said second and third mounting blocks.

5,464,136

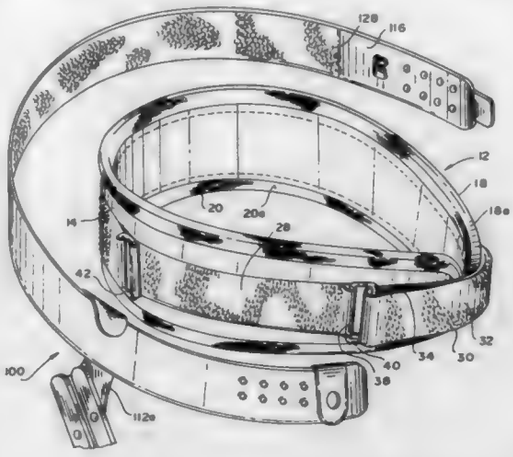
SUPPORT BELT FOR COMPETITIVE SHOOTERS

Tillman L. Eddy, 1501 39th St., West Palm Beach, Fla. 33407

Filed Sep. 28, 1994, Ser. No. 313,762

Int. Cl.[6] A45F *5/00*

U.S. Cl. 224—252 **15 Claims**



1. A competition shooter or law enforcement officer support belt for simultaneously supporting a user's lower back and an outer belt and holster system, said support belt comprising:

an elongated support platform having a flexible longitudinal axis, said support platform for wrapping around a user's lower torso;

said support platform comprising a first end, a second end, a generally stiff midsection defined by said support platform between said first and second ends, an inner surface that engages the user's lower torso, an exterior surface, an upper edge and a lower edge;

means for releasably attaching the outer belt and holster system contiguously to said support platform, said means for releasably attaching being permanently attached to said exterior surface of said support platform between said first end and said second end so as to provide a substantially 360° fastening surface when said support platform is wrapped around the user's lower torso;

said midsection having a width being greater than the width of the outer belt as measured between said upper and lower edges so as to simultaneously provide support to the user's lower back while virtually immobilizing the outer belt and holster system with respect to the support platform when said platform is firmly wrapped around the user's lower torso; and

means for securing said support platform around the user's lower torso.

5,464,137

GARMENT WEIGHT TRANSFER APPARATUS

Hossain A. Shirdavani, 14423 NE. 37th Pl. Apt. G 6, Bellevue, Wash. 98007

Filed May 24, 1993, Ser. No. 65,431

Int. Cl.[6] A45P *3/14*

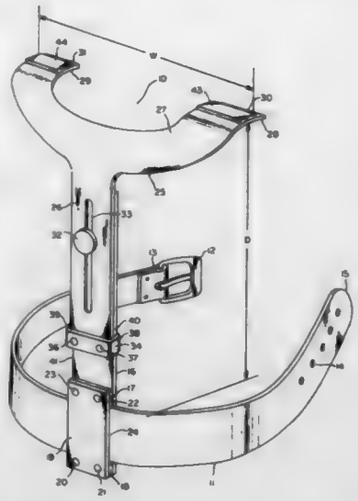
U.S. Cl. 224—265 **1 Claim**

1. Garment weight transfer apparatus for use by a user having a waist, hips, shoulders and a back having a center, said apparatus comprising

an upright member oriented vertically in use and having a lower end,

a T-shaped bracket comprising a stem portion, a beam portion having first and second beam portion ends, a first garment support portion at said first beam portion end and a second garment support portion at said second beam portion end,

a belt having a maximum width and a length and made from material having the stiffness of leather rated in the range of 4



ounces to 10 ounces, said width being in the range of 1.5 to 3 inches, said belt further comprising means for fastening said belt about said waist,

means for slidably attaching said lower end of said upright member to said belt with said upright member essentially vertical to said length of said belt,

means for adjustably attaching said stem portion of said bracket to said upright member such that said garment support portions are a distance from said belt and said distance is adjustable,

whereby with said belt fastened about said waist and in contact with said hips said garment support portions are above said shoulders and the proximity of said garment support portion to said shoulders can be adjusted by said means for adjustably attaching said stem portion to said upright and said stem portion can be positioned at said center of said back using said means for slidably attaching said lower end of said upright to said belt.

5,464,138

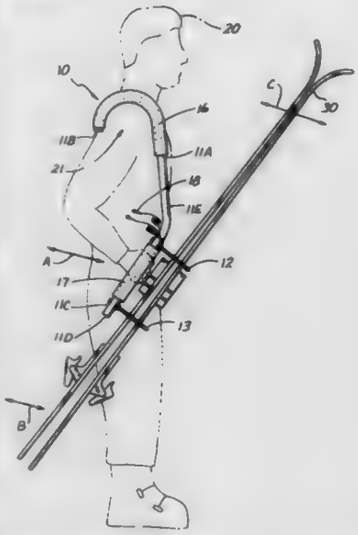
SKI CARRYING DEVICE

Richard Rodriguez, 1161 Highland Dr., Vista, Calif. 92083

Filed Oct. 4, 1994, Ser. No. 317,915

Int. Cl.[6] A45F *3/10*

U.S. Cl. 224—265 **9 Claims**



1. A ski carrying device for carrying a pair of skis, comprising:

an elongated tube of rigid material, the tube having a first end portion, a second end portion, and a mid-portion intermediate the first and second end portions; and

mounting means on the second end portion of the tube for holding the pair of skis;

the tube being shaped so that the first end portion of the tube is curved in an inverted U-shaped configuration adapted to fit over the shoulder of a user standing in an erect position, so that the mid-portion of the tube extends downwardly from the first end portion ahead of the shoulder alongside the torso of the user to the second end portion of the tube, and so that the second end portion of the tube extends downwardly and rearwardly from the mid-portion alongside and adjacent the waist of the user in a position enabling the user to grip the second end portion while standing erect in order to steady the skis held in said mounting means;

the mounting means being arranged to hold the pair of skis on the second end portion in a position extending upwardly in an incline ahead of the user; and

the first end portion of the tube being shaped so that it fits over the shoulder of the user loosely to enable the user to adjust the incline of the skis while gripping the second end portion by pushing and pulling the second end portion forwardly and rearwardly relative to the user alongside the torso of the user to thereby rotate the tube relative to the shoulder of the user to a position in which the skis are inclined as desired.

5,464,139

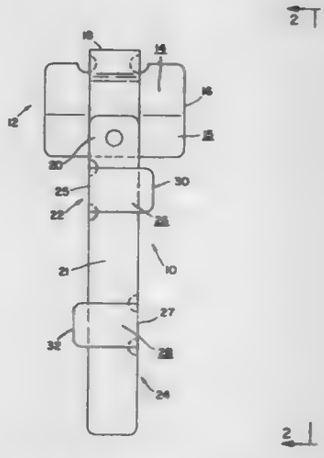
CADDY CLIP

Stanley Schuchmann, 150 Himmel, Moscow Mills, Mo. 63362

Filed Apr. 28, 1994, Ser. No. 234,358

Int. Cl.[6] A45F *5/02*

U.S. Cl. 224—269 **9 Claims**



1. A caddy clip for holding golf clubs in place adjacent the golfer's body comprising:

a generally U-shaped member having a first leg adapted to be located inside the golfer's belt and including a transverse portion extending a significant distance in engagement with the inner surface of the golfer's belt;

an arcuate portion extending upwardly and going over the golfer's belt and joining;

a second leg extending downwardly parallel to said first leg;

said second leg including means for pivotally mounting a lower depending leg for relative movement between said second leg and said depending leg;

said depending leg including a downwardly extending portion including at least one pair of oppositely directed vertically spaced upper and lower clip members mounted upon said depending leg;

each of said clip members extending laterally from said downwardly extending leg in different directions and each including an arcuate portion adapted to removably engage the shaft of a golf club;

the upper clip member adapted to engage and support a golf club head; whereby

the caddy clip is supported by the golfer's belt; a golf club can be removably carried by said caddy clip with the head of the club engaging said upper clip member, and the shank of the club located within and engaged by each of said arcuate portions of upper and lower clip members.

5,464,140

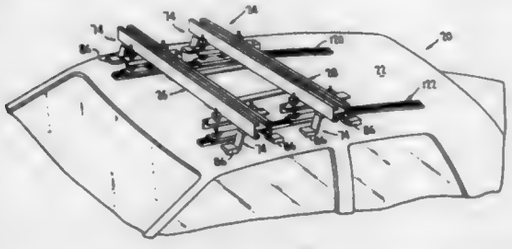
MOUNTING STRUCTURE FOR ROOF RACK SUPPORT MEMBERS

Richard Hill, 11556 Woodbridge Blvd., Seminole, Fla. 34642

Filed Jul. 26, 1994, Ser. No. 280,795

Int. Cl.[6] B60R *9/00*

U.S. Cl. 224—321 **14 Claims**



1. Mounting structure for roof rack support members adapted to be connected to rails attached to the roof of an automotive vehicle comprising, a pair of spaced elongated support members, roof engaging support means connected to each of said support members for engaging the roof of said automotive vehicle, rigid means connected to each of said support members for movement therewith and being spaced from said roof engaging support means, force transmitting means for engaging each of said rails and force applying means operatively connected to each of said force transmitting means and operatively engaging said rigid means for forcing said rigid means and the connected support members downwardly to cause said roof engaging means to be moved into tight engagement with the roof of said automotive vehicle, said force transmitting means comprising a plurality of elongated threaded members and said force applying means comprising a plurality of complementary threaded members in threaded engagement with said elongated threaded members, said complementary threaded members having slots formed therein, said rigid means having holes formed therein, and retainer means disposed within said holes and said slots for retaining said complementary threaded members in position relative to said rigid means.

5,464,141

ROOFTOP PIPE CONTAINER

David R. Brindle, 73 Buttonwoods Ave., Haverhill, Mass. 01830-6453

Filed Mar. 7, 1994, Ser. No. 206,348

Int. Cl.[6] B60R *9/042*

U.S. Cl. 224—328 **4 Claims**

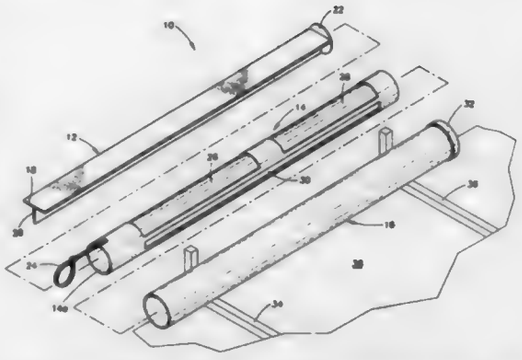
1. A carrier for carrying elongate materials of varying lengths, comprising:

an outer container;

an insert which fits and is slidable within said outer container; and

a shelf assembly disposed within said insert for holding said elongate materials;

said shelf assembly has a T-shaped cross-section and comprises a horizontal member and a vertical member connected to said horizontal member;



said horizontal member provides a surface for storage of some of said elongate materials in an upper portion of the interior of said insert, said vertical member dividing a lower portion of said insert into compartments for storage of further said elongate materials;

wherein said insert has a surface which is discontinuous so as to form at least one access port in said surface, thereby providing access to said elongate materials held by said shelf assembly;

said at least one access port comprises a plurality of access ports located on a top and a side, respectively, of said insert;

shorter elongate materials are stored on said horizontal member and longer elongate materials are stored below said horizontal member; and

a shelf end stop connected to one end of said shelf assembly.

5,464,142

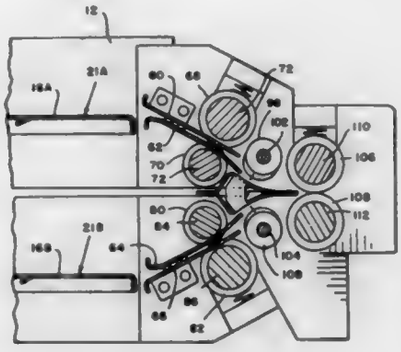
WEB BURSTING MACHINE

Hans C. Mol, Wilton, and James S. Ramsey, Shelton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 3, 1994, Ser. No. 176,176

Int. Cl.[6] B65H *35/10*

U.S. Cl. 225—100 **4 Claims**



1. A web bursting machine for separating individual sheets of material from a pair of spaced apart traveling webs of indefinite length on which said sheets are delineated by successive spaced apart transverse lines of weakening, said machine comprising:

A. means defining first and second spaced apart, substantially parallel feed paths which converge at a downstream location to form a common feed path,

B. means in said first and second feed paths for feeding a web of indefinite length along said feed paths with the transverse lines of weakening of each web disposed one half pitch offset from the other,

C. first and second pairs of adjacent feed rollers disposed in said first and second feed paths respectively adjacent the downstream ends of said feed paths for continuously feeding both said webs past said downstream ends of said feed paths,

D. first and second bursting means disposed in said first and second feed paths respectively adjacent said first and second pairs of feed rollers on the downstream side thereof,

E. a third pair of feed rollers disposed at the juncture of said first and second feed paths and said common feed path for feeding individual sheets which have been separated from said webs along said common feed paths, and

F. control means for momentarily altering the relative linear feeding velocity alternately between said third pair of feed rollers and said first and second pairs of feed rollers when a transverse line of weakening of said first and second web is over said first and second bursting means respectively,

whereby bursting tension is applied to said first and second webs alternately when the transverse lines of weakening of said second and first webs respectively are adjacent said bursting means so as to successively separate individual sheets from said webs as said webs move continuously through the bursting machine, wherein said control means comprises means for alternately momentarily accelerating the rotational velocity of said first and third pairs of feed rollers when a transverse line of weakening of said second web is adjacent said second bursting means, but maintaining the rotational velocity of said second pair of feed rollers constant, and momentarily accelerating the rotational velocity of said second and third pairs of feed rollers when a transverse line of weakening of said first web is adjacent said first bursting means, but maintaining the rotational velocity of said first pair of feed rollers constant, whereby bursting tension is applied alternately to both said webs to separate individual sheets therefrom.

5,464,143

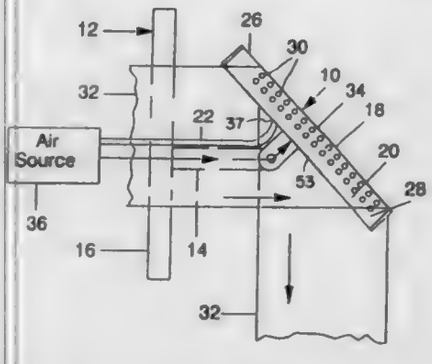
WIDTH ADJUSTABLE ANGLE BAR ASSEMBLY FOR A PRINTING PRESS

Robert E. Hansen, 6340 Americana Dr., Clarendon Hills, Ill. 60514

Continuation of Ser. No. 45,544, Apr. 8, 1993, abandoned. This application May 18, 1994, Ser. No. 245,882

Int. Cl.[6] B65H *23/32*

U.S. Cl. 226—199 **4 Claims**



1. A width adjustable angle bar assembly for a printing press, comprising:

a support;

a hollow angle bar mounted on the support, said angle bar having a cavity with a central portion between a pair of opposed ends, and a plurality of openings extending through the angle bar and communicating with the cavity for passage of air through the angle bar from the cavity to a web passing over the angle bar;

means for passing the air into the central portion of the cavity for distribution of the air by the angle bar against the web;

a pair of blocking members slidably mounted adjacent both opposed ends of the angle bar, respectively, for blocking the passage of air from the central portion of the cavity through the openings adjacent the ends; and

means for symmetrically adjusting the movement of the blocking members toward and away from each other to selectively control the number of openings adjacent the opposed ends communicating with the air passing into the central portion of the cavity.

5,464,144

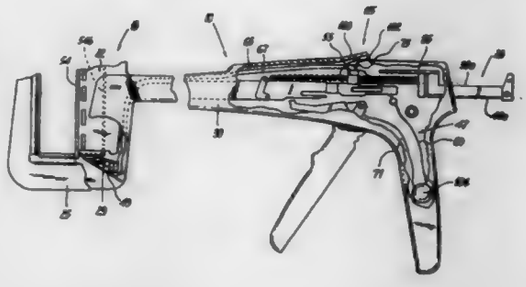
SURGICAL APPARTUS WITH INDICATOR

Thomas D. Guy, Fairfield; Richard N. Granger, Huntington; Robert H. Brady, Brookfield; John Webster, Cromwell; James R. Pratt, Wolcott; Corbett W. Stone, Newtown, and Thomas W. Alesi, Jr., New Fairfield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 109,134, Aug. 19, 1993. This application Oct. 8, 1993, Ser. No. 134,353

Int. Cl.[6] A61B *17/068*

U.S. Cl. 227—176 **10 Claims**



1. A surgical fastening apparatus comprising:

a housing having a cartridge receiving portion;

a voltage source disposed within said surgical fastening apparatus; and

first and second electrical contact members disposed within said surgical fastening apparatus and connected to said voltage source, wherein insertion of a cartridge to a predetermined position within said cartridge receiving portion electrically connects said first contact member and said second contact member thereby completing an electrical circuit.

5,464,145

HEAT EXCHANGER FOR AUTOMOBILE AIR CONDITIONING SYSTEM AND METHOD FOR MANUFACTURE OF THE SAME

Sang-Rok Park, Seoul, and Jai-Heung Yoo, Chungcheongnam, both of, Rep. of Korea, assignors to Doowon Climate Control Co., Ltd., Rep. of Korea

Filed Feb. 22, 1994, Ser. No. 199,716

Claims priority, application Rep. of Korea, Mar. 5, 1993, 93-3355

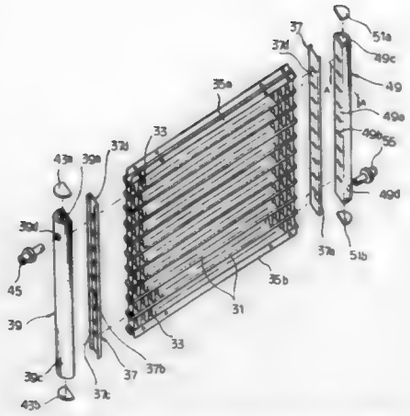
Int. Cl.[6] B23K *1/00*

U.S. Cl. 228—183 **4 Claims**

1. A method for manufacture of a heat exchanger for an automobile air conditioning system comprising the steps of:

provisionally inserting opposite ends of a plurality of refrigerant flowing tubes into their respective apertures of first and second D-shaped cross-sectioned header pipes with interposition of a pair of brazing metal plates between them each plate including at least one flanged portion which extends from a body portion of the plate and overlaps with a portion of a respective header pipe, and provisionally coupling opposite ends of top and bottom support beams to said first and second header pipes with interposition of said brazing metal plates, thus to form a provisionally assembled heat exchanger; and

heating said provisionally assembled heat exchanger in a brazing furnace at a high temperature so as to melt said brazing metal plates and to form a plurality of brazing beads for liquid-tightly jointing said tubes to said header pipes such that said



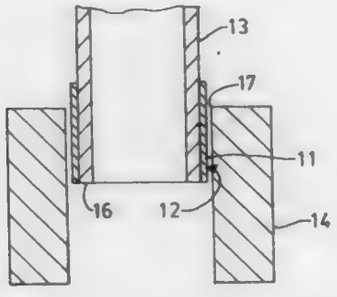
header pipes communicate with each other through the tubes and for jointing said top and bottom support beams to said header pipes.

5,464,146

THIN FILM BRAZING OF ALUMINUM SHAPES

Matthew J. Zaluzec, Canton; Gerald A. Grab, Trenton, and Warren A. Smith, Milan, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 29, 1994, Ser. No. 315,039
Int. Cl.[6] B23K *1119;1120*
U.S. Cl. 228—208 11 Claims



1. A method of brazing unclad first and second aluminum alloy shapes to effect an autogenous joint therebetween, comprising:

depositing a thin sacrificial film of an aluminum eutectic forming material onto a selected zone of at least one of said shapes, the film being effective to uniformly continuously conformed to said zone and form essentially a eutectic alloy with the aluminum of said shapes;

(b) assembling said shapes together to create contact therebetween at said selected zones; and

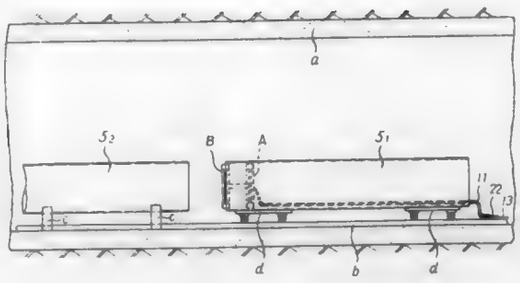
(c) heating such assembly to a temperature to form a eutectic alloy of said material and the aluminum of said shapes, such alloy migrating into one or both said shapes at said zones, filling any space therebetween to effect an autogenous joint.

5,464,147

METHOD OF CONNECTING CYLINDRICAL MEMBERS TO EACH OTHER USING TANDEM TYPE INTERNAL CLAMP

Nobuyoshi Minami, Yokohama, Japan, assignor to Chiyoda Corporation, Yokohama, Japan

Filed Sep. 21, 1994, Ser. No. 309,357
Claims priority, application Japan, Sep. 21, 1993, 5-256327
Int. Cl.[6] B23K *37/053*
U.S. Cl. 228—212 2 Claims



1. A method of connecting cylindrical members such as pipes or the like to each other using a tandem type internal clamp composed of two or more clamps each including a main ring of which peripheral part exhibits a channel-shaped sectional contour and a plurality of expansion ring segments fitted into said main ring so as to be displaced in the radial direction, each of said expansion ring segments having two seal ring segments fixedly secured thereto on the opposite sides thereof, comprising the steps of;

locating said tandem type internal clamp in position in a first cylindrical member to be newly connected to a second cylindrical member already connected to a preceding cylindrical member in such a manner as to allow one of said clamps corresponding to a circular welding seam to be slightly projected outside of said first cylindrical member,

radially displacing expansion ring segments of other clamp in the outward direction, causing seal ring segments of said other clamp to come in tight contact with the inner peripheral surface of said first cylindrical member,

displacing said first cylindrical member until a tapered welding edge of the latter abuts against a tapered welding edge of said second cylindrical member,

inserting the projected part of said one clamp into said second cylindrical member,

radially displacing said expansion ring segments of said one clamp in the outward direction, causing one of seal ring segments of said one clamp to come in tight contact with the inner peripheral surface of said second cylindrical member,

eliminating positional offset of said first cylindrical member relative to said second cylindrical member if any, by bringing said seal ring segments of said first and second cylindrical members in tight contact with the inner peripheral surfaces of the latter,

feeding inert gas into the hollow space defined between said seal ring segments of each of said clamps, and

performing a welding operation around the tapered welding edges of said first and second cylindrical members abutting against each other.

5,464,148

PACKING CARTON

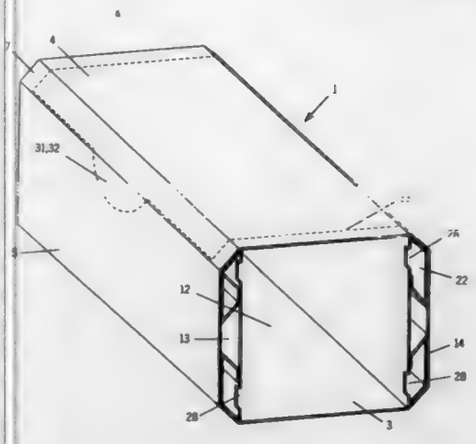
Reinhard Schoch, and Walter Marten, both of Hamburg, Germany, assignors to H.F. & PH.F. Reemtsma GMbH & Co., Hamburg, Germany

Filed Aug. 12, 1994, Ser. No. 289,677
Claims priority, application Germany, Aug. 13, 1993, 43 27 681.4
Int. Cl.[6] B65D *5/50*
U.S. Cl. 229—109 8 Claims

1. A packing carton, comprising:

a carton body having an octagonal cross-sectional shape and an octagonal interior; and

a pair of inserts having a trapezoidal cross-sectional shape geometrically similar to a pair of opposed side portions of the interior of the carton body, each insert comprising a single folded blank having a pair of end portions which have been folded and pressed towards each other into inclined rhombohedral shapes in order to fit within the side portions of the interior of the carton body.

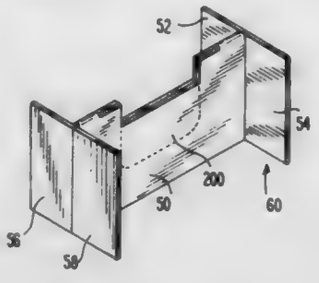


5,464,149

H-PARTITION AND DISPLAY CASE

Kimberly A. Fowler, Lutherville, Md., and Lisa E. Feustle, Chester, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 29, 1993, Ser. No. 174,742
Int. Cl.[6] B65D *25/04*
U.S. Cl. 229—120.27 26 Claims



1. An H-shaped divider comprising
a) a central wall having two ends and two sides,
b) a transversely extending end wall at each end of said central wall extending transversely on both sides of said central wall,
c) said central wall having an opening permitting visual access from a first side of said wall to a second side of said wall, said opening including a removable panel.

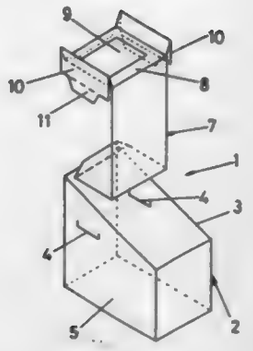
5,464,150

TWO CHAMBER CONTAINER FOR SEPARATE SOLID AND/OR LIQUID FOOD PRODUCTS

Francisco Porres Sanchez, and Maria M. Barrufet Barque, both of Paris, 177-2°-2ª, 08036 Barcelona, Spain

Filed Sep. 21, 1994, Ser. No. 310,286
Claims priority, application Spain, May 4, 1994, 9401204
Int. Cl.[6] B65D *13/00*
U.S. Cl. 229—120.38 5 Claims

1. A container for separating food products comprising:
a prismatic body having a plurality of sides including a bottom side and an opposite open side, with the open side being on an inclined plane with respect to the bottom side; the body having opposite larger side faces extending up to the open side; a cut formed in at least one of the side faces;
a template generally shaped in the form of a "C" and installed in the body down from the open side, a bottom leg of the "C" inside the body, an upstanding vertical face of the "C" defining a partition inside the body for separating the body into a portion outside the "C" and a portion enclosed by the "C" and a top leg of the "C" defining an upper end surface of the template at the open side;



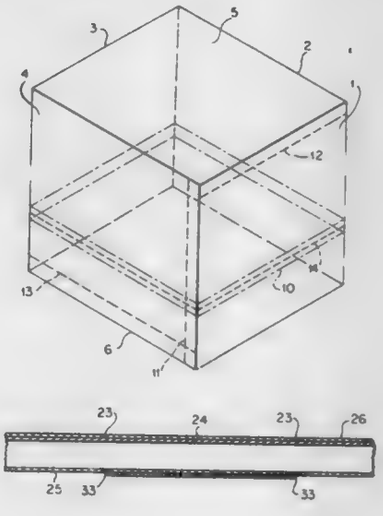
a cutout defined in the upper end surface of the template for receiving a food product through the cutout to be held in the portion of the body enclosed by the template;
a lateral surface extension defined at the upper leg of the template corresponding to at least one side face of the body at which the cut is defined, for supporting the template at the respective side face; a lip on the lateral surface extension introducible into the cut on the side face for attaching the template to the body.

5,464,151

TEAR TAPE SYSTEM AND CONTAINER INCLUDING THE SAME

Alan Parker, Maidstone; Michael C. Chapman, East Malling; Stephen P. Pinchen, Etwall, and Carl J. Stonely, Giltbrook, all of, United Kingdom, assignors to P. P. Payne Limited, United Kingdom

Continuation of Ser. No. 63,572, May 19, 1993, abandoned.
This application May 17, 1994, Ser. No. 245,072
Claims priority, application United Kingdom, May 19, 1992, 9210671
Int. Cl.[6] B65D *5/54;17/00*
U.S. Cl. 229—206 15 Claims



1. A board for container manufacture, the board comprising a corrugated sheet sandwiched between, and adhered to, first and second facing sheets, wherein the first sheet includes a tear tape having a width and two edges and the second sheet includes a line of weakness substantially in register with the tear tape and a

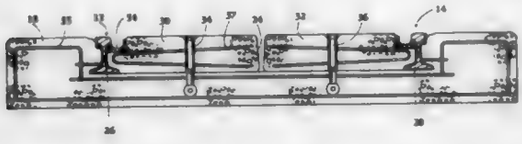
further line of weakness substantially in register with the tear tape, wherein each line of weakness does not extend through the board to the first sheet.

5,464,152

METHOD AND APPARATUS FOR ELECTRICALLY ISOLATING A RAIL IN A PRECAST CONCRETE GRADE CROSSING

Benjamin Wabnitz, Gig Harbor, Wash., assignor to Pacific International Pipe Enterprises, Inc., Portland, Oreg.

Filed Jan. 7, 1994, Ser. No. 179,144
Int. Cl.[6] E01B *1/00*
U.S. Cl. 238—8 **14 Claims**



1. A method for electrically isolating a rail in a precast concrete grade crossing having a base member formed with a central recess, said central recess having parallel walls formed to conform generally to the outer surface of a rail, said method comprising the steps of:

providing a boot formed from substantially planar elastomeric material molded to conform to a substantial portion of the surface of said rail:

encasing a rail having a base portion, a web portion and a head portion in said elastomeric boot which extends from said base portion to cover substantially all of the outer surface of said head portion when said rail is so encased;

positioning the boot-encased rail in the central recess of the precast base member with the outer surface of the rail being directed toward one of the walls of the central recess;

pinching a substantially planar portion of the boot between a substantially vertical surface formed on said one wall of the central recess and an outer substantially vertical surface of the head portion until the boot is in sealing engagement with said head portion; and

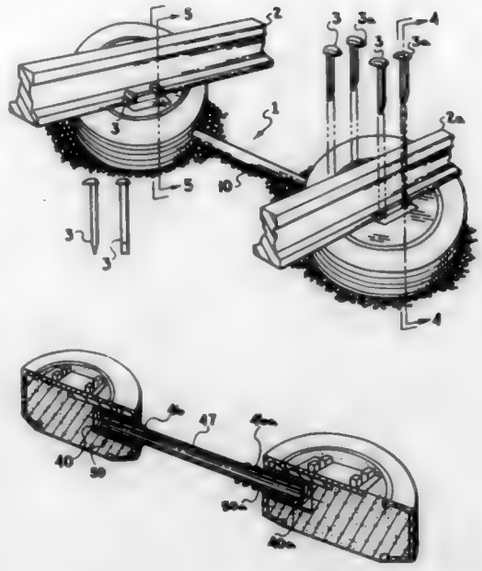
maintaining the boot-encased rail in such sealing engagement.

5,464,153

RAILROAD RAIL SUPPORT AND PROCESS FOR MANUFACTURE

Amos W. Broughton, 5645 Persimmon Ave., Temple City, Calif. 91780

Filed May 2, 1994, Ser. No. 236,377
Int. Cl.[6] E01B *3/00*
U.S. Cl. 238—117 **22 Claims**



1. A railroad rail support including:

first and second horizontally oriented rubber tires each having a circumferential tread, a top sidewall including a top rim bead and a bottom sidewall having a bottom rim bead said bottom sidewall and said bottom rim bead being adapted for location adjacent to a railroad roadbed;

first and second rail support means each disposed within one of said tires and having a top surface in a plane of the top rim bead and a bottom surface in a plane of the bottom rim bead, each said rail support means including a top plate and a plurality of tubular channels extending downwards from said top plate to the bottom surface;

a concrete matrix substantially filling each said rubber tire and retaining a respective rail support means within the rubber tire;

a plurality of railroad spike means installed into the tubular channels said spikes having heads being adapted for overlapping the opposed edges of the bottom flanges of railroad rails;

a means for locking each said spike means into a respective tubular channel;

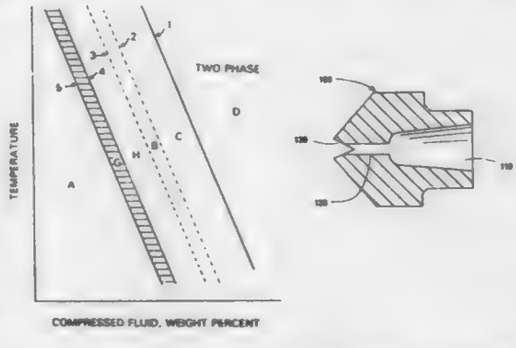
a female threaded member retained within each said rail support means on a common horizontal axis at a right angle to the rails, said female threaded member extending through each respective tire tread; a rail spacing adjustment means having a first end extending into the first fall support means female threaded member and having a right-hand thread and having a second end extending into the second rail support means female threaded member and having a left-hand thread.

5,464,154

METHODS FOR SPRAYING POLYMERIC COMPOSITIONS WITH COMPRESSED FLUIDS AND ENHANCED ATOMIZATION

Kenneth A. Nielsen, Charleston, W. Va., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 29, 1993, Ser. No. 129,256
The portion of the term of this patent subsequent to Jan. 12, 2010, has been disclaimed.
Int. Cl.[6] B05B *17/04*
U.S. Cl. 239—1 **20 Claims**



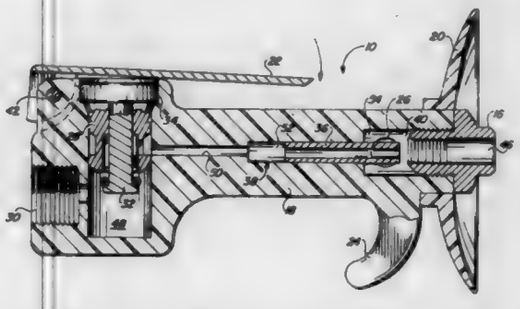
1. In a method for spraying a liquid mixture of a polymeric composition and at least one compressed fluid, which compressed fluid is a gas at standard conditions of 0° Celsius and one atmosphere pressure (STP), which comprises passing the liquid mixture under pressure through a first orifice passageway to produce a first spray comprising a liquid-film spray or a transition spray between a liquid-film spray and a decompressive spray, the improvement which comprises providing an elongated first orifice passageway

which is elongated in at least an amount such that when spraying the liquid mixture of polymeric composition and at least one compressed fluid through the elongated first orifice passageway, a second spray is produced comprising a decompressive spray or a nearly decompressive spray having smaller average droplet size than the first spray.

5,464,155
SAFETY AIR GUN

Raymond A. Schutter, 3950 Harbor Point Dr., Muskegon, Mich. 49441

Filed Jan. 13, 1994, Ser. No. 181,593
Int. Cl.[6] B05B *1/28*
U.S. Cl. 239—124 **21 Claims**



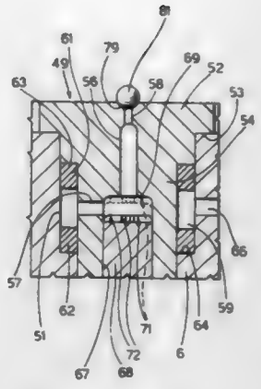
1. A safety air gun comprising a handle with an interior air channel therethrough leading from an inlet for pressurized air to an outlet for discharging pressurized air, the interior channel having an expansion chamber therein, the expansion chamber having an aligned expansion chamber inlet and outlet, the expansion chamber inlet is formed by an inlet tube of predetermined length that protrudes into the expansion chamber from an inlet end thereof, the expansion chamber also having at least one vent hole therein that is vented to atmosphere, the expansion chamber having a larger cross-sectional area than the expansion chamber inlet and outlet, the air gun and expansion chamber being formed such that the dynamic force of air discharged from the air gun outlet is lower when the vent hole is blocked than when the vent hole is open.

5,464,156
ELECTROMAGNETIC FUEL INJECTION VALVE

Mario Ricco; Giovanni Bruni, both of Bari, and Sisto L. De Matthaeis, Modugno, all of, Italy, assignors to Elasis Sistema Ricerca Fiat Nel Mizzogiorno Societa Consortile Per Azioni, Pomigliano D'Arco, Italy

Continuation of Ser. No. 994,895, Dec. 22, 1992, abandoned. This application Jun. 13, 1994, Ser. No. 259,742
Claims priority, application Italy, Dec. 24, 1991, TO91A1043
Int. Cl.[6] F02M *47/02*
U.S. Cl. 239—124 **7 Claims**

1. An electromagnetic fuel injection valve comprising a body (**6**) fitted with a nozzle (**9**) having at least one orifice (**11**) normally closed by a pin (**28**); said orifice (**11**) communicating with an injection chamber (**19**) for supply with pressurized fuel; and a metering valve (**41**) controlled by an electromagnet (**42**); said metering valve (**41**) comprising a head (**49**) having a control chamber (**56**), a supply conduit (**57**) for feeding the pressurized fuel into said control chamber (**56**), and a drain conduit (**58**) coaxial with said control chamber (**56**); said head (**49**) also comprising a cylindrical cavity (**67**) coaxial with said control chamber (**56**) and communicating therewith; said supply conduit (**57**) being located radially at said cavity (**67**); a cylindrical element (**68**) controlling said said pin (**28**), being guided by said cylindrical cavity (**67**) and being urged by the pressurized fuel inside said control chamber (**56**) to cause said pin (**28**) to close said orifice (**11**); said cylindrical element (**68**) partially closing said supply

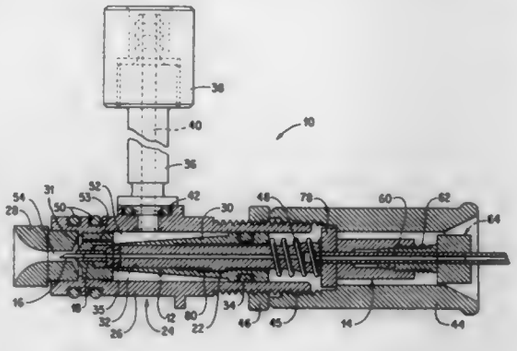


conduit (**57**) when said drain conduit (**58**) is open said cylindrical element (**68**) being provided with an end surface (**71**) having grooves (**72**) for ensuring a residual gap in said cavity (**67**) communicating with said supply conduit (**57**), and wherein said drain conduit (**58**) is connected to a drain chamber (**39**) by activating a control element (**48**) integral with an armature (**43**) of said electromagnet (**42**); said control element (**48**) being guided by a cylindrical guide member (**83**) in one place with said head (**49**); said drain chamber (**39**)comprising at least one groove (**85**) in said guide member (**83**).

5,464,157
NEBULIZER FOR USE IN AN ATOMIC ABSORPTION SYSTEM

Robert P. Bourdoulous, Shelton, and John Vollmer, Newtown, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jul. 18, 1994, Ser. No. 276,144
Int. Cl.[6] B05B *9/03*
U.S. Cl. 239—424 **8 Claims**



1. A nebulizer for use in an atomic absorption system comprising, in combination:

a) a capillary assembly including

i) a capillary holder,

ii) a sapphire capillary tip mounted on one end of said capillary holder and the end of said holder being connected to a sample liquid source; said capillary tip having an outside diameter of about 0.76 millimeters

b) a venturi member having an inlet portion, a throat portion and an exiting bell shaped portion; said throat portion having an inside diameter of about 0.92 millimeters;

c) a body assembly having one end connected to said venturi member;

d) means mounting said capillary assembly in said body assembly for axial movement so that said capillary holder partially enters said venturi inlet portion and said capillary tip enters said venturi throat portion; and

e) means for supplying compressed oxidant to said venturi member in the vicinity of said capillary tip so as to suck sample liquid from said capillary tip to form a mixture of fine liquid mist and gas which is discharged through said exiting bell shaped portion of the venturi member.

5,464,158

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

Karl Hofmann, Neckarrems, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

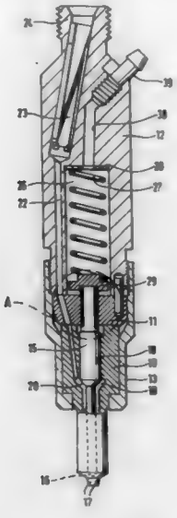
PCT No. PCT/DE93/00669, § 371 Date May 2, 1994, § 102(e) Date May 2, 1994, PCT Pub. No. WO94/03720, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 29, 1993, Ser. No. 211,529

Claims priority, application Germany, Aug. 5, 1992, 42 25 805.7

Int. Cl.[6] F02M *45/08;61/16*

U.S. Cl. 239—533.4 **20 Claims**



1. A fuel injection nozzle for internal combustion engines, having a nozzle body in which an inward-opening valve needle is displaceably supported; a (holding) retaining body that supports the nozzle body via a partition, a chamber in said (holding) retaining body for receiving a closing spring that loads the valve needle in a closing direction; a force transmitting device that penetrates the partition and transmits a force of the closing spring to the valve needle, the force transmitting device includes a piston (**30**) that defines a pressure chamber (**33**) with a face end (**42**) toward the valve needle (**15**) and on another end is loaded by the closing spring (**27**), whereby the face end (**42**) forms a hydraulic effective area, which is less than a hydraulic effective surface area of the valve needle, which is formed by a face end (**41**) of said valve needle remote from a valve seat (**16**) and said face end of said valve needle (**41**) also defines said pressure chamber (**33**); the piston (**30**) has a control edge (**36**) that controls a communication with a pressure-relieved side (**26**) and the pressure chamber (**33**) in the closing position and during the prestroke of the valve needle (**15**), during the prestroke the piston (**30**) is pressed against the valve needle (**15**) by the force of the closing spring (**27**), a communication exists between the pressure chamber (**33**) and the pressure-relieved side (**26**), and after the prestroke (h_v) this communication is interrupted in the remaining stroke of the valve needle (**15**) and of the piston (**30**), so that the remaining stroke of the piston (**30**) takes place by a hydraulic stroke switchover.

5,464,159

METHOD FOR THE CONTAMINATION-FREE SIZE REDUCTION OF SEMICONDUCTOR MATERIAL, ESPECIALLY SILICON

Andreas Wolf, Burgkirchen, and Franz Koeppl, Erlbach, both of, Germany, assignors to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH, Burghausen, Germany

Filed May 3, 1993, Ser. No. 56,180

Claims priority, application Germany, May 27, 1992, 42 18 283.2

Int. Cl.[6] B02C *19/18*

U.S. Cl. 241—1 **5 Claims**

1. A method for the contamination-free size reduction of silicon material comprising:

positioning the silicon material in a focusing region of a semiellipsoidal reflector;

said focusing region being disposed opposite a focal point of the semiellipsoidal reflector; and

subjecting the silicon material to focused shock waves which are generated in said focal point of said semi-ellipsoidal reflector and transmitted in a liquid medium to the silicon material positioned in said focusing region of said semi-ellipsoidal reflector.

5,464,160

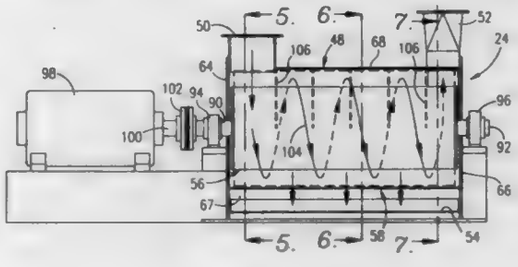
METHOD OF PROCESSING VEGETATIVE CROP PRODUCT

Dale R. McDonald, 601 Colorado St., Fort Collins, Colo. 80521; Joe B. Laugel, Jr., 1532 Caddoa Dr., Loveland, Colo. 80538, and William E. Solomon, 6700 E. Larimer Country Rd. 92, Carr, Colo. 80612

Filed Mar. 16, 1994, Ser. No. 213,934

Int. Cl.[6] B02C *23/24;23/30*

U.S. Cl. 241—17 **9 Claims**



1. A method of processing a vegetative crop product having a high protein xanthophyll-containing portion and a high fiber portion respectively, said method comprising the steps of:

providing a quantity of said xanthophyll-containing vegetative crop product having a moisture content of from about 15–30% by weight;

establishing an elongated, generally horizontally oriented product treatment zone;

introducing vegetative crop to be treated into the product treatment zone through an upper incoming product inlet;

subjecting vegetative crop in the treatment zone to blows from circumferentially spaced, outwardly directed hammers rotatable within the zone about the longitudinal axis thereof and which thereby define a perimeter of the zone, for a time sufficient to produce a friable when dry high protein xanthophyll-containing particulate fraction, and a tougher high fiber fraction having a higher moisture content than the friable fraction;

inducing an imported flow of air through the treatment zone to enhance separation of said high protein particulate fraction from the high fiber fraction produced by impact of the hammers with the crop undergoing fractionation;

allowing portions of the crop undergoing treatment in said zone to exit from said perimeter thereof into a series of separate chambers located along the length of the zone between the

product inlet and the upper product outlet above the axis of rotation of the hammers;

preventing said separate portions of the crop received in separate chambers from short circuiting from one chamber to the next adjacent chamber;

permitting crop which enters respective chambers to gravitate back into the zone;

separating the high protein particulate fraction from the high fiber fraction produced in the zone and thereafter allowing the separated high protein particulate fraction to escape from the zone through a lower product outlet; and

permitting the high fiber fraction to escape from the zone through an upper product outlet spaced axially from the product inlet of the zone.

5,464,161

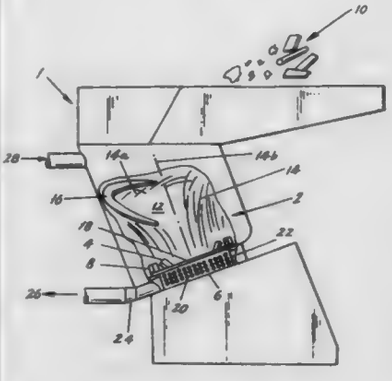
SOLID WASTE PULPER

William K. Upton, III, Chester, Md.; William E. Schneider, White Pine, Tenn.; Stuart H. Brown, Severna Park, Md.; Steven A. Stetz, Stevensville, Md.; Emily J. Gotich, Crofton, Md., and Jack L. McCrea, Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 30, 1994, Ser. No. 312,950

Int. Cl.[6] B02C *18/40*

U.S. Cl. 241—21 **11 Claims**



7. A method for pulping solid waste material at a processing rate, comprising:

orienting a pulping chamber such that a centerline of said pulping chamber is disposed at a non-vertical angle;

introducing said solid waste material to be pulped into said pulping chamber;

pulping said solid waste material introduced into said pulping chamber with a blade assembly mounted in said pulping chamber, said blade assembly comprising a plurality of rotatable blades and a plurality of fixed blades, said rotatable blades being mounted on an impeller in said pulping chamber;

introducing water into said pulping chamber at a predetermined constant flow rate, said water mixing with said pulped waste material to form a slurry;

passing said slurry through a particle size control device in said pulping chamber, said particle size control device functioning to limit the size of said pulped waste material in said slurry which can be discharged from said pulping chamber, said control device further having a first predetermined area through which said slurry passes, said first predetermined area providing a first means to control said processing rate; and

discharging said slurry containing said pulped waste material through a discharge port, said discharge port having a cross-section of a second predetermined area for limiting the maximum flow of said slurry discharged from said pulping chamber, wherein said discharge port provides a second means to control said processing rate.

5,464,162

DEVICE FOR REDUCING PAPER, IN PARTICULAR VALUABLE PAPERS

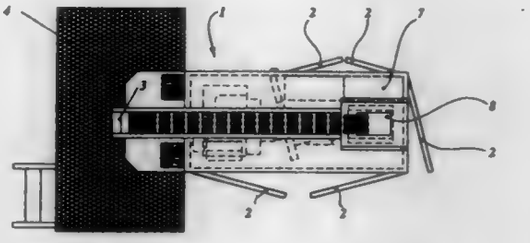
Wilhelmus M. A. Kusters, Venlo, Netherlands, assignor to Kusters Engineering B.V., Venlo, Netherlands

Filed Apr. 26, 1994, Ser. No. 233,625

Claims priority, application Netherlands, Apr. 26, 1993, 9300706

Int. Cl.[6] B02C *9/04;23/20;23/08*

U.S. Cl. 241—36 **12 Claims**



1. A device for reducing paper, in particular valuable papers, comprising:

a frame including an upper wall having an opening therein;

a substantially horizontal conveyor belt supported by the frame, the substantially horizontal conveyor belt having a discharge end above the opening; and

a reducing device substantially contained in the frame, the reducing device including a pre-cutting device and a main cutting device in a substantially horizontal side-by-side relationship under the conveyor belt, the pre-cutting device being positioned below the opening.

5,464,163

ATTRITOR

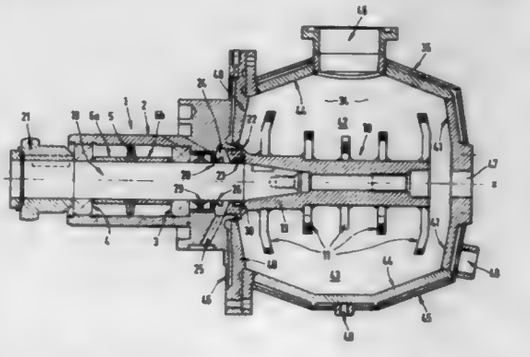
Henning Zoz, Kreuztal, Germany, assignor to ZOZ Maschinenbau GmbH, Krueztal, Germany

Filed Mar. 7, 1994, Ser. No. 207,925

Claims priority, application Germany, Mar. 6, 1993, 43 07 083.3

Int. Cl.[6] B02C *17/16*

U.S. Cl. 241—172 **16 Claims**



1. An attrition mill, comprising:

a stationary milling vessel forming a milling chamber having a horizontal axis and adapted to receive a loose filling of milling bodies;

a bearing-and-seal unit formed with a wall defining an endwall of said chamber, centered on said axis and provided with a shaft seal and a journal bearing, said bearing-and-seal unit having means enabling a number of different milling vessels to be juxtaposed with said bearing-and-seal unit;

a horizontal shaft rotatable about said axis, sealed relative to said milling vessel by said shaft seal and journaled for rotation in said journal bearing; and

a rotor connected to said shaft, disposed in said milling vessel and formed with agitator elements transverse to the axis imparting intensive movement to the bodies of said filling upon rotation of said shaft, said wall of said bearing-and-seal unit being formed with a connecting flange connectable with respective flanges of differently shaped interchangeable milling vessels, a bearing housing cantilevered on said wall of said bearing-and-seal unit, being coaxial with said shaft and extends from said wall away from said chamber, said housing surrounding said shaft and receiving said journal bearing, said journal bearing including two axially spaced rolling bearings journaling said shaft in said housing.

5,464,164

CUTTING MEMBER OF A FLAIL FOR USE IN A ROTARY IMPACT MECHANISM OF A COMMINUTING MACHINE

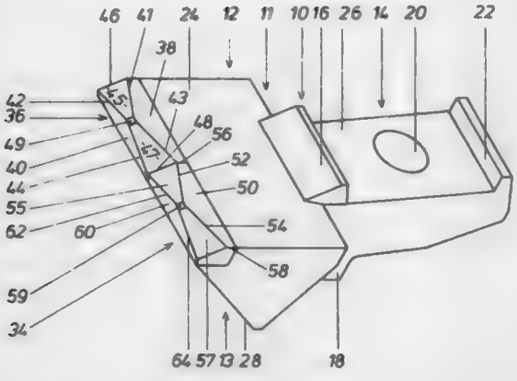
Werner Doppstadt, Vossmayker Strasse 67, 42555 Velbert, Germany

Filed Mar. 31, 1994, Ser. No. 221,097

Claims priority, application Germany, Apr. 20, 1993, 93 05 835.7

Int. Cl.[6] B02C *13/28*

U.S. Cl. 241—197 **11 Claims**



1. A cutting member of a flail for use in a comminuting machine, comprising:

a cutting head having a substantially triangular cross-section defining a first side and a second side;

said first side and said second side converging with the formation of a rim region in which a cutting edge is defined;

a wearing body made of hard metal;

said wearing body being positioned in a cut-out in said rim region and defining said cutting edge;

said wearing body being composed of a plural number of wearing parts disposed in juxtaposed relationship along said rim region;

each one of said wearing parts defining a first face extending substantially in continuation of said first side of said cutting member, and a second face extending from said second side of said cutting member;

said first face of each one of said wearing parts being delimited by opposite lateral edges and a first further edge interconnecting said opposite lateral edges;

said second face of each one of said wearing parts being delimited by opposite lateral edges and a second further edge interconnecting said opposite lateral edges; and

at least one of said first and second further edges defining said cutting edge.

5,464,165

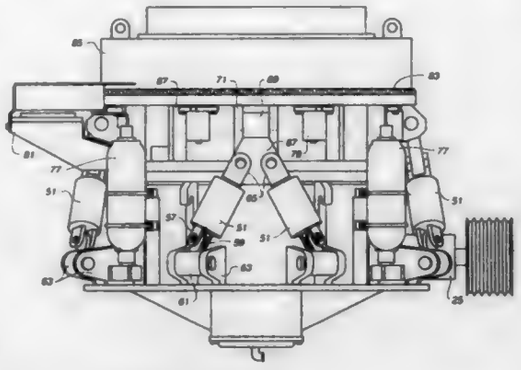
CONE CRUSHER HAVING INCLINED HOLD-DOWN CYLINDERS

Ronald B. DeDeimar, San Ramon, and Greg F. Lach, Dublin, both of Calif., assignors to W. S. Tyler, Incorporated, Gastonia, N.C.

Continuation-in-part of Ser. No. 192,484, Feb. 7, 1994, abandoned. This application Aug. 1, 1994, Ser. No. 284,099

Int. Cl.[6] B02C *2/04*

U.S. Cl. 241—215 **17 Claims**



1. A cone crusher comprising

a lower frame assembly having a crusher head eccentrically driven about a gyratory axis,

an upper bowl assembly, including an inverted concave crusher bowl, seated to said lower frame assembly such that the crusher bowl of said upper bowl assembly opposes the crusher head of said lower frame assembly to form an annular crushing chamber therebetween, and

a plurality of hold-down cylinders connected between said upper bowl assembly and said lower main frame assembly for releasably holding said upper bowl assembly in seating engagement against said lower frame assembly, each of said cylinders having a base end pivotally connected to said lower frame assembly and an top end pivotally connected to said upper bowl assembly,

said hold-down cylinders being inclined from their base ends inwardly toward said gyratory axis when the upper bowl assembly is in seating engagement with the lower frame assembly.

5,464,166

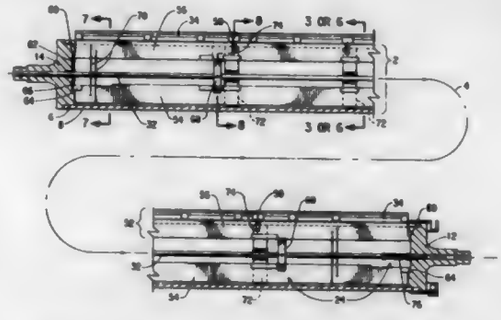
METHOD AND APPARATUS FOR AUTOMATIC ROLL TRANSFER

W. Mark Kirkpatrick, III, and Richard A. Hughbanks, both of Florence, S.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 26, 1994, Ser. No. 296,832

Int. Cl.[6] B26D *1/62*; **B65H** *19/20*

U.S. Cl. 242—527.3 **21 Claims**



1. An apparatus for cutting a film web comprising:

a cylindrical housing rotatably supported along a longitudinal axis thereof and connected to means for rotating the housing about said axis, said housing having an external surface with an aperture extending therethrough;

a knife movably supported by said housing so as to allow said knife to move along a direction orthogonal to said longitudinal axis through said aperture to a cutting position from a retracted position whereat said knife is held within said housing;

a counterweight movably supported by said housing so as to allow said counterweight to move in a direction substantially opposite to the movement of said knife from a retracted position adjacent said longitudinal axis to a cutting position away from said longitudinal axis; and

means for releasing said knife and said counterweight from said retracted positions while said housing is rotating, and for moving said knife and said counterweight to said cutting positions by centrifugal force.

5,464,167

METHOD AND APPARATUS FOR THE JAM-FREE STARTING OF TAPE TRANSPORTATION

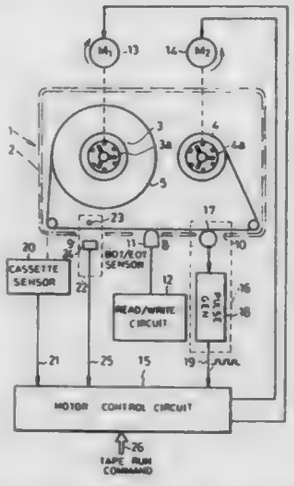
Shinobu Fujisawa, Akishima, and Kazuhiko Nakagawara, Mitaka, both of, Japan, assignors to TEAC Corporation, Tokyo, Japan

Filed Jul. 7, 1993, Ser. No. 87,610

Claims priority, application Japan, Jul. 7, 1992, 4-203011

Int. Cl.[6] B65H *59/38;* **G03B** *21/50;* **G11B** *15/46;23/42*

U.S. Cl. 242—334 **4 Claims**



1. In a tape transport for use with a tape assembly to be loaded in, and unloaded from, the tape transport, the tape assembly having a length of tape extending between a pair of reels within a housing, wherein the tape transport includes a pair of reel motors to be coupled one to each reel of the tape assembly for bidirectional tape transportation between the reels, a method of running the tape of the tape assembly, comprising the steps of:

(a) sensing the loading of the tape assembly in the tape transport;

(b) taking up a possible tape slack between the reels of the tape assembly by simultaneously energizing the pair of reel motors in opposite directions after the loading of the tape assembly is sensed, the step of simultaneously energizing the pair of reel motors including at least one slack takeup cycle comprising the steps of:

(i) simultaneously energizing the pair of reel motors with a first voltage for a third preassigned length of time, and

(ii) simultaneously energizing the pair of reel motors with a second voltage, lower than the first voltage, for a fourth preassigned length of time longer than the third preassigned length of time;

(c) energizing one of the reel motors for a first preassigned length of time for rotating one associated reel of the tape assembly in a direction for winding up the tape onto said one reel after the tape slack is taken up; and

(d) energizing the other of the reel motors for a second preassigned length of time for rotating the other reel of the tape assembly in a direction for winding up the tape onto said other reel after the one of the reel motors is energized for the first preassigned length of time,

thereby removing gaps, if any, that may have been thermally created between the reels of the tape assembly and rolls of the tape thereon.

5,464,168

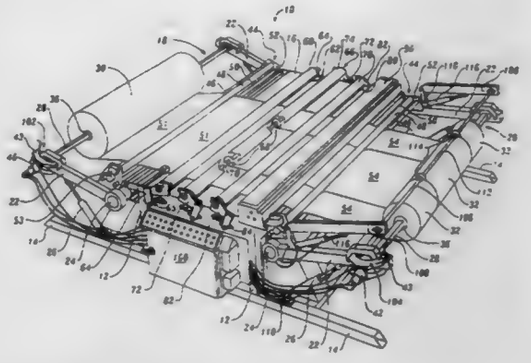
APPARATUS FOR SLITTING BELT

Ernest Baker, Renton, and Charles W. Harris, Normandy Park, both of Wash., assignors to Spencer Industries, Inc., Seattle, Wash.

Filed Feb. 10, 1994, Ser. No. 196,034

Int. Cl.[6] B65H *13/10*

U.S. Cl. 242—530.1 **12 Claims**



1. A belt-slitting machine, including:

a work table;

first and second roll support means at opposite ends of the cutter path, each roll support means including a pair of movable lift arms for supporting a respective first and second spindle, the first roll support means for carrying a supply roll of belt material, the second roll support means for carrying the slit rolls of belt material;

drive means for moving a belt along a cutting path across the work table, the drive means including means for rotating the second spindle to wind the slit belt on a roll and means for rotating the first spindle to unwind the belt from the supply roll, each of said rotating means adapted to engage its corresponding spindle;

cutter means arranged in the cutting path for slitting the belt as it is moved across the work table;

the first and second spindles being substantially rectangular in cross section and being supported adjacent to and inwardly of opposite ends thereof by the lift arms;

wherein the improvement comprises:

means for coupling the rotating means to an end of each of the spindles including a first part engaged by the rotating means and a second part engaged by the spindle, the first and second parts adapted to rotate about a drive axis and including means for slidably interconnecting one another for relative linear movement along a first axis transverse to the spindle, and the second part including means for providing sliding relative movement between the second part and the spindle along a second axis that is substantially perpendicular to the first axis;

means for providing angular displacement relative to the drive axis between the first and second parts of the coupling means;

automatic edge position control means having means for detecting the position of an edge of the belt relative to the cutter

means and responsive means for laterally shifting the first spindle to re-position the supply roll supported thereon for proper alignment with the cutter means; and

outfeed belt divider means for maintaining alignment of cut edges of the belt as it is wound into a roll supported by the second spindle;

wherein each rotating means includes a motor, and further comprising means for disengaging each motor from its corresponding spindle; and

wherein the disengaging means is mounted to the lift arms and is adapted to move the motors away from the spindles, whereby the spindles can be removed from and mounted onto the lift arms.

5,464,169

WINDING DEVICE FOR SHEETS OF PAPER OR CARDBOARD

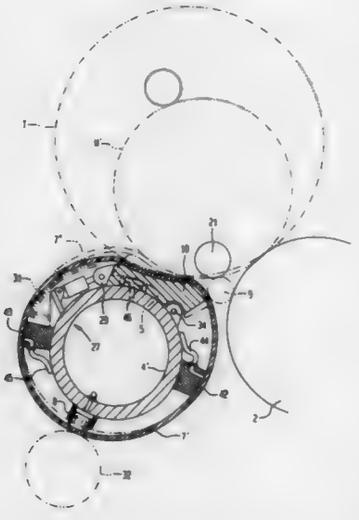
Klaus Henseler, Heidenheim, and Rudolf Beisswanger, Steinheim, both of, Germany, assignors to J. M. Voith GmbH, Germany

Filed Mar. 19, 1993, Ser. No. 34,552

Claims priority, application Germany, Mar. 19, 1992, 42 08 790.2

Int. Cl.[6] B65H *18/20*

U.S. Cl. 242—542 **8 Claims**



1. A winding device for winding a sheet of paper or cardboard, the winding device comprising:

at least two support elements that extend over the length of the sheet, one of the at least two support elements being a carrier roll, the other of the at least two support elements including a rigid carrier for guiding the sheet;

a sheath arranged around the carrier;

a carrying shoe connected to the carrier and located within an inner boundary of the sheath; and

a concave surface provided on a portion of the carrying shoe and having a radius of curvature that essentially corresponds to a maximum winding radius of the sheet, whereby the carrying shoe is adapted to be continually positioned at the periphery of the winding radius.

5,464,170

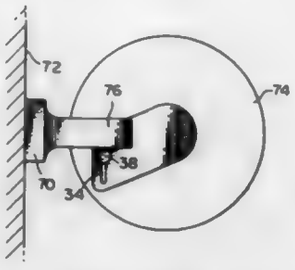
TOILET TISSUE ROLL ADAPTOR

Joseph Mitchell, Deptford, N.J., and John R. Frassanito, Houston, Tex., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Feb. 16, 1994, Ser. No. 197,412

Int. Cl.[6] B65H *16/06*

U.S. Cl. 242—598 **6 Claims**



1. An adaptor for supporting rolls of toilet tissue of greater than conventional diameter, the adaptor being integratable with an existing toilet roll holder having a journal bearing on each side thereof for receiving the ends of a toilet roll holder mandrel, said adaptor comprising:

(a) spindle means for rotatably supporting a roll of toilet tissue of greater than conventional diameter, the roll of toilet tissue having a hollow core therethrough, said spindle means extending through the hollow core;

(b) a side member attached to each end of said spindle means;

(c) means for biasing said side members away from each other;

(d) a journal extending from each of said side members for insertion into the journal bearings of the existing toilet roll holder;

(e) a slot in at least one of said side members;

(f) a slide pin mechanism residing in said slot and including a thole extending therefrom, said slide pin mechanism being moveable to any position along said slot by a user, said thole abutting against a portion of the existing toilet roll holder to limit the amount of downward pivotal movement of said side members and said spindle means, said thole having a bore partially therethrough.

5,464,171

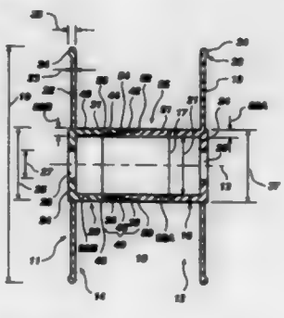
MATING SPOOL ASSEMBLY FOR RELIEVING STRESS CONCENTRATIONS

C. Robert Ripplinger, 66 E. 1st North (P.O. Box 51), Millville, Utah 84326

Filed Nov. 3, 1993, Ser. No. 147,138

Int. Cl.[6] B65H *75/18*

U.S. Cl. 242—609.1 **7 Claims**



1. A spool comprising:

a first portion having homogeneously molded a first flange and a first tubular segment extending therefrom;

a second portion having homogeneously molded a second flange and a second tubular segment extending therefrom;

said first and second portions configured for mutual engagement opposite said flanges to form a joint region spaced from the first and second flanges and for receiving an elongate material for retention between said flanges, said engagement being effected by insertion of said first tubular segment into said second tubular segment to form a continuous tubular portion having a uniform outside diameter; and

means for relieving stress concentrations in the tubular portion within the joint region.

5,464,172

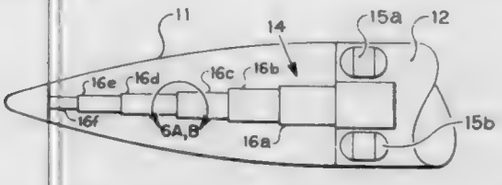
DEPLOYABLE MASS AND SENSOR FOR IMPROVED MISSILE CONTROL

Duane L. Jensen, Byron, and Rolla W. Allen, Santa Clara, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 249,847, May 26, 1994, and a continuation-in-part of Ser. No. 250,042, May 27, 1994. This application Jul. 13, 1994, Ser. No. 274,648

Int. Cl.[6] F42B *10/02*

U.S. Cl. 244—3.1 **4 Claims**



1. An inflatable aerodynamic nose fairing assembly for use with a length-constrained, canister launch missile having an elongated cylindrical shape with a uniformly wide circular cross section from rearward end to forward end, comprising:

a) a filament-reinforced flexible membrane attached to the forward end of the missile and inflatable from a first stowed position to a second deployed position wherein:

i) said membrane when in said stowed position is compactly folded to permit the missile to be lengthened and the usable payload capacity of the missile to be expanded to its full wide circular cylindrical shape;

ii) said membrane when in said deployed position is extended forwardly to form an aerodynamic shape for reduced drag and improved range and performance;

b) inflation means for rapidly inflating said membrane into said deployed position upon broach of the missile canister; and

c) mass deployment means for deploying balancing masses forwardly within said membrane as said membrane is inflated into said deployed position and for maintaining a required balanced relationship between center of pressure and center of gravity of the missile for stable flight control, and wherein said mass deployment means comprises a telescoping actuator assembly which includes:

i) plurality of telescoping segments each of which are selectively weighted to provide a progressive distribution of mass within said membrane;

ii) nose tip portion which forms a portion of a corresponding nose end of the membrane, said nose tip portion includes sensor means for detecting targets and for providing guidance information to the missile; and

iii) shock mitigation means for mitigating shock to the sensor means as the telescoping actuator assembly is forwardly deployed within said membrane.

5,464,173

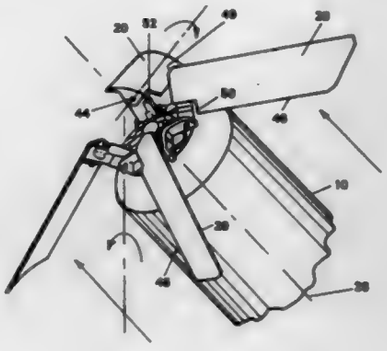
SUBASSEMBLY MEANS

Joseph F. Sharrow, and Samuel R. Hardy, both of King George, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 16, 1994, Ser. No. 357,959

Int. Cl.[6] F42B *10/14*

U.S. Cl. 244—3.3 **12 Claims**



1. Improved collapsible, spin-stabilizing fin subassembly SA means for attachment to missile means as provided on platform support means, storage/launch container means on the platform support means for surrounding and enclosing the missile means prior to launch therefrom, said subassembly SA means comprising:

base means, a series of four fork means and a series of four fin means,

the base means being concentrically affixed to the trailing end of the missile means and having a series of four bifurcated means formed therein, each bifurcated means of the series of four extending in a radial direction and also each bifurcated means being arranged about the circumference of the base means in equidistant relation to each other,

each of the fork means being pivotally and biasingly interconnected about an axis to its associated bifurcated means for pivoting from a collapsed position to an outward extended trailing and partially rotated inward position when all the fork means are in a collapsed position they are arranged in a common plane generally transverse of the axis of the missile means and also are arranged adjacent to the trailing end of the missile means as the missile means is stored in storage container means and when the fork means are in an extended outward trailing and partially rotated inward position each of the fork means are in a convergent relation to each other after the missile means has been launched from its storage container means, and

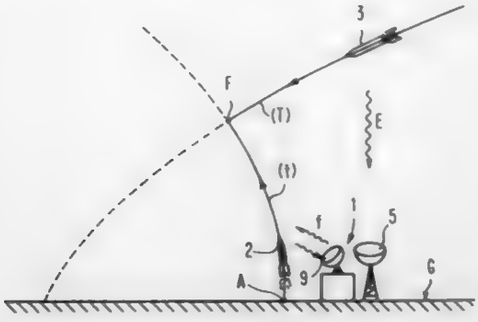
each of the fin means being pivotally and biasingly interconnected about another axis to its associated fork means such that each of the fin means extends from its collapsed position between the missile means and its container means to its outward extended swept-back trailing and partially rotated position when the missile means is launched from its container means so that the outward trailing and partially rotated inward position of the fork means together with the outward extended trailing swept-back and partially rotated position of the fin means causes roll stabilization of the missile means about its axis as the missile means follows its trajectory after launch.

5,464,174

AIR DEFENCE SYSTEM AND DEFENCE MISSILE FOR SUCH A SYSTEM

Pierre Laures, Chatenay Malabry, France, assignor to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Nov. 2, 1994, Ser. No. 332,793
Claims priority, application France, Nov. 25, 1993, 93 14082
Int. Cl.[6] F42B 15/10
U.S. Cl. 244—3.11 13 Claims



1. Air defence system capable of intercepting high-speed airborne missiles (3), including a fixed control installation (1) and defence missiles (2), said fixed installation (1) comprising:

detecting means (4, 5) for detecting said airborne missiles (3);

trajectory calculation means (6) for determining the approach trajectory (T) and the speed of such an airborne missile (3), detected by said detection means (4, 5);

calculation means (7) for determining an interception trajectory (t) which one of said defence missiles (2) has to follow in order to intercept said detected airborne missile (3);

launching means (10) for launching said defence missile (2);

guiding means (8) for guiding said defence missile (2); and

linking means (9, 11) for linking with said defence missile (2);

and each of said defence missiles (2) comprising a propulsion system (20), at least one warhead (21), an inertial unit (22), a homing head (26), steering devices (23), means for linking (22) with said fixed control installation (1) and a steering commands generator (25) deriving steering commands from information sent by said guiding means (8) provided in said fixed control installation and from information delivered by wherein:

the central axis (AD) of said homing head (26) is inclined laterally with respect to the axis (L—L) of said defence missile (2);

said defence missile (2) is roll-stabilized, so that said central axis (AD) of said homing head is directed to the side of said airborne missile (3); and

said calculating means (7) determining the interception trajectory (t) of said defence missile (2):

start by determining a point (F) common to said interception and approach trajectories (t, T), where said interception trajectory is at least substantially perpendicular to said approach trajectory: then

in the vertical plane (AHF) passing through said common point (F) and through the site (A) of said defense missile (2) on the ground, determine said interception trajectory (t) of said defense missile (2) from the following three parameters:

the vertical distance (Z) separating said common point (F) from its horizontal projection (H);

the horizontal distance (X) separating said site of the defence missile (2) on the ground (A) from said horizontal projection (H) of said common point (F); and

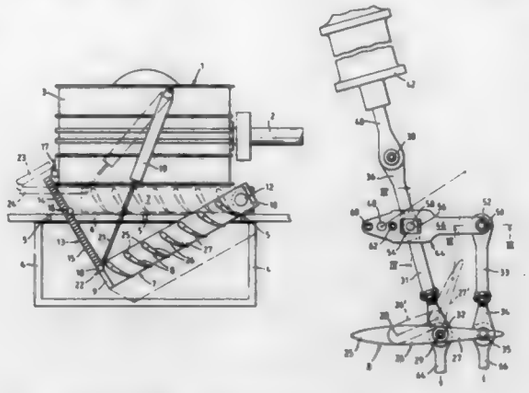
the angle (α) which the intersection (tg) of said vertical plane (AHF) with the plane (π) normal to said approach trajectory (T) of said airborne missile (3), at said common point (F), makes with the horizontal.

5,464,175

VARIABLE CAMBER VANE

Malcolm Short, Bristol, England, assignor to Rolls-Royce PLC, London, England

Filed Mar. 1, 1994, Ser. No. 203,941
Claims priority, application United Kingdom, Mar. 13, 1993, 9305210
Int. Cl.[6] B64C 15/02
U.S. Cl. 244—12.5 9 Claims



1. A variable camber vane comprising

a plurality of chordwise extending members including

a leading edge member,

at least one intermediate chord-wise member hinged to said leading edge member,

a trailing edge member hinged to said intermediate chord-wise member, and

an operating linkage including

a lever having a first end and a second end opposite the first end, the lever being pivotally mounted at the first end for arcuate movement, and formed with a slot intermediate the first and second ends,

first connecting -rod means connecting the intermediate chord-wise member to said lever at a point intermediate its first and second ends, and carrying a slide member which is slidably engaged with the slot formed in the lever to provide a pivoted connection therewith,

second connecting rod means connecting the second end of the lever to the trailing edge member, and

an actuator coupled to the lever to produce arcuate movement thereof,

whereby movement of the lever by the actuator in one direction will vary the camber of the vane in one sense, and movement of the lever in the opposite direction will vary the camber of the vane in the opposite sense.

5,464,176

SHUNTING DEVICE

Michael J. Kruse, 912 St. Mary's Blvd., Jefferson City, Mo. 65109

Filed Jul. 20, 1994, Ser. No. 278,003
Int. Cl.[6] B61L 13/00
U.S. Cl. 246—126 15 Claims

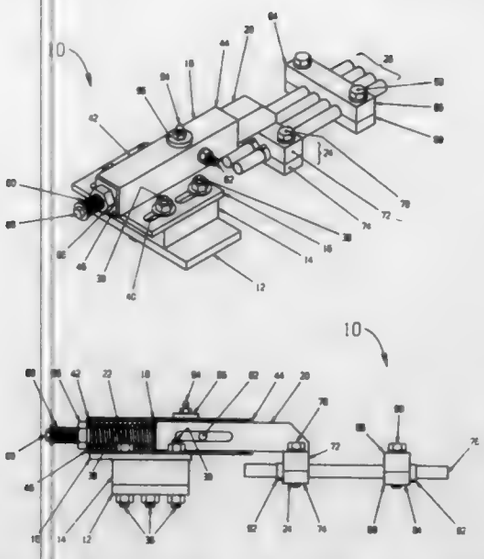
15. A shunting device comprising:

a backing plate for attachment of the device to a vehicle;

an insulator block attached to said backing plate;

a mounting plate with a plurality of slotted openings secured to said insulator block by a plurality of bolts extending through said slotted openings to provide height adjustment, said mounting plate being electrically insulated from said backing plate by said insulator block;

a shock tube comprising a tubular member having a first end and a second end with an end plate closing off said first end, a side surface near said first end of said tubular member attached to said mounting plate;



a brush support comprising a rectangular section and a threaded rod section, said rectangular section having four side surfaces, a first end and a second end, said threaded rod section extending from said first end, and a slotted opening cut through said rectangular section from a first side surface to a third side surface, said brush support insertable and slidable within said shock tube with said threaded rod section extending through a bore in said end plate of said shock tube;

a safety bolt extending through a first bore on a side surface of said shock tube through said slotted opening in said brush support and through another bore on an opposite side of said shock tube, and a nut screwed onto said safety bolt to hold said bolt in position, said brush support slidably along said safety bolt the length of said slotted opening;

a bias means within said shock tube to provide an outward bias on said brush support;

a tension adjustment nut screwed onto said threaded rod section which extends through said bore in said end plate on said shock tube, said tension adjustment nut tightening against said end plate to provide adjustment to said outward bias on said brush support;

an electrical connection bolt screwed into a threaded bore contained on an end of said threaded rod section of said brush support;

a first clamping device comprising a clamping base attached to a fourth surface near said second end of said brush support and a clamping plate attachable to said clamping base, said clamping base and said clamping plate having a plurality of brush receiving recesses therebetween;

a brush comprising a plurality of wire cables clamped within said brush receiving recesses on said first clamping device;

a second clamping device comprising a clamping base and a clamping plate, said clamping plate attachable to said clamping base, said second clamping device attached to said wire cables at a position outward from said first clamping device to maintain alignment of ends of said wire cables;

a plurality of second clamping means wrapped around each of said wire cables for maintaining position and integrity of said wire cables by controlling fraying of said wire cable; and

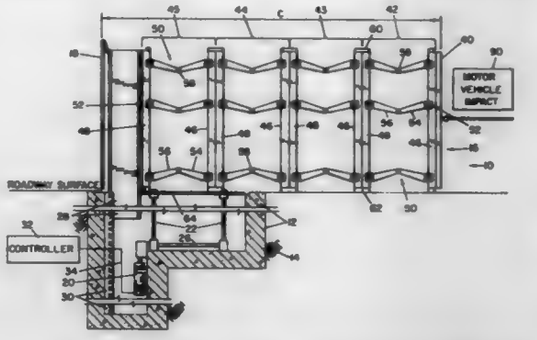
a lubrication means consisting of a grease fitting and a fitting base attached to a side surface of said shock tube, said grease fitting attached to said fitting base, said lubrication means to provide a means to lubricate said brush support slidable within said shock tube.

5,464,177

ENERGY ABSORBING IMPACT BARRIER

James H. Kramer, Fairlawn, Ohio; Daniel S. Lynch, and Charles W. Coker, both of Virginia Beach, Va., assignors to The B.F. Goodrich Company, Akron, Ohio

Filed Dec. 29, 1993, Ser. No. 174,907
Int. Cl.[6] E01F *13/04*; B60G *11/22*
U.S. Cl. 246—127 **39 Claims**



1. An apparatus for decelerating a moving vehicle comprising:

energy absorption means for absorbing kinetic energy of the moving vehicle, said energy absorption means comprising a collapsible assembly which is collapsed for storage in said vault means and is expanded upon deployment and having at least one elastomeric torsion spring for energy absorption;

vault means for receiving said energy absorption means when it is not being used; and,

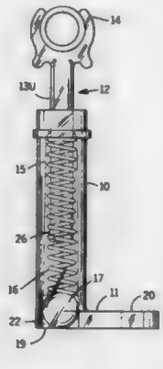
deployment means for deploying said energy absorption means in the path of the vehicle.

5,464,178

NEON TUBE SUPPORT

Harold M. Grinwald, West Bend, and Glen R. Blok, Milwaukee, both of Wis., assignors to Everbrite, Inc., Greenfield, Wis.

Filed Mar. 22, 1994, Ser. No. 215,513
Int. Cl.[6] F16L *3/00*
U.S. Cl. 248—50 **7 Claims**



1. A neon tube support including:

a tubular body having nominally top and bottom ends and an axial cylindrical bore through the body providing a first opening of predetermined diameter at the top end and a second opening at the bottom end,

a helical spring having convolutions defining an axial opening and having opposite ends is disposed axially in the bore,

a stem element comprised of a shaft extending through the opening at the top of the tubular body and into said axial opening of said spring in the bore of the body,

a tube engaging element formed on a portion (if the shaft extending out of the body and a bulbous element formed on

the opposite end of the shaft disposed within said convolutions of said axial opening of the spring in the tubular body,

said bulbous element having a size to provide for the element to pass through said opening at the top of the body and through part of the axial length of the spring for the bulbous element to engage with the spring approximately midway between said opposite ends of the spring,

said bore having a first portion extending axially inwardly of the tubular body a predetermined distance from said second opening at said bottom end of the body and a plug installed in said first portion of the bore for retaining said spring in the tubular body.

5,464,179

TWO-PIECE HOLDING ASSEMBLY MADE OF PLASTIC

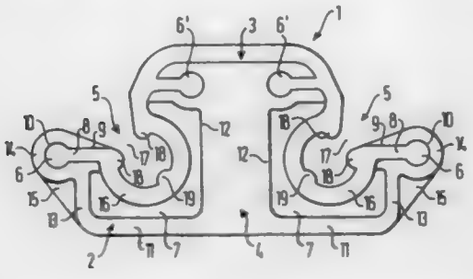
Hans-Werner Ruckwardt, Eisenberg, Germany, assignor to TRW United Carr GmbH & Co., KG, Enkenbach-Alsenborn, Germany

Continuation of Ser. No. 784,454, Oct. 25, 1991, abandoned. This application Jun. 16, 1993, Ser. No. 79,078

Claims priority, application Germany, Jan. 30, 1990, 40 34 545.9

Int. Cl.[6] F16L *3/22*

U.S. Cl. 248—68.1 **6 Claims**



1. A holding assembly for mounting and supporting tube-shaped parts from a subjacent support comprising:

a first outer dish-like component formed of a relatively hard rigid material and including a holding portion for connection to said subjacent support;

a second dish-like component formed of a soft resilient plastic material and supported in said first component by spaced anchorage points, said second component defining laterally open storage zones between said anchorage points, said storage zones adapted to receive and hold tube-shaped parts therein with the second component formed to provide an insertion aperture for each storage zone allowing tube-shaped parts to be placed into the respective storage zone, each insertion aperture being narrower than the respective storage zone and defined by opposed tab-like portions;

an open free space between said first and second components in the area about said storage zones, the holding portion being located between the two storage zones and the second dish-like component joined to the first component with four anchorage points of which two anchorage points are located above the holding portion and two anchorage points are located at a distance laterally spaced from the holding portion such that each storage zone is independently supported by a spaced pair of anchorage points with said open free space extending between the spaced pair of anchorage points.

5,464,180

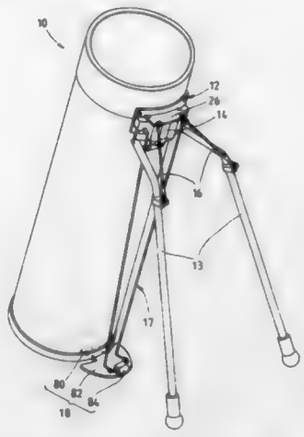
SUPPORT SET OF GOLF CLUB BAG

Der-Bin Cheng, No. 70, Su Chie Road, Wan Lee Township, Mau Li Hsien, Taiwan, Prov. of China

Filed Oct. 26, 1994, Ser. No. 330,067

Int. Cl.[6] A63B *55/00*

U.S. Cl. 248—96 **5 Claims**



1. A golf club bag support set comprising:

a fixation member fastened to a golf club bag;

two rod members spaced at a predetermined interval and pivoted to said fixation member;

a sliding member mounted slidably on said fixation member and provided with a stopping portion extending downwards to rest against an outer edge of a top end of each of said two rod members;

a first elastic members disposed between said fixation member and said sliding member such that said two first elastic members can force said sliding member to slide downwards;

two second elastic members disposed between said sliding member and said rod members such that said rod members can be forced by said two second elastic members to swing outwards; and

an urging member fastened at one end thereof with said sliding member such that said sliding member is actuated to move upwards by said urging member which is exerted on by an external force, thereby bringing about the disengagement of said stopping portion with said two rod members which are then pulled by said two second elastic members to swing outwards so as to enable said golf club bag to sit obliquely on the ground.

5,464,181

BROOM HOLDER

Harry Leventhal, 17031 Boca Club Blvd., Boca Raton, Fla. 33487

Filed Oct. 11, 1994, Ser. No. 320,325

Int. Cl.[6] A46B *17/02*

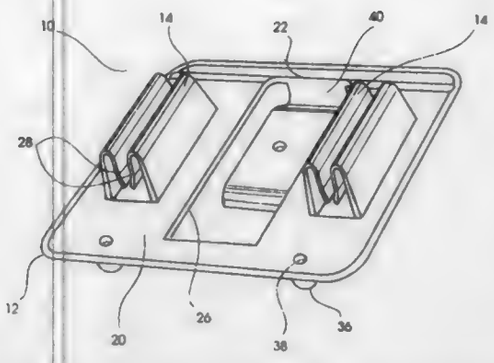
U.S. Cl. 248—113 **9 Claims**

1. A broom holder for use with a conventional shopping cart, wherein the shopping cart is constructed of interconnecting bars, comprising:

a base plate;

a retaining member extending from a first side of said base plate in a laterally spaced relation thereto configured to enable removable mounting of said broom holder to a shopping cart, said retainer having a well portion to seatably receive a first bar of the cart;

a support member laterally spaced from said retainer which extends from said first side of said base plate such that when said first bar is positioned within said well portion said support is positioned between a pair of adjacent bars to prevent said holder from undue pivoting; and



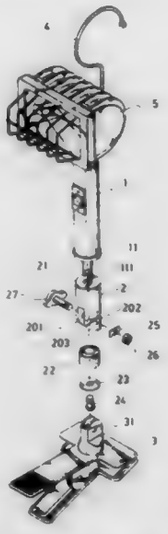
a handle holding member extending from a second side of said base plate.

5,464,182

CLAMP-TYPE LAMP HOLDER

Albert Stekelenburg, Taipei, Taiwan, Prov. of China, assignor to All Line Inc., Taipei, Taiwan, Prov. of China

Filed Nov. 30, 1993, Ser. No. 160,066
Int. Cl.[6] F21V *21/28*
U.S. Cl. 248—276.1 **2 Claims**



1. A clamp-type lamp holder comprising:

a lamp body, a holder clamp, a hanger, and a lamp head, said lamp stem comprising a stem body and a connection body;

a projecting post provided on a bottom end of said stem body which is inserted into a first hole provided in a top portion of said connection body;

a tubular plastic bushing for sleeving about said projection post within said connection body;

a threaded screw which is upwardly threaded into a thread hole in said projecting post of said stem body so as to affix said stem body with said connection body to form said lamp body via a first washer which is disposed below said tubular plastic bushing;

a longitudinal groove formed near a lower end of said connection body;

a transversal notch formed near said longitudinal groove for receiving a second washer to be fitted therein, said transversal notch including a horizontal through hole;

a hand screw to be inserted through said horizontal through hole in said transversal notch and another through hole provided in a projecting seat of said holder clamp so as to allow said stem body, said connection body, and said lamp clamp to be affixed together while allowing said lamp body to swing in a desired angle.

5,464,183

STROLLER ACCESSORY BAR AND DRINK HOLDER

Thomas E. McConnell, Santa Ynez, and Peter C. Arnold, Santa Maria, both of Calif., assignors to Prince Lionhears, Inc., Santa Maria, Calif.

Continuation-in-part of Ser. No. 274, Oct. 9, 1992. This application Jun. 10, 1993, Ser. No. 75,689
Int. Cl.[6] A47K *1/08*
U.S. Cl. 248—311.2 **43 Claims**

1. An accessory for holding a drink, said accessory comprising:

(a) a drink holder comprising:

(i) an annular support member;

(ii) a plurality of fingers extending downwardly from said annular support member, said fingers configured to grip a drink disposed therebetween;

(iii) said fingers being biased inwardly and movable outwardly such that various sizes of drinks are accommodated thereby;

(b) a pivot mount formed to said drink holder for maintaining a drink held by said drink holder in a generally level orientation; and

(c) means formed to said pivot mount for removably attaching said drink holder to a structural member.

5,464,184

SAW BLADE MOUNTING APPARATUS

Giovanni A. Folci, Briosco, Italy, assignor to Black & Decker Inc., Newark, Del.

Filed Aug. 25, 1993, Ser. No. 111,748
Claims priority, application United Kingdom, Aug. 28, 1992, 9218343
Int. Cl.[6] B27G *5/02*
U.S. Cl. 248—425 **21 Claims**

1. An apparatus for mounting a saw blade on a base to enable the saw blade to be positioned accurately in either of two distinct positions relative to the base, comprising:

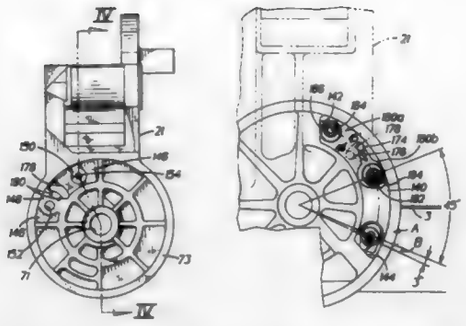
a pivot member for supporting the saw blade;

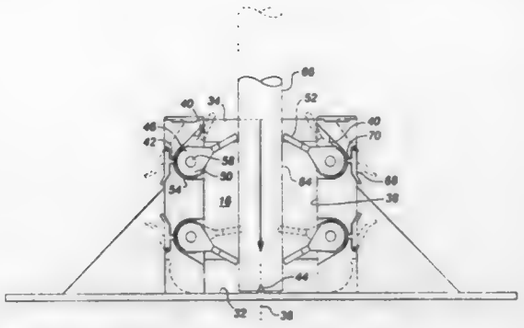
a base including a fixed member;

the pivot member being pivotally mounted on the fixed member about a pivot axis of the apparatus;

a segmented channel formed in the fixed member and having end walls defining abutments which extend around the pivot axis of the apparatus;

at least one asymmetric stop attached to the pivot member for abutting the abutments after rotation of the pivot member





about the pivot axis relative to the fixed member to define the two distinct positions of the saw blade;

and wherein said at least one asymmetric stop further includes a shaft having a first end and a second end, the first end having an eccentric head.

5,464,185

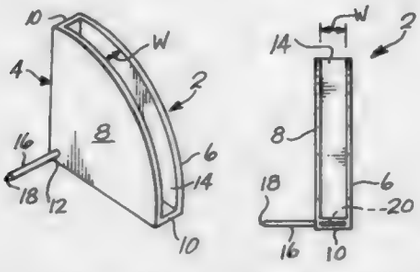
CORNER BRACKET FOR MOUNTING PLANAR OBJECT

Marcus A. Hensley, 4102 36th. SW., Seattle, Wash. 98126

Continuation-in-part of Ser. No. 975,626, Nov. 12, 1992, abandoned. This application Mar. 10, 1994, Ser. No. 209,008

Int. Cl.[6] A47F *7/14*

U.S. Cl. 248—475.1 **20 Claims**



1. A corner bracket for mounting planar objects on a vertical surface, comprising:

a molded plastic corner piece having a front-wall, a rear wall, and two sidewalls extending between and perpendicular to said front and rear walls and meeting each other at a juncture forming an angle corresponding to an angular corner portion of the object to be mounted; said corner piece defining a slot for receiving said angular corner portion; and

a pin including a straight shank having a pointed end and an opposite end integrally joined to said rear wall adjacent to said juncture, said shank extending along an axis substantially perpendicularly from said rear wall to permit said corner piece to be secured to a vertical surface by exerting pressure on said front wall to pierce said surface with said pointed end;

said axis extending along said shank of said pin and perpendicularly through said rear wall, along and through said sidewalls at said juncture from said rear wall to said front wall, and perpendicularly through said front wall, to provide a strong and stable connection between said pin and said corner piece.

5,464,186

VERTICAL MEMBER SUPPORT STAND

Jacques Robert, 102, 312 - 3rd Avenue NE., Calgary, Alberta, Canada

Filed May 2, 1994, Ser. No. 235,888

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—524 **7 Claims**

1. A vertical member support stand, comprising:

a body with a generally tubular vertical member receiving cavity, the cavity having a bottom, a top opening, and circumferential sidewalls;

b. at least three upper pressure members substantially equally spaced around the circumferential sidewalls of the vertical member receiving cavity adjacent the top opening, the pressure members being pivotally mounted whereby they are pivoted into engagement with a vertical member positioned in the vertical member receiving cavity;

c. at least three lower pressure members substantially equally spaced around the circumferential sidewalls of the vertical member receiving cavity adjacent the bottom, the pressure members being pivotally mounted whereby they are pivoted into engagement with a vertical member positioned in the vertical member receiving cavity, each of the pressure members has a mounting end and a vertical member engaging end, the mounting end having a gear segment along its peripheral edge and a transverse mounting aperture; and

d. means for locking the pressure members in a selected pivotal position, including a gear engaging locking member movable between an engaged and a disengaged position, in the engaged position the locking member engages the gear segment at the mounting end of the pressure member, in the disengaged position the locking member is spaced from the pressure member.

5,464,187

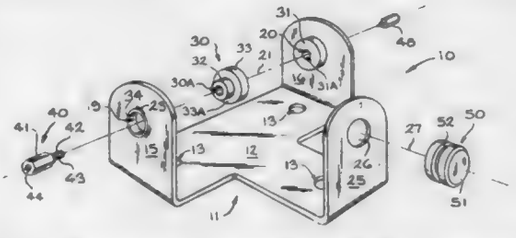
MOUNTING BRACKET FOR AN ANTI-LOCK BRAKE/ TRACTION CONTROL SYSTEM CONTROL VALVE

Herbert L. Linkner, Jr., Dexter, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Oct. 6, 1993, Ser. No. 132,607

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—635 **27 Claims**



1. A mounting bracket for attaching an anti-lock brake/traction control system control valve to a vehicle, the mounting bracket comprising:

a base portion adapted to be attached to a vehicle;

first and second supporting members extending from said base portion, said second supporting member spaced apart from said first supporting member, said first and second members adapted to carry more weight than a first predetermined percentage of the weight of the control valve, said first and second supporting members including means adapted for securing the control valve therebetween, said means for securing including an aperture formed through said first supporting

member, said means for supporting further including an isolation means formed from a resilient material disposed within said aperture, said isolation means having an axial bore formed therethrough, said bore receiving a mounting pin, said mounting pin including a portion extending from said bore and adapted to be attached to the control valve; and

a third supporting member extending from said base portion in the same direction as said first and second members and spaced apart therefrom, said third supporting member adapted to carry less than a second predetermined percentage of the control valve weight.

5,464,188

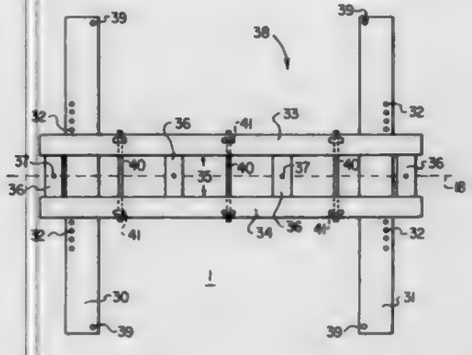
WELL PUMP BASE

W. F. Priebe, Midland; Ricky L. Foster, and Michael C. Pierce, both of Odessa, all of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 7, 1994, Ser. No. 206,365

Int. Cl.[6] F16M *1/00*

U.S. Cl. 248—678 **11 Claims**



1

1. A pump base that is readily moveable from site to site and readily adjustable to various types of pump units, each such pump unit having a long axis, the pump base comprising at least two elongated footing members spaced apart from another, each of said footing members having a plurality of spaced apart adjustment apertures extending along at least a central portion thereof, at least two elongated support members spaced apart from one another and extending transversely to said footing members, said support members extending across and resting upon but not connected to said footing members, said support members being restrained from lateral movement with respect to said footing members by a plurality of restraint members that coact with said support members and said adjustment apertures, a plurality of spaced apart hold down members along the length of said support members, said hold members being unconnected to said support members but restrained from movement in a direction away from said footing members by abutment of said hold down members against a portion of at least two of said support members, each said hold down member carrying a tie down member for securing said pump base to said pump unit, whereby said footing members can be spaced apart along the length of said support members depending on the length of said pump unit, said support members can be spaced apart along the length of said footing members depending on the width of said pump unit, and said hold down members can be spaced along the length of said support members so they oppose corresponding hold down means already carried by said pump unit.

5,464,189

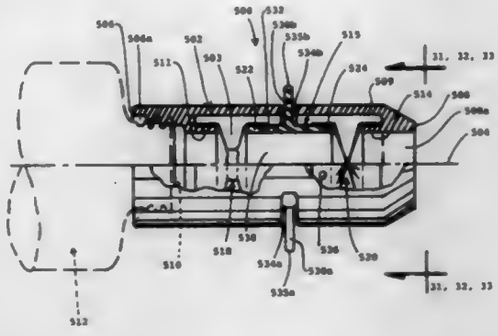
VARIABLE OPENING SEAL

Lehmann K. Li, Wellesley, Mass., assignor to Li Medical Technologies, Inc., Trumbull, Conn.

Continuation of Ser. No. 959,263, Oct. 9, 1992, abandoned. This application Apr. 21, 1994, Ser. No. 230,804

Int. Cl.[6] F16K *7/08*

U.S. Cl. 251—4 **6 Claims**



1. A variable opening seal, said seal comprising:

a housing, a rigid substantially tubular member, first and second resilient tubular elastomeric elements, and activation means for varying the configuration of said seal;

said housing having an external surface, a first longitudinal axis, an internal cavity centered on said longitudinal axis, a first end defining a first axial opening connecting said external surface to said internal cavity, a second end defining a second axial opening connecting said external surface to said internal cavity, said second axial opening being disposed in opposing relation to said first axial opening, and a radial opening connecting said internal cavity to said external surface between said first axial opening and said second axial opening;

said rigid substantially tubular member having a second longitudinal axis, a first end defining a third axial opening and a second end defining a fourth axial opening, with a first longitudinal passageway extending therebetween, said rigid substantially tubular member being co-axially located within said housing cavity between said first end of said housing and said second end of said housing such that (i) said third axial opening is disposed in opposing relation to said first axial opening and said fourth axial opening is disposed in opposing relation to said second axial opening, and (ii) said rigid substantially tubular member is restrained from axial movement within said cavity but is free to rotate about said co-incident first and second longitudinal axes;

said first resilient tubular elastomeric element having a third longitudinal axis, a first end defining a fifth axial opening and a second end defining a sixth axial opening, with a second longitudinal passageway extending therebetween;

said second resilient tubular elastomeric element having a fourth longitudinal axis, a first end defining a seventh axial opening and a second end defining an eighth axial opening, with a third longitudinal passageway extending therebetween;

said first elastomeric tubular element being affixed to said housing and to said rigid substantially tubular member so that said fifth axial opening communicates with said first axial opening and said sixth axial opening communicates with said third axial opening;

said second tubular elastomeric element being affixed to said housing and to said rigid substantially tubular member so that said seventh axial opening communicates with said fourth axial opening and said eighth axial opening communicates with said second axial opening;

said first and second resilient tubular elastomeric elements and said rigid substantially tubular member being positioned relative to one another such that when said seal is in a first position, said first and second resilient tubular elastomeric elements are twisted upon themselves in opposite directions

so as to form a pair of spaced barriers between said first and second axial openings in said housing; and

said activation means being attached to said rigid substantially tubular member and extending through said radial opening in said housing for rotating said rigid substantially tubular member within said housing cavity, said activation means being biased so as to urge said seal toward said first position and being rotatable relative to said housing so as to move said rigid substantially tubular member between (a) a second position wherein said second longitudinal passageway through said first resilient tubular elastomeric element is open and said second resilient tubular elastomeric element is further twisted and closed upon itself, and (b) a third position wherein said third longitudinal passageway through said second resilient tubular elastomeric element is open and said first resilient tubular elastomeric element is further twisted and closed upon itself.

5,464,190

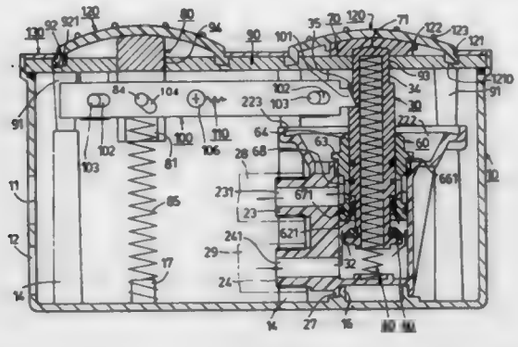
FOOT-OPERATED VALVE

Fang-Hsiung Chang, No. 11, Lane 105, Tung-An St., Feng-Yung City, Taichung Hsien, and Wen-Bin Wang, No. 312, Chung-San Rd., Taichung City, both of, Taiwan, Prov. of China

Filed Jul. 7, 1994, Ser. No. 271,518

Int. Cl.[6] F16K *31/62;35/02*

U.S. Cl. 251—74 **15 Claims**



1. A foot-operated valve, comprising: a housing having an open top, a closed bottom and a surrounding wall formed with a first set of water outlet and inlet holes, one of said water outlet and inlet holes being disposed at a level higher than the other one of said water outlet and inlet holes;

a support plate mounted on said open top of said housing and formed with a first hole;

a first valve set including: a hollow seat secured in said housing below said support plate, said seat having an upright tube portion with an open top and a closed bottom, said tube portion confining an interior and being formed with radially extending outlet and inlet pipe connectors aligned with said first set of water inlet and outlet holes and communicated with said interior of said tube portion; a tubular sleeve secured to and extending into said tube portion, said tubular sleeve confining an axial through-hole and being formed with a passage means to communicate said through-hole and said outlet pipe connector; a push rod extending sealingly and slidably through said tubular sleeve and into said tube portion of said hollow seat, said push rod having a top end which extends out of said open top of said housing via said first hole of said support plate and a bottom end which has a plug secured therearound, said push rod being formed with an annular peripheral groove immediately above said plug and a radial first retaining unit adjacent said top end; and a first compression spring means provided in said upright tube portion and interposed between said closed bottom of said tube portion and said push rod to bias said push rod upwardly so that said plug closes normally a distal bottom end of said tubular sleeve, application of pressure on said top end of said push rod against action of said first compression spring means moving said plug away from said distal bottom end of said tubular sleeve so as to permit water entering said inlet pipe connector to reach said outlet pipe connector via said interior of said tube portion, said annular peripheral groove of said push rod, and said through-hole and said passage means of said tubular sleeve;

a retaining plate unit disposed below said support plate, said retaining plate unit including an elongated first plate supported movably by said support plate and movable in a lateral direction towards and away from said push rod of said first valve set, said first plate having a rear end and a front end formed with a second retaining unit;

an extension spring means for biasing said second retaining unit of said first plate toward said push rod of said first valve set to enable said second retaining unit to engage said first retaining unit on said push rod when pressure is applied on said top end of said push rod; and

a switch assembly including a first switch means operable selectively so as to pull said first plate against action of said extension spring means in order to disengage said second retaining unit from said first retaining unit, thereby permitting said first compression spring means to bias said push rod so that said plug closes said distal bottom end of said tubular sleeve.

5,464,191

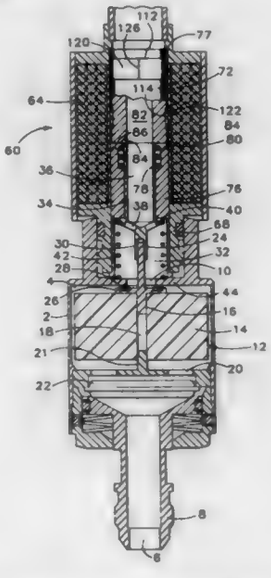
SOLENOID ACTUATED VALVE

David Shenk, Rockford, Ill., assignor to Envirovac, Inc., Rockford, Ill.

Filed Jan. 6, 1994, Ser. No. 178,523

Int. Cl.[6] F16K *31/02*

U.S. Cl. 251—129.21 **6 Claims**



6. A solenoid actuated valve for controlling flow of fluid through a passage defined by a tube member that is part of a housing having an inlet opening and an outlet opening, and wherein the passage defined by the tube member extends from the inlet opening to the outlet opening, said valve comprising:

a tubular armature fitted slidably in the passage for displacement therein under solenoid control, the armature comprising a generally cylindrical magnetic member that is made of passivated stainless steel and is a clearance fit in the passage, and a glide means carried by at least one of said members for guiding movement of the magnetic member relative to the tube member and preventing direct sliding contact therebetween,

an actuator tube fitted within the passage between the armature and the inlet opening and slidable in the passage between a first position, in which the valve is open and fluid that enters the housing by way of the inlet opening flows through the actuator tube and the tubular armature toward the outlet opening, and a second position, in which the valve is closed, and wherein when the solenoid is energized, the armature engages the actuator tube and urges the actuator tube toward its first position,

a first spring urging the actuator tube toward the second position,

a magnetic armature stop fitted inside the tube member between the armature and the inlet opening for limiting movement of the armature toward the inlet opening and forming part of a magnetic circuit containing the armature,

a second spring urging the armature away from the armature stop, and

a means forming a gap of high magnetic reluctance in the magnetic circuit when the armature engages the armature stop, whereby when the solenoid is de-energized the second spring is able to force the armature away from the armature stop.

5,464,192

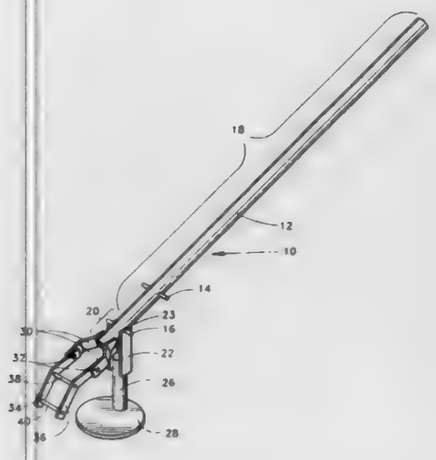
HIGH SPEED MANUAL POST PULLER

Dale A. Burnham, Rte. 5, Box 834-D, Waco, Tex. 76705

Filed Aug. 26, 1994, Ser. No. 296,459

Int. Cl.[6] E21B *19/00*

U.S. Cl. 254—30 **4 Claims**



1. A device for pulling posts imbedded in a natural medium comprising:

a lever arm;

pivot means located proximate one end of the lever arm;

yoke means for removably receiving the pivot means;

a foot plate, mounted on the yoke at a point off-center of the foot plate, for supporting the yoke;

a pair of arm means fixed to the lever arm in juxtaposition with the end of the lever arm, proximate the pivot means;

a pair of angulated links, one pivotally attached to each of said pair of arms;

a pair of gripper means fixed between said links in a spaced relation,

whereby one said gripper means acts on one surface of a post and the other gripper means acts on the opposed side of the post and force applied to the lever arm causes said gripper means to apply force to the pose and move it in the direction of the applied force; and

a second pair of pivot means located on the lever arm, spaced apart from the first pair of pivot means.

5,464,193

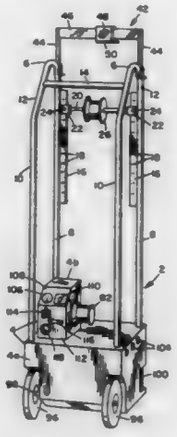
MULTI-FUNCTIONAL WIRE AND CABLE PULLING APPARATUS

Leonard A. Wrate, 386 Encino Dr., Vista, Calif. 92083

Filed Jan. 19, 1994, Ser. No. 183,301

Int. Cl.[6] E21C *29/16*

U.S. Cl. 254—134.3 FT **14 Claims**



1. A movable wire pulling device which comprises:

a housing;

a frame comprising a pair of spaced apart vertical members mounted on said housing;

a sheave mounted between said vertical members and journalled for rotational movement;

an extension clamp cooperating with said frame and moveable outwardly from the end of said vertical members distal to said housing, said extension clamp having means for engaging and securing to a stationary object;

a capstan mounted on said housing and having first electrical motor means therewith to rotate said capstan;

second electrical motor means for moving said extension clamp;

at least two sources of electrical power, each capable of activating said first and second motors;

control and first selection means to select between said two sources of electrical power and to control the operation of said first and second motors; and

means for moving said device when desired;

whereby, said device can be secured into position adjacent a wire feed location by said extension clamp and a wire feed pulling line attached to wires to be pulled routed over said sheave to said capstan, said wire can be pulled securely and evenly by said capstan upon activation of said first motor.

5,464,194

CUTTING TORCH TIP WITH GUIDE

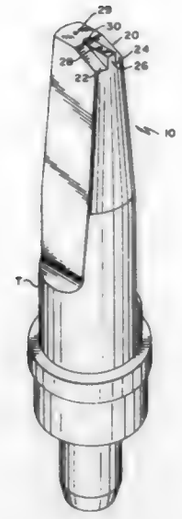
Marvin Ricardo, 6825 W. Flagler St., Apt. #203, Miami, Fla. 33144-2823

Filed Feb. 14, 1994, Ser. No. 195,107

Int. Cl.[6] B23K *7/10*

U.S. Cl. 266—66 **10 Claims**

1. In a cutting torch tip having an end that comes in contact with the material being cut producing a kerf and said tip includes at least two outlets at the end of respective channels for conducting fluids that longitudinally extend internally along said tip, and said outlets include a fuel outlet and an oxygen outlet centrally disposed at that end and the improvement comprising two symmetrical slanted surfaces integrally formed at said end so that an axially protruding guiding member is integrally formed thereon and said protruding guiding member enters inside and is guided by said kerf and, and said protruding guiding member having said first fuel outlet.



5,464,195

NOZZLE FOR ELECTRIC DISPERSION REACTOR

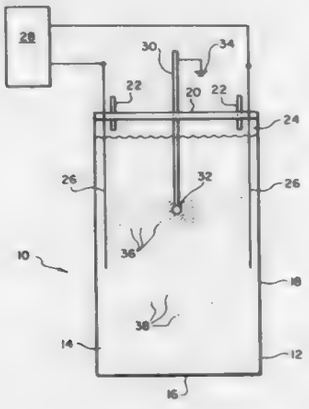
Warren G. Sisson; Osman A. Basaran, both of Oak Ridge, and Michael T. Harris, Knoxville, all of Tenn., assignors to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Continuation-in-part of Ser. No. 832,091, Feb. 6, 1992, Pat. No. 5,207,973, which is a division of Ser. No. 441,793, Nov. 27, 1989, Pat. No. 5,122,360. This application Mar. 23, 1993, Ser. No. 35,772

The portion of the term of this patent subsequent to May 4, 2010, has been disclaimed.

Int. Cl.[6] C22B *3/00*

U.S. Cl. 266—170 16 Claims



1. A nozzle for an electric dispersion reactor comprising, comprising:

first means for delivering a continuous phase fluid at a flow rate to a collection area;

second means, in fluid communication with the first means, for delivering a disperse phase fluid at a flow rate into the continuous phase fluid; and

voltage means for generating an electric field at a location within the first means where the disperse phase enters the continuous phase, the electric field having an intensity sufficient to disperse the disperse phase fluid into the continuous phase fluid.

5,464,196

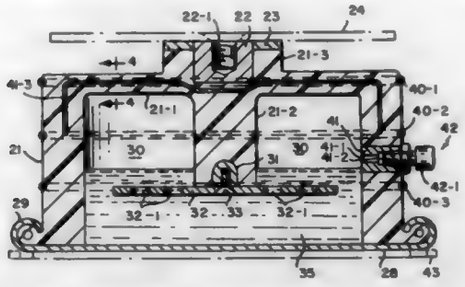
VIBRATION ISOLATOR

John C. Dankowski, San Dimas, Calif., assignor to Fabreeka International, Inc., Stoughton, Mass.

Filed Apr. 20, 1994, Ser. No. 230,391

Int. Cl.[6] F16M *1/00*

U.S. Cl. 267—140.13 8 Claims



1. A shock and vibration isolator comprising

a unibody elastomeric assembly having a load bearing annular sidewall with a top annular diaphragm and a bottom metal plate defining a chamber, the diaphragm including an integral shock absorber portion extending from the center of said diaphragm into said chamber and said shock absorber portion having a free end, a damping plate having a plurality of openings and attached to said shock absorber portion free end,

said sidewall having an integral annular lip,

said metal plate having a portion rolled over said annular lip to seal the assembly to said metal plate,

said diaphragm having a flexible fabric embedded therein,

said fabric extending into and embedded in said sidewall,

an incompressible fluid partially filling said chamber and a compressible fluid in said chamber not separated from each other and in contact with each other at all times,

said damping plate being submerged in said incompressible fluid during normal operation and

said diaphragm having an integral raised elastomeric interface portion smaller in area than the area of said diaphragm and a plate supported by said raised elastomeric interface portion.

5,464,197

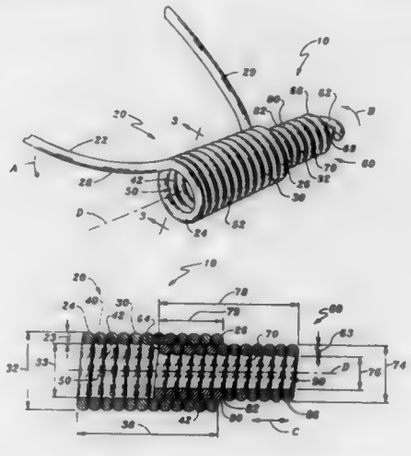
TORSION SPRING HAVING AN ADJUSTABLE SPRING RATE

George Ecclesfield, 2088 Park Marina Dr., Redding, Calif. 96001

Filed Aug. 15, 1994, Ser. No. 290,387

Int. Cl.[6] F16F *1/06*

U.S. Cl. 267—155 19 Claims



1. A torsion spring having an adjustable resistance to torsional loads, comprising in combination:

a main spring having a plurality of courses of wire surrounding a central axis of said main spring, said courses forming a coil of wire extending from a first end to a second end, said main spring including means to resist a torsional load applied thereto,

a means removably attachable to said main spring to variably adjust a resistance of said main spring to the torsional load,

whereby a manner in which said variably adjustable resistance means attaches to said main spring controls a spring rating of said main spring, and wherein said variably adjustable resistance means includes means to inhibit modification of a diameter of said coil.

5,464,198

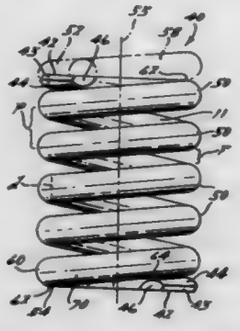
TORSIONAL VIBRATION DAMPER HAVING HELICAL TORSION SPRINGS

John P. Yanko, Shelby Township, and David A. Hall, Clawson, both of Mich., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Continuation of Ser. No. 728,181, Jul. 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 131,861, Dec. 11, 1987, abandoned. This application Jan. 27, 1995, Ser. No. 379,000

Int. Cl.[6] F16F *1/06*

U.S. Cl. 267—167 **18 Claims**



1. An open coil spring for use in a torsional vibration damper for absorbing torsional vibrations from a vehicle engine or transmission input during operation of a motor vehicle, the open coil spring comprising:

a plurality of active coils having a pitch greater than the thickness of wire forming the active coils; and

opposing end coil sections, each end coil section having a pitch substantially equal to the diameter of the wire and having an arcuate flattened end surface terminating in a distal tip such that the distal tip of the end coil section is axially spaced from an active coil adjacent thereto to form a gap therebetween, the arcuate flattened end surface formed substantially perpendicular to a longitudinal axis of the open coil spring and spanning between 190 and 270 degrees and the opposing distal tips axially positioned such that when superimposed they do not complete a full coil turn.

5,464,199

GATHERING STAPLER FOR PRINTED PRODUCTS COMPRISING FOLDED PRINTED SHEETS

Hans-Ulrich Stauber, Grut, Switzerland, assignor to Ferag AG, Switzerland

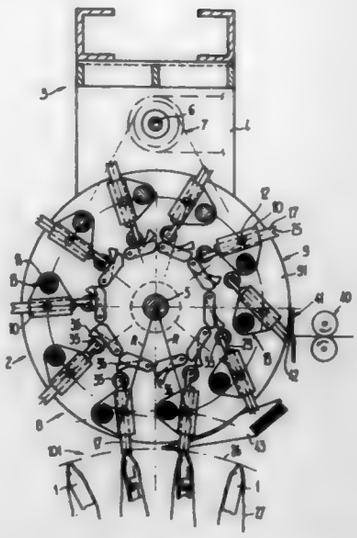
Filed Dec. 23, 1993, Ser. No. 172,649

Claims priority, application Switzerland, Jan. 11, 1993, 00061/93

Int. Cl.[6] B42B *4/02*; B27F *7/17*

U.S. Cl. 270—53 **14 Claims**

1. A gathering stapler for stapling printed products comprising folded printed sheets along a product fold, the stapler comprising:



a plurality of elongated saddle-shaped rests extending parallel to each other and circulating transversely to their longitudinal extent while the printed sheets are gathered and stapled on them;

a rotary stapling apparatus having a plurality of stapling heads and being driven for rotation about an axis of rotation in such a way that each of said stapling heads successively meets up with a rest in a stapling region as the rests circulate and the stapling apparatus rotates;

each of said stapling heads including a staple guide for holding a staple and adapted to seat on a printed product arranged on one of said rests when the latter meets with said stapling head in the stapling region and further including a push rod movably guided within said staple guide;

said staple guides of said plurality of stapling heads being mounted on a carrier rotating about said axis of rotation for an orientation in a substantially radial direction and for a swiveling movement about an axis extending substantially parallel to said axis of rotation through an arc in such a way that the staple guides swivel out of a leading position into a trailing position, in relation to their substantially radial direction, when they meet the rests in the area of the stapling region, said staple guides being further mounted on said carrier for a displacement inwardly against a restoring force; and

the trajectory of the ends of said staple guides and the path of circulation of said rests intersect and each staple guide being displaced inwardly by the associated rest when said staple guide meets up with said associated rest in the stapling region.

5,464,200

SHEET STORING DEVICE WITH LOCKING BINS

Yasushi Nakazato, Tokyo; Makoto Tanaka, Kamakura; Kohki Sakamoto, Yokohama; Hisayo Kondo, Tokyo; Rikio Kasahara, Yokohama; Hiroyuki Shibuki, Yokohama, and Mitsugu Sugiyama, Yokohama, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 15, 1994, Ser. No. 228,376

Claims priority, application Japan, Apr. 15, 1993, 5-112249; Apr. 16, 1993, 5-090141

Int. Cl.[6] B42C *11/12*; B05G *1/00*; B65H *39/10*

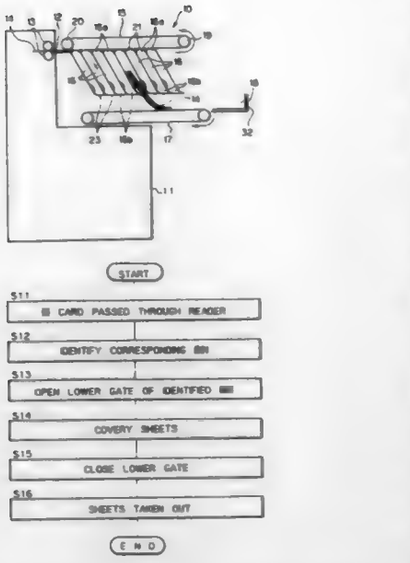
U.S. Cl. 270—53 **12 Claims**

1. A sheet storing device comprising:

a plurality of inclined bins each for storing incoming sheets while sorting said sheets;

sheet introducing means disposed between said bins for selectively introducing the sheets into said plurality of bins; and

sheet discharging means disposed between said bins for selectively discharging the sheets from said plurality of bins;



said sheet introducing means and said sheet discharging means being operable asynchronously to each other; and

selective opening means for controlling the selective discharge from a given bin responsive to the receipt of an ID number assigned to a bin being entered into said sheet storing device.

5,464,201

METHOD OF AND APPARATUS FOR PROCESSING SETS OF COPIES CORRESPONDING TO A SET OF ORIGINALS

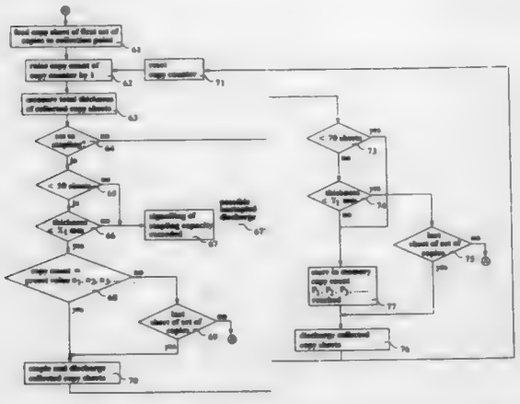
Pieter B. J. Deen, Eindhoven; Nicolaas G. H. Linssen, Grubbenvorst, and Godefridus J. Mennen, Budel, all of, Netherlands, assignors to OCE-Nederland, B.V., Venlo, Netherlands

Filed Jul. 29, 1994, Ser. No. 282,561

Claims priority, application Netherlands, Aug. 2, 1993, 9301345

Int. Cl.[6] B42B *5/00*; G03G *21/00*; B21J *15/28*

U.S. Cl. 270—53 **7 Claims**



1. A method of processing sets of copies each corresponding to a set of originals, which comprises stacking a number of copy sheets associated with a set of copies successively at a collection point, processing said stack of copies in a first manner in accordance with a first criterion when said stack has a thickness less than a first predetermined thickness measurement (X_v, Y_v) and processing said stack of copies in a second manner when said stack has a thickness equal to or greater than said first predetermined thickness measurement (X_v, Y_v), characterized in that the successively formed stacks of copies, each stack corresponding to the same set of originals, are processed in a first manner in accordance with a second supplementary criterion when said stack of copies first formed in succession is as thick as or thinner than a second predetermined thickness measurement (X_1, Y_1), which second thickness measurement (X_1, Y_1) is less than the first thickness measurement (X_v, Y_v).

4. Apparatus including a processing means for processing sets of copies from a set of originals successively delivered by a copying machine, comprising a measuring means for measuring the thickness of delivered sets of copies, and control means which sets said processing means to a first procedure in response to a thickness measurement provided by said measuring means which is less than a predetermined first thickness measurement (X_v, Y_v) and which sets said processing means to a second procedure in response to a thickness measurement provided by said measuring means which is equal to or greater than said predetermined first thickness measurement, characterized in that said control means activates said measuring means after the delivery of each copy sheet and in that said control means sets said processing means to said first procedure for the successively formed stacks of copies each corresponding to the same set of originals when the stack of copies first formed in succession is as thick as or thinner than a second predetermined thickness measurement (X_1, Y_1), which second thickness measurement (X_1, Y_1) is less than the first thickness measurement (X_v, Y_v).

5,464,202

APPARATUS AND METHOD FOR FEEDING SHEETS FROM A STACK

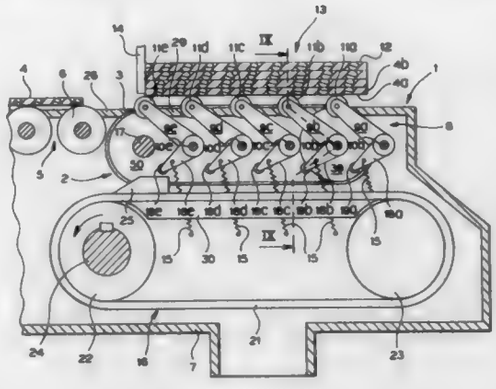
Bernard Capdeboscq, St. Just-Chaleyssin, France, assignor to SA Martin, Villeurbanne, France

Filed Aug. 3, 1994, Ser. No. 285,099

Claims priority, application France, Aug. 5, 1993, 93 09840

Int. Cl.[6] B65H *5/08*

U.S. Cl. 271—11 **16 Claims**



1. A method of feeding a sheet from a stack comprising the steps of:

supporting said stack on a plurality of rows of rollers;

lowering said rollers so that a lowermost sheet of said stack contacts a first carrier;

driving said first carrier to accelerate said lowermost sheet in a direction perpendicular to said rows so that said sheet achieves a linear velocity;

driving a second carrier at a constant speed to transport said sheet away from said first carrier at said linear velocity; and

sequentially raising each row of rollers when a trailing edge of said sheet has moved beyond each said row.

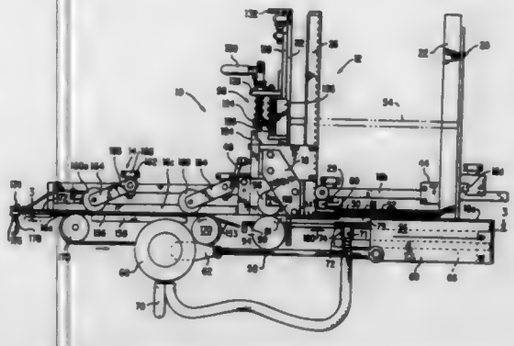
5,464,203
SHEET FEEDER

David Bowser, and Gerald D. Warden, both of Bethlehem, Pa., assignors to Bell & Howell Phillipsburg Company, Skokie, Ill.

Division of Ser. No. 923,257, Jul. 31, 1992, Pat. No. 5,265,868, which is a division of Ser. No. 518,440, May 3, 1990, Pat. No. 5,145,161. This application Oct. 25, 1993, Ser. No. 140,960

Int. Cl.[6] B65H 5/08

U.S. Cl. 271—12 13 Claims



1. A sheet feeding system for feeding a forward-most sheet from a stack of flat sheets, said system comprising:

a hopper for holding said stack;

a reciprocating shuttle plate having a sheet-engaging surface on which said stack rests for gripping said forward-most sheet and pulling said forward-most sheet out of said sheet stack, said reciprocating shuttle plate having motion in a separating direction substantially parallel to the plane of said flat sheets, said plate defining a vacuum opening therethrough to said sheet-engaging surface;

a suction means for synchronously applying suction to said sheet-engaging surface through said vacuum opening for gripping said forward-most sheet to said sheet-engaging surface so that the shuttle plate carries said forward-most sheet with it when it moves in said separating direction and delivers said forward-most sheet to an additional conveyor;

an adjusting means for allowing the position of said vacuum opening relative to said sheet stack in said hopper to be changed in a direction perpendicular to said separating direction approximately parallel to a plane of said forward-most sheet.

5,464,204
PAPER FEED CONTROLLING DEVICE

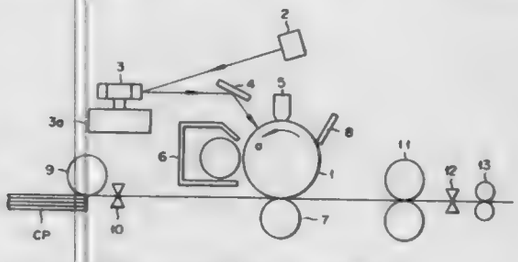
Katsunori Suzuki, Langenhagen, Germany, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Jan. 27, 1994, Ser. No. 187,305

Claims priority, application Japan, Jan. 27, 1993, 5-011877

Int. Cl.[6] B65H 7/08

U.S. Cl. 271—110 9 Claims



1. A paper feed controlling device comprising:

feeding means for feeding a recording paper;

paper size detection means for detecting the size of said recording paper fed from said feeding means while said recording paper is in transit on a paper path; and

control means for controlling said feeding means prior to completion of said detection of the size of said recording paper by said paper size detection means so as to prohibit said feeding means from initiating the feeding of a subsequent recording paper until after the size of said recording paper fed from said paper feeding means has been detected.

5,464,205
FACSIMILE

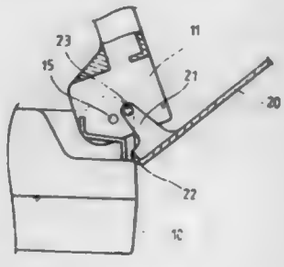
Doo-jin Bang, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 1, 1993, Ser. No. 84,158

Claims priority, application Rep. of Korea, Nov. 11, 1992, 92-21112

Int. Cl.[6] B65H 31/04

U.S. Cl. 271—213 26 Claims



1. A container for an image forming device, comprising:

a housing a cover hinged at the sides of said housing so as to be capable of being opened and closed; and

a tray having a distal end, a proximal end and a guiding piece, for supporting sheets of paper bearing messages received by the image forming device, said tray being hinged at said proximal end onto said cover so that a rotational path of said cover differs from that of said tray and said guiding piece being formed on said proximal end of said tray for contacting said housing to maintain an orientation of said distal end above said proximal end of said tray while said cover is opened and closed.

5,464,206
DEVICE FOR CONTROLLING LATERAL SHEET CONTACT AND FOR INTERRUPTING SHEET FEED UPON OCCURRENCE OF FAULTY SHEET CONTACT

Anton Rodi, Leimen; Dieter Uhrig, Eberbach, and Karleheinz Krestyn, Leimen 3, all of, Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Continuation of Ser. No. 133,207, Dec. 16, 1987, abandoned, which is a continuation of Ser. No. 830,066, Feb. 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 498,241, May 26, 1983, abandoned. This application Mar. 27, 1989, Ser. No. 331,007

Claims priority, application Germany, May 26, 1982, 32 19 653.9

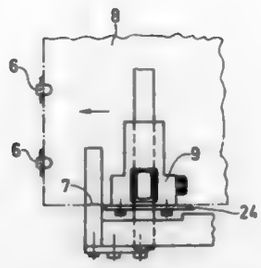
Int. Cl.[6] B65H 7/02

U.S. Cl. 271—227 3 Claims

1. Feeder for a sheet-fed printing machine having a feeder table having at least one pulling unit coupled to the machine drive train for imparting to each newly arrived: sheet a defined direction of pull, and a sensing arrangement for sensing the position of the side edges of the sheet, the feeder which comprises:

at least one side stop attached to the side of the feeder table, facing the sheet;

at least one sensor having a response range, facing a respective side edge of the sheet, the sensor which produces two distinctly different signals that indicate the presence or absence,



respectively, of the sheet in the desired position of the sheet before and alter imparting the pull;

two-step interrogation means synchronously driven by the machine drive train for performing a first and a second interrogation of said sensor respectively before and after the pull;

electronic logic control apparatus operatively responsive to the signals from said sensor that are produced at said first and second interrogation of said sensor before and after the pull for determining if the sheet after the pull is positioned within the response range of the sensor;

alarm indicator having means for responding to the logic control apparatus for producing an alarm indication, indicating in case it is determined by the logic control apparatus, that the respective sheet edge is not present within the response range of the sensor and its position after the second interrogation;

means responsive to said logic control apparatus for interrupting sheet feed in case of said alarm indication; and

side selection means for determining the direction of pull at the time of the first interrogation; and wherein the control logic is responsive to the sequence of said signals produced before and after the pull to determine the actual direction of pull imparted to the sheet and to produce an alarm indication for indicating the absence of desired direction of pull.

5,464,207

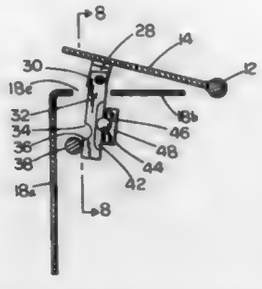
BREAK-AWAY BASKETBALL GOAL

Robert A. Boitano, St. Louis, Mo., assignor to Gared Sports, Inc., St. Louis, Mo.

Filed Nov. 8, 1993, Ser. No. 148,358

Int. Cl.[6] A63B *63/08*

U.S. Cl. 273—1.5 R **13 Claims**



1. A basketball goal for use with a basketball backboard having a front surface, the basketball goal comprising

a rigid annular rim which is normally disposed horizontally during play,

a rigid metal plate fixed to the rigid annular rim and extending rearwardly therefrom in coplanar relationship thereto,

a mounting bracket having at least a back wall by which it is connected to the front surface of the backboard and a top wall intersecting the back wall and extending forwardly therefrom, the mounting bracket being pivotally connected to the rigid metal plate,

means for pivotally connecting the rigid metal plate to the mounting bracket to thereby permit the rigid metal plate and rigid annular rim fixed thereto to pivot in relation to the backboard,

releasable latching means connected to the rigid metal plate and connected to the mounting bracket, and which permits forward tilting of the rigid annular rim from the normally horizontal play position thereof only when force of at least a certain preselected amount is placed downwardly upon a front portion of the rigid annular rim,

means for connecting the releasable latching means to the rigid metal plate,

means for connecting the releasable latching means to the mounting bracket, and

means for causing immediate return of the rigid annular rim to the normal horizontal play position after the latching means has been released and the force causing such release has been removed.

5,464,208

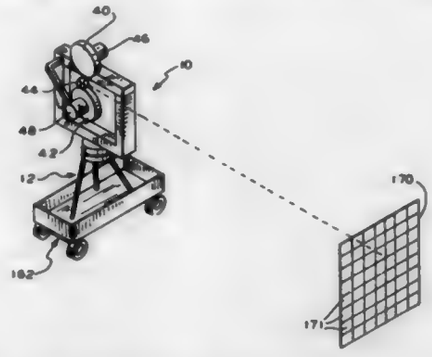
PROGRAMMABLE BASEBALL PITCHING APPARATUS

Richard A. Pierce, Davenport, Iowa, assignor to WNAN, Inc., Sussex, N.J.

Filed Oct. 3, 1994, Ser. No. 316,906

Int. Cl.[6] F41B *15/00*; **A63B** *69/00*

U.S. Cl. 273—26 D **14 Claims**



1. In a ball pitching machine comprising:

(a) a ball feed means for feeding balls to a feeding point where they will be acted upon by rotating drive wheels;

(b) two drive wheels having identical planes and axes of rotation, said wheels being disposed about said feeding point so as to simultaneously act on a fed ball imparting to the fed ball spin and a forward velocity and trajectory, outwardly away from the feeding point in a direction initially perpendicular to the axes of rotation and in the plane of the wheels;

(c) rotating means for rotating each drive wheel independent of other drive wheels at a plurality of preselected rotational speeds thereby effecting a type of pitched ball having a predetermined trajectory; the improvement which comprises

a journaled horizontal cross-member to allow movement of the wheel from a vertical alignment to a horizontal alignment;

a separate motor associated with each drive wheel;

said motors rigidly affixed to said horizontal cross-member;

tilting means for altering the trajectory, upwardly or downwardly, in a vertical plane, coplaner with the plane of the drive wheel;

speed measuring means for determining the speed of the moving ball;

a computer means for inputting at least one set of variables that determine the trajectory based on the speed of the ball and at least one set of variables for effecting the spin applied to the ball by the drive wheel, thereby effecting the type of pitched ball delivered by the machine; said computer means interpreting said input and converting the input to commands by which a servo system controls the direction of the flight path and spin placed on the ball by the drive wheels, thereby causing the ball to be delivered to a specific location in a target area in a predetermined manner; and

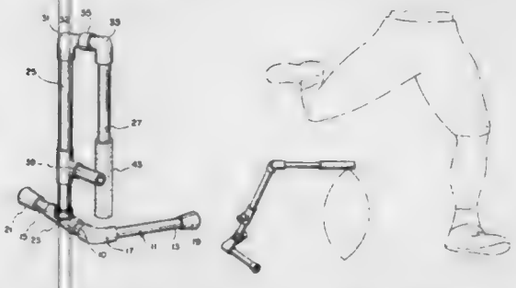
a monitor for selecting the area of impact of the ball, wherein a target screen is provided to predetermine the pitches to be utilize, wherein the target screen is a series of uniformly placed contact switches that will indicate contact when a ball impinges on the switch and wherein recording means are provided for recording the settings of speeds of the motors causing the ball to impact on the particular switch.

5,464,209

PORTABLE FOOTBALL HOLDER

Rick Sang, 1764 Plano Rd., Bowling Green, Ky. 42104

Filed Sep. 16, 1993, Ser. No. 121,646
Int. Cl.[6] A63B *67/00*
U.S. Cl. 273—55 B **9 Claims**



1. A portable football holder for supporting a football having a football tip in an upright position, comprising:

a) base means for supporting said holder on a ground surface;

b) a proximal leg fixedly attached to said base means and extending therefrom;

c) a distal leg pivotably attached to said proximal leg by coupling means for permitting fixation of an angular relationship between said proximal leg and distal leg at any one of a multiplicity of diverse angles, said distal leg having a distal end with a football tip engaging-portion thereon;

d) said legs being pivotable to and fixable at an orientation whereby with said football tip placed beneath said distal end of said distal leg with said football in said upright position and said distal leg extending generally horizontally with respect to said ground surface, force of gravity pivots said holder, as a unit, in a direction forcing said distal end of said distal leg toward said ground surface with a downward force with said base means pivoted with respect to said ground surface, said downward force causing said distal end to engage said football tip and hold said football in said upright position.

5,464,210

LONG TENNIS RACQUET

Stephen J. Davis, Washington Crossing, and André Terzaghi, Havertown, both of Pa., assignors to Prince Sports Group, Inc., Bordentown, N.J.

Filed Aug. 24, 1994, Ser. No. 295,300
Int. Cl.[6] A63B *49/02;49/08*
U.S. Cl. 273—73 C **10 Claims**

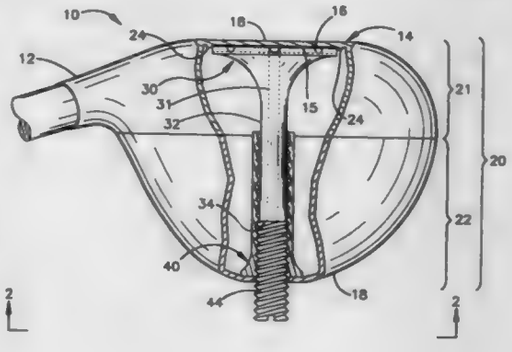
1. A tennis racquet comprising a frame having a head portion forming a strung surface containing strings, a handle, and at least one shaft connecting said head portion and said handle, wherein said head portion defines an egg shape strung surface having a length of at least 14 inches and a strung surface area greater than 95 square inches; wherein said frame is a tubular, widebody profile member formed of a composite material having a minimum weight per unit length; and wherein said racquet has an overall length which is greater than 28 inches but less than such length as would result in a strung weight exceeding 300 grams or a mass moment of inertia about the handle exceeding 56 g-m^2.

5,464,211

GOLF CLUB HEAD

Clyde Atkins, Sr., 361 Rowe St., Conneaut, Ohio 44030

Filed Sep. 19, 1994, Ser. No. 308,571
Int. Cl.[6] A63B *53/04*
U.S. Cl. 273—78 **20 Claims**



1. A hollow golf club head of the type known as a "metal wood" for playing the game of golf, said club head having

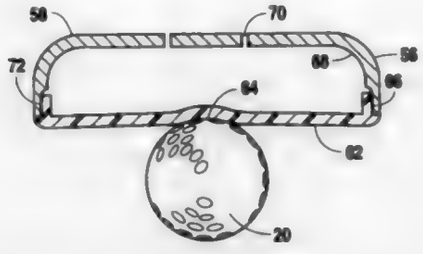
a backwardly slanting striking face having an inner surface and an outer surface, and

an opposing rear portion having an inner surface and an outer surface,

a substantially flat-faced body having a stem portion having an axis protruding centrally from a rear thereof and substantially normal to the plane of said flat face, said face being rigidly bonded to said inner surface of said striking face,

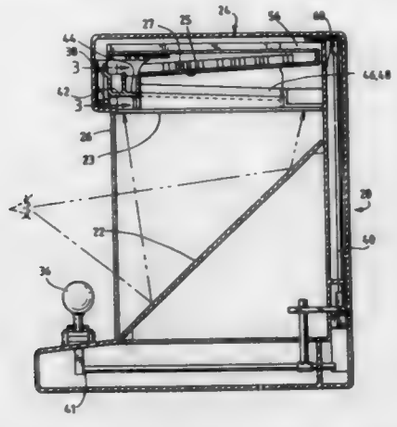
wherein said stem engages in an axially slidable manner the hollow of an open-ended, internally-threaded tube having a screw therein, said tube engaging said inner surface of said rear portion and said screw threadably engaging said tube and applying an axial compressive force to said stem and an equal and opposite axial compressive force to said tube, the magnitude of said compressive force may be adjusted by turning said screw.

5,464,212
GOLF CLUB PUTTER
Thomas A. Cook, 9343 Blazing Star Tr., Garden Ridge, Tex. 78266-2311
Filed Dec. 27, 1994, Ser. No. 364,552
Int. Cl.[6] A63B 53/04
U.S. Cl. 273—78 6 Claims



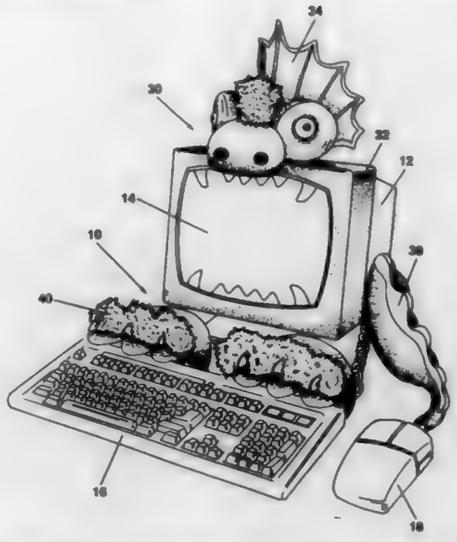
1. A putter comprising:
a shaft having a handle at one end and a putter head assembly at an opposite end;
said putter head assembly including a metal putter body having outer surface walls and a cavity forming an interior of said putter body; said putter body having a forward face portion; said cavity having an open end forming a periphery of said putter body adjacent said outer surface walls at said forward face portion of said putter body;
an adhesive material;
a striking face insert comprising a resilient single layer elastomeric material; said striking face insert being joined to said putter body along said periphery of said putter body with said adhesive material; said face insert and said periphery of said putter body including cooperating structure forming a shear joint connection, whereby the force of an impact between the striking face insert and a golf ball is dispersed through said outer surface walls;
said putter body further including an air egress, whereby air contained within said cavity may escape during compression of said striking face insert during an impact between said insert and a golf ball.

5,464,213
ARCADE TYPE OF PINBALL TOY
James S. W. Lee, Long Island, N.Y., and Chiu K. Kwan, Hunghom, Hong Kong, assignors to C.J. Associates, Ltd., Hunghom, Hong Kong
Filed Feb. 25, 1994, Ser. No. 201,547
Int. Cl.[6] A63F 7/22
U.S. Cl. 273—121 A 23 Claims



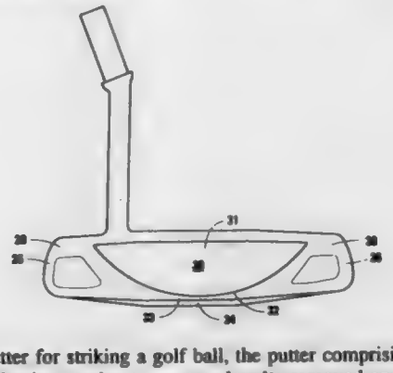
1. A toy simulation of an arcade game, said toy comprising a box open on at least one side, a mirror set in said box to reflect an image of the underside of a top of said box so that the image is .seen through said open side, the top of said box having a compartment with a transparent bottom panel whereby said mirror reflects an image of the contents of said box that is visible through said bottom panel, and controls on said box for manipulating at least one object in said compartment: so that said object appears to be moving in said image reflected by said mirror.

5,464,214
DEVICE FOR ENHANCING THE APPEAL OF A VIDEO TERMINAL
Tom Griffin, 537 N. Myers St., Burbank, Calif. 91506-1931
Filed May 6, 1994, Ser. No. 239,335
Int. Cl.[6] A47B 97/00
U.S. Cl. 273—148 B 13 Claims



1. A device for enhancing the appeal of a video terminal having a video display screen and at least one input device, comprising:
a stretchable (flexible) skirt structure mountable to the video display screen; and
a three-dimensional object supported by the stretchable (flexible) skirt structure.

5,464,215
PUTTER HEAD
Terry B. Koehler, 145 Deer Hollow, Boerne, Tex. 78006, assignor to Terry B. Koehler, Boerne, Tex.
Filed Nov. 12, 1993, Ser. No. 151,135
Int. Cl.[6] A63B 53/04
U.S. Cl. 273—167 R 19 Claims



1. A putter for striking a golf ball, the putter comprising:
a shaft having a grip at a near end and a removed end;

a putter head, the putter head having a face, a sole, a top surface and a back wall; and

walls defining a heel cavity and a toe cavity, said cavities open to the face of said putter head and filled with a low density material; said putter head further including walls defining an open cavity in said back wall wherein the majority of the volume defined by the walls of said cavities lies below a longitudinal axis extending horizontal to the face of said putter head and is located mid-line between the top surface and the sole, thereby raising the center of gravity of the putter head upwardly away from the sole and rearwardly away from the face of the putter head.

5,464,216

GOLF CLUB HEAD

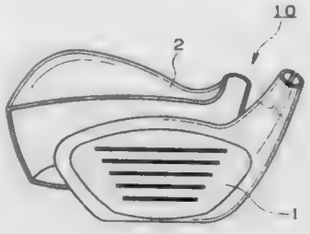
Toshiharu Hoshi, and Naoki Kamimura, both of Shizuoka, Japan, assignors to Yamaha Corporation, Japan

Filed May 3, 1994, Ser. No. 237,456

Claims priority, application Japan, May 6, 1993, 5-023315 U

Int. Cl.[6] A63B *53/04*

U.S. Cl. 273—167 R **8 Claims**



1. A golf club head comprising

a face shell component made of titanium alloy, and

a rear shell component made of pure titanium and united to said face shell component along their mating edges, the face shell having a higher tensile strength and a lower plastic deformability than the rear shell.

5,464,217

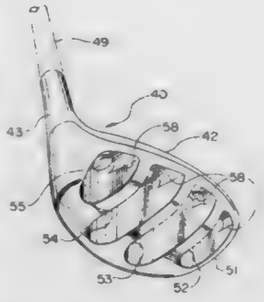
OPEN RAIL METAL WOOD GOLF CLUBHEAD

James L. Shenoha, Lockport, and Carl E. Scheie, Libertyville, both of Ill., assignors to Wilson Sporting Goods Co., Chicago, Ill.

Filed Dec. 21, 1993, Ser. No. 171,212

Int. Cl.[6] A63B *53/04*

U.S. Cl. 273—169 **17 Claims**



1. A golf clubhead comprising:

a front face having a toe portion, a heel portion, a bottom portion, and a top portion,

a crown joined to the top portion of the face and extending rearwardly therefrom,

a plurality of rails which are joined to the face and the crown and which extend rearwardly from the sole portion of the face and downwardly from the crown to provide a plurality of recesses behind the face and between the rails, the rails being constructed and arranged to permit weight of the clubhead to be positioned in the upper portion of the toe portion and the lower portion of the heel portion,

the clubhead including a rear portion and a bottom portion, the recesses extending to the rear portion and to the bottom portion to provide openings in the rear portion and the bottom portion between the rails.

5,464,218

GOLF PUTTER HEAD WITH UNDERCUT BACK CAVITY AND PERIPHERAL WEIGHTING

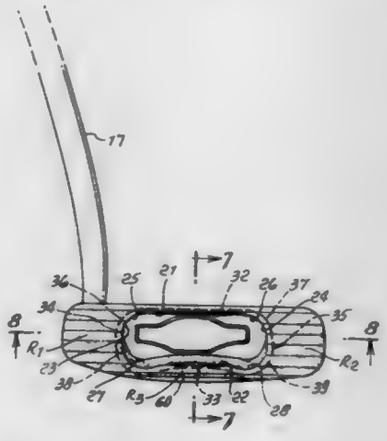
Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Filed Jul. 7, 1994, Ser. No. 267,885

The portion of the term of this patent subsequent to Feb. 1, 2011, has been disclaimed.

Int. Cl.[6] H63B *53/04*

U.S. Cl. 273—169 **27 Claims**



18. In a putter head, the combination comprising:

a) a longitudinally elongated putter body in the form of a bar having a forward face for striking a golf ball, and rear side, top and bottom walls, a toe and a heel,

b) a main recess sunk forwardly in said rear side, and between peripherally weighted toe and heel regions,

c) and an undercut recess extending away from an inner extent of said main recess and in substantially parallel relation to said forward face whereby a reduced thickness plate is formed between said recesses and said forward face, and

d) said bottom wall defining a bevel located centrally of the bar between the head and toe, said bevel diverging toward said rear side, and spaced rearwardly from said forward face.

5,464,219

TEE MARKER AND METHOD OF PROVIDING TEE TO GREEN CENTER DISTANCE

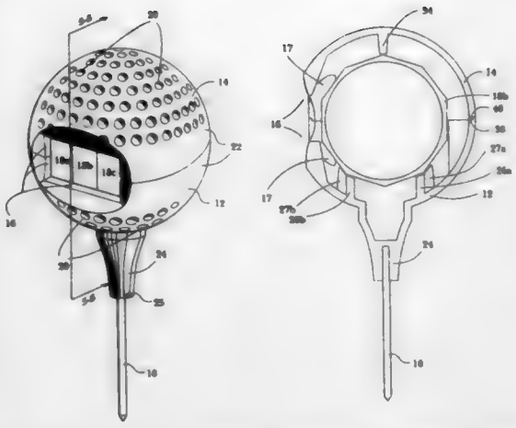
H. William Bradford, 39 County Rd., Essex, Mass. 01929, and Peter E. Carr, 82 Brow Ave., Braintree, Mass. 02184

Filed Dec. 23, 1994, Ser. No. 363,731

Int. Cl.[6] G09F *11/02*; **A63B** *67/02*

U.S. Cl. 273—176 L **21 Claims**

21. A method of adjusting the variable yardage distance information from the teeing ground to the center of the putting green at a golf hole comprising:



utilizing at least one adjustable distance tee marker (ADTM) having a window void through which the variable distance from the teeing ground to the center of the putting green may be viewed, said ADTM comprising a hollow housing containing three movable decagon shaped drums, said drums having one of the numbers 0–9 on each of the ten faces thereof;

adjusting the variable distance from the teeing ground to the center of the putting green by manually rotating each of said decagon shaped drums in said housing such that the desired variable yardage distance may be viewed through said window void; and

locking said drums in place by means of cooperative interaction between their decagon shapes and the interior shape of the housing.

5,464,220

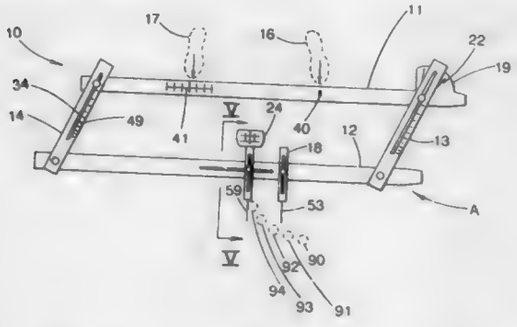
GOLF PRACTICE DEVICE AND METHOD

Dale G. Hansen, 7276 Rezen St., Rockford, Mich. 49341, and Donald C. Wohlin, 5610 Chauncey, NE., Belmont, Mich. 49306

Filed Nov. 30, 1994, Ser. No. 347,271

Int. Cl.[6] A63B *69/36*

U.S. Cl. 273—186.1 **27 Claims**



1. A golf practice device, comprising:

a first strip having indicia for indicating proper positioning of a golfer's feet;

a second strip spaced from and parallel to said first strip and having a ball marker for indicating a proper ball position;

a third strip pivotally intercomnecting said first and second strips, and a fourth strip spaced from said third strip also pivotally interconnecting said first and second strips, said first, second, third and fourth strips forming a pivotally adjustable parallelogram; and

a template attached to one of said strips at a corner defined between said one strip and an adjacent of said strips, said template including indicia defining a plurality of predetermined corner angles corresponding to a plurality of golf clubs, whereby, by arranging said strips to a selected one of said predetermined corner angles on said template, the correct golf stance and ball placement is indicated for a selected golf club.

5,464,221

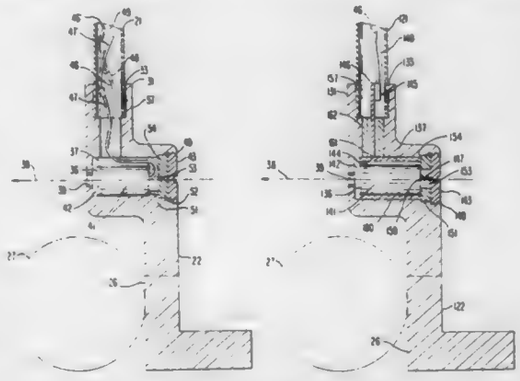
GOLF CLUB PUTTER WITH LASER AIMING SYSTEM

William P. Carney, 4 High Ridge La., Oyster Bay, N.Y. 11771

Continuation-in-part of Ser. No. 290,613, Aug. 15, 1994. This application Sep. 12, 1994, Ser. No. 304,243

Int. Cl.[6] A63B *69/36*

U.S. Cl. 273—186.3 **24 Claims**



1. A golf club putter with laser aiming comprising:

a shaft having a hollow length portion;

a head secured at a first end of said shaft having a face on a front side thereof for striking a golf ball and a hosel on a top side of said head securing said first end of said shaft;

a grip affixed at a second end of said shaft;

said head forming an inner cavity having a lateral bore in a front side thereof and including an access opening in a rear end thereof;

said inner cavity communicating with said hosel and said hollow length portion of said shaft;

a laser module mounted in said inner cavity adapted to emit a laser beam coincident with the axis of said lateral bore;

said laser module having first and second connection means for coupling opposite polarity electrical potentials from a voltage source to said laser module to cause said laser module to emit said laser beam;

said first connection means coupling to said voltage source through said inner cavity, said hosel, and said hollow length portion of said shaft; arid

said laser beam being employed by a user of said club for controlling the direction of said golf ball.

5,464,222

GOLF CLUB PUTTER WITH LASER AIMING SYSTEM

William P. Carney, 4 High Ridge La., Oyster Bay, N.Y. 11771

Filed Aug. 15, 1994, Ser. No. 290,613

Int. Cl.[6] A63B *69/36*

U.S. Cl. 273—186.3 **11 Claims**

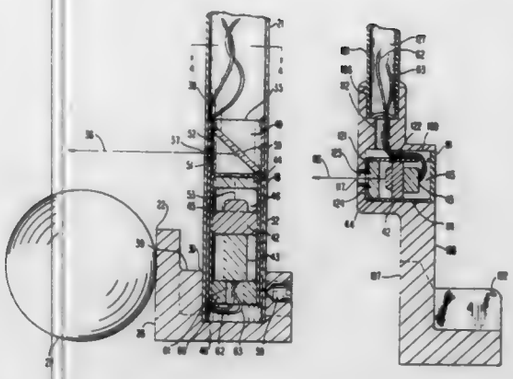
1. A golf club putter with laser aiming comprising:

a shaft including a hollow axial length portion having a putter head affixed at a first end of said shaft and a grip affixed at a second end of said shaft;

said putter head having a face on a front side thereof for striking a golf ball and having an opening on a top side of said putter head securing said first end of said shaft;

said first end of said shaft having a lateral bore therethrough and a laser module mounted in said first end of said shaft including means for projecting a laser beam coincident with the axis of said bore;

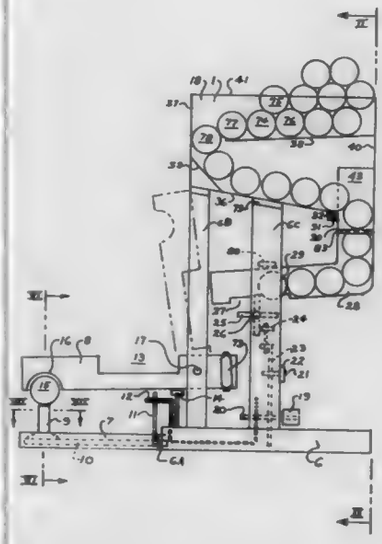
said first end of said shaft being secured to said top side of said head with an angular disposition such that said axis of said



lateral bore extends in a substantially horizontal direction above said golf ball in a vertical diametral plane of said golf ball perpendicular to said face when said golf ball is positioned to be struck; and

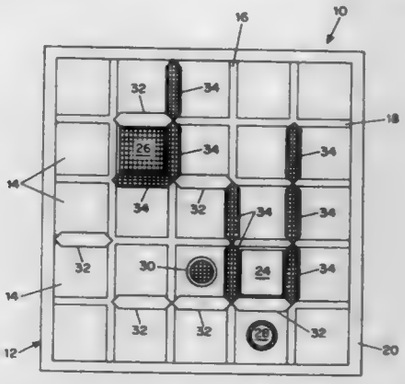
said laser beam being employed by a user of said club for controlling the direction of said golf ball.

5,464,223
GOLF BALL TEEING DEVICE
John R. Dermott, Box 68, Cookstown, Ontario, Canada
Filed Mar. 28, 1994, Ser. No. 218,423
Int. Cl.[6] A63B *57/00*
U.S. Cl. 273—201 **5 Claims**



1. A golf ball teeing device comprising a base, a hopper for holding a plurality of balls connected to the base by vertical projections, a means for transmitting the balls from the hopper to a tee consisting of a sloped stationary tube attached to a hopper exit and to the vertical base projections allowing balls to run down the tube and fall into a pivoting tube attached to the vertical base projections which pivots due to the weight of the ball and the ball falls onto the tee, a means for releasing one ball at a time from the stationary tube which consists of a rotor attached to the vertical base projections and a pendulum having a component above and below a pivot point! which is attached to the vertical base projections, a means for actuation for the ball release means attached to the tee which is rotatable and contacts the pendulum and an above ground thin tee pad attached to the base with means for holding the tee and holding the actuation means for the ball release means.

5,464,224
BOARD GAME APPARATUS AND METHOD OF PLAY
David A. Rosenbaum, 931 McKee St., State College, Pa. 16803
Filed Oct. 4, 1994, Ser. No. 317,337
Int. Cl.[6] A63F *3/00*
U.S. Cl. 273—258 **18 Claims**



8. A game apparatus, comprising:

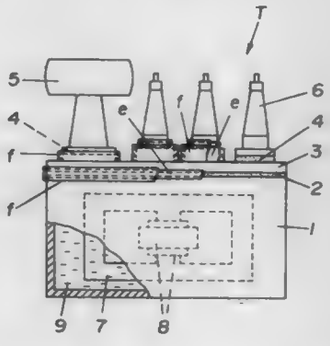
a game board having a field defining an m by n array of playing spaces arranged in rows and columns on the field and a plurality of edge regions, Wherein each region is disposed between a corresponding pair of adjacent playing spaces and wherein visually distinguishable first and second home positions are defined by two of said playing spaces;

first and second playing pieces, said first and second playing pieces being visually distinguishable from one another;

first and second sets of fence pieces, fence pieces of said first set being visually distinguishable from fence pieces of said second set; and

means for randomly selecting individual fence pieces.

5,464,225
OIL LEAKAGE PREVENTIVE METHOD
Kazuyoshi Uematsu, 1-3-11 Uwahara, Shimizu, 424; Kishio Takeshita, Shizuoka, and Minoru Ozawa, Shimizu, all of, Japan, assignors to Kazuyoshi Uematsu, Shimizu, Japan
Filed Jul. 13, 1993, Ser. No. 90,690
Int. Cl.[6] B65D *53/06*
U.S. Cl. 277—1 **3 Claims**



1. An oil leakage preventing method comprising:

removing foreign matters on a surface of a joint portion of two members of a mechanical device;

applying to said surface a first sealing agent obtained by mixing a liquid A including a metal powder and one of a liquid epoxy resin and a modified epoxy resin in a liquid form, and a liquid B including liquid polymercaptan, liquid tertiary amine, an inorganic filler and aluminum silicate;

drying the first sealing agent, and

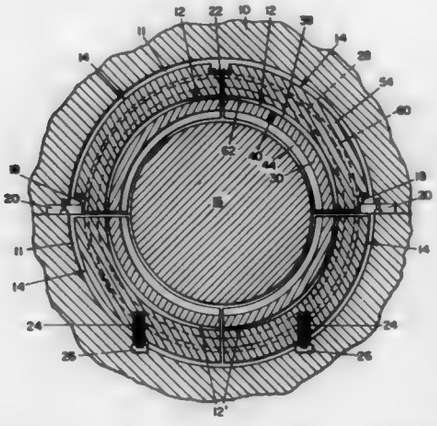
applying to the dried first sealing agent a second sealing agent obtained by mixing a liquid C including a modified epoxy resin in a liquid form, an inorganic filler and aluminum silicate, and a liquid D including modified polyamine in a liquid form for hardening epoxy resin, an inorganic filler and aluminum silicate.

5,464,226

RETRACTABLE PACKING RINGS FOR STEAM TURBINES

William S. Dalton, Chesterfield, Mass., assignor to Demag Delaval Turbomachinery Corp. TurboCare Division, Chicopee, Mass.

Filed Dec. 6, 1993, Ser. No. 162,278
Int. Cl.[6] F16J 15/48
U.S. Cl. 277—53 **4 Claims**



1. In a steam turbine having retractable, spring-loaded, segmented, arcuate, packing rings and holders suspended in the turbine casing and circumscribing the turbine rotor, the packing rings and holders being interengaged by a hook fit and the packing rings being movable by steam pressure between opened and closed position relative to the holders and the rotor, the improvement which comprises providing each of the packing rings and holders with identical, mating, curved profiles for providing full contact between the packing rings and holders in the opened position of the packing rings.

5,464,227

SEAL ASSEMBLY FOR A ROTARY MACHINE

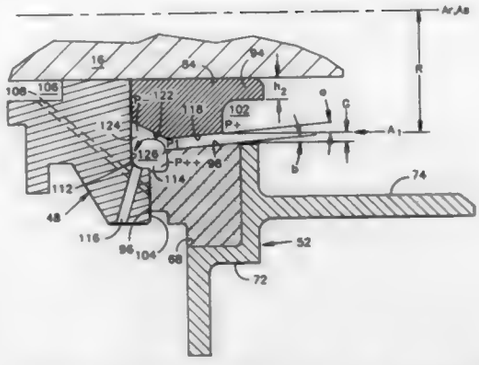
Eric G. Olson, Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 928,836, Aug. 11, 1992, abandoned. This application Jun. 20, 1994, Ser. No. 263,155
Int. Cl.[6] F16J 15/16
U.S. Cl. 277—96.1 **16 Claims**

1. A seal assembly for a rotary machine which includes a rotor assembly having a rotatable rotor shaft, an outward reference direction which extends away from the shaft and an inward reference direction which extends toward the shaft, a stator assembly for supporting the shaft from the stator assembly, the seal assembly being disposed to block the leakage of lubricating fluid from the bearing compartment and the entry of hot working medium gases into the compartment, which includes:

a seal element which is not rotatable, the seal element being adapted to abut a seal plate at a first circumferentially extending region and having a radially inwardly facing surface which is spaced radially from the rotor shaft leaving a circumferentially extending cavity therebetween;

a rotor assembly having



a seal plate rotatable with the rotor shaft which extends circumferentially about the rotor shaft and outward from the rotor shaft to slidably engage the seal element at a first location, and which bounds the cavity between the seal element and the rotor shaft, and

a shaft element which is rotatable with the shaft and extends radially outwardly from the rotor shaft across the cavity into proximity with the radially inwardly facing surface of the seal element leaving an annular chamber adjacent the first location, the shaft element having a radially outwardly facing surface which is spaced radially from the radially inwardly facing surface of the seal element leaving a clearance gap G therebetween which is in fluid communication with the annular chamber, the radially outwardly facing surface extending toward the first location;

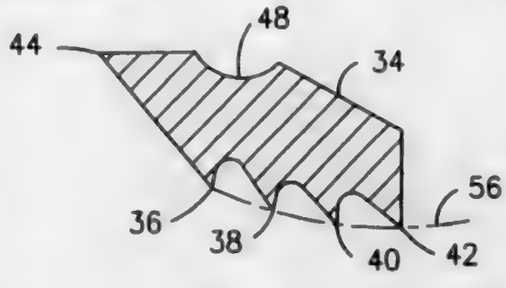
wherein the radially inwardly facing surface of the seal element has a portion of the surface which bounds the annular gap G but does not bound the annular chamber and wherein rotation of the shaft element about the axis of rotation creates an energized boundary layer in the working medium gases in the annular gap G and wherein at least one of said surfaces radially adjacent the annular gap G diverges outwardly from the axis of rotation in the direction of the first location to direct lubricating fluid into the gap G and pressurize the annular chamber adjacent the first location to block fluid leakage from the bearing compartment.

5,464,228

RESTRAINING ELEMENT FOR PRESSURE PIPE JOINTS

Joe Weber, and Lawrence S. Jones, both of Birmingham, Ala., assignors to United States Pipe and Foundry Company, Birmingham, Ala.

Continuation-in-part of Ser. No. 971,110, Nov. 4, 1992, Pat. No. 5,295,697. This application Sep. 16, 1993, Ser. No. 121,631
The portion of the term of this patent subsequent to Mar. 22, 2011, has been disclaimed.
Int. Cl.[6] F16J 15/12
U.S. Cl. 277—207 A **4 Claims**



1. A gasket for preventing separation of telescoped pipes, said telescoped pipes comprising a first pipe having a gasket receiving groove, said groove having a front wall, said gasket comprising a compressible body having a heel portion and a sealing portion, said

heel portion having circumferentially spaced metal segments embedded in an exposed face of said body, each of said metal segments having a row of at least four teeth extending radially inwardly from a first face of said metal segment, and at least some of said metal segments having a single tooth extending radially outwardly of the side of said metal segment opposite said first face, said radially outwardly extending tooth being acutely pointed so as to bite into said front wall within said groove, said four teeth lying in an arc of a circle.

5,464,229

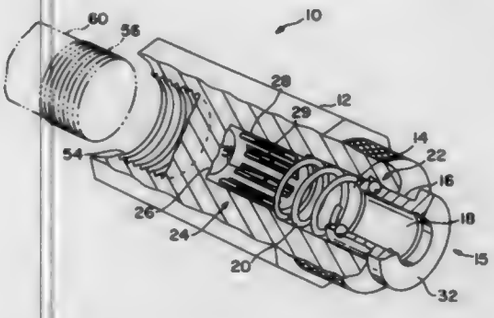
QUICK RELEASE CHUCK DEVICE

Glenn L. Salpaka, Salem, S.C., assignor to Power Tool Holders, Inc., Wilmington, Del.

Filed May 26, 1994, Ser. No. 249,535

Int. Cl.[6] B23B *31/107;31/14*

U.S. Cl. 279—30 **23 Claims**



1. A quick-change chuck device, comprising:

a body member having an internal recess defined therein;

an inner sleeve member fitted into said recess and axially moveable relative said body member, said inner sleeve having an internal bore defined therethrough essentially concentric with said recess said inner sleeve member further comprising an outer sleeve section which is concentric about said body member, said inner sleeve member being axially moyable relative to said body member by pulling back on said outer sleeve section;

an axial spring mechanism disposed relative to said inner sleeve member and said body member so as to bias said inner sleeve member axially away from said body member;

an axial movement locking device configured within said inner sleeve member, said locking device configured to allow a tool shank to be slid into said internal bore when said inner sleeve member is moved axially towards said body member and to axially lock said tool shank within said internal bore when said inner sleeve member is biased by said spring mechanism away from said body member; and

a rotational movement locking device configured within said internal recess of said body member, said rotational movement locking device defining a bore aligned with said internal bore of said inner sleeve member for receiving said tool shank passing through said internal bore, said rotational movement locking device comprising a plurality of spring loaded longitudinal bearing members disposed about said bore and extending radially into said bore so as to contact said tool shank, said bearing members being spring loaded inward so as to rotationally lock said tool shank against rotation in at least one rotational direction.

5,464,230

LOCKABLE DRILL CHUCK

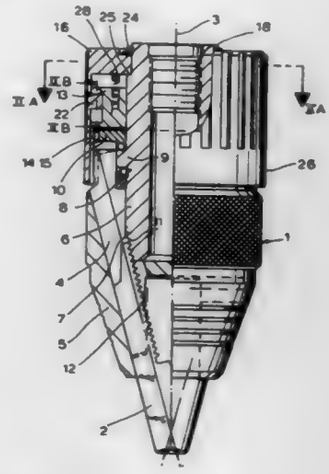
Günter H. Röhm, Heinrich-Röhm-Strasse, 89567 Sontheim, Germany

Filed Mar. 18, 1994, Ser. No. 210,564

Claims priority, application European Pat. Off., Apr. 16, 1993, 93106187

Int. Cl.[6] B23B *31/12*

U.S. Cl. 279—63 **16 Claims**



1. A drill chuck comprising:

a first body rotatable about an axis and formed with a plurality of angularly spaced angled guides;

respective jaws slidable in the guides;

a second body axially fixed but rotatable on the first body;

means including interengaging screwthread formations on the second body and engaged with the jaws for radial displacement of the jaws on the first body toward each other on forward rotation of one of the bodies relative to the other body in a tightening direction and for radial displacement of the jaws away from each other on opposite backward rotation of the one body relative to the other body in a loosening direction;

a locking ring axially displaceable on the other body and formed with at least one tooth, the one body being formed with another tooth axially meshable with the locking-ring tooth in a front locking position of the locking ring to inhibit rotation of the bodies relative to each other;

a spring braced between the locking ring and the other body urging the locking ring axially forward on the other body from a rear unlocked position in which the teeth are disengaged with each other toward the front locked position;

a holding ring axially fixed on the other body and rotatable thereon between angularly offset locked and unlocked positions;

means including interengaging cam formations on the rings for displacing the locking ring into the rear position on rotation of the holding ring from the locked into the unlocked position, the cam formations including a forwardly directed cam surface formed with

a central forwardly open seat in which the cam is received in the locked position of the locking ring, and

a pair of angled surfaces leading forwardly and oppositely away from the seat; and

means including primary stops on the other body and on the holding ring engageable with each other for limiting angular travel of the holding ring on the other body.

5,464,231

CHUCK WITH JAWS HAVING CURVED ENGAGEMENT SURFACES

Tymen Clay, 241 Monteith Avenue, Stratford, Ontario, Canada

Filed Jun. 20, 1994, Ser. No. 262,229
Int. Cl.[6] B23B 31/16
U.S. Cl. 279—123 17 Claims

1. A chuck for holding a workpiece in a lathe, said chuck comprising:

a jaw holder having a front side facing in the direction of the workpiece, at least four radially extending slots in said front side, and means for attaching said holder to said lathe for turning about a centre chuck axis;

at least four jaw devices detachably mounted in respective slots of said holder and radially movable therein, each jaw device having an inner workpiece engaging surface that forms a profile when it is viewed from the front of the jaw device in the direction of said central chuck axis, said profile comprising a central concave arc and two similar convex curves located at opposite ends of said concave arc, and

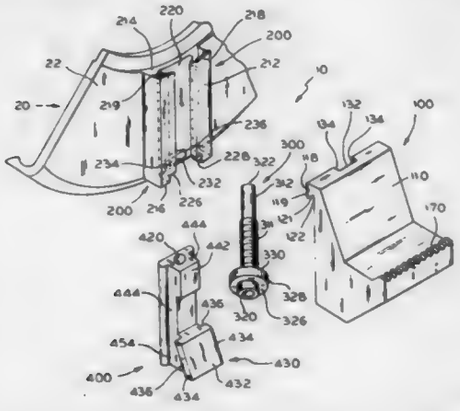
means for moving said jaw devices radially inwardly or outwardly.

5,464,232

LOCKING TOOL HOLDR APPARATUS

Alex R. Chizmadia, Warren, Mich., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Feb. 25, 1994, Ser. No. 201,813
Int. Cl.[6] B23B 31/16
U.S. Cl. 279—124 9 Claims



1. A locking tool assembly for positioning and retaining a workpiece on a chuck rotating about an axis, the locking tool assembly comprising:

a master jaw disposed on the chuck, the master jaw having a curved wedge-shaped lip extended toward the rotation axis of the chuck, and the master jaw having an inner slot extending therethrough, the slot aligned along a radial of the rotation axis of the chuck;

a key locator having a body portion securely disposable in the slot of the master jaw, the body portion slidable relative to the master jaw along the radial of the rotation axis of the chuck, the key locator also having a foot portion extending from the slot of the master jaw;

a lock bolt having a threaded shaft and a circular flange at one end, the circular flange disposable in a recess of the slot in the master jaw so that the threaded shaft of the lock bolt extends toward the rotation axis of the chuck, the lock bolt disposable in and threadedly engageable with a threaded bore of the key locator such that rotation of the lock bolt moves the key locator in the slot along the radial of the rotation axis of the chuck; and

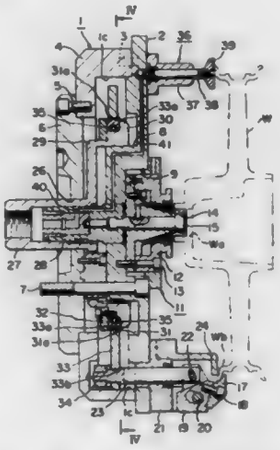
a top jaw having a curved grooved flange, the curved grooved flange being arranged and constructed to mate with the curved wedge-shaped lip of the master jaw, the curvature of the flange being matching and complementary with the curvature of the lip, a recess for receiving the foot of the key locator and a slot connected to the recess, wherein the foot may be moved from the recess into the slot and the lip of the master jaw may be disposed in the groove of the flange of the top jaw by rotating the lock bolt, thereby precisely fastening the top jaw to the master jaw.

5,464,233

FINGER CHUCK FOR USE WITH MACHINE TOOL

Teruo Hanai, Nagoya, Japan, assignor to Howa Machinery Ltd., Nagoya, Japan

Filed Mar. 2, 1994, Ser. No. 204,734
Claims priority, application Japan, Mar. 8, 1993, 5-075412
Int. Cl.[6] B23B 31/18
U.S. Cl. 279—137 16 Claims



1. A finger chuck for use with a machine tool, comprising:

a chuck main body having a front wall and a rear wall, said front wall being opposed to a workpiece, said rear wall being opposed to said front wall, said front wall and said rear wall defining a space therebetween;

centering means supported by said front wall and connected to a center portion of said workpiece, for centering said workpiece on an axis of said chuck main body;

a plurality of jaw means supported by said front wall for holding an outer peripheral portion of said workpiece;

rearwardly protruding means protruding from a center portion of said front wall toward said rear wall within said space;

cavity means defined in said rearwardly protruding means and having an opening on a front surface of said front wall, said cavity means accommodating at least part of said centering means so as to hold said centering means;

drawing means piercing said rear wall in the axial direction of said chuck main body, said drawing means comprising a disc portion provided transverse to an axial line of said chuck main body in said space and being shiftable by a drive source in the axial direction of said chuck main body;

guide means extending from said disc portion in said space and provided integrally with said drawing means, said guide means being guided by said rearwardly protruding means in the axial direction of said chuck mean body;

means forming a seat surface in the vicinity of said guide means;

spider means supported outside said guide means for movement along said seat surface; and

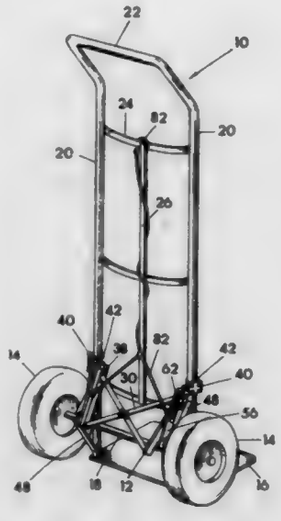
coupling means for coupling said spider means and said jaw means so as to convert the movement of said spider means caused by said drawing means into open and close motions of said jaw means.

5,464,234

REARWARD APPROACH CURB JUMPER FOR A HAND TRUCK

Alan C. Ferguson, 1482 Sky Harbor Dr., Ste. G, Marysville, Calif. 95901

Filed Mar. 8, 1994, Ser. No. 207,086
Int. Cl.[6] B62B *5/02*
U.S. Cl. 280—5.32 **2 Claims**



1. A manually operable upright hand truck having pivotal fulcrum means for assisting in maneuvering said truck rearward and upward from a lower surface onto an adjacent raised surface, said truck including two rotatable wheels at a bottom end of the truck, the wheels being in spaced relationship to one another and on oppositely disposed sides of a cargo platform also at the bottom end of the truck, the cargo platform generally horizontally disposed and resting on the ground when the truck is in a vertical resting position, the cargo platform extending outward from a front side of the truck, and a vertical center axis of the wheels positioned sufficiently rearward of the cargo platform so that the wheels are rearward of a cargo carrying area of the cargo platform, two vertically rising elongated rails attached at bottom ends of the rails to a rearward portion of the cargo platform, the rails being in spaced relationship to one another, upper ends of the rails including a hand grip area, an overall height of said truck defined by a distance between a bottom of said wheels upward to said hand grip area when said truck is in said vertical resting position,

said pivotal fulcrum means for assisting in maneuvering said truck rearward and upward from a lower surface onto an adjacent raised surface comprising an elongated arm pivotally attached to said rails, the pivotal attachment of said arm to said rails being upward from said bottom of said wheels less than 30% of said overall height so as to leave a substantial length of said rails above the pivotal attachment of said arm, the pivotal attachment of said arm to said rails being upward above said cargo platform with said truck in said vertical resting position, said arm providing a pivotal fulcrum upon which to raise said truck upward with said rails serving as levers in conjunction with said arm,

said arm being pivotally positionable into a stored position wherein a distal end of said arm is downward below the pivotal attachment to the rails and adjacent said wheels, said arm further being pivotally positionable into a raised predetermined outward position wherein said arm is extending outward from a rear side of said truck,

limit means in communication with said arm for limiting said arm to a said outward position so as to limit pivotal movement of said distal end of said arm toward said hand grip area,

releasable latch means including a latch in communication with said arm for temporarily maintaining said arm in said outward position while positioning said truck for moving from the lower surface to the raised surface, said releasable latch means being disengagable for allowing said arm to pivot toward and into said stored position,

said arm being of sufficient length that with said wheels on the lower surface adjacent a transition between the lower surface and the raised surface, and with said cargo platform extending outward away from said raised surface simultaneously with said arm in said outward position, said arm extends sufficiently for abutting the top of the raised surface with said distal end simultaneously with said rails lying between 90 degrees and 35 degrees to a horizontal plane of said raised surface,

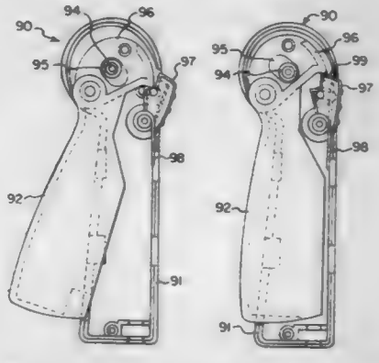
said arm further being of sufficient length to allow tilting of said rails pivotally on the arm abutting the raised surface sufficiently downward toward the raised surface to raise said wheels and said cargo platform to a height above the top of the raised surface and to cause disengaging of said latch means and pivotal movement of said arm toward said stored position and the lowering of said wheels onto the raised surface.

5,464,235

BRAKE LOCK FOR IN-LINE ROLLER SKATE BRAKING SYSTEM

David A. Goldman, 2321 Grove St., No. 2, and Robert J. Dalton, 1077 Gilbert St., both of Boulder, Colo. 80302

Filed Mar. 1, 1993, Ser. No. 22,702
Int. Cl.[6] A63C *17/14*
U.S. Cl. 280—11.2 **1 Claim**



1. In a roller skate having cable actuated brake elements cooperating with one or more wheels of said skate in response to movement of said brake elements in a predetermined direction by a cable having a first and a second end, said first end of said cable being connected to said brake elements, an apparatus for selectively locking said one or more skate wheels to accommodate walking on said skate, comprising;

a hand grip including a housing and a manually operable handle pivotally attached to said housing,

said handle having a movable portion thereof connected to said second end of said cable,

said handle normally assuming a position wherein said cable is not actuatinq said brake elements,

said handle being manually rotatable into an actuated position operable to apply a force to said cable for moving said cable to a wheel locking position and said brake elements in said predetermined direction so as to prevent rolling of said one or more wheels having brake elements associated therewith,

a shoulder formed in said handle,

a manually rotatable thumb latch carried by said housing, and

a spring attached to said housing and physically engaging said thumb latch to force bias said thumb latch in a direction away from said handle and to a thumb latch position wherein said handle is not locked in said actuated position,

said shoulder and said thumb latch being brought into positional alignment when said handle is moved to said actuated position, whereupon said thumb latch may be selectively depressed against said force bias of said spring to a position whereat said thumb latch engages said shoulder and is operable to lock said handle in said actuated position when manual rotation of said handle is thereafter terminated,

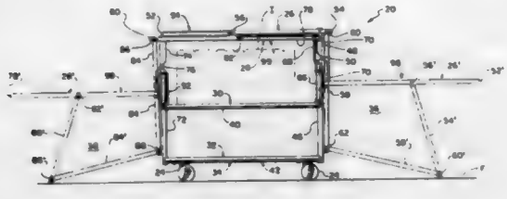
subsequent manual rotation of said handle from said actuated position being operable to automatically reset said thumb latch to said thumb latch position as a result of said force bias of said spring.

5,464,236

PORTABLE MUSICAL INSTRUMENTS CART

Gary M. Benting, and Leslie R. Abraham, both of Owatonna, Minn., assignors to Wenger Corporation, Owatonna, Minn.

Filed Aug. 12, 1994, Ser. No. 289,400
Int. Cl.[6] B60F *5/00*; B62B *3/02*
U.S. Cl. 280—30 **6 Claims**



1. A portable cart for supporting and transporting musical instruments over a floor comprising:

a frame including a base frame presenting first and second opposed ends and first and second upright standards operably, fixedly coupled to said opposed ends;

a floor engaging wheel assembly operably coupled to said base frame such that said base frame is rollably carried on said wheel assembly for transport across said floor;

a first expandable shelf assembly operably pivotally coupled to said first upright standard and including a first expandable shelf having a storage surface and a performance surface each adapted for supporting said instruments, said first expandable shelf assembly being shiftable between a folded position wherein said first expandable shelf storage surface is upwardly presented and an expanded position wherein said first expandable shelf performance surface is upwardly presented; and

a second expandable shelf assembly operably pivotally coupled to said second upright standard and including a second expandable shelf having a storage surface and a performance surface each adapted for supporting said instruments, said second expandable shelf assembly being shiftable between a folded position wherein said second expandable shelf storage surface is upwardly presented and an expanded position wherein said second expandable shelf performance surface is upwardly presented,

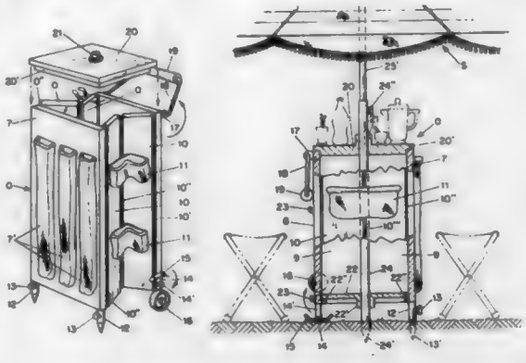
said first and second upright standards presenting respective top ends, said first upright standard top end being higher than said second upright standard top end, said first expandable shelf overlapping said second expandable shelf when said first and second expandable shelves are in the respective folded positions.

5,464,237

FOLDING CART

Elena H. Saporiti, Scalabrini Ortiz 2835 P.B. 1 (1425), Capital Federal, Argentina

Filed Jun. 28, 1994, Ser. No. 267,460
Int. Cl.[6] B62B *1/12*; B60F *5/00*
U.S. Cl. 280—30 **14 Claims**



1. A portable folding cart which is designed to unfold from a flat, collapsed position to an open position, the cart comprising:

opposing front and back side walls, each side wall having on an opposing face a holder formed at a lower end thereof;

opposing first and second foldable walls hingedly secured to the front and back side walls;

a bottom shelf, having an opening in the center thereof, for being positioned on top of the holder;

a top lid, having an opening in the center thereof, for being positioned on top of the walls;

wheel means for supporting the cart, comprising one or more pivotal assemblies connected to said cart, having a wheel and a foot; and

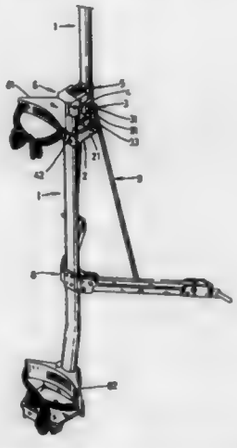
adjustment means for firmly fixing the cart at a selected location.

5,464,238

ANGLE-ADJUSTABLE FOLDING FRAME ASSEMBLY FOR A GOLF CART

Ching-Chang Wu, No. 35-1, Jih Hsin Street, Tu Cheng Hsiang, Teipei Hsien, Taiwan, Prov. of China

Filed May 31, 1994, Ser. No. 251,217
Int. Cl.[6] B62B *1/12*
U.S. Cl. 280—42 **1 Claim**



1. An angle-adjustable folding frame assembly for a golf cart, comprising:

a handle bracket affixed to a main frame of a golf cart having a wheel bracket;

a handle having one end affixed with a handle connector pivoted to said handle bracket, said handle connector having first and

second sides, two parallel lugs fixed to said first side respectively pivoted to said wheel bracket of said main frame by a respective link, a longitudinal rail fixed to said second side, and a raised block fixed on said second side and extending outward from said rail;

a first locating member adapted to slide on said handle, said first locating member including a block, said block having a projecting frame extending therefrom and a positioning rod held by said projecting frame;

a spring connection between said block of said first locating member and said rail of said handle connector;

a slide block having first and second ends, said first end affixed to said block of said first locating member, and said second end terminating in a flange releasably held by said raised block of said handle connector, a longitudinal groove receiving said rail of said handle connector and adapted to slide on said rail; and

a second locating member affixed to said main frame at a front end thereof for securing said first locating member, said second locating member having an inner retaining groove, an outer retaining groove, and a curved guide surface for guiding said positioning rod of said first locating member into one of said inner and outer retaining grooves;

wherein said handle can be set in a first working position by engaging said positioning rod of said first locating member into said outer retaining groove, a second working position by engaging said positioning rod of said first locating member into said inner retaining groove, and a collapsed position by pushing said first locating member backwards toward said handle connector to release said positioning rod of said first locating member from said second locating member and then turning said handle backwards toward said wheel bracket.

5,464,239

BICYCLE, AND A BICYCLE HAVING A HYDRAULIC BRAKE, AND AN ACTUATOR FOR A HYDRAULIC BRAKE ON A BICYCLE

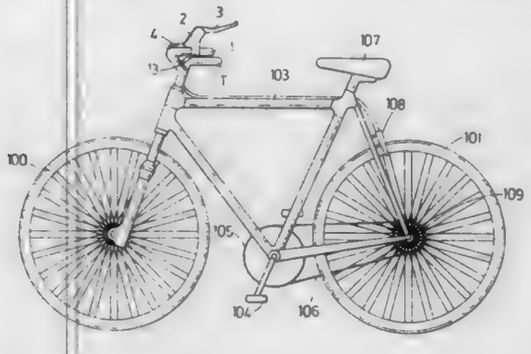
Joachim Gajek, Würzburg, and Gerhard Dumbser, Niederwerrn, both of, Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Aug. 25, 1994, Ser. No. 295,924

Claims priority, application Germany, Aug. 28, 1993, 43 29 039.6

Int. Cl.[6] **B60T** *1/08;11/16;11/10;* **B62L** *3/02*

U.S. Cl. 280—264 **20 Claims**



1. A bicycle, said bicycle comprising:

a frame

at least two wheels, said at least two wheels comprising at least a front wheel and a rear wheel;

said at least two wheels being disposed on said frame;

means for propelling at least one of said front wheel and said rear wheel;

said means for propelling comprising:

a chain

at least two sprockets to engage said chain;

at least two pedals, said at least two pedals being connected to one of said at least two sprockets;

foot powered moving means, said foot powered moving means comprising the sole moving means for moving said bicycle during riding of said bicycle by a cyclist;

a seat, said seat being disposed on said frame;

a handlebar for steering said bicycle;

hydraulic braking means for slowing the movement of said bicycle;

said hydraulic braking means comprising:

an actuator

said actuator comprising:

means for attaching to a handle bar of said bicycle;

a master cylinder, said master cylinder defining an interior portion and an exterior portion;

said master cylinder being configured for containing brake fluid within said interior portion;

piston means, said piston means being slidably disposed within said interior portion;

handle means for moving said piston means within said interior portion;

said piston means for generating pressure in said interior portion of said master cylinder by means of the brake fluid;

at least one first passage, said at least one first passage having a first end and a second end

at least one second passage, said at least one second passage having a first end and a second end;

said first end of said at least one first passage extending into said interior portion of said master cylinder;

said first end of said at least one second passage extending into said interior portion of said master cylinder;

said at least one first passage and said at least one second passage being disposed at an angle (α) with respect to one another;

said second end of said at least one first passage comprising:

first means for connecting;

said first connecting means comprising means for selectively connecting said second end of said at least one first passage to either one of:

a brake hose; and

means for capping said second end of said at least one first passage, and for closing off said second end of said at least one first passage;

said second end of said at least one second passage comprising:

second means for connecting;

said second connecting means comprising means for selectively connecting said second end of said at least one second passage to either one

a brake hose; and

means for capping said second end of said at least one second passage, and for closing off said second end of said at least one passage;

said first connecting means and said second connecting means being substantially identical.

5,464,240

HOLLOW SHELL FRAMES FOR BICYCLES AND OTHER HUMAN-POWERED VEHICLES AND METHOD FOR MAKING SAME

Alexander J. Robinson, Salt Lake City, and Christopher O. Paragas, Kearns, both of Utah, assignors to Genesis Composites, L.C., Salt Lake City, Utah

Filed Jan. 31, 1994, Ser. No. 189,590

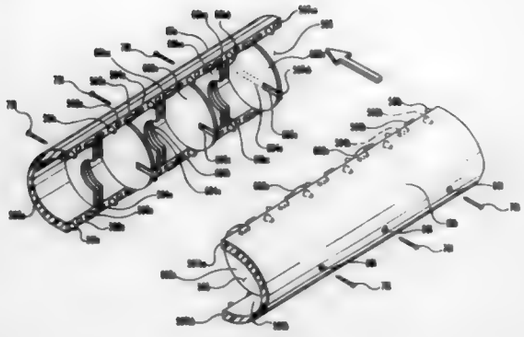
Int. Cl.[6] **B62K** *19/16;19/18*

U.S. Cl. 280—281.1 **26 Claims**

1. A lightweight structural component for a human-powered vehicle, the structural component comprising:

a first partial shell, said first partial shell having a proximal side and a distal surface,

a second partial shell, said second partial shell having a proximal side and a distal surface,



said first and second partial shells being joined to form an assembled tube,

an outer tube skin on said distal surface of each of said partial shells, said outer tube skins forming an exterior surface of the assembled tube,

an interior cavity located on the proximal side of each partial shell, said interior cavities each having a volume that is substantially hollow,

first and second joining faces located along the length of each of said partial shells near its outer skin, said first joining face of said first partial shell being in firm contact with said first joining face of said second partial shell in the assembled tube, and said second joining face of said first partial shell being in firm contact with said second joining face of said second partial shell in the assembled tube, and

a plurality of protruding means located along a joining face of said first partial shell and a plurality of receptacle means located on a corresponding joining face of said second partial shell, said protruding means being arranged to protrude into said receptacle means and engage therewith in the assembled tube;

wherein said assembled tube has a first seam where said first joining face of said first partial shell meets said first joining face of said second partial shell;

wherein said assembled tube has a second seam where said second joining face of said first partial shell meets said second joining face of said second partial shell;

wherein said first seam and said second seam define a plane referred to as the joining plane;

wherein said engaged protruding means and receptacle means prevent movement of said first partial shell with respect to said second partial shell in any direction on the joining plane;

wherein said protruding means and said receptacle means have bonding means on their surfaces to keep said first and second partial shells firmly engaged with each other in the assembled tube and to prevent movement of said first partial shell with respect to said second partial shell in a direction generally orthogonal to the joining plane; and

wherein said structural component is manufactured from a composition of reinforcing fibers and thermoplastic.

5,464,241

PLURAL HEIGHT POWERED FIFTH WHEEL HITCH

James H. Flater, Zeeland, Mich., assignor to Holland Hitch Company, Holland, Mich.

Filed Jul. 25, 1994, Ser. No. 280,158

Int. Cl.[6] B62D *53/08*

U.S. Cl. 280—425.1 **7 Claims**

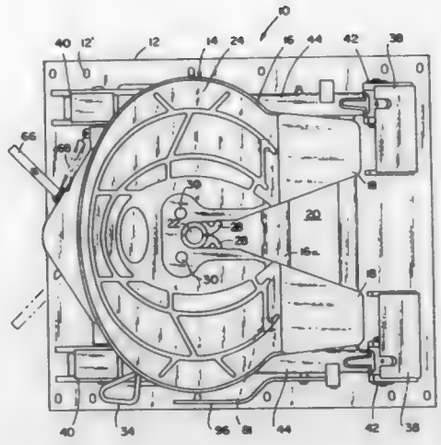
1. A powered, adjustable height fifth wheel hitch comprising:

a support;

a fifth wheel hitch plate above said support, having opposite lateral sides and having a fore to aft longitudinal axis;

linkage between said support and said fifth wheel hitch plate at each said lateral side, allowing said fifth wheel hitch plate to move vertically up or down with respect to said support;

a pair of cam followers on each said linkage;



a pair of wedging cams on said support, positioned to cooperatively engage said cam followers;

each said wedging cam comprising a pair of slidably interconnected lower and upper wedges;

a pair of power actuators mounted on said support and connected to said wedging cams to extend and sequentially shift said lower wedges and then said upper wedges into elevating engagement with said cam followers, to raise said fifth wheel plate relative to said support, and to retract and sequentially shift said upper wedges and then said lower wedges to lower said fifth wheel plate relative to said support.

5,464,242

SKI EQUIPPED WITH ELASTIC DEVICES TO RESIST AND/OR ABSORB BENDING BIASES

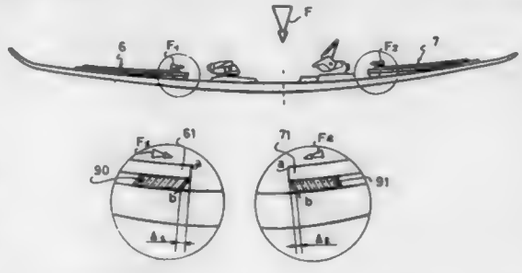
Philippe Commier, Annecy; Axel Phelipon, Alby sur Cheran, and Jacques Le Masson, Cran Gevrier, all of, France, assignors to Salomon S.A., Metz-Tessy, France

Filed Aug. 16, 1994, Ser. No. 291,527

Claims priority, application France, Aug. 20, 1993, 93 10210

Int. Cl.[6] A63C *5/07*

U.S. Cl. 280—602 **10 Claims**



1. A ski comprising:

an elongate beam having a central arched portion of a predeterminate length (LC) between a forward contact line and a rear contact line, an upwardly turned front portion comprising a shovel and a less turned up rear portion comprising a tail, said central portion comprising a binding mounting zone corresponding to a standardized zone;

two transmitters located in said central portion and each on either side of said binding mounting zone, thereby comprising a front transmitter and a rear transmitter; one of the ends of each transmitter being connected to the beam by a complete connection; the other end of each transmitter being connected to the beam by a partial connection, free in translation along a longitudinal direction, the partial connection comprising an elastic and viscous element that resists longitudinal displacement of said transmitter; under bending stress, the displacement (Δ1) of the partially connected end of the front transmitter with respect to the beam being greater than the

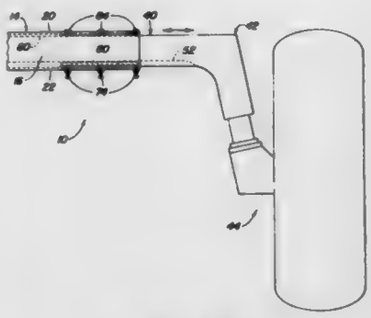
displacement (Δ2) of the partially linked end of the rear transmitter; such that the ratio (Δ1/Δ2) is comprised between 1.2 and 2.5; and the stiffness (K1) of the elastic and/or viscous element of front transmitter being greater than the stiffness (K2) of the elastic and/or viscous element of rear transmitter; such that the ratio (K1/K2) is comprised between 1.2 and 5.

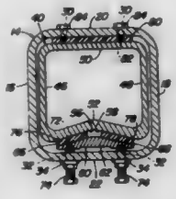
5,464,243

ADJUSTABLE AXLE WITH SHIM STRUCTURE

Marvin A. Maiwald, Ankeny, and Donald K. Davenport, Woodburn, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 13, 1995, Ser. No. 372,751
Int. Cl.[6] B60B *35/10*
U.S. Cl. 280—638 **20 Claims**





1. In a telescoping assembly for a vehicle such as an agricultural sprayer having a fore-and-aft extending main frame, a first tube extending outwardly from the main frame, a second tube telescopingly received by the first tube, the first tube having a generally rectangular cross section with upright sidewalls and upper and lower walls connecting the sidewalls, and the second tube having spaced sidewalls supported between the upright sidewalls and a non-planar wall having a generally V-shaped configuration, first pad structure conforming to the V-shaped configuration supported between the first and second tubes, and an adjustable pad support located between the first and second tubes and contacting the first pad structure for selectively moving the first pad structure against the non-planar wall to locate the second tube relative to the upright sidewalls.

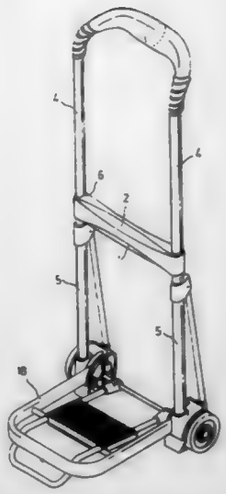
5,464,244

RETRACTABLE HANDLE FOR HAND TRUCKS OR THE LIKE

James Tsai, 103, Ta Ming 1 Rd., Tung Pao Tsun, Tan Tzu Hsiang, Taichung Hsien, Taiwan, Prov. of China

Filed Oct. 25, 1994, Ser. No. 328,823
Int. Cl.[6] B62B *1/04*
U.S. Cl. 280—655 **1 Claim**

1. A retractable handle comprising two parallel sleeves having a respective locating hole near a respective top end, a cross member connected between said sleeves, and two extension rods connected in parallel and moved in and out of said sleeves and having a respective bottom end coupled with a respective stop member, the improvement comprising a pressure plate horizontally connected to a bottom side of said cross member by springs and having two



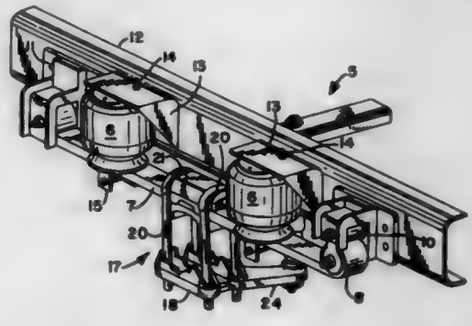
beveled push blocks at two opposite ends and two bottom notches bilaterally disposed on a bottom side thereof; two lock bolts respectively horizontally supported on springs in respective holes on the stop members of said extension rods, said lock bolts being forced by the respective springs through respective locating holes on said sleeves into said bottom notches and stopped above said beveled push blocks to lock the retractable handle in an operative position when said extension rods are pulled out of said sleeves, said lock bolts being forced backwards from said bottom notches into the locating holes on said sleeves, when said pressure plate is depressed against said cross member, permitting said extension rods to be moved back inside said sleeves.

5,464,245

SUSPENSION FOR LIGHT DUTY TRUCKS

Richard G. Vogler, Naperville, Ill., assignor to The Boler Company, Itasca, Ill.

Filed Aug. 8, 1994, Ser. No. 287,203
Int. Cl.[6] B60G *11/02*
U.S. Cl. 280—720 **8 Claims**



1. A kit for replacing a leaf spring pack used in vehicle axle suspensions of the type combining a leaf spring pack and a shock absorber system mounted on and below a fore-and-aft extending chassis frame member on each side of a vehicle with the leaf spring pack and shock absorber system being operatively attached to the adjacent end of an axle,

said kit comprising a single leaf spring having an eye at each end for attachment to the in-place vehicle frame mounts and shackle attachments as used for a leaf spring pack, a spacer to be positioned on top of said single leaf spring mid-way between its opposite ends and having a vertical thickness approximately equal to the difference between the vertical thickness of a said leaf spring pack at its mid-point and the vertical thickness of said single leaf spring at its mid-point and having a length sufficient to fit underneath and support the

existing spring-to-axle attachment components which normally extend over the top of said leaf spring pack, a pair of air spring support brackets to be symmetrically mounted on said chassis frame member at fore-and-aft positions intermediate the middle of said single leaf spring and its opposite ends, a pair of air springs, first fastener means for attaching the upper end of each said air spring to one of said air spring support brackets, and second fastener means for attaching the lower end of each air spring to said single leaf spring.

5,464,246

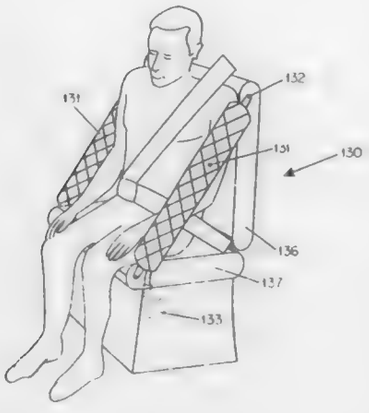
INFLATABLE TUBULAR CUSHIONS FOR CRASH PROTECTION OF SEATED AUTOMOBILE OCCUPANTS

Mynor Castro, Mesa; Gershon Yaniv, Scottsdale; Dirk J. Hardtmann, Phoenix, all of Ariz., and David J. Romeo, Alpine, Wyo., assignors to Simula Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 19,655, Feb. 19, 1993, Pat. No. 5,322,322. This application Jun. 20, 1994, Ser. No. 262,747

Int. Cl.[6] B60R *21/22*

U.S. Cl. 280—730.2 **33 Claims**



1. A protective apparatus for the occupants of a vehicle comprising:

(a) a vehicle seat having a seat back and a seat pan, said seat back having a first and second back side and said seat pan having a first and second pan side;

(b) a first protective sleeve attached along the first back side of the seat back and the first pan side of the seat pan, said protective sleeve having a weak seam along substantially the length of the first protective sleeve;

(c) a first inflatable braided tube of continuous high-strength fibers stowed within the first protective sleeve, said first inflatable braided tube having an upper end and a lower end, said upper end being attached to the seat back at a first position, and said lower end being attached to the seat pan at a second position, wherein the length of the first inflatable braided tube prior to inflation is substantially longer than the straight-line distance from the first position to the second position; and

(d) gas generator means fluidly connected to the braided tube,

wherein the continuous high-strength fibers form clockwise and counterclockwise spirals, relative to each other, prior to inflation, and upon inflation by gas generated by the gas generator means, the first inflatable braided tube increases its diameter and decreases its length, such that the tube ruptures the weak seam of the first protective sleeve and deploys under tension in a substantially straight line between the first and second positions in the vehicle, and forms a semi-rigid member stretched under tension in a substantially straight line from the first position to the second position.

5,464,247

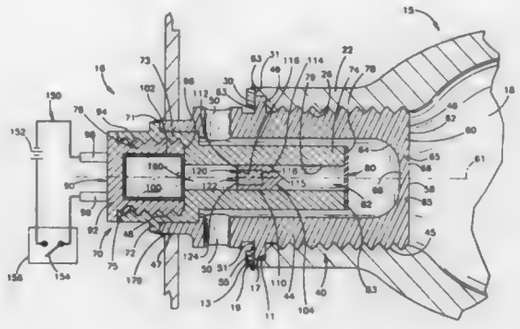
APPARATUS FOR USE IN INFLATING AN AIR BAG AND METHOD OF ASSEMBLY

Douglas J. Rizzi, Eastpointe; Pondget P. Wipasuramonton, Rochester, and Paul T. Saccone, Rochester Hills, all of Mich., assignors to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Sep. 28, 1994, Ser. No. 314,584

Int. Cl.[6] B60R *21/26*

U.S. Cl. 280—737 **21 Claims**



1. An apparatus for use in inflating an air bag, said apparatus comprising:

a container containing a supply of inflation fluid, said container having a first outer surface and an inner surface which is at least in part threaded and defines a threaded opening extending into said container from said first outer surface;

a plug having an outer periphery which is at least in part threaded, said plug being screwed into said threaded opening in said container, said outer periphery of said plug including a second outer surface adjacent said first outer surface of said container;

said outer periphery of said plug and said inner surface of said container defining said threaded opening comprising an interface between said plug and said container, said interface extending to the periphery of said container between said first and second outer surfaces; and

means for blocking leakage of inflation fluid from said container through said interface, said blocking means including (i) a preformed continuous ring of uniform thickness having a flat annular surface overlying said interface and overlying portions of said first and second outer surfaces and (ii) means for securing said ring to said first and second outer surfaces.

5,464,248

ALKALI METAL AZIDE PARTICLES

Masanori Sasaki, Tokyo; Hiroshi Shibafuchi, Uozu; Yasushi Imai, Mitaka; Masahiko Yoshida, Tokyo, and Takehiko Yoshie, Uozu, all of, Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1993, Ser. No. 8,990

Claims priority, application Japan, Feb. 6, 1992, 4-054108

Int. Cl.[6] C01B *21/08*

U.S. Cl. 280—741 **18 Claims**

1. Alkali metal azide particles comprising particles at least 70% of which have a substantially spherical shape and wherein said alkali metal azide particles have a spongy structure and a volume average particle size ratio of 0.4 or less after an ultrasonic dispersion treatment at 26 KHz for 5 minutes.

10. A process for producing alkali metal azide particles, having a substantially spherical shape, a spongy structure, and a volume average particle size ratio of 0.4 or less after an ultrasonic dispersion treatment at 26 KHz for 5 minutes which comprises spray-drying an aqueous solution of an alkali metal azide.

17. A process for producing alkali metal azide particles having a substantially spherical shape, a spongy structure, and a volume average particle size ratio of 0.4 or less after an ultrasonic disper-

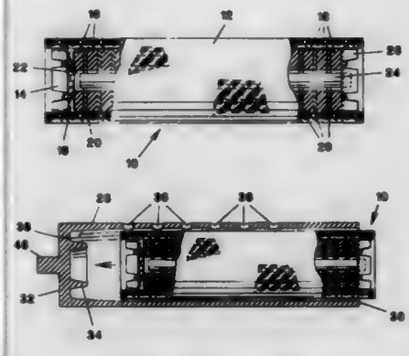
sion treatment at 26 KHz for 5 minutes, said process comprising dissolving an alkali metal azide in an aqueous solvent to form an azide solution and lyophilizing said azide solution.

5,464,249

GENERANT LOADED FILTER ASSEMBLY AND METHOD FOR ITS USE

Donald R. Lauritzen, Hyrum, and Joseph L. Ralston, North Ogden, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Nov. 9, 1994, Ser. No. 336,826
Int. Cl.[6] B60R *21/28*
U.S. Cl. 280—741 **7 Claims**



3. A generant-loaded filter assembly for installation into an automotive airbag module which comprises:

a substantially cylindrical filter pack in the form of a hollow tube of mesh-like construction having first and second ends;

a substantially circular first end cap closing the first end of said filter and including radially extending barbs inserted into said filter pack;

a substantially circular second end cap closing the second end of said filter and including radially extending barbs inserted into said filter pack;

a gas generant enclosed within said filter pack and between said first and second end caps; and

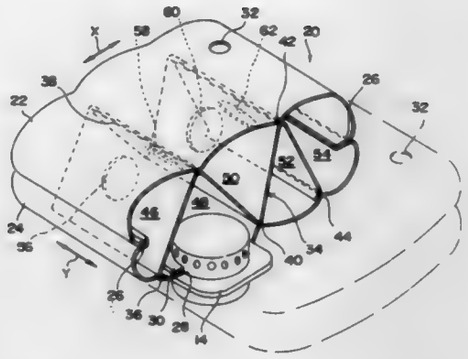
a preload member housed within said filter pack to maintain said gas generant in compression.

5,464,250

BAG SUITABLE FOR USE IN AN AIR BAG APPARATUS AND METHOD OF MANUFACTURING THE SAME

Koki Sato, Aichi, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Jun. 14, 1993, Ser. No. 75,797
Claims priority, application Japan, Jun. 17, 1992, 4-158061
Int. Cl.[6] B60R *21/20*
U.S. Cl. 280—743.1 **20 Claims**



1. A bag suitable for use in an air bag apparatus activated upon application of a predetermined load or above, said bag being expandable towards a side of an occupant, said bag comprising:

a first fabric disposed to be positioned on said occupant side upon activation of said air bag apparatus;

a second fabric disposed to be positioned on a side of a gas generating inflator mounted to a vehicle body, and having peripheral ends respectively sewn on a peripheral end of said first fabric so as to form said bag;

at least one continuous strap member having a dimension narrower than a dimension of said bag, extending in a first direction thereof, said at least one strap member being alternately sewn on said first and second fabrics in a zig-zag configuration and thereby dividing an inside of said bag into a plurality of chambers along a second direction orthogonal to said first direction; and

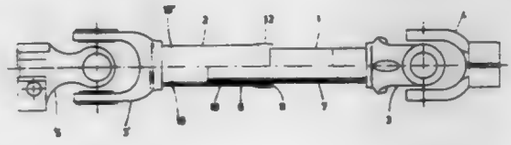
communicating means for causing adjoining chambers of said plurality of chambers to communicate with each other.

5,464,251

TELESCOPIC SHAFT

Melchor Daumal Castellon, Diputación 455, Barcelona, Spain

Filed Dec. 27, 1993, Ser. No. 173,041
Claims priority, application Spain, Dec. 30, 1992, 9202654; Mar. 31, 1993, 9300654
Int. Cl.[6] B62D *1/19*
U.S. Cl. 280—*777* **5 Claims**



1. A telescopic shaft for use in a motor vehicle steering column, comprising two tubular members of circular cross section which fit one into the interior of the other and which have respective longitudinally grooved regions defining longitudinal ribs, meshed with one another, said longitudinal ribs preventing relative rotational movement between the two tubular members and allowing relative axial movement between the two tubular members, at least one of said tubular members having at least one projection directed toward the other tubular member and engaging an end of at least one of the longitudinal ribs defined by the grooved region in said other tubular member, said at least one projection being substantially less deformable than said longitudinal ribs so that the sliding

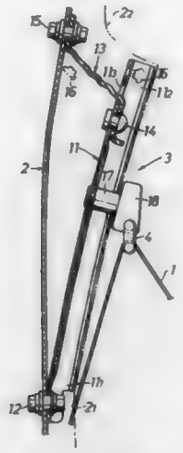
of one of the tubular members with respect to the other tubular member can only occur by means of the deformation of said at least one of the longitudinal ribs under the action of said at least one projection.

5,464,252

ANCHOR DEVICE FOR SEAT BELT

Yoshinobu Kanazawa, and Hidetsugu Okazaki, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1994, Ser. No. 196,840
Claims priority, application Japan, Feb. 17, 1993, 5-027956
Int. Cl.[6] B60R *22/28*
U.S. Cl. 280—805 **7 Claims**



1. An anchor device for a seat belt for connecting a webbing for restraining an occupant to a seat of a vehicle body so that a load applied to the webbing is received by the vehicle body, said anchor device comprising,

a frame to which an anchor for the webbing is connected,

a shock absorbing member secured at one of opposite ends thereof to said frame and at the other of said opposite ends to said vehicle body, said shock absorbing member being deformable by a load above a predetermined load applied by said webbing through said anchor to said frame, and

a coupling member for coupling said shock absorbing member intermediate said one end and said other end thereof and closer to said other end thereof to said frame, said coupling member being deformable when a load above a predetermined load is applied to said webbing and is applied to said frame to separate said frame and said shock absorbing member at said coupling member.

5,464,253

SQUIRT BOOK

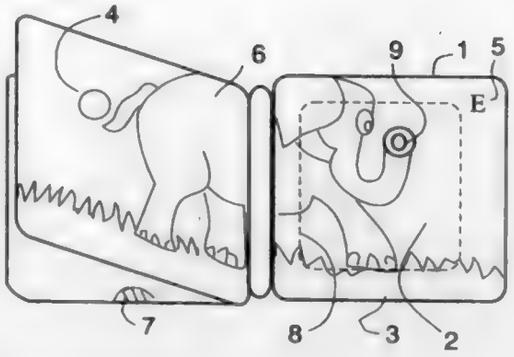
Dennis A. Farrell, 30 Spring Rd., Chappaqua, N.Y. 10514

Filed Dec. 19, 1994, Ser. No. 389,962
Int. Cl.[6] B42D *1/00*
U.S. Cl. 281—38 **6 Claims**

1. A child's book (1) having text and illustration related to animals or activities involving squirts of liquid, having a number of pages which may be unopened or opened, the book comprising:

a waterproof front cover page;

a plurality of waterproof pages each having a recess (4) strategically located with respect to text (5) and illustration (6) involving a squirt activity, said recesses (4) being aligned so as to permit a squirt of water to pass through a plurality of recesses (4) in unopened pages to provide a squirt of liquid related to the squirt activity of text (5) and illustration (6) on an opened page;



a waterproof back cover page (3); and

refillable pump mechanism (2) having a squirt nozzle (9) and refill means.

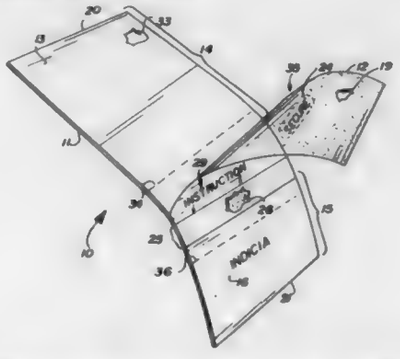
5,464,254

FISHING LICENSE PROTECTOR

Joe E. Campbell, Portland, and Del Isaac, Salem, both of Oreg., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Aug. 29, 1994, Ser. No. 297,221
Int. Cl.[6] B42D *15/00*
U.S. Cl. 283—109 **20 Claims**

1. A business form comprising:



a substantially quadrate first ply of an opaque cellulose based water resistant material having first and second faces, first length and width dimensions, and a first area of said first and second faces;

a substantially quadrate second ply of transparent plastic material having third and fourth faces, second length and width dimensions, and a second area of said third and fourth faces;

a first pattern of permanent adhesive substantially permanently attaching only a first portion of said second ply third face to said first ply first face;

a second pressure sensitive adhesive pattern for connecting a second portion of said second ply third face, distinct from said first portion, to said first ply first face, or for substantially permanently adhering a separate sheet therebetween; and

first indicia facilitating entry of recoverable data imaged on said first ply second face.

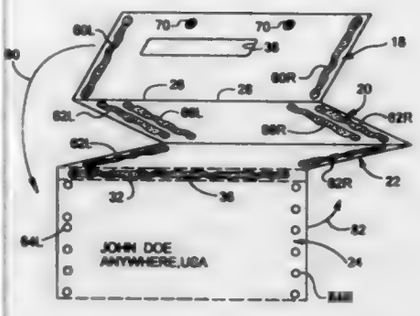
5,464,255

FOLDED BUSINESS FORM WITH RETURN ENVELOPE

John Schildmeyer, Claremont, Calif., assignor to Uarco Incorporated, Barrington, Ill.

Filed Nov. 10, 1993, Ser. No. 150,213
Int. Cl.[6] B65D *27/10;* **B41L** *1/20*
U.S. Cl. 283—116 **11 Claims**

1. A business form comprising:



an elongated sheet of material for receiving indicia, said sheet comprising four connected panels including two end panels at opposite ends of said sheet and two intermediate panels adjacent one another and located between and adjacent respective ones of said end panels;

one of said end panels being somewhat longer in the direction of elongation of said sheet than the other of said end panels and having an address window;

the other of said end panels having two lines of apertures, one adjacent each marginal edge and extending in the direction of elongation of said sheet;

said intermediate panels foldable against and glueable to each other to define a return envelope and said one end panel being foldable over said other end panel with glue on the marginal edges of said one end panel extending through the apertures in said lines whereby both said end panels being foldable against one of said intermediate panels to be glued thereto by glue extending through said lines of apertures.

5,464,256

PLATE AND AN ENDPIECE FOR A COUPLING DEVICE, A COUPLING DEVICE, AND A METHOD OF MAKING IT

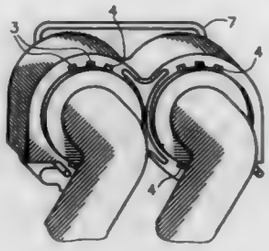
Denis Godeau, Vieilles Maisons, France, assignor to Hutchinson, Paris, France

Filed Aug. 4, 1993, Ser. No. 101,968

Claims priority, application France, Aug. 12, 1992, 92 09947

Int. Cl.[6] F16L *37/14*

U.S. Cl. 285—26 **10 Claims**



1. A coupling device for coupling tubular ducts to a fluid circuit of an internal combustion engine, comprising a tubular duct having an endpiece, said endpiece having an axis, and a coupling plate including at least one body having an opening formed therein to receive said endpiece of said tubular duct and first locking means for locking said endpiece against rotation about its axis in a plurality of predetermined orientations and second locking means for locking said endpiece against axial translation when it is coupled to the fluid circuit, wherein said second locking means is locked by axial translational movement of said tubular duct toward the fluid circuit of the internal combustion engine.

5,464,257

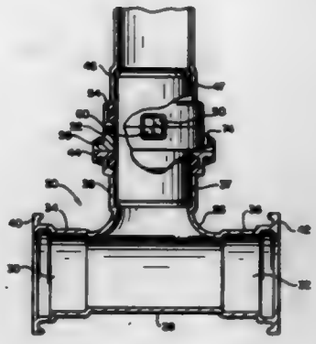
COUPLING FOR JOINING PIPE FITTINGS HAVING OFFSET LUG RESTRAINTS

Gordon S. Riddles, Madison Heights, and Jerry O. Burke, Lynchburg, both of Va., assignors to The Harrington Corporation, Lynchburg, Va.

Filed Oct. 31, 1994, Ser. No. 331,812

Int. Cl.[6] F16L *41/00*

U.S. Cl. 285—156 **12 Claims**



1. A pipe coupling system for fluid lines comprising:

a first pipe fitting having a central body defining a fluid flow path with first and second axially opposite ends having openings and a third laterally directed opening between said end openings and in communication with the fluid flow path;

a first pair of radially outwardly projecting diametrically opposed lugs about said third opening, said openings and said lugs being aligned in a plane passing through the first, second and third openings;

a second pipe fitting having a central body defining a flow path between end openings thereof and having a bend between said end openings;

a second pair of radially outwardly projecting, diametrically opposed, circumferentially spaced lugs about one of the opposite end openings of said second pipe fitting, said opposite end openings, said flow path and said lugs of said second pipe fitting lying in a plane;

a generally ring-shaped coupling for joining said first and second pipe fittings to one another with said third opening of said first pipe fitting and said one of said opposite end openings in fluid communication with one another, said first and second pipe fittings being oriented with the planes thereof lying non-parallel to one another and with said first and second pairs of lugs being misaligned with one another;

said coupling having a third pair of lugs spaced from one another for alignment with the first pair of lugs about said third opening and a fourth pair of lugs spaced from one another for alignment with the second pair of lugs about said one end opening; and

first retaining devices for securing the aligned first and third pair of lugs of said coupling to one another and second retaining devices for securing the aligned second and fourth pairs of lugs of said coupling to one another, thereby securing said first and second pipe fittings to one another.

5,464,258
COMPRESSION JOINT

Hans Kornfeldt; Lars-Åke Körnvik, and Lars Törnblom, all of Västerås, Sweden, assignors to ABB Atom AB, Vasteras, Sweden

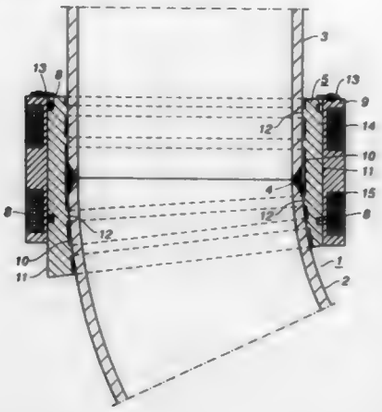
PCT No. PCT/SE93/00495, § 371 Date Dec. 8, 1994, § 102(e) Date Dec. 8, 1994, PCT Pub. No. WO94/00711, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 4, 1993, Ser. No. 351,360

Claims priority, application Sweden, Jun. 23, 1992, 9201922

Int. Cl.[6] F16L *47/00;25/06*

U.S. Cl. 285—293 **4 Claims**



1. A compression joint to be located around a bent tube (1), especially over a joint weld (4) around the tube (1) in order to reinforce the tube (1), wherein said compression joint comprises a first sleeve (5), the inner (10) surface of which is formed to fit closely around the tube (1) at the point of reinforcement, said sleeve (5) being divided into at least two parts (6) along the axial direction, said first sleeve (5) having an outer, arcuate surface (11), a second sleeve (9) with a corresponding inner, arcuate surface, said second sleeve (9) being divided into at least two parts along the axial direction and being rotatably arranged about said first sleeve (5), the outer surface of said second sleeve (9) receiving a winding (14, 15) comprising several layers of strip or wire of memory metal, said strip or wire, before being wound about the second sleeve (9) at a temperature below the transition temperature of the memory metal, being stretched to a suitable length to bring about a desired compressive stress in the joint after winding around the second sleeve (9) and a subsequent increase of the temperature of the winding above the transition temperature.

5,464,259
DOOR LATCH ASSEMBLY WITH MELTABLE FUSE MECHANISM

Richard B. Cohrs, and Gerald E. Mader, both of Indianapolis, Ind., assignors to Von Duprin, Inc., Indianapolis, Ind.

Filed Jun. 1, 1993, Ser. No. 70,065

Int. Cl.[6] E05B *65/10*

U.S. Cl. 292—92 **6 Claims**

1. A latch assembly for a fire door, the fire door having a pushpad for emergency exit, with the pushpad being connected to an extended rod to transfer motion of the pushpad to the latch assembly, the latch assembly comprising:

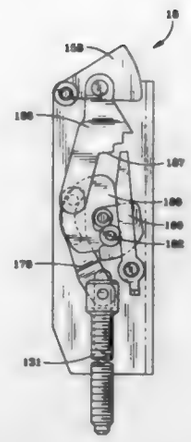
a platform attached to the fire door;

an input wheel rotatably connected to the platform;

a rod connector attached between the rod and the input wheel to rotate the input wheel in response to movement of the rod and connected pushpad;

a linkage assembly coupled to the input wheel to move a latch bolt as the input wheel is rotated;

a deadlock arm assembly pivotally attached to the platform and positioned to block movement of the linkage assembly; and



a fire fuse assembly attached to the linkage assembly to move the deadlock arm assembly out of position to block movement of the linkage assembly, with the fire fuse assembly configured to melt at temperatures substantially above normal room temperature to prevent movement of the deadlock arm out of a position blocking movement of the linkage assembly, the fire fuse assembly having a pin partially disposed within a meltable element, the meltable element connected to the input wheel for rotating movement of the pin and the meltable element with the input wheel, with the pin being positioned to engage and move the deadlock arm assembly as the pin is rotated to prevent blocking obstruction of the linkage assembly by the deadlock arm assembly.

5,464,260
ELECTROMECHANICAL DRIVE FOR A MOTOR-VEHICLE POWER DOOR LATCH

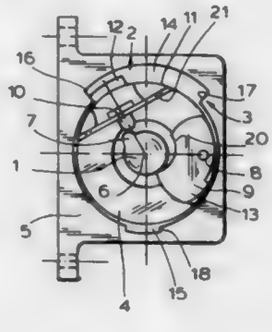
Peter Bartel, Hattingen, and Hans-Joachim Büscher, Düsseldorf, both of, Germany, assignors to Kiekert GmbH & Co. Kg, Heiligenhaus, Germany

Filed Nov. 23, 1993, Ser. No. 156,476

Claims priority, application Germany, Feb. 27, 1993, 43 06 212.1

Int. Cl.[6] E05C *3/06*

U.S. Cl. 292—201 **8 Claims**



1. In combination with a reversible electric motor and with a motor-vehicle door latch having an input member movable between a locked position and an unlocked position, a drive comprising:

a housing having an inner surface formed relative to a main axis traversing the housing with two angularly offset and radially inwardly open notches;

a shaft rotatable in the housing about the main axis and having a radially outwardly projecting bump;

a wheel rotatable in the housing about the main axis, surrounding the shaft in the housing, and connected to the input

member of the latch to rotate jointly with the input member between the locked and unlocked positions;

a lobe on the wheel projecting radially outward into one of the notches, the one notch having a front end surface engaging the lobe in the unlocked position of the wheel and member and a rear end surface engaging the lobe in the locked position of the wheel and member;

a radially outwardly deflectable abutment on the wheel angularly engageable with the bump of the shaft;

a spring urging the abutment radially inward on the wheel, whereby the bump can angularly engage the abutment and angularly displace the wheel when the wheel is not blocked by engagement of the lobe against one of the end surfaces, the spring having such a force that when the wheel is blocked by engagement of the lobe against a one of the end surfaces the bump can outwardly deflect the abutment and move angularly past it; and

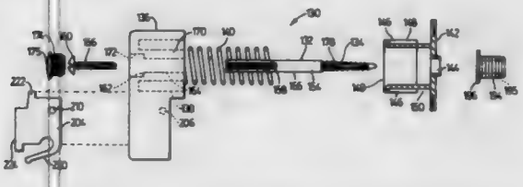
a rocker pivotal on the wheel about a rocker axis generally parallel to the main axis, angularly offset from the abutment, and having an end offset angularly from the rocker axis and formed with an outwardly directed tooth engageable in the other notch only in the locked position of the wheel, the rocker having an inner surface engageable with the bump, the bump and inner surface being dimensioned such that, when the wheel is in the locked position, engagement of the bump with the end of the rocker forces the tooth radially outward into the other notch and thereby angularly blocks the wheel in the housing.

5,464,261

LOCK FOR SLIDING DOORS AND WINDOWS

Boulos Alkhoury, 77 Carleton Place, Brampton, Ontario, Canada

Filed May 20, 1994, Ser. No. 246,449
Int. Cl.[6] E05C 5/04
U.S. Cl. 292—251 **23 Claims**



1. A locking mechanism for securing a glass panel unit comprising:

an elongate fastener having a forward end section with a securing device provided thereon and a rear end section, said fastener including means for rotating same about its central axis mounted on said rear end section and means for adjusting the length of said fastener from said rotating means to the forward end thereof;

means for rotatably mounting said fastener in a support frame so that said fastener extends through a hole in said support frame; and

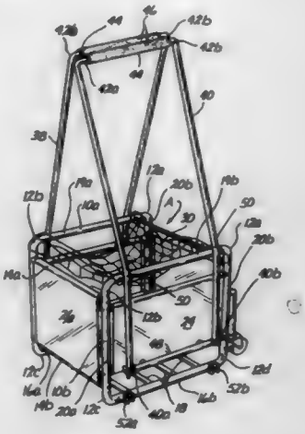
an anchor device with an aperture adapted for mounting fixedly in said glass panel unit, said aperture being capable of receiving said forward end section of said fastener whereby said glass panel unit is secured against movement when said forward end section is in said aperture and said securing device is engaged with said anchor device by rotation of said fastener.

5,464,262

BALL COLLECTOR RECEPTACLE AND DISPENSER

James Madrazo, 11846 Terracina La., Fontana, Calif. 92335

Filed Jun. 9, 1994, Ser. No. 257,282
Int. Cl.[6] A63B 47/02
U.S. Cl. 294—19.2 **11 Claims**



1. A ball retrieving and storage receptacle for picking up, retaining and providing an dispenser for compressible balls, said receptacle comprising:

a rectangular retainer, said retainer being formed of a pair of substantially rectangular tubular frames, each frame having first and second tubular side members and top and bottom tubular members joined at their ends to the ends of the side members, said frames being in opposed parallel register and spaced from each other by a first predetermined distance and fixedly secured parallel to each other with such spacing by pairs of first rigid parallel tubes spaced from each other one above the other, and extending between the opposed frames, and secured to said frames adjacent the top and bottom tubular members of the frames, respectively;

a plurality of parallel second rigid parallel tubes extending between the bottom members of the frames, adjacent second tubes being spaced from each other by a distance slightly less than the diameter of the compressible balls, whereby the balls, when slightly compressed, may pass between a pair of adjacent second rigid tubes;

first planar retainer web means extending between each pair of first rigid tubes, said first retainer web means serving to prevent the passage of balls through the spacing separating the upper and lower first rigid tubes;

a third upper tube and a third lower tube spaced from and extending parallel to each other between the side members of each rectangular frame, the third upper tube being adjacent the top member of a tubular frame and the third lower tube being adjacent the lower member of a tubular frame;

second retainer means extending between a pair of third upper and lower tubes, said second retainer means serving to prevent the passage of balls through the spacing between the third upper and lower tubes extending between the side members of a tubular frame;

a rod extending between the side members of each frame, and fixedly secured to a third lower tube;

a pair of carriers, each of said carriers being formed of a pair of substantially parallel rigid rectilinear elongated elements spaced from each other by a distance less than the linear dimension of each of the top and bottom members of the frames, each of said elements having a first end and a second end, and a dimension substantially in excess of the height of the side members of the frame, each of said elements of the carrier pair having a first end pivotally attached to one of said rods, and each of said elements having its second end connected to the second end of the other element by a transverse member to form therewith a handle; whereby, each carrier may pivot between a first position above the rectangular retainer, and a second opposite position below the retainer in

which latter position the retainer is supported above any horizontal surface in which the retainer may be placed;

and a pair of wheeled casters secured parallel to each other for swivelling and rolling adjacent the lower ends of opposite side members of the frames, the bottoms of the wheel of each caster being disposed no lower than a plane passing through the bottom members of the frames;

whereby, when the rectangular retainer is tilted onto the wheels of both casters, the retainer may be pulled over a horizontal surface on the said wheels.

5,464,263

VACUUM ADSORBER

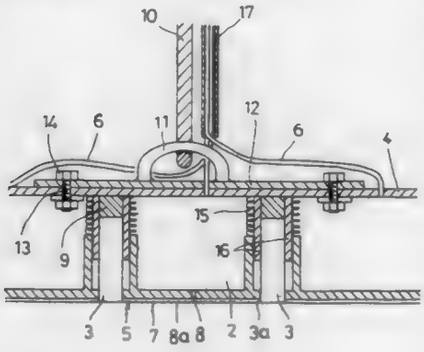
Nishiguchi Hidetsugu, 22-28, Kawasaki 2-chome, Ise-shi, Mie, and Nishiguchi Kenji, Mie, both of, Japan, assignors to Nishiguchi Hidetsugu, Mie, Japan

Filed Oct. 28, 1994, Ser. No. 331,092

Claims priority, application Japan, Aug. 17, 1994, 6-193447

Int. Cl.[6] B25J *15/06*; **B66C** *1/02*

U.S. Cl. 294—64.1 **2 Claims**



1. A vacuum adsorber comprising:

a base;

an adsorption member attached to said base and made from an elastic material so as to have a vacuum cavity with an opening on a side opposite to said base;

a slider having a friction face and a periphery sliding along a side wall of said vacuum cavity;

a spring member provided within said vacuum cavity for biasing said slider toward said opening;

a vacuum tube for connecting said vacuum cavity to a vacuum source; and

a through-hole provided on said friction face for allowing fluids to enter said vacuum cavity.

5,464,264

PICKUP-TRUCK CARGO BED, CONVERTIBLE FROM FULLY OPEN TO PARTIALLY ENCLOSED

Raymond T. Wilson, 3 Lincoln Ct., Amesbury, Mass. 01913-3311

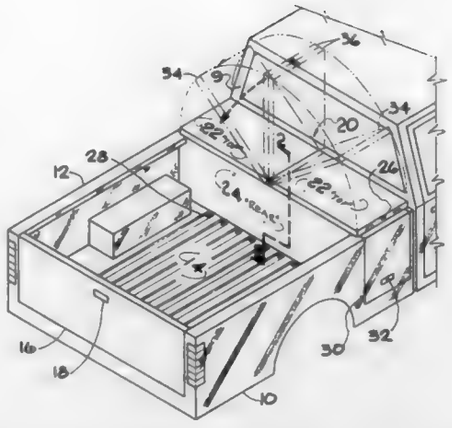
Filed Aug. 1, 1994, Ser. No. 283,687

Int. Cl.[6] B60R *9/00*

U.S. Cl. 296—37.6 **8 Claims**

1. In a pickup truck with a frame, cab, and drive train of conventional construction, and a cargo bed comprising a pair of substantially vertical, longitudinally extending side walls, a substantially vertical, laterally extending front wall longitudinally rearwardly spaced from the rear wall of said cab, and a substantially horizontal, laterally and longitudinally extending floor panel; the improvement wherein said cargo bed is constructed to be convertible from a fully-open position to a partially-enclosed position and back again, and in said partially-enclosed position has:

(a) an approximately vertical rear panel, extending substantially between said side walls and from said floor panel to the upper



edges of said side walls, and longitudinally rearwardly spaced from said front wall by a distance approximately equal to the vertical distance from said floor panel to the upper edges of said side walls;

(b) a substantially horizontal, laterally extending lid assembly which rests on the upper edges of said front wall and of said side walls and of said rear panel of said cargo bed; and

(c) an upwardly facing concavity in said floor panel, said concavity having a bottom wall substantially below the lowermost downwardly facing surface of said floor panel; substantially between said side walls, and substantially between said front wall and said rear panel; so that

(d) said rear panel, said lid assembly, and said concavity, together with said side walls and said front wall of said cargo bed, form an enclosed storage compartment when said cargo bed is converted to said partially-enclosed position, and

(e) said lid assembly and said rear panel are capable of being relocated between purpose-made locations in said cargo bed, to accomplish the conversion of said cargo bed from said partially-enclosed position to said fully-open position, or vice versa.

5,464,265

REAR-WINDOW PANE FOR CONVERTIBLES

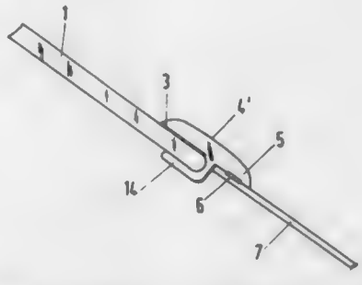
Ludger Hemmis; Matthias Overberg, both of Osnabrück, and Burkhard Schröder, Sassenberg, all of, Germany, assignors to Wilhelm Karmann GmbH, Osnabruek, Germany

Filed Apr. 14, 1994, Ser. No. 227,808

Claims priority, application Germany, Apr. 29, 1993, 9306462 U

Int. Cl.[6] B60J *7/12*

U.S. Cl. 296—146.14 **9 Claims**



1. A folding convertible top for a vehicle, said folding convertible top having an opening defined by a marginal edge portion, a window pane of solid glass disposed in said opening, said glass having an outer edge section, a plastic connecting element extended between said marginal edge portion of said convertible top and said outer edge section of said glass, said connecting element having a U-shaped channel, said outer edge section of said

glass being received in said U-shaped channel, securing means securing said plastic connecting element to said marginal edge portion of said convertible top, and affixing means affixing said plastic connecting element to said outer edge section of said glass, whereby said glass is thereby sealingly secured to said convertible top.

5,464,266

MOTOR VEHICLE WITH A STIFF FLOOR STRUCTURE

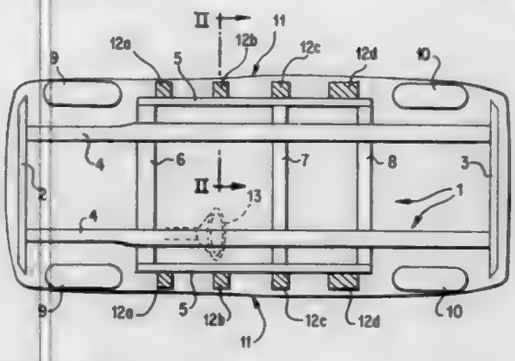
Dieter Guertler, Stuttgart, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany

Filed Aug. 5, 1994, Ser. No. 286,223

Claims priority, application Germany, Aug. 5, 1993, 43 26 270.8

Int. Cl.[6] B60R *27/00*

U.S. Cl. 296—189 **8 Claims**



1. Motor vehicle comprising:

a front bumper and a rear bumper disposed at a common bumper height,

a stiff, generally rigid floor structure disposed at the common bumper height and including at least one longitudinal member connecting the front and rear bumper and a plurality of transverse stiffener members spaced longitudinally with respect to one another and extending transversely outwardly of said at least one longitudinal member,

vehicle side body parts laterally bounding a passenger compartment supported at the floor structure, and

a plurality of energy absorbing impact elements disposed in said vehicle side body parts at said common bumper height and distributed along a length of the passenger compartment immediately adjacent to the stiff floor structure,

whereby said impact elements contribute to transverse stiffness of the vehicle by absorbing the impact energy and transferring collision forces to the floor structure.

5,464,267

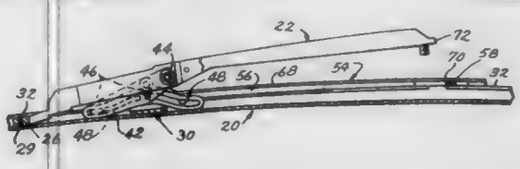
STABLE LIFT MECHANISM FOR SPOILER SUN ROOF PANEL

Lloyd G. Racine, Shelby Township; James F. Feldpausch, St. Clair Shores, and Ronald M. Fantin, Rochester, all of Mich., assignors to Webasto Sunroofs, Inc., Rochester Hills, Mich.

Filed Apr. 18, 1994, Ser. No. 229,752

Int. Cl.[6] B60J *7/047*

U.S. Cl. 296—216 **22 Claims**



1. A sun roof assembly for an opening in a vehicle roof comprising

a stationary frame assembly adapted to be mounted on the vehicle roof below the opening therein including an elongated fore and aft extending track on each side of said opening,

a mounting arm associated with each track,

a sun roof panel of a size to close the opening fixedly mounted on said mounting arms,

a forward slide member slidably mounted in each track for sliding movement between a forward closed or vented position and a rearward open position thereon,

each of said mounting arms having a forward end thereof connected to the associated forward slide member for pivotal movement with respect thereto about a transverse horizontal axis between closed and vented positions when the associated forward slide member is in the forward position thereof and for movement with the associated forward slide member between the forward and rearward positions thereof when the associated mounting arm is in the vented position thereof with respect to the associated forward slide member so that the sun roof panel mounted on said mounting arms is disposed (1) in closing relation with said opening when said mounting arms are in the closed position thereof, (2) in inclined venting relation with the opening when said arms are in the vented position thereof and said forward slide members are in the forward position thereof, and (3) in an opening relation with respect to the opening when said mounting arms are in the vented position thereof and said forward slide members are in the rearward position thereof,

a pair of cooperating lift members associated with each track rearwardly of the forward slide member,

each pair of cooperating lift members including a sliding member mounted in stable sliding relation on the associated track for rearward and forward movements with respect thereto between closed, vented and open positions and a pivoting member pivotally connected to an intermediate portion of the associated mounting arm,

each pair of cooperating lift members having spaced first and second sliding connections therebetween constructed and arranged so that when the sliding member is moved between the closed and vented positions thereof the associated pivoting member is stably moved to pivot the associated mounting arm about the pivotal axis of the associated forward slide member between the closed and vented positions of the associated mounting arm,

a locking member associated with each track, said locking members being constructed and arranged to be moved between a locking position disposed in locking relation with a rearward portion of the associated mounting arm in the closed position thereof and a releasing position enabling the associated mounting arm to be moved out of the closed position thereof,

a moving mechanism movable in opposite directions between locking and open positions,

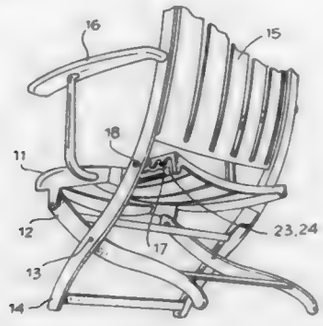
said forward slide members, said sliding members and said locking members being constructed and arranged with respect to said moving mechanism so that (1) said locking members are moved between the locking and releasing positions thereof when said moving mechanism is moved between said locking position and an intermediate releasing position, (2) said sliding members are moved between the closed and vented positions thereof when said moving mechanism is moved between an intermediate closed position and an intermediate vented position to cause the pivoting members to pivot the mounting arms between the closed and vented positions thereof, and (3) the sliding members and forward slide members with the mounting arms in the vented position thereof are moved together between the vented and open positions thereof when said moving mechanism is moved between the intermediate vented position thereof and the open position.

5,464,268

ADJUSTABLE DECK-CHAIR WITH SPRING POSITIONING MEANS

Stefano Levrangi, Vestone, Italy, assignor to Fast S.p.A., Nozza de Vestone, Italy

Filed Aug. 23, 1993, Ser. No. 110,384
Claims priority, application Italy, Jul. 27, 1993, BS92U0080
Int. Cl.[6] A47C *4/26*
U.S. Cl. 297—57 **7 Claims**



1. A folding deck-chair, comprising a seat, a back and additional structure cooperating with said seat and back to provide a seat frame, one of said seat, back and said additional structure of said frame providing a first engaging part and another of said seat, back and additional structure of said frame providing a second engaging part;

rack toothings provided in two vertically disposed portions formed in or applied to two opposite sides of said first engaging part;

a locking pin provided on each of two opposite sides of said second engaging part, said locking pin passing through corresponding said rack toothings to establish one of various different positions of said back and said seat, corresponding to different positions of use of the deck-chair;

guide means for guiding said locking pin in a region adjacent to said rack toothings and for preventing displacement of said toothings away from said locking pin, said guide means including a guide groove provided adjacent to said toothings and following a contour of said toothings and a top spring element carried by said locking pin, said top spring element passing into said guide groove and following said guide groove, said spring element exerting a force urging said spring element into said guide groove, in a direction substantially perpendicular to said vertically disposed portions.

5,464,269

UPHOLSTERED FURNITURE AND MOVABLE HEADREST

Ned W. Mizelle, P.O. Box 5985, High Point, N.C. 27262

Filed Oct. 12, 1993, Ser. No. 134,793
Int. Cl.[6] A47C *1/02*
U.S. Cl. 297—61 **38 Claims**

1. A headrest support for a furniture seating unit having a frame, said headrest support comprising,

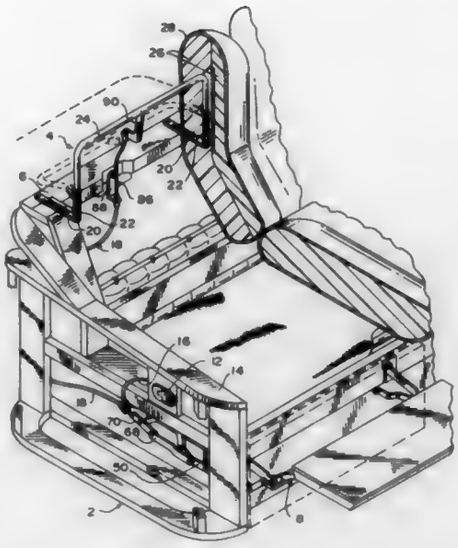
mounting means for attaching said headrest support to an upper portion of the frame,

a pair of laterally spaced helical springs each having an upper end portion and a lower end portion, said lower end portions of the springs being mounted on the mounting means,

a headrest frame mounted on the upper end portions of the springs, said springs supporting the headrest frame for rearward movement from a generally vertical raised position to a generally horizontal lowered position, said springs resiliently biasing the headrest frame to said raised position,

said springs having a stiffness which prevents movement of the headrest frame to said lowered position in response to forces exerted thereon by a seated occupant's head, said springs having a stiffness which permits movement of the headrest frame from its raised position to its lowered position in response to forces which are greater than forces exerted on the headrest frame by a seated occupant's head, and

releasable means for retaining said headrest frame in its lowered position.

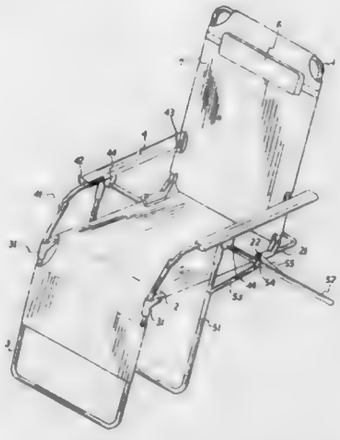


5,464,270

STAGELESS FOLDING DECK CHAIR

Chang I-Shan, No. 184, Pu Tzpeu Wan-Chao Tsun, Chu-Chee Hsiang, Chia-Yi Hsien, Taiwan, Prov. of China

Filed Jul. 29, 1994, Ser. No. 281,992
Int. Cl.[6] A47C *1/02*
U.S. Cl. 297—81 **1 Claim**



1. A stagelessly folding deck chair comprising a back frame, a seat frame, a leg frame, two adjusting armrests, a support frame, a pillow and support sheets, wherein:

said back frame, seat frame and leg frame are all composed of circular tube members and said leg frame is pivotally connected with a front end of the seat frame by two pivot brackets, said seat frame being U-shaped, having two rear fixing brackets each having a flange section on which a lower end of said back frame is pivotally connected;

each of said adjusting armrests being a rectangular tube member, having a lateral slide groove and a rear engaging channel;

said support frame having a front portion and a rear portion which are both U-shaped and respectively connected with each other by two first linking levers, a pivot seat being

disposed under each of said armrests for pivotally connecting said front portion and rear portion of said support frame with said armrests,

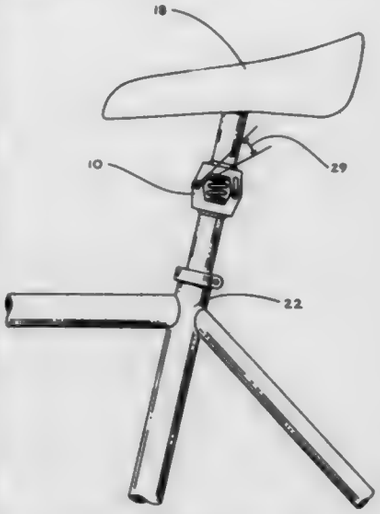
said front and rear portion of said support frame standing on the ground with a first end of each of said first linking levers pivotally connected with a section of said front portion and a second end of each of said first linking levers pivotally connected with a substantially U-shaped locking block, an end of said locking block being integrally formed with a first end of a second linking lever, said first end of the second linking lever being pivotally connected to said seat frame on each of said two rear fixing brackets, and a second end of said second linking lever being pivotally connected with a lower section of said rear portion of said support frame, a U-shaped portion of each said locking block snugly abutting against said rear portion of said support frame when fully opened, an adjusting rod being disposed in said slide groove of each of said armrests, said adjusting rod having a front end which is slightly bent downward pivotally connected to said leg frame at a point vertically spaced from said pivot brackets and a rear end pivotally connected with a section of said back frame, whereby when said adjusting rod slides rearward in said slide groove, said each of first linking lever and said second linking lever holds said support frame fully open to allow inclined angles of said back frame, seat frame and leg frame to be simultaneously stagelessly adjusted to convert the chair into a lying state for stably bearing the weight of a user.

5,464,271

BICYCLE SEATPOST WITH PIVOTAL SUSPENSION

Ryan J. McFarland, 120 Mt. Rushmore Rd., Custer, S. Dak. 57730

Filed Apr. 4, 1994, Ser. No. 222,641
Int. Cl.[6] B62J *1/02*
U.S. Cl. 297—209 **4 Claims**



3. A bicycle seatpost with an integrated pivotal suspension system comprising:

(1) a lower piece having a bottom end and a top end, the bottom end having means for mounting the lower piece to a seatpost acceptor on the frame of a bicycle, said top end of the lower piece having a forward face adapted to be nearest the front of the bicycle and a rearward face adapted to be away from the front of the bicycle, the forward face of the top end of said lower piece having two aligned holes adapted to be perpendicular to the plane of the bicycle frame, the rearward face of said top end of said lower piece having two aligned holes adapted to be perpendicular to the plane of the bicycle frame;

(2) an upper piece having a bottom end and a top end, the top end adapted for attaching a bicycle seat said bottom end of, the upper piece having a forward face adapted to be nearest the front of the bicycle and a rearward face adapted to be away from the front of the bicycle, the forward face of the bottom end having a hole adapted to be perpendicular to the plane of the bicycle frame and alignable with said holes in said forward face of said lower piece, the rearward face of said bottom end of said upper piece having a vertical slot adapted to be perpendicular to the plane of the bicycle frame and alignable with said holes in said rearward face of said lower piece;

(3) a pivot pin inserted through said holes in said forward face of said top end of said lower piece and said hole in said forward face of said bottom end of said upper piece joining said lower piece and said upper piece and allowing said upper piece to rotate about the pivot pin within the plane of the bicycle frame;

(4) a spring having its longitudinal axis extending vertically, the spring interposed between said upper piece and said lower piece, the top of said spring abutting said bottom end of said upper piece and the bottom of said spring abutting said top end of said lower piece;

(5) holding means to hold said spring in the vertical, interposed position; and

(6) a travel limiting pin inserted through said holes in said rearward face of said lower piece and said slot in said rearward face of said bottom end of said upper piece such that forward rotational travel of said top end of said upper piece is limited to the point where said upper piece is aligned with said lower piece, and such that said top end of said upper piece may rotate rearward until the limit of said slot is reached;

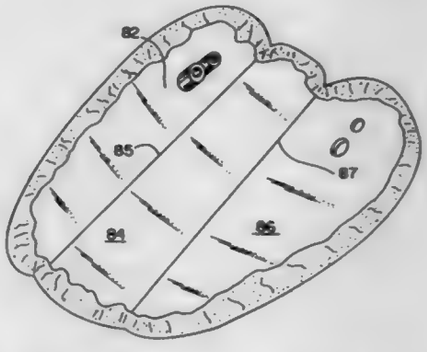
whereby when the seatpost is mounted on a bicycle and a seat mounted on the seatpost and the bicycle hits a bump a rider is cushioned from the effects of the bump by the spring and the seat is maintained in a stable riding position.

5,464,272

ARMREST

David J. Spykerman, Wyoming; Gerald M. DeShaw, Holland; Michael J. Gregg, and Randy E. Eldred, Holland, all of Mich., assignors to Prince Corporation, Holland, Mich.

Division of Ser. No. 975,471, Nov. 12, 1992, Pat. No. 5,395,161. This application Sep. 8, 1994, Ser. No. 303,160
Int. Cl.[6] A47C *31/00*
U.S. Cl. 297—227 **8 Claims**



1. An armrest for a vehicle such as an automobile comprising:

a first concave, molded core section defining a first sidewall of an armrest;

a second concave, molded core section defining a top of an armrest;

a third concave, molded core section defining a second sidewall of an armrest wherein said first, second and third core sections extend substantially the entire length of the armrest defined by said sections;

an upholstery covering for covering the outer surfaces of said first, second and third core sections and extending around at

least a pair of abutting peripheral edges of said first, second and third core sections to be clamped in place when said first, second and third core sections are placed into abutting relationship; and

means for holding said first, second and third core sections together.

5,464,273

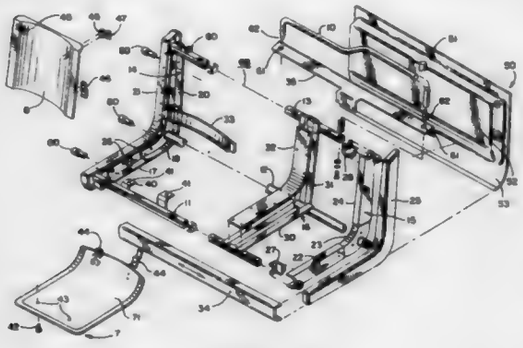
SEAT CONSTRUCTION

Makoto Sera, 2760-21, Izumicho, Izumi-ku, Yokohama, Kanagawa Pref., Japan, assignor to Kotobuki Seating Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 47,701, Apr. 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 729,947, Jul. 15, 1991, abandoned. This application Nov. 30, 1994, Ser. No. 346,844

Int. Cl.[6] A47C *15/00*

U.S. Cl. 297—232 **16 Claims**



1. A seat construction comprising:

a composite inner/outer frame and at least two seat pans each having bottom and back portions and secured to the composite inner/outer frame, said composite inner/outer frame including an inner frame and an outer frame;

said inner frame having an inner frame front horizontal straight cross member located at a position corresponding to front ends of the bottom portions of the seat pans; an inner frame back top horizontal straight cross member located at a position corresponding to top ends of the back portions of the seat pans, and formed independently from said inner frame front horizontal straight cross member; an inner frame intermediate horizontal straight cross member located at a position corresponding to the juncture of the bottom portion and the back portion of each seat pan, and formed independently from said inner frame front and intermediate horizontal cross members, wherein said inner frame intermediate horizontal straight cross member is a straight tubular member; a first boomerang-shaped inner frame side member formed independently from said inner frame horizontal straight cross members, and joined to one end of each of said inner frame cross members; a second boomerang-shaped inner frame side member formed independently from said inner frame cross members and said first boomerang-shaped inner frame side member, and joined to the opposite end of each of said cross members; and an intermediate inner frame member formed independently from said cross members and said side members, and joined to said cross members at substantially mid-way between their opposite ends the opposite ends of said inner frame intermediate horizontal straight cross member passing through the corresponding first and second boomerang-shaped inner frame side members, and welded to outer side surfaces of the corresponding first and second boomerang-shaped inner frame side members;

said outer frame having a pair of outer frame boomerang-shaped side members formed independently from each other and secured to said first and second inner frame boomerang-shaped side members; to encase peripheries of said inner frame side members; a front outer frame cross member formed independently from said paired outer frame boomerang-shaped side members, encasing a periphery of said inner frame front horizontal straight cross member, and secured at its opposite ends to front ends of the outer frame side members; a top outer frame cross member formed independently from said paired outer frame boomerang-shaped side members and said front outer frame cross member, covering a periphery of said inner frame back top horizontal straight cross member, and secured at its opposite ends to top ends of the outer frame side members; and intermediate outer frame brace member formed independently from said paired outer frame boomerang-shaped side members and front and top outer frame cross members, covering a periphery of said intermediate inner frame member, and secured to said intermediate inner frame, whereby said inner frame and outer frame members cooperate to provide a unitary composite inner/outer frame for supporting a load applied to said seat construction.

5,464,274

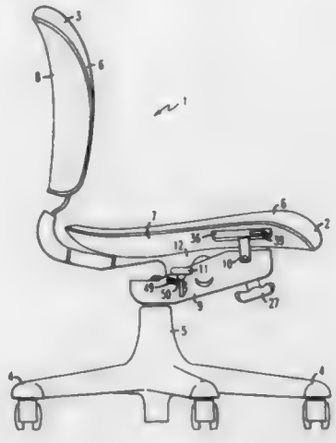
CHAIR SEAT TILT ADJUSTMENT AND LOCKING MECHANISM

Arkady Golynsky, Allentown, and Donald A. Wimmer, Upper Hanover, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 13, 1994, Ser. No. 182,816

Int. Cl.[6] A47C *1/02*

U.S. Cl. 297—328 **6 Claims**



1. A chair tilt control mechanism for a pedestal base chair comprising a chair control housing mounted on a pedestal chair base and pivotally supporting a chair seat support member, the chair seat support member having a front flange portion provided with a plurality of laterally spaced tabs, a laterally movable front stop member retained within the chair control housing adjacent the front flange portion of the chair seat support member, the laterally movable front stop member having an upper set of laterally spaced bearing surfaces separated by a lower set of laterally spaced bearing surfaces, means to laterally move the front stop member whereby either the upper set or the lower set of laterally spaced

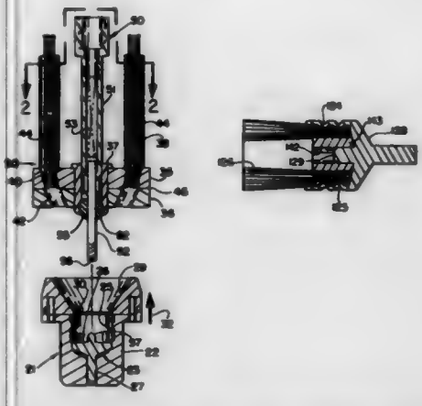
bearing surfaces of the movable front stop member are laterally aligned and in contact with the laterally spaced tabs of the front flange portion, and means to lock the laterally spaced tabs of the front flange portion against either the upper set or the lower set of laterally spaced bearing surfaces of the front stop member.

5,464,275

END BRUSH AND METHOD OF MAKING

Robert L. Altemare, Parma, and Joseph Sigal, South Euclid, both of Ohio, assignors to Jason, Inc., Cleveland, Ohio

Filed Dec. 11, 1992, Ser. No. 989,150
Int. Cl.[6] A46D *1/08*
U.S. Cl. 300—21 **23 Claims**



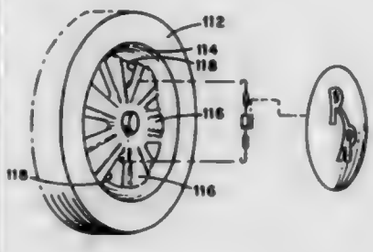
1. A method of making a cup brush comprising the steps of supporting a cup holder having a bottom and a circular wall terminating in a rim, forming and driving a hollow cylindrical bundle of fill material to the bottom of the cup, distributing the bundle uniformly against the cup wall and symmetrically around a center core with substantially all of the tips of the fill material engaging the cup holder bottom, and deforming the cup wall inwardly against the uniform symmetrical bundle and directly against the core to lock the fill material in place between the deformed cup wall and core about the axis of the cup.

5,464,276

ACCESSORY ASSEMBLY FOR A VEHICLE WHEEL

Roderick L. Ott, 790 N. Cedar Bluff Rd., Apt. #2907, Knoxville, Tenn. 37923

Filed Jan. 3, 1994, Ser. No. 176,776
Int. Cl.[6] B60B *7/06*
U.S. Cl. 301—37.34 **14 Claims**



1. A wheel cover assembly for attachment to a vehicle wheel having means including a rim about which a tire is mounted and wherein the rim-including means includes a center which corresponds with the axis of wheel rotation, the assembly comprising:

a cover plate including two opposite inner and outer faces, the outer face bearing indicia, and the cover plate being positionable adjacent the rim-including means of a vehicle wheel so that the inner face of the plate generally faces the rim-including means; and

securement means for attaching the cover plate to the rim-including means of the vehicle wheel and including tension means which are connectable to the vehicle wheel and which span at least a fraction of the rim-including means when connected thereto; and

the tension means having a length which is adjustable to accommodate the attachment of the securement means to the rim-including means of wheels at locations thereon wherein the distance that the attachment locations of one of such wheel rim-including means is spaced from its corresponding center is different from the distance that the attachment locations of the other of such wheel rim-including means is spaced from its corresponding center; and

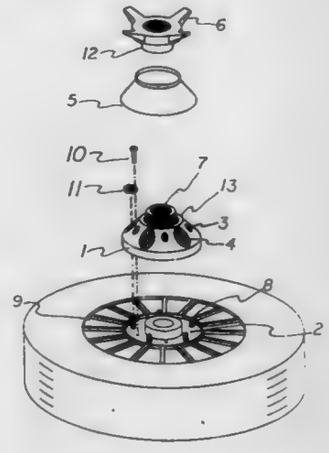
the rim-including means of the vehicle wheel includes a hub cap, and the securement means is connectable to the hub cap for attaching the cover plate to the wheel rim-including means.

5,464,277

ADAPTOR HUB FOR AUTOMOTIVE WHEEL ORNAMENTS

Kevin D. Redd, 231 River Bend Rd., Dawsonville, Ga. 30534

Filed Jan. 18, 1994, Ser. No. 183,481
Int. Cl.[6] B60B *7/06*
U.S. Cl. 301—108.4 **8 Claims**



1. An adapter hub for automotive wheel ornaments, the adapter hub covering the center portion of the wheel and comprising:

an adaptor hub attachment means for attaching the adaptor hub to a wheel, the attachment means comprising a plurality of openings for threaded fasteners, the threaded fasteners engaging internal threads in the automotive wheel;

a plurality of lug openings having through diameters sufficiently large wherein a wheel lug nut can be inserted and torqued through the lug openings for engaging a wheel to a wheel brake assembly;

a wheel ornament attaching means for attaching a wheel ornament to the hub; and

an adaptor hub cover.

5,464,278

FLUID CONTROL SYSTEM FOR TRACTOR TRAILER BRAKE SYSTEM

John J. Camm, 4 Melrose Ave., East Malvern, Victoria, 3145, Australia, assignor to John J. Camm; James O. Camm, and Stephen J. Camm, all of, Australia

PCT No. PCT/AU93/00292, § 371 Date Feb. 22, 1994, § 102(e) Date Feb. 22, 1994, PCT Pub. No. WO94/00326, PCT Pub. Date Jan. 6, 1994

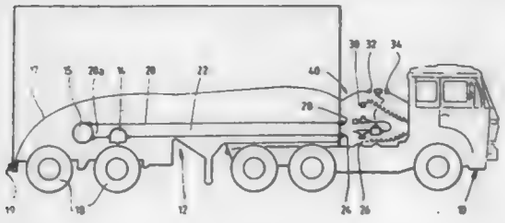
PCT Filed Jun. 18, 1993, Ser. No. 196,158

Claims priority, application Australia, Mar. 5, 1993, PL7657; May 13, 1993, PL8774; Jun. 18, 1993, PL3047

Int. Cl.[6] B60T *17/04*

U.S. Cl. 303—7 **3 Claims**

1. A vehicle brake system for a vehicle which includes a tractor



and a trailer which can be connected to and disconnected from the tractor, said brake system including:

a relay valve for supplying fluid to brakes of the vehicle to activate the vehicle brakes;

a fluid supply coupled to the relay valve so that upon actuation of the relay valve, supply fluid is supplied from the fluid supply via the relay valve to the vehicle brakes to actuate the vehicle brakes;

a control line having a first control line portion which is coupled to the tractor and a second control line portion which is coupled to the trailer, and which is decoupled from the tractor when the trailer is disconnected from the tractor, the first control line portion having a first connector and the second control line portion having a second connector for detachable connection to said first connector so that the first and second control line portions can be coupled together when the trailer is connected to the tractor, the control line being coupled to the relay valve so that upon depression of a brake pedal in the vehicle, a control signal is supplied down the control line to the relay valve to actuate the relay valve; and

fluid supply means for supplying fluid from the fluid supply to the control line to prime the control line when the brake pedal is depressed, the fluid supply means being connected to the control line in the vicinity of the first and second connectors.

5,464,279

HOT COUNTERTOP SELF-SERVICE FOOD STATION

Cindie M. Wells, McFarland; Scott A. Halverson, Poynette, and John A. Jonovic, Madison, all of Wis., assignors to Oscar Mayer Foods Corporation, Madison, Wis.

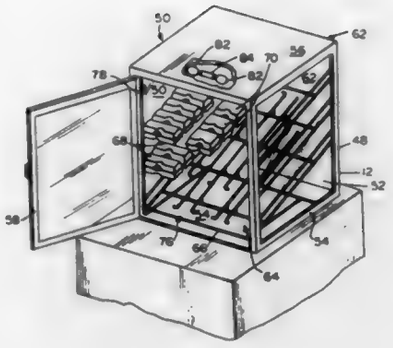
Division of Ser. No. 691,255, Apr. 25, 1991, Pat. No. 5,203,255. This application Apr. 20, 1993, Ser. No. 50,689

Int. Cl.[6] A47F *7/28*; **A47B** *77/08*

U.S. Cl. 312—128 **8 Claims**

1. A display rack for use with peripherally-flanged food packages in heated display oven environments, said display rack comprising:

a generally U-shaped outer frame including a base portion and a pair of spaced and opposed upstanding sidewalls, said outer frame including a front side and a rear side, said rack further including a plurality of shelfs extending between said upstanding sidewalls at spaced apart locations, each said shelf being angled with respect to the base portion and canted so that each shelf slopes downwardly from the rear side to the front side of said frame, each shelf including a plurality of pairs of opposing, spaced-apart mounted guide rails, said said



pair of guide rails defining a product-receiving column adapted to slidably receive and support a package having a flanged portion and a forward edge solely by means of its said flanged portion in a forwardly-urged, gravity fed manner, said pair of guide rails including at least one forward hook stop portion disposed adjacent the front side of the frame and positioned to engage said forward edge of said package at a recessed position under the flanged portion of the package so that substantially no exposed heated rack surfaces are presented at the front side of the rack adjacent a package to be removed, said rack further including means for mounting said pairs of guide rails to each said shelf means; and some of the mounting means including means for adjusting the spacing between the opposing guide rails of a given pair to thereby selectively vary the width of the product-receiving column of that pair of guide rails to receive an alternative flanged package having an alternate width.

5,464,280

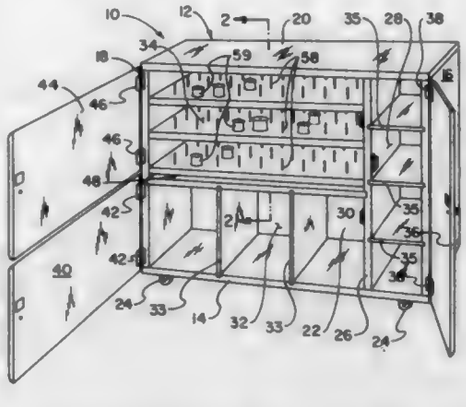
SEWING ARTICLE STORAGE APPARATUS

Richard D. Runger, 347 W. 870 North, Sunset, Utah 84015

Filed Dec. 16, 1993, Ser. No. 167,166

Int. Cl.[6] A47B *91/00*

U.S. Cl. 312—249.11 **3 Claims**



1. A new and improved sewing article storage apparatus, comprising:

a housing assembly which includes a bottom wall, a first side wall and a second side wall supported by said bottom wall, a top wall supported by said first side wall and said second side wall, and a back wall connected to each of said walls,

a set of wheels connected to said bottom wall for supporting said housing assembly and permitted said housing assembly to be readily moved along a horizontal support surface,

a vertical partition, supported by said bottom wall, extending between said bottom wall and said top wall within said housing assembly, said vertical partition, said first side wall, said bottom wall, and said top wall defining a first storage region within said housing assembly,

a horizontal partition, supported by said vertical partition and said second side wall, extending between said vertical partition and said second side wall within said housing assembly, wherein said horizontal partition, said vertical partition, said bottom wall, said second side wall, and said back wall define a second storage region, and wherein said horizontal partition, said vertical partition, said top wall, said second side wall, and said back wall define a third storage region,

a first door connected by first hinge assemblies to said first side wall, said first door extending from said first side wall to said vertical partition for covering said first storage region,

a second door connected by second hinge assemblies to said second side wall, said second door extending from said second side wall to said vertical partition for covering said second storage region,

a third door connected by third hinge assemblies to said second side wall, said third door extending from said second side wall to said vertical partition for covering said third storage region,

drawer assemblies located in said third storage region, said drawer assemblies supported by said second side wall and said vertical partition, wherein each of said drawer assemblies includes a plurality of bottom roller assemblies supported by at least one of said second side wall or said vertical partition, and a planar drawer floor member supported by said bottom roller assemblies, and

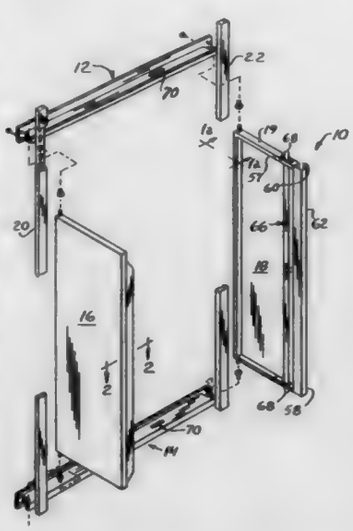
a stop member connected to said drawer floor member for limiting motion of said drawer floor member, wherein said drawer floor member includes a plurality of vertical spike members that project upward from said drawer floor member adapted to store rolls of thread.

5,464,281

QUICK ATTACH DOOR SYSTEM FOR A DOORLESS STORING STRUCTURE

Nicholas Maro, Chicago Heights, Ill., assignor to Viking Metal Cabinet Co., Inc., Chicago, Ill.

Filed Feb. 22, 1993, Ser. No. 20,572
Int. Cl.[6] A47B *47/00*; E06B *3/00*
U.S. Cl. 312—257.1 **13 Claims**



1. A door system for equipping a doorless shelved structure having shelf-supporting apertured uprights, said structure being an open-face cabinet, said system comprising a pair of vertically spaced upper and lower support members, each having a vertically extending face, at least a pair of lug members extending out of said face towards said uprights and intended for engagement with the apertured uprights, said face having a horizontal flange extending in the same direction as the lug members, said horizontal flange terminating in a vertically extending flange to define a channel with said face, said horizontal flange having at each end a pivot hole, each end of the horizontal flange having a cut-out adjacent the respective pivot hole and respective lug member, a pair of door-halves, each door-half at its pivot axis being provided with upper and lower spring pin hinges engageable with respective pivot holes in the upper and lower support members.

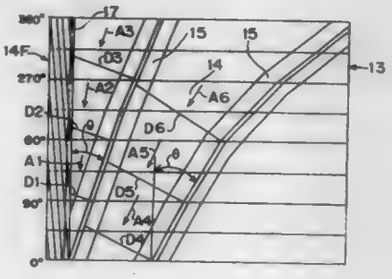
5,464,282

SCREW FOR DOUBLE-SHAFT EXTRUDING DEVICE AND DOUBLE-SHAFT EXTRUDING DEVICE

Toshiro Iwata; Iwami Nagata; Akira Hatakeyama, and Kazuhisa Nishigai, all of Saitama, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 26, 1993, Ser. No. 141,022
Claims priority, application Japan, Jan. 26, 1992, 4-287785; Nov. 16, 1992, 4-328995
Int. Cl.[6] B29B *1/06*
U.S. Cl. 366—83 **12 Claims**

1. A screw for a double-shaft extruding device, comprising:



a shaft; and

a spiral flight provided at an outer peripheral portion of said shaft continuously from a shaft distal end to a shaft proximal end and whose radial height outward from an axis of said shaft is substantially constant, a cross-sectional area of extrusion located between said shaft distal and proximal ends continuously increasing in area from the shaft distal end to the shaft proximal end.

5,464,283

METHOD AND APPARATUS FOR FORMING AND DISPENSING COATING MATERIAL CONTAINING MULTIPLE COMPONENTS

Dennis Davis, Bay Village, Ohio, assignor to Nordson Corporation, Westlake, Ohio

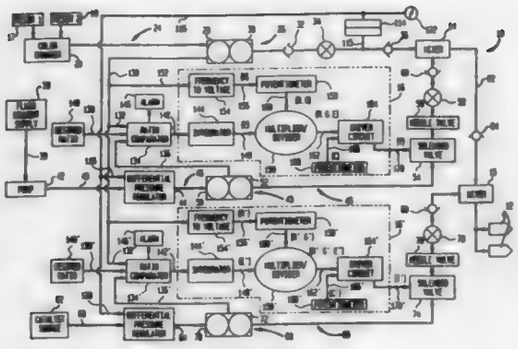
Division of Ser. No. 998,584, Dec. 30, 1992, Pat. No. 5,407,267. This application Mar. 3, 1995, Ser. No. 398,354
Int. Cl.[6] G05D *11/02*; B01F *15/04*
U.S. Cl. 366—152.1 **7 Claims**

1. The method of controlling the relative proportion of a resin and a supercritical fluid within a coating material formulation, comprising:

supplying the resin at a first pressure to a mixer;

supplying the supercritical fluid to the mixer at a pressure which is a function of the first pressure and which is in excess of the critical pressure of the supercritical fluid;

combining the resin and supercritical fluid within the mixer to form the coating material formulation.



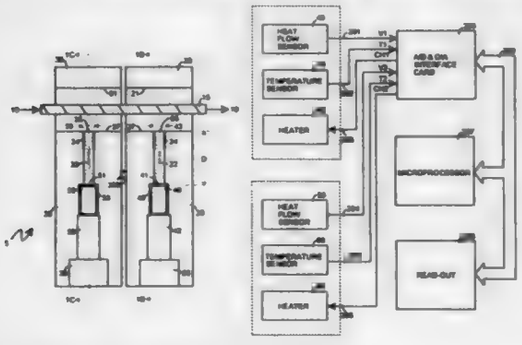
5,464,284

AUTOCALIBRATING NON-CONTACT TEMPERATURE MEASURING TECHNIQUE EMPLOYING DUAL RECESSED HEAT FLOW SENSORS

Dieter L. Rall, Newport Beach, Calif., assignor to Luxtron Corporation, Santa Clara, Calif.

Filed Apr. 6, 1994, Ser. No. 223,631
Int. Cl.[6] G01J *5/08*; G01K *13/06*
U.S. Cl. 374—131 23 Claims

1. A non-contact temperature measuring system for measuring



the temperature of an object, comprising:

first and second reference bodies thermally isolated from each other, each of said first and second reference bodies having a first surface facing said object, and a cavity formed through said first surface;

a first heat flow sensor positioned in said cavity of said first reference body such that said first heat flow sensor substantially only responds to radiation heat flow generated by a temperature difference between said object and said first reference body;

a second heat flow sensor positioned in said cavity of said second reference body such that said second heat flow sensor substantially only responds to radiation heat flow generated by a temperature difference between said object and said second reference body;

first and second temperature sensors for measuring the respective temperatures of said first and second reference bodies; and

means for maintaining a temperature differential between the temperatures of said first and second reference bodies, wherein said cavity of said first reference body is formed such that convection heat flow generated by a temperature differential between said object and said first reference body is substantially prevented from reaching said first heat flow sensor, and said cavity of said second reference body is formed such that convection heat flow generated by a temperature differential between said object and said second reference body is substantially prevented from reaching said second heat flow sensor.

20. A non-contact method of determining the temperature of a moving object, comprising the steps of:

positioning first and second heat flow sensors in respective cavities of first and second reference bodies such that each of said heat flow sensors detects substantially only radiation heat flow from said moving object when said moving object is positioned in a conical line of sight extending out of its respective cavity, wherein said first and second reference bodies have the same form factors with respect to said moving object;

thermally connecting said first and second heat flow sensors to their respective reference bodies such that the temperature of said first heat flow sensor is substantially the same as the temperature of said first reference body, and the temperature of said second heat flow sensor is substantially the same as the temperature of said second reference body;

calibrating said first and second heat flow sensors to a same sensitivity;

applying and maintaining a temperature differential between said first and second reference bodies;

passing said moving object by respective conical lines of sight of said first and second heat flow sensors such that the output voltage of said first heat flow sensor is responsive to a first radiation heat flow generated by a temperature differential between said moving object and said first reference body, and the output voltage of said second heat flow sensor is responsive to a second radiation heat flow generated by a temperature differential between said moving object and said second reference body;

measuring the respective temperatures of said first and second reference bodies; and

calculating the temperature of said moving object from said output voltages of said first and second heat flow sensors, and said temperatures of said first and second reference bodies.

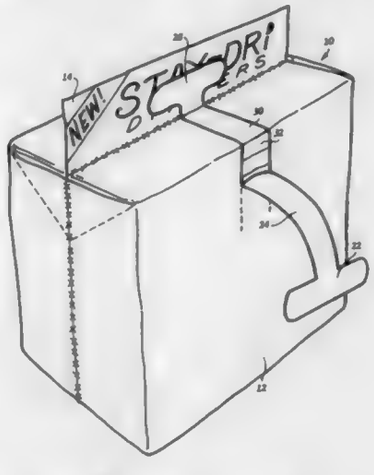
5,464,285

BAG WITH PERFORATED OPENING

Richard F. Anderson, Overland Park, Kans., assignor to Venture Packaging, Inc., Charlotte, N.C.

Filed May 12, 1994, Ser. No. 241,598
Int. Cl.[6] B65D *33/08*
U.S. Cl. 383—10 6 Claims

1. A bag formed of a thin, flaccid material for containing



merchandise and the like, said bag including:

(a) a plurality of walls forming a compartment for receiving and containing said merchandise;

(b) a generally flat flap connected at one of its edges to the exterior surface of one of said walls so as to be capable of extending outwardly therefrom; and

(c) a line of weakness formed in said flap and in said one wall to permit said bag material to be selectively opened along said line of weakness, with said line of weakness being disposed in a pattern that includes a first portion forming a handle opening

in said flap of a predetermined size large enough to receive at least a portion of a human hand when said bag material is separated along said first portion of said pattern, and a second portion forming an access opening in said one wall of a predetermined size large enough to permit removal of said merchandise through said access opening when said bag material is separated along said second portion of said pattern.

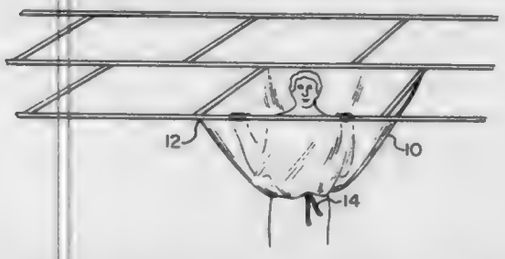
5,464,286

CEILING TILE DUST & DEBRIS CATCHER

Sidney V. Stevens; Deborah S. Stevens, both of 1707 Short Pl., and Ronald Bowker, 1037 Townley Ctr., all of Longmont, Colo. 80501

Filed Nov. 7, 1994, Ser. No. 335,502
Int. Cl.[6] B65D *33/28;33/14*
U.S. Cl. 383—75 **2 Claims**

1. A dust and debris collection system comprising:



(a) a bag of pliable material having a rounded, open end and an opposing rectangular, open end, with each open end defining a perimeter,

(b) said rounded, open end including a drawstring surrounding its perimeter, whereby the drawstring permits gathering of the rounded, open end about the waist of a user, and

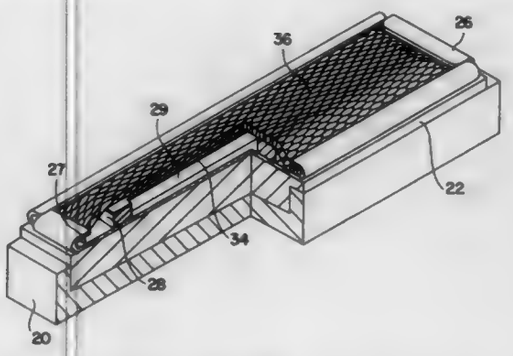
(c) said rectangular, open end includes a suspending means completely surrounding its perimeter, whereby the rectangular, open end is attachable to a metal grid of a suspended ceiling.

5,464,287

BEARING FOR HATCH COVERS OR THE LIKE

James Moy, Norwell, Mass., assignor to Quamco, Inc., Rockland, Mass.

Continuation-in-part of Ser. No. 10,611, Jan. 28, 1993, Pat. No. 5,330,271. This application Jul. 8, 1993, Ser. No. 272,683
Int. Cl.[6] F16C *29/02*
U.S. Cl. 384—13 **20 Claims**



1. A bearing assembly comprising:

base means for supporting a bearing element, said base means being adapted to be secured to a support element;

plate means for defining a bearing surface area, said plate means being positioned in registration with said base means;

flexible, self-lubricating bearing means disposed over said plate means, said bearing means being a woven member comprised of at least a first fiber, said woven member conforming generally to the form of said plate means and extending beyond the edges thereof;

capture means for retaining said woven member on said plate means;

means for maintaining the registration of said plate means with said base means; and

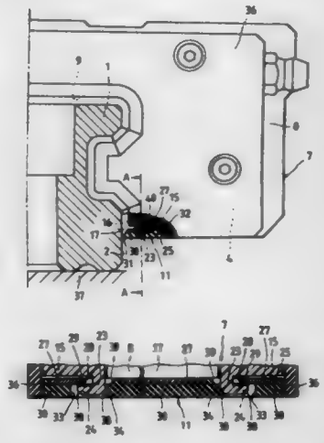
means for reducing the coefficient of friction of the surface of said plate means which faces said woven member, said coefficient of friction reducing means being integral with said plate means.

5,464,288

LINEAR MOTION ROLLING GUIDE UNIT

Kazuhiko Tanaka, Seki, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Dec. 8, 1994, Ser. No. 354,816
Claims priority, application Japan, Dec. 15, 1993, 5-342272
Int. Cl.[6] F16C *29/06;33/72*
U.S. Cl. 384—15 **9 Claims**



1. A linear motion rolling guide unit comprising:

a track rail provided with first raceway surfaces on both of longitudinal wall surfaces thereof, a slider saddling on said track rail so that said slider can be moved slidingly and relatively thereto, a casing provided with second raceway surfaces opposed to said first raceway surfaces of said slider, end caps fixed to both of longitudinal ends of said casing, rolling elements adapted to roll between said first and second raceway surfaces, and underseals comprising elastic members sealing clearances between said track rail and said slider and core metal members fixed to said elastic members,

the parts of lower surfaces of said casing which are on the side of said track rail being provided with longitudinally extending inclined surfaces of grindstone spaces, in which underseals are provided,

said end caps being provided on lower surfaces thereof with downwardly extending projections, at free ends of which locking portions extending in the longitudinal direction of said end caps are provided,

first locking bores being provided in both end portions of said core metal members of said underseals with second locking bores provided in both end portions of said elastic members thereof, in which first and second locking bores said projections of said end caps are fitted,

parts of said first and second locking bores being staggered from each other, i.e., non-aligned with each other so that edge portions of said first locking bores project into the inner side of said second locking bores with edge portions of said second locking bores projecting into the inner side of said first locking bores,

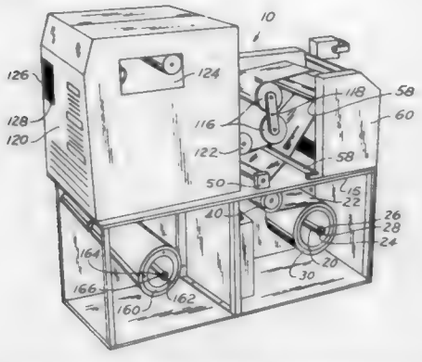
said projections of said end caps being fitted in said first and second locking bores in said underseals with said locking portions of said projections engaged with said edge portions of said first locking bores.

5,464,289

ELECTROGRAPHIC LABEL PRINTING SYSTEM

Wallace J. Beaudry, Hunter Rd., R.R. 1, Elkhart Lake, Wis. 53020

Filed Aug. 24, 1994, Ser. No. 296,191
Int. Cl.[6] B41J 5/30
U.S. Cl. 400—62 11 Claims



1. An apparatus for printing labels, the apparatus comprising:
a base;
a label stock dispenser mounted to the base;
a label stock slitter having a rotatably attached roller cutter mounted to the base adjacent the label stock dispenser;
a flexographic printer mounted to the base adjacent the label stock slitter;
the flexographic printer having a rotatably mounted printing drum;
a first printing plate for printing permanent copy and a second printing plate for printing a register mark removably mounted to the drum;
an electronic printer mounted to the base adjacent the flexographic printer;
the electronic printer having an electronic eye for locating the register mark;
a label takeup spool mounted to the base adjacent to the electronic printer.

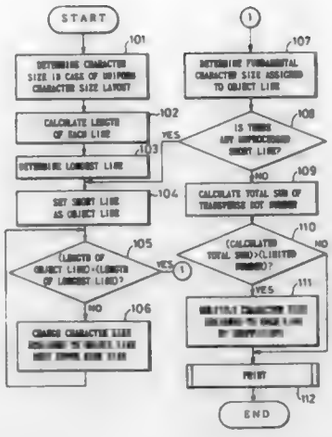
5,464,290

DEVICE AND METHOD FOR PRINTING CHARACTERS ON TAPE HAVING A CONTROLLER TO EVENLY SPACE CHARACTERS

Kenji Watanabe, Tokyo, and Yoshiya Toyosawa, Suwa, both of, Japan, assignors to King Jim Co., Ltd., and Seiko Epson Corporation, both of Tokyo, Japan

Filed Nov. 2, 1994, Ser. No. 334,019
Claims priority, application Japan, Nov. 9, 1993, 5-279146
Int. Cl.[6] B41J 19/00
U.S. Cl. 400—76 18 Claims

1. A tape printing device for printing an input text on tape, comprising:
first judgement means for judging whether a number of lines of characters of the input text is not less than two, and whether a character-size entrusting mode, in which a character size corresponding to each line is automatically determined, is selected;
length information generating means for assigning a same character size to all of the lines and generating length information representing a length of each line to which the same character size is assigned when it is judged by the first judgement means that the character-size entrusting mode is selected and the number of lines of characters of the input text is not less than two;



means for tentatively determining and assigning a different character size to at least one line other than a longest line according to the length information so as to make the length of the at least one other line, which is calculated on the basis of the character size assigned thereto, equal to the length of the longest line;
second judgement means for judging whether a total sum of transverse sizes of all of the lines exceeds a predetermined limited size, the total sum being calculated on the basis of the character size assigned by the length information generating means to the longest line and the character size assigned to the at least one other line and determined tentatively by the tentatively determining means;
means for determining the character size assigned by the length information generating means to the longest line and the character size assigned to the at least one other line by the tentatively determining means as the character size attributes of the lines when it is judged by the second judgement means that the total sum of the transverse sizes of all of the lines does not exceed the predetermined limited size; and
means for determining the character size attributes of the lines by multiplying the character sizes assigned by the length information generating means to the longest line and assigned to the at least one other line by the tentatively determining means by a coefficient determined according to the limited size and the total sum of the transverse sizes of the lines, when it is judged by the second judgement means that the total sum of the transverse sizes of all of the fines exceeds the predetermined limited size; and
print means for printing the input text according to the character-size attribute of each line.

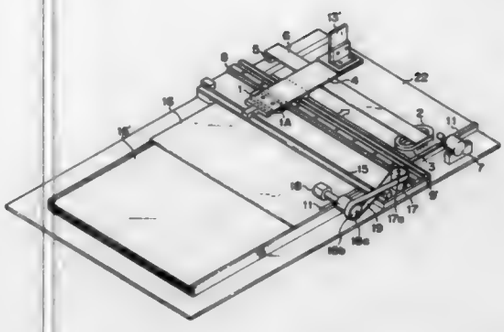
5,464,291

PRINTING APPARATUS

Atsushi Kimura, Yokohama, and Hiroyuki Seki, Urawa, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 28,132, Mar. 9, 1993, abandoned.
This application Jan. 27, 1995, Ser. No. 380,141
Claims priority, application Japan, Mar. 10, 1992, 4-051614
Int. Cl.[6] B41J 23/34
U.S. Cl. 400—185 14 Claims

1. A vibration driven printing apparatus, comprising:
a contact member;
a vibrating member having a first contact portion in contact with said contact member and a second contact portion out of contact with said contact member, said vibrating member for generating a vibration wave to produce a first drive force at said first contact portion and a second drive force at said



second contact portion, the first drive force causing relative movement between said contact member and said vibrating member;

a carriage member having a printing head and arranged to engage one of said contact member and said vibrating member and to be displaced by the relative movement between said contact member and said vibrating member;

a first driven object arranged in contact with the second contact portion of said vibrating member and to be driven by the second drive force; and

a second driven object coupled to said first driven object, said first driven object driving said second driven object of said apparatus in response to the second drive force applied to said first driven object.

5,464,292

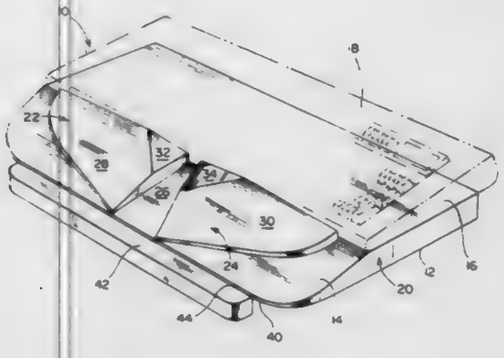
KEYBOARD ALIGNMENT DEVICE

Alan H. Grant, 3208 Woodhollow Dr., Chevy Chase, Md. 20815

Filed Apr. 2, 1993, Ser. No. 42,017

Int. Cl.[6] B43L *15/00*

U.S. Cl. 400—715 **13 Claims**



1. A keyboard alignment device comprising:

a base having a bottom surface, an upper front surface and an upper rear surface for supporting a keyboard on said upper rear surface,

two spaced ramps located on said upper front surface,

a central recess formed between said two spaced ramps,

an elevating projection pivotally mounted on said base, said elevating projection including two portions pivotally mounted to each other, and

a hinge for pivotally mounting said elevating projection on said base.

5,464,293

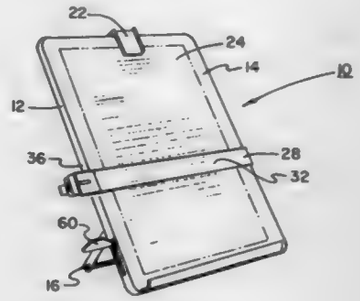
APPARATUS FOR SUPPORTING INFORMATION TO BE READ AND FOR SEQUENTIALLY HIGHLIGHTING THE LINES OF THE SUPPORTED MATERIAL

Robert L. Hall, 7706 S. Loomis Blvd., Chicago, Ill. 60620-3750

Filed Aug. 25, 1994, Ser. No. 295,402

Int. Cl.[6] B41J *29/15*

U.S. Cl. 400—718 **5 Claims**



1. A new and improved apparatus for supporting information to be read and for sequentially highlighting the lines of the supported material through the simplified action of the typist comprising, in combination:

a support plate positionable in a generally vertical orientation having a front surface adapted to receive and support material to be read, the device having a support secured to the rear face thereof for maintaining the front face at an angle of about 10 degrees from the vertical, the plate having a generally vertical track along one edge;

a clip at the upper end of the support plate on the front face to receive and support the sheet material to be read;

a line bar slidably coupled to one edge of the support plate, the line bar having a transparent portion positionable across a horizontal strip of the front face of the device to sequentially highlight lines to be read, the support bar adapted to be moved downwardly in response to the actions of an operator;

frictional components at the edge of the line bar received in the track, the frictional components adapted to retain the line bar at a particular elevational orientation where last set but to move downwardly vertically in response to an exterior force;

adjustment fingers coupled to the frictional components with a spring to hold the fingers apart and the frictional components together whereby a user may squeeze the fingers to release the frictional components to vertically adjust the line bar, the adjustment fingers also including a horizontal locking bar;

a vertically extending stepping bar secured to the rear face of the support plate adjacent to the track the stepping bar including spaced recesses for receiving the locking bar, each recess having a shoulder above and a cam beneath, the stepping bar having a spring urging it to an upward position, the spring being coupled between the edge of the stepping bar and the support plate; and

a trigger secured to the stepping bar through a slot in the side of the support plate under the control of an operator to move the stepping bar downwardly against the action of the spring to urge the locking bar downwardly a predetermined distance equivalent to the space between the recesses whereby, when

the trigger is released, the spring will urge the stepping bar upwardly and the line bar will remain at its preset orientation as it moves outwardly from the stepping bar through the action of the cam.

5,464,294

FOLDING TOOTHBRUSH

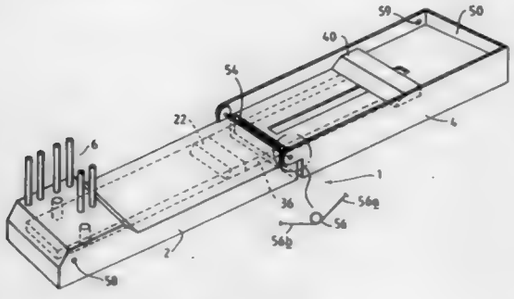
Richard W. M. Chee, and Sharon A. H. Low, both of Singapore, Singapore, assignors to Fortune Dragon Pte Ltd, Singapore, Singapore

Filed Aug. 23, 1994, Ser. No. 294,571

Claims priority, application United Kingdom, Aug. 25, 1993, 9317697

Int. Cl.[6] A46B *11/02*

U.S. Cl. 401—269 **13 Claims**



1. A foldable toothbrush comprising:

a front part having top, bottom, side and front surfaces and brushes located at a brush portion on the top surface adjacent to the front end of the front part, said surfaces forming an interior cavity for storing toothpaste, said upper surface having at least one opening at said brush portion connecting the cavity and the brushes;

a slide member rearwardly and forwardly slidably engaged in the toothpaste cavity;

a rear part hingeably attached at its front end to the rear end of the front part;

means attached to the rear part for slidably engaging, when the toothbrush is unfolded, the slide member to push it forward in the toothpaste cavity.

5,464,295

ARTICULATED FRAME ELEMENT FOR MODULAR FURNITURE, AND HINGE FOR ARTICULATING TWO FRAME ELEMENTS TOGETHER

Jean-Jacques Daillot, 4 Hautgoutte,, 88520 Ban De La Veline, France

Filed Oct. 1, 1993, Ser. No. 131,402

Claims priority, application France, Jan. 2, 1992, 92 12106

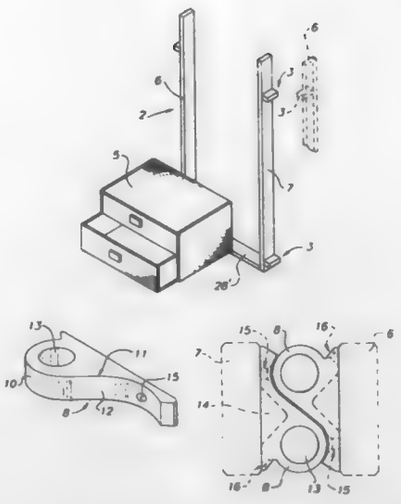
Int. Cl.[6] F16C *11/00*

U.S. Cl. 403—84 **11 Claims**

1. A hinge assembly for articulatable elements, including frame elements of modular furniture, comprising:

paired articulation elements including cooperating external lateral surfaces, each having an identical semi-S-shaped profile, wherein the articulation elements are placed in converse relative positions so that the respective external lateral surfaces are in abutting relation, for allowing movement during installation, wherein each semi-S-shaped profile has a convex cylindrical portion having a radius of curvature and extended to a concave cylindrical portion having a radius of curvature which corresponds to the radius of curvature of the convex cylindrical portion, and wherein each convex cylindrical portion is traversed by a bore; and

a hinge including two locking rods, and spacing means connecting the locking rods and defining a constant distance corresponding to a distance defined between the bores of the paired articulation elements.



5,464,296

PIVOT JOINT

Lothar Broszat, Monheim, Germany, assignor to TRW Fahrwerkesysteme GmbH & Co. KG, Dusseldorf, Germany

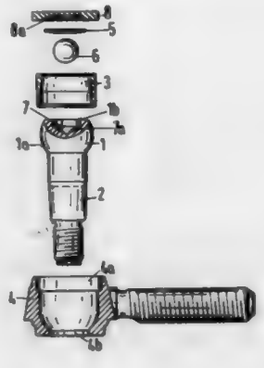
Filed Feb. 17, 1994, Ser. No. 197,923

Claims priority, application Germany, Feb. 20, 1993, 43 05 341.6

Int. Cl.[6] F16C *11/06*

U.S. Cl. 403—138 **2 Claims**

1. Pivot joint with a housing, in which a ball pivot is mounted via its ball race-shaped bearing surface by means of an inset bearing shell to be free from play with a delimited range and, set against a spring force, to be twistable and horizontally sweepable whereby said ball pivot is provided with an end surface located opposite a pivot shank, and a countersink, whereby a ball sits closely on the surface of said countersink extending to this end surface and the ball being acted upon on the force of a spring element supported by a cover which seals the housing, characterized in that the countersink (2) is configured conical and that said spring element is configured as a disk spring (5) which sits with its convex side closely adjacent to said ball (6) and is supported by its rim which fits in a recess (8a) in cover (8).



5,464,297

FITTING, PARTICULARLY FITTING FOR CONNECTING PLATES

Rüdiger Walz, Mötzingen, Germany, assignor to Häfele GmbH & Co., Nagold, Germany

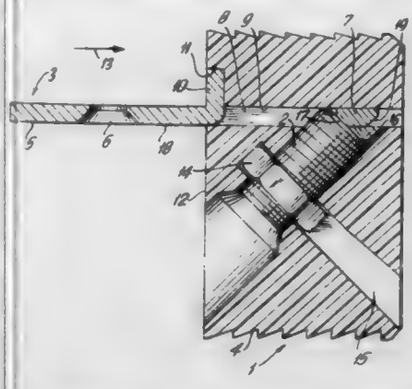
Filed Oct. 5, 1993, Ser. No. 131,724

Claims priority, application Germany, Jan. 10, 1992, 9213729 U

Int. Cl.[6] F16B 9/00

U.S. Cl. 403—231 7 Claims

1. A fitting for connecting structural components, the fitting



comprising a cup-shaped insert connectable to a first structural component and a connecting member connectable to a second structural component, the cup-shaped insert having a slot for receiving the connecting member, the connecting member being insertable in the slot in a direction of insertion, a nut being arranged in the cup-shaped insert, a tightening screw being mounted in the nut the tightening screw having a front end being rotatably mounted in the cup-shaped insert and extending obliquely relative to the direction of insertion, the connecting member having a recess with a front inner edge, the front end of the tightening screw contacting the front inner edge of the recess when the tightening screw is screwed into the cup-shaped insert, means for providing a slight play for the nut, the connecting member having a front edge, the front edge defining an inclined abutting surface for engaging the tightening screw during assembly.

5,464,298

CONNECTOR FOR STRUCTURE MEMBERS

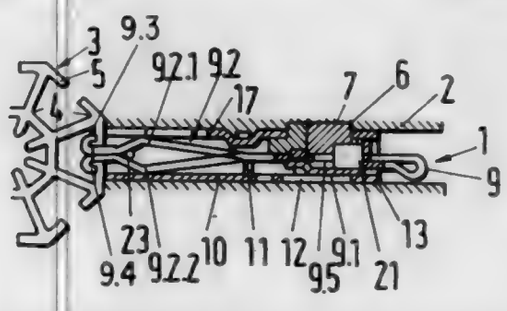
Franz Schomakers, Geeste, Germany, assignor to intur System-Profil GmbH + Co., Geeste, Germany

Filed May 4, 1993, Ser. No. 57,719

Claims priority, application Germany, May 19, 1992, 42 16 439.7

Int. Cl.[6] F16B 7/04

U.S. Cl. 403—252 17 Claims



1. A turnbuckle for connecting a hollow section with a supporting profile having recesses comprising:

a housing disposed in said hollow section, said housing having a longitudinal axis;

a clamping spring means disposed in said housing;

a rotatable catch rotatably mounted for rotatable movement between a non-lock position and a lock position;

operable means between said rotatable catch and said clamping spring means operable to dispose said clamping spring means in said housing at a starting stretching position when said rotatable catch is in said non-lock position and a final stretching position when said rotatable catch is in said lock position, said clamping spring means being receivable in said supporting profile recess when said clamping spring means is in said starting spring position, said clamping spring means clamping said supporting profile when is said final stretching position;

said operable means comprising a first and second concurrently operable interconnecting means interconnected between said rotatable catch and said clamping spring means;

said first interconnecting means comprising a first curvilinear recess in said rotatable catch and a first projection on said clamping spring means disposed in said first curvilinear recess;

said second interconnecting means comprising a second curvilinear recess in said clamping spring means and a second projection on said rotatable catch disposed in said second curvilinear recess;

said first projection being movable in said first recess and said second projection being moveable in said second recess when said rotatable catch is moved between said non-lock position to said lock position such that rotation of said rotatable catch from said non-lock position to said lock position moves said clamping spring means from said starting stretching position to said final stretching position.

5,464,299

CLAMPING DEVICE

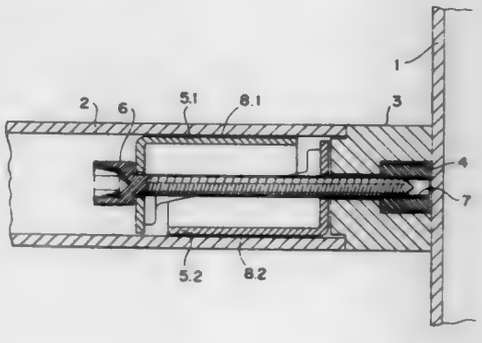
Paul Schärer, Münsingen, and Kaspar Stöckli, Kiesen, both of, Switzerland, assignors to Usm U. Schärer Söhne Ag., Münsingen, Switzerland

Filed Dec. 7, 1993, Ser. No. 162,613

Claims priority, application Switzerland, Dec. 15, 1992, 3828/92

Int. Cl.[6] F16B 7/04

U.S. Cl. 403—297 20 Claims



9. A clamping device for anchoring in a hollow profile member by expansion in a force-derived connection, comprising a pair of wedge sleeve halves being formed as two separate parts, and at least one tearable adhesive film connecting said pair of wedge sleeve halves together as a unit for enabling the assembly of said pair of wedge sleeve halves as a unit into a hollow profile member.

5,464,300

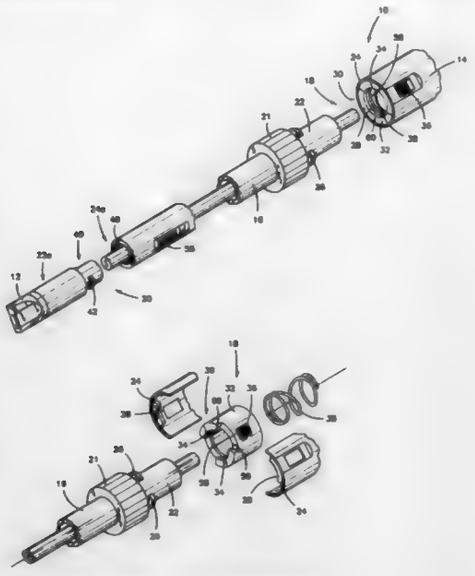
MEDICAL INSTRUMENT AND COUPLING APPARATUS FOR SAME

Lawrence Crainich, Ceda Rd., Charlestown, N.H. 03603

Continuation-in-part of Ser. No. 55,639, Apr. 29, 1993, Pat. No. 5,407,293. This application Oct. 15, 1993, Ser. No. 136,669

Int. Cl.[6] B25G *3/00*

U.S. Cl. 403—322 **20 Claims**



20. A medical instrument, comprising:

handle means for manipulating the instrument;

a tool head;

a tube element for joining the handle means and the tool head, the tube element having a first end and a second end;

first coupling means for releasably coupling the first end of the tube element and the handle means in a coupled position wherein the tube element is rotatable and longitudinally fixed during rotation relative to the handle means after coupling, and

second coupling means for releasably coupling the second end of the tube element and the tool head in a coupled position wherein the tool head is not rotatable relative to the tube element after coupling, whereby the tool head, tube element and handle means are all readily separable from each other.

5,464,301

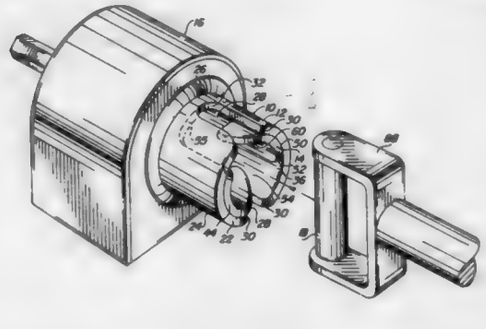
ROTARY LATCH

Joel M. Kramer, Fountain Valley, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 21, 1994, Ser. No. 264,087

Int. Cl.[6] F16B *7/00*

U.S. Cl. 403—322 **25 Claims**



1. A rotary latch comprising:

a first hollow cylinder;

a second cylinder rotatably and concentrically disposed in said first cylinder;

said second cylinder being axially immobile with respect to said first cylinder;

said first cylinder having opposed openings in a first cylinder end;

said second cylinder including at least one slot in a second cylinder first end;

at least one slot extension provided in said second cylinder, said at least one slot extension extending angularly from said at least one slot;

said at least one slot aligned with said openings in a first position of said second cylinder in relation to said first cylinder;

said at least one slot extension aligned with said openings in a second position of said second cylinder in relation to said first cylinder;

said at least one slot offset from said openings in said second position;

whereby a latch pin is receivable in said openings and said at least one slot in said first position, and said latch pin is restrained in said openings and said at least one slot extension in said second position.

5,464,302

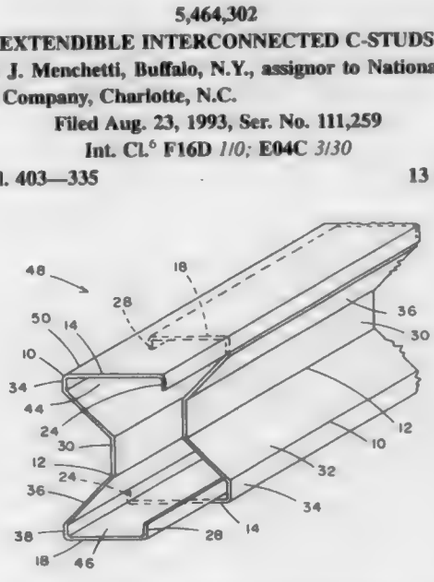
EXTENDIBLE INTERCONNECTED C-STUDS

Robert J. Menchetti, Buffalo, N.Y., assignor to National Gypsum Company, Charlotte, N.C.

Filed Aug. 23, 1993, Ser. No. 111,259

Int. Cl.[6] F16D *1/0;* **E04C** *3/30*

U.S. Cl. 403—335 **13 Claims**



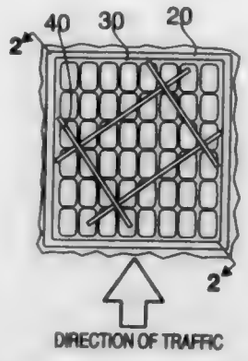
1. A sheet metal C-stud, adapted for interconnecting with a like C-stud to form an extendible stud, said C-stud comprising an elongate web, an elongate first flange extending from one elongate edge of said web, a spaced, parallel elongate second flange extending from an opposite elongate edge of said web in the same direction from said web as said first flange, an elongate lip extending toward said second flange from an outer edge of said first flange, said lip forming a channel with said first flange and said web, and an elongate central area of said web, said central area being disposed within a plane parallel to a second plane which extends through said two elongate edges of said web, said two planes being spaced apart a distance substantially equal to half of the width of said first flange, and said first flange being wider than said second flange by approximately twice the sheet metal thickness.

5,464,303

METHOD FOR REPAIRING PAVEMENT

Raymond Wells, Clearwater, Fla., assignor to D.W.T. Innovative Recycling Corp., Tarpon Springs, Fla.

Filed Dec. 30, 1993, Ser. No. 175,933
Int. Cl.[6] E01C 7/32
U.S. Cl. 404—75 42 Claims



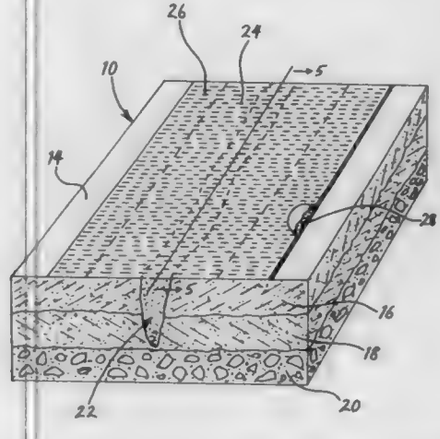
1. A method for repairing pavement, comprising the steps of:
lining an area to be repaired with a vapor barrier;
placing a combination of a mesh and at least one pencil rod on the vapor barrier; and
filling the area to be repaired with a patch material.

5,464,304

METHOD FOR RECREATIONAL SURFACE CRACK REPAIR

William G. Dittmar, 105 S. Mahwah Rd., Mahwah, N.J. 07430

Filed Aug. 11, 1994, Ser. No. 289,020
Int. Cl.[6] E01C 11/04
U.S. Cl. 404—75 8 Claims



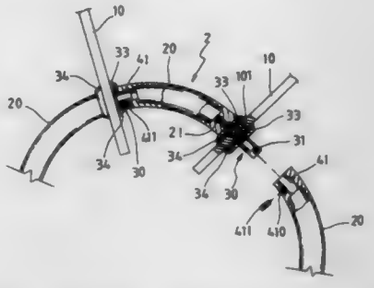
1. A method for repairing recreational surfaces, comprising the steps of:
(a) cleaning a crack within said surface;
(b) filling said crack with a crack filling material;
(c) covering said crack at the exposed outer surface of said crack, and an area surrounding said crack in said recreational surface, with a liquid material which, when it dries bonds to the exposed outer surface of said filled crack and area surrounding said crack, said liquid material when dried resulting in an exposed, non-adhering surface;
(d) overlaying said non-adhering surface with a fabric material, said fabric material extending a spaced distance at its periphery beyond said non-adhering surface;
(e) covering said fabric material with a liquid adhesive material; and
(f) allowing said liquid adhesive material to dry, whereby said periphery of said fabric material which extends beyond said non-adhering surface is adhesively secured to the surface coextensive with said fabric and surrounding said non-adhering surface.

5,464,305

CONNECTOR ASSEMBLY FOR CONNECTING BOARD-LIKE MEMBERS OF A PIECE OF FURNITURE IN FITTING MANNER

Tien Lung Liem, Pan-chiao, Taiwan, Prov. of China, assignor to Chyuan Ryh Shing Co., Ltd., Taipei Hsien, Taiwan, Prov. of China

Filed Jul. 14, 1994, Ser. No. 275,070
Int. Cl.[6] F16B 12/10;17/00
U.S. Cl. 403—362 1 Claim



1. A connector assembly for connecting board-like members of a piece of furniture, each board-like member having a hole therein, comprising:
more than one arch rod member having a male end and a female end, wherein said male end includes a tenon formed by a screw fitted through a sleeve, the screw passing through said hole in the board-like member into a threaded hole of said male end and said female end is formed with a hole for receiving said tenon therein, a radial threaded hole being included on said female end to receive a fixing thread rod therein engaging said tenon of said male end in place in said female end, and flexible pad members, each having a hole therein, are secured on each side of said board-like members such that said screw of said tenon passes through said hole in said flexible pad members;
said male ends of said rod members being received in said female ends of said rod members to join said rod members end-to-end so as to form a circular connector assembly.

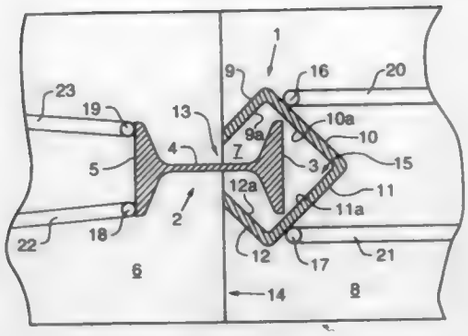
5,464,306

CONCRETE BARRIER JOINTS

Joseph Cristiano, 51 Marcella Crescent, Hamilton, Ontario, Canada

Filed Aug. 17, 1994, Ser. No. 291,841
Int. Cl.[6] E01F 15/00
U.S. Cl. 404—6 13 Claims

1. A coupling for use between two adjacent median barrier panels, each barrier panel having a longitudinally extending main body portion, said coupling comprising:
a male coupling tenon having a free end and a root end, and a longitudinally oriented shank interconnecting said free end and said root end, with said root end securely retained within the main body portion of one of said median barrier panels and said free end extending outwardly from an end face of said main body portion;
a female coupling member positioned within the main body portion of the other of said median barrier panels adjacent a longitudinal end face thereof, said female coupling member defining a hollow, generally vertically oriented interior chan-



nel dimensioned to receive the free end of the male coupling therein in generally vertical sliding relation;

said channel having a first pair of mutually adjacent side walls with respective mutually opposed convergent faces adapted to engage the free end of said male coupling tenon, said first pair of mutually adjacent side walls being oriented within the main body portion of said other median barrier so as to translate non-axially directed forces from the free end of said male coupling tenon into forces that are in substantial part directed axially along the length of said main body portion of the other of said median barrier panels;

a generally vertically oriented slot in said channel opening into said hollow interior thereof, said slot being adapted to receive said shank of said male coupling tenon in vertical sliding relation, and to preclude the passage of said free end of said male coupling tenon therethrough;

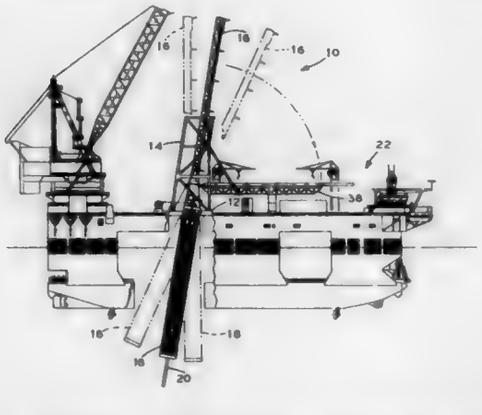
an opening in said female coupling member, said opening being adapted to permit passage of said male coupling tenon into and out of said slot.

5,464,307

APPARATUS FOR NEAR VERTICAL LAYING OF PIPELINE

Jesse R. Wilkins, Picayune, Miss., assignor to McDermott International, Inc., New Orleans, La.

Filed Dec. 29, 1993, Ser. No. 174,971
Int. Cl.[6] F18L *1/00*
U.S. Cl. 405—166 **4 Claims**



1. An apparatus on a vessel for near vertical laying of a pipeline offshore, comprising:

a. a support base mounted on the vessel;

b. a framework mounted on said support base and extending upwardly therefrom;

c. a pipe joint alignment tower pivotally attached to and supported by said support base and framework;

d. a support tower pivotally attached to said support base and extending downward from said support base; and

e. means received in said support tower for receiving and supporting the weight of the pipeline, comprising:

i. a travel block adapted to be movable along the length of said support tower; and

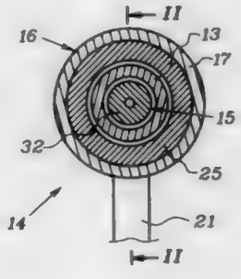
ii. a pedestal at the lower end of said support tower adapted to receive and support the weight of the pipeline from said travel block.

5,464,308

PROCESS AND APPARATUS FOR SIMULTANEOUSLY LAYING LONG PRODUCT AND PROTECTIVE TUBE IN THE GROUND

Bernard Missout, Ivry sur Seine, France, assignor to Cables Pirelli S.A., France

Filed Apr. 7, 1994, Ser. No. 224,168
Claims priority, application France, Apr. 8, 1993, 93 04183
Int. Cl.[6] F16L *1/028*
U.S. Cl. 405—183 **4 Claims**



1. Process for laying in the ground a product of great length simultaneously with the laying of a protective tube designed to surround the said product, characterized in that it includes the steps of:

while advancing furrow forming apparatus in a predetermined direction and breaking up the ground to form a furrow, laying in the said furrow as the furrow is produced, a length of a non-magnetic tube (**13**) suitable for housing the said product (**40**) with a certain amount of play so that the product can move with respect to the tube, the length of said tube laid in said furrow increasing as the length of said furrow increases; and

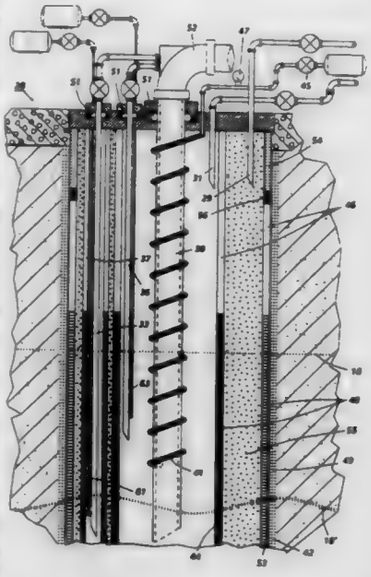
while proceeding to form said furrow and to lay the said tube (**13**), supplying said product to the end of said tube remote from said furrow forming apparatus and pulling the product by one end inside the said tube by means of a magnetic pulling device (**14**) including a tubular yoke (**16**) through which the tube (**13**) can pass with a certain amount of play and movable in said predetermined direction as said furrow forming apparatus advances in said predetermined direction and said tube (**13**) is laid, and a cylindrical core (**15**) capable of being housed with a certain amount of play in the tube, the yoke and the core comprising magnetic means (**23** to **27**; **31** to **33**) arranged to produce a radial magnetic field between said yoke and said core and through the said tube (**13**), said magnetic field being capable of pulling the core (**15**) axially of said tube (**13**) when said yoke (**16**) is moved in said direction, the said end of the product being fixed to the said core so that the product is pulled axially of said tube (**13**) as said tube (**13**) is laid in the furrow and is at least co-extensive with the length of tube (**13**) laid in the furrow.

5,464,309

DUAL WALL MULTI-EXTRACTION TUBE RECOVERY WELL

Alfonso R. Mancini, Penfield, and Richard A. Williams, Savannah, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 56,349, Apr. 30, 1993, Pat. No. 5,358,357. This application Oct. 20, 1994, Ser. No. 326,674
Int. Cl.[6] E03B *3/12*; E21B *43/00*
U.S. Cl. 405—258 20 Claims



1. A process for removing contaminants from a contaminated area of the ground having a vadose zone and a water table, which comprises providing a borehole in the contaminated area to a depth below the water table; placing in the borehole to a depth below the water table a first perforated riser pipe; placing inside the first perforated riser pipe a second perforated riser pipe; placing inside the second perforated riser pipe a first vacuum extraction pipe with a bottom opening situated within the second perforated riser pipe; placing a second vacuum extraction pipe within the first perforated riser pipe but without the second perforated riser pipe; while introducing a gas into the second perforated riser pipe, applying a vacuum to the first vacuum extraction pipe and applying a vacuum to the second vacuum extraction pipe to draw gases and liquid from the soil into the first vacuum extraction pipe and the second vacuum extraction pipe and transport both gases and liquid to the surface as two-phase common streams through the first vacuum extraction pipe and the second vacuum extraction pipe; forming from the common streams at least one primarily liquid stream and at least one primarily gaseous stream; and separately treating the separated liquid and gas streams.

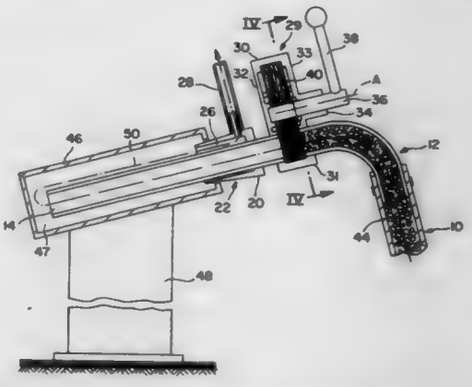
10. An apparatus for removing contaminants from a contaminated area of the ground having a water table and a vadose zone above the water table which comprises a first perforated riser pipe extending downwardly from the surface of the ground to a level below the water table, a second perforated riser pipe situated inside the first perforated riser pipe and extending downwardly from the surface of the ground to a level below the water table, a first vacuum extraction pipe situated inside of the second perforated riser pipe and having a bottom opening situated within the second perforated riser pipe, a second vacuum extraction pipe situated inside the first perforated riser pipe but without the second perforated riser pipe, a gas inlet for introducing a gas into the second perforated riser pipe, at least one vacuum-forming apparatus in fluid communication with the first vacuum extraction pipe and the second vacuum extraction pipe and adapted to form a zone of reduced pressure in the ground around the first perforated riser pipe, whereby gases and liquid can be drawn from the ground into the first vacuum extraction pipe and the second vacuum extraction pipe and conveyed to the surface as two-phase common streams, and a means for receiving the two-phase common streams and separating the two-phase common streams into separate gas and liquid streams.

5,464,310

CONVEYOR CONDUIT FOR BULK MATERIAL TO BE PNEUMATICALLY CONVEYED

Bernd Federhen, Siegen, Germany, assignor to ALB. Klein GmbH & Co. KG, Niederfischbach, Germany

Filed May 20, 1993, Ser. No. 63,649
Claims priority, application Germany, Jul. 16, 1992, 42 23 370.4
Int. Cl.[6] B65G *53/34*
U.S. Cl. 406—164 18 Claims



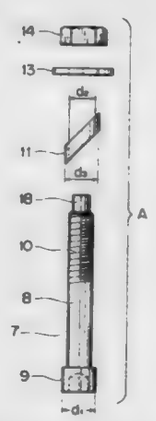
1. Apparatus comprising: a conveyor conduit having a conduit cross section for granulate material to be pneumatically conveyed and; at least one valve having a movable closure body, said closure body having a closure position thereof for blocking the conduit cross section and having an open position thereof for opening the conduit cross section; wherein the closure body of the valve is permeable to conveying air in the closure position but blocks the conduit cross section for the material to be conveyed and comprises strand-like portions which are at least partly movable relative to each other.

5,464,311

BLIND BOLT FOR ARCHITECTURE

Tokuo Hiraguri, and Sohkichi Hiraguri, both of Nagano, Japan, assignors to Alps Seiko Co., Ltd., Nagano, Japan

Filed Jun. 16, 1994, Ser. No. 261,505
Claims priority, application Japan, Apr. 25, 1994, 6-086294
Int. Cl.[6] F16B *21/00*
U.S. Cl. 411—340 8 Claims



1. A blind bolt for architecture comprising:

a headed bolt comprising a male screw at the side opposite its head;

a rotating washer made of a cylindrical member having an external diameter which can be inserted into through-holes of architecture members to be assembled by tightening, and having on both end surfaces slopes intersecting the center axis of said cylindrical member at a predetermined angle sufficient to effect rotation of the rotating washer to a tightening position, said sloping surfaces being parallel to each other, said headed bolt penetrated through the rotating washer; and

a nut screwed to the male screw,

wherein the head of said headed bolt has an external diameter which can be inserted into through-holes of the architecture members, and the longitudinal diameter of an ellipse forming the contour of each of said slopes is larger than the diameter of each of the through-holes of said architecture members.

5,464,312

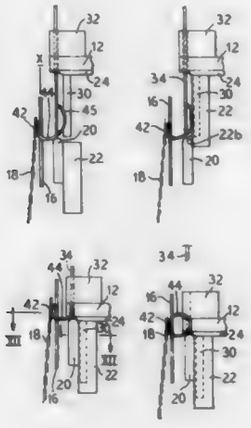
AUTOMATIC BINDER

Peter Hotkowski, Chester, and Peter Burton, East Hadden, both of Conn., assignors to General Binding Corporation, Northbrook, Ill.

Filed May 10, 1994, Ser. No. 240,257

Int. Cl.[6] B42B *9/00*

U.S. Cl. 412—7 **22 Claims**



9. A method of threading a binder element through a plurality of holes arranged in a stack of pages to bind the pages, the element having a transverse spine and curled spaced apart fingers forming rings, comprising the steps of:

holding the spine on a first side of the pages to be bound;

inserting a plurality of guide fingers through the holes of the stack of pages to be bound from a second side opposite to the first side;

engaging with the guide fingers the free ends of the curled fingers;

moving laterally the spine member while retaining with the guide fingers free ends of the curled fingers to open the binder element;

flattening the curled fingers;

driving the curled fingers from the first side toward the second side through said holes;

releasing the spine to allow the binder element to resume its closed configuration.

5,464,313

HEAT TREATING APPARATUS

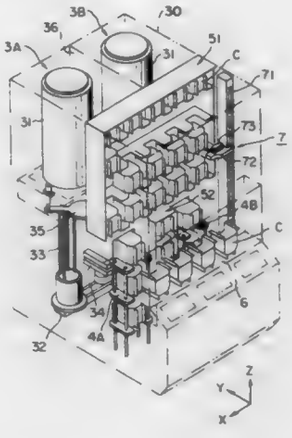
Tetsu Ohsawa, Sagamihara, Japan, assignor to Tokyo Electron Kabushiki Kaisha, and Tokyo Electron Tohoku Kabushiki Kaisha, both of, Japan

Filed Feb. 4, 1994, Ser. No. 191,487

Claims priority, application Japan, Feb. 8, 1993, 5-043199

Int. Cl.[6] F27D *3/12*; **H01L** *21/00*; **B65G** *69/00*

U.S. Cl. 414—172 **8 Claims**



1. A heat treatment apparatus comprising:

a plurality of heat treatment units aligned horizontally with an intermediate region therebetween, each heat treatment unit having a vertical heat treatment furnace, a support boat for objects to be processed, and means for loading and unloading said support boat for objects to and from said heat treatment furnace;

carrier delivery means facing said heat treatment units for conveying a carrier containing a plurality of objects to be processed to and from an outside of the apparatus, the carrier delivery means being spaced from the heat treatment units so as to form a carrier conveyor region between the carrier delivery means and the heat treatment units;

carrier accommodation means arranged in a horizontal array between said carrier conveyor region and said heat treatment units, said carrier accommodation means extending continuously across said heat treatment units including a region facing said intermediate region between the heat treatment units;

a plurality of object delivery means for supporting said objects for delivery, one of said object delivery means being provided facing each of said heat treatment units;

carrier transfer means moveable within said carrier conveyor region, for conveying carriers between said carrier delivery means, said carrier accommodation means, and said plurality of object delivery means; and

object transfer means for conveying the objects between carriers placed in each said object delivery means and said support boats of said heat treatment units;

wherein said carrier accommodation means and said carrier transfer means are used in common for each of the plurality of heat treatment units.

5,464,314

DEVICE FOR HANDLING A VEHICLE WHEEL

Reijo Laaksonen, Kuhmo, Finland, assignor to Auto-Jure OY, Kuhmo, Finland

PCT No. PCT/FI92/00016, § 371 Date Jul. 2, 1993, § 102(e) Date Jul. 2, 1993, PCT Pub. No. WO92/12864, PCT Pub. Date Aug. 6, 1992

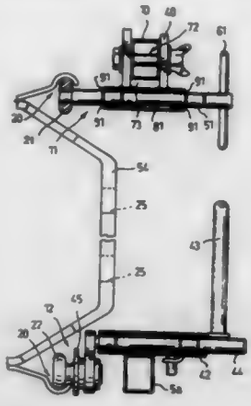
PCT Filed Jan. 23, 1992, Ser. No. 84,196

Claims priority, application Finland, Jan. 23, 1991, 910347

Int. Cl.[6] B60B *29/00*

U.S. Cl. 414—427 15 Claims

1. A device for handling a wheel of a vehicle for selectively



installing or removing the wheel relative to a shaft of the vehicle, said device comprising:

a vertically movable frame,

gripping means connected to said frame for movement therewith for engaging a wheel of a vehicle to displace the wheel relative to the shaft of the vehicle during removal and installation of the wheel, said wheel having a disc with a groove into which said gripping means is engageable,

said gripping means being shaped and arranged to engage said wheel and permit rotation of the wheel on the gripping means,

said gripping means comprising three support members,

said wheel having vertical and horizontal center lines,

two of said support members being engageable in the groove of said disc of the wheel above said horizontal center line on opposite sides of said vertical center line, the third support member being engageable in the groove of said disc of the wheel below the horizontal center line, at least one of said support members including a shaft rotatably supported by said frame and handle means on the latter said shaft for rotating said at least one of said support members.

5,464,315

SQUEEZE AND LIFT APPARATUS

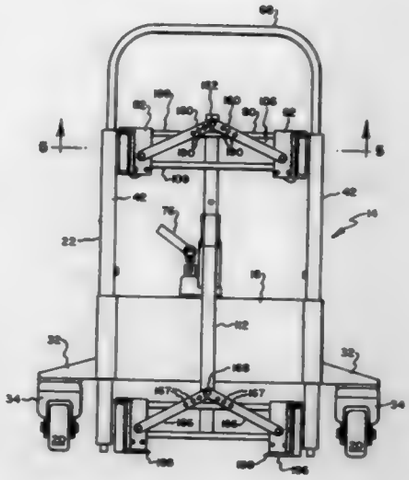
Arthur V. Palmer, Ashville, and Gary Leonard, Lakewood, both of N.Y., assignors to Dawson Metal Company, Inc., Jamestown, N.Y.

Continuation of Ser. No. 127,424, Sep. 27, 1993, abandoned. This application Mar. 14, 1995, Ser. No. 404,119

Int. Cl.[6] B66F *3/00*

U.S. Cl. 414—458 23 Claims

1. A dolly comprising a first frame, wheel means attached to said first frame, a second frame connected to said first frame for movement vertically relative to said first frame, at least one pair of clamp members connected to said second frame, means for applying force, and means comprising a jack for translating by operating said jack the applied force in sequence into movement of said clamp members to clampingly engage freight then by continued operation of said jack into upward movement of said second frame relative to said first frame for lifting the clampingly engaged freight.



5,464,316

ENVELOPE ACCUMULATION, BATCHING AND COMPRESSION APPARATUS AND METHOD

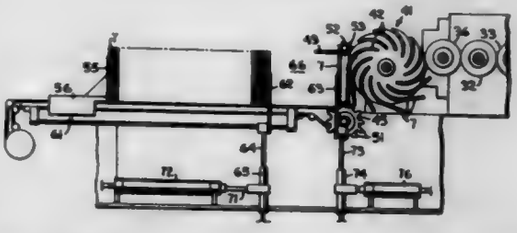
Richard Kranz, Leawood, Kans., assignor to Tension Envelope Corporation, Kansas City, Mo.

Continuation-in-part of Ser. No. 55,513, Apr. 29, 1993, Pat. No. 5,421,700. This application Aug. 11, 1993, Ser. No. 104,663

Int. Cl.[6] B65G *57/00*

U.S. Cl. 414—798.2 32 Claims

1. In a system wherein a plurality of individual items are



sequentially delivered onto a support surface at a delivery point via a delivery means, an apparatus for accumulating, batching and compressing said items into a stack containing a predetermined quantity of said items, said apparatus comprising:

(a) first support means positioned above said surface and first moving means for selectively moving said first support means generally horizontally along said surface in a first direction for initially accumulating said items as they are delivered onto said surface;

(b) sensing means for detecting said predetermined quantity of said items as they are accumulated behind said first movable support means;

(c) second support means and-second moving means for selectively moving said second support means generally vertically between a position below said surface and a position above said surface near a first location between said first support means and said delivery point in response to said sensing means detecting said predetermined quantity to thereby divide said items into first and second stacks, with said first stack including said predetermined quantity; and

(c) third moving means for selectively moving said second support means generally horizontally from said first location along said surface in said first direction to a second location;

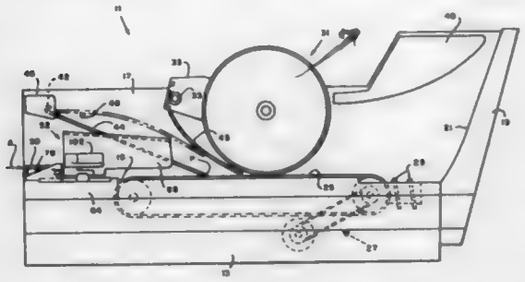
(d) said first, second and third moving means being independent from each other and separately controllable such that horizontal movement of said first support means and horizontal and vertical movement of said second support means can be independently controlled.

5,464,317

REGISTRATION POWER STACKER

Dean H. Foster, Stratford; Russell W. Holbrook, Middlebury; James Morabito, Bethel; Morton Silverberg, Westport, and Steven A. Supron, New Haven, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 978,010, Nov. 18, 1992, abandoned.
This application May 5, 1994, Ser. No. 245,302
Int. Cl.[6] B65G 57/00
U.S. Cl. 414—798.2 10 Claims



1. An improved power stacker for receiving lengthwise orientated envelopes projected longitudinally onto said power stacker at a receiving end of said power stacker from a feed device, said feed device for feeding said envelopes each having a leading edge in a direction of travel along a feed plane, said power stacker having a base supporting both an elongated deck and a laterally positioned vertical registration wall, an envelope transport means for transporting envelopes along said deck from said receiving end to a stack end of said deck, wherein said improvement comprises:

a first deflector means for deflecting the leading edge of said envelope upward above the feed plane of said feed device and away from said deck, and

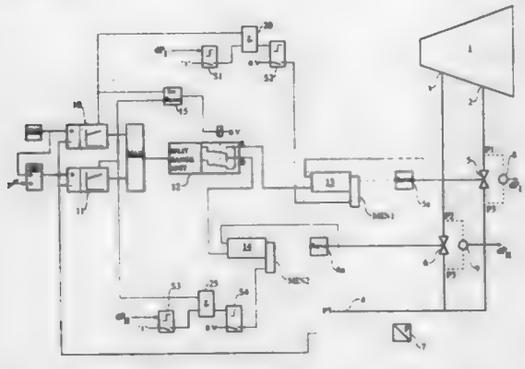
a second deflector means downstream in the direction of travel from said first deflector means for deflecting the leading edge of said envelope downward onto said deck and in communication with said transport means.

5,464,318

CONTROL SYSTEM FOR EXTRACTION AND INJECTION OF STEAM FROM AND INTO A TURBINE

Sivert Eklund, Finspång; Claes Jönsson, Norrköping, and Lars-Göran Sjöberg, Finspång, all of, Sweden, assignors to ABB Stal AB, Finspong, Sweden

PCT No. PCT/SE92/00389, § 371 Date Dec. 20, 1993, § 102(e) Date Dec. 20, 1993, PCT Pub. No. WO93/00501, PCT Pub. Date Jan. 7, 1993
PCT Filed Jun. 9, 1992, Ser. No. 167,946
Claims priority, application Sweden, Jun. 20, 1991, 9101914
Int. Cl.[6] F01D 21/00
U.S. Cl. 415—28 8 Claims



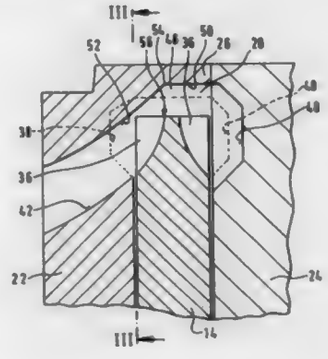
1. A control system for controlling extraction and injection of steam in a steam turbine with at least two extraction/injection points, said steam turbine being connected to a process network, said control system comprising: at least two valves, each of said valves being associated with an extraction/injection point, and control equipment for controlling operation of said valves for extraction and injection of steam into said steam turbine, wherein the valves which are used for extraction of steam from the steam turbine to the process network are the same as the valves which are used for injection of steam from the process network to the turbine.

5,464,319

REGENERATIVE PUMP WITH AN AXIALLY SHIFTING WORKING FLUID CHAMBER

Uwe Liskow, Seoul, Rep. of Korea, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jul. 20, 1994, Ser. No. 277,904
Claims priority, application Germany, Aug. 6, 1993, 43 26 505.7
Int. Cl.[6] F04D 5/00
U.S. Cl. 415—55.1 8 Claims

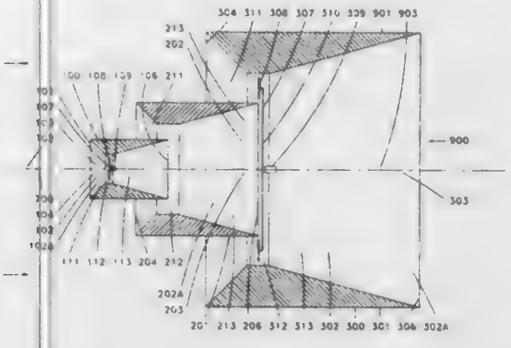


1. A peripheral pump for supplying fuel from a supply tank to an internal combustion engine of a motor vehicle, the peripheral pump comprising an impeller having end sides and being provided with a plurality of vanes which are arranged on said end sides and distributed over a periphery of said impeller; means forming a pump chamber in which said impeller rotates around a rotary axis, said means including two wall parts which limit said pump chamber in direction of said rotary axis and a housing part which limits said pump chamber in a radial direction, each of said wall parts being provided with a substantially ring-shaped supply passage and said supply passages are connected with one another over a periphery of said impeller, one of said wall parts being provided with a suction opening while the other of said wall parts is provided with a pressure opening, one of said supply passages which is arranged in the wall part being provided with said suction opening being a front supply passage with a full cross-section and formed exclusively downstream of said suction opening as considered in a rotary direction of said impeller, the other of said supply passages which is arranged in the wall part being provided with said pressure opening being a rear supply passage and formed in the region of said suction opening, and said rear supply passage has a cross-section which considered in said rotary direction decreases after said suction opening, so that fuel in the region of said suction opening flows substantially exclusively into said rear supply passage and in the rotary direction after said suction opening fuel flows from the rear supply passage into said front supply passage.

5,464,320
SUPERVENTURI POWER SOURCE

Clifton D. Finney, 1057 Oak Hills Pkwy., Baton Rouge, La. 70810

Continuation-in-part of Ser. No. 74,023, Jun. 2, 1993, abandoned. This application Mar. 28, 1994, Ser. No. 219,192
Int. Cl.[6] F03D *1/02;1/04*
U.S. Cl. 415—60 20 Claims



1. A superventuri power source comprising:

a. a series of at least two venturi tubes whereof each of the venturi tubes includes a central axis through a substantially hollow conduit having a venturi constriction; and wherein the venturi constriction includes an inlet of nonzero length and generally decreasing normal cross-sectional area which leads to a throat of generally minimal normal cross-sectional area which, in turn, leads to an outlet of nonzero length and generally increasing normal cross-sectional area; and whereby each normal cross-sectional area is perpendicular to its respective central axis;

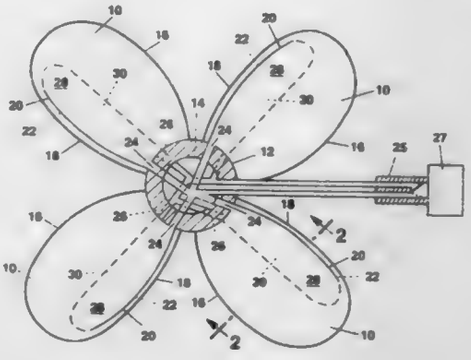
b. a superventuri apparatus including: (i) at least one twosome in the series of at least two venturi tubes labeled an alpha- and a beta-venturi tube, respectively, and of predetermined successively increasing flow capacity, respectively; (ii) the substantially hollow conduit of the alpha-venturi tube having an open entrance and an open exit adjacent its inlet and outlet, respectively, to permit flow of a selected medium through the open entrance into the venturi constriction and out of the open exit; (iii) the respective inlets of the twosome each facing the intended direction of flow of the selected medium; (iv) the open exit of the alpha-venturi tube being placed adjacent the throat of the beta-venturi tube in a manner that the respective central axes of the twosome essentially merge into a central super-axis along an intended line of flow of the selected medium; and (v) as referenced from the super-axis, the inlets of the alpha- and beta-venturi tubes being positioned to intercept relatively inner and outer portions of the selected medium as an alpha- and a beta-flow, respectively, whereby the alpha-flow as exhaust from the open exit of the alpha-venturi tube joins the accelerated beta-flow adjacent the throat of the beta-venturi tube causing a pumping action by the beta-venturi tube on the alpha-venturi tube; and

c. a beta-turbine adjacent the throat of the beta-venturi tube wherein the beta-turbine includes at least one impulse blade comprising a top and a bottom with the radial length between the top and the bottom being less than about three-fourths the minimal distance between the central super-axis and the closest limit of the throat of the beta-venturi tube to recover useful rotary mechanical power from flow power of the selected medium.

5,464,321
MARINE PROPELLER

Robert M. Williams, Chantilly; Ernest O. Rogers, Great Falls, both of Va., and Maurice M. Sevik, Potomac, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1978, Ser. No. 964,237
Int. Cl.[6] B63H *1/14;1/18*
U.S. Cl. 416—93 A 3 Claims



1. A marine propeller using circulation control blowing for increased thrust and reversing comprising:

a propeller shaft;

a hub for attachment to said propeller shaft;

a plurality of fixed propeller blades connected to and radiating from said hub;

a pair of chambers in each blade extending from the hub end to the distal end;

a forward thrust blowing slot in the trailing edge of said blades substantially tangent to the suction surface of each of said blades;

a reverse thrust blowing slot in the trailing edge of each of said blades substantially tangent to the pressure surface of said blades;

a separator between said pair of chambers and said forward and reverse blowing slots;

said separator having a rounded trailing edge forming a Coanda surface over which water from said forward and reverse thrust blowing slots flows;

all of said blowing slots being operative with said propeller rotating in one direction;

means for conducting the water to said blowing slots; and

means for selecting the blowing slot to receive the water.

5,464,322
COOLING CIRCUIT FOR TURBINE STATOR VANE TRAILING EDGE

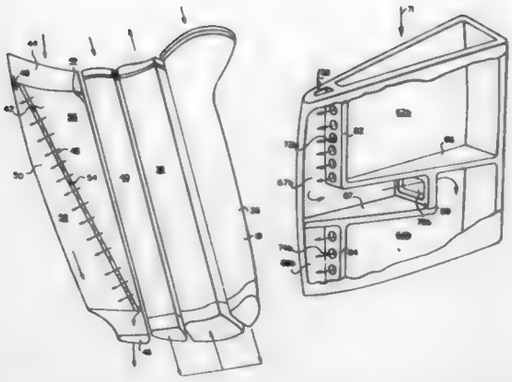
Francisco J. Cunha, Schenectady, and David A. De Angelis, Voorheesville, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1994, Ser. No. 294,670
Int. Cl.[6] F01D *9/06;5/18*
U.S. Cl. 415—115 18 Claims

1. A cooling circuit for a trailing edge of a radially extending stator vane comprising:

an internal cavity extending generally radially along the trailing edge of the stator vane for flowing a cooling medium;

a divider dividing the cavity into respective forward and rear chambers along opposite sides of said divider, said divider having a plurality of openings;



radially outer first and second inlets to said cavity for flowing the cooling medium into said chambers; and

a radially inner outlet for said cavity for exhausting the cooling medium, the cooling medium flowing into said rear chamber from said first inlet being directed along the trailing edge of the vane affording convection cooling thereof and the cooling medium flowing into the forward chamber from said second inlet being directed through said openings in said divider for flow into said rear chamber for impingement cooling of the trailing edge of the vane, the convection and impingement cooling flows in said rear chamber being combined for flow through said radially inner outlet.

12. A cooling circuit for the a trailing edge of a radially extending stator vane comprising:

an internal cavity extending substantially between radially opposite ends of said vane for flowing a cooling medium therethrough, said cavity extending along the trailing edge of said vane and being defined in part by a divider extending between opposite side walls of said vane, thereby dividing said vane into first and second chambers with said second chamber defined in part by said trailing edge and said first chamber lying axially forwardly thereof;

a cooling medium inlet to said first chamber;

said divider having a first plurality of openings therethrough for communicating cooling medium from said first chamber into said second chamber and impingement cooling of the trailing edge of said vane;

third and fourth chambers in said vane, said fourth chamber defined in part by said trailing edge and lying radially inwardly of said second chamber, said third chamber lying forwardly of said fourth chamber and radially inwardly of said first chamber, an outlet for said second chamber for communicating cooling medium from said second chamber into said third chamber, a second divider between said third and fourth chambers, said second divider having a second plurality of openings therethrough for communicating cooling medium from said third chamber into said fourth chamber and impingement cooling of the trailing edge of said stator vane whereby the cooling medium flows in series through the first, second, third and fourth chambers.

5,464,323

VIBRATION ISOLATION SYSTEM FOR FAN BLADE

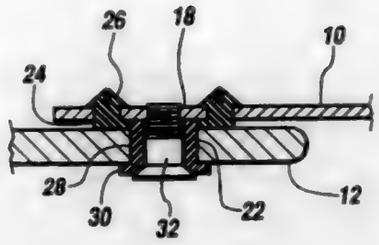
Robert L. Scofield, Cordova, Tenn., assignor to Hunter Fan Company, Memphis, Tenn.

Filed Mar. 2, 1994, Ser. No. 204,865

Int. Cl.[6] **F04D** *29/66*

U.S. Cl. 416—134 R **7 Claims**

1. A vibration isolation assembly for use in securing a fan blade to a mounting surface having a plurality of mounting holes formed therein, said fan blade having an equal number of through holes in a proximate end thereof alignable with said mounting holes, said fan blade also having opposite front and back sides, said assembly comprising:



a plurality of first resilient members for preventing contact between said blade and said mounting surface, each of said first resilient members having attachment means for engaging with a plurality of corresponding attachment holes provided in said mounting surface to secure the first resilient members to said mounting surface;

a plurality of second resilient members disposable within said through holes in said blade, each said second resilient member having a longitudinal hole formed therethrough; and

fastening means insertable through the holes in said second resilient members and engageable with the mounting holes in said mounting surface for fastening said blade to said mounting surface in such a manner that said second resilient members prevent contact between said fastening means and said blade.

5,464,324

VARIABLE-PITCH PROPELLER OR FAN

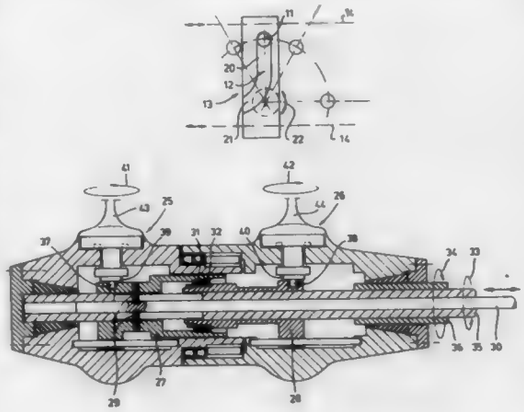
Klaas H. Langenberg, Forsbro Pl. 3283, 82010 Arbrå, Sweden

Filed May 2, 1994, Ser. No. 236,041

Int. Cl.[6] **B63H** *3/04*

U.S. Cl. 416—167 **8 Claims**

1. Propulsion unit comprising two variable-pitch propellers,



each of said propellers having a hollow boss, a number of propeller blades fitted rotatably on the boss, and an adjusting element which is axially slidable in the boss and has a number of grooves running essentially at right angles to the direction of sliding, each propeller blade having a rotary shaft and a control pin which is placed eccentrically relative to its rotary shaft and is slidingly accommodated in one of said grooves of the adjusting element, whereby the propeller blades are adjustable between a forward driving position, a neutral position, and a reverse position, each groove having an esentially straight part and a second part connecting to the straight part and forming an angle with the essentially straight part.

5,464,325

TURBO-COMPRESSOR IMPELLER FOR COOLANT

Peter Albring, Dresden; Rainer Apley, Radebeul; Klaus Döge, Dresden; Günter Heinrich, Dresden; Ernst Lindner, Dresden; Norbert Müller, Dresden; Reinhard Pauer, Dresden; Eberhard Pilling, Dresden, and Rainer Rudischer, Dresden, all of, Germany, assignors to Institut fuer Luft- und Kaeltetechnik Gemeinnuetzige Gesellschaft mbH, Dresden, Germany

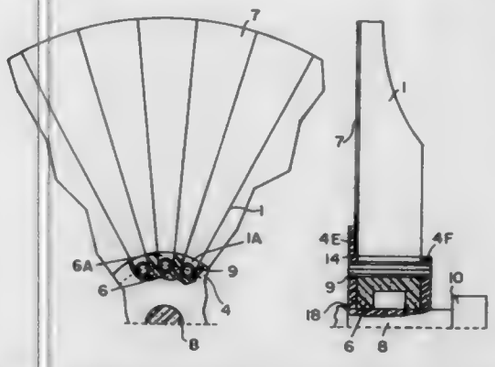
Filed Jun. 27, 1994, Ser. No. 266,940

Claims priority, application Germany, Jun. 25, 1993, 43 21 173.9

Int. Cl.[6] F01D *5/32*

U.S. Cl. 416—185 **6 Claims**

1. An impeller for a radial flow coolant turbo-compressor for



compressing water vapor under vacuum conditions, comprising a plurality of vane elements, a disk element forming an impeller seal disk, a plurality of vane support elements and a hub, wherein said vane elements are arranged circumferentially next to one another and are supported and connected to said hub by said vane support elements, wherein said vane support elements comprise at least one support ring encircling said hub and a respective insert member connecting a root of each of said vane elements to said support ring, and wherein at least one member selected from the group consisting of said vane elements, said disk element, said support elements and said hub is made of a fiber-reinforced composite material.

5,464,326

ROTORS FOR GAS TURBINE ENGINES

David S. Knott, Loughborough, England, assignor to Rolls-Royce, PLC, London, England

PCT No. PCT/GB93/00873, § 371 Date Nov. 1, 1994, § 102(e) Date Nov. 1, 1994, PCT Pub. No. WO93/22539, PCT Pub. Date Nov. 11, 1993

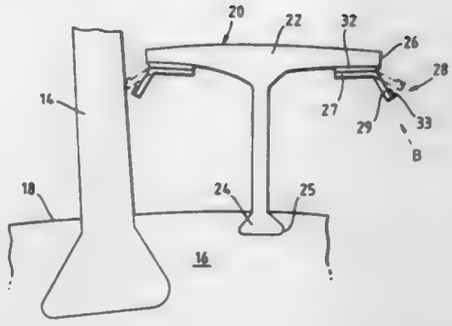
PCT Filed Apr. 27, 1993, Ser. No. 331,542

Claims priority, application United Kingdom, May 7, 1992, 9209895

Int. Cl.[6] F01D *5/22*

U.S. Cl. 416—193 A **6 Claims**

1. A rotor for a gas turbine engine comprising a rotor disc which has a radially outer face on which a plurality of radially extending blades are mounted having spaces between each pair of adjacent blades, the blades (14) being curved in an axially extending direction, separate wall members being provided to bridge the space between adjacent blades to define an inner wall of a flow annulus through the rotor, each of the wall members being adapted for attachment to the radially outer face of the disc and having opposing side faces which are spaced circumferentially from the adjacent blades and which are curved to follow the curvature of the adjacent blades, resilient seal strips being mounted adjacent the opposing side faces of the wall members, each resilient seal strip having a flange portion which is inclined radially inward along a curved edge adjacent the opposing side face of the wall member, the edge having a curvature corresponding to the curvature of the opposing



side face of the wall member and the angle of inclination of the flange portion varying along the curved edge to produce undulations in the flange portions which enhance the flexibility of the flange portion, whereby in operation the flange portion of the resilient seal strip is deflected radially outwards by centrifugal forces as the rotor rotates about a central axis of the engine so that the flange portion comes into contact with the adjacent blade to seal the inner wall of the flow annulus.

5,464,327

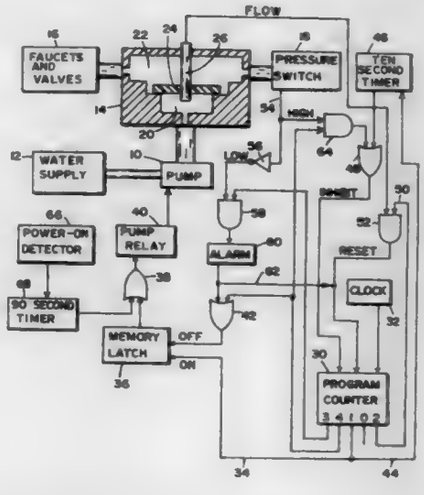
WATER PRESSURE CONTROL SYSTEM

Robert P. Horwitz, Orange, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 1, 1993, Ser. No. 159,631

Int. Cl.[6] F04B *49/00*

U.S. Cl. 417—12 **11 Claims**



1. A water pressure control system comprising in combination:

a pump operable to pump water from a source to a desired destination;

pressure measuring means to measure the pressure of water from said pump;

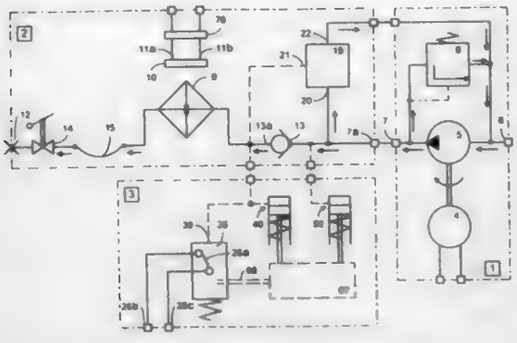
flow measuring means to measure the rate of flow of water from said pump;

control means connected to both of said measuring means and operable to turn on said pump when the water pressure falls below a selected pressure, and further operable to turn off said pump only in response to the flow of water falling below a selected rate.

5,464,328
REGULATING AND CONTROLLING DEVICE FOR A FLUID PRESSURE BOOSTER INSTALLATION

Helmut Stoeger, Herzogstandstrasse 16, 82362 Weilheim, Germany

Filed Feb. 25, 1994, Ser. No. 201,646
Claims priority, application Germany, Mar. 29, 1993, 43 10 155.0
Int. Cl.[6] F04B 49/06
U.S. Cl. 417—44.8 11 Claims



11. In a regulating and controlling device for a fluid pressure booster installation having a motor-driven pressure generating unit, a check valve, a relief valve, a pressure switch having a first cylinder-piston arrangement for connecting the drive motor Of the pressure generating unit to a source of electrical energy, said first cylinder-piston arrangement having a piston rod for contacting an intermediate member which is movably connected to a frame of said switch, and pretensioned by a first spring, and is coupled with a movable carrier, said first cylinder piston having a first lower switch-on pressure and a first upper switch-off pressure, the improvement comprising:

a second cylinder-piston arrangement having a stationary second cylinder, said second cylinder-piston arrangement being pressure-coupled to an outlet of said check valve and having a piston-piston unit which is pretensioned by a second spring against an inner stop defining a moved-in state, which is lifted from the inner stop when the pressure connection is acted upon by a second lower pressure and which comes to rest at an outer stop at a slightly greater second upper pressure;

a third cylinder-piston arrangement having a stationary third cylinder, said third cylinder-piston arrangement having a pressure connection which is common with that of the pressure generating unit and having a piston-piston rod unit which is pretensioned by a third spring against an inner stop defining a moved-in state, which is lifted from the inner stop when the pressure connection is acted on by a determined third lower pressure, and which comes to rest at an outer stop at a slightly greater third upper pressure, wherein the third upper pressure is grater than the first lower pressure and less than the second upper pressure; and

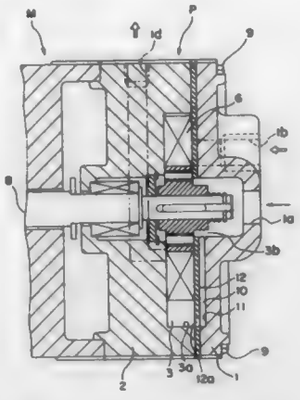
a gear unit arrangement which is driven by the second piston-piston rod unit and by the third piston-piston rod unit and has a trigger element for engaging at the intermediate member;

wherein the trigger element can be moved from an inactive limit position situated outside the movement path of the intermediate member into an active limit position in which it acts on the intermediate member with a pressing surface so as to move the intermediate member from a first limit position to a second limit position with a force sufficient to overcome the spring forces acting on the member and wherein the gear unit arrangement moves the trigger element into its active limit position only when the second piston-piston rod unit contacts its outer stop and the third piston-piston unit contacts its inner stop.

5,464,329
WATER RING TYPE PUMP WITH SIDEWALL WATER REFLUX PASSAGE

Yasutoshi Senoo, Fukuoka; Nobuaki Yanagihara, and Norio Yasu, both of Matsuyama, all of, Japan, assignors to Miura Co., Ltd., Ehime, Japan

Filed May 25, 1994, Ser. No. 249,264
Int. Cl.[6] F04C 19/00
U.S. Cl. 417—68 4 Claims



1. A water ring type vacuum pump, comprising:

a pump chamber communicating with an air inlet and an air outlet and in which a water inlet for feeding sealing water to a center portion of the pump chamber is further provided;

an impeller having a plurality of blades and being rotatably disposed eccentrically within said pump chamber so as to define a pump chamber compression side and a pump chamber suction side;

a rotating shaft extending through a wall of said pump chamber and attached to said impeller for rotatably driving said impeller; and

a reflux passage is provided so as to connect the peripheral wall portion and a center portion of said pump chamber with each other, wherein sealing water that has moved to the peripheral wall portion of the pump chamber is flowed back to a center portion of the pump chamber by way of an opening in a sidewall of said pump chamber, said opening being provided flush with the peripheral wall portion on the pump chamber suction side;

wherein said pump chamber is provided between a first casing and a second casing, a groove is provided in at least one of said casings, a partition member having said opening disposed therein is disposed between the groove and the impeller, and wherein a reflux passage is defined by making the opening and the groove communicate with each other.

5,464,330
CYCLIC HYDRAULIC PUMP IMPROVEMENTS

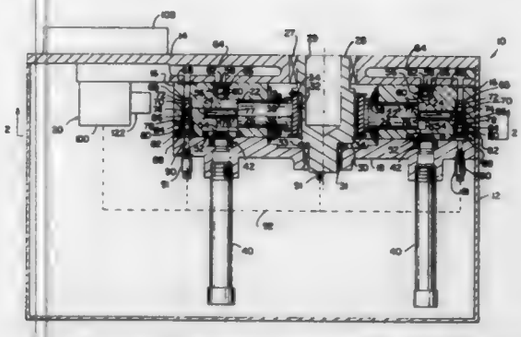
George T. Prince, Franklin, and Mark J. Fisher, Menomonee Falls, both of Wis., assignors to Applied Power Inc., Butler, Wis.

Filed Mar. 9, 1993, Ser. No. 28,491
Int. Cl.[6] F04B 3/00
U.S. Cl. 417—245 6 Claims

1. In a two stage hydraulic pump of the type having multiple sets of two stage pumps, each said set having a first stage pump for delivering a hydraulic fluid flow of a relatively high volume and low pressure and a second stage pump for delivering a hydraulic fluid flow of a relatively low volume and high pressure; the improvement wherein:

each said first stage pump is a reciprocating piston pump having a first stage piston reciprocable in a first stage cylinder;

each said second stage pump is a reciprocating piston pump having a second stage piston reciprocable in a second stage cylinder;



each said second stage piston is driven by said first stage piston to compress said fluid in said second stage cylinder;

a manifold;

at least one valve providing one-way communication from at least two of said first stage cylinders to said manifold; and

at least one valve providing one-way communication from said manifold to at least two of said second stage cylinders;

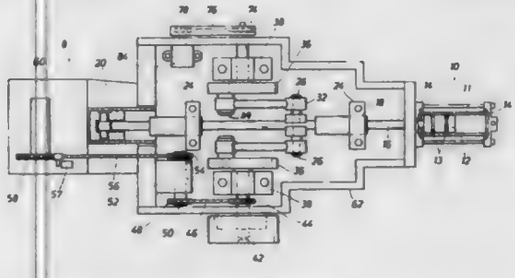
wherein said manifold distributes flow from said at least two first stage pumps to said at least two second stage pumps so as to supercharge said second stage pumps with fluid pumped through said manifold by said first stage pumps.

5,464,331

ENGINE AND POWER OUTPUT

James K. Sawyer, 10311 Sagecourt Dr., Houston, Tex. 77089-5601

Filed Nov. 9, 1993, Ser. No. 149,229
Int. Cl.[6] F04B *17/05*
U.S. Cl. 417—364 **18 Claims**



1. A powered pump system comprising:

a) a power end having

1) a fluid-isolated cylinder with,

2) a cylinder head,

3) an axially directed power piston in said cylinder defining a combustion chamber in said cylinder between said cylinder head and said power piston, and

4) air/fuel mixing means connected to deliver a mixture of air/fuel into said combustion chamber for timed ignition to provide power to said power piston moving said power piston with a power stroke;

b) a pump end having

1) a fluid isolated pump cylinder with

2) a pump cylinder head,

3) an axially directed pump piston in said pump cylinder defining a pumped chamber between said pump cylinder head and said pump piston, and

4) inlet and outlet passage means connected to said pumped chamber to enable pumped fluid to flow there through;

c) an elongate straight rod having two spaced ends wherein said rod at one end is connected to said power piston and the second end is connected to said pump piston wherein said rod delivers an axial power stroke to said pump piston, and wherein said rod is connected to said pump piston and said power piston to preclude rod movement other than axial sliding movement so that said pump piston and rod piston are jointly axially aligned with said rod and said rod is connected to said pistons without rod flexure or deflection; and

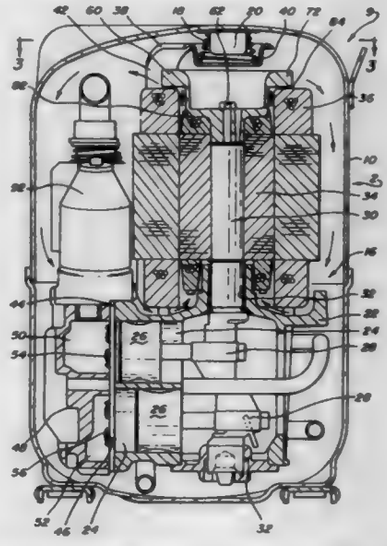
d) a closed shell interposed between said power end and said pump end wherein said closed shell encloses said straight rod and a lubrication system for said rod, and said closed shell is constructed and arranged to isolate said power end from said pump end.

5,464,332

COMPRESSOR WITH MOTOR COOLING FAN

Norman G. Beck; Frank S. Wallis, and Gary A. Holthaus, all of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio

Continuation of Ser. No. 2,809, Jan. 11, 1993, abandoned. This application Jun. 29, 1994, Ser. No. 267,850
Int. Cl.[6] F04B *17/00*
U.S. Cl. 417—368 **17 Claims**



1. A hermetic compressor for a refrigerant comprising:

a hermetically sealed outer shell;

motor means disposed within said shell, said motor means including a motor stator fixedly secured to said shell, a motor rotor rotatably disposed within said motor stator and a driveshaft fixedly secured to said motor rotor;

compressor means disposed within said shell, said compressor means drivingly connected to said driveshaft of said motor means;

fan means fixedly secured to said driveshaft of said motor means and piloted by said motor rotor, said fan means operable to draw said refrigerant between said motor rotor and said motor stator such that heat is absorbed by said refrigerant, said fan means further operable to direct said refrigerant heated by said motor rotor and said motor stator against the interior surface of said outer shell in order to transfer said heat to said outer shell.

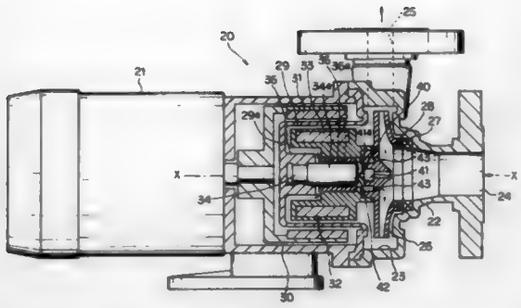
5,464,333

MAGNET PUMP WITH REAR THRUST BEARING MEMBER

Kazuo Okada, Kawagoe, and Toshihiko Kondoh, Sayama, both of, Japan, assignors to Iwaki Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1994, Ser. No. 264,351
Claims priority, application Japan, Jun. 24, 1993, 5-040038 U
Int. Cl.[6] F04B *17/00*
U.S. Cl. 417—420 **7 Claims**

1. A magnet pump, comprising:



a front casing defining an inner pump chamber and having an axially extending suction port and a circumferentially extending discharge port;

an impeller rotatably mounted in the pump chamber, the impeller having a front side portion and a rear side portion opposite to the front side portion, said front side portion facing the suction port;

a cylindrical rear casing cooperating with the front casing to enclose the inner pump chamber fluid tight;

a drive rotor mounted outside the rear casing and having a drive magnet;

a driven rotor having a front side portion on which the impeller is mounted, and a driven magnet facing and forming a magnetic coupling with the drive magnet and rotatable in unison with the impeller;

a spindle secured to the rear casing, said spindle having an extended end portion axially projecting toward the suction port and supporting the driven rotor and the impeller rotatably thereon and movable in the axial direction thereof; and

a rear thrust bearing member for supporting a rearward thrust which acts on the driven rotor and the impeller in a direction opposite to the direction facing the suction port, wherein

said spindle having an axial end face at the extended end portion, and

said rear thrust bearing member being disposed to be in frictional contact with said axial end face of the spindle in the event of at least one of an idling operation of the pump and an abnormal operation thereof.

5,464,334

FUEL INJECTION PUMP

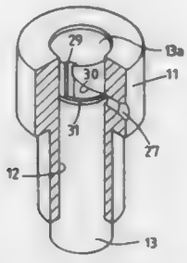
Graeme A. C. Cook; Goulielmos Vranas, and Simon P. McIver, all of Gloucesterhire, England, assignors to Lucas Industries plc, England

Continuation of Ser. No. 163,975, Dec. 8, 1993, abandoned. This application Oct. 24, 1994, Ser. No. 328,974

Claims priority, application United Kingdom, Dec. 8, 1992, 9225585

Int. Cl.[6] F04B *7/04*

U.S. Cl. 417—494 **7 Claims**



1. A fuel injection pump for supplying fuel to an internal combustion engine comprising a pumping plunger slidable within a bore, an outlet from one end of the bore, the outlet being connected in use, to a fuel injection nozzle of an associated engine, the nozzle incorporating a fuel pressure actuated valve member, a coiled compression spring biasing the pumping plunger outwardly of the bore, the pumping plunger being movable inwardly by the action of an engine driven cam against the action of the spring, spill means for spilling fuel from the bore during the inward movement of the pumping plunger thereby to control the amount of fuel supplied to the associated engine, and fluid damping means for restricting the final inward movement and for restricting overtravel of the pumping plunger, said fluid damping means producing an increase in the pressure in the bore above the pumping plunger while the spill means operates to spill fuel from the bore and before the pumping plunger attains its innermost position.

5,464,335

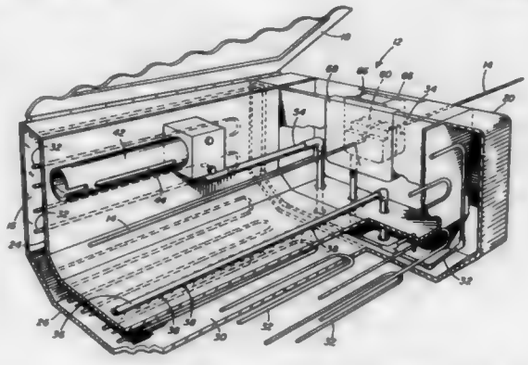
VACUUM TANK FOR VACUUM SIZING APPARATUS

Robert H. Bessemer, York, Pa., and Stanley J. Yeoman, Milton Keynes, United Kingdom, assignors to The Conair Group, Inc., Pittsburgh, Pa.

Filed Aug. 30, 1994, Ser. No. 298,325

Int. Cl.[6] B29C *47/88*

U.S. Cl. 425—71 **14 Claims**



6. A vacuum tank containing water and forming part of a vacuum sizing apparatus utilized for precision cooling and sizing of a molten plastic extrudate comprising:

an elongated tank structure having an extrudate inlet at one end and an extrudate outlet at the other end; seal means sealing said extrudate inlet and said extrudate outlet;

said tank structure having a "U" shaped inner wall and a "U" shaped outer wall extending in parallel, spaced relation to each other through the length of said tank structure;

coolant circulation means including tubing positioned between said inner wall and said outer wall to receive coolant pumped through said tubing and circulate said coolant in a tortuous path between said inner wall and said outer wall;

make-up water means including an elongated tube positioned longitudinally within said tank structure adjacent the bottom of said tank structure , said elongated tube having a plurality of holes formed therein to direct water from within said tube downwardly and outwardly toward the bottom and sides of said tank structure, said elongated tube being at all times below the water level within said tank structure;

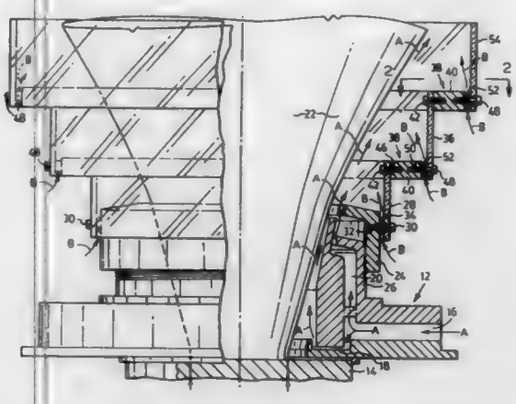
adjustable water over-flow means including an elongated cylindrical tube positioned longitudinally within said tank structure and having slot means extending along its length so that water entering said slot means is conducted through said cylindrical tube and into an over-flow drain conduit for removal from said tank structure; said cylindrical tube being rotatable about its axis to position said slot means at variable distances above the bottom of said tank structure whereby the depth of water within said tank structure may be adjusted; and

a pre-skin block secured to the extrudate inlet end of said elongated tank structure within said tank structure, said pre-skin block being formed as a solid block formed of an acetal resin having a groove to initially receive and size said extrudate, a channel extending around its periphery to receive cooling water and means to removably secure said block to said tank structure.

5,464,336
AIR RINGS FOR COOLING BLOWN PLASTIC FILM

Mirek Planeta, 170 Traders Blvd., Mississauga, Canada

Filed Aug. 11, 1994, Ser. No. 289,036
Int. Cl.[6] B29C 47/88
U.S. Cl. 425—72.1 3 Claims



1. An air ring for supplying cooling air to an extruded tubular plastic film after the film has been extruded from an annular extruder die at an elevated temperature, said air ring comprising:

a lower annular member securable to an annular extruder die so as to surround extruded tubular plastic film as the film leaves the extruder die, said lower annular member having at least one passage therethrough for supplying cooling air from the exterior thereof to a lower portion of the tubular film, and

a first upper annular member surrounding an upper portion of the lower annular member in radially spaced relationship therewith, said first upper annular member projecting above the lower annular member and being detachably secured to the upper portion of the lower annular member by a removable spacer assembly, which provides circumferentially extending passages for the flow of cooling air from the ambient atmosphere between the lower annular member and the first upper annular member to the tubular film,

said removable spacer assembly comprising a series of circumferentially spaced securing devices each extending from the first upper annular member to the lower annular member and each carrying an annular spacer thereon to maintain said radially spaced relationship.

5,464,337
RESIN TRANSFER MOLDING SYSTEM

Edward Bernardon, Bedford, and Michael F. Foley, Cambridge, both of Mass., assignors to The Charles Stark Draper Laboratories, Cambridge, Mass.

Continuation of Ser. No. 869,384, Apr. 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 675,819, Mar. 27, 1991, Pat. No. 5,151,277. This application Jul. 7, 1994, Ser. No. 271,561
Int. Cl.[6] B29C 70/44;70/48
U.S. Cl. 425—112 8 Claims

1. A resin transfer molding system comprising:

a mold surface;

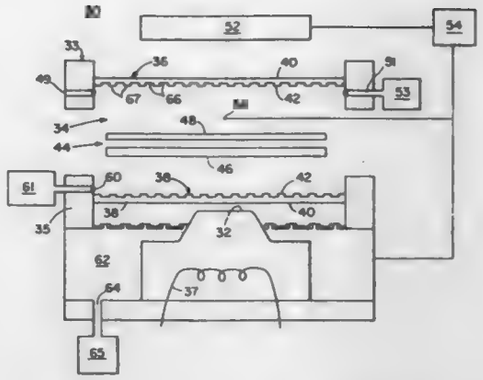
a sealable chamber including opposing elastically deformable and reconfigurable diaphragms forming an outer flexible tooling surface to be formed by said mold surface;

a workpiece including resin and fibrous reinforcing material to be impregnated and formed located between said diaphragms;

means for sealing said diaphragms about said work piece;

means for impregnating said fibrous reinforcing material with said resin while it is between said diaphragms; and

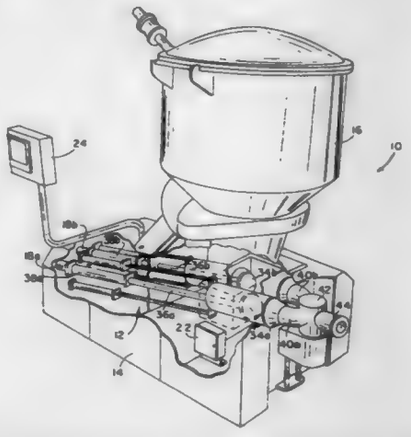
means for forming said workpiece while it is between said diaphragms including means for urging said opposing diaphragms and said workpiece contained therein over the mold surface and for conforming the diaphragms and the workpiece to the contours of the mold surface.



5,464,338
FOOD PUMP

Richard G. Powers, Overland Park, Kans., assignor to Marlen Research Corporation, Overland Park, Kans.

Filed Sep. 2, 1994, Ser. No. 300,442
Int. Cl.[6] B29C 47/92; A22C 7/00
U.S. Cl. 425—145 14 Claims



12. In a food pump having two pistons alternately operable for pumping food product, each piston having a hydraulic cylinder supplied with hydraulic fluid and coupled therewith for applying motive force to a respective piston, said apparatus comprising:

a pair of linear transducers coupled with respective hydraulic cylinders for determining the linear positions thereof and thereby for determining the linear positions of the corresponding pistons, said transducers including means for producing respective position signals representative of said linear positions;

transducer circuitry coupled with said transducers for receiving said position signals and responsive thereto for determining the linear velocities of the cylinders as the change in cylinder position over time and for producing respective velocity signals representative of said linear velocities;

means for receiving an input representative of a desired velocity of the pistons corresponding to a desired rate of flow of the food product and for producing a set point signal representative thereof;

control circuit means for receiving and comparing said velocity and set point signals for determining the deviation in said velocity from said desired velocity and for producing a control signal representative of said deviation;

an electrically operable hydraulic valve coupled with the supply of hydraulic fluid to the hydraulic cylinders, and coupled with

said control circuit means for receiving said control signal and responsive thereto for controlling the application of hydraulic fluid to the cylinders for controlling the linear velocity thereof in accordance with said deviation signal for maintaining said linear velocities at said desired velocity.

5,464,339

MOLDING DYE FOR DISK SUBSTRATE

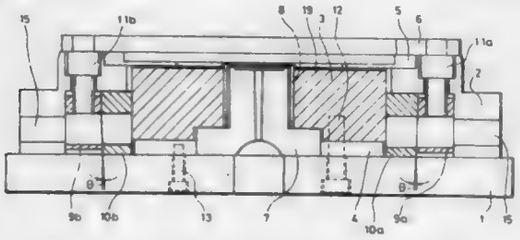
Nobuyuki Arakawa; Takashi Segawa, both of Kanagawa; Moriyoshi Kaneko, Tokyo; Kazuki Miyairi, and Kazutoshi Takayama, both of Nagano, all of, Japan, assignors to Sony Corporation, Tokyo, and Nissei Plastic Industrial Co., Ltd., Nagano, Japan

Filed Jul. 7, 1994, Ser. No. 271,669

Claims priority, application Japan, Jul. 12, 1993, 5-171393

Int. Cl.[6] B29C *33/30*

U.S. Cl. 425—186 **16 Claims**



1. A disk substrate molding die comprising: mounting means for mounting a substantially planar, thin stamper plate having a plane surface and carrying a transfer signal recorded thereon, said mounting means securing said stamper plate for adjustment substantially in an X-Y plane; and

adjustment means for moving said thin stamper plate in said X-Y plane and in a direction of its plane surface, said adjustment means including a plurality of pairs of position adjusting blocks, a first pair of position adjusting blocks fixing said mounting means in said X-Y plane, a second pair of said position adjusting blocks fixing the position of said first pair of position adjusting blocks, the respective first and second pairs cooperating with each other to move along an inclined mating surface therebetween, so that movement of said first and second pairs moves said stamping plate in one of said X-Y directions.

5,464,340

EXTRUDER

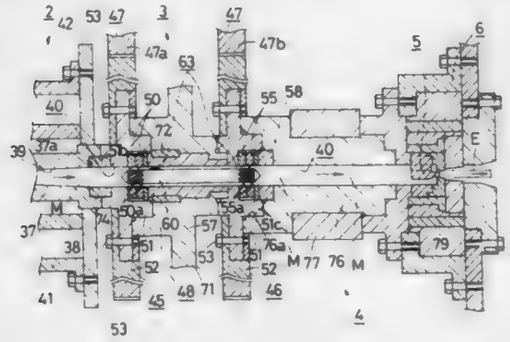
Sadahide Yano, Osakashi, Japan, assignor to Yugen Kaisha Yano Engineering, Osaka, Japan

Filed Mar. 3, 1994, Ser. No. 205,188

Claims priority, application Japan, Mar. 4, 1993, 5-044092

Int. Cl.[6] B21C *29/04*

U.S. Cl. 425—382.3 **10 Claims**



7. An extruder comprising:

an extrusion die;

a feed passage disposed behind the die and guiding a raw material thereinto;

a material feeder disposed behind the feed passage so as to force thereinto a wire-shaped or rod-shaped raw material having a cross-sectional area smaller than that of the feed passage;

a stationary core disposed in an intermediate region of the feed passage so as to define at least one annular passageways around the core and in fluid communication with the feed passage; and

at least one pair of blades which each has a helical edge formed at a predetermined lead angle and disposed in the annular passageway, wherein the blades are driven to rotate so as to force the raw material towards the die.

5,464,341

APPARATUS FOR FORMING SHEET MATERIALS

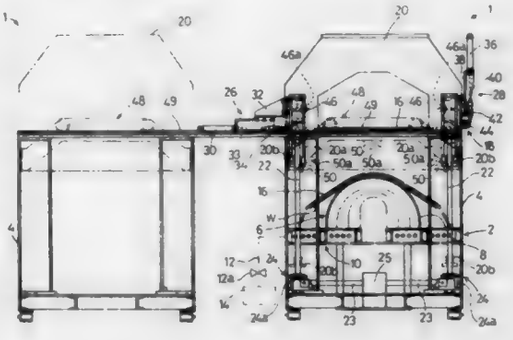
Hiroshi Tachibana, Tokyo, and Harumi Kizuki, Kawaguchi, both of, Japan, assignors to Kabushiki Kaisha Tachibana Seisakusho, Tokyo, Japan

Filed Dec. 22, 1993, Ser. No. 171,743

Claims priority, application Japan, Jan. 14, 1993, 5-022065

Int. Cl.[6] B29C *53/04*; **B22B** *31/20*

U.S. Cl. 425—388 **14 Claims**



1. In an apparatus for forming sheet materials wherein a sheet material is placed on a mold having a convex surface corresponding to the shape to be achieved by forming, wherein a flexible sheet covers said sheet material, and wherein said flexible sheet is tightly contacted with the sheet material by vacuum suction thereby forming said sheet material, said apparatus comprising:

a bed portion supporting said mold;

a sheet supporting member for supporting said flexible sheet in a spread state;

a sheet transporting device for transporting said sheet supporting member to and from said mold in a reciprocating motion;

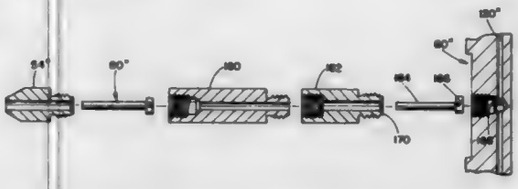
a sheet stretching device mounted on said sheet supporting member, wherein said sheet stretching device applies a stretching force to said flexible sheet when said sheet supporting member is in a stand-by position remote from the mold and releases the stretching force for giving the flexible sheet deflection when said sheet supporting member is in a forming position near the mold; and

a vacuum suction device mounted on said bed portion.

5,464,342
PIN IN BARREL INJECTION MOLDING NOZZLE USING SHORT PIN

Wayne Marik, Mantua; John Begalla, Chardon, and Tom W. Johnson, Hunting Valley, all of Ohio, assignors to Nitrojection Corporation, Chagrin Falls, Ohio

Filed Sep. 24, 1993, Ser. No. 126,323
Int. Cl.[6] B29C *44/42;45/23*
U.S. Cl. 425—533 **19 Claims**



1. An apparatus for injecting a viscous fluid and a non-viscous fluid into a mold cavity of a mold body, comprising:

a nozzle body comprising a discharge end and a flow passage for the viscous fluid extending to said discharge end;

a valve element mounted for reciprocation in said nozzle body flow passage to control a flow of the viscous fluid through said nozzle body discharge end, said valve element comprising:

a barrel having a first end and a second end, and a first bore extending longitudinally in said barrel,

a tip detachably secured to said barrel first end, said tip engaging a portion of said nozzle body discharge end to prevent a flow of the viscous fluid therepast when said valve element is in one end position during reciprocation, said tip having a first end, a second end and a second bore extending longitudinally through said tip from said first end to said second end thereof, said first and second bores communicating with each other,

a pin located in at least said second bore, said pin having a first end located adjacent said tip first end, such that said pin and said tip define between them an annular opening at said tip first end, wherein an annular flow passage is defined between said pin and said tip, said annular flow passage allowing a flow of the non-viscous fluid, said pin having an enlarged diameter section spaced from said pin first end, said enlarged diameter section being removably securable within a cavity defined between said tip and said barrel, said pin and said valve element defining a non-viscous fluid flow passage therebetween, wherein said pin can be removed from said tip when said tip is detached from said barrel.

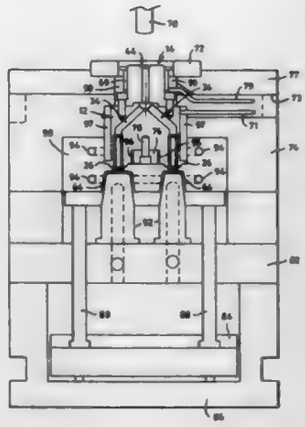
5,464,343
MULTITIP HOT RUNNER SYSTEM

Douglas C. Hepler, Rochester, N.Y., assignor to Polyshot Corporation, Henrietta, N.Y.

Continuation of Ser. No. 982,473, Nov. 27, 1992, abandoned.
This application May 25, 1994, Ser. No. 249,089
Int. Cl.[6] B29C *45/22*
U.S. Cl. 425—549 **12 Claims**

1. A multitip hot runner apparatus for transporting molten plastic from an injection machine to a plurality of mold cavities while controlling the temperature of the molten plastic, said apparatus comprising:

a distribution body of given length and having a central longitudinal axis extending therethrough, said body having top and bottom surfaces, a distribution well formed in said top surface for receiving said molten plastic, a plurality of unrestricted and identically configured through flow channels formed between said distribution well and said bottom surface of said distribution body to transport said molten plastic from said well along said flow channels and toward said bottom surface, each of said flow channels having lower sections for releasably receiving tips for transporting said molten plastic beyond said bottom surface to gates of respective mold cavities, a plurality of heating cartridge holes equal in number to the number of said flow channels and equally spaced within said distribution body with respect to said flow channels so that each flow channel is surrounded in said distribution body by an identical thermal mass to assure uniform heating of said flow channels when heating cartridges are present in said distribution body and energized, said heating cartridge holes being non-through holes extending from said top surface of said distribution body to a predetermined length short of said distribution body given length, and a single non-through thermocouple hole, also extending from said top surface of said distribution body to a predetermined length short of said distribution body given length and near said bottom surface thereof, said thermocouple hole being closely adjacent one of said plurality of said flow channels;



a plurality of heating cartridges one each of which is disposed within said heating cartridge holes;

a thermocouple disposed in said thermocouple hole for monitoring the temperature near said bottom surface of said distribution body and supplying temperature feedback information for controlling the temperature of all of said flow channels;

a plurality of said tips for transporting said molten plastic, each of said tips being releasably connected in a respective one of said lower sections of said flow channels and forming therewith an air space to prevent heat loss, said tips being fabricated of a material with high heat conducting properties relative to those of said distribution body to conduct heat from said distribution body outside of said bottom surface thereof to prevent plastic freeze at cavity gates, and

an interface body attached to said distribution body for receiving molten plastic and transporting it to said distribution chamber of said distribution body, said interface body being adapted to also retain said heating cartridges and said thermocouple within said distribution body and to be heated by said heating cartridges so as to maintain plastic therein in a molten state without the need for separate heating beyond that derived from said distribution body.

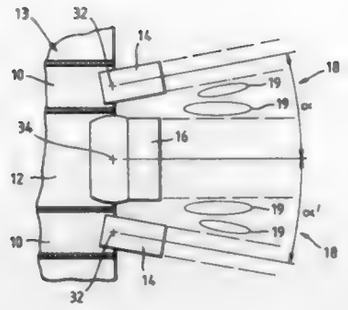
5,464,344
LOW NO_x AIR AND FUEL/AIR NOZZLE ASSEMBLY

Peter F. Hufton, Derbyshire, England, assignor to Rolls-Royce Power Engineering plc, Newcastle upon Tyne, England

Filed Jun. 29, 1994, Ser. No. 267,369
Claims priority, application United Kingdom, Jul. 8, 1993, 9314112
Int. Cl.[6] F23M *3/04*
U.S. Cl. 431—10 **9 Claims**

1. An air and fuel nozzle assembly for emitting air and fuel into a combustion chamber and reducing NO_x production comprising:

a box structure having a fuel passageway and an air passageway spaced laterally from the fuel passageway;



a flow nozzle having a flow nozzle axis in a plane and having a bore therethrough defining a fuel flowpath parallel to the flow nozzle axis positioned to emit a mixture of air and fuel into the combustion chamber, the mixed flow nozzle being in operative relation with the fuel passageway;

an air nozzle having an air nozzle axis in the plane and having a bore therethrough defining an air flowpath parallel to the air nozzle axis positioned to emit air into the combustion chamber, the air nozzle being laterally spaced in the plane from the flow nozzle such that the air nozzle axis is parallel to the flow nozzle axis, the air nozzle being in operative relation with the air passageway; and

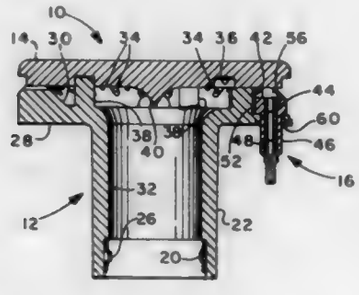
a deflecting member connected to an outlet end of the air nozzle positioned to deflect inwardly the emitted air at an included angle towards the air nozzle axis thereby creating, upon operation of the assembly, spaces between the emitted air and the emitted mixture of air and fuel into which combustion gases flow and are entrained laterally delaying mixture of the air and the mixture of air and fuel.

5,464,345

GASEOUS FUEL BURNER AND METHOD OF MAKING SAME

David J. Kwiatek, LaGrange, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 29, 1994, Ser. No. 282,359
Int. Cl.[6] F23Q *3/00*
U.S. Cl. 431—266 **15 Claims**



1. A burner for gaseous fuel comprising:

(a) a body formed of electrically conductive material having a hollow tubular portion with an annular flange formed integrally therewith and extending generally radially outwardly from one end thereof, said flange having an annular recess formed in an axial face thereof and communicating with the hollow of said tubular portion and a plurality of circumferentially spaced fuel passages extending from said annular recess radially outwardly of said flange;

(b) a cover plate registered against said axial face of said annular flange;

(c) a recess formed in the periphery of said flange and communicating with at least one of said fuel passages;

(d) a spark igniter disposed in said recess and including a connector adapted for electrical connection thereto;

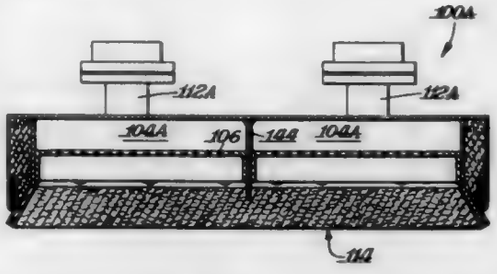
(e) an annular spring member received in said hollow of said tubular portion and distal said flange, said spring member contacting an inner surface of said hollow portion, said spring member having certain portions thereof configured and adapted to frictionally engage a fuel supply tube, and upon insertion of a fuel tube in said spring member said spring is expanded radially and said certain portion is operative to seal about said tube and other portions of said spring are operative to frictionally engage and seal about said hollow portion of said body for retaining said supply tube connected to said burner assembly.

5,464,346

INFRA-RED HEATER FOR TREATING SUBSTRATES

William S. Derr, Philadelphia, Pa., and Mark D. Longacre, Merchantville, N.J., assignors to Mersden Manufacturing Co., Pennsauken, N.J.

Filed Sep. 30, 1994, Ser. No. 315,340
Int. Cl.[6] F23D *14/12*
U.S. Cl. 431—328 **4 Claims**



1. In an infra-red heater for treating a substrate such as in the drying of paper or the like comprising a gas fired burner having a burner body with a plenum chamber divided by a baffle into an upstream intake compartment and a downstream intake compartment, a gas inlet communicating with said upstream intake compartment for supplying a fuel-gas mixture thereto, a fiber matrix in the mouth at the discharge end of said downstream intake compartment, said burner body including peripheral side walls, and said side walls including downstream end portions surrounding said matrix, the improvement being in that said end portions of said side walls and said matrix being outwardly tapered in a discharge direction, said matrix being mounted to said end portions by a layer of adhesive material therebetween, said end portions and said matrix having the shape of a four-sided frusto-pyramid, an insulation housing surrounding said burner body, blanket insulation being in said housing against sides of said burner body, said insulation housing comprising a cover plate terminating in upturned extensions forming a peripheral channel in the general location of said matrix, end caps connected to said end portions of said side walls, said end caps including inclined sections mounted against said end portions of said side wall, straight sections connected to said inclined sections, and said straight sections terminating in downturned section mounted in said peripheral channel of said upturned extension to lock said end caps to said cover plates.

5,464,347

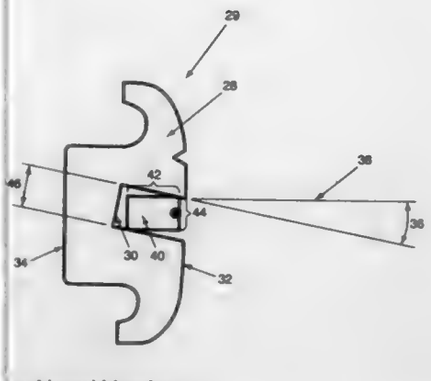
HYBRID ORTHODONTIC BRACKET SYSTEM AND METHOD

Timothy J. Allesee, 3909 Jamie La., Bloomington, Ind. 47401

Filed Nov. 8, 1993, Ser. No. 148,974
Int. Cl.[6] A61C *3/00*
U.S. Cl. 433—8 **29 Claims**

1. An orthodontic bracke. system for straightening upper central, lateral, cuspid, and bicuspid teeth, the bracket system comprising:

a plurality of rectangular wires having a plurality of different sizes;



an upper bicuspid bracket;
an upper cuspid bracket;
an upper lateral bracket;
an upper central bracket including a 0.020 inch width slot for receiving a selected one of the plurality of rectangular wires therein, the slot being aligned at a torque angle of about +17°.

5,464,348

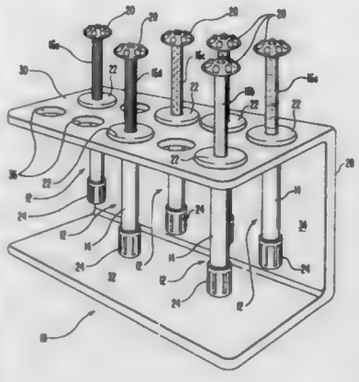
SYRINGE SYSTEM FOR MATCHING TOOTH COMPOSITE COLORS

Dan E. Fischer, Sandy, Utah, and Fred Picavet, Lancon de Province, France, assignors to Ultradent Products, Inc., South Jordan, Utah

Continuation-in-part of Ser. No. 19,266, Feb. 16, 1993, Pat. No. 5,364,267. This application Sep. 9, 1994, Ser. No. 303,433

Int. Cl.[6] A61C *19/10*

U.S. Cl. 433—26 **27 Claims**



1. A syringe system for conveniently and efficiently matching tooth composite colors to natural tooth colors comprising:

a) a plurality of delivery syringes, each delivery syringe containing therein a different colored tooth composite, and each said delivery syringe comprising at least the following parts:

a barrel in which the tooth composite is contained and which is constructed of an opaque material to prevent light activation of the tooth composite;

a plunger longitudinally slidable within the barrel for extruding the tooth composite from the barrel; and

a removable cap for enclosing the end of the barrel until such time as the tooth composite is to be extruded from the barrel; and

b) indicia means, placed on at least one of said parts of each delivery syringe, for displaying the color of the tooth composite contained in the barrel of the delivery syringe, the indicia means comprising:

a cured sample of the composite contained within the delivery syringe barrel;

whereby the indicia means is colored so as to match the color of the tooth composite contained in the barrel.

5,464,349

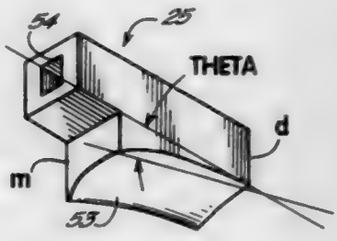
ORTHODONITIC APPLIANCE PROVIDING FOR MESIAL ROTATION OF MOLARS

Craig A. Andreiko, Alta Loma, and Mark A. Payne, Whittier, both of Calif., assignors to Ormco Corporation, Glendora, Calif.

Continuation-in-part of Ser. No. 973,973, Nov. 9, 1993. This application Aug. 4, 1994, Ser. No. 286,000

Int. Cl.[6] A61C *3/00*

U.S. Cl. 433—24 **20 Claims**



1. A method of making an orthodontic appliance for straightening teeth of a patient, the method comprising the steps of:

(1) in a specially programmed digital computer: (a) calculating finish positions of the teeth of the patient based on digitized dental anatomical shape data of the patient, and (b) designing a custom orthodontic appliance to move the teeth of the patient that are mesial to the molars to finish positions on an archform, the appliance including an archwire; and

(2) in the computer, (a) calculating archwire position and orientation in the vicinity of the molars, (b) calculating finish positions of the molars that place the molars on the archform; (c) for each of a plurality of the molars, calculating an angle between the calculated orientation of the archwire and a line tangent to the surface of the molar at a connection point thereon when the molar is in its calculated finish position, and (d) for each such molar, calculating the geometry of a bracket for connection to the molar at the connection point thereon, the bracket having a groove therein for receiving the archwire sloped relative to the tooth at a rotation angle approximately equal to the calculated angle; and

(3) fabricating each bracket in accordance with the calculated geometry to connect the archwire to the molar at the rotation angle.

5,464,350

DENTAL HANDPIECE WITH A CHECK VALVE

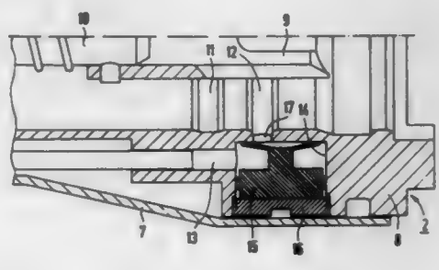
Thomas Bierbaum, Lorsch, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 19, 1994, Ser. No. 293,437

Claims priority, application Germany, Aug. 23, 1993, 9312611 U

Int. Cl.[6] A61C *1/10*

U.S. Cl. 433—84 **15 Claims**



1. A dental handpiece comprising a head part with an exit nozzle

at one end; a coupling member spaced from the head part for coupling the handpiece to a supply source for delivering a cooling fluid to said head part, said coupling member having an outer surface, an inner surface and a passageway for delivery of a cooling fluid from the inner surface to the exit nozzle, said passageway including a recess with a base wall extending radially inward from the outer surface of the coupling member, a first duct extending from the base wall of the recess to the inner surface and a second duct extending from the recess at a point spaced from the base wall toward the exit nozzle; and a check valve member being disposed in the recess having a movable section forming a closing member for the first duct and an immovable section for sealing the recess adjacent to the outer surface of the coupling member.

5,464,351

BRANCH JOINT BOX

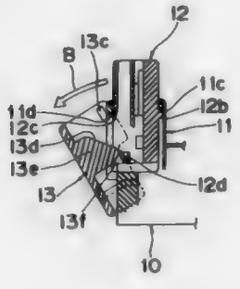
Tatsuya Oka, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Apr. 12, 1994, Ser. No. 226,300

Claims priority, application Japan, May 24, 1993, 5-027087 U

Int. Cl.[6] H01R *13/62*

U.S. Cl. 439—372 **4 Claims**



1. A branch joint box in which after a female connector connected to a wiring harness has been fitted into a male connector provided on the branch joint box, a lock cover provided on the branch joint box is closed and the female connector is locked to the male connector at a fitting position of the female connector by a locking portion of the lock cover, the branch joint box comprising:

a temporary retention means for temporarily retaining the lock cover to the branch joint box at a closed position of the lock cover prior to fitting of the female connector into the male connector;

a temporary retention cancelling means for cancelling temporary retention of the lock cover in response to movement of the female connector into the male connector so as to move the lock cover to an open position of the lock cover, whereby, when the lock cover is closed, the temporary retention cancelling means also moves the female connector away from the male connector when the female connector is more than a predetermined distance from the fitting position, and moves the female connector to the fitting position when the female connector is less than the predetermined distance from the fitting position; and

a fixed retention means which, after the female connector has been fitted into the male connector, at the fitting position, locks the female connector to the male connector and locks the lock cover to the branch joint box.

5,464,352

ELECTRICAL CONNECTOR ASSEMBLY

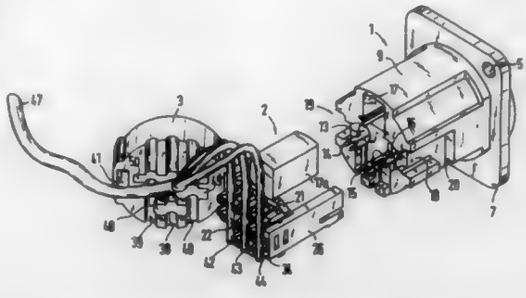
David L. Van Emmerick, Dingley, Australia, assignor to Alcatel Components Limited, Melbourne, Australia

Filed Nov. 12, 1993, Ser. No. 151,163

Claims priority, application Australia, Nov. 13, 1992, PL5808; Apr. 23, 1993, PL8446

Int. Cl.[6] H01R *4/24*

U.S. Cl. 439—404 **11 Claims**



1. A panel mounting insulation-displacement connector for terminating a cable including one or more individual insulated wires, the connector comprising:

a contact retaining body having one or more insulation displacement contacts with insulation displacement means, each for receiving an individual insulated wire of the cable;

a wire guide member having at least one wire channel with an open top opposite a closed bottom surface, each of said at least one channel for retaining an individual insulated wire of the cable, each wire channel being transected by at least one transverse channel, each wire channel and each transverse channel being formed by interstices between an array of fingers having at least two rows projecting from a base of the wire guide member, each wire channel including in its bottom surface a blade aperture in the region of the transverse channel through which one of the insulation displacement means protrudes to lie substantially transverse to the wire channel; and

a clamping member including one or more displacement members, each displacement member being adapted to be received in a corresponding one of the transverse channels to force each individual insulated wire into a corresponding one of the insulation displacement means; the clamping member and the wire guide member having corresponding first and second latching elements which cooperate to attach the clamping member to the wire guide member.

5,464,353

LOCK CONNECTOR

Eiji Saijo; Masashi Saito, and Takeshi Tsuji, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Mar. 31, 1994, Ser. No. 221,244

Claims priority, application Japan, Apr. 21, 1993, 5-119171; Apr. 21, 1993, 5-119172; Apr. 21, 1993, 5-119173

Int. Cl.[6] H01R *3/00*

U.S. Cl. 439—489 **6 Claims**

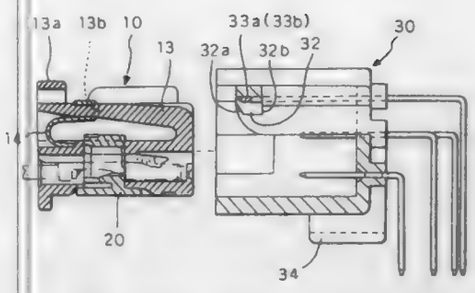
1. A lock connector comprising:

first connector housing having a flexible lock piece formed thereon;

second connector housing having an engagement portion formed thereon to be engaged with said flexible lock piece;

a detecting member for detecting the locked state between the first and second connector housings, said detecting member comprising:

a pair of lock detecting electrodes disposed on said second connector housing where said flexible lock comes in contact with said engagement portion, and



a short circuit electrode disposed on the upper surface of said first connector housing where said flexible lock piece is urged toward said engagement portion, said short circuit electrode electrically connecting said pair of lock detecting electrodes when said flexible lock piece is engaged with said engagement portion in said locked state; and

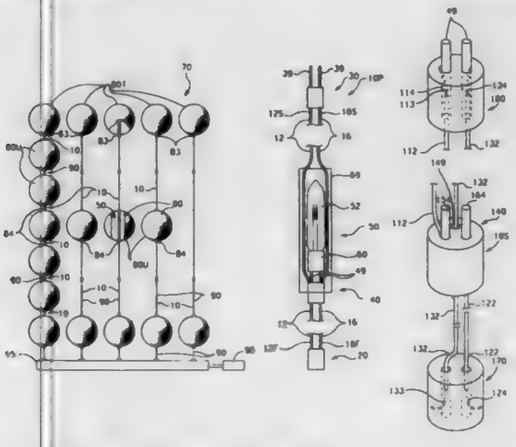
a U-shaped leaf spring including a first leg contacting the flexible lock piece, a second leg contacting a side of said first housing, and a connection portion connecting the first and second legs, said connection portion being adjacent a distal free end of the flexible lock piece in said locked state.

5,464,354

PARALLEL AND SERIES PLUGS AND WIRING SEGMENTS FOR BALLON DISPLAY

Alp T. Akman, 1195-A Linda Vista Dr., San Marcos, Calif. 92069

Filed Feb. 1, 1994, Ser. No. 189,720
Int. Cl.[6] A63H *27/10;* **H01R** *13/41*
U.S. Cl. 439—505 **15 Claims**



1. A series male connector comprising:

an electrically insulative and resilient plug body having a first end and a plug end and having:

a first bore in said plug end;

a second bore disposed through said plug body between said first end of said plug body and said plug end; and

a third bore disposed through said plug body between said first end of said plug body and said plug end;

a first electrically conductive wire having:

a first end disposed in said first bore; and

a second end protruding out of said plug end of said first bore;

a first electrically conductive pin having:

a first end frictionally fitted in said first bore so as to retain said first end of said first wire in said first bore and so as to be in electrical contact with said first end of said first wire; and

a second end protruding out from said plug end and forming a first tine of said male connector;

a second electrically conductive wire having:

a first end disposed in said second bore; and

a second end protruding out of said first end of said plug body;

a second electrically conductive pin having:

a first end frictionally fitted in said second bore so as to retain said first end of said second wire in said second bore and so as to be in electrical contact with said first end of said second wire; and

a second end protruding out from said plug end and forming a second tine of said male connector; and

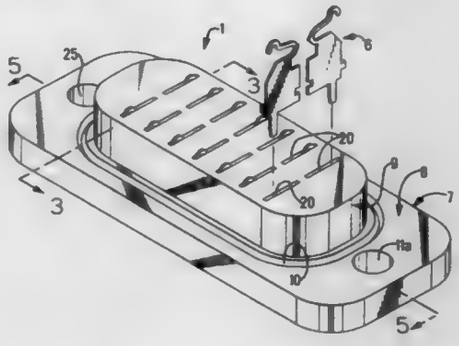
a third electrically conductive wire having a first end and a second end; said third wire disposed through said third bore such that said first end of said third wire protrudes from said first end of said plug body and forms a wire pair with said second end of said second wire and such that said second end of said third wire protrudes from said plug end of said plug body and forms a wire pair with said second end of said first wire.

5,464,355

SEALED LAND GRID ARRAY CONNECTOR

Richard E. Rothenberger, 5 State Dr., Harrisburg, Pa. 17112

Filed Jan. 19, 1994, Ser. No. 183,556
Int. Cl.[6] H01R *13/73*
U.S. Cl. 439—559 **13 Claims**



1. An electrical connector for mounting in a frame comprising:

a. at least one contact element having a compliant head portion, which is axially displaceable along a longitudinal mating axis,

b. an overmolded body retaining said contact elements wherein said body has a frame abutting surface,

c. a compressible sealing element disposed on said frame abutting surface, circumscribing an area interior of said compressible sealing element,

d. a shroud mated to said body creating a shroud junction between said shroud and said body wherein, said shroud junction is contained entirely within said area interior of said compressible sealing element, and

e. at least one retention element that cooperates with said body to compress said compressible sealing element between said body and the frame.

5,464,356

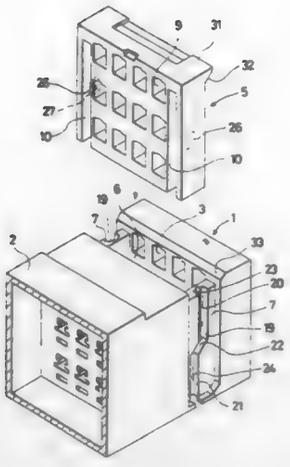
CONNECTOR

Akira Nebeshima; Kaoru Watanabe, and Toshikazu Sabu, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Apr. 6, 1994, Ser. No. 223,974
Claims priority, application Japan, Apr. 13, 1993, 5-04690 U
Int. Cl.[6] H01R *13/514*
U.S. Cl. 439—752 **18 Claims**

1. A connector comprising:

a housing having a first upper surface and including a body having at least one terminal receiving hole for receiving a metal terminal, said housing further including guide walls



between which a retainer insertion groove is located, each of said guide walls including one of a guide groove and a guide projection; and

a retainer having a second upper surface and including at least one communication hole for communication with said at least one terminal receiving hole, said retainer having the other of said guide groove and said guide projection, said guide groove and said guide projection being cooperable for guiding the insertion of said retainer into said retainer insertion groove, wherein:

said retainer is retained in a provisionally-retained position in said retainer insertion groove when said metal terminal is inserted in a partially-inserted position,

said retainer is retained in a completely-retained position in said retainer insertion groove when said retainer is moved from said provisionally-retained position to a completely-retained position thereby pushing the metal terminal from said partially-inserted position to a fully-inserted position, and

said first upper surface and said second upper surface are substantially continuous and flush when said retainer is in the completely-retained position.

5,464,357

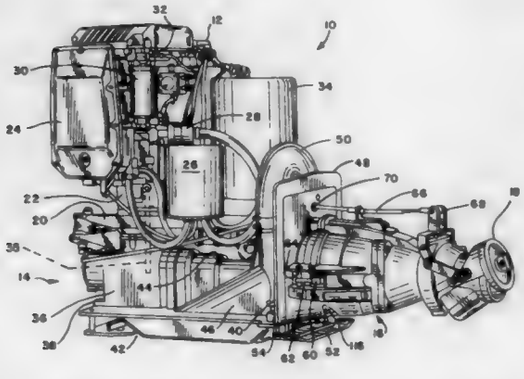
JET PUMP EXHAUST SYSTEM

W. Scott Craig, Kenosha, Wis.; Charles B. Hall, Ingleside; Edward K. Lam, Wadsworth, both of Ill., and Duane E. Rogers, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 5, 1993, Ser. No. 147,973

Int. Cl.[6] B63H *21/32*

U.S. Cl. 440—89 **19 Claims**



1. An exhaust system for a marine jet pump with an internal combustion power head connected to a pump unit, comprising:

a muffler provided with a casing defining an interior, a muffler inlet in fluid communication with the power head to receive exhaust gases therefrom, and a muffler outlet for emitting the exhaust gases;

an exhaust high rise portion having an outlet being vertically displaced from said inlet and said outlet to prevent the entry into said muffler inlet of cooling water passing into said interior through said muffler outlet;

resonating means in fluid communication with said muffler inlet, and indirectly located in an exhaust gas flow path defined by said muffler, for attenuating certain frequencies emitted by the power head;

coolant supply means in fluid communication with said interior for supplying ambient coolant to mix with and cool the exhaust gases; and

a deflector shield disposed in spaced relationship to said high rise portion to permit the passage of exhaust gases therefrom, and also to prevent the entry of cooling water into said high rise portion.

5,464,358

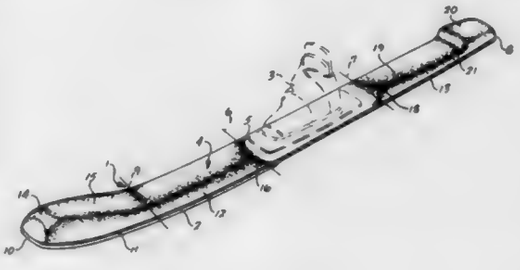
AIRFOIL JUMP SKI

William J. Unger, and William McKinney, both of Toronto, Canada, assignors to Connelly Skis, Inc., Lynnwood, Wash.

Filed Aug. 20, 1993, Ser. No. 109,856

Int. Cl.[6] B63B *1/00*

U.S. Cl. 441—68 **13 Claims**



1. An elongated jump ski having a longitudinal centerline and an aerodynamically contoured top asymmetrical relative to said centerline, said aerodynamically contoured top including a first portion of airfoil cross section aligned transversely of the length of the ski.

5,464,359

SURF FIN FIXING SYSTEM

Brian A. Whitty, Elanora, Australia, assignor to Fin Control Systems Pty. Limited, New South Wales, Australia

Continuation-in-part of Ser. No. 25,656, Mar. 3, 1993, Pat. No. 5,328,397. This application Jul. 12, 1994, Ser. No. 273,743

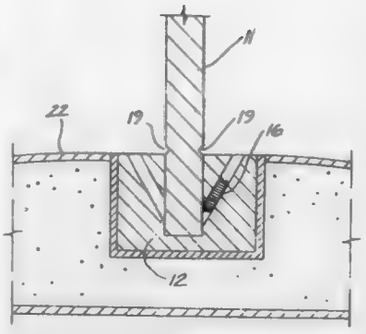
Claims priority, application Australia, Mar. 9, 1992, PL6973; Nov. 2, 1992, PL5226

The portion of the term of this patent subsequent to Jul. 12, 2011, has been disclaimed.

Int. Cl.[6] A63C *15/05*

U.S. Cl. 441—79 **20 Claims**

1. A surf craft including a body with a plurality of fixing elements embedded therein, each fixing element being of material of greater strength than that of the surf craft body and having a fixing cavity therein, a fin attached to the surf craft, said fin having a pair of lateral surfaces and an end surface, the end surface of the fin abutting against the lower surface of the body in the region of the respective fixing elements, the fin having a plurality of fixing formations extending from its end surface, each such formation being engaged within the cavity of a respective fixing element by releasable means laterally engaging said formation.

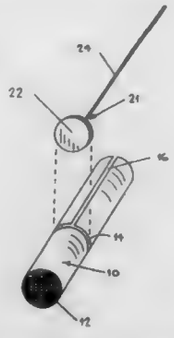


5,464,360

CONTAINER FOR SHIPPING AND UTILIZING STINGING INSECTS

Robert R. Carlson, and Stephanie Carlson, both of 8 Sheffield Ave., W. Babylon, N.Y. 11704

Filed Jul. 11, 1994, Ser. No. 272,570
Int. Cl.[6] A01K *49/00*
U.S. Cl. 449—27 10 Claims



1. A container for transporting live insects and facilitating controlled therapeutic application of stings by said insects to the skin of a patient, said container comprised of an elongated sidewall portion having substantially uniform cross-sectional configuration along a center axis of elongation, end closures disposed at front and rear extremities of said sidewall portion, divider means disposable within said container transversely to said axis for establishing axially adjacent residence and sting-applying chambers and for effecting selection of insects and advancement of said selected insects into said sting-applying chamber.

5,464,361

METHOD OF MAKING FIBER TERMINATION

Nobuo Suzuki, and Osamu Murata, both of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed May 31, 1991, Ser. No. 708,887
Claims priority, application Japan, Jun. 5, 1990, 2-147019
Int. Cl.[6] B24B *1/00*
U.S. Cl. 451—28 17 Claims

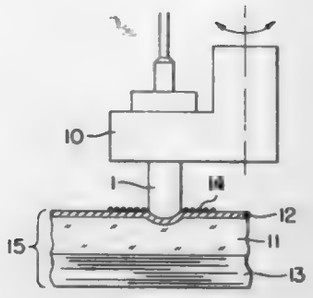
3. A method of connecting an optical fiber to a ferrule, comprising the steps:

providing a ferrule having a through-hole having a center axis;

imparting a convex spherical surface to an end of the ferrule with the apex of the convex spherical end surface being aligned with the center axis of the through-hole;

inserting an optical fiber through the through-hole of the ferrule such that an end portion of the optical fiber projects beyond the convex spherical end surface of the ferrule and then fixing the optical fiber to the ferrule; and

grinding the projecting end of the fixed optical fiber until the end surface thereof has the same convex spherical shape as the convex spherical end surface of the ferrule.

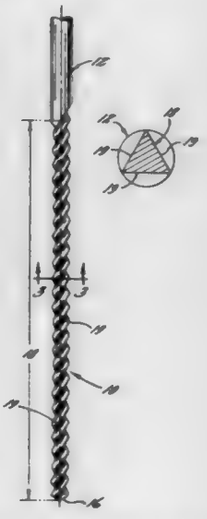


5,464,362

ENDODONTIC INSTRUMENT

Derek E. Heath, and Jerry A. Mooneyhan, both of Johnson City, Tenn., assignors to Tulsa Dental Products, L.L.C., Tulsa, Okla.

Division of Ser. No. 76,367, Jun. 14, 1993, which is a continuation of Ser. No. 787,945, Nov. 5, 1991, abandoned. This application Jul. 7, 1994, Ser. No. 271,645
Int. Cl.[6] A61C *1/02*
U.S. Cl. 451—48 12 Claims



1. An endodontic instrument adapted for use in performing root canal therapy on a tooth, and comprising

an elongate shank having a proximate end and an opposite pilot end, and so as to define a working length adjacent said pilot end, and

at least one continuous helical flute formed so as to extend along the length of said working length, with each of said flutes defining a cutting edge along each side edge thereof, with the cutting edges being characterized as being sharp and free of deformed metal deposits, and wherein said instrument is fabricated by a process which includes the steps of

(a) providing a cylindrical rod of metallic material which is composed of at least about 40% titanium and which has a diameter not greater than about 0.07 inches, and

(b) axially moving the rod past a rotating grinding wheel at a feed rate of between about 3 and 8 inches per minute, while rotating the rod about its axis, and so that the wheel removes at least about 25% of the diameter of the rod at the point of maximum removal and forms a helical surface on the rod, and while rotating the grinding wheel at a relatively slow surface speed of not more than about 3000 feet per minute, and wherein the rotating grinding wheel has a relatively fine grit size which is greater than about 200 grit, a so as to result in the formation of said cutting edges.

5,464,363
POLISHING STACK FOR THERMOPLASTIC FILMS OR SHEETS

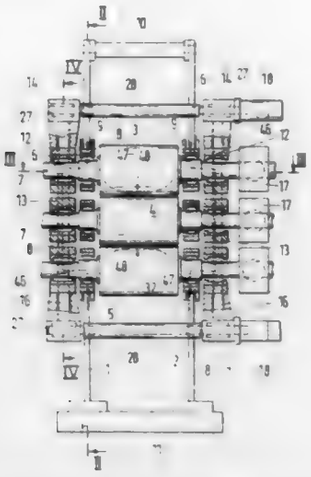
Reinhard Schulz, Hanover, Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Germany

Filed Feb. 7, 1994, Ser. No. 192,602

Claims priority, application Germany, Feb. 18, 1993, 43 04 918.4

Int. Cl.[6] B24B *9/00*

U.S. Cl. 451—190 **4 Claims**



1. A polishing roll stack for polishing a plastic sheet formed in an extrusion die, comprising:

a pair of spaced adjustable polishing rolls and an intermediate fixed center polishing roll, each having a roll journal at each end thereof, said rolls defining therebetween roll gaps between which the sheet passes;

spaced frames for supporting the rolls;

said fixed polishing roll being supported in fixed main bearing and supporting bearings mounted in bearing elements at each end of said polishing roll, and said adjustable polishing rolls being supported in movable main bearings and supporting bearings mounted in bearing elements at each end of said supporting rolls, said supporting rolls in each instance being disposed outwardly of said fixed bearings;

a preloading device mounted on said frames for preloading said main bearings and said supporting bearings for said adjustable polishing rolls, and

an adjusting device for each adjustable polishing roll, said adjusting device being partially mounted in said bearing elements, and means to operate said adjusting device for moving the adjustable rolls toward or away from the fixed roll thereby to adjust the thickness of the roll gaps.

5,464,364
APPARATUS FOR MACHINING A CONCIAL RING

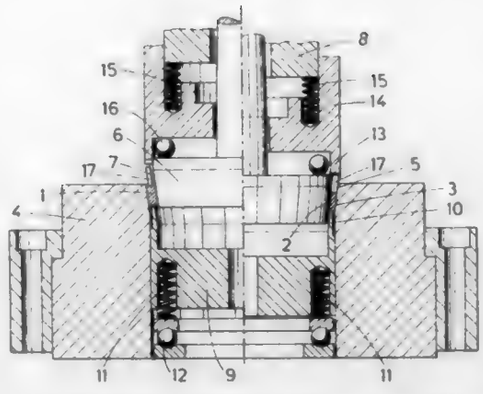
Franz Roitner, Laakirchen, Austria, assignor to Miba Sintermetall Aktiengesellschaft, Laakirchen, Austria

Filed Nov. 19, 1993, Ser. No. 155,959

Claims priority, application Austria, Dec. 24, 1992, A2576/92

Int. Cl.[6] B24B *9/00*

U.S. Cl. 451—194 **9 Claims**



1. An apparatus for machining a conical ring having inside and outside conical machinable surfaces defining parallel generatrices, which comprises

(a) an outer tool, and

(b) an inner tool,

(1) the tools being mounted coaxially to be rotatable about a common axis,

(2) the outer tool having an inside conical machining surface for machining the outside conical machinable surface of the ring and the inner tool having an outside conical machining surface for machining the inside conical machinable surface of the ring when the ring is disposed between the machining surfaces of the tools and is centered on the common axis, and

(3) the tools being mounted to be axially movable relative to each other along the common axis to a range of positions wherein the machinable surfaces of the ring are in sliding contact with the machining surfaces of the tools and into a predetermined position relative to each other.

5,464,365
MOTOR-DRIVEN HAND-HELD MACHINE TOOL.

Manfred Kirn, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

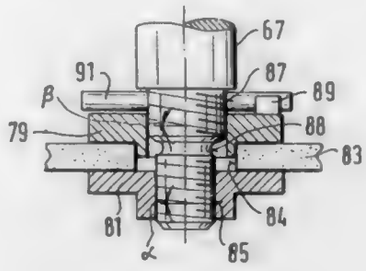
PCT No. PCT/DE92/00735, § 371 Date Mar. 21, 1994, § 102(e) Date Mar. 21, 1994, PCT Pub. No. WO93/05927, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 3, 1991, Ser. No. 211,205

Claims priority, application Germany, Sep. 21, 1991, 41 31 514.6

Int. Cl.[6] B24B *23/00*

U.S. Cl. 451—344 **13 Claims**



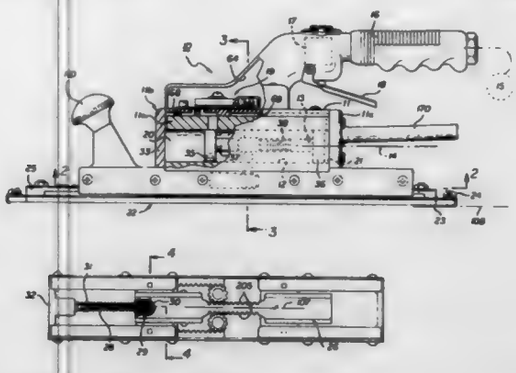
1. A motor-driven hand-held machine tool, comprising a work spindle; a spindle brake; a disc-shaped tool having a central bore hole and surrounding said work spindle with said central bore hole with play; an inner flange and an outer flange between which said disc-shaped tool is clamped; said work spindle being provided with a fastening thread, said outer flange being screwable on said fastening thread against a working rotational direction of said work spindle, said inner and outer flanges and said working spindle being formed so that during braking of said working spindle when said disc-shaped tool continues rotating in the working rotational direction due to its mass inertia, a clamping pressure between said tool and said inner and outer flanges is increased automatically.

5,464,366

RECIPROCATING ABRADING TOOL

Donald H. Hutchins, Sierra Madre, Calif., assignor to Hutchins Manufacturing Company, Pasadena, Calif.

Filed May 6, 1994, Ser. No. 239,410
Int. Cl.[6] B24B 23/00
U.S. Cl. 451—356 11 Claims



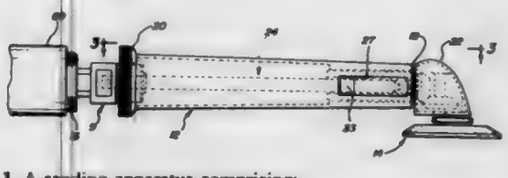
1. A portable abrading tool comprising:
a cylinder body adapted to be held and manipulated by a user;
a piston structure mounted in said body for reciprocation relative thereto along a predetermined axis between two end positions;
valve means automatically operable in timed relation to the piston structure for admitting pressurized fluid to said cylinder body in a relation causing reciprocation of the piston structure;
a control valve manually actuable between an open position passing pressurized fluid from a source thereof to said automatically operable valve means to commence reciprocation of the piston structure, and a closed position preventing delivery of pressurized fluid to said valve means and thereby stopping reciprocation of the piston structure;
a shoe mounted for reciprocation relative to said body and parallel to said axis between two end positions of the shoe to abrade a work surface;
a counterweight mounted for reciprocation parallel to said axis between two end positions of the counterweight;
means driven by said piston structure for reciprocating said shoe relative to said body but oppositely from the piston structure, and reciprocating the counterweight essentially in unison with the piston structure and oppositely from said shoe; and
yielding means acting, when said control valve is closed, stopping reciprocation of the piston structure, shoe and counterweight, to urge and move the piston structure and counterweight in a predetermined axial direction, and then retain said piston structure and counterweight each in a predetermined one of its end positions, and acting to yieldingly urge and move said shoe in the opposite direction and then retain it in a predetermined one of its end positions.

5,464,367

SANDING TOOL FOR CONNECTION WITH A ROTATING DRIVE

Richard W. Zink, Jr., 7659 Inkster Rd. Lot N1, Westland, Mich. 48185

Filed Jun. 3, 1994, Ser. No. 253,717
Int. Cl.[6] B24B 23/03
U.S. Cl. 451—441 5 Claims



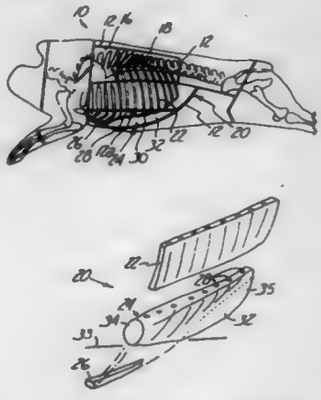
1. A sanding apparatus comprising:
an elongated tubular housing having a first and second end and defining a longitudinal axis;
an orbiting element including an abrasive element;
drive means for rotating said orbiting element, said drive means positioned in said housing;
a connecting sleeve for threadably engaged with a threaded end of a die grinder, said connecting sleeve coupled at said first end of said housing;
means for connecting said drive means to the die grinder, said connecting means coupled with said drive means for driving said drive means and said connecting means positioned at said first end of said housing; and
said orbiting element including means for coupling with said drive means for rotating said orbiting element, said coupling means including means for enabling telescoping longitudinal movement of said housing for enabling coupling of said housing with the die grinder, said telescoping means including a sleeve enabling movement of said housing along said longitudinal axis, said orbiting element positioned at the second end of said housing and coupled with said sleeve.

5,464,368

PROCESS FOR PREPARING PORK MEAT MORSELS

John A. White, 1897 Wachtler, Mendota Heights, Minn. 55118, and Omal C. Maitra, 2644 Humboldt Ave., S., Minneapolis, Minn. 55408

Filed Jul. 5, 1994, Ser. No. 270,249
Int. Cl.[6] A22C 17/00
U.S. Cl. 452—149 24 Claims



1. A process for preparing a pork meat morsel from a pork brisket bone portion having a hard bone, a forward end, and a rearward end, the process comprising:
removing the hard bone from the brisket bone portion;
cutting the brisket bone portion laterally with respect to the forward end to create morsels; and
seasoning the brisket bone portion after the hard bone is removed, wherein the seasoning added is at a maximum level of about 10% of a raw unprocessed weight of the brisket bone portion.

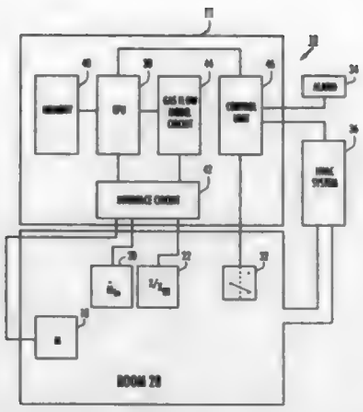
5,464,369

METHOD AND APPARATUS FOR ESTIMATING THE RATE AT WHICH A GAS IS GENERATED WITHIN AN ENCLOSED SPACE

Clifford C. Federspiel, Shorewood, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Feb. 25, 1994, Ser. No. 202,281
Int. Cl.[6] F24F 11/00
U.S. Cl. 454—256 38 Claims

1. An apparatus for estimating the rate at which a gas is generated in an enclosed space, comprising:



a plurality of sensors configured to measure values of selected environmental variables in the enclosed space and generate signals representative of the values;

a gas flow model circuit, operatively connected with the sensors, for receiving the signals from the sensors and generating an estimated gas generation rate value as a function of the values; and

a control unit, operatively connected to the gas flow model circuit, for generating control signals as a function of the estimated gas generation rate.

5,464,370

DEVICE FOR CHANGING A FLUID PASSAGE

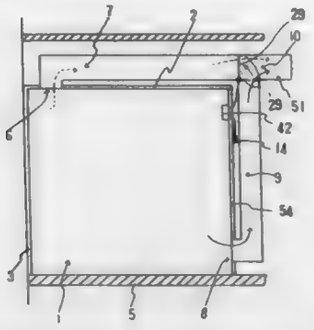
Keishi Shimizu; Kanzi Shimizu, both of Hyogo; Masanobu Mitsumachi, Saitama; Masato Nakajima, Tokyo; Tetsushi Ishigami, Kanagawa, and Yoshitake Kusamichi, Hyogo, all of, Japan, assignors to Yugen Kaisha New Media Systems, Hyogo; Daito Teck Kabushiki Kaisha, Osaki, and Yoshitake Kusamichi, Hyogo, all of, Japan

Filed Sep. 21, 1993, Ser. No. 123,963

Claims priority, application Japan, Sep. 21, 1992, 4-278138

Int. Cl.[6] F16K *11/04*

U.S. Cl. 454—345 **5 Claims**



1. A system for controlling an air flow through a room, comprising:

(a) a first passage connected with an inside of the room at a position near a ceiling;

(b) a second passage connected with the inside of the room at a position near a floor;

(c) an exhaust passage connected with an outside of the room;

(d) means for changing the air flow by selectively connecting only a selected one of the first and second passages to the exhaust passage; and

(e) means for controlling the air flow changing means,

(f) wherein the air flow changing means comprises

(f1) a casing having a first opening, a second opening arranged substantially in an L-shaped relationship relative to the first opening with respect to a chamber in the casing, and a third opening for connecting the chamber to the exhaust passage, with the first and second openings respectively connected with the first and second passages,

(f2) a flap having a side end rotatably supported at a corner between the first opening and the second opening in the casing, such that the flap can be selectively rotated to a first position for closing the first opening and a second position for closing the second opening, and

(f3) means for rotating the flap in accordance with an input from the controlling means.

5,464,371

FEEDER ADAPTER FOR MOUNTING A COMBINE HEADER TO A FEEDER HOUSING OF A COMBINE

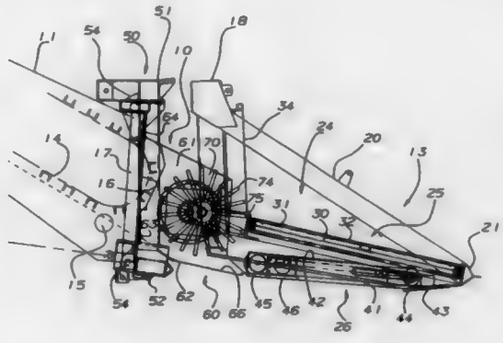
Gregory J. Honey, Bracken, Canada, assignor to Honey Bee Manufacturing Ltd., Frontier, Canada

Filed May 9, 1994, Ser. No. 239,967

Claims priority, application Canada, Dec. 6, 1993, 2110775

Int. Cl.[6] A01F *12/10*

U.S. Cl. 460—20 **11 Claims**



1. A feeder adapter for mounting a combine header to a feeder housing of a combine for feeding a crop cut by said header into a forwardly facing inlet opening of said feeder housing, said combine being of the type having a frame structure for detachably mounting a header to said feeder housing,

said header including a transverse deck having a main draper means and a rearward feed draper means, said main draper means having an upper conveying surface for moving the cut crop transversely in front of a substantially vertical rear panel in a direction from an outer end of the deck to a delivery end at said rearward feed draper means, said rear panel defining an outlet opening, and said rearward feed draper means having an upper conveying surface for delivering cut crop from the delivering end of said main draper means to a rear delivery end positioned at the outlet opening of said rear panel;

said feed adapter including

a housing having a forward facing crop inlet and a rearwardly facing crop outlet, said crop outlet being defined by a frame structure for rigidly attaching said feeder adapter to said combine feeder housing and matching said outlet of said feeder adapter to said inlet opening of said feeder housing,

said frame structure having attachment means for connection of support means between said frame means and said header for suspending the header therefrom and to position the crop delivery end of said rearward feed draper means immediately in front of said forward facing inlet of said feeder adapter,

said feeder adapter housing defining an internal feed chamber disposed between and in communication with said inlet and said outlet of the feeder adapter housing, and

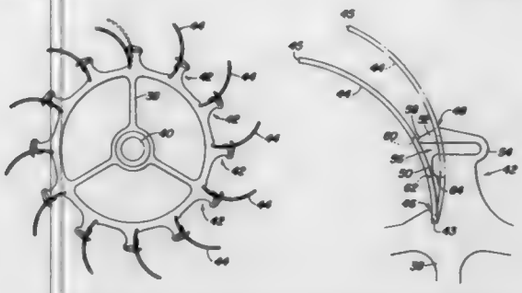
a crop feeder means disposed in said chamber having crop engaging means for contacting cut crop at said adapter housing inlet and propelling crop thereunder to said housing outlet.

5,464,372

CLEANING FAN HAVING SNAP IN BLADES

Fritz K. Lauer, Bettendorf, Iowa, and David W. Rogers, Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Apr. 26, 1994, Ser. No. 233,866
Int. Cl.[6] A01F *12/48*
U.S. Cl. 460—100 8 Claims



2. A cleaning fan for an agricultural combine, the cleaning fan comprising:

a drive shaft;

at least two wheels journalled to the drive shaft, each wheel is provided with a number of radially extending mounting teeth, each tooth is provided a snap in mounting assembly;

at least one fan blade having a radially inner edge, a radially outer edge, and a number of mounting apertures which correspond to the snap-in mounting assembly of each tooth, wherein the mounting aperture has a top edge and a bottom edge that engage the snap in mounting assembly.

5,464,373

BICYCLE SPROCKET ASSEMBLY WITH A CHAIN GUIDING MEANS

Tony Leng, Nan-Tou City, Taiwan, Prov. of China, assignor to Cyclone Precision Inc., Taiwan, Prov. of China

Filed Nov. 15, 1994, Ser. No. 339,829
Int. Cl.[6] F16H *7/18*
U.S. Cl. 474—140 2 Claims

1. A speed varying sprocket assembly for use in combination with a driving chain of a bicycle, said speed varying sprocket assembly including a small sprocket wheel and a large sprocket wheel which are mounted coaxially so as to permit the chain to be shifted from one to the other one of said small and large sprocket wheels, tooth number of said small sprocket wheel being smaller than that of said large sprocket wheel, said large sprocket wheel having an inner side surface adjacent to said small sprocket wheel, and an annular peripheral tooth face defining a plurality of teeth each of which is provided with a tip and a bottom so as to define a tooth valley between any adjacent pair of said teeth, each of the tooth valleys having a middle point at a bottom end thereof, the improvement comprising:

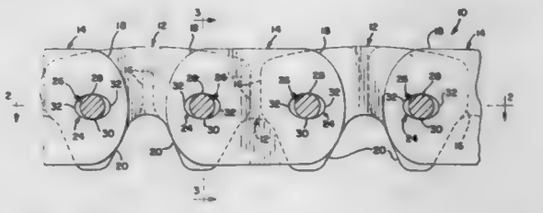
said large sprocket wheel further having several guide units each of which includes a notch formed in said large sprocket wheel, and an elongated chain guiding piece which is secured to said inner side surface of said large sprocket wheel and which is adjacent to said notch, said notches being respectively formed in some of said teeth which are spaced apart from each other, each of said notches being formed at a corner defined between said inner side surface and said annular tooth face and being defined by a curved outer guiding surface extending from the tip of a corresponding one of said teeth to one of the tooth valleys which is adjacent to the corresponding one of said teeth, each of said outer guiding surfaces having a width so as to permit an outer link plate of the chain to slide thereon, each of said pieces having a radial inner end, a radial outer end, and an inner guiding surface that has a straight intermediate portion, a curved inner end portion and a curved outer end portion which makes a junction with a corresponding one of said outer guiding surfaces so as to guide the chain to slide from said inner guiding surface to the corresponding one of said outer guiding surfaces via the junction, said straight intermediate portions of said inner guiding surfaces of said pieces being inclined with respect to axial and radial directions of said sprocket assembly so as to facilitate said chain to be shifted between said large and small sprocket wheels, each of said outer guiding surfaces having a bottom end which is spaced apart from the middle point of a corresponding one of the tooth valleys at a predetermined distance so as to make the chain engage with the corresponding one of the teeth, in such a manner that the tip of the corresponding one of the teeth contacts a lagging edge of an inner link plate of the chain, whereby, in each of the guide units, the chain can slide on the inner and outer guiding surfaces.

5,464,374

CHAIN HAVING IMPROVED LOAD DISTRIBUTION

Philip J. Mott, Dryden, N.Y., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Aug. 3, 1994, Ser. No. 285,174
Int. Cl.[6] F16G *15/02*
U.S. Cl. 474—224 21 Claims



1. A chain comprising:

a plurality of inner links defining a plurality of parallel inner link rows, each inner link having a pair of apertures formed in oppositely extending end portions thereof;

a plurality of pins connecting the inner links of different inner link rows, said pins extending through corresponding apertures in the inner links and being of a size to allow movement of the inner links about the pins, said pins being of substantially uniform cross-sectional shape along the length of the pins; and

a plurality of guide links at opposite outside ends of alternate rows of inner links, said guide links defining guide rows interleaved with said inner link rows, each guide link having a pair of apertures formed in oppositely extending end portions thereof for receiving a pin, the guide link apertures and ends

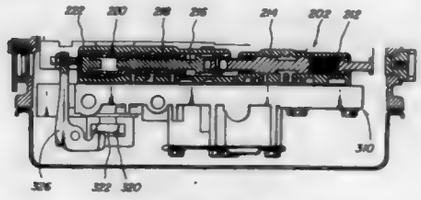
of the pins being shaped such that upper and lower portions of the pins bear against upper and lower edge portions of the apertures to substantially prevent movement of the guide links relative to pins, and at least one side portion of each pin is in a spaced apart relationship from an adjacent side-edge portion of an associated guide link aperture.

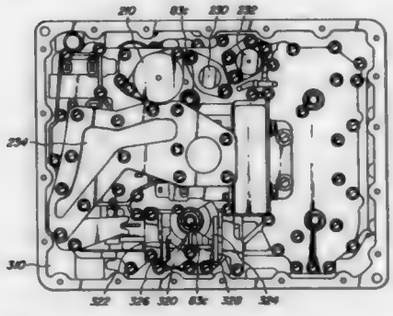
5,464,375

FRICTION-ROLLER-TYPE CONTINUOUSLY VARIABLE TRANSMISSION

Masaki Nakano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 1, 1994, Ser. No. 203,242
Claims priority, application Japan, Mar. 1, 1993, 5-064617
Int. Cl.[6] F16H *15/38*
U.S. Cl. 476—10 **2 Claims**





1. A friction roller type continuously variable transmission, comprising:

an input disk and an output disk both having a common axis and contact surfaces which are opposed to each other to define a toroidal groove therebetween;

a plurality of friction rollers arranged in said toroidal groove and maintained in frictional contact with said contact surfaces of the input and output disks;

a plurality of roller support members for rotatably supporting the friction rollers through eccentric shafts, respectively, said roller support members each having a shaft portion with an axis which is perpendicular to said common axis of the input and output disks, said roller support members being rotatable about the axis of the shaft portions and axially movable along the shaft portions;

hydraulic cylinder units for driving the roller support members in the axial directions of said shaft portions;

a forward drive speed ratio control valve for controlling a hydraulic pressure to be supplied to the hydraulic cylinder units during a forward drive mode of the transmission;

a reverse drive speed ratio instruction valve for controlling the hydraulic pressures to be supplied to the hydraulic cylinder units during a reverse drive mode of the transmission; and

a feed back mechanism for performing a speed ratio feedback by transmitting an angular displacement of the roller support member to the forward drive speed ratio control valve and the reverse drive speed ratio instruction valve so that a speed ratio between the input disk and the output disk assumes a target value;

said feedback mechanism comprising a precession cam provided for one of the roller support members so as to be rotatable jointly therewith, said precession cam having two cam surfaces which are inclined along the rotating direction of the precession cam;

said feedback mechanism further comprising two links adapted to undergo swing movement in accordance with the rotation of the precession cam and provided with first ends and second ends, respectively, said first ends of the two links being maintained in contact with the respective cam surfaces of the precession cam, said second end of one of said links being capable of performing a feedback of the speed ratio to said forward drive speed ratio control valve, and said second end of the other of said links being capable of performing a feedback of the speed ratio to the reverse drive speed ratio instruction valve,

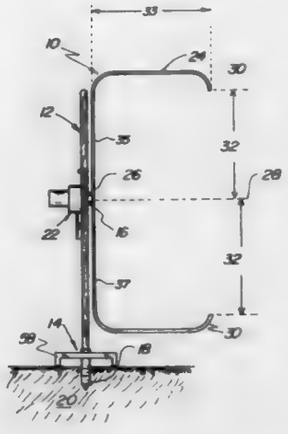
wherein said feedback mechanism further comprises a step motor which is operated in accordance with an instructed speed ratio to actuate said speed ratio control valve for the forward driving mode, said step motor being arranged adjacent to the other of the roller support members which is free from said precession cam.

5,464,376

MOTORIZED JUMP ROPE APPARATUS

Estella D. Weston, and Gwennette Y. Cummings, both of 200 W. 143rd St., Apt 17H, New York, N.Y. 10030

Filed Mar. 17, 1994, Ser. No. 214,097
Int. Cl.[6] A63B *5/22*
U.S. Cl. 482—81 **14 Claims**



1. A new and improved motorized jump rope apparatus, comprising:

a first support assembly which includes a first end portion and a motor-retention portion, wherein said first end portion is adapted to be supported by a ground surface,

a battery-powered motor assembly connected to said motor-retention portion of said first support assembly, and

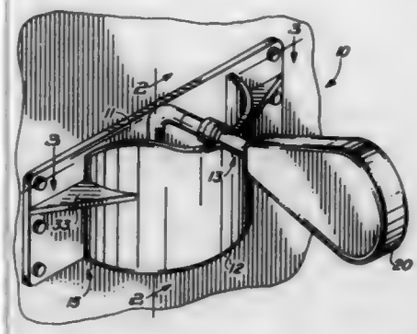
a first jump rope assembly connected to said battery-powered motor assembly at a rotational axis of said battery-powered motor assembly, on one side of said battery-powered motor assembly and on one side of said first support assembly and connected to said battery-powered motor assembly at substantially right angles to said rotational axis, said first jump rope assembly including a first portion extending away from said rotational axis in a first direction and including a second portion extending away from said rotational axis in a second direction which is opposite to said first direction.

5,464,377

STRIKING TARGET FOR MARTIAL ARTS

Stephen E. Beeman, 3881 S. Nova Rd., Port Orange, Fla. 32127

Filed Mar. 31, 1994, Ser. No. 221,108
Int. Cl.[6] A63B 69/00
U.S. Cl. 482—83 21 Claims



1. A striking target for practicing athletics, comprising:

(a) a mounting frame having a rim forming a track said mounting frame including a mounting plate and a semi-cylindrical base plate mounted to said mounting plate extending outward therefrom, said semi-cylindrical base plate having a top surface defining the rim of said mounting frame having the track;

(b) at least one cam portion integral the track of said mounting frame forming a protuberance in said track;

(c) a striking member, adapted to traverse said track mounted to said mounting frame radially inward of the track on the semi-cylindrical base plate extending over the track of said semi-cylindrical base plate beyond the circumference thereof for striking; and,

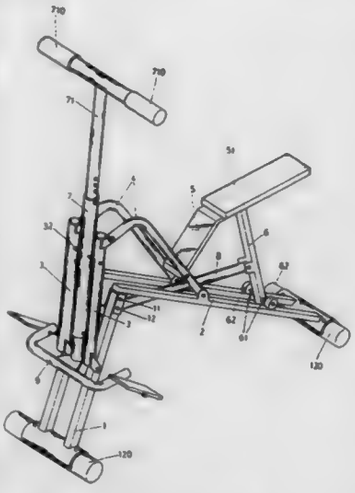
(d) a resilient member connected to said striking member to apply an opposing force against a force applied by the striking member.

5,464,378

FOLDABLE EXERCISER HORSE

Hei-Nan Yu, Taou Yuen, Taiwan, Prov. of China, assignor to Kuo-Ron Lee, Yi Lan, Taiwan, Prov. of China

Filed Jun. 27, 1994, Ser. No. 265,736
Int. Cl.[6] A63B 69/06
U.S. Cl. 482—95 6 Claims



1. A foldable exerciser horse comprising:

a) a pair of spaced parallel front supports including a pair of upper ends and a pair of lower ends;

b) a pair of spaced parallel rear supports including a pair of upper ends and a pair of lower ends;

c) the upper ends of the front supports being pivotally connected to the upper ends of the rear supports;

d) a pair of spaced parallel front stems including a pair of upper ends and a pair of lower ends, and a pair of spaced parallel rear stems including a pair of upper ends and a pair of lower ends;

e) the lower ends of the front stems being pivotally connected to the front supports between the upper and lower ends of the front supports, the upper ends of the front and rear stems being pivotally connected together, and the lower ends of the rear stems being pivotally connected to the rear supports between the upper and lower ends of the rear supports;

f) a rocker member pivotally connected to the front stems adjacent the upper ends of the front stems, and a handle mounted on the rocker member;

g) a seat support including a lower end pivotally connected to the rear stems between the upper and lower ends of the rear stems and an upper portion for supporting a seat thereon, and a seat pillar including a top end pivotally connected to the upper portion of the seat support and a lower end for moveable engagement with the rear supports;

h) a pull rod including a front end pivotally connected to the rocker member and a rear end pivotally connected to the seat pillar between the upper and lower ends of the seat pillar; and

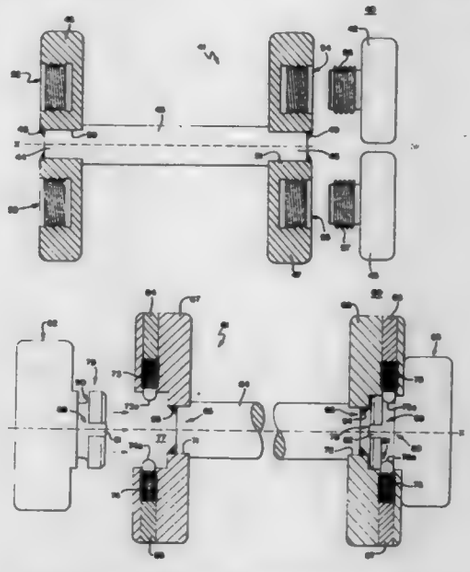
i) whereby the exerciser horse may be folded by pivoting the front supports against the rear supports, the front stems towards the upper ends of the front supports, the rear stems towards the upper ends of the rear supports, and the seat pillar between the rear supports.

5,464,379

VARIABLE WEIGHT DUMBBELL

Victor K. Zarecky, 1075 Colony Dr., Crystal Lake, Ill. 60014

Continuation-in-part of Ser. No. 51,460, Apr. 21, 1993. This application May 6, 1994, Ser. No. 239,280
Int. Cl.[6] A63B 21/075
U.S. Cl. 482—108 33 Claims



1. A variable weight dumbbell system comprising:

a dumbbell having a handle bar having first and second bar ends defining an x-axis;

first and second end-weights at the respective first and second bar ends and each having at least one threaded socket connector; and

at least four insert weights, each having only a single connector and that being a single protruding, threaded portion capable of removably attaching the same to one of said first and second end-weights through a mating threaded socket thereon,

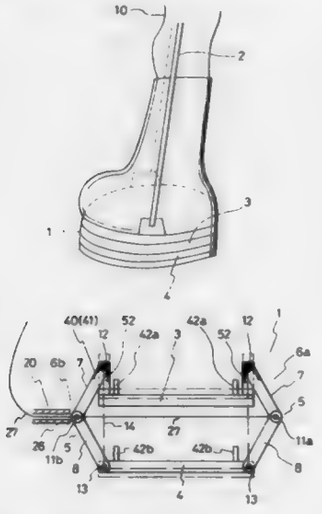
whereby any one of the insert weights is only capable of removably attaching to one of the end-weights and is incapable of receiving another insert weight.

5,464,380

SHOE SOLE FOR LEG APPARATUS

Kiichi Ikeda, Tsuchiura; Shuji Kajita, and Tetsu Iwatsuki, both of Tsukuba, all of, Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 28, 1994, Ser. No. 219,305
Claims priority, application Japan, Mar. 31, 1993, 5-097309
Int. Cl.[6] A61F *5/00;* **A43B** *5/00*
U.S. Cl. 601—29 **7 Claims**



1. A leg apparatus, comprising:

a shoe having an upper sole member and a lower sole member disposed under said upper sole member;

expanders connected to said upper and lower sole member, said expanders vertically moving the upper and lower sole members toward and away from each other and including at least one pair of forward and rearward linkages, each of said linkages having an upper link and lower link swingably joined by a first pivot, with the upper link being connected at an upper end to said upper sole member by a second pivot and the lower link being connected at a lower end to said lower sole member by a third pivot; and

a drive mechanism driving said expanders and including at least one actuator located at a position remote from said upper and lower sole members and outside of the shoe, at least one drive wire driven by the actuator and synchronously driving the pair of linkages between a basic attitude in which the linkages are bent outward and an expanded attitude in which the linkages are straightened vertically; and

a restoring mechanism restoring the expanded linkages to their basic attitude.

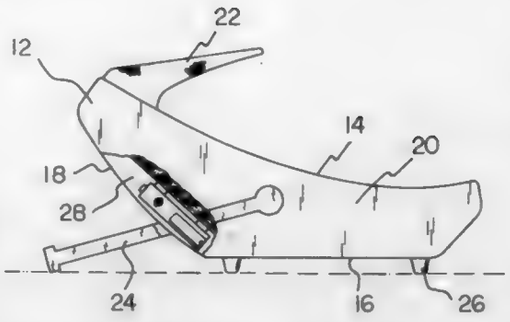
5,464,381

INFANT SOOTHING SEAT

Christi L. Wilson, 310 Constitution Dr. SW., Poplar Grove, Ill. 61065

Filed Aug. 31, 1994, Ser. No. 298,616
Int. Cl.[6] A61H *1/00*
U.S. Cl. 601—49 **1 Claim**

1. A new and improved infant soothing seat for simulating the vibrations that occur in an automobile to sooth a restless infant comprising, in combination:



a seat having an upper surface, a lower surface, a back surface, and two side surfaces, the upper surface having a detachable sun shade removably secured to a top portion thereof, a U-shaped carrying handle pivotally secured to the two side surfaces, a plurality of small legs secured to the lower surface, the back surface having an opening therein, the opening having a plurality of mounting slots therein;

a sound and motion mechanism having a front face, a back face, a top face, a bottom face, a right wall, a left wall, an outer surface and an inner surface, the outer surface of the front face having a control panel thereon, the control panel consisting of a motion control, a sound control, and a charge socket, the outer surface of the top face having a plurality of projections and protrusions secured thereto, the projections and protrusions aligning with the plurality of mounting slots of the back surface to secure the sound and motion mechanism within the opening of the seat, the outer surface of the right wall having a speaker grate secured therein, the right wall having an oblong aperture therein, the oblong aperture having a cover slidably secured thereover, the oblong aperture containing a battery box therein, the battery box housing four batteries therein representing the power source, the inner surface of the sound and motion mechanism having an internal motion control and an internal sound control, the internal motion control consisting of a power switch, a speed control, and a variable speed motor, the power switch having a wire coupling with the power source and the speed control, the speed control having a wire coupling with the variable speed motor, the variable speed motor having an eccentric thereattached, the eccentric functioning to provide the motion for the seat, the internal sound control consisting of a power switch, a volume and tone control, and a speaker, the power switch having a wire coupling with the volume and tone control and the power source, the volume and tone control having a wire coupling with the speaker, the speaker in alignment with the speaker grate, the charge socket electrically connected to the power source, the charge socket allowing the power source to be recharged from an electric source.

5,464,382

VARIABLE MASSAGE DRIVE UNIT FOR A CHAIR-TYPE MASSAGE APPARATUS

Shui-Mu Wang, No. 111, Chung-Shan S. Rd., Yung-Kany City, Tainan Hsien, Taiwan, Prov. of China

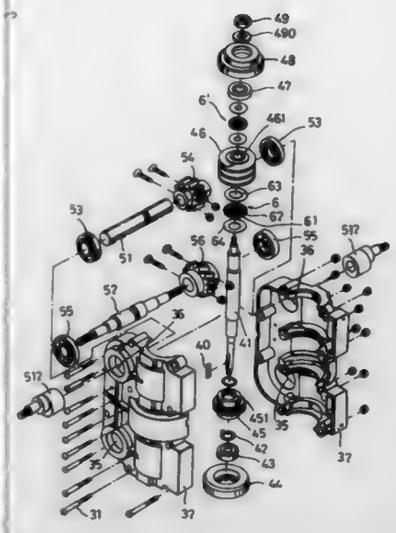
Filed Dec. 19, 1994, Ser. No. 359,068
Int. Cl.[6] A61H *7/00*
U.S. Cl. 601—99 **2 Claims**

1. A variable massage drive unit for a chair-type massage apparatus, said variable massage drive unit including

a hollow casing,

a rotatable drive shaft disposed uprightly in said hollow casing and having two end portions that extend out of said hollow casing,

upper and lower bearings for mounting rotatably and respectively said end portions of said drive shaft to top and bottom walls of said hollow casing so as to permit rotation of said drive shaft in two opposite revolving directions,



parallel first and second output shafts disposed transversely in said hollow casing and having two end portions that extend out of said hollow casing and that are mounted rotatably to opposite side walls of said hollow casing,

first and second gear sets, each of which having a drive gear disposed coaxially on said drive shaft and a driven gear meshing with said drive gear and connected rigidly to a respective one of said first and second output shafts,

first and second one-way clutches provided coaxially on said drive shaft between said drive shaft and said drive gear of a respective one of said first and second gear sets, said first and second one-way clutches being operable respectively to said opposite revolving directions and engaging selectively said drive gear of one of said first and second gear sets with said drive shaft depending on direction of rotation of said drive shaft,

said first output shaft, when driven by said first gear set, rotating at a slower speed as compared to said second output shaft when said second output shaft is driven by said second gear set,

wherein:

said drive shaft has an intermediate portion with a cross-section that is larger than that of said end portions thereof, each of said drive gears of said first and second gear sets being provided on a respective one of said end portions of said drive shaft between said intermediate portion of said drive shaft and an adjacent one of said upper and lower bearings; and

said variable drive massage unit further includes a first thrust bearing disposed coaxially on said drive shaft between said intermediate portion of said drive shaft and said first one-way clutch, and a second thrust bearing disposed coaxially on said drive shaft between said first one-way clutch and said upper bearing.

5,464,383

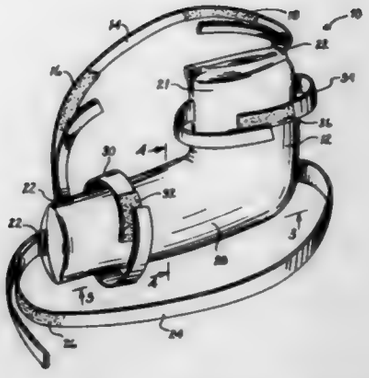
DEVICE FOR SUPPORTING AND IMMOBILIZING A PATIENT'S ARM AND SHOULDER AND METHOD THEREFOR

John Padden, 214 E. Ruth Ave., #303, Phoenix, Ariz. 85020, and Michael A. Steingard, 8602 N. Starling La., Phoenix, Ariz. 85028

Filed Aug. 2, 1994, Ser. No. 284,843
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—20 **20 Claims**

1. An orthopedic pillow device for supporting and immobilizing a patient's arm relative to a patient's shoulder, comprising, in combination:

portable, reversible, pillow support means for selective attachment to one of the patient's right arm and left arm and the patient's upper torso, said support means comprising L-shape pillow means, having a substantially elliptical cross-sectional shaped pillow configuration, for being configured to extend in an L-shaped configuration from just below a person's armpit to about the end of a person's hand for providing support and cushioning for both a lower and upper portion of the arm selected for support and for providing abduction of said lower and upper portions of the arm selected for support with respect to said upper torso for reducing joint stress of said shoulder; said support means having a thickness along its L-shaped configuration and an outer surface portion means for supporting an inner portion of said selected arm extending substantially in one plane downward and in an L-shaped configuration from the arm pit of said selected arm to said upper and said lower portions of said selected arm and an inner surface portion means for extending inwardly from the armpit of said selected arm and in said L-shaped configuration parallel to and adjacent to a front portion of a person's torso; and



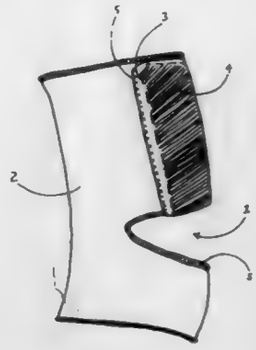
securing means coupled to said support means for securing said support means to both said patient's arm and said upper torso.

5,464,384

ACHILLES TENDON SUPPORT BRACE

Leonardo W. Cromartie, Rembrandt Str 2A Apt 7, Wurezburg/Lengfeld, Germany, assignor to Leonardo W. Cromartie, Wuerzburg, Germany

Filed Nov. 24, 1993, Ser. No. 156,628
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—27 **7 Claims**



1. A dynamic sleeve-shaped ankle brace for supporting an ankle of lower extremity comprising:

a sleeve having an upper end, a lower end, an anterior portion, and a posterior portion; said sleeve having an ankle receiving opening at its upper end, a toe receiving opening at its lower end, and a heel outlet in the posterior portion; said sleeve additionally comprising at least one tendon support pouch in said posterior portion above said heel outlet; and a tendon

support comprising two flexible cylinders positionable in said at least one tendon support pouch; one each of said two flexible cylinders adapted to be positioned along side the right and left sides, respectively, of the Achilles tendon;

wherein when said brace is in use, pressure is relieved from along the right and left sides of the Achilles tendon by diverting pressure to surrounding areas.

5,464,385

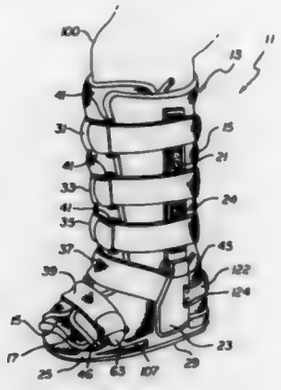
WALKER WITH OPEN HEEL

Tracy E. Grim, Broken Arrow, Okla., assignor to Royce Medical Company, Camarillo, Calif.

Continuation of Ser. No. 809,954, Dec. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 542,571, Jun. 27, 1990, Pat. No. 5,078,128. This application Jan. 19, 1994, Ser. No. 184,494

Int. Cl.[6] A61F *5/052*

U.S. Cl. 602—27 **58 Claims**



11. A leg walker comprising:

a full-length sole, said sole having sole sides, a sole rear, and an open heel portion at said sole rear;

a pair of parallel strut base members extending up generally from said sole sides;

a pair of parallel strut members extending up from and connected to respective said strut base members, said strut members extending up to just below the knee of the leg of the user whose foot is supported at least in part by said sole;

support means for extending around at least one of the lower leg and the foot of the user;

securing means for securing said support means to at least one of said sole, said strut base members and said strut members; and

substantially horizontal, length-adjustable and flexible heel strap means for extending around the heel of the user and for thereby restricting backward movement of the user's heel generally beyond said sole rear at said open heel portion.

5,464,386

TRANSDERMAL DRUG DELIVERY BY ELECTROINCORPORATION OF VESICLES

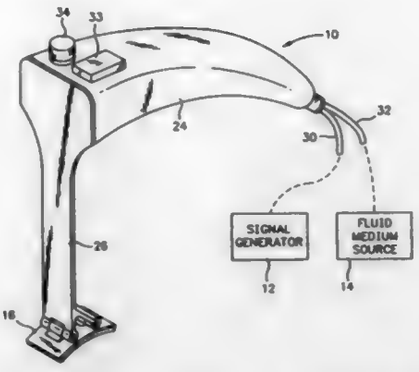
Gunter A. Hofmann, San Diego, Calif., assignor to Genetronics, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 219,970, Mar. 30, 1994, which is a continuation-in-part of Ser. No. 931,061, Aug. 17, 1992, Pat. No. 5,318,514. This application Sep. 22, 1994, Ser. No. 310,647

Int. Cl.[6] A61K *9/66;* **A61N** *1/30;* **A61F** *13/00*

U.S. Cl. 604—20 **20 Claims**

1. A method of molecular delivery through a surface tissue, comprising the steps of:



selecting a quantity of molecules to be delivered through the surface tissue;

selecting a quantity of vesicles as carriers;

encapsulating said molecules in said vesicles;

contacting a selected surface area of the surface tissue with a quantity of said vesicles; and

applying a pulsed electric field of sufficient amplitude and duration to induce pores in the surface tissue and to induce transport of said vesicles through said pores into a underlying tissue to enable diffusion of said molecules into the tissue.

5,464,387

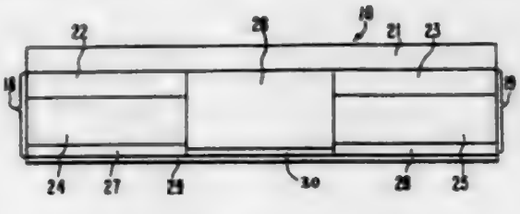
TRANSDERMAL DELIVERY DEVICE

Ronald P. Haak, Menlo Park; Felix Theeuwes, Los Altos Hills; J. Richard Gyory, San Jose, all of Calif., and Gary A. Lattin, Forest Lake, Minn., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 194,783, Feb. 10, 1994, abandoned, which is a continuation of Ser. No. 969,661, Oct. 30, 1992, abandoned, which is a division of Ser. No. 735,126, Jul. 24, 1991, Pat. No. 5,283,768. This application Oct. 27, 1994, Ser. No. 330,031

Int. Cl.[6] A61N *1/30*

U.S. Cl. 604—20 **26 Claims**



1. A transdermal agent delivery device, comprising:

an agent reservoir adapted to be placed in agent transmitting relation with a body surface and positioned within an electric field generated by electrically connecting the agent reservoir to a source of electrical power, the agent reservoir containing:

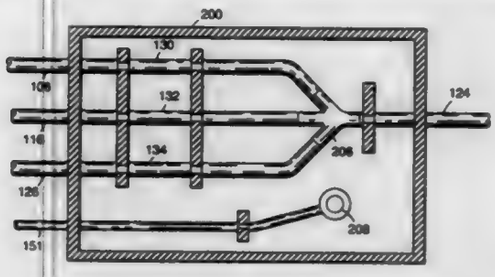
a sufficient amount of a passively transported agent to achieve a therapeutically effective passive flux of the passive agent from the reservoir to, and through, a body surface when the reservoir is placed in passive agent transmitting relation with the body surface; and

a sufficient amount of an actively transported agent to achieve a therapeutically effective electrically assisted flux of the active agent from the reservoir to, and through, a body surface when the reservoir is placed in active agent transmitting relation with the body surface and an electric field is generated through said reservoir.

5,464,388
CARDIOPLEGIA ADMINISTRATION SYSTEM AND METHOD

Kenneth E. Merte, Saline, and William G. O'Neill, Ann Arbor, both of Mich., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 154,925, Nov. 18, 1993, Pat. No. 5,423,749. This application Feb. 6, 1995, Ser. No. 383,940
Int. Cl.[6] A61M *39/00*
U.S. Cl. 604—153 **18 Claims**



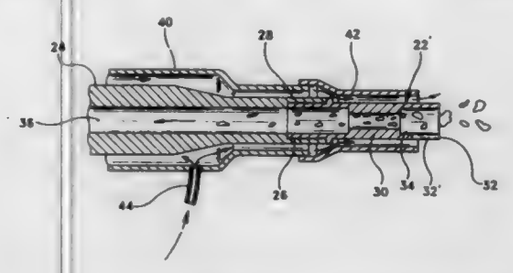
1. A replaceable tubing set cassette adapted for use with a mixer device for selectively mixing two or more medical fluids, the tubing set cassette comprising:

a first supply tube, a second supply tube, and a mixing tube, the first supply tube having upstream and downstream ends, the upstream end of the first supply tube being adapted to connect the first supply tube to a source of a first biological or medical fluid; the second supply tube having upstream and downstream ends, the upstream end of the second supply tube being adapted to connect the second supply tube to a source of a second biological or medical fluid; and the mixing tube having an upstream end connected to the downstream ends of the first and second supply tubes, and a downstream end for supplying a mixed fluid comprising a preselected composition of the first and second fluids, the mixing tube having a lumen, in which the first and second fluids are mixed, and an exterior surface separated from the lumen by a tube wall; at least portions of the first and second supply tubes being contained in a cassette that is adapted to be mounted on the mixer device, the cassette having at least one opening therein allowing access to the first and second supply tubes so that the mixer device can selectively pinch the first and second supply tubes closed.

5,464,389
WORKING TIP FOR FRAGMENTING AND ASPIRATING OCULAR TISSUE

Norman O. Stahl, 3199 Monterey Dr., Merrick, N.Y. 11566

Division of Ser. No. 104,816, Aug. 10, 1993, abandoned. This application Mar. 7, 1994, Ser. No. 207,374
Int. Cl.[6] A61B *17/20*
U.S. Cl. 604—22 **9 Claims**



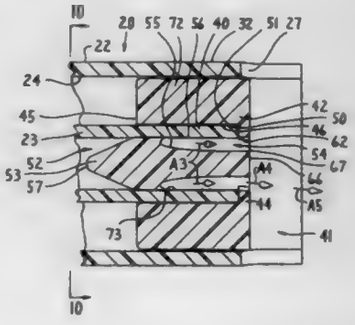
1. A working tip for fragmenting and aspirating ocular tissue, comprising:

an elongate body including a generally cylindrical wall having a substantially uniform outside diameter of about one millimeter and an elongate bore extending therethrough, said bore including a first elongate portion having a relatively small diameter, a second elongate portion having a relatively large diameter, said second elongate portion defining an opening for admitting tissue fragments into said bore, said wall being substantially thicker along said first elongate portion of said bore than said second elongate portion, and a third elongate bore portion having a relatively large diameter, said third elongate bore portion adjoining said first elongate bore portion and defining a second opening in said body through which tissue fragments are removed from said bore, said first elongate portion providing fluid communication between said second and third elongate portions, and wherein said elongate body includes an end portion and an end face, and a slot extending through said cylindrical wall at said end portion and end face.

5,464,390
SURGICAL MULTIORIFICE IRRIGATION APPARATUS

Jeffrey D. Arnett, Kalamazoo, and David H. Grulke, Battle Creek, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed Nov. 29, 1993, Ser. No. 158,526
Int. Cl.[6] B05B *1/34*
U.S. Cl. 604—35 **22 Claims**



1. A surgical irrigation wand for a surgical irrigation handpiece, comprising:

means defining a surgical irrigation tube for connection to an irrigation liquid outlet of a surgical irrigation handpiece, said tube having a distal end for directing irrigation liquid flow forwardly toward a surgical site; and

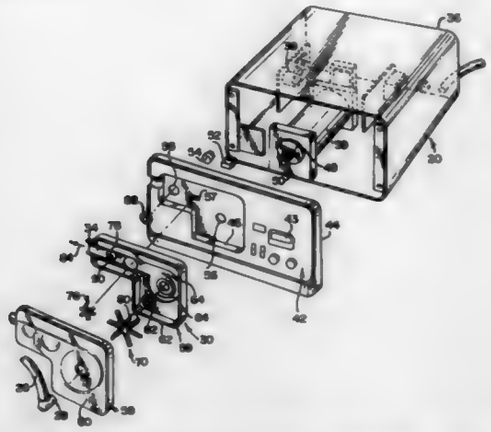
tip means fixed adjacent said distal end of said tube for shaping said flow and projecting multiple, narrow, discrete streams of irrigation liquid forwardly from said tube, which streams have length axes which are skewed with respect to each other, so as to cross each other in laterally spaced relation, which streams angle away from the central axis of said irrigation tube and forwardly from a distal end of said tip means to corresponding circumferentially spaced points on the perimeter of an imaginary circle, rather than the center of such circle, spaced forwardly from said tip means on the surgical site for wetting said circumferentially spaced points at a given instant, said tip means having a forward facing surface proximate said distal end thereof and perforated by multiple discharge apertures from which said streams project, said discharge apertures being spaced one from the other, said tip means including means for forwardly diverging said flow of irrigation liquid to said apertures, said means for diverging said flow comprising a core extending rearwardly from said forward facing surface and having a rearwardly tapered portion.

5,464,391

IRRIGATION SYSTEM FOR A SURGICAL SITE

Donald P. DeVale, Bloomingdale, Ill., assignor to Northgate Technologies Inc., Elgin, Ill.

Filed Mar. 3, 1994, Ser. No. 205,698
Int. Cl.[6] A61M *31/00*
U.S. Cl. 604—67 28 Claims



1. An irrigation system for providing fluid from a source of irrigating fluid to a surgical site comprising a control unit cooperatively associated with a cassette,

and in which the control unit comprises:

a controller;

a motor under the control of said controller;

a first sensor for sensing the flow of fluid in said cassette, said first sensor operatively connected to the controller;

a second sensor for sensing pressure in the cassette, said second sensor operatively connected to the controller; and

user input controls operatively connected to the controller;

and in which the cassette comprises:

a housing defining a chamber, said chamber having an inlet connected to said source of irrigating fluid and an outlet for providing fluid to the surgical site; and

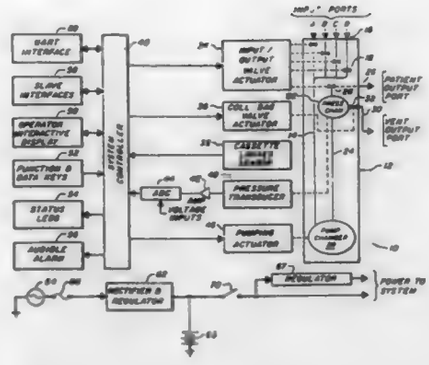
an impeller located in said housing and driven by said motor.

5,464,392

INFUSION SYSTEM HAVING PLURAL FLUID INPUT PORTS AND AT LEAST ONE PATIENT OUTPUT PORT

Paul Epstein, Brookline; Harry Petschek, Lexington, both of Mass.; Eric LaWhite, South Royalton, Vt.; Clair Strohl, Norfolk, Mass.; Henry Coyne, Framingham, Mass.; Edward Kaleskas, Jefferson, Mass., and George Adaniva, Swampscott, Mass., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 636,059, Dec. 31, 1990, Pat. No. 5,304,126, which is a division of Ser. No. 355,035, May 16, 1989, Pat. No. 5,100,380, which is a continuation of Ser. No. 62,064, Jun. 11, 1987, abandoned, which is a continuation of Ser. No. 873,478, Jun. 11, 1986, Pat. No. 4,696,671, which is a continuation of Ser. No. 578,180, Feb. 8, 1984, abandoned.
This application Mar. 7, 1994, Ser. No. 207,281
Int. Cl.[6] A61M *31/00*
U.S. Cl. 604—67 21 Claims



1. An infusion system for delivering plural fluids to a patient, comprising:

a housing;

a plurality of input line receiving port structures adapted to be releasably mounted to the housing, each port structure adapted to receive an individual input line from an associated fluid source;

a controller means to control an infusion of fluids into a patient in accordance with selected instructions, said instructions including selected at least one first fluid input in a first time sequence that specifies a desired successive time sequence, and selected at least one second fluid input different from said at least one first fluid input in a second time sequence that specifies a desired repeat interval and a desired number of times;

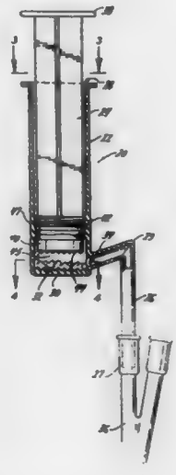
a forced flow mechanism coupled to each input port structure and operatively coupled to said controller means to receiver said instructions for controllably forcing a fluid to flow from a selected one of said fluid inputs at a selected rate during a selected one of said first and second time sequences through the respective input port structure to the patient.

5,464,393

APPARATUS FOR, AND METHOD OF, CRUSHING A PILL, SUSPENDING THE PILL INGREDIENTS IN A LIQUID, AND ADMINISTERING THE SUSPENSION

Jeffrey D. Klearman; Jeffrey J. Bierman, and Eli Schachet, all of St. Louis, Mo., assignors to Lake Medical Products, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 168,019, Dec. 15, 1993, Pat. No. 5,376,072. This application Jun. 23, 1994, Ser. No. 264,628
The portion of the term of this patent subsequent to Dec. 27, 2011, has been disclaimed.
Int. Cl.[6] A61M *37/00*
U.S. Cl. 604—82 36 Claims



1. A pill crushing syringe comprising a barrel having an aperture to facilitate drawing a liquid into the barrel and expelling the liquid therefrom, a plunger moveable within said barrel, at least one abraded surface within said syringe, and a threaded fitting between

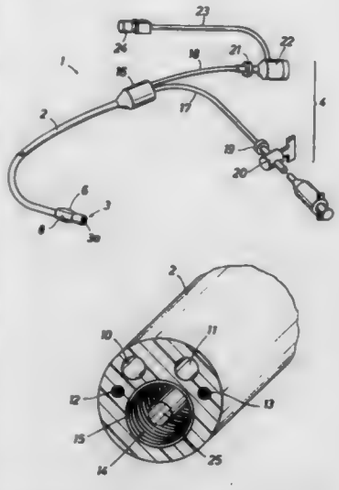
said barrel and said plunger, the threaded fitting advancing said plunger into said barrel as said plunger is rotated therein so that a pill placed within said syringe and adjacent said abraded surface is crushed as said plunger is rotated within the barrel.

5,464,394

MULTILUMEN PERCUTANEOUS ANGIOSCOPY CATHETER

Arnold Miller, Chestnut Hill, Mass., and Daniel R. Lucas, Orange, Calif., assignors to American BioMed, Inc., The Woodlands, Tex.

Filed Jun. 8, 1993, Ser. No. 73,781
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—96 **19 Claims**



1. A percutaneous angioscopy catheter comprising:

(a) an elongated flexible member having a distal end adapted for insertion through a blood vessel of a patient and a proximal end adapted for connection to apparatus disposed outside the body of the patient;

(b) said elongated flexible member defining a first lumen extending axially through said elongated flexible member for slidably mounting an angioscope therein, and at least one second lumen extending axially through said elongated flexible member substantially in parallel with said first lumen;

(c) an inflatable balloon provided on said elongated flexible member in proximity to said distal end and communicating with said second lumen;

(d) supporting means extending axially through said elongated flexible member spaced from and substantially in parallel with said first and second lumen for providing a predetermined rigidity to said elongated flexible member; and

(e) a coil spring provided along the interior of said first lumen for facilitating the passage of the angioscope.

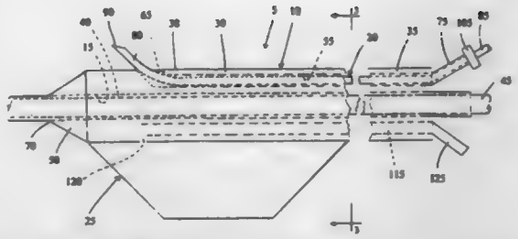
5,464,395

CATHETER FOR DELIVERING THERAPEUTIC AND/OR DIAGNOSTIC AGENTS TO THE TISSUE SURROUNDING A BODILY PASSAGEWAY

David P. Faxon, 2027 Ashbourne Dr., South Pasadena, Calif. 91030, and Christian C. Haudenschild, 7600 Timbercrest Dr., Rockville, Md. 20855

Filed Apr. 5, 1994, Ser. No. 223,451
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—96 **16 Claims**

1. A catheter for delivering therapeutic and/or diagnostic agents directly into tissue surrounding a bodily passageway, comprising:



an elongated body having a distal portion and a proximal portion, said distal portion including a distal surface;

means for directing said elongated body through said bodily passageway so that said distal portion is positioned at a predetermined location therein;

first and second lumens communicating between said distal surface and said proximal portion of said elongated body, said first lumen communicating with said distal surface through a needle exit opening disposed therein;

a needle cannula slidably disposed in said first lumen, said needle cannula comprising a distal portion and a proximal portion, said proximal portion being adapted to be connected to means for dispensing said therapeutic and/or diagnostic agents;

said needle cannula being adapted for movement between (i) a first retracted position wherein said distal portion of said needle cannula is withdrawn inboard of said distal surface, and (ii) a second extended position wherein said distal portion of said needle cannula extends a predetermined distance outboard of said distal surface; and

a balloon fixedly and sealably secured to said distal portion of said elongated body and in fluid communication with said second lumen for dilating said bodily passageway when said balloon is inflated and compacting plaque that has been deposited in said passageway, said balloon extending both longitudinally and circumferentially along only a side portion of said distal portion of said catheter so as to be in opposing radial alignment with said needle exit opening such that when said balloon is fully inflated (i) fluid flow is not restricted through said bodily passageway, and (ii) said needle cannula may be extended said predetermined distance into said tissue surrounding said bodily passageway at a predetermined location.

5,464,396

SYRINGE ASSEMBLY FOR THE STORAGE AND APPLICATION OF A BIOLOGICAL MULTI-COMPONENT MATERIAL

Helmut Barta; Helmut Eder; Manfred Granser; Georg Habison, all of Vienna; Edith Hantak, Seebarn; Franz Moser, Deutsch Wagram, and Peter Pfaffenbichler, Podersdorf, all of, Austria, assignors to Immuno AG, Vienna, Austria

Filed Sep. 22, 1994, Ser. No. 310,404
Claims priority, application Austria, Jan. 18, 1993, 2085/93
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—191 **38 Claims**

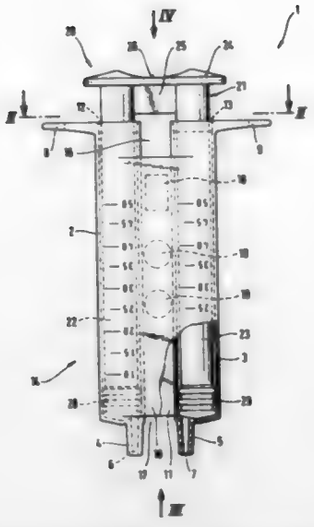
1. A syringe assembly for storing and applying a biological multi-component material, comprising as separate assembly components:

(a) a syringe device including at least two parallel syringe bodies ending in coni and each filled with one of said multi-component material, a connection part connecting said syringe bodies, and piston plugs closing said syringe bodies in the filled state;

(b) an actuation means including piston rods associated with said piston plugs and a common grip element; and

(c) a dispensing element capable of being attached to said coni of said syringe bodies; wherein

said syringe bodies, after having been filled and separately closed by said piston plugs, constitute a one-piece syringe unit with said connection part,



said connection part, on one end of said syringe unit, leaves a recess between said syringe bodies, and

said grip element is connected in one piece with said piston rods, thus forming a one-piece piston rod unit separate from said syringe unit including said piston plugs.

5,464,397

BACTERIA VALVE

Carleton A. Powers Jr., 2268 68th St. SE., Caledonia, Mich. 49316

Filed Jan. 11, 1994, Ser. No. 180,046

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—246 **30 Claims**

1. An antibacteria valve for use with a suction source in a medical apparatus for preventing undesired backflow of body fluid and undesired movement of bacteria, comprising:

an elongated casing defining a longitudinal direction and a chamber, said casing including an inlet and an outlet to said chamber; and

a tubular member protruding from one of said inlet and said outlet including an end section protruding into said chamber, said end section having a ring-shaped fin thereon with a first portion that protrudes radially into said chamber from said end section and a second portion that extends circumferentially around said end section but that is radially spaced therefrom, said elongated casing and said tubular member including surfaces defining an unobstructed path for body fluids to flow from said inlet to said outlet, but said surfaces defining an arduous path for bacteria moving from said outlet to said inlet, whereby body fluid can be readily suctioned through said valve from said inlet to said outlet, but whereby the undesired backflow and undesired movement of bacteria through said valve is substantially prevented due to a tortuous path defined by said casing and said tubular member.

5,464,398

CATHETER

Hans Haindl, 3015, Wennigsen 1, Germany

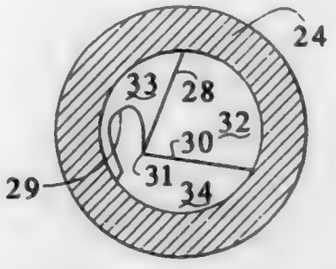
PCT No. PCT/EP91/02071, § 371 Date Jul. 23, 1993, § 102(e) Date Jul. 23, 1993, PCT Pub. No. WO92/09326, PCT Pub. Date Jun. 11, 1992

PCT Filed Apr. 11, 1991, Ser. No. 66,142

Claims priority, application Germany, Nov. 27, 1990, 40 37 641.9

Int. Cl.[6] A61M *25/00;3/00*

U.S. Cl. 604—280 **12 Claims**



1. A catheter comprises an external tube which has a relatively thick wall and which is in part, essentially rigid in cross-section, and which comprises at least two lumina which are separated from one another by a separating wall, characterized in that the catheter in its circumferential area is rigid but is flexible over its length, and, the separating wall is relatively thin and is very easy to deform and move in a direction transverse to the length of the catheter, and that said lumina are each open at both ends.

5,464,399

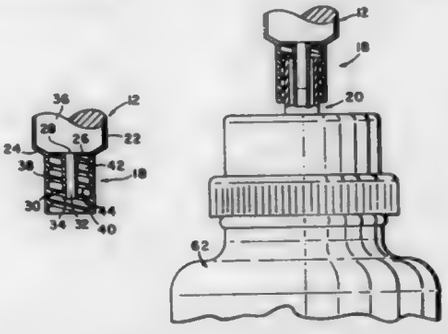
NEEDLELESS INTRAVENOUS INFUSION SYSTEM

Conrad H. Boettger, Hesston, Kans., assignor to St. Francis Research Institute, Wichita, Kans.

Continuation of Ser. No. 837,263, Feb. 18, 1992, abandoned. This application May 25, 1993, Ser. No. 67,394

Int. Cl.[6] A61M *25/00*

U.S. Cl. 604—283 **10 Claims**



1. In a quick-connect coupling assembly for use in liquid transfer systems such as intravenous medicinal liquid delivery equipment for medical patients, the improvement comprising:

a tubular female component configured to present an open socket communicating with a liquid passage through the component;

a tubular male component configured to present a cannula having a blunt, open outer end receivable within said socket of the female component when the components are connected together for establishing liquid communication between said passage in the female component and a passage in the male component; and

mutually interengagable quick-connect structure on said male component and said female component for releasably holding

the components against separation from one another when liquid communication is established between the components,

said male component having an annular outer collar circumscribing said cannula in radially spaced relation therewith to define an annular space between the cannula and the collar which is adapted to receive a portion of the female component when the cannula is received in said socket and the components are connected together,

said collar having an axially endmost extremity which extends axially beyond said blunt, open end of the cannula whereby to dispose the cannula in an environmentally protected, recessed position with respect to said end extremity of the collar,

said socket of the female component having an internal, axially extending, depressible stem forming part of a valve which is opened when the stem is depressed,

said cannula being disposed to depress said stem when the components are connected together whereby to open the valve,

said quick-connect structure on the components comprising intermeshing threads,

said intermeshing threads being disposed on the outside of said portion of the female component at an endmost extremity of said portion and the inside of said collar of the male component,

said threads on the inside of the collar of the male component extending outwardly beyond the outer end of the cannula to a point adjacent said endmost extremity of the collar,

said portion of the female component received within the annular space having a smooth, cylindrical outer surface devoid of threads except at said endmost extremity of the portion,

said threads on the collar extending beside said smooth surface of the female component in spaced opposition thereto when the components are connected together,

said collar of the male component and said outer surface of said portion of the female component being devoid of a fluid-tight seal therebetween from said threads on the endmost extremity of the female component to said endmost extremity of the collar.

5,464,400

EPIDURAL CONNECTOR

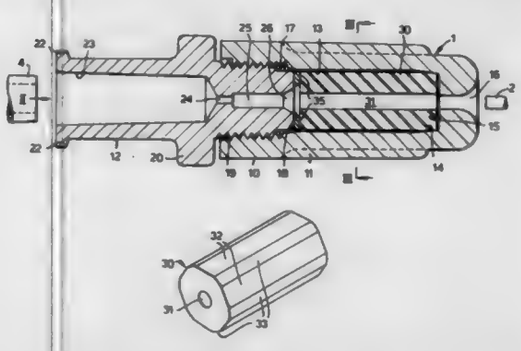
Michael N. Collins, Lyminge, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Dec. 1, 1994, Ser. No. 352,145

Claims priority, application United Kingdom, Dec. 18, 1993, 9325936

Int. Cl.[6] A61M *25/00*

U.S. Cl. 604—283 **9 Claims**



1. A connector for connection to a tube, the connector comprising a housing and an elongated compressible member located in said housing, wherein said compressible member has two ends, an external surface and a bore therethrough, said bore being sized to receive the tube, wherein said housing comprises: a first tubular part having a hollow interior in which the compressible member is located, said first part having a shoulder at one end for engagement with one of said ends of the compressible member; and a second part displaceable axially relative to the first part, the second part having a contact region for engagement with another of said ends of the compressible member such that, by displacing said first and second parts together, said compressible member is compressed axially and thereby expands radially into contact with an internal surface of said first part to seal about the tube, and wherein said external surface of said compressible member and said internal surface of the first part are so shaped that said compressible member contacts the internal surface at a plurality of locations spaced around the compressible member, said locations being separated from one another by gaps extending along the length of said compressible member to provide regions into which the compressible member can be deformed.

5,464,401

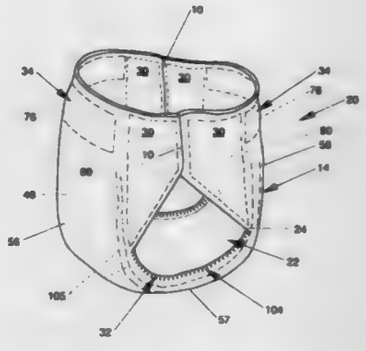
ELASTICIZED DISPOSABLE TRAINING PANT HAVING DIFFERENTIAL EXTENSIBILITY

Margaret H. Hasse, Wyoming; Russell P. Bridges, Cincinnati, and Steven W. Miller, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 795,560, Nov. 21, 1991, Pat. No. 5,246,433. This application Sep. 1, 1993, Ser. No. 115,293

Int. Cl.[6] A61F *13/15*

U.S. Cl. 604—385.1 **16 Claims**



1. An elasticized disposable garment comprising:

(a) a chassis having:

(i) a front portion having an end edge, longitudinal side edges, leg edges, a central region, ear flaps each side ear flap extending laterally outwardly from said central region to said longitudinal side edges and longitudinally along said central region from said end edge to said leg edge;

(ii) a rear portion opposed to said front portion, said rear portion having an end edge, longitudinal side edges, leg edges, a central region, ear flaps each side ear flap extending laterally outwardly from said central region to said longitudinal side edges and longitudinally along said central region from said end edge to said leg edge; and

(iii) a crotch portion between said front portion and said rear portion; said chassis comprising an outer layer, and an elastic ear flap member joined to each said ear flap and extending longitudinally from said end edge of said ear flap towards said leg edge of said ear flap, said outer layer and said elastic ear flap member are mechanically stretched to form an elastomeric laminate, which is elastically extensible each said elastomeric laminate being unitary with said chassis in that said elastomeric laminate comprises a portion of said outer layer each said elastomeric laminate forming an elasticized ear flap in each said ear flap of said chassis, each said elasticized ear flap having differential extensibility along the longitudinal axis when stretched in the lateral direction; and

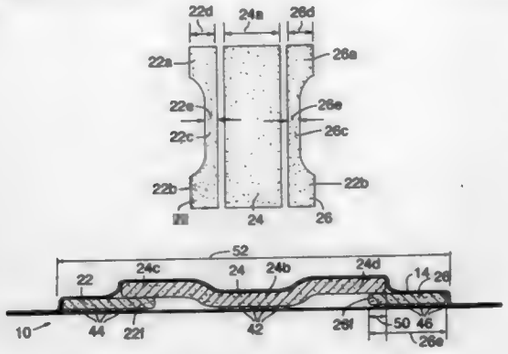
(b) seams joining said front portion to said rear portion adjacent said longitudinal side edges so as to form two leg openings and a waist opening substantially encircled by said end edges.

5,464,402

ABSORBENT GARMENT WITH CONFORMABLE PADS

Peter Zajaczkowski, Auburn, Wash., assignor to Paragon Trade Brands, Inc., Federal Way, Wash.

Filed Mar. 17, 1994, Ser. No. 210,360
Int. Cl.[6] A61F 13/15
U.S. Cl. 604—385.1 12 Claims



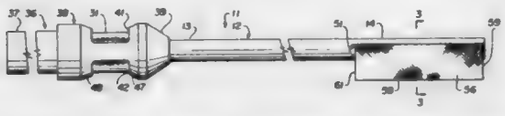
1. An absorbent garment comprising
a back sheet,
a liner sheet overlying said back sheet,
a first elongate absorbent pad positioned between said sheets and having a longitudinal center region, and
a second elongate absorbent pad positioned between said sheets offset laterally from the center region of said first pad,
said first and second pads being disposed in an initial position with marginal side edge portions thereof disposed in a first overlap relationship and being mounted in said garment for shifting laterally relative to each other to vary the extent of overlap therebetween, said first and second pads having substantially planar facing surfaces permitting varying said overlap without significantly varying the combined thickness of said overlapping portions.

5,464,403

PLACEMENT TOOL AND METHOD FOR LAPAROSCOPIC HERNIA REPAIR

Maciej J. Kieturakis, San Carlos; Kenneth H. Mollenauer, Santa Clara, and Helmut L. Kayan, Redwood City, all of Calif., assignors to General Surgical Innovations, Inc., Portola Valley, Calif.

Continuation-in-part of Ser. No. 968,551, Oct. 29, 1992, abandoned. This application Jun. 30, 1993, Ser. No. 85,288
Int. Cl.[6] A61B 19/00
U.S. Cl. 606—1 20 Claims



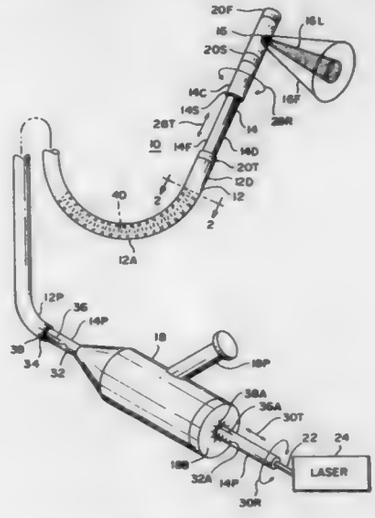
1. A tool for the placement of a sheet of mesh material having first and second edges and a width between the edges in a laparoscopic procedure in a patient utilizing a cannula having a bore therein comprising: an elongate tubular assembly having proximal and distal extremities, the distal extremity adapted to be introduced through the cannula, said elongate tubular assembly including an elongate tubular member having a bore, a rod disposed in the bore of the elongate tubular member and having an outer diameter and having a proximal extremity and a distal extremity with the distal extremity of the rod terminating short of the distal extremity of the elongate tubular assembly, a rotatable member secured to the proximal extremity of the rod, handle means adapted to be grasped by a human hand and secured to the proximal extremity of the elongate tubular assembly and receiving said rotatable member, said handle means having at least one opening therein overlying the rotatable member and adapted to receive a finger of the human hand grasping the handle means for rotating the rotatable member and the rod carried thereby, a sleeve disposed over said elongate tubular member and having a distal extremity which has an inside diameter substantially greater than the outside diameter of the rod to form an annular chamber, said sleeve having a slot therein extending longitudinally of the elongate tubular assembly which permits access to the annular chamber and the distal extremity of the rod, means carried by the distal extremity of the rod for engaging one of said edge of said sheet of mesh so that as the rod is rotated said sheet of mesh is wound about said rod in one direction and brought into and stored as a roll in said annular chamber to permit introduction of the distal extremity of the elongate tubular assembly with the sheet of mesh stored therein through the cannula, said sheet of mesh being dischargeable from the chamber by rotation of the rod in an opposite direction to cause the other edge of said sheet of mesh to move through said slot and out of said annular chamber to permit the sheet of mesh to be placed within the patient during the laparoscopic procedure.

5,464,404

CARDIAC ABLATION CATHETERS AND METHOD

George S. Abela, Wellesley, Mass.; Stephan E. Friedl, Ithaca, N.Y., and Eric D. Mathews, Boston, Mass., assignors to Abela Laser Systems, Inc., Natick, Mass., and University of Florida, Gainesville, Fla.

Filed Sep. 20, 1993, Ser. No. 123,207
Int. Cl.[6] A61B 17/36
U.S. Cl. 606—15 19 Claims



1. An apparatus for patient treatment comprising:
an outer catheter having a proximal end and a distal end having at least a first passage extending lengthwise therein;
an inner catheter disposed at least partly in said first passage and having a proximal end and a distal end, said inner catheter having a side wall, a first window in said side wall, and an optical fiber having a tip, said first window positioned such that light may pass between said tip and said first window, said inner catheter being at least partly lengthwise movably disposed within said outer catheter such that an extending portion of said inner catheter is extendable out said distal end of said outer catheter by a variable amount;

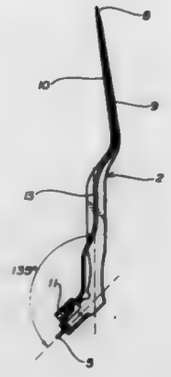
lengthwise offset conductive cardiac tissue detecting first and second electrodes, said fist electrode mounted on an external surface of said side wall and said second electrode mounted on a surface selected from the group consisting of; the external surface of said side wall and an external surface of said outer catheter; and a steering means connected to said outer catheter for steering said outer catheter.

5,464,405

BIPOLAR SURGICAL TWEEZERS

Kazuhiko Fujitsu, Yokosuka; Tomohiko Asahara, Tokyo; Nobuhiro Kagaminuma, Koriyama, and Kohichi Iwai, Nagoya, all of, Japan, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Filed Jan. 18, 1994, Ser. No. 182,610
Claims priority, application Japan, Jan. 20, 1993, 5-023481
Int. Cl.[6] A61B *17/39*
U.S. Cl. 606—51 **1 Claim**



1. Bipolar electric surgical tweezers comprising:

two electrically conductive arms mutually isolated electrically from one another, and said arms acting as an independent bipolar electrode, said arms defining an instrument longitudinal axis, each said arm having an electrical connector for connection to an electrical source;

a perfusion connection port contained on a first of said arms, said port having a port axis;

and each of said arms having: a distal end defining a tip, and a proximal end;

wherein said first arm contains the perfusion connection port on its proximal end, and said first arm further contains a groove extending from said connection port to its tip, and a perfusion pipe located in said groove and connected to said port; and

wherein said port axis and said longitudinal axis form an angle between 90° and 170°.

5,464,406

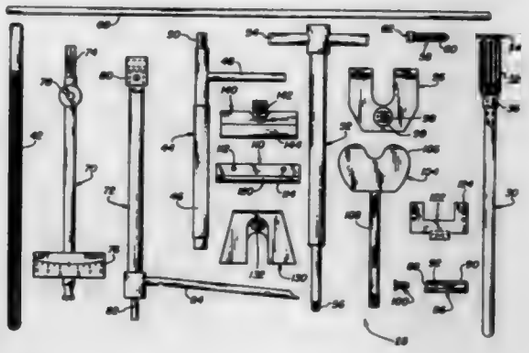
INSTRUMENTATION FOR REVISION SURGERY

Merrill A. Ritter, 9147 W. 82nd St., Indianapolis, Ind. 46278; John M. McDaniel, 2115 N. Industrial Dr., Bloomington, Ind. 47404, and David R. Brown, 3997 E. Lakeview Trail, Leesburg, Ind. 46538

Filed Dec. 9, 1992, Ser. No. 988,229
Int. Cl.[6] A61F *5/00*
U.S. Cl. 606—86 **19 Claims**

1. A set of surgical instruments used for shaping a bone so as to receive a permanent component of a joint prosthesis having a smooth curvilinear surface, said set of surgical instruments comprising:

a provisional component having a surface corresponding to the smooth curvilinear surface of the permanent component of the joint prosthesis;



at least one resection guide operable to be used during resection of the bone;

an intramedullary rod assembly for adjustably positioning said one provisional component and said resection guide in order to shape the bone for receipt of the permanent component of the joint prosthesis, said intramedullary rod assembly including:

(a) a first member operable to be inserted into the bone;

(b) a second member moveable with respect to said first member of said intramedullary rod assembly; and

means for adjusting the position of said second member relative said first member.

5,464,407

FLEXIBLE SURGICAL SCREWDRIVER AND METHODS OF ARTHROSCOPIC LIGAMENT RECONSTRUCTION

David A. McGuire, 3418 Lakeside Dr., Anchorage, Ak. 99515

Continuation-in-part of Ser. No. 956,733, Oct. 2, 1992, Pat. No. 5,391,170, which is a continuation-in-part of Ser. No. 806,906, Dec. 13, 1991, Pat. No. 5,257,996, and a continuation-in-part of Ser. No. 839,466, Feb. 19, 1991. This application Nov. 16, 1994, Ser. No. 340,790
Int. Cl.[6] A61F *5/00*
U.S. Cl. 606—86 **11 Claims**

1. A screwdriver comprising:

a handle having a longitudinal cannula;

a flexible hollow shaft having a proximal end coupled to said handle and a distal end; and

a cannulated drive tip coupled to the distal end of said flexible shaft for being rotated upon rotation of said shaft, wherein a guide wire may be inserted into the cannulated drive tip through said flexible hollow shaft and out through said handle.

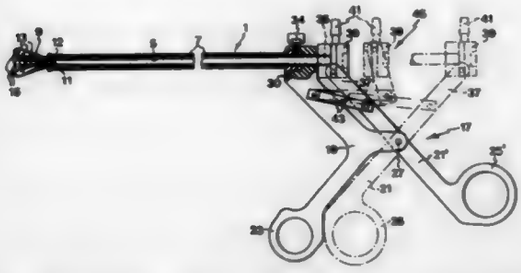
5,464,408

TRANSLUMINAL IMPLANTATION OR EXTRACTION DEVICE

Jerome Duc, Boliette 1, 1802, Corseaux, Switzerland

Filed Jun. 1, 1992, Ser. No. 891,514
Claims priority, application Sweden, Jun. 14, 1991, 9101839
Int. Cl.[6] A61B *19/00*
U.S. Cl. 606—108 **10 Claims**

1. A device for transluminal extraction or implantation of a



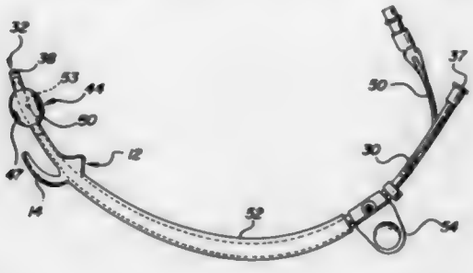
substantially tubular, radially expansible stent, comprising a central tube having a periphery and being surrounded by an exterior tube axially displaceable relative to said central tube, and a plurality of axially extending gripping members attached to said central tube at a distal end thereof, each of said gripping members having a distal end, said gripping members being substantially evenly distributed around the periphery of said central tube and adapted for outward expansion of their distal ends when said central tube is displaced relative to said exterior tube said gripping members being arranged in at least two concentric sets, with a first set being radially displaced relative to a second set to substantially cover one or more gaps between adjacent gripping members of said first and second sets when in an expanded position, said sets of gripping members thereby forming a substantially closed distal end periphery when in said expanded position permitting a substantially continuous circumferential engagement about at least a portion of said stent.

5,464,409

UTERINE MANIPULATOR AND PROTECTOR

Reza S. Mohajer, 3115 W. Shore Dr., Orchard Lake, Mich. 48033

Filed Dec. 9, 1993, Ser. No. 163,502
Int. Cl.[6] A61B *17/00*; A61M *29/00*
U.S. Cl. 606—119 **10 Claims**



8. An improved uterine manipulator device comprising:

an elongated tube having an insertable end adapted to be inserted through the cervical canal into the uterine cavity and an opposite end configured to be located outside the external opening of the vagina with the manipulator device in place, said tube having means defining a passage extending thereal-ong and the passage having an inlet portion adjacent its said opposite end and terminating in a fluid discharge port adjacent said insertable end, said passage serving to channel fluid introduced thereinto along the tube with such fluid delivered to said discharge port;

an air line disposed inside said passage and terminating in an air discharge port spaced from said fluid discharge port;

an inflatable member affixed to said tube proximate said insertable end of the tube and including an interior communicating with said air discharge port and adapted to be inflated with air channeled by said air line;

an elongate plastic sheath having an internal passage extending therealong, said tube being lodged loosely within said internal passage with the sheath in non-clamping relation relative thereto and thus freely slidable relative to the tube;

a shield member having an at least partially open face and integrally formed on one end of the sheath, also in loose slidable relation with respect to the tube, located adjacent but proximally of the tube's insertable end, said shield configured to engage a portion of the outer uterine wall adjacent the external cervical os, said shield including:

a curved biade projecting from a portion of an edge of said shield member and configured to extend into the vaginal cul-de-sac to protect the posterior uterine wall from trauma; and

a finger projecting from an inner surface of said shield member and adapted to extend for a distance into the cervix for engagement therewith; and

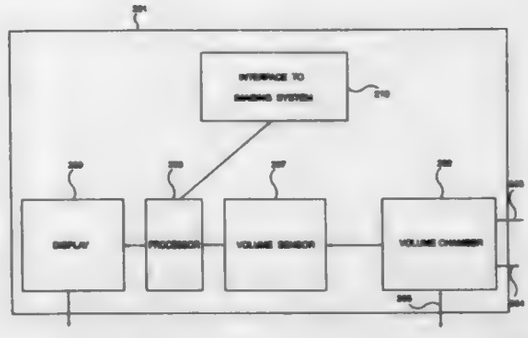
means for fixing the position of the sheath relative to the tube so that the shield member may be properly positioned relative to the external cervical os.

5,464,410

IMAGING FIXATION AND LOCALIZATION SYSTEM WITH RESPIRATORY FEEDBACK DEVICE

Joseph L. Skeens, and Linda M. Miketic, both of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Division of Ser. No. 695,687, May 3, 1991, Pat. No. 5,242,455.
This application Jul. 6, 1992, Ser. No. 909,310
The portion of the term of this patent subsequent to Sep. 7, 2010, has been disclaimed.
Int. Cl.[6] A61B *19/00*
U.S. Cl. 606—130 **21 Claims**



1. A stereotaxic localization system for use in conjunction with an imaging system, comprising:

a. A respiratory feedback device in which respiratory volume is directly measured to define a phase of respiration of a patient, said phase of respiration providing an indication of the position of internal organs of the patient, said respiratory feedback device comprising:

i. A chamber, said chamber comprising a respiration port for respirative connection with the patient;

ii. A volume sensor means in communicative connection with said chamber; and

iii. A display means for displaying respiratory volume to the patient, said display means being in operative connection with said volume sensor means, whereby respiratory volume at a particular time is displayed to the patient to allow the patient to actively control respiratory volume and thereby the position of the patients internal organs; and

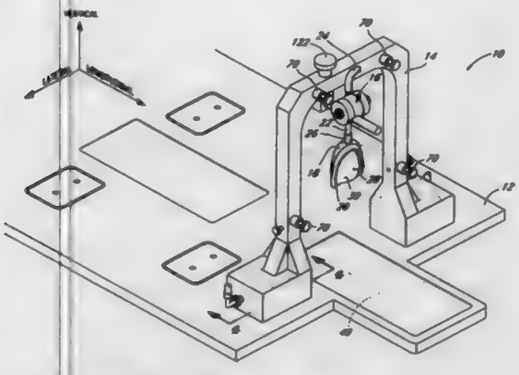
b. A stereotaxic localization means for placing a probe at a desired location within a body during a known phase of respiration as determined by said respiratory feedback device.

5,464,411

VACUUM-ASSISTED FIXATION APPARATUS

Reinhard W. Schulte, Colton; William J. Wicks, Redondo Beach; Helmut J. Meinass, Colton, and Winston J. Nethery, Yorba Linda, all of Calif., assignors to Loma Linda University Medical Center, Loma Linda, Calif.

Filed Nov. 2, 1993, Ser. No. 148,213
Int. Cl.[6] A61B *19/00*
U.S. Cl. 606—130 **36 Claims**



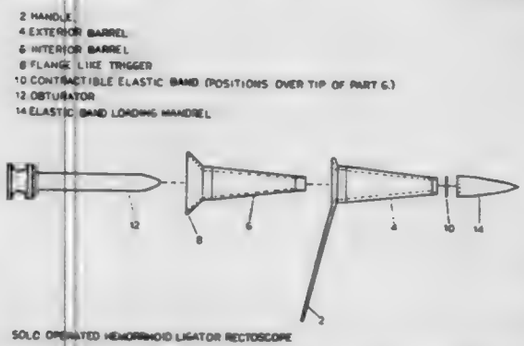
1. A stereotactic fixation apparatus, comprising:
a stereotactic frame; and
a mouthpiece attached to said stereotactic frame, said mouthpiece having a surface for contacting a patient's hard palate and a port positioned at a point on said mouthpiece distal of said surface and adapted for connection to a source of vacuum, said mouthpiece being configured to provide a fluidic path between said surface and said port to provide a vacuum attachment between the surface and the hard palate of the patient.

5,464,412

SOLO OPERATED HEMORRHOID LIGATOR RECTOSCOPE

Jacobus Budding, 20 Lessies Dr., Poquoson, Va. 23662

Filed Jul. 12, 1994, Ser. No. 273,863
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—140 **2 Claims**



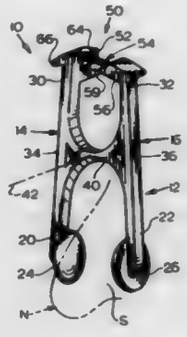
1. A double barreled endoscopic probe, having a longitudinal axis, comprising a conical exterior barrel, having a wall inclined with respect to the longitudinal axis and a conical interior barrel having a wall inclined with respect to the longitudinal axis and parallel to the wall of the exterior barrel, the interior barrel is longer than the than the exterior barrel, the distal end of the interior barrel provides a means for holding a contractile elastic ring in stretched condition, the proximal end of the interior barrel includes a flange which acts as a trigger means to actuate retraction of the interior barrel with respect to the exterior barrel whereby the elastic ring is pushed from the interior barrel, the proximal end of the the exterior barrel includes a handle for manipulation of the probe.

5,464,413

NOSE CLIP

William Siska, Jr., 141 Valley View Dr., Elma, N.Y. 14059, and Vernon C. Lenz, 3509 Main St., Union Gap, Wash. 98903

Filed Nov. 15, 1993, Ser. No. 152,324
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—151 **3 Claims**



1. A nose clip comprising:
a frame which includes first and second largely vertical bars, each having nose-squeezing lower ends adapted to press toward opposite sides of a person's nose, upper ends, and a middle, said frame including a bendable crossbeam which connects said bar middles and which can bend to allow said bar lower ends to move together and apart respectively toward a squeezed position and a released position;
said frame including a mechanism that couples said bar upper ends and prevents them from moving toward each other to thereby keep said frame in said squeezed position, said mechanism being releasable to allow said bar upper ends to move toward each other so said frame can move to said released position.
said mechanism comprises a pawl on said first bar upper end and a toothed beam which extends from the second bar upper end to said pawl, with said pawl and toothed beam oriented to prevent said beam upper ends from moving toward each other and with said toothed beam being mutually disengagable from said pawl;
said bars, crossbeam and beam are integrally molded;
said toothed beam has an inner end which forms a molded hinge connection with the upper end of said second bar, to thereby facilitate molding of the beam.

5,464,414

DISPOSABLE APPROXIMATOR FOR APPROACHING NERVE-ENDINGS IN PARTICULAR FOR FACILITATING SEWING AND REPLACEMENT OF INJURED NERVES

Endre Cziffer, Bakats U. 5., II. 5, H-1093 Budapest, Hungary

PCT No. PCT/HU92/00046, § 371 Date Nov. 12, 1993, § 102(e) Date Nov. 12, 1993, PCT Pub. No. WO93/08727, PCT Pub. Date May 13, 1993
PCT Filed Nov. 5, 1992, Ser. No. 150,005
Claims priority, application Hungary, Nov. 6, 1991, 3478/91
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—152 **12 Claims**

1. An approximator for facilitating suturing of nerve endings comprising:

an elongated leg member having proximal and distal portions and provided with a slide and a carrier console thereon, said slide being slidably disposed on the leg so that it is slidably displaceable along the leg member in only one direction from said distal portion on the leg to said proximal portion closer toward the proximal portion with the carrier console, said slide and said carrier console each being provided with at least one surgical hook therein for hooking onto nerve endings such that a first nerve ending hooked by the hook at least one of the slide is brought into proximity with a second nerve ending hooked by the at least one hook of the carrier console when the slide is displaced from said distal position to said proximal position whereby to facilitate suturing of the first and second nerve endings.

5,464,415

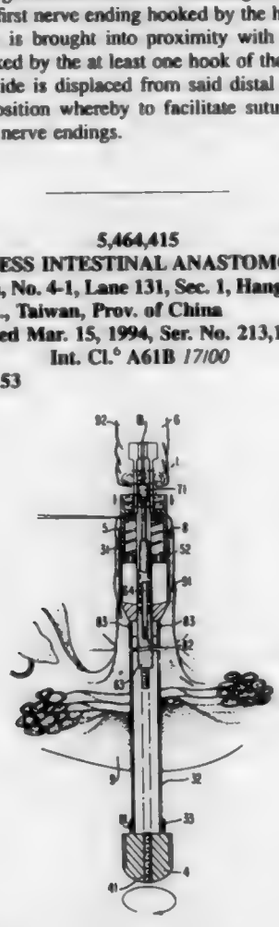
SUTURELESS INTESTINAL ANASTOMOSIS GUN

Te-Chuan Chen, No. 4-1, Lane 131, Sec. 1, Hang Chou S. Road, Taipei R.O.C., Taiwan, Prov. of China

Filed Mar. 15, 1994, Ser. No. 213,130

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—153 **1 Claim**



1. A sutureless, intestinal anastomosis gun for an anastomosis ring, comprising:

a housing comprising an outer tube portion having first and second ends and a tube body portion having first and second ends, the first end of the outer tube portion being connected to the first end of the tube body portion, and being larger in diameter than the tube body portion, and the tube body portion being longer in length than the outer tube portion;

a guide head in the shape of a smooth conic housing fitted over the second end of the outer tube portion for inserting into the rectum through the anus;

a nut mounted on the second end of the tube body portion opposite the outer tube portion;

a lining tube having an upper end and a lower end, the lining tube being fitted inside the outer tube portion, the upper end of the lining tube being adjacent to the second end of the outer tube portion and being formed into a stop edge;

a filler plate threaded at the lower end of the lining tube;

an anastomosis ring seat having an upper end and a lower end, the lower end being formed into a flange for mounting in the lining tube and the upper end being divided into a number of segments by the same number of grooves, such that the diameter of the upper end of the ring seat can be altered;

a spring mounted between the flange and the filler plate in the lining tube;

a movable shaft mounted in the housing and having upper and lower ends, the upper end extending through the filler plate and the lower end being connected to the lower end of the anastomosis ring seat, the movable shaft being provided with an elongated slit;

a fixed shaft mounted in the movable shaft and having upper and lower ends, the lower end of the fixed shaft being affixed to the outer tube portion and the upper end of the fixed shaft forming a restricting head so as to restrict the size of the upper end of the anastomosis ring seat;

a screw rod located in the tube body portion and having upper and lower ends, the upper end being connected to the movable shaft and the lower end being threaded to the nut;

whereby, in use, intestinal anastomosis can be performed by threading a screw through the elongated slit of the movable shaft to the fixed shaft therein, thus allowing linear movement, so that during operation, when the nut is rotated, the lining tube is retracted relative to the outer tube portion and then the anastomosis ring seat is retracted relative to the lining tube under the action of the spring, so as to push the end of the rectum into the gap of the anastomosis ring, whereafter the anastomosis ring is snapped closed and the gun is then disengaged from the anastomosis ring.

5,464,416

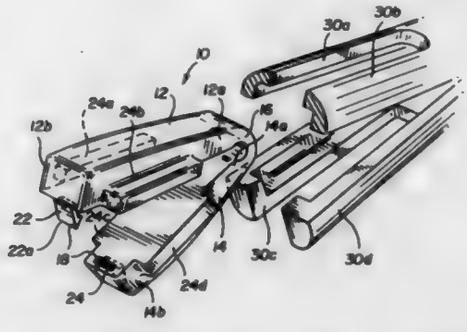
LIGATING CLIP

Mark G. Steckel, Maineville, Ohio, assignor to Ethicon, Inc., Cincinnati, Ohio

Filed Nov. 10, 1992, Ser. No. 974,087

Int. Cl.[6] A61B *17/122*

U.S. Cl. 606—158 **31 Claims**



1. A surgical fastener adapted to be secured in a closed position about body tissue by a fastener-applying instrument comprising:

first and second leg members each having distal and proximal ends and an inner tissue engaging surface and an opposing outer surface;

resilient hinge means for connecting said first and second leg members at their proximal ends; and

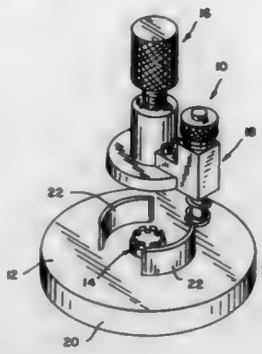
engagement means, positioned laterally on at least one of said first and second leg members between said inner and outer surfaces of said one leg member without extending beyond said opposing outer surface of said one leg member, for engaging with said fastener-applying instrument to allow said instrument to move said first and second leg members toward one another until said first and second leg members are in a closed position about said body tissue.

5,464,417

APPARATUS AND METHOD FOR SUPPORTING AND CUTTING CORNEA TISSUE

Daniel H. Eick, 1136 N. 117th St., Milwaukee, Wis. 53226

Filed May 16, 1994, Ser. No. 243,479
Int. Cl.[6] A61B 17/00
U.S. Cl. 606—166 14 Claims



1. A system for cutting a predetermined portion of cornea tissue, said system comprising:

a base having an aperture formed therein;

a trephine assembly rotatably and eccentrically mounted on said base about an axis which is transverse to said base, said trephine assembly having a rotatable cutting element;

a cornea holder retained in said aperture in said base and having a plurality of circumferentially spaced fingers formed with internally facing chamfers for supporting the predetermined portion of cornea tissue thereon over said aperture; and

a locking device clamping said trephine assembly in position over said cornea holder whereby the predetermined portion of cornea tissue supported on said cornea holder is cut along a circumference of the predetermined portion of the cornea tissue by said rotatable cutting element without touching said base and said cornea holder.

5,464,418

REUSABLE LANCET DEVICE

Steven Schraga, 1841 NE. 146 St., North Miami, Fla. 33181

Filed Dec. 9, 1993, Ser. No. 163,514
Int. Cl.[6] A61B 17/34
U.S. Cl. 606—182 6 Claims

1. To be used with a disposable lancet, an improved, reusable lancet device comprising:

an elongate housing of triangular cross-section,

said housing including a closed first end, an open second end, and an elongate channel therein extending from said first end to said second end,

an elongate needle holding member disposed within said channel and being movable therein between a cocked, retracted position and an extended position,

said needle holder member including a distal segment, a central segment, and a proximal segment,

said proximal segment being structured and disposed to protrude from said open second end of said housing and to hold the disposable lancet therein such that a point of the disposable lancet extends away from said needle holding member,

biasing means structured and disposed to urge said needle holding member into said extended position, said biasing means including a spring disposed about said distal segment of said needle holding member, said spring abutting a flanged lip formed in said needle holding member between said distal segment and said central segment such that extension of said spring results in corresponding movement of said needle holding member,

stopper means structured and disposed to limit an amount which said needle holding member moves axially and an amount which said needle holding member will protrude through said open second end of said housing, thereby retaining said needle holding member within said channel, said stopper means including an elongate slot disposed in said distal segment of said needle holding member, and a peg extending from an interior of said housing through said slot so as to limit movement of said needle holding member to a length of said slot,

trigger means structured and disposed to maintain said needle holding member in said cocked, retracted position until released by a user, releasing by the user resulting in immediate movement of said needle holding member to said extended position, and

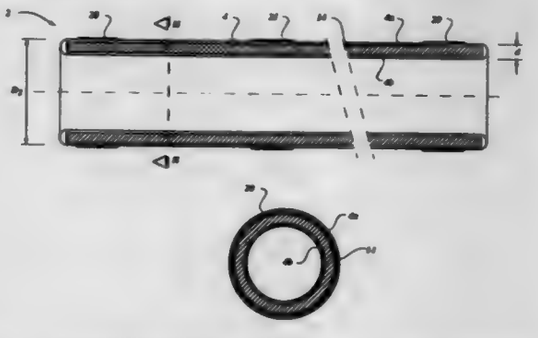
a cap segment of triangular cross-section including an open first side structured and disposed to be matingly fitted over said open second end of said housing, and a piercing opening disposed in a second side thereof, said piercing opening being structured and disposed to enable the point of the lancet to extend therethrough into a piercing position upon release of said needle holding member from said cocked, retracted position.

5,464,419

EXPANDABLE HOLLOW SLEEVE FOR THE LOCAL SUPPORT AND/OR REINFORCEMENT OF A BODY VESSEL, AND METHOD FOR THE FABRICATION THEREOF

Hendrik Glastra, Enschede, Netherlands, assignor to Industrial Research B.V., Netherlands

Filed Mar. 21, 1994, Ser. No. 215,178
Claims priority, application Netherlands, Mar. 22, 1993, 9300500
Int. Cl.[6] A61M 29/00; A61F 2/04
U.S. Cl. 606—194 15 Claims



1. An expandable double-walled sleeve for locally supporting and reinforcing a body vessel, comprising:

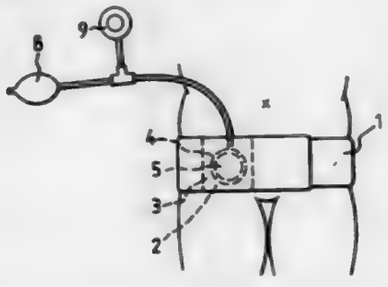
generally tubular inner and outer walls;
absorbent material provided between the inner and outer walls; and
curable material contained within the absorbent material.

5,464,420

COMPRESSIVE HEMOSTATIC BELT

Shinichi Hori, Sakai; Atsuko Kawasaki, Akashi; Takefumi Nakashita, Kobe; Yoshiharu Inui, Takarazuka; Toshiaki Sakaki, Kakogawa, and Miyo Miki, Kobe, all of, Japan, assignors to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Continuation of Ser. No. 906,341, Jun. 30, 1992, abandoned. This application Mar. 7, 1994, Ser. No. 206,255
Claims priority, application Japan, Feb. 6, 1992, 4-020793; Apr. 22, 1992, 4-102850; Apr. 22, 1992, 4-102851
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—202 **6 Claims**



1. A compressive hemostatic belt system, comprising:
a mounting strip for binding a patient, said strip being formed from at least one of a non-elastic and a low-elastic material;
a balloon mounted in said strip and positioned so as to compress a selected area of the body of the patient when inflated, said balloon having means for inflating said balloon with fluid; and
inflation directing means mounted with said balloon, for directing inflation of said balloon substantially only toward the selected area of the body and for preventing inflation away from the body, wherein
said mounting strip includes a pocket holding said balloon and said inflation directing means, the pocket being formed with a contact side part formed from an elastically expandable sheet material and positioned so as to contact with the selected area of the body of the patient.

5,464,421

HEMORRHAGE OCCLUDER, APPLICATOR AND METHOD

Theodore S. Wortrich, Long Beach, Calif., assignor to Surgin Surgical Instrumentation, Inc., Tustin, Calif.

Continuation of Ser. No. 96,650, Jul. 22, 1993, abandoned, which is a continuation of Ser. No. 715,492, Jun. 14, 1991, abandoned. This application Jan. 17, 1995, Ser. No. 373,523
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—213 **8 Claims**

1. An applicator for use by a surgeon in applying an occluder pin having a cap to terminate sacral hemorrhaging comprising:
a handle elongated along a selected axis, a malleable thin metal extender shaft attached to the handle and nominally positioned along the selected axis, the extender being manually deformable both along and about its length and without a memory characteristic such as to retain its shape when deformed to a shape desired for proximity to a location at which sacral hemorrhaging is occurring; and
a C-shaped pin cap holding member attached to the opposite end of the extender from the handle, the pin cap holding member

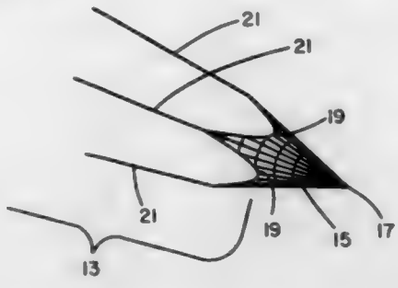
having elastically deformable arcuate arms defining a curved periphery, the curved periphery including a recessed surface formed of a continuous groove extending substantially along the distance of the curved periphery for receiving and retaining the occluder pin cap in a releasable engagement, wherein the arcuate arms define a plane parallel to the axis of the handle at the said opposite end from the handle, and the arcuate arms terminate at spaced apart ends to define a gap, such that upon pressure applied to the occluder pin cap, the pin cap moves between the arcuate arms of the pin cap holding member or upon applying pressure to the occluder pin cap by raising the pin cap holding member in a perpendicular direction to the occluder pin, the arcuate arms elastically deform such that the pin cap is slidably separated from the pin cap holding member.

5,464,422

SUTURE NEEDLE

James D. Silverman, Flagstaff, Ariz., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Continuation of Ser. No. 86,500, Jul. 1, 1993, abandoned. This application Jan. 11, 1995, Ser. No. 374,383
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—223 **21 Claims**



1. A suture needle comprising, in sequence, a shaft portion, a tip portion, a conical point portion and a point, and further having a longitudinal centerline, wherein the tip portion has at least two flat surfaces, said flat surfaces each being in a plane that intersects the centerline at a plane intersection angle, and further having a conical point portion of substantially round cross section, wherein said conical point portion has a surface and said conical point portion forms a cone angle between a plane tangent to the surface of the conical point portion and the longitudinal centerline, and wherein said cone angle is greater than said plane intersection angle.

5,464,423

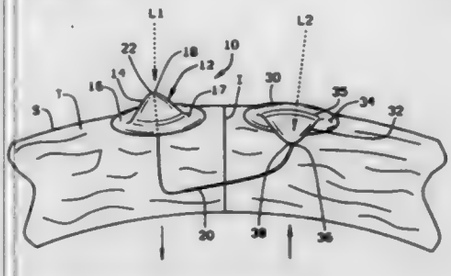
Patent Not Issued For This Number

5,464,424

LASER ADJUSTABLE SUTURE

Francis E. O'Donnell, Jr., 709 The Hamptons, Town & Country, Mo. 63017

Filed Jun. 27, 1994, Ser. No. 265,747
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—228 **4 Claims**



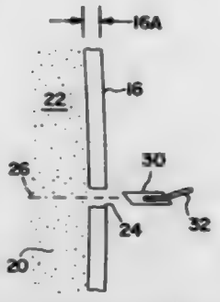
1. A laser adjustable suture comprising:
a length of suture material having a first end and a second end;
a rivet at said first end, said rivet having a deformable dome portion, said dome portion being convex, said first end of said suture being appropriately attached to said convex dome;
a second rivet, said second rivet having a deformable dome portion, said dome portion being concave, said second end of said suture being appropriately attached to said dome, said respective domes being reactive to laser energy so that said domes contract and flatten under the application of an appropriate laser energy source.

5,464,425

MEDULLARY SUTURE ANCHOR

Jeffry B. Skiba, Phoenix, Ariz., assignor to Orthopaedic Biosystems, Ltd., Scottsdale, Ariz.

Filed Feb. 23, 1994, Ser. No. 200,162
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—232 **20 Claims**



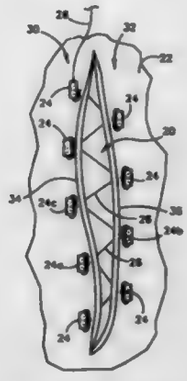
1. A device for attaching soft tissue to bone, comprising:
an elongated anchor having a longitudinal axis;
a bore extending through said anchor and having an axial centerline disposed transversely with respect to and substantially intersecting said longitudinal axis, said bore being configured to receive a suture journaled therethrough; and
respective first and second substantially flat, angled end portions oppositely disposed about said bore, said angled end portions being substantially parallel to each other, said bore being disposed along said longitudinal axis approximately midway between said first and second end portions.

5,464,426

METHOD OF CLOSING DISCONTINUITY IN TISSUE

Peter M. Bonutti, 1303 W. Evergreen Plz., Effingham, Ill. 62401

Continuation-in-part of Ser. No. 62,295, May 14, 1993, Pat. No. 5,403,348. This application Mar. 7, 1994, Ser. No. 207,297
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—232 **71 Claims**



11. A method of closing a discontinuity in body tissue, said method comprising the steps of providing a plurality of anchors, inserting a suture and a thin elongated member through an opening in each of the anchors to provide a series of anchors on the suture and the thin elongated member, and positioning each of the anchors relative to the discontinuity in the body tissue, said step of positioning each of the anchors relative to the body tissue includes inserting the thin elongated member into body tissue at a first location which is disposed along a first side of the discontinuity in the body tissue with the series of anchors on the thin elongated member, moving a first one of the anchors in the series of anchors along the thin elongated member into engagement with the body tissue at the first location, removing the thin elongated member from the body tissue at the first location, thereafter, inserting the thin elongated member into body tissue at a second location which is disposed along a second side of the discontinuity in the body tissue with the series of anchors on the thin elongated member, moving a second one of the anchors in the series of anchors along the thin elongate member into engagement with the body of tissue at the second location, said step of moving a second one of the anchors in the series of anchors into engagement with the body tissue at the second location being performed with the suture extending between the first and second anchors, removing the thin elongated member from the body tissue at the second location, thereafter, inserting the thin elongated member into body tissue at a third location which is disposed along the first side of the discontinuity in the body tissue with the series of anchors on the thin elongated member, moving a third one of the anchors in the series of anchors along the thin elongated member into engagement with the body tissue at the third location, said step of moving a third one of the anchors in the series of anchors into engagement with the body tissue at the third location being performed with the suture extending between the first, second and third anchors, and removing the thin elongated member from the body tissue at the third location.

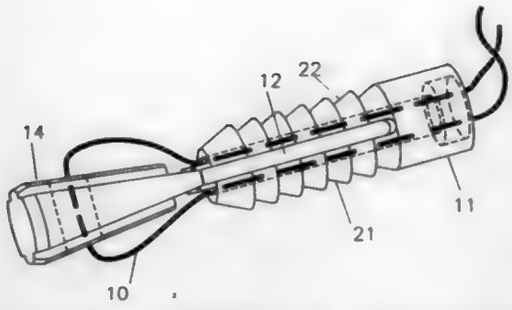
5,464,427

EXPANDING SUTURE ANCHOR

Raymond L. Curtis, Davos Dorf; Urs Schlegel, Davos-Platz, and Thomas Heldstab, Davos Dorf, all of, Switzerland, assignors to Synthes (U.S.A.), Paoli, Pa.

Filed Oct. 4, 1994, Ser. No. 317,396
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—232 **15 Claims**

1. Suture anchor comprising
A) a first main body (H) of a generally cylindrical shape having a front portion (1) for facing a body member to be treated, a



rear portion (2), a longitudinal axis (3), a curved surface (4), a central through-going bore (19) extending from said front portion (1) to said rear portion (2), and a longitudinal slit (12) which opens at said front portion (1) and at said curved surface (4) and is closed at said rear portion (2);

B) a second conical body (14) having a smaller base (15), a larger base (16), a curved surface (17) and a longitudinal axis (13), said second conical body (14) being coaxially introducible with its smaller base (15) into said slit (12) thereby causing expansion of said first main body (11), said second conical body (14) being provided with a through-hole (6) running transversely to said longitudinal axis (13); and

C) two channels (7) positioned on said curved surface (17) of said second conical body (14) and extending from the orifices (18) of said through-hole (6) to said smaller base (15).

5,464,428

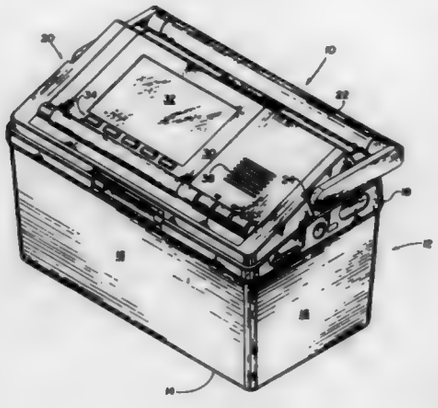
ENVIRONMENTALLY PROTECTED MEDICAL ELECTRONIC INSTRUMENT

Douglas J. Hill, Renton, Wash., assignor to Physio-Control Corporation, Redmond, Wash.

Filed Mar. 8, 1994, Ser. No. 207,552

Int. Cl.[6] A61N *1/08*

U.S. Cl. 607—1 **19 Claims**



1. An environmentally protected medical electronic instrument, comprising:

a container having a bottom, sidewalls having lower edges joined to said bottom in a watertight manner, and an open top;

medical electronic components mounted in said container and accessible through the open top of said container;

a lid mounted on said container so that said lid is alternately movable between a closed position in which said lid covers the open top of said container and the electronic components are accessible therethrough and an open position in which said lid is removed from above the top of said container to access said electrical components; and

water resistant user interface components mounted on the upper surface of said lid so that said user interface components are visible and readily accessed by a user when said lid is in its closed position, said user interface components being electrically connected to the medical electronic components mounted in said container.

5,464,429

APPARATUS FOR PRODUCING HEART DEFIBRILLATION SEQUENCES FROM STIMULATION PULSES AND DEFIBRILLATION SHOCKS

Sven-Erik Hedberg, Kungsaengen; Martin Obel, Danderyd, and Kurt Hoegnelid, Villavägen, all of, Sweden, assignors to Pacesetter AB, Solna, Sweden

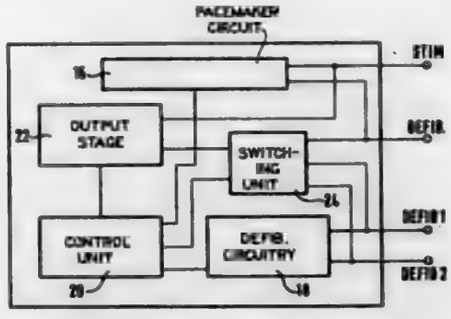
Filed Sep. 1, 1993, Ser. No. 114,357

Claims priority, application Sweden, Sep. 16, 1992, 9202662

The portion of the term of this patent subsequent to Jul. 11, 2012, has been disclaimed.

Int. Cl.[6] A61N *1/362*

U.S. Cl. 607—4 **20 Claims**



1. An apparatus for defibrillation of a heart comprising:

a pacing electrode and a plurality of defibrillation electrodes;

means for delivering pacing pulses through said pacing electrode to a heart for pacing said heart;

means for delivering defibrillation shocks through said plurality of defibrillation electrodes to said heart;

output means, connected to said pacing electrode, for delivering stimulation pulses to said heart having an energy content slightly higher than said pacing pulses and significantly lower than said defibrillator shocks; and

control means, connected to said means for delivering defibrillation shocks and to said output means, for producing a defibrillation sequence consisting of stimulation pulses and defibrillation shocks, respectively delivered to said heart via said pacing electrode and said defibrillation electrodes, at selected time intervals within said sequence.

5,464,430

METHOD AND APPARATUS FOR DE TREATMENT OF TACHYCARDIA AND

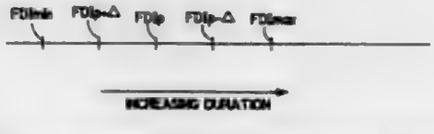
Martin A. Rossing, Ramsey, Minn., assignor t Minneapolis, Minn.

Continuation of Ser. No. 157,360, Nov. 23, 5,403,352. This application Jan. 13, 1995, Se

The portion of the term of this patent subseq 2012, has been disclaimed.

Int. Cl.[6] A61N *1/39;1/362*

U.S. Cl. 607—4



1. An apparatus for detection and treatment of tachyarr comprising:

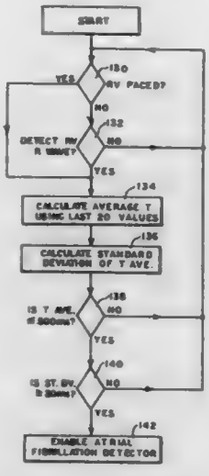
means for sensing depolarizations of a patient's heart;
means for measuring intervals separating successive depolarizations of said patient's heart;
means for defining a first interval range extending between a first interval duration and a second interval duration less than said first interval duration and a second interval range including interval durations less than said second interval duration;
means for determining whether said measured intervals fall within said first or second interval ranges;
first diagnosing means for diagnosing occurrence of a first type of arrhythmia in response to said measured intervals falling within said first interval range;
second diagnosing means for diagnosing occurrence of a second type of arrhythmia in response to said measured intervals falling within said second interval range;
interval range adjustment means responsive to said determining means for adjusting said second interval duration, for subsequent use by said determining means, as a function of the durations of said measured intervals preceding a diagnosis of said first or second type of arrhythmia;
means for delivering a first anti-arrhythmia therapy in response to detection of said first type of arrhythmia; and
means for delivering a second anti-arrhythmia therapy in response to detection of said second type of arrhythmia.

5,464,431

ATRIAL FIBRILLATION DETECTOR

John M. Adams, Issaquah, and Clifton A. Alferness, Redmond, both of Wash., assignors to InControl, Inc., Redmond, Wash.

Division of Ser. No. 306,665, Sep. 15, 1994, which is a continuation-in-part of Ser. No. 96,029, Jul. 22, 1993, abandoned, which is a continuation of Ser. No. 684,130, Apr. 12, 1991, Pat. No. 5,282,837. This application Mar. 27, 1995, Ser. No. 410,829
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—4 **1 Claim**



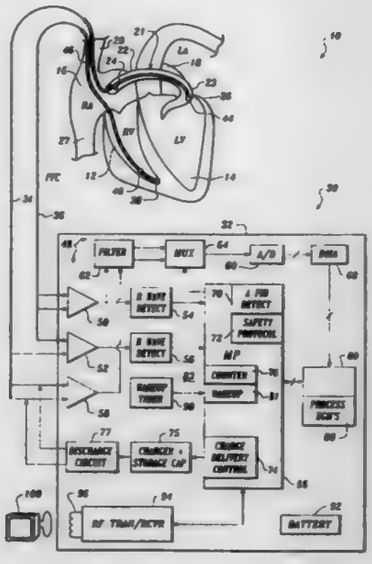
1. Apparatus for administering electrotherapy to a patient's heart to restore a normal heart rhythm comprising:
an unsophisticated primary detector means for detecting, with a first degree of precision, possible abnormalities in a patient's heart rhythm;
a sophisticated secondary detector means for analyzing the heart rhythm and more precisely identifying abnormalities therein, said secondary detector means being generally inactive in regard to detecting and analyzing abnormalities in the heart rhythm in the absence of a detection of a possible abnormality by said primary detector means;
means responsive to the detection of a possible abnormality in the heart rhythm by said primary detector means for activating said secondary detector means, said secondary detector means being constructed and arranged to analyze the patient's heart rhythm with a second degree of precision significantly higher than the first degree of precision exercised by said primary detector means in order to confirm said rhythm abnormality; and,
means responsive to confirmation of said rhythm abnormality by said secondary detector means for delivering appropriate electrocardiac therapy to the heart.

5,464,432

IMPLANTABLE ATRIAL DEFIBRILLATOR HAVING AN INTERMITTENTLY ACTIVATED FIBRILLATION DETECTOR

Kenneth R. Infinger, Redmond, and Joseph M. Bocek, Seattle, both of Wash., assignors to InControl, Inc., Redmond, Wash.

Filed Apr. 25, 1994, Ser. No. 232,767
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—5 **5 Claims**



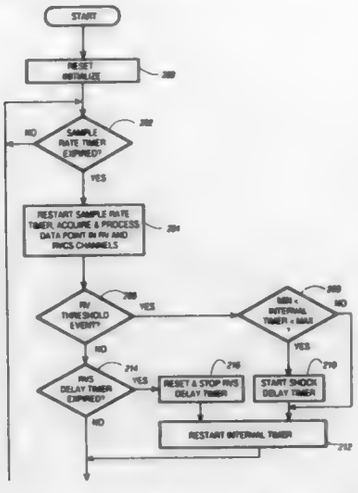
1. An implantable atrial defibrillator for applying cardioverting electrical energy to the atria of a human heart in need of cardioversion, said atrial defibrillator comprising:
lead means for sensing electrical activity of the heart including the atria of the heart;
atrial fibrillation detecting means for detecting if the heart is in atrial fibrillation when said atrial fibrillation detecting means is activated, said atrial fibrillation detecting means having a normally deactivated state;
cardioverting means coupled to said lead means and being responsive to said atrial fibrillation detecting means detecting atrial fibrillation of the heart for applying cardioverting electrical energy to the atria of the heart to cardiovert the atria of the heart; and
timing means for activating said atrial fibrillation detecting means at spaced apart predetermined times.

5,464,433

ATRIAL DEFIBRILLATOR AND METHOD PROVIDING DUAL RESET OF AN INTERVAL TIMER

Harley White, Redmond, and John M. Adams, Issaquah, both of Wash., assignors to InControl, Inc., Redmond, Wash.

Filed Jun. 14, 1994, Ser. No. 259,515
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—5 **16 Claims**



1. An implantable atrial defibrillator for applying cardioverting electrical energy to the atria of a human heart, said atrial defibrillator comprising:

first detecting means for sensing a depolarization activation wave at a first location of the heart and generating a first initiation signal;

second detecting means for sensing said depolarization activation wave at a second location of the heart and generating a second initiation signal; and

timing means for timing the time between immediately successive depolarization activation waves of the heart, said timing means being responsive to one of said first and said second initiation signals for commencing said timing; and

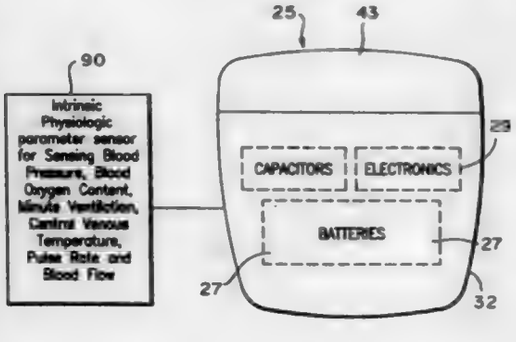
cardioverting means for applying said cardioverting electrical energy to the atria of the heart when the atria of the heart are in need of cardioversion and when said timing means times a time greater than a predetermined time interval.

5,464,434

MEDICAL INTERVENTIONAL DEVICE RESPONSIVE TO SUDDEN HEMODYNAMIC CHANGE

Eckhard Alt, Ottobrunn, Germany, assignor to Intermedics, Inc., Angleton, Tex.

Division of Ser. No. 863,092, Apr. 3, 1992, Pat. No. 5,342,404. This application Jul. 11, 1994, Ser. No. 273,476
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—6 **17 Claims**



1. A method of controlling a therapeutic function of an implantable medical interventional device in the body of a patient to treat cardiac dysrhythmia, comprising the steps of:

sensing variations of an intrinsic physiologic parameter indicative of substantially instantaneous hemodynamic condition of the patient;

generating an electrical signal representing the sensed variations of said parameter;

calculating mean and standard deviation of the generated electrical signal over a predetermined time interval,

detecting a sudden hemodynamic change in the patient from the calculated mean and standard deviation, and

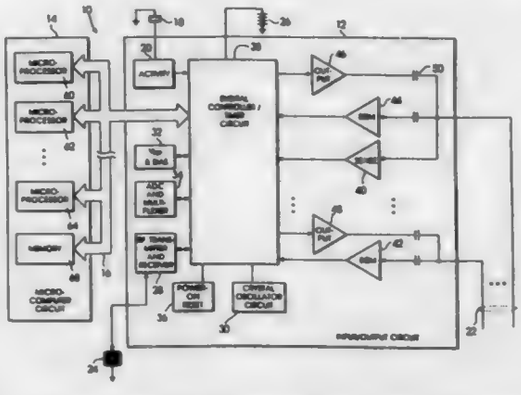
responding to a detected sudden hemodynamic change to control a therapeutic function of the implanted device.

5,464,435

PARALLEL PROCESSORS IN IMPLANTABLE MEDICAL DEVICE

Robert A. Neumann, Blaine, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 3, 1994, Ser. No. 191,674
Int. Cl.[6] A61N *1/36*
U.S. Cl. 607—9 **6 Claims**



1. A multiple-function implantable medical device, comprising:

an independently programmable master processor;

at least one independently programmable slave processor;

an address, data, and control signal bus interconnecting said master and slave processors;

a main memory unit, coupled to said bus;

a plurality of local memory units, each one of said local memory units associated with and accessible by one of said master processor and said at least one slave processor, wherein at least two of said local memory units store identical instructions; and

a therapy delivery means, coupled to said address, data and control signal bus, said delivery means responsive to control signals on said bus, for delivering a plurality of therapies;

wherein each of said local memory units stores instructions for causing a processor associated therewith to issue, on said address, data, and control signal bus, control signals corresponding to a specific one of said plurality of therapies.

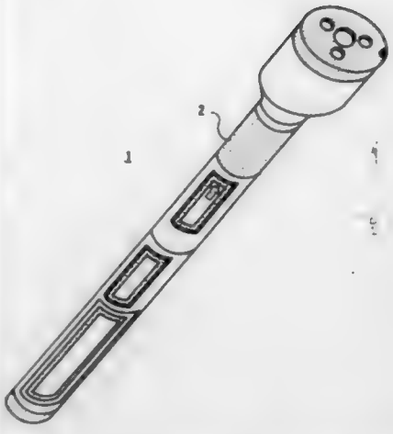
5,464,436

METHOD OF PERFORMING LASER THERAPY

Chadwick F. Smith, Rolling Hills, Calif., assignor to LaserMedics, Inc., Stafford, Tex.

Filed Apr. 28, 1994, Ser. No. 233,426
Int. Cl.[6] A61N *5/00*
U.S. Cl. 607—89 **20 Claims**

1. A method of treating a patient having an external skin layer, comprising the following steps:



providing a laser source for emitting a laser light having a wavelength of between 800 nm and 870 nm;

diagnosing an afflicted area of said patient, a portion of said external skin layer being adjacent said afflicted area;

delivering said laser light to the afflicted area for at least one treatment cycle, said laser source being operable on said afflicted area at a level of 1 Joule/cm^2 per treatment cycle so as to therapeutically treat said afflicted area and such that said external skin layer is not destroyed;

monitoring said afflicted area after the treatment cycle has been completed; and

repeating said steps of diagnosing and delivering said laser light to said afflicted area based on said monitoring step.

5,464,437

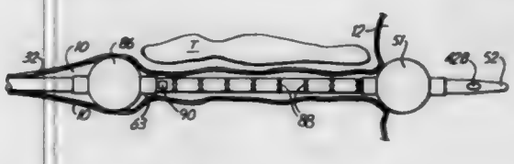
BENIGN PROSTATIC HYPERPLASIA TREATMENT CATHETER WITH URETHRAL COOLING

John M. Reid, Minnetrista; James V. Kauphusman, Champlin, both of Minn.; Christopher H. Porter, Woodinville, Wash., and Bruce H. Neilson, Brooklyn Park, Minn., assignors to Urologix, Inc., Minneapolis, Minn.

Filed Jul. 8, 1993, Ser. No. 88,901

Int. Cl.^{6} A61N *5/02*

U.S. Cl. 607—101 **19 Claims**



1. A method for treating intraprostatic tissue surrounding a urethra, the method comprising:

inserting an intraurethral catheter having a catheter shaft into a prostatic portion of the urethra;

delivering heat from the intraurethral catheter to the intraprostatic tissue surrounding the urethra;

defining a chamber between the urethra and the catheter shaft; and

supplying a fluid to the chamber between the urethra and the catheter shaft such that the fluid comes in direct contact with the urethra to cool the urethra.

5,464,438

GOLD COATING MEANS FOR LIMITING THROMBOSES IN IMPLANTABLE GRAFTS

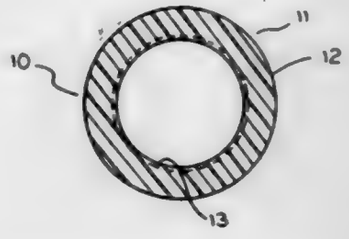
Gerald J. Mesaker, 990 Lake Shore Dr., Chicago, Ill. 60611

Continuation-in-part of Ser. No. 640,912, Jan. 3, 1991, Pat. No. 5,207,706, which is a continuation-in-part of Ser. No. 417,798, Oct. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 254,359, Oct. 5, 1988, abandoned. This application May 3, 1993, Ser. No. 57,341

The portion of the term of this patent subsequent to May 4, 2010, has been disclaimed.

Int. Cl.^{6} A61F *2/06*

U.S. Cl. 623—1 **10 Claims**



1. In an implantable device for use as a component in the blood circulatory system of a living recipient, said device formed from a fabric of a synthetic material, said fabric characterized by interstices created by the nature of the manufacturing of the fabric, said device having a surface formed by said fabric, said surface for exposure to the blood of said recipient, the improvement comprising:

a thin layer of metallic gold applied to coat said fabric forming said surface,

said layer applied to leave said interstices open and unblocked.

5,464,439

FLEXIBLE MEMBRANES PRODUCED FROM ORGANIC BONE MATRIX FOR SKELETAL REPAIR AND RECONSTRUCTION

El Gendler, 917 S. Shenandoah, Los Angeles, Calif. 90035

Division of Ser. No. 4,093, Jan. 13, 1993, Pat. No. 5,306,304, and a continuation of Ser. No. 606,449, Oct. 31, 1990, abandoned. This application Nov. 12, 1993, Ser. No. 150,845

Int. Cl.^{6} A61F *2/28;2/30*

U.S. Cl. 623—16 **6 Claims**

1. A method for the in vivo repair or replacement of a preselected section of an animal skeletal system comprising affixing demineralized natural bone formed into a continuous sheet to the section, wherein the thickness of said sheet is such that the sheet has sufficient flexibility to allow the sheet to be shaped to conform to the configuration of a skeletal region to be repaired and sufficient tensile strength to allow the sheet to be so shaped without damage to the sheet, said thickness being less than about 1.5 millimeters.

5,464,440

POROUS IMPLANT WITH TWO SETS OF PORES

Thomas Johansson, Höganäs, Sweden, assignor to LuCoCer Aktiebolag, LuleA, Sweden

PCT No. PCT/SE92/00784, § 371 Date May 18, 1994, § 102(e) Date May 18, 1994, PCT Pub. No. WO93/13815, PCT Pub. Date Jul. 22, 1993

PCT Filed Nov. 13, 1992, Ser. No. 244,323

Claims priority, application Sweden, Jan. 13, 1992, 9200072

Int. Cl.^{6} A61F *2/28*

U.S. Cl. 623—16 **20 Claims**

1. An implant made of a porous non-toxic material having an outer surface, said porous non-toxic material having a total open

porosity exceeding 5% by volume but not exceeding 80% by volume within at least one portion of the implant;

said at least one portion having communicating micropores with a size not larger than 10 μm but greater than 0 μm and making up not more than 10% but greater than 0% of the total pore volume in said at least one portion of the implant;

at least 5% of at least one section of said surface of the implant being covered by substantially evenly distributed pores having a pore size exceeding 50 μm, said pores existing only in a surface layer of the implant;

said micropores together with said pores existing only in said surface layer being completely or partially filled with a substance having a desirable medical or biological function.

5,464,441

PROSTHETIC LEG

Van L. Phillips, P.O. Box 1873, Rancho Santa Fe, Calif. 92067

Continuation of Ser. No. 464,201, Jan. 12, 1990, Pat. No. 5,217,500. This application Jun. 8, 1993, Ser. No. 74,040

The portion of the term of this patent subsequent to Jun. 8, 2010, has been disclaimed.

Int. Cl.[6] A61F *2/60;2/62*

U.S. Cl. 623—27 **13 Claims**

1. A leg prosthesis for supporting an amputee, said leg prosthesis having a proximal end and a distal end, said proximal end being secured to a socket for locating on the stump of an amputee, and said distal end being secured to a foot member, said leg prosthesis comprising:

a substantially vertically oriented and elongated pylon member providing substantially the sole support for loads incurred by said foot member, said pylon member being constituted by at least two substantially parallel planar leg elements operatively disposed between said socket and said foot member, said leg elements being independently capable of storing and releasing energy, and cooperating to provide a substantial portion of the energy storage and release characteristics of said leg prosthesis, said leg elements being flat with respect to one another and spaced apart substantially equidistantly along their lengths such that said leg elements bend at the same time and in substantial unison when loads are imposed on said prosthesis, said leg elements being secured together at said proximal end and at said distal end, and otherwise being separately formed and detachable such that various sized leg elements can be interchanged to provide the amputee with optimal adjustability.

5,464,442

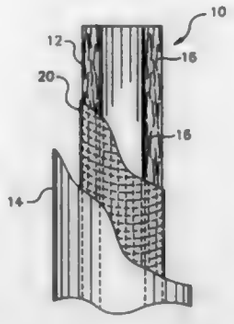
TUBULAR SUPPORT PYLON AND RETAINER FOR PROSTHETIC FOOT

Edward W. Burt, Bellevue; William E. Bryant, Everett, and David M. Crist, Seattle, all of Wash., assignors to Model & Instrument Development Corporation, Seattle, Wash.

Filed Jul. 12, 1993, Ser. No. 90,608

Int. Cl.[6] A61F *2/60*

U.S. Cl. 623—27 **15 Claims**



1. A prosthetic support pylon comprising:

a tubular inner member being deformable along its longitudinal axis and comprised of a material having a composite stiffness value of between about 39,000 pounds per square inch and about 181,000 pounds per square inch; and

a tubular outer member coaxially surrounding said tubular inner member, said tubular outer member comprised of a material having a damping coefficient that is greater than the damping coefficient of the material forming the inner member, the ends of the tubular outer member being mechanically coupled to the adjacent ends of the tubular inner member so that the inner and outer tubular members expand and contract with each other whereby the outer member decreases the intensity of the energy produced by said tubular inner member upon return from a deformation along its longitudinal axis.

5,464,443

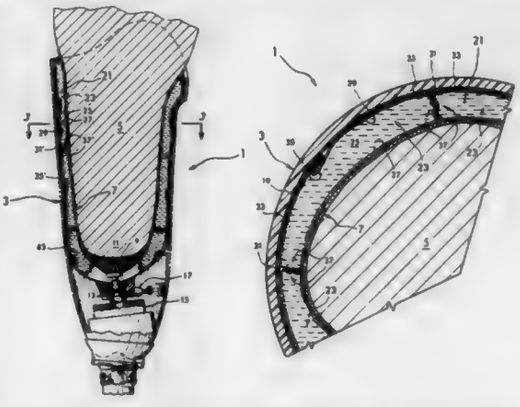
PROSTHETIC DEVICE FOR AMPUTEES

Greg S. Wilson, Broomfield; John C. Dinsmoor, III, Westminster, and Russell C. Miller, Pine, all of Colo., assignors to RIK Medical, L.L.C., Boulder, Colo.

Filed May 3, 1993, Ser. No. 56,654

Int. Cl.[6] A61F *2/80*

U.S. Cl. 623—37 **41 Claims**



18. A prosthetic device primarily intended for use with a residual limb, said prosthetic device including:

a relatively rigid, support shell having an inner surface extending substantially about an axis and dimensioned to receive at least a portion of said residual limb and

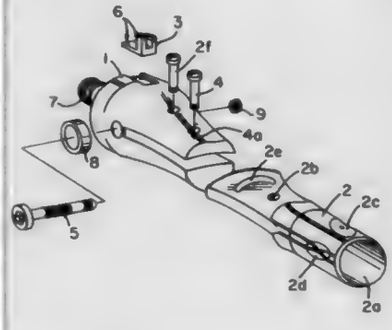
a pad member, said pad member including at least a first pouch at least partially filled with a liquid and means for positioning said pouch of said pad member between said residual limb portion and the inner surface of said support shell, said pouch having inner and outer layers extending at least partially about and along said axis with said liquid being positioned between said inner and outer layers, said inner layer being made of flexible material and said pad member further including means for maintaining the outer layer of said pouch in a substantially fixed position relative to the inner surface of said support shell and means for permitting at least portions of said inner layer of said pouch to move radially about said axis relative to said outer layer.

5,464,444

ATTACHMENT FOR ARTIFICIAL ARM PROSTHETIC DEVICE

Ronald H. Farquharson, Rte. 3, Box 3866 CR 628, Brazoria, Tex. 77422, and Danny P. Still, Rte. 5, Box 5, Angleton, Tex. 77515

Filed Mar. 23, 1994, Ser. No. 216,624
Int. Cl.[6] A61F *2/54*; B25J *17/00*
U.S. Cl. 623—65 **12 Claims**



1. A terminal device for releasable attachment to the end of an arm prosthesis in providing means for coupling with an implement in a variety of positions relative to the arm prosthesis, said terminal device comprising

a structure having a first main part with a fore end and an aft end, the said fore end releasably attach to the end of an arm prosthesis, and the said aft end being operably affixed to a second main part pivotably mated into a slotted opening traversing the aft end of the first main part,

said second main part having a fore end and an aft end, its fore end being affixed to the aft end of said first main part with pivotable means for providing a variety of stationary positions relative to the arm prosthesis, and operative to form an integral device, the aft end of the second main part having a hollow end for releasable insertion therein of an implement by means of an implement coupling part,

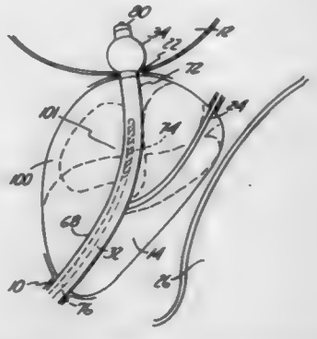
wherein the pivotable means is provided by a worm gear mounted within, and traversing, the first main part in a direction normal to the fore-aft axial alignment thereof, said worm gear communicating with an arcuate toothed fore end of said second main part, said worm gear being revolvable by means visibly mounted at one end of said worm gear.

5,464,445

DEVICE AND METHOD FOR ASYMMETRICAL THERMAL THERAPY WITH HELICAL DIPOLE MICROWAVE ANTENNA

Eric N. Rudie, Plymouth; Bruce H. Neilson, Brooklyn Park, and James V. Kauphusman, Champlin, all of Minn., assignors to Urologix, Inc., Minneapolis, Minn.

Continuation of Ser. No. 847,718, Mar. 6, 1992. This application Mar. 9, 1994, Ser. No. 208,642
The portion of the term of this patent subsequent to May 9, 2012, has been disclaimed.
Int. Cl.[6] A61N *5/02*
U.S. Cl. 607—101 **4 Claims**



1. A device for administering therapy to a prostate comprising:

a urological catheter; and

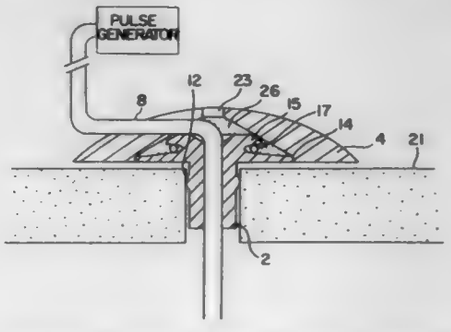
heating means within the catheter for selectively delivering heat to the prostate, wherein the heating means is capable of delivering a first amount of heat in a first radial direction which is greater than a second amount of heat in a second radial direction.

5,464,446

BRAIN LEAD ANCHORING SYSTEM

Chrit Dreessen, Stein; Paul A. Gubbels, Brunsum, and Paul Adams, M Geleen, all of, Netherlands, assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 12, 1993, Ser. No. 134,727
Int. Cl.[6] A61N *1/05*
U.S. Cl. 607—116 **25 Claims**



1. A system for anchoring a brain lead within a cranial burr hole comprising:

a socket having a central lumen, said socket having means for engaging a cranial burr hole to secure said socket to a cranium with said central lumen in general alignment with said burr hole;

a plug having means for fixing said plug within said central lumen, said plug further having means for fixing said plug within said cranial burr hole, said plug further having a lead lumen disposed therethrough, said lead lumen configured to engage a lead, said lead lumen configured to cooperate with said central lumen of said socket for mutual engagement of a

lead within said central lumen, said plug further configured to close said central lumen, said plug having a first surface, said first surface having a flange, and

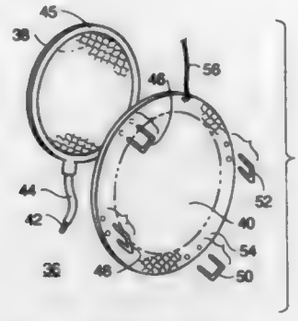
a cap having a lumen designed to have a lead pass therethrough, said cap having means to engage with said flange of said plug.

5,464,447

IMPLANTABLE DEFIBRILLATOR ELECTRODES

Thomas J. Fogarty, Portola Valley, and Thomas A. Howell, Palo Alto, both of Calif., assignors to Sony Corporation, Japan

Filed Jan. 28, 1994, Ser. No. 188,573
Int. Cl.[6] A61N *1/05*
U.S. Cl. 607—129 **14 Claims**



1. An implantable defibrillator electrode, comprising:

a flexible conductive mesh having at least one side;

a flexible conductive wire conductively attached to the flexible conductive mesh;

a flexible insulator affixed to one side of the flexible conductive mesh, the flexible insulator having a surface extending beyond a periphery of the flexible conductive mesh; and

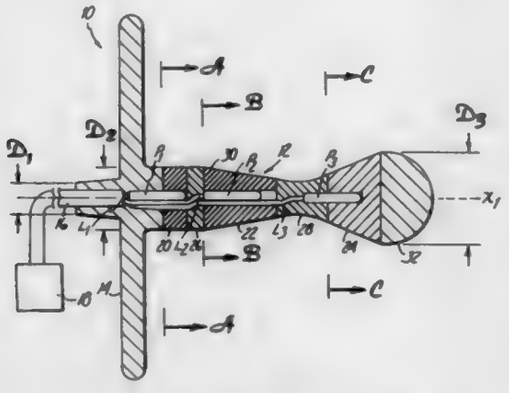
a tail attached to said surface extending beyond the periphery of the flexible conductive mesh.

5,464,448

ELECTRODE AND METHOD OF MAKING NEUROMUSCULAR STIMULATOR

Andrezj Malewicz, Minneapolis, Minn., assignor to Empi, Inc., St. Paul, Minn.

Filed May 2, 1994, Ser. No. 236,341
Int. Cl.[6] A61N *1/05*
U.S. Cl. 607—138 **17 Claims**



7. A neuromuscular stimulator electrode comprising:

an elongated contoured body including a plurality of spaced conductive sections molded from a conductive polymer;

a plurality of non-conductive sections interposed between the conductive sections, wherein the non-conductive sections are molded from a first non-conductive polymer;

a handle extending from a first end of the elongated contoured body and a bulbous end extending from a second end of the elongated contoured body, wherein the handle and bulbous end are molded from a second non-conductive polymer different from the first non-conductive polymer; and

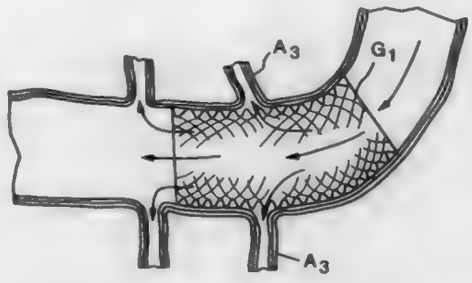
a wire harness extending from the handle.

5,464,449

INTERNAL GRAFT PROSTHESIS AND DELIVERY SYSTEM

Timothy J. Ryan, Los Altos Hills, Calif.; Thomas J. Fogarty, 5660 Alpine Rd., Portola Valley, Calif. 94028, and Kenneth H. Mollenauer, Santa Clara, Calif., assignors to Thomas J. Fogarty, Portola Valley, Calif.

Filed Jul. 8, 1993, Ser. No. 89,290
Int. Cl.[6] A61F *2/08*
U.S. Cl. 623—1 **34 Claims**



1. A graft and system for placement of the graft within a body passage, comprising:

a) longitudinally extending tubular graft means adapted to resiliently assume a foreshortened enlarged diameter condition upon relaxation and, upon being elongated, assume a reduced diameter condition;

b) first and second elongate members extending longitudinally of the graft means, said members being longitudinally movable relative to one another and the graft means;

c) securing means releasably attaching the elongate members to the tubular graft means whereby longitudinal movement of the of the elongate members relative to one another in one direction elongates the graft means and longitudinal movement of the members in an opposite direction relaxes the graft means for expansion to the foreshortened enlarged diameter condition; and,

d) means to selectively release the securing means from the elongate members.

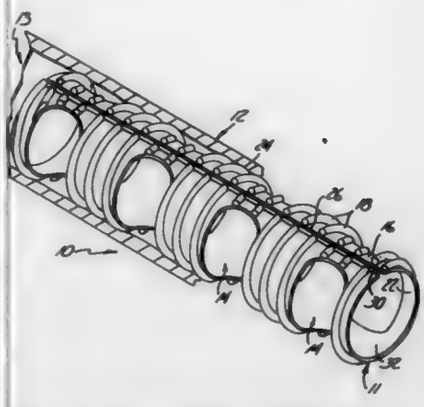
5,464,450

BIODEGRADABLE DRUG DELIVERY VASCULAR STENT

Paul J. Buscemi, Long Lake; Elizabeth A. Stejskal, St. Paul; Donald F. Palme, II, Dayton, and Lixiao Wang, St. Paul, all of Minn., assignors to SCIMED Lifesystems Inc., Maple Grove, Minn.

Continuation of Ser. No. 13,145, Feb. 1, 1993, abandoned, which is a continuation of Ser. No. 771,655, Oct. 4, 1991, abandoned. This application Mar. 21, 1994, Ser. No. 215,206
Int. Cl.[6] A61F *2/06;2/04;* **A61M** *29/02*
U.S. Cl. 623—6 **5 Claims**

1. A biodegradable self-expanding stent for insertion into a lumen of a vessel of a living being, the stent being substantially completely biodegradable the stent comprising:



(a) a generally tubular biodegradable main body surrounded by an array consisting of individual biodegradable materials having individual rates of degradation, the individual biodegradable materials contain a plurality of drugs, said drugs being released into the lumen of the vessel as the biodegradable materials degrade, at rates controlled by the rates of degradation of the biodegradable materials;

(b) said tubular main body including a slot extending lengthwise through the main body and defined by opposing edges of the main body wherein the opposing edges must be moved toward each other under compression in order to transport the biodegradable stent through a vessel of a living being; and said array being annularly aligned oriented fibers disposed about and attached to said tubular main body and so oriented to provide a self-expanding, spring force in an outward, substantially radial direction to increase the effective diameter of said main body.

5,464,451
RE-TANNING PROCESS

Jacques P. Denny, and Josep R. Sorolla, both of Barcelona, Spain, assignors to Sandoz Ltd., Basel, Switzerland, and Muenzing Chemie GmbH, Heilbronn, Germany

Filed Feb. 17, 1994, Ser. No. 197,901

Claims priority, application Germany, Feb. 18, 1993, 43 05 019.0

Int. Cl.[6] C14C *3/18*

U.S. Cl. 8—94.21 **12 Claims**

1. A process for the re-tanning of tanned leather or pelt, wherein the tanned leather or pelt is re-tanned with

(A) a polymeric carboxylic acid, containing α-hydroxyacrylic units as constituent units of the polymer, optionally in salt form, and where the tanned leather or pelt is mineral tanned, it has also been neutralized prior to the re-tanning step,

with the proviso that said re-tanning polymer (A) is not employed together with mineral tanning agents, immediately after a mineral tanning, immediately before a mineral re-tanning or after a mineral re-tanning and also not immediately before a mineral after-treatment.

5,464,452
PROCESS FOR FIXING DYES IN TEXTILE MATERIALS

Arthur H. Cole; Susan C. Glenn, both of Charlotte, N.C., and Grannis S. Johnson, New Hope, Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Filed May 10, 1994, Ser. No. 240,305

Int. Cl.[6] D06P *5/00*

U.S. Cl. 8—495 **26 Claims**

1. A process for fixing a dye to a dyed fine-dimensional yarn fabric made from the group consisting of a polyamide-containing substrate, segmented polyester-polyurethane substrate, and combinations thereof, comprising contacting said fabric with an aqueous solution comprising a dye-fixative composition substantially free of phenol and formaldehyde residues, said dye-fixative composition being elected from the group consisting of

(a) polymethacrylic acid, and

(b) a copolymer of methacrylic acid and an ethylenically unsaturated comonomer selected from the group consisting of 2-acrylamido-2-methyl-propanesulfonic acid, sodium vinyl sulfonate, sodium styrene sulfonate, lower alkyl acrylates, and combinations thereof,

said contacting step being for a time sufficient so that said dye-fixative composition is absorbed by said fabric.

5,464,453
METHOD TO FABRICATE A RELIABLE ELECTRICAL STORAGE DEVICE AND THE DEVICE THEREOF

Robert R. Tong, Sunnyvale; James M. Poplett, Cupertino; Alan B. McEwen, Palo Alto; Gary E. Mason, Sunnyvale; Mark L. Goodwin, Santa Cruz; K. C. Tsai, Saratoga, all of Calif.; Ronald L. Anderson, Lino Lakes, and James P. Nelson, Shoreview, both of Minn., assignors to Pinnacle Research Institute, Inc., Los Gatos, Calif.

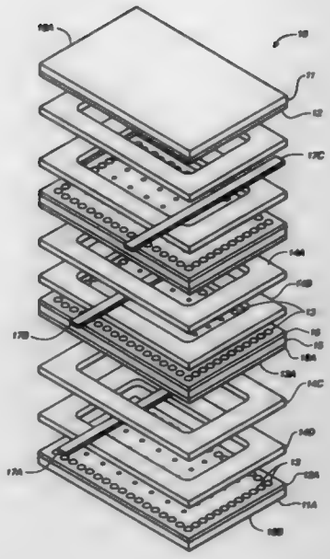
Continuation-in-part of Ser. No. 947,414, Sep. 18, 1992. This application Sep. 18, 1992, Ser. No. 947,294

Int. Cl.[6] H01G *7/00*

U.S. Cl. 29—25.03 **46 Claims**

1. An improved method to produce a dry preunit of an electrical storage device for storage of electrical charge in a condition to have the electrode surfaces contacted with a non-aqueous or aqueous electrolyte to store electrical charge in a double layer manner, which method comprises:

(a) preparing a thin in thickness substantially flat sheet of electrically conducting support material coated on each flat side with the same or different thin layer of a second electrically conducting material having a high surface area, optionally with the provision that both flat sides of the electrically conducting support is a sheet having the perimeter edge surfaces either:



(i) having a thin layer of second electrically conducting material,

(ii) are partly devoid of second electrically conducting material, or

(iii) are devoid of second electrically conducting material;

(b) creating an ion permeable or semipermeable space separator stable to the aqueous or non-aqueous electrolyte obtained by:

(i) depositing substantially uniform in height groups of electrically insulating microprotrusions, on the surface of at least one side of the thin layer of second electrically conducting material,

(ii) placing a thin precut ion permeable or semipermeable separator on one surface of the second electrically conducting material, or

(iii) casting an ion permeable or semipermeable thin layer on the surface of at least one side of the electrically conducting material, or

(iv) creating an air space as separator;

(c) contacting the perimeter edge surface of one or both sides of the thin sheet of step (b) with one or more layers of synthetic organic polymer as a gasket material selected from the group consisting of a thermoplastic and a thermoset polymer;

(d) placing on or within the gasket material and optionally across the thin sheet at least one cord of a different material in which the cord has a higher melting point (T_m) greater than the gasket polymer material and does not melt, flow, or permanently adhere to the gasket under the processing conditions;

(e) producing a repeating layered stack of the thin flat articles of sheet coated with metal oxide and separator produced in step (d) optionally having the end sheets consisting of a thicker support;

(f) heating the stack produced in step (e) at a temperature and applied pressure effective to cause the synthetic gasket material to flow, to adhere to, and to seal the edges of the stack creating a solid integral stack of layers of alternating electrically conductive sheet coated with second electrically conducting material and the ion permeable separator, optionally such that the gasket material creates a continuous integral polymer enclosure;

(g) cooling the solid integral stack of step (f) optionally in an inert gas under slight pressure; and

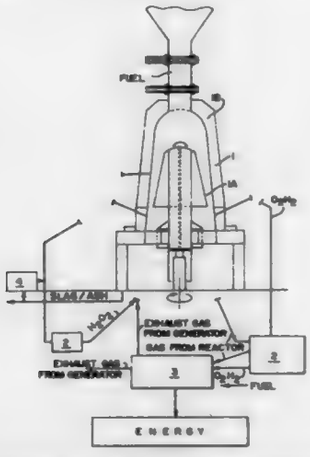
(h) removing the at least one cord of different material between each layer creating at least one opening between the layers of electrically conducting sheet coated with second electrically conducting material.

5,464,454

APPARATUS AND METHODS FOR THE UTILIZATION OF COMBUSTIBLE MATERIALS ESPECIALLY OF INDUSTRIAL AND HOUSEHOLD WASTE

Peter Jeney, Artherstrasse 24, CH-63000 Zug, and Ernst Christen, Rosenweg 623, CH-5726 Unterkulm, both of, Switzerland

Filed Dec. 23, 1993, Ser. No. 172,872
Claims priority, application European Pat. Off., Dec. 24, 1992, 92122005; Dec. 15, 1993, 93120170
Int. Cl.[6] F23G 7/00
U.S. Cl. 44—629 6 Claims



1. A gasification apparatus comprising a combustion or gasification reactor having a combustion or gasification chamber, at least one opening for feeding the fuel, at least one infeed for gases and at least one outlet for gases, characterized in that the combustion or gasification reactor is a double dome reactor with the combustion or gasification chamber being formed by an outer dome and an inner dome, said inner dome having a central axis and rotatable about said axis, whereby at least one of said inner and outer domes is adjustable in the vertical level.

5,464,455

SPECIALTY SOD MATS CONSTRUCTED OF NONWOVEN FABRIC WITH APERTURES

Charles J. Molnar, 12 Malvern Ct., Devon, Wilmington, Del. 19810, assignor to Charles J. Molnar, and Judith R. Molnar, both of Wilmington, Del.

Filed Jul. 21, 1993, Ser. No. 95,684
Int. Cl.[6] A01C 1/04;1/00; A01B 79/00
U.S. Cl. 47—1.01 27 Claims

1. A new and improved plant sod mat comprising the following:
a) a nonwoven sod reinforcement wherein said nonwoven sod reinforcement is a nonwoven fabric with apertures wherein said apertures are at least 0.015 cm in diameter;
b) a layer of planting medium on said nonwoven sod reinforcement and;
c) viable plants growing in said planting medium and whose roots penetrate and entangle with said nonwoven fabric to form said sod mat.

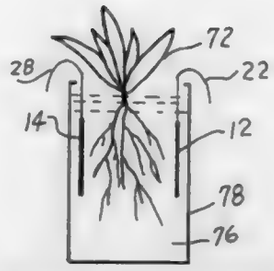
5,464,456

ELECTRONIC STIMULATION OF PLANTS

M. Glen Kertz, 3484 Pheasant, Orange, Tex. 77630

Filed Jun. 30, 1993, Ser. No. 86,446
Int. Cl.[6] A01G 5/06;7/04;7/06;31/00
U.S. Cl. 47—1.3 23 Claims

1. A method of promoting the development or maintaining the freshness of a plant or a part thereof, comprising the steps of:



creating a regularly pulsed electrical current in a plant development medium, said medium including a liquid capable of conducting electricity, said current delivered in a range of −0.0001 to 5 volts to said medium;
contacting said plant or part thereof with said medium; and,
regularly pulsing the electrical current through the medium by alternating turning the electrical current on and off.

5,464,457

SOIL FUMIGATION WITH GASIFORM PESTICIDE

Anthony E. Winston, East Brunswick, and Keith A. Jones, Lambertville, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Jun. 29, 1994, Ser. No. 267,517
Int. Cl.[6] A01B 79/00; A01N 33/00
U.S. Cl. 47—58 14 Claims

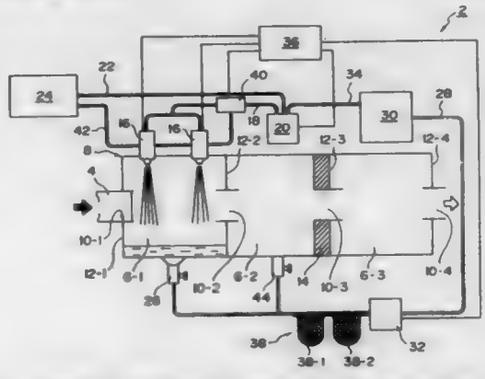
1. A process for fumigating a plot of ground soil which comprises (1) contacting the plot of soil with a particulate pesticide ingredient selected from the group consisting of ammonium bicarbonate, ammonium carbonate and ammonium carbamate; (2) covering the soil surface with a tarpaulin to seal the soil surface from the atmosphere; (3) maintaining the tarpaulin seal on the soil surface for a sufficient time period to allow decomposition of the pesticide ingredient to form ammonia and carbon dioxide gases, and to fumigate the covered plot of soil.

5,464,458

SYSTEM FOR PURIFYING EXHAUST GAS

Isao Yamamoto, 507-1, Nakatajima-cho, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Jun. 7, 1994, Ser. No. 254,936
Claims priority, application Japan, Apr. 5, 1994, 6-090550
Int. Cl.[6] B01D 47/12
U.S. Cl. 55—223 8 Claims



1. A system for purifying exhaust gas discharged from an engine, comprising a cylindrical body formed by continuously arranging at least three in-line chambers through which the exhaust gas flows and which each are defined between two end walls that are spaced apart in the direction of gas flow and have an opening therethrough for permitting the flow of exhaust gas, a nozzle for jetting a pressurized fluid into at least a first said in-line chamber of

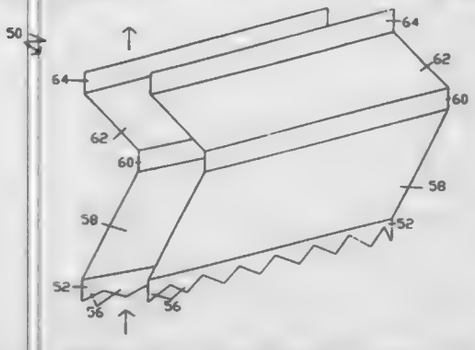
said cylindrical body which said first in-line chamber defines an injection and main separation chamber, a pressurizing device for feeding the pressurized fluid through a pressure passage to the nozzle so that the fluid is jetted into said first in-line chamber, a fluid reservoir connected to said pressurizing device through a first feed passage, a first collection portion provided at said first in-line chamber, a collected fluid reservoir portion connected to said first collection portion through a collection passage, a drawing portion disposed in said collection passage to collect the fluid and a product separated from the exhaust gas by the fluid discharged from said nozzle, and a heat retaining wall member of a second said in-line chamber which is disposed immediately downstream of said first in-line chamber and defines a secondary separation chamber, said heat retaining wall member defining said end wall of said second on-line chamber which is disposed downstream of and opposite said end wall disposed between said first and second in-line chambers, said heat retaining wall member retaining heat from said exhaust gas flow to evaporate moisture within said second in-line chamber, said system further comprising a second collection portion in communication with said second in-line chamber and connected to said collection passage through a branch passage to facilitate flow of moisture from said second in-line chamber, said collected fluid reservoir portion and said pressurizing device communicating with each other through a second feed passage, said system further including control means communicating with and controlling said nozzle, said pressurizing device and said drawing portion to purify the exhaust gas, and a third said in-line chamber which is a muffling chamber having means for reducing noise of the exhaust gas flow.

5,464,459

CHEVRON TYPE MIST ELIMINATOR AND SYSTEM

Gregory K. VanBuskirk, Wichita, Kans.; Chang-Li Hsieh, Carlisle, Mass.; Kenneth J. McNulty, Atkinson, N.H., and Ole V. Hansen, Wichita, Kans., assignors to Koch Engineering Company, Inc., Wichita, Kans.

Filed Jun. 6, 1994, Ser. No. 254,373
Int. Cl.[6] B01D *45/08*
U.S. Cl. 55—257.2 **13 Claims**



1. A mist eliminator for removing liquid droplets from a liquid-rich gas stream, said mist eliminator comprising:

a) a plurality of spaced-apart, substantially aligned, substantially parallel, impingement baffles extending substantially across the cross-sectional area of an apparatus through which a liquid-rich gas stream is passing to form a layer and to provide a substantially tortuous flow path for the liquid-rich gas stream passing through adjacent pairs of the impingement baffles of the mist eliminator;

b) each impingement baffle having a short, straight, axially aligned inlet section with a lower leading edge, a lower angled section extending from the inlet section, a short, straight, axially aligned, interconnecting section extending from the lower angled section, an upper angled section extending from the interconnecting section, and a short, straight, axially aligned outlet section having an outlet leading edge with the length of the lower angled section longer than the length of the upper angled section; and

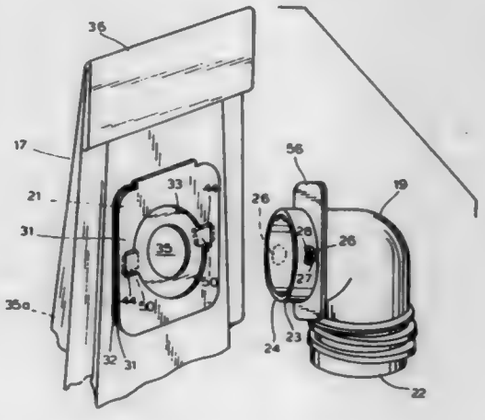
c) the upper angled section having a greater angular inclination from the axis of the apparatus than the lower angled section, whereby the mist eliminator provides for improved drainage of collected liquid from the mist eliminator, and the interconnecting section provides a reduced pressure drop with a high liquid-gas stream throughput.

5,464,460

DISPOSABLE DUST BAG FOR VACUUM CLEANER AND THE LIKE

Mark D. Bosses, Montvale, N.J., assignor to Home Care Industries, Inc., Clifton, N.J.

Filed Apr. 14, 1994, Ser. No. 227,723
Int. Cl.[6] B01D *46/02*; A47L *9/14*
U.S. Cl. 55—374 **22 Claims**



1. In a vacuum cleaner comprising:

(A) a connector through which air is discharged, said connector providing a wall portion having an end and peripherally spaced outwardly extending projections substantially adjacent to said end; and

(B) a disposable dust bag mounted on said connector including

(i) a dust collection chamber formed of a permeable sheet material defining an inlet in said dust bag;

(ii) a substantially rigid collar around said inlet and having an opening therein proportioned to fit over said connector and said projections when said collar is being mounted on said connector; and

(iii) an elastomeric seal around said inlet providing an opening, said seal extending adjacent the sides of said projections both remote from said end and adjacent said end, said seal forming an airtight sealing engagement with the surface of said connector so that said seal forms an airtight seal between said dust bag and said connector when said collar is in an installed position on said connector;

the improvement wherein said collar further defines peripherally spaced pivotable portions disposed about said opening and having free ends disposed radially inwardly further than the remainder of said collar when said pivotable portions and said collar remainder are in the same plane, when said collar is in said installed position said free ends at least indirectly engaging the sides of said projections remote from said end at an angle and resisting movement of said collar relative to said connector out of said installed position, said pivotable portions being aligned with said projections both in said installed position and during mounting.

5,464,461

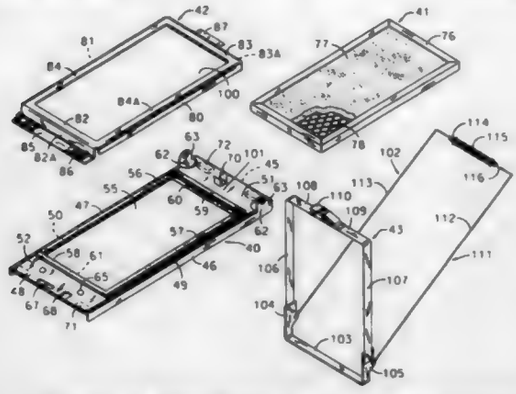
FILTER FOR MOUNTING ON AN AVIONIC LINE REPLACEABLE UNIT

Frederick A. Whitson, Oconomowoc; William K. Siebert, West Bend, and Kenneth B. Raihala, Racine, all of Wis., assignors to Electronic Cable Specialists, Inc., Franklin, Wis.

Filed Dec. 1, 1993, Ser. No. 160,681

Int. Cl.[6] B01D *46/10*

U.S. Cl. 55—480 **4 Claims**



1. A coolant air filter assembly for an avionic line replaceable unit having opposite side walls and end walls and top and bottom surfaces in which there are air inlet and outlet holes surrounded by imperforate margins, the LRU box adapted for mounting in an avionic tray for coupling the air outlet holes in the bottom surface in air flow communication with a negative pressure plenum, the filter assembly comprising:

a base frame having margins defining an opening, the margins having upper and lower surfaces to provide for superimposing said lower surface sealingly to said top surface of an LRU box,

a filter element superimposed on the upper surface of the margins of the base frame and covering said opening in the base frame over said array of holes in said top surface of an LRU box,

a cover connected to said base frame for pivoting between opened and closed positions and having margins defining an opening, the margins arranged for holding down the filter element sealingly to said margins of the base frame when said cover is in closed position with the opening in the cover coincident with said filter element,

clamping means constructed and arranged for clamping said base frame to an LRU, and latch means operative to latch the cover to the base frame and to release the cover for pivoting to provide access to the filter element.

5,464,462

METHOD OF MAKING A QUARTZ GLASS TUBE HAVING A REDUCED ULTRAVIOLET RADIATION TRANSMISSIVITY

Alfred Langer, Kissing; Andreas Genz, Berlin; Manfred Deisenhofer, Unterschöneberg/Altenmpünster; Walter Kiele, Munich; Bernd Lewandowski, Feldafing, and Jürgen Reichardt, Schwabmünchen, all of, Germany, assignors to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH, Munich, Germany

Filed Sep. 13, 1993, Ser. No. 120,729

Claims priority, application Germany, Sep. 15, 1992, 42 30 817.8; Nov. 27, 1992, 42 40 006.6

Int. Cl.[6] C03B *15/14;5/16;* **C03C** *3/04;* **C04B** *35/44*

U.S. Cl. 65—66 **32 Claims**

1. A method of making a quartz glass tube from doped quartz glass having a doping compound which reduces the transmission of the doped quartz glass for ultraviolet radiation (UV) of wave lengths below 300 nm,

wherein the doping compound comprises cerium and aluminum, wherein the cerium is present between 0.065% and 3.25% by weight with respect to the overall weight of the quartz glass, and wherein the mol relationship of aluminum dissolved in the quartz glass to cerium dissolved in the quartz glass is at least 1:1,

comprising the steps of

melting together quartz sand, or rock crystal, or a mixture of quartz sand and rock crystal together with cerium aluminate ($CeAlO_3$) as a UV-absorbing doping compound for the quartz glass in a tungsten crucible, and

continously extruding a quartz glass tube from the tungsten crucible.

5,464,463

HEAT RESISTANT ALUMINUM ALLOY POWDER HEAT RESISTANT ALUMINUM ALLOY AND HEAT AND WEAR RESISTANT ALUMINUM ALLOY-BASED COMPOSITE MATERIAL

Hirohisa Miura, Okazaki; Kunihiko Imahashi, Aichi; Hirohumi Michioka, Toyota; Yasuhiro Yamada, Tajimi; Jun Kusui, Youkaichi, and Akiei Tanaka, Ohmihachiman, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, and Toyo Aluminum Kabushiki Kaisha, Japan

Filed Apr. 14, 1993, Ser. No. 45,697

Claims priority, application Japan, Apr. 16, 1992, 4-096520; Sep. 24, 1992, 4-279408

Int. Cl.[6] C22C *21/02*

U.S. Cl. 75—244 **36 Claims**

21. A heat and wear resistant aluminum alloy-based composite material, comprising:

a matrix; and

at least one of nitride particles, boride particles, oxide particles and carbide particles dispersed, with respect to the whole composite material including the matrix taken as 100% by weight, in the matrix in an amount of from 0.5 to 10% by weight;

the matrix consisting, with respect to the matrix taken as 100% by weight, essentially of:

Ni in an amount of from 5.7 to 20% by weight;

Si in an amount of from 6.0 to 25% by weight;

at least one of Fe in an amount of from 0.6 to 8.0% by weight and Cu in an amount of from 0.6 to 5.0% by weight;

B in a form of the simple substance in an amount of from 0.05 to 10% by weight; and,

the balance of Al;

wherein said aluminum alloy-based composite material is formed by a powder metallurgy process.

5,464,464

METHOD FOR REDUCING PARTICULATE IRON ORE TO MOLTEN IRON WITH HYDROGEN AS REDUCTANT

Jonathan Edelson, Princeton, N.J., assignor to Borealis Technical Incorporated Limited, Israel

Filed Jun. 10, 1994, Ser. No. 258,572

Int. Cl.[6] C22D *7/00*

U.S. Cl. 75—310 **12 Claims**

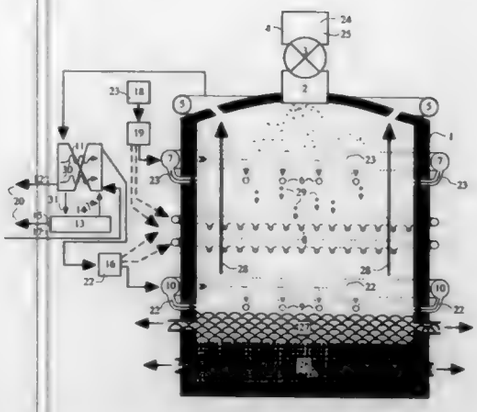
1. A method of reducing particulate iron ore to molten metal comprising the steps of

(a) introducing said ore into a refractory lined furnace means along with fluxing means for the production of slag;

(b) passing said ore particles through a flame generated by combusting oxygen with excess hydrogen, so as to fully melt the ore particles;

(c) regulating the rate of said introduction of said ore particles so that the said ore particles are able to freely fall through said furnace means;

(d) introducing hydrogen into said furnace means through inlet means and causing said hydrogen gas to flow upwardly through said furnace means, in counterflow to said molten ore particles;



(e) introducing oxygen into said furnace means through inlet means for combustion with said hydrogen;
(f) removing hot gaseous by-products from said furnace means; and
(g) collecting said molten particles in then reduced state.

5,464,465

FIBER BONDED AGGLOMERATED ORE MATERIALS

Peter V. Ayotins, Easton, and Robert E. Evans, Huntington, both of Conn., assignors to Cytec Technology Corp., Wilmington, Del.

Division of Ser. No. 149,870, Nov. 10, 1993, Pat. No. 5,372,632. This application Sep. 2, 1994, Ser. No. 300,680
Int. Cl.[6] C22B *1/244*
U.S. Cl. 75—313 **11 Claims**

1. The product produced by the process comprising
A. providing a mixture of:
(i) one or more particulate inorganic materials, selected from an ore, an ore concentrate, a mineral concentrate, or a mixture thereof; and
(ii) an effective, binding amount of one or more fibrous materials at least one of which comprises a monocomponent or bicomponent pulp or fiber of a polymer containing acrylonitrile in a quantity of more than 35 wt %, said fiber having a diameter less than about 100 microns, a length greater than about 0.2 mm, and a minimum aspect ratio in the range of about 20–50; and
B. converting the mixture produced in A. into agglomerates whereby said agglomerates have improved properties relative to those of similar agglomerates devoid of fibers.

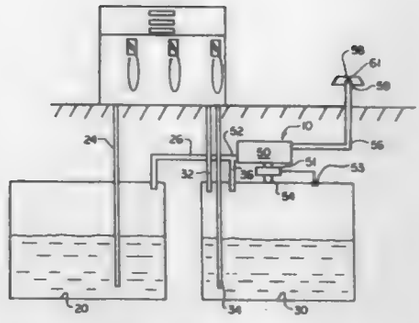
5,464,466

FUEL STORAGE TANK VENT FILTER SYSTEM

Seifollah S. Nanaji, Greensboro; Kenneth L. Pope, Walkertown, and Richard R. Sobota, Kernersville, all of N.C., assignors to Gilbarco, Inc., Greensboro, N.C.

Filed Nov. 16, 1993, Ser. No. 153,528
Int. Cl.[6] B01D *61/00*
U.S. Cl. 95—45 **8 Claims**

1. A method of reducing vaporous fuel emissions from a liquid fuel storage tank having an upper portion in which fuel vapors are stored comprising:
connecting the upper portion of the tank to a space bounded on at least one side with a membrane having the property of permitting fuel vapor to permeate therethrough,
providing an exit from the space to atmosphere,
holding liquid fuel in the tank and a mixture of vaporous fuel and air in the upper portion of the tank above the liquid, and
permitting gaseous phase components in the tank to pass to the space so air passes across the membrane to atmosphere and fuel vapor permeates through the membrane within the space to reduce the volume of gasoline and air held in the space and tank and thereby reduce the pressure in the tank.



5,464,467

ADSORPTIVE SEPARATION OF NITROGEN FROM OTHER GASES

Frank R. Fitch, Bedminster; Martin Bülow, Basking Ridge, and Adeola F. Ojo, Chatham, all of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Continuation-in-part of Ser. No. 195,619, Feb. 14, 1994, abandoned. This application Aug. 8, 1994, Ser. No. 287,324
Int. Cl.[6] B01D *53/047*
U.S. Cl. 95—98 **34 Claims**

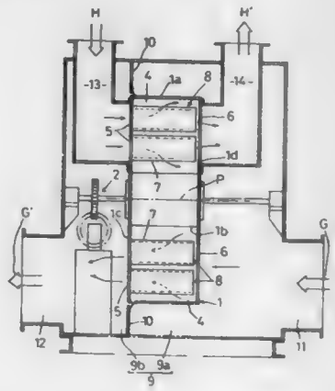
1. A method of separating nitrogen from a gas mixture comprising passing said gas mixture through at least one adsorption zone containing a type X zeolite whose cations comprise about 50 to about 95% lithium, about 4 to about 50% trivalent ions selected from aluminum, scandium, gallium, iron (III), chromium (III), indium, yttrium, single lanthanides, mixtures of two or more lanthanides, and mixtures of these, and 0 to about 15% of residual ions selected from sodium, potassium, ammonium, calcium, strontium, magnesium, barium, zinc, copper II and mixtures of these, thereby preferentially adsorbing nitrogen from said gas mixture.

5,464,468

ROTARY ADSORPTION/DESORPTION GAS TREATING APPARATUS

Shinpei Tanaka, Neyagawa, and Hirofumi Morimoto, Hirakata, both of, Japan, assignors to Taikisha Ltd., Japan

Filed Dec. 6, 1993, Ser. No. 162,677
Claims priority, application Japan, Jun. 3, 1993, 5-133603
Int. Cl.[6] B01D *53/06*
U.S. Cl. 96—125 **18 Claims**



1. A rotary adsorption/desorption gas treating apparatus comprising:

a rotary drum rotatable along a rotation axis including a plurality of gas passage compartments arranged in a peripheral direction of the drum; and

an adsorbing-element cassette mounted inside each of said gas passage compartments and including a gas-permeable adsorbing mat, said adsorbing mat, when mounted in said compartment, including a portion oriented one of normal and inclined relative to a side end face of said rotary drum,

wherein said adsorbing mat adsorbs an elimination-target substance contained in a treatment subject gas,

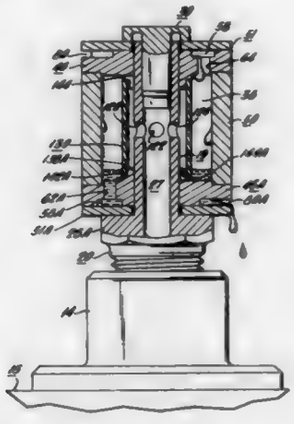
a rotational range of said rotary drum being divided between an adsorption zone and a desorption zone, in said adsorption zone, the treatment subject gas being allowed to continually pass said gas passage compartments in a direction along said rotation axis of the rotary drum, in said desorption zone, a refreshing gas is allowed to continuously pass said gas passage compartments in the direction along said rotation axis of the rotary drum wherein said apparatus continuously adsorbs said elimination-target substance in said adsorption zone and continuously desorbs said elimination-target substance in said desorption zone.

5,464,469

VENT SYSTEM FOR BLOCKING THE PASSAGE OF LIQUID WHILE PERMITTING PASSAGE OF GAS

Steven F. Close, Telford, and Douglas C. Wetterau, Doylestown, both of Pa., assignors to Moore Products Co., Spring House, Pa.

Filed Aug. 23, 1994, Ser. No. 294,494
Int. Cl.[6] B01D *19/00*
U.S. Cl. 96—220 **9 Claims**



1. In a vent system adapted for placement in a vent opening to permit gas to flow through it while preventing substantial flow into said vent opening of liquid from an externally-applied stream, comprising:

a hollow body having first and second end wall structures and sidewalls, together defining a central chamber within said body;

a first port system for said central chamber, secured to said hollow body, and adapted to be connected to said vent opening to permit gas flow between said vent opening and the interior of said central chamber;

a second port system at a first end of said central chamber, permitting gas flow between the interior of said central chamber and the surrounding external ambient;

the improvement wherein:

(a) said second port system comprises a first end chamber adjacent and external to said central chamber, having an end wall substantially parallel to and confronting said first end wall structure of said central chamber and having sidewalls spacing said end wall of said first end chamber from said first end wall structure of said central chamber to define said first end chamber;

(b) said first end wall structure contains at least one passage extending through it, interconnecting said central chamber and said first end chamber;

(c) said sidewalls of said first end chamber contain a first set of openings positioned to permit liquid directed in a stream against the exterior of said first end chamber to enter one of said openings, then to flow rapidly across the end of said at least one passage exposed in said first end chamber, and thereafter to flow out of said first end chamber through another of said first set of openings to ambient; and

(d) said first end chamber contains liquid-flow guiding channels for guiding said liquid from any of said openings over the exposed end of said at least one passage and out of at least one of the others of said openings.

5,464,470

COLOR-CHANGING MARKING COMPOSITION SYSTEM

Armand Brachman, Emmaus, and Keith Allison, Allentown, both of Pa., assignors to Binney & Smith Inc., Easton, Pa.

Filed Feb. 10, 1995, Ser. No. 386,695
Int. Cl.[6] C09D *11/12*
U.S. Cl. 106—22 A **32 Claims**

1. A color-changing marking composition system comprising:

(a) a first marking composition comprising a wax, a dye which is other than a Leuco dye and which changes color when contacted with a color change-inducing compound, and a solvent capable of solubilizing the dye; and

(b) a second marking composition comprising a wax and a color change-inducing compound which when contacted with the dye induces a color change in the dye.

5,464,471

FIBRIN MONOMER BASED TISSUE ADHESIVE

Robert L. Whalen, Somerville, and Donald Dempsey, Newbury, both of Mass., assignors to Whalen Biomedical Inc., Somerville, Mass.

Filed Nov. 10, 1994, Ser. No. 339,176
Int. Cl.[6] C09J *189/00*
U.S. Cl. 106—124 **7 Claims**

1. A single agent hemostatic tissue adhesive comprising a lyophilized powder of fibrin monomer from human recombinant fibrinogen, calcium chloride, and bovine thrombin.

5,464,472

FINE AQUEOUS DISPERSION OF AN ORGANOPHILIC SHEET SILICATE

Ute Horn, Dornburg, and Guido Dessauer, Tutzing, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Jun. 24, 1994, Ser. No. 265,206
Claims priority, application Germany, Jun. 26, 1993, 43 21 376.6
Int. Cl.[6] C09D *1/00;101/26;103/08;105/00;105/04*
U.S. Cl. 106—287.34 **17 Claims**

1. A fine aqueous dispersion consisting essentially of

a sheet silicate capable of ion exchange combined with a quaternary organic onium salt to form an organophilic sheet silicate and

from 3 to 30% by weight, based on the organphilic sheet silicate, as anhydrous organphilic sheet silicate, of a water-soluble natural polymer and/or a salt, ether or ester thereof.

10. Paper or cardboard, coated on one or both sides with the fine aqueous dispersion as claimed in claim **1**.

5,464,473

BACKFILL FOR ENGINEERED BARRIER

Shin J. Shiao, Hsinchu, Taiwan, Prov. of China, assignor to Chao Ming Tsai, Taiwan, Prov. of China

Filed May 25, 1993, Ser. No. 66,436
Int. Cl.[6] C04B *33/00*
U.S. Cl. 106—811 9 Claims

1. A backfill material for use in an engineering barrier, comprising:

a clayic material selected from the group consisting of bentonite, montmorillonite, illite, kaolinite, laterite, ectorite, and attapulgite; and

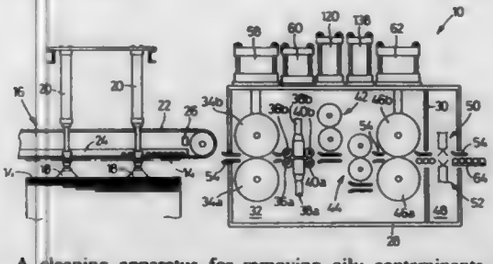
at least one noncementitious reinforcement material, said reinforcement material having a hydrophobic surface.

5,464,474

APPARATUS FOR CLEANING STRIPS BEFORE PRESS FORMING, HAVING DE-OILING ROLLS AND TACKY ROLLS TO REMOVE OIL AND FOREIGN MATTERS

Yutaka Nishimoto; Kimikazu Ikemoto, both of Toyota; Yuji Niimi, Nishikamo, and Akio Asai, Aichi, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 30, 1993, Ser. No. 99,658
Claims priority, application Japan, Jul. 31, 1992, 4-225327; Jun. 29, 1993, 5-186619
Int. Cl.[6] B08B *1/02;* B21C *47/34*
U.S. Cl. 118—676 10 Claims



1. A cleaning apparatus for removing oily contaminants and other foreign matter from workpieces in the form of strips or sheets having upper and lower surfaces, said cleaning apparatus comprising:

a feeding device for sequentially feeding workpieces through a feed path in a feeding direction;

de-oiling rolls rotatably disposed in an upstream portion of said feed path relative to said feeding direction, said deoiling rolls contacting upper and lower surfaces of each sequentially fed workpiece to thereby absorptively remove oily contaminants from the upper and lower surfaces of said each workpiece;

tacky rolls rotatably disposed downstream of said deoiling rolls relative to said feeding direction said tacky rolls contacting the upper and lower surfaces of said each sequentially fed workpiece to remove foreign matter other than oily contaminants from the upper and lower surfaces of each said workpiece; and

a vacuum cleaning device disposed between said de-oiling rolls and said tacky rolls for removing foreign matter from said workpiece via suction, wherein said vacuum cleaning device includes:

a vacuum cleaner head provided with a suction slot extending in a substantially transverse direction relative to said feeding direction, said suction slot having a waveform shape including a plurality of extrema that extend substantially along said feeding direction; and

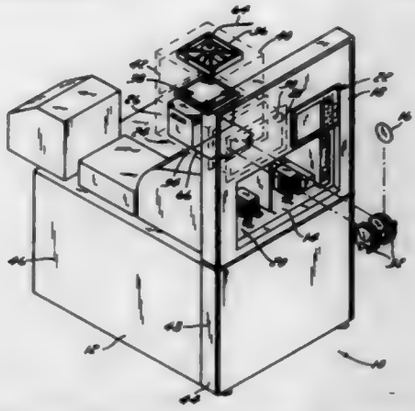
a plurality of guide rolls provided on said vacuum cleaner head adjacent to said suction slot, wherein each said guide roll is located adjacent extremum of said suction slot relative to said feeding direction, wherein each said guide roll is rotatably supported about an axis perpendicular to said feeding direction so as to maintain rolling contact with each workpiece and to hold each workpiece spaced apart from said suction slot of said vacuum cleaner head by a predetermined distance.

5,464,475

WORK-IN-PROCESS STORAGE POD

Roger A. Sikes, and Alexander P. Plevich, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Austin, Tex.

Filed May 20, 1994, Ser. No. 246,830
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—719 8 Claims



1. An improved machine for performing a manufacturing process on a workpiece, the machine including a cabinet defining an interior work space for performing said manufacturing process, said workpiece being placed in said work space by an operator, said cabinet being coupled with a gas source for receiving a flow of gas from said gas source, said cabinet including a front panel, wherein the improvement comprises:

a first aperture in said front panel of said cabinet providing access to an interior chamber within said cabinet, said interior chamber having an interior surface and an open end aligned with said first aperture for storing a work-in-process unit, said interior chamber being accessible to said operator for transferring said work-in-process unit between said interior chamber and said work space;

a second aperture in said interior surface of said interior chamber, said second aperture admitting said flow of gas from said gas source to establish a laminar flow of said gas in said chamber intermediate said second aperture and said first aperture; and

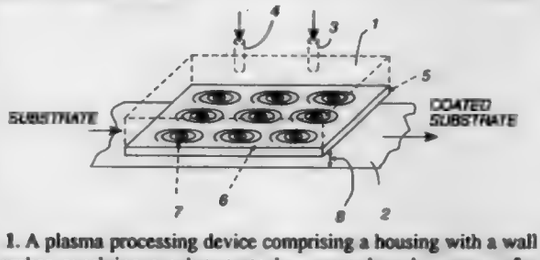
a third aperture in said front panel of said cabinet providing access to said work space.

5,464,476

PLASMA PROCESSING DEVICE COMPRISING PLURAL RF INDUCTIVE COILS

Ian Gibb, Ruislip; Philip Allen, Feltham, and Andrew Barnes, Hillingdon, all of, England, assignors to Central Research Laboratories Limited, Middlesex, United Kingdom

Filed Oct. 17, 1994, Ser. No. 324,191
Claims priority, application United Kingdom, Jan. 19, 1993, 9321489
Int. Cl.[6] C23C *16/30;16/50;16/54*
U.S. Cl. 118—723 MP 7 Claims



1. A plasma processing device comprising a housing with a wall member overlying a substrate to be operated on by means of a plasma process but separated therefrom by a discharge gap, the device comprising a plurality of inductive coils distributed over said wall member, means for supplying RF energy to the coils,

means for introducing a process gas into said housing and causing said gas to flow into the discharge gap, said wall member and/or said housing being constructed to resist the flow of said gas so as to maintain in said housing a higher pressure of said gas than exists in said discharge gap.

5,464,477

PROCESS FOR CLEANING AND DRYING FERROUS SURFACES WITHOUT CAUSING FLASH RUSTING

Sami B. Awad, Drexel Hill, Pa., assignor to Crest Ultrsonics Corporation, Trenton, N.J.

Continuation-in-part of Ser. No. 18,693, Feb. 17, 1993, Pat. No. 5,397,397, which is a continuation-in-part of Ser. No. 947,670, Sep. 18, 1992, abandoned. This application Nov. 2, 1993, Ser. No. 146,362

Int. Cl.[6] **B08B** *3/08;3/12;* **C11D** *7/24*

U.S. Cl. 134—1 **12 Claims**

1. A process for cleaning contaminants from and drying a ferrous metal surface without causing flash rusting on the surfaces comprising the steps of:

contacting said surface with a solvent selected from the group consisting of terpene hydrocarbon, alcohol, ether, amine, ester, orange terpene hydrocarbon, hydrotreated light petroleum distillate, aliphatic hydrocarbon, aliphatic ester, C_{10} branched chain synthetic ester and aliphatic petroleum hydrocarbon;

heating and ultrasonically agitating said solvent to solubilize and dislodge contaminants from said surface;

rinsing said surface with a heated, ultrasonically agitated aqueous rinsing solution capable of protecting ferrous metal surfaces from flash rusting and comprising at least one water-soluble anionic pH modifier in an amount of about 0.00001 percent to about 50 percent by weight of said aqueous rinsing solution, wherein said aqueous rinsing solution has pH above 7, the pH modifier being selected from the group consisting of hydroxides, carbonate, bicarbonate, phosphates of metals in groups I and II elements, ammonia, ammonium water soluble primary amines, water soluble secondary amines, water soluble tertiary amines, and low molecular weight primary, secondary and tertiary alkyl, aryl or alkyl aryl, cyclic or acyclic amines or amine derivatives, with or without alkyloxylation, with or without termination, and derivatives and mixtures thereof, whereby said surface is rendered hydrophilic; and

drying said surface.

5,464,478

METHOD OF RUBBING AN ORIENTATION CONTROLLINGG FILM OF A LIQUID CRYSTAL DISPLAY IN DEIONIZED WATER

Yong S. Byun, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 28, 1993, Ser. No. 174,002

Claims priority, application Rep. of Korea, Dec. 28, 1992, 1992-25828

Int. Cl.[6] **B08B** *3/12;* **G02F** *1/13*

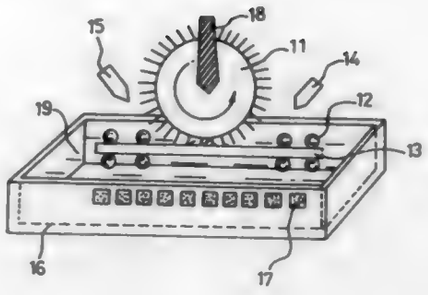
U.S. Cl. 134—1 **1 Claim**

1. A method of rubbing an orientation controlling film printed on a glass substrate of a liquid crystal display using a rubbing roller, comprising the steps of:

disposing the glass substrate on which the orientation controlling film is printed in a bath containing deionized water;

rubbing and washing the glass substrate by rubbing the glass substrate with the rubbing roller in the deionized water and simultaneously supplying ultrasonic waves to the deionized water; and

discharging the deionized water from the bath and drying the glass substrate.



5,464,479

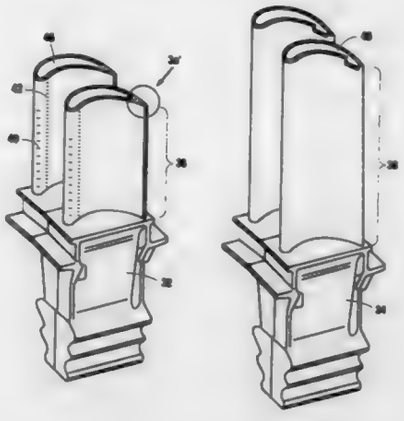
METHOD FOR REMOVING UNDESIRED MATERIAL FROM INTERNAL SPACES OF PARTS

Donald J. Kenton, 2625 Pebble Valley, San Antonio, Tex. 78232; Frank Laughlin, 4007 Hollow Oak Dr., Euless, Tex. 76040, and Charles McComas, 2204 SW. School Creek Trace, Palm City, Fla. 34990

Filed Aug. 31, 1994, Ser. No. 298,790

Int. Cl.[6] **B08B** *3/02;3/04;5/02;9/00*

U.S. Cl. 134—1 **20 Claims**



1. A method for removing undesired material formed in internal spaces of a gas turbine engine part from elevated temperature reactions between impurities in air passing through said internal spaces, said method comprising the steps of:

(a) immersing at least a portion of said part into a first tank containing water at a temperature and for a period of time sufficient to saturate at least a portion of said material;

(b) removing said part from said first tank and immersing said part into a second tank containing a cold liquid at a temperature and for a period of time sufficient to allow water from said immersion step (a) remaining in said material and on said part directly adjacent to said material to freeze thereby loosening at least some of said material from said part; and

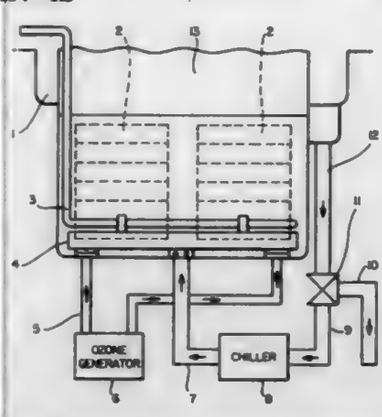
(c) removing said part from said second tank and flushing the internal spaces of said part with sufficient pressure to cause at least some of said material which the prior steps loosened from said part to be removed from said part.

5,464,480

PROCESS AND APPARATUS FOR THE TREATMENT OF SEMICONDUCTOR WAFERS IN A FLUID

Robert R. Matthews, Richmond, Calif., assignor to Legacy Systems, Inc., Richardson, Tex.

Filed Jul. 16, 1993, Ser. No. 92,523
Int. Cl.[6] H01L *21/304*
U.S. Cl. 134—1.3 19 Claims



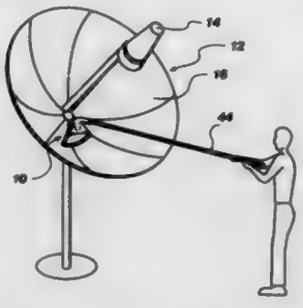
1. A process for removing organic materials from semiconductor wafers comprising contacting the wafers with a solution of ozone and water at a temperature of about 1° C. to about 15° C.

5,464,481

SATELLITE DISH CLEANING APPARATUS AND METHODS

Paul P. Lietz, Jr., 6102 Azure Meadow Dr., Salt Lake City, Utah 84118, and Michael J. Foster, 9107 Shad Cir., Sandy, Utah 84079

Filed Sep. 12, 1994, Ser. No. 304,269
Int. Cl.[6] A46B *15/00;* A47L *13/02;13/11*
U.S. Cl. 134—6 7 Claims



7. A method for removing dust, debris, snow and/or ice from a concave facing surface of a satellite dish, said method comprising the steps of:

providing a satellite dish cleaning apparatus comprising:

a gripping means having a first end, an elongated body and a second opposing end;

an intermediate member including a first end and a second end, said first end of said intermediate member adapted to receive said first end of said gripping means, said intermediate member having a curvilinear neck portion formed between said first end and said second end, said curvilinear neck portion providing an angle of between approximately 10° and 170°, and

a satellite dish engaging means secured to said second end of said intermediate member, said satellite dish engaging means having a contacting surface formed having a configuration substantially conforming to said concave facing surface of said satellite dish;

holding said gripping means adjacent said second end thereof;

positioning said contacting surface of said satellite dish engaging means against said concave facing surface of said satellite dish;

and

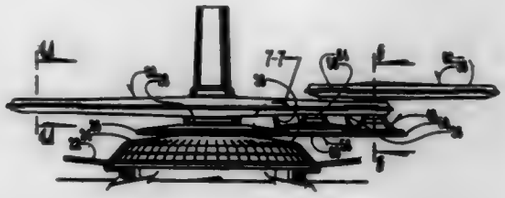
removing said dust, debris, snow or ice from said concave facing surface of said satellite dish with said contacting surface of said satellite dish engaging means.

5,464,482

WASHARM ASSEMBLY FOR DISHWASHER

Daryl A. Michael, Stevensville, Mich., and Rodney M. Welch, Newton, Iowa, assignors to Maytag Corporation, Newton, Iowa

Filed Nov. 7, 1994, Ser. No. 335,457
Int. Cl.[6] A47L *15/22*
U.S. Cl. 134—25.2 14 Claims



1. A wash arm device for a washing appliance comprising:

an upstanding support;

an elongated first spray arm having first and second opposite ends;

an elongated second spray arm having first and second opposite ends;

a first pivot mount pivotally mounting said first spray arm to said upstanding support for pivotal movement about a first axis whereby said first spray arm will rotate in a first circular path about said first axis;

a second pivot mount pivotally mounting said second spray arm to said first spray arm for pivotal movement about a second axis located adjacent an end of said first spray arm, whereby said second spray arm will rotate in a second circular path about said second axis and at least said first end of said second spray arm will protrude radially outwardly beyond the end of said first spray arm during a portion of each revolution of said second spray arm about said second axis;

a drive mechanism interconnecting said upstanding support and said second spray arm for causing said first spray arm to rotate at a first rotational velocity and said second spray arm to rotate at a second rotational velocity which is greater than said first rotational velocity whereby said first and second spray arms rotating together will travel in a combined path in the form of a polygon.

14. A method for spraying fluid in an appliance chamber having n side walls forming n corners therebetween, said method comprising:

rotating a first spray arm about a first vertical axis within said appliance chamber.

spraying fluid outwardly from a first spray chamber in said first spray arm through a plurality of spray holes in said first spray arm so as to create a first circular spray pattern around said first vertical axis;

spraying fluid outwardly from a second spray chamber within a second spray arm through a plurality of spray holes in said second spray arm, said second spray arm being rotatably connected to said first spray arm for rotation about a second vertical axis;

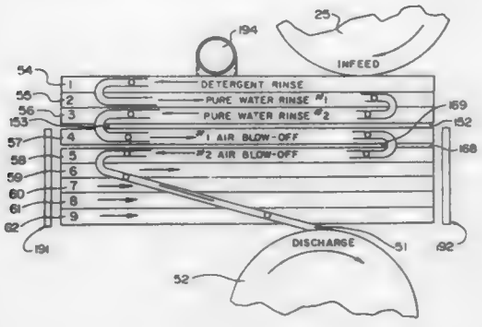
rotating said second spray arm about said second vertical axis during rotation of said first spray arm about said first vertical axis, so that at least a portion of said second spray arm extends beyond the end of said first spray arm and into each of said n corners of said appliance during rotation of said first spray arm about said first vertical axis.

5,464,483

FLEXIBLE, COMPACT VIAL WASHER

Julian P. Avelis, Crete; Garrett W. McBrady, Homewood, and William J. McBrady, Frankfort, all of Ill., assignors to McBrady Engineering, Inc., East Hazel Crest, Ill.

Division of Ser. No. 745,877, Aug. 16, 1991, Pat. No. 5,293,888. This application Feb. 14, 1994, Ser. No. 195,305
Int. Cl.[6] B08B 3/02
U.S. Cl. 134—25.4 60 Claims



1. A method of washing vials comprising:

(A) moving said vials in a substantially horizontal direction;

(B) limiting the motion of said vials to a predetermined path, said path including (a) a plurality of path segments with substantially the entire length of each of said path segments being at a substantially constant distance to substantially the entire lengths of the others of said path segments and (b) connecting segments equal in number to one less than the number of said path segments, each of said connecting segments connecting two of said path segments said vials being substantially moved in opposite directions and at different speeds on two of said path segments to accumulate and bunch said vials; and

(C) removing material from the exterior of said vials while on said path.

5,464,484

OIL SPLITTING ALUMINUM CLEANER AND METHOD

Edward A. Rodzewich, Flourtown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Jun. 7, 1994, Ser. No. 255,218
Int. Cl.[6] B08B 3/08
U.S. Cl. 134—40 7 Claims

1. A method for cleaning aluminum with an aqueous cleaning solution and for splitting oil in an aqueous cleaning bath containing oil and said aqueous cleaning solution comprising applying to said aluminum an effective cleaning amount of said aqueous cleaning solution which comprises an alkali metal phosphate, octylphenoxypolyethyleneoxyethanol, sodium metasilicate, and a quaternary cationic surfactant, whereby said aqueous cleaning solution provides substantially no etching of said aluminum and substantially no oxide buildup on said aluminum.

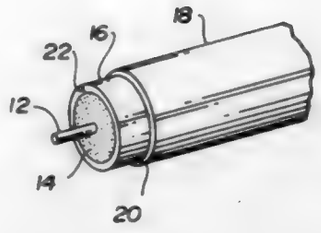
5,464,485

COAXIAL THERMOELEMENTS AND THERMOCOUPLES MADE FROM COAXIAL THERMOELEMENTS

Bertie F. Hall, Jr., Ann Arbor, Mich., assignor to Hoskins Manufacturing Co., Detroit, Mich.

Continuation of Ser. No. 86,151, Jul. 1, 1993, abandoned. This application Jun. 3, 1994, Ser. No. 254,675
Int. Cl.[6] H01L 35/08
U.S. Cl. 136—230 8 Claims

1. A coaxial thermoelement consisting essentially of:



a continuous thermocouple wire having a predetermined length, said thermocouple wire being selected from a group of thermoelectric metals consisting of "ALUMEL", "CHROMEL", iron, copper, "CONSTANTAN", platinum and alloys of platinum and rhodium;

at least one tubular metal sheath circumscribing said thermocouple wire, each of said at least one tubular metal sheath extending from one end to its other end for a distance substantially equal to said predetermined length to protect the thermocouple wire during manufacturing and in use, said at least one metal sheath being made from a metal different from said thermocouple wire; and

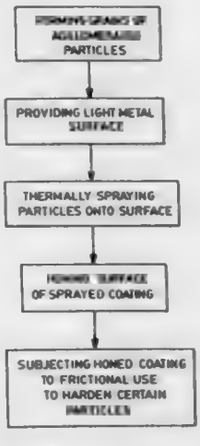
an insulating ceramic powder disposed in said at least one metal sheath to support said thermocouple wire coaxially within said at least one metal sheath and to electrically insulate said thermocouple wire from said at least one metal sheath along said predetermined length.

5,464,486

SOLID LUBRICANT AND HARDENABLE STEEL COATING SYSTEM

V. Durga N. Rao, Bloomfield Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 88,014, Jul. 6, 1993, Pat. No. 5,332,422. This application May 9, 1994, Ser. No. 239,824
Int. Cl.[6] B05D 1/10
U.S. Cl. 148—525 7 Claims



1. A method of making anti-friction coated surfaces subject to sliding wear, comprising:

(a) forming grains of agglomerated solid lubricant particles and air-hardenable, fusable metal particles encapsulating each grain of solid lubricant particles the particles being bound together in such agglomerates by a low melting point medium;

(b) providing a light metal-based component surface;

(c) thermally spraying said grains onto said surface in a thickness of 120–150 microns to form a coating substantially devoid of the medium and having limited porosity; and

(d) removing at least a portion of the fusable particles to expose sharp edges of such particles, whereby air hardening occurs during or after said thermal spraying step.

5,464,487

METHOD OF MAKING A HARDENED BULLET

Charles K. Bane, Farmer City, Ill., assignor to Bull-X, Inc., Farmer City, Ill.

Filed Oct. 26, 1993, Ser. No. 142,187
Int. Cl.[6] C22C *11/00*; F42B *7/00*
U.S. Cl. 148—706 13 Claims

1. A method of making a hardened swaged wrought bullet comprising:

heating a swaged wrought metal bullet which has been swage formed under high pressure in a swage forming die to a temperature near but less than the slump temperature of the metal; and

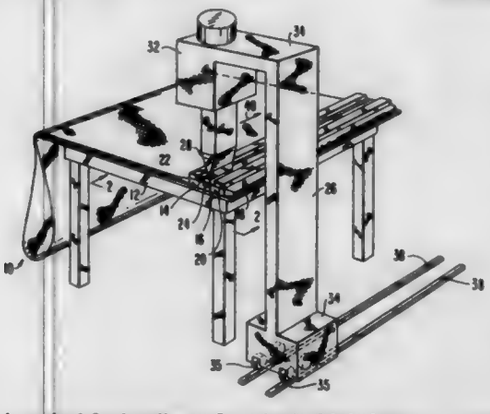
quenching the heated wrought bullet in a liquid to rapidly reduce its temperature to harden the wrought bullet.

5,464,488

METHOD OF SEAMING PLASTIC FABRICS

Randall F. Servin, Hortonville, Wis., assignor to Albany International Corp., Albany, N.Y.

Filed Dec. 22, 1994, Ser. No. 362,660
Int. Cl.[6] B32B *31/16*
U.S. Cl. 156—73.4 18 Claims



1. A method for bonding a first plastic fabric layer to a second plastic fabric layer, said first and second plastic fabric layers being woven from yarns of a synthetic polymeric resin and being overlapped with one another for bonding, said method comprising the steps of:

providing an ultrasonic welding apparatus having a horn for delivering ultrasonic energy to said overlapped first and second plastic fabric layers at a location where said first and second plastic fabric layers are to be bonded to one another;

providing an anvil toward and against which said horn is moved to clamp said first and second plastic fabric layers together for bonding;

disposing said first plastic fabric layer on said anvil;

disposing said second plastic fabric layer over said first plastic fabric layer on said anvil;

moving said horn toward and onto said overlapped first and second plastic fabric layers on said anvil at a preselected rate of speed;

activating said horn to deliver ultrasonic energy to said overlapped first and second plastic fabric layers when the force with which said horn clamps said overlapped first and second plastic fabric layers against said anvil reaches a preselected level;

increasing said force above said preselected level of force while delivering ultrasonic energy to said overlapped first and second plastic fabric layers to soften said yarns from which said first and second plastic fabric layers are woven without melting said yarns and to compress said softened yarns together;

deactivating said horn to stop its delivery of ultrasonic energy when said horn has reached a preselected distance from said anvil;

maintaining said force for a preselected hold time, to allow said synthetic polymeric resin of said yarns to cool and to harden under compression; and

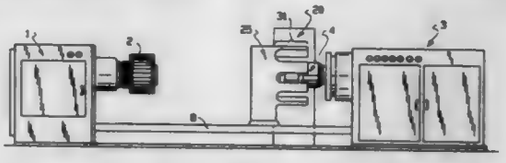
removing said horn from said overlapped first and second plastic fabric layers.

5,464,489

METHOD FOR MANUFACTURING A GREEN RADIAL TIRE USING A TRANSFER UNIT THAT IS MOVABLE DURING PRESSING

Martin De Graaf, Emst, Netherlands, assignor to Veluwse Machibe Industrie B.V., Gelriaweg, Netherlands

Filed May 20, 1994, Ser. No. 246,883
Claims priority, application Netherlands, May 26, 1993, 9300893
Int. Cl.[6] B29D *30/28*
U.S. Cl. 156—126 2 Claims



1. Method for manufacturing a green radial pneumatic tire comprising a tread with a belt defining a tread-belt assembly and, a carcass with beads and side walls, in which method the tread with the belt is arranged on a tread constructing drum, the carcass with the beads and the side walls is arranged on a carcass drum, the tread-belt assembly is taken by a transfer unit with a passage part from the tread constructing drum, the transfer unit is transferred over a path to a first location surrounding the carcass drum, the transfer unit places the tread-belt assembly on the carcass with the beads and the side walls, the tread-belt assembly is pressed against the carcass with the beads and the side walls by a pressure unit with at least one roller, each roller being displaced through a gate in the passage part of the transfer unit from beyond the transfer unit up to against the carcass with beads and side walls and the pressure taking place during a period of time sufficient for adhering the tread-belt assembly to the carcass with the beads and the side walls, thus forming said green radial pneumatic tire, said period of time having a first part and a subsequent second part, each roller being displaced from the carcass after said period of time and the green radial pneumatic tire is taken from the carcass drum by the transfer unit, characterized in that after starting the pressing of the tread-belt assembly onto the carcass with the beads and the side walls and during the first part of said period of time, the transfer unit is transferred along said path to a second location spaced from the carcass drum to permit said pressure unit to move freely, during said period, along said tread-belt assembly and carcass with the beads and the side walls without interference with said transfer unit.

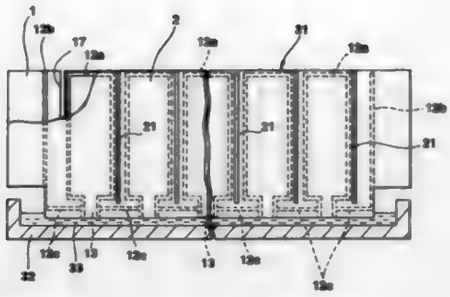
5,464,490

PROCESS FOR MANUFACTURING LIQUID CRYSTAL DISPLAY

Kazuhito Sato, and Yuji Negishi, both of Hamura, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1993, Ser. No. 174,156
Claims priority, application Japan, Aug. 18, 1993, 5-223915; Sep. 22, 1993, 5-257493
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—145 13 Claims

1. A process for manufacturing a liquid crystal display, comprising the steps of:



providing a first base plate of a resin and a second base plate of a resin;

providing the first base plate with an electrical connecting terminal adapted to be connected to a device external to the liquid crystal display;

forming an opening in the second base plate corresponding to the electrical connecting terminal of the first base plate, a size of the opening being in correspondence to a portion having the electrical connecting terminal of said first base plate;

providing at least one of the first and the second base plates with a seal, the seal comprising a liquid crystal cell seal surrounding a display area and a blocking seal obstructing a liquid crystal invasion into an area outside the liquid crystal cell seal;

bonding the first and the second base plates to each other by means of the seal so that the electrical connecting terminal is exposed through the opening:

injecting a liquid crystal between said first and said second base plates;

eliminating a portion of said first and said second base plates including the blocking seal from another portion including the liquid crystal cell seal; and

cutting said first and said second base plates on a line adjoining an edge of the opening.

5,464,491

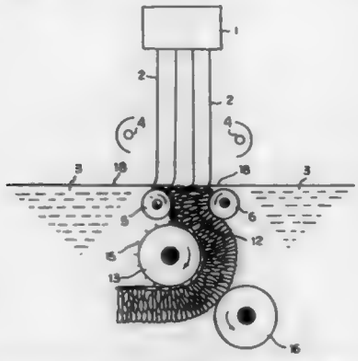
METHOD OF PRODUCING MAT COMPRISING FILAMENT LOOP AGGREGATE

Minoru Yamanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Risuron, Tokyo, Japan

Filed Aug. 12, 1993, Ser. No. 106,043

Int. Cl.[6] D01D *5/22;7/00*

U.S. Cl. 156—167 **12 Claims**



1. A method for producing a mat including a three dimensional filament loop aggregate, the method comprising:

extruding molten thermoplastic synthetic resin from a die to form a plurality of filaments including outer filaments and remaining filaments, heating the plurality of filaments and allowing them to descend from the die onto a surface of a cooling liquid, the plurality of filaments descending into a zone defined between a first rotatable roll and a second rotatable roll each having a top and being fully submerged in the cooling liquid such that the top of the first rotatable roll is 5–10 mm below the surface of the cooling liquid and the top of the second rotatable roll is approximately 10 mm or less below the surface of the cooling liquid;

cooling all of the plurality of filaments simultaneously with the cooling liquid, the outer filaments forming first loops and the remaining filaments forming second loops on the surface of the cooling liquid;

supporting the first loops on the top of the first rotatable roll in the cooling liquid, each of the first loops initially lying substantially horizontally on the top of the first rotatable roll and subsequently being rotated by the first rotatable roll to lie substantially vertically, the first loops forming on the top of the first rotatable roll being within the cooling liquid;

integrating the first loops, when substantially vertical, with the second loops to form the filament loop aggregate, the second loops being substantially horizontal during integrating, the first and second loops being integrated in the zone defined by the first and second rotatable rolls; and

drawing off the integrated first and second filament loops from the zone at a speed lower than that speed at which the filaments descend towards the surface of the cooling liquid, whereby the filament loop aggregate is comprised of the first loops arranged in one plane and the second loops lying in a plane substantially normal thereto.

11. A method of producing a mat including a three dimensional filament loop aggregate, the method comprising the steps of:

extruding molten thermoplastic synthetic resin from a die to form a plurality of filaments including outer filaments and remaining filaments, the plurality of filaments descending from the die onto the surface of cooling liquid between first and second rotatable rolls wherein the first rotatable roll and the second rotatable roll are fully submerged in the cooling liquid;

cooling the plurality of filaments simultaneously in the cooling liquid, the outer filaments forming first loops and the remaining filaments forming second loops on the surface of the cooling liquid;

supporting the first loops on a top of the first rotatable roll such that the first loops lie substantially horizontally on the top and thereafter move around upon rotation of the first rotatable roll to a substantially vertical plane;

providing a supporting roll in the cooling liquid below the first and second rotatable rolls, the first rotatable roll, the second rotatable roll and the supporting roll each having an axis and the first rotatable roll, the second rotatable roll and the supporting roll being arranged so that the axis of the first rotatable roll, the axis of the second rotatable roll and the axis of the supporting roll define an acute triangle, the first and second rotatable rolls and the supporting roll defining a zone for receiving the first and second loops with the first and second loops being integrated in said zone to form the filament loop aggregate wherein the filament loop aggregate is at least partially supported from below by the supporting roll;

transporting the filament loop aggregate first between the first and second rotatable rolls and thereafter between the supporting roll and the second rotatable roll to regulate the width and density of the filament loop aggregate;

providing an auxiliary roll; and

transporting the filament loop aggregate between the supporting roll and the auxiliary roll.

5,464,492

METHOD FOR MANUFACTORING A PORTABLE LIQUID SPILL CONTAINMENT SYSTEM

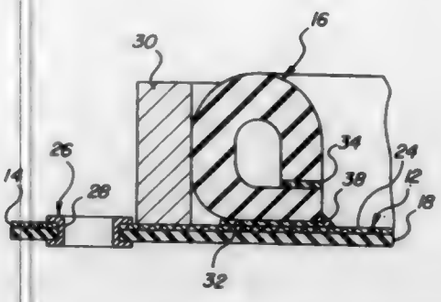
David B. Gregory, Kawkawlin, and Dan A. Oliver, West Branch, both of Mich., assignors to Renew Roof Technologies Inc., Bay City, Mich.

Filed May 20, 1994, Ser. No. 247,137

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—246 **19 Claims**

1. In a method of making portable liquid spill containments; the steps of:



a) forming a liquid-impervious base sheet having perimetrical edges;

b) forming an upstanding depressible endless tubular containment wall, formed of an elastic foam with an elastic memory returning it to shape after each of repeated deformations, and positioning said endless wall along the perimetrical edges of said base sheet to isolate a containment area within said containment wall for spills; and

c) coating said base sheet and containment wall with a liquid-impervious elastomeric polymer compound fluid and curing it to form a continuous skin layer which extends from said base sheet containment area up over and around said base sheet containment wall and provides a unitary, tough, wear resistant cover.

5,464,493

THERMOPLASTIC COMPOSITE FABRICS AND FORMED ARTICLE PRODUCED THEREFROM

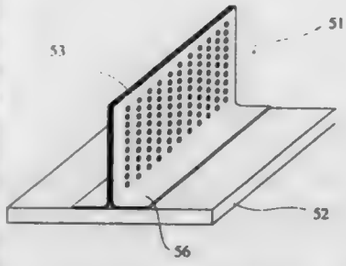
Masaru Iguchi, Kawaguchi; Hiromasa Shigeta, Shiki, and Keizo Matsumoto, Iruma, all of, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 944,091, Sep. 11, 1992, Pat. No. 5,418,035. This application Aug. 12, 1994, Ser. No. 289,562

Claims priority, application Japan, Sep. 12, 1991, 3-261030; Jan. 10, 1992, 4-021802; Jan. 10, 1992, 4-021960; Jan. 10, 1992, 4-021972

Int. Cl.[6] B32B *31/04*

U.S. Cl. 156—290 **1 Claim**



1: A method of producing an integrally formed article of thermoplastic composite members, comprising the steps of:

(a) forming a preformed first member by laminating a plurality of thermoplastic composite fabrics comprising reinforcing fibers and a thermoplastic resin and applying pressure to the resulting laminate to form it into a predetermined shape while heating it at a temperature equal to or higher than a melting point of said thermoplastic resin;

(b) forming a second member by laminating a plurality of thermoplastic composite fabrics comprising reinforcing fibers and a thermoplastic resin and partially bonding said thermoplastic composite fabrics;

(c) bending a non-bonded portion of said second member;

(d) abutting and pressing the non-bonded portion of said second member to said first member while heating said first and second members at a temperature lower than the melting point of said thermoplastic resin; and

(e) heating the resulting assembly at a temperature equal to or higher than a melting point of said thermoplastic resin under pressure.

5,464,494

DISPERSION-BASED HEAT-SEALABLE COATING

Gerd Bolte, Monheim; Guenter Henke, Neuss, and Ulrike Brueninghaus, Erkrath, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP92/02553, § 371 Date May 10, 1994, § 102(e) Date May 10, 1994, PCT Pub. No. WO93/10202, PCT Pub. Date May 27, 1993

PCT Filed Nov. 6, 1992, Ser. No. 240,751

Claims priority, application Germany, Nov. 15, 1991, 41 37 512.2

Int. Cl.[6] C09J *5/06;135/02;163/02*

U.S. Cl. 156—330 **30 Claims**

1. A composition of matter useful as a film-forming reactive system for the surface-to-surface bonding and/or coating of substrates, said composition comprising an aqueous dispersion comprised of:

a polyurethane polymer containing epoxy-reactive functional groups as a first curable resin, having a sum of an acid value, a hydroxyl value and an amine value of from 0.1 to 40,

an acrylate and/or methacrylate homopolymer or copolymer containing carboxyl and/or methylol groups having a sum of an acid value and hydroxyl value from 1 to 40 is present in dispersed form as a second curable resin,

an epoxy compound as a curing component for said first curable resin and said second curable resin.

5,464,495

METHOD AND APPARATUS FOR APPLYING LABELS TO CONTAINERS AND CONTAINERS RESULTING THEREFROM

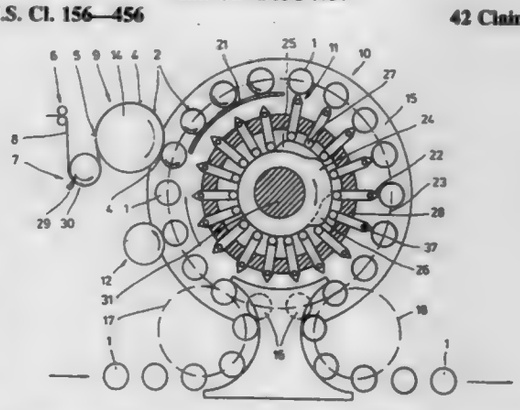
Erich Eder, Donaustauf, Germany, assignor to Krones AG Hermann Kronseder Maschinenfabrik, Neutraubling, Germany

Continuation-in-part of Ser. No. 820,132, Jan. 13, 1992, abandoned. This application Jun. 2, 1993, Ser. No. 71,464

Claims priority, application Germany, Aug. 1, 1991, 41 25 472.4

Int. Cl.[6] B65C *9/04*

U.S. Cl. 156—456 **42 Claims**



1. Apparatus for applying a label composed of sealable material to a container comprising:

means for drawing a web (8) of labels from a source,

means (7) for severing individual labels (2) from the web,

a transfer device (14) to which individual labels are transferred in sequence and from which individual labels are transferred to containers (1), respectively,

conveyor means (10) for conveying containers past said transfer device to provide for the leading end (4) of the transferred

label to be put in contact with and adhere to said container, and means for rotating each container as it is conveyed to effect wrapping of the label around the container for the trailing end of the label to overlap the leading end,

means for applying at least one narrow region of adhesive to said container before said leading end is put in contact with the container, the size and location of said region of adhesive being such as to provide for said leading end of the label covering only part of said region while leaving another part exposed for adhering said trailing end of the label to the container at a place spaced for the extremity of the trailing end so when the label is wrapped around, the trailing end overlaps the leading end of the label at a position where there is no adhesive between the trailing and leading ends, and

a heat sealing device (11) arranged to contact said label in the region of overlap where there is no adhesive between the trailing and leading end to seal the said trailing end (5) of the label to the leading end (4).

5,464,496

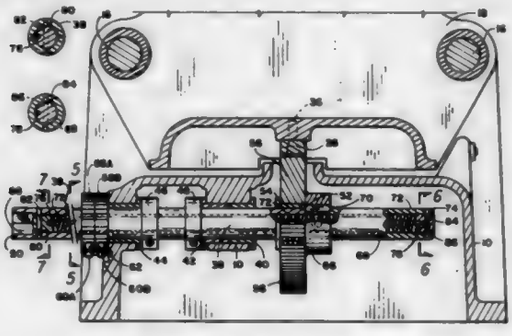
PLASTIC PIPE BUTT FUSION MACHINE

Michael L. Wilson, and Kenneth K. Chan, both of Tulsa, Okla., assignors to TDW Delaware Inc., Wilmington, Del.

Continuation of Ser. No. 991,573, Dec. 16, 1992, abandoned. This application May 27, 1994, Ser. No. 250,643

Int. Cl.[6] B32B *35/00*

U.S. Cl. 156—499 **3 Claims**



1. An butt fusion machine for joining end-to-end lengths of rigid plastic pipe, comprising:

a base;

a first clamping means supported by said base for securing a first length of plastic pipe;

a second clamping means supported by said base for securing a second length of plastic pipe, the first and second lengths of pipe being supported in coaxial arrangement, at least said second clamping means being displacably supported by said base and moveable towards and away from said first clamping means while maintaining said lengths of plastic pipe in coaxial relationship;

an elongated spring having a first and a second end;

an elongated linear gear rack affixed to said second clamping means;

a cylindrical gear rotatably supported by said base and engaging said gear rack;

an elongated tubular spring housing having a first and a second part, the parts being in axial alignment, a substantial portion of said spring being received in each of said spring housing first and second parts, said spring housing first part being rotatably supported to said base and said spring housing second part being secured coaxially to said cylindrical gear, said spring second end being secured to said spring housing second part and said spring first end being secured to said spring housing first part;

means to tension load said spring by rotating said spring housing first part relative to said spring housing second part; and

a ratchet means coaxially secured between said tubular spring housing first part and said base permitting rotation of said spring housing first part in one direction to tension load said spring but prohibiting rotation of said spring housing first part in the opposite direction.

5,464,497

APPARATUS FOR CONTINUAL APPLICATION ON A CONTINUOUS MATERIAL WEB

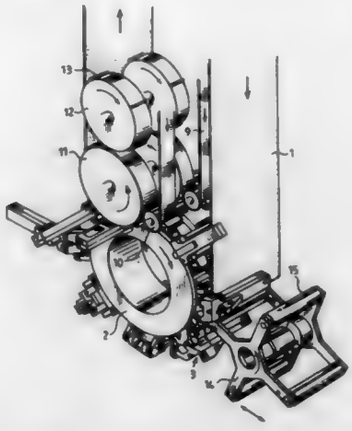
Robert J. Unthank, Georgetown, Canada, assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland

Filed Nov. 15, 1993, Ser. No. 151,892

Claims priority, application Sweden, Nov. 24, 1992, 9203524

Int. Cl.[6] B30B *15/34*

U.S. Cl. 156—519 **20 Claims**



1. An apparatus for application of a strip to a web, comprising:

a rotatable drum;

a plurality of sealing devices pivotally attached to a periphery of the drum;

means for providing a supply of strips to the sealing devices;

means for advancing a material web around at least a portion of the drum;

means for maintaining register between the material web and the strips; and

means for pivoting the sealing devices to seal the strips to the material web.

5,464,498

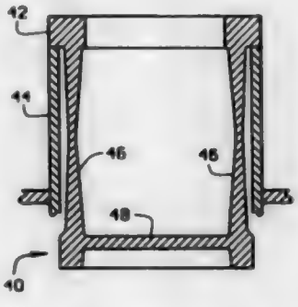
FLEXURAL SPRING SUPPORT FOR VIBRATORY APPARATUS

Philip E. McGrath, Victor, N.Y., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Aug. 18, 1994, Ser. No. 292,938

Int. Cl.[6] B29C *65/06*

U.S. Cl. 156—580.2 **8 Claims**



1. A flexural spring support for a vibratory apparatus comprising:

a first member adapted to be coupled to a stationary frame;

a second member disposed opposite and spaced from said first member and intended to undergo translating motion in a plane responsive to motive means acting upon said second member;

a plurality of spaced flexural springs coupling said first member to said second member, and

said first member, second member and said flexural springs comprising a unitary body of metal.

5,464,499

MULTI-ELECTRODE PLASMA PROCESSING APPARATUS

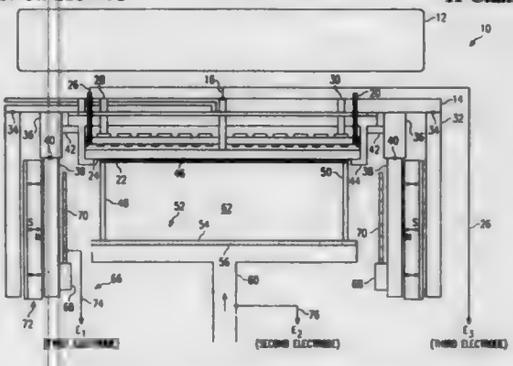
Mehrdad M. Moslehi, Dallas; Cecil J. Davis, Greenville; John Jones, and Robert T. Matthews, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 903,637, Jun. 24, 1992, Pat. No. 5,286,297. This application Nov. 4, 1993, Ser. No. 147,761

The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.

Int. Cl.[6] H05H *1/00*

U.S. Cl. 216—71 **11 Claims**



1. A method for plasma-enhanced processing using multi-electrode plasma generation in a process chamber, comprising the steps of:

holding a semiconductor wafer against a chuck electrode;

injecting a plasma-producing gas through a showerhead electrode to the surface of a semiconductor wafer; and

producing a plasma from said plasma-producing gas wherein said plasma interacts with the walls of the process chamber through a peripheral chamber wall electrode having a conducting screen.

5,464,500

METHOD FOR TAPER ETCHING METAL

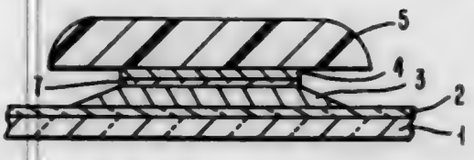
Takatoshi Tsujimura, Tokyo, and Hiroaki Kitahara, Hachioji, both of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 5, 1994, Ser. No. 286,604

Claims priority, application Japan, Aug. 6, 1993, 5-195663

Int. Cl.[6] C23F *1/00*

U.S. Cl. 216—34 **8 Claims**



1. The method for taper etching comprising the steps of laminating a lower metal layer and an upper metal layer having an etching rate different from the etching rate of said lower metal layer on a substrate, forming a middle metal layer having a diffusion coefficient smaller than the diffusion coefficient of said lower and upper metal layers between said lower metal layer and said upper metal layer for preventing an alloy from forming between said lower and upper metal layers, and etching said upper middle and lower metal layer whereby a tapered pattern is formed on said lower metal layer, said lower metal layer is made of aluminum, said upper metal layer is made of molybdenum, and said middle metal layer is made of aluminum oxide.

5,464,501

BLEACHING RECYCLED PULP WITH A REDUCTIVE-OXIDATIVE SEQUENCE

Jack Kogan, Skokie, Ill., and Michel Muguet, Voisin le Bretonneaux, France, assignors to Societe Anonyme Pour l'Etude Et l'Exploitation l'Air Liquide, Des Procedes Georges Claude, Paris, France

Continuation-in-part of Ser. No. 91,158, Jul. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 44,369, Apr. 6, 1993, abandoned. This application Dec. 23, 1993, Ser. No. 173,674

Int. Cl.[6] D21C *5/02;9/153*

U.S. Cl. 162—6 **15 Claims**

1. A method of bleaching waste paper pulp consisting of a first step of treating said pulp with a reductive chemical selected from the group consisting of formamidine sulphinic acid and sodium hydrosulfite followed by a second step consisting of an oxidative treatment wherein said oxidative treatment exposes said pulp to ozone and hydrogen peroxide and wherein the pH of the pulp is adjusted in between said first and second steps.

5,464,502

ANIONIC SULFONATE SURFACTANTS IN THE WASHING AND PULPING OPERATION

Jacqueline K. Pease, Jacksonville, Fla., assignor to Betz PaperChem, Inc., Jacksonville, Fla.

Filed Oct. 5, 1993, Ser. No. 132,076

Int. Cl.[6] D21C *9/02*

U.S. Cl. 162—60 **9 Claims**

1. A method for removing lignin and spent cooking chemicals from pulp which comprises adding within the washing operation an amount of from about 0.1 to 1000 parts per million parts pulp of an anionic sulfonate surfactant selected from the group consisting of sodium dodecyl benzenesulfonate, alkyl diphenol oxide disulfonate, sodium N-methyl-N-palmitoyl-taurine, sodium N-methyl-N-oleyl-taurine, sodium N-methyl-N-(coconut oil)-taurine and sodium N-methyl-N-(tall oil acyl)taurine, wherein the removal of lignin and spent cooking chemicals occurs at a temperature of from about 100°–200° F.

5,464,503

TIRE LIQUEFYING PROCESS REACTOR DISCHARGE SYSTEM AND METHOD

Vahan Avetisian, Burbank; Craig J. Castagnoli, Rowland Heights, and Suk B. Cha, Long Beach, all of Calif., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 28, 1993, Ser. No. 142,014

Int. Cl.[6] C10B *47/18;53/00*

U.S. Cl. 201—3 **7 Claims**

1. A discharge method associated with a tire liquefying process using a process reactor, comprising the steps of:

receiving unreacted hydrocarbons and metal components of tires from a tire liquefying process reactor;

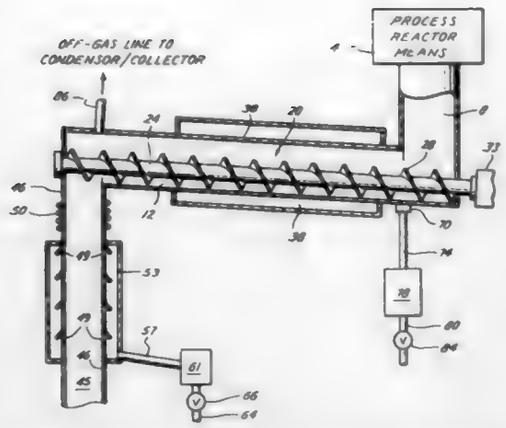
moving the unreacted components with an auger screw means;

heating the moving unreacted components to a temperature sufficient to convert the unreacted hydrocarbon components to a liquid and a gas by pyrolysis;

drawing off the liquid;

drawing off most of the gas;

cooling the remaining gas after pyrolysis that is not drawn off to a condensate in a vertical conduit;



drawing off the condensate from the vertical conduit; and

discharging unreacted metal components through the vertical conduit that is used to cool and condense the remaining gas.

5,464,504

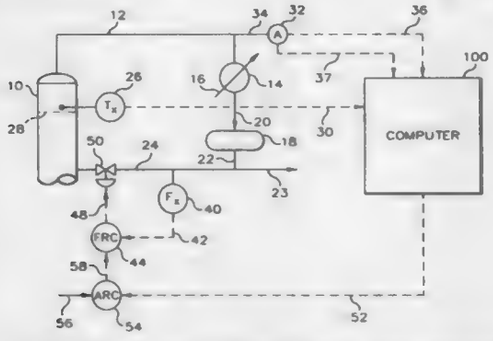
INFERENTIAL CORRECTION OF COMPOSITION FOR A DISTILLATION ANALYZER

Martin H. Beauford, Borger, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 2, 1993, Ser. No. 160,312

Int. Cl.[6] B01D *3/42*

U.S. Cl. 203—3 **15 Claims**



1. A method of correcting a sample analysis signal comprising:

(a) analyzing said sample using an analyzer which periodically samples and then analyzes fluid in a distillation column, wherein said analyzer provides said sample analysis signal representative of the concentration of at least one component in said sample, and further wherein said sample analysis signal is true for said sample and said analyzer retains a value for a time interval between samples until a following sample is analyzed;

(b) determining a change in temperature of a liquid on a selected tray in said distillation column wherein said change in temperature in determined from a current and a delayed temperature measurement of the liquid of said selected tray;

(c) determining a correction signal for said sample analysis signal responsive to said temperature change determination in step (b), wherein said correction signal is calculated with the formula:

$$\Delta X = X(e^{b\Delta T} - 1)$$

where:

X is the concentration of said at least one component resulting from the last completed analysis, in mol fraction,

$\Delta T = T - T_d$, in °K.,

T is the current temperature of liquid on the selected tray, in °K.

T_d is the delayed temperature at the completion of an analyses, in

b is a constant dependent on the separation carried out in said column; and

(d) adding said correction signal determined in step (c) to said sample analysis signal so as to provide a corrected sample analysis signal.

5,464,505

USE OF PROPYLENE OXIDE ADDUCTS IN THE PURIFICATION OF PROPYLENE OXIDE BY EXTRACTIVE DISTILLATION

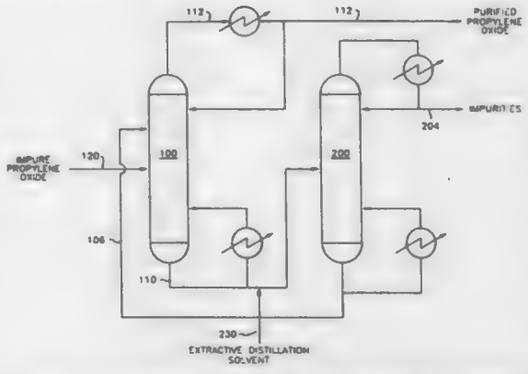
Michael W. Peters, Austin; William A. Smith, Houston; Mark A. Mueller, Austin, and William K. Culbreth, III, Beaumont, all of Tex., assignors to Texaco Chemical Inc., White Plains, N.Y.

Filed May 31, 1994, Ser. No. 251,158

The portion of the term of this patent subsequent to Sep. 26, 2012, has been disclaimed.

Int. Cl.[6] B01D *3/40;* **C07D** *301/32*

U.S. Cl. 203—64 **16 Claims**



1. An extractive distillation process for the distillation of impure propylene oxide feedstock in an extractive distillation column to remove oxygenated contaminants, including water, methanol and acetone from the impure propylene oxide which comprises the steps of:

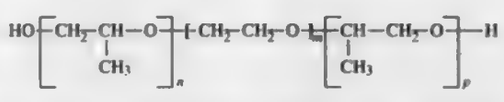
introducing said impure propylene oxide feedstock into the lower half of an extractive distillation column,

introducing an extractive distillation agent comprising a mixture of propylene oxide adducts of oxyethylene glycols into said extractive distillation column above the point of introduction of said impure propylene oxide feedstock, said extractive distillation agent being introduced into said extractive distillation column in the ratio of feedstock to said extractive distillation agent of from about 1:1 to about 20:1,

withdrawing a lighter distillation fraction from said extractive distillation column consisting essentially of propylene oxide contaminated with reduced quantities of said water, acetone and methanol,

withdrawing a heavier distillation fraction from said extractive distillation column containing substantially all of the propylene oxide adducts of oxyethylene glycols and a portion of the water, acetone and methanol introduced into said extractive distillation column,

the polyoxypropylene glycols in said mixture of polyoxypropylene glycols having the formula



wherein n is a positive integer having a value of 1 to about 4, m is a positive integer having a value of 1 to 3, and the mixture has an average molecular weight of about 250 to 350.

13. An extractive distillation process for the continuous distillation of impure propylene oxide feedstock in an extractive distillation column fitted with a reboiler and a reflux condenser to remove oxygenated contaminants, including water, methanol and acetone from the impure propylene oxide which comprises the steps of:

continuously introducing said impure propylene oxide feedstock into the lower half of an extractive distillation column containing at least 25 theoretical plates operated under distillation conditions including a pressure of about 10 to 40 psia, a reflux ratio of from about 1:1 to about 5:1 and a reboiler temperature within the range of about 100° to about 250° C. and a top temperature of about 20° to about 80° C.,

introducing an initial extractive distillation agent charge comprising ethylene glycol, diethylene glycol or triethylene glycol into said extractive distillation column at a point at least 4 theoretical plates above the point of introduction of said impure propylene oxide feedstock, said extractive distillation agent being introduced into said extractive distillation column in the ratio of feedstock to said extractive distillation agent of from about 1:1 to about 20:1,

continuously circulating said initial charge through said extractive distillation column whereby said initial charge will be propoxylated and form a mixture of propylene oxide adducts of oxyethylene glycols,

continuously fractionating said impure propylene oxide feedstock in said extractive distillation column,

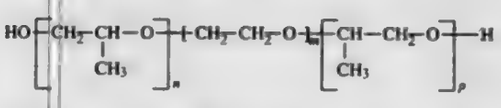
continuously withdrawing a lighter distillation fraction from said extractive distillation column consisting essentially of propylene oxide contaminated with reduced quantities of said water, acetone and methanol,

continuously withdrawing a heavier distillation fraction from said extractive distillation column containing substantially all of the propylene oxide adducts of oxyethylene glycols and a portion of the water, acetone and methanol introduced into said extractive distillation column,

continuously charging said heavier distillation fraction to a distillation column and separating it therein into a lighter distillation fraction comprising water, acetone and methanol and a heavier distillation fraction comprising said mixture of propylene oxide adducts of oxyethylene glycols,

continuously recycling said heavier distillation fraction to said extractive distillation column as said extractive distillation agent,

the polyoxypropylene glycols in said mixture of polyoxypropylene glycols having the formula



wherein n is a positive integer having a value of 1 to about 4, m is a positive integer having a value of 1 to 3, and the mixture has an average molecular weight of about 250 to 350.

5,464,506

ELECTROLYTIC DEVICE AND METHOD HAVING A POROUS AND STIRRING ELECTRODE

Patrick E. Y. Bernard, Chagny, and Claude R. Bertorelli, Dracy le Fort, both of, France, assignors to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/EP92/02032, § 371 Date Feb. 24, 1994, § 102(e) Date Feb. 24, 1994, PCT Pub. No. WO93/05203, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 3, 1992, Ser. No. 199,262

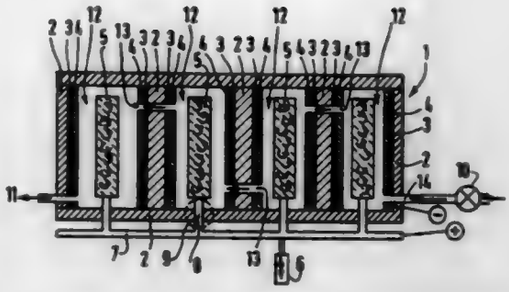
Claims priority, application France, Sep. 6, 1991, 91 11233

Int. Cl.[6] C25C *1/20*

U.S. Cl. 204—105 R **11 Claims**

8. An electrolytic method for recovering metals contained in an electrolyte comprising the steps of:

providing an electrolytic device comprising at least one electrode associated with at least one counter-electrode, wherein



at least one electrode of the device is porous and used for stirring, wherein the porous stirring electrode and the counter-electrode are separated by a membrane permeable to ions but non-permeable to the solution, the porous stirring electrode is made from an expanded organic polymer coated with metal, and the electrode porosity is such that the diameter of the pores in the electrode is between 2 and 10 millimeters, wherein the porous stirring electrode is cathodically biased and the counter electrode is anodically biased,

providing said porous electrode with means enabling said porous electrode to be moved, the movement of the porous electrode bringing about stirring of the electrolyte in the porous electrode volume,

stirring the porous electrode at a frequency of between 0.1 and 10 Hz with an amplitude of between 1 and 10 cm, and

wherein metal ions contained in the electrolyte are reduced when contacting the porous stirring electrode, said porous stirring electrode being coated with metal ions reduced during an electrochemical reaction.

5,464,507

PROCESS FOR THE ELECTROLYTIC DEPOSITION OF METALS

Oronzio de Nora; Antonio Nidola; Ulderico Nevosi, and Carlo Traini, all of Milan, Italy, assignors to De Nora Permelec S.p.A., Italy

Continuation of Ser. No. 25,969, Mar. 3, 1993, abandoned, which is a division of Ser. No. 839,114, Feb. 20, 1992, abandoned. This application Aug. 25, 1994, Ser. No. 296,090

Claims priority, application Italy, Feb. 26, 1991, 91000479; Feb. 28, 1991, 91000514; Mar. 1, 1991, 91000550

Int. Cl.[6] C25C *1/22;1/14;1/18*

U.S. Cl. 204—105 R **9 Claims**

1. A process for the electrolytic recovery of metals from solutions containing metal ions and fluorides or anionic fluorocomplexes carried out in diaphragmless cells, said process comprising the steps of metal deposition from said metal ions and oxygen evolution characterized in that the said oxygen evolution takes place at ceramic insoluble anodes which resist the aggressive action of said solutions, said anodes being made of sinterized powders of tin dioxide doped with copper oxide and antimony oxide or copper oxide and chromium oxide or copper oxide and praseodymium oxide.

5,464,508

PREPARATION OF 4-DIALKOXYMETHYLPYRAZOLES

Dieter Hermeling, Frankenthal; Hartmann Koenig, Limburgerhof, and Norbert Goetz, Worms, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

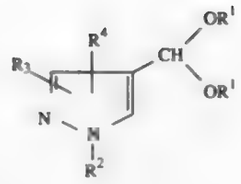
Filed Jul. 27, 1993, Ser. No. 97,116

Claims priority, application Germany, Jul. 29, 1992, 42 25 053.6

Int. Cl.[6] C25B *3/02*

U.S. Cl. 204—78 **3 Claims**

1. A process for preparing 4-dialkoxymethylpyrazoles of the formula I



I

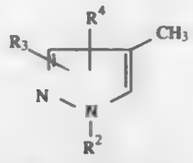
where

R^1 is n-alkyl,

R^2 is a hydrocarbon radical,

R^3 and R^4 are each hydrogen, a hydrocarbon radical, cyano, halogen or alkoxycarbonyl,

which comprises electrochemical oxidation of a 4-methylpyrazole of the formula II



II

in the presence of an alkanol R^1—OH.

5,464,509

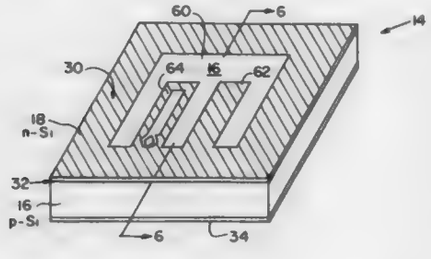
P-N JUNCTION ETCH-STOP TECHNIQUE FOR ELECTROCHEMICAL ETCHING OF SEMICONDUCTORS

Richard Micak, Somerville, and Harry L. Tuller, Wellesley, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 20, 1994, Ser. No. 246,762

Int. Cl.[6] C25F *3/12;3/14*

U.S. Cl. 204—129.3 **33 Claims**



1. An electrochemical etching process comprising:

forming an n-type region on a p-type indirect band gap semiconductor substrate, a p-n junction separating the n-type region from the D-type substrate, at least portions of the n-type region being provided with means for inhibiting injection of holes from the p-type substrate through said portions of the n-type region; and

exposing the n-type region and p-type substrate to an electrochemical etchant with an electrical bias supplied between the p-type substrate and etchant such that the p-type substrate is selectively etched with substantially no etching of said portions of the n-type region, the electrical bias forward biasing the p-n function.

5,464,510

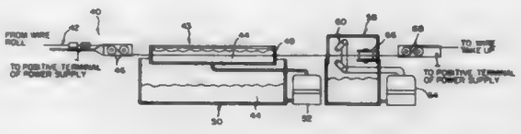
METHOD FOR REMOVAL OF CERTAIN OXIDE FILMS FROM METAL SURFACES

Klaus H. Oehr, Surrey; Richard R. Timewell, Vancouver; Harvey Donahue; Brenda Hoy, both of New Westminster; Ronald Kim, and Reinhold C. Roth, both of Vancouver, all of, Canada, assignors to Dynamotive Corporation, Vancouver, Canada

Continuation-in-part of Ser. No. 95,689, Jul. 21, 1993, Pat. No. 5,407,544. This application Jun. 28, 1994, Ser. No. 266,673

Int. Cl.[6] C25F *1/00*

U.S. Cl. 204—141.5 **29 Claims**



1. A method for removing oxide films from a metal member, comprising the steps of:

applying thermal stress to an oxide film-covered metal member in such a manner as to establish a temperature gradient between the oxide film and the metal member;

applying stress to the metal member so as to rupture the oxide film thereon approximately to the surface of the metal member;

moving the metal member through an electrolysis cell bath having two spaced electrodes, wherein the metal member forms one electrode in the electrolysis cell bath; and

applying a pulsating DC signal to the one electrode and to the other electrode in the electrolysis cell bath, wherein the oxide on the metal member is sufficiently ruptured that the pulsating DC signal flows through the rupture areas to the metal member, maintaining the metal member electrode in a state of depassivation such that no oxygen is produced therefrom, and loosening the oxide film from the metal member, so that the oxide film can be readily removed from the metal member.

5,464,511

CHALCOGENIDE ION SELECTIVE ELECTRODES

Yuri G. Vlasov, Budapestskaja ul 98, k 1, kv305, St. Petersburg 192281, Russian Federation, and Yeugeni A. Bychkov, Max-Planck-Str. 7, 76344 Leopoldshaten, Germany

Division of Ser. No. 157,950, Nov. 24, 1993, Pat. No. 5,366,936. This application Aug. 31, 1994, Ser. No. 298,765

Int. Cl.[6] G01N *27/26*

U.S. Cl. 204—153.1 **8 Claims**

1. A method for detecting the concentration of a specific ion in solution, said method comprising measuring the concentration of said ion in solution by contacting the solution with a sensing element that is selective for said specific ion, said sensing element comprising a vitreous chalcogenide membrane characterized by a modified surface layer of thickness generally ranging from about 20 to 200 nm when place in contact with said solution, said modified surface layer exhibiting an ionic conductivity ranging from 10^{-7} to 10^{-2} S/cm, a diffusion coefficient ranging from 10^{-11} to 10^{-6} cm^2/s and having a ratio electronic to ionic conductivity no greater than 1.0.

5,464,512

METHOD OF URANIUM ISOTOPE ENRICHMENT BY UTILIZING A PHOTOCHEMICALLY SELECTIVE EFFECT

Yu Yokoyama, Takarazuka, and Souichi Sato, Katsuta, both of, Japan, assignors to Doryokuro Kakunenryo Kiahatsu Jigyodan, Tokyo, Japan

Filed Apr. 6, 1994, Ser. No. 223,060
Claims priority, application Japan, Apr. 15, 1993, 5-088372
Int. Cl.[6] B01D 5/00
U.S. Cl. 204—157.2 6 Claims

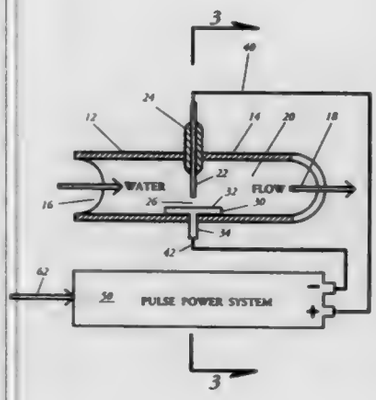
1. A method of uranium isotope enrichment which comprises providing a uranyl carboxylate compound in which the carboxylate has at least one oxygen-containing substituent, placing a powder of the uranyl carboxylate compound in a magnetic field, irradiating the powder for an effective period of time with light having a broad band spectrum of visible or shorter wavelength capable of being absorbed by a uranyl ion in the uranyl carboxylate compound to form reduction products containing the uranyl ion, and separating the reduction products containing the uranyl ion from unreacted uranyl carboxylate compound by fractionation to isolate a fraction enriched with ^{235}U isotope.

5,464,513

METHOD AND APPARATUS FOR WATER CONTAMINATION USING ELECTRICAL DISCHARGE

Vyacheslav L. Goriachev; Alexander N. Bratsev; Valeri N. Vasilkovich; Philip G. Rutberg, all of St. Petersburg, Russian Federation; Hugh W. Greene, Somerville, and Paul E. Sexton, Jr., Decatur, both of Ala., assignors to Scientific Application, Inc., Decatur, Ala.

Filed Jan. 11, 1994, Ser. No. 180,961
Int. Cl.[6] C02F 1/46
U.S. Cl. 204—164 5 Claims



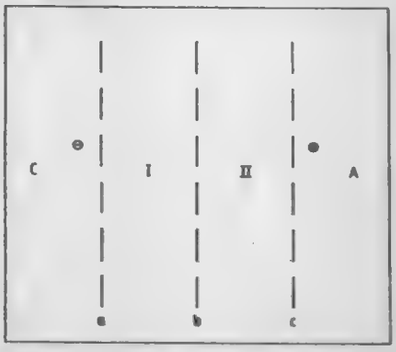
1. A method of water purification comprising the steps of:
a. directing the water to be purified through a decontamination module; and
b. generating by a pulse power unit means an electric discharge arc within said decontamination module, said pulse power unit means comprising a semiconductor switch, a discharge capacitor, and a pulse transformer having an input and output;
c. operating said semiconductor switch and said discharge capacitor at an applied operating voltage and using said semiconductor switch to discharge said discharge capacitor to produce an pulse input signal at said input of said pulse transformer, thereby generating a pulse output signal at said output of said pulse transformer, the applied operating voltage being from 375 to 3500 volts, the pulse input signal being from 375 to 3500 volts to give the pulse output signal having a peak voltage of 10,000 volts to 50,000 volts.

5,464,514

METHOD FOR SEPARATING ORGANIC SUBSTANCES

Henk Pluim, and Jan G. Kraaijenbrink, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Continuation of Ser. No. 968,268, Oct. 30, 1992, abandoned, which is a continuation of Ser. No. 703,098, May 22, 1991, abandoned. This application Feb. 2, 1994, Ser. No. 190,563
Claims priority, application European Pat. Off., May 25, 1990, 90201337
Int. Cl.[6] B01D 61/48;61/44
U.S. Cl. 204—182.4 8 Claims



1. Method for separation of at least one sugar from a mixture of two or more organic substances, of which at least two are sugars, in an initial concentration ratio, which mixture also contains a weak acid capable of reversibly forming a complex with at least one of the organic substances in the mixture, employing an electrodialysis equipment consisting of at least two electrode compartments wherein electrodes are placed and which are separated by at least one main compartment, said at least one main compartment having an inlet and an outlet, wherein said electrode compartments and said main compartments are separated by ion selective membranes, and wherein an electric potential difference is maintained between the electrodes comprising

reversibly forming a complex of the weak acid and at least one of the organic substances in the mixture, leading said mixture into the inlet of said main compartment, and conducting electrodialysis on said mixture in the presence of a macromolecular charged substance, withdrawing the altered mixture from the outlet of said main compartment and leading the mixture back into said inlet until the mixture contains said at least one sugar in a ratio different from the initial concentration ratio.

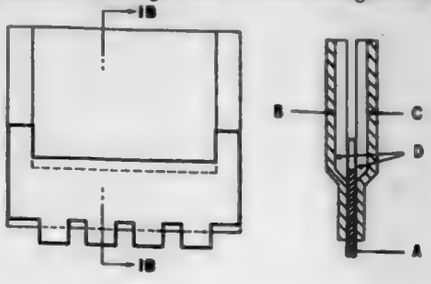
5,464,515

APPARATUS FOR THE APPLICATION OF BIOLOGICAL SAMPLES TO AN ELECTROPHORETIC SLAB SUPPORT

Franck Bellon, Longjumeau, France, assignor to Sebia, A Corp. of France, Issy Les Moulineaux, France

Continuation of Ser. No. 811,174, Dec. 19, 1991, abandoned. This application Jun. 4, 1993, Ser. No. 72,866
Claims priority, application France, Jan. 4, 1991, 91 00092
Int. Cl.[6] G01N 27/26;27/447
U.S. Cl. 204—182.8 25 Claims

1. Procedure for loading of one or several biological samples on



an electrophoretic slab support, comprising the steps of:

loading the one or several biological samples onto one or more projecting elements made of porous material and joined to an edge of a planar porous membrane and as an extension in a same plane of said planar porous membrane, the loading of the one or several biological samples being performed at a free end of the one or more projecting elements, the one or more projecting elements being such that they all have at least one point capable of being placed in contact with a planar surface of the electrophoretic slab support, different points being simultaneously placed in contact with the planar surface of the electrophoretic slab support as a result of an alignment, when the planar porous membrane is arranged in an inclined or perpendicular plane with respect to the planar surface of the electrophoretic slab support,

wherein at least a part of the planar porous membrane is attached to a stiffening support,

wherein diffusion of the one or several biological samples from the free end of the one or more projecting elements towards the planar porous membrane is avoided with an aid of agents for humidification of the one or more projecting elements, the agents comprising a humidification liquid which, as a consequence of an evaporation of liquid from the one or several biological samples, creates a flux from the planar porous membrane towards the free end of the one or more projecting elements and forces the one or several biological samples towards the free end of the one or more projecting elements, and which concentrates the one or several biological samples at the free end, the agents comprising a spongy material attached in a removable or irremovable manner to the planar porous membrane or to the stiffening support or a reservoir attached in a removable or irremovable manner to the stiffening support; and

placing in contact the one or more projecting elements of the planar porous membrane, a part of which is attached to the stiffening support with the electrophoretic slab support in order to cause diffusion of the one or several biological samples from the one or more projecting elements onto the electrophoretic slab support and to thus load the one or several biological samples onto the electrophoretic slab support.

5,464,516

PROCESS FOR PRODUCING AN ELECTROPHORESIS SEPARATION LAYER

Hisao Takeda, Kenagawa; Youichi Koshiji, Kanagawa; Hidehiro Kubota, Kanagawa, and Takashi Iizuka, Kanagawa, all of, Japan, assignors to Hymo Corporation, and Atto Corporation, both of Tokyo, Japan

Continuation-in-part of Ser. No. 868,439, Apr. 15, 1992, abandoned. This application May 2, 1994, Ser. No. 235,934

Int. Cl.[6] C25B *9/00*; H01B *1/00*

U.S. Cl. 204—182.9 **9 Claims**

1. A process for producing an electrophoresis separation layer consisting of a polyacrylamide gel and an electrolytic solution suitable for use in electrophoresis, wherein said electrolytic solution is an aqueous solution consisting essentially of an acid, amine and an ampholyte that has the same number of anionic groups and cationic groups in each single molecule as an electrophoresis cathodic electrode solution, which process consists essentially of:

polymerizing acrylamide in the presence of a crosslinking agent, water, an electrolytic solution for the polyacrylamide gel and a polymerization initiating means;

wherein the electrolytic solution in said polyacrylamide gel is an aqueous solution consisting essentially of an acid, an amine and an ampholyte,

wherein the pH of the electrolytic solution in said polyacrylamide gel ranges from 4 to 7.5,

said acid to be used in the electrolytic solution in the polyacrylamide gel is selected from the group consisting of monobasic acids and mixtures thereof,

said ampholyte that is to be used for controlling the potential gradient of the electrolytic solution in the polyacrylamide gel satisfies the following characteristics (a) and (b):

(a) the ampholyte has the same number of anionic groups and cationic groups in each single molecule, and

(b) the ampholyte has a pKa value in the electrolytic solution in the polyacrylamide gel of no more than the pKa of the ampholyte in an electrophoresis electrode solution on the cathode side of the polyacrylamide gel,

the ratio of the amine to the acid contained in the electrolytic solution in said polyacrylamide gel ranges from 1:0.6 to 1:1 part by gram equivalent; the ratio of the acid to the ampholyte contained therein ranges from 1:0.5 to 1:4 parts by gram equivalent; and the pKa value of said amine ranges from 8 to 8.5, the pKa value of said ampholyte ranges from 7 to 11, the pKa value of said acid is no more than 5; and

connecting said electrophoresis separation layer to electrodes.

5,464,517

ELECTROPHORESIS IN LOW CONDUCTIVITY BUFFERS

Stellan Hjertén, and Jia-Li Liao, both of Uppsala, Sweden, assignors to Bio-Rad Laboratories, Hercules, Calif.

Filed Jan. 30, 1995, Ser. No. 380,425

Int. Cl.[6] G01N *27/26;27/447*

U.S. Cl. 204—183.2 **26 Claims**

1. A method for electrophoretically separating solutes in a mixture thereof, said method comprising:

(a) injecting an aliquot of said mixture into an electrophoretic separation

medium saturated with a buffer solution having a conductivity of less than about 25×10^{-5} $ohm^{-1}cm^{-1}$;

(b) imposing across said medium a voltage of at least about 300 volts per cm of medium length to cause solutes in said aliquot to migrate electrophoretically along said medium while separating into substantially discrete zones; and

(c) detecting said zones as a means of identifying said solutes.

5,464,518

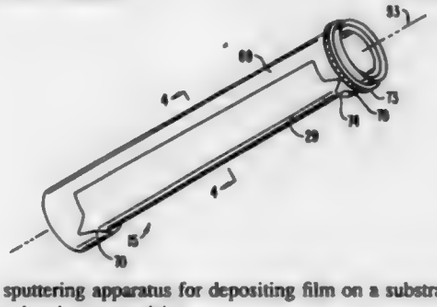
CYLINDRICAL MAGNETRON SHIELD STRUCTURE

Peter A. Sieck, Santa Rosa, and John R. Porter, Napa, both of Calif., assignors to The BOC Group, Inc., New Providence, N.J.

Continuation of Ser. No. 4,964, Jan. 15, 1993, abandoned. This application Sep. 19, 1994, Ser. No. 308,828

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—192.12 **30 Claims**



1. A sputtering apparatus for depositing film on a substrate in a vacuum chamber, comprising:

a magnetron including therein at least one target structure with an outer cylindrically-shaped surface of sputtering material;

first and second support structures holding said target structure at opposite ends thereof such that said target structure is rotatable about its longitudinal axis;

a magnet assembly within said target structure that provides a magnetic field zone extending along a length of said sputtering material surface and extending a circumferential distance therearound;

first and second cylindrical shields, said shields carried at opposite ends of said target structure by said first and second support structures and extended axially along said sputtering material surface to substantially cover the ends of said sputtering material surface, said first shield having an inner edge closest to said second shield and said second shield having an inner edge closest to said first shield;

said inner edges being non-rectangularly shaped to conform substantially to a shape of a pattern of condensation of vaporized material on said target structure which forms when said target structure is held stationary; and

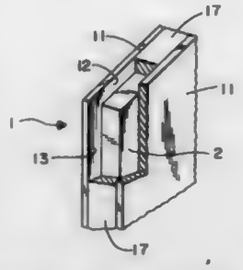
said inner edges being positioned to shield regions where condensation of vaporized material on said target structure would otherwise occur at a rate which exceeds a rate at which deposited condensate is removed from said target structure by sputtering.

5,464,519

REFURBISHED ELECTRODE HAVING AN INNER PLATE AND OUTER ENVELOPE ELECTRODE

Charles P. Tomba, Painesville; Joseph J. Scarpucci, and Andy W. Getzy, both of Eastlake, all of Ohio, assignors to ELTECH Systems Corporation, Chardon, Ohio

Filed Dec. 2, 1993, Ser. No. 160,632
Int. Cl.[6] C25B *11/02;11/10*
U.S. Cl. 204—280 **32 Claims**



1. A refurbished electrode comprising inner and outer titanium members of an at least substantially flat, used inner titanium plate member having front and back major faces and an edge, a new outer titanium envelope member tightly encasing said inner titanium plate member on at least the front and back major faces thereof, while in contact with said inner titanium plate member to pass electrical current between said inner titanium member and said outer titanium member, and a coating on an outer surface of said outer titanium member.

5,464,520

SILICIDE TARGETS FOR SPUTTERING AND METHOD OF MANUFACTURING THE SAME

Osamu Kano; Koichi Yasui; Yasuyuki Sato; Yasuhiro Yamakoshi; Junichi Anan; Hironori Wada, and Akio Yasuoka, all of Kitaibaraki, Japan, assignors to Japan Energy Corporation, Tokyo, Japan

Filed Jul. 19, 1993, Ser. No. 94,283
Claims priority, application Japan, Mar. 19, 1993, 5-083941; Apr. 16, 1993, 5-112517
Int. Cl.[6] C23C *14/34;* **C22C** *29/00;32/00*
U.S. Cl. 204—298.13 **4 Claims**

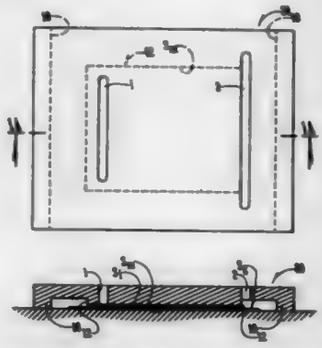
1. A silicide target for sputtering, where the target has a surface and the surface has at least one area comprising silicon phase, and an area ratio of silicon phases defined as the ratio of the total area of the surface silicon phases to the total area of the silicide target, said target characterized in that the area ratio of silicon phases that appears on the sputter surface is 23% or less, the number of coarse silicon phases 10 μm or larger in diameter that appear on the sputter surface is no more than 10 per square millimeter, the density is 99% or more, a deformed layer on the surface is partly removed, and the surface roughness, R_a, is 0.05 μm<R_a≦1 μm.

5,464,521

DEVICE PERMITTING THE SPREADING OF ONE OR SEVERAL REAGENTS ON A GEL

Franck Bellon, Longjumeau, France, assignor to Sebia, France

Continuation of Ser. No. 904,377, Jun. 25, 1992, Pat. No. 5,403,456. This application Aug. 19, 1994, Ser. No. 293,394
Claims priority, application France, Jun. 28, 1991, 91 08122
Int. Cl.[6] G01N *27/26;27/447*
U.S. Cl. 204—299 R **24 Claims**



1. The combination of a gel and a rigid mask constituting a gel/mask set for deposition, spreading and incubation of one or more liquid reagents on the gel, said gel/mask set comprising:

a gel layer Sg having an incubation surface area Si thereon;

a rigid mask having an upper surface and having a lower surface positioned opposite the gel layer Sg, the distance separating the lower surface of the rigid mask and the upper surface of the rigid mask constituting the thickness of the rigid mask; the lower surface of the rigid mask having a surface area Sm devoid of any surface irregularity capable of being an obstacle to spreading of the liquid reagents across the surface area Sm by capillarity;

at least one orifice intersecting the surface area Sm for permitting deposition and spreading of the liquid reagents on the incubation surface area Si on the gel layer Sg, the orifice extending through the thickness of the rigid mask;

at least one slit extending through the thickness of the rigid mask for permitting withdrawal of any liquid reagent present on the incubation surface Si of the gel layer Sg after incubation, the slit intersecting the surface area Sm and being generally aligned with the incubation surface area Si;

the surface area Sm being delimited with respect to the rest of the lower surface so that the liquid reagents can only spread on the incubation surface area Si of the gel layer Sg that is a projection of surface area Sm; and

means disposed between the rigid mask and the gel layer Sg for positioning the rigid mask with respect to the gel layer Sg such that a minimum distance of at least 0.1 mm is maintained between the gel layer Sg and the surface area Sm.

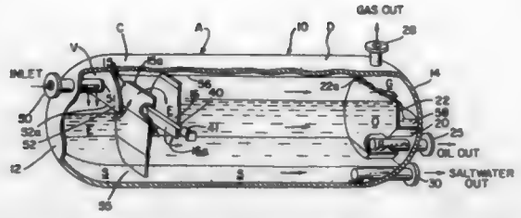
5,464,522

ELECTROSTATIC OIL EMULSION TREATING METHOD AND APPARATUS

Jerry MacEdmondson, 510 Canal St., Newport Beach, Calif. 92663

Filed Nov. 23, 1992, Ser. No. 980,587
Int. Cl.[6] C10G *33/02*
U.S. Cl. 204—302 **4 Claims**

4. In an apparatus for separating an oil emulsion containing a mixture of gas vapor, oil and saltwater into its components, including a generally horizontal elongate metal tank having an interior with a top and a bottom and constructed and arranged for a



substantially longitudinal flow therethrough from an upstream fluid inlet to separate downstream outlets for gas vapor, oil and saltwater, the combination of:

a first means for separating gas vapor and free saltwater from the mixture;

a second means, disposed downstream from the fluid inlet and away from said first means, for applying high potential electric energy to said oil emulsion so as to cause the coalescence of drops of saltwater in said oil emulsion into larger drops; said second means being configured so as to cause said oil emulsion to flow in a downward direction, from said top toward said bottom of said interior, as said high potential electrical energy is applied;

a third means disposed downstream of said second means to permit the larger drops of salt water to separate from the oil; and

said generally horizontal elongate metal tank having an inlet and separate downstream gas vapor, oil and saltwater outlets, fluidly connected to said interior; a plurality of bulkheads defining a first, upstream gas vapor separation and free saltwater separation compartment and a second, downstream coalescing and saltwater separation compartment; fluid distribution and diffusion means disposed in said first upstream compartment including a gas entrapment means for entrapping gas vapor in such a manner as to cause a slight increase in pressure of said entrapped gas vapor and to cause said entrapped gas vapor flowed though a portion of said oil emulsion into said second, downstream coalescing and saltwater separation compartment; a high voltage electrode positioned transverse to said flow of said oil emulsion along said generally horizontal elongate metal tank from said inlet to said outlets, between a pair of electrically grounded metal bulkheads, in said second, downstream coalescing and saltwater separation compartment; said pair of electrically grounded metal bulkheads causing said oil emulsion to flow in a downward direction, from said top toward said bottom of said interior, as said oil emulsion receives said electric charge.

5,464,523

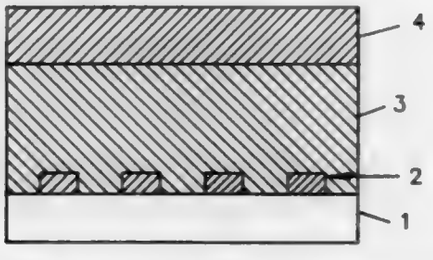
SENSORS FOR SULFUR ACTIVITY MEASUREMENTS

Trikur A. Ramanarayanan, Somerset; Vinod K. Pareek, Flemington; James D. Mumford, III, Long Valley, and Horst Witzke, Flemington, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 64,262, May 20, 1993, abandoned. This application May 18, 1994, Ser. No. 245,341

Int. Cl.[6] **G01N** *27/26;27/407*

U.S. Cl. 204—424 **6 Claims**



1. A sensor for determining the sulfur activity in an environment comprising:

(a) a non-stoichiometric semi-conducting metal sulfide, $M_{\alpha-x}S$, whose p-type or n-type conductivity varies with sulfur activity, where M is the metal and α is the stoichiometric constant, and x is the deviation from that constant and where the maximum value of x is between 0.002 and 0.5;

(b) electrodes attached to said sulfide; and

(c) means for measuring the p-type or n-type conductivity of said sulfide and correlating said conductivity with the sulfur activity.

5,464,524

PLATING METHOD FOR A NICKEL-TITANIUM ALLOY MEMBER

Yoshiaki Ogiwara; Masaki Yasuharn, and Akira Matsuda, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1994, Ser. No. 297,600

Claims priority, application Japan, Sep. 17, 1993, 5-231581

Int. Cl.[6] **C25D** *5/14;5/38;5/40*

U.S. Cl. 205—170 **13 Claims**

1. A plating method for a nickel-titanium alloy member, comprising the steps of:

subjecting a nickel-titanium alloy member to an anodic electrolyzing treatment at a current density of 1 to 20 A/dm^2 for about 1 to 10 minutes; and a cathodic electrolyzing treatment at a current density of 1 to 20 A/dm^2 for about 1 to 10 minutes in succession using an electrolyte containing chloride ions at a concentration of 0.1 mol/liter or more and a pH of 2 or less, or at a concentration of 0.4 mol/liter or more as an essential component thereof;

strike plating the treated nickel-titanium alloy member with a desired metal; and

electroplating the struck nickel-titanium alloy member with a desired metal.

5,464,525

HIGH TEMPERATURE CORROSION INHIBITOR

James G. Edmonson, Conroe, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Dec. 13, 1994, Ser. No. 354,692

Int. Cl.[6] **C10G** *9/16*

U.S. Cl. 208—47 **4 Claims**

1. A method for inhibiting the naphthenic acid-induced corrosion of the internal metallic surfaces of the equipment used in the processing of crude oil or high temperature petroleum distillates between about 350° and 790° F. comprising adding to the crude oil or high temperature petroleum distillates a corrosion inhibiting amount of a mercaptotriazine compound.

5,464,526

HYDROCRACKING PROCESS IN WHICH THE BUILDUP OF POLYNUCLEAR AROMATICS IS CONTROLLED

Dennis L. Saunders, Yorba Linda, Calif., assignor to UOP, Des Plaines, Ill.

Filed May 27, 1994, Ser. No. 250,023

Int. Cl.[6] **C10G** *67/06;47/00;25/03*

U.S. Cl. 208—108 **26 Claims**

1. A hydrocracking process which comprises:

(a) contacting a hydrocarbon feedstock in a hydrocracking zone with a hydrocracking catalyst in the presence of hydrogen under hydrocracking conditions to produce a hydrocracking product of lower average boiling point, said hydrocracking product containing polynuclear aromatic compounds;

(b) contacting at least a portion of said hydrocracking product with a composition comprising an acid contained in the pores of a porous, solid support under conditions such that at least a portion of said polynuclear aromatic compounds are removed from said product; and

(c) withdrawing a hydrocarbon effluent from step (b) having a reduced concentration of polynuclear aromatic compounds.

5,464,527

HYDROCRACKING PROCESS FOR PRODUCING MIDDLE DISTILLATES

John W. Ward, Yorba Linda, Calif., assignor to UOP, Des Plaines, Ill.

Continuation of Ser. No. 888,543, May 22, 1992, abandoned. This application Jun. 3, 1994, Ser. No. 253,622
Int. Cl.[6] C10G 47/20; B01J 29/10
U.S. Cl. 208—111 31 Claims

1. A hydrocracking process for selectively producing middle distillate products which comprises contacting a hydrocarbon feedstock with a hydrocracking catalyst under hydrocracking conditions in the presence of hydrogen so as to produce a product of lower average boiling point, said catalyst comprising:

(a) one or more hydrogenation components; and

(b) a rare earth-exchanged Y zeolite comprising at least 2 wt. % rare earth and having a unit cell size of 24.35 angstroms or below and a water vapor sorptive capacity less than about 10 weight percent at 25° C. and a p/p_o value of 0.10, wherein said rare earth-exchanged Y zeolite is prepared by exchanging a Y zeolite having a unit cell size of 24.35 angstroms or below with rare earth-containing cations, and said Y zeolite contains less than 0.5 weight percent sodium, calculated as Na_2O, prior to said rare earth exchange.

5,464,528

FCC PROCESS AND APPARATUS WITH UPSET TOLERANT THIRD STAGE SEPARATOR

Hartley Owen, Worton, Md., and Paul H. Schipper, Doylestown, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 30, 1993, Ser. No. 175,864
Int. Cl.[6] C10G 11/18
U.S. Cl. 208—161 9 Claims

1. A fluidized catalytic cracking process wherein a heavy feed is catalytically cracked to lighter products comprising:

cracking said feed with a stream of regenerated cracking catalyst having an average particle size within the range of 60–80 microns in a cracking reactor to produce lighter products and spent catalyst;

separating products from spent catalyst;

stripping spent catalyst with steam to produce stripped catalyst;

regenerating said stripped catalyst in a catalyst regeneration means by contact with an oxygen containing gas to produce regenerated catalyst and flue gas containing entrained catalyst and fines;

recycling to said cracking reactor said regenerated cracking catalyst;

recovering entrained catalyst from flue gas by passing said flue gas through at least one stage of cyclone separation to produce a regenerator flue gas which is essentially free of entrained catalyst having a particle size greater than 20 microns but containing entrained catalyst fines comprising micron and submicron sized particles;

separating entrained fines from said produced regenerator flue gas containing fines comprising micron and submicron catalyst particles by inertial separation and filtration in a single separator vessel having:

vertical cylindrical sidewalls, a diameter, a vertical axis, a top and a base; and a vertical cylindrical insert within said vessel having an insert diameter, a top, a bottom, and a vertical axis aligned with said vessel vertical axis and wherein the insert diameter is smaller than the vessel diameter, said insert forming an annulus between said insert and said cylindrical sidewalls of said vessel;

at least one tangential vapor inlet for said produced regenerator flue gas passing through said vessel cylindrical sidewalls into said annulus at an elevation between said top and said base of said cylindrical insert;

a vapor overflow opening between the top of said insert and the top of said vessel for radial out-to-in vapor flow from said annulus into an upper, interior portion of said vessel;

a solids underflow opening between the bottom of said insert and the bottom of said vessel for discharge of solids from said annulus into said bottom portion of said vessel;

a plurality of filtration means within said vessel and within said insert, said filtration means having an interior portion and a porous outer surface at least partially beneath said upper, interior portion of said vessel and said top of said insert for downflow of vapor from said overflow opening past said outer surface of said filtration means;

a vapor outlet for vapor with a reduced solids content connective with said interior portion of said filtration means and passing through said vessel; and

a solids outlet in said base portion of said vessel

inertially separating said produced regenerator flue gas by tangential entry into said annulus to produce:

a solids underflow stream which is discharged down from said annulus via said solids underflow opening; and

a vapor with a reduced content of particulates relative to vapor added by said tangential entry, which is discharged up from said annulus and over said insert; and

filtering said vapor with a reduced content of particulates by contact with said outer surface of said filtration means to produce:

a clean flue gas stream which is withdrawn from said interior portion of said filtration means; and a layer of filtered particulates which builds up on said outer surface of said filtration means; and at least periodically dislodging said layer of particulates from said filters into said base portion of said vessel;

at least periodically removing inertially separated solids and solids dislodged from said filtration means from said base portion of said vessel; and

removing said clean flue gas stream from said vessel via said vapor outlet for vapor with a reduced solids content connective with said interior portion of said filtration means and passing through said vessel.

5,464,529

APPARATUS AND METHOD FOR SEPARATION OF LIQUIDS

Andrew F. Kozak, III, Media, Pa., assignor to Triton Environmental Corporation, Lancaster, Pa.

Continuation-in-part of Ser. No. 975,613, Nov. 19, 1992, Pat. No. 5,304,303, which is a continuation-in-part of Ser. No. 816,126, Dec. 31, 1991, abandoned. This application Sep. 9, 1993, Ser. No. 119,352
Int. Cl.[6] C02F 1/40
U.S. Cl. 210—104 14 Claims

1. A system for separating two liquids having different specific gravities which comprises:

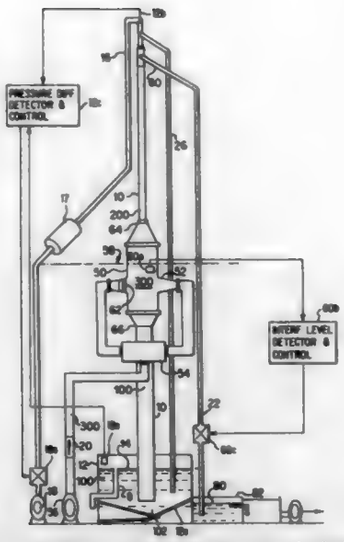
a substantially vertical tube whose lower end communicates only with a liquid having substantially the higher specific gravity of said two liquids to be separated and exposed to a first pressure;

means for establishing and maintaining in the top of said tube a second pressure which is substantially lower than said first pressure;

means for controlling the difference between said first and second pressures so as to define a level within said tube below which separated liquid of the higher specific gravity will be supported and above which separated liquid of the lower specific gravity will be supported by said pressure difference;

means for jointly introducing said liquids to be separated into said tube in the vicinity of said defined level; and

means for withdrawing said higher specific gravity liquid near the bottom and said lower specific gravity liquid near the top of the tube, while preserving said pressure difference,



said pressure difference controlling means including pressure sensors at the top and bottom of said tube, and means for responding to said sensors to maintain said pressure difference substantially constant.

5,464,530

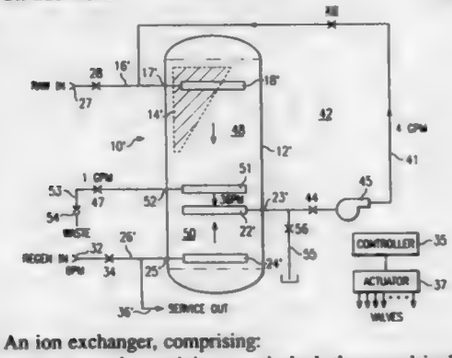
ION EXCHANGE METHODS AND SYSTEMS INCORPORATING REGENERANT RECYCLING

Lewis E. Stivers, 920 Westbrook Dr., Plano, Tex. 75075

Filed Dec. 8, 1993, Ser. No. 163,649

Int. Cl.[6] C02F 1/42

U.S. Cl. 210—141 **6 Claims**



1. An ion exchanger, comprising:

a pressure vessel containing a resin bed, the vessel including a first port defining means for supplying water to be treated to the vessel during a production cycle and for supplying recycled regenerant to the vessel during a regenerant cycle, a second port defining means for removing treated water from the vessel during the production cycle and for supplying regenerant to the vessel during a regenerant cycle, a third port located intermediate of the first and second ports, said third port defining means for supplying recycled regenerant, and a fourth port located intermediate of the first and third ports, said fourth port defining means for draining collected regenerant;

an upper in-bed distributor located in the vessel and connected to the fourth port and defining means for collecting regenerant to be drained from the vessel;

a lower in-bed distributor located below the upper in-bed distributor and connected to the third port and defining means for collecting regenerant to be recycled to the first port;

a first fluid conduit connecting the third port and the first port;

a second fluid conduit connecting the fourth port to a drain; and

pump means supported in the first fluid conduit for pumping collected regenerant from the third port to the first port and for performing, during the regenerant cycle, substantially cocurrent operation relative to the production cycle feed flow in the portion of the vessel located between the first port and the upper in-bed distributor and in the portion of the vessel located between the upper in-bed distributor and the lower in-bed distributor, and including means for performing substantially countercurrent operation relative to the production cycle feed flow in the portion of the vessel located between the lower in-bed distributor and the second port.

5,464,531

PORTABLE WATER PURIFICATION SYSTEM

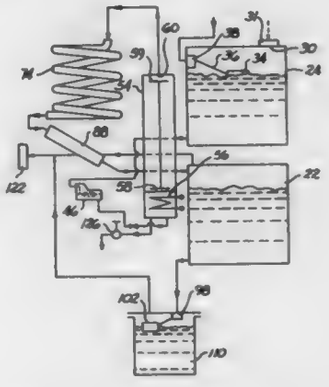
Ralph G. Greene, Dalton, Ga., assignor to Market Design & Development, Inc., Dalton, Ga.

Continuation-in-part of Ser. No. 902,703, Jun. 23, 1992, Pat. No. 5,281,309. This application Oct. 14, 1993, Ser. No. 136,449

The portion of the term of this patent subsequent to Jan. 25, 2011, has been disclaimed.

Int. Cl.[6] B01D 3/42

U.S. Cl. 202—181 **9 Claims**



1. Water purification apparatus positionable upon an existing water dispenser having an open top water reservoir, said apparatus comprising a housing including a base at the bottom of said housing, a feedwater tank for receiving water to be purified, an upstanding boiler having an electrical heating element disposed therein adjacent a lower end for boiling water, a water level control tank communicating said feedwater tank to said boiler, means for mounting said feedwater tank relative to said control tank such that when water within said feedwater tank is above a predetermined level there is water in said control tank, valve control means in said control tank for controlling the level of water therein from exceeding a predetermined level, means for mounting said control tank at an elevation wherein said predetermined level is above said heating element, whereby said heating element is submerged in water in said boiler, a condenser for receiving steam from said boiler and for condensing said steam to form distilled water, a distillate tank, means communicating said condenser with said distillate tank for supplying distilled water to said distillate tank, said distillate tank having a water outlet, a port opening downwardly through said base, means for communicating said outlet with said port, float valve means including a valve disposed for opening and closing communication between said port and said outlet, and said valve means including a float for controlling said valve disposed at an elevation below said base for receipt within said water reservoir for opening and closing said valve in response to water within said reservoir when said apparatus is positioned upon said dispenser.

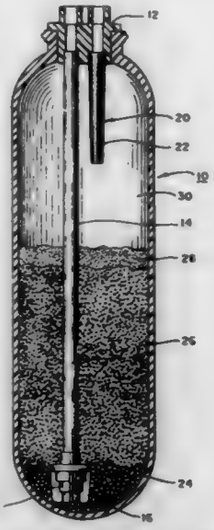
5,464,532
WATER SOFTENER WITH RESIN BEADS OF DIFFERENT MESH SIZES

Duane Nowlin, New Brighton, and Bruce Gillett, Marine on the St. Croix, both of Minn., assignors to Ecowater Systems, Inc., Woodbury, Minn.

Continuation of Ser. No. 266,415, Jun. 27, 1994, abandoned, which is a continuation of Ser. No. 139,328, Oct. 20, 1993, abandoned, which is a continuation of Ser. No. 8,051, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 775,216, Oct. 11, 1991, abandoned. This application Feb. 28, 1995, Ser. No. 396,096

Int. Cl.[6] **B01D** *24/02*; **C02F** *1/42*

U.S. Cl. 210—190 **4 Claims**



1. In a water softening system apparatus having a resin tank containing water softening mineral beads, the resin tank being connected to a hard water flow line, through which flows hard water containing dissolved and/or oxidized iron, a soft water distribution line extending from the resin tank and a regenerate tank in communication with the resin tank, said regeneration tank containing material for generation of a regenerant for intermittent regeneration of said water softening mineral beads, the improvement wherein said water softening mineral beads comprise,

a first quantity of water softening mineral beads of a first range of mesh sizes, said first quantity of water softening mineral beads of a first range of mesh sizes being primarily provided to remove dissolved and/or oxidized iron from the hard water

a second quantity of water softening mineral beads of a second range of mesh sizes, said second quantity of water softening mineral beads of a second range of mesh sizes being primarily provided to remove hardness from the hard water,

said first quantity of water softening mineral beads being placed on top of said second quantity of water softening mineral beads in said resin tank,

said first quantity of water softening mineral beads being of a finer mesh size than said second quantity of water softening mineral beads, with there being a greater amount of said second quantity of water softening mineral beads than of said first quantity of water softening mineral beads when measured by weight,

said hard water flow line being connected to said resin tank such that the hard water flows through said first and second quantities of water softening mineral beads from said top of said resin tank to said bottom of said resin tank, and said regenerate tank is in communication with said resin tank such that said regenerate passed through said first and second quantities of water softening mineral beads from the bottom to the top of said resin tank, such that said hard water and said regenerate have a counterflow pattern in said resin tank, wherein said hard water flows first through said first quantity of water softening mineral beads which is more efficient in removing iron from said hard water, and then through said second quantity of water softening mineral beads which is more efficient in removing hardness, and said regenerant flows through the harder to regenerate second quantity of water softening mineral beads before flowing through the easier to regenerate first quantity of water softening mineral beads, and the flow of regenerant first through said second quantity of water softening mineral beads causes said flow of regenerant into and through said first quantity of water softening mineral beads to be dispersed so as to reduce channeling of said flow through said first quantity of water softening mineral beads, and to more efficiently regenerate said first quantity of water softening mineral beads, such that the overall efficiency of regeneration is increased.

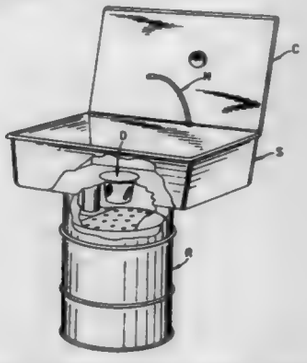
5,464,533
SOLVENT CLEANING SYSTEM WITH TWO STAGE FILTER

Evan E. Koslow, Weston, Conn., assignor to KX Industries, L.P., Orange, Conn.

Filed Apr. 29, 1993, Ser. No. 58,751

Int. Cl.[6] **B01D** *35/027*

U.S. Cl. 210—257.1 **13 Claims**



1. In a solvent cleaning system which includes a cleaning station, a drain leading from the cleaning station into a reservoir, and means for delivering a liquid solvent from said reservoir to said cleaning station, the improvement which comprises:

a housing positionable in said reservoir;

a two stage filter mounted within and spaced from said housing to form a first volume therebetween, said filter defining a substantially axial second volume therethrough;

a first fluid flow passage between said reservoir and one of said first and second volumes;

a positive displacement pump having an intake and a discharge mounted on said housing and forming an integral assembly therewith;

a second fluid flow passage interconnecting the other of said first and second volumes with said pump intake; and

means for connecting said pump discharge to said liquid solvent delivering means.

5,464,534
BLOOD FRACTIONATION SYSTEM AND METHOD

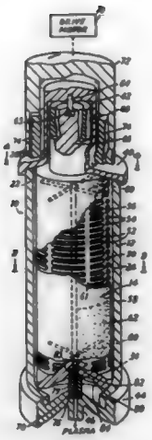
Halbert Fischel, Los Angeles, Calif., assignor to William F. McLaughlin, Newport Beach, Calif.

Continuation of Ser. No. 985,360, Dec. 2, 1992, abandoned, which is a continuation of Ser. No. 732,405, Jul. 18, 1991, abandoned, which is a division of Ser. No. 52,171, May 8, 1987, Pat. No. 5,034,135, which is a continuation of Ser. No. 449,470, Dec. 13, 1982, abandoned. This application Oct. 12, 1993, Ser. No. 135,135

Int. Cl.[6] **B01D** *61/22*

U.S. Cl. 210—321.68 **11 Claims**

1. A system for separating filtrate from a fluid suspension having at least one biological cellular component that is characterized by



having a nonrigid cell membrane free of a rigid outer cell wall, the cellular component being thereby subject to trauma when stressed, the system comprising:

a membrane separation device comprising

a separation chamber,

a cellular suspension input for conveying the cellular suspension into the chamber,

a microporous filter membrane in the chamber having pore openings sized to separate filtrate from the fluid suspension to leave within the chamber a concentrated suspension containing the at least one cellular component that is subject to trauma,

means rotating the membrane at a selected surface velocity to create movement of the fluid suspension within the chamber without substantial trauma to the cellular component for inducing transport of the cellular component from the membrane while the fluid suspension is transported to the membrane,

means for withdrawing the filtrate from the chamber through the rotating filter membrane, and

a cellular concentrate outlet for discharging the cellular suspension from the chamber, and

conduit means communication with the membrane separation device and a source of the cellular suspension and including

flexible input conduit means communicating with the cellular suspension inlet for conveying the cellular suspension from the source into the chamber of the membrane separation device,

flexible output conduit means communicating with the cellular concentrate outlet for conveying the remaining cellular matter from the membrane separation device, a portion of the flexible output conduit being symmetrically positioned opposite to a portion of the flexible input conduit means, and

a peristaltic pump having first and second oppositely spaced rollers symmetrically positioned between the opposite, symmetrically positioned portions of the input and output conduit means so that the first roller moves into and out of engagement with the flexible input conduit means portion concurrently as the second roller moves into and out of engagement with the flexible output conduit means portion, and so that the first roller then sequentially moves into and out of engagement with the flexible output conduit means portion concurrently as the second roller moves into and out of engagement with the flexible input conduit means portion, whereby pressure pulsations caused by the first and second rollers are synchronized to eliminate disparate pressure surges within the chamber of the membrane filtration device.

5,464,535

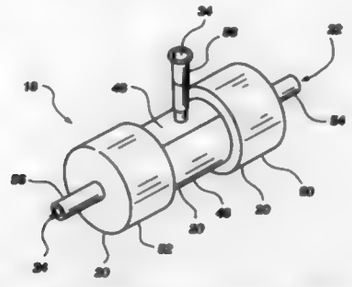
FILTER FOR ON-LINE PLASMA SAMPLING

Udipi R. Shettigar, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Jul. 18, 1988, Ser. No. 220,544

Int. Cl.[6] B01D *63/02*

U.S. Cl. 210—321.89 **1 Claim**



1. A filter for producing 1 to 2 ml per minute of diffusate consisting of:

a filter fiber bundle comprising hollow fibers having ends glued one to another to form a loose mid-portion, said hollow fibers having open ends through which a fluid may pass, said filter fiber bundle being placed within a housing and at least one of said hollow fibers having a semi-permeable portion in proximity of the loose mid-portion;

a sampling port communicating with the interior of said housing proximate said loose mid-portion of said filter fiber bundle;

an inlet arranged to direct fluid from outside said housing to contact the end of said filter fiber bundle and further arranged to pass the fluid into said open ends and through said hollow fibers; and

an outlet arranged to receive fluid passing through said hollow fibers to exterior said filter, whereby fluid directed through said inlet flows through the hollow fibers, and one to two milliliters of diffusate from the fluid passes through the semi-permeable portion each minute so that said diffusate may be sampled from said sampling port, and a dialysate and unfiltered fluid passes through said hollow fibers and through said outlet to exterior said filter.

5,464,536

APPARATUS FOR CENTRIFUGALLY SEPARATING A FLUID MIXTURE INTO ITS COMPONENT PARTS

Ernest Rogers, Pleasant Grove, Utah, assignor to Charles W. Taggart, Salt Lake City, Utah

Filed Jun. 10, 1992, Ser. No. 896,185

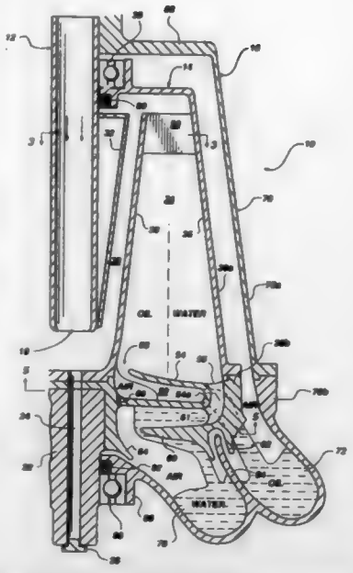
Int. Cl.[6] B04B *7/04*

U.S. Cl. 210—380.1 **27 Claims**

1. An apparatus for centrifugally separating into its component parts through solvent extraction or other chemical means a liquid mixture having first and second immiscible liquids and contaminants dissolved or emulsified in the second liquid, comprising:

an elongate hollow inlet shaft including a first receiving end for receiving mixture, a second receiving end for receiving a solvent, a first discharge end through which the mixture is input into the apparatus, and a second discharge end through which the solvent is delivered into the apparatus;

a rotor rotatably disposed substantially coaxially to and surrounding the inlet shaft, said rotor including first reception means for receiving the mixture from the inlet shaft, first separation means for separating the mixture into its immiscible liquid parts, first discharge means for discharging the separated first liquid from the rotor, second reception means in the rotor for receiving the solvent from the input shaft, mixing means for mixing the solvent with the second liquid whereby the solvent at least partially absorbs the contaminants, second separation means for separating the solvent and absorbed contaminants from the second liquid, second discharge means in the rotor for discharging the separated second



liquid from the rotor, and third discharge means in the rotor for discharging the separated solvent from the rotor;

rotation means for rotating the rotor around the inlet shaft;

a housing containing first, second, and third collection chambers for receiving and collecting the first liquid, second liquid, and solvent from their respective discharge means.

5,464,537

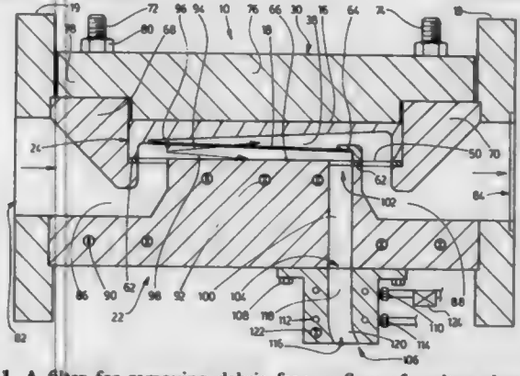
FILTERING DEBRIS FROM MOLTEN PLASTIC

Jaroslav J. Kopernicky, 3 Vivians Crescent, Brampton, Canada, and Salvatore Infan, 3 Heale Avenue, Scarborough, Ontario, Canada

Continuation of Ser. No. 996,023, Dec. 23, 1992, abandoned. This application Oct. 5, 1994, Ser. No. 318,210

Int. Cl.[6] B01D *29/05;35/00;35/18*

U.S. Cl. 210—453 **7 Claims**



1. A filter for removing debris from a flow of molten plastic under pressure, comprising:

a cartridge comprising walls defining a cavity, a cartridge face, means defining a cartridge inlet that extends through the cartridge face and accesses the cavity and a cartridge outlet that extends through the cartridge face and accesses the cavity separately from the cartridge inlet, a screen, and means mounting the screen in the cartridge inlet with the screen inset from the cartridge face thereby to define within the cartridge inlet a debris-accumulating compartment with an open side at the cartridge face;

a holder shaped to receive the cartridge, the holder comprising an holder inlet for receiving the flow of molten plastic, a holder outlet for discharging the flow of molten plastic, a seating structure shaped to seat the cartridge face of the received cartridge, an inlet passage extending from the holder inlet to the cartridge inlet of the received cartridge and discharging the received flow of molten plastic toward the screen of the received cartridge thereby to separate the debris from the plastic, a surface extending transversely from the inlet passage and positioned to close the open side of the debris-accumulating compartment of the received cartridge thereby to contain the separated debris within the debris-accumulating compartment, and a discharge flow path extending from the cartridge outlet of the received cartridge to the holder outlet;

sealing material forming a seal between the seated cartridge face and the seating structure of the holder;

cartridge-securing means releasably securing the received cartridge to the holder such that the cartridge can be displaced from the holder to allow access to the debris-accumulating compartment from externally of the holder, the cartridge-securing means comprising means for urging the received cartridge toward the seating structure of the holder thereby to compress the sealing material between the cartridge face and the seating structure of the holder; and,

means for heating the holder and cartridge thereby to maintain the molten state of the flow of plastic.

5,464,538

REVERSE OSMOSIS MEMBRANE

Donald L. Schmidt; Gene D. Rose, and Edward E. Flagg, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 920,029, Jul. 27, 1992, Pat. No. 5,310,581, which is a continuation of Ser. No. 459,085, Dec. 29, 1989, abandoned. This application May 10, 1994, Ser. No. 240,351

Int. Cl.[6] B01D *69/12*

U.S. Cl. 210—490 **11 Claims**

1. A composite reverse osmosis membrane wherein at least one layer of the membrane is a photocured coating prepared by the method comprising:

(a) applying to a substrate (i) a first compound bearing an average of more than one photolabile onium group bonded to a chromophore group via a linking group, wherein the onium is substantially free of unsaturated substituents which are photo-reactive and has a compatible anion, and (ii) a second compound bearing at least one photo-reactive nucleophile, so as to form a coating of an intimate mixture of (i) and (ii) on the substrate,

(b) exposing the coating of the first compound and second compound to electromagnetic radiation effective to react a plurality of the photolabile onium groups of the first compound with a plurality of photo-reactive nucleophile groups of the second compound with extinction of the cationic charge on the onium groups reacted.

5,464,539

PROCESS FOR THE PRODUCTION OF HYDROGEN BY MICROORGANISMS

Yoshiyuki Ueno; Masayoshi Morimoto; Seiji Ootsuka; Tatsushi Kawai, and Susumu Satou, all of Tokyo, Japan, assignors to Kajima Corporation, Tokyo, and Research Institute of Innovative Technology for the Earth, Kyoto, both of, Japan

Filed Sep. 2, 1994, Ser. No. 229,100

Claims priority, application Japan, Sep. 7, 1993, 5-246134

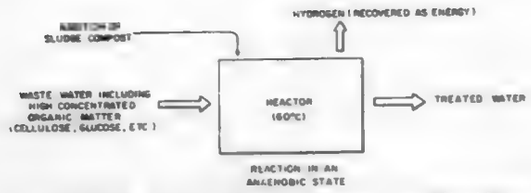
Int. Cl.[6] C02F *3/28;* **C01B** *3/02;3/22*

U.S. Cl. 210—603 **6 Claims**

1. A process for the microbial production of hydrogen gas, comprising the steps of:

(a) providing a sludge compost containing hydrogen-generating anaerobic bacteria and deactivated methane producing bacteria which has been prepared by forcing aeration into a sewage treatment sludge;

(b) contacting a liquid waste containing organic matter with said sludge compost in an anaerobic atmosphere by adding about



0.01 to 20% w/v of said sludge compost to said liquid waste to generate hydrogen gas; and

(c) collecting said generated hydrogen gas.

5,464,540

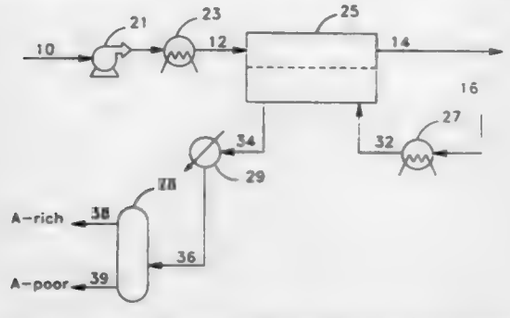
PERVAPORATION BY COUNTERCURRENT CONDENSABLE SWEEP

Dwayne T. Friesen; David D. Newbold; Scott B. McCray, and Roderick J. Ray, all of Bend, Oreg., assignors to Bend Research, Inc., Bend, Oreg.

Filed Dec. 9, 1993, Ser. No. 165,446

Int. Cl.[6] B01D *61/36*

U.S. Cl. 210—640 **31 Claims**



1. A countercurrent sweep pervaporation process for the removal of at least one component of a liquid mixture feed comprising more than one component, said process comprising the steps of:

(a) providing a membrane that has a feed side and a permeate side and is selectively permeable to said at least one component, and is located within a chamber that has a permeate side vapor inlet port and a permeate side vapor outlet port;

(b) providing a pressure difference across said membrane such that the pressure on said permeate side of said membrane is less than the pressure on said feed side of said membrane;

(c) directing said liquid mixture feed against said feed side of said membrane wherein the concentration and pressure of said at least one component of said liquid mixture feed on said feed side are such that the partial pressure of said at least one component in a hypothetical vapor phase in equilibrium with said liquid mixture feed exceeds the partial pressure of said at least one component on said permeate side;

(d) providing a sweep stream of condensable vapor, wherein said condensable vapor

(i) comprises vapor of a component of said liquid mixture feed other than said at least one component,

(ii) has a boiling point greater than −100° C. at atmospheric pressure, and

(iii) has an initial temperature equal to or greater than the temperature of said liquid mixture feed;

(e) directing said sweep stream of condensable vapor past said permeate side of said membrane in a manner such that the flow of said sweep stream is substantially countercurrent to the direction of substantially the entire flow of said liquid mixture feed, thereby transporting at least a portion of said at least one component of said liquid mixture feed from said feed side to said permeate side of said membrane to form a combined permeate side mixture of said condensable vapor and said at least one component, wherein the volumetric flow of said condensable vapor at said vapor inlet port is at least 10% of the volumetric flow of said combined permeate side mixture at said vapor outlet port; and

(f) removing said combined permeate side mixture from said permeate side of said membrane.

5,464,541

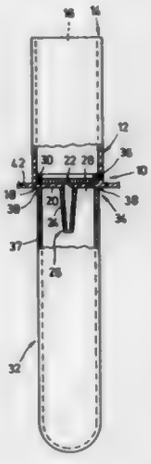
DEVICE AND A METHOD FOR SEPARATING LIQUID SAMPLES

James E. Aysta, Stillwater, Wash., and Metin Colpan, Erkrath, Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn., and Diagen Institute fur molekularbrologische Diagnostic, GmbH, Duesseldorf, Germany

Division of Ser. No. 671,448, Mar. 19, 1991, Pat. No. 5,264,184. This application Nov. 17, 1993, Ser. No. 153,463

Int. Cl.[6] B01D *29/00*

U.S. Cl. 210—767 **22 Claims**



4. A device for separating a liquid sample, comprising:

at least one sample container (12) having an inlet opening (16) and an outlet spout (24) integral with said sample container (12), said outlet spout (24) joining and enclosing an outlet opening (22) in bottom wall (20), between which inlet opening (16) and outlet opening (22) a separation layer (28) is arranged, at least one collecting container (32) for the liquid emerging through said outlet opening (22), having an opening (36) therein, said collecting container (32) abutting said sample container (12) by at least one of said outlet spout (24) and said bottom wall (20) of said sample container (12) by the rim (38) of said collecting container (32) at its opening (36), which provides a means for a non-airtight sealing between rim (38) of opening (36) of collecting container (32), and at least one of outlet spout (24) and bottom wall (20) of sample container (12) which allows for an exchange of air between the interior of collecting container (32) and the environment, and prevents escape of liquid or aerosols from said collecting container (32),

said outlet spout (24) extending through said opening (36) of said collecting container (32) into said collecting container (32).

5,464,542

METHOD AND DEVICE FOR FILTERING AND BACKWASHING SOLID PARTICLES OUT OF LIQUIDS

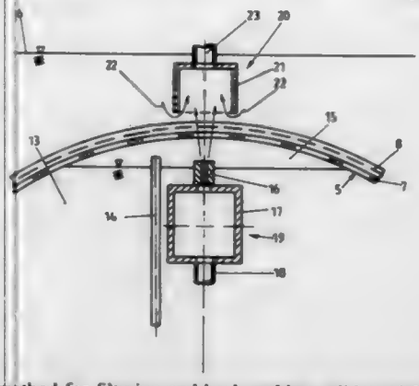
Johann Grienberger, Lauf; Rudolf Bogner, Neumarkt, and Christian Frommann, Deining, all of, Germany, assignors to Hans Huber GmbH Maschinen-und Anlagenbau, Berching, Germany

Filed Nov. 16, 1994, Ser. No. 340,257

Claims priority, application Germany, Nov. 18, 1993, 43 39 268.7

Int. Cl.[6] B01D *33/06*

U.S. Cl. 210—784 10 Claims



1. A method for filtering and backwashing solid particles out of liquids, with a filter drum (5) positioned completely below a liquid level (6) having a cylindrical surface (7) coated with a filter medium (8), the liquid flowing through the outside of the filter drum to the inside, and a backwashing device for the removal of the filter cake from the filter medium, wherein at the beginning of each cycle of backwashing an air cushion (15) is introduced in the filter drum (5), liquid in the filter drum (5) is displaced so that liquid jets from an ejection apparatus (19) containing a spraying head (17) and being arranged in the interior of the filter drum without being sealed to the filter drum penetrate through the air cushion (15) to the backside of the cylindrical surface (7) of the filter drum (5), and the filter cake is removed by being withdrawn at the outside of filter drum (5) in a stream of liquid.

5,464,543

RAPID GRAVITY FILTER BACKWASH SYSTEM AND FILTERS RELATIVE THERETO

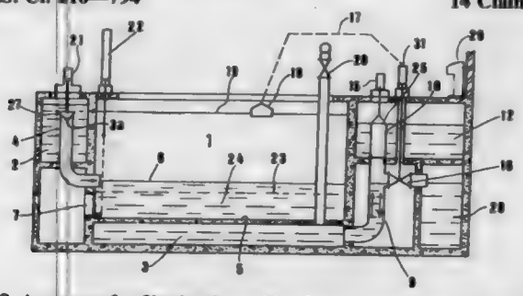
Richard P. Moore, P O Box 471, Germiston, 1400, Transvaal, South Africa

Filed Oct. 18, 1993, Ser. No. 136,912

Claims priority, application South Africa, Jan. 16, 1992, 92/7982

Int. Cl.[6] B01D *24/42*

U.S. Cl. 210—794 14 Claims



9. A process for filtering impurities from a liquid using a liquid filtration system, the system comprising a vessel, a means for dividing said vessel into a plurality of filter chambers, an underbed collecting/distribution means disposed in each of said plurality of filter chambers for removing filtered liquid therefrom and for delivering backwash liquid thereto, a bed of filter media supported on each said underbed collecting/distribution means, a waste backwash liquid outlet means disposed above each said filter media bed for directing waste backwash liquid to drain, inlet means fluidly connected to each of said plurality of filter chambers for introducing liquid to be filtered, filtered liquid outlet means fluidly connected to each said underbed collecting/distribution means for discharging filtered liquid therefrom; said vessel further comprising a common backwash liquid storage chamber disposed above the level of said waste backwash liquid outlet means and above the level of said filtered liquid outlet means, and at least one conduit means fluidly connecting said common backwash liquid storage chamber with each of said plurality of filter chambers; the process comprising the following steps:

(a) passing liquid containing impurities through each said filter media bed in a downward direction to said filtered liquid outlet means wherein said impurities are accumulated in each said filter media bed and a liquid level is maintained above each said filter media bed;

(b) after accumulating said impurities, draining said liquid level in at least one of said plurality of chambers to a wash level located above said filter media bed supported therein and below said liquid level;

(c) introducing a gravity flow of stored first filtrate liquid from said common backwash liquid storage chamber through said filter media bed in an upward direction, said stored first filtrate liquid carrying said accumulated impurities to drain through said waste backwash liquid outlet means, thereby creating a backwashed filter media bed;

(d) terminating said gravity flow of said stored first filtrate liquid through said backwashed filter media bed;

(e) passing liquid to be filtered through said backwashed filter media bed in a downward direction, thereby creating a first filtrate liquid;

(f) passing a gravity flow of said first filtrate liquid to said common backwash liquid storage chamber until a quantity of said first filtrate liquid sufficient to backwash at least one of said filter media beds is stored in said common backwash liquid storage chamber, thereby creating stored first filtrate liquid;

(g) terminating said gravity flow of said first filtrate liquid to said common backwash liquid storage chamber;

(h) passing liquid to be filtered through said backwashed filter media bed in a downward direction to said filtered liquid outlet means wherein said impurities are accumulated in said backwashed filter media bed and said liquid level is maintained above said backwashed filter media bed; and

(i) repeating steps (a)–(i).

5,464,544

METHODS OF EXTINGUISHING ALKALI METAL FIRES WITH NON-AQUEOUS COMPOSITIONS

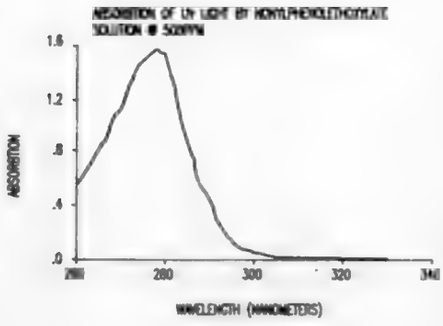
Paul H. Berger, Rome, N.Y., assignor to Metro Fire & Rescue, Inc., Rome, N.Y.

Continuation-in-part of Ser. No. 951,390, Sep. 25, 1992, Pat. No. 5,304,313, which is a continuation of Ser. No. 775,288, Oct. 11, 1991, abandoned. This application Oct. 8, 1992, Ser. No. 958,219

Int. Cl.[6] A62D *1/00;* A62C *1/00;* B01F *17/42*

U.S. Cl. 252—2 1 Claim

1. A method of extinguishing a fire in the presence of an alkali metal, comprising the step of contacting a fire in the presence of an alkali metal with a non-aqueous fire fighting composition which includes a mixture of nonionic surfactants including at least one nonylphenolethoxylate nonionic surfactant, and an organic solvent.



5,464,545

USE OF REVERSE-WATER-SOLUBLE POLYMERS AS NON-FORMALDEHYDE-RELEASING BINDER RESINS FOR TEXTILE-FINISHES

Jayanti V. Isharani; James K. Raper, both of Greensboro; A. Donald Allen, Jr., High Point, and John W. Middleton, Kernersville, all of N.C., assignors to Ciba-Geogy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 71,213, Jun. 2, 1993, abandoned, which is a continuation of Ser. No. 804,628, Dec. 9, 1991, abandoned, which is a continuation of Ser. No. 487,560, Mar. 2, 1990, abandoned. This application Apr. 25, 1994, Ser. No. 232,308

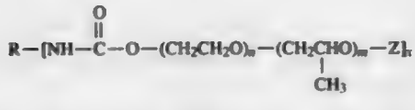
Int. Cl.[6] **D06M** *13/00;15/00*

U.S. Cl. 252—8.6 **15 Claims**

1. A method of finishing a textile which comprises imparting laundering durability to a performance-effect textile finish by applying the performance-effect textile finish to the textile by means of an aqueous finishing formulation which consists essentially of

(a) an effective amount of a performance-effect textile finish selected from the group consisting of a soil-release agent, a soil repellant, a softener, a flame-retardant, an anti-static agent, and a light-stabilizer;

(b) a binder resin which is present in an amount sufficient to impart laundering durability to performance-effect textile finish, wherein said binder resin consists essentially of a non-formaldehyde-releasing, reverse-water-soluble polymer of the formula



wherein R is the residue of an aliphatic or aromatic compound containing 3 or more reactive isocyanate groups; each Z is independently hydrogen, C_1-C_8-alkyl or an additional R group; x is 3 to 30, m is 0 to 100, and n is 5 to 500, which polymer has a cloud point between 20° C. and 60° C. and a solubility of at least it percent in water at 20° C.; and

(c) a dispersant.

5,464,546

THERMALLY STABLE TEXTILE LUBRICANTS

Norbert Bialas, Dormagen; Raymond Mathis, Duesseldorf, both of, Germany; Richard P. Crews, Simpsonville, S.C.; Elbert H. Mudge, Charlotte, N.C., and F. Norman Tuller, Simpsonville, S.C., assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Filed Jun. 16, 1994, Ser. No. 260,852

Int. Cl.[6] **D06M** *13/148;* **C10M** *105/22*

U.S. Cl. 252—8.6 **20 Claims**

1. Thermally stable textile lubricants obtained by reaction of

a) a polyol with

b) a fatty acid containing 6to 22 carbon atoms

in the presence of 0.05 to 8% by weight, based on the sum of components a) and b), of

c) an ester of thiocarboxylic acids selected from the group consisting of general formula (I), general formula (II) and mixtures thereof:

$$R^1—S—R^2—COOH \quad (I)$$

$$HOOC—R^3—S—R^4—COOH \quad (II)$$

in which R^1, R^2, R^3 and R^4 may be the same or different and represent an alkyl, cycloalkyl, aryl or alkaryl group containing 1 to 22 carbon atoms.

5,464,547

MERCERIZATION WETTING COMPOSITION

Albert Stehlin, Rosenau, France, and Thomas Maier, Schliengen, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 8, 1994, Ser. No. 287,391

Claims priority, application Switzerland, Aug. 10, 1993, 2376/93

Int. Cl.[6] **D06M** *13/256;13/328*

U.S. Cl. 252—8.7 **6 Claims**

1. A mercerization composition comprising

(a) at least one compound of the formula

$$R_1—CH_2(CHOH)_m CO—NH—R_3 \quad (2)$$

and/or at least one compound of the formula

$$R_1—CH_2(CHOH)_m O—R_4 \quad (3)$$

where

R_1 is hydroxyl or $—SO_3M$,

R_3 is C_4–C_{10}alkyl,

R_4 is C_6–C_{10}alkyl,

M is an alkali metal and

m is from 2 to 6,

(b) an alkali metal hydroxide and

(c) water to make up 100% by weight, wherein component (a) is present in a concentration of 1–20 g per liter and component (b) in a concentration of 22–28% by weight.

5,464,548

LUBRICANTS, FUNCTIONAL FLUID AND GREASE COMPOSITIONS CONTAINING SULFITE OR SULFATE OVERBASED METAL SALTS AND METHODS OF USING THE SAME

John M. Caboon, Mentor; Jack L. Karn, Richmond Hts., and Nai Z. Huang, Mayfield Hts., all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 996,756, Dec. 24, 1992, abandoned. This application Aug. 11, 1994, Ser. No. 289,354

Int. Cl.[6] **C10M** *135/10;125/00*

U.S. Cl. 252—18 **32 Claims**

1. A lubricating composition comprising a major amount of an oil of lubricating viscosity, and a minor amount of (A) a sulfite or

sulfate overbased or borated overbased metal salt of an acidic organic compound, wherein the lubricating composition contains less than 1.5% by weight of a reaction product of a polyisobutene substituted succinic anhydride and a polyamine, and provided that when (A) is a sulfate overbased or borated overbased metal salt, then the lubricating composition includes (B) at least one phosphorous or boron antiwear/extreme pressure agent, or (C) a sulfur compound, wherein the sulfite overbased or borated overbased metal salt has a metal ratio from about 10 to about 40 and is derived from a carbonated overbased or borated overbased metal salt.

5,464,549

OIL SOLUBLE DISPERSANTS SUITABLE FOR USE IN FUELS AND LUBRICANTS

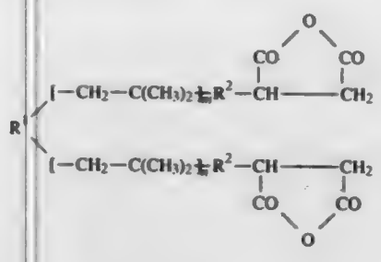
John F. Sieberth, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 12, 1991, Ser. No. 806,145
Int. Cl.[6] C10M *133/58;133/56;159/16*
U.S. Cl. 252—51.5 A **1 Claim**

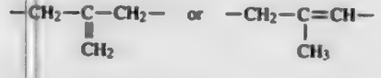
1. An oil-soluble lubricating oil dispersant formed by reacting

(a) at least one oil-soluble lubricating oil dispersant selected from (i) substituted succinimide dispersant in which the substituent is derived from a C_2 to C_5 monoolefin polymer having a number average molecular weight within the range of 700 to 3000, said succinimide dispersant having at least one acylatable primary or secondary amino group, (ii) substituted succinic esteramide dispersant in which the substituent is derived from a C_2 to C_5 monoolefin polymer having a number average molecular weight within the range of 700 to 3000, said succinic esteramide dispersant having at least one acylatable primary or secondary amino group, and/or at least one acylatable hydroxyl group, and (iii) Mannich condensation product formed by condensing long chain hydrocarbyl substituted hydroxyaromatic compound with aldehyde and polyamine, said, Mannich condensation product containing at least one acylatable primary or secondary amino group, wherein said long chain hydrocarbyl substituent has 50 to 300 carbon atoms and is dived from a polymer of a C_2 to C_5 mono-α-olefin, with

(b) at least one modified polymer of isobutene of the formula



where R^1 is an olefinically unsaturated divalent radical, R^2 is one of the divalent radicals.



and m an n are each at least 1.

5,464,550

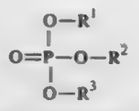
REFRIGERATOR OIL COMPOSITION CONTAINING PHOSPHATE ESTER ADDITIVES FOR FLUOROALKANE REFRIGERANT

Umekichi Sasaki; Hiroshi Hasegawa, and Yuji Shimomura, all of Kanagawa, Japan, assignors to Nippon Oil Company, Limited, Japan

Continuation of Ser. No. 19,648, Feb. 19, 1993, abandoned. This application Nov. 22, 1994, Ser. No. 347,103
Claims priority, application Japan, Feb. 20, 1992, 4-033535
Int. Cl.[6] C09K *5/04;* **C10M** *153/00;157/08*
U.S. Cl. 252—68 **3 Claims**

1. A fluid composition for a refrigerator, which comprises 100 parts by weight of a fluoroalkane refrigerant and 1–500 parts by weight of a refrigerator oil composition, said refrigerator oil composition containing a base oil composed principally of an oxygen-containing compound selected from the group consisting of dibasic acid esters, polyol esters, polyol carbonate esters, polyglycols, and mixtures thereof, which comprises based on the total weight of the refrigerator oil composition:

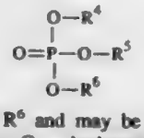
0.5–5.0 wt. % of a phosphate ester represented by the following formula (A):



(A)

wherein R^1, R^2 and R^3 may be the same or different and individually represent a C_{1-18} hydrocarbon; and

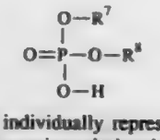
(a) 0.1–5.0 wt. % of a chlorinated phosphate ester represented by the following formula (B):



(B)

wherein R^4, R^5 and R^6 and may be the same or different and individually represent a C_{1-18} hydrocarbon, wherein at least one of the hydrogen atoms is substituted by a corresponding number of chlorine atoms with the proviso that the total number of chlorine atoms contained in R^4, R^5, and R^6 and is 1 to 9; and/or

(b) 0.01–2.0 wt. % of an acid phosphate ester represented by the following formula (C):



(C)

wherein R^7 and R^8 individually represent a hydrogen atom or a C_{1-18} hydrocarbon, an amine salt thereby, or a combination of both the acid phosphate ester and the amine salt with the proviso that R^7 and R^8 are not hydrogen atoms simultaneously.

5,464,551

STABILIZED PHOSPHATE ESTER-BASED FUNCTIONAL FLUID COMPOSITIONS

Gerbrand Deetman, St. Charles, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 897,189, Jun. 11, 1992, abandoned. This application Jul. 28, 1993, Ser. No. 99,267
Int. Cl.[6] C10M *3/26*
U.S. Cl. 252—78.5 **89 Claims**

1. A fluid composition suitable for use as an aircraft hydraulic fluid, comprising:

(a) a fire resistant phosphate ester base stock, the base stock comprising between about 50% and about 85% by weight of a trialkyl phosphate in which the alkyl substituents are substantially isoalkyl C4 or C_5 and are bonded to the phosphate

moiety via a primary carbon atom, between about 18% and about 35% by weight of a dialkyl aryl phosphate in which the alkyl substituents are as previously defined, and between about 0% and about 5% by weight of an alkyl diaryl phosphate in which the alkyl substituent is as previously defined, with the proviso that the sum of the proportionate amount of each base stock component must equal 100%;

(b) an acid scavenger in an amount effective to neutralize phosphoric acid and phosphoric acid partial esters formed in situ by hydrolysis of any of the phosphate esters of said base stock;

(c) an anti-erosion additive in an amount effective to inhibit flow-induced electrochemical or zeta corrosion of the flow-metering edges of hydraulic servo valves in hydraulic systems;

(d) a viscosity index improver in an amount effective to cause the fluid composition to exhibit a viscosity of at least about 3.0 centistokes at about 210° F., at least about 9.0 centistokes at about 100° F., and less than about 4200 centistokes at −65° F.; and

(e) an antioxidant in an amount effective to inhibit oxidation of fluid composition components in the presence of oxidizing agents.

5,464,552

STABLE LIQUID AQUEOUS OXIDANT DETERGENT

David Peterson, Pleasanton, and Gregory V. Buskirk, Danville, both of Calif., assignors to The Clorox Company, Oakland, Calif.

Continuation of Ser. No. 147,414, Nov. 5, 1993, abandoned, which is a continuation of Ser. No. 864,374, Apr. 6, 1992, abandoned, which is a continuation of Ser. No. 444,175, Nov. 30, 1989, abandoned. This application Oct. 27, 1994, Ser. No. 330,236

Int. Cl.[6] C11D *3/04;3/39;3/395*

U.S. Cl. 252—95 **24 Claims**

1. A liquid detergent composition containing at least one oxidant, comprising:

a) a liquid phase which comprises:

(i) from about 0.1–90% weight of the composition of at least one surfactant selected from the group consisting of anionic, nonionic, cationic, amphoteric, zwitterionic surfactants, and mixtures thereof wherein any anionic surfactant is present in amounts up to 50% by weight of the composition;

(ii) from about 5–95% by weight of the composition of liquid carrier therefor, comprising water or a mixture of water and at least one organic solvent, said solvent being present in an amount of no more than 0–10% of the liquid carrier;

b) from about 0.1–50% by weight of the composition of a particular oxidant suspended in said liquid phase, which maintains oxidative stability, said oxidant being selected from the group consisting of alkali metal perborates and percarbonates; and

c) from about 1–50% by weight of the composition of an oxidant stabilizer, said oxidant stabilizer selected from the group consisting of at least one alkali metal chloride or a mixture of said alkali metal chloride and alkali metal borate or boric acid, or a mixture of the three, said oxidant stabilizer acting to desolubilize said particulate oxidant by maintaining high ionic strength in the liquid phase to maintain oxidant potency.

5,464,553

LOW FOAMING EFFECTIVE HYDROTROPE

Anthony E. Winston, East Brunswick; Francis R. Cala, Highland Park; Steven E. Dunn, Hillsborough; Alfredo Vinci, Dayton, and M. Stephen Lajoie, Basking Ridge, all of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Division of Ser. No. 896,379, Jun. 10, 1992, Pat. No. 5,264,047, which is a continuation-in-part of Ser. No. 731,512, Jul. 17, 1991, abandoned. This application Aug. 24, 1993, Ser. No. 110,992

Int. Cl.[6] C11D *9/00*

U.S. Cl. 252—108 **16 Claims**

1. A cleaning composition comprising 60–98 wt. % of alkaline salts, up to 25 wt. % of an organic adjuvant and 0.2 to 15 wt. % of a hydrotrope so combined that when in aqueous solution of from about 0.1 to 15 percent by weight, said solution has a pH of from about 10 to 13, said hydrotrope comprising an alkali metal salt of a monocarboxylic acid having a carbon chain length of between C_7–C_{13}.

5,464,554

SOLID DETERGENT COMPOSITION

Ben Gu, East Brunswick; Ravi Subramanyam, North Brunswick, and Tanya Clifton, Nutley, all of N.J., assignors to Colgate-Palmolive Company, Piscataway, N.J.

Filed Sep. 3, 1993, Ser. No. 116,661

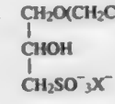
Int. Cl.[6] C11D *9/32;1/12*

U.S. Cl. 252—121 **11 Claims**

1. A solid composition comprising

a. about 5 to 75 wt % soap,

b. about 5 to 75 wt % of a compound of the formula



wherein R is alkyl or alkenyl of 8 to 22 carbon atoms inclusive, R' is hydrogen or methyl, n is an integer having an average value of 1 to 10, X is an alkali metal, ammonium or substituted ammonium cation, or

ii. a long chain alkyl or alkenyl acyl ester of an isethionate salt, or

iii. a mixture of land ii,

c. about 1 to 15 wt % of a material selected from the group consisting of hardened glycerides, high molecular weight fatty acids, fatty alcohols, waxes or mixtures thereof.

5,464,555

GRAPHIC INK REMOVER SOLUTION

Ronnie E. Bayless, Plant City, Fla., assignor to Dotolo Research Corporation, Largo, Fla.

Continuation of Ser. No. 8,205, Jan. 25, 1993, abandoned. This application Oct. 12, 1994, Ser. No. 322,026

Int. Cl.[6] C09D *9/04;* **C11D** *7/26;7/32*

U.S. Cl. 252—153 **8 Claims**

1. A graphic ink remover, consisting of:

from about 30 to about 80 weight percent d-limonene;

from about 10 to about 50 weight percent ethyl lactate;

from about 5 to about 30 weight percent N-methyl pyrrolidone;

from about 0.5 to about 5 weight percent surfactant; and optionally,

from about 0 to about 25 weight percent gamma butyrolactone.

5,464,556

COMPOSITION FOR THE PAINT SPRAY TREATMENT USING SECONDARY ALCOHOL ESTERS IN WATER

Edwin C. Zuerner, Troy; Robert R. Ratzelt, and Norman Foster, both of Bloomfield Hills, all of Mich., assignors to Nortru, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 38,011, Mar. 29, 1993, Pat. No. 5,397,496, which is a continuation-in-part of Ser. No. 861,091, Mar. 31, 1992, Pat. No. 5,198,143, which is a continuation-in-part of Ser. No. 790,650, Nov. 8, 1991, Pat. No. 5,200,104. This application Sep. 30, 1993, Ser. No. 130,106
The portion of the term of this patent subsequent to Mar. 30, 2010, has been disclaimed.

Int. Cl.[6] C11D 7/50

U.S. Cl. 252—170 14 Claims

1. A composition for treating oversprayed paints consisting essentially of:

between about 5 and about 50 percent by volume of carbonyl compound selected from the group consisting of alcohol esters, condensation products of alcohol esters and carboxylic acids, and mixtures thereof, said carbonyl compound being capable of dissolving paint while remaining essentially insoluble and non-reactive with an aqueous media; and

water.

5,464,557

COMPOSITIONS FOR CLEANING ARTICLES WITH 2-ETHYLHEXANOL AND P-CYMENE

Gerald J. Ferber, Cuddington, and Graham J. Smith, Chester, both of, England, assignors to Bush Boake Allen Limited, United Kingdom

Division of Ser. No. 872,210, Apr. 22, 1992, Pat. No. 5,300,154, which is a continuation-in-part of Ser. No. 567,206, Aug. 14, 1990, abandoned, and a continuation-in-part of Ser. No. 600,372, Oct. 17, 1990, abandoned. This application Jan. 21, 1994, Ser. No. 185,584

Int. Cl.[6] C11D 3/44;3/18;7/24;7/26

U.S. Cl. 252—170 3 Claims

1. A solvent composition for cleaning dirty articles, consisting essentially of a two part organic solvent mixture consisting of:

(a) from about 5 to about 95 weight percent para-cymene formula; and

(b) from about 5 to about 95 weight percent 2-ethylhexanol.

5,464,558

POLYMERS AND DETERGENT COMPOSITIONS CONTAINING THEM

Stephen G. Hales, Willaston; Ezat Khoshdel, Neston, and Robert Polywka, Mickle Trafford, all of, United Kingdom, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Division of Ser. No. 44,523, Apr. 7, 1993. This application Jan. 4, 1995, Ser. No. 368,530

Claims priority, application United Kingdom, Apr. 9, 1992, 9207795

Int. Cl.[6] C08F 24/00

U.S. Cl. 252—174.24 15 Claims

1. A detergent composition comprising at least one detergent-active compound and also comprising a detergency builder system consisting wholly or partially of a polymer of at least two different types of structural unit, said polymer consisting essentially of

(i) structural units containing a group of the formula I

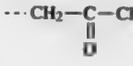
(I)

wherein R represents a hydrogen atom, a C_1-C_3 alkyl or hydroxyalkyl group, or a group of the formula A_2—COOM,

each of A_1 and A_2, which are the same or different, represents a direct bond or an optional spacer group containing from 1 to 4 carbon atoms,

M represents a hydrogen atom or a sodium, potassium, ammonium or lower-alkyl-substituted ammonium ion; and

(ii) structural units of the formula II



(II)

5,464,559

COMPOSITION FOR TREATING WATER WITH RESIN BOUND IONIC SILVER

George L. Marchin, and Jack L. Lambert, both of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Continuation-in-part of Ser. No. 210,876, Mar. 18, 1994, Pat. No. 5,366,636. This application Sep. 9, 1994, Ser. No. 303,368

Int. Cl.[6] C08J 5/20; A61K 31/74; A01N 59/16

U.S. Cl. 252—181 5 Claims

1. A composition for treating water, comprising porous granules of a chelating resin comprising a polystyrene divinyl benzene copolymer having iminodiacetate chelating groups with silver ions bound thereto, said bound silver ions being present in an effective amount for disinfecting water but not over 0.5 mol of silver ions per mol of iminodiacetate, said effective amount selected such that said silver ions are retained by said chelating groups to ensure that water treated by said chelating resin is substantially free of silver ions.

5,464,560

FOAM-FORMING MIXTURES WITH DECREASED DECOMPOSITION OF HYDROHALOCARBON BLOWING AGENTS

Steven L. Schilling, Glen Dale; Robert P. Yeater, Moundsville, both of W. Va.; Phil M. Soland, Shadyside, Ohio; John F. Szabat, Pittsburgh, Pa., and Harold R. Parsons, Wheeling, W. Va., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Apr. 6, 1995, Ser. No. 416,386

Int. Cl.[6] C09K 3/00

U.S. Cl. 252—182.24 10 Claims

1. A polyisocyanate-reactive composition comprising:

a) an isocyanate-reactive compound having at least two hydrogen atoms which are reactive with isocyanate groups,

b) an organic acid containing at least two carboxylic acid groups in which no tertiary amino groups are present and having a pK_a of up to 3.1 and

c) an HCFC blowing agent.

5,464,561

METHODS AND COMPOSITIONS FOR PREPARING RIGID FOAMS WITH NON-CHLOROFLUOROCARBON BLOWING AGENTS

Steve Williams; Warren Kaplan; Paul Neill, and Gerardo Chapa, all of Grayslake, Ill., assignors to Stepan Company, Northfield, Ill.

Division of Ser. No. 238,388, May 5, 1994, Pat. No. 5,407,967. This application Mar. 30, 1995, Ser. No. 415,146

Int. Cl.[6] C09K *3/00;* C08G *18/16;18/22;* C08J *9/14*

U.S. Cl. 252—182.27 2 Claims

1. A polyol mixture comprising

(a) from about 40–95% by weight of a polyol selected from the group consisting of polyester polyols, polyether polyols, and mixtures thereof;

(b) a catalytic amount of a catalyst system comprising a tertiary amine catalyst and a N-(2-hydroxy or 2-alkoxy-5-alkylphenyl)alkyl sarcosinate, where the alkyl groups are independently C_1–C_{18} alkyl groups and the alkoxy groups are C_1–C_6 groups; and

(c) a non-chlorofluorocarbon blowing agent.

5,464,562

POLYOXYALKYLENE POLYETHER MONOOL POLYURETHANE FOAM ADDITIVE

Jimmy L. Patterson, New Boston, Mich., assignor to BASF Corporation, Mt. Olive, N.J.

Filed Apr. 24, 1995, Ser. No. 427,016

Int. Cl.[6] C08K *3/00*

U.S. Cl. 252—182.28 26 Claims

1. A polyol composition comprising:

a) a polyol having polyester linkages;

b) an aliphatic or cycloaliphatic C_4-C_7 hydrocarbon;

c) a polyoxyalkylene polyether monool initiated with a C_8-C_{24} fatty hydrocarbon having one alkylene oxide active hydrogen atom.

5,464,563

BLEACHING COMPOSITION

Samuel B. Moore, Burlington; James F. Leuck, Gibsonville, and Edwin T. Turner, Greensboro, all of N.C., assignors to Burlington Chemical Co., Inc., Burlington, N.C.

Filed Aug. 25, 1993, Ser. No. 112,582

Int. Cl.[6] D06L *3/02*

U.S. Cl. 252—186.29 8 Claims

1. A liquid, silicate-free bleach composition for use in bleaching cellulosic materials including paper pulp, cotton and cotton blends, said composition comprising:

(a) between about 35 to 50 wt % of hydrogen peroxide;

(b) between about 0.05 to 1.0 wt % of magnesium acetate;

(c) between about 0.01 to 0.1 wt % aminoalkylphosphonic acid; and

(d) the balance water.

5,464,564

POWER SURGE RESISTOR PASTES CONTAINING TUNGSTEN DOPANT

Orville W. Brown, Lansdale, Pa., assignor to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 88,452, Jul. 7, 1993, Pat. No. 5,345,212. This application May 17, 1994, Ser. No. 245,153

Int. Cl.[6] H01B *1/00;1/02;1/20;1/22*

U.S. Cl. 252—514 9 Claims

1. A surge resistor paste composition suitable for screen printing onto a substrate comprising in combination (a) about 38–60 parts of palladium and silver, (b) 6–20 parts of glass frit, (c) 1–20 parts of dopant, (d) 2–6 parts of binder and 18–25 parts of vehicle, wherein the dopant component includes at least 1 part tungsten, to total 100 parts by weight of the paste.

5,464,565

PROCESS FOR THE PREPARATION OF HIGHLY CONCENTRATED FREE-FLOWING AQUEOUS SOLUTIONS OF BETAINES

Ingo Hamann, Bad Orb; Hans-Jürgen Köhle, Schluchtern, and Winfried Wehner, Neuhof, all of, Germany, assignors to Witco Surfactants GmbH, Steinau an der Strasse, Germany

Filed Oct. 11, 1994, Ser. No. 321,141

Claims priority, application Germany, Jan. 8, 1993, 43 34 467.4

Int. Cl.[6] C11D *1/90;* C07D *209/12*

U.S. Cl. 252—546 7 Claims

1. A process for preparing a highly concentrated free-flowing aqueous solution containing 30–50% by weight of one or more betaines of the general formula (IV);

$$R^3—C(O)NH—(CH_2)_m—N^+(R^4)(R^5)—(CH_2)_yCOO^- \quad (IV)$$

wherein R^3 is straight or branched alkyl or alkylene containing 6–20 carbon atoms, 0–5 carbon-carbon double bonds and 0–5 hydroxyl substituents, R^4 and R^5 are identical or different and each is straight or branched alkyl containing 1–4 carbon atoms, m is 1, 2 or 3, and y is 1, 2 or 3 comprising forming an aqueous reaction mixture containing a compound containing tertiary amine nitrogen atoms of the general formula (II);

$$R^3—C(O)NH—(CH_2)_m—NR^4R^5 \quad (II)$$

wherein R^3, R^4, R^5 and m have the same meaning as for the formula (IV); one or more haloalkyl carboxylic acids of the formula (Hal)—$(CH_2)_y$COOH wherein (Hal) is fluoride, chloride, bromide or iodide, and y is 1, 2 or 3, and from 1 to 5% by weight of the reaction mixture of at least one compound of the general formula

$$R—\overset{\overset{R^1}{|}}{\underset{\underset{R^2}{|}}{N^+}}—(CH_2)_nCOO^- \quad (I)$$

which R, R^1, and R^2 are identical or different and each is a straight or branched alkyl radical which contains 1 to 10 carbon atoms and which optionally contains a hydroxyl group and n can be 1–3, and subjecting the reaction mixture to quaternization conditions effective to quaternize said one or more compounds which contain tertiary amine nitrogen with said one or more haloalkyl carboxylic acids.

5,464,566

COATING SOLUTION COMPOSITION FOR FORMING GLASS GEL THIN FILM, COLOR GLASS GEL FILTER, AND DISPLAY DEVICE USING THE SAME

Takeo Ito; Hidemi Matsuda, both of Tokyo, and Kazuo Sakai, Kawanishi, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, and Fuji Pigment Co., Ltd., Kawanishi, both of, Japan

Continuation of Ser. No. 854,397, Mar. 19, 1992. This application Aug. 29, 1994, Ser. No. 296,597

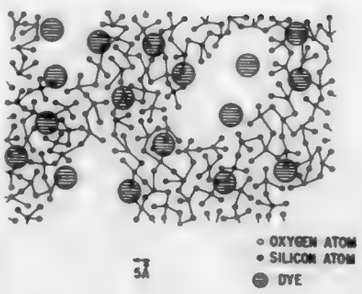
Claims priority, application Japan, Mar. 20, 1991, 3-80602

Int. Cl.[6] F21V *9/00*

U.S. Cl. 252—582 10 Claims

1. A coating solution composition for forming a glass gel thin film, said coating solution composition comprising:

at least one metal alkoxide material selected from the group consisting of a metal alkoxide and a polycondensate of the metal alkoxide;



a pigment having a granular form with an average particle size of 3 nm to 300 nm and which is substantially insoluble in the coating solution;

an alcohol solvent; and

a dispersant having an adsorption property for the pigment, dissolved in the alcohol solvent, and immiscible with the metal alkoxide;

wherein the pigment is also in granular form in the thin film, and wherein the pigment is an organic pigment.

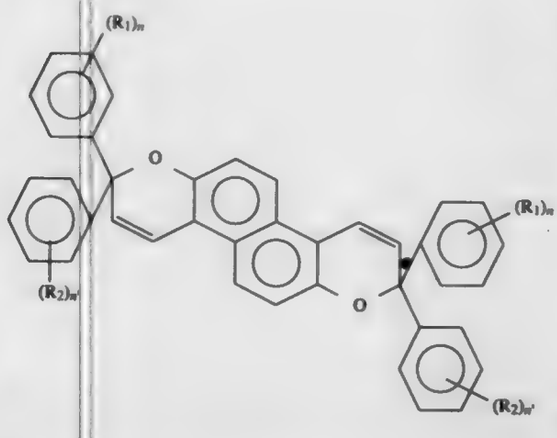
5,464,567

PHOTOCHROMIC TETRAPHENYL NAPHTHODIPYRANS

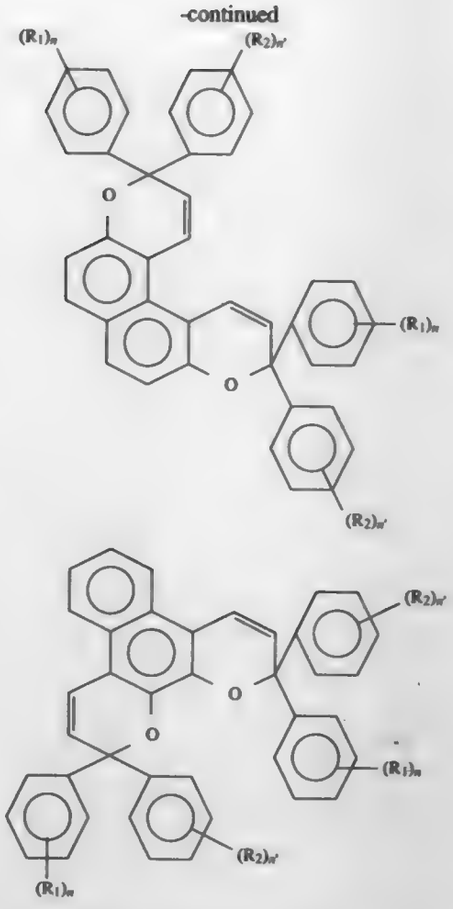
David B. Knowles, Apollo, and Barry V. Gemert, Murrysville, both of Pa., assignors to Transitions Optical, Inc., Pinellas Park, Fla.

Filed Apr. 8, 1994, Ser. No. 225,033
Int. Cl.[6] G02B *5/23*; **C07D** *311/78*
U.S. Cl. 252—586 **12 Claims**

2. A tetraphenyl naphthodipyran selected from the group consisting of naphthopyrans represented by the following graphic formulae:



-continued



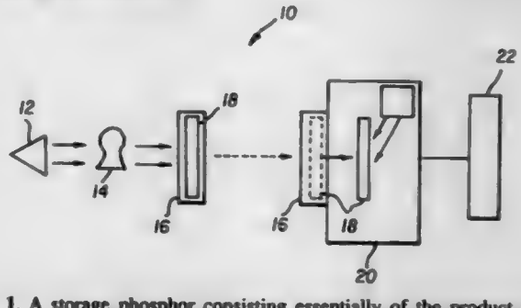
wherein R_1 and R_2 are each selected from the group consisting of (C_1–C_5) alkyl, (C_1–C_5) alkoxy, halogen, hydroxy, phenyl, methacrylyl, acryloxy (C_1–C_4) alkyl and methacryloxy (C_1–C_4) alkyl, and n and n' are each an integer of from 0 to 2.

5,464,568

ALKALINE EARTH METAL FLUOROBROMOIODIDE STORAGE PHOSPHOR, AND RADIATION IMAGE STORAGE PANEL, AND METHOD

Joseph F. Bringley, Rochester; Philip S. Bryan, Webster, and Andrea M. Hyde, Hamlin, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 157,583, Nov. 24, 1993, abandoned. This application Sep. 2, 1994, Ser. No. 300,116
Int. Cl.[6] C09K *11/61*
U.S. Cl. 252—301.4 H **16 Claims**



1. A storage phosphor consisting essentially of the product of firing, at a temperature from about 700° to 1300° C.:

(1) a combination of species characterized by the relationship:

$(Ba_{1-a-b-c}Mg_aCa_bSr_c)FBr_{1-z}I_z:rKX:yA:eQ:tD$

wherein

X is selected from the group consisting of F, Cl, Br, and I;

A is selected from the group consisting of Eu, Ce, Sm, and Tb;

Q is selected from the group consisting of BeO, MgO, CaO, SrO, BaO, ZnO, Al_2O_3, La_2O_3, In_2O_3, SiO_2, TiO_2, ZrO_2, GeO_2, SnO_2, Nb_2O_5, Ta_2O_5, and ThO_2;

D is selected from the group consisting of V, Cr, Mn, Fe, Co, and Ni;

a+b+c is from 0 to 0.4;

z is from 1×10^{-4} to 1;

r is from 10^{-6} to 0.1;

y is from 1×10^{-4} to 0.1;

e is from 10^{-5} to 0.1; and

t is from 0 to 10^{-2}; and

(2) an oxosulfur reducing agent, said oxosulfur reducing agent being present with said combination of species in an amount sufficient to increase relative photostimulated luminescence intensities relative to the phosphor defined above absent said reducing agent for iodine.

5,464,569

PROCESS FOR THE PREPARATION OF OXIDATION INHIBITED FLUID COMPOSITIONS

John S. McConaghy, Jr., St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 30, 1990, Ser. No. 575,516

Int. Cl.[6] B01J *13/00;* **C09K** *5/00;15/32;* **C10M** *129/34*

U.S. Cl. 252—308 **8 Claims**

1. A process for the preparation of an oxidation inhibited fluid composition comprising:.

(a) mixing an aromatic ether represented by the formula

$$R^1—O—\left[—R^2—O—\right]_n—R^3$$

wherein R^1, R^2, and R^3 independently are phenyl, biphenyl, and terphenyl and n is an integer of from zero (0) to 5, and an alkali metal precursor compound convertible under alkali metal precursor compound conversion conditions into an alkali metal salt of oxalic acid, which alkali metal precursor compound is selected from the group consisting of alkali metal phenates characterized by being partially soluble in the aromatic ether, and alkali metal m-phenoxyphenates, alkali metal m-(m-phenoxyphenoxy)phenate, and mixtures thereof characterized by being soluble in the aromatic ether,

(b) heating the aromatic ether/alkali metal precursor compound mixture from Step (a) at an elevated temperature in the presence of molecular oxygen or a molecular oxygen-containing gas and for a time sufficient to convert the alkali metal precursor compound into an alkali metal salt of oxalic acid and form a colloidal dispersion of the aromatic ether and an oxidation inhibiting amount of the alkali metal salt of oxalic acid, and

(c) separating any noncolloidally dispersed solid material from the colloidal dispersion of Step (b) to thereby recover the oxidation inhibited fluid composition, the fluid composition being characterized by being transparent when subjected to visual inspection with white light shining through the fluid composition at a 180° angle to the line of sight.

5,464,570

THFA/PDP THERMOSET THICK FILMS FOR PRINTED CIRCUITS

Frans P. Lautzenhiser, Noblesville; Bradley H. Carter, Kokomo; Donald A. Ozogar, Kokomo, and Dwadasi H. R. Sarma, Kokomo, all of Ind., assignors to Delco Electronics Corporation

Filed Oct. 25, 1993, Ser. No. 140,958

Int. Cl.[6] H01B *1/00*

U.S. Cl. 252—500 **5 Claims**

1. An electrically conductive thick film ink composition including electrically conductive powder and a thermoplastic polymer containing organic vehicle for a process in which the composition is printed onto a substrate and then subjected to a firing operation to form a glaze, the improvement wherein:

said thermoplastic polymer comprises 0.8 to about 1.2 weight percent of the composition;

said organic vehicle is selected from the group consisting of organic alcohols, ethers and esters, and comprises 10 to about 20 weight percent of the composition; and

said electrically conductive powder comprises 73 to about 77 weight percent of the composition, and

said organic vehicle includes a thermosetting polymer in addition to the thermoplastic polymer for retarding spreading of the printed composition during the firing operation, the thermosetting polymer comprising 0.05 to about 0.5 weight percent of the composition.

5,464,571

ONCE-THROUGH NUCLEAR REACTOR FUEL COMPOUNDS

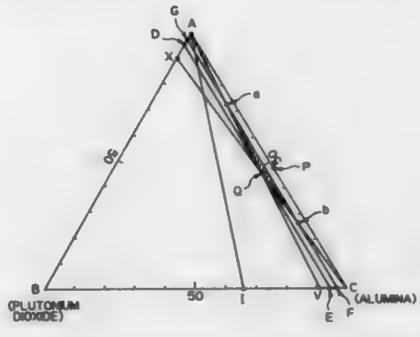
Tadasumi Muromura; Hideki Takano; Hiroshi Akie, and Shojiro Matsuura, all of Ibaraki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Mar. 9, 1994, Ser. No. 207,639

Claims priority, application Japan, Jul. 9, 1993, 5-170579

Int. Cl.[6] C09K *11/04;* **G21G** *4/00*

U.S. Cl. 252—638 **1 Claim**



1. A plutonium fuel composition having a composition range defined by the lines that connect the three compositional points of a three-component system consisting essentially of plutonium dioxide, a plutonium host phase and alumina; said composition having such a phase structure that two phases, said plutonium host phase having plutonium dioxide dissolved therein and said alumina phase, are in equilibrium;

wherein said three compositional points are the point for 3 mol % plutonium oxide, 67 mol % plutonium host phase and 30 mol % alumina; the point for 5 mol % plutonium oxide, 45 mol % plutonium host phase and 50 mol % alumina; and the point for 3 mol % plutonium oxide, 27 mol % plutonium host phase and 70 mol % alumina; and

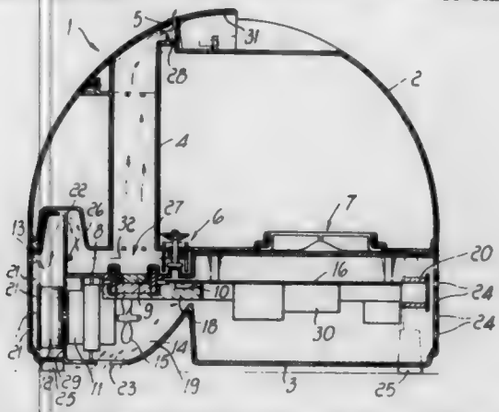
wherein said plutonium host phase is either thoria having a fluorite-type structure or stabilized zirconia having a fluorite-type structure and consisting essentially of 8–53 mol % Gd_2O_3 and 92-47 mol % of ZrO_2.

5,464,572

DEVICE FOR HUMIDIFYING AND IONIZING AIR

Mario Bonzi, Via Rovigo, 31 Brescia, Italy

Filed Feb. 23, 1994, Ser. No. 200,329
Claims priority, application Italy, Mar. 4, 1993, MI93A0416
Int. Cl.[6] B01F *3/04*; B03C *3/00*; H01T *23/00*
U.S. Cl. 261—30 16 Claims



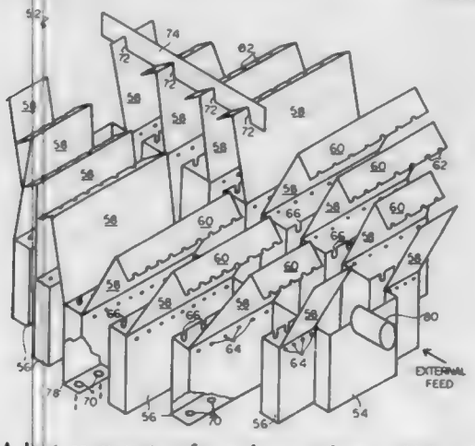
1. Device for humidifying and ionizing air, wherein it includes a first chamber (13) for humidifying air, and a second chamber (14) for ionizing air, said first chamber (13) and said second chamber (14) being separated from each other by a wall (29), means (8, 9) for humidifying air, located in said first chamber (13), means (20) for ionizing air, located in said second chamber (14), first means (11, 12) for aspirating and expelling a first stream of air through said said first chamber (13) and second means (11, 15) for aspirating and expelling a second stream of air through said second chamber (14), said wall (29) keeping said first stream and said second stream separate from each other.

5,464,573

LIQUID COLLECTOR-DISTRIBUTOR WITH INTEGRAL EXCHANGE COLUMN AND METHOD

Pamela J. Tokerud, and Darrin S. Muggli, both of Wichita, Kans., assignors to Koch Engineering Company, Inc., Wichita, Kans.

Filed May 9, 1994, Ser. No. 239,559
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—97 19 Claims



1. A heat or mass transfer exchange column, which column comprises:

a) an inlet in the upper portion of the column for the introduction of a liquid;

b) an outlet in the lower portion of the column for the withdrawal of a treated liquid;

c) an inlet in the lower portion of the column for the introduction of a gas;

d) an outlet in the upper portion of the column for the withdrawal of a treated gas;

e) a plurality of heat or mass transfer sections in the column to include an upper section and a vertically spaced-apart lower section to define a space therebetween said sections; and

f) an integral liquid collector-distributor means in the column space which means comprises:

i) liquid receiving means to receive downwardly flowing liquid;

ii) a plurality of spaced apart, generally parallel, lateral troughs to define an open space between troughs for the passage of upwardly flowing gas and the troughs extending substantially across the cross sectional area of the column and adapted to receive liquid from the liquid receiving means, and to distribute the liquid to the lower packed bed section, the lateral troughs each having spaced apart upward sides and an open top with side edges having upper edges and aperture means in the bottom or side walls of the troughs to distribute liquid to the lower packed bed section; and

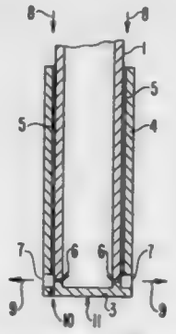
iii) liquid collection means to collect downwardly flowing liquid and to direct the liquid into the lateral troughs, which means includes a plurality of vane elements having a one and other end, the vane elements secured at the one end to the upper edge of one side of the lateral troughs and generally aligned parallel and extending upwardly at an angle to the longitudinal axis of the column and of sufficient length to cover substantially the open space between adjacent lateral troughs, and to provide generally vertical, laterally extending vapor open spaces between the other end of the vane elements and the upper edges of the side edges of the next adjacent trough for the passage of upwardly flowing gas, the vane elements adapted to receive on their upper angled surfaces the downwardly flowing liquid and to direct all or substantially all of the liquid into the lateral troughs to which side edge the vane element is secured.

5,464,574

DEVICE FOR THE PREPARATION OF FROTHED MILK FOR CAPPUCCINO

Gotthart Mahlich, Kronerg/Ts., Germany, assignor to Arthur Eugster AG Elektrohaushaltsgeräte, Romanshorn, Switzerland

Filed Oct. 21, 1994, Ser. No. 327,496
Claims priority, application European Pat. Off., Dec. 29, 1993, 93121055
Int. Cl.[6] A47J *31/40*
U.S. Cl. 261—124 10 Claims



1. A device for the preparation of frothed milk, comprising:

a steam pipe arrangement including an inner pipe having one end adapted for connecting to a superheated steam generator of a coffee or espresso maker with superheated steam flowing through the inner pipe during operation and an outer pipe arranged coaxially with said inner pipe and defining with said inner pipe at least one air flow channel between said inner and outer pipes, said steam pipe arrangement including an outlet configuration for outputting a mixture of steam and air, said

outlet configuration including at least two outlets arranged for opening directly into a container of milk, with at least one of said outlets being substantially radially-oriented with respect to a longitudinal direction of the steam pipe arrangement and being formed by approximately radial openings in said inner and outer pipes that are aligned with one another.

5,464,575

METHOD AND DEVICE FOR PRODUCING A SEAL CONTAINING AN INSERT, AT THE PERIPHERY OF A GLASS PANE, AND GLASS PANE OBTAINED

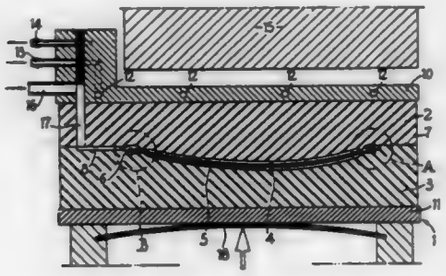
Franck Jaffiol, Nanterre; Jean J. Olivier, Boulogne, and Gérard Thomas, Pantin, all of, France, assignors to Automobiles Peugeot, Paris, and Automobiles Citroen, Neuilly/Seine, both of, France

Continuation of Ser. No. 963,276, Oct. 19, 1992, abandoned, which is a continuation of Ser. No. 637,534, Jan. 4, 1991, abandoned. This application May 16, 1994, Ser. No. 243,093

Claims priority, application France, Jan. 4, 1990, 90 00055

Int. Cl.[6] B29C *35/08*

U.S. Cl. 264—443 **15 Claims**



1. A method for producing a seal on a mineral or organic glass pane having a periphery, the seal being made from a hardenable plastic material including an insert and integrally connected to at least part of the periphery, comprising the steps of:

providing a mold made of a flexible material having a cavity defining a shape which allows the cavity to receive a peripheral edge of the glass pane;

placing the edge of the glass pane in the cavity of the mold in an open state;

arranging at least one insert within the cavity in a defined relative position with respect to the edge of the glass pane, the insert being free of a mechanical support device and being a definitive relative position of the edge and the insert on the glass pane in a shaped state;

closing the mold such that mold flexibility seals the edge of the glass pane without imposing breakage stresses in the pane, while closing the mold cavity;

injecting a plastic material in a fluid and inert state into the cavity at a sufficiently low pressure that the defined relative position of the insert is maintained, the plastic material overmolding the edge of the pane and including at least part of the insert;

activating the plastic material through the mold by high, very high, or ultra-high frequency electromagnetic radiation, the material being thus hardened; and

removing the glass pane with the overmolded seal from the mold after a cooling period.

5,464,576

METHOD OF MAKING ISOTROPIC BONDED MAGNET

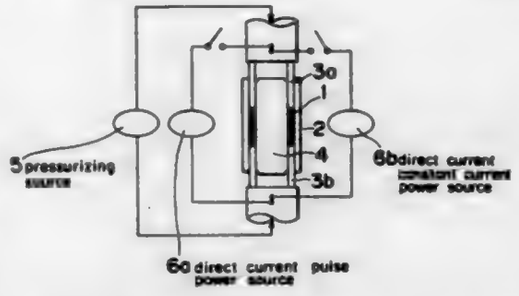
Fumitoshi Yamashita, Ikoma, and Masami Wada, Hirakata, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 29, 1992, Ser. No. 875,290

Claims priority, application Japan, Apr. 30, 1991, 3-128666; Jan. 25, 1991, 4-279237; Jan. 22, 1992, 4-008966

Int. Cl.[6] H05B *1/00*

U.S. Cl. 264—428 **4 Claims**



1. A method of producing a magnetically isotropic bonded magnet which comprises:

a. providing a cylindrical mold, including a means for subjecting contents of said mold to pressure in an axial direction, means for applying a pulsed direct current to the contents of said mold for energizing said contents and for generating an electromagnetic force in a radial direction in said contents, and means for applying constant direct current to said contents to effect sintering and energizing thereof;

b. filling said cylindrical mold with a mixture of rapidly solidified, melt spun magnetically isotropic magnetic powder and an inorganic glass binding agent therefor;

c. subjecting said mixture in said mold to: i) pressure in an axial direction, ii) a pulsed direct current to energize said mixture and generate an electromagnetic force in a radial direction in said mixture which causes an attractive force between particles of the powder of said mixture and iii) a constant direct current for energizing and heating to effect sintering of said mixture, whereby said magnetically isotropic bonded magnet is produced.

5,464,577

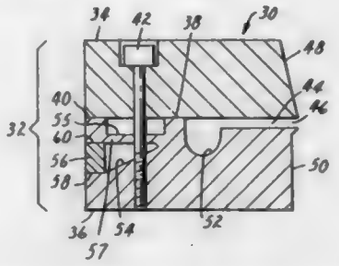
METHOD OF THICKNESS CONTROL FOR DIES

William K. Leonard, River Falls, Wis.; Stephen W. Mohn, St. Paul, Minn.; Timothy J. Edman, Stillwater, Minn., and Philip D. Schiller, Oakdale, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 4, 1994, Ser. No. 177,152

Int. Cl.[6] B29C *47/90*

U.S. Cl. 264—40.5 **6 Claims**



1. A method of controlling a slot exit gap of a die, wherein the die comprises a first plate having a lip, and a second plate having a lip and contacting the first plate at first and second locations which extend across the width of the plates, wherein the first and second plates combine to form a slot and a cavity, wherein the first location is further from the lips than the die cavity and wherein the

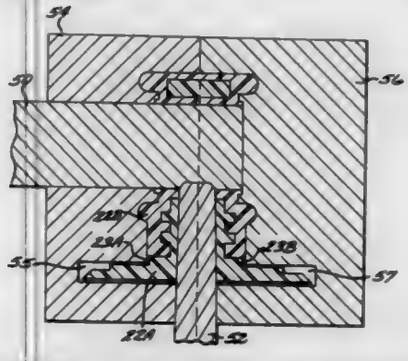
second location is further from the lips than the first location, to form a slot through the die which terminates and is bounded at its exit by the first and second lips, wherein the method comprises the step of deforming at least one of the first and second plates at the second location to provide relative pivoting of the first and second plates around the first location thereby to change the slot exit gap without bending the lips.

5,464,578

METHOD OF MAKING A COMPACT FLUID COUPLER FOR THERMAL INKJET PRINT CARTRIDGE INK RESERVOIR

James G. Salter, Columbus, Ga.; James E. Clark, San Diego, Calif.; David W. Swanson, Escondido, Calif., and George F. Nasworthy, Leucadia, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 18, 1992, Ser. No. 853,372
Int. Cl.[6] B29C *45/14;45/16;70/72*
U.S. Cl. 264—250 **4 Claims**



1. A method for forming a compact, leak-resistant joint between first and second moldable materials which define the frame of an ink-jetprint cartridge, the first material comprising a moldable rigid plastic and the second material comprising a moldable plastic characterized by a shrinkage rate as said second material cools, comprising a sequence of the following steps:

molding said first material into a predetermined first shot reservoir frame structure defining at a snout end thereof an interior standpipe member through which a channel opening extends, said channel opening for carrying ink in a liquid state from an ink reservoir to a printhead region of said cartridge;

positioning said first shot structure in a second shot mold, said mold comprising first and second mold halves which can be closed about said first shot structure and define a portion of one or more mold cavities into which said second material is injected under pressure, and which can be opened upon cooling to permit removal of a molded structure therefrom, wherein a portion of said first shot structure also defines a portion of said one or more mold cavities, and wherein the second shot mold is provided with a channel mold pin for extending through said channel opening to prevent said second material from entering said channel during a second shot molding step, and with a cavity mold pin which extends across said channel opening, said channel mold pin stopping against said cavity mold pin;

injecting said second moldable material in a molten state into said mold as a second shot wherein said second material surrounds said standpipe member, said second material having a shrinkage rate as said material cools, and wherein said first shot structure comprises one or more shutoff surfaces against which said mold halves bear when closed about said first shot structure, and thereby shuts off a path for said molten second moldable material to flow when injected into said mold;

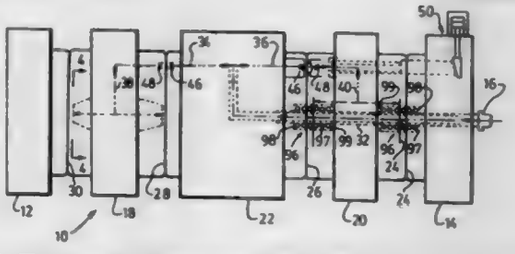
permitting said second material to cool, whereupon said second material shrinks about the periphery of said standpipe member, thereby forming a leak-resistant seal between said first and second materials about said standpipe, said seal resistant to leaks of said liquid ink out of said standpipe and resistant to air leaks through said seal into said reservoir.

5,464,579

MULTI-LEVEL STACKED MOLD SYSTEM

David Brown, 52 Monte Vista Trail, Brampton, Ontario, Canada; Harald Gaul, 204 Thornton Avenue, Thornton, Ontario, Canada; Yosif Kushnir, 755 Steeles Avenue, Apt. 1102, Willowdale, Ontario, Canada; Nick Travaglini, 51 Harris Crescent, Woodbridge, Ontario, Canada, and Victor Wilson, 37 Lawndale Court, Bondhead, Ontario, Canada

Continuation of Ser. No. 908,619, Jun. 29, 1992, abandoned, which is a division of Ser. No. 544,453, Jun. 27, 1990, Pat. No. 5,229,145. This application Jan. 31, 1995, Ser. No. 381,028
Int. Cl.[6] B29C *45/32*
U.S. Cl. 264—297.2 **2 Claims**



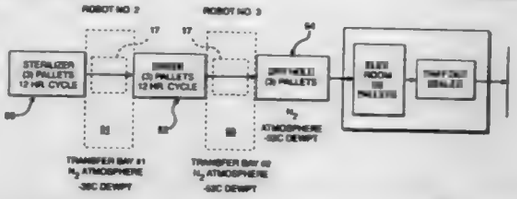
1. The method of significantly increasing the rate of article production by a stacked mold in a molding press having a predetermined upper limit to the axial force applied by the press, in holding the stacked components of the mold in closed, mutually compressing relation, including the steps of increasing to at least four levels the number of levels of mold cavities while maintaining axial symmetry of the levels about a central axial position; locating a stock distribution block at the central axial position; connecting the stock distribution block to an injection head for the press, and to stock flow paths to the mold cavities when the mold is in a closed condition; simultaneously injecting thermoplastic material into all said cavities at substantially the same rate of injection; and simultaneously separating and isolating the distribution block from the injection head and from the mold cavities during opening of the mold.

5,464,580

PROCESS OF STERILIZATION

Miron G. Popescu, Trevose, Pa.; David F. Bekus, Pittstown, N.J.; Shakti Routh, Ringoes, N.J.; Luis E. Vera, Bergenfield, N.J., and Thomas A. Clark, Cranford, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jun. 1, 1994, Ser. No. 251,874
Int. Cl.[6] B65B *55/02*
U.S. Cl. 422—34 **7 Claims**



1. A process for sterilizing a moisture sensitive product comprising; providing a closed sterilization system; maintaining said system in an aseptic condition by periodic decontamination with a disinfecting agent;

a) providing a sterilizable moisture sensitive product to be sterilized in an unsealed moisture impervious package,

b) placing the product containing package in a first vessel,

c) evacuating the first vessel,

d) filling said first vessel with a gaseous sterilant,

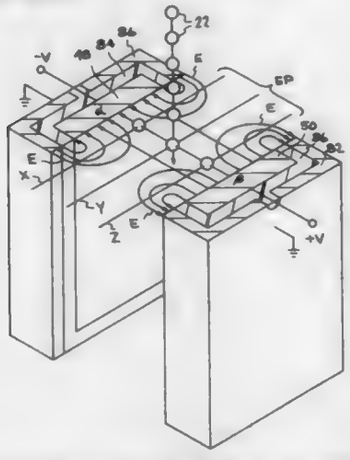
e) holding the product containing package in said first vessel until the product is sterilized,
f) evacuating the gaseous sterilant from said first vessel,
g) transferring the product containing package to a second vessel while maintaining said product containing package in a dry, pathogen free atmosphere and holding the product containing package in said second vessel until the product is substantially free of detectable moisture,
h) transferring the product containing package to a third vessel while maintaining said product containing package in a dry pathogen free atmosphere, said third vessel having an atmosphere comprising a dry inert gas having a dew point of less than −30° C. and maintaining the package in a dry gas atmosphere until the package is sealed.

5,464,581

FLOW CYTOMETER

Ger van den Engh, Seattle, Wash., assignor to The Regents of the University of California, Oakland, Calif.

Filed Aug. 2, 1993, Ser. No. 100,763
Int. Cl.[6] G01N *27/00*
U.S. Cl. 422—82.01 **7 Claims**



1. Cytometer apparatus for sorting cells and particles, comprising:
a. a flow chamber providing a flow of charged particles,
b. a Faraday shield enclosing said flow chamber,
c. a pair of oppositely charged deflection plates disposed on either side of said charged particle flow, each having an internal surface facing said particle flow, an opposed external surface, and vertical sides,
d. ground planes surrounding and spaced apart from the external surface and vertical sides of each said deflection plate, and
e. insulation means located in the space between each of said charged deflection plates and its associated ground plane.

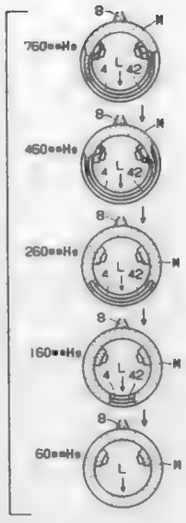
5,464,582

METHOD FOR MOLDING POLYURETHANE FOAM UNDER SUBATMOSPHERIC PRESSURES

Hidenobu Okano, and Katsunori Watanabe, both of Inazawa, Japan, assignors to Toyoda Gosei Co., Ltd., Japan

Continuation of Ser. No. 59,739, May 12, 1993, abandoned, which is a continuation of Ser. No. 712,716, Jun. 10, 1991, abandoned. This application Jun. 29, 1994, Ser. No. 268,661
Claims priority, application Japan, Jun. 12, 1990, 2-153439; Apr. 12, 1991, 3-108745
Int. Cl.[6] B29C *44/06*
U.S. Cl. 264—45.5 **10 Claims**

1. A method for producing a polyurethane foam molded article, wherein said polyurethane foam molded article has a core of low density and a skin layer of high density, comprising the steps of:



(a) lowering the pressure in a mold cavity to a pressure of 400 mm Hg or less;
(b) subsequently injecting a polyurethane material into the mold cavity having a pressure of 400 mm Hg or less; and then
(c) expanding the polyurethane material so that it flows and fills the mold cavity;
wherein the polyurethane material comprises an isocyanate compound, 100 parts by weight of polyol component and 0.1–0.6 parts by weight of water as a blowing agent.

5,464,583

METHOD FOR MANUFACTURING WHISKER PREFORMS AND COMPOSITES

Paul A. Lessing, Idaho Falls, Id., assignor to Lockheed Idaho Technologies Company, Idaho Falls, Id.

Filed Jul. 29, 1993, Ser. No. 100,008
Int. Cl.[6] C04B *35/80;35/81*
U.S. Cl. 264—60 **20 Claims**

1. A method for making a silicon nitride/SiAlON preform article, the method comprising the steps of:
(a) mixing particulate silicon carbide with particulate aluminum nitride and a catalyzing agent, said catalyzing agent being selected from the group consisting of calcium oxide and potassium chloride, to form a mixture;
(b) forming the mixture into a desired shape;
(b) reacting the formed mixture with a gas at a sufficient temperature and pressure to impose free nitrogen to convert the formed mixture into a whisker composition, the individual whiskers consisting substantially of silicon nitride at one end, and SiAlON at the other end.

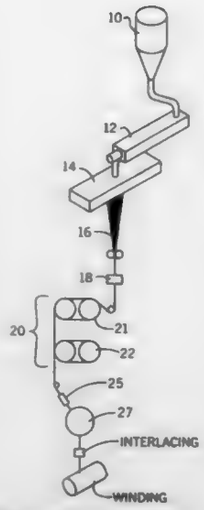
5,464,584

PROCESS FOR MAKING SOIL AND STAIN RESISTANT CARPET FIBER

Ling Yeh, Asheville, N.C., assignor to BASF Corporation, Parsippany, N.J.

Division of Ser. No. 171,369, Dec. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 914,680, Jul. 15, 1992, abandoned. This application Aug. 4, 1994, Ser. No. 289,056
Int. Cl.[6] D01D *5/24;5/253;* **D02J** *1/08;* **D06M** *15/19*
U.S. Cl. 264—103 **10 Claims**

1. A method for producing carpet yarn which has substantial soil hiding, soil repellent and resistance to staining with acid dyes comprising:
(a) forming at least one hollow trilobal fiber from a molten nylon polymer having an amine end group level below about



25 meq/kg, the fiber having a modification ratio of at least 2 and a void volume of at least 3%;

(b) quenching the formed fiber sufficiently to solidify the molten nylon;

(c) immediately after quenching, at a yarn speed of at least 300 mpm, finishing the fiber with spin finish containing fluorochemical;

(d) fully drawing the finished fiber;

(e) texturing the finished yarn by a hot fluid texturing process; and

(f) subsequently, applying to the textured yarn a sulfonated stainblocker, the stainblocker being heated to at least 50° C. and applied while the fiber temperature is at least about 100° C., during said applying the yarn traveling at a rate sufficient to permit fixation of the stainblocker while minimizing penetration of stain- blocker into the yarn.

5,464,585

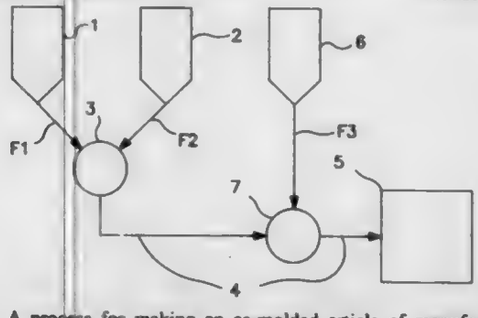
METHOD OF INJECTION MOLDING ARTICLES WITH SELECTIVE CONCENTRATIONS OR GRADIENTS OF MATERIALS

Denise R. Fitzgibbon, Hockessin, Del., assignor to Metton America, Inc., Abingdon, Va.

Filed Jan. 3, 1994, Ser. No. 177,103

Int. Cl.[6] B29C *45/14*

U.S. Cl. 264—108 **25 Claims**



1. A process for making an as-molded article of manufacture composed essentially of a solid resin, wherein a resin-modifying auxiliary material is concentrated in the surface portion of the article, comprising the following steps:

a) injecting into the cavity of a mold over a period of time a liquid that will form a solid resin in the mold, said injecting being conducted in a laminar fashion so that the liquid first coats the wall of the mold cavity, and continuing said injecting until the cavity is substantially full;

b) altering the composition of the injection liquid during said period of injection, without interrupting the injection, by initially incorporating an auxiliary material in the liquid at a first concentration level, and subsequently reducing the concentration of said auxiliary material prior to the end of the injection period, so that the auxiliary material is more concentrated in the portion of the liquid that coats the wall of the mold than it is in the portion of the liquid that is in the center of the mold cavity, said auxiliary material being a material that modifies a property of the resin, and said auxiliary material being mixed into the injection liquid at the beginning of step (a) in an amount that is sufficient to change said property of the resin at the surface of the as-molded article, but which is no more than 50 volume percent of the mixture of liquid and auxiliary material; and

c) after the injected liquid forms a solid resin, removing the resultant article from the mold.

13. A process for making an as-molded article of manufacture composed essentially of a solid resin, wherein a resin-modifying auxiliary material is concentrated in an interior portion of the article, comprising the following steps:

a) injecting into the cavity of a mold over a period of time a liquid that will form a solid resin in the mold, said injecting being conducted in a laminar fashion so that the liquid first coats the wall of the mold cavity, and continuing said injecting until the cavity is substantially full;

b) at some point during the injection period, altering the composition of the injection liquid, without interrupting the injection, by incorporating a greater concentration of an auxiliary material in the liquid than was theretofore being incorporated, so that the auxiliary material is less concentrated in the portion of the liquid that coats the wall of the mold than it is in a portion of the liquid that is more toward the center of the mold cavity, said auxiliary material being a material that modifies a property of the resin, and said auxiliary material being mixed into the injection liquid at some point during step (a) in an amount that is sufficient to change said property of the resin in an interior portion of the as-molded article, but which is less than 50 volume percent of the mixture of liquid and auxiliary material; and

c) after the injection liquid forms a solid resin, removing the resultant article from the mold.

5,464,586

AQUEOUS SLIP AND MOLD-RELEASE AGENT AND PROCESS FOR THE MOLDING AND VULCANIZATION OF TIRES AND OTHER RUBBER ARTICLES

Herbert Wagner, Schönborn, Germany, assignor to Rhein Chemie Rheinau GmbH, Mannheim, Germany

Division of Ser. No. 737,989, Jul. 30, 1991, abandoned. This application Mar. 24, 1994, Ser. No. 217,225

Claims priority, application Germany, Aug. 2, 1990, 40 24 565.9; Mar. 8, 1991, 41 07 932.9

Int. Cl.[6] B29C *33/60;* **C10M** *147/02*

U.S. Cl. 264—130 **20 Claims**

1. In a process for molding and vulcanizing tires and other rubber articles in which negative molds are pressed into a blank with the help of a heating membrane under pressure, the improvement comprising:

spraying the inside surface of the blank with an aqueous slip and mold-release agent comprising

a) 0.5 to 6 wt. % polytetrafluoroethylene as a release effective substance,

b) 20 to 40 wt. % mineral fillers,

c) at least 40 wt. % water,

d) up to 2 wt. % non-ionic surfactant as wetting and dispersing agent,

e) silicone oil in an mount sufficient to replace up to 50% by weight of (a); and

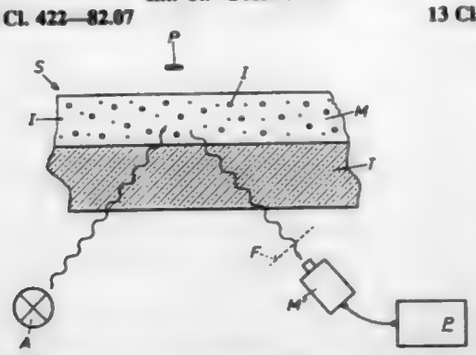
f) iron stearate present in an amount of not more than 1 wt. %, and evaporating the water in said slip and mold-release agent to leave a film of slip and mold release agent on the surface of the blank.

5,464,587

LUMINESCENCE-OPTICAL INDICATOR FOR DETERMINING THE ACTIVITY OF ALKALI METAL IONS IN A SAMPLE SOLUTION

Max Lippitsch; Sonja Draxler, and Marco J. Leiner, all of Graz, Austria, assignors to AVL Medical Instruments AG, Schaffhausen, Switzerland

Filed May 16, 1994, Ser. No. 242,974
Claims priority, application Austria, Jun. 9, 1993, 1129/93
Int. Cl.[6] G01N 21/64
U.S. Cl. 422—82.07 13 Claims



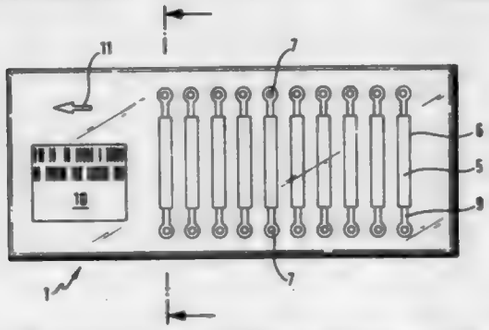
1. A luminescence-optical indicator for determining the activity of alkali metal ions in a sample solution through at least indirect contact with said sample solution, wherein said luminescence-optical indicator comprises at least three components: a fluorophor having a defined luminescence decay time, a functional group with which said luminescence decay time of said fluorophor can be influenced, and a ionophor selectively and reversibly binding said alkali metal ions to be measured such that said functional group alters said decay time of said fluorophor depending on the activity of said alkali metal ions, said fluorophor being chemically bound to said ionophor and said ionophor being chemically bound to said functional group.

5,464,588

ARRANGEMENT FOR COLORIMETRICALLY DETECTING A GASEOUS AND/OR VAPOROUS COMPONENT IN A GAS MIXTURE

Wolfgang Bäther, and Rainer Bommer, both of Lübeck, Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Germany

Filed Feb. 10, 1994, Ser. No. 194,274
Claims priority, application Germany, Feb. 10, 1993, 43 03 861.1
The portion of the term of this patent subsequent to Mar. 14, 2012, has been disclaimed.
Int. Cl.[6] G01N 30/88
U.S. Cl. 422—88 15 Claims



1. An arrangement for colorimetrically detecting a gaseous and/or vaporous component in a gas mixture, the arrangement comprising:

a reagent carrier band having a surface;

a color indicator containing reagents for entering into a color reaction with said component;

said color indicator being in the form of a plurality of surface spreads along respective predetermined paths on said surface of said reagent carrier band to define a plurality of respective reaction zones;

channel carrier means for defining a plurality of pairs of mutually adjacent side walls formed therein and being disposed on said surface for causing each pair of said side walls and the path corresponding thereto to conjointly define a channel;

separate channel access means for each one of the channels to facilitate the penetration of said gas mixture into said one channel to permit said component to enter into a color reaction with the color indicator in the reaction zone of said channel to provide a colorimetric indication of the component;

said reagent carrier band and said channel carrier means being first and second foils;

each pair of said side walls being defined by a cutout in said second foil and said second foil having a plurality of said cutouts defining corresponding pairs of said side walls;

a third foil covering said second foil and said channels to define a cover foil;

said cover foil being penetrable by radiation necessary for evaluating the coloration occurring in said reaction zone;

said first, second and third foils being sandwiched together to define a composite foil;

each one of said channels having a longitudinal end at or near the beginning of the path of the reaction zone of said one channel; and,

each one of said separate channel access means being formed in said arrangement at or near said beginning of the reaction zone thereby permitting the coloration of the colorimetric detection to advance linearly along said path.

5,464,589

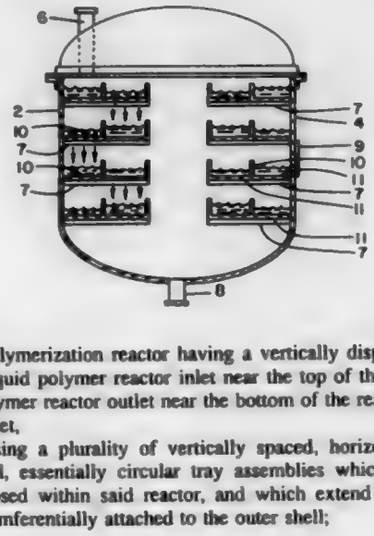
Patent Not Issued For This Number

5,464,590

REACTOR TRAYS FOR A VERTICAL STAGED POLYCONDENSATION REACTOR

Thomas L. Yount, 3208 Nola La.; J. Wesley Adams, 4000 Grey Fox Dr., and Larry C. Windes, 1212 Jerry La., all of Kingsport, Tenn. 37664

Filed May 2, 1994, Ser. No. 238,077
Int. Cl.[6] C08F 2/00; B01D 11/04; F02M 29/04
U.S. Cl. 422—131 18 Claims



1. A polymerization reactor having a vertically disposed outer shell, a liquid polymer reactor inlet near the top of the reactor, a liquid polymer reactor outlet near the bottom of the reactor, and a vapor outlet,

comprising a plurality of vertically spaced, horizontally disposed, essentially circular tray assemblies which are fully enclosed within said reactor, and which extend to and are circumferentially attached to the outer shell;

each tray assembly having a central open section forming a portion of a common vapor chimney connected to the vapor outlet, with open access to the liquid surface on each tray afforded by vertical spacing between successive trays;

each tray assembly having at least one aperture providing a free passageway to permit the discharge of a downwardly flowing liquid polymer to the tray immediately below;

each tray assembly constructed to facilitate traversal of liquid polymer from tray inlet to tray outlet over the floor of the tray in a single flow channel;

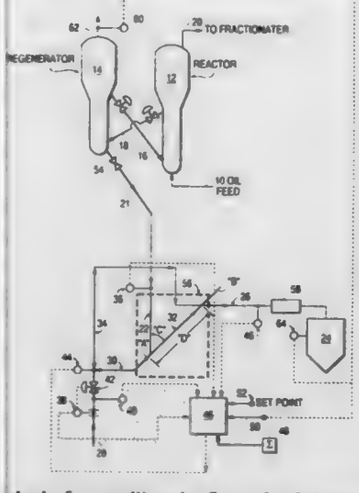
wherein flow of the liquid polymer is accomplished by means of a hydraulic gradient wherein the height of the fluid surface at the tray inlet is greater that the height of the fluid surface at the tray outlet, and the single flow channel is defined by baffle walls having sufficient height to prevent spillage of liquid polymer, said baffle walls forming a channel having at least two curved-loop subsections, wherein the liquid flows between subsections through a channel section defined by a substantially semi-circular turnaround wall wherein the angular direction of the flow of liquid polymer upon the tray is reversed.

5,464,591

PROCESS AND APPARATUS FOR CONTROLLING AND METERING THE PNEUMATIC TRANSFER OF SOLID PARTICULATES

David B. Bartholic, 75 Wetumpka La., Watchung, N.J. 07060

Filed Feb. 8, 1994, Ser. No. 193,456
Int. Cl.[6] B01J *19/00*
U.S. Cl. 422—142 **21 Claims**



1. The method of controlling the flow of a fluidized particulate solid used in the processing of a hydrocarbon feedstock, which comprises:

(a) passing a fluidized stream of said particulate solid downwardly from a pressurized source of said particulate solid in a first conduit to a junction with a second conduit where said solid particulate is mixed with a stream of a fluid transport medium from a third conduit;

(b) passing a stream of the resulting mixed solid/particulate transport medium upwardly in the second conduit from the first conduit for a distance at least as great as the diameter of the first conduit at said junction to a fourth conduit;

(c) transporting the particulate solid/fluid transport medium stream in the fourth conduit to a desired location;

(d) determining the temperature of the particulate solid in the first conduit;

(e) determining the temperature of the transport medium in the third conduit;

(f) determining the temperature of the solid particulate/transport medium mixture; and

(g) setting the flow rate of the transport medium in the third conduit to produce a target mass flow of the particulate solid in the fourth conduit determined in accordance with the following equation:

$$Mp=Mm\cdot Cm\cdot(T46-T40)/Cp\cdot(T36-T46)$$

where:

Mp represents the target mass flow of the particulate solid in the fourth conduit,

Mm represents the mass flow of the transport medium in the third conduit,

Cp represents the heat capacity of the particulate solid,

Cm represents the heat capacity of the transport medium,

T46 represents the temperature of the particulate solid in the fourth conduit,

T40 represents the temperature of the transport medium in the third conduit,

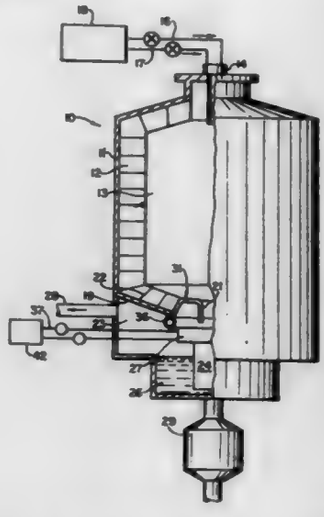
T36 represents the temperature of the particulate solid in the first conduit.

5,464,592

GASIFIER THROAT

Donald D. Brooker, Hopewell Junction, N.Y.; James S. Falsetti, New Fairfield, Conn.; James K. Wolfenbarger, Torrance, Calif., and Dinh-Cuong Vuong, Nederland, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 22, 1993, Ser. No. 155,368
Int. Cl.[6] F28D *21/00;* **C10J** *3/00;* **F23J** *1/02;* **F22B** *37/00*
U.S. Cl. 422—207 **11 Claims**



1. A gasifier for the partial oxidation of a carbonaceous fuel mixture, including a synthesis gas, said gasifier comprising,

a) a combustion chamber in which the carbonaceous fuel mixture is directed and partially oxidized, said combustion chamber having a floor,

b) a bath section below the floor of said combustion chamber for holding liquid coolant,

c) a throat section at the chamber floor, said throat section having a throat opening through which said combustion chamber communicates with said bath section to conduct products of said partial oxidation from said combustion chamber into said bath section,

d) said throat section including:

1) a walled manifold between said floor and said bath section for receiving liquid coolant,

2) a plurality of pipes having one end joined to the wall of said manifold to receive coolant from said manifold, said pipes having a U-shape portion defining a cooling channel contiguous with the floor of said combustion chamber, and

said pipes having an open discharge end, said open end being end directed toward said bath section.

5,464,593

PROCESS FOR PRODUCING SPHERICAL ZEOLITE CATALYST AND APPARATUS FOR PRODUCING THE SAME

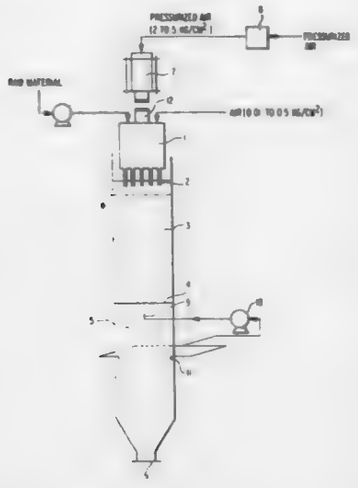
Kazuo Takahashi; Fumio Kumata; Hitoshi Nozaki; Shinichi Inoue, and Toshiji Makabe, all of Kanagawa, Japan, assignors to Mitsubishi Oil Co., Ltd., Tokyo, and Chiyoda Corporation, Yokohama, both of, Japan

Division of Ser. No. 849,346, Mar. 11, 1992, Pat. No. 5,362,696. This application Jul. 12, 1994, Ser. No. 273,874

Claims priority, application Japan, Mar. 11, 1991, 3-70611; May 21, 1991, 3-146756

Int. Cl.[6] B01J *20/18;29/06*

U.S. Cl. 422—224 **9 Claims**



1. An apparatus for producing a spherical zeolite catalyst which comprises:

dropping means having at least one opening of a circular cross section for feeding a zeolite-containing alumina sol to a reactor,

impulse generating means for applying knocks to the dropping means to form spherical droplets of the zeolite-containing alumina sol,

an impulse generating means regulator for regulating the strength of the knocks and the intervals between the knocks,

a reactor, where the spherical zeolite catalyst is formed, having an upper part and a lower part, where the upper part of the reactor contains an oil phase which receives the zeolite-containing alumina sol from the dropping means having at least one dropping opening and where the lower part of the reactor contains an aqueous alkaline solution, with an interface between the oil phase and the aqueous alkaline solution, and

outlet means at the lower part of the reactor to withdraw the spherical zeolite catalyst;

wherein the impulse generating means gives constant strength knocks to the at least one dropping opening at regular time intervals to form sol droplets having constant diameter.

5,464,594

CERAMIC FIBER REINFORCED SILICON CARBOXIDE COMPOSITE

Roger Y. Leung, Schaumburg, and Stephen T. Gonczy, Prospect, both of Ill., assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 426,820, Oct. 25, 1989. This application Dec. 20, 1990, Ser. No. 638,107

The portion of the term of this patent subsequent to Jun. 7, 2011, has been disclaimed.

Int. Cl.[6] D04H *1/58;* **B32B** *9/00*

U.S. Cl. 422—288 **11 Claims**

1. A fiber reinforced glass composite comprising

(a) refractory fibers;

(b) a carbon-containing black glass ceramic composition having the empirical formula SiCxOy wherein x ranges from about 0.5 to about 2.0 and y ranges from about 0.5 to about 3.0.

5,464,595

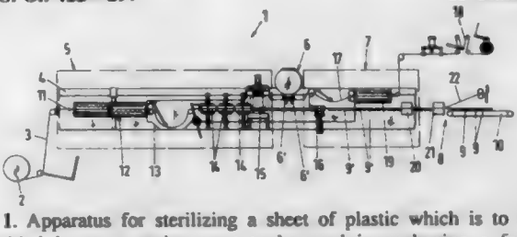
METHOD AND MACHINE FOR DRAWING OFF FOODS AND DRINKS ASEPTICALLY

Josef Finnah, Ahaus, Germany, assignor to GEA Finnah GmbH, Ahaus, Germany

Filed Dec. 9, 1993, Ser. No. 164,605

Int. Cl.[6] A61L *2/00;* **A23B** *3/00;* **A23L** *3/16*

U.S. Cl. 422—297 **11 Claims**



1. Apparatus for sterilizing a sheet of plastic which is to be molded into a container part to be used in packaging a food product, the apparatus comprising:

first steam-discharging means for applying steam to one side of one segment of a sheet;

first cooling means for cooling the other side of said one segment of said sheet;

said first steam-discharging means applying steam to said one side of said one segment simultaneously as said first cooling means cools said other side of said one segment;

second steam-discharging means applying steam to said other side of a juxtaposed segment of said sheet;

second cooling means cooling said one side of said juxtaposed segment of said sheet;

said second steam-discharging means applying steam to said other side of said juxtaposed segment simultaneously as said second cooling means cools said one side of said juxtaposed segment.

5,464,596

METHOD FOR TREATING WASTE STREAMS CONTAINING ZINC

Allan S. Myerson, Brooklyn, N.Y., assignor to Metals Recycling Technologies Corp., Atlanta, Ga.

Continuation-in-part of Ser. No. 953,645, Sep. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 820,987, Jan. 15, 1992, Pat. No. 5,208,004. This application May 4, 1994, Ser. No. 238,250

Int. Cl.[6] C22B *19/24*

U.S. Cl. 423—101 **50 Claims**

1. A continuous method for the recovery of zinc oxide from waste material streams which comprise zinc compounds, comprising the steps of:

a. roasting said waste material at an elevated temperature and in a reducing atmosphere;

b. treating said waste material with an ammonium chloride solution at an elevated temperature to form a product solution which comprises dissolved zinc and dissolved zinc oxide whereby any iron oxide in said waste material will not go into solution;

c. separating said product solution from any undissolved materials present in said product solution including any of said iron oxide;

d. adding zinc metal and a dispersant to said product solution whereby any lead and cadmium ions contained within said product solution are displaced by said zinc metal and precipitate out of said product solution as lead and cadmium metals and said dispersant is selected from the group consisting of dispersants which will prevent the aggregation of said zinc metal;

e. separating said product solution from the lead and cadmium metals;

f. lowering the temperature of said product solution thereby precipitating the zinc component as a mixture of crystallized zinc compounds;

g. separating said precipitated zinc compounds from said product solution;

h. washing said zinc compounds solids with a wash water thereby solubilizing certain of said zinc compounds;

i. separating the remaining zinc compounds solids from said solution; and then

j. drying said remaining zinc compounds solids at a temperature of at least 100° C. whereby said resulting product is zinc oxide of 99% or greater purity.

5,464,597

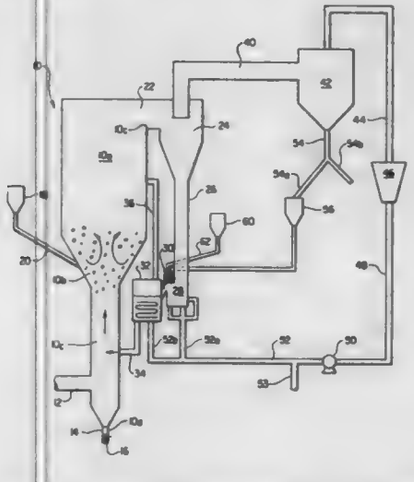
METHOD FOR CLEANING AND COOLING SYNTHESIZED GAS

John T. Tang, Robbinsville, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Feb. 18, 1994, Ser. No. 198,752

Int. Cl.[6] B01J *8/18;* **B01D** *53/12;53/48*

U.S. Cl. 423—210 **16 Claims**



1. A method of treating gas comprising the steps of passing said gas into a vessel containing a particulate material at a temperature less than that of said gas in a manner so that said gas is cooled and entrains at least a portion of said material, passing said gas with said entrained material to a separator for separating said entrained material from said gas, passing said separated material back to said vessel in a manner to establish a pressure seal between said vessel and said separator to prevent the backflow of said material to said separator, passing said separated gas to a turbine to drive same, and passing the exhaust gas from said turbine to said pressure seal to aerate said separated material to promote the flow of said separated material from said pressure seal.

5,464,598

METHOD FOR REMOVING A CONTAMINANT FROM A FLUID USING A CHEMICALLY IMPREGNATED AND COATED ZEOLITE

Fred Klatte, Two Spruce St., San Francisco, Calif. 94118

Continuation-in-part of Ser. No. 975,680, Nov. 13, 1992, Pat. No. 5,278,112. This application Nov. 10, 1993, Ser. No. 150,438

Int. Cl.[6] C01B *17/02*

U.S. Cl. 423—220 **10 Claims**

1. A method for absorbing a contaminant from a fluid, including the step of:

flowing the fluid containing said contaminant through a bed comprising coated, impregnated zeolite crystals and thereby absorbing said contaminant from the fluid,

wherein the coated, impregnated zeolite crystals have been produced by:

(a) producing impregnated zeolite crystals by impregnating zeolite crystals with a first chemical selected from a group consisting of a quaternary ammonium cation and a permanganate; and

(b) after step (a), coating the impregnated zeolite crystals with a second chemical selected from said group, wherein the second chemical is different than the first chemical.

5,464,599

PROCESS FOR PURIFYING A GAS TO REMOVE NITROGEN MONOXIDE THEREFROM

Gérard De Soete, Colombes, France, assignor to Solvay (SociétéAnonyme, Brussels, Bulgaria

PCT No. PCT/EP92/02173, § 371 Date Jun. 22, 1994, § 102(e) Date Jun. 22, 1994, PCT Pub. No. WO93/06916, PCT Pub. Date Apr. 15, 1993

PCT Filed Sep. 18, 1992, Ser. No. 211,082

Claims priority, application France, Aug. 30, 1991, 91 12098

Int. Cl.[6] C01B *21/02*

U.S. Cl. 423—239.1 **13 Claims**

1. A process for purifying a gas containing nitrogen monoxide to remove nitrogen monoxide therefrom; the process comprising:

a. adjusting oxygen content of the gas to provide a quantity of oxygen which is at least equal to a stoichiometric quantity which is necessary in order to oxidize the nitrogen monoxide contained in the gas to nitrogen dioxide;

b. contacting the gas, substantially in the absence of any liquid, with an alkali metal pyrosulphite which is a solid and which is employed in a quantity sufficient to convert the nitrogen monoxide contained in the gas to alkali metal nitrite and alkali metal nitrate; and

c. removing the alkali metal nitrite and the alkali metal nitrate from the gas.

11. A process for purifying a gas containing nitrogen monoxide and sulphur dioxide to remove nitrogen monoxide therefrom, the process comprising:

a. adjusting oxygen content of the gas to provide a quantity of oxygen in the gas which is at least equal to a stoichiometric quantity which is necessary in order to oxidize the nitrogen monoxide contained in the gas to nitrogen dioxide; and

b. contacting the gas with an alkali metal compound comprising an alkali metal pyrosulphite,

wherein the alkali metal pyrosulfite is employed in a quantity which is sufficient to convert the nitrogen monoxide contained in the gas to alkali metal nitrite and alkali metal nitrate, and

wherein the alkali metal pyrosulphite employed is formed in situ within the gas by reacting at least one alkali metal bicarbonate with the sulphur dioxide present in the gas.

5,464,600

AMINE CATALYZED REACTION IN THE PRODUCTION OF THIOPHOSPHORYL CHLORIDE

Peter E. Newallis; Vidanatha A. Prasad, both of LeaWood, Kans., and Jacqueline M. Applegate, Parkville, Mo., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Dec. 27, 1994, Ser. No. 364,351

Int. Cl.[6] C01B *25/10*

U.S. Cl. 423—300 **15 Claims**

1. An process for preparing thiophosphoryl chloride by reacting phosphorous trichloride with sulfur in the presence of a catalyst, the improvement wherein the catalyst is a tertiary amine.

5,464,601

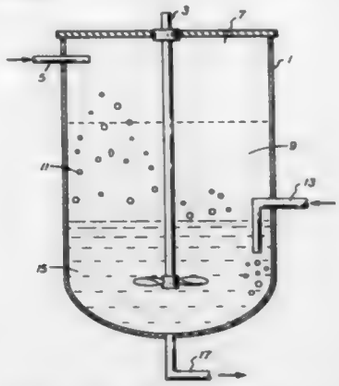
PROCESS FOR PREPARING SULFIDES OF PHOSPHORUS

Edward J. Griffith, Manchester, and Toan M. Ngo, Eureka, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 29, 1994, Ser. No. 219,227

Int. Cl.[6] C01B *25/14*; **C09K** *3/00*

U.S. Cl. 423—303 **16 Claims**



1. In a process wherein phosphorus and sulfur are caused to react under reaction conditions, the improvement which comprises the steps of:

(a) forming a pre-mix by combining elemental sulfur with elemental phosphorus in the absence of a diluent at a temperature above the melting point of one of said elements but below the temperature at which said elements will react with each other,

(b) maintaining the mixture at a temperature at which the pre-mix of (a) above is at least partially in the liquid state, and

(c) introducing said liquid mixture into a suitable reaction vessel maintained at a temperature under which said elements react to form a sulfide of phosphorus.

9. In a process wherein elemental phosphorus and elemental sulfur are caused to react under reaction conditions to produce a phosphorus sulfide product, the improvement which comprises providing said reaction with a pre-mix of elemental phosphorus and elemental sulfur and a minor portion of diluent comprising a phosphorus sulfide, said pre-mix being maintained at a temperature below the reaction temperature of said elements prior to being introduced into a reactor.

14. In a process for preparing phosphorus pentasulfide wherein elemental sulfur is caused to react with elemental phosphorus under reaction conditions, the improvement which comprises providing said reaction with a pre-mix containing from about 22% to about 25% of atoms of elemental phosphorus and from about 75% to about 78% of atoms of elemental sulfur at a temperature below the reaction temperature of said elements.

16. A pre-mix composition for preparing phosphorus sulfides comprising, by weight, from about 25 to about 28 percent elemental phosphorus, from about 72 to about 78 percent elemental sulfur and from about 2 to about 10 percent phosphorus pentasulfide whereby said composition is air-stable below the activation temperature of the reaction of phosphorus and sulfur.

5,464,602

SEQUENTIAL PYROLYSIS OF PLASTIC TO RECOVER POLYSTRENE HCL AND THEREPHTHALIC ACID

Robert J. Evans, Lakewood, and Helena L. Chum, Arvada, both of Colo., assignors to Midwest Research Institute, Kansas City, Mo.

Continuation of Ser. No. 206,222, Mar. 7, 1994, abandoned, which is a continuation of Ser. No. 943,692, Oct. 26, 1993, abandoned, which is a division of Ser. No. 711,546, Jun. 7, 1991, Pat. No. 5,216,149. This application Jan. 9, 1995, Ser. No. 370,470

The portion of the term of this patent subsequent to Aug. 4, 2009, has been disclaimed.

Int. Cl.[6] F23G *7/12*

U.S. Cl. 423—488 **1 Claim**

1. A process of pyrolyzing a polyvinyl chloride, polyethylene terephthalate, polystyrene and polyethylene containing plastic waste feed stream in a carrier gas so that pyrolysis of polyethylene terephthalate occurs prior to pyrolysis of polystyrene, and said pyrolysis of polystyrene occurs prior to pyrolysis of polyethylene, comprising the following steps carried out in the order given:

a) heating said plastic waste feed stream to a first temperature in a range of from about 250° C. to about 350° C.;

b) adding an acid or base catalyst on an oxide or carbonate support to said feed stream while said feed stream is in said first temperature range;

c) heating said plastic waste feed stream at a heat rate of about 30° C./minute within said first temperature range to pyrolyze polyethylene terephthalate and polyvinyl chloride from said plastic waste feed stream;

d) separating terephthalic acid or HCl produced by step c) from said plastic waste feed stream;

e) heating the effluent of step d) at a heat rate of about 30° C./minute to a second temperature in a range of from about 350° C. to about 475° C. to pyrolyze polystyrene from said plastic waste feed stream;

f) separating styrene produced by step e) from said plastic waste feed stream;

g) heating the effluent of step f) at a heat rate of about 30 ° C./minute to a third temperature in a range of from about 475° C. to about 600° C. to pyrolyze polyethylene from said plastic waste feed stream; and

h) separating hydrocarbons produced by step g) from said waste feed stream.

5,464,603

METHOD OF TREATING AQUEOUS IODIDE SOLUTIONS

George L. Marchin, and Jack L. Lambert, both of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Continuation-in-part of Ser. No. 187,176, Jan. 25, 1994, Pat. No. 5,367,031. This application Sep. 9, 1994, Ser. No. 303,322

Int. Cl.[6] C01B *7/14*; **C02F** *1/28*

U.S. Cl. 423—501 **5 Claims**

4. The method of preparing iodine from an aqueous solution containing iodide, comprising contacting said solution with porous granules composed of a polyvalent metal chelating resin having zirconium peroxide bound to the chelating groups thereof, said contacting oxidizes iodide to iodine, separating the solution from the granules while leaving the iodine within said granules, and thereafter recovering the iodine from said granules by solvent elution.

5,464,604
METHOD FOR PURIFYING HIGH-TEMPERATURE REDUCING GAS

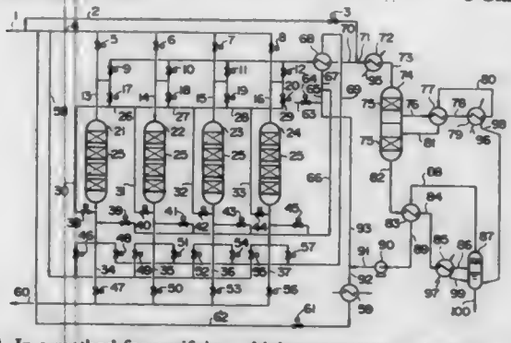
Mitsugi Suehiro, Tokyo; Toru Seto, Hiroshima; Shigeaki Mitsuoka, Hiroshima, and Kenji Inoue, Hiroshima, all of, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 951,944, Sep. 28, 1992, abandoned, which is a continuation of Ser. No. 721,917, Jun. 20, 1991, abandoned, which is a continuation of Ser. No. 457,284, Dec. 27, 1989, abandoned. This application Apr. 28, 1994, Ser. No. 234,716

Claims priority, application Japan, Jan. 5, 1989, 64-132

Int. Cl.[6] **B01D** *53/48;53/52;* **C01B** *17/04*

U.S. Cl. 423—570 **1 Claim**



1. In a method for purifying a high-temperature reducing gas in which sulfur compounds present in the high-temperature reducing gas are absorbed and removed by an absorbent according to a dry method, and recovered, the improvement which comprises:

absorbing and removing the sulfur compounds using at least four fixed bed reactor towers filled with the absorbent, the high-temperature reducing gas to be purified being obtained from gasification of fuels selected from the group consisting of coal and fuel oil, said gas having a temperature of from 250° to 500° C., regenerating the absorbent with an oxygen-containing gas, and then reducing the regenerated absorbent using the high-temperature reducing gas in a reduction step which is separate from the absorption and regeneration step to produce a gas from the reduction step, mixing this gas with a gas discharged from the regeneration step, the mixture thus obtained being subjected to a subsequent sulfur recovery step, the reactor towers cycling through the absorption, regeneration and reduction steps; and

mixing sulfur dioxide containing gas discharged from the regeneration process with a portion of the high-temperature reducing gas and subjecting the mixture to a sulfur recovery process in the presence of a catalyst under a pressure of from 10 to 25 kg/cm^2G, the inlet temperature of the sulfur recovery process being from 200° to 300° C., whereby sulfur dioxide is reduced directly to elemental sulfur by the reducing gas.

5,464,605
PROCESS FOR THE DECOMPOSITION AND REMOVAL OF PEROXIDES

Richard A. Hayden, Pittsburgh, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 7,169, Jan. 21, 1993. This application Feb. 14, 1994, Ser. No. 194,826

Int. Cl.[6] **C01B** *13/00;* **B01J** *21/18;20/20*

U.S. Cl. 423—579 **3 Claims**

1. A process for the decomposition and removal of peroxides from gaseous or liquid media which comprises contacting said media with a carbonaceous char, said char being prepared by (a) carbonizing a bituminous coal or a coal having bituminous properties at temperatures below 700° C. in the presence of an oxidant gas; (b) oxidizing said bituminous coal or coal having bituminous properties at temperatures below 700° C. during or after said carbonization; and (c) contacting said carbonized and oxidized bituminous coal or coal having bituminous properties with a nitrogen-containing compound and during said contacting increasing the temperature to above 700° C.

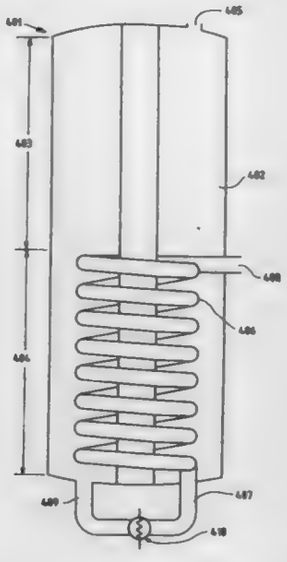
5,464,606
TWO-STAGE WATER GAS SHIFT CONVERSION MKTHOD

Richard F. Buswell, Glastonbury; Joseph V. Clausi, Portland, both of Conn., and Craig Louie, Vancouver, Canada, assignors to Ballard Power Systems Inc., North Vancouver, Canada

Filed May 27, 1994, Ser. No. 250,370

Int. Cl.[6] **C01B** *3/12*

U.S. Cl. 423—655 **7 Claims**



1. A water gas shift conversion method comprising the steps of:

(a) providing a water gas shift reactor comprising:

(1) a first reactor section having an inlet and a first quantity of catalyst disposed therein, said catalyst promoting a water gas shift reaction; and

(2) a second reactor section in fluid communication with said first reactor section, said second reactor section having an outlet and a second quantity of catalyst disposed therein, said second reactor section in heat exchange relationship with a coolant fluid directed through a conduit within said second reactor section;

(b) introducing a gaseous reactant stream comprising carbon monoxide and water vapor to said first reactor section through said inlet;

(c) contacting said stream with at least a portion of the catalyst disposed within said first reactor section;

(d) contacting said stream with at least a portion of said catalyst disposed within said second reactor section;

(e) exhausting said stream from said second reactor section through said outlet;

(f) directing at least a portion of said stream from said second reactor section outlet through a heat exchanger, said heat exchanger having an inlet and an outlet, wherein the temperature of said stream is reduced between said heat exchanger inlet and said heat exchanger outlet;

(g) directing said stream portion from said heat exchanger outlet to said conduit;

wherein said coolant fluid comprises said stream and wherein the temperature of said stream in said second reactor section is reduced by heat exchange with said coolant fluid.

5,464,607

5,5'-/(1,3-PROPANEDIYL) BIS-/IMINO(2-OXO-2,1-ETHANEDIYL)ACETYLIMINO/BIS(2,4,6-TRIIODO-1,3-BENZENEDICARBOXYLAMIDES), AND CONTRAST MEDIA CONTAINING THEM

Pierlucio Anelli; Marino Brocchetta; Fulvio Uggeri, and Massimo Visigalli, all of Milan, Italy, assignors to Dibra S.p.A., Milan, Italy

PCT No. PCT/EP92/02770, § 371 Date Jun. 1, 1994, § 102(e) Date Jun. 1, 1994, PCT Pub. No. WO93/12071, PCT Pub. Date Jun. 24, 1993

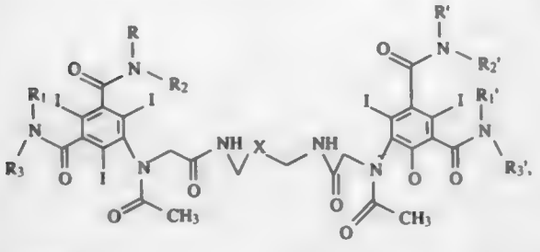
PCT Filed Dec. 1, 1992, Ser. No. 244,598

Claims priority, application Italy, Dec. 10, 1991, MI91A3305

Int. Cl.[6] C07C *235/68*

U.S. Cl. 424—9.452 **8 Claims**

1. Symmetrical and asymmetrical 5,5 '-[(1,3-propanediyl) bis[imino(2-oxo-2,1-ethanediyl)acetylimino]]bis -(2,4,6-triiodo-1,3-benzenedicarboxyamides) of general formula (I)



(I)

wherein:

R,R',R_1,R_1, which can be the same or different, are H, C_1–C_4 alkyl, linear for branched C_1–C_4 mono- or polyhydroxyalkyl,

R_2,R_2 which can be the same or different, are one of the groups of formula $—CH_2CH_2OH$, $—CH_2CH(OH)CH_2OH$, $—CH(CH_2OH)CH(OH)CH_2OH$, $—CH_2(CHOH)_4CH_2OH$ or $—CH(CH_2OH)_2$,

X is one of the groups —CH(OH)—, $—CH(CH_2OH)—$, $—C(OH)(CH_2OH)—$ or $—C(CH_2OH)_2—$,

as well as enantiomers, diastereoisomers and/or rotamers thereof.

5,464,608

COMPOSITION FOR THE CLEANING OF TEETH AND THE PROPHYLAXIS OF CARIES

Serguei V. Khartchenko; Nadejda Khartchenko; Alina Khartchenko, and Alissa S. Khartchenko, all of Alberta, Canada, assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Oct. 26, 1993, Ser. No. 141,667

Int. Cl.[6] A61K *7/16;7/20;9/46;9/20*

U.S. Cl. 424—53 **6 Claims**

1. A granulated carbon dioxide and oxygen evolving tablet or candy composition for the cleaning of teeth and the prophylaxis of caries, by removal of both soft and hard tartar from the teeth along with pathogenic microflora, and the diminution of the inflammatory processes present in the gums and mucus membrane without harm to the enamel of the teeth, said composition consisting essentially of the following in the indicated proportionate percentages, by weight, citric acid 60–64%, 0.5–0.9% ascorbic acid and other water soluble vitamins, sodium bicarbonate 26–30%, and sodium percarbonate about 1%, whereby said composition, when contacted with saliva, creates a pH level of 5.4 to 5.6 and evolves carbon dioxide and oxygen effective to deodorize and freshen the oral cavity.

5,464,609

USE OF KETOROLAC FOR TREATMENT OF ORAL DISEASES AND CONDITIONS

Gary R. Kelm; Harvey M. Pickrum; Matthew J. Doyle, and William Buchanan, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 132,426, Oct. 5, 1993, abandoned, which is a continuation of Ser. No. 947,193, Sep. 18, 1992, abandoned, which is a continuation-in-part of Ser. No. 930,493, Aug. 14, 1992, abandoned, which is a continuation of Ser. No. 651,061, Feb. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 494,697, Mar. 16, 1990, abandoned. This application Jul. 25, 1994, Ser. No. 280,163

Int. Cl.[6] A61K *31/19;7/22*

U.S. Cl. 424—54 **3 Claims**

1. A method for prevention or treatment of bone loss following tooth extractions, comprising topical administration to gingival mucosal tissue of the oral cavity, of a composition providing from about 0.001% to about 0.2% of ketorolac in the oral cavity, wherein said composition is not swallowed and is expectorated after about at least 15 seconds in the mouth.

5,464,610

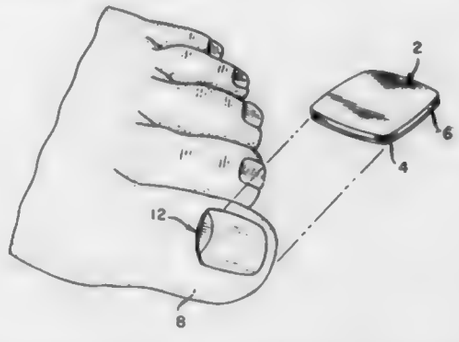
METHOD FOR TREATING ONYCHOMYCOSIS

Jesse C. Hayes, Jr., Cleveland; Gerald R. Dever, Cordova; Thomas J. Laughlin, Germantown; Charles F. Schroer, Jr., Bartlett, and Gary C. Wildman, Germantown, all of Tenn., assignors to Schering-Plough Healthcare Products, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 961,282, Oct. 15, 1992, abandoned. This application Jun. 2, 1993, Ser. No. 71,130

Int. Cl.[6] A61K *7/04;31/60*

U.S. Cl. 424—61 **20 Claims**



1. A method for treating onychomycosis without drilling a hole in a nail plate and without daily scraping of the nail, comprising topically administering to the afflicted nail of a human, a medicated device comprising salicylic acid or a salt, ester or mixture thereof in a plaster preparation, wherein said plaster preparation is attached to a carrier and the salicylic acid is present in the plaster preparation in an amount ranging from about 10 to about 80% by weight of the preparation.

5,464,611

Patent Not Issued For This Number

5,464,612

SOLID PREPARATION COMPRISING ION EXCHANGER AND ACTIVE AGENT

Hiroshi Matoba, Osaka; Shinji Ohmori, Ikeda; Hiroyoshi Koyama, Mishima, and Toshio Kashihara, Suita, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Apr. 28, 1994, Ser. No. 233,964

Claims priority, application Japan, Apr. 28, 1993, 5-125091

Int. Cl.[6] A61K *31/74*

U.S. Cl. 424—78.1 30 Claims

1. A solid preparation comprising (A) a clad powdery or granular preparation containing a medicinally active ingredient and (B) a powdery or granular ion exchanger, wherein the ion exchanger and the active ingredient are not in direct contact.

5,464,613

FAT-BASED PEST BAIT

Stephen J. Barcay, Burnsville, and Douglas G. Anderson, Lakeville, both of Minn., assignors to Ecolab, Inc., St. Paul, Minn.

Filed Jun. 17, 1994, Ser. No. 261,461

Int. Cl.[6] A01N *25/00;57/12;57/16;59/14*

U.S. Cl. 424—84 8 Claims

1. A substantially water-free insecticidal composition for use against insect pests comprising:

about 0.01–5.0 wt % acephate, and

about 95–99.99 wt % of a fat-based carrier comprising a mixture of a solid fat and a liquid fat.

5,464,614

STABILIZED SUPEROXIDE DISMUTASE (SOD) COMPOSITION

Reiner Meyer, Maria Enzersdorf, Austria, assignor to Boehringer Ingelheim International GmbH, Germany

Filed Nov. 15, 1993, Ser. No. 152,015

Claims priority, application Germany, Nov. 27, 1992, 42 39 877.0

Int. Cl.[6] A61K *38/44*

U.S. Cl. 424—94.3 6 Claims

1. A water soluble composition comprising 0.1–10 mg/ml manganese superoxide dismutase, 1–11% (weight/volume) hydroxypropyl-β-cyclodextrin, and 1.0–4.5% (weight/volume) mannitol.

5,464,615

USE OF TRANSGLUTAMINASES AS IMMUNOSUPPRESSANTS

Thomas Stief, Sevilla, Spain; Norbert Heimburger, and Hans U. Schorlemmer, both of Marburg, Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Germany

Continuation of Ser. No. 131,879, Oct. 5, 1993, abandoned, which is a continuation of Ser. No. 845,829, Mar. 6, 1992, abandoned, which is a continuation of Ser. No. 399,960, Aug. 29, 1989, abandoned. This application Sep. 22, 1994, Ser. No. 310,038

Claims priority, application Germany, Aug. 31, 1988, 38 29 524.5

Int. Cl.[6] A61K *38/48;38/55*

U.S. Cl. 424—94.63 4 Claims

1. A method of treating a patient in need of suppression of the immune response in transplant rejection by administering to such patient an effective amount of an immunosuppressant agent comprising a transglutaminase with a pharmaceutically acceptable excipient.

5,464,616

6β-SUBSTITUTED PENICILLANIC ACIDS AS BETA-LACTAMASE INHIBITORS

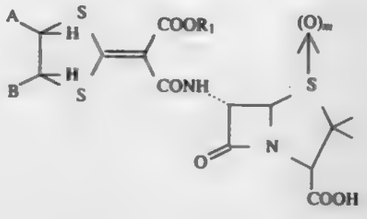
Kazuharu Noguchi, Edmonton; Ronald G. Micetich, Sherwood Park, and Mohsen Daneshtalab, Edmonton, all of, Canada, assignors to Synphar Laboratories, Ind., Alberta, Canada

Filed Aug. 4, 1994, Ser. No. 285,670

Int. Cl.[6] C07D *499/76;* A61K *31/425*

U.S. Cl. 424—114 25 Claims

1. A 6β-substituted penicillanic acid of the formula XII:



or a pharmaceutically acceptable salt or ester thereof, wherein

A and B are each hydrogen wherein the carbon atoms to which A and B are attached are linked by a single bond, or A and B together form a bond, wherein the carbon atoms to which A and B are attached are linked by a double bond,

R1 is selected from the group consisting of a) hydrogen, b) a pharmaceutically acceptable salt and c) a pharmaceutically acceptable group selected from the group consisting of methyl; ethyl; propyl; isopropyl; propenyl; propynyl; butyl; isobutyl; tert-butyl; butenyl; butynyl; pentyl; pentenyl; pentynyl; hexyl; heptyl; octyl; nonyl; decyl; cyclopropyl; cyclobutyl; cyclopentyl; cyclopentenyl; cyclohexyl; cyclohexenyl; cycloheptyl; cyclooctyl; cyclononyl; cyclodecyl; allyl; phenyl; naphthyl; aralkyl, aralkenyl, and aralkynyl, wherein the aryl parts of the molecule are pheny' or naphthyl; heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl and alkylheterocyclyl, wherein the heterocyclyl parts of the molecule consist of 1–5 carbon atoms and at least one hetero atom selected from the group consisting of nitrogen, oxygen and sulfur; wherein said group is unsubstituted or substituted with a substituent selected from the group consisting of floro; chloro; bromo; iodo; azido; nitro; monoalkyl substituted amino, dialkyl substituted amino, aryl substituted amino, alkanoylamino, arylcarbonylamino, cyano, hydroxy, alkoxy, aryloxy, alkanoyloxy, arylcarbonyloxy, mercapto, alkylthio, arylthio, alkanoylthio, arylcarbonylthio, oxyimino, alkoxyimino and carboxy, wherein the alkyl parts of the molecule contain 1 to 10 carbon atoms, the alkanoyl parts of the molecule contain 1 to 6 carbon atoms, and the aryl parts of the molecule are phenyl or naphthyl; and

n is an integer between 0 and 2.

5,464,617
β-LACTAM COMPOUNDS

Markus Böhringer, Möhlin, Switzerland; Christian Hubschwerlen, Durmenach, France; Philippe Pflieger, Folgensburg, France, and Jean-Luc Specklin, Kembs-Loechle, France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

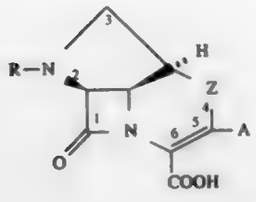
Filed Mar. 3, 1995, Ser. No. 398,411

Claims priority, application Switzerland, Mar. 11, 1994, 751/94; Jan. 31, 1995, 260/95

Int. Cl.[6] C07D *487/04;* A61K *31/395*

U.S. Cl. 424—114 **87 Claims**

1. A compound of the formula



I

in which Z signifies methylene, oxygen or sulphur and R signifies hydrogen, lower (cyclo)alkyl optionally substituted by carboxy, lower alkoxycarbonyl, carbamoyl, lower alkylcarbamoyl, phenylcarbamoyl or hydroxyphenylcarbamoyl, lower alkenylmethyl, lower aLkenylmethoxycarbonyl, formyl, lower (cyclo)alkanoyl or (cyclo)alkylsulphonyl optionally substituted by halogen, cyano, carbamoyl-lower-alkoxy, carbamoyl-lower alkylthio or carbamoyl-lower alkylamino, carbamoyl optionally substituted by lower (cyclo)alkyl, lower alkoxycarbonyl-lower alkyl, benzyloxycarbonyl-lower alkyl or carboxy-lower alkyl or a ring structure of the formulae

$$Q—X—CO— \quad (a1)$$

$$Q—X—SO_2— \quad (a2)$$

wherein Q represents a 5- or 6-membered ring optionally containing nitrogen, sulphur and/or oxygen and X represents a direct bond or one of the groups $—CH_2—$, $—CH_2CH_2—$, $—CH{=}CH—$, $—NH—$, $—NHCH_2—$, $—CH_2NH—$, $—CH(NH_2)—$, $—CH_2CH_2NH—$, $—C(=NOCH_3)—$, $—OCH_2—$ and $—SCH_2—$; and wherein further A signifies lower alkyl, hydroxy-lower alkyl, vinyl, cyanovinyl, lower alkoxy, optionally phenyl-substituted lower (cyclo)alkanoyloxy or (cyclo)alkylsulphonyloxy, optionally lower-(cyclo)alkyl-substituted benzoyloxy or phenylsulphonyloxy, a residue —S—Het or —S—CH_2—Het, wherein Het represents a 5- or 6-membered heterocycle containing nitrogen, sulphur and/or oxygen, or a residue —CH_2—L, wherein L represents optionally phenyl-substituted lower (cyclo)alkanoyloxy or (cyclo)alkylsulphonyloxy, optionally lower (cyclo)alkyl-substituted benzoyloxy or phenylsulphonyloxy, carbamoyloxy, lower (cyclo)alkoxycarbonyl, carboxy, azido, amino, lower (cydo)alkanoylamino, lower (cyclo)alkylsulphonylamino, lower (cyclo)alkylamino, all-lower (cyclo)alkylamino, a S- or 6-membered ring bonded to a nitrogen atom or a residue —S—Het or —S—CH_2—Het, wherein Her has the above significance, and pharmaceutically compatible, readily hydrolyzable esters and salts of these compounds.

5,464,618
GUSTATORY STIMULANT COMPOSITION USEFUL FOR CORN ROOTWORM CONTROL

Charles C. Doane, Phoenix; Jack W. Jenkins, Litchfield Park, Ariz., and Dirk A. Avé, Southampton, Pa., assignors to Ecogen Inc., Langhorne, Pa.

Continuation-in-part of Ser. No. 806,373, Dec. 13, 1991, abandoned, which is a continuation of Ser. No. 667,091, Mar. 29, 1991, Pat. No. 5,120,540. This application Feb. 9, 1994, Ser. No. 193,986

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 **19 Claims**

1. A gustatory stimulant composition for beetles of the subfamily Galerucinae comprising a dried powdered Cucurbitaceae plant material, a lubricant and an adherent, said composition being substantially free of volatile attractants for beetles of the subfamily Galerucinae.

5,464,619
BEVERAGE COMPOSITIONS CONTAINING GREEN TEA SOLIDS, ELECTROLYTES AND CARBOHYDRATES TO PROVIDE IMPROVED CELLULAR HYDRATION AND DRINKABILITY

James T. Kuznicki, and Lana S. Turner, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 3, 1994, Ser. No. 253,646

Int. Cl.[6] A61K *35/78;33/14;9/08*

U.S. Cl. 424—195.1 **19 Claims**

1. A dry composition consisting essentially of:
(a) from about 0.1% to about 3.5% flavanols;
(b) from about 0.1% to about 3% sodium ions;
(c) from about 0.05% to about 0.8% potassium ions;
(d) from about 1.0% to about 95% of a carbohydrate which provides
(i) from about 0.5% to about 50% fructose; and
(ii) from about 0.5% to about 50% glucose.

5,464,620
PHARMACEUTICAL COMPOSITION FOR TREATING GASTROINTESTINAL DISEASE

Xinxian Zhao, Shenzhen, China

Filed Jul. 1, 1994, Ser. No. 273,231

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 **1 Claim**

1. A pharmaceutical composition for the treating of gastritis, duodenal and gastric ulcer comprising:
5–40 wt % of hydrochloric acid extract of Rhizoma coptidis;
5–40 wt % of water extract of Radix scutellariae; and
30–60 wt % of water extract of Radix astragali.

5,464,621
CANINE CORONA VIRUS VACCINE

William Baxendale, Huntingdon, and William S. K. Chalmers, St. Ives, both of, United Kingdom, assignors to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 70,079, Jun. 1, 1993, abandoned, which is a division of Ser. No. 514,069, Apr. 25, 1990, Pat. No. 5,232,694. This application Aug. 3, 1994, Ser. No. 285,611

Claims priority, application European Pat. Off., May 3, 1989, 89304441

Int. Cl.[6] A61K *39/215;* C12N *7/08*

U.S. Cl. 424—221.1 **1 Claim**

1. An essentially pure culture of the canine corona virus strain deposited at the Collection Nationale de Cultures de Microorganismes of Institut Pasteur, having the accession number I-743, or viruses derived by passaging said strain.

5,464,622

ANTIMICROBIAL COMPOSITIONS COMPRISING IODOPROPARGYL BUTYLCARBAMATE AND 2-MERCAPTOPYRIDINE N-OXIDE AND METHOD OF CONTROLLING MICROBES

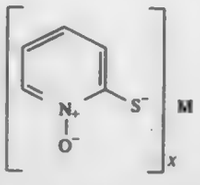
Raj I. Mehta, Gujarat, Ind.; Barry C. Lange, Lansdale, Pa., and Samuel E. Sherba, Willingboro, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 619,281, Nov. 27, 1990, abandoned. This application Nov. 4, 1992, Ser. No. 971,694

Int. Cl.[6] A01N *31/08;31/16;47/10;25/00*

U.S. Cl. 424—405 2 Claims

1. A microbicidal composition comprising a synergistic mixture a first component of which is a sodium salt of 2-mercaptopyridine N-oxide of the formula



wherein M is sodium; where X=1; and a second component of which is iodopropargyl butylcarbamate wherein the ratio of the first component to the second component is in the range from about 200/1 to about 1/99.

5,464,623

PROCESS FOR PELLETIZING INSECTICIDAL N-HYDROCARBOYL PHOSPHOROAMIDOTHIOATES AND PHOSPHOROAMIDODITHIOATES

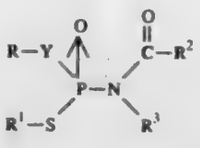
Jimmy H. Chan, Martinez; Rodrick I. Satre, Point Richmond; James H. Trusler, Pleasant Hill, and Sadanand G. Memula, Fremont, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 18, 1989, Ser. No. 395,969

Int. Cl.[6] A01N *25/00;57/00*

U.S. Cl. 424—405 39 Claims

1. A method for preparing pellets comprising a compound or mixture of compounds of the formula:



where R and R^1 individually are alkyl, alkenyl or alkynyl of up to 6 carbon atoms, R^3 is hydrogen or alkyl of 1–6 carbon atoms, R^2 is hydrogen, alkyl of 1–18 carbon atoms, cycloalkyl of 3–8 carbon atoms, alkenyl of 2–18 carbon atoms or alkynyl of 3–18 carbon atoms, and Y is oxygen or sulfur; comprising the steps of

(a) forming an extrudable mixture comprising said compound in from 3–25% by weight of a solvent, said solvent characterized as having a solubility of said compound therein of at least about 0.5 gm/100 ml;

(b) forming said pellets by extrusion.

5,464,624

METHOD FOR LOADING A DELIVERY SYSTEM FOR A CHEMICAL REPELLANT COMPOSITION

Arthur F. Isbell, 800 Delma Cir., Bryan, Tex. 77802

Filed Dec. 18, 1992, Ser. No. 992,709

Int. Cl.[6] A61K *31/165*

U.S. Cl. 424—405 21 Claims

1. A method for loading a delivery system for a chemical repellant consisting essentially of the steps of:

(a) preparing an aqueous solution of a water-soluble isothiuronium salt;

(b) preparing a weak base selected from the group consisting of carbonates, bicarbonates, and combinations thereof and having a pH of between approximately 8.0 and 11.6;

(c) combining the aqueous solution of isothiuronium salt and the weak base to form an aqueous mixture of the aqueous solution of isothiuronium salt and the weak base;

(d) adding capsaicin to the aqueous mixture of the aqueous solution of isothiuronium salt and the weak base to form the chemical repellant;

(e) loading the chemical repellant into the delivery system; and

(f) sealing the delivery system.

5,464,625

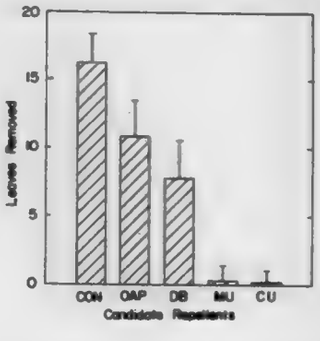
NON-TOXIC METHODS OF REPELLING RODENTS FROM MATERIALS SUSCEPTIBLE TO RODENT CONSUMPTION

Dale L. Nolte, Philadelphia, Pa.; J. Russell Mason, Bridgeton, and Larry Clark, Salem, both of N.J., assignors to Monell Chemical Senses Center, Philadelphia, Pa.

Continuation of Ser. No. 880,512, May 8, 1992, abandoned. This application Oct. 15, 1993, Ser. No. 137,948

Int. Cl.[6] A01N *25/02*

U.S. Cl. 424—405 23 Claims



1. A method of repelling rodents from a material susceptible to rodent predation selected from the group consisting of crops, seeds, seedlings, telephone cables, electric cables, and refuse containers comprising the steps of:

(a) selecting at least one rodent aversive compound from the group consisting of acetophenone, 2-aminobenzyl alcohol, 2-amino-4'5'-dimethoxyacetophenone, anthranilamide, anthranilic acid, isobutyl anthranilate, 4-ketobenztriazine, meta-aminoacetophenone, meta-hydroxyacetophenone, meta-methoxyacetophenone, 2-methoxybenzoic acid, methyl anthranilate, ortho-aminoacetophenone, ortho-hydroxyacetophenone, ortho-methoxyacetophenone, para-aminoacetophenone, para-hydroxyacetophenone, para-methoxyacetophenone, 2-methoxyacetophenone, and veratryl amine; and

(b) applying said rodent aversive compound selected in step (a) to said material otherwise susceptible to rodent predation in an amount effective to repel said rodent from said material.

5,464,626

DIMETHYL SUBSTITUTED OXYMETHYL CYCLOHEXANE DERIVATIVES AND USES THEREOF FOR THEIR INSECT ATTRACTANCY PROPERTIES

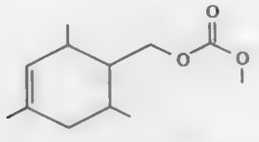
Craig B. Warren, Rumson; Anna B. Marin, Leonardo, both of N.J.; Jerry F. Butler, Gainesville, Fla., and Anubhav P. S. Narula, Hazlet, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y., and The University of Florida, Gainesville, Fla.

Filed May 14, 1993, Ser. No. 61,044

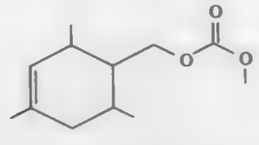
Int. Cl.[6] A01N *25/08*

U.S. Cl. 424—408 **4 Claims**

1. A method of attracting one or more of the insect species:
Culex nigripalpus;
Aedes atlanticus;
Culex salinarius;
Aedes vexans;
Culex spp.;
Simulium spp.;
Psoroferia ferox;
Aedes infirmatus;
Drosophila melanogaster;
Coccinellidae;
Anopheles crucians;
Psoroferia columbiae;
Culicoides spp.; and
Aedes spp.;
consisting of the step of exposing a three dimensional space proximate to at least one insect which is one of said insect species to a concentration and quantity of the carbonate compound having the structure:



which concentration and quantity is sufficient to attract said insect species wherein said compound having the structure:



is present in the interstices of a microporous polymer matrix at a level of from about 1 percent up to a level of about 45 percent by weight of the polymer matrix; and wherein the polymer which constitutes said polymer matrix is compatible with said carbonate compound.

5,464,627

EXTRUDIBLE WET PASTE COMPOSITION OF AN AGRICULTURALLY ACTIVE CHEMICAL; FREE-FLOWING, WATER-DISPERSIBLE OR WATER-SOLUBLE GRANULES THEREFROM

Edward Fu, Newark, Del., and Kolazi S. Narayanan, Palisades Park, N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Nov. 10, 1993, Ser. No. 149,869

Int. Cl.[6] A01N *25/14*

U.S. Cl. 424—409 **4 Claims**

1. A free-flowing granule made by drying a wet paste composition for forming free-flowing granules of an agriculturally active chemical, which can be dispersed or dissolved rapidly in water, and thereafter applied to a plant surface, comprises, by weight:
(a) 20–80% of an agriculturally active chemical,
(b) 1–4% of a water-insoluble, film-forming polymer selected from a copolymer of 50% N-vinylpyrrolidone and 50% of a C_{16} α-olefin or a copolymer of 20% N-vinylpyrrolidone and 80% of a C_{20} α-olefin, which adheres to the plant surface and resists wash-off of the agricultural chemical by rain water thus extending the contact time of the chemical thereon,
(c) 0.5–3% of an anionic surfactant,
(d) 2–10% of a C_5–C_{24} alkylpyrrolidone,
(e) 2–8% of water, and, optionally,
(f) 0–4% of a C_1–C_4 alkylpyrrolidone,
(g) 0–80% of a salt former,
(h) 0–4% of a disintegrant,
(i) 0–10% of a dispersant,
(j) 0–8% of a wetting agent, and
(k) 0–2% of a defoamer.

5,464,628

PHARMACEUTICAL COMPOSITIONS CONTAINING 4-SUBSTITUTED IMIDAZOLES TO BE ADMINISTERED TRANSDERMALLY

Harry Jalonen, and Risto Lammintausta, both of Turku, Finland, assignors to Orion-yhtyma Oy, Espoo, Finland

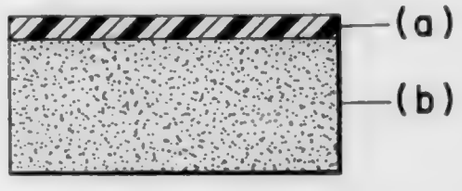
PCT No. PCT/FI92/00166, § 371 Date Nov. 12, 1993, § 102(e) Date Nov. 12, 1993, PCT Pub. No. WO92/21334, PCT Pub. Date Dec. 10, 1992

PCT Filed May 27, 1992, Ser. No. 146,203

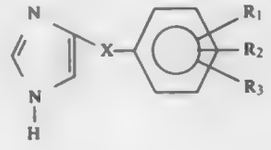
Claims priority, application United Kingdom, May 31, 1991, 9111773

Int. Cl.[6] A61F *13/02*

U.S. Cl. 424—448 **8 Claims**

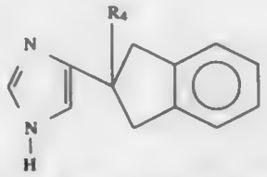


1. A transdermal preparation comprising a therapeutically active compound of the formula



(I)

or



(II)

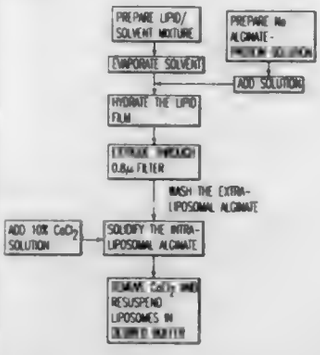
where R_1, R_2 and R_3 which can be the same or different are H, CH_3, C_2H_5 or Cl; X is CH=CH or $(CH_2)_n$ where n is 1 to 3; and R_4 is hydrogen or a straight alkyl of 1 to 4 carbon atoms.

5,464,629

METHOD OF FORMING HYDROGEL PARTICLES HAVING A CONTROLLED SIZE USING LIPOSOMES

Mariam Monshipouri, Bethesda, and Alan S. Rudolph, Bowie, both of Md., assignors to Georgetown University, Washington, D.C.

Filed Nov. 16, 1993, Ser. No. 152,366
Int. Cl.[6] A61K *9/127*; B01J *13/02*
U.S. Cl. 424—450 7 Claims



1. A method of fabricating a hydrogel particle of controlled size within a liposome, which comprises:

a) encapsulating one or more hydrogel-forming substances in liposomes in a liquid medium, said hydrogel-forming substances being selected from the group consisting of sodium alginate, chitosan and K-carrageenan;

b) removing any unencapsulated hydrogel-forming substances from the liquid medium by centrifugation, filtration or column chromatography;

c) adding calcium ions, as an initiator, to the liquid medium, thereby initiating cross-linking of the hydrogel-forming substances; and

d) removing any extra calcium ions from the liquid medium by centrifugation, filtration, or column chromatography.

5,464,630

LIPOSOMES THAT PROVIDE THYMIC DEPENDENT HELP TO WEAK VACCINE ANTIGENS

Howard R. Six, East Stroudburg, Pa., and Nathalie B. Garcon, Rixensart, Belgium, assignors to Research Development Foundation, Carson City, Nev.

Continuation of Ser. No. 94,398, Jul. 19, 1993, abandoned, which is a continuation of Ser. No. 821,242, Jan. 10, 1992, abandoned, which is a continuation of Ser. No. 558,960, Jul. 27, 1990, abandoned. This application Jan. 30, 1995, Ser. No. 380,213
Int. Cl.[6] A61K *9/127*
U.S. Cl. 424—450 12 Claims

1. A liposomal immunogenic carrier for antigens, consisting essentially of a liposome-forming lipid, a 'N-2(2,4 dinitrophenyl E-aminocaproylphosphatidylethanolamine' target antigen and at least one helper peptide having at least one T-helper cell recognition site, wherein said T-helper cell recognition site is in or on the liposome and wherein said target antigen and helper peptide are not bound to each other, and wherein said helper peptide is HA_2 polypeptide subunit of influenza virus.

5,464,631

ENCAPSULATED DOSAGE FORMS

Charles E. Hoover, Sparta, N.J.; Randy J. Dennin, Greenwood, S.C.; E. Allan Gabor, Summit, N.J.; Mark Schobel, Flemington, N.J., and Albert F. Sorg, Columbia, N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 544,307, Jun. 27, 1990. This application Jul. 12, 1993, Ser. No. 89,925
Int. Cl.[6] A61K *9/28*;*9/48*
U.S. Cl. 424—454 22 Claims

1. A tamper resistant and tamper evident medicament dosage form comprising an active pharmaceutical ingredient, pharmaceutically acceptable carrier materials and excipients that are compressed into a generally ovoid, cylindrically shaped medicament caplet that is partially encapsulated by a gelatin capsule, wherein said caplet is of a first color and said gelatin capsule is of a second, different color and wherein said caplet is adhesively bonded to said gelatin capsule.

5,464,632

RAPIDLY DISINTEGRATABLE MULTIPARTICULAR TABLET

Gérard Cousin, Gallardon; Etienne Bruna, Chartres, and Edouard Gendrot, Vernouillet, all of, France, assignors to Laboratoires Prographarm, Chateauneuf, France

Continuation of Ser. No. 35,355, Mar. 22, 1993, abandoned. This application Nov. 29, 1994, Ser. No. 346,324
Claims priority, application France, Jul. 22, 1991, 91 09245
Int. Cl.[6] A61K *9/20*
U.S. Cl. 424—465 6 Claims

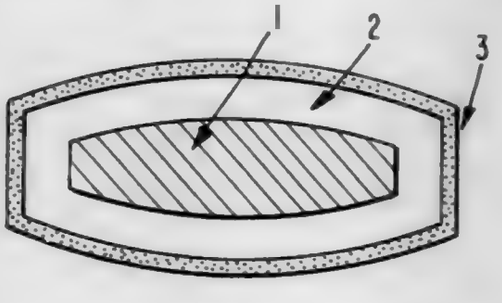
1. A rapidly disintegratable tablet for oral administration with or without the use of water, said tablet comprising an active substance and a mixture of excipients, wherein said active substance is multiparticulate and in the form of coated microcrystals, coated microgranules or uncoated microgranules and wherein said mixture of excipients comprises excipients which are responsible for the disintegration, said tablet being intended to be swallowed said disintegration occurring in less than sixty seconds under the action of the excipients which are responsible for the disintegration and which are selected from the group consisting at least one disintegrating agent and at least one swelling agent.

5,464,633

PHARMACEUTICAL TABLETS RELEASING THE ACTIVE SUBSTANCE AFTER A DEFINITE PERIOD OF TIME

Ubaldo Conte, Busto Arsizio; Aldo La Manna, and Lauretta Maggi, both of Pavia, all of, Italy, assignors to Jagotec AG, Hergiswill, Switzerland

Filed May 24, 1994, Ser. No. 248,232
Int. Cl.[6] A61K *9/30*;*9/32*;*9/34*;*9/36*
U.S. Cl. 424—480 15 Claims



1. Pharmaceutical tablet for oral administration suitable to release the active substance after a definite period of time, consisting essentially of:

a core containing the active substance to be released in the gastric or intestinal tract, a polymeric substance which swells and/or gels and/or erodes on contact with water or aqueous liquids and is selected from the group consisting of hydroxypropylmethylcellulose having a methoxyl content of 22.1% and a viscosity of 15,000 centipoises, crosslinked polyvinylpyrrolidone, crosslinked sodium carboxymethylcellulose, potassium methacrylate-divinyl-benzene copolymer, polyvinylalcohols and beta cyclodextrin and adjuvants and excipients;

a layer applied externally to said core by a compression process said layer being suitable to allow the release of the active substance contained in the core after a definite period of time and being selected from the group consisting of hydroxypropylmethylcellulose having a methoxyl content of 22.1 and a viscosity of 4,000 centipoises, carboxy vinyl polymers, glucans, mannans, xanthans and carboxymethylcellulose and adjuvants and excipients;

wherein said layer is applied externally to said core and has a thickness of 0.2–4.5 mm which allows the release of said active substance in said core after contact with water or an aqueous liquid for a period of 2 to 3 hours.

5,464,634

RED BLOOD CELL SURROGATE

Nir Kossovsky; Andrew E. Gelman, and H. James Hnatyszyn, all of Los Angeles, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 29,773, Mar. 3, 1993, Pat. No. 5,306,508, which is a continuation-in-part of Ser. No. 199, Jan. 4, 1993, Pat. No. 5,334,394, which is a continuation-in-part of Ser. No. 690,601, Apr. 24, 1991, Pat. No. 5,178,882, which is a continuation-in-part of Ser. No. 542,255, Jun. 22, 1990, Pat. No. 5,219,577. This application Apr. 25, 1994, Ser. No. 232,756

The portion of the term of this patent subsequent to Apr. 26, 2011, has been disclaimed.

Int. Cl.[6] A61K *9/16;9/18;38/42*

U.S. Cl. 424—493 **29 Claims**

1. A red cell surrogate comprising:

a nanocrystalline core particle, said core particle having a surface;

an oxygen carrier anchor coating located on the surface of said nanocrystalline core particle;

an oxygen carrier bound to said oxygen carrier anchor coating;

a layer of lipid surrounding said oxygen carrier; and

an outer layer.

5,464,635

BLOW MOLDING MACHINE

Albert Geiger, Garmisch-Partenkirchen, Germany, assignor to Geiger Technik GmbH, Garmisch-Partenkirchen, Germany

Filed Feb. 17, 1994, Ser. No. 197,878

Claims priority, application Germany, Feb. 25, 1993, 43 05 735.7

Int. Cl.[6] B29C *49/30*

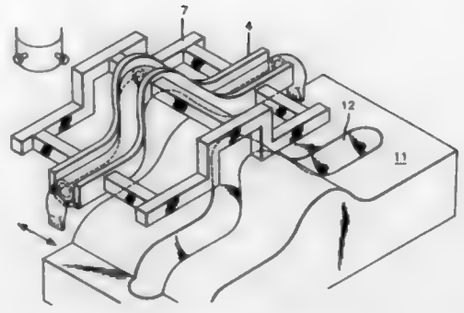
U.S. Cl. 425—532 **17 Claims**

12. A blow molding machine for producing multiaxial hollow plastic articles, said blow molding machine comprising

a blow head for producing a heat-moldable tube,

a divided blow mold, said blow mold including a mold cavity into which a tubular piece is introduced as a parison and blown up to form a hollow plastic article, and

a premold movable between said blow head and said blow mold, said premold having a shape matching a cavity of said blow mold and being provided with a mold trough open at a side of said blow head and displaceable at least in its tube receiving position below said blow head in a horizontal plane and positioned to be moved in a vertical direction for the release



of said parison over said cavity of said blow mold by means for dropping the parison from a bottom of said mold trough into said cavity of said blow mold.

5,464,636

BIOCIDAL METHODS AND COMPOSITIONS FOR RECIRCULATING WATER SYSTEMS

Terry V. T. Hight; Jack V. Matson, both of Houston, Tex.; Lawrence F. Rakestraw, Chesterfield, Mo.; Zhihe Zhang, Houston, Tex., and Thomas C. Kuechler, St. Louis, Mo., assignors to The University of Houston, Houston, Tex.

Continuation of Ser. No. 750,744, Aug. 21, 1991, abandoned, which is a continuation of Ser. No. 366,936, Jun. 16, 1989, abandoned. This application Mar. 14, 1994, Ser. No. 212,287

Int. Cl.[6] A01N *43/50*

U.S. Cl. 424—661 **71 Claims**

1. A biocidal composition for use in recirculating water systems comprising a hypochlorite donor and a bromide ion donor,

wherein the composition contains a biocidally effective amount of the bromide ion donor to make the composition perform as a bromine biocide in said recirculating water system and to maintain a mole ratio of the sum of all bromine containing species to the sum of all hypohalite species in the recirculating water of at least about 0.2 to about 20; and

wherein the hypochlorite donor is dichloroisocyanuric acid, trichloroisocyanuric acid, or mixtures thereof; and

wherein the bromide ion donor is sodium bromide.

5,464,637

EGG CONTAINING IRON OR VITAMIN D_3 IN HIGH CONTENT

Hiroshi Horikawa, Tochigi; Eiji Honzawa, Saitama; Tadahiro Masumura, and Akira Fukazawa, both of Tochigi, all of, Japan, assignors to C. Itoh Feed Mills Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 20,647, Feb. 22, 1993, abandoned. This application Aug. 25, 1994, Ser. No. 296,353

Claims priority, application Japan, Feb. 27, 1992, 4-040977; Mar. 19, 1992, 4-063228

Int. Cl.[6] A23K *1/175;1/18*

U.S. Cl. 426—2 **8 Claims**

1. A method of producing an egg containing 8 to 15 mg of iron per 100 g of yolk, which comprises feeding a feed containing 0.1 to 1 wt. % of an inorganic iron salt, 0.001 to 0.1 wt. % of a ferrous organic acid salt consisting of a ferrous salt and an organic acid 0.1 having reducing action and 0.001 to 0.3 wt. % of casein phosphopeptide to egg-producing chicken.

5,464,638

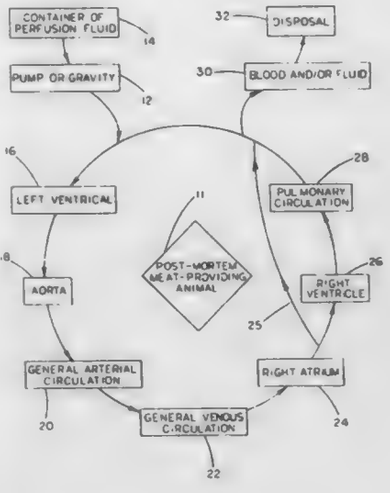
PERFUSION AIDED MEAT PROCESSING

Jan W. Kakolewski, 324 E. Hawthorne, Minden, Nebr. 68959

Continuation-in-part of Ser. No. 184,219, Jan. 18, 1994, abandoned, which is a continuation-in-part of Ser. No. 958,071, Oct. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 733,437, Aug. 26, 1991, abandoned. This application Jan. 26, 1995, Ser. No. 378,536

Int. Cl.[6] A23L *1/314;1/318*

U.S. Cl. 426—2 20 Claims



1. A process for tenderizing, flavoring, cholesterol or sodium extracting or fat binding of meat through perfusion, said process comprising;

inducing the brain death of a meat-providing animal;

leaving said meat-providing animal substantially intact, thereby leaving the appendages of said animal intact and the circulatory system of said animal generally intact;

accessing said circulatory system of said animal;

providing a fluid-conducting tube having a penetrating end and an opposite end;

providing a perfusion fluid generally free of melted fats and having a physiological osmolality which is at least iso-osmotic with the osmolality of the animal's blood;

connecting a source of said perfusion fluid to said opposite end of said fluid-conducting tube;

inserting said penetrating end of said fluid-conducting tube into the arterial side of the circulatory system of said animal;

heating said perfusion fluid to a temperature of at least 80° F. (26.7° C.);

introducing said fluid into said circulatory system of said animal;

circulating said fluid through said circulatory system of said animal;

replacing at least some of the blood of said animal with said perfusion fluid; and

draining most of said blood and said fluid from said circulatory system of said animal from fewer than three exit points in said circulatory system.

5,464,639

COMPOSITION AND PROCESS USED FOR STABILIZING EGG PROTEINS SUBJECTED TO SUBSEQUENT HEAT TREATMENT

Gene F. Clyde, New Milford, Conn.; Marta P. Izquierdo Quimi, and Luis R. King Solis, both of Quito, Ecuador, assignors to NESTEC S.A., Vevey, Switzerland

Filed Dec. 29, 1994, Ser. No. 366,072

Claims priority, application European Pat. Off., Jan. 13, 1994, 94100409

Int. Cl.[6] A21D *2/00;* A23L *1/24;1/105;3/3463*

U.S. Cl. 426—20 14 Claims

1. Process for stabilizing egg yolk proteins or emulsions containing egg yolk proteins intended to subsequent thermal treatment, which comprises adding thereto an acidic amylaceous fermented composition resulting from a process wherein

a) a slurry of cereal flour and at least one additional non-cereal starch material is first subjected to gelatinization and further homogenized;

b) inoculated with an acidifying strain or a mixture of acidifying strains selected from Lactobacillus species and *Streptococcus thermophilus;*

c) then subjected to a fermentation over a period and at a temperature such as to afford a pH of about 4.0 to 4.2 of the fermented material; and

d) finally stabilized.

5,464,640

PROCESS FOR PREPARING A DOUGH FOR ALIMENTARY PASTA

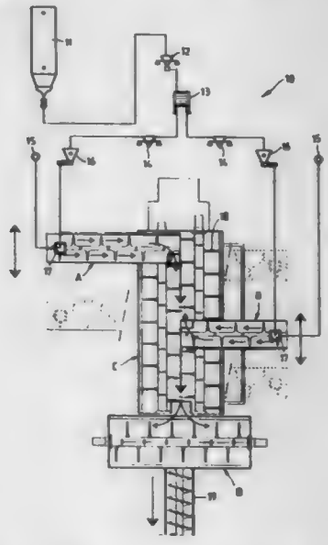
Gerardo Dalbon, Daré, Italy, assignor to M. G. Braibanti S.p.A., Milan, Italy

Filed Aug. 3, 1993, Ser. No. 100,987

Claims priority, application Italy, Aug. 4, 1992, MI92A1918

Int. Cl.[6] A21D *8/00*

U.S. Cl. 426—231 15 Claims



1. Process for preparing an extrudable dough for pasta from cereal meal said process comprising:

(1) separating raw cereal meal material into at least two fractions having different granulometries, each defined within a granulometric range;

(2) determining the weight percent amounts of said fractions with different granulometry, by measuring the weight of each of said fractions;

(3) metering a quantity of each of the above said fractions and metering water for each of said fractions, in a variable ratio, by means of a first metering device for said fractions and a second metering device for the water; and

(4) separately kneading each granuolmetric fraction to form an extrudable dough for pasta.

5,464,641

SIZE REDUCTION OF OFFAL LOAVES TO CUBES

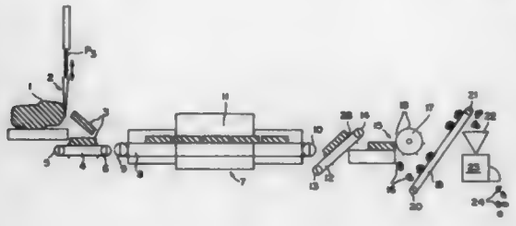
Dominique Guyot, and Rémi Thevenot, both of Amiens, France, assignors to Nestec S.A., Vevey, Switzerland

Filed Apr. 26, 1993, Ser. No. 52,884

Claims priority, application European Pat. Off., May 29, 1992, 92109043

Int. Cl.[6] A23N *17/00;* B26D *7/10;9/00*

U.S. Cl. 426—241 10 Claims



1. A process for obtaining cubes of offal comprising:

slicing a loaf of offal having a temperature no higher than −10° C. to obtain slices having a thickness of between 6 cm and 15 cm; and

passing the slices through a microwave tunnel oven to heat-temper the slices so that upon leaving the oven, the heat-tempered slices have a temperature of from −5° C. to −9° C.; and

size-reducing the heat-tempered slices to chips and then size-reducing the chips to cubes.

6. A process for obtaining cubes of offal comprising size-reducing a loaf of offal having a temperature no higher than −10° C. to chips and passing the chips through a microwave tunnel oven to heat-temper the chips so that upon leaving the oven, the heat-tempered chips have a temperature of from −4° C. to −6° C., and size-reducing the heat-tempered chips to cubes.

5,464,642

PROCESS FOR MAKING REDUCED-FAT FRIED SNACKS WITH LIGHTER, MORE EXPANDED SNACK STRUCTURES

Maria D. Villagran, West Chester; Lori J. Toman, Cincinnati; Kenneth D. Byars, Fairfied; Nancy C. Dawes, Cincinnati, and Stephen P. Zimmerman, Wyoming, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 16, 1993, Ser. No. 106,838

Int. Cl.[6] A21D *8/00;13/00*

U.S. Cl. 426—439 12 Claims

1. A process for making Fried snacks, which process comprises the steps of:

(a) Forming a sheetable dough consisting essentially of

(1) from about 1% to about 10% calcium carbonate;

(2) from about 50% to about 70% of a source of starch based flour comprising pregelatinized starch;

(3) at least about 3% hydrolyzed starches having a DE of from about 5 to about 30;

(4) from about 0% to about 5% emulsifier;

(5) from about 20% to about 40% added water;

(b) forming the dough into a sheet;

(c) forming snack pieces of predetermined size and shape from the sheet; and

(d) trying said snack pieces.

5,464,643

LOW FAT FRIED SNACK

Richard W. Lodge, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 438,275, Nov. 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 411,353, Sep. 22, 1989, abandoned. This application Dec. 9, 1993, Ser. No. 164,583

Int. Cl.[6] A21D *13/00;8/02*

U.S. Cl. 426—439 19 Claims

1. A process for making a fried snack comprising the steps of:

(a) forming a sheetable dough consisting essentially of:

(1) from about 50% to about 70% of a source of starch based flour comprising a pregelatinized starch;

(2) at least about 3% hydrolyzed starches having a DE of from about 10 to about 20;

(3) from about 0.5% to about 5% emulsifier;

(4) from about 20% to about 40% added water;

(b) forming the dough into a sheet;

(c) forming snack pieces of predetermined size and shape from the sheet; and

(d) frying said snack pieces.

5,464,644

READY-TO-EAT-CEREAL CONTAINING PSYLLIUM AND USE THEREOF FOR LOWERING CHOLESTEROL LEVELS

Richard D. Wullschleger, Battle Creek, Mich.; Shirley C. Chen, Tokyo, Japan; Frederick A. Bowman, Augusta, and Larry V. Hawblitz, Battle Creek, both of Mich., assignors to Kellogg Company, Battle Creek, Mich.

Filed Sep. 27, 1989, Ser. No. 412,825

The portion of the term of this patent subsequent to Jul. 13, 2010, has been disclaimed.

Int. Cl.[6] A23L *1/42;1/29*

U.S. Cl. 426—549 15 Claims

1. A psyllium-containing ready-to-eat cereal product comprising on a dry weight basis 62% heavy wheat bran; 26% light wheat bran; and 2% psyllium.

5,464,645

PROCESS OF MAKING A WATER CONTINUOUS DISPERSION WITH MORE THAN 50 DISPERSED PHASE AND PRODUCTS THEREOF

Leendert H. Wesdorp, Schiedam, Netherlands; Robert A. Madsen, Ellicott City, Md.; Ian T. Norton, Rushden, and Charles R. Brown, Bedford, both of, Great Britain, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Continuation-in-part of Ser. No. 899,670, Jun. 16, 1992, abandoned. This application Feb. 15, 1994, Ser. No. 196,611

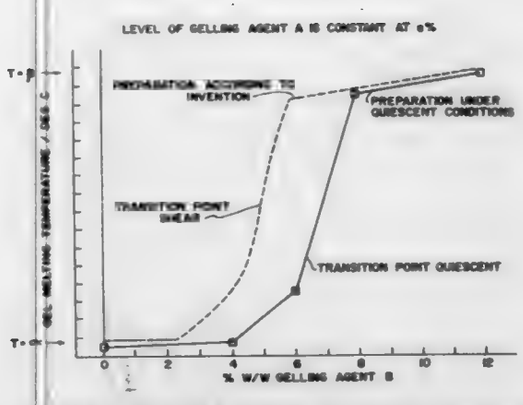
Int. Cl.[6] A23L *1/0522;1/0532;1/1056;* A23D *7/02*

U.S. Cl. 426—573 13 Claims

1. A process for preparing a water continuous edible dispersion having at least two gelling agents forming at least two phases and 0 to 20 wt. % of a fat, the process comprising the steps of:

a. mixing together a gelling agent A having a higher gelation rate with a gelling agent B having a lower gelation rate which under quiescent conditions form a mixture having more than 50% of an A-continuous phase and a B-dispersed phase, based on total dispersion;

b. heating the mixture of gelling agents A and B to an elevated temperature above a gel-forming temperature of the agents A and B; and



c. cooling and shearing the mixture for a residence time sufficient to form the gelling phase of gelling agent A such that the A-continuous phase is inverted to a greater than 50% A-dispersed phase and the B-dispersed phase is inverted to a B-continuous phase of the total edible dispersion.

5,464,646

MANUFACTURING OF ACRIDITY-FREE RAW FLOUR FROM ARACEAE TUBERS

Alvin S. Huang, and James Hollyer, both of Honolulu, Hi., assignors to University of Hawaii, Honolulu, Hi.

Filed Jul. 1, 1994, Ser. No. 271,205
Int. Cl.[6] A23L *1/214*
U.S. Cl. 426—615 **8 Claims**

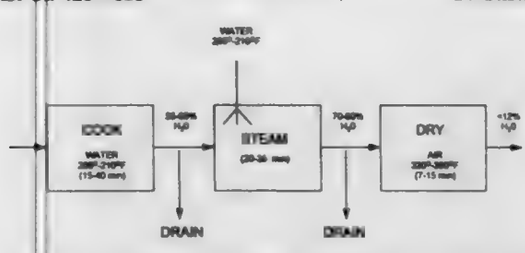
1. A process for producing low-acridity, low-starch gelatinization raw flour from Araceae tubers comprising the steps of:
(a) providing tuber particles from Araceae tubers;
(b) soaking said tuber particles in water at a temperature of from about 38° to about 48° C. for a period of less than 4 hours;
(c) treating said tuber particles for a time sufficient to remove acridity substances with an aqueous solution having an alkali concentration of from about 0.02 to about 0.1%;
(d) drying said tuber particles; and
(e) comminuting said tuber particles to form a flour.

5,464,647

QUICK COOKING BARLEY AND PROCESS FOR PREPARATION

Donald L. Messick, Rehoboth Beach, Del., assignor to Kraft Foods, Inc., Northfield, Ill.

Filed Oct. 13, 1993, Ser. No. 136,421
Int. Cl.[6] A23L *1/172*
U.S. Cl. 426—618 **14 Claims**



1. A process for preparing a quick-cooking barley which can be cooked by boiling in at least an equal volume of boiling water followed by a 5 minute stand and which will have a cooked texture, as measured by a shear press value of from about 70 to about 95 lbs/force and appearance similar to long-cooking barley, after said long-cooking barley has been soaked for several hours and cooked in boiling water for a period of at least 40 minutes, wherein the process does not include any flattening or flaking of the barley, said process comprising the steps of:
(a) cooking hulled and medium- or fine-pearled barley in boiling or near-boiling water for a time effective to raise the moisture content of the barley to within the range of from about 55 to about 65%;
(b) separating the cooked barley from the hot water;
(c) subjecting the barley to an atmosphere of ambient, saturated steam for from about 20 to about 35 minutes while spraying hot water onto the barley, at least during the initial period of steaming, in order to obtain a drained moisture of from about 70 to about 80%;
(d) draining the steamed barley from free and surface water; and
(e) drying the drained barley with hot air having a temperature of about 320°–350° F. over a time period of about 7–15 minutes to obtain a moisture content of about 12% or less.

5,464,648

PROCESS FOR PREPARING A COHESIVE MASS OF HERRING EGGS

Hideo Nishijima, 1720 Salzbourg Crescent, Quebec, Canada

Filed Dec. 9, 1993, Ser. No. 163,634
Int. Cl.[6] A23L *1/328*
U.S. Cl. 426—643 **23 Claims**

1. A process for the preparation of a coherent mass of herring eggs, comprising subjecting loose unwashed herring eggs to a saline washing stage, subjecting the loose washed herring eggs obtained from the washing stage to a cohesion stage, subjecting a coherent mass of herring eggs obtained from the cohesion stage to a quick freezing stage, defrosting the frozen herring eggs obtained from the quick freezing stage, and subjecting the defrosted coherent mass of herring eggs to a curing stage for the curing thereof, said saline washing stage comprising
contacting the loose unwashed herring eggs with an aqueous washing saline solution comprising sodium chloride so as to obtain washed loose herring eggs, said sodium chloride being present in the washing saline solution at a concentration in the range of 4% to 20% of sodium chloride saturation, said cohesion stage comprising
maintaining a wet mass of the washed loose herring eggs obtained from said saline washing stage, in a gathered together state for a time period sufficient to obtain said coherent mass of herring eggs, said freezing stage
being a quick freezing stage wherein said coherent mass of herring eggs obtained from the cohesion stage is brought to a freezing temperature of −30° C. or lower and said curing stage comprising
soaking the defrosted coherent mass of herring eggs in an aqueous saline solution saturated with sodium chloride for a time period sufficient to obtain a cured coherent mass of herring eggs.

5,464,649

REDUCED FAT CONFECTIONERY PRODUCTS AND PROCESS

James F. St. John, Hummelstown; John G. Fetterhoff, Newville; John R. Carpenter; B. Douglas Brown, both of Hershey; C. Daniel Azzara, Annville; Stanley M. Tarka, Jr., Hershey; Craig Rank, Harrisburg, and George K. Strohmaier, Hummelstown, all of Pa., assignors to Hershey Foods Corporation, Hershey, Pa.

Filed Oct. 30, 1992, Ser. No. 968,927
Int. Cl.[6] A23G *1/00;3/00*
U.S. Cl. 426—660 **81 Claims**

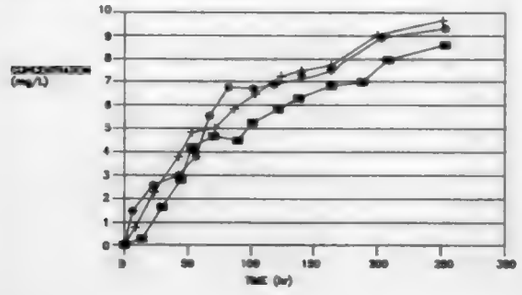
1. A lowfat chocolate of full-fat texture comprising a fat and nonfat solids, said nonfat solids comprising at least 35% by weight nutritive carbohydrate sweetener and less than 1% by weight of an edible emulsifier, said chocolate containing 20–24.5% by weight total fat and having a Casson yield value of less than 2000 dynes/cm^2 and wherein said chocolate has substantially all particles less than about 60 microns in size.

5,464,650

INTRAVASCULAR STENT AND METHOD

Eric P. Berg; Ronald J. Tuch, both of Plymouth; Michael Dror, Edina, and Rodney G. Wolff, Minnetonka Beach, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 26, 1993, Ser. No. 52,878
Int. Cl.[6] B05D 1/02;1/18;1/38
U.S. Cl. 427—2.30 22 Claims



1. A method for making an intravascular stent comprising the steps of:

(a) providing a cylindrical, radially expandable stent body;

(b) applying to the stent body by spraying a solution which includes a solvent, a polymer dissolved in the solvent and a therapeutic substance dispersed in the solvent;

(c) evaporating the solvent;

(d) repeating application and evaporating steps (b) and (c) to provide an amount of polymer and therapeutic substance on the stent body; and

(e) radially expanding the stent body and applied polymer and therapeutic substance such that the polymer and therapeutic substance are retained on the stent body.

5,464,651

PHOSPHORS, COMPOSITIONS CONTAINING SUCH PHOSPHORS AND METHODS OF USE

Richard Turk, East Lansing, and Paul Nowaczyk, Howell, both of Mich., assignors to Michigan Biotechnology Institute, Lansing, Mich.

Filed Nov. 18, 1993, Ser. No. 154,230
Int. Cl.[6] B05D 5/06
U.S. Cl. 427—64 4 Claims

1. A method for making an object photo-luminescent which comprises applying to the object a phosphor of the formula:

$$(A_w B M_x X_n Y_n)_z$$

in which A is a basic amino acid; B is carbonic acid, oxalic acid or a saturated linear di- or tricarboxylic acid of the structure;

$$\begin{array}{l} \text{COOH} \\ (CH_2)_r \\ R_1—C(R_2)—\text{COOH} \end{array}$$

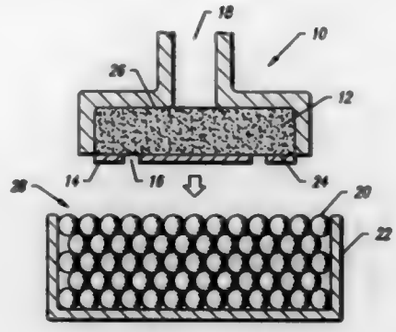
in which r is 0 to 10, R_1 is H, OH or NH_2, R_2 is H, OH, CH_2 COOH or CH_2(OH)COOH; w is 1 or 2; n is 0, 1 or 2 and the various n's may be the same or different; M is hydrogen or a metal selected from the Periodic Group IA, or Periodic Group IIA, or Periodic Group IIB, and when there are two M's they can be the same or different; X is a halogen; Y is hydroxyl and Y>X; and z is 1 to 16 formula units; so that the phosphor can be activated to make the object photo-luminescent.

5,464,652

GREEN CERAMIC VIA METALLIZATION TECHNIQUE

Richard P. Himmel, Mission Viejo, and Raymond Brown, Fountain Valley, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 978,618, Nov. 19, 1992, abandoned. This application Jan. 6, 1994, Ser. No. 178,352
Int. Cl.[6] B05D 5/12
U.S. Cl. 427—97 13 Claims



1. A method of making a filled via in a dielectric substrate comprising the steps of:

(a) providing a green tape dielectric substrate;

(b) providing a solid phase conductor ball; and

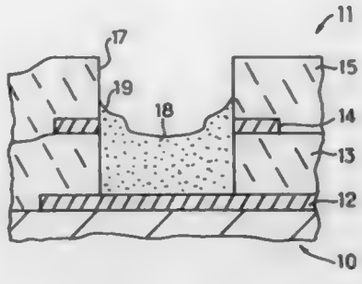
(c) pushing the conductor ball into the substrate until a via which is filled with the solid conductor ball is formed.

5,464,653

METHOD FOR INTERCONNECTION OF METAL LAYERS OF THE MULTILAYER NETWORK OF AN ELECTRONIC BOARD, AND THE RESULTANT BOARD

Philippe Chantraine, Seine, and Marta Zorilla, Fontenay-le-Fleury, both of, France, assignors to Bull S.A., Paris, France

Filed Dec. 18, 1990, Ser. No. 628,896
Claims priority, application France, Dec. 21, 1989, 89 16956
Int. Cl.[6] B05D 5/12
U.S. Cl. 427—96 16 Claims



1. A method for interconnecting a multilayer metal network of an electronic circuit board comprising:

depositing at least a first and second superimposed metal layers of the multilayer network, said first and second metal layers being separated by a substantially inert insulator layer deposited between said layers;

making a via hole having the first metal layer as its bottom and traversing the second metal layer; and

depositing a metal in said via hole to grow said metal from the two metal layers, said insulator layer being substantially inert to said deposition, to form a via stud connecting the two metal layers.

5,464,654

HYDROGEN-OCCLUSION ELECTRODE AND A METHOD OF MANUFACTURING THE ELECTRODE

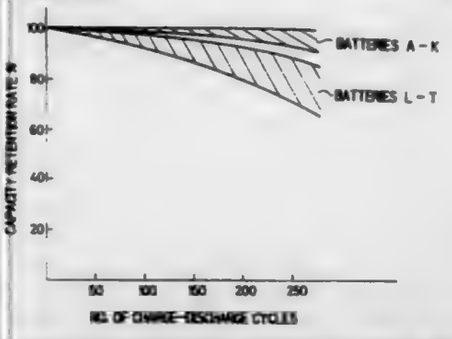
Takashi Mizuno, Iwaki, Japan, assignor to Furukawa Denchi Kabushiki Kaisha, Japan

Division of Ser. No. 74,452, Jun. 10, 1993, Pat. No. 5,360,687. This application Jul. 14, 1994, Ser. No. 273,138

Claims priority, application Japan, Dec. 6, 1992, 4-179462; Dec. 6, 1992, 4-179463

Int. Cl.[6] H01M *4/04*

U.S. Cl. 427—123 **1 Claim**



1. A method of manufacturing a hydrogen-occlusion electrode comprising (1) forming an electrode plate body using an electrode comprising, based on volume percentage of said electrode, a mixture of from about 42–84 volume % of a hydrogen-occlusion alloy, from about 3–13 volume % of a polyvinylidene fluoride bonding material, and from about 3–15 volume % of an electroconductive material having an average particle size of about 1.3 μm or smaller, wherein said electrode has from about 10–30 volume % of residual pores; and (2) heat treating said electrode plate body in a vacuum or inert gas atmosphere at a temperature in the range of from about 160° C. to 200° C.

5,464,655

METHOD AND APPARATUS FOR PREPARING METAL-CERAMIC COMPOSITE BODY

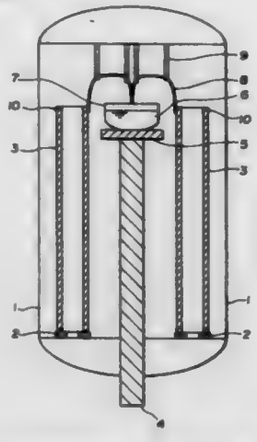
Shigeru Takahata, Chiba, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1994, Ser. No. 273,831

Claims priority, application Japan, Jul. 29, 1993, 5-207083; Jan. 29, 1993, 5-294193

Int. Cl.[6] B05D *7/22*

U.S. Cl. 427—238 **15 Claims**



1. A method for preparing metal-ceramic composite body by impregnating a porous ceramic preform with a molten metal, comprising the steps of:

setting a porous ceramic preform having continuous internal porosity, a crucible containing a molten metal and a channeling bundle of a plurality of filaments which are wettable by the molten metal and having one end and an opposite end such that the one end of the bundle is disposed above the molten metal in the crucible and the opposite end of the bundle is disposed in contact with the preform,

moving the crucible upward until the one end of the bundle is immersed in the molten metal whereby the molten metal is channeled to the preform through the filaments of the bundle and impregnates the preform through gravity; and

moving the crucible downward until the one end of the bundle is removed from the molten metal whereby channeling of the molten metal to the preform is interrupted.

5,464,656

METHOD OF APPLYING SINGLE-SOURCE MOLECULAR ORGANIC CHEMICAL VAPOR DEPOSITION AGENTS

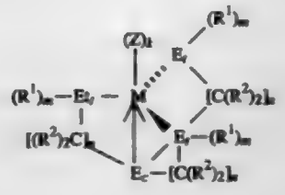
John G. Verkade, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Division of Ser. No. 911,923, Jul. 10, 1992, Pat. No. 5,344,948, which is a continuation-in-part of Ser. No. 841,589, Feb. 25, 1992, abandoned. This application Jun. 2, 1994, Ser. No. 253,106

Int. Cl.[6] C23C *16/18*

U.S. Cl. 427—248.1 **18 Claims**

1. A method for applying an M_xE_y film to the surface of a substrate comprising applying said film by the technique of chemical vapor deposition to decompose a vapor comprising a single-source molecular organic precursor of the formula



wherein:

(a) M is selected from the group consisting of a lanthanide, an actinide, a Group IIIA metal, a Group IIIA metalloid, a Group IVA metal, a Group IVA metalloid, a Group VA metal, a Group VA metalloid, a Group IIIB metal, a Group IVB metal, a Group VB metal, a Group VIB metal, a Group VIIB metal, and a Group VIIIB metal;

(b) k=0–1;

(c) Z is selected from the group consisting of hydrogen, halide, and a group which bonds to M through N, O, P, S, As, Si, or C;

(d) E_c is selected from the group consisting of N, P, and As;

(e) each E_y is independently selected from the group consisting of N, P, As, O, S, and Se; with the proviso that

(i) when E_y is O, S, or Se, m=0; and

(ii) when E_y is N, P, or As, m=1;

(f) each R^1 is independently selected from the group consisting of hydrogen, $(C_1–C_{20})$alkyl, $(C_2–C_{20})$alkenyl, $(C_2–C_{20})$alkynyl, $(C_6–C_{18})$aryl, $(C_7–C_{20})$aralkyl, a $(C_5–_{18})$heterocycle, and triorganosilyl;

(g) n=1–4; and

(h) each R^2 is independently selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, aryl, aralkyl, and a heterocycle;

as to deposit a film comprising M_xE_y on said, surface, wherein M is as above defined, x=1–5, E is N, P, As, O, S, Se, or mixtures thereof, and y=1–5.

5,464,657

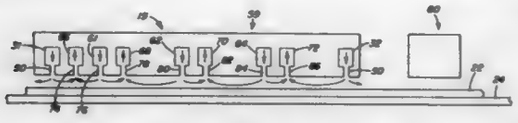
METHOD FOR COATING A MOVING GLASS SUBSTRATE

Patricia R. Athey, O'Hara Township; Douglas S. Dauson, McCandless Township; David E. Lecocq, Lower Burrell; George A. Neuman, Pittsburgh; John F. Sopko, Trafford, and Royann L. Stewart-Davis, Plum Boro, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 17,930, Feb. 16, 1993, Pat. No. 5,356,718. This application Jun. 23, 1994, Ser. No. 264,816

Int. Cl.[6] C23C *16/00;* C03C *17/245*

U.S. Cl. 427—255.5 20 Claims



1. A method of coating a moving substrate to provide a coating having a continuously varying chemical composition as the distance from the substrate increases, comprising the steps of:

directing a vapor coating composition onto the surface of the substrate at a first position;

thereafter moving a first portion of the vapor coating composition along a first region of the substrate surface in a first direction and a second portion of the vapor coating composition along a second region of the substrate surface in a second direction opposite to the first direction, and

maintaining the first portion of the coating composition on the first region of the substrate surface for a longer period of time than the second portion of the vapor coating composition on the second region of the substrate surface in order to coat the substrate with the coating having the continuously varying chemical composition as the distance from the substrate increases.

5,464,658

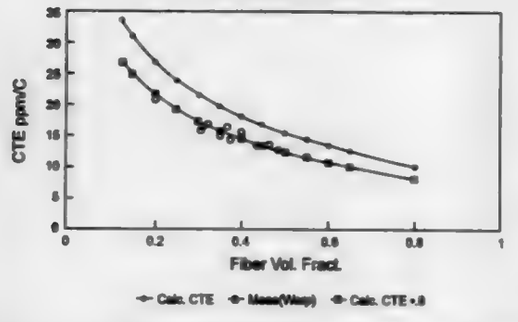
SYSTEM OF ELECTRONIC LAMINATES WITH IMPROVED REGISTRATION PROPERTIES

Donald E. Yuhas, Glen Ellyn; Carol L. Vorres; David P. Groppi, both of Mt. Prospect, all of Ill., and Jiri D. Konicek, Onalaska, Wis., assignors to Allied Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 982,797, Nov. 30, 1992, Pat. No. 5,350,621. This application May 19, 1994, Ser. No. 246,054

Int. Cl.[6] C03C *25/02*

U.S. Cl. 427—385.5 1 Claim



1. In the method of forming multilayer printed circuit boards from thermosetting polymer layers reinforced with woven fabric by coating said fabric with a precursor of a thermosetting polymer, curing said coated fabric, and forming multiple layers of said coated fabric the improvement comprising using a fabric having a ratio of fiber volume in warp and fill directions of 1/1.08±0.10 having substantially the same coefficient of thermal expansion in both the warp and fill directions.

5,464,659

SILICONE/ACRYLATE VIBRATION DAMPERS

Kurt C. Melancon, St. Paul, and William A. Driscoll, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 887,298, May 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 704,380, May 23, 1991, Pat. No. 5,308,887. This application Sep. 13, 1993, Ser. No. 121,031

Int. Cl.[6] B05D *3/02;3/06;* C08L *33/02;* C09J *4/02*

U.S. Cl. 427—387 17 Claims

1. A method of vibrationally damping an article, comprising applying a vibration damper to the article, wherein the vibration damper is the polymerization product of a radiation curable material that comprises (a) from about 5 parts to about 95 parts by weight polymerizable acrylic monomer and (b) correspondingly, from about 95 parts to about 5 parts by weight of a preformed silicone adhesive that is the reaction product of one or more polydiorganosiloxanes and one or more copolymeric silicone resins; wherein the sum of (a) plus (b) equals 100 parts by weight, whereby the vibration damper vibrationally damps the article.

5,464,660

USE OF SPECIAL COMPOUNDS AS SMOOTHING AGENTS IN COMBING OILS

Wolfgang Becker, Moenchengladbach; Raymond Mathis, Duesseldorf; Sylva Stapper-Druyen, Moenchengladbach; Karin Robrahn, Mettmann; Rainer Hoffmann, Bremen, and Yasar C. Kiray, Bremen, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP92/00903, § 371 Date Apr. 8, 1994, § 102(e) Date Apr. 8, 1994, PCT Pub. No. WO92/19805, PCT Pub. Date Nov. 12, 1992

PCT Filed Apr. 23, 1992, Ser. No. 140,116

Claims priority, application Germany, May 2, 1991, 41 14 240.3

Int. Cl.[6] B05D *3/02*

U.S. Cl. 427—389 20 Claims

1. A process for producing combed slivers of wool from washed and carded wool bearing a combing oil applied after washing and before carding, wherein the improvement comprises the use of a combing oil comprising a smoothing effective amount of one or more compounds, having solidification points above 25° C., selected from the group consisting of:

A) dialkyl ethers containing 2 identical or different aliphatic hydrocarbon radicals each containing 6 to 22 carbon atoms;

B) carboxylic acid esters of aliphatic monocarboxylic and dicarboxylic acids containing 2 to 22 carbon atoms and aliphatic monohydric alcohols containing 1 to 22 carbon atoms; and

C) esters of dihydric, trihydric and tetrahydric aliphatic alcohols containing 2 to 22 carbon atoms and aliphatic monocarboxylic acids containing 2 to 22 carbon atoms.

5,464,661

REDUCED SOLVENT ISLAND COATING SYSTEM

Maureen M. Lein, Chester; Gary F. Pelletier, Dover, both of N.H.; Jeffrey D. Goad, Barboursville, and Chinsoo S. Lee, Charleston, both of W. Va., assignors to Davidson Textron Inc., Dover, N.H.

Filed May 25, 1994, Ser. No. 248,649

Int. Cl.[6] B05D *1/02;1/36;7/14*

U.S. Cl. 427—409 15 Claims

1. A process for manufacturing a metallized part comprising the steps of:

providing a part made from a material selected from the group consisting of thermoplastic urethanes, thermoplastic urethane alloys, polyester alloys, thermoplastic olefins and aluminum;

spray depositing a coating layer selected from the group consisting of a primer layer, basecoat layer and combined primer/

basecoat layer, containing a film forming polymer at 30–50% by weight with an organic solvent carrier at 50–70% by weight initially and adding CO_2 as a supplemental carrier at 15–20% by weight;

vacuum depositing a layer of corrosion prone metal material to form a discontinuous film covering the basecoat layer including a plurality of discrete islands of the corrosion prone metal material appearing macroscopically as a continuous film of such metal and having a plurality of macroscopically unobservable channels between the islands to maintain the discontinuous film electrically non-conductive over the basecoat layer; and

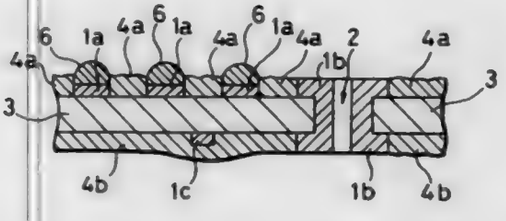
spray depositing a layer of clear resinous protective dielectric topcoat containing film forming polymer at 30–50% by weight with organic solvent carrier at 50–70% by weight initially and adding CO_2 as a supplemental carrier at 15–20% by weight to completely cover the layer of vacuum deposited corrosion prone metal material and filling the channels for bonding with the topcoat the corrosion prone metal material to the basecoat layer throughout a bottom of the channels by an adhesion force greater than two orders of magnitude in strength as compared to the strength of the adhesion force between the topcoat and a continuous layer of the corrosion prone metal material.

5,464,662

FABRICATION METHOD OF PRINTED WIRING BOARD

Tomoo Murakami, and Takanori Tsunoda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 2, 1994, Ser. No. 300,131
Claims priority, application Japan, Sep. 3, 1993, 5-219367
Int. Cl.[6] B05D *5/12*
U.S. Cl. 427—510 **8 Claims**



1. A fabrication method of a printed circuit board having an insulating base material and a conductive layer affixed to a surface of said insulating base material, said fabrication method comprising the steps of:

(a) patterning said conductive layer to a given circuit pattern including a plurality of soldering pads;

(b) forming a solder resist film on said insulating base material to cover said patterned conductive layer;

(c) selectively exposing said solder resist film to irradiated light and a developing process so that said solder resist film is selectively left in areas adjacent to said plurality of soldering pads, said selective exposure being carried out utilizing reflection of said irradiated light reflected from said insulating base material;

(d) forming an etching resist film to cover said patterned conductive layer except for said plurality of soldering pads;

(e) selectively etching surface areas of said plurality of soldering pads using said etching resistant film as a mask to produce resist dams made of said solder resist film selectively left on said insulating base material; and

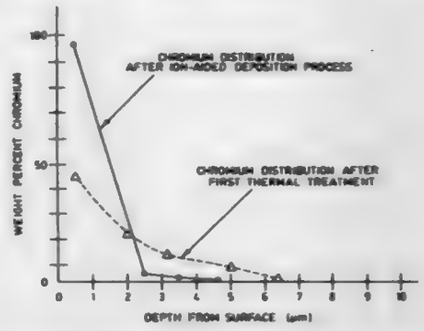
(f) forming solder films on said plurality of soldering pads.

5,464,663

CHROMIUM SURFACE TREATMENT OF NICKEL–BASED SUBSTRATES

Holger H. Streckert, San Diego, and Paul W. Trester, Encinitas, both of Calif., assignors to General Atomics, San Diego, Calif.

Filed Feb. 17, 1995, Ser. No. 390,777
Int. Cl.[6] B05D *3/06*
U.S. Cl. 427—529 **17 Claims**



1. A method for applying a chromium surface treatment onto a nickel-based substrate to improve the corrosion resistance of said nickel-based substrate while retaining thermal conductivity, the method comprising the steps of:

(a) ion plating said nickel-based substrate with chromium atoms using a physical vapor deposition process;

(b) thermally treating said chromium-plated nickel-based substrate in an inert environment to interdiffuse chromium and nickel atoms of said chromium-plated nickel-based substrate; and

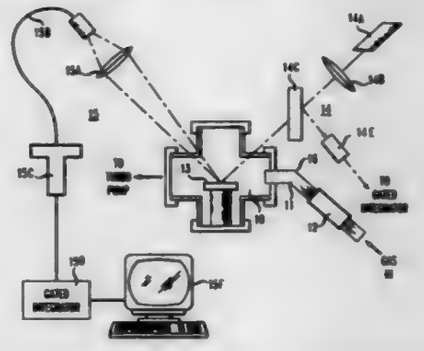
(c) thermally treating said interdiffused chromium-plated nickel-based substrate in an oxygen-containing environment to create a layer of chromium oxide.

5,464,664

DOWNSTREAM AMMONIA PLASMA PASSIVATION OF GAAS

Eray S. Aydil, Summit; Konstantinos P. Giapis, Short Hills, and Richard A. Gottscho, Maplewood, all of N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.

Continuation of Ser. No. 899,557, Jun. 16, 1992, abandoned. This application Mar. 1, 1994, Ser. No. 204,792
Int. Cl.[6] B05D *3/06*
U.S. Cl. 427—535 **7 Claims**



1. A method for passivating GaAs surfaces comprising the steps of:

placing a workpiece comprising gallium arsenide within an evacuable chamber; evacuating said chamber

maintaining said workpiece at a temperature of less than 100° C.;

forming an ammonia plasma at a location sufficiently removed from said workpiece such that said workpiece is not within the plasma glow and wherein said plasma is outside the line

of sight to said workpiece to substantially protect said workpiece from ion bombardment and radiation damage; and

causing products from said plasma to flow into contact with said workpiece for a time sufficient to increase photoluminescence intensity from said gallium arsenide by at least a factor of 10.

5,464,665

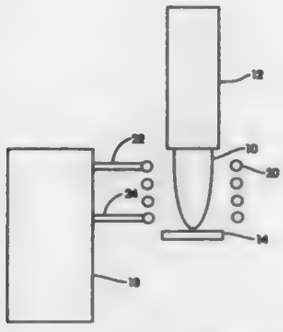
MICROWAVE RF, OR AC/DC DISCHARGE ASSISTED FLAME DEPOSITION OF CVD DIAMOND

Thomas R. Anthony, Schenectady, and James F. Fleischer, Scotia, both of N.Y., assignors to General Electric Company, Worthington, Ohio

Continuation of Ser. No. 782,681, Oct. 25, 1991, abandoned. This application Jun. 9, 1993, Ser. No. 74,197

Int. Cl.[6] B05D *3/06*; **B01J** *3/06*

U.S. Cl. 427—570 **4 Claims**



1. In a chemical vapor deposition (CVD) method for the synthesis of diamond wherein a hydrocarbon/hydrogen gaseous mixture is subjected to a combustion flame in the presence of oxygen to at least partially decompose said gaseous mixture to form CVD diamond on the surface of substrate, the improvement which comprises:

subjecting said combustion flame to dielectric heating comprising radio frequency discharge comprising an antenna adapted to surround said combustion flame, and said antenna and said substrate are connected to a transmitter for superimposing radio frequency waves on said flame, whereby said method has a carbon utilization rate of at least 1%.

5,464,666

PROCESS FOR CHEMICAL VAPOR CODEPOSITION OF COPPER AND ALUMINUM ALLOYS

Stephen M. Fine, and David A. Bohling, both of Emmaus, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 6, 1995, Ser. No. 384,088

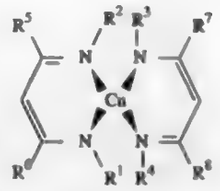
Int. Cl.[6] B05D *3/06*

U.S. Cl. 427—576 **15 Claims**

1. A method for the simultaneous codeposition of aluminum and copper on a substrate under chemical vapor deposition conditions to form a layer of aluminum and copper on said substrate, comprising the steps of:

(a) heating said substrate to a temperature in the range of approximately 150° to 250° C.;

(b) contacting said substrate at chemical vapor deposition conditions with a copper precursor of the formula:



wherein R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8 are individually H, or C_1–C_{10} hydrocarbon;

(c) simultaneously to step (b) contacting said substrate at chemical vapor deposition conditions with an aluminum precursor selected from the group consisting of:

$$H_3AlN(R^9)(R^{10})(R^{11}),$$

where R^9, R^{10} and R^{11} are individually C_1–C_4 hydrocarbon and at least one of the R groups can be $CH_2CH_2N(CH_3)_2$, or

$$H_{(3-x)}Al(R^{12})_x$$

where R^{12} are individually C_1–C_4 hydrocarbon and x=1–3, or

$$Cl_{(3-x)}Al(R^{13})_x$$

where R^{13} are individually C_1–C_4 hydrocarbon and x=1– 3;

(d) codepositing a layer of aluminum and copper on said substrate.

5,464,667

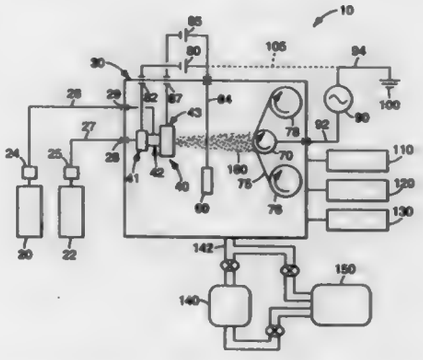
JET PLASMA PROCESS AND APPARATUS

Günter A. Köhler, Stillwater; Seth M. Kirk, Minneapolis, and Gary J. Follett, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 16, 1994, Ser. No. 291,111

Int. Cl.[6] B05D *3/06*

U.S. Cl. 427—577 **30 Claims**



1. A process for the plasma deposition of a carbon-rich coating onto a substrate comprising:

(a) providing a substrate in a vacuum chamber;

(b) generating a carbon-rich plasma in the vacuum chamber by:

(1) injecting a plasma gas into a hollow cathode slot system containing a cathode comprising two electrode plates arranged parallel to each other;

(2) providing a sufficient voltage to create and maintain a carbon-rich plasma in the hollow cathode slot system; and

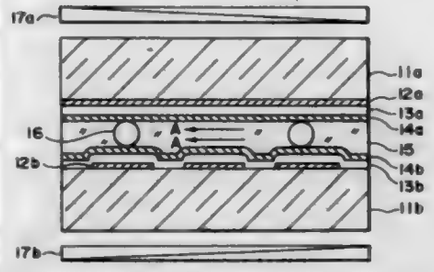
(3) maintaining a vacuum in the vacuum chamber sufficient for maintaining the plasma; and

(c) depositing the carbon-rich plasma on the substrate to form a carbon-rich coating.

5,464,668
LIQUID CRYSTAL DEVICE

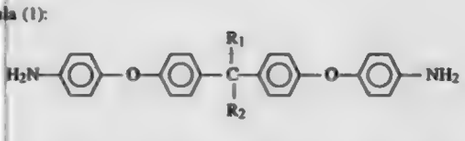
Masanobu Asaoka, Yokohama; Hideaki Takao, Sagamihara; Takeshi Togano, Yokohama, and Makoto Kojima, Hino, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1993, Ser. No. 13,329
Claims priority, application Japan, Feb. 5, 1992, 4-047806; Feb. 5, 1992, 4-047810; Dec. 25, 1992, 4-357902
Int. Cl.[6] C09K 19/00; G02F 1/13
U.S. Cl. 428—1 **9 Claims**



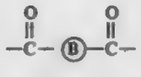
1. A liquid crystal device, comprising: a pair of substrates and a liquid crystal disposed between the substrates; at least one of said pair of substrates having thereon an alignment film comprising a polyamide imide formed by reaction between a diamine component of formula (1) shown below, at least one naphthalenetetracarboxylic acid component and at least one dicarboxylic acid component comprising structural unit of formula (3) shown below;

Formula (1):



wherein R_1 and R_2 independently denote an alkyl group or a fluoroalkyl group having 1–10 carbon atoms;

Formula (3):



wherein Ⓑ denotes a divalent organic residue comprising an aromatic ring, aromatic polycyclic ring or condensed polycyclic ring.

5,464,669
METHOD FOR FORMING AN ORIENTATION FILM OF PHOTOPOLYMER IN A LIQUID CRYSTAL DISPLAY

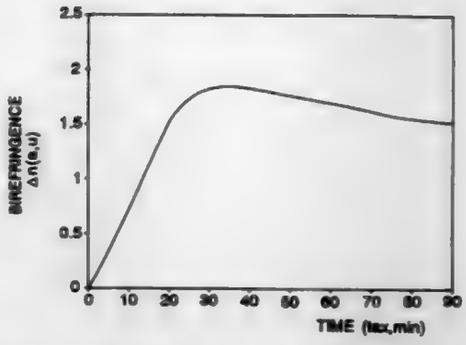
Dae S. Kang, Euiwang; Woo S. Park; Hyun H. Shin, both of Anyang; Soon B. Kwon, Seoul, all of, Rep. of Korea; Tntyana Y. Marusii, Kiev, Ukraine; Yuriy A. Reznikov, Kiev, Ukraine; Anatoliy I. Khizhnyak, Kiev, Ukraine, and Oleg V. Yaroschchuk, Kiev, Ukraine, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 12, 1994, Ser. No. 180,240
Claims priority, application Rep. of Korea, Sep. 18, 1993, 18950/1993
Int. Cl.[6] G02F 1/1337
U.S. Cl. 428—1 **4 Claims**

1. A method for forming orientation films for a liquid crystal display, comprising the steps of:

forming a film of polyvinyl-4-fluorocinnamate polymer on the surface of a first substrate;

forming a film of polyvinyl-4-fluorocinnamate polymer on the surface of a second substrate; and

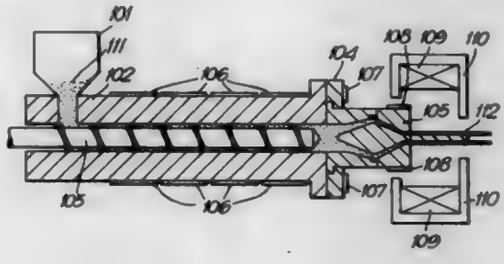


irradiating the films with different amounts of linearly polarized ultraviolet light such that the resulting liquid crystal display has a pretilt angle.

5,464,670
RESIN BOUND MAGNET AND ITS PRODUCTION PROCESS

Takeshi Ikuma; Masaaki Sakata; Hiroharu Akioka, and Tatsuya Shimoda, all of Suwa, Japan, assignors to Seiko Epson Corporation, Nagano, Japan

Continuation of Ser. No. 508,719, Apr. 13, 1990, abandoned. This application Jan. 31, 1994, Ser. No. 188,733
Int. Cl.[6] B32B 1/08
U.S. Cl. 428—35.8 **10 Claims**



1. A resin bonded magnet comprising a rare earth magnetic powder and an organic resin wherein it is moulded as a single body in a cylindrical form satisfying a relation of

$$2D\dot{L}/d^2 \geqq 1.56$$

among the outer diameter (D), the inner diameter (d) and the length (L) of the magnet, and it also has a radial orientation said rare earth magnetic powder having a coercivity of between kOe and 12 kOe and wherein an average particle size of the aforementioned magnetic powder satisfies

$$1\ \mu \leqq r \leqq .1\ t\ (t \leqq 1\ mm)$$

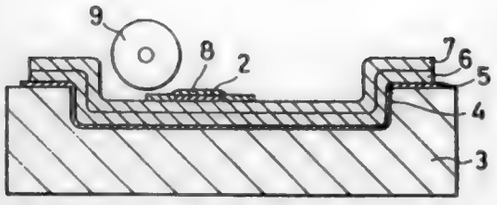
with the thickness t of the moulded article.

5,464,671
FIBER REINFORCED PLASTIC PRODUCT AND AN INDICATION METHOD THEREOF

Kuniyuki Harada, Ohta; Kazutaka Sawada, Isesaki; Yoshiteru Hosoya, Gunma, and Tetsuo Shibusawa, Ohta, all of, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1994, Ser. No. 193,547
Claims priority, application Japan, Feb. 26, 1993, 5-062934
Int. Cl.[6] B41M 7/02; B42D 15/00; G09C 3/00
U.S. Cl. 428—40 **7 Claims**

1. A fiber reinforced plastic product, comprising:



a fiber mat and a resin impregnated fiber mat with one of said mats alternatively overlaid with respect to the other of said mats;

a label containing information thereon, said label being in contact with said one of said fiber mats based on the laying of said label on said one of said fiber mats while said one of said fiber mats is in a non-completely hardened state;

a transparent surface fiber mat impregnated with a resin and overlaying said label such that the printed information on said label is viewable.

5,464,672

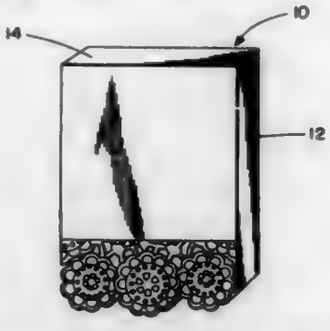
NOTE PAD

Kathleen M. Jackson, 111 Prospect St., Stamford, Conn. 06901

Filed Nov. 4, 1994, Ser. No. 334,055

Int. Cl.[6] C09J *7/04*

U.S. Cl. 428—40 **1 Claim**



1. A note pad comprising a plurality of paper sheets stacked to form a pad;

an adhesive on corresponding first edges of the plurality of sheets to releasably bind the pad of sheets;

repositionable adhesive located along a border of each sheet adjacent the first edge thereof, whereby each sheet may be removed from the pad and secured to a surface; and

the border along the edge of each sheet opposite the said first edge thereof having a filigree design to facilitate the removal of each sheet from the pad.

5,464,673

INFORMATION RECORDING MEDIUM HAVING RECORDING LAYER WITH ORGANIC POLYMER AND DYE CONTAINED THEREIN

Itsuo Watanabe, Shimodate; Atsushi Kuwano, Tsukuba; Jun Taketatsu, Tsukuba; Nobuaki Takane, Tsukuba; Mitsuo Yamada, Shimodate, and Seiji Tai, Hitachi, all of, Japan, assignors to Hitachi Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1992, Ser. No. 926,108

Claims priority, application Japan, Aug. 8, 1991, 3-198174; Aug. 8, 1991, 3-198175; Dec. 26, 1991, 3-345072; Feb. 26, 1992, 4-038283; Apr. 17, 1992, 4-096929; Apr. 23, 1992, 4-103402

Int. Cl.[6] B32B *3/00*; G11B *7/24*

U.S. Cl. 428—65.1 **12 Claims**

1. An erasable and rewritable information recording medium having a recording layer wherein said recording layer comprises a composition having:

(I) at least one conjugated organic polymer whose conformation changes by exposure to thermal energy and

(II) at least one dye selected from the group consisting of phthalocyanine dyes, tetrapyradinoporphyradine dyes, naphthalocyanine dyes, and nickel dithiol complexes.

5,464,674

MAGNETIC RECORDING MEDIUM AND METHOD FOR ITS PRODUCTION

Ichiro Makino, Machida; Akira Mitsui, Yokohama; Mikio Takehara, Yokohama; Eiichi Ando, Yokohama; Junichi Ebisawa, Tokyo; Koichi Suzuki, Yokohama; Kiyoshi Matsumoto, Tokyo; Toru Iseda, Yokohama, and Susumu Suzuki, Kawasaki, all of, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Division of Ser. No. 489,954, Mar. 7, 1990, Pat. No. 5,209,835, which is a continuation-in-part of Ser. No. 318,330, Mar. 3, 1989, Pat. No. 5,110,637. This application Jun. 12, 1993, Ser. No. 3,417

Claims priority, application Japan, Mar. 3, 1988, 63-48765; Mar. 31, 1988, 63-76202; Jun. 14, 1988, 63-144827; Jan. 21, 1988, 63-264163; Mar. 7, 1989, 1-53009; Mar. 1, 1990, 2-47138

The portion of the term of this patent subsequent to May 5, 2009, has been disclaimed.

Int. Cl.[6] G11B *5/66*; C23C *14/00*; C03C *3/155*

U.S. Cl. 428—694 T **12 Claims**

1. A magnetic recording medium comprising a magnetic recording layer and at least one outermost protective layer formed on the recording layer, wherein said outermost protective layer is made of a uniform and homogeneous oxide film having no crystal grain boundaries consisting essentially of ZrB_xO_y, wherein the atomic ratio x of boron to zirconium is $0.1<x<4$ and the atomic ratio y of oxygen to zirconium is $2<y<8$.

5,464,675

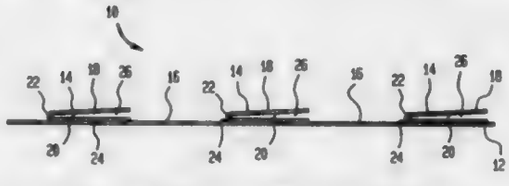
ANEMOMETER FABRIC

Sam Weir, 3 Ocean Ave., Monmouth Beach, N.J. 07750

Filed Mar. 1, 1994, Ser. No. 204,505

Int. Cl.[6] B32B *3/14*

U.S. Cl. 428—78 **20 Claims**



1. An anemometer fabric comprising in combination:

a support fabric member including an outwardly facing upper surface;

at least three dual surfaced fabric structures secured to said fabric member defining at least first, second and third side by side tabs overlaying said upper surface of said support fabric member;

said tabs being displaceable in a single direction in response to an applied aerodynamic force and being arranged such that said second tab is between said first and third tabs so that said second tab isolates said first tab from said third tab;

said tabs having a first color on one side thereof and a second color on the other side thereof, said first color being distinct from said second color and facing outwardly in the absence of an aerodynamic force on said anemometer fabric so that said second color of said tabs is unexposed to a viewer; and wherein said tabs are secured such that an applied aerodynamic force urges said tabs to alter their spatial relationship with said support fabric member whereby said second color of said tabs is exposed to a viewer, thereby altering the appearance of said anemometer fabric.

5,464,676

REDUCED STAINING CARPET YARNS AND CARPET

Matthew B. Hoyt, Arden, and Phillip E. Wilson, Asheville, both of N.C., assignors to BASF Corporation, Mt. Olive, N.J.

Division of Ser. No. 262,201, Jun. 20, 1994, which is a continuation-in-part of Ser. No. 900,629, Jun. 18, 1992, abandoned. This application Apr. 18, 1995, Ser. No. 423,736

Int. Cl.[6] B32B *3/02*

U.S. Cl. 428—85 11 Claims

1. A carpet which comprises a multilobal composite filament having reduced stainability, said filament comprising a polyamide core having an amine end group content of from about 5 to about 45 meq/kg, and a hydrophobic polymer sheath surrounding said core, said hydrophobic polymer being selected from the group consisting of aromatic polyesters, aliphatic polyesters, polyethylene, polymethylpentene, polybutene, and polymethyl butene, and wherein the weight ratio between said core and said sheath is from about 2:1 to about 10:1.

5,464,677

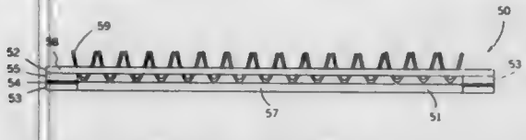
PROCESS FOR MANUFACTURING SUBSTANTIALLY 100 NYLON 6 CARPET

Thomas F. Corbin; Otto M. Ilg, and Robert N. Armstrong, all of Asheville, N.C., assignors to BASF Corporation, Parsippany, N.J.

Continuation of Ser. No. 753,478, Aug. 30, 1991, Pat. No. 5,370,757. This application Aug. 11, 1994, Ser. No. 289,163

Int. Cl.[6] B32B *3/02;3/06*

U.S. Cl. 428—95 2 Claims



1. A carpet comprising two sections wherein:

a first section is essentially composed of nylon 6 and comprises a pile face of nylon 6 face yarn; a nylon 6 support material into which said nylon 6 face yarn is tufted or woven; a nylon 6 backing which binds said face yarn into said support material where said face yarn is woven or tufted into said support material; and a first fastening means attached to said backing on a side opposite from said pile face, said first fastening means provided for removably and replaceably fastening said support structure with said tufted or woven face yarn bound therein to a fastener of an installation surface; and

a second section comprising a second fastening means releasably engagable with the first fastening means of the first section.

5,464,678

FIBERS CONTAINING AN ANTISTATIC FINISH AND PROCESS THEREFOR

Elbert H. Mudge, Charlotte, and Charles G. DeWitt, Matthews, both of N.C., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation-in-part of Ser. No. 119,084, Nov. 16, 1993. This application Mar. 16, 1994, Ser. No. 213,769

Int. Cl.[6] B32B *3/02;* B06D *3/02*

U.S. Cl. 428—96 20 Claims

1. A process for applying an antistatic finish to synthetic fibers having at least 10 denier per filament comprising the steps of

A) applying to the above fibers a composition comprising

a) at least one salt of a phosphate partial ester having one or two straight chain C_{12} alkyl groups,

b) at least one lubricant, and

c) at least one anionic and/or cationic emulsifier, and

B) autoclaving the treated fibers from step A) at a temperature in the range of from about 93° to about 150° C.

5,464,679

METAL HONEYCOMB BODY OF INTERTWINED SHEET-METAL LAYERS, AND METHOD FOR ITS PRODUCTION

Wolfgang Maus; Helmut Swars; Rolf Brück, all of Bergish Gladbach, and Bohumil Humpolik, Ludwigsburg, all of, Germany, assignors to Emitec Gesellschaft fuer Emissionstechnologie mbH, Lohmar, Germany

Filed Jul. 14, 1993, Ser. No. 91,613

Claims priority, application Germany, Jul. 14, 1992, 42 23 096.9; Jul. 14, 1992, 42 23 134.5

Int. Cl.[6] B32B *3/12*

U.S. Cl. 428—116 23 Claims

1. A metal honeycomb body, comprising a jacket member defining an interior with a substantially annular inner region and a substantially annular outer region, at least partly structured sheet-metal layers disposed in said interior, said sheet-metal layers being wrapped around one another and extending alternatingly back and forth in a curved fashion between said outer annular region and said inner annular region, and said sheet-metal layers forming loops, and at least three reversal lines defined in said outer annular region, said sheet-metal layers being intertwined about said at least three reversal lines.

5,464,680

PLASTIC-COATED CONCRETE FORM PANEL

Edward R. Hauser, St. Joseph, Wis., and David D.-L. Lu, Ramsey, Minn., assignors to WorldTech Coatings, Inc., and Ralph N. Hakim, Vancouver, Wash.

Continuation of Ser. No. 64,788, May 21, 1993, abandoned, which is a continuation of Ser. No. 776,604, Oct. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 647,486, Jan. 25, 1991, abandoned. This application Oct. 6, 1994, Ser. No. 319,489

Int. Cl.[6] B32B *21/08;27/40*

U.S. Cl. 428—141 13 Claims

1. Plastic-coated plywood sheet concrete form panel comprising a non-oiled base plywood sheet having on one face an oil-free topcoat of poly(urethane-urea) derived from a mixture of 25 to 50 mole percent of poly(oxypropylene) isocyanate-terminated urethane prepolymer formed by reacting a stoichiometric excess of a first polyisocyanate with a polyoxypropylene polyol having a molecular weight in the range of 200 to 2,000 in admixture with 50 to 75 mole percent of a second polyisocyanate having from three to five isocyanate groups per molecule, the curing of which mixture was accelerated by a 1,4-diaza-(2.2.2)-bicyclooctane applied in an aqueous solvent as an undercoat for said topcoat, said topcoat having a specular gloss (60 degrees) of at least 75, a smoothness Ra value of less than 0.1 micrometer, being sufficiently crosslinked to resist softening at 50° C. and being adhered to said base plywood sheet by an alkali resistant seal-prime coating having a thickness of 0.4 to 1.8 mils.

5,464,681

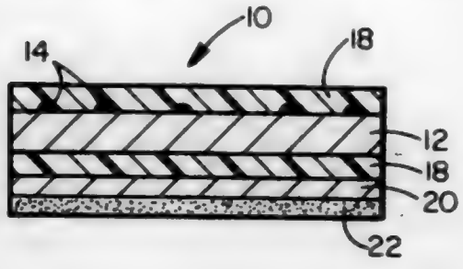
REPLACEABLE ADHESIVE DISPLAY

Richard J. Luce, Milwaukee County, Wis., assignor to Service Litho-Print, Inc., Oshkosh, Wis.

Continuation-in-part of Ser. No. 954,488, Sep. 30, 1992, abandoned. This application Jul. 6, 1993, Ser. No. 88,206

Int. Cl.[6] B32B 3/00

U.S. Cl. 428—195 21 Claims



1. A replaceable adhesive display for mounting on a surface, comprising:

(a) a substrate selected from the group consisting of paper, metallized paper, and foil, said substrate having a front facing and a back facing, and an image printed on at least one of said facings;

(b) a transparent overlay disposed on at least one of said facings, said overlay having an outwardly disposed adhesive-enhancing surface; and

(c) a pressure sensitive, replaceable adhesive coating applied to said adhesive-enhancing surface, whereby said display can be sealed and unsealed several times on said mounting surface.

5,464,682

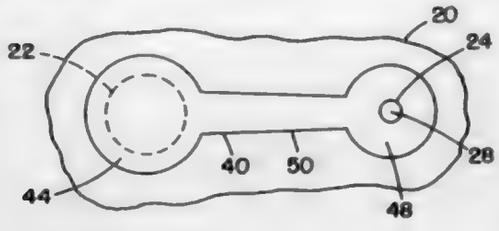
MINIMAL CAPTURE PADS APPLIED TO CERAMIC VIAS IN CERAMIC SUBSTRATES

Eric D. Perfecto; Chandrika Prasad, both of Wappingers Falls; Keshav Prasad, Poughkeepsie; Gordon J. Robbins, Wappingers Falls; Madhavan Swaminathan, Wappingers Falls, and George E. White, Fishkill, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1993, Ser. No. 166,424

Int. Cl.[6] B32B 9/00

U.S. Cl. 428—210 15 Claims



1. An apparatus comprising:

a ceramic substrate;

a ceramic via defined within said ceramic substrate at an actual location which differs from a design desired location for said ceramic via due to distortion that has occurred during the manufacture of said substrate; and

a minimal capture pad which electrically communicates said actual location determined after said manufacture to said design desired location, said minimal capture pad comprising a first contact portion substantially conforming to the shape of said ceramic via in electrical contact therewith, and a second contact portion for electrically contacting a thin film stud disposed at said design desired location and substantially conforming to the shape of said thin film stud.

5,464,683

COATED TRANSPARENT SUBSTRATE

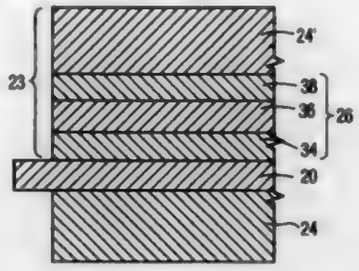
Helmut Rudigier, Bad Ragaz, Switzerland, and Reinhard Sperger, Feldkirch, Austria, assignors to Balzers Aktiengesellschaft, Balzers, Liechtenstein

Filed Dec. 7, 1992, Ser. No. 986,365

Claims priority, application Switzerland, Dec. 13, 1991, 3700/91

Int. Cl.[6] B32B 9/04

U.S. Cl. 428—216 3 Claims



1. A coated transparent substrate, comprising on at least one of its sides, a multi-layer transparent layer-system with at least one layer of the Oxynitride of Hafnium, so as to form a transparent optical element, said layer-system comprising a sequence of a Hafnium-Oxynitride layer and of a Silicon-Oxide layer comprising following layers of respective thickness, considered in a direction from said substrate:

HfON:	8 nm.
SiO_2:	42 nm,
HfON:	103 nm,
SiO_2:	193 nm.
HfON:	98 nm,
SiO_2:	95 nm.

5,464,684

HYBRID YARN COMPRISING A CORE OF INTERMIXED POLYAMIDE FILAMENTS AND REINFORCING RILAMENTS WHEREIN THE CORE IS WRAPPED BY A POLYAMIDE FIBER

Joerg Vogelsang, Harthausen; Giorgio Greening, Rossdorf; Regina Laws, Weinheim, and Peter Ittemann, Mannheim, all of, Germany, assignors to Cytec Technology Corp., West Paterson, N.J.

Filed Nov. 2, 1992, Ser. No. 970,455

Int. Cl.[6] D02G 3/02;3/36; D03D 3/00; B32B 5/06

U.S. Cl. 428—229 10 Claims

1. A hybrid yarn comprising polyamide fiber A and reinforcing fiber B within which the individual filaments of the two kinds of fiber have been intermixed and which is overwrapped by a polyamide yarn A' wherein the polyamide A has a melt viscosity of less than 220 Pa.s.

5,464,685

TEXTILE DRYER APPARATUS HAVING AN IMPROVED TEXTILE DRYER FABRIC

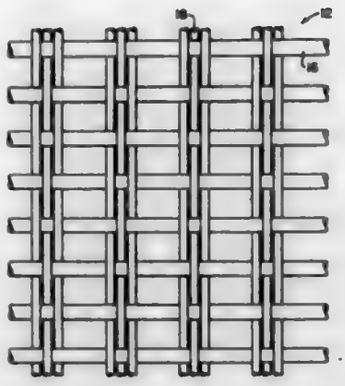
Ted Fry, Summerville, S.C., assignor to Asten, Inc., Charleston, S.C.

Filed Mar. 25, 1994, Ser. No. 218,139

Int. Cl.[6] D03D 3/00

U.S. Cl. 428—229 14 Claims

1. A combination of a textile dryer fabric and a textile dryer apparatus having at least one drying zone through which a high volume of hot air is passed, the textile dryer fabric for transporting



a textile through the drying zone where the textile is dried by the passage of the heated air through the textile and the dryer fabric, wherein the textile dryer fabric is made of synthetic monofilament yarns and heat set such that the fabric has a permeability of at least 900 CFM, and said monofilament yarns are made of a material selected such that the fabric loses less than about 10 percent of its initial tensile strength after continuous exposure to dry air at 400° F. for 30 days.

5,464,686

PRESENSITIZED PLATE FOR USE IN MAKING LITHOGRAPHIC PRINTING PLATE REQUIRING NO DAMPENING WATER

Tatsuji Higashi, and Noboru Yasuda, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Continuation of Ser. No. 787,817, Nov. 5, 1991, abandoned. This application Jan. 21, 1994, Ser. No. 184,349

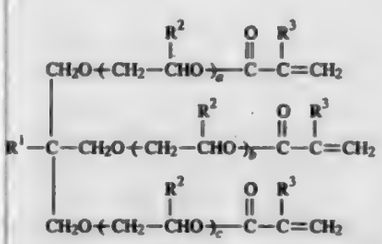
Claims priority, application Japan, Nov. 7, 1990, 2-301876

Int. Cl.[6] G03C *1/76;* **G03F** *7/033*

U.S. Cl. 430—272 **22 Claims**

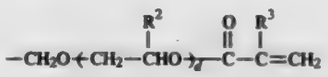
1. A presensitized plate requiring no dampening water for use in making a lithographic printing plate requiring no dampening water, which comprises a substrate, a light-sensitive resin layer formed on the substrate and a silicone rubber layer applied onto the light-sensitive layer and formed by crosslinking through an addition reaction between groups ≡Si—H and —CH=CH—, wherein the light-sensitive resin layer is formed from a light-sensitive composition which comprises the following components:

(i) from 1 to 50% by total weight of the light-sensitive composition of at least one monomer represented by the following general formula (I):

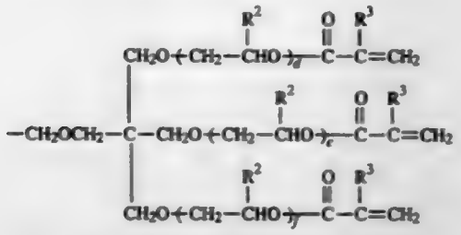


(I)

wherein a+b+c=6 to 30 if R^1 represents H or an alkyl group having 1 to 10 carbon atoms; a+b+c+d=8 to 40 if R^1 represents the group:



or a+b+c+d+e+f=12 to 60 if R^1 represents the group:



wherein a to f are the same or different and each represents an integer; R^2 and R^3 are the same or different and each represents a hydrogen atom or a methyl group;

(ii) a photopolymerization initiator; and

(iii) a polymeric compound having film-forming ability.

5,464,687

WETTABLE POLYOLEFIN FIBER COMPOSITIONS AND METHOD

Paresh J. Sheth, Sugarland, Tex., assignor to Lyondell Petrochemical Company, Houston, Tex.

Continuation-in-part of Ser. No. 154,682, Nov. 18, 1993, which is a continuation-in-part of Ser. No. 987,810, Dec. 7, 1992, abandoned. This application Jul. 12, 1994, Ser. No. 273,726

Int. Cl.[6] C08K *5/06;* **C08L** *23/12*

U.S. Cl. 428—286 **34 Claims**

1. A polyolefin composition, comprising:

(a) about 98 to 70% by weight of a polyolefin;

(b) a selected amount of a polar group material, the polar group material being an ethylene copolymer comprising 70 to 82% and about 30 to 18% by weight of an alkyl acrylate wherein the alkyl acrylate has one to four carbon atoms, said alkyl acrylate being present in an amount between 0.2%–3.0% by weight of the sum of the polyolefin and ethylene copolymer, wherein at least a portion of said copolymer is grafted onto said polyolefin; and

(c) a hydrophilic modifier in an amount by weight of from 0.1% to 2.0% of the polyolefin.

5,464,688

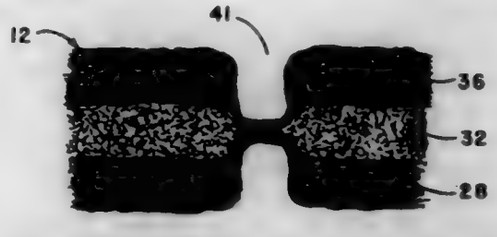
NONWOVEN WEB LAMINATES WITH IMPROVED BARRIER PROPERTIES

Terry K. Timmons; Peter Kobylivker; Lin-Sun Woon, all of Marietta; Laura E. Keck, and Jerald T. Jascomb, both of Alpharetta, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 47,219, Apr. 14, 1993, abandoned, and a continuation-in-part of Ser. No. 976,774, Nov. 16, 1992, Pat. No. 5,271,883, , and a continuation of Ser. No. 540,070, Jun. 18, 1990, abandoned. This application Aug. 26, 1994, Ser. No. 296,822

Int. Cl.[6] B32B *5/06*

U.S. Cl. 428—298 **26 Claims**



1. A laminate comprising a fine fiber nonwoven fabric barrier layer which layer is formed from a reactor granule of a modified

polymer which polymer has a molecular weight distribution between 2.2 and 3.5 Mw/Mn and a melt flow rate greater than 800 gms/10 min at 230° C. and wherein the pore size distribution of said laminate is shifted downward.

5,464,689

RESIN COMPOSITION, POROUS FILM PRODUCED THEREFROM AND PROCESS FOR PRODUCING SAME

Hiroshi Matsumura, Fukuroi; Takaaki Shimada, Kagawa; Takayuki Hisanaka, Kakegawa; Yoshiki Ochi; Tetsuo Kuwaki, both of Tokuyama, and Yoshinobu Muta, Urayasu, all of, Japan, assignors to Uni-Charm Corporation, Kawanoe, and Tokuyama Corporation, Yamaguchi, both of, Japan

Filed Jun. 14, 1994, Ser. No. 260,446

Claims priority, application Japan, Jun. 15, 1993, 5-143767

Int. Cl.[6] C08L *67/04*

U.S. Cl. 428—317.9 **3 Claims**

1. A resin composition which comprises of 95 to 60 volume % of a resin mixture of 40 to 85% by weight of a copolymer between D-hydroxybutyrate and D-hydroxyvalerate containing 8 to 15 mol % of D-hydroxyvalerate-derived monomer unit and 60 to 15% by weight of poly-ε-caprolactone, and 5 to 40 volume % of an inorganic filler or fillers.

5,464,690

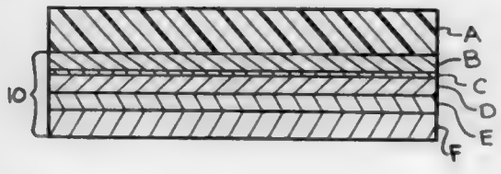
HOLOGRAPHIC DOCUMENT AND METHOD FOR FORMING

David R. Boswell, Woodley, England, assignor to NovaVision, Inc., Bowling Green, Ohio

Filed Apr. 4, 1994, Ser. No. 222,283

Int. Cl.[6] B32D *7/12*

U.S. Cl. 428—334 **14 Claims**



1. A method for forming a composite sheet adapted to apply a holographic image directly to a substrate comprising the steps of:

(a) providing a film of material selected from the group consisting of a polyester, biaxially oriented polypropylene, cellulosic triacetate, polystyrene, polyethylene and polyvinylchloride;

(b) depositing on said film a layer of metal having a thickness in the range of 20 millimicrons to 100 millimicrons;

(c) applying to said metal layer a first lacquer coating having a thickness in the range of 0.5 microns to 3 microns, said first lacquer coating being a member selected from the group consisting of acrylic, styrene-acrylonitrile polymer, polyester and nitrocellulose;

(d) applying to said first lacquer coating a second lacquer coating having a thickness in the range of 0.05 microns to 0.2 microns, said second lacquer coating being a member selected from the group consisting of acrylic, styrene-acrylonitrile polymer, polyester and nitrocellulose; and

(e) applying to said second lacquer coating a heat activatible adhesive having a thickness in the range of 0.75 microns to 4 microns.

5,464,691

LAMINATED BARRIER FILM

Eric S. Gardiner, Westtown, and Thomas Z. Fu, Bayside, both of N.Y., assignors to Arizona Chemical Company, Panama City, Fla.

Filed Jul. 22, 1994, Ser. No. 279,631

Int. Cl.[6] B32B *7/12*

U.S. Cl. 428—336 **32 Claims**

1. A barrier film for packaging comprising:

(a) a first layer containing a polyolefinic extrudate composed of a non-polar polyolefinic material containing an amount of an amphiphilic resin of the structure

A-B-A'

sufficient to modify the surface energy of the polyolefinic extrudate, wherein each of A and A' is selected from an essentially non-polar hydrocarbonous group and B is an essentially polar group derived from a telechelic diol, and wherein the amount of amphiphilic resin ranges from about 0.05 to about 10% by weight of the total weight of the first layer; and

(b) a second layer composed of a more polar material than the first layer bonded to the first layer,

wherein the barrier film contains from about 0.0127 to about 0.508 millimeters thickness of the first layer and from about 0.0127 to about 0.508 millimeters thickness of the second layer and wherein the bonding strength between the first and second layers is greater than about 50 N/m in the absence of a tie layer.

5,464,692

FLEXIBLE MASKING TAPE

Mortimer J. Huber, St. Paul, Minn., assignor to Quality Manufacturing incorporated, St. Paul, Minn.

Filed Jun. 17, 1993, Ser. No. 78,578

Int. Cl.[6] C09J *7/02*

U.S. Cl. 428—343 **17 Claims**

1. A method of making a removable masking tape suitable for protecting a surface of a substrate having irregular contours, comprising

(a) providing a polymeric tape that is flexible, stretchable, compressible and deformable for conforming to a contour of the surface having substantial planar curvature without departing from the contour when said masking tape is applied to the surface of the substrate; and

(b) rendering the polymeric tape capable of adhering to the surface of the substrate, wherein the polymeric tape contains a polyvinyl acetate resin and is water soluble.

5,464,693

STRUCTURE FOR INSTALLING MIRROR BASE ON GLASS PLATE AND METHOD FOR INSTALLING MIRROR BASE ON GLASS PLATE

Michio Ono; Masaharu Kume, both of Yokohama, and Takayuki Matsuo, Aikawa, all of, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Division of Ser. No. 434,673, Sep. 19, 1989, Pat. No. 5,160,780. This application May 28, 1992, Ser. No. 889,417

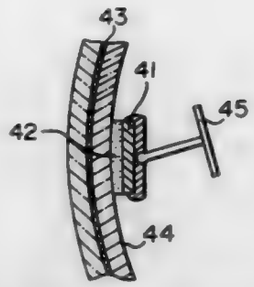
Claims priority, application Japan, Dec. 24, 1987, 325182; Sep. 2, 1988, 220205; Jan. 4, 1988, 129555

Int. Cl.[6] C08G *77/06;* **B32B** *17/10;* **G02B** *7/18*

U.S. Cl. 428—344 **5 Claims**

1. An apparatus comprising a glass plate and a mirror base wherein said mirror base is bonded to said glass plate by a film or sheet of thermosetting heat-curable adhesive interposed between the mirror base and the glass plate, said adhesive having elasticity or plasticity after heat-curing and is cross-linkable at a temperature from 50° C. to 200° C. within from 5–60 minutes, said adhesive having the following physical properties after cross-linking:

hardness (JIS-A): from 30–90,



modulus at the elongation of 50% tensioned by dumbbell (ASTMD-1822) from 5–50 kg/cm^2,
breaking strength: from 30–400 kg/cm^2, and
breaking elongation from 100–1000%.

5,464,694

SPINNABLE POLYESTER BASED ON MODIFIED POLYETHYLENE TEREPHTHALATE AND ALIPHATIC DICARBOXYLIC ACIDS

Bernd Heinrich, Friedberg, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Sep. 2, 1993, Ser. No. 116,134

Claims priority, application Germany, Sep. 5, 1992, 42 29 759.1

Int. Cl.^{6} B32B *19/00*

U.S. Cl. 128—357 **6 Claims**

1. A spinnable modified polyester for producing fully-oriented polyester yarn by high-speed spinning comprising:.

polyethylene terephthalate; and

aliphatic dicarboxylic acids as cocondensed units,

wherein the aliphatic dicarboxylic acids present as cocondensed units have in total from 4 to 10 carbon atoms; and

wherein the aliphatic dicarboxylic acids are present in an amount sufficient to provide a glass transition temperature of the polyester is] of up to 70° C., recrystallization temperature of the polyester of up to 180° C., and a heat of fusion of the polyester, determined by DSC measurement, of up to 30 J/g.

5,464,695

COMPOSITE FIBER CONTAINING INORGANIC FINE POWDER

Masao Kawamoto; Kazuhiko Tanaka; Kiyoshi Hirakawa, all of Kurashiki, and Eiichirou Nakamura, Takatsuki, all of, Japan, assignors to Kuraray Company Limited, Kurashiki, Japan

Continuation of Ser. No. 173,483, Dec. 27, 1993, abandoned, which is a continuation of Ser. No. 918,013, Jul. 24, 1992, abandoned. This application Feb. 27, 1995, Ser. No. 395,201

Claims priority, application Japan, Jul. 25, 1991, 3-209805; Aug. 1, 1991, 3-216439

Int. Cl.^{6} D02G *3/00*

U.S. Cl. 428—370 **6 Claims**

1. A composite fiber having a single fiber fineness of not more than 8 deniers and comprising a sheath comprising a protective polymer component (A) and a core comprising a polymer component (B), said component (A) being exposed on at least 60% of a circumference of a cross-section of said fiber, said protective polymer component (A) comprising a fiber-forming thermoplastic polymer and said polymer component (B) containing an inorganic fine powder, said component (B):

(I) containing said inorganic fine powder in an amount of 5 to 85% by weight based on total weight of component (B),

(II) containing as a sole spin enhancer at least 0.1% by weight based on the weight of the polymer constituting component (B) of a hydroxy-tert-butylphenyl compound with its hydroxy group present at the ortho-position relative to the tert-butyl group, and

(III) comprising a block copolymer, said block copolymer having a number average molecular weight of 30,000 to 250,000 and comprising units of poly(vinylaromatic) block having a number average molecular weight of 4,000 to 50,000 and units of a poly(conjugated diene) block having a number average molecular weight of 10,000 to 150,000, at least 30% of the double bonds based on the conjugated diene of said poly(conjugated diene) block being hydrogenated,

wherein said block copolymer has a melt flow rate of at least 5 g/10 min.

5,464,696

PARTICLES FOR NMR IMAGING

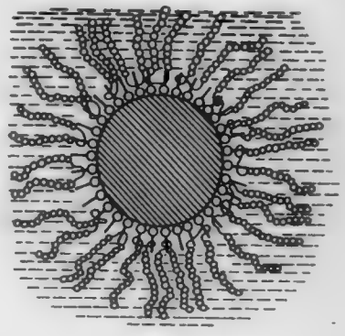
Hervé Tournier, Valleiry; Roland Hyacinthe, Douvaine, both of, France, and Michel Schneider, Troinex, Switzerland, assignors to Bracco International B.V., Geneva, Switzerland

Filed Jul. 26, 1993, Ser. No. 96,414

Claims priority, application Switzerland, Aug. 13, 1992, 92810618.6; May 25, 1993, 93810380.1

Int. Cl.^{6} B23B *5/16*

U.S. Cl. 428—403 **12 Claims**



1. A particle for use in the NMR imaging of human or animal patients, said particle comprising:

a magnetite iron oxide core and a layer of at least one amphipatic compound having a negatively charged phosphorus containing head moiety bonded to a hydrophobic tail moiety and one or more surfactants,

said amphipatic compound being an alkyl, alkenyl or cycloalkyl mono ester of phosphoric acid or a phospholipid in micellar form, and

the layer being in the shape of a three dimensional shell having at least one non-ionic surfactant which causes the amphipatic compound to be in said micellar form,

molecules of the amphipatic compound being organized relative to the iron oxide core so that the phosphorus containing head moiety of the amphipatic compound is pointing towards the iron oxide core whereas the hydrophobic tail moiety protrudes therefrom,

the negatively charged head moiety having the negative charges of two oxygen atoms available for interaction with the core and the hydrophobic tail moiety having at least eight carbon atoms.

5,464,697

SUBSTITUTED TETRACYANOQUINODIMETHANES, PROCESSES FOR THEIR PREPARATION AND THEIR USE

John Zambounis, Murten, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

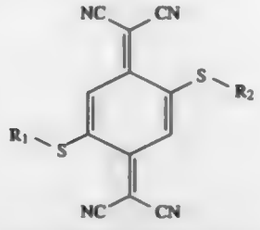
Division of Ser. No. 147,655, Nov. 4, 1993, Pat. No. 5,426,232, which is a division of Ser. No. 48,084, Apr. 15, 1993, Pat. No. 5,281,730. This application Mar. 14, 1995, Ser. No. 404,011

Claims priority, application Switzerland, Apr. 22, 1992, 1305/92

Int. Cl.[6] **B32B** *9/04;27/38*

U.S. Cl. 428—412 **11 Claims**

1. A carrier material which contains a layer of at least one compound of the formula I



(I)

in which R_1 and R_2 independently of one another are C_1–C_6 alkyl, C_5–C_8 cycloalkyl which is unsubstituted or substituted by C_1–C_4 alkyl, unsubstituted phenyl or benzyl, or phenyl or benzyl which is substituted by F, Cl, Br, C_1–C_6 alkyl, C_1–C_6 alkoxy or di(C_1–C_6 alkylamino), on at least one surface.

5,464,698

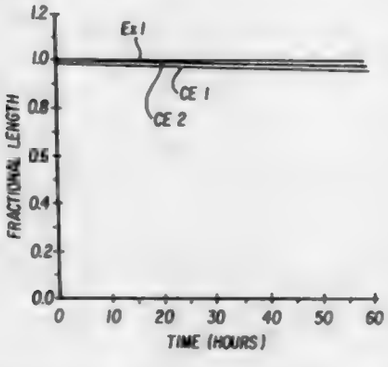
FUSER MEMBERS OVERCOATED WITH FLUOROCARBON ELASTOMER CONTAINING TIN OXIDE

Jiann H. Chen, Fairport; John J. Fitzgerald; William B. Vreeland, II, both of Webster; Wayne T. Ferrar, Fairport; Gary F. Roberts, Macedon, and William J. Staudenmayer, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1994, Ser. No. 268,140

Int. Cl.[6] **B32B** *27/00*

U.S. Cl. 428—421 **11 Claims**



1. A fuser member comprising: a core and a layer overlying said core, said layer comprising a cured fluorocarbon random copolymer comprising subunits having the general structures:

$$-(CH_2CF_2)_x-,\ -(CF_2CF_2)_z-,$$

and

$$-(CF_2CF)_y-;$$
$$\quad\quad\quad|$$
$$\quad\quad\quad CF_3$$

wherein

x is from 30 to 90 mole percent,

y is from 10 to 70 mole percent, and

z is from 0 to 34 mole percent;

said layer further comprising particulate filler, said particulate filler including tin oxide and a material selected from the group consisting of alkali metal oxides, alkali metal hydroxides, and combinations thereof; said particulate filler having a total concentration in said layer of from about 25 to 50 percent of the total volume of said layer, said tin oxide having a concentration of from 20 to 40 percent of the total volume of said layer.

5,464,699

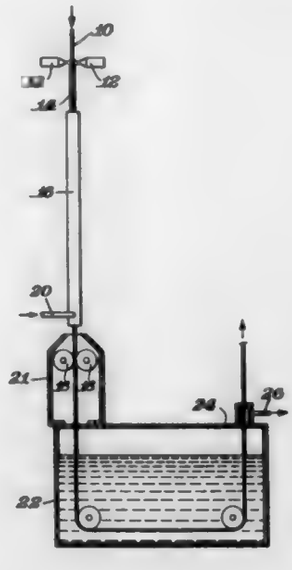
PYROPHORIC MATERIALS AND METHODS FOR MAKING THE SAME

Alfonso L. Baldi, Sea Isle City, N.J., assignor to Alloy Surfaces Co. Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 786,271, Nov. 1, 1991, Pat. No. 5,262,466, which is a continuation-in-part of Ser. No. 608,999, Nov. 1, 1990, Pat. No. 5,102,700, Ser. No. 472,663, Jan. 30, 1990, Pat. No. 5,077,257, Ser. No. 433,119, Nov. 8, 1989, Pat. No. 5,028,385, Ser. No. 440,026, Nov. 21, 1989, Pat. No. 4,977,036, Ser. No. 533,879, Jun. 6, 1990, Pat. No. 5,182,078, and Ser. No. 182,718, Apr. 18, 1988, Pat. No. 4,970,114. This application Nov. 15, 1993, Ser. No. 152,830

Int. Cl.[6] **B32B** *15/18;* **F42B** *12/70;* **C06B** *45/14;45/30*

U.S. Cl. 428—607 **9 Claims**



1. A pyrophoric coating formed by leaching aluminum from an aluminide coated metal foil having a thickness of 0.0005 inch to 0.005 inch in which the aluminide coating was formed on or into the foil by an exothermic and diffusion reaction of a powder containing aluminum and chromium with or without a transition metal selected from the group consisting of iron, nickel or cobalt and in which the weight ratio of chromium to aluminum is at east 1:50 but no more than about 1:4.

5,464,700

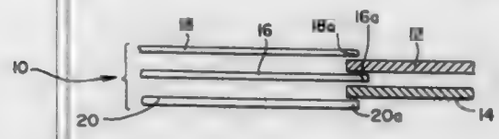
GASKETED MEMBRANE ELECTRODE ASSEMBLY FOR ELECTROCHEMICAL FUEL CELLS

Alfred E. Steck, West Vancouver, and Jinzhu Wei, North Vancouver, both of, Canada, assignors to Ballard Power Systems Inc., North Vancouver, Canada

Continuation of Ser. No. 710,090, Jun. 4, 1991, abandoned. This application Apr. 11, 1994, Ser. No. 225,519

Int. Cl.[6] H01M 8/10;8/02

U.S. Cl. 429—30 16 Claims



1. A gasketed membrane electrode assembly for use in the electrochemically active portion of a fuel cell, said assembly comprising:

a. an anode comprising electrically conductive sheet material, said anode having a pair of oppositely facing major planar surfaces, each of said anode major planar surfaces having an inner electrochemically active portion and an outer peripheral edge portion;

b. a cathode comprising electrically conductive sheet material, said cathode having a pair of oppositely facing major planar surfaces, each of said cathode major planar surfaces having an inner electrochemically active portion and an outer peripheral edge portion;

c. an ion exchange membrane interposed between one of said anode major planar surfaces and one of said cathode major planar surfaces, said membrane having an outer peripheral edge portion and an inner central portion;

d. a first layer of gasketing sheet material interposed between said one of said anode major planar surfaces and said membrane, said first layer overlapping and extending outwardly away from the outer peripheral edge portion of said one of said anode major planar surfaces in a direction away from the inner electrochemically active portion of said one of said anode major planar surfaces, said first layer overlapping and extending outwardly away from the outer peripheral edge portion of said membrane in a direction away from the inner central portion of said membrane; and

e. a second layer of gasketing sheet material interposed between said one of said cathode major planar surfaces and said membrane, said second layer overlapping and extending outwardly away from the outer peripheral edge portion of said one of said cathode major planar surfaces in a direction away from the inner electrochemically active portion of said one of said cathode major planar surfaces, said second layer overlapping and extending outwardly away from the outer peripheral edge portion of said membrane in a direction away from the inner central portion of said membrane.

5,464,701

LEAKPROOF, VALVE REGULATED, MAINTENANCE-FREE LEAD ACID BATTERY

Gonzalo C. Rey, Joplin, Mo., assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Feb. 27, 1995, Ser. No. 387,300

Int. Cl.[6] H01M 2/12

U.S. Cl. 429—53 12 Claims

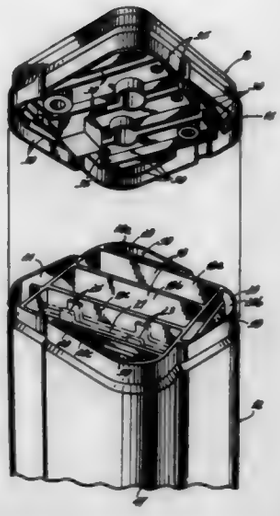
1. A valve regulated, maintenance-free lead-acid battery comprising

a case,

at least one plate compartment in the case, each said compartment containing plates and electrolyte,

an electrolyte-absorbing chamber in said case for each said compartment,

each said chamber having a vent to atmosphere, and



a pressure regulating valve associated with each compartment, for releasing gas pressure within that compartment in excess of a predetermined value,

each said valve having a downstream side which communicates with an inlet to a respective one of said chambers,

each said chamber containing a gas permeable, electrolyte absorptive inert material, said absorptive material positioned between said inlet and said vent of said chamber so that gas released through the downstream side of said valve flows through said absorptive material in passing to the said vent, the path of contact of said gas within said absorptive material being sufficiently long that substantially all droplets of said electrolyte entrained in said released gas are absorbed by said material and are not swept out said vent.

5,464,702

HIGH PERFORMANCE EPOXY RESIN SYSTEMS CONTAINING TRIMETHYLQUINOLINE OLIGOMERS

Yefim Blyakhman, Bronx, N.Y., assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Oct. 7, 1994, Ser. No. 320,092

Int. Cl.[6] C08G 59/40;65/00

U.S. Cl. 428—413 11 Claims

1. A curable epoxy resin composition which comprises

(a) an epoxy resin having at least two epoxy groups and an epoxy equivalent weight of 125 to 430, and

(b) an effective curing amount of a mixture of homo-oligomeric 1,2-dihydro-2,2,4-trimethylquinolines (OTMQ) wherein the effective amount of hardener of component (b) is from 0.5 to 1.5 equivalents of—NH— for each equivalent of epoxy moiety.

5,464,703

TIN OXIDE FILLED DIMETHYLSILOXANE-FLUOROALKYLSILOXANE FUSER ROLL FOR FIXING TONER TO A SUBSTRATE

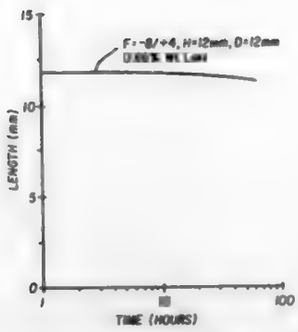
Wayne T. Ferrar, Fairport; William B. Vreeland, Webster; Charles E. Hewitt, Rochester; John J. Fitzgerald, Webster, and Tonya D. Binga, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1994, Ser. No. 268,131

Int. Cl.[6] B32B 27/00

U.S. Cl. 428—421 20 Claims

1. A fuser member useful for heat-fixing an electrographic toner to a substrate, said fuser member having a core and a base cushion layer covering said core, said base cushion layer comprising a crosslinked poly(dimethylsiloxane-fluoroalkylsiloxane) elastomer,



said base cushion layer having tin oxide particles dispersed therein in a concentration of from 20 to 40 percent of the total volume of said base cushion layer.

5,464,704

SURFACE-TREATED SUBSTRATE

Takashige Yoneda; Tsuneo Wakabayashi, and Yukiko Takano, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Continuation of Ser. No. 883,391, May 15, 1992, Pat. No. 5,314,731. This application Jan. 19, 1994, Ser. No. 183,299

Claims priority, application Japan, May 17, 1991, 3-141413; May 17, 1991, 3-141414; May 17, 1991, 3-141415; May 17, 1991, 3-141416; Nov. 20, 1991, 3-331367

Int. Cl.[6] B32B *17/06*

U.S. Cl. 428—429 **13 Claims**

1. A surface-treated substrate consisting essentially of a substrate having at least two different treated surface layers wherein the first layer constituting the outermost layer among the treated surface layers is a layer obtained by treatment with a hydrolyzable silane compound (I) capable of forming a surface having a contact angle of at least 70° against water and the second layer constituting an underlayer in contact with the outermost layer is a layer obtained by treatment with tetraisocyanate silane.

5,464,705

BATTERY INCORPORATING HYDRAULIC ACTIVATION OF DISCONNECT SAFETY DEVICE ON OVERCHARGE

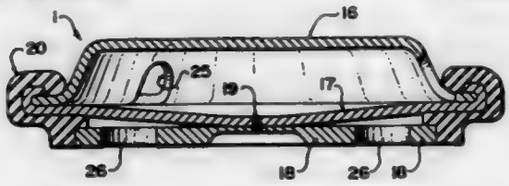
David Wainwright, Maple Ridge, Canada, assignor to Moli Energy (1990) Limited, Canada

Filed Feb. 24, 1994, Ser. No. 201,349

Claims priority, application Canada, Apr. 8, 1993, 2093763

Int. Cl.[6] H01M *2/20;6/14*

U.S. Cl. 429—61 **22 Claims**



1. A rechargeable battery cell which comprises:

(a) a Li_xMO_2 cathode wherein x is equal to or less than 1.1, and M is Ni, Co, Mn or combinations thereof;

(b) a carbonaceous anode;

(c) an electrolyte of one or more lithium salts dissolved in one or more non-aqueous organic solvents; and

(d) an internal electrical disconnect device which activates by the displacement of said electrolyte resulting from the net increase in solids volume which occurs on overcharge of the battery that exceeds the liquid and solid void volume in the battery cell;

wherein electrode balance, void volume and charging level are selected so that the disconnect device operates during overcharge abuse prior to cell failure, but not during normal float charging or storage at high temperature.

5,464,706

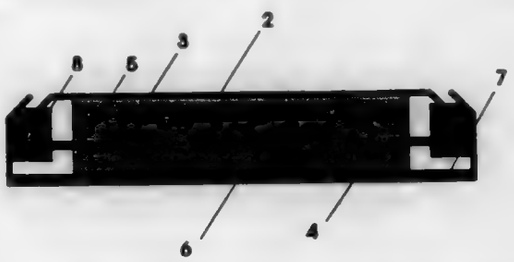
CURRENT COLLECTOR FOR LITHIUM ION BATTERY

Sankar Dasgupta, c/o Electrofuels Manufacturing Co. 21 Hanna Ave., Toronto, Ont., and James K. Jacobs, c/o Electrofuel Manufacturing Co. Unit 10, 21 Hanna Ave., Toronto, both of, Canada

Filed Mar. 2, 1994, Ser. No. 204,439

Int. Cl.[6] H01M *6/14;2/14*

U.S. Cl. 429—194 **6 Claims**



1. In a lithium ion battery, having a positive electrode comprising a positive active material capable of reacting with lithium ions in discharging said battery and releasing lithium ions in charging said battery, said positive electrode having two opposing major faces, a negative electrode comprising a negative active material capable of releasing lithium ions in discharging said battery and intercalating lithium ions in charging said battery, said negative electrode having two opposing major faces, a non-aqueous electrolyte containing a lithium salt capable of ionic dissociation, a first current collector in contact with a distal major face of said positive electrode and a second current collector in contact with a distal major face of said negative electrode, the improvement comprising inserting between said first current collector and said distal major face of said positive electrode an electrically conductive, continuous and coherent ceramic layer consisting essentially of a compound selected from the group consisting of titanium nitride and zirconium nitride.

5,464,707

ELECTRICALLY-CONDUCTING ADHESION-PROMOTERS

Russell D. Moulton, 1026 Foxchase Dr., Apt. No. 326, San Jose, Calif. 95123, and Milton N. Golovin, 29 Redmile Ct., Reisterstown, Md. 21136

Continuation of Ser. No. 968,155, Oct. 29, 1992, abandoned. This application Aug. 16, 1994, Ser. No. 293,341

Int. Cl.[6] H01M *4/60*

U.S. Cl. 429—212 **4 Claims**

1. An electrode/current collector composite comprising:

a metal foil suitable for use as a current collector,

a layer of a solid polymeric matrix, electrically-conducting, adhesion-promoter comprising formed on at least one surface of the metal foil which comprises from about 30 to 80 weight percent of a conductive material; from about 20 to about 70 weight percent of a polymer derived from a solid matrix forming monomer or partial polymer thereof; and an effective amount of acid functionalities so as to enhance the adherence of this layer of electrically-conducting adhesion-promoter to the surface of the metal foil; and a

a composite electrode paste selected from the group consisting of a cathode paste and an anode paste

wherein the cathode paste comprises from about 1 to about 20 weight percent of a conductive material, from about 35 to about 60 weight percent of a compatible cathodic material, from about 10 to about 50 weight percent of an electrolytic

solvent and from about 5 to 30 weight percent of a cathode prepolymer all based on the total weight of the paste and

further wherein the anode paste comprises from about 1 to about 20 weight percent of a conductive material, from about 35 to about 60 weight percent of a compatible anodic material, from about 10 to about 50 weight percent of an electrolytic solvent and from about 5 to about 30 weight percent of an anode prepolymers all based on the total weight of the paste wherein said adhesion-promotor is interposed between said metal foil and said composite electrode.

5,464,708

TITANIUM DIOXIDE-BASED MATERIAL

Robin J. Neat, Milton, and William J. Macklin, Oxford, both of, United Kingdom, assignors to United Kingdom Atomic Energy Authority, Didcot, England

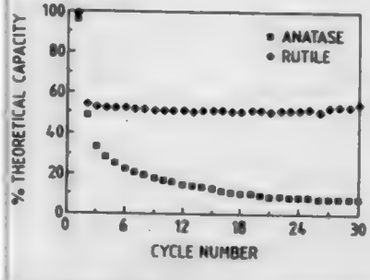
PCT No. PCT/GB92/01787, § 371 Date Feb. 25, 1994, § 102(e) Date Feb. 25, 1994, PCT Pub. No. WO93/08612, PCT Pub. Date Apr. 29, 1993

PCT Filed Sep. 29, 1992, Ser. No. 199,173

Claims priority, application United Kingdom, Jan. 16, 1991, 9121912

Int. Cl.[6] H01M *4/04;4/48*

U.S. Cl. 429—218 **4 Claims**



1. A method of making a rechargeable electrochemical cell with a cathode containing as the active material a material of stoichiometric formula Li_xTiO_2, characterised in that x is above 0.5 but is no higher than 1.0, and that the method comprises the successive steps of:

(i) assembling an electrochemical cell having an anode comprising metallic lithium as active material; a non-aqueous lithium ion conducting electrolyte; and a cathode containing titanium dioxide in its rutile form as active cathode material; and

(ii) discharging the cell at an elevated temperature between 100° C. and 150° C. such that the cathode material is transformed into material of formula Li_xTiO_2.

5,464,709

ALKALINE CELLS THAT ARE SUBSTANTIALLY FREE OF MERCURY

Dale R. Getz, North Ridgeville; John C. Nardi, Brunswick, and Robert F. Scarr, Westlake, all of Ohio, assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Continuation of Ser. No. 255,158, Jun. 7, 1994, Pat. No. 5,395,714, which is a continuation of Ser. No. 82,147, Jun. 25, 1993, Pat. No. 5,364,715, which is a continuation of Ser. No. 566,925, Aug. 14, 1990, abandoned. This application Dec. 2, 1994, Ser. No. 349,164

Int. Cl.[6] G03C *3/00*

U.S. Cl. 429—229 **12 Claims**

1. An electrochemical cell comprising an alkaline electrolyte, a cathode comprising manganese dioxide as an active cathode component, and an anode gel comprised of zinc as the active anode component, wherein the cell contains less than 50 parts of mercury per million parts by weight of the cell and said zinc anode has a gel expansion of less than 25% after being discharged for 161 minutes to 15% depth of discharge at 2.88A.

5,464,710

ENHANCEMENT OF OPTICALLY VARIABLE IMAGES

Peter Y. Yang, San Diego, Calif., assignor to Deposition Technologies, Inc., San Diego, Calif.

Filed Dec. 10, 1993, Ser. No. 165,376

Int. Cl.[6] G03H *1/04;* B32B *31/18*

U.S. Cl. 430—1 **15 Claims**

6. An optically variable image device comprising

a substrate having an optically variable relief image pattern on a surface thereof, and

a thin film of synthesized high oxygen content oxide of bismuth adhered to and substantially duplicating the image pattern,

said thin film having an atomic ratio of oxygen to bismuth of at least 1.7.

5,464,711

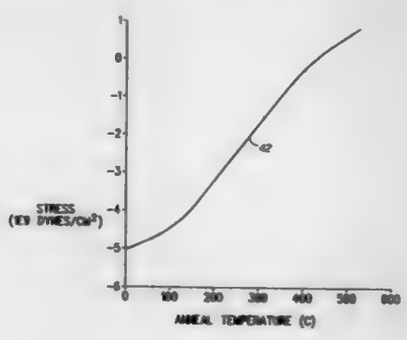
PROCESS FOR FABRICATING AN X-RAY ABSORBING MASK

C. Joseph Mogab, Austin, Tex.; William J. Dauksher, Mesa, and Douglas J. Resnick, Phoenix, both of Ariz., assignors to Motorola Inc., Schumburg, Ill.

Filed Aug. 1, 1994, Ser. No. 283,325

Int. Cl.[6] G03F *9/00*

U.S. Cl. 430—5 **15 Claims**



1. A process for fabricating an X-ray absorbing mask for use in the fabrication of semiconductor devices comprising the steps of:

providing a silicon substrate having a front surface and a back surface;

forming a membrane layer on the front surface;

forming an X-ray absorbing layer to overlie the membrane layer, wherein the X-ray absorbing layer is an amorphous material selected from the group consisting of a material containing at least one of Hf or Re, an FeW alloy, and TaFe alloy, and a material composed of a refractory metal, silicon, and nitrogen;

annealing the X-ray absorbing layer to reduce internal stress therein; and

patterning the X-ray absorbing layer to define a masking pattern.

5,464,712

METHOD FOR FABRICATING A PHASE SHIFTING MASK

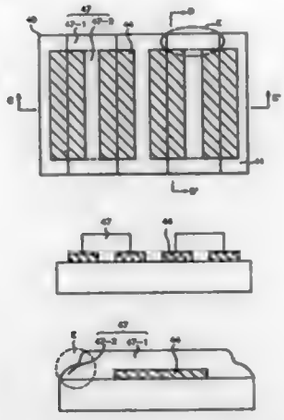
O. Suk Han, Songpa-ku, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Rep. of Korea

Filed Apr. 26, 1994, Ser. No. 233,069

Claims priority, application Rep. of Korea, Jun. 15, 1993, 10867/1993

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—5 45 Claims



1. A method for fabricating a phase shifting mask comprising steps for:

forming a plurality of opaque layer patterns in array at a fixed interval from each other in the direction of width thereof on a substrate;

coating an interlayer on all over the substrate to cover the plurality of the opaque layer patterns;

forming interlayer .patterns on the substrate at both sides in the longitudinal direction of each opaque layer pattern by etching the interlayers;

forming a plurality of insulation films on the substrate between adjacent one pair of the opaque layer patterns the interlayer patterns formed thereon;

removing the remained interlayers under each of the insulation film; and

forming a phase shifter having 90 degrees area in a part where the interlayer has been removed and 180 degrees area in rest of the part by making the insulation film cause to flow with heat treatment.

5,464,713

PHASE SHIFT MASK AND METHOD FOR REPAIRING A DEFECT OF A PHASE SHIFT MASK

Nobuyuki Yoshioka; Kunihiro Hosono, and Junji Miyazaki, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Dainippon Printing Co., Ltd., both of Tokyo, Japan

Filed Sep. 21, 1994, Ser. No. 309,832

Claims priority, application Japan, Sep. 24, 1993, 5-238251; Aug. 26, 1994, 6-202187

Int. Cl.[6] G03F 9/00

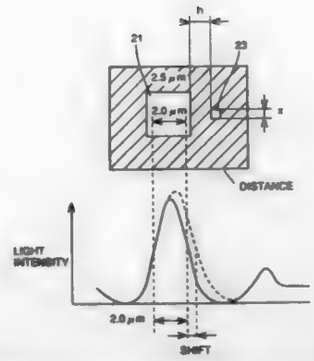
U.S. Cl. 430—5 15 Claims

1. A phase shift mask, comprising:

a light transmitting portion exposing a surface of a transparent substrate; and

a phase shifter portion formed on said transparent substrate, having a smaller transmittance of exposure light than that of said light transmitting portion and converting a phase of exposure light by 180°,

wherein a phase shifter defective portion in which a portion of said phase shifter portion is missing is provided in a region including a boundary between said light transmitting portion and said phase shifter portion, and



a repairing member having substantially the same transmittance and phase angle as those of said phase shifter portion is provided in said phase shifter defective portion.

5,464,714

PROCESS FOR PRODUCING COLOR FILTER PLATE AND COLOR FILTER PLATE THUS PRODUCED

Yasuyuki Watanabe, Chigasaki; Kazuya Ishiwata, Yokosuka, and Naoya Nishida, Hadano, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1994, Ser. No. 206,937

Claims priority, application Japan, Mar. 5, 1993, 5-069114; Mar. 5, 1993, 5-069115

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—7 10 Claims

1. A process for producing a color filter plate, comprising the steps of:

(a) forming a color filter pattern on a transparent substrate,

(b) forming a light-interrupting mask layer over the color filter pattern,

(c) abrading the mask layer with an abrasive to expose the color filter pattern and leave a patterned mask layer contiguous with the color filter pattern, and

(d) coating the color filter pattern and the patterned mask layer with a protective layer.

5,464,715

METHOD OF DRIVING MASK STAGE AND METHOD OF MASK ALIGNMENT

Kenji Nishi, Yokohama, and Seiro Murakami, Chiba, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan

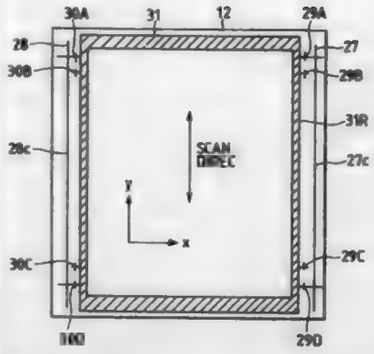
Filed Mar. 25, 1994, Ser. No. 217,841

Claims priority, application Japan, Apr. 2, 1993, 5-076045; Apr. 13, 1993, 5-086066

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—22 9 Claims

2. A method of driving a mask stage using an exposure device having said mask stage which mounts a mask formed with a predetermined pattern and is movable in a predetermined scan direction, a movable mirror which is arranged on said mask stage and has a reflection surface substantially parallel to the scan



direction, measurement means for measuring a coordinate position, in a direction perpendicular to the scan direction, of said mask stage by radiating a measurement beam onto said movable mirror, a substrate stage which mounts a photosensitive substrate and is movable in a direction substantially parallel to the scan direction, an illumination system for illuminating a predetermined area on the mask with illumination light, and a projection optical system for projecting the pattern on the mask onto the photosensitive substrate,

said exposure device for sequentially exposing the pattern on the mask onto the photosensitive substrate while synchronously scanning said mask stage and said substrate stage in the scan direction with respect to an optical axis of said projection optical system, comprising the steps of:

the first step of placing the mask on said mask stage;

the second step of calculating a curved amount of said movable mirror by measuring the coordinate position, in the direction perpendicular to the scan direction, of said mask stage by said measurement means while scanning said mask stage in the scan direction; and

the third step of moving said mask stage in the direction perpendicular to the scan direction to correct the curved amount of said movable mirror calculated in the second step when said mask stage is scanned in the scan direction with respect to the optical axis;

wherein the mask has a measurement mark, and

the second step includes the step of scanning said mask stage while the measurement mark is aligned to a reference position, and calculating the curved amount of said movable mirror on the basis of the coordinate position, in the direction perpendicular to the scan direction, of said mask stage measured by said measurement means.

5,464,716

IMAGE-HOLDING MEMBER AND PRODUCTION METHOD THEREOF, METHOD FOR FORMING IMAGE-FORMING MASTER USING THE IMAGE-HOLDING MEMBER AND THE FORMING APPARATUS, AND IMAGE-FORMING METHOD USING THEM

Yuichi Yashiki, Minami Ashigara, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 197,707, Feb. 17, 1994, Pat. No. 5,411,826, which is a division of Ser. No. 848,276, Mar. 9, 1992, Pat. No. 5,310,612. This application Jan. 30, 1995, Ser. No. 380,507

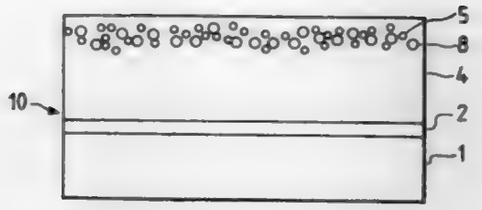
Claims priority, application Japan, Mar. 11, 1991, 3-69442; Mar. 11, 1991, 3-69443; Mar. 28, 1991, 3-87387; Jul. 4, 1991, 3-190675

Int. Cl.[6] G03G *5/047*

U.S. Cl. 430—41 **1 Claim**

1. An image holding member comprising:

a substrate having electrically conductive surface, a charge generating layer formed on said electrically conductive substrate, and a heat softening layer formed on said charge generating layer and containing a charge transporting material, electrically conductive particles, insulating particles, and a heat softening resin, said electrically conductive particles and said insulating particles existing in the inside of said heat softening layer and in the vicinity of the surface thereof.



5,464,717

ELECTROPHOTOGRAPHIC PHOTORECEPTOR WITH SUBBING LAYER AND CHARGE GENERATING LAYER

Yasuo Sakaguchi; Katsumi Daimon; Michiaki Takahashi; Kazuo Yamasaki, and Yasuhiro Yamaguchi, all of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 2, 1994, Ser. No. 252,781

Claims priority, application Japan, Jun. 4, 1993, 5-158140

Int. Cl.[6] G03G *5/10*

U.S. Cl. 430—58 **20 Claims**

1. An electrophotographic photoreceptor comprising a conductive substrate having thereon at least a subbing layer, a charge generating layer, and a charge transporting layer in this order, in which said subbing layer comprises an organometallic compound and a binder resin compatible with said organometallic compound, and said charge generating layer is a layer prepared by coating a coating composition comprising hydroxygallium phthalocyanine crystals as a charge generating material, a binder resin, and a halogenated benzene as a dispersing medium on said subbing layer, followed by drying.

5,464,718

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER, PROCESS CARTRIDGE INCLUDING SAME AND ELECTROPHOTOGRAPHIC APPARATUS

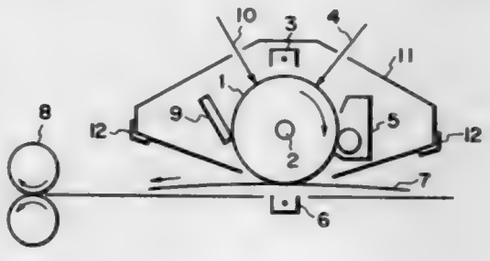
Yoshio Kashizaki, Yokohama; Akihiro Senoo, Tokyo, and Masato Tanaka, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 359,745

Claims priority, application Japan, Dec. 24, 1993, 5-345825

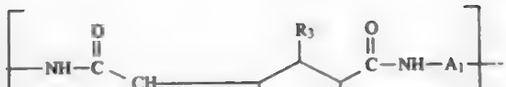
Int. Cl.[6] G03G *5/14;15/00*

U.S. Cl. 430—58 **19 Claims**



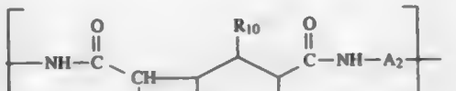
1. An electrophotographic photosensitive member, comprising: an electroconductive support, an intermediate layer disposed on the electroconductive support and a photosensitive layer disposed on the intermediate layer, wherein

the intermediate layer comprises a resin having at least one of a recurring unit (1) below and a recurring unit (2) below:



(1)

wherein A_1 is a divalent organic group; R_1 and R_2 independently denote hydrogen atom, substituted or unsubstituted alkyl group, substituted or unsubstituted alkoxyalkyl group, or substituted or unsubstituted aralkyl group; and R_3 to R_7 independently is hydrogen atom, halogen atom, substituted or unsubstituted alkyl group, substituted or unsubstituted alkoxy group, substituted or unsubstituted aryl group, nitro group, or cyano group; and



(2)

wherein A_2 denotes a divalent organic group; R_8 and R_9 independently is hydrogen atom, substituted or unsubstituted alkyl group, substituted or unsubstituted alkoxyalkyl group, or substituted or unsubstituted aralkyl group; R_{10} is hydrogen atom, halogen atom, substituted or unsubstituted alkyl group, substituted or unsubstituted alkoxy group, substituted or unsubstituted aryl group, nitro group, or cyano group; and R_{11} and R_{12} independently denote alkyl group.

5,464,719

TONERS AND DEVELOPERS CONTAINING AMMONIUM TETRAHALOFERRATE SALTS AS CHARGE-CONTROL AGENTS

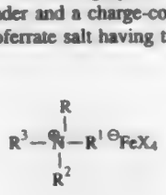
John C. Wilson, Rochester, and Dinesh Tyagi, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 7, 1994, Ser. No. 350,598

Int. Cl.[6] G03G *9/097*

U.S. Cl. 430—110 **10 Claims**

1. A dry, particulate electrostatographic toner composition comprising a polymeric binder and a charge-control agent comprising an ammonium tetrahaloferrate salt having the structure:



wherein

R, R^1, R^2 and R^3 are the same or different and are independently selected from the group consisting of hydrogen; an unsubstituted alkyl group having from 1 to 24 carbon atoms; a substituted alkyl group having from 1 to 24 carbon atoms substituted with one or more hydroxy-, carboxy-, alkoxy-, carboalkoxy-, acyloxy-, nitro-, cyano-, keto- or halo-groups; a cycloalkyl group having from 3 to 7 carbon atoms; an unsubstituted aryl group having from 6 to 14 carbon atoms; a substituted aryl group having from 6 to 14 carbon atoms substituted with one or more hydroxy-, carboxy-, alkoxy-, carboalkoxy-, acyloxy-, amino-, nitro-, cyano-, keto- or halo-groups; an alkaryl group having from 1 to 20 carbon atoms in the alkyl group and 6 to 14 carbon atoms in the aryl group; an aralkyl group having from 1 to 4 carbon atoms in the alkyl group and 6 to 14 carbon atoms in the aryl group wherein the aryl group is unsubstituted or substituted with one or more alkyl-, hydroxy-, carboxy-, alkoxy-, carboalkoxy-, acyloxy-, amino-, nitro-, cyano-, keto- or halo- groups; or wherein any two or more of R, R^1, R^2 or R^3 can be interconnected to one another to form a 5 to 14 membered saturated or unsaturated ring system, and

X, which can be the same or different, is independently selected from the group consisting of fluorine, chlorine, bromine or iodine.

5,464,720

ELECTROPHOTOGRAPHIC METHOD AND APPARATUS USING MAGNETIC TONER

Yoshinobu Baba, and Tatsuya Tada, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1993, Ser. No. 59,993

Claims priority, application Japan, May 13, 1992, 4-120708

Int. Cl.[6] G03G *13/09*

U.S. Cl. 430—122 **24 Claims**

1. An image forming method comprising:

forming a latent image on a latent image bearing member by a latent image forming means;

carrying a magnetic toner onto a developer carrying member provided with an internal magnetic field forming means;

forming on said developer carrying member a magnetic toner layer formed of the magnetic toner by means of a developer control member provided on said developer carrying member in a non-contact state;

vibrating the magnetic toner layer on the developer carrying member by means of an electrode; and

developing the latent image while transferring said vibrated magnetic toner on the developer carrying member to said latent image bearing member to form a magnetic toner image on said latent image bearing member;

wherein said magnetic toner contains a magnetic material having an intensity of magnetization of from 10 emu/g to 40 emu/g in a magnetic field of 1K oersted and a horizontal direction Feret's diameter of from 0.05 μm to 0.5 μm, and said magnetic material is formed of a metal oxide;

chainlike masses of the magnetic toner, formed on said developer carrying member, are in a density of not less than 8×10^4 ears/cm^2 in a developing zone formed between said latent image bearing member and said developer carrying member;

the chainlike masses of said magnetic toner each have a length of not more than 180 μm; and

when the weight average particle diameter of said magnetic toner is r (μm) and the true density thereof is ρ (g/cm^3), the magnetic toner on said developer carrying member in the developing zone is in a quantity of not less than $0.06\times r\times\rho$ mg/cm^2.

5,464,721

AMORPHOUS SILICON PHOTORECEPTOR AND ELECTROPHOTOGRAPHIC PROCESS USING THE SAME

Shigeru Yagi, and Masato Ono, both of Minami-ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1993, Ser. No. 113,100

Claims priority, application Japan, Sep. 2, 1992, 4-257569; Sep. 2, 1992, 4-257572

Int. Cl.[6] G03G *13/02;13/22*

U.S. Cl. 430—126 **22 Claims**

1. A process for the formation of an image, which comprises:

bringing a metallic charger into contact with the surface of an amorphous silicon photoreceptor, wherein the metallic charger is coated with amorphous silicon or amorphous car-

bon at at least the portion of the charger brought into contact with the surface of the photoreceptor;

providing a potential difference between said amorphous silicon photoreceptor and said metallic charger to charge said photoreceptor;

exposing said photoreceptor to light to form an electrostatic latent image;

developing said electrostatic latent image to cause toner particles to be attached to the surface of said photoreceptor;

superimposing a transfer medium on the surface of said photoreceptor; and

transferring the toner particles to said transfer medium.

5,464,722

PRODUCTION OF TONER FOR DEVELOPING ELECTROSTATIC IMAGES

Koichi Tomiyama, Kawasaki; Hiroshi Yusa, Machida, and Takakuni Kobori, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1994, Ser. No. 176,231

Claims priority, application Japan, Jan. 11, 1993, 5-017884; Jan. 11, 1993, 5-017887

Int. Cl.[6] G03G *9/087*

U.S. Cl. 430—137 **29 Claims**

1. A process for producing a toner for developing electrostatic images, comprising:

pre-mixing binder resin particles, a colorant and resin particles carrying or containing inorganic fine powder to prepare a premix,

melt-kneading the premix to obtain a kneaded product,

cooling the kneaded product to obtain a colored resinous solid,

pulverizing the colored resinous solid to obtain a pulverized product, and

classifying the pulverized product to obtain toner particles.

5,464,723

MASS TRANSFERABLE DONOR RIBBONS FOR USE IN THERMAL DYE TRANSFER IMAGING

Hsin-hsin Chou, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 58,440, May 7, 1993, abandoned. This application Aug. 31, 1994, Ser. No. 299,251

Int. Cl.[6] B41M *5/26*

U.S. Cl. 430—200 **11 Claims**

1. A thermal mass transfer donor element comprising a flexible substrate having coated thereon a layer of a clear thermally mass transferable dye receptive binder, which is receptive to thermally transferred dyes, and a thermally mass transferable pigment layer comprising a shiny metal pigment and a second binder, wherein said dye receptive binder layer is adjacent said pigment layer on said substrate or in between said pigment layer and said substrate, wherein said donor element is suitable for thermally transferring metallic images.

5,464,724

PS PLATE AND METHOD FOR PROCESSING SAME

Keiji Akiyama; Noriaki Watanabe; Hisashi Hotta; Tadao Toyama, and Nobuyuki Nishimiya, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

Filed Jul. 15, 1993, Ser. No. 91,358

Claims priority, application Japan, Jul. 16, 1992, 4-189448

Int. Cl.[6] G03C *1/77*

U.S. Cl. 430—272 **17 Claims**

1. A presensitized plate for use in making a lithographic printing plate comprising an aluminum substrate having anodized layers on both sides, a photosensitive layer on one side of the substrate and a coating layer of a metal oxide obtained by coating only the side of the substrate opposite to the side carrying the photosensitive layer with a sol-gel reaction solution obtained through hydrolysis and polycondensation of an organic or inorganic metal compound in water and an organic solvent in the presence of an acid or alkali catalyst in an amount ranging from 0.001% to 10% by weight on the basis of the weight of the starting metal compound and then drying the layer.

5,464,725

METHOD OF MANUFACTURING A PRINTED WIRING BOARD

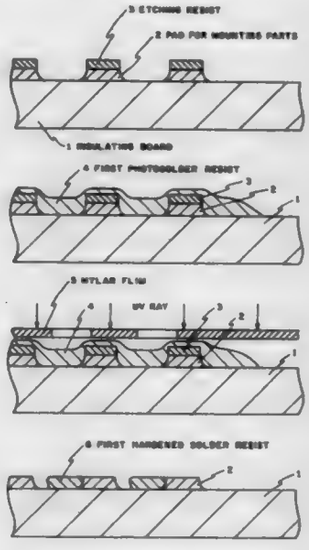
Kiminori Ishido, and Masahiro Yamaguchi, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Oct. 13, 1992, Ser. No. 959,752

Claims priority, application Japan, Jan. 31, 1991, 3-285333

Int. Cl.[6] G03C *5/00*

U.S. Cl. 430—311 **4 Claims**



1. A method of manufacturing a printed wiring board comprising the processes of:

forming pads for mounting parts on an insulating board in a circuit-forming process using etching resist and thereafter leaving said etching resist formed on the pad as it is without peeling it off,

applying a first photosolder resist onto particular areas including at least the interspaces between the pads formed on said insulating board, and

exposing the interspaces between the pads to light and then peeling off said etching resist together with the first photosolder resist, which has not yet completely hardened despite subjection to a developing process and exposure to light for hardening said first photosolder resist.

5,464,726

PHOTOSENSITIVE COMPOSITION AND USE THEREOF

Jeffrey D. Gelorme; Eugene R. Skarvinko, Both of Binghamton, and David W. Wang, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 382,311, Jul. 20, 1989, abandoned. This application Nov. 25, 1994, Ser. No. 348,944

Int. Cl.[6] G03F *7/38*

U.S. Cl. 430—326 **19 Claims**

1. A method for the production of a resist image which comprises:

providing on a substrate a positive photosensitive composition containing a cationically curable cyanate ester or prepolymer thereof and a cationic photoinitiator, wherein said cationic photoinitiator is a cationic initiator that generates a Bronsted acid upon exposure to actinic light and is present in an amount sufficient to retard polymerization of said cyanate ester or prepolymer thereof.

imagewise exposing said composition in a predetermined pattern to actinic light;

then heating said composition; and then

developing by removing those portions of said composition that were exposed to said actinic light to thereby provide said resist image.

5,464,727

CLEANING OF EMULSION MANUFACTURING APPARATUS

Douglas E. Singer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 8, 1995, Ser. No. 385,530
Int. Cl.[6] G03C *11/24;11/015*
U.S. Cl. 430—347 **5 Claims**

1. A method for cleaning and preparing photographic manufacturing equipment surfaces having solid silver halide and silver deposited on the photographic manufacturing equipment surfaces comprising:

preparing an aqueous solution containing potassium iodide and ferric ethylenediamine tetraacetate;

flushing the photographic manufacturing equipment surfaces with the aqueous solution containing potassium iodide and ferric ethylenediamine tetraacetate for a time sufficient to remove the deposited silver halide and silver; and

flushing the photographic manufacturing equipment surfaces with a high purity water rinse.

5,464,728

METHOD OF BLEACHING AND FIXING A COLOR PHOTOGRAPHIC ELEMENT CONTAINING HIGH IODINE EMULSIONS

Richard P. Szajewski, and John M. Buchanan, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 29, 1992, Ser. No. 998,157
Int. Cl.[6] G03C *7/42*
U.S. Cl. 430—393 **16 Claims**

1. A method of desilvering an imagewise exposed, developed color negative silver halide element, said method comprising bleaching the photographic element with a peracid bleach comprising a chloride salt and a peracid bleaching agent, and subsequently contacting the photographic element with a fixer solution comprising thiosulfate anion and sodium cation;

wherein the photographic element has an iodide content of greater than 5.5 mole % based on incorporated silver; and

wherein the fixer solution has an ammonium ion content of less than 1.4M,

said contacting time of said element with said fixer solution being less than 300 seconds.

5,464,729

PROCESS FOR CREATING AN IMAGE ON FILM USED IN SCREEN PRINTING

William H. Hoebener, 1342 N. Coach House Rd., Wichita, Kans. 67235, and Christian M. Hoebener, 158 Karren Ct., Wichita, Kans. 67212

Filed Nov. 7, 1994, Ser. No. 335,157
Int. Cl.[6] G03F *5/00*
U.S. Cl. 430—396 **14 Claims**

1. A process for creating an image on a film for use in screen printing, the film having a front side and an emulsion coated back side, the process steps comprising:

introducing the film into a printer, the printer electronically coupled to a computer, the printer programmed to recognize information in the form of a computer design image from the computer and converting the design image into a desired print image;

transferring a design image from the computer to the printer and converting the design image to a print image;

imprinting the print image with a light photosensitive protective barrier on the front side of the film;

exposing the film with print image to light, the light photosensitive protective barrier covering the print image on the front side and preventing a mirror image on the emulsion coated back side from reacting and hardening to the light exposure; and

washing the emulsion coated back side of the exposed film and washing away the unhardened emulsion covering the mirror image.

5,464,730

LOW REPLENISHMENT RATE PROCESS OF DEVELOPMENT OF BLACK-AND-WHITE SILVER HALIDE PHOTOGRAPHIC MATERIAL USING A DEVELOPER HAVING A LOW BROMIDE ION CONCENTRATION AND A SPECIFIED PH RANGE

Eiichi Okutsu; Takashi Toyoda, and Tadashi Ito, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 45,254, Apr. 13, 1993, abandoned. This application Apr. 22, 1994, Ser. No. 232,341
Claims priority, application Japan, Apr. 13, 1992, 4-492847
Int. Cl.[6] G03C *5/29;5/31*
U.S. Cl. 430—399 **12 Claims**

1. A method of developing a transmissive black-and-white exposed silver halide photographic material with an automatic processor in which a developer is replenished with a predetermined amount of a replenisher in proportion to the area of the photographic material, comprising developing the material in a developer which contains a developing agent and which has a pH value of 9.8 or less, and wherein the developer which is being replenished has a bromide ion concentration of 0.01 mol/^{l} or less and the rate of replenishment of said developer is 200 ml or less per m^2 of said material being processed, and the photographic material comprises a support having on one surface of the support a photographic silver halide emulsion layer comprising a silver halide emulsion containing 2.6 g/m^2 or less of silver and silver halide grains having a silver halide chloride content of 96 mol % or more.

5,464,731

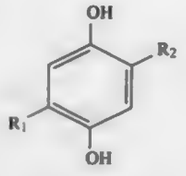
SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Nobutaka Ohki; Naoki Asanuma, and Osamu Takahashi, all of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

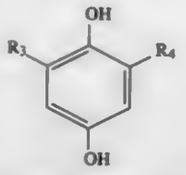
Filed Mar. 1, 1994, Ser. No. 203,400
Claims priority, application Japan, Mar. 1, 1993, 5-039813
Int. Cl.[6] G03C *1/46*
U.S. Cl. 430—505 **20 Claims**

1. A silver halide color photographic material comprising a support provided thereon at least one light sensitive silver halide

emulsion layer and at least one light insensitive layer, wherein said at least one light insensitive layer contains at least one of the compounds represented by Formula (I) and at least one of the compounds represented by Formula (II); and the amount of the compounds represented by Formula (II) in said at least one light insensitive layer is 15 to 100 mole % of the amount of the compounds represented by Formula (I) in the same light insensitive layer;



(I)



(II)

wherein R_1, R_2, R_3 and R_4 are the same or different and each represents an alkyl group, provided that a total number of carbon atoms in R_1 and R_2 is 16 to 60, and a total number of carbon atoms in R_3 and R_4 is 16 to 60, and that none of R_1, R_2, R_3 and R_4 contains a hydroquinone structure.

5,464,732

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shuji Kida; Yukio Oya, and Akiyoshi Tai, all of Odawara, Japan, assignors to Konica Corporation, Japan

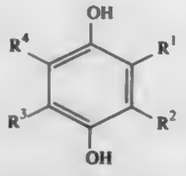
Filed Jun. 2, 1994, Ser. No. 253,092

Claims priority, application Japan, Jun. 19, 1993, 5-134741

Int. Cl.[6] G03C *7/36;7/392*

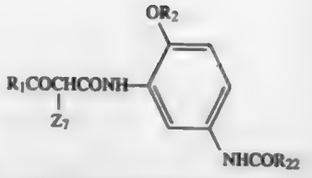
U.S. Cl. 430—505 **4 Claims**

1. A silver halide photographic light-sensitive material comprising a support having provided thereon a plurality of silver halide emulsion layers, wherein a silver halide emulsion layer at a position closest to said support contains an amount of a yellow dye-forming coupler represented by Formula XX, and a compound represented by Formula HQ-I in an amount of 2 mol % to 4 mol %, based on said amount of said yellow dye-forming coupler, an at least one layer of said silver halide photographic light-sensitive material contains an antimold agent represented by Formula XXI;



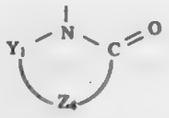
(HQ-I)

wherein R^1, R^2, R^3 and R^4 are each independently hydrogen, halogen, alkyl, alkenyl, aryl, cycloalkyl, alkoxy, aryloxy, alkylthio, arylthio, acyl, alkylacylamino, arylacylamino, alkylcarbamoyl, arylcarbamoyl, alkylsulfonamido, arylsulfonamido, alkylsulfamoyl, arylsulfamoyl, alkylsulfonyl, arylsulfonyl, nitro, cyano, alkoxycarbonyl, aryloxycarbonyl, alkylacyloxy or arylacyloxy, the above groups represented by R^1, R^2, R^3, and R^4 may have a substituent, provided that at least one of R^1 and R^3 is a group having 6 or more carbon atoms in total including any substituent thereof,

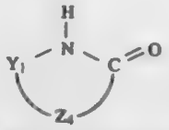


(XX)

wherein R_1 is alkyl or cycloalkyl; R_2 is alkyl, cycloalkyl or aryl; R_{22} is a straight chain unsubstituted alkyl having 11 to 21 carbon atoms; and Z_7 is a group represented by Formula XII provide that the molecular weight thereof is not greater than 128 in the state of a compound represented by Formula XII';

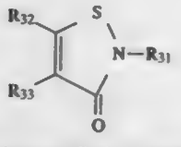


(XII)



(XII')

wherein Y_1 is —N(R_{12})—, in which R_{12} is hydrogen, alkyl, aryl, a heterocyclic, —O—, —S(O)$_r$—, in which r is 0, 1 or 2, —CO— or —C(R_{13})(R_{14})— in which R_{13} and R_{14} are each hydrogen, alkyl, halogen, cyano, nitro, aryl, hydroxyl, alkoxy, aryloxy, a heterocyclic carbonyloxy, sulfonyloxy, carbonyl, oxycarbonyl, carbamoyl, sulfonyl, sulfamoyl, amino sulfonamido, acylamino, alkylthio, arylthio, or a heterocylic thio; Z_4 is a group of non-metal atoms necessary to form a five- or six-member ring together with the —Y_1—N—CO— group,



(XXI)

wherein R_{31} is hydrogen, alkyl, cycloalkyl, alkenyl, aralkyl, aryl, alkoxyl, —CONHR in which R is alkyl, aryl, alkylthio, arylthio, alkylsulfonyl, or arylsulfonyl, or a heterocyclic; R_{32} and R_{33} each independently represents hydrogen, halogen, alkyl, cycloalkyl, aryl, a heterocyclic, cyano, alkylthio, arylthio, alkylthiosulfoxide, alklysulfonyl, alkylsulfinyl; R_{32} and R_{33} may combine to form a benzene ring which may have a substituent.

5,464,733

PHOTOGRAPHIC MATERIAL HAVING REDUCED FOG

James A. Friday, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 870,139, Apr. 16, 1992, abandoned. This application Jan. 26, 1993, Ser. No. 9,367

Int. Cl.[6] G03C *1/46*

U.S. Cl. 430—507 **7 Claims**

1. A multilayer color photographic element comprising a support having coated thereon photographic silver halide emulsion layers comprising blue sensitive, green sensitive and red sensitive layers; the photographic element comprising:

a) at least one of a bleach accelerating releasing coupler and a bleach accelerating silver salt in at least one layer of the photographic element;

b) a layer containing finely divided silver; and

c) an interlayer containing an oxidized developer scavenger, disposed between the layer containing finely divided silver and a layer containing dye forming coupler.

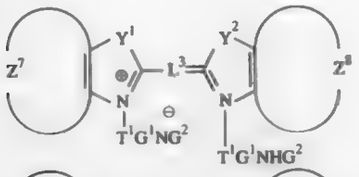
5,464,734

METHINE COMPOUNDS AND SILVER HALIDE PHOTOGRAPHIC MATERIALS CONTAINING THE COMPOUND

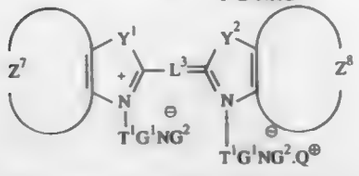
Yoshio Inagaki, and Shuzo Suga, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 8, 1994, Ser. No. 257,051
Claims priority, application Japan, Jun. 8, 1993, 5-137462
Int. Cl.[6] G03C *1/12;1/815*
U.S. Cl. 430—570 **5 Claims**

1. A silver halide photographic material having at least one silver halide emulsion layer and a layer containing a dispersion of fine solid grains of a dye or dyes, wherein the photographic material comprises at least one compound represented by formula (18) or (19):



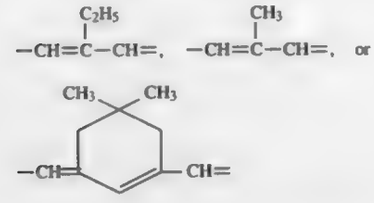
(18)



(19)

wherein T^1 represents $—CH_2—CH_2—$ or $—CH_2—$;

G^1 represents a carbonyl group, a sulfinyl group, or a sulfonyl group; G^2 represents $—CO—T^2$, $—SO—T^2$, $—SO_2—T^2$, or a cyano group; T^2 represents CH_3, C_2H_5, or NH_2; Y^1 and Y^2 each represent an oxygen atom, a sulfur atom, a selenium atom, $—NR^4—$ where R^4 represents an alkyl group having 1 to 4 carbon atoms, or $—CR^5R^6—$ where R^5 and R^6 each represent an alkyl group having 1 to 4 carbon atoms, and wherein R^4, R^5 and R^6 may each be substituted by a hydroxy group, a carboxy group, a methoxy group, a sulfo group, a sulfato group, an acetoxy group, or a carboxymethoxy group; Z^7 and Z^8 each represent an atomic group for completing a benzene ring or a naphthalene ring, wherein the benzene ring and naphthalene ring may each be substituted by a chlorine atom, a methyl group, or a methoxy group; L^3 represents



and Q represents an onium ion for neutralizing the charge of the molecule.

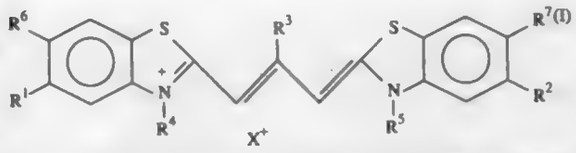
5,464,735

SUPERSENSITIZING BIS-BENZOTHIAZOLOCYANINE DYE COMBINATION FOR RED SENSITIVE SILVER HALIDE EMULSIONS

Carl R. Preddy, Rochester, and John V. Holtzclaw, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 7, 1993, Ser. No. 163,969
Int. Cl.[6] G03C *1/29*
U.S. Cl. 430—574 **8 Claims**

1. A photographic element comprising a layer of a silver halide emulsion containing a sensitizing combination of first and second cyanine red spectral sensitizing dyes according to structure I:



(I)

said first dye has substituents according to the following definitions: R^1 and R^2 represent halogen; R^3 represents hydrogen; R^4 and R^5 represent R^8-$CONHSO_2R^9$— or $—R^9$-$CONHSO_2R^8$ wherein R^8 is alkyl and $—R^9$ is alkylene; R^6 and R^7 represent hydrogen, alkyl or alkoxy; and X represents a monovalent cation trialkylammonium, tetraalkylammonium, sodium, potassium, lithium or N-alkylpyridinium; and

said second dye has substituents according to the following definitions: R^1 and R^2 represent hydrogen, halogen, alkyl or alkoxy; R^3 represents alkyl; R^4 and R^5 represent sulfoalkyl, carboxyalkyl, sulfoalkylcarbamoylalkyl, sulfoalkylcarbamidoalkyl, sulfo(hydroxy)alkyl, R^8-$CONHSO_2R^9$— or $—R^9—CONHSO_2R^8$ wherein R^8 is alkyl and $—R^9$ is alkylene; and R^6 and R^7 represent hydrogen or alkoxy and X represents a monovalent cation, as defined above.

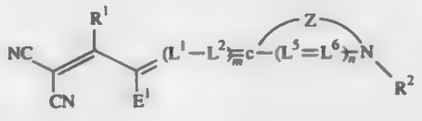
5,464,736

PHOTOGRAPHIC ELEMENTS CONTAINING PARTICULAR SENSITIZING DYES

Margaret J. Helber, Rochester; Thomas R. Dobles, Hilton; Donald R. Diehl, Rochester; Heidi E. Dankosh, Rochester, and John D. Mee, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 28, 1994, Ser. No. 234,744
Int. Cl.[6] G03C *1/12*
U.S. Cl. 430—581 **20 Claims**

1. A photographic element comprising a silver halide emulsion sensitized by dye of the formula I:



I

wherein:

R^1 represents a substituted or unsubstituted aromatic or heteroaromatic group, an aralkyl group, a substituted or unsubstituted alkyl or H, wherein the substituents of the substituted aromatic or heteroaromatic group and the substituted alkyl are selected from halogen, alkoxy, acyl, alkyl, alkoxycarbonyl, aminocarbonyl, carbonamido, carboxy, sulfamoyl, sulfonamido, sulfo, nitro, hydroxy, amino, or cyano;

R^2 represents a substituent or unsubstituted alkyl, alkenyl, aryl, aralkyl, or H, wherein the substituents of the substituted alkyl, alkenyl, aryl or arakyl are selected from halogen, alkoxy, acyl, alkyl, alkoxycarbonyl, aminocarbonyl, carbonamido, carboxy, sulfamoyl, sulfonamido, sulfo, nitro, hydroxy, amino, cyano or sulfato;

E^1 represents an electron withdrawing group;

Z represents the non-metallic atoms required to complete a ring system containing at least one 5- or 6-membered heterocyclic nucleus;

L^1, L^2, L^5 and L^6 independently represent a substituted or unsubstituted methine, wherein the substituents of the substituted methine are selected from alkyl, alkenyl, aryl, aralkyl, halogen, acetoxy, acyl, cyano, carbonamido, alkoxycarbonyl, alkoxy or aminocarbonyl;

m may be 0, 1, 2 or 3;

n may be 0 or 1.

5,464,737

POST-PROCESSING STABILIZERS FOR PHOTOTHERMOGRAPHIC ARTICLES

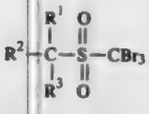
Kumars Sakizadeh, Woodbury; John T. Blair, Oakdale, both of Minn., and David T. Ask, Somerset, Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 54,850, Apr. 29, 1993, Pat. No. 5,369,000. This application Nov. 30, 1994, Ser. No. 310,218

Int. Cl.[6] G03C *1/498*

U.S. Cl. 430—619 6 Claims

1. A photothermographic article comprising a photothermographic composition coated on a substrate wherein said photothermographic composition comprises: (a) light-sensitive silver halide; (b) a light-insensitive organic silver salt; (c) a reducing agent for said light-insensitive organic silver salt; and (d) an anti-foggant of the formula:



wherein R^1 represents halogen; R^2 and R^3 each independently represent an alkyl group, a cycloalkyl group, or taken together form a cycloaliphatic ring.

5,464,738

SULFONYL HYDRAZIDE DEVELOPERS FOR PHOTOTHERMOGRAPHIC AND THERMOGRAPHIC ELEMENTS

Doreen C. Lynch, Afton; Sharon M. Simpson, Lake Elmo, and Paul G. Skoug, Stillwater, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 6, 1995, Ser. No. 369,738

Int. Cl.[6] G03C *1/498*

U.S. Cl. 430—619 18 Claims

1. A heat-developable, black-and-white photothermographic element comprising a support bearing at least one photosensitive, image-forming photothermographic emulsion layer comprising:

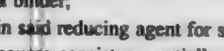
(a) a photosensitive silver halide;

(b) a non-photosensitive, reducible silver source;

(c) a reducing agent for said non-photosensitive, reducible silver source; and

(d) a binder;

wherein said reducing agent for said non-photosensitive, reducible silver source consists essentially of a compound of the formula:



R^1 and R^2 are each independently selected from the group consisting of: alkyl and alkenyl groups of up to 20 carbon atoms; alkoxy groups of up to 20 carbon atoms; aryl, alkaryl, and aralkyl groups of up to 20 carbon atoms; aryloxy groups of up to 20 carbon atoms; non-aromatic and aromatic heterocyclic ring groups containing up to 6 ring atoms; alicyclic ring groups containing up to 6 ring carbon atoms; and fused ring and bridging groups containing up to 14 ring atoms.

5,464,739

COMPOSITION METHOD FOR DETERMINING THE PRESENCE OF LEUKOCYTE CELLS, ESTERASE OR PROTEASE IN A TEST SAMPLE

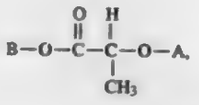
Gary M. Johnson, Elkhart, and Robert J. Schaeper, South Bend, both of Ind., assignors to Bayer Corporation, Elkhart, Ind.

Filed Aug. 22, 1994, Ser. No. 293,723

Int. Cl.[6] C12Q *1/00;1/44;* C07C *59/08*

U.S. Cl. 435—4 54 Claims

1. A lactate ester having the structure



wherein A is an alcohol blocking group, and wherein B-O- is a residue of a compound B-OH and provides a detectable response when the lactate ester is hydrolyzed to generate the compound B-OH, wherein the detectable response is chromogenic, fluorescent, a reflectance change, a pH change, chemiluminescent, colorimetric, or spectrophotometric.

5,464,740

DIAGNOSITC AGENT AND METHODS FOR IDENTIFYING HIV INFECTED INDIVIDUALS AND MONITORING THEIR THERAPY

Fred I. Chasalow, Glen Cove, N.Y., assignor to AMUR Research Corp., Glen Cove, N.Y.

Continuation-in-part of Ser. No. 940,927, Sep. 8, 1992, abandoned. This application May 20, 1993, Ser. No. 65,062

Int. Cl.[6] C12Q *1/70*

U.S. Cl. 435—5 8 Claims

1. A method for identifying a patient infected with HIV-1 comprising the steps of:

detecting by High Performance Liquid Chromatography the amount of an agent selected from the group consisting of sphingomyelin, sphingosyl-phosphocholine and ceramides in a serum or plasma sample from said patient;

wherein said patient is HIV-1 infected if the amount of said agent in said patient's serum or plasma sample is statistically different from the amount of said agent in serum or plasma samples obtained from an age matched control, non-HIV-1 infected group.

5,464,741

PALLADIUM (II) OCTAETHYLPORPHINE ALPHA-ISOTHIOCYANATE AS A PHOSPHORESCENT LABEL FOR IMMUNOASSAYS

John L. Hendrix, Palm Harbor, Fla., assignor to Henwell, Inc., Palm Harbor, Fla.

Filed Oct. 8, 1993, Ser. No. 134,133

Int. Cl.[6] C12Q *1/70*

U.S. Cl. 435—5 7 Claims

1. A phosphorescent labeled compound comprising a specific binding partner conjugated to a palladium (II) ochaethylporphine alpha-isothiocyanate label, said label having a Stokes shift of not less than 150 nanometers.

5,464,742

PROCESS FOR TESTING GENE-DISEASE ASSOCIATIONS

Michael R. Swift, 1004 Mt. Carmel Church Rd.; Lawrence L. Kupper, and Charles L. Chase, all of Chapel Hill, N.C., assignors to Michael R. Swift, Scarsdale, N.Y.

Continuation of Ser. No. 562,007, Aug. 2, 1990, abandoned. This application Oct. 19, 1993, Ser. No. 137,898

Int. Cl.[6] C12Q *1/00;1/68*

U.S. Cl. 435—6 17 Claims

1. A process for selecting a set of families for use in testing an association of an allele and a disease which comprises the steps of:

(a) selecting a population of individuals;

(b) selecting index individuals from said population, said index individuals carrying one or two copies of said allele, the presence of said allele having been determined by analysis of said individuals' macromolecules;

(c) determining the presence of said disease within blood relatives of said index individuals;

(d) selecting test individuals from said blood relatives, said test individuals being persons determined to have said disease; and

(e) selecting the set of families, each family having an index individual and at least one test individual.

5,464,743

NUCLEIC ACID PROBES AND METHODS FOR DETECTING CRYPTOCOCCUS NEOFORMANS

William G. Weisburg, Milford, and Susan M. Barns, Hopkinton, both of Mass., assignors to Amoco Corporation, Naperville, Ill.

Continuation of Ser. No. 795,112, Nov. 20, 1991, abandoned, which is a continuation of Ser. No. 420,578, Oct. 12, 1989, abandoned. This application Jul. 1, 1992, Ser. No. 908,849

Int. Cl.[6] C12Q *1/68;* C07H *21/04;* C12P *19/34*

U.S. Cl. 435—6 8 Claims

1. A purified nucleic acid probe which hybridizes under predetermined stringency conditions to 18S rRNA or rDNA of *Cryptococcus neoformans* to form a stable hybridization complex, but does not form a stable complex with the rRNA or rDNA of non-Cryptococcus organisms under said conditions, wherein said probe consists of a nucleotide sequence fully complementary or identical to about 30 consecutive nucleotides within a nucleotide sequence of any one of probes **1679** or **1687**.

5,464,744

METHODS AND COMPOSITIONS FOR REDUCING FALSE POSITIVE SIGNALS IN AN RNA AMPLIFICATION SYSTEM

Michael P. Farrell, Marlborough, and Juili L. Lin-Goerke, Framingham, both of Mass., assignors to Norval B. Galloway

Filed Sep. 24, 1992, Ser. No. 950,131

Int. Cl.[6] C12Q *1/68;* C12P *19/30;* C07H *21/02*

U.S. Cl. 435—6 20 Claims

1. A method for detecting the presence of a replicatable template molecule of interest in a sample, comprising the steps of:

a) providing a Qβ replicase enzyme preparation which has been pretreated with a ribonuclease, or a mixture of ribonucleases, under conditions appropriate for the substantial reduction of endogenous or contaminating replicatable template RNA species in the enzyme preparation;

b) contacting a portion of the Qβ replicase enzyme preparation with a sample which is to be tested for the presence of a replicatable template, under conditions appropriate for replication; and

c) detecting the presence of amplified template as an indication of the presence of the replicatable template molecule of interest in the sample.

5,464,745

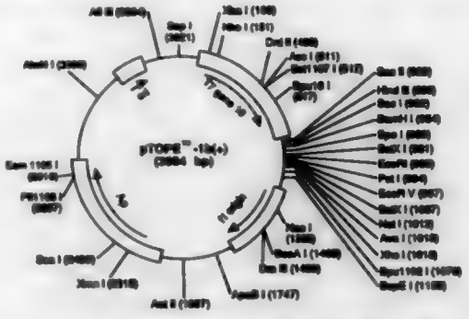
PROTEIN LIGAND BINDING REGION MAPPING SYSTEM

Robert Mierendorf, Madison, Wis.; Richard Garber, Seattle, Wash.; Robert Novy, Verona, Wis., and Beth Hammer, Madison, Wis., assignors to Novagen, Inc., Madison, Wis.

Filed Mar. 31, 1993, Ser. No. 40,753

Int. Cl.[6] C12Q *1/68;* C12N *15/63;* C12P *21/00*

U.S. Cl. 435—6 10 Claims



1. A method for mapping the ligand binding domains of a protein which binds to a ligand, the method comprising the steps of

(a) randomly cleaving the gene encoding for the protein into DNA fragments of sufficient length so as to likely include the ligand binding domain;

(b) enzymatically adding only a single nucleotide residue overhang to one end of each strand of the DNA fragments from step (a);

(c) inserting the DNA fragments from step (b) into a recombinant DNA construct having regulatory elements sufficient to transcribe and translate inserted DNA fragments in a host, the DNA construct having been prepared with single nucleotide overhangs complementary to the single nucleotide overhangs on the fragments from step (b);

(d) transforming the DNA construct from step (c) into a host which transcribes and translates the recombinant DNA construct and culturing the host under conditions so that the DNA construct expresses peptides encoded by the DNA fragments;

(e) screening the peptides for a peptide which binds to the ligand;

(f) sequencing the DNA fragment which expresses the peptide which binds to the ligand; and (g) determining the corresponding amino acid sequence encoded by the DNA fragment of step (f), to thereby map the ligand binding domain of the protein.

5,464,746

HAPTENS, TRACERS, IMMUNOGENS AND ANTIBODIES FOR CARBAZOLE AND DIBENZOFURAN DERIVATIVES

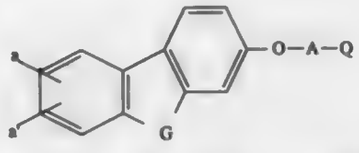
James R. Fino, Antioch, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 808,839, Dec. 17, 1991, abandoned. This application Jul. 1, 1993, Ser. No. 84,495

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 10 Claims

1. A conjugate having the following structure:



wherein a and a' when taken alone are 1 to 4 groups independently selected from the group consisting of: hydrogen, C_1–C_{10}-alkyl, C_1–C_{10}-alkoxy, C_1–C_{10}-alkylthio, halo-C_1–C_{10}-alkyl, C_1–C_{10}-alkylamino, di-(C_1–C_{10}-alkyl)amino,

aryl-C_1– C_{10}-alkyl, optionally substituted aryl, halogen, amino, carboxy, carboxamido, hydroxy, mercapto, nitro, nitroso, sulfo, phospho and protected forms thereof; or

G is selected from S, O, and NR wherein R is hydrogen, C_1-C_{10}-alkyl, optionally substituted aryl, optionally substituted sulfonyl, thiophenyl, carboxy, carboxamido, and protected forms thereof;

A is a linking moiety of the formula -L-y, wherein y is a functional group that can react directly or after activation with functional groups in a second molecule and L is spacer group consisting of from 1 to about 50 atoms; and

Q is an oligonucleotide.

5,464,747

OXIDATION-RESISTANT MUTEINS OF β-GALACTOSIDASE FRAGMENTS

Scott J. Eisenbeis, Indianapolis, Ind.; Mark Krevolin, Pinole, Calif.; Christopher P. Bryant, Bourbonnais, Ill.; Sophie J. Bogusiawski; David J. Ledden, both of Indianapolis, Ind., and Scott Clark, Berkeley, Calif., assignors to Boehringer Mannheim Corporation, Indianapolis, Ind.

Filed Oct. 29, 1993, Ser. No. 146,633

Int. Cl.[6] C12N *9/38;15/56;* **G01N** *33/535*

U.S. Cl. 435—7.6 **16 Claims**

1. A mutein of an enzyme acceptor polypeptide of β-galactosidase having an amino acid other than cysteine substituted at position 602.

5,464,748

METHOD OF DETECTING AND MONITORING LEVELS OF 3'-AMINO-3'-DEOXYTHYMIDINE IN BODY FLUIDS AND ANTIBODIES FOR SAME

Jean-Pierre Sommadossi, Birmingham, Ala., assignor to The UAB Research Foundation, Birmingham, Ala.

Continuation of Ser. No. 835,234, Feb. 13, 1992, abandoned. This application Sep. 7, 1993, Ser. No. 117,245

Int. Cl.[6] G01N *33/531*

U.S. Cl. 435—7.7 **13 Claims**

1. A method for analyzing a sample of human plasma to determine the presence of 3'-amino-3'-deoxythymidine (AMT), comprising the steps of

providing a sample of human plasma suspected of containing AMT;

mixing with the sample (i) a tracer compound comprising an analog of AMT having attached thereto a label group able to be detected, and (ii) an antibody having a high degree of specificity to AMT and no cross-reactivity with 3'-azido-3'-deoxythymidine (AZT);

determining the amount of tracer compound bound to the antibody; and

calculating the amount of AMT present in the sample based on the amount of tracer compound bound to the antibody.

5,464,749

IMMUNOASSAY OF FREE SUBSTANCES IN BIOLOGICAL FLUIDS

Moshe Schwarzberg, Hastings-on-Hudson, N.Y., and Santosh Dayal, Fair Lawn, N.J., assignors to Bayer Corporation, Tarrytown, N.Y.

Filed Jul. 22, 1991, Ser. No. 733,934

Int. Cl.[6] C12Q *1/00;* **G01N** *33/53;33/536;33/538*

U.S. Cl. 435—7.92 **16 Claims**

1. A method of determining free analyte level in a biological fluid sample which contains the analyte both in free and bound portions that are in binding equilibrium with naturally occurring analyte receptors in said fluid sample, the method comprising the sequential steps of:

(a) combining the sample with a known first liquid volume containing soluble receptor specific to the analyte in excess of the free analyte in the sample;

(b) incubating the resultant mixture for a period of time sufficient to allow the binding reaction of the free analyte with the receptor specific to the analyte to reach substantial completion to form a first incubation mixture;

(c) adding to the first incubation mixture of step (b) a known second liquid volume containing soluble conjugate sufficient to reduce the sample proportion in the resultant mixture to no greater than 10% v/v, said conjugate comprising a labeled analyte or labeled analog thereof to allow the conjugate to bind with the receptor specific to the analyte not bound in step (b) to form a second incubation mixture;

(d) introducing to the second incubation mixture of step (c) separation means comprising a solid phase coated with immobilized binder for the specific to the analyte receptor, which binder is in excess of the specific to the analyte receptor to bind substantially with all of the receptor specific to the analyte to in the incubation mixture;

(e) separating and washing the solid phase from the mixture of step (d);

(f) measuring the amount of said conjugate that is bound to the solid phase of step (e); and

(g) using the measurement of step (f) for determining the free analyte concentration in the sample.

5,464,750

ACCUMULATION OF HEAT SHOCK PROTEINS FOR EVALUATING BIOLOGICAL DAMAGE DUE TO CHRONIC EXPOSURE OF AN ORGANISM TO SUBLETHAL LEVELS OF POLLUTANTS

Brenda M. Sanders; Kenneth D. Jenkins, both of Long Beach, Calif.; Jack L. Nichols, Vancouver, and Bryan E. Imber, Victoria, both of, Canada, assignors to StressGen Biotechnology Corporation, Victoria, Canada, and Ca. State University Long Beach Foundation, Long Beach, Calif.

Continuation-in-part of Ser. No. 404,401, Sep. 12, 1989, Pat. No. 5,232,833, which is a continuation-in-part of Ser. No. 244,757, Sep. 14, 1988, abandoned. This application Sep. 23, 1991, Ser. No. 764,015

The portion of the term of this patent subsequent to Aug. 3, 2010, has been disclaimed.

Int. Cl.[6] C12Q *1/02;* **G01N** *33/53*

U.S. Cl. 435—7.21 **9 Claims**

1. A method of detecting chronic exposure of an organism to sublethal levels of one or more pollutants in its habitat, comprising:

conducting first and second assays, each assay comprising:

(a) sampling by removing at least one organism from said habitat under sampling conditions that do not induce a heat shock protein response in said organism;

(b) obtaining a physiological sample of said organism;

(c) measuring the concentration in said sample of at least one heat shock protein selected from the group consisting of hsp 20–30, hsp 60, hsp 70, hsp 90 and ubiquitin; and

(d) comparing the heat shock protein concentrations measured in the first and second assays and considering said habitat to have been chronically exposed to one or more pollutants if said concentrations are at least about 2 times above a baseline heat shock protein concentration corresponding to an unpolluted habitat and the measured concentrations do not vary more than about 50% one from the other.

5,464,751

LIGAND FOR THE NEU GENE PRODUCT

Mark I. Greene, Penn Valley, Pa.; Kunio Dobashi, Gunma, Japan; James G. Davis, Philadelphia, Pa., and Junji Hamuro, Yokahama, Japan, assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

PCT No. PCT/US91/02331, § 371 Date Sep. 24, 1992, § 102(e) Date Sep. 24, 1992

Continuation-in-part of Ser. No. 505,837, Apr. 6, 1990, abandoned. This PCT application Apr. 4, 1991, Ser. No. 927,422

Int. Cl.[6] G01N *33/574*

U.S. Cl. 435—7.23 14 Claims

7. A purified proteinaceous substance which is bindable with p185, wherein said proteinaceous substance:

increases the activity of the tyrosine kinase contained in p185 but does not increase the activity of tyrosine kinase of epidermal growth factor receptor;

is heat stable from about 56° to about 100° C.;

is degradable by protease; and

has a molecular weight of from about 7,000 to about 14,000 daltons.

5,464,752

AUTOMATED ANALYZER FOR SCREENING CELLS OR FORMED BODIES FOR ENUMERATION OF POPULATIONS EXPRESSING SELECTED CHARACTERISTICS

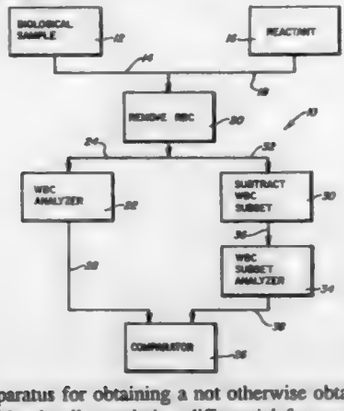
Kenneth H. Kortright, Cooper City; Wallace H. Coulter, Miami Springs; Carlos Rodriguez; Thomas Russell, both of Miami, and Ronald Paul, North Miami Beach, all of Fla., assignors to Coulter Corporation, Miami, Fla.

Division of Ser. No. 587,646, Sep. 20, 1990, Pat. No. 5,223,398, which is a continuation of Ser. No. 25,345, Mar. 13, 1987, abandoned. This application Apr. 8, 1993, Ser. No. 46,404

The portion of the term of this patent subsequent to Jun. 29, 2010, has been disclaimed.

Int. Cl.[6] C12Q *1/24;* G01N *33/577*

U.S. Cl. 435—7.24 39 Claims



1. An apparatus for obtaining a not otherwise obtainable multipart white blood cell population differential from a whole blood sample having at least a red blood cell population and white blood cell populations therein for identification and/or enumeration and/or study, comprising:

means for removing said red blood cell population from said sample without adversely affecting relevant qualities and/or quantities of said white blood cell populations;

means for electronically sensing and counting at least said white blood cell populations of granulocytes, monocytes and lymphocytes with at least two different electronic parameters to provide a total white blood cell population count;

means for removing or shifting the neutrophil population contribution from said white blood cell populations by providing microspheres having a neutrophil specific monoclonal antibody bonded thereto and means for mixing said microspheres with said sample to bind to said neutrophil population to shift at least one electronic characteristic of said neutrophil population and in so doing allowing for the electronic sensing of eosinophils and basophils;

means for electronically sensing and counting at least said remaining white blood cell populations of monocytes, lymphocytes, eosinophils and basophils with at least two different electronic parameters; and

means for comparing said counts to derive a count of said white blood cell population of neutrophils and thereby obtaining at least a five-part white blood cell differential.

5,464,753

PURIFICATION AND MANIPULATION OF BONE MARROW AND BLOOD CELLS ON THE BASIS OF P-GLYCOPROTEIN EXPRESSION

Preet M. Chaudhary, 809 S. Damen, #1107B, Chicago, Ill. 60612, and Igor B. Roninson, 818 S. Laflin, Chicago, Ill. 60607

Continuation of Ser. No. 666,340, Mar. 8, 1991, abandoned. This application Sep. 28, 1993, Ser. No. 128,056

Int. Cl.[6] G01N *33/49;33/533;33/536*

U.S. Cl. 435—7.24 8 Claims

1. A method of purifying a P-glycoprotein expressing pluripotent hematopoietic stem cell from a mixture of blood or bone marrow cells, the method comprising the steps of:

(a) staining a mixture of blood or bone marrow cells with a fluorescent compound having the ability to enter cells and be retained therein, having absorbance and emission spectra suitable for fluorescence-activated cell sorting, and the ability to be a substrate for P-glycoprotein-mediated efflux, wherein the fluorescent compound is selected from the group consisting of $DiOC_2(3)$, HIDC-iodide and DODC-iodide;

(b) removing the stained cells from the fluorescent compound for a time and at a temperature sufficient to allow efflux of the fluorescent compound to produce dull and bright cells;

(c) selecting the dull cells; and

(d) eliminating any T-cells present among the dull cells.

5,464,754

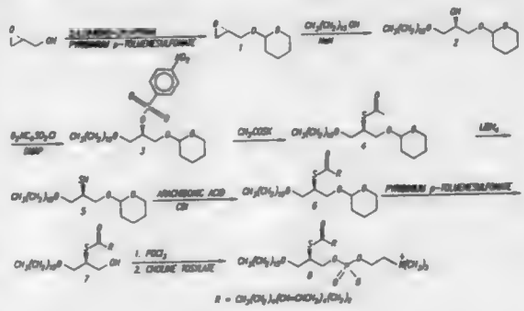
ASSAY AND SUBSTRATE FOR ARACHIDONOYL-SPECIFIC PHOSPHOLIPASE A2

Edward A. Dennis, La Jolla; Laure J. Reynolds, and Lin Yu, both of San Diego, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

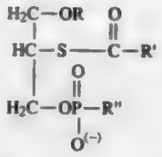
Filed Aug. 17, 1993, Ser. No. 107,378

Int. Cl.[6] C12Q *1/34;* C12P *21/06;* C07C *321/00;* A01N *57/36*

U.S. Cl. 435—18 23 Claims



1. A compound useful as a substrate in cytosolic phospholipase A_2 assays having the formula:



wherein R is an alkyl or alkenyl group having from about 6 to about 18 carbon atoms,

R' is an alkenyl group having at least one double bond and having from about 16 to about 22 carbon atoms, and

R" is a polar group selected from the group consisting of oxy radicals of choline, ethanolamine, inositol, serine, glycerol, and alkanols having from 1 to 4 carbons.

5,464,755

MICROBIOLOGICAL MEDIUM AND METHOD OF ASSAY

Barry Bochner, Alameda, Calif., assignor to Biolog, Inc., Hayward, Calif.

Filed Apr. 29, 1994, Ser. No. 236,324
Int. Cl.[6] C12Q *1/00;1/02;1/04*
U.S. Cl. 435—34 **52 Claims**

1. A method for detecting the presence of bacterial organisms in a test sample suspected of containing bacterial organisms comprising the steps of:

a) inoculating a solid test medium with said test sample, wherein said medium comprises: i) a chromogenic β-glucuronidase substrate capable of forming a first color upon reacting with β-glucuronidase; ii) a chromogenic arylsulfatase substrate capable of forming a second color upon reacting with arylsulfatase; iii) a milk-derived, opaque reagent; and iv) a tryptophan-containing compound capable of forming a third color upon reacting with at least one bacterial enzyme, wherein said first, second and third colors are visually distinguishable;

b) incubating said test medium to produce bacterial colonies of said bacterial organisms which generate one or more of said first, second and third colors; and

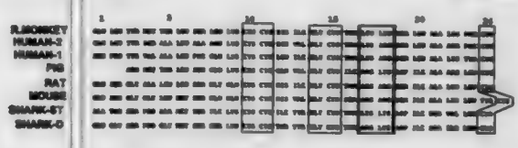
c) examining said test medium for i) the presence of bacterial colonies having said first color, ii) the presence of bacterial colonies having said second color; iii) the presence of bacterial colonies having said third color; iv) the presence of bacterial colonies without said first, second or third colors; and v) the presence of a zone of clearing surrounding said bacterial colonies.

5,464,756

PROCESSES AND COMPOSITIONS FOR THE ISOLATION OF HUMAN RELAXIN

Dennis J. Henner, Pacifica; Richard L. Vandlen, Hillsborough; James A. Wilkins, San Mateo, and Daniel G. Yansura, Pacifica, all of Calif., assignors to Genentech, San Francisco, Calif.

Continuation of Ser. No. 347,550, May 4, 1989, abandoned. This application Jul. 1, 1992, Ser. No. 908,766
Int. Cl.[6] C12P *21/06;21/02;* **C12N** *15/70;15/12*
U.S. Cl. 435—69.1 **15 Claims**



13. A process for producing biologically active H1 or H2 relaxin comprising the steps of:

(a) providing an expression vector comprising a first DNA whose sequence encodes a polypeptide comprising a human relaxin H1 or H2 A-chain as shown in FIG. 1, wherein an Asp codon is introduced into said first DNA sequence as part of a second DNA sequence encoding an amino acid sequence Ser-Glu-Ala-Ala-Asp to precede the codon of the first amino acid of the human relaxin A chain, thereby forming an Asp-A chain junction;

(b) transforming a procaryotic host cell with said expression vector;

(c) culturing the transformed cell so as to produce a polypeptide comprising the human relaxin A-chain;

(d) recovering the polypeptide from the culture;

(e) placing said polypeptide under reducing conditions so as to form a reduced, free-cysteine form of the recovered polypeptide;

(f) treating said reduced, free-cysteine form of the recovered polypeptide with acid at a pH of about 1 to about 3 under conditions for cleaving the polypeptide at the Asp-A chain junction to form cleavage products;

(g) separating the human relaxin A-chain from other cleavage products; and

(h) combining the human relaxin A-chain with a corresponding H1 or H2 human relaxin B chain having the sequence of human relaxin B as shown in FIG. 1 to produce biologically active human relaxin.

5,464,757

DNA ENCODING CRF BINDING PROTEIN

Ellen Potter, La Jolla; Dominic P. Behan, San Diego; Wolfgang H. Fischer, Encinitas, all of Calif.; Elizabeth A. Linton, Dorchester-on-Thames; Philip J. Lowry, Reading, both of, England, and Wylie W. Vale, Jr., La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif., and University of Reading, Whiteknights, United Kingdom

Continuation-in-part of Ser. No. 967,683, Oct. 26, 1992, which is a continuation-in-part of Ser. No. 641,341, Jan. 15, 1991, abandoned. This application Jul. 23, 1993, Ser. No. 97,828
Int. Cl.[6] C12N *15/12;15/16;15/63;* **C07K** *14/435*
U.S. Cl. 435—69.1 **12 Claims**

1. An isolated and purified DNA fragment containing a nucleic acid sequence encoding a CRF binding protein having amino acid SEQ ID NO:1.

5,464,758

TIGHT CONTROL OF GENE EXPRESSION IN EUCARYOTIC CELLS BY TETRACYCLINE-RESPONSIVE PROMOTERS

Manfred Gossen, Ringstrasse 33, D-69115 Heidelberg, and Hermann Bujard, Remlerstrasse 9, D-69120 Heidelberg, both of, Germany

Filed Jun. 14, 1993, Ser. No. 76,726
Int. Cl.[6] C12N *15/09;5/10;15/11;15/62*
U.S. Cl. 435—69.1 **19 Claims**

1. A polynucleotide molecule coding for a transactivator fusion protein comprising a prokaryotic tet repressor and a eucaryotic transcriptional activator protein domain.

5,464,759

SEQUENTIAL OLIGONUCLEOTIDE SYNTHESES USING IMMUNOAFFINITY TECHNIQUES

Thomas R. Coolidge, Falls Village, Conn.; William Lewis, Lincoln, Nebr.; Sheldon M. Schuster, Gainesville, Fla.; Jay Stout, Lincoln, Nebr.; Gino van Heeke, Gainesville, Fla.; Dwane Wylie, Lincoln, Nebr., and Fred W. Wagner, Walton, Nebr., assignors to BioNebraska, Inc., and Board of Regents of the University of Nebraska, both of Lincoln, Nebr.

Division of Ser. No. 454,372, Dec. 21, 1989, Pat. No. 5,221,736, which is a continuation-in-part of Ser. No. 288,009, Dec. 21, 1988, Pat. No. 5,049,656. This application Feb. 17, 1993, Ser. No. 18,100

Int. Cl.[6] C12P *19/34;* C12Q *1/68*

U.S. Cl. 435—91.2 **2 Claims**

1. A method for DNA replication comprising: applying to the DNA to be replicated, a polymerase chain reaction technique in combination with an oligonucleotide probe produced by a method comprising:

(a) preparing a 3'-blocked nucleotide compound of at least one nucleotide in length;

(b) reacting a 3'-activated, 5'-blocked nucleotide with the 3'-blocked nucleotide compound to produce a mixture of an extended nucleotide compound and an unreacted nucleotide compound;

(c) adding a 5'-terminus capping agent to the mixture to cap the unreacted nucleotide compound;

(d) combining the mixture of the extended nucleotide compound and the 5'-capped unreacted nucleotide compound with an affinity agent that is selective for the cap on the 5'-capped. unreacted nucleotide; and

(e) isolating the extended nucleotide compound thereby producing the oligonucleotide.

5,464,760

FERMENTATION AND RECOVERY PROCESS FOR LACTIC ACID PRODUCTION

Shih-Perng Tsai, Downers Grove; Seung H. Moon, Westmont, both of Ill., and Robert Coleman, Lansing, Mich., assignors to University of Chicago, Chicago, Ill.

Continuation-in-part of Ser. No. 504,223, Apr. 4, 1990, abandoned. This application Oct. 23, 1992, Ser. No. 965,830

Int. Cl.[6] C12P *7/56;* C13K *1/06*

U.S. Cl. 435—139 **16 Claims**

1. A method of converting starch in a mixture to glucose and glucose to lactic acid, comprising:

(a) providing an ungelatinized and nonliquified starch-containing material capable of conversion to a simple sugar; and

(b) performing a combination step of gelatinizing and liquifying said starch by

(1) adding an amount of α amylase enzyme to said starch-containing material effective to cause gelafinization and liquefaction of said starch-containing material during said combination step;

(2) adding a stabilizing ion to form a starch containing material mixture;

(3) maintaining said starch-containing material mixture at a pH in the range of about 4 to 7;

(4) heating said starch-containing material mixture to a first elevated temperature of about 90°– 130° C.;

(5) maintaining said starch-containing material mixture at said elevated temperature without enzyme deactivation;

(6) cooling the temperature of said starch-containing material mixture to a second elevated temperature which is below the temperature used in step (4) and above about 50° C.; and

(7) adjusting the pH to below about 6.5;

(c) adding an effective amount of glucoamylase to said material mixture and maintaining said glucoamylase and said material mixture at the aforesaid conditions in said steps b(6) and b(7) without glucoamylase deactivation to produce said glucose; and

(d) simultaneously with said step (c) adding a mixed culture containing *L. delbruecki* subsp. *lactic* ATCC 12315, *L. Casei* NRRLB-1445, *L. delbruecki* NRLLB-445, *L. Helveticus* NRRLB-1937 and *L. Casei* NRRLB-1922 to form a fermentation broth to effect conversion of said glucose to lactic acid.

5,464,761

PROCESS FOR THE ENZYMATIC PREPARATION OF ALIPHATIC ALCOHOLS AND ALDEHYDES FROM LINOLEIC ACID, LINOLEIC ACID, OR A NATURAL PRECURSOR

Bernard Muller, Chambesy, Switzerland; Antoine Gautier, Lawrenceville, N.J.; Christopher Dean, Grand-Lancy, and Jean-Charles Kuhn, Geneva, both of, Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

PCT No. PCT/EP93/01057, § 371 Date Jan. 21, 1994, § 102(e) Date Jan. 21, 1994, PCT Pub. No. WO93/24644, PCT Pub. Date Dec. 9, 1993

PCT Filed May 3, 1993, Ser. No. 185,786

Claims priority, application Switzerland, May 26, 1992, 1693/92; Jul. 28, 1992, 2372/92; Jan. 1, 1992, 3075/92

Int. Cl.[6] C12P *7/24;7/64;7/02;1/02*

U.S. Cl. 435—147 **15 Claims**

1. An enzymatic process for the preparation of n-hexanal, 3-(Z)-hexen-1-al, 2-(E)-hexen-1-al, or their corresponding alcohols, starting from linoleic or linolenic acid, or from a natural origin precursor thereof consisting of a hydrolyzed oil, said process comprising the following discrete reaction steps:

a) adding to said acid or natural precursor thereof soya flour in a pure oxygen atmosphere and in a reaction medium, which soya flour contains lipoxygenase to convert said acid, to form 13-hydroperoxy-octadeca- 9,11-dienoic acid or 13-hydroperoxy-octadeca- 9,11,15-trienoic acid;

b) adding a guava homogenate to the medium, which homogenate contains lyase to convert the 13-hydroperoxy-octadeca-9,11-dienoic acid into n-hexanal or the 13-hydroperoxy-octadeca-9,11,15-trienoic acid into 3-(Z)-hexen-1-al; and either

c) recovering the formed n-hexanal or 3-(Z)-hexen-1-al from the medium; or

c') adding a yeast to the medium to reduce n-hexanal into n-hexanol or 3-(Z)-hexen-1-al into 3-(Z)-hexen- 1-ol; and recovering the formed n-hexanol or 3-(Z)-hexen-1-ol from the medium; or

c") isomerizing said 3-(Z)-hexen-1-al under temperature and pH conditions effective to obtain 2-(E)-hexen- 1-al, and either recovering the formed 2-(E)-hexen-1-al from the medium or adding a yeast to said 2-(E)-hexen-1-al to form 2-(E)-hexen-1-ol and recovering the latter from the medium.

5,464,762

ASYMMETRIC BIOREDUCTION OF 6-BROMO-2-TETRALONE TO (S)-6-BROMO-2 TETRAOL BY TRICHOSPORON CAPITATUM

Michel M. Chartrain, Westfield; Jayanthi Reddy, Scotch Plains, and David M. Tschaen, Holmdel, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 24, 1994, Ser. No. 265,176

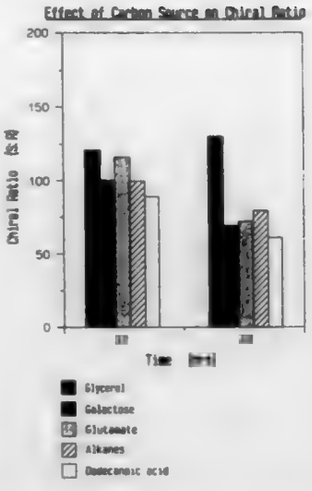
Int. Cl.[6] C12P *7/22;41/00*

U.S. Cl. 435—156 **3 Claims**

1. A method of using a medium which comprises 60 g/l of glycerol, 50 g/l of soy peptone, and 20 g/l of yeast extract for the production of (S)-6-bromo-2-tetralone with an optical purity greater than 98%, the method comprising:

(a) cultivating *Trichosporon capitatum* (MY 1890) (ATCC 74312) in the medium;

(b) mixing 6-bromo-2-tetralone into the medium; and



(c) recovering the (S)-6-bromo-2-tetraol produced.

5,464,763

PROCESS FOR THE INCORPORATION OF FOREIGN DNA INTO THE GENOME OF DICOTYLEDONOUS PLANTS

Robbert A. Schilperoort, and Andreas Hoekema, both of Leiden, Netherlands, assignors to Rijksuniversiteit Leiden, and Robbert Adriaan Schilperoort, both of Leiden, Netherlands

Continuation of Ser. No. 550,736, Jul. 9, 1990, abandoned, which is a continuation of Ser. No. 583,022, Feb. 23, 1984, Pat. No. 4,940,838. This application Dec. 23, 1993, Ser. No. 173,271

Claims priority, application Netherlands, Feb. 24, 1983, 8300698

The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.

Int. Cl.[6] C12N *15/84;1/21;15/74*

U.S. Cl. 435—172.3 **12 Claims**

1. A process for incorporating into the genome of dicotyledonous plants foreign DNA, comprising infecting the plants or plant cells or incubating plant protoplasts with Agrobacterium strains, which contain plasmids, said Agrobacterium strains containing at least one plasmid having the vir-region of a Ti plasmid but no T-region, and at least one other plasmid having a T-region but no vir-region, said T-region being composed of naturally occurring border sequences consisting of about 23 base pairs at the extremities of said T-region and only foreign DNA between said border sequences, the vir-region plasmid and the T-region plasmid containing no homology which could lead to cointegrate formation.

5,464,764

POSITIVE-NEGATIVE SELECTION METHODS AND VECTORS

Mario R. Capecchi, and Kirk R. Thomas, both of Salt Lake City, Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

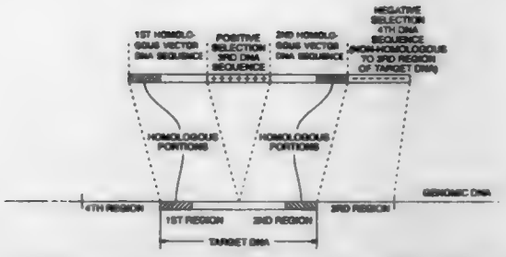
Continuation of Ser. No. 397,707, Aug. 22, 1989, abandoned. This application Feb. 4, 1993, Ser. No. 14,083

Int. Cl.[6] C12N *15/65;15/64;15/09;15/11*

U.S. Cl. 435—172.3 **44 Claims**

19. A method for enriching for a transformed murine embryonic stem cell containing a modification in a target DNA sequence in the genome of said cell comprising:

(a) transfecting cells capable of mediating homologous recombination with a positive-negative selection vector comprising:



a first homologous vector DNA sequence capable of homologous recombination with a first region of said target DNA sequence,

a positive selection marker DNA sequence capable of conferring a positive selection characteristic in said cells,

a second homologous vector DNA sequence capable of homologous recombination with a second region of said target DNA sequence, and

a negative selection marker DNA sequence, capable of conferring a negative selection characteristic in said cells, thereby allowing killing of said cells but substantially incapable of homologous recombination with said target DNA sequence,

wherein the spatial order of said sequences in said PNS vector is: said first homologous vector DNA sequence, said positive selection marker DNA sequence, said second homologous vector DNA sequence and said negative selection marker DNA sequence as shown in FIG. 1,

wherein the 5'-3' orientation of said first homologous vector sequence relative to said second homologous vector sequence is the same as the 5'-3' orientation of said first region relative to said second region of said target sequence;

wherein the vector is capable of modifying the target DNA sequence by homologous recombination of said first and second homologous vector sequences with the first and second regions of said target sequence;

(b) selecting for transformed cells in which said positive-negative selection vector has integrated into said target DNA sequence by homologous recombination by sequentially or simultaneously selecting against transformed cells containing said negative selection marker and selecting for cells containing said positive selection marker; and

(c) analyzing the DNA of transformed cells surviving the selecting step to identify a cell containing the modification.

5,464,765

TRANSFORMATION OF PLANT CELLS

Ronald A. Coffee, Haslemere, and James M. Dunwell, Berkshire, both of, England, assignors to Zeneca Limited, London, England

Continuation of Ser. No. 804,664, Dec. 11, 1991, Pat. No. 5,302,523, which is a continuation-in-part of Ser. No. 541,890, Jun. 21, 1990, abandoned. This application Jan. 14, 1994, Ser. No. 181,433

Claims priority, application United Kingdom, Jun. 21, 1989, 8914232

The portion of the term of this patent subsequent to Apr. 12, 2011, has been disclaimed.

Int. Cl.[6] C12N *15/87*

U.S. Cl. 435—172.3 **4 Claims**

1. A method of producing transformed corn cells comprising providing in a liquid medium (i) a suspension of cells of a regenerable cell line of corn, (ii) a multiplicity of elongate needle-like bodies which are metal or ceramic fibers having a diameter smaller than the diameter of said cells and (iii) a nucleic acid, subjecting said liquid medium containing the said cell suspension, the said elongate needle-like bodies and said nucleic acid to physical motion so as to create collisions between said elongate needle-like bodies and said suspended cells whereby said nucleic acid is introduced into said suspended cells.

5,464,766

MULTIENZYME POWDERED COMPOSITION CONTAINING BACTERIA FOR TREATMENT OF WASTE

Mark Bruno, Raleigh, N.C., assignor to Enzyme Research & Development Corporation, Gilberts, Ill.

Filed Apr. 4, 1994, Ser. No. 222,108

Int. Cl.[6] C12N *9/00;9/96;* C02F *1/00*

U.S. Cl. 435—187 7 Claims

1. A powdered composition for use in treating organic waste comprising:

multiple enzymes comprising less than 26% by weight of the total weight of the composition, said multiple enzymes comprising by weight

from about 0.1% to about 15% protease;

from about 0.1% to about 15% amylase;

from about 0.1% to about 15% cellulase;

from about 0.1% to about 15% lipase;

from about 0.1% to about 15% bacterial culture selected from the group consisting of Bacillus subtilis, Bacillus licheniformis, Bacillus megaterium, and Bacillus polymyxa;

from about 0.1% to about 20% disodium phosphate;

from about 0.1% to about 15% monosodium phosphate;

said disodium phosphate and monosodium phosphate providing buffers;

from about 1% to about 20% nonylphenoldecylethoxylate as an preservative;

from about 0.1% to about 10% sodium thiosulfate as an ion scavenger; and

from about 50% to about 95% dendritic salt providing a buffer.

5,464,767

REAGENTS AND METHODS FOR THE QUANTIFICATION OF TOTAL DOXEPINS IN BIOLOGICAL FLUIDS

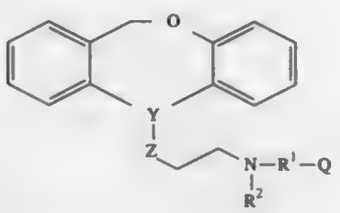
Maciej Adamczyk, Gurnee; Jeffrey R. Fishpaugh, Chicago; Donald Johnson, Lindenhurst, and Robert E. Hruska, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 916,066, Jul. 24, 1992, Pat. No. 5,332,661, which is a continuation-in-part of Ser. No. 738,400, Jul. 31, 1991, abandoned. This application Apr. 12, 1994, Ser. No. 226,809

Int. Cl.[6] C12N *9/96;* C07K *14/76;* C07D *267/16;311/80*

U.S. Cl. 435—188 19 Claims

8. A compound of the formula:



wherein Y-Z is the E-isomer of C=CH, the Z-isomer of C=CH or N-CH_2, R_1 is a linking group comprising from 1 to 6 carbon atoms and 0 to ,2 heteroatoms, R_2 can be H or CH_3, and Q is a detectable moiety or an immunogenic carrier material.

5,464,768

ENHANCED NITRITE PRODUCTION IN TRANSFECTED MURINE CELLS

Johnathan L. Kiel; Jill E. Parker, and John G. Bruno, all of San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation of Ser. No. 21,920, Feb. 24, 1993, abandoned. This application May 16, 1994, Ser. No. 243,350

Int. Cl.[6] C12N *15/85*

U.S. Cl. 435—240.2 1 Claim

1. A mammalian cell line formed by transfecting the murine macrophage RAW 264.7 with a barley nitrate reductase 1.1 kilobase pair gene fragment.

5,464,769

DESICCATED CONIFER SOMATIC EMBRYOS

Stephen M. Attree, and Lawrence C. Fowke, both of Saskatoon, Canada, assignors to University of Saskatchewan, Saskatchewan, Canada

Filed Dec. 1, 1993, Ser. No. 159,693

Int. Cl.[6] C12N *5/02;5/04;* H01C *1/06*

U.S. Cl. 435—240.4 8 Claims

1. A desiccated conifer somatic embryo having a moisture content ranging between 10 and 32%, a dry weight between 30 and 600% higher than the corresponding mean dry weight of a zygotic embryo from a mature seed of the same species, and an amount of storage lipid between 50 and 700% higher than the corresponding mean amount of lipid of a zygotic embryo from a mature seed of the same species, wherein the desiccated conifer somatic embryo is capable of germinating into a viable plant.

5,464,770

DNA ENCODING (ASP 113) AND (LYS 46, ASP 113) THAUMATIN I

Joachim L. Weickmann, and Pradip Ghosh-Dastidar, both of Los Angeles, Calif., assignors to Xoma Corporation, Berkeley, Calif.

Continuation of Ser. No. 797,474, Nov. 13, 1985, abandoned. This application May 2, 1988, Ser. No. 189,250

Int. Cl.[6] C12N *1/19;15/29*

U.S. Cl. 435—254.21 3 Claims

1. A purified and isolated DNA sequence encoding the amino acid sequence of sweet-tasting (Asp^{113}) Thaumatin I wherein the DNA sequence is a manufactured gene and the base sequence comprises one or more codons selected from among alternative codons specifying the same amino acid on the basis of preferential expression characteristics of the codon in *Saccharomyces cerevisiae.*

5,464,771

BIOLOGICALLY PURE CULTURE OF ACTINOMYCES VISCOSUS STRAIN USED FOR THE BIOREMEDIATION OF CHLORINATED HYDROCARBONS

Frank O. Bryant, Franklin Springs, and Horace G. Cutler, Watkinsville, both of Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 29, 1994, Ser. No. 235,747

Int. Cl.[6] C12S *13/00;* C12N *1/20;1/38;* C02F *3/00*

U.S. Cl. 435—262.5 2 Claims

1. A biologically pure culture of *Actinomyces viscosus* strain ATCC 55473 or mutants thereof capable of degrading pentachlorophenol in aqueous substrates containing yeast extract and lactic acid under anaerobic conditions without production of toxigenic or mutagenic intermediates selected from the group consisting of

2,3,4,5-tetrachlorophenol; 2,3,4-trichlorophenol; 3,4,5-trichlorophenol; 2,4,5-trichlorophenol; 2,4,6-trichlorophenol and 2,3,6-trichlorophenol.

5,464,772

PROCESS FOR PRODUCING OPTICALLY ACTIVE HALOGEN-CONTAINING ALCOHOLS USING LIPASE AY-120 FROM *CANDIDA RUGOSA*

Katutoshi Hirose; Yoshihiro Takagi; Toshihiko Otomatsu, all of Kobe, and Yoshiichi Suzuki, Tokyo, all of, Japan, assignors to Showa Shell Sekiyu Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1993, Ser. No. 46,181

Claims priority, application Japan, Apr. 15, 1992, 4-121209

Int. Cl.[6] C12P *41/00*

U.S. Cl. 435—280 **6 Claims**

1. A process for producing an optically active halogen-containing alcohol of the formula I

I

wherein R^1 is selected from the group consisting of CF_3, CCl_3, CF_3CCl_2, CF_3CH_2 and CF_3CF_2, R^2 is selected from the group consisting of an alkyl group of C_2–C_{16}, alkene group of C_2–C_{16}, alkyne group of C_2–C_{16}, phenyl group, and alkyl substituted phenyl group, and the C having an asterisk indicates an asymmetric atom,

comprising asymmetrically hydrolyzing a halogenated alkyl ester of a carboxylic acid represented by the following formula II

II

wherein R^1 and R^2 are the same as mentioned above and R^3 is selected from the group consisting of an alkyl group of C_1–C_{18}, alkene group of C_1–C_{18}, alkane group of C_1–C_{18}, phenyl group, and alkyl substituted phenyl group,

with lipase AY-120 in an aqueous solution; and

purifying said optically active halogen-containing alcohol.

5,464,773

CELL DISRUPTING APPARATUS

Luis A. Melendez, Norwood; Robert E. Rosenbaum, Framingham; Marcela A. Vera-Garcia, Framingham; D. Michael Olive, Framingham, and John E. Swenson, Marlboro, all of Mass., assignors to Amoco Corporation, Chicago, Ill.

Filed Mar. 14, 1994, Ser. No. 213,194

Int. Cl.[6] C12M *1/33*

U.S. Cl. 435—306.1 **8 Claims**

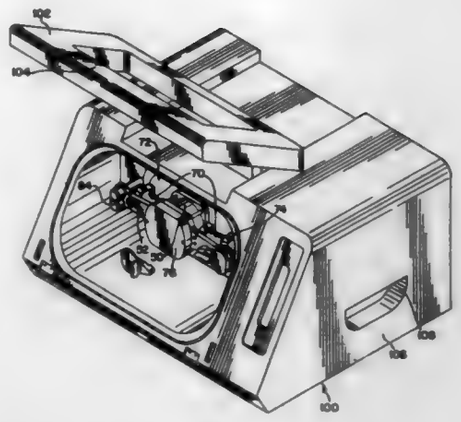
1. A cell disrupting apparatus, comprising:

container means for substantially enclosing cellular material and cell-disruption material, said container means comprising four containers; and

container-moving means operatively connected to said container means for moving said container means with sufficient force to shake said cellular material in the presence of said cellular-disrupting material so as to substantially sever cellular components of said cellular material for analysis or harvesting in the absence of substantially damaging said cellular components; said container-moving means not comprising a curved strap restricting the shaking movement; and said container-moving means comprising:

a substantially horizontal shaft;

a motor for rotating said horizontal shaft;



an eccentric cam secured to said shaft; bearings mounted on said cam;

a bearing sleeve positioned about and mounted on said bearings;

a yoke having a central portion riding upon and secured to said bearing sleeve, said yoke having a pair of diametrically opposed elongated arms extending integrable outwardly from said central portion for holding said four containers, each of said arms having an enlarged hand portion providing an outer end opposite said central portion, said enlarged hand portion having a convex outer edge and defining a pair of holes for receiving two of said containers;

springs attached to said arms and motor for preventing said arms from spinning directly with the motor and for converting rotational movement of the motor into movement described by said cam; and

sample retainers fastened to the hand portions of said yoke, each of said sample retainers comprising a generally teardrop-shaped glove with a pair of substantially symmetrical concave flanges for matingly engaging and securing said two of said containers to said arms of said yoke.

5,464,774

BOVINE BASIC FIBROBLAST GROWTH FACTOR

Andrew J. Baird, San Diego; Frederick S. Esch, Foster City; Denis Gospodarowicz, San Francisco, all of Calif.; Peter Bohlen, Cortland, N.Y., and Nicholas C. Ling, San Diego, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 586,518, Mar. 5, 1984, abandoned, Ser. No. 670,160, Nov. 9, 1984, abandoned, Ser. No. 747,154, Jun. 20, 1985, Pat. No. 4,956,455, and Ser. No. 940,524, Dec. 10, 1986, Pat. No. 4,785,079. This application Dec. 31, 1987, Ser. No. 139,953

Claims priority, application WIPO, Jun. 18, 1986, PCT/US86/01318

Int. Cl.[6] C12N *15/18*

U.S. Cl. 536—23.51 **3 Claims**

1. An isolated DNA sequence comprising a nucleotide sequence encoding the amino acid sequence of bovine basic fibroblast growth factor (FGF) as follows:

Pro—Ala—Leu—Pro—Glu—Asp—Gly—Gly—Ser—Gly—Ala—
Phe—Pro—Pro—Gly—His—Phe—Lys—Asp—Pro—Lys—Arg—
Leu—Tyr—Cys—Lys—Asn—Gly—Gly—Phe—Phe—Leu—Arg—
Ile—His—Pro—Asp—Gly—Arg—Val—Asp—Gly—Val—Arg—
Glu—Lys—Ser—Asp—Pro—His—Ile—Lys—Leu—Gln—Leu—
Gln—Ala—Glu—Glu—Arg—Gly—Val—Val—Ser—Ile—Lys—
Gly—Val—Cys—Ala—Asn—Arg—Tyr—Leu—Ala—Met—Lys—
Glu—Asp—Gly—Arg—Leu—Leu—Ala—Ser—Lys—Cys—Val—
Thr—Asp—Glu—Cys—Phe—Phe—Phe—Glu—Arg—Leu—Glu—
Ser—Asn—Asn—Tyr—Asn—Thr—Tyr—Arg—Ser—Arg—Lys—
Tyr—Ser—Ser—Trp—Tyr—Val—Ala—Leu—Lys—Arg—Thr—
Gly—Gln—Tyr—Lys—Leu—Gly—Pro—Lys—Thr—Gly—Pro—

-continued

Gly—Gln—Lys—Ala—Ile—Leu—Phe—Leu—Pro—Met—Ser—Ala—Lys—Ser.

5,464,775

METHOD OF DETECTING ADULTERANT IN URINE

Jack V. Smith, St. Petersburg, Fla., assignor to Chimera Research and Chemical, Inc., Seminole, Fla.

Continuation-in-part of Ser. No. 760,879, Sep. 16, 1991, abandoned. This application Jul. 27, 1994, Ser. No. 281,296

Int. Cl.[6] G01N *33/48*

U.S. Cl. 436—63 8 Claims

1. A method for the detection of glutaraldehyde adulterant in a urine sample comprising

(a) obtaining an aliquot of urine from an unknown sample and an aliquot of a standard low calibrator, inserting both the sample and low calibrator aliquot in an automatic chemical analyzer,

(b) separately mixing both of the aliquots with an aqueous carbonyl indicator in a reagent mixture, comprising an indicator and surfactant wherein the indicator is selected from the group consisting of 2,4-dinitrophenylhydrazine, 4-nitrophenylhydrazine, hydrazine, phenylhydrazine, semicarbazide hydrochloride, and hydroxylamine hydrochloride,

(c) performing spectrophotometric absorbance readings on the mixtures of (b) above, wherein the spectrophotometric absorbance readings from the mixtures of reagent with the sample and low calibrator indicate the presence of the adulterant if the absorbance of the sample mixture is greater than or equal to the absorbance of the low calibrator mixture.

5,464,776

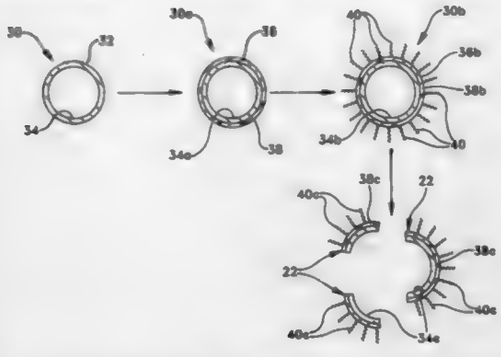
METHOD FOR PREPARING A DUAL PATHWAY CLOTTING ENHANCER FOR BLOOD COLLECTION TUBE

Erwin A. Vogler, Newhill, and Jane C. Graper, Durham, both of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 76,521, Jun. 14, 1993, Pat. No. 5,378,431. This application Sep. 15, 1994, Ser. No. 306,292

Int. Cl.[6] G01N *33/86*

U.S. Cl. 436—69 3 Claims



1. A method for preparing an additive for a blood collection tube which activates both the intrinsic and extrinsic coagulation pathways comprising:

a) coating the outside surface of a hollow glass microsphere with plastic;

b) immobilizing an activator of the extrinsic coagulation pathway on said coating to give a microsphere having a surface which activates the extrinsic coagulation pathway; and

c) providing a surface of unmodified glass which activates the intrinsic coagulation pathway.

5,464,777

DRY REAGENT FOR CREATININE ASSAY

Kin-Fai Yip, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.

Filed Sep. 26, 1994, Ser. No. 312,559

The portion of the term of this patent subsequent to Jan. 31, 2012, has been disclaimed.

Int. Cl.[6] G01N *33/546;33/53;33/557*

U.S. Cl. 436—98 6 Claims

1. An assay for a urinary protein and creatinine which comprises the steps of:

a) providing a reaction vessel having a substantially horizontal axis of rotation and an analytical reaction channel containing first and second reaction zones, the second reaction zone situated a predetermined distance from and in fluid communication with the first reaction zone whereby a liquid test sample disposed in the reaction channel is capable of being transported by gravity along the reaction channel between the reaction zones by rotating the reaction vessel along its axis of rotation; delivery means for providing a unidirectional flow of a liquid test sample into the reaction vessel and inlet means in liquid communication with the delivery means for introducing the liquid test sample into the delivery means, the first reaction zone having an antibody reagent dried therein and the second reaction zone containing a dried lithium salt of an organic acid capable of reacting with creatinine under alkaline conditions in which the pH is from about 11.5 to 12.5 to form a colored reaction product therewith and a dried alkaline material which upon rehydration is capable of providing the necessary alkalinity for the creatine/organic acid reaction, said reaction vessel also having a viewing port between the first and second reaction zones;

b) introducing urine suspected of containing protein and creatinine as the liquid test sample into the reaction vessel through the delivery means and also introducing a reaction fluid containing a polymeric agglutinator which specifically binds with the antibody reagent dried in the first reaction zone to thereby solubilize the antibody reagent and cause an agglutination reaction which is quantified by the taking of readings through the viewing port;

c) rotating the reaction vessel about its axis of rotation to bring the liquid test sample/reaction fluid combination into contact with the lithium salt of the organic acid and alkaline material thereby causing their dissolution and raising the pH to a level of from about 11.5 to 12.5 and resulting in a colored response between the organic acid anion and any creatinine present in the liquid test sample and determining the magnitude of this colored response as a function of the creatinine in the urine sample.

5,464,778

GLYCOPROTEIN LIGAND FOR P-SELECTIN AND METHODS OF USE THEREOF

Richard D. Cummings, Edmond; Kevin L. Moore, and Rodger P. McEver, Oklahoma City, all of Okla., assignors to Board of Regents of the University of Oklahoma, Norman, Okla.

Continuation of Ser. No. 976,552, Nov. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 650,484, Feb. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 554,199, Jul. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 320,408, Mar. 8, 1989, Pat. No. 5,378,464. This application Jul. 21, 1994, Ser. No. 278,551

Int. Cl.[6] G01N *33/564*

U.S. Cl. 436—503 10 Claims

10. A method for in vitro screening of a compound that inhibits P-selectin binding comprising:

adding to P-selectin in the presence of a compound to be tested, a purified ligand for P-selectin which can be derived from the ligand present on myeloid cells by extraction of the myeloid cells, binding of the extract to a wheat germ agglutinin column followed by elution from the column with equilibration buffer containing 100 mM N-acetylglucosamine, addition to calcium and magnesium up to 1 mM, application to an

albumin column in series with a P-selectin column and elution with equilibration buffer with 5 mM EDTA, wherein the ligand comprises a fucosylated sialylated carbohydrate containing glucosamine and galactosamine in the approximate ratio of 2:1, N linked oligosaccharides, O linked oligosaccharides or Ser/Thr-linked oligosaccharides containing the core disaccharide sequence Galβ1–3GalNAcα-Ser/Thr, NeuAcα2–3Galβ1–4(Fucα1–3)GlcNAcβ, and poly-N-acetyllactosamine sequences, wherein the ligand has an apparent relative molecular weight of 120,000 daltons as assessed by SDS-PAGE under reducing conditions, and an apparent molecular weight of 250,000 dalton as assessed by SDS-PAGE under non-reducing conditions, and wherein the ligand specifically binds to P-selectin in the presence of calcium, and

determining if P-selectin is inhibited from binding to the glycoprotein ligand by the compound.

5,464,779

METHOD AND APPARATUS FOR EVALUATION OF SEMICONDUCTOR PRODUCTION PROCESS

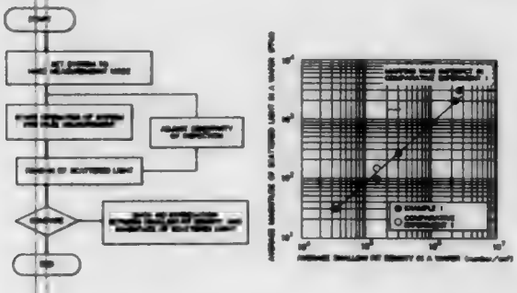
Nobuyoshi Fujimaki, Annaka, Japan, assignor to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1994, Ser. No. 223,053

Claims priority, application Japan, Apr. 8, 1993, 5-107289

Int. Cl.[6] H01L *21/66*

U.S. Cl. 437—8 **3 Claims**



1. A method for the evaluation of a semiconductor production process, comprising the steps of:

heat-treating a silicon wafer by using a furnace system and etching the heat-treated silicon wafer by immersing in an etching liquid;

obtaining a correlation between an average value of shallow pit density determined by microscopic observation and an average value of a magnitude of light scattered determined by a wafer surface inspection system using a beam of light, which correlation is characterized by obtaining several heat-treated silicon wafers by using furnace systems with different levels of impurity contamination;

determining an average value of the magnitude of scattered light reflected from a surface of a silicon wafer by using said wafer surface inspection system, which wafer is heat-treated by a furnace system under evaluation;

determining the shallow pit density of said heat-treated silicon wafer from said furnace system under evaluation, based on said average value of the magnitude of scattered light reflected from said silicon wafer surface and said correlation;

inspecting the cleanliness of said furnace system for heat treating the silicon wafer in the semiconductor production process; and

judging the acceptability or rejectability of said furnace system, based on said determining of shallow pit density.

5,464,780

METHOD OF FORMING INSULATED GATE EFFECT TRANSISTOR IN A SUBSTRATE DEPRESSION

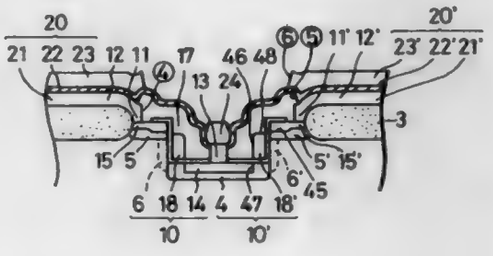
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 735,057, Jul. 24, 1991, abandoned. This application Dec. 17, 1993, Ser. No. 168,360

Claims priority, application Japan, Jul. 25, 1990, 2-196869; Jul. 25, 1990, 2-196870

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—41 **13 Claims**



1. A method of forming a semiconductor device having at least one insulated gate field effect transistor comprising the sequential steps of:

forming a depression in a surface of a semiconductor substrate, said depression having a bottom surface and at least one side surface to become a channel of said transistor;

forming a pair of lightly doped regions in an upper portion of the semiconductor substrate and the bottom surface of the depression;

forming a gate insulating layer on said side surface;

forming a gate electrode adjacent to said side surface with said gate insulating layer therebetween; and

using said gate electrode as a mask to introduce a dopant species to an upper portion of said pair of lightly doped regions in order to form a first heavily doped region in the upper portion of the lightly doped region in the upper portion of the semiconductor substrate and a second heavily doped region in the upper portion of the lightly doped region in the bottom surface of the depression where said first and second heavily doped regions contain said dopant species at a higher concentration than the lightly doped regions which remain after the upper portions thereof have introduced therein said dopant species.

5,464,781

AMINO NAPHTHYRIDINE COMPOUNDS AS ANTI-RHOUMATIC AGENTS

Bernard J. Armitage; John G. Bowen; Malcolm J. Crossley; Ian M. Hunneyball; Bruce W. Leslie; Thomas K. Miller, and Michael Spowage, all of Nottinghamshire, England, assignors to The Boots Company PLC, Notts, England

PCT No. PCT/EP92/02901, § 371 Date Jun. 3, 1994, § 102(e) Date Jun. 3, 1994, PCT Pub. No. WO93/13097, PCT Pub. Date Jul. 8, 1993

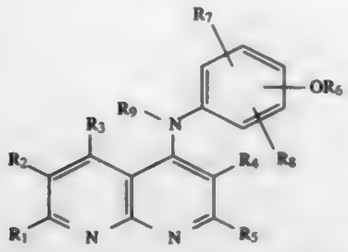
PCT Filed Oct. 12, 1992, Ser. No. 244,369

Claims priority, application United Kingdom, Dec. 23, 1991, 9127252

Int. Cl.[6] A61K *31/435*; C07D *47/04*

U.S. Cl. 514—300 16 Claims

1. Compounds of the formula I



(I)

and pharmaceutically acceptable salts thereof, in which

R_1 represents hydrogen, a C_{1-6} alkyl group, hydroxy, a carboxy C_{2-4} alkenyl group, a C_{2-6} alkoxycarbonyl C_{2-4} alkenyl group, a hydroxy C_{1-6} alkoxycarbonyl C_{1-4} alkyl group, a carboxy group, a C_{2-6} alkoxycarbonyl group or a C_{1-6} alkanoylamino group;

R_2 represents hydrogen, halo, a C_{1-6} alkoxy group, hydroxy, a C_{1-6} alkanoyloxy group, or a phenoxy group (which may be optionally substituted by a C_{1-4} alkyl group, halo or a C_{1-4} alkoxy group);

R_3 represents hydrogen or a C_{1-4} alkyl group;

R_4 represents hydrogen, halo, a C_{2-7} alkoxycarbonyl group, a benzyloxycarbonyl group (which may be optionally substituted by a C_{1-4} alkyl group, halo or a C_{1-4} alkoxy group), a C_{1-6} alkanoyl group, a benzoyl group (which may be optionally substituted by a C_{1-4} alkyl group, halo or a C_{1-4} alkoxy group), carbamoyl, a C_{1-6} alkyl group, a carboxy group, a C_{1-6} hydroxyalkyl group or a C_{1-6} alkylthio group;

R_5 represents hydrogen or a C_{1-4} alkyl group;

R_6 represents hydrogen, a C_{1-6} alkyl group, optionally substituted by one or more of the following: hydroxy, halo or an amino group of formula $—NR_{12}R_{13}$ (in which R_{12} and R_{13} independently represent hydrogen or a C_{1-4} alkyl group or R_{12} and R_{13} together with the nitrogen atom to which they are attached represent a pyrrolidine ring, a morpholine ring or a piperidine ring) a C_{3-12} alicyclic hydrocarbon group, a phenyl group (which may be optionally substituted by a C_{1-4} alkyl group, halo or a C_{1-4} alkoxy group), a C_{3-6} cycloalkyl C_{1-4} alkyl group or a benzyl group (which may be optionally substituted by a C_{1-4} alkyl group, halo or a C_{1-4} group);

R_7 represents hydrogen, halo, trifluoromethyl, trifloromethoxy, a C_{1-6} alkyl group, a carboxy group, or a C_{1-6} alkoxy group;

R_8 represents hydrogen, halo, trifluoromethyl, trifluoromethoxy, a C_{1-6} alkyl group or a C_{1-6} alkoxy group; and

R_9 represents hydrogen or a C_{1-4} alkyl group; with the proviso that one of R_1, R_2 and R_3 is other than hydrogen, methyl or halo.

5,464,782

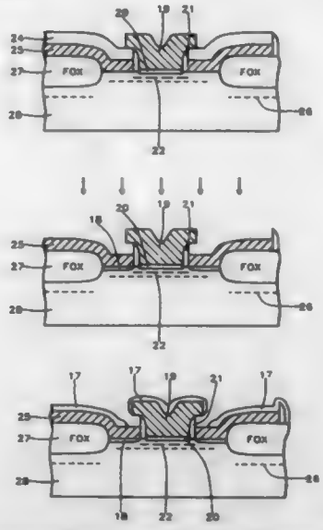
METHOD TO ENSURE ISOLATION BETWEEN SOURCE-DRAIN AND GATE ELECTRODE USING SELF ALIGNED SILICIDATION

Chao-Ming Koh, Hsin-chu, Taiwan, Prov. of China, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

Filed Jul. 5, 1994, Ser. No. 270,765

Int. Cl.[6] H01L *21/265*; *21/44*; *21/48*

U.S. Cl. 437—41 19 Claims



1. The method for fabricating a MOSFET device on a semiconductor having device regions formed therein comprising:

forming a field oxide pattern for isolation of device regions on the surface of said substrate;

ion implanting a first conductivity imparting dopant for anti-punch thru protection;

depositing a first polysilicon layer over said substrate and said field oxide pattern;

depositing a first dielectric layer over said first polysilicon layer;

patterning to form openings through said first dielectric layer and said first polysilicon layer to said device regions;

depositing a second dielectric layer;

anisotropically etching said second dielectric layer to form spacer insulator on the sides of said openings;

ion implanting a second conductivity imparting dopant into said openings into said device regions;

growing a gate oxide on said device region in said openings;

depositing a second polysilicon layer over said first dielectric layer and said gate oxide;

patterning of said second polysilicon layer, to form a polysilicon gate structure completely covering said device region, said spacer insulator and partially overlapping said first polysilicon layer, thus creating an overhang;

etching completely said first dielectric layer to expose said first polysilicon layer and some of said spacer insulator;

ion implanting a third conductivity imparting dopant into said polysilicon gate structure and into said first polysilicon layer

annealing to drive said third conductivity imparting dopant from said first polysilicon layer into said substrate forming source-drain regions;

depositing a metal film on all exposed areas, said first polysilicon layer and said polysilicon gate structure but not regions protected by said overhang;

annealing to form metal silicide from said first polysilicon layer and said polysilicon gate structure;

removal of unreacted said metal;

depositing an insulator film on exposed said metal silicide layers;

patterning to form second openings in said insulator film to said metal silicide, formed from said polysilicon gate structure, and said metal silicide, formed from said first polysilicon layer; depositing a second metal film on said insulator film;

patterning to form metal contacts to said metal silicide, formed from said polysilicon gate structure and said metal silicide, formed from said first polysilicon layer.

5,464,783

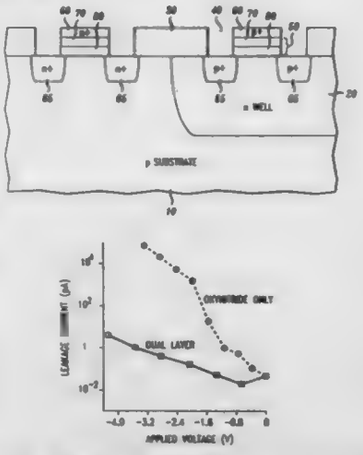
OXYNITRIDE-DIOXIDE COMPOSITE GATE DIELECTRIC PROCESS FOR MOS MANUFACTURE

Young O. Kim, Marlboro; Lalita Manchanda, Aberdeen, and Gary R. Weber, Whitehouse Station, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 36,585, Mar. 24, 1993, abandoned. This application Feb. 2, 1995, Ser. No. 382,956

Int. Cl.[6] H01L *21/8234*

U.S. Cl. 437—42 **9 Claims**



1. Method for making an MOS integrated circuit of the kind in which at least one transistor has a composite gate dielectric comprising a substantially silicon dioxide layer overlain by a silicon oxynitride layer, the method comprising:

a) forming a dielectric layer on a principal surface of a silicon substrate;

b) depositing a gate electrode layer over the dielectric layer;

c) patterning the gate electrode layer, thereby to define at least one gate contact; and

d) doping a source region and a drain region in substrate portions that lie adjacent the gate contact,

CHARACTERIZED IN THAT the step of forming a dielectric layer further comprises:

e) forming a silicon oxynitride layer having a thickness in the range 30Å–100Å; and

f) then subjecting the substrate to an oxidizing atmosphere such that chemical species comprising oxygen migrate through the oxynitride layer to a surface layer of the substrate and react therewith, resulting in the growth of a substantially silicon dioxide layer having a thickness in the range 5 Å–30 Å adjacent and underlying the silicon oxynitride layer, thereby to form said composite gate dielectric.

5,464,784

METHOD OF FABRICATING INTEGRATED DEVICES

Giuseppe Crisenza, Trezzo sull'Adda, and Cesare Clementi, Busto Arsizio, both of, Italy, assignors to SGS-Thomson Microelectronics s.r.l., Milano, Italy

Filed Sep. 30, 1993, Ser. No. 129,689

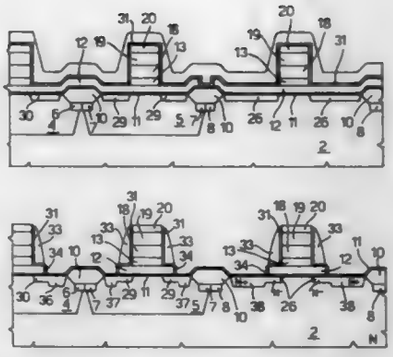
Claims priority, application European Pat. Off., Sep. 30, 1992, 92830542

Int. Cl.[6] H01L *21/8247;21/266*

U.S. Cl. 437—43 **14 Claims**

1. A method of fabricating an integrated circuit that includes a plurality of non-volatile memory cells comprising the steps of:

forming a gate oxide layer on a substrate;



depositing a first polysilicon layer on top of said gate oxide;

forming a first layer of insulating material overlying said first polysilicon layer;

depositing a second layer of polysilicon overlying said first insulating layer;

etching a portion of said second polysilicon layer to form a first gate region having a first length in a first direction;

etching a portion of said first polysilicon layer to form a second gate region having a second length in said first direction, the second length being longer than said first length in said first direction, said first gate region overlying said second gate region;

etching said second polysilicon layer and said first layer of insulating material in portions of locations to expose first portions of said first polysilicon layer and said second polysilicon layer and to not expose other second portions of said first polysilicon layer; and

depositing a third layer of polysilicon onto the exposed portions of the first and second polysilicon layers to provide a layer polysilicon physically connecting the first layer of polysilicon and the second layer of polysilicon at locations and doping the exposed polysilicon layer such that some regions of the second polysilicon layer that directly overlie the first polysilicon layer are electrically connected together to form a gate of a MOS transistor at the first regions but the first and second polysilicon layers being electrically insulated from each other at the second regions on the integrated circuit to form a gate structure having a floating gate and a control gate.

5,464,785

METHOD OF MAKING A FLASH EPROM DEVICE HAVING A DRAIN EDGE P+ IMPLANT

Gary Hong, Hsinchu, Taiwan, Prov. of China, assignor to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed Nov. 30, 1994, Ser. No. 346,866

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **21 Claims**

1. A method of fabricating an EPROM device with a floating gate and a control gate formed over a lightly doped P type semiconductor substrate with an N+ source region and an N+ drain region, said method comprising,

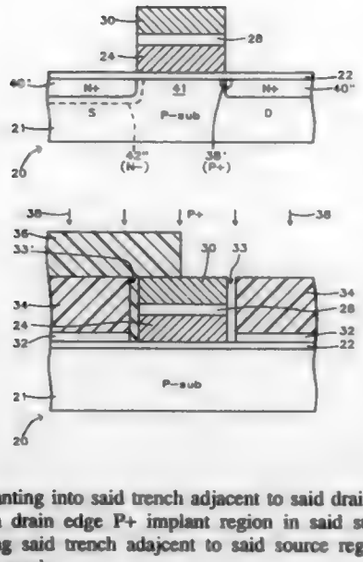
forming a first dielectric layer on said substrate,

forming a stack having a top and sidewalls comprising a floating gate over said first dielectric layer, an interconductor dielectric layer over said floating gate, and a control gate over said interconductor dielectric layer,

forming a sacrificial layer over said top and said sidewalls of said stack and over said first dielectric layer,

forming a first mask leaving said sacrificial layer over said top of said stack exposed,

removing said sacrificial layer from said top and said sidewalls of said stack thereby forming a trench adjacent to said source region and a trench adjacent to said drain region between said sidewalls of said stack and said first mask,



ion implanting into said trench adjacent to said drain region to form a drain edge P+ implant region in said substrate by masking said trench adajcent to said source region with a second mask,

removing said second mask, said first mask and said sacrificial layer over said first dielectric layer,

performing a source/drain implant to form said N+ source and said N+ drain regions self aligned with said stack, and

forming an N– region in said substrate beneath said N+ source region by an additional source implant.

5,464,786

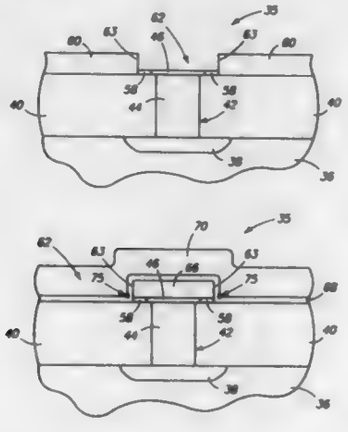
METHOD FOR FORMING A CAPACITOR HAVING RECESSED LATERAL REACTION BARRIER LAYER EDGES

Thomas A. Figura, and Paul J. Schuele, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Oct. 24, 1994, Ser. No. 328,095

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—52 **19 Claims**



11. A method of forming a capacitor comprising the following steps:

providing a substrate having a node to which electrical connection to a capacitor is to be made;

providing an electrically conductive reaction barrier layer over the substrate node;

providing an electrically conductive lower capacitor plate layer over the reaction barrier layer;

etching the lower capacitor plate layer into an external shape having lateral confines corresponding to that of a finished lower capacitor plate shape;

etching the reaction barrier layer to form opposing lateral recesses beneath the etched lower capacitor plate layer, the recesses defining opposing recessed lateral reaction barrier layer edges;

providing oxidation barrier blocks over the opposing recessed lateral reaction barrier layer edges; and

providing a capacitor dielectric layer and a cell capacitor layer over the etched lower capacitor plate layer.

5,464,787

SEMICONDUCTOR DEVICE AND A METHOD OF MANUFACTURING THE SAME

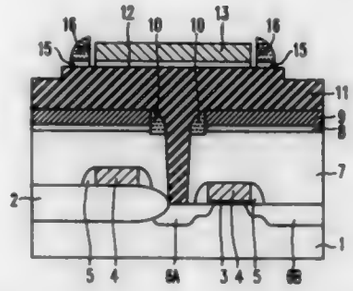
Eui K. Ryou, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Dec. 30, 1994, Ser. No. 366,770

Claims priority, application Rep. of Korea, Dec. 30, 1993, 93-31156

Int. Cl.[6] H01L *21/8242*

U.S. Cl. 437—52 **22 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

forming an interlayer insulation film on a silicon substrate formed with a junction region, and sequentially depositing a silicon nitride film and a first polysilicon layer on said interlayer insulation film;

sequentially etching exposed portions of said first polysilicon layer and said silicon nitride film by an etching process utilizing a contact hole mask, whereby a recess is formed;

depositing a polysilicon on the surface of said first polysilicon layer including said recess, and theen etching said polysilicon to form a polysilicon spacer on the inner wall of said recess;

etching said interlayer insulation film by an etching process utilizing said first polysilicon layer and said polysilicon spacer as an etching mask until a part of said junction region is exposed, whereby a contact hole is formed;

depositing a second polysilicon layer on said first polysilicon film and said polysilicon spacer including said contact hole;

sequentially depositing a first oxide film and a third polysilicon layer on said second polysilicon layer;

coating a photoresist on said third polysilicon layer, and then forming a photoresist pattern by a photoresist patterning process utilizing a charge storage electrode mask;

sequentially etching the exposed part of said third polysilicon layer and said first oxide film by an etching process utilizing said photoresist pattern as an etching mask, whereby the pattern composed of said third polysilicon layer and said first oxide film is formed;

removing said photoresist pattern, and then depositing a second oxide film on said second polysilicon layer including said pattern;

depositing a polysilicon on said second oxide film, and then etching said polysilicon to form a polysilicon spacer on the inner wall of said pattern;

etching the exposed part of said second oxide film until a part of the surface of said second and third polysilicon layers is exposed;

etching the exposed part of said second polysilicon layer by an anisotropic polysilicon etching process, whereby the surface of said second polysilicon layer is stepped;

etching the exposed part of said second oxide film by the anisotropic oxide etching process to expose said second polysilicon layer between said pattern and said polysilicon spacer; and

etching said second polysilicon layer by the anisotropic polysilicon etching process utilizing said first and second oxide films remaining on said second polysilicon layer as an etching barrier layer until said silicon nitride film is exposed and, then removing said remaining first and second oxide films to form a charge storage electrode;

forming a dielectric film on the surface of said charge storage electrode, and then forming a plate electrode on said dielectric.

5,464,788

TOCOLYTIC OXYTOCIN RECEPTOR ANTAGONISTS

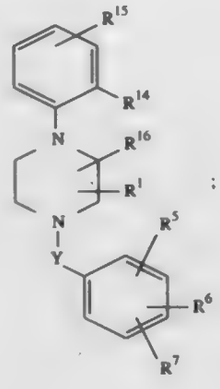
Mark G. Bock, Hatfield; Ben E. Evans, Lansdale; J. Christopher Culberson, Hatfield; Kevin F. Gilbert, Bechtelsville; Kenneth E. Rittle, Green Lane, and Peter D. Williams, Harleysville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 24, 1994, Ser. No. 217,270

Int. Cl.[6] C07D *273/00;413/00;451/00*

U.S. Cl. 514—252 **11 Claims**

1. A compound of the formula



wherein

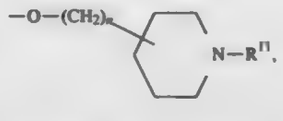
Y is selected from the group consisting of $—SO_2—$, —CO— $(CH_2)_n$— and $—(CH_2)_p—$;

R^1 is selected from the group consisting of hydrogen, cyano, phenyl, $—CONHR^2$, $—CONR^2R^2$, $—(CH_2)_m—OR^2$, $—(CH_2)_pS(O)_r—R^2$, $—(CH_2)_m—CO_2R^2$, $—(CH_2)_m—N_3$, $—(CH_2)_m—NH_2$ and $—(CH_2)_m—NR^2R^2$;

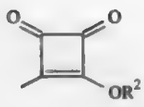
R^2 is selected from the group consisting of hydrogen, C_{3-8} cycloalkyl and C_{1-5} alkyl;

R^5 and R^6 are each independently selected from the group consisting of hydrogen, C_{1-5} alkyl, C_{1-5} alkoxy, halogen and $—(CH_2)_n—N(R^2)—R^{17}$;

R^7 is selected from the group consisting of hydrogen and



R^{11} is selected from the group consisting of hydrogen, C_{1-5} alkoxycarbonyl, C_{1-5} alkylcarbonyl, C_{1-5} alkyl, $—Z—R^{13}$,



and substituted C_{1-5} alkyl wherein said substituent on said alkyl is unsubstituted, mono-, di- or tri-substituted pyridyl wherein said substituents on said pyridyl are independently selected from the group consisting of halogen, C_{1-5} alkyl and C_{1-5} alkoxyl;

R^{13} is selected from the group consisting of unsubstituted C_{1-10} alkyl and substituted C_{1-10} alkyl wherein said subsituent is selected from the group consisting of $—N(R^2)_2$, $—NHR^2$ and imidazolyl;

R^{14} is selected from the group consisting of C_{1-5} alkyl, C_{1-5} alkoxy and halogen;

R^{15} is selected from the group consisting of hydrogen and C_{1-5} alkyl;

R^{16} is selected from the group consisting of hydrogen and oxo;

R^{17} is $—Z—R^{18}$; and

R^{18} is selected from the group consisting of C_{1-5} alkoxyl, Het. unsubstituted or substituted C_{1-5} alkyl wherein said substitutent is Het and unsubstituted or substituted C_{2-5} alkenyl wherein said substituent is Het;

Het is selected from the group consisting of imidazolyl, benzimidazolyl, carboxymethyl-substituted benzimidazolyl and indolyl.

Z is —CO— or $—SO_2—$;

m is an integer of from 1 to 5;

n is an integer of from 0 to 3;

p is an integer of from 1 to 3; and

r is an integer of from 0 to 2;

provided that when R^{15} is hydrogen or methyl; then R^1 is not hydrogen;

and the pharmaceutically acceptable salts thereof.

5,464,789

METHOD OF MANUFACTURING A CMOS SEMICONDUCTOR DEVICE

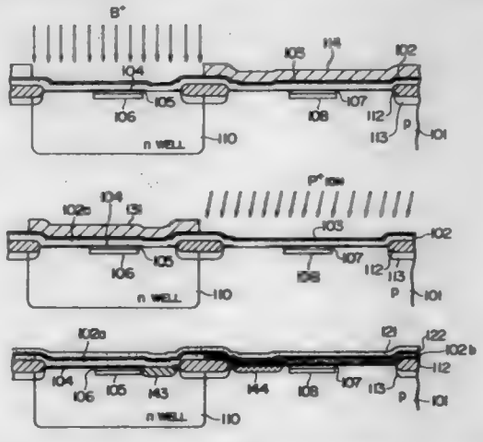
Yasuyuki Saito, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 533,867, Jun. 6, 1990, abandoned. This application Jul. 23, 1993, Ser. No. 95,995

Claims priority, application Japan, Jun. 8, 1989, 1-145641

Int. Cl.[6] H01L *21/76*

U.S. Cl. 437—57 **2 Claims**



1. A method of manufacturing a CMOS semiconductor device comprising the steps of:

forming an n-type well in a part of a p-type semiconductor substrate;

forming a gate oxide film on the surface of the semiconductor substrate and on the n-type well, said gate oxide film having holes, exposing the semiconductor substrate, corresponding to a region where a drain of an n-channel transistor in the p-type semiconductor substrate is to be formed and to a region where a drain of a p-channel transistor in the n-type well is to be formed;

forming punch-through current suppression layers and counter-dose regions under regions where gates of the p-channel and n-channel transistors are to be formed;

depositing a polysilicon film on said gate oxide film and on the semiconductor surface exposed through said holes;

depositing an amorphous film on said polysilicon film, wherein said amorphous film is a refractory metal

selectively forming a first resist film having a hole corresponding to said n-type well;

implanting boron ions through the amorphous film into said polysilicon film over the n-type well;

removing said first resist film;

selectively forming a second resist film having a hole corresponding to a region where said n-channel transistor is to be formed;

implanting n-type impurity ions into said polysilicon film within the region where said n-channel transistor is to be formed; and

heat processing to diffuse boron and n-type impurity regions into said n-type well and p-type substrate, respectively, to form impurity diffusion regions at the portions where drains are to be formed.

5,464,790

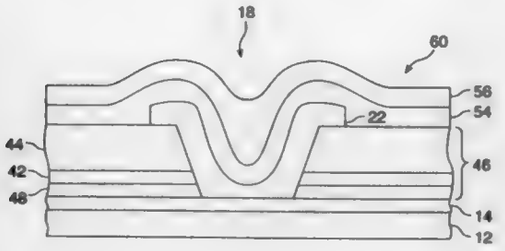
METHOD OF FABRICATING AN ANTIFUSE ELEMENT HAVING AN ETCH-STOP DIELECTRIC LAYER

Frank W. Hawley, Campbell, Calif., assignor to Actel Corporation, Sunnyvale, Calif.

Division of Ser. No. 197,102, Feb. 15, 1994, which is a continuation of Ser. No. 950,264, Sep. 23, 1992, abandoned. This application Jul. 28, 1994, Ser. No. 282,145

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—60 **10 Claims**



1. A process for fabricating an antifuse via comprising the steps of:

forming a first etch-stop dielectric layer from a first dielectric material over an underlying layer;

forming an isolation dielectric layer from a second dielectric material over said first etch-stop dielectric layer;

etching an antifuse via through said isolation dielectric layer with an etching process having a selectivity between said first and second dielectric materials, performing an over-etch process of from about 30–70% using said first etch-stop dielectric layer as an etch stop; and

etching said antifuse via through said first etch-stop dielectric layer with an etching process having a selectivity between said second dielectric material and said underlying layer, performing an over-etch process of from about 30–70% using said underlying layer as an etch stop.

5,464,791

METHOD OF FABRICATING A MICRO-TRENCH STORAGE CAPACITOR

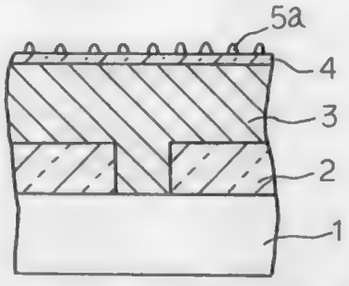
Toshiyuki Hirota, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 30, 1994, Ser. No. 297,964

Claims priority, application Japan, Aug. 31, 1993, 5-237271

Int. Cl.[6] H01L *21/8242*

U.S. Cl. 437—60 **42 Claims**



1. A method of forming a plurality of trenches in a film having an electrical conductivity comprising the steps of:

forming a film having an electrical conductivity;

depositing a silicon oxide film on said electrically conductive film;

forming a polysilicon film doped with an impurity on said silicon oxide film;

subjecting said polysilicon film to an etchant for causing a segregation of said impurity into crystal grains and subsequent selective removal of said polysilicon film to leave only said crystal grains on said silicon oxide film;

subjecting said silicon oxide film to an anisotropic dry etching by use of said crystal grains as a first mask so as to leave only part of said silicon oxide film covered by said crystal grains; and

subjecting said electrically conductive film to an anisotropic dry etching by use of said remaining silicon oxide film as a second mask for a selective removal of said electrically conductive film to form a plurality of trenches in said electrically conductive film.

5,464,792

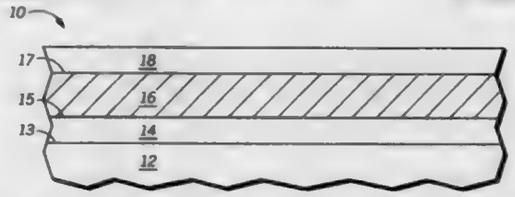
PROCESS TO INCORPORATE NITROGEN AT AN INTERFACE OF A DIELECTRIC LAYER IN A SEMICONDUCTOR DEVICE

Hsing-Huang Tseng, and Philip J. Tobin, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 71,885, Jun. 7, 1993, Pat. No. 5,407,870. This application Jan. 27, 1994, Ser. No. 186,957

Int. Cl.[6] H01L *21/225*

U.S. Cl. 437—160 **19 Claims**



1. A process for fabricating a semiconductor device (10) comprising the steps of:

providing a substrate (12);

forming a first dielectric layer (14) on the substrate;

depositing a buffer layer (16) on the first dielectric layer;

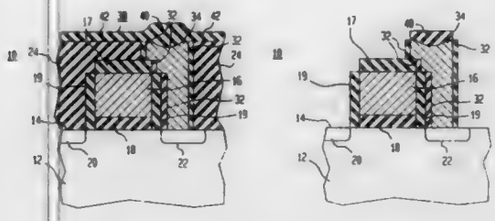
depositing an oxynitride layer on the buffer layer; and

annealing the device to diffuse nitrogen from the oxynitride layer through the buffer layer and into the first dielectric layer to create a region of high nitrogen concentration near an interface (15) between the buffer layer and the first dielectric layer.

5,464,793
METHOD OF MAKING CONTACT FOR SEMICONDUCTOR DEVICE

Siegfried Roehl, Sauerlach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 160,318, Nov. 29, 1993, abandoned, which is a continuation of Ser. No. 937,921, Aug. 31, 1992, abandoned. This application Oct. 3, 1994, Ser. No. 317,151
Int. Cl.[6] H01L *21/44*
U.S. Cl. 437—186 **14 Claims**



8. A method of making a conductive contact to a surface of a body of a semiconductor material comprising the steps of:

depositing on the surface of the body a layer of undoped polysilicon;

forming an opening through the undoped polysilicon layer to the surface of the body;

coating side walls of the opening with a layer of silicon nitride;

filling the remaining portion of the opening with doped polysilicon;

heating the doped and undoped polysilicon in an oxidizing atmosphere to grow a layer of silicon dioxide thereon which is thicker over the doped polysilicon than over the undoped polysilicon;

etching the silicon dioxide layer so as to remove a portion thereof over the undoped polysilicon while leaving a portion of the silicon dioxide layer over the doped polysilicon;

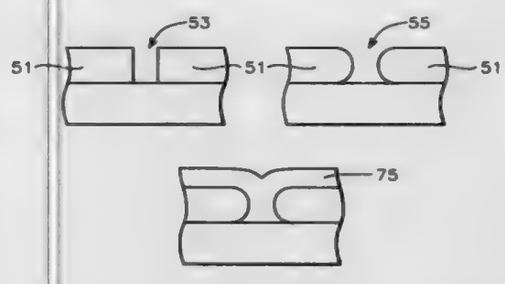
removing the undoped polysilicon; and

forming a layer of a dielectric material on the body surface surrounding the doped polysilicon.

5,464,794
METHOD OF FORMING CONTACT OPENINGS HAVING CONCAVO-CONCAVE SHAPE

Water Lur, Taipei, and Jiun Y. Wu, Dou-Lio, both of, Taiwan, Prov. of China, assignors to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Filed May 11, 1994, Ser. No. 241,005
Int. Cl.[6] H01L *21/283*
U.S. Cl. 437—187 **4 Claims**



1. A method of forming contact openings having concavo-concave profiles in the fabrication of an integrated circuit comprising:

providing a glasseous premetal dielectric layer over the surface of a semiconductor substrate;

etching said contact openings through said glasseous premetal dielectric layer wherein said contact openings have vertical sidewalls and are of a first width;

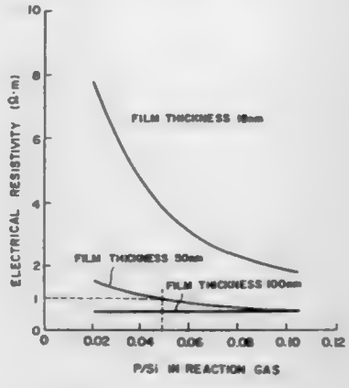
reflowing said glasseous premetal dielectric layer to transform each said vertical sidewall to a concave shape wherein said contact opening will have a concavoconcave shape and wherein the width of said opening at the narrowest point will be of a second width less than said first width and wherein the bottom of said opening has a width equal to the first width

and filling said contact opening with conductive material.

5,464,795
METHOD OF FORMING POLYCRYSTALLINE SILICON THIN FILMS FOR SEMICONDUCTOR DEVICES

Shizuo Oguro, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 1, 1994, Ser. No. 203,559
Claims priority, application Japan, Mar. 2, 1993, 5-040800
Int. Cl.[6] H01L *21/20*
U.S. Cl. 437—233 **5 Claims**



1. A method of forming a semiconductor thin film, the method comprising the steps of:

introducing a dopant impurity;

depositing an amorphous silicon thin film by a chemical vapor deposition (CVD) process while said dopant impurity is being introduced, and

heat-treating said deposited amorphous silicon thin film for polycrystallization,

said deposited amorphous silicon thin film having a thickness of 50 nanometers or below, and said dopant impurity having number of atoms D in a ratio with respect to a silicon (Si) having number of atoms S in a reaction gas such that the ratio D/S is 0.05–0.2.

5,464,796
7-ISOINDOLINYL-QUINOLONE-CARBOXYLIC ACID DERIVATIVES

Uwe Petersen, Leverkusen; Andreas Krebs, Odenthal; Thomas Schenke, Bergisch Gladbach; Franz Kunisch, Odenthal-Glöbusch; Thomas Philipps, Köln; Klaus Grohe, Odenthal; Klaus-Dieter Bremm, Wuppertal; Rainer Endermann, Wuppertal; Karl-Georg Metzger, Wuppertal; Ingo Haller, Wuppertal, and Hans-Joachim Zeiler, Wuppertal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

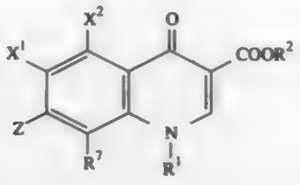
Filed Jun. 11, 1992, Ser. No. 896,955

Claims priority, application Germany, Jun. 22, 1991, 41 20 646.0

Int. Cl.[6] C07D *215/38*; A61K *31/47*

U.S. Cl. 514—312 **10 Claims**

1. A quinolinecarboxylic acid or ester thereof of the formula



in which

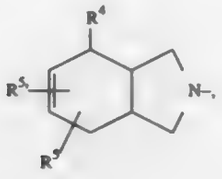
X^1 is halogen,

X^2 is hydrogen, amino, alkylamino having 1 to 4 carbon atoms, dialkylamino having 1 to 3 carbon atoms per alkyl group, hydroxyl, alkoxy having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, halogen or methyl,

R^1 is alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, 2-hydroxyethyl, 2-fluoroethyl, or phenyl which is optionally substituted by 1 or 2 fluorine atoms,

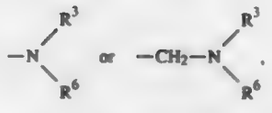
R^2 is hydrogen, alkyl having 1 to 4 carbon atoms which is optionally substituted by hydroxyl, methoxy, amino, methylamino or dimethylamino, or (5-methyl-2-oxo-1,3-dioxol-4-yl)-methyl,

Z is a radical having the structure



wherein

R^4 is



wherein R^3 is hydrogen, optionally hydroxyl-substituted C_1–C_3-alkyl, or alkoxycarbonyl having 1 to 4 C atoms in the alkoxy part and

R^6 is hydrogen or methyl,

R^5 is hydrogen, C_1–C_3-alkyl or cyclopropyl,

$R^{5'}$ is hydrogen or methyl, and

R^7 is H, halogen, methyl, hydroxyl or methoxy,

or a pharmaceutically usable hydrate, acid addition salt or alkali metal, alkaline earth metal, silver or guanidinium salt thereof.

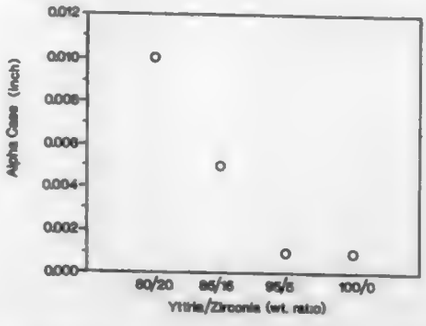
5,464,797
YTTRIA-ZIRCONIA SLURRIES AND MOLD FACECOATS FOR CASTING REACTIVE METALS

Mehrdad Yasrebi, Clackamas; William W. Kemp, Milwaukie; David H. Sturgis, Gladstone, all of Oreg.; Douglas G. Nikolas, Battleground; Gary L. Wright, Brush Prairie, both of Wash.; Thomas J. Kelly, III, Gresham, Oreg.; Mark E. Springgate, Portland, Oreg., and Ted R. Crego, Gladstone, Oreg., assignors to Precision Castparts Corporation, Portland, Oreg.

Division of Ser. No. 89,259, Jul. 8, 1993, Pat. No. 5,407,001. This application Dec. 5, 1994, Ser. No. 349,257

Int. Cl.[6] C04B *35/505*; C22C *1/00*; *3/00*

U.S. Cl. 501—103 **8 Claims**



1. A composition for forming ceramic molds, comprising an aqueous slurry of from about 20 weight percent to about 90 weight percent fused yttria-zirconia, wherein the fused yttria-zirconia has from about 0.1 weight percent to about 20.0 weight percent zirconia.

5,464,798
CERAMIC-ZEOLITE COMPOSITE MEMBRANES AND USE FOR SEPARATION OF VAPOR/GAS MIXTURES

Meng-Dong Jia, P.O. Box 914, Beijing, China, and Richard D. Noble, 1262 Bear Mountain Ct., Boulder, Colo. 80303

Filed Feb. 24, 1994, Ser. No. 201,472

Int. Cl.[6] B01J *29/06*

U.S. Cl. 502—64 **14 Claims**

1. A method for synthesizing a continuous zeolite membrane comprising:

a) placing a zeolite-forming gel inside a porous substrate membrane container, said container having at least one opening and an inner wall;

b) capping the end(s) of the container;

c) heating the capped container, and, in turn, forcing water within the gel to permeate through the pores of the substrate container thereby forming a continuous zeolite layer on the inner wall of the substrate container, and

d) calcining the zeolite layer.

5,464,799
ZEOLITE NU-85 CATALYST

John L. Casci, Cleveland; Mervyn D. Shannon, Cheshire, and Ivan J. S. Lake, Cleveland, all of, England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 717,194, Jun. 18, 1991, Pat. No. 5,385,718. This application Nov. 9, 1994, Ser. No. 338,142

Claims priority, application United Kingdom, Jun. 21, 1990, 9013859

Int. Cl.[6] B01J *29/06*

U.S. Cl. 502—65 **4 Claims**

1. A catalyst comprising zeolite NU-85 having a composition expressed on an anhydrous basis, in terms of mole ratios of oxide, by the formula:

100 XO_2: less than or equal to 10 Y_2O_3: less than or equal to 20 $R_{2/n}O$

where R is one or more cations of valency n, X is silicon and/or germanium, Y is one or more of aluminum, iron, gallium, boron, titanium, vanadium, zirconium, molybdenum, arsenic, antimony, chromium and manganese and having, in its as-prepared form, lattice images which, when orientated to show the20±0.2 Angstrom fringes of zeolite EU-1 exhibit intergrown 12.5±0.2 Angstrom fringes together with said 20±0.2 Angstrom fringes and/or a X-ray diffraction pattern including the lines shown in Table 1 in which R is at least partially hydrogen.

5,464,800

STABLE, HIGH-YIELD REFORMING CATALYST

Leonid B. Galperin, Chicago; Paula L. Bogdan, Mount Prospect, and Edwin P. Boldingh, Arlington Heights, all of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 194,973, Feb. 14, 1994, Pat. No. 5,384,038, which is a division of Ser. No. 974,544, Nov. 12, 1992, Pat. No. 5,314,854. This application Jan. 24, 1995, Ser. No. 378,117

Int. Cl.[6] B01J *29/60;29/068*

U.S. Cl. 502—66 **10 Claims**

1. A catalyst particle for the conversion of hydrocarbons comprising:

(a) a multigradient noble-metal component comprising platinum and ruthenium;

(b) a nonacidic large-pore molecular sieve; and,

(c) an inorganic-oxide binder.

5,464,801

CATALYST COMPOSITIONS COMPRISING RHODIUM CATALYST COMPLEXES

Jeffrey A. Kocal, Midland, and Anthony Revis, Freeland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Dec. 30, 1993, Ser. No. 176,168

Int. Cl.[6] B01J *23/46;31/28*

U.S. Cl. 502—172 **10 Claims**

1. A catalyst composition comprising:

(A) a rhodium catalyst;

(B) an allyl ester, vinyl ester, or unsaturated acetate; and

(C) an alcohol having 3 or more carbon atoms.

5,464,802

PROCESS FOR PREPARING A SUPPORTED METAL CATALYST FOR THE SELECTIVE HYDROGENATION OF HYDROCARBONS BY MEANS OF SUCH A PROCESS AND PROCESS FOR SELECTIVE HYDROGENATION OF HYDROCARBONS USING SUCH A CATALYST

Giuseppe Gubitosa, Novara, and Alberto Cremona, Cusano Milanino, both of, Italy, assignors to Ministero Dell'Universita' E Della Ricerca Scientifica E Tecnologica, Rome, Italy

Filed Apr. 23, 1993, Ser. No. 52,249

Claims priority, application Italy, Apr. 23, 1992, MI92A0967

Int. Cl.[6] B01J *31/00;27/122;23/72*

U.S. Cl. 502—331 **11 Claims**

1. Process for preparing a Pd and Cu-containing catalyst for the selective hydrogenation of polyunsaturated hydrocarbons, wherein said process comprises the following sequential steps:

(a) impregnating a porous support with a palladium and potassium salt solution,

(b) submitting the solid material obtained from the step (a) to a flowing hydrogen stream,

(c) impregnating the solid material obtained from the step (b) with a solution of a copper salt,

(d) submitting the solid material obtained from the step (c) to a flowing hydrogen stream,

(e) and drying the resulting solid product,

with the proviso that the resulting catalyst comprises from 0.05% to 0.4% by weight Pd, from 0.01% to 0.2% by weight Cu, and from 0.01% to 3% by weight K.

5,464,803

PRESSURE-SENSITIVE RECORD MATERIAL

Gordon B. McGuinness, Chilwell, and Richard D. Saunders, Windsor, both of, England, assignors to The Wiggins Teape Group Limited, England

Filed Jun. 3, 1993, Ser. No. 70,777

Claims priority, application United Kingdom, Jun. 4, 1992, 9211854; Jan. 15, 1992, 9221607

Int. Cl.[6] B41M *5/20*

U.S. Cl. 503—213 **19 Claims**

1. A chromogenic composition for use in pressure-sensitive record material, said composition comprising chromogenic material in a vegetable oil vehicle, the vehicle:

having a melting point such as to be solid or semi-solid at ambient temperatures of around 20°–25° C.;

being at least a major proportion of relatively high melting vegetable oil which is solid or semi-solid at said ambient temperatures; and

being substantially free of an ester of a non-aromatic monocarboxylic acid having a saturated or unsaturated straight or branched hydrocarbon chain with at least three carbon atoms in the chain.

5,464,804

THERMAL RECORDING MATERIAL

Hiroshi Kawakami; Chiyoshi Nozaki, and Ken Iwakura, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 36,390, Mar. 24, 1993, Pat. No. 5,288,688. This application Sep. 30, 1993, Ser. No. 128,662

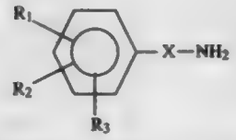
Claims priority, application Japan, Mar. 24, 1992, 4-066212; Sep. 30, 1992, 4-286873

The portion of the term of this patent subsequent to Feb. 22, 2011, has been disclaimed.

Int. Cl.[6] B41M *5/30*

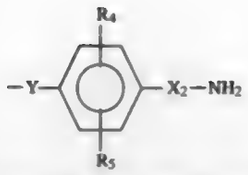
U.S. Cl. 503—217 **6 Claims**

1. A thermal recording material comprising, on a support, a heat-sensitive coloring layer containing an electron-donating colorless dye, an isocyanate compound and an amino compound, wherein the electron-donating colorless dye is a black-coloring aminofluoran substituted with 2-arylamino-3-H, a halogen atom or a 6-alkyl, and wherein the amino compound is represented by formula (I):



(I)

wherein X represents a direct bond, —CO—, —SO_2—, —CONH— or —SO_2NH—; R_1, R_2, and R_3 each represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, a sulfonyloxy group, an oxycarbonyl group, a carbamoyl group, a sulfamoyl group, an oxysulfonyl group, an acyl group, a sulfonyl group, a halogen atom, a nitro group, a cyano group, a hydroxyl group, —$CONH_2$, —SO_2NH_2, —$CONHNH_2$, —SO_2NHNH_2 or a group represented by formula (II):



(II)

wherein Y represents a divalent group; R_4 and R_5 each represents a hydrogen atom, an alkyl group, an aryl group, an alkoxy group, an acyl group, a sulfonyl group, a halogen atom, a nitro group or a cyano group; X_2 represents a direct bond, —CO—, —SO_2—, —CONH— or —SO_2NH; and the R_1, R_2, R_3, R_4 and R_5 substituents may optionally be substituted with a substituent having 1 to 8 carbon atoms, and

R_1 and R_2, and R_4 and R_5 may be bonded to each other to form a ring.

5,464,805

METHOD OF CONTROLLING MILDEW IN CULTIVATED PLANTS

Anthony E. Winston, East Brunswick, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Division of Ser. No. 149,310, Nov. 9, 1993, which is a continuation-in-part of Ser. No. 984,532, Dec. 2, 1992, abandoned. This application Mar. 23, 1995, Ser. No. 408,787

The portion of the term of this patent subsequent to Jun. 13, 2012, has been disclaimed.

Int. Cl.[6] **A01N** *37/02;59/00;* **C05G** *3/02;3/06*

U.S. Cl. 504—101 **7 Claims**

1. A method for controlling mildew disease in cultivated plants which comprises contacting the plant matter with a fungicidally effective application of an aqueous formulation which has a content comprising (1) about 0.1–2 weight percent of an ingredient selected from the group consisting of alkali metal and ammonium bicarbonates; (2) about 0.05–1.5 weight percent of a basic ingredient selected from the group consisting of alkali metal and ammonium carbonates; (3) about 0.05–2 weight percent of a surfactant ingredient selected from the group consisting of alkali metal and ammonium C_8–C_{22} aliphatic-containing carboxylate, sulfonate, sulfate and phosphate salts; (4) about 0.01–0.5 weight percent of a water-soluble pseudoplastic thickener ingredient; and (5) about 0.1–2 weight percent of an ingredient selected from the group consisting of phosphorus-containing fertilizer compounds; based on the formulation weight; wherein the ingredients have a formulated fertilizer-effective amount and ratio of nitrogen, phosphorus and potassium elements; and. wherein the pH of the formulation is in the range between about 7.5–10.5.

5,464,806

GLYPHOSATE-CONTAINING HERBICIDAL COMPOSITIONS HAVING ENHANCED EFFECTIVENESS

James W. Kassebaum, Manchester; Miguel M. Dayawon, St. Louis, and Joseph J. Sandbrink, Des Peres, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 22,811, Feb. 22, 1993, Pat. No. 5,258,359, which is a continuation of Ser. No. 739,589, Aug. 2, 1991, abandoned. This application Aug. 3, 1993, Ser. No. 101,626

Int. Cl.[6] **A01N** *25/30;57/04*

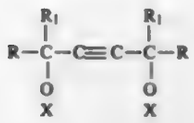
U.S. Cl. 504—206 **17 Claims**

1. A method of controlling vegetation by the use of a glyphosate-containing herbicidal composition applied to foliage of plants comprising the steps of:

1. intimately mixing the following ingredients to form an aqueous solution

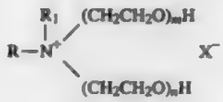
a) a herbicidally effective amount of glyphosate and/or glyphosate salt;

b) about 0.01 part to about 1 part of an acetylenic diol surfactant having the following structural formula per part of glyphosate acid equivalent:



wherein X is hydrogen or $(R_2O)_n$—H where R_2 is ethylene and n is the average number of repeating ethylene oxide units with n being a number of 1 to about 100, R is hydrogen or lower alkyl group containing 1 to about 8 carbon atoms and R_1 is methyl, ethyl, cyclopropyl, or phenyl;

c) about 0.01 part to about 1 part of an ethoxylated quaternary amine surfactant having the following molecular structure per part of glyphosate acid equivalent:



wherein R is a C_8–C_{20}alkyl, R_1 is methyl or ethyl, m+n total 2 to about 25 and X is a suitable counterion; and

d) water;

2. applying the resulting solution of step 1 to foliage of plants; whereby the solution has enhanced resistance from being removed from the plants by a subsequently applied gentle spray of water.

5,464,807

METHODS OF USING GLYPHOSATE COMPOSITIONS COMPRISING ALKOXYLATED QUATERNARY AMMONIUM SURFACTANTS

Jean-Pierre Claude, Overijse; Shuaib A. Khan, and Robert W. Mitchell, both of Brussels, all of, Belgium, assignors to Monsanto Company, St. Louis, Mo.

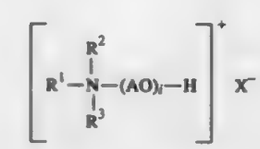
Division of Ser. No. 649,105, Feb. 1, 1991, abandoned. This application Sep. 23, 1994, Ser. No. 311,824

Claims priority, application United Kingdom, Feb. 5, 1990, 9002495

Int. Cl.[6] **A01N** *25/30;57/04*

U.S. Cl. 504—206 **6 Claims**

1. A method of controlling vegetation comprising spraying on the foliage of the vegetation a water based composition of a glyphosate herbicide having reduced foam in a herbicidally effective amount and a quaternary ammonium compound having the formula:



wherein A or each A represents an alkylene group having 2 or 3 carbon atoms, R^1 and R^2 are each independently an alkyl group having from 1 to 5 carbon atoms; R^3 is an alkyl group having from 1 to 5 carbon atoms or a group having the formula $(AO)_j$—H; i (in a compound in which R^3 is an alkyl group) or i+j (in a compound in which R^3 is a group having the formula $(AO)_j$—H) has a value of from 2 to 20; and X^- is a suitable anion in an amount sufficient to enhance the herbicidal effectiveness thereof.

5,464,808

1-[α-CYCLOPROPYL-α-(SUBSTITUTED OXY)-O-TOLYL]SULFAMOYL]-3-(4,6-DIMETHOXY-2-PYRIMIDINYL)UREA HERBICIDAL AGENTS

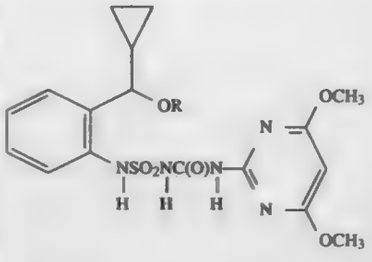
Michael E. Condon, Lawrenceville, and Philip M. Harrington, Cranbury, both of N.J., assignors to American Cyanamid Company, Wayne, N.J.

Filed Dec. 28, 1993, Ser. No. 174,506

Int. Cl.[6] C07D *239/69;239/52;239/42;* **A01N** *43/54*

U.S. Cl. 504—214 **25 Claims**

1. A compound having the structural formula



wherein

R is hydrogen, C(O)R_1, or C_1–C_6alkyl optionally interrupted by one O or S atom, or optionally substituted with one or more C_1–C_4alkoxy, halogen, hydroxy, oxo or C_1–C_6carbalkoxy groups;

R_1 is C_1–C_6alkyl, optionally substituted with one or more C_1–C_4alkoxy, halogen or hydroxy groups, phenyl optionally substituted with one or more C_1–C_4alkyl, C_1–C_4alkoxy, halogen or hydroxy groups, or NR_2R_3; and

R_2 and R_3 are each independently hydrogen or C_1–C_6alkyl.

5,464,809

FUNGICIDAL 2-METHOXIMINOCARBOXYLIC ESTERS

Wolfgang Krämer, Burscheid; Dieter Berg, Wuppertal; Heinz-Wilhelm Dehne, Monheim, and Stefan Dutzmann, Hilden, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

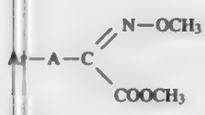
Division of Ser. No. 163,495, Dec. 7, 1993, Pat. No. 5,380,914, which is a division of Ser. No. 709,937, Jun. 4, 1991, Pat. No. 5,312,960. This application Sep. 12, 1994, Ser. No. 304,756

Claims priority, application Germany, Jun. 16, 1990, 40 19 307.1

Int. Cl.[6] A01N *43/66*

U.S. Cl. 504—227 **8 Claims**

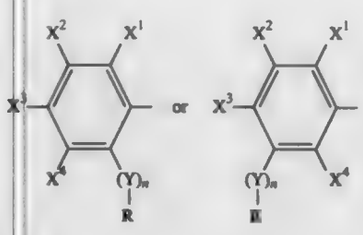
1. A 2-methoximinocarboxylic ester of the formula



(I)

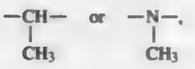
in which

Ar represents



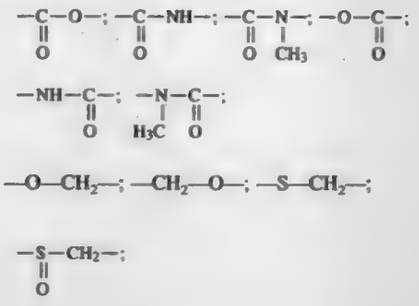
and

A represents —CH_2—;



where

Y represents



—SO_2—CH_2—; —O—; —CH=CH— or —CH_2—CH_2—;

n represents the number 0 or 1,

R represents optionally substituted heteroaryl, and

X^1, X^2, X^3 and X^4 each independently represents hydrogen, halogen, hydroxyl or methoxy, but in the event that X^2 represents bromine X^3 does not simultaneously represent hydroxyl or methoxy.

5,464,810

SUBSTITUTED TRIAZOLINONES

Wilhelm Haas, Pulheim; Karl-Heinz Linker, Leverkusen; Otto Schallner, Monheim; Kurt Findeisen; Hans-Joachim Santel, both of Leverkusen, and Markus Dollinger, Leichlingen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

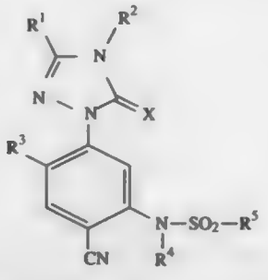
Filed Jan. 28, 1994, Ser. No. 189,017

Claims priority, application Germany, Feb. 5, 1993, 43 03 376.8

Int. Cl.[6] A01N *43/653;* **C07D** *249/12*

U.S. Cl. 504—273 **8 Claims**

1. A triazolinone compound of the formula



(I)

wherein

R^1 represents hydrogen, fluorine, chlorine, bromine, iodine, cyano, hydroxyl or one of the radicals —R^6, —O—R^6, —O—NR^6R^7, —S—R^6, —S(O)—R^6 or —SO_2—R^6,

R^2 represents hydrogen, hydroxyl, amino, cyano or one of the radicals —R^6, —O—R^6 or —N=CR^6R^7,

R^3 represents hydrogen, fluorine, chlorine, bromine, iodine, a straight chain or branched alkyl having from 1 to 8 carbon atoms or a straight chain or branched halogenoalkyl having from 1 to 8 carbon atoms and from 1 to 17 halogen atoms which may be identical or different,

R^4 represents hydrogen, one of the radicals —R^6, —O—R^6 or —SO_2—R^6, one equivalent of an alkali metal or alkaline

earth metal cation, or an ammonium cation which is optionally singly or multiply substituted by alkyl(s) having from 1 to 16 carbon atoms and which are identical or different, and

R^5 represents amino, hydroxyl or one of the radicals —R^6 or —NR^6R^7, and

X represents oxygen or sulphur, where

R^6 represents straight chain or branched alkyl having from 1 to 14 carbon atoms and which is optionally singly or multiply substituted wherein the substituents are selected from the group consisting of halogen, cyano, carboxyl, carbamoyl, alkoxy, alkoxyalkoxy, alkylthio, alkylsulphinyl, alkylsulphonyl, alkoxycarbonyl, N-alkylaminocarbonyl, N,N-dialkylaminocarbonyl, trialkylsilyl and alkylsulphonylaminocarbonyl wherein said alkyl moieties are straight chain or branched and each have from 1 to 8 carbon atoms; or

R^6 represents alkenyl or alkinyl each having from 2 to 8 carbon atoms and which are optionally singly or multiply substituted by halogen which may be identical or different; or

R^6 represents cycloalkyl having from 3 to 7 carbon atoms and which is optionally singly or multiply substituted by halogen which is identical or different or straight chain or branched alkyl having from 1 to 4 carbon atoms; or

R^6 also represents arylalkyl or aryl each having from 6 to 10 carbon atoms in the aryl part and optionally from 1 to 4 carbon atoms in the straight chain or branched alkyl part and which are optionally singly or multiply substituted in the aryl part by substituents which are identical or different and the substituents are halogen, cyano, nitro, amino, N-acetylamino, or alkyl, alkoxy, alkylthio, alkylsulphinyl or alkylsulphonyl which are straight chain or branched and each have from 1 to 6 carbon atoms, halogenoalkyl, halogenoalkoxy, halogenoalkylthio, halogenoalkylsulphinyl or halogenoalkylsulphonyl which are straight chain or branched and each have 1 to 6 carbon atoms and from 1 to 13 halogen atoms which may be identical or different, alkoxycarbonyl or alkoximinoalkyl which are straight chain or branched and each have from 1 to 6 carbon atoms in the individual alkyl parts and optionally substituted phenyl wherein the substituents are identical or different and are selected from the group consisting of halogen, straight chain or branched alkyl, straight chain or branched halogenoalkyl and halogenoalkoxy wherein said alkyl moieties have 1 to 6 carbon atoms;

R^7 represents hydrogen or straight chain or branched alkyl having from 1 to 8 carbon atoms and which is optionally singly or multiply substituted wherein the substituents are halogen, cyano, carboxyl, carbamoyl, or alkoxy, alkoxyalkoxy, alkylthio, alkylsulphinyl, alkylsulphonyl, alkoxycarbonyl, N-alkylaminocarbonyl, N,N-dialkylaminocarbonyl, trialkylsilyl or alkylsulphonylaminocarbonyl which are straight chain or branched and each have from 1 to 8 carbon atoms in the individual alkyl moieties; or

R^7 represents alkenyl or alkinyl each having from 2 to 8 carbon atoms and which are optionally singly or multiply substituted by halogen which may be identical or different; or

R^7 represents cycloalkyl having from 3 to 7 carbon atoms and which is optionally singly or multiply substituted by halogen or straight chain or branched alkyl having from 1 to 4 carbon atoms; or

R^7 represents arylalkyl or aryl each having from 6 to 10 carbon atoms in the aryl part and optionally from 1 to 4 carbon atoms in the straight chain or branched alkyl part and which are optionally singly or multiply substituted in the aryl part wherein the substituents are halogen, cyano, nitro, or alkyl, alkoxy, alkylthio, alkylsulphinyl or alkylsulphonyl which are straight chain or branched and each have from 1 to 6 carbon atoms, halogenoalkyl, halogenoalkoxy, halogenoalkylthio, halogenoalkylsulphinyl or halogenoalkylsulphonyl which are each straight chain or branched and each have from 1 to 6 carbon atoms and from 1 to 13 halogen atoms which are identical or different, alkoxycarbonyl or alkoximinoalkyl which are straight chain or branched and each have from 1 to 6 carbon atoms in the individual alkyl parts and optionally substituted phenyl wherein the substituents are identical or different and are halogen, straight chain or branched alkyl or alkoxy, having straight chain or branched halogenoalkyl or halogenoalkoxy wherein said alkyl moieties have 1 to 6 carbon atoms.

5,464,811

BENZENE DERIVATIVES SUBSTITUTED WITH HETEROCYCLIC RING AND HERBICIDES CONTAINING SAME AS ACTIVE INGREDIENTS

Kenji Hirai; Mitsuo Yamashita; Tomoko Tateno; Emiko Ejiri; Kikuko Harasawa, all of Kanagawa; Yuichi Onji, Chiba; Sadayuki Ugai, Shizuoka, and Shoin Nagato, Saitama, all of, Japan, assignors to Sagami Chemical Research Center, Tokyo; Chisso Corporation, Osaka, and Kaken Pharmaceutical Co., Ltd., Tokyo, all of, Japan

Division of Ser. No. 855,694, May 6, 1992, Pat. No. 5,424,277.

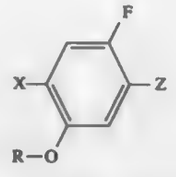
This application Mar. 24, 1995, Ser. No. 409,453

Claims priority, application Japan, Jul. 17, 1990, 2-187163; Jul. 17, 1990, 2-187164

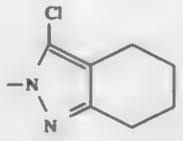
Int. Cl.[6] A01N *43/56*; C07D *231/56*

U.S. Cl. 504—281 **4 Claims**

1. A benzene derivative substituted with a heterocyclic ring represented by the formula:



wherein R represents a cycloalkyl group having 3 to 8 carbon atoms, X represents a halogen atom, and Z represents



in which said cycloalkyl group may be substituted with an alkyl group having 1 to 6 carbon atoms.

5,464,812

THIN FILM OF OXIDE SUPERCONDUCTOR POSSESSING LOCALLY DIFFERENT CRYSTAL ORIENTATIONS AND PROCESSES FOR PREPARING THE SAME

Hiroshi Inada, and Michitomo Iiyama, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

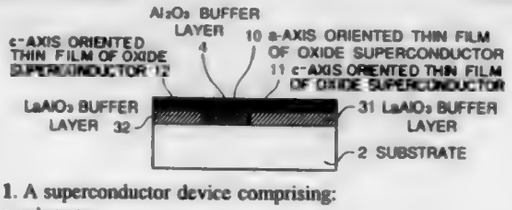
Continuation of Ser. No. 845,420, Mar. 4, 1992, abandoned.

This application Feb. 24, 1994, Ser. No. 201,080

Claims priority, application Japan, Mar. 4, 1991, 3-062602; Mar. 4, 1991, 3-062603

Int. Cl.[6] B32B *9/00*

U.S. Cl. 505—237 **6 Claims**



1. A superconductor device comprising:

a substrate;

a first buffer layer portion deposited on said substrate and formed of a material having a crystal structure such that a thin film of superconducting oxide superconductor whose c-axis is oriented along a direction which is perpendicular to said substrate is easily grown thereon, said first buffer portion being made of $LaAlO_3$ or $PrGaO_3$;

a second buffer layer portion deposited on said substrate and formed of a material having a crystal structure such that a thin film of superconducting oxide superconductor whose c-axis is oriented along a direction which is parallel to said substrate is easily grown thereon, said second buffer layer portion being made of Al_2O_3 or MgO;

a first superconductor portion deposited on said first buffer layer portion; and

a second superconductor portion deposited on said second buffer layer portion, said first and second superconductor portions having a substantially same thickness and being both composed of an oxide superconductor selected from the group of a Y-Ba-Cu-O oxide superconductor, a Bi-Sr-Ca-Cu-O oxide superconductor, and a Tl-Ba-Ca-Cu-O oxide superconductor.

5,464,813

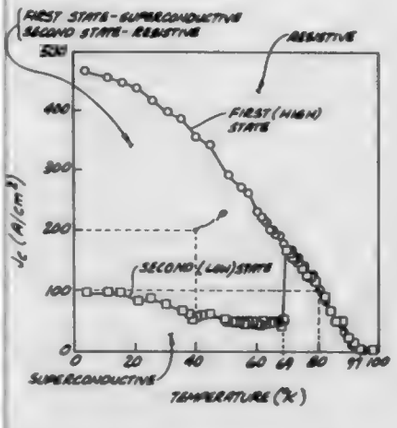
METHOD OF PRODUCING SUPERCONDUCTOR WHICH EXHIBITS CRITICAL CURRENT DENSITY BIFURCATION

Yusuf S. Hascicek, and Louis R. Testardi, both of Tallahassee, Fla., assignors to Florida State University, Tallahassee, Fla.

Division of Ser. No. 644,175, Jan. 22, 1991, Pat. No. 5,286,710. This application Nov. 15, 1993, Ser. No. 152,322

Int. Cl.[6] H01J *39/12*

U.S. Cl. 505—490 **4 Claims**



1. A process for producing a polycrystalline superconducting material which exhibits bifurcation of its critical current density versus temperature curve, said process comprising:

pressing a superconductive yttrium, barium and copper oxide powder, wherein the molar ratio of yttrium:barium:copper is 1:2:3, to form a specimen having a sinterable shape;

sintering said specimen for about 12 hours under an oxygen flow of about 100 cc/minute at a temperature of about 900° C.;

after sintering, heat treating said specimen for about 12 hours under an oxygen flow of greater than about 100 cc/minute at a temperature in the range of 930° C. to 950° C.;

subjecting said specimen to an oxygenation process for about 5 hours under an oxygen flow of about 150 cc/minute at a temperature of about 450° C.

5,464,814

ACELLULAR RED BLOOD CELL SUBSTITUTE

Lakshman R. Sehgal, Flossmoor; Richard E. De Woskin, Mount Prospect; Gerald S. Moss; Steven A. Gould, both of Highland Park; Arthur L. Rosen, Wilmette, and Hanna Sehgal, Flossmoor, all of Ill., assignors to Northfield Laboratories, Inc., Evanston, Ill.

Continuation of Ser. No. 896,734, Jun. 9, 1992, abandoned, which is a continuation of Ser. No. 345,416, Apr. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 876,689, Jun. 20, 1986, Pat. No. 4,826,811. This application Feb. 28, 1994, Ser. No. 203,505

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[6] A61K *37/14*

U.S. Cl. 514—6 **1 Claim**

1. A process for the preparation of a tetramer-free, stroma-free, cross-linked, polymerized, pyridoxylated hemoglobin which process comprises (a) separating hemoglobin from blood and removing red blood cell stromal contaminants by (i) first exposing the blood to carbon monoxide such that the hemoglobin is saturated with carbon monoxide, (ii) then heat treating the hemoglobin for 1–2 hours at 60° C. to 65° C. to cause precipitation of stromal contaminants, and (iii) removing the stroma contaminants by filtration or centrifugation or both, (b) removing carbon monoxide from the hemoglobin, (c) pyridoxylating and polymerizing the hemoglobin, then (d) removing the remaining unpolymerized hemoglobin tetramer, (e) heating the tetramer free, stroma-free cross-linked, polymerized, pyridoxylated hemoglobin to 65°–70° C. for 8–10 hours to reduce viral activity, and (f) isolating the hemoglobin where the isolated hemoglobin has residual methemoglobin reductase enzyme activity ranging from 1.0 to 2.0 units of enzyme activity.

5,464,815

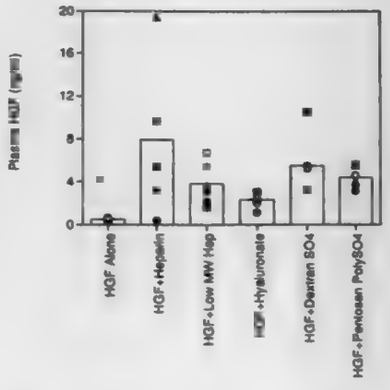
INHIBITION OF HEPARIN-BINDING

Steven Chamow, San Mateo; Nishit Modi, San Bruno; Ralph Schwall, Pacifica, and Thomas Zioncheck, Montara, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 118,162, Sep. 8, 1993, abandoned. This application Jun. 6, 1994, Ser. No. 254,390

Int. Cl.[6] A61K *38/17;38/18;* **C07K** *1/14;* **G01N** *33/68*

U.S. Cl. 514—8 **27 Claims**



1. A method of extending the plasma half-life of a selectin comprising coadministering a therapeutically effective amount of said selectin with a therapeutically acceptable compound capable of inhibiting the binding of said selectin to a low affinity heparin-like binding site on the surface of cells of an organ perfused with blood.

5,464,816

METHOD AND PHARMACEUTICAL COMPOSITIONS FOR TREATING IMMUNODEFICIENCIES

Yoshitaka Nagai, Tokyo; Hayao Abe, Chiba, and Masanobu Arita, Kanagawa, all of, Japan, assignors to Mitsui Pharmaceuticals Inc., Tokyo, Japan

Continuation of Ser. No. 734,259, May 15, 1985, Pat. No. 5,112,810. This application Mar. 26, 1990, Ser. No. 498,637

Int. Cl.[6] A61K *38/04;38/08*

U.S. Cl. 514—2 2 Claims

1. A method for the treatment of Guillain-Barre syndrome comprising administering to a host an effective Guillain-Barre syndrome treating amount of serum thymic factor consisting of a nonapeptide of natural origin having an amino acid sequence of p-Glu-Ala-Lys-Ser-Gln-Gly-Gly-Ser-Asn-OH, wherein p-Glu represents pyroglutamic acid, Ala represents alanine, Lys represents lysine, Ser represents serine, Gln represents glutamine, Gly represents glycine, and Asn represents asparagine.

5,464,817

METHOD FOR REDUCING THE VISCOSITY OF PATHOLOGICAL MUCOID AIRWAY CONTENTS IN THE RESPIRATORY TRACT COMPRISING ADMINISTERING ACTIN-BINDING COMPOUNDS WITH OR WITHOUT DNASE I

Thomas P. Stossel, Belmont; Stuart E. Lind, Wellesley, and Paul A. Janmey, Arlington, all of Mass., assignors to Brigham and Women's Hospital, Boston, Mass.

Continuation-in-part of Ser. No. 774,738, Oct. 10, 1991, Pat. No. 5,260,224, which is a continuation of Ser. No. 507,214, Apr. 11, 1990, abandoned. This application Apr. 2, 1993, Ser. No. 42,247

Int. Cl.[6] C12N *9/00;* C07K *14/00;7/00*

U.S. Cl. 514—2 16 Claims

1. A method for solubilizing mucus in the respiratory tract of a subject comprising the step of administering an efficacious level of at least one actin-binding compound, other than DNase I, into the respiratory tract of said subject wherein said actin-binding compound sequesters actin monomers, severs actin filaments, or prevents or reduces the polymerization of actin.

5,464,818

PROTEIN HAVING CELL GROWTH-STIMULATING AND MACROPHAGE CHEMOTACTIC ACTIONS, PREPARATIVE METHOD THEREFOR AND USE THEREOF

Tadashi Yamaguchi; Hiroshi Uesaka; Kazuo Watanabe, and Juichi Awaya, all of Aichi, Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Aichi, Japan

Filed Dec. 29, 1994, Ser. No. 365,820

Claims priority, application Japan, Dec. 29, 1993, 5-351225

Int. Cl.[6] C12P *21/00;* A61K *38/00;38/02*

U.S. Cl. 514—2 5 Claims

1. A protein derived from a newly isolated strain of *Clostridium perfringens* FERM BP-4584 and having following physicochemical, biological and enzymatic characteristics:

(A) Molecular weight; 420,000±40,000, as determined by gel permeation chromatography with a high-speed liquid chromatography column,

(B) Subunit constitution; a single subunit having a molecular weight of 130,000±20,000, as determined by SDS-polyacrylamide gel electrophoresis,

(C) Isoelectric point; 4.8,

(D) Internal metal; calcium ion,

(E) Electrophoretic characteristics; it shows a single dyed band having an electrophoretic mobility of less than 0.1, when the protein is analyzed by electrophoresis in accordance with the Davis method at a pH of 8.3, an electric current of 20 mA/gel, for two hours by using a polyacrylamide minislab-gel prepared at a straight concentration gradient of 4 to 20%,

(F) Biological activity; cell growth-stimulating action and macrophage chemotactic action,

(G) Enzymatic activity: proteinase activity, and

(H) Enzymatic properties;

1) the activity decreases in the presence of a serine protease inhibitor,

2) the activity increases in the presence of various metal ions, and

3) the activity is stabilized in the presence of calcium ion.

5,464,819

PHYSIOLOGICALLY ACTIVE PEPTIDE HAVING IMMUNOREGULATORY ACTIVITIES

Naoyoshi Suzuki, Tokyo, Japan, assignor to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jul. 12, 1991, Ser. No. 729,353

Claims priority, application Japan, Jul. 12, 1990, 2-182714

Int. Cl.[6] A61K *38/00;* C07K *5/00;7/00;17/00*

U.S. Cl. 514—16 3 Claims

1. A substantially pure, physiologically active peptide consisting of an amino acid sequence represented by a formula selected from the group consisting of formulae (3) to (6):

Glu-Pro-Val-Val (3),

Glu-Glu-Pro-Val-Val (4),

Ala-Glu-Glu-Pro-Val-Val (5),

and

Gly-Ala-Glu-Glu-Pro-Val-Val (6).

5,464,820

SPECIFIC INHIBITORS OF TISSUE KALLIKREIN

James Burton, Jamaica Plain; Zhengxin Dong, Somerville, and Timothy B. Frigo, Watertown, all of Mass., assignors to The University Hospital, Boston, Mass.

Filed Jun. 22, 1993, Ser. No. 79,812

Int. Cl.[6] A61K *37/00;37/02;* C07K *5/00;7/00*

U.S. Cl. 514—16 20 Claims

1. A pharmaceutical composition comprised of a substrate analog of tissue kallikrein with a length of less than 20 amino acids containing a sequence which corresponds to positions 388 to 390 of human kininogen, and which has a 4-amino phenylalanine (Phe(4NH_2)), or a similar modified amino acid, corresponding to position 389, and a pharmaceutically acceptable carrier.

5,464,821

SMALL PEPTIDIC COMPOUNDS USEFUL FOR THE TREATMENT OF GLAUCOMA

Aasmul-Olsen Stig, Skodsborg, Denmark; Fred Widmer, Ryde, Australia, and Kailash K. Gauri, Lentföhrden, Germany, assignors to Caribiotech, Ltd., Denmark

PCT No. PCT/DK92/00095, § 371 Date Sep. 24, 1993, § 102(e) Date Dec. 16, 1993, PCT Pub. No. WO92/16551, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 25, 1992, Ser. No. 122,510

Claims priority, application Denmark, Mar. 25, 1991, 0532/91

Int. Cl.[6] A61K *38/00;* C07K *5/00;7/00;17/00*

U.S. Cl. 514—18 9 Claims

1. A peptidic compound selected from the group consisting of:

H-Gly-Gly-Val-OEt (Sequence ID No. 3),

H-Asn-Gly-Gly-Val-NH_2 (Sequence ID No. 4),

Ac-Gly-Gly-Val-NH_2 (Sequence ID No. 8),

H-Asn-Leu-Gly-Val-NH_2 (Sequence ID No. 5),

H-Gly-Val-Tyr-NH_2 (Sequence ID No. 7),

and pharmaceutically acceptable derivatives and salts thereof.

5,464,822

POLYPEPTIDES AND POLYPEPTIDE ANALOGUES

Enno Christophers; Oliver Wiedow, both of Kiel, and Jens-Michael Schroder, Blumenthal, all of, Germany, assignors to Zeneca Limited, London, England

Continuation of Ser. No. 536,096, Jun. 8, 1990, abandoned. This application Aug. 10, 1992, Ser. No. 926,371

Claims priority, application United Kingdom, Jun. 9, 1989, 8913346; Jun. 9, 1989, 8913349; Sep. 25, 1989, 8921613; Nov. 2, 1989, 8924717

Int. Cl.[6] A61K *38/18; C07K 14/00;14/81*

U.S. Cl. 514—12 **3 Claims**

1. An isolated polypeptide of Formula I Ala-Gln-Glu-Pro-Val-Lys-Gly-Pro-Val-Ser-Thr-Lys-Pro-Gly-Ser-Cys-Pro-Ile-Ile-Leu-Ile-Arg-Cys-Ala-Met-Leu-Asn-Pro-Pro-Asn-Arg-Cys-Leu-Lys-Asp-Thr-Asp-Cys-Pro-Gly-Ile-Lys-Lys-Cys-Cys-Glu-Gly-Ser-Cys-Gly-Met-Ala-Cys-Phe-Val-Pro-Gln.

5,464,823

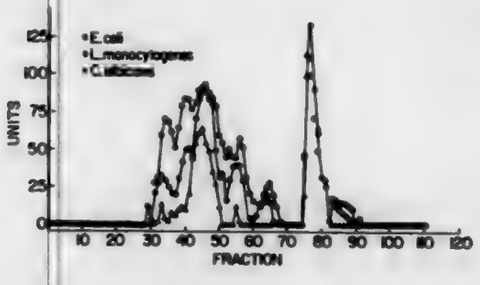
MAMMALIAN ANTIBIOTIC PEPTIDES

Robert I. Lehrer, Santa Monica; Vladimir N. Kokryakov, Los Angeles, and Sylvia S. L. Harwig, Woodland Hills, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 93,926, Jul. 20, 1993. This application Jul. 26, 1993, Ser. No. 95,769

Int. Cl.[6] C07K *7/00;* **A61K** *38/10*

U.S. Cl. 514—13 **18 Claims**



1. A purified and isolated compound having antimicrobial activity against *E. coli, L. monocytogenes* or *Candida albicans*, said compound being of the formula

A_1-A_2-A_3-A_4-A_5-C-A_7-C-A_9-A_{10}-A_{11}-A_{12}-C-A[13]-(SEQ ID NO: 9)

and the N-terminal acylated, C-terminal amidated or esterified and the cystine-bridged forms thereof

wherein A_1, A_9, A_{10} and A_{11} are basic amino acids;

A_2 and A_3 are small amino acids;

A_5, A_7, A_{12}, A_{14} and A_{16} are hydrophobic amino acids; and

A_4 is a basic or a small amino acid;

A_{17} is not present or, if present, is a small amino acid;

A_{18} is not present or, if present, is a basic amino acid.

5,464,824

USE OF FURANONES AS PERFUMING INGREDIENTS

Jean-Marc Gandin, Annemasse, France, assignor to Firmenich SA, Geneva, Switzerland

PCT No. PCT/EP93/03164, § 371 Date Jul. 5, 1994, § 102(e) Date Jul. 5, 1994, PCT Pub. No. WO94/12143, PCT Pub. Date Jun. 9, 1994

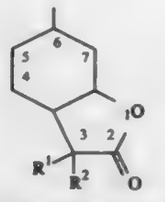
PCT Filed Nov. 11, 1993, Ser. No. 256,219

Claims priority, application Switzerland, Nov. 18, 1992, 3533/92

Int. Cl.[6] A61K *7/46*

U.S. Cl. 512—13 **20 Claims**

1. A method of conferring, improving, enhancing or modifying the odor of a perfuming composition or a perfumed article, which method comprises adding to said composition or article a fragrance effective amount of a furanone of formula



(I)

wherein symbols R^1 and R^2, taken separately, are identical and represent each a methyl radical, or are different and represent each a hydrogen atom or a methyl radical, or, taken together, represent a methylene radical.

5,464,825

RAISING GLUTATHIONE EQUIVALENT LEVELS USING N-ACYL GLUTATHIONE MONOESTERS

Mary Anderson; Alton Meister, both of New York, and Ellen J. Levy, Brooklyn, all of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 102,962, Aug. 6, 1993, abandoned, which is a continuation of Ser. No. 988,025, Dec. 9, 1992, abandoned, which is a continuation of Ser. No. 673,811, Mar. 14, 1991, abandoned. This application Apr. 12, 1994, Ser. No. 226,409

Int. Cl.[6] A61K *38/00;* **C07K** *5/00;7/00;17/00*

U.S. Cl. 514—18 **7 Claims**

1. Substantially pure N-acyl monoalkyl glutathione monoester, only the glycine carboxyl group being esterified, where the acyl group contains 1 to 10 carbon atoms and the monoalkyl group contains 1 to 9 carbon atoms.

5,464,826

METHOD OF TREATING TUMORS IN MAMMALS WITH 2',2'-DIFLUORONUCLEOSIDES

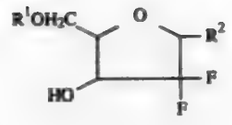
Gerald B. Grindey, and Larry W. Hertel, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 99,268, Jul. 29, 1993, abandoned, which is a continuation of Ser. No. 746,441, Aug. 16, 1991, abandoned, which is a division of Ser. No. 163,571, Mar. 3, 1988, Pat. No. 5,061,793, which is a continuation of Ser. No. 786,419, Oct. 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 677,783, Dec. 4, 1984, abandoned. This application Jul. 26, 1994, Ser. No. 280,687

Int. Cl.[6] A61K *31/70;* **C07H** *19/073*

U.S. Cl. 514—50 **7 Claims**

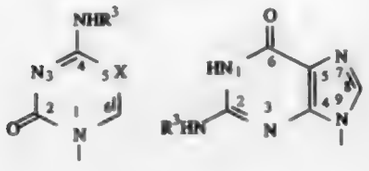
1. A method of treating susceptible neoplasms in mammals comprising administering to a mammal in need of such treatment a therapeutically effective amount of a compound of the formula

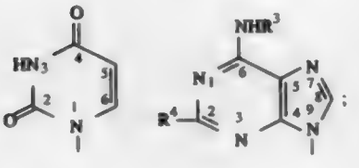


wherein:

R^1 is hydrogen;

R^2 is a base defined by one of the formulae





X is C–R^4;

R^3 is hydrogen;

R^4 is hydrogen, C_1–C_4 alkyl, bromo, fluoro, chloro or iodo; and the pharmaceutically-acceptable salts thereof.

5,464,827

ESTERIFIED POLYANIONIC CYCLODEXTRINS AS SMOOTH MUSCLE CELL PROLIFERATION INHIBITORS

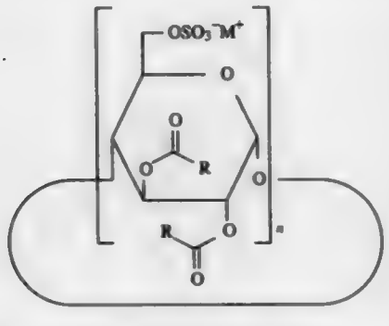
Richard M. Soll, Lawrenceville, N.J., assignor to American Home Products Corporation, Madison, N.J.

Filed Jun. 20, 1994, Ser. No. 263,691

Int. Cl.[6] A61K *31/70*; C08B *37/02*

U.S. Cl. 514—58 **9 Claims**

5. A method of inhibiting smooth muscle cell proliferation occuring in a mammal which comprises administering thereto a therapeutically effective amount of a compound of Formula I below:



where:

M is a pharmaceutically acceptable cation;

R is selected from the group consisting of C_1–C_{12} lower alkyl, C_3–C_{12} cycloalkyl, and aryl optionally substituted with 1–3 substituents independently selected from halogen, C_1–C_{12} lower alkyl or C_1–C_{12} alkoxy; and

n is an integer from 6–8, representing α-cyclodextrin (n=6), β-cyclodextrin (n=7), and γ-cyclodextrin (n=8).

5,464,828

AQUEOUS SUSPENSION OF SUCRALFATE

Masahide Katayama; Haruhige Yamashita; Taizo Okada, and Shigeo Morioka, all of Shinagawa, Japan, assignors to Chugai Pharmaceutical Co., Ltd., and Sato Pharmaceutical Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 968,469, Oct. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 670,109, Mar. 12, 1991, abandoned, which is a continuation of Ser. No. 318,205, Mar. 2, 1989, abandoned. This application Jan. 24, 1994, Ser. No. 185,157

Claims priority, application Japan, Mar. 2, 1988, 63-47423

Int. Cl.[6] A61K *31/70*

U.S. Cl. 514—60 **2 Claims**

1. An aqueous suspension consisting essentially of sucralfate and hydroxypropyl starch, wherein the sucralfate is present in an amount of 0.1–50 w/v % and the hydroxypropyl starch is present in an amount of 0.05–10.0 w/v %.

5,464,829

CEPHALOSPORIN DERIVATIVES

Masaki Tsuchima; Yuko Kano; Katsuyoshi Iwamatsu; Atsushi Tamura, and Seiji Shibahara, all of Kanagawa, Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

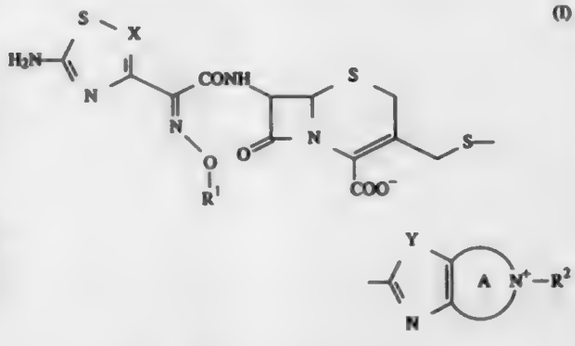
Filed Dec. 16, 1993, Ser. No. 167,204

Claims priority, application Japan, Dec. 18, 1992, 4-339267; Aug. 3, 1993, 5-192403

Int. Cl.[6] C07D *501/36*; A61K *31/545*

U.S. Cl. 514—206 **4 Claims**

1. A cephalosporin derivative represented by formula (I):



wherein X is a carbon atom or a nitrogen atom; Y is a sulfur atom, an oxygen atom or a nitrogen atom substituted with a substituted or unsubstituted lower alkyl group; R^1 is a hydrogen atom, a lower alkyl group or a substituted lower alkyl group; R^2 is a lower alkyl group, a substituted lower alkyl group, a lower alkylene group or a substituted lower alkylene group, wherein said substituted lower alkyl and alkylene groups are alkyl and alkylene groups each substituted with a substituent selected from the group consisting of a halogen atom, a hydroxyl group, a carboxyl group, a carbamoyl group, an amino group, and an alkylamino group having 1 to 4 -carbon atoms, and said substituents may be substituted with a member selected from the group consisting of an alkyl group having 1 to 4 -carbon atoms, an alkylene group having 1 to 4 -carbon atoms, and an aralkyl group having 7 to 10 -carbon atoms; and A is an unsaturated six-membered heterocyclic ring containing at least one nitrogen atom, wherein said heterocyclic ring is selected from the group consisting of pyridine, pyrimidine, pyrazine, pyridazine, dihydro derivatives of pyridazine, tetrahydro derivatives of pyridazine, thiazine, thiadiazine, oxazine and oxadiazine, or a pharmaceutically acceptable salt thereof.

5,464,830

SUBSTITUTED DIBENZOXAPINE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHODS OF USE

E. Ann Hallinan, Evanston; Timothy J. Hagen, Glenview; Robert K. Husa, Vernon Hills; Sofya Tsymbalov, Des Plaines, all of Ill.; Albert C. Lee, Fort Collins, Colo., and Jean-Pierre Van Hoeck, Chastre, Belgium, assignors to G. D. Searle & Co., Chicago, Ill.

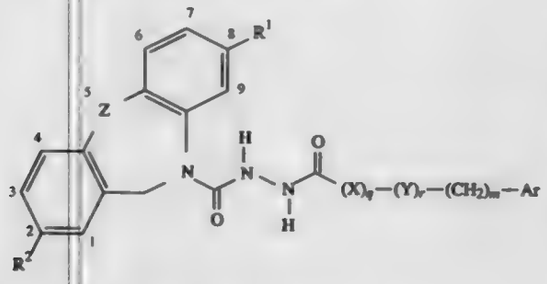
Continuation of Ser. No. 108,551, Aug. 24, 1993, Pat. No. 5,378,840, which is a continuation-in-part of Ser. No. 695,654, May 3, 1991, abandoned. This application Aug. 24, 1994, Ser. No. 295,302

The portion of the term of this patent subsequent to Aug. 24, 2013, has been disclaimed.

Int. Cl.[6] C07D *413/12;267/20;281/16;* A61K *31/55*

U.S. Cl. 514—211 10 Claims

1. A compound having the structure:



or a pharmaceutically-acceptable salt thereof, wherein:

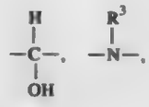
R^1 is: hydrogen, halogen or $—CF_3$;

R^2 is: hydrogen, halogen, —OH or $—OCH_3$;

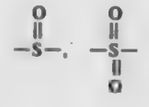
Z is: oxygen, sulfur,

X is: $—CH=CH—$, $—CF_2—$, —CHF—, $—(CH_2)_n—$ or $—(CH_2)_p—CH=CH—$;

Y is:



sulfur,



or oxygen;

q is: 0 or 1;

r is: 0 or 1, provided that r is not 0 when:

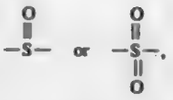
(1) X is $—CH=CH—$, $—(CH_2)_n—$ or $—(CH_2)_p—CH=CH—$, q is 1 and Ar is imidazolyl or phenyl,

(2) X is $—(CH_2)_n—$, q is 1 and Ar is phenyl or alkyl-substituted phenyl, or

(3) q is 0, m is 1, 2, 3, 4, 5 or 6, and Ar is imidazolyl, phenyl or alkyl-substituted phenyl;

m is: an integer of from 0 to 6, provided that m is not 0 when X is $—(CH_2)_n—$,

q is 1, Y is oxygen, sulfur,



r is 1, and Ar is phenyl or alkyl-substituted phenyl;

n is: an integer of from 1 to 6;

p is: an integer of from 1 to 6;

R^3 is: hydrogen or t-butyloxycarbonyl; and

Ar is: aryl, alkyl-substituted aryl or aryl-substituted aryl.

9. A method for treating pain in an animal comprising administering to said animal a therapeutically-effective amount of a compound of claim 1.

5,464,831

THIENOTHIADIAZINE SULFONAMIDES USEFUL AS CARBONIC ANHYDRASE INHIBITORS

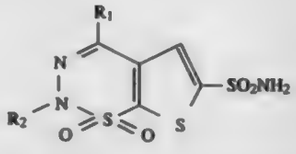
Thomas R. Dean, Weatherford, Tex., and Abdelmoula Namil, Cappelle en Pevèle, France, assignors to Alcorn Laboratories, Inc., Fort Worth, Tex.

Filed Sep. 9, 1994, Ser. No. 303,900

Int. Cl.[6] C07D *513/04;* A61K *31/54*

U.S. Cl. 514—222.8 6 Claims

1. A compound having the following structure:



or a pharmaceutically acceptable salt thereof wherein:

R_1 is H; C_{1-8} alkyl unsubstituted or substituted optionally with OH, C_{1-4} alkoxy, NR_3R_4, $OC(=O)R_5$ or $C(=O)R_5$;

R_2 is H; C_{1-8} alkyl C_{1-8} alkyl substituted with OH, NR_3R_4, halogen, C_{1-4} alkoxy, C_{2-4} alkoxy, C_{1-4} alkoxy, $OC(=O)R_5$, $S(=O)_mR_7$, or $C(=O)R_5$; C_{3-7} alkenyl unsubstituted or substituted optionally with OH, NR_3R_4, or C_{1-4} alkoxy; C_{3-7} alkynyl unsubstituted or substituted optionally with OH, NR_3R_4, or C_{1-4} alkoxy; C_{0-3} alkyl substituted with R_6 which can be unsubstituted or substituted optionally with C_{1-3} alkyl, C_{1-3} haloalkyl, OH, $(CH_2)_nNR_3R_4$, halogen, C_{1-4} alkoxy, C_{1-4} haloalkoxy, $OC(=O)R_5$, $C(=O)R_5$, $S(=O)_mR_7$ or $SO_2NR_3R_4$, wherein m is 0–2 and n is 0–2;

R_3 and R_4 are the same or different and are H; C_{1-8} alkyl; C_{2-4} alkyl substituted optionally with OH, halogen, C_{1-4} alkoxy or $C(=O)R_5$; OH; C_{1-4} alkoxy; C_{2-4} alkoxy substituted optionally with OH, halogen, C_{1-4} alkoxy or $C(=O)R_5$; or R_3 and R_4 can be joined to form a ring of 5 or 6 atoms selected from O, S, C or N which can be unsubstituted or substituted optionally on carbon with OH, (=O), halogen, C_{1-4} alkoxy, $C(=O)R_5$, C_{1-6} alkyl, C_{1-6} alkyl substituted optionally with OH, halogen, C_{1-4} alkoxy, $C(=O)R_5$ or on nitrogen with C_{1-4} alkoxy, $C(=O)R_5$, $S(=O)_mR_7$, C_{1-6} alkyl or C_{2-6} alkyl substituted optionally with OH, halogen, C_{1-4} alkoxy, $C(=O)R_5$ or on sulfur by $(=O)_m$, wherein m is 0–2;

R_5 is C_{1-8} alkyl; C_{1-4} alkyl substituted optionally with OH, NR_3R_4, halogen, C_{1-4} alkoxy or $C(=O)R_8$; C_{1-4} alkoxy; C_{2-4} alkoxy substituted optionally with OH, NR_3R_4, halogen or C_{1-4} alkoxy; or NR_3R_4.

R_6 is a monocyclic ring system of 5 or 6 atoms composed of C, N, O and/or S, selected from the group consisting of benzene, furan, thiophene, pyrrole, pyrazole, imidazole, triazole, tetrazole, oxazole, isoxazole, isothiazole, thiazole, thiadiazole, pyridine pyrimidine, pyridazine, and pyrazine;

R_7 is C_{1-4} alkyl; C_{2-4} alkyl substituted optionally with OH, NR_3R_4, C_{1-4} alkoxy or $C(=O)R_5$; R_6 which can be unsubstituted or substituted optionally with OH, $(CH_2)_nNR_3R_4$, halogen, C_{1-4} alkoxy, C_{1-4} haloalkoxy, $C(=O)R_5$, $S(=O)_mC_{1-4}$ alkyl or $SO_2NR_3R_4$; wherein m is 0–2; and n is 0–2; and

R_9 is C_{1-4} alkyl; C_{1-4} alkoxy; amino, C_{1-3} alkylamino, of di-C_{1-3} alkylamino.

5,464,832

SUBSTITUTED 3-THIOACRYLOYL COMPOUNDS AND THEIR USE AS ANTIMICROBIAL AGENTS

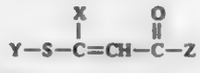
Peter Osei-Gyimah, Horsham, Pa.; Samuel E. Sherba, Willingboro, N.J.; Barry C. Lange, Lansdale, Pa.; Rai J. Mehta, King of Prussia, Pa., and Rhoda W. Joseph, Buckingham, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 107,422, Aug. 16, 1993, Pat. No. 5,302,592, which is a continuation of Ser. No. 880,471, May 6, 1992, abandoned, which is a continuation of Ser. No. 747,157, Aug. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 568,809, Aug. 17, 1990, abandoned. This application Dec. 13, 1993, Ser. No. 166,498

Int. Cl.[6] C07D *211/06;265/30;263/04;* **A61K** *31/535*

U.S. Cl. 514—238.5 **3 Claims**

1. A compound of the formula



I

wherein Z is NR^1R^2;

R^1 and R^2 are joined together with the nitrogen atom to which they are attached to form a ring containing 4 to 5 carbon atoms, with or without an oxygen heteroatom;

Y is CN; and

X is selected from the group consisting of hydrogen, halogen, phenyl, CO_2CH_3, and $(C_1–C_3)$alkyl.

5,464,833

APOPTOSIS REGULATING COMPOSITION

Satoru Nakai; Koutoku Aihara, both of Itano; Hideo Tanaka, Tokushima; Hitomi Iba, Wakayama; Kazuyoshi Kawai, Itano; Hiroyuki Ichikawa; Seiji Akamatsu, both of Tokushima; Fumio Saito, Takasaki; Michiaki Tominaga, Tokushima, and Masakazu Adachi, Takasaki, all of, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/01144, § 371 Date Apr. 19, 1994, § 102(e) Date Apr. 19, 1994, PCT Pub. No. WO94/04504, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 12, 1993, Ser. No. 211,818

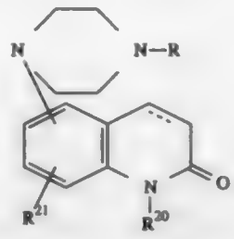
Claims priority, application Japan, Aug. 19, 1992, 4-220373

Int. Cl.[6] A61K *31/495*

U.S. Cl. 514—251 **6 Claims**

1. A method for regulating apoptosis in a host in need of such regulation which comprises administering to said host an apoptosis regulating effective amount of at least one compound selected from the group consisting of the following carbostyril derivatives or salts thereof as an active ingredient together with a pathologically acceptable carrier:

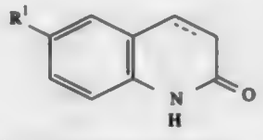
(1) Carbostyril derivatives of the following general formula



(1)

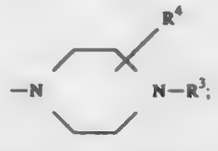
wherein R is a benzoyl group which may optionally have, on the phenyl ring thereof, one to three substituents each selected from the group consisting of lower alkoxy groups, halogen atoms, lower alkyl groups, lower alkanoylamino group and lower alkylthio groups; a lower alkylenedioxybenzoyl group; a hydrogen atom; a pyridylcarbonyl group; a lower alkanesulfonyl group; a lower alkynyl group; or a phenyl-lower alkyl group which may optionally have, on the phenyl ring thereof, one to three substituents each selected from the group consisting of lower alkoxy groups, halogen atoms and lower alkyl groups; the carbon-carbon bond between the 3 and 4 positions of the carbostyril skeleton is a single bond or a double bond; R^{20} is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group or a phenyl-lower alkyl group; and R^{21} is a hydrogen atom or a lower alkoxy group; provided that when both R^{20} and R^{21} are hydrogen atoms, R should not be a benzoyl group having a lower alkoxy group as a phenyl ring substituent; and salts thereof;

(2) Carbostyril derivatives of the following general formula



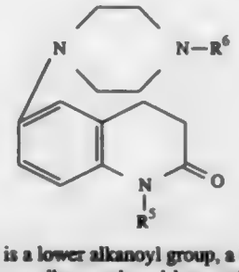
(2)

wherein R^1 is a group of the formula



R^3 is a hydrogen atom or a benzoyl group; R^4 is an oxo group; and the carbon-carbon bond between the 3 and 4 positions of the carbostyril skeleton is a single bond or a double bond; and salts thereof;

(3) Carbostyril derivatives of the following general formula

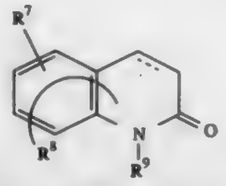


(3)

wherein R^5 is a lower alkanoyl group, a lower alkoxycarbonyl group, a lower alkoxycarbonyl-lower alkyl group, a phenyl-lower alkyl group having a lower alkanoyloxy group or a hydroxyl group on the phenyl ring thereof, or a benzoyl group which may optionally have, on the phenyl ring thereof, at least one substituent selected from the group consisting of a hydroxyl group and amino groups optionally having a lower alkyl group, or a naphthoyl group; and R^6 is a benzoyl group

which may optionally have at least one lower alkoxy group on the phenyl ring thereof; and salts thereof;

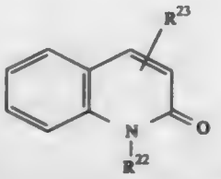
(4) Carbostyril derivatives of the following general formula



(4)

wherein R^7 is a piperazinyl group, R^8 is a hydrogen atom or a lower alkyl group; R^9 is a hydrogen atom or a phenyl-lower alkyl group; and the carbon-carbon bond between the 3 and 4 positions of the carbostyril skeleton is a single bond or a double bond; and salts thereof;

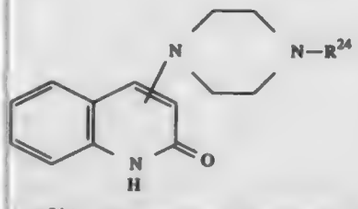
(5) Carbostyril derivatives of the following general formula



(5)

wherein R^{22} is a C_1–C_{16} alkyl group, a phenyl-lower alkoxycarbonyl-lower alkyl group, an amido-lower alkyl group which may optionally have at least one lower alkyl group, or a phenyl-lower alkyl group; and R^{23} is a piperazinyl group which may optionally have a lower alkyl group in the 4 position of the piperazine ring; and salts thereof;

(6) Carbostyril derivatives of the following general formula



(6)

wherein R^{24} is a hydrogen atom, a phenyl-lower alkyl group, a benzoyl-lower alkyl group, or a benzoyl group which may optionally have one to three lower alkoxy groups or lower alkylenedioxy groups on the phenyl ring thereof; and salts thereof; and

(7) 6-[4-(3,4-Dimethoxybenzoyl)-1-1,2,3,4-tetrahydropirazyl]-3,4-dihydrocarbostyril and salts thereof.

5,464,834

N-SUBSTITUTED N'-HETEROBICYCLIC PIPERAZINES HAVING PHARMACEUTICAL ACTIVITY

Jean-Louis Peglion, Le Vesinet; Bertrand Goument, Viroflay; Mark Millan, Paris, and Jean-Michel Rivet, Nanterre, all of, France, assignors to Adir et Compagnie, Courbevoie, France

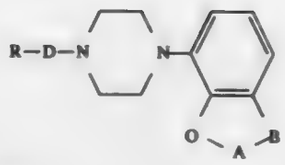
Filed Jun. 11, 1993, Ser. No. 75,679

Claims priority, application France, Jun. 12, 1992, 92 07065

Int. Cl.[6] A61K *31/495*; **C07D** *495/04;407/14;405/10*

U.S. Cl. 514—254 **15 Claims**

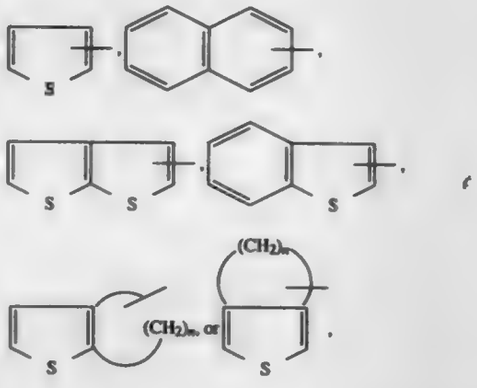
1. A 1,4-disubstituted piperazine selected from those of formula I:



(I)

wherein:

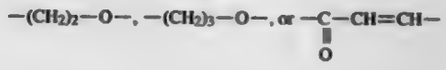
R represents:



in which n is 3 or 4;

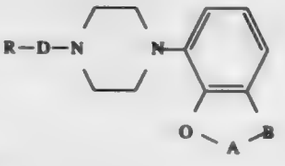
D represents a single bond, except when R represents naphthyl, or a hydrocarbon chain having from 1 to 8 carbon atoms inclusive which is straightchain or branched by a gem-dimethyl; and

—A—B— represents:



in racemic or optically active form, and its physiologically tolerable salts with a pharmaceutically-acceptable acid.

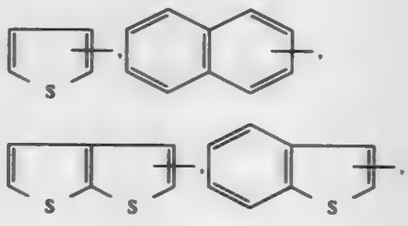
10. A method for treating a mammal suffering from anxieity or depression, comprising the step of administering to the said mammal an amount of a 1,4-disubstituted piperazine selected from those of formula I:



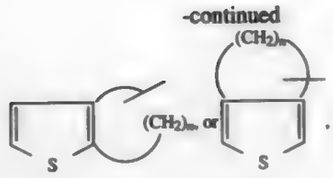
(I)

wherein:

R represents:



-continued



in which n is 3 or 4;

D represents a single bond or a hydrocarbon chain having 1 to 8 carbon atoms inclusive which is straight-chain or branched by a gem-dimethyl; and

—A—B— represents:

$$-(CH_2)_2-O-,\ -(CH_2)_3-O-,\ \text{or}\ -CO-CH=CH-,$$

in racemic or optically active form, and its physiologically-tolerable salts with a pharmaceutically-acceptable acid, which is effective for alleviation of the said anxiety and depression.

5,464,835

USE FOR BIS-HETEROCYCLIC COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Oliver J. McConnell, Vero Beach, Fla.; Gabriel Saucy, Essex Fells, N.J.; Robert Jacobs, Santa Barbara, Calif., and Sarath P. Gunasekera, Vero Beach, Fla., assignors to Harbor Branch Oceanographic Institution, Inc., Fort Pierce, Fla., and University of California, Oakland, Calif.

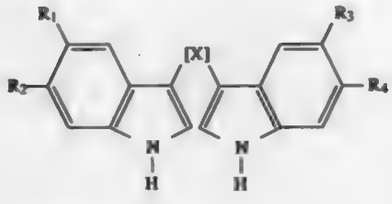
Continuation-in-part of Ser. No. 21,929, Feb. 24, 1993, Pat. No. 5,290,777. This application Feb. 24, 1994, Ser. No. 201,309

The portion of the term of this patent subsequent to Mar. 11, 2012, has been disclaimed.

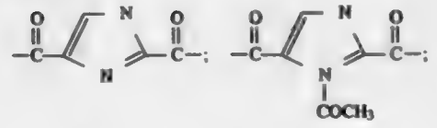
Int. Cl.[6] A61K *31/495;31/415*

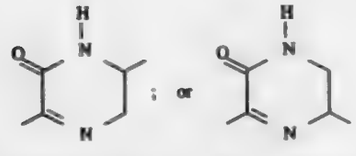
U.S. Cl. 514—254 **9 Claims**

1. A method for inhibiting or controlling inflammation in a patient, said method comprising administration to said patient an effective amount of a bis-heterocycle compound, wherein said compound has the structure



wherein X =





and wherein R_1 and R_3 are —H while R_2 and R_4 are —H, —OH, halogen, —R, —OR, —OCOR, or —OA; or R_2 and R_4 are —H while R_1 and R_3 are —H, —OH, halogen, —R, —OR, —OCOR, or —OA; R is C1–5 alkyl, and A is —R-phenyl.

5,464,836

BENZOPHENONES HAVING AN ANTIFUNGAL ACTIVITY

Giovanni Camaggi, Novara; Lucio Filippini, San Donato Milanese; Marilena Gusmeroli, Monza; Raul Riva, Novara; Carlo Garavaglia, Cuggiono, and Luigi Mirenna, Milan, all of, Italy, assignors to Ministero Dell'Universita' E Della Ricerca Scientifica E Tecnologica, Rome, Italy

Continuation of Ser. No. 904,554, Jun. 26, 1992, abandoned. This application Oct. 5, 1993, Ser. No. 131,880

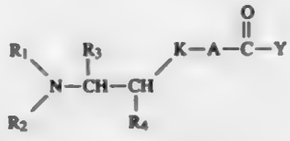
Claims priority, application Italy, Jul. 1, 1991, MI91A1812

Int. Cl.[6] A61K *31/535;* **C07D** *265/30;* **C07C** *211/27*

U.S. Cl. 514—239.2 **5 Claims**

1. A composition suitable for inhibiting the growth of pathogenous fungi in the cultivation of useful plants including

at least one benzophenone compound of the formula (I):



(I)

wherein:

R_1 and R_2, the same or different, represent a C_1–C_6 alkyl group or a C_7–C_{10} arylalkyl group;

or R_1 and R_2 together with the N atom, represent a C_3–C_8 heterocyclic group or C_2–C_7 heterocyclic group containing a second heteroatom selected from O and S, said heterocyclic groups being optionally substituted with one or more C_1–C_4 alkyl groups;

R_3 represents an hydrogen atom or a C_1–C_3 alkyl group;

R_4 represents a C_1–C_3 alkyl group;

K represents an oxygen atom or methylene;

A represents a benzene group, optionally substituted with one or more halogen atoms, C_1–C_4 alkyl or haloalkyl groups, C_1–C_4 alkoxylic or C_1–C_4 haloalkoxylic groups;

Y represents a C_6–C_{10} aryl group, said group being optionally substituted with one or more halogen atoms, C_1–C_4 alkyl or haloalkyl groups,

C_1–C_4 alkoxylic or haloalkoxylic groups,

a fungicidally effective adjuvant or carrier suitable for application to plants, and

a surface-active agent selected from the group consisting of sodium, calcium, triethanolamine salts of alkylsulphates, alkylsuphonates, alkyl-aryl sulphonates, polyethoxylated alkylphenols, fatty alcohols condensed with ethylene oxide, polyoxyethylated fatty acids, esters of polyoxyethylated sorbitol, polyoxyethylate fats, and lignin sulphonates.

5,464,837

METHOD FOR CONTROLLING FISH PARASITES USING TRIAZINE DIONE DERIVATIVES

Heinz Mehlhorn, Neuss-Odesheim; Günter Schmahl, Bochum; Werner Lindner, Cologne, and Axel Haberkorn, Wuppertal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

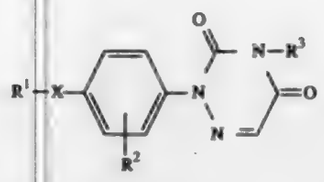
Continuation of Ser. No. 617,473, Nov. 26, 1990, abandoned, which is a continuation of Ser. No. 376,085, Jul. 6, 1989, abandoned. This application Jul. 13, 1992, Ser. No. 913,758

Claims priority, application Germany, Jul. 30, 1988, 38 26 058.1

Int. Cl.[6] A61K *31/53*

U.S. Cl. 514—242 **8 Claims**

1. A method for controlling fish parasites comprising administering to fish having such parasites or to a habitat of fish having such parasite at least one triazinedione of the formula



in which

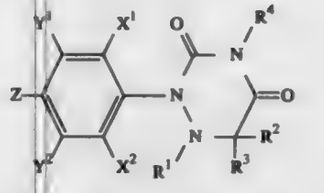
X represents O, S, SO or SO_2;

R^1 represents phenyl, thiazolyl, oxazolyl, benzothiazolyl or benzoxazolyl each of which is optionally substituted by C_{1-4}-halogenoalkyl, halogen, nitro, CN, C_{1-4}-alkoxy, C_{1-4}-halogenoalkoxy, C_{1-4}-alkylthio or C_{1-4}-halogenoalkylthio;

R^2 represents hydrogen or one or more halogen or C_{1-6}-alkyl radicals; and

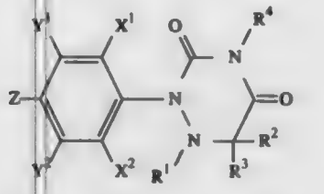
R^3 represents hydrogen or C_{1-4}-alkyl in an amount effective to control fish parasite.

7. A method which comprises treating insects or productive, breeding aquarium or ornamental fishes infested with parasite protozoa or metazoa by administering an effective amount of a compound of the formula (I)



in which R^1 represents together with R^2 a chemical bond, R^2 represents together with R^1 a chemical bond, R^3 represents hydrogen, C_1–C_{12} alkyl, R^4 represents hydrogen, straight-chain or branched C_1–C_{12} alkyl, X^1, X^2, Y^1, Y^2 represent hydrogen, halogen, C_1–C_6 alkyl, Z represents phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl each of which is unsubstituted or substituted by hydrogen, trifluoromethyl, C_1–C_6 alkoxy, C_1–C_6 alkylthio.

8. A method which comprises treating insects or productive, breeding aquarium or ornamental fishes infested with parasite protozoa or metazoa by administering an effective amount of a compound of the formula (I)



in which R^1 represents together with R^2 a chemical bond; R^2 represents together with R^1 a chemical bond; R^3 represents hydrogen; R^4 represents hydrogen, straight-chain or branched C_1–C_{12} alkyl or benzyl; X^1, X^2, Y^1, Y^2 represent hydrogen, halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy or trifluoromethyl; Z represents phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl or 1-cyano-1-phenylmethyl, each of which is unsubstituted or substituted on the phenyl ring by a substituent selected from the group consisting of halogen, trifluoromethyl, nitro, cyano, C_1–C_6 alkyl, C_1–C_6 alkoxy and C_1–C_6 alkylthio.

5,464,838

AMINOCARBOXYLIC ACID DERIVATIVES HAVING ANTIALLERGIC/ANTIASTHMATIC EFFECT AND A PROCESS FOR THEIR PREPARATION

Bernhard Kutscher, Maintal; Georg Niebch, Rodenbach; Ilona Fleischhauer, Offenbach; Jürgen Engel, Alzenau; Ute Achterrath-Tuckermann, Maintal, and Stefan Szelenyi, Schwaig, all of, Germany, assignors to Asta Medica Aktiengesellschaft, Dresden, Germany

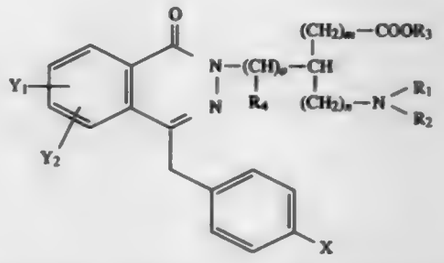
Filed Mar. 4, 1993, Ser. No. 27,487

Claims priority, application Germany, Mar. 7, 1992, 42 07 234.4

Int. Cl.[6] **C07D** *237/32;* **A61K** *31/50*

U.S. Cl. 514—248 **4 Claims**

1. Compounds having the structure of formula I,



where R_1 and R_2 are the same or different and represent hydrogen, a straight-chain or branched alkyl radical with 1–6 carbon atoms, benzyl or phenylethyl,

R_3 represents hydrogen, a straight-chain or branched alkyl radical with 1–6 carbon atoms or benzyl,

X represents hydrogen, halogen, C_1–C_6-alkyl or C_1–C_6-alkoxyl.

Y_1 and Y_2 are the same or different and represent hydrogen, halogen, alkyl with 1–6 carbon atoms or alkoxy with 1–6 carbon atoms, where m, n and o can assume the values from 0–4.

5,464,839

FUNGICIDAL MIXTURES

Horst Wingert; Hubert Sauter, both of Mannheim; Eberhard Ammermann, Heppenheim; Gisela Lorenz, Neustadt; Reinhold Saur, Böhl-Iggelheim; Klaus Scheiberger, Gönnheim, and Manfred Hampel, Neustadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sep. 23, 1994, Ser. No. 311,182

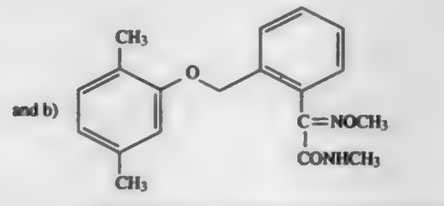
Claims priority, application Germany, Sep. 24, 1993, 43 32 629.3

Int. Cl.[6] **A01N** *37/18;43/54*

U.S. Cl. 514—256 **5 Claims**

1. A fungicidal mixture containing synergistic fungicidally effective amounts of

a) the oxime ether carboxamide of the formula I

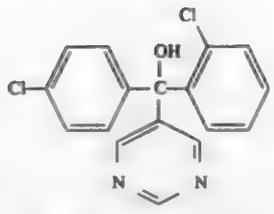


(I)

and b)

b) (±)-2-chlorophenyl)(4-chlorophenyl)(pyrimidin-5-yl)methanol of the formula II

(II)



wherein the weight ratio of the compound I to the compound II is from 10:1 to 0.1:1.

5,464,840

TRICYCLIC DERIVATIVES, COMPOSITIONS AND METHODS OF USE

Pauline C. Ting, New Providence; Daniel M. Solomon, Edison, and Wing C. Tom, Cedar Grove, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

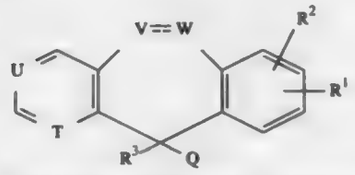
Filed Dec. 6, 1993, Ser. No. 162,748

Int. Cl.[6] A61K *31/435;* **C07D** *211/68*

U.S. Cl. 514—277 **15 Claims**

1. A compound of the Formula I:

(I)



or a pharmaceutically acceptable salt or solvate thereof, wherein:

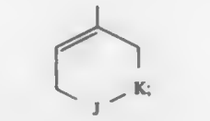
each of T and U represents =CH—;

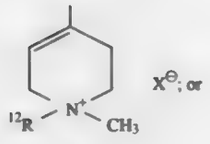
the ——— line represents an optional double bond; when ——— is a double bond, each of V and W represents =CH—; when ——— represents a single bond, each of V and W represents —CH_2—;

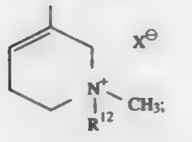
R^1 and R^2 are each independently selected from the group consisting of H and halogen;

R^3 is alkenyl; or aralkyl;

Q represents







wherein one of J and K represents

and the other represents —CH_2—;

R^{12} is lower alkyl;

R^{16} is H; lower alkyl; aryl; aralkyl; alkaryl; COR^{17} or $C(O)OR^{18}$, wherein R^{17} is H or lower alkyl or aryl, R^{18} is lower alkyl or aryl; and

X represents halogen.

5,464,841

USE OF DELTA OPIOID RECEPTOR ANTAGONISTS TO TREAT IMMUNOREGULATORY DISORDERS

Philip S. Portoghese, 17 Oriole La., St. Paul, Minn. 55127; Burt M. Sharp, 4301 Cedarwood Rd., St. Louis Park, Minn. 55416, and Kristin M. Linner, 831 S. Cleveland Ave., St. Paul, Minn. 55116

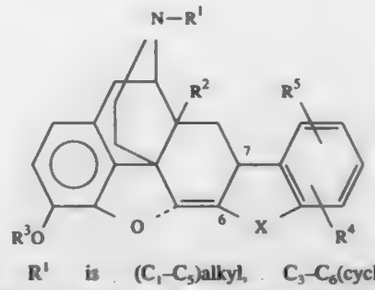
Filed Nov. 8, 1993, Ser. No. 149,039

Int. Cl.[6] A61K *31/445;* **C07D** *221/02;471/02;453/00*

U.S. Cl. 514—279 **15 Claims**

1. A therapeutic method for treating a viral infection selected from the group consisting of coronavirus and cytomegalovirus characterized by a depressed autologous mixed lymphocyte response (AMLR) comprising administering to a mammal in need of such treatment an amount of a compound of the formula I:

(I)



wherein R^1 is (C_1–C_5)alkyl, C_3–C_6(cycloalkyl)alkyl, C_5–C_7(cycloalkenyl)alkyl, aryl, aralkyl, trans (C_4–C_5)alkenyl, allyl or furan-2-ylalkyl, R^2 is H, OH or O_2C(C_1–C_5)alkyl; R^3 is H, (C_1–C_5)alkyl; or ((C_1–C_5)alkyl)-CO; R^4 and R^5 are individually H, F, Cl, Br, NCS, NO_2, NH_2, (C_1–C_5)alkyl or (C_1–C_5)alkoxy, or together are benzo; and X is O, S or NY, wherein Y is H, (C_1–C_5)alkyl or benzyl; and the pharmaceutically acceptable salts thereof; wherein said amount is effective to elevate the AMLR of said mammal.

5,464,842

AZABICYCLO OXIME AND AMINE CHOLINERGIC AGENTS AND METHODS OF TREATMENT

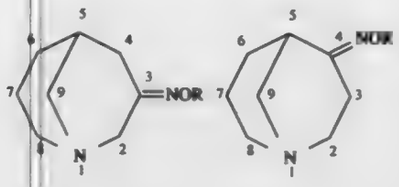
David J. Lauffer, Saline, and Haile Tecle, Ypsilanti, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 830, Jan. 5, 1993, Pat. No. 5,318,978, which is a continuation of Ser. No. 777,820, Oct. 15, 1991, abandoned. This application Mar. 3, 1994, Ser. No. 205,964

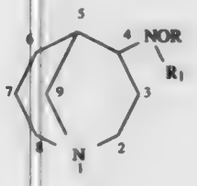
Int. Cl.[6] **C07D** *221/02;* **A61K** *31/44*

U.S. Cl. 514—299 **11 Claims**

1. A compound selected from a compound of the formulae:



V IV



XII

wherein R_1 is hydrogen or a straight or branched alkyl group having from 1 to 4 carbon atoms;

wherein R is

(a) hydrogen;

(b) a straight or branched hydrocarbon chain having from 1 to 20 carbon atoms which is saturated or which is unsaturated and contains from 1 to 4 double and/or triple bonds;

(c) phenyl or phenyl substituted with 1 to 3 substituents selected from chlorine, bromine, fluorine, trifluoromethyl, nitro, hydroxy, trifluoromethoxy, straight or branched alkoxy having from 1 to 4 carbon atoms, straight or Branched alkyl having from 1 to 4 carbon atoms, —NR_4R_5 wherein each of R_4 and R_5 is hydrogen or straight or branched alkyl group having from 1 to 4 carbon atoms;

(d) cycloalkyl having from 3 to 8 carbon atoms, or cycloalkenyl having from 4 to 8 carbon atoms;

(e) a straight or branched hydrocarbon chain having from 1 to 20 carbon atoms which is saturated or which is unsaturated and contains from 1 to 4 double and/or triple bonds, and the terminal carbon of the hydrocarbon chain is substituted with a group selected from:

(i) a cycloalkyl group having from 3 to 8 carbon atoms, or a cycloalkenyl group having from 4 to 8 carbon atoms;

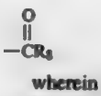
(ii) an aromatic group selected from phenoxy, phenyl, 2- or 3-thienyl, 2- or 3-furanyl, 2- or 3-pyrrolyl, 2-, 3-, or 4-pyridinyl, 3- or 5-(1,2,4)-thiadiazolyl, 3-(1,2,5)-thiadiazolyl, 2-(1,3,4)-thiadiazolyl, 5-(1,2,4)-oxadiazolyl, 2-(1,3,4)-oxadiazolyl, 3-(1,2,5)-oxadiazolyl, 3- or 5-thiadiazolyl, 2-, 4-, or 5-thiazolyl, 2-, 4-, or 5-oxazolyl, wherein the aromatic group is unsubstituted or is substituted with 1 to 3 substituents selected from straight or branched alkyl having from 1 to 4 carbon atoms, straight or branched alkoxy having from 1 to 4 carbon atoms, chlorine, fluorine, bromine, trifluoromethyl, nitro, hydroxy, trifluoromethoxy, or NR_4R_5 wherein R_4 and R_5 have the meanings defined above,

(iii) NR_6R_7 wherein each of R_6 and R_7 is hydrogen, a straight or branched alkyl group having from 1 to 4 carbon atoms, phenyl, or benzyl, or NR_6R_7 taken together form a pyrrolidino or piperidino ring;

(iv)

wherein each of R_6 and R_7 has the meaning defined above;

(v)



wherein R_8 is a straight or branched alkyl group having from 1 to 6 carbon atoms;

(vi) CN;

(vii) —CO_2R_9 wherein R_9 is hydrogen, a straight or branched hydrocarbon group having from 1 to 6 carbon atoms which is saturated or which is unsaturated and contains 1 or 2 double and/or triple bonds, or benzyl;

(viii) XR_{10} wherein X is oxygen or sulfur, and R_{10} is a straight or branched hydrocarbon chain having from 1 to 6 carbon atoms which is saturated or which is unsaturated and contains 1 or 2 double and/or triple bonds and is unsubstituted or is substituted with an alkoxy group having from 1 to 4 carbon atoms;

the individual geometric isomers and corresponding enantiomers, and pharmaceutically acceptable salts thereof.

5,464,843

IMIDAZO[1,2-A]PYRIDINYLDIACID COMPOUNDS FOR COGNITIVE ENHANCEMENT AND FOR TREATMENT OF COGNITIVE DISORDERS AND NEUTROTOXIC INJURY

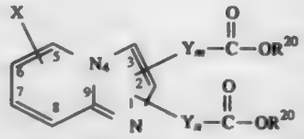
Donald W. Hansen, Jr., Skokie; Karen B. Peterson, Vernon Hills, both of Ill., and Joseph B. Monahan, Black Jack, Mo., assignors to G.D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 902,630, Jun. 23, 1992, abandoned. This application Oct. 8, 1993, Ser. No. 133,496

Int. Cl.[6] **C07D** *471/04;* **A61K** *31/44*

U.S. Cl. 514—300 **4 Claims**

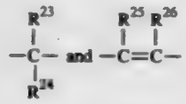
1. A compound of Formula III



(III)

wherein each R^{20} is independently selected from hydrogen, alkyl, allyl, cycloalkyl, cycloalkylalkyl, phenyl and benzyl;

wherein each of Y_m and Y_n is a spacer group independently selected from one or more groups of the formula

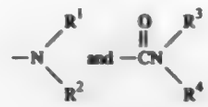


wherein each of R^{23} and R^{24} is independently selected from hydrogen, alkyl, cycloalkyl, halo, haloalkyl, hydroxy, hydroxyalkyl, alkoxy, alkoxyalkyl, and alkanoyl;

wherein R^{23} and R^{24} may be taken together to form oxo; wherein each of R^{25} and R^{26} is independently selected from hydrogen, alkyl, haloalkyl, hydroxyalkyl and alkoxyalkyl; m is an integer of from one to three, inclusive; n is an integer of from zero to three, inclusive;

wherein X is one or more groups independently selected from hydrogen, alkyl, cycloalkyl, halo, haloalkyl, phenyl, benzyl,

hydroxy, hydroxyalkyl, alkoxy, phenoxy, alkoxyalkyl, benzyloxy, alkanoyl,



wherein each of R^1, R^2, R^3 and R^4 is independently selected from hydrogen and alkyl; or a pharmaceutically-acceptable salt thereof.

5,464,844

[3H,7H]THIAZOLE[3,4-A]PYRIDINES HAVING ANTIASTHMATIC AND ANTIINFLAMMATORY ACTIVITIES ON THE RESPIRATORY TRACT

Giorgio Long; Giampiero De Cillis; Antonella Rozzi; Simonetta D'Alò, and Licia Gallico, all of Milan, Italy, assignors to Boehringer Mannheim Italia, S.p.A., Milan, Italy

PCT No. PCT/EP92/02783, § 371 Date Jun. 2, 1994, § 102(e) Date Jun. 2, 1994, PCT Pub. No. WO93/11133, PCT Pub. Date Jun. 10, 1993

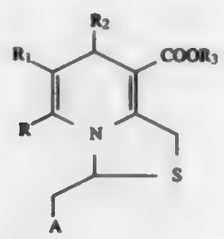
PCT Filed Dec. 2, 1992, Ser. No. 244,208

Claims priority, application Italy, Dec. 6, 1991, MI91A3270

Int. Cl.[6] A61K *31/435;* C07D *513/04*

U.S. Cl. 514—301 **9 Claims**

1. Compounds of general formula (I)



I

wherein:

R is (C_1–C_4) alkyl;

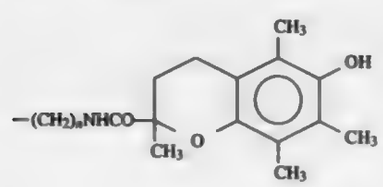
R_1 is a cyanc, free or salified carboxy, (C_1–C_6) alkoxycarbonyl group or a group of formula —$CONH(CH_2)_qNR_aR_b$ wherein q is an integer from 2 to 4; R_a is hydrogen, (C_1–C_6) alkyl, benzyl; R_b is hydrogen or (C_1–C_6) alkyl;

R_2 is a (C_3–C_7)-cycloalkyl, α-, β-, or γ-pyridyl, or optionally substituted phenyl;

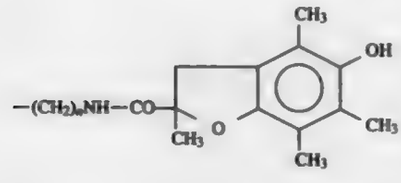
R_3 is hydrogen, a pharmaceutically acceptable cation or (C_1–C_6) alkyl;

A is a group of formula:

a)

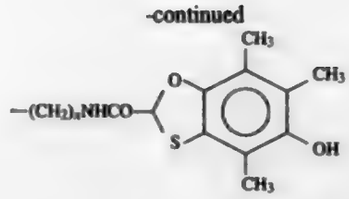


b)

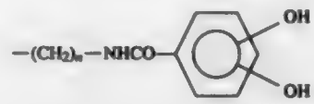


-continued

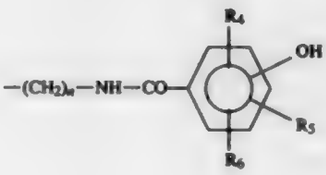
c)



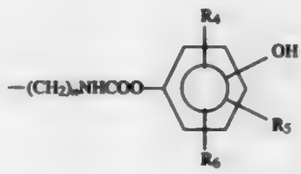
d)



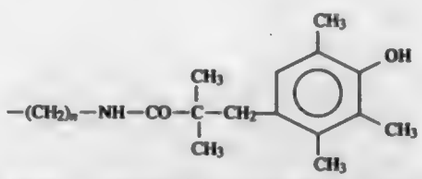
e)



f)



h)



R_4, R_5 and R_6 are straight or branched (C_1–C_4) alkyl or one of them is hydrogen and the other are straight or branched (C_1–C_4) alkyl; or one of them is —CH_2NRaRb, being Ra, Rb as defined above; Rc is (C_1–C_4) alkyl; n is zero or an integer from 1 to 3;

and the pharmaceutically acceptable salts thereof, the single enantiomers, racemates, diastereomers and the mixtures thereof.

5,464,845

METHODS FOR LOWERING SERUM CHOLESTEROL

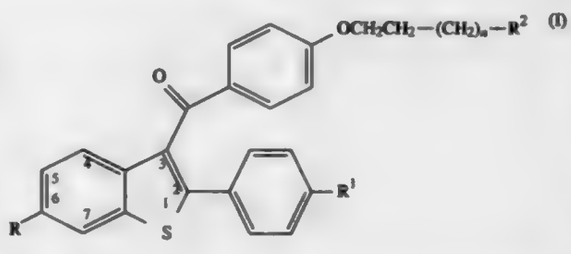
Larry J. Black; Henry U. Bryant, both of Indianapolis; George J. Cullinan, Trafalgar, and Raymond F. Kauffman, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 995,222, Dec. 22, 1992, abandoned. This application Nov. 30, 1993, Ser. No. 159,159

Int. Cl.[6] A61K *31/445;31/38;31/40;31/56*

U.S. Cl. 514—326 **22 Claims**

1. A method of lowering serum cholesterol levels comprising administering to a patient a serum cholesterol lowering amount of a compound having the formula



(I)

wherein

n is 0, 1 or 2;

R is hydroxyl, methoxy, C_1–C_7 alkanoyloxy, C_3–C_7 cycloalkanoyloxy, (C_1–C_6 alkoxy)-C_1–C_7 alkanoyloxy, substituted or unsubstituted aroyloxy, or substituted or unsubstituted aryloxycarbonyloxy;

R^1 is hydrogen, hydroxyl, halo, methoxy, C_1–C_7 alkanoyloxy, C_3–C_7 cycloalkanoyloxy, (C_1–C_6 alkoxy)-C_1–C_7 alkanoyloxy, substituted or unsubstituted aroyloxy, or substituted or unsubstituted aryloxycarbonyloxy;

R^2 is a heterocyclic ring selected from the group consisting of pyrrolidino, piperidino, or hexamethyleneimino; or a pharmaceutically acceptable salt on solvate thereof.

5,464,846

1,3-DIHYDRO-1-(PYRIDINYLAMINO)-2H-INDOL-2-ONES AND INTERMEDIATES FOR THE PREPARATION THEREOF

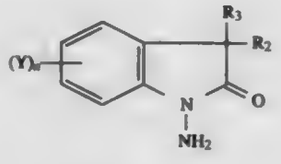
Richard C. Effland, Bridgewater, and David G. Wettlaufer, Phillipsburg, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Continuation of Ser. No. 961,947, Oct. 16, 1992, abandoned, which is a division of Ser. No. 736,366, Jul. 26, 1991, Pat. No. 5,179,119, which is a division of Ser. No. 535,640, Jun. 11, 1990, Pat. No. 5,053,511, which is a continuation-in-part of Ser. No. 388,437, Aug. 2, 1989, Pat. No. 5,006,537. This application May 13, 1994, Ser. No. 243,654

Int. Cl.[6] C07D *401/04*; A61K *31/44*

U.S. Cl. 514—333 **4 Claims**

1. A compound of the formula



wherein R_2 and R_3 are independently pyridinylmethyl or pyridinylethyl; Y is hydrogen, halogen, hydroxy, loweralkyl, loweralkoxy, nitro, amino, or trifluoromethyl; n is 1, 2, or 3; the geometric isomer thereof, the optical isomer thereof, the racemic mixture thereof, or the pharmaceutically acceptable acid addition salt thereof.

5,464,847

BRANCHED ALKYLAMINO DERIVATIVES OF THIAZOLE, PROCESSES FOR PREPARING THEM AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Gilles Courtemanche, Saint Martin du Tertre; Claudie Gautier, Paris; Danielle Gully, Saubens; Pierre Roger, Montigny le Bretonneux; Gérard Valette, Lacroix Falgarde, and Camille G. Wermuth, Strasbourg, all of, France, assignors to Elf Sanofi, Paris, France

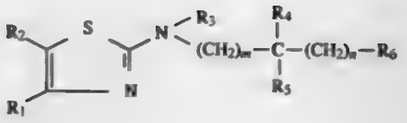
Filed Jun. 23, 1993, Ser. No. 80,172

Claims priority, application France, Jun. 24, 1992, 92 07736

Int. Cl.[6] C07D *417/12*; A61K *31/425*

U.S. Cl. 514—342 **10 Claims**

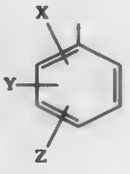
1. A compound selected from the compounds of of the formula I:



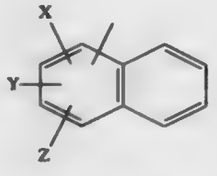
(I)

in which:

R_1 represents a radical of formula A_1 or a radical of formula A_2:



(A_1)



(A_2)

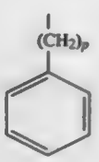
(in which formulae X, Y and Z, which may be identical or different, are selected from hydrogen, halogen, (C_1–C_5)alkoxy, (C_1–C_5)alkyl, hydroxyl, cyano, nitro, trifluoromethyl and (C_7–C_9)aralkyl),

R_2 is selected from hydrogen, halogen, (C_1– C_5)alkyl, hydroxymethyl and formyl,

R_3 is selected from (C_1–C_5)alkyl, (C_3– C_8)cycloalkyl, (C_2–C_6)alkenyl, (C_4–C_8)cycloalkylalkyl and phenyl,

R_4 is selected from hydrogen, (C_1–C_5)alkyl, (C_3–C_6) cycloalkyl and (C_4–C_8)cycloalkylalkyl having a linear or branched chain,

R_5 is selected from (C_1–C_5)alkyl, (C_3– C_8)cycloalkyl, optionally substituted with (C_1–C_5)alkyl, (C_4–C_8)cycloalkylalkyl having a linear or branched chain, (C_2–C_6)alkenyl, and a radical of the formula B:



(II)

(in which formula p is equal to 0, 1, 2 or 3),

R_6 is selected from phenyl, pyridyl, imidazolyl, pyrrolyl, thienyl and furyl (which are optionally substituted with one or more groups selected from halogen, (C_1–C_5)alkoxy, (C_1–C_5)alkyl, hydroxyl, cyano, nitro, trifluoromethyl, methylthio and radicals of formula B), and (C_3–C_8)cycloalkyl optionally substituted with (C_1–C_5)alkyl,

m and n, which may be identical or different, each represent 0 or 1,

their possible stereoisomers and their addition salts with an inorganic or organic acid.

5,464,848

1,2,4-OXADIAZOLYL-PHENOXYALKYLISOXAZOLES AND THEIR USE AS ANTIVIRAL AGENTS

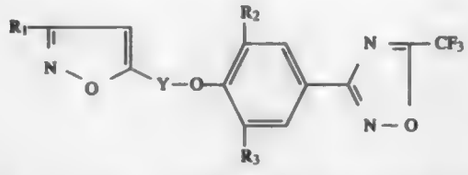
Guy D. Diana, North Coventry Township, and Theodore J. Nitz, East Coventry Township, both of Pa., assignors to Sterling Winthrop Inc., New York, N.Y.

Continuation-in-part of Ser. No. 869,287, Apr. 15, 1992, Pat. No. 5,349,068. This application Oct. 1, 1993, Ser. No. 131,050

Int. Cl.[6] C07D *413/12;* A61K *31/41*

U.S. Cl. 514—364 **30 Claims**

1. A compound of the formula



R1 is C_{1-5}-alkyl, C_{1-5}-alkoxy, hydroxy, cyclopropyl, hydroxy-C_{1-5}-alkyl, $_{1-5}$-alkoxy -C_{1-5}-alkyl or hydroxy-C_{1-5}-alkoxy, methylthiomethyl, methylsulfinylmethyl, methylsulfonylmethyl;

R2 and R3 independently are hydrogen, C_{1-5}-alkyl or halo; and Y is alkylene of 3 to 5 carbon atoms.

5,464,849

N-HYDROXYUREA DERIVATIVES AS ANTIALLERGY AND ANTIINFLAMMATORY AGENTS

Takashi Mano; Rodney W. Stevens, and Masami Nakane, all of Aichi, Japan, assignors to Pfizer Inc., New York, N.Y.

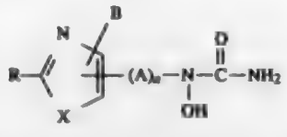
Continuation of Ser. No. 78,253, Jun. 24, 1993, abandoned. This application Oct. 5, 1994, Ser. No. 318,180

Claims priority, application Japan, Jan. 9, 1991, 3-012871

Int. Cl.[6] C07D *263/32;277/28;* A61K *31/425;31/42*

U.S. Cl. 514—365 **12 Claims**

1. A compound of the formula



of a pharmaceutically acceptable acid addition salt thereof wherein R is alkyl having one to six carbon atoms, phenyl, substituted phenyl wherein said substituent is phenyl, phenoxy, methyl, methoxy, fluoro, chloro or trifluoromethyl, phenoxy or substituted phenoxy wherein said substituent is methyl, methoxy, fluoro, chloro or trifluoromethyl; X is S or O; n is an inter of 1 or 2; A is —CH_2 or —$CH(CH_3)$— and B is hydrogen or methyl.

5,464,850

SYNERGISTIC PRESERVATIVE SYSTEMS FOR CHEMISTRY REAGENTS

Liann Voo, West Roxbury; Dennis C. Tagliaferro, Tewksbury, and Joan B. Wilson, Walpole, all of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Continuation of Ser. No. 771,704, Oct. 4, 1991, abandoned. This application May 17, 1994, Ser. No. 245,303

Int. Cl.[6] A61K *31/425*

U.S. Cl. 514—372 **9 Claims**

1. A method for killing microorganisms in an aqueous composition which comprises adding thereto a synergistic mixture of a first component, which is 1,3 -bis-(hydroxymethyl)-5,5-dimethyl-2,4-imidazolidinedione, and a second component, which is a mixture of 5-chloro-2-methyl-4-isothiazolin-3-one and 2-methyl-4 -isothiazolin-3-one, wherein the ratio of the first component to the second component ranges from about 2:1 to about 1200:1.

5,464,851

BIOCIDE COMPOSITION AND USE

Fraser F. Morpeth, Newark, Del., assignor to Zeneca Limited, London, England

Division of Ser. No. 5,422, Jan. 19, 1993, Pat. No. 5,364,874, which is a continuation of Ser. No. 689,623, Apr. 23, 1991, abandoned. This application Jul. 29, 1994, Ser. No. 281,975

Claims priority, application United Kingdom, Apr. 27, 1990, 9009529

Int. Cl.[6] A01N *43/80;37/34;* C14C *9/00;* C10M *133/24;133/38;* C09D *5/14;* B27K *3/00;* C07C *7/20*

U.S. Cl. 514—373 **13 Claims**

1. A medium which is susceptible to attack by micro-organisms and which contains from 0.0001 to 10% by weight of the medium of a composition having a fractional inhibitory concentration of less than one which comprises an effective amount of

(a) 2-methyl-4,5-trimethylene-4-isothiazolin-3-one, and

(b) 2-bromo-2-bromomethyl glutaronitrile.

5,464,852

SACCHARIN DERIVATIVE PROTEOLYTIC ENZYME INHIBITORS

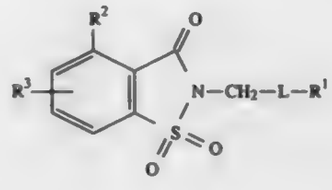
Richard P. Dunlap, Penfield; Albert J. Mura, Rochester; Dennis J. Hlasta, Clifton Park; Ranjit C. Desai, Colonie, and Lee H. Latimer, Brighton, all of N.Y., assignors to Sterling Winthrop Inc., New York, N.Y.

Division of Ser. No. 113,508, Aug. 27, 1993, Pat. No. 5,380,737, which is a continuation of Ser. No. 793,035, Nov. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 514,920, Apr. 26, 1990, abandoned, and a continuation-in-part of Ser. No. 608,068, Nov. 1, 1990, abandoned, and a continuation-in-part of Ser. No. 782,016, Oct. 24, 1991, Pat. No. 5,128,339, said Ser. No. 514,920is a continuation-in-part of Ser. No. 347,125, May 4, 1989, abandoned, and a continuation-in-part of Ser. No. 347,126, May 4, 1989, abandoned, said Ser. No. 782,016is a continuation-in-part of Ser. No. 608,068, Nov. 1, 1990, abandoned. This application Aug. 11, 1994, Ser. No. 289,113

Int. Cl.[6] A71K *31/425;31/41;* C07D *249/04;275/06*

U.S. Cl. 514—373 **18 Claims**

1. A compound having the structural formula



wherein

L—R^1 is a substituted or unsubstituted triazolyl;

R^2 is primary or secondary alkyl of two to four carbon atoms, primary alkylamino of one to three carbon atoms, primary alkylmethylamino of two to four carbon atoms, diethylamino or primary alkoxy of one to three carbon atoms; and

R^3 is from one to three substituents at any or all of the 5-, 6- and 7-positions and is selected from the group consisting of hydrogen, lower-alkyl, cycloalkyl, amino lower-alkyl, lower-alkylamino-lower-alkyl, di-lower-alkylamino-lower-alkyl, hydroxy-lower-alkyl, lower-alkoxy-lower-alkyl, perfluoro-lower-alkyl, perchloro-lower-alkyl, formyl, cyano, carboxy, aminocarbonyl, R-oxycarbonyl, B=N wherein B=N is

amino, lower-alkylamino, di-lower alkylamino, carboxy-lower-alkylamino, 1-pyrrolidinyl, 1-piperdinyl, 1-azetidinyl, 4-morpholinyl, 1-piperazinyl, 4-lower-alkyl-1-piperazinyl, 4-benzyl-1-piperazinyl or 1-imidazolyl, 1-lower-alkyl-2-pyrrolyl, lower alkylsulfonylamino, perfluoro-lower-alkylsulfonylamino, perchloro-lower alkylsulfonylamino, nitro, hydroxy, lower-alkoxy, cycloalkoxy, B=N-lower-alkoxy, hydroxy-lower-alkoxy polyhydroxy-lower-alkoxy, or acetal or ketal thereof, lower-alkoxy-lower-alkoxy, poly-lower-alkoxy lower-alkoxy, hydroxy-poly-lower alkylenoxy, lower-alkoxy-poly-lower-alkylenoxy, B=N-carbonyloxy, carboxy-lower-alkoxy, R-oxycarbonyl lower-alkoxy, methyl-enedioxy, di-lower-alkylphosphonyloxy, R-thio, R-sulfinyl, R-sulfonyl, perfluoro-lower-alkylsulfonyl, perchloro-lower alkylsulfonyl, aminosulfonyl, lower-alkylaminosulfonyl, di-lower alkylaminosulfonyl and halo wherein R is lower-alkyl, phenyl, benzyl or naphthyl or phenyl or naphthyl having one or two substituents selected from the group consisting of lower-alkyl, lower-alkoxy and halo;

or a pharmaceutically acceptable acid addition salt thereof if the compound has a basic functional group or a pharmaceutically acceptable base addition salt thereof if the compound has an acidic functional group.

5,464,853

N-(5-ISOXAZOLYL)BIPHENYLSULFONAMIDES, N-(3-ISOXAZOLYL)BIPHENYLSULFONAMIDES AND DERIVATIVES THEREOF THAT MODULATE THE ACTIVITY OF ENDOTHELIN

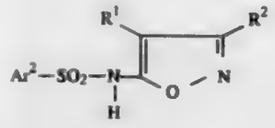
Ming F. Chan; Bore G. Raju; Rosario S. Castillo; Adam Kois; Chengde Wu, all of San Diego, and Vitukudi Balaji, Encinitas, all of Calif., assignors to ImmunoPharmaceutics, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 100,565, Jul. 30, 1993, abandoned, and a continuation-in-part of Ser. No. 100,125, Jul. 30, 1993, abandoned, and a continuation-in-part of Ser. No. 65,202, May 20, 1993, abandoned. This application Oct. 21, 1993, Ser. No. 142,159

Int. Cl.[6] **C07D** *261/06;* **A61K** *31/41*

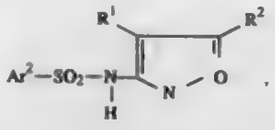
U.S. Cl. 514—378 **25 Claims**

1. A compound of formula I:



(I)

or



or a pharmaceutically acceptable salt of a compound of formula I, wherein:

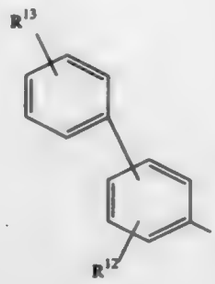
R^1 and R^2 are either (i), (ii) or (iii) as follows:

(i) R^1 and R^2 are each independently selected from the group consisting of H, NH_2, NO_2, halide, pseudohalide, alkyl, alkenyl, alkynyl, aryl, arylalkyl, heteroaryl, alkoxy, alkylamino, alkylthio, alkyloxy, haloalkyl, alkylsufinyl, alkylsulfonyl, aryloxy, arylamino, arylthio, arylsufinyl, arylsulfonyl, haloalkyl, haloaryl, alkoxycarbonyl, alkylcarbonyl, aminocarbonyl, arylcarbonyl, formyl, substituted or unsubstituted amido and substituted or unsubstituted ureido, in which the alkyl, alkenyl and alkynyl portions contain from 1 up to about 14 carbon atoms and are either straight or branched chains, and the aryl portions contain from about 4 to about 16 carbons; or,

(ii) R^1 and R^2 together form $—(CH_2)_n—$ where n is 1 to 4; or,

(iii) R^1 and R^2 together form —CH=CH—;

Ar^2 is a group of formula:



II

in which

(i) R^{12} and R^{13} are independently selected from the group consisting of H, OH NH S, NH_2, NO_2, halide, pseudohalide, alkyl, alkenyl, alkynyl, aryl, arylalkyl, heteroaryl, alkoxy, alkylamino, dialkylamino, alkylthio, alkyloxy, haloalkyl, alkylsufinyl, alkylsulfonyl, aryloxy, arylamino, arylthio, arylsufinyl, arylsulfonyl, haloalkyl, haloaryl, alkoxycarbonyl, carbonyl, alkylcarbonyl, aminocarbonyl, arylcarbonyl, formyl, substituted or unsubstituted amido, substituted or unsubstituted ureido, in which the alkyl, alkenyl and alkynyl portions contain from 1 up to about 14 carbon atoms, preferably from 1 to 6 atoms, and are either straight or branched chains or cyclic, and the aryl portions contain from about 4 to about 16 carbons, preferably 4 to 10 carbons; or

(ii) R^{12} and R^{13} together are O, S, or NR^{14} in which R^{14} is H or alkyl; and

each 6-membered ring of Ar^2 in formula II is unsubstituted or substituted with one to six substituents that are each independently selected from R^{12} or R^{13}, as defined in (i).

5,464,854

METHOD OF MODIFYING OVARIAN HORMONE-REGULATED AT1 RECEPTOR ACTIVITY AS TREATMENT OF INCAPACITATING SYMPTOM(S) OF P.M.S.

Anathony S. dePadova, 49 Dexter Dr., North, Basking Ridge, N.J. 07920

Continuation-in-part of Ser. No. 145,147, Nov. 11, 1993. This application Apr. 29, 1994, Ser. No. 235,468

Int. Cl.[6] **A61K** *31/54;31/44;31/41;31/415;31/40*

U.S. Cl. 514—381 **7 Claims**

1. A method of treating PMS comprising administering to a female during the luteal phase or symptomatic period of a menstrual cycle an effective amount of an AT_1 antagonist.

5,464,855

THIOPHENE-2-CARBOXAMIDOTETRAZOLES AND PHARMACEUTICAL USE THEREOF

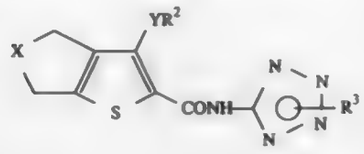
Thomas Capiris, Plymouth, and David T. Connor, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Aug. 9, 1994, Ser. No. 287,572

Int. Cl.[6] C07D *403/12;495/04;* **A61K** *31/44;31/41*

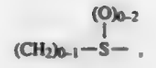
U.S. Cl. 514—382 **28 Claims**

1. A compound of the formula



wherein:

X is $(CH_2)_{1-2}$,



and $(CH_2)_{0-1}$—NR^1, where R^1 is hydrogen, C_1–C_6 alkyl, C_1–C_6 alkanoyl, or C_1–C_6 alkoxycarbonyl;

Y is O or S;

R^2 is C_1–C_6 alkyl or $(CH_2)_{0-1}$Ar, where Ar is phenyl or phenyl substituted with one, two, or three groups selected from halo, C_1–C_6 alkyl, hydroxy, C_1–C_6 alkoxy, nitro, amino, C_1–C_6 alkylamino, and di-C_1–C_6 alkylamino;

R^3 is hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, and C_2–C_6 alkynyl; and the pharmaceutically acceptable acid addition salts and solvates thereof.

5,464,856

ARYLMETHYLENYL DERIVATIVES OF IMIDAZOLIDINONES USEFUL AS ANTIINFLAMMATORY AGENTS

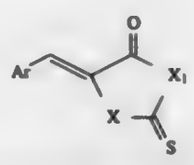
Wiacaeslaw A. Cetenko; David T. Connor; Roderick J. Sorenson; Paul C. Unangst, all of Ann Arbor, Mich., and Stephen R. Stabler, Santa Clara, Calif., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 988,562, Dec. 10, 1992, Pat. No. 5,306,822, which is a division of Ser. No. 702,132, May 13, 1991, Pat. No. 5,208,250, which is a continuation of Ser. No. 375,794, Jul. 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 334,346, Apr. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 198,528, May 25, 1988, abandoned. This application Jan. 24, 1994, Ser. No. 185,748

Int. Cl.[6] A61K *31/415*

U.S. Cl. 514—389 **5 Claims**

1. A method of treating inflammation in humans comprising administering an anti-inflammatory amount of a compound of the formula (I)



I

and the pharmaceutically acceptable salts thereof; wherein Ar is

(i) phenyl;

(ii) phenyl substituted by from one to three of lower alkoxy, hydroxy, halogen, trifluoromethyl, NOra, mercapto, or lower alkylthio, $NR_{10}R_{11}$ wherein R_{10} and R_{11} are independently hydrogen, or lower alkyl;

X is NH or NCH_3; and

X_1 is NH or NCH_3.

5,464,857

2-PHENYL-4,4,5,5-TETRAMETHYLIMIDAZOLINE-1-OXYL-3-OXIDE DERIVATIVES AND THEIR USE AS THERAPEUTIC AGENTS FOR MAINTAINING BLOOD PRESSURE

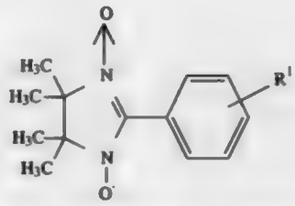
Hiroshi Maeda, Kumamoto; Yoichi Miyamoto, Ibaraki, and Takaaki Akaike, Kumamoto, all of, Japan, assignors to Hiroshi Maeda, Kumamoto, Japan

Filed Nov. 21, 1994, Ser. No. 302,872

Int. Cl.[6] A61K *31/415;* **C07D** *233/06*

U.S. Cl. 514—398 **11 Claims**

1. The imidazoline derivatives represented by the following formula (1)



(1)

where R^1 is a water-solubilizing or fat-solubilizing substituent; or a pharmaceutically acceptable salt thereof.

5,464,858

HEME BINDING COMPOUNDS AND USE THEREOF

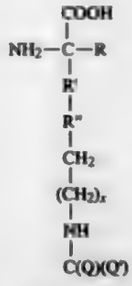
Owen W. Griffith, Milwaukee, and Krishnaswamy Narayanan, Wauwatosa, both of Wis., assignors to The Medical College of Wisconsin Research Foundation, Inc., Milwaukee, Wis.

Continuation of Ser. No. 87,371, Jul. 7, 1993, Pat. No. 5,424,447. This application Dec. 12, 1994, Ser. No. 354,257

Int. Cl.[6] A61K *31/415;31/40;31/195;31/155*

U.S. Cl. 514—399 **7 Claims**

1. Physiologically active compounds including N^6-substituted ornithine or N^6-substituted lysine moieties or monoalkyl carbon-substituted N^5-substituted ornithine or N^6 -substituted lysine moieties, having the formula



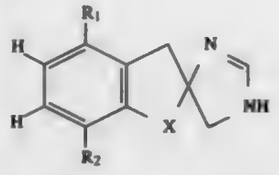
wherein R is $(CH_2)_yCH_3$ or H, R' is CH_2 or $C(H)(CH_2)_yCH_3$, and R" is CH_2 or $C(H)(CH_2)_yCH_3$, with y ranging from 0 to 5, and x is 0 or 1 and wherein none or only one of R, R' and R" provides an alkyl substituent on ornithine or lysine moiety, and wherein Q is a heme binding moiety selected from the group consisting of imidazole, pyrrole and selenium and Q' is —NH_2 when there is a double bond between the omega carbon and Q and Q' is =NH when there is a single bond between the omega carbon and Q, and physiologically acceptable acid addition salts thereof.

5,464,859
BENZOSPIROALKENE DERIVATIVES

Alex Cordi, Suresnes; Jean-Michel Lacoste, Sevres; Michel Laubie, Vaucresson; Tony Verbeuren, Vernouillet, and Jean-Jacques Descombes, Neuilly-Plaisance, all of, France, assignors to ADIR et Compagnie, Courbevoie, France

Filed Jul. 19, 1994, Ser. No. 276,909
Claims priority, application France, Jul. 20, 1993, 93 08860
Int. Cl.[6] A61K *31/415*; C07D *491/107*;*495/10*;*235/02*
U.S. Cl. 514—401 4 Claims

1. A compound of formula (I):



(I)

wherein:

—X represents $—CH_2—$, $—(CH_2)_2—$, —CH=CH—, $—O—CH_2—$, $—S—CH_2—$, $—SO—CH_2—$, or $—SO_2—CH_2—$,

$—R_1$ represents hydrogen or halogen or linear or branched (C_1–C_6) alkoxy,

$—R_2$ represents linear or branched (C_1–C_6)alkoxy or linear or branched (C_1–C_6) alkylthio,

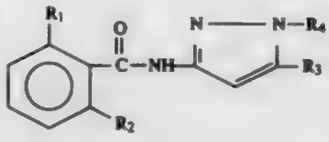
its isomers or its addition salts with a pharmaceutically-acceptable acid.

5,464,860
N(PYRAZOL-3-YL) BENZAMIDES AND PHARMACEUTICAL COMPOSITIONS

Francis Lepage, Creteil, and Bernard Hubiot, Paris, both of, France, assignors to Novapharme, Paris, France

Continuation-in-part of Ser. No. 697,607, May 9, 1991, Pat. No. 5,258,397. This application Jun. 16, 1993, Ser. No. 77,194
Claims priority, application France, Nov. 30, 1988, 88 15718; May 30, 1990, 90 06735
Int. Cl.[6] A61K *31/415*; C07D *231/40*
U.S. Cl. 514—404 10 Claims

1. A compound selected from the compounds of the general formula:



Ia

in which

R_1 is C_1–C_4 alkyl,

R_2 is C_1–C_4 alkyl,

R_3 is selected from hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy and C_1–C_4 hydroxyalkyl, and

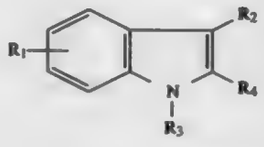
R_4 is selected from hydrogen, C_1–C_4 alkyl, C_2–C_7 alkanoyl and C_1–C_4 hydroxyalkyl.

5,464,861
2-THIOINDOLES (SELENOINDOLES) AND RELATED DISULFIDES (SELENIDES) WHICH INHIBIT PROTEIN TYROSINE KINASES AND WHICH HAVE ANTITUMOR PROPERTIES

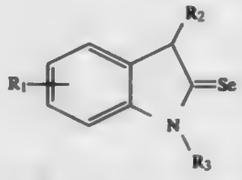
Ellen M. Dobrusin; Howard D. H. Showalter, both of Ann Arbor, Mich.; William A. Denny, Pakuranga, New Zealand; Brian D. Palmer, Glendene, New Zealand; Gordon W. Rewcastle, Manurewa, New Zealand; Moana Tercel, Forrest Hill, New Zealand, and Andrew M. Thompson, Mount Eden, New Zealand, assignors to Warner-Lambert, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 926,015, Aug. 6, 1992, abandoned. This application Aug. 9, 1993, Ser. No. 94,792
Int. Cl.[6] A61K *31/40*; C07D *209/04*
U.S. Cl. 514—414 14 Claims

1. 2-Selenoindole, 2-indolineselenone and selenide compounds of the group represented by the general Formulas I and XXXII



I



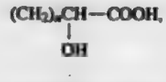
XXXII

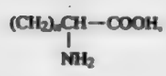
and pharmaceutically acceptable salts thereof, wherein

R_1 is a member selected from H, halogen, R, OH, OCOR, OR, CF_3, NO_2, NH_2, NHR, COOH, CONHR, $(CH_2)_nOH$, $(CH_2)_nOR$, $(CH_2)_nNH_2$, $(CH_2)_nNHR$, and $(CH_2)_nNRR$, and further represents replacement in the ring of 1 or 2 ring methine (—CH=) atoms with aza (—N=) atoms;

R_2 is a member selected from

C_{2-4} alkyl,
$(CH_2)_nCOOH$,
$(CH_2)_nCOOR$,
$(CH_2)_nCOR$,
$(CH_2)_nSO_2R$,
$(CH_2)_nSO_2NRR$,
$(CH_2)_nSO_2NHR$,
CH=CHCOOH,





$(CH_2)_nCONH_2$,
$(CH_2)_nCONHR$,
$(CH_2)_nCONRR$,
$(CH_2)_nCONHCH_2Ph$,
CONHR,
CONRR,
CONHPh,
COY,
COPhCOOH,
COPhCOOH,
$(CH_2)_nCONHPh$,
$(CH_2)_nCONHPhR$,
SO_2Y;

n is an integer from 1 to 4;

R is lower alkyl;

R_3 is a member selected from H, lower alkyl, and benzyl;

Y represents a benzene, pyridine, thiophene, furan, thiazole, or imidazole ring optionally substituted with a lower alkyl, COOH, OH, OCOR, NH_2, CONHR, CONRR, OR, or NHR group; and

R_4 represents SeH, Se_oX, and Se_oQ where o is 1, 2, or 3, X is a member selected from H, lower alkyl, benzyl, and benzene, pyridine, thiophene, furan, thiazole, and imidazole rings, and Q is another 2-selenoindolyl moiety of Formula I.

5,464,862

METHOD FOR INHIBITING BONE LOSS USING CENTCHROMAN DERIVATIVES

Virender M. Labroo, Mill Creek; James R. Piggott, Bothell, and Steven D. Bain, Seattle, all of Wash., assignors to Zymo-Genetics, Inc., Seattle, Wash.

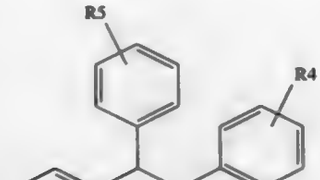
Continuation-in-part of Ser. No. 29,729, Mar. 11, 1993, Pat. No. 5,280,040. This application Jan. 13, 1994, Ser. No. 180,728

The portion of the term of this patent subsequent to Jan. 18, 2011, has been disclaimed.

Int. Cl.[6] A61K *31/40*

U.S. Cl. 514—422 **24 Claims**

1. A method for reducing bone loss in a patient comprising administering to a patient suffering from bone loss due to osteoporosis, Paget's disease or hyperparathyroidism an effective amount of a composition comprising a bone loss inhibiting compound of the formula



or a pharmaceutically acceptable salt thereof, wherein

R1, R4 and R5 are individually hydrogen, hydroxy, halo, trifluoromethyl, lower alkyl, lower alkoxy or tertiary amino lower alkoxy; and

R2 and R3 are individually hydrogen or lower alkyl,

in combination with a pharmaceutically acceptable carrier.

5,464,863

N-HETEROARYL-N'-PHENYLUREA DERIVATIVES, THEIR PRODUCTION AND USE

Masashi Nagamine, Gose; Kenji Yamamoto; Yoshimitsu Matsui, both of Kawachinagano; Kenji Horiuchi, Daito, and Masanori Yoshida, Hashimoto, all of, Japan, assignors to Nihon Nohyaku Co., Ltd., Japan

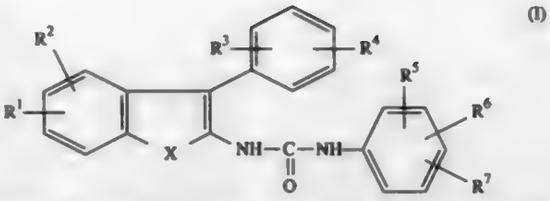
Filed Sep. 24, 1994, Ser. No. 201,378

Claims priority, application Japan, Feb. 27, 1993, 5-063460

Int. Cl.[6] A61K *31/38*; C07D *333/66*

U.S. Cl. 514—443 **6 Claims**

1. An N-heteroaryl-N'-phenylurea derivative represented by the general formula (I):



(I)

wherein R^1 and R^2, which may be the same or different, are hydrogen atoms; halogen atoms; unsubstituted C_1–C_{10} alkyl groups; substituted C_1–C_6 alkyl groups having a C_2–C_8-dialkylamino group as the substituent; substituted C_1–C_6 alkyl groups having as the substituent a saturated cyclic amino group which may have a heteroatom in the ring; C_1–C_6 alkoxy groups; or nitro groups, R^1 and R^2 being able to be taken together to represent a C_3–C_6 alkylene group, R^3 and R^4, which may be the same or different, are hydrogen atoms, halogen atoms, C_1–C_6 alkyl groups, C_1–C_6 haloalkyl groups, C_1–C_6 alkoxy groups or C_1–C_6 alkylthio groups, R^5, R^6 and R^7, which may be the same or different, are hydrogen atoms, halogen atoms, C_1–C_8 alkyl groups, C_1–C_6 haloalkyl groups, C_3–C_7 alkenyl groups, C_1–C_6 alkoxy groups, C_1–C_6 alkylthio groups or C_2–C_8-dialkylamino groups, and X is —S— or a pharmacologically acceptable salt thereof.

5,464,864

USE OF TETRAHYDROCARBAZONE DERIVATIVES AS $5HT_1$ RECEPTOR AGONISTS

Francis D. King; Laramie M. Gaster, both of Harlow; Alberto J. Kaumann, Trumpington, and Rodney C. Young, Hertford, all of, England, assignors to SmithKline Beecham P.L.C., Brentford, England

PCT No. PCT/GB92/01082, § 371 Date Dec. 23, 1993, § 102(e) Date Dec. 23, 1993, PCT Pub. No. WO93/00086, PCT Pub. Date Jan. 7, 1993

PCT Filed Jun. 17, 1992, Ser. No. 167,846

Claims priority, application United Kingdom, Jun. 26, 1991, 9113802

Int. Cl.[6] C07D *209/88*; A61K *31/40*

U.S. Cl. 514—468 **6 Claims**

1. A compound of formula (I) which is 3-methylamino-6-carboxamido-1,2,3,4-tetrahydrocarbazole, or a salt, solvate or hydrate thereof.

5,464,865

4-ARYL- AND 4-ARYLTHIO-5-HYDROXY-2(5H)-FURANONES AS INHIBITORS OF PHOSPHOLIPASE A_2

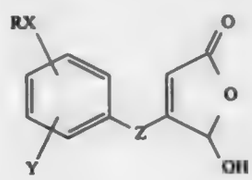
James P. Demers, New York, N.Y., and Richard B. Sulsky, Franklin Park, N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Dec. 22, 1993, Ser. No. 171,725

Int. Cl.[6] A61K *31/34*

U.S. Cl. 514—473 **18 Claims**

1. A compound of formula:



wherein

R contains from about five to about twenty carbon atoms and is selected from alkyl, acyl, cycloalkyl (C_3–C_8), aryl-alkyl,

(cycloalkyl)alkyl, alkenyl, aryl-alkenyl, alkynyl, (cycloalkyl)alkynyl, (cycloalkyl)alkenyl, aryl-alkynyl or aryl groups wherein

said alkyl, cycloalkyl, aryl-alkyl, (cycloalkyl)alkyl, alkenyl, aryl-alkenyl, alkynyl, (cycloalkyl)alkynyl, (cycloalkyl)alkenyl, aryl-alkynyl or aryl groups are unsubstituted or substituted by one or more lower alkyl groups(C_1–C_8),

wherein said cycloalkyl groups contain 3–8 carbon atoms and include no or one or more double bonds, said aryl groups are selected from phenyl and naphthyl and are monocyclic or fused bicyclic, and said aryl groups are unsubstituted or substituted by one or more halogen, nitro, lower alkyl, lower alkylthio, perfluoroalkyl, hydroxy, or lower alkoxy groups(C_1–C_8);

X is oxygen, sulfur, SO_2, NH, N(lower alkyl), N(lower acyl), aminocarbonyl, carbonyl, carbonylamino, CH_2 or a carbon-carbon bond;

Y is hydrogen, halogen, lower alkyl, nitro, alkylthio, perfluoroalkyl, hydroxy, or lower alkoxy(C_1–C_8); and

Z is sulfur or a carbon-carbon bond; and pharmaceutically acceptable salts thereof.

5,464,856

SUBSTITUTED HYDRINDANES FOR THE TREATMENT OF ANGIOGENESIS-DEPENDENT DISEASES

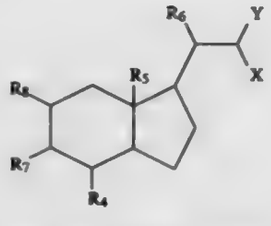
Abbot F. Clark, Arlington, and Raymond E. Conrow, Fort Worth, both of Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 169,930, Dec. 20, 1993, abandoned, which is a continuation of Ser. No. 930,635, Aug. 17, 1992, abandoned. This application Mar. 10, 1994, Ser. No. 209,525

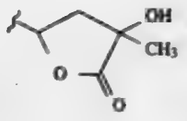
Int. Cl.[6] A61K *31/27*

U.S. Cl. 514—480 **4 Claims**

1. A method for controlling neovascularization in warm blooded animals, which comprises administering to the animal a pharmaceutically effective amount of a substituted hydrindane having the following structure



where X is OH, OR_1, OR_2, $OS(O)_2R_3$, $ON{=}CHR_1$, $ON{=}CR_1R_1$, CN, R_1, R_2, $CH(OH)R_2$, $CH(OR_1)R_2$, $CH(OR_2)R_2$, $C(OH)R_1R_1$, $C(OR_1)R_1R_1$, $C(OR_2)R_1R_1$, $C(OH)R_1R_2$, $C(OR_1)R_1R_2$, $C(OR_2)R_1R_2$, $C(OH)R_2R_2$, $C(OR_1)R_2R_2$, $C(OR_2)R_2R_2$, $S(=O)_nH$, $S(=O)_nR_1$, SR_2, $P(=O)R_1R_1$, $P(=O)(OH)_2$, $P(=O)(OH)(OR_1)$, $P(=O)(OR_1)(OR_1)$, $P(=O)(OH)(NH_2)$, $P(=O)(OR_1)(NH_2)$, $P(=O)(OH)(NHR_1)$, $P(=O)(OH)(NR_1R_1)$, $P(=O)(OR_1)(NHR_1)$ $P(=O)(OR_1)(NR_1R_1)$, NH_2, NHR_1, NHR_2, NR_1R_1, NR_1R_2, NHOH, $N(OH)R_1$, $N(OH)R_2$, $NH(OR_1)$, $NH(OR_2)$, $N(OR_1)R_2$, $N(OR_2)R_1$, $N(OR_2)R_2$, $N(OR_1)R_1$, $^{\oplus}S(R_1)(R_1)Q^{\ominus}$, $^{\oplus}N(R_1)(R_1)(R_1)Q^{\ominus}$ wherein $Q^{\ominus}$ is a halide, sulfonate, or carboxylate anion; $C(=O)R_1$, $C(=O)R_2$, $C(=O)NH_2$, $C(=O)NHR_1$, $C(=O)NR_1R_1$, $C(=O)N(OH)R_1$, $C(=O)N(OR_1)R_1$, $C(=O)N(OR_2)R_1$; or



n=0, 1 or 2;

R_1 is aryl, haloaryl, C_1–C_{10} alkyl, branched alkyl, cycloalkyl, aralkyl, carboxyalkyl or haloalkyl, optionally unsaturated and/or substituted with up to 6 OH, 6 OR_3, or 6 OR_2; or imidazolyl, triazolyl, thiadiazolyl, oxadiazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, or pyridyl, optionally substituted with up to three halogen or C_1–C_6 alkyl groups;

R_2 is $C(=O)H$, $C(=O)R_1$, $C(=O)OR_1$, $C(=O)OH$, $C(=O)NH_2$, $C(=O)NHR_1$, $C(=O)NR_1R_1$;

R_3 is aryl, haloaryl, C_1–C_{10} alkyl, branched alkyl, cycloalkyl, aralkyl, carboxyalkyl or haloalkyl optionally unsaturated and/or substituted with up to 6 OH;

R_4 is H, (=O), OR_2, OR_1, OH, =NOH, $=NOR_1$, $=NOR_2$;

R_5 and R_6 are independently H, CH_3 or CH_2CH_3;

Y is H, OH, OR_1, OR_2 or (=O), with the proviso that if Y is OH, then X is R_1, R_2, $CH(OH)R_2$, $CH(OR_1)R_2$, $CH(OR_2)R_2$, $C(OH)R_1R_2$, $C(OR_1)R_1R_2$, $C(OR_2)R_1R_2$, $C(OH)R_2R_2$, $C(OR_1)R_2R_2$, $C(OR_2)R_2R_2$, and if Y is (=O) then X is R_1, R_2, $CH(OH)R_2$, $CH(OR_1)R_2$, $CH(OR_2)R_2$, $C(OH)R_1R_2$, $C(OR_1)R_1R_2$, $C(OR_2)R_1R_2$, $C(OH)R_2R_2$, $C(OR_1)R_2R_2$, $C(OR_2)R_2R_2$, NH_2, NHR_1, NR_1R_1, NHOH, $N(OH)R_1$, $NH(OR_1)$, $NH(OR_2)_2$, $N(OR_1R)R_1$, or $N(OR_2)R_1$;

R_7 and R_8 are independently H or C_1 to C_6 alkyl, branched alkyl, hydroxyalkyl, optionally unsaturated; or R_7 and R_8 together form a double bond;

R_1R_1 attached to the same C, S, P or N atom taken together can form a ring of from 3 through 7 members; and

for those substituents containing more than one R_1, R_2, or R_3 each R_1, R_2, or R_3 may be the same or different;

or a pharmaceutically acceptable salt or ester thereof.

5,464,867

DIAMINOCYCLOBUTENE-3,4-DIONES

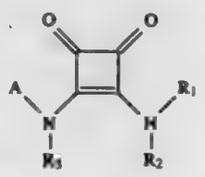
Madelene M. Antane, Lawrenceville; John A. Butera, Clarksburg; Bradford H. Hirth, Monmouth Junction, and Schuyler A. Antane, Lawrenceville, all of N.J., assignors to American Home Products Corporation, Madison, N.J.

Filed Nov. 16, 1994, Ser. No. 340,697

Int. Cl.[6] C07C *225/20*; A61K *31/275*

U.S. Cl. 514—524 **27 Claims**

1. A compound of the formula:



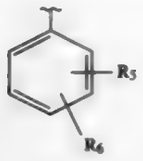
(I)

wherein:

R_1 and R_2 are, independent from each other, hydrogen, $C_{1\text{-}10}$ straight chain alkyl, $C_{1\text{-}10}$ branched alkyl, or $C_{3\text{-}10}$ cyclic or bicyclic alkyl;

R_3 is an aryl substituent selected from the group consisting of formyl, alkanoyl of 2 to 7 carbon atoms, alkenoyl of 3 to 7 carbon atoms, alkylsulfonyl of 1 to 7 carbon atoms, aroyl of 7 to 12 carbon atoms, arylalkenoyl of 9 to 20 carbon atoms, arylsulfonyl of 6 to 12 carbon atoms, arylalkanoyl of 8 to 12 carbon atoms or arylalkylsulfonyl of 7 to 12 carbon atoms;

A is a substituted phenyl group of the following formula:



wherein:

R_5 and R_6, independent from each other, are selected from the following: cyano, nitro, amino, C_{1-6} alkyl, C_{1-6} perfluoroalkyl, C_{1-6} alkoxy, C_{1-6} perfluoroalkoxy, C_{1-6} alkylamino, C_{2-12} dialkylamino, sulfamyl, C_{1-6} alkylsulfonamido, C_{6-12} arylsulfonamido, alkylcarboxamido containing 2 to 7 carbon atoms, arylcarboxamido containing 7 to 13 carbon atoms, C_{2-6} alkanoyl, C_{1-6} alkylsulfonyl, C_{1-6} perfluoroalkylsulfonyl, C_{6-12} arylsulfonyl, chloro, bromo, fluoro, iodo, 1-imidazolyl, carboxyl or hydrogen;

or a pharmaceutically acceptable salt thereof.

5,464,868

PROSTAGLANDIN E1 DERIVATIVES FOR TRANSDERMAL ADMINISTRATION AND METHODS OF TREATMENT THEREWITH

Jürgen C. Frölich, Röhrichtweg 11, 3000 Hannover 71, and Herbert Bippi, Warburghof 10B, 3000 Hannover 61, both of, Germany

Division of Ser. No. 483,995, Feb. 22, 1990, Pat. No. 5,219,885, which is a continuation of Ser. No. 156,177, Feb. 16, 1988, abandoned. This application Apr. 7, 1993, Ser. No. 44,511

Claims priority, application Germany, Feb. 16, 1987, 37 04 825.2

Int. Cl.[6] A61K *31/557*

U.S. Cl. 514—530 **2 Claims**

1. A method for treatment of ulcer of the skin in a patient comprising the step of contacting the skin of said patient with a transdermal pharmaceutical composition in a transdermally effective amount, said pharmaceutical composition itself comprising a C_{1-4} alkyl ester of prostaglandin E1 or 6-keto prostaglandin E1.

5,464,869

USE OF DIMERCAPTAN ACIDS, SALTS AND METABOLITES THEREOF AS ANTIRETROVIRAL TREATMENTS

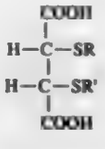
John D. Travers, Yardley, and Eileen C. Helzner, Plymouth Meeting, both of Pa., assignors to Ethicon, Inc., Somerville, N.J.

Continuation of Ser. No. 77,977, Jun. 15, 1993, abandoned. This application Jan. 30, 1995, Ser. No. 380,787

Int. Cl.[6] A61K *31/19;311195*

U.S. Cl. 514—574 **5 Claims**

1. A method for the treatment of retrovirus in humans comprising administering to a human infected with retrovirus a thereapeutically effective amount of a dimercaptan compound having the formula:



wherein R and R' are independently selected from the group consisting of hydrogen, a disulfide linkage to cysteine, a disulfide linkage to methionine, a disulfide linkage to gluthathione and a disulfide linkage to meso-2,3, dimercaptosuccinic acid and pharmaceutically acceptable salts thereof alone or in combination with other drugs thereapeutically effective in the treatment of said human.

5,464,870

METHODS OF INHIBITING DEVELOPMENT OF LEUKOPLAKIA WITH FENRETINIDE

Umberto Veronesi; Fausto Chiesa, and Alberto Costa, all of Milan, Italy, assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Feb. 10, 1993, Ser. No. 15,944

Int. Cl.[6] A61K *31/165*

U.S. Cl. 514—617 **10 Claims**

1. A method of inhibiting development of leukoplakia in a patient diagnosed with leukoplakia comprising the step of administering an effective leukoplakia inhibiting amount of fenretinide to the patient.

5,464,871

AROMATIC NITRO AND NITROSO COMPOUNDS AND THEIR METABOLITES USEFUL AS ANTI-VIRAL AND ANTI-TUMOR AGENTS

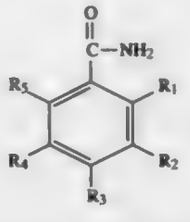
Ernest Kun, Mill Valley; Jerome Mendeleyev, San Francisco, and Eva Kirsten, Daly City, all of Calif., assignors to Octamer, Inc., Sausalito, Calif.

Continuation-in-part of Ser. No. 60,409, May 12, 1993. This application Jun. 11, 1993, Ser. No. 76,313

Int. Cl.[6] C07C *233/65;207/04;* **A61K** *31/24*

U.S. Cl. 514—617 **6 Claims**

1. A compound of the structural formula:



wherein R_1, R_2, R_3, R_4, and R_5 are, independent of one another, selected from the grop consisting of hydrogen, hydroxy, amino, nitro, iodo, $(C_1–C_6)$ alkyl, $(C_1–C_6)$ alkoxy, $(C_3–C_7)$ cycloalkyl, and phenyl and pharmaceutically acceptable salts thereof, wherein at least two of the five R_1, R_2, R_3, R_4, and R_5 substituents are always hydrogen, at least one of the five substituents are always nitro, and at least one substituent positioned adjacent to a nitro is always iodo.

5,464,872

ARYLALKYL (THIO) AMIDES

Michel Langlois, Sceaux; Pierre Renard, Versailles, and Gérard Adam, Le Mesnil le Roi, all of, France, assignors to Adir et Compagnie, Courbevoie, France

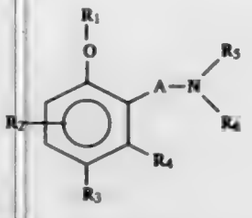
Continuation of Ser. No. 131,207, Oct. 1, 1993, abandoned. This application Jan. 18, 1995, Ser. No. 375,583

Claims priority, application France, Jan. 2, 1992, 92 11671

Int. Cl.[6] A61K *31/16;* C07C *233/05*

U.S. Cl. 514—630 10 Claims

1. A compound which is selected from those of formula (I):



(I)

in which:

A represents a $—CH_2—CH_2—$ chain, unsubstituted or substituted with lower alkyl,

R_1 represents hydrogen or lower alkyl,

R_2 represents hydrogen, halogen, or lower alkyl,

R_3 and R_4, together with the benzene ring which carries them, form a naphthalene ring-system E_3: on the understanding that the portion of the ring-system E_3 formed by R_3 and R_4 and the two carbon atoms of the benzene ring which carry them is:

unhydrogenated or partially hydrogenated,

and unsubstituted or substituted with one or more radicals chosen from: halogen, hydroxyl, lower alkyl, lower alkoxy, lower alkoxycarbonyl, and trifluoromethyl,

R_5 represents hydrogen or lower alkyl,

R_6 represents a group

in which X represents oxygen and R_7 represents a radical chosen from:

lower alkyl, unsubstituted or substituted with one or more radicals chosen from halogen, hydroxyl, and lower alkoxy,

linear or branched alkenyl having 2 to 7 carbon atoms, inclusive, unsubstituted or substituted with one or more radicals chosen from halogen, hydroxyl, and lower alkoxy,

and $—(CH_2)_m—E_4$ in which m represents 0 or 1 to 4, inclusive, and E_4 represents a mono- or bicyclic cycloalkyl having 3 to 12 carbon atoms, inclusive, unsubstituted or substituted with one or more radicals chosen from halogen, and lower alkyl, its optical isomers, and addition salts thereof with a pharmaceutically-acceptable acid or base when R_3 or R_4 represents a salifiable group, on the understanding that the terms "lower alkyl" and "lower alkoxy" denote linear or branched groups having 1 to 6 carbon atoms, inclusive, and that the terms "cycloalkenyl" and "alkenyl" denote hydrocarbon groups containing one or more double bonds.

5,464,873

ALICYCLIC DIAMINE FUNGICIDES

David J. Robins, Milton of Campsie, and Dale R. Walters, Prestwick, both of, Scotland, assignors to British Technology Group Limited, London, England

PCT No. PCT/GB93/01125, § 371 Date Oct. 21, 1994, § 102(e) Date Oct. 21, 1994, PCT Pub. No. WO93/24444, PCT Pub. Date Dec. 9, 1993

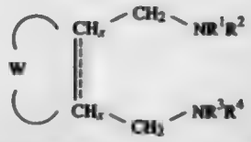
PCT Filed May 28, 1993, Ser. No. 325,210

Claims priority, application United Kingdom, May 28, 1992, 9211291

Int. Cl.[6] A01N *33/02*

U.S. Cl. 514—659 8 Claims

1. A method of treating plants to control fungal infection thereof, said method comprising applying to said plants a fungicidally effective amount of a compound having the formula (1):



(1)

wherein R^1, R^2, R^3 and R^4, which may be the same or different, represent hydrogen atoms or alkyl groups of 1–6 carbon atoms, x is 0 or 1 and when x is 0, the dashed line completes a double bond, and W represents a saturated or ethylenically unsaturated divalent hydrocarbyl group required to complete a cycloalkane, cycloalkene or cycloalkadiene ring of 3 to 6 ring atoms and from 0 to 2 double bonds, in the form of the free base or an acid addition salt tolerable to plants.

5,464,874

AQUEOUS SURFACTANT COMPOSITIONS OF ELEVATED VISCOSITY

Dieter Balzer, Haltern, Germany, assignor to Huels Aktiengesellschaft, Marl, Germany

Continuation of Ser. No. 817,583, Jan. 7, 1992, abandoned. This application Aug. 22, 1994, Ser. No. 293,682

Claims priority, application Germany, Apr. 30, 1991, 41 14 141.5

Int. Cl.[6] A61K *7/48;7/50;* C11D *3/48;9/50*

U.S. Cl. 514—777 10 Claims

1. In an aqueous cosmetic surfactant composition of elevated viscosity comprising 4 to 30% by weight of a base surfactant and 3 to 29.5% by weight of a thickener mixture and additive, the improvement wherein the thickener mixture and additive comprises

(A) 3 to 25% by weight of an alkyl polyglycoside having the formula $R—O—Z_n$, in which R is an alkyl radical having 8 to 18 carbon atoms, or a mixture thereof, and Z_n represents a polyglycoside where n=1 to 5 and Z represents a hexose or pentose unit, or a mixture thereof,

(B) 0.005 to 2% by weight of a polymer selected from the group consisting of

(1) fatty acid esters of alkoxylated polyhydric alcohols having 3 to 8 carbon atoms and 3 to 6 hydroxyl groups, wherein the average degree of alkoxylation is 20–500 mol/mol;

(2) fatty alcohol ethers of alkoxylated polyhydric alcohols having 3 to 8 carbon atoms and 3 to 6 hydroxyl groups wherein the average degree of alkoxylation is 20–500 mol/mol;

(3) fatty acid esters of alkoxylated fatty alcohols;

(4) fatty acid diesters of polyglycol ethers having average molecular weights between 2,000 and 25,000;

(5) fatty alcohol diethers of polyglycol ethers having average molecular weights between 2,000 and 25,000;

(6) xanthan polymers; and

(7) compounds of the formula $R'—O(C_2H_4O)_mCOOR''$, in which R' and R'' are independently selected alkyl groups having 8 to 20 carbon atoms, and m is an average number from 20 to 100; and

(C) 0 to 2.5% by weight of a foreign electrolyte selected from the group consisting of alkali metal halides, alkali metal sulfates, ammonium phosphates, alkaline earth metal halides, alkaline earth metal sulfates, and alkali metal phosphates,

wherein said weight percentages are based on the aqueous cosmetic surfactant composition.

5,464,875

PROCESS FOR PREPARING WEAKLY-BASIC ANION EXCHANGERS AND REAGENTS SUITABLE FOR THIS PURPOSE

Reinhold Klipper, Köln; Stefan Antons, Leverkusen; Guido Steffan; Alfred Mitschker, both of Odenthal; Werner Strüver, Leverkusen, and Holger Lütjens, Köln, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 12, 1994, Ser. No. 289,812

Claims priority, application Germany, Aug. 20, 1993, 43 28 075.7

Int. Cl.[6] C08F *8/32*

U.S. Cl. 521—32 **2 Claims**

1. Process for preparing a weakly-basic anion exchanger based on a crosslinked vinylaromatic polymer containing ring-bonded primary aminomethyl groups, comprising

a) reacting a crosslinked vinylaromatic polymer with N-chloromethylphthalimide,

b) cleaving the reaction product so obtained with methylamine at an elevated temperature under pressure thereby to form an anion exchanger and N,N'-dimethylphthalamide,

c) cyclizing the N,N'-dimethylphthalamide to N-methylphthalimide, and

d) reacting the N-methylphthalimide with chlorine at elevated temperature in the presence of a free radical former selected from the group consisting of a peroxide, hydroperoxide and azo compound.

5,464,876

PROCESS FOR THE RECOVERY OF VALUABLE MATERIALS DURING THE WORK-UP OF POLYVINYL CHLORIDE

Günther Lyding; Maria Pille, both of Kelkheim; Helmold von Plessen, Königstein, and Joachim Semel, Eppstein, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Oct. 4, 1994, Ser. No. 317,765

Claims priority, application Germany, Jan. 7, 1993, 43 34 114.4

Int. Cl.[6] C10B *53/00*

U.S. Cl. 521—46.5 **2 Claims**

1. Process for the recovery of reusable materials during the work-up of polyvinyl chloride by thermal treatment of the polyvinyl chloride, which comprises heating the polyvinyl chloride to a temperature of from 250° to 500° C. in the absence of oxygen, producing hydrogen chloride, a carbon-containing residue and a plasticizer-containing distillate, and recovering the plasticizer from the distillate by fractional distillation, wherein said plasticizer is a carboxylic acid ester.

5,464,877

METHOD FOR RECOVERING A SYNTHETIC WASTE MATERIAL CONTAMINATED WITH OTHER MATERIALS

François-Marie Franci, Pontault-Combault, France, assignor to Helverep S.A., Switzerland

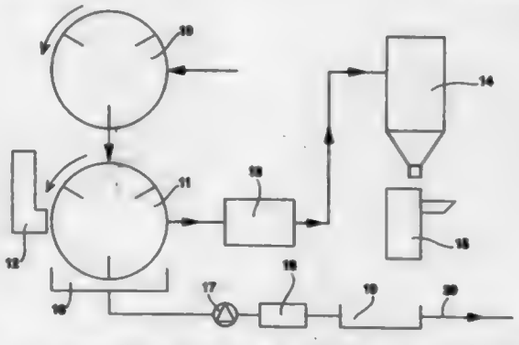
PCT No. PCT/CH93/00169, § 371 Date Mar. 24, 1994, § 102(e) Date Mar. 24, 1994, PCT Pub. No. WO94/01491, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 2, 1993, Ser. No. 204,159

Claims priority, application France, Jul. 3, 1992, 92 08413

Int. Cl.[6] C08J *11/04;11/06;* B29B *17/02*

U.S. Cl. 521—48 **11 Claims**



1. A method for recovering synthetic material from waste articles made substantially of said synthetic material and having surfaces contaminated with other materials, comprising the simultaneous steps of:

a) chemically treating said other materials by impregnating said other materials with a chemical solution which aggressively degrades and removes said other materials but is substantially neutral toward said synthetic material, and

b) mechanically treating said waste articles by bulk tumbling said waste articles in a hermetically closed rotary drum,

wherein said treatment steps a) and b) are performed simultaneously by introducing said waste articles into said drum in an uncrushed and uncomminuted condition and providing said chemical solution in said drum in an amount of between 1% and 5% in weight of the waste articles before performing said treatment steps.

5,464,878

DEGRADABLE POLYMERIC FORM AND PROCESS FOR MAKING

Speros P. Nemphos, League City, Tex., and James T. McQueen, Jaffrey, N.H., assignors to Camelot Technologies, Inc., Calgary, Canada

Filed Jun. 11, 1993, Ser. No. 75,118

Int. Cl.[6] C08G *9/00*

U.S. Cl. 521—50 **41 Claims**

1. A degradable polymeric foam having a density of not more than 16 lb/cu ft. comprising a polymer alloy comprising:

(i) from 50 to 100% of one or more co or homopolymers having a viscosity average molecular weight of greater than 40,000 comprising the residues selected from the group consisting of one or more monomers of the Formula:

$$—OCR_1R_2(CR_3R_4)_nCO—, \quad \text{I}$$

one or more monomers of the formula

$$—OCH(CH_3)CO— \quad \text{II}$$

and mixture thereof, wherein in Formula I, R_1, R_2, R_3, and R_4 are independently selected from the group consisting of a hydrogen atom and a C_{1-4} alkyl radical, and n is zero or an integer from 1 to 5, provided that when a monomer residue of Formula II is present and in Formula I n is 1 and R_2, R_3, and R_4 are hydrogen, R_1 can not be a methyl radical; and

(ii) from 0 to 50 weight % of one or more polymers selected from the group consisting of polymers having a Hildebrand parameter (σ) of not more than 3 $MPA^{1/2}$ different from that of said one or more co or homopolymers; provided that when component (ii) is present in the alloy, the intrinsic viscosity of the alloy melt permits the dispersion of a blowing agent throughout said melt and prevents separation of the component of the alloy.

5,464,879

1,1,1,2-TETRAFLUOROETHANE AS A BLOWING AGENT IN INTEGRAL SKIN POLYURETHANE SHOE SOLES

Valeri L. Valoppi, Southgate, Mich., assignor to BASF Corporation, Mt. Olive, N.J.

Continuation of Ser. No. 999,632, Dec. 31, 1992, abandoned. This application Mar. 31, 1994, Ser. No. 220,954

Int. Cl.[6] C08J 9/34

U.S. Cl. 521—51 **10 Claims**

1. A flexible integral skin polyurethane foam composition which is the reaction product of:

A) an organic polyisocyanate;

B) an isocyanate reactive hydroxyl-functional polyol composition consisting essentially of

Bi) one or more polyoxyalkylene polyether polyols or vinyl polymer grafted polyoxyalkylene polyether dispersions;

Bii) a chain extender having 2 functional groups bearing active hydrogen atoms and being free of aromatic functionality; and optionally,

Biii) an aliphatic alcohol containing from 10–20 carbon atoms;

in the presence of

C. a urethane promoting catalyst;

D. a blowing agent which is either 1,1,1,2-tetrafluoroethane or a mixture of 1,1,1,2-tetrafluoroethane and water and

E. optionally, surfactants, fillers, pigments, antioxidants, and stabilizers.

5,464,880

PROCESS FOR THE CFC-FREE PRODUCTION OF CELLULAR POLYURETHANE MOLDED PARTS

Hans G. Weber, Duderstadt; Peter Haas, Haan; Erhard Michels, Köln; Christian Weber, Leverkusen, and Klaus Brecht, Kürten, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 31, 1994, Ser. No. 332,676

Claims priority, application Germany, Nov. 4, 1993, 43 37 569.3

Int. Cl.[6] C08J 9/34

U.S. Cl. 521—51 **5 Claims**

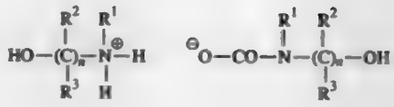
1. A process for the chlorofluorocarbon-free production of cellular polyurethane molded parts having solid surfaces by reacting a reaction mixture in a sealed mold, allowing the reaction mixture to fully react, and removing the molded pad from the mold, wherein said reaction mixture comprises:

A) a polyisocyanate component having an isocyanate content of 18 to 33.6% comprising at least one polyisocyanate from the diphenylmethane series, or mixtures thereof,

B) a polyol component having an average hydroxyl functionality of 2 to 3, and comprising at least one polyether polyol having a molecular weight of 2,000 to 10,000 and/or at least one polyester polyol having a molecular weight of 2,000 to 10,000,

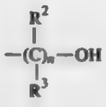
C) from 2 to 15% by weight, based on the weight of component B), of at least one difunctional compound having a molecular weight of 62 to 1999, and

D) blowing agents and other auxiliary substances and additives, wherein said blowing agents comprise one or more carbamates wherein said carbamates are selected from the group consisting of carbamates corresponding to the general formula:



wherein:

R^1 represents hydrogen, or a C_1–C_5 alkyl group or a group of the formula:



R^2 and R^3 may represent identical or different groups, and represent hydrogen or C_1–C_3 alkyl groups, and

n is an integer from 2 to 6.

5,464,881

EXPANDABLE STYRENE POLYMERS OF HIGH HEAT RESISTANCE

Rolf Henn, Ketsch; Siegmund Besecke, Hameln; Andreas Deckers, Ludwigshafen; Norbert Guentherberg, Speyer; Martin Brudermueller, Mannheim; Gerhard Nestler, Ludwigshafen, and Karl-Heinz Wassmer, Limburgerhof, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/01222, § 371 Date Nov. 22, 1994, § 102(e) Date Nov. 22, 1994, PCT Pub. No. WO93/24561, PCT Pub. Date Dec. 9, 1993

PCT Filed May 17, 1993, Ser. No. 343,567

Claims priority, application Germany, May 26, 1992, 42 17 383.3

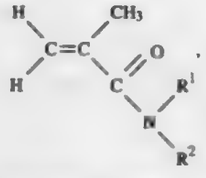
Int. Cl.[6] C08J 9/16

U.S. Cl. 521—60 **1 Claim**

1. A foam having a density of from 0.01 to 0.2 g/cm^3, comprising

a) from 0 to 90% by weight of a styrene polymer or styrene copolymer other than b) containing at least 50% by weight of copolymerized styrene,

b) from 10 to 100% by weight of a styrene/methacrylamide copolymer comprising from 0.5 to 50% by weight of at least one copolymerized N-substituted methacrylamide of the formula I



I

where R^1 and R^2 are identical or different and are hydrogen, C_1- to C_{15}-alkyl, C_6- to C_{16}-cycloalkyl or C_6- to C_{20}-aryl, it being possible, if R^1 and R^2 contain at least 2 carbon atoms, for at least 2 carbon atoms to be linked via hetero atoms.

5,464,882

METHOD FOR INHIBITING THE DEGRADATION OF HYDROCHLOROFLUOROCARBONS UTILIZED AS FOAMING AGENTS IN THE PREPARATION OF FOAMED POLYURETHANES AND POLYISOCYANURATES

Giampiero Basile; Ezio Musso, both of Alessandria; Claudio Tonelli, Milan, and Sauro Girolomoni, Alessandria, all of, Italy, assignors to Ausimont S.p.A., Milan, Italy

Continuation of Ser. No. 866,139, Apr. 9, 1992, abandoned. This application Jun. 15, 1994, Ser. No. 260,092

Claims priority, application Italy, Apr. 11, 1991, MI91A0989; Jul. 5, 1991, MI91A1861

Int. Cl.[6] C08J 9/14

U.S. Cl. 521—95 7 Claims

1. A process for inhibiting dehydrohalogenation of hydrochlorofluorocarbons in a reaction medium consisting essentially of said hydrochlorofluorocarbons mixed with polyols and polyisocyanates for use in a foaming reaction to produce foamed polyurethanes or polyisocyanurates, said process comprising adding a dehydrohalogenation inhibiting agent to said reaction medium up to twenty-four hours before starting the foaming reaction to prevent said hydrochlorofluorocarbons from undergoing dehydrohalogenation in said reaction medium, wherein said hydrochlorofluorocarbons have two carbon atoms, the first of which is bound to a chlorine or fluorine atom, the second of which is bound to a hydrogen atom, while the remaining atoms bound to the two carbon atoms are selected from the group consisting of H, Cl and F, with the proviso that the total number of F atoms in the hydrochlorofluorocarbons is not higher than 4, and said hydrochlorofluorocarbons have a boiling temperature of from about −15° C. to about 70° C. and wherein said dehydrohalogenation inhibiting agent is selected from the group consisting of nitromethane, nitroethane and 1-nitropropane.

5,464,883

WATERBORNE CORRECTION FLUID FOR CORRECTING LASER-JET AND PHOTOCOPIED MARKINGS

Mahendra K. Sharma; Andy H. Singleton, and John J. Hiller, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Jun. 3, 1994, Ser. No. 254,084

Int. Cl.[6] C09D 10/00; C08K 3/22

U.S. Cl. 523—161 2 Claims

1. A high solids content waterborne correction fluid for correcting laser-jet printed and photocopied markings consisting essentially of:

(A) 5 to 25 weight percent of a sulfopolyester having a weight average molecular weight of 7,000 to 15,000, an inherent viscosity of 0.2 to 0.4 dl/g, and a glass transition temperature of 35° C. to 60° C., comprising repeat units from

(1) a dicarboxylic acid selected from the group consisting of aromatic dicarboxylic acids, saturated aliphatic dicarboxylic acids, cycloaliphatic dicarboxylic acids, and combinations thereof;

(2) a diol; and

(3) a difunctional sulfomonomer containing at least one sulfonate group attached to an aromatic nucleus wherein the functional groups are hydroxy, carboxy or amino, provided the difunctional sulfomonomer is present in an amount from 10 to 24 mole percent based on 100 mole percent dicarboxylic acid and 100 mole percent diol;

(B) 25 to 55 weight percent of titanium dioxide; and

(C) 20 to 45 weight percent of water,

wherein the correction fluid has a solids content of 50 to 80 percent.

5,464,884

COATING PROCESS AND CURABLE COMPOSITIONS

Eric Nield, Dell Lees, Seer Green, Beaconsfield, HP9 2UJ; Daljit K. Suemul, Abbotts Road, Erdington, Birmingham, B24 8DE, and Denis M. H. Bovey, 17 Cippenham Close, Slough, Berkshire, SL1 5BH, all of, England

Continuation of Ser. No. 894,427, Jun. 5, 1992, abandoned, which is a division of Ser. No. 453,299, Dec. 22, 1989, Pat. No. 5,141,779. This application Jun. 1, 1994, Ser. No. 252,523

Claims priority, application United Kingdom, Dec. 23, 1988, 8830071; Jan. 4, 1989, 8900077

The portion of the term of this patent subsequent to Sep. 7, 2010, has been disclaimed.

Int. Cl.[6] C08L 67/02;63/00; C08K 3/00;5/00

U.S. Cl. 523—400 6 Claims

1. A curable composition comprising a liquid selected from the group consisting of organic solvent and water and solid particles of a crystallizable polymer, selected from the group consisting of poly(ethylene terephthalate), poly(ethylene terephthalate/isophthalate), and poly(butylene terephthalate) dispersed in said liquid, said particles comprising amorphous zones containing an entrapped curable epoxy resin, whereby adjacent zones may be linked together by curing of the entrapped epoxy resin, said coating composition also comprising a curing agent for said curable epoxy resin.

5,464,885

LOW VOC, AQUEOUS DISPERSED, EPOXY-ESTER ACRYLIC GRAFT COATINGS

Gary P. Craun, Berea, Ohio, assignor to The Glidden Company, Cleveland, Ohio

Filed Apr. 4, 1994, Ser. No. 222,029

The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl.[6] C08K 3/20; C08L 63/02

U.S. Cl. 523—423 6 Claims

1. In a process for producing an aqueous dispersed, protective coating composition substantially free of volatile organic compounds and containing a polymeric binder dispersed into water, the polymeric binder being emulsion polymerized microgel polymer particles the process comprising:

esterifying by weight between 1% and 70% low molecular weight epoxy resin having a number average molecular weight between about 100 and 1,000 with between 1% and 70% low molecular weight, carboxyl functional, unsaturated polyester oligomer having an Acid No. between about 30 and 500 and a number average molecular weight between about 200 and 3,000 to form a carboxyl functional unsaturated epoxy-ester having an Acid No. between about 30 and 200;

dispersing the carboxyl functional epoxy-ester into water by at least partially neutralizing the carboxyl functional epoxy-ester with ammonia;

copolymerizing by emulsion polymerization at least 1% by weight ethylenic monomer in the presence of the carboxyl functional unsaturated epoxy-ester dispersed into water to produce internally crosslinked emulsion microgel polymer particles of a copolymer of emulsion polymerized ethylenic monomer crosslinked with the epoxy-ester by addition copolymerization crosslinking, the emulsion microgel polymer particles having an Acid No. between about 25 and 150, where the emulsion crosslinked microgel polymer particles have an average particle size less than 0.20 microns, and said microgel polymer particles are stably dispersed into water without surfactant.

5,464,886

POLYMER CONCRETE COATING FOR PIPE, TUBULAR SHAPES, OTHER METAL MEMBERS AND METAL STRUCTURES

Bang T. Tran, 1210 Aldine Meadows, Houston, Tex. 77032, and Thomas J. Toerner, 31 E. Lance Leaf Rd., The Woodlands, Tex. 77381

Continuation of Ser. No. 600,543, Oct. 19, 1990, abandoned. This application Mar. 29, 1993, Ser. No. 39,521

Int. Cl.[6] C08L 63/02

U.S. Cl. 523—428 6 Claims

1. A protective coating for metal members, comprising: a mixture of:

an organic resin comprising between 60–75% by weight of a bisphenol A based epoxy and between about 25–40% by weight of a polyglycol di-epoxide;

a filler material consisting substantially of particles up to 200 mesh wherein the ratio by weight of said filler material to said organic resin is between about 1:1 and 7:3, and

an amine, selected from the group consisting of aminoethylpiperazine and tetraethylene pentamine.

5,464,887

CROSSLINKED UNSATURATED POLYESTERS AS FLATTING AGENTS IN AQUEOUS ELECTROCOATING COMPOSITIONS

Matthew S. Scott, Pittsburgh; Gregory J. McCollum, Hampton Township, Allegheny County; Chester J. Szymanski, McCandless Township, Allegheny County, and Craig A. Wilson, Richland Township, Allegheny County, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 8, 1994, Ser. No. 225,211

Int. Cl.[6] C25D 13/00; C08L 67/06

U.S. Cl. 523—501 26 Claims

1. An aqueous electrocoating composition comprising

(a) an electrodepositable water dispersible polymer, and

(b) a microparticulate crosslinked unsaturated polyester product of precipitation from a liquid medium that is comprised of organic solvent as the major component, the product being present in the composition in an amount effective to provide flatting of a cured film of the aqueous electrocoating composition on a substrate.

5,464,888

CURABLE SEALER AND/OR ADHESIVE COMPOSITION, AND A METHOD FOR COATING SAME IN A WET STATE WITH A BASE COAT PAINT, AND COATED SUBSTRATES FORMED THEREBY

Ian R. Owen, River Falls, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

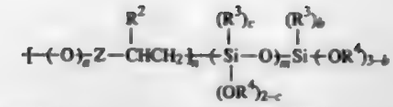
Filed Mar. 31, 1994, Ser. No. 221,101

Int. Cl.[6] C08K 5/3415

U.S. Cl. 524—104 18 Claims

1. A curable sealer and/or adhesive composition comprising:

(a) a polyoxyalkylene polymer having silicon-containing hydrolyzable end groups, wherein said polyoxyalkylene polymer comprises a structural unit of the formula (I): $-(R^1O)_q-$ (I), where R^1 is an alkylene group having 1 to 4 carbon atoms and q is an integer providing an average molecular weight for formula (I) of from about 500 to about 20,000 and a viscosity of from about 100 to 200,000 cps at 15° C., and each said silicon-containing hydrolyzable end group having the general formula (II):



(II)

wherein Z is —R—, —R—O—R"—, —R—O—C(O)—, —C(O)NHR—, —C(O) NH—X—NHC(O)—NR"—R—, —C(O) NH—X—NHC(O)—O—R—, —C(O) NH—X—NHC(O)—S—R—, or —C(O)—R—, where R and R" are the same or different and each is a bivalent hydrocarbon group having 1 to 20 carbon atoms, X is an alkylene or aryl group having 1 to 20 carbon atoms, R^2 is a hydrogen, a hydrocarbon group having 1–20 carbon atoms, or a triorganosiloxy group, R^3 is a substituted or unsubstituted monovalent group having 1–20 carbon atoms or an organosiloxy group, R^4 is a saturated or unsaturated monovalent hydrocarbon group having 1–20 carbon atoms, a is 0 or 1, b is 0, 1 or 2, c is 0, 1, or 2, n is 0 or 1 and m is an integer between 0 to 18; and

(b) a polar organic solvent material having a Snyder's polarity value in the range from 6.2 to 7.3 and belonging to Snyder's selectivity group III, wherein said polar organic solvent material is contained in an amount of from 1 to 5 parts by weight per 100 parts by weight of said sealer and/or adhesive composition, and wherein said polar organic solvent material is contained in an amount of from 1 to 10 parts by weight per 100 parts by weight said polyoxyalkylene polymer having a silicon-containing hydrolyzable group.

5,464,889

PHOSPHITE ANTIOXIDANTS

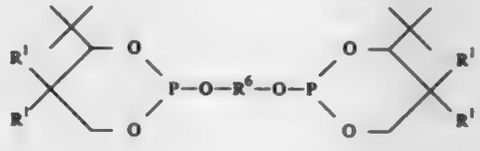
James A. Mahood, Parkersburg, W. Va., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 96,113, Jul. 22, 1993, abandoned. This application Aug. 3, 1994, Ser. No. 285,585

Int. Cl.[6] C08K 5/527; C07F 9/6574

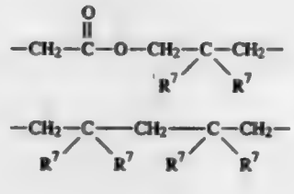
U.S. Cl. 524—119 6 Claims

5. A phosphite selected from the group consisting of phosphites of the formulas:

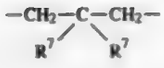


and

wherein each R^1 is independently selected from the group consisting of alkyl radicals having from 1 to 10 carbon atoms, each R^6 is a divalent radical selected from the group consisting of



-continued



wherein each R^7 is individually selected from alkyl radicals having from 1 to 6 carbon atoms, said phosphite having no hydrogen atom directly attached to a beta carbon atom relative to the oxygen attached to the phosphorous atom.

6. A polymeric composition comprising (a) a polymer selected from the group consisting of polyolefins, polyesters, polycarbonates, rubber modified graft copolymers, polyamides, polyetherimides, polyphenylene ethers, polyvinylhalides, polystyrenes, and polyurethanes, and (b) a phosphite as claimed in claim **5**.

5,464,890

POLYESTER MONOFILAMENTS EXTRUDED FROM A HIGH TEMPERATURE POLYESTER RESIN BLEND WITH INCREASED RESISTANCE TO HYDROLYTIC AND THERMAL DEGRADATION AND FABRICS THEREOF

Michelle A. Diaz-Kotti, Columbia, and Peter J. Brissette, Blythewood, both of S.C., assignors to Shakespeare Company, Columbia, S.C.

Filed Nov. 12, 1993, Ser. No. 151,406
Int. Cl.[6] C08K *5/29*
U.S. Cl. 524—195 **18 Claims**

1. An extruded polyester monofilament comprising:

from about 45 to about 94 percent by weight of a high temperature polyester resin;

from about 5 to about 50 percent by weight of a polyethylene terephthalate resin; and

from about 1 to about 5 percent by weight of a hydrolyric stabilizing agent, wherein said monofilament has increased resistance to hydrolyric degradation as compared to monofilaments consisting essentially of polyethylene terephthalate resin and as compared to monofilaments consisting essentially of high temperature polyester resin, and wherein said monofilament has at least as good a resistance to thermal degradation as compared to monofilaments consisting essentially of polyethylene terephthalate resin and increased resistance to thermal degradation as compared to monofilaments consisting essentially of high temperature polyester resin.

5,464,891

THERMOPLASTIC RESIN COMPOSITION

Kenji Nagaoka, and Kaoru Kitadono, both of Ichihara, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

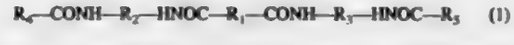
Filed Apr. 7, 1994, Ser. No. 224,497
Claims priority, application Japan, Apr. 7, 1993, 5-080583
Int. Cl.[6] C08K *5/20;* **C08L** *77/00*
U.S. Cl. 524—230 **17 Claims**

1. A thermoplastic resin composition comprising:

a continuous phase comprising a polyamide resin A;

a dispersed phase comprising a polyphenylene ether resin B;

at least one amide compound C represented by formula 1,



wherein R_1, R_2, and R_3 represent divalent hydrocarbon groups, which may be identical or different, and R_4 and R_5 represent monovalent hydrocarbon groups, which may be identical or different, and the amount of said amide compound C is between about 0.1 and about 30 parts by weight per 100 parts by weight with respect to the total weight of said resins A and B; and

a compatibilizing agent D wherein said compatibilizing agent D is a compound having at least one functional group selected from the group consisting of carboxyl, anhydride, hydride, amide, imide, carboxylate, epoxy, amino, isocyanate, oxazoline ring and hydroxyl, and said resin A and said compatibilizing agent D are different.

5,464,892

VINYL CHLORIDE RESIN COMPOSITION FOR POWDER MATERIAL

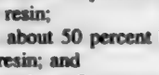
Seiko Yada, Hiratsuka; Yukihiro Ogawa, Yokohama; Takao Nomura, Toyota, and Yoshiro Umemoto, Nagoya, all of, Japan, assignors to Nippon Zeon Co., Ltd.; Zeon Kasei Co., Ltd., and Toyota Jidosha Kabushikaisha, all of Tokyo, Japan

Continuation-in-part of Ser. No. 652,596, Jan. 28, 1991, abandoned. This application Jan. 19, 1993, Ser. No. 6,160
Int. Cl.[6] C08K *5/04;3/00;* **B29C** *41/18*
U.S. Cl. 524—284 **48 Claims**

1. A composition suitable for use in a slush molding process comprising:

100 parts by weight of a vinyl chloride resin;

0.01 to 3 parts by weight of a metal carboxylate having the formula:



wherein R is an alkyl group containing 10 to 20 carbons atoms and M is at least one metal selected from the group consisting of lead, zinc, magnesium, calcium, cadmium, strontium and barium;

an amount, compatible with said metal carboxylate of 0.01 to 5 parts by weight, of a hydroxystearic acid diester polymer;

0.1 to 10 pats by weight of at least one perchloric acid compound selected from the group consisting of perchloric acid and a metal perchlorate; and

a plasticizer.

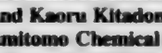
14. A method of forming a shaped article by slush molding which comprises:

forming a powder composition comprising:

100 parts by weight of vinyl chloride resin,

stabilizer,

0.01 to 3 parts by weight of a metal carboxylate having the formula:



wherein R is an alkyl group of 10 to 20 carbon atoms, and M is at least one metal selected from the group consisting of lead, zinc, magnesium, calcium, cadmium, strontium, and barium, and

an amount, which is compatible with said metal carboxylate, of 0.01 to 5 parts by weight, of at least one member selected from the group consisting of a hydroxystearic acid and a hydroxystearic acid diester polymer;

applying said powder composition to the inside of a mold, and

subjecting the powder composition inside said mold to molding conditions; whereby forming said shaped article inside said mold, and also forming, between said shaped article and said mold, a compatible mixture of said metal carboxylate and said hydroxystearic acid component.

5,464,893

RADIATION-RESISTANT POLYCARBONATES

Rick L. Archey, Pleasant Hills; Charles E. Lundy, Pittsburgh; Aaron D. Meltzer, Pittsburgh; Harald Pielartzik, Pittsburgh, all of Pa.; Gerhard Fennhoff, Willich, Germany; Ralf Hufen, Duisburg, Germany; Klaus Kircher, Leverkusen, Germany; Rudiger Schubart, Berg-Gladbach, Germany, and Richard Weider, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany, and Bayer Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 18,623, Feb. 17, 1993, abandoned, and Ser. No. 85,067, Jun. 29, 1993, abandoned. This application Mar. 22, 1994, Ser. No. 216,576

Int. Cl.[6] G08K *5/36*

U.S. Cl. 524—366 **16 Claims**

1. A thermoplastic molding composition comprising an aromatic polycarbonate and

(i) about 0.001 to 5% of a compound conforming to

$$Y[OCHR^1(CH_2)_n]_m\text{-}S_{n1}\text{-}[\text{-}(\text{—}CH_2)_nCHR^2\text{-}O]_mY'$$

wherein n_1 is a whole number between 2 and 6, and where Y and Y' independently one of the other denote a hydrogen atom or a C_{1-40} alkyl, or C_3–C_5-cycloalkyl radicals or acyl radicals, a pyranyl, or silyl group,

m is 0 to 70,

n is 1 to 4, and R^1 and R^2 independently denote hydrogen C_{1-22} alkyl, cycloalkyl aryl, alkylaryl or cycloalkyl-aryl radicals, and

(ii) 0.001 to 2% of a member selected from the group consisting of

(a) aliphatic monoalcohol ,cycloaliphatic monoalcohol, aliphatic polyalcohol and cycloaliphatic polyalcohol, and

(b) derivatives of said alcohols selected from the group consisting of ethers, carboxylic acid esters, acetale, alkylcarbonates, epoxides, urethanes, phosphate esters, phosphonate esters, phosphoric esters, phosphonic esters and siloxanes, said percents being relative to the weight of the composition.

5,464,894

FLAMEPROOFED THERMOPLASTIC POLYESTERS

Brigitte Gareiss, Ludwigshafen; Petra Baierweck, Boehl-Iggelheim; Christoph Plachetta, Limburgerhof, and Karl-heinz Ulmerich, Carlsberg, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 31, 1994, Ser. No. 220,494

Claims priority, application Germany, Apr. 20, 1993, 43 12 751.7

Int. Cl.[6] C08K *3/26*

U.S. Cl. 524—424 **4 Claims**

1. A flameproofed thermoplastic molding material, obtainable by mixing

A) from 20 to 70% by weight of a mixture of carbonates of metals of the 2nd main group of the Periodic Table of Elements

and

B) from 0 to 70% by weight of conventional additives and processing assistants

in a melt of

C) from 10 to 80% by weight of a polyester prepolymer having a viscosity number of from 40 to 100 ml/g

and subsequently carrying out solid-phase postcondensation.

5,464,895

ORGANOPHOSPHATE DISPERSING AGENT, FILLED THERMOSETTING COMPOSITION CONTAINING SAME, AND APPLICATION THEREOF

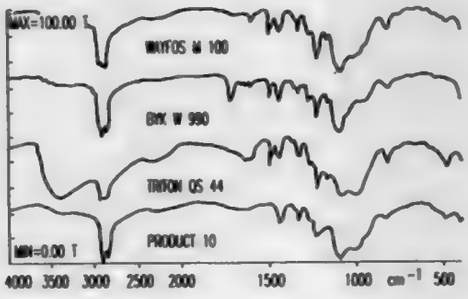
Pierre Blanchard, Reyrieux; Jean-Bernard Egraz, Ecully, and Georges Ravet, St Genis-les-Ollieres, all of, France, assignors to Coatex, S.A., Caluire, France

Division of Ser. No. 820,257, Jan. 14, 1992, Pat. No. 5,412,139. This application Sep. 29, 1994, Ser. No. 314,905

Claims priority, application France, Jan. 16, 1991, 91 00645

Int. Cl.[6] C08K *3/26;3/30;* **C07F** *9/02*

U.S. Cl. 524—425 **12 Claims**

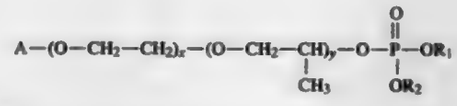


1. Thermosetting composition, comprising;

(a) a thermosetting resin,

(b) a pulverulent mineral filler in a quantity ranging up to 75% by weight of the total weight of the resin and the filler,

(c) an organophosphate dispersing agent, in an amount of 0.3 to 5% by weight of the weight of the filler, having the following general formula:

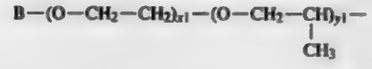


(I)

where:

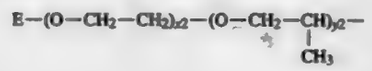
A is a branched or unbranched polyaryl group,

x and y are whole numbers between 0 and 100 such that x+y is a whole number greater than 40 but not greater than 100,



x1 and y1 are whole numbers between 0 and 100 such that x1+y1 is a whole number not greater than 100,

B is a branched or unbranched polyaryl group, or an alkyl, aryl, arylalkyl, alkylaryl, alkanoyl, or amine radical,



x2 and y2 are whole numbers between 0 and 100 such that x2+y2 is a whole number not greater than 100,

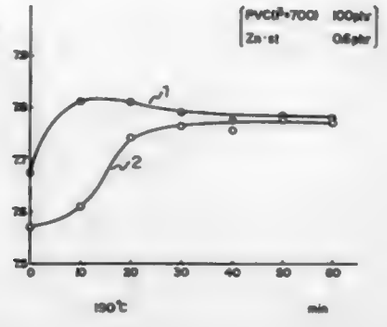
E is a branched or unbranched polyaryl group, or an alkyl, aryl, arylalkyl, alkylaryl, alkanoyl, or amine radical, and R_1 and R_2 may be identical or different.

5,464,896

STABILIZED, HALOGEN-CONTAINING RESIN COMPOSITION

Tsutomu Nosu, Kagawa, and Yoshiyuki Nagae, both of Kagawa, Japan, assignors to Kyowa Chemical Industry Co., Ltd., Kagawa, Japan

Continuation-in-part of Ser. No. 907,230, Jul. 1, 1992, abandoned. This application Dec. 6, 1993, Ser. No. 162,303
Claims priority, application Japan, Jul. 5, 1991, 3-192440
The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.
Int. Cl.[6] C08K 3/26
U.S. Cl. 524—436 3 Claims



1. A stabilized halogen-containing resin composition comprising 100 parts by weight of a halogenated polymer of an ethylenically unsaturated monomer, 0.01 to 5 parts by weight of a perchloric acid-containing hydrotalcite compound of the following formula (2), and 0.01 to 10 parts by weight of a hydrotalcite compound prepared by removing crystal water of a compound of the formula (1) under heat,

$$M^{2+}_{1-x}Al_x(OH)_2(CO_3)_y(ClO_4)_z \cdot mH_2O \quad (2)$$

wherein M^{2+} is Mg^2 and/or Zn^{2+}, x is defined by $0<x<0.5$, y is defined by $0<y<0.25$, z is defined by $0<z\leq 0.5$, x, y and z satisfy the relationship of $2y+z=x$, and m is defined by $0\leq m<1$,

$$M^{2+}_{1-x}Al_x(OH)_2(CO_3)_{x/2} \cdot mH_2O \quad (1)$$

wherein M^{2+} is Mg^{2+} and/or Zn^{2+}, x is defined by $0.1<x<0.5$, and m is defined by $0<m<1$.

5,464,897

AQUEOUS FLUOROPOLYMER DISPERSIONS

Suryya K. Das, Pittsburgh, and Soner Kilic, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 814,657, Dec. 30, 1991, abandoned. This application Jul. 25, 1994, Ser. No. 280,027
Int. Cl.[6] C08F 2/16
U.S. Cl. 524—458 24 Claims

1. A stable aqueous fluorocopolymer dispersion synthesized by aqueous dispersion polymerization of

a) monomers comprising a fluoroolefin monomer component and a vinyl ether monomer component, in the presence of

b) a base neutralized, stable aqueous dispersion of a hydroxyl functional polymeric dispersant having an acid value of at least about 1.5 mg KOH/gram of polymer and not exceeding about 35 mg KOH/gram of polymer and a number average molecular weight ranging from about 500 to about 250,000, the amount of neutralizing base not exceeding about 10 percent based on the resin solids of the polymeric dispersant, the acid value adapted to provide a stable dispersion of the fluorocopolymer in water without externally added surfactant.

5,464,898

SUSPENSIONS FOR PRODUCING FILLED CAST RESINS

Guenther Ittmann, Gross-Umstadt, and Manfred Krieg, Darmstadt, both of, Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

Continuation of Ser. No. 99,555, Jul. 30, 1993, abandoned. This application Sep. 19, 1994, Ser. No. 308,613
Claims priority, application Germany, Jul. 31, 1992, 42 25 309.8
Int. Cl.[6] C08K 3/22;3/36;2/00
U.S. Cl. 524—493 7 Claims

1. A cast resin suspension comprising

(A) 40 to 80% by weight of an inorganic filler selected from the group consisting of aluminum hydroxide and silicon dioxide.,

(B) 60 to 20% by weight of a liquid polymerizable organic monomer, and

(C) 0 to 5 parts by weight based on the sum of (A) and (B) of a polymerizable organosilicon component as coupling agent,

wherein inorganic filler (A) is a mixture of at least two filler particle fractions having different median particle sizes, wherein the size ratio of the average particle sizes of the large and small filler particles ranges from 6:1 to 3:1 and wherein the weight ratio of the contents of large and small filler particles is from 2:1 to 1:2, and

wherein component (B) comprises

at least 50 parts by weight of monomers of the formula I:

(I)

wherein

R^1 is hydrogen or methyl,

R_2 is a linear, branched or cyclic hydrocarbon group having 1 to 18 carbon atoms, which may be substituted by one or more substituents selected from the group consisting of halogen, hydroxy, C_1–C_4 alkoxy, and di-C_1–C_{12}-alkylamino.

5,464,899

HIGH MODULUS LOW HYSTERESIS RUBBER COMPOUND FOR PNEUMATIC TIRES

Roy M. Freeman; William L. Hergenrother, both of Akron, and Frederick J. Ravagnani, Uniontown, all of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 998,301, Dec. 30, 1992, abandoned. This application Mar. 31, 1994, Ser. No. 220,765
Int. Cl.[6] C08L 51/04; C08K 5/098
U.S. Cl. 524—504 13 Claims

1. A sulfur-vulcanizable rubber compound, capable of being worked prior to vulcanization, having high modulus and low hysteresis properties subsequent to vulcanization comprising:

100 parts by weight of an uncured grafted rubber copolymer containing.

from about 25 to 55 parts by weight of polyisoprene,

from about 75 to 45 parts by weight of a diene polymer selected from the group consisting of homopolymers of conjugated diene monomers and copolymers thereof with monoolefin monomers and EPDM terpolymers, to total 100 parts by weight of said grafted rubber copolymer,

wherein a portion of at least one of said polyisoprene and said diene polymers is grafted with a polymeric metal salt of an α, β-ethylenically unsaturated carboxylic acid to form said uncured grafted rubber copolymer;

about 50 to 70 parts by weight of a reinforcing filler, per 100 parts by weight of said grafted rubber copolymer; and

at least about 4 parts by weight of a curative selected from the group consisting of sulfur and sulfur donors, per 100 parts by weight of said grafted rubber copolymer;

wherein the sulfur-vulcanizable rubber compound is devoid of peroxide components, and

wherein the sulfur-vulcanizable rubber compound, upon vulcanization, has a tan δ of from about 0.03 to 0.18, measured at 100° C., 7% deflection and 10 Hz.

5,464,900

WATER SOLUBLE ORGANOSILOXANE COMPOUNDS

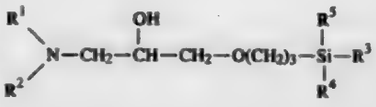
John J. Stofko, Jr., St. Paul, and Jeffery C. Chang, North Oaks, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 19, 1993, Ser. No. 138,810
Int. Cl.[6] C07F 7/10
U.S. Cl. 524—838 3 Claims

1. A water soluble organosilane oligomer prepared by dissolving in water an alkoxy silane comprising an alkoxy silane addition product of at least two reactants wherein:

(a) the first reactant is at least one 3-glycidoxypropylalkoxysilane and

(b) the second reactant is at least one secondary hydroxylalkyl amine, wherein the alkoxy silane addition product has the formula:



wherein

at least one of R^1 or R^2 is a hydroxyalkyl group having 2–8 carbon atoms, and R^1 and R^2 can each be different or the same;

R^3 is an alkoxy group having 1–4 carbon atoms; and

R^4 and R^5 can each be an alkyl group having 1–4 carbon atoms, or an alkoxy group having 1 to 4 carbon atoms.

5,464,901

CURABLE RESIN COMPOSITION COMPRISING A SILICONE RESIN HAVING EPOXY AND PHENYL GROUPS IN THE MOLECULE AND A VINYL POLYMER HAVING A GROUP REACTIVE WITH THE EPOXY GROUP

Yuji Yoshikawa, Annaka, and Mitsuhiro Takarada, Takasaki, both of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1994, Ser. No. 210,401
Claims priority, application Japan, Mar. 19, 1993, 5-085729
Int. Cl.[6] C08L 83/04
U.S. Cl. 525—103 8 Claims

1. A curable resin composition which consists essentially of:

(A) a silicone resin having epoxy and phenyl groups and at least two hydrolyzable groups selected from the group consisting of a silyl group, a silanol group and mixtures thereof in the molecule;

(B) a vinyl polymer having at least one group reactive with the epoxy group of the silicone resin and selected from the group consisting of carboxyl group-containing vinyl polymers, carboxylic anhydride group containing vinyl polymers, amino group-containing vinyl polymers and copolymers of two or more monomers for the polymers whereby said at least one group is a carboxyl group, a carboxylic anhydride group, and amino group or a mixture thereof; and

(C) a condensation catalyst for the hydrolyzable groups of the silicone resin, wherein the silicone resin and the vinyl polymer are present in such amounts that the epoxy group in the silicone resin is in the range of 0.2 to 10 equivalents per unit equivalent of the at least one group reactive with the epoxy group and the condensation catalyst is present in an amount of from 0.005 to 5 wt. % of the silicone resin.

5,464,902

TOUGHENING OF BRITTLE EPOXY RESIN MATRICES WITH FUNCTIONALIZED PARTICULATE ELASTOMERS

Hans G. Recker, Irvine, Calif., assignor to Cytec Technology Corp., Wilmington, Del.

Continuation of Ser. No. 856,312, Mar. 23, 1992, abandoned. This application Feb. 4, 1994, Ser. No. 191,686
Int. Cl.[6] C08F 8/00
U.S. Cl. 525—119 20 Claims

1. An epoxy resin system suitable for use as as structural film adhesive or for melt impregnation of fiber-reinforcement to form a heat-curable prepreg, comprising:

(a) an uncured base resin system comprising an epoxy resin which, when impregnated onto intermediate modulus unidirectional carbon fibers then consolidated into a quasiisotropic panel in accordance with Boeing Support Specification BSS 7260, has a compression strength after 1500 inch-lb/inch impact of 24 Ksi or less, and which when cured exhibits single phase morphology;

having dispersed therein in particulate form

(b) from 0.5 to about 10 percent by weight, based on the total weight of (a) and (b), of a preformed functionalized particulate elastomer having a particle size of from about 2 μm to about 70 μm, and a glass transition temperature of less than 10° C.,

wherein said epoxy resin system, when cured, exhibits greater toughness as measured by compression strength after impact when laid up into a quasiisotropic panel employing carbon fiber reinforcement and cured, as compared to said epoxy resin system devoid of said preformed functionalized particulate elastomer.

5,464,903

PROCESS FOR PREPARING ETHYLENE COPOLYMER PLASTICIZED PVC

George H. Hofmann, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 31, 1994, Ser. No. 331,842
Int. Cl.[6] C08G 67/02; C08L 27/06;33/04
U.S. Cl. 525—185 4 Claims

1. In a process to prepare plasticized PVC, wherein PVC is plasticized with a miscible amount, between 20 and 150 parts per 100 parts of PVC, of a primary plasticizer which is an ethylene copolymer having a melt index of from 1 to 100, selected from the group consisting of bipolymers of ethylene with vinyl acetate, terpolymers of ethylene with vinyl acetate and with carbon monoxide, and terpolymers of ethylene with a C1–C8 alkyl acrylate and with carbon monoxide, and optionally also plasticized with up to 20 parts per 100 parts of the PVC but fewer parts than the parts of the primary plasticizer, of a first low molecular weight, non-ethylene copolymer secondary plasticizer, the process comprising mixing the PVC, the ethylene copolymer primary plasticizer and optional secondary plasticizer in melt-mixing equipment,

the improvement comprising:

substitution of some of the 20–150 parts of primary plasticizer, with a modifier, in an amount from 5–30 of those parts before commencing melt-mixing with the PVC, the modifier comprising:

a) a partially-crosslinked ethylene copolymer, the ethylene copolymer before being crosslinked selected from the group consisting of bipolymers of ethylene and vinyl acetate, terpolymers of ethylene with vinyl acetate and with carbon monoxide, and terpolymers of ethylene with a C1–C8 alkyl acrylate and with carbon monoxide, the level of crosslinking being between 25 and 80 percent;

b) 0–30 percent of the total modifier a) plus b), of a second low molecular weight, non-ethylene copolymer plasticizer which is added to the ethylene copolymer of the modifier before crosslinking.

5,464,904

LOW-MELTING TETRAFLUOROETHYLENE COPOLYMER AND ITS USES

George R. Chapman, Jr., Media, Pa.; Lewis E. Crenshaw, Wilmington; Rita S. McMinn, Newark, both of Del.; Richard A. Morgan, Vienna, W. Va.; Donnan E. Priester, Greenville, Del.; Charles W. Stewart, Newark, Del., and Robert E. Tarney, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 156,621, Nov. 23, 1993, Pat. No. 5,397,829, which is a continuation-in-part of Ser. No. 104,749, Aug. 11, 1993, abandoned, which is a continuation-in-part of Ser. No. 935,353, Aug. 28, 1992, Pat. No. 5,266,639. This application Nov. 16, 1994, Ser. No. 341,046

Int. Cl.[6] C08F *214/16;214/28*

U.S. Cl. 525—200 6 Claims

1. A polymer blend composition having improved processibility, comprising a polyolefin and an effective amount, to improve processibility, of a partially-crystalline fluoropolymer containing no more than 2 wt % hydrogen, having a melt viscosity from about 0.1×10^3 to 20×10^3 Pa.s, and having the end of crystalline melting, T_m(end), in the range from about 170° C. to about 265° C.

5,464,905

ETHYLENE/α-OLEFIN COPOLYMER COMPOSITION, GRAFT MODIFIED ETHYLENE/α-OLEFIN COPOLYMER COMPOSITION, ETHYLENE COPOLYMER COMPOSITION, AND MULTI-STAGE OLEFIN POLYMERIZATION PROCESS

Toshiyuki Tsutsui; Ken Yoshitsugu; Mamoru Takahashi; Akira Todo; Seiji Ohta, and Hajime Inagaki, all of Yamaguchi, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Nov. 18, 1993, Ser. No. 154,467

Claims priority, application Japan, Nov. 19, 1992, 4-310616; Nov. 19, 1992, 4-310632

Int. Cl.[6] C08L *23/08;23/16;23/18*

U.S. Cl. 525—240 9 Claims

1. An ethylene/α-olefin copolymer composition comprising:

[A1] an ethylene/α-olefin copolymer in an amount of 20 to 90% by weight, which is obtained by copolymerizing ethylene with an α-olefin of 3 to 20 carbon atoms in the presence of a catalyst for olefin polymerization comprising (a) an organoaluminum oxy-compound and (b) at least two kinds of compounds of Group IV transition metals of the periodic table containing a ligand having a cyclopentadienyl skeleton, and which has such properties that:

(A-i) the density is in the range of 0.850 to 0.980 g/cm^3, and

(A-ii) the intrinsic viscosity [η] as measured in decalin at 135° C. is in the range of 0.4 to 8 dl/g; and

(A-iii) the melt tension (MT(g)) at 190° C. and the melt flow rate (MFR) satisfy the relation

$$MT>2.2\times MFR^{0.84}$$

[B1] an ethylene/α-olefin copolymer in an amount of 10 to 80% by weight, which has a density and MFR different from the ethylene/α-olefin copolymer [A1] and is obtained by copolymerizing ethylene with an α-olefin of 3 to 20 carbon atoms in the presence of a catalyst for olefin polymerization comprising (a) an organoaluminum oxy-compound and (b') a compound of Group IV transition metal of the periodic table containing a ligand having a cyclopentadienyl skeleton, and which has such properties that:

(B-i) the density is in the range of 0.850 to 0.980 g/cm^3, and

(B-ii) the intrinsic viscosity [η] as measured in decalin at 135° C. is in the range of 0.4 to 8 dl/g.

5,464,906

ETHYLENE HOMOPOLYMERIZATION USING GROUP 3 METAL COMPLEXES

Jasson T. Patton, and David R. Neithamer, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

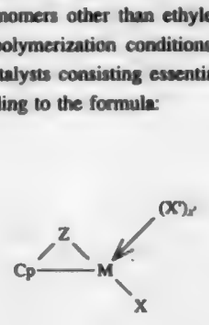
Filed Nov. 21, 1994, Ser. No. 342,984

Int. Cl.[6] C08F *4/52*

U.S. Cl. 525—240 11 Claims

3. A process for preparing a polymer blend composition, comprising:

(A) contacting ethylene and optionally one or more ethylenically unsaturated monomers other than ethylene and optionally a diluent under polymerization conditions in the presence of one or more catalysts consisting essentially of a metal complex corresponding to the formula:



or a dimer thereof

wherein:

M is a Group 3 metal;

Cp is a cyclopentadienyl group bound in an η^5 bonding mode to M or such a cyclopentadienyl group substituted with from one to four substituents selected from the group consisting of hydrocarbyl, silyl, germyl, halo, hydrocarbyloxy, amine, and mixtures thereof, said substituent having up to 40 nonhydrogen atoms, or optionally, two or more such substituents are joined together to form a hydrocarbylene group thereby causing Cp to have a fused ring structure;

Z is a moiety comprising boron, or a member of Group 14 of the Periodic Table of the Elements, and optionally nitrogen, phosphorus, sulfur or oxygen, said moiety having up to 20 nonhydrogen atoms, and optionally Cp and Z together form a fused ring system;

X, independently each occurrence, is hydride, hydrocarbyl, silyl, germyl, hydrocarbyloxy, amido, phosphido, sulphido, or a combination thereof, said X containing up to 50 atoms;

X' is a stable, weakly coordinating Lewis base ligand group; and

x' is 0 or 1,

in at least one reactor to produce a first polymer or a solution thereof,

(B) contacting ethylene and optionally one or more ethylenically unsaturated monomers other than ethylene and optionally a diluent under addition polymerization conditions in the presence of secondary catalyst composition comprising a metal complex that is different than the Group 3 metal complex of step (A) in the same or a different reactor to produce a second polymer or a solution thereof,

(C) combining the first and second polymers or solutions thereof, and

(D) recovering a blend composition comprising the first polymer and second polymer.

5,464,907

PROCESS FOR THE MODIFICATION OF α-OLEFIN (CO) POLYMERS

Jernej Jelenic, Schalkhaar; John Meijer, Deventer, and Peter Hope, Twello, all of, Netherlands, assignors to Akzo Nobel N.V., Netherlands

PCT No. PCT/EP93/02008, § 371 Date Feb. 21, 1995, § 102(e) Date Feb. 21, 1995, PCT Pub. No. WO94/05707, PCT Pub. Date Mar. 17, 1994

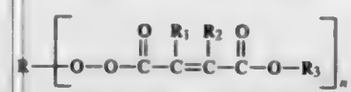
PCT Filed Jul. 28, 1993, Ser. No. 387,913

Claims priority, application European Pat. Off., Aug. 27, 1992, 92202608

Int. Cl.[6] C08F *8/00*

U.S. Cl. 525—303 **8 Claims**

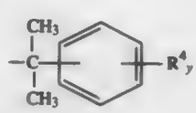
1. A process for the modification of a linear or branched C_3–C_{10} α-olefin (co)polymer which may contain up to 5% by weight of ethylene, which comprises contacting the (co)polymer, at a temperature of at least 120° C., with an effective amount of at least one peroxide represented by any one of the formulas I–IV to modify the (co)polymer and that the weight average molecular weight of the (co)polymer after modification is at least 70% of the weight average molecular weight of the (co)polymer prior to modification:



(I)

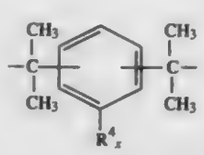
wherein n= 1, 2 or 3; R^1 and R^2 are independently selected from hydrogen, C_{1-10} alkyl groups, C_{6-12} aryl groups, C_{7-22} aralkyl groups and C_{7-22} alkaryl groups, which groups may be substituted with one or more functional groups selected from hydroxy, halogen, ester, acid, amido, alkoxy, aryloxy, ketone and nitrile groups; R^3 is selected from C_{1-10} alkyl groups, C_{6-12} aryl groups, C_{7-22} alkaryl groups and C_{2-10} 1-alkene groups, which groups may be substituted with one or more functional groups selected rom hydroxy, halogen, ester, acid, amido, alkoxy, aryloxy, ketone and nitrile groups, and R^1 and R^2, R^1 and R^3 or R^2 and R^3 may combine to form a ring, and

when n=1; R is selected from a tertiary-alkyl group, a tertiary cycloalkyl group, a tertiary alkylcycloalkyl group, a tertiary alkynyl group containing 4–8 carbon atoms and a group of the general formula:

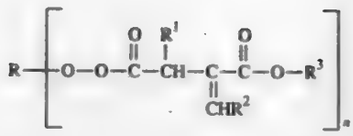


wherein y=0, 1 or 2 and R^4 represents an isopropyl group, an isopropenyl group or a 2-hydroxyisopropyl group;

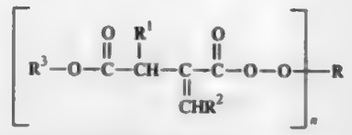
when n= 2; R is selected from an alkylene group with 8–12 carbon atoms which at both ends has a tertiary structure, an alkynylene group with 8–12 carbon atoms which at both ends has a tertiary structure, a group of the general formula:



wherein x= 0 or 1 and R^4 has the above-indicated meaning; and when n= 3; R= 1,2,4-triisopropylbenzene-α,α' ,α"-triyl or 1,3,5-triisopropylbenzene-α,α',α"-triyl;

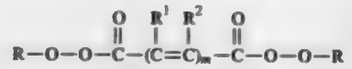


(IIa)



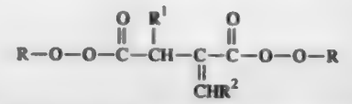
(IIb)

wherein n, R^1, R^2 and R^3 are as defined above;



(III)

wherein m=1–2 and R, R^1 and R^2 are as defined above; and



(IV)

wherein R, R^1 and R^2 are as defined above; and when there is an aromatic ring in the molecule, in the case of disubstitution, the ring substituents must not be ortho to one another and in the case of trisubstitution, the ring substituents must not be in three adjacent positions.

5,464,908

PROCESS FOR PREPARING WATER-SOLUBLE POLYMERS

Shin-ichi Sato, and Kiyoji Kuma, both of Kitakyushu, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Continuation of Ser. No. 951,068, Sep. 25, 1992, abandoned. This application Sep. 29, 1993, Ser. No. 128,318

Claims priority, application Japan, Sep. 27, 1991, 3-249386

Int. Cl.[6] C08F *8/12*

U.S. Cl. 525—380 **18 Claims**

1. A process for preparing a water-soluble polymer, the process comprising: (A) subjecting monomer(s) comprising an N-vinylcarboxylic acid amide to water-in-oil suspension polymerization; and, after the polymerization is effected until the amount of remaining monomer(s) is 1 to 10%, (B) adding a hydroxylamine salt in an amount by mole 0.5 to 10 times the amount of remaining monomer(s) and 1 to 10% by weight of the total amount of monomer(s) charged before the polymerization; and (C) stirring at a temperature for a period from 30 minutes to 4 hours, followed by acid hydrolysis.

5,464,909

POWDER COATING HAVING GOOD UV RESISTANCE

Yeon-Ho Chang; Robert B. Barbee, and Brian S. Phillips, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Mar. 24, 1995, Ser. No. 410,617

Int. Cl.[6] C08F *20/00*

U.S. Cl. 525—438 **23 Claims**

1. A curable polyester comprising

(a) about 40 to about 100 mole percent of residues of 2,6-decalindicarboxylic acid;

(b) about 40 to about 100 mole percent of residues of 2,2-dimethyl-1,3-propanediol;

and any remaining residues comprised of residues of polyols and polycarboxylic acids;

said polyester having a number average molecular weight of from about 1500 to 10,000, a glass transition temperature of about 45° C. to about 100° C., and a hydroxy or acid number of from 20 to 100.

5,464,910

EPOXY RESIN ADDUCT COMBINED WITH A BORATE ESTER AND PHENOLIC COMPOUND

Takuo Nakatsuka, Okayama; Tsuyoshi Toyota, Takamatsu; Mie Tanimoto, Marugame, and Akiko Matsumoto, Sakaide, all of, Japan, assignors to Shikoku Chemicals Corporation, Marugame, Japan

Filed Dec. 22, 1993, Ser. No. 171,681

Int. Cl.[6] C08F *283/00*

U.S. Cl. 525—486 **13 Claims**

1. An epoxy resin composition comprising an epoxy resin and, as essential components, (1) an epoxy adduct obtained by the reaction of an epoxy compound having at least one epoxy group in one molecule with any one of a nitrogen-containing heterocyclic compound, an aliphatic amine or an aromatic amine; (2) a borate ester selected from the group consisting of trimethyl borate, triethyl borate, tripropyl borate, tributyl borate, trioctyl borate, triphenyl borate, and tricresyl borate; and (3) a phenolic compound.

5,464,911

SUPERIOR STAIN RESISTANT COMPOSITIONS

Michael S. Williams, and Thomas H. Moss, III, both of Rome, Ga., assignors to Peach State Labs, Inc., Rome, Ga.

Division of Ser. No. 783,580, Oct. 28, 1991, Pat. No. 5,310,828, which is a continuation-in-part of Ser. No. 457,348, Dec. 27, 1989, Pat. No. 5,061,763, which is a continuation-in-part of Ser. No. 341,774, Apr. 20, 1989, Pat. No. 4,940,757. This application Apr. 21, 1994, Ser. No. 231,020

Int. Cl.[6] C08L *61/14*

U.S. Cl. 525—502 **11 Claims**

1. A polyamide fiber treated with a polymeric stain resistant composition wherein at least some of the aromatic moieties in the polymer are sulfonated and at least some of the aromatic moieties in the polymer contain free hydroxyl groups prepared by:

(i) allowing a hydroxyaromatic compound to react with a compound selected from the group consisting of an unsaturated carboxylic acid, unsaturated carboxylic acid anhydride, unsaturated carboxylic acid chloride, unsaturated carboxylic acid precursor, saturated carboxylic acid, saturated carboxylic acid anhydride, saturated carboxylic acid chloride, saturated carboxylic acid precursor, saturated isocyanate and an unsaturated isocyanate;

(ii) homopolymerizing or copolymerizing the ester formed in step (i) with an aldehyde in an aldehyde condensation reaction to form an aromatic condensation polymer; and then

(iii) allowing the product of step (ii) to react with an acrylic acid, or α-substituted acrylic acid, or a mixture thereof, in the presence of a free radical agent.

5,464,912

AMINES FROM NITRO GROUP TERMINATED MESOGENIC EPOXY RESIN ADDUCTS WITH REDUCED HYDROXYL GROUP FUNCTIONALITY

Robert E. Hefner, Jr., and Jimmy D. Earls, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 241,883, May 12, 1994, Pat. No. 5,412,044, which is a division of Ser. No. 154,805, Nov. 18, 1993, Pat. No. 5,344,898, which is a division of Ser. No. 982,804, Nov. 30, 1992, Pat. No. 5,298,575. This application Jan. 23, 1995, Ser. No. 377,070

Int. Cl.[6] C08F *283/00*

U.S. Cl. 525—523 **10 Claims**

1. An adduct containing terminating nitro or nitroso groups and one or more rodlike mesogenic moieties per molecule which adduct results from the reaction of

(A) one or more compounds containing an average of more than one vicinal epoxide group per molecule and

(B) one or more compounds containing one or more nitro or nitroso groups and one hydrogen atom per molecule which is reactive with an epoxide group thereby forming an adduct essentially free of epoxy groups and containing nitro or nitroso groups; followed by

(C) reaction of a part or all of the backbone aliphatic hydroxyl groups contained therein, wherein said reaction is an etherification of the hydroxyl group, an esterification of the hydroxyl group, conversion of the hydroxyl group to a halogen, a urethanation of the hydroxyl group, an oxidation of the hydroxy group to the ketone carbonyl group or a reduction of said ketone carbonyl group to provide the alkane; and

(D) reduction of the nitro or nitroso groups contained therein to amine groups; with the proviso that said at least one or more rodlike mesogenic moieties per molecule are present in either component (A) or (B) or in both components (A) and (B); and wherein components (A) and (B) are employed in amounts which provide a ratio of equivalents of hydrogen reactive with an epoxide group, excluding secondary hydroxyl groups formed by epoxide ring opening reaction to form the adduct, per equivalent of epoxide reacted of from about 1:1 to about 100:1.

5,464,913

CYCLOALIPHATIC EPOXY AND PRIMARY HYDROXYL GROUPS-CONTAINING CATIONIC RESIN

Reiziro Nishida, and Akira Tominaga, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 231,455, Apr. 20, 1994, abandoned, which is a continuation of Ser. No. 835,031, Feb. 6, 1992, abandoned, which is a continuation of Ser. No. 493,685, Mar. 15, 1990, abandoned. This application Feb. 15, 1995, Ser. No. 389,740

Int. Cl.[6] C08L *63/02;63/08;* C08K *3/20*

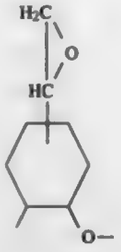
U.S. Cl. 525—524 **8 Claims**

1. A cationically electrodepositable paint composition which consists essentially of a self-curing cationically electrodepositable resin and a curing catalyst, said resin having in the molecule:

(1) a primary hydroxyl group,

(2) a cationic group, and

(3) at least one epoxy group-containing functional group represented by the following structural formula

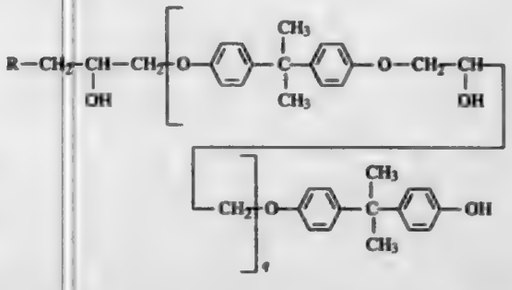


and being obtained by reacting:

(A) an epoxy resin having in the molecule at least three epoxy group-containing functional groups represented by the above structural formula,

(B) a cationizing agent, and

(C) at least one compound represented by the following formula:



wherein q is 0 to 7, and R is a residue of an active hydrogen-containing compound selected from the group consisting of an amine, a phenol, an organic acid, a thiol, an alcohol and an inorganic acid,

and having a number-average molecular weight of at least 200 and, on average, 2 or less phenolic hydroxyl groups in the molecule,

said self-curing being caused by a reaction between the primary hydroxyl group (1) and the epoxy group-containing functional group (3), and

said curing catalyst being a carboxylate of lead selected from the group consisting of lead 2-ethyl hexanoate, lead naphthenate, lead octanoate, lead benzoate, lead acetate, lead lactate, lead formate and lead glycoate.

5,464,914

PREPARATION OF A LOW POLYDISPERSE POLYMER

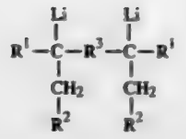
Grace Y. Lo, and Arnold L. Gatzke, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 29, 1994, Ser. No. 268,212

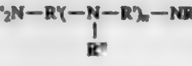
Int. Cl.[6] C08F *4/48;236/10*

U.S. Cl. 526—180 **19 Claims**

1. A process comprising dissolving and reacting in a nonpolar solvent and in the presence of an organic polyamine and a sufficient quantity of a trisubstituted amine to keep a difunctional organolithium initiator dissolved in the nonpolar solvent, an anionically polymerizable monomer or monomers selected from the group consisting of conjugated diene monomers and copolymerizable olefin monomers, the difunctional organolithium initiator corresponding to the formula:



wherein R^1 and R^2 are each independently C_1 to C_6 branched or linear alkyl or cycloalkyl groups; and R^3 contains at least one arylene group and is attached to each lithium-substituted carbon atom of the above formula through an aromatic carbon; and wherein the organic polyamine corresponds to the formula:



wherein R' independently in each occurrence is a C_2–C_{20} alkadiyl group or an inertly-substituted C_2–C_{20} alkadiyl group; R" independently in each occurrence is a C_1–C_{20} alkyl group or an inertly-substituted C_1–C_{20} alkyl group; and n is 0or 1.

5,464,915

METHOD OF PREPARING STYRENE POLYMERS BY SUSPENSION POLYMERIZATION

Galina D. Ballova; Vladimir Rupyshev, both of S. Peterburg; Sergei G. Rumyantsev, Omsk; Viktor V. Amosov; Igor A. Mekhed, both of Angarsk; Larisa V. Alexeeva, S. Peterburg; Viktor A. Pykhtin; Mikhail D. Reinik, both of Angarsk; Evgenia N. Eremina, S. Peterburg; Valentina P. Shamina, S. Peterburg; Larisa F. Maladzyanova, S. Peterburg; Valentina G. Karmakova, S. Peterburg; Svetlana V. Kusheverskaya, S. Peterburg; Vera K. Abramova, S. Peterburg, and Mikhail G. Rozhavsky, S. Peterburg, all of, Russian Federation, assignors to Plastpolymer Share Holding Company, St. Peterburg, and Angarsk Oil Chemical Share Holding Company, Angarsk, both of, Russian Federation

PCT No. PCT/SU91/00122, § 371 Date Apr. 26, 1993, § 102(e) Date Apr. 26, 1993, PCT Pub. No. WO93/00374, PCT Pub. Date Jan. 7, 1993

PCT Filed Jun. 25, 1991, Ser. No. 39,470

Int. Cl.[6] C08F *2/18*

U.S. Cl. 526—225 **7 Claims**

1. A method of preparing styrene polymers by suspension or mass-suspension polymerization of styrene or vinyl toluene, or by suspension or mass-suspension co-polymerization of styrene or vinyl toluene and methyl methacrylate and/or acrylonitrile or divinyl-benzene, or by mass-suspension copolymerization of styrene or vinyl toluene and methyl methacrylate and/or acrylonitrile, and/or rubber at temperatures below 140° C. in an aqueous medium, in the presence of a stabilizing system comprising 0.15 to 1.5 wt. % of tricalcium phosphate prepared in situ, calcium carbonate, and a mixture of secondary sodium alkylsulfates of the general formula R—OSO_3Na, where R is a hydrocarbon radical with 8 to 18 carbon atoms, characterized in that calcium carbonate in an amount of between 0.07 and 0.35 wt. % is introduced into an aqueous suspension of in-situ tricalcium phosphate, and the mixture thus obtained is heated before dispersing therein the polymerizable vinyl monomers or prepolymer to be polymerized, while the mixture of secondary sodium alkasulfates in an amount of between 0.001 and 0.020 wt. % is introduced into the suspension polymerization process when the conversion of the monomer comonomers or prepolymer is at 15% to 47%.

5,464,916
METHOD FOR MAKING STRUCTURED SUSPENSION PSA BEADS

Chung I. Young, St. Paul, and Ying-Yuh Lu, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 982,144, Nov. 25, 1992, Pat. No. 5,374,698, which is a continuation of Ser. No. 882,373, May 6, 1992, abandoned, which is a continuation of Ser. No. 707,848, May 30, 1991, abandoned. This application Dec. 15, 1994, Ser. No. 356,499

Int. Cl.[6] C08F *226/06;228/02;218/02;220/56;220/10;220/44;230/04*

U.S. Cl. 526—264 **10 Claims**

1. A method for suspension polymerization of a pressure-sensitive acrylate copolymer bead having a glass transition temperature of 0° C. or less, comprising the steps of:

(a) combining an aqueous solution Phase I comprising:

(i) about 20 to about 95 parts by weight water;

(ii) about 5 to about 80 parts by weight water soluble monomer; wherein the amounts of (i) plus (ii) equals 100 parts by weight total;

(iii) about 0 to about 1.0 percent by weight water soluble free radical initiator based on the total weight of (i) plus (ii); and

(iv) about 0.5 to about 20 percent by weight of a surfactant selected from the group consisting of anionic surfactants, nonionic surfactants, and mixtures thereof, based on the total weight of (i) plus (ii), with a mixture Phase II comprising:

(v) about 80 to about 99.5 parts by weight of acrylic acid ester of non-tertiary alcohol, said alcohol having from about 1 to about 14 carbon atoms, with the average number of carbon atoms being about 4 to about 12;

(vi) about 0.5 to about 20 parts by weight of polar monomer copolymerizable with said acrylic acid ester; wherein the amounts of (v) plus (vi) equals 100 parts by weight total;

(vii) about 0.01 to about 0.5 percent by weight of chain transfer agent based on the total weight of (v) plus (vi);

(viii) about 0.05 to about 1 percent by weight of oil soluble free radical initiator based on the total weight of (v) plus (vi); and

(ix) about 0.05 to about 30 percent by weight of a modifier moiety based on the total weight of (v) plus (vi);

wherein some or all of said surfactant in said Phase I is optionally alternatively included in said Phase II;

to form a water-in-oil emulsion, wherein said water-in-oil emulsion comprises about 1 to about 60 weight percent of a water phase comprising aqueous solution Phase I, and about 40 to about 99 weight percent of an oil phase comprising mixture Phase II based upon the total weight of said water-in-oil emulsion;

(b) combining about 10 to about 60 weight percent of said water-in-oil emulsion with about 40 to about 90 weight percent of a water Phase III wherein said percentages are based upon the total weight of said water-in-oil emulsion and Phase III, in order to form a water-in-oil emulsion in a water suspension; and wherein said water Phase III comprises:

(x) about 100 parts by weight water; and

(xi) about 0.01 to about 5 parts by weight of a suspension agent;

wherein some or all of said polar monomer in said mixture Phase II is optionally alternatively included in said water Phase III;

(c) concurrently agitating and heating said suspension to a temperature of about 40° C. to about 60° C. and permitting polymerization of said monomers in the water-in-oil emulsion until polymer beads are formed; and

(d) collecting said polymer beads;

wherein some or all of said modifier moiety is optionally alternatively included in one or more of the following: Phase III, the water-in-oil emulsion, the water-in-oil emulsion in a water suspension; an aqueous suspension of polymer beads after exotherm of the polymerization has been reached.

5,464,917
ORGANOPOLYSILOXANE

Hirofumi Kishita, Annaka; Kouichi Yamaguchi, Takasaki; Nobuyuki Kobayashi, Annaka, and Kouichi Ishida, Gunma, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

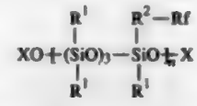
Filed Aug. 1, 1994, Ser. No. 282,490

Claims priority, application Japan, Jul. 30, 1993, 5-206946

Int. Cl.[6] C08G *77/08*

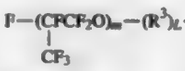
U.S. Cl. 528—14 **6 Claims**

1. An organopolysiloxane comprising substantially only a straight-chain organopolysiloxane represented by the following general formula (1):



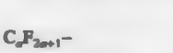
(1)

wherein R^1 represents an unsubstituted or substituted monovalent hydrocarbon group having 1 to 10 carbon atoms, R^2 represents a bivalent organic group, Rf represents a perfluoroalkyl ether group represented by the following general formula (2):



(2)

wherein R^3 represents $-CF(CF_3)-$, $-CF_2CF_2-$ or $-CF(CF_3)CF_2-$, L is 0 or 1, and m is an integer of 1 to 5, or a perfluoroalkyl group represented by the following general formula (3):



(3)

wherein a is an integer of 1 to 20, X's, which are the same or different, each represent a hydrogen atom or an organosilyl group represented by the following general formula (4):

(4)

wherein R^4 represents a hydrogen atom or the same group as R^1, and n is an integer of 15 to 4,000, and having a content of cyclic polysiloxanes with molecular weights of 3,000 or below of 50 ppm or below.

5,464,918
PEROXIDE-SUBSTITUTED POLYSILAZANES

Joanne M. Schwark, Wilmington, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 17,888, Feb. 16, 1993, Pat. No. 5,344,907, which is a continuation-in-part of Ser. No. 772,394, Oct. 7, 1991, abandoned. This application Aug. 30, 1994, Ser. No. 298,017

The portion of the term of this patent subsequent to Sep. 6, 2011, has been disclaimed.

Int. Cl.[6] C08G *77/06*

U.S. Cl. 528—24 **11 Claims**

1. A process for the preparation of an uncrosslinked, peroxide-substituted polysilazane, said process comprising reacting a polysilazane with less than one molar equivalent per equivalent of nitrogen in the polysilazane of a hydroperoxide having the formula ROOH where R is H, substituted or unsubstituted 1–10 carbon alkyl, 2–10 carbon alkenyl, 2–10 carbon alkynyl, aryl, a carboxylic acid group or a silyl group, at a temperature below the decomposition temperature of the hydroperoxide to produce an uncrosslinked polysilazane substituted with chemically bound peroxide groups.

5,464,919
FLAME RETARDANT POLYESTER-POLYURETHANE HYBRID RESIN COMPOSITIONS

David P. Sinclair, Winfield, Ill., assignor to Cook Composites and Polymers Co., Port Washington, Wis.

Filed May 11, 1994, Ser. No. 241,185
Int. Cl.[6] C08G 18/10
U.S. Cl. 528—60 12 Claims

1. A polyester-polyurethane hybrid resin formed by the reaction of:

(a) an A-side composition comprising a polyfunctional isocyanate compound and a free radical polymerization catalyst; and

(b) a B-side composition comprising a mixture of an ethylenically unsaturated monomer solution which has dissolved therein about 40–90 wt. % of a substantially water-free, unsaturated polyester polyol having an acid number less than five, said polyester polyol comprising an oligomer obtained by the condensation reaction of a polycarboxylic acid and an unsaturated polycarboxylic acid or anhydride with a polyhydric alcohol, wherein the polycarboxylic acid moieties of the polyester polyol comprise from about 15 to about 50 mole % of at least one halogenated aromatic polycarboxylic acid comprising at least one member selected from the group consisting of brominated and chlorinated terephthalic and isophathalic acids, brominated and chlorinated di- and triphenyldicarboxylic acids, and brominated and chlorinated naphthalene dicarboxylic acids and mixtures thereof.

5,464,920
CAST ELASTOMERS PREPARED FROM AMINOCROTONATES

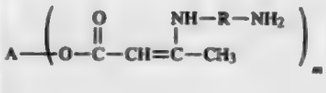
Robson Mafoti, Pittsburgh, and Alan D. Bushmire, Bridgeville, both of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 270,567, Jul. 5, 1994, abandoned. This application Dec. 6, 1994, Ser. No. 349,859
Int. Cl.[6] C08G 18/10;18/30
U.S. Cl. 528—60 8 Claims

1. A process for the preparation of cast elastomers comprising reacting in an open mold at an isocyanate index of 90 to 110

(a) an organic polyisocyanate;

(b) an aminocrotonate-terminated polyether having a number average molecular weight of from 1200 to 6500 and having the formula



wherein

A is the m-functional group left by the removal of the hydroxyl groups of a polyether polyol having a number average molecular weight of from 1000 to 6000,

R is the difunctional residue of an organic diamine having the formula $H_2N—R—NH_2$ wherein said organic diamine is

(1) a substituted aromatic diamine in which one or more aromatic ring substituents are situated ortho to the amino groups that give rise to the $—NH_2$ groups of the aminocrotonate-terminated polyethers, or

(2) an aromatic diamine other than diamine (b)(1) in which the amino groups giving rise to the $—NH_2$ groups of the aminocrotonate-terminated polyethers have a reduced reactivity which is due primarily to electronic effects rather than steric factors,

such that each free $—NH_2$ group of the aminocrotonate-terminated polyether has a sufficiently moderated reactivity toward the organic polyisocyanate, as indicated by a gel time of about 60 to about 300 chain extender or crosslinker), to allow the preparation of an elastomer in an open mold, and

m is a number of from 2 to 8; and

(c) a chain extending agent having a molecular weight of from 62 to 400, optionally in admixture with 0 to 30% by weight, relative to the chain extending agent, of a crosslinking agent having a molecular weight of from 300 to 500.

5,464,921
POLYISOCYANATE MIXTURES, A PROCESS FOR THEIR PRODUCTION AND THEIR USE FOR THE PRODUCTION OF POLYURETHANES

Hans-Josef Laas, Köln; Reinhard Halpaap, Odenthal; Christian Wamprecht, Neuss; Hans-Ulrich Meier-Westhues, Leverkusen; Wolfgang Schultz, Krefeld, and Lothar Kahl, Bergisch Gladbach, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 22, 1993, Ser. No. 156,202
Claims priority, application Germany, Dec. 1, 1992, 42 40 330.8
Int. Cl.[6] C08G 18/10;18/32
U.S. Cl. 528—67 1 Claim

1. A mixture of polyisocyanates which is solid below 40° C. and liquid above 125° C. and which has

a) an average isocyanate functionality of at least 2.1,

b) a content of free isocyanate groups bonded to tertiary (cyclo)aliphatic carbon atoms (calculated as NCO; molecular weight=42) of 5 to 22 wt. %,

c) a urethane group content (calculated as —NH—CO—O—; molecular weight=59) of 2 to 30 wt. %,

d) an isocyanurate group content (calculated as $C_3N_3O_3$; molecular weight=126) of 0 to 30 wt. % and

e) a carboxylic acid ester group content (calculated as —CO—O—; molecular weight=44) of 0 to 25 wt. % and/or

f) a carbonate group content (calculated as —O—CO—O; molecular weight=60) of from 0 to 34 wt. %

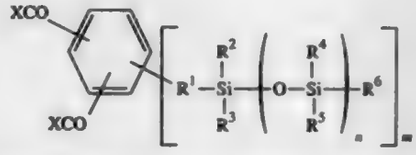
with the proviso that the total amount of ester groups e) and carbonate groups f) is at least 2 wt. %.

5,464,922
ORGANOPOLYSILOXANE-GRAFTED POLYBENZOBISOXAZOLES AND METHOD FOR PREPARING SAME

Maki Itoh, and Akihito Sakakibara, both of Kanagawa, Japan, assignors to Dow Corning Asia Ltd., Tokyo, Japan

Filed Aug. 24, 1994, Ser. No. 295,348
Claims priority, application Japan, Aug. 25, 1993, 5-210310; Aug. 25, 1993, 5-210311
Int. Cl.[6] C08G 77/00
U.S. Cl. 528—40 20 Claims

1. A phthaloyl halide-functional organopolysiloxane having the formula (I)



(I)

in which X denotes halogen, R^1 denotes a divalent organic group having at least 2 carbon atoms, R^2 through R^6 independently denote monovalent organic groups, n is an integer having a value of at least 1 and m is 1 or 2.

5,464,923

POLYMER COMPOSITIONS CONTAINING SUBSTITUTED BIPHENYL PYRAZINES

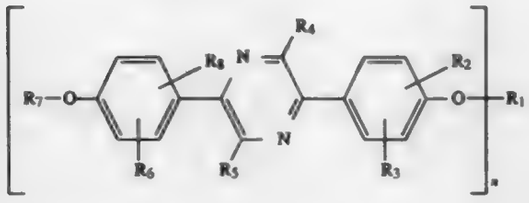
Richard Vicari; George Kvakovszky, and Olan S. Fruchey, all of Corpus Christi, Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Oct. 19, 1994, Ser. No. 326,104

Int. Cl.[6] C08G *63/00*

U.S. Cl. 528—68 **11 Claims**

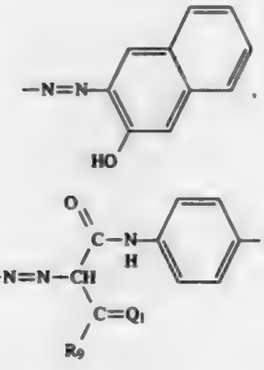
1. A composition comprising (a) a polymer selected from the group consisting of polycarbonate, polysulfone, polyester, polyarylate, polyetherketone, epoxide, polyimide, polyamide, and polyurethane, (b) having chemically incorporated therein at least one monomer having the formula:



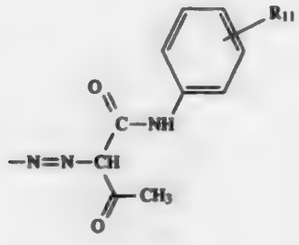
wherein n is 3, with the proviso that

(A) R_1 is

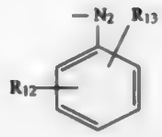
(B) R_2, R_3, R_6, and R_8 are each independently selected from the group consisting: of H, halogen, NO_2, NH_2, N_2, SO_3H, SO_3M (where M is an alkali metal),



where R_9 and R_{10} are each H, C_{1-6}alkyl, $COOCH_3$, or $COOC_2H_5$, and Q_1 is NH or O,



where R_{11} is C_1–C_6, and

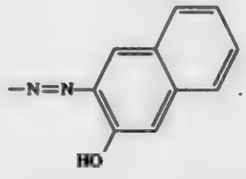


where R_{12} and R_{13} are each independently selected from the group consisting of H, NO_2, Cl, OCH_3, CH_3, COOH, $COOCH_3$, NH_2,

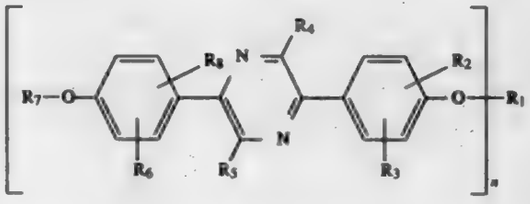
with the proviso that at least one of R_2, R_3, R_6, and R_8 must be other than H;

(C) R_7 is selected from the group consisting of H and —CH_2—C_6H_5, and

(D) R_4 and R_5 are each independently selected from the group consisting of H, NO_2, NH_2, and



9. A composition comprising (a) a polymer selected from the group consisting of polycarbonate, polysulfone, polyester, polyarylate, polyetherketone, epoxide, polyimide, polyamide, and polyurethane, (b) having chemically incorporated therein a monomer having the formula:



wherein n is 1; R_1 and R_7 are each H; R_2 and R_8 are each SO_3H; R_3 and R_6 are each H; and R_4 and R_5 are each H.

5,464,924

FLEXIBLE POLY(AMINO ETHERS) FOR BARRIER PACKAGING

H. Craig Silvis, and Shari L. Kram, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

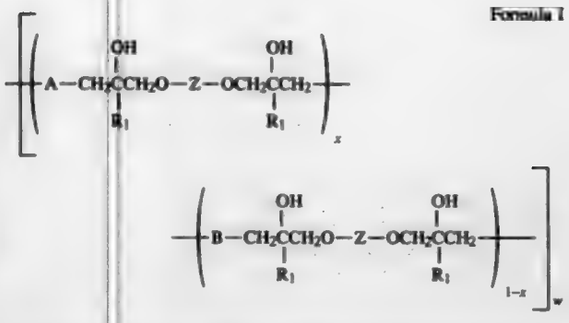
Filed Jan. 7, 1994, Ser. No. 179,830

Int. Cl.[6] C08G *59/22;59/50;59/64;73/02*

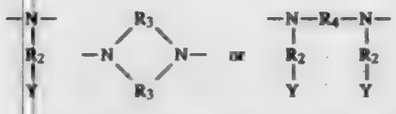
U.S. Cl. 528—102 **8 Claims**

1. A thermoplastic hydroxyfunctional polyaminoether represented by the formula:

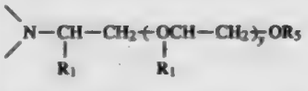
Formula I



wherein each A is individually an amino group represented by one of the formulas:



wherein R_1 is hydrogen, methyl, or mixtures thereof; R_2 is C_2–C_{20} alkylene or phenylene; R_3 is C_2–C_{10} substituted or unsubstituted alkylene wherein the substituent(s) is alkylamido, hydroxy, alkoxy, halo, cyano, aryloxy, alkylcarbonyl or arylcarbonyl; R_4 is substituted or unsubstituted C_2–C_{20} alkylene wherein the substituent(s) is the same as that for R_3 and Y is individually alkylamido, hydroxy, alkoxy, halo, cyano, aryloxy, alkylcarbonyl or arylcarbonyl; B is represented by the formula:



wherein R_1 is hydrogen, methyl or mixtures thereof; and R_5 is a C_1–C_{10} alkyl; y is from 1 to about 40; each Z is individually an alkylene, a poly(alkylene oxide), substituted or unsubstituted m-phenylene, p-phenylene, carbonyldiphenylene, sulfonyldiphenylene, isopropylidenediphenylene, methylenediphenylene, biphenylene, oxidiphenylene, diphenylene sulfide, naphthylene, diphenylenecyano-methane, or mixtures thereof; wherein the substituent(s) is alkylamido, hydroxy, alkoxy, halo, cyano, aryloxy, alkylcarbonyl or arylcarbonyl or mixtures thereof; w is a whole number from about 10 to about 400; and x is from 0.2 to 0.8.

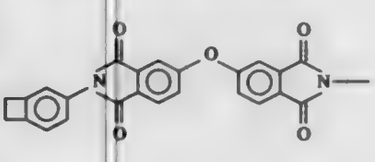
5,464,925

BENZOCYCLOBUTENE-TERMINATED POLYMIDES

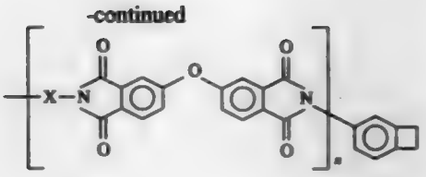
Eric S. Moyer, and Denise J. D. Moyer, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 25, 1994, Ser. No. 248,906
Int. Cl.[6] C08G *73/10*
U.S. Cl. 528—170 **11 Claims**

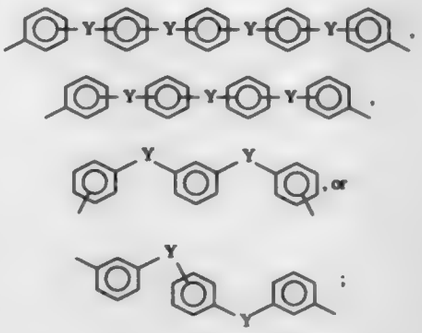
1. An oligomer having the formula:



-continued



wherein X is:



where each Y is independently S, O, CH_2, C═O, CH_3—C—CH_3, O═S═O, or CF_3—C—CF_3 and n is in the range of about 1 to about 15.

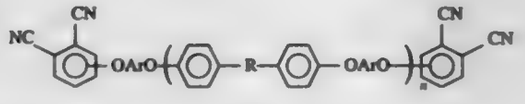
5,464,926

SYNTHESIS AND POLYMERIZATION OF OLIGOMERIC MULTIPLE AROMATIC ETHER-CONTAINING PHTHALONITRILES

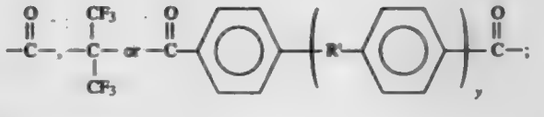
Teddy M. Keller, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 19,373, Feb. 18, 1993, Pat. No. 5,352,760. This application Jul. 27, 1994, Ser. No. 280,969
Int. Cl.[6] C08G *65/00*
U.S. Cl. 528—206 **11 Claims**

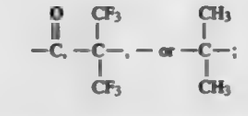
1. An arylether-containing phthalonitrile monomer having the formula:



wherein AR represents an aromatic group, R represents



R' represents



y is an integer having a value of 0 to 4; and
n represents an average value of from 1 to about 100.

5,464,927
POLYAMIC ACID AND POLYIMIDE FROM FLUORINATED REACTANT

Marie Angelopoulos, Briarcliff Manor, N.Y.; Jeffrey D. Gelorme, Plainvill, Conn.; Jeffrey W. Labadie, Sunnyvale, Calif.; David A. Lewis, Carmel, N.Y.; Sally A. Swanson, San Jose, Calif., and Nancy C. Labianca, Yalesville, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 782,923, Oct. 25, 1991, abandoned. This application May 10, 1993, Ser. No. 58,303
Int. Cl.[6] C08G *73/10;69/26*
U.S. Cl. 528—350 **22 Claims**

1. A copolyamic acid from

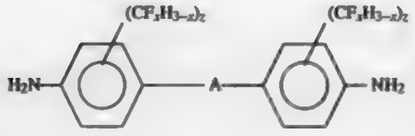
a) tetracarboxylic acid dianhydride,

b) organic diamine having the formula:

$H_2N\ R^1\ NH_2$; wherein R^1 is a polycyclic aromatic organic diradical selected from the group consisting of aromatic, heterocyclic, and directly attached rings; and

(c) a co-reactant selected from the group consisting of:

(1) fluorinated diamine having a formula selected from the group consisting of:



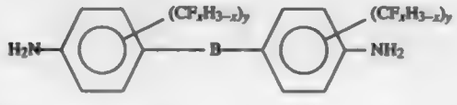
wherein A is

$$C(CF_xH_{3-x})\ (R^2)$$

R^2 selected from the group consisting of alkyl containing 1–6 carbon atoms, aryl containing 6 carbon atoms and CF_xH_{3-x};

x is a whole number integer from 1–3

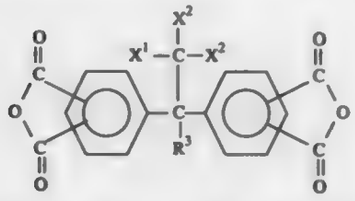
z is a whole number integer from 0–4; and



wherein B is a direct bond or

$$C(CH_3)_2;\ \text{and}$$

y is a whole number integer from 1–4; (2) fluorinated tetracarboxylic acid dianhydride having the formula



wherein X^1 is fluorine and each X^2 individually is selected from the group consisting of hydrogen, fluorine and chlorine; R^3 is selected from the group consisting of alkyl containing 1–6 carbon atoms, aryl containing 6 carbon atoms and $C(X^2)_3$; and (3) mixtures of (1) and (2);

and when said co-reactant includes said fluorinated diamine, the molar ratio of said organic diamine to said fluorinated diamine is about 9.5:1 to about 7:3; and when said co-reactant includes said fluorinated tetracarboxylic acid dianhydride, the molar ratio of said tetracarboxylic acid dianhydride to said fluorinated tetracarboxylic acid dianhydride is about 9.5:0.5 to about 7:3.

5,464,928
DIRECT PROCESS FOR PREPARING SEMI-CRYSTALLINE POLYIMIDES

Alice C. Chang, Yorktown, and Terry L. St. Clair, Poquoson, both of Va., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 1, 1994, Ser. No. 299,385
Int. Cl.[6] C08G *73/10;69/26*
U.S. Cl. 528—353 **23 Claims**

1. A direct process for preparing semi-crystalline polyimides, the process comprising the steps of:

(a) providing a polar aprotic solvent;

(b) adding a dianhydride and a diamine to the solvent to form a mixture;

(c) stirring the mixture at ambient temperature;

(d) adding glacial acetic acid to the mixture to provide a ratio of polar aprotic solvent to glacial acetic acid ranging from about 90 to 10 to about 75 to 25 by volume to form a solution;

(e) heating the solution to a range from about 110° C. to about 140° C. to form a polyimide precipitate; and

(f) recovering the polyimide precipitate as a semi-crystalline polyimide powder.

5,464,929
ABSORBABLE POLYOXAESTERS

Rao S. Bezwada, Whitehouse Station, and Dennis D. Jamiolkowski, Long Valley, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Mar. 6, 1995, Ser. No. 399,308
Int. Cl.[6] C08G *63/66*
U.S. Cl. 528—361 **22 Claims**

1. An aliphatic polyoxaesters comprising a first divalent repeating unit of formula I:

$$[O—C(O)—C(R_1)\ (R_2)—O—(R_3)—O—C(R_1)\ (R_2)—C(O)—] \quad \text{I}$$

and a second repeating unit selected from the group of formulas consisting of:

$$[—O—R_4—]_a, \quad \text{II}$$

$$[—O—R_5—C(O)—]_b, \text{ and} \quad \text{III}$$

$$([—O—R_5—C(O)]_p—O—)_zG \quad \text{XI}$$

and combinations thereof, wherein R_1 and R_2 are independently hydrogen or an alkyl group containing 1 to 8 carbon atoms; R_3 is an alkylene unit or is an oxyalkylene group of the following formula:

$$—[(CH_2)_c—O—]_D—(CH_2)_E— \quad \text{IV}$$

wherein C is an integer in the range of from 2 to about 5, D is an integer in the range of from about 0 to about 12, and E is an integer in the range of from about 2 to about 5, except when D is zero, in which case E will be from 2 to 12; R_4 is an alkylene unit containing from 2 to 8 carbon atoms; A is an integer in the range of from 1 to 1,000; R_5 is selected from the group consisting of $—C(R_6)\ (R_7)—$, $—(CH_2)_3—O—$, $—CH_2—CH_2—O—CH_2—$, $—CR_8H—CH_2—$, $—(CH_2)_4—$, $—(CH_2)_F—O—C(O)—$ and $—(CH_2)_F—C(O)—CH_2$; R_6 and R_7 are independently hydrogen or an alkyl containing from 1 to 8 carbon atoms; R_8 is hydrogen or methyl; F is an integer in the range of from 2 to 6; B is an integer in the range of from 1 to n such that the molecular weight of formula III is less than about 40,000; P is an integer in the range of from 1 to m much that the molecular weight of formula XI is less than about 40,000; G represents the residue minus from 1 to L hydrogen atoms from the hydroxyl groups of an alcohol previously containing from 2 to 12 hydroxyl groups; and L is an integer from about 1 to about 12.

5,464,930

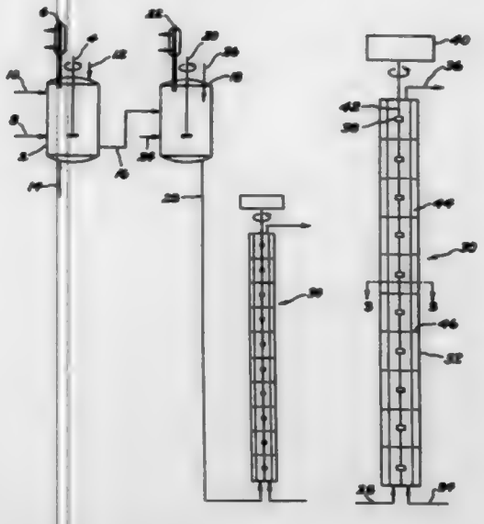
ARTICLE FOR USE IN OPTICAL APPLICATION FORMED FROM LINEAR POLYCARBONATE RESINS

James M. Silva, Clifton Park, N.Y., and Robert A. Pyles, Evansville, Ind., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 128,848, Dec. 4, 1987, Pat. No. 5,011,967, which is a division of Ser. No. 917,751, Oct. 10, 1986, Pat. No. 4,737,573. This application Apr. 5, 1990, Ser. No. 504,816

Int. Cl.[6] C08G *73/00*

U.S. Cl. 528—371 8 Claims



1. An article for use in an optical application formed of a composition consisting essentially of a linear polycarbonate resin prepared by passing, with effective agitation, an interfacial polycarbonate formation catalyst into a tank reactor containing carbonates consisting essentially of bischloroformate oligomers, water and a substantially inert, substantially water-insoluble organic liquid, said mixture also containing p-cumyl phenol as a molecular weight regulator, and simultaneously introducing an aqueous alkali or alkaline earth metal base solution at a rate to maintain the aqueous phase of said mixture at a pH in the range of about 10–14, the rate of catalyst addition being adjusted to effect polycarbonate formation under controlled conditions; and recovering said linear polycarbonate.

5,464,931

OXIDATION OF DIMERCAPTANS TO ORGANIC DISULFIDE POLYMERS

James E. Shaw; William E. Sattich, and Howard F. Efner, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 15, 1994, Ser. No. 290,666

Int. Cl.[6] C09K *3/00*; C08G *75/14*

U.S. Cl. 528—389 22 Claims

1. A process for producing an organic disulfide polymer comprising contacting a dithiol with elemental sulfur in the presence of a catalyst wherein said catalyst comprises a base and an alkoxylated compound selected from the group consisting of alkoxylated alcohol, alkoxylated mercaptan, and combinations thereof.

5,464,932

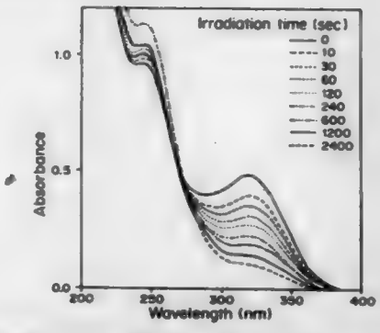
PHOTOCROSSLINKABLE POLYPHOSPHAZENES AND THEIR USE AS MICROENCAPSULATION MATERIALS

Harry R. Allcock; Charles G. Cameron, and Dawn E. Smith, all of State College, Pa., assignors to The Penn State Research Foundation, University Park, Pa.

Filed Apr. 15, 1994, Ser. No. 228,574

Int. Cl.[6] C08G *79/02*

U.S. Cl. 528—399 30 Claims



1. A polyphosphazene having a substituent group selected from the group consisting of a chalcone and a cinnamate.

5,464,933

SYNTHETIC PEPTIDE INHIBITORS OF HIV TRANSMISSION

Dani P. Bolognesi; Thomas J. Matthews, and Carl T. Wild, all of Durham, N.C., assignors to Duke University, Durham, N.C.

Filed Jun. 7, 1993, Ser. No. 73,028

Int. Cl.[6] A61K *37/02*

U.S. Cl. 530—324 19 Claims

HIV1LAI (DP-178; SEQ ID:1) YTSLIHSLIEESQNQQEKNEQELLELDKWASLWNWF

HIV1SF2 (DP-185; SEQ ID:3) YTNTIYTLLEESQNQQEKNEQELLELDKWASLWNWF

HIV1RF (SEQ ID:4) YTGIIYNLLEESQNQQEKNEQELLELDRWANLWNWF

HIV1MN (SEQ ID:5) YTSLIYSLLEKSQIQQEKNEQELLELDKWASLWNWF

HIV2ROD (SEQ ID:6) LEAVLRQSLEDADVSGLFNVNPTSLDWNMGNITGSLWE

HIV2NIH2 (SEQ ID:7) LEAVLRQSLEDADVSGLFNVNPTSLDWLMGNVFTWLS

DP180 (SEQ ID:2) [illegible]

DP118 (SEQ ID:10) [illegible]

DP125 (SEQ ID:8) [illegible]

DP116 (SEQ ID:9) LGWRTLKNDMTLKEQIDD

1. A peptide having a formula selected from the group consisting of:

X-YTSLIHSLIEESQNQQEKNEQELLELDKWASLWNWF-Z (SEQ ID: 1)

X-YTNTIYTLLEESQNQQEKNEQELLELDKWASLWNWF-Z (SEQ ID NO:3)

X-YTGIIYNLLEESQNQQEKNEQELLELDKWANLWNWF-Z (SEQ ID NO:4)

X-YTSLIYSLLEKSQIQQEKNEQELLELDKWASLWNWF-Z (SEQ ID NO:5)

X-LEANISKSLEQAQIQQEKNMYELQKLNSWDIFGNWF-Z (SEQ ID NO:6)

and

X-LEANISQSLEQAQIQQEKNMYELQKLNSWDVFTNWL-Z (SEQ ID NO:7),

in which:

amino acid residues are presented by the single-letter code;

X comprises an amino group, an acetyl group, a 9-fluorenylmethoxy-carbonyl group, a hydrophobic group, or a macromolecule carrier group;

Z comprises a carboxyl group, an amido group, a hydrophobic group, or a macromolecular carrier group.

5,464,934

METAL CHELATES AS SPACER COMPOUNDS IN BIOLOGICALLY ACTIVE PEPTIDES

T. Jeffrey Dunn, Cedar Hill; Ananthachari Srinivasan, St. Chalres; Leon R. Lyle, Webster Groves, and Raghavan Rajagopalan, Maryland Heights, all of Mo., assignors to Mallinckrodt Medical, Inc., St. Louis, Mo.

Filed May 14, 1993, Ser. No. 63,172

Int. Cl.[6] C07K *5/00;7/00;17/00;* **A61K** *49/00*

U.S. Cl. 530—326 **10 Claims**

1. A peptide having the following general formula:

$$(AA_1\text{-}AA_2)_n\text{-}X\text{-}(AA_3\text{-}AA_4)_m$$

wherein X is a ligand selected from -Cys-Gly-Glu(γ-)CO- (SEQ ID NO:1) and -Cys-Gly-Gly-Gly-Lys(ε-)NH-CO$(CH_2)_3$-CO- (SEQ ID NO:2), wherein $(AA_1\text{-}AA_2)_n$ is a peptide chain of length n; $(AA_3\text{-}AA_4)_m$ is a peptide chain of length m; n and m range from 0 to 20; the sum n+m is greater than 5 and less than or equal to 20; and wherein either $(AA_1\text{-}AA_2)_n$ or $(AA_3\text{-}AA_4)_m$ has biological activity.

5,464,935

PEPTIDE INHIBITORS OF SELECTIN BINDING

George A. Heavner, Malvern, Pa.; Douglas Riexinger, Flemington, N.J., and Miljenko Mervic, King of Prussia, Pa., assignors to Centocor, Inc., Malvern, Pa.

Continuation of Ser. No. 891,986, May 28, 1992, abandoned. This application Feb. 6, 1995, Ser. No. 384,680

Int. Cl.[6] C07K *7/06;* **A61K** *38/08*

U.S. Cl. 530—329 **1 Claim**

1. A peptide selected from the group consisting of peptides having the formula:

Gly—Gly—D—Ile—D—Trp—D—Thr—D—Trp—D—Val

Gly—D—Ile—D—Trp—D—Thr—D—Trp—D—Val

Gly—Ile—Trp—Thr—Trp—Val

Gly—Gly—Ile—Trp—Thr—Trp—Val

Asn—Lys—Thr—Trp—Thr—Trp—Val—NH_2

Lys—Thr—Trp—Thr—Trp—Val—NH_2, and

Thr—Trp—Thr—Trp—Val—NH_2.

5,464,936

COMPOSITIONS FOR IDENTIFICATION OF PAPILLOMAVIRUS REPLICATION INHIBITORS

Michael R. Botchan, Kensington; Robin Clark, Oakland; Ian J. Mohr, Berkeley, and Shaw Sun, Fremont, all of Calif., assignors to Cetus Oncology Corporation, Emeryville, and University of California, Oakland, both of Calif.

Filed Dec. 21, 1990, Ser. No. 632,027

Int. Cl.[6] A61K *38/43;39/12;* **C07K** *2/00;17/00*

U.S. Cl. 530—350 **4 Claims**

1. A composition comprising substantially purified, isolated papillomavirus proteins E1 and E2, about 68 kD and 48 kD, respectively.

5,464,937

TYPE II INTERLEUKIN-1 RECEPTORS

John E. Sims, Seattle; David J. Cosman, Bainbridge; Stephen D. Lupton, Seattle; Bruce A. Mosley, Seattle, and Steven K. Dower, Redmond, all of Wash., assignors to Immunex Corporation, Seattle, Wash.

Division of Ser. No. 91,519, Jul. 12, 1993, Pat. No. 5,350,683, which is a continuation of Ser. No. 701,415, May 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 627,071, Dec. 13, 1990, abandoned, which is a continuation-in-part of Ser. No. 573,576, Aug. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 534,193, Jun. 5, 1990, abandoned. This application May 13, 1994, Ser. No. 242,211

Int. Cl.[6] C07K *14/705*

U.S. Cl. 530—350 **4 Claims**

1. An isolated and purified biologically active Type II IL-1 receptor (Type II IL-1R), selected from the group consisting of:

(a) a Type II IL-1R having an amino acid sequence as set forth in SEQ ID NO.: 2, having an amino terminus at amino acid 1, and a carboxy terminus selected from the group consisting of an amino acid between amino acids 330 and 385, inclusive, of SEQ ID NO.:2;

(b) a polypeptide having an amino acid sequence as set forth in SEQ ID NO:13, having an amino terminus at amino acid 1, and a carboxy terminus selected from the group consisting of an amino acid between amino acids 342 and 397, inclusive, of SEQ ID NO.:13;

(c) a fragment of the polypeptide of (a) or (b), which fragment is capable of binding IL-1; and

(d) a biologically active Type II IL-1R according to (a), (b) or (c), wherein the Type II IL-1R polypeptide contains modifications in the amino acid sequence selected from the group consisting of: inactivated N-linked glycosylation sites; altered KEX2 protease cleavage Sites; deleted or substituted cysteine residues; conservative amino acid substitutions; and combinations thereof, which Type II IL-1R binds IL-1.

5,464,938

ISOLATED VIRAL PROTEIN TNF ANTAGONISTS

Craig A. Smith, and Raymond G. Goodwin, both of Seattle, Wash., assignors to Immunex Corporation, Seattle, Wash.

Continuation of Ser. No. 963,330, Oct. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 507,213, Apr. 9, 1990, abandoned. This application Aug. 18, 1994, Ser. No. 292,549

Int. Cl.[6] C07K *14/065*

U.S. Cl. 530—350 **6 Claims**

1. An isolated and substantially homogeneous soluble viral protein selected from the group consisting of Shope fibroma virus T2 protein comprising the sequence of amino acids I through 325 of SEQ ID NO: 2, myxoma virus T2 protein comprising the sequence of amino acids 1 through 326 of SEQ ID NO:4, and cowpox virus T2-equivalent protein comprising the sequence of amino acids 1 through 355 of SEQ ID NO:6.

5,464,939

HIGHLY PURIFIED PROTEIN, PRODUCTION AND USE THEREOF

Kato Koichi, Kawabe; Yamada Takao, Matsubara, and Onda Haruo, Kawanishi, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 582,778, Sep. 12, 1990, abandoned, which is a continuation of Ser. No. 298,228, Jan. 13, 1989, abandoned, which is a continuation of Ser. No. 674,556, Nov. 26, 1984, abandoned. This application Sep. 9, 1992, Ser. No. 942,358

Claims priority, application Japan, Nov. 28, 1983, 58-225079

Int. Cl.[6] C07K *3/00;* **C12P** *21/06;* **C12N** *1/20;* **C07H** *19/00*

U.S. Cl. 530—351 **15 Claims**

1. A substantially pure non-glycosylated human interleukin-2 protein having a specific activity of not less than 10^4 U/mg, which reacts negatively in the limulus lysate test.

5,464,940

Patent Not Issued For This Number

5,464,941

BIPHENYL PYRAZINE COMPOUNDS

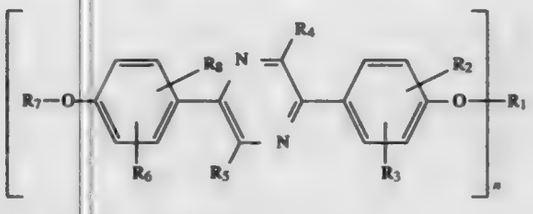
Richard Vicari; George Kvakovszky; Olan S. Fruchey, all of Corpus Christi, Tex., and Hans J. Metz, Darmstadt, Germany, assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Oct. 19, 1994, Ser. No. 326,103

Int. Cl.[6] C07C *245/08;* **C09B** *35/03;* **C07D** *241/00*

U.S. Cl. 534—741 **14 Claims**

1. A compound having the formula:

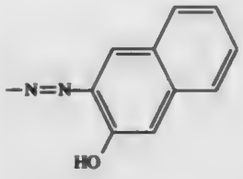


wherein n is 1 or 3, with the proviso that

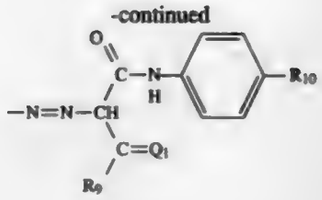
A) where n is 1,

R_1 and R_7 are each independently selected from the group consisting of H and $—CH_2—C_6H_5$

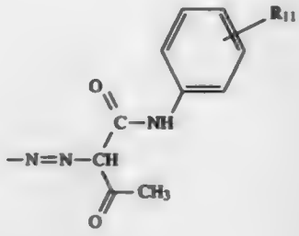
R_2, R_3, R_6, and R_8 are each independently selected from the group consisting of H, halogen, NO_2 NH_2, $N_2^{\oplus}$, SO_3H, SO_3M (where M is an alkali metal), C_6H_5, —OR' where R' is C_{1-8},



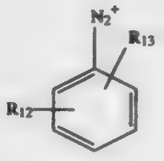
-continued



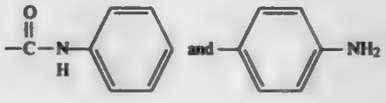
where R_9 and R_{10} are each H, C_{1-6}, $COOCH_3$, and $COOC_2H_5$, and Q_1 is NH or O;



where R_{11} is C_1–C_6;



where R_{12} and R_{13} are each independently selected from the group consisting of H, NO_2, Cl, OCH_3, CH_3, COOH, $COOCH_3$, NH_2,



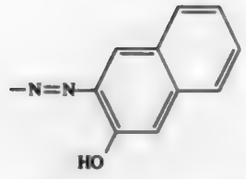
with the proviso that at least one of R_2, R_3, R_6, and R_8 must be other than H;

(B) where n is 3,

R_1 is

and R_2, R_3, R_6, R_7, and R_8 are the same as (A) above;

C) where n is 1 or 3, R_4 and R_5 are each independently selected from the group consisting of H, NO_2, NH_2, and



D) where n is 1 and R_2, R_3, R_4, R_5, R_6, and R_8 are H, R_1, R_7 are not H.

5,464,942

PHOSPHOLIPID- OR LIPID-LINKED GLYCOSAMINOGLYCAN AND PROCESS FOR PRODUCING THE SAME

Katsukiyo Sakurai, Tokyo; Nobuo Sugiura, Gifu; Koji Kimata, and Sakaru Suzuki, both of Aichi, all of, Japan, assignors to Seikagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP91/00995, § 371 Date Mar. 24, 1992, § 102(e) Date Mar. 24, 1992, PCT Pub. No. WO92/01720, PCT Pub. Date Feb. 6, 1992

PCT Filed Jul. 24, 1991, Ser. No. 847,065

Claims priority, application Japan, Jul. 24, 1990, 2-193816; Jul. 24, 1990, 2-193817; Jul. 24, 1990, 2-193818

Int. Cl.[6] A61K *31/725*; C08B *37/10*

U.S. Cl. 536—21 **17 Claims**

2. A phospholipid-linked glycosaminoglycan, or a salt thereof, in which a primary amino group of a phospholipid is linked to a carbonyl group of a reducing terminal moiety of a glycosaminoglycan through an amido bond, said phospholipid-linked glycosaminoglycan being represented by the following formulae: **2**. A phospholipid-linked glycosaminoglycan, or a salt thereof, in which a primary amino group of a phospholipid is linked to a carbonyl group of a reducing terminal moiety of a glycosaminoglycan through an amido bond, said phospholipid-linked glycosaminoglycan being represented by the following formulae: **+t,1310**

wherein P^1 is a phospholipid represented by the formula (IX): **2**. A phospholipid-linked glycosaminoglycan, or a salt thereof, in which a primary amino group of a phospholipid is linked to a carbonyl group of a reducing terminal moiety of a glycosaminoglycan through an amido bond, said phospholipid-linked glycosaminoglycan being represented by the following formulae: **+t,1310**

wherein P^1 is a phospholipid represented by the formula (IX): **+t,1370**

wherein each of R^4 and R^5 is hydrogen, —CH=CHR[6] or —COR[7], wherein each of R^6 and R^7 is a C_{6-24} alkyl group, and Y is —CH_2CH_2NH— or **2**. A phospholipid-linked glycosaminoglycan, or a salt thereof, in which a primary amino group of a phospholipid is linked to a carbonyl group of a reducing terminal moiety of a glycosaminoglycan through an amido bond, said phospholipid-linked glycosaminoglycan being represented by the following formulae: **+t,1310**

wherein P^1 is a phospholipid represented by the formula (IX): **+t,1370**

wherein each of R^4 and R^5 is hydrogen, —CH=CHR[6] or —COR[7], wherein each of R^6 and R^7 is a C_{6-24} alkyl group, and Y is —CH_2CH_2NH— or **+t,1371**

and GAG is a glycosaminoglycan residue of hyaluronic acid, chondroitin, chondroitin sulfate A, C, D, E or K, chondroitin polysulfate, dermatan sulfate, heparin, heparan sulfate, keratan sulfate or keratan polysulfate, wherein the reducing terminal group has been removed.

5,464,943

DNA ENCODING GLYCOSYLATED FGF AND PRODUCTION THEREOF

Masaharu Senoo, Toyonaka; Reiko Sasada, and Koichi Igarashi, both of Kyoto, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 7,089, Jan. 19, 1993, Pat. No. 5,360,896, which is a continuation of Ser. No. 511,469, Apr. 20, 1990, abandoned. This application Jul. 15, 1994, Ser. No. 275,635

Claims priority, application Japan, Apr. 26, 1989, 1-108595

Int. Cl.[6] C07H *21/00*; C07K *14/50*; C12N *15/18*;*15/63*

U.S. Cl. 536—23.5 **9 Claims**

1. A DNA coding for a mutein of a naturally occurring fibroblast growth factor (FGF), the DNA having artificially introduced therein at least one nucleotide sequence coding for a glycosylation site which is represented by -Asn-X-Y, wherein X is Gly, Lys, Val or Ala; Y is Thr, Ser or Cys; subject to the limitation that -X-Y- is not -Gly-Ser-.

5,464,944

SYNTHETIC ANTIFUNGAL PEPTIDES

A. Gururaj Rao, Polk County, and Lingxiu Zhong, Johnston, both of Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Jun. 21, 1993, Ser. No. 81,509

Int. Cl.[6] A01G *13/00*; C07K *7/00*; C07H *21/00*

U.S. Cl. 536—23.6 **4 Claims**

1. A protein having the sequence of SEQUENCE I.D. No. 1 or SEQUENCE I.D. No. 2.

2. A nucleotide sequence which codes for a protein according to claim 1.

5,464,945

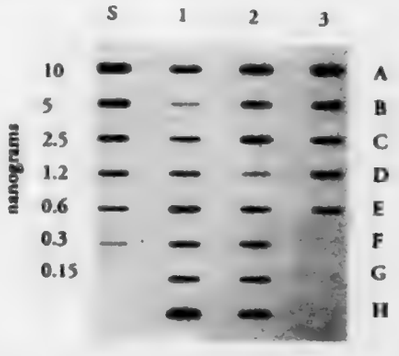
OLIGONUCLEOTIDE PROBES SPECIFIC FOR THE HUMAN ALPHA SATELLITE LOCUS

Rebecca L. Reynolds, Alameda, and P. Sean Walsh, Walnut Creek, both of Calif., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 28, 1992, Ser. No. 938,084

Int. Cl.[6] C07H *21/04*; C12Q *1/68*

U.S. Cl. 536—24.31 **4 Claims**

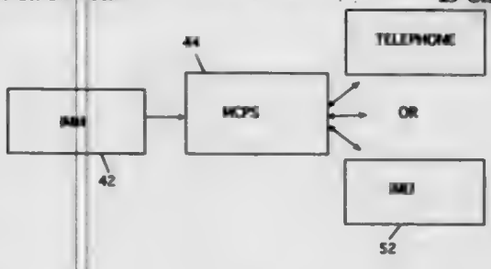


1. A labeled or unlabeled oligonucleotide probe, wherein said oligonucleotide probe sequence consists of Seq ID No. 1 or the complement thereto.

5,464,946
SYSTEM AND APPARATUS FOR INTERACTIVE MULTIMEDIA ENTERTAINMENT

Scott W. Lewis, San Jose, Calif., assignor to Multimedia Systems Corporation, San Jose, Calif.

Filed Feb. 11, 1993, Ser. No. 977,033
Int. Cl.[6] G09B 15/02; G10H 1/26
U.S. Cl. 84—609 29 Claims



16. An multimedia Karaoke information entertainment system comprising:

interactive multimedia mastering system (IMM) for receiving program source material from a network;

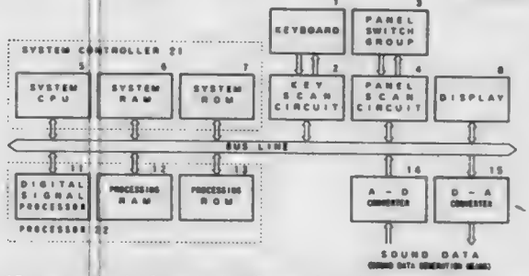
an interactive multimedia device (IMD) for storing program source material received from the IMM and that can select certain program source material from the IMM; and

multimedia call processing system (MCPS) that can receive credit or purchase information and can retrieve program source material to be sent to the IMD.

5,464,947
APPARATUS FOR AND METHOD OF PRODUCING FLUCTUATIONS IN SOUND FOR ELECTRONIC SOUND SYSTEM

Mineo Kitamura, Hamamatsu, Japan, assignor to Kawai Musical Inst. Mfg. Co., Ltd., Japan

Filed Dec. 23, 1993, Ser. No. 172,146
Claims priority, application Japan, Dec. 25, 1992, 4-0346063
Int. Cl.[6] G10H 1/057;1/06
U.S. Cl. 84—624 24 Claims



13. An method of producing fluctuations in sound for an electronic sound system comprising the steps of:

(A) generating sound data;

(B) generating speed information for determining the speed of generation of sound data generated in said step (A);

(C) controlling the speed of generation of sound data generated in said step (A) according to speed information generated in said step (B);

(D) generating a plurality of parallel pieces of frequency modulation information for changing the sound data generation speed controlled in said step (C);

(E) independently weighting the plurality of pieces of frequency modulation information generated in said step (D);

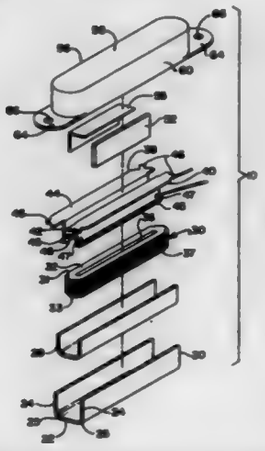
(F) synthesizing the plurality of weighted pieces of frequency modulation information having been weighted in said step (E); and

(G) synthesizing frequency modulation information synthesized in said step (F) with speed information generated in said step (B).

5,464,948
SENSOR ASSEMBLY FOR A STRINGED MUSICAL INSTRUMENT

Jeffrey J. Lace, Huntington Beach, Calif., assignor to Actodyne General, Inc., Huntington Beach, Calif.

Filed Apr. 22, 1994, Ser. No. 231,115
Int. Cl.[6] G10H 3/18
U.S. Cl. 84—726 20 Claims



1. A sensor assembly for a stringed musical instrument having a plurality of moveable strings comprising:

a case including means for forming a longitudinal channel;

at least one magnet disposed in said longitudinal channel along an interior surface of said channel forming means;

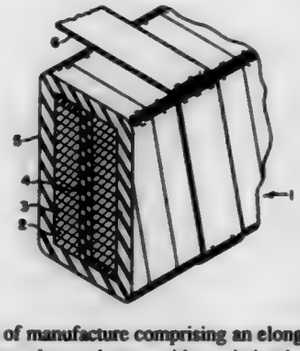
at least one coil disposed in said longitudinal channel; and

means disposed in a space within said coil for pressing said coil against said magnet to lock said coil within said longitudinal channel.

5,464,949
HEAT RESISTANT RESIN COMPOSITIONS, ARTICLES AND METHOD

Mark Markovitz, Schenectady, and Jeffrey D. Sheaffer, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 14,046, Feb. 5, 1993, Pat. No. 5,314,984, which is a continuation of Ser. No. 629,155, Dec. 18, 1990.
This application Dec. 21, 1993, Ser. No. 171,070
Int. Cl.[6] H01B 7/00;13/08
U.S. Cl. 174—120 R 5 Claims



1. An article of manufacture comprising an elongated conductor, a tape wrapped on the conductor, said tape being impregnated with a solventless vacuum-pressure impregnatable thermosetting resin composition having viscosity less than 4,500 cps at 25° C. and

unique thermal stability consisting essentially of a bismaleimide resin composition, vinyl toluene, an epoxy resin composition consisting essentially of a nitrogen-free 1, 2 epoxy resin having at least two epoxide groups per molecule, and a small but effective amount of a phenolic accelerator and a labile halogen-free catalytic hardener.

5,464,950

ALUMINUM NITRIDE CIRCUIT BOARD AND METHOD OF PRODUCING SAME

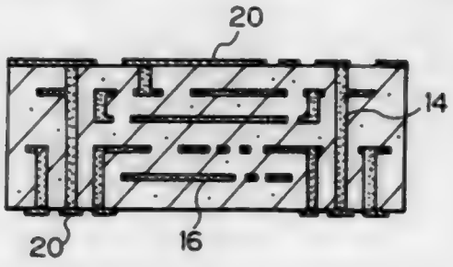
Michio Horiuchi; Yoichi Harayama, and Koishiro Hayashi, all of Nagano, Japan, assignors to Shinko Electric Industries Co., Ltd., Nagano, Japan

Filed Sep. 3, 1993, Ser. No. 115,767

Claims priority, application Japan, Sep. 5, 1992, 4-262928; Sep. 9, 1992, 4-266735; Jan. 12, 1992, 4-299912

Int. Cl.[6] H05K *1/00*

U.S. Cl. 174—256 **2 Claims**



1. An aluminum nitride circuit board comprising:

an aluminum nitride ceramic body;

an inner conductor metal, which is to be used as a wiring material, formed in said aluminum nitride ceramic body, said inner conductor metal being mainly made of copper, a melting point of which is lower than the firing temperature of said aluminum nitride ceramic body; and

a layer mainly made of a periodic table IVb group metal or compound, such as titanium, zirconium, or hafnium, formed in an interface between said aluminum nitride ceramic body and said inner conductor metal.

5,464,951

TABLET UNIT COMPRISING A REDUCED NUMBER OF CIRCUIT ELEMENTS

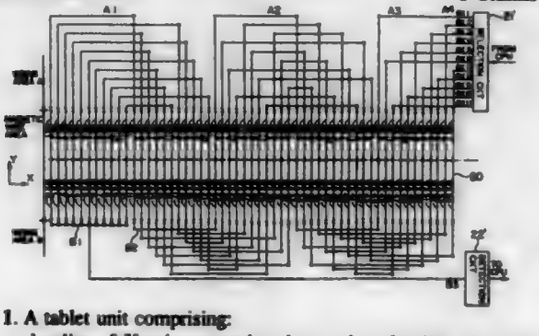
Seiichi Maruyama, Sano, Japan, assignor to Mitsumi Electric Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1993, Ser. No. 143,452

Claims priority, application Japan, Jan. 27, 1992, 4-074737 U

Int. Cl.[6] G08C *21/00*

U.S. Cl. 178—18 **6 Claims**



1. A tablet unit comprising:

a plurality of X-axis magnetic wires and a plurality of Y-axis magnetic wires arranged at a predetermined pitch on a tablet board in a matrix fashion for detecting an abscissa and an ordinate, respectively, each of said plurality of X-axis and Y-axis magnetic wires being made of an amorphous material;

a switching circuit supplied with a selection signal for selectively putting said plurality of X-axis and Y-axis magnetic wires into an electroconductive state in accordance with said selection signal; and

a detecting circuit connected to said plurality of X-axis and Y-axis magnetic wires for detecting a particular one of said plurality of X-axis magnetic wires and a particular one of said plurality of Y-axis magnetic wires when said particular ones are indicated as a coordinate by a coordinate indicator pen during said electroconductive state;

said plurality of X-axis magnetic wires being divided into first through N-th (N being an integer not smaller than two) groups, any one of said X-axis magnetic wires belonging to a particular group being arranged to adjoin two other X-axis magnetic wires belonging to different groups to form a specific combination of three different groups so that those X-axis magnetic wires belonging to said particular group are spaced from one another by at least a predetermined distance and that said specific combination is unique and does not repeatedly appear;

said plurality of Y-axis magnetic wires being divided into first through N-th (N being an integer not smaller than two) groups, any one of said Y-axis magnetic wires belonging to a particular group being arranged to adjoin two other Y-axis magnetic wires belonging to different groups to form a specific combination of three different groups so that those Y-axis magnetic wires belonging to said particular group are spaced from one another by at least said predetermined distance and that said specific combination is unique and does not repeatedly appear;

the X-axis magnetic wires belonging to each group being connected to one another in series or in parallel;

the Y-axis magnetic wires belonging to each group being connected to one another in series or in parallel;

said switching circuit successively and selectively putting said plurality of X-axis and Y-axis magnetic wires group by group into said electroconductive state in a predetermined cycle.

5,464,952

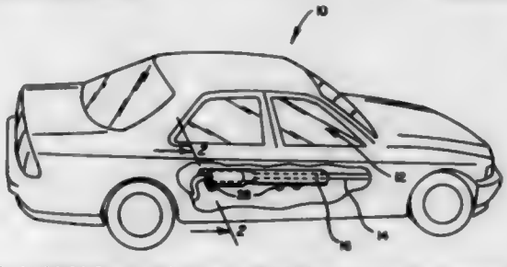
SHIELD BETWEEN VEHICLE EXHAUST AND PASSENGER COMPARTMENT

Hiten T. Shah, Delaware, and Jerry M. Wolf, Westerville, both of Ohio, assignors to Acoust-A-Fiber Research and Development Inc., Delaware, Ohio

Continuation of Ser. No. 157,445, Nov. 26, 1993, abandoned. This application Mar. 23, 1995, Ser. No. 409,956

Int. Cl.[6] F01N *5/00*; B60K *13/04*

U.S. Cl. 181—211 **10 Claims**



1. A shield for securing to a vehicle intermediate the passenger area and the exhaust system comprising,

a pair of heat reflective layers sandwiching a sound deadening loose fibrous layer therebetween, said layers being formed in a generally U-shaped trough having two ends and two sides, said trough being configured to extend along the length of said exhaust system with the open end of the U-shape facing the exhaust system,

a hardened resin adhesive impregnating the periphery of said fibrous layer and bonding it to said heat reflective layers along said ends and said sides to provide a hard periphery for said shield,

in the sandwich inside said periphery and between said heat reflective layers said fibrous layer partially filling a space to create a void for absorbing sound from said exhaust system and road noises.

5,464,953

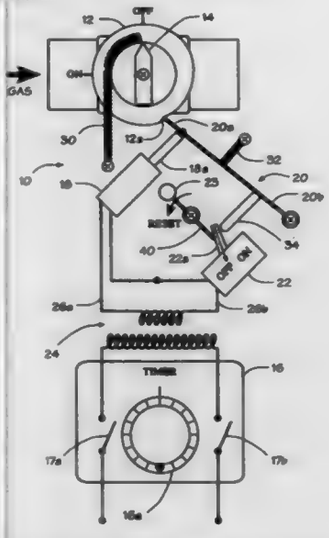
TIMING APPARATUS FOR A PIZZA OVEN SWITCH

Chang E. Kim, 12591 Barbara Ave., Garden Grove, Calif. 92641

Filed Dec. 27, 1993, Ser. No. 173,059

Int. Cl.[6] H01H *43/00*

U.S. Cl. 200—33 R **17 Claims**



1. Control apparatus for a device having a control knob rotatable between an "on" and "off" position, said apparatus comprising:

a disc member rotatable with said control knob, said disc member having a detent in the periphery thereof;

means for biasing said control knob to its "on" position;

an arm pivotable about a fixed end and having the free end thereof engageable with said detent only with said control knob rotated to its "off" position;

a solenoid having the armature thereof mechanically coupled to pivot said arm; and

an electrically operated timer in circuit relation with said solenoid, said timer being presettable to energize said solenoid at a predetermined time for a given time duration, energization of said solenoid pivoting said arm about its fixed end in a direction to forcibly disengage the free end of said arm from the detent in said disc member, thereby enabling rotation of said control knob to its "on" position under force of said biasing means.

5,464,954

SAFETY SWITCH ASSEMBLY

Haruo Kimura, Kyoto; Yoshio Sekino, Osaka; Takashi Masuya, Osaka, and Takao Fukui, Osaka, all of, Japan, assignors to Idec Izumi Corporation, Osaka, Japan

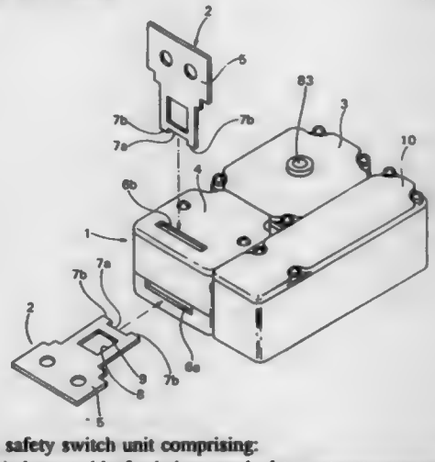
PCT No. PCT/JP93/01226, § 371 Date Jul. 19, 1994, § 102(e) Date Jul. 19, 1994, PCT Pub. No. WO94/06141, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 31, 1993, Ser. No. 232,227

Claims priority, application Japan, Aug. 31, 1992, 4-231031; Aug. 31, 1992, 4-231032; Jan. 21, 1992, 4-073395; Nov. 2, 1992, 4-075947; Aug. 4, 1993, 5-193365

Int. Cl.[6] H01H *27/00*

U.S. Cl. 200—61.62 **6 Claims**



1. A safety switch unit comprising:

a switch assembly for being attached to a structure proximate a door;

an actuator for being attached to the door proximate the switch assembly and for being inserted and locked within the switch assembly when the door is closed, the actuator including first and second portions projecting in an actuating direction, the second portion projecting farther than the first portion, the first and second portions being inserted into the switch assembly along an insertion path;

a cam shaft within the switch assembly, the cam shaft having an axis extending transversely with respect to the actuating direction, the axis being offset from the insertion path;

a first disc-shaped cam plate rotatably mounted on the cam shaft, the first cam plate having a first cam groove, a first periphery, a first recess in the first periphery, and a first side in the first recess, the first side for being initially contacted by the first portion of the actuator when the actuator is inserted within the switch assembly, the first cam plate being rotated by the insertion of the actuator;

a second disc-shaped cam plate rotatably mounted on the cam shaft adjacent the first cam plate, the second cam plate having a second cam groove, a second periphery, a second recess in the second periphery, and a second side in the second recess, the second side for being initially contacted by the second portion of the actuator when the actuator is inserted within the switch assembly, the second cam plate being rotated by the insertion of the actuator;

a first cam follower pin moving in and along the first cam groove;

a second cam follower pin moving in and along the second cam groove;

an operating rod connected to the first and second cam follower pins, the rotation of the first and second cam plates moving the first and second cam follower pins along the respective first and second cam grooves to axially shift the operating rod; and

a switch section for effecting safety switching operation in accordance with the axial movement of the operating rod, the switch section having first and second electrical contact points forming a switch, the switch being in one of an open state and a closed state during a first phase of the insertion of the

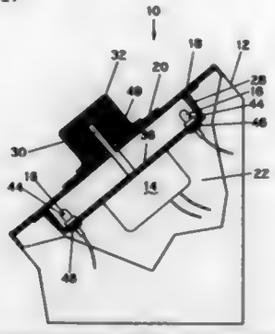
actuator within the switch assembly before the actuator is locked within the switch assembly, and being in the other of the open state and the closed state during a second phase of the insertion of the actuator within the switch assembly when the actuator is locked within the switch assembly.

5,464,955

BACKLIT APPLIANCE CONTROL CONSOLE

Ronald E. Cole, Greenwood, Ind., assignor to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 47,318, Apr. 15, 1993, abandoned. This application Jan. 9, 1995, Ser. No. 395,282
Int. Cl.[6] H01H *9/16*
U.S. Cl. 200—317 **10 Claims**



1. A backlit appliance control console, comprising:
(a) a housing having an interior and a control mounting plate with control openings and light windows;
(b) a light source carried in a light box in the housing interior projecting light through the light windows; and,
(c) a multi-function rotary switching mechanism carried in the housing interior and mounted to the control mounting plate having a shaft extending through one of the control openings and the light box for selecting appliance functions;
(d) a console annunciator carried by the control mounting plate for receiving light from the light source projected through the light windows and the light box to illuminate selected areas with data indicating appliance functions, the console annunciator having at least one opening through which the shaft extends; and,
(e) a control annunciator disposed around the periphery of the shaft between a control knob and the console annunciator for receiving light from the light source to illuminate data indicating control positions in relation to illuminated data on the console annunciator.

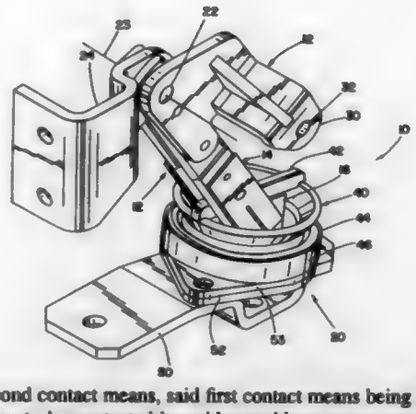
5,464,956

ROTATING ARC INTERRUPTER FOR LOADBREAK SWITCH

Edward A. Steele, Gurnee, and James K. Niemira, Skokie, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Apr. 8, 1994, Ser. No. 225,221
Int. Cl.[6] H01H *9/44;33/18;1/56*
U.S. Cl. 218—29 **16 Claims**

1. A rotating arc interrupter comprising:
movable contact means movable between open and closed positions;
a generally planar stationary contact being engaged by said movable contact means in said closed position; and
means for commutating current flow away from said stationary contact and for generating a magnetic field arranged to extinguish arcing current in response to said movable contact means moving out of said closed position toward said open position, said commutating means comprising first contact means arranged coplanar with said stationary contact and second contact means being defined about a generally open volume, said stationary contact being disposed within said



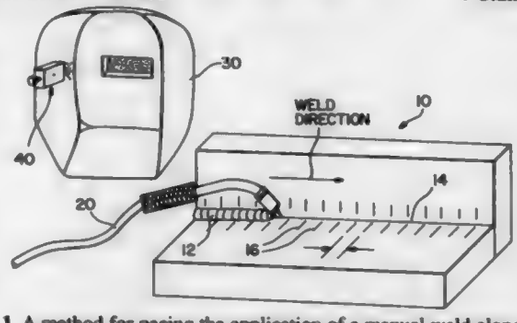
second contact means, said first contact means being arranged so as to be contacted by said movable contact means as said movable contact means moves out of said closed position and before said movable contact means disengages said stationary contact.

5,464,957

MANUAL ARC WELDING SPEED PACER

J. Jeffrey Kidwell, Louisville; Stuart E. Reed, Homeworth; Patrick M. Ryan, Alliance; Dennis D. Harwig, Canton, and E. Allen Womack, Jr., Akron, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 27, 1993, Ser. No. 9,696
Int. Cl.[6] B23K *9/095*
U.S. Cl. 219—130.01 **4 Claims**



1. A method for pacing the application of a manual weld along a weld line, comprising the steps of:
providing a weld line with markings spaced at regular intervals;
positioning a module for generating perceivable signals in a welding helmet;
generating discrete, timed signals which are perceivable to a welder by the module in the welding helmet as the welder applies a manual weld along the weld line; and
temporally controlling the signals at a selected rate corresponding to a rate of welding along the weld line based on the spaced markings.

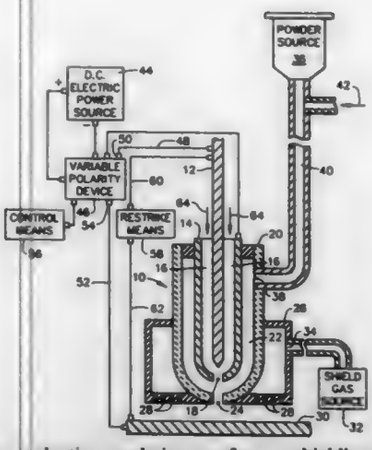
5,464,958

ARC WELDING APPARATUS WITH VARIABLE POLARITY REVERSING DEVICE AND CONTROL

Gilbert E. Flowers; Joel H. Cohen, both of Cincinnati; Earl L. Kelly, Jr., West Chester; Levi Williams, Milford, all of Ohio; Gray W. Grubbs, Burlington, Ky., and Stefan P. Kyselica, Hinsdale, Ill., assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 5, 1994, Ser. No. 223,193
Int. Cl.[6] B23K *10/00*
U.S. Cl. 219—130.51 **5 Claims**

1. In an electric arc welding apparatus including an electrode; arc striking means to strike an arc between the electrode and an



electrically conductive workpiece surface; a shielding gas source and means to flow shielding gas about the arc between the electrode and the workpiece surface; and a direct current electric power source connected between the electrode and the workpiece surface charging the electrode and the workpiece surface with opposite electric polarities; the improvement including the combination of:

a variable polarity device, operating in a low direct electric current range of of about 0.5–45 amps and operatively connected between the direct current electric power source and the combination of the electrode and the workpiece surface, the device being capable of reversing between positive and negative the direct current polarities of the electrode and the workpiece surface in said current range; and,

control means which schedules:

a) frequency of time rate of reversing of the polarities at a low time frequency in the range of about 1–1000 cycles per second to provide a series of polarity cycles, each cycle defined by a period of time and direct electric current amperage at each polarity, and

b) length of time of each of the periods of time and the amperage of the electric current at each polarity in a cycle.

5,464,959

ION EXCHANGE TREATMENT METHOD IN PRODUCING AND RECYCLING AQUEOUS EDM FLUID

Nobuyuki Takahashi, Yokohama, Japan, assignor to Sodick Co., Ltd., Yokohama, Japan

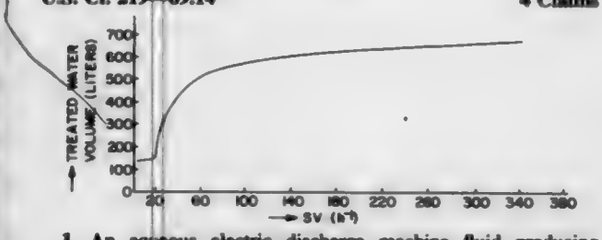
PCT No. PCT/JP93/00572, § 371 Date Feb. 1, 1994, § 102(e) Date Feb. 1, 1994, PCT Pub. No. WO93/22094, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 26, 1993, Ser. No. 167,971

Claims priority, application Japan, Apr. 28, 1992, 4-110306; Dec. 18, 1992, 4-354903

Int. Cl.[6] B23H *1/10*

U.S. Cl. 219—69.14 **4 Claims**



1. An aqueous electric discharge machine fluid producing method for producing an aqueous electric discharge machine fluid which is used for electric discharge machining in which a workpiece is machined by inducing electric discharges in a machining gap formed between an electrode and a workpiece while disposing the aqueous EDM fluid in the machining gap, comprises:

(a) a process of supplying raw water under pressure into a container charged with ion-exchange resins;

(b) a process of detecting electric conductivity of treated water being obtained from the container charged with the ion-exchange resins; and

(c) a process of adjusting the supply flow rate of raw water at the space velocity at least higher than 20 h^{-1} whereby the detected electric conductivity of said treated water may become lower than 50 μS/cm.

5,464,960

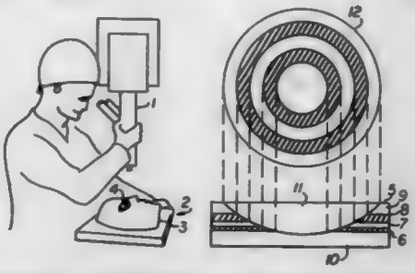
LASER CALIBRATION DEVICE

Deborah K. Hall, Menlo Park, Calif., and Erik Reacs, Baltimore, Md., assignors to Iatrotech, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 3,521, Jan. 12, 1993, Pat. No. 5,261,822. This application Nov. 10, 1993, Ser. No. 150,603

Int. Cl.[6] B23K *26/02*

U.S. Cl. 219—121.6 **16 Claims**



1. A method for measuring and mapping the intensity of an ablative, pulsed laser beam and using said laser beam to ablate a section of tissue to a desired depth, which comprises:

forming a target comprising at least one layer of ablatable material having a constant thickness;

aiming the pulsed laser beam at said target;

observing the effect of said beam upon an area of said target impinged upon by the laser beam;

counting the number of laser pulses necessary to ablate a first entire portion of said area;

dividing said thickness by said number to obtain a first ablating factor for said portion;

and applying to said tissue a number of laser pulses proportional to the ratio of said depth over said first ablating factor.

5,464,961

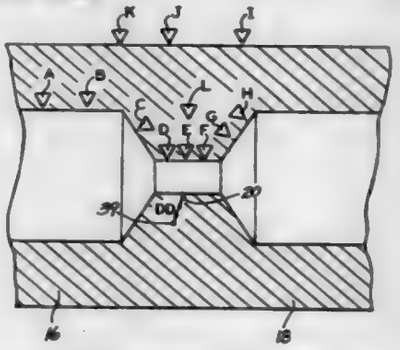
ARCJET ANODE

Paul G. Lichon, Bothell, Wash., assignor to Olin Corporation, Redmond, Wash.

Filed Sep. 10, 1993, Ser. No. 120,615

Int. Cl.[6] B23K *10/00*

U.S. Cl. 219—121.52 **15 Claims**



1. An anode for an arcjet thruster, comprising:

a converging upstream portion;

a diverging downstream portion; and

a constricted portion disposed between said upstream portion and said downstream portion, said constricted portion having

a plurality of symmetrically disposed conductive rails having both a width and a depth of from about 0.025 mm to about 0.13 mm effective to preferentially receive an arc and to conduct from said arc from said converging upstream portion to said diverging downstream portion.

5,464,962

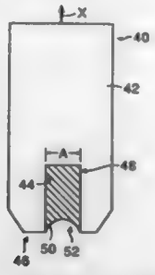
ELECTRODE FOR A PLASMA ARC TORCH

Lifeng Luo, Mayfield Heights, Ohio, and Richard W. Couch, Jr., Hanover, N.H., assignors to Hypertherm, Inc., Hanover, N.H.

Continuation-in-part of Ser. No. 886,067, May 20, 1992, Pat. No. 5,310,988. This application Jul. 29, 1994, Ser. No. 283,070

Int. Cl.[6] B23K *10/00*

U.S. Cl. 219—121.52 20 Claims



1. An electrode for a plasma arc cutting torch, the electrode comprising:

an elongated electrode body formed of a high thermal conductivity material and having a bore disposed in a bottom end of the electrode body along a central axis through the electrode body;

an insert including a high thermionic emissivity material and disposed in the bore such that an emission surface of the insert is exposed;

wherein the emission surface is shaped to define a predetermined recess in the insert for reducing deposition of the high thermionic emissivity material on the nozzle during operation of the torch.

5,464,963

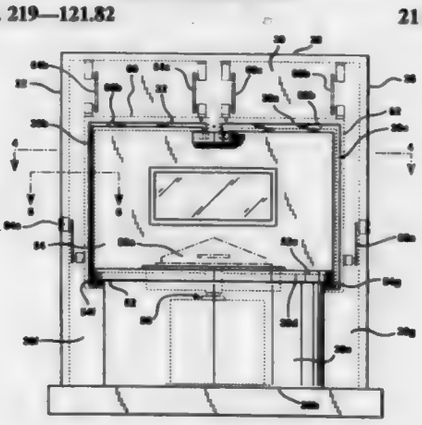
SEALING ARRANGEMENT FOR A LASER ENCLOSURE

Jonathan E. Hostler, Canton, Mich.; William H. DeCamp, Cincinnati, and Daniel W. Slanker, Huber Heights, both of Ohio, assignors to Motoman Inc., West Liberty, Ohio

Filed Aug. 27, 1993, Ser. No. 113,227

Int. Cl.[6] B23K *26/02*

U.S. Cl. 219—121.82 21 Claims



1. A laser system comprising:

generator means for generating and directing a laser beam to a laser workstation;

a housing having an inner cavity for containing said laser workstation, said housing including a section having an opening through which workpieces pass into and out of said inner cavity;

transport means for moving said workpieces through said opening into and out of said inner cavity; and,

passive sealing means pivotably and movably coupled to one of said section and said transport means for sealing a portion of said transport means with a portion of said section to inhibit laser energy from exiting said housing through said opening.

5,464,964

IMAGE HEATING APPARATUS CHANGING SET TEMPERATURE IN ACCORDANCE WITH TEMPERATURE OF HEATER

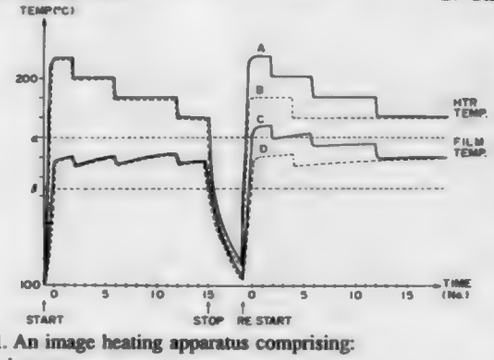
Kouichi Okuda; Shunji Nakamura; Toshio Yoshimoto; Yasumasa Ohtsuka, all of Yokohama; Yohji Tomoyuki, Ichikawa; Daizo Fukuzawa, Tokyo; Tomoko Nanbu, and Hidenobu Suzuki, both of Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1992, Ser. No. 986,788

Claims priority, application Japan, Dec. 11, 1991, 3-327614; Mar. 31, 1992, 4-108637; Apr. 10, 1992, 4-118393

Int. Cl.[6] H05B *1/02*

U.S. Cl. 219—497 27 Claims



1. An image heating apparatus comprising:

a heater;

temperature detecting means for detecting a temperature of said heater;

electric power supply control means for controlling electric power supply to said heater during image heating, so that the temperature detected by said temperature detecting means is maintained at a predetermined set temperature; and

temperature determining means for determining the set temperature on the basis of a lowering rate of the temperature detected by said temperature detecting means.

5,464,965

APPARATUS FOR CONTROLLING TEMPERATURE OF AN ELEMENT HAVING A TEMPERATURE VARIABLE RESISTANCE

John A. McGregor, and Robert P. Parris, both of Phoenix, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

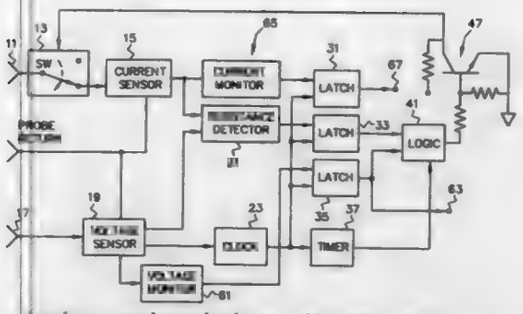
Filed Apr. 20, 1993, Ser. No. 49,925

Int. Cl.[6] H05B *1/02*

U.S. Cl. 219—497 11 Claims

1. An apparatus for controlling the temperature of a device wherein heat is generated by current flowing through a heating element due to an applied voltage having a predetermined frequency, the heating element having a resistor with a temperature variable resistance value, the apparatus comprising:

means (51,53,59) responsive to said current and voltage for sampling said resistance value at a sampling rate determined by said predetermined frequency and providing a signal representative of said resistance value and for providing reset



signals at a predetermined rate, said predetermined rate being less than said sampling rate;

logic means (**41**) coupled to said resistance value means (**21**) for providing a control signal in accordance with said resistance value representative signal; and

switch means (**13,47**) responsive to said control signal and said reset signals for preventing current flow through said heating element when said resistance value representative signal indicates that said resistance of said heating element exceeds a predetermined resistance value, said switch means being reset by each of said reset signals.

5,464,966

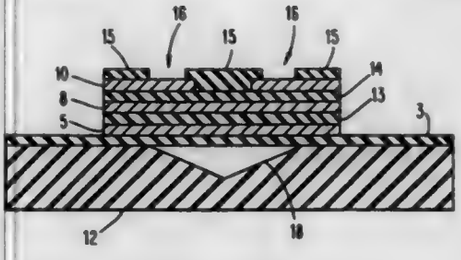
MICRO-HOTPLATE DEVICES AND METHODS FOR THEIR FABRICATION

Michael Gaitan, Gaithersburg; John S. Suehle, Westminister; Stephen Semancik, Mt. Airy, and Richard E. Cavicchi, Washington Grove, all of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Oct. 26, 1992, Ser. No. 965,947

Int. Cl.[6] H05B *3/00;* **G01F** *1/68;* **H01C** *1/012*

U.S. Cl. 219—544 **31 Claims**



1. A micro-hotplate device which comprises:

a support substrate;

a microbridge structure formed on said support substrate, said microbridge structure having a suspended portion;

a heating element formed directly on said microbridge structure so as to be thermally isolated from said support substrate;

a layer of electrically insulating material formed directly on said heating element; and

a conductive heat distribution plate formed directly on said layer of electrically insulating material, said conductive heat distribution plate being centrally located over said microbridge structure.

5,464,967

METHOD FOR THAWING FOOD IN MICROWAVE OVEN

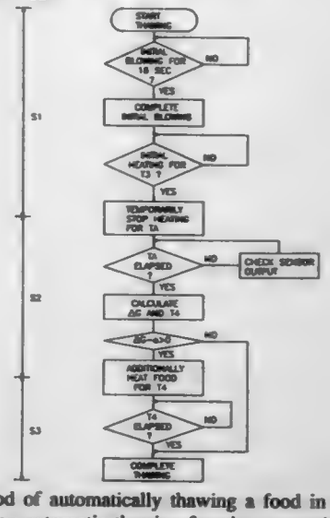
Chun S. Gong, Kyungsangnam-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 20, 1994, Ser. No. 309,189

Claims priority, application Rep. of Korea, Sep. 28, 1993, 20285/1993

Int. Cl.[6] H05B *6/68*

U.S. Cl. 219—703 **6 Claims**



1. A method of automatically thawing a food in a microwave oven having an automatic thawing function, comprising the steps of:

selecting the automatic thawing function of the microwave oven;

generating an automatic thawing signal upon selection of the automatic thawing function of the microwave oven;

initially heating the food for a first predetermined time according to the automatic thawing signal;

temporarily stopping the initial heating of the food for a second predetermined time after completion of the initial heating step;

determining whether or not an additional heating of the food should be executed, on the basis of a variation of an output signal generated from a gas sensor adapted to sense a water vapor or gas generated from the food, during the second predetermined time;

calculating an additional heating time for the additional heating during the second predetermined time;

displaying the calculated additional heating time; and

additionally heating the food for the additional heating time calculated at the calculating step so as to complete the automatic thawing of the food.

5,464,968

DEVICE FOR THE CONTROL AND DETECTION OF ADEQUATE HEAT LEVELS IN MICROWAVE OVENS

Alain Germain, Bagneux; Andre-Jean Berteaud, Dravell, and Francois Galtier, Paris, all of, France, assignors to Microondes Energie Systemes, Fresnes, and Solufrance, Paris, both of, France

Filed Jun. 30, 1993, Ser. No. 85,397

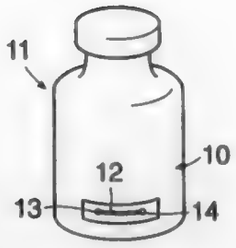
Claims priority, application France, Jul. 2, 1992, 9208175

Int. Cl.[6] H05B *6/68*

U.S. Cl. 219—710 **10 Claims**

1. A process for controlling microwave heating of a product to a temperature higher than or equal to a determined temperature for a period longer than or equal to a determined time, which comprises the steps of

a. marking the product or a receptacle containing said product with a thermally crosslinkable ink comprising conductive particles whose resistivity decreases in predetermined manner in relation to the determined temperature and the determined period of heating for said product,



b. microwave heating the marked product or receptacle to the determined temperature or to a temperature higher than the determined temperature for a period time equal to or longer than the determined time,

c. measuring the resistivity of the crosslinkable ink to verify that the product has been heated to a sufficient temperature for a sufficient period of time.

5,464,969

SELF-VENTING MICROWAVEABLE PACKAGE AND METHOD OF MANUFACTURE

Gerald Miller, Oshkosh, Wis., assignor to Curwood, Inc., Oshkosh, Wis.

Filed Nov. 10, 1994, Ser. No. 337,173

Int. Cl.[6] H05B *6/80*

U.S. Cl. 219—735 **10 Claims**

1. A self-venting package adapted for microwave cooking including a first package wall composed solely of a thermoplastic polymeric film construction free of susceptor materials; a second package wall also composed solely of a thermoplastic polymeric film construction free of susceptor materials, said second package wall joined at a portion of its perimeter to said first package wall; a product receiving chamber defined between said first and said second walls, said chamber adapted to receive a product to be heated; a seal strip disposed between said first and second package walls at an edge of said package, said seal strip having at least three layers of thermoplastic polymeric film construction and consisting of a first outer layer, positioned adjacent to an inner surface of said first package wall and adapted to be sealed thereto, a second outer layer, positioned adjacent to an inner surface of said second package wall and adapted to be sealed thereto, and a tie layer disposed between said first and said second outer layers, said tie layer being peelably bonded to said first outer layer and said second outer layer, whereby, after product is introduced into said product receiving chamber and said package is sealed, when sufficient force is exerted against said seal strip from pressure generated internal to said product receiving chamber, said tie layer will separate from one of said outer layers to which it is sealed and venting of said package will take place through said seal strip to thereby reduce the internal pressure within said chamber and prevent explosion of said package during heating.

5,464,970

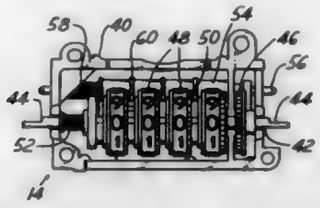
MULTIPLE COUNTER ASSEMBLY

Walter J. Nill, Davison, and Jean M. Buechler, Goodrich, both of Mich., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Jun. 16, 1994, Ser. No. 260,545

Int. Cl.[6] G01C *22/00*

U.S. Cl. 235—95 R **11 Claims**



1. A mechanical counter assembly having a plurality of counters connected in series and an input driver responsive to events being counted, comprising:

first and second counters aligned on a common axis;

each counter including a central shaft on the common axis, number wheels mounted for rotation on the shaft and means for driving the number wheels;

the first counter having input means for rotation of the first counter shaft by the input driver;

identical drive means on both ends of one counter shaft and on at least one end of the other counter shaft, the drive means comprising a shaped termination of the shaft end;

and a coupler drivingly joining both shafts for joint rotation of the shafts, the coupler comprising an elongated member having an aperture on each end shaped to mate with the shaped termination of each shaft to provide for the transfer of torque between shafts.

5,464,971

APPARATUS AND METHOD FOR RECEIVING AND PROCESSING A BET

Peter H. Sutcliffe, 16 Brewery Yard, Fennay Bridge, Huddersfield, Great Britain, and Peter Smith, Ingleby Cottage, Kearby, Near Wetherby, Great Britain

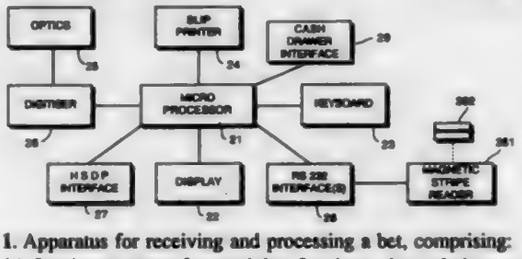
PCT No. PCT/GB92/00449, § 371 Date Jan. 31, 1994, § 102(e) Date Jan. 31, 1994, PCT Pub. No. WO92/16914, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 12, 1992, Ser. No. 108,705

Claims priority, application United Kingdom, Mar. 12, 1991, 9105164; Apr. 3, 1991, 9106953

Int. Cl.[6] G06F *15/30*

U.S. Cl. 235—379 **26 Claims**



1. Apparatus for receiving and processing a bet, comprising:

(a) first input means for receiving first input data relating to an event on which bets are to be taken;

(b) second input means for receiving second input data relating to an individual bet on said event, said second input means comprising an input portion for receiving a slip having characters thereon;

(c) receipt generating means for generating a receipt for said second input data;

(d) storing means for storing said first and second input data; and

(e) calculating means for calculating the payout value of a bet from said first and second input data;

wherein:

(1) said apparatus further comprises:

electrical imaging means for forming an image of at least part of a slip in or at said input portion and generating an electrical image signal representing said image; and

output means for receiving said electrical image signal and processing the signal to display the image on a display means and/or print a hard copy of said image;

(2) said storing means is arranged to store said electrical image signal together with the respective said second input data; and

(3) said receipt, generating means is arranged either to generate a receipt which comprises said hard copy together with additional identifying information, or to generate a receipt which comprises at least part of said slip, together with additional identifying information.

5,464,972

OMNIDIRECTIONAL BAR CODE LABEL SCANNER

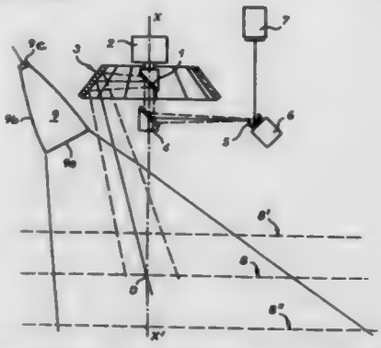
Jean-Louis Massieu, Montauban, and Serge Thuries, Saint-Jean, both of, France, assignors to Reflexion Plus, Chatou, France

Filed Jun. 29, 1993, Ser. No. 84,557

Claims priority, application France, Jul. 1, 1992, 92 08088

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—462 **10 Claims**



1. Omnidirectional bar code label scanner comprising a source producing a thin parallel light beam, a dynamic deviator adapted to scan said beam in a pattern, having a center, on a plane scanning area across which the beam is scanned and through which the label passes, and a photosensor with a light collector aimed at the scanning area to generate a signal corresponding to the bar code that it carries when the pattern passes longitudinally over the label, the deviator comprising scanning optics centred on a main axis and comprising a reflective ring with facets arranged in a regular frustum of a pyramid and at the center of the ring a mirror rotating at constant speed about the main axis on which the beam impinges along said axis so as to scan each facet of the ring consecutively and form at each a reflected beam which traces a diametral segment of the pattern in the scanning area, said deviator comprising on an upstream side of the scanning optics an auxiliary member for moving a center of the pattern in a curve centered on the main axis of the scanning area, the auxiliary member comprising apparatus for producing from an incident light beam path an emergent path which, by virtue of rotation at a speed which is slow relative to that of the scanning optics mirror, traces out a narrow aperture cone at the scanning optics mirror, whereby the center of the pattern created by the scanning optics traces out a curve centered on said main axis in said scanning area at said slow speed.

5,464,973

DEVICE FOR IDENTIFYING AN OBJECT BY MEANS OF AN INSERT INCORPORATED INTO THAT OBJECT

Jean-Albert Despres, 5, Rue des Seigneurs, 41300 Soucomes, France

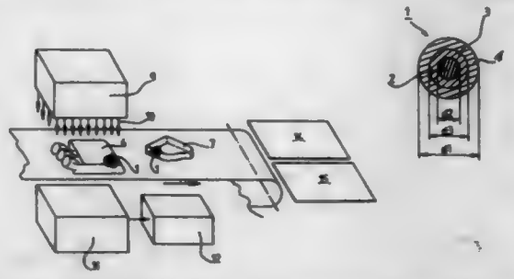
PCT No. PCT/FR93/00680, § 371 Date Mar. 2, 1994, § 102(e) Date Mar. 2, 1994, PCT Pub. No. WO94/01836, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 2, 1993, Ser. No. 204,226

Claims priority, application France, Jul. 3, 1992, 92 08270

Int. Cl.[6] G06K *19/06*

U.S. Cl. 235—494 **17 Claims**



15. An identification insert for incorporation into an object, comprising

a plurality of concentric spherical elements, adjacent ones of said spherical elements being coupled to one another to form the insert, said spherical elements being made from materials having different transparencies, the transparency of said materials of said spherical elements increasing from an innermost one of said spherical elements to an outermost one of said spherical elements.

5,464,974

DYNAMICALLY VARIABLE MACHINE READABLE BINARY CODE AND METHOD FOR READING AND PRODUCING THEREOF

Dennis G. Priddy, Safety Harbor, and Robert S. Cymbalski, Clearwater, both of Fla., assignors to International Data Matrix, Inc., Clearwater, Fla.

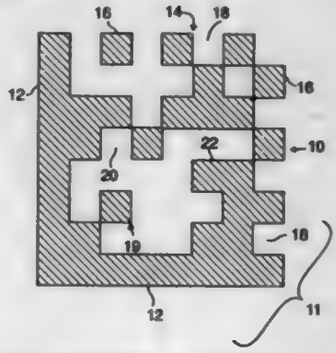
Continuation of Ser. No. 907,769, Jun. 30, 1992, Pat. No. 5,329,107, which is a continuation of Ser. No. 627,080, Dec. 13, 1990, Pat. No. 5,126,542, which is a continuation of Ser. No. 513,362, Apr. 24, 1990, Pat. No. 5,033,609, which is a continuation of Ser. No. 190,205, May 5, 1988, Pat. No. 4,939,354.

This application Jun. 23, 1994, Ser. No. 264,642

The portion of the term of this patent subsequent to Jun. 30, 2009, has been disclaimed.

Int. Cl.[6] G06K *19/06;7/10*

U.S. Cl. 235—494 **27 Claims**



1. A method for determining the location and orientation of a machine optically readable code formed of a plurality of data elements, the code having an identifiable perimeter, comprising the steps of:

scanning an image including said code;

converting said scanned image into a digitized image; and

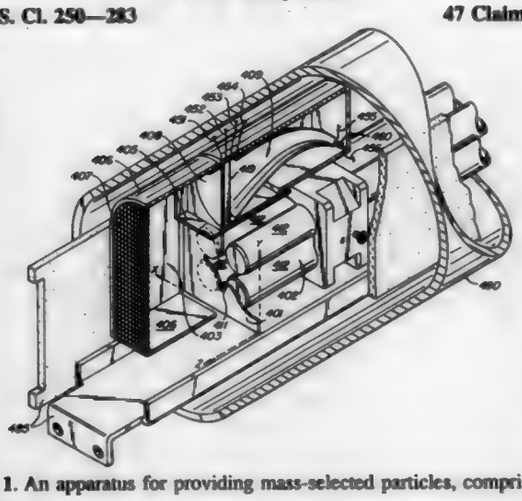
conducting a binary search of said digitized image to locate said identifiable perimeter and calculating the position of each data element cell relative to said identifiable perimeter.

5,464,975

METHOD AND APPARATUS FOR CHARGED PARTICLE COLLECTION, CONVERSION, FRAGMENTATION OR DETECTION

Nicholas J. Kirchner, 250 Del Medio Ave., Ste. 201, Mountain View, Calif. 94040, and Michael Weber-Grafnu, 808 Pear Ave., Sunnyvale, Calif. 94087

Filed Dec. 14, 1993, Ser. No. 167,716
Int. Cl.[6] H01J 49/26
U.S. Cl. 250—283 47 Claims



1. An apparatus for providing mass-selected particles, comprising:

mass filter means adapted to receive a flux of particles at an entry and to emit a mass-selected subset of said received flux of particles at an exit; and

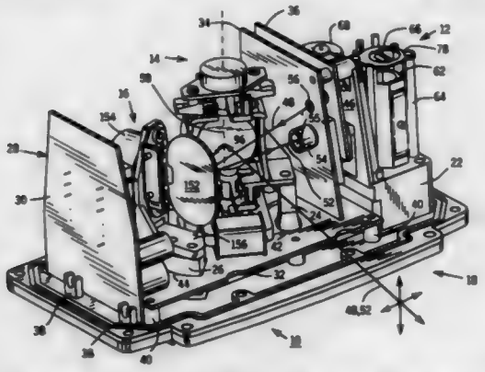
electric field means for deflecting at least some of said mass-selected subset of particles thus emitted across a substantially open spatial region through substantially 180 degrees of arc.

5,464,976

BAR CODE READER HAVING DUAL MIRROR OSCILLATING ASSEMBLY WITH DIFFERENT ORIENTATION OF OSCILLATION

Robert E. Scofield, Pewaukee, and Richard D. Bechtel, Dousman, both of Wis., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Sep. 26, 1994, Ser. No. 312,264
Int. Cl.[6] H01J 3/14
U.S. Cl. 250—234 20 Claims



1. An optical code reader for reading codes having varying slopes of orientation, the reader comprising:

a light source configured to produce a light beam;

a first mirror oscillating assembly including a first mirror defining the light path of the light beam and configured to oscillate the first mirror cyclically about a first axis for the first half of the cycles at a first velocity and the second half of the cycles at a second velocity different from the first velocity, the oscillating assembly controlling the first and second velocities based upon control signals;

a second mirror oscillating assembly including a second mirror further defining the light path and configured to oscillate the second mirror between maximum positive and negative angles of rotation about a second axis skewed from the first axis; and

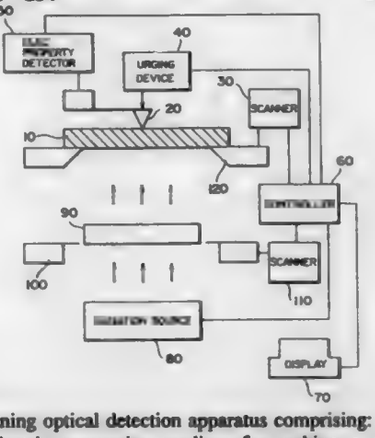
a control circuit coupled to the first and second mirror oscillating assemblies, and configured to apply control signals to the first mirror oscillating assembly which produce the first velocity when the second mirror rotates from the maximum positive angle to the maximum negative angle and apply control signals to the first mirror oscillating assembly which produce the second velocity when the second mirror rotates from the maximum negative angle to the maximum positive angle.

5,464,977

SCANNING OPTICAL DETECTION APPARATUS AND METHOD, AND PHOTOELECTRIC CONVERSION MEDIUM APPLIED THERETO

Nobuyuki Nakagiri; Hiroyuki Kondo, both of Tsukuba, and Yoshihiko Suzuki, Funabashi, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 159,995, Nov. 30, 1993, abandoned.
This application Dec. 20, 1994, Ser. No. 359,473
Claims priority, application Japan, Mar. 10, 1993, 5-049274; Jun. 17, 1993, 5-146311; Jun. 30, 1993, 5-160902
Int. Cl.[6] H04N 5/30
U.S. Cl. 250—234 13 Claims



1. A scanning optical detection apparatus comprising:

a photoelectric conversion medium for making a change in electric property according to incidence of a light image in a wavelength range of from the infrared region to the gamma-ray region;

a probe arranged in contact with said photoelectric conversion medium;

scanning means for relatively scanning said probe relative to said photoelectric conversion medium;

urging means for urging said probe against said photoelectric conversion medium by a predetermined urging force so as to permit slide-contact therebetween;

detecting means for detecting through said probe said change in electric property made in said photoelectric conversion medium; and

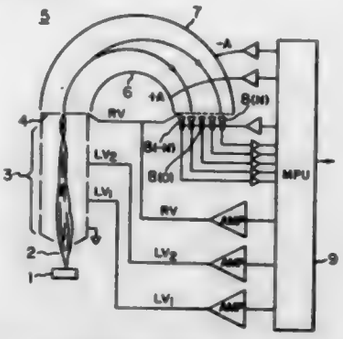
information processing means for forming distribution information corresponding to said light image by making a correspondence between said change in electric property detected by said detecting means and a relative scan position between said probe and said photoelectric conversion medium.

5,464,978

METHOD AND APPARATUS FOR ELECTRON ENERGY ANALYSIS

Masato Kudo; Tetsu Sekine, and Koji Murakami, all of Tokyo, Japan, assignors to JEOL Ltd., Tokyo, Japan

Filed Aug. 26, 1994, Ser. No. 296,521
Claims priority, application Japan, Sep. 23, 1993, 6-219989
Int. Cl.[6] H01J 37/05
U.S. Cl. 250—305 **4 Claims**



1. An electron energy spectrometer comprising:

an electron energy analyzer equipped with a plurality of detector devices including a reference detector device;

a sweeping means for energy-sweeping said energy analyzer stepwise so that energy of electrons impinging on said reference detector device is varied from an initial value in equal increments;

a means for performing interpolation calculations, using output signals obtained from said detector devices in each step in a sweep, to find intensities of the output signals corresponding to various values of said energy which is varied in equal increments; and

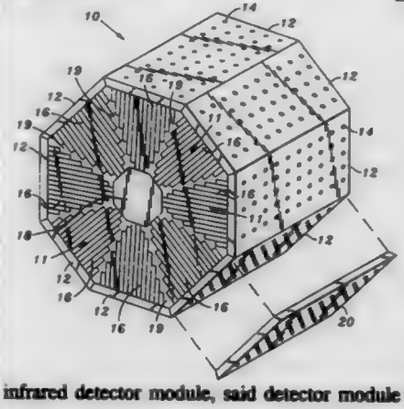
a means for summing up intensities of the output signals at each of the various energy values for obtaining spectral information, said intensities of the output signals being found by said interpolation calculations.

5,464,979

SURROUND VIEW DETECTOR FOCAL PLANE

Wei H. Koh, Irvine, Calif., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jun. 6, 1994, Ser. No. 254,134
Int. Cl.[6] G01S 5/16
U.S. Cl. 250—332 **21 Claims**



1. An infrared detector module, said detector module comprising:

a) a plurality of infrared detector arrays configured to view in a corresponding plurality of different directions, each of said infrared detector arrays having a plurality of infrared detector elements formed thereon; and

b) at least one conductive conduit supporting layer having a plurality of conductive conduits formed thereon, said conductive conduit supporting layers extending inwardly from each of said infrared detector arrays;

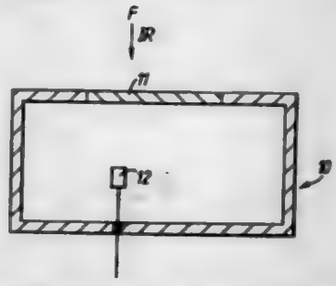
c) wherein signals representative of outputs of the infrared detector elements are communicated from the infrared detector elements to signal processing circuitry via said conductive conduits.

5,464,980

FLAME SENSORS AND METHODS OF SENSING FLAME

David J. Spring, Slough, United Kingdom, and John D. King, St. Paul, Minn., assignors to Kidde-Graviner Limited, and Detector Electronics (UK) Limited, Derby, England

PCT No. PCT/GB92/01497, § 371 Date Feb. 14, 1994, § 102(e) Date Feb. 14, 1994, PCT Pub. No. WO93/04346, PCT Pub. Date Mar. 4, 1993
PCT Filed Aug. 13, 1992, Ser. No. 193,125
Claims priority, application United Kingdom, Aug. 23, 1991, 9118202
Int. Cl.[6] G01J 5/38
U.S. Cl. 250—338.1 **25 Claims**



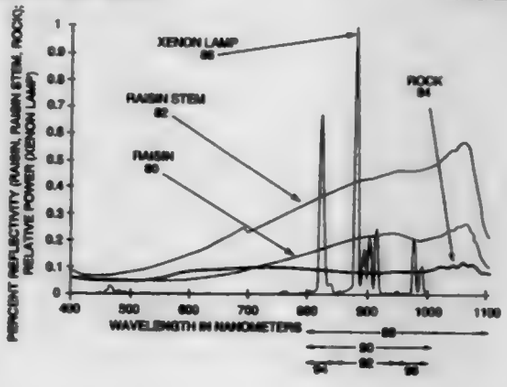
1. A flame sensor comprising a cell having a window transmissive of radiation emitted by a flame and containing gas absorptive of selected radiation in the emission spectrum of the flame, and detection means responsive to direct heating of the gas due to absorption by the gas of the selected radiation, wherein said gas comprises a mixture of radiation-absorptive gas including at least one isotope of carbon dioxide selected from $^{13}C^{16}O_2$ and $^{13}C^{18}O_2$.

5,464,981

METHODS OF SEPARATING SELECTED ITEMS FROM A MIXTURE INCLUDING RAISINS AND THE SELECTED ITEMS

Henry P. Squyres, Medford, and Duncan B. Campbell, Central Point, both of Oreg., assignors to Simco/Ramic Corporation, Medford, Oreg.

Continuation of Ser. No. 237,736, May 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 63,401, May 17, 1993. This application Feb. 10, 1995, Ser. No. 386,329
Int. Cl.[6] B07C 5/342
U.S. Cl. 250—341.8 **27 Claims**



1. A method of operating an automated optical inspection system to separate selected items from a mixture including raisins and the selected items, comprising:

illuminating the mixture with illumination characterized by a spectral power distribution including a high intensity of power at wavelengths in the near infrared;

detecting reflections of wavelengths of the illumination in the near infrared from the mixture;

identifying the selected items in the mixture based on the detected reflections; and

separating the selected items from the mixture with use of the identification.

5,464,982

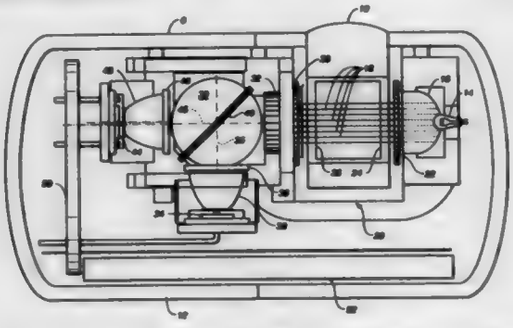
RESPIRATORY GAS ANALYZER

Steven Drucker, Oakland; Alexey Goder, El Cerrito; Davood Khalili, Santa Clara; Kevin Williams, Pinole; Ken Christensen, Livermore, and Emery Major, Point Richmond, all of Calif., assignors to Andros Incorporated, Berkeley, Calif.

Filed Mar. 21, 1994, Ser. No. 215,481

Int. Cl.[6] G01N *21/61;21/35*

U.S. Cl. 250—343 16 Claims



1. An apparatus for determining the concentration of a selected gas in a mixture of gases containing the selected gas and providing an electrical signal representative thereof, comprising:

a housing;

a sample cell supported in said housing for containing the gas mixture;

source means mounted in said housing for emitting infrared radiation;

measuring detector means for detecting infrared radiation passing through said sample cell at the characteristic absorption wavelength of the selected gas and providing an output signal representative thereof;

reference detector means for detecting infrared radiation passing through said sample cell at a wavelength other than that of said characteristic absorption wavelength of the selected gas and providing an output signal representative thereof;

lenseless optical means mounted in said housing for directing said radiation into a beam traveling down a beam path through said sample cell, said optical means comprising a reflector for forming a substantially collimated beam directed through said sample cell and further comprising dichroic beam splitting means for directing a portion of said collimated beam having a bandwidth including said characteristic absorption wavelength to said measuring detector means and for directing a portion of said collimated beam having a bandwidth not including said characteristic absorption wavelength to said reference detector means, said optical means further comprising first and second collector means positioned, respectively, adjacent to each of said measuring detector means and said reference detector means for reflectively focusing said respective beam portions thereon;

filter means associated with said measuring detector means for further limiting energy passing therethrough to said bandwidth including said characteristic absorption wavelength; and

filter means associated with said reference detector means for further limiting energy passing therethrough to said bandwidth not including said characteristic absorption wavelengths.

5,464,983

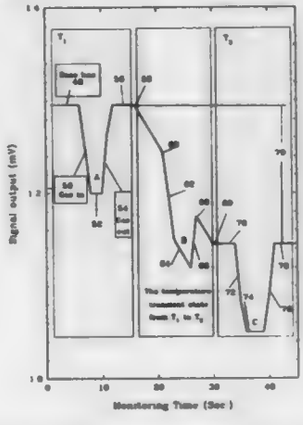
METHOD AND APPARATUS FOR DETERMINING THE CONCENTRATION OF A GAS

Annie Q. Wang, Pittsburgh, Pa., assignor to Industrial Scientific Corporation, Oakdale, Pa.

Filed Apr. 5, 1994, Ser. No. 222,825

Int. Cl.[6] G01N *21/59*

U.S. Cl. 250—343 16 Claims



1. A method for determining the concentration of a known type gas present in a gas sample mixture comprising:

(a) providing light through a chamber;

(b) introducing the gas sample mixture into the chamber;

(c) detecting light in the chamber and producing an electric output signal which is a function of the amount of light detected;

(d) measuring the output signal for three sequential instantaneous periods of time t_1, t_2, t_3;

(e) determining the relative difference between the output signals at t_1 and the output signal at t_2 which gives a change of output signal value CS_1;

(f) determining the relative difference between the output signal at t_2 and the output signal at t_3 which gives a change of output signal value CS_2;

(g) determining the relative difference between the change of output signal value CS_1 and the change of output signal value CS_2 which gives a change of the change of the output signal value CCS_1;

(h) repeating the method steps of (d) through (g) to develop a plurality of CCS data which generates a pattern; and

(i) comparing the CCS data of step (h) to corresponding CCS data for the known type of gas at a range of known concentrations and at a range of known temperatures to determine the concentration of the known type gas in the sample mixture contained in the chamber.

5,464,984

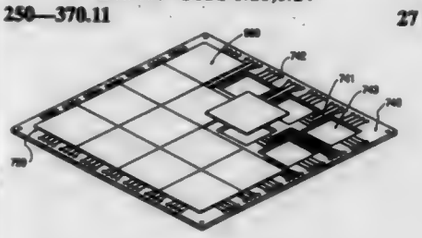
X-RAY IMAGING SYSTEM AND SOLID STATE DETECTOR THEREFOR

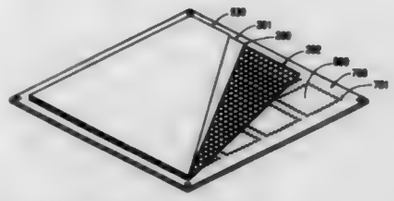
John D. Cox, Gainesville, and Donald W. Williams, High Springs, both of Fla., assignors to General Imaging Corporation, Alachua, Fla.

Continuation-in-part of Ser. No. 35,344, Mar. 18, 1993, Pat. No. 5,381,013, which is a continuation-in-part of Ser. No. 750,273, Aug. 27, 1991, Pat. No. 5,220,170, which is a continuation-in-part of Ser. No. 462,042, Jan. 8, 1990, Pat. No. 5,043,582, which is a continuation-in-part of Ser. No. 151,235, Feb. 1, 1988, Pat. No. 4,985,265, which is a continuation-in-part of Ser. No. 807,650, Dec. 11, 1985, abandoned. This application Jan. 9, 1995, Ser. No. 369,813

Int. Cl.[6] G01T *1/20;1/24*

U.S. Cl. 250—370.11 27 Claims





1. An x-ray imaging sensor, comprising:

a scintillator layer for converting impinging x-rays into visible light;

a plurality of sensor tiles, each of said sensor tiles having an array of sensors for receiving visible light from said scintillator layer and converting said visible light into an electrical signal;

a plurality of substrates for supporting, respectively, said plurality of sensor tiles;

a plurality of processor arrays connected, respectively, to said plurality of substrates for processing signals from said sensor tiles, each of said substrates being larger than the sensor tile to which it is connected and having a periphery which extends beyond the periphery of the sensor tile to which it is connected, and a metallization layer on each of the substrates, said metallization layer providing an electrical connection to said processors; and

a backplane having openings for receiving said processor arrays, said substrates extending beyond said openings to be supported by said backplane, said backplane having a metallization layer for connecting to the metallization layers on the substrates.

5,464,985

NON-LINEAR FIELD REFLECTRON

Timothy J. Cornish, and Robert J. Cotter, both of Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.

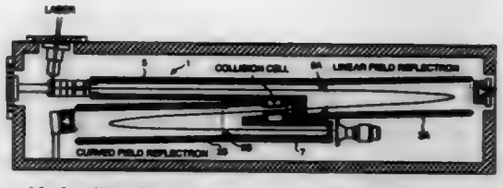
Filed Oct. 1, 1993, Ser. No. 130,530

Int. Cl.[6] H01J *49/40*

U.S. Cl. 250—396 R 18 Claims

1. A reflectron, for use with a mass spectrometer having at least one mass analyzer for receiving ions having various mass to charge ratios, comprising:

a plurality of lens plates, each having an opening therein for allowing said ions to pass therethrough, to which voltages are applied for generating an electric field, increasing non-linearly in a direction away from a first opening in a first lens plate of said plurality of lens plates through which said ions first pass when entering said reflectron, to cause said ions having various mass to charge ratios that enter said reflectron to focus at focus points outside of said reflectron having substantially the same location.



5,464,986

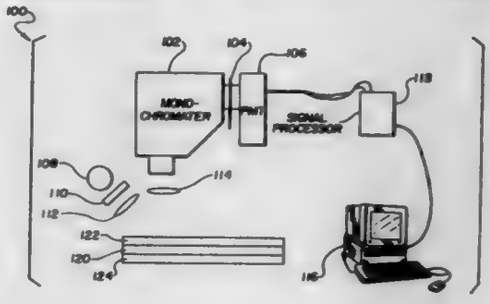
FLUORESCENT SPECTRAL DIFFERENTIAL MEASUREMENT OF A SUBSTRATE COATING

Jeffrey A. Boettcher, Falcon Heights, and Lanny L. Harklau, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 8, 1994, Ser. No. 193,428

Int. Cl.[6] G01N *21/64*

U.S. Cl. 250—459.1 33 Claims



1. A method for measuring a fluorescent emission value of a functional coating of a substrate, comprising the steps of:

providing a functional coating with an effective amount of a fluorescer that absorbs radiant energy in a wavelength range A, emits radiant energy in an emission wavelength range B, and contains within the emission wavelength range B a narrower wavelength range C; the amount of emitted radiant energy changing abruptly from the emission in that part of range B which is just below range C and the emission in range C;

exciting the fluorescer with radiant energy of the wavelength of range A;

detecting the radiant energy emissions of wavelength range B and the included wavelength range C emitted by the functional coating; and

performing a derivative calculation of the detected wavelength range C to obtain a differential change in radiant energy emissions :of the functional coating.

5,464,987

METHOD FOR CONSTRUCTING A CARBON MOLECULE AND STRUCTURES OF CARBON MOLECULES

Sigeo Ihara, Tokorozawa, and Satoshi Itoh, Kodaira, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

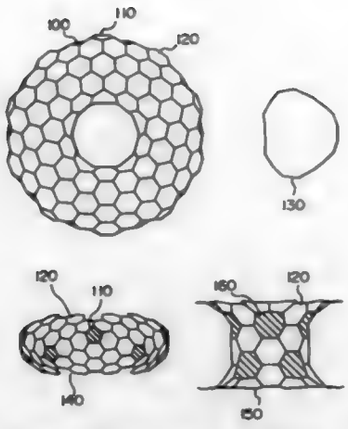
Continuation of Ser. No. 105,039, Aug. 11, 1993, Pat. No. 5,401,975. This application Sep. 2, 1994, Ser. No. 300,350

Claims priority, application Japan, Aug. 20, 1992, 4-221238

Int. Cl.[6] G21G *5/00*

U.S. Cl. 250—492.3 7 Claims

1. A method for constructing a toroidal or helical or any shape of molecule, comprising the steps of:



forming a any shape molecule such that a plurality of n-fold rings each including n atoms are arranged in a torus form, wherein n is a positive integer and other than six, while changing external physical force to be applied to the atoms;

changing the atoms arrangement of said any shape of molecule such that first ones of said n-fold rings arranged on an outer wall or positively curved surface of said any shape of molecule are replaced by first m-fold rings, where m is a positive integer and less than six, each including m atoms; and

changing the atoms arrangement of said any shape of molecule such that second ones of said n-fold rings arranged on an inner wall or negatively curved surface of said any shape of molecule are replaced by second m-fold rings each including m atoms and k-fold rings each including k atoms, wherein k is an integer and greater than six, said second n-fold rings being apart from each other,

wherein each of said first and second m-fold rings and said k-fold rings is surrounded by said n-fold rings.

5,464,988

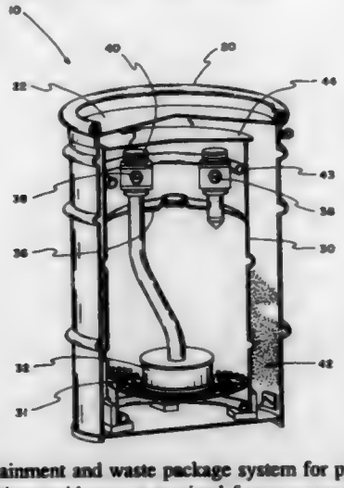
TRITIUM WASTE PACKAGE

Rich Rossmeisler, Cranbury; Lloyd Ciebiera, Titusville; Francis J. Tulipano, Teaneck; Sylvester Vinson, Ewing, and R. Thomas Walters, Lawrenceville, all of N.J., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Nov. 23, 1994, Ser. No. 347,134

Int. Cl.[6] G21F *9/30;5/00*

U.S. Cl. 250—507.1 **7 Claims**



1. A containment and waste package system for processing and shipping tritium oxide waste received from a process gas stream comprising:

a) an outer drum having a removable top and a void space;

b) an inner drum seated within a portion of the void space of the outer drum, and containing a disposable molecular sieve bed (DMSB),

c) the DMSB having

i) an inlet diffuser assembly,

ii) an outlet diffuser assembly, and

iii) a hydrogen catalytic recombiner;

iv) inlet and outlet valves;

d) a cushioning and heat-absorbing material in all void spaces between the outer and inner drums, whereby the DMSB absorbs tritium oxide from the process gas and converts it to a solid form so that the tritium is contained during shipment to a disposal site.

5,464,989

MASK ROM USING TUNNEL CURRENT DETECTION TO STORE DATA AND A METHOD OF MANUFACTURING THEREOF

Shinichi Mori; Osamu Ueda, and Masayuki Yamashita, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

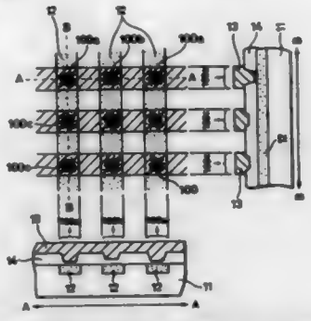
Continuation of Ser. No. 832,451, Feb. 7, 1992, abandoned.

This application May 17, 1994, Ser. No. 245,305

Claims priority, application Japan, Feb. 19, 1991, 3-024733; Apr. 17, 1991, 3-085486

Int. Cl.[6] H01L *49/02*

U.S. Cl. 257—30 **3 Claims**



1. A mask ROM having a plurality of memory cells, comprising:

a semiconductor substrate having a main surface;

a plurality of parallel first signal lines extending in a column direction on said main surface of said semiconductor substrate,

a plurality of parallel second signal lines extending in a row direction on said main surface of said semiconductor substrate, crossing said plurality of first signal lines at a plurality of crossovers each forming a respective memory cell of said plurality of memory cells;

an insulation film formed between said plurality of first signal lines and said plurality of second signal lines; and selecting means for selecting one of said plurality of first signal lines and one of sad plurality of second signal lines and causing electric field between the selected first signal line and the selected second signal line by applying potential difference between the selected first signal line and the selected second signal line, said insulation film having, at each of said plurality of crossovers for storing data, one of

i. a first thickness necessary for keeping an insulating state between the selected first signal line and the selected second signal line even if an electric field is received between the first signal line selected by the selecting means and the second signal line selected by the selecting means.,

ii. a second thickness for causing a first tunnel current to flow between the selected first signal line and the selected second signal line when the electric field is received between the first signal line and the second signal line selected by the selecting means, and

iii. a third thickness for causing a second tunnel current to flow between the selected first signal line and the selected

second signal line when the electric field is received between the first signal line and the second signal line selected by the selecting means.

5,464,990

VOLTAGE NON-LINEAR DEVICE AND LIQUID CRYSTAL DISPLAY DEVICE INCORPORATING SAME

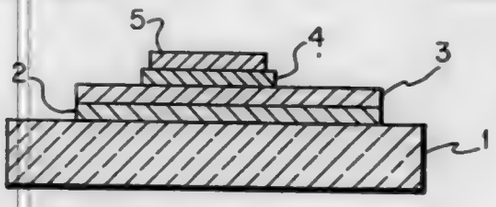
Yoshiyuki Shiratsuki; Yoshinori Yamaguchi; Kazuhiro Hayashi, and Takahiro Niitsu, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 24, 1993, Ser. No. 126,225

Claims priority, application Japan, Sep. 25, 1992, 4-256340

Int. Cl.[6] H01L *27/02; G02F 1/13*

U.S. Cl. 257—40 13 Claims



1. A voltage non-linear device comprising:

an insulating substrate,

a bottom electrode film formed on the insulating substrate,

a voltage non-linear film formed on the bottom electrode film, and

a top electrode film formed on the voltage non-linear film,

wherein said bottom electrode film, said voltage non-linear film and said top electrode film are made of at least one of a metal and a metal oxide formed by applying a metallo-organic paste and sintering the thus applied paste, and

wherein said bottom electrode film has a double-layered structure comprising an upper layer and a lower layer, the upper layer being formed of material which depresses formation of projections on a surface facing the voltage non-linear film during formation of the bottom electrode film.

5,464,991

NONLINEAR OPTICAL MATERIALS AND THEIR MANUFACTURING METHOD

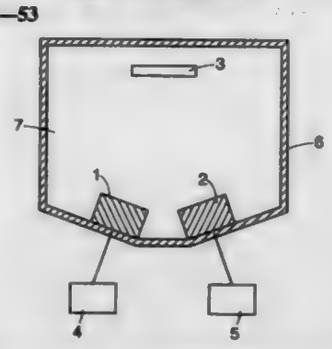
Yoshio Manabe; Ichiro Tanahashi, and Tsuneo Mitsuyu, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 685,277, Apr. 12, 1991, abandoned. This application Oct. 31, 1994, Ser. No. 332,469

Claims priority, application Japan, Apr. 13, 1990, 2-97973

Int. Cl.[6] H01L *29/04*

U.S. Cl. 257—53 8 Claims



1. A non-linear optical device comprising a transparent substrate and a thin film formed thereon, said thin film having (1) an amorphous layer selected from the group consisting of nitrides and carbides; and (2) semiconductor crystallites having a size less than about 10 nanometers dispersed within said amorphous layer wherein said semiconductor crystallites are about 20 weight percent of said thin film, said device exhibiting non-linear optical properties.

5,464,992

INSULATED GATE BIPOLAR TRANSISTOR PROVIDED WITH A MINORITY CARRIER EXTRACTING LAYER

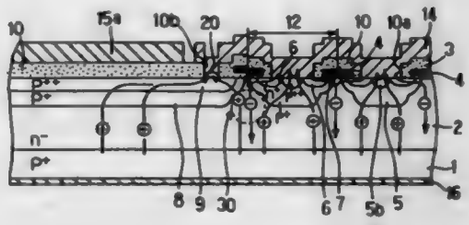
Naoto Okabe, Chita; Tsuyoshi Yamamoto, and Naohito Kato, both of Kariya, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 276,486, Jul. 18, 1994, abandoned, which is a continuation of Ser. No. 937,161, Aug. 31, 1992, abandoned, which is a division of Ser. No. 710,721, Jun. 7, 1991, Pat. No. 5,169,793. This application Dec. 19, 1994, Ser. No. 358,983

Claims priority, application Japan, Jun. 8, 1990, 2-151353; May 31, 1991, 3-129382

Int. Cl.[6] H01L *29/78;33/00;27/01*

U.S. Cl. 257—139 10 Claims



1. An insulated gate bipolar transistor comprising:

a semiconductor substrate of a first conductivity type;

a semiconductor layer of a second conductivity type located on said substrate, said semiconductor layer having a first region and a second region which shares a border with said first region;

base layers of said first conductivity type located over a surface of said first region of said semiconductor layer;

a well layer of said first conductivity type located over a surface of said second region of said semiconductor layer, said well layer having a junction depth equal to that of said base layers;

source layers of said second conductivity type located in each base layer, each base layer constituting a portion of a respective unit cell region, a junction of each source layer within a corresponding base layer terminating at a surface thereof and at a distance from a junction between said corresponding base layer and the semiconductor layer;

a gate electrode located in said first region such that said gate electrode overlaps at least a channel region with a gate insulating film interposed therebetween, said channel region being formed at a distance away from a surface of said base layer located between said semiconductor layer and said source layer, said gate electrode also being located over a portion of said second region adjacent said border between said first region and said second region such that said gate electrode overlaps only said portion of said well layer adjacent said border;

a source electrode having a first contact portion connected to said corresponding base layer and corresponding source layer in each of said unit cell regions, and a second contact portion connected to a contact region of said well layer; and

a minority carrier extracting layer of said first conductivity type located at a surface of said well layer, said minority carrier extracting layer overlapping virtually an entire area of said well layer and including said second contact portion, said minority carrier extracting layer having an impurity concentration higher than said well layer so as to permit a flowing out of minority carriers, which have flowed from said semiconductor substrate into said second region of said semiconductor layer, into said source electrode.

5,464,993

MONOLITHIC INTEGRATED BRIDGE TRANSISTOR CIRCUIT AND CORRESPONDING MANUFACTURING PROCESS

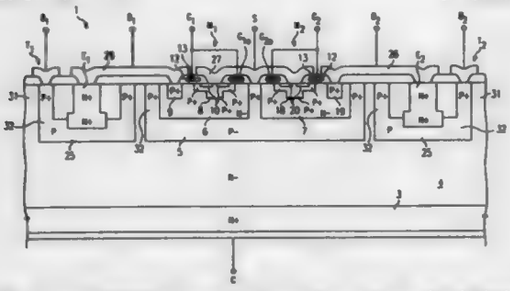
Raffaele Zambrano, San Giovanni La Punta, and Sergio Palara, Aci Castello, both of, Italy, assignors to Consorzio per la Ricerca sulla Microelectronica nel Mezzogiorno, Catania, Italy

Filed Sep. 20, 1993, Ser. No. 124,245

Claims priority, application European Pat. Off., Sep. 18, 1992, 92830506

Int. Cl.[6] H01L *29/10*

U.S. Cl. 257—140 **27 Claims**



12. A monolithically integrated, transistor bridge circuit, being of a suitable type for power applications, comprising:

at least one transistor pair of an insulated-gate-bipolar type;

at least one pair of bipolar junction transistors, integrated with said insulated-gate-bipolar transistor pair;

wherein said insulated-gate-bipolar transistor pair are formed within an isolation well accommodating respective epitaxial region portions wherein respective drain and source active regions of each said insulated-gate-bipolar transistor are formed.

5,464,994

INSULATED-GATE THYRISTOR

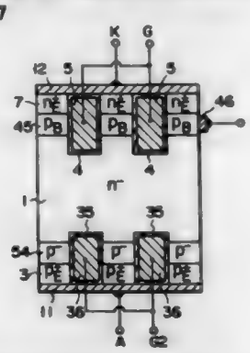
Tukashi Shinohe, Yokohama; Kazuya Nakayama, Sagamihara; Minami Takeuchi, Tokyo; Masakazu Yamaguchi, Tokyo; Mitsuhiko Kitagawa, Tokyo; Ichiro Omura, Kawasaki, and Akio Nakagawa, Hiratsuka, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 760,344, Sep. 16, 1991, Pat. No. 5,381,026. This application Aug. 16, 1994, Ser. No. 291,754

Claims priority, application Japan, Sep. 17, 1990, 2-243956; Sep. 17, 1990, 2-243957; Sep. 17, 1990, 2-243958; Sep. 28, 1990, 2-259063; Feb. 4, 1991, 3-13593; Apr. 16, 1991, 3-109602; Jun. 14, 1991, 3-143449; Jul. 31, 1991, 3-213226

Int. Cl.[6] H01L *29/74;29/743*

U.S. Cl. 257—147 **11 Claims**



1. An insulated-gate thyristor comprising:

a base layer of a first conductivity type, having first and second major surfaces;

a first emitter region of the first conductivity type, formed in the first major surface of said base layer;

at least a pair of first grooves extending through said first emitter region into said base layer, and opposing each other and spaced apart by a predetermined distance;

first insulated gate electrodes formed in said first grooves;

a channel layer of the second conductivity type, formed in the second major surface of said base layer;

a second emitter region of a second conductivity type, formed on said channel layer;

at least a pair of second grooves extending through said second emitter region and said channel layer into said base layer, and opposing each other and spaced apart by a predetermined distance; and

second insulated gate electrodes formed in said second grooves.

5,464,995

HETEROSTRUCTURE FIELD EFFECT TRANSISTOR INCLUDING A PULSE DOPED CHANNEL

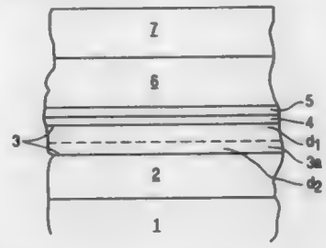
Jürgen Dickmann, Ulm-Einsingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Continuation of Ser. No. 915,580, Jul. 20, 1992, abandoned. This application Jun. 8, 1994, Ser. No. 257,448

Claims priority, application Germany, Jul. 19, 1991, 41 23 939.3

Int. Cl.[6] H01L *29/784;29/812;29/80*

U.S. Cl. 257—192 **20 Claims**



1. A heterostructure field effect transistor having active transistor layers comprising: a heterojunction and a current carrying channel layer composed of a semiconductor material having a high charge carrier mobility, the improvement wherein:

a side of the channel layer opposite the heterojunction is doped only in a narrow region within the channel so that the doped narrow region is asymmetrically disposed in the channel layer; and

the doped narrow region extends along and in direct contact with the entire layer edge of the channel layer opposite the heterojunction.

5,464,996

PROCESS TRACKING BIAS GENERATOR FOR ADVANCED LATERAL OVERFLOW ANTIBLOOMING DRAIN

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 29, 1994, Ser. No. 297,332

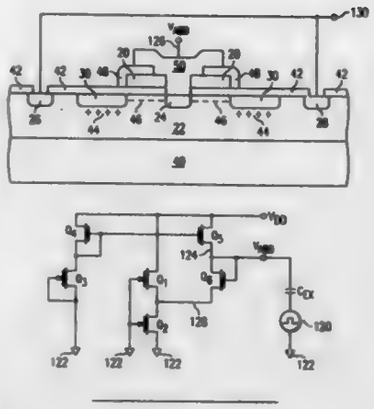
Int. Cl.[6] H01L *29/78;27/14;31/00*

U.S. Cl. 257—230 **5 Claims**

1. A process tracking bias generator for antiblooming structures comprising:

a lateral overflow antiblooming drain; and

bias circuitry coupled to the antiblooming drain for automatically adjusting a bias for the antiblooming drain independent of process variations.

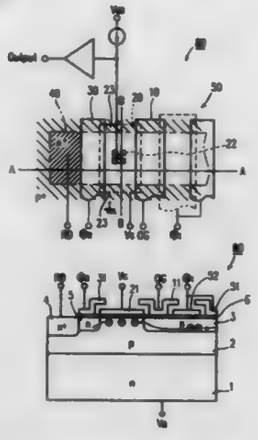


5,464,997

CHARGE DETECTION DEVICE, A METHOD FOR PRODUCING THE SAME, AND A CHARGE TRANSFER AND DETECTION APPARATUS INCLUDING SUCH A CHARGE DETECTION DEVICE

Takashi Watanabe, Kyoto, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Aug. 2, 1994, Ser. No. 284,928
Claims priority, application Japan, Apr. 1, 1994, 6-065203
Int. Cl.[6] H01L *29/796*; G11C *19/28*
U.S. Cl. 257—239 13 Claims



1. A charge detection device for converting a signal charge, consisting of carriers of a first polarity, externally provided, into a voltage signal, the charge detection device comprising a MOS transistor, the MOS transistor including:

a semiconductor substrate of a first conductivity type;

a first semiconductor layer having a transistor channel for carriers of a second polarity, the first semiconductor layer being formed in the semiconductor substrate and having a second conductivity type, the carriers of the second polarity being majority carriers of the first semiconductor layer;

an insulating layer provided on the first semiconductor layer; and

a gate electrode provided on the insulating layer,

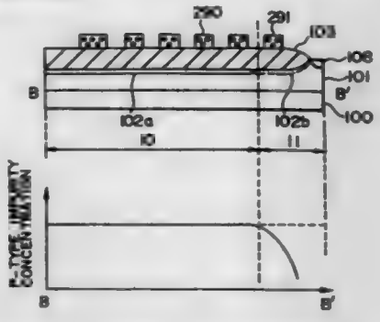
wherein transistor characteristics of the MOS transistor are changed by the signal charge accumulated in a surface region of the first semiconductor layer immediately below an interface between the first semiconductor layer and the insulating layer, said charge detection device thereby detecting a quantity of the signal charge.

5,464,998

NON-VOLATILE SEMICONDUCTOR MEMORY NAND STRUCTURE WITH DIFFERENTLY DOPED CHANNEL STOPPERS

Toshiyuki Hayakawa, Yokohama, and Ryeuhei Kirisawa, Kitakami, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Mar. 31, 1994, Ser. No. 220,590
Claims priority, application Japan, Apr. 1, 1993, 5-074886
Int. Cl.[6] H01L *29/68*
U.S. Cl. 257—316 3 Claims



1. A semiconductor memory device comprising:

a plurality of NAND type memory cells arranged in a matrix pattern over a semiconductor substrate; and

a plurality of channel stopper layers, provided on the semiconductor substrate, for separating adjacent NAND type memory cells,

each of the NAND type memory cells including;

a plurality of memory cell transistors having drains and sources mutually connected in series,

a source side select transistor connected to a source of one end transistor of the memory cell transistors, and

a drain side select transistor connected to a drain of the other end transistor of the memory cell transistors,

each of the channel stopper layers having a first channel stopper layer portion for separating the source side select transistors and a second channel stopper layer portion for separating the memory cell transistors,

wherein, a first impurity concentration of the first channel stopper layer portion is lower than a second impurity concentration of the second channel stopper layer portion.

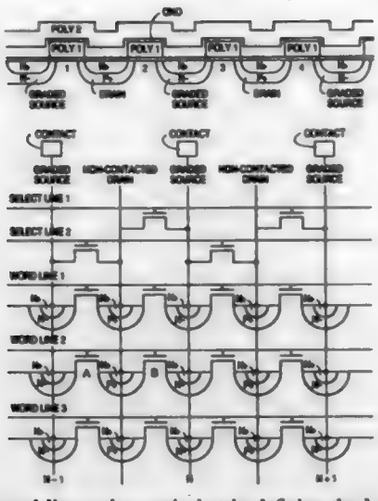
5,464,999

METHOD FOR PROGRAMMING AN ALTERNATE METAL/SOURCE VIRTUAL GROUND FLASH EPROM CELL ARRAY

Albert Bergemont, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 830,938, Feb. 4, 1992, Pat. No. 5,346,842.
This application Apr. 20, 1994, Ser. No. 230,545
Int. Cl.[6] H01L *29/68*;*29/78*
U.S. Cl. 257—322 1 Claim

1. A method of flash erasing programmed cross-point flash EPROM cells in an alternate source virtual ground flash EPROM array formed in a silicon substrate of P-type conductivity, wherein the flash EPROM array includes a layer of first insulating material formed on the silicon substrate, a plurality of spaced-apart, parallel vertical strips of second insulating material and underlying first conductive material formed on the first insulating material, a plurality of buried N+ bit lines formed in the surface of the semiconductor substrate between areas of the semiconductor substrate directly beneath the vertical strips, alternate buried N+ bit lines having additional N-type dopant introduced thereto to define graded N+/N− source lines that alternate with buried N+ drain lines, a plurality of spaced-apart parallel word lines of second conductive material formed perpendicular to the vertical strips such that the second conductive material is separated from the first conductive material by the second insulating material, the intersec-



tion of a word line and a vertical strip defining the location of a cross-point flash EPROM cell, the flash EPROM array further including, for each buried N+ drain line in the array, a first MOS select transistor connected between said buried N+ drain line and a first adjacent graded N+/N– source line, a first select line connected to a gate of the first MOS select transistor, and a second MOS select transistor connected between said buried N+ drain line and second adjacent N+/N– graded source line, a second select line connected to a gate of the second MOS select transistor, the flash erasing method comprising:

applying an erase voltage level to each of the graded source lines; and

holding both the first select line and the second select line at a low voltage level.

5,465,000

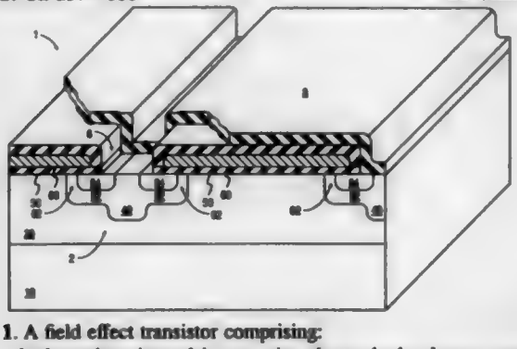
THRESHOLD ADJUSTMENT IN VERTICAL DMOS DEVICES

Richard K. Williams, Cupertino, Calif., assignor to Siliconix incorporated, Santa Clara, Calif.

Division of Ser. No. 854,162, Mar. 20, 1992, Pat. No. 5,248,627. This application May 14, 1993, Ser. No. 62,370

Int. Cl.[6] H01L *29/10;29/78*

U.S. Cl. 257—335 **21 Claims**



1. A field effect transistor comprising:

a body region situated in a semiconductor body along a major surface thereof, a first PN junction being formed between the semiconductor body and the body region;

a source situated in the body region along said surface, a second PN junction spaced apart from the first PN junction being formed between the body region and the source;

a drain situated in the semiconductor body along said surface and extending to meet the body region; and

a gate comprising a conductive gate layer disposed over said surface and electrically insulated from the semiconductor body, the conductive gate layer lying over at least part of the body region between the first and second PN junctions to electrostatically control conduction in a threshold adjusted channel of the body region at a specified operational condition of the transistor, a threshold adjust dopant being vertically localized generally in the channel, the threshold adjust dopant also being present in the semiconductor body laterally outside the body region, the threshold adjust dopant having a peak concentration whose depth into the semiconductor body below said surface is nonuniform laterally along said surface.

5,465,001

ELECTRONIC COMPONENT CAPABLE OF NEGATIVE DYNAMIC RESISTANCE

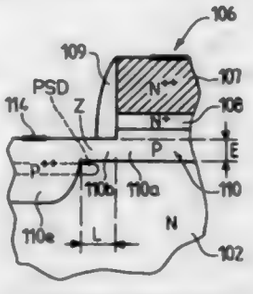
Tomasz Skotnicki, Maylan, and Gérard Merckel, Montbonnot, both of, France, assignors to France Telecom, Paris, France

Filed Jan. 7, 1994, Ser. No. 178,574

Claims priority, application France, Jan. 12, 1993, 93 00197

Int. Cl.[6] H01L *29/70;29/73*

U.S. Cl. 257—370 **20 Claims**



1. An electronic semiconductor component comprising:

a semiconductor substrate;

a first active region in the substrate having a first conductivity;

a projecting region on an upper face of the substrate, the projecting region comprising a third active region having the first conductivity;

a second active region having a second conductivity opposite the first conductivity, the second active region located between the first active region and the upper face of the substrate and comprising:

a first part located under the third active region and

a depletable zone extending from the first part of the second active region between the first active region and the upper face of the substrate;

a depleter for depleting the depletable zone under the action of a selected bias voltage;

first, second and third metallizations respectively in contact with the first active region, the second active region, and a third active region; and

wherein the component is adapted to have a negative dynamic resistance.

5,465,002

INTEGRATED VLSI RADIATION/PARTICLE DETECTOR WITH BIASED PIN DIODES

Walter Snoeys, Santa Clara County, and Sherwood I. Parker, Alameda County, both of Calif., assignors to University of Hawaii, Honolulu, HI.

Continuation of Ser. No. 763,817, Sep. 23, 1991, Pat. No. 5,237,197, which is a continuation of Ser. No. 371,891, Jun. 26, 1989, abandoned. This application Apr. 26, 1993, Ser. No. 52,896

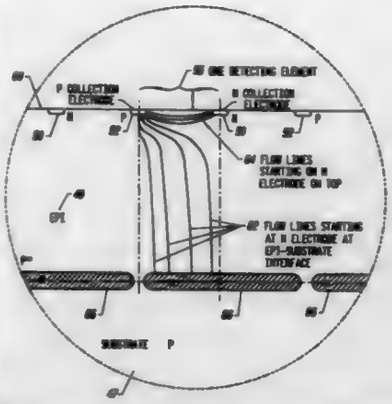
The portion of the term of this patent subsequent to Aug. 17, 2010, has been disclaimed.

Int. Cl.[6] H01L *31/115;31/117*

U.S. Cl. 257—458 **17 Claims**

1. A monolithic device for detecting ionization, comprising:

a charge depletable substrate of high purity first conductivity type silicon having first and second surfaces, and a substrate thickness therebetween;



a plurality of spaced-apart collection electrodes of highly doped first conductivity type material disposed adjacent said first surface;

voltage-biasable doped well regions of second conductivity type material forming a first diode junction region at an interface with said substrate, disposed adjacent said first surface between adjacent said collection electrodes;

a region of highly doped second conductivity type material forming a second diode junction region at an interface with said substrate, disposed adjacent said second surface and underlying said collection electrodes;

wherein voltage differentials coupled between said collection electrodes and said well regions, and coupled between said collection electrodes and said region of highly doped second conductivity type material substantially deplete adjacent regions of said substrate and produce an electric field extending from said first and second diode junction regions into said substrate and then to said collection electrodes;

wherein in the presence of ionization said substrate releases charges, released charges of a first polarity tending to follow force lines resulting from said electric field and be directed to said collection electrodes which then collects said first type charges, and wherein released charges of opposite polarity tend to be directed by said force lines to a said first or second diode junction region.

5,465,003

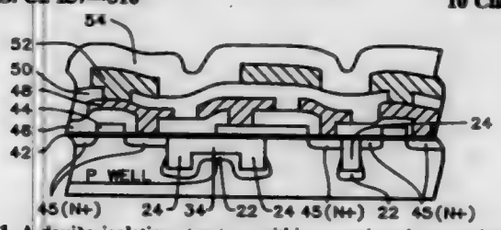
PLANARIZED LOCAL OXIDATION BY TRENCH-AROUND TECHNOLOGY

Water Lur, Taipei; Anna Su, and Neng H. Shen, both of Hsing-Chu, all of, Taiwan, Prov. of China, assignors to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Division of Ser. No. 127,061, Sep. 27, 1993, Pat. No. 5,372,968. This application Dec. 1, 1994, Ser. No. 347,674

Int. Cl.[6] H01L *29/00;23/58*

U.S. Cl. 257—510 **10 Claims**



1. A device isolation structure within a semiconductor substrate comprising:

narrow device isolation regions each consisting of a deep trench; and

wide device isolation regions each consisting of two deep trenches flanking a shallow trench;

wherein the top surface of said narrow and wide device isolation regions and said semiconductor substrate is planarized.

5,465,004

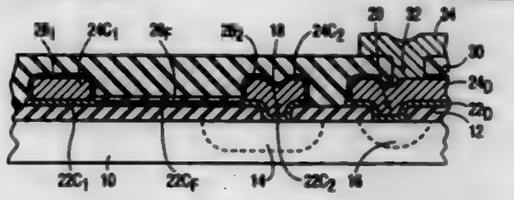
PROGRAMMABLE SEMICONDUCTOR INTEGRATED CIRCUITS HAVING FUSIBLE LINKS

Sheldon C. P. Lim, Sunnyvale; Julie W. Hellstrom, Santa Clara, and Ting P. Yen, Fremont, all of Calif., assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 151,590, Nov. 12, 1993, abandoned, which is a continuation of Ser. No. 654,844, Feb. 11, 1991, abandoned, which is a division of Ser. No. 395,926, Aug. 18, 1989, Pat. No. 5,015,604. This application Mar. 6, 1995, Ser. No. 400,776

Int. Cl.[6] H01L *29/12;27/02*

U.S. Cl. 257—529 **8 Claims**



1. A semiconductor structure having a programmable fuse comprising:

(a) a semiconductor body,

(b) a first dielectric layer disposed on a surface of said semiconductor body, said first dielectric layer having at least one aperture therethrough to said semiconductor body,

(c) a barrier metal pattern disposed on a surface of said first dielectric layer opposite to said surface of said semiconductor body, said barrier metal pattern extending through said at least one aperture to said semiconductor body,

said barrier metal pattern having at least one first portion of one thickness and a second intermediate portion of a second smaller thickness separate from said at least one aperture, said second portion having reduced dimensions in both lateral and thickness directions, and said barrier metal pattern having an oxide form on at least said second portion to reduce said dimensions of said barrier metal pattern at said second portion to provide a high resistance fuse,

(d) a first primary conductive pattern of metal contacting said barrier metal pattern at said at least one aperture,

(e) a second dielectric layer on said surface of said first dielectric layer, said second dielectric layer having at least one opening extending therethrough to approximately a position of said at least one aperture, and

(f) a second primary metal pattern contacting said first primary metal pattern through said at least one opening.

5,465,005

POLYSILICON RESISTOR STRUCTURE INCLUDING POLYSILICON CONTACTS

Robert H. Eklund, Plano; Robert H. Havemann, Garland, both of Tex., and Leo Stroth, Wolfersdorf, Germany, assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 785,360, Oct. 30, 1991, Pat. No. 5,236,857. This application Feb. 8, 1993, Ser. No. 14,890

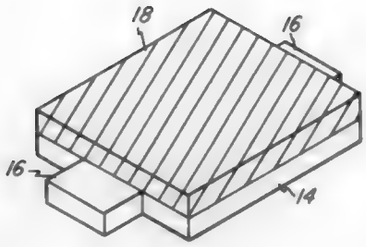
Int. Cl.[6] H01C *8/00*

U.S. Cl. 257—538 **7 Claims**

1. A polysilicon resistor structure comprising:

a polysilicon resistor body doped to a selected level to obtain a selected resistivity, said resistor body doped with both n-type and p-type impurities; and

at least two polysilicon contact portions abutting said resistor body, wherein said resistor body is wider than said contact portions.

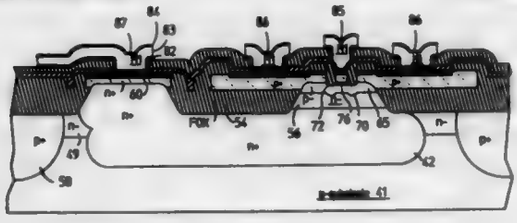


5,465,006

BIPOLAR STRIPE TRANSISTOR STRUCTURE

Yaw-Hwang Chen, Ft. Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 15, 1994, Ser. No. 276,020
Int. Cl.[6] H01L 29/73;29/70;29/40
U.S. Cl. 257—557 13 Claims



1. A transistor comprising:

a substrate having a first surface and a second surface;

an epitaxial layer having a first surface and a second surface, said second surface of said epitaxial layer being adjacent said first surface of said substrate;

a collector in said first surface of said substrate, said collector having a contact region, said collector contact region extending from said collector to said first surface of said epitaxial layer;

a mesa region having a first surface and a second surface, said first surface of said mesa region being coplanar with said first surface of said epitaxial layer, said second surface being adjacent to a channel region of said collector;

a field oxide region surrounding said mesa region, said field oxide region having a first surface and a second surface opposing said first surface, said second surface of said field oxide region being on said collector region, said first surface of said field oxide region being along a side wall of said mesa region, such that said field oxide region neither reaches nor crosses the plane of said first surface of said mesa region;

a base region formed in said mesa region, said base region having a first surface and a second surface, wherein said first surface of said base is coplanar with said first surface of said mesa region and said second surface of said base extends into said mesa region;

an emitter region on said first surface of said base, said emitter being smaller in diameter than said first surface of said base;

emitter isolation walls surrounding said emitter and extending into said first surface of said base, whereby said emitter isolation walls neither reach nor cross the plane of said first surface of said field oxide region; and

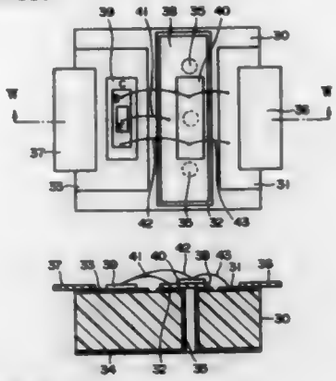
electrical contacts for said collector contact region, said base and said emitter, wherein said electrical contacts permit electrical access to said transistor.

5,465,007

HIGH FREQUENCY TRANSISTOR WITH REDUCED PARASITIC INDUCTANCE

Yasukazu Ikeda; Hideo Matsumoto, and Susumu Sakamoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 940,312, Sep. 3, 1992, abandoned.
This application Jul. 8, 1994, Ser. No. 272,864
Claims priority, application Japan, Sep. 5, 1991, 3-225670
Int. Cl.[6] H01L 23/12;23/50
U.S. Cl. 257—584 3 Claims



1. A semiconductor device comprising:

an electrically insulating substrate having opposed top and bottom surfaces;

first, second, and third metallized electrodes disposed on the top surface of said substrate;

a high frequency transistor having first, second, and third electrodes and mounted on said first metallized electrode, said first electrode of said transistor being electrically connected to said first metallized electrode;

a metal sheet disposed on said second metallized electrode;

a wire connecting said Second electrode to said metal sheet, thereby electrically connecting said second electrode of said transistor to said second metallized electrode via said metal sheet;

a wire connecting said third electrode of said transistor to said third metallized electrode;

a through-hole extending through said substrate and having an inside surface; and

a metallized ground electrode disposed on the bottom surface of said substrate and continuously extending on the inside surface of the through-hole, said metallized ground electrode being electrically connected to said second metallized electrode and said metal sheet covering and closing the through-hole at the top surface of said substrate, the through-hole being open at the bottom surface of said substrate.

5,465,008

CERAMIC MICROELECTRONICS PACKAGE

Martin Goetz; Joseph Babiarz, both of San Diego; Deborah S. Wein, Oceanside; Paul M. Anderson, and Alan W. Lindner, both of San Diego, all of Calif., assignors to Stratedge Corporation, San Diego, Calif.

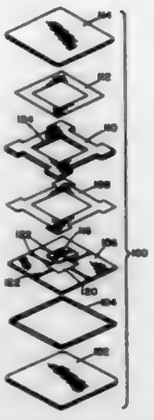
Filed Oct. 8, 1993, Ser. No. 134,269
Int. Cl.[6] H01L 23/92;23/12
U.S. Cl. 257—691 19 Claims

1. A ceramic microelectronic package suitable for high-frequency electronic devices, comprising:

a base having a top and a bottom, at least a portion of each of said top surface and said bottom surface of said base being conductive;

a ceramic circuit substrate having a first cavity and a plurality of conductive patterns deposited on a surface of said ceramic circuit substrate;

first means for attaching said ceramic circuit substrate to said top of said base;



a ceramic seal ring substrate having a second cavity larger than said first cavity;

second means for attaching said ceramic seal ring substrate to said ceramic circuit substrate, said second attaching means being non-conductive;

a ceramic lid attached to said ceramic seal ring substrate; and

third means for attaching said ceramic seal ring to said ceramic lid;

wherein said base acts as a single ground plane and said ceramic lid is electrically isolated from said single ground plane.

5,465,009

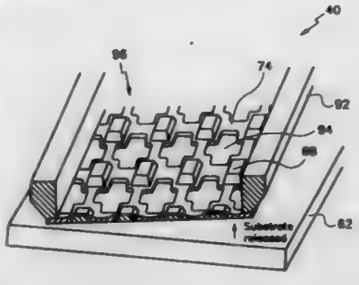
PROCESSES AND APPARATUS FOR LIFT-OFF AND BONDING OF MATERIALS AND DEVICES

Timothy J. Drabik; Kevin P. Martin, both of Atlanta, Ga., and John Callahan, Revere, Mass., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation-in-part of Ser. No. 865,119, Apr. 8, 1992, Pat. No. 5,286,335. This application Feb. 15, 1994, Ser. No. 196,857

Int. Cl.[6] H01L *23/16;39/02*

U.S. Cl. 257—723 **9 Claims**



1. In a carrier layer for lift-off of an array of devices, the carrier layer formed on the array, the array formed on a sacrificial layer, the sacrificial layer formed on a growth substrate, an improvement for facilitating the lift-off of the carrier layer and the array by enhancing etching of the sacrificial layer and for facilitating bonding of the array by permitting more easy alignment with locations on a host substrate, the improvement comprising perforations within said carrier layer situated about the devices of the array.

5,465,010

ELECTRICAL [ARRANGEMENT] DISTRIBUTION SYSTEM FOR VECHICLE

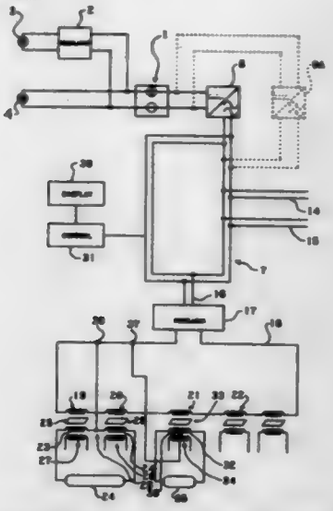
Philip J. Rimmer, London, England, assignor to Timewell Technology Ltd., London, England

Filed May 28, 1993, Ser. No. 68,972

Claims priority, application United Kingdom, Mar. 1, 1993, 9304132

Int. Cl.[6] B60L *1/00*

U.S. Cl. 307—9.1 **20 Claims**



1. An electrical arrangement for use in supplying electrical power to units in a motor vehicle, the arrangement comprising a battery, an inverter to receive power from the battery and to generate a high frequency signal at an intermediate voltage higher than the voltage of the battery, and a distribution network to distribute the high frequency signal to the units in the vehicle, the distribution network including a current regulator for establishing a constant current loop, the constant current loop containing the primary winding of two or more transformers, each transformer for activating and deactivating a unit associated therewith.

5,465,011

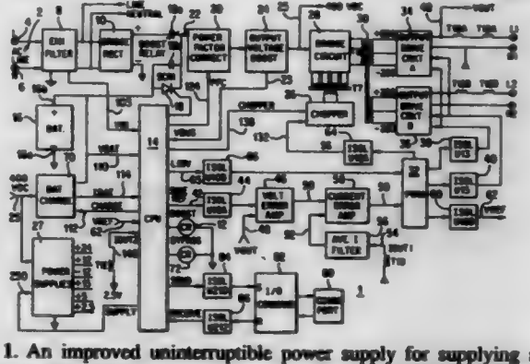
UNINTERRUPTIBLE POWER SUPPLY WITH IMPROVED OUTPUT REGULATION

Frank D. Miller, Moorpark, and Thomas E. Helfrich, Santa Ana, both of Calif., assignors to Square D Company, Palatine, Ill.

Filed Dec. 14, 1992, Ser. No. 990,566

Int. Cl.[6] H02J *7/00;* H02M *7/00*

U.S. Cl. 307—64 **21 Claims**



1. An improved uninterruptible power supply for supplying a load with AC electrical output power from an AC input source when said AC input source is within settable voltage limits, and supplying said load with AC electrical output power from a DC

auxiliary power source when said AC input source is outside said voltage limits, said improved uninterruptible power supply comprising:

A. means for monitoring said AC input source to determine frequency and amplitude of said AC input source;

B. means for converting said AC input source to a first DC voltage;

C. means for transferring between said AC input source and said DC auxiliary power source to select an input source of said AC electrical output power, said input source being said first DC voltage when the amplitude of said AC input source is within said voltage limits and said DC auxiliary power source when the amplitude of said AC input source is outside said voltage limits;

D. means for providing active power factor correction of said AC input source when said AC input source is said input source;

E. means for boosting and regulating said input source to produce a second and higher DC voltage;

F. means for converting said second DC voltage to produce equal and commonly grounded positive and negative DC voltages;

G. means for inverting said positive and negative DC voltages to produce said AC electrical output power;

H. means for generating a signal proportional to an average AC electrical output current of said AC; electrical output power to provide an average current feedback loop to said inverting means;

I. means for regulating said AC electrical output power to a voltage amplitude corresponding to said determined frequency;

J. means for limiting said AC electrical output power to a current level within settable current limits to prevent failure of said inverting means; and

K. means for maintaining a voltage phase relationship between said AC input power and said AC output power during said transferring between said AC input power source and said DC auxiliary power source.

5,465,012

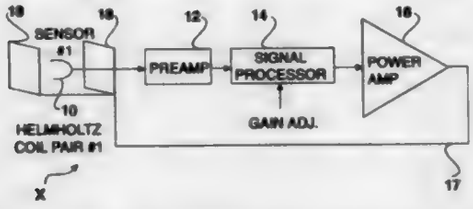
ACTIVE FEEDBACK SYSTEM FOR SUPPRESSION OF ALTERNATING MAGNETIC FIELDS

Curt Dunnam, 5244 Perry City Rd., Trumansburg, N.Y. 14886

Filed Dec. 30, 1992, Ser. No. 998,970

Int. Cl.[6] H04B *15/00*

U.S. Cl. 307—91 **8 Claims**



1. A magnetic field compensation, closed-loop, wideband, negative-feedback system for suppressing alternating magnetic fields in a large volume of space, comprising:

a) sensing means for detecting a predetermined range of simultaneous frequencies and for generating a first signal responsive thereto, said sensing means exhibiting a substantially constant phase shift over said predetermined range of simultaneous frequencies;

b) a pair of driven coils for generating a compensating magnetic field, said pair of driven coils being disposed in a close approximation of Helmholtz geometry;

c) signal processing means operatively connected to said sensing means for receiving said first signal generated thereby and for generating a second signal, said second signal being derived from said first signal and incorporating predetermined gain and phase correction thereof, said signal processing means further comprises an absolute peak detector for determining magnetic field peak excursions; and

d) power amplifying means operatively connected to said pair of driven coils and to said signal processing means for receiving and amplifying said second signal therefrom and for applying said amplified signal to said pair of driven coils, said power amplifying means, said pair of driven coils, said sensing means, and said signal processing means forming a closed-loop, wideband, negative-feedback suppression system, said suppression system having sufficient closed-loop gain to counteract a predetermined, highest anticipated instantaneous magnetic field.

5,465,013

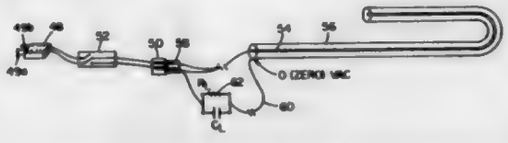
ELECTRIC FIELD SHIELDING SYSTEM FOR AC ELECTRICALLY POWERED DEVICE WITH A TWO-BLADE PLUG

Howard I. Bassen, Chevy Chase, and John P. Casamento, Gaithersburg, both of Md., assignors to The Government of the United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Jul. 12, 1993, Ser. No. 90,231

Int. Cl.[6] H01J *31/00;* **H04B** *3/28;* **H05K** *9/00*

U.S. Cl. 307—91 **30 Claims**



28. A method of shielding E-field emitted by an ungrounded AC electrical appliance, comprising the steps of:

placing an E-field shield in a vicinity of the appliance; and

connecting the E-field shield to a neutral terminal of an AC power source.

5,465,014

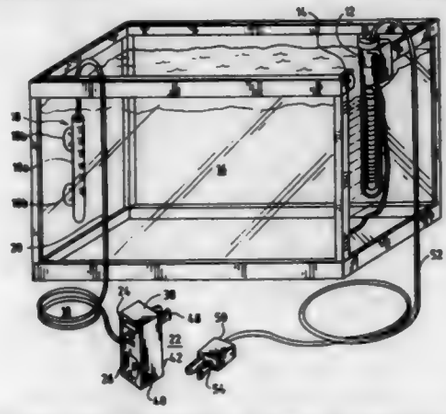
AQUARIUM HEATER OVERRIDE CONTROL SYSTEM

Claude G. Avvisati, 1215 Diane La., Elk Grove Village, Ill. 60007

Continuation of Ser. No. 819,751, Jan. 13, 1994, abandoned. This application Jan. 17, 1995, Ser. No. 373,865

Int. Cl.[6] H05B *3/80*

U.S. Cl. 307—117 **11 Claims**



1. A stand alone and portable aquarium tank temperature override control system for use with a separate and/or portable aquarium heater, comprising:

a sensing means, located within or in thermal contact with a surface of an aquarium tank and responsive to the temperature

of the aquarium tank environment, for generating a control signal proportional to the temperature within the aquarium tank; and

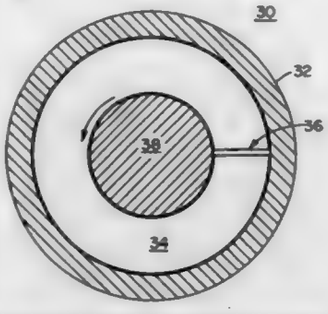
a power control means connected to the sensing means and the aquarium heater responsive to the control signal for disconnecting the power from the aquarium heater when the temperature of the aquarium tank environment exceeds a predetermined threshold value to save aquarium inhabitants if the heater fails in the "on" condition.

5,465,015

TRANSVERSE FIELD ACTIVATED MAGNETOSTRICTIVE MOTOR

George V. Anastas, Mountain View, Calif., and James H. Goldie, Lexington, Mass., assignors to SatCon Technology Corporation, Cambridge, Mass.

Filed Sep. 24, 1993, Ser. No. 194,141
Int. Cl.[6] H02N *2/00;2/12*
U.S. Cl. 310—26 **10 Claims**



1. A transverse field activated magnetostrictive motor, comprising:

a magnetostrictive member having a direction of motion transverse to its principal orientation axis;

a reaction surface mechanically coupled to said magnetostrictive member; and

means for providing a travelling magnetic field sequentially along said magnetostrictive member, said field having a field component parallel to the principal orientation axis of said magnetostrictive member to sequentially, locally decouple said member from said reaction surface to move said member in the direction of motion of the travelling field in relation to said surface.

5,465,016

ELECTRIC MOTOR AND BRUSH/SHUNT ASSEMBLY THEREFOR

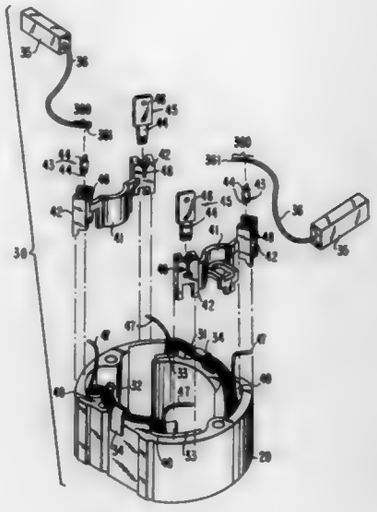
Dennis J. Mancl, Bluff City; Donald C. Johnson, Johnson City, both of Tenn., and Paul W. Havens, Abingdon, Va., assignors to Electrolux Corporation, Atlanta, Ga.

Filed Sep. 8, 1993, Ser. No. 118,129
Int. Cl.[6] H02K *5/14;13/00*
U.S. Cl. 310—71 **24 Claims**

13. A brush/shunt assembly for use in a dynamo-electric machine, said assembly comprising:

a commutator brush; and

a stranded wire shunt connected at a first end thereof to said commutator brush and having a second end for connection to a terminal on a stationary stator portion of said dynamo-electric machine, said second end of said stranded wire shunt (a) lacking an insulation sheath, and (b) being stiffened without use of an additional rigid element for insertion into said terminal.

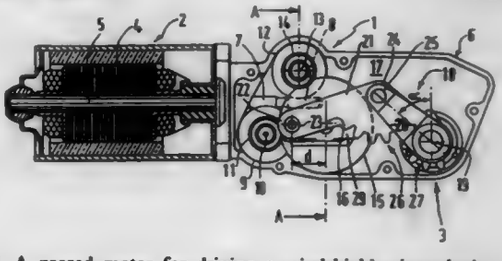


5,465,017

GEARED MOTOR FOR DRIVING A WINDSHIELD WIPER DEVICE FOR A MOTOR VEHICLE

Frédéric Vacca, Behoust, France, assignor to Valeo Systemes d'Essuyage, Montigny-le Bretonneux, France

Filed Dec. 17, 1993, Ser. No. 173,654
Claims priority, application France, Dec. 17, 1992, 92 15243
Int. Cl.[6] H02K *7/116*
U.S. Cl. 310—83 **6 Claims**



1. A geared motor for driving a windshield wiper device, in particular for a motor vehicle, comprising an electric motor adapted to actuate a wheel which moves around an axis and drives a direction reversal mechanism actuating an output shaft, wherein said wheel carries, in a fixed manner, a driving device formed by a plate attached to said wheel and supported entirely by a seat provided on the wheel, the driving device connecting the direction reversal mechanism to said wheel.

5,465,018

SHAFT MOUNTED EDDY CURRENT DRIVE

Paul D. Boggs, III, 4701 Old Denton Rd., Fort Worth, Tex. 76117

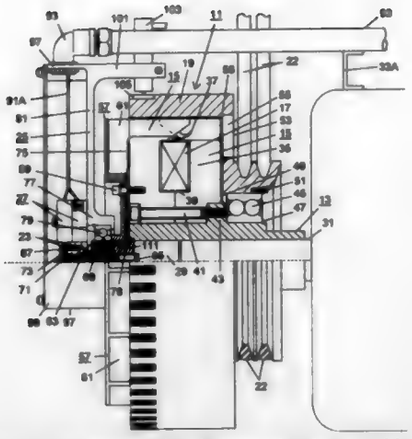
Filed Mar. 18, 1993, Ser. No. 35,981
Int. Cl.[6] H02K *49/00*
U.S. Cl. 310—105 **13 Claims**

1. A variable speed drive, comprising:

a) a hub that is structured and arranged to be coupled to a motor shaft, said hub having a shoulder that is directly coupled to said hub said shoulder extending in a direction that is transverse to an axis of rotation of said hub;

b) an electromagnet mounted on said hub and abutting against said shoulder, said electromagnet being directly coupled to said hub so as to rotate in unison with said hub;

c) a driven member mounted to said hub by bearings, said driven member having a load portion and an armature, said load



portion being structured and arranged to be rotatably coupled to a load, said armature being located adjacent to said electromagnet.

5,465,019

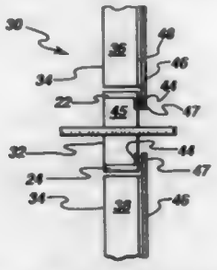
HIGH-EFFICIENCY, LOW-NOISE ELECTRONICALLY COMMUTATED MOTOR HAVING IMPROVED STARTING CAPABILITY

Gerald B. Kliman, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 20, 1993, Ser. No. 123,668

Int. Cl.[6] H02K *37/00*; H02P *5/06*

U.S. Cl. 310—156 **9 Claims**



1. A single-phase electronically commutated motor (ECM), comprising:

a permanent magnet rotor having a plurality of magnetic poles situated on an outer surface of a cylindrical rotor core, said rotor including a parking magnet disposed on at least one of two ends of said rotor core; and

a stator situated about said rotor with an air gap therebetween, said stator having a winding, said stator having at least one parking magnet lamination extending through said air gap and overlapping said parking magnet for interaction therewith, such that there is sufficient starting torque at predetermined parking positions of said rotor.

5,465,020

INTEGRAL SHAFT BEARING AND BOBBIN FOR ELECTRIC MOTORS

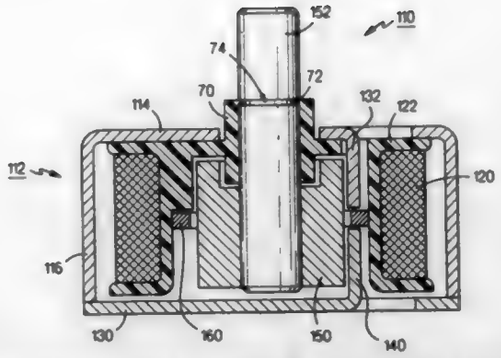
Brian Peterson, Woodbury, Conn., assignor to Tri-Tech, Inc., Waterbury, Conn.

Filed Jan. 7, 1994, Ser. No. 178,907

Int. Cl.[6] H02K *5/16*

U.S. Cl. 310—194 **6 Claims**

1. In an electric motor of the type having a housing, a non-metallic bobbin upon which is wound a stator coil, a rotor having a rotor shaft fixedly attached thereto and extending therefrom, said rotor being disposed for rotation axially centrally of said bobbin, the improvement comprising: providing a bearing structure, said



bearing structure being monolithic with said bobbin and having a central opening for journaling therein of said rotor shaft, and said bearing structure and said rotor shaft being secured against relative axial movement by means of an annular, inwardly extending lip formed around an inner periphery of said bearing structure and engaging a complementarily dimensioned channel defined in an outer periphery of said rotor shaft.

5,465,021

ELECTROMECHANICAL DISPLACEMENT DEVICE AND ACTUATOR SUITABLE FOR USE IN SUCH A ELECTROMECHANICAL DISPLACEMENT DEVICE

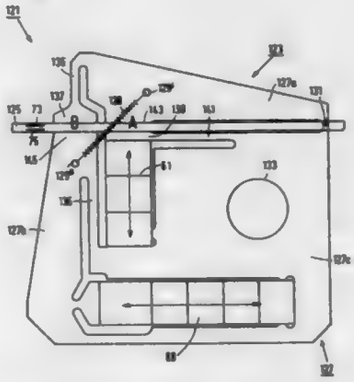
Albert Visscher; Marinus P. Koster, and Johannus W. Weekamp, all of Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 131,269, Oct. 1, 1993, abandoned. This application Jan. 6, 1995, Ser. No. 369,578

Claims priority, application European Pat. Off., Jan. 2, 1992, 92203027

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—328 **9 Claims**



1. An electromechanical displacement device provided with a holder, a round shaft displaceable relative to the holder, and an actuator connected to the holder and capable of displacing the shaft relative to the holder, wherein the actuator is provided with two series of clamping members which can be clamped against the displaceable shaft, while each member of at least one series of clamping members is provided with a clamping element of transducer material, and which actuator is further provided with a series of transport elements of transducer material by which the distance between the series of clamping members can be changed while one series of clamping members is connected to the displaceable shaft with clamping force,

wherein the improvement comprises that the first series of clamping members is clamped against the displaceable element with a mechanical pretensioning force exerted on the actuator by mechanical pretensioning means while the second series of clamping members is disengaged from this element, and the mechanical pretensioning force is transmitted to the

second series of clamping members through activation of the clamping elements, the second series of clamping members being clamped against the displaceable element with the mechanical pretensioning force while the first series of clamping members is disengaged from this element,

wherein the two series of clamping members are interconnected by means of a ring which concentrically surrounds the shaft and which is provided with plate-shaped bridges which lie between clamping members of a single series, which are flexible in radial direction, and by which the pretensioning force is transmitted to the clamping members, and in that the actuator is provided with plate-shaped coupling pieces situated between clamping members of different series and flexible in axial direction.

5,465,022

SPARK PLUG FOR INTERNAL-COMBUSTION ENGINE AND MANUFACTURE METHOD OF THE SAME

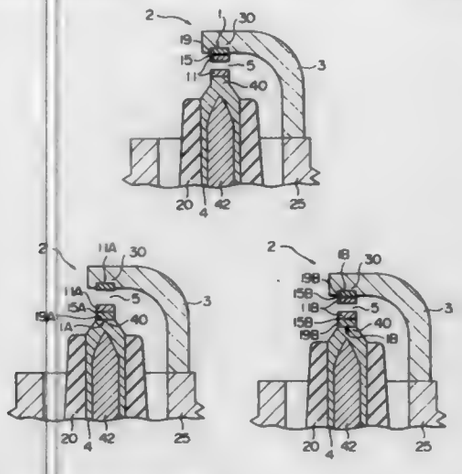
Akio Katoh, Nishio; Nobuo Abe, Yokkaichi; Takeshi Hanai, Kuwana, and Kenji Horibe, Aichi, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 11, 1993, Ser. No. 104,203

Claims priority, application Japan, Aug. 12, 1992, 4-236548; Sep. 1, 1992, 4-257342; Sep. 25, 1992, 4-256461

Int. Cl.[6] H01T *13/20;13/32*

U.S. Cl. 313—144 **9 Claims**



1. A spark plug comprising:

a central electrode;

a ground electrode; and

a composite chip comprising a discharging layer and a heat street relieving layer, which layers are integrally joined beforehand, said heat stress relieving layer being joined to at least one of said central electrode and said ground electrode; and

an alloy layer formed between said discharging layer and said heat stress relieving layer to be effective in joining said discharging layer and said heat stress relieving layer to each other, said alloy layer having a thickness of at least 3 μm or more,

said discharging layer consisting of 70 to 100 wt. % of platinum and 0 to 30 wt. % of iridium,

said heat stress relieving layer of said composite chip being provided on at least one of said first and second electrodes, and consisting of 60 to 90 wt. % of platinum and 10 to 40 wt. % of nickel,

wherein irregularities are formed on a surface of said discharging layer only.

5,465,023

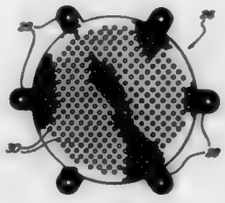
CARBON-CARBON GRID FOR ION ENGINES

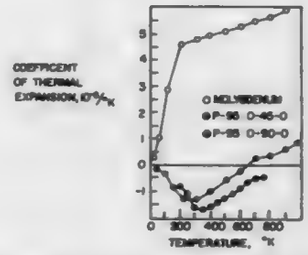
Charles E. Garner, La Canada, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 1, 1993, Ser. No. 89,064

Int. Cl.[6] H01J *1/46*

U.S. Cl. 313—293 **20 Claims**





1. An improved grid member for use in an ion discharge apparatus comprising:

a body member formed of carbon fibers having a plurality of holes, the carbon fibers being orientated to provide a negative coefficient of thermal expansion for at least a portion of the grid member's operative range of use.

5,465,024

FLAT PANEL DISPLAY USING FIELD EMISSION DEVICES

Robert C. Kane, Woodstock, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 414,836, Sep. 29, 1989, abandoned. This application Feb. 24, 1992, Ser. No. 839,717

Int. Cl.[6] H01J *19/24*

U.S. Cl. 313—309 **7 Claims**

1. A flat panel display comprising:

a field emission device including an edge emitter and a gate spaced from the edge emitter, the gate and edge emitter being constructed to have a potential applied therebetween to produce edge emission of electrons;

a screen including a layer of luminescent material positioned in spaced relation from the edge emitter and the gate of the field emission device to receive at least some emitted electrons and thereby energize a part of the luminescent material; and

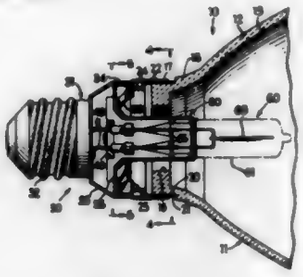
an encapsulating layer, wherein the edge emitter is a part of a support structure that is positioned between the screen and the encapsulating layer.

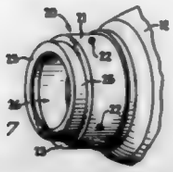
5,465,025

LAMP WITH REMOVABLE BASE AND REPLACEABLE BULB CAPSULE

Thomas S. Hendrickson, Crestwood, Ill., assignor to Litetronics International, Inc., Alsip, Ill.

Filed May 10, 1993, Ser. No. 59,777
Int. Cl.[6] H01J 5/54; H01R 33/00; F21V 17/00
U.S. Cl. 313—318.09 20 Claims





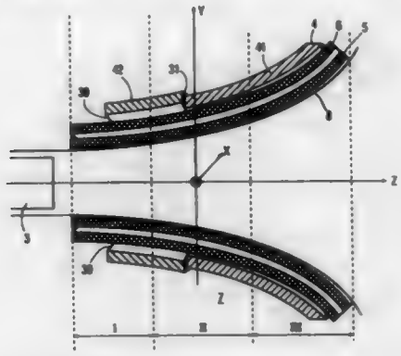
18. A lamp comprising: a globe having a light transmitting front portion and a rear portion defining an opening thereinto, first mounting means discrete from said globe and mounted on said rear portion and including a hole aligned with said opening, removable base structure including a socket, and a replaceable bulb capsule including a light-transmitting envelope and at least one wire terminal lead projecting therefrom for removable insertion directly in said socket, and said base structure including second mounting means telescopically receiving said rear portion therein for engagement with said first mounting means in a mounted condition in which said socket and said bulb capsule received in said socket extend through said opening and said hole into said globe.

5,465,026

DEFLECTION YOKE WITH A CORE EXTENSION

Bruno Rousnel, and Alain Dumesnil, both of Genlis, France, assignors to Videocolor, Paris La Defense, France

Filed Apr. 1, 1993, Ser. No. 41,390
Claims priority, application France, Apr. 7, 1992, 92 04248
Int. Cl.[6] H01J 29/76
U.S. Cl. 313—440 9 Claims



1. An apparatus, comprising;

a cathode ray tube having a neck and an electron gun assembly disposed in said neck for producing a plurality of electron beams that form beam spots at electron beam landing locations on said tube;

a deflection yoke mounted on said neck of said cathode ray tube and including a deflection winding and a magnetic core for producing a deflection field between a beam entrance section and a beam exit section of said yoke to vary the beam landing locations upon deflection; and

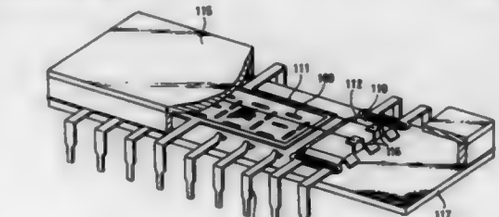
said core having first and second core portions magnetically coupled to each other and to said deflection winding, one of said core portions being adjustable on said yoke in a direction perpendicular to a Z-axis of said tube, relative to a position of the other one of said core portions on said yoke, for modifying said deflection field to correct for convergence error of said beam spot landing locations.

5,465,027

CHIP-IN-GLASS FLUORESCENT INDICATOR PANEL WITH HEAT PROTECTION

Mitsuhiro Ishizuka, and Hiroshi Saeki, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Apr. 30, 1993, Ser. No. 56,296
Claims priority, application Japan, May 7, 1992, 4-114387
Int. Cl.[6] H01J 1/88
U.S. Cl. 313—517 4 Claims



1. A chip-in-glass fluorescent indicator panel comprising:

a glass substrate;

a wiring layer formed on said glass substrate;

an insulating layer covering said wiring layer;

a pattern-like graphite layer formed on said insulating layer and electrically connected to said wiring layer;

a phosphor layer formed on said pattern-like graphite layer;

a filament suspended above said phosphor layer with an interval;

a grid arranged between said filament and said phosphor layer;

an IC fixed on said insulating layer on one end side of said glass substrate and connected to said pattern-like graphite layer through said wiring layer;

an IC shield arranged between said IC and said filament, the IC shield being arranged in parallel with the glass substrate and the filament being suspended in parallel with the glass substrate;

a filament fixing portion which is an integrally formed part of said IC shield, the filament fixing portion being a bent tab portion of the IC shield; and

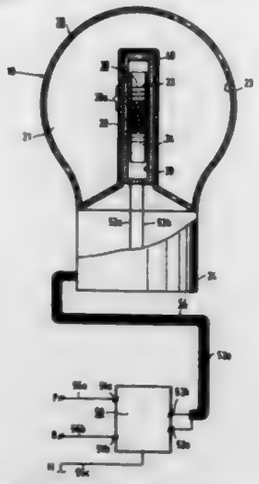
an anchor, arranged on said insulating layer on the other end side of said glass substrate, for suspending said filament between said anchor and said filament fixing portion.

5,465,028

ILLUMINATION UNIT, AND ELECTRODELESS LOW-PRESSURE DISCHARGE LAMP AND COIL SUITABLE FOR USE THEREIN

Petrus H. Antonis, Eindhoven, Netherlands; Jacob Schlejen, Morgantown, W. Va., and Leonardus U. E. Konings, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1993, Ser. No. 138,946
Claims priority, application European Pat. Off., Jan. 21, 1992, 92203222
Int. Cl.[6] H05B 41/16
U.S. Cl. 315—248 23 Claims



1. An illumination unit, comprising:

an electrodeless low-pressure discharge lamp comprising a discharge vessel sealed in a gastight manner and containing an ionizable filling and a coil for generating an electric field within said discharge vessel, said coil comprising a primary winding having respective turns and a secondary winding having respective turns; and

a supply device comprising input terminals, an output terminal which is electrically neutral with respect to ground and which is connected to a first end of the primary winding, and a further output terminal which is connected to a second end of the primary winding, a high-frequency magnetic field being generated by the primary winding in a nominal operating condition, which field maintains an electric discharge in the discharge vessel and induces a potential gradient in the secondary winding in a direction from a first end which is electrically neutral with respect to ground to a second, free end of the secondary winding, which gradient is oppositely directed to the potential gradient from the first to the second end in the primary winding, and

wherein the relative number of turns of the primary winding is at least 3/2 times the relative number of turns of the secondary winding in a first end portion of the coil which comprises half the number of turns of the coil.

5,465,029

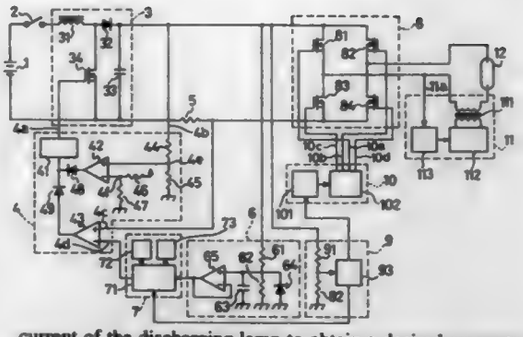
POWER CONTROL APPARATUS FOR DISCHARGING LAMP AND METHOD THEREOF

Yasumasa Hanazaki, and Nobuo Ukita, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1994, Ser. No. 226,056
Claims priority, application Japan, Sep. 17, 1993, 5-231384
Int. Cl.[6] G05F 1/00
U.S. Cl. 315—308 16 Claims

1. A discharging lamp lighting apparatus comprising:

storing means for previously storing a plurality of discharging lamp voltage-current characteristics indicative of a relationship between discharging lamp voltage and discharging lamp



current of the discharging lamp to obtain a desired amount of emission of the discharging lamp;

predicting means for predicting a value of final discharging lamp voltage of said discharging lamp;

characteristic selecting means for selecting a one of said discharging lamp voltage-current characteristics identified by said final discharging lamp voltage predicted by said predicting means; and

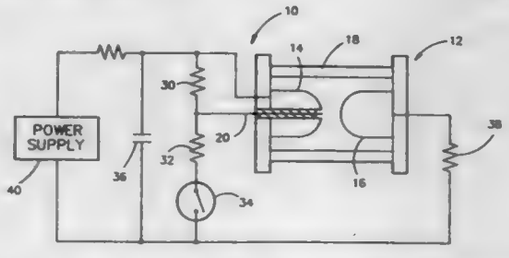
current control means for controlling actual discharging lamp current supplied to said discharging lamp to the current specified by said one of the discharging lamp voltage-current corresponding characteristics selected by said characteristic selecting means.

5,465,030

TRIGGER APPARATUS FOR SPARK GAP DISCHARGERS

Brian G. Smith, Crofton, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 20, 1995, Ser. No. 376,192
Int. Cl.[6] H01J 11/04
U.S. Cl. 315—349 1 Claim



1. A trigger apparatus for a high voltage source spark gap discharger, comprising:

(a) an arc discharge tube having a first and a second primary electrode and a trigger electrode; and

(b) a switch, a trigger resistor and a limiting resistor in series with said high voltage source, said trigger resistor in parallel with said first primary electrode and said trigger electrode.

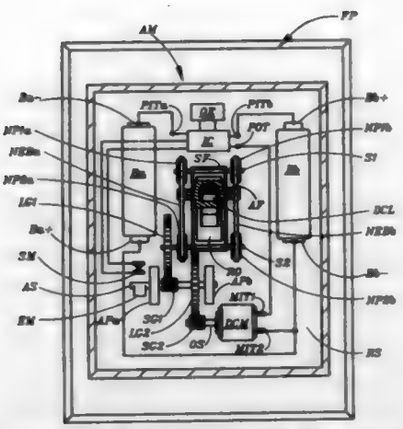
5,465,031

PROGRAMMABLE ACTUATOR FOR LIGHT DIMMER

Ole K. Nilssen, 408 Caesar Dr., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 465,612, Jan. 19, 1990, which is a continuation of Ser. No. 718,478, Apr. 1, 1985, abandoned. This application Mar. 3, 1993, Ser. No. 25,740
Int. Cl.[6] H05B 37/02
U.S. Cl. 315—362 33 Claims

1. Actuator means adapted to be mounted on the front of a wall switch face plate having an aperture and a front surface, said actuator means being operable repeatedly to adjust, in accordance with a preset program, the position of a control lever protruding through this aperture, said control lever being connected in con-



trolling relationship with a power control means located behind said face plate, said power control means being operable to control to different levels the flow of power to a load, said actuator means comprising:

structure means adapted to be mounted on the front of said face plate;

energy source means physically supported by said structure means and operable to supply operative power;

mechanical actuator means physically supported by said structure means and operable to engage with and, when so engaged and when receiving operative power, to cause movement of said control lever; and

programming means connected in circuit between said energy source means and said mechanical actuator means, said programming means: i) having clock means, ii) being receptive of programming instructions to establish said preset program, and iii) being operable to provide operative power to said mechanical actuator means in accordance with said instructions, thereby to cause movement of said control lever in accordance with said preset program.

5,465,032
VERTICAL DEFLECTION CIRCUIT

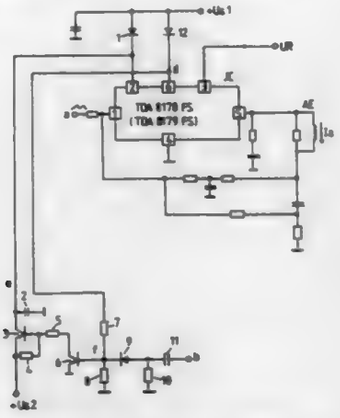
Achim Elgert, Bad Dürrheim, and Thomas Hölzer, Schlangenbad, both of, Germany, assignors to Deutsche Thomson-Brandt GmbH, Germany

Filed Feb. 18, 1994, Ser. No. 204,011

Claims priority, application Germany, Sep. 2, 1991, 41 29 107.7

Int. Cl.[6] H01J *29/70;29/76*

U.S. Cl. 315—403 **8 Claims**



1. A vertical deflection apparatus, comprising:

a source of a first supply voltage;

a source of a second supply voltage greater than said first supply voltage;

a deflection amplifier having first and second supply terminals for energizing first and second amplifier stages in a signal path of said amplifier, respectively;

a flyback generator for generating a flyback pulse voltage at said first supply terminal that is larger during a flyback interval than during a scan interval;

a source of a signal indicative of said flyback interval and coupled to a control terminal of a transistor switch for selectively coupling said second supply voltage to said second supply terminal, during said flyback interval, and for selectively coupling said first supply voltage to said second supply terminal, during said scan interval.

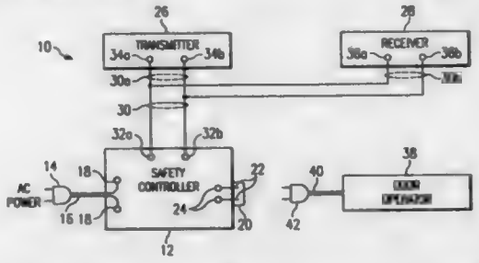
5,465,033
UNIVERSAL SAFETY SYSTEM FOR AUTOMATIC DOORS

Mohammed Fassih-Nia, Garland, Tex., assignor to Texas Optoelectronics, Inc., Garland, Tex.

Filed May 27, 1994, Ser. No. 250,552

Int. Cl.[6] G05B *5/00*

U.S. Cl. 318—480 **12 Claims**



1. A safety system for universal attachment to an automatic garage door opener having a plug for receiving power from a standard wall outlet, the system comprising:

a transmitter positioned to transmit a beam of light across the opening of said garage door;

a receiver positioned to receive said light beam from said transmitter if said beam is not interrupted, and for generating a signal indicating whether said light beam is received or interrupted; and

controller means electrically connected to said transmitter and said receiver, said controller means having a plug adapter for receiving said plug and controlling said power to said opener therethrough, said controller means being responsive to said signal so that said power to said garage door opener is supplied if said signal indicates that said beam is being received, said power being disconnected otherwise.

5,465,034
LOW ACOUSTIC NOISE SEEKING METHOD AND APPARATUS

Thomas L. Andrews, Jr., Ward, and Gary E. Counts, Arvada, both of Colo., assignors to Integral Peripherals, Inc., Boulder, Colo.

Continuation of Ser. No. 786,333, Oct. 31, 1991, Pat. No. 5,291,110. This application Jan. 31, 1994, Ser. No. 189,540

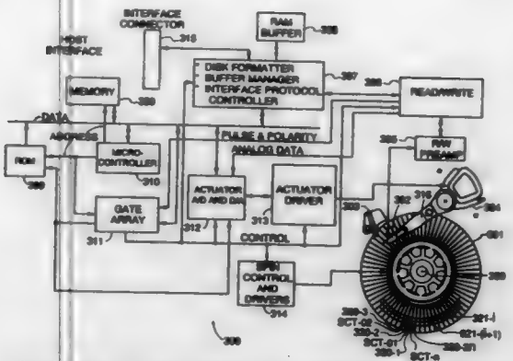
Int. Cl.[6] G11B *21/02*

U.S. Cl. 318—560 **14 Claims**

1. In a miniature disk drive, a silent seek servo system comprising:

a microprocessor; and

a seek controller, operating in said microprocessor and responsive to a seek command from a disk controller, for generating a positioning signal for an actuator of said miniature disk drive, said positioning signal indicating a series of positions of said actuator, wherein said positions define a smooth, continuous, and completely symmetric acceleration trajectory which decreases acoustic noise generated by acceleration and



deceleration of said actuator, and said acceleration trajectory has a continuous first derivative throughout a continuous range including a point at which acceleration and velocity of said actuator are zero.

5,465,035

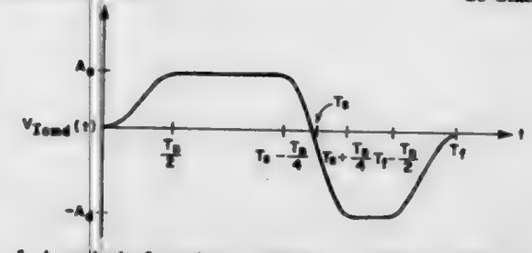
BAND LIMITED CONTROL OF A FLEXIBLE STRUCTURE USING PIECEWISE TRIGONOMETRIC INPUT SIGNALS

John A. Scaramuzzo, Jr., Natick, and Roger W. Brockett, Lexington, both of Mass., assignors to Quantum Corporation, Milpitas, Calif.

Filed May 11, 1993, Ser. No. 60,388

Int. Cl.[6] G11B 5/55

U.S. Cl. 318—561 **26 Claims**



1. A method of moving a member to a desired position in a system including the member and a motor for moving the member, the method comprising the steps of:

(a) selecting the desired position for the member;

(b) generating an input signal characterized as a piecewise trigonometric function of time specified by a final time, a switch time, an acceleration amplitude, and a deceleration amplitude, the piecewise trigonometric function of time comprising concatenated cosine and constant functions; and

(c) applying the input signal to the motor for driving the motor to move the member to the desired position,

wherein the final time, the switch time, the acceleration amplitude and the deceleration amplitude are parameters related to the desired position for the member.

5,465,036

CONTROL APPARATUS OF ROBOT

Masateru Yasuhara, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1993, Ser. No. 163,655

Claims priority, application Japan, Dec. 11, 1992, 4-332081

Int. Cl.[6] G05B 19/18

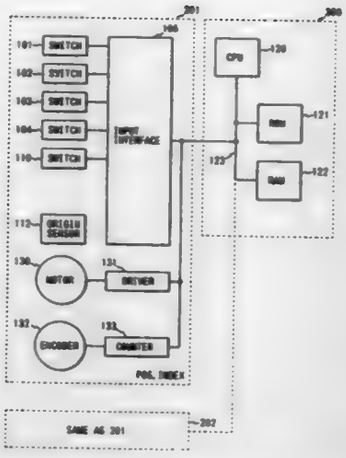
U.S. Cl. 318—568.11 **24 Claims**

1. A robot comprising:

(a) a moving member which is movably attached to a base; and

(b) a control apparatus for controlling the operation of said moving member,

said control apparatus having data setting means for setting origin search data and offset data to control the operation of the moving member, said data setting means providing sensible indication through which set origin search data and set offset data are identifiable.



5,465,037

SYSTEM AND METHOD FOR TRACKING A FEATURE ON AN OBJECT USING A REDUNDANT AXIS

Jan P. Huissoon, 468 Lorindale Street, Waterloo, Ontario, Canada, and David L. Strauss, 200 Eastforest Trail, Kitchener, Ontario, Canada

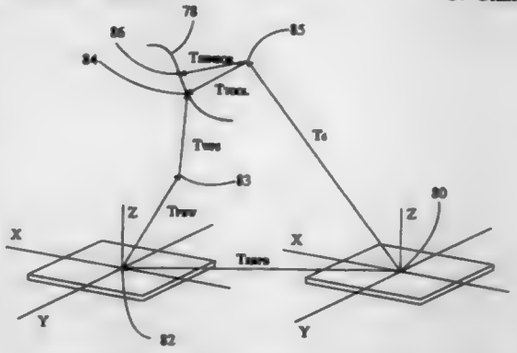
PCT No. PCT/CA94/00039, § 371 Date Jan. 13, 1994, § 102(e) Date Jan. 13, 1994, PCT Pub. No. WO94/15758, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 11, 1994, Ser. No. 182,126

Claims priority, application United Kingdom, Jan. 11, 1993, 9300403

Int. Cl.[6] B25J 9/16

U.S. Cl. 318—568.11 **17 Claims**



1. A system for tracking a feature on an object in real time without path preprogramming, said system comprising:

(a) a manipulator having a movable end and a base, said movable end being movable relative to said base;

(b) a sensor mounted adjacent to said movable end, said sensor being oriented to monitor said feature near said end;

(c) said system having at least two degrees of freedom with at least one degree of freedom being created by a redundant axis; and

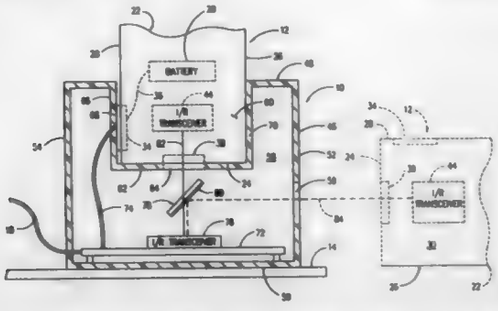
(d) said system having control means for receiving information from said sensor, for processing said information to control said redundant axis and for sending processed information to said manipulator, thereby causing said end to track said feature in real time without path preprogramming.

5,465,038

BATTERY CHARGING/DATA TRANSFER APPARATUS FOR A HANDHELD COMPUTER

David S. Register, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed Nov. 24, 1993, Ser. No. 158,092
Int. Cl.[6] H01M 10/46
U.S. Cl. 320—2 18 Claims



1. Apparatus for facilitating data transfer between a data input/output device, such as a desktop computer, and a handheld computer having incorporated therein first transceiver means for transmitting and receiving a data-carrying infrared light beam, said apparatus comprising:

a support structure configured to releasably receive a portion of the handheld computer and support the handheld computer in a docked orientation, wherein said support structure has an inset well area disposed therein and configured to complementarily and releasably receive said portion of the handheld computer, said inset well area having an inner side wall.

second transceiver means, carried by said support structure and operably connectable to the data input/output device, for transmitting and receiving the data-carrying infrared light beam; and

coupling means, carried by said support structure, for optically coupling said first and second transceiver means, when the handheld computer is in said docked orientation thereof, in a manner such that the data carrying infrared light beam transmitted by one of said first and second transceiver means is received by the other of said first and second transceiver means;

wherein said coupling means include an I/R interface window structure disposed in said inner side wall, and

wherein said second transceiver means are inwardly spaced apart from said I/R interface window structure in a facing relationship therewith.

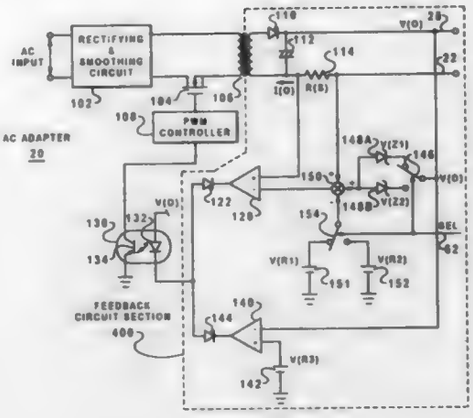
5,465,039

POWER SUPPLY FOR ELECTRONIC DEVICE, AND ELECTRONIC DEVICE SYSTEM

Izuru Narita, Sagamihara; Keiji Suzuki, Fujisawa; Toshitsugu Mito, Atsugi, and Noboru Tsurukawa, Yamato, all of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 9, 1993, Ser. No. 118,899
Claims priority, application Japan, Sep. 16, 1992, 4-246338
Int. Cl.[6] H02J 7/00
U.S. Cl. 320—32 10 Claims

1. A power supply apparatus for an electronic device which is powered by either a drive current or a battery, said power supply apparatus comprising means for supplying said drive current for driving the electronic device and a charging current for charging said battery, said power supply apparatus having constant power feedback control means for performing feedback control of an outputted power based on a current feedback value and a voltage feedback value, such that the outputted power is substantially constant.

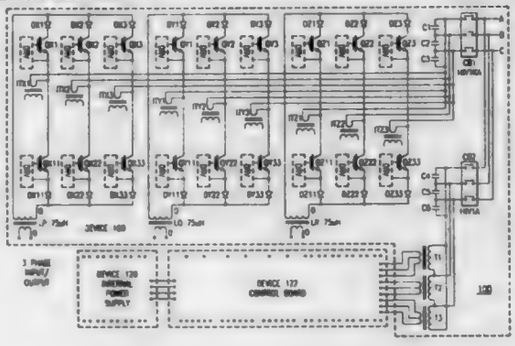


5,465,040

THREE PHASE POWER FACTOR CORRECTION DEVICE AND METHOD

Hemtong Yasotornrat, 110 Avenida Felipe, Anaheim Hills, Calif. 92807

Filed Sep. 23, 1993, Ser. No. 127,142
Int. Cl.[6] G05F 1/70
U.S. Cl. 323—210 11 Claims



1. A device for improving power factor in a multiple phase power distribution system coupled to a load, comprising:

at least one energy storage device;

first switching means operatively coupled between an input of said energy storage device and each of said multiple phases;

second switching means operatively coupled between an output of said energy storage device and each of said multiple phases; and

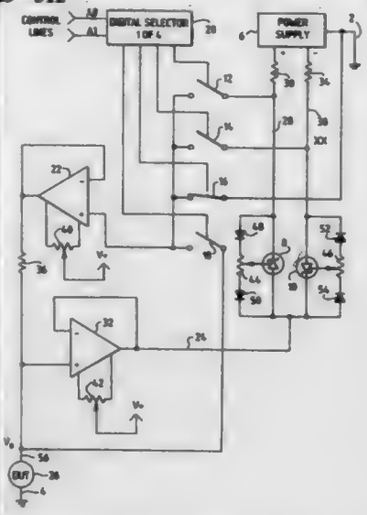
control means operatively coupled to said first and second switching means, said control means operable to open or close said first switching means in order to couple said energy storage device for sinking current from at least one of said multiple phases which is supplying less than an ideal amount of current to said load, and further operable to control said second switching means in order to couple said energy storage device for sourcing current to at least one of said multiple phases which is supplying more than an ideal amount of current to said load.

5,465,041

BIPOLAR TRACKING CURRENT SOURCE/SINK WITH GROUND CLAMP

Gary G. Sanders, Rock Falls, and John R. Kessinger, Polo, both of, Ill., assignors to Penberthy, Inc., Prophetstown, Ill.

Filed Sep. 17, 1993, Ser. No. 122,212
Int. Cl.[6] G05F 3/08;3/14
U.S. Cl. 323—312 15 Claims



1. A tracking current source comprising:

sensing means for sensing the voltage of a circuit point;

reference means for generating a reference voltage;

summing means for summing said sensed voltage with said reference voltage; and

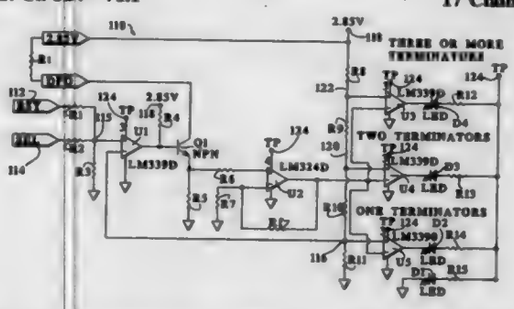
means for supplying said summed voltage through a resistor to a load.

5,465,042

INACTIVE STATE TERMINATION TESTER

Francis M. Samela, Lombard, and Joseph R. Llorens, Winfield, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Aug. 4, 1994, Ser. No. 285,970
Int. Cl.[6] G01R 27/16
U.S. Cl. 324—71.1 17 Claims



16. A method for determining the number of terminators connected to a bus, said method comprising the steps of:

a) detecting bus inactivity; and

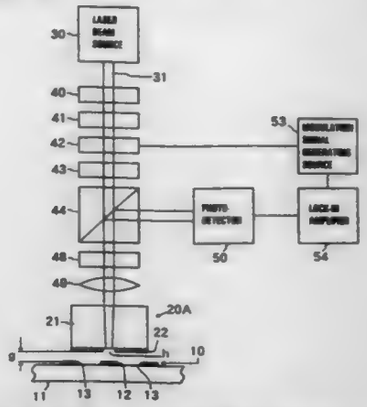
b) determining the number of terminators connected to said bus during bus inactivity.

5,465,043

NON-CONTACT TYPE PROBE AND NON-CONTACT TYPE VOLTAGE MEASURING APPARATUS, WHEREIN THE PROBE'S IRRADIATION SURFACE IS COATED WITH A CONDUCTIVE FILM HAVING A PINHOLE

Ikuo Sakai, Shizuoka, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 19, 1993, Ser. No. 94,415
Claims priority, application Japan, Jul. 28, 1992, 4-221951
Int. Cl.[6] G01R 19/00
U.S. Cl. 324—96 13 Claims



6. A non-contact type voltage measuring apparatus, comprising:

a light source for generating a detection light;

a non-contact type probe comprising an electrooptic material having an irradiation surface for an external electric field and incident and emitting surfaces for said detection light, wherein said irradiation surface for the external electric field is coated with a conductive film having a pinhole, wherein the conductive film coated on the electrooptic material is kept at a fixed potential, said non-contact type probe being disposed in such a manner that the detection light incident into said electrooptic material is reflected from a pinhole opening surface or passed in parallel to a surface having a pinhole and adjacently to said pinhole;

a photodetector for photodetecting a light emitted from said electrooptic material; and

means for detecting a polarization state of said detection light in said electrooptic material on the basis of the output of said photodetector.

5,465,044

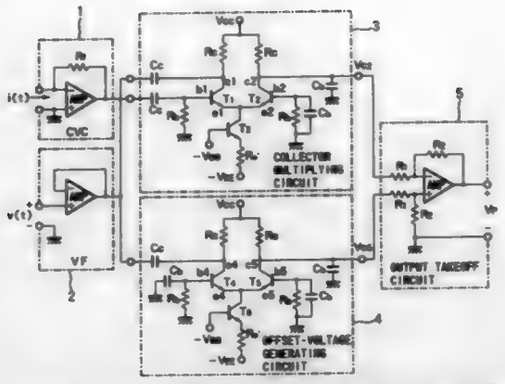
ANALOG MULTIPLYING-AVERAGING CIRCUIT AND WATTMETER CIRCUIT USING THE CIRCUIT

Yoshimitsu Matsumoto, 22-1-404, Konakadai 8-chome, Inage-ku, Chiba-shi, Chiba 263, Japan, and Toshiaki Kansaku, 123-8, Nanabayashico, Hunabashi-shi, Chiba 274, Japan

Continuation of Ser. No. 980,785, Feb. 26, 1993, abandoned.
This application Dec. 12, 1994, Ser. No. 353,951
Claims priority, application Japan, Aug. 27, 1990, 2-224671
Int. Cl.[6] G01R 11/32; G06G 7/16
U.S. Cl. 324—142 3 Claims

2. A two-input product averaging circuit comprising:

a collector multiplying circuit including a first differential amplifier which includes a first transistor circuit having a collector, an emitter and a base, and a second transistor circuit having a collector, an emitter and a base, a first voltage signal being inputted to the base of the first transistor circuit and a second voltage signal being inputted to the collector of said first transistor circuit, the base and the collector of said second transistor circuit being grounded with respect to input signals so that a first signal power proportional to an average value of a product of the first and second voltage signals together is supplied across the collector and the emitter of said first transistor circuit and a second signal power of zero is supplied across the collector and the emitter of said second transistor



circuit, and thereby a first temperature difference proportional to a difference between said first and second signal powers is produced across each junction of said first and second transistor circuits and direct currents generated by said first temperature difference flow into the respective collectors of said first and second transistor circuits, wherein a first DC collector voltage based upon said direct currents and corresponding to the average value of the product of the first and second voltage signals is extracted from the collector of said second transistor circuit;

an offset-voltage generating circuit including a second differential amplifier which includes a third transistor circuit having a collector, an emitter and a base, and a fourth transistor circuit having a collector, an emitter and a base, said second voltage signal being inputted to the collector of said third transistor circuit, the base of said third transistor circuit being grounded with respect to input signals, and the base and the collector of said fourth transistor circuit being grounded with respect to input signals so that a third signal power proportional to an average value of the square of the second voltage signal is supplied across the collector and the emitter of said third transistor circuit and a fourth signal power of zero is supplied across the collector and the emitter of said fourth transistor circuit, and thereby a second temperature difference proportional to a difference between said third and fourth signal powers is produced across each junction of said third and fourth transistor circuits and direct currents generated by said second temperature difference flow into the respective collectors of said third and fourth transistor circuits, wherein a second DC collector voltage based upon said direct currents and corresponding to the average value of the square of the second voltage signal is extracted from the collector of said fourth transistor circuit; and

an output takeoff circuit coupled to said collector of said second transistor circuit and said collector of said fourth transistor circuit for extracting a DC voltage signal proportional to a difference between the first and second DC collector voltages.

5,465,045

EDDY CURRENT PROBE WITH DEFLECTABLE SIDEWALLS

Richard DeRock, 757 First Ave., Gibbon, Minn. 55335

Filed Oct. 28, 1993, Ser. No. 143,879

Int. Cl.[6] G01N *27/90;27/87;* **G01R** *33/12*

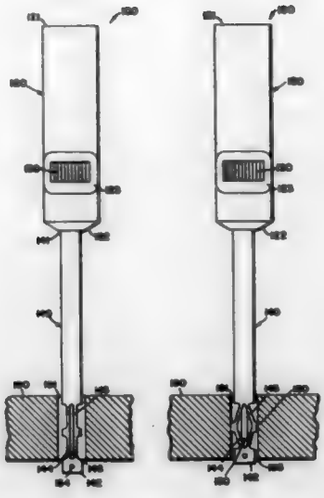
U.S. Cl. 324—220 **20 Claims**

1. An eddy current probe, comprising:

a tube having a longitudinal axis and having flexible sidewalls extending substantially parallel to said longitudinal axis;

an eddy current coil mounted on at least one of said flexible sidewalls; and

a shaft connected to and movably mounted within said tube, wherein axial movement of said shaft relative to said flexible sidewalls causes radial deflection of said flexible sidewalls relative to said longitudinal axis.



5,465,046

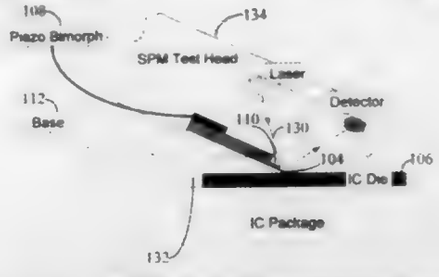
MAGNETIC FORCE MICROSCOPY METHOD AND APPARATUS TO DETECT AND IMAGE CURRENTS IN INTEGRATED CIRCUITS

Ann. N. Campbell, 13170-B Central SE #188, Albuquerque, N.M. 87123; Richard E. Anderson, 2800 Tennessee NE, Albuquerque, N.M. 87110, and Edward I. Cole, Jr., 2116 White Cloud NE, Albuquerque, N.M. 87112

Filed Mar. 21, 1994, Ser. No. 215,431

Int. Cl.[6] G01R *33/02*

U.S. Cl. 324—244 **29 Claims**



1. A method to non-invasively and nondestructively detect internal current in integrated circuits having internal conductive paths and a top surface, said method comprising the steps of:

(a) positioning an integrated circuit onto a stage of an apparatus having a magnetic tip attached to a cantilever, said cantilever having a base and a resonant frequency;

(b) applying an electrical signal to said integrated circuit to produce magnetic fields from the conductive paths:

(c) approaching said integrated circuit with said magnetic tip of said apparatus to within a distance from said top surface of said integrated circuit small enough for a magnetic interaction to occur between said magnetic tip and the magnetic fields from said internal conductive paths and large enough that said magnetic tip does not physically interact with said top surface of said integrated circuit;

(d) vibrating said cantilever at its resonant frequency;

(e) scanning said integrated circuit and said magnetic tip relative to each other;

(f) detecting changes in the resonance properties of said cantilever caused by interactions in the magnetic forces between said conductive paths and said magnetic tip and determining current paths, magnitudes, and direction in said conductive paths from said changes in the resonance properties of said cantilever; and

(g) generating a map of said current in said integrated circuit.

5,465,047

ELECTRON SPIN RESONATOR HAVING VARIABLE RESONANCE FREQUENCY AND ERROR DETECTING AUTOMATIC FREQUENCY CONTROL

Akio Nakanishi; Akira Furuse, both of Osaka; Kazuo Nakagawa, Tokyo; Makoto Tsuneda, Tokyo, and Atsushi Nukanobu, Tokyo, all of, Japan, assignors to Nikkiso Co., Ltd., Tokyo, and Sumitomo Special Metals Co., Ltd., Osaka, both of, Japan

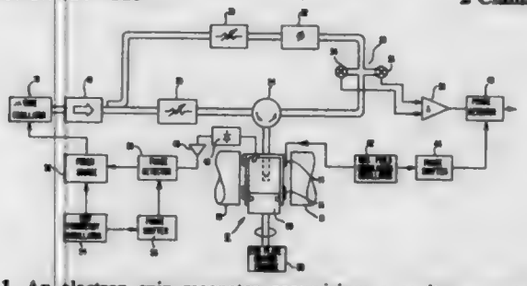
PCT No. PCT/JP92/01587, § 371 Date Oct. 14, 1993, § 102(e) Date Oct. 14, 1993, PCT Pub. No. WO93/11425, PCT Pub. Date Oct. 6, 1993

PCT Filed Dec. 4, 1992, Ser. No. 98,324

Claims priority, application Japan, Dec. 6, 1991, 3-322957

Int. Cl.[6] G01R *33/20*

U.S. Cl. 324—316 2 Claims



1. An electron spin resonator comprising: a cavity resonator arranged within a fixed polarized magnetic field to detect an electron spin resonant signal of a measuring sample; an automatic frequency control means whereby a resonant frequency of the cavity resonator is varied to detect, as an error signal, a difference between said resonant frequency of said cavity resonator and a frequency of a micro-wave applied to said cavity resonator, said micro-wave being generated by said variation of the resonant frequency, means for amplifying said detected error signal; and means for negatively feeding back said amplified error signal to a micro-wave oscillator so that a micro-wave signal output therefrom is controlled to follow the resonant frequency so as to reduce said error signal to zero.

5,465,048

Patent Not Issued For This Number

5,465,049

INTEGRATED TYPE PLANAR MAGNETIC SENSOR HAVING SQUID AND FLUX TRANSFORMER FORMED OF OXIDE SUPERCONDUCTOR

Takashi Matsuura, and Hideo Itozaki, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Apr. 20, 1993, Ser. No. 48,197

Claims priority, application Japan, Apr. 20, 1992, 4-126862

Int. Cl.[6] G01R *33/035*

U.S. Cl. 324—248 11 Claims

1. A magnetic sensor comprising:

(A) a substrate;

(B) a SQUID;

(C) a superconducting flux transformer of an oxide superconductor thin film; and

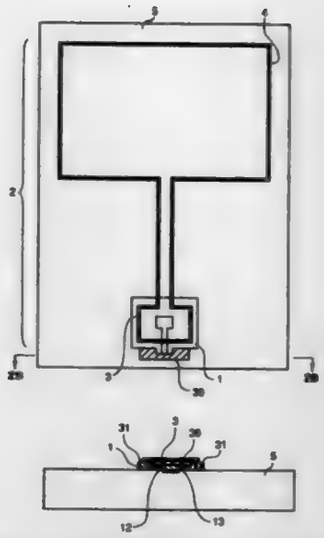
(D) a magnetic shield;

wherein said SQUID comprises:

(B1) a washer of an oxide superconductor thin film formed on a principal surface of the substrate;

(B2) a hole at the center of the washer that has a shape similar to the washer;

(B3) a slit formed between one side of the washer and the hole; and



(B4) at least one Josephson junction by which portions of the washer at each side of the slit are connected across the slit;

wherein said superconducting flux transformer comprises:

(C1) an input coil arranged on the SQUID but isolated from the SQUID; and

(C2) a pickup coil arranged on the principal surface of the substrate far from the SQUID,

the pickup coil and the input coil being connected in parallel so that magnetic flux that penetrates the pickup Soil is transferred to the input coil so that the magnetic flux penetrates the SQUID; and wherein said magnetic shield covers the Josephson junction of the SQUID to exclude flux from the input coil from penetrating into the Josephson junction of the SQUID.

5,465,050

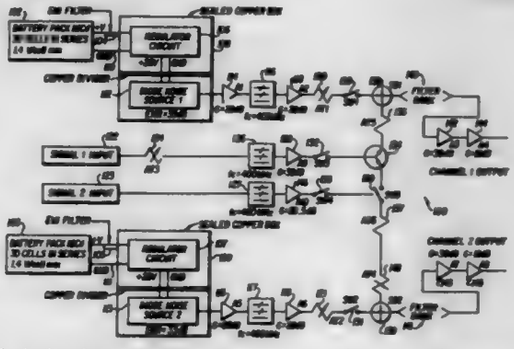
DYNAMIC RANGE TESTER

Anne M. P. Marinelli, Laurel, and Michael S. Patterson, Olney, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 13, 1994, Ser. No. 275,692

Int. Cl.[6] G01R *17/04*

U.S. Cl. 324—603 8 Claims



1. A signal-to-noise generator for use in evaluating the dynamic range of a system, comprising:

a signal input for receiving a user input signal;

a signal splitter connected to said input for creating first and second user input signals from said user input signal;

first and second noise signal generating means for generating first and second noise signals; and

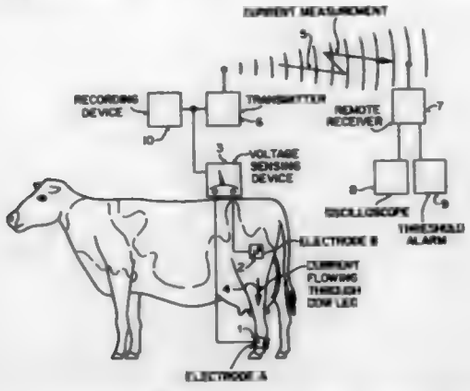
first and second combining means for combining said respective first user input and first noise signals and said second user input and second noise signals to form respective first and second output signals for use in evaluating the dynamic range of a system.

5,465,051

FOUR-TERMINAL RESISTOR METHOD FOR MEASURING ELECTRIC CURRENT IN COWS

Martin H. Graham, Berkeley, Calif., assignor to And Yet, Inc., Berkeley, Calif.

Filed Apr. 15, 1994, Ser. No. 228,148
Int. Cl.[6] G08B 21/00
U.S. Cl. 324—713 13 Claims



6. A method for measuring an electric current flowing through a cow, the electric current entering the cow at an entry location and leaving the cow at an exit location, the method comprising the steps of:

attaching first and second electrodes to the cow, the first and second electrodes forming a conductive path and located between the entry and exit locations;

establishing an electrical resistance of the conductive path by applying a calibration current through the conductive path, measuring a calibration voltage drop across the conductive path, and establishing the electrical resistance by dividing the calibration voltage by the calibration current;

monitoring a voltage drop between the first and second electrodes; and

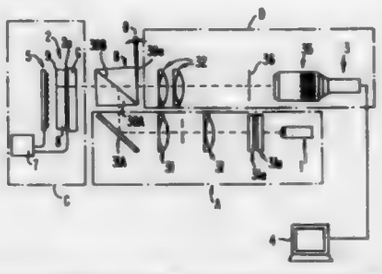
determining the electric current by dividing the voltage drop by the electrical resistance.

5,465,052

METHOD OF TESTING LIQUID CRYSTAL DISPLAY SUBSTRATES

Francois J. Henley, Los Gatos, Calif., assignor to Photon Dynamics, Inc., Milpitas, Calif.

Filed Sep. 10, 1991, Ser. No. 757,460
Int. Cl.[6] G01R 31/02; G09G 3/36
U.S. Cl. 324—770 19 Claims



1. A computer aided apparatus for testing a liquid crystal display base plate comprising:

means for applying a predetermined voltage to the gate or base leads of the pixel elements located on the liquid crystal display plate under test;

means for applying a predetermined voltage to the source or supply leads of the pixel elements located on the liquid crystal display base plate under test;

means for irradiating the liquid crystal display base plate with a beam of light, said beam of light being coherent and uniform;

means for modulating said beam of light, the magnitude of said modulation being proportional to the voltage appearing on the gate or base lead and/or source or supply lead;

means for directing said beam of light to and from said modulation means; and

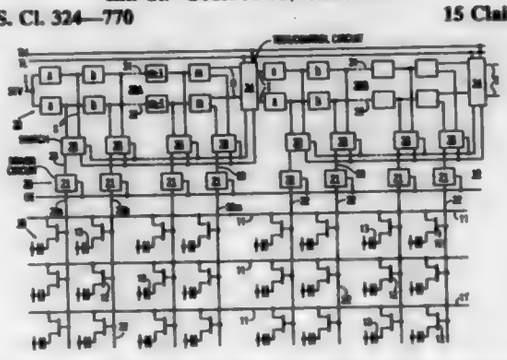
means for measuring the intensity of said beam of light after it has been modulated by said modulation means.

5,465,053

ELECTRONIC DRIVE CIRCUITS FOR ACTIVE MATRIX DEVICES, AND A METHOD OF SELF-TESTING AND PROGRAMMING SUCH CIRCUITS

Martin J. Edwards, Crawley, United Kingdom, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1993, Ser. No. 121,651
Claims priority, application United Kingdom, Sep. 18, 1992, 9219836
Int. Cl.[6] G01R 31/02; G09G 3/18
U.S. Cl. 324—770 15 Claims



1. An electronic drive circuit for an active matrix device comprising:

a plurality of circuit blocks each having a block output for supplying an output signal for the active matrix device,

at least first and second parallel circuit paths in each circuit block to provide redundancy by alternative routing through the circuit block,

an output switch connecting the parallel circuit paths of each circuit block to its respective block output for selecting which of the parallel circuit paths provides the output signal from the circuit block,

a test and control arrangement coupled to the circuit blocks by a circuit path input from one of the parallel circuit paths and via a control output to said output switch, the test and control arrangement having a test input for a test signal for electrically testing at least one parallel circuit path of the circuit block, an internal switch responsive to the electrical testing for electrically switching the test and control arrangement so as to generate a control signal at said control output thereby to select, via the output switch, which of the parallel circuit paths is to provide at the block output the output signal for the active matrix device.

5,465,054

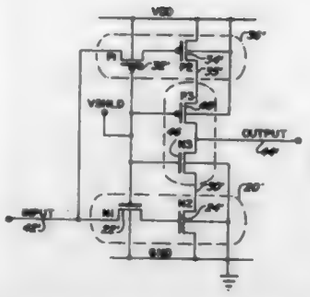
HIGH VOLTAGE CMOS LOGIC USING LOW VOLTAGE CMOS PROCESS

Richard A. Erhart, Chandler, Ariz., assignor to Vivid Semiconductor, Inc., Tempe, Ariz.

Filed Apr. 8, 1994, Ser. No. 224,762
Int. Cl.[6] H03K 17/10
U.S. Cl. 326—34 25 Claims

1. A CMOS integrated circuit transistor configuration for allowing operation at relatively higher power supply voltages, comprising in combination:

a. first and second power supply conductors adapted to receive first and second power supply voltages, the magnitude of the



difference between the first and second power supply voltages corresponding to a predetermined operating voltage;

b. a first shielding voltage conductor adapted to receive a first shielding voltage, the first shielding voltage being approximately midway between the first and second power supply voltages;

c. an input terminal for receiving an input signal;

d. a first CMOS transistor having source, drain and gate terminals, the drain terminal of said first CMOS transistor being coupled to said input terminal, and the gate terminal of said first CMOS transistor being coupled to said first shielding voltage conductor;

e. a second CMOS transistor having source, drain and gate terminals, said second CMOS transistor operating reliably only when the voltage applied across its gate and source terminals is less than said predetermined operating voltage, the gate terminal of said second CMOS transistor being coupled to the source terminal of said first CMOS transistor, the source terminal of said second CMOS transistor being coupled to one of said first and second power supply conductors; and

f. an output terminal for providing an output signal, said output terminal being coupled to the drain terminal of said second CMOS transistor.

5,465,055

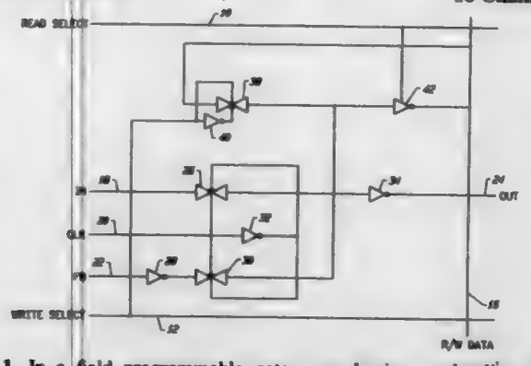
RAM-LOGIC TILE FOR FIELD PROGRAMMABLE GATE ARRAYS

Michael G. Ahrens, Sunnyvale, Calif., assignor to Crosspoint Solutions, Inc., Santa Clara, Calif.

Filed Oct. 19, 1994, Ser. No. 325,714

Int. Cl.[6] H03R *19/177*

U.S. Cl. 326—41 **16 Claims**



1. In a field programmable gate array having a plurality of conducting lines in a first direction and a plurality of conducting lines in a second direction perpendicular to said first direction; an array of circuit blocks located at the intersections of said first and second direction conducting lines and connected to said conducting lines; and a plurality of wiring segments connecting said circuit blocks, said wiring segments interconnectable through programmable antifuses so that each block is configured to perform a memory function or a logic function; each of said circuit blocks comprising:

five input terminals, said first, second and third input terminals each connected to one of said wiring segments and said fourth and fifth input terminals each connected to one of two said first direction conducting lines;

a bidirectional terminal coupled to a second direction conducting line;

an output terminal coupled to a wiring segment;

a multiplexer having first and second inputs, a control input, and an output, said first input being coupled to said first input terminal, said second input being coupled to said second input terminal, said control input being coupled to said third input terminal, and said output coupled to said output terminal through an output node;

a transmission gate, responsive to said fourth input terminal, coupled to said bidirectional terminal and to said output node; and

a tri-state output, responsive to said fifth input terminal, having an input and an output, said input coupled to said output node and said output coupled to said bidirectional terminal.

5,465,056

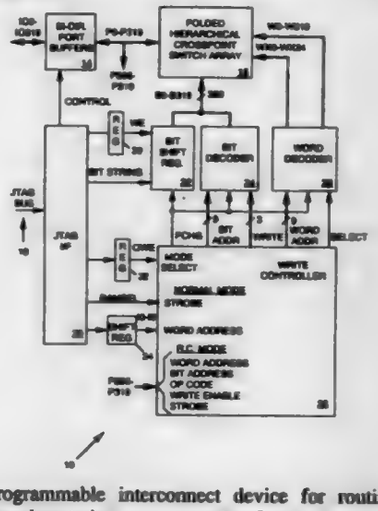
APPARATUS FOR PROGRAMMABLE CIRCUIT AND SIGNAL SWITCHING

Wen-Jai Hsieh; Chi-Song Horng, and Chun C. D. Wong, all of Palo Alto, Calif., assignors to I-Cube, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 269,794, Jun. 30, 1994. This application Nov. 2, 1994, Ser. No. 333,524

Int. Cl.[6] H03K *19/0175*

U.S. Cl. 326—41 **23 Claims**



1. A programmable interconnect device for routing signals between signal ports in response to data from an external controller, the device comprising:

switch means

having a plurality of said signal ports,

having memory means for storing a set of data bits, each data bit having a state indicating whether said switch means is to convey a signal between a separate pair of said signal ports associated with said data bit, and

having means for conveying signals between each pair of signal ports when indicated by the state of the data bit associated with said pair of signal ports; and

programming means

for receiving said set of data bits in serial form from said external controller and storing the received set of data bits in said memory means,

for receiving a multiple bit parallel data word from said external controller, said parallel data word identifying a particular bit of said set of data bits stored in said memory means and indicating a state to which said particular bit is to be set, and

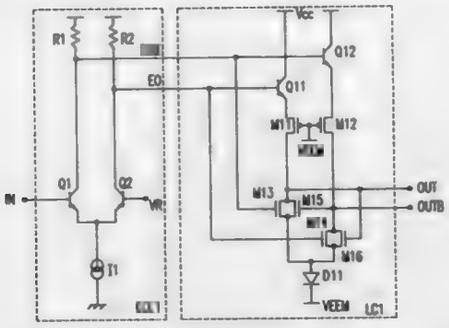
for setting said particular bit stored in said memory means to the indicated state.

5,465,057

LEVEL CONVERSION CIRCUIT FOR SIGNAL OF ECL-LEVEL

Hiroyuki Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 22, 1994, Ser. No. 231,059
Claims priority, application Japan, Apr. 23, 1993, 5-096360
Int. Cl.[6] H03L 19/0175
U.S. Cl. 326—66 8 Claims



1. A level conversion circuit for convening a first signal having a first amplitude into a second signal having a second amplitude that is larger than said first amplitude, said circuit comprising:

an input node supplied with said first signal,

an output node from which said second signal is derived,

a first voltage line,

a second voltage line,

a first transistor of a bipolar type having a base connected to said input node,

a collector connected to said first voltage line and an emitter,

a second transistor of a field effect type and of a first channel type having a source-drain path connected between the emitter of said first transistor and said output node and a gate supplied with a bias voltage,

a third transistor of a field effect type and of a second channel type opposite to said first channel type having a source-drain path connected between said output node and said second voltage line and a gate supplied with an inverted signal of said first signal,

a fourth transistor of a field effect type and of said second channel type having a source-drain path connected in parallel to the source-drain path of said third transistor and a gate supplied with an inverted signal of said second signal.

5,465,058

GRAPHICS SYSTEM INCLUDING AN OUTPUT BUFFER CIRCUIT WITH CONTROLLED MILLER EFFECT CAPACITANCE

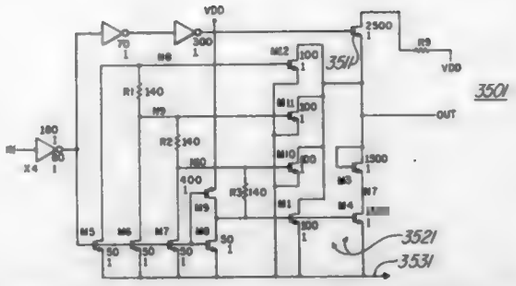
William R. Krenik, Garland, and Louis J. Izzi, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 127,213, Sep. 27, 1993, Pat. No. 5,365,126, which is a division of Ser. No. 647,614, Jan. 24, 1991, Pat. No. 5,274,284. This application Nov. 14, 1994, Ser. No. 339,057
Int. Cl.[6] H03K 19/0175;19/094
U.S. Cl. 326—83 16 Claims

1. A computer graphics system comprising:

a digital computer;

a video memory connected to said digital computer and operable to store color codes for information in a video image; and



a palette device, said palette device including clock control circuitry and a clock buffer coupled to said clock control circuitry, said clock buffer having first and second supply rails and comprising:

a source follower output field effect transistor having a source coupled to an output line and further having a drain;

a voltage dropping circuit connected between the drain of the source followed output field effect transistor and the first supply rail, said voltage dropping circuit for introducing a controlled amount of Miller effect capacitance in the source follower output field effect transistor;

a common source output transistor connected to the second supply rail; and

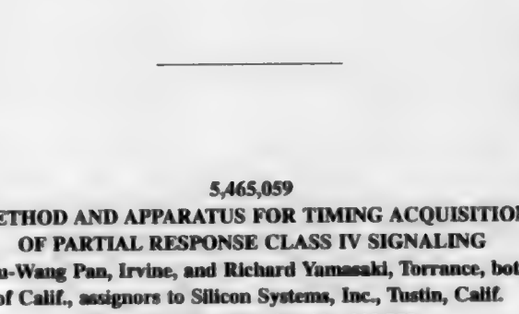
a diode coupled between the common source output transistor and the source of said source follower output field offset transistor.

5,465,059

METHOD AND APPARATUS FOR TIMING ACQUISITION OF PARTIAL RESPONSE CLASS IV SIGNALING

Tzu-Wang Pan, Irvine, and Richard Yamasaki, Torrance, both of Calif., assignors to Silicon Systems, Inc., Tustin, Calif.

Filed Apr. 18, 1994, Ser. No. 228,758
Int. Cl.[6] G01R 29/00
U.S. Cl. 327—12 23 Claims



1. A phase detector comprising:

quantizing means coupled to an input signal, said quantizing means outputting a quantized signal X;

logic means coupled to said quantizing means and receiving said quantized signal, said logic means providing as output a prediction signal, said logic means receiving as input first and second previous prediction signals X_n and X_{n-1}, said prediction signal having a value dependent on said first and second previous prediction signals and said quantized signal X.

5,465,060

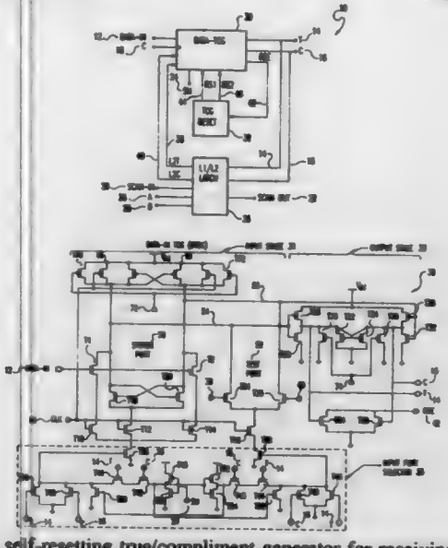
FAST EDGE TRIGGERED SELF-RESETTING CMOS RECEIVER WITH PARALLEL L1/L2 (MASTER/SLAVE) LATCH

Antonio R. Pelella, Highland Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 10, 1994, Ser. No. 257,852

Int. Cl.[6] H03K *5/153*

U.S. Cl. 327—51 **7 Claims**



1. A self-resetting true/compliment generator for receiving data from single-ended input signal and generating full logic level true and compliment data signals, comprising:

an input stage comprising:

a system port having a single-ended input for receiving a data signal into a complementary transistor current switch for creating true and compliment data signals from said data signal; and

a test port for receiving true and compliment data signals from a memory;

an output stage, connected to said input stage, having amplifying means for amplifying said true and compliment data signals to full high or low logic levels;

input port selector means for enabling said system port or said test port to drive said output stage, said input port selector having means for disabling said system port and said test port when said output stage outputs true and compliment data signals; and

self-resetting means, connected between said output stage and said input stage, for resetting said input stage and said output stage when said output stage outputs true and compliment data signals.

5,465,061

LOW-CONSUMPTION LOW-NOISE CHARGE-PUMP CIRCUIT

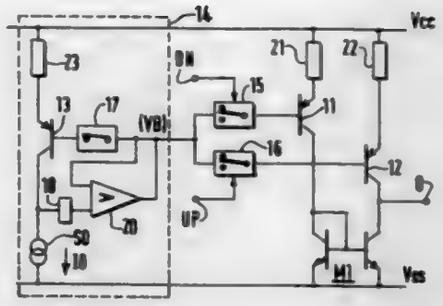
Yves Dufour, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1994, Ser. No. 201,581

Claims priority, application France, Mar. 3, 1993, 93 02464

Int. Cl.[6] H03K *17/66*

U.S. Cl. 327—112 **21 Claims**



1. A charge-pump circuit comprising: a first supply terminal and a second supply terminal, a first current source and a second current source of similar construction coupled to the first and second supply terminals so that currents supplied to the second supply terminal from the first and second current sources are nominally identical, said current sources being activated independently and with a cyclic activation by down and up control signals, a current mirror having an input branch in a connection between the first current source and the second supply terminal and having an output connected to an output of the second current source to form an output terminal of the charge-pump circuit, wherein the first and the second current source essentially comprise a first and a second transistor, respectively, a control electrode of each of said transistors being coupled to an output of a reference voltage generator common to the two transistors via a first transistor switch, controlled by the down signal, for the first transistor, and via a second transistor switch, controlled by the up signal, for the second transistor, and the reference voltage generator comprises a third transistor of a construction similar to that of the first and second transistors, a reference current source connected in series with the third transistor, and means for making current through the third transistor equal to current of said reference current source, a control electrode of the third transistor carrying a reference voltage to be applied to the control electrodes of the first and the second transistors.

5,465,062

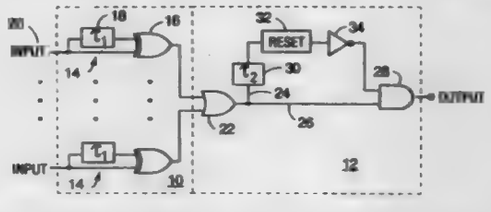
TRANSITION DETECTOR CIRCUIT

Vincent L. Fong, Fremont, Calif., assignor to Rohm Corporation, San Jose, Calif.

Continuation of Ser. No. 68,831, May 28, 1993, abandoned, which is a continuation of Ser. No. 806,976, Dec. 12, 1991, abandoned, which is a continuation of Ser. No. 516,751, Apr. 30, 1990, abandoned. This application Feb. 3, 1994, Ser. No. 191,361

Int. Cl.[6] H03K *3/07;17/296;* **H03H** *11/26*

U.S. Cl. 327—172 **24 Claims**



1. An apparatus for detecting a transition between logic states in a plurality of digital signals comprising

a plurality of input means each receiving one of the plurality of digital signals, each for generating a first pulse having a first predetermined pulsewidth when a transition occurs in the digital signal received by the input means;

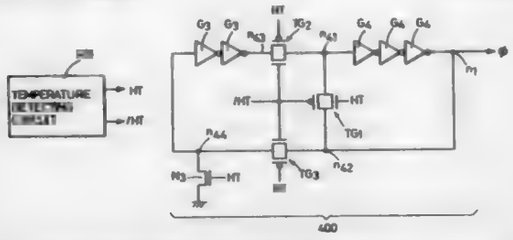
output means responsive to the first pulse from any one of the input means for generating a second pulse having a second predetermined pulsewidth which is less than the first predetermined pulsewidth.

5,465,063

PULSE GENERATING CIRCUIT WITH TEMPERATURE COMPENSATION

Tatsuya Fukuda; Shigeru Mori; Masanori Hayashikoshi, and Seiji Sawada, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1993, Ser. No. 49,398
Claims priority, application Japan, Aug. 7, 1992, 4-211678
Int. Cl.[6] H03L *1/02*
U.S. Cl. 327—512 10 Claims



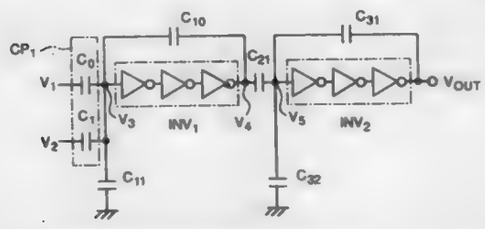
1. A pulse signal generating circuit comprising:
signal generating means for generating a pulse signal at a pulse period;
temperature detecting means for detecting an operation temperature and producing a detection signal therefrom; and
control means for controlling the pulse period of the pulse signal, which is generated by said signal generating means in response to said detection signal supplied from said temperature detecting means, wherein
said signal generating means includes a plurality of inverters, which are mutually connected in a ring form,
said control means includes switch means for selectively forming a ring oscillator formed of said plurality of inverters, or formed of some of said plurality of inverters, in response to said detection signal supplied from said temperature detecting means,
said temperature detecting means is operable to generate the detection signal at a first state when an operation temperature is higher than a predetermined temperature, and to generate the detection signal at a second state when the operation temperature is lower than a predetermined temperature,
said switch means includes a first transfer gate which is connected after a first set of adjacent inverters at a first node and before a second set of adjacent inverters at a second node, and
said first transfer gate being responsive to said detection signal at said first state to be turned on, and responsive to said detection signal at said second state to be turned off.

5,465,064

WEIGHTED SUMMING CIRCUIT

Guoliang Shou; Weikang Yang; Sunao Takatori, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan Inc., and Sharp Corporation, both of Tokyo, Japan

Filed Feb. 3, 1994, Ser. No. 190,926
Claims priority, application Japan, Feb. 4, 1993, 5-040424
Int. Cl.[6] H03K *12/00*
U.S. Cl. 327—361 4 Claims



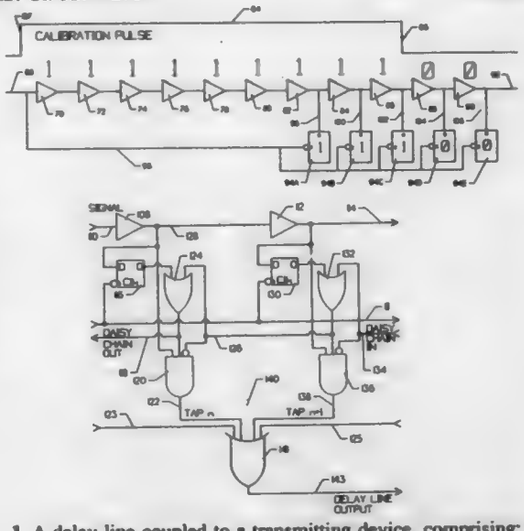
1. A weighted summing circuit comprising:
a capacitive coupling having a plurality of inputs and an output, each input receiving one of a plurality of input voltages, said capacitive coupling generating a weighted sum of said plurality of input voltages;
a first inverter connected to said output of said capacitive coupling, said first inverter having a first inverter input and a first inverter output;
a first feedback capacitance connected between said first inverter input and said first inverter output;
a connecting capacitance having a first terminal connected to said first inverter output, and a second terminal;
a second inverter having a second inverter input connected to said second terminal of said connecting capacitance, and a second inverter output;
a second feedback capacitor connected between said second inverter output and said second inverter input;
a first grounding capacitor connected between said first inverter input and ground; and
a second grounding capacitor connected between said second inverter input and ground,
wherein the closed loop gains of said first inverter and said second inverter are substantially equal.

5,465,065

GATE COMPENSATION DELAY AND DELAY LINES

Rick Stevens, Apple Valley, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 31, 1993, Ser. No. 40,480
Int. Cl.[6] H03H *11/26*
U.S. Cl. 327—276 6 Claims

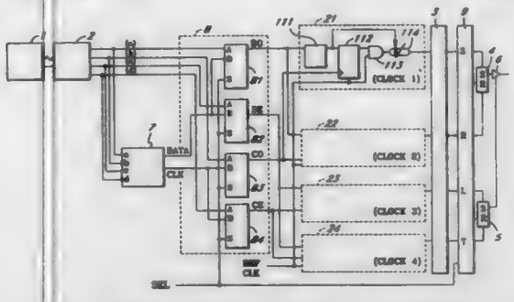


1. A delay line coupled to a transmitting device, comprising:
a. a plurality of digital gates coupled in series wherein a signal applied to a first of said plurality of digital gates cascades through said plurality of digital gates at a rate determined by an average propagation delay of each of said plurality of digital gates, each of said plurality of digital gates having an output;
b. a plurality of taps, each one of the plurality of taps being electrically coupled to a corresponding one of the outputs of said plurality of digital gates;
c. a multiplexer for selecting a delay by selecting a one of said plurality of taps; and
d. a register coupled to said multiplexer for storing a value to control said multiplexer to select said one of said plurality of taps, the value being defined by the transmitting device;
f. a means responsively coupled to said register for setting said value defined by said transmitting device, wherein said setting means comprises a multiplexer for switching a pulse provided by said transmitting device into said first of said plurality of digital gates.

5,465,066
WAVEFORM FORMATTER

Kazuhiro Yamashita, Kazo; Toshiyuki Negishi, Ouura; Masatoshi Sato, and Hiroshi Tsukahara, both of Gyoda, all of, Japan, assignors to Advantest Corporation, Tokyo, Japan

Filed Sep. 21, 1994, Ser. No. 310,162
Claims priority, application Japan, Sep. 21, 1993, 5-055709 U
Int. Cl.[6] H03K *1/04;11/00*
U.S. Cl. 327—294 **5 Claims**

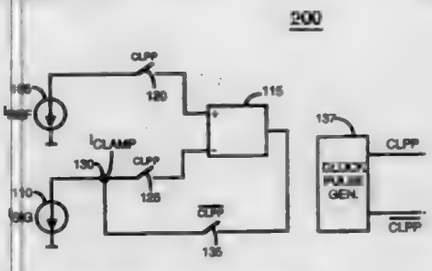


1. A waveform formatter for generating test signals for semiconductor devices, comprising:
- a reference clock generator for generating a reference clock for said waveform formatter;
- an interleave circuit for generating a plurality of clock signals and a plurality of data in a parallel form on the basis of said reference clock;
- a parallel-serial convertor for converting a parallel signal to a serial signal;
- a data selector for selecting signals either from said interleave circuit or said parallel-serial convertor;
- a plurality of clock generators for generating clock signals based on the signals from said data selector;
- a waveform combining circuit for generating waveforms by multiplexing said clock signals from said clock generators.

5,465,067
CURRENT CLAMPING CIRCUIT

David J. Anderson, Ahwatukee, Ariz., assignor to Samsung Semiconductor, Inc., San Jose, Calif.

Filed May 13, 1994, Ser. No. 242,203
Int. Cl.[6] H03K *5/08*
U.S. Cl. 327—322 **16 Claims**

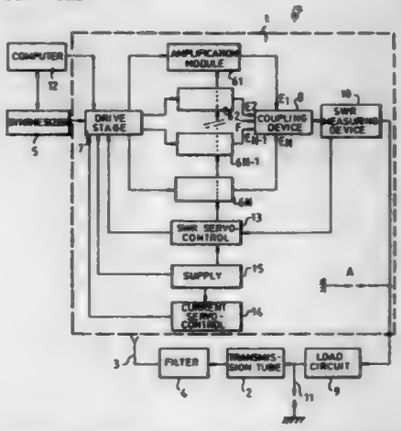


1. A current clamping circuit comprising:
- a current signal input terminal to which an input current signal is provided;
- a reference current input terminal to which a reference current signal is provided;
- a clock signal generator which generates a clock signal exhibiting first and second logic levels:
- a current differencing circuit, coupled said clock signal generator and to the current signal input terminal and the reference signal input terminal, for determining the current difference between the input current signal and the reference current signal while the clock signal exhibits the first logic level, the current differencing device including an output terminal at which the current difference is generated; and
- a summing circuit, coupled said clock signal generator and to the output terminal of the current differencing circuit and to the current signal input terminal, for summing the current difference with the input current signal while the clock signal exhibits the second logic level to clamp the input current signal to the reference current signal.

5,465,068
EXCITATION STAGE OF A TRANSMISSION TUBE FOR SHORT-WAVE TRANSMITTER

Bernard Darges, St Leu la Foret, France, assignor to Thomson-CSF, Puteaux, France

Continuation of Ser. No. 79,821, Jun. 22, 1993, abandoned. This application Feb. 21, 1995, Ser. No. 391,269
Claims priority, application France, Jun. 26, 1992, 92-07884
Int. Cl.[6] G01S *13/44*
U.S. Cl. 327—323 **8 Claims**



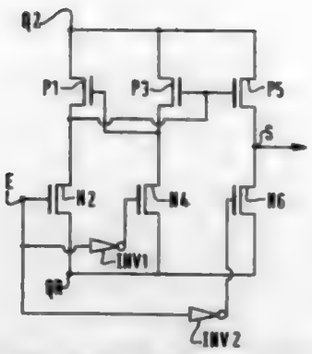
1. An excitation stage of a transmission tube for a short-wave transmitter, comprising:
- a predetermined number of semiconductor-based amplification modules parallel-connected at the input of a coupling device to couple the outputs of the amplification modules to the input of the transmission tube, the coupling device including a diode-based limiter device for limiting voltage pulses output from said coupling device which are capable of short-circuiting electrodes of the transmission tube,
- a driving stage which includes a PIN diode attenuator,
- a standing wave ratio servo control circuit coupled at the output of the excitation state, and a current servo control circuit, for controlling the PIN diode attenuator and diminishing the gain of the excitation state for protecting the excitation stage against mismatching of the transmission tube with the excitation state and against over-excitation of the driving circuit.

5,465,069
INTERFACE CIRCUIT AND VOLTAGE-RAISING CIRCUIT INCLUDING SUCH A CIRCUIT

Marc Boiron, Bieville-Beuville, and Stéphane Bouvier, Langrune/Mer, both of, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1994, Ser. No. 269,808
Claims priority, application France, Jun. 30, 1993, 93 08004
Int. Cl.[6] H03K *17/10;19/0185*
U.S. Cl. 327—333 **11 Claims**

1. An interface circuit which is responsive to a signal applied to its input that varies between a reference level (VR) available on a first terminal and a first voltage level (Vl) to deliver an output signal varying between reference level (VR) and a second voltage level (V2) such that the excursion of the output signal is greater



than or equal to that of the input signal, the second voltage level (V2) being available on a second terminal, said interface circuit comprising:

a first branch comprising a first and a second mutually complementary transistor, which each have a first and a second main electrode and a control electrode, the first main electrode/second main electrode and second main electrode/first main electrode paths being connected in series between the first and second terminals, a second branch comprising a third and a fourth mutually complementary transistor which each have a first and a second main electrode and a control electrode, the first main electrode/second main electrode and second main electrode/first main electrode paths being connected in series between the first and second terminals, the control electrodes of the first and third transistors of the first and of the second branches being connected respectively to the second main electrodes of the third and first transistors of the second and of the first branch,

a first inverter module having an input coupled to the input of the interface circuit and to the control electrode of the second transistor of the first branch and an output coupled to the control electrode of the fourth transistor of the second branch,

a third branch comprising a fifth and a sixth mutually complementary transistor which are of large dimension with respect to the transistors of the second branch and whose first main electrode/second main electrode and second main electrode/first main electrode paths are coupled in series between said first and second terminals, the second main electrode of the fifth transistor of the third branch constituting an output of the interface circuit, and its control electrode being coupled to that of the third transistor in the second branch,

and a second inverter module having an input coupled to the input of the interface circuit and an output coupled to the control electrode of the sixth transistor of the third branch, the response times of the first and second inverter modules being chosen such that the fifth and sixth transistors of the third branch are never on at the same instant.

5,465,070

LOGARITHMIC TRANSFORMATION CIRCUITRY FOR USE IN SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES

Mikio Koyama, Kawasaki, and Tadashi Arai, Tokyo, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 4, 1992, Ser. No. 986,043

Claims priority, application Japan, Dec. 5, 1991, 3-321873; Jul. 21, 1992, 4-194001; Jul. 31, 1992, 4-205486

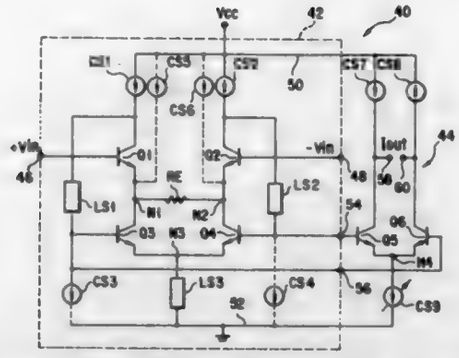
Int. Cl.[6] G06G *7/12*

U.S. Cl. 327—350 **5 Claims**

1. A logarithmic transformation circuit comprising:

a pair of first and second transistors each having first and second current carrying electrodes and a control electrode, the control electrodes of said first and second transistors being coupled to input terminals of said circuit;

third and fourth transistors coupled to said first and second transistors, said third and fourth transistors having control



electrodes serving as output terminals of said logarithmic transformation circuit, first current carrying electrodes connected at first and second nodes to the second current carrying electrodes of said first and second transistors, and second current carrying electrodes coupled to a ground potential;

an impedance element connected between said first and second nodes;

first and second level-shift circuits connected to said first current carrying electrodes of said first and second transistors and to said control electrodes of said third and fourth transistors; and

a first current source section connected between said control electrodes of said third and fourth transistors and a ground potential.

5,465,071

INFORMATION SIGNAL PROCESSING APPARATUS

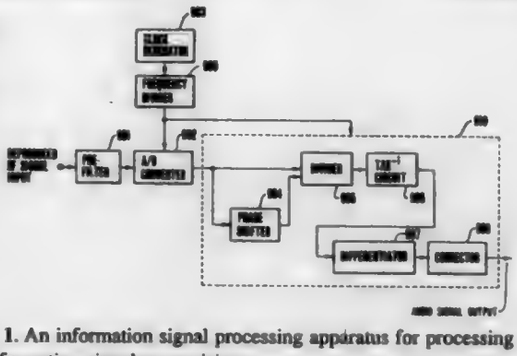
Takashi Kobayashi, Tokyo, and Shinichi Hatae, Kanagawa, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 88,775, Jul. 8, 1993, abandoned. This application Jan. 27, 1995, Ser. No. 379,035

Claims priority, application Japan, Jul. 13, 1992, 4-185259; Jul. 13, 1992, 4-185260; Jul. 13, 1992, 4-185264

Int. Cl.[6] H03D *3/00*

U.S. Cl. 329—315 **19 Claims**



1. An information signal processing apparatus for processing an information signal, comprising:

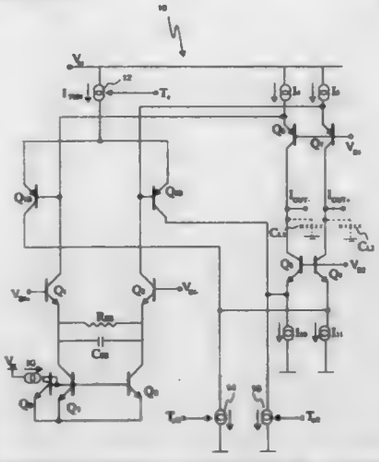
(A) sampling means for receiving as its input a frequency-modulated information signal having a predetermined frequency band, forming a sample pulse signal by sampling the input frequency-modulated information signal in accordance with a clock signal having a first frequency representative of a sub-Nyquist frequency of the input frequency-modulated information signal, and outputting the sample pulse signal; and

(B) sample pulse signal computing processing means for performing computing processing of the sample pulse signal outputted from said sampling means, in accordance with the clock signal having the first frequency.

5,465,072
TUNABLE OPERATIONAL TRANSCONDUNCTANCE AMPLIFIER HAVING HIGH LINEARITY

Mojtaba Atarodi, Santa Clara, Calif., assignor to Linear Technology Corporation, Milpitas, Calif.

Filed Aug. 5, 1994, Ser. No. 286,526
Int. Cl.[6] H03G *3/30*; H03F *3/45*
U.S. Cl. 330—254 **11 Claims**



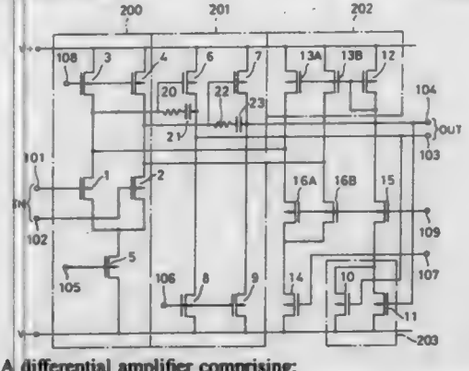
1. In an amplifier including an input stage for receiving an input signal and an output stage, a tuning circuit comprising:

a differential gain stage for varying transconductance gain of said amplifier over a predefined tuning range in response to a tuning current provided thereto, said differential gain stage being connected between said input and output stages wherein said output stage includes first and second tuning circuit transistors connected in parallel to said differential gain stage.

5,465,073
DIFFERENTIAL AMPLIFIER ADAPTED TO BE INTEGRATED IN C-MOS MONOLITHIC IC

Noritoshi Satoh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 12, 1994, Ser. No. 289,746
Claims priority, application Japan, Aug. 25, 1993, 5-232284
Int. Cl.[6] H03F *3/45*
U.S. Cl. 330—258 **6 Claims**



1. A differential amplifier comprising:

an input stage differential amplifier circuit for amplifying a differential input signal;

an output stage differential amplifier circuit taking the differential output of said input stage differential amplifier as a differential input;

first and second common-mode current generating transistors receiving differential outputs of said output stage differential amplifier circuit at respective controlling electrodes and generating common-mode currents corresponding to the received differential outputs;

a current mirror circuit inputting a composite current of the common-mode current generated by said first and second common-mode current generating transistors; and

composing means for feeding back a current corresponding to an output mirror current of said current mirror circuit to a constant current source of said input stage differential amplifier circuit and composing therewith,

said composing means including reference current generating transistor having a controlling electrode applied with a constant bias, and a differential current of the reference current and said output mirror current being fed back to the constant current source of said input stage differential amplifier circuit for composition,

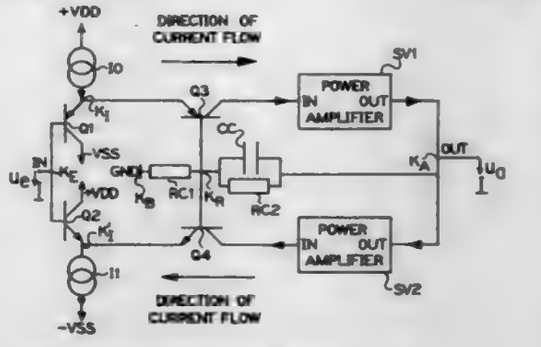
wherein said input stage differential amplifier circuit comprises a first pair of differential transistors supplied with the differential input signal at controlling electrodes, a constant current transistor supplying an operation current for said first pair of differential transistors, and a pair of load transistors connected between an output electrode of said first pair of differential transistors and a first power source and serving as active loads for said first pair of differential transistors; and

said output stage differential amplifier circuit comprises a second pair of differential transistors supplied with the differential outputs of said input stage differential amplifier circuit at controlling electrodes thereof and having a common electrode connected to said first power source, and a pair of load transistors connected between said second pair of differential transistors and a second power source and serving as active loads for said second pair of differential transistors.

5,465,074
AMPLIFIER OUTPUT STAGE

Martin Maschmann, Duisburg; Werner Schardein, Kamp-Lintfort, and Bedrich Hosticka, Duisberg, all of, Germany, assignors to Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.v., and Siemens Aktiengesellschaft, both of Munich, Germany

Filed Jun. 17, 1994, Ser. No. 261,441
Claims priority, application Germany, Jun. 17, 1993, 43 20 061.3
Int. Cl.[6] H03F *3/26*
U.S. Cl. 330—263 **14 Claims**



1. An amplifier output stage, comprising:

first and second complementary amplifiers with asymmetrical characteristics and having inputs and outputs;

first and second power amplifiers having inputs respectively connected to the outputs of the first and second complementary amplifiers and having outputs connected to an output node of the amplifier output stage;

a feedback network connected between the output node and a reference potential node, the feedback network being formed by an ohmic divider having a divider node that defines a feedback node;

a respective first input of the first and second complementary amplifiers connected to an input node of the amplifier output stage and a respective second input of the first and second complementary amplifiers connected to the feedback node;

the first and second complementary amplifiers being complementary transconductance amplifiers each having first and second inputs and said output and having an asymmetrical characteristic of their output current relative to the voltage pending at their inputs given opposite directions of current flow of their output currents;

the output current of one transconductance amplifier of the first and second complementary amplifiers having only positive values and increasing with increasing positive input voltage, and having a positive value for an input voltage of zero and decreasing with increasing negative input-voltage;

the output current of the other transconductance amplifier of the first and second complementary amplifiers having only negative values and increasing with increasing negative input voltage, and having a negative value for an input voltage of zero and decreasing with increasing positive input voltage; and.

a compensation capacitor connected in parallel to one of the resistors of the voltage divider between the feedback node and the output node.

5,465,075

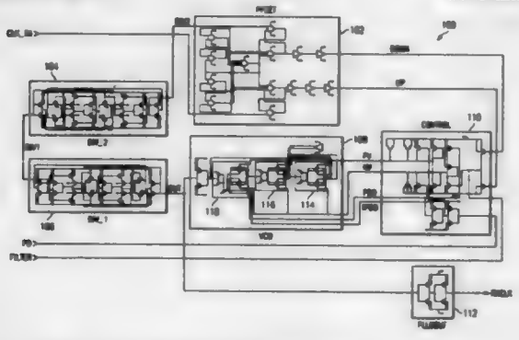
PHASE-LOCKED LOOP CIRCUIT WITH MINIMUM OUTPUT JITTER AND MAXIMUM FREQUENCY STABILITY

Daniel A. Yaklin, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 3, 1994, Ser. No. 176,616

Int. Cl.[6] H03L *7/089*

U.S. Cl. 331—8 **10 Claims**



1. A phase-locked loop circuit, comprising:

phase detector circuitry operable to detect a phase difference between a first input signal and a second input signal and generate an error signal responsive to said phase difference;

control voltage generating circuitry operable to generate a control signal responsive to said error signal;

oscillator circuitry including at least one delay circuit and operable to generate a high frequency signal responsive to said control signal, said high frequency signal providing at least one of said first and second input signals; and

power down circuitry connected to said control voltage circuitry and said at least one delay circuit and operable to prevent current drawn from said control voltage circuitry and said at least one delay circuit during a power down mode of operation of said phase-locked loop circuit.

5,465,076

PROGRAMMABLE DELAY LINE PROGRAMMABLE DELAY CIRCUIT AND DIGITAL CONTROLLED OSCILLATOR

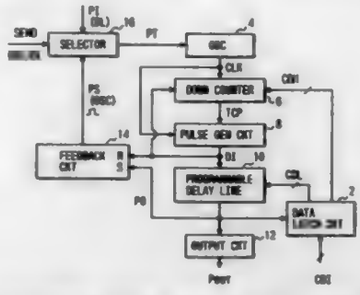
Shigenori Yamauchi, Kariya, and Takamoto Watanabe, Nagoya, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 956,955, Oct. 2, 1992, Pat. No. 5,331,294. This application Aug. 25, 1993, Ser. No. 111,488

Claims priority, application Japan, Jan. 4, 1991, 3-258039; Aug. 26, 1992, 4-227492

Int. Cl.[6] H03B *28/00;* **H03K** *5/14;5/159*

U.S. Cl. 331—179 **17 Claims**



1. A programmable delay line comprising a plurality of delay stages connected in series, each of said delay stages including:

a basic path for passing an input signal;

a delay path for passing said input signal with a predetermined delay time; and

a selector for selecting either of said basic path or said delay path to pass said input signal in accordance with digital data externally inputted, wherein a difference in the times for passing said input signal through said basic path and through said delay path in each of said plurality of delay stages is UD.2" (n=0, 1, 2, 3 . . .), said UD being a possible minimum time difference between passing of said input signal through said basic path and through said delay path in each of said plurality of delay stages and said n being the number of the respective one of said delay stages, wherein at least said delay path comprises a delay means for providing said difference, wherein said delay means comprises one or more inverting circuits, and wherein said basic path in the last of said delay stages comprises three first inverting circuits having the same inverting interval and said delay path in the last of said delay stages comprises two of said first inverting circuits and a second inverting circuit having a delay time twice that of said first inverting circuit.

5,465,077

RELAY MODULE

Yasunori Kinoshita, Kunitachi; Shinichi Fujimori, and Keiko Kobayashi, both of Minamitsuru, all of, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP93/01400, § 371 Date May 23, 1994, § 102(e) Date May 23, 1994, PCT Pub. No. WO94/08374, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 29, 1993, Ser. No. 244,275

Claims priority, application Japan, Jan. 7, 1992, 4-268533

Int. Cl.[6] H01H *9/02*

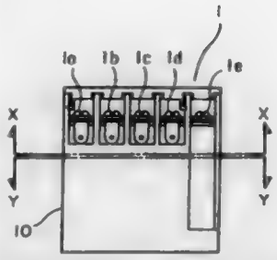
U.S. Cl. 335—132 **4 Claims**

1. A connection device for a numerically controlled machine tool, comprising:

a distribution panel of said numerically controlled machine tool;

an induction motor;

a relay module, including only a case and a plurality of terminal screws for an electromagnetic contactor for said induction motor, mounted on said distribution panel; and



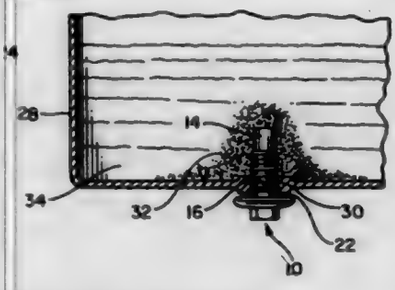
an electromagnetic switch which replaces said relay module to connect said induction motor to said distribution panel and to control a power supply to said induction motor.

5,465,078

MAGNETIC DRAIN BOLT

James D. Jones, Jr., Palatine, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Feb. 23, 1995, Ser. No. 392,522
Int. Cl.[6] H01F *7/02*
U.S. Cl. 335—305 **10 Claims**



1. A magnetic drain bolt comprising:

a bolt body, said bolt body comprising of a male-threaded member and a head member, said male-threaded member having a fastening protuberance formed at an end thereof;

a magnet; said magnet having a recess formed at a bottom end thereof for receipt of said fastening protuberance, said recess having a depth sized equivalent to a height of said fastening protuberance, said magnet having a diameter slightly smaller than a diameter of the male-threaded member; and

attachment means securing said fastening protuberance to the magnet within said recess whereby the fastening protuberance provides additional support for securing the magnet to the bolt body.

5,465,079

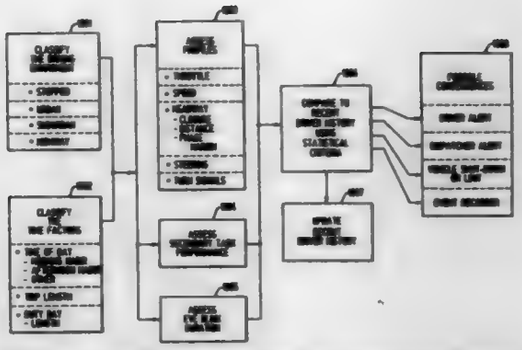
METHOD AND APPARATUS FOR DETERMINING DRIVER FITNESS IN REAL TIME

Paul J. Bouchard, San Diego; Jerry D. Woll, Poway; Bryan D. Woll, Laguna Niguel, and Jimmie R. Asbury, San Diego, all of Calif., assignors to Vorad Safety Systems, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 930,066, Aug. 14, 1992, Pat. No. 5,302,956, and a continuation-in-part of Ser. No. 930,158, Aug. 14, 1992, abandoned. This application Aug. 13, 1993, Ser. No. 106,407
Int. Cl.[6] G08B *21/00*
U.S. Cl. 340—576 **7 Claims**

1. A system for evaluating fitness of a vehicle driver to operate a vehicle, including:

(a) a collision warning apparatus for collecting data relevant to determining the operational state of the vehicle and the driver;



(b) an operational event recorder apparatus coupled to the collision warning apparatus for recording the collected relevant data and recording a driver profile;

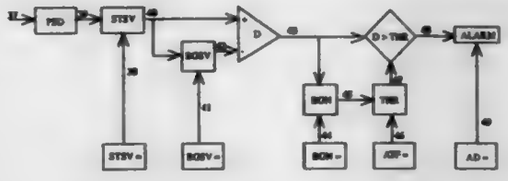
(c) a driver fitness evaluation apparatus coupled to the operational event recorder and the collision warning apparatus for generating the driver profile, and providing a real-time evaluation of the driver's fitness to operate the vehicle by comparing the recorded driver profile with the driver's current performance as indicated by the recorded relevant data.

5,465,080

INFRARED INTRUSION SENSOR

Kevin C. Liddiard, Fairview Park; Brian W. Rice, Rostrevor, and Rodney J. Watson, Para Hills, all of, Australia, assignors to The Commonwealth of Australia, Canberra, Australia

PCT No. PCT/AU93/00093, § 371 Date Sep. 7, 1994, § 102(e) Date Sep. 7, 1994, PCT Pub. No. WO93/18492, PCT Pub. Date Sep. 16, 1993
PCT Filed Mar. 8, 1993, Ser. No. 295,857
Claims priority, application Australia, Mar. 9, 1992, PL1228
Int. Cl.[6] G08B *13/19*
U.S. Cl. 340—567 **15 Claims**



8. The infrared intrusion sensor of claim 1 wherein the signal processing means is comprised of:

an analogue-to-digital converter adapted to convert analogue signals received from the detector to digital signals;

memory means adapted to provide storage of information; and

a digital signal processing module adapted to process digital signals from the analogue-to-digital converter and produce output alarm signals wherein the output alarm signals are one or more of:

Target detection

Target direction of movement;

Near/far field indication;

Sensor identification;

Detection probability.

5,465,081

MULTICOMPONENT WIRELESS SYSTEM WITH PERIODIC SHUTDOWN OF TRANSMITTING AND RECEIVING MODES

Robert E. Todd, Blythe, Great Britain, assignor to Cedar-Dell Limited, Hexham, Great Britain

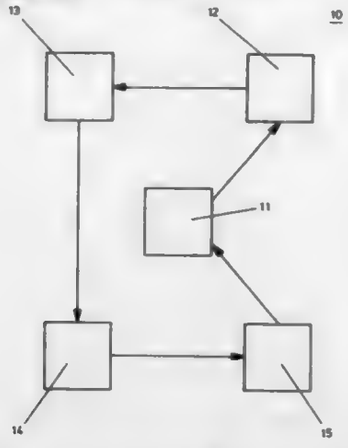
PCT No. PCT/GB91/00323, § 371 Date Oct. 6, 1992, § 102(e) Date Oct. 6, 1992, PCT Pub. No. WO91/14244, PCT Pub. Date Sep. 19, 1991

PCT Filed Mar. 4, 1991, Ser. No. 934,442

Claims priority, application United Kingdom, Mar. 3, 1990, 9004828; Jan. 18, 1990, 9022698; Nov. 1, 1990, 9023736

Int. Cl.[6] H04Q *3/00*; H04J *3/00*

U.S. Cl. 340—825.05 **18 Claims**



1. A communication system comprising a control module, and a plurality of communications modules spaced apart from one another and from the control module wherein each module comprises a short range transceiver capable of transmitting data to and receiving data from another module in the system, and where in use the control module communicates directly with at least one but not all of the communications modules, the communication between the control module and the remainder of the communications modules occurring by consecutive communication between individual communications modules in the system, wherein data received by a module is modified by the module before being transmitting to the next module in sequence, and wherein the data transmitted to the next module controls the output of the next module, wherein immediately before transmitting data, each communications module switches into the receive mode to check whether the airways are clear to avoid interference of transmissions, and wherein each module knows when within any given time slot the module should transmit and receive data such that the module shuts down transmitting and receiving modes at a predetermined time after transmission until it is time for the module to receive a signal.

5,465,082

APPARATUS FOR AUTOMATING ROUTINE COMMUNICATION IN A FACILITY

John Chaco, Seymour, Conn., assignor to Executone Information Systems, Inc., Milford, Conn.

Continuation-in-part of Ser. No. 559,196, Jul. 27, 1990, Pat. No. 5,291,399. This application Aug. 3, 1992, Ser. No. 924,101

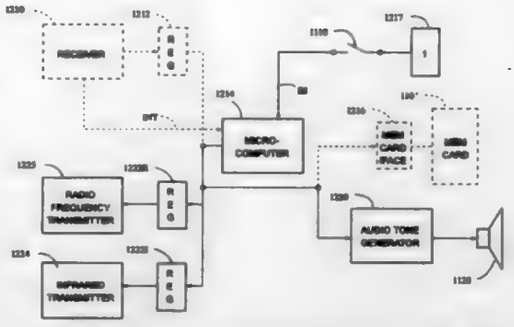
The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl.[6] G08B *5/00;13/14;23/00*; G06K *5/00*

U.S. Cl. 340—825.54 **30 Claims**

1. Apparatus for automating routine communication and location determination, comprising:

a plurality of badges, each having: a database memory, removably coupled to said badge, for storing information including information specific to one of a plurality of users; a transmitter for wirelessly transmitting a portion of said information



including said specific information; a badge switch for activating said badge; and a processor for controlling said transmitter and coordinating retrieval and transmission of said portion of said information;

a plurality of transceivers each being connected to a network server and each being disposed at preassigned locations to cover a predetermined range for receiving wireless transmissions from said badges within said range and for transmitting to said network server messages about said received wireless transmissions; and

a central processor being connected to said network server having:

means for receiving information about badges which have been activated and their respective users and said messages from said transceivers through said network server; means for processing said messages for updating said information about said badges and their associated users; and a display for displaying said updated information.

5,465,083

DATA INPUT CONTROLLER FOR INHIBITING AND ENABLING INPUT

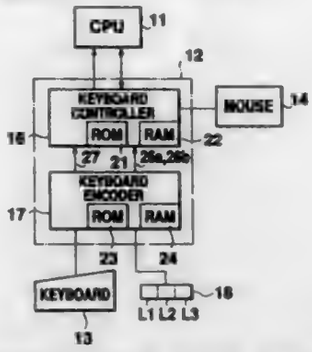
Mitsunaga Okamoto, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Jun. 25, 1993, Ser. No. 83,642

Claims priority, application Japan, Jun. 30, 1992, 4-173534

Int. Cl.[6] G06F *1/00*

U.S. Cl. 340—825.31 **8 Claims**



1. An information processing apparatus comprising a central processing unit, a keyboard for entering data, and a data input controller which controls sending of data corresponding to a key input through the keyboard to the central processing unit, wherein said data input controller includes:

a key input detector for detecting whether or not a specific key combination is entered through said keyboard;

an inhibition circuit for inhibiting sending of data to said central processing unit when said key input detector detects the specific key combination entry;

a password registration circuit for registering as a password data entered through said keyboard after said inhibition circuit inhibits sending of data;

a password check circuit for determining whether or not data entered through said keyboard matches the registered password, and for maintaining the inhibition of the sending of data when the data entered and the registered password match each other, thereby establishing a key lock mode; and

a release circuit for determining whether or not data entered through said keyboard matches the registered password in said key lock mode, and for releasing the inhibition of the sending of data and exiting the key lock mode when the data entered and the registered password match.

5,465,084

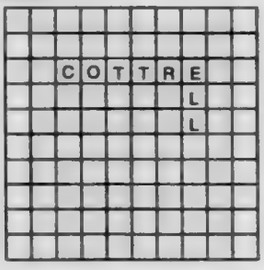
METHOD TO PROVIDE SECURITY FOR A COMPUTER AND A DEVICE THEREFOR

Stephen R. Cottrell, 3507 Ross Rd., Palo Alto, Calif. 94303

Continuation of Ser. No. 675,697, Mar. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 499,713, Mar. 27, 1990, abandoned. This application Sep. 22, 1994, Ser. No. 310,092

Int. Cl.[6] G06F *3/02*

U.S. Cl. 340—825.310 **18 Claims**



1. A security system for limiting access to a device, comprising:

means for defining a master pattern, wherein said master pattern comprises a predetermined geometric arrangement of elements selected from at least one set of at least three elements each having respective information content that is different for each of said elements, such that each element in said master pattern has an associated position and information content;

a memory storing one or more master patterns defined by said master pattern defining means;

means for enabling a user to describe a pattern consisting of a geometric arrangement of elements;

a comparator for comparing a user-described pattern with the master patterns stored in said memory to determine whether the elements of a pattern described by a user have the same positions and information content as a master pattern stored in said memory; and

means for granting access to said device if a user-described pattern is determined to match at least one of the stored master patterns.

5,465,085

RETAIL STORE DISPLAY SYSTEM

Michael W. Caldwell, San Jose, Calif., and Hendrik Blankenstein, Sandy, Utah, assignors to Display Network, Inc., San Jose, Calif.

Continuation of Ser. No. 836,070, Feb. 13, 1992, abandoned. This application Feb. 22, 1994, Ser. No. 198,647

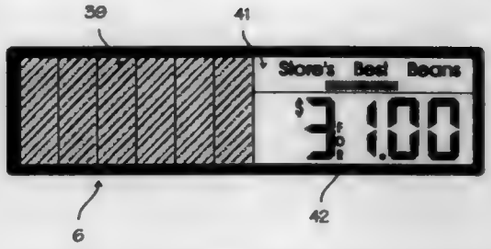
Int. Cl.[6] G06F *15/16;* **G09G** *3/00*

U.S. Cl. 340—825.35 **4 Claims**

1. An electronic display unit for electronically displaying item data associated with it, said data being provided in updatable form by a computer, said display unit comprising:

a receiver including a detector, and amplifier and a comparator, for receiving and comparing data transmitted by said computer;

a non-volatile semiconductor memory coupled to said receiver for storing its own address along with the data provided by said computer, for retaining such data even in the absence of external power and for providing said address to said receiver for comparison to the received data;



a display coupled to said non-volatile memory for displaying said data;

a controller coupled to said receiver which receives a signal from said receiver when the address stored in said non-volatile memory is contained within a message received from said computer and if so, changes the displayed information to the extent indicated by said message;

a photovoltaic power supply which supplies adequate power for the entire display unit without need for battery backup; and

an electronic switch coupled between said power supply, said receiver and said memory for selectively providing power either to said memory, to said receiver, or to neither of them depending upon the amount of power available from said power supply.

5,465,086

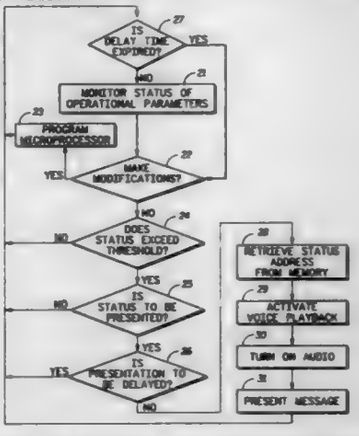
SELECTIVE CALL RECEIVER AND METHOD FOR INDICATING STATUS OF OPERATIONAL PARAMETERS WITH VOICE MESSAGES

John K. Gleeson, Boca Raton, and David S. Fraklin, Boynton Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 871,520, Apr. 21, 1992, abandoned. This application Jun. 13, 1994, Ser. No. 258,916

Int. Cl.[6] G08B *5/22;* **H04Q** *7/00*

U.S. Cl. 340—825.44 **14 Claims**



7. A selective call receiver having operational parameters, comprising:

a receiver for receiving a radio frequency signal including information to be presented to the user, wherein the information is unrelated to the operational parameters;

a microprocessor coupled to the receiver for monitoring the status of the operational parameters; and

audible means coupled to the microprocessor for presenting the information received by the radio frequency signal and for automatically alerting the user, without user input, when the status of one of the operational parameters exceeds a threshold, the audible means generating a voice message corresponding thereto; and

timing means coupled to the microprocessor for delaying, when the status of one of the operational parameters exceeds a threshold, presentation of the voice message until after presentation of the information included within the signal received by the receiver, wherein the delayed voice message is presented to the user irrespective of the length of the information included within the signal.

5,465,087

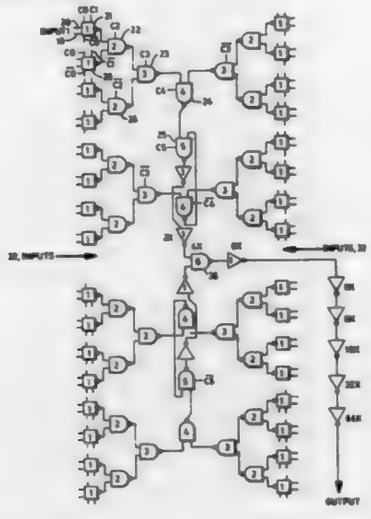
BROADBAND SWITCH

Michael Cooperman, Framingham; Arnold Paige, Natick, and Richard W. Sieber, Attleboro, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 808,032, Dec. 11, 1991, Pat. No. 5,285,202, which is a continuation of Ser. No. 347,370, May 4, 1989, abandoned. This application Feb. 8, 1994, Ser. No. 193,819

Int. Cl.[6] H04Q *1/00*

U.S. Cl. 340—825.8 **4 Claims**



1. A switch, comprising:

a plurality of switching means configured as a multistage tree-multiplexer wherein a first stage of said tree-multiplexer receives input signals, and a last stage includes a single switching means coupled to an output port;

each of said switching means having a plurality of signal inputs, an output, and a control input means;

each switching means in said first stage further comprises:

a pass-transistor selection means having a control input coupled to the respective control input means of said switching means, a plurality of signal inputs each coupled to receive a respective input signal, and an output;

each of said selection means being responsive to said respective control input for selectively switching a signal from a selected one of said signal inputs to the output of said selection means;

wherein the output of each switching means before the last stage drives a respective input of a switching means in the immediately following stage, and the output of the single switching means in said last stage is coupled to said output port;

each of said switching means after the first stage being operable in a blocking state to force the output of said switching means to a predetermined steady-state logic value in response to a first control signal at the respective control input means; and

each of said switching means after the first stage being operable in an unblocking state to selectably switch a signal from a selected input of said switching means to the output of said switching means in response to a second control signal at the respective control input means, and in response to output signals from switching means in the preceding stage which are in said blocking state.

5,465,088

RECEIVER FOR TRAFFIC MESSAGES

Peter Braegas, Hildesheim, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

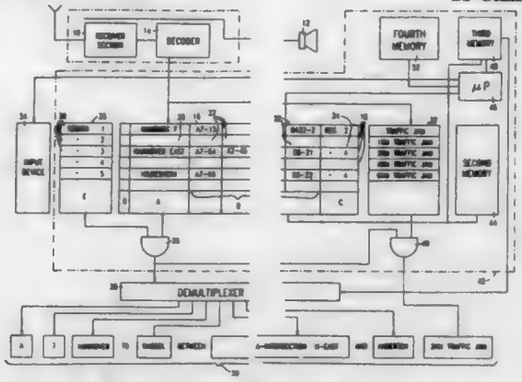
PCT No. PCT/DE93/00145, § 371 Date Nov. 12, 1993, § 102(e) Date Nov. 12, 1993, PCT Pub. No. WO93/18495, PCT Pub. Date Sep. 16, 1993

PCT Filed Feb. 19, 1993, Ser. No. 150,001

Claims priority, application Germany, Mar. 13, 1992, 42 08 277.3

Int. Cl.[6] G08G *1/09*; G06F *15/48*

U.S. Cl. 340—905 **28 Claims**



1. A traffic broadcast receiver comprising:

a) a first memory for allocating received addresses to segments of a street system;

b) a device for reproducing received coded signals in clearly understandable form; and

c) an additional device, said additional device including

i) a second memory for storing travel parameters of the segments stored in the first memory and addresses allocated to the segments,

ii) an input device for permitting tile supply of at least one destination input which is to be allocated to a stored segment,

iii) a computer adapted to determine tile optimum route to the destination, and

iv) a third memory in which segments forming the optimum route determined by the computer can be stored.

5,465,089

METHOD AND APPARATUS FOR GUIDANCE OF ROAD CONDITION

Yasuhiro Nakatani; Atsushi Ichimura; Toshio Tanaka, all of Kobe; Hiroshi Takeuchi, Nishinomiya, and Yoichi Okano, Kobe, all of, Japan, assignors to Fujitsu Ten Limited, Kobe, Japan

Continuation of Ser. No. 123,198, Sep. 20, 1993, abandoned, which is a continuation of Ser. No. 794,225, Nov. 19, 1991, abandoned. This application Dec. 14, 1994, Ser. No. 356,049

Claims priority, application Japan, Nov. 20, 1990, 2-312798

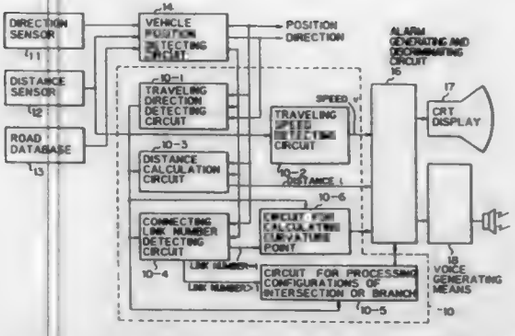
Int. Cl.[6] G08G *1/123*

U.S. Cl. 340—995 **14 Claims**

1. An apparatus for providing guidance concerning a road condition, comprising:

a direction sensor for detecting a unit link having a forthcoming end among a plurality of unit links included in road information, on which a vehicle is traveling;

a direction detecting circuit, operatively connected to said direction sensor, for detecting an instantaneous position of the vehicle and a traveling direction of the vehicle;



a distance calculating circuit, operatively connected to said direction detecting circuit, for calculating a distance form the instantaneous position to the forthcoming end of said unit link using said instantaneous position and said traveling direction;

a number detecting circuit, operatively connected to said direction detecting circuit, for detecting a number of intersecting unit links connected to the forthcoming end of said unit link at an intersection;

an intersection calculating circuit, operatively connected to said direction detecting circuit and said number detecting circuit, for calculating an intersecting angle at said forthcoming end of the said unit link with said intersecting unit links, one end of which connects to another end of another adjacently arranged link to thereby represent a road; and

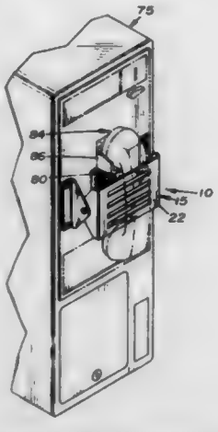
a display circuit, operatively connected to said intersection calculating circuit and said distance calculating circuit, for displaying information concerning a curvature at the intersection of said intersecting unit links and the forthcoming end of said unit link as the road condition.

5,465,090

KEY PAD SHIELDING DEVICE AND METHOD

Jeffrey J. Deignan, P.O. Box 2908, Kirkland, Wash. 98083

Filed May 27, 1994, Ser. No. 250,029
Int. Cl.[6] H04M *1/00*
U.S. Cl. 341—22 **6 Claims**



1. A key pad shielding device, comprising:

a. a cover capable of covering and forming a cavity over a key pad, said cover having a bottom opening capable of enabling a user to select keys on said key pad, and;

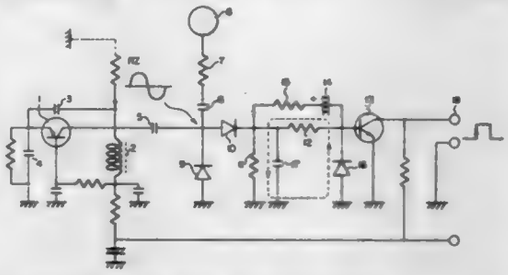
b. an adjustable, view limiting means attached to said cover enabling a user to selectively view said keys on said key pad and prevent viewing of said keys on said key pad by others positioned behind or adjacent thereto.

5,465,091

TOUCH SENSOR

Atsushi Nishino, Neyagawa; Akihiko Yoshida, Nirakata; Teruo Namba, Tokyo; Masaaki Aoki, Tokyo, and Atsushi Naito, Tokyo, all of, Japan, assignors to Showa Shell Sekiyu K.K., and Matsushita Electrical Industrial Co., Ltd.

Continuation of Ser. No. 903,673, Jun. 24, 1992, abandoned.
This application Feb. 16, 1994, Ser. No. 197,533
Claims priority, application Japan, Jun. 28, 1991, 3-158089
Int. Cl.[6] H03K *17/975*
U.S. Cl. 341—33 **13 Claims**



1. A single-oscillator touch sensor comprising:

oscillator circuit means consisting of an LC oscillator circuit,

rectification circuit means for rectifying output from said LC oscillator circuit,

sensor plate means connected to said oscillator circuit and said rectification circuit means at a common point located between said oscillator circuit and said rectification circuit means, a resistance element and a capacitance element connecting said sensor plate means to said common point,

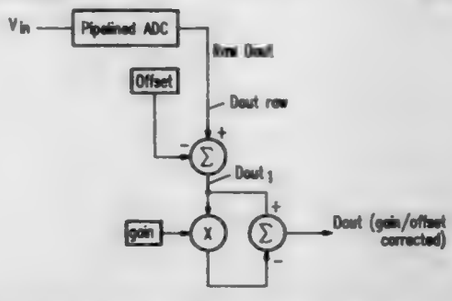
voltage detection circuit means for detecting contact between a substance and said sensor plate means by detecting an impedance drop caused by contact of the substance with said sensor plate means as a change in voltage in said rectification circuit means.

5,465,092

PIPELINED ANALOG-TO-DIGITAL CONVERTER WITH CURVEFIT DIGITAL CORRECTION

Michael K. Mayes, San Jose, and Sing W. Chin, Alameda, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 19, 1994, Ser. No. 183,679
Int. Cl.[6] H03M *1/06*
U.S. Cl. 341—118 **32 Claims**



1. A pipelined analog to digital converter system comprising:

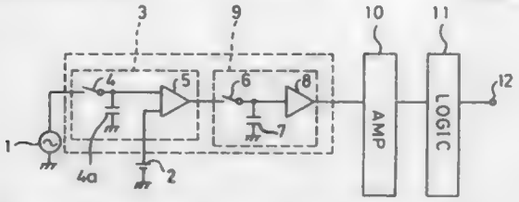
a pipelined analog to digital converter circuit for receiving an analog input signal and providing a raw digital output word representing said analog input signal, said raw digital output word including a system gain error and a system offset error; and

digital circuitry for receiving said raw digital output word and providing a final digital output word representative of said analog input signal, said digital circuitry modifying said raw digital output word to adjust for said system gain error and said system offset error inherent in said pipelined analog to digital converter circuit.

5,465,093
ANALOG-TO-DIGITAL CONVERTER

Kelichi Kusumoto, Osaka, and Akira Matsuzawa, Yawata, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 30, 1993, Ser. No. 128,654
Claims priority, application Japan, Jan. 1, 1992, 4-263408
Int. Cl.[6] H03M *1/06*
U.S. Cl. 341—122 **8 Claims**



1. An analog-to-digital converter (ADC) comprising:

plural sets of first sampling means for sampling an analog input voltage, each set of said first sampling means including a first switch, a first holding capacitor, and an amplifying means for amplifying the voltage difference between a sampled analog input voltage and a reference voltage;

plural sets of second sampling means for sampling the amplified voltage difference between a sampled analog input voltage and a reference voltage and providing an output voltage for each set of second sampling means, each set of said second sampling means including a second switch, a second holding capacitor;

logical-level amplifier means for amplifying each said output voltage to a logical-level voltage; and

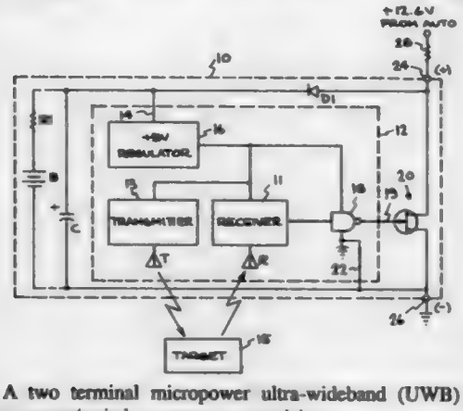
a logic device for converting said logical-level voltage into a digital value;

wherein the output voltages serve as comparison signals for execution of the analog-to-digital conversion.

5,465,094
TWO TERMINAL MICROPOWER RADAR SENSOR

Thomas E. McEwan, Livermore, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Jan. 14, 1994, Ser. No. 182,335
Int. Cl.[6] G01S *13/04*
U.S. Cl. 342—28 **20 Claims**



1. A two terminal micropower ultra-wideband (UWB) radar motion sensor/switch apparatus, comprising:

a first terminal;

a second terminal;

a switch connected between the first terminal and the second terminal;

a diode having its anode connected to the first terminal;

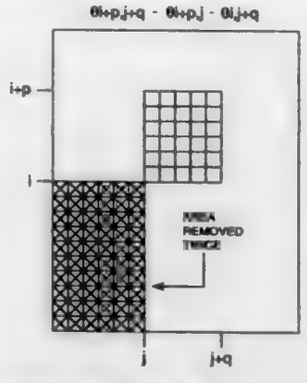
a UWB radar motion sensor connected electrically in parallel with the switch and having its power input connected to the cathode of the diode, its signal output connected to the switch to control the switch, and a ground lead connected to the second terminal;

an energy storage means connected between the power input of the UWB radar motion sensor and the second terminal.

5,465,095
TIME EFFICIENT METHOD FOR PROCESSING ADAPTIVE TARGET DETECTION THRESHOLDS IN DOPPLER RADAR SYSTEMS

Steve M. Bryant, Eldersburg, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 5, 1994, Ser. No. 286,577
Int. Cl.[6] G01S *13/534;7/292*
U.S. Cl. 342—159 **8 Claims**



1. A process applicable to doppler radar systems that can produce a unique target detection threshold for every cell in a two-dimensional data array, herein referred to as a range-doppler matrix, which is completely independent of the number of unique target, clutter, noise regions in a surveillance area associated with said range-doppler matrix, said process comprising the steps of:

a. digitizing and storing radar signal returns in memory in the form of said range-doppler matrix, 'r' range gates long and 'd' doppler filters wide, wherein each data element in said range-doppler matrix is herein referred to as a range-doppler cell, wherein said range-doppler matrix is divided, for Single Instruction, Multiple Data (SIMD) signal processing purposes, into several, equally sized parallel processing elements;

b. integrating said radar signal amplitudes for each range-doppler cell in a given parallel processing element resulting in a secondary, two-dimensional data array, $\theta_{m,n}$;

c. establishing a quantity, herein referred to as an 'areasum', which is a function of targets, if any exist, background noise, and clutter in a region surrounding and including said range-doppler cell for which said process must determine said adaptive target detection threshold;

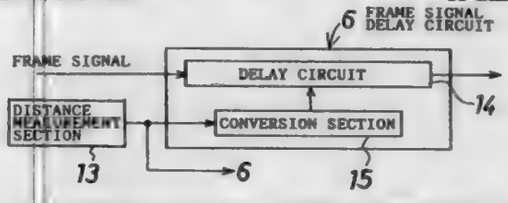
d. establishing a quantity, herein referred to as a 'windowsum', which is primarily a function of said target's characteristics, if one exists, in said range-doppler cell for which said process must determine said adaptive target detection threshold;

e. establishing said adaptive target detection threshold for said range-doppler cell by removing any signal bias, represented by the value of said windowsum, from said areasum, then averaging that result with a normalizing factor.

5,465,096
TRANSMISSION APPARATUS FOR ORBITING SATELLITE

Hizuru Nawata, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 202,960, Feb. 28, 1994, abandoned. This application Dec. 30, 1994, Ser. No. 367,687
Claims priority, application Japan, Mar. 1, 1993, 5-040118
Int. Cl.[6] H04B *7/185*
U.S. Cl. 342—354 **16 Claims**



1. A transmission apparatus for an orbiting satellite which travels around the earth along a low or intermediate orbit, comprising:

M input terminals, M being an integral number equal to or grater than 2;

a frame generator for generating a frame synchronizing signal at a fixed interval;

M composers for forming frame signals from respective transmission data received at said M input terminals in response to the frame synchronizing signal from said frame generator;

M transmitters for receiving outputs of said M composers and outputting M spot beams having different radiation directions from one another;

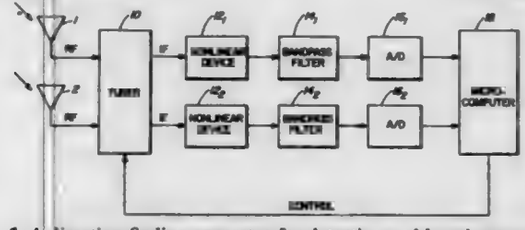
M frame signal delay circuits individually interposed between said M composers and said M transmitters; and

delay time setting means for setting, for each of said M frame signal delay circuits, a delay time which varies inversely proportionally to the distance from the orbiting satellite to the center of a cell resulting from a corresponding spot beam transmitted to the earth.

5,465,097
DIRECT SEQUENCE SPREAD SPECTRUM DIRECTION FINDER

Robert J. Fry, Ottawa, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed May 4, 1994, Ser. No. 237,925
Claims priority, application Canada, Jul. 12, 1993, 2100318
Int. Cl.[6] G01S *5/04*
U.S. Cl. 342—442 **8 Claims**

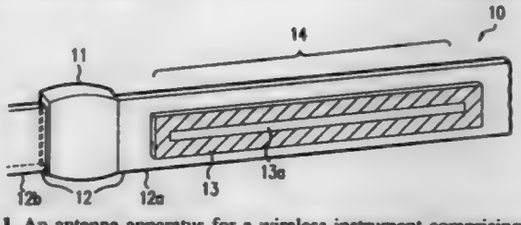


1. A direction finding apparatus for detecting and locating transmitters of direct sequence spread spectrum signals, the apparatus comprising: two antenna spaced apart by a distance d, a tuner having inputs connected to said two antenna, and a microcomputer connected to said tuner for controlling said tuner; the tuner including means for amplifying and converting signals from the two antenna to intermediate frequency (IF) signals in separate channels and said apparatus further including similar nonlinear devices in each channel for receiving said IF signals from said tuner; at least one bandpass filter connected to outputs of each nonlinear device and including means for isolating at least one discrete spectral component in each channel; an analog-to-digital (A/D) converter connected to an output of each bandpass filter for digitizing a selected discrete spectral component from one channel and a corresponding component from the other channel, outputs of the A/D converters being connected to said microcomputer and said micrometer including means for determining a frequency of a selected discrete spectral component and a phase difference between a selected discrete spectral component in one channel and a corresponding component in the other channel, said microcomputer further including means for determining an angle-of-arrival of a signal with respect to a baseline between centers of the two antenna from the distance d between the antenna, said frequency and said phase difference.

5,465,098
ANTENNA APPARATUS FOR TRANSCEIVER

Teruhiko Fujisawa, Suwa, and Koichi Ito, Chiba, both of, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

PCT No. PCT/JP92/00831, § 371 Date Jun. 29, 1993, § 102(e) Date Jun. 29, 1993, PCT Pub. No. WO93/09576, PCT Pub. Date May 13, 1993
PCT Filed Jul. 1, 1992, Ser. No. 81,380
Claims priority, application Japan, Nov. 5, 1991, 3-288763
Int. Cl.[6] H01Q *1/12;13/10*
U.S. Cl. 343—718 **80 Claims**

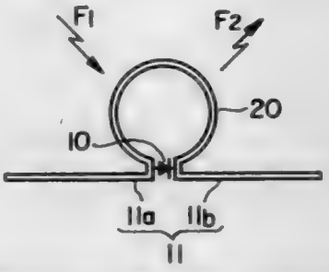


1. An antenna apparatus for a wireless instrument comprising a wrist band fixed to an antenna element having a strip shaped conductive plate with a slot formed in a longitudinal direction of the conductive plate and a capacitance element attached between side sections of the conductive plate and extending across said slot.

5,465,099
DETECTABLE DEVICE AND MOVABLE ITEM DETECTING SYSTEM

Tsutomu Mitsui; Noriyuki Akaba, and Yukitsugu Shimokawa, all of Tokyo, Japan, assignors to Nippon Information Industry Corporation, Tokyo, Japan

Continuation of Ser. No. 946,952, Sep. 17, 1992, abandoned. This application Aug. 26, 1994, Ser. No. 296,859
Claims priority, application Japan, Sep. 25, 1991, 3-245415
Int. Cl.[6] H01Q *1/00*
U.S. Cl. 343—730 **8 Claims**



1. A detectable device attachable to a movable item that receives radio waves at a predetermined frequency and, after receipt thereof, reradiates harmonic radio waves of said received radio waves, the device comprising:

a dipole antenna for receiving and converting said radio waves at said predetermined frequency to an electric current at said predetermined frequency, the length of said dipole antenna being selected to be less than one-half the wavelength of said

predetermined frequency so that said dipole antenna acts as a capacitance at said predetermined frequency;

a diode provided at feed points of said dipole antenna for generating an electric current at a frequency that is a harmonic of said received radio waves; and

a loop antenna whose feed points are connected in parallel to said diode for converting the electric current at said harmonic frequency to radio waves and transmitting the radio waves at said harmonic frequency, said loop antenna having a length selected that is less than the wavelength of said predetermined frequency that will cause the reactance of said loop antenna to be positive so that said loop antenna acts as an inductance at said predetermined frequency;

a compound capacitance of said dipole antenna and said diode and the inductance of said loop antenna constituting a parallel resonant circuit resonating at said predetermined frequency;

whereby current flowing through said diode is substantially increased.

5,465,100

RADIATING DEVICE FOR A PLANNAR ANTENNA

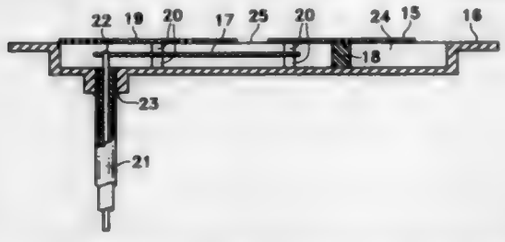
Olivier Remondiere, Frouzins, and Jean-François David, Toulouse, both of, France, assignors to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 830,404, Jan. 30, 1992, abandoned. This application Feb. 23, 1995, Ser. No. 393,526

Claims priority, application France, Feb. 1, 1991, 91 01152

Int. Cl.[6] H01Q *13/12*

U.S. Cl. 343—769 **8 Claims**



1. A radiating device for a planar antenna, said device comprising:

a top ground plane defined at least in part in a first sheet of thin conductive material,

a feed line defined in a second sheet of thin conductive material,

a conductive disk surrounded by an annular slot defined at least in part in said top ground plane to thereby define an annular radiating element, said annular radiating element being fed by electromagnetic coupling from an electrical interface portion of the feed line,

a conductive body comprising a thin conductive bottom wall and a thin conductive side wall projecting upwards from said conductive bottom wall to thereby define a cavity beneath said annular radiating element, said bottom wall functioning as a bottom ground plane for both the annular radiating element and for the feed line, said conductive body also functioning to provide mechanical support for the device as a whole including said top ground plane, said feed line and said conductive disk,

a dielectric supporting column disposed between a central portion of said conductive disk and said conductive bottom wall, and

a thin conductive cover separate from the first sheet of thin conductive material and fitted within an opening defined in the first sheet of thin conductive material above the feed line so as to constitute a portion of the top ground plane in the vicinity of the feed line,

wherein

the feed line is a conductive track held between the thin conductive cover and the bottom ground plane by dielectric spacers,

the conductive cover is in direct mechanical and electrical contact with the first sheet of thin conductive material, and

the first sheet of thin conductive material is in direct mechanical and electrical contact with the side walls of the conductive body.

5,465,101

DISPLAY DEVICE

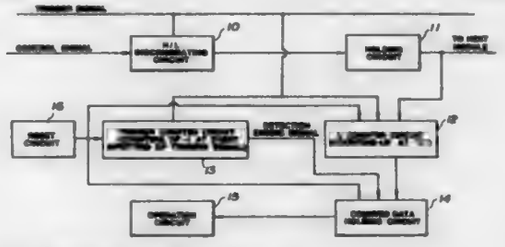
Nobuo Akiba; Isao Ohtsuka; Shigekazu Shiratori, and Katsunori Kase, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Jul. 2, 1993, Ser. No. 84,964

Claims priority, application Japan, Jul. 3, 1992, 4-177049

Int. Cl.[6] G09G *3/32;* **H04N** *5/66*

U.S. Cl. 345—1 **1 Claim**



1. A display device, comprising:

a plurality of cascade-connected display units;

a control means for outputting display data signals to each of said plurality of display units and for outputting a control signal to a first-stage display unit of said plurality of display units, said control signal changing an output state of said first-stage display unit which thereby changes an input state of a second-stage display unit cascade-connected to said first-stage display unit,

wherein the output states of successive units of said plurality of cascade-connected display units change in correspondence with successive trigger pulses output by a trigger counter circuit which supplies said trigger pulses simultaneously to each of said plurality of display units

wherein each of said display units comprises an automatic discriminating circuit for discriminating a level of an output signal output from a preceding display unit which corresponds to the output state of said preceding display unit and

wherein said automatic discriminating circuit comprises an H/L discriminating circuit for discriminating the level of said output signal

a holding circuit for holding said output signal

an L counter circuit for counting a number of low level output signals output from the display unit

a counted data holding circuit for holding data corresponding to the number of low level output signals counted by said L counter circuit and

an operation circuit for determining a stage number of each of said plurality of cascade-connected display units in accordance with said data held by said counted data holding circuit.

5,465,102

IMAGE DISPLAY APPARATUS

Minoru Usui, Akishima; Kouji Yamagishi, Oome; Ken Yoshino, Koganei, and Hideki Mori, Tokyo, all of, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

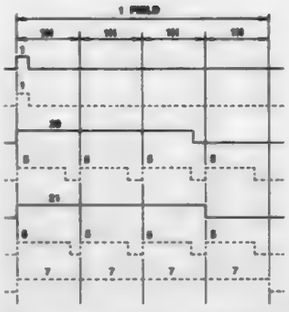
Division of Ser. No. 866,744, Apr. 10, 1992, Pat. No. 5,347,294. This application May 5, 1994, Ser. No. 238,444

Claims priority, application Japan, Apr. 17, 1991, 3-110831; Jun. 12, 1991, 3-140269; Sep. 13, 1991, 3-263188; Sep. 26, 1991, 3-276597

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—89 **3 Claims**

1. An image display apparatus for supplying a gray scale signal representing one of multiple gray scales including a minimum gray scale, a minimum gray scale and at least one intermediate gray



scale according to image data to a liquid crystal device to present a gray-scaled display, and for scanning said liquid crystal panel N times, where N is an integer equal to or greater than 2, during one field period of a video signal, the apparatus comprising:

comparing means for comparing current image data with image data of one screen before, and for producing a comparison result; and

means for supplying, N times during the one field period, a first modified gray scale signal indicating a gray scale greater than that of the current image data when a comparison result from said comparing means indicates that a gray scale of the current image data is greater than that of the image data of one screen before, and for supplying, N times during the one field period, a second modified gray scale signal indicating a gray scale smaller than that of the current image data when the comparison result indicates that the gray scale of the current image data is smaller than that of the image data of one screen before.

5,465,103
DISPLAY DEVICE WITH COORDINATE INPUT FUNCTION

Kazuo Yoshioka, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

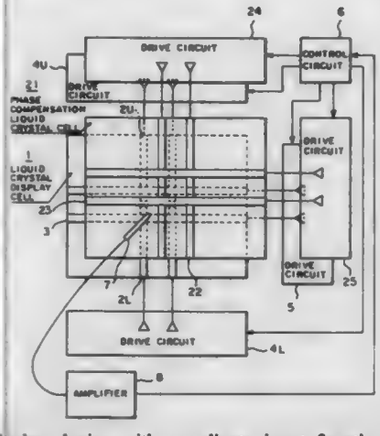
Continuation-in-part of Ser. No. 516,550, Apr. 30, 1990, Pat. No. 5,162,782. This application Sep. 3, 1992, Ser. No. 940,397

Claims priority, application Japan, Aug. 28, 1989, 1-221115

The portion of the term of this patent subsequent to Nov. 10, 2009, has been disclaimed.

Int. Cl.[6] G09G 3/02

U.S. Cl. 345—104 **6 Claims**



1. A display device with coordinate input function having a liquid crystal display panel for both displaying images and inputting coordinates, comprising:

a sensor means for sensing coordinate input detection signals from a control means;

a liquid crystal display panel of two-layer type including an optical phase compensation cell, as a first layer of the liquid crystal display panel and a liquid crystal display cell as a second layer of the liquid crystal display panel; and

a plurality of transparent electrodes arranged on said compensation cell in an X-Y matrix form, for inputting the coordinate input detection signals to said sensor means, wherein said compensation cell is a phase compensation film which exhibits optical anisotropy.

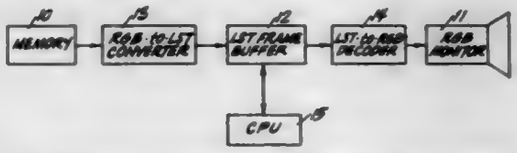
5,465,104
COLOR INFORMATION STORAGE AND PROCESSING SYSTEM

James B. Munson, Albuquerque, N.M., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 369,040, Jun. 20, 1989, abandoned. This application Jun. 24, 1992, Ser. No. 912,570

Int. Cl.[6] G09G 5/00

U.S. Cl. 345—150 **16 Claims**



1. A method of controlling a color monitor using color information, comprising the steps of:

providing a first dimension which is representative of an achromatic dimension of the color information;

deriving an achromatic value representative of the color information as a function of the achromatic dimension;

providing second and third dimensions which are representative of chromatic dimensions of the color information;

the second dimension being derived from a first set of opposed chrominance values wherein a first chrominance value of the first set varies linearly from unity to zero and a second chrominance value of the first set varies linearly from zero to unity as the second dimension increases from a minimum value to a maximum value;

the third dimension being derived from a second set of opposed chrominance values wherein a third chrominance value of the second set varies linearly from unity to zero and a fourth chrominance value of the second set varies linearly from zero to unity as the third dimension increases from a minimum value to a maximum value;

providing four corner point color values wherein: a first corner point color value corresponds to a first preselected unique color value when each of the second and third dimensions are at their respective minimum value;

a second corner point color value corresponds to a second preselected unique color value when each of the second and third dimensions are at their respective maximum values;

a third corner point color value corresponds to a third preselected unique color value when the second dimension is at its maximum value and the third dimension is at its minimum value;

a fourth corner point value corresponds to a fourth preselected unique color value when the second dimension is at its minimum value and the third dimension is at its maximum value;

the unique color values of the four corner points each being preselected so that the second and third dimensions are mapped to a color space wherein the second and third dimensions are defined by linear equations in respect of the constituent first and second sets of opposed chrominance values;

deriving first and second chromatic values representative of the color information as a function of the second and third dimensions and the four corner point color values;

utilizing the achromatic value and the first and second chromatic values to generate color value signals; and

operating the color monitor as a function of the color value signals.

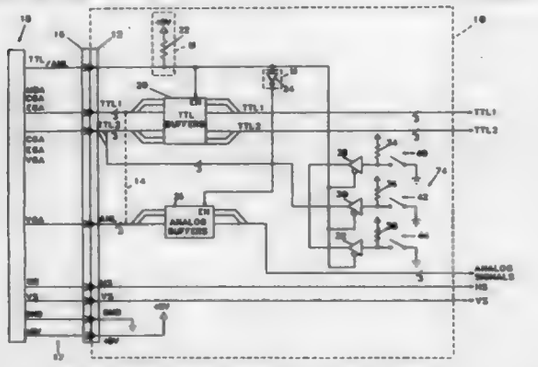
5,465,105
AUTOSENSING SWITCHING SYSTEM

Remigius G. Shatas, Huntsville, and David L. Ligon, Athens, both of Ala., assignors to Cybex Corporation, Huntsville, Ala.

Continuation-in-part of Ser. No. 488,710, Mar. 5, 1991, Pat. No. 5,268,676, which is a continuation-in-part of Ser. No. 447,010, Dec. 5, 1989, Pat. No. 5,193,200, which is a continuation-in-part of Ser. No. 95,140, Sep. 11, 1987, Pat. No. 4,885,718. This application Sep. 29, 1993, Ser. No. 129,772

Int. Cl.[6] G09G *1/00;5/00*

U.S. Cl. 345—204 **13 Claims**



1. A selective video transmission system comprising:

a plurality of first communications links each including a plurality of source conductors, each of said first communications links uniquely couplable to an electrical interface of one of a plurality of computers each providing a different class of video signals, certain of said source conductors of each of said first links being dedicated to a discrete said class of video signals;

a second communications link connectable with said plurality of source conductors of said first communications link by and including discrete sets of conductors, each of said sets of conductors dedicated to transmission of a particular said class of video signals, for passing one of said classes of video signals along a discrete conductive path;

said system including indicating signal means for generating an indicating signal indicative of a said class of video signals coupled to said second communications link, and;

switching means coupled to said discrete sets of conductors of said second communications link and responsive to said indicating signal means, for passing said particular class of video signals coupled to said second communications link.

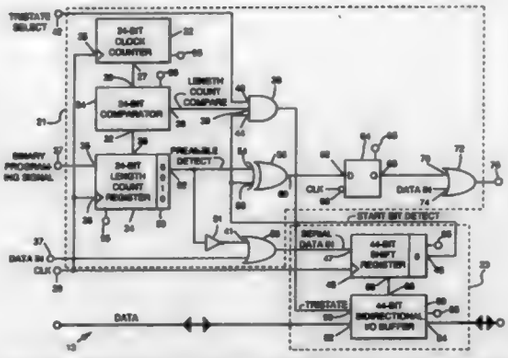
5,465,106
GENERIC DRIVER INTERFACE CARD

Kimberly W. Keech, Brea, and Robert J. Rothaus, Yorba Linda, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 951,257, Sep. 25, 1992, abandoned. This application Mar. 10, 1994, Ser. No. 209,672

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—204 **9 Claims**



1. A generic digital logic driver interface card for replacing an older generation digital logic circuit card operating at a high current drive level of older generation electronic equipment in an original card slot of said older generation digital circuit card, said generic digital logic driver interface card providing a configurable digital logic function for duplicating the logic function of said older generation digital circuit card at a low current drive level of present generation digital circuit cards and having configurable I/O drivers for interfacing with older generation I/O connections in the original card slot at the high current drive level of said older generation electronic equipment, said interface card comprising:

a programmable gate array operating at the low current drive level of present generation digital circuit cards and having a plurality of I/O signal lines;

a bidirectional programmable I/O driver having a plurality of I/O signal lines that couple the programmable gate array I/O signal lines to said original card slot, said bidirectional programmable I/O driver providing a selectable directional interface between said programmable gate array and said older generation electronic equipment, said bidirectional programmable I/O driver comprising means for transmitting logical data signals from a low current drive logic element connected to a low current level terminal of said I/O driver to a high current drive logic element connected to a high current level terminal of said I/O driver, and conversely to transmit logical data signals from said high current drive logic element through said high current level terminal to said low current level terminal and said low current drive logic element;

an EEPROM having a plurality of signal lines that are connected to the programmable gate array to provide data to said programmable gate array for programming said programmable gate array and said bidirectional programmable I/O driver, and

power on reset logic circuitry for programming said programmable gate array and said bidirectional programmable I/O driver upon powering up of said generic digital logic driver interface card.

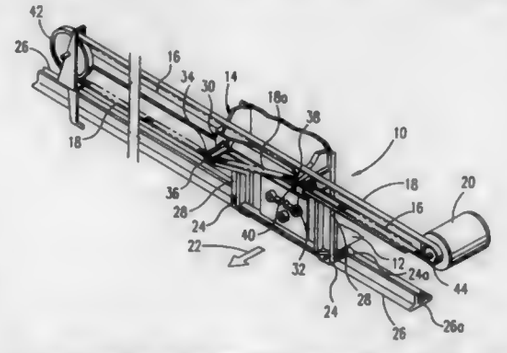
5,465,107
PRINTHEAD DRIVE SYSTEM FOR SERIAL PRINTER

Randall D. Mayo, Georgetown, and Donald N. Spitz, Lexington, both of Ky., assignors to Lexmark International, Inc., Greenwich, Conn.

Filed Sep. 17, 1993, Ser. No. 123,408

Int. Cl.[6] B41J *2/01;19/14*

U.S. Cl. 346—139 R **17 Claims**



1. A printhead drive system for a printer having a printhead assembly pulled back and forth transverse to a direction of feed of a record sheet on which printing is to take place, said drive system comprising:

a guide rod having an axis lying in a first plane, said first plane generally parallel to the direction of feed of the record sheet

and said guide rod extending transverse to the direction of feed of the record sheet;

support means for slidably supporting said printhead assembly on said guide rod;

pulling means for applying first and second pulling forces to said support means to pull said printhead assembly in first and second directions along said guide rod,

said pulling means being attached to said support means at first and second positions located on opposite sides of said first plane, whereby said first and second pulling forces tend to tilt said printhead assembly in a same direction in a second plane normal to said first plane which is generally parallel to the direction of feed of the record sheet.

5,465,108

INK JET PRINT HEAD AND INK JET PRINTER

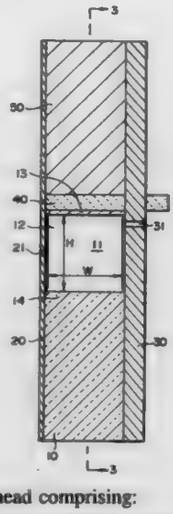
Hisayoshi Fujimoto, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jun. 11, 1992, Ser. No. 897,381

Claims priority, application Japan, Jun. 21, 1991, 3-150596; Jul. 1, 1991, 3-160276; Aug. 21, 1991, 3-209023; Sep. 24, 1991, 3-242184

Int. Cl.[6] B41J *2/045*

U.S. Cl. 347—68 **27 Claims**



1. An ink jet print head comprising:

(a) a diaphragm array including a group of bending curved partitions, each of said partitions having an upper end and a lower end, the array further including an upper end wall bridging between each said upper end of said partitions, and a lower end wall bridging between each said lower ends of said partitions, wherein said upper end wall, said lower end wall and said partitions form ink channels therebetween, said ink channels extending in a first direction and being ordered along a second direction orthogonal to the first direction;

(b) an orifice board fixed to one side of said diaphragm array and facing an end of each of said ink channels, said orifice board having ink jet orifices for fluidly communicating with respective ink channels;

(c) a back board fixed to another side of said diaphragm array and facing another end of each of said ink channels, said back board having ink supply inlets for fluidly communicating with respective ink channels; and

(d) a piezoelectric actuator abutting one of the upper end wall and the lower end wall for selectively applying in the first direction a compressing force which causes selected partitions to bend in the second direction.

5,465,109

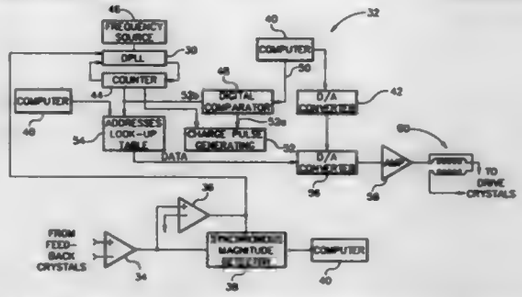
DIGITAL PHASE LOCK LOOP STIMULATION GENERATOR

Mark C. Bowers, Vandalia, Ohio, assignor to Scitex Digital Printing, Inc., Dayton, Ohio

Filed Nov. 22, 1991, Ser. No. 796,490

Int. Cl.[6] G01D *15/18*

U.S. Cl. 347—74 **21 Claims**



1. In a printing system, a method of controlling the formation of droplets in a fluid stream, said method comprising the steps of:

generating a continuously flowing fluid stream through a droplet generator;

applying a drive voltage to said droplet generator for causing said droplet generator to resonate and said fluid stream to break up into droplets;

monitoring a tab feedback voltage to provide a measure of the resonance of said droplet generator; and

using a digital phase lock loop for setting a center frequency of said digital phase lock loop with a crystal oscillator and for tracking a desired phase relationship between said drive voltage and said tab feedback voltage to control the formation of said droplets.

5,465,110

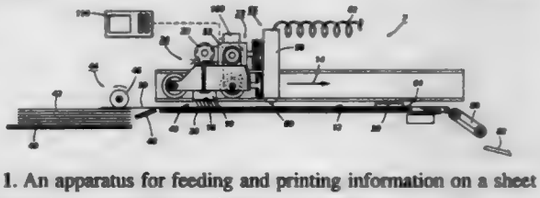
SHEET HANDLING DEVICE AND METHOD FOR TRANSPORTING SHEETS

Michael Carlotta, Sodus, and David G. Anderson, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 992,199, Dec. 17, 1992. This application May 16, 1994, Ser. No. 243,356

Int. Cl.[6] B41J *13/00*

U.S. Cl. 347—104 **4 Claims**



1. An apparatus for feeding and printing information on a sheet disposed on a supporting substrate, comprising:

a movable printhead; and

a feeder unit, connected to said printhead and movable in unison therewith, extending across at least a substantial portion of the sheet, said feeder unit in a non-printing mode, moves in a first direction to acquire and feed the sheet to a printing area on the supporting substrate and, in a printing mode, said feeder unit moves in a second direction opposed to the first direction to flatten the sheet, said printhead being enabled in the printing mode and disabled in the non-printing mode.

5,465,111
METHOD AND APPARATUS FOR CORRECTING IMAGE FORMATION USING FUZZY LOGIC

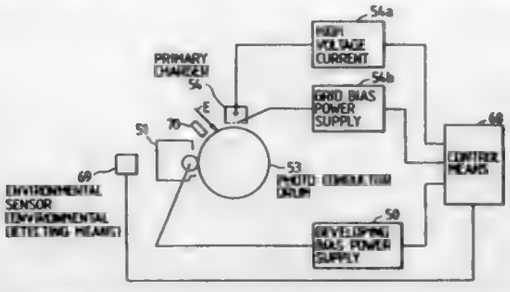
Hisashi Fukushima, Kawasaki; Yoshio Uchikawa, Kitasakuma, and Yoshito Mizoguchi, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1992, Ser. No. 898,200

Claims priority, application Japan, Jun. 14, 1991, 3-142895; Jun. 26, 1991, 3-154634

Int. Cl.[6] G01D *15/06;* **G03G** *21/00*

U.S. Cl. 347—115 **23 Claims**



1. An image forming apparatus for forming images on a recording medium comprising:

an electrophotographic printer engine for forming images having a plurality of colors;

detection means for quantitatively detecting a state of devices of the image forming apparatus relating to image formation;

control means for setting quantities of control for each color of said electrophotographic printer engine based on the detected state of each of the devices of the image forming apparatus;

calculation means for determining, based on the quantities of state detected by said detection means, quantities of control using fuzzy sets, and for calculating quantities of control to be set by the control means for each color, each quantity of control corresponding to one of the detected quantities of state from a degree to which the quantity of state belongs to each fuzzy set; and

an extraction means for extracting, in accordance with predetermined rules, a main quantity of control by which the control means sets the amount of each color in a specific position within the area represented by each quantity of control calculated by said calculation means.

5,465,112
TESTING APPARATUS FOR DETECTING AN IMAGE SIGNAL IN RADIO WAVES LEAKING FROM AN INFORMATION PROCESSING SYSTEM

Tomoyuki Nakao, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 2, 1993, Ser. No. 160,211

Claims priority, application Japan, Dec. 2, 1992, 4-322844

Int. Cl.[6] H04N *7/00*

U.S. Cl. 348—4 **31 Claims**

1. A testing apparatus for detecting an image from an image signal in radio waves leaking from an information processing system, the information processing system using horizontal and vertical synchronizing signals to display the image, the testing apparatus comprising:

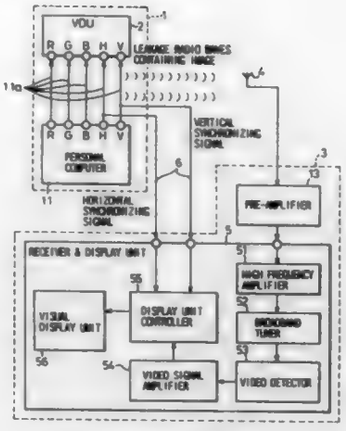
radio wave receiving means for receiving the radio waves leaking from the information processing system;

image signal detecting means for detecting the image signal from the received radio waves;

synchronizing signal receiving means for receiving the horizontal and vertical synchronizing signals from the information processing system;

image reproducing means for reproducing the image from the detected image signal by using the received horizontal and vertical synchronizing signals; and

display means for displaying the reproduced image.



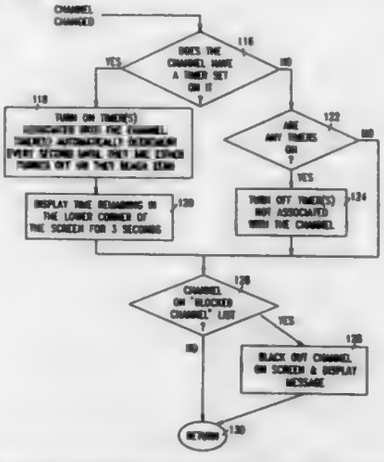
5,465,113
PROGRAMMABLE CHANNEL REGULATING CABLE TELEVISION CONTROLLER

Christopher P. Gilboy, Freehold, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Dec. 13, 1993, Ser. No. 165,623

Int. Cl.[6] H04N *7/00*

U.S. Cl. 348—5.5 **9 Claims**



1. A programmable channel regulating cable television controller, comprising:

means for setting a time limit to be applied to the display of a cable television channel designated by a user and selected from a plurality of available cable television channels on a remotely located television set;

means for setting a time period during which said time limit is to be applied;

a channel timer for storing the amount of time available for display of said user designated cable television channel;

means for decrementing said channel timer in accordance with the amount of time said cable television channel is displayed;

means for disabling the display of said user designated cable television channel on said remotely located television set and for displaying a message for the viewer when said amount of time available for display reaches zero without disabling any other of said plurality of available cable television channels;

means for reininitializing said channel timer upon expiration of said time period; and

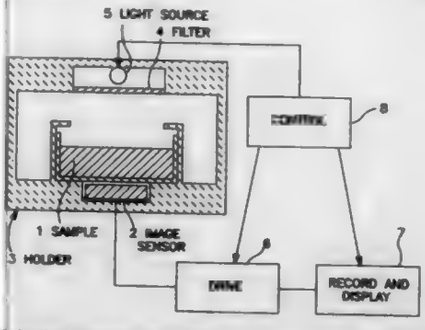
means for simultaneous display of a channel number associated with said user designated cable television channel, said time limit and said time period on said remotely located television set.

5,465,114

BIOLOGICAL SAMPLE OBSERVATION SYSTEM USING A TEMPERATURE CONTROLLED SOLID STATE SENSOR

Shigeyuki Miyamoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 12, 1993, Ser. No. 17,641
Claims priority, application Japan, Feb. 12, 1992, 4-057234
Int. Cl.[6] H04N 7/18
U.S. Cl. 348—80 **9 Claims**



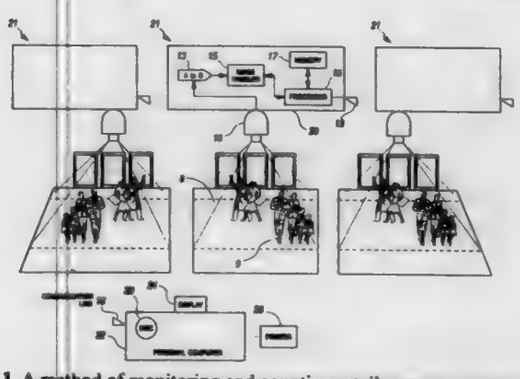
1. A biological sample observation system comprising a holding member in the form of a housing having a recess portion and a solid state area image sensor located in the recess portion, the holding member being configured to directly receive an object to be observed above a photoreception face of the solid state image sensor with no magnifying optical lens between the object to be observed and the photoreception face of the solid state image sensor, a light source located in the holding member for radiating light toward the photoreception face of the solid state image sensor through the object to be observed, a drive unit connected to the solid state image sensor for driving the solid state image sensor, a record and display unit connected to the drive unit for receiving through the drive unit observed image information picked up by the solid state image sensor, and a control unit connected to at least the drive unit for intermittently or periodically putting the solid state image sensor into an operating condition.

5,465,115

VIDEO TRAFFIC MONITOR FOR RETAIL ESTABLISHMENTS AND THE LIKE

Gary L. Conrad, Elgin; Byron A. Denenberg, Northfield, and George L. Kramerich, Chicago, all of Ill., assignors to RCT Systems, Inc., Wheeling, Ill.

Continuation of Ser. No. 62,306, May 14, 1993, abandoned. This application Jan. 10, 1995, Ser. No. 370,825
Int. Cl.[6] H04N 7/18
U.S. Cl. 348—155 **36 Claims**



1. A method of monitoring and counting retail customers traversing wide zones of a retail mall or store, said method comprising the steps of

positioning an overhead video camera to produce a video image extending across a zone to be monitored for customer movement,

digitizing said video image at repetitive time intervals to produce digital information representing said video image said at repetitive time intervals,

processing said digital information using a linear array of segments of the video image consecutively positioned and fixed in position during processing across the zone to be monitored, with each of said gates having a predetermined size relative to the size of a retail customer for distinguishing retail customers traversing said zone by examining consecutive segments which are occupied to determine whether the number of consecutive segments which are occupied corresponds to an individual retail customer, to determine

(1) the number of retail customers traversing said zone, and

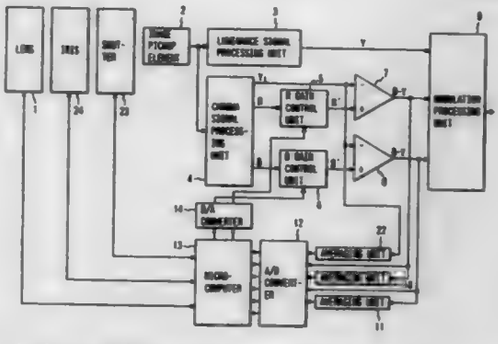
(2) a direction of movement transverse to said linear array of gates through said zone for said retail customers traversing said zone such that said retail customers are counted as entering or exiting said zone.

5,465,116

IMAGE PICKUP DEVICE HAVING WHITE BALANCE CONTROL FUNCTION

Masao Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 138,691, Oct. 18, 1993, abandoned, which is a division of Ser. No. 782,135, Oct. 25, 1991, Pat. No. 5,313,277. This application Apr. 3, 1995, Ser. No. 415,590
Claims priority, application Japan, Jan. 30, 1990, 2-290821; Jan. 30, 1990, 2-290822
Int. Cl.[6] H04N 9/73
U.S. Cl. 348—223 **17 Claims**



1. An image pickup apparatus, comprising:

(a) image pickup means for forming a video signal from an object light;

(b) adjusting means for adjusting a white balance of the video signal which is generated from the image pickup means;

(c) discriminating means for discriminating a size of an area which is occupied by a single object in a picture with respect to the video signal from the image pickup means; and

(d) limiting means for limiting an operation range of said adjusting means in accordance with an output of the discriminating means, wherein said limiting means limits said operation range so as to make narrower said operation range as said size becomes larger.

5. An image pickup apparatus, comprising:

(a) image pickup means for forming a video signal from an object light;

(b) adjusting means for adjusting a white balance of the video signal which is generated from the image pickup means;

(c) discriminating means for discriminating a size of an area which is occupied by a single object in a picture with respect to the video signal from the image pickup means;

(d) detecting means for detecting a chrominance level of said area; and

(e) control means for controlling the operation of the adjusting means in accordance with an output of the discriminating means and an output of the detecting means.

9. An image pickup apparatus, comprising:

(a) image pickup means for forming a video signal from an object light;

(b) adjusting means for adjusting a white balance of the video signal which is generated from the image pickup means;

(c) discriminating means for discriminating a size and chrominance level of an area which is occupied by a single object in a picture with respect to the video signal from the image pickup means; and

(d) control means for controlling the operation of the adjusting means in accordance with an output of the discriminating means, wherein said control means includes limiting means for limiting an operation range of said adjusting means in accordance with an output of the discriminating means, said limiting means limiting said operation range so as to make narrower said operation range as said size becomes larger.

13. An image pickup apparatus, comprising:

(a) image pickup means for forming a video signal from an object light;

(b) adjusting means for adjusting a white balance of the video signal which is generated from the image pickup means from the image pickup means;

(c) discriminating means for discriminating a size of an area which is occupied by a single object in a picture with respect to the video signal from the image pickup means; and

(d) zoom control means for controlling a zooming condition based on an output of said discriminating means.

5,465,117

CONNECTING APPARATUS FOR A VIDEO TAPE RECORDER HAVING A BUILT-IN CAMERA

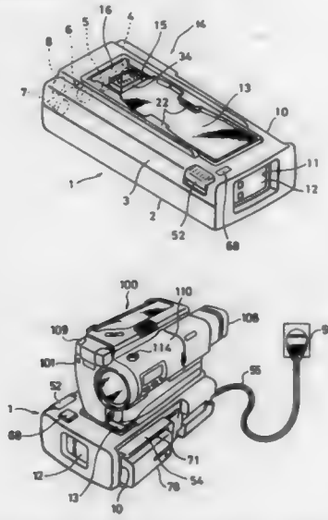
Yoshihiro Ide, Tokyo; Imao Kakuno, Kanagawa; Nobumasa Sakurai, Saitama; Hidero Mitsui, and Yoshisada Okayasu, both of Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 27, 1993, Ser. No. 112,475

Claims priority, application Japan, Sep. 2, 1992, 4-259114

Int. Cl.[6] H04N *5/30*

U.S. Cl. 348—373 **14 Claims**



12. A connecting apparatus for connecting a built-in camera type video tape recorder (VTR) with other electrical devices, said VTR having a support member having an opening therein covered by a normally closed shutter plate and a terminal portion positioned proximate said opening so as to be uncovered when said shutter plate is in its open position, said connecting apparatus comprising:

a) audio, video and power terminals for connection to said other electrical devices;

b) a support surface on which said VTR may be mounted, said support surface having an opening therein and a slidable shutter member for normally covering said opening;

c) a connection terminal disposed in said connecting apparatus proximate said opening, said terminal being positioned to be uncovered by said shutter member when opened;

d) a shutter mechanism for biasing said shutter member in its closed position and responsive to the mounting of said VTR on said support surface to synchronously open said shutter member and shutter plate and move said connection terminal into engagement with said terminal portion.

5,465,118

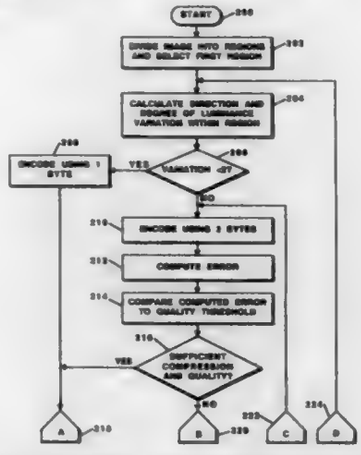
LUMINANCE TRANSITION CODING METHOD FOR SOFTWARE MOTION VIDEO COMPRESSION/ DECOMPRESSION

Steven M. Hancock, and Mark A. Pietras, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1993, Ser. No. 170,044

Int. Cl.[6] H04N *7/26;7/28*

U.S. Cl. 348—396 **15 Claims**



1. An image processing system which compresses a digitized video image comprising:

A. means for partitioning the image into non-overlapping contiguous regions containing a plurality of pixels each having a unique luminance value indicative of the luminance of its associated pixel; and

B. means for compressing the luminance information of pixels in each region by encoding the luminance values within each region into a compressed code, wherein said means for compressing includes:

1. means for comparing the luminance values of the pixels located along the perimeter of a region to determine a pixel containing the smallest luminance value and its location within the region and for providing a base luminance value indicative of the smallest luminance value;

2. means for determining direction of greatest luminance change from the base luminance value location;

3. means for computing a total change in luminance along the direction of greatest luminance change starting from the base luminance value location;

4. means for selecting a transition function value indicative of the type of luminance transition within the region starting from the location of the base luminance value wherein the luminance transition values are indicative of the following functions:

a. a linear luminance transition;

b. a low contrast luminance edge transition at one quarter of the distance across the region;

c. a low contrast luminance edge transition at one half of the distance across the region;

d. a low contrast luminance edge transition at three quarters of the distance across the region;

e. a high contrast luminance edge transition at one quarter of the distance across the region;

f. a high contrast luminance edge transition at one half of the distance across the region; and

g. a high contrast luminance edge transition at three quarters of the distance across the region; and

5. means for generating a digitized encoded data stream containing encoded data indicative of the direction of greatest luminance change and an index value representative of the luminance characteristics within the region, wherein the index value is selected as a function of the base luminance value, the direction of greatest luminance change, the total change in luminance value, and the transition function value wherein said means for generating a digitized encoded data stream, further comprises:

means for generating a short code of compressed video image data comprising i) M_1 number of bits indicative of the direction of greatest luminance change, and ii) M_2 number of bits indicative of the base luminance value;

means for generating a medium length code of compressed video image data comprising i) M_3 number of bits indicative of the direction of greatest luminance change, ii) M_4 number of bits indicative of an index value which is a pointer to an array containing encoded luminance information; and

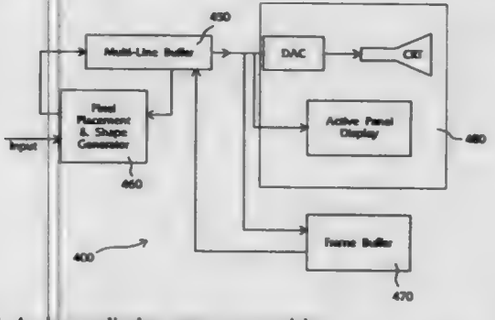
means for providing said encoded data stream as said short length code when the value of total variation in luminance is less than a first threshold value, and for providing said encoded data stream as said medium length code when the value of the total variation in luminance is not less then the first threshold value.

5,465,119

PIXEL INTERLACING APPARATUS AND METHOD

Gary Demos, Culver City, Calif., assignor to DemoGraFX, Culver City, Calif.

Filed Feb. 22, 1991, Ser. No. 659,227
Int. Cl.[6] H05N *7/01;11/20*
U.S. Cl. 348—447 **19 Claims**



1. An image display system, comprising:

an accumulation circuit for receiving and accumulating a succession of non-viewable pixel groups derived from pseudo-random pixel sets generated at a first rate to create a succession of viewable pixel frames at a second slower rate, said pixel frames relating to a succession of images;

a placement circuit coupled to the accumulation circuit for receiving said pixel frames;

an enhancement circuit coupled to the placement circuit, for placing a pixel frame corresponding to an image directly in a line buffer when an examination of prior pixel frames indicates that the image is fast moving, and for placing a differentially computed higher resolution image in the line buffer when the image is not fast moving;

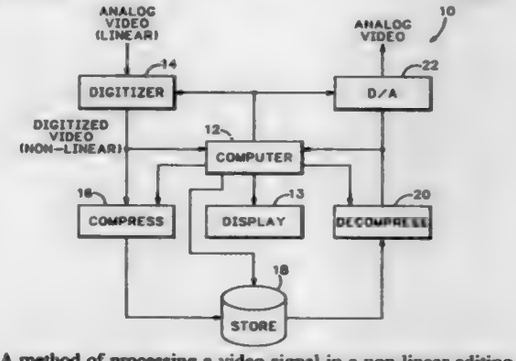
a display coupled to the line buffer for viewing the image contained therein.

5,465,120

SPIRAL BUFFER FOR NON-LINEAR EDITING

John C. Schultheiss, Grass Valley, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Feb. 7, 1994, Ser. No. 192,896
Int. Cl.[6] H04N *5/14*
U.S. Cl. 348—716 **2 Claims**



1. A method of processing a video signal in a non-linear editing system comprising the steps of:

simultaneously cataloging and capturing for storage the video signal as it is received, the cataloging indicating which segments of the video signal are to be kept;

storing the video signal from the cataloging and capturing step in a circular buffer of a random access non-linear storage device as it is received; and

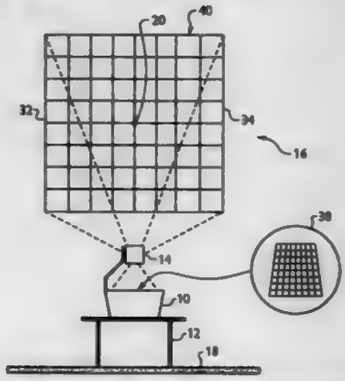
overwriting old segments of the video signal in the circular buffer with new segments of the video signal during the storing step when the circular buffer is full and the old segments have not been indicated by the cataloging and capturing step to be kept.

5,465,121

METHOD AND SYSTEM FOR COMPENSATING FOR IMAGE DISTORTION CAUSED BY OFF-AXIS IMAGE PROJECTION

James L. Blalock, deceased, late of Aubry, and William R. Sterrett, Farmers Branch, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1993, Ser. No. 40,737
Int. Cl.[6] H04N *5/74*
U.S. Cl. 348—744 **15 Claims**



7. A system for modifying an image source data file to compensate for distortions resulting from a projection of a source image onto a surface that is not perpendicular to a source image projection system, said system comprising:

means for identifying a data processing system image source data file;

means for displaying a test pattern utilizing a data processing system visual output device;

means for modifying said test pattern utilizing a distortion compensation factor; and

means for modifying said data processing system image source data file utilizing said distortion compensation factor, wherein a subsequent projection of said source image is compensated for distortion.

5,465,122

NON-DEFORMABLE FRAME FOR SPECTACLES, AND IN PARTICULAR SPECTACLES FOR CHILDREN SO OBTAINED

Caterino Curto, and Gianantonio Longo, both of Segusino, Italy, assignors to F.A.O.M.S. S.R.L., Segusino, Italy

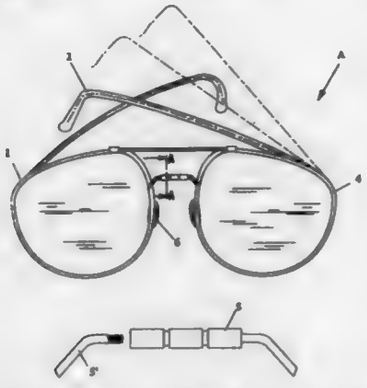
PCT No. PCT/IT94/00008, § 371 Date May 2, 1994, § 102(e) Date May 2, 1994, PCT Pub. No. WO94/18597, PCT Pub. Date Aug. 18, 1994

PCT Filed Feb. 2, 1994, Ser. No. 232,239

Claims priority, application Italy, Feb. 8, 1993, TV93A0014

Int. Cl.[6] G02C *5/02*

U.S. Cl. 351—124 **43 Claims**



1. A non-deformable frame assembly for spectacles having a pair of lens surrounds joined by an upper connecting bar and a lower bridge connector, comprising:

a) said upper connecting bar comprising a torsion bar having respective ends fixedly attached to each of said lens surrounds; and

b) said lower bridge connector comprising a first metallic element having one end affixed to one of said lens surrounds and having another end comprising an internally threaded blind hole; and a second metallic element having one end affixed to the other of said lens surrounds and having another end comprising a male threaded termination engageable into said threaded blind hole.

5,465,123

NONCONTACT TYPE TONOMETER

Hiroshi Iijima, Tokyo, Japan, assignor to Kabushiki Kaisha Topcon, Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,469

Claims priority, application Japan, Dec. 20, 1993, 5-319629

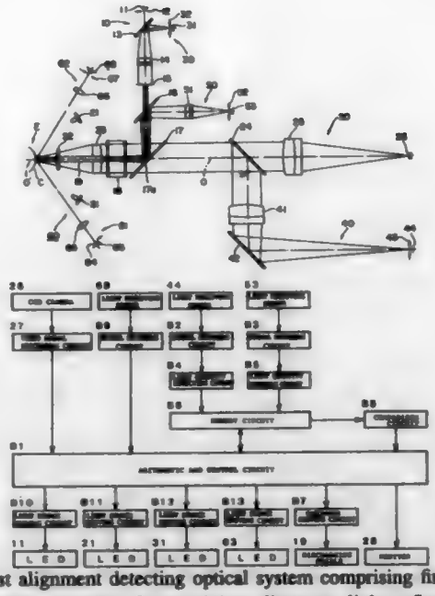
Int. Cl.[6] A61B *3/14*

U.S. Cl. 351—208 **3 Claims**

1. A noncontact type tonometer comprising:

a discharging nozzle for discharging pulsed air toward a cornea of a subject eye;

an optical system for projecting alignment light emitted from an alignment light source onto said eye;



a first alignment detecting optical system comprising first light receiving means for receiving alignment light reflected by said eye without causing said reflected alignment light to pass through said discharging nozzle;

a second alignment detecting optical system comprising second light receiving means for receiving alignment light reflected by said eye through said discharging nozzle; and

means for detecting a quantity level of light received by each of said first and second light receiving means.

5,465,124

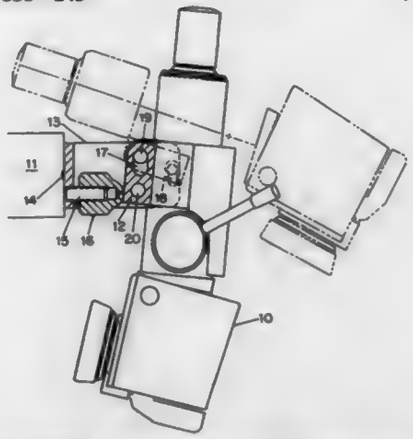
HEADBAND WITH ADJUSTABLE DEVICE FOR POSITIONING AN OPTICAL DEVICE

Joseph Nussenbaum, New York, N.Y., assignor to Propper Manufacturing Co., Inc., Long Island City, N.Y.

Filed Jun. 9, 1994, Ser. No. 257,351

Int. Cl.[6] A61B *3/00*

U.S. Cl. 351—245 **9 Claims**



1. An apparatus for positioning an optical device comprising:

(a) a headband;

(b) first and second substantially parallel mounting plates extending laterally outward from a frontal location on the headband, said first and second mounting plates each having proximal and distal vertically elongated slots cut therethrough, said slots in the first mounting plate being in alignment with the slots in the second mounting plate; and

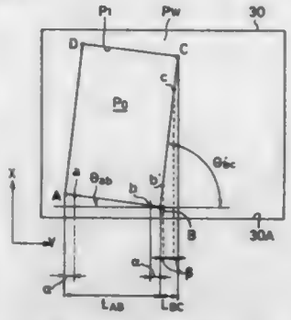
(c) adjustable stop means affixed to the headband between the first and second mounting plates.

5,465,125

METHOD OF DETECTING INCLINATION ANGLE OF IMAGE FRAME READ BY MICROFILM READER

Ushio Anayama, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 29, 1994, Ser. No. 267,238
Claims priority, application Japan, Jun. 30, 1993, 5-183528
Int. Cl.[6] G03B 21/00
U.S. Cl. 353—26 A 7 Claims



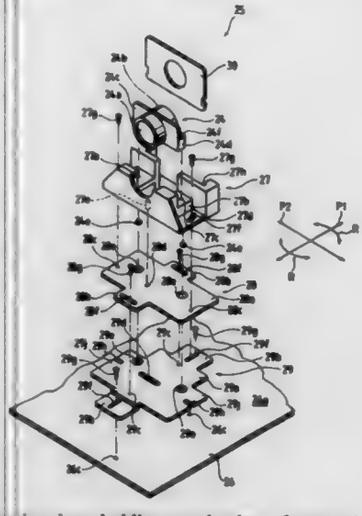
1. A method of determining an inclination angle of an image frame of a rectangular projected image, which is read by a microfilm reader and projected on a screen of the microfilm reader, comprising a step of detecting an inclination angle of a bottom side line of the image frame to determine the inclination angle of the image frame, wherein lengths of two side lines of the image frame projected on a bottom side of said screen are compared with each other and the side line having the length greater than the length of the other side line is discriminated as said bottom side line of the image frame.

5,465,126

FOCUSING LENS HOLDING MECHANISM USED IN OPTICAL SYSTEM

Hideo Fukuda, Nishinomiya, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 7, 1992, Ser. No. 957,361
Claims priority, application Japan, Jan. 25, 1991, 3-279815
Int. Cl.[6] G02B 7/02
U.S. Cl. 353—101 8 Claims



3. A focusing lens holding mechanism, for use in an optical system of a image forming apparatus, said holding mechanism comprising:

a holder for holding a focusing lens on an optical axis of said optical system, said holder being mounted so as to be movable in a first direction, said holder including:

a holding portion for holding said focusing lens, and

a first installation portion having a first opening therein, said first opening allowing for said holder to be mounted so as to be moveable in said first direction;

a mounting plate, on which said holder is mounted, said mounting plate being movable in a second direction, said mounting plate including:

a first main plate portion for receiving said holder, and

a second installation portion integrally formed with said first main plate portion, said second installation portion remaining exposed even when said holder is mounted on said mounting plate, said second installation portion having a second opening therein, said second opening allowing for said mounting plate to be mounted so as to be moveable in said second direction; and

a coupling plate, through which said mounting plate is coupled to a base member of said optical system, said coupling plate being mounted so as to be movable in a third direction, said coupling plate including:

a second main plate portion on which said mounting plate is placed, and

a third installation portion integrally formed with said second main plate portion, said third installation portion remaining exposed even when said mounting plate is mounted to said coupling plate, said third installation portion having a third opening therein, said third opening allowing for said coupling plate to be mounted to said base member so as to be movable in a third direction;

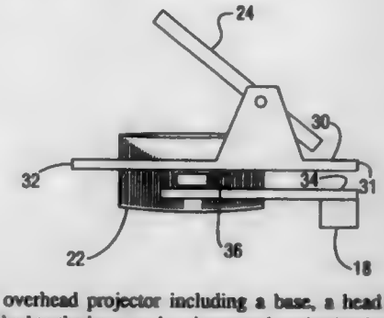
wherein one of said first, second and third directions is to adjust a length of an optical path of said focusing lens, another of said three directions is to adjust a position of the optical axis of said focusing lens, and the remaining of said three directions is to adjust a inclination of said focusing lens so as to adjust a resolving power balance of said focusing lens, wherein said holder, mounting plate and coupling plate can be moved independently from each other.

5,465,127

OVERHEAD PROJECTOR WITH VIBRATION CONTROL HEAD

Dwight G. Baldwin; Xinowei Zhao; Mike E. Darland, both of Austin, and Ernesto M. Rodriguez, Round Rock, all of Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 15, 1995, Ser. No. 401,311
Int. Cl.[6] G03B 21/132
U.S. Cl. 353—119 16 Claims



1. An overhead projector including a base, a head supporting arm attached to the base, and an improved projection head attached to the head supporting arm, the projection head comprising:

a generally horizontal mounting plate having a front edge and a rear edge attached to the head supporting arm near the rear edge of the mounting plate in a cantilevered fashion;

a head bracket adapted to support a projection lens and a projection mirror, the head bracket having a front edge, a rear edge, and a transverse centerline approximately midway between the front edge and the rear edge;

wherein the head bracket is attached to the mounting plate by fasteners and rigid spacers are disposed between the mounting plate and the head bracket proximate each fastener;

the fasteners being positioned near the front edge of the mounting plate and near the centerline of the head bracket.

5,465,128

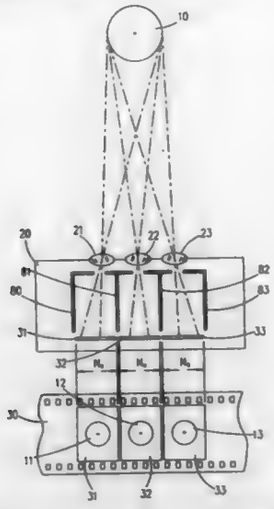
2-D AND 3-D MULTI-LENS CAMERA WITH ONE LENS HAVING A WIDER PLANE THAN THE OTHER LENSES

Allen K. Wah Lo, Dunwoody, and Augustine K. Wu, Norcross, both of Ga., assignors to Image Technology International, Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 988,678, Dec. 10, 1992, abandoned. This application Dec. 29, 1993, Ser. No. 174,831

Int. Cl.[6] G03B *35/08*

U.S. Cl. 354—114 7 Claims



1. A camera for taking both two-dimensional and three-dimensional pictures, comprising a plurality of fixed picture-taking lenses, a film plane behind each lens, a set of baffles between each picture taking lens and its respective film plane, with the film plane for one of the lenses being from 1.5 to 4 times wider than the film plane behind each of the other lenses due to a corresponding difference in the width between the sets of baffles, with spacing between the lenses being determined by the width of the different film planes, with the film planes being optically separated by baffles so that the image formed by each lens is incident upon the corresponding film plane.

5,465,129

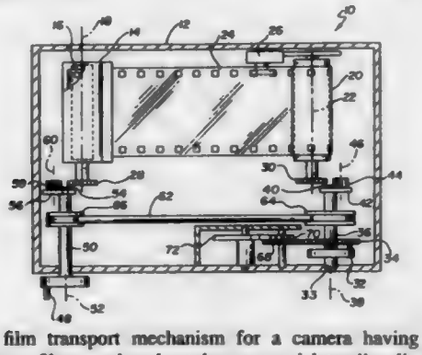
SPRING DRIVEN FILM TRANSPORT SYSTEM

Mikhail Vaynshteyn, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1994, Ser. No. 215,239

Int. Cl.[6] G03B *1/18*

U.S. Cl. 354—170 10 Claims



1. A film transport mechanism for a camera having a case enclosing a film spool and a take-up spool laterally aligned and mounted for rotation on spaced parallel axes, said mechanism comprising a take-up gear coaxially and drivingly connected with said take-up spool, said take-up gear being connectable with a forward idler gear driven by a winder gear for driving said take-up spool in a forward film winding direction for winding film thereon from said film spool, a spiral spring biasing said winder gear in a film winding direction, and a rewinder connectable with said film spool for rewinding film thereon from the take-up spool, said mechanism being characterized by:

means interconnecting said winder gear and said rewinder for allowing film movement in a film advance and a film rewind direction wherein said use of said film rewinder in said rewind direction causes said spiral spring to rewind.

5,465,130

FOCUS LIMITER

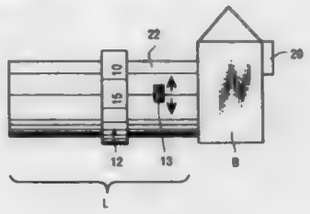
Haruki Eguchi, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

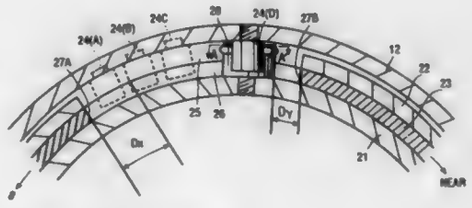
Filed Jan. 29, 1993, Ser. No. 20,845

Claims priority, application Japan, Jan. 30, 1992, 4-040352

Int. Cl.[6] G03B *1/18*

U.S. Cl. 354—195.1 4 Claims





1. A lens unit, comprising:

a focus ring for moving a focus lens along an optical axis, upon rotation of the focus ring about said optical axis, within a predetermined focusing range defined between a near end and a far end;

a focus-limiting system that narrows said predetermined focusing range, said focus-limiting system including a focus limiting member to which said focus ring is contacted to thereby stop a rotation of said focus ring, said focus limiting member comprising:

a first pin which is capable of contacting one portion of said focus ring, thereby limiting one side of said focusing range; and

a second pin which is capable of contacting a second portion of said focus ring, thereby limiting a second side of said focusing range;

a driving source for moving said focus limiting member;

an actuating system that includes an operation switch that actuates said driving source to move said focus limiting member when said operation switch is turned ON;

an inner stationary ring arranged in an inner periphery of said focus ring; and

an outer stationary ring arranged on an outer periphery of said focus ring,

wherein said focus ring is rotatable between said inner stationary ring and said outer stationary ring.

5,465,131

LENS SHUTTER CAMERA INCLUDING ZOOM LENS

Keisuke Haraguchi; Shinsuke Kohmoto; Takeo Kobayashi; Shigeru Kondoh; Hideki Ohkubo; Norio Numako, and Hirofumi Matsuo, all of Tokyo, Japan, assignors to Asahi Kogaku Kabushiki Kaisha, Tokyo, Japan

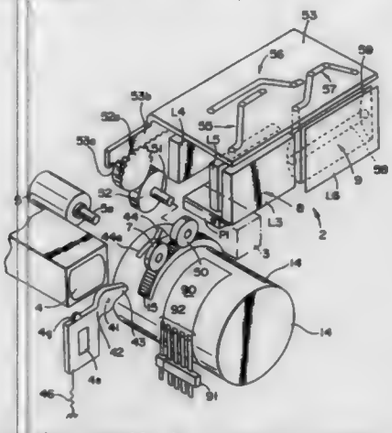
Division of Ser. No. 924,631, Aug. 4, 1992, Pat. No. 5,321,462, which is a continuation of Ser. No. 480,214, Feb. 14, 1990, Pat. No. 5,157,429, which is a division of Ser. No. 144,030, Jan. 7, 1988, Pat. No. 4,944,030. This application Mar. 10, 1994, Ser. No. 222,697

Claims priority, application Japan, May 12, 1986, 61-108278; May 12, 1986, 61-108279; May 28, 1986, 61-80861; May 28, 1986, 61-80862; Jun. 2, 1986, 61-83932; Jun. 2, 1986, 61-127496; Jun. 21, 1986, 61-145470; Jun. 26, 1986, 61-150995; Aug. 15, 1986, 61-125045; Aug. 22, 1986, 61-196911; Aug. 29, 1986, 61-132658; Aug. 29, 1986, 61-132659; Aug. 29, 1986, 61-132660; Aug. 29, 1986, 61-132661

The portion of the term of this patent subsequent to Oct. 20, 2009, has been disclaimed.

Int. Cl.[6] G03B *17/00*

U.S. Cl. 354—202 2 Claims



1. A camming assembly for a camera comprising first and second overlying generally planar cam members, said cam members being mounted for sliding movement relative to each other, a guide pin for guiding motion of said second cam member, at least one cam surface for guiding motion of an operating component of said camera, said second cam member including an aperture receiving said guide pin and said at least one cam surface for guiding motion of said operating component of said camera.

5,465,132

FINDER SYSTEM FOR A REFLEX CAMERA

Jürgen Mangelsdorf, Cremlingen, Germany, assignor to Rollei Fototechnic GmbH & Co., Braunschweig, Germany

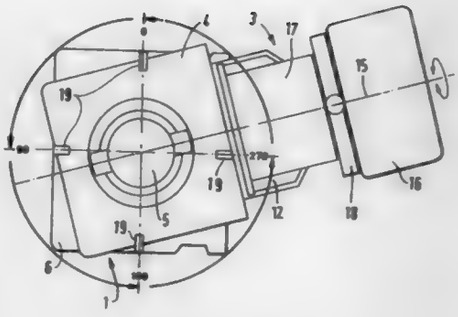
Filed May 27, 1993, Ser. No. 68,719

Claims priority, application Germany, Sep. 14, 1992, 9212286 U

Int. Cl.[6] G03B *13/02*

U.S. Cl. 354—219 11 Claims

1. A finder system for a reflex camera with a finder in the form of a hood with an eyepiece at the top that can be looked straight down through, comprising a hood having an opening in one wall of the hood, an attachment that accepts interchangeably either a 90° telescopic finder or a video finder which rests against the opening, the optical axis of the telescopic or video finder being perpendicular to the axis of the straight-down finder, a mirror being positioned in the hood at the intersection of the optical axis of the straight-down finder and the axis of the telescopic finder or the video finder and at an angle of 45° to either axes, and the mirror deflecting the light 90° parallel with the optical axis of the telescopic or video finder and further comprising means for rotating the finder system about 360° in the camera to one of four different positions defined by slots distributed at angles of 90°.



5,465,133

STILL VIDEO CAMERA

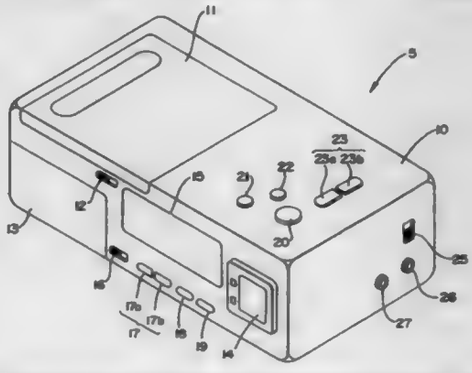
Harumi Aoki; Tahei Morisawa; Kimiaki Ogawa, and Makoto Mogamiya, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 82,681, Feb. 19, 1993, abandoned, which is a division of Ser. No. 814,555, Dec. 30, 1991, abandoned, which is a continuation of Ser. No. 417,055, Oct. 4, 1989, Pat. No. 5,111,299. This application Nov. 14, 1994, Ser. No. 340,432

Claims priority, application Japan, Jan. 4, 1988, 63-250266; Jan. 4, 1988, 63-250267; Jan. 4, 1988, 63-250268; Jan. 4, 1988, 63-250269; Jan. 4, 1988, 63-250270

Int. Cl.[6] G03B *7/08*

U.S. Cl. 354—442 14 Claims



1. An exposure compensating mode changing device for a camera, comprising:

means for calculating an exposure value in accordance with a brightness of an object to be photographed;

means for automatically setting an exposure on the basis of said exposure value provided by said exposure value calculating means;

means for compensating said set exposure so as to activate said automatic exposure means on the basis of a compensated exposure value;

means for applying a reference exposure compensation value to said exposure value calculated by said calculating means when said exposure compensation means is in an active state;

a switch for activating said exposure compensating means;

switching means for changing said exposure compensation value from said reference exposure compensation value when said exposure compensating means is activated;

said switching means for changing said exposure compensating means comprising an up/down switch for changing operating values other than said exposure compensation value, when said switch for activating said exposure compensating means is in an inactive state; and

an indicator for displaying said exposure compensation value, said indicator displaying said exposure compensation value when said switch for activating said exposure compensation means is in an active state;

said indicator further comprising means for indicating when said compensation value differs from said reference exposure compensation value, wherein said means for indicating when said compensation value differs from said reference exposure compensation value maintains an indication regardless of whether said exposure compensation value is being displayed.

5,465,134

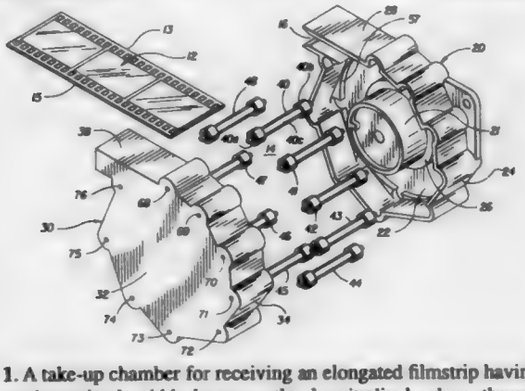
PASSIVE FILM TAKE-UP CHAMBER

Joseph P. Palmer, Batavia, and Robert S. Jones, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 16, 1994, Ser. No. 197,777

Int. Cl.[6] B03B *1/00*

U.S. Cl. 355—75 **14 Claims**



1. A take-up chamber for receiving an elongated filmstrip having a predetermined width between the longitudinal edges thereof comprising:

a chamber housing for enclosing a filmstrip within the chamber, the housing having first and second side walls spaced apart to accommodate the width of the filmstrip, a lateral wall extending between the first and second side walls, and a slit extending through the lateral wall and between the first and second side walls through which the filmstrip may be introduced or withdrawn from the chamber; and

guiding means comprising a plurality of ramp shaded interior surface segments and a plurality of guiding rollers supported within the chamber housing for guiding the filmstrip by contact with its longitudinal edges into a path in proximity to the lateral wall so that the filmstrip is wound upon the guiding means in a roll as it is advanced into the slit and winds against the guiding means along the lateral wall said plurality of guiding rollers being interspersed between said plurality of said shamed interior surface segments.

5,465,135

CHARGER CONTROL IN AN ELECTROPHOTOGRAPHIC COPYING APPARATUS

Kiyohari Nakagama, and Kazuhiro Nakazawa, both of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 11, 1994, Ser. No. 209,987

Claims priority, application Japan, Mar. 15, 1993, 5-054004; Mar. 15, 1993, 5-054005; Mar. 15, 1993, 5-054006; Mar. 15, 1993, 5-054007

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—208 **9 Claims**

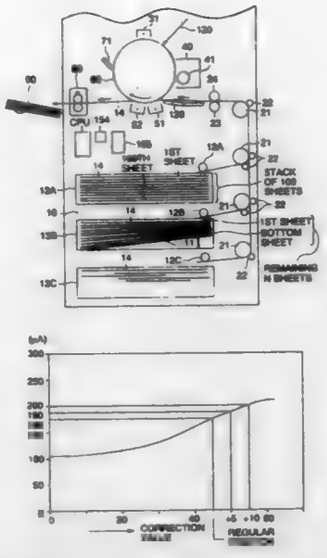
1. An electrophotographic copying apparatus, comprising:

an electric power source to supply a corona discharging output to an electrode;

stack means on which transfer sheets to be fed are stacked;

a time counter to count a time during which the transfer sheets are left in the stack means;

means for storing an output value of a humidity detector;



a calculator to calculate a correction value for each transfer sheet in accordance with the output value of the humidity detector and the time counted by the time counter; and

control means for controlling the corona discharging output for each transfer sheet in accordance with the correction value.

5,465,136

IMAGE FORMING APPARATUS AND PROCESS CARTRIDGE DETACHABLE THERETO WITH CHARGING MEMBER PRESSURE CONTACT RELEASE FEATURE

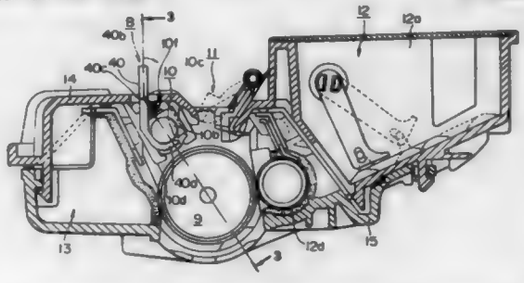
Kazushi Watanabe, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1994, Ser. No. 215,734

Claims priority, application Japan, Mar. 23, 1993, 5-088049

Int. Cl.[6] G03G *15/00;21/18*

U.S. Cl. 355—210 **20 Claims**



1. A process cartridge detachably mountable in an image forming apparatus, said process cartridge comprising:

an image bearing member for bearing an image; and

a charging member, which is movable to be in releasable pressure contact with said image bearing member, for charging said image bearing member,

wherein mounting of said process cartridge to the image forming apparatus is prohibited when pressure contact between said image bearing member and said charging member is released.

5,465,137

PRINTING MEMBER FOR ELECTROSTATIC PHOTOCOPYING

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

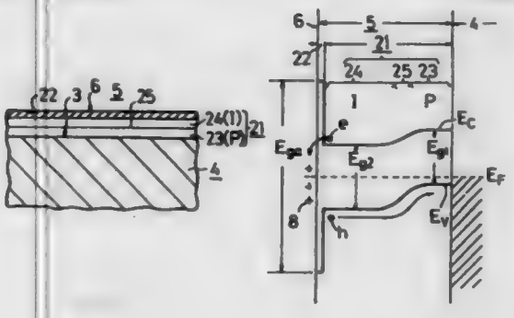
Division of Ser. No. 46,839, Apr. 14, 1993, Pat. No. 5,303,007, which is a division of Ser. No. 891,049, Jun. 1, 1992, Pat. No. 5,255,905, which is a division of Ser. No. 606,187, Oct. 31, 1990, Pat. No. 5,143,808, which is a division of Ser. No. 577,006, Sep. 19, 1990, Pat. No. 5,070,364, which is a division of Ser. No. 452,355, Dec. 19, 1989, Pat. No. 4,999,270, which is a division of Ser. No. 116,337, Nov. 2, 1987, Pat. No. 4,889,783, which is a division of Ser. No. 814,083, Dec. 24, 1985, abandoned, which is a continuation of Ser. No. 502,583, Jul. 21, 1983, abandoned, which is a division of Ser. No. 276,503, Jun. 23, 1981, Pat. No. 4,418,132. This application Nov. 9, 1993, Ser. No. 149,550

Claims priority, application Japan, Jun. 25, 1980, 55-86801

The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—211 6 Claims



1. An electrostatic machine comprising:

a printing member including:

a conductive substrate;

a non-single crystal p-type semiconductor layer formed on said conductive substrate;

a non-single crystal intrinsic semiconductor layer formed on said p-type semiconductor layer;

an intrinsic or substantially intrinsic insulating layer formed on said intrinsic layer with an external surface to permit the passage of charge photo-generated in said intrinsic layer so that charge on the external surface can be neutralized;

where said intrinsic semiconductor layer is thicker than any of the p-type semiconductor layer or the insulating layer;

where said p-type layer, said intrinsic layer, and said insulating layer consist essentially of material selected from the group consisting of silicon, silicon with nitrogen, silicon with carbon and silicon with oxygen either in stoichiometric or non-stoichiometric amounts;

means for providing said charge on said external surface of the insulating layer of the printing member;

means for projecting a light image onto said external surface of said insulating layer to form an electrostatic charge image; and

means for developing the electrostatic charge image to form a visible image pattern on the insulating layer of the printing member.

5,465,138

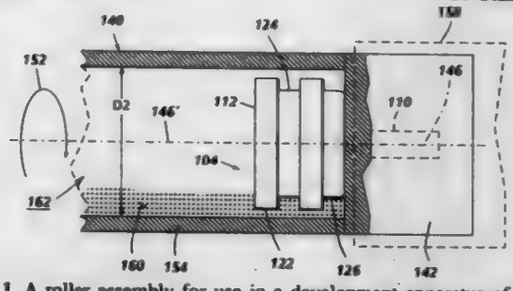
DEVELOPMENT APPARATUS HAVING A SPINCAST ROLL ASSEMBLY

Timothy R. Jankowiak, Webster; Daniel L. Coughlin, Elba; Julie A. Perez, Pittsford; Daniel R. Gilmore, III, Fairport; Thomas L. DiGravio, and Kevin H. Taft, both of Ontario, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1994, Ser. No. 297,477

Int. Cl.[6] G03G *15/08*

U.S. Cl. 355—245 16 Claims



1. A roller assembly for use in a development apparatus of an electrostatographic reproduction machine, the roller assembly comprising:

(a) a first and a second preformed end cap sections each including a cylindrical capping portion having an outer surface and assembly recesses formed into said outer surface; and

(b) a sleeve section connecting said first and said second preformed end cap sections, said sleeve section being spincast as a layer over each said cylindrical capping portion, and into said assembly recesses of said first and said second end cap sections to precisely and reliably assemble and lock each said capping portion to said sleeve section.

5,465,139

DEVELOPER HAVING A TONER HOPPER DISPOSED COMPLETELY BELOW THE IMAGING DRUM

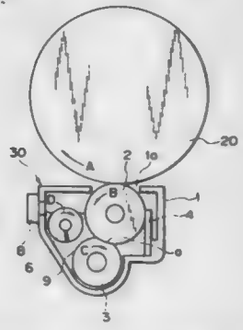
Noriyuki Kimura, Kawasaki, and Minoru Suzuki, Yokohama, both of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 50,610, Apr. 22, 1993, abandoned. This application Aug. 15, 1994, Ser. No. 290,100

Claims priority, application Japan, May 8, 1992, 4-116235

Int. Cl.[6] G03G *15/06*

U.S. Cl. 355—260 21 Claims



18. A developing device for image forming equipment having an image carrier for carrying an electrostatic latent image, said device comprising:

a casing disposed completely below and facing the image carrier and formed with an opening facing said image carrier;

a developer carrier accommodated in said casing and partly exposed through said opening of said casing;

a supply member for supplying a developer to said developer carrier, said supply member comprising an elastic roller which partly contacts said casing; and

a developer transport space defined in said casing by at least said developer carrier, said supply member and said casing and

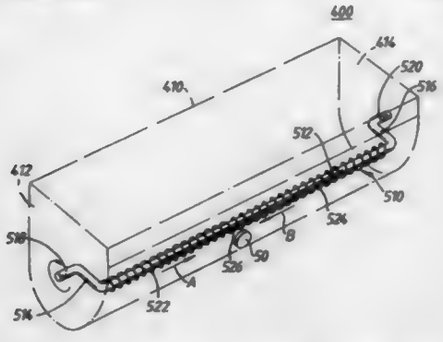
formed above a contact position where said developer carrier contacts said supply member.

5,465,140

DEVELOPING DEVICE AND IMAGE FORMING APPARATUS INCLUDING AN AGITATOR HAVING TWO SPRINGS WOUND IN DIFFERENT DIRECTIONS AROUND A ROD

Tetsuya Nakamura; Takahito Kabai; Michihisa Iguchi; Seiji Arai; Chinobu Sakai, and Satoshi Katagata, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 169,659, Dec. 20, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 412,086
Claims priority, application Japan, Dec. 21, 1992, 4-340228
Int. Cl.[6] G03G *15/06*
U.S. Cl. 355—260 **36 Claims**



1. A developing device for developing an electrostatic latent image formed on a surface of a photosensitive member by using a toner contained in a toner hopper, the developing device comprising:

agitating means for agitating the toner and for providing the toner to a developing roller, the agitating means including a rod having first and second rod portions and a joining portion where the first rod portion joins the second rod portion, wherein the rod is rotated along an inner surface of the toner hopper;

a first coil member loosely wound around the first rod portion of the agitating means to the joining portion in a first winding sense; and

a second coil member joined to the first coil member and loosely wound around the second rod portion of the agitating means from the joining portion in a second winding sense, the second winding sense being opposite to the first winding sense.

5,465,141

FIXING APPARATUS FOR CHANGING THE DUTY CYCLE OF ELECTRIC CURRENT SUPPLY

Naoki Asano; Yutaka Kikuchi, both of Kawasaki, and Yasuyoshi Hayakawa, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

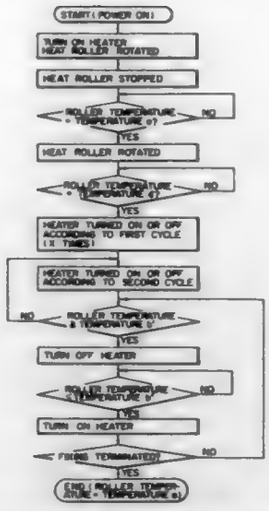
Filed Apr. 8, 1992, Ser. No. 865,242
Claims priority, application Japan, Apr. 22, 1991, 3-116643
Int. Cl.[6] G03G *15/20*
U.S. Cl. 355—285 **7 Claims**

1. A fixing apparatus, comprising:

a heating member maintained at a predetermined fixing temperature;

electric supply means for supplying an electric current to the heating member; and

control means for controlling a duty cycle of the electric current, wherein said control means decreases said duty cycle and then increases it after the electric-current supply to said heating member is started but before said heating member has reached at said predetermined fixing temperature.



5,465,142

OBSTACLE AVOIDANCE SYSTEM FOR HELICOPTERS AND OTHER AIRCRAFT

Rolf Krumes, Anaheim; Dennis C. Richman, Irvine, and Carl L. Bose, Rancho Palos Verdes, all of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Apr. 30, 1993, Ser. No. 56,220
Int. Cl.[6] G01C *3/08;* **G01B** *11/26;* **G08B** *21/00;* **G02B** *26/08*
U.S. Cl. 356—5.01 **31 Claims**

1. A system for sensing objects in the flight path of an aircraft and alerting a pilot of the aircraft to their presence, the system comprising:

means in the form of a laser radar subsystem for emitting a beam of laser energy, for receiving returns from objects, and for processing the returns to produce range data related to the range of the objects from the aircraft, the laser radar subsystem being mounted on an aircraft having means in the form of an avionics system for producing instrumentation data concerning the attitude and the velocity vectors of the aircraft and means in the form of a video display system for displaying information to a pilot of the aircraft;

means in the form of a scanning subsystem that is mounted on the aircraft and operatively coupled to the laser radar subsystem for scanning the beam over a field of regard and producing directional information related to the instantaneous direction of the beam relative to the aircraft; and

means in the form of processor circuitry operatively connected to the laser radar subsystem, the scanning subsystem, the avionics system, and the video display system, for controlling operation of the laser radar subsystem and the scanning subsystem, for processing the range data, directional information, and instrumentation data in order to produce video information related to the range and direction of the objects, and for interfacing the video information to the video display system;

the scanning subsystem including means in the form of a first scanner mechanism including means in the form of a rotatably mounted scanning holographic optical element pair for directing the beam off axis together with means for reducing zero order beam bleed-through transmittance so that rotating the

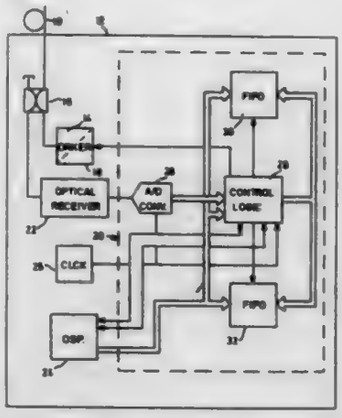
optical element produces a circular scan pattern centered on the first scan axis and means in the form of a second scanner mechanism for moving the first scan axis azimuthally in a repetitive motion so that the circular scan pattern covers the field of regard.

5,465,143

ADP SWITCH AND ADJUSTABLE DATA ACQUISITION WINDOW

Ching Chu, Oakville; David Liao, Burlington, and Kai D. Feng, North York, all of, Canada, assignors to Antel Optronics Inc., Burlington, Canada

Filed Jan. 27, 1994, Ser. No. 186,966
Int. Cl.[6] G01N *21/88*
U.S. Cl. 356—73.1 **11 Claims**



1. An OTDR comprising a light source to transmit an optical pulse to and along an optical fibre to be tested, an optical receiver to detect an optical signal produced by reflection of said pulse as it passes along said fibre and to produce an electrical signal corresponding thereto, an amplifier having an input to receive said electrical signal and an output to direct said signal to a signal processor to obtain an indication of the variation of said signal as said pulse passes along said fibre, an input switch to regulate the passage of said signal from said receiver to said input and having a first condition in which said receiver is disconnected from said amplifier and a second condition in which said receiver is connected to said amplifier, monitoring means to monitor said received signal and identify periods during which said electrical signal exceeds a predetermined value, selection means to select one of said periods and control means to maintain said switch in said first condition prior to said selected one of said periods and in said second condition thereafter.

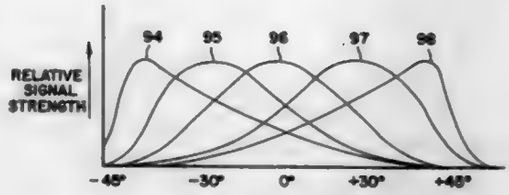
5,465,144

REMOTE TRACKING SYSTEM FOR MOVING PICTURE CAMERAS AND METHOD

Jeffrey L. Parker, Ponte Verda Beach; David F. Sorrells, Jacksonville; John D. Mix, Jacksonville, and Richard P. Daber, Jacksonville, all of Fla., assignors to ParkerVision, Inc., Jacksonville, Fla.

Continuation of Ser. No. 116,462, Sep. 3, 1993, abandoned, which is a division of Ser. No. 530,999, May 31, 1990, Pat. No. 5,268,734. This application Oct. 19, 1994, Ser. No. 326,069
The portion of the term of this patent subsequent to Jan. 12, 2010, has been disclaimed.
Int. Cl.[6] G01B *11/26*; G05B *1/06*; G03B *1/00*
U.S. Cl. 356—139.06 **23 Claims**

1. A method of calculating the angular displacement of one object with respect to a reference position in a camera control system comprising the steps of:



A. scanning an area containing the object with a first transmitted signal from a location having a continuous infrared energy source by varying the position of the signal through the area with respect to the reference position to provide three or more levels of strength of the transmitted signal at the object during each scan to provide information at the object indicative of an alignment between the first transmitted signal and the object;

B. detecting at the object the levels of signal strength of the first transmitted signal received at the object to obtain the alignment information provided by the first transmitted signal of step A;

C. generating from the object a return signal which includes information indicative of the alignment information received at the object from which the alignment of the first transmitted signal and the object can be determined and transmitting the return signal;

D. receiving the return signal;

E. obtaining from the return signal received in step D the information indicative of alignment in step C;

F. automatically determining the angular displacement of the object with respect to the reference position from the information obtained in step E; and

G. controlling the camera control system in response to the angular displacement determined in step F.

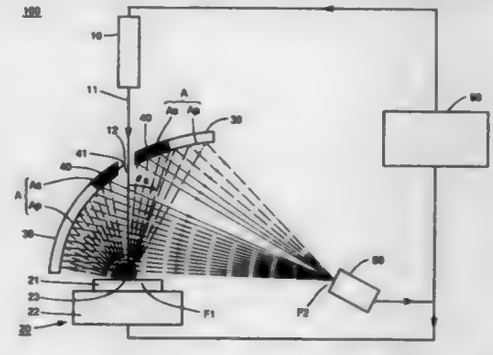
5,465,145

SEMICONDUCTOR WAFER INSPECTION APPARATUS

Yukiko Nakashige, and Tadashi Nishioka, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Ryoden Semiconductor System Engineering Corporation, Hyogo, both of, Japan

Filed Sep. 20, 1994, Ser. No. 309,999
Claims priority, application Japan, Jan. 18, 1993, 5-260201
Int. Cl.[6] G01N *21/88*
U.S. Cl. 356—237 **11 Claims**

1. A semiconductor wafer inspection apparatus comprising:



light projecting means for directing a beam of light to a main surface of a semiconductor wafer;

light collecting means for collecting beams of light scattered from the main surface of said semiconductor wafer; and

light receiving means receiving the scattered light collected by said light collecting means for measuring intensity of the scattered light; wherein

said light collecting means includes

a light collecting portion having a first light reflectance, and

a reflection adjustment portion having a second light reflectance different from said first light reflectance.

5,465,146

FIXING DEVICE FOR ELECTROPHOTOGRAPHIC APPARATUS

Yuichiro Higashi, and Youichi Ishikawa, both of Tokyo, Japan, assignors to Nitto Kogyo Co., Ltd., Tokyo, Japan

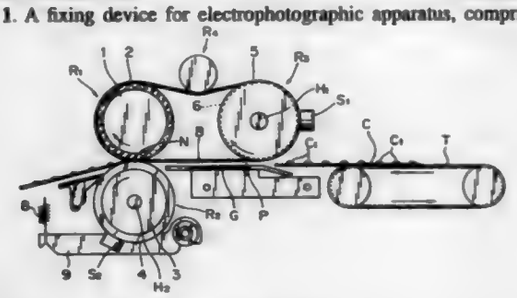
Filed Mar. 8, 1994, Ser. No. 207,466

Claims priority, application Japan, Mar. 10, 1993, 5-049239

Int. Cl.[6] G03G *15/20*

U.S. Cl. 355—285 **11 Claims**

1. A fixing device for electrophotographic apparatus, comprising:



a fixing roller having an elastic surface;

a heating roller for supplying a heat;

an endless fixing belt comprising a metal body and a release thin film formed on a surface thereof, said fixing belt being stretched between the fixing roller and the heating roller, said metal body having a heat capacity per cm^2 in the range of 0.001 to 0.02 cal/°C.;

a pressing roller for pressing said fixing roller through the fixing belt, said pressing roller forming a nip portion together with the fixing belt therebetween; and

a guide plate disposed between the heating roller and the nip portion to guide an unfixed image carrying support member to said nip portion, said guide plate forming substantially a linear heating path together with said fixing belt.

5,465,147

METHOD AND APPARATUS FOR ACQUIRING IMAGES USING A CCD DETECTOR ARRAY AND NO TRANSVERSE SCANNER

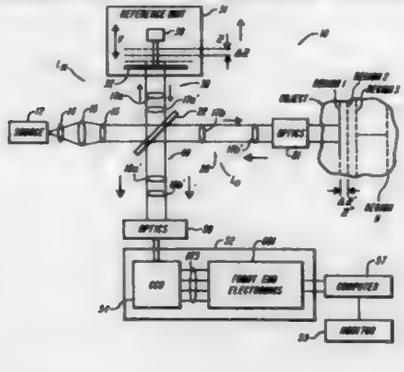
Eric A. Swanson, Acton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 875,670, Apr. 29, 1992, Pat. No. 5,321,501, which is a continuation-in-part of Ser. No. 692,877, Apr. 29, 1991, abandoned. This application Jun. 2, 1994, Ser. No. 253,059

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—345 **33 Claims**

1. An apparatus for acquiring an at least one dimensional image of a region of an object without any transverse scanning, comprising:



a source for outputting radiation having a short coherence length;

means for splitting said radiation into reference radiation and object radiation;

means for receiving said object radiation and directing said object radiation toward the region of the object;

means for receiving said reference radiation and directing said reference radiation through a reference path; and

array detecting means for receiving a portion of said object radiation scattered off of said region and a portion of said reference radiation, and for detecting incident intensity in a parallel fashion over said at least one dimension resulting from said portion of said reference radiation coherently interfering with said portion of the object radiation scattered from said region and for outputting a signal corresponding to said incident intensity, wherein said portion of the reference radiation requires a reference delay time to travel from said means for splitting to said array detecting means and said portion of the object radiation requires an object delay time to travel from said means for splitting to said region and then to said array detecting means.

5,465,148

APPARATUS AND METHOD FOR DETECTING THE RELATIVE POSITIONAL DEVIATION BETWEEN TWO DIFFRACTION GRATINGS

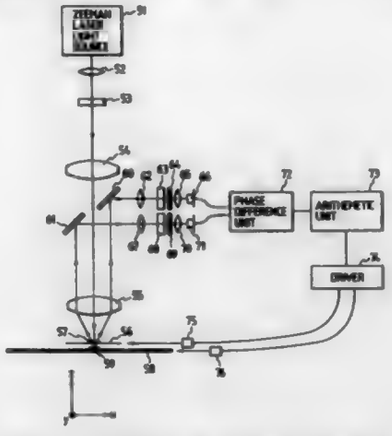
Takahiro Matsumoto; Noriyuki Nose; Kenji Saito, all of Atsugi, and Koichi Sentoku, Kanagawa, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1993, Ser. No. 139,143

Claims priority, application Japan, Jun. 23, 1992, 4-309700

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—349 **16 Claims**



1. A method of detecting the relative positional deviation between two diffraction gratings, said method comprising the steps of:

splitting a light beam into two light beams;

causing one of the two light beams to enter one of the two diffraction gratings, and causing the other light beam to enter the other diffraction grating;

causing +nth-order diffracted beams diffracted by the two diffraction gratings to interfere with each other, and causing −nth-order diffracted beams diffracted by the two diffraction gratings to interfere with each other, thereby forming two interference signals; and

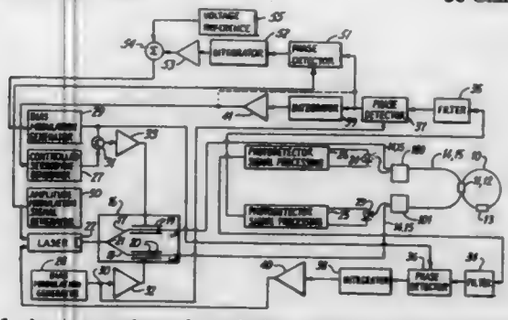
detecting the relative positional deviation between the two diffraction gratings on the basis of the two interference signals.

5,465,149

LIGHTWAVE PHASE CONTROL FOR REDUCTION OF RESONATOR FIBER OPTIC GYROSCOPE KERR EFFECT ERROR

Lee J. Strandjord, Glendale, and Glen A. Sanders, Scottsdale, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 10, 1994, Ser. No. 209,510
Int. Cl.[6] G01C *19/72*
U.S. Cl. 356—350 **30 Claims**



1. An error reducer for reducing rotation rate errors arising because of an optical Kerr effect in a coiled optical fiber in a rotation sensor capable of sensing rotation about an axis of said coiled optical fiber formed in a closed optical path in conjunction with at least a first coil coupler which is connected therewith such that electromagnetic waves can be coupled between said coiled optical fiber and a first external optical fiber, said rotation sensing based on having opposing coiled optical fiber electromagnetic waves propagating through said coiled optical fiber in opposing directions so as to result in each of said opposing coiled optical fiber electromagnetic waves impinging at least in part on a corresponding one of first and second photodetectors in a plurality of photodetectors each coupled to a selected one of said coiled optical fiber and said external optical fiber with at least one of said opposing coiled optical fiber electromagnetic waves propagating in one of said opposing directions being subject to having phasing thereof varied by a first set of selected signals supplied to a first input of a first phase modulator, said first photodetector providing an output signal in response to such impingement thereon of a corresponding said opposing coiled optical fiber electromagnetic wave, which is representative of that wave, said error reducer comprising:

an amplitude modulation signal generator means capable of providing amplitude modulation component in said opposing coiled optical fiber electromagnetic waves;

a balance control signal generating means having an amplitude control input and an output electrically connected to said first phase modulator so as to be capable of providing a phase modulation component in a said opposing coiled optical fiber electromagnetic wave at a selected balance control frequency, said balance control signal generating means being further capable of adjusting values of amplitude of said phase modulation component provided thereby in accord with a second set of selected signals provided at said amplitude control input thereof;

a first signal component phase detection means having an output and having a detection input electrically connected to said first photodetector to receive said first photodetector output signal, said first signal component phase detection means being capable of providing output signals at said output thereof representing amplitudes of components of signals occurring at said detection input thereof based on a first selected demodulation frequency; and

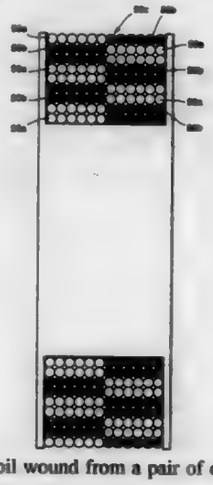
an amplitude modulation signal component phase detection means having an output electrically connected to said balance control signal generating means amplitude control input and having both a detection input electrically connected to said first signal component phase detection means output to receive said first signal component phase detection means output signal, and a demodulation input, electrically connected to said amplitude modulation signal generator means, said amplitude modulation signal component phase detection means being capable of using signals supplied at said demodulation input thereof, having a substantial demodulation signal component therein at a second selected demodulation frequency, to cause the second set of selected signals to appear at said output thereof representing amplitudes of components of signals occurring at said detection input thereof based on said demodulation frequency.

5,465,150

OPTICAL FIBER GYROSCOPE SENSING COIL HAVING A REDUCED SENSITIVITY TO TEMPERATURE VARIATIONS OCCURRING THEREIN

Alan R. Malvern, Plymouth, Great Britain, assignor to British Aerospace PLC, London, England

Filed Mar. 18, 1994, Ser. No. 214,639
Claims priority, application United Kingdom, Mar. 19, 1993, 9305688
Int. Cl.[6] G01C *19/72*
U.S. Cl. 356—350 **4 Claims**



1. A fiber optic coil wound from a pair of optical fiber supplies comprising:

a winding of fiber on a spool, said fiber extending in opposite directions from a mid point on said spool, one of said opposite directions being clockwise and another of said opposite directions being counter clockwise, towards ends of said spool and back to said center thereof to form a first double layer, said fibers being crossed at said center of said spool and being wound in directions opposite to each other at least once again, one of said opposite directions being clockwise and another of said opposite directions being counter-clockwise towards said ends of said spool and back to said center thereof to form at least a second double layer, said winding of fiber including a single layer of said fiber provided on an outermost layer of said coil.

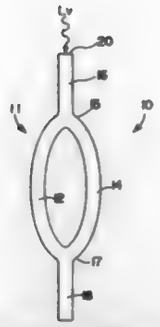
5,465,151

SENSORS EMPLOYING INTERFERENCE OF ELECTROMAGNETIC WAVES PASSING THROUGH WAVEGUIDES HAVING FUNCTIONALIZED SURFACES

Martin N. Wybourne; John F. W. Keana, both of Eugene, Oreg.; Sui X. Cai, Irvine, Calif.; Mingdi Yan, and Jong Wu, both of Eugene, Oreg., assignors to State of Oregon Acting By and Through the State Board of Higher Education on Behalf of The University of Oregon, Eugene, Oreg.

Continuation-in-part of Ser. No. 6,453, Jan. 21, 1993. This application Feb. 5, 1993, Ser. No. 14,425
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—361 **8 Claims**

1. A sensor element, comprising:



(a) an optical waveguide comprising a reference waveguide portion and an analyte waveguide portion both made of a material exhibiting an index of refraction to an electromagnetic radiation and both having a first end and a second end;

(b) means for introducing the electromagnetic radiation into the first ends such that the electromagnetic radiation passes in parallel through the reference and analyte waveguide portions from the first ends to the second ends by total internal reflection;

(c) means for converging the electromagnetic radiation at the second ends into an exit beam of the electromagnetic radiation; and

(d) the analyte waveguide portion having an external surface that is functionalized relative to the reference waveguide portion so as to enable the external surface of the analyte portion to selectively interact with molecules of an analyte in a manner that imparts a phase change to the electromagnetic radiation passing through the analyte waveguide portion relative to the electromagnetic radiation passing through the reference waveguide portion, the phase change being sufficient to generate a corresponding interference pattern in the exit beam.

5,465,152

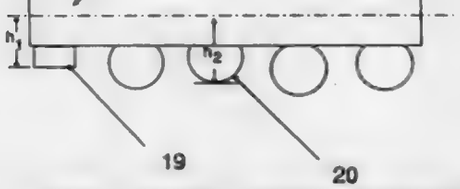
METHOD FOR COPLANARITY INSPECTION OF PACKAGE OR SUBSTRATE WARPAGE FOR BALL GRID ARRAYS, COLUMN ARRAYS, AND SIMILAR STRUCTURES

Steve Bilodeau, Setauket; Frank Jacovino, Plainview; Joanne Cameron, Oakdale, and James Cain, Calverton, all of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Jun. 3, 1994, Ser. No. 253,989

Int. Cl.[6] G01B *11/00*

U.S. Cl. 356—371 **12 Claims**



1. A method for determining coplanarity of substrates for ball grid array, column grid array, and similar surface mount integrated circuit chips, using 3-D optical sensing means, comprising the steps of: providing opaque fiducials as index pads where the heights of said index pads are correlated with signal pad heights in a neighborhood about said index pads; said index pads being opaque to incident radiation from said 3-D optical sensing means; reflecting by said index pads sufficient radiation allow height measurement by said 3-D optical sensing means; disposing said index pads in a prearranged pattern over a domain of array signal pads; restricting said index pads to a predetermined range of heights; measuring the heights of each of at least three said index pads at said index pad coordinate locations; suitably fitting a preselected surface shape to the index pad height and coordinate location data; and calculating the difference in height between each index pad and the preselected surface shape evaluated at the index pad location.

5,465,153

ELECTRO-OPTICAL SYSTEM FOR GAUGING SPECULAR SURFACE PROFILE DEVIATIONS

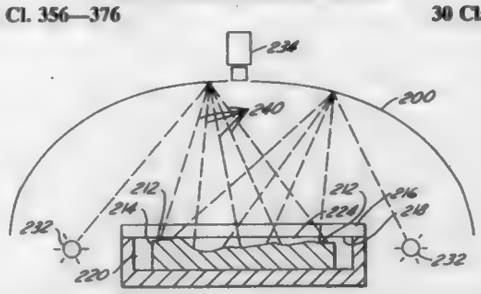
Theodore B. Ladewski, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Continuation-in-part of Ser. No. 770,885, Oct. 4, 1991, Pat. No. 5,289,267. This application Oct. 13, 1993, Ser. No. 136,230

The portion of the term of this patent subsequent to Feb. 22, 2011, has been disclaimed.

Int. Cl.[6] G01B *11/00;* **G01J** *1/02*

U.S. Cl. 356—376 **30 Claims**



1. A system for gauging the surface geometry of a test object using electromagnetic radiation, comprising:

a source of electromagnetic radiation for irradiating a test object, said electromagnetic radiation having a direction of travel;

means for altering the direction of travel of the electromagnetic radiation originating from said source before said radiation irradiates the test object;

means for sensing an image of electromagnetic radiation that originates from said source and reflects from the test object;

an attenuating medium disposed between the test object and said sensing means such that the radiation reflected from the test object travels through said attenuating medium prior to being received by said sensing means, whereby the intensity of said received radiation varies across the image as a function of the test object surface geometry; and

means for calibrating said system and for producing a set of correction data for correcting optically generated errors in said image.

5,465,154

OPTICAL MONITORING OF GROWTH AND ETCH RATE OF MATERIALS

Karl B. Levy, 19050 Dagmar Dr., Saratoga, Calif. 95070

Continuation of Ser. No. 348,191, May 5, 1989, abandoned. This application Dec. 21, 1990, Ser. No. 632,413

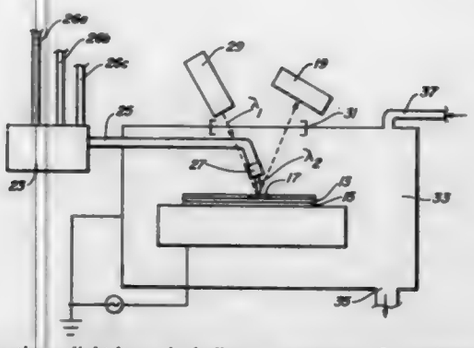
Int. Cl.[6] H01L *21/306;* **B44C** *1/22*

U.S. Cl. 356—382 **5 Claims**

1. A method for determining the rate of change of thickness in a first thin planar layer of a first material having a refractive index n_2 at a predetermined wavelength λ_1 and being at least partly transparent to light at the wavelength λ_1, fabricated on a second layer of a different material, where the first layer is positioned between and has an interface with each of the second layer and a third layer of material that overlies the first layer, and where it is intended that the thickness of the first layer will be decreasing with time or increasing with time, the method comprising the steps of:

providing a planar substrate with said second, first, and third planar layers thereon;

creating an aperture through the third layer of material so that a portion of the first layer is exposed;



directing a light beam including a component of wavelength λ_1 into the aperture to illuminate the exposed first layer at a predetermined incidence angle θ_1 such that a portion of the light beam is reflected at the surface of the exposed first layer and at the first layer-second layer interface;

performing an interferometry intensity measurement of light beam reflectivity R at each of a sequence of consecutive times $\{t_i\}_{i=1}^{N}$ at which the reflectivity attains a local extremum, with $t_1<t_2< \ldots <t_N$;

determining the average rate of change v_i of thickness of the first layer in a time interval $t_i<t< t_{i+1}$ (i=1,2, . . . ,N–1) by use of the relation

$$v_i=\lambda_1/2n_2(t_{i+1}-t_i).$$

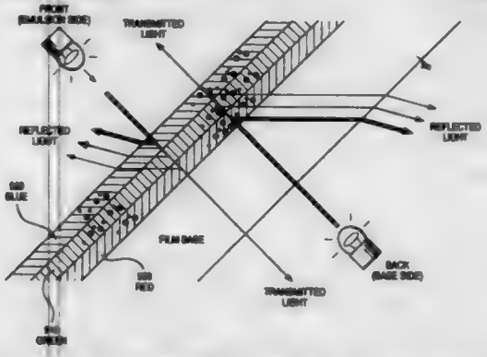
5,465,155
DUPLEX FILM SCANNING

Albert D. Edgar, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 916,244, Jul. 17, 1992, abandoned. This application Jun. 8, 1994, Ser. No. 257,226

Int. Cl.[6] G03F *3/08*

U.S. Cl. 358—500 **4 Claims**



1. A system for electronically developing an image captured on a film having two or more image capture layers, the system comprising:

development means for applying a developing solution to said film;

a first light source for illuminating said film with a first light;

a first scanner for digitally capturing said first light reflected from said film during development to form a first digital scan image having a plurality of pixels;

a second light source for illuminating said film with a second light, said second light source oriented to scan a surface of said film opposite a surface scanned by said first light source; and

a second scanner for digitally capturing said second light reflected from said film during development to form a second digital scan image having a plurality of pixels;

digital image combination means for forming a final image by digitally combining a pixel from each of said digital scan images to form a final image pixel.

5,465,156
FACSIMILE MACHINE HAVING PRINTER UNIT AND INTERFACE

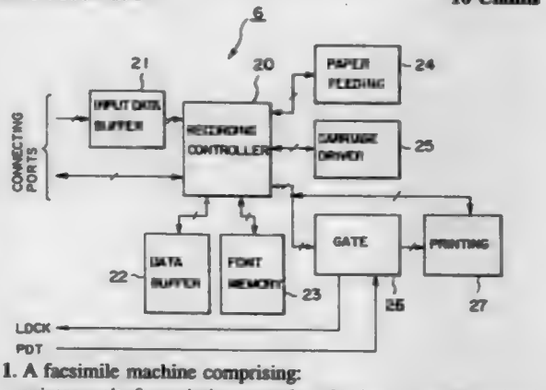
Yoshihiro Arai, Isehara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 29, 1993, Ser. No. 38,646

Claims priority, application Japan, Mar. 30, 1992, 4-103540

Int. Cl.[6] H04N *1/00;1/32*

U.S. Cl. 358—296 **10 Claims**



1. A facsimile machine comprising:

a printer unit for printing out data having a predetermined format; and

interface means, coupled to said printer unit, for converting facsimile image data into recording data having a format in which said printer unit can input the recording data, and for supplying the recording data to said printer unit, wherein said printer unit comprises:

a printing portion for printing recording data; and

data supply control means, coupled to said interface means and said printer portion, for supplying the recording data from said interface means to said printing portion at predetermined printing intervals.

5,465,157
RECORDING APPARATUS WITH IMAGE MODIFICATION FOR INCREASED IMAGE RESOLUTION

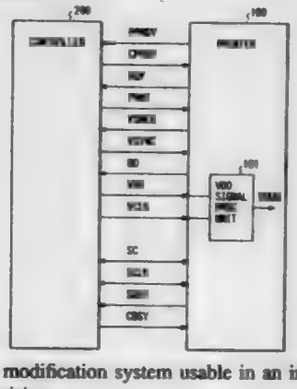
Kaoru Seto, Chigasaki; Kiyoshi Kanaiwa, Kawasaki; Michio Itoh, Hachioji; Hiroshi Mano, Tokyo; Hiromichi Yamada, Yokohama; Atsushi Kashihara, Hachioji; Takashi Kawana, Yokohama, and Tetsuo Saito, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1992, Ser. No. 838,871

Claims priority, application Japan, Feb. 22, 1991, 3-028615; May 17, 1991, 3-113230

Int. Cl.[6] H04N *1/40;1/1409;* **G06K** *9/46*

U.S. Cl. 358—298 **16 Claims**



1. An image modification system usable in an image recording apparatus comprising:

memory means for temporarily storing a part of bit information from bit information generated by a bit information generator;

means for extracting predetermined plural areas, each such area consisting of plural bit information, from the part of bit information stored in said memory means;

feature matching means for detecting whether the part of bit information stored in said memory means coincides with one predetermined feature of predetermined plural features;

judging means for judging whether or not the part of bit information stored in said memory means is bit information for a half-tone image; and

information modifying means for modifying print information of an object pixel which corresponds to a bit in the part of bit information stored in said memory means, in a case where both said feature matching means detects coincidence with said one predetermined feature of the predetermined plural features and said judging means judges that the part of bit information stored in said memory means is not bit information for a half-tone image.

5,465,158

VIDEO TAPE RECORDER CAPABLE OF RECORDING AND REPRODUCING WIDE-BAND CHROMINANCE SIGNAL

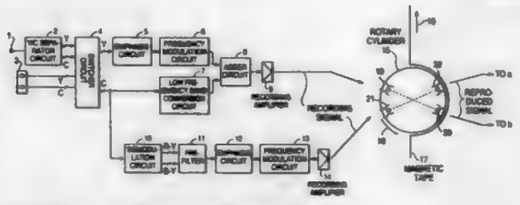
Yoshihiro Morioka, Neyagawa; Masaaki Kobayashi, Kawanishi; Mutsuyuki Okayama, Kobe; Etsuto Nakatsu, Hirakata, and Kohei Suzuki, Takatsuki, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 28,170, Mar. 9, 1993, abandoned. This application Mar. 24, 1995, Ser. No. 409,964

Claims priority, application Japan, Mar. 17, 1992, 4-060228

Int. Cl.[6] H04N *9/79;9/80*

U.S. Cl. 358—310 **5 Claims**



1. A video signal recorder comprising:

a converter, said converter converting an input color video signal into a luminance signal, a carrier chrominance signal, and two color difference signals;

a first frequency modulator, said first frequency modulator frequency modulating the luminance signal;

a low frequency band converter, said low frequency band converter converting a frequency band of the carrier chrominance signal to a low frequency band to obtain a low frequency band converted carrier chrominance signal;

a second frequency modulator, said second frequency modulator frequency modulating the color difference signals to obtain a frequency modulated chrominance signal;

an adder, said adder adding the low frequency band converted carrier chrominance signal and the frequency modulating luminance signal to obtain a recording video signal;

a first head for recording the recording video signal on an recording medium to form a first recording track) and

a second head for recording the frequency modulated chrominance signal on said recording medium so as to form a second recording track oversaid on at least a part of the first recording track such that a recording layer of the recording medium in which said at least a part of the first recording track is formed is divided in a thickness direction thereof into a lower layer in which the first recording track is formed and an upper layer in which the second recording track is formed.

5,465,159

IMAGE SIGNAL RECORDING APPARATUS CAPABLE OF RECORDING FIELD IMAGE SIGNALS, FRAME IMAGE SIGNALS AND HIGH DEFINITION IMAGE SIGNALS

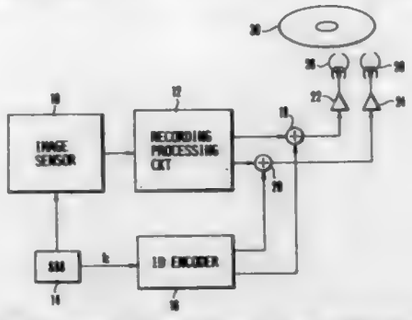
Kazuhito Ohashi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 507,320, Apr. 9, 1990, abandoned. This application Sep. 8, 1994, Ser. No. 303,147

Claims priority, application Japan, Apr. 24, 1989, 1-104214

Int. Cl.[6] H04N *5/781*

U.S. Cl. 358—342 **15 Claims**



1. An image signal recording method capable of recording field image signals, frame image signals composed of two field image signals with their corresponding scanning lines being in an interlacing relation to each other on a picture and high-definition image signals composed of four field image signals with their corresponding scanning lines being in an interlacing relation to each other on the picture on a recording medium, respectively, comprising:

(A) a first step of dividing a high-definition image signal corresponding to one picture into four field image signals with their corresponding scanning lines being in an interlacing relation to each other on the picture;

(B) a second step of multiplexing a first index signal indicating that frame reproduction is possible during reproduction with two field image signals from among said four field image signals formed in said first step, and multiplexing a second index signal indicating that frame reproduction is impossible during reproduction with the other two field image signals; and

(C) a third step of recording said four field image signals, multiplexed with said first or second index signals, in the second step on four tracks of said recording medium, one field image signal on each track, respectively.

5,465,160

COMPOSITE IMAGE FORMING APPARATUS FOR AUTOMATICALLY COMBINING DOCUMENT AND IMAGE CHARACTERS

Yasushi Kamo; Masayuki Hayashi; Masaaki Ito, all of Yokohama; Shinji Yamakawa, Kawasaki, and Midori Aida, Yokohama, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 845,263, Mar. 3, 1992. This application Aug. 31, 1994, Ser. No. 298,184

Claims priority, application Japan, Mar. 5, 1991, 3-037664; May 2, 1991, 3-100914; Jun. 17, 1991, 3-144697; Jul. 3, 1991, 3-162560; Jan. 30, 1992, 4-014453; Feb. 3, 1992, 4-017417

Int. Cl.[6] H04N *1/23;1/387;1/44*

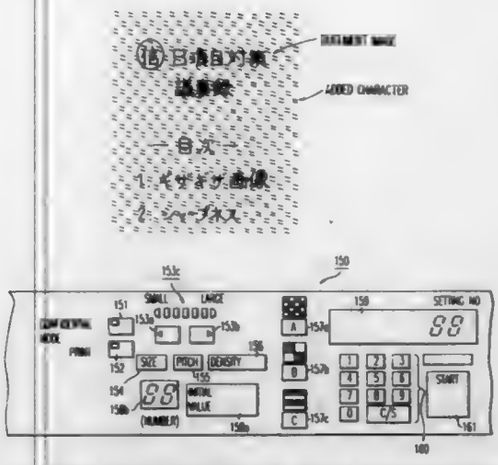
U.S. Cl. 358—401 **25 Claims**

1. A composite image forming apparatus comprising:

scanning means for obtaining image data for each dot by scanning a document in a main scanning direction and scanning the same in a sub scanning direction;

character generating means for generating character data indicating either a character or a numeric character;

image composition means for obtaining composite image data by combining the character data generated by said character



generating means with the image data of the entire document obtained by said scanning means;

image forming means for carrying out an image forming process based on the composite image data from said image composition means so that a composite image is formed for each copy of the document;

input means for inputting a copy repetition number which indicates the number of image forming processes repeatedly carried out by said image forming means with respect to the same document;

character setting control means for changing the respective character data, generated by said character generating means, each time a composite image is formed by said image forming means to make a copy of the document when an image forming process is repeatedly carried out with respect to the same document to make a plurality of copies until an image composition repetition number of said image composition means reaches said copy repetition number from said input means;

wherein, said character setting control means includes:

first input means for inputting an image composition repetition number to said image composition means when said first input means is depressed, said image composition means repeatedly obtaining the composite image data until said image composition repetition number is reached;

second input means for inputting an image composition instruction to said image composition means when said second input means is depressed, said image composition means being instructed to obtain the composite image data by said instruction; and

wherein, said control means enables the image forming means to repeatedly carry out an image forming process with respect to each copy of the document until the image composition repetition number is reached if the instruction is input by said second input means.

5,465,161

IMAGE PROCESSING APPARATUS AND METHOD FOR CONFIRMING THE STATE OF AN ADDITION DEVICE

Masahiro Funada, Yokohama; Toshiyuki Kitamura; Mitsuhiro Yamamoto, both of Kawasaki, and Eiji Ohta, Fujisawa, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

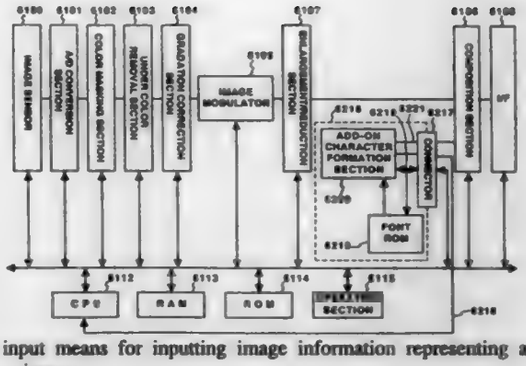
Division of Ser. No. 856,996, Mar. 24, 1992, Pat. No. 5,257,119. This application Jul. 1, 1993, Ser. No. 85,088

Claims priority, application Japan, Mar. 25, 1991, 3-060248; May 8, 1991, 3-102354; May 29, 1991, 3-124345; Jul. 1, 1991, 3-160560

Int. Cl.[6] **H04N** *1/44;1/56;1/40*

U.S. Cl. 358—438 **5 Claims**

1. An image processing apparatus comprising:



input means for inputting image information representing an image;

process means for processing the image information, and outputting processed image information;

addition means for adding information for identifying an apparatus by which the image information is processed to the image represented by the image information;

confirmation means for confirming a state of said addition means; and

control means for controlling the apparatus based on the state of said addition means obtained by said confirmation means,

wherein the information added by said addition means corresponds to apparatus-identification data given by a supplier who supplies the apparatus.

5,465,162

IMAGE RECEIVING APPARATUS

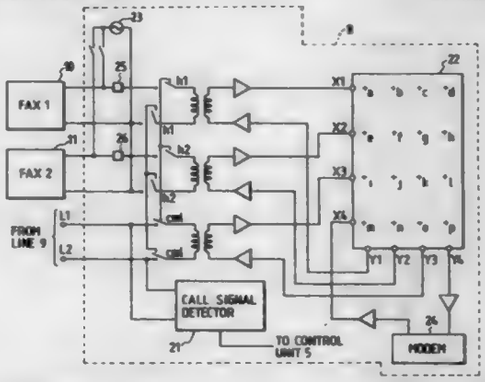
Teruyuki Nishii, Yokohama; Tsunehiro Watanabe, Kawaguchi, and Hisao Terajima, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 878,394, May 4, 1992, abandoned. This application Oct. 14, 1994, Ser. No. 323,070

Claims priority, application Japan, May 13, 1991, 3-137134

Int. Cl.[6] **H04N** *1/32*

U.S. Cl. 358—442 **13 Claims**



1. An image communication apparatus capable of accommodating an extension terminal, comprising

communication means for receiving an image signal from a line and sending the image signal to the extension terminal;

memory means for storing the image signal received from the line by said communication means;

record means for recording the image signal received from the line by said communication means; and

connection means for selectively connecting the extension terminal, said communication means and the line;

said communication means sending the image signal stored in said memory means to the extension terminal through said connection means.

10. An image communication apparatus comprising:

connecting means for connecting a plurality of extension terminals;

discriminating means for discriminating whether or not a calling party is another image communication apparatus after a responding to an incoming call;

generating means for generating plural kinds of calling signals in accordance with a result of discrimination by said discrimination means; and

providing means for providing the generated calling signals to the plurality of extension terminals.

5,465,163

IMAGE PROCESSING METHOD AND APPARATUS FOR PROCESSING OVERSIZED ORIGINAL IMAGES AND FOR SYNTHESIZING MULTIPLE IMAGES

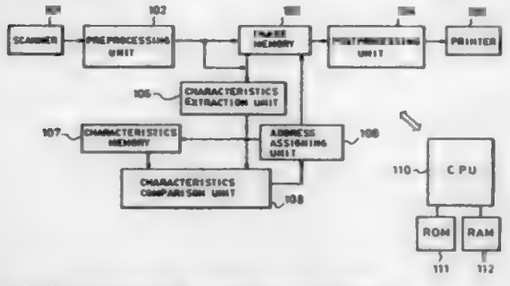
Kunio Yoshihara, Sagamihara; Kazuhiko Hirooka, Tokyo; Masanori Sakai; Keiju Kuboki, both of Yokohama; Mitsuo Nimura, Kawasaki, and Ritsushi Tanabe, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1992, Ser. No. 846,585

Claims priority, application Japan, Mar. 18, 1991, 3-078611; Apr. 12, 1991, 3-079635; Jul. 19, 1991, 3-179149; Jul. 31, 1991, 3-214740; Jul. 31, 1991, 3-214741; Jul. 31, 1991, 3-214742

Int. Cl.[6] H04N *1/21;1/387;1/393;* **G06K** *9/46;9/68*

U.S. Cl. 358—444 **28 Claims**



1. An image processing apparatus, comprising:

input means for inputting images;

storage means for storing the images input from said input means, said storage means storing a plurality of images having common partial images;

characteristics extraction means for extracting characteristics of images input from the input means;

determination means for determining positions of respective overlapped common partial images of the plurality of images stored in said storage means based on the image characteristics extracted in said characteristics extraction means;

synthesis means for forming an image by synthesizing said plurality of images according to a result of the determination by said determination means; and

output means for outputting the image synthesized by said synthesis means.

5,465,164

IMAGE PROCESSING METHOD AND DEVICE FOR THE SAME

Susumu Sugiura, Atsugi, and Yoshinobu Mita, Kawasaki, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1992, Ser. No. 868,103

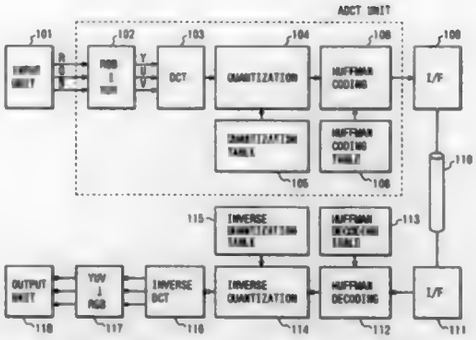
Claims priority, application Japan, Apr. 15, 1991, 3-082403; Apr. 8, 1992, 4-087114

Int. Cl.[6] H04N *1/41*

U.S. Cl. 358—448 **9 Claims**

1. An image processing method for processing image data arranged in image blocks, comprising the step of:

converting image data to a space frequency component for each image block; and



diffusing a quantization error produced by quantizing a space frequency component of an image block to another space frequency component of the same image block.

5,465,165

IMAGE PROCESSING SYSTEM

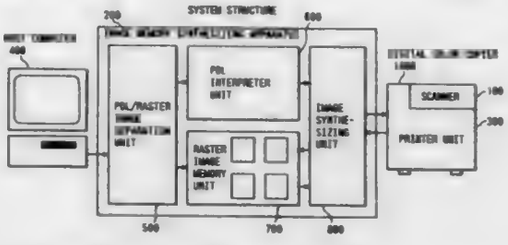
Staoshi Tanio, Tokyo, and Naoto Arakawa, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1992, Ser. No. 895,801

Claims priority, application Japan, Jun. 11, 1991, 3-139087; Jul. 31, 1991, 3-192044

Int. Cl.[6] H04N *1/00;* **G06F** *15/62*

U.S. Cl. 358—448 **25 Claims**



1. An image processing system comprising:

a) a plurality of image signal generation sources each including a page description language data;

b) synthesizing means for synthesizing image signals from said plurality of image signal generation sources, wherein said synthesizing means formulates the page description language data into images, and then synthesizes the images; and

c) output means for outputting to a printer the image signal synthesized by said synthesizing means.

5,465,166

IMAGE READING DEVICE FOR IMAGE RECORDING EQUIPMENT

Yasushi Kamo, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 13,664, Jan. 28, 1993, abandoned, which is a continuation of Ser. No. 581,732, Sep. 12, 1990, abandoned. This application Mar. 14, 1994, Ser. No. 209,362

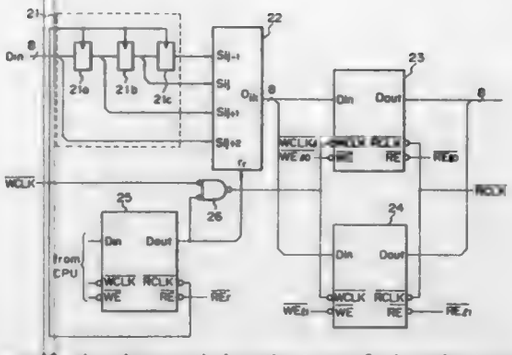
Claims priority, application Japan, Sep. 12, 1989, 1-234687; Aug. 20, 1990, 2-217188

Int. Cl.[6] H04N *1/393*

U.S. Cl. 358—451 **10 Claims**

1. Image forming equipment having magnification changing means for executing magnification changing processing with input data in response to an input magnification change ratio, said equipment comprising:

first and second line memories for outputting data corresponding to an image to be reproduced;



magnification change ratio inputting means for inputting a magnification change ratio which is variable in a main scanning direction;

CPU means for receiving said magnification change ratio and for outputting data corresponding to said magnification change ratio;

a NAND gate for receiving, at first and second inputs thereof, a write clock signal and an output of a first storing means in order to control the timing of data output by said first and second line memories;

first storing means for receiving said data output by the CPU means, storing predetermined data corresponding to magnification ratios represented by vectors offset from pixel locations of a document to be copied in order to determine locations of shifted pixels in the output image, said first storing means outputting said predetermined data; and

interpolation calculating means for generating an enlarged or reduced output image according to the predetermined data output by said first storing means by interpolating the predetermined data;

whereby image data are outputted with a variable magnification change ratio in the main scanning direction on the basis of the predetermined data stored in said first storing means and an output signal from said NAND gate.

5,465,167

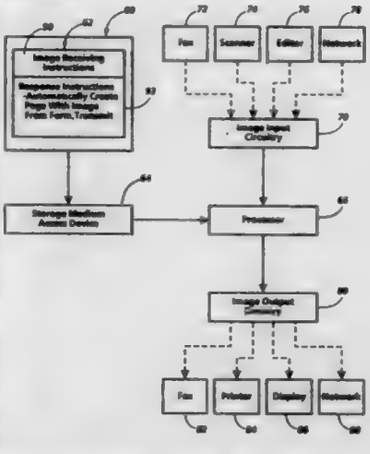
USING AN IMAGE FROM A FORM IN AUTOMATIC CREATION OF A FORM OR SHEET

Martin F. N. Cooper, Fremont; Walter A. L. Johnson, Santa Clara, and Z. Erol Smith, III, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 20, 1992, Ser. No. 855,388

Int. Cl.[6] H04N *1/32*

U.S. Cl. 358—468 **28 Claims**



1. A method of operating a system that includes:

image input circuitry for obtaining data defining images as input;

image output circuitry for providing data defining images as output; and

a processor connected for receiving data defining images from the image input circuitry and for providing data defining images to the image output circuitry;

the method comprising:

operating the processor to receive input image data from the image input circuitry; the input image data defining a first image set that shows a first form that has been marked; the input image data further including destination information indicating an image destination; and

in response to the input image data, operating the processor to use the input image data to automatically produce created page data and to provide the created page data to the image output circuitry for transmission to the image destination; the created page data defining a second image set that shows a page, the page including a segment that is a version of an image from the first form.

5,465,168

GRADATION DRIVING METHOD FOR BISTABLE FERROELECTRIC LIQUID CRYSTAL USING EFFECTIVE CONE ANGLE IN BOTH STATES

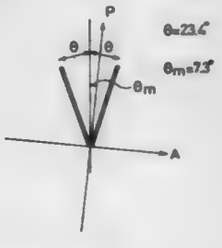
Mitsuhiro Koden, Nara; Akira Tagawa, Kashihara; Hitoshi Takeda, Tenri; Hirofumi Katsuse, Tenri; Makoto Shiomi, Tenri; Takaji Numao, Nara; Hiroshi Gouda, Tenri; Masayuki Katakami; Naofumi Kondo, both of Nara, and Mikio Katayama, Ikoma, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 28, 1993, Ser. No. 10,560

Claims priority, application Japan, Jan. 29, 1992, 4-013767; Jun. 30, 1992, 4-173495; Jul. 13, 1992, 4-185186; Jul. 27, 1992, 4-199841; Nov. 19, 1992, 4-310553

Int. Cl.[6] G02F *1/1343;1/13*

U.S. Cl. 359—56 **22 Claims**



liquid crystal : SF0731
cell thickness : 3μm
rubbing : parallel
orientation : C2

20. A method for driving a liquid crystal display which comprises:

a liquid crystal cell including a pair of substrates each having an electrode film and an orientation control layer on each electrode film, and

a pair of polarizing plates provided in the state of "cross nicol" on both sides of the liquid crystal cell; comprising the steps of:

providing a ferroelectric liquid crystal between the substrates, the ferroelectric liquid crystal showing bistable characteristics having two maximum apparent tilt angles $\pm\Theta$ and two memory angles $\pm\Theta m$, where $\Theta > \Theta m$;

aligning one of polarizing directions of the polarizing plates with the angle Θm;

applying to the cell an alternating voltage having such a low frequency that an apparent tilt angle of the ferroelectric liquid crystal changes alternatively with respect to the angle Θm and synchronously with the alternating voltage thus having the apparent tilt angle assume both positive and negative values, and

controlling a magnitude of the alternating voltage to change each intensity of light transmitted during a half cycle and the next half cycle,

whereby an average intensity of light transmitted through the cell per cycle of the applied alternating voltage is controlled.

22. The method of claim 20 in which the frequency of the alternating voltage is more than 10 Hz.

5,465,169

FERROELECTRIC LIQUID CRYSTAL DEVICE WITH ELECTROCONDUCTIVE PROTECTIVE FILM AND ELECTROCONDUCTIVE ALIGNMENT FILM

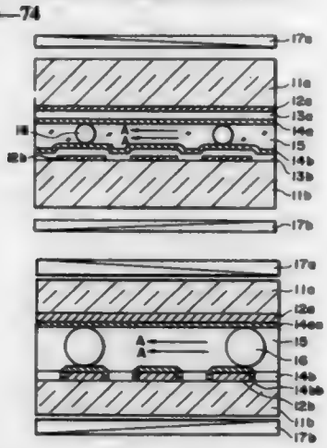
Ken Eguchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1993, Ser. No. 111,477

Claims priority, application Japan, Aug. 25, 1992, 4-247198; Jan. 9, 1992, 4-296580

Int. Cl.[6] G02F *1/1337;1/141*

U.S. Cl. 359—74 16 Claims



1. A liquid crystal device, comprising a pair of substrates each having an electrode thereon and a liquid crystal disposed between the substrates, wherein at least one of the substrates is provided with an electroconductive protective film and also an alignment film comprising an alignment material and a polymeric electroconductive compound.

14. A liquid crystal device, comprising:

a pair of mutually opposed substrates each having an electrode locally-disposed thereon so as to form a pixel at a portion where the electrodes intersect with each other, said liquid crystal device further comprising a liquid crystal disposed between the substrates, wherein at least one of the substrates is provided with an alignment film having locally enhanced electroconductivity at the portion thereof on the electrode.

5,465,170

ALIGNMENT ADJUSTING SYSTEM FOR USE IN OPTICAL SYSTEM OF OPTICAL TRANSCEIVER

Yoshinori Arimoto, Kokubunji, Japan, assignor to ATR Optical and Radio Communications Research Lab., Kyoto, Japan

Filed Jan. 19, 1994, Ser. No. 183,416

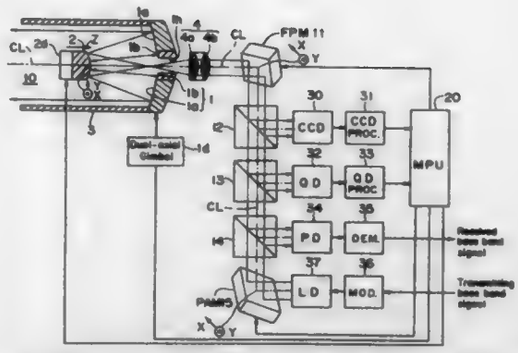
Claims priority, application Japan, Jan. 19, 1993, 5-006526

Int. Cl.[6] H04B *10/00*

U.S. Cl. 359—159 7 Claims

1. An alignment adjusting system for use in an optical system in an optical transceiver, comprising:

an optical antenna having a main mirror and a submirror, both of which being provided around an optical axis of said optical antenna and away from each other by a predetermined interval, said optical antenna transmitting a beam of transmitting light output from said optical transceiver to an optical antenna



of a destination station after sequentially reflecting said beam of transmitting light by said submirror and said main mirror;

an optical coupling means for optically coupling said optical antenna to said optical transceiver;

a return-reflection mirror for return-reflecting a part of said beam of transmitting light output from said optical transceiver;

first detection means for detecting a defocusing amount of said beam of transmitting light in said optical antenna, in response to said beam of transmitting light return-reflected by said return-reflection mirror;

first moving means for moving said submirror in a direction parallel to the optical axis of said optical antenna; and

first control means for controlling said first moving means so that the defocusing amount of said beam of transmitting light becomes substantially zero, in response to a defocusing amount of said beam of transmitting light in said optical antenna which is detected by said first detection means,

wherein said main mirror is either one of a ring-shaped concave parabolic mirror and a ring-shaped concave nearly-parabolic hyperbolic mirror;

said return-reflection mirror is either one of a ring-shaped concave spherical mirror and a ring-shaped concave nearly-spherical elliptical mirror, said return-reflection mirror being formed integrally together with said main mirror and concentrically with said main mirror around the optical axis of said optical antenna so that a mirror surface of said return-reflection mirror crosses a mirror surface of said main mirror; and

said main mirror and said return-reflection mirror are arranged so that a focal point of said main mirror coincides with the center of curvature of said return-reflection mirror.

5,465,171

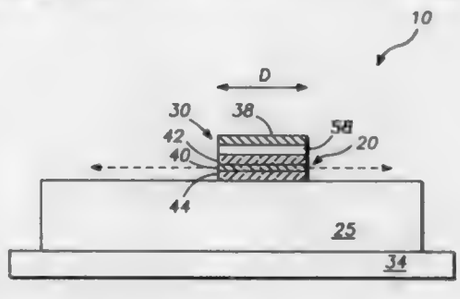
OPTICAL MODULATOR DEVICE USING A THIN FILM RESONATOR

Robert J. Weber, Boone, Iowa; Russell W.-C. Chung, San Diego, and Yet-zen Liu, West Lake Village, both of Calif., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 4, 1994, Ser. No. 334,674

Int. Cl.[6] G02F *1/11*

U.S. Cl. 359—287 18 Claims



1. An optical device comprising:

a thin film resonator comprising a piezoelectric crystal layer having first and second opposing surfaces, said first opposing surface being in contact with a metallic electrode;

an at least partially acoustically reflective surface; and

a semiconductor laser positioned between said acoustically reflective surface and said second opposing surface of said thin film resonator, said semiconductor laser being acoustically coupled to said thin film resonator;

whereby optical energy produced by said laser is modulated in accordance with acoustical energy generated by said thin film resonator.

5,465,172

IMAGE READING APPARATUS

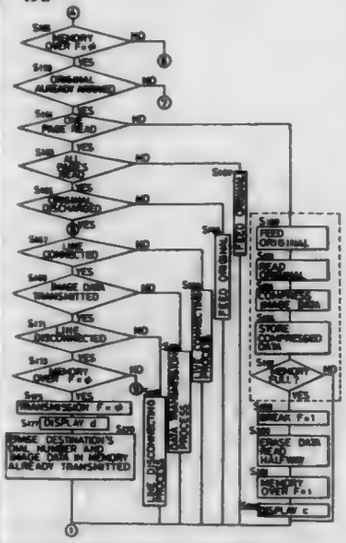
Shigenobu Fukushima, Toyokawa; Munehiro Nakatani, Toyohashi; Hideo Muramatsu, Shinshiro; Toshio Tsuboi, Okazaki; Hiroaki Hamano, and Kanako Hamano, both of Hirakata, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 667,605, Mar. 8, 1991, abandoned. This application Sep. 15, 1993, Ser. No. 121,665

Claims priority, application Japan, Mar. 12, 1990, 2-62433; Mar. 12, 1990, 2-62434; Mar. 12, 1990, 2-62435; Mar. 12, 1990, 2-62436; Mar. 12, 1990, 2-62437

Int. Cl.[6] H04N *1/42*

U.S. Cl. 358—498 **9 Claims**



1. An image reading apparatus, comprising:

reading means for sequentially reading a series of a plurality of original images in a reading operation;

storing means for storing at one time image data corresponding to the plurality of original images sequentially read by said reading means;

transmitting means for transmitting said image data stored in said storing means to another device;

detecting means for detecting a lacking condition of storage capacity of said storing means;

controlling means for controlling said reading means to interrupt said reading operation and also for controlling said transmitting means to transmit only image data corresponding to original images which have the entirety of their image data stored in said storing means and to not transmit image data corresponding to an original image which does not have the entirety of its image data stored in said storing means when a lacking condition of storage capacity of said storing means is detected by said detecting means in the course of reading the series of the plurality of original images by said reading means; and

restarting means for automatically restarting the interrupted reading operation of said reading means after said transmission of only image data corresponding to original images which have the entirety of their image data stored in said storing means for subsequent reading, by said reading means, of the entire original image which was being read by said reading means when said reading operation was interrupted, and for subsequent transmission, by said transmission means, of the entirety of the image data of the original image which was being read by said reading means when said reading operation was interrupted.

5,465,173

IMAGE PROCESSING APPARATUS

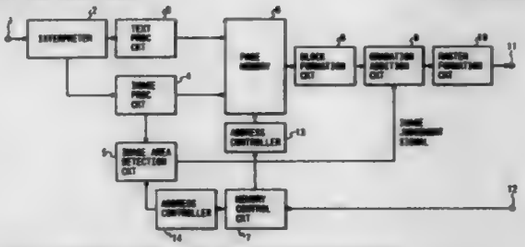
Hisashi Ishikawa, Saitama; Hideo Homma, Tokyo; Yoshitake Nagashima, Chigasaki, and Takashi Saito, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 103,168, Aug. 6, 1993, Pat. No. 5,321,532, which is a continuation of Ser. No. 13,194, Jan. 29, 1992, abandoned, which is a continuation of Ser. No. 616,210, Nov. 20, 1990, abandoned. This application Apr. 12, 1994, Ser. No. 225,973

Claims priority, application Japan, Nov. 20, 1989, 1-301477; Nov. 20, 1989, 1-301478; Nov. 20, 1989, 1-301479

Int. Cl.[6] H04N *1/41*

U.S. Cl. 358—534 **33 Claims**



29. An image processing apparatus comprising:

memory means for storing, on the basis of blocks each having a predetermined number of pixels, one frame pixel data including both halftone image data and line image data; and

control means for reading pixel data of a predetermined part area of the frame pixel data stored in said memory means,

wherein the pixel data read by said control means includes the halftone image data and the line image data.

5,465,174

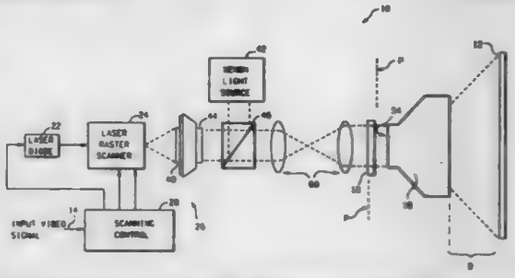
SINGLE LIGHT VALVE FULL-COLOR PROJECTOR DISPLAY

Donald E. Sprotbery, 6033 Butterfield La., Anaheim Hills, Calif. 92807

Continuation of Ser. No. 77,131, May 27, 1993, abandoned, which is a continuation of Ser. No. 712,236, Jun. 7, 1991, abandoned. This application Mar. 23, 1994, Ser. No. 216,773

Int. Cl.[6] G02F *1/133;* H04N *5/74*

U.S. Cl. 359—40 **16 Claims**



1. A projection apparatus for displaying an image on screen in accordance with the first and second video signals comprising:

laser means for providing a beam of coherent light;

means for controlling the intensity of said coherent beam in response to said first and second video signals;

liquid crystal light valve means in optical alignment with said coherent beam for modulating light illuminating an output layer thereof in accordance with an internally generated voltage pattern produced in response to incidence of said coherent beam on an input layer thereof;

scanning means for deflecting the coherent beam to a first set of areas on said input layer in response to said first video signal and for deflecting said coherent beam to a second set of areas on said input layer in response to said second video signal;

means for illuminating said output layer with a light source;

polarizing beam splitter means positioned in an optical path between said illuminating light source and said output layer for polarizing and directing said illuminating light onto said output layer and for relaying modulating light reflected by said output layer to an image plane; and

striped filter means disposed at said image plane between said beam splitter means and said screen having first and second sets of filter elements in optical alignment with said first and second sets of areas of said input layer for transmitting radiant energy in first and second wavelength bands, respectively, to said display screen wherein said radiant energy passes through said striped filter means only once.

5,465,175

AUTOSTEREOSCOPIC DISPLAY DEVICE

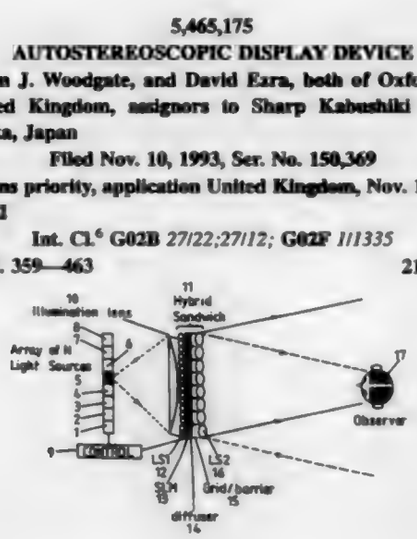
Graham J. Woodgate, and David Ezra, both of Oxfordshire, United Kingdom, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 10, 1993, Ser. No. 150,369

Claims priority, application United Kingdom, Nov. 11, 1992, 9223651

Int. Cl.[6] G02B *27/22;27/12;* **G02F** *1/1335*

U.S. Cl. 359—463 **21 Claims**



1. A display for producing an autostereoscopic image, comprising:

at least one light source for producing a divergent beam of light;

a spatial light modulator comprising a plurality of light modulating cells for modulating light passing therethrough from the at least one light source in accordance with image data;

a first array of optical components arranged to receive the divergent light beam from the at least one light source, each of the optical components being arranged to produce an image of the at least one source at a common image plane such that each image is laterally displaced by a respective predetermined amount from an optical axis of the corresponding optical component and the respective predetermined amounts vary progressively across the common image plane; and

a second array of optical components having a common object plane which coincides with the common image plane.

5,465,176

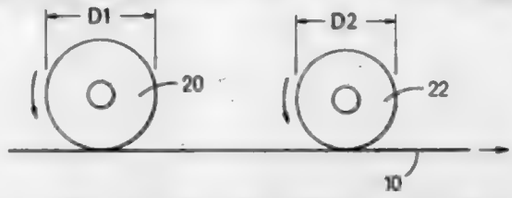
METHOD OF EMBOSSING REPEATING PATTERNS ON A SUBSTRATE, THE PATTERNS HAVING DIFFERENT RATES OF REPETITION

James S. Bianco, Enfield, Conn., and David J. Horan, Westfield, Mass., assignors to Control Module Inc., Enfield, Conn.

Continuation of Ser. No. 962,934, Oct. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 957,882, Oct. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 921,460, Jul. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 857,729, Mar. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 810,483, Dec. 19, 1991, abandoned. This application Jul. 29, 1994, Ser. No. 282,774

Int. Cl.[6] G02B *5/18;* **B44B** *5/00;* **B29D** *11/00*

U.S. Cl. 359—567 **2 Claims**



1. A method of producing embossed first and second elongate, parallel, repeating, patterns of optical elements on a sheet for use in producing secure identification means, said method comprising:

(a) continuously embossing a first said pattern on a first side of said sheet, with a first embossing roll of a first circumference; and

(b) continuously embossing a second said pattern on said first side of said sheet, parallel to said first pattern, with a second embossing roll of a second circumference different from said first circumference;

whereby, said first and second patterns repeat at different rates such that each embossing of said first and second patterns causes said first and second patterns to be offset lengthwise, relative to an immediately preceding embossing of said patterns, by an increment equal to the difference in circumferences between said first and second embossing rolls.

5,465,177

METHOD AND DEVICE FOR THE PROJECTION OF A COLOR IMAGE RESULTING FROM A MODULATION BY OPTICAL VALVES

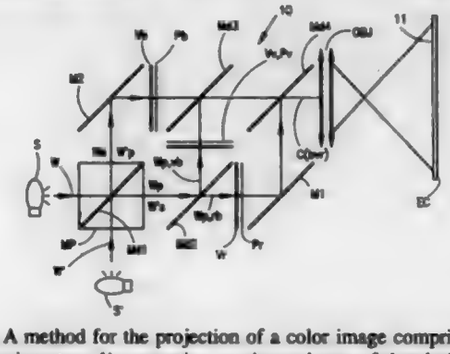
Bruno Barbier, and Patrick Lach, both of Bordeaux, France, assignors to Sextant Avionique, Meudon la Foret, France

Filed Sep. 28, 1993, Ser. No. 127,574

Claims priority, application France, Sep. 28, 1992, 92 11539

Int. Cl.[6] G02B *27/14;5/02*

U.S. Cl. 359—634 **19 Claims**



6. A method for the projection of a color image comprising the following steps 1) generating a primary beam of depolarized and collimated white light, 2) splitting said primary beam into two secondary beams of white light, and 3) modulating, by optical valves, three color beams which come from the primary beam by means for splitting said primary beam into said two secondary beams, wherein said two secondary beams have directions of propagation which are separated angularly, and wherein said sec-

ondary beams have polarizations which are elliptical and have opposite directions, and wherein one of said color beams comes from a first of said two secondary beams, and two of said color beams come from a second of said two secondary beams.

5,465,178
FOCUSING OPTICAL SYSTEM FOR SEMICONDUCTOR LASERS

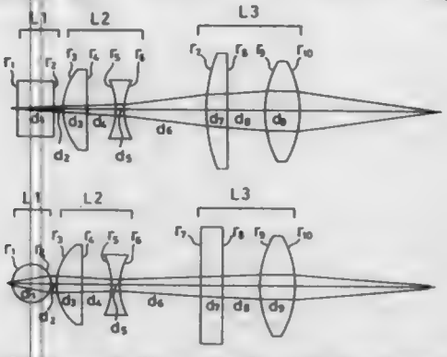
Sadao Nakai, 6-45, Kita-Kasugaoka 3-Chome, Ibaraki-shi, Osaka 567; Masanobu Yamanaka, Minoo; Koji Ishikawa, Neyagawa; Tsuyoshi Sato, Tokyo; Kimiaki Yamamoto, Tokyo, and Mikihiko Terashima, Tokyo, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo; Sadao Nakai, Osaka, and Kimnon Electric Co. Ltd., Tokyo, all of, Japan

Filed Sep. 10, 1993, Ser. No. 118,791

Claims priority, application Japan, Sep. 11, 1992, 4-243402

Int. Cl.[6] G02B *13/12;9/14;* **H01S** *3/08*

U.S. Cl. 359—670 **7 Claims**



1. A focusing optical system for focusing a light beam emitted from a light source having varying exit angles in both a horizontal and a vertical direction on a spot form having substantially equal diameters in said horizontal and vertical directions, comprising:

a first lens unit including at least one rotation asymmetric lens having a positive power to a direction defined at least by a larger exit angle of said varying exit angles;

a second lens unit including a negative power lens and a positive power lens; and

a third lens unit including at least one rotation asymmetric lens having positive power with respect to said direction defined by said larger exit angle as a whole and having positive power with respect to a second direction defined by a smaller exit angle of said varying exit angles.

5,465,179
MULTICHANNEL RECORDING AND/OR REPRODUCING APPARATUS

Yoshiyuki Kunito, and Tadashi Fukami, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 132,995, Oct. 7, 1993. This application Jul. 12, 1994, Ser. No. 273,966

Claims priority, application Japan, Jan. 8, 1992, 4-296437; Jan. 13, 1992, 4-301853; Jan. 13, 1992, 4-301854

Int. Cl.[6] G11B *5/00;15/14*

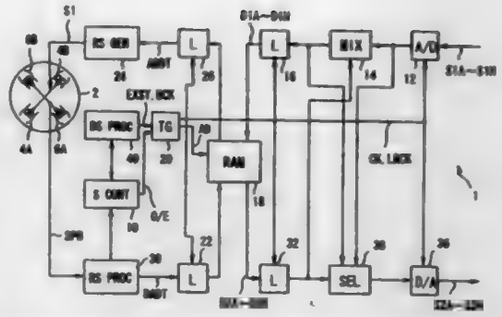
U.S. Cl. 360—8 **12 Claims**

1. A recording and/or reproducing apparatus for recording audio data by helically sequentially forming a pair of recording tracks with plus and minus azimuth angles on a magnetic tape, said magnetic recording and/or reproducing apparatus comprising:

a rotary drum having a magnetic tape wound therearound;

a pair of reproducing magnetic heads positioned on said rotary drum for reproducing a signal from a pair of recording tracks on said magnetic tape;

input means for inputting a 2^n channel signal, n being a positive integer and 2^n being a number of channels;



storing means for performing sampling processing for said inputted 2^n channel signal at a sampling frequency of f_s and interleave processing for a result of the sampling processing for N frame cycles, and for storing data including data from said interleave processing and sampling processing;

recording signal forming means for performing block-interleave processing on a signal from said storing means, performing error correction on said block-interleave-processed signal, and converting said error-corrected signal into a recording signal at a frequency f_r;

control means for controlling said input means, said storing means including the sampling frequency f_s of the sampling processing, and said recording signal forming means including the frequency f_r of the recording signal; and

a pair of recording magnetic heads positioned on said rotary drum behind said pair of reproducing magnetic heads, respectively, for at least 8.5+4N track pitch, for recording said recording signal from said recording signal forming means on said magnetic tape,

wherein a frame cycle correlates to an amount of time for said pair of recording magnetic heads to form a pair of recording tracks and N represents the number of frame cycles in an interleave cycle, and

wherein the sampling frequency and the number of channels in said recording and/or reproducing apparatus are either 32 kHz 2-channel, 44.1 kHz 2-channel, 48 khz 2-channel, 32 kHz 8-channel, 44.1 kHz 4-channel or 48 kHz 4-channel.

5,465,180
METHOD OF AND APPARATUS FOR RECORDING AND/OR REPRODUCING A CURRENT DIGITAL VIDEO SIGNAL AND A HIGH-DEFINITION DIGITAL VIDEO SIGNAL IN A COMMON TRACK FORMAT

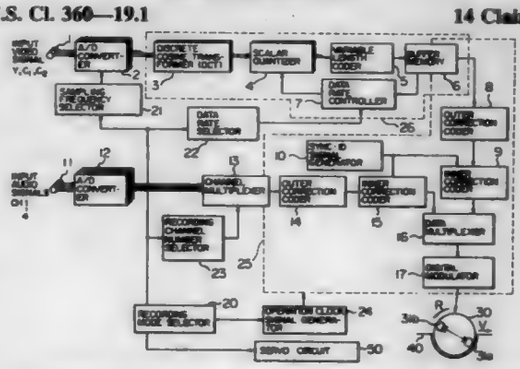
Nobutaka Amada, and Takaharu Noguchi, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 23, 1993, Ser. No. 79,868

Claims priority, application Japan, Jun. 29, 1992, 4-170456

Int. Cl.[6] H04N *5/782*

U.S. Cl. 360—19.1 **14 Claims**



1. A magnetic recording method for recording a first video signal digitized at a first sampling frequency and compressed to a first data rate or a second video signal digitized at a second sampling frequency and compressed to a second data rate n (where n is an

integer of 2 or larger) times as large as said first data rate, comprising the steps of:

during recording of said first video signal,

multiplexing digitized audio signals of m (where m is an integer of 2 or larger) channels and said first video signal together in a time division manner, resulting first multiplexed signals being output in sequence;

recording, while running a magnetic tape at a first transportation speed and rotating a rotary drum at a predetermined rotating speed, said first video signal and said audio signals of m channels multiplexed in a time division manner with k (where k is an integer) pairs of magnetic heads, each pair of said magnetic heads being mounted 180° opposite positions on said rotary drum, and on k tracks in every one half revolution of said rotary drum; and

during recording of said second video signal,

multiplexing digitized audio signals of n×m channels and said second video signal together in a time division manner, resulting second multiplexed signals being output in sequence;

recording, while running said magnetic tape at a second transportation speed n times said first transportation speed and rotating said rotary drum at a same rotating speed as said predetermined rotating speed, said second video signal and said audio signals of n×m channels multiplexed in a time division manner with n×k pairs of magnetic heads, each pair of said magnetic heads being mounted at 180° opposite positions on said rotary drum, and on n×k tracks in every one half revolution of said rotary drum.

5,465,181

APPARATUS FOR RECORDING AND REPRODUCING A DIGITAL/VIDEO SIGNAL HAVING A REDUCED NUMBER OF PROCESSING CHANNELS

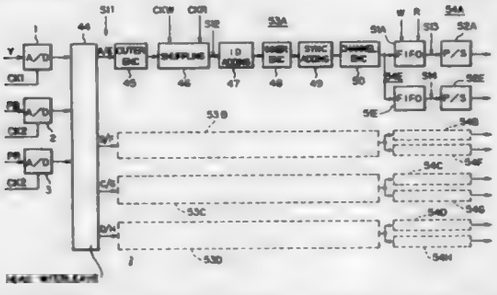
Tadaaki Yoshinaka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 932,504, Aug. 20, 1992, abandoned. This application Mar. 18, 1994, Ser. No. 210,780

Claims priority, application Japan, Aug. 30, 1991, 3-246794

Int. Cl.[6] H04N *5/78*

U.S. Cl. 360—36.2 **3 Claims**



1. A recording apparatus for recording a digital video signal on a magnetic tape, comprising:

N magnetic heads in two groups attached to a rotary drum at an angular interval of 180 degrees;

said magnetic tape being wrapped around a peripheral surface of said rotary drum in an angular range where scans of pairs of said N magnetic heads arranged at an angular interval of 180 degrees overlap;

head interleave means for distributing an input digital video signal to a plurality of channels of a number which is fewer than the number N of said N magnetic heads in which each channel contains two time division multiplexed signals for respective recording by two of said N magnetic heads arranged at an angular interval of 180 degrees;

a plurality of digital recording processing means of a number less than the number N each of which is connected to a respective one of said channels and includes an encoder of an error correction code; and

a plurality of memory means of a number which is equal to said number N, a pair of said plurality of memory means being coupled to receive one of said plurality of channels from a respective one of said digital recording processing means and a reading operation from each of said plurality of memory means being executed so as to separate said two time division multiplexed signals into different signals each for connection to a respective one of said two magnetic heads arranged at an angular interval of 180 degrees, so that N recording signals are generated from said plurality of memory means, respectively.

5,465,182

RECORDING METHOD OF SERVO INFORMATION

Tetsuro Ishikawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

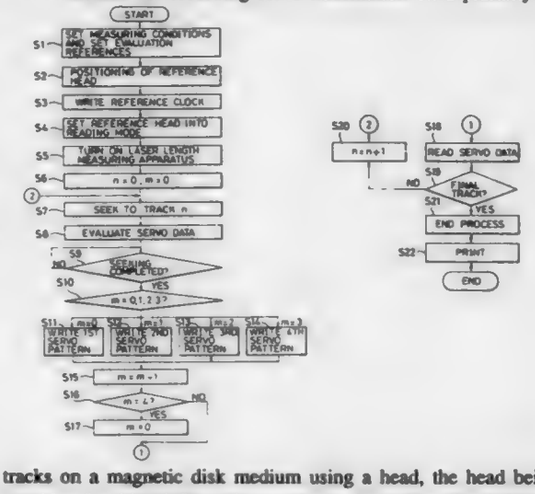
Filed May 5, 1993, Ser. No. 58,011

Claims priority, application Japan, May 6, 1992, 4-113280

Int. Cl.[6] G11B *21/02*

U.S. Cl. 360—75 **11 Claims**

1. A method for recording servo information on a plurality of



tracks on a magnetic disk medium using a head, the head being capable of writing information on the tracks and reading information from the tracks, the plurality of tracks being adjacent to a first track and successively adjacent to each other, the first track having previously recorded servo information, comprising the steps of

writing servo information on a first selected one of the plurality of tracks which is adjacent to the first track or a previously recorded one of the plurality of tracks;

reading out the servo information written on said first selected track in said writing step;

converting the servo information read out into digital servo information;

storing said digital servo information into a memory;

seeking a second selected one of the plurality of tracks;

verifying said servo information, at least part of said verifying step occurring during said seeking step; and

repeating said writing, reading, seeking and verifying steps for the successive ones of the plurality of tracks.

5,465,183

CONTROL SYSTEM FOR POSITIONING HEAD IN DISK DEVICE BY ESTIMATING AND CORRECTING ACTUATOR PARAMETERS BASED ON HEAD POSITION AND ACTUATOR DRIVE CURRENT OBTAINED BY VIBRATING THE HEAD

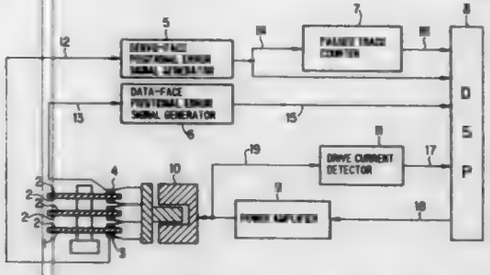
Toshiro Hattori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 7, 1994, Ser. No. 178,761

Claims priority, application Japan, Jan. 7, 1993, 5-016943; Nov. 4, 1993, 5-275701

Int. Cl.[6] G11B 5/596;21/02

U.S. Cl. 360—78.9 12 Claims



7. Control system for positioning a head in a disk drive which rotates disks to perform at least data reproduction, comprising:

an actuator for moving said head in the substantially radial direction of said disks;

positional information generating means for generating positional information representing the position of said head on said disks;

servo control means for controlling a drive current to said actuator so that the position of said head can match a given target position on the basis of the detected value of a drive current supplied to said actuator and said head position information;

parameter estimation means for estimating a current dynamical parameter of said actuator, based on the value of the drive current supplied to said actuator and said positional information obtained by vibrating said head at one or more predetermined frequencies in one or more predetermined positions on said disks; and

parameter correction means for correcting the loop gain of said control system in said servo control means by using said estimated parameters.

5,465,184

HARD DISC DRIVES AND READ/WRITE HEADS FORMED FROM HIGHLY THERMALLY CONDUCTIVE SILICON CARBIDE

Michael A. Pickering, Dracut; Jitendra S. Goela, Andover, and Lee E. Burns, Woburn, all of Mass., assignors to CVD, Incorporated, Woburn, Mass.

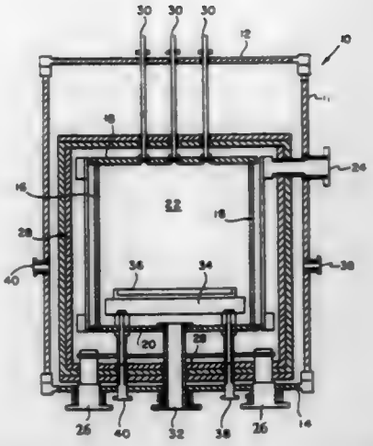
Division of Ser. No. 959,880, Oct. 13, 1992, Pat. No. 5,374,412, which is a continuation-in-part of Ser. No. 923,077, Jul. 31, 1992, abandoned. This application Nov. 17, 1994, Ser. No. 340,981

Int. Cl.[6] G11B 5/012;5/82;5/147

U.S. Cl. 360—97.01 12 Claims

1. In a rigid magnetic memory disc comprising a silicon carbide substrate having a polished surface and a magnetic coating thereon, the improvement wherein said silicon carbide is free-standing chemical vapor deposited, β, polycrystalline silicon carbide having a thermal conductivity of at least about 300 W/mK at room temperature.

5. In a read/write head comprising a silicon carbide substrate having a polished surface and a read and write circuitry coating fabricated thereon, the improvement wherein said silicon carbide is



free-standing chemical vapor deposited, β, polycrystalline silicon carbide having a thermal conductivity of at least about 300 W/mK at room temperature.

5,465,185

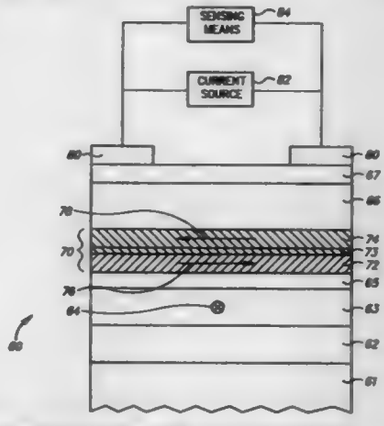
MAGNETORESISTIVE SPIN VALVE SENSOR WITH IMPROVED PINNED FERROMAGNETIC LAYER AND MAGNETIC RECORDING SYSTEM USING THE SENSOR

David E. Heim, Redwood City, and Stuart S. P. Parkin, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 15, 1993, Ser. No. 139,477

Int. Cl.[6] G11B 5/39

U.S. Cl. 360—113 46 Claims



36. A magnetic recording disk drive comprising:

a magnetic recording disk;

a motor connected to the disk for rotating the disk;

a spin valve magnetoresistive sensor for sensing magnetically recorded data on the disk, the sensor comprising:

a free ferromagnetic layer having a preferred axis of magnetization in the absence of an applied magnetic field;

a nonmagnetic spacer layer adjacent to the free ferromagnetic layer;

a first pinned ferromagnetic film adjacent to the spacer layer and having an axis of magnetization generally perpendicular to the magnetization axis of the free ferromagnetic layer;

a second pinned ferromagnetic film having a direction of magnetization generally antiparallel to the magnetization direction of the first pinned ferromagnetic film;

an antiferromagnetically coupling film located between and in contact with the first and second pinned ferromagnetic films for coupling the first and second pinned ferromagnetic films together antiferromagnetically so that their magnetizations

are aligned antiparallel with one another and remain antiparallel in the presence of an applied magnetic field; and

an exchange bias layer of antiferromagnetic material adjacent to and in contact with the second pinned ferromagnetic film for pinning the magnetization of the second pinned ferromagnetic film in a fixed direction and thereby pinning the magnetization of the first pinned ferromagnetic film antiparallel to the magnetization of the second pinned ferromagnetic film to which it is antiferromagnetically coupled;

a carrier supporting the spin valve magnetoresistive sensor, the carrier having a substrate onto which the sensor is attached;

an actuator for moving the carrier generally radially across the disk so the sensor may access different regions of magnetically recorded data on the disk;

means connecting the carrier to the actuator for maintaining the carrier near the disk;

means electrically coupled to the sensor for detecting changes in resistance of the sensor caused by rotation of the magnetization axis of the free ferromagnetic layer relative to the fixed, generally perpendicularly oriented magnetizations of the antiferromagnetically coupled first and second pinned ferromagnetic films in response to magnetic fields from the magnetically recorded disk; and

means for supporting the motor and actuator.

5,465,186

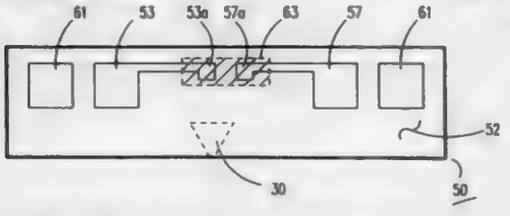
SHORTED MAGNETORESISTIVE HEAD LEADS FOR ELECTRICAL OVERSTRESS AND ELECTROSTATIC DISCHARGE PROTECTION DURING MANUFACTURE OF A MAGNETIC STORAGE SYSTEM

Christopher H. Bajorek, Los Gatos; A. David Erpelding, San Jose; Glen A. Garfunkel, Los Gatos; Surya Pattanaik, San Jose; Neil L. Robertson, Campbell, and Albert J. Wallash, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1994, Ser. No. 187,881

Int. Cl.[6] G11B *5/33*

U.S. Cl. 360—113 **37 Claims**



1. A method for protecting a magnetoresistive sensor element in a magnetic head assembly from damage caused by electrostatic discharge during fabrication of said magnetic head assembly and subsequent handling and assembly of said magnetic head assembly in a magnetic storage system, said method comprising the steps of:

electrically connecting said magnetoresistive sensor element conductive leads together for providing a short circuit path shunting said magnetoresistive sensor element;

electrically connecting said magnetoresistive sensor element to external circuitry, said external circuitry comprising at least one protective device being electrically connected for providing a current bypass path for said magnetoresistive sensor element, said protective device shorted by said short circuit path; and

opening said short circuit path in parallel with said magnetoresistive sensor element at a desired process or assembly step prior to the completion of said subsequent handling of and assembly of said magnetic head assembly in a magnetic storage system.

5,465,187

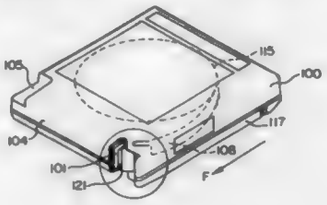
MAGNETIC TAPE CARTRIDGE HAVING LEADER BLOCK RETAINER MECHANISM

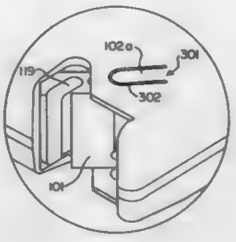
David T. Hoge, Westminster; Michael V. Konshak, Louisville; John C. Owens, Arvada, all of Colo.; Michael W. Johnson, Cottage Grove, Minn.; George P. Ramboseck, Shafer, Minn., and Thomas J. Rieger, St. Paul, Minn., assignors to Storage Technology Corporation, Louisville, Colo.

Continuation of Ser. No. 952,950, Sep. 25, 1992, abandoned. This application Oct. 17, 1994, Ser. No. 323,610

Int. Cl.[6] G11B *23/027;23/037;23/02*

U.S. Cl. 360—132 **13 Claims**





1. A magnetic tape cartridge, comprising:

a substantially rectangular housing having a top side parallel to a bottom side, said top side and said bottom side being joined by a plurality of sidewalls, said plurality of sidewalls being substantially perpendicular to said top side and said bottom side, which housing has an opening in one corner thereof and is adapted to enclose a single reel of magnetic tape rotatably mounted in a parallel plane between said top side and said bottom side, and including a leader block;

said leader block having a first end and a second end, said first end being attached to one end of said magnetic tape and said second end having a leader block retrieval slot attached thereto, and a first retainer engagement surface opposite a second retainer engagement surface both located between said first end and said second end, said first retainer engagement surface being adjacent to and in a parallel plane as said top side and said second retainer engagement surface being adjacent to and in a parallel plane with said bottom side; and

leader block retainer means located adjacent to said opening and formed as part of and surrounded by at least one of said top side and said bottom side, and operable to resist extraction of said leader block from said housing by independently engaging said at least one of said first retainer engagement surface and said second retainer engagement surface.

5,465,188

CIRCUIT PROTECTION DEVICE

Dennis M. Pryor, and Michael Challis, both of Swindon, England, assignors to Raychem Limited, United Kingdom

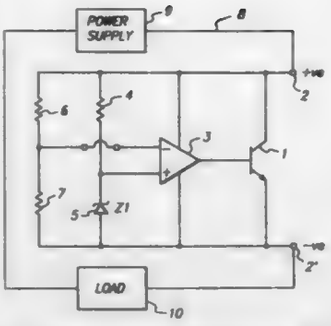
Filed Jun. 10, 1993, Ser. No. 75,521

Claims priority, application United Kingdom, Dec. 13, 1990, 9027111

Int. Cl.[6] H02H *3/20*

U.S. Cl. 361—18 **19 Claims**

1. A circuit protection arrangement that is series connected in a line of an electrical circuit to be protected, which comprises a transistor switch that controls the circuit current and has a control input, and a control arrangement that controls the voltage of the control input and is responsive to an overcurrent through the switch, the control arrangement comprising a comparator circuit



that compares a fraction of the voltage across the switch with a reference voltage and opens the switch if the fraction is greater than the reference voltage, the comparator circuit being powered by a voltage drop in the line across the switch.

5,465,189

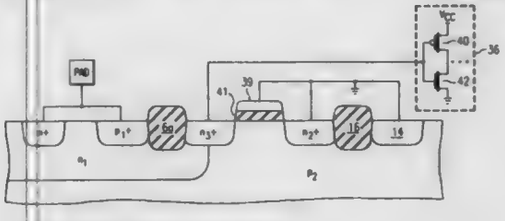
LOW VOLTAGE TRIGGERING SEMICONDUCTOR CONTROLLED RECTIFIERS

Thomas L. Polgreen, Dallas, Tex.; Amitava Chatterjee, Garland, and Ping Yang, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 104,281, Aug. 10, 1993, abandoned, which is a continuation of Ser. No. 488,590, Mar. 5, 1993, abandoned. This application Aug. 12, 1994, Ser. No. 289,983

Int. Cl.[6] H02H *9/04*

U.S. Cl. 361—58 **37 Claims**



1. An integrated circuit comprising:

a device for which ESD protection is desired, said device including at least one MOS transistor;

a lateral semiconductor controlled rectifier coupled to said device, said semiconductor controlled rectifier including a common region;

a MOS-like structure integral with said semiconductor controlled rectifier, said MOS-like structure also including said common region, said semiconductor controlled rectifier being operable to be triggered by a current generated when said MOS-like structure is in avalanche breakdown.

5,465,190

CIRCUIT AND METHOD FOR PROTECTING POWER COMPONENTS AGAINST FORWARD OVERVOLTAGES

Philippe Meunier, Aix-en-Provence, and Antoine Pavlin, Puyricard, both of, France, assignors to SGS-Thomson Microelectronics S.A., Saint-Genis, France

Filed Jul. 7, 1993, Ser. No. 88,302

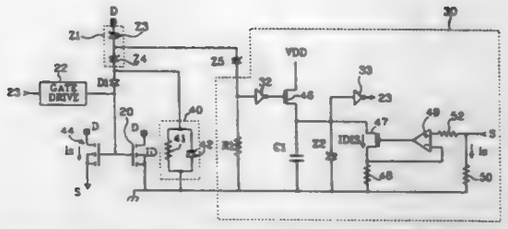
Claims priority, application France, Jul. 16, 1992, 92 09119

Int. Cl.[6] H02H *9/04; G05F 3/26*

U.S. Cl. 361—91 **20 Claims**

12. A protection circuit for protecting a power transistor against overvoltages comprising:

a clamping circuit, coupled to the power transistor, in response to an overvoltage, partially turning on the power transistor and maintaining voltage across the power transistor at a predetermined voltage level lower than a forward breakdown voltage of the power transistor;



a detection circuit, coupled to the clamping circuit and the power transistor, detecting a quantity of energy dissipated in the power transistor and comparing the quantity of energy dissipated with a predetermined energy threshold; and

a gate drive circuit, coupled to the detection circuit and the power transistor, substantially fully turning on the power transistor when the detection circuit detects that the quantity of energy dissipated has exceeded the predetermined energy threshold.

5,465,191

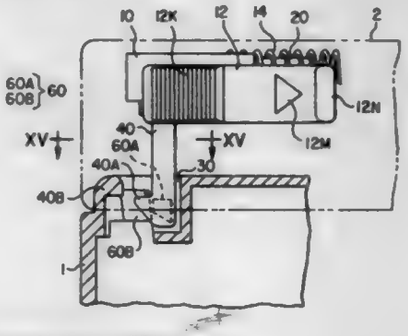
SINGLE HAND OPERABLE LATCH MECHANISM FOR HINGED CONTAINER

Hideo Nomura; Yoshiharu Uchiyama, and Tetsuo Ogawa, all of Kanagawa, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 7, 1993, Ser. No. 133,532

Int. Cl.[6] G06F *1/16;* **H05K** *7/12;* **E05C** *1/10*

U.S. Cl. 361—681 **5 Claims**



1. A container comprising:

a body;

a cover to the body hingedly mounted to the body along one side to be opened and closed;

an engaging member provided on at least one of said cover or said body,. wherein said engaging member is movable by force between a position for engaging the cover with the body and a position for releasing the cover from the body when the cover is closed; and

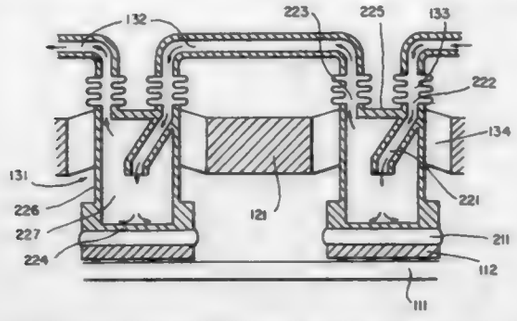
lock means for preventing the engaging member from being moved from the position for releasing the cover to the position for engaging the cover after the engaging member is moved from the position for engaging to the position for releasing when the cover is closed, and for allowing the engaging member to move from the position for releasing the cover to the position for engaging the cover when the cover is opened.

5,465,192

COOLING APPARATUS FOR INTEGRATED CIRCUIT CHIPS FOR PREVENTING FORCIBLE CONTACT BETWEEN A COOLING MEMBER AND THE CHIPS

Minoru Yoshikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 21, 1994, Ser. No. 263,377
Claims priority, application Japan, Jun. 21, 1993, 5-148740
Int. Cl.[6] H05K 7/20
U.S. Cl. 361—705 9 Claims



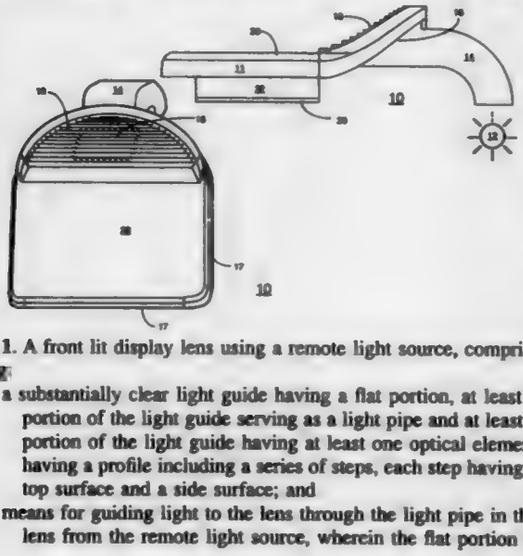
1. A cooling apparatus for integrated circuit chips, comprising:
a block having a hole;
a hollow cooling member for cooling an integrated circuit chip, said cooling member being inserted in the hole of said block, a lower portion of said cooling member protruding from a lower surface of said block, the lower portion of said cooling member being thermally in contact with the integrated circuit chip;
an elastic member provided between said cooling member and said block for supporting said cooling member in said block; and
a nozzle for spraying a coolant inside said cooling member, said nozzle being fixedly secured in said cooling member so that the coolant sprayed from said nozzle does not cause the lower portion of said cooling member to be forcibly contacted with the circuit chip.

5,465,193

FRONT LIGHT GUIDE FOR LIQUID CRYSTAL DEVICE WITH STAIRSTEP ELEMENT WHICH EMITS LIGHT

James L. Tracy, Margate, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1993, Ser. No. 82,649
Int. Cl.[6] G02F 1/1335
U.S. Cl. 362—31 17 Claims



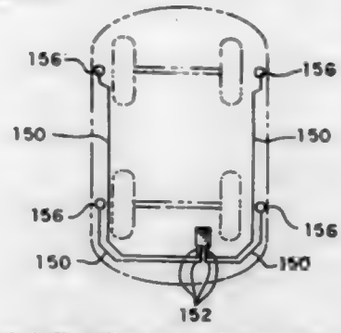
1. A front lit display lens using a remote light source, comprising:
a substantially clear light guide having a flat portion, at least a portion of the light guide serving as a light pipe and at least a portion of the light guide having at least one optical element having a profile including a series of steps, each step having a top surface and a side surface; and
means for guiding light to the lens through the light pipe in the lens from the remote light source, wherein the flat portion is placed over a display and front illuminates the display and said optical element emits light from the surfaces which provides illumination in the vicinity of the display.

5,465,194

OPTICAL FIBER ILLUMINATION DEVICE

Joseph E. Currie, R.F.D. 8 17 Lawrence Rd., Hudson, N.H. 03051

Continuation-in-part of Ser. No. 132,341, Oct. 6, 1993, Pat. No. 5,400,225. This application Nov. 3, 1994, Ser. No. 335,368
Int. Cl.[6] B60Q 1/00; F21V 7/04
U.S. Cl. 362—32 13 Claims



1. An optical fiber illumination device having at least one illumination assembly, said assembly comprising:
at least one optical fiber cable, said optical fiber cable having at least one input and at least one output;
at least a first light source and a second light source arranged adjacent to said at least one input, said first light source being energized by a first electric circuit, said second light source being energized by a second electric circuit;
a first lens interposed between said first light source and said at least one input;
a second lens interposed between said second light source and said at least one input, said second lens possessing a filtering characteristic distinguishable from a distinguishing characteristic of said first lens;
a first control means for disabling said first light source, said first control means being responsive to said second electric circuit;
a light source box surrounding said at least one input of said at least one optical fiber cable, said first and second light sources, and said first and second lenses; and
wherein said at least one output of said at least one optical fiber cable is positioned adjacent to a tire of a motor vehicle;
whereby light from said first and second light sources is transmitted through said at least one optical fiber cable to illuminate the tire of the motor vehicle.

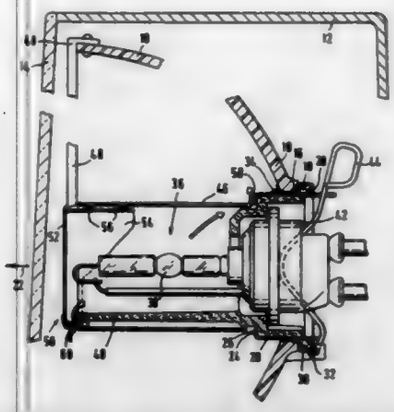
5,465,195

HEADLIGHT FOR MOTOR VEHICLES

Bert Jenner, Hamburg; Hans-Joachim Schmidt, Dusslingen; Giancarlo Chiaramonte, Bodelshausen, and Wolfgang Lehmann, Bempflingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jul. 23, 1993, Ser. No. 97,088
Claims priority, application Germany, Jul. 31, 1992, 42 25 303.9
Int. Cl.[6] B60Q 1/04; F21V 9/06
U.S. Cl. 362—61 12 Claims

1. A headlight for motor vehicles, comprising a reflector; a lamp support; a gas discharge lamp arranged in said reflector and fixed to said lamp support and including a region extending in said reflector and a glass cylinder which at least partially absorbs light in UV-wavelength range and surrounds said region of said gas discharge lamp; and a light stop which at least partially screens a light emitted by said gas discharge lamp, said light stop being at least indirectly mounted on said reflector, said glass cylinder being



held on said light stop at least in its first end region facing a light direction, always from said reflector said glass cylinder adjoining said lamp support, and said lamp support and said glass cylinder being arranged so that an opening leading to an interior of said glass cylinder remains between said lamp support and said glass cylinder, said glass cylinder having an end side which faces the light direction, always from said lamp support said end side of said glass cylinder being covered by said light stop, and an opening leading to an interior of said glass cylinder remains between said glass cylinder and said light stop.

5,465,196

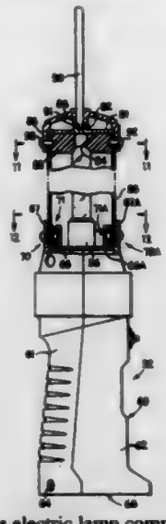
PORTABLE CORDLESS ELECTRIC UTILITY LAMP

Mark J. Hasenberg, Kenosha, Wis., and Peter B. Rau, Danville, Ill., assignors to Snap-on Incorporated, Kenosha, Wis.

Continuation-in-part of Ser. No. 984,964, Dec. 3, 1992, abandoned. This application Jun. 24, 1994, Ser. No. 265,229

Int. Cl.[6] F21L *7/00*

U.S. Cl. 362—183 **15 Claims**



1. A portable cordless electric lamp comprising: a base including first and second parts cooperating in an assembled condition to define a handle portion, an elongated cylindrical tube formed of a light transmitting material and having opposite ends, coupling structures respectively on said base parts, one end of said tube being received in both of said coupling structures when said base parts are in the assembled condition for holding said base parts in the assembled condition, each of said coupling structures including a part-cylindrical outer wall portion and retaining structure spaced a slight distance radially inwardly of said part-cylindrical wall portion, said part-cylindrical wall portions cooperating in the assembled condition of said parts to define a cylindrical wall, said one end of said tube being coaxially received between said cylindrical wall and said retaining structures, fastening structure securing said one end of said tube to each of said coupling structures, an electric bulb mounted on said base and disposed within said tube for emitting light therefrom, and a battery carried by said base and coupled to said bulb.

5,465,197

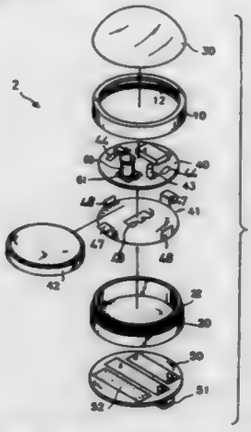
PORTABLE LIGHT

Tseng-Lu Chien, 8th Fl.-6, No. 9, Sanmin Rd., Taipei, Taiwan, Prov. of China

Filed Jun. 7, 1994, Ser. No. 255,923

Int. Cl.[6] A43B *23/00;* **F21L** *15/08*

U.S. Cl. 362—203 **10 Claims**



1. A portable light comprising a shell which defines an opening, a lens which is mounted on the shell so as to cover the opening, a printed circuit board having first and second sides and which is positioned in the shell, a light emitting diode which is operatively connected with and mounted on the first side of the printed circuit board, a motion-sensitive switch which is operatively connected with and mounted on the first side of the printed circuit board, and a metal strip which is operatively connected with the printed circuit board, a dry battery, wherein the, dry battery is sandwiched between the second side of the printed circuit board and the metal strip, whereby the metal strip connects one side of the battery with the circuit board and at the same time retains the dry battery against the circuit board so that the opposite electrode of the dry battery directly engages the circuit board.

5,465,198

COMBINATION CLOCK RADIO, NIGHT LIGHT AND POWER RECEPTACLE

Diane L. Kellogg, 10372 Southerland Dr., Boise, Id. 83709

Filed Jun. 17, 1994, Ser. No. 261,812

Int. Cl.[6] F21V *33/00*

U.S. Cl. 362—253 **19 Claims**

1. A combination appliance comprising:

a single casing for receiving and holding an electrical buss, electrical receptacle, radio, clock and light;

an electrical buss disposed and held within said casing;

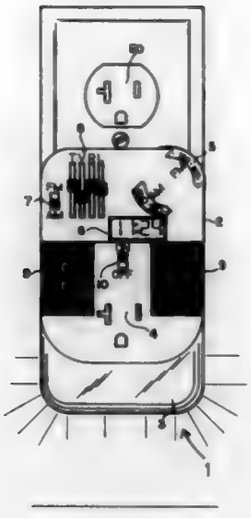
an electrical connector projecting from the casing operatively connected to the electrical buss, the electrical connector being adapted to engage an electrical power supply receptacle;

a radio disposed and held within said casing and operatively connected to the electrical buss;

a clock disposed and held within said casing and operatively connected to the electrical buss;

a light disposed and held within said casing and operatively connected to the electrical buss; and

an electrical receptacle disposed and held within said casing and operatively connected to the electrical buss.

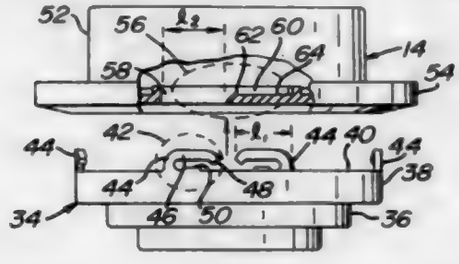


5,465,199

SYSTEM FOR ATTACHING TRIM TO LAMP HOUSING

Douglas R. Bray, Medford, N.J., and Michael M. Strazhnik, Philadelphia, Pa., assignors to Sea Gull Lighting, Riverside, N.J.

Filed Aug. 19, 1994, Ser. No. 292,995
Int. Cl.[6] F21S 1/02
U.S. Cl. 362—364 19 Claims



1. A trim attachment system for a recessed lighting unit including a lamp housing having a generally cylindrical support and a trim piece having a generally cylindrical portion for attachment thereto, the system comprising at least one first attachment region associated with a first circumferential region on a selected one of said cylindrical support and/or trim piece and at least one second attachment region associated with a second circumferential region on the other one of said cylindrical support or trim piece for mating with the first attachment region,

the first attachment region including a slot extending along the first circumferential region and having a first length, and a detent sector adjacent to and in communication with the slot and also extending along the first circumferential region, said detent sector includes a detent region and a tooth, the tooth being adjacent to the slot so that the lip of the finger travels over the tooth to reach the detent region,

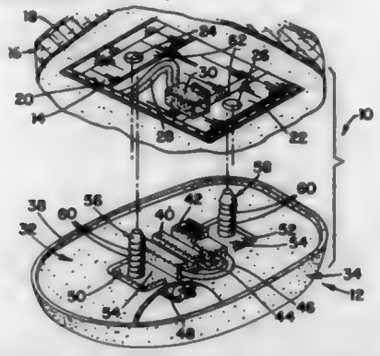
the second attachment region including a finger thereon, the finger having a second length smaller than the first length so as to allow the finger to pass through the slot, the finger having a proximal end connected to the selected one of said cylindrical support and/or trim piece and a distal end, the finger having a lip at its distal end for seating into the detent sector when the finger is passed through the slot and the trim piece is rotated relative to the housing.

5,465,200

LAMP ASSEMBLY FASTENING SYSTEM

Anthony J. Finocchio, Mt. Clemens, and Edward M. Finan, Bingham Farms, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 19, 1993, Ser. No. 93,340
Int. Cl.[6] F21Y 21/00; B60Q 3/02
U.S. Cl. 362—368 7 Claims



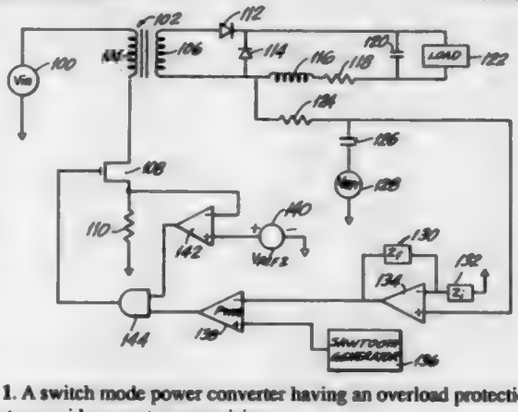
1. In combination with a support panel secured to a frame member having a pair of spaced retainer openings formed in the support panel, a lamp assembly including a base, first and a second cantilevered members formed with said base member, each of said cantilevered members being connected to said base member by a resilient hinge, first and second stud members respectively mounted on said first and second cantilevered members and adapted to be received by said pair of retainer openings for connecting said lamp assembly to said support panels, each of said stud members formed with a plurality of ratchet teeth along its length, each of said first and second stud members being located in a position on the respective first and second cantilevered members so that, during insertion of said first and second stud members into said first and second retainer members, said ratchet teeth engage the support panel at one side of each of said pair of retainer openings to cause said cantilevered members to pivot away from said portion about said resilient hinge to permit said stud members to be ratcheted into said pair of retainer openings and lock said lamp assembly to said support panel.

5,465,201

OVERLOAD PROTECTION OF SWITCH MODE CONVERTERS

Isaac Cohen, Dix Hills, N.Y., assignor to Lambda Electronics, Inc., Melville, N.Y.

Continuation of Ser. No. 7,070, Jan. 21, 1993, abandoned.
This application Jun. 27, 1994, Ser. No. 266,169
Int. Cl.[6] H02M 3/335; H02H 7/12
U.S. Cl. 363—21 29 Claims



1. A switch mode power converter having an overload protection system, said converter comprising:

an input stage having an input voltage source;

a switching circuit for coupling said input voltage source and an output stage;

said output stage further comprising an inductor for providing an output current to a load circuit, said inductor having a first terminal and a second terminal, said inductor having an inherent resistance, said output current thereby providing a voltage between the first terminal and the second terminal of said inductor including a DC voltage component proportional to said inherent resistance and to said output current;

a filter circuit having a pole and having a filter input and a filter output, said filter input coupled to said inductor to sense said voltage between the first terminal and the second terminal, said filter circuit providing said DC voltage component at said filter output, said DC voltage thereby being proportional to internal temperature of said converter;

an error amplifier responsive to said DC voltage and to a reference voltage source said error amplifier providing an error signal proportional to the difference between said DC voltage proportional to said output current and said reference voltage, said error signal adjusting an operating parameter of said switching circuit.

5,465,202

INVERTER APPARATUS PROVIDED WITH ELECTRIC DISCHARGE CONTROL CIRCUIT OF DC SMOOTHING CAPACITOR AND METHOD OF CONTROLLING THE SAME

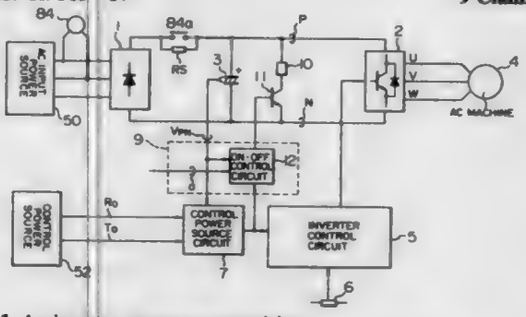
Satoshi Ibori, Funabashi; Hitoshi Yamashita, Yachiyo; Shigeyuki Baba, Narashino; Hiroshi Fujii, Chiba; Takatsugu Kambara, Funabashi, and Akira Ishibashi, Tokyo, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 799,936, Nov. 29, 1991, abandoned. This application Mar. 3, 1994, Ser. No. 205,082

Claims priority, application Japan, Nov. 30, 1990, 2-329377

Int. Cl.[6] H02M *5/45*

U.S. Cl. 363—37 **9 Claims**



1. An inverter apparatus comprising:

a rectifier, having an input adapted to be connected to an a.c. power source for receipt of input a.c. power therefrom, and having an output;

a d.c. intermediate circuit, including a smoothing capacitor, connected to said output of said rectifier;

an inverter circuit, having an input connected to said d.c. intermediate circuit, for outputting a.c. electric power for application to an a.c. powered device;

a series circuit, including a semiconductor switching element and a resistor, said series circuit connected in parallel with said smoothing capacitor; and

a discharge control circuit, for turning on said semiconductor switching element in response to continuous interruption of the input a.c. power for at least a predetermined time.

5,465,203

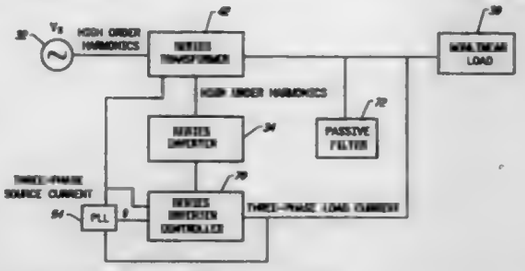
HYBRID SERIES ACTIVE/PARALLEL PASSIVE POWER LINE CONDITIONER WITH CONTROLLED HARMONIC INJECTION

Subhashish Bhattacharya, and Deepakraj M. Divan, both of Madison, Wis., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 18, 1993, Ser. No. 79,303

Int. Cl.[6] H02M *1/12*

U.S. Cl. 363—40 **21 Claims**



1. A power line conditioner, comprising:

an active filter, said active filter being coupled, in series through a series transformer, to a three-phase power distribution network, said three-phase power distribution network including a voltage source inducing three-phase input currents at a first end of said three-phase power distribution network, a load at a second end of said three-phase power distribution network, said load circulating three-phase load currents;

a passive filter coupled, in parallel, to said three-phase power distribution network; and

an active filter controller coupled to said active filter, said active filter controller including means for generating control signals to force said active filter, with signals applied to said series transformer, to allow a predetermined amount of load harmonics into said voltage source, said load harmonics corresponding to selected harmonics of said three-phase load currents, and thereby reduce the voltage distortion at said passive filter.

5,465,204

HEURISTIC CONTROL SYSTEM EMPLOYING EXPERT SYSTEM, NEURAL NETWORK AND TRAINING PATTERN GENERATING AND CONTROLLING SYSTEM

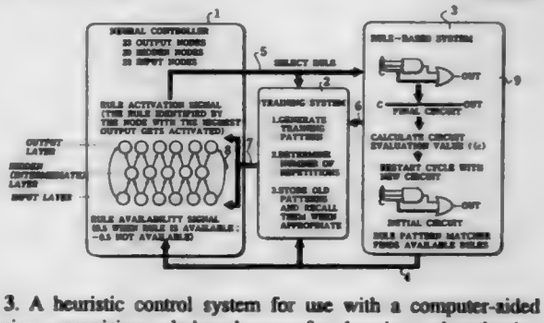
Masatoshi Sekine, Kanagawa, Japan, and Eric Chang, Beverly Hills, Calif., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 5, 1992, Ser. No. 972,304

Claims priority, application Japan, Nov. 8, 1991, 3-293072

Int. Cl.[6] G05B *13/02;* **G06F** *15/18*

U.S. Cl. 364—152 **7 Claims**



3. A heuristic control system for use with a computer-aided design, comprising: rule-based means for choosing and evaluating a rule among a plurality of given rules; training means for choosing strongly a rule whose evaluation result is favorable based on a predetermined value which evaluates an evaluation result of the rule-based means, and for generating a learning pattern; and neural network means for designing an optimized circuit based on a signal

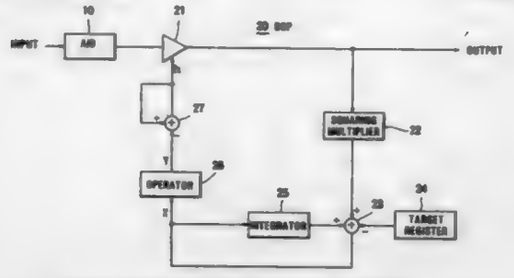
fed from the training means and for sending a resultant signal to the rule-based means for another iteration of heuristic control.

5,465,205

AUTOMATIC GAIN CONTROL APPARATUS

Ryo Kamiya, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 3, 1992, Ser. No. 985,036
Claims priority, application Japan, Dec. 9, 1991, 3-350350
Int. Cl.[6] G05B *13/02*
U.S. Cl. 364—157 **8 Claims**



1. An automatic gain control apparatus comprising:

multiplier means for multiplying an input signal by a given AGC multiplication factor to produce an output signal;

adder means for subtracting a target value from the output signal and adding an integrated value to the output signal to produce an error value;

integrator means for integrating the error value from the adder means to produce said integrated value;

operator means for computing a compensation value based on the error value according to a predetermined polynomial; and

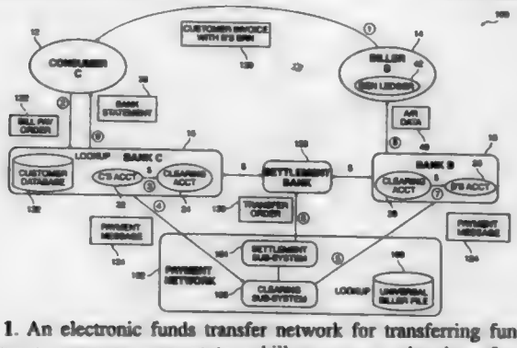
accumulator means for producing said AGC multiplication factor according to the compensation value, wherein the automatic gain control apparatus is composed of a digital signal processor specifically programmed to functionally constitute the multiplier means, the adder means, the operator means, and the accumulator means.

5,465,206

ELECTRONIC BILL PAY SYSTEM

James J. Hilt, Daly City; Ron Hodges, San Ramon; Stephen W. Pardue, Half Moon Bay, and William L. Powar, Palo Alto, all of Calif., assignors to Visa International, San Mateo, Calif.

Filed Nov. 1, 1993, Ser. No. 146,515
Int. Cl.[6] G06F *157/00*
U.S. Cl. 364—406 **30 Claims**



1. An electronic funds transfer network for transferring funds from a consumer account to a biller account, wherein a funds transfer from the consumer account occurs when a first transaction processor applies a debit portion of an accounting transaction to the consumer account and a funds transfer to the biller account occurs where a second transaction processor applies a credit portion of a resulting accounting transaction to the biller account, comprising:

order input means for consumer input of a bill pay order, said bill pay order including at least a reference to a biller identification (biller ID), a payment amount, and an identifier of a consumer-biller account to be credited, wherein said consumer-biller account is used to determine amounts owed to a biller by a consumer;

a first transaction processor, configured to at least maintain a balance of the consumer account and process debit portions of accounting transactions against the consumer account, said first transaction processor being a computer operated for a consumer financial institution with whom the consumer maintains the consumer account;

means for transmitting said bill pay order from said order input means to said first transaction processor;

payment data packet generation means, controlled by said first transaction processor, for generating a payment data packet based on said bill pay order, said payment data packet comprising at least data fields indicating said biller ID, said payment amount and said consumer-biller account identifier;

an electronic packet transfer network which electronically couples said payment data packet generation means at an originating node to a plurality of similar nodes, wherein each node is uniquely identified by a financial institution identifier (BID), said electronic packet transfer network including destination translation means for translating said biller ID field of said payment data packet into a pointer to a destination node;

a second transaction processor located at said destination node, configured to at least maintain a balance of the biller account and process credit portions of accounting transactions against the biller account, said second transaction processor being a computer operated for the biller financial institution with whom a biller maintains the biller account;

payment data packet accepting means, coupled to said electronic packet transfer network and to said second transaction processor, for accepting said payment data packet from said electronic packet transfer network and applying a credit transaction to the biller account according to said payment amount field of said payment data packet; and

a biller accounts receivable data processor, coupled to one of said electronic packet transfer network or said payment data packet accepting means, which processes biller data included in said payment data packet and provides said biller data in a form used by said biller to update said consumer-biller account to reflect a credit based on to said payment amount.

5,465,207

VEHICLE DATA SYSTEM

Darrell L. Boatwright; George E. Hanson; Phillip Miller; Steven E. Koenck; Jerry L. Walter, all of Cedar Rapids, Iowa; Joseph J. Kubler, Boulder, Colo.; Keith K. Cargin, Jr., Cedar Rapids, Iowa; Darald R. Schultz, Cedar Rapids, Iowa; Patrick H. Davis, Cedar Rapids, Iowa, and Steven R. Kunert, Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

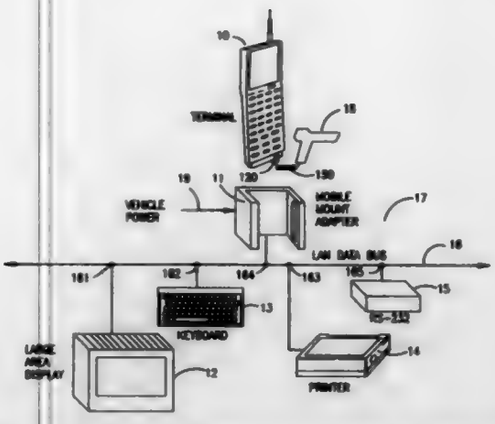
Continuation-in-part of Ser. No. 305,302, Jan. 31, 1989, abandoned, and a continuation-in-part of Ser. No. 347,602, May 3, 1989, abandoned. This application Sep. 21, 1992, Ser. No. 947,687
Int. Cl.[6] G06F *12/00;13/38*
U.S. Cl. 364—424.01 **9 Claims**

1. The method of transmitting data in a transport vehicle manned by a single person, which comprises:

establishing a vehicle local area network within the vehicle and connecting respective points on the vehicle where data device means are to be mounted,

providing operating potential to the vehicle local area network from a vehicle power source,

coupling different portable data device means to the vehicle local area network at at least one of the respective points on the vehicle, for data interchange with other data device means which are coupled with the vehicle local area network, and



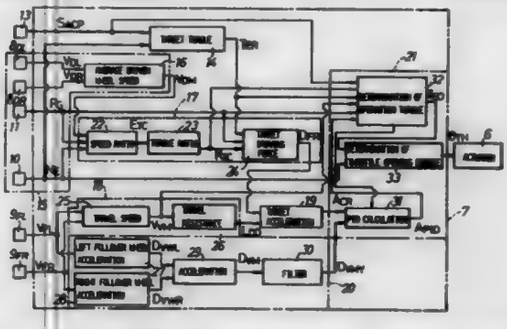
dynamically assigning addresses to the respective different portable data device means as they are coupled with the vehicle local area network and using such addresses in effecting data interchange with such respective portable data device means via the vehicle local area network.

5,465,208

POWER SOURCE OUTPUT CONTROL SYSTEM OF VEHICLE WITH TRAVEL RESISTANCE DETECTOR

Kazuhiko Mochizuki; Hiromi Inagaki, and Kenji Akuzawa, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1993, Ser. No. 59,405
Claims priority, application Japan, May 13, 1992, 4-120392
Int. Cl.[6] G01P *15/00*
U.S. Cl. 364—426.01 **2 Claims**



1. A power source output control system for a vehicle, comprising:

an actuator means for changing output from a power source;

an accelerator operation amount detector for detecting an amount of operation of an accelerator operation member;

a power source output detector for detecting output from said power source;

a target torque determination means for determining a target torque for said power source on the basis of said accelerator operation amount detected by said accelerator operation amount detector and said power source output detected by said power source output detector;

a driving-force detecting means for detecting a driving force being applied to a driven wheel of said vehicle;

a target driving-force determination means for determining a target driving force to be applied to said driven wheel on the basis of said target torque determined by said target torque determination means and said driving force detected by said driving-force detecting means;

a travel resistance detecting means for detecting a travel resistance acting on the vehicle;

a target acceleration determination means for determining a target acceleration from said vehicle on the basis of said target driving force determined by said target driving-force determination means and said travel resistance detected by said travel resistance detecting means;

an acceleration detecting means for detecting an acceleration of said vehicle; and

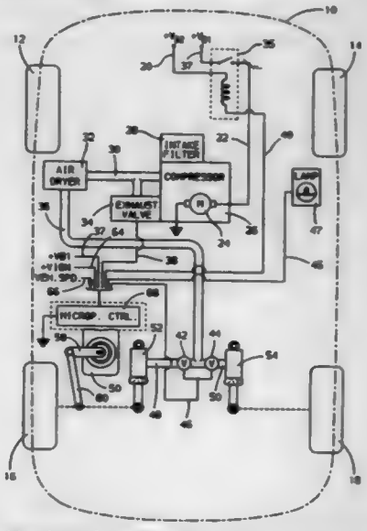
an operation control means for controlling operation of said actuator on the basis of said acceleration detected by said acceleration detecting means and said target acceleration determined by said target acceleration determination means.

5,465,209

VEHICLE LEVEL CONTROL SYSTEM

Steven P. Sammut, Beavercreek; Marc J. Georgia, Springboro; Bruce A. Heaston, West Milton; Kamal N. Majeed, Centerville, all of Ohio, and James J. Kowalik, Canton, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 10, 1994, Ser. No. 257,985
Int. Cl.[6] B60G *17/00*
U.S. Cl. 364—424.05 **3 Claims**



2. A combination of a vehicle and a level control system comprising:

the vehicle with first and second chargeable and dischargeable air suspension members on a right suspension and on a left suspension of the vehicle, respectively;

a suspension height sensor mounted to a vehicle body and a vehicle wheel at one of the right and left suspensions;

a compressor having a controllable motor and an exhaust valve;

a pneumatic line coupling the compressor to first and second valves, the first valve coupling the pneumatic line to one of the air suspensions and the second valve coupling the pneumatic line to the other of the air suspensions;

a microprocessor controller comprising

(a) means for detecting a trim set request from a service switch, wherein the trim set request signals a trim set function,

(b) means, responsive to the trim set request, for receiving a sensor signal from the height sensor,

(c) means, responsive to the trim set request and the sensor signal, for determining a difference value between the sensor signal and a predetermined offset value indicative of an effect, on the height sensor, of an average sized operator in the vehicle,

(d) means for storing the difference value in memory,

(e) means, responsive to the height sensor and the stored difference value, for determining a set of control commands, and

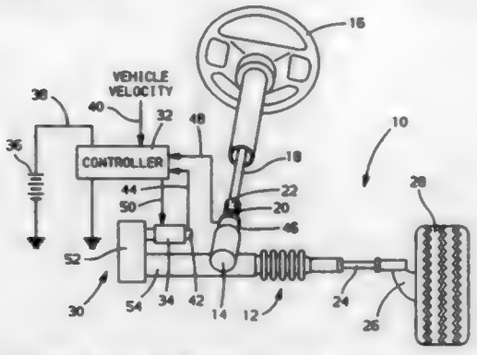
(f) means for outputting the control commands to the compressor, the first and second valves and the exhaust valve to level the vehicle to the stored difference value.

5,465,210

METHOD FOR DETERMINING A VEHICLE STEERING WHEEL CENTER POSITION

Allen J. Walenty, Macomb, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 18, 1994, Ser. No. 292,642
Int. Cl.[6] B62D *5/04*
U.S. Cl. 364—424.05 **6 Claims**



1. A method for determining a center position of a steering wheel for a vehicle equipped with electric power steering having a brushless motor, the method comprising:

detecting vehicle operating conditions corresponding to a straight direction of vehicle travel;

estimating a center position of the brushless motor when the vehicle operating conditions are detected;

establishing a range of angular positions of the brushless motor about the estimated center position, the range having a minimum and maximum position; and

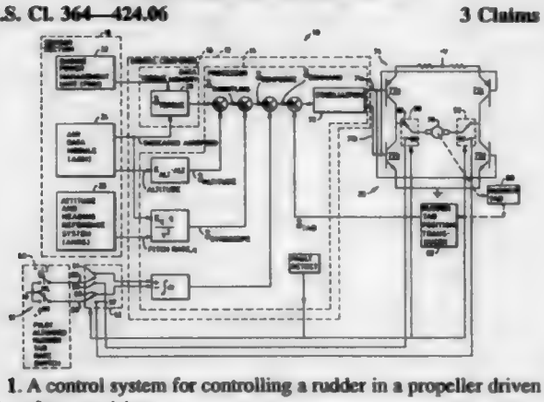
determining the center position of the steering wheel as an angular position of the brushless motor equal to a midpoint of the range of angular positions.

5,465,211

CONTROL SYSTEM FOR PROPELLER DRIVEN AIRCRAFT

William M. Byrne, Jr., Wichita, Kans., assignor to Beech Aircraft Corporation, Wichita, Kans.

Filed May 2, 1994, Ser. No. 236,296
Int. Cl.[6] B63H *25/42*; **B63B** *39/08*
U.S. Cl. 364—424.06 **3 Claims**



1. A control system for controlling a rudder in a propeller driven aircraft, comprising:

a digital memory having prestored data representative of the rudder trim required to maintain the aircraft in coordinated flight as a function of torque and airspeed;

a pitch rate sensor means for producing an electrical signal representative of the actual pitch rate of the aircraft;

a rudder trim actuator for actuating;

computer means for reading rudder trim data from the digital memory in response to actual torque and airspeed of the aircraft and for modifying such read data in accordance with the electrical signal produced by the pitch rate sensor means to provide a control signal; and

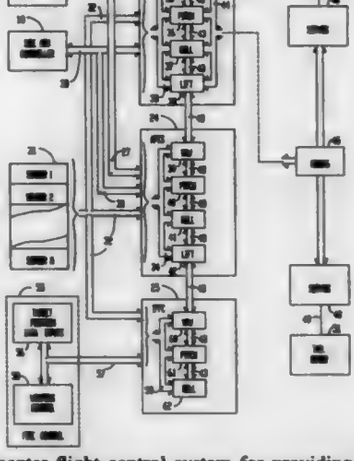
said rudder trim actuator being responsive to said control signal to automatically reduce rudder pedal forces induced by throttling and gyroscopic effects of the aircraft engine responding to pilot commanded inputs affecting torque and airspeed.

5,465,212

HELICOPTER INTEGRATED FIRE AND FLIGHT CONTROL HAVING A PRE-LAUNCH AND POST-LAUNCH MANEUVER DIRECTOR

Donald W. Fowler, Oxford; Nicholas D. Lappos, Milford, and Joan A. Edwards, Fairfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1993, Ser. No. 173,601
Int. Cl.[6] B64C *11/34*;*11/18*;*11/30*
U.S. Cl. 364—427 **9 Claims**



1. A helicopter flight control system for providing control surface command signals to helicopter control surfaces thereby controlling the yaw, pitch, roll and lift attitude axes of the helicopter in flight, comprising:

means for providing a target position signal indicative of a target position with respect to the helicopter;

means for providing a ballistic trajectory signal indicative of the required helicopter launch attitude for a projectile launched by the helicopter to hit said target position; and

pre-launch director means for providing a pre-launch maneuver signal indicative of helicopter attitude prior to assuming said launch attitude to counteract for the changes in position of the helicopter caused by the helicopter assuming said launch attitude.

5,465,213

SYSTEM AND METHOD OF MANUFACTURING A SINGLE BOOK COPY

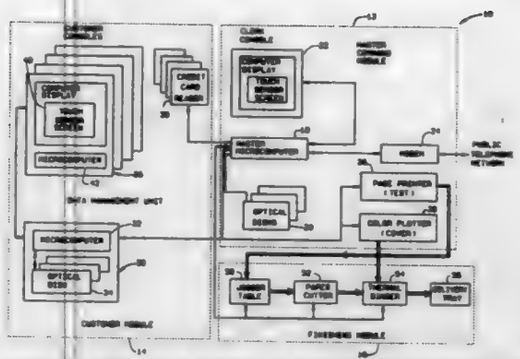
Harvey M. Ross, 787 Cross Creek Dr., St. Louis, Mo. 63141

Continuation-in-part of Ser. No. 558,759, Jul. 27, 1990, abandoned. This application Jul. 12, 1993, Ser. No. 90,417
Int. Cl.[6] G06F *19/00*
U.S. Cl. 364—468 **8 Claims**

1. A book manufacturing system comprising:

computer means for storing data corresponding to the text of and information concerning a plurality of books in a format retrievable by said computer means;

selection means in communication with said computer means for selectively retrieving stored data corresponding to each of such books;



means for high speed printing of the text of a selected one of said books on paper pages upon a signal from said selection means and command from said computer means;

said format describing the cover of the book in a bit mapped color format, and wherein said computer means stores and selectively retrieves data corresponding to the color graphics of the covers of said plurality of books, and

color printer means for reproducing the cover graphics of said selected one of said books on suitable cover material upon a signal from said selection means and command from said computer means.

5,465,214

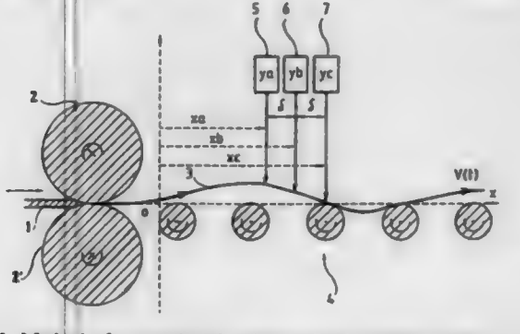
METHOD OF MEASURING THE SHAPE AND/OR THE PLANARITY OF A RUNNING MATERIAL, AND DEVICE FOR ITS IMPLEMENTATION

Francois Jeuniaux, Sancy; Marc Malhomme; Jean-Marc Moretti, both of Dunkerque, and Gérard Haralamb, Dillingen, all of, France, assignors to GTS Industries (Societe Anonyme), Grand Synthe, France

Filed Nov. 22, 1994, Ser. No. 345,766

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—472 **11 Claims**



1. Method of measuring the shape of a longitudinal fiber of a running strip, such as a metal strip as it is being rolled, in which method readings are taken of the running speed (V(t)) of the said strip and of the heights (y_i) of a set of n points of index (i) of the said fiber in a predetermined reference frame (xOy), the axis (Ox) of which is oriented along the running direction of the said strip, and a function (y(l)) depending on the shape of the said fiber is determined from the said heights (y_i) and the said speed (V(t)), which method comprises, when readings are taken of the height of the point of index (i) of the said fiber, located at a distance (l) from the point of index 1 of the said fiber, measured along the axis (Ox), taking simultaneous readings of the heights of at least two other points which are close to it and are located on either side of it, calculating the curvature ($K(x)_i$) of the said fiber in the vicinity of the said point of index i approximately using the said heights, then, using the curvatures calculated for the said points, determining a function (k(l)) representing the change in the curvature of the said fiber between the said points of index 1 and index n, and, by successive integrations of the said function (k(l)), determining a function (Y(l)) representing the actual shape of the said fiber between the said points of index 1 and index n.

5,465,215

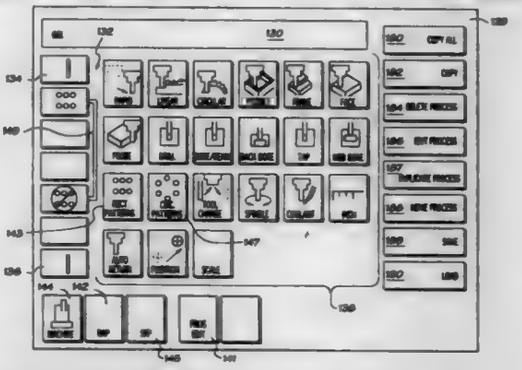
NUMERICAL CONTROL METHOD AND APPARATUS

S. Scott Strickland, Terrace Park; James R. Krietemeyer, Cincinnati; Jing Liao; Ian D. Mead, both of West Chester, and Robert L. Puckett, Cincinnati, all of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jul. 7, 1994, Ser. No. 271,933

Int. Cl.[6] G06F *15/00*; G05B *19/04*

U.S. Cl. 364—474.22 **20 Claims**



1. Apparatus comprising:

a) numeric keyboard means for entry of numeric data;

b) selection and display means for:

i) displaying and manually selecting graphic icons associated with plural machining operations;

ii) displaying lead-through graphic images associated with selected machining operations wherein functions associated with selected machining operations are displayed;

c) means for enabling manual entry of numeric data associated with selected machining operations during display of leads-through graphic images;

d) means for translating operation selections, function selections and numeric data into codes to produce an instruction block conforming to a predetermined programming convention;

e) means for executing the instruction block so produced to control operation of machine actuators.

5,465,216

AUTOMATIC DESIGN VERIFICATION

Shai Rotem, Hofit, and Ze'ev Shtadler, Haifa, both of, Israel, assignors to Intel Corporation, Santa Clara, Calif.

Filed Jun. 2, 1993, Ser. No. 71,244

Int. Cl.[6] G06F *17/50*

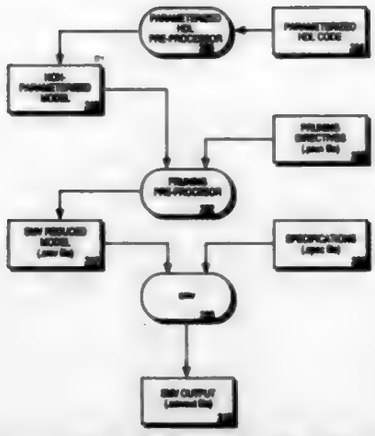
U.S. Cl. 364—488 **20 Claims**

1. In a computer system, an automatic method for formal verification of a portion of a logic circuit, comprising the following steps:

a. receiving a parameterized model of said logic circuit from a first file, said parameterized model of said logic circuit including parameterized expressions representing components in said logic circuit, wherein said expressions include parameters which may be defined externally;

b. defining said parameters externally to said parameterized model, said defining including assigning values to certain of said parameters which specify that fewer components are in said parameterized model of said logic circuit than a full model of said logic circuit;

c. for each of said parameterized expressions in said parameterized model, generating component description statements in a hardware description language (HDL) for said components using said externally defined parameters, and storing a reduced model of said logic circuit in a second file for further



processing, wherein said reduced model of said logic circuit comprises a subset of said full model of said logic circuit; and

d. transmitting said second file to a process for formal verification, said process for formal verification performing formal verification on said reduced model of said logic circuit using said second file.

5,465,217

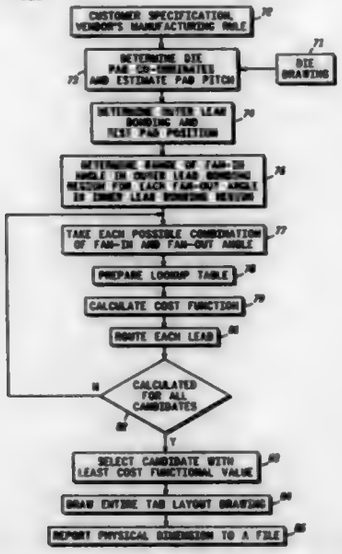
METHOD FOR AUTOMATIC TAB ARTWORK BUILDING

Wai-Yeung Yip; Arijit Chandra, both of Mesa, and Chi-Taou Tsai, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 16, 1993, Ser. No. 106,852

Int. Cl.[6] H01L 23/48; G06F 17/50

U.S. Cl. 364—489 5 Claims



1. A method for building automated package artwork, comprising:

computing an allowable range of fan in and fan out angles for a plurality of leads according to design and manufacturing constraints, wherein design constraints comprise die pad pitch, inner lead bonding position and outer lead bonding position;

assigning to each fan in angle within the allowable range of fan in and fan out angles, a fan out angle within the allowable range of fan in and fan out angles to form a plurality of allowable combinations of fan in and fan out angles;

calculating a value for an electrical cost function based on signal lead crosstalk and supply lead simultaneous switching noise, for each of the plurality of allowable combinations of fan in and fan out angles; and

selecting an optimal routing for each lead based on electrical characteristics as denoted by the value of the electrical cost function.

5,465,218

ELEMENT PLACEMENT METHOD AND APPARATUS

Kelichi Handa, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 10, 1994, Ser. No. 194,389

Claims priority, application Japan, Feb. 12, 1993, 5-024469; Mar. 4, 1993, 5-043898

Int. Cl.[6] G06F 17/50

U.S. Cl. 364—489 33 Claims

1. An LSI element placement method of placing elements in accordance with an order in which branches are arranged, each branch being constituted by an element array included in a circuit diagram having first and second terminals, said method comprising the steps of:

a partial circuit extraction step of sequentially extracting data of a predetermined number of branches included in the circuit diagram from the first terminal side of the circuit diagram so as to overlap the data by a predetermined number; and

an element placement step of performing an element placement operation based on a genetic algorithm in the extracted partial circuit data and said overlapping data, thereby generating an element placement result including placement coordinate data of all elements included in the partial circuit data.

5,465,219

COMBUSTION ANALYZER BASED ON CHAOS THEORY ANALYSIS OF FLAME RADIATION

Larry A. Jeffers, Washington Township, Stark County, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 19, 1993, Ser. No. 109,119

Int. Cl.[6] G01J 3/00

U.S. Cl. 364—498 15 Claims

1. A method of analyzing and controlling parameters affecting a burner flame using chaos theory analysis, comprising:

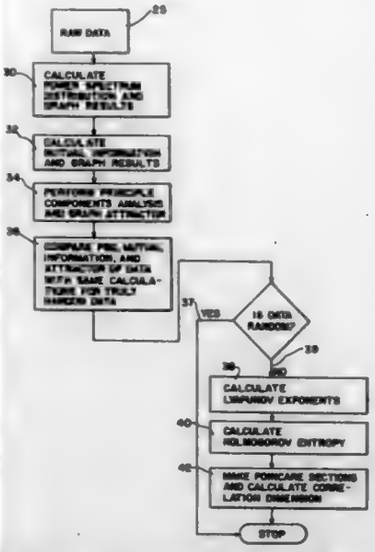
accumulating raw data representing at least one characteristic of the flame, over time;

calculating a power spectrum distribution for the raw data;

calculating a mutual information curve for the raw data;

calculating a multi-dimensional attractor from the raw data using principal components analysis;

comparing the power spectrum distribution, mutual information curve and multi-dimensional attractor for the raw data with a power spectrum distribution, mutual information curve and multi-dimensional attractor for truly random data and continuing said analysis and control of said parameters if said comparison determines that the accumulated raw data is non-random;



calculating Lyapunov exponents for each dimension of the attractor for providing an indication of a rate of divergence of trajectories of the attractor;

calculating Kolmogorov entropy to provide an indication of the ability to make detail predictions concerning the raw data, positive values for the Kolmogorov entropy indicating strong chaotic behavior;

taking at least one cross section of the chaotic attractor at at least two different locations as a quantitative measure of the chaotic attractor;

at least one of Lyapunov exponents, Kolmogorov entropy and cross section of the attractor being a signal indicative of flame quality; and

using the signal to control at least one parameter of the burner to adjust the flame.

5,465,220

OPTICAL EXPOSURE METHOD

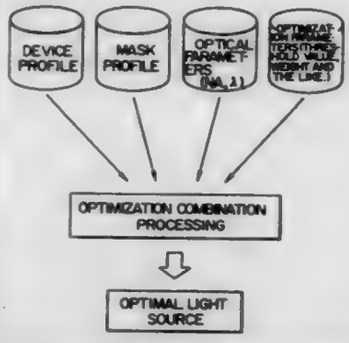
Tamae Haruki; Kenji Nakagawa; Masao Taguchi; Hiroyuki Tanaka; Satoru Asai, and Isamu Hanyu, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 1, 1993, Ser. No. 69,853

Claims priority, application Japan, Jun. 2, 1992, 4-141548; Jun. 2, 1992, 4-141755; Jun. 18, 1992, 4-182913; Jan. 6, 1992, 4-267415; Mar. 19, 1993, 5-60593

Int. Cl.[6] G06F 9/00

U.S. Cl. 364—525 **6 Claims**



1. An optimization method for a light source profile in an optical exposure apparatus including a light source having a light source surface of a predetermined irradiation area, an illumination lens, a photomask having a predetermined mask profile, a projection lens and a device substrate, wherein a light from said light source is irradiated on to said photomask through said illumination lens, said light passing through said photomask is exposed on said device substrate through said projection lens to form a device profile on said device substrate, said optimization method comprising the steps of:

dividing said light source surface into a predetermined number of blocks, so that a point light source corresponding to each divided block is a processing element of optimization processing;

converting said respective processing element into binary information;

varying a value of said processing element by the predetermined number of the blocks in accordance with the conditions of said device profile, said mask profile, optical parameter and optimization parameter; and

conducting optimization combination processing to determine the light source profile, until a predetermined evaluation judgement condition is obtained.

5,465,221

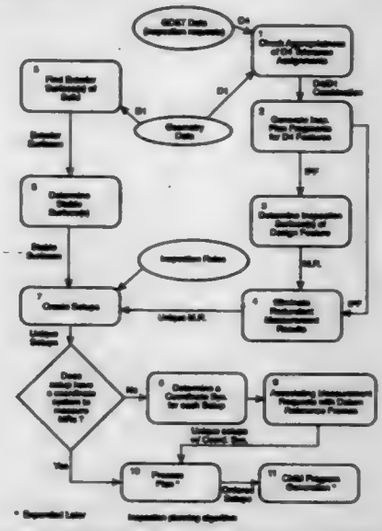
AUTOMATED PROCESS PLANNING FOR QUALITY CONTROL INSPECTION

Francis L. Merat, University Heights; Kavous Roumina, Westlake; Steven M. Raegegger, Centerville, and Robert B. Delvalle, Cleveland Heights, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 30, 1993, Ser. No. 179,596

Int. Cl.[6] G06F 17/50

U.S. Cl. 364—552 **24 Claims**



1. Apparatus including computer means for generating a plan for inspection of a part using a coordinate measuring machine (CMM), in a feature-based rapid design system (RDS) having a Feature-Based Design Environment (FBDE) means, an Episodal Associative Memory (EAM), a Fabrication Planning (FAB) means, and an Inspection Plan (INSP) means, wherein features include form features (D1) which define the form or shape of the part, manufacturing features (D2) , inspection features (D3) , and geometric and design (GD&T) features (D4), wherein said Inspection Plan (INSP) means comprises:

a) means for checking appropriateness of D4 Tolerance assignments, using an "Allowable D1–D4 Specification" table which contains information regarding GD&T tolerance (D4) and form (D1) features, which is accessed each time a D4 feature is to be created;

b) means for generating an inspection plan fragment for D4 features, wherein each D4 feature initiates an Inspection Plan Fragment (IPF) which is a set of specifications about how a D4 instance is to be inspected/evaluated;

c) means for determining inspection surface(s) of design feature, which comprises specifying a set of surfaces by indentifying the existing surface(s) of each design feature, and then generating a measurement request (MR) instance for each specified surface, and linking these MRs to the IPF which was generated for the D4 feature instance;

d) means for eliminating redundant measurement requests by merging MRs when information needed to evaluate tolerances can be obtained from a single pass over inspection points on the same surface;

e) means for finding exterior surface(s) of solid to determine flat exterior surfaces upon which the model can be placed;

f) means for determining stable surface(s) by transformation of a candidate surface to an X-Y plane followed by creation of a two-dimensional convex hull area for the candidate surface, and projection of the center of the mass of the solid model onto the X-Z plane to determine the surface stability;

g) means for creating setups by orienting the part such that it is resting on an identified surface and then identifying which of the surfaces to be inspected can be accessed by the CMM in this part orientation, the set-up surface and list of accessible MRs being stored in a set-up class object, using simple heuristics for determining which surfaces are inspectable in a particular orientation, wherein the resulting heuristic tests the space above each inspection point for collision with the part;

h) means for Establishing a coordinate frame in each setup by locating a CMM origin in a CMM frame of reference, establishing the origin by intersecting three ortho-normal vectors from tactile data provided the operator, the intersection vectors being created using a 3-2-1 isostasies principle;

i) means for associating measurement requests with datum reference frames (DRFs);

j) means for creating a process plan which consists of two sub-processes: 1) an ordering of setups (a global ordering), and 2) an ordering of individual measurement requests within a setup (a local ordering); a goal of global ordering being to find a minimum number of setups for complete inspection of the manufactured part, which is accomplished by first identifying a setup with the largest number of measurement requests (MRs), say setup X, and then removing MRs specified in X are from all other setups; wherein local ordering requires a logical grouping of MRs with the DRF that each MR references; and

k) means for generating a CMM program, by first translating MR feature objects are into metacode feature objects, and then translating the metacode into CMM code, wherein for each DRF in a metacode object produced by the process planner, the origin of the coordinate system is determined and translated into the coordinates of the sample point to the origin of the setup datum reference frame.

5,465,222

BARREL SHIFTER OR MULTIPLY/DIVIDE IC STRUCTURE

Michael C. Seckora, Gales Creek, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

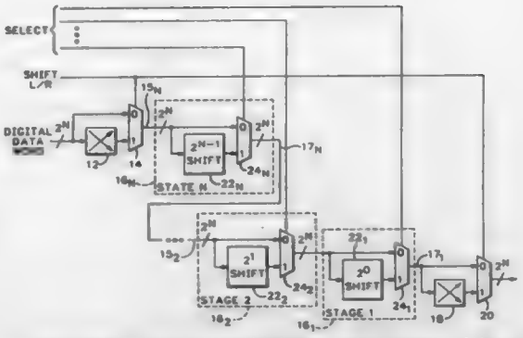
Filed Feb. 14, 1994, Ser. No. 195,428

Int. Cl.[6] G06F *7/00;15/00*

U.S. Cl. 364—715.08 **3 Claims**

1. A digital data word shift circuit, comprising,

a plurality of stages (16) coupled in series, including an input stage (16_N) and an output stage (16_1), each stage having an output (17_N . . . (17_2, 17_1) and an input (15_N . . . (15_2, 15_1), with the output (17) of each stage except the output of the output stage being coupled to the input (15) of the following stage, the input (15_N) of the input stage being coupled to receive a digital data word and the output (17_1) of the output stage providing a shifted digital data word, each stage having a shifter (22_N . . . (22_2, 22_1) and a multiplier (24_N . . . (24_2, 24_1), the input of each stage being coupled to an input of the shifter for that stage and to a first input of the multiplexer for that stage, an output of the said shifter being coupled to a



second input of the said multiplexer, and an output of the said multiplexer being coupled to the output of that stage,

means for controlling (SELECT) the multiplexers (24) so that a predetermined shift is produced by the stages upon the digital data word to produce the shifted digital data word,

means for selecting (14) in response to a shift direction command (SHIFT L/R) between the digital data word and a reversed version of the digital data word for input to the input stage, and

means for selecting (20) in response to the shift direction command between the shifted digital data word and a reversed version of the shifted digital data word from the output stage.

5,465,223

BARREL SHIFTER

Eiichi Nishimura, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

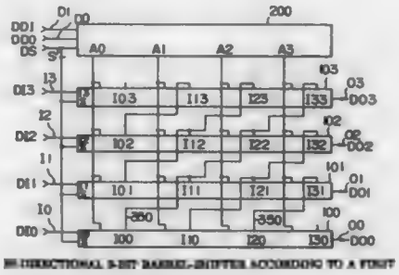
PCT No. PCT/JP93/00025, § 371 Date Jun. 24, 1994, § 102(e) Date Jun. 24, 1994, PCT Pub. No. WO93/19456, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 11, 1993, Ser. No. 256,113

Claims priority, application Japan, Jan. 9, 1992, 4-002045

Int. Cl.[6] G06F *5/01;7/00*

U.S. Cl. 364—715.08 **11 Claims**



BI-DIRECTIONAL 4-BIT BARREL-SHIFTER ACCORDING TO A FIRST EMBODIMENT OF THE PRESENT INVENTION

1. A barrel-shifter comprising

M (M≧1, natural number) stages of barrel-shifter unit circuits each composed of

first to Nth i/o nodes (N≧2, natural number);

an output terminal;

an input terminal;

first to Nth switching elements respectively connected between said output terminal and said first to Nth i/o nodes; and

a left/right shift selection circuit having an input portion connected to said input terminal and output portions connected to said first i/o node and Nth i/o node, wherein said left/right shift selection circuit which receives a right shift signal or left shift signal and outputs data corresponding to data which are input to said input terminal to said first i/o node in response to said left shift signal while it outputs data corresponding to that which are input to said input terminal to said Nth i/o node in response to said right shift signal;

characterized in that said barrel-shifter further comprises:

a decoder circuit for commonly driving said first to Nth switching elements of each stage barrel-shifter unit circuit and for making only one of said first to Nth switching elements conductive; and

connecting lines for connecting i/o nodes of adjacent barrel-shifter unit circuits to one another wherein the Qth ($1 \leq Q \leq (N-1)$, natural number) connecting line of first to (N−1)th connecting lines between a Pth ($1 \leq P < M$) stage and a (P+1)th stage barrel-shifter unit circuits connects the Qth i/o node of the Pth ($1 \leq P < M$) stage barrel-shifter unit circuit to the (Q+1)th i/o node of the (P+1)th stage barrel-shifter unit circuit.

5,465,224

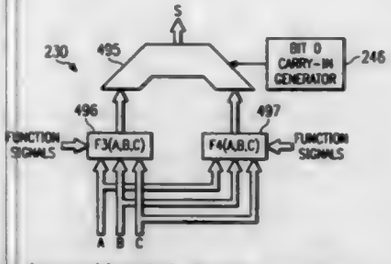
THREE INPUT ARITHMETIC LOGIC UNIT FORMING THE SUM OF A FIRST BOOLEAN COMBINATION OF FIRST, SECOND AND THIRD INPUTS PLUS A SECOND BOOLEAN COMBINATION OF FIRST, SECOND AND THIRD INPUTS

Karl M. Guttag, Missouri City, Tex.; Richard Simpson, Carlton, and Brendan Walsh, Bedford, both of, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 30, 1993, Ser. No. 160,113

Int. Cl.[6] G06F 7/38

U.S. Cl. 364—716 **21 Claims**



1. A three input arithmetic logic unit comprising:

a first three input Boolean function generator having a first input receiving a first multibit input signal A, a second input receiving a second multibit input signal B, a third input receiving a third multibit input signal C, and an output forming a first selected Boolean combination F1(A,B,C) of signals received at said first, second and third inputs;

a second three input Boolean function generator having a first input receiving the first multibit input signal A, a second input receiving the second multibit input signal B, and a third input receiving the third multibit input signal C and an output forming a second selected Boolean combination F2(A,B,C) of signals received at said first, second and third inputs; and

an adder having a first input connected to said output of said first three input Boolean function generator, a second input connected to said output of said second three input Boolean function generator and an output forming the sum of signals received at said first and second inputs.

5,465,225

METHOD OF INCREASING THE DATA-PROCESSING SPEED OF A SIGNAL PROCESSOR

Franz-Otto Witte, Emmendingen, Germany, assignor to Deutsche ITT Industries GmbH, Freiburg, Germany

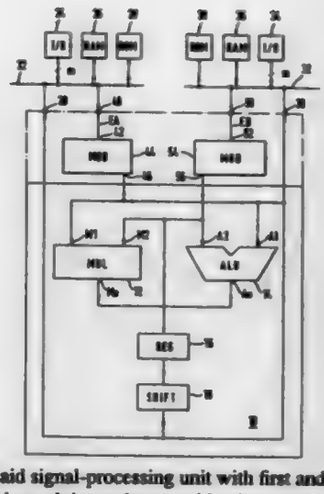
Filed Jan. 24, 1994, Ser. No. 185,626

Claims priority, application Germany, Feb. 12, 1993, 43 04 198.1

Int. Cl.[6] G06F 7/38

U.S. Cl. 364—736 **20 Claims**

1. A method of increasing the data-processing speed of a signal processor having a signal-processing unit comprising at least one arithmetic logic unit and one multiplier, said method comprising the steps of:



providing said signal-processing unit with first and second input-data words, each input-data word having an n-bit word length, each input-data word being selectably provided as an input to said arithmetic logic unit and as an input to said multiplier;

presetting a masking unit, which operates independently of said multiplier and said arithmetic logic unit, with a selectable presettable mask value, said presettable mask value being selectable for each bit in one of said n-bit input-data words; and

changing the contents of at least one of said first and second input-data words in accordance with said selectable presettable mask value before providing said at least one of said first and second input-data words to said signal-processing unit.

5,465,226

HIGH SPEED DIGITAL PARALLEL MULTIPLIER

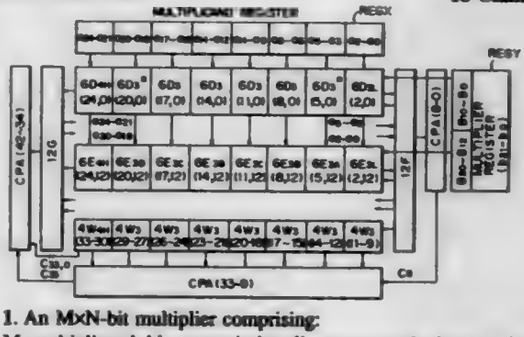
Gensuke Goto, Ebina, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 179,827, Jan. 11, 1994, abandoned, which is a continuation of Ser. No. 67,169, May 26, 1993, abandoned, which is a continuation of Ser. No. 672,862, Mar. 20, 1991, abandoned. This application Dec. 5, 1994, Ser. No. 354,016

Claims priority, application Japan, Mar. 20, 1990, 2-072384; Feb. 5, 1991, 3-013629

Int. Cl.[6] G06F 7/52

U.S. Cl. 364—757 **18 Claims**



1. An M×N-bit multiplier comprising:

M multiplicand bit transmission lines arranged along a first direction;

N multiplier bit transmission lines arranged along a second direction substantially perpendicular to the first direction;

M×N partial product generators, each provided at one intersection between said multiplicand bit transmission lines and said multiplier bit transmission lines;

R rows of M first multi-input adders comprising Wallace tree type adders arranged hierarchically and for adding output

signals of S of said partial product generators located adjacently in a column, where R is at least two and less than N, and S=(N/R)≧5; and

at least one row of M second multi-input adders comprising Wallace tree type adders arranged hierarchically and adding output signals of said first multi-input adders,

said S partial product generators and one of said first multi-input adders forming one basic cell,

MxR basic cells being repetitively arranged in a matrix corresponding to the arrangement of said first multi-input adders, each of said R basic cells in a column processing the same set of corresponding multiplicand bit signals, and the output signal lines of said basic cells being extended by predetermined bits along the second direction being connected to the corresponding said second multi-input adders arranged between the basic cell rows using repetitive line patterns forming a substantially rectangular layout configuration of said multiplier.

5,465,227

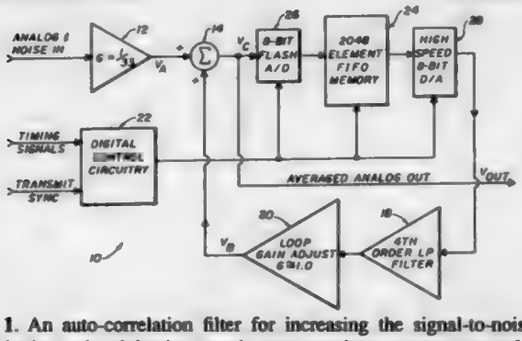
REAL TIME AUTO-CORRELATION FILTER METHOD AND APPARATUS

Scott R. Durkee, New Haven, and Erik A. Fjerstad, Shelburne, both of Vt., assignors to Simmonds Precision Products, Inc., Akron, Ohio

Filed Oct. 14, 1993, Ser. No. 137,231

Int. Cl.[6] G06G *7/02;7/12*

U.S. Cl. 364—825 **24 Claims**



1. An auto-correlation filter for increasing the signal-to-noise ratio in a signal having synchronous analog components to be detected and associated asynchronous noise components comprising: means for inputting a plurality of cycles of the signal and noise components; means for producing digitized samples of the signal and noise components over a time period that is a function of the time duration of each cycle; means for storing for an n_{th} cycle said digitized samples at the end of said time period until the start of an $n_{th}+1$ cycle; means for converting said stored n_{th} cycle digital samples into a corresponding restored analog signal; and means for summing said n_{th} cycle restored analog signal with signal and noise components of the $n_{th}+1$ cycle corresponding to said time period.

5,465,228

ASSOCIATIVE MEMORY

Hiroshi Sasama, Tokyo, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Filed Sep. 30, 1994, Ser. No. 315,861

Claims priority, application Japan, Jan. 4, 1993, 5-248120

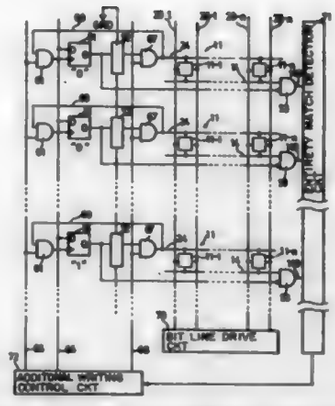
Int. Cl.[6] G11C *15/00*

U.S. Cl. 365—49 **5 Claims**

1. An associative memory comprising:

at least one word memory for storing data;

at least one match detection circuit associated with said word memory and detecting one of a match and a mismatch between at least a partial bit pattern of an entered retrieval



data and a bit pattern corresponding to said at least partial bit pattern of the retrieval data and which is stored in said word memory; and

a data addition writing circuit for detecting a failure state, wherein none of said match detection circuits outputs a match signal indicative of a match between said at least partial bit pattern of the entered retrieval data and corresponding bit pattern stored in the at least one word memory and for overwriting the at least partial bit pattern of the entered retrieval data into an empty one of the at least one word memory upon detecting the failure state.

5,465,229

SINGLE IN-LINE MEMORY MODULE

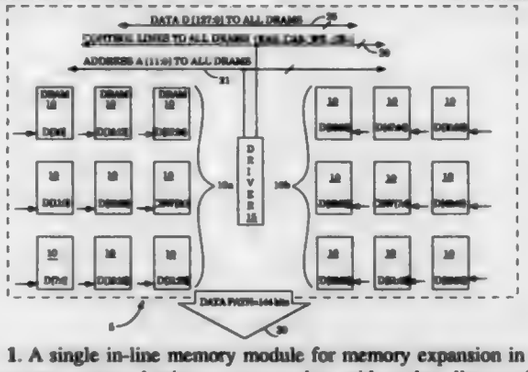
Andreas Bechtolsheim, Stanford; Edward Frank, Portola Valley; James Testa, Mountain View, and Shawn Storm, Mt. View, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 279,824, Jul. 25, 1994, Pat. No. 5,383,148, which is a continuation of Ser. No. 115,438, Sep. 1, 1993, abandoned, which is a continuation of Ser. No. 886,413, May 19, 1992, Pat. No. 5,270,964. This application Nov. 28, 1994, Ser. No. 345,477

The portion of the term of this patent subsequent to Feb. 14, 2010, has been disclaimed.

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—52 **15 Claims**



1. A single in-line memory module for memory expansion in a computer system having a memory bus with n data lines, said single in-line memory module comprising the elements of:

a printed circuit board, said printed circuit board having a first side and a second side, said printed circuit board having an electrical connector;

a first set of memory elements arranged on said printed circuit board, said set of memory elements having a total of at least n data lines; and

a driver circuit mounted on said printed circuit board, said driver circuit coupled to a set control signals in said electrical connector, said driver circuit transmitting said controls signals to said first set of memory elements.

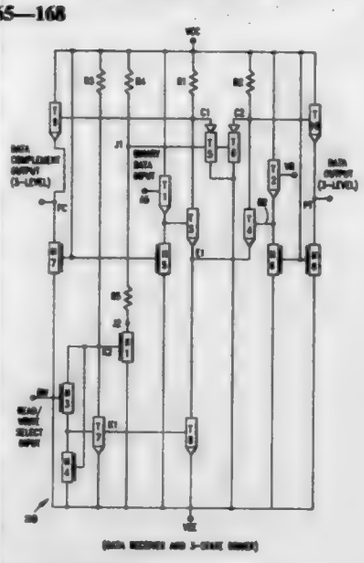
5,465,230
READ/WRITE/RESTORE CIRCUIT FOR MEMORY ARRAYS

Frank A. Montegari, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 525,286, May 17, 1990, abandoned. This application Dec. 12, 1991, Ser. No. 808,047

Int. Cl.[6] G11C *11/56*

U.S. Cl. 365—168 **11 Claims**



1. A memory comprising:

CMOS memory cells, each cell coupled to a pair of bit lines; and

read/write/restore means coupled to the bit lines for reading and writing the cells and restoring the bit lines in response to a two-state address signal in timed relationship with a three-level data and data complement signal pair.

5,465,231
EEPROM AND LOGIC LSI CHIP INCLUDING SUCH EEPROM

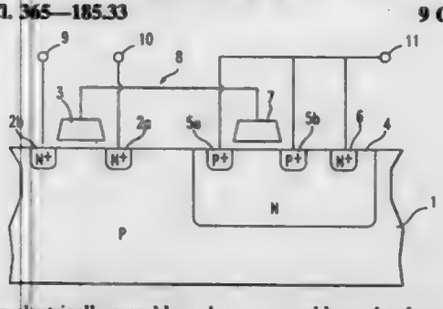
Katsuhiko Ohsaki, 1963-1 Misono Ritto-cho, Kurita-gun Shiga-ken, Japan

Filed May 6, 1994, Ser. No. 239,078

Claims priority, application Japan, May 7, 1993, 5-106635

Int. Cl.[6] G11C *11/40*

U.S. Cl. 365—185.33 **9 Claims**



1. An electrically erasable and programmable read only memory (EEPROM) cell comprising:

a first MOS transistor formed in a semiconductor substrate of a first conductivity type and having current conducting regions of a second conductivity type and a gate electrode, said first MOS transistor having a gate capacitance;

a well of said second conductivity type provided in said substrate;

a capacitor formed of a plate electrode formed on said well with an insulating layer interposed therebetween, said capacitor having a capacitance;

the gate electrode of said first MOS transistor and said plate electrode being connected in common to form a floating gate, and said well serving as a control gate;

the capacitance of said capacitor being smaller than the gate capacitance of said first MOS transistor.

said well including a region of said first coductivity type adjacent said plate electrode;

write means including a first write voltage coupleable to said well and a second write voltage coupleable to one of said current conducting regions of said first MOS transistor to cause injection of carriers into said floating gate at said first MOS transistor; and

erase means including an erase voltage coupleable to a common connection of said well and said first conductivity type region and a ground voltage coupleable to a current conducting region of said first MOS transistor, whereby carriers in the floating gate are removed by FN tunnelling in the region of said plate electrode in said well.

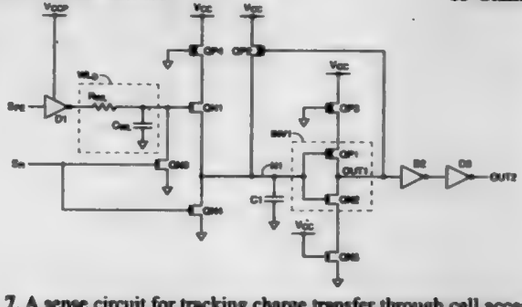
5,465,232
SENSE CIRCUIT FOR TRACKING CHARGE TRANSFER THROUGH ACCESS TRANSISTORS IN A DYNAMIC RANDOM ACCESS MEMORY

Adrian E. Ong, and Paul S. Zagar, both of Boise, Id., assignors to Micron Semiconductor, Inc., Boise, Id.

Filed Jul. 15, 1994, Ser. No. 275,890

Int. Cl.[6] G11C *11/40*

U.S. Cl. 365—189.05 **13 Claims**



7. A sense circuit for tracking charge transfer through cell access transistors in a dynamic random access memory array comprising:

(a) a dummy wordline to which a signal is applied;

(b) an insulated-gate field-effect transistor (IGFET) which simulates access transistors in the array with respect to threshold voltage, said IGFET having a gate controlled by the signal on the dummy wordline;

(c) a pull-up node that is charged from a power supply bus through the IGFET;

(d) an output signal representative of the charge status on the pull-up node, said output signal being employed to trigger data latching in the memory.

5,465,233
STRUCTURE FOR DESELECTING BROKEN SELECT LINES IN MEMORY ARRAYS

William C. Slemmer, Dallas, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed May 28, 1993, Ser. No. 69,025

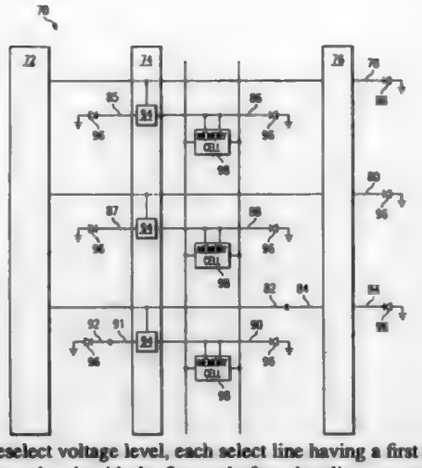
Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—200 **9 Claims**

1. Memory array circuitry for selecting a portion of a memory array, comprising:

a plurality of memory cells;

a plurality of select lines which select a portion of the memory cells in the memory array when set to a select voltage level and which deselect a portion of the memory array when set to



a deselect voltage level, each select line having a first end and a second end, with the first end of a select line connected to a driver; and

a plurality of high impedance reverse biased diodes , with a reverse biased diode connected to the second end of the select line which holds the select line to the deselect voltage level if the select line is broken.

5,465,234

SEMICONDUCTOR MEMORY DEVICE HAVING SHIFTING CIRCUIT CONNECTED BETWEEN DATA BUS LINES AND DATA BUFFER CIRCUITS FOR CHANGING CONNECTIONS THEREBETWEEN

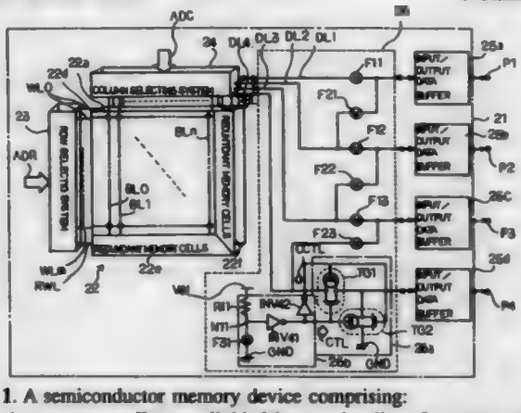
Seiichi Hannai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 23, 1994, Ser. No. 347,078

Claims priority, application Japan, Nov. 26, 1993, 5-296501

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—200 **6 Claims**



1. A semiconductor memory device comprising:

a) a memory cell array divided into a plurality of memory cell sub-arrays each implemented by a plurality of addressable memory cells for storing internal data bits, respectively;

b) a plurality of data buffer circuits operative to change data bits between said internal data bits and external data bits, and having respective priorities different from one another;

c) an addressing means operative to couple selected addressable memory cells respectively selected from said plurality of memory cell sub-arrays to said plurality of data buffer circuits; and

d) a shifting circuit coupled between said addressing means and said plurality of data buffer circuits, and operative to respectively connect said plurality of memory cell sub-arrays to said data buffer circuits when a defective memory cell sub-array with a defective memory cell is not incorporated in said plurality of memory cell sub-arrays, said shifting circuit being further operative to connect available memory cell sub-arrays without said defective memory cell to the data buffer circuits in an order of said priority and to isolate said defective memory cell sub-array or sub-arrays from the data buffer circuit or circuits lower in said priority.

5,465,235

NON-VOLATILE MEMORY DEVICE WITH A SENSE AMPLIFIER CAPABLE OF COPYING BACK

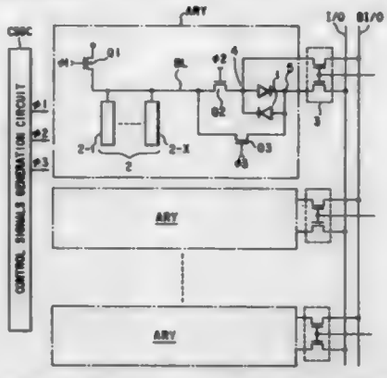
Junichi Miyamoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 30, 1994, Ser. No. 297,753

Claims priority, application Japan, Sep. 2, 1993, 5-218499; Jul. 29, 1994, 6-178194

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—203 **19 Claims**



17. A non-volatile semiconductor memory device comprising:

memory cells having own threshold values as transistors for distinguishing conductiveness or nonconductiveness, for storing data corresponding to said threshold values;

a latch type sense amplifier having first and second latch nodes for latching complimentary signals, latching data of said memory cells at said first latch node as read data;

first data control means for using said read data as data to be written in said memory cells; and

second data control means for using data at said second latch node, which is inverted data of said read data, as data to be written in said memory cells.

5,465,236

NONVOLATILE SEMICONDUCTOR MEMORY SYSTEM WITH A PLURALITY OF ERASE BLOCKS

Kiyomi Naruke, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 77,390, Jun. 17, 1993, Pat. No. 5,375,094. This application Aug. 23, 1994, Ser. No. 294,753

Claims priority, application Japan, Jun. 19, 1992, 4-160567

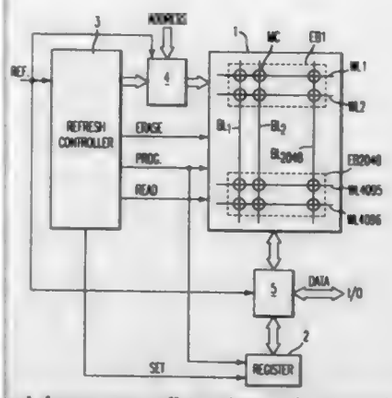
The portion of the term of this patent subsequent to Dec. 20, 2011, has been disclaimed.

Int. Cl.[6] H01L *29/76*

U.S. Cl. 365—218 **8 Claims**

1. A nonvolatile semiconductor memory system comprising:

a memory cell array having a plurality of memory cell transistors arranged in a matrix of rows and columns with a plurality of bit lines connected to the drains of said memory cell transistors arranged in a same column and a plurality of word lines connected to the control gates of said memory cell transistors arranged in a same row, wherein said memory cell transistors are divided into a plurality of erase blocks comprising a plurality of said memory cell transistors and a plurality of refresh blocks comprising a plurality of said memory cell transistors, wherein the memory cell transistors of a respective erase block are addressed for erasing stored



data and the memory cell transistors of a respective refresh block are independently addressed for refreshing of stored data; and

a plurality of registers for temporally storing data which is read from said memory cell transistors.

5,465,237

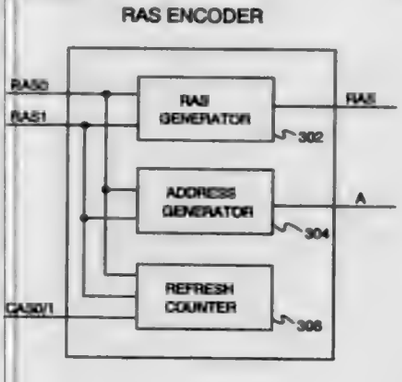
RAS ENCODED GENERATOR FOR A MEMORY BANK

Roger Chen, and Kenneth K. Kinsey, Jr., both of San Jose, Calif., assignors to Advanced Peripherals Labs, Inc., San Jose, Calif.

Filed Dec. 1, 1994, Ser. No. 347,967

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—233 **8 Claims**



1. A circuit for providing an encoded row address strobe (RAS) in accordance with a first predetermined addressing scheme to a memory module which has a second predetermined addressing scheme within a computer, the circuit comprising:

a RAS generator means for receiving first and second row address strobe (RAS) signals and generating a single RAS signal to the memory module; and

an address generator means for receiving the first and second RAS signals, and for generating an address signal based upon the first and second RAS signals, the address signal indicating which portion of the memory module is to be accessed so as to allow the memory module to operate in accordance with the first predetermined addressing scheme.

5,465,238

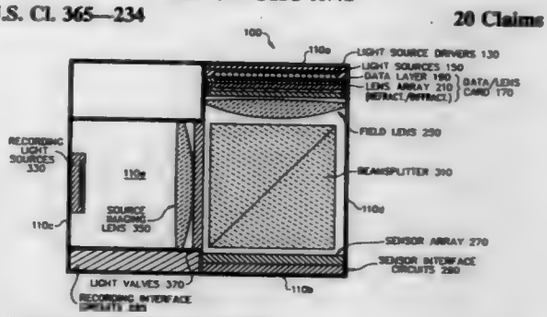
OPTICAL RANDOM ACCESS MEMORY HAVING MULTIPLE STATE DATA SPOTS FOR EXTENDED STORAGE CAPACITY

James T. Russell, Bellevue, Wash., assignor to Information Optics Corporation, Issaquah, Wash.

Continuation-in-part of Ser. No. 815,924, Dec. 30, 1991, Pat. No. 5,379,266. This application Jul. 7, 1994, Ser. No. 273,002

Int. Cl.[6] G11C *11/42*

U.S. Cl. 365—234 **20 Claims**



1. An optical system comprising:

an optical data means for storing data as light altering characteristics and being organized into a plurality (P) of juxtaposed data regions each having capacity to store (N) data spots, in which at least certain ones of said data spots have a multiplicity of three or more light altering states, and wherein said multiplicity of light altering states are adapted to encode two or more bits of data at each of said certain ones of said data spots;

controllable light source means for selectively illuminating at least one of said data regions of said optical data means;

data imaging lens means having a plurality of juxtaposed lenslets each being formed and arranged in such proximity to and in optical registration with a separate one of said juxtaposed data regions so that the image resolving power thereof is substantially uniform over the field of view of said separate data region to form an image thereof on a common image surface spaced from said data means and lens means;

sensor means having a plurality (S) of juxtaposed light sensor elements arranged at said image surface for sensing data as a light image corresponding to an illuminated data region, said sensor means including light state detection means for detecting at each of said sensor elements said multiplicity of light altering states of said data spots as imaged onto said common image surface; and

data signal output means coupled to said sensor means for outputting data signals representing said two or more bits of data of said data spots of an illuminated and imaged data region.

5,465,239

ANALOGUE DISPLAY TIMEPLACE ABLE TO PROVIDE ALPHANUMERICAL INFORMATION CONCERNING THE STATE OF AN OPERATION MODE OR OF A PROGRAMMED EVENT

Daniel Koch, Crémines, Switzerland, assignor to ETA SA Fabriques D'Ebauches, Grenchen, Switzerland

Filed Sep. 9, 1994, Ser. No. 303,460

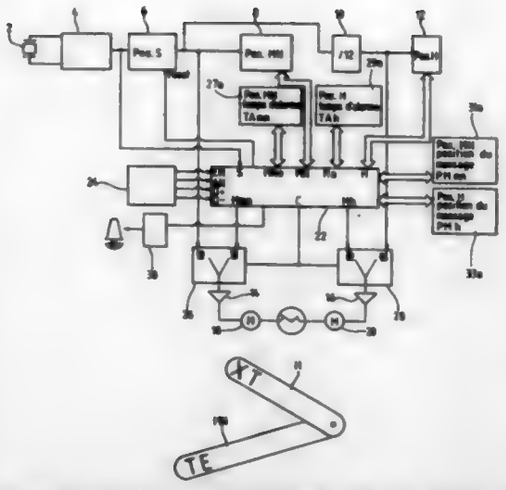
Claims priority, application Switzerland, Sep. 16, 1993, 02790/93

Int. Cl.[6] G04B *23/02;19/04*

U.S. Cl. 368—72 **20 Claims**

1. An analogue display timepiece having a time display mode, and at least one other operation mode for displaying information relating to a state of said other mode and/or to the state of a programmed event linked to said other mode, said timepiece comprising:

at least two analogue display organs comprising respectively, an hour hand and a minute hand capable of being activated independently by motor means,



electronic control means for controlling said other mode, and

state display means for providing a user of the timepiece with at least one alphanumerical message informing the user of the state of said other mode and/or the state of said event, said state display means comprising the hands themselves which, as a function of their relative angular position driven under the control of the electronic control means, are arranged to act structurally upon said message to make it intelligible in a selected angular position of the hands.

5,465,240

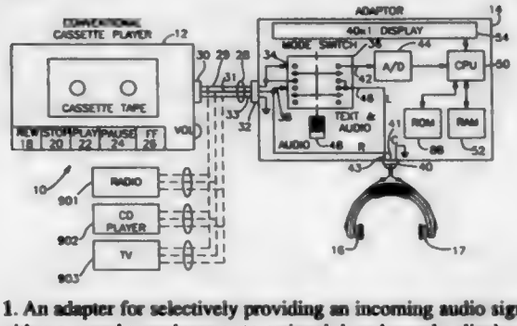
APPARATUS AND METHODS FOR DISPLAYING TEXT IN CONJUNCTION WITH RECORDED AUDIO PROGRAMS

Roy J. Mankovitz, 18057 Medley Dr., Encino, Calif. 91316

Filed Jan. 5, 1993, Ser. No. 1,117

Int. Cl.[6] H04B *1/20*

U.S. Cl. 369—1 **37 Claims**



1. An adapter for selectively providing an incoming audio signal to either a sound transducer or to a signal decoder and a display in response to a first or second information type, respectively, the incoming audio signal containing the first and second information types and being generated by an audio source and communicated to the adapter, and displaying the second information type in synchronization with the first information type, the first information type containing audio information, the second information type containing data related to the audio information, the adapter comprising:

means for determining whether the first or second information type is contained in the audio signals communicated to the adapter;

means for processing the second information type to generate first display information representative of the second information type;

sound transducer means for generating sound representative of the first information type;

switching means for electrically connecting the incoming audio signal to either the sound transducer in response to the first information type or to the processing means in response to the second information type;

means for generating from the first display information second display information in synchronization with the first information type; and

a display for displaying the second display information.

5,465,241

OPTICAL TAPE RECORDING AND REPRODUCING APPARATUS

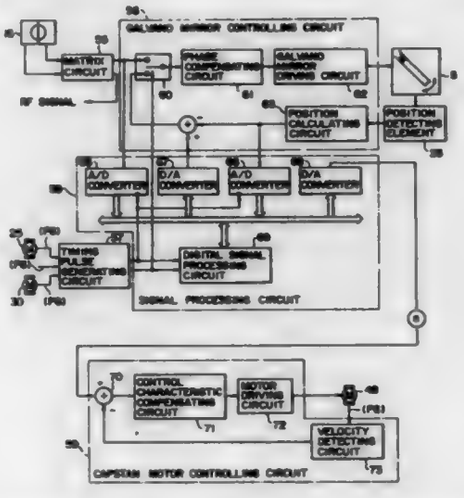
Tatsuya Narahara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 959,674, Oct. 13, 1992, abandoned. This application Jun. 23, 1994, Ser. No. 264,625

Claims priority, application Japan, Jan. 14, 1991, 3-291931

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—44.11 **6 Claims**



1. An optical tape recording an reproducing apparatus, comprising:

means for feeding an optical tape along a predetermined path;

a laser light source for producing a laser beam;

an optical system for focusing the laser beam from said laser light source upon a current track of the optical tape to optically record or reproduce information onto or from the optical tape and for receiving the laser beam reflected from the optical tape, said optical system including a tracking actuator mounted for movement from its central position to effect tracking of the laser beam;

first detecting means for dynamically detecting a displacement of the position of a spot of the laser beam at a predetermined sampling point of the current track of the optical tape from the center line of the current track, said displacement of the position of the spot from the center line being represented by a tracking error signal;

second detecting means for detecting a displacement of said tracking actuator from its central position; and

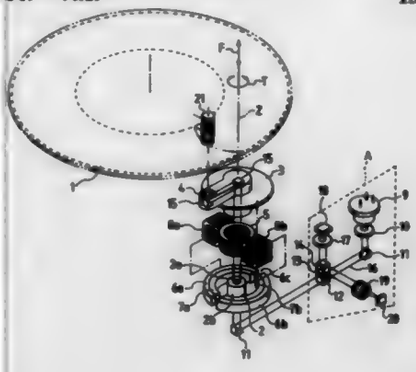
control means for dynamically controlling the position of the spot of the laser beam with respect to the current track of the optical tape in response to the tracking error signal, for integrating over time the tracking error signal and for controlling the position of the spot of the laser beam with respect to a next track in response to a control signal produced by subtracting the displacement detected by said second detecting means from the tracking error signal integrated by said control means.

5,465,242

OPTICAL DISK DEVICE

Yugi Terashima; Shogo Horitsouchi, and Hiroyuki Matsuba, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 16,193, Feb. 11, 1993, abandoned, which is a continuation of Ser. No. 754,802, Sep. 4, 1991, abandoned. This application Apr. 14, 1994, Ser. No. 227,709
Claims priority, application Japan, Sep. 4, 1990, 2-234908
Int. Cl.[6] G11B 7/12
U.S. Cl. 369—44.19 13 Claims



1. An optical disk device for reading or recording information from/in an optical disk in which the information is stored between an innermost track and an outermost track, comprising:

a shaft positioned just under a middle point between the innermost and outermost tracks of the optical disk;

a support mounted on said shaft for axial movement along said shaft and angular movement around said shaft, the support being located within a projected area of the optical disk;

condensing means for converging a light beam onto the optical disk, said condensing means being supported on said support off said shaft by half of a distance between the innermost and outermost tracks to be moved between the innermost and outermost tracks of the optical disk by the angular movement of the circular support;

a substantially cylindrical central yoke disposed concentrically around said shaft;

a substantially cylindrical side yoke comprising a pair of arcuate side yoke members, the arcuate side yoke members being disposed concentrically around said cylindrical central yoke;

a substantially cylindrical magnet comprising a pair of arcuate magnets coupled to said arcuate side yoke members, said arcuate magnets, said central yoke, and said arcuate side yoke members coacting to provide a magnetic circuit which is located within a projected area of the optical disk;

a focusing coil mounted on said support and disposed between said cylindrical yoke and said arcuate side yoke members to axially move said support along said shaft in a magnetically coacting relationship with respect to said magnetic circuit; and

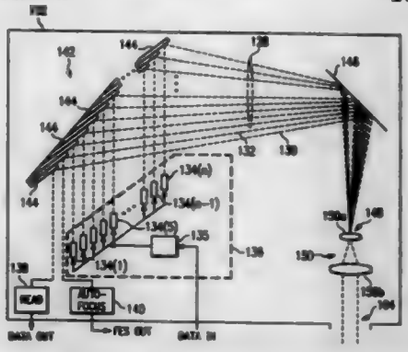
a tracking coil mounted of said support, said cylindrical central yoke-penetrating through an opening of said tracking coil to angularly move said support around said shaft in a magnetically coacting relationship with respect to said magnetic circuit, and said tracking coil being angularly moved along said cylindrical central yoke while directing a central axis of said tracking coil in a tangent line of a circle around said shaft.

5,465,243

OPTICAL RECORDER AND READER OF DATA ON LIGHT SENSITIVE MEDIA

John D. Boardman, Garland; Scott M. Hamilton; Mervin L. Gangstead, Richardson; Jimmie L. Sadler, Garland; Richard A. Trimble, Rowlett, and Jeffrey P. Welch, Plano, all of Tex., assignors to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 877,535, May 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 873,029, Apr. 24, 1992, Pat. No. 5,216,534. This application Apr. 25, 1994, Ser. No. 232,596
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—49 24 Claims



1. Apparatus for optically recording and reading a data signal within a plurality of data tracks of a light sensitive recording media comprising:

first light source means for emitting a plurality of write beams;

means for modulating each write beam by a designated portion of the data signal to generate a plurality of data signal modulated write beams;

a second light source means for emitting a read beam; and

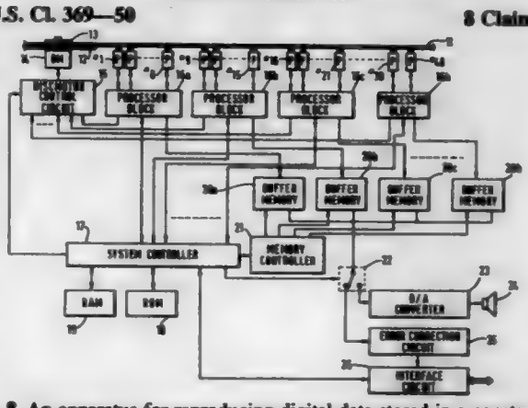
a plurality of reflector panes in a layered configuration and a single pane reflective mirror, each reflector pane and said mirror having a preselected angle of reflection to deflect and spatially combine the plurality of data signal modulated write beams and the read beam into a collimated multi-channel light beam.

5,465,244

DISC REPRODUCING APPARATUS

Akira Kobayashi; Takuji Yoshida; Hisahide Hattori, all of Kanagawa, and Toshiya Takabayashi, Saitama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 858,160, Mar. 27, 1992, abandoned. This application May 2, 1994, Ser. No. 236,168
Claims priority, application Japan, Mar. 28, 1991, 3-090073
Int. Cl.[6] G11B 5/09
U.S. Cl. 369—50 8 Claims



8. An apparatus for reproducing digital data stored in a constant linear velocity format within a data area on a disc, the digital data

being composed of a series of data blocks which have corresponding address data to identify each said data block, comprising:

rotating means for rotating the disc about an axis of rotation thereof;

a plurality of optical pickup devices, fixed with respect to each other and the axis of rotation of the rotating means, for reading the data from the rotating disc, each pickup device comprising a movable lens which moves to read the data from a different part of the data area on the disc;

first control means for controlling the rotating means to rotate the disc at a first speed corresponding to one of the optical pickup devices, and controlling the optical pickup devices to simultaneously begin to read out the data during a first reproduction mode;

data processing means having a plurality of processing units for processing the data read by each of the optical pickup devices and outputting processed data corresponding to the data;

first storing means having a plurality of storage areas, each corresponding to each said data block identified by the corresponding address data, for storing the processed data, composed of said data blocks, output by each of the processing units in the first reproduction mode;

second storing means for storing flag data for identifying the storage areas of the first storing means and indicating which of said each data block was stored in a corresponding one of the storage areas;

detecting means for inspecting the flag data to detect absence of the data stored in the storage areas of the first storing means; and

second control means acting in response to the detecting means for controlling the rotating means to rotate the disc at a second speed corresponding to a selected one of the optical pickup devices which is to read out missing data determined by inspecting the flag data, the second control means causing the selected optical pickup device to read out the missing data in a second reproduction mode.

5,465,245

OPTICAL PICKUP CONTROL SYSTEM FOR AN OPTICAL DISC HAVING RECORDED AND NON-RECORDED AREAS

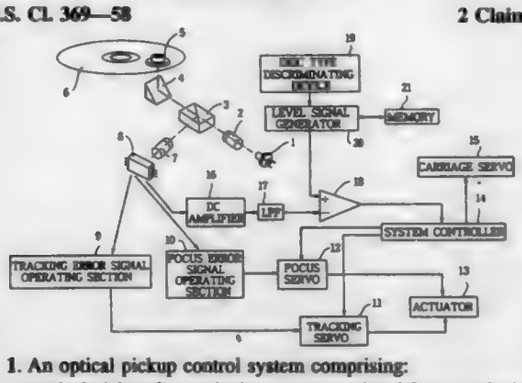
Naoharu Yanagawa, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 921,038, Jul. 29, 1992, abandoned. This application May 20, 1994, Ser. No. 246,923

Claims priority, application Japan, Feb. 21, 1992, 4-072293

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—58 **2 Claims**



1. An optical pickup control system comprising:

an optical pickup for producing an output signal for reproducing information recorded on an optical disc;

a disc type discriminating device for discriminating the type of optical disc and for producing a disc type signal in accordance with a discriminated type;

a memory storing reference values for discriminating change of reflectivity from a recorded area of said information to an unrecorded area for every type of discriminated disc;

a level signal generator, responsive to said disc type signal, for deriving a reference value from said memory for said type of optical disc;

a comparator for comparing a level of said output signal of said optical pickup with a level of said derived reference value, therein determining that said optical pickup has reached said unrecorded area, and for producing a stop signal; and

stopping means, responsive to said stop signal, for stopping radial movement of said optical pickup.

5,465,246

DEVICE INSURING SAFE INSERTION OF CARTRIDGES INTO LOADING APPARATUS OF PLAYBACK AND/OR RECORDING UNITS

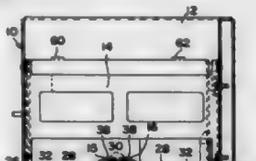
Stephane M. A. d'Alayer de Costemore d'Arc, Genappe, Belgium, assignor to Staar S.A., Brussels, Belgium

Filed Apr. 25, 1994, Ser. No. 231,830

Claims priority, application Belgium, May 12, 1993, 9300491

Int. Cl.[6] G11B *17/04;33/02*

U.S. Cl. 369—77.2 **13 Claims**



1. In a loading apparatus for cartridges with a flat, rectangular casing having longitudinal edges and transverse edges, parallel top and bottom faces, and transverse-edge grooves that are asymmetrical relative to the parallel faces, the apparatus having an entrance through which a cartridge properly oriented when inserted is moved front edge first and top face up in a direction perpendicular to the front edge, an improved blocking device to insure that the cartridge is properly oriented when inserted comprising:

a pair of movable blocking elements, of opposite hand, mounted in the entrance straddling a line dividing the entrance;

each blocking element presenting (i) a stop member near the dividing line which is engaged by the front edge of the cartridge to impede its insertion and which is carried on a flexible portion of the blocking element that can flex to displace the stop member clear of the cartridge to allow insertion, (ii) a lateral surface near a side margin of the entrance which is engaged by a corner of the front edge of the cartridge to move the movable blocking element laterally away from the dividing line as the cartridge starts through the entrance, and (iii) a laterally extending tongue near the entrance side margin which enters one of the cartridge transverse-edge grooves when the cartridge is top face up when inserted; and

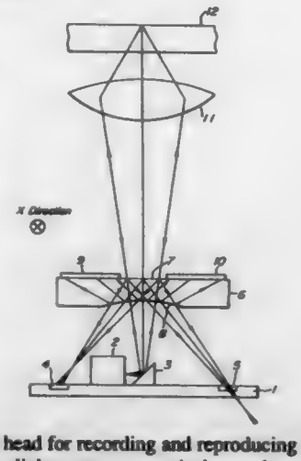
a pair of displacement members mounted near the dividing line coacting with the blocking elements to flex the flexible portions and retract the stop members thereof responsive to lateral movement of both blocking elements produced by engagement of the lateral surfaces thereof by both corners of the front-edge of the cartridge thereby to allow the cartridge through the entrance only when the cartridge is properly oriented when inserted.

5,465,247

OPTICAL HEAD

Shohei Kobayashi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 14, 1993, Ser. No. 61,034
Claims priority, application Japan, May 14, 1992, 4-122059
Int. Cl.[6] H01J 3/14
U.S. Cl. 369—109 1 Claim



1. An optical head for recording and reproducing information by irradiating a fine light spot on an optical record medium, comprising:

a light source for emitting a linearly polarized light beam;

an optical lens system including an objective lens for projecting said light beam onto the optical record medium as the light spot and for collecting light reflected by the optical record medium to form a return light beam;

a beam splitting means having a beam splitting surface for splitting said return light beam into a plurality of light beams, said beam splitting surface being curved such that light rays in the return light beam are made incident upon said beam splitting surface substantially at a same incident angle; and

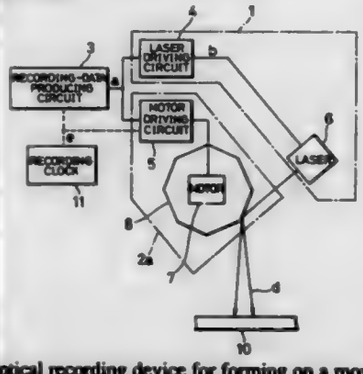
a photoelectric converting means having a plurality of photodetectors for receiving said plurality of light beams split by said beam splitting surface, wherein said beam splitting surface is arranged in a converging portion of said return light beam.

5,465,248

DEFLECTING A LIGHT BEAM IN THE SAME DIRECTION AND SPPED OF A RECORDING MEDIUM BY A ROTATING POLYGON OR A HOLOGRAPHIC DISK

Hiroshi Fuji, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1993, Ser. No. 172,134
Claims priority, application Japan, Dec. 22, 1992, 4-342668
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—112 20 Claims



18. An optical recording device for forming on a moving recording medium a recording mark corresponding to recording data by focusing a light spot on a projection start position on said optical recording medium and raising a temperature of a portion of said optical recording medium exposed to the light spot, comprising:

laser source means for generating a laser beam for forming said light spot on said medium; and

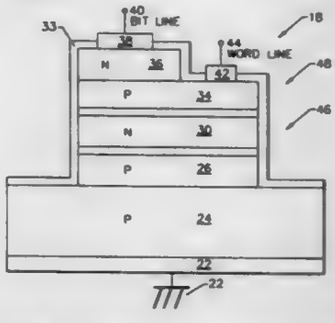
causing means for causing said light spot to follow said portion of said medium during a period in which information is recorded in said portion.

5,465,249

NONVOLATILE RANDOM ACCESS MEMORY DEVICE HAVING TRANSISTOR AND CAPACITOR MADE IN SILICON CARBIDE SUBSTRATE

James A. Cooper, Jr., West Lafayette, Ind.; John W. Palmour, and Calvin H. Carter, Jr., both of Cary, N.C., assignors to Cree Research, Inc., Durham, N.C., and Purdue Research Foundation, Lafayette, Ind.

Filed Nov. 26, 1991, Ser. No. 798,219
Int. Cl.[6] G11C 11/401
U.S. Cl. 365—149 35 Claims



1. A nonvolatile random access memory (NVRAM) device having memory storage for substantially indefinite periods of time even in the absence of refresh, said NVRAM device comprising:

a bit line for writing information to storage when a potential is applied thereto; and

means for storing a charge for substantially indefinite periods of time, said means including a transistor formed of silicon carbide, said transistor connecting said charge storage means to said bit line so that the NVRAM device stores the charge for substantially indefinite periods of time even in the absence of refresh.

5,465,250

HYBRID LOOPBACK FOR FDDI-II SLAVE STATIONS

David C. Brief, Palo Alto, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 24, 1993, Ser. No. 83,111
Int. Cl.[6] H04L 12/42;12/64
U.S. Cl. 370—15 33 Claims

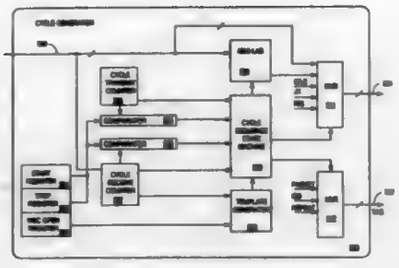
1. A method for testing hybrid mode operation of elements of an FDDI-II network, comprising the steps of:

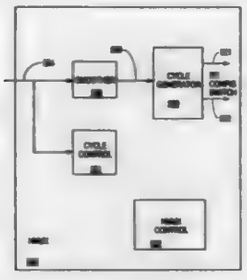
creating a loopback ring for testing of hybrid mode operation;

generating hybrid mode cycles using circuitry in a non-monitor station attached to the loopback ring;

transmitting information from the hybrid mode cycles, on the loopback ring; and

measuring the progress of the information around the loopback ring.





5,465,251

NETWORK ADDRESSING

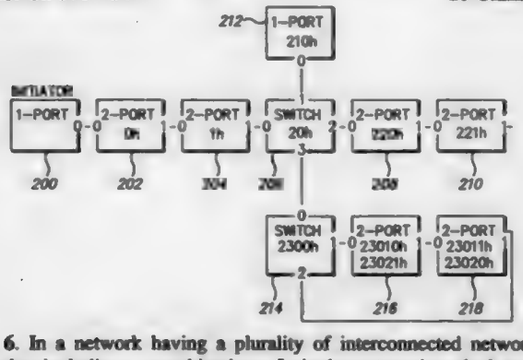
Ian D. Judd, Winchester, and Reginald Beer, Chandlers Ford, both of, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1993, Ser. No. 74,243

Claims priority, application United Kingdom, Jun. 23, 1992, 9213240.6

Int. Cl.[6] H04L *12/56;* H04Q *11/00*

U.S. Cl. 370—54 10 Claims



6. In a network having a plurality of interconnected network nodes including a combination of single-port nodes, dual port nodes, and switch nodes, a method of routing a message frame from a source node to a destination node, comprising the steps of:

issuing said message frame to said destination node, said message frame including a path address value specifying a path between said source node and said destination node;

receiving said message frame at a switch node along said path adjacent to said source node, and determining whether a first and a second predetermined portion of said path address value corresponds to a predetermined value of zero,

if said first and said second predetermined portion of said path address corresponds to said predetermined value of zero, accepting said message frame at said switch node;

if said first predetermined portion of said path address corresponds to said predetermined value of zero and said second predetermined portion of said path address does not correspond to said predetermined value of zero,

determining a port in said switch node from said second predetermined portion of said path address,

deleting said first and said second predetermined portion of said path address, and

routing said message frame to the next node along said path through said port;

if said first predetermined portion of said path address does not correspond to said predetermined value of zero, discarding said message frame; and,

repeating the steps of receiving, determining, deleting, discarding, and routing at each subsequent node along said path until one of said subsequent nodes accepts said message frame.

5,465,252

METHOD FOR RECEIVING AND DELIVERING SECTION OVERHEADS OF AND FOR STM-1 SIGNALS IN A SECTION-OVERHEAD SERVER OF A NETWORK NODE

Horst Müller, Hohenschäftlarn, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

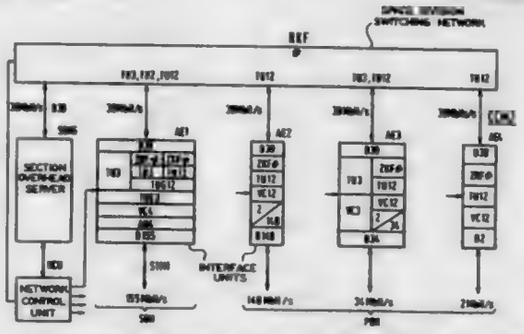
PCT No. PCT/DE92/00072, § 371 Date Aug. 11, 1993, § 102(e) Date Aug. 11, 1993, PCT Pub. No. WO92/14315, PCT Pub. Date Aug. 20, 1992

PCT Filed Feb. 5, 1992, Ser. No. 104,162

Claims priority, application Germany, Feb. 12, 1991, 41 04 238.7

Int. Cl.[6] H04J *3/12*

U.S. Cl. 370—65.5 2 Claims



1. A method for receiving section overheads from all incoming synchronous transfer module signals and for outputing section overheads to all outgoing synchronous transfer module signals in a switching device having a section overhead server connected to a space-division switching network with synchronous transfer module interface units and to a processor in a network node of a digital information transmission system, the method comprising the steps of:

in a receiving section of each synchronous transfer module interface unit, converting an synchronous transfer module signal into four D39 signals each having one byte frame of 152 rows and 16 columns,

inserting overhead bytes for special purposes of section overheads, with the exception of frame synchronization bytes and bytes for determining bit error rate from each section overhead, into a special. column of said byte frame of one of said four D39 signals,

supplying only bytes of said special column to the section overhead server via the space-division switching network for each incoming synchronous transfer module signal,

evaluating the bytes of said special column in the section overhead server and generating are outgoing special column of new overhead bytes for said special column for each outgoing synchronous transfer module signal;

inserting said outgoing special column instead of said special column into one of said four D39 signals supplied to a transmitting section of said synchronous transfer module interface unit via said space-division switching network, and

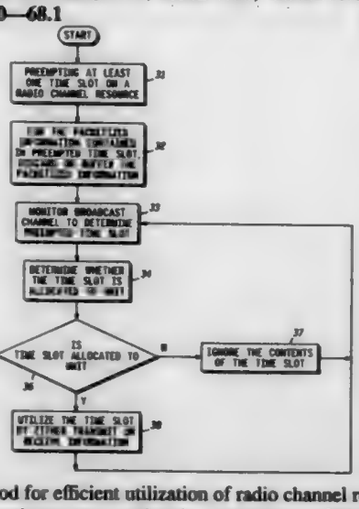
converting said four D39 signals into said each outgoing synchronous transfer module signal.

5,465,253

METHOD AND APPARATUS FOR DEMAND-ASSIGNED REDUCED-RATE OUT-OF-BAND SIGNALING CHANNEL

Moe Rahnema, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 177,025, Jan. 4, 1994, abandoned. This application Mar. 29, 1995, Ser. No. 412,506
Int. Cl.[6] H04J 3/12; H04B 7/00; H04M 11/06
U.S. Cl. 370—68.1 34 Claims



1. A method for efficient utilization of radio channel resources in a communication system, wherein a sequence of time slots is provided on each of the radio channel resources for packetized communications, the method comprising the steps of:

a) preempting, on at least one of the radio channel resources, packetized information contained within at least one time slot of said sequence of time slots every N time slots to produce at least one preempted time slot;

b) utilizing the at least one preempted time slot for transmitting or receiving signaling information, the signaling information being superimposed on the at least one preempted time slot; and

c) indicating a location of the preempted time slot using an independent broadcast channel, the independent broadcast channel allowing the communication system to distinguish the signaling information from the packetized information.

5,465,254

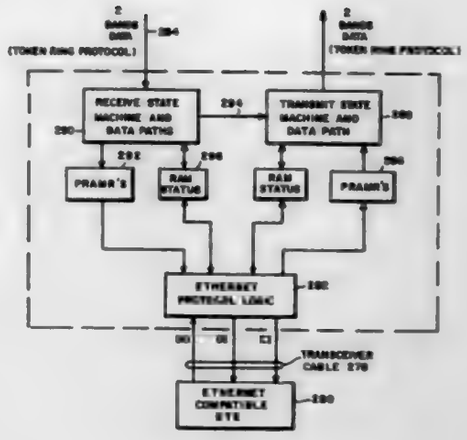
RING-TYPE COMMUNICATION NETWORK

Philip D. Wilson, 21 Philemon Whale La., Sudbury, Mass. 01776; Richard D. Serafin, 2005 Windsor Ridge Dr., Westboro, Mass. 01581; Paul W. Kelley, 115 Spring St., Hopkinton, Mass. 01748, and Tadeusz Witkowicz, 263 W. Main St., Milbury, Mass. 01527

Division of Ser. No. 870,541, Apr. 17, 1992, Pat. No. 5,295,012, which is a division of Ser. No. 726,497, Apr. 24, 1985, Pat. No. 5,107,490. This application Aug. 20, 1993, Ser. No. 110,101
The portion of the term of this patent subsequent to Apr. 21, 2009, has been disclaimed.
Int. Cl.[6] H04J 14/08
U.S. Cl. 370—79 4 Claims

1. Network bridging circuitry for connecting one or more networks of a kind which carry digital data among a plurality of data generating and data using devices and are arranged to communicate in accordance with a collision detection protocol with one or more networks of a kind which carry digital data among a plurality of data generating and data using devices and are arranged to form a continuous closed ring and communicate in accordance with a non-collision detection protocol, the network bridging circuitry comprising:

protocol interface circuitry arranged to pass digital data from the network arranged in accordance with a collision detection protocol to the network arranged in accordance with a non-collision detection protocol and viceversa.

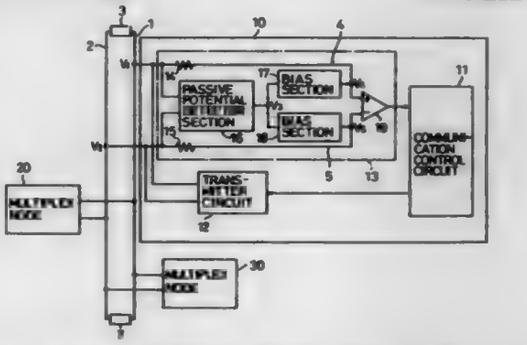


5,465,255

MULTIPLEX TRANSMISSION SYSTEM

Motoharu Tanaka, Yokohama; Kyosuke Hashimoto, Hiratsuka, and Yusaku Himono, Tokyo, all of, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 960,928, Oct. 13, 1992, abandoned. This application Jan. 31, 1994, Ser. No. 190,233
Claims priority, application Japan, Jan. 16, 1991, 3-267619; Feb. 19, 1992, 4-031953; Aug. 14, 1992, 4-216740
Int. Cl.[6] H04L 5/22
U.S. Cl. 370—85.1 14 Claims



12. A multiplex transmission system including at least two multiplex nodes interconnected by two signal transmission lines for data transmission among the multiplex nodes, comprising:

two terminal circuits individually connected to the signal transmission lines at respective ends thereof, and having two resistance elements and at least one capacitor, for stabilizing transmission waveforms, said two resistance elements being connected in series between the ends of the signal transmission lines, and said at least one capacitor for being connected between a junction of said resistance elements and ground potential;

each of the multiplex nodes including a transmitter circuit and a receiver circuit, each connected to the signal transmission lines, for respectively transmitting data to and receiving data from other multiplex nodes;

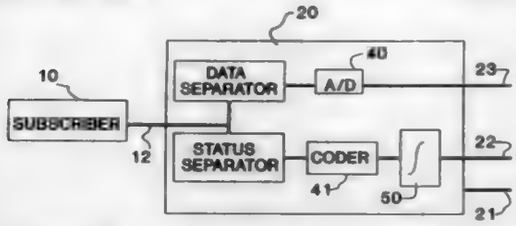
each of the transmitter circuits including one of a capacitor and an inductor for controlling a switching speed thereof when the transmission lines are driven; and

each of the two terminal circuits further including a capacitor for stabilizing transmission waveforms, to suppress noise produced on the signal transmission lines due to a steep edge component of a pulse and an unbalanced switching speed of the transmitter circuit when the signal transmission lines are driven by the transmitter circuit.

5,465,256
TELEPHONE CROSS CONNECT STATUS SIGNAL PRE-PROCESSOR

Charles J. C. Fowler, Sinking Spring, Pa., assignor to Krone AG, Berlin-Zehlendorf, Germany

Filed Dec. 23, 1993, Ser. No. 172,558
Int. Cl.[6] H04J 3/12
U.S. Cl. 370—110.1 11 Claims

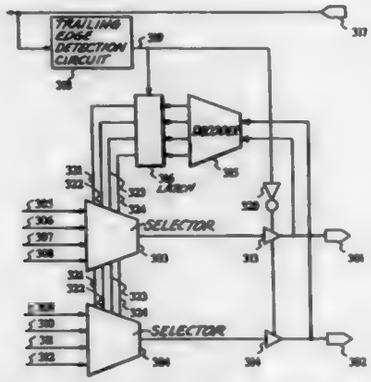


1. A telephone signal processing system comprising:
line card means connected to a telephone line for receiving analog signals from the telephone line, said line card means separating DC Signaling and VF from the telephone line;
coder means for receiving the DC Signaling and converting said DC Signaling into a digital status code, said digital status code containing a plurality of packets, each of said plurality of packets representing a specific status of the telephone line, said coder means generating said plurality of packets at a predetermined rate;
integration means for integrating said digital status code from said coder means over time to remove noise spikes and generate an integrated digital status code that is used by the telephone system to configure a telephone system.

5,465,257
TEST SIGNAL OUTPUT CIRCUIT IN LSI

Hitoshi Yamahata, and Masahiro Kuruda, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Mar. 3, 1993, Ser. No. 25,966
Claims priority, application Japan, Mar. 3, 1992, 4-045084
Int. Cl.[6] G01R 31/28
U.S. Cl. 371—22.5 2 Claims

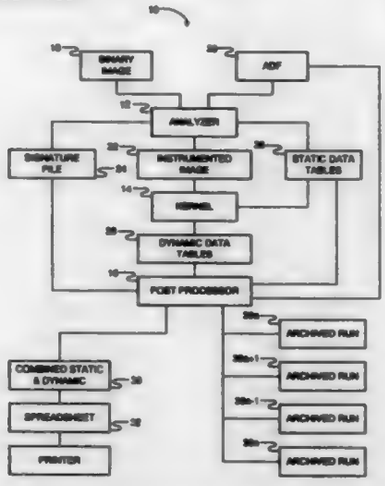


1. A test signal output circuit provided in an LSI, comprising:
test signal output terminals;
test mode signal input terminals;
at least one selector for transmitting fixed internal signals selectively to said test signal output terminals in response to input signals directed to said test mode signal input terminals;
signal terminals composed of at least a portion of said test signal output terminals and said test mode signal input terminals for combined use in a timesharing manner;
a trailing edge detection circuit for detecting the trailing edge of a reset signal for resetting the entire LSI;
an input-output switching circuit for switching said signal terminals between a test mode signal input mode that receives test mode signals and a test mode signal output mode that outputs test signals, said switching occurring in response to trailing edges detected by said trailing edge detection circuit;
a decoder; and
a latched circuit for holding the outputs of said decoder or test mode signals from said test mode signal input terminals in response to the output of said trailing edge detection circuit; wherein
the output of said selector is controlled by responses to the output of said latched circuit.

5,465,258
BINARY IMAGE PERFORMANCE EVALUATION TOOL

Steven E. Adams, Acton, Mass., assignor to Integrity Systems, Inc., Belmont, Mass.

Continuation of Ser. No. 435,615, Nov. 13, 1989, abandoned.
This application Mar. 9, 1993, Ser. No. 29,366
Int. Cl.[6] G06F 11/34
U.S. Cl. 395—700 7 Claims



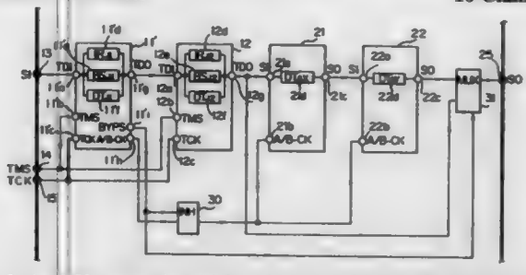
1. A digital data processing system for evaluating the performance of a computer program, said digital system comprising:
(a) a first computer comprising:
(i) means for selecting an architecture description file having definitions of boundaries;
(ii) means for identifying boundaries according to said definitions in said architecture description file, in a binary image of said computer program;
(iii) means for inserting at said identified boundaries tracking code that includes instructions leading to routines in a kernel program, said routines adapted for collection of runtime performance information, so that a modified binary image is created;
(b) a second computer comprising:
(i) means for running said kernel program including means for running said modified binary image;
respond to said tracking code in said modified binary image; and
means for collecting said runtime performance information as specified in said routines.

5,465,259

LSI SYSTEM WITH A PLURALITY OF LSIS HAVING DIFFERENT SCAN SYSTEMS AND PROVIDED ON A PRINTED CIRCUIT BOARD

Akihiko Hanafusa, Yokohama, and Toshihiko Tada, Kawasaki, both of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 12, 1993, Ser. No. 104,852
Claims priority, application Japan, Aug. 14, 1992, 4-216939
Int. Cl.[6] G05B *23/02*
U.S. Cl. 371—22.3 **10 Claims**



1. An LSI system in which at least one JTAG-LSI and at least one A/B-LSI are provided on the same printed circuit board, the at least one JTAG-LSI performing a scan operation in accordance with scan data, a test clock signal and a test mode select signal and the at least one A/B-LSI performing a scan operation in accordance with scan data and two-phase clock signals, the LSI system comprising:

a common scan data-in terminal which is provided on the printed circuit board and receives scan data into the LSI system;

a common scan data-out terminal which is provided on the printed circuit board and outputs scan data from the LSI system;

a first external terminal which is provided on the printed circuit board and receives the test clock signal;

a second external terminal which is provided on the printed circuit board and receives the test mode select signal;

a first group comprising at least one JTAG-LSI, each JTAG-LSI of the first group comprising

a scan system which uses the test clock signal received by the first external terminal and the test mode select signal received by the second external terminal, the scan system of each JTAG-LSI in the first group being identical,

a scan data-in pin which receives scan data into the respective JTAG-LSI,

a scan data-out pin which outputs scan data from the respective JTAG-LSI, and

a plurality of chains which are individually selectable by the test mode select signal, a scan operation being performed with respect to a selected chain, the plurality of chains including an instruction register chain, a boundary scan chain and a data chain; and

a second group comprising at least one A/B-LSI, the first group and the second group being connected in one of a series connection and a parallel connection between the common scan data-in terminal and the common scan data-out terminal, each A/B-LSI of the second group comprising

a scan system which uses two-phase clock signals and is different from the respective scan systems of the at least one JTAG-LSI in the first group, the respective scan system of each A/B-LSI of the second group being identical,

a scan data-in pin which receives scan data into the respective A/B-LSI,

a scan data-out pin which outputs scan data from the respective A/B-LSI, and

a data chain, a scan operation being performed with respect to the data chain,

wherein the first group comprises a plurality of JTAG-LSIs cascaded together via the respective scan data-in pins and the respective scan data-out pins to connect a first JTAG-LSI to a last JTAG-LSI with scan data received in the respective scan data-in pin of a first JTAG-LSI, transferred through the respective JTAG-LSIs, and output from the respective scan data-out pin of the last JTAG-LSI, the second group comprises a plurality of A/B-LSIs cascaded together via the respective scan data-in pins and the respective scan data-out pins to connect a first A/B-LSI to a last A/B-LSI with scan data received in the respective scan data-in pin of the first A/B-LSI, transferred through the respective A/B-LSIs and output from the respective scan data-out pin of the last A/B-LSI, the first group and the second group are connected in series with each other between the common scan data-in terminal and the common scan data-out terminal, and the first group includes a JTAG-LSI which generates a bypass control signal and the two-phase clock signals in synchronization with the test clock signal, the LSI system further comprising

an inhibit circuit which receives the bypass control signal and supplies the two-phase clock signals to each A/B-LSI in the second group in accordance with the bypass control signal and

a multiplexer which receives the bypass control signal, the output of the scan data-out pin of the last JTAG-LSI in the first group and the output of the scan data-out pin of the last A/B-LSI in the second group, and selects one of the output of the last JTAG-LSI in the first group and the output of the last A/B-LSI in the second group, and provides the selected output to the common scan data-out terminal.

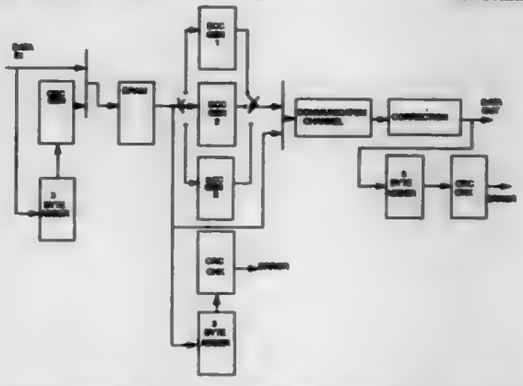
◆

5,465,260

DUAL PURPOSE CYCLIC REDUNDANCY CHECK

Christopher P. Zook, Boulder, Colo., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Nov. 4, 1993, Ser. No. 147,865
Int. Cl.[6] G06F *11/10;* **H03M** *13/00*
U.S. Cl. 371—37.7 **103 Claims**



44. Apparatus for generating/checking a CRC byte where each byte is an element of the finite field GF(2P) and where p is the number of binary digits in each byte and is equal to the number of bits in each byte comprising:

a first m-way adder circuit;

first switching means for switching each successive data byte into said first m-way adder circuit wherein said first adder circuit produces successive summations of m bytes at a time; and

a first CRC generator wherein said successive summations are divided by a first order factor whose root is a power of α in a cyclic redundancy code divisor to produce a CRC byte and wherein α is the primitive element of the finite field.

5,465,261

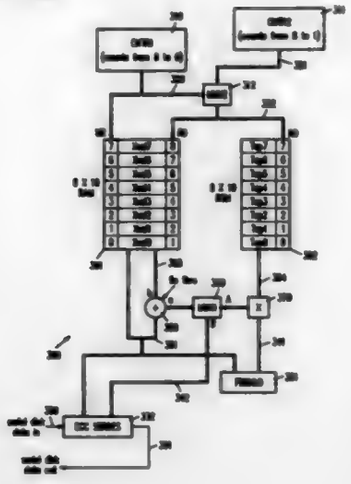
RAM BASED ARCHITECTURE FOR ECC CIRCUITS

Daniel J. Deschene, Morgan Hill, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 3, 1993, Ser. No. 100,985

Int. Cl.[6] H03M *13/00*; G06F *11/10*

U.S. Cl. 371—39.1 **38 Claims**



1. An ECC circuit for analyzing an I bit data sequence having data words of N bit width, comprising:

a first bus for providing a first data word of N bit width;

a first addressable memory device having M addressable locations where M is greater than 1, each of N bit width, for storing information pertaining to an N bit portion of said I bit data sequence, said first addressable memory device including address and bi-directional data lines for reading and writing said information;

a second addressable memory device having M addressable locations, each of N bit width, for storing M tap weight values, said second addressable memory device including address and data lines for reading said tap weight values;

a logic device for logically combining a first and a second logical combination input value and providing a logical combination output value;

a register;

a multiplier for multiplying a first and a second multiplicand and provide a product; and

a controller for:

reading a first location of said first memory device to provide a first logical combination input value to said logic device, said first data word serving as said second logical input value to said logic device, and storing said logical combination output value in said register;

sequentially reading successive locations of said first memory device and said second memory device to serve as said first logical combination input value and said second multiplicand, respectively, with said value stored in said register serving as said first multiplicand, and with said product serving as said second logical combination input value, said logical combination output value being written to the previously read location of said first memory device; and

reading a last location of said second memory device to provide said second multiplicand, with said value stored in said register serving as said first multiplicand, and writing said product to the previously read location of said first memory device.

5,465,262

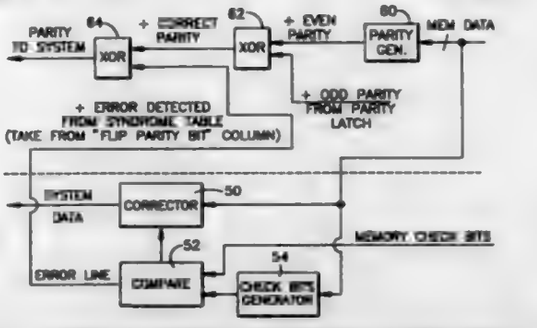
METHOD AND STRUCTURE FOR PROVIDING ERROR CORRECTION CODE AND AUTOMATIC PARITY SENSING

Timothy J. Dell, Colchester, Vt., and Jimmy G. Foster, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 188,245, Jan. 28, 1994, and a continuation-in-part of Ser. No. 187,859, Jan. 28, 1994, Pat. No. 5,379,304. This application Apr. 14, 1994, Ser. No. 227,444

Int. Cl.[6] G06F *11/10*

U.S. Cl. 371—49.3 **11 Claims**



11. A method of providing error correction and parity check on SIMM memory added as add-on memory to a computer system which system writes eight-bit bytes of data together with a parity bit; and wherein said system utilizes either one of odd parity or even parity, comprising the steps of:

generating on said SIMM check bits from the data bytes written; sensing whether the system is writing odd parity or even parity, comparing the parity of the generated parity bit with the system parity bit and manipulating said check bits to show uncorrectable error responsive to bad parity responsive to either "even" or "odd" parity sensed; storing said generated check bits with said data bytes in DRAM chips on said SIMM;

reading said data bytes and associated check bits from the DRAM chips and generating new check bits and comparing the newly-generated check bits with the stored check bits to correct and output all single-bit errors and detect some multi-bit errors and bad parity in the read data;

writing parity bits to said computer system from said read data bytes responsive to and corresponding to the sensed parity type of said system;

whereby a given SIMM can utilize either an "even" parity or "odd" parity system.

5,465,263

MONOLITHIC, MULTIPLE WAVELENGTH, DUAL POLARIZATION LASER DIODE ARRAYS

David P. Bour, Cupertino, and Thomas L. Paoli, Los Altos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 994,029, Dec. 12, 1992, and a continuation-in-part of Ser. No. 158,250, Nov. 29, 1993. This application Nov. 4, 1994, Ser. No. 332,989

Int. Cl.[6] H01S *3/10*

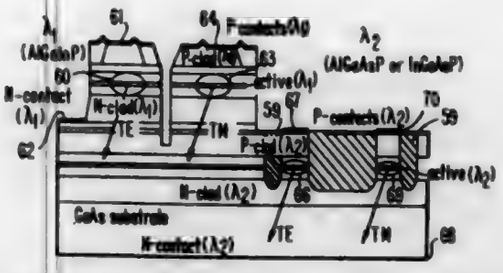
U.S. Cl. 372—23 **75 Claims**

1. A dual-wavelength, dual polarization laser diode array, comprising:

(a) a common semiconductor body having side-by-side first and second active regions,

(b) said first active region having first and second laterally-spaced zones that are capable of emitting TE-polarized radiation and TM-polarized radiation, respectively, at a first wavelength,

(c) said second active region having third and fourth laterally-spaced zones that are capable of emitting TE-polarized and



TM-polarized radiation, respectively, at a second wavelength that is different from the first wavelength,

(d) electrodes connected to the body for separately introducing carriers into said zones of the diode laser array to cause each zone to independently emit radiation,

(e) optical reflectors associated with the body to form at least one optical cavity for lasing radiation,

(f) polarization selecting means connected to said first and second zones of the first active region for causing the first and second zones to emit, respectively, TE-polarized and TM-polarized radiation at said first wavelength,

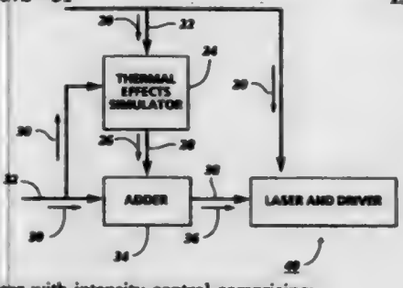
(g) polarization selecting means connected to said third and fourth zones of the second active region for causing said third and fourth zones to emit, respectively, TE-polarized and TM-polarized radiation at said second wavelength.

5,465,264

ELECTRONIC SIMULATION FOR COMPENSATING LASER DIODE THERMAL EFFECTS

Steven A. Buhler, Redondo Beach, and Ellis D. Harris, Claremont, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 22, 1993, Ser. No. 155,323
Int. Cl.[6] H01S *3/10*
U.S. Cl. 372—31 **13 Claims**



1. A laser with intensity control comprising:

a) a laser

b) simulator means for simulating laser thermal effects and generating a compensating signal in accordance with the simulated laser thermal effects which comprises,

i) a control means for receiving a control signal;

ii) an input means for receiving an input signal;

iii) a current generating means for generating said compensating signal operably connected and responsive to said input means for generating said compensation signal from the input signal, said current generating means also operably connected and responsive to said control means to only generate said compensating signal when said control means has received the control signal; and

iv) an output means operably connected and responsive to said current generating means for transmitting said compensating signal, and

v) said compensating signal is approximately described by the equation $I=Ae^{(-t/RC)}+B$ wherein:

A=a first constant,

B=a second constant describing an offset voltage, and

e=the base for natural logarithms approximately equal to 2.71828, and for the elements in the exponent:

t=time constant of the circuit,

R=resistance of the circuit, and

C=capacitance of the circuit,

c) a base level gain control signal for driving said laser connected to said simulator input means,

d) adding means operatively connected to said base level gain control signal and the compensating signal for combining said base level gain control signal and the compensating signal to generate a laser driving signal for controlling the intensity of the laser, said laser driving signal also being connected to said simulator input means, and

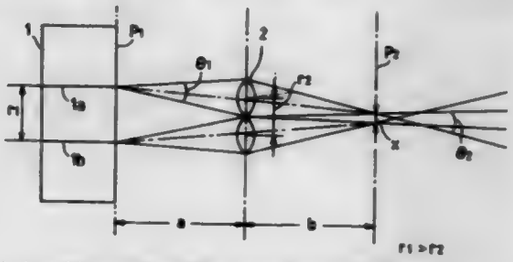
e) said laser being operatively connected to the laser driving signal.

5,465,265

MULTI-BEAM LASER LIGHT SOURCE AND MULTI-BEAM SEMICONDUCTOR LASER ARRAY

Takeshi Ota, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1993, Ser. No. 79,917
Claims priority, application Japan, Jan. 24, 1992, 4-166313; Jan. 12, 1993, 5-003515
Int. Cl.[6] H01S *3/085*; H01L *33/00*
U.S. Cl. 372—101 **24 Claims**



1. A multi-beam laser light source, comprising:

a laser array having a plurality of independently drivable laser elements arranged with an equal projection point interval therebetween; and

a lens array having a plurality of lenses receiving light from the laser elements, the plurality of lenses being arranged with an interval therebetween shorter than the projection point interval;

wherein the lenses focus light from the laser elements on a surface, and an interval between adjacent focused light spots on the surface is shorter than the projection point interval, and

wherein $x=r_2-(r_1-r_2)\alpha(r_1>r_2x)$ is satisfied, wherein

r_1 is the interval of the projecting points,

r_2 is the interval of the lens array.

x is the interval between the focused light spots on the surface, and

α is a projection magnifying power of said lenses.

5,465,266

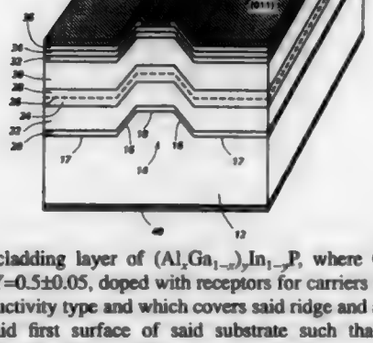
INDEX-GUIDED LASER ON A RIDGED (001) SUBSTRATE

David P. Bour, and Ross D. Bringans, both of Cupertino, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 28, 1994, Ser. No. 268,005
Int. Cl.[6] H01S *3/19*
U.S. Cl. 372—46 **15 Claims**

1. A semiconductor device comprising:

a substantially (001) substrate doped with receptors for carriers of a first conductivity type, said substrate having a first and second surfaces which are substantially parallel to each other, said substrate further having third and fourth surfaces which join said first and second surfaces so that said second, third, and fourth surfaces form a ridge and such that said third surface is inclined from the first surface a minimum of 5 degrees and a maximum given by the {111} plane;



a first cladding layer of $(Al_xGa_{1-x})_yIn_{1-y}P$, where $0.7<X\leq 1.0$ and $Y=0.5\pm 0.05$, doped with receptors for carriers of said first conductivity type and which covers said ridge and at least part of said first surface of said substrate such that said first cladding layer follows the contours of said ridge;

an active region adjacent to said first cladding layer and disposed over said ridge such that said active region follows the contours of said ridge, said active region having a first phase with a first bandgap on planes substantially parallel to said first surface and a second phase with a second bandgap which occurs on planes substantially parallel to said third surface and a third bandgap on planes substantially parallel to said fourth surface, wherein the first phase is more ordered than the second phase;

a second cladding layer of $(Al_xGa_{1-x})_yIn_{1-y}P$, where $0.7<X\leq 1.0$ and $Y=0.5\pm 0.05$, doped with receptors for carriers of a second conductivity type and which covers said active region and said ridge; and

means for injecting current into said active layer;

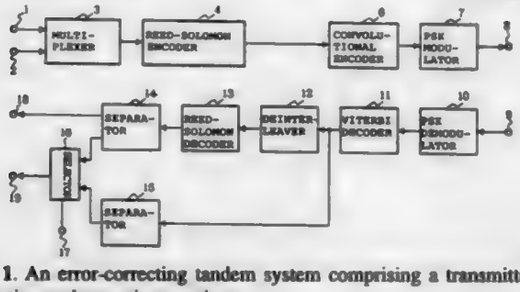
wherein said first and second cladding layers have bandgaps different than said first, second, and third bandgaps.

5,465,267

ERROR-CORRECTING TANDEM ENCODING SYSTEM

Toshiya Todoroki, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 30, 1993, Ser. No. 176,394
Claims priority, application Japan, Jan. 5, 1993, 5-000344
Int. Cl.[6] H04L *27/06*
U.S. Cl. 375—279 **2 Claims**



1. An error-correcting tandem system comprising a transmitter section and a receiver section;

said transmitter section comprising:

multiplexer means for multiplexing data and voice signals supplied thereto;

Reed-Solomon encoder means for Reed-Solomon-encoding an output signal from said multiplexer means while interleaving the output signal without causing a delay;

convolutional encoder means for convolutionally encoding a Reed-Solomon encoded signal from said Reed-Solomon encoder means; and

phase-shift keying modulator means having a fixed bit rate for phase-shift-keying an output signal from said convolutional encoder means;

said receiver section comprising:

phase-shift-keying demodulator means having a fixed bit rate for demodulating a phase-shift-keyed signal supplied thereto;

Viterbi decoder means for decoding a demodulated output signal from said phase-shift-keying demodulator means based on a Viterbi algorithm;

deinterleaver means for deinterleaving a decoded output signal from said Viterbi decoder means;

Reed-Solomon decode means for decoding a deinterleaved output signal from said deinterleaver means;

first separator means for separating voice and data signals from a decoded output signal from said Reed-Solomon decoder means;

second separator means for extracting a voice signal from the decoded output signal from said Viterbi decoder means; and

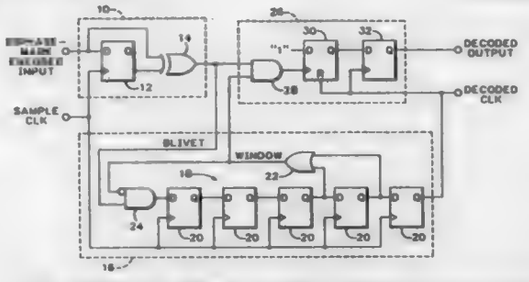
selector means for selecting the voice signal extracted by said second separator means when a decoding delay poses a problem, and for selecting the voice signal separated by said first separator means when a decoding delay poses no problem.

5,465,268

DIGITAL DECODING OF BIPHASE-MARK ENCODED SERIAL DIGITAL SIGNALS

Joe L. Rainbolt, Colfax, Calif., assignor to The Grass Valley Group, Inc., Nevada City, Calif.

Filed Jan. 14, 1994, Ser. No. 181,512
Int. Cl.[6] H03D *3/22;* **H03M** *5/06;* **H03L** *7/00*
U.S. Cl. 375—333 **12 Claims**



1. An apparatus for digitally decoding a biphase-mark encoded serial digital signal comprising:

means for digitally detecting edges in the encoded serial digital signal to produce a blivet signal;

means for digitally filtering the blivet signal to regenerate a decoded clock signal that defines bit intervals for the encoded serial digital signal; and

means for digitally decoding the encoded serial digital signal as a function of the blivet signal and the decoded clock signal, according to the presence/absence of a transition representing an edge of the encoded serial digital signal in the middle of each bit interval defined by the decoded clock signal, to produce a decoder serial digital signal.

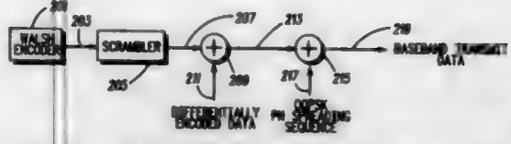
5,465,269

METHOD AND APPARATUS FOR ENCODING AND DECODING A SUPPLEMENTARY SIGNAL

T. Michael Schaffner; William R. Bayer, both of Palatine, and Michael J. Bach, Niles, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 2, 1994, Ser. No. 190,433
Int. Cl.[6] H04B *1/69;1/707;* **H04J** *13/02;13/04*
U.S. Cl. 375—200 **11 Claims**

7. A differential coherent modulation and demodulation system, comprising:



a non-coherent Walsh modulator for non-coherently modulating source data using Walsh code to provide non-coherently modulated data;

a phase modulator operatively connected to said non-coherent Walsh modulator for phase modulating a supplementary signal on the non-coherently modulated data received from said non-coherent Walsh modulator to provide coded data;

a transmitter operatively connected to said phase modulator for transmitting the coded data received from said phase modulator;

a receiver for receiving the coded data from said transmitter to provide received coded data;

a fast Hadamard transform circuit operatively connected to said receiver for demodulating the received coded data to provide a plurality of complex-number symbols;

a magnitude determination circuit operatively connected to said fast Hadamard transform circuit for determining a magnitude of each of the complex-number symbols, choosing a complex-number symbol having a largest magnitude and outputting the magnitude of the chosen complex-number symbol as the source data; and

a phase determination circuit operatively connected to said magnitude determination circuit for determining a phase of the complex-number symbol having the largest magnitude to output the phase as the supplementary signal.

5,465,270

PROCESS AND DEVICE FOR THE DIGITIZED TRANSMISSION OF SIGNALS

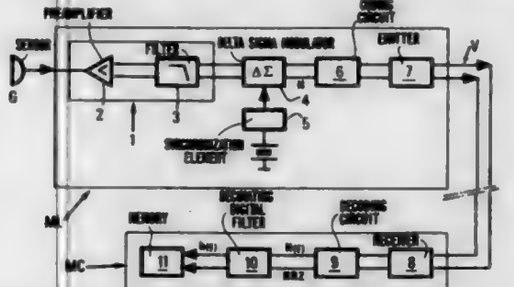
Claude Beaudoucel, Henonville, and Patrick Coquerel, Sartrouville, both of, France, assignors to Institut Francias du Petrole, Rueil Malmaison, France

Filed Aug. 27, 1993, Ser. No. 112,339

Claims priority, application France, Aug. 28, 1992, 92 10427

Int. Cl.[6] H04B *14/04*

U.S. Cl. 375—242 **15 Claims**



1. A process for simplifying transmission of analog signals received by a plurality of sensors to a remote station comprising:

associating with each sensor a local modulator for oversampling each analog signal to be transmitted and digitally converting each oversampled analog signal into lower resolution digital words by application to a local modulator;

transmitting from each local modulator to the remote station a clock signal allowing a synchronization of the remote station with each local modulator;

transmitting as a bit stream on a transmission channel without formatting the lower resolution digital words corresponding to each analog signal; and

converting, by digital filtering at the remote station, each received bit stream into higher resolution digital words.

5,465,271

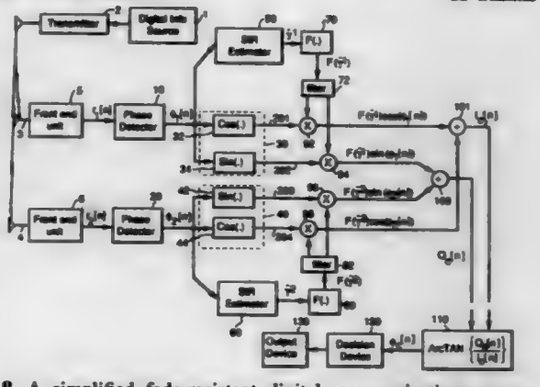
POST DETECTION WEIGHTED VECTOR COMBINING DIVERSITY RECEIVERS USING PHASE METRICS FOR MOBILE AND INDOOR RADIO CHANNELS

Stephen M. Hladik, Albany, N.Y., and Sandeep Chennakeslu, Cary, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 20, 1993, Ser. No. 109,553

Int. Cl.[6] H04B *7/02;* **H04L** *1/02*

U.S. Cl. 375—267 **11 Claims**



8. A simplified fade-resistant digital communications system comprising:

a) a digital information source adapted for providing a stream of message bits;

b) a transmitter means adapted for encoding and transmitting the message bits in a radio-frequency (RF) signal;

c) a plurality of N receiver branches each adapted for receiving the transmitted RF signal wherein each receiver branch comprises:

i. an antenna adapted for sensing the transmitted RF signal;

ii. a front end unit coupled to the antenna for down converting each sensed signal to a sampled baseband signal, $r_j(n)$,

iii. a phase detector coupled to the front end unit for detecting a phase $\phi_j(n)$ for each sample $r_j(n)$,

iv. signal-to-impairment ratio (SIR) estimator coupled to the phase detector for estimating an SIR $\hat{\gamma}$ from each detected phase $\phi_j(n)$,

v. a combining weight computation element coupled to the SIR ratio estimator adapted for weighting each SIR $\hat{\gamma}$ by a predetermined amount to result in a weighting factor $F(\hat{\gamma})$,

vi. vector converter coupled to the phase detector adapted for determining a unit magnitude vector having components defined as the cosine and sine of detected phase $\phi_j(n)$,

vii. a first signal multiplier coupled to the vector converter for weighting the sine component of detected phase $\phi_j(n)$ by the weighting factor $F(\hat{\gamma})$ to result in an in-phase component $I_j(n)$, and

viii. a second signal multiplier coupled to the vector convertor for weighting the cosine component of detected phase $\phi_j(n)$ by the weighting factor $F(\hat{\gamma})$ to result in a quadrature phase component $Q_j(n)$ for the signal sensed from antenna j;

d) an in-phase summer adapted for combining all in-phase components $I_j(n)$ for all antennae j into a composite in phase coefficient $I_c(n)$;

e) a quadrature phase summer adapted for combining all quadrature-phase components $Q_j(n)$ for all antennae j into a composite quadruture-phase coefficient $Q_c(n)$;

f) an inverse tangent unit coupled to the summers for determining a composite phase $\phi_c(n)$ according to:

$$\phi_c(n) = \mathrm{Tan}^{-1}\left\{ \frac{Q_c(n)}{I_c(n)} \right\}$$

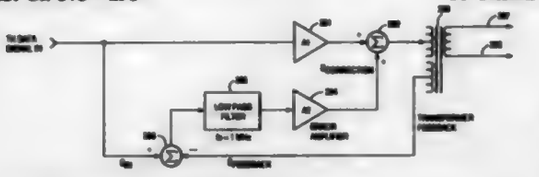
g) a decision device coupled to the inverse tangent unit for converting $\phi_c(n)$ into message bits; and

h) an output device coupled to the decision device for utilizing the message bits.

5,465,272
DATA TRANSMITTER BASELINE WANDER CORRECTION CIRCUIT

Robert W. Smith, Los Altos, Calif., assignor to SynOptics Communications, Inc., Santa Clara, Calif.

Filed Apr. 8, 1994, Ser. No. 225,953
Int. Cl.[6] H04L *27/04*
U.S. Cl. 375—295 **16 Claims**



16. An apparatus comprising:

a first summer coupled to a transformer for subtracting a feedback signal of a winding corresponding to the transformer from a transmit data signal to provide a correction signal;

a filter coupled to the first summer for filtering the correction signal;

an amplifier coupled to the filter for amplifying the filtered correction signal;

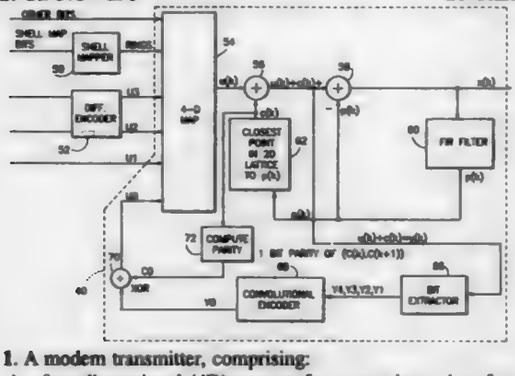
a comparator for generating a fixed level signal by comparing the transmit data signal to a reference potential; and

a second summer for summing the amplified signal with the fixed level signal to provide an output signal back to the transformer.

5,465,273
MODEM UTILIZING PARITY AND CONVOLUTIONAL ENCODER FEEDBACK

Paul D. Cole, Fairfield, Conn., assignor to General DataComm, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 230,682, Apr. 20, 1994. This application Jun. 24, 1994, Ser. No. 267,112
Int. Cl.[6] H04L *5/12;23/02;* H04K *1/02*
U.S. Cl. 375—296 **20 Claims**



1. A modem transmitter, comprising:

a) a four-dimensional (4D) mapper for generating pairs of two-dimensional (2D) points in a 2D constellation grid, said 4D mapper having means for receiving a plurality of bit inputs, at least one of said plurality of bit inputs being a rotation-defining bit which helps define a rotation of a point generated by said 4D mapper;

b) offset means for offsetting said 2D points generated by said 4D mapper by values c(k) in a 2D constellation lattice, to obtain offset points y(k), where k is a time index for said 2D points;

c) predistortion means for predistorting said offset points y(k) by values p(k) to obtain predistorted outputs x(k), wherein said predistortion means provides said values p(k) to said offset means, and said offset means chooses said values c(k) based on said values p(k);

d) convolutional encoder means for receiving said offset points y(k) as inputs, and determining therefrom at least one bit value Y0;

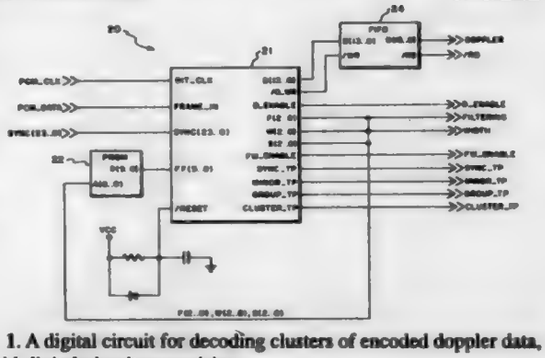
e) parity computation means for receiving said values c(k) as inputs from said offset means, and generating a parity bit value of two consecutive values c(k); and

f) means for using said parity bit value and said bit value Y0 to generate said rotation-defining bit.

5,465,274
DIGITAL CIRCUIT FOR DECODING ENCODED DOPPLER DATA

Christian L. Houlberg, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 7, 1995, Ser. No. 418,968
Int. Cl.[6] H04L *27/00*
U.S. Cl. 375—340 **17 Claims**



1. A digital circuit for decoding clusters of encoded doppler data, said digital circuit comprising:

a serial to parallel shift register for receiving said clusters of encoded doppler data, said clusters of encoded doppler data being included in Groups One through N of a plurality of Sub Frames, each of said Groups One through N having n eight bit data words;

said serial to parallel shift register shifting the n eight bit data words of said Groups One through N of each of said plurality of Sub Frames from a serial format to a parallel format;

a comparator circuit coupled to said serial to parallel shift register for a comparing a frame sync signal within each of said plurality of Sub Frames to a reference sync signal, said comparator circuit generating a sync pulse whenever said frame sync signal is identical to said reference sync signal;

a programmed read only memory for providing at least first, second, third and fourth count words, said first count word being representative of the n eight bit words in each of said Groups One through N, said second count word being representative of the Groups N of said eight bit words, said third count word being representative of a location of automatic gain control data and word width data within each of said plurality of Sub Frames and said fourth count word being representative of at least two locations of gain data within each of said Groups One through N;

a first programmed counter coupled to said programmed read only memory and said comparator circuit for receiving said sync pulse and said first count word, said first programmed counter responsive to said sync pulse and said first count word generating a load signal whenever the n eight bit words in each of said Groups One through N is equivalent to said first count word;

a second programmed counter coupled to said first programmed counter, said programmed read only memory and said comparator circuit for receiving said load signal, said second count word and said sync signal, said second programmed counter responsive to said sync pulse, said second count word and said load signal generating a first enable signal whenever the Groups N of said eight bit words is equivalent to said second count word;

said comparator circuit receiving said first enable signal to enable said comparator circuit allowing said comparator to generate said sync pulse;

a third programmed counter coupled to said programmed read only memory and said comparator circuit for receiving said third count word and said sync signal, said third programmed counter responsive to said sync pulse and said third count word generating a second enable signal whenever said third programmed counter has a count equivalent to the location of said automatic gain control data and said word width data within each of said plurality of Sub Frames

a first latch coupled to said serial to parallel shift register and said third programmed counter for receiving the n eight bit data words of said Groups One through N of each of said plurality of Sub Frames and said second enable signal, said first latch responsive to said second enable signal latching said word width data within ezch of said plurality of Sub Frames into said first latch;

a second latch coupled to said serial to parallel shift register and said third programmed counter for receiving the n eight bit data words of said Groups One through N of each of said plurality of Sub Frames and said second enable signal, said second latch responsive to said second enable signal latching said automatic gain control data within each of said plurality of Sub Frames into said second latch;

a forth programmed counter coupled to said programmed read only memory and said first programmed counter for receiving said fourth count word and said load signal, said forth programmed counter responsive to said fourth count word and said load signal generating a third enable signal whenever said fourth programmed counter has a count equivalent to the at least two locations of said gain data within each of said Groups One through N;

a third latch coupled to said serial to parallel shift register and said fourth programmed counter for receiving the n eight bit data words of said Groups One through N of each of said plurality of Sub Frames and said third enable signal, said third latch responsive to said third enable signal latching the at least two locations of said gain data within each of said Groups One through N into said third latch;

a fifth programmed counter coupled to said first latch and said fourth programmed counter for receiving said third enable signal and said word width data;

a sixth programmed counter coupled to said fifth programmed counter, said second latch and said forth programmed counter for receiving said third enable signal and said automatic gain control data;

said fifth and sixth programmed counters, responsive to said third enable signal, said word width data and said automatic gain control data generating a fourth enable signal; and

a word decoder circuit coupled to said serial to parallel shift register, said first latch, said third latch and said fifth programmed counter for receiving the n eight bit data words of said Groups One through N of each of said plurality of Sub Frames, said word width data, said gain data and said fourth enable signal, said word decoder circuit responsive to said word width data, said gain data and said fourth enable signal extracting said clusters of encoded doppler data from each Groups One through N of each of said plurality of Sub Frames;

said word decoder circuit providing a plurality of doppler data words representative of said clusters of encoded doppler data extracted from each Groups One through N of each of said plurality of Sub Frames.

5,465,275

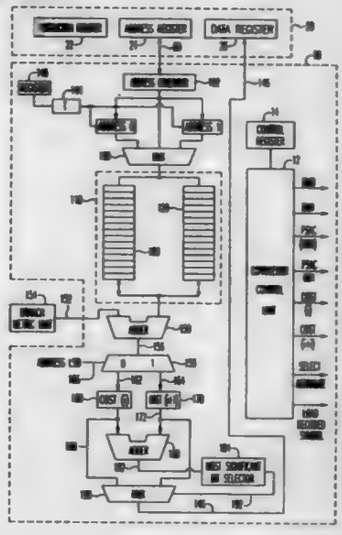
EFFICIENT UTILIZATION OF PRESENT STATE/NEXT STATE REGISTERS

David M. Blaker, Emmaus; Marc S. Diamondstein, Allentown; Gregory S. Ellard, Forest Park; Mohammad S. Mobin, Whitehall; Homayoon Sam, Wescosville, and Mark E. Thierbach, South Whitehall Township, Lehigh County, all of Pa., assignors to AT&T IPM Corp., Coral Gables, Fla.

Filed Nov. 16, 1993, Ser. No. 153,334

Int. Cl.[6] H04L 27/06

U.S. Cl. 375—341 **3 Claims**



1. In a Viterbi decoder for determining the next state accumulated cost for each possible transition at a series of symbol instants, said decoder including memory having a portion allocated to a first array and a portion allocated to a second array, a method for determining which next state cost to retain, comprising the steps of:

retrieving an accumulated cost associated with a first present state from a first storage register of a first array, the first storage register of the first array capable of being any storage register in the first array;

adding the accumulated cost associated with a first present state to a first to branch metric resulting in a first potential accumulated cost;

retrieving an accumulated cost associated with a second present state from a second storage register of the first array;

adding the accumulated cost associated with the second present state to a second branch metric resulting in a second potential accumulated cost;

subtracting one of the first and second potential accumulated costs from the other resulting in a difference;

identifying in a bit representation of the difference a most significant bit;

determining the smaller of the first and second potential accumulated costs as the next state accumulated cost by the most significant bit of the difference;

storing the next state accumulated cost in a storage register of a second array;

designating the second array as containing present state accumulated costs;

calculating a subsequent next state accumulated cost based on an accumulated cost from the second array; and

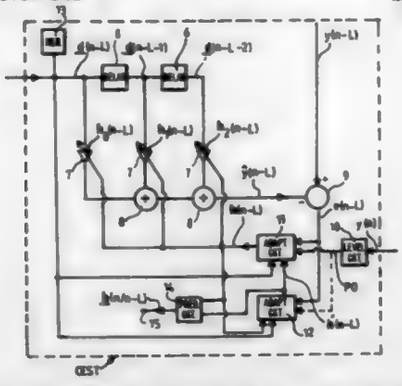
storing the subsequent next state accumulated cost in a storage register of the first array.

5,465,276

METHOD OF FORMING A CHANNEL ESTIMATE FOR A TIME-VARYING RADIO CHANNEL

Lars G. Larsson, Stockholm, and Perols B. O. Gudmundson, Sollentuna, both of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Sep. 9, 1992, Ser. No. 942,270
Claims priority, application Sweden, Sep. 10, 1991, 9102612
Int. Cl.[6] H03D *1/06;* H04B *1/10*
U.S. Cl. 375—346 15 Claims



1. In a radio receiver, a method of adapting a channel estimate for a time-varying radio channel in which radio signals are transmitted over the radio channel between a transmitter and the receiver and are subjected to disturbances such as multipath propagation, fading and noise, and in which received radio signals are sampled to obtain received symbol sequences which include information-carrying symbols and at least one known symbol sequence such as a synchronizing sequence, said method comprising the steps of:

forming a first channel estimate by estimating parameters of a transmission function of the radio channel based on the synchronizing sequence in a received symbol sequence,

forming a first derivative estimate by estimating at least a first time derivative of the first channel estimate,

measuring a signal strength of the received radio signals;

setting an initial value of the first derivative estimate;

adapting the first derivative estimate based on a subsequent received symbol sequence; and

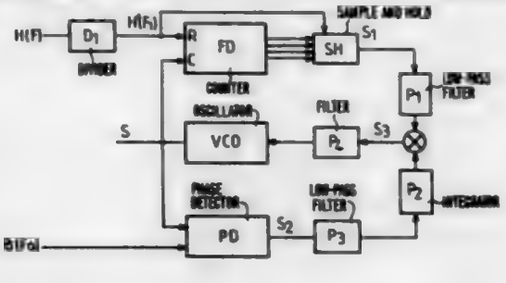
adapting the first channel estimate based on the first derivative estimate when the measured signal strength is less than a threshold value.

5,465,277

DEVICE FOR THE SYNCHRONIZATION OF DIGITAL DATA BURSTS AND READ APPARATUS COMPRISING THE DEVICE

Jacobus C. Schreurs, and Rudolf A. Horstman, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 395,126, Aug. 17, 1989, abandoned.
This application Feb. 5, 1991, Ser. No. 651,116
Claims priority, application France, Aug. 19, 1988, 88 11034
Int. Cl.[6] H03D *3/24*
U.S. Cl. 375—376 25 Claims



1. A device for the synchronization of a local clock signal with an information signal comprising a plurality of time spaced digital data bursts having a first clock frequency, the frequency of the data bursts having a given relationship with the frequency of a reference signal having a second clock frequency, said device comprising:

a frequency comparator for producing at its output a frequency-error signal corresponding to a frequency shift of the local clock signal relative to a continuous signal derived from said reference signal, said frequency comparator comprising a counter having a countdown input for receiving said local clock signal and a control input for receiving a first signal derived from said second clock frequency,

a phase comparator for producing at its output a phase-error signal which is representative of the phase difference between the local clock signal and the digital data of said information signal, and

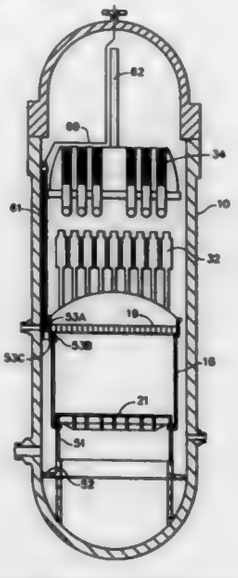
control means for controlling the frequency of the local clock signal as a function of said frequency-error and phase-error signals.

5,465,278

SHROUD ELECTROCHEMICAL POTENTIAL MONITOR

Robert L. Cowan, II, Livermore; Gerald M. Gordon, Soquel; Donald A. Hale, Cupertino, and Richard W. Perry, San Jose, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed May 23, 1994, Ser. No. 247,736
Int. Cl.[6] G21C *17/00*
U.S. Cl. 376—245 20 Claims



9. A shroud electrochemical potential monitor for monitoring electrochemical potential near a weldment in a shroud surrounding a fuel core inside a pressure vessel of a light water nuclear reactor, comprising:

a first electrochemical potential sensor;

means for supporting said first electrochemical potential sensor; and

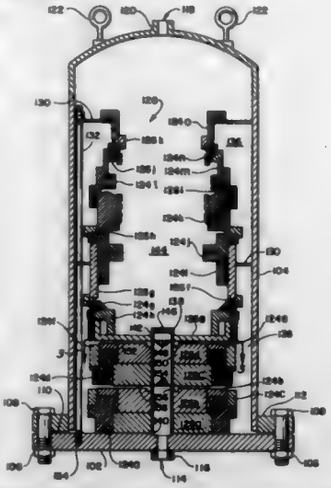
means for coupling said supporting means to a wall of said shroud.

5,465,279

REACTOR COOLANT PUMP SEAL TEST DECONTAMINATION HOUSING

Thomas G. Bengel, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sep. 9, 1994, Ser. No. 303,901
Int. Cl.[6] G21C *17/00*
U.S. Cl. 376—245 24 Claims



17. A reactor coolant pump test decontamination loop comprising:

a sealed test housing including:

a flange comprising a fluid inlet centrally located at a first end;

a flanged bell comprising a flanged end mating with the flange and a fluid outlet at a second end longitudinally spaced apart from the flanged end;

a fluid distribution tube connecting at a first end to the fluid inlet and extending longitudinally within the test housing;

a seal assembly comprising a plurality of reactor coolant pump seals and a plurality of stacking spacers, each of the stacking spacers and the seals having a generally annular-shaped cross section, the seal assembly being arranged in a generally annular-shaped stack centered on the fluid distribution tube within the test housing;

a generally annular-shaped first space within the test housing defined by the test housing and an outer radial periphery of the seal assembly;

a generally cylindrical-shaped second space within the test housing defined by the interior radial periphery of the seal assembly;

positioning means for positioning and stabilizing the seal assembly within the test housing; and

flow distribution means for directing a flow of the process fluid across a radially extending surface of a selected one of the pump seals located at a first longitudinal position spaced apart from the bottom flange, including:

a plurality of circumferentially spaced penetrations in the flow distribution tube at about the first longitudinal position providing for an outflow of the process fluid therefrom;

an annular-shaped channel communicating with the plurality of circumferentially spaced penetrations;

a plurality of about radially extending channels at about the first longitudinal position each communicating with the annular-shaped channel; and

a vent hole in a second end of the flow distribution tube for outflow of the process fluid to the second space; and

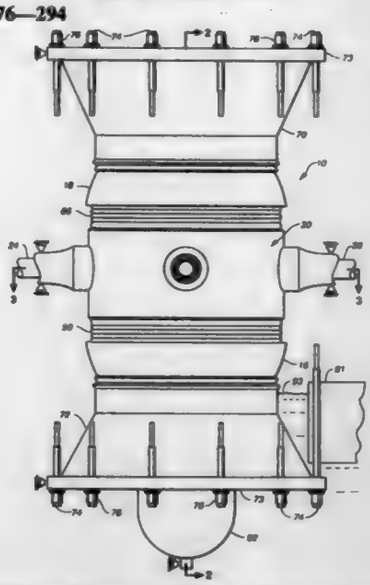
the seal assembly being characterized in that the radially extending surface is spaced apart from an opposing surface of one of the plurality of stacking spacers and another one of the pump seals, wherein the process fluid can flow therebetween from the first plurality of radially extending channels to the first space.

5,465,280

PRESSURE VESSEL APPARATUS

Bendt W. Wedellsborg, I. C. E. C. 1995 University Ave., Suite 119, Berkeley, Calif. 94704

Filed Jun. 8, 1994, Ser. No. 257,004
Int. Cl.[6] G21C *13/00*
U.S. Cl. 376—294 18 Claims



1. Pressure vessel apparatus defining a pressure vessel interior for containing fluid under high temperature and pressure, said pressure vessel apparatus comprising, in combination:

a lower pressure vessel housing;

an upper pressure vessel housing;

connector means connecting said lower and upper pressure vessel housings, with said upper pressure vessel housing disposed over said lower pressure vessel housing, and said upper and lower pressure vessel housings at least partially defining said pressure vessel interior, said connector means including at least one bellows extending between said upper and lower pressure vessel housings and allowing relative movement between said upper and lower pressure vessel housings responsive to application of forces on said upper and lower pressure vessel housings, and said connector means additionally comprising a plurality of elongated connectors operatively associated with said upper and lower pressure vessel housings continuously urging said upper and lower pressure vessel housings toward each other.

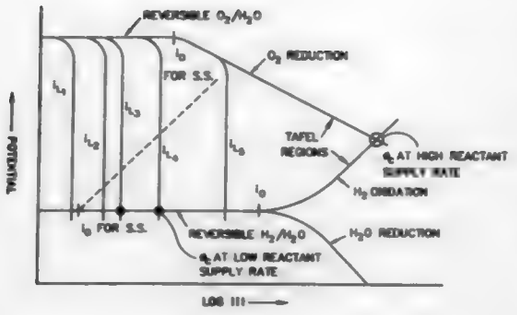
5,465,281

INSULATED PROTECTIVE COATING FOR MITIGATION OF STRESS CORROSION CRACKING OF METAL COMPONENTS IN HIGH-TEMPERATURE WATER

Peter L. Andresen, Schenectady, and Young J. Kim, Clifton Park, both of N.Y., assignors to General Electric Company, San Jose, Calif.

Filed Apr. 11, 1994, Ser. No. 226,153
Int. Cl.[6] G21C *9/00*
U.S. Cl. 376—305 20 Claims

1. A method for mitigating growth of a crack in a surface of a metal component in a water-cooled nuclear reactor or associated equipment, said uncoated surface of said metal component being susceptible to stress corrosion cracking in high-temperature water, comprising the step of applying a coating on said surface of said metal component, said coating comprising electrically insulating material having restricted mass transport crevices which penetrate to said surface of said metal component and which restrict the flow of oxidants to said surface, whereby the corrosion potential of said surface of said metal component is decreased to a level below a critical potential at which stress corrosion cracking occurs.



5,465,282

FUEL ASSEMBLY FOR A NUCLEAR REACTOR

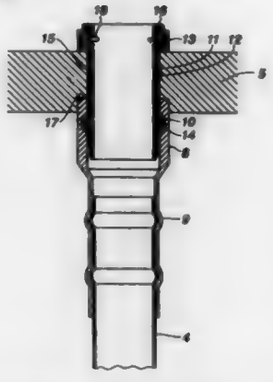
Pontus Berglund, Västerås, Sweden, assignor to ABB Atom AB, VästerÅs, Sweden

Filed Nov. 15, 1994, Ser. No. 340,888

Claims priority, application Sweden, Nov. 25, 1993, 9303925

Int. Cl.[6] G21C *3/30*

U.S. Cl. 376—426 **4 Claims**



1. A fuel assembly for a nuclear reactor, comprising a number of parallel fuel rods which are retained by means of spacer grids, arranged along the fuel rods, as well as guide thimbles, said guide thimbles being fixed to the spacer grids and the guide thimbles with the associated fuel rods being fixed between a top nozzle and a bottom nozzle, wherein through-holes are arranged in the top nozzle for connection to a top sleeve joined to the upper end of the respective guide thimble, wherein a first locking element is arranged in the top sleeve for cooperation with a second locking element arranged on a guide sleeve, wherein the guide sleeve is insertable through that hole in the top nozzle which corresponds to the respective top sleeve, and wherein the locking elements in connected position are interlocked by means of a locking sleeve insertable into the guide sleeve, wherein the locking sleeve includes a third locking element in the form of a through-opening arranged in the wall of the locking sleeve, wherein a corbelled-out portion is arranged in the edge of said opening, wherein said opening imparts to the corbelled-out portion resilient properties and wherein the corbelled-out portion, when the locking sleeve is inserted into the guide sleeve, is adapted to cooperate with a fourth locking element in the form of an annular slot arranged in the inner wall of the guide sleeve.

5,465,283

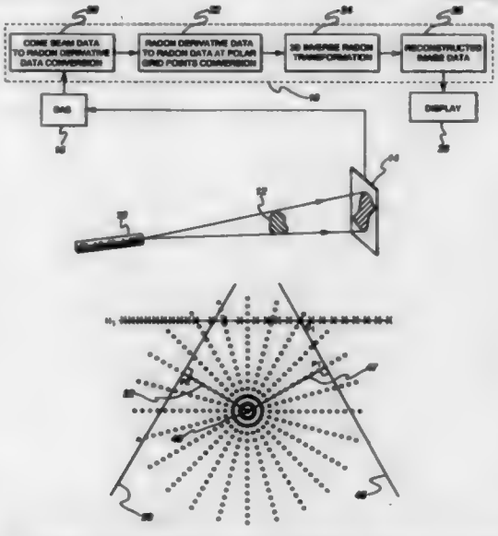
METHOD AND APPARATUS FOR GENERATING RADON DERIVATIVE DATA ON A NEAR UNIFORMLY SPACE GRID IN A CONE BEAM COMPUTERIZED TOMOGRAPHY IMPLEMENTATION

Kwok C. Tam, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 6, 1994, Ser. No. 254,711

Int. Cl.[6] A61B *6/03*; G01N *23/08*

U.S. Cl. 378—4 **16 Claims**



1. A method of generating Radon derivative data on a substantially uniform polar grid, comprising the steps of:

providing a scanning trajectory about an object;

discretely sampling the scanning trajectory with a plurality of uniformly spaced cone beam source positions;

emitting cone beam energy from the discretely sampled cone beam source positions towards the object;

acquiring cone beam energy passing through the object on a detector as cone beam projection data;

partitioning the cone beam projection data into a plurality of vertical planes in Radon space, each vertical plane having a polar grid with a plurality of polar grid points uniformly spaced in r, θ and ϕ coordinates; and

generating Radon derivative data on locations proximate to each of the plurality of polar grid points for each vertical plane.

5,465,284

SYSTEM FOR QUANTITTATIVE RADIOGRAPHIC IMAGING

Andrew Karellas, Auburn, Mass., assignor to University of Massachusetts Medical Center, Worcester, Mass.

PCT No. PCT/US90/07178, § 371 Date Jun. 2, 1992, § 102(e) Date Jun. 2, 1992, PCT Pub. No. WO91/09495, PCT Pub. Date Jun. 27, 1991

Continuation-in-part of Ser. No. 446,472, Dec. 5, 1989, Pat. No. 5,150,394. This PCT application Dec. 5, 1990, Ser. No. 853,775

The portion of the term of this patent subsequent to Sep. 22, 2009, has been disclaimed.

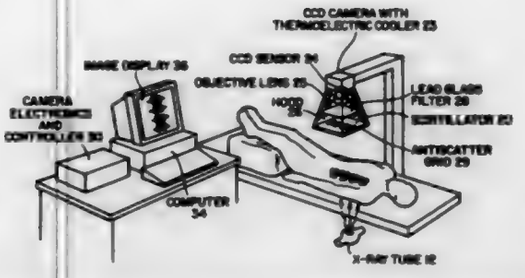
Int. Cl.[6] G01N *23/04*

U.S. Cl. 378—62 **60 Claims**

1. A method of x-ray imaging of a patient's body comprising:

providing an x-ray radiation source such that radiation emitted by the source is transmitted through the body to be imaged;

providing a charged coupled device (CCD) sensor to receive radiation from a scintillator that generates a spatial light intensity pattern in response to radiation emitted by the source and transmitted through the body;



providing an image intensifier between the radiation source and the CCD;

generating a discrete electronic representation of the spatial light intensity pattern from the radiation received by the CCD from the scintillator;

forming an image of the body from the analyzed representation.

5,465,285

X-RAY EXAMINATION APPARATUS HAVING AN X-RAY FILM CASSETTE LOADING AND POSITIONING DEVICE

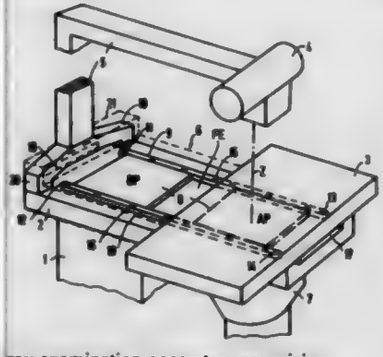
Arthur Gall, Langenzendelbach; Heinz Meier, Nuernberg; Wilko Kuphal, Ruckersdorf, and Georg Vogel, Bubenreuth, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 29,544, Mar. 11, 1993. This application Sep. 12, 1994, Ser. No. 304,604

Claims priority, application Germany, Mar. 30, 1992, 42 10 421.1

Int. Cl.[6] G03B 42/02

U.S. Cl. 378—173 **3 Claims**



1. An x-ray examination apparatus comprising:

an x-ray radiator;

a radiator carrier having a first end at which said x-ray radiator is mounted and having a second end remote from said x-ray radiator;

a loading and positioning device having a manually freely accessible first loading opening for loading an x-ray film cassette into said loading and positioning device on a first side of said radiator carrier, said first side and said first loading opening being disposed on one side of and remote from said x-ray radiator, and a film plane and including means for conveying said x-ray film cassette along a conveying path entirely co-planar with said film plane from said first loading opening to an exposure position beneath said x-ray radiator and having a second manually freely accessible loading opening disposed at a second side of said x-ray radiator for optionally loading said x-ray film cassette into said loading and positioning device on said second side of said x-ray radiator;

bearing structure for bearing said loading and positioning device and said radiator carrier; and

said second end of said radiator carrier having a section with a longitudinal axis, and said second end of said radiator carrier being attached to said bearing structure over said conveying path with said longitudinal axis intersecting said conveying path with no portion of said second end of said radiator carrier impeding movement of an x-ray film cassette from said loading opening to said exposure position.

5,465,286

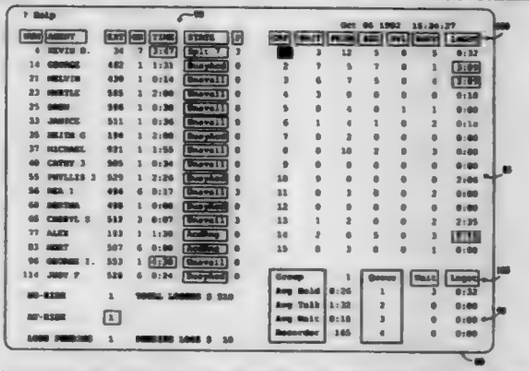
APPARATUS FOR SUPERVISING AN AUTOMATIC CALL DISTRIBUTION TELEPHONE SYSTEM

William K. Clare, Parkridge, N.J., and Donn P. Sundby, Brewster, Mass., assignors to Executone Information Systems, Inc., Milford, Conn.

Filed May 24, 1994, Ser. No. 248,260

Int. Cl.[6] H04M 3/22;3/42;3/00

U.S. Cl. 379—34 **26 Claims**



1. An agent supervising apparatus for supervising an automatic call distribution (ACD) telephone system having a plurality of telephone stations assigned to a plurality of agents for handling a plurality of telephone calls, the ACD being coupled to a locating network for determining the locations of said agents, the agent supervising apparatus comprising:

an agent supervising station including a processing unit, a display and an input device for monitoring a plurality of agent call handling status;

said locating network including:

a plurality of remote badge units, each being associated with a respective one of said plurality of agents for transmitting corresponding identification information;

a plurality of transceivers, each adapted for detecting said identification information from said remote badge units and for forwarding said identification information to a locating processor; and

said locating processor being responsive to said identification information for generating location information corresponding to the locations of said plurality of agents; and

said processing unit of said agent supervising station including associated memory and stored programs, responsive to said location information and to commands from said input device, for displaying on said display a graphic indicating said call handling status including locations of said plurality of agents.

5,465,287

SUBSCRIBER LINE IMPEDANCE MEASUREMENT DEVICE AND METHOD

Avihay Egozi, Hibat Zion, Israel, assignor to Teledata Communication Ltd., Herzlia, Israel

Filed Jan. 13, 1994, Ser. No. 181,214

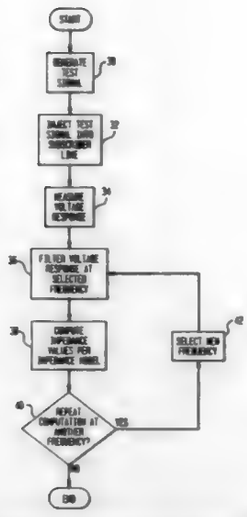
Int. Cl.[6] H04M 3/08;3/22;1/24

U.S. Cl. 379—5 **16 Claims**

9. In a telephone system, a method of measuring subscriber line loop impedance comprising the steps of:

injecting a multi-frequency input signal into subscriber line;

measuring voltage response on said subscriber line;



filtering said voltage response to obtain its value at a desired frequency;

analyzing said voltage response value at said desired frequency to derive the amplitude and phase shift thereof; and

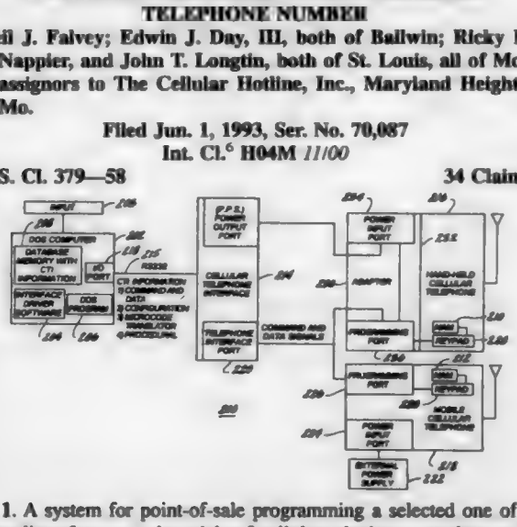
computing the subscriber line loop impedance from said derived amplitude and phase shift of said voltage response value.

5,465,288

POINT-OF-SALE SYSTEM FOR PROGRAMMING A CELLULAR TELEPHONE WITH ITS ASSIGNED TELEPHONE NUMBER

Neil J. Falvey; Edwin J. Day, III, both of Ballwin; Ricky L. Nappier, and John T. Longtin, both of St. Louis, all of Mo., assignors to The Cellular Hotline, Inc., Maryland Heights, Mo.

Filed Jun. 1, 1993, Ser. No. 70,087
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—58 **34 Claims**



1. A system for point-of-sale programming a selected one of a plurality of types and models of cellular telephones, each type or model of telephone requiring programming by a specific set of command signals for controlling the telephone and a specific set of data signals to be stored in the telephone including data defining a telephone number to be assigned to the telephone, said data signals for programming the telephone for operation as part of a cellular telephone system, each telephone having a programming port through which data may be transferred by data signals and through which the telephone may be controlled by command signals, said system comprising:

a point-of-sale computer having an I/O port and including:

a database storing sets of command information and data information including the assigned telephone number, each set for programming a particular one of the plurality of cellular telephones;

means for identifying the particular set of command and data information in the database required for programming the selected cellular telephone; and interface driver software for sending information via the I/O port corresponding to the particular set of command and data information;

interface means connected to the I/O port and having a telephone interface port, for sending via the telephone interface port the specific set of command signals and data signals corresponding to the information provided by the computer via the I/O port; and

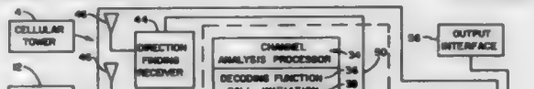
means for providing the specific set of command signals and data signals to the programming port of the selected cellular telephone via the telephone interface port thereby providing the specific set of command signals and data signals via the programming port to the selected cellular telephone for programming it with the assigned telephone number.

5,465,289

CELLULAR BASED TRAFFIC SENSOR SYSTEM

Joseph P. Kennedy, Jr., Great Falls, Va., assignor to E-Systems, Inc., Dallas, Tex.

Filed Mar. 5, 1993, Ser. No. 26,568
Int. Cl.[6] H04Q *7/20*
U.S. Cl. 379—59 **11 Claims**



9. A method for providing vehicular traffic information to a central control center comprising the steps of:

monitoring control and voice channels of a cellular telephone system for call initiations, calls in progress, and call handoffs;

recording monitored call initiations, calls in progress, and call handoffs in a data file;

comparing the number of recorded call initiations with a standard value;

determining an area of vehicular traffic congestion when the number of recorded call initiations exceeds the standard value for the area;

forwarding notice of the area of vehicular traffic congestion to the central control center;

calculating a time period between detected call handoffs;

determining a vehicular traffic flow rate based on the time period between call handoffs; and

forwarding the vehicular traffic flow rate to the central control center.

5,465,290

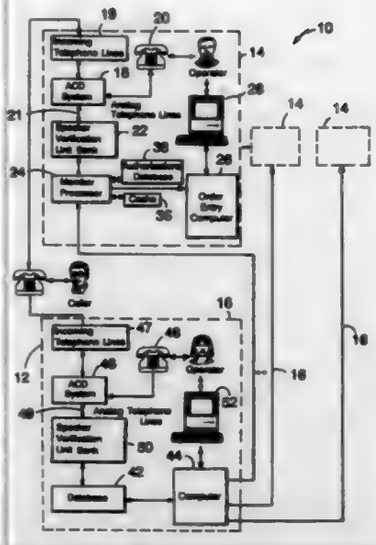
CONFIRMING IDENTITY OF TELEPHONE CALLER

Thomas H. Hampton, Lyme; Thomas J. Litle, IV, Nashua, and Nigel H. Searle, Keene, all of N.H., assignors to Litle & Co., Salem, N.H.

Continuation of Ser. No. 675,488, Mar. 26, 1991, abandoned. This application Dec. 16, 1993, Ser. No. 168,912
Int. Cl.[6] H04M *1/64;11/04*
U.S. Cl. 379—67 **48 Claims**

1. A method for verifying whether a person speaking during a telephone call is one of a plurality of authorized users of a system, comprising

prior to the telephone call, storing, at a first processing station, data corresponding to a valid signature and to caller identification information for each of said authorized users, said valid



signature and said caller identification information being sufficient to identify said person as being one of said authorized users.

receiving, via the public telephone system, at a second processing station, a telephone call comprising (i) a voice signal representing a signature of a possible user and (ii) a voice signal or a tone signal representing caller identification information for the possible user,

digitally signal processing, using a digital data processing sytem located at the second station, the signals received at the second station, and

based on signature data communicated via a telephone line from the first station to the second station either before the telephone call or after the telephone call, testing the signal presenting the signature of the possible user against the valid signature of the authorized user whose caller identification information corresponds to the caller identification information received at the second processing station and wherein

the step of testing the signal representing the signature of the possible user against the valid signature comprises using the caller identification information, in a first protocol compatible with the digital data processing system located in the second station, and communicating with the first station via the telephone line between the first station and the second station in a second protocol compatible with the first station.

5,465,291

APPARATUS FOR ORDERING FROM REMOTE LOCATIONS

John Barrus, 60 Wadsworth St., Cambridge, Mass. 02042; Krisztina Holly, 23801 Ladrillo St., Woodland Hills, Calif. 91367, and Michael Cassidy, 11910 Enid Dr., Potomac, Md. 20854

Continuation of Ser. No. 80,584, Jun. 24, 1993, abandoned, which is a continuation of Ser. No. 685,843, Apr. 16, 1991, abandoned. This application Jan. 6, 1995, Ser. No. 369,583

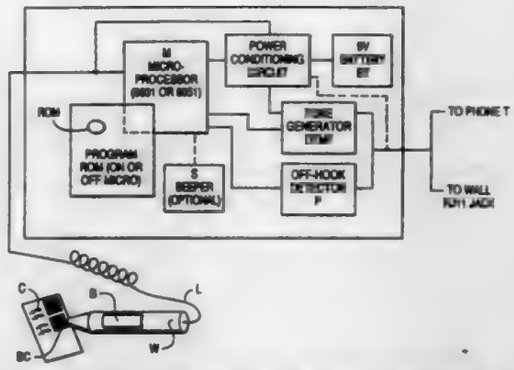
Int. Cl.[6] H04M *1/64*

U.S. Cl. 379—67 **8 Claims**

1. A system for remote, real-time ordering on a user telephone terminal items of merchandise or services from a provider of such items via a central telephone terminal, comprising:

bar code reader means at the user terminal for machine reading bar codes selectively scanned by the user from a pre-provided catalog containing bar codes corresponding to such items and bar codes corresponding to a predetermined plurality of commands for controlling the central terminal;

transmitting means at the user terminal for successively transmitting to the central terminal item orders and commands corresponding to selected bar codes scanned by the user while



the user terminal is on-line with the central terminal, said transmitting means directly, in real time, converting signals resulting from the machine reading of the selected bar codes to DTMF signals and transmitting the DTMF signals to the central terminal over a telephone line; and

receiving and processing means at the central terminal for receiving and processing item orders and commands successively transmitted by the transmitting means, each in accordance with the user's freely discretionary selections made while the user terminal is on-line with the central terminal, among the items and said predetermined plurality of commands from the catalog, said receiving and processing means automatically recognizing whether each transmission is an item order or a command and, when an item order is recognized, automatically storing the same, generating a corresponding confirmatory voice response describing the ordered item and sending the voice response over the telephone line back to the user terminal, and, when a command is recognized, automatically executing the command.

5,465,292

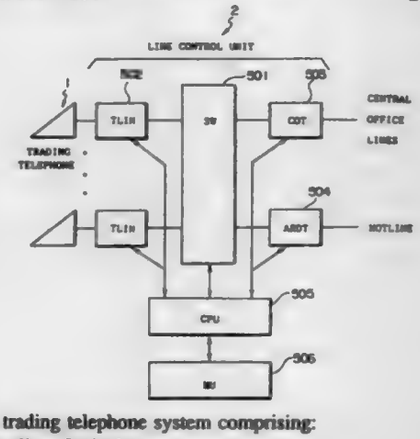
TRADING TELEPHONE

Toshie Takahashi; Takashi Sato; Toshimi Kurumada, and Yoshiyuki Kokubun, all of Fukushima, Japan, assignors to Hitachi Telecom Technologies, Ltd., Fukushima, Japan

Filed Sep. 20, 1993, Ser. No. 123,247

Int. Cl.[6] H04M *1/00*

U.S. Cl. 379—164 **20 Claims**



1. A trading telephone system comprising:

a plurality of telephones;

a line control unit having trunks connected to at least one public line and to at least one direct-in line for establishing connection of a respective one of the plurality of telephones with at least one of the at least one public line and the at least one direct-in line, the line control unit having trunks connected to an interphone line for establishing connection of a respective one of the plurality of telephones with at least another one of the plurality of telephones;

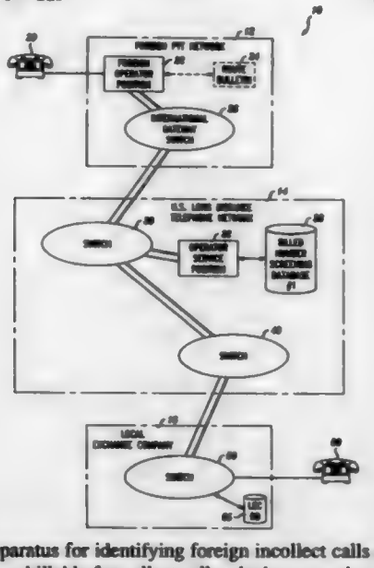
wherein each of the plurality of telephones include a keyboard, a first display device for displaying engaged line information, a second display device divided into sectors for displaying line names having corresponding line selection keys, a third display device divided into sectors for displaying line names having corresponding line selection keys, and pagenation means having at least one memory for storing information of line names and dialing numbers on a first plurality of pages and a control unit for at least controlling read out of information from the pagenation means for display, the at least one memory of the pagenation means storing incoming line information on a second plurality of pages, a plurality of the sectors of the third display device and the corresponding line selection keys of the third display device enabling display of the incoming line information.

5,465,293

APPARATUS AND METHOD FOR SCREENING FOREIGN INCOLLECT CALLS TO DOMESTIC NON-COLLECT CALL TELEPHONE NUMBERS TO REDUCE FRAUD

Martin S. Chiller, Mt. Arlington; Peter L. Coulter, Piscataway, and Richard J. Petillo, Long Valley, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 30, 1993, Ser. No. 175,875
Int. Cl.[6] H04M *1/66*
U.S. Cl. 379—189 **21 Claims**



9. An apparatus for identifying foreign incollect calls directed to domestic non-billable for collect calls telephone numbers, comprising:

means for decoding a foreign operator language digit on an incoming call to determine if the call is operator assisted;

means for completing the call normally as a non-collect-call to its telephone number if the call is not operator assisted;

means for adding a special access code to the call at an international gateway switch if the call is operator assisted;

means for switching the call from the international gateway switch to a regional long distance switch;

means for stripping the special access code from each call having such a code;

means for switching each such call to an operator services position system over a dedicated trunk;

means for determining by said operator services position system if a telephone number to which the call is directed is in a non-billable for collect calls database;

means for switching the call to a local exchange company for normal completion to the telephone number to which it is directed if the call is to a telephone number that is not in the non-billable for collect calls database;

means for routing the call to an audible message to the foreign operator that the call is non-billable as a collect call if the call is to a telephone number that is in the non-billable for collect calls database;

means for generating a record that this operator assisted call is non-billable as a collect call and

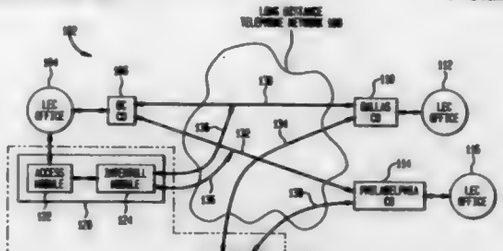
means for switching the call to a switch of said local exchange company for completion.

5,465,294

SYSTEM AND METHOD FOR RECOVERING FROM A TELECOMMUNICATIONS DISASTER

John M. Chapman, Jr., Aurora, Ill.; David N. Decker, Phillipsburg, N.J.; Sondra L. Diles, Kansas City, Mo.; Nicholas P. DeVito, Bedminster, N.J.; William C. Leach, Glen Gardner, N.J.; Richard Lechner, Fords, N.J.; Allen D. Langham, Overland Park, Kans.; Willard R. Manning, Edison, N.J.; Thomas R. Ryan, Grayson, Ga.; Edward J. Smith, La Plata, Md.; William C. Thompson, Jr., Grayson, and Robert Yursis, Roswell, both of Ga., assignors to AT&T Corp., Murray Hill, N.J.

Filed Jun. 30, 1994, Ser. No. 268,391
Int. Cl.[6] H04M *7/00*
U.S. Cl. 379—207 **9 Claims**



1. A telephone disaster recovery unit for quickly re-establishing long distance telephone service to a telephone LEC office after a telephone central office connected to the LEC office has been rendered inoperable by a disaster, the central office located at a disaster site, the telephone disaster recovery unit comprising:

a mobile, on-site component configured to emulate access and intertoll functions of the inoperable central office, said on-site component transported to the disaster site and connected to the LEC office;

an off-site component to emulate switching functions of the inoperable central office, said off-site component permanently positioned in a predetermined location;

first communication media in a long distance telephone network to connect said off-site component to other telephone central offices; and

second communication media in said long distance telephone network to connect said on-site component to said off-site component.

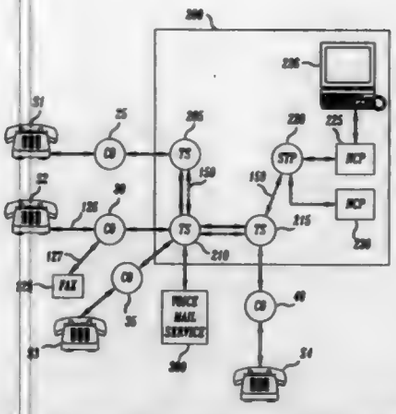
5,465,295

CALLER DIRECTED ROUTING OF A TELEPHONE CALL BASED ON A DIALED SUFFIX

Daniel S. Furman, Maplewood, N.J., assignor to AT&T IPM Corp., Coral Gables, Fla.

Continuation of Ser. No. 998,168, Dec. 29, 1992, abandoned. This application Dec. 20, 1994, Ser. No. 360,182
Int. Cl.[6] H04M *3/42*
U.S. Cl. 379—211 **14 Claims**

1. A method of processing a telephone call in a public telecommunications system comprising a plurality of interconnected switches, said method comprising the steps of



responsive to receipt of said telephone call at an originating one of said switches, receiving a sequence of telephone keypad digits associated with said telephone call, in which said sequence of telephone keypad digits represents a caller dialed telephone number and suffix code, said suffix code immediately following said telephone number and being distinguishable from said telephone number,

translating said received dialed telephone number and said received suffix into another telephone number, and

forwarding the telephone call to a destination identified by the other telephone number.

5,465,296

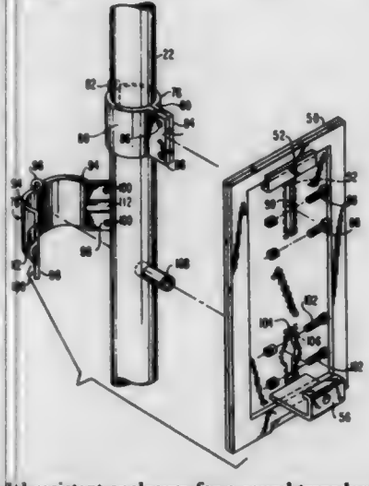
REMOTELY PROGRAMMABLE, VANDAL-RESISTANT VOICE COMMUNICATIONS UNIT

John J. McMonagle, Jr., 1369 E. 84th St., Brooklyn, N.Y. 11236, and Kevin T. Vesely, 100 Edinburgh Rd., Wallkill, N.Y. 10940

Division of Ser. No. 616,998, Nov. 21, 1990, Pat. No. 5,363,436, which is a continuation-in-part of Ser. No. 415,782, Oct. 2, 1989, Pat. No. 5,086,463. This application Apr. 6, 1994, Ser. No. 224,003

Int. Cl.[6] H04M *1/23*

U.S. Cl. 379—355 **6 Claims**



1. A vandal-resistant enclosure for a sound transducer, comprising: an outer housing having a transducer mounting wall; a transducer mounting member having first and second walls which oppose each other, the transducer mounting member being affixed to the transducer mounting wall such that the first wall thereof abuts the transducer mounting wall; and a sound transducer mounted on the second wall of the transducer mounting member such that the sound transducer faces the transducer mounting wall to receive sounds passing therethrough; the transducer mounting member being formed with a first plurality of apertures extending from the first wall thereof adjacent the transducer mounting wall toward the transducer and terminating within the transducer mounting member, and a second plurality of apertures extending from the second wall thereof adjacent the transducer and terminating within the transducer mounting member; each of the second plurality of apertures extends substantially parallel to a respective one of the first plurality of apertures and is offset therefrom; each of the second plurality of apertures is connected to the respective one of the first plurality of apertures to provide a plurality of deviated passageways through the transducer mounting member from the transducer to the transducer mounting wall.

5,465,297

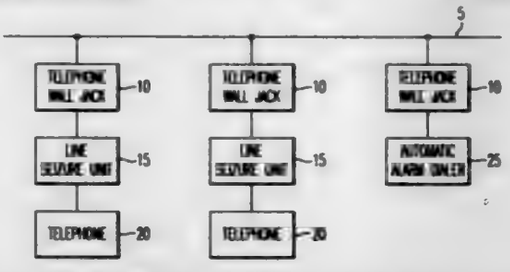
TELEPHONE LINE SEIZURE CIRCUIT

Khaled Azem, Alexandria, Va., assignor to Design Tech International Inc., Springfield, Va.

Filed Mar. 11, 1994, Ser. No. 208,697

Int. Cl.[6] H04M *1/00*

U.S. Cl. 379—387 **11 Claims**



1. A telephone line seizure circuit connected between a telephone and a telephone line in which an automatic telephone dialer is connected to the telephone line, comprising:

a first circuit for determining if the automatic telephone dialer is off-hook, wherein the first circuit detects a D.C. voltage level on the telephone line to determine if the automatic telephone dialer is off-hook;

a second circuit for disconnecting the telephone connected to the telephone line seizure circuit when it is determined that the automatic telephone dialer is off-hook, and the second circuit maintaining the telephone connected to the telephone line seizure circuit disconnected for a predetermined period of time until a central office releases the telephone line to which the telephone is connected; and

wherein the first circuit and the second circuit are powered from the telephone line.

5,465,298

SOLID STATE ISOLATION DEVICE USING OPTO-ISOLATORS

Dennis E. Wilkison, and Zhenyu L. Liu, both of San Jose, Calif., assignors to Cermetek Microelectronics, Sunnyvale, Calif.

Filed Apr. 14, 1994, Ser. No. 227,604

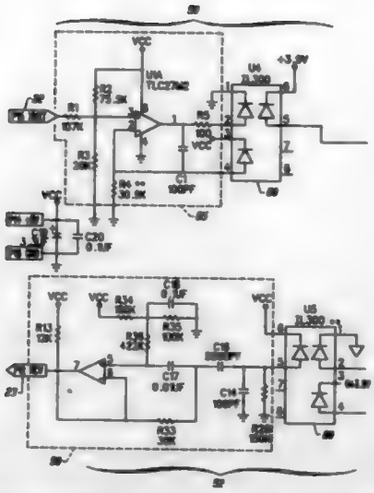
Int. Cl.[6] H02H *3/22*

U.S. Cl. 379—406 **14 Claims**

1. In an isolation circuit for connecting analog transmit and receive channels in a user device to a line pair for full duplex communications on the line pair while providing an electrical isolation barrier between the user device and the line pair, comprising:

transmit optical isolation means, having an input located on the user device side of the barrier and an output on the line side of the barrier and being responsive to signals at its input, for generating analog signals at its output linearly corresponding to analog signals at its input;

said transmit optical isolation means comprising a monolithic opto-isolator having an LED and first and second photodiodes, each photodiode, on being reverse biased, delivering a



current proportional to the optical flux incident thereon, and a driver coupled between the transmit channel and said opto-isolator in a feedback configuration such that each of said first and second photodiodes delivers a current proportional to a voltage signal from the transmit channel;

receive optical isolation means, having an input located on the line side of the barrier and an output on the user device side of the barrier and being responsive to signals at its input, for generating analog signals at its output linearly corresponding to analog signals at it input;

means for coupling the input of said transmit optical isolation means to said transmit channel;

means for coupling the output of said receive optical isolation means to said receive channel; and

duplexing means coupled to the line pair for directing signals at the output of said transmit optical isolation means onto the line pair; for directing signals on the line pair to the input of said receive optical isolation means; and for preventing at least a portion of any signals on the line pair that correspond to signals generated at the output of said transmit optical isolation means from reaching the input of said receive optical isolation means;

the improvement comprising:

load and current control means for providing a high AC impedance regulated reference voltage derived from loop current to a receive path optical isolation means photodiode, whereby said photodiode receives bias adequate current to avoid receive path distortion independently of line current level;

said load and current control means providing a regulated reference voltage derived from said loop current to a transmit path line driver circuit, whereby transmit path distortion is avoided under conditions of varying load impedance.

5,465,299

ELECTRONIC DOCUMENT PROCESSING SYSTEM AND METHOD OF FORMING DIGITAL SIGNATURE

Hiroshi Matsumoto, Fujisawa; Kazuo Takaragi, Ebina; Seiichi Susaki, Yokohama; Hiroyuki Maezawa, Tama, and Shinobu Koizumi, Sagamihara, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Chubu Software, Ltd., Aichi, both of, Japan

Filed Nov. 29, 1993, Ser. No. 158,618

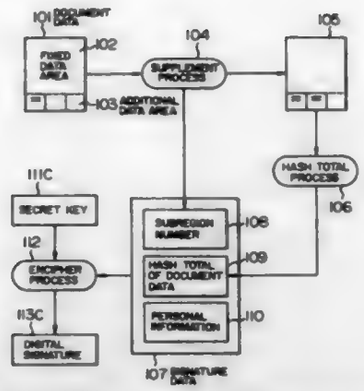
Claims priority, application Japan, Dec. 3, 1992, 4-350461

Int. Cl.[6] H04K *1/00*

U.S. Cl. 380—23 **18 Claims**

1. A method of forming a digital signature to be added to an electronic document, comprising the steps of:

generating a former version electronic document;



performing a hash total process to said former version electronic document to generate a former version hash total;

performing an encipher process with at least said former version hash total and personal information of a signatory to generate a first digital signature;

adding the first digital signature to the former version electronic document;

changing the former version electronic document of a former version to which at least said first digital signature has already been added to generate a new version electronic document;

creating version management information which describes the change between the former version and new version electronic documents;

performing a hash total process to said new version electronic document to generate a new version hash total;

performing an encipher process with at least said new version hash total, personal information of another signatory, and said version management information to generate a new digital signature; and

altering at least a part of said first digital signature to correspond to said new version electronic document.

5,465,300

SECURE COMMUNICATION SETUP METHOD

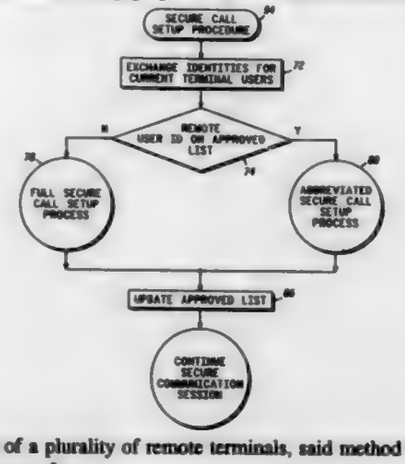
Barry N. Altschuler, Scottsdale; Douglas A. Hardy, Mesa; James A. Stephens, Chandler, and Joseph Kish, III, Gilbert, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1993, Ser. No. 172,971

Int. Cl.[6] H04L *9/30*

U.S. Cl. 380—30 **12 Claims**

1. A method of engaging in a secure communication session



with one of a plurality of remote terminals, said method comprising the steps of:

determining whether a prior secure communication session has been conducted with one of said plurality of remote terminals;

performing a first secure call setup process including a plurality of public key encryption steps when no prior secure communication session has been conducted with said one remote terminal; and

performing a second secure call setup process without said plurality of public key encryption steps when a prior secure communication session has been conducted with said one remote terminal, said second secure call setup process being accomplished more quickly than said first secure call setup process.

5,465,301

SECURITY THREADS

Richard B. Jotcham, Wiltshire, and Gerald S. Payne, Bath, both of, United Kingdom, assignors to Portals (Bathford) Limited, Bath, United Kingdom

Filed Jan. 19, 1994, Ser. No. 183,342

Claims priority, application United Kingdom, Jan. 20, 1993, 9300998

Int. Cl.[6] H04L *9/00*; B42D *15/00*

U.S. Cl. 380—54 **63 Claims**

1. A security thread for use in security articles, said thread

comprising a substrate bearing indicia, the thread having a thermochromic coating on one side of the thread, said thermochromic coating comprising a coating containing a thermochromic material selected from pigments and dyestuffs, which material is coloured when the temperature of said thermochromic coating is below an activation temperature and is colourless when the temperature is at or above said activation temperature, the indicia being obscured when the material is coloured and visible when the material is colourless.

5,465,302

METHOD FOR THE LOCATION OF A SPEAKER AND THE ACQUISITION OF A VOICE MESSAGE, AND RELATED SYSTEM

Gianni Lazzari, Mattarello; Maurizio Omologo, Rubano, and Piergiorgio Svaizer, Mezzano di Primiero, all of, Italy, assignors to Istituto Trentino Di Cultura, Trento, Italy

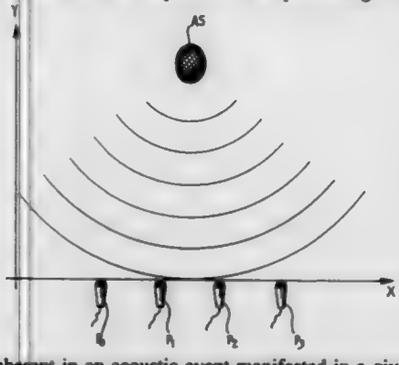
Filed Oct. 19, 1993, Ser. No. 137,995

Claims priority, application Italy, Jan. 23, 1992, TO92A0855

Int. Cl.[6] H04R *3/00*

U.S. Cl. 381—92 **28 Claims**

1. A method for the acquisition and processing of acoustic



signals inherent in an acoustic event manifested in a given spatial region, the method comprising the operations of:

acquiring the said acoustic signals at a plurality of different points in the said spatial region,

generating from the said acoustic signals first signals indicative of cross-spectra for a plurality of pairs of the said acoustic signals,

extracting phase information present in the said cross-spectra for the purposes of acquisition and/or processing, and

locating at any moment the said acoustic event on the basis of delays calculated on the basis of the estimation of signals obtained by antitransformation of the said first signals.

5,465,303

AUTOMATED FINGERPRINT CLASSIFICATION/ IDENTIFICATION SYSTEM AND METHOD

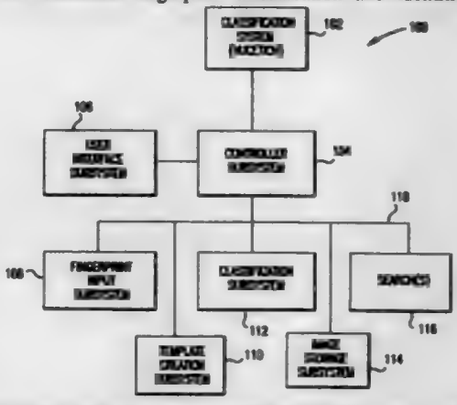
Laurence L. Levison, McLean, Va.; Paul B. Goldberg, Longwood, and Scott D. Stanek, Orlando, both of Fla., assignors to Aeroflex Systems Coproration, Plainview, N.Y.

Filed Nov. 12, 1993, Ser. No. 151,020

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—124 **14 Claims**

1. An automated fingerprint classification and identification



apparatus used to determine or verify the identity of an unknown person by comparing one or more of the person's unknown fingerprints to known fingerprints stored in a data base, the apparatus comprising:

a fingerprint input subsystem, operable to create a digitized bit-map of the unknown fingerprint and to store said bit-map in a memory of said fingerprint subsystem;

a template creation subsystem, coupled to said fingerprint input subsystem, operable to receive said bit-map of said unknown fingerprint and to create a digitized template based on locations of minutiae points in said bit-map;

a classification subsystem, coupled to said fingerprint input subsystem and said template creation subsystem, operable to receive said bit-map and said template and to assign said unknown fingerprint to a primary Vucetich category based on visually distinct patterns present in said bit-map and digital information extracted from said template, said classification subsystem includes,

(a) means for determining a central feature of said unknown fingerprint, wherein said central feature is the innermost point of said unknown fingerprint;

(b) means for creating a bounding rectangle around said central feature;

(c) means for determining whether said central feature is within a first valley, and if not, then moving said central feature upward until it is within said first valley;

(d) means for generating a colored area by applying a floodfill algorithm to said unknown fingerprint in order to fill in said first valley and at least one valley adjacent to said first valley;

(e) means for classifying said unknown fingerprint as a whorl if said colored area does not touch the border of said bounding rectangle or if said colored area touches the

border of said bounding rectangle and at least half of said colored area is above said central feature;

(f) means for classifying said unknown fingerprint as an arch if said colored area touches both sides of said bounding rectangle and approximately half of said colored area is right of said central feature and half of said colored area is left of said central feature; and

(g) means for classifying said unknown fingerprint as a loop if said colored area touches only one side of said bounding rectangle, wherein said loop in an inside loop if said colored area is weighted on said left side and said loop in an external loop if said colored area is weighted on said right side;

an image storage subsystem, coupled to said classification subsystem, said template creation subsystem, and said fingerprint input subsystem, operable to store said bit-map and said template in memory locations that correspond to the primary Vucetich category and also to store known bit-maps and templates of known bit-maps in memory locations that correspond to the primary Vucetich category; and

a search subsystem, coupled to the image storage subsystem, operable to compare said template of said unknown fingerprint to templates of said known fingerprints that are of the same primary Vucetich category as said unknown fingerprint, and to produce a result indicating a probability that said unknown fingerprint is identical to one of said known fingerprints.

5,465,304

SEGMENTATION OF TEXT, PICTURE AND LINES OF A DOCUMENT IMAGE

John F. Cullen, Palo Alto, Calif., and Koichi Ejiri, Narashino, Japan, assignors to Ricoh Corporation, Menlo Park, Calif., and Ricoh Company Ltd., Tokyo, Japan

Continuation of Ser. No. 864,423, Apr. 6, 1992, Pat. No. 5,335,290. This application Apr. 20, 1994, Ser. No. 230,073

The portion of the term of this patent subsequent to Aug. 2, 2011, has been disclaimed.

Int. Cl.[6] G06K *9/34*

U.S. Cl. 382—176 **24 Claims**

1. In a character recognition system, a method for segmenting portions of a medium representation into text and non-text types, said method comprising the steps of:

a) accessing said medium representation, said medium representation comprising a plurality of scanlines;

b) extracting a set of run lengths from said plurality of scanlines;

c) generating a set of run length classifications by generating a run length classification for each run length of said set of run lengths, said run length classification determined according to a length of each run length;

d) constructing a plurality of rectangles using said set of run length classifications, each of said plurality of rectangles representing a portion of said medium representation;

e) classifying each of said plurality of rectangles as either a non-text type or an unknown type; and

f) merging a plurality of rectangles of said unknown type into a plurality of text blocks.

5,465,305

CHARACTER RECOGNITION METHOD AND APPARATUS FOR PREPARING A PLURALITY OF CHARACTER RECOGNITION PROCESSES IN PARALLEL

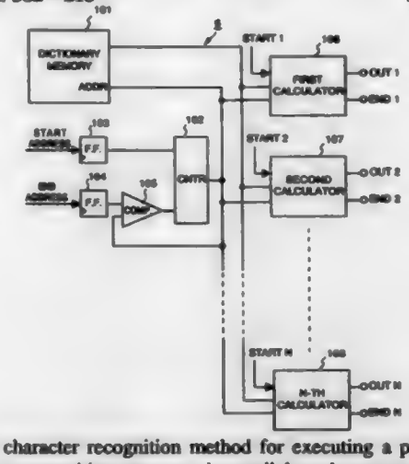
Shugoro Ueno, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 970,185, Nov. 2, 1992, abandoned. This application Apr. 28, 1994, Ser. No. 235,150

Claims priority, application Japan, Nov. 8, 1991, 3-292650

Int. Cl.[6] G06K *9/64*

U.S. Cl. 382—218 **11 Claims**



1. A character recognition method for executing a plurality of character recognition processes in parallel, each process accessing a common storage medium that stores standard character patterns and receiving an address for accessing the common storage medium from a common counter, comprising the steps of:

instructing the start of each character recognition process one after another at a predetermined interval; and

incrementing the address value of the common counter in a cyclic manner in accordance with the progress of character recognition by the plurality of character recognition processes, and

each character recognition process comprising the steps of:

inputting a segmented character pattern;

setting an initial access address value in a register, based on a current value indicated in the common counter, at a time when a character recognition process starts in accordance with said instructing step;

reading the standard character pattern from the common storage medium, based on the initial access address value;

comparing the input segmented character pattern and the read standard character pattern;

repeating the steps of:

inputting an address value currently indicated in the common counter for accessing a standard character pattern stored in the common storage medium;

comparing the input address value and the initial access address value stored in the register;

reading the standard character pattern from the common storage medium, based on the input address value;

comparing the input segmented character pattern and the read standard character pattern until the input address value coincides with the initial access address value stored in the register so as to perform recognition of the input segmented character pattern; and

outputting a character recognized in accordance with the character pattern recognized in the recognition.

5,465,306

IMAGE STORAGE DEVICE WHICH STORES PORTIONS OF IMAGE DATA DEFINING PIXELS MAKING UP AN IMAGE, AN IMAGE PROCESSING DEVICE INCLUDING THE IMAGE STORAGE DEVICE

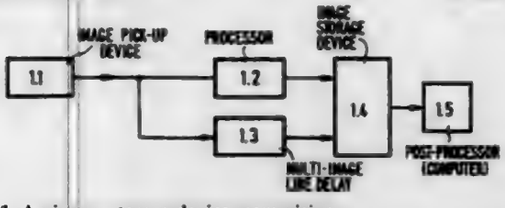
Antonius J. M. Van Lier, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 46,475, Apr. 12, 1993, abandoned, which is a continuation of Ser. No. 794,282, Nov. 19, 1991, abandoned. This application Jul. 25, 1994, Ser. No. 279,984

Claims priority, application Netherlands, Nov. 28, 1990, 9002593

Int. Cl.[6] G06K *9/36*

U.S. Cl. 382—276 **10 Claims**



1. An image storage device, comprising:

addressing means for sequentially receiving image data defining pixels making up the image, and addressing the pixels as a grid of multi-pixel cells;

first storage means for storing information concerning where in the grid cells having particular image characteristics are located;

second storage means for storing information concerning position and nature of the particular image characteristics in the cells having the particular image characteristics;

working memory means for storing only image data defining those pixels included in the cells having the particular image characteristics; and

storage control means for specifying as the image data defining the pixels making up the image is being received, those pixels whose image data is to be stored in said working memory means;

wherein the image storage device stores only the image data defining those pixels included in the cells having the particular image characteristics, those pixels constituting less than all of the pixels making up the image.

5,465,307

PARALLEL PROCESSING APPARATUS FOR RECOGNIZING AN AREA MARKED WITH A CLOSED LOOP

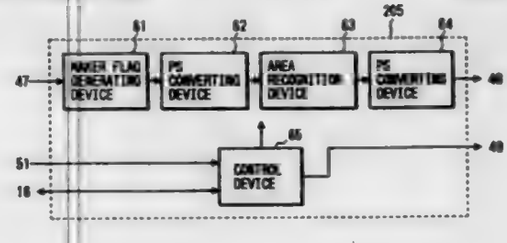
Kengo Azumaya; Yoshiyuki Hirayama, and Kazuhiro Tasaki, all of Saitama, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1993, Ser. No. 93,930

Claims priority, application Japan, Jul. 21, 1992, 4-193627

Int. Cl.[6] G06K *9/20*

U.S. Cl. 382—165 **5 Claims**



1. An area recognition apparatus comprising:

scan reading means for reading image data by scanning an original document line by line in main-scan and sub-scan directions said image data image data including density data;

a plurality of image processing devices for processing in parallel said image data from said scan reading means, each of said image processing devices corresponding to different respective areas on each line, scanned and each of said image processing devices includes mark portion detecting means for detecting a mark portion from said image data, and crossing portion detecting means for detecting a crossing portion where said mark portion crosses a predetermined portion on the original document in accordance with said image data;

parallel-to-serial converting means for converting outputs of said image processing devices containing results detected by said mark portion detecting means and said crossing portion detecting means into serial data corresponding to the areas on each line;

closed area recognizing means for recognizing a closed area formed by said mark portion and said crossing portion based on the serial data from said parallel-to-serial converting means and outputting serial data containing results of said recognition; and

serial-to-parallel converting means for converting the serial data output from said closed area recognizing means to parallel data.

5,465,308

PATTERN RECOGNITION SYSTEM

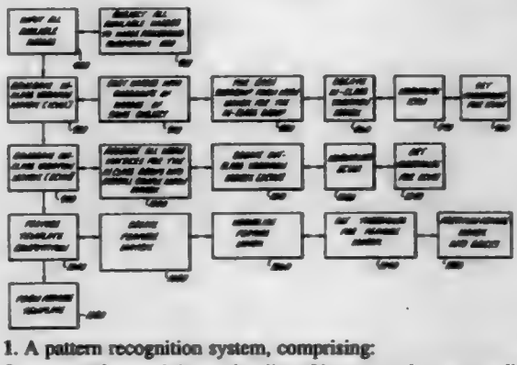
Timothy L. Hutcheson, Los Gatos; Wilson Or, Santa Clara; Venkatesh Narayanan, Fremont; Subramaniam Mohan, Sunnyvale; Peter G. Wohlmut, Saratoga; Ramanujam Srinivasan, Sunnyvale, all of Calif.; Bobby R. Hunt, and Thomas W. Ryan, both of Tucson, Ariz., assignors to Datron/Transoc, Inc., Simi Valley, Calif.

Division of Ser. No. 920,188, Jul. 23, 1992, Pat. No. 5,274,714, which is a division of Ser. No. 533,113, Jun. 4, 1990, Pat. No. 5,161,204. This application Aug. 25, 1993, Ser. No. 111,616

The portion of the term of this patent subsequent to Dec. 28, 2010, has been disclaimed.

Int. Cl.[6] G06K *9/62*

U.S. Cl. 382—159 **6 Claims**



1. A pattern recognition system, comprising:

first means for receiving a plurality of images and corresponding image identification information;

second means for processing said plurality of images into image information;

third means for determining the most distinctive aspects of said image information, said third means including means for performing an In-Class to Out-of-Class study including:

means for generating an In-Class Variation Matrix;

means for generating an Out-Class Variation Matrix;

means for normalizing said In-Class Variation Matrix;

means for normalizing said Out-Class Variation Matrix;

means for generating a feature Matrix;

means for normalizing said feature Matrix into a normalized feature Matrix;

means for partitioning said normalized feature Matrix into bricks;

means for prioritizing said bricks, and

means for creating a feature template vector whose elements correspond to a subset of said bricks;

fourth means for forming feature vectors of the magnitudes of said most distinctive aspects of said image information;

fifth means for storing said feature vectors, said fifth means including neural network processor means adapted to store said feature vectors;

sixth means for receiving a query image;

seventh means for generating a query feature vector from said query image;

eighth means for querying said fifth means to determine the most similar previously stored feature vectors to said query feature vector;

ninth means for outputting image identification information corresponding to the previously stored feature vector most similar to said query feature vector.

5,465,309

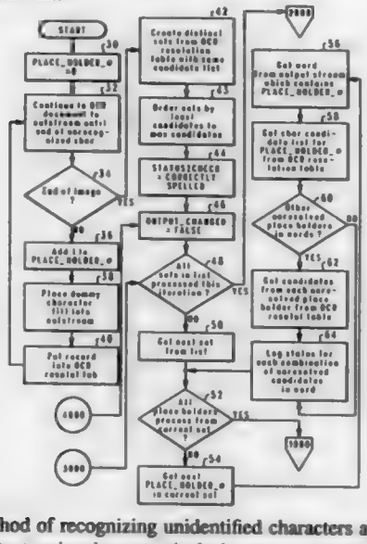
METHOD OF AND APPARATUS FOR CHARACTER RECOGNITION THROUGH RELATED SPELLING HEURISTICS

William J. Johnson, Flower Mound, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1993, Ser. No. 166,200

Int. Cl.[6] G06K *9/72*

U.S. Cl. 382—229 **1 Claim**



1. A method of recognizing unidentified characters appearing in an output text string in an optical character recognition system, comprising the computer implemented steps of:

a) for each unidentified character, producing a list of candidate characters associated with said unidentified character, said list being ordered from most likely to least likely;

b) grouping said unidentified characters into character match sets having equivalent lists of candidate characters;

c) ordering said character match sets according to number of candidate characters, from least to most;

d) whenever more than one character match sets have the same number of candidate characters, ordering said more than one character match sets according to number of word occurrences, from more to fewer;

e) whenever more than one of the character match sets ordered according to step d) have the same number of word occurrences, ordering said more than one character match sets ordered according to word length, from longer to shorter;

f) sequentially from the unidentified characters ordered according to steps a) through e), substituting for each unidentified character its associated candidate characters to form possible words;

g) performing a spelling check for each possible word formed according to step f);

h) whenever step g) yields more than one correctly spelled words, saving said more than one correctly spelled words for further processing;

i) whenever step g) yields a single correctly spelled word, substituting the candidate character yielding said correctly spelled word for its associated unidentified character and substituting said candidate character yielding said correctly spelled word for an unidentified character of any word saved according to step h) having the same list of candidate characters.

5,465,310

OPTICAL HYBRID SWITCH WITH ELECTROPTICALLY ACTIVE WAVEGUIDE STRUCTURE FORMEDFROM AN NLO POLYMER

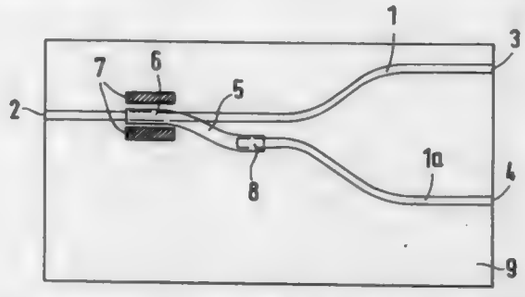
Peter Kersten, Leonberg, and Klaus-D. Matthies, Möglingen, both of, Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Apr. 15, 1994, Ser. No. 228,085

Claims priority, application Germany, Apr. 17, 1993, 43 12 568.9

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—22 **8 Claims**



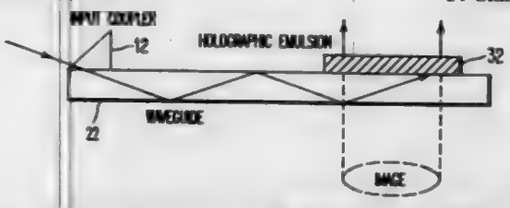
1. An optical hybrid switch for the voltage-controlled switching of light of the visible or nonvisible spectrum received via an incoming passive waveguide to at least one of two outgoing passive waveguides, comprising an electrooptically active waveguide structure deposited on a substrate and coupled to the passive waveguides and containing at least one coupler which is adjustable by applying a voltage and acts as an optical switch, characterized in that the incoming passive optical waveguide (**1**) continues without interruption as one of the outgoing waveguides, and that the electrooptically active waveguide structure (**5**) combines, on the one hand, with the continuous passive optical waveguide (**1**) to form a coupler (**6**) adjustable by applying a voltage and acting as an optical switch and, on the other hand, with the other outgoing waveguide (**1***a*) to form a fixed coupler (**8**), and that the passive waveguides (**1**, **1***a*) are embedded in the substrate (**9**, **10**), and that the electrooptically active structure (**5**) is deposited on the substrate (**9**, **10**) as a rib waveguide (**12**) and arranged so that in areas where couplers (**6**, **8**) are to be formed, it extends above the passive optical waveguide (**1**, **1***a*), and that in areas in which adjustable couplers (**6**) are to be formed, it is additionally flanked by coplanar electrodes (**14**).

5,465,311

SIDE ILLUMINATED MULTIMODE WAVEGUIDE

H. John Caulfield; Qiang Huang, both of Huntsville, Ala.; Andrei Putilin, Moscow, Russian Federation, and Valentin Morozov, Boulder, Colo., assignors to The University of Alabama in Huntsville, Huntsville, Ala.

Division of Ser. No. 841,576, Feb. 26, 1992, Pat. No. 5,295,208. This application Jan. 10, 1994, Ser. No. 179,209
The portion of the term of this patent subsequent to Mar. 15, 2011, has been disclaimed.
Int. Cl.[6] G02B 6/34
U.S. Cl. 385—27 14 Claims



1. A waveguide hologram for illumination with a light beam having at least one spectral component with a wavelength λ, said waveguide hologram comprising:

a waveguide for supporting multimode propagation of light, and having first and second main surfaces defining a thickness dimension disposed therebetween,

a widthwise extent having opposing ends,

a lengthwise extent having opposing ends, and

first and second edge surfaces disposed at the opposing ends of said lengthwise extent;

input coupling means, disposed at one of said first and second main surfaces in the vicinity of said first edge surface, for coupling said light beam into said waveguide so that said coupled light beam provides a spatially continuous pattern of light within said waveguide and the rays of said spatially continuous pattern of light are totally internally reflected therewithin, and the thickness dimension of said waveguide being greater than the wavelength λ of said at least one spectral component of said light beam coupled into said waveguide; and

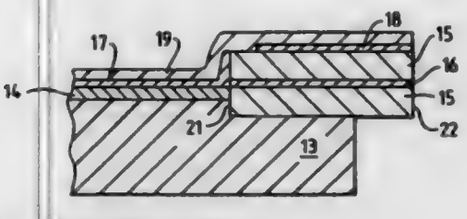
a recording medium disposed on one of said first and second main surfaces and containing a recorded hologram consisting of an interference pattern.

5,465,312

INTEGRATED OPTICAL FIBRE AND SUBSTRATE SUPPORTED OPTICAL WAVEGUIDE HAVING DIRECTLY CONNECTED OPTICAL CORES

Graeme D. Maxwell, and Benjamin J. Ainslie, both of Suffolk, England, assignors to British Telecommunications, plc, London, England

PCT No. PCT/GB91/01932, § 371 Date Aug. 10, 1993, § 102(e) Date Aug. 10, 1993, PCT Pub. No. WO92/08154, PCT Pub. Date May 14, 1992
PCT Filed Nov. 5, 1991, Ser. No. 50,358
Claims priority, application United Kingdom, Nov. 5, 1990, 9024022
Int. Cl.[6] G02B 6/30
U.S. Cl. 385—49 16 Claims



1. An optical device comprising:

(a) a primary substrate for mechanical support,

(b) an optical waveguiding structure which is supported on said substrate and which waveguiding structure comprises at least one optically waveguiding path region the materials of which have a glass structure,

(c) at least one fibre tail or fibre end portion which:

(c1) is located between two layers of the waveguiding structure,

(c2) is fully integrated into the waveguiding structure and secured therein by material having a glass structure,

(c3) is directly connected to one of said path regions,

(c4) is aligned with at least the end portion of the path region to which it is directly connected, and

(c5) extends beyond the edge of the substrate;

wherein the waveguiding structure includes confining regions and the fibre has a core surrounded by a cladding wherein the materials of said confining regions, said core and said cladding all have a glass structure;

wherein the materials of the path region or regions and the core or cores are the same or substantially the same and the materials of said confining regions and said cladding or claddings are the same or substantially the same; and

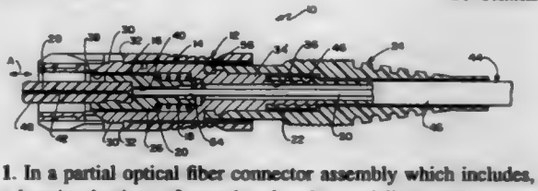
wherein the materials of the cladding of the fibre or fibre tails and the confining regions of the waveguiding device comprise silica with dopants to reduce the melting point.

5,465,313

OPTICAL FIBER CONNECTOR AND METHOD OF FABRICATING SAME

Yuriy Belenkiy, Niles; Igor Grois, Northbrook; Irina L. Gumin, Skokie; Ilya Makhlin, Wheeling; Mark Margolin, Lincolnwood, and Michael J. Pescetto, Hanover Park, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jun. 29, 1994, Ser. No. 268,155
Int. Cl.[6] G02B 6/36
U.S. Cl. 385—80 10 Claims



1. In a partial optical fiber connector assembly which includes,

a housing having a forward end and an axially extending passageway therethrough,

a ferrule assembly inserted into said passageway from the forward end of said housing, said ferrule assembly having a spring providing a biasing force and a means for maintaining said ferrule assembly in said housing,

a ferrule positioned at the front end of said ferrule assembly and extending out of the forward end of said housing for axially receiving a fiber end of an optical fiber cable inserted into said passageway from the rearward end of the housing,

an outer shell having a forward end and a rearward end movably mounted about said housing, wherein the forward end of said shell is in its most forward position substantially flush with the forward end of said housing, and the rearward end of said housing extends past the rearward end of said shell,

wherein the improvement comprises

a tube removably positioned in said passageway with a front end of the tube at the ferrule assembly and a rear end of the tube exposed at the rearward end of the housing for receiving epoxy injected into the tube,

wherein said ferrule assembly includes a chamfered recess for sealingly receiving the front end of the tube,

whereby the connector assembly can be transported with the tube in a position in the passageway, epoxy later can be injected through the tube to the ferrule assembly, the tube can be removed and the optical fiber end of the optical fiber cable can be inserted into the passageway into engagement with the injected epoxy.

5,465,314
METHOD OF MANUFACTURING OPTICAL CONNECTOR

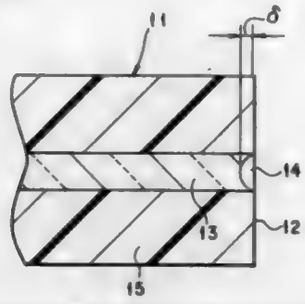
Xu Jie, Ichihara, and Kenji Suzuki, Chiba, both of, Japan, assignors to The Furukawa Electronic Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1994, Ser. No. 299,593

Claims priority, application Japan, Sep. 9, 1993, 5-224213; Feb. 3, 1994, 6-011717

Int. Cl.[6] G02B *6/25*

U.S. Cl. 385—85 **6 Claims**



1. A method of manufacturing an optical connector comprising the steps of:

providing an optical connector having at least one fiber insertion hole;

inserting an optical fiber into said at least one fiber insertion hole of said optical connector such that a fiber end face of said optical fiber is exposed; and

polishing said fiber end face of said optical fiber with a grindstone made by mixing cerium oxide abrasive grains and zirconia abrasive grains,

wherein:

a maximum grain size of said cerium oxide abrasive grains is not more than 10 μm,

a maximum grain size of said zirconia abrasive grains is not more than 6 μm,

said cerium oxide abrasive grains contain 20 to 30% by volume of cerium oxide based on a total amount of said grindstone, and

said grindstone contains not more than 3% by weight of a resin binder with respect to a weight of said grindstone.

5,465,315
DISPLAY APPARATUS HAVING A PLURALITY OF DISPLAY DEVICES

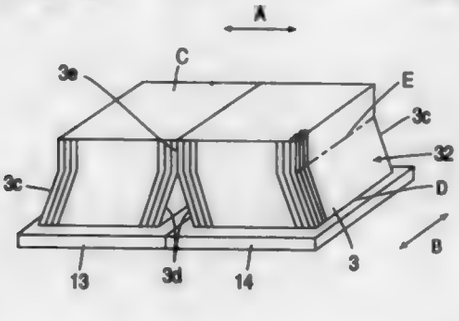
Keiji Sakai; Yoshio Yoshida, both of Nara; Hiroyuki Yamamoto; Yukio Kurata, both of Tenri; Yasuo Nakata, Nara, and Takahiro Miyake, Kyoto, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1992, Ser. No. 986,052

Claims priority, application Japan, Dec. 2, 1991, 3-318190; Dec. 2, 1991, 3-318191; Jan. 17, 1992, 4-006810; Jan. 17, 1992, 4-006813; Jan. 24, 1992, 4-010648; Jan. 24, 1992, 4-010649; Jan. 28, 1992, 4-013392

Int. Cl.[6] G02B *6/08*

U.S. Cl. 385—116 **15 Claims**



1. A display apparatus comprising:

a plurality of display devices arranged in one direction, each of the plurality of display devices having a display area; and

a plurality of image transmission means corresponding to the respective display devices, one end face of each of the image transmission means being coupled to a display area of the corresponding one of the display devices, other end faces of the image transmission means corresponding to the adjacent ones of the display devices being in contact with each other,

the plurality of image transmission means being bent toward the one direction in which the display devices are arranged.

5,465,316
METHOD AND DEVICE FOR CODING AND DECODING SPEECH SIGNALS USING INVERSE QUANTIZATION

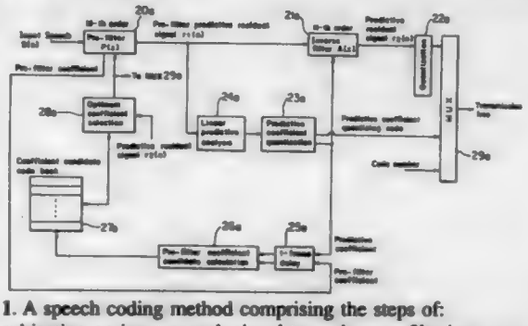
Yosahinori Tanaka, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 18, 1993, Ser. No. 108,889

Claims priority, application Japan, Feb. 26, 1993, 5-039021

Int. Cl.[6] G10L *9/00*

U.S. Cl. 395—2.28 **14 Claims**



1. A speech coding method comprising the steps of:

subjecting an input speech signal to an inverse filtering process by a first filter using a coefficient determined by a first predictive coefficient for said first filter and a second predictive coefficient for a second filter and obtaining a first predictive residual Signal from said first filter, said first predictive coefficient for said first filter and said second predictive coefficient for said second filter being obtained by analyzing a previous frame;

subjecting said first predictive residual signal obtained in said inverse filtering process by said first filter to a linear predictive analysis to obtain said second predictive coefficient;

performing an inverse filtering process by said second filter using said second predictive coefficient from said linear predictive analysis and obtaining a second predictive residual signal; and

quantizing said second predictive residual signal obtained by the inverse filtering process by said second filter.

5,465,317
SPEECH RECOGNITION SYSTEM WITH IMPROVED REJECTION OF WORDS AND SOUNDS NOT IN THE SYSTEM VOCABULARY

Edward A. Epstein, Putnam Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

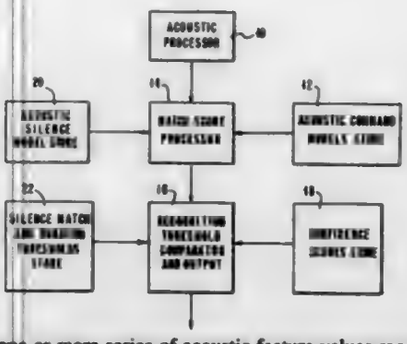
Filed May 18, 1993, Ser. No. 62,972

Int. Cl.[6] G10L *5/06*

U.S. Cl. 395—2.45 **20 Claims**

1. A speech recognition apparatus comprising:

an acoustic processor for measuring the value of at least one feature of each of a sequence of at least two sounds, said acoustic processor measuring the value of the feature of each sound during each of a series of successive time intervals to produce a series of feature signals representing the feature values of the sound; means for storing a set of acoustic command models, each acoustic command model represent-



ing one or more series of acoustic feature values representing an utterance of a command associated with the acoustic command model.

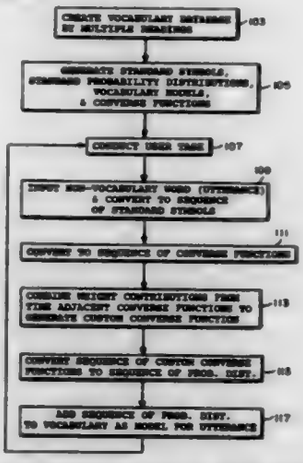
a match score processor for generating a match score for each sound and each of one or more acoustic command models from the set of acoustic command models, each match score comprising an estimate of the closeness of a match between the acoustic command model and a series of feature signals corresponding to the sound; and

means for outputting a recognition signal corresponding to the acoustic command model having a best match score for a current sound if the best match score for the current sound is greater than a recognition threshold score for the current sound, the recognition threshold score for the current sound is equal to (a) a first confidence score if the best match score for a prior sound was greater than a recognition threshold for the prior sound, or (b) a second confidence score greater than the first confidence score if the best match score for the prior sound was less than the recognition threshold for the prior sound.

5,465,318
METHOD FOR GENERATING A SPEECH RECOGNITION MODEL FOR A NON-VOCABULARY UTTERANCE

Vladimir Sejnoha, Cambridge, Mass., assignor to Kurzweil Applied Intelligence, Inc., Waltham, Mass.

Continuation of Ser. No. 676,792, Mar. 28, 1991, abandoned. This application Jun. 18, 1993, Ser. No. 79,704
Int. Cl.[6] G10L 9/00
U.S. Cl. 395—2.52 **7 Claims**



1. In a speech recognition system in which vocabulary models are represented by sequences of precalculated probability distributions for a predetermined set of acoustic symbols; the method of expeditiously generating a model for a non-vocabulary word uttered by a user, said method comprising:

pre-calculating along with said probability distributions a corresponding set of converse probability functions which represent the probabilities that particular ones of said precalculated probability distributions would correspond to a given input acoustic symbol;

for a non-standard word uttered by a user, generating a corresponding utterance sequence of acoustic symbols;

for each symbol in said utterance sequence, selecting the respective precalculated converse probability function thereby to generate a single valued sequence of said converse probability functions;

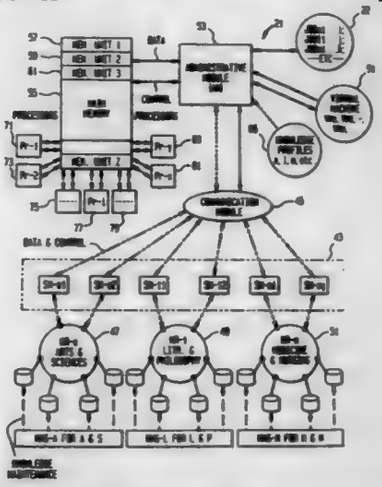
for successive symbols in said utterance sequence, generating respective custom converse probability functions each of which is a composite of weighted contributions from the precalculated converse probability function corresponding to the respective symbol and the precalculated converse probability functions corresponding to time-adjacent symbols in the utterance sequence, the weighting of the contributions being independent of the utterance sequence; and

for each custom converse probability function, selecting the best matching one of said precalculated probability distributions, whereby the resulting single valued sequence of selected precalculated probability distributions provides a model of the word uttered by the user.

5,465,319
ARCHITECTURE FOR A COMPUTER SYSTEM USED FOR PROCESSING KNOWLEDGE

Syed V. Ahamed, Somerset, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 146,248, Nov. 2, 1993, abandoned. This application Oct. 5, 1994, Ser. No. 318,582
Int. Cl.[6] G06F 9/44
U.S. Cl. 395—11 **20 Claims**



1. An architecture for a computer system used for processing knowledge, said architecture comprises:

a. a processor;

b. a memory connected to said processor; and

c. a plurality of modules for performing functions for processing knowledge, each function relates to a particular inquiry and involves specific subprocesses, wherein each module is a programmable system of a certain processing power and contains hardware, firmware and software, each module accepts inputs and generate outputs in the processing of said subprocesses, and the plurality of modules include:

i. a knowledge module for storing knowledge in at least one knowledge bank containing data organized in a knowledge hierarchy, and for processing said subprocesses using knowledge functions, wherein said knowledge hierarchy provides links between said data thereby forming a knowledge network, and wherein said knowledge functions are implemented by object oriented tools for establishing relationships between the data in the at least one knowledge bank and for generating the outputs from the established

relationships, said knowledge functions being selected from the group consisting of logical, inductive, associative, inferential, and deductive reasoning type functions, and combinations thereof;

ii. a communication module for communicating between said knowledge module and other modules processing said subprocesses, and for organizing said inputs and said outputs of said subprocesses, and for controlling and guiding each subprocess to a specific knowledge bank by organizing said subprocesses according to said data and said knowledge hierarchy of said knowledge module;

iii. an administrative module for performing housekeeping functions involving resource allocation, real-time multitasking and scheduling of said subprocesses, and for providing hardware to said knowledge module to execute the subprocesses; and

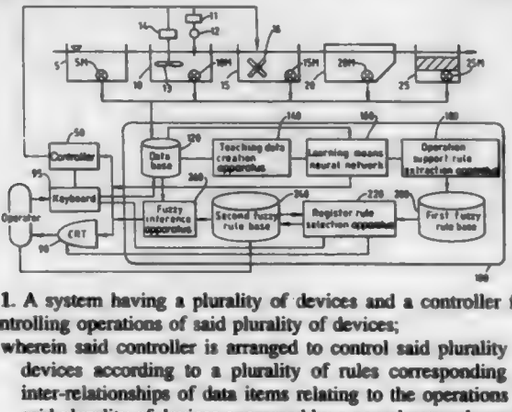
iv. a switching module for selecting and switching between said knowledge bank and said administrative module according to said communication module.

5,465,320

METHOD OF AUTOMATED LEARNING, AN APPARATUS THEREFOR, AND A SYSTEM INCORPORATING SUCH AN APPARATUS

Ichiro Enbutsu; Kenzi Baba; Naoki Hara, all of Hitachi; Mikio Yoda, Tokai; Shoji Watanabe, and Hayao Yahagi, both of Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 2, 1992, Ser. No. 907,539
Claims priority, application Japan, Jul. 4, 1991, 3-164212
Int. Cl.[6] G06F *9/00*
U.S. Cl. 395—22 **1 Claim**



1. A system having a plurality of devices and a controller for controlling operations of said plurality of devices;

wherein said controller is arranged to control said plurality of devices according to a plurality of rules corresponding to inter-relationships of data items relating to the operations of said plurality of devices expressed by a neural network model having a hierarchical structure constructed of an input layer, at least one hidden layer and an output layer, said data items including output values as control variables to at least one of said plurality of devices and input values as state variables of at least a further one of said plurality of devices affecting on said output values, said controller comprising:

means for analyzing said data items to make evaluation indices obtained from weighing factors to inner combinations among output layer neurons, hidden layer neurons and input layer neurons of said neural network model;

means for calculating a summation of absolute values of said evaluation indices;.

means for normalizing each of said evaluation indices by said summation to obtain relative evaluation indices;

means for selecting pairs of said input and output values as to which of said relative evaluation indices satisfy a predetermined relationship with a predetermined threshold value;

means for deriving said plurality of rules corresponding to said inter-relationships between said selected input and output values; and

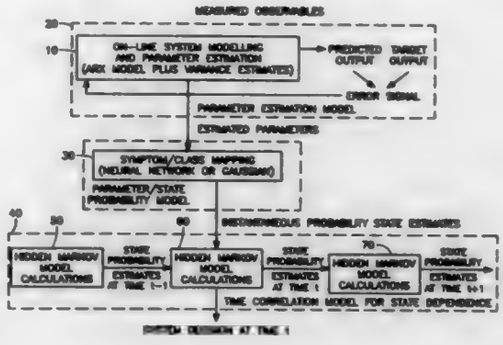
means for controlling said plurality of devices based on said derived rules.

5,465,321

HIDDEN MARKOV MODELS FOR FAULT DETECTION IN DYNAMIC SYSTEMS

Padhraic J. Smyth, Altadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 7, 1993, Ser. No. 47,135
Int. Cl.[6] G06F *15/80*
U.S. Cl. 395—22 **30 Claims**



25. Apparatus for monitoring a system having a normal working state corresponding to normal operation of said system and a plurality of individual failure states corresponding to different failure modes of said system, said system exhibiting respective sets of measurable parameters corresponding to inputs and behavior symptoms causally related to said inputs, said apparatus operable in successive sampling intervals, said apparatus comprising:

means for defining plural transition probabilities for plural pairs of said states, each transition probability being related to the probability that said system will change from one to the other of said pairs of states at any time, wherein said means for defining plural transition probabilities comprises means for estimating a mean time between failures (MTBF) characteristic of each of said failure states and computing each corresponding transition probability therefrom;

means for observing a set of actual values of said parameters in a current one of said sampling intervals;

means for obtaining an instantaneous probability comprising an estimate of the probability of one of (a) said set of actual values being observed and (b) said system being in said one state, given the other of (a) and (b);

means for computing plural respective intermediate probabilities corresponding to respective ones of said states, each intermediate probability being equal to the corresponding instantaneous probability of said one state multiplied by a sum over plural states of the intermediate probability for a given state computed during the previous sampling interval multiplied by the transition probability between said given state and said one state; and

means for computing from the intermediate probability for each one of said states of the current sampling interval a posterior probability that said system is in the corresponding one of said states given the sets of actual values observed over the current and previous sampling intervals, and for determining from the posterior probabilities of the plural states whether said system has transitioned to one of said failure states and issuing an indication corresponding thereto.

5,465,322

APPARATUS AND METHOD FOR PARSING A STREAM OF DATA INCLUDING A BITMAP AND CREATING A TABLE OF BREAK ENTRIES CORRESPONDING WITH THE BITMAP

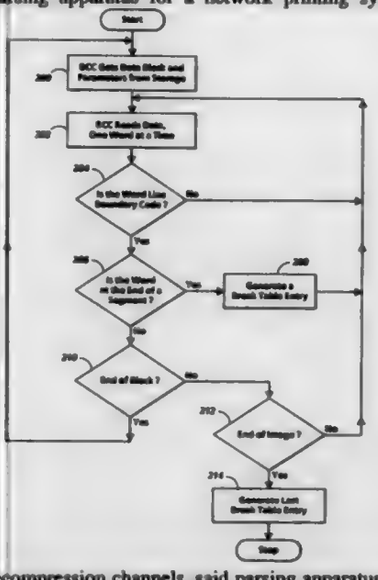
Lillian-Liu Hsu, Rochester; Kitty Sathi, Pittsford; Mark C. Biondi, Rochester; Thomas B. Zell, Victor; David A. Catapano, Rochester, and Richard T. Lauria, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 4, 1993, Ser. No. 72

Int. Cl.[6] H04N *1/419*

U.S. Cl. 395—114 16 Claims

10. A parsing apparatus for a network printing system with



multiple decompression channels, said parsing apparatus receiving a stream of image data corresponding with one or more images and being written in a printer page description language, the stream of image data including a compressed bitmap having break entries dividing the bitmap into a plurality of image data segments, comprising:

a preparsing system for separating image data associated with the compressed bitmap from the stream of image data, said separating including segregating image data associated with each of the one or more images into an image data set;

a boundary code catching system, communicating with said preparsing system, for examining the image data set associated with the compressed bitmap and placing the break entries thereof into a break entry table;

the plurality of image data segments of the compressed bitmap being decompressed, in parallel, with the multiple decompression channels by reference to the break entry table.

5,465,323

METHOD FOR MODELLING A SURFACE AND DEVICE FOR IMPLEMENTING SAME

Jean-Laurent Mallet, Nancy, France, assignor to Association Scientifique Pour La Geologie et de ses Applications:, Nancy; Societe National Elf Aquitaine (Production), Courbevoie; Total Compagnie Francaise Des Petroles, Puteaux, and Compagnie Generale De Geophysique, Massy, all of, France

PCT No. PCT/FR90/00676, § 371 Date May 20, 1991, § 102(e) Date May 20, 1991, PCT Pub. No. WO91/04544, PCT Pub. Date Apr. 4, 1991

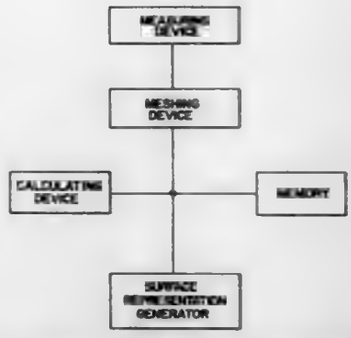
PCT Filed Sep. 19, 1990, Ser. No. 689,044

Claims priority, application France, Sep. 20, 1989, 89 12341

Int. Cl.[6] G06T *17/00*

U.S. Cl. 395—123 16 Claims

16. A device for modeling a surface representing an interface between two areas with different properties in a three-dimensional body, comprising:



means for measuring to obtain a set of geometrical data, from said interface of said three-dimensional body, relating to the surface and associated with respective points on said surface;

means for meshing the surface so that all said points are a subset of nodes of a mesh;

means for storing at a specific memory address for each node of the mesh, the following data:

first, second, and third coordinates,

a number of satellite nodes,

satellite node address data providing access to specific coordinates of said satellite nodes and consequently to satellite node related data relating thereto, and

geometrical data associated with said each node of the mesh;

calculation means for fitting fitted coordinates of each node processed by an iterative method in which for each step of an iteration there is added a weighted combination of the coordinates of the node and of the satellites of said node and a combination of the geometrical data associated with said node, to thereby minimize a sum of a global roughness index obtained by summing local roughness indices associated with the nodes, each local roughness index derived from a weighted sum of the coordinates of the node and the coordinates of its satellites, and of a global violation index of said geometrical data; and

means for creating a representation of the surface from the fitted coordinates of each node.

5,465,324

METHOD AND SYSTEM FOR DEFINING GEOMETRIC RELATIONS IN A COMPUTER AIDED DESIGN SYSTEM

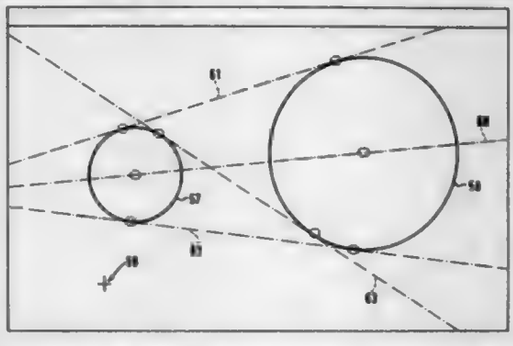
Kevin Lee, Schoenaich, and Berthold Hug, Ammerbuch, both of, Germany, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 6, 1993, Ser. No. 1,390

Claims priority, application European Pat. Off., Jan. 10, 1992, 92100307

Int. Cl.[6] G06T *11/00*

U.S. Cl. 395—133 20 Claims



1. Method for defining geometric relations in a computer aided design system, comprising the steps of:

(a) identifying, retrieving or defining a geometric object;

(b) identifying, retrieving or defining a cursor position;

(c) generating at least one geometric relation between said cursor position and said geometric object, or between said geometric object and at least a second geometric object, wherein said geometric relations is or are of a type which is independent of said cursor position;

(d) generating graphic representations of said cursor position, said geometric object or objects, and said geometric relation, and displaying said graphic. representations on a display associated with a computer aided design system; and

(e) entering a selection mode for accepting said geometric relation.

5,465,325

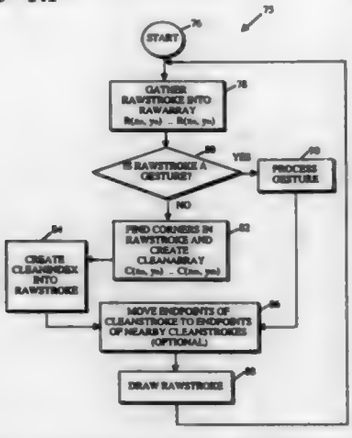
METHOD AND APPARATUS FOR MANIPULATING INKED OBJECTS

Stephen P. Capps, and Ernest H. Beeruink, both of San Carlos, Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Continuation-in-part of Ser. No. 977,145, Nov. 16, 1992. This application May 27, 1993, Ser. No. 68,442

Int. Cl.[6] G06F *15/62*

U.S. Cl. 395—141 16 Claims



1. A method for manipulating an inked object comprising the steps of:

receiving an ink stroke made by a pointing device of a computer system, said ink stroke being represented internally to said computer system as an array of ink coordinates;

displaying said ink stroke on a screen of said computer system by displaying a plurality of line segments on said screen which connect pixels of said screen corresponding to said array of ink coordinates;

creating an internal representative stroke from said array of ink coordinates within said computer system, where said representative stroke is not displayed on said screen;

receiving a user-initiated command into said computer system which causes a manipulation of said representative stroke within said computer system;

transforming coordinates of said array of ink coordinates into transformed coordinates in said computer system in accordance with said manipulation of said representative stroke; and

re-displaying said ink stroke on said screen of said computer system in accordance with said transformed coordinates of said array of ink coordinates without displaying said representative stroke.

5,465,326

MIXED-MODE TRANSMISSION CONTROL APPARATUS FOR ADDING AN IDENTIFICATION BLOCK TO MIXED-MODE DATA

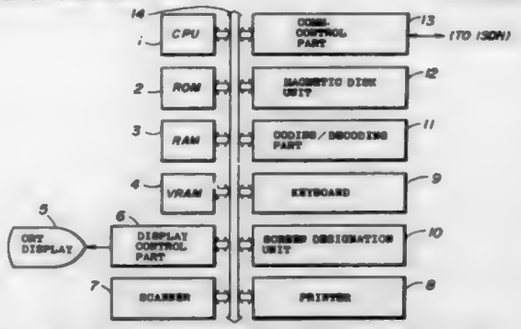
Nozomi Sawada, Ebina, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 794,028, Nov. 19, 1991, abandoned. This application Jun. 22, 1994, Ser. No. 264,231

Claims priority, application Japan, Nov. 20, 1990, 2-312828

Int. Cl.[6] G06T *11/60*

U.S. Cl. 395—147 13 Claims



1. An apparatus for processing mixed-mode document data in which encoded character text data and raster image data coexist and for transmitting the mixed-mode document data in a plurality of mixed-mode format blocks from a transmitting terminal to a reception terminal via a network, said apparatus comprising:

storage means for storing at least one of terminal identifying data identifying the transmitting terminal, date/time data denoting a date and time of transmission, and page number data denoting each page of the mixed-mode document data;

generating means for generating an identification block in a mixed mode format, said identification block including at least one of the terminal identifying data, the date/time data and the page number data stored in said storage means;

editing means for editing the mixed-mode document data so that the identification block generated by said generating means is added to said plurality of mixed-mode format blocks of the mixed-mode document data before the transmission; and

control means for transmitting the mixed-mode document data in said plurality of mixed-mode format blocks including said identification block added by said editing means to the reception terminal by performing a predetermined data transmission procedure.

5,465,327

METHOD AND SYSTEM FOR DOCUMENT ADMINISTRATION UTILIZING ICONIC REPRESENTATIONS WITHIN A DATA PROCESSING SYSTEM

Diana S. Wang, Trophy Club, and Marvin L. Williams, Lewisville, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 15, 1990, Ser. No. 494,014

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—159 12 Claims

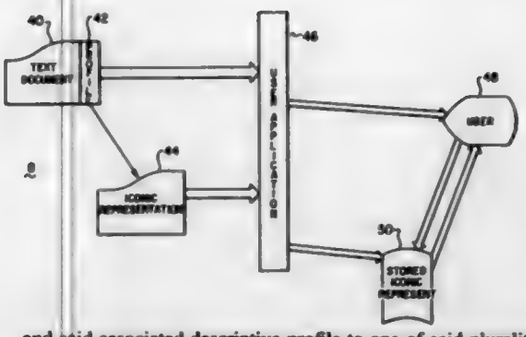
1. A method of document administration in a data processing system having a plurality of documents stored therein and accessible by a plurality of user locations within said data processing system, each document having a descriptive profile associated therewith, said method comprising the steps of:

creating an iconic representation of a selected document;

storing said created iconic representation within said data processing system at a first selected memory location;

storing said selected document at a second selected memory location within said data processing system; and

entering an indication of said first selected memory location within said descriptive profile associated with said selected document wherein upon a transfer of said selected document



and said associated descriptive profile to one of said plurality of user locations a user thereat may elect to separately retrieve said iconic representation utilizing said first indication of said selected memory location within said descriptive profile.

5,465,328

FAULT-TOLERANT TRANSACTION-ORIENTED DATA PROCESSING

Richard Dievendorff, and Chandrasekaran Mohan, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 14, 1994, Ser. No. 181,521

Claims priority, application United Kingdom, Mar. 30, 1993, 9306649

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—182.13 **10 Claims**

1. A method of fault-tolerant transaction-oriented data processing in which resource updates performed by a first application program are made permanent and visible to other application programs only on successful completion of the transaction, and are backed out following discovery of an error condition prior to successful completion, comprising the steps of:

initiating execution of a first unit of work, said first unit of work including one or more operations initiated by said first application program;

specifying whether operations within said first unit of work are to be excluded from the effects of application-requested backouts following detection of error conditions within said first unit of work;

responsive to detection of an error condition by said first application program, backing out resource updates performed in said first unit of work whilst ensuring that excluded operations are not made available to other application programs and are not backed out by said backing out step;

establishing a unit of work which includes said excluded operations.

5,465,329

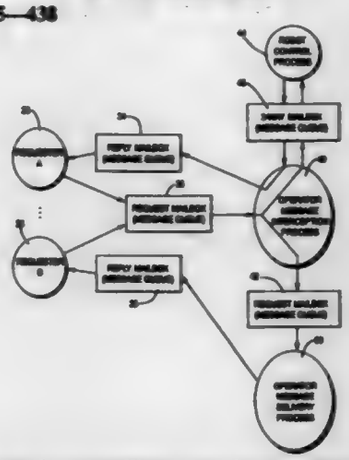
METHOD AND APPARATUS FOR USING INTERCEPTED OPERATOR MESSAGES TO CONTROL ROBOTICS

John W. Whisler, Raleigh, N.C., assignor to Alphatronix, Durham, N.C.

Filed Jun. 6, 1990, Ser. No. 534,132

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—438 **3 Claims**



1. A method for controlling access by a computer to storage media accessible via storage device, said method comprising the steps of:

(a) requesting access to the data via the storage device by transmitting a message in a general format directed to an operator of the computer;

(b) parsing the message transmitted in step (a) to separate the message into tokens and obtain position information for the tokens;

(c) identifying any known tokens in the tokens parsed in step (b) by comparison with a list of known tokens;

(d) applying rules for identifying a mount command for volumes of the data storage media for access by the storage device, in dependence upon said identifying in step (c) and the position information obtained in step (b);

(e) identifying a volume to be mounted when the mount command is identified in step (d);

(f) storing a set of instructions for a robot control device to select and mount the volume identified in step from among a group of the volumes; and

(g) transmitting the set of instructions for controlling the robot control device with input data to select and mount the volume when the mount command and volume are identified in steps (d) and (e) and the input data does not request an invalid data storage device.

5,465,330

NETWORK ADDRESS MANAGING METHOD AND SYSTEM

Takao Komatsu, and Akira Kanda, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

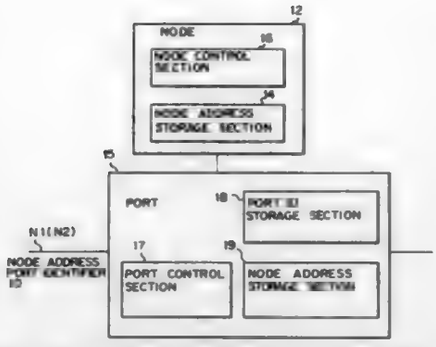
Continuation of Ser. No. 701,102, May 16, 1991, abandoned. This application Feb. 28, 1994, Ser. No. 203,673

Claims priority, application Japan, Jun. 14, 1990, 2-155691; Jul. 3, 1990, 2-175749

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—824 **9 Claims**

1. A method, for use in a network system including a plurality of ports connected over a network to input and output information



therethrough, for managing node addresses of a plurality of nodes constructed to be connected to said plurality of ports, said method comprising the steps of:

storing a port identifier in a port identifier storage section in each of said plurality of ports, wherein each port has a unique port identifier,

transferring a node address over the network to a first node address storage section in the one of said plurality of ports in which a port identifier that corresponds to the node address is stored, according to a correspondence table between port identifiers and node addresses, wherein said step of transferring is performed for each of said plurality of ports, and wherein each port receives a unique node address, and

upon connection of one of said nodes to one of said ports, transferring the node address in the first node address storage section of said one of said ports to a second node address storage section of said one of said nodes, whereby a correspondence is determined between said one of said nodes and said node address to allow said one of said nodes to be accessed using said node address.

5,465,331

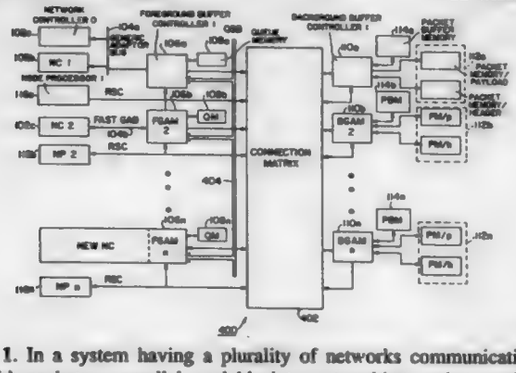
APPARATUS HAVING THREE SEPARATED AND DECENTRALIZED PROCESSORS FOR CONCURRENTLY AND INDEPENDENTLY PROCESSING PACKETS IN A COMMUNICATION NETWORK

Michael S. Yang, Katonah, and Jih-Shyr Yih, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1992, Ser. No. 996,384

Int. Cl.[6] G06F *15/16;* **H04J** *3/02*

U.S. Cl. 395—200.08 **12 Claims**



1. In a system having a plurality of networks communicating with packets, a parallel, scalable inter-networking packet routing apparatus for receiving and storing packets from one of the plurality of networks, processing the packets and forwarding packets to another one of the plurality of networks comprising:

a plurality of first control means each first control means for receiving packets from anyone of the plurality of networks, for maintaining a queuing status of the received packets and transferring packets;

a plurality of packet memory means for storing packets received and transferred by the plurality of first control means;

a plurality of second control means, separate from the plurality of first control means, each second control means coupled to an individual one of said plurality of packet memory means, for receiving the transferred packets from a first control means, and for organizing and maintaining packets in respective packet memory means, the plurality of second control means operate concurrently with and independently from the plurality of first control means;

connection switch means, coupled between the plurality of first control means and the plurality of second control means, for transfering packets between any one of the plurality of first control means and any one of the plurality of second control means; and

a plurality of node processor means coupled to a respective first control means and said connection switch means, each node processor means for 1) obtaining status of the stored packets from the respective first control means, 2) accessing packets from a packet memory means by way of the connection switch means and a second control means, 3) processing packets based on their origin and destination, 4) storing the processed packets back into the packet memory means by way of the connection switch means and the second control means and 5) for updating the queueing status of the packets by way of the respective first control means, the plurality of node processors operate concurrently with and independently from the first and second control means.

5,465,332

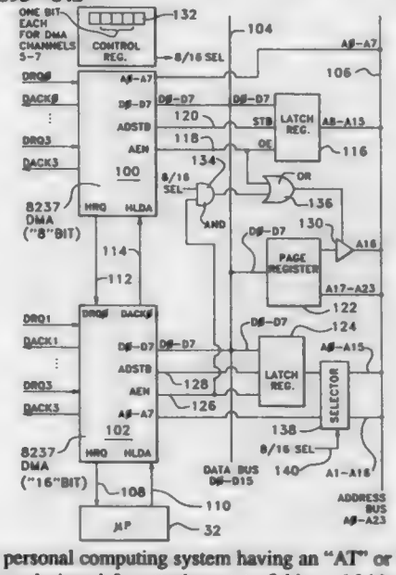
SELECTABLE 8/16 BIT DMA CHANNELS FOR "ISA" BUS

Michael J. Deloye, Boynton Beach; Daniel P. Fuoco, and Dennis L. Moeller, both of Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 21, 1992, Ser. No. 947,680

Int. Cl.[6] G06F *13/28;13/00;* **H01J** *3/00*

U.S. Cl. 395—842 **9 Claims**



9. In a personal computing system having an "AT" or "ISA" bus architecture designed for attachment to 8-bit or 16-bit peripheral devices, DMA channel apparatus for executing DMA cycles comprising:

a first DMA controller responsive to 8-bit peripheral devices for controlling 8-bit DMA data transfers in one byte address space intervals within a 64k byte storage space;

a second DMA controller coupled to said first DMA controller such that said second DMA controller is responsive to 16-bit peripheral devices for controlling 16-bit DMA data transfers in two byte address space intervals within a 128k byte storage space;

a page register responsive to an active first DMA controller for addressing storage space as pages with each page having 64k bytes of storage space;

said page register responsive to an inactive first DMA controller for addressing storage space as pages with each page having 128k bytes of storage space;

a control register for storing an 8-bit/16-bit mode bit for selecting whether a DMA channel coupled to said second DMA controller is to operate as an 8-bit or 16-bit channel, said mode bit remaining set in one of said 8-bit or 16-bit modes while said DMA channel is active such that said DMA channel operates as an 8-bit or 16-bit channel throughout its active cycle;

said second DMA controller responsive to an 8-bit peripheral device and an 8-bit mode bit from said control register for controlling 8-bit DMA transfers in one byte address space intervals within a 64k byte storage space; and

said page register responsive to an active second DMA controller and an 8-bit mode bit from said control register for addressing storage space as pages with each page having 64k bytes of storage space.

5,465,333

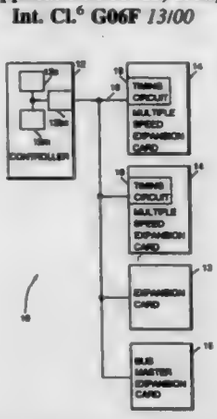
APPARATUS FOR PROGRAMMING THE SPEED AT WHICH AN EXPANSION CARD GENERATES READY SIGNALS TO INSURE COMPATIBILITY WITH THE SPEED OF AN ATTACHED BUS

Howard T. Olnowich, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 146,472, Nov. 2, 1993, abandoned, which is a continuation of Ser. No. 543,276, Jun. 25, 1990, abandoned. This application Feb. 15, 1995, Ser. No. 389,606

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—281 **5 Claims**



1. Data transfer apparatus for adapting a computer system having a bus connecting to expansion devices to interact compatibly with an expansion device designed to couple to a plurality of differently configured buses; said apparatus comprising:

a system clock generator for generating a cyclic system clock signal;

a synchronous bus for transferring data at a predetermined speed; said synchronous bus including a path for transmitting said system clock signal, said synchronous bus further including a signal path for conveying start signals to said expansion device, each start signal indicating that a data transfer is required between the expansion device and said bus;

an expansion device coupled to said bus containing circuitry selectively programmable to configure the respective device to conduct data transfers relative to said bus at one of a plurality of speeds including said predetermined speed; and

means coupled to said bus for transferring programming signals via said bus to said programmable circuitry on said expansion device for selectively configuring said expansion device to conduct data transfers relative to said synchronous bus at said predetermined speed; said programming signals including data signals representing numerical timing information associated with said predetermined speed;

said programmable circuitry including:

a register for receiving and storing said data signals representing said numerical timing information; and

a programmable timing circuit coupled to said register and said bus for utilizing said numerical timing information and said clock signals repeatedly to control data transfers between said respective expansion device and said bus at said predetermined speed, said programmable timing circuit including means for generating a ready signal after a predetermined number of cycles of said system clock signals following receipt of each said start signal, said ready signal indicating that the expansion device is ready to transfer data relative to said bus, and said predetermined number of cycles conforming each respective transfer to said predetermined speed,

wherein said programmable timing circuit further includes two registers and two programmable counter circuits respectively associated with individual ones of said two registers, and wherein said numerical timing information contains two distinct numerical timing values that are stored in respective ones of said registers and are loaded cyclically from said registers into said respectively associated programmable counter circuits; said at least two counter circuits being stepped by said clock signals after loading of respective numerical timing values therein, and upon reaching a predetermined count state establishing conditions for enabling issuance of said ready signal; said timing circuit further including means for selecting between outputs of said counters, in data transfers designated by individual ones of said start signals, to variably control delays in issuance of said ready signal corresponding to said numerical values held in said respective registers.

5,465,334

PROCESSOR WITH A RESPECTIVE LATCH PROVIDED FOR EACH PIPELINED STAGE TO TRANSFER DATA TO THE PIPELAND STAGES

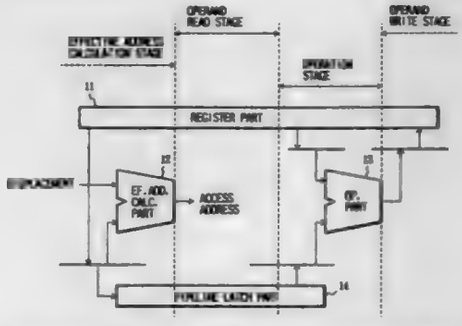
Taizo Sato, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 16, 1993, Ser. No. 121,507

Claims priority, application Japan, Sep. 16, 1992, 4-246691; Sep. 2, 1993, 5-218850

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—375 **8 Claims**



1. A processor which executes instructions using pipeline processing having an effective address calculation stage that uses a displacement from an instruction code and an operation stage that performs an operation, at least one stage existing between the effective address calculation stage and the operation stage, the processor comprising:

a register which temporarily stores data;

a pipeline latch part which includes a respective latch provided for, and respectfully corresponding to, each stage between the effective address calculation stage and the operation stage and includes a respective latch corresponding to the operation stage, the pipeline latch part, during the effective address

calculation stage, receiving data stored in the register and transferring the received data through the each respective latch in accordance with the execution of instructions to provide the data to the respective latch corresponding to the operation stage when the operation stage performs the operation;

an effective address calculation part which, during the effective address calculation stage, receives data stored in the register and adds the data to the displacement of the instruction code, to thereby calculate an effective address; and

an operation part which, during the operation stage, receives data stored in the register, receives data from the latch corresponding to the operation stage in the pipeline latch part, executes the operation on the received data, produces a corresponding result and supplies the result to the register.

5,465,335

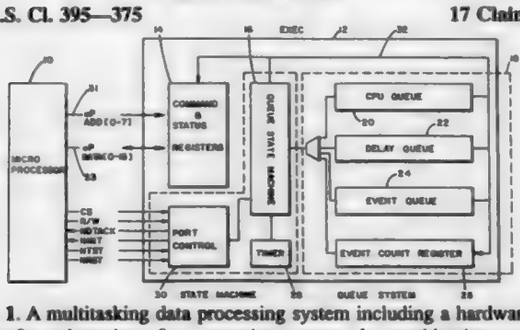
HARDWARE-CONFIGURED OPERATING SYSTEM KERNEL HAVING A PARALLEL-SEARCHABLE EVENT QUEUE FOR A MULTITASKING PROCESSOR

Mark F. Anderson, Biose, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 776,931, Oct. 15, 1991, abandoned. This application Jun. 13, 1994, Ser. No. 258,919

Int. Cl.[6] G06F *7/00*

U.S. Cl. 395—375 **17 Claims**



1. A multitasking data processing system including a hardware-configured portion of an operating system, the combination comprising:

processor queue means configured in hardware and including a plurality of word stores, for storing in priority order, task names ready for execution;

event queue means configured in hardware and including a plurality of word stores, for storing task names that await an occurrence of an event to be placed in said processor queue means; processor means for signalling occurrence of an event; and

match logic means configured in hardware and responsive to an asynchronously signalled event from said processor means for searching said word stores in parallel in said event queue means to find a task name associated with said signalled event occurrence, and for transferring said task name to said processor queue means.

5,465,336

FETCH AND STORE BUFFER THAT ENABLES OUT-OF-ORDER EXECUTION OF MEMORY INSTRUCTIONS IN A DATA PROCESSING SYSTEM

Benjamin T. Imai, Round Rock; Hung Q. Le, and Dung Q. Nguyen, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

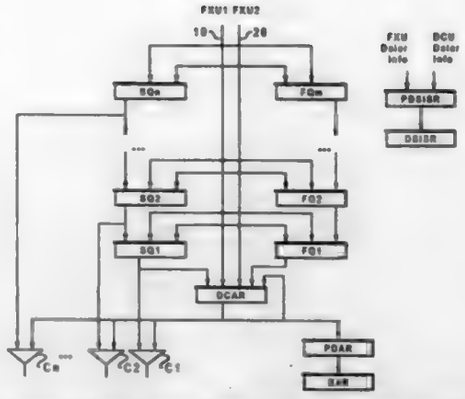
Filed Jun. 30, 1994, Ser. No. 269,868

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—375 **2 Claims**

1. A method for handling fetch and store requests in a data processing system, comprising the steps of:

(a) entering a store request into a store queue in response to receiving the store request from an execution unit;



(b) entering a fetch request into a fetch queue and setting one or more marks in a field associated with the fetch request, which indicate the store queue entries present at the time the fetch request is entered, in response to receiving the fetch request from an execution unit;

(c) draining any store queue entries out to a memory unit if the fetch queue is empty;

(d) if the fetch queue contains at least one entry, further performing the steps of:

(1) copying a copy of the fetch request in the fetch queue into a memory unit address register and sending the fetch request to the memory unit, when the memory unit is ready to accept a request, wherein the copied fetch request becomes the pending fetch request,

(2) determining if the pending fetch request in the memory unit address register is addressed to the same memory location as any store queue entries marked in the pending request's field,

(3) if the determination is negative, performing steps (d)(1) and (d)(2) on a next, if any, fetch request contained in the fetch queue, and

(4) if the determination is affirmative, draining the store queue entries, marked in the pending fetch request's field, from the store queue to the memory, and then copying a second copy of the pending fetch request to the memory unit address register and sending the pending fetch request to the memory unit to be executed;

(e) loading status information associated with an interrupt tagged request into a pending data storage interrupt status register and copying the pending fetch request to a pending data address register; and

(f) if an interrupt associated with a request is detected, setting a tag associated with the request indicating the interrupt; and

(1) if an interrupt tagged request is a store, halting execution of all requests until the interrupt is acknowledged by instruction sequencing logic;

(2) if an interrupt tagged request is a fetch, draining all store queue entries marked in the interrupt tagged request's field from the store queue to the memory to be executed, while halting the draining of the fetch queue until the interrupt is acknowledged by the instruction sequencing logic.

5,465,337

METHOD AND APPARATUS FOR A MEMORY MANAGEMENT UNIT SUPPORTING MULTIPLE PAGE SIZES

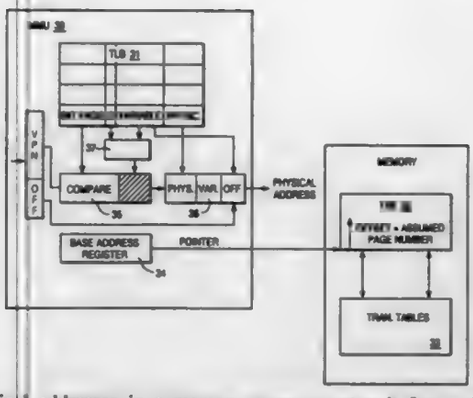
Shing I. Kong, Menlo Park, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 929,792, Aug. 13, 1992, abandoned. This application Oct. 5, 1994, Ser. No. 318,539

Int. Cl.[6] G06F *12/10;12/00*

U.S. Cl. 395—417 **12 Claims**

4. A method for translating virtual addresses having variable virtual page sizes and variable offset sizes stored together to



physical addresses in a memory management unit for a virtual address system comprising the steps of:

(a) comparing a number of bits of a virtual address to be translated with entries stored in a first translation lookaside buffer, the number of bits of the virtual address and each entry being compared being controlled by a value stored in each of the entries;

(b) providing a physical page number when the compared bits of a virtual address and an entry are the same; and

(c) obtaining a physical page number from a second translation lookaside buffer in memory when the compared bits of a virtual address and an entry are not the same;

wherein step (c) includes the steps of

comparing entries in the second translation lookaside buffer with a virtual page address,

wherein a portion of a virtual address having an assumed length is compared with a portion of an entry in the second translation lookaside buffer of the same length,

deriving a length value when a comparison occurs,

generating a physical address if the length value is not greater than the assumed length, and

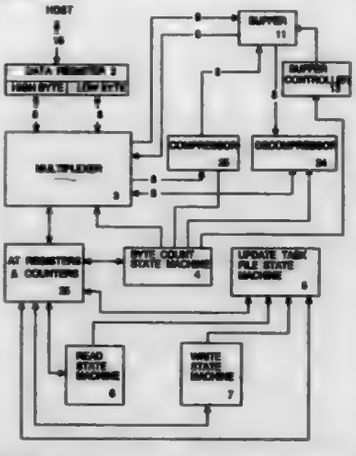
generating a pointer to one of a series of physical addresses if the length value is greater than the assumed length.

5,465,338

DISK DRIVE SYSTEM INTERFACE ARCHITECTURE EMPLOYING STATE MACHINES

Donald W. Clay, Louisville, Colo., assignor to Conner Peripherals, Inc., San Jose, Calif.

Filed Aug. 24, 1993, Ser. No. 110,883
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—310 **7 Claims**



1. An interface apparatus, within a storage system, for controlling the transfer of sectors of data between a host processor and a buffer within the storage system in response to READ and WRITE command issued by the host processor, said apparatus comprising;

a Byte Count State Machine for controlling the transfer of a sector of data between said host processor and said buffer and for generating a signal indicating when last byte of data has been transferred for a sector;

an Update Task File State Machine having a machine cycle for decrementing by one the number of sectors still to be transferred after a sector has been transferred by said Byte Count State Machine and for causing a sector address to be generated for the next sector to be transferred by said Byte Count State Machine;

a Read State Machine for controlling the processing of all READ commands issued by said host processor to said storage system and processing said received READ command in response to said last byte signal generated by said Byte Count State Machine and the initiation of machine cycles in said Update Task File State Machine to maintain the count of the number of sectors still to be read and the generation of then next sectors address where a next sector is to be read; and

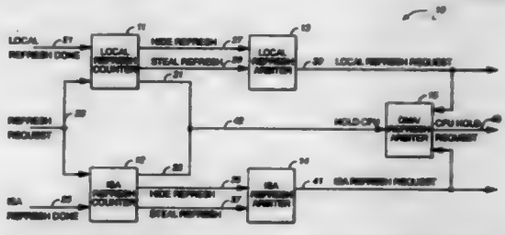
a Write State Machine for controlling the processing of all WRITE commands issued by said host processor to said storage system and processing said received WRITE command in response to said last byte signal generated by said Byte Count State Machine and the initiation of machine cycles in said Update Task File State Machine to maintain the count of the number of sectors still to be written and the generation of then next sectors address where a next sector is to be written.

5,465,339

DECOUPLED REFRESH ON LOCAL AND SYSTEM BUSSES IN A PC/AT OR SIMILAR MICROPROCESSOR ENVIRONMENT

Ned Garinger; Joseph A. Thomsen, both of Chandler, and Jeffery M. Michelsen, Mesa, all of Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Feb. 27, 1991, Ser. No. 661,785
Int. Cl.[6] G06F *12/16*
U.S. Cl. 395—433 **3 Claims**



1. In a computer having a first memory connected to a first bus connected to a CPU and a second memory connected to a second bus connected to said CPU, a memory refresh device comprising:

first means for receiving a refresh request signal and generating in response thereto a first signal indicating that at least one refresh request for said first memory is pending, for generating a third signal in lieu of said first signal when a first predetermined number of refresh requests for said first memory are pending, and for generating a fifth signal in lieu of both said first and third signals when a third predetermined number, larger than said first predetermined number, of refresh requests for said first memory are pending;

first responsive means responsive to said first signal for causing a refresh operation of said first memory to be performed as said first memory becomes available for refresh and responsive to said third signal for causing a refresh operation of said first memory to be performed in prolongation of a current access of said first memory without the first bus being relinquished for a subsequent access;

second means for receiving said refresh request signal and generating in response thereto a second signal indicating that at least one refresh request for said second memory is pending, for generating a fourth signal in lieu of said second signal when a second predetermined number of refresh requests for

said second memory are pending, and for generating a sixth signal in lieu of both said second and fourth signals when a fourth predetermined number, larger than said second predetermined number, of refresh requests for said second memory are pending;

second responsive means responsive to said second signal for causing a refresh operation of said second memory to be performed as said second memory becomes available and responsive to said fourth signal for causing a refresh operation of said second memory to be performed in prolongation of a current access of said second memory without the bus being relinquished for a subsequent access; and

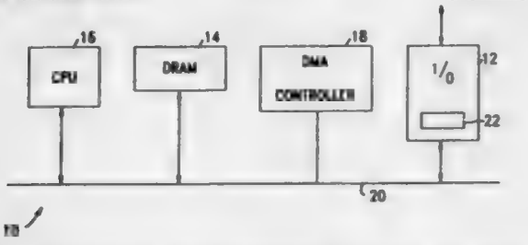
means connected to said CPU and responsive to assertion of either of said fifth signal or said sixth signal for requesting that said CPU be placed in a hold state while said first and second responsive means cause said first and second memories to be refreshed.

5,465,340

DIRECT MEMORY ACCESS CONTROLLER HANDLING EXCEPTIONS DURING TRANSFERRING MULTIPLE BYTES IN PARALLEL

Tadhg Creedon; Eugene G. O'Neill, and Anne O'Connell, all of Galway, Ireland, assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 30, 1992, Ser. No. 828,358
Int. Cl.[6] G06F *13/26*
U.S. Cl. 395—846 **8 Claims**



1. A direct memory access controller for transferring data from a source address to a destination address during a sequence of read and write memory cycles, the direct memory access controller comprising:

a DATA IN latch to receive data from the source address during a read memory cycle;

a DATA OUT latch to latch data through to the destination address during a write memory cycle;

a cross-bar switching mechanism coupling the DATA IN latch to the DATA OUT latch so that the data of the DATA IN latch are moved and shifted to the DATA OUT latch as a function of an offset between the source address and the destination address;

a combinational logic block arrangement arranged to receive the source address and the destination address and to generate a DATA OUT latch enable signal set during each read memory cycle and each write memory cycle to selectively enable a portion of the data received at the DATA IN latch into the DATA OUT latch as the function of the offset and the quantity of data to be transferred from the source address to the destination address;

an output-write-time signal generator operating to selectively assert an output-write-time signal once during each read memory cycle and once during each write memory cycle:

i) before data received from the source address becomes stable in the DATA IN latch during the read memory cycle, and

ii) before a write pulse portion of the write memory cycle; and

a logic device arranged to receive as inputs the output-write-time signal and the DATA OUT latch enable signal and to output an active DATA OUT latch enable signal when the output-write-time signal is asserted by the output-write-time signal generator;

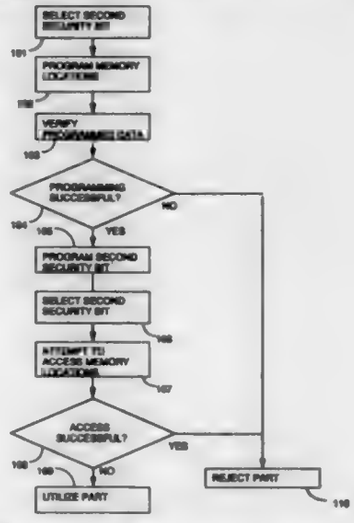
the DATA OUT latch having a latch enable input coupled to the output of the logic device so that the portion of the data enabled by the active DATA OUT latch enable signal are latched into the DATA OUT latch when the output-write-time signal is asserted by the output-write-time signal generator.

5,465,341

VERIFIABLE SECURITY CIRCUITRY FOR PREVENTING UNAUTHORIZED ACCESS TO PROGRAMMED READ ONLY MEMORY

Bryan C. Doi, Fremont; Steven D. Thomas, Palm Dale; Vincent J. Coli, San Jose, and Vito D. Giglio, Canoga Park, all of Calif., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Oct. 23, 1992, Ser. No. 965,635
Int. Cl.[6] G06F *12/14*
U.S. Cl. 395—183.06 **10 Claims**



1. A security system for programmable read-only memory locations within a very large scale integrated (VLSI) circuit, the security system comprising:

a first security bit memory location in which is stored a first security data bit, the first security data bit having a first value when the first security bit memory location is unprogrammed and the first security data bit having a second value when the first security bit memory location is programmed;

a second security bit memory location in which is stored a second security data bit, the second security data bit having the first value when the second security bit memory location is unprogrammed and the second security data bit having the second value when the second security bit memory location is programmed;

selection means, electrically coupled to the first security bit memory location and the second security bit memory location, for selecting to provide a value for a security access signal, one of the first security data bit, the second security data bit or neither the first security data bit nor the second security data bit; and,

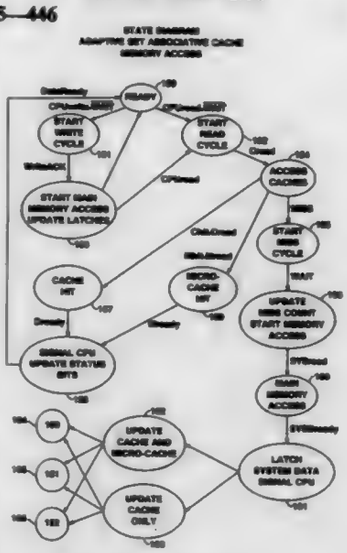
access means, coupled to the selection means, for allowing and preventing direct access, by any device outside the VLSI circuit, to the programmable read-only memory locations in response to the security access signal;

wherein the access means prevents any device outside the VLSI circuit direct access to the programmable read-only memory locations when the selection means selects neither the first security data bit nor the second security data bit, when the selection means selects the first security data bit and the first security data bit has the second value, or when the selection means selects the second security data bit and the second security data bit has the second value.

5,465,342
DYNAMICALLY ADAPTIVE SET ASSOCIATIVITY FOR CACHE MEMORIES

Stephen J. Walsh, Durham, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 22, 1992, Ser. No. 995,619
Int. Cl.[6] G06F *12/08*
U.S. Cl. 395—446 **11 Claims**



1. A data processing system comprising

a main memory for storing data and instructions for operating said data processing system,

a set associative cache memory having a plurality of locations for temporarily storing selected ones of said data and instructions,

means for temporarily and dynamically increasing a set associativity of at least one of said locations in said cache memory.

means for counting cache accesses occurring since the most recent increase in the set associativity of said cache memory, and

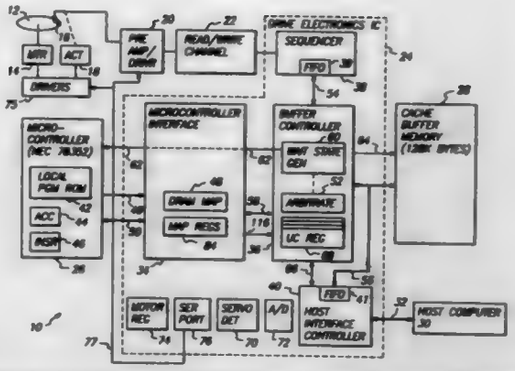
means responsive to said access counting means for reducing the set associativity of the most recently increased set associativity.

5,465,343
SHARED MEMORY ARRAY FOR DATA BLOCK AND CONTROL PROGRAM STORAGE IN DISK DRIVE

James A. Henson, Morgan Hill; James P. McGrath, Mountain View; Bruce R. Peterson, San Jose; Tim R. Glassburn, Milpitas; Michael L. Raab, Fremont, and James H. Do, Milpitas, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Filed Apr. 30, 1993, Ser. No. 56,428
Int. Cl.[6] G06F *13/12*
U.S. Cl. 395—439 **18 Claims**

1. In a disk drive architecture including a rotating data storage disk, a positionable data transducer for writing data to, and reading data from, selectable track locations defined on the disk, a preamplifier/driver connected to the data transducer, a read/write channel connected to the preamplifier/driver, sequencer means including sequencer FIFO buffer means for transferring user data blocks between selected track locations of the disk and the sequencer FIFO buffer means, host interface controller means including interface FIFO buffer means for transferring user data blocks, commands and status values between a host computer and the interface FIFO buffer means, buffer memory means for storing data blocks in transit between the sequencer means and the host interface controller means, buffer controller means for controlling accesses to the buffer memory means, programmed digital microcontroller means for decoding and executing commands received



from the host computer and for controlling a positioning mechanism for positioning the data transducer at selected track locations, an improvement enabling program execution by the microcontroller means of microcontroller instructions stored in the buffer memory means comprising:

microcontroller interface means connected between the microcontroller means and the buffer controller means, the microcontroller interface means including address mapping register means for mapping at least one predetermined portion of directly addressable memory of the microcontroller means to address locations of the buffer memory means and further including instruction prefetch register means for storing microcontroller instructions retrieved from the buffer memory means,

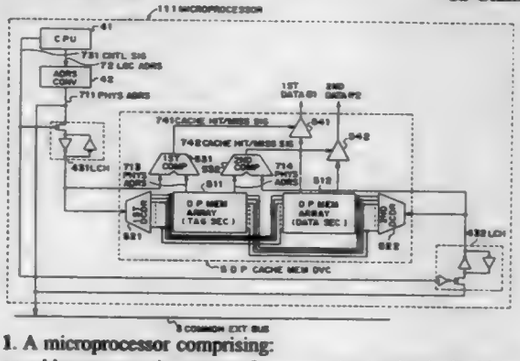
the buffer controller means including programmable access arbitration means for arbitrating requests for access to the buffer memory means by the sequencer means, the host interface controller means and the microcontroller means and,

microcontroller wait state generator means responsive to the access arbitration means for generating and asserting a wait state control to the microcontroller means until a request made by the microcontroller means for access to the buffer memory means can be handled.

5,465,344
MICROPROCESSOR WITH DUAL-PORT CACHE MEMORY FOR REDUCING PENALTY OF CONSECUTIVE MEMORY ADDRESS ACCESSES

Koutarou Hirai, Kobe, and Seiji Yamaguchi, Hirakata, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 746,944, Aug. 19, 1991, abandoned. This application Dec. 9, 1994, Ser. No. 352,445
Claims priority, application Japan, Aug. 20, 1990, 2-219247
Int. Cl.[6] G06F *13/00;13/14*
U.S. Cl. 395—458 **12 Claims**



1. A microprocessor comprising:

an address generation means for generating a physical address;

first and second storage means for storing outputs of the address generation means;

a cache memory including (a) a dual port memory means for memorizing a tag address and data which can independently

be accessed by means of second parts of the outputs of the first and second storage means, and (b) a first comparator which detects a match between a first part of an output from the first storage means and an output of the tag address of the dual port memory means accessed by a second part of the output of the first storage means, and (c) a second comparator which detects a match between a first part of an output from the second storage means and an output of the tag address of the dual port memory means accessed by a second part of the output of the second storage means; and

a control means for outputting a control signal for accessing said cache memory by enabling portions of the first and second storage means to alternately become ON.

5,465,345

PARALLEL PROCESSING OF RECEIVED AND TRANSMITTED BIT STREAM IN TELECOMMUNICATIONS EQUIPMENT INCLUDING A DSP AND SUPPORTING HDLC/SDLC PROTOCOLS

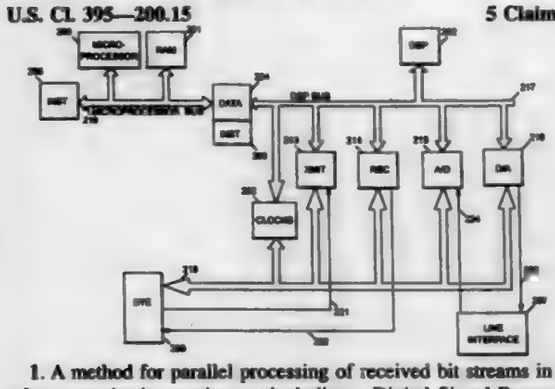
Alain Blanc, and Lucien Ceresiani, both of Vence, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 21, 1992, Ser. No. 947,601

Claims priority, application European Pat. Off., Nov. 29, 1991, 91480174

Int. Cl.[6] G06F *3/00;15/16*

U.S. Cl. 395—200.15 **5 Claims**



1. A method for parallel processing of received bit streams in a telecommunication equipment including a Digital Signal Processing system (202) having associated RAM storage, said telecommunication equipment receiving bit streams transporting HDLC/SDLC frames, the method comprising the steps of:

generating at least one table providing a zero deletion and a character alignment function required in the HDLC/SDLC line control protocols,

receiving an incoming bit stream and assembling samples of n consecutive bits therefrom to be processed in parallel,

using said assembled n consecutive bits as addressing elements for accessing said at least one table in order to derive a character corresponding to data to be extracted from the HDLC frame,

wherein said generating step includes the steps of:

building a first table (45) providing the zero deletion function and which is accessed by means of an address comprising a first address (R-spl) containing the said n consecutive bits to be processed in parallel, a second address field (R-onc-ctr) containing the current number of consecutive '1' bits received in said consecutive bits, said first table providing a word comprising a first read field giving a new value (NEW-R-one-ctr) to be used for a next access to the table, a second read field (FAI)representative of the HDLC Flag, Idle and Abort signals, and a third read field (R-data) representative of the residual data bits contained in a last processed sample,

building a second table (CHAR-SYNCHRO 48) providing the character alignment function which is accessed by means of an address comprising a first address field (R-data) containing said residual data bits, a second address field (R-bit-ctr) containing the number of bits which are assembled in a current character, said second table providing a word comprising a first read field giving the new value (NEW-R-one-ctr) of said address field which is to be used for the next access to said second table, a second read field (DATA-SEGMENT) containing the significant portion of said residual data input (R-data) which is correctly positioned according to the value of said second address field of said second table (CHAR-SYNCHRO 48), a third read field which is used at the completion of the assembling process of one character in order to take into account the bits which were contained in the last processed sample and which corresponds to a next character,

said method further including the step of performing successive logical OR operations of said second read field (DATA-SEGMENT) in order to progressively elaborate the character being extracted from said HDLC/SDLC bit stream, and storing said elaborated character within the RAM storage.

5,465,346

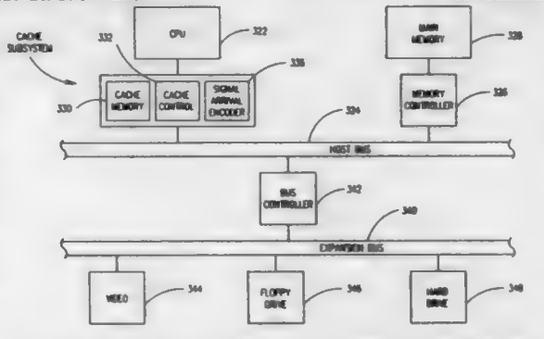
METHOD AND APPARATUS FOR SYNCHRONOUS BUS INTERFACE OPTIMIZATION

Terry J. Parks, Round Rock, and Darius D. Gaskins, Austin, both of Tex., assignors to Dell USA, L.P., Austin, Tex.

Continuation-in-part of Ser. No. 816,313, Dec. 30, 1991, Pat. No. 5,245,231. This application Aug. 5, 1993, Ser. No. 102,446

Int. Cl.[6] G06F *13/00;13/36*

U.S. Cl. 395—296 **19 Claims**



14. A method for reducing the amount of time required for bus cycles in a computer system having a bus, a first device coupled to the bus which generates a signal, and a second device coupled to the bus which receives the signal as an input, wherein the second device includes a signal arrival encoder which encodes the arrival time of the signal, the method comprising the steps of:

the first device generating a signal on the bus to the second device on a first bus cycle;

the signal arrival encoder monitoring the arrival time of the signal to the second device on said first bus cycle;

the signal arrival encoder encoding said arrival time of the signal into signal arrival information;

the second device latching the signal, wherein the second device uses said signal arrival information in determining when to latch the signal.

5,465,347

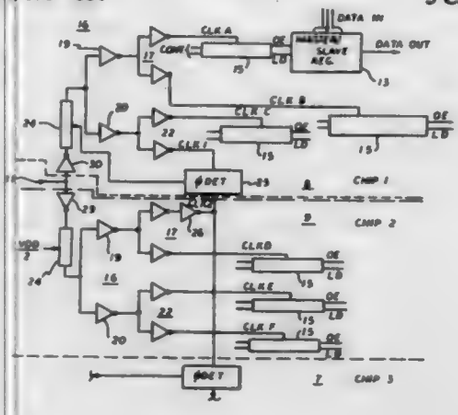
SYSTEM FOR REDUCING PHASE DIFFERENCE BETWEEN CLOCK SIGNALS OF INTEGRATED CIRCUIT CHIPS BY COMPARING CLOCK SIGNAL FROM ONE CHIP TO CLOCK SIGNAL FROM ANOTHER CHIP

Hu H. Chao, Pleasantville, N.Y.; Jung H. Chang, Saratoga, Calif., and Feng-Hsien W. Shih, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 578,035, Sep. 5, 1990, Pat. No. 5,305,451. This application Dec. 28, 1993, Ser. No. 174,357

Int. Cl.[6] G06F *1/04*

U.S. Cl. 395—550 **5 Claims**



1. A system for providing multiple clocking signals which are phase-locked to reduce clock skew between integrated circuit chips comprising:

a source of single phase clock signals for supplying a common clock signal to all of said integrated circuit chips;

a clock distribution tree circuit at each integrated circuit chip for receiving a clock signal and distributing said signal to a plurality of register cells on an integrated circuit chip;

a controllable delay line on each integrated circuit chip for delaying a received clock signal, and supplying said clock signal to said clock distribution tree circuit; and,

a phase detector on one of said integrated circuit chips for comparing the phase of a clock signal from said one of said integrated circuit chips' clock distribution tree circuit to a clock signal from another chip's clock distribution tree, and providing a signal to said controllable delay line of said one of said integrated circuit chips to reduce the phase difference between compared clock signals; and

a plurality of first and second register circuits on each intergrated circuit chip for receiving respective LOAD and OUTPUT signals for a respective register cell; and

a series of fixed delay circuits for receiving a clock signal from a respective clock distributing tree circuit and providing delayed clocking signals to said first and second register circuits, whereby a time delay is introduced between the generation of signals produced by said first and second register circuit to said register cell.

5,465,348

TROUBLE DIAGNOSIS SYSTEM OF UPC CIRCUIT

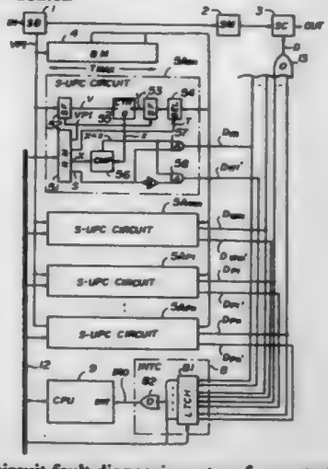
Shigeo Amemiya; Takao Ogura; Takafumi Chujo; Hiroshi Takeo; Michio Kusayanagi, all of Kawasaki; Naoaki Yamanaka, Tokyo; Yoichi Sato, Yokohama; Akihiko Takase, Tokyo; Shigeo Shinada, Yokohama; Mitsuhiro Takano, Yokohama; Kiyoshi Saitou, Yokohama; Kazuhiko Hohara, Fujisawa, and Tetsuhiro Okabe, Yokohama, all of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 8, 1993, Ser. No. 2,772

Claims priority, application Japan, Jan. 10, 1992, 4-003022

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—182.02 **30 Claims**



1. A UPC circuit fault diagnosis system for controlling traffic of a cell on the basis of prescribed information about the cell which is one type of fixed-length packet in an asynchronous transfer mode (ATM), the system comprising:

a main system UPC circuit (W) for performing usage parameter control, by using a predetermined value and performing a determination of whether or not m kinds of cells have traffic surplus in respect to said predetermined value, and controlling the amount of traffic of said m kinds of cells flowing along a transfer path;

a standby system UPC circuit (P) for performing usage parameter control, by using a predetermined value and performing a determination of whether or not n kinds of cells have traffic surplus in respect to said predetermined value, and controlling the amount of traffic of said n kinds of cells flowing along the transfer path;

each circuit including judgement means for determining the amount of traffic of cells of one or more kinds which is flowing along the transfer path; and

comparison means for comparing results of said judgement means of two UPC circuits and performing fault diagnosis of each UPC circuit.

5,465,349

SYSTEM FOR MONITORING ABNORMAL INTEGRATED CIRCUIT OPERATING CONDITIONS AND CAUSING SELECTIVE MICROPROCESSOR INTERRUPTS

Francois Gerosimi, Aix en Provence, and Paul Sourenian, Marseille, both of, France, assignors to Gemplus Card International, Gemenos, France

Continuation of Ser. No. 779,817, Oct. 21, 1991, abandoned. This application Oct. 5, 1994, Ser. No. 384,531

Claims priority, application France, Jan. 28, 1990, 90 12986

Int. Cl.[6] G06F *11/24;11/30;12/14*

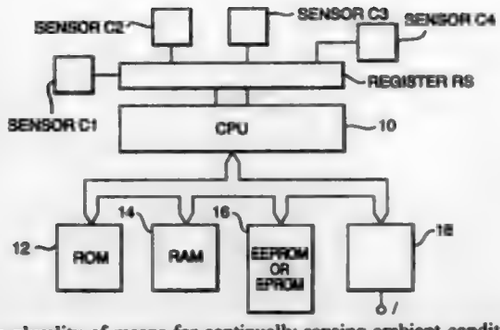
U.S. Cl. 364—550 **2 Claims**

1. An integrated circuit comprising:

a first memory means for storing application programs;

a second memory means which is programmable and non-volatile, for storing data;

at least one I/O port means;



a plurality of means for continually sensing ambient conditions or electrical conditions of the integrated circuit which fall outside a normal operating range;

register means for storing sensing information from the sensing means indicative of said ambient conditions or said electrical conditions of the integrated circuit which fall outside said normal operating range;

a microprocessor means connected to said first and second memory means, said I/O port means, and said register means;

said first memory means storing test subroutines for causing said microprocessor means to detect the presence or absence of said sensing information in said register means only in response to requests for the execution of one or more of said subroutines in the set consisting of;

(a) writing data to said second memory means;

(b) clearing data from said second memory means; or

(c) transmission of data from said second memory means, through the I/O port;

the microprocessor means being interrupted if said sensing information is found to be present in said register means.

5,465,350

DATA TO ACCESS FILES IN AN OPTICAL DISK ARE COPIED TO A HARD DRIVE WHERE THE DATA ARE MAINTAINED EVEN UPON REMOVAL OF THE DISK

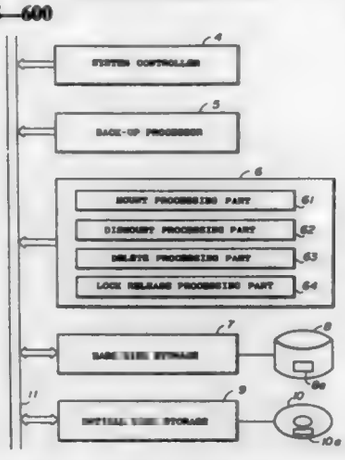
Kazumasa Fueki, Urawa, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 25, 1991, Ser. No. 797,212

Claims priority, application Japan, Nov. 30, 1990, 2-340208

Int. Cl.[6] G06F 17/30

U.S. Cl. 395—600 **12 Claims**



1. A management method for managing image data on a first recording medium by using (1) management data on the first recording medium and (2) management data on a second recording medium,

wherein each among a plurality of filing units has a respective second recording medium,

wherein the first recording medium is connectable to, and disconnectable from, any one of the plurality of filing units,

wherein an allowed filing unit, from among the plurality of filing units, is the only filing unit which is allowed to record new image data on the first recording medium, and

wherein the first recording medium has a storage capacity larger than that of the second recording medium but has an access time longer than an access time of the second recording medium,

the data management method comprising the steps of:

a) recording, on the first recording medium, management data including a mount mark, wherein the mount mark indicates that the first recording medium is connected to the only allowed filing unit among the plurality of filing units;

b) if management data has not been recorded onto any of the second recording media, copying the management data from the first recording medium to the second recording medium of the allowed filing unit;

c) recording new image data on the first recording medium while the first recording medium is connected to the allowed filing unit, using the management data recorded on the second recording medium of the allowed filing unit;

d) recording new management data on the second recording medium of the allowed filing unit, the new management data being related to the new image data recorded on the first recording medium, wherein the new management data includes a write-allowing flag which defines the filing unit, to which the first recording medium is connected, as the allowed filing unit; and

e) when the new management data satisfies a predetermined condition, copying the new management data recorded on the second recording medium to the first recording medium while the first recording medium is attached to the allowed filing unit, wherein the first recording medium is capable of being disconnected from the allowed filing unit when the new management data does not satisfy the predetermined condition.

5,465,351

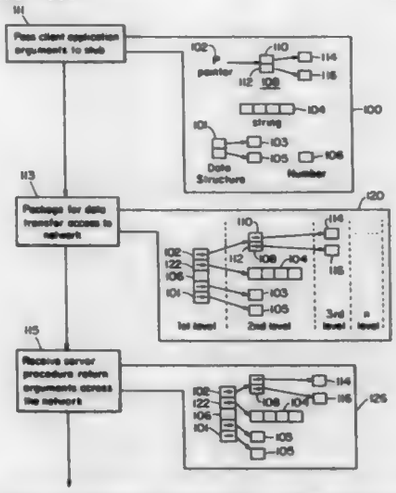
CLIENT-SIDE MEMORY MANAGEMENT PROCESS FOR CLIENT-SERVER COMPUTING

Steven E. Lemmo, Natick, Mass., assignor to Noblenet Inc., Natick, Mass.

Filed Aug. 14, 1992, Ser. No. 930,842

Int. Cl.[6] G06F 17/30

U.S. Cl. 395—600 **18 Claims**



17. A memory management system for a client-server computing network, including a client-side function comprising:

means for passing one or more server return arguments to be copied into a client application;

means for automatically copying from the returned high level data structure to another high level data structure each said

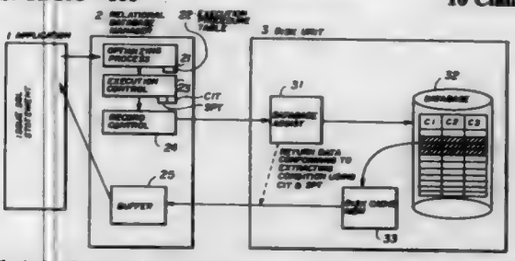
argument that is not a pointer, and for automatically copying each data element and data structure defined by an argument that is a pointer; and

means for automatically zeroing all copied pointers to prevent the network from chasing said pointers and freeing data elements and data structures not copied.

5,465,352
TABLE-AND-CACHE-BASED DATABASE ASSIST METHOD

Takayuki Nakazawa; Takafumi Okizuka; Nobuyuki Takebe, and Jinshi Annen, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 19, 1993, Ser. No. 19,882
Claims priority, application Japan, Feb. 20, 1992, 4-032403
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **10 Claims**



1. A database assist method adapted to a data processing system which includes a first progressing unit and an input/output unit which is coupled to the first processing unit and includes a second processing unit, a database and cache memory, said database assist method assisting a database related process which includes selection of items from records stored in the database and comprising the steps of:

(a) forming an execution procedure table which defines a procedure for retrieving information of interest from the database in response to a processing request from a request source;

(b) generating a column information table and a selection/projection table based on the execution procedure table, said column information table includes item structures within the records, said selection/projection table including the items to be extracted and extracting conditions;

(c) storing a block group of interest into cache memory from the database based on the column information table and the selection/projection table and carrying out a specified process in response to the processing request with respect to the stored block group for a specified item; and

(d) returning a result of the specified process carried out in said step (c) to the request source by a batch processing.

5,465,353
IMAGE MATCHING AND RETRIEVAL BY MULTI-ACCESS REDUNDANT HASHING

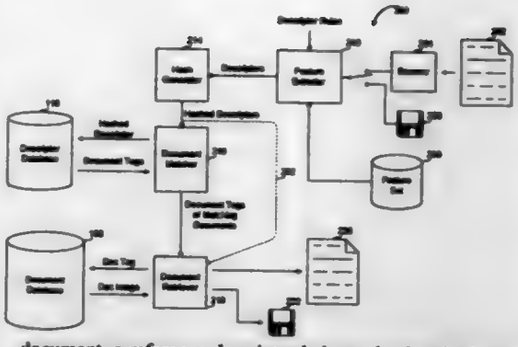
Jonathan J. Hull, Amherst, N.Y., and Peter E. Hart, Menlo Park, Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan, and Ricoh Corporation, Menlo Park, Calif.

Filed Apr. 1, 1994, Ser. No. 222,281
Int. Cl.[6] G06F *15/40;15/62*
U.S. Cl. 395—600 **18 Claims**

1. An apparatus for matching an input document to a reference document in a document database, comprising:

a document database, wherein reference descriptors are derived from content of reference documents in said document database;

a descriptor database, identifying, for each reference descriptor, a list of reference documents which include content from which said each reference descriptor is derived, the descriptor database including, for each reference document, a plurality of redundant reference descriptors for said each reference



document, a reference descriptor being redundant in that said each reference document is identifiable from less than all of said plurality of redundant reference descriptors for said each reference document;

input means for inputting content of an input document to be matched against said reference documents of said document database;

descriptor derivation means, coupled to said input means, for deriving input descriptors from said content of said input document;

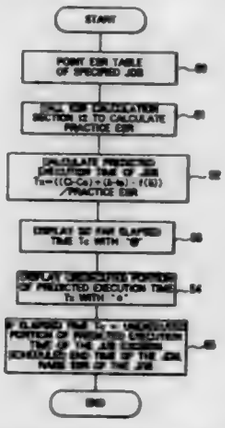
accumulation means, coupled to said descriptor database and said descriptor derivation means, for accumulating votes for reference documents in said document database by matching said input descriptors with said reference descriptors, said accumulation means accumulating a vote for each reference document in a list of reference documents associated with a particular reference descriptor when the particular reference descriptor matches an input descriptor; and

output means, coupled to said accumulation means, for outputting an indication of at least one matching reference document with a count of accumulated votes larger than a threshold count or larger than a count of accumulated votes for a nonmatching reference document.

5,465,354
METHOD AND APPARATUS FOR JOB EXECUTION PREDICTION AND CONTROL AND METHOD FOR JOB EXECUTION SITUATION DISPLAY

Toshio Hirosawa, Machida; Jun'ichi Kurihara, Matsuyama; Tsutomu Itoh, Kanagawa, and Motohide Kokunishi, Kokubunji, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1993, Ser. No. 31,593
Claims priority, application Japan, Mar. 19, 1992, 4-063058
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—650 **35 Claims**



1. An execution and prediction and control method of a plurality of jobs executed in parallel in a computer system having a CPU and display means, comprising the computer-executed steps of:

a) obtaining target excution end times of said plurality of jobs to be executed in parallel and outputting the target execution end times to said display means, wherein said target execution end times are obtained from at least one of a user terminal, a calculated value, and an associated auxiliary storage device;

b) collecting information of historical data including run time data on processing amounts of a plurality of jobs during execution of said plurality of jobs;

c) obtaining, using said collected information of historical data, predicted execution end times of said plurality of jobs being executed;

d) comparing the predicted execution end times obtained for said plurality of jobs with the target execution end times of said plurality of jobs; and

e) controlling subsequent execution priorities of said plurality of jobs in accordance with results of the comparisons, respectively, so that the target execution end times of said plurality of jobs can be best achieved.

5,465,355

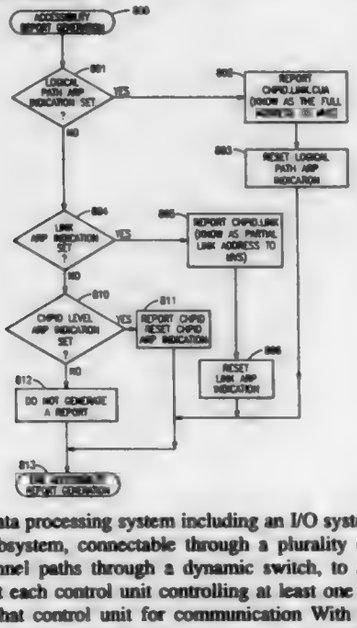
ESTABLISHING AND RESTORING PATHS IN A DATA PROCESSING I/O SYSTEM

Thomas E. Cook, Red Hook; Mark J. Fantacone; Robert E. Galbraith, both of Poughkeepsie; Steven G. Glassen, Wallkill; Allan S. Meritt, Poughkeepsie; Kenneth J. Oakes, and Harry M. Yudenfriend, both of Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 754,859, Sep. 4, 1991, abandoned. This application Nov. 12, 1993, Ser. No. 150,748

Int. Cl.[6] G06F *13/00;13/14*

U.S. Cl. 395—200.15 **17 Claims**



8. In a data processing system including an I/O system having a channel subsystem, connectable through a plurality of reconfigurable channel paths through a dynamic switch, to at least one control unit each control unit controlling at least one device connected to that control unit for communication With the channel subsystem, and also having memory means for storing software instructions and data including data about channel path availability, to be accessed by said software, a method for reporting changes in channel path availability from the channel subsystem to the memory means comprising the steps of:

a) determining in the channel subsystem the accessibility through said dynamic switch of a channel path in said plurality of channel paths between said channel subsystem and a control unit;

b) generating a report defining said channel path and logical channel paths therein determined to be accessible;

c) sending a signal indicating said report generated in step b) is pending;

d) fetching said report generated in response to said signal; and

e) varying said data stored in memory about the availability of said channel path and logical channel paths based on said report, thereby making said device connected to said channel path determined to be accessible, available for use by said software through said channel path.

5,465,356

Patent Not Issued For This Number

5,465,357

METHOD AND APPARATUS FOR AN AUTOMATED DYNAMIC LOAD OF AN ABIOS DEVICE SUPPORT LAYER IN A COMPUTER SYSTEM

Richard Bealkowski, Delray Beach; Douglas R. Geisler, and Michael R. Turner, both of Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 22, 1992, Ser. No. 902,315

Int. Cl.[6] G06F *9/24*

U.S. Cl. 395—700 **8 Claims**

1. A personal computer system compatible with application programs and operating system software, the personal computer system comprising:

a data bus;

a microprocessor electrically coupled to said data bus; said microprocessor having different first and second modes of operation; said first and second modes having respective different first and second memory addressing ranges, said second range being greater than said first range; said microprocessor operating in said first mode during initialization of said system and continuing after said initialization to operate either in said first mode or in said second mode; said microprocessor being capable of handling application programs while operating in either said first mode or said second mode; said microprocessor using different first and second portions of operating system microcode when operating respectively in said first and second modes;

non-volatile memory electrically coupled to the data bus, and accessible to said microprocessor via said data bus;

said non-volatile memory storing said first portion of operating system microcode for use by said microprocessor in said first mode,

said first portion of operating system microcode including an initialization program,

said non-volatile memory also storing a load indicator, inspected by said microprocessor during initialization of said system, for indicating if said personal computer system does or does not require access to said second portion of operating system microcode for subsequent operations;

volatile memory electrically coupled to the data bus, and accessible to said microprocessor via said bus; and,

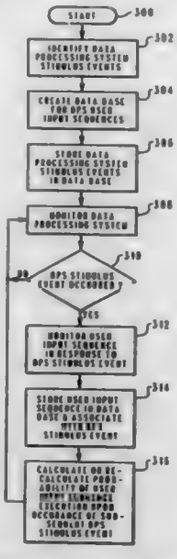
a direct access storage device electrically coupled to the data bus, and accessible to said microprocessor via said bus, said direct access storage device storing said second portion of operating system microcode, said microprocessor being responsive to said load indicator for loading said second portion of operating system microcode into said volatile memory during execution of said initialization program when said load indicator indicates that said personal computer requires access to said second portion of operating system.

5,465,358

SYSTEM FOR ENHANCING USER EFFICIENCY IN INITIATING SEQUENCE OF DATA PROCESSING SYSTEM USER INPUTS USING CALCULATED PROBABILITY OF USER EXECUTING SELECTED SEQUENCES OF USER INPUTS

Jerry A. Blades, and Harvey G. Kiel, both of Rochester, Minn., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Dec. 28, 1992, Ser. No. 997,398
Int. Cl.[6] G06F *15/40*
U.S. Cl. 395—700 **14 Claims**



1. A method in a data processing system for enhancing user efficiency in initiating a sequence of data processing system user inputs, said method comprising the data-processing-system-implemented steps of:

identifying a stimulus event within said data processing system;

storing, within said data processing system, each sequence of data processing system user inputs which occurs in response to each subsequent occurrence of said stimulus event;

thereafter calculating a positive probability of a user executing a selected sequence of data processing system user inputs in response to a subsequent occurrence of said stimulus event, utilizing said stored sequences of data processing system user inputs;

displaying, within said data processing system in response to a subsequent occurrence of said stimulus event, an identification of one or more selected sequences of data processing system user inputs;

indicating said calculated positive probability of a user executing each of said identified one or more selected sequences of data processing system user inputs; and

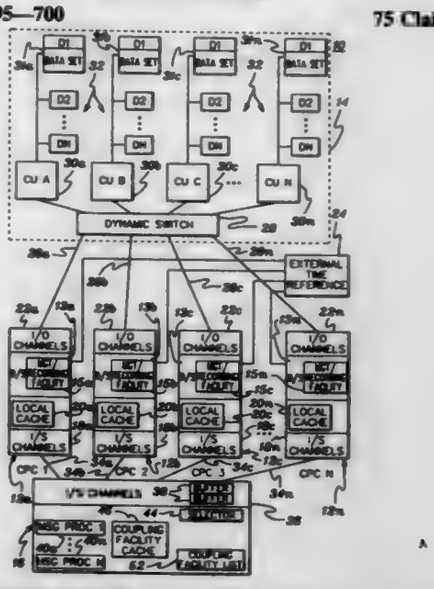
automatically initiating one of said identified one or more selected sequences of data processing system user inputs in response to a user input, wherein a user's efficiency in performing a sequence of data processing system inputs within said data processing system is enhanced.

5,465,359

METHOD AND SYSTEM FOR MANAGING DATA AND USERS OF DATA IN A DATA PROCESSING SYSTEM

Ruth A. Allen, Poughkeepsie, N.Y.; Lisa M. Goetze, Austin, Tex.; Jeffrey M. Nick, Fishkill, N.Y.; Kelly B. Pushong, Highland, N.Y.; David H. Surman, Milton, N.Y., and Michael D. Swanson, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1993, Ser. No. 146,727
Int. Cl.[6] G06F *9/06*
U.S. Cl. 395—700 **75 Claims**



1. A method for managing status information in a data processing system comprising at least one operating system, said method comprising the steps of:

executing by said at least one operating system a user process, said at least one operating system being coupled to a coupling facility comprising processing means and a memory, said memory comprising a storage structure; and

maintaining at said coupling facility status information indicating whether said user process is attached to said storage structure.

5,465,360

METHOD AND APPARATUS FOR INDEPENDENTLY RESETTING PROCESSORS AND CACHE CONTROLLERS IN MULTIPLE PROCESSOR SYSTEMS

David A. Miller, Houston; Kenneth A. Jansen, Spring; Paul R. Culley, Cypress; Mark Taylor, and Javier F. Izquierdo, both of Houston, all of Tex., assignors to Compaq Computer Corp., Houston, Tex.

Continuation of Ser. No. 15,314, Feb. 9, 1993, which is a continuation of Ser. No. 431,653, Nov. 3, 1989. This application Nov. 12, 1993, Ser. No. 152,241
Int. Cl.[6] G06F *9/00*
U.S. Cl. 395—700 **6 Claims**

1. A computer system comprising:

a system bus for transmitting program instructions and data;

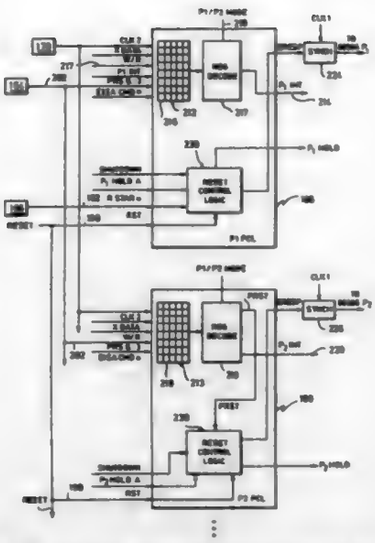
a primary processor connected to said system bus for controlling said system bus and for executing program instructions;

at least one secondary processor connected to said system bus for controlling said system bus and for executing program instructions;

means for generating a system reset signal;

means responsive to said system reset signal for resetting all of said primary and secondary processors;

means for generating a primary processor reset signal including:



means for receiving program instructions and data via said system bus;

decoding means for decoding said program instructions to determine that a primary processor reset has been requested, said decoding means including:

a primary processor reset data register;

means for generating a register select signal for enabling said primary processor reset data register to receive data in response to primary processor reset program instructions; and

means for writing reset data indicative of a primary processor reset request to said primary processor reset data register; and

reset signal means responsive to said decoding means determining that a primary processor reset has been requested for generating said primary processor reset signal, said reset signal means comprising:

means responsive to the state of data in said primary processor reset data register for generating a primary processor reset initiation signal;

means responsive to said primary processor reset initiation signal for generating a processor hold request signal;

means for providing the processor hold request to said primary processor;

means for delaying the generation of said primary processor reset signal until said primary processor is in a hold state; and

means for providing said primary processor reset signal after said primary processor is in a hold state; and

means responsive to said primary processor reset signal for resetting only said primary processor.

5,465,361

MICROCODE LINKER/LOADER THAT GENERATES MICROCODE SEQUENCES FOR MRI SEQUENCER BY MODIFYING PREVIOUSLY GENERATED MICROCODE SEQUENCES

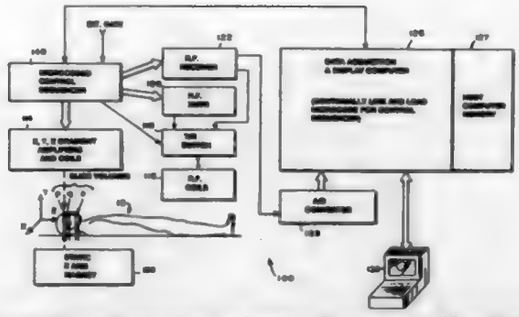
John C. Hoenninger, III, Oakland, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 579,631, Sep. 10, 1990, abandoned. This application Dec. 13, 1993, Ser. No. 165,534

Int. Cl.[6] G06F 9/30

U.S. Cl. 395—700 **64 Claims**

1. In a magnetic resonance imaging system of the type including a magnetic field generator, an RF field generator, an RF receiver, a



data acquisition subsystem, and a control sequencer, said magnetic field generator and said RF field generator cooperating to stimulate nuclear magnetic resonance phenomena within an object to be imaged, said RF receiver receiving NMR signals produced by said nuclear magnetic resonance phenomena, said data acquisition subsystem acquiring digitized signals, said control sequencer controlling at least one of said magnetic field generator, said RF field generator and said data acquisition subsystem, said control sequencer having a control store for storing and accessing instructions for execution,

a method of efficiently and rapidly generating instructions for execution by said control sequencer,

said method comprising:

(a) generating a sequencer control store memory image including sequencer instructions, said instructions including first parameters that define a first projection;

(b) loading said sequencer control store memory image, including said first projection parameters, into said sequencer control store;

(c) executing, with said sequencer, said sequencer control store memory image loaded into said sequencer control store by said loading step (b);

(d) controlling, with said sequencer, said magnetic field generator and/or said RF field generator in response to execution of said sequencer control store memory image by said executing step (c) so as to stimulate nuclear magnetic resonance phenomena within said object;

(e) acquiring, with said RF receiver and said data acquisition subsystem, first NMR signals emitted by said nuclear magnetic resonance phenomena stimulated by said controlling step (d);

(f) reusing said sequencer control store memory image by rapidly replacing said first projection parameters within said sequencer control store memory image with second projection parameters defining a second projection to create an altered sequence control store memory image, and loading said altered sequencer control store memory image, including said second projection parameters, into said sequencer control store;

(g) executing, with said control sequencer, said altered sequencer control store memory image loaded by said reusing step (f);

(h) controlling, with said sequencer, said magnetic field generator and/or said RF field generator in response to execution of said altered memory image by said executing step (g) so as to stimulate nuclear magnetic resonance phenomena within said object;

(i) acquiring, with said RF receiver and said data acquisition subsystem, second NMR signals emitted by said nuclear magnetic resonance phenomena stimulated by said controlling step (h); and

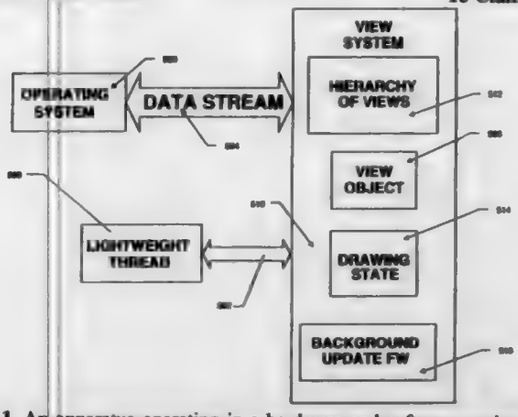
(j) generating an image of said object based at least in part on said first and second NMR signals acquired by said steps (e) and (i).

5,465,362

OBJECT-ORIENTED VIEW-SYSTEM FOR DISPLAYING INFORMATION IN A WINDOWING ENVIRONMENT

Debra L. Orton, San Jose; Keith A. Rollin, Sunnyvale, and Bill Gibbons, Los Altos Hills, all of Calif., assignors to Taligent, Inc., Cupertino, Calif.

Filed Dec. 30, 1993, Ser. No. 175,851
Int. Cl.[6] G06F 9/44
U.S. Cl. 395—700 16 Claims



1. An apparatus operating in a hardware and software environment for generating a visual display on a display screen, the visual display having a plurality of windows displayed on a desktop background, each of the plurality of windows being assigned to, and displaying screen information generated by, one of a plurality of application programs, the apparatus comprising:

(a) a processor;

(b) a storage attached to and under the control of the processor, the storage having a screen buffer for holding screen information;

(c) means, coupled to the display screen, for visually displaying screen information held in the screen buffer on the display screen;

(d) view object class information stored in the storage, the view object class information including a data structure for holding screen information for one of the plurality of windows, methods for storing screen information in the data structure and an object constructor method containing a virtual initialization method:

means for constructing a view system object in the storage for each of the plurality of application programs, each view system object including:

a view hierarchy structure having a plurality of levels for holding at least one view object; and

means for transferring screen information stored in view objects held in the view hierarchy structure to the screen buffer so that the screen information is displayed on the display screen; and

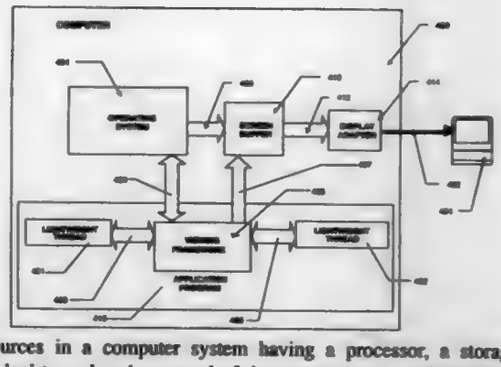
(f) means for instantiating a view object from the view object class information by executing the object constructor method and, in turn, invoking the virtual initialization method of the view object to initialize the view object by inserting the view object into a view hierarchy structure of one view system object.

5,465,363

WRAPPER SYSTEM FOR ENABLING A NON-MULTITASKING APPLICATION TO ACCESS SHARED RESOURCES IN A MULTITASKING ENVIRONMENT

Debra L. Orton, 972 Nantucket Ct., San Jose, Calif. 95126, and Keith Rollin, 1599 Meadowlark La., Sunnyvale, Calif. 94087

Filed Dec. 30, 1993, Ser. No. 176,148
Int. Cl.[6] G06F 9/44
U.S. Cl. 395—700 14 Claims



1. An apparatus for processing a request generated by a non-multitasking application task to access a plurality of shared resources in a computer system having a processor, a storage attached to and under control of the processor and a multitasking operating system running in the storage and controlling the processor, the apparatus comprising:

(a) means controlled by the multitasking operating system for constructing a first multitasking wrapper object containing a plurality of non-multitasking target objects, each of the plurality of target objects containing data and logic for accessing one of the plurality of shared resources;

(b) means responsive to the request to access one of the plurality of shared resources for reserving one of the plurality of target objects which can access the one shared resource: and

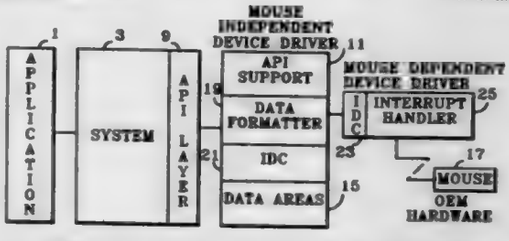
(c) means responsive to the request for using the data and logic in the reserved target object for accessing the one shared resource.

5,465,364

METHOD AND SYSTEM FOR PROVIDING DEVICE DRIVER SUPPORT WHICH IS INDEPENDENT OF CHANGEABLE CHARACTERISTICS OF DEVICES AND OPERATING SYSTEMS

Frederick L. Lathrop, Delray Beach, and Kenneth A. Rowland, Boynton Beach, both of Fla., assignors to International Business Machines, Inc., Armonk, N.Y.

Continuation of Ser. No. 970,434, Nov. 2, 1992, abandoned, which is a continuation of Ser. No. 411,074, Sep. 22, 1989, abandoned. This application Mar. 18, 1994, Ser. No. 210,530
Int. Cl.[6] G06F 13/12;13/10;3/00
U.S. Cl. 395—700 8 Claims



1. A device driver arrangement for use with a specific operating system of a computer system, wherein devices external to said computer system are attachable to said computer system, and said specific operating system interfaces between said computer system and application programs for controlling access to said external devices, said device driver arrangement comprising:

a device independent driver section forming an integral part of said operating system and operating independently of any electrical or physical attribute of any device externally attachable to said computer system;

a device dependent driver section discretely separate from said device independent driver section and having dependency in its operations on a characteristic of at least one device externally attachable to said computer system;

means incorporated in said device independent driver section for interacting with an application program interface (API) layer;

means incorporated in said device independent driver section for formatting data in transit between said device dependent driver section and said computer system;

means incorporated in said device independent driver section for communicating with said device dependent driver section and for managing storage of data transferred between said device dependent driver section and said computer system;

means incorporated in said device dependent driver section for communicating with said device independent driver section; and means in said device dependent driver section for managing transmittal of data between said at least one pointer device and said device independent driver section via said communicating means;

said device dependent driver dependent section having no dependence on any specific attribute of said operating system that is not contained in said device independent driver section; said device dependent driver section communicating with said operating system only through said device independent driver section.

5,465,365

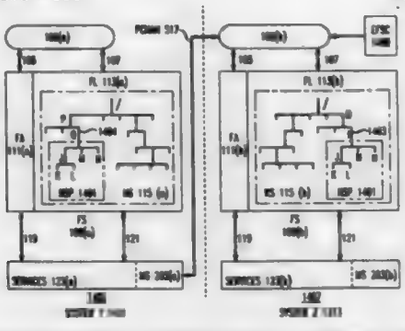
APPARATUS AND METHODS FOR MAKING A PORTION OF A FIRST NAME SPACE AVAILABLE AS A PORTION OF A SECOND NAME SPACE

Philip S. Winterbottom, Gillette, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 999,755, Dec. 31, 1992, abandoned. This application May 20, 1994, Ser. No. 247,626

Int. Cl.[6] G06F *12/00;13/00*

U.S. Cl. 395—600 **23 Claims**



1. Apparatus which is implemented in a computer system for making an exported name from a portion of a first name space of user-defined names representing entities available to be used in a portion of a second name space of user-delined names so that use of the exported name in the portion of the second name space results in use of the exported name in the portion of the first name space, the apparatus comprising:

mounting means operating in the second name space for incorporating the portion of the first name space into the second name space and thereby making the exported name available in the second name space;

means operating in the first name space for receiving a first operation specification produced in the second name space, the first operation specification specifying an operation and including the exported name, the exported name being used in the first operation specification as required for the portion in the second name space, the means for receiving operating after operation of the mounting means;

interpretation means operating in the first name space for responding to the first operation specification by producing a second operation specification which specifics the same operation and includes the exported name, the exported name being used in the second operation specification as required for the portion in the first name space; and

means operating in the first name space and responsive to the second operation specification for performing the operation on the entity represented by the exported name.

5,465,366

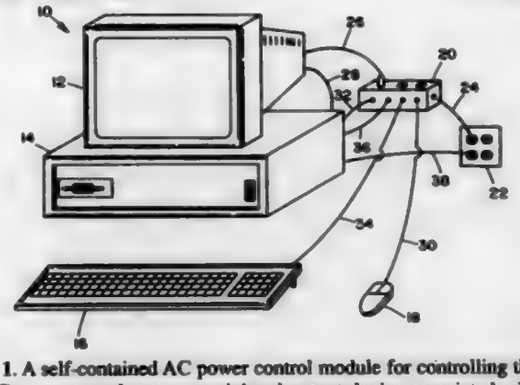
POWER CONTROL MODULE FOR COMPUTER MONITORS

Lee J. Heineman, Philadelphia, Pa., assignor to Energy Concepts, Inc., Rockland, Del.

Filed Sep. 3, 1993, Ser. No. 117,515

Int. Cl.[6] G06F *1/32*

U.S. Cl. 395—750 **11 Claims**



1. A self-contained AC power control module for controlling the AC power to at least one peripheral output device associated with an existing electronic data processing system having at least an AC power supply, a microprocessor, and an associated peripheral input device, comprising:

a data path terminating on a1 first end in an input coupling means for coupling with the peripherial input device and on a second end in an output coupling means for coupling with the data processing system;

said data path including data switching means for enabling or disabling the flow of data pulses through said data path;

a power path terminating on a first end in an input coupling means for coupling with an AC power source and on a second end in an output coupling means for coupling with the peripherial output device;

said power path including power switching means for selectively enabling or disabling AC power through said power path;

a detection circuit coupled to said data path upstream of said data switch means, responsive to pulses received via said data path input coupling means;

a timing module, connected to said detection circuit, which is reset by each detected pulse and which times out after a predetermined duration, for outputting a control signal to said data and power switching means;

said power switching means comprising a zero-crossing AC power switch, for monitoring the AC voltage and for controlling the AC supply power to the peripheral output device in response to the control signal and the detected voltage; and

said data switching means comprising a data switch, for controlling input of data to the microprocessor in response to the control signal.

5,465,367

SLOW MEMORY REFRESH IN A COMPUTER WITH A LIMITED SUPPLY OF POWER

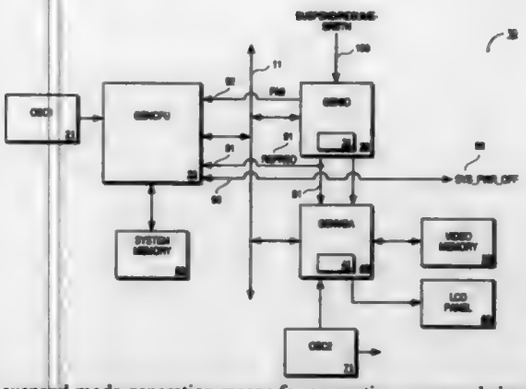
Chandrashekar M. Reddy, Santa Clara; Scott D. Hirose, San Jose; Sung-Soo Cho, Sunnyvale; James P. Kardach, San Jose; Steven M. Farrer, Santa Clara, and Meeling Roberts, Fremont, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 963,282, Oct. 19, 1992, abandoned, which is a continuation of Ser. No. 597,363, Oct. 12, 1990, abandoned. This application Jul. 19, 1994, Ser. No. 277,771

Int. Cl.[6] G06F *1/32*

U.S. Cl. 395—750 **30 Claims**

1. In a computer system with a limited source of power and memory being refreshed using a first clock, an improvement for conserving power in refreshing the memory comprising:



suspend mode generation means for generating a suspend signal upon activation of a power suspend mode, the power suspend mode being activated in response to a first event internal to the computer system and a second event external to the computer system;

an input/output unit coupled to receive said suspend signal and for generating an interrupt in response thereto;

a central processing unit coupled to receive said interrupt and in response thereto for generating a first suspend control bit and a second suspend control bit and for saving current system registers and stack pointers of said computer system to a particular location in said memory in response to said interrupt, said central processing unit coupled to system dynamic memory;

wherein said system dynamic memory is a portion of said memory, wherein said input/output unit is coupled to receive said first suspend control bit and is also for generating a power off signal in response thereto;

a video interface device coupled to a video dynamic memory wherein said video dynamic memory is a portion of said memory, said video interface device coupled to receive said second suspend control bit;

resume mode generation means coupled to the CPU for generating a resume signal upon deactivation of the power suspend mode, the power suspend mode being deactivated in response to a third event internal to the computer system and a fourth event external to the computer system;

wherein the input/output unit comprises clock generation means, coupled to the suspend mode generation means and the resume mode generation means, for generating a second clock slower than the first clock, the second clock being fast enough to be used to refresh said system and video dynamic memory without causing a loss of data contained therein;

means for refreshing the video dynamic memory and the system dynamic memory using the second clock in response to said second suspend control bit and said power off signal, respectively, to place said memory into a reduced power state;

means for disabling the first clock after the suspend signal is received from the suspend mode generation means;

means for enabling the first clock after the resume signal is received from the resume mode generation means; and

means for refreshing the system dynamic memory and the video dynamic memory using the first clock after the resume signal is received from the resume mode generation means.

5,465,368

DATA FLOW MACHINE FOR DATA DRIVEN COMPUTING

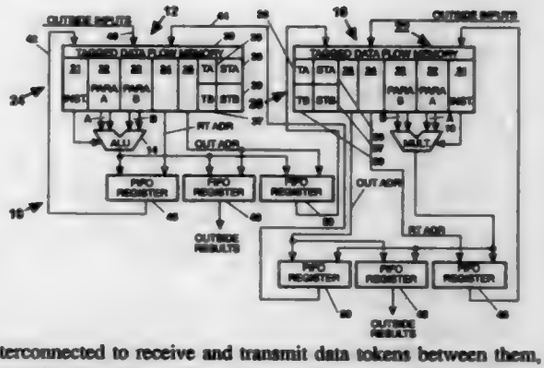
George S. Davidson, and Victor G. Grafe, both of Albuquerque, N.M., assignors to United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 223,133, Jul. 22, 1988, abandoned. This application Jul. 24, 1990, Ser. No. 559,523

Int. Cl.[6] **G06F** *13/00*

U.S. Cl. 395—800 **4 Claims**

1. A data flow machine, comprising at least two processor elements capable of receiving an input data token and operatively



interconnected to receive and transmit data tokens between them, each of said processor elements comprising:

(a) two processors operatively connected, each of said processors further comprising

control logic,

data paths operatively connecting at least one execution unit,

an input means connected to receive said input data token to a data flow memory in a one-to-one operative connection with said processor and deliver said input data token to said data flow memory, said input means of each of said processors further comprises a first input FIFO register, a second input FIFO register, and a third input FIFO register, said first input FIFO register operatively connected to receive an input data token from the data flow memory in the one-to-one operative connection with that processor, said second input FIFO register operatively connected to receive an input data token from the other processor of the same processor element, and said third input FIFO register operatively connected to receive an input data token from another processor element,

a flag checking and updating means,

a transmitting means and

an output means to output said data token, said output means connected to said execution unit and comprising a first output FIFO register, a second output FIFO register, and a third output FIFO register,

(b) said data flow memory having a plurality of storage locations, each storage location having an address and a plurality of storage areas further comprising:

a parameter storage area for storing at least one parameter indicator,

an operation storage area for storing an operation indicator of an operation to be performed on at least one of said parameter indicators,

a flag storage area having a state representative of the presence of parameter indicators required by said operation, and

an output target address storage area which provides an output target address to which said output data token is directed;

wherein said input means directs an input data token having a target address and a first parameter indicator to one of said storage locations identified by said target address, and in response thereto said flag checking and updating means checks the state of the flag in the flag storage area in the identified storage location to determine if other parameter indicators required by the operation in the identified storage location are present and further updates the state of the flag in the flag storage area in the identified storage location to indicate that said first parameter indicator is present, and in response thereto said transmitting means transmits said operation indicator and those parameter indicators that are present in said identified storage location to said execution unit wherein said operation is performed and a valid output data token is generated only if all parameter indicators required by the operation are present in the identified storage location, said first output FIFO register is operatively connected to transmit an output data token to the data flow memory in the one-to-one operative connection with that processor, said second output FIFO register is operatively connected to transmit an output data token to the other processor of

the same processor element, and said third output FIFO register is operatively connected to transmit an output data token to another processor element.

5,465,369

NETWORK STRUCTURE FOR PARALLEL SOFTWARE PROCESSING

Ion Minca, Sos. Colentina nr. 83, B1.85, sector 2,, Bucharest, Romania

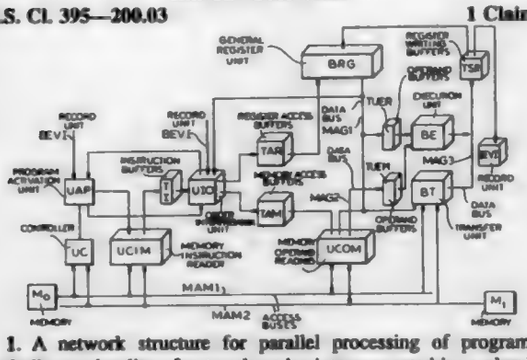
PCT No. PCT/RO92/00005, § 371 Date Jun. 10, 1993, § 102(e) Date Jun. 10, 1993, PCT Pub. No. WO93/07571, PCT Pub. Date Apr. 15, 1993

PCT Filed Feb. 12, 1992, Ser. No. 75,556

Claims priority, application Romania, Jan. 10, 1991, 148526

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.03 **1 Claim**



1. A network structure for parallel processing of programs including a plurality of network nodes interconnected by a plurality of network branches terminating at each node, said network structure comprising:

a plurality of processing units in said branches, each of said network branches comprising one of said processing units;

a plurality of memory units distributed at said nodes, each of said nodes comprising one of said memory units;

each of said processing units providing a multiplicity of high-granularity virtual processors for carrying out processing operations on memory units of nodes terminating each branch provided with a respective processing unit and transfer operations therebetween,

each memory unit comprising:

means forming a memory connection bus, for providing all processing units connected to the respective memory unit with memory access,

means forming an interprocess control block, for routing control commands from a virtual processor of a respective processing unit to a virtual processor of another processing unit, both processing units being connected to the respective memory unit by said memory connection bus, and

each of said processing units comprises:

a program activation unit comprising a program address stack and control means for current instruction address computation and emission of instruction retrieve orders from a memory unit connected to the respective processing unit, for execution of jumps and for program state changes based on control indicators used in control of the respective processing unit, and acting as a mixer of processing programs which, by a cyclical scanning of said program address stack delivers in successive cycles one instruction or two instructions of each processing program to generate a processing flow which shares all resources of the respective processing unit,

a memory instruction reading unit connected to said program activation unit and including a cache memory, and which takes instruction retrieve orders from the program activation unit and retrieves instructions from a connected memory unit or from its cache memory,

instruction buffers connected to said memory instruction reading unit and which receive instructions retrieved by said memory instruction reading unit,

an order interpretation block connected to said instruction buffers, said order interpretation block including interpretation units for order interpretation block processing throughput, and receiving instructions from the instruction buffers, interpreting received instructions and computing operation type, register-operand addresses, execution indicators and memory-operand addresses, except for jump instructions when a jump address is sent to the program activation unit where a jump operation is executed,

a general register block operatively connected to said order interpretation block, said general register block including general registers, and two access gates, controlled by a priority access mechanism for reading and writing,

a memory operand reading unit operatively connected to said general register block and including cache memory, for retrieving operands from a connected memory unit or from a respective cache memory,

a register access buffer block connected to general register block add to said order interpretation block and which receives from said order interpretation block an operation type, register-operand addresses and execution indicators and the operation type register-operand and sends addresses and execution indicators to said general register block,

a memory access buffer block, connected to said order interpretation block and to said memory operand reading unit and which receives from said order interpretation block memory-operand addresses and sends them to said memory operand reading unit for operand retrieval,

a register-operand buffer block connected to said register access buffer block for storing operation type, register-operands, register-operand address and execution indicators emitted by said register access buffer block and general register block,

a memory-operand buffer block connected to said memory operand reading unit and which stores memory operands emitted by said memory operand reading unit,

a data bus connecting said general register block and said register-operands buffer block,

a data bus connecting said memory operands reading unit and said memory operands buffer block,

an execution block connected to said data buses, including execution units, specialized as to operation types and whereby, for each execution unit type, said execution units being in a number significant for execution block processing throughput per operation type and receiving operation type, register-operands, register operand addresses and execution indicators from the register-operand buffer block and the memory operands from the memory operand buffer block, and executing the operation and determining operation result, in conformity with said execution indicators, and a result register address from the register-operand addresses, a transfer block, including transfer units receiving transfer orders and result register address from said order interpretation block and transfer parameters from said general register block, and executing a data transfer between two memory units to which the respective processing unit is connected, under the transfer orders and the transfer parameters, and updating, after completing the data transfer, the transfer parameters,

a control system connected to said data buses and comprising means for control of the respective processing unit, said control indicators, and all of the buffers and buses of the respective processing unit, based on indicators, addresses and labels for the instructions and operands thereof, unit components, and a record block storing said control indicators,

a register writing buffer block which receives said operation result and a result register address from the execution block or said transfer parameters and result register address, and writes them in the general register block and in same time updates control indicators stored in said record block,

a data bus connecting said execution block or said transfer block and said register writing buffer block, and

a control unit which receives control commands from a memory connection bus connecting the processing unit to

respective memory units, and performing operations of start, stop and testing of the processes within the processing unit, to each process being allocated one virtual processor obtained by unit processing resource sharing.

5,465,370

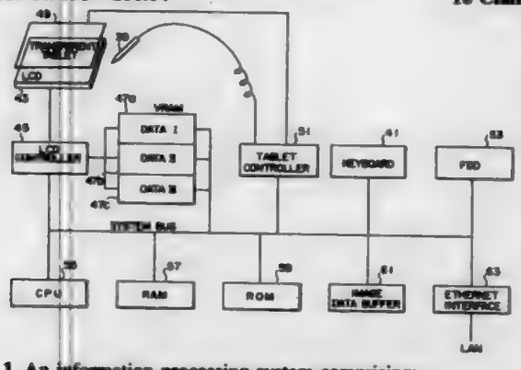
ELECTRONIC MEETING SUPPORT SYSTEM

Takafumi Ito, Tokyo; Kenji Suzuki, Seka, both of, Japan; Takayuki Ikeda, Irving, Calif.; Fumio Oyama, Tokyo, Japan, and Walt Mazur, Laguna Hills, Calif., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan, and Toshiba America Information Systems Inc., Calif.

Filed Jan. 28, 1992, Ser. No. 826,846

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.04 **16 Claims**



1. An information processing system comprising:

a plurality of information processing apparatuses each comprising an input device, a display device, and a communication device for performing a data communication with other information processing apparatuses;

a data communication path for performing a data communication among the communication devices of said plurality of information processing apparatuses;

means for transmitting information input by the input device of an arbitrary one of said plurality of information processing apparatuses to all the information processing apparatuses in real time via said data communication path;

means for displaying the transmitted information on the display devices of said information processing apparatuses;

each of said information processing apparatuses comprising means for discriminating, in the information input from the input device of the arbitrary information processing apparatus, first information which is transmitted to said information processing apparatuses via said data communication path and is displayed on the display devices of said information processing apparatuses and second information which is not transmitted to other information processing apparatuses, and is displayed on only the display device of the information processing apparatus having the input device at which the second information is input;

each of said information processing apparatuses further comprising:

first storage means for storing the first information;

second storage means for storing the second information; and

means for selecting whether or not first display information stored in said first storage means and second display information stored in said second storage means are displayed, or whether the first display information stored in said first storage means and the second display information stored in said second storage means are added together and the added together display information is displayed, the added together display information comprising stored data of the first and second display information and being created by means of a display controller.

5,465,371

SORTER FOR SORTING DATA BASED ON A PLURALITY OF REFERENCE VALUE DATA

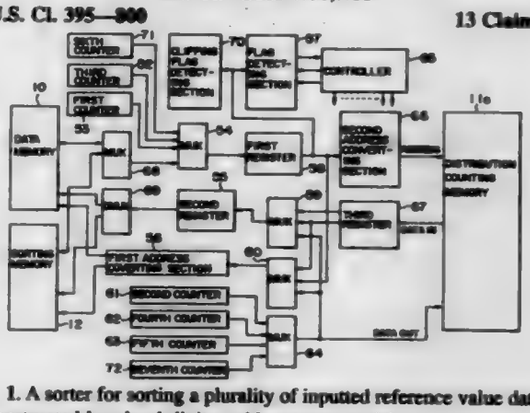
Tatsuya Fujii, Nishinomoya, and Naoto Shiraishi, Mineo, both of, Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 827,635, Jan. 29, 1992, abandoned. This application Nov. 18, 1992, Ser. No. 978,925

Claims priority, application Japan, Jan. 29, 1991, 3-029305; Nov. 11, 1991, 3-323851; Jan. 25, 1992, 4-034158

Int. Cl.[6] G06F *7/06;7/16*

U.S. Cl. 395—800 **13 Claims**



1. A sorter for sorting a plurality of inputted reference value data constructed by plural digits, said sorter comprising:

data number generating means for generating a data number corresponding to each of the inputted reference value data;

reference value data memory regions of plural digits for dividing the inputted reference value data into two or more data groups, and storing the divided data to addresses corresponding to respective data numbers;

a counting start region having a first memory region corresponding to a designated data group addressed on the basis of the reference value data of each of the divided data groups;

the counting start region storing the data number generated from the data number generating means to the first memory region when each of the reference value data corresponding to the first memory region is first inputted;

a counting end region having a second memory region addressed on the basis of said reference value data;

the counting end region updating and storing the data number generated from the data number generating means to the second memory region every time said reference value data corresponding to the second memory region are inputted;

a pointer region for designating an address next to an address designated on the basis of the data number;

first control means for writing a new updated data number to the pointer region designated by the data number before update every time the data number of said counting end region is updated;

a sorting memory having sorting address regions corresponding to said divided data groups and storing sorted results;

second control means for chaining and writing data numbers written to the counting start region, the pointer region and the counting end region on an upper position side to the sorting memory after the data numbers are completely written to the counting start and end regions on the upper position side in accordance with the reference value data on the upper position side of said divided data groups;

third control means for chaining and writing data numbers written to the counting start region, the pointer region and the counting end region on a lower position side to the sorting memory after the reference value data on said upper position side are completely sorted and reference value data from a memory region for reference value data on the lower position side corresponding to the reference value data on said upper position side having the same reference value on the upper position side are completely written to the counting start and end regions on the lower position side,

wherein said sorter further comprises flag setting means having a flag group corresponding to an address based on the reference value data on the upper position side;

the flag setting means sets a flag of said flag group at an address corresponding to a memory region for performing clipping or picking processing; and

the third control means omits a sorting operation of the reference value data on the lower position side with respect to the reference value data on the upper position side at the address corresponding to the clipping processing after the reference value data on the upper position side are completely sorted.

5,465,372

DATAFLOW COMPUTER FOR FOLLOWING DATA DEPENDENT PATH PROCESSES

Israel Gottlieb, Jerusalem, and Yehuda Singer, Tel Aviv, both of, Israel, assignors to Bar Ilan University, Ramat Gan, Israel

Filed Jan. 6, 1993, Ser. No. 994

Claims priority, application Israel, Jan. 6, 1992, 100,598

Int. Cl.[6] G06F *9/30;9/345;9/445;11/28*

U.S. Cl. 395—800 **12 Claims**

1. A dataflow machine for generally following data dependent path processes, the machine comprising:

an instruction store;

an operand store;

a plurality of data dependent path process executors, each process executor comprising

an instruction queue and

a queue loader associated with said instruction queue and operative to load said instruction queue with instructions selected from said instruction store, wherein said instructions with which said instruction queue is loaded are associated with a dynamically determined data dependent path process and are selected based, at least in part, on an active operand associated with each said instruction, said active operand comprising a result of a previous instruction, and wherein at least some of said instructions are selected based, at least in part, on availability of an outside operand, and wherein said queue loader is operative to read said outside operand from said operand store;

execution apparatus operative to sequentially apply each instruction in each said instruction queue to at least the active operand associated with each said instruction and to produce a result from each said instruction; and

storing apparatus operative to store said result in said operand store.

5,465,373

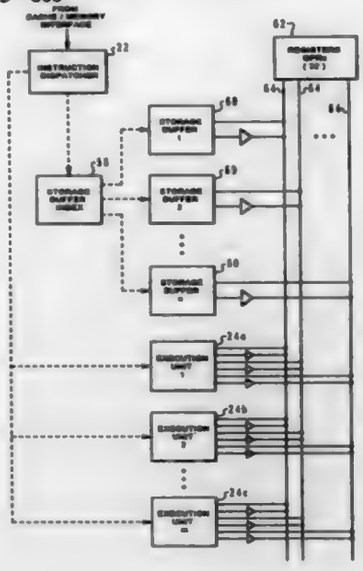
METHOD AND SYSTEM FOR SINGLE CYCLE DISPATCH OF MULTIPLE INSTRUCTIONS IN A SUPERSCALAR PROCESSOR SYSTEM

James A. Kahle; Chin-Cheng Kau; David S. Levitan; Aubrey D. Ogden; Ali A. Poursepanj; Paul K.-G. Tu, all of Austin, and Donald E. Waldecker, Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 8, 1993, Ser. No. 1,864

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—800 **7 Claims**



3. A system for enhanced instruction dispatch efficiency in a superscalar processor system capable of simultaneously dispatching multiple scalar instructions to a plurality of execution units during each single processor cycle, each of said multiple scalar instructions including at least one source operand and one destination operand, said system comprising:

a plurality of intermediate storage buffers within said superscalar processor system;

means for determining if an appropriate one of said plurality of execution units is available for execution of a selected one of said multiple scalar instructions during said single processor cycle;

means for determining if a destination operand within a preceding one of said multiple scalar instructions is equal to a source operand within said selected one of said multiple scalar instructions;

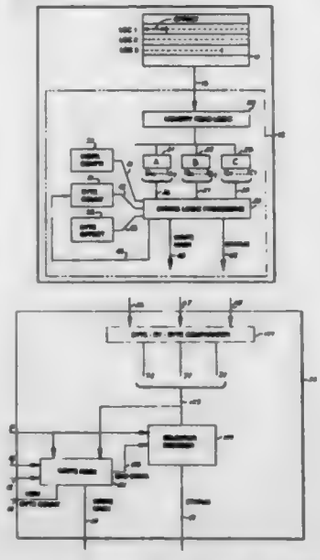
means for assigning a particular one of said plurality of intermediate storage buffers to said destination operand within said selected one of said multiple scalar instructions during said single processor cycle; and

means for dispatching said selected one of said multiple scalar instructions to said appropriate one of said plurality of execution units in response to said availability thereof, said assignment of said particular one of said plurality of intermediate storage buffers to said destination operand and an assignment of another one of said plurality of intermediate storage buffers to said destination operand within said preceding one of said multiple scalar instructions during said single processor cycle wherein results of execution of said selected one of said multiple scalar instructions may be written to said particular one of said plurality of intermediate storage buffers.

5,465,374
PROCESSOR FOR PROCESSING DATA STRING BY BYTE-BY-BYTE

Robert M. Dinkjian, Woodstock; Lisa C. Heller, Saugerties; Steven R. Kordus, Kingston; Kenneth A. Lauricella, Hurley; Thomas W. Seigendall, Saugerties, all of N.Y.; Robert A. Skaggs, Manassas, Va., and Nelson S. Xu, Hyde Park, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1993, Ser. No. 3,369
Int. Cl.[6] G06F 7/00
U.S. Cl. 395—800 6 Claims



1. A data processor system comprising memory and a data processor, the memory comprising a plurality of data word locations each arranged to contain a predetermined number of data bytes and a data string stored in the memory, the data processor comprising:

a data register;

memory access circuitry for reading one of the data word locations containing at least a portion of the data string and storing the portion of the data string in the data register;

end condition detection circuitry connected to the data register generating a multi-bit output word in which certain bits are significant condition bits defining presence of an end condition for a correspondingly positioned byte in the data register;

a byte count register storing a value defining a number representing unprocessed bytes in the data string;

a first mask circuit connected to the byte count register for generating a byte count mask defining positions of bytes in the data register and belonging to the data string;

a first logic circuit connected to the end condition detection circuitry and to the first mask circuit for logically combining the byte count mask and the multi-bit output word of the end condition detection circuit and generating a multi-bit end condition output word defining end conditions of bytes in the data register belonging to the data string;

a second mask circuit connected to the first logic circuit for detecting a first significant condition bit in a first position nearer one end of the end condition output word than any other significant bit in the end condition output word and for generating an end condition mask defining only bits of the end condition output word up to and including the first significant condition bit;

a second logic circuit connected to the first mask circuit and the second mask circuit for generating a multi-bit output mask having a significant condition bit in a position corresponding to a first; byte in the data register representing an end condition and a significant condition bit in each position corresponding to a byte belonging to the data string and positioned between the first byte representing an end condition and one end of the data register corresponding to the one end of the end condition output word;

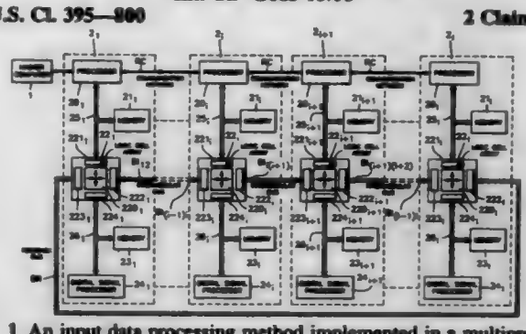
an offset register defining the position of a first byte of the string in a memory location with respect to one end of the memory word stored in the data register; and

a shift register connected between the first mask circuit and the first logic circuit and responsive to contents of the offset register to shift the byte count mask generated by the first mask circuit in a direction away from one end of the byte count mask corresponding to the one end of the data register by a number of bit positions defined by the contents of the offset register before the multi-bit mask generated by the first mask circuit is applied to the first logic circuit.

5,465,375
MULTIPROCESSOR SYSTEM WITH CASCADED MODULES COMBINING PROCESSORS THROUGH A PROGRAMMABLE LOGIC CELL ARRAY

André Thepaut, and Gerald Ouvradou, both of Plouzane, France, assignors to France Telecom, Paris, France

Filed Jan. 14, 1993, Ser. No. 4,582
Claims priority, application France, Jan. 14, 1992, 92-00312
Int. Cl.[6] G06F 15/16
U.S. Cl. 395—800 2 Claims



1. An input data processing method implemented in a multiprocessor data processing system,

said multiprocessor data processing system comprising a plurality of cascaded modules, each of said cascaded modules comprising:

a data processing unit connected to other data processing units in immediately adjacent downstream and upstream modules by means of a communication network,

a first memory for storing data,

an additional processing unit,

a second memory for storing data associated with said additional processing unit,

a programmable logic cell array configurable into first, second, third and fourth input/output interfacing means for temporarily memorizing data into memorized data, and into a central processing and switching means for processing said memorized data into processed data and switching said processed data towards one of said input/output interfacing means,

a first module bus for interconnecting said data processing unit, said first memory and said first input/output interfacing means, and

a second module bus for interconnecting said additional processing unit, said second memory and said fourth input/output interfacing means,

said second and third input/output interfacing means in said each of said cascaded modules being interconnected to the third input/output interfacing means in said immediately adjacent upstream module and the second input/output interfacing means in said immediately adjacent downstream module, by two intermodular buses, respectively,

said second and third input/output interfacing means respectively in said programmable logic cell array of a last module and a first module in said plurality of said cascaded modules being connected by means of a feedback bus,

said input data processing method comprising:

a first step further consisting in loading a respective set of matrix multiplication weights into said second memory of each of said cascaded modules via said communication network and said input data into said first memory of said first module, and

at least one set of second and third steps in each of said cascaded modules,

said second step consisting in carrying out partial processings on said input data in said additional processing unit of said each cascaded module as a function of said respective set of matrix multiplication weights for determining partial data, and

said third step consisting in downloading said partial data to any one of said programmable logic cell arrays or any one of said first and second memories in said cascaded modules via said intermodular buses and said feedback bus.

5,465,376

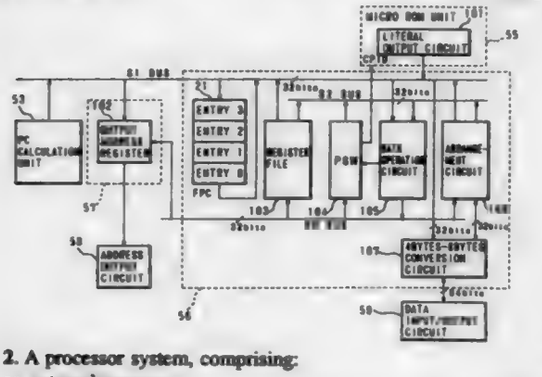
MICROPROCESSOR, COPROCESSOR AND DATA PROCESSING SYSTEM USING THEM

Toyohiko Yoshida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Division of Ser. No. 524,243, May 15, 1990, Pat. No. 5,218,711. This application May 5, 1993, Ser. No. 59,943

Int. Cl.[6] G06F *9/46*

U.S. Cl. 395—800 **3 Claims**



2. A processor system, comprising:

an external memory;

a floating-point processor which executes floating-point instructions;

an integer processor which is connected with said external memory via an external bus and with said floating-point processor, and which executes integer instructions, including:

a decoder for decoding instructions, including said integer instructions and floating-point instructions, fetched from said external memory via said external bus; and

a program counter value calculator for calculating PC values of said integer instructions and floating-point instructions, according to decoded results of said decoder;

a main program counter which is connected with said program counter value calculator via a first internal signal path, and holds the PC values of said integer instructions and floating-point instructions calculated by said program counter value calculator; and

a floating-point program counter which is connected with said program counter value calculator via a second internal signal path, and holds the PC values of said floating-point instructions calculated by said program counter value calculator;

wherein, when one floating-point instruction is executed by said floating-point processor, a PC value of said one floating-point instruction is written into said floating-point program counter from said program counter value calculator via said second internal signal path; and

when an exception is generated by execution of said one floating-point instruction in said floating-point processor and a program for exception processing is activated, said PC value of said one floating-point instruction is read out from said floating-point program counter into said integer processor via said second internal signal path by executing a predetermined instruction during execution of said program.

5,465,377

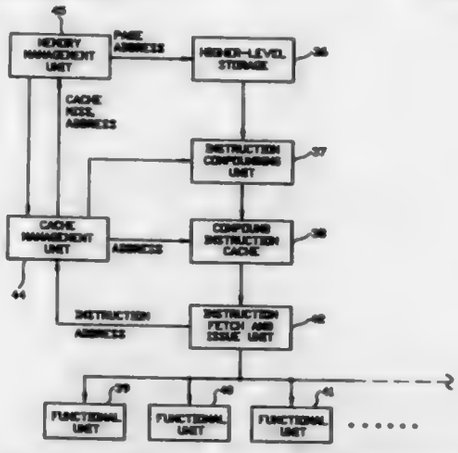
COMPOUNDING PREPROCESSOR FOR CACHE FOR IDENTIFYING MULTIPLE INSTRUCTIONS WHICH MAY BE EXECUTED IN PARALLEL

Bartholomew Blaner, Newark Valley, and Stamatis Vassiliadis, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 642,011, Jan. 15, 1991, Pat. No. 5,295,249, which is a continuation-in-part of Ser. No. 519,384, May 4, 1990, abandoned, and Ser. No. 522,291, May 10, 1990, Pat. No. 5,214,763. This application Sep. 24, 1993, Ser. No. 126,457

Int. Cl.[6] G06F *9/38;13/00*

U.S. Cl. 395—800 **6 Claims**



1. An apparatus for processing a series of instruction groups containing a sequence of compiled instructions for parallel execution, comprising:

buffer means for receiving a series of instruction groups, each group containing a sequence of compiled instructions;

categorization means responsive to the sequence of compiled instructions of each instruction group for:

determining whether at least two adjacent instructions of the sequence of compiled instructions belong to predetermined categories of instructions; and

providing first signals conditioned to indicate to which predetermined categories the at least two adjacent instructions of the sequence of compiled instructions belong;

interlock means responsive to the sequence of compiled instructions for providing second signals conditioned to indicate whether interlocks exist between the at least two adjacent instructions of the sequence of compiled instructions;

compounding signal means connected to the categorization and interlock means and responsive to the first and second signals for providing a compounding signal to indicate whether the at least two adjacent instructions of the sequence of compiled instructions belong to instruction categories compatible for execution in parallel and are interlock-free prior to an instruction fetch and decode cycle for instruction execution of said each instruction group during which cycle timing and selection of instructions for execution is determined; and

storage means connected to the compounding signal means for receiving a plurality of compounding signals for the sequence of instructions and for storing instructions which are grouped for concurrent execution.

5,465,378

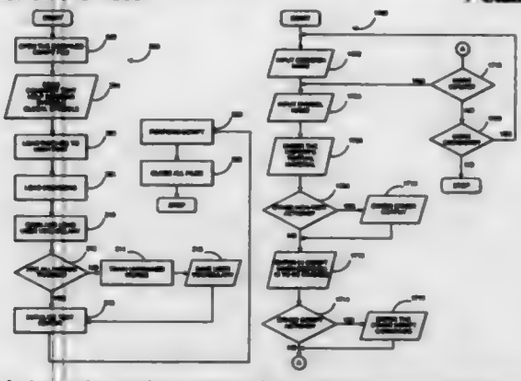
REPORT GENERATING SYSTEM

David T. Duensing, Leawood; Dayle E. Phillips, Overland Park, and Dennis C. Simmons, Mission Hills, all of Kans., assignors to Compuspeak, Inc., Kansas City, Mo.

Division of Ser. No. 774,743, Oct. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 523,607, May 15, 1990, abandoned. This application Oct. 12, 1993, Ser. No. 135,167

Int. Cl.[6] G06F *15/00*; G10L *5/00*

U.S. Cl. 395—800 7 Claims



1. A user-interactive method of operating a computer for generating a report, the computer having memory means for storing data, input means for receiving inputs into the computer, and output means for presenting outputs from the computer, said method comprising the steps of:

storing data in the computer memory means representative of sets of user inputs representing information needed for generating said report, and data representative of computer actions respectively corresponding to said inputs, said actions including at least one of retrieving report material, presenting a set of user inputs, and implementing computer commands;

presenting by way of the computer output means one of said sets of user inputs for selection by user;

entering by way of the computer input means a user-selected input;

responding in the computer to said user-selected input by performing said actions corresponding thereto;

repeating said entering and responding steps in accordance with said corresponding actions until said inputs needed for generating said report have been entered; and

compiling in the computer said report material corresponding to said user-selected inputs for generating said report thereby.

5,465,379

OPTICAL MESH-CONNECTED BUS INTERCONNECT FOR A COMPUTER

Yao Li, Monmouth Junction, and Satish Rao, Robbinsville, both of N.J., assignors to NEC Research Institute, Inc., Princeton, N.J.

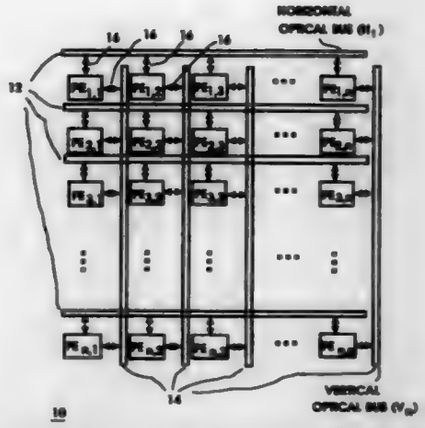
Continuation-in-part of Ser. No. 854,430, Mar. 19, 1992, abandoned. This application Mar. 1, 1994, Ser. No. 204,765

Int. Cl.[6] G02B *6/26*

U.S. Cl. 395—800 11 Claims

1. A mesh-connected bus network comprising:

a plurality of processing modules, each processing module including a processing element, a first and a second light source means, and a first and a second light detecting means, the first and second light source means of said processing modules forming, respectively, first and second two-dimensional arrays of rows and columns of light source means, the first and second light detecting means of the modules forming, respectively, first and second two-dimensional arrays of columns and rows of light detecting means, the first two-dimensional array of light source means being associated with the first two-dimensional array of light detecting means, and the second two-dimensional array of light source means being associated with the first two-dimensional array of light detecting means, the first array of light source means and the first array of light detecting means forming a first routing stage, the second array of light source means and the second array of light detecting means forming a second routing stage orthogonal to said first routing stage,



means for optically routing signals in the first stage of said network comprising means for converting a spot of light emitted by any one of said light sources means of any row of said first two-dimensional arrays of light source means into a stripe of light and directing said stripe of light over each of the detecting means in the associated row of the first two-dimensional array of light detecting means, and

means for optically routing signals in the second stage of the network comprising means for converting a spot of light emitted by any one of said light source means in any column of said second two-dimensional array of light source means into a stripe of light and directing said stripe of light over each of the detecting means in the associated column of the second two-dimensional array of light detecting means.

5,465,380

DATA TRANSFER METHOD OF TRANSFERRING DATA BETWEEN PROGRAMS OF A SAME PROGRAM GROUP IN DIFFERENT PROCESSORS USING UNIQUE IDENTIFIERS OF THE PROGRAMS

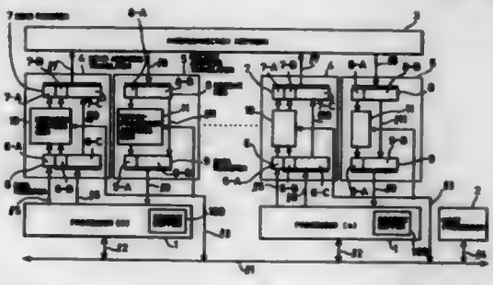
Naoki Hamanaka, Tokyo; Teruo Tanaka, Hachioji; Koichiro Omoda, Sagamihara, and Shigeo Nagashima, Hachioji, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 912,215, Jul. 10, 1992, Pat. No. 5,301,322, which is a continuation of Ser. No. 379,230, Jul. 13, 1989, abandoned, which is a continuation of Ser. No. 52,871, May 22, 1987, abandoned. This application Apr. 4, 1994, Ser. No. 222,949

Claims priority, application Japan, May 23, 1986, 61-117351

Int. Cl.[6] G06F *9/00*

U.S. Cl. 395—800 3 Claims



1. A method of transferring data between a plurality of processors interconnected by a network, wherein said plurality of processors execute a plurality of programs each belonging to one of a plurality of program groups, wherein a unique processor identifi-

cation code (processor ID) is assigned to each processor, and an identification code is assigned to each program, wherein said identification code assigned to each program is unique within one of the plurality of program groups to which said each program belongs, said method comprising the steps of:

assigning said plurality of programs to said plurality of processors such that a number of programs belonging to each program group are assigned to plural processors within said plurality of processors, wherein plural programs within said number of programs are assigned to one of said plural processors, and wherein plural programs belonging to different program groups are assigned to a same one of said plurality of processors;

executing said plurality of programs by said plurality of processors;

designating an identification code and data by a first one of said plurality of programs being executed by a first one of said plurality of processors at a timing when said first program requires transfer of said data to a second one of said plurality of programs which belongs to a same program group as said first program, said designated identification code being one assigned to said second program;

determining a processor ID assigned to a second one of said processors to which said second program has been assigned in said assigning step based on said designated identification code and a result of said assigning step indicating programs belonging to said same program group to which said first program belongs; and

transferring said designated data from said first processor to said second processor by way of said network using a processor ID determined by said determining a processor ID step.

5,465,381

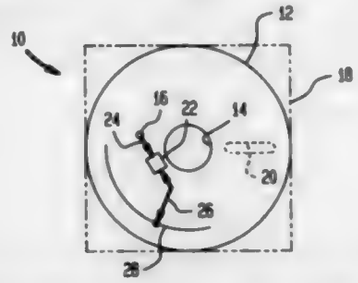
PROCESSOR AND READ/WRITE HEAD INCORPORATED IN DISK FOR COMMUNICATING DATA TO HOST DIRECTLY FROM PROCESSOR READ/WRITE HEAD TO READ/WRITE HEAD OF HOST DISK DRIVE

Alfred C. Schmidt, 201 Branch Brook Rd., Wilton, Conn. 06897, and Robert Cordery, 11½ Jeanette St., Danbury, Conn. 06811

Continuation of Ser. No. 185,106, Jan. 21, 1994, abandoned, which is a continuation of Ser. No. 88,495, Jul. 7, 1993, abandoned, which is a continuation of Ser. No. 458,865, Dec. 29, 1989, abandoned. This application Jun. 6, 1994, Ser. No. 254,621

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—800 **13 Claims**



1. Data processing apparatus for communicating with a host system, the host system including a disk drive having a drive read/write head for communication bidirectionally with a removable, rotating, disk-shaped recording medium, the medium being contained within an enclosure; the data processing apparatus comprising:

a) a module, the module having physical dimensions substantially similar to the physical dimensions of the enclosure, whereby the module is inserted in the disk drive;

b) a disk-shaped recording medium rotated by the disk drive and contained within the module;

c) data processing means, including a data processor having memory means for secure storage of data, for reading and writing said data on said recording medium and communicating said data to the host, the data processing means being at least partially comprised in the module;

d) detecting and generating means for detecting signals produced by the drive read/write head and producing signals read by the drive read/write head, the detecting and generating means being connected to the data processing means and being at least partially comprised in the module; and

e) a read/write head being coupled to the detecting and generating means and being fixedly disposed upon or within the recording medium for direct access by said drive read/write head, whereby said data processing means communicates said data to the host through the detecting and generating means via the read/write head to the drive read/write head.

5,465,382

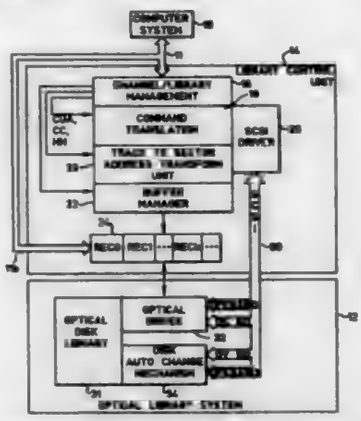
SYSTEM AND METHOD FOR MAPPING DIRECTLY ACCESSIBLE MAGNETIC DASD STORAGE TO FIXED BLOCK OPTICAL STORAGE

Kenneth F. Day, III; William D. Lamear, Jr., and Edward R. Morse, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 870,024, Apr. 17, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 275,934

Int. Cl.[6] G06F *12/02*

U.S. Cl. 395—404 **8 Claims**



1. In an information processing system including a computer installation for processing data and channel means connected to the computer installation for directing storage and retrieval of data in a plurality of magnetic direct access storage devices (DASD's), each magnetic DASD including a plurality of rigid magnetic disks, data being stored in the form of a substantially circular track denoted by a cylinder number (CC) and a head number (HH) in a DASD identified by a channel unit address (CUA), a combination for storing said data in an optical storage format, the combination comprising:

optical storage means, including a plurality of optical disks, for storing data on said optical disks in sequences of respective optical sectors on one or more of the optical disks;

control means connected to the optical storage means for directing reading and writing of data at an optical storage address in the optical storage means in response to channel control information including track address data which identifies a circular track having an information storage capacity;

address means in the control means for producing the optical storage address in response to CC, HH, and CUA data in said track address data, the optical storage address identifying a respective subsequence of optical sectors having an information storage capacity at least equal to the information storage capacity of the circular track;

the optical storage address including an optical sector address in a sequence of optical sector addresses, the address means including relative optical sector means for converting the CC and HH data to a relative optical sector number (ROSN)denoting the position of the optical storage address in the sequence of numbers;

the relative optical sector means calculating the ROSN according to:

$$ROSN=((DCN\times NEH+DHN)\times OST$$

where:

DCN=CC

NEH=total number of heads in a magnetic DASD

DHN=HH

OST=number of optical sectors per circular track, and

OST=(ETL+OSL) rounded up to next whole number such that:

ETL=circular track length in bytes

OSL=optical sector length in bytes.

5,465,383

SYSTEM FOR FORMING TEST PATTERNS FOR LARGE SCALE INTEGRATED CIRCUITS

Takeshi Shimono, Tokyo, and Noriyo Konishi, Ishikawa, both of, Japan, assignors to NEC Corporation, Tokyo, Japan

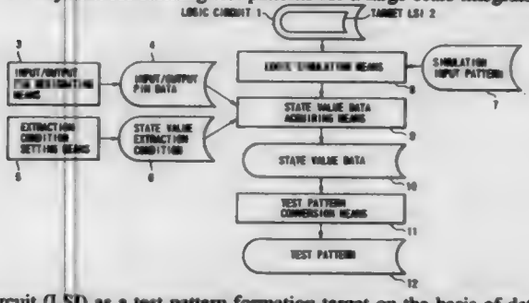
Continuation of Ser. No. 134,875, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 612,473, Nov. 14, 1990, abandoned. This application Mar. 14, 1995, Ser. No. 404,126

Claims priority, application Japan, Nov. 15, 1989, 1-296756

Int. Cl.[6] G06F *11/25;11/263*

U.S. Cl. 395—800 **12 Claims**

1. A system for forming test patterns for a large scale integrated



circuit (LSI) as a test pattern formation target on the basis of data of state values from input/output pins of said LSI acquired during logic simulation of a logic circuit including said LSI, comprising:

extraction condition setting means for setting a state value extraction condition for an internal circuit element of said logic circuit including said LSI, said internal circuit element having one of a first state and a second state, said state value extraction condition being satisfied when said internal circuit element is in said second state, said extraction condition setting means comparing the state of said internal circuit element with said state value extraction condition to determine whether said internal circuit element has entered said second state; and

state value data acquiring means for acquiring said data of state values from said input/output pins of said LSI during logic simulation only when said state value extraction condition set by said extraction condition setting means is satisfied,

wherein said test patterns of said LSI are created from said data of state values acquired by said state value data acquiring means.

5,465,384

AUTOMATIC POLLING AND DISPLAY INTERACTIVE ENTERTAINMENT SYSTEM

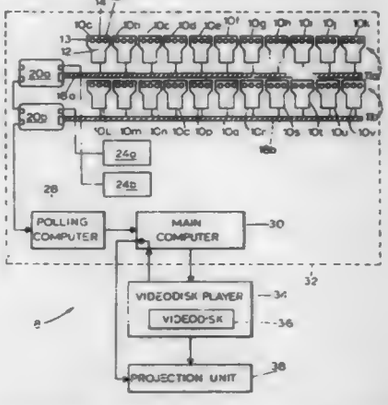
Robert S. Bejan; Kevin P. Centanni, both of New York; Scott R. Gaertner, Brooklyn, all of N.Y., and William L. Franzblau, Morristown, N.J., assignors to Actifilm, Inc., New York, N.Y.

Filed Nov. 25, 1992, Ser. No. 981,193

Int. Cl.[6] H04H *9/00*

U.S. Cl. 455—2 **25 Claims**

1. An interactive entertainment system, comprising:



an image storage medium for storing images at addresses;

means for retrieving the images from the storage medium substantially instantaneously by accessing the images using the addresses;

a display coupled to the retrieving means;

means for communicating a list of choices of images from the storage medium to an audience; and

means for conducting a poll of the audience including at least a pair of polling units, each unit having means for registering a user choice of images from the storage medium and means for producing a signal in response to the registered user choice and wherein the conducting means includes means coupled to the polling units for receiving the signal and for tabulating user choices;

wherein the conducting means automatically causes the retrieving means to access a first stored image at an address and supply the first stored image to the display based upon the tabulated user choices.

5,465,385

CATV SYSTEM WITH AN EASY PROGRAM RESERVATION

Eiji Ohga; Masahiko Kawasaki; Kazushi Sakuma; Tatsuo Takahashi, and Ryusuke Tozaki, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 965,447, Oct. 23, 1992, abandoned. This application Feb. 23, 1994, Ser. No. 200,907

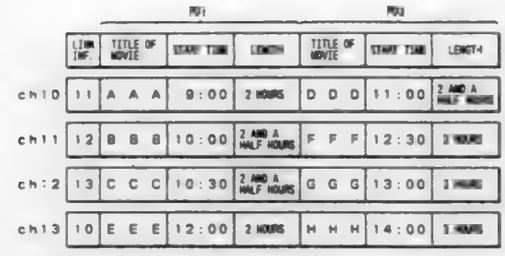
Claims priority, application Japan, Jan. 28, 1991, 3-281450

Int. Cl.[6] H04H *1/02*

U.S. Cl. 455—6.1 **16 Claims**

1. A cable television (CATV) terminal apparatus for receiving a television signal transmitted from a CATV center facility and providing the received television signal to a television receiver (TV receiver), comprising:

means for displaying, on the TV receiver upon receiving a first instruction from a user, information indicating programs being broadcast and scheduled to be broadcast over a set of linked channels based on program data transmitted from the center facility wherein the linked channels are channels logically coupled to each other, the program data for each of said linked channels including titles, start times, lengths of the



respective programs and linking information which identifies another one of said linked channels;

means for receiving a second instruction indicating one of the programs that has been selected by the user;

means for storing data indicating the start time, length and channel of the selected program; and

means for automatically displaying, on the TV receiver based on the stored data, the selected program during a period defined by the start time and the length.

5,465,386

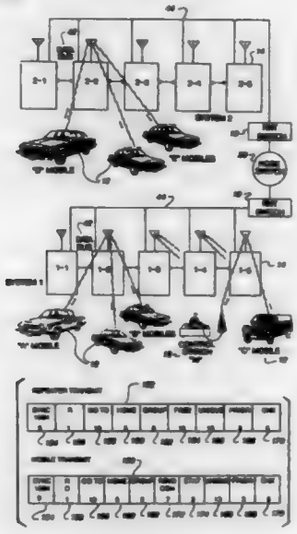
SIGNALING PROTOCOL FOR A DISTRIBUTIVE WIDE AREA TRANSMISSION TRUNKED COMMUNICATION SYSTEM

Keith W. Barnes; Donald R. Bauman; Howard N. Brace; Philip A. Keefer, and Michael E. Mihelich, all of Waseca, Minn., assignors to E.F. Johnson Company, Waseca, Minn.

Division of Ser. No. 903,050, Jun. 23, 1992, abandoned, which is a continuation of Ser. No. 716,757, Jun. 18, 1991, Pat. No. , which is a continuation of Ser. No. 332,675, Mar. 31, 1989, abandoned. This application Sep. 2, 1994, Ser. No. 300,930

Int. Cl.[6] H04B *7/14*

U.S. Cl. 455—15 **5 Claims**



1. An improved land mobile transmission trunked communication system having an enhanced control signal protocol, the land mobile transmission trunked communication system including a plurality of transceiver means for transmitting and receiving transmission trunked radio communications over one or more radio channels, the transmission trunked radio communications comprising an information signal having either voice information, data information, or both, and a control signal, the information signals being transmitted on one of a set of preassigned radio channels and the control signals being transmitted simultaneously in the subaudio range of the same channel over which the information signals are transmitted according to a predetermined control signal format, and a plurality of repeater means, each repeater means for establishing transmission trunked radio communications on one of the preassigned set of the radio channels between the repeater means and one or more transceiver means, the improvement comprising:

the predetermined control signal format including:

a first predetermined control signal format when the control signals are transmitted from the transceiver means to the repeater means having:

a nine bit Sync field that initializes and synchronizes the repeater means;

a one bit Reserved field that indicates a transceiver means control message;

a ten bit GoTo field that contains a directly decodable predetermined radio channel number of one of the repeater means to which the control signals are being transmitted;

a five bit Home field that contains a predetermined home number of the transceiver means sending the control signal;

an eight bit Group field that contains a Group ID code of a fleet or subfleet of transceiver means which are being called;

a three bit Status field that defines the status of the transceiver means;

a thirteen bit Unique ID field that contains a unique identification number for the transceiver means;

a three bit Priority field that indicates a predetermined priority level assigned to the transceiver means; and

an eight bit Checksum field that includes a seven bit truncated BCH encoding scheme checksum and a single bit parity; and

a second predetermined control signal format when the control signals are transmitted from the repeater means to the transceiver means having:

a nine bit Sync field that initializes and synchronizes the transceiver means;

a one bit Reserved field that indicates a repeater means control message;

a ten bit GoTo field that contains a directly decodable predetermined radio channel number of one of the repeater means that the transceiver means should tune to in order to receive the control signals that are being transmitted by that repeater means;

a five bit Home field that contains a predetermined home number of one of the repeater means;

an eight bit Group field that contains a Group ID code of a fleet or subfleet of transceiver means which are being called;

a ten bit Free field that contains a directly decodable predetermined radio channel number of one of the repeater means that is not busy and is available for service;

a thirteen bit Unique ID field that contains the unique identification number for the transceiver means;

a three bit Priority field that indicates a current operating priority level for all of the repeater means; and

an eight bit Checksum field that includes a seven bit truncated BCH encoding scheme checksum and a single bit parity.

5,465,387

ADAPTIVE FRAUD MONITORING AND CONTROL

Arabinda Mukherjee, South Brunswick, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Oct. 8, 1993, Ser. No. 134,358

Int. Cl.[6] H04M *1/19;* **H04L** *9/32*

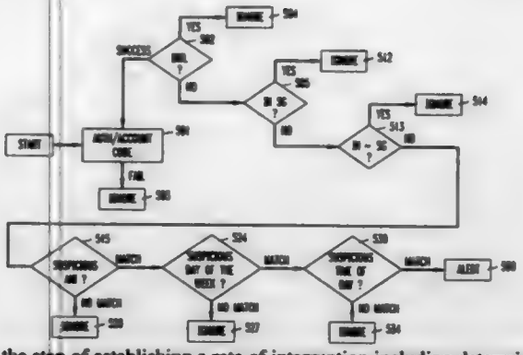
U.S. Cl. 455—26.1 **22 Claims**

4. The method of monitoring access to a system, comprising:

establishing a rate of interruption for demanding authentication from a potential accessor;

denying access in the event of failure to authenticate in response to each demand; and

automatically varying the rate of interruption to a another rate in response to predetermined conditions;



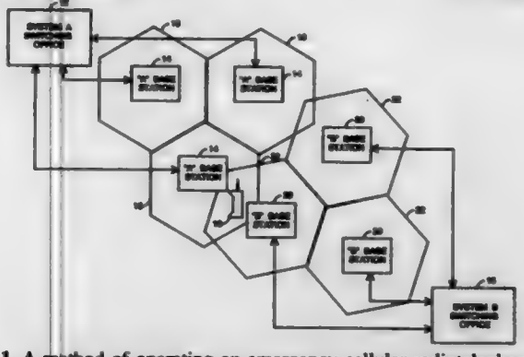
the step of establishing a rate of interruption including determining whether calls are suspicious and determining the rate of interruptions on the basis of only the rate of failed suspicious calls.

5,465,385

EMERGENCY CELLULAR RADIOTELEPHONE AND METHOD THEREFOR

Robert G. Zicker, 2930 Ascot La., Roswell, Ga. 30076

Filed Feb. 19, 1993, Ser. No. 20,308
Int. Cl.[6] H04Q *7/20*
U.S. Cl. 455—33.1 **22 Claims**



1. A method of operating an emergency cellular radiotelephone in cooperation with a cellular telecommunication network having A and B cellular systems, said A and B systems each having a plurality of signalling channels assigned thereto, and said method comprising the steps of:

receiving, at said radiotelephone, signalling channels assigned to said system A;

receiving, at said radiotelephone, signalling channels assigned to said system B;

identifying, at said radiotelephone after said receiving steps, the one of said system A and system B signalling channels which has a signal with the greatest signal strength; and

communicating, in response to said identifying step, between said radiotelephone and the one of said A and B systems which has said identified one of said channels assigned thereto.

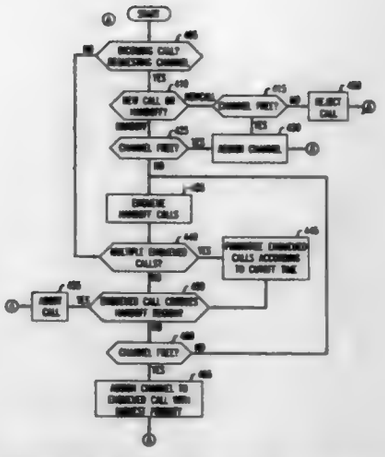
5,465,389

METHOD OF PRIORITIZING HANDOFF PROCEDURES IN A CELLULAR SYSTEM

Prathima Agrawal, New Providence; Dinesh K. Anvekar, North Plainfield, and Balakrishnan Narendran, New Providence, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Feb. 25, 1994, Ser. No. 201,601
Int. Cl.[6] H04B *7/26*
U.S. Cl. 455—33.2 **9 Claims**

1. A method of prioritizing handoff requests in a cellular system comprising the steps of:



receiving a plurality of handoff requests for assignment of communication channels from a plurality of mobile units which are projected to enter a second cell;

determining a projected cutoff time for each such handoff request, each projected cutoff time representing an estimate of a time at which the mobile unit corresponding to the associated handoff request will exit a handoff region formed by a first cell and the second cell;

arranging the handoff requests in a priority queue based on the cutoff time associated with each handoff request such that the request with the shortest cutoff time is given first priority in the queue; and

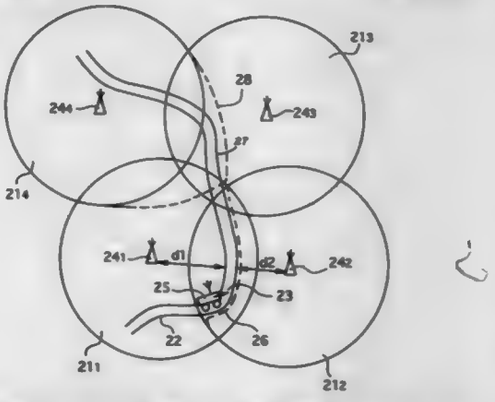
assigning available communication channels to the mobile units requesting handoff requests in the order of the queue.

5,465,390

METHOD FOR LAYING OUT THE INFRASTRUCTURE OF A CELLULAR COMMUNICATIONS NETWORK

Robert Cohen, Paris, France, assignor to France Telecom, Paris, France

Filed Feb. 12, 1993, Ser. No. 17,102
Claims priority, application France, Feb. 14, 1992, 92 01904
Int. Cl.[6] H04Q *7/00;9/00*
U.S. Cl. 455—33.4 **29 Claims**



1. A method for planning cells of a radio cellular communication network, each cell comprising a base station for controlling a plurality of mobile units in a geographical cover zone covered by said station, handover selection to manage changes of base station controlling a mobile unit when said mobile unit passes to the cover zone of a neighboring cell, said method comprising, the each of said cells, the steps of:

assuming a geographical location and technical characteristics for the base station of said cell;

estimating a radio-electric cover of said base station;

determining a real geographical cover zone of said base station, comprising the steps of:

simulating movements of mobile units in said cell;

determining places of transfer of said mobile units to a neighboring cell, from said handover selection, as a function of said simulated movements; and

obtaining a real geographical cover zone of said cell, by modifying said radio-electric cover taking into account said places of transfer; and

affecting transmission resources to said cell as a function of said real geographical cover zone.

5,465,391

METHOD FOR SETTING UP A GROUP CALL IN A CELLULAR RADIO SYSTEM

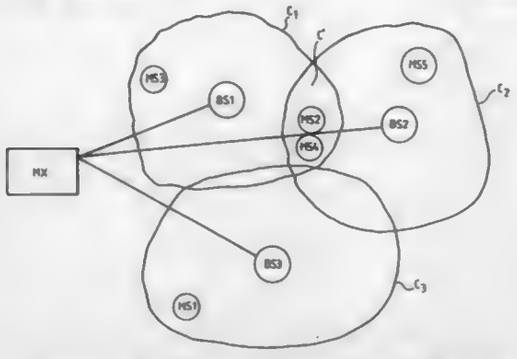
Hannu Töyrylä, Vantaa, Finland, assignor to Nokia Telecommunications Oy, Espoo, Finland

Continuation of Ser. No. 50,027, Apr. 28, 1993, abandoned. This application Sep. 6, 1994, Ser. No. 300,237

Claims priority, application Finland, Aug. 29, 1991, 914086

Int. Cl.[6] H04Q *7/38*

U.S. Cl. 455—33.4 **2 Claims**



1. A method for setting up a group call potentially involving a plurality of mobile radio stations, in a mobile radio system in which a geographical area covered by the system is divided into a plurality of radio cells, at least some of which overlap one another in at least one respective overlapping peripheral area, each cell having at least one base station provided with a respective multichannel transceiver, each base station being assigned at least one radio frequency channel for speech connections, the radio frequency channels for speech connections being different from one another in neighboring ones of said cells, each said base station also having a radio frequency channel for control, there being at least two mobile radio stations within said geographical area, each registered with a respective base station of a respective cell, but being free to roam within said geographical area providing that when transitioning beyond a respective said overlapping area from one said cell to another said cell, the respective mobile radio station changes registration from the respective cell departed to the respective cell entered, comprising:

a) programming into each of said mobile radio stations an identification of at least one group to which each mobile radio station belongs;

b) maintaining a file listing which of the base stations in said plurality of radio cells belong to an operation area of the group, said operation area being smaller than said geographical area covered by said mobile radio system,

c) initiating a group call, initiating a signalling message by a user's respective said mobile radio station indicating that a group call is requested and the identity of the desired said group,

d) retrieving from said file information as to which of said base stations serve cells belonging to said operation area of the respective said group, and allocating traffic channels for said group call on each of the respective base station multichannel transceivers belonging to said operation area,

e) transmitting on a control channel of said multichannel transceivers of said base stations which belong to said operation area of the respective said group, to the mobile radio stations of the respective said group, a first group call paging message containing an instruction to switch to said group call on the respective said allocated traffic channel of a respective one of said base stations belonging to said operation area of the respective said group call,

f) receiving said first group call paging message at said mobile radio stations registered to any of said base stations belonging to said operation area of the respective said group, and switching said mobile radio stations belonging to said operation area of the respective said group to said group call on the respective said allocated traffic channel of a respective one of said base stations belonging to said operation area of the respective said group call,

g) determining which of said base stations in said plurality of radio cells are in radio cells not belonging to but abutting radio cells belonging to said operation area of the respective said group,

h) transmitting on a control channel of said multichannel transceivers of said base stations in said abutting cells, to the mobile radio stations of the respective said group, a second group call paging message which contains the respective said group identification and an instruction to mobile radio stations receiving said second group call paging message and belonging to the respective said group, to switch to a respective said allocated traffic channel of a respective adjoining one of said base stations belonging to said operation area of the respective said group call,

i) receiving said second group call paging message at said mobile radio stations which are registered to any of said base stations in said abutting radio cells and belonging to the respective said group, and switching said mobile radio stations to said group call on the respective said allocated traffic channel of a respective adjoining one of said base stations belonging to said operation area of the respective said group call.

5,465,392

APPARATUS AND METHOD FOR OPERATING A WIRELESS LOCAL AREA NETWORK HAVING POWER CONSERVATION

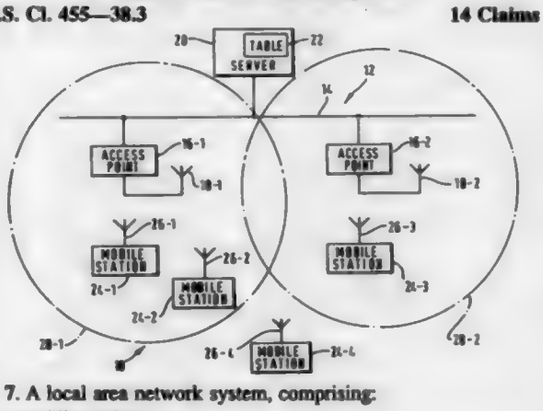
Robert Baptist, Populierstraat; Theodoor A. Kleijne, Engelberg; Leo Monteban, Schildpadweide, and Marc Meertens, Schonenburgveind, all of, Netherlands, assignors to AT&T Global Information Solutions Company, Dayton, Ohio

Filed May 17, 1994, Ser. No. 245,128

Claims priority, application England, Jan. 20, 1993, 9321657

Int. Cl.[6] H04B *7/26;* **H04Q** *7/20*

U.S. Cl. 455—38.3 **14 Claims**



7. A local area network system, comprising:

a mobile station;

means for monitoring transmission activity of the mobile station;

means for transmitting an inquiry message requesting a response message from the mobile station if no transmission activity of the mobile station is detected for a predetermined first time period;

means for operating the mobile station in a low power mode for a second time period commencing after transmission activity occurs at the mobile station; and

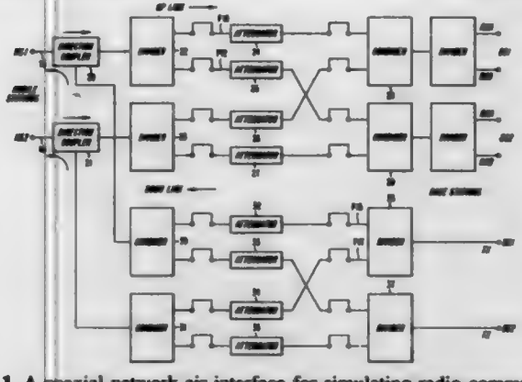
means for operating the mobile station in a high power mode for a third time period commencing prior to transmission of the inquiry message so as to enable receipt of the inquiry message by the mobile station.

5,465,393

SIMULATED AIR INTERFACE SYSTEM FOR SIMULATING RADIO COMMUNICATION

Ture Frostrom, Stockholm; Tomas J. Nilsson, Huddinge; Yngve Andersson, Haninge; Michael M. J. Carlsson; Lars-Olof Sundell, both of Stockholm, and Jonas P. Uden, Gothenburg, all of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Apr. 12, 1993, Ser. No. 45,102
Int. Cl.[6] H04B *17/00*
U.S. Cl. 455—54.1 **11 Claims**



1. A coaxial network air interface for simulating radio communication between a plurality of mobile stations and a plurality of base stations on a plurality of radio paths comprising:

a directional coupler for each mobile station for splitting a radio path between each mobile station and each base station into an up-link path and down-link path, said each up-link path comprising:

a divider for dividing said up-link path into a first plurality of paths;

means for generating selective traffic conditions on signals in said first plurality of paths, said means being located on said first plurality of paths between said divider and a combining means; and

said combining means for combining a third plurality of paths, wherein each combining means receives one up-link path from said each mobile station, and said combining means is connected to a base station;

said each down-link path comprising:

a second divider for dividing said down-link path from said each base station into a second plurality of paths;

means for generating selective traffic conditions on signals in said second plurality of paths, said means being located on said second plurality of paths between said second divider and a second combining means; and

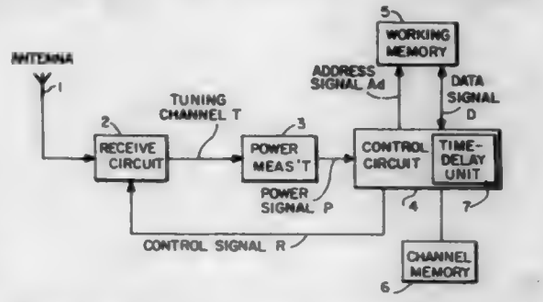
said second combining means for combining a fourth plurality of paths, wherein each second combining means receives one down-link path from said each base station, and said second combining means is connected to the directional coupler of the down-link path.

5,465,394

DEVICE FOR FIXING THE DURATION OF WAITING PERIODS BETWEEN ATTEMPTS TO ESTABLISH A CONNECTION BETWEEN A TERMINAL AND A MOBILE RADIO SYSTEM

Francis Pinault, and Christophe Jouin, both of Bois-Colombes, France, assignors to Alcatel Radiotelephone, Paris, France

Filed Dec. 15, 1993, Ser. No. 166,958
Claims priority, application France, Dec. 16, 1992, 92 15282
Int. Cl.[6] H04B *1/034*
U.S. Cl. 455—54.1 **6 Claims**



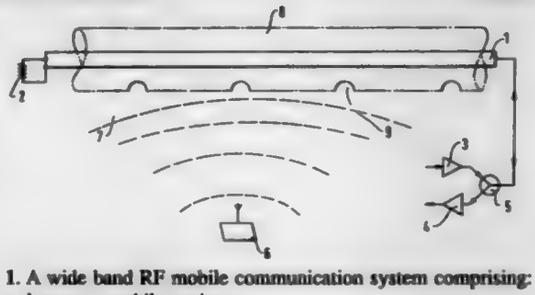
1. Device for seeking a connection between a terminal and a mobile radio system comprising a synchronization unit for determining, in response to a control signal, whether said connection can be achieved and a time-delay unit for producing, after an initial period, said control signal after a first waiting period, said time-delay unit producing said control signal again after a second waiting period if said synchronization unit determines that said connection cannot be achieved after said first waiting period, said time delay unit further comprising means for fixing a duration of said second waiting period so that it is greater than that of said first waiting period, wherein said device is implemented in said terminal having a battery whose capacity is represented by capacity information held in said time-delay unit, and said time-delay unit comprises means for fixing at least one of said first and second waiting periods according to said capacity information.

5,465,395

COMMUNICATION VIA LEAKY CABLES

David V. Bartram, 32 Quenby Way, Bromham, Bedford MK43 8QU, England

Continuation of Ser. No. 944,801, Sep. 14, 1992, abandoned, which is a continuation of Ser. No. 689,013, Apr. 22, 1991, abandoned. This application Jan. 27, 1994, Ser. No. 187,817
Int. Cl.[6] H04B *7/26;* H01P *3/06*
U.S. Cl. 455—55.1 **5 Claims**



1. A wide band RF mobile communication system comprising:

at least one mobile station;

a continuous installation duct;

a coaxial leaky feeder cable acting as a transmitting and receiving antenna for RF signals;

the installation duct comprising a continuous rugged tube with the leaky feeder cable disposed longitudinally in loosely spaced relationship within the installation duct and withdrawable for inspection and replacement,

and in which the duct comprises substantially perfect RF screening material with relatively widely spaced discontinuities enabling egress and entry of wideband RF radiation to and

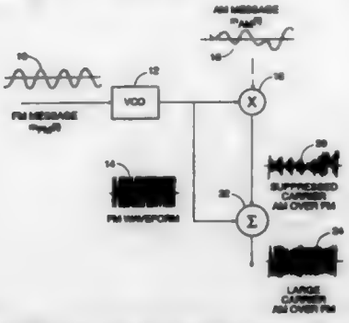
from said coaxial leaky feeder cable, the discontinuities being disposed to define a filterable pattern on RF radiation incident upon the leaky feeder cable.

5,465,396

IN-BAND ON-CHANNEL DIGITAL BROADCASTING

Billie J. Hunsinger; A. J. Vigil, both of Urbana, and Leland P. Solie, Mahomet, all of Ill., assignors to USA Digital Radio Partners, L.P., Arlington, Va.

Filed Jan. 12, 1993, Ser. No. 3,189
Int. Cl.[6] H04B *1/04;1/12;1/68*
U.S. Cl. 455—61 17 Claims



1. A method for broadcasting information in a composite signal from a transmitter to one or more receivers, comprising:

a) frequency modulating an FM message to generate an FM waveform;

b) multiplying said FM waveform by an AM message to generate a suppressed carrier AM over FM signal;

c) combining said suppressed carrier AM over FM signal with said FM waveform to generate a large carrier AM over FM composite signal;

d) transmitting said large carrier AM over FM composite signal;

e) receiving said large carrier AM over FM composite signal;

f) recovering one of said FM message and an AM waveform corresponding to said AM message over FM composite signal.

5,465,397

METHOD AND APPARATUS FOR SELECTING THE BEST FIXED COMMUNICATION UNIT

William F. Pickert, Hoffman Estates, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 35,109, Mar. 19, 1993, abandoned.
This application Dec. 22, 1994, Ser. No. 361,899
Int. Cl.[6] H04B *15/00*
U.S. Cl. 455—62 17 Claims

1. A portable communication unit capable of communicating on a plurality of communication channels, the portable communication unit including a method for scanning the plurality of communication channels for selecting a best fixed communication unit of an at least two fixed communication units for communicating therewith, the method for initiating communication comprising the steps of:

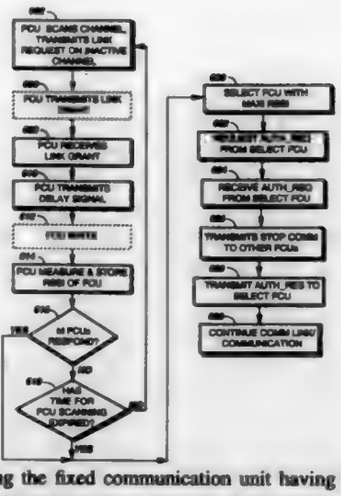
(a1) scanning the plurality of communication channels for initiating communication;

(a) transmitting a communication link request;

(b) receiving a link grant response from a fixed communication unit receiving the communication link request;

(c) measuring and storing a signal strength of the link grant response received from the fixed communication unit responding to the communication link request;

(d) transmitting a wait signal for delaying communication with the fixed communication unit responding to the communication ink request, the portable communication unit repeats step (a1) through step (d) for initiating communication with another of the at least two fixed communication units;



(e) selecting the fixed communication unit having a maximum measured received signal strength of the link grant response as the best fixed communication unit; and

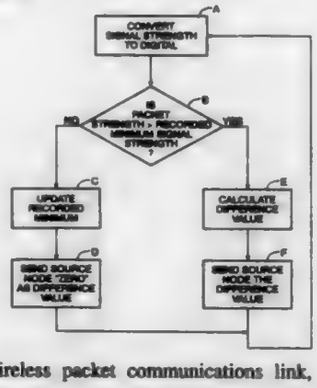
(f) initiating communication with the best fixed communication unit.

5,465,398

AUTOMATIC POWER LEVEL CONTROL OF A PACKET COMMUNICATION LINK

George H. Flammer, Cupertino, Calif., assignor to Metricom, Inc., Los Gatos, Calif.

Filed Oct. 7, 1993, Ser. No. 134,193
Int. Cl.[6] H04B *7/00*
U.S. Cl. 455—69 11 Claims



1. In a wireless packet communications link, a method for minimizing power transmitted from a source node to a target node, said method comprising the steps of:

obtaining at the target node a quantitative indicator of received signal strength for a packet successfully received at the target node;

transmitting, from the target node to the source node a quantitative indicator of the difference between said quantitative indicator of received signal strength and a stored minimum of previously obtained quantitative indicators of received signal strength; thereafter

repeating said steps of obtaining and transmitting to accumulate a series Of transmitted quantitative indicators of the difference at the source node; and

using said transmitted quantitative indicators to adjust a transmitted power level used by the source node to communicate with the target node to be the minimum necessary to reliably transmit a packet.

5,465,399

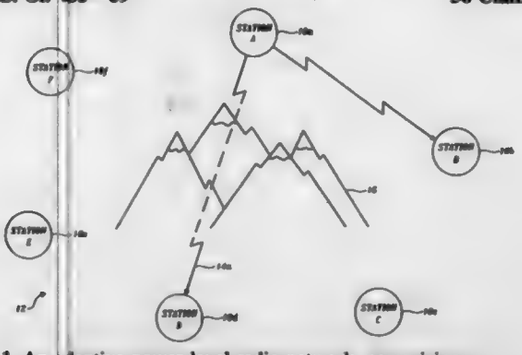
APPARATUS AND METHOD FOR CONTROLLING TRANSMITTED POWER IN A RADIO NETWORK

John C. Oberholtzer, and John H. Nitardy, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 932,303, Aug. 19, 1992, abandoned. This application Sep. 16, 1994, Ser. No. 307,473

Int. Cl.[6] H04B 7/00

U.S. Cl. 455—69 36 Claims



1. An adaptive power level radio network, comprising:

a plurality of member stations, one of said plurality of member stations becoming a controller station by initiating a communication with the other member stations on the network, said plurality of member stations each including:

(a) a transmitter having a selectively variable transmit power level, the transmitter of the controller station transmitting a radio signal at a predefined power level;

(b) a receiver; and

(c) control means, connected to the receiver and to the transmitter, for:

(i) controlling the transmit power level of the transmitter;

(ii) designating one of said plurality of member stations as a selected station by determining which of said plurality of member stations had the poorest reception based on prior communications between said one of said plurality of member stations and the other member stations of the network; and

(iii) adjusting the transmit power level of the controller station, in response to respondent signal received by the controller station from the transmitter of said selected station, said respondent signal indicating whether said selected, member station has received a transmission from the controller station that was transmitted at the predefined transmit power level, the control means of the controller station responding to a failure to receive the respondent signal from said selected station, by incrementally increasing the transmit power level of the transmitter in the controller station, to establish communications with stud selected station.

5,465,400

POWER SUPPLY CONTROL DEVICE FOR CONTROLLING THE TURNING ON AND OFF OF POWER SUPPLY

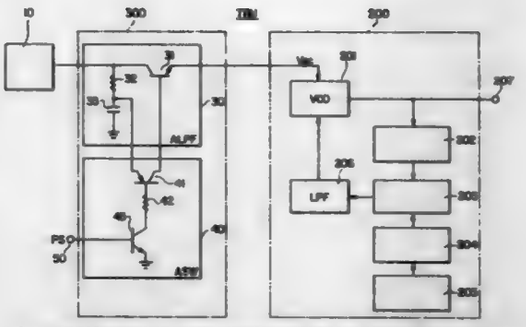
Hidehiko Norimatsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 9, 1992, Ser. No. 958,792

Claims priority, application Japan, Jan. 9, 1991, 3-290563

Int. Cl.[6] H04B 1/40

U.S. Cl. 455—76 9 Claims



9. A control device for turning on and off a voltage supply to a circuit, comprising:

first means for supplying a battery voltage to a circuit;

filter means for removing noise and ripples from said battery voltage, wherein said filter means comprises a serially connected resistor, one end of which is connected to an electrode of said first means, and a capacitor, one of whose terminals is connected to a reference potential, and a first transistor inserted between said electrode of said first means and a power input terminal of said circuit and having a control electrode; and

switching means having a second transistor responsive to a control signal for selectively connecting a connecting point between said resistor and said capacitor to the control electrode of said first transistor, whereby the charge of said capacitor is in a substantially steady state at the time said selective connection is accomplished in response to said control signal and accordingly said voltage supply is in a steady state from the time said selective connection is accomplished.

5,465,401

COMMUNICATION SYSTEM AND METHODS FOR ENHANCED INFORMATION TRANSFER

E. Earle Thompson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 15, 1992, Ser. No. 991,015

The portion of the term of this patent subsequent to Aug. 2, 2012, has been disclaimed.

Int. Cl.[6] H04B 1/38;1/16

U.S. Cl. 455—89 11 Claims

1. A communication device for transmitting and receiving information using electromagnetic energy comprising:

a plurality of electrical circuits for communicating said information;

a main body containing the electrical circuits of the communication device;

a processor and an associated memory for executing communication programs and applications with the electrical circuits;

a microphone for entering audio information into the communication device;

a speaker for outputting audio information;

a source of electrical power contained within the communication device for operating the processor and the electrical circuits;

a lid for covering a portion of the communication device, the lid having a plurality of positions which energizes selected electrical circuits receiving the source of electrical power, including a first position which energizes only a limited number of the plurality of electrical circuits, a second position which energizes the selected electrical circuits of the plurality of electrical circuits associated with telephone programs and applications, and a third position in which all the plurality of

electrical circuits are fully energized in the communication device and for providing speaker phone operation;

a pivot pin connecting the lid to the main body: and

a shaft potentiometer for monitoring the position of the lid relative to the main body.

5,465,402

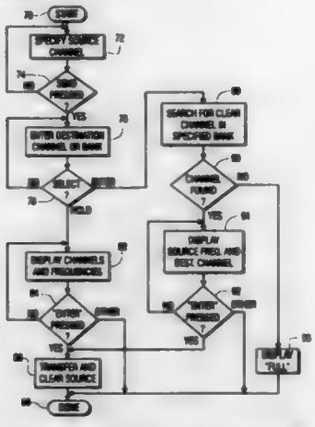
AUTOMATIC FREQUENCY TRANSFER AND STORAGE METHOD

Akira Ono, Irving, Tex.; Tuteo Masaki, Sakura, and Hironori Warabi, Mihama, both of, Japan, assignors to Uniden America Corp., Ft. Worth, Tex., and Uniden Corporation, Ichikawa, Japan

Filed Mar. 23, 1994, Ser. No. 216,638

Int. Cl.[6] H04B 1/06

U.S. Cl. 455—161.2 **11 Claims**



1. A method of transferring a frequency identifier in a channel memory in a scanning receiver, the frequency identifier being correlated to a frequency, and, the channel memory comprising a plurality of storage locations for storing a plurality of frequency identifiers, and, the storage locations being identified by a plurality of unique channel numbers, and, the scanning receiver comprising a controller coupled to the channel memory, the method comprising the steps of:

specifying a source channel number that identifies a first storage location;

specifying a destination channel number that identifies a second storage location;

transferring, by the controller, the frequency identifier stored in said first storage location to said second storage location, and

subsequently selecting said destination channel number thereby causing said controller to recall the frequency identifier stored in said second storage location and enabling the scanning receiver to receive the frequency correlated to the frequency identifier stored therein.

5,465,403

SHORTWAVE RADIO RECEIVER WITH TIMER RECEPTION MODE

Masanao Owaki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

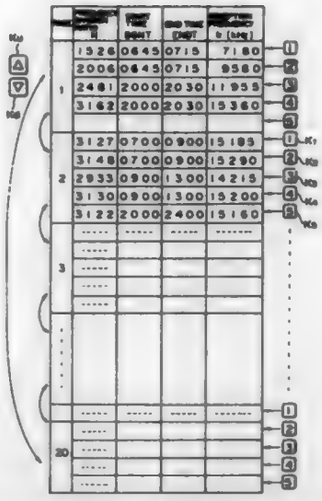
Continuation of Ser. No. 902,307, Jun. 22, 1992, abandoned. This application Feb. 4, 1994, Ser. No. 192,311

Claims priority, application Japan, Jun. 28, 1991, 3-185143

Int. Cl.[6] H04B 1/16

U.S. Cl. 455—186.1 **12 Claims**

1. A shortwave radio receiver of synthesizer type having a phase-locked loop therein and wherein a desired broadcasting station is selected by frequency conversion of a reception signal in conformity with an oscillation signal obtained from said phase-locked loop, said receiver comprising:



a data table having entries including frequency data for receiving programs from shortwave broadcasting stations, and time data indicative of the broadcast start time and end time of each station, said entries being arranged in pages with a plurality of entries per page;

a data entry keyboard for manually entering said frequency data, said start time and said end time into said data table;

a timer circuit for producing a time;

a memory for the timer circuit; and

a plurality of station select keys, each associated with one of said plurality of entries stored in each page of said table;

wherein, when desired frequency data of a designated station has been selected out of said data table by depressing one of said select keys, said selected frequency data and said start and end times corresponding thereto are read out from said data table and are written in said timer memory;

and in a timer reception mode, the time indicated by said timer circuit is compared with the start time written in said timer memory, and when a coincidence is attained therebetween, the frequency data written in said timer memory is supplied to said phase-locked loop to select and pick up the designated station.

5,465,404

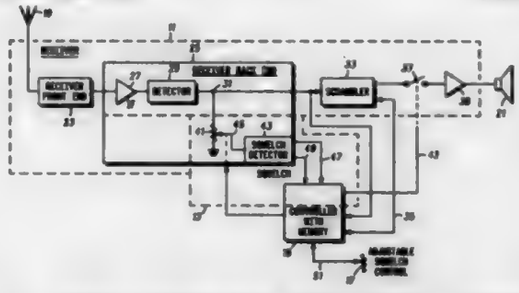
COMMUNICATIONS RECEIVER WITH AN ADAPTIVE SQUELCH SYSTEM

Michael H. Retzer, Palatine, and Alan D. Muehlfeld, Mount Prospect, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 29, 1993, Ser. No. 10,690

Int. Cl.[6] H04B 1/10

U.S. Cl. 455—220 **7 Claims**



1. A wireless communications receiver having an adaptive squelch system and operable in multiple states, comprising:

a receiver for providing a first received signal when operating in a first state and a second received signal when operating in a second state, wherein the first received signal and the second received signal have different characteristics;

means for providing a threshold level and providing a first unsquelch signal and a subsequent second unsquelch signal when the first received signal or the second received signal satisfies a quality level; and

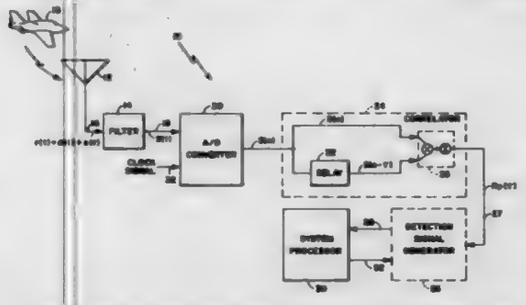
a squelch controller coupled to the squelch circuit for receiving the first unsquelch signal and the second unsquelch signal and for setting the quality level of the squelch circuit based on the first unsquelch signal and the second unsquelch signal to a first predetermined level when the receiver is operating in the first state and setting the quality level to a second predetermined level when the receiver is operating in the second state.

5,465,405

APPARATUS AND METHOD FOR DETECTING SIGNALS

Behshad Baseghi; Mohammad Mazooji, and Brian E. Holtz, all of Santa Barbara, Calif., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 922,218, Jul. 30, 1992, abandoned.
This application Nov. 2, 1994, Ser. No. 333,619
Int. Cl.[6] H04B *17/00*
U.S. Cl. 455—226.4 **4 Claims**



1. Apparatus for detecting the presence of a received signal comprising:

(a) filter means, fed by said received signal, such filter having a predetermined frequency bandwidth for producing a frequency bandwidth limited output signal;

(b) means for sampling said output signal at a sampling rate to provide a pulse train comprising samples of the output signal;

(c) means for producing a time delayed replica of said pulse train, said time delay between said pulse train and said replica being selected in accordance with said predetermined frequency bandwidth and said sampling rate;

(d) means for correlating said pulse train with said time delayed replica of said pulse train to provide a correlation signal; and

(e) means for comparing said correlation signal to a predetermined threshold level to provide a signal indicating the presence of said received signal, said comparing means comprising:

a first comparator for comparing said correlation signal to said threshold level;

memory means for storing said signal indicating the presence of said received signal;

a second comparator for comparing said correlation signal to said signal indicating the presence of said receiver signal from said storing means; and

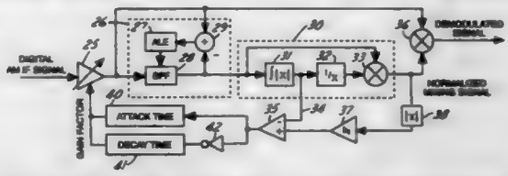
means responsive to outputs of said first and second comparators for updating said memory means with a new signal indicating the presence of said received signal when said correlation signal is greater than said threshold level and said stored signal indicating the presence of said received signal, said new signal being equal to said correlation signal.

5,465,406

AUTOMATIC GAIN CONTROL OVERSHOOT LIMITER FOR AM RECEIVER

John E. Whitecar, Plymouth, and Robert D. Plowdrey, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 6, 1994, Ser. No. 300,894
Int. Cl.[6] H04B *1/06*
U.S. Cl. 455—234.1 **11 Claims**



8. A radio receiver processing an AM IF signal including a carrier signal and a modulating signal, comprising:

a variable gain section amplifying said AM IF signal in response to a gain factor, for producing a modified AM IF signal;

an adaptive narrow bandpass filter receiving said modified AM IF signal, for producing said carrier signal substantially without modulation sidebands;

an averager coupled to said adaptive narrow bandpass filter receiving said carrier signal for producing a carrier strength signal; and

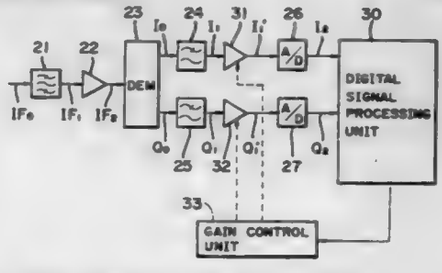
a comparer comparing said carrier strength signal with a comparison signal to determine said gain factor.

5,465,407

GAIN CONTROLLER FOR A DIGITAL MOBILE RADIO RECEIVER

Kazuya Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 26, 1993, Ser. No. 23,332
Claims priority, application Japan, Feb. 29, 1992, 4-079275
Int. Cl.[6] H04B *1/06*
U.S. Cl. 455—234.2 **3 Claims**



1. A digital mobile radio receiver comprising:

a limiter amplifier for amplifying an intermediate frequency signal;

an orthogonal detector for orthogonally detecting an output of said limiter amplifier and outputting an I component and a Q component;

a first low pass filter for removing undesired waves from said I component and outputting an I_1 component;

a second low pass filter for removing undesired waves from said Q component and outputting a Q_1 component;

a first head amplifier for amplifying said I_1 component at a level of gain that is set by a control signal;

a second head amplifier for amplifying said Q_1 component at a level of gain that is set at the same level as that of the gain of said first head amplifier by said control signal;

a first analog-to-digital converter for converting said I_1 component amplified by said first head amplifier to a digital value;

a second analog-to-digital converter for converting said Q_1 component amplified by said second head amplifier to a digital value;

a digital signal processing unit for estimating both an input level of said first analog-to-digital converter and an input level of

said second analog to digital converter based on both an output level of said first analog-to-digital converter and an output level of said second analog-to-digital converter, calculating a proper input level based;on the estimated input level, and outputting gain information; and

a gain control unit for outputting said control signal to control both gains of said first head amplifier and said second head amplifier based on said gain information.

5,465,408

AGC CIRCUIT FOR OPERATING IN ACCORDANCE WITH THE NATURE OF THE INTERFERENCE SIGNAL AND METHOD FOR CONTROLLING THIS CIRCUIT

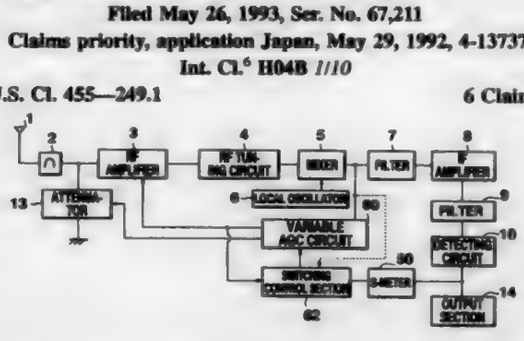
Sakae Sugayama, Moriguchi; Takao Asami, Atsugi; Kenji Kato, Tokyo, and Akira Maeta, Tottori, all of, Japan, assignors to Sanyo Electric Co., Ltd., Osaka; Nissan Motor Co., Ltd., Kanagawa; Clarion Co., Ltd., Tokyo, and Tottori Sanyo Electric Co., Ltd., Tottori, all of, Japan

Filed May 26, 1993, Ser. No. 67,211

Claims priority, application Japan, May 29, 1992, 4-137375

Int. Cl.[6] H04B *1/10*

U.S. Cl. 455—249.1 **6 Claims**



1. An AGC circuit for operating in accordance with a kind of interference signal which comprises

a mixing circuit for mixing an RF signal with a signal having a predetermined frequency to obtain intermediate frequency signals,

a filter means for extracting a signal of a certain frequency from these intermediate frequency signals to obtain the signal of a desired station,

a desired station signal level detecting means for detecting the level of the signal of said desired station which is the output of said filter means,

a broad-band signal level detecting means for detecting the level of a broad-band signal prior to filtering by said filter means,

an attenuating means for attenuating the RF signal to be input to said mixing circuit, and

an attenuation value controlling means for controlling an attenuation value in said attenuating means on the basis of detected results of said desired station signal level detecting means and said broad-band signal level detecting means,

wherein said attenuation value controlling means contains an amplifier for amplifying the signal to be input to said broad-band signal level detecting means, and it changes an amplification degree in this amplifier to alter the level of the broad-band signal to be input to said attenuation value controlling means, thereby changing the attenuation value in said attenuating means.

5,465,409

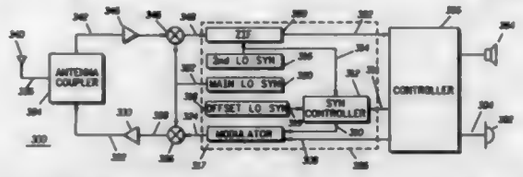
RADIO ARCHITECTURE WITH DUAL FREQUENCY SOURCE SELECTION

Jaime A. Borras, Hialeah; Mark J. Chambers, Plantation; Jesus S. Pena Finol, Coral Springs; Armando J. Gonzalez, Miami; Cesar W. Carralero, Hialeah; Sayed H. Beladi, Plantation, and Levent Y. Erbora, Miami, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 7, 1994, Ser. No. 206,704

Int. Cl.[6] H04B *1/44*; H04J *1/00*

U.S. Cl. 455—260 **13 Claims**



11. An integrated circuit providing first and second radio architectures, comprising:

a synthesizer controller having a select input for selecting between the first and second radio architecture and providing an isolated local oscillator (LO) signal;

an offset LO synthesizer providing an offset LO signal to the synthesizer controller; and

a second LO synthesizer providing a second LO signal to the synthesizer controller;

a first isolator circuit having an input coupled to the offset LO signal and providing a differential current mode signal in response to the first radio architecture being selected;

a second isolator circuit having an input coupled to the second LO signal and providing a differential current mode signal in response to the second radio architecture being selected; and

the first isolator having an output and the second isolator having an output, wherein the first and second isolator outputs are coupled together to provide a single ended voltage mode output as the isolated LO signal in response to the select signal, and either the first isolator circuit or the second isolator circuit is enabled at one time, when the first isolator circuit is enabled the first radio architecture is enabled, and when the second isolator circuit is enabled the second radio architecture is enabled.

5,465,410

METHOD AND APPARATUS FOR AUTOMATIC FREQUENCY AND BANDWIDTH CONTROL

Bradley M. Hiben, Glen Ellyn; Donald G. Newberg, Schaumburg, and Robert D. Logalbo, Bartlett, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 22, 1994, Ser. No. 343,298

Int. Cl.[6] H04B *1/10*

U.S. Cl. 455—266 **33 Claims**

24. An FM receiver configured to receive a desired signal at a frequency f1, the FM receiver comprising:

a plurality of filters including;

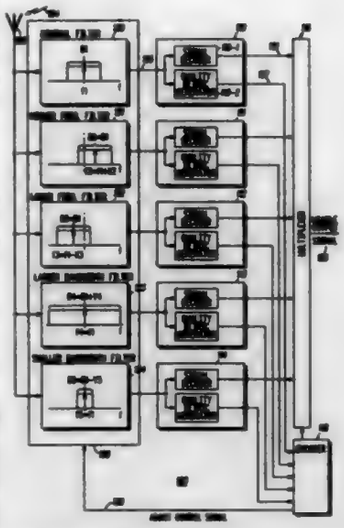
a nominal filter with a center frequency f1 and a bandwidth B1;

a higher frequency filter with a center frequency f2 and a bandwidth B2, wherein f2 is substantially equal to (f1+X2), wherein X2 is a variable frequency offset, and wherein B2 is substantially equal to B1;

a lower frequency filter with a center frequency f3 and a bandwidth B3, wherein f3 is substantially equal to (f1−X3), wherein X3 is a variable frequency offset, and wherein B3 is substantially equal to B1;

a larger bandwidth filter with a center frequency f4 and a bandwidth B4, wherein f4 is substantially equal to f1, wherein B4 is substantially equal to (B1+Y4), and wherein Y4 is a variable bandwidth offset;

a smaller bandwidth filter with a center frequency f5 and a bandwidth B5, wherein f5 is substantially equal to f1,



wherein B5 is substantially equal to (B1−Y5), and wherein Y5 is a variable bandwidth offset;

wherein the center frequency and bandwidth for each of the plurality of filters is adjustable;

an antenna, operably coupled to an input for each of the plurality of filters;

a plurality of signal decoders operably coupled to receive a filtered signal from at least a corresponding one of the plurality of filters; and

a quality metric generator, operably coupled to receive at least a portion of the filtered signal, thereby producing at least one of a plurality of signal quality metrics.

5,465,411

DIVERSITY RECEIVER WITH SWITCHING NOISE REDUCTION

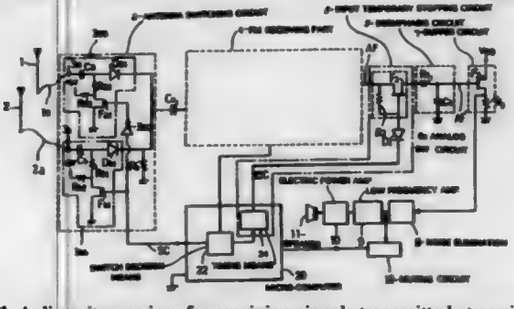
Yukinaga Koike, Nagano, Japan, assignor to Nisshin Onpa Co., Ltd.; Circuit Design Inc., both of Nagano; Hoshino Gakki Co. Ltd., Nagoya Aichi, all of, Japan, and Samsun Technologies Corporation, Hicksville, N.Y.

Filed Dec. 15, 1993, Ser. No. 167,332

Claims priority, application Japan, Jun. 16, 1993, 5-144122

Int. Cl.[6] H04B *1/06*

U.S. Cl. 455—275 **7 Claims**



1. A diversity receiver for receiving signals transmitted at carrier frequencies, which comprises:

means including a plurality of antennas for receiving a plurality of signals;

means for processing the received signals in accordance with a first mode or a second mode and for generating a receiving unit introduction signal;

a receiving unit for demodulating the receiving unit introduction signal and for generating a wave detection signal;

means for detecting the amplitude of the receiving unit introduction signal;

means for switching from one of the first and second modes to the other mode in accordance with the detected amplitude of the receiving unit introduction signal; and

voltage clamp means for clamping the voltage of the wave detection signal during the switching from one of the first and second modes to the other mode.

5,465,412

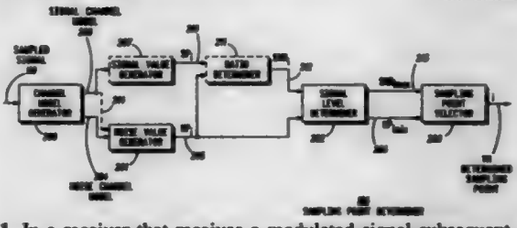
APPARATUS AND METHOD FOR DETERMINING A POINT IN TIME FOR DETECTING A SAMPLED SIGNAL IN A RECEIVER

Bruce D. Mueller, Palatine, and Kevin L. Baum, Hoffman Estates, both of Ill., assignors to Motorola, Schaumburg, Ill.

Filed May 19, 1993, Ser. No. 64,182

Int. Cl.[6] H04B *1/10*

U.S. Cl. 455—296 **20 Claims**



1. In a receiver that receives a modulated signal subsequent to transmission thereof by a transmitter on a communication channel, wherein the receiver down converts the modulated signal to produce a down converted signal and samples the down converted signal at multiple points in time to produce a sampled signal, a method for determining one of the multiple points in time for detecting the sampled signal to produce a detected signal, comprising the steps of:

modeling, at the multiple points in time, the communication channel responsive to the sampled signal to produce at least a noise channel model;

generating, at the multiple points in time, a noise value indicative of a quantity of noise in the noise channel model;

determining, from the noise value generated at the multiple points in time, a minimum noise value; and

selecting, from among the multiple points in time, a first point in time corresponding to the minimum noise value for detecting the sampled signal to produce the detected signal.

5,465,413

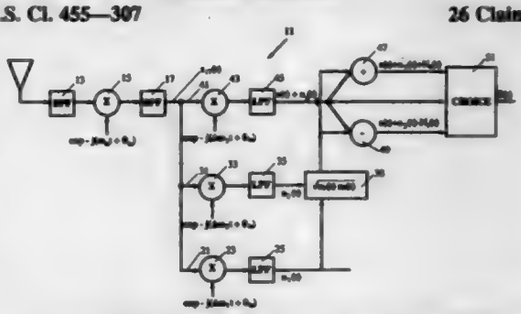
ADAPTIVE NOISE CANCELLATION

Per Enge, Los Altos; Dominic Farmer, Milpitas, and Brian Westfall, Mountain View, all of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Mar. 5, 1993, Ser. No. 27,004

Int. Cl.[6] H04B *1/12*

U.S. Cl. 455—307 **26 Claims**



1. A method for removing impulse noise from a circuit electrical signal s(t) that includes a desired signal $s_0(t)$ plus a noise signal n(t), where each component may vary with time t, the method comprising the steps of:

receiving a circuit input signal that is a sum of a desired signal $s_y(t)$ plus a noise signal n(t) that includes impulse noise from a circuit electrical signal, where the noise signal n(t) is to be determined;

passing the circuit input signal through a bandpass filter, with a selected frequency passband PB, to form a bandpassed signal;

passing the bandpassed signal through a first selected signal processing channel that has frequency support contained in a first frequency band having a central frequency ω_1, to produce a first noise signal $n_1(t)$;

passing the bandpassed signal through a second selected signal processing channel that has frequency support contained in a second frequency band, having a central frequency ω_2, that is spaced apart from and does not overlap any part of the first frequency band, to produce a second noise signal $n_2(t)$;

passing the bandpassed signal through a third selected signal processing channel that has a third frequency band, having a central frequency ω_3, that is spaced apart from and does not overlap any part of the first frequency band and the second frequency band, to produce a third channel output signal $s(t)+n_3(t)$, where the third channel has frequency support contained in the third frequency band that includes substantially all frequencies that contribute to the desired signal s(t), and where the frequencies ω_1, ω_2 and ω_3 lie in the selected frequency pass band PB;

where the first, second and third selected channels include frequency shift by selected first, second and third shift frequencies, respectively, and include passage through a low pass filter with selected first, second and third roll-off frequencies, respectively, to form first, second and third channel output signals, respectively;

forming a combined signal that is a symmetric, homogeneous function $HS\{n_1(t), n_2(t); \theta\}$ of degree one from the first and second channel output signals,

where the first and second channel output signals have m adjustable parameters $\theta=(\theta 1, \ldots, \theta m$; m=1 or 2);

forming a linear combination signal $LC\{HS\{n_1(t), n_2(t); \theta\}; s(t)+n_3(t)\}$ of the combined signal $HS\{n_1(t), n_2(t); \theta\}$ and the third channel output signal $s(t)+n_3(t)$;

adjusting the parameters θ whereby the linear combination signal $LC\{HS\{n_1(t), n_2(t); \theta\}; s(t)+n_3(t)\}$ provides a best possible estimate of the desired signal s(t), according to a selected criterion, for an optimal choice $\theta=\theta_0$ of these parameters; and

issuing the linear combination signal $LC\{HS\{n_1(t), n_2(t); \theta=\theta_0\}; s(t)+ n_3(t)\}$ as an estimate of the desired signal s(t).

5,465,414

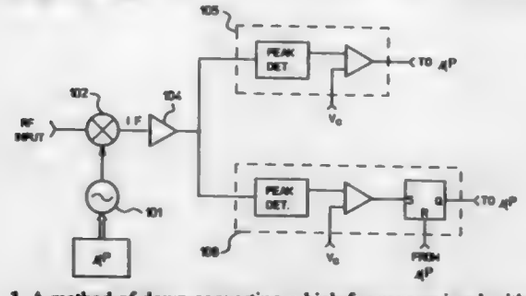
AUTOMATIC DETERMINATION OF THE PRESENCE OF A MICROWAVE SIGNAL AND WHETHER THE SIGNAL IS CW OR PULSED

Raymond W. Moskaluk, and Nancy W. Nelson, both of San Jose, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 388,774, Jul. 31, 1989, abandoned. This application Jun. 27, 1994, Ser. No. 265,981

Int. Cl.[6] H04B *1/26;17/00;* **G01R** *23/16*

U.S. Cl. 455—313 **14 Claims**



1. A method of down converting a high frequency signal within a first frequency range to a first lower frequency signal in a second frequency range by mixing the high frequency signal with harmonics of a minimal number of second lower frequency signals within a third frequency range,

the second lower frequency signals having second frequencies and chosen so that some harmonic of at least one of the second lower frequency signals will convert any signal in the first frequency range to a signal in the second frequency range, wherein, the high frequency signal includes maximum and minimum frequencies;

the first lower frequency signal is an intermediate frequency signal and includes maximum and minimum intermediate frequencies; the second lower frequency signal is a local oscillator signal and includes first and succeeding local oscillator frequencies;

the harmonics include a selected harmonic number, a lowest integer harmonic number, and a minimum allowable harmonic number;

the first local oscillator frequency is selected according to the relationship:

$$f_{MAX}=N_{MAX}f_{LO1}\geq f_{IFmax}$$

where f_{MAX} is the maximum frequency, N_{MAX} is the selected harmonic number, f_{IFmax} is the maximum intermediate frequency, and f_{LO1} is the first local oscillator frequency;

succeeding local oscillator frequencies are chosen to satisfy the following relationships:

$$Nf_{LOn}+f_{IFmin}\leq Nf_{LOn+1}+f_{IFmax}$$
$$Nf_{LOn}-f_{IFmin}\geq Nf_{LOn+1}+f_{IFmin}$$
$$(N-1)f_{LOn}+f_{IFmax}\geq Nf_{LOn+1}-f_{IFmax}$$

where f_{IFmin} is the minimum intermediate frequency, and N is the lowest integer harmonic number at which:

$$N\geq 2f_{IFmax}/(f_{LOn}-f_{LOn+1});$$

proceeding to select additional local oscillator frequencies until a last selected frequency, f_{LOn}, satisfies the relationship:

$$N_{MIN}f_{LOn}-f_{IFmax}\leq f_{MIN}$$

where f_{MIN} is the minimum frequency and N_{MIN} is the minimum allowable harmonic number.

5,465,415

EVEN ORDER TERM MIXER

David E. Bien, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 6, 1992, Ser. No. 926,599

Int. Cl.[6] H04B *1/26*

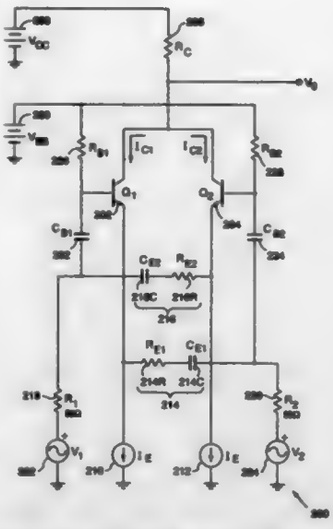
U.S. Cl. 455—326 **24 Claims**

1. A signal mixer for receiving and mixing first and second ac input signals, and for providing an ac output signal with even order terms and substantially suppressed odd order terms of the mixing products of said first and second input signals, said signal mixer comprising:

first mixer means for receiving and mixing first and second ac input signals to provide a first ac mixed signal, wherein said first mixer means is de-biased in a first linear operating region and has a first input impedance associated therewith, and wherein said first and second ac input signals are received at opposing ends of said first input impedance;

second mixer means coupled to said first mixer means for receiving and mixing said first and second ac input signals to provide a second ac mixed signal, wherein said second mixer means is de-biased in a second linear operating region and has a second input impedance associated therewith, and wherein said first and second ac input signals are received at opposing ends of said second input impedance; and

combiner means coupled to said first and second mixer means for receiving and combining said first and second ac mixed



signals to provide an ac output signal, wherein said ac output signal includes a first plurality of even order terms and a second plurality of odd order terms of mixing products of said first and second ac input signals, and further wherein each of said first plurality of even order terms is greater in magnitude than adjacent ones of said second plurality of odd order terms.

5,465,416

BALANCED OUTPUT HIGH-FREQUENCY TRANSDUCERS AND MIXERS USING THE SAME WITH SYMMETRICALLY LOCATED COMPONENTS

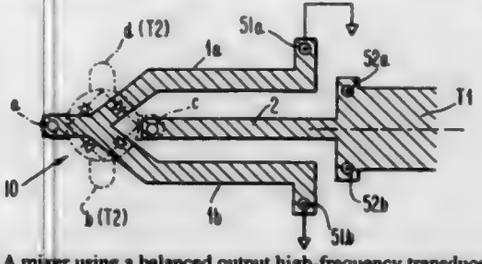
Yoshiyuki Yanagimoto, Kobe, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 29, 1993, Ser. No. 145,417

Claims priority, application Japan, Jan. 31, 1992, 4-081503 U

Int. Cl.[6] H04B *1/26*

U.S. Cl. 455—327 **4 Claims**



1. A mixer using a balanced output high-frequency transducer on a printed circuit board, a first surface of said printed circuit board having a ground plane, comprising:

branched strip lines symmetrically forked from a base thereof located on a second surface opposite to the ground plane, ends thereof distal to the base being connected to the ground plane;

a single strip line located on said second surface between said branched strip lines so as to be electrically insulated from said branched strip lines and extending substantially the same length as said branched strip lines, said single strip line having a first input/output terminal at the tip thereof distal to the base of said branched strip lines;

a pair of twin-branched ground strips located on said first surface corresponding to substantially the same location as said branched strip lines and extending from the base substantially the same length as said branched strip lines, only ends thereof proximal to the base being continuous with said ground plane while tips thereof distal to the base are connected to said single strip line at said first input/output terminal;

a bridge-shaped ground strip line located on said first surface and corresponding to said single strip line, both ends thereof being continuous with said ground plane; and

a symmetrical diode ring having four diodes connected to one another in a ring form creating four terminals, wherein a first pair of diagonally placed terminals of said diode ring being connected to said base of said branched strip lines and the tip of said single strip line thereof, a second pair of diagonally placed terminals of said diode ring located outside said branched strip lines with respect to said single strip line, said first pair of diagonally placed terminals serving as said first input/output terminals, said second pair of diagonally placed terminals serving as second input/output terminals.

5,465,417

INTEGRATED BARIUM-FERRITE TUNED MIXER FOR SPECTRUM ANALYSIS TO 60 GHZ

Hassan Tanbakuchi, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 16, 1993, Ser. No. 168,886

Int. Cl.[6] H04B *1/26*

U.S. Cl. 455—330 **20 Claims**

1. A frequency-tunable resonator filter and mixer to provide a tunable bandpass filter and image-enhanced, single-balanced mixer in response to a radio-frequency (RF) input signal having a given frequency at an RF input, comprising:

at least one frequency-tunable resonator, comprising:

an input suspended stripline coupling coupled to the RF input for receiving the RF input signal;

a ferrimagnetic sphere proximate to and magnetically coupled to the input suspended stripline coupling; and

an output suspended stripline coupling proximate to and magnetically coupled to the ferrimagnetic sphere such that the RF input signal is coupled to the output suspended stripline coupling when a resonance frequency of the at least one frequency-tunable resonator approximates the given frequency of the RF input signal, the output suspended stripline coupling having a first end and a second end;

an electromagnet proximate to the at least one frequency-tunable resonator for producing a DC magnetic field that is uniform over the at least one frequency-tunable resonator for tuning the resonance frequency of the at least one frequency-tunable resonator;

a diode bridge connected to the first end of the output suspended stripline coupling;

a low-pass filter having a first end and a second end, the first end of the low-pass filter being connected to the second end of the output suspended stripline coupling;

a local oscillator (LO) and intermediate frequency (IF) diplexer having a first end, a second end, and an IF port, the first end of the LO and IF diplexer being connected to the second end of the low-pass filter;

a balun having a first end and a second end, the first end of the balun being connected to the second end of the LO and IF diplexer; and

a swept LO input coupled to the second end of the balun for generating an LO signal;

wherein the diode bridge combines the RF input signal with a harmonic of the LO signal for producing an IF output signal at the IF port.

5,465,418

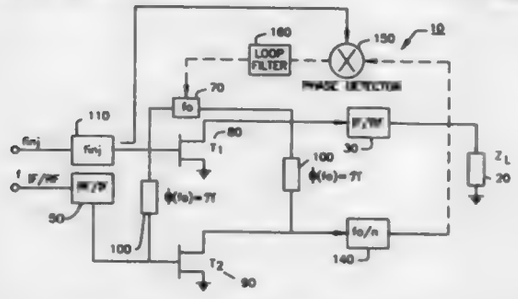
SELF-OSCILLATING MIXER CIRCUITS AND METHODS THEREFOR

Xuesong Zhou, Philadelphia, Pa., and Afshin S. Daryoush, Shaker Heights, Ohio, assignors to Drexel University, Philadelphia, Pa.

Continuation-in-part of Ser. No. 54,717, Apr. 29, 1993. This application Jan. 13, 1994, Ser. No. 180,650

Int. Cl.[6] H04B *1/28*

U.S. Cl. 455—332 7 Claims



1. A tunable communications circuit for transforming a signal having a first frequency to a signal having a second frequency comprising:

push-pull amplifier means for amplifying the signal having the first frequency to produce an amplified signal, wherein the push-pull amplifier means comprises a pair of field effect transistors;

feedback means coupled to the push-pull amplifier means for phase shifting the amplified signal during each half cycle of the push-pull amplifier means, thereby creating an oscillating output signal, wherein the feedback means comprises at least one transmission line connected between a drain and a gate of one of the field effect transistors such that a substantially one hundred and eighty degree phase shift is introduced to the amplified signal;

means coupled to said push-pull amplifier means for coupling said oscillating output signal to said signal having the first frequency, whereby said push-pull amplifier means mixes the signal having the first frequency with the oscillating signal to produce the signal of the second frequency;

means interfaced with a gate terminal of one of the pair of field effect transistors for locking the frequency of the oscillating signal to prevent the oscillating signal from being free-running;

output means coupled to drain terminals of the pair of field effect transistors for receiving the signal having the second frequency; and

wherein the transistors operate at Class B for both oscillation and mixing functions and said Class B operation enables simultaneous realization of large locking range and high conversion gain; and wherein the circuit exhibits phase control of said signals of said first and second frequency.

5,465,419

ARRANGEMENT FOR FREQUENCY CONVERSION OF AN INPUT SIGNAL WITH AN OSCILLATOR SIGNAL TO FORM AN INTERMEDIATE FREQUENCY SIGNAL

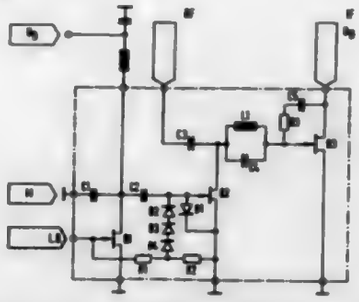
Walter Zimmermann, Dorfen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 9, 1993, Ser. No. 118,225

Claims priority, application European Pat. Off., Sep. 30, 1992, 92116745

Int. Cl.[6] H04B *1/28*

U.S. Cl. 455—333 4 Claims



1. An arrangement for frequency conversion of an input signal having a frequency f_1 with a local oscillator signal having a frequency f_2 to form an intermediate frequency signal having a frequency f_3, comprising:

a signal carrying path having an input path and an output path;

a control source for generating said local oscillator signal with the oscillator frequency f_2;

a local oscillator driver amplifier comprising a transistor;

a first circuit inserted into said input path and having properties of transmission for the frequency f_1 and rejection for the frequency f_3;

a second circuit inserted into said output path having properties of transmission for the frequency f_3 and rejection for the frequency f_1;

a switch element arranged between a junction between said first and second circuits to ground;

said switch element being switched between a high-impedance and a low-impedance state with said frequency f_2 of the oscillator signal;

an IF amplifier comprising a resistor fed-back transistor provided in said output path;

a limiter and control circuit;

said control source being connected to said switch element via said local oscillator driver amplifier and said limiter and control circuit;

said local oscillator driver amplifier amplifying said local oscillator signal and controlling the switch element at a control input thereof via a capacitor; and

said limiter and control circuit limiting an amplified local oscillator signal amplified with said local oscillator driver amplifier and being connected to regulate a gate of said local oscillator drive amplifier so that said control input of said switch element is optimally driven and a current consumption of the frequency conversion arrangement is minimized.

5,465,420

TRANSCONDUCTANCE MIXER WITH FEEDBACK

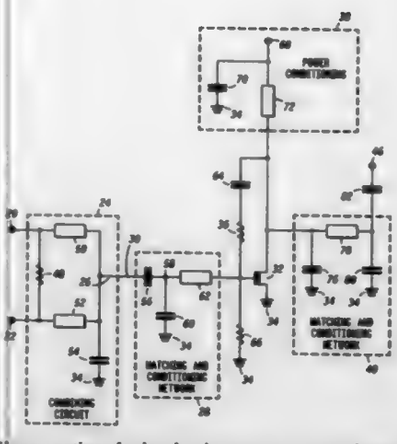
Richard M. Dougherty, and Glenn R. Fraser, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 31,413, Mar. 15, 1993, abandoned. This application Aug. 18, 1994, Ser. No. 292,944

Int. Cl.[6] H04B *1/28*

U.S. Cl. 455—333 38 Claims

1. A transconductance mixer having first and second input terminals for receiving, respectively, first and second multiplicand signals, and an output terminal for providing a mixed signal, and comprising:



a non-linear active device having one or more input nodes, a reference node and an output node, wherein the output node has an output impedance;

a first circuit for coupling said first multiplicand signal from said first input terminal of the mixer to a first input node of said active device and for coupling said second multiplicand signal from said second input terminal of the mixer to either said first input node or said reference node or a second input node of said active device;

a second circuit extending between said output node of said active device and said output terminal of said mixer, for coupling to said output terminal of said mixer a first portion of a product signal produced from said first and second multiplicand signals by said active device and appearing at said output node of said active device, wherein said first portion of said product signal forms said mixed signal; and

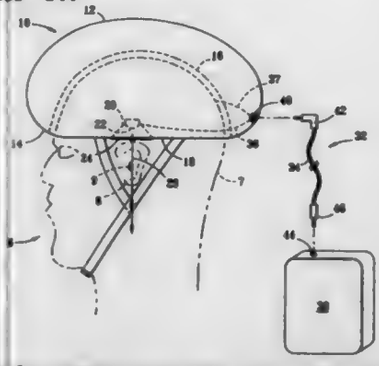
a feedback circuit having an impedance which decreases with increasing frequency at operating frequencies of the mixer for passing AC signals but not DC signals, said feedback circuit being coupled between said first circuit and said output node of said active device, for feeding a second portion of said product signal back into said first input node of said active device to lower said output impedance at a frequency of said mixed signal.

5,465,421

PROTECTIVE SPORTS HELMET WITH SPEAKERS, HELMET RETROFIT KIT AND METHOD

Lee A. McCormick, 10612 Raleigh, Frisco, Tex. 75034, and Keith M. McCormick, 5724 Macrae St., Fort Worth, Tex. 76148

Filed Jun. 14, 1993, Ser. No. 77,127
Int. Cl.[6] H04B *1/08*
U.S. Cl. 455—344 **1 Claim**



1. A kit for converting an existing sports helmet for portable audio sound producing capabilities for use on a wearer's head during physical exercise or sports activities at which head injuries are to be protected against and wherein said existing sports helmet has a protective shell and a lower rim with portions thereof terminating above the wearer's ear canals, said kit comprising:

(a) attachment means attachable to at least one of said portions of said lower rim terminating above the wearer's ear canals so that said ear canals are not shielded, wherein said attachment means for attaching said speaker comprises:

(i) a plurality of prongs insertable into said helmet shell flush with said rim and having an internal orifice;

(ii) a short projection fastened to said speaker having a male portion of said clip device, which short projection is removably insertable into said internal orifice of one of said plurality of short prongs for secure engagement within said orifice; and

(iii) a plurality of wire holding eyelets, each having a shaft and a male portion of said clip device attached, which shaft is removably insertable into an internal orifice of another one of said plurality of prongs for secure engagement within said internal orifice;

(b) at least one speaker attachable to said sports helmet through said attachment means so that said at least one speaker does not shield said ear canals and is aimed to emit sound therefrom primarily directed downwardly past said wearer's ear canal and so that other sounds, earnings, or communications from the surroundings can also be heard;

(c) a portable sound signal producing device for being carried by said wearer of said sports helmet;

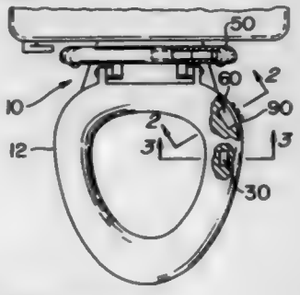
(d) means for operatively connecting said at least one speaker, attached to said sports helmet, with said portable sound signal producing device such that signals from said sound producing device are communicated to and said at least one speaker for causing desirable sounds to be emitted therefrom during physical exercise or sports activities by the wearer of said sports helmet.

5,465,422

SEAT APPARATUS FOR ACTUATING AN AUDIO SOURCE

Mark A. Dean, 7829 Normandy St., Miramar, Fla. 33023

Filed Jun. 13, 1994, Ser. No. 258,943
Int. Cl.[6] H04B *1/06*; A47K *13/00*
U.S. Cl. 455—344 **3 Claims**



1. A seat apparatus comprising:

a base including a top surface defining a seat, said base structured to be supported on a support surface and structured to support a person in a seat position thereon, at least a portion of said base being hollow,

a lid movably mounted to said support surface and independent movable relative to said support surface and said base between a raised position and a lowered position in covering relation to said top surface of said base.

audio means located externally of said base and structured and disposed for transmitting audible sounds upon operation thereof,

control means for controlling operation of said audio means, said control means including means for controlling power and volume of said audio means.

actuation means for operating said audio means between an on and off condition, said actuation means being mounted and

concealed within the hollow portion of said base, said actuation means including a normally open switch structured and disposed to close in response to the person sitting on said top surface of said base, said switch being further structured to open when the person is removed from said top surface, wherein closing of said switch operates said audio means to said on condition, and opening of said switch operates said audio means to said off condition.

transmitter means mounted and concealed within said base, said transmitter means connected to said switch for transmitting an activation signal into the air upon closing of said switch, and

receiver means remotely located from said transmitter means and connected to said audio means, wherein said receiver means operates said audio means to said on condition upon a receipt of said activation signal transmitted from said transmitter means.

DESIGNS PATENTS

GRANTED NOV. 7, 1995

ERRATA

For CLASS	See PATENT NO.
D08–96	D363,888
D25–19	D363,993

DESIGNS

NOVEMBER 7, 1995

363,811
ARCHERY COVERALL
Rodney D. Burrow, 4800 Fayettville Hwy., Pulaski, Tenn. 38478

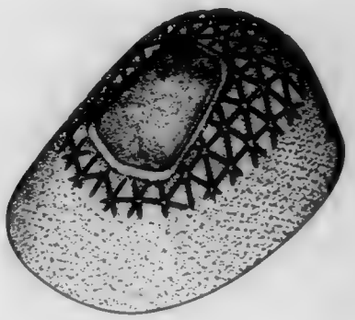
Filed Sep. 23, 1994, Ser. No. 28,850
Term of patent 14 years
U.S. Cl. D2—743

363,812
COMBINED NECK GUARD AND SUN VISOR
Ernie Cassidy, 331 Seminole Way, Fort Myers Beach, Fla. 33931

Filed Sep. 14, 1993, Ser. No. 12,929
Term of patent 14 years
U.S. Cl. D2—879

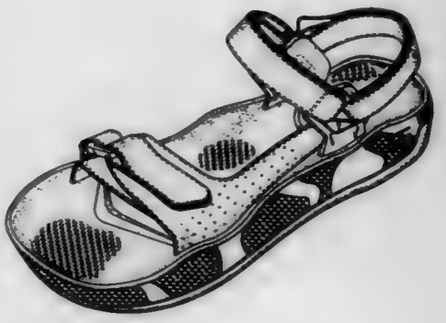
363,813
CUSHIONED HEEL CUP
Kenneth M. Gay, Bartlett, Tenn., assignor to Schering-Plough Healthcare Products, Inc., Memphis, Tenn.

Filed May 12, 1994, Ser. No. 22,794
Term of patent 14 years
U.S. Cl. D2—915

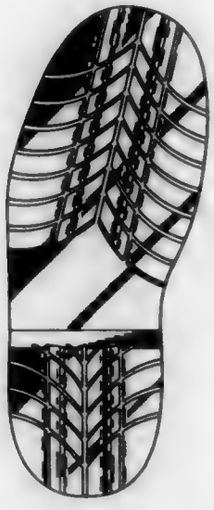


363,814
SANDAL
Kanzo Tsujino, Orange, Calif., assignor to Asics Corporation, Kobe, Japan

Filed May 4, 1994, Ser. No. 22,398
Term of patent 14 years
U.S. Cl. D2—916

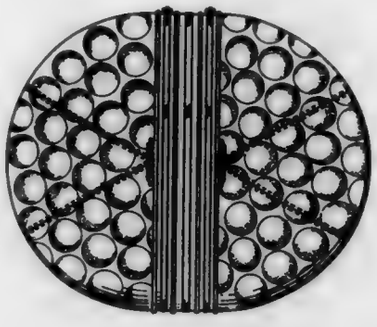


363,815
SHOE SOLE
James H. Lucarelli, Nashua, N.H., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 20, 1994, Ser. No. 24,717
Term of patent 14 years
U.S. Cl. D2—960

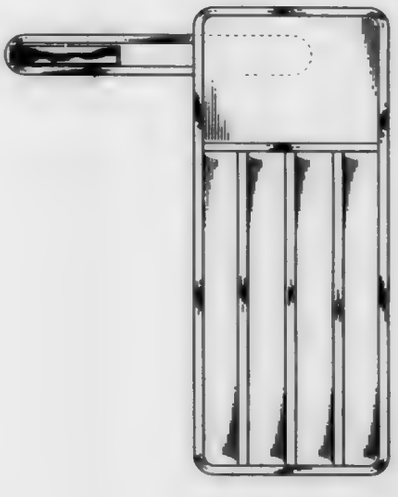


363,816
BLADDER FOR A SHOE SOLE
Larry R. Sarkinen, Vancouver, Wash.; James C. Sell, Jr., Beaverton, and Steve Roth, Portland, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.
Filed Mar. 15, 1995, Ser. No. 36,195
Term of patent 14 years
U.S. Cl. D2—961

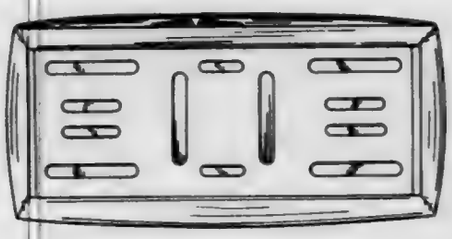
363,817
SPORTS BAG
Jacqueline C. Beckwith, 79 Hollywood Road, Suite 2D, Central, Hong Kong
Filed May 5, 1992, Ser. No. 881,340
Claims priority, application United Kingdom, Nov. 8, 1991, 2018921
Term of patent 14 years
U.S. Cl. D3—254



363,818
CASE FOR REMOVABLE BARRELS FOR PAINTBALL GUNS
Robert L. Booth, and Minnie S. Booth, both of 122 Fer Don Rd., Dayton, Ohio 45405
Filed Aug. 31, 1993, Ser. No. 12,400
Term of patent 14 years
U.S. Cl. D3—254



363,819
SOLAR PANEL BAG
Dana W. Gleason, 409 E. Olive, Bozeman, Mont. 59715
Filed Dec. 6, 1993, Ser. No. 16,071
Term of patent 14 years
U.S. Cl. D3—315

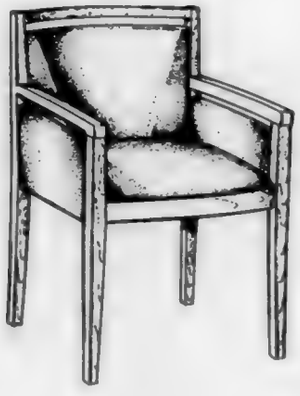


363,820
COMBINED BRUSH FOR TEETH AND GUMS AND STAND THEREFOR
Ralph C. Winge, Los Angeles, Calif., assignor to Watts Health Foundation, Inc., Inglewood, Calif.
Filed Jul. 22, 1993, Ser. No. 10,998
Term of patent 14 years
U.S. Cl. D4—108

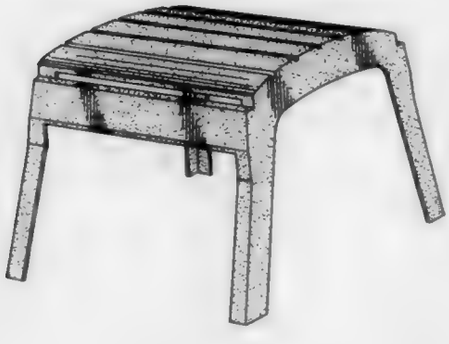
363,821
BROOM WITH ADJUSTABLE HANDLE
Esther E. Burgess, 1526 New York Ave., Brooklyn, N.Y. 11210
Filed Jun. 27, 1994, Ser. No. 25,103
Term of patent 14 years
U.S. Cl. D4—132

363,822
HANGER FOR IN-LINE SKATES
Kevin M. O'Neil, 4560 W. Arm Rd., Spring Park, Minn. 55384
Filed Sep. 12, 1994, Ser. No. 28,311
Term of patent 14 years
U.S. Cl. D6—315

363,823
CHAIR
Joseph D. Ricchio, Jr., Seal Beach, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 22, 1994, Ser. No. 20,314
Term of patent 14 years
U.S. Cl. D6—334



363,824
OTTOMAN
Norbert Lyons, Winthrop, Mass., assignor to Syroco, Inc., East Boston, Mass.
Filed Aug. 16, 1993, Ser. No. 11,837
Term of patent 14 years
U.S. Cl. D6—349

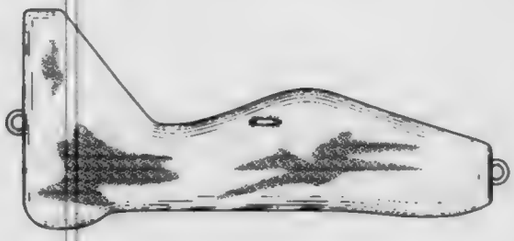


363,825
CHAIR
Stephen C. Hess, Birmingham, Ala., assignor to Winston Furniture Company of Alabama, Birmingham, Ala.
Filed Jul. 1, 1994, Ser. No. 25,454
Term of patent 14 years
U.S. Cl. D6—369

363,826
DINING ARM CHAIR FRAME
Leo Martin, Coconut Grove, Fla., assignor to Miami Metal Products, Inc., Miami, Fla.
Filed Nov. 9, 1994, Ser. No. 30,823
Term of patent 14 years
U.S. Cl. D6—370

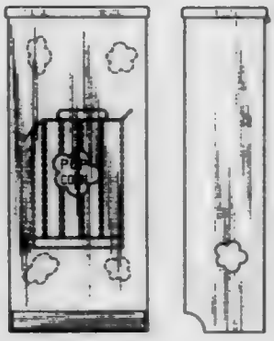
363,827
CHAIR
Eunice Noell, 6205 SW. Hood Ave., Portland, Oreg. 97201
Filed Oct. 24, 1994, Ser. No. 30,180
Term of patent 14 years
U.S. Cl. D6—373

363,828
ERGONOMICAL BODY SUPPORT
Betty A. Lockwood, P.O. Box 185, Pleasant Valley, N.Y. 12569
Filed Apr. 8, 1994, Ser. No. 21,084
Term of patent 14 years
U.S. Cl. D6—375



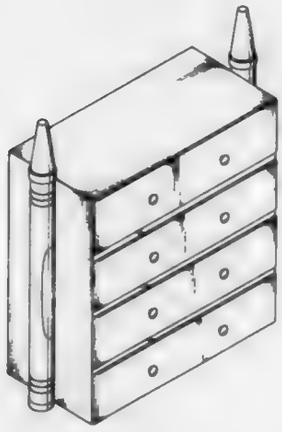
363,829
CHAIR
France Berlic, 1165 N. Ocean Dr., Suite G, Riv. Beach, Fla. 33404
Filed Aug. 29, 1994, Ser. No. 27,706
Claims priority, application Slovenia, Jun. 7, 1994, M-9450083
Term of patent 14 years
U.S. Cl. D6—380

363,830
MICRO POPCORN DISPENSER
Carolyn A. Forrest, 3811 Huggins St., Flint, Mich. 48506
Filed Feb. 16, 1994, Ser. No. 18,837
Term of patent 14 years
U.S. Cl. D6—408

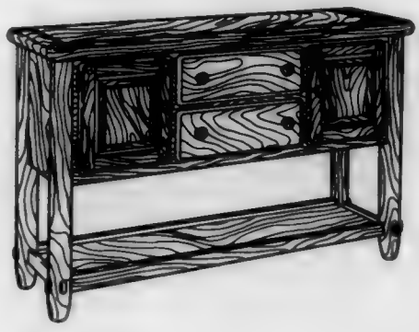


363,831
PANTS STRETCHER
John W. Mueller, 505 North St., Plymouth, Wis. 53073
Filed Dec. 30, 1993, Ser. No. 16,963
Term of patent 14 years
U.S. Cl. D6—411

363,832
DRESSER
Robert S. Germany, 4155 S. Braeswood #32, Houston, Tex. 77025
Division of Ser. No. 736,813, Jul. 29, 1991, Pat. No. 8,347,531.
This application May 10, 1994, Ser. No. 22,641
Term of patent 14 years
U.S. Cl. D6—434



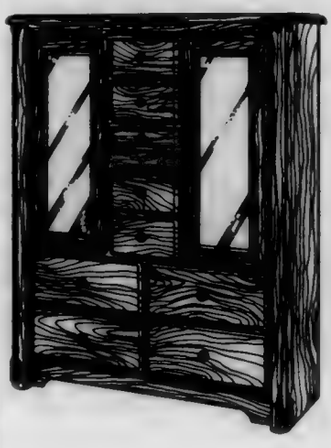
363,833
CABINET
Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Mar. 24, 1994, Ser. No. 20,404
Term of patent 14 years
U.S. Cl. D6—436



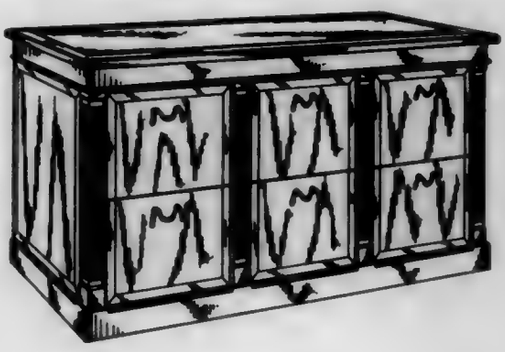
363,834
UTILITY CABINET
David W. Thompson, Dublin, Ohio, assignor to Schottenstein Stores Corporation, Columbus, Ohio
Filed Feb. 1, 1994, Ser. No. 18,200
Term of patent 14 years
U.S. Cl. D6—438

363,835
CABINET
Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Mar. 25, 1994, Ser. No. 20,426
Term of patent 14 years
U.S. Cl. D6—439

363,836
CHEST
Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Mar. 25, 1994, Ser. No. 20,421
Term of patent 14 years
U.S. Cl. D6—444

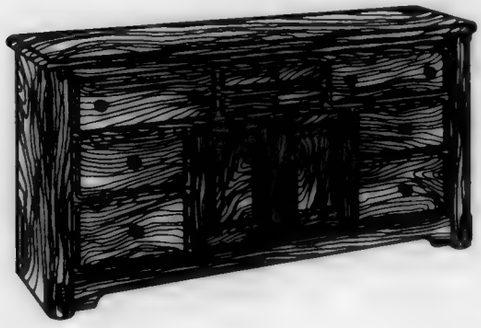


363,837
CREDENZA
Michael D. Tatum, Dallas, Tex., and Robert W. Pardom, deceased, late of Washington, D.C., assignors to Kimball International, Inc., Jasper, Ind.
Filed Jun. 11, 1993, Ser. No. 9,406
The portion of the term of this patent subsequent to May 9, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—446

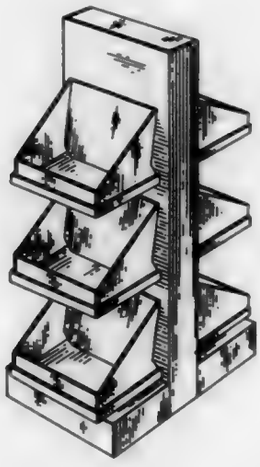


363,838
DRESSER
Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Mar. 24, 1994, Ser. No. 20,335
Term of patent 14 years
U.S. Cl. D6—446

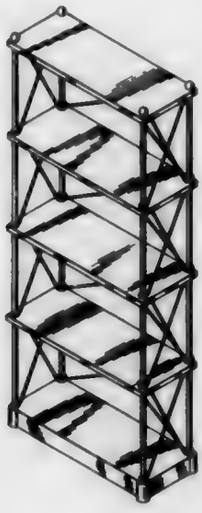
363,839
DRESSER
Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Mar. 25, 1994, Ser. No. 20,413
Term of patent 14 years
U.S. Cl. D6—446



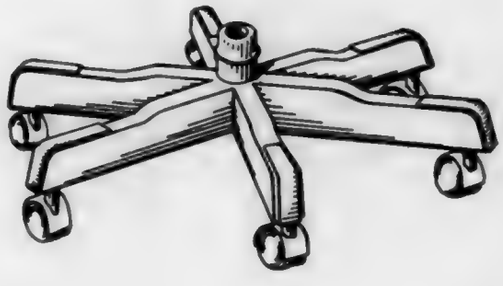
363,840
DISPLAY STAND
Benjamin S. Weshler, Old Westbury, N.Y., assignor to Display Systems, Inc., Maspeth, N.Y.
Filed Jun. 14, 1993, Ser. No. 9,387
Term of patent 14 years
U.S. Cl. D6—476



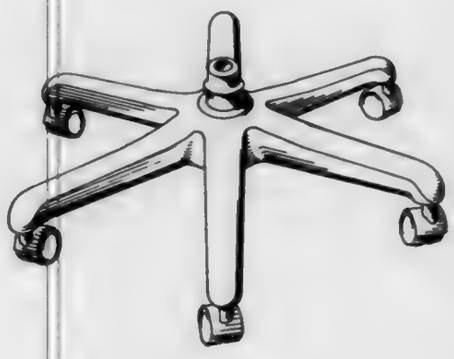
363,841
SHELVING ASSEMBLY
Aagje M. T. Nourse, Fort Worth, Tex., assignor to BBA Holdings, Inc., Wilmington, Del.
Filed Nov. 14, 1994, Ser. No. 30,927
Term of patent 14 years
U.S. Cl. D6—479



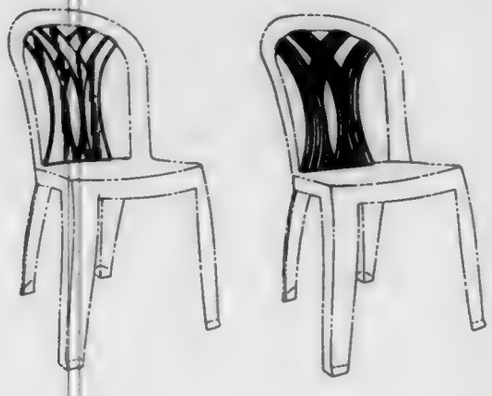
363,842
CHAIR BASE
Robert F. Larkin, High Point, N.C., assignor to Miller Desk, Inc., High Point, N.C.
Filed Jun. 13, 1994, Ser. No. 24,296
Term of patent 14 years
U.S. Cl. D6—498



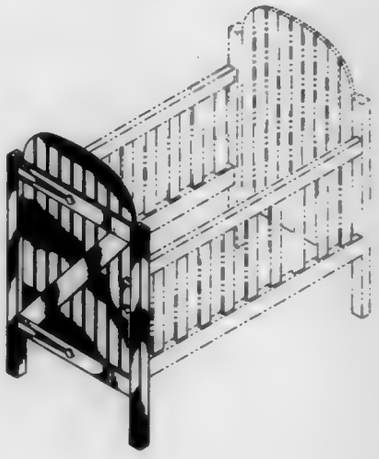
363,843
CHAIR BASE
Robert F. Larkin, High Point, N.C., assignor to Miller Desk, Inc., High Point, N.C.
Filed Jun. 13, 1994, Ser. No. 24,302
Term of patent 14 years
U.S. Cl. D6—498



363,844
CHAIR BACK
Wade A. F. Maple, Sherrills Ford, N.C., and Thomas Sauvage, Saint Martin d'Uriage, France, assignors to Sunbeam Corporation, Fort Lauderdale, Fla.
Filed Jun. 1, 1994, Ser. No. 25,440
Term of patent 14 years
U.S. Cl. D6—502

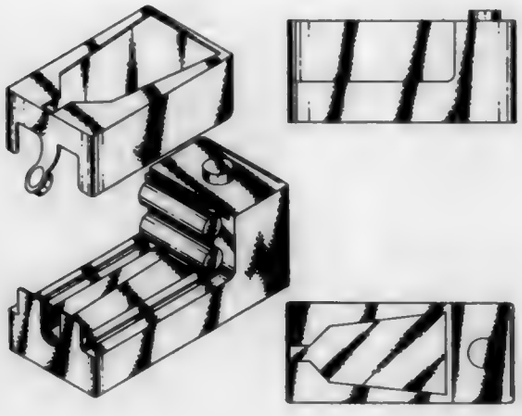


363,845
CRIB ENDBOARD
Stephanie K. Almborg, Dallas, Tex., assignor to SKA! Design, Inc., Dallas, Tex.
Filed Jun. 29, 1994, Ser. No. 25,326
Term of patent 14 years
U.S. Cl. D6—508

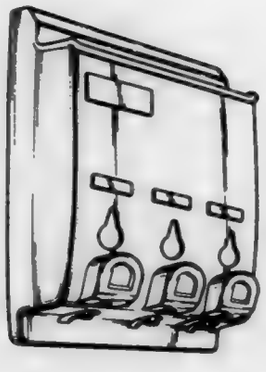


363,846
PORTION OF A TOOTHBRUSH HOLDER ATTACHMENT FOR A TOOTHPASTE TUBE
Brian Cooney, Atlanta, Ga., assignor to Tribro Corporation, Manassas, Va.
Filed Jun. 13, 1994, Ser. No. 24,298
Term of patent 14 years
U.S. Cl. D6—534

363,847
AUTOMATIC TOOTHPASTE TUBE DISPENSER
Ivan Young, 509 W. 61st Pl., Chicago, Ill. 60621-3231
Filed Sep. 7, 1994, Ser. No. 28,102
Term of patent 14 years
U.S. Cl. D6—541

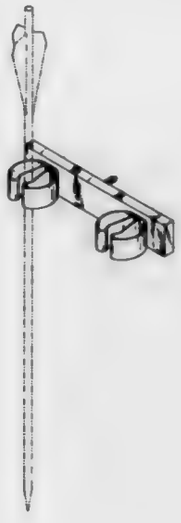


363,848
LIQUID SOAP DISPENSER
Leonard C. Andrus, W. Bloomfield, and Larry G. Turner, Fenton, both of Mich., assignors to Braun-Craft Manufacturing Company, Southfield, Mich.
Filed Aug. 4, 1994, Ser. No. 26,758
The portion of the term of this patent subsequent to Jul. 11, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—544

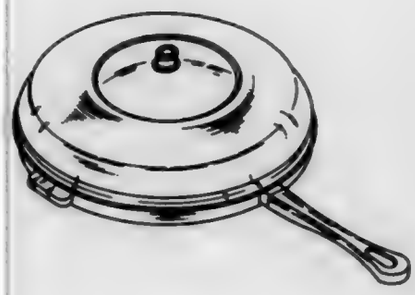


363,849
GOLF CLUB SUPPORT STAND AND TOWEL HOLDER
Joseph D. Bruns, 1220 Witherspoon, and Ronald R. Earl, 2457 Dillon Ct., both of Thousand Oaks, Calif. 91360
Filed Sep. 15, 1993, Ser. No. 13,008
Term of patent 14 years
U.S. Cl. D6—552

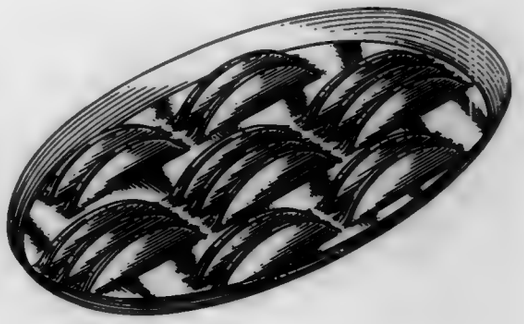
363,850
ARROW CLIP
Kent F. Towler, 2349 N. 500 West, Rensselaer, Ind. 47978
Filed Sep. 1, 1994, Ser. No. 27,973
Term of patent 14 years
U.S. Cl. D6—552



363,851
BAKING PAN
Ming-Jing Chen, No. 29, Alley 39, Lane 206, Sec. 2, Tai-He Rd., Ah-Yi Li, Changhua City, Taiwan, Prov. of China
Filed Mar. 8, 1994, Ser. No. 19,611
Term of patent 14 years
U.S. Cl. D7—361



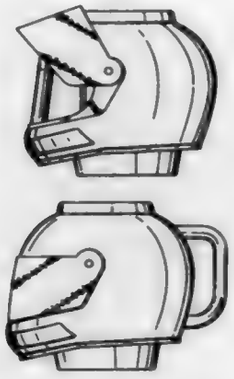
363,853
TACO PLATTER
Bette E. Smith, 23681 Posey La., West Hills, Calif. 91304
Filed May 2, 1994, Ser. No. 22,249
Term of patent 14 years
U.S. Cl. D7—584



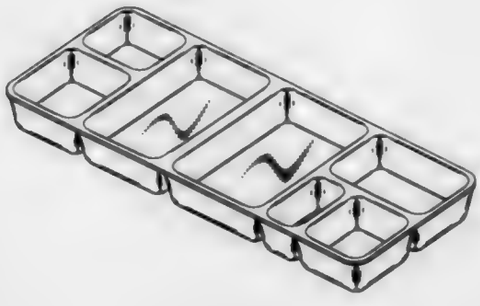
363,852
BABY JUICE CUP LID
Brian Q. Young, P.O. Box 862469, Los Angeles, Calif. 90086-2469
Filed Jan. 28, 1994, Ser. No. 18,063
Term of patent 14 years
U.S. Cl. D7—392.1

363,854
SHOT GLASS
Michael Katz, 1355 S. Inca St., Denver, Colo. 80223
Filed Apr. 12, 1994, Ser. No. 21,172
Term of patent 14 years
U.S. Cl. D7—509

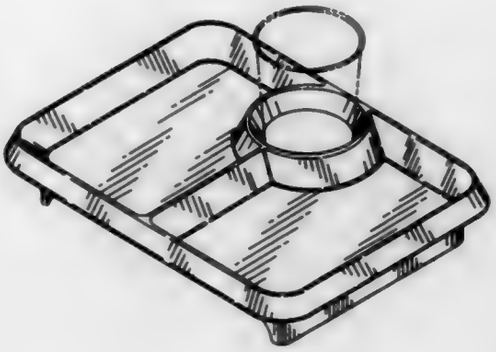
363,855
DRINK CONTAINER
Karl Van Blankenburg, 61830 Lantern Cove, Washington, Mich. 48094
Filed Aug. 2, 1993, Ser. No. 11,339
Term of patent 14 years
U.S. Cl. D7—515



363,856
FOOD SERVICE TRAY
John W. Westbrooks, Jr., Christiana, Tenn., assignor to Standex International Corporation, Murfreesboro, Tenn.
Filed Jun. 14, 1994, Ser. No. 24,427
Term of patent 14 years
U.S. Cl. D7—553

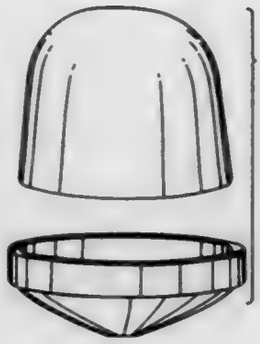


363,857
LAP TRAY
Sy Susman, 435 Promontory Dr. West, Newport Beach, Calif. 92660
Filed Aug. 31, 1994, Ser. No. 27,866
Term of patent 14 years
U.S. Cl. D7—553

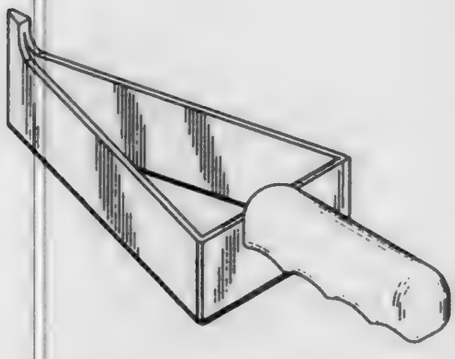


363,858
DOUBLE BEVERAGE CARRIER
Bruce R. Sweeney, Box 299, Ashville, N.Y. 14710
Filed Aug. 25, 1994, Ser. No. 27,618
Term of patent 14 years
U.S. Cl. D7—608

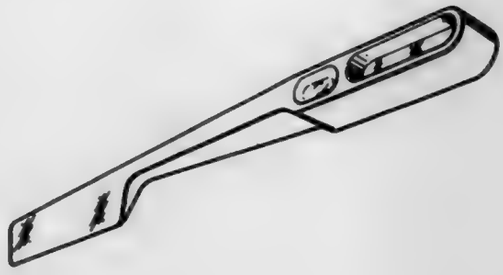
363,859
CONTAINER FOR SAVING A PARTIALLY EATEN STICK-MOUNTED SUCKER
Patricia Matnick, R.R. 1, Box 89D, Weatherly, Pa. 18255
Filed Jul. 12, 1994, Ser. No. 25,797
Term of patent 14 years
U.S. Cl. D7—629



363,860
CAKE CUTTER
John F. Gallo, 121 Harriet St., Throop, Pa. 18512
Filed Jul. 5, 1994, Ser. No. 25,565
Term of patent 14 years
U.S. Cl. D7—673

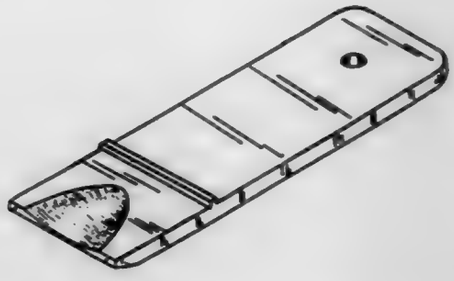


363,861
SPATULA
Roger P. Slater, 20 Petersfield, Croft, Leicestershire LE9 3GY, England
Filed Jul. 25, 1994, Ser. No. 26,270
Term of patent 14 years
U.S. Cl. D7—688

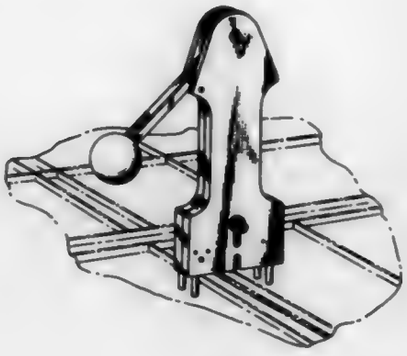


363,862
SHOVEL
Richard V. Lusignan, 35 Lancer Ln., West Warwick, R.I. 02893
Filed Jun. 27, 1994, Ser. No. 25,892
Term of patent 14 years
U.S. Cl. D8—10

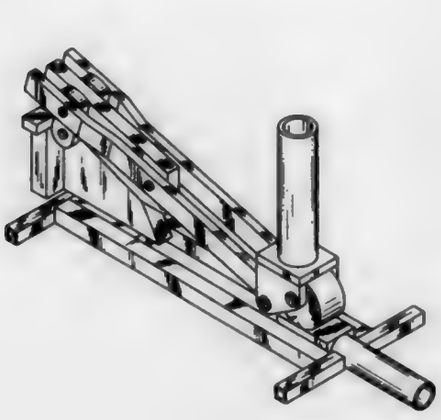
363,863
COMPACT TAB LIFTING TOOL
Raymond P. Tipp, P.O. Box 3778, Missoula, Mont. 59806
Filed May 23, 1994, Ser. No. 23,344
Term of patent 14 years
U.S. Cl. D8—40



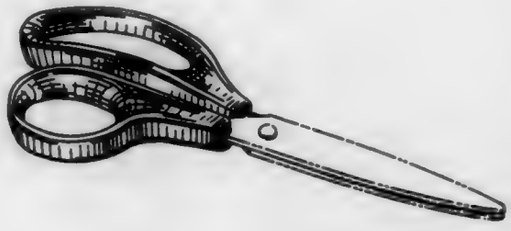
363,864
RULE PULLER FOR DIE PATTERN DISASSEMBLY
Allan L. Masterson, Los Alamitos, and Thomas L. Knutson, Yorba Linda, both of Calif., assignors to Frank Wagner & Son, Ontario, Calif.
Filed Feb. 24, 1994, Ser. No. 19,160
Term of patent 14 years
U.S. Cl. D8—51



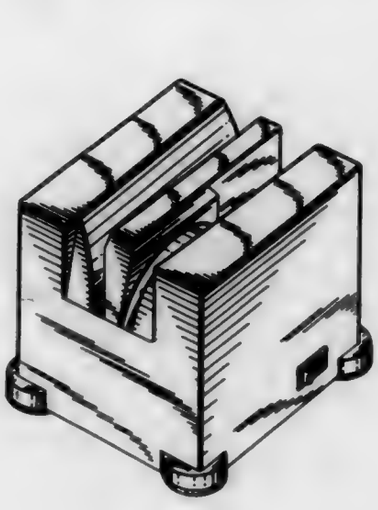
363,865
REBAR CUTTING TOOL
Cristobal Pulido, 26964 Manon Ave., Hayward, Calif. 94544
Filed Apr. 25, 1994, Ser. No. 21,814
Term of patent 14 years
U.S. Cl. D8—51



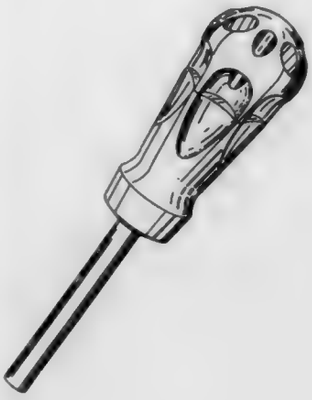
363,866
SCISSOR HANDLES
Charles S. Ramsey, Wausau, and Robert W. Cornell, Schofield, both of Wis., assignors to Fiskars Oy Ab, Helsinki, Finland
Continuation of Ser. No. 462, Oct. 15, 1992, Pat. No. Des. 350,466, which is a continuation of Ser. No. 528,179, May 24, 1990, Pat. No. Des. 353,087. This application Sep. 12, 1994, Ser. No. 28,298
Term of patent 14 years
U.S. Cl. D8—57



363,867
KNIFE SHARPENER
Marc Harrison, Portsmouth, R.I., and Alain Vadrot, Paray-le-Monial, France, assignors to Cuisine de France, ltd., Shelton, Conn.
Filed Aug. 8, 1994, Ser. No. 26,892
Term of patent 14 years
U.S. Cl. D8—63

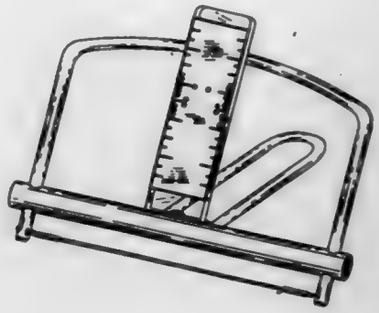


363,868
SCREWDRIVER
Gary P. Israel, and Marvin L. Cox, both of Wichita, Kans., assignors to Wescon Products Company, Wichita, Kans.
Filed Jul. 6, 1993, Ser. No. 10,277
Term of patent 14 years
U.S. Cl. D8—83

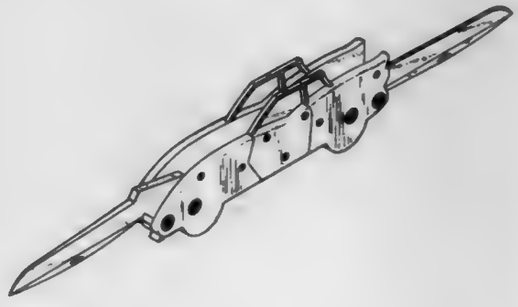


363,869
SHARPENING STONE HOLDER FOR A KNIFE SHARPENER
Glenn D. Ross, Marietta, Ga., assignor to Frost Cutlery Company, Chattanooga, Tenn.
Filed Aug. 29, 1994, Ser. No. 27,718
Term of patent 14 years
U.S. Cl. D8—93

363,870
ADJUSTABLE CLAY CUTTER
Robert J. Oberloier, and Nicole A. Oberloier, both of 5571 Quilley Ave., Rogers, Minn. 55374
Filed Aug. 4, 1994, Ser. No. 26,742
Term of patent 14 years
U.S. Cl. D8—98



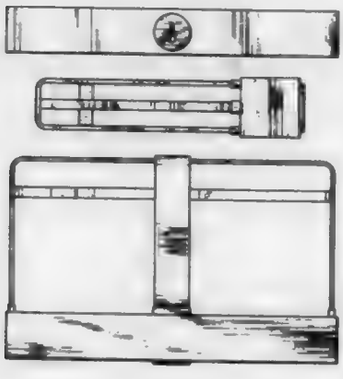
363,871
FOLDING KNIFE
Darrell R. Coggins, 3125 Fence Rd., Decula, Ga. 30211
Filed Mar. 10, 1994, Ser. No. 19,740
Term of patent 14 years
U.S. Cl. D8—100



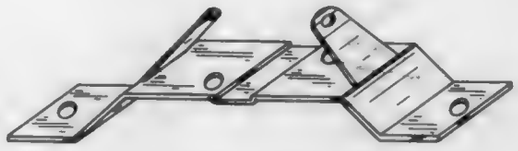
363,872
DOOR LEVER
Anthony J. Carsello, Chino, Calif., assignor to Emhart Inc., Newark, Del.
Filed Aug. 13, 1993, Ser. No. 11,803
Term of patent 14 years
U.S. Cl. D8—308

363,873
HINGE WING COVER
Francis G. H. Ainscough, McHenry, Ill., assignor to Newell Operating Company, Freeport, Ill.
Filed Aug. 3, 1994, Ser. No. 25,996
Term of patent 14 years
U.S. Cl. D8—323

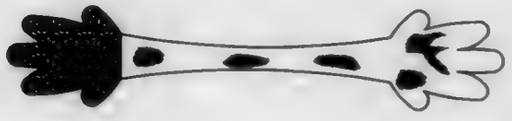
363,874
LOCKING PROTECTIVE COVER FOR A VIDEOCASSETTE
Paul A. Crane, 2507 Kyle Rd., Selma, Ala. 36703
Filed Mar. 10, 1994, Ser. No. 19,738
Term of patent 14 years
U.S. Cl. D8—346



363,875
DOWNSPOUT HANGER
George P. Korb, 6607 Mt. Vista Rd., Kingsville, Md. 21087
Filed Oct. 14, 1993, Ser. No. 14,650
Term of patent 14 years
U.S. Cl. D8—373



363,876
BAG HOLDING STRAP FOR ATTACHMENT TO A SHOPPING CART
Brenda J. Morissette, R.R. #1 Box 76FF, Howes Cave, N.Y. 12092
Filed Nov. 9, 1993, Ser. No. 15,150
Term of patent 14 years
U.S. Cl. D8—373



363,877
STRAP HOLDER
Robert D. Dee, Allentown, Pa., assignor to Smirne Plastics, Inc., Allentown, Pa.
Filed Jun. 23, 1994, Ser. No. 24,917
Term of patent 14 years
U.S. Cl. D8—373

363,878

BOLT, NUT AND WASHER ASSEMBLY

Shin Hayabusa, Kakogawa, Japan, assignor to Unitite Kabushiki Kaisha, Kobe, Japan

Continuation-in-part of Ser. No. 692,071, Apr. 26, 1991, abandoned. This application May 17, 1993, Ser. No. 8,389

Claims priority, application Japan, Feb. 8, 1991, 3-3229

Term of patent 14 years

U.S. Cl. D8—387

363,880

PIZZA SPACER

Andrew Liebmann, 4210 Thimens Blvd., St. Laurent (Quebec), Canada

Filed Aug. 5, 1994, Ser. No. 26,830

Term of patent 14 years

U.S. Cl. D9—456

363,879

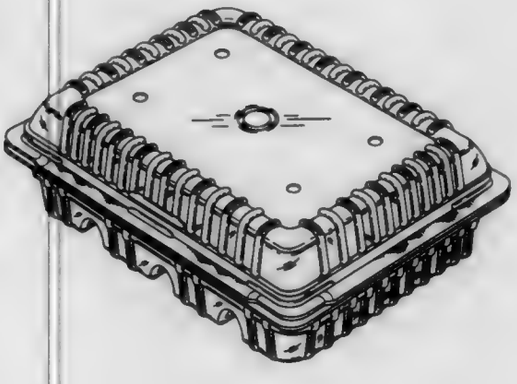
BLUEBERRY CONTAINER

Calvin S. Krupa, 750 Navajo Rd., Medina, Minn. 55340, and Robert Knoss, 19081 Hopi St., Anoka, Minn. 55303

Filed Oct. 3, 1994, Ser. No. 29,338

Term of patent 14 years

U.S. Cl. D9—423



363,881

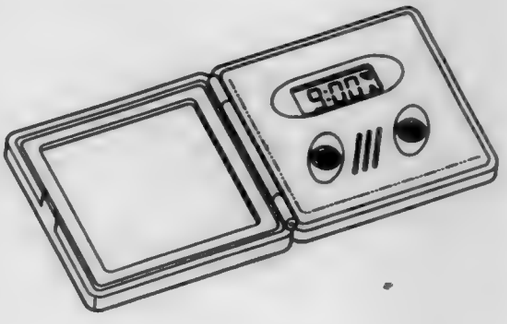
ALARM CLOCK

Kevin L. Yung, Chaiwan, Hong Kong, assignor to Travic Product Design Corporation Ltd., Hong Kong

Filed Aug. 11, 1994, Ser. No. 27,182

Term of patent 14 years

U.S. Cl. D10—18



363,882
WRISTWATCH

Giampiero Bodino, Milan, Italy, assignor to Baume & Mercier SA, Geneva, Switzerland

Filed Mar. 23, 1995, Ser. No. 36,628

Claims priority, application Hague Agreement, Sep. 27, 1994, DMA/002.643

Term of patent 14 years

U.S. Cl. D10—32

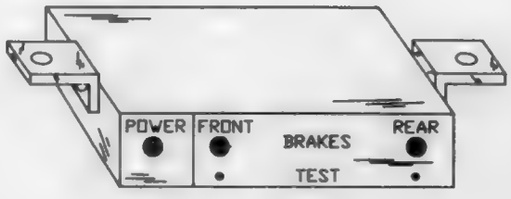
363,884
BRAKE WEAR MONITOR

Dewayne E. Reede, P.O. Box 365, Norwalk, Conn. 06851

Filed Feb. 24, 1994, Ser. No. 19,137

Term of patent 14 years

U.S. Cl. D10—65



363,883
WRIST WATCH

Hirofumi Machara, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1995, Ser. No. 35,786

Term of patent 14 years

U.S. Cl. D10—39

363,885
DENSITOMETER

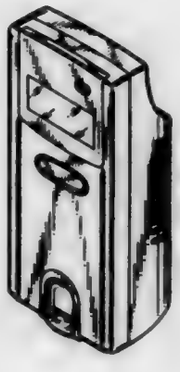
Eiichi Okamoto, and Aya Ohkawa, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 18, 1994, Ser. No. 31,245

Claims priority, application Japan, May 19, 1994, 6-14541

Term of patent 14 years

U.S. Cl. D10—78



363,886

COLOR MEASURING APPARATUS

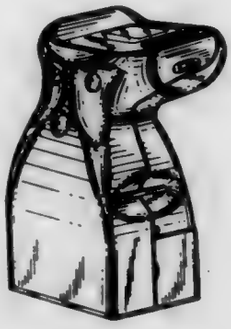
Luigi Colani, St. Paul Cap de Joux, France, assignor to Carl Zeiss Jena GmbH, Jena, Germany

Filed Jul. 27, 1994, Ser. No. 26,431

Claims priority, application Germany, Jan. 29, 1994, 94 00 702.0

Term of patent 14 years

U.S. Cl. D10—81



363,888

GAUGE

Cecil M. Williamson, Carrollton, Tex., assignor to Rochester Gauges, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 959,227, Nov. 16, 1992, abandoned. This application Jan. 28, 1994, Ser. No. 18,104

Term of patent 14 years

U.S. Cl. D10—96

363,887

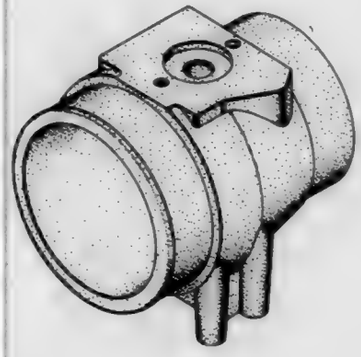
MASS AIR FLOW UNIT

James K. Middlebrook, 5351 Bonsai Ave., Moorpark, Calif. 93021

Filed Oct. 26, 1993, Ser. No. 14,656

Term of patent 14 years

U.S. Cl. D10—96



363,889

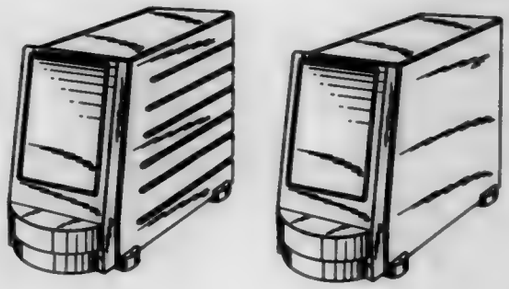
EQUIPMENT HOUSING

Ewald F. Dickau, Glastonbury, Conn., and David G. Houser, Concord, Mass., assignors to Loctite Corporation, Hartford, Conn.

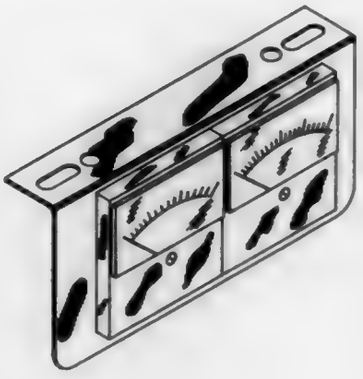
Filed Feb. 22, 1994, Ser. No. 19,043

Term of patent 14 years

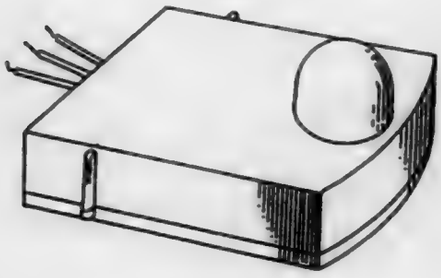
U.S. Cl. D10—96



363,890
ELECTRICAL TESTER FOR TRAILER CONNECTION
David B. Nieman, 2 Hillcrest Dr., Ventura, Iowa 50482
Filed Mar. 30, 1994, Ser. No. 20,675
Term of patent 14 years
U.S. Cl. D10—102



363,891
MOTION DETECTION SENSOR
Keith A. Gough, Prescott, England, assignor to Bridisco Limited, London, England
Filed Jun. 28, 1993, Ser. No. 9,973
Term of patent 14 years
U.S. Cl. D10—106



363,892
RECEIVER BASE MODULE FOR A SECURITY SYSTEM
Bert S. Bedrosian, Scottsdale, Ariz., assignor to Guard-Tech Industries, Inc., Scottsdale, Ariz.
Filed Jan. 30, 1995, Ser. No. 34,286
Term of patent 14 years
U.S. Cl. D10—106

363,893
BRACELET
Edmond Avakian, P.O. Box 133, 1211 Geneva 26, Switzerland
Filed Apr. 9, 1993, Ser. No. 6,920
Claims priority, application WIPO, Jan. 12, 1992, DMA/001917
Term of patent 14 years
U.S. Cl. D11—4

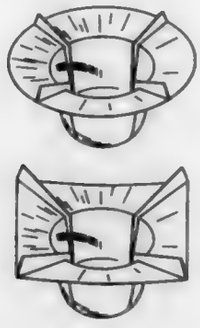
363,894
AN EAR ORNAMENT
Marilyn J. Kerr, 708 Cumberland St., Lebanon, Pa. 17042
Filed Sep. 16, 1994, Ser. No. 28,580
Term of patent 14 years
U.S. Cl. D11—40

363,895
VASE WITH DRAIN
Denise M. Guiliani, 21 Debra Dr., Tewksbury, Mass. 01876
Filed May 16, 1994, Ser. No. 22,935
Term of patent 14 years
U.S. Cl. D11—146

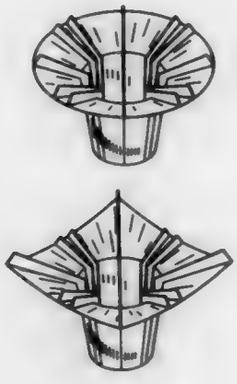
363,896
HANGING PLANTER BAG
Paul B. Bergmann, 12139 62nd St. North, Stillwater, Minn. 55082
Filed Apr. 25, 1994, Ser. No. 21,895
Term of patent 14 years
U.S. Cl. D11—148

363,897
PLANTER
Arthur R. Carlson, East Hawthorn, Australia, assignor to Bemis Manufacturing Company, Sheboygan Falls, Wis.
Filed Nov. 10, 1994, Ser. No. 30,861
Claims priority, application Australia, Jun. 10, 1994, 1000/94
Term of patent 14 years
U.S. Cl. D11—152

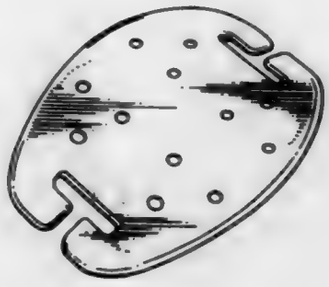
363,898
FLOWER POT COVER
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 782,237, Oct. 18, 1991, Pat. No. Des. 349,876, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and Ser. No. 411,245, Sep. 22, 1989, and Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113. This application Feb. 1, 1993, Ser. No. 4,296
Term of patent 14 years
U.S. Cl. D11—164



363,899
FLOWER POT COVER
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 782,237, Oct. 18, 1991, Pat. No. Des. 349,876, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and Ser. No. 411,245, Sep. 22, 1989, and Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113. This application Apr. 30, 1993, Ser. No. 7,760
Term of patent 14 years
U.S. Cl. D11—164

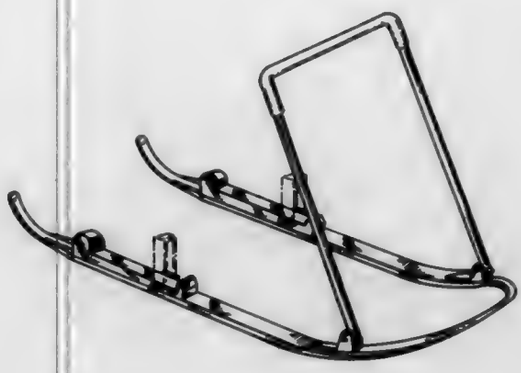


363,900
BRASSIERE STRAP BRIDGING AND SUPPORT MEMBER
Warren H. Roush, and Anne F. Roush, both of Marietta, Ga., assignors to Anjowa, Inc., Dacula, Ga.
Filed Sep. 15, 1994, Ser. No. 28,456
Term of patent 14 years
U.S. Cl. D11—218

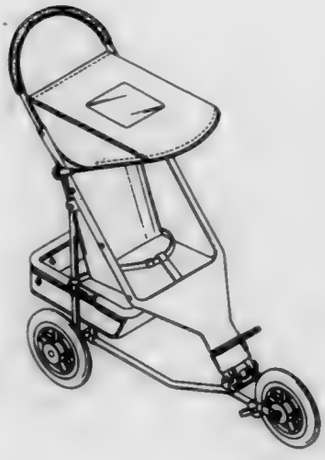


363,901
BUTTON
Andrew D. Le, 3853 Deans Pl Way, San Jose, Calif. 95121
Filed Mar. 28, 1994, Ser. No. 20,478
Term of patent 14 years
U.S. Cl. D11—222

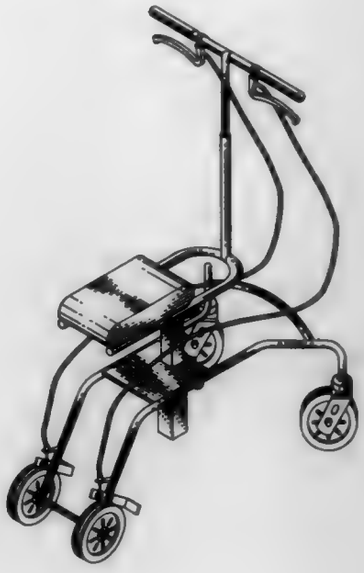
363,902
SLED
John R. Wright, 7900 E. Princess Dr., Apt. 2181, Scottsdale, Ariz. 85255
Filed Feb. 9, 1994, Ser. No. 18,581
Term of patent 14 years
U.S. Cl. D12—8



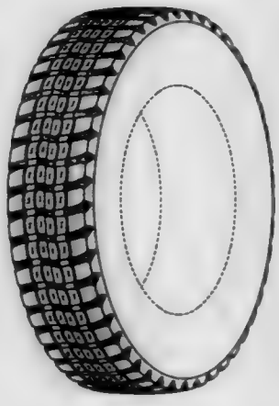
363,903
STROLLER
Ping-Jan Chiu, No. 1146, Chung-San Rd., Ta-Chia Chen, Taichung Hsien, Taiwan, Prov. of China
Filed Oct. 14, 1994, Ser. No. 29,728
Term of patent 14 years
U.S. Cl. D12—129



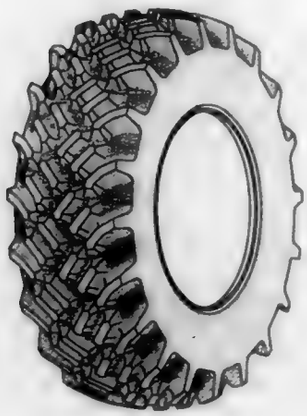
363,904
FOUR WHEELED ORTHOPEDIC SUPPORT
Heather E. Stone, 567 Scenic Heights Rd., Cheney, Wash. 99004
Filed Nov. 4, 1994, Ser. No. 30,639
Term of patent 14 years
U.S. Cl. D12—130



363,905
TIRE TREAD
Harden, Jr., Richard W., Tallmadge, and Daniel E. Schuster, North Royalton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 20, 1994, Ser. No. 24,715
Term of patent 14 years
U.S. Cl. D12—146

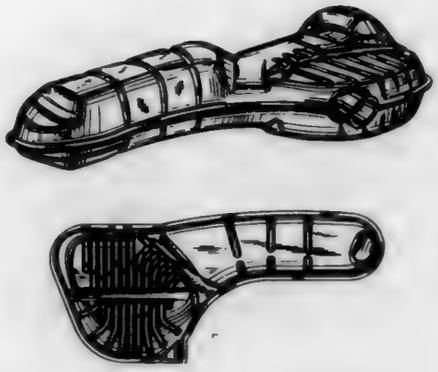


363,906
TRACTOR TIRE
Mark L. Bonko, Uniontown, and Loran C. Lopp, Jr., Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 10, 1994, Ser. No. 24,267
Term of patent 14 years
U.S. Cl. D12—147

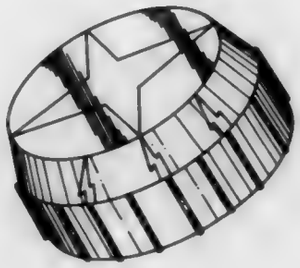


363,907
TIRE
Mark L. Bonko, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 1, 1994, Ser. No. 20,783
Term of patent 14 years
U.S. Cl. D12—151

363,908
CONFORMAL STAMP FORMED MUFFLER
Ross A. Maag, Ottawa, Ohio, assignor to AP Parts Manufacturing Company, Toledo, Ohio
Filed Aug. 18, 1994, Ser. No. 27,273
Term of patent 14 years
U.S. Cl. D12—194



363,909
MAGNETIC GAS CAP
Jessie Carnett, 26 Dogwood Dr., Rhodhiss, N.C. 28667
Filed Mar. 14, 1994, Ser. No. 19,853
Term of patent 14 years
U.S. Cl. D12—197



363,910

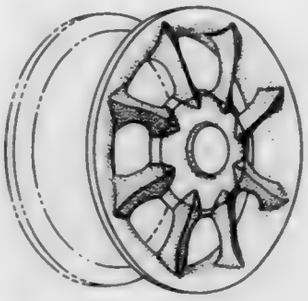
VEHICLE WHEEL FRONT FACE

Suny Chung, Placentia, Calif., assignor to American Racing Equipment, Inc., Rancho Dominguez, Calif.

Filed Jun. 21, 1994, Ser. No. 24,868

Term of patent 14 years

U.S. Cl. D12—209



363,911

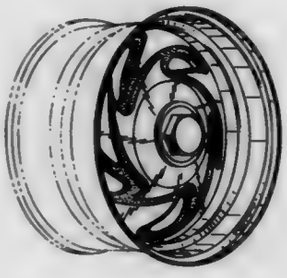
VEHICLE WHEEL FRONT FACE

Suny Chung, Placentia, Calif., assignor to American Racing Equipment, Inc., Rancho Dominguez, Calif.

Filed Jun. 22, 1994, Ser. No. 24,873

Term of patent 14 years

U.S. Cl. D12—209



363,912

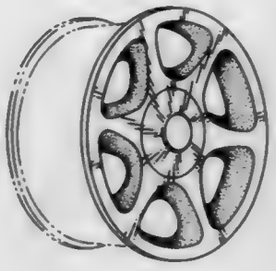
VEHICLE WHEEL FRONT FACE

Suny Chung, Placentia, Calif., assignor to American Racing Equipment, Inc., Rancho Dominguez, Calif.

Filed Jun. 22, 1994, Ser. No. 24,874

Term of patent 14 years

U.S. Cl. D12—209



363,913

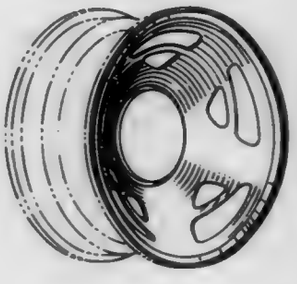
VEHICLE WHEEL FRONT FACE

Suny Chung, Placentia, Calif., assignor to American Racing Equipment, Inc., Rancho Dominguez, Calif.

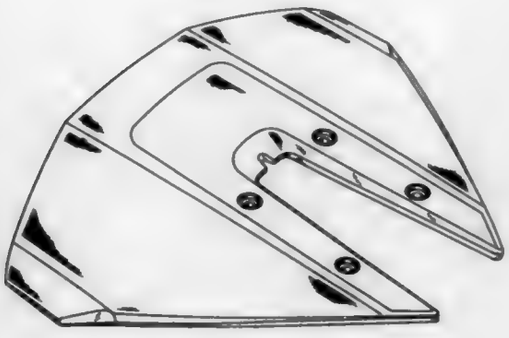
Filed Jun. 22, 1994, Ser. No. 24,877

Term of patent 14 years

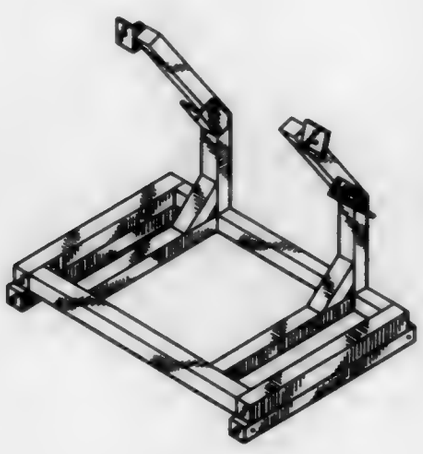
U.S. Cl. D12—209



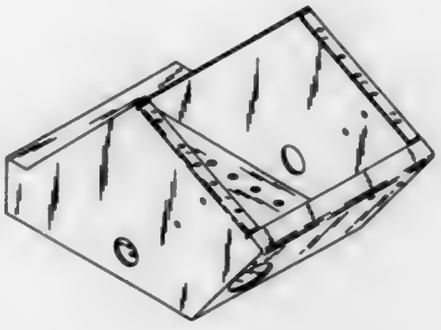
363,914
BOAT STABILIZER
James F. Corn, 18202 NE. 136th St., Kearney, Mo. 64060
Continuation-in-part of Ser. No. 4,301, Feb. 1, 1993, Pat. No. Des. 352,023. This application Oct. 31, 1994, Ser. No. 30,508
Term of patent 14 years
U.S. Cl. D12—317



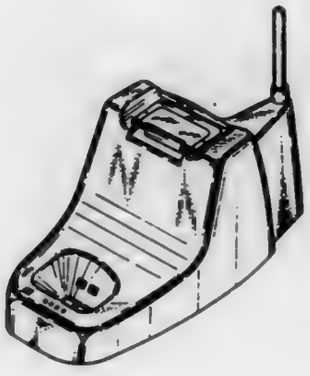
363,915
RACK FOR INFRARED RECEIVER PODS OF AIRPLANES
Wade H. Weems, 2445 Dunn Ave., Apt. 210, Jacksonville, Fla. 32218
Continuation-in-part of Ser. No. 864,828, Apr. 6, 1992, abandoned. This application Jan. 24, 1994, Ser. No. 17,881
Term of patent 14 years
U.S. Cl. D12—345



363,916
HOUSING FOR COMMUNICATIONS EQUIPMENT FOR A VEHICLE
Frederick M. Johnson, 181 Farm St., Millis, Mass. 02054
Filed Jul. 2, 1993, Ser. No. 10,250
Term of patent 14 years
U.S. Cl. D12—415



363,917
CHARGER WITH DATA RECEIVER FOR BARCODE READER
Harumi Kanou; Takeshi Matsuda; Kazumi Nagase, and Yoshiaki Kobayashi, all of Tokyo, Japan, assignors to SMK Corporation, Tokyo, Japan
Filed Aug. 31, 1994, Ser. No. 27,707
Claims priority, application Japan, Mar. 1, 1994, 6-5163
Term of patent 14 years
U.S. Cl. D13—108



363,918

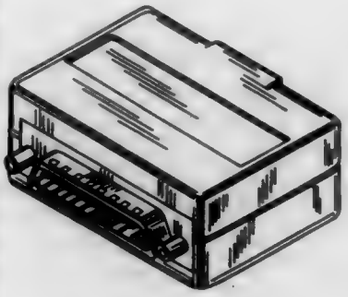
CABLE INTERFACE ASSEMBLY

Nicholas Buongervino, Hauppauge; Ronald Edwards, Sayville; Peter Musteric, Hauppauge, and Patrick Mauro, Lake Grove, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Filed Apr. 21, 1995, Ser. No. 37,880

Term of patent 14 years

U.S. Cl. D13—147



363,919

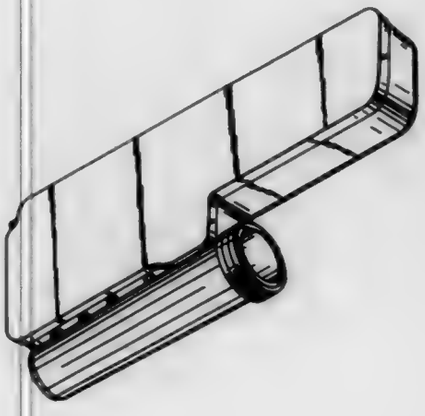
ELECTRICAL CURRENT LIMITER FOR POWER DISTRIBUTION SYSTEMS

Bruce A. Biller, Chicago; Hiram S. Jackson, Morton Grove, and Henry W. Scherer, Gurnee, all of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Apr. 7, 1994, Ser. No. 21,111

Term of patent 14 years

U.S. Cl. D13—160



363,920

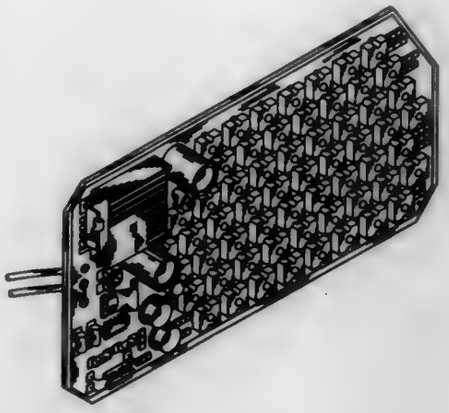
ELECTRICAL CIRCUIT BOARD

John K. Roberts, and Keith R. Spencer, both of Sheboygan, Wis., assignors to K. W. Muth Company, Inc., Sheboygan, Wis.

Filed Dec. 2, 1992, Ser. No. 2,113

Term of patent 14 years

U.S. Cl. D13—182



363,921

CABINET FOR HOUSING COMPUTER EQUIPMENT

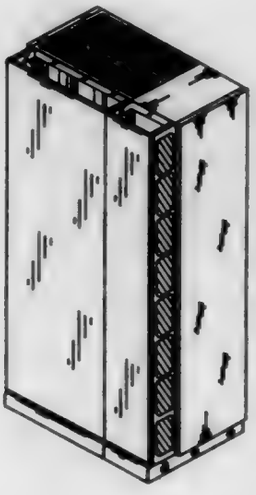
Gilbert Podzielli, Nice, and Daniel Richelet, Barnabe, both of, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1992, Ser. No. 2,563

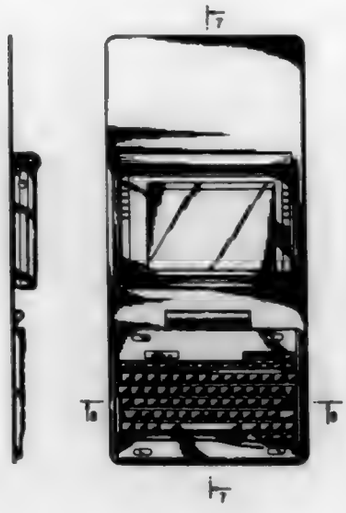
Claims priority, application France, Jun. 16, 1992, 92 3734

Term of patent 14 years

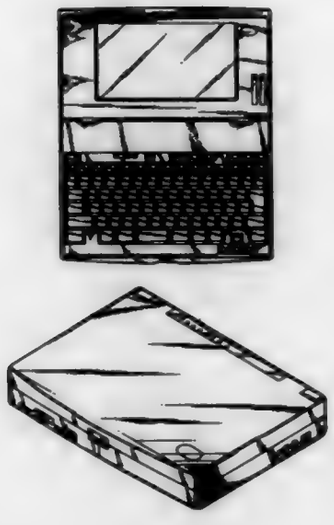
U.S. Cl. D13—184



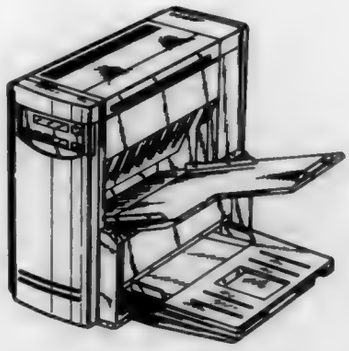
363,922
PEN BASED COMPUTER
Masahiko Kobayashi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan
Filed Oct. 19, 1993, Ser. No. 14,295
Claims priority, application Japan, Apr. 19, 1993, 5-11475; Sep. 16, 1993, 5-28019
Term of patent 14 years
U.S. Cl. D14—100



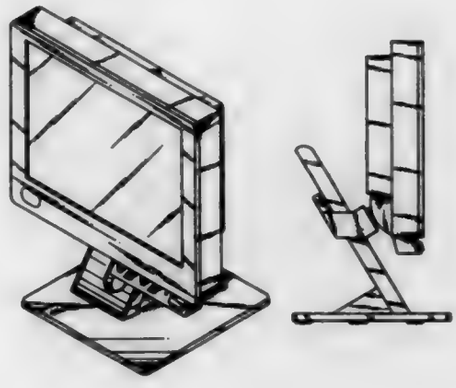
363,923
PERSONAL COMPUTER
Shima Hisashi, Kanagawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 22, 1994, Ser. No. 20,244
Claims priority, application Japan, Sep. 29, 1993, 5-29502
Term of patent 14 years
U.S. Cl. D14—106



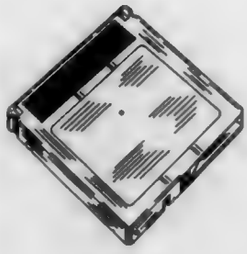
363,924
COMBINED SCANNER WITH PRINTER
Yoshitaka Ueda, and Toshiya Moriyama, both of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 1, 1994, Ser. No. 23,791
Term of patent 14 years
U.S. Cl. D14—107

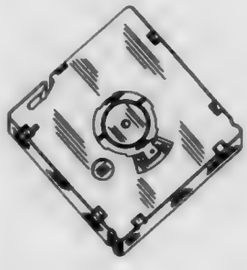


363,925
DISPLAY FOR A COMPUTER
Toshitaka Imai, Kanagawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 12, 1994, Ser. No. 21,171
Claims priority, application Japan, Jan. 20, 1993, 5-31983
Term of patent 14 years
U.S. Cl. D14—113



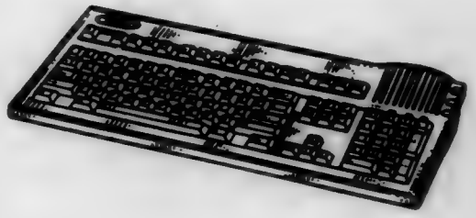
363,926
CARTRIDGE WITH A 1.8 INCH FORM FACTOR FOR A REMOVABLE CARTRIDGE DISK DRIVE
Syed H. Iftikar, Fremont; Herbert E. Thompson, Los Gatos, and Albert J. Guerini, Gilroy, all of Calif., assignors to Syquest Technology, Inc., Fremont, Calif.
Filed Jul. 23, 1993, Ser. No. 11,027
The portion of the term of this patent subsequent to Aug. 30, 2008, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—114



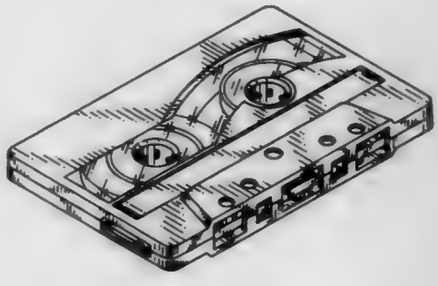


363,927
SUPPORT MOUNT FOR FLAT SCREEN TELEVISIONS
John B. Rosen, 87580 Cherry Ridge Rd., Eugene, Oreg. 97402
Filed Dec. 20, 1993, Ser. No. 16,687
Term of patent 14 years
U.S. Cl. D14—114

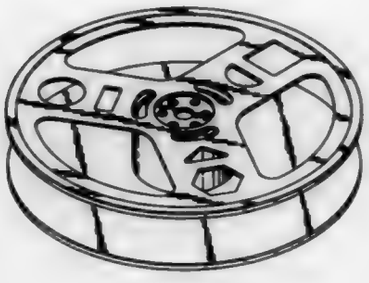
363,928
MULTIMEDIA KEYBOARD FOR PERSONAL COMPUTER
Randall W. Martin, The Woodlands, Tex., assignor to Compaq Computer Corporation, Houston, Tex.
Filed Dec. 30, 1993, Ser. No. 16,937
Term of patent 14 years
U.S. Cl. D14—115



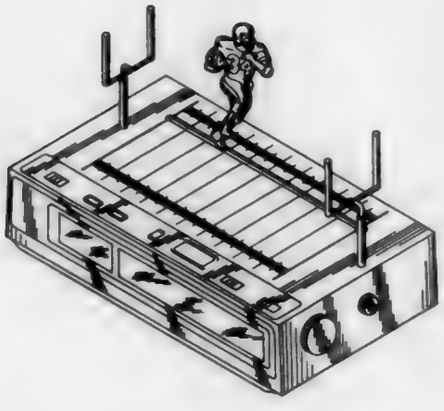
363,929
AUDIO TAPE CASSETTE
Kunihiko Tanaka, and Noriko Katayama, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Aug. 22, 1994, Ser. No. 27,478
Claims priority, application Japan, Feb. 25, 1994, 6-4821
Term of patent 14 years
U.S. Cl. D14—121



363,930
TAPE REEL FOR A VIDEO CASSETTE
John A. Bailey, Woodbury, Minn., and Donald J. Staufenberg, Dublin, Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Apr. 5, 1994, Ser. No. 20,914
Term of patent 14 years
U.S. Cl. D14—122

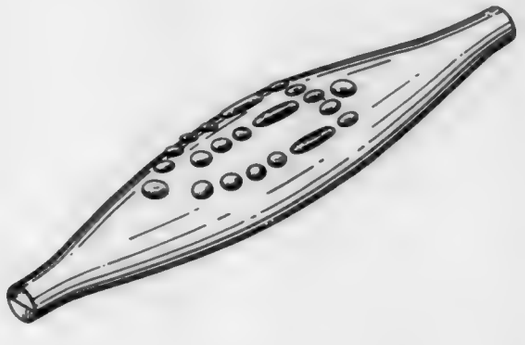


363,931
CLOCK RADIO
Kevin Coughlin, 6401 S. Lamon Ave., Chicago, Ill. 60638
Continuation-in-part of Ser. No. 89,037, Jul. 9, 1993, abandoned. This application Feb. 9, 1994, Ser. No. 18,530
Term of patent 14 years
U.S. Cl. D14—171

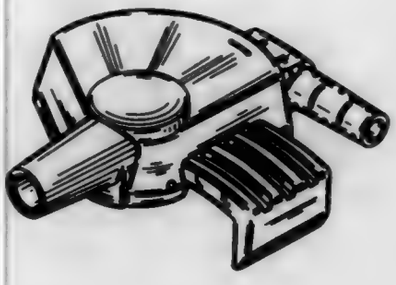


363,932
COMBINED MULTI-FUNCTION REMOTE CONTROL AND OVERLAY
Jeffrey A. Madill, Acworth, and William J. Saunders, Lithonia, both of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.
Division of Ser. No. 877,583, May 1, 1992, Pat. No. Des. 348,065. This application Sep. 7, 1993, Ser. No. 12,655
Term of patent 14 years
U.S. Cl. D14—219

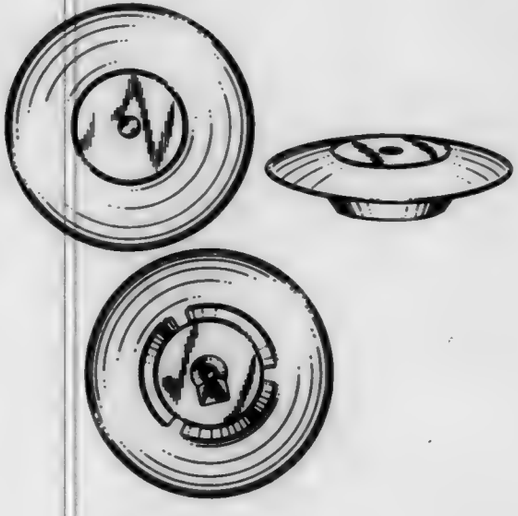
363,933
REMOTE CONTROL
Philippe Starck, Paris, France, assignor to Thomson Consumer Electronics (Societe Anonyme), Corbevoie, France
Filed Aug. 2, 1994, Ser. No. 26,660
Claims priority, application France, Feb. 4, 1994, 940 627
Term of patent 14 years
U.S. Cl. D14—218



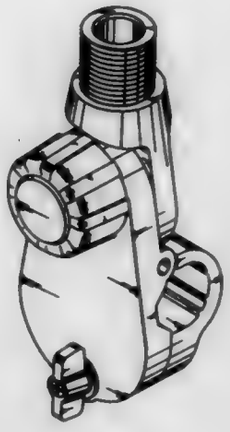
363,934
HELMET ATTACHMENT FOR A MICROPHONE
David S. Pratt, San Jose; Philip Bourgeois, Woodside; Edward J. Cornelius, III, San Francisco; Chin H. Lee, Palo Alto, and Blaise G. Stoltenberg, Oakland, all of Calif., assignors to Setcom Corporation, Mountain View, Calif.
Filed Aug. 8, 1994, Ser. No. 26,673
Term of patent 14 years
U.S. Cl. D14—229



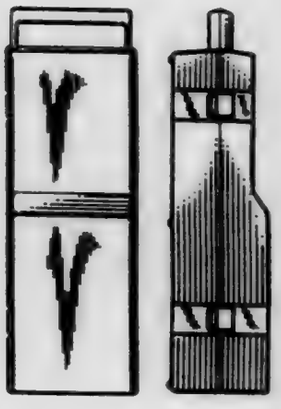
363,935
MOLDED HOUSING FOR AN ANTENNA
William T. McGreevy, Babylon, N.Y., assignor to Loyd D. Johnson, Bradford, Ark.
Filed May 26, 1994, Ser. No. 23,532
Term of patent 14 years
U.S. Cl. D14—230



363,936
ANTENNA MOUNT
Mark A. Nysether, and John R. Brown, both of P.O. Box 479, Everett, Wash. 98206
Division of Ser. No. 6,496, Mar. 31, 1993, Pat. No. Des. 357,922. This application Feb. 17, 1995, Ser. No. 35,054
Term of patent 14 years
U.S. Cl. D14—238

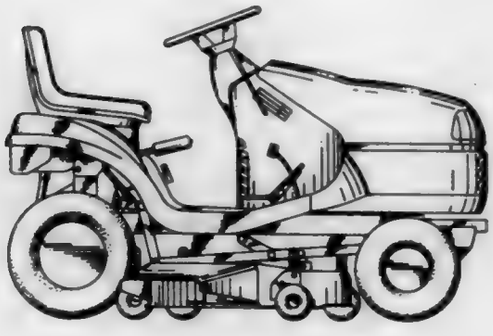


363,937
ACDC PHOEN KIT
Donald M. Marks, Boca Raton; Melvin Leiner; James J. Caprio, both of Lauderhill, and Darren M. Marks, Boca Raton, all of Fla., assignors to Sine Communications, Delray Beach, Fla.
Filed Aug. 6, 1993, Ser. No. 11,492
Term of patent 14 years
U.S. Cl. D14—253

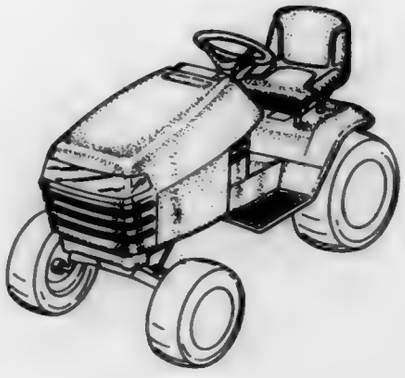


363,938
LADYBUG LAWN MOWER
Gredo W. Kahng, 1510 Spillers La., Houston, Tex. 77043
Filed Jun. 6, 1994, Ser. No. 23,987
Term of patent 14 years
U.S. Cl. D15—14

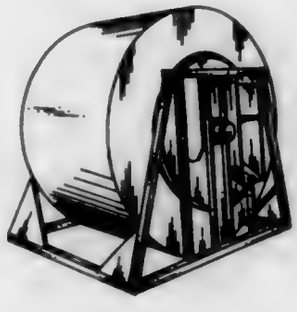
363,939
RIDING MOWER
Hisato Kato, and Hiroyuki Ogasawara, both of Sakai, Japan, assignors to Kubota Corporation, Osaka, Japan
Filed May 4, 1994, Ser. No. 22,395
Claims priority, application Japan, Nov. 9, 1993, 5-33991
Term of patent 14 years
U.S. Cl. D15—15



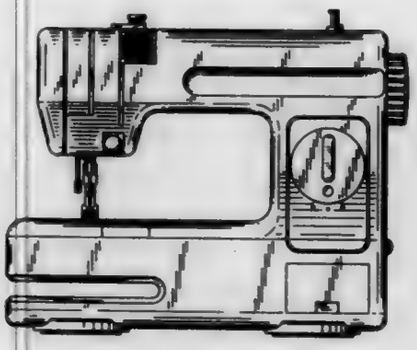
363,940
YARD AND GARDEN TRACTOR
Darrell W. Hinklin, Excelsior, Minn., assignor to The Toro Company
Filed May 26, 1994, Ser. No. 23,554
Term of patent 14 years
U.S. Cl. D15—15



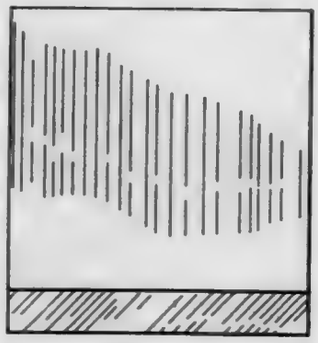
363,941
FEED MIXER
John L. Johnstrud, Albert Lea; Randal J. Johnsrud, Rochester, and Kenneth G. Connaughty, Rushford, all of Minn., assignors to Easy Systems, Inc., Trimont, Minn.
Filed May 2, 1994, Ser. No. 22,122
Term of patent 14 years
U.S. Cl. D15—19



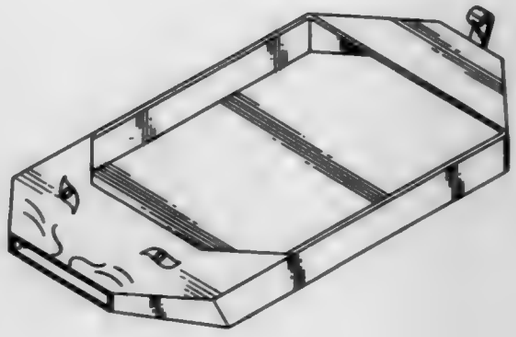
363,942
SEWING MACHINE
Yui-Ming Chan, Kwai Chung, Hong Kong, assignor to Lucky Collection Limited, Hong Kong, Hong Kong
Filed Oct. 5, 1993, Ser. No. 13,898
Term of patent 14 years
U.S. Cl. D15—69



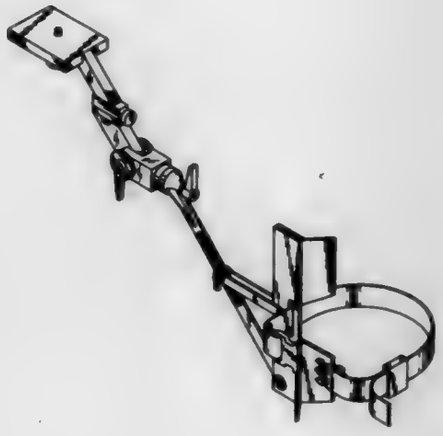
363,943
CONCRETE FORM SPLASH FUNNEL
John Hendrickson, 2313 N. 29th, Tacoma, Wash. 98403
Filed Dec. 27, 1993, Ser. No. 16,831
Term of patent 14 years
U.S. Cl. D15—136



363,944
OIL DRIP PAN
Phyllis J. McCarter, 34 Hickory Forest Dr., Hilton Head Island, S.C. 29926-2669
Filed Jul. 25, 1994, Ser. No. 26,320
Term of patent 14 years
U.S. Cl. D15—150



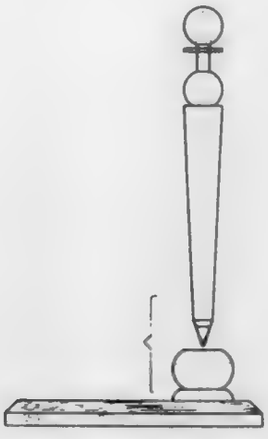
363,945
CAMERA SUPPORT FOR ATTACHMENT TO A TREE OR POST
Michael A. LaBree, 13 Beard Rd., Hillsboro, N.H. 03244
Filed Mar. 31, 1994, Ser. No. 20,745
Term of patent 14 years
U.S. Cl. D16—242



363,946
ELECTRONIC STRINGED MUSICAL INSTRUMENT
Richard M. Eberlen, 1942 W. Summit Ave., San Antonio, Tex. 78201
Filed Apr. 12, 1994, Ser. No. 21,166
Term of patent 14 years
U.S. Cl. D17—14

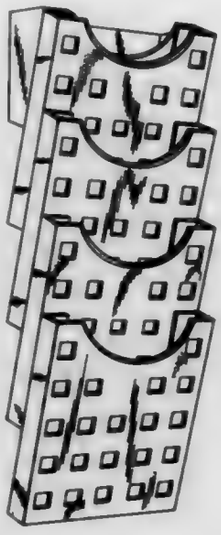
363,947
PLURAL-NIBBED WRITING INSTRUMENT
Shigeru Kimura, Tokyo, Japan, assignor to Tombow Pencil Co., Ltd., Tokyo, Japan
Filed Nov. 14, 1994, Ser. No. 30,902
Term of patent 14 years
U.S. Cl. D19—36

363,948
DESK SET
Gordon L. Danielson, 1005 Dumbarton Rd., Glen Burnie, Md. 21060
Filed Dec. 8, 1994, Ser. No. 31,884
Term of patent 14 years
U.S. Cl. D19—36

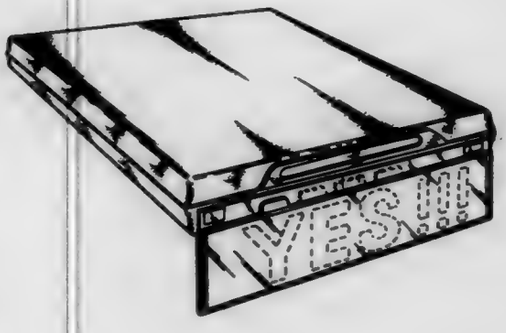


363,949
FOUNTAIN PEN
Philippe Compte, Paris, France, assignor to St. Dupont S.A., Paris, France
Filed Sep. 13, 1994, Ser. No. 28,373
Claims priority, application France, Mar. 17, 1994, 941562
Term of patent 14 years
U.S. Cl. D19—49

363,950
WALL-MOUNT FILING POCKETS
Bernd Brüning, Ulm/Donau, Germany, assignor to Helit Innovative Buroprodukte GmbH, Kierspe, Germany
Filed Apr. 8, 1994, Ser. No. 21,085
Claims priority, application Germany, Jan. 13, 1993, M9308102.2
Term of patent 14 years
U.S. Cl. D19—90

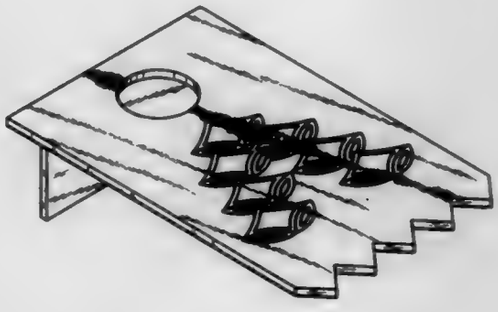


363,951
COMBINED CUSHION, SIGN AND SIGN HOLDER
Dean A. Chatman, 5923 Hershelt St., Lakewood, Calif. 90712
Filed Feb. 4, 1994, Ser. No. 18,384
Term of patent 14 years
U.S. Cl. D28—42

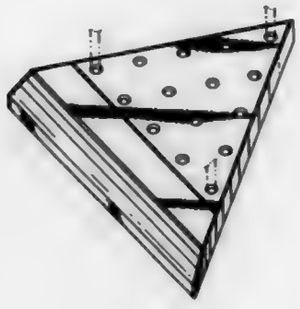


363,952
ILLUMINABLE MESSAGE DISPLAY BOARD
James G. Cook, 1557 Fletcher Rd., R.R.1. Hannon, Ontario, Canada
Filed Jan. 20, 1995, Ser. No. 33,781
Term of patent 14 years
U.S. Cl. D70—47

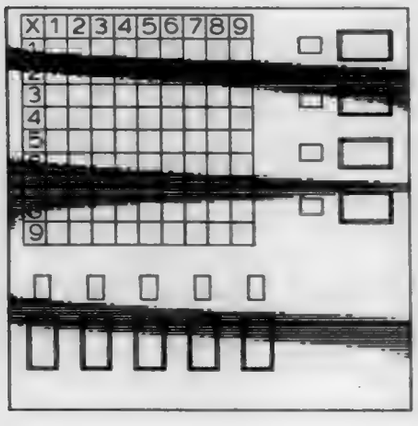
363,953
APERTURED BOARD FOR USE IN ASSOCIATION WITH A BEAN BAG TOSSING GAME
James F. Bane, 6057 Azalea St., Chino, Calif. 91710
Filed Mar. 31, 1993, Ser. No. 6,548
Term of patent 14 years
U.S. Cl. D21—5



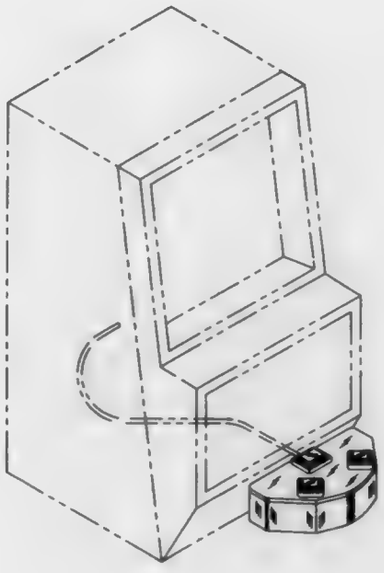
363,954
GAME BOARD
Anthony B. Serrano, 1924 Margaret St., San Jose, Calif. 95116
Filed Feb. 2, 1994, Ser. No. 18,232
Term of patent 14 years
U.S. Cl. D21—20



363,955
GAME BOARD
Karla R. Hansen, and George B. Hansen, Jr., both of 1047 Quail Hollow Dr., Sierra Vista, Ariz. 85635-1364
Filed Sep. 7, 1994, Ser. No. 28,108
Term of patent 14 years
U.S. Cl. D21—36



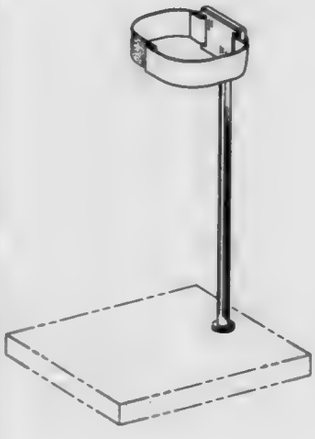
363,956
REMOTE CONTROL DEVICE FOR A SLOT MACHINE
Linton Mathews, 6621 Cowboy Trail, Las Vegas, Nev. 89121
Continuation-in-part of Ser. No. 19,944, Mar. 15, 1994, Pat. No. Des. 359,518. This application Mar. 28, 1994, Ser. No. 20,512
The portion of the term of this patent subsequent to Jun. 20, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—48



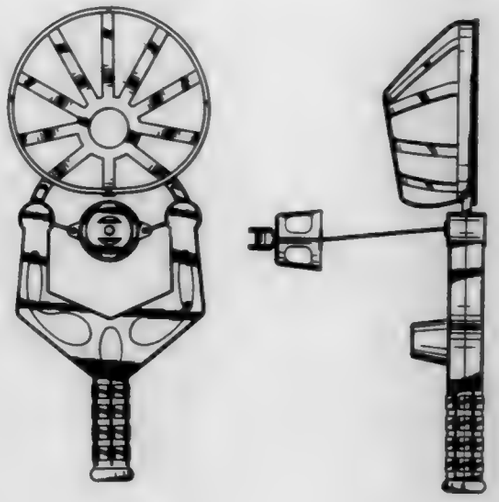
363,957
SKILL AND AMUSEMENT TOY
Robert D. Triner, 5562 Fleetwood NW., Canton, Ohio 44718
Division of Ser. No. 887,286, May 22, 1992, Pat. No. Des. 349,308. This application Aug. 1, 1994, Ser. No. 26,534
Term of patent 14 years
U.S. Cl. D21—59

363,958
TOY ALLIGATOR
Daniel Kelly, 205 N. 11th St., Tampa, Fla. 33602
Filed Jan. 6, 1994, Ser. No. 17,160
Term of patent 14 years
U.S. Cl. D21—157

363,959
DOLL STAND
Don Grubbs, 1502 Harrison, Wichita Falls, Tex. 76309
Filed Oct. 19, 1993, Ser. No. 14,346
Term of patent 14 years
U.S. Cl. D21—189



363,960
PROPELLING AND CATCHING DEVICE
Chung-Hing Choi, Hong Kong, Hong Kong, assignor to Hing Fat Toys Manufacturer Limited, Hong Kong
Filed Feb. 14, 1994, Ser. No. 18,632
Term of patent 14 years
U.S. Cl. D21—210



363,961
GOLF CLUB
John Krzynowek, Wilbraham, and Thomas M. Greene, Monson, both of Mass., assignors to Lisco, Inc., Tampa, Fla.
Filed Aug. 16, 1994, Ser. No. 27,249
Term of patent 14 years
U.S. Cl. D21—214

363,962
WEDGE GOLF CLUB HEAD
Warren Smith, 931 Derringer La., Henderson, Nev. 89014
Filed May 25, 1994, Ser. No. 23,553
Term of patent 14 years
U.S. Cl. D21—220

363,963
GOLF CLUB GRIP
David L. Boone, and Loren Smeltzer, both of Phoenix, Ariz., assignors to Royal Grip, Inc., Tempe, Ariz.
Filed Aug. 15, 1994, Ser. No. 27,170
Term of patent 14 years
U.S. Cl. D21—222

363,964
WHEEL FRAME OF ROLLER SKATE
Ting-hsing Chen, Tainan, Taiwan, Prov. of China, assignor to Far Great Plastics Industrial Co., Ltd., Tainan, Taiwan, Prov. of China
Filed Jan. 31, 1995, Ser. No. 34,248
Term of patent 14 years
U.S. Cl. D21—226

363,965
SKI POLE MITT
Bruce J. Guderian, 1010 Collyer St., Longmont, Colo. 80501
Filed Jul. 27, 1994, Ser. No. 26,418
Term of patent 14 years
U.S. Cl. D21—230

363,966

GOLF AID FOR PUTTING PRACTICE

Marvin L. Julliano, 7719 Mohawk, Prairie Village, Kans. 66208

Filed Jun. 21, 1994, Ser. No. 24,746

Term of patent 14 years

U.S. Cl. D21—234

363,967

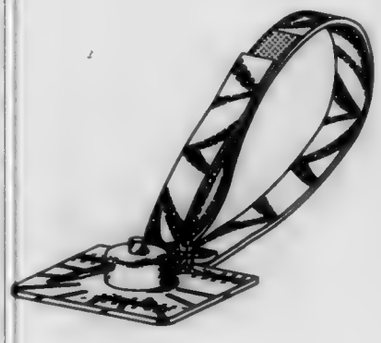
GOLF TRAINING AID

Michael J. Donohue, 5681 Reinhold St., Fair Oaks, Calif. 95628

Filed Nov. 28, 1994, Ser. No. 31,422

Term of patent 14 years

U.S. Cl. D21—234



363,968

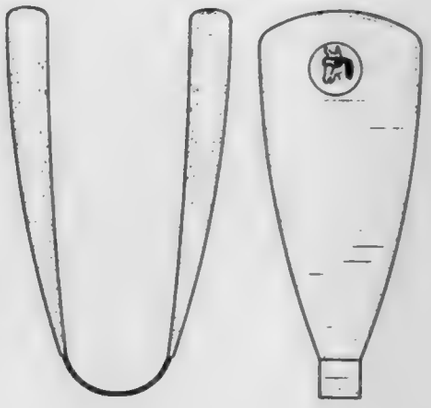
AQUATIC EXERCISE FLOAT

Margaret M. Koellner, P.O. Box 430, Flippin, Ark. 72634

Filed Jul. 25, 1994, Ser. No. 26,396

Term of patent 14 years

U.S. Cl. D21—236



363,969

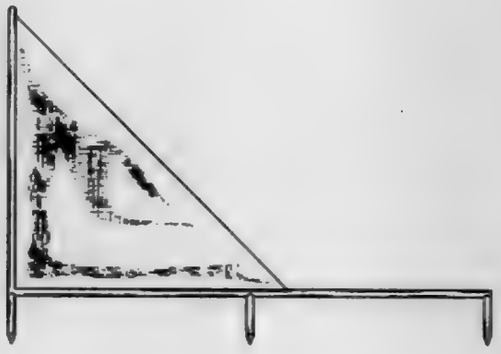
SHIELD FOR ICE FISHING HOLE

Louis J. Judd, Jr., and Susan E. H. Judd, both of HC 32 Box 286A, Owls Head, Me. 04854

Filed Aug. 1, 1994, Ser. No. 26,597

Term of patent 14 years

U.S. Cl. D21—253



363,970

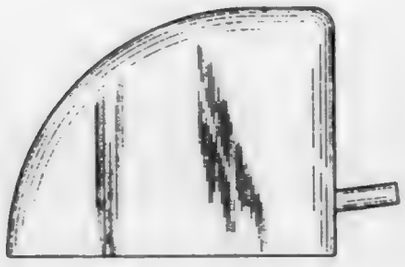
AUTOMATIC FISH JIGGER

Carroll E. Cutshaw, 980 Highway 25 E., Newport, Tenn. 37821

Filed Feb. 16, 1994, Ser. No. 18,774

Term of patent 14 years

U.S. Cl. D22—134



363,971

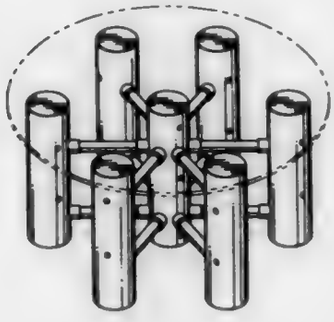
SUPPORT FOR SALT FOR USE IN A WATER SOFTENER

Steven M. Peddicord, 5310 Rustle Leaf, Arlington, Tex. 76017, and Donald B. Peddicord, 200 Oak St., Lewisville, Tex. 75067

Filed Mar. 12, 1992, Ser. No. 850,080

Term of patent 14 years

U.S. Cl. D23—207



363,972

HAND-HELD SHOWER

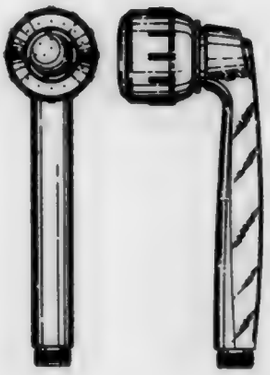
Hing W. Huen, Kowloon, Hong Kong, assignor to Quesco International (H.K.) Ltd., Hong Kong, Hong Kong

Filed Apr. 29, 1994, Ser. No. 22,197

Claims priority, application United Kingdom, Jan. 28, 1994, 2036660

Term of patent 14 years

U.S. Cl. D23—223



363,973

FAUCET

Wen-Mu Wang, No. 32, Lane 266, Fu Te I Rd., Hsi Tze Chen, Taipei, Taiwan, Prov. of China

Filed Aug. 26, 1994, Ser. No. 27,564

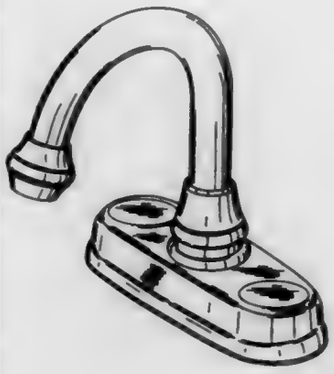
Term of patent 14 years

U.S. Cl. D23—238

363,974
FAUCET

Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart, Inc., Newark, Del.

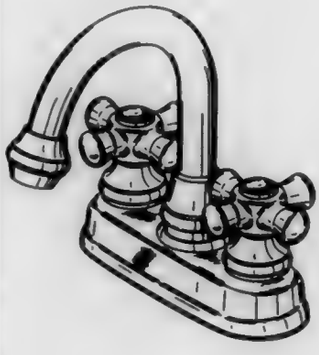
Filed Jan. 25, 1995, Ser. No. 33,978
Term of patent 14 years
U.S. Cl. D23—241



363,975
FAUCET

Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.

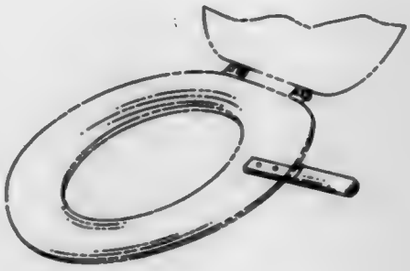
Filed Jan. 25, 1995, Ser. No. 33,985
Term of patent 14 years
U.S. Cl. D23—241



363,976
TOILET SEAT HANDLE

Charles E. Vinal, Syracuse, N.Y., assignor to Saul-Grip, Inc., Syracuse, N.Y.

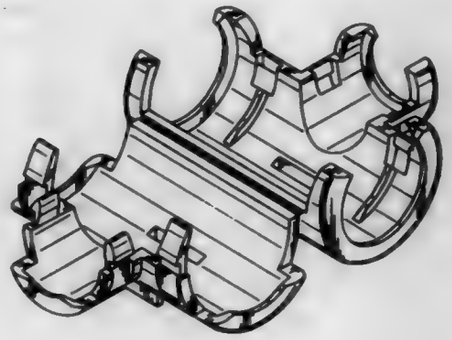
Filed Apr. 14, 1993, Ser. No. 7,069
Term of patent 14 years
U.S. Cl. D23—252



363,977
CONNECTOR BOX FOR TUBE

Bernard Streit, Anteuil, France, assignor to Sofamou S.A., Clerval, France

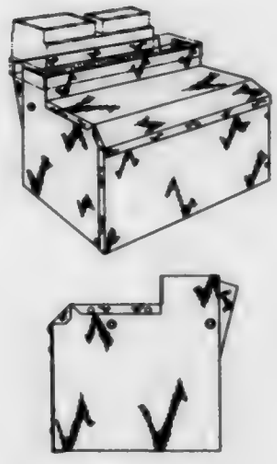
Filed Feb. 10, 1994, Ser. No. 18,594
Claims priority, application France, Aug. 17, 1993, 934337
Term of patent 14 years
U.S. Cl. D23—263



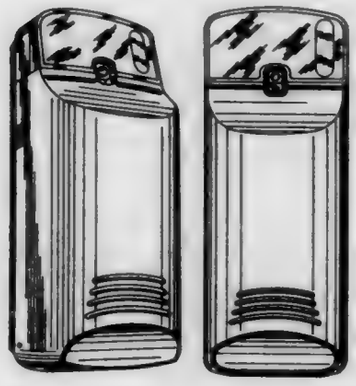
363,978
DRAIN DOWNSPOUT
James M. McKenna, 4055 Brixham Way, Alpharetta, Ga. 30302
Filed Nov. 9, 1994, Ser. No. 30,819
Term of patent 14 years
U.S. Cl. D23—267

363,979
BEAD SEAL GASKET
James M. Clark, 637 Bangs Ave., Modesto, Calif. 93756
Filed Aug. 16, 1994, Ser. No. 27,197
Term of patent 14 years
U.S. Cl. D23—269

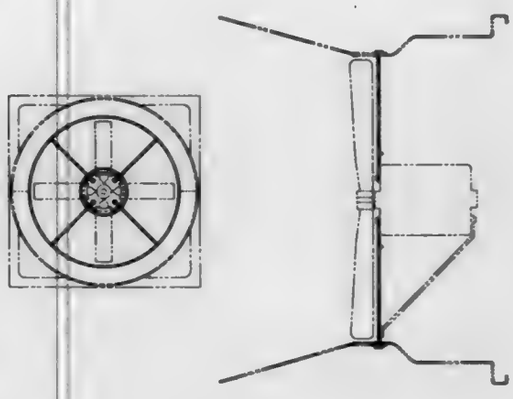
363,980
AIR CONDITIONER HOUSING UNIT FOR THE PASSENGER COMPARTMENT OF A VAN
Robert E. Roach, Arlington, Tex., assignor to Specific Cruise Systems, Inc., Fort Worth, Tex.
Filed May 5, 1993, Ser. No. 7,951
Term of patent 14 years
U.S. Cl. D23—325



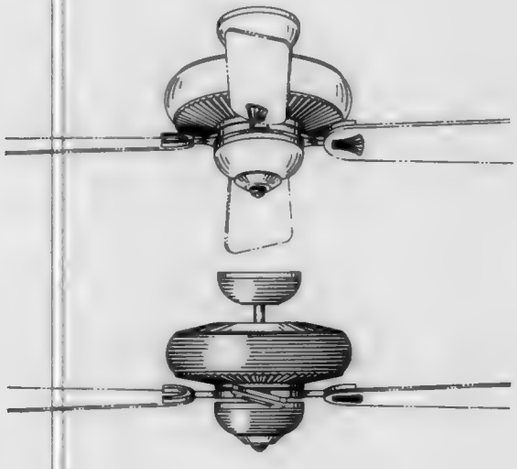
363,981
AEROSOL SPRAY DISPENSER
Kenneth J. Muderlak, Shorewood, Wis., assignor to Technical Concepts, Inc., Elk Grove Village, Ill.
Filed Oct. 12, 1994, Ser. No. 29,635
Term of patent 14 years
U.S. Cl. D23—366



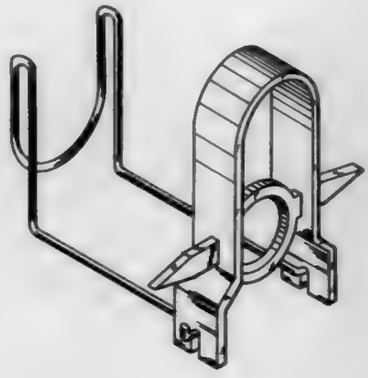
363,982
FAN ASSEMBLY MOTOR MOUNTING
Ray E. Swartzendruber, Syracuse, Ind., assignor to CTB Inc., Milford, Ind.
Filed Dec. 1, 1993, Ser. No. 15,903
Term of patent 14 years
U.S. Cl. D23—411



363,983
COMBINED CEILING FAN MOUNTING CANOPY, MOTOR AND SWITCH HOUSING AND BLADE IRONS UNIT
Charles J. DiPasquale, Carrollton, Tex., assignor to Smartel, Inc., Carrollton, Tex.
Filed Jan. 27, 1995, Ser. No. 34,115
Term of patent 14 years
U.S. Cl. D23—411



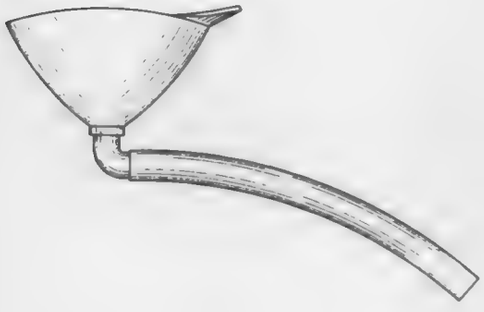
363,984
LEVER FOR VACUTUBE PUNCTURE
Ronald H. Smick, 1245 U.S. 6 East, Ottawa, Ill. 61350
Filed Jun. 2, 1994, Ser. No. 23,903
Term of patent 14 years
U.S. Cl. D24—108



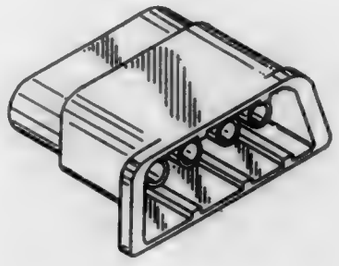
363,985
PORTABLE ORAL AND DENTAL SPRAYER
Dale J. Van Hovel, and Julie M. Van Hovel, both of 515 Woodside Way, Susanville, Calif. 96130
Filed Sep. 23, 1993, Ser. No. 13,346
Term of patent 14 years
U.S. Cl. D24—111

363,986
DENTAL SYRINGE
Rigoberto Pena, P.O. Box 900, Hidalgo, Tex. 78557
Filed May 2, 1994, Ser. No. 22,150
Term of patent 14 years
U.S. Cl. D24—114

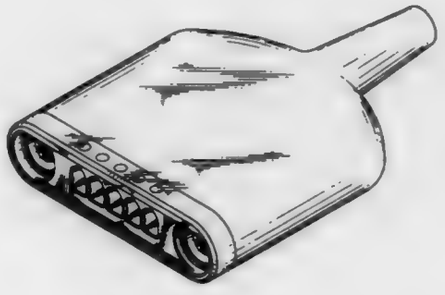
363,987
PORTABLE FEMALE URINAL
Shirley D. Hollifield, and Jack L. Hollifield, both of 380 Hughes Lake Rd., Cleveland, Tenn. 37323
Filed May 16, 1994, Ser. No. 22,943
Term of patent 14 years
U.S. Cl. D24—122



363,988
CONNECTOR FOR APPLYING COMPRESSIVE PRESSURE TO THE LEG
John F. Dye, Bridgewater, Mass., assignor to The Kendall Company, Mansfield, Mass.
Filed Apr. 26, 1994, Ser. No. 21,925
Term of patent 14 years
U.S. Cl. D24—129



363,989
POD FOR COUPLING A PLURALITY OF SENSORS TO A PATIENT MONITOR
Helen C. Crouse, Waltham, Mass., assignor to Siemens Medical Systems, Inc., Iselin, N.J.
Filed Jun. 3, 1994, Ser. No. 23,927
Term of patent 14 years
U.S. Cl. D24—187



363,990
BABY BOTTLE

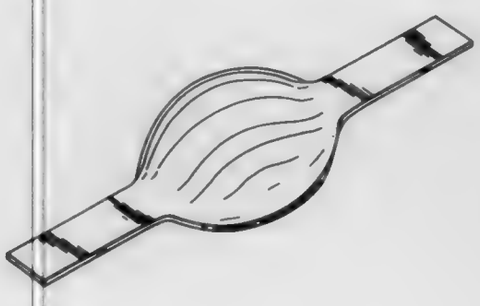
Steven B. Dunn, Beverly Hills, Calif., assignor to Munchkin Bottling, Inc., Van Nuys, Calif.

Filed Apr. 23, 1993, Ser. No. 7,472
The portion of the term of this patent subsequent to Oct. 31, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—197

363,991
FOOD DISLODGER FOR PERFORMING THE HEIMLICH MANEUVER

Claudia Benware, RR 1, Box 144C, Brushton, N.Y. 12916, and Ellen M. Jaycox, 1B Berry La., Latham, N.Y. 12110

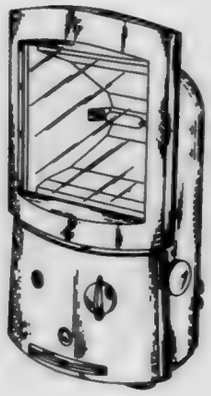
Filed Jul. 18, 1994, Ser. No. 25,196
Term of patent 14 years
U.S. Cl. D24—200



363,992
TANNING LAMP

Maria L. J. P. Vos, Rotterdam, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

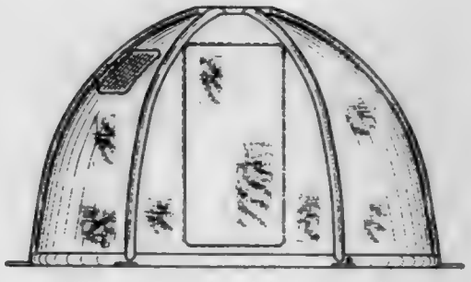
Filed Oct. 28, 1994, Ser. No. 30,417
Claims priority, application WIPO, May 2, 1994, DM/029,507
Term of patent 14 years
U.S. Cl. D24—210



363,993
INFLATABLE SHELTER

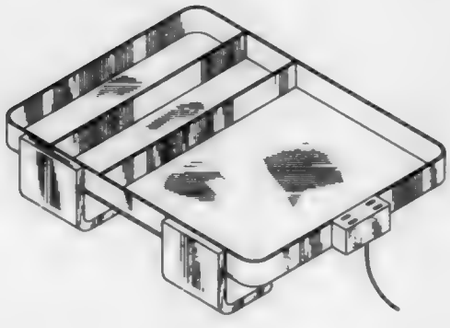
Stanley N. Johnson, 65 E. Annapolis St., and Gerald J. Smith, 342 S. Saratoga, both of St. Paul, Minn. 55118

Filed Jan. 21, 1994, Ser. No. 17,729
Term of patent 14 years
U.S. Cl. D25—19

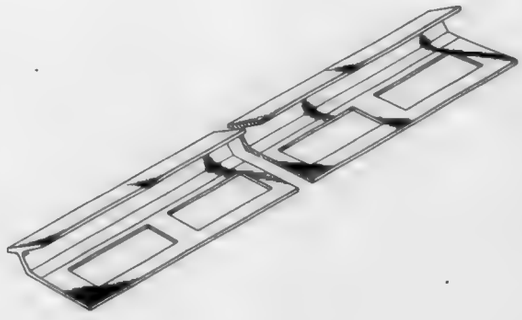


363,994
COMBINED ACUPUNCTURE AND VIBRATING MASSAGER
Tzu-Keng Cheng, 197 Shing-Sheng St., Chung-Ho City, Taipei, Taiwan, Prov. of China
Filed Dec. 8, 1994, Ser. No. 32,155
Term of patent 14 years
U.S. Cl. D24—215

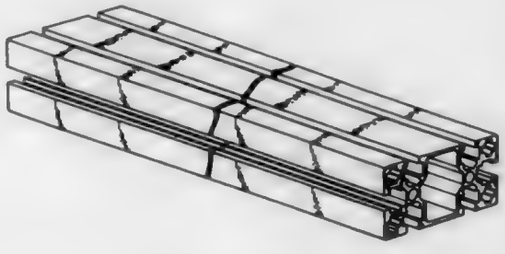
363,995
LADDER MOUNTED TOOL TRAY
Merle Mollenhauer, 1235 Blairs Ferry Rd., Marion, Iowa 52302
Filed Nov. 29, 1993, Ser. No. 15,773
Term of patent 14 years
U.S. Cl. D25—68



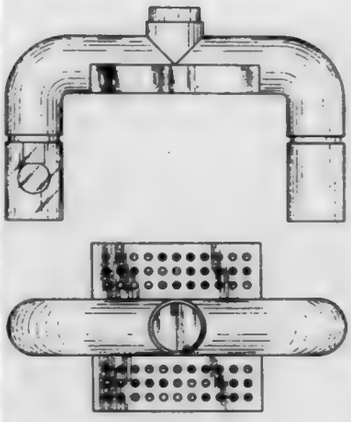
363,996
TILE EDGING STRIP
Alan Davies, Hednesford, England, assignor to McKechnie UK Limited, Walsall, England
Filed Dec. 21, 1994, Ser. No. 32,564
Claims priority, application United Kingdom, Jun. 30, 1994, 2040045
Term of patent 14 years
U.S. Cl. D25—119



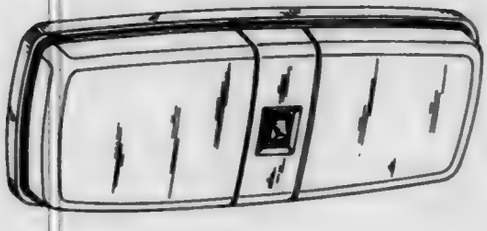
363,997
FRAME BAR FOR CONSTITUTING A FRAME STRUCTURE
Ryoichi Nomura, Toyama, Japan, assignor to Nic Autotec Co., Ltd., Toyama, Japan
Filed Jun. 3, 1994, Ser. No. 23,946
Term of patent 14 years
U.S. Cl. D25—122



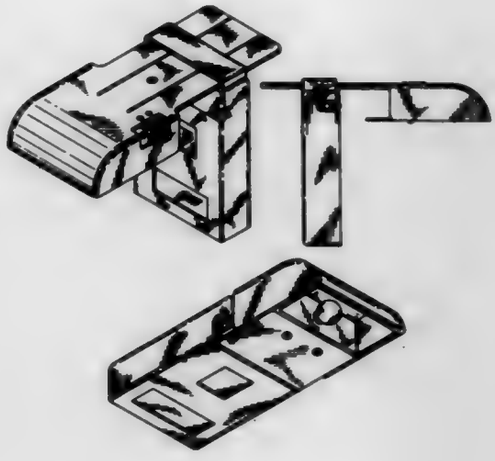
363,998
DISPOSABLE TOILET NIGHT-LIGHT
Dominick D. DeLillo, 566 S. Western Hwy., Blauvelt, N.Y. 10913, and Richard Greco, 110 Walnut St., West Hempstead, N.Y. 11552
Filed May 23, 1994, Ser. No. 23,350
Term of patent 14 years
U.S. Cl. D26—24



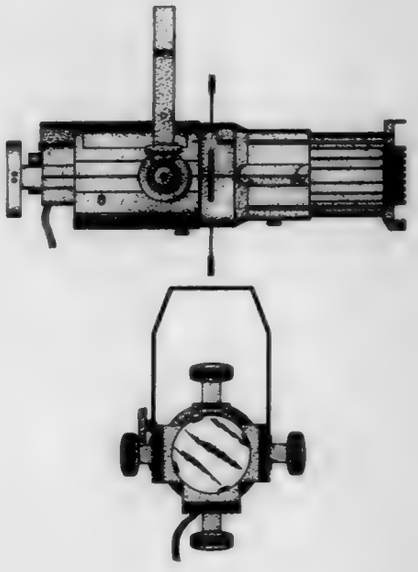
363,999
LAMP FIXTURE
James C. Taylor, Angola, and John W. Schindler, Huntington, both of Ind., assignors to Theodore Bargman Company, Albion, Ind.
Division of Ser. No. 18,159, Jan. 31, 1994. This application Jan. 18, 1995, Ser. No. 33,713
Term of patent 14 years
U.S. Cl. D26—28



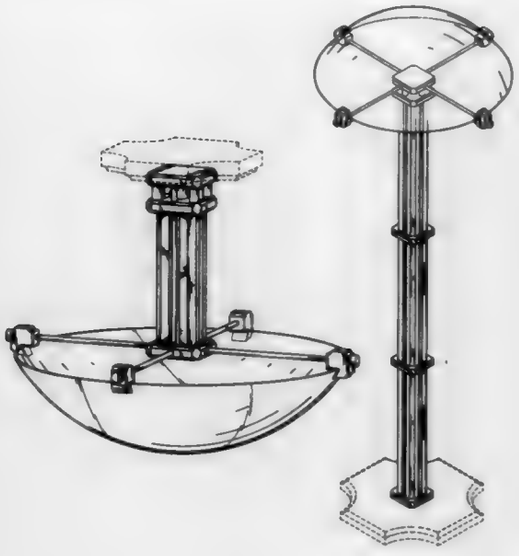
364,000
PORTABLE LIGHT FOR LAPTOP COMPUTER
Arthur S. Friedman, 2144 Seneca West, Merrick, N.Y. 11566
Filed Aug. 26, 1994, Ser. No. 27,666
Term of patent 14 years
U.S. Cl. D26—60



364,001
STAGE LIGHT
Larry Lieberman, and John Laverack, both of New York, N.Y., assignors to Altman/Stage Lighting, Yonkers, N.Y.
Filed Oct. 17, 1994, Ser. No. 29,790
Term of patent 14 years
U.S. Cl. D26—63



364,002
LAMP
Kevin von Kluck, Hudson, Ohio, assignor to The L. D. Kichler Co., Cleveland, Ohio
Filed Jul. 7, 1993, Ser. No. 10,448
Term of patent 14 years
U.S. Cl. D26—88

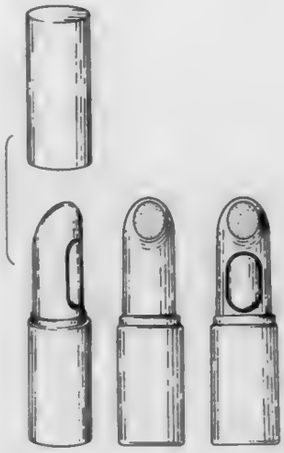


364,003
COMBINED BACK APPLICATOR AND CONTAINER THEREFOR
Robert P. Benson, 4800 S. 2220 E. #18, Slc., Utah 84117
Filed Jun. 13, 1994, Ser. No. 24,462
Term of patent 14 years
U.S. Cl. D28—7

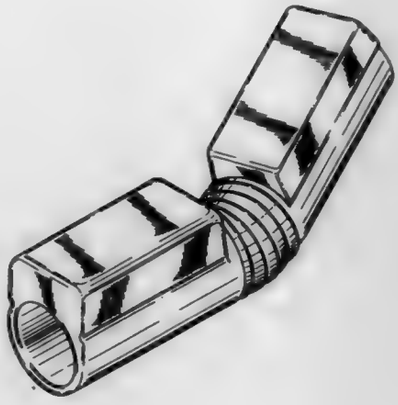
364,004
WASH CLOTH FOR INFANTS
Kimberly Ederle, 590 Landings Blvd., Ann Arbor, Mich. 48103
Filed Oct. 7, 1994, Ser. No. 29,512
Term of patent 14 years
U.S. Cl. D28—63

364,005
COSMETIC CONTAINER
Susan R. Wacker, New York, N.Y., assignor to Elizabeth Arden Company, Division of Conopco, Inc., New York, N.Y.
Filed Aug. 9, 1994, Ser. No. 26,929
Term of patent 14 years
U.S. Cl. D28—76

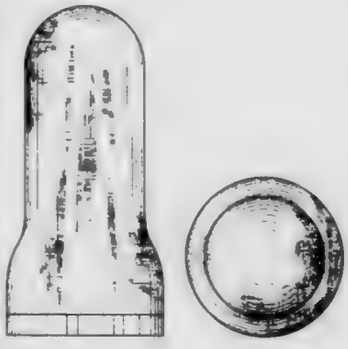
364,006
LIPSTICK CONTAINER
Melvin E. Kamen, Highlands, N.J., assignor to Revlon Consumer Products Corporation, New York, N.Y.
Filed Jul. 7, 1994, Ser. No. 25,658
Term of patent 14 years
U.S. Cl. D28—88



364,008
ARM COVER
Louis E. Florio, 173 Holbrook Rd., Holbrook, N.Y. 11741
Filed Feb. 16, 1994, Ser. No. 18,826
Term of patent 14 years
U.S. Cl. D29—120

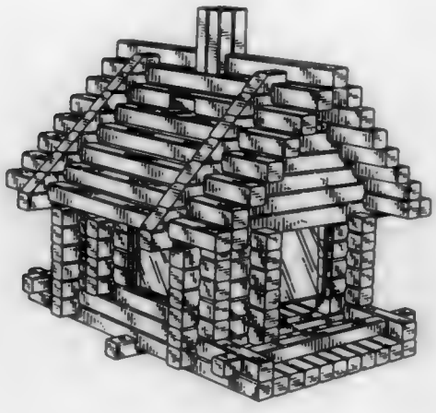


364,007
FINGER PROTECTOR
Gregory McLaren, and Tamera McLaren, both of 1718 Sylvan Way #810, Lodi, Calif. 95242
Filed May 27, 1994, Ser. No. 23,585
Term of patent 14 years
U.S. Cl. D29—113



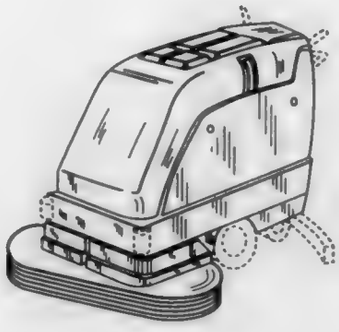
364,009
ELBOW PAD
Robert A. Engdahl, 7272 Suranac #67, La Mesa, Calif. 91941
Filed Aug. 22, 1994, Ser. No. 27,429
Term of patent 14 years
U.S. Cl. D29—121

364,010
BIRD FEEDER
Stanley M. Wawzonek, R.R. #1, Jerseyville, Ontario, Canada
Filed Mar. 16, 1994, Ser. No. 19,994
Claims priority, application Canada, Sep. 22, 1993, 22-09-93-1
Term of patent 14 years
U.S. Cl. D30—125

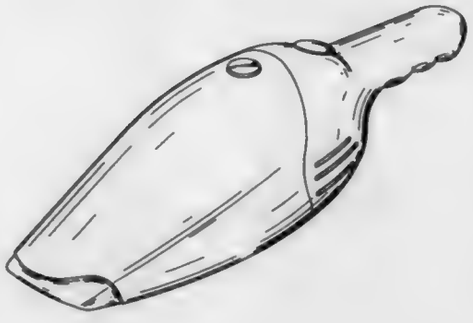


364,011
STOCK PROD
Jon A. Berg, Owatonna; Ronald H. Langlie, Ellendale; David F. Buelow, Owatonna, and Larry E. Tiedemann, Winona, all of Minn., assignors to North Central Plastics, Incorporated, Ellendale, Minn.
Filed May 2, 1994, Ser. No. 22,324
Term of patent 14 years
U.S. Cl. D30—156

364,012
FLOOR CLEANING MACHINE
Eugene L. Bothun, Loveland; Tim L. Mercer, Westminster; Alexander S. Johnson, Golden, and Edward T. Biegel, Parker, all of Colo., assignors to Windsor Industries, Inc., Englewood, Colo.
Filed Apr. 25, 1994, Ser. No. 23,764
Term of patent 14 years
U.S. Cl. D32—19



364,013
BATTERY FED VACUUM CLEANER
Christan S. Klingspor, Djursholm, and Adam Szczepanowski, Stockholm, both of, Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Aug. 10, 1993, Ser. No. 11,598
Claims priority, application Sweden, Feb. 12, 1993, 930377
Term of patent 14 years
U.S. Cl. D32—22



364,014
WAND HANDLE FOR A LIQUID EXTRACTOR VACUUM CLEANER

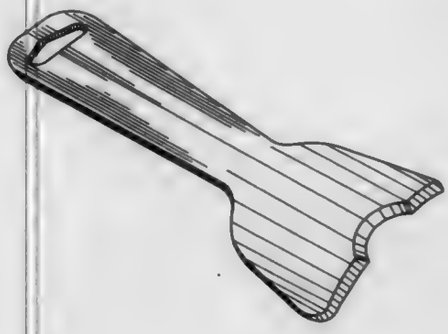
Brenda K. Langeland, Grand Rapids, and Kenneth L. Roberts, Battle Creek, both of Mich., assignors to Bissell Inc., Grand Rapids, Mich.

Filed Jan. 14, 1994, Ser. No. 17,520
Term of patent 14 years
U.S. Cl. D32—34

364,015
BULLNOSE CORNER CLEANING TOOL

John Stoltzfus, P.O. Box 8077, Mammoth Lakes, Calif. 93546

Filed Nov. 14, 1994, Ser. No. 30,914
Term of patent 14 years
U.S. Cl. D32—46



364,016
DUSTER

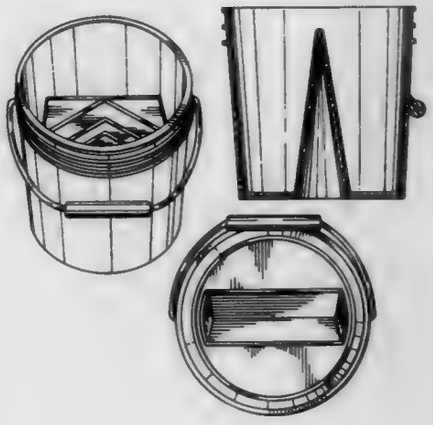
Ellen V. Aronson, 4512 67th St. W., Apt. C, Bradenton, Fla. 34210

Filed Aug. 8, 1994, Ser. No. 26,843
Term of patent 14 years
U.S. Cl. D32—52

364,017
PAINT BUCKET FOR A MINI ROLLER

Stephen P. Moffitt, 71 Horseshoe Rd., Guilford, Conn. 06737

Filed Jul. 28, 1994, Ser. No. 26,467
Term of patent 14 years
U.S. Cl. D32—53.1



364,018

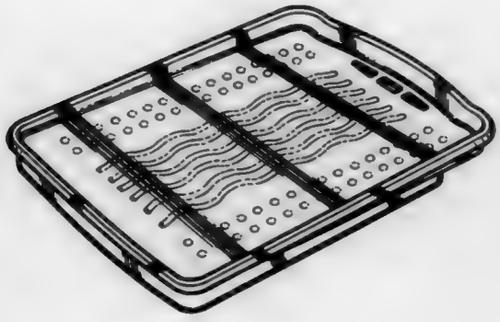
DISH DRAINER TRAY

Keith E. Brightbill, Wooster; Charles W. Craft, Apple Creek, and Gregg M. Davis, Powell, all of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Dec. 13, 1994, Ser. No. 32,171

Term of patent 14 years

U.S. Cl. D32—55



364,019

STEAM GENERATOR FOR A STEAM IRON

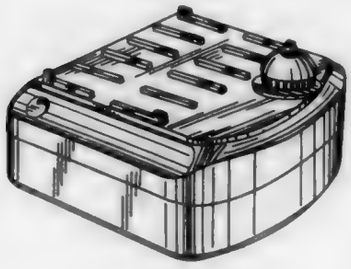
Bernd Reibl, Sindelfingen, Germany, assignor to Rowenta-Werke GmbH, Offenbach am Main, Germany

Filed Sep. 14, 1994, Ser. No. 28,428

Claims priority, application Germany, Mar. 14, 1994, 94 02 106.6

Term of patent 14 years

U.S. Cl. D32—73



364,020

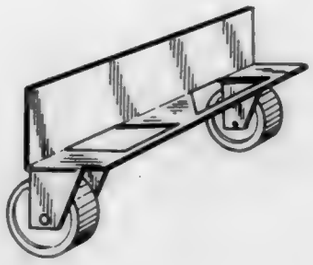
WHEELED DOLLY FOR GOLF BAGS

Jessie L.-K. Wang, 531 - 12th Ave., San Francisco, Calif. 94118

Filed Jul. 18, 1994, Ser. No. 26,058

Term of patent 14 years

U.S. Cl. D34—23



364,021

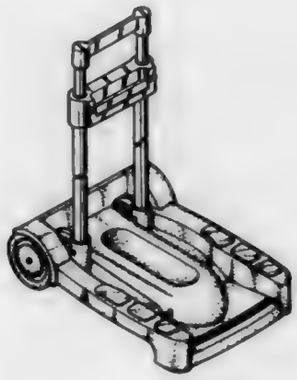
LUGGAGE CART

Yang Shih-Hsien, 4 Fl., No. 41, Lane 46, Lu Lin St., Taipei, Taiwan, Prov. of China

Filed Mar. 28, 1994, Ser. No. 20,561

Term of patent 14 years

U.S. Cl. D34—26



364,022

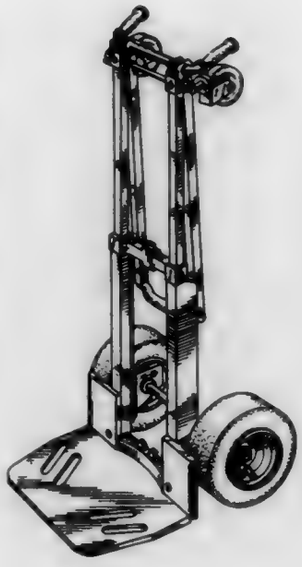
HAND TRUCK

Eugene A. Kazmark, Jr., Joliet, Ill., assignor to Remin Laboratories, Inc., Joliet, Ill.

Filed Sep. 21, 1994, Ser. No. 28,726

Term of patent 14 years

U.S. Cl. D34—26



364,023

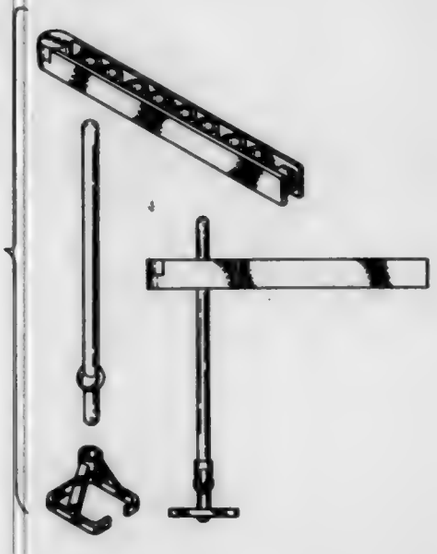
CAMSHAFT REMOVAL KIT

Samuel J. Johnson, 1414 39th St., Fort Madison, Iowa 52627

Filed Nov. 4, 1993, Ser. No. 14,901

Term of patent 14 years

U.S. Cl. D34—28



364,024

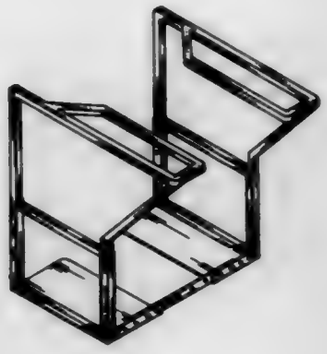
SUPPORT DEVICE FOR CHAIRS

Henry O'Keefe, and Patricia O'Keefe, both of P.O. Box 286, Malin, Oreg. 97632

Filed Feb. 22, 1994, Ser. No. 19,051

Term of patent 14 years

U.S. Cl. D34—28



364,025

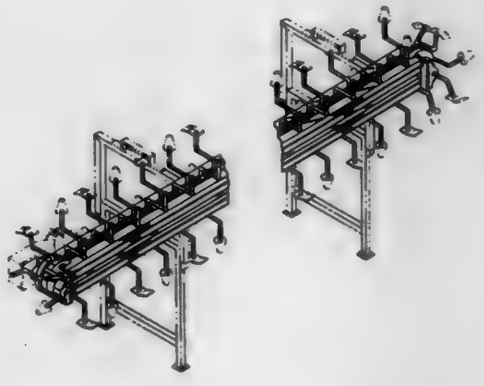
COMBINED BELT AND VARIABLE OFFSET ARM POKTION OF A CONVEYOR FOR SUPPORTING POULTRY AND POULTRY PARTS

James F. Davis, 11976 Bells Ferry Rd., Canton, Ga. 30114

Division of Ser. No. 17,593, Jan. 18, 1994. This application Jan. 11, 1995, Ser. No. 33,370

Term of patent 14 years

U.S. Cl. D34—29



364,026

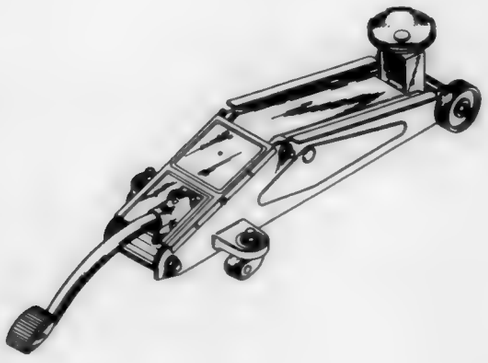
JACK

Michael Hung, 9-16, Nan Kan Hsia, Nan Kan, Lu Chu Hsiang, Tao Yuan County, Taiwan, Prov. of China

Filed Sep. 13, 1994, Ser. No. 28,344

Term of patent 14 years

U.S. Cl. D34—31



364,027

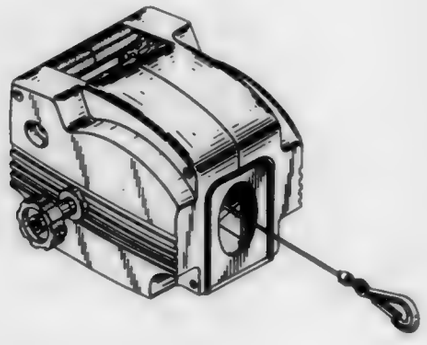
ELECTRIC WINCH

Michael Hung, 9-16, Nan Kan Hsia, Nan Kan, Lu Chu Hsiang, Tao Yuan County, Taiwan, Prov. of China

Filed Jun. 15, 1994, Ser. No. 24,532

Term of patent 14 years

U.S. Cl. D34—33



364,028

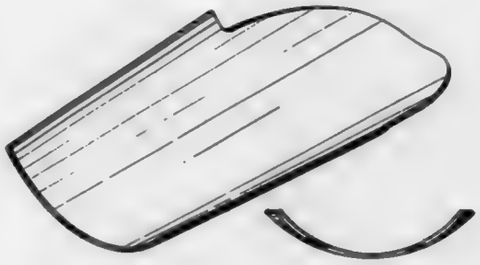
CEMENT TRUCK CHUTE LINER

Kevin Rouleau, 5701 104th Pl. SW., Mukilteo, Wash. 98275

Filed May 26, 1994, Ser. No. 23,543

Term of patent 14 years

U.S. Cl. D34—35



364,029

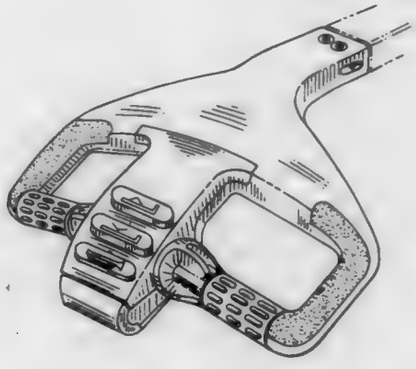
ANGLED TWIST-GRIP HANDLE

Daniel T. Noonan, Greene; Howard S. Ryan, Skaneateles, and Timothy Fitch, Marcellus, all of N.Y., assignors to The Raymond Corporation, Greene, N.Y.

Filed Jun. 29, 1994, Ser. No. 25,477

Term of patent 14 years

U.S. Cl. D34—35



364,030

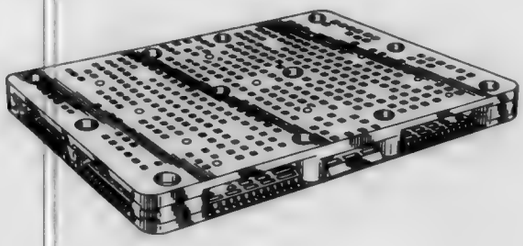
PLASTIC PALLET ASSEMBLY

Brandon L. Pigott, 1017 Elmwood Ave., Wilmette, Ill. 60091; Schuyler F. Pigott, 1122 N. Patton St., Arlington Heights, Ill. 60004; Peter S. Pigott, 803 Elmwood Ave., Wilmette, Ill. 60091, and Maurice J. Pigott, 591 Cherry St., Winnetka, Ill. 60093

Continuation-in-part of Ser. No. 15,696, Nov. 24, 1993, Pat. No. Des. 354,606, which is a continuation-in-part of Ser. No. 12,508, Sep. 2, 1993, Pat. No. Des. 347,511, which is a continuation-in-part of Ser. No. 7,372, Apr. 21, 1993, Pat. No. Des. 346,681, which is a continuation-in-part of Ser. No. 961,396, Oct. 15, 1992, Pat. No. 5,343,814, which is a continuation-in-part of Ser. No. 644,928, Jan. 23, 1991, Pat. No. 5,197,395, which is a continuation-in-part of Ser. No. 230,025, Aug. 9, 1988, Pat. No. 4,843,976. This application Jun. 7, 1994, Ser. No. 24,050

Term of patent 14 years

U.S. Cl. D34—38



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7th DAY OF NOVEMBER, 1995

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

ABB Atom AB: *See*—
Berglund, Pontus, 5,465,282, Cl. 376-426.000.
Komfeldt, Hans; Körnvik, Lars-Åke; and Törnblom, Lars, 5,464,258, Cl. 285-293.000.

ABB Stal AB: *See*—
Eklund, Sivert; Jönsson, Claes; and Sjöberg, Lars-Göran, 5,464,318, Cl. 415-28.000.

ABB Vetco Gray Inc.: *See*—
Boehm, Carl F., Jr., 5,464,063, Cl. 166-382.000.

Abbate, Agostino; Frankel, Julius; Scholz, Wilfried; Colangelo, Vito J.; and Korman, William J., to United States of America, Army. Stress tester. 5,463,896, Cl. 73-81.000.

Abbott Laboratories: *See*—
Adamczyk, Maciej; Fishpaugh, Jeffrey R.; Johnson, Donald; and Hruska, Robert E., 5,464,767, Cl. 435-188.000.
Brentz, Charles W., 5,463,895, Cl. 73-61.710.
Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adaniva, George, 5,464,392, Cl. 604-67.000.
Fino, James R., 5,464,746, Cl. 435-6.000.

Abdulally, Iqbal F., to Foster Wheeler Energy Corporation. Fluidized bed combustion system and method having a multicompartment variable duty recycle heat exchanger. 5,463,968, Cl. 110-347.000.

Abe, Hayao: *See*—
Nagai, Yoshitaka; Abe, Hayao; and Arita, Masanobu, 5,464,816, Cl. 514-2.000.

Abe, Nobuo: *See*—
Kateh, Akio; Abe, Nobuo; Hanai, Takeshi; and Horibe, Kenji, 5,465,022, Cl. 313-144.000.

Abela, George S.; Friedl, Stephan E.; and Mathews, Eric D., to Abela Laser Systems, Inc.; and University of Florida. Cardiac ablation catheters and method. 5,464,404, Cl. 606-15.000.

Abela Laser Systems, Inc.: *See*—
Abela, George S.; Friedl, Stephan E.; and Mathews, Eric D., 5,464,404, Cl. 606-15.000.

Abernethy, William J. Collapsible sea anchor or drogue. 5,463,971, Cl. 114-311.000.

Abraham, Leslie R.: *See*—
Benting, Gary M.; and Abraham, Leslie R., 5,464,236, Cl. 280-30.000.

Abramova, Vera K.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Ansosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

Achterrath-Tuckermann, Ute: *See*—
Kutscher, Bernhard; Niebch, Georg; Fleischhauer, Ilona; Engel, Jürgen; Achterrath-Tuckermann, Ute; and Szelenyi, Stefan, 5,464,838, Cl. 514-248.000.

Acoust-A-Fiber Research and Development Inc.: *See*—
Shah, Hiten T.; and Wolf, Jerry M., 5,464,952, Cl. 181-211.000.

Actel Corporation: *See*—
Hawley, Frank W., 5,464,790, Cl. 437-60.000.

Actifilm, Inc.: *See*—
Bejan, Robert S.; Centanni, Kevin P.; Gaertner, Scott R.; and Franzblau, William L., 5,465,384, Cl. 455-2.000.

Actodyne General, Inc.: *See*—
Lace, Jeffrey J., 5,464,948, Cl. 84-726.000.

Adachi, Masakazu: *See*—
Nakai, Satoru; Aihara, Koutoku; Tanaka, Hideo; Iba, Hitomi; Kawai, Kazuyoshi; Ichikawa, Hiroyuki; Akamatsu, Seiji; Saito, Fumio; Tominaga, Michiaki; and Adachi, Masakazu, 5,464,833, Cl. 514-251.000.

Adam, Gérard: *See*—
Langlois, Michel; Renard, Pierre; and Adam, Gérard, 5,464,872, Cl. 514-630.000.

Adamczyk, Maciej; Fishpaugh, Jeffrey R.; Johnson, Donald; and Hruska, Robert E., to Abbott Laboratories. Reagents and methods for the quantification of total doxepins in biological fluids. 5,464,767, Cl. 435-188.000.

Adams, John M.; and Alfemess, Clifton A., to InControl, Inc. Atrial fibrillation detector. 5,464,431, Cl. 607-4.000.

Adams, John M.: *See*—
White, Harley; and Adams, John M., 5,464,433, Cl. 607-5.000.

Adams, J. Wesley: *See*—
Youst, Thomas L.; Adams, J. Wesley; and Windes, Larry C., 5,464,590, Cl. 422-131.000.

Adams, Paul: *See*—
Dreesen, Chrit; Gubbels, Paul A.; and Adams, Paul, 5,464,446, Cl. 607-116.000.

Adams, Steven E., to Integrity Systems, Inc. Binary image performance evaluation tool. 5,465,258, Cl. 395-700.000.

Adaniva, George: *See*—
Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adaniva, George, 5,464,392, Cl. 604-67.000.

Adir et Compagnie: *See*—
Cordi, Alex; Lacoste, Jean-Michel; Laubie, Michel; Verbeuren, Tony; and Descombes, Jean-Jacques, 5,464,859, Cl. 514-401.000.
Langlois, Michel; Renard, Pierre; and Adam, Gérard, 5,464,872, Cl. 514-630.000.
Peglion, Jean-Louis; Goument, Bertrand; Millan, Mark; and Rivet, Jean-Michel, 5,464,834, Cl. 514-254.000.

Advanced Micro Devices, Inc.: *See*—
Sikes, Roger A.; and Plevich, Alexander P., 5,464,475, Cl. 118-719.000.

Advanced Peripherals Labs, Inc.: *See*—
Chen, Roger; and Kinsey, Kenneth K., Jr., 5,465,237, Cl. 365-233.000.

Advantest Corporation: *See*—
Yamashita, Kazuhiro; Negishi, Toshiyuki; Sato, Masatoshi; and Tsukahara, Hiroshi, 5,465,066, Cl. 327-294.000.

Aeroflex Systems Corporation: *See*—
Levison, Laurence L.; Goldberg, Paul B.; and Stanek, Scott D., 5,465,303, Cl. 382-124.000.

Aeroquip Corporation: *See*—
Haunhorst, Gregory A., 5,464,042, Cl. 137-595.000.

Aerospatiale Societe Nationale Industrielle: *See*—
Laures, Pierre, 5,464,174, Cl. 244-3.110.

Agency of Industrial Science & Technology: *See*—
Ikeda, Kiichi; Kajita, Shuji; and Iwatsuki, Tetsu, 5,464,380, Cl. 601-29.000.

Agrawal, Prathima; Anvekar, Dinesh K.; and Narendran, Balakrishnan, to AT&T Corp. Method of prioritizing handoff procedures in a cellular system. 5,465,389, Cl. 455-33.200.

Ahamed, Syed V., to AT&T Corp. Architecture for a computer system used for processing knowledge. 5,465,319, Cl. 395-11.000.

Ahreas, Michael G., to Crosspoint Solutions, Inc. RAM-logic tile for field programmable gate arrays. 5,465,055, Cl. 326-41.000.

Aida, Midori: *See*—
Kamo, Yasushi; Hayashi, Masayuki; Ito, Masaaki; Yamakawa, Shinji; and Aida, Midori, 5,465,160, Cl. 358-401.000.

Aihara, Koutoku: *See*—
Nakai, Satoru; Aihara, Koutoku; Tanaka, Hideo; Iba, Hitomi; Kawai, Kazuyoshi; Ichikawa, Hiroyuki; Akamatsu, Seiji; Saito, Fumio; Tominaga, Michiaki; and Adachi, Masakazu, 5,464,833, Cl. 514-251.000.

Ainslie, Benjamin J.: *See*—
Maxwell, Graeme D.; and Ainslie, Benjamin J., 5,465,312, Cl. 385-49.000.

Air Products and Chemicals, Inc.: *See*—
Fine, Stephen M.; and Bohling, David A., 5,464,666, Cl. 427-576.000.
Kumar, Ravi; and Kleinberg, William T., 5,463,869, Cl. 62-24.000.

Airflow Sciences Corporation: *See*—
Gielow, Robert L.; and Paul, James C., 5,463,967, Cl. 110-104.00R.

Aizawa, Michihiko: *See*—
Nishino, Yoshitaka; Sawa, Toshio; Nakao, Takashi; Aizawa, Michihiko; and Yokose, Kenji, 5,463,880, Cl. 62-484.000.

Ajinomoto Co., Inc.: *See*—
Suzuki, Naoyoshi, 5,464,819, Cl. 514-16.000.

Akabe, Noriyuki: *See*—
Mitsui, Tsutomu; Akabe, Noriyuki; and Shimokawa, Yukitsugu, 5,465,099, Cl. 343-730.000.

Akaike, Takaaki: *See*—
Maeda, Hiroshi; Miyamoto, Yoichi; and Akaike, Takaaki, 5,464,857, Cl. 514-398.000.

Akamatsu, Seiji: *See*—
Nakai, Satoru; Aihara, Koutoku; Tanaka, Hideo; Iba, Hitomi; Kawai, Kazuyoshi; Ichikawa, Hiroyuki; Akamatsu, Seiji; Saito, Fumio; Tominaga, Michiaki; and Adachi, Masakazu, 5,464,833, Cl. 514-251.000.

Akerman, Rose: *See*—
Thomas, Stacy L; and Akerman, Rose, 5,464,423, Cl. 606-223.000.

Akiba, Nobuo; Ohtsuka, Isao; Shiratori, Shigekazu; and Kase, Katsunori, to Futaba Denshi Kogyo K.K. Display device. 5,465,101, Cl. 345-1.000.

Akie, Hiroshi: *See*—
Muromura, Tadasumi; Takano, Hideki; Akie, Hiroshi; and Matsuura, Shojiro, 5,464,571, Cl. 252-638.000.

Akioka, Hiroharu: *See*—

Ikuma, Takeshi; Sakata, Masaaki; Akioka, Hiroharu; and Shimod, Tatsuya, 5,464,670, Cl. 428-35.800.

Akiyama, Keiji; Watanabe, Noriaki; Hotta, Hisashi; Toyama, Tadao; and Nishimiya, Nobuyuki, to Fuji Photo Film Co., Ltd. PS plate and method for processing same. 5,464,724, Cl. 430-272.000.

Akman, Alp T. Parallel and series plugs and wiring segments for ballon display. 5,464,354, Cl. 439-505.000.

Akuzawa, Kenji: *See*—
Mochizuki, Kazuhiko; Inagaki, Hiromi; and Akuzawa, Kenji, 5,465,208, Cl. 364-426.010.

Akzo N.V.: *See*—
Baxendale, William; and Chalmers, William S. K., 5,464,621, Cl. 424-221.100.

Akzo Nobel N.V.: *See*—
Jelenic, Jernej; Meijer, John; and Hope, Peter, 5,464,907, Cl. 525-303.000.

ALB. Klein GmbH & Co. KG: *See*—
Federhen, Bernd, 5,464,310, Cl. 406-164.000.

Albano, John V.; Sundaram, Kandasamy M.; and Herrmann, Hellmut A. Quench cooler. 5,464,057, Cl. 165-173.000.

Albany International Corp.: *See*—
Servin, Randall F., 5,464,488, Cl. 156-73.400.

Albring, Peter; Apley, Rainer; Döge, Klaus; Heinrich, Günter; Lindner, Ernst; Müller, Norbert; Pauer, Reinhard; Pilling, Eberhard; and Rudischer, Rainer, to Institut fuer Luft- und Kaeltetechnik Gemeinnuetzige Gesellschaft. Turbo-compressor impeller for coolant. 5,464,325, Cl. 416-185.000.

Alcatel Components Limited: *See*—
Van Emmerick, David L., 5,464,352, Cl. 439-404.000.

Alcatel N.V.: *See*—
Kersten, Peter; and Matthies, Klaus-D., 5,465,310, Cl. 385-22.000.
Remondiere, Olivier; and David, Jean-François, 5,465,100, Cl. 343-769.000.

Alcatel Radiotelephone: *See*—
Pinault, Francis; and Jouin, Christophe, 5,465,394, Cl. 455-54.100.

Alcon Laboratories, Inc.: *See*—
Clark, Abbot F.; and Conrow, Raymond E., 5,464,866, Cl. 514-480.000.
Dean, Thomas R.; and Namil, Abdelmoula, 5,464,831, Cl. 514-222.800.

Aldred, Alan J.: *See*—
Edwards, David B.; McCarthy, William J.; Aldred, Alan J.; and Jackman, Anthony D., 5,464,097, Cl. 206-524.700.

Alesi, Thomas W., Jr.: *See*—
Guy, Thomas D.; Granger, Richard N.; Brady, Robert H.; Webster, John; Pratt, James R.; Stone, Corbett W.; and Alesi, Thomas W., Jr., 5,464,144, Cl. 227-176.000.

Alexander, Robert J.; and Stanglein, Daniel C., to FPS Food Processing Systems, Inc. Robotic egg carton pickup head. 5,463,847, Cl. 53-473.000.

Alexeeva, Larisa V.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Melkhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

Alferness, Clifton A.: *See*—
Adams, John M.; and Alferness, Clifton A., 5,464,431, Cl. 607-4.000.

Alfred Teves GmbH: *See*—
Lohberg, Peter; Bayer, Ronald; Halat, Siegfried; Kircher, Dieter; Perez, Diogenes; and Sparschuh, Stefan, 5,464,079, Cl. 188-315.000.

Alkhoury, Boulos. Lock for sliding doors and windows. 5,464,261, Cl. 292-251.000.

All Line Inc.: *See*—
Stekelenburg, Albert, 5,464,182, Cl. 248-276.100.

Allcock, Harry R.; Cameron, Charles G.; and Smith, Dawn E., to Penn State Research Foundation, The. Photocrosslinkable polyphosphazenes and their use as microencapsulation materials. 5,464,932, Cl. 528-399.000.

Allegheny Ludlum Corporation: *See*—
Snyder, Ralph E.; Sorace, Dominic A.; and Benford, James G., 5,463,889, Cl. 72-197.000.

Allen, A. Donald, Jr.: *See*—
Isharani, Jayanti V.; Raper, James K.; Allen, A. Donald, Jr.; and Middleton, John W., 5,464,545, Cl. 252-8.600.

Allen-Bradley Company, Inc.: *See*—
Scofield, Robert E.; and Bechtel, Richard D., 5,464,976, Cl. 250-234.000.

Allen, Edward. Liquid dispenser bottles with reservoirs for droppers. 5,464,048, Cl. 141-24.000.

Allen, Philip: *See*—
Gibb, Ian; Allen, Philip; and Barnes, Andrew, 5,464,476, Cl. 118-723.0MP.

Allen, Rolla W.: *See*—
Jensen, Duane L.; and Allen, Rolla W., 5,463,957, Cl. 102-293.000.
Jensen, Duane L.; and Allen, Rolla W., 5,464,172, Cl. 244-3.100.

Allen, Ruth A.; Goetze, Lisa M.; Nick, Jeffrey M.; Pushong, Kelly B.; Surman, David H.; and Swanson, Michael D., to International Business Machines Corporation. Method and system for managing data and users of data in a data processing system. 5,465,359, Cl. 395-700.000.

Allesee, Timothy J. Hybrid orthodontic bracket system and method. 5,464,347, Cl. 433-8.000.

AlliedSignal Inc.: *See*—
Leung, Roger Y.; and Gonczy, Stephen T., 5,464,594, Cl. 422-288.000.
Yuhas, Donald E.; Vorres, Carol L.; Groppi, David P.; and Konicek, Jiri D., 5,464,658, Cl. 427-385.500.

Allison, Keith: *See*—
Brachman, Armand; and Allison, Keith, 5,464,470, Cl. 106-22.00A.

Alloy Surfaces Co. Inc.: *See*—
Baldi, Alfonso L., 5,464,699, Cl. 428-607.000.

Allure Home Creation Co., Inc.: *See*—
Ho, Stanley; and Ho, Mark, 5,464,113, Cl. 220-9.200.

Alpern, Erwin A. Hand rail attachment for beds. 5,463,784, Cl. 5-430.000.

Alpers, Helmut A.; and Russett, Jon P., to Flurry International, Inc. Method and apparatus for frozen dessert dispensing. 5,464,120, Cl. 222-1.000.

Alphatronix: *See*—
Whisler, John W., 5,465,329, Cl. 395-438.000.

Alps Seiko Co., Ltd.: *See*—
Hiraguri, Tokuo; and Hiraguri, Sohkichi, 5,464,311, Cl. 411-340.000.

Alt, Eckhard, to Intermedics, Inc. Medical interventional device responsive to sudden hemodynamic change. 5,464,434, Cl. 607-6.000.

Altemare, Robert L.; and Sigal, Joseph, to Jason, Inc. End brush and method of making. 5,464,275, Cl. 300-21.000.

Altschuler, Barry N.; Hardy, Douglas A.; Stephens, James A.; and Kish, Joseph, III, to Motorola, Inc. Secure communication setup method. 5,465,300, Cl. 380-30.000.

Aluminum Company of America: *See*—
McCleary, Sherri F.; Nitowiki, Gary A.; Marinelli, James M.; and Siemon, John T., 5,463,804, Cl. 29-469.500.

Alza Corporation: *See*—
Haak, Ronald P.; Theeuwes, Felix; Gyory, J. Richard; and Lattin, Gary A., 5,464,387, Cl. 604-20.000.

Amada, Nobutaka; and Noguchi, Takaharu, to Hitachi, Ltd. Method of and apparatus for recording and/or reproducing a current digital video signal and a high-definition digital video signal in a common track format. 5,465,180, Cl. 360-19.100.

Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mituhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Okabe, Tetuhiro, to Fujitsu Limited. Trouble diagnosis system of UPC circuit. 5,465,348, Cl. 395-182.020.

American BioMed, Inc.: *See*—
Miller, Arnold; and Lucas, Daniel R., 5,464,394, Cl. 604-96.000.

American Cyanamid Company: *See*—
Condon, Michael E.; and Harrington, Philip M., 5,464,808, Cl. 504-214.000.

American Home Products Corporation: *See*—
Antane, Madelene M.; Butera, John A.; Hirth, Bradford H.; and Antane, Schuyler A., 5,464,867, Cl. 514-524.000.
Soll, Richard M., 5,464,827, Cl. 514-58.000.

Ammermann, Eberhard: *See*—
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,464,839, Cl. 514-256.000.

Amoco Corporation: *See*—
Melendez, Luis A.; Rosenbaum, Robert E.; Vera-Garcia, Marcela A.; Olive, D. Michael; and Swenson, John E., 5,464,773, Cl. 435-306.100.
Weisburg, William G.; and Barns, Susan M., 5,464,743, Cl. 435-6.000.

Amosov, Viktor V.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Melkhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

AMUR Research Corp.: *See*—
Chasalow, Fred I., 5,464,740, Cl. 435-5.000.

Anan, Junichi: *See*—
Kano, Osamu; Yasui, Koichi; Sato, Yasuyuki; Yamakoshi, Yasuhiro; Anan, Junichi; Wada, Hironori; and Yasuoka, Akio, 5,464,520, Cl. 204-298.130.

Anastas, George V.; and Goldie, James H., to SatCon Technology Corporation. Transverse field activated magnetostrictive motor. 5,465,015, Cl. 310-26.000.

Anayama, Ushio, to Fuji Photo Film Co., Ltd. Method of detecting inclination angle of image frame read by microfilm reader. 5,465,125, Cl. 353-26.00A.

And Yet, Inc.: *See*—
Graham, Martin H., 5,465,051, Cl. 324-713.000.

Anderson, David G.: *See*—
Carlotta, Michael; and Anderson, David G., 5,465,110, Cl. 347-104.000.

Anderson, David J., to Samsung Semiconductor, Inc. Current clamping circuit. 5,465,067, Cl. 327-322.000.

Anderson, Douglas G.: *See*—
Barcay, Stephen J.; and Anderson, Douglas G., 5,464,613, Cl. 424-84.000.

Anderson, Mark F., to Hewlett-Packard Company. Hardware-configured operating system kernel having a parallel-searchable event queue for a multitasking processor. 5,465,335, Cl. 395-375.000.

Anderson, Mary; Meister, Alton; and Levy, Ellen J., to Cornell Research Foundation, Inc. Raising glutathione equivalent levels using N-acyl glutathione monoesters. 5,464,825, Cl. 514-18.000.

Anderson, Paul M.: *See*—
Goetz, Martin; Babiarz, Joseph; Wein, Deborah S.; Anderson, Paul M.; and Lindner, Alan W., 5,465,008, Cl. 257-691.000.

Anderson, R. Carver; and Eaton, Glen, to SpaceLabs, Inc. Airflow control manifold for automatic blood pressure monitoring device. 5,464,019, Cl. 128-677.000.

Anderson, Richard E.: *See*—
Campbell, Ann. N.; Anderson, Richard E.; and Cole, Edward L., Jr., 5,465,046, Cl. 324-244.000.

Anderson, Richard F., to Venture Packaging, Inc. Bag with perforated opening. 5,464,285, Cl. 383-10.000.

Anderson, Ronald L.: *See*—
Tong, Robert R.; Poplett, James M.; McEwen, Alan B.; Mason, Gary E.; Goodwin, Mark L.; Tsai, K. C.; Anderson, Ronald L.; and Nelson, James P., 5,464,453, Cl. 29-25.030.

Andersson, Yngve: *See*—
Frostrom, Tore; Nilsson, Tomas J.; Andersson, Yngve; Carlsson, Michael M. J.; Sundell, Lars-Olof; and Uden, Jonas P., 5,465,393, Cl. 455-54.100.

Ando, Eiichi: *See*—
Makino, Ichiro; Mitsui, Akira; Takehara, Mikio; Ando, Eiichi; Ebisawa, Junichi; Suzuki, Koichi; Matsumoto, Kiyoshi; Iseda, Toru; and Suzuki, Susumu, 5,464,674, Cl. 428-694.00T.

Andreiko, Craig A.; and Payne, Mark A., to Ormco Corporation. Orthodontic appliance providing for mesial rotation of molars. 5,464,349, Cl. 433-24.000.

Andrejevic, Ratomir, to Techno Arms (PTY) Ltd. Shot gun. 5,463,828, Cl. 42-20.000.

Andresen, Peter L.; and Kim, Young J., to General Electric Company. Insulated protective coating for mitigation of stress corrosion cracking of metal components in high-temperature water. 5,465,281, Cl. 376-305.000.

Andrews, Thomas L., Jr.; and Counts, Gary E., to Integral Peripherals, Inc. Low acoustic noise seeking method and apparatus. 5,465,034, Cl. 318-560.000.

Andros Incorporated: *See*—
Drucker, Steven; Goder, Alexey; Khalili, Davood; Williams, Kevin; Christensen, Ken; and Major, Emery, 5,464,982, Cl. 250-343.000.

Anelli, Pierlucio; Brocchetta, Marino; Uggeri, Fulvio; and Visigalli, Massimo, to Dibra S.p.A. 5,5'-/(1,3-propanediyl) bis-/imino(2-oxo-2,1-ethanediyl)acetylimino/bis(2,4,6-triiodo-1,3-benzenedicarboxylamides), and contrast media containing them. 5,464,607, Cl. 424-9.452.

Angarsk Oil Chemical Share Holding Company: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

Angelopoulos, Marie; Gelorme, Jeffrey D.; Labadie, Jeffrey W.; Lewis, David A.; Swanson, Sally A.; and Labianca, Nancy C., to International Business Machines Corporation. Polyamic acid and polyimide from fluorinated reactant. 5,464,927, Cl. 528-350.000.

Annen, Jinshi: *See*—
Nakazawa, Takayuki; Okizuka, Takafumi; Takebe, Nobuyuki; and Annen, Jinshi, 5,465,352, Cl. 395-600.000.

Antane, Madelene M.; Butera, John A.; Hirth, Bradford H.; and Antane, Schuyler A., to American Home Products Corporation. Diaminocyclobutene-3,4-diones. 5,464,867, Cl. 514-524.000.

Antane, Schuyler A.: *See*—
Antane, Madelene M.; Butera, John A.; Hirth, Bradford H.; and Antane, Schuyler A., 5,464,867, Cl. 514-524.000.

Antel Optronics Inc.: *See*—
Chu, Ching; Liao, David; and Feng, Kai D., 5,465,143, Cl. 356-73.100.

Anthony, Thomas R.; and Fleischer, James F., to General Electric Company. Microwave RF, or AC/DC discharge assisted flame deposition of CVD diamond. 5,464,665, Cl. 427-570.000.

Antonis, Petrus H.; Schlejen, Jacob; and Konings, Leonardus U. E., to U.S. Philips Corporation. Illumination unit, and electrodeless low-pressure discharge lamp and coil suitable for use therein. 5,465,028, Cl. 315-248.000.

Antons, Stefan: *See*—
Klipper, Reinhold; Antons, Stefan; Steffan, Guido; Mitschker, Alfred; Strüver, Werner; and Lütjens, Holger, 5,464,875, Cl. 521-32.000.

Anvekar, Dinesh K.: *See*—
Agrawal, Prathima; Anvekar, Dinesh K.; and Narendran, Balakrishnan, 5,465,389, Cl. 455-33.200.

Aoki, Eiji; Yamada, Koichiro; and Yukitomo, Tatsuhiko, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Insulation structure for liquefied gas tank. 5,464,116, Cl. 220-586.000.

Aoki, Harumi; Morisawa, Tahei; Ogawa, Kimiaki; and Mogamiya, Makoto, to Asahi Kogaku Kogyo Kabushiki Kaisha. Still video camera. 5,465,133, Cl. 354-442.000.

Aoki, Jun; Masuda, Katsuhiko; and Hashizume, Isamu, to Honda Giken Kogyo Kabushiki Kaisha. Main clutch connecting system having a pilot clutch. 5,464,084, Cl. 192-35.000.

Aoki, Masaaki: *See*—
Nishino, Atsushi; Yoshida, Akihiko; Namba, Teruo; Aoki, Masaaki; and Naito, Atsushi, 5,465,091, Cl. 341-33.000.

Apley, Rainer: *See*—
Albring, Peter; Apley, Rainer; Döge, Klaus; Heinrich, Günter; Lindner, Ernst; Müller, Norbert; Pauer, Reinhard; Pilling, Eberhard; and Rudischer, Rainer, 5,464,325, Cl. 416-185.000.

Apple Computer, Inc.: *See*—
Capps, Stephen P.; and Beernink, Ernest H., 5,465,325, Cl. 395-141.000.

Applegate, Jacqueline M.: *See*—
Newallis, Peter E.; Prasad, Vidanatha A.; and Applegate, Jacqueline M., 5,464,600, Cl. 423-300.000.

Applied Power Inc.: *See*—
Prince, George T.; and Fisher, Mark J., 5,464,330, Cl. 417-245.000.

Aqua Bath Company, Inc.: *See*—
Harris, Donnie L.; and McAllister, George P., Jr., 5,463,780, Cl. 4-604.000.

Arai, Seiji: *See*—
Nakamura, Tetsuya; Kabai, Takahito; Iguchi, Michihisa; Arai, Seiji; Sakai, Chinobu; and Katagata, Satoshi, 5,465,140, Cl. 355-260.000.

Arai, Tadashi: *See*—
Koyama, Mikio; and Arai, Tadashi, 5,465,070, Cl. 327-350.000.

Arai, Yoshihiro, to Ricoh Company, Ltd. Facsimile machine having printer unit and interface. 5,465,156, Cl. 358-296.000.

Arakawa, Naoto: *See*—
Tanio, Staoshi; and Arakawa, Naoto, 5,465,165, Cl. 358-448.000.

Arakawa, Nobuyuki; Segawa, Takashi; Kaneko, Moriyoshi; Miyairi, Kazuki; and Takayama, Kazutoshi, to Sony Corporation; and Nissei Plastic Industrial Co., Ltd. Molding dye for disk substrate. 5,464,339, Cl. 425-186.000.

Araki, Shinji: *See*—
Tajima, Makoto; Araki, Shinji; and Beppu, Kei, 5,464,056, Cl. 165-167.000.

Archey, Rick L.; Lundy, Charles E.; Meltzer, Aaron D.; Pielartzik, Harald; Fennhoff, Gerhard; Hufen, Ralf; Kircher, Klaus; Schubart, Rudiger; and Weider, Richard, to Bayer Aktiengesellschaft; and Bayer Corporation. Radiation-resistant polycarbonates. 5,464,893, Cl. 524-366.000.

Arimoto, Yoshinori, to ATR Optical and Radio Communications Research Lab. Alignment adjusting system for use in optical system of optical transceiver. 5,465,170, Cl. 359-159.000.

Arita, Masanobu: *See*—
Nagai, Yoshitaka; Abe, Hayao; and Arita, Masanobu, 5,464,816, Cl. 514-2.000.

Arizona Chemical Company: *See*—
Gardiner, Eric S.; and Fu, Thomas Z., 5,464,691, Cl. 428-336.000.

Armitage, Bernard J.; Bowen, John G.; Crossley, Malcolm J.; Hanneyball, Ian M.; Leslie, Bruce W.; Miller, Thomas K.; and Spowage, Michael, to Boots Company PLC, The. Amino naphthyridine compounds as anti-rhoumatic agents. 5,464,781, Cl. 514-300.000.

Armstrong, Robert N.: *See*—
Corbin, Thomas F.; Ilg, Otto M.; and Armstrong, Robert N., 5,464,677, Cl. 428-95.000.

Arnett, Jeffrey D.; and Grulke, David H., to Stryker Corporation. Surgical multiorifice irrigation apparatus. 5,464,390, Cl. 604-35.000.

Arnold, Joseph E.; and Wahlstedt, David A., to Reell Precision Manufacturing Corporation. Torque limiting spring hinge. 5,464,083, Cl. 192-8.00C.

Arnold, Peter C.: *See*—
McConnell, Thomas E.; and Arnold, Peter C., 5,464,183, Cl. 248-311.200.

Arthur Eugster AG Elektrohaushaltsgeräte: *See*—
Mahlich, Gotthart, 5,464,574, Cl. 261-124.000.

Asahara, Tomohiko: *See*—
Fujitsu, Kazuhiko; Asahara, Tomohiko; Kagamimasa, Nobuhiro; and Iwai, Kohichi, 5,464,405, Cl. 606-51.000.

Asahi Glass Company Ltd.: *See*—
Makino, Ichiro; Mitsui, Akira; Takehara, Mikio; Ando, Eiichi; Ebisawa, Junichi; Suzuki, Koichi; Matsumoto, Kiyoshi; Iseda, Toru; and Suzuki, Susumu, 5,464,674, Cl. 428-694.00T.
Ono, Michio; Kume, Masaharu; and Matsuo, Takayuki, 5,464,693, Cl. 428-344.000.
Yoneda, Takashige; Wakabayashi, Tsuneo; and Takano, Yukiko, 5,464,704, Cl. 428-429.000.

Asahi Kogaku Kabushiki Kaisha: *See*—
Haraguchi, Keisuke; Kobmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Matsuo, Hirofumi, 5,465,131, Cl. 354-202.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Aoki, Harumi; Morisawa, Tahei; Ogawa, Kimiaki; and Mogamiya, Makoto, 5,465,133, Cl. 354-442.000.
Eguchi, Haruki, 5,465,130, Cl. 354-195.100.

Asai, Akio: *See*—
Nishimoto, Yutaka; Ikemoto, Kimikazu; Niimi, Yuji; and Asai, Akio, 5,464,474, Cl. 118-676.000.

Asai, Satoru: *See*—
Haruki, Tamae; Nakagawa, Kenji; Taguchi, Masao; Tanaka, Hiroyuki; Asai, Satoru; and Hanyu, Isamu, 5,465,220, Cl. 364-525.000.

Asami, Takao: *See*—
Sugayama, Sakae; Asami, Takao; Kato, Kenji; and Maeta, Akira, 5,465,408, Cl. 455-249.100.

Asano, Naoki; Kikuchi, Yutaka; and Hayakawa, Yasuyoshi, to Canon Kabushiki Kaisha. Fixing apparatus for changing the duty cycle of electric current supply. 5,465,141, Cl. 355-285.000.

Asanuma, Naoki: *See*—
Ohki, Nobutaka; Asanuma, Naoki; and Takahashi, Osamu, 5,464,731, Cl. 430-505.000.

Asaoka, Masanobu; Takao, Hideaki; Togano, Takeshi; and Kojima, Makoto, to Canon Kabushiki Kaisha. Liquid crystal device. 5,464,668, Cl. 428-1.000.

Asbury, Jimmie R.: *See*—
Bouchard, Paul J.; Woll, Jerry D.; Woll, Bryan D.; and Asbury, Jimmie R., 5,465,079, Cl. 340-576.000.

Aschenbruck, Emil; Rohrbacher, Reinhold; Moreau, Alain; and Guillaux, Michel, to Man Gutehoffnungshutte AG. Process for tensioning and loosening tension rods in multicomponent, assembled gas turbine rotors. 5,463,812, Cl. 29-889.210.

Ask, David T.: *See*—
Sakizadeh, Kumars; Blair, John T.; and Ask, David T., 5,464,737, Cl. 430-619.000.
Association Scientifique pour la Geologie et de ses Applications: *See*—
Mallet, Jean-Laurent, 5,465,323, Cl. 395-123.000.
Asta Medica Aktiengesellschaft: *See*—
Kutscher, Bernhard; Niebch, Georg; Fleischhauer, Ilona; Engel, Jürgen; Achterrath-Tuckermann, Ute; and Szelenyi, Stefan, 5,464,838, Cl. 514-248.000.
Asten, Inc.: *See*—
Fry, Ted, 5,464,685, Cl. 428-229.000.
AT&T Corp.: *See*—
Agrawal, Prathima; Anvekar, Dinesh K.; and Narendran, Balakrishnan, 5,465,389, Cl. 455-33.200.
Ahamed, Syed V., 5,465,319, Cl. 395-11.000.
Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yurzis, Robert, 5,465,294, Cl. 379-207.000.
Chiller, Martin S.; Coulter, Peter I.; and Petillo, Richard J., 5,465,293, Cl. 379-189.000.
Gilboy, Christopher P., 5,465,113, Cl. 348-5.500.
Kim, Young O.; Manchanda, Lalita; and Weber, Gary R., 5,464,783, Cl. 437-42.000.
Mukherjee, Arabinda, 5,465,387, Cl. 455-26.100.
Winterbottom, Philip S., 5,465,365, Cl. 395-600.000.
AT&T Global Information Solutions Company: *See*—
Baptist, Robert; Kleijne, Theodoor A.; Monteban, Leo; and Meertens, Marc, 5,465,392, Cl. 455-38.300.
AT&T IPM Corp.: *See*—
Aydil, Eray S.; Giapis, Konstantinos P.; and Gottscho, Richard A., 5,464,664, Cl. 427-535.000.
Blaker, David M.; Diamondstein, Marc S.; Ellard, Gregory S.; Mobin, Mohammad S.; Sam, Homayoon; and Thierbach, Mark E., 5,465,275, Cl. 375-341.000.
Furman, Daniel S., 5,465,295, Cl. 379-211.000.
Atarodi, Mojtaba, to Linear Technology Corporation. Tunable operational transconductance amplifier having high linearity. 5,465,072, Cl. 330-254.000.
Athey, Patricia R.; Dauson, Douglas S.; Lecocq, David E.; Neuman, George A.; Sopko, John F.; and Stewart-Davis, Royann L., to PPG Industries, Inc. Method for coating a moving glass substrate. 5,464,657, Cl. 427-255.500.
Atkins, Clyde, Sr. Golf club head. 5,464,211, Cl. 273-78.000.
Atlantic Richfield Company: *See*—
Priebe, W. F.; Foster, Ricky L.; and Pierce, Michael C., 5,464,188, Cl. 248-678.000.
ATR Optical and Radio Communications Research Lab.: *See*—
Arimoto, Yoshinori, 5,465,170, Cl. 359-159.000.
Atto Corporation: *See*—
Takeda, Hisao; Koshiji, Youichi; Kubota, Hidehiro; and Iizuka, Takashi, 5,464,516, Cl. 204-182.900.
Attree, Stephen M.; and Fowke, Lawrence C., to University of Saskatchewan. Desiccated conifer somatic embryos. 5,464,769, Cl. 435-240.400.
Audi AG: *See*—
Paul, Michael, 5,463,988, Cl. 123-90.160.
Aureli, William D.; and Furst, Robert E., to Torrington Company, The. Spherical bearing and method of assembling a spherical bearing. 5,463,811, Cl. 29-898.046.
Ausimont S.p.A.: *See*—
Basile, Giampiero; Musso, Ezio; Tonelli, Claudio; and Girolomoni, Sauro, 5,464,882, Cl. 521-95.000.
Auto-Jure Oy: *See*—
Laaksonen, Reijo, 5,464,314, Cl. 414-427.000.
Automobiles Citroen: *See*—
Jaffiol, Franck; Olivier, Jean J.; and Thomas, Gérard, 5,464,575, Cl. 264-443.000.
Automobiles Peugeot: *See*—
Jaffiol, Franck; Olivier, Jean J.; and Thomas, Gérard, 5,464,575, Cl. 264-443.000.
Avé, Dirk A.: *See*—
Doane, Charles C.; Jenkins, Jack W.; and Avé, Dirk A., 5,464,618, Cl. 424-195.100.
Avelis, Julian P.; McBrady, Garrett W.; and McBrady, William J., to McBrady Engineering, Inc. Flexible, compact vial washer. 5,464,483, Cl. 134-25.400.
Avellanet, Marisol. Twist hairdo roller. 5,464,030, Cl. 132-245.000.
Avetisian, Vahan; Castagnoli, Craig J.; and Cha, Suk B., to Texaco Inc. Tire liquefying process reactor discharge system and method. 5,464,503, Cl. 201-3.000.
AVL Medical Instruments AG: *See*—
Lippitsch, Max; Draxler, Sonja; and Leiner, Marco J., 5,464,587, Cl. 422-82.070.
AVL Scientific Corporation: *See*—
Burns, Rickey D.; Meincke, Drew F.; and Heitz, Bernhard H., 5,463,910, Cl. 73-864.870.
Avotins, Peter V.; and Evans, Robert E., to Cytec Technology Corp. Fiber bonded agglomerated ore materials. 5,464,465, Cl. 75-313.000.
Avvisati, Claude G. Aquarium heater override control system. 5,465,014, Cl. 307-117.000.
Awad, Sami B., to Crest Ultrasonics Corporation. Process for cleaning and drying ferrous surfaces without causing flash rusting. 5,464,477, Cl. 134-1.000.
Awaya, Juichi: *See*—
Yamaguchi, Tadashi; Uesaka, Hiroshi; Watanabe, Kazuo; and Awaya, Juichi, 5,464,818, Cl. 514-2.000.
Aydil, Eray S.; Giapis, Konstantinos P.; and Gottscho, Richard A., to AT&T IPM Corp. Downstream ammonia plasma passivation of GaAs. 5,464,664, Cl. 427-535.000.
Aysta, James E.; and Colpan, Metin, to Minnesota Mining and Manufacturing Company; and Diagen Institute fur molekularbrologische Diagnostic, GmbH. Device and a method for separating liquid samples. 5,464,541, Cl. 210-767.000.
Azem, Khaled, to Design Tech International Inc. Telephone line seizure circuit. 5,465,297, Cl. 379-387.000.
Azumaya, Kengo; Hirayama, Yoshiyuki; and Tasaki, Kazuhiro, to Fuji Xerox Co., Ltd. Parallel processing apparatus for recognizing an area marked with a closed loop. 5,465,307, Cl. 382-165.000.
Azzara, C. Daniel: *See*—
St. John, James F.; Fetterhoff, John G.; Carpenter, John R.; Brown, B. Douglas; Azzara, C. Daniel; Tarka, Stanley M., Jr.; Rank, Craig; and Strohmaier, George K., 5,464,649, Cl. 426-660.000.
B.F. Goodrich Company, The: *See*—
Kramer, James H.; Lynch, Daniel S.; and Coker, Charles W., 5,464,177, Cl. 246-127.000.
Baader, Helmut: *See*—
Kaspers, Norbert; Lang, Karl-Heinz; Baader, Helmut; Grün, Herbert; and Otto, Thomas, 5,463,953, Cl. 101-485.000.
Baba, Kenzi: *See*—
Enbutsu, Ichiro; Baba, Kenzi; Hara, Naoki; Yoda, Mikio; Watanabe, Shoji; and Yahagi, Hayao, 5,465,320, Cl. 395-22.000.
Baba, Shigeyuki: *See*—
Ibori, Satoshi; Yamashita, Hitoshi; Baba, Shigeyuki; Fujii, Hiroshi; Kambara, Takatsugu; and Ishibashi, Akira, 5,465,202, Cl. 363-37.000.
Baba, Yoshinobu; and Tada, Tatsuya, to Canon Kabushiki Kaisha. Electrophotographic method and apparatus using magnetic toner. 5,464,720, Cl. 430-122.000.
Babcock & Wilcox Company, The: *See*—
Jeffers, Larry A., 5,465,219, Cl. 364-498.000.
Kidwell, J. Jeffrey; Reed, Stuart E.; Ryan, Patrick M.; Harwig, Dennis D.; and Womack, E. Allen, Jr., 5,464,957, Cl. 219-130.010.
Babiarz, Joseph: *See*—
Goetz, Martin; Babiarz, Joseph; Wein, Deborah S.; Anderson, Paul M.; and Lindner, Alan W., 5,465,008, Cl. 257-691.000.
Bach, Michael J.: *See*—
Schaffner, T. Michael; Bayer, William R.; and Bach, Michael J., 5,465,269, Cl. 375-200.000.
Bagwell, Thomas H.: *See*—
Moehlenbrock, Andrew W.; Owensby, Joseph E.; and Bagwell, Thomas H., 5,463,844, Cl. 53-436.000.
Baierweck, Petra: *See*—
Gareiss, Brigitte; Baierweck, Petra; Plachetta, Christoph; and Ulmerich, Karlheinz, 5,464,894, Cl. 524-424.000.
Bailer, Rudolf, to Uhlmann Pac-Systeme GmbH & Co. KG. System for supplying literature inserts to a carton-packing machine. 5,463,840, Cl. 53-117.000.
Bain, Steven D.: *See*—
Labroo, Virender M.; Piggott, James R.; and Bain, Steven D., 5,464,862, Cl. 514-422.000.
Baird, Andrew J.; Esch, Frederick S.; Gospodarowicz, Denis; Bohlen, Peter; and Ling, Nicholas C., to Salk Institute for Biological Studies, The. Bovine basic fibroblast growth factor. 5,464,774, Cl. 536-23.510.
Baird, James D. Portable non-invasive flowmeter for partially filled pipe. 5,463,905, Cl. 73-861.250.
Bajorek, Christopher H.; Erpelding, A. David; Garfunkel, Glen A.; Pattanaik, Surya; Robertson, Neil L.; and Wallash, Albert J., to International Business Machines Corporation. Shorted magnetoresistive head leads for electrical overstress and electrostatic discharge protection during manufacture of a magnetic storage system. 5,465,186, Cl. 360-113.000.
Baker, Ernest; and Harris, Charles W., to Spencer Industries, Inc. Apparatus for slitting belt. 5,464,168, Cl. 242-530.100.
Balaji, Vitukudi: *See*—
Chan, Ming F.; Raju, Bore G.; Castillo, Rosario S.; Kois, Adam; Wu, Chengde; and Balaji, Vitukudi, 5,464,853, Cl. 514-378.000.
Baldi, Alfonso L., to Alloy Surfaces Co. Inc. Pyrophoric materials and methods for making the same. 5,464,699, Cl. 428-607.000.
Baldwin, Dwight G.; Zhao, Xiaowei; Darland, Mike E.; and Rodriguez, Ernesto M., to Minnesota Mining and Manufacturing Company. Overhead projector with vibration control head. 5,465,127, Cl. 353-119.000.
Baldwin-Gegenheimer GmbH: *See*—
Waizmann, Franz; Hillenbrand, Jürgen; and Langenmayr, Manfred, 5,463,951, Cl. 101-423.000.
Ballard Power Systems Inc.: *See*—
Buswell, Richard F.; Clausi, Joseph V.; and Louie, Craig, 5,464,606, Cl. 423-655.000.
Steck, Alfred E.; and Wei, Jinzhu, 5,464,700, Cl. 429-30.000.

Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K. Method of preparing styrene polymers by suspension polymerization. 5,464,915, Cl. 526-225.000.

Balsimo, William V., to Minnesota Mining and Manufacturing Company. Separation-science membrane dispenser. 5,464,117, Cl. 221-1.000.

Balzer, Dieter, to Huels Aktiengesellschaft. Aqueous surfactant compositions of elevated viscosity. 5,464,874, Cl. 514-777.000.

Balzers Aktiengesellschaft: *See*—
Rudigier, Helmut; and Sperger, Reinhard, 5,464,683, Cl. 428-216.000.

Bane, Charles K., to Bull-X, Inc. Method of making a hardened bullet. 5,464,487, Cl. 148-706.000.

Banez, Augusto E. Portable folding structure. 5,463,833, Cl. 52-71.000.

Bang, Doo-jin, to SamSung Electronics Co., Ltd. Facsimile. 5,464,205, Cl. 271-213.000.

Baptist, Robert; Kleijne, Theodoor A.; Monteban, Leo; and Meertens, Marc, to AT&T Global Information Solutions Company. Apparatus and method for operating a wireless local area network having power conservation. 5,465,392, Cl. 455-38.300.

Bar Ilan University: *See*—
Gottlieb, Israel; and Singer, Yehuda, 5,465,372, Cl. 395-800.000.

Barbee, Robert B.: *See*—
Chang, Yeon-Ho; Barbee, Robert B.; and Phillips, Brian S., 5,464,909, Cl. 525-438.000.

Barber Industries Ltd.: *See*—
Johnson, Clarence W., 5,464,040, Cl. 137-556.000.

Barbier, Bruno; and Lach, Patrick, to Sextant Avionique. Method and device for the projection of a color image resulting from a modulation by optical valves. 5,465,177, Cl. 359-634.000.

Barcay, Stephen J.; and Anderson, Douglas G., to Ecolab, Inc. Fat-based pest bait. 5,464,613, Cl. 424-84.000.

Barmag AG: *See*—
Lorenz, Hellmut, 5,463,861, Cl. 57-339.000.

Barna, Randall S. Arch support system and method for manufacture and use. 5,463,824, Cl. 36-44.000.

Barnes, Andrew: *See*—
Gibb, Ian; Allen, Philip; and Barnes, Andrew, 5,464,476, Cl. 118-723.0MP.

Barnes, Keith W.; Bauman, Donald R.; Brace, Howard N.; Keefer, Philip A.; and Mihelich, Michael E., to E.F. Johnson Company. Signaling protocol for a distributive wide area transmission trunked communication system. 5,465,386, Cl. 455-15.000.

Barngrover, Kerwin: *See*—
Young, William C.; and Barngrover, Kerwin, 5,463,877, Cl. 62-264.000.

Barns, Susan M.: *See*—
Weisburg, William G.; and Barns, Susan M., 5,464,743, Cl. 435-6.000.

Barrufet Barque, Maria M.: *See*—
Porres Sanchez, Francisco; and Barrufet Barque, Maria M., 5,464,150, Cl. 229-120.380.

Barrus, John; Holly, Krisztina; and Cassidy, Michael. Apparatus for ordering from remote locations. 5,465,291, Cl. 379-67.000.

Barta, Helmut; Eder, Helmut; Granser, Manfred; Habison, Georg; Hantak, Edith; Moser, Franz; and Pfaffenbichler, Peter, to Immuno AG. Syringe assembly for the storage and application of a biological multi-component material. 5,464,396, Cl. 604-191.000.

Bartel, Peter; and Bücher, Hans-Joachim, to Kiekert GmbH & Co. KG. Electromechanical drive for a motor-vehicle power door latch. 5,464,260, Cl. 292-201.000.

Bartholic, David B. Process and apparatus for controlling and metering the pneumatic transfer of solid particulates. 5,464,591, Cl. 422-142.000.

Bartram, David V. Communication via leaky cables. 5,465,395, Cl. 455-55.100.

Basaran, Osman A.: *See*—
Sisson, Warren G.; Basaran, Osman A.; and Harris, Michael T., 5,464,195, Cl. 266-170.000.

Baseghi, Behshad; Mazooji, Mohammad; and Holtz, Brian E., to Raytheon Company. Apparatus and method for detecting signals. 5,465,405, Cl. 455-226.400.

BASF Aktiengesellschaft: *See*—
Gareiss, Brigitte; Baierweck, Petra; Plachetta, Christoph; and Ulmerich, Karlheinz, 5,464,894, Cl. 524-424.000.
Henn, Rolf; Beseckе, Siegmund; Deckers, Andreas; Guentherberg, Norbert; Brudermueller, Martin; Nestler, Gerhard; and Wassmer, Karl-Heinz, 5,464,881, Cl. 521-60.000.
Hermeling, Dieter; Koenig, Hartmann; and Goetz, Norbert, 5,464,508, Cl. 204-78.000.
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,464,839, Cl. 514-256.000.

BASF Corporation: *See*—
Corbin, Thomas F.; Ilg, Otto M.; and Armstrong, Robert N., 5,464,677, Cl. 428-95.000.
Hoyt, Matthew B.; and Wilson, Phillip E., 5,464,676, Cl. 428-85.000.
Patterson, Jimmy L., 5,464,562, Cl. 252-182.280.
Valoppi, Valeri L., 5,464,879, Cl. 521-51.000.
Yeh, Ling, 5,464,584, Cl. 264-103.000.

Basile, Giampiero; Musso, Ezio; Tonelli, Claudio; and Girolomoni, Sauro, to Ausimont S.p.A. Method for inhibiting the degradation of hydrochlorofluorocarbons utilized as foaming agents in the preparation of foamed polyurethanes and polyisocyanurates. 5,464,882, Cl. 521-95.000.

Bassen, Howard I.; and Casamento, John P., to United States of America, Health and Human Services. Electric field shielding system for AC electrically powered device with a two-blade plug. 5,465,013, Cl. 307-91.000.

Batesville Casket Company, Inc.: *See*—
Rojdev, Ilija, 5,463,800, Cl. 27-1.000.

Bäther, Wolfgang; and Bommer, Rainer, to Drägerwerk Aktiengesellschaft. Arrangement for colorimetrically detecting a gaseous and/or vaporous component in a gas mixture. 5,464,588, Cl. 422-88.000.

Bauhofer, Markus: *See*—
Krotky, Peter; Bauhofer, Markus; and Heinzelmann, Walter, 5,463,991, Cl. 123-195.00R.

Baum, Kevin L.: *See*—
Mueller, Bruce D.; and Baum, Kevin L., 5,465,412, Cl. 455-296.000.

Bauman, Donald R.: *See*—
Barnes, Keith W.; Bauman, Donald R.; Brace, Howard N.; Keefer, Philip A.; and Mihelich, Michael E., 5,465,386, Cl. 455-15.000.

Baumer S.R.L.: *See*—
Gambetti, Mario, 5,463,846, Cl. 53-465.000.

Baxendale, William; and Chalmers, William S. K., to Akzo N.V. Canine corona virus vaccine. 5,464,621, Cl. 424-221.100.

Bayer Aktiengesellschaft: *See*—
Archey, Rick L.; Lundy, Charles E.; Meltzer, Aaron D.; Pielartzik, Harald; Fennhoff, Gerhard; Hufen, Ralf; Kircher, Klaus; Schubart, Rudiger; and Weider, Richard, 5,464,893, Cl. 524-366.000.
Haas, Wilhelm; Linker, Karl-Heinz; Schallner, Otto; Findeisen, Kurt; Santel, Hans-Joachim; and Dollinger, Markus, 5,464,810, Cl. 504-273.000.
Klipper, Reinhold; Antons, Stefan; Steffan, Guido; Mitschker, Alfred; Strüver, Werner; and Lätjens, Holger, 5,464,875, Cl. 521-32.000.
Krämer, Wolfgang; Berg, Dieter; Dehne, Heinz-Wilhelm; and Dutzmann, Stefan, 5,464,809, Cl. 504-227.000.
Laas, Hans-Josef; Halpaap, Reinhard; Wamprecht, Christian; Meier-Westhues, Hans-Ulrich; Schultz, Wolfgang; and Kahl, Lothar, 5,464,921, Cl. 528-67.000.
Mehlhorn, Heinz; Schmahl, Günter; Lindner, Werner; and Haberkorn, Axel, 5,464,837, Cl. 514-242.000.
Petersen, Uwe; Krebs, Andreas; Schenke, Thomas; Kunisch, Franz; Philipps, Thomas; Grohe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, 5,464,796, Cl. 514-312.000.
Weber, Hans G.; Haas, Peter; Michels, Erhard; Weber, Christian; and Brecht, Klaus, 5,464,880, Cl. 521-51.000.

Bayer Corporation: *See*—
Archey, Rick L.; Lundy, Charles E.; Meltzer, Aaron D.; Pielartzik, Harald; Fennhoff, Gerhard; Hufen, Ralf; Kircher, Klaus; Schubart, Rudiger; and Weider, Richard, 5,464,893, Cl. 524-366.000.
Johnson, Gary M.; and Schaeper, Robert J., 5,464,739, Cl. 435-4.000.
Mafoti, Robson; and Bushmire, Alan D., 5,464,920, Cl. 528-60.000.
Newallis, Peter E.; Prasad, Vidanatha A.; and Applegate, Jacqueline M., 5,464,600, Cl. 423-300.000.
Schilling, Steven L.; Yeater, Robert P.; Soland, Phil M.; Szabat, John F.; and Parsons, Harold R., 5,464,560, Cl. 252-182.240.
Schwarzberg, Moshe; and Dayal, Santosh, 5,464,749, Cl. 435-7.920.

Bayer, Ronald: *See*—
Lohberg, Peter; Bayer, Ronald; Halat, Siegfried; Kircher, Dieter; Perez, Diogenes; and Sparschuh, Stefan, 5,464,079, Cl. 188-315.000.

Bayer, William R.: *See*—
Schaffner, T. Michael; Bayer, William R.; and Bach, Michael J., 5,465,269, Cl. 375-200.000.

Bayless, Ronnie E., to Dotolo Research Corporation. Graphic ink remover solution. 5,464,555, Cl. 252-153.000.

Bealkowski, Richard; Geisler, Douglas R.; and Turner, Michael R., to International Business Machines Corporation. Method and apparatus for an automated dynamic load of an ABIOS device support layer in a computer system. 5,465,357, Cl. 395-700.000.

Beard, Richard C.; and Kachner, Michael D., to Goodyear Tire & Rubber Company, The. Radial ply tire with specified bead portion design. 5,464,051, Cl. 152-454.000.

Beaudry, Wallace J. Electrographic label printing system. 5,464,289, Cl. 400-62.000.

Beauducel, Claude; and Coquerel, Patrick, to Institut Francais du Petrole. Process and device for the digitized transmission of signals. 5,465,270, Cl. 375-242.000.

Beauford, Martin H., to Phillips Petroleum Company. Inferential correction of composition for a distillation analyzer. 5,464,504, Cl. 203-3.000.

Bechtel, Richard D.: *See*—
Scofield, Robert E.; and Bechtel, Richard D., 5,464,976, Cl. 250-234.000.

Bechtolsheim, Andreas; Frank, Edward; Testa, James; and Storm, Shawn, to Sun Microsystems, Inc. Single in-line memory module. 5,465,229, Cl. 365-52.000.

Beck, Norman G.; Wallis, Frank S.; and Holthaus, Gary A., to Copeland Corporation. Compressor with motor cooling fan. 5,464,332, Cl. 417-368.000.

Becker, Wolfgang; Mathis, Raymond; Stapper-Druyen, Sylvia; Robrahn, Karin; Hoffmann, Rainer; and Kiray, Yasar C., to Henkel Kommanditgesellschaft auf Aktien. Use of special compounds as smoothing agents in combing oils. 5,464,660, Cl. 427-389.000.

Beckwith, Carlos A., to Centro de Investigacion Y Asistencia Tecnica del Estado de Wueretaro A.C. Whole stalk sugar cane harvester that tops, cuts, cleans and loads. 5,463,856, Cl. 56-62.000.

Becton, Dickinson and Company: *See*—
Vogler, Erwin A.; and Graper, Jane C., 5,464,776, Cl. 436-69.000.

Beech Aircraft Corporation: *See*—
Byrne, William M., Jr., 5,465,211, Cl. 364-424.060.

Beeman, Stephen E. Striking target for martial arts. 5,464,377, Cl. 482-83.000.

Beer, Reginald: *See*—
Judd, Ian D.; and Beer, Reginald, 5,465,251, Cl. 370-54.000.

Beernink, Ernest H.: *See*—
Capps, Stephen P.; and Beernink, Ernest H., 5,465,325, Cl. 395-141.000.

Begalla, John: *See*—
Marik, Wayne; Begalla, John; and Johnnson, Tom W., 5,464,342, Cl. 425-533.000.

Behan, Dominic P.: *See*—
Potter, Ellen; Behan, Dominic P.; Fischer, Wolfgang H.; Linton, Elizabeth A.; Lowry, Philip J.; and Vale, Wylie W., Jr., 5,464,757, Cl. 435-69.100.

Behrens, Prierich-Otto: *See*—
Krüger, Manfred; Mayer, Dieter; Behrens, Prierich-Otto; and Krohn, Manfred, 5,463,946, Cl. 100-93.0RP.

Behringwerke Aktiengesellschaft: *See*—
Stief, Thomas; Heimburger, Norbert; and Schorlemmer, Hans U., 5,464,615, Cl. 424-94.630.

Beisswanger, Rudolf: *See*—
Henseler, Klaus; and Beisswanger, Rudolf, 5,464,169, Cl. 242-542.000.

Bejan, Robert S.; Centanni, Kevin P.; Gaertner, Scott R.; and Franzblau, William L., to Actifilm, Inc. Automatic polling and display interactive entertainment system. 5,465,384, Cl. 455-2.000.

Bekus, David F.: *See*—
Popescu, Miron G.; Bekus, David F.; Routh, Shakti; Vera, Luis E.; and Clark, Thomas A., 5,464,580, Cl. 422-34.000.

Beladi, Sayed H.: *See*—
Borras, Jaime A.; Chambers, Mark J.; Finol, Jesus S. Pena; Gonzalez, Armando J.; Carralero, Cesar W.; Beladi, Sayed H.; and Erbora, Levent Y., 5,465,409, Cl. 455-260.000.

Belenkiy, Yuriy; Grois, Igor; Gumin, Irina L.; Makhlin, Ilya; Margolin, Mark; and Peacetto, Michael J., to Molex Incorporated. Optical fiber connector and method of fabricating same. 5,465,313, Cl. 385-80.000.

Bell & Howell Phillipsburg Company: *See*—
Bowser, David; and Warden, Gerald D., 5,464,203, Cl. 271-12.000.

Bell, Jonathan M.: *See*—
Bell, Michael; and Bell, Jonathan M., 5,463,823, Cl. 36-11.500.

Bell, Michael; and Bell, Jonathan M. Sandal having heel retaining means for use on other footwear. 5,463,823, Cl. 36-11.500.

Bellew, William S.; and Wilson, Carolyn G., to Ryobi North America. Portable planer with adjustable chip deflector. 5,463,816, Cl. 30-415.000.

Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., to Charles Stark Draper Laboratory, Inc., The. Method and apparatus for automated handling of cut material. 5,463,921, Cl. 83-151.000.

Bellon, Franck, to Sebia, A Corp. of France. Apparatus for the application of biological samples to an electrophoretic slab support. 5,464,515, Cl. 204-182.800.

Bellon, Franck, to Sebia. Device permitting the spreading of one or several reagents on a gel. 5,464,521, Cl. 204-299.00R.

Belongia, David C.; and Klein, Annette T., to West Bend Company, The. Automatic breadmaker with plural kneading members. 5,463,937, Cl. 99-348.000.

Bend Research, Inc.: *See*—
Friesen, Dwayne T.; Newbold, David D.; McCray, Scott B.; and Ray, Roderick J., 5,464,540, Cl. 210-640.000.

Benedetto, Alfred P., Jr. Wheel support for securing a wheel of a wheeled vehicle to a transport vehicle. 5,464,076, Cl. 188-32.000.

Benford, James G.: *See*—
Snyder, Ralph E.; Sorace, Dominic A.; and Benford, James G., 5,463,889, Cl. 72-197.000.

Bengel, Thomas G., to Westinghouse Electric Corporation. Reactor coolant pump seal test decontamination housing. 5,465,279, Cl. 376-245.000.

Benjamin Moore & Co.: *See*—
Muscara, Dominic, 5,464,047, Cl. 141-1.000.

Benting, Gary M.; and Abraham, Leslie R., to Wenger Corporation. Portable musical instruments cart. 5,464,236, Cl. 280-30.000.

Beppu, Kei: *See*—
Tajima, Makoto; Araki, Shinji; and Beppu, Kei, 5,464,056, Cl. 165-167.000.

Berg, Dieter: *See*—
Krämer, Wolfgang; Berg, Dieter; Dehne, Heinz-Wilhelm; and Dutzmann, Stefan, 5,464,809, Cl. 504-227.000.

Berg, Eric P.; Tuch, Ronald J.; Dror, Michael; and Wolff, Rodney G., to Medtronic, Inc. Intravascular stent and method. 5,464,650, Cl. 427-2.300.

Bergamini, Giorgio, to Nuovopignone - Industrie Meccaniche E Fonderia S.p.A. Fluid flowmeter-controller. 5,464,039, Cl. 137-551.000.

Bergemont, Albert, to National Semiconductor Corporation. Method for programming an alternate metal/source virtual ground flash EPROM cell array. 5,464,999, Cl. 257-322.000.

Berger, Paul H., to Metro Fire & Rescue, Inc. Methods of extinguishing alkali metal fires with non-aqueous compositions. 5,464,544, Cl. 252-2.000.

Berglund, Pontus, to ABB Atom AB. Fuel assembly for a nuclear reactor. 5,465,282, Cl. 376-426.000.

Bernad: *See*—
Weingarten, Zvi, 5,464,064, Cl. 169-22.000.

Bernard, Patrick E. Y.; and Bertorelli, Claude R., to Eastman Kodak Company. Electrolytic device and method having a porous and stirring electrode. 5,464,506, Cl. 204-105.00R.

Bernard, Roger; and Bevand, Jacques, to GEC Alsthom Transport SA. Method of centering steerable axles of a bogie. 5,463,963, Cl. 105-168.000.

Bernardon, Edward; and Foley, Michael F., to Charles Stark Draper Laboratories, The. Resin transfer molding system. 5,464,337, Cl. 425-112.000.

Bernardon, Edward: *See*—
Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,463,921, Cl. 83-151.000.

Berteaud, Andre-Jean: *See*—
Germain, Alain; Berteaud, Andre-Jean; and Galtier, Francois, 5,464,968, Cl. 219-710.000.

Bertorelli, Claude R.: *See*—
Bernard, Patrick E. Y.; and Bertorelli, Claude R., 5,464,506, Cl. 204-105.00R.

Besecke, Siegmund: *See*—
Henn, Rolf; Besecke, Siegmund; Deckers, Andreas; Guentherberg, Norbert; Brudermueller, Martin; Nestler, Gerhard; and Wassmer, Karl-Heinz, 5,464,881, Cl. 521-60.000.

Bessemer, Robert H.; and Yeoman, Stanley J., to Conair Group, Inc., The. Vacuum tank for vacuum sizing apparatus. 5,464,335, Cl. 425-71.000.

Bessler, Warren F.; and Bowden, Frank J., to General Electric Company. Control system for refrigerant metering solenoid valve. 5,463,876, Cl. 62-223.000.

Betz Laboratories, Inc.: *See*—
Edmonson, James G., 5,464,525, Cl. 208-47.000.
Rodzewich, Edward A., 5,464,484, Cl. 134-40.000.

Betz PaperChem, Inc.: *See*—
Pease, Jacqueline K., 5,464,502, Cl. 162-60.000.

Bevand, Jacques: *See*—
Bernard, Roger; and Bevand, Jacques, 5,463,963, Cl. 105-168.000.

Bezwada, Rao S.; and Jamiolkowski, Dennis D., to Ethicon, Inc. Absorbable polyoxaesters. 5,464,929, Cl. 528-361.000.

Bhattacharya, Subhashish; and Divan, Deepakraj M., to Electric Power Research Institute, Inc. Hybrid series active/parallel passive power line conditioner with controlled harmonic injection. 5,465,203, Cl. 363-40.000.

Bialas, Norbert; Mathis, Raymond; Crews, Richard P.; Mudge, Elbert H.; and Tuller, F. Norman, to Henkel Kommanditgesellschaft auf Aktien. Thermally stable textile lubricants. 5,464,546, Cl. 252-8.600.

Bianco, James S.; and Horan, David J., to Control Module Inc. Method of embossing repeating patterns on a substrate, the patterns having different rates of repetition. 5,465,176, Cl. 359-567.000.

Bien, David E., to National Semiconductor Corporation. Even order term mixer. 5,465,415, Cl. 455-326.000.

Bierbaum, Thomas, to Siemens Aktiengesellschaft. Dental handpiece with a check valve. 5,464,350, Cl. 433-84.000.

Bierman, Jeffrey J.: *See*—
Klearman, Jeffrey D.; Bierman, Jeffrey J.; and Schachet, Eli, 5,464,393, Cl. 604-82.000.

Biesse S.p.A.: *See*—
Zanarini, Gianfranco, 5,463,935, Cl. 99-292.000.

Bilodeau, Steve; Jacovino, Frank; Cameron, Joanne; and Cain, James, to Robotic Vision Systems, Inc. Method for coplanarity inspection of package or substrate warpage for ball grid arrays, column arrays, and similar structures. 5,465,152, Cl. 356-371.000.

Bina, Roberto; Nespoli, Andrea; and Garaberini, Antonio, to G.D Societa per Azioni. Hopper for elongate elements, in particular smoking articles. 5,464,027, Cl. 131-283.000.

Binga, Tonya D.: *See*—
Ferrar, Wayne T.; Vreeland, William B.; Hewitt, Charles E.; Fitzgerald, John J.; and Binga, Tonya D., 5,464,703, Cl. 428-421.000.

Binney & Smith Inc.: *See*—
Brachman, Armand; and Allison, Keith, 5,464,470, Cl. 106-22.00A.

Bio-Rad Laboratories: *See*—
Hjertén, Stellan; and Liao, Jia-Li, 5,464,517, Cl. 204-183.200.

Biolog, Inc.: *See*—
Bochner, Barry, 5,464,755, Cl. 435-34.000.

Biondi, Mark C.: *See*—
Hsu, Lillian-Liu; Sathi, Kitty; Biondi, Mark C.; Zell, Thomas B.; Catapano, David A.; and Lauria, Richard T., 5,465,322, Cl. 395-114.000.

BioNebraska, Inc.: *See*—
Coolidge, Thomas R.; Lewis, William; Schuster, Sheldon M.; Stout, Jay; van Heeke, Gino; Wylie, Dwane; and Wagner, Fred W., 5,464,759, Cl. 435-91.200.

Bippi, Herbert: *See*—
Frölich, Jürgen C.; and Bippi, Herbert, 5,464,868, Cl. 514-530.000.

Birnbaum, Burton H., to Polar Electro Oy. Telemetric transmitter unit. 5,464,021, Cl. 128-696.000.

Bisping, Bernhard; and Post, Lothar, to Rheinmetall GmbH. Device for firing practice ammunition. 5,463,930, Cl. 89-29.000.

Black & Decker Inc.: *See*—
Folci, Giovanni A., 5,464,184, Cl. 248-425.000.

Black, Larry J.; Bryant, Henry U.; Cullinan, George J.; and Kauffman, Raymond F., to Eli Lilly and Company. Methods for lowering serum cholesterol. 5,464,845, Cl. 514-326.000.

Blades, Jerry A.; and Kiel, Harvey G., to International Business Machines Corporation. System for enhancing user efficiency in initiating sequence of data processing system user inputs using calculated probability of user executing selected sequences of user inputs. 5,465,358, Cl. 395-700.000.

Blair, David W., to Princeton Scientific Enterprises, Inc. Conductive polymer ignitors. 5,463,954, Cl. 102-202.000.

Blair, John T.: *See*—
Sakizadeh, Kumars; Blair, John T.; and Ask, David T., 5,464,737, Cl. 430-619.000.

Blaker, David M.; Diamondstein, Marc S.; Ellard, Gregory S.; Mobin, Mohammad S.; Sam, Homayoon; and Thierbach, Mark E., to AT&T IPM Corp. Efficient utilization of present state/next state registers. 5,465,275, Cl. 375-341.000.

Blalock, James L., deceased (by Karen Blalock, independent administratrix); and Sterrett, William R., to International Business Machines Corporation. Method and system for compensating for image distortion caused by off-axis image projection. 5,465,121, Cl. 348-744.000.

Blalock, Karen, independent administratrix: *See*—
Blalock, James L., deceased; and Sterrett, William R., 5,465,121, Cl. 348-744.000.

Blanc, Alain; and Ceresiani, Lucien, to International Business Machines Corporation. Parallel processing of received and transmitted bit stream in telecommunications equipment including a DSP and supporting HDLC/SDLC protocols. 5,465,345, Cl. 395-200.150.

Blanchard, Pierre; Egraz, Jean-Bernard; and Ravet, Georges, to Coatex, S.A. Organophosphate dispersing agent, filled thermosetting composition containing same, and application thereof. 5,464,895, Cl. 524-425.000.

Blanchard, Ronald L.: *See*—
Swenson, Eric T.; Thomas, Riley A., III; Blanchard, Ronald L.; and Marshall, Brian P., 5,463,992, Cl. 123-198.00R.

Bland, Donald L.: *See*—
Hinshaw, Howard G.; Moulton, Keith R.; and Bland, Donald L., 5,464,054, Cl. 165-80.300.

Blander, Richard S.; Wenzel, Kenneth J.; and Piska, Venu G., to Chrysler Corporation. Method of detecting timing apparatus malfunction in an engine. 5,463,898, Cl. 73-116.000.

Blaner, Bartholomew; and Vassiliadis, Stamatis, to International Business Machines Corporation. Compounding preprocessor for cache for identifying multiple instructions which may be executed in parallel. 5,465,377, Cl. 395-800.000.

Blankenstein, Hendrik: *See*—
Caldwell, Michael W.; and Blankenstein, Hendrik, 5,465,085, Cl. 340-825.350.

Blizzard, William A., Jr., to Weatherford U.S., Inc. Metal-to-metal sealable port. 5,464,062, Cl. 166-376.000.

Blok, Glen R.: *See*—
Grinwald, Harold M.; and Blok, Glen R., 5,464,178, Cl. 248-50.000.

Blosser, Kea. Double knife stubbel cutter. 5,463,857, Cl. 56-238.000.

Blumenstock, Andreas: *See*—
Denz, Helmut; and Blumenstock, Andreas, 5,463,998, Cl. 123-520.000.

Blyakhman, Yefim, to Ciba-Geigy Corporation. High performance epoxy resin systems containing trimethylquinoline oligomers. 5,464,702, Cl. 428-413.000.

Boardman, John D.; Hamilton, Scott M.; Gangstead, Mervin L.; Sadler, Jimmie L.; Trimble, Richard A.; and Welch, Jeffrey P., to E-Systems, Inc. Optical recorder and reader of data on light sensitive media. 5,465,243, Cl. 369-49.000.

Boatwright, Darrell L.; Hanson, George E.; Miller, Phillip; Koenck, Steven E.; Walter, Jerry L.; Kubler, Joseph J.; Cargin, Keith K., Jr.; Schultz, Darald R.; Davis, Patrick H.; and Kunert, Steven R., to Norand Corporation. Vehicle data system. 5,465,207, Cl. 364-424.010.

BOC Group, Inc., The: *See*—
Fitch, Frank R.; Bülow, Martin; and Ojo, Adeola F., 5,464,467, Cl. 95-91.000.
Sieck, Peter A.; and Porter, John R., 5,464,518, Cl. 204-192.120.

Bocek, Joseph M.: *See*—
Infinger, Kenneth R.; and Bocek, Joseph M., 5,464,432, Cl. 607-5.000.

Bochner, Barry, to Biolog, Inc. Microbiological medium and method of assay. 5,464,755, Cl. 435-34.000.

Bock, Mark G.; Evans, Ben E.; Culberson, J. Christopher; Gilbert, Kevin F.; Rittle, Kenneth E.; and Williams, Peter D., to Merck & Co., Inc. Tocolytic oxytocin receptor antagonists. 5,464,788, Cl. 514-252.000.

Boehm, Carl F., Jr., to ABB Vetco Gray Inc. Well assembly metal seal. 5,464,065, Cl. 166-382.000.

Boehringer Ingelheim International GmbH: *See*—
Meyer, Reiner, 5,464,614, Cl. 424-94.300.

Boehringer Mannheim Corporation: *See*—
Eisenbeis, Scott J.; Krevolin, Mark; Bryant, Christopher P.; Boguslawski, Sophie J.; Ledden, David J.; and Clark, Scott, 5,464,747, Cl. 435-7.600.

Boehringer Mannheim Italia, S.p.A.: *See*—
Long, Giorgio; De Cillis, Giampiero; Rozzi, Antonella; D'Alò, Simonetta; and Gallico, Licia, 5,464,844, Cl. 514-301.000.

Boeing Company, The: *See*—
Klees, Garry W., 5,463,866, Cl. 60-204.000.
Oberholtzer, John C.; and Nitardy, John H., 5,465,399, Cl. 455-69.000.

Boettcher, Jeffrey A.; and Harklau, Lanny L., to Minnesota Mining and Manufacturing Company. Fluorescent spectral differential measurement of a substrate coating. 5,464,986, Cl. 250-459.100.

Boettger, Conrad H., to St. Francis Research Institute. Needleless intravenous infusion system. 5,464,399, Cl. 604-283.000.

Bogdan, Paula L.: *See*—
Galperin, Leonid B.; Bogdan, Paula L.; and Boldingh, Edwin P., 5,464,800, Cl. 502-66.000.

Boggavarapu, Rao L.; Goldstein, Yeshayahu S. A.; Keogh, Catherine M.; Suchocki, Anthony J.; and Widner, Melvin M., to General Dynamics Land Systems, Inc. Electrical power feed assembly for electrothermal gun. 5,463,928, Cl. 89-8.000.

Boggs, Paul D., III. Shaft mounted eddy current drive. 5,465,018, Cl. 310-105.000.

Bogner, Rudolf: *See*—
Grienberger, Johann; Bogner, Rudolf; and Frommann, Christian, 5,464,542, Cl. 210-784.000.

Boguslawski, Sophie J.: *See*—
Eisenbeis, Scott J.; Krevolin, Mark; Bryant, Christopher P.; Boguslawski, Sophie J.; Ledden, David J.; and Clark, Scott, 5,464,747, Cl. 435-7.600.

Bohlen, Peter: *See*—
Baird, Andrew J.; Esch, Frederick S.; Gospodarowicz, Denis; Bohlen, Peter; and Ling, Nicholas C., 5,464,774, Cl. 536-23.510.

Bohling, David A.: *See*—
Fine, Stephen M.; and Bohling, David A., 5,464,666, Cl. 427-576.000.

Böhringer, Markus; Hubschwerlen, Christian; Pflieger, Philippe; and Specklin, Jean-Luc, to Hoffmann-La Roche Inc. β-lactam compounds. 5,464,617, Cl. 424-114.000.

Boiron, Marc; and Bouvier, Stéphane, to U.S. Philips Corporation. Interface circuit and voltage-raising circuit including such a circuit. 5,465,069, Cl. 327-333.000.

Boitano, Robert A., to Gared Sports, Inc. Break-away basketball goal. 5,464,207, Cl. 273-1.50R.

Boldingh, Edwin P.: *See*—
Galperin, Leonid B.; Bogdan, Paula L.; and Boldingh, Edwin P., 5,464,800, Cl. 502-66.000.

Boler Company, The: *See*—
Vogler, Richard G., 5,464,245, Cl. 280-720.000.

Bolognesi, Dani P.; Matthews, Thomas J.; and Wild, Carl T., to Duke University. Synthetic peptide inhibitors of HIV transmission. 5,464,933, Cl. 530-324.000.

Bolte, Gerd; Henke, Guenter; and Brueninghaus, Ulrike, to Henkel Kommanditgesellschaft auf Aktien. Dispersion-based heat-sealable coating. 5,464,494, Cl. 156-330.000.

Bommer, Rainer: *See*—
Bäther, Wolfgang; and Bommer, Rainer, 5,464,588, Cl. 422-88.000.

Bonas Machine Company Limited: *See*—
McIntyre, Jonathan F.; Mahboubian-Jones, Malcolm G. B.; and Turnbull, Ian, 5,464,046, Cl. 139-455.000.

Bonko, Mark L., to Goodyear Tire & Rubber Company, The. Non-directional pneumatic tire for use on agricultural tractors and other like vehicles. 5,464,050, Cl. 152-209.00B.

Bonutti, Peter M. Method of closing discontinuity in tissue. 5,464,426, Cl. 606-232.000.

Bonzi, Mario. Device for humidifying and ionizing air. 5,464,572, Cl. 261-30.000.

Boots Company PLC, The: *See*—
Armitage, Bernard J.; Bowen, John G.; Crossley, Malcolm J.; Hunneyball, Ian M.; Leslie, Bruce W.; Miller, Thomas K.; and Spowage, Michael, 5,464,781, Cl. 514-300.000.

Borealis Technical Incorporated Limited: *See*—
Edelson, Jonathan, 5,464,464, Cl. 75-310.000.

Borg-Warner Automotive, Inc.: *See*—
Mott, Philip J., 5,464,374, Cl. 474-224.000.
Yanko, John P.; and Hall, David A., 5,464,198, Cl. 267-167.000.

Borras, Jaime A.; Chambers, Mark J.; Finol, Jesus S. Pena; Gonzalez, Armando J.; Carralero, Cesar W.; Beladi, Sayed H.; and Erbora, Levent Y., to Motorola, Inc. Radio architecture with dual frequency source selection. 5,465,409, Cl. 455-260.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Weyh, Werner; Schwander, Udo; Gatter, Raimond; Notar, Robert; Konopa, Helmut; and Erdmann, Klaus, 5,464,124, Cl. 222-129.100.

Bose, Carl L.: *See*—
Krumes, Rolf; Richman, Dennis C.; and Bose, Carl L., 5,465,142, Cl. 356-5.010.

Bosses, Mark D., to Home Care Industries, Inc. Disposable dust bag for vacuum cleaner and the like. 5,464,460, Cl. 55-374.000.

Boston Scientific Corporation: *See*—
Nicholas, Peter M.; and Crowley, Robert J., 5,464,016, Cl. 128-662.060.

Boswell, David R., to NovaVision, Inc. Holographic document and method for forming. 5,464,690, Cl. 428-334.000.

Botchan, Michael R.; Clark, Robin; Mohr, Ian J.; and Sun, Shaw, to Cetus Oncology Corporation; and University of California. Compositions for identification of papillomavirus replication inhibitors. 5,464,936, Cl. 530-350.000.

Bouchard, Paul J.; Woll, Jerry D.; Woll, Bryan D.; and Asbury, Jimmie R., to Vorad Safety Systems, Inc. Method and apparatus for determining driver fitness in real time. 5,465,079, Cl. 340-576.000.

Bounds, David J.; Weston, John A.; Johnson, Anthony D.; and Campbell, Bernard J., to Mars, Incorporated. Transaction systems. 5,464,087, Cl. 194-200.000.

Bour, David P.; and Paoli, Thomas L., to Xerox Corporation. Monolithic, multiple wavelength, dual polarization laser diode arrays. 5,465,263, Cl. 372-23.000.

Bour, David P.; and Bringans, Ross D., to Xerox Corporation. Index-guided laser on a ridged (001) substrate. 5,465,266, Cl. 372-46.000.

Bourdoulous, Robert P.; and Vollmer, John, to Perkin-Elmer Corporation, The. Nebulizer for use in an atomic absorption system. 5,464,157, Cl. 239-424.000.

Bouvier, Stéphane: *See*—
Boiron, Marc; and Bouvier, Stéphane, 5,465,069, Cl. 327-333.000.

Bovey, Denis M. H.: *See*—
Nield, Eric; Suemul, Daljit K.; and Bovey, Denis M. H., 5,464,884, Cl. 523-400.000.

Bowden, Frank J.: *See*—
Bessler, Warren F.; and Bowden, Frank J., 5,463,876, Cl. 62-223.000.

Bowen, John G.: *See*—
Armitage, Bernard J.; Bowen, John G.; Crossley, Malcolm J.; Hunneyball, Ian M.; Leslie, Bruce W.; Miller, Thomas K.; and Spowage, Michael, 5,464,781, Cl. 514-300.000.

Bowers, Mark C., to Scitex Digital Printing, Inc. Digital phase lock loop stimulation generator. 5,465,109, Cl. 347-74.000.

Bowker, Ronald: *See*—
Stevens, Sidney V.; Stevens, Deborah S.; and Bowker, Ronald, 5,464,286, Cl. 383-75.000.

Bowman, Frederick A.: *See*—
Wullschleger, Richard D.; Chen, Shirley C.; Bowman, Frederick A.; and Hawblitz, Larry V., 5,464,644, Cl. 426-549.000.

Bowser, David; and Warden, Gerald D., to Bell & Howell Phillipsburg Company. Sheet feeder. 5,464,203, Cl. 271-12.000.

Bracco International B.V.: *See*—
Tournier, Hervé; Hyacinthe, Roland; and Schneider, Michel, 5,464,696, Cl. 428-403.000.

Brace, Howard N.: *See*—
Barnes, Keith W.; Bauman, Donald R.; Brace, Howard N.; Keefer, Philip A.; and Mihelich, Michael E., 5,465,386, Cl. 455-15.000.

Brachman, Armand; and Allison, Keith, to Binney & Smith Inc. Color-changing marking composition system. 5,464,470, Cl. 106-22.00A.

Bradford, H. William; and Carr, Peter E. Tee marker and method of providing tee to green center distance. 5,464,219, Cl. 273-176.00L.

Bradley, Edward J.: *See*—
Pellerin, James W.; Poy, Russell H.; and Bradley, Edward J., 5,463,883, Cl. 68-140.000.

Brady, Robert H.: *See*—
Guy, Thomas D.; Granger, Richard N.; Brady, Robert H.; Webster, John; Pratt, James R.; Stone, Corbett W.; and Alesi, Thomas W., Jr., 5,464,144, Cl. 227-176.000.

Braegas, Peter, to Robert Bosch GmbH. Receiver for traffic messages. 5,465,088, Cl. 340-905.000.

Branson Ultrasonics Corporation: *See*—
McGrath, Philip E., 5,464,498, Cl. 156-580.200.

Bratsev, Alexander N.: *See*—
Goriachev, Vladislav L.; Bratsev, Alexander N.; Feduikovich, Valeri N.; Rutberg, Philip G.; Greene, Hugh W.; and Chism, Paul E., Jr., 5,464,513, Cl. 204-164.000.

Bray, Douglas R.; and Strazhnik, Michael M., to Sea Gull Lighting. System for attaching trim to lamp housing. 5,465,199, Cl. 362-364.000.

Brecht, Klaus: *See*—
Weber, Hans G.; Haas, Peter; Michels, Erhard; Weber, Christian; and Brecht, Klaus, 5,464,880, Cl. 521-51.000.

Bremm, Klaus-Dieter: *See*—
Petersen, Uwe; Krebs, Andreas; Schenke, Thomas; Kunisch, Franz; Philipps, Thomas; Grohe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, 5,464,796, Cl. 514-312.000.

Brentz, Charles W., to Abbott Laboratories. Sample pipetting method. 5,463,895, Cl. 73-61.710.

Bridge, Robert S. Tracheostomy tube. 5,464,011, Cl. 128-207.140.

Bridges, Russell P.: *See*—
Hasse, Margaret H.; Bridges, Russell P.; and Miller, Steven W., 5,464,401, Cl. 604-385.100.

Bridgestone Corporation: *See*—
Freeman, Roy M.; Hergenrother, William L.; and Ravagnani, Frederick J., 5,464,899, Cl. 524-504.000.
Iwata, Toshiro; Nagata, Iwami; Hatakeyama, Akira; and Nishigai, Kazuhisa, 5,464,282, Cl. 366-83.000.

Brief, David C., to National Semiconductor Corporation. Hybrid loopback for FDDI-II slave stations. 5,465,250, Cl. 370-15.000.

Brigham and Women's Hospital: *See*—
Stossel, Thomas P.; Lind, Stuart E.; and Janmey, Paul A., 5,464,817, Cl. 514-2.000.

Brindle, David R. Rooftop pipe container. 5,464,141, Cl. 224-328.000.

Bringans, Ross D.: *See*—
Bour, David P.; and Bringans, Ross D., 5,465,266, Cl. 372-46.000.

Bringley, Joseph F.; Bryan, Philip S.; and Hyde, Andrea M., to Eastman Kodak Company. Alkaline earth metal fluorobromoiodide storage phosphor, and radiation image storage panel, and method. 5,464,568, Cl. 252-301.40H.

Brinkerhoff, Joseph M. Sprinkler system controller. 5,464,044, Cl. 137-78.300.

Brissette, Peter J.: *See*—
Diaz-Kotti, Michelle A.; and Brissette, Peter J., 5,464,890, Cl. 524-195.000.

British Aerospace PLC: *See*—
Malvern, Alan R., 5,465,150, Cl. 356-350.000.

British Technology Group Limited: *See*—
Robins, David J.; and Walters, Dale R., 5,464,873, Cl. 514-659.000.

British Telecommunications, plc: *See*—
Maxwell, Graeme D.; and Ainslie, Benjamin J., 5,465,312, Cl. 385-49.000.

Brocchetta, Marino: *See*—
Anelli, Pierlucio; Brocchetta, Marino; Uggeri, Fulvio; and Visigalli, Massimo, 5,464,607, Cl. 424-9.452.

Brockett, Roger W.: *See*—
Scaramuzzo, John A., Jr.; and Brockett, Roger W., 5,465,035, Cl. 318-561.000.

Bromley, Robert: *See*—
Laug, Tamara; and Bromley, Robert, 5,463,797, Cl. 24-115.00G.

Brooker, Donald D.; Falsetti, James S.; Wolfenbarger, James K.; and Vuong, Dinh-Cuong, to Texaco Inc. Gasifier throat. 5,464,592, Cl. 422-207.000.

Broszat, Lothar, to TRW Fahrwerkesysteme GmbH & Co. KG. Pivot joint. 5,464,296, Cl. 403-138.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Taira, Hiroshi, 5,463,947, Cl. 101-125.000.

Broughton, Amos W. Railroad rail support and process for manufacture. 5,464,153, Cl. 238-117.000.

Brown, B. Douglas: *See*—
St. John, James F.; Fetterhoff, John G.; Carpenter, John R.; Brown, B. Douglas; Azzara, C. Daniel; Tarka, Stanley M., Jr.; Rank, Craig; and Strohmaier, George K., 5,464,649, Cl. 426-660.000.

Brown, Charles R.: *See*—
Wesdorp, Leendert H.; Madsen, Robert A.; Norton, Ian T.; and Brown, Charles R., 5,464,645, Cl. 426-573.000.

Brown, David; Gaul, Harald; Kushnir, Yosif; Travaglini, Nick; and Wilson, Victor. Multi-level stacked mold system. 5,464,579, Cl. 264-297.200.

Brown, David R.: *See*—
Ritter, Merrill A.; McDaniel, John M.; and Brown, David R., 5,464,406, Cl. 606-86.000.

Brown, Mary A.: *See*—
Hogan, James E.; and Brown, Mary A., 5,463,792, Cl. 15-322.000.

Brown, Orville W., to National Starch and Chemical Investment Holding Corporation. Power surge resistor pastes containing tungsten dopant. 5,464,564, Cl. 252-514.000.

Brown, Raymond: *See*—
Himmel, Richard P.; and Brown, Raymond, 5,464,652, Cl. 427-97.000.

Brown, Stuart H.: *See*—
Upton, William K., III; Schneider, William E.; Brown, Stuart H.; Stetz, Steven A.; Gotich, Emily J.; and McCrea, Jack L., 5,464,161, Cl. 241-21.000.

Brück, Rolf: *See*—
Maus, Wolfgang; Swars, Helmut; Brück, Rolf; and Humpolik, Bohumil, 5,464,679, Cl. 428-116.000.

Brudermueller, Martin: *See*—
Henn, Rolf; Besecke, Siegmund; Deckers, Andreas; Guentherberg, Norbert; Brudermueller, Martin; Nestler, Gerhard; and Wassmer, Karl-Heinz, 5,464,881, Cl. 521-60.000.

Brueninghaus, Ulrike: *See*—
Bolte, Gerd; Henke, Guenter; and Brueninghaus, Ulrike, 5,464,494, Cl. 156-330.000.

Bruna, Etienne: *See*—
Cousin, Gérard; Bruna, Etienne; and Gendrot, Edouard, 5,464,632, Cl. 424-465.000.

Bruni, Giovanni: *See*—
Ricco, Mario; Bruni, Giovanni; and De Matthaeis, Sisto L., 5,464,156, Cl. 239-124.000.

Bruno, John G.: *See*—
Kiel, Johnathan L.; Parker, Jill E.; and Bruno, John G., 5,464,768, Cl. 435-240.200.

Bruno, Mark, to Enzyme Research & Development Corporation. Multienzyme powdered composition containing bacteria for treatment of waste. 5,464,766, Cl. 435-187.000.

Brüstle, Klaus; and Rupprechter, Helmut, to Julius Blum Gesellschaft m.b.H. Hinge pot. 5,463,796, Cl. 16-383.000.

Bryan, Philip S.: *See*—
Bringley, Joseph F.; Bryan, Philip S.; and Hyde, Andrea M., 5,464,568, Cl. 252-301.40H.

Bryant, Christopher P.: *See*—
Eisenbeis, Scott J.; Krevolin, Mark; Bryant, Christopher P.; Boguslawski, Sophie J.; Ledden, David J.; and Clark, Scott, 5,464,747, Cl. 435-7.600.

Bryant, Frank O.; and Cutler, Horace G., to United States of America, Agriculture. Biologically pure culture of *Actinomyces viscosus* strain used for the bioremediation of chlorinated hydrocarbons. 5,464,771, Cl. 435-252.500.

Bryant, Henry U.: *See*—
Black, Larry J.; Bryant, Henry U.; Cullinan, George J.; and Kauffman, Raymond F., 5,464,845, Cl. 514-326.000.

Bryant, Steve M., to United States of America, Air Force. Time efficient method for processing adaptive target detection thresholds in doppler radar systems. 5,465,095, Cl. 342-159.000.

Bryant, William E.: *See*—
Burt, Edward W.; Bryant, William E.; and Crist, David M., 5,464,442, Cl. 623-27.000.

Buchanan, John M.: *See*—
Szajewski, Richard P.; and Buchanan, John M., 5,464,728, Cl. 430-393.000.

Buchanan, William: *See*—
Kelm, Gary R.; Pickrum, Harvey M.; Doyle, Matthew J.; and Buchanan, William, 5,464,609, Cl. 424-54.000.

Budding, Jacobus. Solo operated hemorrhoid ligator rectoscope. 5,464,412, Cl. 606-140.000.

Buechler, Jean M.: *See*—
Nill, Walter J.; and Buechler, Jean M., 5,464,970, Cl. 235-95.00R.

Buhler, Steven A.; and Harris, Ellis D., to Xerox Corporation. Electronic simulation for compensating laser diode thermal effects. 5,465,264, Cl. 372-31.000.

Bujard, Hermann: *See*—
Gossen, Manfred; and Bujard, Hermann, 5,464,758, Cl. 435-69.100.

Buley, Todd W.; and Sandhu, Gurtej S., to Micron Semiconductor, Inc. Method of chamber cleaning in MOCVD applications. 5,464,031, Cl. 134-1.000.

Bull S.A.: *See*—
Chantraine, Philippe; and Zorilla, Marta, 5,464,653, Cl. 427-96.000.

Bull-X, Inc.: *See*—
Bane, Charles K., 5,464,487, Cl. 148-706.000.

Bülow, Martin: *See*—
Fitch, Frank R.; Bülow, Martin; and Ojo, Adeola F., 5,464,467, Cl. 95-96.000.

Burke, Jerry O.: *See*—
Riddles, Gordon S.; and Burke, Jerry O., 5,464,257, Cl. 285-156.000.

Burke, Lawrence M.; and Shalla, Ronald L. Game-ball conditioner. 5,463,787, Cl. 15-97.100.

Burlington Chemical Co., Inc.: *See*—
Moore, Samuel B.; Leuck, James F.; and Turner, Edwin T., 5,464,563, Cl. 252-186.290.

Burnham, Dale A. High speed manual post puller. 5,464,192, Cl. 254-30.000.

Burns, Lee E.: *See*—
Pickering, Michael A.; Goela, Jitendra S.; and Burns, Lee E., 5,465,184, Cl. 360-97.010.

Burns, Rickey D.; Meincke, Drew F.; and Heitz, Bernhard H., to AVL Scientific Corporation. Multi-function aspirating device. 5,463,910, Cl. 73-864.870.

Burrows, Bruce D., to Ebtech, Inc. Sealed actuator probe assembly for a bottled water station. 5,464,127, Cl. 222-181.500.

Burt, Edward W.; Bryant, William E.; and Crist, David M., to Model & Instrument Development Corporation. Tubular support pylon and retainer for prosthetic foot. 5,464,442, Cl. 623-27.000.

Burton, James; Dong, Zhengxin; and Frigo, Timothy B., to University Hospital, The. Specific inhibitors of tissue kallikrein. 5,464,820, Cl. 514-16.000.

Burton, Peter: *See*—
Hotkowski, Peter; and Burton, Peter, 5,464,312, Cl. 412-7.000.

Buscemi, Paul J.; Stejskal, Elizabeth A.; Palme, Donald F., II; and Wang, Lixiao, to SCIMED Lifesystems Inc. Biodegradable drug delivery vascular stent. 5,464,450, Cl. 623-6.000.

Büscher, Hans-Joachim: *See*—
Bartel, Peter; and Büscher, Hans-Joachim, 5,464,260, Cl. 292-201.000.

Bush Boake Allen Limited: *See*—
Ferber, Gerald J.; and Smith, Graham J., 5,464,557, Cl. 252-170.000.

Bushmire, Alan D.: *See*—
Mafoti, Robson; and Bushmire, Alan D., 5,464,920, Cl. 528-60.000.

Buskirk, Gregory V.: *See*—
Peterson, David; and Buskirk, Gregory V., 5,464,552, Cl. 252-95.000.

Buswell, Richard F.; Clausi, Joseph V.; and Louie, Craig, to Ballard Power Systems Inc. Two-stage water gas shift conversion method. 5,464,606, Cl. 423-655.000.

Butera, John A.: *See*—
Antane, Madelene M.; Butera, John A.; Hirth, Bradford H.; and Antane, Schuyler A., 5,464,867, Cl. 514-524.000.

Butler, Aaron S.; Davis, Franklin J.; and Comeau, Roger J., to United Technologies Corporation. Fuel nozzle guide for a gas turbine engine combustor. 5,463,864, Cl. 60-39.310.

Butler, Jerry F.: *See*—
Warren, Craig B.; Marin, Anna B.; Butler, Jerry F.; and Narula, Anubhav P. S., 5,464,626, Cl. 424-408.000.

Byars, Kenneth D.: *See*—
Villagran, Maria D.; Toman, Lori J.; Byars, Kenneth D.; Dawes, Nancy C.; and Zimmerman, Stephen P., 5,464,642, Cl. 426-439.000.

Bychkov, Yeugeni A.: *See*—
Vlasov, Yuri G.; and Bychkov, Yeugeni A., 5,464,511, Cl. 204-153.100.

Byram, David C., to Minnesota Mining and Manufacturing Company. Convenient "drop-down" respirator harness structure and method of use. 5,464,010, Cl. 128-207.110.

Byrne, William M., Jr., to Beech Aircraft Corporation. Control system for propeller driven aircraft. 5,465,211, Cl. 364-424.060.

Byun, Yong S., to Goldstar Co., Ltd. Method of rubbing an orientation controlling film of a liquid crystal display in deionized water. 5,464,478, Cl. 134-1.000.

C. Itoh Feed Mills Co., Ltd.: *See*—
Horikawa, Hiroshi; Honzawa, Eiji; Marumura, Tadahiro; and Fukazawa, Akira, 5,464,637, Cl. 426-2.000.

C.J. Associates, Ltd.: *See*—
Lee, James S. W.; and Kwan, Chiu K., 5,464,213, Cl. 273-121.00A.

Ca. State University Long Beach Foundation: *See*—
Sanders, Brenda M.; Jenkins, Kenneth D.; Nichols, Jack L.; and Imber, Bryan E., 5,464,750, Cl. 435-7.210.

Cables Pirelli S.A.: *See*—
Missout, Bernard, 5,464,308, Cl. 405-183.000.

Cahoon, John M.; Karn, Jack L.; and Huang, Nai Z., to Lubrizol Corporation, The. Lubricants, functional fluid and grease compositions containing sulfite or sulfate overbased metal salts and methods of using the same. 5,464,548, Cl. 252-18.000.

Cai, Sui X.: *See*—
Wybourne, Martin N.; Keana, John F. W.; Cai, Sui X.; Yan, Mingdi; and Wu, Jong, 5,465,151, Cl. 356-361.000.

Cain, James: *See*—
Bilodeau, Steve; Jacovino, Frank; Cameron, Joanne; and Cain, James, 5,465,152, Cl. 356-371.000.

Cala, Francis R.: *See*—
Winston, Anthony E.; Cala, Francis R.; Dunn, Steven E.; Vinci, Alfredo; and Lajoie, M. Stephen, 5,464,553, Cl. 252-108.000.

Caldwell Manufacturing Company: *See*—
Westfall, Norman R., 5,463,793, Cl. 16-197.000.

Caldwell, Michael W.; and Blankenstein, Hendrik, to Display Network, Inc. Retail store display system. 5,465,085, Cl. 340-825.350.

Calgon Carbon Corporation: *See*—
Hayden, Richard A., 5,464,605, Cl. 423-579.000.

California Institute of Technology: *See*—
Jones, Jack A., 5,463,879, Cl. 62-480.000.

Callahan, John: *See*—
Drabik, Timothy J.; Martin, Kevin P.; and Callahan, John, 5,465,009, Cl. 257-723.000.

Callahan, Steven E.; and Petit, Robert G., to Microplas, Inc. Protective covers. 5,464,091, Cl. 206-45.150.

Callaway Golf Company: *See*—
Schmidt, Glenn H.; and Helmstetter, Richard C., 5,464,218, Cl. 273-169.000.

Calsonic Corporation: *See*—
Tajima, Makoto; Araki, Shinji; and Beppu, Kei, 5,464,056, Cl. 165-167.000.

Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Riva, Raul; Garavaglia, Carlo; and Mireoma, Luigi, to Ministero Dell'Universita' E Della Ricerca Scientifica E Tecnologica. Benzophenones having an antifungal activity. 5,464,836, Cl. 514-239.200.

Camelot Technologies, Inc.: *See*—
Nemphos, Speros P.; and McQueen, James T., 5,464,878, Cl. 521-50.000.

Cameron, Charles G.: *See*—
Allcock, Harry R.; Cameron, Charles G.; and Smith, Dawn E., 5,464,932, Cl. 528-399.000.

Cameron, Joanne: *See*—
Bilodeau, Steve; Jacovino, Frank; Cameron, Joanne; and Cain, James, 5,465,152, Cl. 356-371.000.

Camm, James O.: *See*—
Camm, John J., 5,464,278, Cl. 303-7.000.

Camm, John J., to Camm, John J.; Camm, James O.; and Camm, Stephen J. Fluid control system for tractor trailer brake system. 5,464,278, Cl. 303-7.000.

Camm, Stephen J.: *See*—
Camm, John J., 5,464,278, Cl. 303-7.000.

Campbell, Ann. N.; Anderson, Richard E.; and Cole, Edward I., Jr. Magnetic force microscopy method and apparatus to detect and image currents in integrated circuits. 5,465,046, Cl. 324-244.000.

Campbell, Bernard J.: *See*—
Bounds, David J.; Weston, John A.; Johnson, Anthony D.; and Campbell, Bernard J., 5,464,087, Cl. 194-200.000.

Campbell, Duncan B.: *See*—
Squyres, Henry P.; and Campbell, Duncan B., 5,464,981, Cl. 250-341.800.

Campbell, Joe E.; and Isaac, Del, to Moore Business Forms, Inc. Fishing license protector. 5,464,254, Cl. 283-109.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See*—
Fry, Robert J., 5,465,097, Cl. 342-442.000.

Canon Kabushiki Kaisha: *See*—
Asano, Naoki; Kikuchi, Yutaka; and Hayakawa, Yasuyoshi, 5,465,141, Cl. 355-285.000.
Asaoka, Masanobu; Takao, Hideaki; Togano, Takeshi; and Kojima, Makoto, 5,464,668, Cl. 428-1.000.
Baba, Yoshinobu; and Tada, Tatsuya, 5,464,720, Cl. 430-122.000.
Eguchi, Ken, 5,465,169, Cl. 359-74.000.
Fukushima, Hisashi; Uchikawa, Yoshio; and Mizoguchi, Yoshito, 5,465,111, Cl. 347-115.000.
Funada, Masahiro; Kitamura, Toshiyuki; Yamamoto, Mitsuhiro; and Ohta, Eiji, 5,465,161, Cl. 358-438.000.
Ishikawa, Hisashi; Homma, Hideo; Nagashima, Yoshitake; and Saito, Takashi, 5,465,173, Cl. 358-534.000.
Kashizaki, Yoshio; Senoo, Akihiro; and Tanaka, Masato, 5,464,718, Cl. 430-58.000.

Kimura, Atsushi; and Seki, Hiroyuki, 5,464,291, Cl. 400-185.000.
Kobayashi, Takashi; and Hatae, Shinichi, 5,465,071, Cl. 329-315.000.
Matsumoto, Takahiro; Nose, Noriyuki; Saito, Kenji; and Sentoku, Koichi, 5,465,148, Cl. 356-349.000.
Nishii, Teruyuki; Watanabe, Tsunehiro; and Terajima, Hisao, 5,465,162, Cl. 358-442.000.
Ohashi, Kazuhito, 5,465,159, Cl. 358-342.000.
Okuda, Kouichi; Nakamura, Shunji; Yoshimoto, Toshio; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Pukuzawa, Daizo; Nanbu, Tomoko; and Suzuki, Hidenobu, 5,464,964, Cl. 219-497.000.
Seto, Kaoru; Kanaiwa, Kiyoshi; Itoh, Michio; Mano, Hiroshi; Yamada, Hiromichi; Kashihara, Atsushi; Kawana, Takashi; and Saito, Tetsuo, 5,465,157, Cl. 358-298.000.
Sugiura, Susumu; and Mita, Yoshinobu, 5,465,164, Cl. 358-448.000.
Suzuki, Masao, 5,465,116, Cl. 348-223.000.
Tanio, Staoshi; and Arakawa, Naoto, 5,465,165, Cl. 358-448.000.
Tomiyama, Koichi; Yusa, Hiroshi; and Kobori, Takakuni, 5,464,722, Cl. 430-137.000.
Ueno, Shugoro, 5,465,305, Cl. 382-218.000.
Watanabe, Kazushi, 5,465,136, Cl. 355-210.000.
Watanabe, Yasuyuki; Ishiwata, Kazuya; and Nishida, Naoya, 5,464,714, Cl. 430-7.000.
Yasuhara, Masateru, 5,465,036, Cl. 318-568.110.
Yonehara, Takao, 5,463,975, Cl. 117-9.000.
Yoshihara, Kunio; Hirooka, Kazuhiko; Sakai, Masanori; Kuboki, Keiju; Nimura, Mitsuo; and Tanabe, Ritsushi, 5,465,163, Cl. 358-444.000.

Capdeboscq, Bernard, to SA Martin. Apparatus and method for feeding sheets from a stack. 5,464,202, Cl. 271-11.000.

Capecchi, Mario R.; and Thomas, Kirk R., to University of Utah Research Foundation. Positive-negative selection methods and vectors. 5,464,764, Cl. 435-172.300.

Capiris, Thomas; and Connor, David T., to Warner-Lambert Company. Thiophene-2-carboxamidotetrazoles and pharmaceutical use thereof. 5,464,855, Cl. 514-382.000.

Capps, Stephen P.; and Beernink, Ernest H., to Apple Computer, Inc. Method and apparatus for manipulating inked objects. 5,465,325, Cl. 395-141.000.

Cargin, Keith K., Jr.: *See*—
Boatwright, Darrell L.; Hanson, George E.; Miller, Phillip; Koenck, Steven E.; Walter, Jerry L.; Kubler, Joseph J.; Cargin, Keith K., Jr.; Schultz, Darald R.; Davis, Patrick H.; and Kunert, Steven R., 5,465,207, Cl. 364-424.010.

Carl Manufacturing Co., Ltd.: *See*—
Mori, Chuzo, 5,463,922, Cl. 83-622.000.

Carlbiotech, Ltd.: *See*—
Stig, Aasmul-Olsen; Widmer, Fred; and Gauri, Kailash K., 5,464,821, Cl. 514-18.000.

Carlotta, Michael; and Anderson, David G., to Xerox Corporation. Sheet handling device and method for transporting sheets. 5,465,110, Cl. 347-104.000.

Carlson, Eric V.; and Nikzi, Iraj, to Carlson, Eric V. Foldable stool sample collection device. 5,463,782, Cl. 4-661.000.

Carlson, Robert R.; and Carlson, Stephanie. Container for shipping and utilizing stinging insects. 5,464,360, Cl. 449-27.000.

Carlson, Stephanie: *See*—
Carlson, Robert R.; and Carlson, Stephanie, 5,464,360, Cl. 449-27.000.

Carlson, Thomas R.; and Davidian, Richard M., to Stanley Works, The. Concealed bearing hinge and method of making same. 5,463,795, Cl. 16-273.000.

Carlsson, Michael M. J.: *See*—
Frostrom, Tore; Nilsson, Tomas J.; Andersson, Yngve; Carlsson, Michael M. J.; Sundell, Lars-Olof; and Uden, Jonas P., 5,465,393, Cl. 455-54.100.

Carney, William P. Golf club putter with laser aiming system. 5,464,221, Cl. 273-186.300.

Carney, William P. Golf club putter with laser aiming system. 5,464,222, Cl. 273-186.300.

Carpenter, John R.: *See*—
St. John, James F.; Fetterhoff, John G.; Carpenter, John R.; Brown, B. Douglas; Azzara, C. Daniel; Tarka, Stanley M., Jr.; Rank, Craig; and Strohmaier, George K., 5,464,649, Cl. 426-660.000.

Carr, Peter E.: *See*—
Bradford, H. William; and Carr, Peter E., 5,464,219, Cl. 273-176.00L.

Carralero, Cesar W.: *See*—
Borras, Jaime A.; Chambers, Mark J.; Finol, Jesus S. Pena; Gonzalez, Armando J.; Carralero, Cesar W.; Beladi, Sayed H.; and Erbora, Levent Y., 5,465,409, Cl. 455-260.000.

Carriere, Raymond, to ICI Canada Inc. Transmission tube connector. 5,463,955, Cl. 102-275.200.

Carter, Bradley H.: *See*—
Lautzenhiser, Frans P.; Carter, Bradley H.; Ozogar, Donald A.; and Sarma, Dwadasi H. R., 5,464,570, Cl. 252-500.000.

Carter, Calvin H., Jr.: *See*—
Cooper, James A., Jr.; Palmour, John W.; and Carter, Calvin H., Jr., 5,465,249, Cl. 365-149.000.

Casamento, John P.: *See*—
Bassen, Howard I.; and Casamento, John P., 5,465,013, Cl. 307-91.000.

Casci, John L.; Shannon, Mervyn D.; and Lake, Ivan J. S., to Imperial Chemical Industries PLC. Zeolite NU-85 catalyst. 5,464,799, Cl. 502-63.000.

Case, Cecil L.: *See*—
O'Halloran, Michael L.; Case, Cecil L.; Pruitt, Martin E.; and Fritz, David P., 5,463,852, Cl. 56-6.000.

Casio Computer Co., Ltd.: *See*—
Sato, Kazuhito; and Negishi, Yuji, 5,464,490, Cl. 156-145.000.
Usui, Minoru; Yamagishi, Kouji; Yoshino, Ken; and Mori, Hideki, 5,465,102, Cl. 345-89.000.

Cassidy, Michael: *See*—
Barrus, John; Holly, Krisztina; and Cassidy, Michael, 5,465,291, Cl. 379-67.000.

Castagnoli, Craig J.: *See*—
Avetisian, Vahan; Castagnoli, Craig J.; and Cha, Suk B., 5,464,503, Cl. 201-3.000.

Castillo, Rosario S.: *See*—
Chan, Ming F.; Raju, Bore G.; Castillo, Rosario S.; Kois, Adam; Wu, Chengde; and Balaji, Vitukudi, 5,464,853, Cl. 514-378.000.

Castro, Mynor; Yaniv, Gershon; Hardtmann, Dirk J.; and Romeo, David J., to Simula Inc. Inflatable tubular cushions for crash protection of seated automobile occupants. 5,464,246, Cl. 280-730.200.

Cataldo, Michael D., to Dunkin' Donuts Incorporated. Proofing oven. 5,463,940, Cl. 99-476.000.

Catapano, David A.: *See*—
Hsu, Lillian-Liu; Sathi, Kitty; Biondi, Mark C.; Zell, Thomas B.; Catapano, David A.; and Lauria, Richard T., 5,465,322, Cl. 395-114.000.

Caterpillar Inc.: *See*—
Maley, Dale C.; and Shinogle, Ronald D., 5,463,996, Cl. 123-446.000.

Caulfield, H. John; Huang, Qiang; Putilin, Andrei; and Morozov, Valentin, to University of Alabama in Huntsville, The. Side illuminated multimode waveguide. 5,465,311, Cl. 385-27.000.

Cavicchi, Richard E.: *See*—
Gaitan, Michael; Suehle, John S.; Semancik, Stephen; and Cavicchi, Richard E., 5,464,966, Cl. 219-544.000.

Cedar-Dell Limited: *See*—
Todd, Robert E., 5,465,081, Cl. 340-825.050.

Cellular Hotline, Inc., The: *See*—
Falvey, Neil J.; Day, Edwin J., III; Nappier, Ricky L.; and Longtin, John T., 5,465,288, Cl. 379-58.000.

Centanni, Kevin P.: *See*—
Bejan, Robert S.; Centanni, Kevin P.; Gaertner, Scott R.; and Franzblau, William L., 5,465,384, Cl. 455-2.000.

Centocor, Inc.: *See*—
Heavner, George A.; Riexinger, Douglas; and Mervic, Miljenko, 5,464,935, Cl. 530-329.000.

Central Research Laboratories Limited: *See*—
Gibb, Ian; Allen, Philip; and Barnes, Andrew, 5,464,476, Cl. 118-723.IMP.

Centro de Investigacion Y Asistencia Tecnica del Estado de Wueretaro A.C.: *See*—
Beckwith, Carlos A., 5,463,856, Cl. 56-62.000.

Ceresiani, Lucien: *See*—
Blanc, Alain; and Ceresiani, Lucien, 5,465,345, Cl. 395-200.150.

Cermetek Microelectronics: *See*—
Wilkison, Dennis E.; and Liu, Zhenyu L., 5,465,298, Cl. 379-406.000.

Cetenko, Wiaczeslaw A.; Connor, David T.; Sorenson, Roderick J.; Unangst, Paul C.; and Stabler, Stephen R., to Warner-Lambert Company. Arylmethylenyl derivatives of imidazolidinones useful as antiinflammatory agents. 5,464,856, Cl. 514-389.000.

Cetus Oncology Corporation: *See*—
Botchan, Michael R.; Clark, Robin; Mohr, Ian J.; and Sun, Shaw, 5,464,936, Cl. 530-350.000.

Cha, Suk B.: *See*—
Avetisian, Vahan; Castagnoli, Craig J.; and Cha, Suk B., 5,464,503, Cl. 201-3.000.

Chaco, John, to Executone Information Systems, Inc. Apparatus for automating routine communication in a facility. 5,465,082, Cl. 340-825.540.

Challis, Michael: *See*—
Pryor, Dennis M.; and Challis, Michael, 5,465,188, Cl. 361-18.000.

Chalmers, William S. K.: *See*—
Baxendale, William; and Chalmers, William S. K., 5,464,621, Cl. 424-221.100.

Chambers, Mark J.: *See*—
Borras, Jaime A.; Chambers, Mark J.; Finol, Jesus S. Pena; Gonzalez, Armando J.; Carralero, Cesar W.; Beladi, Sayed H.; and Erbora, Levent Y., 5,465,409, Cl. 455-260.000.

Chamow, Steven; Modi, Nishit; Schwall, Ralph; and Zionchock, Thomas, to Genentech, Inc. Inhibition of heparin-binding. 5,464,815, Cl. 514-8.000.

Chan, Jimmy H.; Satre, Rodrick I.; Trusler, James H.; and Memula, Sadanand G., to Chevron Research Company. Process for pelletizing insecticidal N-hydrocarboyl phosphoroamidothioates and phosphoroamidodithioates. 5,464,623, Cl. 424-405.000.

Chan, Kenneth K.: *See*—
Wilson, Michael L.; and Chan, Kenneth K., 5,464,496, Cl. 156-499.000.

Chan, Ming F.; Raju, Bore G.; Castillo, Rosario S.; Kois, Adam; Wu, Chengde; and Balaji, Vitukudi, to ImmunoPharmaceutics, Inc. N-(5-isoxazolyl)biphenylsulfonamides, N-(3-isoxazolyl)biphenylsulfonamides and derivatives thereof that modulate the activity of endothelin. 5,464,853, Cl. 514-378.000.

Chandra, Arijit: *See*—
Yip, Wai-Yeung; Chandra, Arijit; and Tsai, Chi-Tsou, 5,465,217, Cl. 364-489.000.

Chang, Alice C.; and St. Clair, Terry L., to United States of America, National Aeronautics and Space Administration. Direct process for preparing semi-crystalline polyimides. 5,464,928, Cl. 528-353.000.

Chang, Eric: *See*—
Sekine, Masatoshi; and Chang, Eric, 5,465,204, Cl. 364-152.000.

Chang, Fang-Hsiung; and Wang, Wen-Bin. Foot-operated valve. 5,464,190, Cl. 251-74.000.

Chang, Jeffery C.: *See*—
Stofko, John J., Jr.; and Chang, Jeffery C., 5,464,900, Cl. 524-838.000.

Chang, Jung H.: *See*—
Chao, Hu H.; Chang, Jung H.; and Shih, Feng-Hsien W., 5,465,347, Cl. 395-550.000.

Chang, Yeon-Ho; Barbee, Robert B.; and Phillips, Brian S., to Eastman Chemical Company. Powder coating having good UV resistance. 5,464,909, Cl. 525-438.000.

Chantraine, Philippe; and Zorilla, Marta, to Bull S.A. Method for interconnection of metal layers of the multilayer network of an electronic board, and the resultant board. 5,464,653, Cl. 427-96.000.

Chao, Hu H.; Chang, Jung H.; and Shih, Feng-Hsien W., to International Business Machines Corporation. System for reducing phase difference between clock signals of integrated circuit chips by comparing clock signal from one chip to clock signal from another chip. 5,465,347, Cl. 395-550.000.

Chapa, Gerardo: *See*—
Williams, Steve; Kaplan, Warren; Neill, Paul; and Chapa, Gerardo, 5,464,561, Cl. 252-182.270.

Chapman, George R., Jr.; Crenshaw, Lewis E.; McMinn, Rita S.; Morgan, Richard A.; Priester, Donnan E.; Stewart, Charles W.; and Tarney, Robert E., to Du Pont de Nemours, E. I., and Company. Low-melting tetrafluoroethylene copolymer and its uses. 5,464,904, Cl. 525-200.000.

Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yursis, Robert, to AT&T Corp. System and method for recovering from a telecommunications disaster. 5,465,294, Cl. 379-207.000.

Chapman, Michael C.: *See*—
Parker, Alan; Chapman, Michael C.; Pinchen, Stephen P.; and Stonely, Carl J., 5,464,151, Cl. 229-206.000.

Charles Stark Draper Laboratories, The: *See*—
Bernardon, Edward; and Foley, Michael F., 5,464,337, Cl. 425-112.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,463,921, Cl. 83-151.000.

Charles, Steven T.; Ripley, John A.; and Huculak, John C. Self-contained surgical tubing management system. 5,464,025, Cl. 128-849.000.

Chartrain, Michel M.; Reddy, Jayanthi; and Tachaen, David M., to Merck & Co., Inc. Asymmetric bioreduction of 6-bromo-2-tetralone to (s)-6-bromo-2 tetraol by trichosporon capitatum. 5,464,762, Cl. 435-156.000.

Chasalow, Fred I., to AMUR Research Corp. Diagnostic agent and methods for identifying HIV infected individuals and monitoring their therapy. 5,464,740, Cl. 435-5.000.

Chase, Charles L.: *See*—
Swift, Michael R.; Kupper, Lawrence L.; and Chase, Charles L., 5,464,742, Cl. 435-6.000.

Chatterjee, Amitava: *See*—
Polgreen, Thomas L.; Chatterjee, Amitava; and Yang, Ping, 5,465,189, Cl. 361-58.000.

Chaudhary, Preet M.; and Roninson, Igor B. Purification and manipulation of bone marrow and blood cells on the basis of P-glycoprotein expression. 5,464,753, Cl. 435-7.240.

Chee, Richard W. M.; and Low, Sharon A. H., to Fortune Dragon Pte Ltd. Folding toothbrush. 5,464,294, Cl. 401-269.000.

Chen, Faye: *See*—
Gibson, Jeremy H., 5,463,941, Cl. 99-495.000.

Chen, Jiann H.; Fitzgerald, John J.; Vreeland, William B., II; Ferrar, Wayne T.; Roberts, Gary P.; and Staudenmayer, William J., to Eastman Kodak Company. Fuser members overcoated with fluorocarbon elastomer containing tin oxide. 5,464,698, Cl. 428-421.000.

Chen, Peter: *See*—
Tseng, Ben; and Chen, Peter, 5,464,098, Cl. 206-554.000.

Chen, Roger; and Kinsey, Kenneth K., Jr., to Advanced Peripherals Labs, Inc. RAS encoded generator for a memory bank. 5,465,237, Cl. 365-233.000.

Chen, Shirley C.: *See*—
Wullschleger, Richard D.; Chen, Shirley C.; Bowman, Frederick A.; and Hawblitz, Larry V., 5,464,644, Cl. 426-549.000.

Chen, Te-Chuan. Sutureless intestinal anastomosis gun. 5,464,415, Cl. 606-153.000.

Chen, Yaw-Hwang, to Hewlett-Packard Company. Bipolar stripe transistor structure. 5,465,006, Cl. 257-557.000.

Cheng, Der-Bin. Support set of golf club bag. 5,464,180, Cl. 248-96.000.

Chennakeshu, Sandeep: *See*—
Hladik, Stephen M.; and Chennakeshu, Sandeep, 5,465,271, Cl. 375-267.000.

Cheung, Harry, to Praxair Technology, Inc. Side column cryogenic rectification system for producing lower purity oxygen. 5,463,871, Cl. 62-38.000.

Chevron Research Company: *See*—
Chan, Jimmy H.; Satre, Rodrick I.; Trusler, James H.; and Memula, Sadanand G., 5,464,623, Cl. 424-405.000.

Chiaramonte, Giancarlo: *See*—
Jenner, Bert; Schmidt, Hans-Joachim; Chiaramonte, Giancarlo; and Lehmann, Wolfgang, 5,465,195, Cl. 362-61.000.

Chien, Tseng-Lu. Portable light. 5,465,197, Cl. 362-203.000.

Chiesa, Fausto: *See*—
Veronesi, Umberto; Chiesa, Fausto; and Costa, Alberto, 5,464,870, Cl. 514-617.000.

Chiller, Martin S.; Coulter, Peter I.; and Petillo, Richard J., to AT&T Corp. Apparatus and method for screening foreign incollect calls to domestic non-collect call telephone numbers to reduce fraud. 5,465,293, Cl. 379-189.000.

Chimera Research and Chemical, Inc.: *See*—
Smith, Jack V., 5,464,775, Cl. 436-63.000.

Chin, Sing W.: *See*—
Mayes, Michael K.; and Chin, Sing W., 5,465,092, Cl. 341-118.000.

Chiou, Xian-Shun; and Wong, Chih-Hsien. Windshield wiper with an automatic pressure means. 5,463,790, Cl. 15-250.290.

Chism, Paul E., Jr.: *See*—
Goriachev, Vladislav L.; Bratsev, Alexander N.; Feduikovich, Valeri N.; Rutberg, Philip G.; Greene, Hugh W.; and Chism, Paul E., Jr., 5,464,513, Cl. 204-164.000.

Chisso Corporation: *See*—
Hirai, Kenji; Yamashita, Mitsuo; Tateno, Tomoko; Ejiri, Emiko; Harasawa, Kikuko; Onji, Yuichi; Ugai, Sadayuki; and Nagato, Shoin, 5,464,811, Cl. 504-281.000.

Chiyoda Corporation: *See*—
Minami, Nobuyoshi, 5,464,147, Cl. 228-212.000.
Takahashi, Kazuo; Kumata, Fumio; Nozaki, Hitoshi; Inoue, Shinichi; and Makabe, Toshiji, 5,464,593, Cl. 422-224.000.

Chizmadia, Alex R., to Illinois Tool Works Inc. Locking tool holder apparatus. 5,464,232, Cl. 279-124.000.

Chmielewski, Thomas A., Jr.; Demarest, Scott T.; and Colavito, Leonard R., to Control Concepts, Inc. Agricultural harvester with closed loop ground tracking control. 5,463,854, Cl. 56-10.20E.

Cho, Sung-Soo: *See*—
Reddy, Chandrashekar M.; Hirose, Scott D.; Cho, Sung-Soo; Kardach, James P.; Farrer, Steven M.; and Roberts, Meeling, 5,465,367, Cl. 395-750.000.

Chou, Hsin-hsin, to Minnesota Mining and Manufacturing Company. Mass transferable donor ribbons for use in thermal dye transfer imaging. 5,464,723, Cl. 430-200.000.

Christen, Ernst: *See*—
Jeney, Peter; and Christen, Ernst, 5,464,454, Cl. 44-629.000.

Christensen, Ken: *See*—
Drucker, Steven; Goder, Alexey; Khalili, Davood; Williams, Kevin; Christensen, Ken; and Major, Emery, 5,464,982, Cl. 250-343.000.

Christophers, Enno; Wiedow, Oliver; and Schroder, Jens-Michael, to Zeneca Limited. Polypeptides and polypeptide analogues. 5,464,822, Cl. 514-12.000.

Chrysler Corporation: *See*—
Blander, Richard S.; Wenzel, Kenneth J.; and Pitka, Venu G., 5,463,898, Cl. 73-116.000.

Chu, Ching; Liao, David; and Feng, Kai D., to Antel Optronics Inc. ADP switch and adjustable data acquisition window. 5,465,143, Cl. 356-73.100.

Chugai Pharmaceutical Co., Ltd.: *See*—
Katayama, Masahide; Yamashita, Harushige; Okada, Taizo; and Morioka, Shigeo, 5,464,828, Cl. 514-60.000.

Chujo, Takafumi: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mituhiro; Saitou, Kiyoshi; Hobara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.

Chum, Helena L.: *See*—
Evans, Robert J.; and Chum, Helena L., 5,464,602, Cl. 423-488.000.

Chung, Russell W.-C.: *See*—
Weber, Robert J.; Chung, Russell W.-C.; and Liu, Yet-zen, 5,465,171, Cl. 359-287.000.

Church & Dwight Co., Inc.: *See*—
Winston, Anthony E.; and Jones, Keith A., 5,464,457, Cl. 47-58.000.
Winston, Anthony E.; Cala, Francis R.; Dunn, Steven E.; Vinci, Alfredo; and Lajoie, M. Stephen, 5,464,553, Cl. 252-108.000.
Winston, Anthony E., 5,464,805, Cl. 504-101.000.

Churchill, Stephen J., to New Holland North America, Inc. Solenoid operated hydraulic valve. 5,464,085, Cl. 192-85.00R.

Chyuan Ryh Shing Co., Ltd.: *See*—
Liem, Tien Lung, 5,464,305, Cl. 403-362.000.

Ciba Corning Diagnostics Corp.: *See*—
Voo, Liann; Tagliaferro, Dennis C.; and Wilson, Joan B., 5,464,850, Cl. 514-372.000.

Ciba-Geigy Corporation: *See*—
Blyakhman, Yefim, 5,464,702, Cl. 428-413.000.
Isharani, Jayanti V.; Raper, James K.; Allen, A. Donald, Jr.; and Middleton, John W., 5,464,545, Cl. 252-8.600.
Stehlin, Albert; and Maier, Thomas, 5,464,547, Cl. 252-8.700.
Zambounis, John, 5,464,697, Cl. 428-412.000.

Ciebiera, Lloyd: *See*—
Rossmassler, Rich; Ciebiera, Lloyd; Tulipano, Francis J.; Vinson, Sylvester; and Walters, R. Thomas, 5,464,988, Cl. 250-507.100.

Cimbali S.p.A.: *See*—
Locati, Santino, 5,463,934, Cl. 99-286.000.

Cincinnati Milacron Inc.: *See*—

Strickland, S. Scott; Krietemeyer, James R.; Liao, Jing; Mead, Ian D.; and Puckett, Robert L., 5,465,215, Cl. 364-474.220.
Circuit Design Inc.: *See*—
Koike, Yukinaga, 5,465,411, Cl. 455-275.000.
Cirrus Logic, Inc.: *See*—
Zook, Christopher P., 5,465,260, Cl. 371-37.700.
Ciuffetelli, Andrew J. Mushroom harvester and method. 5,463,858, Cl. 56-327.100.
Clare, William K.; and Sundby, Donn P., to Executone Information Systems, Inc. Apparatus for supervising an automatic call distribution telephone system. 5,465,286, Cl. 379-34.000.
Clarion Co., Ltd.: *See*—
Sugayama, Sakae; Asami, Takao; Kato, Kenji; and Maeta, Akira, 5,465,408, Cl. 455-249.100.
Clark, Abbot F.; and Conrow, Raymond E., to Alcon Laboratories, Inc. Substituted hydrindanes for the treatment of angiogenesis-dependent diseases. 5,464,866, Cl. 514-480.000.
Clark, James E.: *See*—
Salter, James G.; Clark, James E.; Swanson, David W.; and Nasworthy, George F., 5,464,578, Cl. 264-250.000.
Clark, Larry: *See*—
Nolte, Dale L.; Mason, J. Russell; and Clark, Larry, 5,464,625, Cl. 424-405.000.
Clark, Robert H.; and Terrell, Joel J., III, to Toastmaster Inc. Combined bread baker and butter churn. 5,463,936, Cl. 99-327.000.
Clark, Robin: *See*—
Botchan, Michael R.; Clark, Robin; Mohr, Ian J.; and Sun, Shaw, 5,464,936, Cl. 530-350.000.
Clark, Scott: *See*—
Eisenbeis, Scott J.; Krevolin, Mark; Bryant, Christopher P.; Boguslawski, Sophie J.; Ledden, David J.; and Clark, Scott, 5,464,747, Cl. 435-7.600.
Clark, Thomas A.: *See*—
Popescu, Miron G.; Bekus, David F.; Routh, Shakti; Vera, Luis E.; and Clark, Thomas A., 5,464,580, Cl. 422-34.000.
Claude, Jean-Pierre; Khan, Shuaib A.; and Mitchell, Robert W., to Monsanto Company. Methods of using glyphosate compositions comprising alkoxylated quaternary ammonium surfactants. 5,464,807, Cl. 504-206.000.
Clausi, Joseph V.: *See*—
Buswell, Richard F.; Clausi, Joseph V.; and Louie, Craig, 5,464,606, Cl. 423-655.000.
Clay, Donald W., to Conner Peripherals, Inc. Disk drive system interface architecture employing state machines. 5,465,338, Cl. 395-310.000.
Clay, Tymen. Chuck with jaws having curved engagement surfaces. 5,464,231, Cl. 279-123.000.
Clementi, Cesare: *See*—
Crisenza, Giuseppe; and Clementi, Cesare, 5,464,784, Cl. 437-43.000.
Clifton, Tanya: *See*—
Gu, Ben; Subramanyam, Ravi; and Clifton, Tanya, 5,464,554, Cl. 252-121.000.
Clorox Company, The: *See*—
Peterson, David; and Buskirk, Gregory V., 5,464,552, Cl. 252-95.000.
Close, Steven F.; and Wetterau, Douglas C., to Moore Products Co. Vent system for blocking the passage of liquid while permitting passage of gas. 5,464,469, Cl. 96-220.000.
Clyde, Gene F.; Izquierdo Quimi, Marta P.; and King Solis, Luis R., to NESTEC S.A. Composition and process used for stabilizing egg proteins subjected to subsequent heat treatment. 5,464,639, Cl. 426-20.000.
Coatex, S.A.: *See*—
Blanchard, Pierre; Egraz, Jean-Bernard; and Ravet, Georges, 5,464,895, Cl. 524-425.000.
Coca-Cola Company, The: *See*—
Weyh, Werner; Schwander, Udo; Gatter, Raimond; Notar, Robert; Konopa, Helmut; and Erdmann, Klaus, 5,464,124, Cl. 222-129.100.
Coelln, Axel, to Transact International Inc. Ball transfer unit. 5,464,086, Cl. 193-35.0SS.
Coffee, Ronald A.; and Dunwell, James M., to Zeneca Limited. Transformation of plant cells. 5,464,765, Cl. 435-172.300.
Cohen, Isaac, to Lambda Electronics, Inc. Overload protection of switch mode converters. 5,465,201, Cl. 363-21.000.
Cohen, Joel H.: *See*—
Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; Grubbs, Gray W.; and Kyselica, Stefan P., 5,464,958, Cl. 219-130.510.
Cohen, Robert, to France Telecom. Method for laying out the infrastructure of a cellular communications network. 5,465,390, Cl. 455-33.400.
Cohrs, Richard B.; and Mader, Gerald E., to Von Duprin, Inc. Door latch assembly with meltable fuse mechanism. 5,464,259, Cl. 292-92.000.
Coker, Charles W.: *See*—
Kramer, James H.; Lynch, Daniel S.; and Coker, Charles W., 5,464,177, Cl. 246-127.000.
Colangelo, Vito J.: *See*—
Abbate, Agostino; Frankel, Julius; Scholz, Wilfried; Colangelo, Vito J.; and Korman, William J., 5,463,896, Cl. 73-81.000.
Colavito, Leonard R.: *See*—
Chmielewski, Thomas A., Jr.; Demarest, Scott T.; and Colavito, Leonard R., 5,463,854, Cl. 56-10.20E.
Cold Metal Products, Inc.: *See*—
Hughes, Charles H., 5,463,818, Cl. 33-813.000.
Cole, Arthur H.; Glenn, Susan C.; and Johnson, Grannis S., to Henkel Corporation. Process for fixing dyes in textile materials. 5,464,452, Cl. 8-495.000.
Cole, Edward L., Jr.: *See*—
Campbell, Ann. N.; Anderson, Richard E.; and Cole, Edward L., Jr., 5,465,046, Cl. 324-244.000.
Cole, Paul D., to General DataComm, Inc. Modem utilizing parity and convolutional encoder feedback. 5,465,273, Cl. 375-296.000.
Cole, Ronald E., to Emerson Electric Co. Backlit appliance control console. 5,464,955, Cl. 200-317.000.
Coleman, Robert: *See*—
Tsai, Shih-Peng; Moon, Seung H.; and Coleman, Robert, 5,464,760, Cl. 435-139.000.
Colgate-Palmolive Company: *See*—
Gu, Ben; Subramanyam, Ravi; and Clifton, Tanya, 5,464,554, Cl. 252-121.000.
Coli, Vincent J.: *See*—
Doi, Bryan C.; Thomas, Steven D.; Coli, Vincent J.; and Giglio, Vito D., 5,465,341, Cl. 395-183.060.
Collier, William R. Methods and apparatus for installing conductor cables in rigid building structures. 5,463,838, Cl. 52-741.100.
Collins, Michael N., to Smiths Industries Public Limited Company. Epidural connector. 5,464,400, Cl. 604-283.000.
Colpan, Metin: *See*—
Aysta, James E.; and Colpan, Metin, 5,464,541, Cl. 210-767.000.
Comeau, Roger J.: *See*—
Butler, Aaron S.; Davis, Franklin J.; and Comeau, Roger J., 5,463,864, Cl. 60-39.310.
Commier, Philippe; Phelipon, Axel; and Le Masson, Jacques, to Salomon S.A. Ski equipped with elastic devices to resist and/or absorb bending biases. 5,464,242, Cl. 280-602.000.
Commonwealth of Australia, The: *See*—
Liddiard, Kevin C.; Rice, Brian W.; and Watson, Rodney J., 5,465,080, Cl. 340-567.000.
Compagnie Generale de Geophysique: *See*—
Mallet, Jean-Laurent, 5,465,323, Cl. 395-123.000.
Compaq Computer Corp.: *See*—
Miller, David A.; Jansen, Kenneth A.; Culley, Paul R.; Taylor, Mark; and Izquierdo, Javier F., 5,465,360, Cl. 395-700.000.
Compuspeak, Inc.: *See*—
Duensing, David T.; Phillips, Dayle E.; and Simmons, Dennis C., 5,465,378, Cl. 395-800.000.
Conair Group, Inc., The: *See*—
Bessemer, Robert H.; and Yeoman, Stanley J., 5,464,335, Cl. 425-71.000.
Condon, Mark J.: *See*—
Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,463,921, Cl. 83-151.000.
Condon, Michael E.; and Harrington, Philip M., to American Cyanamid Company. 1-[α-cyclopropyl-α-(substituted oxy)-o-tolyl]sulfamoyl]-3-(4,6-dimethoxy-2-pyrimidinyl)urea herbicidal agents. 5,464,808, Cl. 504-214.000.
Connelly Skis, Inc.: *See*—
Unger, William J.; and McKinney, William, 5,464,358, Cl. 441-68.000.
Conner Peripherals, Inc.: *See*—
Clay, Donald W., 5,465,338, Cl. 395-310.000.
Connor, David T.: *See*—
Capiris, Thomas; and Connor, David T., 5,464,855, Cl. 514-382.000.
Cetenko, Wiaczeslaw A.; Connor, David T.; Sorenson, Roderick J.; Unangst, Paul C.; and Stabler, Stephen R., 5,464,856, Cl. 514-389.000.
Conoco Inc.: *See*—
Wilson, Dennis R.; Siebert, Robert M.; and Lively, Pat, 5,464,061, Cl. 166-302.000.
Conrad, Gary L.; Denenberg, Byron A.; and Kramerich, George L., to RCT Systems, Inc. Video traffic monitor for retail establishments and the like. 5,465,115, Cl. 348-155.000.
Conrow, Raymond E.: *See*—
Clark, Abbot F.; and Conrow, Raymond E., 5,464,866, Cl. 514-480.000.
Consorzio per la Ricerca sulla Microelectronica nel Mezzogiorno: *See*—
Zambrano, Raffaele; and Palara, Sergio, 5,464,993, Cl. 257-140.000.
Conte, Ubaldo; La Manna, Aldo; and Maggi, Lauretta, to Jagotec AG. Pharmaceutical tablets releasing the active substance after a definite period of time. 5,464,633, Cl. 424-480.000.
Control & Regulation Circuits Meitav Ltd.: *See*—
Shavit, Jacob, 5,463,875, Cl. 62-140.000.
Control Concepts, Inc.: *See*—
Chmielewski, Thomas A., Jr.; Demarest, Scott T.; and Colavito, Leonard R., 5,463,854, Cl. 56-10.20E.
Control Module Inc.: *See*—
Bianco, James S.; and Horan, David J., 5,465,176, Cl. 359-567.000.
Cook Composites and Polymers Co.: *See*—
Sinclair, David P., 5,464,919, Cl. 528-60.000.
Cook, Graeme A. C.; Vranas, Goulielmos; and McIver, Simon P., to Lucas Industries plc. Fuel injection pump. 5,464,334, Cl. 417-494.000.
Cook, Thomas A. Golf club putter. 5,464,212, Cl. 273-78.000.
Cook, Thomas E.; Fantacone, Mark J.; Galbraith, Robert E.; Glassen, Steven G.; Meritt, Allan S.; Oakes, Kenneth J.; and Yudenfriend, Harry M., to International Business Machines Corporation. Establishing and restoring paths in a data processing I/O system. 5,465,355, Cl. 395-200.150.
Cool Fog Systems, Inc.: *See*—
Early, Brian J.; Reens, Daniel J.; and Karnoff, Robert S., 5,463,873, Cl. 62-121.000.

Coolidge, Thomas R.; Lewis, William; Schuster, Sheldon M.; Stout, Jay; van Heeke, Gino; Wylie, Dwane; and Wagner, Fred W., to BioNebraska, Inc.; and University of Nebraska, Board of Regents of the. Sequential oligonucleotide syntheses using immunoaffinity techniques. 5,464,759, Cl. 435-91.200.

Cooper, James A., Jr.; Palmour, John W.; and Carter, Calvin H., Jr., to Cree Research, Inc.; and Purdue Research Foundation. Nonvolatile random access memory device having transistor and capacitor made in silicon carbide substrate. 5,465,249, Cl. 365-149.000.

Cooper, Martin F. N.; Johnson, Walter A. L.; and Smith, Z. Erol, III, to Xerox Corporation. Using an image from a form in automatic creation of a form or sheet. 5,465,167, Cl. 358-468.000.

Cooperman, Michael; Paige, Arnold; and Sieber, Richard W., to GTE Laboratories Incorporated. Broadband switch. 5,465,087, Cl. 340-825.800.

Copeland Corporation: *See*—
Beck, Norman G.; Wallis, Frank S.; and Holthaus, Gary A., 5,464,332, Cl. 417-368.000.

Coquerel, Patrick: *See*—
Beauducel, Claude; and Coquerel, Patrick, 5,465,270, Cl. 375-242.000.

Corbin, Thomas P.; Ilg, Otto M.; and Armstrong, Robert N., to BASF Corporation. Process for manufacturing substantially 100% nylon 6 carpet. 5,464,677, Cl. 428-95.000.

Cordery, Robert: *See*—
Schmidt, Alfred C.; and Cordery, Robert, 5,465,381, Cl. 395-800.000.

Cordi, Alex; Lacoste, Jean-Michel; Laubie, Michel; Verbeuren, Tony; and Descombes, Jean-Jacques, to Adir et Compagnie. Benzospiroalkene derivatives. 5,464,859, Cl. 514-401.000.

Cordis Corporation: *See*—
Viera, Fernando M., 5,464,023, Cl. 128-772.000.

Cordrey, Daniel, to Lin Pac Inc. Paperboard support structure for supporting a load. 5,463,965, Cl. 108-513.000.

Cornell Research Foundation, Inc.: *See*—
Anderson, Mary; Meister, Alton; and Levy, Ellen J., 5,464,825, Cl. 514-18.000.

Cornish, Timothy J.; and Cotter, Robert J., to Johns Hopkins University, The. Non-linear field reflectron. 5,464,985, Cl. 250-396.00R.

Cosman, David J.: *See*—
Sims, John E.; Cosman, David J.; Lupton, Stephen D.; Mosley, Bruce A.; and Dower, Steven K., 5,464,937, Cl. 530-350.000.

Cosmoplast: *See*—
Rennie, Patrick, 5,464,134, Cl. 222-507.000.

Costa, Alberto: *See*—
Veroesi, Umberto; Chiesa, Fausto; and Costa, Alberto, 5,464,870, Cl. 514-617.000.

Cotter, Robert J.: *See*—
Cornish, Timothy J.; and Cotter, Robert J., 5,464,985, Cl. 250-396.00R.

Cottrell, Stephen R. Method to provide security for a computer and a device therefor. 5,465,084, Cl. 340-825.310.

Couch, Richard W., Jr.: *See*—
Luo, Lifeng; and Couch, Richard W., Jr., 5,464,962, Cl. 219-121.520.

Coudurier, Alain, to SEB S.A. Process for the preparation of a surface for the securement of a coating. 5,463,916, Cl. 76-107.100.

Coughlin, Daniel L.: *See*—
Jaskowiak, Timothy R.; Coughlin, Daniel L.; Perez, Julie A.; Gilmore, Daniel R., III; DiGravio, Thomas L.; and Taft, Kevin H., 5,465,138, Cl. 355-245.000.

Coulter Corporation: *See*—
Kortright, Kenneth H.; Coulter, Wallace H.; Rodriguez, Carlos; Russell, Thomas; and Paul, Ronald, 5,464,752, Cl. 435-7.240.

Coulter, Peter I.: *See*—
Chiller, Martin S.; Coulter, Peter I.; and Petillo, Richard J., 5,465,293, Cl. 379-189.000.

Coulter, Wallace H.: *See*—
Kortright, Kenneth H.; Coulter, Wallace H.; Rodriguez, Carlos; Russell, Thomas; and Paul, Ronald, 5,464,752, Cl. 435-7.240.

Counts, Gary E.: *See*—
Andrews, Thomas L., Jr.; and Counts, Gary E., 5,465,034, Cl. 318-560.000.

Courtemanche, Gilles; Gautier, Claudie; Gully, Danielle; Roger, Pierre; Valette, Gérard; and Wermuth, Camille G., to Elf Sanofi. Branched alkylamino derivatives of thiazole, processes for preparing them and pharmaceutical compositions containing them. 5,464,847, Cl. 514-142.000.

Cousin, Gérard; Bruna, Etienne; and Gendrot, Edouard, to Laboratoires Prographarm. Rapidly disintegratable multiparticular tablet. 5,464,632, Cl. 424-465.000.

Cowan, Kenneth M.: *See*—
Hale, Arthur H.; Cowan, Kenneth M.; and Nahm, James J. W., 5,464,060, Cl. 166-293.000.

Cowan, Robert L., II; Gordon, Gerald M.; Hale, Donald A.; and Perry, Richard W., to General Electric Company. Shroud electrochemical potential monitor. 5,465,278, Cl. 376-245.000.

Cox, John D.; and Williams, Donald W., to General Imaging Corporation. X-ray imaging system and solid state detector therefor. 5,464,984, Cl. 250-370.110.

Coyne, Henry: *See*—
Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adaniva, George, 5,464,392, Cl. 604-67.000.

Craig, W. Scott; Hall, Charles B.; Lam, Edward K.; and Rogers, Duane E., to Outboard Marine Corporation. Jet pump exhaust system. 5,464,357, Cl. 440-89.000.

Crainich, Lawrence. Medical instrument and coupling apparatus for same. 5,464,300, Cl. 403-322.000.

Crain, Gary P., to Glidden Company, The. Low VOC, aqueous dispersed, epoxy-ester acrylic graft coatings. 5,464,885, Cl. 523-423.000.

Crayson, Nicholas M.: *See*—
Gardner, James H.; and Crayson, Nicholas M., 5,464,026, Cl. 131-216.000.

Crealise Conditionnement Inc. - Crealise Packaging Inc.: *See*—
Guillot, Christian, 5,464,112, Cl. 215-254.000.

Cree Research, Inc.: *See*—
Cooper, James A., Jr.; Palmour, John W.; and Carter, Calvin H., Jr., 5,465,249, Cl. 365-149.000.

Creedon, Tadhg; O'Neill, Eugene G.; and O'Connell, Anne, to Digital Equipment Corporation. Direct memory access controller handling exceptions during transferring multiple bytes in parallel. 5,465,340, Cl. 395-846.000.

Crego, Ted R.: *See*—
Yasrebi, Mehrdad; Kemp, William W.; Sturgis, David H.; Nikolas, Douglas G.; Wright, Gary L.; Kelly, Thomas J., III; Springgate, Mark E.; and Crego, Ted R., 5,464,797, Cl. 501-103.000.

Cremona, Alberto: *See*—
Gubitosa, Giuseppe; and Cremona, Alberto, 5,464,802, Cl. 502-331.000.

Crenshaw, Lewis E.: *See*—
Chapman, George R., Jr.; Crenshaw, Lewis E.; McMinn, Rita S.; Morgan, Richard A.; Priester, Donnan E.; Stewart, Charles W.; and Tarney, Robert E., 5,464,904, Cl. 525-200.000.

Crest Ultrasonics Corporation: *See*—
Awad, Sami B., 5,464,477, Cl. 134-1.000.

Crews, Richard P.: *See*—
Bialas, Norbert; Mathis, Raymond; Crews, Richard P.; Mudge, Elbert H.; and Tuller, F. Norman, 5,464,546, Cl. 252-8.600.

Crisenza, Giuseppe; and Clementi, Cesare, to SGS-Thomson Microelectronics s.r.l. Method of fabricating integrated devices. 5,464,784, Cl. 437-43.000.

Crist, David M.: *See*—
Burt, Edward W.; Bryant, William E.; and Crist, David M., 5,464,442, Cl. 623-27.000.

Cristiano, Joseph. Concrete barrier joints. 5,464,306, Cl. 404-6.000.

Cromartie, Leonardo W., to Cromartie, Leonardo W. Achilles tendon support brace. 5,464,384, Cl. 602-27.000.

Crossley, Malcolm J.: *See*—
Armitage, Bernard J.; Bowen, John G.; Crossley, Malcolm J.; Hunneyball, Ian M.; Leslie, Bruce W.; Miller, Thomas K.; and Spowage, Michael, 5,464,781, Cl. 514-300.000.

Crosspoint Solutions, Inc.: *See*—
Ahrens, Michael G., 5,465,055, Cl. 326-41.000.

Crowley, Robert J.: *See*—
Nicholas, Peter M.; and Crowley, Robert J., 5,464,016, Cl. 128-662.060.

Crown Textile Company: *See*—
Pinkus, Fred J., 5,463,779, Cl. 2-144.000.

Cuir, Gérard: *See*—
Cuir, Jean-Pierre; and Cuir, Gérard, 5,463,950, Cl. 101-329.000.

Cuir, Jean-Pierre; and Cuir, Gérard. Printing machine comprising at least one cylinder with double displacement. 5,463,950, Cl. 101-329.000.

Cukovich, Mark S. Variable valve timing mechanism. 5,463,987, Cl. 123-90.150.

Culberson, J. Christopher: *See*—
Bock, Mark G.; Evans, Ben E.; Culberson, J. Christopher; Gilbert, Kevin F.; Rittle, Kenneth E.; and Williams, Peter D., 5,464,788, Cl. 514-251.000.

Culbreth, William K., III: *See*—
Peters, Michael W.; Smith, William A.; Mueller, Mark A.; and Culbreth, William K., III, 5,464,505, Cl. 203-64.000.

Cullen, John F.; and Ejiri, Koichi, to Ricoh Corporation; and Ricoh Company Ltd. Segmentation of text, picture and lines of a document image. 5,465,304, Cl. 382-176.000.

Cullen, Steven R., to Versa Corporation. Agricultural feed bagging machine. 5,463,849, Cl. 53-527.000.

Cullen, Steven R., to Versa Corporation. Agricultural feed bagging machine including a rotor winch. 5,464,049, Cl. 141-114.000.

Culley, Paul R.: *See*—
Miller, David A.; Jansen, Kenneth A.; Culley, Paul R.; Taylor, Mark; and Izquierdo, Javier F., 5,465,360, Cl. 395-700.000.

Cullinan, George J.: *See*—
Black, Larry J.; Bryant, Henry U.; Cullinan, George J.; and Kauffman, Raymond F., 5,464,845, Cl. 514-326.000.

Cummings, Gwennette Y.: *See*—
Weston, Estella D.; and Cummings, Gweanette Y., 5,464,376, Cl. 482-81.000.

Cummings, Richard D.; Moore, Kevin L.; and McEver, Rodger P., to University of Oklahoma, Board of Regents of the. Glycoprotein ligand for P-selectin and methods of use thereof. 5,464,778, Cl. 436-503.000.

Cunha, Francisco J.; and De Angelis, David A., to General Electric Company. Cooling circuit for turbine stator vane trailing edge. 5,464,322, Cl. 415-115.000.

Currie, Joseph E. Optical fiber illumination device. 5,465,194, Cl. 362-32.000.

Curtis, Raymond L.; Schlegel, Urs; and Heldstab, Thomas, to Synthes (U.S.A.). Expanding suture anchor. 5,464,427, Cl. 606-232.000.

Curto, Caterino; and Longo, Gianantonio, to F.A.O.M.S. S.R.L. Non-deformable frame for spectacles, and in particular spectacles for children so obtained. 5,465,122, Cl. 351-124.000.

Curwood, Inc.: *See*—
Miller, Gerald, 5,464,969, Cl. 219-735.000.

Cutler, David K., to Cutler Induction Systems, Inc. Single point fuel injection system. 5,463,997, Cl. 123-460.000.

Cutler, Horace G.: *See*—
Bryant, Frank O.; and Cutler, Horace G., 5,464,771, Cl. 435-262.500.

Cutler Induction Systems, Inc.: *See*—
Cutler, David K., 5,463,997, Cl. 123-460.000.

CVD, Incorporated: *See*—
Pickering, Michael A.; Goela, Jitendra S.; and Burns, Lee E., 5,465,184, Cl. 360-97.010.

Cybex Corporation: *See*—
Shatas, Remigius G.; and Ligon, David L., 5,465,105, Cl. 345-204.000.

Cyclone Precision Inc.: *See*—
Leng, Tony, 5,464,373, Cl. 474-140.000.

Cymbalski, Robert S.: *See*—
Priddy, Dennis G.; and Cymbalski, Robert S., 5,464,974, Cl. 235-494.000.

Cytec Technology Corp.: *See*—
Avotins, Peter V.; and Evans, Robert E., 5,464,465, Cl. 75-313.000.
Recker, Hans G., 5,464,902, Cl. 525-119.000.
Vogelsang, Joerg; Greening, Giorgio; Laws, Regina; and Ittemann, Peter, 5,464,684, Cl. 428-229.000.

Cziffer, Endre. Disposable approximator for approaching nerve-endings in particular for facilitating sewing and replacement of injured nerves. 5,464,414, Cl. 606-152.000.

D.W.T. Innovative Recycling Corp.: *See*—
Wells, Raymond, 5,464,303, Cl. 404-75.000.

D/P, Inc.: *See*—
Wood, James, 5,463,835, Cl. 52-288.100.

Daansen, Warren S. Dispensing apparatus having a pump tube. 5,464,125, Cl. 222-156.000.

Daber, Richard P.: *See*—
Parker, Jeffrey L.; Sorrells, David F.; Mix, John D.; and Daber, Richard P., 5,465,144, Cl. 356-139.060.

Dade International Inc.: *See*—
Jones, Donald, 5,464,121, Cl. 222-1.000.

Daillot, Jean-Jacques. Articulated frame element for modular furniture, and hinge for articulating two frame elements together. 5,464,295, Cl. 403-84.000.

Daimler-Benz Aktiengesellschaft: *See*—
Dickmann, Jürgen, 5,464,995, Cl. 257-192.000.

Daimon, Katsumi: *See*—
Sakaguchi, Yasuo; Daimon, Katsumi; Takahashi, Michiaki; Yamasaki, Kazuo; and Yamaguchi, Yasuhiro, 5,464,717, Cl. 430-58.000.

Dainippon Printing Co., Ltd.: *See*—
Yoshioka, Nobuyuki; Hosono, Kunihiro; and Miyazaki, Junji, 5,464,713, Cl. 430-5.000.

Daito Teck Kabushiki Kaisha: *See*—
Shimizu, Keishi; Shimizu, Kanzi; Mitsumachi, Masanobu; Nakajima, Masato; Ishigami, Tetsushi; and Kusamichi, Yoshitake, 5,464,370, Cl. 454-345.000.

d'Alayer de Costemore d'Arc, Stephane M. A., to Staar S.A. Device insuring safe insertion of cartridges into loading apparatus of playback and/or recording units. 5,465,246, Cl. 369-77.200.

Dalbon, Gerardo, to M. G. Braibanti S.p.A. Process for preparing a dough for alimentary pasta. 5,464,640, Cl. 426-231.000.

Dallah Water Saving: *See*—
Younes, Abd El Rasoul M., 5,464,037, Cl. 137-410.000.

D'Alò, Simonetta: *See*—
Long, Giorgio; De Cillis, Giampiero; Rozzi, Antonella; D'Alò, Simonetta; and Gallico, Licia, 5,464,844, Cl. 514-301.000.

Dalton, Robert J.: *See*—
Goldman, David A.; and Dalton, Robert J., 5,464,235, Cl. 280-11.200.

Dalton, William S., to Demag Delaval Turbomachinery Corp. TurboCare Division. Retractable packing rings for steam turbines. 5,464,226, Cl. 277-53.000.

Damia, Giorgio, to Dar Societa' per Azioni. Pressure adjustment valve for circuits for the manual administration of gas mixtures in the medical field. 5,464,043, Cl. 137-614.200.

Damson, Erich: *See*—
Shrive, Nigel G.; Damson, Erich; Meyer, Richard A.; and Iverslie, Scott P., 5,463,902, Cl. 73-781.000.

Daneshtalab, Mohsen: *See*—
Noguchi, Kazuharu; Micetich, Ronald G.; and Daneshtalab, Mohsen, 5,464,616, Cl. 424-114.000.

Dankosh, Heidi E.: *See*—
Helber, Margaret J.; Dobles, Thomas R.; Diehl, Donald R.; Dankosh, Heidi E.; and Mee, John D., 5,464,736, Cl. 430-581.000.

Dankowski, John C., to Fabreeka International, Inc. Vibration isolator. 5,464,196, Cl. 267-140.130.

Dar Societa' per Azioni: *See*—
Damia, Giorgio, 5,464,043, Cl. 137-614.200.

Darges, Bernard, to Thomson-CSF. Excitation stage of a transmission tube for short-wave transmitter. 5,465,068, Cl. 327-323.000.

Darland, Mike E.: *See*—
Baldwin, Dwight G.; Zhao, Xiaowei; Darland, Mike E.; and Rodriguez, Ernesto M., 5,465,127, Cl. 353-119.000.

Darr, Richard C.: *See*—
Slat, William A.; and Darr, Richard C., 5,464,106, Cl. 215-12.100.

Daryoush, Afshin S.: *See*—
Zhou, Xuesong; and Daryoush, Afshin S., 5,465,418, Cl. 455-332.000.

Das, Suryya K.; and Kilic, Soner, to PPG Industries, Inc. Aqueous fluoropolymer dispersions. 5,464,897, Cl. 524-458.000.

Dasgupta, Sankar; and Jacobs, James K. Current collector for lithium ion battery. 5,464,706, Cl. 429-194.000.

Datron/Transoc, Inc.: *See*—
Hutcheson, Timothy L.; Or, Wilson; Narayanan, Venkatesh; Mohan, Subramanian; Wohlmut, Peter G.; Srinivasan, Ramanujam; Hunt, Bobby R.; and Ryan, Thomas W., 5,465,308, Cl. 382-159.000.

Dauksher, William J.: *See*—
Mogab, C. Joseph; Daukaher, William J.; and Resnick, Douglas J., 5,464,711, Cl. 430-5.000.

Daumal Castellon, Melchor. Telescopic shaft. 5,464,251, Cl. 280-777.000.

Dauson, Douglas S.: *See*—
Athey, Patricia R.; Dauson, Douglas S.; Lecocq, David E.; Neuman, George A.; Sopko, John F.; and Stewart-Davis, Royann L., 5,464,657, Cl. 427-255.500.

Davenport, Donald K.: *See*—
Maiwald, Marvin A.; and Davenport, Donald K., 5,464,243, Cl. 280-514.000.

David, Jean-François: *See*—
Remondiere, Olivier; and David, Jean-François, 5,465,100, Cl. 343-769.000.

Davidian, Richard M.: *See*—
Carlson, Thomas R.; and Davidian, Richard M., 5,463,795, Cl. 16-273.000.

Davidson, George S.; and Grafe, Victor G., to United States of America, Energy. Data flow machine for data driven computing. 5,465,368, Cl. 395-800.000.

Davidson Textron Inc.: *See*—
Lein, Maureen M.; Pelletier, Gary F.; Goad, Jeffrey D.; and Lee, Chinsoo S., 5,464,661, Cl. 427-409.000.

Davis, Cecil J.: *See*—
Moslehi, Mehrdad M.; Davis, Cecil J.; Jones, John; and Matthews, Robert T., 5,464,499, Cl. 216-71.000.

Davis, Dennis, to Nordson Corporation. Method and apparatus for forming and dispensing coating material containing multiple components. 5,464,283, Cl. 366-152.100.

Davis, Franklin J.: *See*—
Butler, Aaron S.; Davis, Franklin J.; and Comeau, Roger J., 5,463,864, Cl. 60-39.310.

Davis, James G.: *See*—
Greene, Mark I.; Dobashi, Kunio; Davis, James G.; and Hamuro, Junji, 5,464,751, Cl. 435-7.230.

Davis, Patrick H.: *See*—
Boatwright, Darrell L.; Hanson, George E.; Miller, Phillip; Koenck, Steven E.; Walter, Jerry L.; Kubler, Joseph J.; Cargin, Keith K., Jr.; Schultz, Darald R.; Davis, Patrick H.; and Kunert, Steven R., 5,465,207, Cl. 364-424.010.

Davis, Stephen J.; and Terzaghi, André, to Prince Sports Group, Inc. Long tennis racquet. 5,464,210, Cl. 273-73.00C.

Dawes, Nancy C.: *See*—
Villagran, Maria D.; Toman, Lori J.; Byars, Kenneth D.; Dawes, Nancy C.; and Zimmerman, Stephen P., 5,464,642, Cl. 426-439.000.

Dawson Metal Company, Inc.: *See*—
Palmer, Arthur V.; and Leonard, Gary, 5,464,315, Cl. 414-458.000.

Day, Edwin J., III: *See*—
Falvey, Neil J.; Day, Edwin J., III; Nappier, Ricky L.; and Longtin, John T., 5,465,288, Cl. 379-58.000.

Day, Kennith F., III; Lamear, William D., Jr.; and Morse, Edward R., to International Business Machines Corporation. System and method for mapping directly accessible magnetic DASD storage to fixed block optical storage. 5,465,382, Cl. 395-404.000.

Dayal, Santosh: *See*—
Schwarzberg, Moshe; and Dayal, Santosh, 5,464,749, Cl. 435-7.920.

Dayawon, Miguel M.: *See*—
Kassebaum, James W.; Dayawon, Miguel M.; and Sandbrink, Joseph J., 5,464,806, Cl. 504-206.000.

De Nora Permelec S.p.A.: *See*—
de Nora, Oronzio; Nidola, Antonio; Nevosi, Ulderico; and Traini, Carlo, 5,464,507, Cl. 204-105.00R.

Deadmond, Richard S.: *See*—
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; and Starr, Frank C., 5,463,845, Cl. 53-459.000.
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; Starr, Frank C.; Roloff, Robb W.; and Devlin, Robert D., 5,463,848, Cl. 53-482.000.

Dean, Christopher: *See*—
Muller, Bernard; Gautier, Antoine; Dean, Christopher; and Kuhn, Jean-Charles, 5,464,761, Cl. 435-147.000.

Dean, Mark A. Seat apparatus for actuating an audio source. 5,465,422, Cl. 455-344.000.

Dean, Thomas R.; and Namil, Abdelmoula, to Alcon Laboratories, Inc. Thienothiadiazine sulfonamides useful as carbonic anhydrase inhibitors. 5,464,831, Cl. 514-222.800.

De Angelis, David A.: *See*—

Cunba, Francisco J.; and De Angelis, David A., 5,464,322, Cl. 415-115.000.

DeCamp, William H.: *See*—
Hostler, Jonathan E.; DeCamp, William H.; and Shanker, Daniel W., 5,464,963, Cl. 219-121.820.

De Cillis, Giampiero: *See*—
Long, Giorgio; De Cillis, Giampiero; Rozzi, Antonella; D'Alò, Simonetta; and Gallico, Licia, 5,464,844, Cl. 514-301.000.

Decker, David N.: *See*—
Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yursis, Robert, 5,465,294, Cl. 379-207.000.

Deckers, Andreas: *See*—
Hens, Rolf; Beaecke, Siegmund; Deckers, Andreas; Guentherberg, Norbert; Brudermueller, Martin; Nestler, Gerhard; and Wassmer, Karl-Heinz, 5,464,881, Cl. 521-60.000.

DeDeimar, Ronald B.; and Lach, Greg F., to W. S. Tyler, Incorporated. Cone crusher having inclined hold-down cylinders. 5,464,165, Cl. 241-215.000.

Deen, Pieter B. J.; Linssen, Nicolaas G. H.; and Mennen, Godefridus J., to OCE-Nederland, B.V. Method of and apparatus for processing sets of copies corresponding to a set of originals. 5,464,201, Cl. 270-53.000.

Deere & Company: *See*—
Lauer, Fritz K.; and Rogers, David W., 5,464,372, Cl. 460-100.000.
Maiwald, Marvin A.; and Davenport, Donald K., 5,464,243, Cl. 280-638.000.

Deetman, Gerbrand, to Monsanto Company. Stabilized phosphate ester-based functional fluid compositions. 5,464,551, Cl. 252-78.500.

De Graaf, Martin, to Veluwse Machibe Industrie B.V. Method for manufacturing a green radial tire using a transfer unit that is movable during pressing. 5,464,489, Cl. 156-126.000.

Dehne, Heinz-Wilhelm: *See*—
Krämer, Wolfgang; Berg, Dieter; Dehne, Heinz-Wilhelm; and Dutzmann, Stefan, 5,464,809, Cl. 504-227.000.

Deignan, Jeffrey J. Key pad shielding device and method. 5,465,090, Cl. 341-22.000.

Deisenhofer, Manfred: *See*—
Langer, Alfred; Genz, Andreas; Deisenhofer, Manfred; Kiele, Walter; Lewandowski, Bernd; and Reichardt, Jürgen, 5,464,462, Cl. 65-66.000.

Delatorre, Leroy C., to Panex Corporation. Torque flowmeter. 5,463,903, Cl. 73-861.000.

Delco Electronics Corporation: *See*—
Lautzenhiser, Frans P.; Carter, Bradley H.; Ozogar, Donald A.; and Sarma, Dwadasi H. R., 5,464,570, Cl. 252-500.000.
Nill, Walter J.; and Buechler, Jean M., 5,464,970, Cl. 235-95.00R.

Dell, Timothy J.; and Foster, Jimmy G., to International Business Machines Corporation. Method and structure for providing error correction code and automatic parity sensing. 5,465,262, Cl. 371-49.300.

Dell USA, L.P.: *See*—
Parks, Terry J.; and Gaskins, Darius D., 5,465,346, Cl. 395-296.000.
Register, David S., 5,465,038, Cl. 320-2.000.

Deloye, Michael J.; Fuoco, Daniel P.; and Moeller, Dennis L., to International Business Machines Corporation. Selectable 8/16 bit DMA channels for "ISA" bus. 5,465,332, Cl. 395-842.000.

Deluxe Craft Manufacturing Co.: *See*—
Mandeltort, Stanley T., 5,464,105, Cl. 211-184.000.

Delvalle, Robert B.: *See*—
Merat, Francis L.; Roumina, Kavous; Ruegsegger, Steven M.; and Delvalle, Robert B., 5,465,221, Cl. 364-552.000.

Demag Delaval Turbomachinery Corp. TurboCare Division: *See*—
Dalton, William S., 5,464,226, Cl. 277-53.000.

Demarest, Scott T.: *See*—
Chmielewski, Thomas A., Jr.; Demarest, Scott T.; and Colavito, Leonard R., 5,463,854, Cl. 56-10.20E.

De Matthaeis, Sisto L.: *See*—
Ricco, Mario; Bruni, Giovanni; and De Matthaeis, Sisto L., 5,464,156, Cl. 239-124.000.

Demers, James P.; and Sulsky, Richard B., to Ortho Pharmaceutical Corporation. 4-aryl- and 4-arylthio-5-hydroxy-2(5H)-furanones as inhibitors of phospholipase A_2. 5,464,865, Cl. 514-473.000.

DemoGraFX: *See*—
Demos, Gary, 5,465,119, Cl. 348-447.000.

Demos, Gary, to DemoGraFX. Pixel interlacing apparatus and method. 5,465,119, Cl. 348-447.000.

Dempsey, Donald: *See*—
Whalen, Robert L.; and Dempsey, Donald, 5,464,471, Cl. 106-124.000.

Den Norske Stats Oljeselskap a.s.: *See*—
Kristiansen, Terje, 5,464,059, Cl. 166-269.000.

Denenberg, Byron A.: *See*—
Conrad, Gary L.; Denenberg, Byron A.; and Kramerich, George L., 5,465,115, Cl. 348-155.000.

Dennin, Randy J.: *See*—
Hoover, Charles E.; Dennin, Randy J.; Gabor, E. Allan; Schobel, Mark; and Sorg, Albert F., 5,464,631, Cl. 424-454.000.

Dennis, Edward A.; Reynolds, Laure J.; and Yu, Lin, to University of California, Regents of the. Assay and substrate for arachidonoyl-specific phospholipase A2. 5,464,754, Cl. 435-18.000.

Denny, Jacques P.; and Sorolla, Josep R., to Sandoz Ltd.; and Muenzing Chemie GmbH. Re-tanning process. 5,464,451, Cl. 8-94.210.

Denny, William A.: *See*—
Dobrusin, Ellen M.; Showalter, Howard D. H.; Denny, William A.; Palmer, Brian D.; Rewcastle, Gordon W.; Tercel, Moana; and Thompson, Andrew M., 5,464,861, Cl. 514-414.000.

de Nora, Oronzio; Nidola, Antonio; Nevosi, Ulderico; and Traini, Carlo, to De Nora Permelec S.p.A. Process for the electrolytic deposition of metals. 5,464,507, Cl. 204-105.00R.

Denz, Helmut; and Blumenstock, Andreas, to Robert Bosch GmbH. Method and arrangement for checking the operability of a tank-venting system. 5,463,998, Cl. 123-520.000.

dePadova, Anathony S. Method of modifying ovarian hormone-regulated AT1 receptor activity as treatment of incapacitating symptom(s) of P.M.S.. 5,464,854, Cl. 514-381.000.

De Pauw, Carlo E. M.: *See*—
Pien, André L. J.; and De Pauw, Carlo E. M., 5,463,830, Cl. 47-9.000.

Deposition Technologies, Inc.: *See*—
Yang, Peter Y., 5,464,710, Cl. 430-1.000.

Dermott, John R. Golf ball teeing device. 5,464,223, Cl. 273-201.000.

DeRock, Richard. Eddy current probe with deflectable sidewalls. 5,465,045, Cl. 324-220.000.

Derr, William S.; and Longacre, Mark D., to Mersden Manufacturing Co. Infra-red heater for treating substrates. 5,464,346, Cl. 431-328.000.

Desai, Ranjit C.: *See*—
Dunlap, Richard P.; Mura, Albert J.; Hlasta, Dennis J.; Desai, Ranjit C.; and Latimer, Lee H., 5,464,852, Cl. 514-373.000.

Deschene, Daniel J., to National Semiconductor Corporation. RAM based architecture for ECC circuits. 5,465,261, Cl. 371-39.100.

Descombes, Jean-Jacques: *See*—
Cordi, Alex; Lacoste, Jean-Michel; Laubie, Michel; Verbeuren, Tony; and Deacombes, Jean-Jacques, 5,464,859, Cl. 514-401.000.

DeShaw, Gerald M.: *See*—
Spykerman, David J.; DeShaw, Gerald M.; Gregg, Michael J.; and Eldred, Randy E., 5,464,272, Cl. 297-227.000.

Design Tech International Inc.: *See*—
Azem, Khaled, 5,465,297, Cl. 379-387.000.

De Soete, Gérard, to Solvay (Société Anonyme. Process for purifying a gas to remove nitrogen monoxide therefrom. 5,464,599, Cl. 423-239.100.

Despres, Jean-Albert. Device for identifying an object by means of an insert incorporated into that object. 5,464,973, Cl. 235-494.000.

Dessauer, Guido: *See*—
Horn, Ute; and Dessauer, Guido, 5,464,472, Cl. 106-287.340.

Detector Electronics (UK) Limited: *See*—
Spring, David J.; and King, John D., 5,464,980, Cl. 250-338.100.

Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V: *See*—
Peschka, Walter; and Schneider, Gottfried, 5,463,868, Cl. 62-6.000.

Deutsche ITT Industries GmbH: *See*—
Witte, Franz-Otto, 5,465,225, Cl. 364-736.000.

Deutsche Thomson-Brandt GmbH: *See*—
Elgert, Achim; and Hölzer, Thomas, 5,465,032, Cl. 315-403.000.

DeVale, Donald P., to Northgate Technologies Inc. Irrigation system for a surgical site. 5,464,391, Cl. 604-67.000.

Dever, Gerald R.: *See*—
Hayes, Jesse C., Jr.; Dever, Gerald R.; Laughlin, Thomas J.; Schroer, Charles F., Jr.; and Wildman, Gary C., 5,464,610, Cl. 424-61.000.

DeVito, Nicholas P.: *See*—
Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yursis, Robert, 5,465,294, Cl. 379-207.000.

Devlin, Robert D.: *See*—
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; Starr, Frank C.; Roloff, Robb W.; and Devlin, Robert D., 5,463,848, Cl. 53-482.000.

DeWitt, Charles G.: *See*—
Mudge, Elbert H.; and DeWitt, Charles G., 5,464,678, Cl. 428-96.000.

DeWitt, Robert R.: *See*—
Stevens, Albert F.; DeWitt, Robert R.; Lile, William R.; Mitchell, Paul R.; and Tenturelli, Stephen, 5,464,099, Cl. 209-3.100.

De Woskin, Richard E.: *See*—
Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,464,814, Cl. 514-6.000.

DGS Property Pty. Ltd.: *See*—
Griek, Cornelis J.; and Mitchinson, Anthony K., 5,464,070, Cl. 182-45.000.

Diagen Institute fur molekularbrologische Diagnostic, GmbH: *See*—
Ayata, James E.; and Colpan, Metin, 5,464,541, Cl. 210-767.000.

Diamondstein, Marc S.: *See*—
Blaker, David M.; Diamondstein, Marc S.; Ellard, Gregory S.; Mobin, Mohammad S.; Sam, Homayoon; and Thierbach, Mark E., 5,465,275, Cl. 375-341.000.

Diana, Guy D.; and Nitz, Theodore J., to Sterling Winthrop Inc. 1,2,4-oxadiazolyl-phenoxyalkylisoxazoles and their use as antiviral agents. 5,464,848, Cl. 514-364.000.

Diaz-Kotti, Michelle A.; and Brissette, Peter J., to Shakespeare Company. Polyester monofilaments extruded from a high temperature polyester resin blend with increased resistance to hydrolytic and thermal degradation and fabrics thereof. 5,464,890, Cl. 524-195.000.

Dibra S.p.A.: *See*—
Anelli, Pierlucio; Brocchetta, Marino; Uggeri, Fulvio; and Visigalli, Massimo, 5,464,607, Cl. 424-9.452.

Dickmann, Jürgen, to Daimler-Benz Aktiengesellschaft. Heterostructure field effect transistor including a pulse doped channel. 5,464,995, Cl. 257-192.000.

Diehl, Donald R.: *See*—
Helber, Margaret J.; Dobles, Thomas R.; Diehl, Donald R.; Dankosh, Heidi E.; and Mee, John D., 5,464,736, Cl. 430-581.000.

Dievendorff, Richard; and Mohan, Chandrasekaran, to International Business Machines Corporation. Fault-tolerant transaction-oriented data processing. 5,465,328, Cl. 395-182.130.

Digital Equipment Corporation: *See*—
Creedon, Tadhg; O'Neill, Eugene G.; and O'Connell, Anne, 5,465,340, Cl. 395-846.000.
Munson, James B., 5,465,104, Cl. 345-150.000.

Digital Instruments, Inc.: *See*—
Prater, Craig B.; Massie, James; Grigg, David A.; Elings, Virgil B.; Hansma, Paul K.; and Drake, Barney, 5,463,897, Cl. 73-105.000.

DiGravio, Thomas L.: *See*—
Jaskowiak, Timothy R.; Coughlin, Daniel L.; Perez, Julie A.; Gilmore, Daniel R., III; DiGravio, Thomas L.; and Taft, Kevin H., 5,465,138, Cl. 355-245.000.

Diles, Sondra L.: *See*—
Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yursis, Robert, 5,465,294, Cl. 379-207.000.

DiNanno, James M.: *See*—
Stange, Thomas C.; DiNanno, James M.; Maillet, John P., Jr.; and Heino, Richard N., 5,463,839, Cl. 53-54.000.

Dinkjian, Robert M.; Heller, Lisa C.; Kordus, Steven R.; Lauricella, Kenneth A.; Seigendall, Thomas W.; Skaggs, Robert A.; and Xu, Nelson S., to International Business Machines Corporation. Processor for processing data string by byte-by-byte. 5,465,374, Cl. 395-800.000.

Dinsmoor, John C., III: *See*—
Wilson, Greg S.; Dinsmoor, John C., III; and Miller, Russell C., 5,464,443, Cl. 623-37.000.

Display Network, Inc.: *See*—
Caldwell, Michael W.; and Blankenstein, Hendrik, 5,465,085, Cl. 340-825.350.

Dittmar, William G. Method for recreational surface crack repair. 5,464,304, Cl. 404-75.000.

Divan, Deepakraj M.: *See*—
Bhattacharya, Subhashish; and Divan, Deepakraj M., 5,465,203, Cl. 363-40.000.

Do, James H.: *See*—
Henson, James A.; McGrath, James P.; Peterson, Bruce R.; Glassburn, Tim R.; Raab, Michael L.; and Do, James H., 5,465,343, Cl. 395-439.000.

Doane, Charles C.; Jenkins, Jack W.; and Avé, Dirk A., to Ecogen Inc. Gustatory stimulant composition useful for corn rootworm control. 5,464,618, Cl. 424-195.100.

Dobashi, Kunio: *See*—
Greene, Mark I.; Dobashi, Kunio; Davis, James G.; and Hamuro, Junji, 5,464,751, Cl. 435-7.230.

Dobles, Thomas R.: *See*—
Helber, Margaret J.; Dobles, Thomas R.; Diehl, Donald R.; Dankosh, Heidi E.; and Mee, John D., 5,464,736, Cl. 430-581.000.

Dobrusin, Ellen M.; Showalter, Howard D. H.; Denny, William A.; Palmer, Brian D.; Rewcastle, Gordon W.; Tercel, Moana; and Thompson, Andrew M., to Warner-Lambert. 2-thioindoles (selenoindoles) and related disulfides (selenides) which inhibit protein tyrosine kinases and which have antitumor properties. 5,464,861, Cl. 514-414.000.

Doell, Andreas: *See*—
Thiel, Rudolf; Doell, Andreas; and Halasy-Wimmer, Georg, 5,464,077, Cl. 188-72.500.

Döge, Klaus: *See*—
Albring, Peter; Apley, Rainer; Döge, Klaus; Heinrich, Günter; Lindner, Ernst; Müller, Norbert; Pauer, Reinhard; Pilling, Eberhard; and Rudischer, Rainer, 5,464,325, Cl. 416-185.000.

Doi, Bryan C.; Thomas, Steven D.; Coli, Vincent J.; and Giglio, Vito D., to VLSI Technology, Inc. Verifiable security circuitry for preventing unauthorized access to programmed read only memory. 5,465,341, Cl. 395-183.000.

Dollinger, Markus: *See*—
Haas, Wilhelm; Linker, Karl-Heinz; Schallner, Otto; Findeisen, Kurt; Santel, Hans-Joachim; and Dollinger, Markus, 5,464,810, Cl. 504-273.000.

Donahue, Harvey: *See*—
Oehr, Klaus H.; Timewell, Richard R.; Donahue, Harvey; Hoy, Brenda; Kim, Ronald; and Roth, Reinhold C., 5,464,510, Cl. 204-141.500.

Dong, Zhengxin: *See*—
Burton, James; Dong, Zhengxin; and Frigo, Timothy B., 5,464,820, Cl. 514-16.000.

Doowon Climate Control Co., Ltd.: *See*—
Park, Sang-Rok; and Yoo, Jai-Heung, 5,464,145, Cl. 228-183.000.

Doppstadt, Werner. Cutting member of a flail for use in a rotary impact mechanism of a comminuting machine. 5,464,164, Cl. 241-197.000.

Doryokuro Kakunenryo Kiahatsu Jigyodan: *See*—
Yokoyama, Yu; and Sato, Souichi, 5,464,512, Cl. 204-157.200.

Dotolo Research Corporation: *See*—
Bayless, Ronnie E., 5,464,555, Cl. 252-153.000.

Doucet, Bernard, to Doucet Freres. Method and a machine for repairing a ground area planted with grass for example a turfed racecourse or equestrian training ground. 5,464,066, Cl. 172-1.000.

Doucet Freres: *See*—
Doucet, Bernard, 5,464,066, Cl. 172-1.000.

Dougherty, Richard M.; and Fraser, Glenn R., to Motorola, Inc. Transconductance mixer with feedback. 5,465,420, Cl. 455-333.000.

Dow Chemical Company, The: *See*—
Hefner, Robert E., Jr.; and Earls, Jimmy D., 5,464,912, Cl. 525-523.000.
Lo, Grace Y.; and Gatzke, Arnold L., 5,464,914, Cl. 526-180.000.
Moyer, Eric S.; and Moyer, Denise J. D., 5,464,925, Cl. 528-170.000.
Patton, Jasson T.; and Neithamer, David R., 5,464,906, Cl. 525-240.000.
Schmidt, Donald L.; Rose, Gene D.; and Flagg, Edward E., 5,464,538, Cl. 210-490.000.
Silvis, H. Craig; and Kram, Shari L., 5,464,924, Cl. 528-102.000.

Dow Corning Asia Ltd.: *See*—
Itoh, Maki; and Sakakibara, Akihito, 5,464,922, Cl. 528-40.000.

Dow Corning Corporation: *See*—
Kosal, Jeffrey A.; and Revis, Anthony, 5,464,801, Cl. 502-172.000.

Dower, Steven K.: *See*—
Sims, John E.; Cosman, David J.; Lupton, Stephen D.; Mosley, Bruce A.; and Dower, Steven K., 5,464,937, Cl. 530-350.000.

Doyle, Matthew J.: *See*—
Kelm, Gary R.; Pickrum, Harvey M.; Doyle, Matthew J.; and Buchanan, William, 5,464,609, Cl. 424-54.000.

Drabik, Timothy J.; Martin, Kevin P.; and Callahan, John, to Georgia Tech Research Corporation. Processes and apparatus for lift-off and bonding of materials and devices. 5,465,009, Cl. 257-723.000.

Draftex Industries Limited: *See*—
Eckart, Ralf, 5,463,832, Cl. 49-479.100.

Drägerwerk Aktiengesellschaft: *See*—
Bäther, Wolfgang; and Bommer, Rainer, 5,464,588, Cl. 422-88.000.

Drake, Barney: *See*—
Prater, Craig B.; Massie, James; Grigg, David A.; Elings, Virgil B.; Hansma, Paul K.; and Drake, Barney, 5,463,897, Cl. 73-105.000.

Draxler, Sonja: *See*—
Lippitsch, Max; Draxler, Sonja; and Leiner, Marco J., 5,464,587, Cl. 422-82.070.

Dreessen, Chrit; Gubbels, Paul A.; and Adams, Paul, to Medtronic, Inc. Brain lead anchoring system. 5,464,446, Cl. 607-116.000.

Drexel University: *See*—
Zhou, Xuesong; and Daryoush, Afshin S., 5,465,418, Cl. 455-332.000.

DRG Medical Packaging Supplies Limited: *See*—
Scarrow, David, 5,464,123, Cl. 222-83.500.

Driscoll, William A.: *See*—
Melancon, Kurt C.; and Driscoll, William A., 5,464,659, Cl. 427-387.000.

Dror, Michael: *See*—
Berg, Eric P.; Tuch, Ronald J.; Dror, Michael; and Wolff, Rodney G., 5,464,650, Cl. 427-2.300.

Drucker, Steven; Goder, Alexey; Khalili, Davood; Williams, Kevin; Christensen, Ken; and Major, Emery, to Andros Incorporated. Respiratory gas analyzer. 5,464,982, Cl. 250-343.000.

Drummond, James T. Liquid container having a remotely cleavable seal. 5,464,133, Cl. 222-484.000.

Dry, Daniel J. Metal roof truss. 5,463,837, Cl. 52-639.000.

Du Pont de Nemours, E. I., and Company: *See*—
Chapman, George R., Jr.; Crenshaw, Lewis E.; McMinn, Rita S.; Morgan, Richard A.; Priester, Donnan E.; Stewart, Charles W.; and Tarney, Robert E., 5,464,904, Cl. 525-200.000.
Hofmann, George H., 5,464,903, Cl. 525-185.000.
Kirkpatrick, W. Mark, III; and Hughbanks, Richard A., 5,464,166, Cl. 242-527.300.

Duc, Jerome. Transluminal implantation or extraction device. 5,464,408, Cl. 606-108.000.

Duensing, David T.; Phillips, Dayle E.; and Simmons, Dennis C., to Compuspeak, Inc. Report generating system. 5,465,378, Cl. 395-800.000.

Dufour, Yves, to U.S. Philips Corporation. Low-consumption low-noise charge-pump circuit. 5,465,061, Cl. 327-112.000.

Duke University: *See*—
Bolognesi, Dani P.; Matthews, Thomas J.; and Wild, Carl T., 5,464,933, Cl. 530-324.000.

Dulak, Joseph O. Golf marker cleaner and grass remover. 5,464,067, Cl. 172-13.000.

Dumbeer, Gerhard: *See*—
Gajek, Joachim; and Dumbeer, Gerhard, 5,464,239, Cl. 280-264.000.

Dumesnil, Alain: *See*—
Roussel, Bruno; and Dumesnil, Alain, 5,465,026, Cl. 313-440.000.

Dunkin' Donuts Incorporated: *See*—
Cataldo, Michael D., 5,463,940, Cl. 99-476.000.

Dunlap, Richard P.; Mura, Albert J.; Hlasta, Dennis J.; Desai, Ranjit C.; and Latimer, Lee H., to Sterling Winthrop Inc. Saccharin derivative proteolytic enzyme inhibitors. 5,464,852, Cl. 514-373.000.

Dunn, Steven E.: *See*—
Winston, Anthony E.; Cala, Francis R.; Dunn, Steven E.; Vinci, Alfredo; and Lajoie, M. Stephen, 5,464,553, Cl. 252-108.000.

Dunn, T. Jeffrey; Srinivasan, Ananthachari; Lyle, Leon R.; and Rajagopalan, Raghavan, to Mallinckrodt Medical, Inc. Metal chelates as spacer compounds in biologically active peptides. 5,464,934, Cl. 530-326.000.

Dunnam, Curt. Active feedback system for suppression of alternating magnetic fields. 5,465,012, Cl. 307-91.000.

Dunwell, James M.: *See*—
Coffee, Ronald A.; and Dunwell, James M., 5,464,765, Cl. 435-172.300.
Duphar International Research B.V.: *See*—
Pluim, Henk; and Kraaijenbrink, Jan G., 5,464,514, Cl. 204-182.400.
Durkee, Scott R.; and Fjerstad, Erik A., to Simmonds Precision Products, Inc. Real time auto-correlation filter method and apparatus. 5,465,227, Cl. 364-825.000.
Dutzmann, Stefan: *See*—
Krämer, Wolfgang; Berg, Dieter; Dehne, Heinz-Wilhelm; and Dutzmann, Stefan, 5,464,809, Cl. 504-227.000.
Dynamotive Corporation: *See*—
Oehr, Klaus H.; Timewell, Richard R.; Donahue, Harvey; Hoy, Brenda; Kim, Ronald; and Roth, Reinhold C., 5,464,510, Cl. 204-141.500.
E.F. Johnson Company: *See*—
Barnes, Keith W.; Bauman, Donald R.; Brace, Howard N.; Keefer, Philip A.; and Mihelich, Michael E., 5,465,386, Cl. 455-15.000.
E-Systems, Inc.: *See*—
Boardman, John D.; Hamilton, Scott M.; Gangstead, Mervin L.; Sadler, Jimmie L.; Trimble, Richard A.; and Welch, Jeffrey P., 5,465,243, Cl. 369-49.000.
Kennedy, Joseph P., Jr., 5,465,289, Cl. 379-59.000.
Eagle-Picher Industries, Inc.: *See*—
Rey, Gonzalo C., 5,464,701, Cl. 429-53.000.
Earls, Jimmy D.: *See*—
Hefner, Robert E., Jr.; and Earls, Jimmy D., 5,464,912, Cl. 525-523.000.
Early, Brian J.; Reens, Daniel J.; and Karnoff, Robert S., to Cool Fog Systems, Inc. Method and apparatus for evaporative cooling of air leading to a gas turbine engine. 5,463,873, Cl. 62-121.000.
Eastman Chemical Company: *See*—
Chang, Yeon-Ho; Barbee, Robert B.; and Phillips, Brian S., 5,464,909, Cl. 525-438.000.
Sharma, Mahendra K.; Singleton, Andy H.; and Hiller, John J., 5,464,883, Cl. 523-161.000.
Eastman Kodak Company: *See*—
Bernard, Patrick E. Y.; and Bertorelli, Claude R., 5,464,506, Cl. 204-105.00R.
Bringley, Joseph F.; Bryan, Philip S.; and Hyde, Andrea M., 5,464,568, Cl. 252-301.40H.
Chen, Jiann H.; Fitzgerald, John J.; Vreeland, William B., II; Ferrar, Wayne T.; Roberts, Gary F.; and Staudenmayer, William J., 5,464,698, Cl. 428-421.000.
Ferrar, Wayne T.; Vreeland, William B.; Hewitt, Charles E.; Fitzgerald, John J.; and Binga, Tonya D., 5,464,703, Cl. 428-421.000.
Friday, James A., 5,464,733, Cl. 430-507.000.
Helber, Margaret J.; Dobles, Thomas R.; Diehl, Donald R.; Dankosh, Heidi E.; and Mee, John D., 5,464,736, Cl. 430-581.000.
Palmer, Joseph P.; and Jones, Robert S., 5,465,134, Cl. 355-75.000.
Preddy, Carl R.; and Holtzclaw, John V., 5,464,735, Cl. 430-574.000.
Singer, Douglas E., 5,464,727, Cl. 430-347.000.
Szajewski, Richard P.; and Buchanan, John M., 5,464,728, Cl. 430-393.000.
Vaynshteyn, Mikhail, 5,465,129, Cl. 354-170.000.
Wilson, John C.; and Tyagi, Dinesh, 5,464,719, Cl. 430-110.000.
Eaton Corporation: *See*—
Kwiatek, David J., 5,464,345, Cl. 431-266.000.
Eaton, Glen: *See*—
Anderson, R. Carver; and Eaton, Glen, 5,464,019, Cl. 128-677.000.
Ebisawa, Junichi: *See*—
Makino, Ichiro; Mitsui, Akira; Takehara, Mikio; Ando, Eiichi; Ebisawa, Junichi; Suzuki, Koichi; Matsumoto, Kiyoshi; Iseda, Toru; and Suzuki, Susumu, 5,464,674, Cl. 428-694.00T.
Ebtech, Inc.: *See*—
Burrows, Bruce D., 5,464,127, Cl. 222-181.500.
Ecclesfield, George. Torsion spring having an adjustable spring rate. 5,464,197, Cl. 267-155.000.
Eckart, Ralf, to Draftex Industries Limited. Sealing or guiding strip, window frame assembly, and method of making window frame assembly. 5,463,832, Cl. 49-479.100.
Ecogen Inc.: *See*—
Doane, Charles C.; Jenkins, Jack W.; and Avé, Dirk A., 5,464,618, Cl. 424-195.100.
Ecolab, Inc.: *See*—
Barcay, Stephen J.; and Anderson, Douglas G., 5,464,613, Cl. 424-[illegible].000.
Ecowater Systems, Inc.: *See*—
Nowlin, Duane; and Gillett, Bruce, 5,464,532, Cl. 210-190.000.
Eddy, Tillman L. Support belt for competitive shooters. 5,464,136, Cl. 224-252.000.
Edelson, Jonathan, to Borealis Technical Incorporated Limited. Method for reducing particulate iron ore to molten iron with hydrogen as reductant. 5,464,464, Cl. 75-310.000.
Eder, Erich, to Krones AG Hermann Kronseder Maschinenfabrik. Method and apparatus for applying labels to containers and containers resulting therefrom. 5,464,495, Cl. 156-456.000.
Eder, Helmut: *See*—
Barta, Helmut; Eder, Helmut; Granser, Manfred; Habison, Georg; Hantak, Edith; Moser, Franz; and Pfaffenbichler, Peter, 5,464,396, Cl. 604-191.000.
Edgar, Albert D., to International Business Machines Corporation. Duplex film scanning. 5,465,155, Cl. 358-500.000.
Edman, Timothy J.: *See*—
Leonard, William K.; Mohn, Stephen W.; Edman, Timothy J.; and Schiller, Philip D., 5,464,577, Cl. 264-40.500.
Edmonson, ames G., to Betz Laboratories, Inc. High temperature corrosion inhibitor. 5,464,525, Cl. 208-47.000.
Edwards, David B.; McCarthy, William J.; Aldred, Alan J.; and Jackman, Anthony D., to May & Baker Limited. Shock protection packaging for liquids. 5,464,097, Cl. 206-524.700.
Edwards, Joan A.: *See*—
Fowler, Donald W.; Lappos, Nicholas D.; and Edwards, Joan A., 5,465,212, Cl. 364-427.000.
Edwards, Martin J., to U.S. Philips Corporation. Electronic drive circuits for active matrix devices, and a method of self-testing and programming such circuits. 5,465,053, Cl. 324-770.000.
Effland, Richard C.; and Wettlaufer, David G., to Hoechst-Roussel Pharmaceuticals, Inc. 1,3-dihydro-1-(pyridinylamino)-2H-indol-2-ones and intermediates for the preparation thereof. 5,464,846, Cl. 514-333.000.
Efner, Howard F.: *See*—
Shaw, James E.; Sattich, William E.; and Efner, Howard F., 5,464,931, Cl. 528-389.000.
Egozi, Avihay, to Teledata Communication Ltd. Subscriber line impedance measurement device and method. 5,465,287, Cl. 379-5.000.
Egraz, Jean-Bernard: *See*—
Blanchard, Pierre; Egraz, Jean-Bernard; and Ravet, Georges, 5,464,895, Cl. 524-425.000.
Eguchi, Haruki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focus limiter. 5,465,130, Cl. 354-195.100.
Eguchi, Ken, to Canon Kabushiki Kaisha. Ferroelectric liquid crystal device with electroconductive protective film and electroconductive alignment film. 5,465,169, Cl. 359-74.000.
Eick, Daniel H. Apparatus and method for supporting and cutting cornea tissue. 5,464,417, Cl. 606-166.000.
Eisenbeis, Scott J.; Krevolin, Mark; Bryant, Christopher P.; Boguslawski, Sophie J.; Ledden, David J.; and Clark, Scott, to Boehringer Mannheim Corporation. Oxidation-resistant muteins of β-galactosidase fragments. 5,464,747, Cl. 435-7.600.
Ejiri, Emiko: *See*—
Hirai, Kenji; Yamashita, Mitsuo; Tateno, Tomoko; Ejiri, Emiko; Harasawa, Kikuko; Onji, Yuichi; Ugai, Sadayuki; and Nagato, Shoin, 5,464,811, Cl. 504-281.000.
Ejiri, Koichi: *See*—
Cullen, John F.; and Ejiri, Koichi, 5,465,304, Cl. 382-176.000.
Eklund, Robert H.; Havemann, Robert H.; and Stroth, Leo, to Texas Instruments Incorporated. Polysilicon resistor structure including polysilicon contacts. 5,465,005, Cl. 257-538.000.
Eklund, Sivert; Jönsson, Claes; and Sjöberg, Lars-Göran, to ABB Stal AB. Control system for extraction and injection of steam from and into a turbine. 5,464,318, Cl. 415-28.000.
Elasis Sistema Ricerca Fiat Nel Mizzogiorno Societa Consortile per Azioni: *See*—
Ricco, Mario; Bruni, Giovanni; and De Matthaeis, Sisto L., 5,464,156, Cl. 239-124.000.
Eldred, Randy E.: *See*—
Spykerman, David J.; DeShaw, Gerald M.; Gregg, Michael J.; and Eldred, Randy E., 5,464,272, Cl. 297-227.000.
Eldridge, Jess S., to Minnesota Mining and Manufacturing Company. Runoff water sampler. 5,463,909, Cl. 73-864.520.
Electric Power Research Institute, Inc.: *See*—
Bhattacharya, Subhashish; and Divan, Deepakraj M., 5,465,203, Cl. 363-40.000.
Electrolux Corporation: *See*—
Mancl, Dennis J.; Johnson, Donald C.; and Havens, Paul W., 5,465,016, Cl. 310-71.000.
Electronic Cable Specialists, Inc.: *See*—
Whitson, Frederick A.; Siebert, William K.; and Raihala, Kenneth B., 5,464,461, Cl. 55-480.000.
Elf Sanofi: *See*—
Courtemanche, Gilles; Gautier, Claudie; Gully, Danielle; Roger, Pierre; Valette, Gérard; and Wermuth, Camille G., 5,464,847, Cl. 514-342.000.
Elgert, Achim; and Hölzer, Thomas, to Deutsche Thomson-Brandt GmbH. Vertical deflection circuit. 5,465,032, Cl. 315-403.000.
Eli Lilly and Company: *See*—
Black, Larry J.; Bryant, Henry U.; Cullinan, George J.; and Kauffman, Raymond F., 5,464,845, Cl. 514-326.000.
Grindey, Gerald B.; and Hertel, Larry W., 5,464,826, Cl. 514-50.000.
Elings, Virgil B.: *See*—
Prater, Craig B.; Massie, James; Grigg, David A.; Elings, Virgil B.; Hansma, Paul K.; and Drake, Barney, 5,463,897, Cl. 73-105.000.
Ellard, Gregory S.: *See*—
Blaker, David M.; Diamondstein, Marc S.; Ellard, Gregory S.; Mobin, Mohammad S.; Sam, Homayoon; and Thierbach, Mark E., 5,465,275, Cl. 375-341.000.
Eltech Systems Corporation: *See*—
Tomba, Charles P.; Scarpucci, Joseph J.; and Getsy, Andy W., 5,464,519, Cl. 204-280.000.
Emerson Electric Co.: *See*—
Cole, Ronald E., 5,464,955, Cl. 200-317.000.
Emitec Gesellschaft fuer Emissionstechnologie mbH: *See*—
Maus, Wolfgang; Swars, Helmut; Brück, Rolf; and Humpolik, Bohumil, 5,464,679, Cl. 428-116.000.
Empi, Inc.: *See*—

Malewicz, Andrezj, 5,464,448, Cl. 607-138.000.
Enbutsu, Ichiro; Baba, Kenzi; Hara, Naoki; Yoda, Mikio; Watanabe, Shoji; and Yahagi, Hayao, to Hitachi, Ltd. Method of automated learning, an apparatus therefor, and a system incorporating such an apparatus. 5,465,320, Cl. 395-22.000.
Endermann, Rainer: *See*—
Petersen, Uwe; Krebs, Andreas; Schenke, Thomas; Kunisch, Franz; Philipps, Thomas; Grobe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, 5,464,796, Cl. 514-312.000.
Energy Concepts, Inc.: *See*—
Heineman, Lee J., 5,465,366, Cl. 395-750.000.
Enge, Per; Farmer, Dominic; and Westfall, Brian, to Trimble Navigation Limited. Adaptive noise cancellation. 5,465,413, Cl. 455-307.000.
Engel, Jürgen: *See*—
Kutscher, Bernhard; Niebch, Georg; Fleischhauer, Ilona; Engel, Jürgen; Achterrath-Tuckermann, Uta; and Szelenyi, Stefan, 5,464,838, Cl. 514-248.000.
Ennis, G. Thomas, to N/S Corporation. Mechanized automated vehicle washing apparatus. 5,463,788, Cl. 15-97.300.
Envirovac, Inc.: *See*—
Shenk, David, 5,464,191, Cl. 251-129.210.
Enzyme Research & Development Corporation: *See*—
Bruno, Mark, 5,464,766, Cl. 435-187.000.
Epstein, Edward A., to International Business Machines Corporation. Speech recognition system with improved rejection of words and sounds not in the system vocabulary. 5,465,317, Cl. 395-2.450.
Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adaniva, George, to Abbott Laboratories. Infusion system having plural fluid input ports and at least one patient output port. 5,464,392, Cl. 604-67.000.
Erbora, Levent Y.: *See*—
Borras, Jaime A.; Chambers, Mark J.; Finol, Jesus S. Pena; Gonzalez, Armando J.; Carralero, Cesar W.; Beladi, Sayed H.; and Erbora, Levent Y., 5,465,409, Cl. 455-260.000.
Erdmann, Klaus: *See*—
Weyh, Werner; Schwander, Udo; Gatter, Raimond; Notar, Robert; Konopa, Helmut; and Erdmann, Klaus, 5,464,124, Cl. 222-129.100.
Eremina, Evgenia N.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa P.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.
Erhart, Richard A., to Vivid Semiconductor, Inc. High voltage CMOS logic using low voltage CMOS process. 5,465,054, Cl. 326-34.000.
Erland, Robert K. Fiber reinforced plastic (FRP) composite hinge. 5,463,794, Cl. 16-225.000.
Erpelding, A. David: *See*—
Bajorek, Christopher H.; Erpelding, A. David; Garfunkel, Glen A.; Pattanaik, Surya; Robertson, Neil L.; and Wallash, Albert J., 5,465,186, Cl. 360-113.000.
Esch, Frederick S.: *See*—
Baird, Andrew J.; Esch, Frederick S.; Gospodarowicz, Denis; Bohlen, Peter; and Ling, Nicholas C., 5,464,774, Cl. 536-23.510.
Espinel, Carlos H. Evaluation of salt sensitivity in hypertension. 5,464,018, Cl. 128-672.000.
ETA SA Fabriques D'Ebauches: *See*—
Koch, Daniel, 5,465,239, Cl. 368-72.000.
Ethicon Endo-Surgery, Inc.: *See*—
Fujitsu, Kazuhiko; Asahara, Tomohiko; Kagaminuma, Nobuhiro; and Iwai, Kohichi, 5,464,405, Cl. 606-51.000.
Ethicon, Inc.: *See*—
Bezwada, Rao S.; and Jamiolkowski, Dennis D., 5,464,929, Cl. 528-361.000.
Popescu, Miron G.; Bekus, David F.; Routh, Shakti; Vera, Luis E.; and Clark, Thomas A., 5,464,580, Cl. 422-34.000.
Steckel, Mark G., 5,464,416, Cl. 606-158.000.
Travers, John D.; and Helzner, Eileen C., 5,464,869, Cl. 514-574.000.
Ethyl Corporation: *See*—
Sieberth, John F., 5,464,549, Cl. 252-51.50A.
Evans, Ben E.: *See*—
Bock, Mark G.; Evans, Ben E.; Culberson, J. Christopher; Gilbert, Kevin F.; Rittle, Kenneth E.; and Williams, Peter D., 5,464,788, Cl. 514-252.000.
Evans, Robert E.: *See*—
Avotins, Peter V.; and Evans, Robert E., 5,464,465, Cl. 75-313.000.
Evans, Robert J.; and Chum, Helena L., to Midwest Research Institute. Sequential pyrolysis of plastic to recover polystyrene HCL and terephthalic acid. 5,464,602, Cl. 423-488.000.
Everbrite, Inc.: *See*—
Grinwald, Harold M.; and Blok, Glen R., 5,464,178, Cl. 248-50.000.
Eveready Battery Company, Inc.: *See*—
Getz, Dale R.; Nardi, John C.; and Scarr, Robert F., 5,464,709, Cl. 429-229.000.
Everett, Richard C. Bicycle brake shoe with cleaning portion. 5,464,075, Cl. 188-24.120.
Executone Information Systems, Inc.: *See*—
Chaco, John, 5,465,082, Cl. 340-825.540.
Clare, William K.; and Sundby, Donn P., 5,465,286, Cl. 379-34.000.
Exxon Research & Engineering Co.: *See*—
Ramanarayanan, Trikur A.; Pareek, Vinod K.; Mumford, James D., III; and Witzke, Horst, 5,464,523, Cl. 204-424.000.
Ezra, David: *See*—
Woodgate, Graham J.; and Ezra, David, 5,465,175, Cl. 359-463.000.
F.A.O.M.S. S.R.L.: *See*—
Curto, Caterino; and Longo, Gianantonio, 5,465,122, Cl. 351-124.000.
Fabreeka International, Inc.: *See*—
Dankowski, John C., 5,464,196, Cl. 267-140.130.
Falcone, Ronald, to Hewlett-Packard Company. Patient alarm detection using target mode. 5,464,012, Cl. 128-630.000.
Falsetti, James S.: *See*—
Brooker, Donald D.; Falsetti, James S.; Wolfenbarger, James K.; and Vuong, Dinh-Cuong, 5,464,592, Cl. 422-207.000.
Falvey, Neil J.; Day, Edwin J., III; Nappier, Ricky L.; and Longtin, John T., to Cellular Hotline, Inc., The. Point-of-sale system for programming a cellular telephone with its assigned telephone number. 5,465,288, Cl. 379-58.000.
Fantacone, Mark J.: *See*—
Cook, Thomas E.; Fantacone, Mark J.; Galbraith, Robert E.; Glassen, Steven G.; Meritt, Allan S.; Oakes, Kenneth J.; and Yudenfriend, Harry M., 5,465,355, Cl. 395-200.150.
Fantin, Ronald M.: *See*—
Racine, Lloyd G.; Feldpausch, James P.; and Fantin, Ronald M., 5,464,267, Cl. 296-216.000.
Fanuc Ltd.: *See*—
Kinoshita, Yasunori; Fujimori, Shinichi; and Kobayashi, Keiko, 5,465,077, Cl. 335-132.000.
Farmer, Dominic: *See*—
Enge, Per; Farmer, Dominic; and Westfall, Brian, 5,465,413, Cl. 455-307.000.
Farquharson, Ronald H.; and Still, Danny P. Attachment for artificial arm prosthetic device. 5,464,444, Cl. 623-65.000.
Farr, James B., to Tecumseh Products Company. Inductively activated control and protection circuit for refrigeration systems. 5,463,874, Cl. 62-126.000.
Farrell, Dennis A. Squirt book. 5,464,253, Cl. 281-38.000.
Farrell, Michael P.; and Lin-Goerke, Juili L., to Galloway, Norval B. Methods and compositions for reducing false positive signals in an RNA amplification system. 5,464,744, Cl. 435-6.000.
Farrer, Steven M.: *See*—
Reddy, Chandrashekar M.; Hirose, Scott D.; Cho, Sung-Soo; Kardach, James P.; Farrer, Steven M.; and Roberts, Meeling, 5,465,367, Cl. 395-750.000.
Fasimo, Victor. Animal-operative, animal feeder. 5,463,979, Cl. 119-54.000.
Fassih-Nia, Mohammed, to Texas Optoelectronics, Inc. Universal safety system for automatic doors. 5,465,033, Cl. 318-480.000.
Fast S.p.A.: *See*—
Levrangi, Stefano, 5,464,268, Cl. 297-57.000.
Faughn, Jim A., to United States of America, Army. Automatic guntube ember extinguisher system. 5,463,926, Cl. 89-1.200.
Faxon, David P.; and Haudenschild, Christian C. Catheter for delivering therapeutic and/or diagnostic agents to the tissue surrounding a bodily passageway. 5,464,395, Cl. 604-96.000.
Fazio, Bonnie F.: *See*—
Mills, Veronica A.; and Fazio, Bonnie F., 5,464,024, Cl. 128-849.000.
Federhen, Bernd, to ALB. Klein GmbH & Co. KG. Conveyor conduit for bulk material to be pneumatically conveyed. 5,464,310, Cl. 406-164.000.
Federspiel, Clifford C., to Johnson Service Company. Method and apparatus for estimating the rate at which a gas is generated within an enclosed space. 5,464,369, Cl. 454-256.000.
Feduikovich, Valeri N.: *See*—
Goriachev, Vladislav L.; Bratsev, Alexander N.; Feduikovich, Valeri N.; Rutberg, Philip G.; Greene, Hugh W.; and Chism, Paul E., Jr., 5,464,513, Cl. 204-164.000.
Feldpausch, James P.: *See*—
Racine, Lloyd G.; Feldpausch, James P.; and Fantin, Ronald M., 5,464,267, Cl. 296-216.000.
Fellinger, Lennart E.: *See*—
Karlsson, Hans B.; Fellinger, Lennart E.; and Micael, Axel T., 5,463,931, Cl. 91-428.000.
Feng, Kai D.: *See*—
Chu, Ching; Liao, David; and Feng, Kai D., 5,465,143, Cl. 356-73.100.
Fennhoff, Gerhard: *See*—
Archey, Rick L.; Lundy, Charles E.; Meltzer, Aaron D.; Pielartzik, Harald; Fennhoff, Gerhard; Hufen, Ralf; Kircher, Klaus; Schubart, Rudiger; and Weider, Richard, 5,464,893, Cl. 524-366.000.
Ferag AG: *See*—
Stauber, Hans-Ulrich, 5,464,199, Cl. 270-53.000.
Ferber, Gerald J.; and Smith, Graham J., to Bush Boake Allen Limited. Compositions for cleaning articles with 2-ethylhexanol and p-cymene. 5,464,557, Cl. 252-170.000.
Ferguson, Alan C. Rearward approach curb jumper for a hand truck. 5,464,234, Cl. 280-5.320.
Ferrar, Wayne T.; Vreeland, William B.; Hewitt, Charles E.; Fitzgerald, John J.; and Binga, Tonya D., to Eastman Kodak Company. Tin oxide filled dimethylsiloxane-fluoroalkylsiloxane fuser roll for fixing toner to a substrate. 5,464,703, Cl. 428-421.000.
Ferrar, Wayne T.: *See*—
Chen, Jiann H.; Fitzgerald, John J.; Vreeland, William B., II; Ferrar, Wayne T.; Roberts, Gary F.; and Staudenmayer, William J., 5,464,698, Cl. 428-421.000.
Fetterhoff, John G.: *See*—

St. John, James P.; Fetterhoff, John G.; Carpenter, John R.; Brown, B. Douglas; Azzara, C. Daniel; Tarka, Stanley M., Jr.; Rank, Craig; and Strohmaier, George K., 5,464,649, Cl. 426-660.000.

Feustle, Lisa E.: *See*—
Fowler, Kimberly A.; and Feustle, Lisa E., 5,464,149, Cl. 229-120.270.

Fichtel & Sachs AG: *See*—
Gajek, Joachim; and Dumbser, Gerhard, 5,464,239, Cl. 280-264.000.
Schierling, Bernhard; and Göbel, Hilmar, 5,463,900, Cl. 73-469.000.

Figura, Thomas A.; and Schuele, Paul J., to Micron Technology, Inc. Method for forming a capacitor having recessed lateral reaction barrier layer edges. 5,464,786, Cl. 437-52.000.

Filippini, Lucio: *See*—
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Riva, Raul; Garavaglia, Carlo; and Mirenna, Luigi, 5,464,836, Cl. 514-239.200.

Fin Control Systems Pty. Limited: *See*—
Whitty, Brian A., 5,464,359, Cl. 441-79.000.

Finan, Edward M.: *See*—
Finocchio, Anthony J.; and Finan, Edward M., 5,465,200, Cl. 362-368.000.

Findeisen, Kurt: *See*—
Haas, Wilhelm; Linker, Karl-Heinz; Schallner, Otto; Findeisen, Kurt; Santel, Hans-Joachim; and Dollinger, Markus, 5,464,810, Cl. 504-270.000.

Fine, Stephen M.; and Bohling, David A., to Air Products and Chemicals, Inc. Process for chemical vapor codeposition of copper and aluminum alloys. 5,464,666, Cl. 427-576.000.

Finnah, Josef, to GEA Finnah GmbH. Method and machine for drawing off foods and drinks aseptically. 5,464,595, Cl. 422-297.000.

Finney, Clifton D. Superventuri power source. 5,464,320, Cl. 415-60.000.

Fino, James R., to Abbott Laboratories. Haptens, tracers, immunogens and antibodies for carbazole and dibenzofuran derivatives. 5,464,746, Cl. 435-6.000.

Finocchio, Anthony J.; and Finan, Edward M., to General Motors Corporation. Lamp assembly fastening system. 5,465,200, Cl. 362-368.000.

Finol, Jesus S. Pena: *See*—
Borras, Jaime A.; Chambers, Mark J.; Finol, Jesus S. Pena; Gonzalez, Armando J.; Carralero, Cesar W.; Beladi, Sayed H.; and Erbora, Levent Y., 5,465,409, Cl. 455-260.000.

Firmenich S.A.: *See*—
Muller, Bernard; Gautier, Antoine; Dean, Christopher; and Kuhn, Jean-Charles, 5,464,761, Cl. 435-147.000.

Firmenich SA: *See*—
Gaudin, Jean-Marc, 5,464,824, Cl. 512-13.000.

Fischel, Halbert, to McLaughlin, William F. Blood fractionation system and method. 5,464,534, Cl. 210-321.680.

Fischer, Dan E.; and Picavet, Fred, to Ultradent Products, Inc. Syringe system for matching tooth composite colors. 5,464,348, Cl. 433-26.000.

Fischer, Wolfgang H.: *See*—
Potter, Ellen; Behan, Dominic P.; Fischer, Wolfgang H.; Linton, Elizabeth A.; Lowry, Philip J.; and Vale, Wylie W., Jr., 5,464,757, Cl. 435-69.100.

Fisher, Mark J.: *See*—
Prince, George T.; and Fisher, Mark J., 5,464,330, Cl. 417-245.000.

Fishpaugh, Jeffrey R.: *See*—
Adamczyk, Maciej; Fishpaugh, Jeffrey R.; Johnson, Donald; and Hruska, Robert E., 5,464,767, Cl. 435-188.000.

Fitch, Frank R.; Bülow, Martin; and Ojo, Adeola F., to BOC Group, Inc., The. Adsorptive separation of nitrogen from other gases. 5,464,467, Cl. 95-96.000.

Fitzgerald, John J.: *See*—
Chen, Jiann H.; Fitzgerald, John J.; Vreeland, William B., II; Ferrar, Wayne T.; Roberts, Gary F.; and Staudenmayer, William J., 5,464,698, Cl. 428-421.000.
Ferrar, Wayne T.; Vreeland, William B.; Hewitt, Charles E.; Fitzgerald, John J.; and Binga, Tonya D., 5,464,703, Cl. 428-421.000.

Fitzgibbon, Denise R., to Metton America, Inc. Method of injection molding articles with selective concentrations or gradients of materials. 5,464,585, Cl. 264-108.000.

Fjerstad, Erik A.: *See*—
Durkee, Scott R.; and Fjerstad, Erik A., 5,465,227, Cl. 364-825.000.

Flagg, Edward E.: *See*—
Schmidt, Donald L.; Rose, Gene D.; and Flagg, Edward E., 5,464,538, Cl. 210-490.000.

Flammer, George H., to Metricom, Inc. Automatic power level control of a packet communication link. 5,465,398, Cl. 455-69.000.

Flater, James H., to Holland Hitch Company. Plural height powered fifth wheel hitch. 5,464,241, Cl. 280-425.100.

Fleischer, James F.: *See*—
Anthony, Thomas R.; and Fleischer, James F., 5,464,665, Cl. 427-570.000.

Fleischhauer, Ilona: *See*—
Kutscher, Bernhard; Niebch, Georg; Fleischhauer, Ilona; Engel, Jürgen; Achterrath-Tuckermann, Ute; and Szelenyi, Stefan, 5,464,838, Cl. 514/248.000.

Fleury, Marc; Lenormand, Roland; and Ringot, Gabriel, to Institut Francais du Petrole. Process and device for surveying the properties of a permeable material. 5,463,894, Cl. 73-38.000.

Florida State University: *See*—
Hascicek, Yusuf S.; and Testardi, Louis R., 5,464,813, Cl. 505-490.000.

Flory, Robert S.: *See*—
Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,463,921, Cl. 83-151.000.

Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; Grubbs, Gray W.; and Kyselica, Stefan P., to General Electric Company. Arc welding apparatus with variable polarity reversing device and control. 5,464,958, Cl. 219-130.510.

Flurry International, Inc.: *See*—
Alpers, Helmut A.; and Russett, Jon P., 5,464,120, Cl. 222-1.000.

Fogarty, Thomas J.; and Howell, Thomas A., to Sony Corporation. Implantable defibrillator electrodes. 5,464,447, Cl. 607-129.000.

Fogarty, Thomas J.: *See*—
Ryan, Timothy J.; Fogarty, Thomas J.; and Mollenauer, Kenneth H., 5,464,449, Cl. 623-1.000.

Fogle, John R., to Phillips, Robert L. Ribbed flexible cutting line. 5,463,815, Cl. 30-276.000.

Folci, Giovanni A., to Black & Decker Inc. Saw blade mounting apparatus. 5,464,184, Cl. 248-425.000.

Foley, Michael F.: *See*—
Bernardon, Edward; and Foley, Michael F., 5,464,337, Cl. 425-112.000.

Folkerts, Charles H.: *See*—
Livshits, Mikhail; Sanvido, David J.; and Folkerts, Charles H., 5,463,993, Cl. 123-339.200.

Follett, Gary J.: *See*—
Köhler, Günter A.; Kirk, Seth M.; and Follett, Gary J., 5,464,667, Cl. 427-577.000.

Fong, Vincent L., to Rohm Corporation. Transition detector circuit. 5,465,062, Cl. 327-172.000.

Ford Motor Company: *See*—
Pursifull, Ross D.; and Kotwicki, Allan J., 5,464,000, Cl. 123-674.000.
Rao, V. Durga N., 5,464,486, Cl. 148-525.000.
Whitecar, John E.; and Plowdrey, Robert D., 5,465,406, Cl. 455-234.100.
Zaluzec, Matthew J.; Grab, Gerald A.; and Smith, Warren A., 5,464,146, Cl. 228-208.000.

Formosa, Daniel J.: *See*—
Stowell, Davin; and Formosa, Daniel J., 5,463,814, Cl. 30-232.000.

Fortune Dragon Pte Ltd: *See*—
Chee, Richard W. M.; and Low, Sharon A. H., 5,464,294, Cl. 401-269.000.

Foster, Dean H.; Holbrook, Russell W.; Morabito, James; Silverberg, Morton; and Supron, Steven A., to Pitney Bowes Inc. Registration power stacker. 5,464,317, Cl. 414-798.200.

Foster, Jimmy G.: *See*—
Dell, Timothy J.; and Foster, Jimmy G., 5,465,262, Cl. 371-49.300.

Foster, Michael J.: *See*—
Lietz, Paul P., Jr.; and Foster, Michael J., 5,464,481, Cl. 134-6.000.

Foster, Norman: *See*—
Zuerner, Edwin C.; Ratzelt, Robert R.; and Foster, Norman, 5,464,556, Cl. 252-170.000.

Foster, Ricky L.: *See*—
Priebe, W. F.; Foster, Ricky L.; and Pierce, Michael C., 5,464,188, Cl. 248-678.000.

Foster Wheeler Energy Corporation: *See*—
Abdulally, Iqbal F., 5,463,968, Cl. 110-347.000.
Tang, John T., 5,464,597, Cl. 423-210.000.

Fowke, Lawrence C.: *See*—
Attree, Stephen M.; and Fowke, Lawrence C., 5,464,769, Cl. 435-240.400.

Fowler, Charles J. C., to Krone AG. Telephone cross connect status signal pre-processor. 5,465,256, Cl. 370-110.100.

Fowler, Donald W.; Lappos, Nicholas D.; and Edwards, Joan A., to United Technologies Corporation. Helicopter integrated fire and flight control having a pre-launch and post-launch maneuver director. 5,465,212, Cl. 364-427.000.

Fowler, Kimberly A.; and Feustle, Lisa E., to Lever Brothers Company. H-partition and display case. 5,464,149, Cl. 229-120.270.

Fowler, Reginald H.: *See*—
Parekh, Shafi; Geiger, Bernard M.; Tsimberg, Alexander; Malik, Zaya H.; and Fowler, Reginald H., 5,463,878, Cl. 62-394.009.

Foxboro Company, The: *See*—
Kalinoski, Richard W., 5,463,904, Cl. 73-861.240.

FPS Food Processing Systems, Inc.: *See*—
Alexander, Robert J.; and Stanglein, Daniel C., 5,463,847, Cl. 53-473.000.

Fraklin, David S.: *See*—
Gleeson, John K.; and Fraklin, David S., 5,465,086, Cl. 340-825.440.

France Telecom: *See*—
Cohen, Robert, 5,465,390, Cl. 455-33.400.
Skotnicki, Tomasz; and Merckel, Gérard, 5,465,001, Cl. 257-370.000.
Thepaut, André; and Ouvradou, Gerald, 5,465,375, Cl. 395-800.000.

France Transfo: *See*—
Sacotte, Michel, 5,463,806, Cl. 29-605.000.

Franci, François-Marie, to Helverep S.A. Method for recovering a synthetic waste material contaminated with other materials. 5,464,877, Cl. 521-48.000.

Frank, Edward: *See*—
Bechtolsheim, Andreas; Frank, Edward; Testa, James; and Storm, Shawn, 5,465,229, Cl. 365-52.000.

Frankel, Julius: *See*—

Abbate, Agostino; Frankel, Julius; Scholz, Wilfried; Colangelo, Vito J.; and Korman, William J., 5,463,896, Cl. 73-81.000.

Franz Haas Waffelmaschinen Industriegesellschaft m.b.H.: *See*—
Koletnik, Erich; Haas, Franz; and Haas, Johann, 5,463,939, Cl. 99-353.000.

Franzblau, William I.: *See*—
Bejan, Robert S.; Centanni, Kevin P.; Gaertner, Scott R.; and Franzblau, William I., 5,465,384, Cl. 455-2.000.

Fraser, Glenn R.: *See*—
Dougherty, Richard M.; and Fraser, Glenn R., 5,465,420, Cl. 455-333.000.

Frassanito, John R.: *See*—
Mitchell, Joseph; and Frassanito, John R., 5,464,170, Cl. 242-598.000.

Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.v.: *See*—
Maschmann, Martin; Schardein, Werner; and Hosticka, Bedrich, 5,465,074, Cl. 330-263.000.

Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V.: *See*—
Ledjeff, Konstantin; Schuler, Alexander; and Gieshoff, Jurgen, 5,464,006, Cl. 126-361.000.

Freeman, Roy M.; Hergenrother, William L.; and Ravagnani, Frederick J., to Bridgestone Corporation. High modulus low hysteresis rubber compound for pneumatic tires. 5,464,899, Cl. 524-504.000.

Freissle, Manfred F. A. Screening arrangement. 5,464,101, Cl. 209-405.000.

Friday, James A., to Eastman Kodak Company. Photographic material having reduced fog. 5,464,733, Cl. 430-507.000.

Friedl, Stephan E.: *See*—
Abela, George S.; Friedl, Stephan E.; and Mathews, Eric D., 5,464,404, Cl. 606-15.000.

Friesen, Dwayne T.; Newbold, David D.; McCray, Scott B.; and Ray, Roderick J., to Bend Research, Inc. Pervaporation by countercurrent condensable sweep. 5,464,540, Cl. 210-640.000.

Frigo, Timothy B.: *See*—
Burton, James; Dong, Zhengxin; and Frigo, Timothy B., 5,464,820, Cl. 514-16.000.

Prigulti, Ronnie J.: *See*—
Woo, Lansing S.; and Prigulti, Ronnie J., 5,463,884, Cl. 70-16.000.

Fritz, David P.: *See*—
O'Halloran, Michael L.; Case, Cecil L.; Pruitt, Martin E.; and Fritz, David P., 5,463,852, Cl. 56-6.000.

Froezert USA, Inc.: *See*—
Parekh, Shafi; Geiger, Bernard M.; Tsimberg, Alexander; Malik, Zaya H.; and Fowler, Reginald H., 5,463,878, Cl. 62-394.000.

Frölich, Jürgen C.; and Bippi, Herbert. Prostaglandin E1 derivatives for transdermal administration and methods of treatment therewith. 5,464,868, Cl. 514-530.000.

Frommann, Christian: *See*—
Grienberger, Johann; Bogner, Rudolf; and Frommann, Christian, 5,464,542, Cl. 210-784.000.

Frostrom, Tore; Nilsson, Tomas J.; Andersson, Yngve; Carlsson, Michael M. J.; Sundell, Lars-Olof; and Uden, Jonas P., to Telefonaktiebolaget LM Ericsson. Simulated air interface system for simulating radio communication. 5,465,393, Cl. 455-54.100.

Fruchey, Olan S.: *See*—
Vicari, Richard; Kvakovszky, George; and Fruchey, Olan S., 5,464,923, Cl. 528-68.000.
Vicari, Richard; Kvakovszky, George; Fruchey, Olan S.; and Metz, Hans J., 5,464,941, Cl. 534-741.000.

Fry, Robert J., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Direct sequence spread spectrum direction finder. 5,465,097, Cl. 342-442.000.

Fry, Ted, to Asten, Inc. Textile dryer apparatus having an improved textile dryer fabric. 5,464,685, Cl. 428-229.000.

Fu, Edward; and Narayanan, Kolazi S., to ISP Investments Inc. Extrudible wet paste composition of an agriculturally active chemical; free-flowing, water-dispersible or water-soluble granules therefrom. 5,464,627, Cl. 424-409.000.

Fu, Thomas Z.: *See*—
Gardiner, Eric S.; and Fu, Thomas Z., 5,464,691, Cl. 428-336.000.

Fuehrer, Reece R.; and Martin, Roy K., to General Motors Corporation. Drive-reversing gearing for an engine driven transmission. 5,463,915, Cl. 74-665.00H.

Fueki, Kazumasa, to Ricoh Company, Ltd. Data to access files in an optical disk are copied to a hard drive where the data are maintained even upon removal of the disk. 5,465,350, Cl. 395-600.000.

Fuji, Hiroshi, to Sharp Kabushiki Kaisha. Deflecting a light beam in the same direction and speed of a recording medium by a rotating polygon or a holographic disk. 5,465,248, Cl. 369-112.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Harada, Kuniyuki; Sawada, Kazutaka; Hosoya, Yoshiteru; and Shibusawa, Tetsuo, 5,464,671, Cl. 428-40.000.

Fuji Photo Film Co., Ltd.: *See*—
Akiyama, Keiji; Watanabe, Noriaki; Hotta, Hisashi; Toyama, Tadao; and Nishimiya, Nobuyuki, 5,464,724, Cl. 430-272.000.
Anayama, Ushio, 5,465,125, Cl. 353-26.00A.
Higashi, Tatsuji; and Yasuda, Noboru, 5,464,686, Cl. 430-272.000.
Inagaki, Yoshio; and Suga, Shuzo, 5,464,734, Cl. 430-570.000.
Kawakami, Hiroshi; Nozaki, Chiyoshi; and Iwakura, Ken, 5,464,804, Cl. 503-217.000.
Kawasumi, Seiji; and Inukai, Yuzo, 5,463,952, Cl. 101-454.000.
Ohki, Nobutaka; Asanuma, Naoki; and Takahashi, Osamu, 5,464,731, Cl. 430-505.000.
Okutsu, Eiichi; Toyoda, Takashi; and Ito, Tadashi, 5,464,730, Cl. 430-399.000.

Fuji Pigment Co., Ltd.: *See*—
Ito, Takeo; Matsuda, Hidemi; and Sakai, Kazuo, 5,464,566, Cl. 252-582.000.

Fuji Xerox Co., Ltd.: *See*—
Azumaya, Kengo; Hirayama, Yoshiyuki; and Tasaki, Kazuhiro, 5,465,307, Cl. 382-165.000.
Ota, Takeshi, 5,465,265, Cl. 372-101.000.
Sakaguchi, Yasuo; Daimon, Katsumi; Takahashi, Michiaki; Yamasaki, Kazuo; and Yamaguchi, Yasuhiro, 5,464,717, Cl. 430-58.000.
Shiratsuki, Yoshiyuki; Yamaguchi, Yoshinori; Hayashi, Kazuhiro; and Niitsu, Takahiro, 5,464,990, Cl. 257-40.000.
Yagi, Shigeru; and Ono, Masato, 5,464,721, Cl. 430-126.000.
Yashiki, Yuichi, 5,464,716, Cl. 430-41.000.

Fujigen Inc.: *See*—
Kamijyo, Yoshimochi, 5,463,923, Cl. 84-291.000.

Fujii, Hiroshi: *See*—
Ibori, Satoshi; Yamashita, Hitoshi; Baba, Shigeyuki; Fujii, Hiroshi; Kambara, Takatsugu; and Ishibashi, Akira, 5,465,202, Cl. 363-37.000.

Fujii, Tatsuya; and Shiraishi, Naoto, to Ricoh Company Ltd. Sorter for sorting data based on a plurality of reference value data. 5,465,371, Cl. 395-800.000.

Fujimaki, Nobuyoshi, to Shin-Etsu Handotai Co., Ltd. Method and apparatus for evaluation of semiconductor production process. 5,464,779, Cl. 437-11.000.

Fujimori, Naoji: *See*—
Hachigo, Akihiro; Nakahata, Hideaki; Shikata, Shinichi; and Fujimori, Naoji, 5,463,901, Cl. 73-753.000.

Fujimori, Shinichi: *See*—
Kinoshita, Yasunori; Fujimori, Shinichi; and Kobayashi, Keiko, 5,465,077, Cl. 335-132.000.

Fujimoto, Hisayoshi, to Rohm Co., Ltd. Ink jet print head and ink jet printer. 5,465,108, Cl. 347-68.000.

Fujisawa, Shinobu; and Nakagawara, Kazuhiko, to TEAC Corporation. Method and apparatus for the jam-free starting of tape transportation. 5,464,167, Cl. 242-334.000.

Fujisawa, Teruhiko; and Ito, Koichi, to Seiko Epson Corporation. Antenna apparatus for transceiver. 5,465,098, Cl. 343-718.000.

Fujitsu, Kazuhiko; Asahara, Tomohiko; Kagaminuma, Nobuhiro; and Iwai, Kohichi, to Ethicon Endo-Surgery, Inc. Bipolar surgical tweezers. 5,464,405, Cl. 606-51.000.

Fujitsu Limited: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mituhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.
Goto, Gensuke, 5,465,226, Cl. 364-757.000.
Hanafusa, Akihiko; and Tada, Toshihiko, 5,465,259, Cl. 371-22.300.
Haruki, Tamae; Nakagawa, Kenji; Taguchi, Masao; Tanaka, Hiroyuki; Asai, Satoru; and Hanyu, Isamu, 5,465,220, Cl. 364-525.000.
Ishikawa, Tetsuro, 5,465,182, Cl. 360-75.000.
Nakao, Tomoyuki, 5,465,112, Cl. 348-4.000.
Nakazawa, Takayuki; Okizuka, Takafumi; Takebe, Nobuyuki; and Annen, Jinshi, 5,465,352, Cl. 395-600.000.
Sato, Taizo, 5,465,334, Cl. 395-375.000.
Tanaka, Yosahinori, 5,465,316, Cl. 395-2.280.

Fujitsu Ten Limited: *See*—
Nakatani, Yasuhiro; Ichimura, Atsushi; Tanaka, Toshio; Takeuchi, Hiroshi; and Okano, Yoichi, 5,465,089, Cl. 340-995.000.

Fukami, Tadashi: *See*—
Kunito, Yoshiyuki; and Fukami, Tadashi, 5,465,179, Cl. 360-8.000.

Fukazawa, Akira: *See*—
Horikawa, Hiroshi; Honzawa, Eiji; Masumura, Tadahiro; and Fukazawa, Akira, 5,464,637, Cl. 426-2.000.

Fukuda, Hideo, to Mita Industrial Co., Ltd. Focusing lens holding mechanism used in optical system. 5,465,126, Cl. 353-101.000.

Fukuda, Masao, to Ishida Co., Ltd. Longitudinal sealer for packaging machine. 5,463,850, Cl. 53-551.000.

Fukuda, Tatsuya; Mori, Shigeru; Hayashikoshi, Masanori; and Sawada, Seiji, to Mitsubishi Denki Kabushiki Kaisha. Pulse generating circuit with temperature compensation. 5,465,063, Cl. 327-512.000.

Fukui, Takao: *See*—
Kimura, Haruo; Sekino, Yoshio; Masuya, Takashi; and Fukui, Takao, 5,464,954, Cl. 200-61.620.

Fukushima, Hisashi; Uchikawa, Yoshio; and Mizoguchi, Yoshito, to Canon Kabushiki Kaisha. Method and apparatus for correcting image formation using fuzzy logic. 5,465,111, Cl. 347-115.000.

Fukushima, Shigenobu; Nakatani, Munehiro; Muramatsu, Hideo; Tsuboi, Toshio; Hamano, Hiroaki; and Hamano, Kanako, to Minolta Camera Kabushiki Kaisha. Image reading apparatus. 5,465,172, Cl. 358-498.000.

Fukuzawa, Daizo: *See*—
Okuda, Kouichi; Nakamura, Shunji; Yoshimoto, Toshio; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Fukuzawa, Daizo; Nanbu, Tomoko; and Suzuki, Hidenobu, 5,464,964, Cl. 219-497.000.

Funada, Masahiro; Kitamura, Toshiyuki; Yamamoto, Mitsuhiro; and Ohta, Eiji, to Canon Kabushiki Kaisha. Image processing apparatus and method for confirming the state of an addition device. 5,465,161, Cl. 358-438.000.

Fuoco, Daniel P.: *See—*
Deloye, Michael J.; Fuoco, Daniel P.; and Moeller, Dennis L., 5,465,332, Cl. 395-842.000.
Furman, Daniel S., to AT&T IPM Corp. Caller directed routing of a telephone call based on a dialed suffix. 5,465,295, Cl. 379-211.000.
Furst, Robert E.: *See—*
Aureli, William D.; and Furst, Robert E., 5,463,811, Cl. 29-898.046.
Furukawa Denchi Kabushiki Kaisha: *See—*
Mizuno, Takashi, 5,464,654, Cl. 427-123.000.
Furukawa Electric Co., Ltd., The: *See—*
Ogiwara, Yoshiaki; Yasuhara, Masaki; and Matsuda, Akira, 5,464,524, Cl. 205-170.000.
Tanaka, Motoharu; Hashimoto, Kyosuke; and Himono, Yusaku, 5,465,255, Cl. 370-85.100.
Furukawa Electronic Co., Ltd., The: *See—*
Jie, Xu; and Suzuki, Kenji, 5,465,314, Cl. 385-85.000.
Furuse, Akira: *See—*
Nakanishi, Akio; Furuse, Akira; Nakagawa, Kazuo; Tsuneda, Makoto; and Nukanobu, Atsushi, 5,465,047, Cl. 324-316.000.
Futaba Denshi Kogyo K.K.: *See—*
Akiba, Nobuo; Ohtsuka, Isao; Shiratori, Shigekazu; and Kase, Katsunori, 5,465,101, Cl. 345-1.000.
Fyler, Donald C.: *See—*
Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,463,921, Cl. 83-151.000.
G. D. Searle & Co.: *See—*
Hallinan, E. Ann; Hagen, Timothy J.; Husa, Robert K.; Tsymbalov, Sofya; Lee, Albert C.; and Van Hoeck, Jean-Pierre, 5,464,830, Cl. 514-211.000.
Hansen, Donald W., Jr.; Peterson, Karen B.; and Monahan, Joseph B., 5,464,843, Cl. 514-300.000.
G.D Societa per Azioni: *See—*
Bina, Roberto; Nespoli, Andrea; and Gamberini, Antonio, 5,464,027, Cl. 131-283.000.
G. Mondini S.p.A.: *See—*
Mondini, Giovanni, 5,464,126, Cl. 222-162.000.
Gabor, E. Allan: *See—*
Hoover, Charles E.; Dennin, Randy J.; Gabor, E. Allan; Schobel, Mark; and Sorg, Albert F., 5,464,631, Cl. 424-454.000.
Gaertner, Scott R.: *See—*
Bejan, Robert S.; Centanni, Kevin P.; Gaertner, Scott R.; and Franzblau, William I., 5,465,384, Cl. 455-2.000.
Gaitan, Michael; Suehle, John S.; Semancik, Stephen; and Cavicchi, Richard E., to United States of America, Commerce. Micro-hotplate devices and methods for their fabrication. 5,464,966, Cl. 219-544.000.
Gajek, Joachim; and Dumbser, Gerhard, to Fichtel & Sachs AG. Bicycle, and a bicycle having a hydraulic brake, and an actuator for a hydraulic brake on a bicycle. 5,464,239, Cl. 280-264.000.
Galbraith, Robert E.: *See—*
Cook, Thomas E.; Fantacone, Mark J.; Galbraith, Robert E.; Glassen, Steven G.; Meritt, Allan S.; Oakes, Kenneth J.; and Yudenfriend, Harry M., 5,465,355, Cl. 395-200.150.
Gall, Arthur; Meier, Heinz; Kuphal, Wilko; and Vogel, Georg, to Siemens Aktiengesellschaft. X-ray examination apparatus having an X-ray film cassette loading and positioning device. 5,465,285, Cl. 378-173.000.
Gallico, Licia: *See—*
Long, Giorgio; De Cillis, Giampiero; Rozzi, Antonella; D'Alò, Simonetta; and Gallico, Licia, 5,464,844, Cl. 514-301.000.
Galloway, Norval B.: *See—*
Farrell, Michael P.; and Lin-Goerke, Juili L., 5,464,744, Cl. 435-6.000.
Galocy, Baran. Split-keyboard midi controller. 5,463,925, Cl. 84-423.00R.
Galperin, Leonid B.; Bogdan, Paula L.; and Boldingh, Edwin P., to UOP. Stable, high-yield reforming catalyst. 5,464,800, Cl. 502-66.000.
Galtier, Francois: *See—*
Germain, Alain; Berteaud, Andre-Jean; and Galtier, Francois, 5,464,968, Cl. 219-710.000.
Gamberini, Antonio: *See—*
Bina, Roberto; Nespoli, Andrea; and Gamberini, Antonio, 5,464,027, Cl. 131-283.000.
Gambetti, Mario, to Baumer S.R.L. Method of and apparatus for wrapping an article. 5,463,846, Cl. 53-465.000.
Gangstead, Mervin L.: *See—*
Boardman, John D.; Hamilton, Scott M.; Gangstead, Mervin L.; Sadler, Jimmie L.; Trimble, Richard A.; and Welch, Jeffrey P., 5,465,243, Cl. 369-49.000.
GAO Gesellschaft fur Automation und Organisation mbH: *See—*
Kaspers, Norbert; Lang, Karl-Heinz; Baader, Helmut; Grün, Herbert; and Otto, Thomas, 5,463,953, Cl. 101-485.000.
Garavaglia, Carlo: *See—*
Canaggi, Giovanni; Filippini, Lucio; Guzmeroli, Marilena; Riva, Raul; Garavaglia, Carlo; and Mirenna, Luigi, 5,464,836, Cl. 514-239.200.
Garber, Richard: *See—*
Mierendorf, Robert; Garber, Richard; Novy, Robert; and Hammer, Beth, 5,464,745, Cl. 435-6.000.
Garcon, Nathalie B.: *See—*
Six, Howard R.; and Garcon, Nathalie B., 5,464,630, Cl. 424-450.000.
Gardiner, Eric S.; and Fu, Thomas Z., to Arizona Chemical Company. Laminated barrier film. 5,464,691, Cl. 428-336.000.
Gardner, James H.; and Crayson, Nicholas M. Device for smoking tobacco and the like. 5,464,026, Cl. 131-216.000.
Gared Sports, Inc.: *See—*
Boitano, Robert A., 5,464,207, Cl. 273-1.50R.
Gareiss, Brigitte; Baierweck, Petra; Plachetta, Christoph; and Ulmerich, Karlheinz, to BASF Aktiengesellschaft. Flameproofed thermoplastic polyesters. 5,464,894, Cl. 524-424.000.
Garfunkel, Glen A.: *See—*
Bajorek, Christopher H.; Erpelding, A. David; Garfunkel, Glen A.; Pattanaik, Surya; Robertson, Neil L.; and Wallash, Albert J., 5,465,186, Cl. 360-113.000.
Garinger, Ned; Thomsen, Joseph A.; and Michelsen, Jeffery M., to VLSI Technology, Inc. Decoupled refresh on local and system busses in a PC/at or similar microprocessor environment. 5,465,339, Cl. 395-433.000.
Garner, Charles E., to United States of America, National Aeronautics and Space Administration. Carbon-carbon grid for ion engines. 5,465,023, Cl. 313-293.000.
Gas Research Institute: *See—*
Zemel, Jay N.; and Hsieh, Hsin-Yi, 5,463,899, Cl. 73-195.000.
Gaskins, Darius D.: *See—*
Parks, Terry J.; and Gaskins, Darius D., 5,465,346, Cl. 395-296.000.
Gaster, Laramie M.: *See—*
King, Francis D.; Gaster, Laramie M.; Kaumann, Alberto J.; and Young, Rodney C., 5,464,864, Cl. 514-468.000.
Gatter, Raimond: *See—*
Weyh, Werner; Schwander, Udo; Gatter, Raimond; Notar, Robert; Konopa, Helmut; and Erdmann, Klaus, 5,464,124, Cl. 222-129.100.
Gatzke, Arnold L.: *See—*
Lo, Grace Y.; and Gatzke, Arnold L., 5,464,914, Cl. 526-180.000.
Gaudin, Jean-Marc, to Firmenich SA. Use of furanones as perfuming ingredients. 5,464,824, Cl. 512-13.000.
Gauer, Joseph A., to Whirlpool Corporation. Method and apparatus for operating a microwave dryer. 5,463,821, Cl. 34-261.000.
Gaul, Harald: *See—*
Brown, David; Gaul, Harald; Kushnir, Yosif; Travaglini, Nick; and Wilson, Victor, 5,464,579, Cl. 264-297.200.
Gauri, Kailash K.: *See—*
Stig, Aasmul-Olsen; Widmer, Fred; and Gauri, Kailash K., 5,464,821, Cl. 514-18.000.
Gautier, Antoine: *See—*
Muller, Bernard; Gautier, Antoine; Dean, Christopher; and Kuhn, Jean-Charles, 5,464,761, Cl. 435-147.000.
Gautier, Claudie: *See—*
Courtemanche, Gilles; Gautier, Claudie; Gully, Danielle; Roger, Pierre; Valette, Gérard; and Wermuth, Camille G., 5,464,847, Cl. 514-342.000.
GEA Finnah GmbH: *See—*
Finnah, Josef, 5,464,595, Cl. 422-297.000.
GEC Alsthom Transport SA: *See—*
Bernard, Roger; and Bevand, Jacques, 5,463,963, Cl. 105-168.000.
Geiger, Albert, to Geiger Technik GmbH. Blow molding machine. 5,464,635, Cl. 425-532.000.
Geiger, Bernard M.: *See—*
Parekh, Shafi; Geiger, Bernard M.; Tsimberg, Alexander; Malik, Zaya H.; and Fowler, Reginald H., 5,463,878, Cl. 62-394.000.
Geiger Technik GmbH: *See—*
Geiger, Albert, 5,464,635, Cl. 425-532.000.
Geisler, Douglas R.: *See—*
Bealkowski, Richard; Geisler, Douglas R.; and Turner, Michael R., 5,465,357, Cl. 395-700.000.
Gelman, Andrew E.: *See—*
Kossovsky, Nir; Gelman, Andrew E.; and Hnatyszyn, H. James, 5,464,634, Cl. 424-493.000.
Gelorme, Jeffrey D.; Skarvinko, Eugene R.; and Wang, David W., to International Business Machines Corporation. Photosensitive composition and use thereof. 5,464,726, Cl. 430-326.000.
Gelorme, Jeffrey D.: *See—*
Angelopoulos, Marie; Gelorme, Jeffrey D.; Labadie, Jeffrey W.; Lewis, David A.; Swanson, Sally A.; and Labianca, Nancy C., 5,464,927, Cl. 528-350.000.
Gemert, Barry V.: *See—*
Knowles, David B.; and Gemert, Barry V., 5,464,567, Cl. 252-586.000.
Gemplus Card International: *See—*
Geronimi, Francois; and Sourenian, Paul, 5,465,349, Cl. 364-550.000.
Gendler, El. Flexible membranes produced from organic bone matrix for skeletal repair and reconstruction. 5,464,439, Cl. 623-16.000.
Gendrot, Edouard: *See—*
Cousin, Gérard; Bruna, Etienne; and Gendrot, Edouard, 5,464,632, Cl. 424-465.000.
Genentech: *See—*
Henner, Dennis J.; Vandlen, Richard L.; Wilkins, James A.; and Yansura, Daniel G., 5,464,756, Cl. 435-69.100.
Genentech, Inc.: *See—*
Chamow, Steven; Modi, Nishit; Schwall, Ralph; and Zioncheck, Thomas, 5,464,815, Cl. 514-8.000.
General Atomics: *See—*
Streckert, Holger H.; and Trester, Paul W., 5,464,663, Cl. 427-529.000.
General Binding Corporation: *See—*
Hotkowski, Peter; and Burton, Peter, 5,464,312, Cl. 412-7.000.
General DataComm, Inc.: *See—*
Cole, Paul D., 5,465,273, Cl. 375-296.000.
General Dynamics Land Systems, Inc.: *See—*

Boggavarapu, Rao L.; Goldstein, Yeshayahu S. A.; Keogh, Catherine M.; Suchocki, Anthony J.; and Widner, Melvin M., 5,463,928, Cl. 89-8.000.

General Electric Company: *See*—
Andresen, Peter L.; and Kim, Young J., 5,465,281, Cl. 376-305.000.
Anthony, Thomas R.; and Fleischer, James F., 5,464,665, Cl. 427-570.000.
Bessler, Warren F.; and Bowden, Frank J., 5,463,876, Cl. 62-223.000.
Cowan, Robert L., II; Gordon, Gerald M.; Hale, Donald A.; and Perry, Richard W., 5,465,278, Cl. 376-245.000.
Cunha, Francisco J.; and De Angelis, David A., 5,464,3[illegible]2, Cl. 415-115.000.
Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; Grubbs, Gray W.; and Kyselica, Stefan P., 5,464,958, Cl. 219-130.510.
Hladik, Stephen M.; and Chennakeshu, Sandeep, 5,465,271, Cl. 375-267.000.
Kliman, Gerald B., 5,465,019, Cl. 310-156.000.
Mahood, James A., 5,464,889, Cl. 524-119.000.
Markovitz, Mark; and Sheaffer, Jeffrey D., 5,464,949, Cl. 174-120.00R.
Maughan, James R., 5,464,004, Cl. 126-39.00E.
Pla, Frederic G.; and Hedeen, Robert A., 5,463,893, Cl. 73-4.00R.
Silva, James M.; and Pyles, Robert A., 5,464,930, Cl. 528-371.000.
Smith, Alan W., 5,463,865, Cl. 60-39.142.
Tam, Kwok C., 5,465,283, Cl. 378-4.000.

General Housewares Corp.: *See*—
Stowell, Davin; and Formosa, Daniel J., 5,463,814, Cl. 30-232.000.

General Imaging Corporation: *See*—
Cox, John D.; and Williams, Donald W., 5,464,984, Cl. 250-370.110.

General Mills, Inc.: *See*—
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; and Starr, Frank C., 5,463,845, Cl. 53-459.000.
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; Starr, Frank C.; Roloff, Robb W.; and Devlin, Robert D., 5,463,848, Cl. 53-482.000.

General Motors Corporation: *See*—
Finocchio, Anthony J.; and Finan, Edward M., 5,465,200, Cl. 362-368.000.
Fuehrer, Reece R.; and Martin, Roy K., 5,463,915, Cl. 74-665.00H.
Livshits, Mikhail; Sanvido, David J.; and Folkerts, Charles H., 5,463,993, Cl. 123-339.200.
Sammut, Steven P.; Georgin, Marc J.; Heaston, Bruce A.; Majeed, Kamal N.; and Kowalik, James J., 5,465,209, Cl. 364-424.050.
Walenty, Allen J., 5,465,210, Cl. 364-424.050.

General Surgical Innovations, Inc.: *See*—
Kieturakis, Maciej J.; Mollenauer, Kenneth H.; and Kayan, Helmut L., 5,464,403, Cl. 606-1.000.

Genesis Composites, L.C.: *See*—
Robinson, Alexander J.; and Paragas, Christopher O., 5,464,240, Cl. 280-281.100.

Genetronics, Inc.: *See*—
Hofmann, Gunter A., 5,464,386, Cl. 604-20.000.

Genz, Andreas: *See*—
Langer, Alfred; Genz, Andreas; Deisenhofer, Manfred; Kiele, Walter; Lewandowski, Bernd; and Reichardt, Jürgen, 5,464,462, Cl. 65-65.000.

Georgetown University: *See*—
Monshipouri, Mariam; and Rudolph, Alan S., 5,464,629, Cl. 424-450.000.

Georgia Tech Research Corporation: *See*—
Drabik, Timothy J.; Martin, Kevin P.; and Callahan, John, 5,465,009, Cl. 257-723.000.

Georgin, Marc J.: *See*—
Sammut, Steven P.; Georgin, Marc J.; Heaston, Bruce A.; Majeed, Kamal N.; and Kowalik, James J., 5,465,209, Cl. 364-424.050.

Germain, Alain; Berteaud, Andre-Jean; and Galtier, Francois, to Microondes Energie Systemes; and Solufrance. Device for the control and detection of adequate heat levels in microwave ovens. 5,464,968, Cl. 219-710.000.

Geronimi, Francois; and Sourenian, Paul, to Gemplus Card International. System for monitoring abnormal integrated circuit operating conditions and causing selective microprocessor interrupts. 5,465,349, Cl. 364-550.000.

Getrag Getriebe-und Zahnradfabrik Hermann Hagenmeyer GmbH & Cie: *See*—
Knoedel, Gunter; and Schaarschmidt, Reinhard, 5,463,911, Cl. 74-473.00R.

Getsy, Andy W.: *See*—
Tomba, Charles P.; Scarpucci, Joseph J.; and Getsy, Andy W., 5,464,519, Cl. 204-280.000.

Getz, Dale R.; Nardi, John C.; and Scarr, Robert F., to Eveready Battery Company, Inc. Alkaline cells that are substantially free of mercury. 5,464,709, Cl. 429-229.000.

Gezari, Walter A.; and Marotta, Christopher J., to Stidd Systems, Inc. High-performance seating/support system. 5,463,972, Cl. 114-363.000.

Ghosh-Dastidar, Pradip: *See*—
Weickmann, Joachim L.; and Ghosh-Dastidar, Pradip, 5,464,770, Cl. 435-254.210.

Giapis, Konstantinos P.: *See*—
Aydil, Eray S.; Giapis, Konstantinos P.; and Gottscho, Richard A., 5,464,664, Cl. 427-535.000.

Gibb, Ian; Allen, Philip; and Barnes, Andrew, to Central Research Laboratories Limited. Plasma processing device comprising plural RF inductive coils. 5,464,476, Cl. 118-723.0MP.

Gibbons, Bill: *See*—
Orton, Debra L.; Rollin, Keith A.; and Gibbons, Bill, 5,465,362, Cl. 395-700.000.

Gibson, Jeremy H., to Chen, Faye. Garlic press. 5,463,941, Cl. 99-495.000.

Gielow, Robert L.; and Paul, James C., to Airflow Sciences Corporation. Static mixer device for improving homogeneity of a characteristic of a mixture stream created from fluid streams separately entering the device. 5,463,967, Cl. 110-104.00R.

Gieshoff, Jurgen: *See*—
Ledjeff, Konstantin; Schuler, Alexander; and Gieshoff, Jurgen, 5,464,006, Cl. 126-361.000.

Gifford, William J. Ground effect vehicle. 5,464,069, Cl. 180-116.000.

Giglio, Vito D.: *See*—
Doi, Bryan C.; Thomas, Steven D.; Coli, Vincent J.; and Giglio, Vito D., 5,465,341, Cl. 395-183.060.

Gilbarco, Inc.: *See*—
Nanaji, Seifollah S.; Pope, Kenneth L.; and Sobota, Richard R., 5,464,466, Cl. 95-45.000.

Gilbert, Kevin F.: *See*—
Bock, Mark G.; Evans, Ben E.; Culberson, J. Christopher; Gilbert, Kevin F.; Rittle, Kenneth E.; and Williams, Peter D., 5,464,788, Cl. 514-252.000.

Gilboy, Christopher P., to AT&T Corp. Programmable channel regulating cable television controller. 5,465,113, Cl. 348-5.500.

Gillett, Bruce: *See*—
Nowlin, Duane; and Gillett, Bruce, 5,464,532, Cl. 210-190.000.

Gilmore, Daniel R., III: *See*—
Jaskowiak, Timothy R.; Coughlin, Daniel L.; Perez, Julie A.; Gilmore, Daniel R., III; DiGravio, Thomas L.; and Taft, Kevin H., 5,465,138, Cl. 355-245.000.

Girolomoni, Sauro: *See*—
Basile, Giampiero; Musso, Ezio; Tonelli, Claudio; and Girolomoni, Sauro, 5,464,882, Cl. 521-95.000.

Giuseppe, Caccia; and Luigi, Airoldi, to Universal Ice Cream Machines S.r.l. Automatic machine for dispensing an ice-cream portion. 5,464,119, Cl. 221-156.000.

Glassburn, Tim R.: *See*—
Henson, James A.; McGrath, James P.; Peterson, Bruce R.; Glassburn, Tim R.; Raab, Michael L.; and Do, James H., 5,465,343, Cl. 395-439.000.

Glassen, Steven G.: *See*—
Cook, Thomas E.; Fantacone, Mark J.; Galbraith, Robert E.; Glassen, Steven G.; Meritt, Allan S.; Oakes, Kenneth J.; and Yudenfriend, Harry M., 5,465,355, Cl. 395-200.150.

Glastra, Hendrik, to Industrial Research B.V. Expandable hollow sleeve for the local support and/or reinforcement of a body vessel, and method for the fabrication thereof. 5,464,419, Cl. 606-194.000.

Gleeson, John K.; and Fraklin, David S., to Motorola, Inc. Selective call receiver and method for indicating status of operational parameters with voice messages. 5,465,086, Cl. 340-825.440.

Glenn, Susan C.: *See*—
Cole, Arthur H.; Glenn, Susan C.; and Johnson, Grannis S., 5,464,452, Cl. 8-495.000.

Glidden Company, The: *See*—
Craun, Gary P., 5,464,885, Cl. 523-423.000.

Gnezdilov, Vladimir A. Roller coaster. 5,463,962, Cl. 104-55.000.

Goad, Jeffrey D.: *See*—
Lein, Maureen M.; Pelletier, Gary F.; Goad, Jeffrey D.; and Lee, Chinsoo S., 5,464,661, Cl. 427-409.000.

Göbel, Hilmar: *See*—
Schierling, Bernhard; and Göbel, Hilmar, 5,463,900, Cl. 73-469.000.

Godeau, Denis, to Hutchinson. Plate and an endpiece for a coupling device, a coupling device, and a method of making it. 5,464,256, Cl. 285-26.000.

Goder, Alexey: *See*—
Drucker, Steven; Goder, Alexey; Khalili, Davood; Williams, Kevin; Christensen, Ken; and Major, Emery, 5,464,982, Cl. 250-343.000.

Goela, Jitendra S.: *See*—
Pickering, Michael A.; Goela, Jitendra S.; and Burns, Lee E., 5,465,184, Cl. 360-97.010.

Goetz, Martin; Babiarz, Joseph; Wein, Deborah S.; Anderson, Paul M.; and Lindner, Alan W., to Stratedge Corporation. Ceramic microelectronics package. 5,465,008, Cl. 257-691.000.

Goetz, Norbert: *See*—
Hermeling, Dieter; Koenig, Hartmann; and Goetz, Norbert, 5,464,508, Cl. 204-78.000.

Goetze, Lisa M.: *See*—
. Allen, Ruth A.; Goetze, Lisa M.; Nick, Jeffrey M.; Pushong, Kelly B.; Surman, David H.; and Swanson, Michael D., 5,465,359, Cl. 395-700.000.

Goldberg, Paul B.: *See*—
Levison, Laurence L.; Goldberg, Paul B.; and Stanek, Scott D., 5,465,303, Cl. 382-124.000.

Goldie, James H.: *See*—
Anastas, George V.; and Goldie, James H., 5,465,015, Cl. 310-26.000.

Goldman, David A.; and Dalton, Robert J. Brake lock for in-line roller skate braking system. 5,464,235, Cl. 280-11.200.

Goldstar Co., Ltd.: *See*—
Byun, Yong S., 5,464,478, Cl. 134-1.000.

Gong, Chun S., 5,464,967, Cl. 219-703.000.
Kang, Dae S.; Park, Woo S.; Shin, Hyun H.; Kwon, Soon B.; Marusii, Tatyana Y.; Reznikov, Yuriy A.; Khizhnyak, Anatoliy I.; and Yaroshchuk, Oleg V., 5,464,669, Cl. 428-1.000.

Goldstar Electron Co., Ltd.: *See*—
Han, O. Suk, 5,464,712, Cl. 430-5.000.

Goldstein, Yeshayahu S. A.: *See*—
Boggavarapu, Rao L.; Goldstein, Yeshayahu S. A.; Keogh, Catherine M.; Suchocki, Anthony J.; and Widner, Melvin M., 5,463,928, Cl. 89-8.000.

Golovin, Milton N.: *See*—
Moulton, Russell D.; and Golovin, Milton N., 5,464,707, Cl. 429-212.000.

Golynsky, Arkady; and Wimmer, Donald A., to Westinghouse Electric Corporation. Chair seat tilt adjustment and locking mechanism. 5,464,274, Cl. 297-328.000.

Gonczy, Stephen T.: *See*—
Leung, Roger Y.; and Gonczy, Stephen T., 5,464,594, Cl. 422-288.000.

Gong, Chun S., to Goldstar Co., Ltd. Method for thawing food in microwave oven. 5,464,967, Cl. 219-703.000.

Gonzalez, Armando J.: *See*—
Borras, Jaime A.; Chambers, Mark J.; Finol, Jesus S. Pena; Gonzalez, Armando J.; Carralero, Cesar W.; Beladi, Sayed H.; and Erbora, Levent Y., 5,465,409, Cl. 455-260.000.

Goodwin, Mark L.: *See*—
Tong, Robert R.; Poplett, James M.; McEwen, Alan B.; Mason, Gary E.; Goodwin, Mark L.; Tsai, K. C.; Anderson, Ronald L.; and Nelson, James P., 5,464,453, Cl. 29-25.030.

Goodwin, Raymond G.: *See*—
Smith, Craig A.; and Goodwin, Raymond G., 5,464,938, Cl. 530-350.000.

Goodyear Tire & Rubber Company, The: *See*—
Beard, Richard C.; and Kachner, Michael D., 5,464,051, Cl. 152-454.000.
Bonko, Mark L., 5,464,050, Cl. 152-209.00B.

Gordon, Gerald M.: *See*—
Cowan, Robert L., II; Gordon, Gerald M.; Hale, Donald A.; and Perry, Richard W., 5,465,278, Cl. 376-245.000.

Goriachev, Vladislav L.; Bratsev, Alexander N.; Feduikovich, Valeri N.; Rutberg, Philip G.; Greene, Hugh W.; and Chism, Paul E., Jr., to Scientific Utilization, Inc. Method and apparatus for water decontaminstion using electrical discharge. 5,464,513, Cl. 204-164.000.

Gorka, Phillip E.: *See*—
Mowry, Gregory S.; Gorka, Phillip E.; Strayer, Brian D.; and Kracke, Alan G., 5,463,805, Cl. 29-603.000.

Gospodarowicz, Denis: *See*—
Baird, Andrew J.; Esch, Frederick S.; Gospodarowicz, Denis; Bohlen, Peter; and Ling, Nicholas C., 5,464,774, Cl. 536-23.510.

Gossen, Manfred; and Bujard, Hermann. Tight control of gene expression in eucaryotic cells by tetracycline-responsive promoters. 5,464,758, Cl. 435-69.100.

Gotich, Emily J.: *See*—
Upton, William K., III; Schneider, William E.; Brown, Stuart H.; Stetz, Steven A.; Gotich, Emily J.; and McCrea, Jack L., 5,464,161, Cl. 241-21.000.

Goto, Gensuke, to Fujitsu Limited. High speed digital parallel multiplier. 5,465,226, Cl. 364-757.000.

Gottlieb, Israel; and Singer, Yehuda, to Bar Ilan University. Dataflow computer for following data dependent path processes. 5,465,372, Cl. 395-800.000.

Gottscho, Richard A.: *See*—
Aydil, Eray S.; Giapis, Konstantinos P.; and Gottscho, Richard A., 5,464,664, Cl. 427-535.000.

Gouda, Hiroshi: *See*—
Koden, Mitsuhiro; Tagawa, Akira; Takeda, Hitoshi; Katsuse, Hirofumi; Shioni, Makoto; Numao, Takaji; Gouda, Hiroshi; Katakami, Masayuki; Kondo, Naofumi; and Katayama, Mikio, 5,465,168, Cl. 359-56.000.

Gould, Steven A.: *See*—
Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,464,814, Cl. 514-6.000.

Goument, Bertrand: *See*—
Peglion, Jean-Louis; Goument, Bertrand; Millan, Mark; and Rivet, Jean-Michel, 5,464,834, Cl. 514-254.000.

Grab, Gerald A.: *See*—
Zaluzec, Matthew J.; Grab, Gerald A.; and Smith, Warren A., 5,464,146, Cl. 228-208.000.

Grafe, Victor G.: *See*—
Davidson, George S.; and Grafe, Victor G., 5,465,368, Cl. 395-800.000.

Graham, Martin H., to And Yet, Inc. Four-terminal resistor method for measuring electric current in cows. 5,465,051, Cl. 324-713.000.

Graham, R. William: *See*—
Graham, Robert W., 5,463,799, Cl. 24-704.100.

Graham, Robert W., to Graham, R. William; and Wiewandt, Jerald E. Fastener for connecting materials with weakened portion. 5,463,799, Cl. 24-704.100.

Granger, Richard N.: *See*—
Guy, Thomas D.; Granger, Richard N.; Brady, Robert H.; Webster, John; Pratt, James R.; Stone, Corbett W.; and Alesi, Thomas W., Jr., 5,464,144, Cl. 227-176.000.

Grauser, Manfred: *See*—
Barta, Helmut; Eder, Helmut; Grauser, Manfred; Habison, Georg; Hantak, Edith; Moser, Franz; and Pfaffenbichler, Peter, 5,464,396, Cl. 604-191.000.

Grant, Alan H. Keyboard alignment device. 5,464,292, Cl. 400-715.000.

Graper, Jane C.: *See*—
Vogler, Erwin A.; and Graper, Jane C., 5,464,776, Cl. 436-69.000.

Grass Valley Group, Inc., The: *See*—
Rainbolt, Joe L., 5,465,268, Cl. 375-333.000.
Schultheiss, John C., 5,465,120, Cl. 348-716.000.

Grate-Lok Co., Inc.: *See*—
Mangone, Ronald W.; and Imm, Dennis, 5,463,786, Cl. 14-73.000.

Grau, Ulrich; and Ziegert, Günter, to Hoechst Aktiengesellschaft. Apparatus for removing solid medications from blister packs. 5,464,118, Cl. 221-5.000.

Graves, Jodie B. Motorized track guided vehicle for infants with soothing track bumps. 5,463,961, Cl. 104-53.000.

Great Plains Manufacturing, Incorporated: *See*—
Johnson, Eric; Lloyd, Gail A.; and Massey, R. Nathan, 5,463,855, Cl. 56-17.200.

Green, Garrey D. Cap for gas outlet nozzles. 5,464,114, Cl. 220-284.000.

Greene, Hugh W.: *See*—
Goriachev, Vladislav L.; Bratsev, Alexander N.; Feduikovich, Valeri N.; Rutberg, Philip G.; Greene, Hugh W.; and Chism, Paul E., Jr., 5,464,513, Cl. 204-164.000.

Greene, Mark I.; Dobashi, Kunio; Davis, James G.; and Hamuro, Junji, to University of Pennsylvania, Trustees of the. Ligand for the neu gene product. 5,464,751, Cl. 435-7.230.

Greene, Ralph G., to Market Design & Development, Inc. Portable water-purification system. 5,464,531, Cl. 202-181.000.

Greening, Giorgio: *See*—
Vogelsang, Joerg; Greening, Giorgio; Laws, Regina; and Ittemann, Peter, 5,464,684, Cl. 428-229.000.

Greenwald, Kenneth. Lockable bottle cap retainer. 5,464,109, Cl. 215-207.000.

Gregg, Michael J.: *See*—
Spykerman, David J.; DeShaw, Gerald M.; Gregg, Michael J.; and Eldred, Randy E., 5,464,272, Cl. 297-227.000.

Gregory, David B.; and Oliver, Dan A., to Renew Roof Technologies Inc. Method for manufacturing a portable liquid spill containment system. 5,464,492, Cl. 156-246.000.

Griek, Cornelis J.; and Mitchinson, Anthony K., to DGS Property Pty. Ltd. Stanchion assembly. 5,464,070, Cl. 182-45.000.

Grienberger, Johann; Bogner, Rudolf; and Frommann, Christian, to Hans Huber GmbH Maschinen-und Anlagenbau. Method and device for filtering and backwashing solid particles out of liquids. 5,464,542, Cl. 210-784.000.

Griffin, Tom. Device for enhancing the appeal of a video terminal. 5,464,214, Cl. 273-148.00B.

Griffith, Edward J.; and Ngo, Toan M., to Monsanto Company. Process for preparing sulfides of phosphorus. 5,464,601, Cl. 423-303.000.

Griffith, Owen W.; and Narayanan, Krishnaswamy, to Medical College of Wisconsin Research Foundation, Inc., The. Heme binding compounds and use thereof. 5,464,858, Cl. 514-399.000.

Grigg, David A.: *See*—
Prater, Craig B.; Massie, James; Grigg, David A.; Elings, Virgil B.; Hansma, Paul K.; and Drake, Barney, 5,463,897, Cl. 73-105.000.

Grim, Tracy E., to Royce Medical Company. Walker with open heel. 5,464,385, Cl. 602-27.000.

Grindey, Gerald B.; and Hertel, Larry W., to Eli Lilly and Company. Method of treating tumors in mammals with 2',2'-difluoronucleosides. 5,464,826, Cl. 514-50.000.

Grinwald, Harold M.; and Blok, Glen R., to Everbrite, Inc. Neon tube support. 5,464,178, Cl. 248-50.000.

Grohe, Klaus: *See*—
Petersen, Uwe; Krebs, Andreas; Schenke, Thomas; Kunisch, Franz; Philipps, Thomas; Grohe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, 5,464,796, Cl. 514-312.000.

Grois, Igor: *See*—
Belenkiy, Yuriy; Grois, Igor; Gumin, Irina L.; Makhlin, Ilya; Margolin, Mark; and Pescetto, Michael J., 5,465,313, Cl. 385-80.000.

Groppi, David P.: *See*—
Yuhas, Donald E.; Vorres, Carol L.; Groppi, David P.; and Konicek, Jiri D., 5,464,658, Cl. 427-385.500.

Grubbs, Gray W.: *See*—
Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; Grubbs, Gray W.; and Kyselica, Stefan P., 5,464,958, Cl. 219-130.510.

Grulke, David H.: *See*—
Arnett, Jeffrey D.; and Grulke, David H., 5,464,390, Cl. 604-35.000.

Grumman Aerospace Corporation: *See*—
Koh, Wei H., 5,464,979, Cl. 250-332.000.

Grün, Herbert: *See*—
Kaspers, Norbert; Lang, Karl-Heinz; Baader, Helmut; Grün, Herbert; and Otto, Thomas, 5,463,953, Cl. 101-485.000.

GTE Laboratories Incorporated: *See*—
Cooperman, Michael; Paige, Arnold; and Sieber, Richard W., 5,465,087, Cl. 340-825.800.

GTS Industries (Societe Anonyme): *See*—
Jeuniaux, Francois; Malhomme, Marc; Moretti, Jean-Marc; and Haralamb, Gérard, 5,465,214, Cl. 364-472.000.

Gu, Ben; Subramanyam, Ravi; and Clifton, Tanya, to Colgate-Palmolive Company. Solid detergent composition. 5,464,554, Cl. 252-121.000.
Gubbels, Paul A.: *See*—
Driessen, Chrit; Gubbels, Paul A.; and Adams, Paul, 5,464,446, Cl. 607-116.000.
Gubitosa, Giuseppe; and Cremona, Alberto, to Ministero Dell'Universita' E Della Ricerca Scientifica E Tecnologica. Process for preparing a supported metal catalyst for the selective hydrogenation of hydrocarbons by means of such a process and process for selective hydrogenation of hydrocarbons using such a catalyst. 5,464,802, Cl. 502-331.000.
Gudmundson, Perols B. O.: *See*—
Larsson, Lars G.; and Gudmundson, Perols B. O., 5,465,276, Cl. 375-346.000.
Guentherberg, Norbert: *See*—
Henn, Rolf; Beaecke, Siegmund; Deckers, Andreas; Guentherberg, Norbert; Brudermueller, Martin; Nestler, Gerhard; and Wassmer, Karl-Heinz, 5,464,881, Cl. 521-60.000.
Guertler, Dieter, to Mercedes-Benz AG. Motor vehicle with a stiff floor structure. 5,464,266, Cl. 296-189.000.
Guillaux, Michel: *See*—
Aschenbruck, Emil; Rohrbacher, Reinhold; Moreau, Alain; and Guillaux, Michel, 5,463,812, Cl. 29-889.210.
Guillot, Christian, to Crealise Conditionnement Inc. - Crealise Packaging Inc. Tamper-evident closure cap for containers. 5,464,112, Cl. 215-254.000.
Gully, Danielle: *See*—
Courtemanche, Gilles; Gautier, Claudie; Gully, Danielle; Roger, Pierre; Valette, Gérard; and Wermuth, Camille G., 5,464,847, Cl. 514-342.000.
Gumin, Irina L.: *See*—
Belenkiy, Yuriy; Grois, Igor; Gumin, Irina L.; Makhlin, Ilya; Margolin, Mark; and Pescetto, Michael J., 5,465,313, Cl. 385-80.000.
Gunasekera, Sarath P.: *See*—
McConnell, Oliver J.; Saucy, Gabriel; Jacobs, Robert; and Gunasekera, Sarath P., 5,464,835, Cl. 514-254.000.
Gusmeroli, Marilena: *See*—
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Riva, Raul; Garavaglia, Carlo; and Mirenna, Luigi, 5,464,836, Cl. 514-239.200.
Guttag, Karl M.; Simpson, Richard; and Walsh, Brendan, to Texas Instruments Incorporated. Three input arithmetic logic unit forming the sum of a first Boolean combination of first, second and third inputs plus a second Boolean combination of first, second and third inputs. 5,465,224, Cl. 364-716.000.
Guy, Thomas D.; Granger, Richard N.; Brady, Robert H.; Webster, John; Pratt, James R.; Stone, Corbett W.; and Alesi, Thomas W., Jr., to United States Surgical Corporation. Surgical apparatus with indicator. 5,464,144, Cl. 227-176.000.
Guyot, Dominique; and Thevenot, Rémi, to Nestec S.A. Size reduction of offal loaves to cubes. 5,464,641, Cl. 426-241.000.
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; and Starr, Frank C., to General Mills, Inc. Apparatus for folding, filling, and sealing microwave popcorn bags. 5,463,845, Cl. 53-459.000.
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; Starr, Frank C.; Roloff, Robb W.; and Devlin, Robert D., to General Mills, Inc. Apparatus for folding and ejecting microwave popcorn bags from a fixture. 5,463,848, Cl. 53-482.000.
Gyory, J. Richard: *See*—
Haak, Ronald P.; Theeuwes, Felix; Gyory, J. Richard; and Lattin, Gary A., 5,464,387, Cl. 604-20.000.
H.F. & PH.F. Reemtsma GmbH & Co.: *See*—
Schoch, Reinhard; and Marten, Walter, 5,464,148, Cl. 229-109.000.
Haak, Ronald P.; Theeuwes, Felix; Gyory, J. Richard; and Lattin, Gary A., to Alza Corporation. Transdermal delivery device. 5,464,387, Cl. 604-20.000.
Haas, Franz: *See*—
Koletnik, Erich; Haas, Franz; and Haas, Johann, 5,463,939, Cl. 99-333.000.
Haas, Johann: *See*—
Koletnik, Erich; Haas, Franz; and Haas, Johann, 5,463,939, Cl. 99-353.000.
Haas, Peter: *See*—
Weber, Hans G.; Haas, Peter; Michels, Erhard; Weber, Christian; and Brecht, Klaus, 5,464,880, Cl. 521-51.000.
Haas, Wilhelm; Linker, Karl-Heinz; Schallner, Otto; Findeisen, Kurt; Santel, Hans-Joachim; and Dollinger, Markus, to Bayer Aktiengesellschaft. Substituted triazolinones. 5,464,810, Cl. 504-273.000.
Haberkorn, Axel: *See*—
Mehlhorn, Heinz; Schmahl, Günter; Lindner, Werner; and Haberkorn, Axel, 5,464,837, Cl. 514-242.000.
Habison, Georg: *See*—
Barta, Helmut; Eder, Helmut; Granser, Manfred; Habison, Georg; Hantak, Edith; Moser, Franz; and Pfaffenbichler, Peter, 5,464,396, Cl. 604-191.000.
Hachigo, Akihiro; Nakahata, Hideaki; Shikata, Shinichi; and Fujimori, Naoji, to Sumitomo Electric Industries, Ltd. Stacked piezoelectric surface acoustic wave device with a boron nitride layer in the stack. 5,463,901, Cl. 73-753.000.
Häfele GmbH & Co.: *See*—
Walz, Rüdiger, 5,464,297, Cl. 403-231.000.
Hagen, Timothy J.: *See*—
Hallinan, E. Ann; Hagen, Timothy J.; Husa, Robert K.; Tsymbalov, Sofya; Lee, Albert C.; and Van Hoeck, Jean-Pierre, 5,464,830, Cl. 514-211.000.
Haindl, Hans. Catheter. 5,464,398, Cl. 604-280.000.
Hakim, Ralph N.: *See*—
Hauser, Edward R.; and Lu, David D.-L., 5,464,680, Cl. 428-141.000.
Halajian, Eugene M.: *See*—
Wieczorek, Joseph P.; Halajian, Eugene M.; and Trombley, Michael, 5,464,052, Cl. 160-23.100.
Halasy-Wimmer, Georg: *See*—
Thiel, Rudolf; Doell, Andreas; and Halasy-Wimmer, Georg, 5,464,077, Cl. 188-72.500.
Halat, Siegfried: *See*—
Lohberg, Peter; Bayer, Ronald; Halat, Siegfried; Kircher, Dieter; Perez, Diogenes; and Sparschuh, Stefan, 5,464,079, Cl. 188-315.000.
Hale, Arthur H.; Cowan, Kenneth M.; and Nahm, James J. W., to Shell Oil Company. Universal fluids for drilling and cementing wells. 5,464,060, Cl. 166-293.000.
Hale, Donald A.: *See*—
Cowan, Robert L., II; Gordon, Gerald M.; Hale, Donald A.; and Perry, Richard W., 5,465,278, Cl. 376-245.000.
Hales, Stephen G.; Khoshdel, Ezat; and Polywka, Robert, to Lever Brothers Company, Division of Conopco, Inc. Polymers and detergent compositions containing them. 5,464,558, Cl. 252-174.240.
Hall, Bertie F., Jr., to Hoskins Manufacturing Co. Coaxial thermoelements and thermocouples made from coaxial thermoelements. 5,464,485, Cl. 136-230.000.
Hall, Charles B.: *See*—
Craig, W. Scott; Hall, Charles B.; Lam, Edward K.; and Rogers, Duane E., 5,464,357, Cl. 440-89.000.
Hall, David A.: *See*—
Yanko, John P.; and Hall, David A., 5,464,198, Cl. 267-167.000.
Hall, Deborah K.; and Rencs, Erik, to Iatrotech, Inc. Laser calibration device. 5,464,960, Cl. 219-121.600.
Hall, Robert L. Apparatus for supporting information to be read and for sequentially highlighting the lines of the supported material. 5,464,293, Cl. 400-718.000.
Haller, Ingo: *See*—
Petersen, Uwe; Krebs, Andreas; Schenke, Thomas; Kunisch, Franz; Philipps, Thomas; Grohe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, 5,464,796, Cl. 514-312.000.
Hallinan, E. Ann; Hagen, Timothy J.; Husa, Robert K.; Tsymbalov, Sofya; Lee, Albert C.; and Van Hoeck, Jean-Pierre, to G. D. Searle & Co. Substituted dibenzoxapine compounds, pharmaceutical compositions and methods of use. 5,464,830, Cl. 514-211.000.
Halpaap, Reinhard: *See*—
Laas, Hans-Josef; Halpaap, Reinhard; Wamprecht, Christian; Meier-Westhues, Hans-Ulrich; Schultz, Wolfgang; and Kahl, Lothar, 5,464,921, Cl. 528-67.000.
Halverson, Scott A.: *See*—
Wells, Cindie M.; Halverson, Scott A.; and Jonovic, John A., 5,464,279, Cl. 312-128.000.
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; and Nagashima, Shigeo, to Hitachi, Ltd. Data transfer method of transferring data between programs of a same program group in different processors using unique identifiers of the programs. 5,465,380, Cl. 395-800.000.
Hamann, Ingo; Köhle, Hans-Jürgen; and Wehner, Winfried, to Witco Surfactants GmbH. Process for the preparation of highly concentrated free-flowing aqueous solutions of betaines. 5,464,565, Cl. 252-546.000.
Hamano, Hiroaki: *See*—
Fukushima, Shigenobu; Nakatani, Munehiro; Muramatsu, Hideo; Tsuboi, Toshio; Hamano, Hiroaki; and Hamano, Kanako, 5,465,172, Cl. 358-498.000.
Hamano, Kanako: *See*—
Fukushima, Shigenobu; Nakatani, Munehiro; Muramatsu, Hideo; Tsuboi, Toshio; Hamano, Hiroaki; and Hamano, Kanako, 5,465,172, Cl. 358-498.000.
Hamilton, Scott M.: *See*—
Boardman, John D.; Hamilton, Scott M.; Gangstead, Mervin L.; Sadler, Jimmie L.; Trimble, Richard A.; and Welch, Jeffrey P., 5,465,243, Cl. 369-49.000.
Hammer, Beth: *See*—
Mierendorf, Robert; Garber, Richard; Novy, Robert; and Hammer, Beth, 5,464,745, Cl. 435-6.000.
Hampel, Manfred: *See*—
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,464,839, Cl. 514-256.000.
Hampton, Thomas H.; Litle, Thomas J., IV; and Searle, Nigel H., to Litle & Co. Confirming identity of telephone caller. 5,465,290, Cl. 379-67.000.
Hamuro, Junji: *See*—
Greene, Mark I.; Dobashi, Kunio; Davis, James G.; and Hamuro, Junji, 5,464,751, Cl. 435-7.230.
Han, O. Suk, to Goldstar Electron Co., Ltd. Method for fabricating a phase shifting mask. 5,464,712, Cl. 430-5.000.
Hanafusa, Akihiko; and Tada, Toshihiko, to Fujitsu Limited. LSI system with a plurality of LSIs having different scan systems and provided on a printed circuit board. 5,465,259, Cl. 371-22.300.
Hanai, Takeshi: *See*—
Katoh, Akio; Abe, Nobuo; Hanai, Takeshi; and Horibe, Kenji, 5,465,022, Cl. 313-144.000.
Hanai, Teruo, to Howa Machinery Ltd. Finger chuck for use with machine tool. 5,464,233, Cl. 279-137.000.

Hanazaki, Yasumasa; and Ukita, Nobuo, to Mitsubishi Denki Kabushiki Kaisha. Power control apparatus for discharging lamp and method thereof. 5,465,029, Cl. 315-308.000.
Hancock, Steven M.; and Pietras, Mark A., to International Business Machines Corporation. Luminance transition coding method for software motion video compression/decompression. 5,465,118, Cl. 348-396.000.
Handa, Keiichi, to Kabushiki Kaisha Toshiba. Element placement method and apparatus. 5,465,218, Cl. 364-489.000.
Hannai, Seiichi, to NEC Corporation. Semiconductor memory device having shifting circuit connected between data bus lines and data buffer circuits for changing connections therebetween. 5,465,234, Cl. 365-200.000.
Hanover Displays Limited: *See*—
Williams, David G., 5,463,827, Cl. 40-449.000.
Hans Huber GmbH Maschinen-und Anlagenbau: *See*—
Grienberger, Johann; Bogner, Rudolf; and Frommann, Christian, 5,464,542, Cl. 210-784.000.
Hansberry, Mitchell L.: *See*—
Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Fyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,463,921, Cl. 83-151.000.
Hansen, Dale G.; and Wohlin, Donald C. Golf practice device and method. 5,464,220, Cl. 273-186.100.
Hansen, Donald W., Jr.; Peterson, Karen B.; and Monahan, Joseph B., to G.D. Searle & Co. Imidazo[1,2-a]pyridinyldiacid compounds for cognitive enhancement and for treatment of cognitive disorders and neurotoxic injury. 5,464,843, Cl. 514-300.000.
Hansen, Ole V.: *See*—
VanBuskirk, Gregory K.; Hsieh, Chang-Li; McNulty, Kenneth J.; and Hansen, Ole V., 5,464,459, Cl. 55-257.200.
Hansen, Robert E. Width adjustable angle bar assembly for a printing press. 5,464,143, Cl. 226-199.000.
Hansma, Paul K.: *See*—
Prater, Craig B.; Massie, James; Grigg, David A.; Elings, Virgil B.; Hansma, Paul K.; and Drake, Barney, 5,463,897, Cl. 73-105.000.
Hanson, George E.: *See*—
Boatwright, Darrell L.; Hanson, George E.; Miller, Phillip; Koenck, Steven E.; Walter, Jerry L.; Kubler, Joseph J.; Cargin, Keith K., Jr.; Schultz, Darald R.; Davis, Patrick H.; and Kunert, Steven R., 5,465,207, Cl. 364-424.010.
Hantak, Edith: *See*—
Barta, Helmut; Eder, Helmut; Granser, Manfred; Habison, Georg; Hantak, Edith; Moser, Franz; and Pfaffenbichler, Peter, 5,464,396, Cl. 604-191.000.
Hanyu, Isamu: *See*—
Haruki, Tamae; Nakagawa, Kenji; Taguchi, Masao; Tanaka, Hiroyuki; Asai, Satoru; and Hanyu, Isamu, 5,465,220, Cl. 364-525.000.
Hara, Naoki: *See*—
Enbutsu, Ichiro; Baba, Kenzi; Hara, Naoki; Yoda, Mikio; Watanabe, Shoji; and Yahagi, Hayao, 5,465,320, Cl. 395-22.000.
Harada, Kuniyuki; Sawada, Kazutaka; Hosoya, Yoshiteru; and Shibusawa, Tetsuo, to Fuji Jukogyo Kabushiki Kaisha. Fiber reinforced plastic product and an indication method thereof. 5,464,671, Cl. 428-40.000.
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Matsuo, Hirofumi, to Asahi Kogaku Kabushiki Kaisha. Lens shutter camera including zoom lens. 5,465,131, Cl. 354-202.000.
Haralamb, Gérard: *See*—
Jeuniaux, Francois; Malhomme, Marc; Moretti, Jean-Marc; and Haralamb, Gérard, 5,465,214, Cl. 364-472.000.
Harasawa, Kikuko: *See*—
Hirai, Kenji; Yamashita, Mitsuo; Tateno, Tomoko; Ejiri, Emiko; Harasawa, Kikuko; Onji, Yuichi; Ugai, Sadayuki; and Nagato, Shoin, 5,464,811, Cl. 504-281.000.
Harayama, Yoichi: *See*—
Horiuchi, Michio; Harayama, Yoichi; and Hayashi, Koishiro, 5,464,950, Cl. 174-256.000.
Harbor Branch Oceanographic Institution, Inc.: *See*—
McConnell, Oliver J.; Saucy, Gabriel; Jacobs, Robert; and Gunasekera, Sarath P., 5,464,835, Cl. 514-254.000.
Hardtmann, Dirk J.: *See*—
Castro, Mynor; Yaniv, Gershon; Hardtmann, Dirk J.; and Romeo, David J., 5,464,246, Cl. 280-730.200.
Hardy, Douglas A.: *See*—
Altschuler, Barry N.; Hardy, Douglas A.; Stephens, James A.; and Kish, Joseph, III, 5,465,300, Cl. 380-30.000.
Hardy, Samuel R.: *See*—
Sharrow, Joseph F.; and Hardy, Samuel R., 5,464,173, Cl. 244-3.300.
Harken, Inc.: *See*—
Hartlmeier, Greg W.; and Harken, Olaf T., 5,463,970, Cl. 114-105.000.
Harken, Olaf T.: *See*—
Hartlmeier, Greg W.; and Harken, Olaf T., 5,463,970, Cl. 114-105.000.
Harklau, Lanny L.: *See*—
Boettcher, Jeffrey A.; and Harklau, Lanny L., 5,464,986, Cl. 250-459.100.
Harrington Corporation, The: *See*—
Riddles, Gordon S.; and Burke, Jerry O., 5,464,257, Cl. 285-156.000.
Harrington, Philip M.: *See*—
Condon, Michael E.; and Harrington, Philip M., 5,464,808, Cl. 504-214.000.
Harris, Charles W.: *See*—
Baker, Ernest; and Harris, Charles W., 5,464,168, Cl. 242-530.100.
Harris, Donnie L.; and McAllister, George P., Jr., to Aqua Bath Company, Inc. Ramp for barrier-free showers. 5,463,780, Cl. 4-604.000.
Harris, Ellis D.: *See*—
Buhler, Steven A.; and Harris, Ellis D., 5,465,264, Cl. 372-31.000.
Harris, Michael T.: *See*—
Sisson, Warren G.; Basaran, Osman A.; and Harris, Michael T., 5,464,195, Cl. 266-170.000.
Harris, Milton. Discrete pallet deck board remover machine. 5,463,808, Cl. 29-823.000.
Hart, Peter E.: *See*—
Hull, Jonathan J.; and Hart, Peter E., 5,465,353, Cl. 395-600.000.
Harting, Darwin B., to ICI Americas Inc. Wear decoppering liner. 5,463,956, Cl. 102-283.000.
Hartlmeier, Greg W.; and Harken, Olaf T., to Harken, Inc. Furling foil for sailing vessel. 5,463,970, Cl. 114-105.000.
Hartnell, Dale, to Major Industrial Technology, Inc. Hot solvent cleaning tank. 5,464,033, Cl. 134-105.000.
Haruki, Tamae; Nakagawa, Kenji; Taguchi, Masao; Tanaka, Hiroyuki; Asai, Satoru; and Hanyu, Isamu, to Fujitsu Limited. Optical exposure method. 5,465,220, Cl. 364-525.000.
Haruo, Onda: *See*—
Koichi, Kato; Takao, Yamada; and Haruo, Onda, 5,464,939, Cl. 530-151.000.
Harwig, Dennis D.: *See*—
Kidwell, J. Jeffrey; Reed, Stuart E.; Ryan, Patrick M.; Harwig, Dennis D.; and Womack, E. Allen, Jr., 5,464,957, Cl. 219-130.010.
Harwig, Sylvia S. L.: *See*—
Lehrer, Robert I.; Kokryakov, Vladimir N.; and Harwig, Sylvia S. L., 5,464,823, Cl. 514-13.000.
Hascicek, Yusuf S.; and Testardi, Louis R., to Florida State University. Method of producing superconductor which exhibits critical current density bifurcation. 5,464,813, Cl. 505-490.000.
Hasegawa, Hiroshi: *See*—
Sasaki, Umekichi; Hasegawa, Hiroshi; and Shimomura, Yuji, 5,464,550, Cl. 252-68.000.
Hasegawa, Isao, to Kabushiki Kaisha Hasegawa Seiko; and Maruei Kogyo Kabushiki Kaisha. Method for producing ratchet devices. 5,463,891, Cl. 72-340.000.
Hasenberg, Mark J.; and Rau, Peter B., to Snap-on Incorporated. Portable cordless electric utility lamp. 5,465,196, Cl. 362-183.000.
Hashimoto, Hideyuki: *See*—
Shinagawa, Masatoshi; and Hashimoto, Hideyuki, 5,463,831, Cl. 29-377.000.
Hashimoto, Kazuya, to NEC Corporation. Gain controller for a digital mobile radio receiver. 5,465,407, Cl. 455-234.200.
Hashimoto, Kyosuke: *See*—
Tanaka, Motoharu; Hashimoto, Kyosuke; and Himono, Yusaku, 5,465,255, Cl. 370-85.100.
Hashizume, Isamu: *See*—
Aoki, Jun; Masuda, Katsuhiko; and Hashizume, Isamu, 5,464,084, Cl. 192-35.000.
Hasse, Margaret H.; Bridges, Russell P.; and Miller, Steven W., to Procter & Gamble Company, The. Elasticized disposable training pant having differential extensibility. 5,464,401, Cl. 604-385.100.
Hatae, Shinichi: *See*—
Kobayashi, Takashi; and Hatae, Shinichi, 5,465,071, Cl. 329-315.000.
Hatakeyama, Akira: *See*—
Iwata, Toshiro; Nagata, Iwami; Hatakeyama, Akira; and Nishigai, Kazuhisa, 5,464,282, Cl. 366-83.000.
Hattori, Hisahide: *See*—
Kobayashi, Akira; Yoshida, Takuji; Hattori, Hisahide; and Takabayashi, Toshiya, 5,465,244, Cl. 369-50.000.
Hattori, Toshiro, to NEC Corporation. Control system for positioning head in disk device by estimating and correcting actuator parameters based on head position and actuator drive current obtained by vibrating the head. 5,465,183, Cl. 360-78.900.
Haudenschild, Christian C.: *See*—
Faxon, David P.; and Haudenschild, Christian C., 5,464,395, Cl. 604-96.000.
Haunhorst, Gregory A., to Aeroquip Corporation. Quick connect air-conditioning coupling. 5,464,042, Cl. 137-595.000.
Hauprich, William G.: *See*—
Rice, Crispin J.; and Hauprich, William G., 5,464,071, Cl. 182-205.000.
Hauser, Edward R.; and Lu, David D.-L., to WorldTech Coatings, Inc.; and Hakim, Ralph N. Plastic-coated concrete form panel. 5,464,680, Cl. 428-141.000.
Havemann, Robert H.: *See*—
Eklund, Robert H.; Havemann, Robert H.; and Stroth, Leo, 5,465,005, Cl. 257-538.000.
Havens, Paul W.: *See*—
Mancl, Dennis J.; Johnson, Donald C.; and Havens, Paul W., 5,465,016, Cl. 310-71.000.
Hawblitz, Larry V.: *See*—
Wullschleger, Richard D.; Chen, Shirley C.; Bowman, Frederick A.; and Hawblitz, Larry V., 5,464,644, Cl. 426-549.000.
Hawley, Frank W., to Actel Corporation. Method of fabricating an antifuse element having an etch-stop dielectric layer. 5,464,790, Cl. 437-60.000.
Hay & Forage Industries: *See*—
O'Halloran, Michael L.; Case, Cecil L.; Pruitt, Martin E.; and Fritz, David P., 5,463,852, Cl. 56-6.000.

Hayakawa, Katsumi; Tsukuda, Masahiro; Sato, Yukiyoshi; Tatewaki, Junichi; and Yamasaka, Kazuya, to Oji Seitai Kaisha, Ltd. Unwrapping apparatus for stretch-wrapped load and shrink-wrapped load. 5,463,841, Cl. 53-381.200.

Hayakawa, Toshiyuki; and Kirisawa, Ryouhei, to Kabushiki Kaisha Toshiba. Non-volatile semiconductor memory NAND structure with differently doped channel stoppers. 5,464,998, Cl. 257-316.000.

Hayakawa, Yasuyoshi: *See*—
Asano, Naoki; Kikuchi, Yutaka; and Hayakawa, Yasuyoshi, 5,465,141, Cl. 355-285.000.

Hayashi, Kazuhiro: *See*—
Shiratsuki, Yoshiyuki; Yamaguchi, Yoshinori; Hayashi, Kazuhiro; and Niitsu, Takahiro, 5,464,990, Cl. 257-40.000.

Hayashi, Koishiro: *See*—
Horiuchi, Michio; Harayama, Yoichi; and Hayashi, Koishiro, 5,464,950, Cl. 174-256.000.

Hayashi, Masayuki: *See*—
Kamo, Yasushi; Hayashi, Masayuki; Ito, Masaaki; Yamakawa, Shinji; and Aida, Midori, 5,465,160, Cl. 358-401.000.

Hayashikoshi, Masanori: *See*—
Fukuda, Tatsuya; Mori, Shigeru; Hayashikoshi, Masanori; and Sawada, Seiji, 5,465,063, Cl. 327-512.000.

Hayden, Richard A., to Calgon Carbon Corporation. Process for the decomposition and removal of peroxides. 5,464,605, Cl. 423-579.000.

Hayes, Jesse C., Jr.; Dever, Gerald R.; Laughlin, Thomas J.; Schroer, Charles F., Jr.; and Wildman, Gary C., to Schering-Plough Healthcare Products, Inc. Method for treating onychomycosis. 5,464,610, Cl. 424-61.000.

Heaston, Bruce A.: *See*—
Sammut, Steven P.; Georgin, Marc J.; Heaston, Bruce A.; Majeed, Kamal N.; and Kowalik, James J., 5,465,209, Cl. 364-424.050.

Heath, Derek E.; and Mooneyhan, Jerry A., to Tulsa Dental Products, L.L.C. Endodontic instrument. 5,464,362, Cl. 451-48.000.

Heavner, George A.; Riexinger, Douglas; and Mervic, Miljenko, to Centocor, Inc. Peptide inhibitors of selectin binding. 5,464,935, Cl. 530-329.000.

Hedberg, Sven-Erik; Obel, Martin; and Hoegnelid, Kurt, to Pacesetter AB. Apparatus for producing heart defibrillation sequences from stimulation pulses and defibrillation shocks. 5,464,429, Cl. 607-4.000.

Hedeen, Robert A.: *See*—
Pla, Frederic G.; and Hedeen, Robert A., 5,463,893, Cl. 73-4.00R.

Hefner, Robert E., Jr.; and Earls, Jimmy D., to Dow Chemical Company, The. Amines from nitro group terminated mesogenic epoxy resin adducts with reduced hydroxyl group functionality. 5,464,912, Cl. 525-523.000.

Heidelberger Druckmaschinen AG: *See*—
Rodi, Anton; Uhrig, Dieter; and Krestyn, Karlheinz, 5,464,206, Cl. 271-227.000.

Heim, David E.; and Parkin, Stuart S. P., to International Business Machines Corporation. Magnetoresistive spin valve sensor with improved pinned ferromagnetic layer and magnetic recording system using the sensor. 5,465,185, Cl. 360-113.000.

Heimburger, Norbert: *See*—
Stief, Thomas; Heimburger, Norbert; and Schorlemmer, Hans U., 5,464,615, Cl. 424-94.630.

Heinecke, Richard L., to ITT Corporation. Gate-type, side-ported, line blind valve. 5,464,035, Cl. 137-312.000.

Heineman, Lee J., to Energy Concepts, Inc. Power control module for computer monitors. 5,465,366, Cl. 395-750.000.

Heino, Richard N.: *See*—
Stange, Thomas C.; DiNanno, James M.; Maillet, John P., Jr.; and Heino, Richard N., 5,463,839, Cl. 53-54.000.

Heinrich, Bernd, to Hoechst Aktiengesellschaft. Spinnable polyester based on modified polyethylene terephthalate and aliphatic dicarboxylic acids. 5,464,694, Cl. 128-357.000.

Heinrich, Günter: *See*—
Albring, Peter; Apley, Rainer; Döge, Klaus; Heinrich, Günter; Lindner, Ernst; Müller, Norbert; Pauer, Reinhard; Pilling, Eberhard; and Rudischer, Rainer, 5,464,325, Cl. 416-185.000.

Heinzelmann, Walter: *See*—
Krotky, Peter; Bauhofer, Markus; and Heinzelmann, Walter, 5,463,991, Cl. 123-195.00R.

Heitz, Bernhard H.: *See*—
Burns, Rickey D.; Meincke, Drew F.; and Heitz, Bernhard H., 5,463,910, Cl. 73-864.870.

Helber, Margaret J.; Dobles, Thomas R.; Diehl, Donald R.; Dankosh, Heidi E.; and Mee, John D., to Eastman Kodak Company. Photographic elements containing particular sensitizing dyes. 5,464,736, Cl. 430-581.000.

Heldstab, Thomas: *See*—
Curtis, Raymond L.; Schlegel, Urs; and Heldstab, Thomas, 5,464,427, Cl. 606-232.000.

Helfrich, Thomas E.: *See*—
Miller, Frank D.; and Helfrich, Thomas E., 5,465,011, Cl. 307-64.000.

Heller, Lisa C.: *See*—
Dinkjian, Robert M.; Heller, Lisa C.; Kordus, Steven R.; Lauricella, Kenneth A.; Seigendall, Thomas W.; Skaggs, Robert A.; and Xu, Nelson S., 5,465,374, Cl. 395-800.000.

Hellstrom, Julie W.: *See*—
Lim, Sheldon C. P.; Hellstrom, Julie W.; and Yen, Ting P., 5,465,004, Cl. 257-529.000.

Helmstetter, Richard C.: *See*—
Schmidt, Glenn H.; and Helmstetter, Richard C., 5,464,218, Cl. 273-169.000.

Helverep S.A.: *See*—
Franci, François-Marie, 5,464,877, Cl. 521-48.000.

Helzner, Eileen C.: *See*—
Travers, John D.; and Helzner, Eileen C., 5,464,869, Cl. 514-574.000.

Hemmis, Ludger; Overberg, Matthias; and Schröder, Burkhard, to Wilhelm Karmann GmbH. Rear-window pane for convertibles. 5,464,265, Cl. 296-146.140.

Hendrickson, Thomas S., to Litetronics International, Inc. Lamp with removable base and replaceable bulb capsule. 5,465,025, Cl. 313-318.090.

Hendrix, John L., to Henwell, Inc. Palladium (II) octaethylporphine alpha-isothiocyanate as a phosphorescent label for immunoassays. 5,464,741, Cl. 435-5.000.

Henke, Guenter: *See*—
Bolte, Gerd; Henke, Guenter; and Brueninghaus, Ulrike, 5,464,494, Cl. 156-330.000.

Henkel Corporation: *See*—
Cole, Arthur H.; Glenn, Susan C.; and Johnson, Grannis S., 5,464,452, Cl. 8-495.000.
Mudge, Elbert H.; and DeWitt, Charles G., 5,464,678, Cl. 428-96.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Becker, Wolfgang; Mathis, Raymond; Stapper-Druyen, Syliva; Robrahn, Karin; Hoffmann, Rainer; and Kiray, Yasar C., 5,464,660, Cl. 427-387.000.
Bialas, Norbert; Mathis, Raymond; Crews, Richard P.; Mudge, Elbert H.; and Tuller, F. Norman, 5,464,546, Cl. 252-8.600.
Bolte, Gerd; Henke, Guenter; and Brueninghaus, Ulrike, 5,464,494, Cl. 156-330.000.

Henley, Francois J., to Photon Dynamics, Inc. Method of testing liquid crystal display substrates. 5,465,052, Cl. 324-770.000.

Henn, Rolf; Besecke, Siegmund; Deckers, Andreas; Guentherberg, Norbert; Brudermueller, Martin; Nestler, Gerhard; and Wassmer, Karl-Heinz, to BASF Aktiengesellschaft. Expandable styrene polymers of high heat resistance. 5,464,881, Cl. 521-60.000.

Henner, Dennis J.; Vandlen, Richard L.; Wilkins, James A.; and Yansura, Daniel G., to Genentech. Processes and compositions for the isolation of human relaxin. 5,464,756, Cl. 435-69.100.

Henseler, Klaus; and Beisswanger, Rudolf, to J. M. Voith GmbH. Winding device for sheets of paper or cardboard. 5,464,169, Cl. 242-542.000.

Hensley, Marcus A. Corner bracket for mounting planar object. 5,464,185, Cl. 248-475.100.

Henson, James A.; McGrath, James P.; Peterson, Bruce R.; Glassburn, Tim R.; Raab, Michael L.; and Do, James H., to Quantum Corporation. Shared memory array for data block and control program storage in disk drive. 5,465,343, Cl. 395-439.000.

Henwell, Inc.: *See*—
Hendrix, John L., 5,464,741, Cl. 435-5.000.

Hepler, Douglas C., to Polyshot Corporation. Multitip hot runner system. 5,464,343, Cl. 425-549.000.

Hergenrother, William L.: *See*—
Freeman, Roy M.; Hergenrother, William L.; and Ravagnani, Frederick J., 5,464,899, Cl. 524-504.000.

Herget, Gerhard H.; and Judge, Ken J. Vibrating wire range extender. 5,463,907, Cl. 73-862.392.

Hermann Berstorff Maschinenbau GmbH: *See*—
Krüger, Manfred; Mayer, Dieter; Behrens, Frierich-Otto; and Krohn, Manfred, 5,463,946, Cl. 100-93.0RP.
Schulz, Reinhard, 5,464,363, Cl. 451-190.000.

Hermeling, Dieter; Koenig, Hartmann; and Goetz, Norbert, to BASF Aktiengesellschaft. Preparation of 4-dialkoxymethylpyrazoles. 5,464,508, Cl. 204-78.000.

Herrmann, Hellmut A.: *See*—
Albano, John V.; Sundaram, Kandasamy M.; and Herrmann, Hellmut A., 5,464,057, Cl. 165-173.000.

Hershey Foods Corporation: *See*—
St. John, James F.; Fetterhoff, John G.; Carpenter, John R.; Brown, B. Douglas; Azzara, C. Daniel; Tarka, Stanley M., Jr.; Rank, Craig; and Strohmaier, George K., 5,464,649, Cl. 426-660.000.

Hertel, Larry W.: *See*—
Grindey, Gerald B.; and Hertel, Larry W., 5,464,826, Cl. 514-50.000.

Hervieux, Pierre: *See*—
Lavoie, Camilien; and Hervieux, Pierre, 5,464,002, Cl. 124-86.000.

Hewitt, Charles E.: *See*—
Ferrar, Wayne T.; Vreeland, William B.; Hewitt, Charles E.; Fitzgerald, John J.; and Binga, Tonya D., 5,464,703, Cl. 428-421.000.

Hewlett-Packard Company: *See*—
Anderson, Mark F., 5,465,335, Cl. 395-375.000.
Chen, Yaw-Hwang, 5,465,006, Cl. 257-557.000.
Falcone, Ronald, 5,464,012, Cl. 128-630.000.
Koch, Albert F., III; and Prater, David M., 5,464,015, Cl. 128-660.070.
Lee, Kevin; and Hug, Berthold, 5,465,324, Cl. 395-133.000.
Moskaluk, Raymond W.; and Nelson, Nancy W., 5,465,414, Cl. 455-313.000.
Sakai, Ikuo, 5,465,043, Cl. 324-96.000.
Salter, James G.; Clark, James E.; Swanson, David W.; and Nasworthy, George F., 5,464,578, Cl. 264-250.000.
Tanbakuchi, Hassan, 5,465,417, Cl. 455-330.000.
Yanagimoto, Yoshiyuki, 5,465,416, Cl. 455-327.000.

Heyworth, Richard G. Double sided container closure and cooperating container. 5,464,110, Cl. 215-223.000.

Hiben, Bradley M.; Newberg, Donald G.; and Logalbo, Robert D., to Motorola, Inc. Method and apparatus for automatic frequency and bandwidth control. 5,465,410, Cl. 455-266.000.

Hidetsugu, Nishiguchi; and Kenji, Nishiguchi, to Hidetsugu, Nishiguchi. Vacuum adsorber. 5,464,263, Cl. 294-64.100.

Higashi, Tatsuji; and Yasuda, Noboru, to Fuji Photo Film Co., Ltd. Presensitized plate for use in making lithographic printing plate requiring no dampening water. 5,464,686, Cl. 430-272.000.

Higashi, Yuichiro; and Ishikawa, Youichi, to Nitto Kogyo Co., Ltd. Fixing device for electrophotographic apparatus. 5,465,146, Cl. 355-285.000.

Hight, Terry V. T.; Matson, Jack V.; Rakestraw, Lawrence F.; Zhang, Zhihe; and Kuechler, Thomas C., to University of Houston, The. Biocidal methods and compositions for recirculating water systems. 5,464,636, Cl. 424-661.000.

Hill, Douglas J., to Physio-Control Corporation. Environmentally protected medical electronic instrument. 5,464,428, Cl. 607-1.000.

Hill, Richard. Mounting structure for roof rack support members. 5,464,140, Cl. 224-321.000.

Hillenbrand, Jürgen: *See*—
Wauzmann, Franz; Hillenbrand, Jürgen; and Langenmayr, Manfred, 5,463,951, Cl. 101-423.000.

Hiller, John J.: *See*—
Sharma, Mahendra K.; Singleton, Andy H.; and Hiller, John J., 5,464,883, Cl. 523-161.000.

Hilt, James J.; Hodges, Ron; Pardue, Stephen W.; and Powar, William L., to Visa International. Electronic bill pay system. 5,465,206, Cl. 364-406.000.

Himmel, Richard P.; and Brown, Raymond, to Hughes Aircraft Company. Green ceramic via metallization technique. 5,464,652, Cl. 427-97.000.

Himono, Yusaku: *See*—
Tanaka, Motoharu; Hashimoto, Kyosuke; and Himono, Yusaku, 5,465,255, Cl. 370-85.100.

Hinshaw, Howard G.; Moulton, Keith R.; and Bland, Donald L., to Thermalloy, Inc. Spring clamp and heat sink assembly. 5,464,054, Cl. 165-80.300.

Hiraguri, Sohkichi: *See*—
Hiraguri, Tokuo; and Hiraguri, Sohkichi, 5,464,311, Cl. 411-340.000.

Hiraguri, Tokuo; and Hiraguri, Sohkichi, to Alps Seiko Co., Ltd. Blind bolt for architecture. 5,464,311, Cl. 411-340.000.

Hirai, Kenji; Yamashita, Mitsuo; Tateno, Tomoko; Ejiri, Emiko; Harasawa, Kikuko; Onji, Yuichi; Ugai, Sadayuki; and Nagato, Shoin, to Sagami Chemical Research Center; Chisso Corporation; and Kaken Pharmaceutical Co., Ltd. Benzene derivatives substituted with heterocyclic ring and herbicides containing same as active ingredients. 5,464,811, Cl. 504-281.000.

Hirai, Koutarou; and Yamaguchi, Seiji, to Matsushita Electric Industrial Co., Ltd. Microprocessor with dual-port cache memory for reducing penalty of consecutive memory address accesses. 5,465,344, Cl. 395-458.000.

Hirakawa, Kiyoshi: *See*—
Kawamoto, Masao; Tanaka, Kazuhiko; Hirakawa, Kiyoshi; and Nakamura, Eiichirou, 5,464,695, Cl. 428-370.000.

Hirashima, Shigeyoshi: *See*—
Maehara, Kenso; Majima, Otamu; and Hirashima, Shigeyoshi, 5,463,949, Cl. 101-152.000.

Hirayama, Yoshiyuki: *See*—
Azumaya, Kengo; Hirayama, Yoshiyuki; and Tasaki, Kazuhiro, 5,465,307, Cl. 382-165.000.

Hirooka, Kazuhiko: *See*—
Yoshihara, Kunio; Hirooka, Kazuhiko; Sakai, Masanori; Kuboki, Keiju; Nimura, Mitsuo; and Tanabe, Ritsushi, 5,465,163, Cl. 358-444.000.

Hirosawa, Toshio; Kurihara, Jun'ichi; Itoh, Tsutomu; and Kokunishi, Motohide, to Hitachi, Ltd. Method and apparatus for job execution prediction and control and method for job execution situation display. 5,465,354, Cl. 395-650.000.

Hirose, Katutoshi; Takagi, Yoshihiro; Otomatsu, Toshihiko; and Suzuki, Yoshiichi, to Showa Shell Sekiyu Kabushiki Kaisha. Process for producing optically active halogen-containing alcohols using lipase ay-120 from *Candida rugosa* . 5,464,772, Cl. 435-280.000.

Hirose, Scott D.: *See*—
Reddy, Chandrashekar M.; Hirose, Scott D.; Cho, Sung-Soo; Kardach, James P.; Farrer, Steven M.; and Roberts, Meeling, 5,465,367, Cl. 395-750.000.

Hiroshi Maeda: *See*—
Maeda, Hiroshi; Miyamoto, Yoichi; and Akaike, Takaaki, 5,464,857, Cl. 514-398.000.

Hirota, Toshiyuki, to NEC Corporation. Method of fabricating a micro-trench storage capacitor. 5,464,791, Cl. 437-60.000.

Hirth, Bradford H.: *See*—
Antanje, Madelene M.; Butera, John A.; Hirth, Bradford H.; and Antane, Schuyler A., 5,464,867, Cl. 514-524.000.

Hisanaka, Takayuki: *See*—
Matsumura, Hiroshi; Shimada, Takaaki; Hisanaka, Takayuki; Ochi, Yoshiki; Kuwaki, Tetsuo; and Muta, Yoshinobu, 5,464,689, Cl. 428-317.900.

Hitachi Chemical Co., Ltd.: *See*—
Watanabe, Itsuo; Kuwano, Atsushi; Taketatsu, Jun; Takane, Nobuaki; Yamada, Mitsuo; and Tai, Seiji, 5,464,673, Cl. 428-65.100.

Hitachi Chubu Software, Ltd.: *See*—
Matsumoto, Hiroshi; Takaragi, Kazuo; Susaki, Seiichi; Maezawa, Hiroyuki; and Koizumi, Shinobu, 5,465,299, Cl. 380-23.000.

Hitachi, Ltd.: *See*—
Amada, Nobutaka; and Noguchi, Takaharu, 5,465,180, Cl. 360-19.100.
Enbutsu, Ichiro; Baba, Kenzi; Hara, Naoki; Yoda, Mikio; Watanabe, Shoji; and Yahagi, Hayao, 5,465,320, Cl. 395-22.000.
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; and Nagashima, Shigeo, 5,465,380, Cl. 395-800.000.
Hirosawa, Toshio; Kurihara, Jun'ichi; Itoh, Tsutomu; and Kokunishi, Motohide, 5,465,354, Cl. 395-650.000.
Ibori, Satoshi; Yamashita, Hitoshi; Baba, Shigeyuki; Fujii, Hiroshi; Kambara, Takatsugu; and Ishibashi, Akira, 5,465,202, Cl. 363-37.000.
Ihara, Sigeo; and Itoh, Satoshi, 5,464,987, Cl. 250-492.300.
Kajiwara, Toshiyuki; Yamagushi, Teruo; Okoshi, Hitoshi; and Nakamura, Tsuneo, 5,463,801, Cl. 26-33.00Q.
Matsumoto, Hiroshi; Takaragi, Kazuo; Susaki, Seiichi; Maezawa, Hiroyuki; and Koizumi, Shinobu, 5,465,299, Cl. 380-23.000.
Nishino, Yoshitaka; Sawa, Toshio; Nakao, Takashi; Aizawa, Michihiko; and Yokose, Kenji, 5,463,880, Cl. 62-484.000.

Hitachi Telecom Technologies, Ltd.: *See*—
Takahashi, Toshie; Sato, Takashi; Kurumada, Toshimi; and Kokubun, Yoshiyuki, 5,465,292, Cl. 379-164.000.

Hjertén, Stellan; and Liao, Jia-Li, to Bio-Rad Laboratories. Electrophoresis in low conductivity buffers. 5,464,517, Cl. 204-183.200.

Hladik, Stephen M.; and Chennakeshu, Sandeep, to General Electric Company. Post detection weighted vector combining diversity receivers using phase metrics for mobile and indoor radio channels. 5,465,271, Cl. 375-267.000.

Hlasta, Dennis J.: *See*—
Dunlap, Richard P.; Mura, Albert J.; Hlasta, Dennis J.; Desai, Ranjit C.; and Latimer, Lee H., 5,464,852, Cl. 514-373.000.

Hnatyszyn, H. James: *See*—
Kossovsky, Nir; Gelman, Andrew E.; and Hnatyszyn, H. James, 5,464,634, Cl. 424-493.000.

Ho, Mark: *See*—
Ho, Stanley; and Ho, Mark, 5,464,113, Cl. 220-9.200.

Ho, Richard K. Pump spray bottle. 5,464,129, Cl. 222-377.000.

Ho, Stanley; and Ho, Mark, to Allure Home Creation Co., Inc. Collapsible hamper for storage of laundry and other items. 5,464,113, Cl. 220-9.200.

Hochhausl, Anton, to Scovill Fasteners Inc. Attaching machine for attaching fasteners. 5,463,807, Cl. 29-809.000.

Hodges, Ron: *See*—
Hilt, James J.; Hodges, Ron; Pardue, Stephen W.; and Powar, William L., 5,465,206, Cl. 364-406.000.

Hoebener, Christian M.: *See*—
Hoebener, William H.; and Hoebener, Christian M., 5,464,729, Cl. 430-396.000.

Hoebener, William H.; and Hoebener, Christian M. Process for creating an image on film used in screen printing. 5,464,729, Cl. 430-396.000.

Hoechst Aktiengesellschaft: *See*—
Grau, Ulrich; and Ziegert, Günter, 5,464,118, Cl. 221-5.000.
Heinrich, Bernd, 5,464,694, Cl. 128-357.000.
Horn, Ute; and Dessauer, Guido, 5,464,472, Cl. 106-287.340.
Lyding, Günther; Pille, Maria; von Plessen, Helmold; and Semel, Joachim, 5,464,876, Cl. 521-46.500.

Hoechst Celanese Corporation: *See*—
Vicari, Richard; Kvakovszky, George; and Fruchey, Olan S., 5,464,923, Cl. 528-68.000.
Vicari, Richard; Kvakovszky, George; Fruchey, Olan S.; and Metz, Hans J., 5,464,941, Cl. 534-741.000.

Hoechst-Roussel Pharmaceuticals, Inc.: *See*—
Effland, Richard C.; and Wettlaufer, David G., 5,464,846, Cl. 514-333.000.

Hoegnelid, Kurt: *See*—
Hedberg, Sven-Erik; Obel, Martin; and Hoegnelid, Kurt, 5,464,429, Cl. 607-4.000.

Hoekema, Andreas: *See*—
Schilperoort, Robbert A.; and Hoekema, Andreas, 5,464,763, Cl. 435-172.300.

Hoenninger, John C., III, to University of California, The Regents of the. Microcode linker/loader that generates microcode sequences for MRI sequencer by modifying previously generated microcode sequences. 5,465,361, Cl. 395-700.000.

Hoffman, Ronald J.; and Olsen, Jens K., to Ryobi Outdoor Products. Method of making a powdered metal camshaft assembly. 5,463,809, Cl. 29-888.100.

Hoffmann-La Roche Inc.: *See*—
Böhringer, Markus; Hubschwerlen, Christian; Pflieger, Philippe; and Specklin, Jean-Luc, 5,464,617, Cl. 424-114.000.
Reynolds, Rebecca L.; and Walsh, P. Sean, 5,464,945, Cl. 536-24.310.

Hoffmann, Rainer: *See*—
Becker, Wolfgang; Mathis, Raymond; Stapper-Druyen, Syliva; Robrahn, Karin; Hoffmann, Rainer; and Kiray, Yasar C., 5,464,660, Cl. 427-389.000.

Hofmann, George H., to Du Pont de Nemours, E. I., and Company. Process for preparing ethylene copolymer plasticized PVC. 5,464,903, Cl. 525-183.000.

Hofmann, Gunter A., to Genetronics, Inc. Transdermal drug delivery by electroincorporation of vesicles. 5,464,386, Cl. 604-20.000.

Hofmann, Karl, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 5,464,158, Cl. 239-533.400.

Hogan, James E.; and Brown, Mary A. Aspirating tooth brush. 5,463,792, Cl. 15-322.000.

Hogan, Sherman D. Tobacco package with disposal pouch. 5,464,093, Cl. 206-265.000.

Hoge, David T.; Konshak, Michael V.; Owens, John C.; Johnson, Michael W.; Ramboseк, George P.; and Rieger, Thomas J., to Storage Technology Corporation. Magnetic tape cartridge having leader block retainer mechanism. 5,465,187, Cl. 360-132.000.

Hohara, Kazuhiko: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mituhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.

Holbrook, Russell W.: *See*—
Foster, Dean H.; Holbrook, Russell W.; Morabito, James; Silverberg, Morton; and Supron, Steven A., 5,464,317, Cl. 414-798.200.

Holland Hitch Company: *See*—
Flater, James H., 5,464,241, Cl. 280-425.100.

Hollis, Thomas J. Hydraulically operated restrictor/shutoff flow control valve. 5,463,986, Cl. 123-41.100.

Holly, Krisztina: *See*—
Barrus, John; Holly, Krisztina; and Cassidy, Michael, 5,465,291, Cl. 379-67.000.

Hollyer, James: *See*—
Huang, Alvin S.; and Hollyer, James, 5,464,646, Cl. 426-615.000.

Holthaus, Gary A.: *See*—
Beck, Norman G.; Wallis, Frank S.; and Holthaus, Gary A., 5,464,332, Cl. 417-368.000.

Holtz, Brian E.: *See*—
Baseghi, Behshad; Mazooji, Mohammad; and Holtz, Brian E., 5,465,405, Cl. 455-226.400.

Holtzclaw, John V.: *See*—
Preddy, Carl R.; and Holtzclaw, John V., 5,464,735, Cl. 430-574.000.

Hölzer, Thomas: *See*—
Elgert, Achim; and Hölzer, Thomas, 5,465,032, Cl. 315-403.000.

Home Care Industries, Inc.: *See*—
Bosses, Mark D., 5,464,460, Cl. 55-374.000.

Homma, Hideo: *See*—
Ishikawa, Hisashi; Homma, Hideo; Nagashima, Yoshitake; and Saito, Takashi, 5,465,173, Cl. 358-534.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Aoki, Jun; Masuda, Katsuhiko; and Hashizume, Isamu, 5,464,084, Cl. 192-35.000.
Iguchi, Masaru; Shigeta, Hiromasa; and Matsumoto, Keizo, 5,464,493, Cl. 156-290.000.
Kanazawa, Yoshinobu; and Okazaki, Hidetsugu, 5,464,252, Cl. 280-805.000.
Mochizuki, Kazuhiko; Inagaki, Hiromi; and Akuzawa, Kenji, 5,465,208, Cl. 364-426.010.
Sakai, Hisao; Shimada, Hiroo; Sono, Hiroshi; Nagahiro, Kenichi; Sugita, Narutoshi; Maeda, Hirotsugu; Miyao, Masakatsu; Nakamura, Katsunori; Ogita, Yasunori; and Suzuki, Osamu, 5,463,995, Cl. 123-432.000.

Honey Bee Manufacturing Ltd.: *See*—
Honey, Gregory J., 5,464,371, Cl. 460-20.000.

Honey, Gregory J., to Honey Bee Manufacturing Ltd. Feeder adapter for mounting a combine header to a feeder housing of a combine. 5,464,371, Cl. 460-20.000.

Honeywell Inc.: *See*—
McGregor, John A.; and Parris, Robert P., 5,464,965, Cl. 219-497.000.
Strandjord, Lee J.; and Sanders, Glen A., 5,465,149, Cl. 356-350.000.

Hong, Gary, to United Microelectronics Corporation. Method of making a flash EPROM device having a drain edge P+ implant. 5,464,785, Cl. 437-43.000.

Honzawa, Eiji: *See*—
Horikawa, Hiroshi; Honzawa, Eiji; Masumura, Tadahiro; and Fukazawa, Akira, 5,464,637, Cl. 426-2.000.

Hoover, Charles E.; Dennin, Randy J.; Gabor, E. Allan; Schobel, Mark; and Sorg, Albert F., to Warner-Lambert Company. Encapsulated dosage forms. 5,464,631, Cl. 424-454.000.

Hope, Peter: *See*—
Jelenic, Jernej; Meijer, John; and Hope, Peter, 5,464,907, Cl. 525-303.000.

Horan, David J.: *See*—
Bianco, James S.; and Horan, David J., 5,465,176, Cl. 359-567.000.

Hori, Shinichi; Kawasaki, Atsuko; Nakashita, Takefumi; Inui, Yoshiharu; Sakaki, Toshiaki; and Miki, Miyo, to Sumitomo Rubber Industries, Ltd. Compressive hemostatic belt. 5,464,420, Cl. 606-202.000.

Horibe, Kenji: *See*—
Katoh, Akio; Abe, Nobuo; Hanai, Takeshi; and Horibe, Kenji, 5,465,022, Cl. 313-144.000.

Horikawa, Hiroshi; Honzawa, Eiji; Masumura, Tadahiro; and Fukazawa, Akira, to C. Itoh Feed Mills Co., Ltd. Egg containing iron or vitamin D_3 in high content. 5,464,637, Cl. 426-2.000.

Horinouchi, Shogo: *See*—
Terashima Yugi; Horinouchi, Shogo; and Matsuba, Hiroyuki, 5,465,242, Cl. 369-44.190.

Horiuchi, Kenji: *See*—
Nagamine, Masashi; Yamamoto, Kenji; Matsui, Yoshimitsu; Horiuchi, Kenji; and Yoshida, Masanori, 5,464,863, Cl. 514-443.000.

Horiuchi, Michio; Harayama, Yoichi; and Hayashi, Koishiro, to Shinko Electric Industries Co., Ltd. Aluminum nitride circuit board and method of producing same. 5,464,950, Cl. 174-256.000.

Horiuchi, Shigeyuki, to Masudaya Corporation. Swimming toy fish aquarium having multiple toy fish and different magnet positions. 5,463,826, Cl. 40-426.000.

Horn, Ute; and Dessauer, Guido, to Hoechst Aktiengesellschaft. Fine aqueous dispersion of an organophilic sheet silicate. 5,464,472, Cl. 106-287.340.

Horng, Chi-Song: *See*—
Hsieh, Wen-Jai; Horng, Chi-Song; and Wong, Chun C. D., 5,465,056, Cl. 326-41.000.

Horstman, Rudolf A.: *See*—
Schreurs, Jacobus C.; and Horstman, Rudolf A., 5,465,277, Cl. 375-376.000.

Horwitz, Robert P., to ITT Corporation. Water pressure control system. 5,464,327, Cl. 417-12.000.

Hoshi, Toshiharu; and Kamimura, Naoki, to Yamaha Corporation. Golf club head. 5,464,216, Cl. 273-167.00R.

Hoshino Gakki Co. Ltd.: *See*—
Koike, Yukinaga, 5,465,411, Cl. 455-275.000.

Hoskins Manufacturing Co.: *See*—
Hall, Bertie F., Jr., 5,464,485, Cl. 136-230.000.

Hosono, Kunihiro: *See*—
Yoshioka, Nobuyuki; Hosono, Kunihiro; and Miyazaki, Junji, 5,464,713, Cl. 430-5.000.

Hosoya, Yoshiteru: *See*—
Harada, Kuniyuki; Sawada, Kazutaka; Hosoya, Yoshiteru; and Shibusawa, Tetsuo, 5,464,671, Cl. 428-40.000.

Hosticka, Bedrich: *See*—
Maschmann, Martin; Schardein, Werner; and Hosticka, Bedrich, 5,465,074, Cl. 330-263.000.

Hostler, Jonathan E.; DeCamp, William H.; and Slanker, Daniel W., to Motoman Inc. Sealing arrangement for a laser enclosure. 5,464,963, Cl. 219-121.820.

Hotkowski, Peter; and Burton, Peter, to General Binding Corporation. Automatic binder. 5,464,312, Cl. 412-7.000.

Hotta, Hisashi: *See*—
Akiyama, Keiji; Watanabe, Noriaki; Hotta, Hisashi; Toyama, Tadao; and Nishimiya, Nobuyuki, 5,464,724, Cl. 430-272.000.

Houlberg, Christian L., to United States of America, Navy. Digital circuit for decoding encoded doppler data. 5,465,274, Cl. 375-340.000.

Howa Machinery Ltd.: *See*—
Hanai, Teruo, 5,464,233, Cl. 279-137.000.

Howell, Thomas A.: *See*—
Fogarty, Thomas J.; and Howell, Thomas A., 5,464,447, Cl. 607-129.000.

Hoy, Brenda: *See*—
Oehr, Klaus H.; Timewell, Richard R.; Donahue, Harvey; Hoy, Brenda; Kim, Ronald; and Roth, Reinhold C., 5,464,510, Cl. 204-141.500.

Hoyt, John G. Free standing boom with substantially constant leech tension. 5,463,969, Cl. 114-39.001.

Hoyt, Matthew B.; and Wilson, Phillip E., to BASF Corporation. Reduced staining carpet yarns and carpet. 5,464,676, Cl. 428-85.000.

Hroch, George J., to NCR Corporation. Actuator mechanism for positioning reference members in a document track. 5,463,913, Cl. 74-526.000.

Hruska, Robert E.: *See*—
Adamczyk, Maciej; Fishpaugh, Jeffrey R.; Johnson, Donald; and Hruska, Robert E., 5,464,767, Cl. 435-188.000.

Hsieh, Chang-Li: *See*—
VanBuskirk, Gregory K.; Hsieh, Chang-Li; McNulty, Kenneth J.; and Hansen, Ole V., 5,464,459, Cl. 55-257.200.

Hsieh, Hsin-Yi: *See*—
Zemel, Jay N.; and Hsieh, Hsin-Yi, 5,463,899, Cl. 73-195.000.

Hsieh, Wen-Jai; Horng, Chi-Song; and Wong, Chun C. D., to I-Cube, Inc. Apparatus for programmable circuit and signal switching. 5,465,056, Cl. 326-41.000.

Hsu, Lillian-Liu; Sathi, Kitty; Biondi, Mark C.; Zell, Thomas B.; Catapano, David A.; and Lauria, Richard T., to Xerox Corporation. Apparatus and method for parsing a stream of data including a bitmap and creating a table of break entries corresponding with the bitmap. 5,465,322, Cl. 395-114.000.

Huang, Alvin S.; and Hollyer, James, to University of Hawaii. Manufacturing of acridity-free raw flour from Araceae tubers. 5,464,646, Cl. 426-615.000.

Huang, Nai Z.: *See*—
Cahoon, John M.; Karn, Jack L.; and Huang, Nai Z., 5,464,548, Cl. 252-18.000.

Huang, Qiang: *See*—
Caulfield, H. John; Huang, Qiang; Putilin, Andrei; and Morozov, Valentin, 5,465,311, Cl. 385-27.000.

Hubbard, Leslie H. One way animal gate. 5,463,984, Cl. 119-840.000.

Huber, Mortimer J., to Quality Manufacturing incorporated. Flexible masking tape. 5,464,692, Cl. 428-343.000.

Hublot, Bernard: *See*—
Lepage, Francis; and Hublot, Bernard, 5,464,860, Cl. 514-404.000.

Hubschwerlen, Christian: *See*—
Böhringer, Markus; Hubschwerlen, Christian; Pfleger, Philippe; and Specklin, Jean-Luc, 5,464,617, Cl. 424-114.000.

Huculak, John C.: *See*—
Charles, Steven T.; Ripley, John A.; and Huculak, John C., 5,464,025, Cl. 128-849.000.

Huels Aktiengesellschaft: *See*—
Balzer, Dieter, 5,464,874, Cl. 514-777.000.

Hufen, Ralf: *See*—

Archey, Rick L.; Lundy, Charles E.; Meltzer, Aaron D.; Pielartzik, Harald; Fennhoff, Gerhard; Hufen, Ralf; Kircher, Klaus; Schubart, Rudiger; and Weider, Richard, 5,464,893, Cl. 524-366.000.

Hufton, Peter F., to Rolls-Royce Power Engineering plc. Low NO_x air and fuel/air nozzle assembly. 5,464,344, Cl. 431-10.000.

Hug, Berthold: *See*—
Lee, Kevin; and Hug, Berthold, 5,465,324, Cl. 395-133.000.

Hughbanks, Richard A.: *See*—
Kirkpatrick, W. Mark, III; and Hughbanks, Richard A., 5,464,166, Cl. 242-527.300.

Hughes Aircraft Company: *See*—
Himmel, Richard P.; and Brown, Raymond, 5,464,652, Cl. 427-97.000.
Keech, Kimberly W.; and Rothaus, Robert J., 5,465,106, Cl. 345-204.000.

Hughes, Charles H., to Cold Metal Products, Inc. Wide-width micrometer and method of using the same. 5,463,818, Cl. 33-813.000.

Huissoon, Jan P.; and Strauss, David L. System and method for tracking a feature on an object using a redundant axis. 5,465,037, Cl. 318-568.110.

Hull, Jonathan J.; and Hart, Peter E., to Ricoh Company, Ltd.; and Ricoh Corporation. Image matching and retrieval by multi-access redundant hashing. 5,465,353, Cl. 395-600.000.

Humpolik, Bohumil: *See*—
Maus, Wolfgang; Swars, Helmut; Brück, Rolf; and Humpolik, Bohumil, 5,464,679, Cl. 428-116.000.

Hunneyball, Ian M.: *See*—
Armitage, Bernard J.; Bowen, John G.; Crossley, Malcolm J.; Hunneyball, Ian M.; Leslie, Bruce W.; Miller, Thomas K.; and Spowage, Michael, 5,464,781, Cl. 514-300.000.

Hunsinger, Billie J.; Vigil, A. J.; and Solie, Leland P., to USA Digital Radio Partners, L.P. In-band on-channel digital broadcasting. 5,465,396, Cl. 455-61.000.

Hunt, Bobby R.: *See*—
Hutcheson, Timothy L.; Or, Wilson; Narayanan, Venkatesh; Mohan, Subramanian; Wohlmut, Peter G.; Srinivasan, Ramanujam; Hunt, Bobby R.; and Ryan, Thomas W., 5,465,308, Cl. 382-159.000.

Hunter Fan Company: *See*—
Scofield, Robert L., 5,464,323, Cl. 416-134.00R.

Hupf, Charles J.; and Rohrer, Jeffrey, to Regal Ware, Inc. Motorized tool for slicing and tenderizing foods and method. 5,463,942, Cl. 99-537.000.

Hurwitz, Robert. Kit for cleaning radiological cassettes. 5,464,096, Cl. 206-494.000.

Husa, Robert K.: *See*—
Hallinan, E. Ann; Hagen, Timothy J.; Husa, Robert K.; Tsymbalov, Sofya; Lee, Albert C.; and Van Hoeck, Jean-Pierre, 5,464,830, Cl. 514-211.000.

Hutcheson, Timothy L.; Or, Wilson; Narayanan, Venkatesh; Mohan, Subramaniam; Wohlmut, Peter G.; Srinivasan, Ramanujam; Hunt, Bobby R.; and Ryan, Thomas W., to Datron/Transoc, Inc. Pattern recognition system. 5,465,308, Cl. 382-159.000.

Hutchins, Donald H., to Hutchins Manufacturing Company. Reciprocating abrading tool. 5,464,366, Cl. 451-356.000.

Hutchins Manufacturing Company: *See*—
Hutchins, Donald H., 5,464,366, Cl. 451-356.000.

Hutchinson: *See*—
Godeau, Denis, 5,464,256, Cl. 285-26.000.

Hyacinthe, Roland: *See*—
Tournier, Hervé; Hyacinthe, Roland; and Schneider, Michel, 5,464,696, Cl. 428-403.000.

Hyde, Andrea M.: *See*—
Bringley, Joseph F.; Bryan, Philip S.; and Hyde, Andrea M., 5,464,568, Cl. 252-301.40H.

Hymo Corporation: *See*—
Takeda, Hisao; Koshiji, Youichi; Kubota, Hidehiro; and Iizuka, Takashi, 5,464,516, Cl. 204-182.900.

Hynecek, Jaroslav, to Texas Instruments Incorporated. Process tracking bias generator for advanced lateral overflow antiblooming drain. 5,464,996, Cl. 257-230.000.

Hyperthern, Inc.: *See*—
Luo, Lifeng; and Couch, Richard W., Jr., 5,464,962, Cl. 219-121.520.

Hyundai Electronics Industries Co., Ltd.: *See*—
Ryou, Hui K., 5,464,787, Cl. 437-52.000.

I-Cube, Inc.: *See*—
Hsieh, Wen-Jai; Horng, Chi-Song; and Wong, Chun C. D., 5,465,056, Cl. 326-41.000.

Iatrotech, Inc.: *See*—
Hall, Deborah K.; and Rencs, Erik, 5,464,960, Cl. 219-121.600.

Iba, Hitomi: *See*—
Nakai, Satoru; Aihara, Koutoku; Tanaka, Hideo; Iba, Hitomi; Kawai, Kazuyoshi; Ichikawa, Hiroyuki; Akamatsu, Seiji; Saito, Fumio; Tominaga, Michiaki; and Adachi, Masakazu, 5,464,833, Cl. 514-251.000.

Ibori, Satoshi; Yamashita, Hitoshi; Baba, Shigeyuki; Fujii, Hiroshi; Kambara, Takatsugu; and Ishibashi, Akira, to Hitachi, Ltd. Inverter apparatus provided with electric discharge control circuit of dc smoothing capacitor and method of controlling the same. 5,465,202, Cl. 363-37.000.

Ichikawa, Hiroyuki: *See*—
Nakai, Satoru; Aihara, Koutoku; Tanaka, Hideo; Iba, Hitomi; Kawai, Kazuyoshi; Ichikawa, Hiroyuki; Akamatsu, Seiji; Saito, Fumio; Tominaga, Michiaki; and Adachi, Masakazu, 5,464,833, Cl. 514-251.000.

Ichimura, Atsushi: *See*—
Nakatani, Yasuhiro; Ichimura, Atsushi; Tanaka, Toshio; Takeuchi, Hiroshi; and Okano, Yoichi, 5,465,089, Cl. 340-995.000.

ICI Americas Inc.: *See*—
Harting, Darwin B., 5,463,956, Cl. 102-282.000.

ICI Canada Inc.: *See*—
Carriere, Raymond, 5,463,955, Cl. 102-275.200.

Ide, Yoshihiro; Kakuno, Imao; Sakurai, Nobumasa; Mitsui, Hideto; and Okayasu, Yoshisada, to Sony Corporation. Connecting apparatus for a video tape recorder having a built-in camera. 5,465,117, Cl. 348-373.000.

Idec Izumi Corporation: *See*—
Kimura, Haruo; Sekino, Yoshio; Masuya, Takashi; and Fukui, Takao, 5,464,954, Cl. 200-61.620.

Igarashi, Koichi: *See*—
Senoo, Masaharu; Sasada, Reiko; and Igarashi, Koichi, 5,464,943, Cl. 536-23.500.

Igarashi, Yoshiaki; and Ito, Yoshiro, to Precision Fukuhara Works, Ltd. Double-knit fabric having non-run and stretchability characteristics and method and apparatus for knitting the same. 5,463,881, Cl. 66-31.000.

Iguchi, Masaru; Shigeta, Hiromasa; and Matsumoto, Keizo, to Honda Gikeu Kogyo Kabushiki Kaisha. Thermoplastic composite fabrics and formed article produced therefrom. 5,464,493, Cl. 156-290.000.

Iguchi, Michihisa: *See*—
Nakamura, Tetsuya; Kabai, Takahito; Iguchi, Michihisa; Arai, Seiji; Sakai, Chinobu; and Katagata, Satoshi, 5,465,140, Cl. 355-260.000.

Ihara, Sigeo; and Itoh, Satoshi, to Hitachi, Ltd. Method for constructing a carbon molecule and structures of carbon molecules. 5,464,987, Cl. 250-492.300.

Iijima, Hiroshi, to Kabushiki Kaisha Topcon. Noncontact type tonometer. 5,465,123, Cl. 351-208.000.

Iiyama, Michitomo: *See*—
Inada, Hiroshi; and Iiyama, Michitomo, 5,464,812, Cl. 505-237.000.

Iizuka, Takashi: *See*—
Takeda, Hisao; Koshiji, Youichi; Kubota, Hidehiro; and Iizuka, Takashi, 5,464,516, Cl. 204-182.900.

Ikeda, Kiichi; Kajita, Shuji; and Iwatsuki, Tetsu, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Shoe sole for leg apparatus. 5,464,380, Cl. 601-29.000.

Ikeda, Takayuki: *See*—
Ito, Takafumi; Suzuki, Kenji; Ikeda, Takayuki; Oyama, Fumio; and Mazur, Walt, 5,465,370, Cl. 395-200.040.

Ikeda, Yasukazu; Matsumoto, Hideo; and Sakamoto, Susumu, to Mitsubishi Denki Kabushiki Kaisha. High frequency transistor with reduced parasitic inductance. 5,465,007, Cl. 257-584.000.

Ikemoto, Kimikazu: *See*—
Nishimoto, Yutaka; Ikemoto, Kimikazu; Niimi, Yuji; and Asai, Akio, 5,464,474, Cl. 118-676.000.

Ikuma, Takeshi; Sakata, Masaaki; Akioka, Hiroharu; and Shimod, Tatsuya, to Seiko Epson Corporation. Resin bound magnet and its production process. 5,464,670, Cl. 428-35.800.

Ilg, Otto M.: *See*—
Corbin, Thomas F.; Ilg, Otto M.; and Armstrong, Robert N., 5,464,677, Cl. 428-95.000.

Illinois Tool Works Inc.: *See*—
Chizmadia, Alex R., 5,464,232, Cl. 279-124.000.
Jones, James D., Jr., 5,465,078, Cl. 335-305.000.

Image Technology International, Inc.: *See*—
Wah Lo, Allen K.; and Wu, Augustine K., 5,465,128, Cl. 354-114.000.

Imahashi, Kunihiko: *See*—
Miura, Hirohisa; Imahashi, Kunihiko; Michioka, Hirohumi; Yamada, Yasuhiro; Kusui, Jun; and Tanaka, Akiei, 5,464,463, Cl. 75-244.000.

Imai, Benjamin T.; Le, Hung Q.; and Nguyen, Dung Q., to International Business Machines Corporation. Fetch and store buffer that enables out-of-order execution of memory instructions in a data processing system. 5,465,336, Cl. 395-375.000.

Imai, Yasushi: *See*—
Sasaki, Masanori; Shibafuchi, Hiroshi; Imai, Yasushi; Yoshida, Masahiko; and Yoshie, Takehiko, 5,464,248, Cl. 280-741.000.

Imber, Bryan E.: *See*—
Sanders, Brenda M.; Jenkins, Kenneth D.; Nichols, Jack L.; and Imber, Bryan E., 5,464,750, Cl. 435-7.210.

Imm, Dennis: *See*—
Mangone, Ronald W.; and Imm, Dennis, 5,463,786, Cl. 14-73.000.

Immunex Corporation: *See*—
Sims, John E.; Cosman, David J.; Lupton, Stephen D.; Mosley, Bruce A.; and Dower, Steven K., 5,464,937, Cl. 530-350.000.
Smith, Craig A.; and Goodwin, Raymond G., 5,464,938, Cl. 530-350.000.

Immuno AG: *See*—
Barta, Helmut; Eder, Helmut; Granser, Manfred; Habison, Georg; Hantak, Edith; Moser, Franz; and Pfaffenbichler, Peter, 5,464,396, Cl. 604-191.000.

ImmunoPharmaceutics, Inc.: *See*—
Chan, Ming F.; Raju, Bore G.; Castillo, Rosario S.; Kois, Adam; Wu, Chengde; and Balaji, Vitukudi, 5,464,853, Cl. 514-378.000.

Imperial Chemical Industries PLC: *See*—
Casci, John L.; Shannon, Mervyn D.; and Lake, Ivan J. S., 5,464,799, Cl. 502-65.000.

Inada, Hiroshi; and Iiyama, Michitomo, to Sumitomo Electric Industries, Ltd. Thin film of oxide superconductor possessing locally different crystal orientations and processes for preparing the same. 5,464,812, Cl. 505-237.000.

Inagaki, Hajime: *See*—

Tsutsui, Toshiyuki; Yoshitsugu, Ken; Takahashi, Masoru; Todo, Akira; Ohta, Seiji; and Inagaki, Hajime, 5,464,905, Cl. 525-240.000.

Inagaki, Hiromi: *See*—
Mochizuki, Kazuhiko; Inagaki, Hiromi; and Akuzawa, Kenji, 5,465,208, Cl. 364-426.010.

Inagaki, Yoshio; and Suga, Shuzo, to Fuji Photo Film Co., Ltd. Methine compounds and silver halide photographic materials containing the compound. 5,464,734, Cl. 430-570.000.

InControl, Inc.: *See*—
Adams, John M.; and Alferness, Clifton A., 5,464,431, Cl. 607-4.000.
Infinger, Kenneth R.; and Bocek, Joseph M., 5,464,432, Cl. 607-5.000.
White, Harley; and Adams, John M., 5,464,433, Cl. 607-5.000.

Industrial Research B.V.: *See*—
Glastra, Hendrik, 5,464,419, Cl. 606-194.000.

Industrial Scientific Corporation: *See*—
Wang, Annie Q., 5,464,983, Cl. 250-343.000.

Industrial Technology Research Institute: *See*—
Koh, Chao-Ming, 5,464,782, Cl. 437-41.000.

Infan, Salvatore: *See*—
Kopernicky, Jaroslav J.; and Infan, Salvatore, 5,464,537, Cl. 210-453.000.

Infinger, Kenneth R.; and Bocek, Joseph M., to InControl, Inc. Implantable atrial defibrillator having an intermittently activated fibrillation detector. 5,464,432, Cl. 607-5.000.

Information Optics Corporation: *See*—
Russell, James T., 5,465,238, Cl. 365-234.000.

Ing. h.c.F. Porsche AG: *See*—
Krotky, Peter; Bauhofer, Markus; and Heinzelmann, Walter, 5,463,991, Cl. 123-195.00R.

Inoue, Kenji: *See*—
Suchiro, Mitsugi; Seto, Toru; Mitsuoka, Shigeaki; and Inoue, Kenji, 5,464,604, Cl. 423-570.000.

Inoue, Nori; Okumura, Hitoshi; and Nakata, Hiroyuki, to Sumitomo Wiring Systems, Ltd. Lever-operated connector. 5,463,912, Cl. 74-519.000.

Inoue, Shinichi: *See*—
Takahashi, Kazuo; Kumata, Fumio; Nozaki, Hitoshi; Inoue, Shinichi; and Makabe, Toshiji, 5,464,593, Cl. 422-224.000.

Institut Francais du Petrole: *See*—
Beauducel, Claude; and Coquerel, Patrick, 5,465,270, Cl. 375-242.000.
Fleury, Marc; Lenormand, Roland; and Ringot, Gabriel, 5,463,894, Cl. 73-38.000.

Institut fuer Luft- und Kaeltetechnik Gemeinnuetzige Gesellschaft mbH: *See*—
Albring, Peter; Apley, Rainer; Döge, Klaus; Heinrich, Günter; Lindner, Ernst; Müller, Norbert; Pauer, Reinhard; Pilling, Eberhard; and Rudischer, Rainer, 5,464,325, Cl. 416-185.000.

Integral Peripherals, Inc.: *See*—
Andrews, Thomas L., Jr.; and Counts, Gary E., 5,465,034, Cl. 318-560.000.

Integrity Systems, Inc.: *See*—
Adams, Steven E., 5,465,258, Cl. 395-700.000.

Intel Corporation: *See*—
Reddy, Chandrashekar M.; Hirose, Scott D.; Cho, Sung-Soo; Kardach, James P.; Farrer, Steven M.; and Roberts, Meeling, 5,465,367, Cl. 395-750.000.
Rotem, Shai; and Shtadler, Ze'ev, 5,465,216, Cl. 364-488.000.

Inteplast Corporation: *See*—
Tseng, Ben; and Chen, Peter, 5,464,098, Cl. 206-554.000.

Intermedics, Inc.: *See*—
Alt, Eckhard, 5,464,434, Cl. 607-6.000.

International Business Machines Corporation: *See*—
Allen, Ruth A.; Goetze, Lisa M.; Nick, Jeffrey M.; Pushong, Kelly B.; Surman, David H.; and Swanson, Michael D., 5,465,359, Cl. 395-700.000.
Angelopoulos, Marie; Gelorme, Jeffrey D.; Labadie, Jeffrey W.; Lewis, David A.; Swanson, Sally A.; and Labianca, Nancy C., 5,464,927, Cl. 528-350.000.
Bajorek, Christopher H.; Erpelding, A. David; Garfunkel, Glen A.; Pattanaik, Surya; Robertson, Neil L.; and Wallash, Albert J., 5,465,186, Cl. 360-113.000.
Bealkowski, Richard; Geisler, Douglas R.; and Turner, Michael R., 5,465,357, Cl. 395-700.000.
Blades, Jerry A.; and Kiel, Harvey G., 5,465,358, Cl. 395-700.000.
Blalock, James L., deceased; and Sterrett, William R., 5,465,121, Cl. 348-744.000.
Blanc, Alain; and Ceresiani, Lucien, 5,465,345, Cl. 395-200.150.
Blaner, Bartholomew; and Vassiliadis, Stamatis, 5,465,377, Cl. 395-800.000.
Chao, Hu H.; Chang, Jung H.; and Shih, Feng-Hsien W., 5,465,347, Cl. 395-550.000.
Cook, Thomas E.; Fantacone, Mark J.; Galbraith, Robert E.; Glassen, Steven G.; Meritt, Allan S.; Oakes, Kenneth J.; and Yudenfriend, Harry M., 5,465,355, Cl. 395-200.150.
Day, Kennith F., III; Larnear, William D., Jr.; and Morse, Edward R., 5,465,382, Cl. 395-404.000.
Dell, Timothy J.; and Foster, Jimmy G., 5,465,262, Cl. 371-49.300.
Deloye, Michael J.; Fuoco, Daniel P.; and Moeller, Dennis L., 5,465,332, Cl. 395-842.000.
Dievendorff, Richard; and Mohan, Chandrasekaran, 5,465,328, Cl. 395-182.130.
Dinkjian, Robert M.; Heller, Lisa C.; Kordus, Steven R.; Lauricella, Kenneth A.; Seigendall, Thomas W.; Skaggs, Robert A.; and Xu, Nelson S., 5,465,374, Cl. 395-800.000.
Edgar, Albert D., 5,465,155, Cl. 358-500.000.
Epstein, Edward A., 5,465,317, Cl. 395-2.450.
Gelorme, Jeffrey D.; Skarvinko, Eugene R.; and Wang, David W., 5,464,726, Cl. 430-326.000.
Hancock, Steven M.; and Pietras, Mark A., 5,465,118, Cl. 348-396.000.
Heim, David E.; and Parkin, Stuart S. P., 5,465,185, Cl. 360-113.000.
Imai, Benjamin T.; Le, Hung Q.; and Nguyen, Dung Q., 5,465,336, Cl. 395-375.000.
Johnson, William J., 5,465,309, Cl. 382-229.000.
Judd, Ian D.; and Beer, Reginald, 5,465,251, Cl. 370-54.000.
Kahle, James A.; Kau, Chin-Cheng; Levitan, David S.; Ogden, Aubrey D.; Poursepanj, Ali A.; Tu, Paul K.-G.; and Waldecker, Donald E., 5,465,373, Cl. 395-800.000.
Montegari, Frank A., 5,465,230, Cl. 365-168.000.
Narita, Izuru; Suzuki, Keiji; Mito, Toshitsugu; and Tsurukawa, Noboru, 5,465,039, Cl. 320-32.000.
Nomura, Hideo; Uchiyama, Yoshiharu; and Ogawa, Tetsuo, 5,465,191, Cl. 361-681.000.
Olnowich, Howard T., 5,465,333, Cl. 395-281.000.
Pelella, Antonio R., 5,465,060, Cl. 327-51.000.
Perfecto, Eric D.; Prasad, Chandrika; Prasad, Keshav; Robbins, Gordon J.; Swaminathan, Madhavan; and White, George E., 5,464,682, Cl. 428-210.000.
Tsujimura, Takatoshi; and Kitahara, Hiroaki, 5,464,500, Cl. 216-34.000.
Vader, David T.; and Vasile, Vincent C., 5,463,872, Cl. 62-51.100.
Walsh, Stephen J., 5,465,342, Cl. 395-446.000.
Wang, Diana S.; and Williams, Marvin L., 5,465,327, Cl. 395-159.000.
Yang, Michael S.; and Yih, Jih-Shyr, 5,465,331, Cl. 395-200.080.

International Business Machines, Inc.: *See*—
Lathrop, Frederick L.; and Rowland, Kenneth A., 5,465,364, Cl. 395-700.000.

International Data Matrix, Inc.: *See*—
Priddy, Dennis G.; and Cymbalski, Robert S., 5,464,974, Cl. 235-494.000.

International Flavors & Fragrances Inc.: *See*—
Warren, Craig B.; Marin, Anna B.; Butler, Jerry F.; and Narula, Anubhav P. S., 5,464,626, Cl. 424-408.000.

intur System-Profil GmbH + Co.: *See*—
Schomakers, Franz, 5,464,298, Cl. 403-252.000.

Inui, Yoshiharu: *See*—
Hori, Shinichi; Kawasaki, Atsuko; Nakashita, Takefumi; Inui, Yoshiharu; Sakaki, Toshiaki; and Miki, Miyo, 5,464,420, Cl. 606-202.000.

Inukai, Yuzo: *See*—
Kawasumi, Seiji; and Inukai, Yuzo, 5,463,952, Cl. 101-454.000.

Inventio AG: *See*—
Müller, Wolfgang, 5,464,072, Cl. 187-249.000.

Iowa State University Research Foundation, Inc.: *See*—
Verkade, John G., 5,464,656, Cl. 427-248.100.
Weber, Robert J.; Chung, Russell W.-C.; and Liu, Yet-zen, 5,465,171, Cl. 359-287.000.

Isaac, Del: *See*—
Campbell, Joe E.; and Isaac, Del, 5,464,254, Cl. 283-109.000.

Isbell, Arthur F. Method for loading a delivery system for a chemical repellant composition. 5,464,624, Cl. 424-405.000.

Iseda, Toru: *See*—
Makino, Ichiro; Mitsui, Akira; Takehara, Mikio; Ando, Eiichi; Ebisawa, Junichi; Suzuki, Koichi; Matsumoto, Kiyoshi; Iseda, Toru; and Suzuki, Susumu, 5,464,674, Cl. 428-694.00T.

I-Shan, Chang. Stageless folding deck chair. 5,464,270, Cl. 297-81.000.

Isharani, Jayanti V.; Raper, James K.; Allen, A. Donald, Jr.; and Middleton, John W., to Ciba-Geigy Corporation. Use of reverse-water-soluble polymers as non-formaldehyde-releasing binder resins for textile-finishes. 5,464,545, Cl. 252-8.600.

Ishibashi, Akira: *See*—
Ibori, Satoshi; Yamashita, Hitoshi; Baba, Shigeyuki; Fujii, Hiroshi; Kambara, Takatsugu; and Ishibashi, Akira, 5,465,202, Cl. 363-37.000.

Ishida Co., Ltd.: *See*—
Fukuda, Masao, 5,463,850, Cl. 53-551.000.

Ishida, Kouichi: *See*—
Kishita, Hirofumi; Yamaguchi, Kouichi; Kobayashi, Nobuyuki; and Ishida, Kouichi, 5,464,917, Cl. 528-14.000.

Ishido, Kiminori; and Yamaguchi, Masahiro, to NEC Corporation. Method of manufacturing a printed wiring board. 5,464,725, Cl. 430-311.000.

Ishigami, Tetsushi: *See*—
Shimizu, Keishi; Shimizu, Kanzi; Mitsumachi, Masanobu; Nakajima, Masato; Ishigami, Tetsushi; and Kusamichi, Yoshitake, 5,464,370, Cl. 454-345.000.

Ishikawa, Hisashi; Homma, Hideo; Nagashima, Yoshitake; and Saito, Takashi, to Canon Kabushiki Kaisha. Image processing apparatus. 5,465,173, Cl. 358-534.000.

Ishikawa, Koji: *See*—
Nakai, Sadao; Yamanaka, Masanobu; Ishikawa, Koji; Sato, Tsuyoshi; Yamamoto, Kimiaki; and Terashima, Mikihiko, 5,465,178, Cl. 359-670.000.

Ishikawa, Tetsuro, to Fujitsu Limited. Recording method of servo information. 5,465,182, Cl. 360-75.000.

Ishikawa, Youichi: *See*—
Higashi, Yuichiro; and Ishikawa, Youichi, 5,465,146, Cl. 355-285.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Aoki, Eiji; Yamada, Koichiro; and Yukitomo, Tatsuhiko, 5,464,116, Cl. 220-586.000.
Ishiwata, Kazuya: *See*—
Watanabe, Yasuyuki; Ishiwata, Kazuya; and Nishida, Naoya, 5,464,714, Cl. 430-7.000.
Ishizuka, Mitsuhiro; and Saeki, Hiroshi, to NEC Corporation. Chip-in-glass fluorescent indicator panel with heat protection. 5,465,027, Cl. 313-517.000.
ISP Investments Inc.: *See*—
Fu, Edward; and Narayanan, Kolazi S., 5,464,627, Cl. 424-409.000.
Istituto Trentino Di Cultura: *See*—
Lazzari, Gianni; Omologo, Maurizio; and Svaizer, Piergiorgio, 5,465,302, Cl. 381-92.000.
Ito, Hiromi: *See*—
Sarukawa, Chuji; Ito, Sadaaki; and Ito, Hiromi, 5,463,938, Cl. 99-352.000.
Ito, Junji: *See*—
Manada, Nobuaki; Ito, Junji; Kurabayashi, Toru; and Nishizawa, Jun-ichi, 5,463,977, Cl. 117-85.000.
Ito, Koichi: *See*—
Fujisawa, Teruhiko; and Ito, Koichi, 5,465,098, Cl. 343-718.000.
Ito, Masaaki: *See*—
Kano, Yasushi; Hayashi, Masayuki; Ito, Masaaki; Yamakawa, Shinji; and Aida, Midori, 5,465,160, Cl. 358-401.000.
Ito, Sadaaki: *See*—
Sarukawa, Chuji; Ito, Sadaaki; and Ito, Hiromi, 5,463,938, Cl. 99-352.000.
Ito, Tadashi: *See*—
Okutsu, Eiichi; Toyoda, Takashi; and Ito, Tadashi, 5,464,730, Cl. 430-399.000.
Ito, Takafumi; Suzuki, Kenji; Ikeda, Takayuki; Oyama, Fumio; and Mazur, Walt, to Kabushiki Kaisha Toshiba; and Toshiba America Information Systems Inc. Electronic meeting support system. 5,465,370, Cl. 395-200.040.
Ito, Takeo; Matsuda, Hidemi; and Sakai, Kazuo, to Kabushiki Kaisha Toshiba; and Fuji Pigment Co., Ltd. Coating solution composition for forming glass gel thin film, color glass gel filter, and display device using the same. 5,464,566, Cl. 252-582.000.
Ito, Yoshiro: *See*—
Igarashi, Yoshiaki; and Ito, Yoshiro, 5,463,881, Cl. 66-31.000.
Itoh, Maki; and Sakakibara, Akihito, to Dow Corning Asia Ltd. Organopolysiloxane-grafted polybenzobisoxazoles and method for preparing same. 5,464,922, Cl. 528-40.000.
Itoh, Michio: *See*—
Seto, Kaoru; Kanaiwa, Kiyoshi; Itoh, Michio; Mano, Hiroshi; Yamada, Hiromichi; Kashihara, Atsushi; Kawana, Takashi; and Saito, Tetsuo, 5,465,157, Cl. 358-298.000.
Itoh, Satoshi: *See*—
Ihara, Sigeo; and Itoh, Satoshi, 5,464,987, Cl. 250-492.300.
Itoh, Tsutomu: *See*—
Hirosawa, Toshio; Kurihara, Jun'ichi; Itoh, Tsutomu; and Kokunishi, Motohide, 5,465,354, Cl. 395-650.000.
Itozaki, Hideo: *See*—
Matsuura, Takashi; and Itozaki, Hideo, 5,465,049, Cl. 324-248.000.
ITT Automotive Europe GmbH: *See*—
Thiel, Rudolf; Doell, Andreas; and Halasy-Wimmer, Georg, 5,464,077, Cl. 188-72.500.
ITT Corporation: *See*—
Heinecke, Richard L., 5,464,035, Cl. 137-312.000.
Horwitz, Robert P., 5,464,327, Cl. 417-12.000.
Ittemann, Peter: *See*—
Vogelsang, Joerg; Greening, Giorgio; Laws, Regina; and Ittemann, Peter, 5,464,684, Cl. 428-229.000.
Ittmann, Guenther; and Krieg, Manfred, to Roehm GmbH Chemische Fabrik. Suspensions for producing filled cast resins. 5,464,898, Cl. 524-493.000.
Iverslie, Scott P.: *See*—
Shrive, Nigel G.; Damson, Erich; Meyer, Richard A.; and Iverslie, Scott P., 5,463,902, Cl. 73-781.000.
Iwai, Kohichi: *See*—
Fujitsu, Kazuhiko; Asahara, Tomohiko; Kagaminuma, Nobuhiro; and Iwai, Kohichi, 5,464,405, Cl. 606-51.000.
Iwaki Co., Ltd.: *See*—
Okada, Kazuo; and Kondoh, Toshihiko, 5,464,333, Cl. 417-420.000.
Iwakura, Ken: *See*—
Kawakami, Hiroshi; Nozaki, Chiyoshi; and Iwakura, Ken, 5,464,804, Cl. 503-217.000.
Iwamatsu, Katsuyoshi: *See*—
Tsushima, Masaki; Kano, Yuko; Iwamatsu, Katsuyoshi; Tamura, Atsushi; and Shibahara, Seiji, 5,464,829, Cl. 514-206.000.
Iwasaki, Jyuzaemon: *See*—
Otsuka, Kiyotaka; and Iwasaki, Jyuzaemon, 5,463,813, Cl. 30-43.900.
Iwata, Toshiro; Nagata, Iwami; Hatakeyama, Akira; and Nishigai, Kazuhisa, to Bridgestone Corporation. Screw for double-shaft extruding device and double-shaft extruding device. 5,464,282, Cl. 366-83.000.
Iwatsuki, Tetsu: *See*—
Ikeda, Kiichi; Kajita, Shuji; and Iwatsuki, Tetsu, 5,464,380, Cl. 601-29.000.
Izquierdo, Javier F.: *See*—
Miller, David A.; Jansen, Kenneth A.; Culley, Paul R.; Taylor, Mark; and Izquierdo, Javier F., 5,465,360, Cl. 395-700.000.
Izquierdo Quimi, Marta P.: *See*—
Clyde, Gene F.; Izquierdo Quimi, Marta P.; and King Solis, Luis R., 5,464,639, Cl. 426-20.000.
Izzi, Louis J.: *See*—
Krenik, William R.; and Izzi, Louis J., 5,465,058, Cl. 326-83.000.
J. M. Voith GmbH: *See*—
Henseler, Klaus; and Beisswanger, Rudolf, 5,464,169, Cl. 242-542.000.
Jackman, Anthony D.: *See*—
Edwards, David B.; McCarthy, William J.; Aldred, Alan J.; and Jackman, Anthony D., 5,464,097, Cl. 206-524.700.
Jackson, Kathleen M. Note pad. 5,464,672, Cl. 428-40.000.
Jacobs, James K.: *See*—
Dasgupta, Sankar; and Jacobs, James K., 5,464,706, Cl. 429-194.000.
Jacobs, Robert: *See*—
McConnell, Oliver J.; Saucy, Gabriel; Jacobs, Robert; and Gunasekera, Sarath P., 5,464,835, Cl. 514-254.000.
Jacovino, Frank: *See*—
Bilodeau, Steve; Jacovino, Frank; Cameron, Joanne; and Cain, James, 5,465,152, Cl. 356-371.000.
Jaffiol, Franck; Olivier, Jean J.; and Thomas, Gérard, to Automobiles Peugeot; and Automobiles Citroen. Method and device for producing a seal containing an insert, at the periphery of a glass pane, and glass pane obtained. 5,464,575, Cl. 264-443.000.
Jagotec AG: *See*—
Conte, Ubaldo; La Manna, Aldo; and Maggi, Lauretta, 5,464,633, Cl. 424-480.000.
Jalonen, Harry; and Lammintausta, Risto, to Orion-yhtyma Oy. Pharmaceutical compositions containing 4-substituted imidazoles to be administered transdermally. 5,464,628, Cl. 424-448.000.
James River Corporation of Virginia: *See*—
Sharp, Dennis, 5,463,843, Cl. 53-399.000.
Jamiolkowski, Dennis D.: *See*—
Bezwada, Rao S.; and Jamiolkowski, Dennis D., 5,464,929, Cl. 528-361.000.
Janmey, Paul A.: *See*—
Stossel, Thomas P.; Lind, Stuart E.; and Janmey, Paul A., 5,464,817, Cl. 514-2.000.
Jansen, Kenneth A.: *See*—
Miller, David A.; Jansen, Kenneth A.; Culley, Paul R.; Taylor, Mark; and Izquierdo, Javier F., 5,465,360, Cl. 395-700.000.
Japan Atomic Energy Research Institute: *See*—
Muromura, Tadasumi; Takano, Hideki; Akie, Hiroshi; and Matsuura, Shojiro, 5,464,571, Cl. 252-638.000.
Japan Energy Corporation: *See*—
Kano, Osamu; Yasui, Koichi; Sato, Yasuyuki; Yamakoshi, Yasuhiro; Anan, Junichi; Wada, Hironori; and Yasuoka, Akio, 5,464,520, Cl. 204-298.130.
Japan Tobacco, Inc.: *See*—
Takeda, Kazuko; Muramatsu, Motohiko; and Koyama, Takashi, 5,464,028, Cl. 131-336.000.
Jascomb, Jerald T.: *See*—
Timmons, Terry K.; Kobylivker, Peter; Woon, Lin-Sun; Keck, Laura E.; and Jascomb, Jerald T., 5,464,688, Cl. 428-298.000.
Jaskowiak, Timothy R.; Coughlin, Daniel L.; Perez, Julie A.; Gilmore, Daniel R., III; DiGravio, Thomas L.; and Taft, Kevin H., to Xerox Corporation. Development apparatus having a spincast roll assembly. 5,465,138, Cl. 355-245.000.
Jason, Inc.: *See*—
Altemare, Robert L.; and Sigal, Joseph, 5,464,275, Cl. 300-21.000.
Jeffers, Larry A., to Babcock & Wilcox Company, The. Combustion analyzer based on chaos theory analysis of flame radiation. 5,465,219, Cl. 364-498.000.
Jelenic, Jernej; Meijer, John; and Hope, Peter, to Akzo Nobel N.V. Process for the modification of α-olefin (co) polymers. 5,464,907, Cl. 525-303.000.
Jeney, Peter; and Christen, Ernst. Apparatus and methods for the utilization of combustible materials especially of industrial and household waste. 5,464,454, Cl. 44-629.000.
Jenkins, Jack W.: *See*—
Doane, Charles C.; Jenkins, Jack W.; and Avé, Dirk A., 5,464,618, Cl. 424-195.100.
Jenkins, Kenneth D.: *See*—
Sanders, Brenda M.; Jenkins, Kenneth D.; Nichols, Jack L.; and Imber, Bryan E., 5,464,750, Cl. 435-7.210.
Jenner, Bert; Schmidt, Hans-Joachim; Chiaramonte, Giancarlo; and Lehmann, Wolfgang, to Robert Bosch GmbH. Headlight for motor vehicles. 5,465,195, Cl. 362-61.000.
Jennings, James W.: *See*—
McCoy, James N.; Podio, Augusto L.; and Jennings, James W., 5,464,058, Cl. 166-250.010.
Jensen, Duane L.; and Allen, Rolla W., to Lockheed Missiles & Space Company, Inc. Inflatable nose fairing. 5,463,957, Cl. 102-293.000.
Jensen, Duane L.; and Allen, Rolla W., to Lockheed Missiles & Space Company, Inc. Deployable mass and sensor for improved missile control. 5,464,172, Cl. 244-3.100.
JEOL Ltd.: *See*—
Kudo, Masato; Sekine, Tetsu; and Murakami, Koji, 5,464,978, Cl. 250-305.000.
Jeuniaux, Francois; Malhomme, Marc; Moretti, Jean-Marc; and Haralamb, Gérard, to GTS Industries (Societe Anonyme). Method of measuring the shape and/or the planarity of a running material, and device for its implementation. 5,465,214, Cl. 364-472.000.

Jia, Meng-Dong; and Noble, Richard D. Ceramic-zeolite composite membranes and use for separation of vapor/gas mixtures. 5,464,798, Cl. 502-64.000.
Jie, Xu; and Suzuki, Kenji, to Furukawa Electronic Co., Ltd., The. Method of manufacturing optical connector. 5,465,314, Cl. 385-85.000.
Johannes, de Jong, to Kone Oy. Device for removing the rubbish gathering in the threshold of an elevator car. 5,464,073, Cl. 187-334.000.
Johansson, Thomas, to LuCoCer Aktiebolag. Porous implant with two sets of pores. 5,464,440, Cl. 623-16.000.
Johnson, Tom W.: *See*—
Marik, Wayne; Begalla, John; and Johnson, Tom W., 5,464,342, Cl. 425-533.000.
Johns Hopkins University, The: *See*—
Cornish, Timothy J.; and Cotter, Robert J., 5,464,985, Cl. 250-396.00R.
Johnson, Anthony D.: *See*—
Bounds, David J.; Weston, John A.; Johnson, Anthony D.; and Campbell, Bernard J., 5,464,087, Cl. 194-200.000.
Johnson, Clarence W., to Barber Industries Ltd. Safety valve actuator. 5,464,040, Cl. 137-556.000.
Johnson, Donald: *See*—
Adamczyk, Maciej; Fishpaugh, Jeffrey R.; Johnson, Donald; and Hruska, Robert E., 5,464,767, Cl. 435-188.000.
Johnson, Donald C.: *See*—
Mancl, Dennis J.; Johnson, Donald C.; and Havens, Paul W., 5,465,016, Cl. 310-71.000.
Johnson, Eric; Lloyd, Gail A.; and Massey, R. Nathan, to Great Plains Manufacturing, Incorporated. Snap-on height adjustment spacer clips for mower deck wheel spindles and the like. 5,463,855, Cl. 56-17.200.
Johnson, Gary M.; and Schaeper, Robert J., to Bayer Corporation. Composition method for determining the presence of leukocyte cells, esterase or protease in a test sample. 5,464,739, Cl. 435-4.000.
Johnson, Grannis S.: *See*—
Cole, Arthur H.; Glenn, Susan C.; and Johnson, Grannis S., 5,464,452, Cl. 8-495.000.
Johnson, Michael W.: *See*—
Hoge, David T.; Konshak, Michael V.; Owens, John C.; Johnson, Michael W.; Rambosek, George P.; and Rieger, Thomas J., 5,465,187, Cl. 360-132.000.
Johnson Service Company: *See*—
Federspiel, Clifford C., 5,464,369, Cl. 454-256.000.
Johnson, Walter A. L.: *See*—
Cooper, Martin F. N.; Johnson, Walter A. L.; and Smith, Z. Erol, III, 5,465,167, Cl. 358-468.000.
Johnson, William J., to International Business Machines Corporation. Method of and apparatus for character recognition through related spelling heuristics. 5,465,309, Cl. 382-229.000.
Jones, Donald, to Dade International Inc. Precision fluid dispersing apparatus and method. 5,464,121, Cl. 222-1.000.
Jones, Hedi E. Anti-slide seat for bed-patients. 5,463,781, Cl. 5-630.000.
Jones, Jack A., to California Institute of Technology. Heat cascading regenerative sorption heat pump. 5,463,879, Cl. 62-480.000.
Jones, James D., Jr., to Illinois Tool Works Inc. Magnetic drain bolt. 5,465,078, Cl. 335-305.000.
Jones, John: *See*—
Moslehi, Mehrdad M.; Davis, Cecil J.; Jones, John; and Matthews, Robert T., 5,464,499, Cl. 216-71.000.
Jones, Keith A.: *See*—
Winston, Anthony E.; and Jones, Keith A., 5,464,457, Cl. 47-58.000.
Jones, Lawrence S.: *See*—
Weber, Joe; and Jones, Lawrence S., 5,464,228, Cl. 277-207.00A.
Jones, Robert S.: *See*—
Palmer, Joseph P.; and Jones, Robert S., 5,465,134, Cl. 355-75.000.
Jonovic, John A.: *See*—
Wells, Cindie M.; Halverson, Scott A.; and Jonovic, John A., 5,464,279, Cl. 312-128.000.
Jönsson, Claes: *See*—
Eklund, Sivert; Jönsson, Claes; and Sjöberg, Lars-Göran, 5,464,318, Cl. 415-28.000.
Joseph, Rhoda W.: *See*—
Osei-Gyimah, Peter; Sherba, Samuel E.; Lange, Barry C.; Mehta, Rai J.; and Joseph, Rhoda W., 5,464,832, Cl. 514-238.500.
Jotcham, Richard B.; and Payne, Gerald S., to Portals (Bathford) Limited. Security threads. 5,465,301, Cl. 380-54.000.
Jouin, Christophe: *See*—
Pinault, Francis; and Jouin, Christophe, 5,465,394, Cl. 455-54.100.
Juang, Jing-Song. LED display blood pressure meter. 5,464,017, Cl. 128-672.000.
Judd, Ian D.; and Beer, Reginald, to International Business Machines Corporation. Network addressing. 5,465,251, Cl. 370-54.000.
Judge, Ken J.: *See*—
Herget, Gerhard H.; and Judge, Ken J., 5,463,907, Cl. 73-862.392.
Julius Blum Gesellschaft m.b.H.: *See*—
Brüstle, Klaus; and Rupprechter, Helmut, 5,463,796, Cl. 16-383.000.
Kabai, Takahito: *See*—
Nakamura, Tetsuya; Kabai, Takahito; Iguchi, Michihisa; Arai, Seiji; Sakai, Chinobu; and Katagata, Satoshi, 5,465,140, Cl. 355-260.000.
Kabushiki Kaisha Hasegawa Seiko: *See*—
Hasegawa, Isao, 5,463,891, Cl. 72-340.000.
Kabushiki Kaisha Risuron: *See*—
Yamanaka, Minoru, 5,464,491, Cl. 156-167.000.
Kabushiki Kaisha Tachibana Seisakusho: *See*—
Tachibana, Hiroshi, 5,463,890, Cl. 72-294.000.
Tachibana, Hiroshi; and Kizuki, Harumi, 5,464,341, Cl. 425-388.000.
Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Sato, Koki, 5,464,250, Cl. 280-743.100.
Kabushiki Kaisha Topcon: *See*—
Iijima, Hiroshi, 5,465,123, Cl. 351-208.000.
Kabushiki Kaisha Toshiba: *See*—
Handa, Keiichi, 5,465,218, Cl. 364-489.000.
Hayakawa, Toshiyuki; and Kirisawa, Ryouhei, 5,464,998, Cl. 257-316.000.
Ito, Takafumi; Suzuki, Kenji; Ikeda, Takayuki; Oyama, Fumio; and Mazur, Walt, 5,465,370, Cl. 395-200.040.
Ito, Takeo; Matsuda, Hidemi; and Sakai, Kazuo, 5,464,566, Cl. 252-[illegible]87.000.
Kobayashi, Akira; Yoshida, Takuji; Hattori, Hisahide; and Takabayashi, Toshiya, 5,465,244, Cl. 369-50.000.
Koyama, Mikio; and Arai, Tadashi, 5,465,070, Cl. 327-350.000.
Miyamoto, Junichi, 5,465,235, Cl. 365-203.000.
Nakamura, Tetsuya; Kabai, Takahito; Iguchi, Michihisa; Arai, Seiji; Sakai, Chinobu; and Katagata, Satoshi, 5,465,140, Cl. 355-260.000.
Naruke, Kiyomi, 5,465,236, Cl. 365-218.000.
Saito, Yasuyuki, 5,464,789, Cl. 437-57.000.
Sekine, Masatoshi; and Chang, Eric, 5,465,204, Cl. 364-152.000.
Shinohe, Takashi; Nakayama, Kazuya; Takeuchi, Minami; Yamaguchi, Masakazu; Kitagawa, Mitsuhiko; Omura, Ichiro; and Nakagawa, Akio, 5,464,994, Cl. 257-147.000.
Kachner, Michael D.: *See*—
Beard, Richard C.; and Kachner, Michael D., 5,464,051, Cl. 152-454.000.
Kagaminuma, Nobuhiro: *See*—
Fujitsu, Kazuhiko; Asahara, Tomohiko; Kagaminuma, Nobuhiro; and Iwai, Kohichi, 5,464,405, Cl. 606-51.000.
Kahl, Lothar: *See*—
Laas, Hans-Josef; Halpaap, Reinhard; Wamprecht, Christian; Meier-Westhues, Hans-Ulrich; Schultz, Wolfgang; and Kahl, Lothar, 5,464,921, Cl. 528-67.000.
Kahle, James A.; Kau, Chin-Cheng; Levitan, David S.; Ogden, Aubrey D.; Poursepanj, Ali A.; Tu, Paul K.-G.; and Waidecker, Donald E., to International Business Machines Corporation. Method and system for single cycle dispatch of multiple instructions in a superscalar processor system. 5,465,373, Cl. 395-800.000.
Kajima Corporation: *See*—
Ueno, Yoshiyuki; Morimoto, Masayoshi; Ootsuka, Seiji; Kawai, Tatsushi; and Satou, Susumu, 5,464,539, Cl. 210-603.000.
Kajita, Shuji: *See*—
Ikeda, Kiichi; Kajita, Shuji; and Iwatsuki, Tetsu, 5,464,380, Cl. 601-29.000.
Kajiwara, Toshiyuki; Yamagushi, Teruo; Okoshi, Hitoshi; and Nakamura, Tsuneo, to Hitachi, Ltd. Rolling mill coating equipment. 5,463,801, Cl. 26-33.00Q.
Kaken Pharmaceutical Co., Ltd.: *See*—
Hirai, Kenji; Yamashita, Mitsuo; Tateno, Tomoko; Ejiri, Emiko; Harasawa, Kikuko; Onji, Yuichi; Ugai, Sadayuki; and Nagato, Shoin, 5,464,811, Cl. 504-281.000.
Kakolewski, Jan W. Perfusion aided meat processing. 5,464,638, Cl. 426-2.000.
Kakuno, Imao: *See*—
Ide, Yoshihiro; Kakuno, Imao; Sakurai, Noburnasa; Mitsui, Hidero; and Okayasu, Yoshisada, 5,465,117, Cl. 348-373.000.
Kaleskas, Edward: *See*—
Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adaniva, George, 5,464,392, Cl. 604-67.000.
Kalinoski, Richard W., to Foxboro Company, The. Multimeasurement vortex sensor for a vortex-generating plate. 5,463,904, Cl. 73-861.240.
Kambara, Takatsugu: *See*—
Ibori, Satoshi; Yamashita, Hitoshi; Baba, Shigeyuki; Fujii, Hiroshi; Kambara, Takatsugu; and Ishibashi, Akira, 5,465,202, Cl. 363-37.000.
Kamijyo, Yoshimochi, to Fujigen Inc. Electric guitar having a solid body made of wood fiber board, and method of making the same. 5,463,923, Cl. 84-291.000.
Kamimura, Naoki: *See*—
Hoshi, Toshiharu; and Kamimura, Naoki, 5,464,216, Cl. 273-167.00R.
Kamiya, Ryo, to Yamaha Corporation. Automatic gain control apparatus. 5,465,205, Cl. 364-157.000.
Kamo, Yasushi; Hayashi, Masayuki; Ito, Masaaki; Yamakawa, Shinji; and Aida, Midori, to Ricoh Company, Ltd. Composite image forming apparatus for automatically combining document and image characters. 5,465,160, Cl. 358-401.000.
Kamo, Yasushi, to Ricoh Company, Ltd. Image reading device for image recording equipment. 5,465,166, Cl. 358-451.000.
Kanaiwa, Kiyoshi: *See*—
Seto, Kaoru; Kanaiwa, Kiyoshi; Itoh, Michio; Mano, Hiroshi; Yamada, Hiromichi; Kashihara, Atsushi; Kawana, Takashi; and Saito, Tetsuo, 5,465,157, Cl. 358-298.000.
Kanazawa, Yoshinobu; and Okazaki, Hidetsugu, to Honda Giken Kogyo Kabushiki Kaisha. Anchor device for seat belt. 5,464,252, Cl. 280-805.000.
Kanda, Akira: *See*—
Komatsu, Takao; and Kanda, Akira, 5,465,330, Cl. 395-824.000.
Kane, Robert C., to Motorola, Inc. Flat panel display using field emission devices. 5,465,024, Cl. 313-309.000.

Kaneko, Moriyoshi: *See*—
Arakawa, Nobuyuki; Segawa, Takashi; Kaneko, Moriyoshi; Miyairi, Kazuki; and Takayama, Kazutoshi, 5,464,339, Cl. 425-186.000.
Kang, Dae S.; Park, Woo S.; Shin, Hyun H.; Kwon, Soon B.; Marusii, Tatyana Y.; Reznikov, Yuriy A.; Khizhnyak, Anatoliy I.; and Yaroshchuk, Oleg V., to Goldstar Co., Ltd. Method for forming an orientation film of photopolymer in a liquid crystal display. 5,464,669, Cl. 428-1.000.
Kano, Osamu; Yasui, Koichi; Sato, Yasuyuki; Yamakoshi, Yasuhiro; Anan, Junichi; Wada, Hironori; and Yasuoka, Akio, to Japan Energy Corporation. Silicide targets for sputtering and method of manufacturing the same. 5,464,520, Cl. 204-298.130.
Kano, Yuko: *See*—
Tsushima, Masaki; Kano, Yuko; Iwamatsu, Katsuyoshi; Tamura, Atsushi; and Shibahara, Seiji, 5,464,829, Cl. 514-206.000.
Kansai Paint Co., Ltd.: *See*—
Nishida, Reiziro; and Tominaga, Akira, 5,464,913, Cl. 525-524.000.
Kansaku, Toshiaki: *See*—
Matsumoto, Yoshimitsu; and Kansaku, Toshiaki, 5,465,044, Cl. 324-142.000.
Kansas State University Research Foundation: *See*—
Marchin, George L.; and Lambert, Jack L., 5,464,559, Cl. 252-181.000.
Marchin, George L.; and Lambert, Jack L., 5,464,603, Cl. 423-501.000.
Kaplan, Warren: *See*—
Williams, Steve; Kaplan, Warren; Neill, Paul; and Chapa, Gerardo, 5,464,561, Cl. 252-182.270.
Kardach, James P.: *See*—
Reddy, Chandrashekar M.; Hirose, Scott D.; Cho, Sung-Soo; Kardach, James P.; Farrer, Steven M.; and Roberts, Meeling, 5,465,367, Cl. 395-750.000.
Karellas, Andrew, to University of Massachusetts Medical Center. System for quantitative radiographic imaging. 5,465,284, Cl. 378-62.000.
Karlsson, Hans B.; Fellinger, Lennart E.; and Micael, Axel T., to Voac Hydraulics Boras AB. Controller for a hydraulic motor. 5,463,931, Cl. 91-428.000.
Karmakova, Valentina G.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa P.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.
Karn, Jack L.: *See*—
Cahoon, John M.; Karn, Jack L.; and Huang, Nai Z., 5,464,548, Cl. 252-18.000.
Karnoff, Robert S.: *See*—
Early, Brian J.; Reens, Daniel J.; and Karnoff, Robert S., 5,463,873, Cl. 62-121.000.
Kasahara, Rikio: *See*—
Nakazato, Yasushi; Tanaka, Makoto; Sakamoto, Kohki; Kondo, Hisayo; Kasahara, Rikio; Shibaki, Hiroyuki; and Sugiyama, Mitsugu, 5,464,200, Cl. 270-53.000.
Kase, Katsunori: *See*—
Akiba, Nobuo; Ohtsuka, Isao; Shiratori, Shigekazu; and Kase, Katsunori, 5,465,101, Cl. 345-1.000.
Kashihara, Atsushi: *See*—
Seto, Kaoru; Kanaiwa, Kiyoshi; Itoh, Michio; Mano, Hiroshi; Yamada, Hiromichi; Kashihara, Atsushi; Kawana, Takashi; and Saito, Tetsuo, 5,465,157, Cl. 358-298.000.
Kashihara, Toshio: *See*—
Matoba, Hiroshi; Ohmori, Shinji; Koyama, Hiroyoshi; and Kashihara, Toshio, 5,464,612, Cl. 424-78.100.
Kashizaki, Yoshio; Senoo, Akihiro; and Tanaka, Masato, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member, process cartridge including same and electrophotographic apparatus. 5,464,718, Cl. 430-58.000.
Kaspers, Norbert; Lang, Karl-Heinz; Baader, Helmut; Grün, Herbert; and Otto, Thomas, to GAO Gesellschaft fur Automation und Organisation mbH. Method for printing cards having blind hole-shaped recesses and an apparatus for carrying out the method. 5,463,953, Cl. 101-485.000.
Kassebaum, James W.; Dayawon, Miguel M.; and Sandbrink, Joseph J., to Monsanto Company. Glyphosate-containing herbicidal compositions having enhanced effectiveness. 5,464,806, Cl. 504-206.000.
Katagata, Satoshi: *See*—
Nakamura, Tetsuya; Kabai, Takahito; Iguchi, Michihisa; Arai, Seiji; Sakai, Chinobu; and Katagata, Satoshi, 5,465,140, Cl. 355-260.000.
Katakami, Masayuki: *See*—
Koden, Mitsuhiro; Tagawa, Akira; Takeda, Hitoshi; Katsuse, Hirofumi; Shiomi, Makoto; Numao, Takaji; Gouda, Hiroshi; Katakami, Masayuki; Kondo, Naofumi; and Katayama, Mikio, 5,465,168, Cl. 359-56.000.
Katayama, Masahide; Yamashita, Harushige; Okada, Taizo; and Morioka, Shigeo, to Chugai Pharmaceutical Co., Ltd.; and Sato Pharmaceutical Co., Ltd. Aqueous suspension of sucralfate. 5,464,828, Cl. 514-60.000.
Katayama, Mikio: *See*—
Koden, Mitsuhiro; Tagawa, Akira; Takeda, Hitoshi; Katsuse, Hirofumi; Shiomi, Makoto; Numao, Takaji; Gouda, Hiroshi; Katakami, Masayuki; Kondo, Naofumi; and Katayama, Mikio, 5,465,168, Cl. 359-56.000.
Kato, Kenji: *See*—
Sugayama, Sakae; Asami, Takao; Kato, Kenji; and Maeta, Akira, 5,465,408, Cl. 455-249.100.
Kato, Naohito: *See*—
Okabe, Naoto; Yamamoto, Tsuyoshi; and Kato, Naohito, 5,464,992, Cl. 257-139.000.
Katoh, Akio; Abe, Nobuo; Hanai, Takeshi; and Horibe, Kenji, to Nippondenso Co., Ltd. Spark plug for internal-combustion engine and manufacture method of the same. 5,465,022, Cl. 313-144.000.
Katsuse, Hirofumi: *See*—
Koden, Mitsuhiro; Tagawa, Akira; Takeda, Hitoshi; Katsuse, Hirofumi; Shiomi, Makoto; Numao, Takaji; Gouda, Hiroshi; Katakami, Masayuki; Kondo, Naofumi; and Katayama, Mikio, 5,465,168, Cl. 359-56.000.
Kau, Chin-Cheng: *See*—
Kahle, James A.; Kau, Chin-Cheng; Levitan, David S.; Ogden, Aubrey D.; Poursepanj, Ali A.; Tu, Paul K.-G.; and Waldecker, Donald E., 5,465,373, Cl. 395-800.000.
Kauffman, Raymond F.: *See*—
Black, Larry J.; Bryant, Henry U.; Cullinan, George J.; and Kauffman, Raymond F., 5,464,845, Cl. 514-326.000.
Kaumann, Alberto J.: *See*—
King, Francis D.; Gaster, Laramie M.; Kaumann, Alberto J.; and Young, Rodney C., 5,464,864, Cl. 514-468.000.
Kauphusman, James V.: *See*—
Reid, John M.; Kauphusman, James V.; Porter, Christopher H.; and Neilson, Bruce H., 5,464,437, Cl. 607-101.000.
Rudie, Eric N.; Neilson, Bruce H.; and Kauphusman, James V., 5,464,445, Cl. 607-101.000.
Kawai, Kazuyoshi: *See*—
Nakai, Satoru; Aihara, Koutoku; Tanaka, Hideo; Iba, Hitomi; Kawai, Kazuyoshi; Ichikawa, Hiroyuki; Akamatsu, Seiji; Saito, Fumio; Tominaga, Michiaki; and Adachi, Masakazu, 5,464,833, Cl. 514-251.000.
Kawai Musical Inst. Mfg. Co., Ltd.: *See*—
Kitamura, Mineo, 5,464,947, Cl. 84-624.000.
Kawai, Tatsushi: *See*—
Ueno, Yoshiyuki; Morimoto, Masayoshi; Ootsuka, Seiji; Kawai, Tatsushi; and Satou, Susumu, 5,464,539, Cl. 210-603.000.
Kawakami, Hiroshi; Nozaki, Chiyoshi; and Iwakura, Ken, to Fuji Photo Film Co., Ltd. Thermal recording material. 5,464,804, Cl. 503-217.000.
Kawamoto, Masao; Tanaka, Kazuhiko; Hirakawa, Kiyoshi; and Nakamura, Eiichirou, to Kuraray Company Limited. Composite fiber containing inorganic fine powder. 5,464,695, Cl. 428-370.000.
Kawana, Takashi: *See*—
Seto, Kaoru; Kanaiwa, Kiyoshi; Itoh, Michio; Mano, Hiroshi; Yamada, Hiromichi; Kashihara, Atsushi; Kawana, Takashi; and Saito, Tetsuo, 5,465,157, Cl. 358-298.000.
Kawasaki, Atsuko: *See*—
Hori, Shinichi; Kawasaki, Atsuko; Nakashita, Takefumi; Inui, Yoshiharu; Sakaki, Toshiaki; and Miki, Miyo, 5,464,420, Cl. 606-202.000.
Kawasaki, Masahiko: *See*—
Ohga, Eiji; Kawasaki, Masahiko; Sakuma, Kazushi; Takahashi, Tatsuo; and Tozaki, Ryusuke, 5,465,385, Cl. 455-6.100.
Kawasaki Steel Corporation: *See*—
Sasama, Hiroshi, 5,465,228, Cl. 365-49.000.
Kawasumi, Seiji; and Inukai, Yuzo, to Fuji Photo Film Co., Ltd. Planographic printing plate with electrolytically roughened design pattern on a back surface thereof. 5,463,952, Cl. 101-454.000.
Kayan, Helmut L.: *See*—
Kieturakis, Maciej J.; Mollenauer, Kenneth H.; and Kayan, Helmut L., 5,464,403, Cl. 606-1.000.
Kaylor, Joseph B., to Valkyrie Scientific Proprietary, L.C. Method for extinguishing tank fires. 5,464,065, Cl. 169-44.000.
Keana, John F. W.: *See*—
Wybourne, Martin N.; Keana, John F. W.; Cai, Sui X.; Yan, Mingdi; and Wu, Jong, 5,465,151, Cl. 356-361.000.
Keck, Laura E.: *See*—
Timmons, Terry K.; Kobylivker, Peter; Woon, Lin-Sun; Keck, Laura E.; and Jascomb, Jerald T., 5,464,688, Cl. 428-298.000.
Keech, Kimberly W.; and Rothaus, Robert J., to Hughes Aircraft Company. Generic driver interface card. 5,465,106, Cl. 345-204.000.
Keefer, Philip A.: *See*—
Barnes, Keith W.; Bauman, Donald R.; Brace, Howard N.; Keefer, Philip A.; and Mihelich, Michael E., 5,465,386, Cl. 455-15.000.
Kehoskie, Michael P.: *See*—
Krauter, Allan I.; Vivenzio, Robert L.; and Kehoskie, Michael P., 5,464,007, Cl. 600-144.000.
Keller, Teddy M., to United States of America, Navy. Synthesis and polymerization of oligomeric multiple aromatic ether-containing phthalonitriles. 5,464,926, Cl. 528-206.000.
Keller, Wilhelm A. Electrically operated dispensing appliance having two electric motors for advancing and retracting thrust rods. 5,464,128, Cl. 222-333.000.
Keller, Wilhelm A. Manually operated dispensing device for a double dispensing cartridge. 5,464,131, Cl. 222-391.000.
Kelley, Paul W.: *See*—
Wilson, Philip D.; Serafin, Richard D.; Kelley, Paul W.; and Witkowicz, Tadeusz, 5,465,254, Cl. 370-79.000.
Kellogg Company: *See*—
Wullschleger, Richard D.; Chen, Shirley C.; Bowman, Frederick A.; and Hawblitz, Larry V., 5,464,644, Cl. 426-549.000.
Kellogg, Diane L. Combination clock radio, night light and power receptacle. 5,465,198, Cl. 362-253.000.
Kelly, Earl L., Jr.: *See*—

Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; Grubbs, Gray W.; and Kyselica, Stefan P., 5,464,958, Cl. 219-130.510.

Kelly, Thomas J., III: *See*—
Yasrebi, Mehrdad; Kemp, William W.; Sturgis, David H.; Nikolas, Douglas G.; Wright, Gary L.; Kelly, Thomas J., III; Springgate, Mark E.; and Crego, Ted R., 5,464,797, Cl. 501-103.000.

Kelm, Gary R.; Pickrum, Harvey M.; Doyle, Matthew J.; and Buchanan, William, to Procter & Gamble Company, The. Use of ketorolac for treatment of oral diseases and conditions. 5,464,609, Cl. 424-54.000.

Kelsey-Hayes Company: *See*—
Linkner, Herbert L., Jr., 5,464,187, Cl. 248-635.000.

Kemp, William W.: *See*—
Yasrebi, Mehrdad; Kemp, William W.; Sturgis, David H.; Nikolas, Douglas G.; Wright, Gary L.; Kelly, Thomas J., III; Springgate, Mark E.; and Crego, Ted R., 5,464,797, Cl. 501-103.000.

Kemper, William S.: *See*—
Spani, Wayne M.; and Kemper, William S., 5,463,906, Cl. 73-861.270.

Kendall, Charles S. Portable tripod riser. 5,463,945, Cl. 108-59.000.

Kenji, Nishiguchi: *See*—
Hidetsugu, Nishiguchi; and Kenji, Nishiguchi, 5,464,263, Cl. 294-64.100.

Kennedy, Joseph P., Jr., to E-Systems, Inc. Cellular based traffic sensor system. 5,465,289, Cl. 379-59.000.

Kenton, Donald J.; Laughlin, Frank; and McComas, Charles. Method for removing undesired material from internal spaces of parts. 5,464,479, Cl. 134-1.000.

Keogh, Catherine M.: *See*—
Boggavarapu, Rao L.; Goldstein, Yeshayahu S. A.; Keogh, Catherine M.; Suchocki, Anthony J.; and Widner, Melvin M., 5,463,928, Cl. 89-8.000.

Kersten, Peter; and Matthies, Klaus-D., to Alcatel N.V. Optical hybrid switch with electroptically active waveguide structure formedfrom an NLO polymer. 5,465,310, Cl. 385-22.000.

Kertz, M. Glen. Electronic stimulation of plants. 5,464,456, Cl. 47-1.300.

Kessinger, John R.: *See*—
Sanders, Gary G.; and Kessinger, John R., 5,465,041, Cl. 323-312.000.

Kestin, Hesh. Pocket-portable rain covering (unbrella TM). 5,464,034, Cl. 135-90.000.

Khalili, Davood: *See*—
Drucker, Steven; Goder, Alexey; Khalili, Davood; Williams, Kevin; Christensen, Ken; and Major, Emery, 5,464,982, Cl. 250-343.000.

Khan, Shuaib A.: *See*—
Claude, Jean-Pierre; Khan, Shuaib A.; and Mitchell, Robert W., 5,464,807, Cl. 504-206.000.

Khartchenko, Alina: *See*—
Khartchenko, Serguei V.; Khartchenko, Nadejda; Khartchenko, Alina; and Khartchenko, Alissa S., 5,464,608, Cl. 424-53.000.

Khartchenko, Alissa S.: *See*—
Khartchenko, Serguei V.; Khartchenko, Nadejda; Khartchenko, Alina; and Khartchenko, Alissa S., 5,464,608, Cl. 424-53.000.

Khartchenko, Nadejda: *See*—
Khartchenko, Serguei V.; Khartchenko, Nadejda; Khartchenko, Alina; and Khartchenko, Alissa S., 5,464,608, Cl. 424-53.000.

Khartchenko, Serguei V.; Khartchenko, Nadejda; Khartchenko, Alina; and Khartchenko, Alissa S., to University of Minnesota, Regents of the. Composition for the cleaning of teeth and the prophylaxis of caries. 5,464,608, Cl. 424-53.000.

Khizhnyak, Anatoliy I.: *See*—
Kang, Dae S.; Park, Woo S.; Shin, Hyun H.; Kwon, Soon B.; Marusii, Tatyana Y.; Reznikov, Yuriy A.; Khizhnyak, Anatoliy I.; and Yaroschchuk, Oleg V., 5,464,669, Cl. 428-1.000.

Khoshdel, Ezat: *See*—
Hales, Stephen G.; Khoshdel, Ezat; and Polywka, Robert, 5,464,558, Cl. 252-174.240.

Kida, Shuji; Oya, Yukio; and Tai, Akiyoshi, to Konica Corporation. Silver halide color photographic light-sensitive material. 5,464,732, Cl. 430-505.000.

Kidde-Graviner Limited: *See*—
Spring, David J.; and King, John D., 5,464,980, Cl. 250-338.100.

Kidwell, J. Jeffrey; Reed, Stuart E.; Ryan, Patrick M.; Harwig, Dennis D.; and Womack, E. Allen, Jr., to Babcock & Wilcox Company, The. Manual arc welding speed pacer. 5,464,957, Cl. 219-130.010.

Kiekert GmbH & Co. KG: *See*—
Bartel, Peter; and Büscher, Hans-Joachim, 5,464,260, Cl. 292-201.000.

Kiel, Harvey G.: *See*—
Blades, Jerry A.; and Kiel, Harvey G., 5,465,358, Cl. 395-700.000.

Kiel, Johnathan L.; Parker, Jill E.; and Bruno, John G., to United States of America, Air Force. Enhanced nitrite production in transfected murine cells. 5,464,768, Cl. 435-240.200.

Kiele, Walter: *See*—
Langer, Alfred; Genz, Andreas; Deisenhofer, Manfred; Kiele, Walter; Lewandowski, Bernd; and Reichardt, Jürgen, 5,464,462, Cl. 65-66.000.

Kieturakis, Maciej J.; Mollenauer, Kenneth H.; and Kayan, Helmut L., to General Surgical Innovations, Inc. Placement tool and method for laparoscopic hernia repair. 5,464,403, Cl. 606-1.000.

Kikuchi, Yutaka: *See*—
Asano, Naoki; Kikuchi, Yutaka; and Hayakawa, Yasuyoshi, 5,465,141, Cl. 355-285.000.

Kilic, Soner: *See*—
Das, Suryya K.; and Kilic, Soner, 5,464,897, Cl. 524-458.000.

Kim, Chang E. Timing apparatus for a pizza oven switch. 5,464,953, Cl. 200-33.000.

Kim, John H. Laparoscope defogging. 5,464,008, Cl. 600-157.000.

Kim, Ronald: *See*—
Oehr, Klaus H.; Timewell, Richard R.; Donahue, Harvey; Hoy, Brenda; Kim, Ronald; and Roth, Reinhold C., 5,464,510, Cl. 204-141.500.

Kim, Young J.: *See*—
Andresen, Peter L.; and Kim, Young J., 5,465,281, Cl. 376-305.000.

Kim, Young O.; Manchanda, Lalita; and Weber, Gary R., to AT&T Corp. Oxynitride-dioxide composite gate dielectric process for MOS manufacture. 5,464,783, Cl. 437-42.000.

Kimata, Koji: *See*—
Sakurai, Katsukiyo; Sugiura, Nobuo; Kimata, Koji; and Suzuki, Sakaru, 5,464,942, Cl. 536-21.000.

Kimberly-Clark Corporation: *See*—
Timmons, Terry K.; Kobylivker, Peter; Woon, Lin-Sun; Keck, Laura E.; and Jascomb, Jerald T., 5,464,688, Cl. 428-298.000.

Kimnon Electric Co. Ltd.: *See*—
Nakai, Sadao; Yamanaka, Masanobu; Ishikawa, Koji; Sato, Tsuyoshi; Yamamoto, Kimiaki; and Terashima, Mikihiko, 5,465,178, Cl. 359-670.000.

Kimura, Atsushi; and Seki, Hiroyuki, to Canon Kabushiki Kaisha. Printing apparatus. 5,464,291, Cl. 400-185.000.

Kimura, Haruo; Sekino, Yoshio; Masuya, Takashi; and Fukui, Takao, to Idec Izumi Corporation. Safety switch assembly. 5,464,954, Cl. 200-61.620.

Kimura, Noriyuki; and Suzuki, Minoru, to Ricoh Company, Ltd. Developer having a toner hopper disposed completely below the imaging drum. 5,465,139, Cl. 355-260.000.

King, Francis D.; Gaster, Laramie M.; Kaumann, Alberto J.; and Young, Rodney C., to SmithKline Beecham P.L.C. Use of tetrahydrocarbazone derivatives as $5HT_1$ receptor agonists. 5,464,864, Cl. 514-468.000.

King Jim Co., Ltd.: *See*—
Watanabe, Kenji; and Toyosawa, Yoshiya, 5,464,290, Cl. 400-76.000.

King, John D.: *See*—
Spring, David J.; and King, John D., 5,464,980, Cl. 250-338.100.

King Solis, Luis R.: *See*—
Clyde, Gene F.; Izquierdo Quimi, Marta P.; and King Solis, Luis R., 5,464,639, Cl. 426-20.000.

Kinoshita, Yasunori; Pujimori, Shinichi; and Kobayashi, Keiko, to Fanuc Ltd. Relay module. 5,465,077, Cl. 335-132.000.

Kinsey, Kenneth K., Jr.: *See*—
Chen, Roger; and Kinsey, Kenneth K., Jr., 5,465,237, Cl. 365-233.000.

Kiray, Yasar C.: *See*—
Becker, Wolfgang; Mathis, Raymond; Stapper-Druyen, Syliva; Robrahn, Karin; Hoffmann, Rainer; and Kiray, Yasar C., 5,464,660, Cl. 427-389.000.

Kircher, Dieter: *See*—
Lohberg, Peter; Bayer, Ronald; Halat, Siegfried; Kircher, Dieter; Perez, Diogenes; and Sparschuh, Stefan, 5,464,079, Cl. 188-315.000.

Kircher, Klaus: *See*—
Archey, Rick L.; Lundy, Charles E.; Meltzer, Aaron D.; Pielartzik, Harald; Fennhoff, Gerhard; Hufen, Ralf; Kircher, Klaus; Schubert, Rudiger; and Weider, Richard, 5,464,893, Cl. 524-366.000.

Kirchner, Nicholas J.; and Weber-Grafau, Michael. Method and apparatus for charged particle collection, conversion, fragmentation or detection. 5,464,975, Cl. 250-283.000.

Kirisawa, Ryouhei: *See*—
Hayakawa, Toshiyuki; and Kirisawa, Ryouhei, 5,464,998, Cl. 257-316.000.

Kirk, Seth M.: *See*—
Köhler, Günter A.; Kirk, Seth M.; and Follett, Gary J., 5,464,667, Cl. 427-577.000.

Kirkpatrick, W. Mark, III; and Hughbanks, Richard A., to Du Pont de Nemours, E. I., and Company. Method and apparatus for automatic roll transfer. 5,464,166, Cl. 242-527.300.

Kirn, Manfred, to Robert Bosch GmbH. Motor-driven hand-held machine tool. 5,464,365, Cl. 451-344.000.

Kirsten, Eva: *See*—
Kun, Ernest; Mendeleyev, Jerome; and Kirsten, Eva, 5,464,871, Cl. 514-617.000.

Kish, Joseph, III: *See*—
Altschuler, Barry N.; Hardy, Douglas A.; Stephens, James A.; and Kish, Joseph, III, 5,465,300, Cl. 380-30.000.

Kishita, Hirofumi; Yamaguchi, Kouichi; Kobayashi, Nobuyuki; and Ishida, Kouichi, to Shin-Etsu Chemical Co., Ltd. Organopolysiloxane. 5,464,917, Cl. 528-14.000.

Kitadono, Kaoru: *See*—
Nagaoka, Kenji; and Kitadono, Kaoru, 5,464,891, Cl. 524-230.000.

Kitagawa, Mitsuhiko: *See*—
Shinohe, Takashi; Nakayama, Kazuya; Takeuchi, Minami; Yamaguchi, Masakazu; Kitagawa, Mitsuhiko; Omura, Ichiro; and Nakagawa, Akio, 5,464,994, Cl. 257-147.000.

Kitahara, Hiroaki: *See*—
Tsujimura, Takatoshi; and Kitahara, Hiroaki, 5,464,500, Cl. 216-34.000.

Kitamura, Mineo, to Kawai Musical Inst. Mfg. Co., Ltd. Apparatus for and method of producing fluctuations in sound for electronic sound system. 5,464,947, Cl. 84-624.000.

Kitamura, Toshiyuki: *See*—
Funada, Masahiro; Kitamura, Toshiyuki; Yamamoto, Mitsuhiro; and Ohta, Eiji, 5,465,161, Cl. 358-438.000.

Kizuki, Harumi: *See*—

Tachibana, Hiroshi; and Kizuki, Harumi, 5,464,341, Cl. 425-388.000.
Klatte, Fred. Method for removing a contaminant from a fluid using a chemically impregnated and coated zeolite. 5,464,598, Cl. 423-220.000.
Klearman, Jeffrey D.; Bierman, Jeffrey J.; and Schachet, Eli, to Lake Medical Products, Inc. Apparatus for, and method of, crushing a pill, suspending the pill ingredients in a liquid, and administering the suspension. 5,464,393, Cl. 604-82.000.
Klees, Garry W., to Boeing Company, The. Supersonic jet engine installation and method with sound suppressing nozzle. 5,463,866, Cl. 60-204.000.
Kleijne, Theodoor A.: *See*—
Baptist, Robert; Kleijne, Theodoor A.; Monteban, Leo; and Meertens, Marc, 5,465,392, Cl. 455-38.300.
Klein, Annette T.: *See*—
Belongia, David C.; and Klein, Annette T., 5,463,937, Cl. 99-348.000.
Kleinberg, William T.: *See*—
Kumar, Ravi; and Kleinberg, William T., 5,463,869, Cl. 62-24.000.
Kliman, Gerald B., to General Electric Company. High-efficiency, low-noise electronically commutated motor having improved starting capability. 5,465,019, Cl. 310-156.000.
Klipper, Reinhold; Antons, Stefan; Steffan, Guido; Mitschker, Alfred; Seriver, Werner; and Lütjens, Holger, to Bayer Aktiengesellschaft. Process for preparing weakly-basic anion exchangers and reagents suitable for this purpose. 5,464,875, Cl. 521-32.000.
KMS Fusion, Inc.: *See*—
Ladewski, Theodore B., 5,465,153, Cl. 356-376.000.
Knasel, Susan M., to Super Market Merchandising. Fruit cutting and coring apparatus. 5,463,943, Cl. 99-542.000.
Knoedel, Gunter; and Schaarschmidt, Reinhard, to Getrag Gestriebe-und Zahnradfabrik Hermann Hagenmeyer GmbH & Cie. Actuation apparatus for a gearshift sleeve in a stepped automotive gearbox. 5,463,911, Cl. 74-473.000.
Knott, David S., to Rolls-Royce, PLC. Rotors for gas turbine engines. 5,464,326, Cl. 416-193.00A.
Knowles, David B.; and Gemert, Barry V., to Transitions Optical, Inc. Photochromic tetraphenyl naphthodipyrans. 5,464,567, Cl. 252-586.000.
Kobayashi, Akira; Yoshida, Takuji; Hattori, Hisahide; and Takabayashi, Toshiya, to Kabushiki Kaisha Toshiba. Disc reproducing apparatus. 5,465,244, Cl. 369-50.000.
Kobayashi, Keiko: *See*—
Kinoshita, Yasunori; Fujimori, Shinichi; and Kobayashi, Keiko, 5,465,077, Cl. 335-132.000.
Kobayashi, Masaaki: *See*—
Morioka, Yoshihiro; Kobayashi, Masaaki; Okayama, Mutsuyuki; Nakatsu, Etsuto; and Suzuki, Kohei, 5,465,158, Cl. 358-310.000.
Kobayashi, Nobuyuki: *See*—
Kishita, Hirofumi; Yamaguchi, Kouichi; Kobayashi, Nobuyuki; and Ishida, Kouichi, 5,464,917, Cl. 528-14.000.
Kobayashi, Shohei, to Olympus Optical Co., Ltd. Optical head. 5,465,247, Cl. 369-109.000.
Kobayashi, Takashi; and Hatae, Shinichi, to Canon Kabushiki Kaisha. Information signal processing apparatus. 5,465,071, Cl. 329-315.000.
Kobayashi, Takeo: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Matsuo, Hirofumi, 5,465,131, Cl. 354-202.000.
Kobori, Takakuni: *See*—
Tomiyama, Koichi; Yusa, Hiroshi; and Kobori, Takakuni, 5,464,722, Cl. 430-137.000.
Kobyliviker, Peter: *See*—
Timmons, Terry K.; Kobyliviker, Peter; Woon, Lin-Sun; Keck, Laura E.; and Jaccomb, Jerald T., 5,464,688, Cl. 428-298.000.
Koch, Albert F., III; and Prater, David M., to Hewlett-Packard Company. Real-time ultrasonic endocardial displacement display. 5,464,015, Cl. 128-660.070.
Koch, Daniel, to ETA SA Fabriques D'Ebauches. Analogue display timeplace able to provide alphanumerical information concerning the state of an operation mode or of a programmed event. 5,465,239, Cl. 368-72.000.
Koch Engineering Company, Inc.: *See*—
Tokerud, Pamela J.; and Muggli, Darrin S., 5,464,573, Cl. 261-97.000.
VanBuskirk, Gregory K.; Hsieh, Chang-Li; McNulty, Kenneth J.; and Hansen, Ole V., 5,464,459, Cl. 55-257.200.
Koden, Mitsuhiro; Tagawa, Akira; Takeda, Hitoshi; Katsuse, Hirofumi; Shiomi, Makoto; Numao, Takaji; Gouda, Hiroshi; Katakami, Masayuki; Kondo, Naofumi; and Katayama, Mikio, to Sharp Kabushiki Kaisha. Gradation driving method for bistable ferroelectric liquid crystal using effective cone angle in both states. 5,465,168, Cl. 359-56.000.
Koehler, Terry B., to Koehler, Terry B. Putter head. 5,464,215, Cl. 273-167.008.
Koenck, Steven E.: *See*—
Boatwright, Darrell L.; Hanson, George E.; Miller, Phillip; Koenck, Steven E.; Walter, Jerry L.; Kubler, Joseph J.; Cargin, Keith K., Jr.; Schultz, Darald R.; Davis, Patrick H.; and Kunert, Steven R., 5,465,207, Cl. 364-424.010.
Koenig, Hartmann: *See*—
Hermeling, Dieter; Koenig, Hartmann; and Goetz, Norbert, 5,464,508, Cl. 204-78.000.
Koeniger, Carl E., to Owens-Illinois Plastic Products Inc. Hollow plastic container with viewing stripe and method of making. 5,464,107, Cl. 215-12.200.
Koeppl, Franz: *See*—
Wolf, Andreas; and Koeppl, Franz, 5,464,159, Cl. 241-1.000.
Koerber, Gregory K., to Valmet-Appleton, Inc. Conveyor diverter system. 5,464,088, Cl. 198-370.070.
Kogan, Jack; and Muguet, Michel, to Societe Anonyme pour l'Etude et l'Exploitation l'Air Liquide, des Procedes Georges Claude. Bleaching recycled pulp with a reductive-oxidative sequence. 5,464,501, Cl. 162-8.000.
Koh, Chao-Ming, to Industrial Technology Research Institute. Method to ensure isolation between source-drain and gate electrode using self aligned silicidation. 5,464,782, Cl. 437-41.000.
Koh, Wei H., to Grumman Aerospace Corporation. Surround view detector focal plane. 5,464,979, Cl. 250-332.000.
Köhle, Hans-Jürgen: *See*—
Hamann, Ingo; Köhle, Hans-Jürgen; and Wehner, Winfried, 5,464,565, Cl. 252-546.000.
Köhler, Günter A.; Kirk, Seth M.; and Follett, Gary J., to Minnesota Mining and Manufacturing Company. Jet plasma process and apparatus. 5,464,667, Cl. 427-577.000.
Kohmoto, Shinsuke: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Matsuo, Hirofumi, 5,465,131, Cl. 354-202.000.
Koichi, Kato; Takao, Yamada; and Haruo, Onda, to Takeda Chemical Industries, Ltd. Highly purified protein, production and use thereof. 5,464,939, Cl. 530-351.000.
Koike, Yukinaga, to Nisshin Onpa Co., Ltd.; Circuit Design Inc.; Hoshino Gakki Co. Ltd.; and Samsun Technologies Corporation. Diversity receiver with switching noise reduction. 5,465,411, Cl. 455-275.000.
Kois, Adam: *See*—
Chan, Ming F.; Raju, Bore G.; Castillo, Rosario S.; Kois, Adam; Wu, Chengde; and Balaji, Vituladi, 5,464,853, Cl. 514-378.000.
Koiwa, Mitsuru: *See*—
Taruya, Masaaki; and Koiwa, Mitsuru, 5,463,999, Cl. 123-647.000.
Koizumi, Shinobu: *See*—
Matsumoto, Hiroshi; Takaragi, Kazuo; Sasaki, Seiichi; Maezawa, Hiroyuki; and Koizumi, Shinobu, 5,465,299, Cl. 380-23.000.
Kojima, Makoto: *See*—
Asaoka, Masanobu; Takao, Hideaki; Togano, Takeshi; and Kojima, Makoto, 5,464,668, Cl. 428-1.000.
Kokryakov, Vladimir N.: *See*—
Lehrer, Robert I.; Kokryakov, Vladimir N.; and Harwig, Sylvia S. L., 5,464,823, Cl. 514-13.000.
Kokuban, Yoshiyuki: *See*—
Takahashi, Toshie; Sato, Takashi; Kurumada, Toshimi; and Kokuban, Yoshiyuki, 5,465,292, Cl. 379-164.000.
Kokunishi, Motohide: *See*—
Hirosawa, Toshio; Kurihara, Jun'ichi; Itoh, Tsutomu; and Kokunishi, Motohide, 5,465,354, Cl. 395-650.000.
Koletnik, Erich; Haas, Franz; and Haas, Johann, to Franz Haas Waffelmaschinen Industriegesellschaft m.b.H. Hinge for pivotally connecting two tongs of a pair of baking tongs. 5,463,939, Cl. 99-353.000.
Komatsu, Takao; and Kanda, Akira, to Mitsubishi Denki Kabushiki Kaisha. Network address managing method and system. 5,465,330, Cl. 395-824.000.
Komori, Yasumasa. Dehydration treatment apparatus for sludge. 5,463,819, Cl. 34-135.000.
Kondo, Hiroyuki: *See*—
Nakagiri, Nobuyuki; Kondo, Hiroyuki; and Suzuki, Yoshihiko, 5,464,977, Cl. 250-234.000.
Kondo, Hisayo: *See*—
Nakazato, Yasushi; Tanaka, Makoto; Sakamoto, Kohki; Kondo, Hisayo; Kasahara, Rikio; Shibaki, Hiroyuki; and Sugiyama, Mitsugu, 5,464,200, Cl. 270-53.000.
Kondo, Naofumi: *See*—
Koden, Mitsuhiro; Tagawa, Akira; Takeda, Hitoshi; Katsuse, Hirofumi; Shiomi, Makoto; Numao, Takaji; Gouda, Hiroshi; Katakami, Masayuki; Kondo, Naofumi; and Katayama, Mikio, 5,465,168, Cl. 359-56.000.
Kondoh, Shigeru: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Matsuo, Hirofumi, 5,465,131, Cl. 354-202.000.
Kondoh, Toshihiko: *See*—
Okada, Kazuo; and Kondoh, Toshihiko, 5,464,333, Cl. 417-420.000.
Kone Oy: *See*—
Johannes, de Jong, 5,464,073, Cl. 187-334.000.
Kong, Shing L., to Sun Microsystems, Inc. Method and apparatus for a memory management unit supporting multiple page sizes. 5,465,337, Cl. 395-417.000.
Konica Corporation: *See*—
Kida, Shuji; Oya, Yukio; and Tai, Akiyoshi, 5,464,732, Cl. 430-505.000.
Nakagama, Kiyohari; and Nakazawa, Kazuhiro, 5,465,135, Cl. 355-208.000.
Konicek, Jiri D.: *See*—
Yuhas, Donald E.; Vorres, Carol L.; Groppi, David P.; and Konicek, Jiri D., 5,464,658, Cl. 427-385.500.
Konings, Leonardus U. E.: *See*—
Antonis, Petrus H.; Schlejen, Jacob; and Konings, Leonardus U. E., 5,465,028, Cl. 315-248.000.
Konishi, Noriyo: *See*—
Shimono, Takeshi; and Konishi, Noriyo, 5,465,383, Cl. 395-800.000.
Konopa, Helmut: *See*—

Weyh, Werner; Schwander, Udo; Gutter, Raimond; Notar, Robert; Konopa, Helmut; and Erdmann, Klaus, 5,464,124, Cl. 222-129.100.

Konshak, Michael V.: *See*—
Hoge, David T.; Konshak, Michael V.; Owens, John C.; Johnson, Michael W.; Ramboosk, George P.; and Rieger, Thomas J., 5,465,187, Cl. 360-132.000.

Kopernicky, Jaroslav J.; and Infan, Salvatore. Filtering debris from molten plastic. 5,464,537, Cl. 210-453.000.

Korb, Lothar. Notch cutter and method. 5,463,920, Cl. 83-56.000.

Kordus, Steven R.: *See*—
Dinkjian, Robert M.; Heller, Lisa C.; Kordus, Steven R.; Lauricella, Kenneth A.; Seigendall, Thomas W.; Skaggs, Robert A.; and Xu, Nelson S., 5,465,374, Cl. 395-800.000.

Korman, William J.: *See*—
Abbate, Agostino; Frankel, Julius; Scholz, Wilfried; Colangelo, Vito J.; and Korman, William J., 5,463,896, Cl. 73-81.000.

Kornfeldt, Hans; Körnvik, Lars-Åke; and Törnblom, Lars, to ABB Atom AB. Compression joint. 5,464,258, Cl. 285-293.000.

Körnvik, Lars-Åke: *See*—
Kornfeldt, Hans; Körnvik, Lars-Åke; and Törnblom, Lars, 5,464,258, Cl. 285-293.000.

Korte, John E.: *See*—
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; and Starr, Frank C., 5,463,845, Cl. 53-459.000.
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; Starr, Frank C.; Roloff, Robb W.; and Devlin, Robert D., 5,463,848, Cl. 53-482.000.

Kortright, Kenneth H.; Coulter, Wallace H.; Rodriguez, Carlos; Russell, Thomas; and Paul, Ronald, to Coulter Corporation. Automated analyzer for screening cells or formed bodies for enumeration of populations expressing selected characteristics. 5,464,752, Cl. 435-7.240.

Kosal, Jeffrey A.; and Revis, Anthony, to Dow Corning Corporation. Catalyst compositions comprising rhodium catalyst complexes. 5,464,801, Cl. 502-172.000.

Koshiji, Youichi: *See*—
Takeda, Hisao; Koshiji, Youichi; Kubota, Hidehiro; and Iizuka, Takashi, 5,464,516, Cl. 204-182.900.

Koslow, Evan E., to KX Industries, L.P. Solvent cleaning system with two stage filter. 5,464,533, Cl. 210-257.100.

Kossovsky, Nir; Gelman, Andrew E.; and Hnatyszyn, H. James, to University of California, The Regents of the. Red blood cell surrogate. 5,464,634, Cl. 424-493.000.

Koster, Marinus P.: *See*—
Visscher, Albert; Koster, Marinus P.; and Weekamp, Johannus W., 5,465,021, Cl. 310-328.000.

Kothe, Lutz. Process for producing, in particular, two-part surgical instruments. 5,463,917, Cl. 76-119.000.

Kotobuki Seating Co. Ltd.: *See*—
Sera, Makoto, 5,464,273, Cl. 297-232.000.

Kotwicki, Allan J.: *See*—
Pursifull, Ross D.; and Kotwicki, Allan J., 5,464,000, Cl. 123-674.000.

Kowalik, James J.: *See*—
Sammut, Steven P.; Georgin, Marc J.; Heaston, Bruce A.; Majeed, Kamal N.; and Kowalik, James J., 5,465,209, Cl. 364-424.050.

Koyama, Hiroyoshi: *See*—
Matoba, Hiroshi; Ohmori, Shinji; Koyama, Hiroyoshi; and Kashihara, Toshio, 5,464,612, Cl. 424-78.100.

Koyama, Mikio; and Arai, Tadashi, to Kabushiki Kaisha Toshiba. Logarithmic transformation circuitry for use in semiconductor integrated circuit devices. 5,465,070, Cl. 327-350.000.

Koyama, Takashi: *See*—
Takeda, Kazuko; Muramatsu, Motohiko; and Koyama, Takashi, 5,464,028, Cl. 131-336.000.

Kozak, Andrew F., III, to Triton Environmental Corporation. Apparatus and method for separation of liquids. 5,464,529, Cl. 210-104.000.

Kraaijenbrink, Jan G.: *See*—
Pluim, Henk; and Kraaijenbrink, Jan G., 5,464,514, Cl. 204-182.400.

Kracke, Alan G.: *See*—
Mowry, Gregory S.; Gorka, Phillip E.; Strayer, Brian D.; and Kracke, Alan G., 5,463,805, Cl. 29-603.000.

Kraft Foods, Inc.: *See*—
Messick, Donald L., 5,464,647, Cl. 426-618.000.

Kram, Shari L.: *See*—
Silvis, H. Craig; and Kram, Shari L., 5,464,924, Cl. 528-102.000.

Kramer, James H.; Lynch, Daniel S.; and Coker, Charles W., to B.F. Goodrich Company, The. Energy absorbing impact barrier. 5,464,177, Cl. 246-127.000.

Kramer, Joel M., to United States of America, National Aeronautics and Space Administration. Rotary latch. 5,464,301, Cl. 403-322.000.

Kramer, Thomas. 6.5 calibre cartridge for rifles and cartridge chamber therefor. 5,463,959, Cl. 102-464.000.

Krämer, Wolfgang; Berg, Dieter; Dehne, Heinz-Wilhelm; and Dutzmann, Stefan, to Bayer Aktiengesellschaft. Fungicidal 2-methoximinocarboxylic esters. 5,464,809, Cl. 504-227.000.

Kramerich, George L.: *See*—
Conrad, Gary L.; Denenberg, Byron A.; and Kramerich, George L., 5,465,115, Cl. 348-155.000.

Kranz, Richard, to Tension Envelope Corporation. Envelope accumulation, batching and compression apparatus and method. 5,464,316, Cl. 414-798.200.

Krauter, Allan I.; Vivenzio, Robert L.; and Kebodkie, Michael P., to Welch Allyn, Inc. Fluid insensitive braking for an endoscope. 5,464,007, Cl. 600-144.000.

Krebs, Andreas: *See*—
Petersen, Uwe; Krebs, Andreas; Schenke, Thomas; Kunisch, Franz; Philipps, Thomas; Grohe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, 5,464,796, Cl. 514-312.000.

Krenik, William R.; and Izzi, Louis J., to Texas Instruments Incorporated. Graphics system including an output buffer circuit with controlled Miller effect capacitance. 5,465,058, Cl. 326-83.000.

Krestyn, Karlheinz: *See*—
Rodi, Anton; Uhrig, Dieter; and Krestyn, Karlheinz, 5,464,206, Cl. 271-227.000.

Krevolin, Mark: *See*—
Eisenbeis, Scott J.; Krevolin, Mark; Bryant, Christopher P.; Bogusławski, Sophie J.; Ledden, David J.; and Clark, Scott, 5,464,747, Cl. 435-7.600.

Krieg, Manfred: *See*—
Ittmann, Guenther; and Krieg, Manfred, 5,464,898, Cl. 524-493.000.

Krieger, John M. Tethering stake. 5,463,834, Cl. 52-155.000.

Krietemeyer, James R.: *See*—
Strickland, S. Scott; Krietemeyer, James R.; Liao, Jing; Mead, Ian D.; and Puckett, Robert L., 5,465,215, Cl. 364-474.220.

Kristiansen, Terje, to Den Norske Stats Oljeselskap a.s. Apparatus and method for supplying fluid into different zones in a formation. 5,464,059, Cl. 166-269.000.

Krohn, Manfred: *See*—
Krüger, Manfred; Mayer, Dieter; Behrens, Frierich-Otto; and Krohn, Manfred, 5,463,946, Cl. 100-93.0RP.

Krone AG: *See*—
Fowler, Charles J. C., 5,465,256, Cl. 370-110.100.

Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Eder, Erich, 5,464,495, Cl. 156-456.000.

Krotky, Peter; Bauhofer, Markus; and Heinzelmann, Walter, to Ing. h.c.F. Porsche AG. Cylinder head threaded connection arrangement. 5,463,991, Cl. 123-195.00R.

Krüger, Manfred; Mayer, Dieter; Behrens, Frierich-Otto; and Krohn, Manfred, to Hermann Berstorff Maschinenbau GmbH. Continuously operating material press with lubricating film for reducing friction. 5,463,946, Cl. 100-93.0RP.

Krumes, Rolf; Richman, Dennis C.; and Bose, Carl L., to Northrop Grumman Corporation. Obstacle avoidance system for helicopters and other aircraft. 5,465,142, Cl. 356-5.010.

Kruse, Michael J. Shunting device. 5,464,176, Cl. 246-126.000.

Kruto, Donald. Fluid flow control system. 5,464,038, Cl. 137-486.000.

Kubler, Joseph J.: *See*—
Boatwright, Darrell L.; Hanson, George E.; Miller, Phillip; Koenck, Steven E.; Walter, Jerry L.; Kubler, Joseph J.; Cargin, Keith K., Jr.; Schultz, Darald R.; Davis, Patrick H.; and Kunert, Steven R., 5,465,207, Cl. 364-424.010.

Kuboki, Keiju: *See*—
Yoshihara, Kunio; Hirooka, Kazuhiko; Sakai, Masanori; Kuboki, Keiju; Nimura, Mitsuo; and Tanabe, Ritsushi, 5,465,163, Cl. 358-444.000.

Kubota, Hidehiro: *See*—
Takeda, Hisao; Koshiji, Youichi; Kubota, Hidehiro; and Iizuka, Takashi, 5,464,516, Cl. 204-182.900.

Kudo, Masato; Sekine, Tetsu; and Murakami, Koji, to JEOL Ltd. Method and apparatus for electron energy analysis. 5,464,978, Cl. 250-305.000.

Kuechler, Thomas C.: *See*—
Hight, Terry V. T.; Matson, Jack V.; Rakestraw, Lawrence F.; Zhang, Zhihe; and Kuechler, Thomas C., 5,464,636, Cl. 424-661.000.

Kuhn, Jean-Charles: *See*—
Muller, Bernard; Gautier, Antoine; Dean, Christopher; and Kuhn, Jean-Charles, 5,464,761, Cl. 435-147.000.

Kuma, Kiyoji: *See*—
Sato, Shin-ichi; and Kuma, Kiyoji, 5,464,908, Cl. 525-380.000.

Kumar, Ravi; and Kleinberg, William T., to Air Products and Chemicals, Inc. Integrated adsorption/cryogenic distillation process for the separation of an air feed. 5,463,869, Cl. 62-24.000.

Kumata, Fumio: *See*—
Takahashi, Kazuo; Kumata, Fumio; Nozaki, Hitoshi; Inoue, Shinichi; and Makabe, Toshiji, 5,464,593, Cl. 422-224.000.

Kume, Masaharu: *See*—
Ono, Michio; Kume, Masaharu; and Matsuo, Takayuki, 5,464,693, Cl. 428-344.000.

Kun, Ernest; Mendeleyev, Jerome; and Kirsten, Eva, to Octamer, Inc. Aromatic nitro and nitroso compounds and their metabolites useful as anti-viral and anti-tumor agents. 5,464,871, Cl. 514-617.000.

Kunert, Steven R.: *See*—
Boatwright, Darrell L.; Hanson, George E.; Miller, Phillip; Koenck, Steven E.; Walter, Jerry L.; Kubler, Joseph J.; Cargin, Keith K., Jr.; Schultz, Darald R.; Davis, Patrick H.; and Kunert, Steven R., 5,465,207, Cl. 364-424.010.

Kunisch, Franz: *See*—
Petersen, Uwe; Krebs, Andreas; Schenke, Thomas; Kunisch, Franz; Philipps, Thomas; Grohe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, 5,464,796, Cl. 514-312.000.

Kunito, Yoshiyuki; and Fukami, Tadashi, to Sony Corporation. Multichannel recording and/or reproducing apparatus. 5,465,179, Cl. 360-8.000.

Kuphal, Wilko: *See*—
Gall, Arthur; Meier, Heinz; Kuphal, Wilko; and Vogel, Georg, 5,465,285, Cl. 378-173.000.

Kupper, Lawrence L.: *See*—
Swift, Michael R.; Kupper, Lawrence L.; and Chase, Charles L., 5,464,742, Cl. 435-6.000.

Kurabayashi, Toru: *See*—
Manada, Nobuaki; Ito, Junji; Kurabayashi, Toru; and Nishizawa, Junichi, 5,463,977, Cl. 117-85.000.

Kururay Company Limited: *See*—
Kawamoto, Masao; Tanaka, Kazuhiko; Hirakawa, Kiyoshi; and Nakamura, Eiichirou, 5,464,695, Cl. 428-370.000.

Kurata, Yukio: *See*—
Sakai, Keiji; Yoshida, Yoshio; Yamamoto, Hiroyuki; Kurata, Yukio; Nakata, Yasuo; and Miyake, Takahiro, 5,465,315, Cl. 385-116.000.

Kurihara, Jun'ichi: *See*—
Hirosawa, Toshio; Kurihara, Jun'ichi; Itoh, Tsutomu; and Kokunishi, Motohide, 5,465,354, Cl. 395-650.000.

Kurumada, Toshimi: *See*—
Takahashi, Toshie; Sato, Takashi; Kurumada, Toshimi; and Kokuban, Yoshiyuki, 5,465,292, Cl. 379-164.000.

Kurzweil Applied Intelligence, Inc.: *See*—
Sejnoha, Vladimir, 5,465,318, Cl. 395-2.520.

Kusamichi, Yoshitake: *See*—
Shimizu, Keishi; Shimizu, Kanzi; Mitsumachi, Masanobu; Nakajima, Masato; Ishigami, Tetsushi; and Kusamichi, Yoshitake, 5,464,370, Cl. 454-345.000.

Kusayanagi, Michio: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mitsuhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.

Kusheverskaya, Svetlana V.: *See*—
Ballova, Galina D.; Rupythev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa P.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

Kushnir, Yosif: *See*—
Brown, David; Gaul, Harald; Kushnir, Yosif; Travaglini, Nick; and Wilson, Victor, 5,464,579, Cl. 264-297.200.

Kusters Engineering B.V.: *See*—
Kusters, Wilhelmus M. A., 5,464,162, Cl. 241-36.000.

Kusters, Wilhelmus M. A., to Kusters Engineering B.V. Device for reducing paper, in particular valuable papers. 5,464,162, Cl. 241-36.000.

Kusuda, Masahiro: *See*—
Yamahata, Hitoshi; and Kusuda, Masahiro, 5,465,257, Cl. 371-22.500.

Kusui, Jun: *See*—
Miura, Hirohisa; Imahashi, Kunihiko; Michioka, Hirohumi; Yamada, Yasuhiro; Kusui, Jun; and Tanaka, Akiei, 5,464,463, Cl. 75-244.000.

Kusumoto, Keiichi; and Matsuzawa, Akira, to Matsushita Electric Industrial Co., Ltd. Analog-to-digital converter. 5,465,093, Cl. 341-122.000.

Kutscher, Bernhard; Niebch, Georg; Fleischhauer, Ilona; Engel, Jürgen; Achterrath-Tuckermann, Ute; and Szelenyi, Stefan, to Asta Medica Aktiengesellschaft. Aminocarboxylic acid derivatives having antiallergic/antiasthmatic effect and a process for their preparation. 5,464,838, Cl. 514-248.000.

Kuwaki, Tetsuo: *See*—
Matsumura, Hiroshi; Shimada, Takaaki; Hisanaka, Takayuki; Ochi, Yoshiki; Kuwaki, Tetsuo; and Muta, Yoshinobu, 5,464,689, Cl. 428-317.900.

Kuwano, Atsushi: *See*—
Watanabe, Itsuo; Kuwano, Atsushi; Taketatsu, Jun; Takane, Nobuaki; Yamada, Mitsuo; and Tai, Seiji, 5,464,673, Cl. 428-65.100.

Kuznicki, James T.; and Turner, Lana S., to Procter & Gamble Company, The. Beverage compositions containing green tea solids, electrolytes and carbohydrates to provide improved cellular hydration and drinkability. 5,464,619, Cl. 424-195.100.

Kvakovszky, George: *See*—
Vicari, Richard; Kvakovszky, George; and Fruchey, Olan S., 5,464,923, Cl. 528-68.000.
Vicari, Richard; Kvakovszky, George; Fruchey, Olan S.; and Metz, Hans J., 5,464,941, Cl. 534-741.000.

Kwan, Chiu K.: *See*—
Lee, James S. W.; and Kwan, Chiu K., 5,464,213, Cl. 273-121.00A.

Kwiatek, David J., to Eaton Corporation. Gaseous fuel burner and method of making same. 5,464,345, Cl. 431-266.000.

Kwon, Soon B.: *See*—
Kang, Dae S.; Park, Woo S.; Shin, Hyun H.; Kwon, Soon B.; Marusii, Tatyana Y.; Reznikov, Yuriy A.; Khizhnyak, Anatoliy I.; and Yaroschchuk, Oleg V., 5,464,669, Cl. 428-1.000.

KX Industries, L.P.: *See*—
Koslow, Evan E., 5,464,533, Cl. 210-257.100.

Kyowa Chemical Industry Co., Ltd.: *See*—
Nosu, Tsutomu; and Nagae, Yoshiyuki, 5,464,896, Cl. 524-436.000.

Kyselica, Stefan P.: *See*—
Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; Grubbs, Gray W.; and Kyselica, Stefan P., 5,464,958, Cl. 219-130.510.

Laaksonen, Reijo, to Auto-Jure Oy. Device for handling a vehicle wheel. 5,464,314, Cl. 414-427.000.

Laas, Hans-Josef; Halpaap, Reinhard; Wamprecht, Christian; Meier-Westhues, Hans-Ulrich; Schultz, Wolfgang; and Kahl, Lothar, to Bayer Aktiengesellschaft. Polyisocyanate mixtures, a process for their production and their use for the production of polyurethanes. 5,464,921, Cl. 528-67.000.

Labadie, Jeffrey W.: *See*—
Angelopoulos, Marie; Gelorme, Jeffrey D.; Labadie, Jeffrey W.; Lewis, David A.; Swanson, Sally A.; and Labianca, Nancy C., 5,464,927, Cl. 528-350.000.

Labianca, Nancy C.: *See*—
Angelopoulos, Marie; Gelorme, Jeffrey D.; Labadie, Jeffrey W.; Lewis, David A.; Swanson, Sally A.; and Labianca, Nancy C., 5,464,927, Cl. 528-350.000.

Laboratoires Progipharm: *See*—
Cousin, Gérard; Bruna, Etienne; and Gendrot, Edouard, 5,464,632, Cl. 424-465.000.

Labroo, Virender M.; Piggott, James R.; and Bain, Steven D., to ZymoGenetics, Inc. Method for inhibiting bone loss using centchroman derivatives. 5,464,862, Cl. 514-422.000.

Lacayo, Rodolfo W. Newspaper and magazine protective carrying pouch. 5,464,095, Cl. 206-449.000.

Lace, Jeffrey J., to Actodyne General, Inc. Sensor assembly for a stringed musical instrument. 5,464,948, Cl. 84-726.000.

Lach, Greg F.: *See*—
DeDeimar, Ronald B.; and Lach, Greg F., 5,464,165, Cl. 241-215.000.

Lach, Patrick: *See*—
Barbier, Bruno; and Lach, Patrick, 5,465,177, Cl. 359-634.000.

Lacoste, Jean-Michel: *See*—
Cordi, Alex; Lacoste, Jean-Michel; Laubie, Michel; Verbeuren, Tony; and Descombes, Jean-Jacques, 5,464,859, Cl. 514-401.000.

Ladewski, Theodore B., to KMS Fusion, Inc. Electro-optical system for gauging specular surface profile deviations. 5,465,153, Cl. 356-376.000.

LaHaye Laboratories, Inc.: *See*—
La Haye, Peter G., 5,464,094, Cl. 206-316.100.

La Haye, Peter G., to LaHaye Laboratories, Inc. Packaging container for stick-on lenses enabling testing thereof without removal from container. 5,464,094, Cl. 206-316.100.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Rieth, Norbert, 5,463,870, Cl. 62-25.000.

Lajoie, M. Stephen: *See*—
Winston, Anthony E.; Cala, Francis R.; Dunn, Steven E.; Vinci, Alfredo; and Lajoie, M. Stephen, 5,464,553, Cl. 252-108.000.

Lake, Ivan J. S.: *See*—
Casci, John L.; Shannon, Mervyn D.; and Lake, Ivan J. S., 5,464,799, Cl. 502-65.000.

Lake Medical Products, Inc.: *See*—
Klearman, Jeffrey D.; Bierman, Jeffrey J.; and Schachet, Eli, 5,464,393, Cl. 604-82.000.

Lakso Company, The: *See*—
Stange, Thomas C.; DiNanno, James M.; Maillet, John P., Jr.; and Heino, Richard N., 5,463,839, Cl. 53-54.000.

Lam, Edward K.: *See*—
Craig, W. Scott; Hall, Charles B.; Lam, Edward K.; and Rogers, Duane E., 5,464,357, Cl. 440-89.000.

La Manna, Aldo: *See*—
Conte, Ubaldo; La Manna, Aldo; and Maggi, Lauretta, 5,464,633, Cl. 424-480.000.

Lambda Electronics, Inc.: *See*—
Cohen, Isaac, 5,465,201, Cl. 363-21.000.

Lambert, Jack L.: *See*—
Marchin, George L.; and Lambert, Jack L., 5,464,559, Cl. 252-181.000.
Marchin, George L.; and Lambert, Jack L., 5,464,603, Cl. 423-501.000.

Lamear, William D., Jr.: *See*—
Day, Kennith P., III; Lamear, William D., Jr.; and Morse, Edward R., 5,465,382, Cl. 395-404.000.

Lammintausta, Risto: *See*—
Jalonen, Harry; and Lammintausta, Risto, 5,464,628, Cl. 424-448.000.

Lancaster, William G., to Lantech, Inc. Method and apparatus for stretch wrapping the top and sides of a load. 5,463,842, Cl. 53-399.000.

Landais, Joel, to Moulinex S.A. Device for locking a filter carrier on an infusion head of an espresso coffeemaker. 5,463,933, Cl. 99-285.000.

Lang, Karl-Heinz: *See*—
Kaspers, Norbert; Lang, Karl-Heinz; Baader, Helmut; Grün, Herbert; and Otto, Thomas, 5,463,953, Cl. 101-485.000.

Lange, Barry C.: *See*—
Mehta, Raj L; Lange, Barry C.; and Sherba, Samuel E., 5,464,622, Cl. 424-405.000.
Osei-Gyimah, Peter; Sherba, Samuel E.; Lange, Barry C.; Mehta, Rai J.; and Joseph, Rhoda W., 5,464,832, Cl. 514-238.500.

Langenberg, Klaas H. Variable-pitch propeller or fan. 5,464,324, Cl. 416-167.000.

Langenmayr, Manfred: *See*—
Waizmann, Franz; Hillenbrand, Jürgen; and Langenmayr, Manfred, 5,463,951, Cl. 101-423.000.

Langer, Alfred; Genz, Andreas; Deisenhofer, Manfred; Kiele, Walter; Lewandowski, Bernd; and Reichardt, Jürgen, to Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH. Method of making a quartz glass tube having a reduced ultraviolet radiation transmissivity. 5,464,462, Cl. 65-66.000.

Langham, Allen D.: *See*—

Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yursis, Robert, 5,465,294, Cl. 379-207.000.

Langlois, Michel; Renard, Pierre; and Adam, Gérard, to Adir et Compagnie. Arylalkyl (thio) amides. 5,464,872, Cl. 514-630.000.

Lantech, Inc.: *See*—
Lancaster, William G., 5,463,842, Cl. 53-399.000.

Lanxide Technology Company, LP: *See*—
Schwark, Joanne M., 5,464,918, Cl. 528-24.000.

Lappos, Nicholas D.: *See*—
Fowler, Donald W.; Lappos, Nicholas D.; and Edwards, Joan A., 5,465,212, Cl. 364-427.000.

Larkin, David J.; Neudeck, Philip G.; Powell, J. Anthony; and Matus, Lawrence G., to Ohio Aerospace Institute. Compound semiconductor and controlled doping thereof. 5,463,978, Cl. 117-89.000.

Larsson, Lars G.; and Gudmundson, Perols B. O., to Telefonaktiebolaget LM Ericsson. Method of forming a channel estimate for a time-varying radio channel. 5,465,276, Cl. 375-346.000.

La Rue, Len. List filter. 5,463,820, Cl. 34-235.000.

LaserMedics, Inc.: *See*—
Smith, Chadwick F., 5,464,436, Cl. 607-89.000.

Lathrop, Frederick L.; and Rowland, Kenneth A., to International Business Machines, Inc. Method and system for providing device driver support which is independent of changeable characteristics of devices and operating systems. 5,465,364, Cl. 395-700.000.

Latimer, Lee H.: *See*—
Dunlap, Richard P.; Mura, Albert J.; Hlasta, Dennis J.; Desai, Ranjit C.; and Latimer, Lee H., 5,464,852, Cl. 514-373.000.

Lattin, Gary A.: *See*—
Haak, Ronald P.; Theeuwes, Felix; Gyory, J. Richard; and Lattin, Gary A., 5,464,387, Cl. 604-20.000.

Laubie, Michel: *See*—
Cordi, Alex; Lacoste, Jean-Michel; Laubie, Michel; Verbeuren, Tony; and Deacombes, Jean-Jacques, 5,464,859, Cl. 514-401.000.

Lauer, Fritz K.; and Rogers, David W., to Deere & Company. Cleaning fan having snap in blades. 5,464,372, Cl. 460-100.000.

Lauffer, David J.; and Tecle, Haile, to Warner-Lambert Company. Azabicyclo oxime and amine cholinergic agents and methods of treatment. 5,464,842, Cl. 514-299.000.

Laug, Tamara; and Bromley, Robert, to Laug, Tamara. Line holding storage device and process of using the same. 5,463,797, Cl. 24-115.000.

Laugel, Joe B., Jr.: *See*—
McDonald, Dale R.; Laugel, Joe B., Jr.; and Solomon, William E., 5,464,160, Cl. 241-17.000.

Laughlin, Frank: *See*—
Kenton, Donald J.; Laughlin, Frank; and McComas, Charles, 5,464,479, Cl. 134-1.000.

Laughlin, Thomas J.: *See*—
Hayes, Jesse C., Jr.; Dever, Gerald R.; Laughlin, Thomas J.; Schroer, Charles F., Jr.; and Wildman, Gary C., 5,464,610, Cl. 424-61.000.

Laures, Pierre, to Aerospatiale Societe Nationale Industrielle. Air defence system and defence missile for such a system. 5,464,174, Cl. 244-3.110.

Lauria, Richard T.: *See*—
Hsu, Lillian-Liu; Sathi, Kitty; Biondi, Mark C.; Zell, Thomas B.; Catapano, David A.; and Lauria, Richard T., 5,465,322, Cl. 395-114.000.

Lauricella, Kenneth A.: *See*—
Dinkjian, Robert M.; Heller, Lisa C.; Kordus, Steven R.; Lauricella, Kenneth A.; Seigendall, Thomas W.; Skagga, Robert A.; and Xu, Nelson S., 5,465,374, Cl. 395-800.000.

Lauritzen, Donald R.; and Ralston, Joseph L., to Morton International, Inc. Generant loaded filter assembly and method for its use. 5,464,249, Cl. 280-741.000.

Lautzenhiser, Frans P.; Carter, Bradley H.; Ozogar, Donald A.; and Sarma, Dwadasi H. R., to Delco Electronics Corporation. THFA/PDP thermoset thick films for printed circuits. 5,464,570, Cl. 252-500.000.

Lavoie, Camilien; and Hervieux, Pierre. Archery armguard device. 5,464,002, Cl. 124-86.000.

LaWhite, Eric: *See*—
Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adamiva, George, 5,464,392, Cl. 604-67.000.

Laws, Regina: *See*—
Vogelsang, Joerg; Greening, Giorgio; Laws, Regina; and Ittemann, Peter, 5,464,684, Cl. 428-229.000.

Lazzari, Gianni; Omologo, Maurizio; and Svaizer, Piergiorgio, to Istituto Trentino Di Cultura. Method for the location of a speaker and the acquisition of a voice message, and related system. 5,465,302, Cl. 381-92.000.

Le, Hung Q.: *See*—
Imai, Benjamin T.; Le, Hung Q.; and Nguyen, Dung Q., 5,465,336, Cl. 395-375.000.

Leach, William C.: *See*—
Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yursis, Robert, 5,465,294, Cl. 379-207.000.

LeBlanc, Janiene: *See*—
LeBlanc, Wayne; and LeBlanc, Janiene, 5,464,102, Cl. 211-12.000.

LeBlanc, Wayne; and LeBlanc, Janiene. Foldable apparatus for transporting filled plastic grocery bags. 5,464,102, Cl. 211-12.000.

Lechner, Richard: *See*—
Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yursis, Robert, 5,465,294, Cl. 379-207.000.

Lecocq, David E.: *See*—
Athey, Patricia R.; Dauson, Douglas S.; Lecocq, David E.; Neuman, George A.; Sopko, John F.; and Stewart-Davis, Royann L., 5,464,657, Cl. 427-255.500.

Ledden, David J.: *See*—
Eisenbeis, Scott J.; Krevolin, Mark; Bryant, Christopher P.; Boguslawski, Sophie J.; Ledden, David J.; and Clark, Scott, 5,464,747, Cl. 435-7.600.

Ledjeff, Konstantin; Schuler, Alexander; and Giesboff, Jurgen, to Fraunhofer-Gesellschaft zur Forderung der Angewandten Forschung E.V. Water heater. 5,464,006, Cl. 126-361.000.

Lee, Albert C.: *See*—
Halliman, E. Ann; Hagen, Timothy J.; Husa, Robert K.; Tsymbalov, Sofya; Lee, Albert C.; and Van Hoeck, Jean-Pierre, 5,464,830, Cl. 514-211.000.

Lee, Chinsoo S.: *See*—
Lein, Maureen M.; Pelletier, Gary F.; Goad, Jeffrey D.; and Lee, Chinsoo S., 5,464,661, Cl. 427-409.000.

Lee, James S. W.; and Kwan, Chiu K., to C.J. Associates, Ltd. Arcade type of pinball toy. 5,464,213, Cl. 273-121.00A.

Lee, Kevin; and Hug, Berthold, to Hewlett-Packard Company. Method and system for defining geometric relations in a computer aided design system. 5,465,324, Cl. 395-133.000.

Lee, Kuo-Ron: *See*—
Yu, Hei-Nan, 5,464,378, Cl. 482-95.000.

Lee, Tommy W.: *See*—
Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Pyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,463,921, Cl. 83-151.000.

Leeds, Richard A. Picture frame leveling device. 5,463,817, Cl. 33-371.000.

Legacy Systems, Inc.: *See*—
Matthews, Robert R., 5,464,480, Cl. 134-1.300.

Lehmann, Wolfgang: *See*—
Jenner, Bert; Schmidt, Hans-Joachim; Chiaramonte, Giancarlo; and Lehmann, Wolfgang, 5,465,195, Cl. 362-61.000.

Lehrer, Robert I.; Kokryakov, Vladimir N.; and Harwig, Sylvia S. L., to University of California, The Regents of the. Mammalian antibiotic peptides. 5,464,823, Cl. 514-13.000.

Lein, Maureen M.; Pelletier, Gary F.; Goad, Jeffrey D.; and Lee, Chinsoo S., to Davidson Textron Inc. Reduced solvent island coating system. 5,464,661, Cl. 427-409.000.

Leiner, Marco J.: *See*—
Lippitsch, Max; Draxler, Sonja; and Leiner, Marco J., 5,464,587, Cl. 422-82.070.

Le Masson, Jacques: *See*—
Commier, Philippe; Phelipon, Axel; and Le Masson, Jacques, 5,464,242, Cl. 280-602.000.

Lemelson, Jerome H. Medical scanning and treatment system and method. 5,464,013, Cl. 128-653.100.

Lemieux, Thomas; and Nelson, Rod. Hand tool extension handle. 5,463,918, Cl. 81-487.000.

Lemmo, Steven E., to Noblenet Inc. Client-side memory management process for client-server computing. 5,465,351, Cl. 395-600.000.

Leng, Tony, to Cyclone Precision Inc. Bicycle sprocket assembly with a chain guiding means. 5,464,373, Cl. 474-140.000.

Lenormand, Roland: *See*—
Fleury, Marc; Lenormand, Roland; and Ringot, Gabriel, 5,463,894, Cl. 73-38.000.

Lenz, Vernon C.: *See*—
Siska, William, Jr.; and Lenz, Vernon C., 5,464,413, Cl. 606-151.000.

Leonard, Gary: *See*—
Palmer, Arthur V.; and Leonard, Gary, 5,464,315, Cl. 414-458.000.

Leonard, William K.; Mohn, Stephen W.; Edman, Timothy J.; and Schiller, Philip D., to Minnesota Mining and Manufacturing Company. Method of thickness control for dies. 5,464,577, Cl. 264-40.500.

Lepage, Francis; and Hublot, Bernard, to Novapharme. N(pyrazol-3-yl) benzamides and pharmaceutical compositions. 5,464,860, Cl. 514-404.000.

Lerner, Albert M. Diagnosing and treating subacute cardiac dysfunction. 5,464,020, Cl. 128-696.000.

Leslie, Bruce W.: *See*—
Armitage, Bernard J.; Bowen, John G.; Crossley, Malcolm J.; Hunneyball, Ian M.; Leslie, Bruce W.; Miller, Thomas K.; and Spowage, Michael, 5,464,781, Cl. 514-300.000.

Lessing, Paul A., to Lockheed Idaho Technologies Company. Method for manufacturing whisker preforms and composites. 5,464,583, Cl. 264-60.000.

Leuck, James F.: *See*—
Moore, Samuel B.; Leuck, James F.; and Turner, Edwin T., 5,464,563, Cl. 252-186.290.

Leung, Roger Y.; and Gonczy, Stephen T., to AlliedSignal Inc. Ceramic fiber reinforced silicon carboxide composite. 5,464,594, Cl. 422-288.000.

Leventhal, Harry. Broom holder. 5,464,181, Cl. 248-113.000.

Lever Brothers Company: *See*—

Fowler, Kimberly A.; and Feustle, Lisa E., 5,464,149, Cl. 229-120.270.
Lever Brothers Company, Division of Conopco, Inc.: *See*—
Hales, Stephen G.; Khoshdel, Ezat; and Polywka, Robert, 5,464,558, Cl. 252-174.240.
Levison, Laurence L.; Goldberg, Paul B.; and Stanek, Scott D., to Aeroflex Systems Corporation. Automated fingerprint classification/identification system and method. 5,465,303, Cl. 382-124.000.
Levitan, David S.: *See*—
Kahle, James A.; Kau, Chin-Cheng; Levitan, David S.; Ogden, Aubrey D.; Poursepanj, Ali A.; Tu, Paul K.-G.; and Waldecker, Donald E., 5,465,373, Cl. 395-800.000.
Levrangi, Stefano, to Fast S.p.A. Adjustable deck-chair with spring positioning means. 5,464,268, Cl. 297-57.000.
Levy, Ellen J.: *See*—
Anderson, Mary; Meister, Alton; and Levy, Ellen J., 5,464,825, Cl. 514-18.000.
Levy, Karl B. Optical monitoring of growth and etch rate of materials. 5,465,154, Cl. 356-382.000.
Lewandowski, Bernd: *See*—
Langer, Alfred; Genz, Andreas; Deisenhofer, Manfred; Kiele, Walter; Lewandowski, Bernd; and Reichardt, Jürgen, 5,464,462, Cl. 65-66.000.
Lewis, David A.: *See*—
Angelopoulos, Marie; Gelorme, Jeffrey D.; Labadie, Jeffrey W.; Lewis, David A.; Swanson, Sally A.; and Labianca, Nancy C., 5,464,927, Cl. 528-350.000.
Lewis, Richard S., to Loral Aerospace Corp. Load assist apparatus for missiles. 5,463,927, Cl. 89-1.801.
Lewis, Scott W., to Multimedia Systems Corporation. System and apparatus for interactive multimedia entertainment. 5,464,946, Cl. 84-609.000.
Lewis, William: *See*—
Coolidge, Thomas R.; Lewis, William; Schuster, Sheldon M.; Stout, Jay; van Heeke, Gino; Wylie, Dwane; and Wagner, Fred W., 5,464,759, Cl. 435-91.200.
Lexmark International, Inc.: *See*—
Mayo, Randall D.; and Spitz, Donald N., 5,465,107, Cl. 346-139.00R.
Li, Lehmann K., to Li Medical Technologies, Inc. Variable opening seal. 5,464,189, Cl. 251-4.000.
Li Medical Technologies, Inc.: *See*—
Li, Lehmann K., 5,464,189, Cl. 251-4.000.
Li, Yao; and Rao, Satish, to NEC Research Institute, Inc. Optical mesh-connected bus interconnect for a computer. 5,465,379, Cl. 395-800.000.
Liang, Joseph. Universally pivotal luggage steering apparatus. 5,464,080, Cl. 190-18.00A.
Liao, David: *See*—
Chu, Ching; Liao, David; and Feng, Kai D., 5,465,143, Cl. 356-73.100.
Liao, Jia-Li: *See*—
Hjertén, Stellan; and Liao, Jia-Li, 5,464,517, Cl. 204-183.200.
Liao, Jing: *See*—
Strickland, S. Scott; Krietemeyer, James R.; Liao, Jing; Mead, Ian D.; and Puckett, Robert L., 5,465,215, Cl. 364-474.220.
Lichon, Paul G., to Olin Corporation. Arcjet anode. 5,464,961, Cl. 219-121.520.
Liddiard, Kevin C.; Rice, Brian W.; and Watson, Rodney J., to Commonwealth of Australia, The. Infrared intrusion sensor. 5,465,080, Cl. 340-567.000.
Liem, Tien Lung, to Chyuan Ryh Shing Co., Ltd. Connector assembly for connecting board-like members of a piece of furniture in fitting manner. 5,464,305, Cl. 403-362.000.
Lietz, Paul R., Jr.; and Foster, Michael J. Satellite dish cleaning apparatus and methods. 5,464,481, Cl. 134-6.000.
Lifshey, Arthur L., to Merck & Co., Inc. Non-streaming ophthalmic tip and delivery device. 5,464,122, Cl. 222-83.000.
Ligon, David L.: *See*—
Shatas, Remigius G.; and Ligon, David L., 5,465,105, Cl. 345-204.000.
Lile, William R.: *See*—
Stevens, Albert F.; DeWitt, Robert R.; Lile, William R.; Mitchell, Paul R.; and Tentarelli, Stephen, 5,464,099, Cl. 209-3.100.
Lim, Sheldon C. P.; Hellstrom, Julie W.; and Yen, Ting P., to North American Philips Corporation. Programmable semiconductor integrated circuits having fusible links. 5,465,004, Cl. 257-529.000.
Lin Pac Inc.: *See*—
Cordrey, Daniel, 5,463,965, Cl. 108-513.000.
Lind, Stuart E.: *See*—
Stossel, Thomas P.; Lind, Stuart E.; and Janmey, Paul A., 5,464,817, Cl. 514-2.000.
Lindner, Alan W.: *See*—
Goetz, Martin; Babiarz, Joseph; Wein, Deborah S.; Anderson, Paul M.; and Lindner, Alan W., 5,465,008, Cl. 257-691.000.
Lindner, Ernst: *See*—
Albring, Peter; Apley, Rainer; Döge, Klaus; Heinrich, Günter; Lindner, Ernst; Müller, Norbert; Pauer, Reinhard; Pilling, Eberhard; and Rudischer, Rainer, 5,464,325, Cl. 416-185.000.
Lindner, Werner: *See*—
Mehlhorn, Heinz; Schmahl, Günter; Lindner, Werner; and Haberkorn, Axel, 5,464,837, Cl. 514-242.000.
Linear Technology Corporation: *See*—
Atarodi, Mojtaba, 5,465,072, Cl. 330-254.000.
Ling, Nicholas C.: *See*—
Baird, Andrew J.; Esch, Frederick S.; Gospodarowicz, Denis; Bohlen, Peter; and Ling, Nicholas C., 5,464,774, Cl. 536-23.510.
Lin-Goerke, Juili L.: *See*—
Farrell, Michael P.; and Lin-Goerke, Juili L., 5,464,744, Cl. 435-6.000.
Linker, Karl-Heinz: *See*—
Haas, Wilhelm; Linker, Karl-Heinz; Schallner, Otto; Findeisen, Kurt; Santel, Hans-Joachim; and Dollinger, Markus, 5,464,810, Cl. 504-273.000.
Linkner, Herbert L., Jr., to Kelsey-Hayes Company. Mounting bracket for an anti-lock brake/traction control system control valve. 5,464,187, Cl. 248-633.000.
Linner, Kristin M.: *See*—
Portoghese, Philip S.; Sharp, Burt M.; and Linner, Kristin M., 5,464,841, Cl. 514-279.000.
Linssen, Nicolaas G. H.: *See*—
Deen, Pieter B. J.; Linssen, Nicolaas G. H.; and Mennen, Godefridus J., 5,464,201, Cl. 270-53.000.
Linton, Elizabeth A.: *See*—
Potter, Ellen; Behan, Dominic P.; Fischer, Wolfgang H.; Linton, Elizabeth A.; Lowry, Philip J.; and Vale, Wylie W., Jr., 5,464,757, Cl. 435-69.100.
Lippitsch, Max; Draxler, Sonja; and Leiner, Marco J., to AVL Medical Instruments AG. Luminescence-optical indicator for determining the activity of alkali metal ions in a sample solution. 5,464,587, Cl. 422-82.070.
Liskow, Uwe, to Robert Bosch GmbH. Regenerative pump with an axially shifting working fluid chamber. 5,464,319, Cl. 415-55.100.
Litetronics International, Inc.: *See*—
Hendrickson, Thomas S., 5,465,025, Cl. 313-318.090.
Litle & Co.: *See*—
Hampton, Thomas H.; Litle, Thomas J., IV; and Searle, Nigel H., 5,465,290, Cl. 379-67.000.
Litle, Thomas J., IV: *See*—
Hampton, Thomas H.; Litle, Thomas J., IV; and Searle, Nigel H., 5,465,290, Cl. 379-67.000.
Litterst, Jürgen, to Premark FEG Corporation. Dish washing unit for trays loaded with dishes. 5,464,032, Cl. 134-72.000.
Liu, Yet-zen: *See*—
Weber, Robert J.; Chung, Russell W.-C.; and Liu, Yet-zen, 5,465,171, Cl. 359-287.000.
Liu, Zhenyu L.: *See*—
Wilkison, Dennis E.; and Liu, Zhenyu L., 5,465,298, Cl. 379-406.000.
Lively, Pat: *See*—
Wilson, Dennis R.; Siebert, Robert M.; and Lively, Pat, 5,464,061, Cl. 166-302.000.
Livshits, Mikhail; Sauvido, David J.; and Folkerts, Charles H., to General Motors Corporation. Engine speed control. 5,463,993, Cl. 123-339.200.
Llorens, Joseph R.: *See*—
Samela, Francis M.; and Llorens, Joseph R., 5,465,042, Cl. 324-71.100.
Lloyd, Gail A.: *See*—
Johnson, Eric; Lloyd, Gail A.; and Massey, R. Nathan, 5,463,855, Cl. 56-17.200.
Lo, Grace Y.; and Gatzke, Arnold L., to Dow Chemical Company, The. Preparation of a low polydisperse polymer. 5,464,914, Cl. 526-180.000.
Lo, Hsin-Hsin. Dummy passenger. 5,463,825, Cl. 40-414.000.
Locati, Santino, to Cimbali S.p.A. Automatic coffee machine for delivering coffee alone or, combined with milk, in the form of cappuccino. 5,463,934, Cl. 99-286.000.
Lockheed Idaho Technologies Company: *See*—
Leasing, Paul A., 5,464,583, Cl. 264-60.000.
Lockheed Missiles & Space Company, Inc.: *See*—
Jensen, Duane L.; and Allen, Rolla W., 5,463,957, Cl. 102-293.000.
Jensen, Duane L.; and Allen, Rolla W., 5,464,172, Cl. 244-3.100.
Lodge, Richard W., to Procter & Gamble Company, The. Low fat fried snack. 5,464,643, Cl. 426-439.000.
Logalbo, Robert D.: *See*—
Hiben, Bradley M.; Newberg, Donald G.; and Logalbo, Robert D., 5,465,410, Cl. 455-266.000.
Logemann Brothers Co.: *See*—
Wolf, Robert J.; and Schuman, Leroy J. W., 5,463,944, Cl. 100-35.000.
Lohberg, Peter; Bayer, Ronald; Halat, Siegfried; Kircher, Dieter; Perez, Diogenes; and Sparschuh, Stefan, to Alfred Teves GmbH. Two-tube shock absorber. 5,464,079, Cl. 188-315.000.
Loma Linda University Medical Center: *See*—
Schulte, Reinhard W.; Wicks, William J.; Meinaus, Helmut J.; and Nethery, Winston J., 5,464,411, Cl. 606-130.000.
Long, Giorgio; De Cillis, Giampiero; Rozzi, Antonella; D'Alò, Simonetta; and Gallico, Licia, to Boehringer Mannheim Italia, S.p.A. [3H,7H]thiazole[3,4-a]pyridines having antiasthmatic and antiinflammatory activities on the respiratory tract. 5,464,844, Cl. 514-301.000.
Long, Jack R.; and Weber, Hans B., to National Castings Incorporated. Rocker seat connection. 5,463,964, Cl. 105-187.000.
Longacre, Mark D.: *See*—
Derr, William S.; and Longacre, Mark D., 5,464,346, Cl. 431-328.000.
Longo, Gianantonio: *See*—
Curto, Caterino; and Longo, Gianantonio, 5,465,122, Cl. 351-124.000.
Longtin, John T.: *See*—
Falvey, Neil J.; Day, Edwin J., III; Nappier, Ricky L.; and Longtin, John T., 5,465,288, Cl. 379-58.000.
Loral Aerospace Corp.: *See*—
Lewis, Richard S., 5,463,927, Cl. 89-1.801.
Lorenz, Gisela: *See*—

Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,464,839, Cl. 514-256.000.

Lorenz, Hellmut, to Barmag AG. Friction false twist unit. 5,463,861, Cl. 57-339.000.

Louie, Craig: *See*—
Buswell, Richard F.; Clausi, Joseph V.; and Louie, Craig, 5,464,606, Cl. 423-655.000.

Low, Sharon A. H.: *See*—
Chee, Richard W. M.; and Low, Sharon A. H., 5,464,294, Cl. 401-269.000.

Lowry, Charles P. Streamlined bullet. 5,463,960, Cl. 102-501.000.

Lowry, Philip J.: *See*—
Potter, Ellen; Behan, Dominic P.; Fischer, Wolfgang H.; Linton, Elizabeth A.; Lowry, Philip J.; and Vale, Wylie W., Jr., 5,464,757, Cl. 435-69.100.

Lu, David D.-L.: *See*—
Hauser, Edward R.; and Lu, David D.-L., 5,464,680, Cl. 428-141.000.

Lu, Ying-Yuh: *See*—
Young, Chung I.; and Lu, Ying-Yuh, 5,464,916, Cl. 526-264.000.

Lubrizol Corporation, The: *See*—
Cahoon, John M.; Karn, Jack L.; and Huang, Nai Z., 5,464,548, Cl. 252-18.000.

Lucas, Alan W. Handling systems for lamellae. 5,464,090, Cl. 198-803.010.

Lucas, Daniel R.: *See*—
Miller, Arnold; and Lucas, Daniel R., 5,464,394, Cl. 604-96.000.

Lucas Industries plc: *See*—
Cook, Graeme A. C.; Vranas, Goulielmos; and McIver, Simon P., 5,464,334, Cl. 417-494.000.

Luce, Richard J., to Service Litho-Print, Inc. Replaceable adhesive display. 5,464,681, Cl. 428-195.000.

LuCoCer Aktiebolag: *See*—
Johansson, Thomas, 5,464,440, Cl. 623-16.000.

Luigi, Airoldi: *See*—
Giuseppe, Caccia; and Luigi, Airoldi, 5,464,119, Cl. 221-156.000.

Lundy, Charles E.: *See*—
Archey, Rick L.; Lundy, Charles E.; Meltzer, Aaron D.; Pielartzik, Harald; Fennhoff, Gerhard; Hufen, Ralf; Kircher, Klaus; Schubert, Rudiger; and Weider, Richard, 5,464,893, Cl. 524-366.000.

Luo, Lifeng; and Couch, Richard W., Jr., to Hypertherm, Inc. Electrode for a plasma arc torch. 5,464,962, Cl. 219-121.520.

Lupton, Stephen D.: *See*—
Sims, John E.; Cosman, David J.; Lupton, Stephen D.; Mosley, Bruce A.; and Dower, Steven K., 5,464,937, Cl. 530-350.000.

Lur, Water; and Wu, Jium Y., to United Microelectronics Corporation. Method of forming contact openings having concavo-concave shape. 5,464,794, Cl. 437-187.000.

Lur, Water; Su, Anna; and Shen, Neng H., to United Microelectronics Corporation. Planarized local oxidation by trench-around technology. 5,465,003, Cl. 257-510.000.

Lütjens, Holger: *See*—
Klipper, Reinhold; Antons, Stefan; Steffan, Guido; Mitschker, Alfred; Strüver, Werner; and Lütjens, Holger, 5,464,875, Cl. 521-32.000.

Luxtron Corporation: *See*—
Rall, Dieter L., 5,464,284, Cl. 374-131.000.

Lyding, Günther; Pille, Maria; von Plessen, Helmold; and Semel, Joachim, to Hoechst Aktiengesellschaft. Process for the recovery of valuable materials during the work-up of polyvinyl chloride. 5,464,876, Cl. 521-46.500.

Lyle, Leon R.: *See*—
Dunn, T. Jeffrey; Srinivasan, Ananthachari; Lyle, Leon R.; and Rajagopalan, Raghavan, 5,464,934, Cl. 530-326.000.

Lynch, Daniel S.: *See*—
Kramer, James H.; Lynch, Daniel S.; and Coker, Charles W., 5,464,177, Cl. 246-127.000.

Lynch, Doreen C.; Simpson, Sharon M.; and Skoug, Paul G., to Minnesota Mining and Manufacturing Company. Sulfonyl hydrazide developers for photothermographic and thermographic elements. 5,464,738, Cl. 430-619.000.

Lyondell Petrochemical Company: *See*—
Sheth, Paresh J., 5,464,687, Cl. 428-286.000.

M. G. Braibanti S.p.A.: *See*—
Dalbon, Gerardo, 5,464,640, Cl. 426-231.000.

MacEdmondson, Jerry. Electrostatic oil emulsion treating method and apparatus. 5,464,522, Cl. 204-302.000.

Macklin, William J.: *See*—
Neat, Robin J.; and Macklin, William J., 5,464,708, Cl. 429-218.000.

Mader, Gerald E.: *See*—
Cohrs, Richard B.; and Mader, Gerald E., 5,464,259, Cl. 292-92.000.

Madrazo, James. Ball collector receptacle and dispenser. 5,464,262, Cl. 294-19.200.

Madsen, Robert A.: *See*—
Wesdorp, Leendert H.; Madsen, Robert A.; Norton, Ian T.; and Brown, Charles R., 5,464,645, Cl. 426-573.000.

Maeda, Hiroshi; Miyamoto, Yoichi; and Akaike, Takaaki, to Hiroshi Maeda. 2-phenyl-4,4,5,5-tetramethylimidazoline-1-oxyl-3-oxide derivatives and their use as therapeutic agents for maintaining blood pressure. 5,464,857, Cl. 514-398.000.

Maeda, Hirotsugu: *See*—
Sakai, Hisao; Shimada, Hiroo; Sono, Hiroshi; Nagahiro, Kenichi; Sugita, Narutoshi; Maeda, Hirotsugu; Miyao, Masakazu; Nakamura, Katsunori; Ogita, Yasunori; and Suzuki, Osamu, 5,463,995, Cl. 123-432.000.

Maehara, Kenso; Majima, Osamu; and Hirashima, Shigeyoshi, to Ryobi Ltd.; and Sony Co. Gravure press with improved printing drum arrangement. 5,463,949, Cl. 101-152.000.

Maeta, Akira: *See*—
Sugayama, Sakae; Asami, Takao; Kato, Kenji; and Maeta, Akira, 5,465,408, Cl. 455-249.100.

Maezawa, Hiroyuki: *See*—
Matsumoto, Hiroshi; Takaragi, Kazuo; Susaki, Seiichi; Maezawa, Hiroyuki; and Koizumi, Shinobu, 5,465,299, Cl. 380-23.000.

Mafoti, Robson; and Bushmire, Alan D., to Bayer Corporation. Cast elastomers prepared from aminocrotonates. 5,464,920, Cl. 528-60.000.

Maggi, Lauretta: *See*—
Conte, Ubaldo; La Manna, Aldo; and Maggi, Lauretta, 5,464,633, Cl. 424-400.000.

Mahboubian-Jones, Malcolm G. B.: *See*—
McIntyre, Jonathan F.; Mahboubian-Jones, Malcolm G. B.; and Turnbull, Ian, 5,464,046, Cl. 139-455.000.

Mahlich, Gotthart, to Arthur Eugster AG Elektrohaushaltsgeräte. Device for the preparation of frothed milk for cappuccino. 5,464,574, Cl. 261-124.000.

Mahood, James A., to General Electric Company. Phosphite antioxidants. 5,464,889, Cl. 524-119.000.

Maier, Thomas: *See*—
Stehlin, Albert; and Maier, Thomas, 5,464,547, Cl. 252-8.700.

Maillet, John P., Jr.: *See*—
Stange, Thomas C.; DiNanno, James M.; Maillet, John P., Jr.; and Heino, Richard N., 5,463,839, Cl. 53-54.000.

Maitra, Omal C.: *See*—
White, John A.; and Maitra, Omal C., 5,464,368, Cl. 452-149.000.

Maiwald, Marvin A.; and Davenport, Donald K., to Deere & Company. Adjustable axle with shim structure. 5,464,243, Cl. 280-638.000.

Majeed, Kamal N.: *See*—
Sammut, Steven P.; Georgin, Marc J.; Heaston, Bruce A.; Majeed, Kamal N.; and Kowalik, James J., 5,465,209, Cl. 364-424.050.

Majima, Osamu: *See*—
Maehara, Kenso; Majima, Osamu; and Hirashima, Shigeyoshi, 5,463,949, Cl. 101-152.000.

Major, Emery: *See*—
Drucker, Steven; Goder, Alexey; Khalili, Davood; Williams, Kevin; Christensen, Ken; and Major, Emery, 5,464,982, Cl. 250-343.000.

Major Industrial Technology, Inc.: *See*—
Hartnell, Dale, 5,464,033, Cl. 134-105.000.

Makabe, Toshiji: *See*—
Takahashi, Kazuo; Kumata, Fumio; Nozaki, Hitoshi; Inoue, Shinichi; and Makabe, Toshiji, 5,464,593, Cl. 422-224.000.

Makhlin, Ilya: *See*—
Belenkiy, Yuriy; Grois, Igor; Gumin, Irina L.; Makhlin, Ilya; Margolin, Mark; and Pescetto, Michael J., 5,465,313, Cl. 385-80.000.

Makino, Ichiro; Mitsui, Akira; Takehara, Mikio; Ando, Eiichi; Ebisawa, Junichi; Suzuki, Koichi; Matsumoto, Kiyoshi; Iseda, Toru; and Suzuki, Susumu, to Asahi Glass Company Ltd. Magnetic recording medium and method for its production. 5,464,674, Cl. 428-694.00T.

Maladzyanova, Larisa F.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

Malewicz, Andrezj, to Empi, Inc. Electrode and method of making neuromuscular stimulator. 5,464,448, Cl. 607-138.000.

Maley, Dale C.; and Shinogle, Ronald D., to Caterpillar Inc. Hydraulically-actuated fluid injector having pre-injection pressurizable fluid storage chamber and direct-operated check. 5,463,996, Cl. 123-446.000.

Malhomme, Marc: *See*—
Jeuniaux, Francois; Malhomme, Marc; Moretti, Jean-Marc; and Haralamb, Gérard, 5,465,214, Cl. 364-472.000.

Malik, Zaya H.: *See*—
Parekh, Shafi; Geiger, Bernard M.; Tsimberg, Alexander; Malik, Zaya H.; and Fowler, Reginald H., 5,463,878, Cl. 62-394.000.

Mallet, Jean-Laurent, to Association Scientifique pour la Geologie et de ses Applications; Societe National Elf Aquitaine (Production); Total Compagnie Francaise des Petroles; and Compagnie Generale de Geophysique. Method for modelling a surface and device for implementing same. 5,465,323, Cl. 395-123.000.

Mallinckrodt Medical, Inc.: *See*—
Dunn, T. Jeffrey; Srinivasan, Ananthachari; Lyle, Leon R.; and Rajagopalan, Raghavan, 5,464,934, Cl. 530-326.000.

Malvern, Alan R., to British Aerospace PLC. Optical fiber gyroscope sensing coil having a reduced sensitivity to temperature variations occurring therein. 5,465,150, Cl. 356-350.000.

Man Gutehoffmungshutte AG: *See*—
Aschenbruck, Emil; Rohrbacher, Reinhold; Moreau, Alain; and Guillaux, Michel, 5,463,812, Cl. 29-889.210.

Manabe, Yoshio; Tanahashi, Ichiro; and Mitsuyu, Tsuneo, to Matsushita Electric Industrial Co., Ltd. Nonlinear optical materials and their manufacturing method. 5,464,991, Cl. 257-53.000.

Manada, Nobuaki; Ito, Junji; Kurabayashi, Toru; and Nishizawa, Jun-ichi, to Research Development Corporation; Manada, Nobuaki; Kurabayashi, Toru; and Nishizawa, Jun-Ichi. Method of and apparatus for epitaxially growing chemical compound crystal. 5,463,977, Cl. 117-85.000.

Manchanda, Lalita: *See*—
Kim, Young O.; Manchanda, Lalita; and Weber, Gary R., 5,464,783, Cl. 437-42.000.

Mancini, Alfonso R.; and Williams, Richard A., to Xerox Corporation. Dual wall multi-extraction tube recovery well. 5,464,309, Cl. 405-258.000.

Mancl, Dennis J.; Johnson, Donald C.; and Havens, Paul W., to Electrolux Corporation. Electric motor and brush/shunt assembly therefor. 5,465,016, Cl. 310-71.000.

Mandelkorn, Stanley T., to Deluxe Craft Manufacturing Co. Multiple item shelving display system. 5,464,105, Cl. 211-184.000.

Mangelsdorf, Jürgen, to Rollei Fototechnic GmbH & Co. Finder system for a reflex camera. 5,465,132, Cl. 354-219.000.

Mangone, Ronald W.; and Imm, Dennis, to Grate-Lok Co., Inc. Weldless grating for bridge decks. 5,463,786, Cl. 14-73.000.

Mankovitz, Roy J. Apparatus and methods for displaying text in conjunction with recorded audio programs. 5,465,240, Cl. 369-1.000.

Manning, Willard R.: *See*—
Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yurais, Robert, 5,465,294, Cl. 379-207.000.

Mano, Hiroshi: *See*—
Seto, Kaoru; Kanaiwa, Kiyoshi; Itoh, Michio; Mano, Hiroshi; Yamada, Hironichi; Kashihara, Atsushi; Kawana, Takashi; and Saito, Tetsuo, 5,465,157, Cl. 358-298.000.

Mano, Takashi; Stevens, Rodney W.; and Nakane, Masami, to Pfizer Inc. N-hydroxyurea derivatives as antiallergy and antiinflammatory agents. 5,464,849, Cl. 514-365.000.

Marchin, George L.; and Lambert, Jack L., to Kansas State University Research Foundation. Composition for treating water with resin bound ionic silver. 5,464,559, Cl. 252-181.000.

Marchin, George L.; and Lambert, Jack L., to Kansas State University Research Foundation. Method of treating aqueous iodide solutions. 5,464,603, Cl. 423-501.000.

Marcinko, Kathleen; Placente-Vitro, Maria; and Spector, George. Stuffed animal nursing mom. 5,463,981, Cl. 119-71.000.

Margolin, Mark: *See*—
Belenkiy, Yuriy; Groin, Igor; Gumin, Irina L.; Makhlin, Ilya; Margolin, Mark; and Peacetto, Michael J., 5,465,313, Cl. 385-80.000.

Marik, Wayne; Begalla, John; and Johnson, Tom W., to Nitrojection Corporation. Pin in barrel injection molding nozzle using short pin. 5,464,342, Cl. 425-533.000.

Marin, Anna B.: *See*—
Warren, Craig B.; Marin, Anna B.; Butler, Jerry F.; and Narula, Anubhav P. S., 5,464,626, Cl. 424-408.000.

Marinelli, Anae M. P.; and Patterson, Michael S., to United States of America, Army. Dynamic range tester. 5,465,050, Cl. 324-603.000.

Marinelli, James M.: *See*—
McCleary, Sherri F.; Nitowski, Gary A.; Marinelli, James M.; and Siemon, John T., 5,463,804, Cl. 29-469.500.

Market Design & Development, Inc.: *See*—
Greene, Ralph G., 5,464,531, Cl. 202-181.000.

Markovitz, Mark; and Sheaffer, Jeffrey D., to General Electric Company. Heat resistant resin compositions, articles and method. 5,464,949, Cl. 174-120.000.

Marlen Research Corporation: *See*—
Powers, Richard G., 5,464,338, Cl. 425-145.000.

Maro, Nicholas, to Viking Metal Cabinet Co., Inc. Quick attach door system for a doorless storing structure. 5,464,281, Cl. 312-257.100.

Marotta, Christopher J.: *See*—
Gezari, Walter A.; and Marotta, Christopher J., 5,463,972, Cl. 114-363.000.

Marotta Scientific Controls, Inc.: *See*—
Reinicke, Robert H., 5,464,041, Cl. 137-595.000.

Mars, Incorporated: *See*—
Bounds, David J.; Weston, John A.; Johnson, Anthony D.; and Campbell, Bernard J., 5,464,087, Cl. 194-200.000.

Marshall, Brian P.: *See*—
Swenson, Eric T.; Thomas, Riley A., III; Blanchard, Ronald L.; and Marshall, Brian P., 5,463,992, Cl. 123-198.00R.

Marten, Walter: *See*—
Schoch, Reinhard; and Marten, Walter, 5,464,148, Cl. 229-109.000.

Martin, Kevin P.: *See*—
Drabik, Timothy J.; Martin, Kevin P.; and Callahan, John, 5,465,009, Cl. 257-723.000.

Martin Marietta Energy Systems, Inc.: *See*—
Sisson, Warren G.; Basaran, Osman A.; and Harris, Michael T., 5,464,195, Cl. 266-170.000.

Martin, Roy K.: *See*—
Fuehrer, Reece R.; and Martin, Roy K., 5,463,915, Cl. 74-665.00H.

Maruei Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Isao, 5,463,891, Cl. 72-340.000.

Marusii, Tatyana Y.: *See*—
Kang, Dae S.; Park, Woo S.; Shin, Hyun H.; Kwon, Soon B.; Marusii, Tatyana Y.; Reznikov, Yuriy A.; Khizhnyak, Anatoliy I.; and Yaroshchuk, Oleg V., 5,464,669, Cl. 428-1.000.

Maruyama, Seiichi, to Mitsumi Electric Co., Ltd. Tablet unit comprising a reduced number of circuit elements. 5,464,951, Cl. 178-18.000.

Masaki, Tateo: *See*—
Ono, Akira; Masaki, Tateo; and Warabi, Hironori, 5,465,402, Cl. 455-161.200.

Masayuki, Nakamura, to Senju Pharmaceutical Co., Ltd. Production of crystals of diester phosphate monopotassium salt. 5,463,976, Cl. 117-66.000.

Maschmann, Martin; Schardein, Werner; and Hosticka, Bedrich, to Fraunhofer-Gesellschaft zur Foerderung der angewandten Forschung e.v.; and Siemens Aktiengesellschaft. Amplifier output stage. 5,465,074, Cl. 330-263.000.

Masco Corporation of Indiana: *See*—
Niemann, James E.; and Spangler, Anthony G., 5,464,045, Cl. 137-801.000.

Mason, Gary E.: *See*—
Tong, Robert R.; Poplett, James M.; McEwen, Alan B.; Mason, Gary E.; Goodwin, Mark L.; Tsai, K. C.; Anderson, Ronald L.; and Nelson, James P., 5,464,453, Cl. 29-25.030.

Mason, J. Russell: *See*—
Nolte, Dale L.; Mason, J. Russell; and Clark, Larry, 5,464,625, Cl. 424-405.000.

Massachusetts Institute of Technology: *See*—
Micak, Richard; and Tuller, Harry L., 5,464,509, Cl. 204-129.300.
Swanson, Eric A., 5,465,147, Cl. 356-345.000.

Massey, R. Nathan: *See*—
Johnson, Eric; Lloyd, Gail A.; and Massey, R. Nathan, 5,463,855, Cl. 56-17.200.

Massie, James: *See*—
Prater, Craig B.; Massie, James; Grigg, David A.; Elings, Virgil B.; Hansma, Paul K.; and Drake, Barney, 5,463,897, Cl. 73-105.000.

Massieu, Jean-Louis; and Thuries, Serge, to Reflexion Plus. Omnidirectional bar code label scanner. 5,464,972, Cl. 235-462.000.

Masuda, Katsuhiko: *See*—
Aoki, Jun; Masuda, Katsuhiko; and Hashizume, Isamu, 5,464,084, Cl. 192-35.000.

Masudaya Corporation: *See*—
Horiuchi, Shigeyuki, 5,463,826, Cl. 40-426.000.

Masumura, Tadahiro: *See*—
Horikawa, Hiroshi; Honzawa, Eiji; Masumura, Tadahiro; and Fukazawa, Akira, 5,464,637, Cl. 426-2.000.

Masuya, Takashi: *See*—
Kimura, Haruo; Sekino, Yoshio; Masuya, Takashi; and Fukui, Takao, 5,464,954, Cl. 200-61.620.

Mathews, Eric D.: *See*—
Abela, George S.; Friedl, Stephan E.; and Mathews, Eric D., 5,464,404, Cl. 606-15.000.

Mathis, Raymond: *See*—
Becker, Wolfgang; Mathis, Raymond; Stapper-Druyen, Sylvia; Robrahn, Karin; Hoffmann, Rainer; and Kiray, Yasar C., 5,464,660, Cl. 427-389.000.
Bialas, Norbert; Mathis, Raymond; Crews, Richard P.; Mudge, Elbert H.; and Tuller, F. Norman, 5,464,546, Cl. 252-8.600.

Matoba, Hiroshi; Ohmori, Shinji; Koyama, Hiroyoshi; and Kashihara, Toshio, to Takeda Chemical Industries, Ltd. Solid preparation comprising ion exchanger and active agent. 5,464,612, Cl. 424-78.100.

Matson, Jack V.: *See*—
Hight, Terry V. T.; Matson, Jack V.; Rakestraw, Lawrence F.; Zhang, Zhihe; and Kuechler, Thomas C., 5,464,636, Cl. 424-661.000.

Matsuba, Hiroyuki: *See*—
Terashima, Yugi; Horinouchi, Shogo; and Matsuba, Hiroyuki, 5,465,242, Cl. 369-44.190.

Matsuda, Akira: *See*—
Ogiwara, Yoshiaki; Yasuhara, Masaki; and Matsuda, Akira, 5,464,524, Cl. 205-170.000.

Matsuda, Hidemi: *See*—
Ito, Takeo; Matsuda, Hidemi; and Sakai, Kazuo, 5,464,566, Cl. 252-582.000.

Matsui, Yoshimitsu: *See*—
Nagamine, Masashi; Yamamoto, Kenji; Matsui, Yoshimitsu; Horiuchi, Kenji; and Yoshida, Masanori, 5,464,863, Cl. 514-443.000.

Matsumoto, Akiko: *See*—
Nakatsuka, Takuo; Toyota, Tsuyoshi; Tanimoto, Mie; and Matsumoto, Akiko, 5,464,910, Cl. 525-486.000.

Matsumoto, Hideo: *See*—
Ikeda, Yasukazu; Matsumoto, Hideo; and Sakamoto, Susumu, 5,465,007, Cl. 257-584.000.

Matsumoto, Hiroshi; Takaragi, Kazuo; Susaki, Seiichi; Maezawa, Hiroyuki; and Koizumi, Shinobu, to Hitachi, Ltd.; and Hitachi Chubu Software, Ltd. Electronic document processing system and method of forming digital signature. 5,465,299, Cl. 380-23.000.

Matsumoto, Keizo: *See*—
Iguchi, Masaru; Shigeta, Hiromasa; and Matsumoto, Keizo, 5,464,493, Cl. 156-290.000.

Matsumoto, Kiyoshi: *See*—
Makino, Ichiro; Mitsui, Akira; Takehara, Mikio; Ando, Eiichi; Ebisawa, Junichi; Suzuki, Koichi; Matsumoto, Kiyoshi; Ikeda, Toru; and Suzuki, Susumu, 5,464,674, Cl. 428-694.00T.

Matsumoto, Takahiro; Nose, Noriyuki; Saito, Kenji; and Sentoku, Koichi, to Canon Kabushiki Kaisha. Apparatus and method for detecting the relative positional deviation between two diffraction gratings. 5,465,148, Cl. 356-349.000.

Matsumoto, Yoshimitsu; and Kansaku, Toshiaki. Analog multiplying-averaging circuit and wattmeter circuit using the circuit. 5,465,044, Cl. 324-142.000.

Matsumura, Hiroshi; Shimada, Takaaki; Hisanaka, Takayuki; Ochi, Yoshiki; Kuwaki, Tetsuo; and Muta, Yoshinobu, to Uni-Charm Corporation; and Tokuyama Corporation. Resin composition, porous film produced therefrom and process for producing same. 5,464,689, Cl. 428-317.900.

Matsuo, Hirofumi: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Matsuo, Hirofumi, 5,465,131, Cl. 354-202.000.

Matsuo, Takayuki: *See*—
Ono, Michio; Kume, Masaharu; and Matsuo, Takayuki, 5,464,693, Cl. 428-344.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hirai, Koutarou; and Yamaguchi, Seiji, 5,465,344, Cl. 395-458.000.
Kusumoto, Keiichi; and Matsuzawa, Akira, 5,465,093, Cl. 341-122.000.
Manabe, Yoshio; Tanahashi, Ichiro; and Mitsuyu, Tsuneo, 5,464,991, Cl. 257-53.000.
Morioka, Yoshihiro; Kobayashi, Masaaki; Okayama, Mutsuyuki; Nakatsu, Etsuto; and Suzuki, Kohei, 5,465,158, Cl. 358-310.000.
Terashima, Yugi; Horinouchi, Shogo; and Matsuba, Hiroyuki, 5,465,242, Cl. 369-44.190.
Yamashita, Fumitoshi; and Wada, Masami, 5,464,576, Cl. 264-428.000.

Matsushita Electric Works, Ltd.: *See*—
Otsuka, Kiyotaka; and Iwasaki, Jyuzaemon, 5,463,813, Cl. 30-43.900.

Matsushita Electrical Industrial Co., Ltd.: *See*—
Nishino, Atsushi; Yoshida, Akihiko; Namba, Teruo; Aoki, Masaaki; and Naito, Atsushi, 5,465,091, Cl. 341-33.000.

Matsuura, Shojiro: *See*—
Muromura, Tadasumi; Takano, Hideki; Akie, Hiroshi; and Matsuura, Shojiro, 5,464,571, Cl. 252-638.000.

Matsuura, Takashi; and Itozaki, Hideo, to Sumitomo Electric Industries, Ltd. Integrated type planar magnetic sensor having SQUID and flux transformer formed of oxide superconductor. 5,465,049, Cl. 324-248.000.

Matsuzawa, Akira: *See*—
Kusumoto, Keiichi; and Matsuzawa, Akira, 5,465,093, Cl. 341-122.000.

Matthews, Robert R., to Legacy Systems, Inc. Process and apparatus for the treatment of semiconductor wafers in a fluid. 5,464,480, Cl. 134-1.300.

Matthews, Robert T.: *See*—
Moslehi, Mehrdad M.; Davis, Cecil J.; Jones, John; and Matthews, Robert T., 5,464,499, Cl. 216-71.000.

Matthews, Thomas J.: *See*—
Bolognesi, Dani P.; Matthews, Thomas J.; and Wild, Carl T., 5,464,933, Cl. 530-324.000.

Matthies, Klaus-D.: *See*—
Kersten, Peter; and Matthies, Klaus-D., 5,465,310, Cl. 385-22.000.

Matus, Lawrence G.: *See*—
Larkin, David J.; Neudeck, Philip G.; Powell, J. Anthony; and Matus, Lawrence G., 5,463,978, Cl. 117-89.000.

Maughan, James R., to General Electric Company. Atmospheric gas burner having diffusion pilot for improved dynamic stability. 5,464,004, Cl. 126-39.00E.

Maus, Wolfgang; Swars, Helmut; Brück, Rolf; and Humpolik, Bohumil, to Emitec Gesellschaft fuer Emissionstechnologie mbH. Metal honeycomb body of intertwined sheet-metal layers, and method for its production. 5,464,679, Cl. 428-116.000.

Maxwell, Graeme D.; and Ainslie, Benjamin J., to British Telecommunications, plc. Integrated optical fibre and substrate supported optical waveguide having directly connected optical cores. 5,465,312, Cl. 385-49.000.

May & Baker Limited: *See*—
Edwards, David B.; McCarthy, William J.; Aldred, Alan J.; and Jackman, Anthony D., 5,464,097, Cl. 206-524.700.

Mayer, Dieter: *See*—
Krüger, Manfred; Mayer, Dieter; Behrens, Friedrich-Otto; and Krohn, Manfred, 5,463,946, Cl. 100-93.0RP.

Mayes, Michael K.; and Chin, Sing W., to National Semiconductor Corporation. Pipelined analog-to-digital converter with curvefit digital correction. 5,465,092, Cl. 341-118.000.

Mayo, Randall D.; and Spitz, Donald N., to Lexmark International, Inc. Printhead drive system for serial printer. 5,465,107, Cl. 346-139.00R.

Maytag Corporation: *See*—
Michael, Daryl A.; and Welch, Rodney M., 5,464,482, Cl. 134-25.200.

Mazooji, Mohammad: *See*—
Baseghi, Behshad; Mazooji, Mohammad; and Holtz, Brian E., 5,465,405, Cl. 455-226.400.

Mazur, Walt: *See*—
Ito, Takafumi; Suzuki, Kenji; Ikeda, Takayuki; Oyama, Fumio; and Mazur, Walt, 5,465,370, Cl. 395-200.040.

McAllister, George P., Jr.: *See*—
Harris, Donnie L.; and McAllister, George P., Jr., 5,463,780, Cl. 4-604.000.

McArthur, Jim. Mobile storage rack for containers. 5,464,104, Cl. 211-133.000.

McBrady Engineering, Inc.: *See*—
Avelis, Julian P.; McBrady, Garrett W.; and McBrady, William J., 5,464,483, Cl. 134-25.400.

McBrady, Garrett W.: *See*—
Avelis, Julian P.; McBrady, Garrett W.; and McBrady, William J., 5,464,483, Cl. 134-25.400.

McBrady, William J.: *See*—
Avelis, Julian P.; McBrady, Garrett W.; and McBrady, William J., 5,464,483, Cl. 134-25.400.

McCarthy, William J.: *See*—
Edwards, David B.; McCarthy, William J.; Aldred, Alan J.; and Jackman, Anthony D., 5,464,097, Cl. 206-524.700.

McCleary, Sherri F.; Nitowski, Gary A.; Marinelli, James M.; and Siemon, John T., to Aluminum Company of America. Coating aluminum alloy sheet to promote adhesive bonding for vehicle assemblies. 5,463,804, Cl. 29-469.500.

McCollum, Gregory J.: *See*—
Scott, Matthew S.; McCollum, Gregory J.; Szymanski, Chester J.; and Wilson, Craig A., 5,464,887, Cl. 523-501.000.

McComas, Charles: *See*—
Kenton, Donald J.; Laughlin, Frank; and McComas, Charles, 5,464,479, Cl. 134-1.000.

McConaghy, John S., Jr., to Monsanto Company. Process for the preparation of oxidation inhibited fluid compositions. 5,464,569, Cl. 252-308.000.

McConnell, Oliver J.; Saucy, Gabriel; Jacobs, Robert; and Gunasekera, Sarath P., to Harbor Branch Oceanographic Institution, Inc.; and University of California. Use for bis-heterocyclic compounds and pharmaceutical compositions containing same. 5,464,835, Cl. 514-254.000.

McConnell, Thomas E.; and Arnold, Peter C., to Prince Lionhears, Inc. Stroller accessory bar and drink holder. 5,464,183, Cl. 248-311.200.

McCormick, Keith M.: *See*—
McCormick, Lee A.; and McCormick, Keith M., 5,465,421, Cl. 455-344.000.

McCormick, Lee A.; and McCormick, Keith M. Protective sports helmet with speakers, helmet retrofit kit and method. 5,465,421, Cl. 455-344.000.

McCoy, James N.; Podio, Augusto L.; and Jennings, James W., to McCoy, James N. Method of using a polished rod transducer. 5,464,058, Cl. 166-250.010.

McCray, Scott B.: *See*—
Friesen, Dwayne T.; Newbold, David D.; McCray, Scott B.; and Ray, Roderick J., 5,464,540, Cl. 210-640.000.

McCrea, Jack L.: *See*—
Upton, William K., III; Schneider, William E.; Brown, Stuart H.; Stetz, Steven A.; Gotich, Emily J.; and McCrea, Jack L., 5,464,161, Cl. 241-21.000.

McDaniel, John M.: *See*—
Ritter, Merrill A.; McDaniel, John M.; and Brown, David R., 5,464,406, Cl. 606-86.000.

McDermott International, Inc.: *See*—
Wilkins, Jesse R., 5,464,307, Cl. 405-166.000.

McDonald, Dale R.; Laugel, Joe B., Jr.; and Solomon, William E. Method of processing vegetative crop product. 5,464,160, Cl. 241-17.000.

McEver, Rodger P.: *See*—
Cummings, Richard D.; Moore, Kevin L.; and McEver, Rodger P., 5,464,778, Cl. 436-503.000.

McEwan, Thomas E., to University of California, The Regents of the. Two terminal micropower radar sensor. 5,465,094, Cl. 342-28.000.

McEwen, Alan B.: *See*—
Tong, Robert R.; Poplett, James M.; McEwen, Alan B.; Mason, Gary E.; Goodwin, Mark L.; Tsai, K. C.; Anderson, Ronald L.; and Nelson, James P., 5,464,453, Cl. 29-25.030.

McFarland, Ryan J. Bicycle seatpost with pivotal suspension. 5,464,271, Cl. 297-209.000.

McGrath, James P.: *See*—
Henson, James A.; McGrath, James P.; Peterson, Bruce R.; Glassburn, Tim R.; Raab, Michael L.; and Do, James H., 5,465,343, Cl. 395-497.000.

McGrath, Philip E., to Branson Ultrasonics Corporation. Flexural spring support for vibratory apparatus. 5,464,498, Cl. 156-580.200.

McGregor, John A.; and Parris, Robert P., to Honeywell Inc. Apparatus for controlling temperature of an element having a temperature variable resistance. 5,464,965, Cl. 219-497.000.

McGuinness, Gordon B.; and Saunders, Richard D., to Wiggins Teape Group Limited, The. Pressure-sensitive record material. 5,464,803, Cl. 503-213.000.

McGuire, David A. Flexible surgical screwdriver and methods of arthroscopic ligament reconstruction. 5,464,407, Cl. 606-86.000.

McIntyre, Jonathan F.; Mahboubian-Jones, Malcolm G. B.; and Turnbull, Ian, to Bonas Machine Company Limited. Electrically controlled jacquard selection apparatus. 5,464,046, Cl. 139-455.000.

McIver, Simon P.: *See*—
Cook, Graeme A. C.; Vranas, Goulielmos; and McIver, Simon P., 5,464,334, Cl. 417-494.000.

McKeel, William H. Combination airflow infant pad and toddler pillow. 5,463,785, Cl. 5-655.000.

McKinney, William: *See*—
Unger, William J.; and McKinney, William, 5,464,358, Cl. 441-68.000.

McLaughlin, William F.: *See*—
Fischel, Halbert, 5,464,534, Cl. 210-321.680.

McMinn, Rita S.: *See*—

Chapman, George R., Jr.; Crenshaw, Lewis E.; McMinn, Rita S.; Morgan, Richard A.; Priester, Donnan E.; Stewart, Charles W.; and Tarney, Robert E., 5,464,904, Cl. 525-200.000.

McMonagle, John J., Jr.; and Vesely, Kevin T. Remotely programmable, vandal-resistant voice communications unit. 5,465,296, Cl. 379-355.000.

McNulty, Kenneth J.: *See*—
VanBuskirk, Gregory K.; Hsieh, Chang-Li; McNulty, Kenneth J.; and Hansen, Ole V., 5,464,459, Cl. 55-257.200.

McQueen, James T.: *See*—
Nemphos, Speros P.; and McQueen, James T., 5,464,878, Cl. 521-50.000.

McWilliams, Joseph A.: *See*—
Paybarah, Ali; and McWilliams, Joseph A., 5,463,919, Cl. 82-92.000.

Mead, Ian D.: *See*—
Strickland, S. Scott; Krietemeyer, James R.; Liao, Jing; Mead, Ian D.; and Puckett, Robert L., 5,465,215, Cl. 364-474.220.

Medical College of Wisconsin Research Foundation, Inc., The: *See*—
Griffith, Owen W.; and Narayanan, Krishnaswamy, 5,464,858, Cl. 514-399.000.

Medtronic, Inc.: *See*—
Berg, Eric P.; Tuch, Ronald J.; Dror, Michael; and Wolff, Rodney G., 5,464,650, Cl. 427-2.300.
Dreessen, Chrit; Gubbels, Paul A.; and Adams, Paul, 5,464,446, Cl. 607-116.000.
Neumann, Robert A., 5,464,435, Cl. 607-9.000.
Rossing, Martin A., 5,464,430, Cl. 607-4.000.

Mee, John D.: *See*—
Helber, Margaret J.; Dobles, Thomas R.; Diehl, Donald R.; Dankosh, Heidi E.; and Mee, John D., 5,464,736, Cl. 430-581.000.

Meertens, Marc: *See*—
Baptist, Robert; Kleijne, Theodoor A.; Monteban, Leo; and Meertens, Marc, 5,465,392, Cl. 455-38.300.

Mehlhorn, Heinz; Schmahl, Günter; Lindner, Werner; and Haberkorn, Axel, to Bayer Aktiengesellschaft. Method for controlling fish parasites using triazine dione derivatives. 5,464,837, Cl. 514-242.000.

Mehta, Rai J.: *See*—
Osei-Gyimah, Peter; Sherba, Samuel E.; Lange, Barry C.; Mehta, Rai J.; and Joseph, Rhoda W., 5,464,832, Cl. 514-238.500.

Mehta, Raj J.; Lange, Barry C.; and Sherba, Samuel E., to Rohm and Haas Company. Antimicrobial compositions comprising iodopropargyl butylcarbamate and 2-mercaptopyridine n-oxide and method of controlling microbes. 5,464,622, Cl. 424-405.000.

Meier, Heinz: *See*—
Gall, Arthur; Meier, Heinz; Kuphal, Wilko; and Vogel, Georg, 5,465,285, Cl. 378-173.000.

Meier-Westhues, Hans-Ulrich: *See*—
Laas, Hans-Josef; Halpaap, Reinhard; Wamprecht, Christian; Meier-Westhues, Hans-Ulrich; Schultz, Wolfgang; and Kahl, Lothar, 5,464,921, Cl. 528-67.000.

Meijer, John: *See*—
Jelenic, Jernej; Meijer, John; and Hope, Peter, 5,464,907, Cl. 525-303.000.

Meiji Seika Kaisha Ltd.: *See*—
Tsushima, Masaki; Kano, Yuko; Iwamatsu, Katsuyoshi; Tamura, Atsushi; and Shibahara, Seiji, 5,464,829, Cl. 514-206.000.

Meinass, Helmut J.: *See*—
Schultz, Reinhard W.; Wicks, William J.; Meinass, Helmut J.; and Nethery, Winston J., 5,464,411, Cl. 606-130.000.

Meincke, Drew F.: *See*—
Burns, Rickey D.; Meincke, Drew F.; and Heitz, Bernhard H., 5,463,910, Cl. 73-864.870.

Meister, Alton: *See*—
Anderson, Mary; Meister, Alton; and Levy, Ellen J., 5,464,825, Cl. 514-18.000.

Mejia, Santiago. Armoring material mounting assembly. 5,463,929, Cl. 89-36.020.

Mekhed, Igor A.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

Melancon, Kurt C.; and Driscoll, William A., to Minnesota Mining and Manufacturing Company. Silicone/acrylate vibration dampers. 5,464,659, Cl. 427-387.000.

Melendez, Luis A.; Rosenbaum, Robert E.; Vera-Garcia, Marcela A.; Olive, D. Michael; and Swenson, John E., to Amoco Corporation. Cell disrupting apparatus, 5,464,773, Cl. 435-306.100.

Meltzer, Aaron D.: *See*—
Archey, Rick L.; Lundy, Charles E.; Meltzer, Aaron D.; Pielartzik, Harald; Fennhoff, Gerhard; Hufen, Ralf; Kircher, Klaus; Schubert, Rudiger; and Weider, Richard, 5,464,893, Cl. 524-366.000.

Memula, Sadanand G.: *See*—
Chan, Jimmy H.; Satre, Rodrick L.; Trusler, James H.; and Memula, Sadanand G., 5,464,623, Cl. 424-405.000.

Menaker, Gerald J. Gold coating means for limiting thromboses in implantable grafts. 5,464,438, Cl. 623-1.000.

Menchetti, Robert J., to National Gypsum Company. Extendible interconnected C-studs. 5,464,302, Cl. 403-335.000.

Mendeleyev, Jerome: *See*—
Kun, Ernest; Mendeleyev, Jerome; and Kirsten, Eva, 5,464,871, Cl. 514-617.000.

Mennen, Godefridus J.: *See*—
Deen, Pieter B. J.; Linssen, Nicolaas G. H.; and Mennen, Godefridus J., 5,464,201, Cl. 270-53.000.

Merat, Francis L.; Roumina, Kavous; Ruegsegger, Steven M.; and Delvalle, Robert B., to United States of America, Air Force. Automated process planning for quality control inspection. 5,465,221, Cl. 364-552.000.

Mercedes-Benz AG: *See*—
Guertler, Dieter, 5,464,266, Cl. 296-189.000.

Merck & Co., Inc.: *See*—
Bock, Mark G.; Evans, Ben E.; Culberson, J. Christopher; Gilbert, Kevin F.; Rittle, Kenneth E.; and Williams, Peter D., 5,464,788, Cl. 514-252.000.
Chartrain, Michel M.; Reddy, Jayanthi; and Tschaen, David M., 5,464,762, Cl. 435-156.000.
Lifshey, Arthur L., 5,464,122, Cl. 222-83.000.

Merckel, Gérard: *See*—
Skotnicki, Tomasz; and Merckel, Gérard, 5,465,001, Cl. 257-370.000.

Meritt, Allan S.: *See*—
Cook, Thomas E.; Fantacone, Mark J.; Galbraith, Robert E.; Glassen, Steven G.; Meritt, Allan S.; Oakes, Kenneth J.; and Yudenfriend, Harry M., 5,465,355, Cl. 395-200.150.

Meraden Manufacturing Co.: *See*—
Derr, William S.; and Longacre, Mark D., 5,464,346, Cl. 431-328.000.

Merte, Kenneth E.; and O'Neill, William G., to Minnesota Mining and Manufacturing Company. Cardioplegia administration system and method. 5,464,388, Cl. 604-153.000.

Mervic, Miljenko: *See*—
Heavner, George A.; Riexinger, Douglas; and Mervic, Miljenko, 5,464,935, Cl. 530-329.000.

Messick, Donald L., to Kraft Foods, Inc. Quick cooking barley and process for preparation. 5,464,647, Cl. 426-618.000.

Metals Recycling Technologies Corp.: *See*—
Myerson, Allan S., 5,464,596, Cl. 423-101.000.

Methode Electronics, Inc.: *See*—
Samela, Francis M.; and Llorens, Joseph R., 5,465,042, Cl. 324-71.100.

Metricom, Inc.: *See*—
Flammer, George H., 5,465,398, Cl. 455-69.000.

Metro Fire & Rescue, Inc.: *See*—
Berger, Paul H., 5,464,544, Cl. 252-2.000.

Metton America, Inc.: *See*—
Fitzgibbon, Denise R., 5,464,585, Cl. 264-108.000.

Metz, Hans J.: *See*—
Vicari, Richard; Kvakovszky, George; Fruchey, Olas S.; and Metz, Hans J., 5,464,941, Cl. 534-741.000.

Metzger, Karl-Georg: *See*—
Petersen, Uwe; Krebs, Andreas; Schenke, Thomas; Kanisch, Franz; Philipps, Thomas; Grohe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, 5,464,796, Cl. 514-312.000.

Meunier, Philippe; and Pavlin, Antoine, to SGS-Thomson Microelectronics S.A. Circuit and method for protecting power components against forward overvoltages. 5,465,190, Cl. 361-91.000.

Meyer, Reiner, to Boehringer Ingelheim International GmbH. Stabiliaed superoxide dismutase (SOD) composition. 5,464,614, Cl. 424-94.300.

Meyer, Richard A.: *See*—
Shrive, Nigel G.; Damson, Erich; Meyer, Richard A.; and Iverslie, Scott P., 5,463,902, Cl. 73-781.000.

Miba Sintermetall Aktiengesellschaft: *See*—
Roitner, Franz, 5,464,364, Cl. 451-194.000.

Micael, Axel T.: *See*—
Karlsson, Hans B.; Fellinger, Lennart E.; and Micael, Axel T., 5,463,931, Cl. 91-428.000.

Micetich, Ronald G.: *See*—
Noguchi, Kazuharu; Micetich, Ronald G.; and Daneshtalab, Mohsen, 5,464,616, Cl. 424-114.000.

Michael, Daryl A.; and Welch, Rodney M., to Maytag Corporation. Washarm assembly for dishwasher. 5,464,482, Cl. 134-25.200.

Michels, Erhard: *See*—
Weber, Hans G.; Haas, Peter; Michels, Erhard; Weber, Christian; and Brecht, Klaus, 5,464,880, Cl. 521-51.000.

Michelsen, Jeffery M.: *See*—
Garinger, Ned; Thomsen, Joseph A.; and Michelsen, Jeffery M., 5,465,339, Cl. 395-433.000.

Michigan Biotechnology Institute: *See*—
Turk, Richard; and Nowaczyk, Paul, 5,464,651, Cl. 427-64.000.

Michioka, Hirohumi: *See*—
Miura, Hirohisa; Imahashi, Kunihiko; Michioka, Hirohumi; Yamada, Yasuhiro; Kusui, Jun; and Tanaka, Akiei, 5,464,463, Cl. 75-244.000.

Micron Semiconductor, Inc.: *See*—
Buley, Todd W.; and Sandhu, Gurtej S., 5,464,031, Cl. 134-1.000.
Ong, Adrian E.; and Zagar, Paul S., 5,465,232, Cl. 365-189.050.

Micron Technology, Inc.: *See*—
Figura, Thomas A.; and Schuele, Paul J., 5,464,786, Cl. 437-52.000.

Microondes Energie Systemes: *See*—
Germain, Alain; Berteaud, Andre-Jean; and Galtier, Francois, 5,464,968, Cl. 219-710.000.

Microplas, Inc.: *See*—
Callahan, Steven E.; and Petit, Robert G., 5,464,091, Cl. 206-45.150.

Middleton, John W.: *See*—

Isharani, Jayanti V.; Raper, James K.; Allen, A. Donald, Jr.; and Middleton, John W., 5,464,545, Cl. 252-8.600.
Midwest Research Institute: *See*—
Evans, Robert J.; and Chum, Helena L., 5,464,602, Cl. 423-488.000.
Mierendorf, Robert; Garber, Richard; Novy, Robert; and Hammer, Beth, to Novagen, Inc. Protein ligand binding region mapping system. 5,464,745, Cl. 435-6.000.
Mihelich, Michael E.: *See*—
Barnes, Keith W.; Bauman, Donald R.; Brace, Howard N.; Keefer, Philip A.; and Mihelich, Michael E., 5,465,386, Cl. 455-15.000.
Miketic, Linda M.: *See*—
Skeens, Joseph L.; and Miketic, Linda M., 5,464,410, Cl. 606-130.000.
Miki, Miyo: *See*—
Hori, Shinichi; Kawasaki, Atsuko; Nakashita, Takefumi; Inui, Yoshiharu; Sakaki, Toshiaki; and Miki, Miyo, 5,464,420, Cl. 606-202.000.
Miles Inc.: *See*—
Yip, Kin-Fai, 5,464,777, Cl. 436-98.000.
Millan, Mark: *See*—
Peglion, Jean-Louis; Goument, Bertrand; Millan, Mark; and Rivet, Jean-Michel, 5,464,834, Cl. 514-254.000.
Miller, Arnold; and Lucas, Daniel R., to American BioMed, Inc. Multilumen percutaneous angioscopy catheter. 5,464,394, Cl. 604-96.000.
Miller, Dave, to Puma AG. Shoe with a central rotary closure and self-aligning coupling elements. 5,463,822, Cl. 36-50.100.
Miller, David A.; Jansen, Kenneth A.; Culley, Paul R.; Taylor, Mark; and Izquierdo, Javier F., to Compaq Computer Corp. Method and apparatus for independently resetting processors and cache controllers in multiple processor systems. 5,465,360, Cl. 395-700.000.
Miller, Frank D.; and Helfrich, Thomas E., to Square D Company. Uninterruptible power supply with improved output regulation. 5,465,011, Cl. 307-64.000.
Miller, Gerald, to Curwood, Inc. Self-venting microwaveable package and method of manufacture. 5,464,969, Cl. 219-735.000.
Miller, Phillip: *See*—
Boatwright, Darrell L.; Hanson, George E.; Miller, Phillip; Koenck, Steven E.; Walter, Jerry L.; Kubler, Joseph J.; Cargin, Keith K., Jr.; Schultz, Darald R.; Davis, Patrick H.; and Kunert, Steven R., 5,465,207, Cl. 364-424.010.
Miller, Russell C.: *See*—
Wilson, Greg S.; Dinsmoor, John C., III; and Miller, Russell C., 5,464,443, Cl. 623-37.000.
Miller, Steven W.: *See*—
Hasse, Margaret H.; Bridges, Russell P.; and Miller, Steven W., 5,464,401, Cl. 604-385.100.
Miller, Thomas K.: *See*—
Armitage, Bernard J.; Bowen, John G.; Crossley, Malcolm J.; Hanneyball, Ian M.; Leslie, Bruce W.; Miller, Thomas K.; and Spowage, Michael, 5,464,781, Cl. 514-300.000.
Mills, Veronica A.; and Fazio, Bonnie F., to Standard Textile Co., Inc. Reusable surgical drape with fluid-retaining trough. 5,464,024, Cl. 128-849.000.
Minami, Nobuyoshi, to Chiyoda Corporation. Method of connecting cylindrical members to each other using tandem type internal clamp. 5,464,147, Cl. 228-212.000.
Minca, Ion. Network structure for parallel software processing. 5,465,369, Cl. 395-200.030.
Ministero Dell'Universita' E Della Ricerca Scientifica E Tecnologica: *See*—
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Riva, Raul; Garavaglia, Carlo; and Mirenna, Luigi, 5,464,836, Cl. 514-239.200.
Gubitosa, Giuseppe; and Cremona, Alberto, 5,464,802, Cl. 502-331.000.
Ministry of International Trade & Industry: *See*—
Ikeda, Kiichi; Kajita, Shuji; and Iwatsuki, Tetsu, 5,464,380, Cl. 601-29.000.
Minnesota Mining and Manufacturing Company: *See*—
Ayata, James E.; and Colpan, Metin, 5,464,541, Cl. 210-767.000.
Baldwin, Dwight G.; Zhao, Xiaowei; Darland, Mike E.; and Rodriguez, Ernesto M., 5,465,127, Cl. 353-119.000.
Balsimo, William V., 5,464,117, Cl. 221-1.000.
Boetticher, Jeffrey A.; and Harklau, Lanny L., 5,464,986, Cl. 250-459.100.
Byram, David C., 5,464,010, Cl. 128-207.110.
Chou, Hsin-hsin, 5,464,723, Cl. 430-200.000.
Eldridge, Jess S., 5,463,909, Cl. 73-864.520.
Köhler, Günter A.; Kirk, Seth M.; and Follett, Gary J., 5,464,667, Cl. 427-577.000.
Leonard, William K.; Mohn, Stephen W.; Edman, Timothy J.; and Schiller, Philip D., 5,464,577, Cl. 264-40.500.
Lynch, Doreen C.; Simpson, Sharon M.; and Skoug, Paul G., 5,464,738, Cl. 430-619.000.
Melancon, Kurt C.; and Driscoll, William A., 5,464,659, Cl. 427-187.000.
Merte, Kenneth E.; and O'Neill, William G., 5,464,388, Cl. 604-153.000.
Owen, Ian R., 5,464,888, Cl. 524-104.000.
Sakizadeh, Kumars; Blair, John T.; and Ask, David T., 5,464,737, Cl. 430-619.000.
Stofko, John J., Jr.; and Chang, Jeffery C., 5,464,900, Cl. 524-838.000.
Young, Chung L; and Lu, Ying-Yuh, 5,464,916, Cl. 526-264.000.
Minolta Camera Kabushiki Kaisha: *See*—
Fukushima, Shigenobu; Nakatani, Munehiro; Muramatsu, Hideo; Tsuboi, Toshio; Hamano, Hiroaki; and Hamano, Kanako, 5,465,172, Cl. 358-498.000.
Minolta Co., Ltd.: *See*—
Suzuki, Katsunori, 5,464,204, Cl. 271-110.000.
Mirenna, Luigi: *See*—
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Riva, Raul; Garavaglia, Carlo; and Mirenna, Luigi, 5,464,836, Cl. 514-239.200.
Missout, Bernard, to Cables Pirelli S.A. Process and apparatus for simultaneously laying long product and protective tube in the ground. 5,464,308, Cl. 405-183.000.
Mita Industrial Co., Ltd.: *See*—
Fukuda, Hideo, 5,465,126, Cl. 353-101.000.
Mita, Yoshinobu: *See*—
Sugiura, Susumu; and Mita, Yoshinobu, 5,465,164, Cl. 358-448.000.
Mitchell, Joseph; and Prassanito, John R., to Scott Paper Company. Toilet tissue roll adaptor. 5,464,170, Cl. 242-598.000.
Mitchell, Paul R.: *See*—
Stevens, Albert F.; DeWitt, Robert R.; Lile, William R.; Mitchell, Paul R.; and Tentarelli, Stephen, 5,464,099, Cl. 209-3.100.
Mitchell, Robert W.: *See*—
Claude, Jean-Pierre; Khan, Shuaib A.; and Mitchell, Robert W., 5,464,807, Cl. 504-206.000.
Mitchinson, Anthony K.: *See*—
Griek, Cornelis J.; and Mitchinson, Anthony K., 5,464,070, Cl. 182-45.000.
Mito, Toshitsugu: *See*—
Narita, Izuru; Suzuki, Keiji; Mito, Toshitsugu; and Tsurukawa, Noboru, 5,465,039, Cl. 320-32.000.
Mitschker, Alfred: *See*—
Klipper, Reinhold; Antons, Stefan; Steffan, Guido; Mitschker, Alfred; Strüver, Werner; and Lütjens, Holger, 5,464,875, Cl. 521-32.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Fukuda, Tatsuya; Mori, Shigeru; Hayashikoshi, Masanori; and Sawada, Seiji, 5,465,063, Cl. 327-512.000.
Hanazaki, Yasumasa; and Ukita, Nobuo, 5,465,029, Cl. 315-308.000.
Ikeda, Yasukazu; Matsumoto, Hideo; and Sakamoto, Susumu, 5,465,007, Cl. 257-584.000.
Komatsu, Takao; and Kanda, Akira, 5,465,330, Cl. 395-824.000.
Mori, Shinichi; Ueda, Osamu; and Yamashita, Masayuki, 5,464,989, Cl. 257-30.000.
Nakashige, Yukiko; and Nishioka, Tadashi, 5,465,145, Cl. 356-237.000.
Taruya, Masaaki; and Koiwa, Mitsuru, 5,463,999, Cl. 123-647.000.
Yoshida, Toyohiko, 5,465,376, Cl. 395-800.000.
Yoshioka, Kazuo, 5,465,103, Cl. 345-104.000.
Yoshioka, Nobuyuki; Hosono, Kunihiro; and Miyazaki, Junji, 5,464,713, Cl. 430-5.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Suehiro, Mitsugi; Seto, Toru; Mitsuoka, Shigeaki; and Inoue, Kenji, 5,464,604, Cl. 423-570.000.
Mitsubishi Kasei Corporation: *See*—
Sato, Shin-ichi; and Kuma, Kiyoji, 5,464,908, Cl. 525-380.000.
Mitsubishi Oil Co., Ltd.: *See*—
Takahashi, Kazuo; Kumata, Fumio; Nozaki, Hitoshi; Inoue, Shinichi; and Makabe, Toshiji, 5,464,593, Cl. 422-224.000.
Mitsui, Akira: *See*—
Makino, Ichiro; Mitsui, Akira; Takehara, Mikio; Ando, Eiichi; Ebisawa, Junichi; Suzuki, Koichi; Matsumoto, Kiyoshi; Ieda, Toru; and Suzuki, Susumu, 5,464,674, Cl. 428-694.00T.
Mitsui, Hidero: *See*—
Ide, Yoshihiro; Kakuno, Imao; Sakurai, Nobumasa; Mitsui, Hidero; and Okayasu, Yoshisada, 5,465,117, Cl. 348-373.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Tsutsui, Toshiyuki; Yoshitsugu, Ken; Takahashi, Mamoru; Todo, Akira; Ohta, Seiji; and Inagaki, Hajime, 5,464,905, Cl. 525-240.000.
Mitsui Pharmaceuticals Inc.: *See*—
Nagai, Yoshitaka; Abe, Hayao; and Arita, Masanobu, 5,464,816, Cl. 514-2.000.
Mitsui, Tsutomu; Akaba, Noriyuki; and Shimokawa, Yukitsugu, to Nippon Information Industry Corporation. Detectable device and movable item detecting system. 5,465,099, Cl. 343-730.000.
Mitsumachi, Masanobu: *See*—
Shimizu, Keishi; Shimizu, Kanzi; Mitsumachi, Masanobu; Nakajima, Masato; Ishigami, Tetsushi; and Kusamichi, Yoshitake, 5,464,370, Cl. 454-345.000.
Mitsumi Electric Co., Ltd.: *See*—
Maruyama, Seiichi, 5,464,951, Cl. 178-18.000.
Mitsuoka, Shigeaki: *See*—
Suehiro, Mitsugi; Seto, Toru; Mitsuoka, Shigeaki; and Inoue, Kenji, 5,464,604, Cl. 423-570.000.
Mitsuyu, Tsuneo: *See*—
Manabe, Yoshio; Tanahashi, Ichiro; and Mitsuyu, Tsuneo, 5,464,991, Cl. 257-53.000.
Miura Co., Ltd.: *See*—
Senoo, Yasutoshi; Yanagihara, Nobuaki; and Yasu, Norio, 5,464,329, Cl. 417.68.000.
Miura, Hirohisa; Imahashi, Kunihiko; Michioka, Hirohumi; Yamada, Yasuhiro; Kusui, Jun; and Tanaka, Akiei, to Toyota Jidosha Kabushiki Kaisha; and Toyo Aluminum Kabushiki Kaisha. Heat resistant aluminum alloy powder heat resistant aluminum alloy and heat and wear resistant aluminum alloy-based composite material. 5,464,463, Cl. 75-244.000.

Mix, John D.: *See*—
Parker, Jeffrey L.; Sorrells, David F.; Mix, John D.; and Daber, Richard P., 5,465,144, Cl. 356-139.060.

Miyairi, Kazuki: *See*—
Arakawa, Nobuyuki; Segawa, Takashi; Kaneko, Moriyoshi; Miyairi, Kazuki; and Takayama, Kazutoshi, 5,464,339, Cl. 425-186.000.

Miyake, Takahiro: *See*—
Sakai, Keiji; Yoshida, Yoshio; Yamamoto, Hiroyuki; Kurata, Yukio; Nakata, Yasuo; and Miyake, Takahiro, 5,465,315, Cl. 385-116.000.

Miyamoto, Junichi, to Kabushiki Kaisha Toshiba. Non-volatile memory device with a sense amplifier capable of copying back. 5,465,235, Cl. 365-203.000.

Miyamoto, Shigeyuki, to NEC Corporation. Biological sample observation system using a temperature controlled solid state sensor. 5,465,114, Cl. 348-80.000.

Miyamoto, Yoichi: *See*—
Maeda, Hiroshi; Miyamoto, Yoichi; and Akaike, Takaaki, 5,464,857, Cl. 514-398.000.

Miyao, Masakatsu: *See*—
Sakai, Hisao; Shimada, Hiroo; Sono, Hiroshi; Nagahiro, Kenichi; Sugita, Narutoshi; Maeda, Hirotsugu; Miyao, Masakatsu; Nakamura, Katsunori; Ogita, Yasunori; and Suzuki, Osamu, 5,463,995, Cl. 123-432.000.

Miyazaki, Junji: *See*—
Yoshioka, Nobuyuki; Hosono, Kunihiro; and Miyazaki, Junji, 5,464,713, Cl. 430-5.000.

Mizelle, Ned W. Upholstered furniture and movable headrest. 5,464,269, Cl. 297-61.000.

Mizoguchi, Yoshito: *See*—
Fukushima, Hisashi; Uchikawa, Yoshio; and Mizoguchi, Yoshito, 5,465,111, Cl. 347-115.000.

Mizrahi, Zadok. Stove. 5,464,005, Cl. 126-39.00R.

Mizuno, Takashi, to Furukawa Denchi Kabushiki Kaisha. Hydrogen-occlusion electrode and a method of manufacturing the electrode. 5,464,654, Cl. 427-123.000.

Mlcak, Richard; and Tuller, Harry L., to Massachusetts Institute of Technology. P-N junction etch-stop technique for electrochemical etching of semiconductors. 5,464,509, Cl. 204-129.300.

Mobil Oil Corporation: *See*—
Owen, Hartley; and Schipper, Paul H., 5,464,528, Cl. 208-161.000.

Mobin, Mohammad S.: *See*—
Blaker, David M.; Diamondstein, Marc S.; Ellard, Gregory S.; Mobin, Mohammad S.; Sam, Homayoon; and Thierbach, Mark E., 5,465,275, Cl. 375-341.000.

Mochizuki, Kazuhiko; Inagaki, Hiromi; and Akuzawa, Kenji, to Honda Giken Kogyo Kabushiki Kaisha. Power source output control system of vehicle with travel resistance detector. 5,465,208, Cl. 364-426.010.

Model & Instrument Development Corporation: *See*—
Burt, Edward W.; Bryant, William E.; and Crist, David M., 5,464,442, Cl. 623-27.000.

Modi, Nishit: *See*—
Chamow, Steven; Modi, Nishit; Schwall, Ralph; and Zioncheck, Thomas, 5,464,815, Cl. 514-8.000.

Moehlenbrock, Andrew W.; Owensby, Joseph E.; and Bagwell, Thomas H., to W. R. Grace & Co.-Conn. Machine and method for packaging poultry products. 5,463,844, Cl. 53-436.000.

Moeller, Dennis L.: *See*—
Deloye, Michael J.; Fuoco, Daniel P.; and Moeller, Dennis L., 5,465,332, Cl. 395-842.000.

Mogab, C. Joseph; Daulsher, William J.; and Resnick, Douglas J., to Motorola Inc. Process for fabricating an X-ray absorbing mask. 5,464,711, Cl. 430-5.000.

Mogamiya, Makoto: *See*—
Aoki, Harumi; Morisawa, Tahei; Ogawa, Kimiaki; and Mogamiya, Makoto, 5,465,133, Cl. 354-442.000.

Mohajer, Reza S. Endometrial sampler. 5,464,022, Cl. 128-758.000.

Mohajer, Reza S. Uterine manipulator and protector. 5,464,409, Cl. 606-119.000.

Mohan, Chandrasekaran: *See*—
Dievendorff, Richard; and Mohan, Chandrasekaran, 5,465,328, Cl. 395-182.130.

Mohan, Subramaniam: *See*—
Hutcheson, Timothy L.; Or, Wilson; Narayanan, Venkatesh; Mohan, Subramaniam; Wohlmut, Peter G.; Srinivasan, Ramanujam; Hunt, Bobby R.; and Ryan, Thomas W., 5,465,308, Cl. 382-159.000.

Mohn, Stephen W.: *See*—
Leonard, William K.; Mohn, Stephen W.; Edman, Timothy J.; and Schiller, Philip D., 5,464,577, Cl. 264-40.500.

Mohr, Ian J.: *See*—
Botchan, Michael R.; Clark, Robin; Mohr, Ian J.; and Sun, Shaw, 5,464,936, Cl. 530-350.000.

Mol, Hans C.; and Ramsey, James S., to Pitney Bowes Inc. Web bursting machine. 5,464,142, Cl. 225-100.000.

Molex Incorporated: *See*—
Belenkiy, Yuriy; Grois, Igor; Gumin, Irina L.; Makhlin, Ilya; Margolin, Mark; and Pescetto, Michael J., 5,465,313, Cl. 385-80.000.

Moli Energy (1990) Limited: *See*—
Wainwright, David, 5,464,705, Cl. 429-61.000.

Mollenauer, Kenneth H.: *See*—
Kieturakis, Maciej J.; Mollenauer, Kenneth H.; and Kayan, Helmut L., 5,464,403, Cl. 606-1.000.
Ryan, Timothy J.; Fogarty, Thomas J.; and Mollenauer, Kenneth H., 5,464,449, Cl. 623-1.000.

Molnar, Charles J., to Molnar, Charles J.; and Molnar, Judith R. Specialty sod mats constructed of nonwoven fabric with apertures. 5,464,455, Cl. 47-1.010.

Molnar, Judith R.: *See*—
Molnar, Charles J., 5,464,455, Cl. 47-1.010.

Monahan, Joseph B.: *See*—
Hansen, Donald W., Jr.; Peterson, Karen B.; and Monahan, Joseph B., 5,464,843, Cl. 514-300.000.

Mondek, Martin J.: *See*—
Rush, William B., II; Mondek, Martin J.; Sullivan, Donald K.; Walker, Mark A.; and Zdanowicz, Lawrence E., Sr., 5,463,990, Cl. 123-195.00P.

Mondini, Giovanni, to G. Mondini S.p.A. Volumetric dosage machine particularly for granulates, powders and loose products in general. 5,464,126, Cl. 222-162.000.

Monell Chemical Senses Center: *See*—
Nolte, Dale L.; Mason, J. Russell; and Clark, Larry, 5,464,625, Cl. 424-405.000.

Monsanto Company: *See*—
Claude, Jean-Pierre; Khan, Shuaib A.; and Mitchell, Robert W., 5,464,807, Cl. 504-206.000.
Deetman, Gerbrand, 5,464,551, Cl. 252-78.500.
Griffith, Edward J.; and Ngo, Toan M., 5,464,601, Cl. 423-303.000.
Kassebaum, James W.; Dayawon, Miguel M.; and Sandbrink, Joseph J., 5,464,806, Cl. 504-206.000.
McConaghy, John S., Jr., 5,464,569, Cl. 252-308.000.

Monshipouri, Mariam; and Rudolph, Alan S., to Georgetown University. Method of forming hydrogel particles having a controlled size using liposomes. 5,464,629, Cl. 424-450.000.

Monteban, Leo: *See*—
Baptist, Robert; Kleijne, Theodoor A.; Monteban, Leo; and Meertens, Marc, 5,465,392, Cl. 455-38.300.

Montegari, Frank A., to International Business Machines Corporation. Read/write/restore circuit for memory arrays. 5,465,230, Cl. 365-168.000.

Moon, Seung H.: *See*—
Tsai, Shih-Perng; Moon, Seung H.; and Coleman, Robert, 5,464,760, Cl. 435-139.000.

Mooneyhan, Jerry A.: *See*—
Heath, Derek E.; and Mooneyhan, Jerry A., 5,464,362, Cl. 451-48.000.

Moore Business Forms, Inc.: *See*—
Campbell, Joe E.; and Isaac, Del, 5,464,254, Cl. 283-109.000.

Moore, Kevin L.: *See*—
Cummings, Richard D.; Moore, Kevin L.; and McEver, Rodger P., 5,464,778, Cl. 436-503.000.

Moore Products Co.: *See*—
Close, Steven F.; and Wetterau, Douglas C., 5,464,469, Cl. 96-220.000.

Moore, Richard P. Rapid gravity filter backwash system and filters relative thereto. 5,464,543, Cl. 210-794.000.

Moore, Samuel B.; Leuck, James F.; and Turner, Edwin T., to Burlington Chemical Co., Inc. Bleaching composition. 5,464,563, Cl. 252-186.290.

Morabito, James: *See*—
Foster, Dean H.; Holbrook, Russell W.; Morabito, James; Silverberg, Morton; and Supron, Steven A., 5,464,317, Cl. 414-798.200.

Moreau, Alain: *See*—
Aschenbruck, Emil; Rohrbacher, Reinhold; Moreau, Alain; and Guillaux, Michel, 5,463,812, Cl. 29-889.210.

Moretti, Jean-Marc: *See*—
Jeuniaux, Francois; Malhomme, Marc; Moretti, Jean-Marc; and Haralamb, Gérard, 5,465,214, Cl. 364-472.000.

Morgan, Richard A.: *See*—
Chapman, George R., Jr.; Crenshaw, Lewis E.; McMinn, Rita S.; Morgan, Richard A.; Priester, Donnan E.; Stewart, Charles W.; and Tarney, Robert E., 5,464,904, Cl. 525-200.000.

Mori, Chuzo, to Carl Manufacturing Co., Ltd. Punch for making a multiplicity of holes. 5,463,922, Cl. 83-622.000.

Mori, Hideki: *See*—
Usui, Minoru; Yamagishi, Kouji; Yoshino, Ken; and Mori, Hideki, 5,465,102, Cl. 345-89.000.

Mori, Shigeru: *See*—
Fukuda, Tatsuya; Mori, Shigeru; Hayashikoshi, Masanori; and Sawada, Seiji, 5,465,063, Cl. 327-512.000.

Mori, Shinichi; Ueda, Osamu; and Yamashita, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Mask ROM using tunnel current detection to store data and a method of manufacturing thereof. 5,464,989, Cl. 257-30.000.

Morimoto, Hirofumi: *See*—
Tanaka, Shinpei; and Morimoto, Hirofumi, 5,464,468, Cl. 96-125.000.

Morimoto, Masayoshi: *See*—
Ueno, Yoshiyuki; Morimoto, Masayoshi; Ootsuka, Seiji; Kawai, Tatsushi; and Satou, Susumu, 5,464,539, Cl. 210-603.000.

Morioka, Shigeo: *See*—
Katayama, Masahide; Yamashita, Harushige; Okada, Taizo; and Morioka, Shigeo, 5,464,828, Cl. 514-60.000.

Morioka, Yoshihiro; Kobayashi, Masaaki; Okayama, Mutsuyuki; Nakatsu, Etsuto; and Suzuki, Kohei, to Matsushita Electric Industrial Co., Ltd. Video tape recorder capable of recording and reproducing wide-band chrominance signal. 5,465,158, Cl. 358-310.000.

Morisawa, Tahei: *See*—
Aoki, Harumi; Morisawa, Tahei; Ogawa, Kimiaki; and Mogamiya, Makoto, 5,465,133, Cl. 354-442.000.

Morozov, Valentin: *See*—
Caulfield, H. John; Huang, Qiang; Putilin, Andrei; and Morozov, Valentin, 5,465,311, Cl. 385-27.000.
Morpeth, Fraser F., to Zeneca Limited. Biocide composition and use. 5,464,851, Cl. 514-373.000.
Morse, Edward R.: *See*—
Day, Kennith F., III; Lamear, William D., Jr.; and Morse, Edward R., 5,465,382, Cl. 395-404.000.
Morton International, Inc.: *See*—
Lauritzen, Donald R.; and Ralston, Joseph L., 5,464,249, Cl. 280-741.000.
Moschini, Renzo, to Weber S.r.l. Process for producing rheocast ingots, particularly from which to produce high-mechanical-performance die castings. 5,464,053, Cl. 164-460.000.
Moser, Franz: *See*—
Barta, Helmut; Eder, Helmut; Granser, Manfred; Habison, Georg; Hantak, Edith; Moser, Franz; and Pfaffenbichler, Peter, 5,464,396, Cl. 604-191.000.
Moskaluk, Raymond W.; and Nelson, Nancy W., to Hewlett-Packard Company. Automatic determination of the presence of a microwave signal and whether the signal is CW or pulsed. 5,465,414, Cl. 455-313.000.
Moslehi, Mehrdad M.; Davis, Cecil J.; Jones, John; and Matthews, Robert T., to Texas Instruments Incorporated. Multi-electrode plasma processing apparatus. 5,464,499, Cl. 216-71.000.
Mosley, Bruce A.: *See*—
Sims, John E.; Cosman, David J.; Lupton, Stephen D.; Mosley, Bruce A.; and Dower, Steven K., 5,464,937, Cl. 530-350.000.
Moss, Gerald S.: *See*—
Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,464,814, Cl. 514-6.000.
Moss, Thomas H., III: *See*—
Williams, Michael S.; and Moss, Thomas H., III, 5,464,911, Cl. 525-502.000.
Motoman Inc.: *See*—
Hostler, Jonathan E.; DeCamp, William H.; and Slanker, Daniel W., 5,464,963, Cl. 219-121.820.
Motorola: *See*—
Mueller, Bruce D.; and Baum, Kevin L., 5,465,412, Cl. 455-296.000.
Motorola, Inc.: *See*—
Altschuler, Barry N.; Hardy, Douglas A.; Stephens, James A.; and Kish, Joseph, III, 5,465,300, Cl. 380-30.000.
Borras, Jaime A.; Chambers, Mark J.; Finol, Jesus S. Pena; Gonzalez, Armando J.; Carralero, Cesar W.; Beladi, Sayed H.; and Erbora, Levent Y., 5,465,409, Cl. 455-260.000.
Dougherty, Richard M.; and Fraser, Glenn R., 5,465,420, Cl. 455-333.000.
Gleeson, John K.; and Praklin, David S., 5,465,086, Cl. 340-825.440.
Hiben, Bradley M.; Newberg, Donald G.; and Logalbo, Robert D., 5,465,410, Cl. 455-266.000.
Kane, Robert C., 5,465,024, Cl. 313-309.000.
Mogab, C. Joseph; Dauksher, William J.; and Resnick, Douglas J., 5,464,711, Cl. 430-5.000.
Pickert, William F., 5,465,397, Cl. 455-62.000.
Rahnema, Moe, 5,465,253, Cl. 370-68.100.
Retzer, Michael H.; and Muehlfeld, Alan D., 5,465,404, Cl. 455-220.000.
Schaffner, T. Michael; Bayer, William R.; and Bach, Michael J., 5,465,269, Cl. 375-200.000.
Tracy, James L., 5,465,193, Cl. 362-31.000.
Tseng, Hsing-Huang; and Tobin, Philip J., 5,464,792, Cl. 437-160.000.
Yip, Wai-Yeung; Chandra, Arijit; and Tsai, Chi-Taou, 5,465,217, Cl. 364-489.000.
Mott, Philip J., to Borg-Warner Automotive, Inc. Chain having improved load distribution. 5,464,374, Cl. 474-224.000.
Moulinex S.A.: *See*—
Landais, Joel, 5,463,933, Cl. 99-285.000.
Moulton, Keith R.: *See*—
Hinshaw, Howard G.; Moulton, Keith R.; and Bland, Donald L., 5,464,054, Cl. 165-80.300.
Moulton, Russell D.; and Golovin, Milton N. Electrically-conducting adhesion-promoters. 5,464,707, Cl. 429-212.000.
Mowry, Gregory S.; Gorka, Phillip E.; Strayer, Brian D.; and Kracke, Alan G., to Seagate Technology, Inc. Method of lapping MR. sensors. 5,463,805, Cl. 29-603.000.
Moy, James, to Quamco, Inc. Bearing for hatch covers or the like. 5,464,287, Cl. 384-13.000.
Moyer, Denise J. D.: *See*—
Moyer, Eric S.; and Moyer, Denise J. D., 5,464,925, Cl. 528-170.000.
Moyer, Eric S.; and Moyer, Denise J. D., to Dow Chemical Company, The. Benzocyclobutene-terminated polymides. 5,464,925, Cl. 528-170.000.
MTU Motoren- und Turbinen-Union Friedrichshafen GmbH: *See*—
Ruetz, Georg, 5,463,867, Cl. 60-602.000.
Mudge, Elbert H.; and DeWitt, Charles G., to Henkel Corporation. Fibers containing an antistatic finish and process therefor. 5,464,678, Cl. 428-96.000.
Mudge, Elbert H.: *See*—
Bialas, Norbert; Mathis, Raymond; Crews, Richard P.; Mudge, Elbert H.; and Tuller, F. Norman, 5,464,546, Cl. 252-8.600.
Muehlfeld, Alan D.: *See*—
Retzer, Michael H.; and Muehlfeld, Alan D., 5,465,404, Cl. 455-220.000.
Mueller, Bruce D.; and Baum, Kevin L., to Motorola. Apparatus and method for determining a point in time for detecting a sampled signal in a receiver. 5,465,412, Cl. 455-296.000.
Mueller, James F.: *See*—
Bellio, Stephen L.; Bernardon, Edward; Condon, Mark J.; Flory, Robert S.; Pyler, Donald C.; Hansberry, Mitchell L.; Lee, Tommy W.; and Mueller, James F., 5,463,921, Cl. 83-151.000.
Mueller, Mark A.: *See*—
Peters, Michael W.; Smith, William A.; Mueller, Mark A.; and Culbreth, William K., III, 5,464,505, Cl. 203-64.000.
Muenzing Chemie GmbH: *See*—
Denny, Jacques P.; and Sorolla, Josep R., 5,464,451, Cl. 8-94.210.
Muggli, Darrin S.: *See*—
Tokerud, Pamela J.; and Muggli, Darrin S., 5,464,573, Cl. 261-97.000.
Muguet, Michel: *See*—
Kogan, Jack; and Muguet, Michel, 5,464,501, Cl. 162-6.000.
Mukherjee, Arabinda, to AT&T Corp. Adaptive fraud monitoring and control. 5,465,387, Cl. 455-26.100.
Muller, Bernard; Gautier, Antoine; Dean, Christopher; and Kuhn, Jean-Charles, to Firmenich S.A. Process for the enzymatic preparation of aliphatic alcohols and aldehydes from linoleic acid, linoleic acid, or a natural precursor. 5,464,761, Cl. 435-147.000.
Müller, Horst, to Siemens Aktiengesellschaft. Method for receiving and delivering section overheads of and for STM-1 signals in a section-overhead server of a network node. 5,465,252, Cl. 370-65.500.
Müller, Norbert: *See*—
Albring, Peter; Apley, Rainer; Döge, Klaus; Heinrich, Günter; Lindner, Ernst; Müller, Norbert; Pauer, Reinhard; Pilling, Eberhard; and Rudischer, Rainer, 5,464,325, Cl. 416-185.000.
Müller, Wolfgang, to Inventio AG. Self-propelled elevator system. 5,464,072, Cl. 187-249.000.
Multimedia Systems Corporation: *See*—
Lewis, Scott W., 5,464,946, Cl. 84-609.000.
Mumford, James D., III: *See*—
Ramanarayanan, Trikur A.; Pareek, Vinod K.; Mumford, James D., III; and Witzke, Horst, 5,464,523, Cl. 204-424.000.
Munson, James B., to Digital Equipment Corporation. Color information storage and processing system. 5,465,104, Cl. 345-150.000.
Mura, Albert J.: *See*—
Dunlap, Richard P.; Mura, Albert J.; Hlasta, Dennis J.; Desai, Ranjit C.; and Latimer, Lee H., 5,464,852, Cl. 514-373.000.
Murakami, Koji: *See*—
Kudo, Masato; Sekine, Tetsu; and Murakami, Koji, 5,464,978, Cl. 250-305.000.
Murakami, Seiro: *See*—
Nishi, Kenji; and Murakami, Seiro, 5,464,715, Cl. 430-22.000.
Murakami, Tomoo; and Tsunoda, Takanori, to NEC Corporation. Fabrication method of printed wiring board. 5,464,662, Cl. 427-510.000.
Muramatsu, Hideo: *See*—
Fukushima, Shigenobu; Nakatani, Munehiro; Muramatsu, Hideo; Tsuboi, Toshio; Hamano, Hiroaki; and Hamano, Kanako, 5,465,172, Cl. 358-498.000.
Muramatsu, Motohiko: *See*—
Takeda, Kazuko; Muramatsu, Motohiko; and Koyama, Takashi, 5,464,028, Cl. 131-336.000.
Murata, Osamu: *See*—
Suzuki, Nobuo; and Murata, Osamu, 5,464,361, Cl. 451-28.000.
Muromura, Tadasumi; Takano, Hideki; Akie, Hiroshi; and Matsuura, Shojiro, to Japan Atomic Energy Research Institute. Once-through nuclear reactor fuel compounds. 5,464,571, Cl. 252-638.000.
Murphy, Edward J. Waste removal device. 5,463,982, Cl. 119-166.000.
Muscara, Dominic, to Benjamin Moore & Co. Method and apparatus for dispensing paint into containers. 5,464,047, Cl. 141-1.000.
Musso, Ezio: *See*—
Basile, Giampiero; Musso, Ezio; Tonelli, Claudio; and Girolomoni, Sauro, 5,464,882, Cl. 521-95.000.
Muta, Yoshinobu: *See*—
Matsumura, Hiroshi; Shimada, Takaaki; Hisanaka, Takayuki; Ochi, Yoshiki; Kuwaki, Tetsuo; and Muta, Yoshinobu, 5,464,689, Cl. 428-317.900.
Myerson, Allan S., to Metals Recycling Technologies Corp. Method for treating waste streams containing zinc. 5,464,596, Cl. 423-101.000.
N/S Corporation: *See*—
Ennis, G. Thomas, 5,463,788, Cl. 15-97.300.
Nagae, Yoshiyuki: *See*—
Nosu, Tsutomu; and Nagae, Yoshiyuki, 5,464,896, Cl. 524-436.000.
Nagahiro, Kenichi: *See*—
Sakai, Hisao; Shimada, Hiroo; Sono, Hiroshi; Nagahiro, Kenichi; Sugita, Narutoshi; Maeda, Hirotsugu; Miyao, Masakatsu; Nakamura, Katsunori; Ogita, Yasunori; and Suzuki, Osamu, 5,463,995, Cl. 123-432.000.
Nagai, Katsumi, to Orihiro Co., Ltd. Vertical-type filling and packaging machine. 5,463,851, Cl. 53-552.000.
Nagai, Masayuki, to Sumitomo Metal Industries, Ltd. Tube bending apparatus and method. 5,463,888, Cl. 72-157.000.
Nagai, Yoshitaka; Abe, Hayao; and Arita, Masanobu, to Mitsui Pharmaceuticals Inc. Method and pharmaceutical compositions for treating immunodeficiencies. 5,464,816, Cl. 514-2.000.

Nagamine, Masashi; Yamamoto, Kenji; Matsui, Yoshimitsu; Horiuchi, Kenji; and Yoshida, Masanori, to Nihon Nohyaku Co., Ltd. N-heteroaryl-N'-Phenylurea derivatives, their production and use. 5,464,863, Cl. 514-443.000.

Nagaoka, Kenji; and Kitadono, Kaoru, to Sumitomo Chemical Co., Ltd. Thermoplastic resin composition. 5,464,891, Cl. 524-230.000.

Nagashima, Shigeo: *See*—
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; and Nagashima, Shigeo, 5,465,380, Cl. 395-800.000.

Nagashima, Yoshitake: *See*—
Ishikawa, Hisashi; Homma, Hideo; Nagashima, Yoshitake; and Saito, Takashi, 5,465,173, Cl. 358-534.000.

Nagata, Iwami: *See*—
Iwata, Toshiro; Nagata, Iwami; Hatakeyama, Akira; and Nishigai, Kazuhisa, 5,464,282, Cl. 366-83.000.

Nagato, Shoin: *See*—
Hirai, Kenji; Yamashita, Mitsuo; Tateno, Tomoko; Ejiri, Emiko; Harasawa, Kikuko; Onji, Yuichi; Ugai, Sadayuki; and Nagato, Shoin, 5,464,811, Cl. 504-281.000.

Nagaura, Yoshiaki. Method and apparatus for transporting live fish. 5,463,983, Cl. 119-203.000.

Nahm, James J. W.: *See*—
Hale, Arthur H.; Cowan, Kenneth M.; and Nahm, James J. W., 5,464,060, Cl. 166-293.000.

Naito, Atsushi: *See*—
Nishino, Atsushi; Yoshida, Akihiko; Namba, Teruo; Aoki, Masaaki; and Naito, Atsushi, 5,465,091, Cl. 341-33.000.

Najafi-Sani, Mohammad. Drill bits. 5,464,068, Cl. 175-374.000.

Nakagama, Kiyohari; and Nakazawa, Kazuhiro, to Konica Corporation. Charger control in an electrophotographic copying apparatus. 5,465,135, Cl. 355-208.000.

Nakagawa, Akio: *See*—
Shinohe, Takashi; Nakayama, Kazuya; Takeuchi, Minami; Yamaguchi, Masakazu; Kitagawa, Mitsuhiko; Omura, Ichiro; and Nakagawa, Akio, 5,464,994, Cl. 257-147.000.

Nakagawa, Kazuo: *See*—
Nakanishi, Akio; Furuse, Akira; Nakagawa, Kazuo; Tsuneda, Makoto; and Nukanobu, Atsushi, 5,465,047, Cl. 324-316.000.

Nakagawa, Kenji: *See*—
Haruki, Tamae; Nakagawa, Kenji; Taguchi, Masao; Tanaka, Hiroyuki; Asai, Satoru; and Hanyu, Isamu, 5,465,220, Cl. 364-525.000.

Nakagawa, Masao, to Nisshinbo Industries, Inc. Hydraulic press. 5,463,892, Cl. 72-456.000.

Nakagawa, Toshihiro; Sakai, Toshiaki; and Nozaki, Hiroaki, to Zexel Corporation. Method of manufacturing plunger barrel. 5,463,810, Cl. 29-888.400.

Nakagawara, Kazuhiko: *See*—
Fujisawa, Shinobu; and Nakagawara, Kazuhiko, 5,464,167, Cl. 242-314.000.

Nakagiri, Nobuyuki; Kondo, Hiroyuki; and Suzuki, Yoshihiko, to Nikon Corporation. Scanning optical detection apparatus and method, and photoelectric conversion medium applied thereto. 5,464,977, Cl. 250-234.000.

Nakahata, Hideaki: *See*—
Hachigo, Akihiro; Nakahata, Hideaki; Shikata, Shinichi; and Fujimori, Naoji, 5,463,901, Cl. 73-753.000.

Nakai, Sadao; Yamanaka, Masanobu; Ishikawa, Koji; Sato, Tsuyoshi; Yamamoto, Kimiaki; and Terashima, Mikihiko, to Olympus Optical Co., Ltd.; Nakai, Sadao; and Kimnon Electric Co. Ltd. Focusing optical system for semiconductor lasers. 5,465,178, Cl. 359-670.000.

Nakai, Satoru; Aihara, Koutoku; Tanaka, Hideo; Iba, Hitomi; Kawai, Kazuyoshi; Ichikawa, Hiroyuki; Akamatsu, Seiji; Saito, Fumio; Tominaga, Michiaki; and Adachi, Masakazu, to Otsuka Pharmaceutical Co., Ltd. Apoptosis regulating composition. 5,464,833, Cl. 514-251.000.

Nakajima, Masato: *See*—
Shimizu, Keishi; Shimizu, Kanzi; Mitsumachi, Masanobu; Nakajima, Masato; Ishigami, Tetsushi; and Kusamichi, Yoshitake, 5,464,370, Cl. 454-145.000.

Nakamura, Eiichirou: *See*—
Kawamoto, Masao; Tanaka, Kazuhiko; Hirakawa, Kiyoshi; and Nakamura, Eiichirou, 5,464,695, Cl. 428-370.000.

Nakamura, Katsunori: *See*—
Sakai, Hisao; Shimada, Hiroo; Sono, Hiroshi; Nagahiro, Kenichi; Sugita, Narutoshi; Maeda, Hirotsugu; Miyao, Masakatsu; Nakamura, Katsunori; Ogita, Yasunori; and Suzuki, Osamu, 5,463,995, Cl. 123-432.000.

Nakamura, Shunji: *See*—
Okuda, Kouichi; Nakamura, Shunji; Yoshimoto, Toshio; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Fukuzawa, Daizo; Nanbu, Tomoko; and Suzuki, Hidenobu, 5,464,964, Cl. 219-497.000.

Nakamura, Tetsuya; Kabai, Takahito; Iguchi, Michihisa; Arai, Seiji; Sakai, Chinobu; and Katagata, Satoshi, to Kabushiki Kaisha Toshiba. Developing device and image forming apparatus including an agitator having two springs wound in different directions around a rod. 5,465,140, Cl. 355-260.000.

Nakamura, Tsuneo: *See*—
Kajiwara, Toshiyuki; Yamagushi, Teruo; Okoshi, Hitoshi; and Nakamura, Tsuneo, 5,463,801, Cl. 26-33.00Q.

Nakane, Masami: *See*—
Mano, Takashi; Stevens, Rodney W.; and Nakane, Masami, 5,464,849, Cl. 514-365.000.

Nakanishi, Akio; Furuse, Akira; Nakagawa, Kazuo; Tsuneda, Makoto; and Nukanobu, Atsushi, to Nikkiso Co., Ltd.; and Sumitomo Special Metals Co., Ltd. Electron spin resonator having variable resonance frequency and error detecting automatic frequency control. 5,465,047, Cl. 324-316.000.

Nakano, Masaki, to Nissan Motor Co., Ltd. Friction-roller-type continuously variable transmission. 5,464,375, Cl. 476-10.000.

Nakao, Takashi: *See*—
Nishino, Yoshitaka; Sawa, Toshio; Nakao, Takashi; Aizawa, Michihiko; and Yokose, Kenji, 5,463,880, Cl. 62-484.000.

Nakao, Tomoyuki, to Fujitsu Limited. Testing apparatus for detecting an image signal in radio waves leaking from an information processing system. 5,465,112, Cl. 348-4.000.

Nakashige, Yukiko; and Nishioka, Tadashi, to Mitsubishi Denki Kabushiki Kaisha; and Ryoden Semiconductor System Engineering Corporation. Semiconductor wafer inspection apparatus. 5,465,145, Cl. 356-237.000.

Nakashita, Takefumi: *See*—
Hori, Shinichi; Kawasaki, Atsuko; Nakashita, Takefumi; Inui, Yoshiharu; Sakaki, Toshiaki; and Miki, Miyo, 5,464,420, Cl. 606-202.000.

Nakata, Hiroyuki: *See*—
Inoue, Nori; Okumura, Hitoshi; and Nakata, Hiroyuki, 5,463,912, Cl. 74-519.000.

Nakata, Yasuo: *See*—
Sakai, Keiji; Yoshida, Yoshio; Yamamoto, Hiroyuki; Kurata, Yukio; Nakata, Yasuo; and Miyake, Takahiro, 5,465,315, Cl. 385-116.000.

Nakatani, Munehiro: *See*—
Fukushima, Shigenobu; Nakatani, Munehiro; Muramatsu, Hideo; Tsuboi, Toshio; Hamano, Hiroaki; and Hamano, Kanako, 5,465,172, Cl. 358-498.000.

Nakatani, Yasuhiro; Ichimura, Atsushi; Tanaka, Toshio; Takeuchi, Hiroshi; and Okano, Yoichi, to Fujitsu Ten Limited. Method and apparatus for guidance of road condition. 5,465,089, Cl. 340-995.000.

Nakatsu, Etsuo: *See*—
Morioka, Yoshihiro; Kobayashi, Masaaki; Okayama, Mutsuyuki; Nakatsu, Etsuo; and Suzuki, Kohei, 5,465,158, Cl. 358-310.000.

Nakatsuka, Takuo; Toyota, Tsuyoshi; Tanimoto, Mie; and Matsumoto, Akiko, to Shikoku Chemicals Corporation. Epoxy resin adduct combined with a borate ester and phenolic compound. 5,464,910, Cl. 525-486.000.

Nakayama, Kazuya: *See*—
Shinohe, Takashi; Nakayama, Kazuya; Takeuchi, Minami; Yamaguchi, Masakazu; Kitagawa, Mitsuhiko; Omura, Ichiro; and Nakagawa, Akio, 5,464,994, Cl. 257-147.000.

Nakazato, Yasushi; Tanaka, Makoto; Sakamoto, Kohki; Kondo, Hisayo; Kasahara, Rikio; Shibaki, Hiroyuki; and Sugiyama, Mitsugu, to Ricoh Company, Ltd. Sheet storing device with locking bins. 5,464,200, Cl. 270-53.000.

Nakazawa, Kazuhiro: *See*—
Nakagama, Kiyohari; and Nakazawa, Kazuhiro, 5,465,135, Cl. 355-208.000.

Nakazawa, Takayuki; Okizuka, Takafumi; Takebe, Nobuyuki; and Annen, Jinshi, to Fujitsu Limited. Table-and-cache-based database assist method. 5,465,352, Cl. 395-600.000.

Namba, Teruo: *See*—
Nishino, Atsushi; Yoshida, Akihiko; Namba, Teruo; Aoki, Masaaki; and Naito, Atsushi, 5,465,091, Cl. 341-33.000.

Namil, Abdelmoula: *See*—
Dean, Thomas R.; and Namil, Abdelmoula, 5,464,831, Cl. 514-222.800.

Nanaji, Seifollah S.; Pope, Kenneth L.; and Sobota, Richard R., to Gilbarco, Inc. Fuel storage tank vent filter system. 5,464,466, Cl. 95-45.000.

Nanbu, Tomoko: *See*—
Okuda, Kouichi; Nakamura, Shunji; Yoshimoto, Toshio; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Fukuzawa, Daizo; Nanbu, Tomoko; and Suzuki, Hidenobu, 5,464,964, Cl. 219-497.000.

Nappier, Ricky L.: *See*—
Falvey, Neil J.; Day, Edwin J., III; Nappier, Ricky L.; and Longtin, John T., 5,465,288, Cl. 379-58.000.

Narahara, Tatsuya, to Sony Corporation. Optical tape recording and reproducing apparatus. 5,465,241, Cl. 369-44.110.

Narayanan, Kolazi S.: *See*—
Fu, Edward; and Narayanan, Kolazi S., 5,464,627, Cl. 424-409.000.

Narayanan, Krishnaswamy: *See*—
Griffith, Owen W.; and Narayanan, Krishnaswamy, 5,464,858, Cl. 514-399.000.

Narayanan, Venkatesh: *See*—
Hutcheson, Timothy L.; Or, Wilson; Narayanan, Venkatesh; Mohan, Subramaniam; Wohlmut, Peter G.; Srinivasan, Ramanujam; Hunt, Bobby R.; and Ryan, Thomas W., 5,465,308, Cl. 382-159.000.

Nardi, John C.: *See*—
Getz, Dale R.; Nardi, John C.; and Scarr, Robert F., 5,464,709, Cl. 429-229.000.

Narendran, Balakrishnan: *See*—
Agrawal, Prathima; Anvekar, Dinesh K.; and Narendran, Balakrishnan, 5,465,389, Cl. 455-33.200.

Narita, Izuru; Suzuki, Keiji; Mito, Toshitsugu; and Tsurukawa, Noboru, to International Business Machines Corporation. Power supply for electronic device, and electronic device system. 5,465,039, Cl. 320-32.000.

Naruke, Kiyomi, to Kabushiki Kaisha Toshiba. Nonvolatile semiconductor memory system with a plurality of erase blocks. 5,465,236, Cl. 365-218.000.

Narula, Anubhav P. S.: *See*—
Warren, Craig B.; Marin, Anna B.; Butler, Jerry F.; and Narula, Anubhav P. S., 5,464,626, Cl. 424-408.000.

Nasworthy, George F.: *See*—
Salter, James G.; Clark, James E.; Swanson, David W.; and Nasworthy, George F., 5,464,578, Cl. 264-250.000.
National Castings Incorporated: *See*—
Long, Jack R.; and Weber, Hans B., 5,463,964, Cl. 105-187.000.
National Gypsum Company: *See*—
Menchetti, Robert J., 5,464,302, Cl. 403-335.000.
National Semiconductor Corporation: *See*—
Bergemont, Albert, 5,464,999, Cl. 257-322.000.
Bien, David E., 5,465,415, Cl. 455-326.000.
Brief, David C., 5,465,250, Cl. 370-15.000.
Deschene, Daniel J., 5,465,261, Cl. 371-39.100.
Mayes, Michael K.; and Chin, Sing W., 5,465,092, Cl. 341-118.000.
National Starch and Chemical Investment Holding Corporation: *See*—
Brown, Orville W., 5,464,564, Cl. 252-514.000.
Navistar International Transportation Corp.: *See*—
Swenson, Eric T.; Thomas, Riley A., III; Blanchard, Ronald L.; and Marshall, Brian P., 5,463,992, Cl. 123-198.00R.
Nawata, Hizuru, to NEC Corporation. Transmission apparatus for orbiting satellite. 5,465,096, Cl. 342-354.000.
NCR Corporation: *See*—
Hroch, George J., 5,463,913, Cl. 74-526.000.
Neat, Robin J.; and Macklin, William J., to United Kingdom Atomic Energy Authority. Titanium dioxide-based material. 5,464,708, Cl. 429-218.000.
Nebeshima, Akira; Watanabe, Kaoru; and Saba, Toshikazu, to Sumitomo Wiring Systems, Ltd. Connector. 5,464,356, Cl. 439-752.000.
NEC Corporation: *See*—
Hannai, Seiichi, 5,465,234, Cl. 365-200.000.
Hashimoto, Kazuya, 5,465,407, Cl. 455-234.200.
Hattori, Toshiro, 5,465,183, Cl. 360-78.900.
Hirota, Toshiyuki, 5,464,791, Cl. 437-60.000.
Ishido, Kiminori; and Yamaguchi, Masahiro, 5,464,725, Cl. 430-311.000.
Ishizuka, Mitsuhiro; and Saeki, Hiroshi, 5,465,027, Cl. 313-517.000.
Miyamoto, Shigeyuki, 5,465,114, Cl. 348-80.000.
Murakami, Tomoo; and Tsunoda, Takanori, 5,464,662, Cl. 427-510.000.
Nawata, Hizuru, 5,465,096, Cl. 342-354.000.
Norimatsu, Hidehiko, 5,465,400, Cl. 455-76.000.
Oguro, Shizuo, 5,464,795, Cl. 437-233.000.
Satoh, Noritoshi, 5,465,073, Cl. 330-258.000.
Shimono, Takeshi; and Konishi, Noriyo, 5,465,383, Cl. 395-800.000.
Takahashi, Hiroyuki, 5,465,057, Cl. 326-66.000.
Todoroki, Toshiya, 5,465,267, Cl. 375-279.000.
Yamahata, Hitoshi; and Kusuda, Masahiro, 5,465,257, Cl. 371-22.500.
Yoshikawa, Minoru, 5,465,192, Cl. 361-705.000.
NEC Research Institute, Inc.: *See*—
Li, Yao; and Rao, Satish, 5,465,379, Cl. 395-800.000.
Negishi, Toshiyuki: *See*—
Yamashita, Kazuhiro; Negishi, Toshiyuki; Sato, Masatoshi; and Tsukahara, Hiroshi, 5,465,066, Cl. 327-294.000.
Negishi, Yuji: *See*—
Sato, Kazuhito; and Negishi, Yuji, 5,464,490, Cl. 156-145.000.
Neill, Paul: *See*—
Williams, Steve; Kaplan, Warren; Neill, Paul; and Chapa, Gerardo, 5,464,561, Cl. 252-182.270.
Neilson, Bruce H.: *See*—
Reid, John M.; Kauphusman, James V.; Porter, Christopher H.; and Neilson, Bruce H., 5,464,437, Cl. 607-101.000.
Rudie, Eric N.; Neilson, Bruce H.; and Kauphusman, James V., 5,464,445, Cl. 607-101.000.
Neithamer, David R.: *See*—
Patton, Jasson T.; and Neithamer, David R., 5,464,906, Cl. 525-240.000.
Nelson, James P.: *See*—
Tong, Robert R.; Poplett, James M.; McEwen, Alan B.; Mason, Gary E.; Goodwin, Mark L.; Tsai, K. C.; Anderson, Ronald L.; and Nelson, James P., 5,464,453, Cl. 29-25.030.
Nelson, Nancy W.: *See*—
Moskaluk, Raymond W.; and Nelson, Nancy W., 5,465,414, Cl. 455-313.000.
Nelson, Rod: *See*—
Lemieux, Thomas; and Nelson, Rod, 5,463,918, Cl. 81-487.000.
Nemphos, Speros P.; and McQueen, James T., to Camelot Technologies, Inc. Degradable polymeric form and process for making. 5,464,878, Cl. 521-50.000.
Nespoli, Andrea: *See*—
Bina, Roberto; Nespoli, Andrea; and Gamberini, Antonio, 5,464,027, Cl. 131-283.000.
NESTEC S.A.: *See*—
Clyde, Gene F.; Izquierdo Quimi, Marta P.; and King Solis, Luis R., 5,464,639, Cl. 426-20.000.
Guyot, Dominique; and Thevenot, Rémi, 5,464,641, Cl. 426-241.000.
Nestler, Gerhard: *See*—
Henn, Rolf; Beseckе, Siegmund; Deckers, Andreas; Guentherberg, Norbert; Brudermueller, Martin; Nestler, Gerhard, and Wassmer, Karl-Heinz, 5,464,881, Cl. 521-60.000.
Nethery, Winston J.: *See*—
Schulte, Reinhard W.; Wicks, William J.; Meinass, Helmut J.; and Nethery, Winston J., 5,464,411, Cl. 606-130.000.
Neudeck, Philip G.: *See*—
Larkin, David J.; Neudeck, Philip G.; Powell, J. Anthony; and Matus, Lawrence G., 5,463,978, Cl. 117-89.000.
Neuman, George A.: *See*—
Athey, Patricia R.; Dauson, Douglas S.; Lecocq, David E.; Neuman, George A.; Sopko, John F.; and Stewart-Davis, Royann L., 5,464,657, Cl. 427-255.500.
Neumann, Robert A., to Medtronic, Inc. Parallel processors in implantable medical device. 5,464,435, Cl. 607-9.000.
Nevosi, Ulderico: *See*—
de Nora, Oronzio; Nidola, Antonio; Nevosi, Ulderico; and Traini, Carlo, 5,464,507, Cl. 204-105.00R.
New Holland North America, Inc.: *See*—
Churchill, Stephen J., 5,464,085, Cl. 192-85.00R.
Newallis, Peter E.; Prasad, Vidanatha A.; and Applegate, Jacqueline M., to Bayer Corporation. Amine catalyzed reaction in the production of thiophosphoryl chloride. 5,464,600, Cl. 423-300.000.
Newberg, Donald G.: *See*—
Hiben, Bradley M.; Newberg, Donald G.; and Logalbo, Robert D., 5,465,410, Cl. 455-266.000.
Newbold, David D.: *See*—
Friesen, Dwayne T.; Newbold, David D.; McCray, Scott B.; and Ray, Roderick J., 5,464,540, Cl. 210-640.000.
Newman, Donald E., to Stretch Devices, Inc. Mug imprinting roller frame. 5,463,948, Cl. 101-127.100.
Ngo, Toan M.: *See*—
Griffith, Edward J.; and Ngo, Toan M., 5,464,601, Cl. 423-303.000.
Nguyen, Dung Q.: *See*—
Imai, Benjamin T.; Le, Hung Q.; and Nguyen, Dung Q., 5,465,336, Cl. 395-375.000.
Nicholas, Peter M.; and Crowley, Robert J., to Boston Scientific Corporation. Medical acoustic imaging catheter and guidewire. 5,464,016, Cl. 128-662.060.
Nichols, Jack L.: *See*—
Sanders, Brenda M.; Jenkins, Kenneth D.; Nichols, Jack L.; and Imber, Bryan E., 5,464,750, Cl. 435-7.210.
Nick, Jeffrey M.: *See*—
Allen, Ruth A.; Goetze, Lisa M.; Nick, Jeffrey M.; Pushong, Kelly B.; Surman, David H.; and Swanson, Michael D., 5,465,359, Cl. 395-700.000.
Nidola, Antonio: *See*—
de Nora, Oronzio; Nidola, Antonio; Nevosi, Ulderico; and Traini, Carlo, 5,464,507, Cl. 204-105.00R.
Niebch, Georg: *See*—
Kutscher, Bernhard; Niebch, Georg; Fleischhauer, Ilona; Engel, Jürgen; Achterrath-Tuckermann, Ute; and Szelenyi, Stefan, 5,464,838, Cl. 514-248.000.
Nield, Eric; Suemal, Daljit K.; and Bovey, Denis M. H. Coating process and curable compositions. 5,464,884, Cl. 523-400.000.
Nielsen, Kenneth A., to Union Carbide Chemicals & Plastics Technology Corporation. Methods for spraying polymeric compositions with compressed fluids and enhanced atomization. 5,464,154, Cl. 239-1.000.
Niemann, James E.; and Spangler, Anthony G., to Masco Corporation of Indiana. Spout mounting system. 5,464,045, Cl. 137-801.000.
Niemira, James K.: *See*—
Steele, Edward A.; and Niemira, James K., 5,464,956, Cl. 218-29.000.
Nihon Nohyaku Co., Ltd.: *See*—
Nagamine, Masashi; Yamamoto, Kenji; Matsui, Yoshimitsu; Horiuchi, Kenji; and Yoshida, Masanori, 5,464,863, Cl. 514-443.000.
Niimi, Yuji: *See*—
Nishimoto, Yutaka; Ikemoto, Kimikazu; Niimi, Yuji; and Asai, Akio, 5,464,474, Cl. 118-676.000.
Niitsu, Takahiro: *See*—
Shiratsuki, Yoshiyuki; Yamaguchi, Yoshinori; Hayashi, Kazuhiro; and Niitsu, Takahiro, 5,464,990, Cl. 257-40.000.
Nikkiso Co., Ltd.: *See*—
Nakanishi, Akio; Furuse, Akira; Nakagawa, Kazuo; Tsuneda, Makoto; and Nukanobu, Atsushi, 5,465,047, Cl. 324-316.000.
Nikolas, Douglas G.: *See*—
Yasrebi, Mehrdad; Kemp, William W.; Sturgis, David H.; Nikolas, Douglas G.; Wright, Gary L.; Kelly, Thomas J., III; Springgate, Mark E.; and Crego, Ted R., 5,464,797, Cl. 501-103.000.
Nikon Corporation: *See*—
Nakagiri, Nobuyuki; Kondo, Hiroyuki; and Suzuki, Yoshihiko, 5,464,977, Cl. 250-234.000.
Nishi, Kenji; and Murakami, Seiro, 5,464,715, Cl. 430-22.000.
Nikzi, Iraj: *See*—
Carlson, Eric V.; and Nikzi, Iraj, 5,463,782, Cl. 4-661.000.
Nill, Walter J.; and Buechler, Jean M., to Delco Electronics Corporation. Multiple counter assembly. 5,464,970, Cl. 235-95.00R.
Nilsen, Ole K. Programmable actuator for light dimmer. 5,465,031, Cl. 315-362.000.
Nilsson, Finn, to Spacemaker Limited. Framework for shelving unit. 5,463,966, Cl. 108-110.000.
Nilsson, Tomas J.: *See*—
Frostrom, Tore; Nilsson, Tomas J.; Andersson, Yngve; Carlsson, Michael M. J.; Sundell, Lars-Olof; and Uden, Jonas P., 5,465,393, Cl. 455-54.100.
Nimura, Mitsuo: *See*—
Yoshihara, Kunio; Hirooka, Kazuhiko; Sakai, Masanori; Kuboki, Keiju; Nimura, Mitsuo; and Tanabe, Ritsushi, 5,465,163, Cl. 358-444.000.
Nippon Carbide Kogyo Kabushiki Kaisha: *See*—
Sasaki, Masanori; Shibafuchi, Hiroshi; Imai, Yasushi; Yoshida, Masahiko; and Yoshie, Takehiko, 5,464,248, Cl. 280-741.000.

Nippon Information Industry Corporation: *See*—
Mitsui, Tsutomu; Akaba, Noriyuki; and Shimokawa, Yukitsugu, 5,465,099, Cl. 343-730.000.
Nippon Oil Company, Limited: *See*—
Sasaki, Umekichi; Hasegawa, Hiroshi; and Shimomura, Yuji, 5,464,550, Cl. 252-68.000.
Nippon Suisan Kabushiki Kaisha: *See*—
Sarukawa, Chuji; Ito, Sadaaki; and Ito, Hiromi, 5,463,938, Cl. 99-352.000.
Nippon Thompson Co., Ltd.: *See*—
Tanaka, Kazuhiko, 5,464,288, Cl. 384-15.000.
Nippon Zeon Co., Ltd.: *See*—
Yada, Seiko; Ogawa, Yukihiro; Nomura, Takao; and Umemoto, Yoshiro, 5,464,892, Cl. 524-284.000.
Nippondenso Co., Ltd.: *See*—
Katoh, Akio; Abe, Nobuo; Hanai, Takeshi; and Horibe, Kenji, 5,465,022, Cl. 313-144.000.
Okabe, Naoto; Yamamoto, Tsuyoshi; and Kato, Naohiro, 5,464,992, Cl. 257-139.000.
Yamauchi, Shigenori; and Watanabe, Takamoto, 5,465,076, Cl. 331-179.000.
Nishi, Kenji; and Murakami, Seiro, to Nikon Corporation. Method of driving mask stage and method of mask alignment. 5,464,715, Cl. 430-22.000.
Nishida, Naoya: *See*—
Watanabe, Yasuyuki; Ishiwata, Kazuya; and Nishida, Naoya, 5,464,714, Cl. 430-7.000.
Nishida, Reiziro; and Tominaga, Akira, to Kansai Paint Co., Ltd. Cycloaliphatic epoxy and primary hydroxyl groups-containing cationic resin. 5,464,913, Cl. 525-524.000.
Nishigai, Kazuhisa: *See*—
Iwata, Toshiro; Nagata, Iwami; Hatakeyama, Akira; and Nishigai, Kazuhisa, 5,464,282, Cl. 366-83.000.
Nishii, Teruyuki; Watanabe, Tsuochiro; and Terajima, Hisao, to Canon Kabushiki Kaisha. Image receiving apparatus. 5,465,162, Cl. 358-442.000.
Nishijima, Hideo. Process for preparing a cohesive mass of herring eggs. 5,464,648, Cl. 426-643.000.
Nishimiya, Nobuyuki: *See*—
Akiyama, Keiji; Watanabe, Noriaki; Hotta, Hisashi; Toyama, Tadao; and Nishimiya, Nobuyuki, 5,464,724, Cl. 430-272.000.
Nishimoto, Yutaka; Ikemoto, Kimikazu; Niimi, Yuji; and Asai, Akio, to Toyota Jidosha Kabushiki Kaisha. Apparatus for cleaning strips before press forming, having de-oiling rolls and tacky rolls to remove oil and foreign matters. 5,464,474, Cl. 118-676.000.
Nishimura, Eiichi, to Oki Electric Industry Co., Ltd. Barrel shifter. 5,465,223, Cl. 364-715.080.
Nishino, Atsushi; Yoshida, Akihiko; Namba, Teruo; Aoki, Masaaki; and Naito, Atsushi, to Showa Shell Sekiyu K.K.; and Matsushita Electrical Industrial Co., Ltd. Touch sensor. 5,465,091, Cl. 341-33.000.
Nishino, Yoshitaka; Sawa, Toshio; Nakao, Takashi; Aizawa, Michihiko; and Yokose, Kenji, to Hitachi, Ltd. Absorption refrigerator. 5,463,880, Cl. 62-484.000.
Nishioka, Tadashi: *See*—
Nakashige, Yukiko; and Nishioka, Tadashi, 5,465,145, Cl. 356-237.000.
Nishizawa, Jun-Ichi: *See*—
Manada, Nobuaki; Ito, Junji; Kurabayashi, Toru; and Nishizawa, Jun-ichi, 5,463,977, Cl. 117-85.000.
Nishizawa, Jun-ichi: *See*—
Manada, Nobuaki; Ito, Junji; Kurabayashi, Toru; and Nishizawa, Jun-ichi, 5,463,977, Cl. 117-85.000.
Nissan Motor Co., Ltd.: *See*—
Nakano, Masaki, 5,464,375, Cl. 476-10.000.
Sugayama, Sakae; Asami, Takao; Kato, Kenji; and Maeta, Akira, 5,465,408, Cl. 455-249.100.
Nissei Plastic Industrial Co., Ltd.: *See*—
Arakawa, Nobuyuki; Segawa, Takashi; Kaneko, Moriyoshi; Miyairi, Kazuki; and Takayama, Kazutoshi, 5,464,339, Cl. 425-186.000.
Nisshin Oupa Co., Ltd.: *See*—
Koike, Yukinaga, 5,465,411, Cl. 455-275.000.
Nisshinbo Industries, Inc.: *See*—
Nakagawa, Masao, 5,463,892, Cl. 72-456.000.
Nitardy, John H.: *See*—
Oberholtzer, John C.; and Nitardy, John H., 5,465,399, Cl. 455-69.000.
Nitowski, Gary A.: *See*—
McCleary, Sherri F.; Nitowski, Gary A.; Marinelli, James M.; and Siemon, John T., 5,463,804, Cl. 29-469.500.
Nitrojection Corporation: *See*—
Marik, Wayne; Begalla, John; and Johnston, Tom W., 5,464,342, Cl. 425-533.000.
Nitto Kogyo Co., Ltd.: *See*—
Higashi, Yuichiro; and Ishikawa, Youichi, 5,465,146, Cl. 355-285.000.
Nitz, Theodore J.: *See*—
Diana, Guy D.; and Nitz, Theodore J., 5,464,848, Cl. 514-364.000.
Noble, Richard D.: *See*—
Jia, Meng-Dong; and Noble, Richard D., 5,464,798, Cl. 502-64.000.
Noblenet Inc.: *See*—
Lemmo, Steven E., 5,465,351, Cl. 395-600.000.
Noguchi, Kazuharu; Micetich, Ronald G.; and Daneshtalab, Mohsen, to Synphar Laboratories, Ind. 6β-substituted penicillanic acids as beta-lactamase inhibitors. 5,464,616, Cl. 424-114.000.
Noguchi, Takaharu: *See*—
Amada, Nobutaka; and Noguchi, Takaharu, 5,465,180, Cl. 360-19.100.
Nokia Telecommunications Oy: *See*—
Töyrylä, Hannu, 5,465,391, Cl. 455-33.400.
Nolte, Dale L.; Mason, J. Russell; and Clark, Larry, to Monell Chemical Senses Center. Non-toxic methods of repelling rodents from materials susceptible to rodent consumption. 5,464,625, Cl. 424-405.000.
Nomura, Hideo; Uchiyama, Yoshiharu; and Ogawa, Tetsuo, to International Business Machines Corporation. Single hand operable latch mechanism for hinged container. 5,465,191, Cl. 361-681.000.
Nomura, Takao: *See*—
Yada, Seiko; Ogawa, Yukihiro; Nomura, Takao; and Umemoto, Yoshiro, 5,464,892, Cl. 524-284.000.
Norand Corporation: *See*—
Boatwright, Darrell L.; Hanson, George E.; Miller, Phillip; Koenck, Steven E.; Walter, Jerry L.; Kubler, Joseph J.; Cargin, Keith K., Jr.; Schultz, Darald R.; Davis, Patrick H.; and Kunert, Steven R., 5,465,207, Cl. 364-424.010.
Nordson Corporation: *See*—
Davis, Dennis, 5,464,283, Cl. 366-152.100.
Norimatsu, Hidehiko, to NEC Corporation. Power supply control device for controlling the turning on and off of power supply. 5,465,400, Cl. 455-70.000.
North American Philips Corporation: *See*—
Lim, Sheldon C. P.; Hellstrom, Julie W.; and Yen, Ting P., 5,465,004, Cl. 257-529.000.
Northcott, Anthony J.: *See*—
Severn, Michael J.; Northcott, Anthony J.; and Rowlinson, Anne G., 5,463,863, Cl. 60-39.030.
Northfield Laboratories, Inc.: *See*—
Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,464,814, Cl. 514-6.000.
Northgate Technologies Inc.: *See*—
DeVale, Donald P., 5,464,391, Cl. 604-67.000.
Northrop Grumman Corporation: *See*—
Krumes, Rolf; Richman, Dennis C.; and Bose, Carl L., 5,465,142, Cl. 356-5.010.
Norton, Ian T.: *See*—
Weadorp, Leendert H.; Madsen, Robert A.; Norton, Ian T.; and Brown, Charles R., 5,464,645, Cl. 426-573.000.
Nortru, Inc.: *See*—
Zuerner, Edwin C.; Ratzelt, Robert R.; and Foster, Norman, 5,464,556, Cl. 252-170.000.
Nose, Noriyuki: *See*—
Matsumoto, Takahiro; Nose, Noriyuki; Saito, Kenji; and Semoto, Koichi, 5,465,148, Cl. 356-349.000.
Nosu, Tsutomu; and Nagae, Yoshiyuki, to Kyowa Chemical Industry Co., Ltd. Stabilized, halogen-containing resin composition. 5,464,896, Cl. 524-436.000.
Notar, Robert: *See*—
Weyh, Werner; Schwander, Udo; Gatter, Raimond; Notar, Robert; Konopa, Helmut; and Erdmann, Klaus, 5,464,124, Cl. 222-129.100.
Novagen, Inc.: *See*—
Mierendorf, Robert; Garber, Richard; Novy, Robert; and Hammer, Beth, 5,464,745, Cl. 435-6.000.
Novapharme: *See*—
Lepage, Francis; and Hublot, Bernard, 5,464,860, Cl. 514-404.000.
NovaVision, Inc.: *See*—
Boswell, David R., 5,464,690, Cl. 428-334.000.
Novy, Robert: *See*—
Mierendorf, Robert; Garber, Richard; Novy, Robert; and Hammer, Beth, 5,464,745, Cl. 435-6.000.
Nowaczyk, Paul: *See*—
Turk, Richard; and Nowaczyk, Paul, 5,464,651, Cl. 427-64.000.
Nowlin, Duane; and Gillett, Bruce, to Ecowater Systems, Inc. Water softener with resin beads of different mesh sizes. 5,464,532, Cl. 210-190.000.
Nozaki, Chiyoshi: *See*—
Kawakami, Hiroshi; Nozaki, Chiyoshi; and Iwakura, Ken, 5,464,804, Cl. 503-217.000.
Nozaki, Hiroaki: *See*—
Nakagawa, Toshihiro; Sakai, Toshiaki; and Nozaki, Hiroaki, 5,463,810, Cl. 29-881.400.
Nozaki, Hitoshi: *See*—
Takahashi, Kazuo; Kumata, Fumio; Nozaki, Hitoshi; Inoue, Shinichi; and Makabe, Toshiji, 5,464,593, Cl. 422-224.000.
Nukanobu, Atsushi: *See*—
Nakanishi, Akio; Furuse, Akira; Nakagawa, Kazuo; Tsuneda, Makoto; and Nukanobu, Atsushi, 5,465,047, Cl. 324-316.000.
Numako, Norio: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Matsuo, Hirofumi, 5,465,131, Cl. 354-202.000.
Numao, Takaji: *See*—
Koden, Mitsuhiro; Tagawa, Akira; Takeda, Hitoshi; Katsuse, Hirofumi; Shiomi, Makoto; Numao, Takaji; Gouda, Hiroshi; Katakami, Masayuki; Kondo, Naofumi; and Katayama, Mikio, 5,465,168, Cl. 359-56.000.
Nuovopignone - Industrie Meccaniche E Fonderia S.p.A.: *See*—
Bergamini, Giorgio, 5,464,039, Cl. 137-551.000.

Nussenbaum, Joseph, to Propper Manufacturing Co., Inc. Headband with adjustable device for positioning an optical device. 5,465,124, Cl. 351-245.000.

Oakes, Kenneth J.: *See*—
Cook, Thomas E.; Fantacone, Mark J.; Galbraith, Robert E.; Glassen, Steven G.; Meritt, Allan S.; Oakes, Kenneth J.; and Yudenfriend, Harry M., 5,465,355, Cl. 395-200.150.

Obel, Martin: *See*—
Hedberg, Sven-Erik; Obel, Martin; and Hoegnelid, Kurt, 5,464,429, Cl. 607-4.000.

Oberholtzer, John C.; and Nitardy, John H., to Boeing Company, The. Apparatus and method for controlling transmitted power in a radio network. 5,465,399, Cl. 455-69.000.

O'Brien, Paul, to Side-Kik Corporation. Display rack. 5,464,103, Cl. 211-133.000.

OCE-Nederland, B.V.: *See*—
Deen, Pieter B. J.; Linssen, Nicolaas G. H.; and Mennen, Godefridus J., 5,464,201, Cl. 270-53.000.

Ochi, Yoshiki: *See*—
Matsumura, Hiroshi; Shimada, Takaaki; Hisanaka, Takayuki; Ochi, Yoshiki; Kuwaki, Tetsuo; and Muta, Yoshinobu, 5,464,689, Cl. 428-317.900.

O'Connell, Anne: *See*—
Creedon, Tadhg; O'Neill, Eugene G.; and O'Connell, Anne, 5,465,340, Cl. 395-846.000.

Octamer, Inc.: *See*—
Kun, Ernest; Meadeleyev, Jerome; and Kirsten, Eva, 5,464,871, Cl. 514-617.000.

O'Donnell, Francis E., Jr. Laser adjustable suture. 5,464,424, Cl. 606-228.000.

Oehr, Klaus H.; Timewell, Richard R.; Donahue, Harvey; Hoy, Brenda; Kim, Ronald; and Roth, Reinhold C., to Dynamotive Corporation. Method for removal of certain oxide films from metal surfaces. 5,464,510, Cl. 204-141.500.

Ogawa, Kimiaki: *See*—
Aoki, Harumi; Morisawa, Tahei; Ogawa, Kimiaki; and Mogamiya, Makoto, 5,465,133, Cl. 354-442.000.

Ogawa, Tetsuo: *See*—
Nomura, Hideo; Uchiyama, Yoshiharu; and Ogawa, Tetsuo, 5,465,191, Cl. 361-681.000.

Ogawa, Yukihiro: *See*—
Yada, Seiko; Ogawa, Yukihiro; Nomura, Takao; and Umemoto, Yoshiro, 5,464,892, Cl. 524-284.000.

Ogden, Aubrey D.: *See*—
Kahle, James A.; Kau, Chin-Cheng; Levitan, David S.; Ogden, Aubrey D.; Poursepanj, Ali A.; Tu, Paul K.-G.; and Waldecker, Donald E., 5,465,373, Cl. 395-800.000.

Ogita, Yasunori: *See*—
Sakai, Hisao; Shimada, Hiroo; Sono, Hiroshi; Nagahiro, Kenichi; Sugita, Narutoshi; Maeda, Hirotsugu; Miyao, Masakatsu; Nakamura, Katsunori; Ogita, Yasunori; and Suzuki, Osamu, 5,463,995, Cl. 123-432.000.

Ogiwara, Yoshiaki; Yasuhara, Masaki; and Matsuda, Akira, to Furukawa Electric Co., Ltd., The. Plating method for a nickel-titanium alloy member. 5,464,524, Cl. 205-170.000.

Ogura, Takao: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mituhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.

Oguro, Shizuo, to NEC Corporation. Method of forming polycrystalline silicon thin films for semiconductor devices. 5,464,795, Cl. 437-233.000.

O'Halloran, Michael L.; Case, Cecil L.; Pruitt, Martin E.; and Fritz, David P., to Hay & Forage Industries. Wide cut harvester having rotary cutter bed. 5,463,852, Cl. 56-6.000.

Ohashi, Kazuhito, to Canon Kabushiki Kaisha. Image signal recording apparatus capable of recording field image signals, frame image signals and high definition image signals. 5,465,159, Cl. 358-342.000.

Ohga, Eiji; Kawasaki, Masahiko; Sakuma, Kazushi; Takahashi, Tatsuo; and Tozaki, Ryusuke, to Pioneer Electronic Corporation. CATV system with an easy program reservation. 5,465,385, Cl. 455-6.100.

Ohio Aerospace Institute: *See*—
Larkin, David J.; Neudeck, Philip G.; Powell, J. Anthony; and Matus, Lawrence G., 5,463,978, Cl. 117-89.000.

Ohki, Nobutaka; Asanuma, Naoki; and Takahashi, Osamu, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,464,731, Cl. 430-505.000.

Ohkubo, Hideki: *See*—
Haraguchi, Keisuke; Kohmoto, Shinsuke; Kobayashi, Takeo; Kondoh, Shigeru; Ohkubo, Hideki; Numako, Norio; and Matsuo, Hirofumi, 5,465,131, Cl. 354-202.000.

Ohmori, Shinji: *See*—
Matoba, Hiroshi; Ohmori, Shinji; Koyama, Hiroyoshi; and Kashihara, Toshio, 5,464,612, Cl. 424-78.100.

Ohsaki, Katsuhiko. EEPROM and logic LSI chip including such EEPROM. 5,465,231, Cl. 365-185.330.

Ohsawa, Tetsu, to Tokyo Electron Kabushiki Kaisha; and Tokyo Electron Tohoku Kabushiki Kaisha. Heat treating apparatus. 5,464,313, Cl. 414-171.000.

Ohta, Eiji: *See*—
Funada, Masahiro; Kitamura, Toshiyuki; Yamamoto, Mitsuhiro; and Ohta, Eiji, 5,465,161, Cl. 358-438.000.

Ohta, Seiji: *See*—
Tsutsui, Toshiyuki; Yoshitsugu, Ken; Takahashi, Mamoru; Todo, Akira; Ohta, Seiji; and Inagaki, Hajime, 5,464,905, Cl. 525-240.000.

Ohtsuka, Isao: *See*—
Akiba, Nobuo; Ohtsuka, Isao; Shiratori, Shigekazu; and Kase, Katsunori, 5,465,101, Cl. 345-1.000.

Ohtsuka, Yasumasa: *See*—
Okuda, Kouichi; Nakamura, Shunji; Yoshimoto, Toshio; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Fukuzawa, Daizo; Nanbu, Tomoko; and Suzuki, Hidenobu, 5,464,964, Cl. 219-497.000.

Oji Seital Kaisha, Ltd.: *See*—
Hayakawa, Katsumi; Tsukuda, Masahiro; Sato, Yukiyoshi; Tatewaki, Junichi; and Yamasaka, Kazuya, 5,463,841, Cl. 53-381.200.

Ojo, Adeola F.: *See*—
Fitch, Frank R.; Bülow, Martin; and Ojo, Adeola F., 5,464,467, Cl. 95-98.000.

Oka, Mitsuhiro, to Okasan Corporation. Sorting apparatus in solid waste sorting system. 5,464,100, Cl. 209-31.000.

Oka, Tatsuya, to Sumitomo Wiring Systems, Ltd. Branch joint box. 5,464,351, Cl. 439-372.000.

Okabe, Naoto; Yamamoto, Tsuyoshi; and Kato, Naohito, to Nippondenso Co., Ltd. Insulated gate bipolar transistor provided with a minority carrier extracting layer. 5,464,992, Cl. 257-139.000.

Okabe, Tetuhiro: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mituhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.

Okada, Kazuo; and Kondoh, Toshihiko, to Iwaki Co., Ltd. Magnet pump with rear thrust bearing member. 5,464,333, Cl. 417-420.000.

Okada, Taizo: *See*—
Katayama, Masahide; Yamashita, Harushige; Okada, Taizo; and Morioka, Shigeo, 5,464,828, Cl. 514-60.000.

Okamoto, Mitsunaga, to Sanyo Electric Co., Ltd. Data input controller for inhibiting and enabling input. 5,465,083, Cl. 340-825.310.

Okano, Hidenobu; and Watanabe, Katsunori, to Toyoda Gosei Co., Ltd. Method for molding polyurethane foam under subatmospheric pressures. 5,464,582, Cl. 264-45.500.

Okano, Yoichi: *See*—
Nakatani, Yasuhiro; Ichimura, Atsushi; Tanaka, Toshio; Takeuchi, Hiroshi; and Okano, Yoichi, 5,465,089, Cl. 340-995.000.

Okasan Corporation: *See*—
Oka, Mitsuhiro, 5,464,100, Cl. 209-31.000.

Okayama, Mutsuyuki: *See*—
Morioka, Yoshihiro; Kobayashi, Masaaki; Okayama, Mutsuyuki; Nakatsu, Etsuto; and Suzuki, Kohei, 5,465,158, Cl. 358-310.000.

Okayasu, Yoshisada: *See*—
Ide, Yoshihiro; Kakuno, Imao; Sakurai, Nobumasa; Mitsui, Hidero; and Okayasu, Yoshisada, 5,465,117, Cl. 348-373.000.

Okazaki, Hidetsugu: *See*—
Kanazawa, Yoshinobu; and Okazaki, Hidetsugu, 5,464,252, Cl. 280-805.000.

Oki Electric Industry Co., Ltd.: *See*—
Nishimura, Eiichi, 5,465,223, Cl. 364-715.080.

Okizuka, Takafumi: *See*—
Nakazawa, Takayuki; Okizuka, Takafumi; Takebe, Nobuyuki; and Annen, Jinshi, 5,465,352, Cl. 395-600.000.

Okoshi, Hitoshi: *See*—
Kajiwara, Toshiyuki; Yamagushi, Teruo; Okoshi, Hitoshi; and Nakamura, Tsuneo, 5,463,801, Cl. 26-33.00Q.

Okuda, Kouichi; Nakamura, Shunji; Yoshimoto, Toshio; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Fukuzawa, Daizo; Nanbu, Tomoko; and Suzuki, Hidenobu, to Canon Kabushiki Kaisha. Image heating apparatus changing set temperature in accordance with temperature of heater. 5,464,964, Cl. 219-497.000.

Okumura, Hitoshi: *See*—
Inoue, Nori; Okumura, Hitoshi; and Nakata, Hiroyuki, 5,463,912, Cl. 74-519.000.

Okutsu, Eiichi; Toyoda, Takashi; and Ito, Tadashi, to Fuji Photo Film Co., Ltd. Low replenishment rate process of development of black-and-white silver halide photographic material using a developer having a low bromide ion concentration and a specified pH range. 5,464,730, Cl. 430-399.000.

Olin Corporation: *See*—
Lichon, Paul G., 5,464,961, Cl. 219-121.520.

Olive, D. Michael: *See*—
Melendez, Luis A.; Rosenbaum, Robert E.; Vera-Garcia, Marcela A.; Olive, D. Michael; and Swenson, John E., 5,464,773, Cl. 435-306.100.

Oliver, Dan A.: *See*—
Gregory, David B.; and Oliver, Dan A., 5,464,492, Cl. 156-246.000.

Olivier, Jean J.: *See*—
Jaffiol, Franck; Olivier, Jean J.; and Thomas, Gérard, 5,464,575, Cl. 264-443.000.

Olnowich, Howard T., to International Business Machines Corporation. Apparatus for programming the speed at which an expansion card generates ready signals to insure compatibility with the speed of an attached bus. 5,465,333, Cl. 395-281.000.

Olsen, Jens K.: *See*—
Hoffman, Ronald J.; and Olsen, Jens K., 5,463,809, Cl. 29-888.100.

Olson, Allen W. Coffee maker. 5,463,932, Cl. 99-280.000.

Olson, Eric G., to United Technologies Corporation. Seal assembly for a rotary machine. 5,464,227, Cl. 277-96.100.

Olympus Optical Co., Ltd.: *See*—
Kobayashi, Shohei, 5,465,247, Cl. 369-109.000.
Nakai, Sadao; Yamanaka, Masanobu; Ishikawa, Koji; Sato, Tsuyoshi; Yamamoto, Kimiaki; and Terashima, Mikihiko, 5,465,178, Cl. 359-670.000.

Omoda, Koichiro: *See*—
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; and Nagashima, Shigeo, 5,465,380, Cl. 395-800.000.

Omologo, Maurizio: *See*—
Lazzari, Gianni; Omologo, Maurizio; and Svaizer, Piergiorgio, 5,465,302, Cl. 381-92.000.

Omura, Ichiro: *See*—
Shinohe, Takashi; Nakayama, Kazuya; Takeuchi, Minami; Yamaguchi, Masakazu; Kitagawa, Mitsuhiko; Omura, Ichiro; and Nakagawa, Akio, 5,464,994, Cl. 257-147.000.

O'Neill, Eugene G.: *See*—
Creedon, Tadhg; O'Neill, Eugene G.; and O'Connell, Anne, 5,465,340, Cl. 395-846.000.

O'Neill, William G.: *See*—
Merte, Kenneth E.; and O'Neill, William G., 5,464,388, Cl. 604-153.000.

Ong, Adrian E.; and Zagar, Paul S., to Micron Semiconductor, Inc. Sense circuit for tracking charge transfer through access transistors in a dynamic random access memory. 5,465,232, Cl. 365-189.050.

Onji, Yuichi: *See*—
Hiraj, Kenji; Yamashita, Mitsuo; Tateno, Tomoko; Ejiri, Emiko; Harasawa, Kikuko; Onji, Yuichi; Ugai, Sadayuki; and Nagato, Shoin, 5,464,811, Cl. 504-281.000.

Ono, Akira; Masaki, Tateo; and Warabi, Hironori, to Uniden America Corp.; and Uniden Corporation. Automatic frequency transfer and storage method. 5,465,402, Cl. 455-161.200.

Ono, Masato: *See*—
Yagi, Shigeru; and Ono, Masato, 5,464,721, Cl. 430-126.000.

Ono, Michio; Kume, Masaharu; and Matsuo, Takayuki, to Asahi Glass Company Ltd. Structure for installing mirror base on glass plate and method for installing mirror base on glass plate. 5,464,693, Cl. 428-144.000.

Ootsuka, Seiji: *See*—
Ueno, Yoshiyuki; Morimoto, Masayoshi; Ootsuka, Seiji; Kawai, Tatsushi; and Satou, Susumu, 5,464,539, Cl. 210-603.000.

Opex Corporation: *See*—
Stevens, Albert F.; DeWitt, Robert R.; Lile, William R.; Mitchell, Paul R.; and Tentarelli, Stephen, 5,464,099, Cl. 209-3.100.

Or, Wilson: *See*—
Hutcheson, Timothy L.; Or, Wilson; Narayanan, Venkatesh; Mohan, Subramaniam; Wohlmut, Peter G.; Srinivasan, Ramanujam; Hunt, Bobby R.; and Ryan, Thomas W., 5,465,308, Cl. 382-159.000.

Orihiro Co., Ltd.: *See*—
Nagai, Katsumi, 5,463,851, Cl. 53-552.000.

Orion-yhtyma Oy: *See*—
Jalonen, Harry; and Lammintausta, Risto, 5,464,628, Cl. 424-448.000.

Ormco Corporation: *See*—
Andreiko, Craig A.; and Payne, Mark A., 5,464,349, Cl. 433-24.000.

Ortho Pharmaceutical Corporation: *See*—
Deraers, James P.; and Sulsky, Richard B., 5,464,865, Cl. 514-473.000.
Veronesi, Umberto; Chiesa, Fausto; and Costa, Alberto, 5,464,870, Cl. 514-617.000.

Orthopaedic Biosystems, Ltd.: *See*—
Skiba, Jeffry B., 5,464,425, Cl. 606-232.000.

Orton, Debra L.; Rollin, Keith A.; and Gibbons, Bill, to Taligent, Inc. Object-oriented view-system for displaying information in a windowing environment. 5,465,362, Cl. 395-700.000.

Orton, Debra L.; and Rollin, Keith. Wrapper system for enabling a non-multitasking application to access shered resources in a multitasking environment. 5,465,363, Cl. 395-700.000.

Oscar Mayer Foods Corporation: *See*—
Wells, Cindie M.; Halverson, Scott A.; and Jonovic, John A., 5,464,279, Cl. 312-128.000.

Osei-Gyimah, Peter; Sherba, Samuel E.; Lange, Barry C.; Mehta, Rai J.; and Joseph, Rhoda W., to Rohm and Haas Company. Substituted 3-thioacryloyl compounds and their use as antimicrobial agents. 5,464,832, Cl. 514-210.500.

Ota, Takeshi, to Fuji Xerox Co., Ltd. Multi-beam laser light source and multi-beam semiconductor laser array. 5,465,265, Cl. 372-101.000.

Otomatsu, Toshihiko: *See*—
Hirose, Katutoshi; Takagi, Yoshihiro; Otomatsu, Toshihiko; and Suzuki, Yoshiichi, 5,464,772, Cl. 435-280.000.

Otsuka, Kiyotaka; and Iwasaki, Jyuzaemon, to Matsushita Electric Works, Ltd. Reciprocatory dry shaver. 5,463,813, Cl. 30-43.900.

Otsuka Pharmaceutical Co., Ltd.: *See*—
Nakai, Satoru; Aihara, Koutoku; Tanaka, Hideo; Iba, Hitomi; Kawai, Kazuyoshi; Ichikawa, Hiroyuki; Akamatsu, Seiji; Saito, Fumio; Tominaga, Michiaki; and Adachi, Masakazu, 5,464,833, Cl. 514-251.000.

Ott, Roderick L. Accessory assembly for a vehicle wheel. 5,464,276, Cl. 301-37.340.

Otto, Thomas: *See*—
Kaspers, Norbert; Lang, Karl-Heinz; Baader, Helmut; Grün, Herbert; and Otto, Thomas, 5,463,953, Cl. 101-485.000.

Outboard Marine Corporation: *See*—
Craig, W. Scott; Hall, Charles B.; Lam, Edward K.; and Rogers, Duane E., 5,464,357, Cl. 440-89.000.
Rush, William B., II; Mondek, Martin J.; Sullivan, Donald K.; Walter, Mark A.; and Zdanowicz, Lawrence E., Sr., 5,463,990, Cl. 123-195.00P.

Ouvradou, Gerald: *See*—
Thepaut, André; and Ouvradou, Gerald, 5,465,375, Cl. 395-800.000.

Overberg, Matthias: *See*—
Hemmis, Ludger; Overberg, Matthias; and Schröder, Burkhard, 5,464,265, Cl. 296-146.140.

Owaki, Masanao, to Sony Corporation. Shortwave radio receiver with timer reception mode. 5,465,403, Cl. 455-186.100.

Owen, Hartley; and Schipper, Paul H., to Mobil Oil Corporation. FCC process and apparatus with upset tolerant third stage separator. 5,464,528, Cl. 208-161.000.

Owen, Ian R., to Minnesota Mining and Manufacturing Company. Curable sealer and/or adhesive composition, and a method for coating same in a wet state with a base coat paint, and coated substrates formed thereby. 5,464,888, Cl. 524-104.000.

Owens, Edward: *See*—
Vacek, Ronald R.; Semmler, Bruce; and Owens, Edward, 5,464,111, Cl. 215-249.000.

Owens-Illinois Plastic Products Inc.: *See*—
Koeniger, Carl E., 5,464,107, Cl. 215-12.200.

Owens, John C.: *See*—
Hoge, David T.; Konshak, Michael V.; Owens, John C.; Johnson, Michael W.; Rambosek, George P.; and Rieger, Thomas J., 5,465,187, Cl. 360-132.000.

Owensby, Joseph E.: *See*—
Moehlenbrock, Andrew W.; Owensby, Joseph E.; and Bagwell, Thomas H., 5,463,844, Cl. 53-436.000.

Oya, Yukio: *See*—
Kida, Shuji; Oya, Yukio; and Tai, Akiyoshi, 5,464,732, Cl. 430-505.000.

Oyama, Fumio: *See*—
Ito, Takafumi; Suzuki, Kenji; Ikeda, Takayuki; Oyama, Fumio; and Mazur, Walt, 5,465,370, Cl. 395-200.040.

Ozawa, Minoru: *See*—
Uematsu, Kazuyoshi; Takeshita, Kishio; and Ozawa, Minoru, 5,464,225, Cl. 277-1.000.

Ozogar, Donald A.: *See*—
Lautzenhiser, Frans P.; Carter, Bradley H.; Ozogar, Donald A.; and Sarma, Dwadasi H. R., 5,464,570, Cl. 252-500.000.

P. P. Payne Limited: *See*—
Parker, Alan; Chapman, Michael C.; Pinchen, Stephen P.; and Stonely, Carl J., 5,464,151, Cl. 229-206.000.

Pacesetter AB: *See*—
Hedberg, Sven-Erik; Obel, Martin; and Hoegnelid, Kurt, 5,464,429, Cl. 607-4.000.

Pacific International Pipe Enterprises, Inc.: *See*—
Wabnitz, Benjamin, 5,464,152, Cl. 238-8.000.

Padden, John; and Steingard, Michael A. Device for supporting and immobilizing a patient's arm and shoulder and method therefor. 5,464,383, Cl. 602-20.000.

Pai Lung Machinery Mill Co., Ltd.: *See*—
Yeh, Tzu-Pin, 5,463,882, Cl. 66-92.000.

Paige, Arnold: *See*—
Cooperman, Michael; Paige, Arnold; and Sieber, Richard W., 5,465,087, Cl. 340-825.800.

Palara, Sergio: *See*—
Zambrano, Raffaele; and Palara, Sergio, 5,464,993, Cl. 257-140.000.

Palme, Donald F., II: *See*—
Buscemi, Paul J.; Stejskal, Elizabeth A.; Palme, Donald F., II; and Wang, Lixiao, 5,464,450, Cl. 623-6.000.

Palmer, Arthur V.; and Leonard, Gary, to Dawson Metal Company, Inc. Squeeze and lift apparatus. 5,464,315, Cl. 414-458.000.

Palmer, Brian D.: *See*—
Dobrusin, Ellen M.; Showalter, Howard D. H.; Denny, William A.; Palmer, Brian D.; Rewcastle, Gordon W.; Tercel, Moana; and Thompson, Andrew M., 5,464,861, Cl. 514-414.000.

Palmer, Joseph P.; and Jones, Robert S., to Eastman Kodak Company. Passive film take-up chamber. 5,465,134, Cl. 355-75.000.

Palmour, John W.: *See*—
Cooper, James A., Jr.; Palmour, John W.; and Carter, Calvin H., Jr., 5,465,249, Cl. 365-149.000.

Pan, Tzu-Wang; and Yamasaki, Richard, to Silicon Systems, Inc. Method and apparatus for timing acquisition of partial response class IV signaling. 5,465,059, Cl. 327-12.000.

Panex Corporation: *See*—
Delatorre, Leroy C., 5,463,903, Cl. 73-861.020.

Paoli, Thomas L.: *See*—
Bour, David P.; and Paoli, Thomas L., 5,465,263, Cl. 372-23.000.

Paragas, Christopher O.: *See*—
Robinson, Alexander J.; and Paragas, Christopher O., 5,464,240, Cl. 280-281.100.

Paragon Trade Brands, Inc.: *See*—
Zajaczkowski, Peter, 5,464,402, Cl. 604-385.100.

Pardue, Stephen W.: *See*—
Hilt, James J.; Hodges, Ron; Pardue, Stephen W.; and Powar, William L., 5,465,206, Cl. 364-406.000.

Pareek, Vinod K.: *See*—

Ramanarayanan, Trikur A.; Pareek, Vinod K.; Mumford, James D., III; and Witzke, Horst, 5,464,523, Cl. 204-424.000.
Parekh, Shafi; Geiger, Bernard M.; Tsimberg, Alexander; Malik, Zaya H.; and Fowler, Reginald H., to Proezert USA, Inc. Chilled product dispensing apparatus. 5,463,878, Cl. 62-394.000.
Park, Sang-Rok; and Yoo, Jai-Heung, to Doowon Climate Control Co., Ltd. Heat exchanger for automobile air conditioning system and method for manufacture of the same. 5,464,145, Cl. 228-183.000.
Park, Woo S.: *See*—
Kang, Dae S.; Park, Woo S.; Shin, Hyun H.; Kwon, Soon B.; Marusii, Tatyana Y.; Reznikov, Yuriy A.; Khizhnyak, Anatoliy I.; and Yaroshchuk, Oleg V., 5,464,669, Cl. 428-1.000.
Parker, Alan; Chapman, Michael C.; Pinchen, Stephen P.; and Stonely, Carl J., to P. P. Payne Limited. Tear tape system and container including the same. 5,464,131, Cl. 229-206.000.
Parker, Jeffrey L.; Sorrells, David F.; Mix, John D.; and Daber, Richard P., to ParkerVision, Inc. Remote tracking system for moving picture cameras and method. 5,465,144, Cl. 356-139.060.
Parker, Jill E.: *See*—
Kiel, Johnathan L.; Parker, Jill E.; and Bruno, John G., 5,464,768, Cl. 435-240.200.
Parker, Sherwood I.: *See*—
Snoeys, Walter; and Parker, Sherwood I., 5,465,002, Cl. 257-458.000.
ParkerVision, Inc.: *See*—
Parker, Jeffrey L.; Sorrells, David F.; Mix, John D.; and Daber, Richard P., 5,465,144, Cl. 356-139.060.
Parkin, Stuart S. P.: *See*—
Heim, David E.; and Parkin, Stuart S. P., 5,465,185, Cl. 360-113.000.
Parks, Terry J.; and Gaskins, Darius D., to Dell USA, L.P. Method and apparatus for synchronous bus interface optimization. 5,465,346, Cl. 395-296.000.
Parris, Robert P.: *See*—
McGregor, John A.; and Parris, Robert P., 5,464,965, Cl. 219-497.000.
Parsons, Harold R.: *See*—
Schilling, Steven L.; Yeater, Robert P.; Soland, Phil M.; Szabat, John F.; and Parsons, Harold R., 5,464,560, Cl. 252-182.240.
Patent-Treuhand-Gesellschaft für elektrische Glühlampen mbH: *See*—
Langer, Alfred; Genz, Andreas; Deisenhofer, Manfred; Kiele, Walter; Lewandowski, Bernd; and Reichardt, Jürgen, 5,464,462, Cl. 65-66.000.
Pattanaik, Surya: *See*—
Bajorek, Christopher H.; Erpelding, A. David; Garfunkel, Glen A.; Pattanaik, Surya; Robertson, Neil L.; and Wallash, Albert J., 5,465,186, Cl. 360-113.000.
Patterson, Andrew J.: *See*—
Tomkins, Murray R.; and Patterson, Andrew J., 5,464,036, Cl. 137-315.000.
Patterson, Jimmy L., to BASF Corporation. Polyoxyalkylene polyether monool polyurethane foam additive. 5,464,562, Cl. 252-182.280.
Patterson, Michael S.: *See*—
Marinelli, Anne M. P.; and Patterson, Michael S., 5,465,050, Cl. 324-603.000.
Patton, Jasson T.; and Neithamer, David R., to Dow Chemical Company, The. Ethylene homopolymerization using group 3 metal complexes. 5,464,906, Cl. 525-240.000.
Pauer, Reinhard: *See*—
Albring, Peter; Apley, Rainer; Döge, Klaus; Heinrich, Günter; Lindner, Ernst; Müller, Norbert; Pauer, Reinhard; Pilling, Eberhard; and Rudischer, Rainer, 5,464,325, Cl. 416-185.000.
Paul, James C.: *See*—
Gielow, Robert L.; and Paul, James C., 5,463,967, Cl. 110-104.00R.
Paul, Michael, to Audi AG. Valve actuating mechanism for an internal combustion engine. 5,463,988, Cl. 123-90.160.
Paul, Ronald: *See*—
Kortright, Kenneth H.; Coulter, Wallace H.; Rodriguez, Carlos; Russell, Thomas; and Paul, Ronald, 5,464,752, Cl. 435-7.240.
Pavlin, Antoine: *See*—
Meunier, Philippe; and Pavlin, Antoine, 5,465,190, Cl. 361-91.000.
Paybarah, Ali; and McWilliams, Joseph A., to Zortech International Limited. Apparatus for cutting wound coils. 5,463,919, Cl. 82-92.000.
Payne, Gerald S.: *See*—
Jotcham, Richard B.; and Payne, Gerald S., 5,465,301, Cl. 380-54.000.
Payne, Mark A.: *See*—
Andreiko, Craig A.; and Payne, Mark A., 5,464,349, Cl. 433-24.000.
Peach State Labs, Inc.: *See*—
Williams, Michael S.; and Moss, Thomas H., III, 5,464,911, Cl. 525-502.000.
Pease, Jacqueline K., to Betz PaperChem, Inc. Anionic sulfonate surfactants in the washing and pulping operation. 5,464,502, Cl. 162-60.000.
Peck, Kenneth. Adjustable compound bow. 5,464,001, Cl. 124-25.600.
Peglion, Jean-Louis; Goument, Bertrand; Millan, Mark; and Rivet, Jean-Michel, to Adir et Compagnie. N-substituted N'-heterobicyclic piperazines having pharmaceutical activity. 5,464,834, Cl. 514-254.000.
Pelella, Antonio R., to International Business Machines Corporation. Fast edge triggered self-resetting CMOS receiver with parallel L1/L2 (Master/Slave) latch. 5,465,060, Cl. 327-51.000.
Pellerin, James W.; Poy, Russell H.; and Bradley, Edward J., to Pellerin Milnor Corporation. Textile treating machine. 5,463,883, Cl. 68-140.000.
Pellerin Milnor Corporation: *See*—
Pellerin, James W.; Poy, Russell H.; and Bradley, Edward J., 5,463,883, Cl. 68-140.000.
Pelletier, Gary F.: *See*—
Lein, Maureen M.; Pelletier, Gary F.; Goad, Jeffrey D.; and Lee, Chinsoo S., 5,464,661, Cl. 427-409.000.
Penberthy, Inc.: *See*—
Sanders, Gary G.; and Kessinger, John R., 5,465,041, Cl. 323-312.000.
Penn State Research Foundation, The: *See*—
Allcock, Harry R.; Cameron, Charles G.; and Smith, Dawn E., 5,464,932, Cl. 528-399.000.
Perez, Diogenes: *See*—
Lohberg, Peter; Bayer, Ronald; Halat, Siegfried; Kircher, Dieter; Perez, Diogenes; and Sparschuh, Stefan, 5,464,079, Cl. 188-315.000.
Perez, Julie A.: *See*—
Jaskowiak, Timothy R.; Coughlin, Daniel L.; Perez, Julie A.; Gilmore, Daniel R., III; DiGravio, Thomas L.; and Taft, Kevin H., 5,465,138, Cl. 355-245.000.
Perfecto, Eric D.; Prasad, Chandrika; Prasad, Keshav; Robbins, Gordon J.; Swaminathan, Madhavan; and White, George E., to International Business Machines Corporation. Minimal capture pads applied to ceramic vias in ceramic substrates. 5,464,682, Cl. 428-210.000.
Perkin-Elmer Corporation, The: *See*—
Bourdoulous, Robert P.; and Vollmer, John, 5,464,157, Cl. 239-424.000.
Perry, Darwin L. Fruit picking apparatus. 5,463,859, Cl. 56-332.000.
Perry, Richard W.: *See*—
Cowan, Robert L., II; Gordon, Gerald M.; Hale, Donald A.; and Perry, Richard W., 5,465,278, Cl. 376-245.000.
Peacetto, Michael J.: *See*—
Belenkiy, Yuriy; Groia, Igor; Gumin, Irina L.; Makhlin, Ilya; Margolin, Mark; and Peacetto, Michael J., 5,465,313, Cl. 385-80.000.
Peachka, Walter; and Schneider, Gottfried, to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V. Heat pumping method as well as heat pump for generating cryogenic temperatures. 5,463,868, Cl. 62-6.000.
Peters, Michael W.; Smith, William A.; Mueller, Mark A.; and Culbreth, William K., III, to Texaco Chemical Inc. Use of propylene oxide adducts in the purification of propylene oxide by extractive distillation. 5,464,505, Cl. 203-64.000.
Petersen, Uwe; Krebs, Andreas; Schenke, Thomas; Kunisch, Franz; Philipps, Thomas; Grobe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. 7-isoindolinyl-quinolone-carboxylic acid derivatives. 5,464,796, Cl. 514-312.000.
Peterson, Brian, to Tri-Tech, Inc. Integral shaft bearing and bobbin for electric motors. 5,465,020, Cl. 310-194.000.
Peterson, Bruce R.: *See*—
Henson, James A.; McGrath, James P.; Peterson, Bruce R.; Glassburn, Tim R.; Raab, Michael L.; and Do, James H., 5,465,343, Cl. 395-439.000.
Peterson, David; and Butkirk, Gregory V., to Clorox Company, The. Stable liquid aqueous oxidant detergent. 5,464,552, Cl. 252-95.000.
Peterson, Karen B.: *See*—
Hansen, Donald W., Jr.; Peterson, Karen B.; and Monahan, Joseph B., 5,464,843, Cl. 514-300.000.
Petillo, Richard J.: *See*—
Chiller, Martin S.; Coulter, Peter L.; and Petillo, Richard J., 5,465,293, Cl. 379-189.000.
Petit, Robert G.: *See*—
Callahan, Steven E.; and Petit, Robert G., 5,464,091, Cl. 206-45.150.
Petschek, Harry: *See*—
Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adaniva, George, 5,464,392, Cl. 604-67.000.
Pfaffenbichler, Peter: *See*—
Barta, Helmut; Eder, Helmut; Granser, Manfred; Habison, Georg; Hantak, Edith; Moser, Franz; and Pfaffenbichler, Peter, 5,464,396, Cl. 604-191.000.
Pfizer Inc.: *See*—
Mano, Takashi; Stevens, Rodney W.; and Nakane, Masami, 5,464,849, Cl. 514-365.000.
Pflieger, Philippe: *See*—
Böhringer, Markus; Hubschwerlen, Christian; Pflieger, Philippe; and Specklin, Jean-Luc, 5,464,617, Cl. 424-114.000.
Phelipon, Axel: *See*—
Commier, Philippe; Phelipon, Axel; and Le Masson, Jacques, 5,464,242, Cl. 280-602.000.
Philipps, Thomas: *See*—
Petersen, Uwe; Krebs, Andreas; Schenke, Thomas; Kunisch, Franz; Philipps, Thomas; Grobe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, 5,464,796, Cl. 514-312.000.
Phillips, Brian S.: *See*—
Chang, Yeon-Ho; Barbee, Robert B.; and Phillips, Brian S., 5,464,909, Cl. 525-438.000.
Phillips, Dayle E.: *See*—
Duensing, David T.; Phillips, Dayle E.; and Simmons, Dennis C., 5,465,378, Cl. 395-800.000.
Phillips Petroleum Company: *See*—
Beauford, Martin H., 5,464,504, Cl. 203-3.000.
Shaw, James E.; Sattich, William E.; and Efner, Howard F., 5,464,931, Cl. 528-389.000.
Phillips, Robert L.: *See*—
Fogle, John R., 5,463,815, Cl. 30-276.000.
Phillips, Van L. Prosthetic leg. 5,464,441, Cl. 623-27.000.

Photon Dynamics, Inc.: *See*—
Henley, Francois J., 5,465,052, Cl. 324-770.000.
Physio-Control Corporation: *See*—
Hill, Douglas J., 5,464,428, Cl. 607-1.000.
Piacente-Vitro, Maria: *See*—
Mastinko, Kathleen; Piacente-Vitro, Maria; and Spector, George, 5,463,981, Cl. 119-71.000.
Picavet, Fred: *See*—
Fischer, Dan E.; and Picavet, Fred, 5,464,348, Cl. 433-26.000.
Pickering, Michael A.; Goela, Jitendra S.; and Burns, Lee E., to CVD, Incorporated. Hard disc drives and read/write heads formed from highly thermally conductive silicon carbide. 5,465,184, Cl. 360-97.010.
Pickert, William F., to Motorola, Inc. Method and apparatus for selecting the best fixed communication unit. 5,465,397, Cl. 455-62.000.
Pickrum, Harvey M.: *See*—
Kelm, Gary R.; Pickrum, Harvey M.; Doyle, Matthew J.; and Buchanan, William, 5,464,609, Cl. 424-54.000.
Pielartzik, Harald: *See*—
Archey, Rick L.; Lundy, Charles E.; Meltzer, Aaron D.; Pielartzik, Harald; Fennhoff, Gerhard; Hufen, Ralf; Kircher, Klaus; Schubert, Rudiger; and Weider, Richard, 5,464,893, Cl. 524-366.000.
Pien, André L. J.; and De Pauw, Carlo E. M., to Wetenschappelijk en Technisch Centrum voor het Bouwbedrijf. Vegetation-inhibiting product for young plantings. 5,463,830, Cl. 47-9.000.
Pierce, Michael C.: *See*—
Priebe, W. F.; Foster, Ricky L.; and Pierce, Michael C., 5,464,188, Cl. 248-678.000.
Pierce, Richard A., to WNAN, Inc. Programmable baseball pitching apparatus. 5,464,208, Cl. 273-26.00D.
Pietras, Mark A.: *See*—
Hancock, Steven M.; and Pietras, Mark A., 5,465,118, Cl. 348-396.000.
Piggott, James R.: *See*—
Labroo, Virender M.; Piggott, James R.; and Bain, Steven D., 5,464,862, Cl. 514-422.000.
Pille, Maria: *See*—
Lyding, Günther; Pille, Maria; von Plessen, Helmold; and Semel, Joachim, 5,464,876, Cl. 521-46.500.
Pilling, Eberhard: *See*—
Albring, Peter; Apley, Rainer; Döge, Klaus; Heinrich, Günter; Lindner, Ernst; Müller, Norbert; Pauer, Reinhard; Pilling, Eberhard; and Rudischer, Rainer, 5,464,325, Cl. 416-185.000.
Pinault, Francis; and Jouin, Christophe, to Alcatel Radiotelephone. Device for fixing the duration of waiting periods between attempts to establish a connection between a terminal and a mobile radio system. 5,465,394, Cl. 455-54.100.
Pinchen, Stephen P.: *See*—
Parker, Alan; Chapman, Michael C.; Pinchen, Stephen P.; and Stonely, Carl J., 5,464,151, Cl. 229-206.000.
Pinkus, Fred J., to Crown Textile Company. Multiple ply tie interlining and method. 5,463,779, Cl. 2-144.000.
Pinnacle Research Institute, Inc.: *See*—
Tong, Robert R.; Poplett, James M.; McEwen, Alan B.; Mason, Gary E.; Goodwin, Mark L.; Tsai, K. C.; Anderson, Ronald L.; and Nelson, James P., 5,464,453, Cl. 29-25.030.
Pioneer Electronic Corporation: *See*—
Ohga, Eiji; Kawasaki, Masahiko; Sakuma, Kazushi; Takahashi, Tatsuo; and Tozaki, Ryusuke, 5,465,385, Cl. 455-6.100.
Yanagawa, Naoharu, 5,465,245, Cl. 369-58.000.
Pioneer Hi-Bred International, Inc.: *See*—
Rao, A. Gururaj; and Zhong, Lingxiu, 5,464,944, Cl. 536-23.600.
Piska, Venu G.: *See*—
Blander, Richard S.; Wenzel, Kenneth J.; and Piska, Venu G., 5,463,898, Cl. 73-116.000.
Pitney Bowes Inc.: *See*—
Foster, Dean H.; Holbrook, Russell W.; Morabito, James; Silverberg, Morton; and Supron, Steven A., 5,464,317, Cl. 414-798.200.
Mol, Hans C.; and Ramsey, James S., 5,464,142, Cl. 225-100.000.
Pittman, Jerry W. Hydraulic disc brake actuator. 5,464,078, Cl. 188-112.00R.
Pla, Frederic G.; and Hedeen, Robert A., to General Electric Company. Sensor matching through real-time output compensation. 5,463,893, Cl. 73-4.00R.
Plachetta, Christoph: *See*—
Gareiss, Brigitte; Baierweck, Petra; Plachetta, Christoph; and Ulmerich, Karlheinz, 5,464,894, Cl. 524-424.000.
Planeta, Mirek. Air rings for cooling blown plastic film. 5,464,336, Cl. 425-72.100.
Plastipak Packaging, Inc.: *See*—
Slat, William A.; and Darr, Richard C., 5,464,106, Cl. 215-12.100.
Plastpolymer Share Holding Company: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Arnosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karnakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.
Plevich, Alexander P.: *See*—
Sikes, Roger A.; and Plevich, Alexander P., 5,464,475, Cl. 118-719.000.
Plowdrey, Robert D.: *See*—
Whitecar, John E.; and Plowdrey, Robert D., 5,465,406, Cl. 455-234.100.
Pluim, Henk; and Kraaijenbrink, Jan G., to Duphar International Research B.V. Method for separating organic substances. 5,464,514, Cl. 204-182.400.
Podio, Augusto L.: *See*—
McCoy, James N.; Podio, Augusto L.; and Jennings, James W., 5,464,058, Cl. 166-250.010.
Polar Electro Oy: *See*—
Birnbaum, Burton H., 5,464,021, Cl. 128-696.000.
Polgreen, Thomas L.; Chatterjee, Amitava; and Yang, Ping, to Texas Instruments Incorporated. Low voltage triggering semiconductor controlled rectifiers. 5,465,189, Cl. 361-58.000.
Polyshot Corporation: *See*—
Hepler, Douglas C., 5,464,343, Cl. 425-549.000.
Polywka, Robert: *See*—
Hales, Stephen G.; Khoshdel, Ezat; and Polywka, Robert, 5,464,558, Cl. 252-174.240.
Pope, Brenda. Combination blanket/carrying bag/apparel. 5,463,783, Cl. 5-417.000.
Pope, Kenneth L.: *See*—
Nanaji, Seifollah S.; Pope, Kenneth L.; and Sobota, Richard R., 5,464,466, Cl. 95-45.000.
Popescu, Miron G.; Bekus, David F.; Routh, Shakti; Vera, Luis E.; and Clark, Thomas A., to Ethicon, Inc. Process of sterilization. 5,464,580, Cl. 422-34.000.
Poplett, James M.: *See*—
Tong, Robert R.; Poplett, James M.; McEwen, Alan B.; Mason, Gary E.; Goodwin, Mark L.; Tsai, K. C.; Anderson, Ronald L.; and Nelson, James P., 5,464,453, Cl. 29-25.030.
Porres Sanchez, Francisco; and Barrufet Barque, Maria M. Two chamber container for separate solid and/or liquid food products. 5,464,150, Cl. 229-120.380.
Portals (Bathford) Limited: *See*—
Jotcham, Richard B.; and Payne, Gerald S., 5,465,301, Cl. 380-54.000.
Porter, Christopher H.: *See*—
Reid, John M.; Kauphusman, James V.; Porter, Christopher H.; and Neilson, Bruce H., 5,464,437, Cl. 607-101.000.
Porter, John R.: *See*—
Sieck, Peter A.; and Porter, John R., 5,464,518, Cl. 204-192.120.
Portoghese, Philip S.; Sharp, Burt M.; and Linner, Kristin M. Use of delta opioid receptor antagonists to treat immunoregulatory disorders. 5,464,841, Cl. 514-279.000.
Post, Lothar: *See*—
Bisping, Bernhard; and Post, Lothar, 5,463,930, Cl. 89-29.000.
Potter, Ellen; Behan, Dominic P.; Fischer, Wolfgang H.; Linton, Elizabeth A.; Lowry, Philip J.; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The ; and University of Reading. DNA encoding CRF binding protein. 5,464,757, Cl. 435-69.100.
Poursepanj, Ali A.: *See*—
Kahle, James A.; Kau, Chin-Cheng; Levitan, David S.; Ogden, Aubrey D.; Poursepanj, Ali A.; Tu, Paul K.-G.; and Waldecker, Donald E., 5,465,373, Cl. 395-800.000.
Powar, William L.: *See*—
Hilt, James J.; Hodges, Ron; Pardue, Stephen W.; and Powar, William L., 5,465,206, Cl. 364-406.000.
Powell, J. Anthony: *See*—
Larkin, David J.; Neudeck, Philip G.; Powell, J. Anthony; and Matus, Lawrence G., 5,463,978, Cl. 117-89.000.
Power Tool Holders, Inc.: *See*—
Salpaka, Glenn L., 5,464,229, Cl. 279-30.000.
Powers, Richard G., to Marlen Research Corporation. Food pump. 5,464,338, Cl. 425-145.000.
Powers Jr., Carleton A. Bacteria valve. 5,464,397, Cl. 604-246.000.
Poy, Russell H.: *See*—
Pellerin, James W.; Poy, Russell H.; and Bradley, Edward J., 5,463,883, Cl. 68-140.000.
PPG Industries, Inc.: *See*—
Athey, Patricia R.; Dauson, Douglas S.; Lecocq, David E.; Neuman, George A.; Sopko, John F.; and Stewart-Davis, Royann L., 5,464,657, Cl. 427-255.500.
Das, Suryya K.; and Kilic, Soner, 5,464,897, Cl. 524-458.000.
Scott, Matthew S.; McCollum, Gregory J.; Szymanski, Chester J.; and Wilson, Craig A., 5,464,887, Cl. 523-501.000.
Prasad, Chandrika: *See*—
Perfecto, Eric D.; Prasad, Chandrika; Prasad, Keshav; Robbins, Gordon J.; Swaminathan, Madhavan; and White, George E., 5,464,682, Cl. 428-210.000.
Prasad, Keshav: *See*—
Perfecto, Eric D.; Prasad, Chandrika; Prasad, Keshav; Robbins, Gordon J.; Swaminathan, Madhavan; and White, George E., 5,464,682, Cl. 428-210.000.
Prasad, Vidanatha A.: *See*—
Newallis, Peter E.; Prasad, Vidanatha A.; and Applegate, Jacqueline M., 5,464,600, Cl. 423-300.000.
Prater, Craig B.; Massie, James; Grigg, David A.; Elings, Virgil B.; Hansma, Paul K.; and Drake, Barney, to Digital Instruments, Inc.; and University of California, The Regents of the. Scanning stylus atomic force microsope with cantilever tracking and optical access. 5,463,897, Cl. 73-105.000.
Prater, David M.: *See*—
Koch, Albert F., III; and Prater, David M., 5,464,015, Cl. 128-660.070.
Pratt, James R.: *See*—
Guy, Thomas D.; Granger, Richard N.; Brady, Robert H.; Webster, John; Pratt, James R.; Stone, Corbett W.; and Alesi, Thomas W., Jr., 5,464,144, Cl. 227-176.000.
Praxair Technology, Inc.: *See*—

Cheung, Harry, 5,463,871, Cl. 62-38.000.

Precision Castparts Corporation: *See*—
Yasrebi, Mehrdad; Kemp, William W.; Sturgis, David H.; Nikolas, Douglas G.; Wright, Gary L.; Kelly, Thomas J., III; Springgate, Mark E.; and Crego, Ted R., 5,464,797, Cl. 501-103.000.

Precision Fukuhara Works, Ltd.: *See*—
Igarashi, Yoshiaki; and Ito, Yoshiro, 5,463,881, Cl. 66-31.000.

Preddy, Carl R.; and Holtzclaw, John V., to Eastman Kodak Company. Supersensitizing bis-benzothiazolocyanine dye combination for red sensitive silver halide emulsions. 5,464,735, Cl. 430-574.000.

Premark FEG Corporation: *See*—
Litterst, Jürgen, 5,464,032, Cl. 134-72.000.

Priddy, Dennis G.; and Cymbalski, Robert S., to International Data Matrix, Inc. Dynamically variable machine readable binary code and method for reading and producing thereof. 5,464,974, Cl. 235-494.000.

Priebe, W. F.; Foster, Ricky L.; and Pierce, Michael C., to Atlantic Richfield Company. Well pump base. 5,464,188, Cl. 248-678.000.

Priester, Donnan E.: *See*—
Chapman, George R., Jr.; Crenshaw, Lewis E.; McMinn, Rita S.; Morgan, Richard A.; Priester, Donnan E.; Stewart, Charles W.; and Tarney, Robert E., 5,464,904, Cl. 525-200.000.

Prince Corporation: *See*—
Spykerman, David J.; DeShaw, Gerald M.; Gregg, Michael J.; and Eldred, Randy E., 5,464,272, Cl. 297-227.000.

Prince, George T.; and Fisher, Mark J., to Applied Power Inc. Cyclic hydraulic pump improvements. 5,464,330, Cl. 417-245.000.

Prince Lionhears, Inc.: *See*—
McConnell, Thomas E.; and Arnold, Peter C., 5,464,183, Cl. 248-311.200.

Prince Sports Group, Inc.: *See*—
Davis, Stephen J.; and Terzaghi, André, 5,464,210, Cl. 273-73.00C.

Princeton Scientific Enterprises, Inc.: *See*—
Blair, David W., 5,463,954, Cl. 102-202.000.

Procter & Gamble Company, The: *See*—
Hasse, Margaret H.; Bridges, Russell P.; and Miller, Steven W., 5,464,401, Cl. 604-385.100.
Kelm, Gary R.; Picknum, Harvey M.; Doyle, Matthew J.; and Buchanan, William, 5,464,609, Cl. 424-54.000.
Kuznicki, James T.; and Turner, Lana S., 5,464,619, Cl. 424-195.100.
Lodge, Richard W., 5,464,643, Cl. 426-439.000.
Villagran, Maria D.; Toman, Lori J.; Byars, Kenneth D.; Dawes, Nancy C.; and Zimmerman, Stephen P., 5,464,642, Cl. 426-439.000.

Propper Manufacturing Co., Inc.: *See*—
Nussenbaum, Joseph, 5,465,124, Cl. 351-245.000.

Pruitt, Martin E.: *See*—
O'Halloran, Michael L.; Case, Cecil L.; Pruitt, Martin E.; and Fritz, David P., 5,463,852, Cl. 56-6.000.

Pryor, Dennis M.; and Challis, Michael, to Raychem Limited. Circuit protection device. 5,465,188, Cl. 361-18.000.

Puckett, Robert L.: *See*—
Strickland, S. Scott; Krietemeyer, James R.; Liao, Jing; Mead, Ian D.; and Puckett, Robert L., 5,465,215, Cl. 364-474.220.

Puma AG: *See*—
Miller, Dave, 5,463,822, Cl. 36-50.100.

Purdue Research Foundation: *See*—
Cooper, James A., Jr.; Palmour, John W.; and Carter, Calvin H., Jr., 5,465,249, Cl. 365-149.000.

Pursifull, Ross D.; and Kotwicki, Allan J., to Ford Motor Company. Fuel controller with an adaptive adder. 5,464,000, Cl. 123-674.000.

Pushong, Kelly B.: *See*—
Allen, Ruth A.; Goetze, Lisa M.; Nick, Jeffrey M.; Pushong, Kelly B.; Surman, David H.; and Swanson, Michael D., 5,465,359, Cl. 395-700.000.

Putilin, Andrei: *See*—
Caulfield, H. John; Huang, Qiang; Putilin, Andrei; and Morozov, Valentin, 5,465,311, Cl. 385-27.000.

Pykhtin, Viktor A.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa P.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

Pyles, Robert A.: *See*—
Silva, James M.; and Pyles, Robert A., 5,464,930, Cl. 528-371.000.

Quality Manufacturing incorporated: *See*—
Huber, Mortimer J., 5,464,692, Cl. 428-343.000.

Quamco, Inc.: *See*—
Moy, James, 5,464,287, Cl. 384-13.000.

Quantum Corporation: *See*—
Henson, James A.; McGrath, James P.; Peterson, Bruce R.; Glassburn, Tim R.; Raab, Michael L.; and Do, James H., 5,465,343, Cl. 395-439.000.
Scaramuzzo, John A., Jr.; and Brockett, Roger W., 5,465,035, Cl. 318-561.000.

Raab, Michael L.: *See*—
Henson, James A.; McGrath, James P.; Peterson, Bruce R.; Glassburn, Tim R.; Raab, Michael L.; and Do, James H., 5,465,343, Cl. 395-439.000.

Racine, Lloyd G.; Feldpausch, James F.; and Fantin, Ronald M., to Webasto Sunroofs, Inc. Stable lift mechanism for spoiler sun roof panel. 5,464,267, Cl. 296-216.000.

Rahnema, Moe, to Motorola, Inc. Method and apparatus for demand-assigned reduced-rate out-of-band signaling channel. 5,465,253, Cl. 370-68.100.

Raihala, Kenneth B.: *See*—
Whitson, Frederick A.; Siebert, William K.; and Raihala, Kenneth B., 5,464,461, Cl. 55-480.000.

Rainbolt, Joe L., to Grass Valley Group, Inc., The. Digital decoding of biphase-mark encoded serial digital signals. 5,465,268, Cl. 375-333.000.

Rajagopalan, Raghavan: *See*—
Dunn, T. Jeffrey; Srinivasan, Ananthachari; Lyle, Leon R.; and Rajagopalan, Raghavan, 5,464,934, Cl. 530-326.000.

Raju, Bore G.: *See*—
Chan, Ming F.; Raju, Bore G.; Castillo, Rosario S.; Kois, Adam; Wu, Chengde; and Balaji, Vitukudi, 5,464,853, Cl. 514-378.000.

Rakestraw, Lawrence F.: *See*—
Hight, Terry V. T.; Matson, Jack V.; Rakestraw, Lawrence F.; Zhang, Zhihe; and Kuechler, Thomas C., 5,464,636, Cl. 424-661.000.

Rall, Dieter L., to Luxtron Corporation. Autocalibrating non-contact temperature measuring technique employing dual recessed heat flow sensors. 5,464,284, Cl. 374-131.000.

Ralston, Joseph L.: *See*—
Lauritzen, Donald R.; and Ralston, Joseph L., 5,464,249, Cl. 280-741.000.

Ramanarayanan, Trikur A.; Pareek, Vinod K.; Mumford, James D., III; and Witzke, Horst, to Exxon Research & Engineering Co. Sensors for sulfur activity measurements. 5,464,523, Cl. 204-424.000.

Rambosek, George P.: *See*—
Hoge, David T.; Konshak, Michael V.; Owens, John C.; Johnson, Michael W.; Rambosek, George P.; and Rieger, Thomas J., 5,465,187, Cl. 360-132.000.

Ramsey, James S.: *See*—
Mol, Hans C.; and Ramsey, James S., 5,464,142, Cl. 225-100.000.

Rank, Craig: *See*—
St. John, James F.; Fetterhoff, John G.; Carpenter, John R.; Brown, B. Douglas; Azzara, C. Daniel; Tarka, Stanley M., Jr.; Rank, Craig; and Strohmaier, George K., 5,464,649, Cl. 426-660.000.

Rao, A. Gururaj; and Zhong, Lingxiu, to Pioneer Hi-Bred International, Inc. Synthetic antifungal peptides. 5,464,944, Cl. 536-23.600.

Rao, Satish: *See*—
Li, Yao; and Rao, Satish, 5,465,379, Cl. 395-800.000.

Rao, V. Durga N., to Ford Motor Company. Solid lubricant and hardenable steel coating system. 5,464,486, Cl. 148-525.000.

Raper, James K.: *See*—
Isharani, Jayanti V.; Raper, James K.; Allen, A. Donald, Jr.; and Middleton, John W., 5,464,545, Cl. 252-8.600.

Rasmussen, Melvin A. Solar actuated animal feeder. 5,463,980, Cl. 119-57.100.

Ratzelt, Robert R.: *See*—
Zuerner, Edwin C.; Ratzelt, Robert R.; and Foster, Norman, 5,464,556, Cl. 252-170.000.

Rau, Peter B.: *See*—
Hasenberg, Mark J.; and Rau, Peter B., 5,465,196, Cl. 362-183.000.

Ravagnani, Frederick J.: *See*—
Freeman, Roy M.; Hergenrother, William L.; and Ravagnani, Frederick J., 5,464,899, Cl. 524-504.000.

Ravet, Georges: *See*—
Blanchard, Pierre; Egraz, Jean-Bernard; and Ravet, Georges, 5,464,895, Cl. 524-425.000.

Ray, Roderick J.: *See*—
Prieaen, Dwayne T.; Newbold, David D.; McCray, Scott B.; and Ray, Roderick J., 5,464,540, Cl. 210-640.000.

Raychem Limited: *See*—
Pryor, Dennis M.; and Challis, Michael, 5,465,188, Cl. 361-18.000.

Raytheon Company: *See*—
Baseghi, Behshad; Mazooji, Mohammad; and Holtz, Brian E., 5,465,405, Cl. 455-226.400.

RCT Systems, Inc.: *See*—
Conrad, Gary L.; Denenberg, Byron A.; and Kramerich, George L., 5,465,115, Cl. 348-155.000.

Recker, Hans G., to Cytec Technology Corp. Toughening of brittle epoxy resin matrices with functionalized particulate elastomers. 5,464,902, Cl. 525-119.000.

Redd, Kevin D. Adaptor hub for automotive wheel ornaments. 5,464,277, Cl. 301-105.400.

Reddy, Chandrashekar M.; Hirose, Scott D.; Cho, Sung-Soo; Kardach, James P.; Parrer, Steven M.; and Roberts, Meeling, to Intel Corporation. Slow memory refresh in a computer with a limited supply of power. 5,465,367, Cl. 395-750.000.

Reddy, Jayanthi: *See*—
Chartrain, Michel M.; Reddy, Jayanthi; and Tschaen, David M., 5,464,762, Cl. 435-156.000.

Redfield Engineering: *See*—
Roden, Michael J., 5,463,791, Cl. 15-320.000.

Reed, Stuart E.: *See*—
Kidwell, J. Jeffrey; Reed, Stuart E.; Ryan, Patrick M.; Harwig, Dennis D.; and Womack, E. Allen, Jr., 5,464,957, Cl. 219-130.010.

Reell Precision Manufacturing Corporation: *See*—
Arnold, Joseph E.; and Wahlstedt, David A., 5,464,083, Cl. 192-8.00C.

Reens, Daniel J.: *See*—
Early, Brian J.; Reens, Daniel J.; and Karnoff, Robert S., 5,463,873, Cl. 62-121.000.

Reflexion Plus: *See*—

Massieu, Jean-Louis; and Thuries, Serge, 5,464,972, Cl. 235-462.000.
Regal Ware, Inc.: *See*—
Hupf, Charles J.; and Rohrer, Jeffrey, 5,463,942, Cl. 99-537.000.
Register, David S., to Dell USA, L.P. Battery charging/data transfer apparatus for a handheld computer. 5,465,038, Cl. 320-2.000.
Reichardt, Jürgen: *See*—
Langer, Alfred; Genz, Andreas; Deisenhofer, Manfred; Kiele, Walter; Lewandowski, Bernd; and Reichardt, Jürgen, 5,464,462, Cl. 65-66.000.
Reid, John M.; Kauphusman, James V.; Porter, Christopher H.; and Neilson, Bruce H., to Urologix, Inc. Benign prostatic hyperplasia treatment catheter with urethral cooling. 5,464,437, Cl. 607-101.000.
Reinicke, Robert H., to Marotta Scientific Controls, Inc. Magnetically latched multi-valve system. 5,464,041, Cl. 137-595.000.
Reisensuer, Theodore E. Roller chain breaker. 5,463,862, Cl. 59-7.000.
Remondiere, Olivier; and David, Jean-François, to Alcatel N.V. Radiating device for a planar antenna. 5,465,100, Cl. 343-769.000.
Renard, Pierre: *See*—
Langlois, Michel; Renard, Pierre; and Adam, Gérard, 5,464,872, Cl. 514-630.000.
Rencs, Erik: *See*—
Hall, Deborah K.; and Rencs, Erik, 5,464,960, Cl. 219-121.600.
Renew Roof Technologies Inc.: *See*—
Gregory, David B.; and Oliver, Dan A., 5,464,492, Cl. 156-246.000.
Rennie, Patrick, to Cosmoplast. Squeeze lube with a closure device resiliently urged forward closed position. 5,464,134, Cl. 222-507.000.
Rentz, Rosemary. Manicure work station. 5,464,029, Cl. 132-73.500.
Research Development Corporation: *See*—
Manada, Nobuaki; Ito, Junji; Kurabayashi, Toru; and Nishizawa, Junichi, 5,463,977, Cl. 117-85.000.
Research Development Foundation: *See*—
Six, Howard R.; and Garcon, Nathalie B., 5,464,630, Cl. 424-450.000.
Research Institute of Innovative Technology for the Earth: *See*—
Ueno, Yoshiyuki; Morimoto, Masayoshi; Ootsuka, Seiji; Kawai, Tatsushi; and Satou, Susumu, 5,464,539, Cl. 210-603.000.
Resnick, Douglas J.: *See*—
Mogab, C. Joseph; Dauksher, William J.; and Resnick, Douglas J., 5,464,711, Cl. 430-5.000.
Retzer, Michael H.; and Muehlfeld, Alan D., to Motorola, Inc. Communications receiver with an adaptive squelch system. 5,465,404, Cl. 455-220.000.
Reuterfors, Aldor E. Repositionable tuning peg. 5,463,924, Cl. 84-304.000.
Revis, Anthony: *See*—
Kosal, Jeffrey A.; and Revis, Anthony, 5,464,801, Cl. 502-172.000.
Rewcastle, Gordon W.: *See*—
Dobrusin, Ellen M.; Showalter, Howard D. H.; Denny, William A.; Palmer, Brian D.; Rewcastle, Gordon W.; Tercel, Moana; and Thompson, Andrew M., 5,464,861, Cl. 514-414.000.
Rey, Gonzalo C., to Eagle-Picher Industries, Inc. Leakproof, valve regulated, maintenance-free lead acid battery. 5,464,701, Cl. 429-53.000.
Reynolds, Laure J.: *See*—
Dennis, Edward A.; Reynolds, Laure J.; and Yu, Lin, 5,464,754, Cl. 435-18.000.
Reynolds, Rebecca L.; and Walsh, P. Sean, to Hoffmann-La Roche Inc. Oligonucleotide probes specific for the human alpha satellite locus. 5,464,945, Cl. 536-24.310.
Reznikov, Yuriy A.: *See*—
Kang, Dae S.; Park, Woo S.; Shin, Hyun H.; Kwon, Soon B.; Marusii, Tatyana Y.; Reznikov, Yuriy A.; Khizhnyak, Anatoliy I.; and Yaroshchuk, Oleg V., 5,464,669, Cl. 428-1.000.
Rhein Chemie Rheinau GmbH: *See*—
Wagner, Herbert, 5,464,586, Cl. 264-130.000.
Rheinmetall GmbH: *See*—
Bisping, Bernhard; and Post, Lothar, 5,463,930, Cl. 89-29.000.
Ricardo, Marvin. Cutting torch tip with guide. 5,464,194, Cl. 266-66.000.
Ricco, Mario; Bruni, Giovanni; and De Matthaeis, Sisto L., to Elasis Sistema Ricerca Fiat Nel Mizzogiorno Societa Consortile per Azioni. Electromagnetic fuel injection valve. 5,464,156, Cl. 239-124.000.
Rice, Brian W.: *See*—
Liddiard, Kevin C.; Rice, Brian W.; and Watson, Rodney J., 5,465,080, Cl. 340-567.000.
Rice, Crispin J.; and Hauprich, William G. Ladder leveling device. 5,464,071, Cl. 182-205.000.
Richman, Dennis C.: *See*—
Krumes, Rolf; Richman, Dennis C.; and Bose, Carl L., 5,465,142, Cl. 356-5.010.
Ricoh Company, Ltd.: *See*—
Arai, Yoshihiro, 5,465,156, Cl. 358-296.000.
Cullen, John F.; and Ejiri, Koichi, 5,465,304, Cl. 382-176.000.
Fueki, Kazumasa, 5,465,350, Cl. 395-600.000.
Fuji, Tatuya; and Shiraishi, Naoto, 5,465,371, Cl. 395-800.000.
Hull, Jonathan J.; and Hart, Peter E., 5,465,353, Cl. 395-600.000.
Kano, Yasushi; Hayashi, Masayuki; Ito, Masaaki; Yamakawa, Shinji; and Aida, Midori, 5,465,160, Cl. 358-401.000.
Kano, Yasushi, 5,465,166, Cl. 358-451.000.
Kimura, Noriyuki; and Suzuki, Minoru, 5,465,139, Cl. 355-260.000.
Nakazato, Yasushi; Tanaka, Makoto; Sakamoto, Kohki; Kondo, Hisayo; Kasahara, Rikio; Shibaki, Hiroyuki; and Sugiyama, Mitsugu, 5,464,200, Cl. 270-53.000.
Sawada, Nozomi, 5,465,326, Cl. 395-147.000.
Ricoh Corporation: *See*—
Cullen, John F.; and Ejiri, Koichi, 5,465,304, Cl. 382-176.000.
Hull, Jonathan J.; and Hart, Peter E., 5,465,353, Cl. 395-600.000.
Riddles, Gordon S.; and Burke, Jerry O., to Harrington Corporation, The. Coupling for joining pipe fittings having offset lug restraints. 5,464,257, Cl. 285-156.000.
Rieger, Thomas J.: *See*—
Hoge, David T.; Konshak, Michael V.; Owens, John C.; Johnson, Michael W.; Rambosek, George P.; and Rieger, Thomas J., 5,465,187, Cl. 360-132.000.
Rieter Ingolstadt Spinnereimaschinenbau AG: *See*—
Sauer, Jurgen, 5,463,860, Cl. 57-263.000.
Rieth, Norbert, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process and installation for the production of at least one gas from air under pressure. 5,463,870, Cl. 62-25.000.
Riexinger, Douglas: *See*—
Heavner, George A.; Riexinger, Douglas; and Mervic, Miljenko, 5,464,935, Cl. 530-329.000.
Rijksuniversiteit Leiden: *See*—
Schilperoort, Robbert A.; and Hoekema, Andreas, 5,464,763, Cl. 435-172.300.
RIK Medical, L.L.C.: *See*—
Wilson, Greg S.; Dinsmoor, John C., III; and Miller, Russell C., 5,464,443, Cl. 623-37.000.
Rimmer, Philip J., to Tunewell Technology Ltd. Electrical [arrangement] distribution system for vechicle. 5,465,010, Cl. 307-9.100.
Ringot, Gabriel: *See*—
Fleury, Marc; Lenormand, Roland; and Ringot, Gabriel, 5,463,894, Cl. 73-38.000.
Ripley, John A.: *See*—
Charles, Steven T.; Ripley, John A.; and Huculak, John C., 5,464,025, Cl. 128-849.000.
Ripplinger, C. Robert. Mating spool assembly for relieving stress concentrations. 5,464,171, Cl. 242-609.100.
Ritter, Merrill A.; McDaniel, John M.; and Brown, David R. Instrumentation for revision surgery. 5,464,406, Cl. 606-86.000.
Rittle, Kenneth E.: *See*—
Bock, Mark G.; Evans, Ben E.; Culberson, J. Christopher; Gilbert, Kevin F.; Rittle, Kenneth E.; and Williams, Peter D., 5,464,788, Cl. 514-252.000.
Riva, Raul: *See*—
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Riva, Raul; Garavaglia, Carlo; and Mirenna, Luigi, 5,464,836, Cl. 514-239.200.
Rivet, Jean-Michel: *See*—
Peglion, Jean-Louis; Goument, Bertrand; Millan, Mark; and Rivet, Jean-Michel, 5,464,834, Cl. 514-254.000.
Rizzi, Douglas J.; Wipasuramonton, Pondget P.; and Saccone, Paul T., to TRW Vehicle Safety Systems Inc. Apparatus for use in inflating an air bag and method of assembly. 5,464,247, Cl. 280-737.000.
Robbins, Gordon J.: *See*—
Perfecto, Eric D.; Prasad, Chandrika; Prasad, Keshav; Robbins, Gordon J.; Swaminathan, Madhavan; and White, George E., 5,464,682, Cl. 428-210.000.
Robert Bosch GmbH: *See*—
Braegas, Peter, 5,465,088, Cl. 340-905.000.
Denz, Helmut; and Blumenstock, Andreas, 5,463,998, Cl. 123-520.000.
Hofmann, Karl, 5,464,158, Cl. 239-533.400.
Jenner, Bert; Schmidt, Hans-Joachim; Chiaramonte, Giancarlo; and Lehmann, Wolfgang, 5,465,195, Cl. 362-61.000.
Kirn, Manfred, 5,464,365, Cl. 451-344.000.
Liskow, Uwe, 5,464,319, Cl. 415-55.100.
Robert, Jacques. Vertical member support stand. 5,464,186, Cl. 248-524.000.
Roberts, Gary F.: *See*—
Chen, Jiann H.; Fitzgerald, John J.; Vreeland, William B., II; Ferrar, Wayne T.; Roberts, Gary F.; and Staudenmayer, William J., 5,464,698, Cl. 428-421.000.
Roberts, Meeling: *See*—
Reddy, Chandrashekar M.; Hirose, Scott D.; Cho, Sung-Soo; Kardach, James P.; Farrer, Steven M.; and Roberts, Meeling, 5,465,367, Cl. 395-750.000.
Robertson, Neil L.: *See*—
Bajorek, Christopher H.; Erpelding, A. David; Garfunkel, Glen A.; Pattanaik, Surya; Robertson, Neil L.; and Wallash, Albert J., 5,465,186, Cl. 360-113.000.
Robins, David J.; and Walters, Dale R., to British Technology Group Limited. Alicyclic diamine fungicides. 5,464,873, Cl. 514-659.000.
Robinson, Alexander J.; and Paragas, Christopher O., to Genesis Composites, L.C. Hollow shell frames for bicycles and other human-powered vehicles and method for making same. 5,464,240, Cl. 280-281.100.
Robotic Vision Systems, Inc.: *See*—
Bilodeau, Steve; Jacovino, Frank; Cameron, Joanne; and Cain, James, 5,465,152, Cl. 356-371.000.
Robraln, Karin: *See*—
Becker, Wolfgang; Mathis, Raymond; Stapper-Druyen, Sylvia; Robraln, Karin; Hoffmann, Rainer; and Kiray, Yasar C., 5,464,660, Cl. 427-389.000.
Roden, Michael J., to Redfield Engineering. Surface cleaning appliance. 5,463,791, Cl. 15-320.000.

Rodi, Anton; Uhrig, Dieter; and Krestyn, Karlheinz, to Heidelberger Druckmaschinen AG. Device for controlling lateral sheet contact and for interrupting sheet feed upon occurrence of faulty sheet contact. 5,464,206, Cl. 271-227.000.

Rodriguez, Carlos: *See*—
Kortright, Kenneth H.; Coulter, Wallace H.; Rodriguez, Carlos; Russell, Thomas; and Paul, Ronald, 5,464,752, Cl. 435-7.240.

Rodriguez, Ernesto M.: *See*—
Baldwin, Dwight G.; Zhao, Xiaowei; Darland, Mike E.; and Rodriguez, Ernesto M., 5,465,127, Cl. 353-119.000.

Rodriguez, Richard. Ski carrying device. 5,464,138, Cl. 224-265.000.

Rodzewich, Edward A., to Betz Laboratories, Inc. Oil splitting aluminum cleaner and method. 5,464,484, Cl. 134-40.000.

Roehl, Siegfried, to Siemens Aktiengesellschaft. Method of making contact for semiconductor device. 5,464,793, Cl. 437-186.000.

Roehm GmbH Chemische Fabrik: *See*—
Ittmann, Guenther; and Krieg, Manfred, 5,464,898, Cl. 524-493.000.

Roger, Pierre: *See*—
Courtemanche, Gilles; Gautier, Claudie; Gully, Danielle; Roger, Pierre; Valette, Gérard; and Wermuth, Camille G., 5,464,847, Cl. 514-342.000.

Rogers, David W.: *See*—
Lauer, Fritz K.; and Rogers, David W., 5,464,372, Cl. 460-100.000.

Rogers, Duane E.: *See*—
Craig, W. Scott; Hall, Charles B.; Lam, Edward K.; and Rogers, Duane E., 5,464,357, Cl. 440-89.000.

Rogers, Ernest, to Taggart, Charles W. Apparatus for centrifugally separating a fluid mixture into its component parts. 5,464,536, Cl. 210-380.100.

Rogers, Ernest O.: *See*—
Williams, Robert M.; Rogers, Ernest O.; and Sevik, Maurice M., 5,464,321, Cl. 416-93.00A.

Roheim, Karl-Axel. Mortar adaptor. 5,463,958, Cl. 102-445.000.

Rohm and Haas Company: *See*—
Mehta, Raj L; Lange, Barry C.; and Sherba, Samuel E., 5,464,622, Cl. 424-405.000.
Osei-Gyimah, Peter; Sherba, Samuel E.; Lange, Barry C.; Mehta, Rai J.; and Joseph, Rhoda W., 5,464,832, Cl. 514-238.500.

Rohm Co., Ltd.: *See*—
Fujimoto, Hisayoshi, 5,465,108, Cl. 347-68.000.

Rohm Corporation: *See*—
Fong, Vincent L., 5,465,062, Cl. 327-172.000.

Röhm, Günter H. Lockable drill chuck. 5,464,230, Cl. 279-63.000.

Rohrbacher, Reinhold: *See*—
Aschenbruck, Emil; Rohrbacher, Reinhold; Moreau, Alain; and Guillaux, Michel, 5,463,812, Cl. 29-889.210.

Rohrer, Jeffrey: *See*—
Hupf, Charles J.; and Rohrer, Jeffrey, 5,463,942, Cl. 99-537.000.

Roitner, Franz, to Miba Sintermetall Aktiengesellschaft. Apparatus for machining a concial ring. 5,464,364, Cl. 451-194.000.

Rojdev, Ilija, to Batesville Casket Company, Inc. Seal sustaining hardware for caskets. 5,463,800, Cl. 27-1.000.

Rollei Fototechnic GmbH & Co.: *See*—
Mangeladorf, Jürgen, 5,465,132, Cl. 354-219.000.

Rollin, Keith: *See*—
Orton, Debra L.; and Rollin, Keith, 5,465,363, Cl. 395-700.000.

Rollin, Keith A.: *See*—
Orton, Debra L.; Rollin, Keith A.; and Gibbons, Bill, 5,465,362, Cl. 395-700.000.

Rolls-Royce, PLC: *See*—
Knott, David S., 5,464,326, Cl. 416-193.00A.
Severn, Michael J.; Northcott, Anthony J.; and Rowlinson, Anne G., 5,463,863, Cl. 60-39.030.
Short, Malcolm, 5,464,175, Cl. 244-12.500.

Rolls-Royce Power Engineering plc: *See*—
Hufton, Peter F., 5,464,344, Cl. 431-10.000.

Rolnik, Mikhail D.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

Roloff, Robb W.: *See*—
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; Starr, Frank C.; Roloff, Robb W.; and Devlin, Robert D., 5,463,848, Cl. 53-482.000.

Romeo, David J.: *See*—
Castro, Mynor; Yaniv, Gershon; Hardtmann, Dirk J.; and Romeo, David J., 5,464,246, Cl. 280-730.200.

Rominson, Igor B.: *See*—
Chaudhary, Preet M.; and Rominson, Igor B., 5,464,753, Cl. 435-7.240.

Rose, Gene D.: *See*—
Schmidt, Donald L.; Rose, Gene D.; and Flagg, Edward E., 5,464,538, Cl. 210-490.000.

Rosen, Arthur L.: *See*—
Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,464,814, Cl. 514-6.000.

Rosenbaum, David A. Board game apparatus and method of play. 5,464,224, Cl. 273-258.000.

Rosenbaum, Robert E.: *See*—
Melendez, Luis A.; Rosenbaum, Robert E.; Vera-Garcia, Marcela A.; Olive, D. Michael; and Swenson, John E., 5,464,773, Cl. 435-306.100.

Rosolia, Antonio. Apparatus for sampling and registering fluids in pipelines. 5,463,908, Cl. 73-863.830.

Ross, Harvey M. System and method of manufacturing a single book copy. 5,465,213, Cl. 364-468.000.

Rossing, Martin A., to Medtronic, Inc. Method and apparatus for detection and treatment of tachycardia and fibrillation. 5,464,430, Cl. 607-4.000.

Rossmassler, Rich; Ciebiera, Lloyd; Tulipano, Francis J.; Vinson, Sylvester; and Walters, R. Thomas, to United States of America, Energy. Tritium waste package. 5,464,988, Cl. 250-507.100.

Rotem, Shai; and Shtadler, Ze'ev, to Intel Corporation. Automatic design verification. 5,465,216, Cl. 364-488.000.

Roth, Reinhold C.: *See*—
Oehr, Klaus H.; Timewell, Richard R.; Donahue, Harvey; Hoy, Brenda; Kim, Ronald; and Roth, Reinhold C., 5,464,510, Cl. 204-141.500.

Rothaus, Robert J.: *See*—
Keech, Kimberly W.; and Rothaus, Robert J., 5,465,106, Cl. 345-104.000.

Rothenberger, Richard E. Sealed land grid array connector. 5,464,355, Cl. 439-559.000.

Rothenberger Werkzeuge-Maschinen GmbH: *See*—
Seitz, Reiner, 5,463,886, Cl. 72-13.000.

Roumina, Kavous: *See*—
Merat, Francis L.; Roumina, Kavous; Ruegsegger, Steven M.; and Delvalle, Robert B., 5,465,221, Cl. 364-552.000.

Roussel, Bruno; and Dumesnil, Alain, to Videocolor. Deflection yoke with a core extension. 5,465,026, Cl. 313-440.000.

Routh, Shakti: *See*—
Popescu, Miron G.; Bekus, David F.; Routh, Shakti; Vera, Luis E.; and Clark, Thomas A., 5,464,580, Cl. 422-34.000.

Rowland, Kenneth A.: *See*—
Lathrop, Frederick L.; and Rowland, Kenneth A., 5,465,364, Cl. 395-700.000.

Rowlinson, Anne G.: *See*—
Severn, Michael J.; Northcott, Anthony J.; and Rowlinson, Anne G., 5,463,863, Cl. 60-39.030.

Royce Medical Company: *See*—
Grim, Tracy E., 5,464,385, Cl. 602-27.000.

Rozhavsky, Mikhail G.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

Rozzi, Antonella: *See*—
Long, Giorgio; De Cillis, Giampiero; Rozzi, Antonella; D'Alò, Simonetta; and Gallico, Licia, 5,464,844, Cl. 514-301.000.

Ruckwardt, Hans-Werner, to TRW United Carr GmbH & Co., KG. Two-piece holding assembly made of plastic. 5,464,179, Cl. 248-68.100.

Rudie, Eric N.; Neilson, Bruce H.; and Kauphusman, James V., to Urologix, Inc. Device and method for asymmetrical thermal therapy with helical dipole microwave antenna. 5,464,445, Cl. 607-101.000.

Rudigier, Helmut; and Sperger, Reinhard, to Balzers Aktiengesellschaft. Coated transparent substrate. 5,464,683, Cl. 428-216.000.

Rudischer, Rainer: *See*—
Albring, Peter; Apley, Rainer; Döge, Klaus; Heinrich, Günter; Lindner, Ernst; Müller, Norbert; Pauer, Reinhard; Pilling, Eberhard; and Rudischer, Rainer, 5,464,325, Cl. 416-185.000.

Rudolph, Alan S.: *See*—
Monshipouri, Mariam; and Rudolph, Alan S., 5,464,629, Cl. 424-450.000.

Ruegsegger, Steven M.: *See*—
Merat, Francis L.; Roumina, Kavous; Ruegsegger, Steven M.; and Delvalle, Robert B., 5,465,221, Cl. 364-552.000.

Ruetz, Georg, to MTU Motoren- und Turbinen-Union Friedrichshafen GmbH. Supercharged internal combustion engine exhaust system. 5,463,867, Cl. 60-602.000.

Rumyantsev, Sergei G.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

Runger, Richard D. Sewing article storage apparatus. 5,464,280, Cl. 312-249.110.

Rupprechter, Helmut: *See*—
Brüstle, Klaus; and Rupprechter, Helmut, 5,463,796, Cl. 16-383.000.

Rupyshev, Vladimir: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.

Rush, William B., II; Mondek, Martin J.; Sullivan, Donald K.; Walter, Mark A.; and Zdanowicz, Lawrence E., Sr., to Outboard Marine Corporation. Outboard motor with four-stroke engine and exhaust gas discharge system therefor. 5,463,990, Cl. 123-195.000.

Russell, James T., to Information Optics Corporation. Optical random access memory having multiple state data spots for extended storage capacity. 5,465,238, Cl. 365-234.000.

Russell, Thomas: *See*—
Kortright, Kenneth H.; Coulter, Wallace H.; Rodriguez, Carlos; Russell, Thomas; and Paul, Ronald, 5,464,752, Cl. 435-7.240.

Russett, Jon P.: *See*—
Alpert, Helmut A.; and Russett, Jon P., 5,464,120, Cl. 222-1.000.

Rutberg, Philip G.: *See*—
Gorsuchev, Vladislav L.; Bratsev, Alexander N.; Fedulkovich, Valeri N.; Rutberg, Philip G.; Greene, Hugh W.; and Chism, Paul E., Jr., 5,464,513, Cl. 204-164.000.

Ryan, Patrick M.: *See*—
Kidwell, J. Jeffrey; Reed, Stuart E.; Ryan, Patrick M.; Harwig, Dennis D.; and Womack, E. Allen, Jr., 5,464,957, Cl. 219-130.010.

Ryan, Thomas R.: *See*—
Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yurnis, Robert, 5,465,294, Cl. 379-207.000.

Ryan, Thomas W.: *See*—
Hutcheson, Timothy L.; Or, Wilson; Narayanan, Venkatesh; Mohan, Subramaniam; Wohlmut, Peter G.; Srinivasan, Ramanujam; Hunt, Bobby R.; and Ryan, Thomas W., 5,465,308, Cl. 382-159.000.

Ryan, Timothy J.; Fogarty, Thomas J.; and Mollenauer, Kenneth H., to Fogarty, Thomas J. Internal graft prosthesis and delivery system. 5,464,449, Cl. 623-1.000.

Ryobi Ltd.: *See*—
Machara, Kenso; Majima, Osamu; and Hirashima, Shigeyoshi, 5,463,949, Cl. 101-152.000.

Ryobi North America: *See*—
Bellew, William S.; and Wilson, Carolyn G., 5,463,816, Cl. 30-415.000.

Ryobi Outdoor Products: *See*—
Hoffman, Ronald J.; and Olsen, Jens K., 5,463,809, Cl. 29-888.100.

Ryoden Semiconductor System Engineering Corporation: *See*—
Nakashige, Yukiko; and Nishioka, Tadashi, 5,465,145, Cl. 356-237.000.

Ryou, Eui K., to Hyundai Electronics Industries Co., Ltd. Semiconductor device and a method of manufacturing the same. 5,464,787, Cl. 437-52.000.

S&C Electric Company: *See*—
Steele, Edward A.; and Niemira, James K., 5,464,956, Cl. 218-29.000.

Sääf, Lars; and Stenfors, Sven E., to Saab Automobile Aktiebolag. Reinforced cylinder head. 5,463,989, Cl. 123-193.500.

SA Martin: *See*—
Capdeboscq, Bernard, 5,464,202, Cl. 271-11.000.

Saab Automobile Aktiebolag: *See*—
Sääf, Lars; and Stenfors, Sven E., 5,463,989, Cl. 123-193.500.

Saba, Toshikazu: *See*—
Nebashima, Akira; Watanabe, Kaoru; and Saba, Toshikazu, 5,464,356, Cl. 439-752.000.

Sabre Safety Limited: *See*—
Tatarek-Gintowt, Andrew R. T., 5,464,009, Cl. 128-205.240.

Saccone, Paul T.: *See*—
Rizzi, Douglas J.; Wipasuramonton, Pondget P.; and Saccone, Paul T., 5,464,247, Cl. 280-737.000.

Sacotte, Michel, to France Transfo. Method for compacting electrical windings equipping transformers. 5,463,806, Cl. 29-605.000.

Sadler, Jimmie L.: *See*—
Boardman, John D.; Hamilton, Scott M.; Gangstead, Mervin L.; Sadler, Jimmie L.; Trimble, Richard A.; and Welch, Jeffrey P., 5,465,243, Cl. 369-49.000.

Saeki, Hiroshi: *See*—
Ishizuka, Mitsuhiro; and Saeki, Hiroshi, 5,465,027, Cl. 313-517.000.

Sagami Chemical Research Center: *See*—
Hirai, Kenji; Yamashita, Mitsuo; Tateno, Tomoko; Ejiri, Emiko; Harasawa, Kikuko; Onji, Yuichi; Ugai, Sadayuki; and Nagato, Shoin, 5,464,811, Cl. 504-281.000.

Saijo, Eiji; Saito, Masashi; and Tsuji, Takeshi, to Sumitomo Wiring Systems, Ltd. Lock connector. 5,464,353, Cl. 439-489.000.

Saito, Fumio: *See*—
Nakai, Satoru; Aihara, Koutoku; Tanaka, Hideo; Ibe, Hitomi; Kawai, Kazuyoshi; Ichikawa, Hiroyuki; Akamatsu, Seiji; Saito, Fumio; Tominaga, Michiaki; and Adachi, Masakazu, 5,464,833, Cl. 514-251.000.

Saito, Kenji: *See*—
Matsumoto, Takahiro; Nose, Noriyuki; Saito, Kenji; and Sentoku, Koichi, 5,465,148, Cl. 356-349.000.

Saito, Masashi: *See*—
Saijo, Eiji; Saito, Masashi; and Tsuji, Takeshi, 5,464,353, Cl. 439-489.000.

Saito, Takashi: *See*—
Ishikawa, Hisashi; Homma, Hideo; Nagashima, Yoshitake; and Saito, Takashi, 5,465,173, Cl. 358-534.000.

Saito, Tetsuo: *See*—
Seto, Kaoru; Kanaiwa, Kiyoshi; Itoh, Michio; Mano, Hiroshi; Yamada, Hiromichi; Kashihara, Atsushi; Kawana, Takashi; and Saito, Tetsuo, 5,465,157, Cl. 358-298.000.

Saito, Yasuyuki, to Kabushiki Kaisha Toshiba. Method of manufacturing a CMOS semiconductor device. 5,464,789, Cl. 437-57.000.

Saitou, Kiyoshi: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mitsuhiro; Saitou, Kiyoshi; Hobara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.

Sakaguchi, Yasuo; Daimon, Katsumi; Takahashi, Michiaki; Yamasaki, Kazuo; and Yamaguchi, Yasuhiro, to Fuji Xerox Co., Ltd. Electrophotographic photoreceptor with subbing layer and charge generating layer. 5,464,717, Cl. 430-58.000.

Sakai, Chinobu: *See*—
Nakamura, Tetsuya; Kabai, Takahito; Iguchi, Michihisa; Arai, Seiji; Sakai, Chinobu; and Katagata, Satoshi, 5,465,140, Cl. 355-260.000.

Sakai, Hisao; Shimada, Hiroo; Sono, Hiroshi; Nagahiro, Kenichi; Sugita, Narutoshi; Maeda, Hirotsugu; Miyao, Masakatsu; Nakamura, Katsunori; Ogita, Yasunori; and Suzuki, Osamu, to Honda Giken Kogyo Kabushiki Kaisha. Intake system for internal combustion engine. 5,463,995, Cl. 123-432.000.

Sakai, Ikuo, to Hewlett-Packard Company. Non-contact type probe and non-contact type voltage measuring apparatus, wherein the probe's irradiation surface is coated with a conductive film having a pinhole. 5,465,043, Cl. 324-96.000.

Sakai, Kazuo: *See*—
Ito, Takeo; Matsuda, Hidemi; and Sakai, Kazuo, 5,464,566, Cl. 252-182.000.

Sakai, Keiji; Yoshida, Yoshio; Yamamoto, Hiroyuki; Kurata, Yukio; Nakata, Yasuo; and Miyake, Takahiro, to Sharp Kabushiki Kaisha. Display apparatus having a plurality of display devices. 5,465,315, Cl. 385-116.000.

Sakai, Masanori: *See*—
Yoshihara, Kunio; Hirooka, Kazuhiko; Sakai, Masanori; Kuboki, Keiju; Nimura, Mitsuo; and Tanabe, Ritsushi, 5,465,163, Cl. 358-444.000.

Sakai, Toshiaki: *See*—
Nakagawa, Toshihiro; Sakai, Toshiaki; and Nozaki, Hiroaki, 5,463,810, Cl. 29-888.400.

Sakaki, Toshiaki: *See*—
Hori, Shinichi; Kawasaki, Atsuko; Nakashita, Takefumi; Imai, Yoshiharu; Sakaki, Toshiaki; and Miki, Miyo, 5,464,420, Cl. 606-202.000.

Sakakibara, Akihito: *See*—
Itoh, Maki; and Sakakibara, Akihito, 5,464,922, Cl. 528-40.000.

Sakamoto, Kohki: *See*—
Nakazato, Yasushi; Tanaka, Makoto; Sakamoto, Kohki; Kondo, Hisayo; Kasahara, Rikio; Shibaki, Hiroyuki; and Sugiyama, Mitsuga, 5,464,200, Cl. 270-53.000.

Sakamoto, Susumu: *See*—
Ikeda, Yasukazu; Matsumoto, Hideo; and Sakamoto, Susumu, 5,465,007, Cl. 257-584.000.

Sakata, Masaaki: *See*—
Ikuma, Takeshi; Sakata, Masaaki; Akioka, Hirokaru; and Shimod, Tatsuya, 5,464,670, Cl. 428-35.800.

Sakizadeh, Kumars; Blair, John T.; and Ask, David T., to Minnesota Mining and Manufacturing Company. Post-processing stabilizers for photothermographic articles. 5,464,737, Cl. 430-619.000.

Sakuma, Kazushi: *See*—
Obga, Eiji; Kawasaki, Masahiko; Sakuma, Kazushi; Takahashi, Tatsuo; and Tozaki, Ryusuke, 5,465,385, Cl. 455-6.100.

Sakurai, Katsukiyo; Sugiura, Nobuo; Kimata, Koji; and Suzuki, Sakaru, to Seikagaku Kogyo Kabushiki Kaisha. Phospholipid- or lipid-linked glycosaminoglycan and process for producing the same. 5,464,942, Cl. 536-21.000.

Sakurai, Nobumasa: *See*—
Ide, Yoshihiro; Kakuno, Izuo; Sakurai, Nobumasa; Mitsui, Hideru; and Okayasu, Yoshisada, 5,465,117, Cl. 348-373.000.

Salk Institute for Biological Studies, The: *See*—
Baird, Andrew J.; Esch, Frederick S.; Gospodarowicz, Denis; Bohlen, Peter; and Ling, Nicholas C., 5,464,774, Cl. 536-23.510.
Potter, Ellen; Behan, Dominic P.; Fischer, Wolfgang H.; Linton, Elizabeth A.; Lowry, Philip J.; and Vale, Wylie W., Jr., 5,464,757, Cl. 435-69.100.

Salomon S.A.: *See*—
Commier, Philippe; Phelipon, Axel; and Le Masson, Jacques, 5,464,242, Cl. 280-602.000.

Salpaka, Glenn L., to Power Tool Holders, Inc. Quick release chuck device. 5,464,229, Cl. 279-30.000.

Salter, James G.; Clark, James E.; Swanson, David W.; and Nasworthy, George F., to Hewlett-Packard Company. Method of making a compact fluid coupler for thermal inkjet print cartridge ink reservoir. 5,464,578, Cl. 264-250.000.

Sam, Homayoon: *See*—
Blaker, David M.; Diamondstein, Marc S.; Ellard, Gregory S.; Mobin, Mohammad S.; Sam, Homayoon; and Thierbach, Mark E., 5,465,275, Cl. 375-341.000.

Samela, Francis M.; and Llorens, Joseph R., to Methode Electronics, Inc. Inactive state termination tester. 5,465,042, Cl. 324-71.100.

Samelson, Judy. Container made from recycled product. 5,464,108, Cl. 215-386.000.

Sammut, Steven P.; Georgin, Marc J.; Heaston, Bruce A.; Majeed, Kamal N.; and Kowalik, James J., to General Motors Corporation. Vehicle level control system. 5,465,209, Cl. 364-424.050.

Samsun Technologies Corporation: *See*—
Koike, Yukinaga, 5,465,411, Cl. 455-275.000.

SamSung Electronics Co., Ltd.: *See*—
Bang, Doo-jin, 5,464,205, Cl. 271-213.000.

Samsung Semiconductor, Inc.: *See*—

Anderson, David J., 5,465,067, Cl. 327-322.000.
Sandbrink, Joseph J.: *See*—
Kassebaum, James W.; Dayawon, Miguel M.; and Sandbrink, Joseph J., 5,464,806, Cl. 504-206.000.
Sanders, Brenda M.; Jenkins, Kenneth D.; Nichols, Jack L.; and Imber, Bryan E., to StressGen Biotechnology Corporation; and Ca. State University Long Beach Foundation. Accumulation of heat shock proteins for evaluating biological damage due to chronic exposure of an organism to sublethal levels of pollutants. 5,464,750, Cl. 435-7.210.
Sanders, Gary G.; and Kessinger, John R., to Penberthy, Inc. Bipolar tracking current source/sink with ground clamp. 5,465,041, Cl. 323-312.000.
Sanders, Glen A.: *See*—
Strandjord, Lee J.; and Sanders, Glen A., 5,465,149, Cl. 356-350.000.
Sandhu, Gurtej S.: *See*—
Buley, Todd W.; and Sandhu, Gurtej S., 5,464,031, Cl. 134-1.000.
Sandoz Ltd.: *See*—
Denny, Jacques P.; and Sorolla, Josep R., 5,464,451, Cl. 8-94.210.
Sang, Rick. Portable football holder. 5,464,209, Cl. 273-55.00B.
Santel, Hans-Joachim: *See*—
Haas, Wilhelm; Linker, Karl-Heinz; Schallner, Otto; Findeisen, Kurt; Santel, Hans-Joachim; and Dollinger, Markus, 5,464,810, Cl. 504-273.000.
Santoli, Domenico; and Spector, George. Lawnmower with adjustable side cutters. 5,463,853, Cl. 56-6.000.
Sanvido, David J.: *See*—
Livshits, Mikhail; Sanvido, David J.; and Folkerts, Charles H., 5,463,993, Cl. 123-339.200.
Sanwa Kagaku Kenkyusho Co., Ltd.: *See*—
Yamaguchi, Tadashi; Uesaka, Hiroshi; Watanabe, Kazuo; and Awaya, Juichi, 5,464,818, Cl. 514-2.000.
Sanyo Electric Co., Ltd.: *See*—
Okamoto, Mitsunaga, 5,465,083, Cl. 340-825.310.
Sugayama, Sakae; Asami, Takao; Kato, Kenji; and Maeta, Akira, 5,465,408, Cl. 455-249.100.
Saporiti, Elena H. Folding cart. 5,464,237, Cl. 280-30.000.
Sarma, Dwadasi H. R.: *See*—
Lautzenhiser, Frans P.; Carter, Bradley H.; Ozogar, Donald A.; and Sarma, Dwadasi H. R., 5,464,570, Cl. 252-500.000.
Sarukawa, Chuji; Ito, Sadaaki; and Ito, Hiromi, to Nippon Suisan Kabushiki Kaisha. Apparatus for powdering batter-coated food pieces. 5,463,938, Cl. 99-352.000.
Sasada, Reiko: *See*—
Senoo, Masaharu; Sasada, Reiko; and Igarashi, Koichi, 5,464,943, Cl. 536-23.500.
Sasaki, Masanori; Shibafuchi, Hiroshi; Imai, Yasushi; Yoshida, Masahiko; and Yoshie, Takehiko, to Nippon Carbide Kogyo Kabushiki Kaisha. Alkali metal azide particles. 5,464,248, Cl. 280-741.000.
Sasaki, Umekichi; Hasegawa, Hiroshi; and Shimomura, Yuji, to Nippon Oil Company, Limited. Refrigerator oil composition containing phosphate ester additives for fluoroalkane refrigerant. 5,464,550, Cl. 252-68.000.
Sasama, Hiroshi, to Kawasaki Steel Corporation. Associative memory. 5,465,228, Cl. 365-49.000.
SatCon Technology Corporation: *See*—
Anastas, George V.; and Goldie, James H., 5,465,015, Cl. 310-26.000.
Sathi, Kitty: *See*—
Hsu, Lillian-Lin; Sathi, Kitty; Biondi, Mark C.; Zell, Thomas B.; Catapano, David A.; and Lauria, Richard T., 5,465,322, Cl. 395-114.000.
Sato, Kazuhito; and Negishi, Yuji, to Casio Computer Co., Ltd. Process for manufacturing liquid crystal display. 5,464,490, Cl. 156-145.000.
Sato, Koki, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Bag suitable for use in an air bag apparatus and method of manufacturing the same. 5,464,250, Cl. 280-743.100.
Sato, Masatoshi: *See*—
Yamashita, Kazuhiro; Negishi, Toshiyuki; Sato, Masatoshi; and Tsukahara, Hiroshi, 5,465,066, Cl. 327-294.000.
Sato Pharmaceutical Co., Ltd.: *See*—
Katayama, Masahide; Yamashita, Harushige; Okada, Taizo; and Morioka, Shigeo, 5,464,828, Cl. 514-60.000.
Sato, Shin-ichi; and Kuma, Kiyoji, to Mitsubishi Kasei Corporation. Process for preparing water-soluble polymers. 5,464,908, Cl. 525-380.000.
Sato, Souichi: *See*—
Yokoyama, Yu; and Sato, Souichi, 5,464,512, Cl. 204-157.200.
Sato, Taizo, to Fujitsu Limited. Processor with a respective latch provided for each pipelined stage to transfer data to the pipeland stages. 5,465,334, Cl. 395-375.000.
Sato, Takashi: *See*—
Takahashi, Toshie; Sato, Takashi; Kurumada, Toshimi; and Kokubun, Yoshiyuki, 5,465,292, Cl. 379-164.000.
Sato, Tsuyoshi: *See*—
Nakai, Sadao; Yamanaka, Masanobu; Ishikawa, Koji; Sato, Tsuyoshi; Yamamoto, Kimiaki; and Terashima, Mikihiko, 5,465,178, Cl. 359-670.000.
Sato, Yasuyuki: *See*—
Kano, Osamu; Yasui, Koichi; Sato, Yasuyuki; Yamakoshi, Yasuhiro; Anan, Junichi; Wada, Hironori; and Yasuoka, Akio, 5,464,520, Cl. 204-298.130.
Sato, Yoichi: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mituhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.
Sato, Yukiyoshi: *See*—
Hayakawa, Katsumi; Tsukuda, Masahiro; Sato, Yukiyoshi; Tatewaki, Junichi; and Yamasaka, Kazuya, 5,463,841, Cl. 53-381.200.
Satoh, Noritoshi, to NEC Corporation. Differential amplifier adapted to be integrated in C-MOS monolithic IC. 5,465,073, Cl. 330-258.000.
Satou, Susumu: *See*—
Ueno, Yoshiyuki; Morimoto, Masayoshi; Ootsuka, Seiji; Kawai, Tatsushi; and Satou, Susumu, 5,464,539, Cl. 210-603.000.
Satre, Rodrick L: *See*—
Chan, Jimmy H.; Satre, Rodrick L; Trusler, James H.; and Memula, Sadanand G., 5,464,623, Cl. 424-405.000.
Sattich, William E.: *See*—
Shaw, James E.; Sattich, William E.; and Efner, Howard F., 5,464,931, Cl. 528-389.000.
Saucy, Gabriel: *See*—
McConnell, Oliver J.; Saucy, Gabriel; Jacobs, Robert; and Gunasekera, Sarath P., 5,464,835, Cl. 514-254.000.
Sauer Inc.: *See*—
Welscher, William L., 5,463,803, Cl. 29-467.000.
Sauer, Jurgen, to Rieter Ingolstadt Spinnereimaschinenbau AG. Process and device for piecing an open-end spinning device. 5,463,860, Cl. 57-263.000.
Saunders, Dennis L., to UOP. Hydrocracking process in which the buildup of polynuclear aromatics is controlled. 5,464,526, Cl. 208-108.000.
Saunders, Richard D.: *See*—
McGuinness, Gordon B.; and Saunders, Richard D., 5,464,803, Cl. 503-213.000.
Saur, Reinhold: *See*—
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,464,839, Cl. 514-256.000.
Sauter, Hubert: *See*—
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,464,839, Cl. 514-256.000.
Sawa, Toshio: *See*—
Nishino, Yoshitaka; Sawa, Toshio; Nakao, Takashi; Aizawa, Michihiko; and Yokose, Kenji, 5,463,880, Cl. 62-484.000.
Sawada, Kazutaka: *See*—
Harada, Kuniyuki; Sawada, Kazutaka; Hosoya, Yoshiteru; and Shibusawa, Tetsuo, 5,464,671, Cl. 428-40.000.
Sawada, Nozomi, to Ricoh Company, Ltd. Mixed-mode transmission control apparatus for adding an identification block to mixed-mode data. 5,465,326, Cl. 395-147.000.
Sawada, Seiji: *See*—
Fukuda, Tatsuya; Mori, Shigeru; Hayashikoshi, Masanori; and Sawada, Seiji, 5,465,063, Cl. 327-512.000.
Sawyer, James K. Engine and power output. 5,464,331, Cl. 417-364.000.
Scaramuzzo, John A., Jr.; and Brockett, Roger W., to Quantum Corporation. Band limited control of a flexible structure using piecewise trigonometric input signals. 5,465,035, Cl. 318-561.000.
Scarpucci, Joseph J.: *See*—
Tomba, Charles P.; Scarpucci, Joseph J.; and Getsy, Andy W., 5,464,519, Cl. 204-280.000.
Scarr, Robert F.: *See*—
Getz, Dale R.; Nardi, John C.; and Scarr, Robert F., 5,464,709, Cl. 429-229.000.
Scarrow, David, to DRG Medical Packaging Supplies Limited. Vial connector system. 5,464,123, Cl. 222-83.500.
Schaarschmidt, Reinhard: *See*—
Knoedel, Gunter; and Schaarschmidt, Reinhard, 5,463,911, Cl. 74-473.00R.
Schachet, Eli: *See*—
Klearman, Jeffrey D.; Bierman, Jeffrey J.; and Schachet, Eli, 5,464,393, Cl. 604-82.000.
Schaeper, Robert J.: *See*—
Johnson, Gary M.; and Schaeper, Robert J., 5,464,739, Cl. 435-4.000.
Schaffner, T. Michael; Bayer, William R.; and Bach, Michael J., to Motorola, Inc. Method and apparatus for encoding and decoding a supplementary signal. 5,465,269, Cl. 375-200.000.
Schallner, Otto: *See*—
Haas, Wilhelm; Linker, Karl-Heinz; Schallner, Otto; Findeisen, Kurt; Santel, Hans-Joachim; and Dollinger, Markus, 5,464,810, Cl. 504-273.000.
Schardein, Werner: *See*—
Maschmann, Martin; Schardein, Werner; and Hosticka, Bedrich, 5,465,074, Cl. 330-263.000.
Schärer, Paul; and Stöckli, Kaspar, to Usm U. Schärer Söhne Ag. Clamping device. 5,464,299, Cl. 403-297.000.
Scheie, Carl E.: *See*—
Shenoha, James L.; and Scheie, Carl E., 5,464,217, Cl. 273-169.000.
Schelberger, Klaus: *See*—
Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,464,839, Cl. 514-256.000.
Schenke, Thomas: *See*—

Peterses, Uwe; Krebs, Andreas; Schenke, Thomas; Kunisch, Franz; Philippa, Thomas; Grohe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, 5,464,796, Cl. 514-312.000.

Schering Corporation: *See*—
Ting, Pauline C.; Solomon, Daniel M.; and Tom, Wing C., 5,464,840, Cl. 514-277.000.

Schering-Plough Healthcare Products, Inc.: *See*—
Hayes, Jesse C., Jr.; Dever, Gerald R.; Laughlin, Thomas J.; Schroer, Charles F., Jr.; and Wildman, Gary C., 5,464,610, Cl. 424-61.000.

Schierling, Bernhard; and Göbel, Hilmar, to Fichtel & Sachs AG. Balancing process and balanced component after this process. 5,463,900, Cl. 73-469.000.

Schildmeyer, John, to Uarco Incorporated. Folded business form with return envelope, 5,464,255, Cl. 283-116.000.

Schiller, Philip D.: *See*—
Leonard, William K.; Mohn, Stephen W.; Edman, Timothy J.; and Schiller, Philip D., 5,464,577, Cl. 264-40.500.

Schilling, Steven L.; Yeater, Robert P.; Soland, Phil M.; Szabat, John F.; and Parsons, Harold R., to Bayer Corporation. Foam-forming mixtures with decreased decomposition of hydrohalocarbon blowing agents. 5,464,560, Cl. 252-182.240.

Schilperoort, Robbert A.; and Hoekema, Andreas, to Rijksuniversiteit Leiden; and Schilperoort, Robbert Adriaan. Process for the incorporation of foreign DNA into the genome of dicotyledonous plants. 5,464,763, Cl. 435-172.300.

Schilperoort, Robbert Adriaan: *See*—
Schilperoort, Robbert A.; and Hoekema, Andreas, 5,464,763, Cl. 435-172.300.

Schipper, Paul H.: *See*—
Owen, Hartley; and Schipper, Paul H., 5,464,528, Cl. 208-161.000.

Schlegel, Urs: *See*—
Curtis, Raymond L.; Schlegel, Urs; and Heldstab, Thomas, 5,464,427, Cl. 606-232.000.

Schlejen, Jacob: *See*—
Antonis, Petrus H.; Schlejen, Jacob; and Konings, Leonardus U. E., 5,465,028, Cl. 315-248.000.

Schmahl, Günter: *See*—
Mehlhorn, Heinz; Schmahl, Günter; Lindner, Werner; and Haberkorn, Axel, 5,464,837, Cl. 514-242.000.

Schmidt, Alfred C.; and Cordery, Robert. Processor and read/write head incorporated in disk for communicating data to host directly from processor read/write head to read/write head of host disk drive. 5,465,381, Cl. 395-800.000.

Schmidt, Donald L.; Rose, Gene D.; and Flagg, Edward E., to Dow Chemical Company, The. Reverse osmosis membrane. 5,464,538, Cl. 210-490.000.

Schmidt, Glenn H.; and Helmstetter, Richard C., to Callaway Golf Company. Golf putter head with undercut back cavity and peripheral weighting. 5,464,218, Cl. 273-169.000.

Schmidt, Hans-Joachim: *See*—
Jennet, Bert; Schmidt, Hans-Joachim; Chiaramonte, Giancarlo; and Lehmann, Wolfgang, 5,465,195, Cl. 362-61.000.

Schneider, Gottfried: *See*—
Peschka, Walter; and Schneider, Gottfried, 5,463,868, Cl. 62-6.000.

Schneider, Michel: *See*—
Tournier, Hervé; Hyacinthe, Roland; and Schneider, Michel, 5,464,696, Cl. 428-403.000.

Schneider, William E.: *See*—
Upton, William K., III; Schneider, William E.; Brown, Stuart H.; Stetz, Steven A.; Gotich, Emily J.; and McCrea, Jack L., 5,464,161, Cl. 241-21.000.

Schobel, Mark: *See*—
Hoover, Charles E.; Dennin, Randy J.; Gabor, E. Allan; Schobel, Mark; and Sorg, Albert F., 5,464,631, Cl. 424-454.000.

Schoch, Reinhard; and Marten, Walter, to H.F. & PH.F. Reemtsma GmbH & Co. Packing carton. 5,464,148, Cl. 229-109.000.

Scholz, Wilfried: *See*—
Abbate, Agostino; Frankel, Julius; Scholz, Wilfried; Colangelo, Vito J.; and Korman, William J., 5,463,896, Cl. 73-81.000.

Schomakers, Franz, to intur System-Profil GmbH + Co. Connector for structure members. 5,464,298, Cl. 403-252.000.

Schorlemmer, Hans U.: *See*—
Stief, Thomas; Heimburger, Norbert; and Schorlemmer, Hans U., 5,464,615, Cl. 424-94.630.

Schraga, Steven. Reusable lancet device. 5,464,418, Cl. 606-182.000.

Schreurs, Jacobus C.; and Horstman, Rudolf A., to U.S. Philips Corporation. Device for the synchronization of digital data bursts and read apparatus comprising the device. 5,465,277, Cl. 375-376.000.

Schröder, Burkhard: *See*—
Hemmis, Ludger; Overberg, Matthias; and Schröder, Burkhard, 5,464,265, Cl. 296-146.140.

Schroder, Jens-Michael: *See*—
Christophers, Enno; Wiedow, Oliver; and Schroder, Jens-Michael, 5,464,822, Cl. 514-12.000.

Schroer, Charles F., Jr.: *See*—
Hayes, Jesse C., Jr.; Dever, Gerald R.; Laughlin, Thomas J.; Schroer, Charles F., Jr.; and Wildman, Gary C., 5,464,610, Cl. 424-61.000.

Schubert, Rudiger: *See*—
Archey, Rick L.; Lundy, Charles E.; Meltzer, Aaron D.; Pielartzik, Harald; Pennhoff, Gerhard; Hufen, Ralf; Kircher, Klaus; Schubert, Rudiger; and Weider, Richard, 5,464,893, Cl. 524-366.000.

Schuchmann, Stanley. Caddy clip. 5,464,139, Cl. 224-269.000.

Schuele, Paul J.: *See*—
Figura, Thomas A.; and Schuele, Paul J., 5,464,786, Cl. 437-52.000.

Schuler, Alexander: *See*—
Ledjeff, Konstantin; Schuler, Alexander; and Giesshoff, Jurgen, 5,464,006, Cl. 126-361.000.

Schulte, Reinhard W.; Wicks, William J.; Meinass, Helmut J.; and Nethery, Winston J., to Loma Linda University Medical Center. Vacuum-assisted fixation apparatus. 5,464,411, Cl. 606-130.000.

Schultheiss, John C., to Grass Valley Group, Inc., The. Spiral buffer for non-linear editing. 5,465,120, Cl. 348-716.000.

Schultz, Darald R.: *See*—
Boatwright, Darrell L.; Hanson, George E.; Miller, Phillip; Koenck, Steven E.; Walter, Jerry L.; Kubler, Joseph J.; Cargin, Keith K., Jr.; Schultz, Darald R.; Davis, Patrick H.; and Kunert, Steven R., 5,465,207, Cl. 364-424.010.

Schultz, Wolfgang: *See*—
Laas, Hans-Josef; Halpaap, Reinhard; Wamprecht, Christian; Meier-Westhues, Hans-Ulrich; Schultz, Wolfgang; and Kahl, Lothar, 5,464,921, Cl. 528-67.000.

Schulz, Reinhard, to Hermann Berstorff Maschinenbau GmbH. Polishing stack for thermoplastic films or sheets. 5,464,363, Cl. 451-190.000.

Schuman, Leroy J. W.: *See*—
Wolf, Robert J.; and Schuman, Leroy J. W., 5,463,944, Cl. 100-35.000.

Schuster, Sheldon M.: *See*—
Coolidge, Thomas R.; Lewis, William; Schuster, Sheldon M.; Stout, Jay; van Heeke, Gino; Wylie, Dwane; and Wagner, Fred W., 5,464,759, Cl. 435-91.200.

Schutter, Raymond A. Safety air gun. 5,464,155, Cl. 239-124.000.

Schwall, Ralph: *See*—
Chamow, Steven; Modi, Nishit; Schwall, Ralph; and Zioncheck, Thomas, 5,464,815, Cl. 514-8.000.

Schwander, Udo: *See*—
Weyh, Werner; Schwander, Udo; Gatter, Raimond; Notar, Robert; Konopa, Helmut; and Erdmann, Klaus, 5,464,124, Cl. 222-129.100.

Schwark, Joanne M., to Lanxide Technology Company, LP. Peroxide-substituted polysilazanes. 5,464,918, Cl. 528-24.000.

Schwarzberg, Moshe; and Dayal, Santosh, to Bayer Corporation. Immunoassay of free substances in biological fluids. 5,464,749, Cl. 435-7.920.

Scientific Utilization, Inc.: *See*—
Goriachev, Vladislav L.; Bratsev, Alexander N.; Feduikovich, Valeri N.; Rutberg, Philip G.; Greene, Hugh W.; and Chism, Paul E., Jr., 5,464,513, Cl. 204-164.000.

SCIMED Lifesystems Inc.: *See*—
Buscemi, Paul J.; Stejskal, Elizabeth A.; Palme, Donald F., II; and Wang, Lixiao, 5,464,450, Cl. 623-6.000.

Scitex Digital Printing, Inc.: *See*—
Bowers, Mark C., 5,465,109, Cl. 347-74.000.

Scofield, Robert E.; and Bechtel, Richard D., to Allen-Bradley Company, Inc. Bar code reader having dual mirror oscillating assembly with different orientation of oscillation. 5,464,976, Cl. 250-234.060.

Scofield, Robert L., to Hunter Fan Company. Vibration isolation system for fan blade. 5,464,323, Cl. 416-134.00R.

Scott, Matthew S.; McCollum, Gregory J.; Szymanski, Chester J.; and Wilson, Craig A., to PPG Industries, Inc. Crosslinked unsaturated polyesters as flatting agents in aqueous electrocoating compositions. 5,464,887, Cl. 523-501.000.

Scott Paper Company: *See*—
Mitchell, Joseph; and Frassanito, John R., 5,464,170, Cl. 242-598.000.

Scovill Fasteners Inc.: *See*—
Hochhausl, Anton, 5,463,807, Cl. 29-809.000.

Sea Gull Lighting: *See*—
Bray, Douglas R.; and Strazhnik, Michael M., 5,465,199, Cl. 362-554.000.

Seagate Technology, Inc.: *See*—
Mowry, Gregory S.; Gorka, Phillip E.; Strayer, Brian D.; and Kracke, Alan G., 5,463,805, Cl. 29-603.000.

Searle, Nigel H.: *See*—
Hampton, Thomas H.; Litle, Thomas J., IV; and Searle, Nigel H., 5,465,290, Cl. 379-67.000.

SEB S.A.: *See*—
Coudurier, Alain, 5,463,916, Cl. 76-107.100.

Sebia: *See*—
Bellon, Franck, 5,464,521, Cl. 204-299.00R.

Sebia, A Corp. of France: *See*—
Bellon, Franck, 5,464,515, Cl. 204-182.800.

Seckora, Michael C., to Tektronix, Inc. Barrel shifter or multiply/divide IC structure. 5,465,222, Cl. 364-715.080.

Seeder, Lewis. Mount for a flag, display and the like. 5,463,974, Cl. 116-173.000.

Seeley, Dennis H. Container having an audible signaling device. 5,464,092, Cl. 206-217.000.

Segawa, Takashi: *See*—
Arakawa, Nobuyuki; Segawa, Takashi; Kaneko, Moriyoshi; Miyairi, Kazuki; and Takayama, Kazutoshi, 5,464,339, Cl. 425-186.000.

Sehgal, Hansa: *See*—
Sehgal, Lakshman R.; De Wonkin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, 5,464,814, Cl. 514-6.000.

Sehgal, Lakshman R.; De Woskin, Richard E.; Moss, Gerald S.; Gould, Steven A.; Rosen, Arthur L.; and Sehgal, Hansa, to Northfield Laboratories, Inc. Acellular red blood cell substitute. 5,464,814, Cl. 514-6.000.
Seigendall, Thomas W.: *See*—
Dinkjian, Robert M.; Heller, Lisa C.; Kordus, Steven R.; Lauricella, Kenneth A.; Seigendall, Thomas W.; Skaggs, Robert A.; and Xu, Nelson S., 5,465,374, Cl. 395-800.000.
Seikagaku Kogyo Kabushiki Kaisha: *See*—
Sakurai, Katsukiyo; Sugiura, Nobuo; Kimata, Koji; and Suzuki, Sakaru, 5,464,942, Cl. 536-21.000.
Seiko Epson Corporation: *See*—
Fujisawa, Teruhiko; and Ito, Koichi, 5,465,098, Cl. 343-718.000.
Ikuma, Takeshi; Sakata, Masaaki; Akioka, Hiroharu; and Shimod, Tatsuya, 5,464,670, Cl. 428-35.800.
Watanabe, Kenji; and Toyosawa, Yoshiya, 5,464,290, Cl. 400-76.000.
Seiko Instruments Inc.: *See*—
Suzuki, Nobuo; and Murata, Osamu, 5,464,361, Cl. 451-28.000.
Seitz, Reiner, to Rothenberger Werkzeuge-Maschinen GmbH. Method and apparatus for manufacturing of soldering rod containing copper. 5,463,886, Cl. 72-13.000.
Sejnoha, Vladimir, to Kurzweil Applied Intelligence, Inc. Method for generating a speech recognition model for a non-vocabulary utterance. 5,465,318, Cl. 395-2.520.
Seki, Hiroyuki: *See*—
Kimura, Atsushi; and Seki, Hiroyuki, 5,464,291, Cl. 400-185.000.
Sekine, Masatoshi; and Chang, Eric, to Kabushiki Kaisha Toshiba. Heuristic control system employing expert system, neural network and training pattern generating and controlling system. 5,465,204, Cl. 364-152.000.
Sekine, Tetsu: *See*—
Kudo, Masato; Sekine, Tetsu; and Murakami, Koji, 5,464,978, Cl. 250-305.000.
Sekino, Yoshio: *See*—
Kimura, Haruo; Sekino, Yoshio; Masuya, Takashi; and Fukui, Takao, 5,464,954, Cl. 200-61.620.
Semancik, Stephen: *See*—
Gaitan, Michael; Suehle, John S.; Semancik, Stephen; and Cavicchi, Richard E., 5,464,966, Cl. 219-544.000.
Semel, Joachim: *See*—
Lyding, Günther; Pille, Maria; von Plessen, Helmold; and Semel, Joachim, 5,464,876, Cl. 521-46.500.
Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 5,464,780, Cl. 437-41.000.
Yamazaki, Shunpei, 5,465,137, Cl. 355-211.000.
Semmler, Bruce: *See*—
Vacek, Ronald R.; Semmler, Bruce; and Owens, Edward, 5,464,111, Cl. 215-249.000.
Senju Pharmaceutical Co., Ltd.: *See*—
Masayuki, Nakamura, 5,463,976, Cl. 117-68.000.
Senoo, Akihiro: *See*—
Kashizaki, Yoshio; Senoo, Akihiro; and Tanaka, Masato, 5,464,718, Cl. 430-58.000.
Senoo, Masaharu; Sasada, Reiko; and Igarashi, Koichi, to Takeda Chemical Industries, Ltd. DNA encoding glycosylated FGF and production thereof. 5,464,943, Cl. 536-23.500.
Senoo, Yasutoshi; Yanagihara, Nobuaki; and Yasu, Norio, to Miura Co., Ltd. Water ring type pump with sidewall water reflux passage. 5,464,329, Cl. 417-68.000.
Sentoku, Koichi: *See*—
Matsumoto, Takahiro; Nose, Noriyuki; Saito, Kenji; and Sentoku, Koichi, 5,465,148, Cl. 356-349.000.
Sera, Makoto, to Kotobuki Seating Co. Ltd. Seat construction. 5,464,273, Cl. 297-232.000.
Serafin, Richard D.: *See*—
Wilson, Philip D.; Serafin, Richard D.; Kelley, Paul W.; and Witkowicz, Tadeusz, 5,465,254, Cl. 370-79.000.
Serdi - Societe D'Etudes De Realisation Et De Diffusion Industrielles: *See*—
Vachoux, André, 5,463,802, Cl. 29-214.000.
Service Litho-Print, Inc.: *See*—
Luce, Richard J., 5,464,681, Cl. 428-195.000.
Servin, Randall F., to Albany International Corp. Method of seaming plastic fabrics. 5,464,488, Cl. 156-73.400.
Seto, Kaoru; Kanaiwa, Kiyoshi; Itoh, Michio; Mano, Hiroshi; Yamada, Hiromichi; Kashihara, Atsushi; Kawana, Takashi; and Saito, Tetsuo, to Canon Kabushiki Kaisha. Recording apparatus with image modification for increased image resolution. 5,465,157, Cl. 358-298.000.
Seto, Toru: *See*—
Suehiro, Mitsugi; Seto, Toru; Mitsuoka, Shigeaki; and Inoue, Kenji, 5,464,604, Cl. 423-570.000.
Severn, Michael J.; Northcott, Anthony J.; and Rowlinson, Anne G., to Rolls-Royce plc. Fuel control system. 5,463,863, Cl. 60-39.030.
Sevik, Maurice M.: *See*—
Williams, Robert M.; Rogers, Ernest O.; and Sevik, Maurice M., 5,464,321, Cl. 416-93.00A.
Sextant Avionique: *See*—
Barbier, Bruno; and Lach, Patrick, 5,465,177, Cl. 359-634.000.
Sfanid Renov'cuves: *See*—
Vasseur, Jean-Claude, 5,463,887, Cl. 72-39.000.
SGS-Thomson Microelectronica, Inc.: *See*—
Slemmer, William C., 5,465,233, Cl. 365-200.000.
SGS-Thomson Microelectronics S.A.: *See*—
Meunier, Philippe; and Pavlin, Antoine, 5,465,190, Cl. 361-91.000.
SGS-Thomson Microelectronics s.r.l.: *See*—
Crisenza, Giuseppe; and Clementi, Cesare, 5,464,784, Cl. 437-43.000.
Shah, Hiten T.; and Wolf, Jerry M., to Acoust-A-Fiber Research and Development Inc. Shield between vehicle exhaust and passenger compartment. 5,464,952, Cl. 181-211.000.
Shakespeare Company: *See*—
Diaz-Kotti, Michelle A.; and Brissette, Peter J., 5,464,890, Cl. 524-195.000.
Shalla, Ronald L.: *See*—
Burke, Lawrence M.; and Shalla, Ronald L., 5,463,787, Cl. 15-97.100.
Shamina, Valentina P.: *See*—
Ballova, Galina D.; Rupyshev, Vladimir; Rumyantsev, Sergei G.; Amosov, Viktor V.; Mekhed, Igor A.; Alexeeva, Larisa V.; Pykhtin, Viktor A.; Rolnik, Mikhail D.; Eremina, Evgenia N.; Shamina, Valentina P.; Maladzyanova, Larisa F.; Karmakova, Valentina G.; K, 5,464,915, Cl. 526-225.000.
Shannon, Mervyn D.: *See*—
Casci, John L.; Shannon, Mervyn D.; and Lake, Ivan J. S., 5,464,799, Cl. 502-65.000.
Shapcott, Michael, to Zapata Technologies, Inc. Electromagnet crown sorting and un-jamming device. 5,464,089, Cl. 198-392.000.
Sharma, Mahendra K.; Singleton, Andy H.; and Hiller, John J., to Eastman Chemical Company. Waterborne correction fluid for correcting laser-jet and photocopied markings. 5,464,883, Cl. 523-161.000.
Sharp, Burt M.: *See*—
Portoghese, Philip S.; Sharp, Burt M.; and Limer, Kristin M., 5,464,841, Cl. 514-279.000.
Sharp Corporation: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,465,064, Cl. 327-361.000.
Sharp, Dennis, to James River Corporation of Virginia. Bulk package wrapping and securing system. 5,463,843, Cl. 53-399.000.
Sharp Kabushiki Kaisha: *See*—
Fuji, Hiroshi, 5,465,248, Cl. 369-112.000.
Koden, Mitsuhiro; Tagawa, Akira; Takeda, Hitoshi; Katsuse, Hirofumi; Shiomi, Makoto; Numao, Takaji; Gouda, Hiroshi; Katakami, Masayuki; Kondo, Naofumi; and Katayama, Mikio, 5,465,168, Cl. 359-56.000.
Sakai, Keiji; Yoshida, Yoshio; Yamamoto, Hiroyuki; Kurata, Yukio; Nakata, Yasuo; and Miyake, Takahiro, 5,465,315, Cl. 385-116.000.
Watanabe, Takashi, 5,464,997, Cl. 257-239.000.
Woodgate, Graham J.; and Ezra, David, 5,465,175, Cl. 359-463.000.
Sharrow, Joseph F.; and Hardy, Samuel R., to United States of America, Navy. Subassembly means. 5,464,173, Cl. 244-3.300.
Shatas, Remigius G.; and Ligon, David L., to Cybex Corporation. Autosensing switching system. 5,465,105, Cl. 345-204.000.
Shavit, Jacob, to Control & Regulation Circuits Meitav Ltd. Defrost control system. 5,463,875, Cl. 62-140.000.
Shaw, James E.; Sattich, William E.; and Efner, Howard F., to Phillips Petroleum Company. Oxidation of dimercaptans to organic disulfide polymers. 5,464,931, Cl. 528-389.000.
Sheaffer, Jeffrey D.: *See*—
Markovitz, Mark; and Sheaffer, Jeffrey D., 5,464,949, Cl. 174-120.00R.
Shell Oil Company: *See*—
Hale, Arthur H.; Cowan, Kenneth M.; and Nahm, James J. W., 5,464,060, Cl. 166-293.000.
Shen, Neng H.: *See*—
Lur, Water; Su, Anna; and Shen, Neng H., 5,465,003, Cl. 257-510.000.
Shenk, David, to Envirovac, Inc. Solenoid actuated valve. 5,464,191, Cl. 251-129.210.
Shenoha, James L.; and Scheie, Carl E., to Wilson Sporting Goods Co. Open rail metal wood golf clubhead. 5,464,217, Cl. 273-169.000.
Sherba, Samuel E.: *See*—
Mehta, Raj I.; Lange, Barry C.; and Sherba, Samuel E., 5,464,622, Cl. 424-405.000.
Osei-Gyimah, Peter; Sherba, Samuel E.; Lange, Barry C.; Mehta, Rai J.; and Joseph, Rhoda W., 5,464,832, Cl. 514-238.500.
Sherman, James R. Crosshair support member for an archery sight. 5,464,003, Cl. 124-87.000.
Sheth, Paresh J., to Lyondell Petrochemical Company. Wettable polyolefin fiber compositions and method. 5,464,687, Cl. 428-286.000.
Shettigar, Udipi R., to University of Utah. Filter for on-line plasma sampling. 5,464,535, Cl. 210-321.890.
Shiao, Shin J., to Tsai, Chao Ming. Backfill for engineered barrier. 5,464,473, Cl. 106-811.000.
Shibafuchi, Hiroshi: *See*—
Sasaki, Masanori; Shibafuchi, Hiroshi; Imai, Yasushi; Yoshida, Masahiko; and Yoshie, Takehiko, 5,464,248, Cl. 280-741.000.
Shibahara, Seiji: *See*—
Tashima, Masaki; Kano, Yuko; Iwamatsu, Katsuyoshi; Tamura, Atsushi; and Shibahara, Seiji, 5,464,829, Cl. 514-206.000.
Shibaki, Hiroyuki: *See*—
Nakazato, Yasushi; Tanaka, Makoto; Sakamoto, Kohki; Kondo, Hisayo; Kasahara, Rikio; Shibaki, Hiroyuki; and Sugiyama, Mitsugu, 5,464,200, Cl. 270-53.000.
Shibusawa, Tetsuo: *See*—
Harada, Kuniyuki; Sawada, Kazutaka; Hosoya, Yoshiteru; and Shibusawa, Tetsuo, 5,464,671, Cl. 428-40.000.
Shigeta, Hiromasa: *See*—
Iguchi, Masaru; Shigeta, Hiromasa; and Matsumoto, Keizo, 5,464,493, Cl. 156-290.000.

Shih, Feng-Hsien W.: *See*—
. Chao, Hu H.; Chang, Jung H.; and Shih, Feng-Hsien W., 5,465,347, Cl. 395-550.000.
Shikata, Shinichi: *See*—
Hachigo, Akihiro; Nakahata, Hideaki; Shikata, Shinichi; and Fujimori, Naoji, 5,463,901, Cl. 73-753.000.
Shikoku Chemicals Corporation: *See*—
Nakatsuka, Takuo; Toyota, Tsuyoshi; Tanimoto, Mie; and Matsumoto, Akiko, 5,464,910, Cl. 525-486.000.
Shimada, Hiroo: *See*—
Sakai, Hisao; Shimada, Hiroo; Sono, Hiroshi; Nagahiro, Kenichi; Sugita, Narutoshi; Maeda, Hirotsugu; Miyao, Masakatsu; Nakamura, Katsunori; Ogita, Yasunori; and Suzuki, Osamu, 5,463,995, Cl. 123-433.000.
Shimada, Takaaki: *See*—
Matsumura, Hiroshi; Shimada, Takaaki; Hisanaka, Takayuki; Ochi, Yoshiki; Kuwaki, Tetsuo; and Muta, Yoshinobu, 5,464,689, Cl. 428-317.900.
Shimizu, Kanzi: *See*—
Shimizu, Keishi; Shimizu, Kanzi; Mitsumachi, Masanobu; Nakajima, Masato; Ishigami, Tetsushi; and Kusamichi, Yoshitake, 5,464,370, Cl. 454-345.000.
Shimizu, Keishi; Shimizu, Kanzi; Mitsumachi, Masanobu; Nakajima, Masato; Ishigami, Tetsushi; and Kusamichi, Yoshitake, to Yugen Kaisha New Media Systems; Daito Teck Kabushiki Kaisha; and Yoshitake Kusamichi. Device for changing a fluid passage. 5,464,370, Cl. 454-345.000.
Shimod, Tatsuya: *See*—
Ikuma, Takeshi; Sakata, Masaaki; Akioka, Hiroharu; and Shimod, Tatsuya, 5,464,670, Cl. 428-35.800.
Shimokawa, Yukitsugu: *See*—
Mitsui, Tsutomu; Akaba, Noriyuki; and Shimokawa, Yukitsugu, 5,465,099, Cl. 343-730.000.
Shimomura, Yuji: *See*—
Sasaki, Umekichi; Hasegawa, Hiroshi; and Shimomura, Yuji, 5,464,550, Cl. 252-68.000.
Shimono, Takeshi; and Konishi, Noriyo, to NEC Corporation. System for forming test patterns for large scale integrated circuits. 5,465,383, Cl. 395-800.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Kishita, Hirofumi; Yamaguchi, Kouichi; Kobayashi, Nobuyuki; and Ishida, Kouichi, 5,464,917, Cl. 528-14.000.
Takahata, Shigeru, 5,464,655, Cl. 427-238.000.
Yoshikawa, Yuji; and Takarada, Mitsuhiro, 5,464,901, Cl. 525-103.000.
Shin-Etsu Handotai Co., Ltd.: *See*—
Fujimaki, Nobuyoshi, 5,464,779, Cl. 437-8.000.
Shin, Hyun H.: *See*—
Kang, Dae S.; Park, Woo S.; Shin, Hyun H.; Kwon, Soon B.; Marusii, Tatyana Y.; Reznikov, Yuriy A.; Khizhnyak, Anatoliy I.; and Yaroschchuk, Oleg V., 5,464,669, Cl. 428-1.000.
Shinada, Shigeo: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mituhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.
Shinagawa, Masatoshi; and Hashimoto, Hideyuki, to Toyoda Gosei Co., Ltd. Weather strip for motor vehicle. 5,463,831, Cl. 49-377.000.
Shinko Electric Industries Co., Ltd.: *See*—
Horiuchi, Michio; Harayama, Yoichi; and Hayashi, Koishiro, 5,464,950, Cl. 174-256.000.
Shinogle, Ronald D.: *See*—
Maley, Dale C.; and Shinogle, Ronald D., 5,463,996, Cl. 123-446.000.
Shinohe, Takashi; Nakayama, Kazuya; Takeuchi, Minami; Yamaguchi, Masakazu; Kitagawa, Mitsuhiko; Omura, Ichiro; and Nakagawa, Akio, to Kabushiki Kaisha Toshiba. Insulated-gate thyristor. 5,464,994, Cl. 257-147.000.
Shiomi, Makoto: *See*—
Koden, Mitsuhiro; Tagawa, Akira; Takeda, Hitoshi; Katsuse, Hirofumi; Shiomi, Makoto; Numao, Takaji; Gouda, Hiroshi; Katakami, Masayuki; Kondo, Naofumi; and Katayama, Mikio, 5,465,168, Cl. 359-56.000.
Shiraishi, Naoto: *See*—
Fujii, Tatsuya; and Shiraishi, Naoto, 5,465,371, Cl. 395-800.000.
Shiratori, Shigekazu: *See*—
Akiba, Nobuo; Obtsuka, Isao; Shiratori, Shigekazu; and Kase, Katsunori, 5,465,101, Cl. 345-1.000.
Shiratsuki, Yoshiyuki; Yamaguchi, Yoshinori; Hayashi, Kazuhiro; and Niitsu, Takahiro, to Fuji Xerox Co., Ltd. Voltage non-linear device and liquid crystal display device incorporating same. 5,464,990, Cl. 257-40.000.
Shirdavani, Hossain A. Garment weight transfer apparatus. 5,464,137, Cl. 224-265.000.
Short, Malcolm, to Rolls-Royce PLC. Variable camber vane. 5,464,175, Cl. 244-12.500.
Shou, Guolisng; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, to Yozan Inc.; and Sharp Corporation. Weighted summing circuit. 5,465,064, Cl. 327-361.000.
Shover, Stephanie A. Protective garment for female canines. 5,463,985, Cl. 119-850.000.
Showa Shell Sekiyu K.K.: *See*—
Nishino, Atsushi; Yoshida, Akihiko; Namba, Teruo; Aoki, Masaaki; and Naito, Atsushi, 5,465,091, Cl. 341-33.000.
Showa Shell Sekiyu Kabushiki Kaisha: *See*—
Hirose, Katutoshi; Takagi, Yoshihiro; Otomatsu, Toshihiko; and Suzuki, Yoshiichi, 5,464,772, Cl. 435-280.000.
Showalter, Howard D. H.: *See*—
Dobrusin, Ellen M.; Showalter, Howard D. H.; Denny, William A.; Palmer, Brian D.; Rewcastle, Gordon W.; Tercel, Moana; and Thompson, Andrew M., 5,464,861, Cl. 514-414.000.
Shrive, Nigel G.; Damson, Erich; Meyer, Richard A.; and Iverslie, Scott P., to University Technologies International Inc. Soft tissue extensometer. 5,463,902, Cl. 73-781.000.
Shtadler, Ze'ev: *See*—
Rotem, Shai; and Shtadler, Ze'ev, 5,465,216, Cl. 364-488.000.
Side-Kik Corporation: *See*—
O'Brien, Paul, 5,464,103, Cl. 211-133.000.
Sieber, Richard W.: *See*—
Cooperman, Michael; Paige, Arnold; and Sieber, Richard W., 5,465,087, Cl. 340-825.800.
Siebert, Robert M.: *See*—
Wilson, Dennis R.; Siebert, Robert M.; and Lively, Pat, 5,464,061, Cl. 166-302.000.
Siebert, William K.: *See*—
Whitson, Frederick A.; Siebert, William K.; and Raihala, Kenneth B., 5,464,461, Cl. 55-480.000.
Sieberth, John F., to Ethyl Corporation. Oil soluble dispersants suitable for use in fuels and lubricants. 5,464,549, Cl. 252-51.50A.
Sieck, Peter A.; and Porter, John R., to BOC Group, Inc., The. Cylindrical magnetron shield structure. 5,464,518, Cl. 204-192.120.
Siemens Aktiengesellschaft: *See*—
Bierbaum, Thomas, 5,464,350, Cl. 433-84.000.
Gall, Arthur; Meier, Heinz; Kuphal, Wilko; and Vogel, Georg, 5,465,285, Cl. 378-173.000.
Müller, Horst, 5,465,252, Cl. 370-65.500.
Maschmann, Martin; Schardein, Werner; and Hosticka, Bedrich, 5,465,074, Cl. 330-263.000.
Roehl, Siegfried, 5,464,793, Cl. 437-186.000.
Zimmermann, Walter, 5,465,419, Cl. 455-333.000.
Siemon, John T.: *See*—
McCleary, Sherri F.; Nitowski, Gary A.; Marinelli, James M.; and Siemon, John T., 5,463,804, Cl. 29-469.500.
Sigal, Joseph: *See*—
Altemare, Robert L.; and Sigal, Joseph, 5,464,275, Cl. 300-21.000.
Sikes, Roger A.; and Plevich, Alexander P., to Advanced Micro Devices, Inc. Work-in-process storage pod. 5,464,475, Cl. 118-719.000.
Silicon Systems, Inc.: *See*—
Pan, Tzu-Wang; and Yamasaki, Richard, 5,465,059, Cl. 327-12.000.
Siliconix incorporated: *See*—
Williams, Richard K., 5,465,000, Cl. 257-335.000.
Silva, James M.; and Pyles, Robert A., to General Electric Company. Article for use in optical application formed from linear polycarbonate resins. 5,464,930, Cl. 528-371.000.
Silverberg, Morton: *See*—
Foster, Dean H.; Holbrook, Russell W.; Morabito, James; Silverberg, Morton; and Supron, Steven A., 5,464,317, Cl. 414-798.200.
Silverman, James D., to W. L. Gore & Associates, Inc. Suture needle. 5,464,422, Cl. 606-223.000.
Silvis, H. Craig; and Kram, Shari L., to Dow Chemical Company, The. Flexible poly(amino ethers) for barrier packaging. 5,464,924, Cl. 528-102.000.
Simco/Ramic Corporation: *See*—
Squyres, Henry P.; and Campbell, Duncan B., 5,464,981, Cl. 250-341.800.
Simmonds Precision Products, Inc.: *See*—
Durkee, Scott R.; and Fjerstad, Erik A., 5,465,227, Cl. 364-825.000.
Simmons, Dennis C.: *See*—
Duensing, David T.; Phillips, Dayle E.; and Simmons, Dennis C., 5,465,378, Cl. 395-800.000.
Simpson, Richard: *See*—
Guttag, Karl M.; Simpson, Richard; and Walsh, Brendan, 5,465,224, Cl. 364-716.000.
Simpson, Sharon M.: *See*—
Lynch, Doreen C.; Simpson, Sharon M.; and Skoog, Paul G., 5,464,738, Cl. 430-619.000.
Sims, John E.; Cosman, David J.; Lupton, Stephen D.; Mosley, Bruce A.; and Dower, Steven K., to Immunex Corporation. Type II Interleukin-1 receptors. 5,464,937, Cl. 530-350.000.
Sinnula Inc.: *See*—
Castro, Mynor; Yaniv, Gershon; Hardtmann, Dirk J.; and Romeo, David J., 5,464,246, Cl. 280-730.200.
Sinclair, David P., to Cook Composites and Polymers Co. Flame retardant polyester-polyurethane hybrid resin compositions. 5,464,919, Cl. 528-60.000.
Singer, Douglas E., to Eastman Kodak Company. Cleaning of emulsion manufacturing apparatus. 5,464,727, Cl. 430-347.000.
Singer, Yehuda: *See*—
Gottlieb, Israel; and Singer, Yehuda, 5,465,372, Cl. 395-800.000.
Singleton, Andy H.: *See*—
Sharma, Mahendra K.; Singleton, Andy H.; and Hiller, John J., 5,464,883, Cl. 523-161.000.
Siska, William, Jr.; and Lenz, Vernon C. Nose clip. 5,464,413, Cl. 606-151.000.

Sisson, Warren G.; Basaran, Osman A.; and Harris, Michael T., to Martin Marietta Energy Systems, Inc. Nozzle for electric dispersion reactor. 5,464,195, Cl. 266-170.000.

Six, Howard R.; and Garcon, Nathalie B., to Research Development Foundation. Liposomes that provide thymic dependent help to weak vaccine antigens. 5,464,630, Cl. 424-450.000.

Sjöberg, Lars-Göran: *See*—
Eklund, Sivert; Jönsson, Claes; and Sjöberg, Lars-Göran, 5,464,318, Cl. 415-28.000.

Skaggs, Robert A.: *See*—
Dinkjian, Robert M.; Heller, Lisa C.; Kordus, Steven R.; Lauricella, Kenneth A.; Seigendall, Thomas W.; Skaggs, Robert A.; and Xu, Nelson S., 5,465,374, Cl. 395-800.000.

Skarvinko, Eugene R.: *See*—
Gelorme, Jeffrey D.; Skarvinko, Eugene R.; and Wang, David W., 5,464,726, Cl. 430-326.000.

Skeens, Joseph L.; and Miketic, Linda M., to University of Pittsburgh. Imaging fixation and localization system with respiratory feedback device. 5,464,410, Cl. 606-130.000.

Skiba, Jeffry B., to Orthopaedic Biosystems, Ltd. Medullary suture anchor. 5,464,425, Cl. 606-232.000.

Skotnicki, Tomasz; and Merckel, Gérard, to France Telecom. Electronic component capable of negative dynamic resistance. 5,465,001, Cl. 257-370.000.

Skoug, Paul G.: *See*—
Lynch, Doreen C.; Simpson, Sharon M.; and Skoug, Paul G., 5,464,738, Cl. 430-619.000.

Slanker, Daniel W.: *See*—
Hostler, Jonathan E.; DeCamp, William H.; and Slanker, Daniel W., 5,464,963, Cl. 219-121.820.

Slat, William A.; and Darr, Richard C., to Plastipak Packaging, Inc. Multilayer containers. 5,464,106, Cl. 215-12.100.

Slemmer, William C., to SGS-Thomson Microelectronics, Inc. Structure for deselecting broken select lines in memory arrays. 5,465,233, Cl. 365-200.000.

Smith, Alan W., to General Electric Company. Starter air valve position pressure transducer. 5,463,865, Cl. 60-39.142.

Smith, Brian G., to United States of America, Army. Trigger apparatus for spark gap dischargers. 5,465,030, Cl. 315-349.000.

Smith, Chadwick F., to LaserMedics, Inc. Method of performing laser therapy. 5,464,436, Cl. 607-89.000.

Smith, Craig A.; and Goodwin, Raymond G., to Immunex Corporation. Isolated viral protein TNF antagonists. 5,464,938, Cl. 530-350.000.

Smith, Dawn E.: *See*—
Allcock, Harry R.; Cameron, Charles G.; and Smith, Dawn E., 5,464,932, Cl. 528-399.000.

Smith, Edward J.: *See*—
Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yursis, Robert, 5,465,294, Cl. 379-207.000.

Smith, Graham J.: *See*—
Ferber, Gerald J.; and Smith, Graham J., 5,464,557, Cl. 252-170.000.

Smith, Jack V., to Chimera Research and Chemical, Inc. Method of detecting adulterant in urine. 5,464,775, Cl. 436-63.000.

Smith, Peter: *See*—
Sutcliffe, Peter H.; and Smith, Peter, 5,464,971, Cl. 235-379.000.

Smith, Robert W., to SynOptics Communications, Inc. Data transmitter baseline wander correction circuit. 5,465,272, Cl. 375-295.000.

Smith, Warren A.: *See*—
Zaluzec, Matthew J.; Grab, Gerald A.; and Smith, Warren A., 5,464,146, Cl. 228-208.000.

Smith, William A.: *See*—
Peters, Michael W.; Smith, William A.; Mueller, Mark A.; and Culbreth, William K., III, 5,464,505, Cl. 203-64.000.

Smith, Z. Erol, III: *See*—
Cooper, Martin F. N.; Johnson, Walter A. L.; and Smith, Z. Erol, III, 5,465,167, Cl. 358-468.000.

SmithKline Beecham P.L.C.: *See*—
King, Francis D.; Gaster, Laramie M.; Kaumann, Alberto J.; and Young, Rodney C., 5,464,864, Cl. 514-468.000.

Smiths Industries Public Limited Company: *See*—
Collins, Michael N., 5,464,400, Cl. 604-283.000.

Smyth, Padhraic J., to United States of America, National Aeronautics and Space Administration. Hidden markov models for fault detection in dynamic systems. 5,465,321, Cl. 395-22.000.

Snap-on Incorporated: *See*—
Hasenberg, Mark J.; and Rau, Peter B., 5,465,196, Cl. 362-183.000.

Snoeys, Walter; and Parker, Sherwood I., to University of Hawaii. Integrated vlsi radiation/particle detector with biased pin diodes. 5,465,002, Cl. 257-458.000.

Snyder, Ralph E.; Sorace, Dominic A.; and Benford, James G., to Allegheny Ludlum Corporation. Segmented scribing roller for refining the domain structure of electrical steels by local mechanical deformation. 5,463,889, Cl. 72-197.000.

Sobota, Richard R.: *See*—
Nanaji, Seifollah S.; Pope, Kenneth L.; and Sobota, Richard R., 5,464,466, Cl. 95-45.000.

Societe Anonyme pour l'Etude et l'Exploitation l'Air Liquide, des Procedes Georges Claude: *See*—
Kogan, Jack; and Muguet, Michel, 5,464,501, Cl. 162-6.000.

Societe National Elf Aquitaine (Production): *See*—
Mallet, Jean-Laurent, 5,465,323, Cl. 395-123.000.

Sodick Co., Ltd.: *See*—
Takahashi, Nobuyuki, 5,464,959, Cl. 219-69.140.

Soland, Phil M.: *See*—
Schilling, Steven L.; Yeater, Robert P.; Soland, Phil M.; Szabat, John F.; and Parsons, Harold R., 5,464,560, Cl. 252-182.240.

Solie, Leland P.: *See*—
Hunsinger, Billie J.; Vigil, A. J.; and Solie, Leland P., 5,465,396, Cl. 455-61.000.

Soll, Richard M., to American Home Products Corporation. Esterified polyanionic cyclodextrins as smooth muscle cell proliferation inhibitors. 5,464,827, Cl. 514-58.000.

Solomon, Daniel M.: *See*—
Ting, Pauline C.; Solomon, Daniel M.; and Tom, Wing C., 5,464,840, Cl. 514-277.000.

Solomon, William E.: *See*—
McDonald, Dale R.; Laugel, Joe B., Jr.; and Solomon, William E., 5,464,160, Cl. 241-17.000.

Solufrance: *See*—
Germain, Alain; Berteaud, Andre-Jean; and Galtier, Francois, 5,464,968, Cl. 219-710.000.

Solvay (Société Anonyme: *See*—
De Soete, Gérard, 5,464,599, Cl. 423-239.100.

Sommadossi, Jean-Pierre, to UAB Research Foundation, The. Method of detecting and monitoring levels of 3'-amino-3'-deoxythymidine in body fluids and antibodies for same. 5,464,748, Cl. 435-7.700.

Sono, Hiroshi: *See*—
Sakai, Hisao; Shimada, Hiroo; Sono, Hiroshi; Nagahiro, Kenichi; Sugita, Narutoshi; Maeda, Hirotsugu; Miyao, Masakatsu; Nakamura, Katsunori; Ogita, Yasunori; and Suzuki, Osamu, 5,463,995, Cl. 123-432.000.

Sony Co.: *See*—
Machara, Kenso; Majima, Osamu; and Hirashima, Shigeyoshi, 5,463,949, Cl. 101-152.000.

Sony Corporation: *See*—
Arakawa, Nobuyuki; Segawa, Takashi; Kaneko, Moriyoshi; Miyairi, Kazuki; and Takayama, Kazutoshi, 5,464,339, Cl. 425-186.000.
Fogarty, Thomas J.; and Howell, Thomas A., 5,464,447, Cl. 607-129.000.
Ide, Yoshihiro; Kakuno, Imao; Sakurai, Nobumasa; Mitsui, Hidero; and Okayasu, Yoshisada, 5,465,117, Cl. 348-373.000.
Kunito, Yoshiyuki; and Fukami, Tadashi, 5,465,179, Cl. 360-8.000.
Narahara, Tatsuya, 5,465,241, Cl. 369-44.110.
Owaki, Masanao, 5,465,403, Cl. 455-186.100.
Yoshinaka, Tadaaki, 5,465,181, Cl. 360-36.200.

Sopko, John F.: *See*—
Athey, Patricia R.; Dauson, Douglas S.; Lecocq, David E.; Neuman, George A.; Sopko, John F.; and Stewart-Davis, Royann L., 5,464,657, Cl. 427-255.500.

Sorace, Dominic A.: *See*—
Snyder, Ralph E.; Sorace, Dominic A.; and Benford, James G., 5,463,889, Cl. 72-197.000.

Sorenson, Roderick J.: *See*—
Cetenko, Wiaczeslaw A.; Connor, David T.; Sorenson, Roderick J.; Unangst, Paul C.; and Stabler, Stephen R., 5,464,856, Cl. 514-389.000.

Sorg, Albert F.: *See*—
Hoover, Charles E.; Dennin, Randy J.; Gabor, E. Allan; Schobel, Mark; and Sorg, Albert F., 5,464,631, Cl. 424-454.000.

Sorolla, Josep R.: *See*—
Denny, Jacques P.; and Sorolla, Josep R., 5,464,451, Cl. 8-94.210.

Sorrells, David F.: *See*—
Parker, Jeffrey L.; Sorrells, David F.; Mix, John D.; and Daber, Richard P., 5,465,144, Cl. 356-139.060.

Sourenian, Paul: *See*—
Geronimi, Francois; and Sourenian, Paul, 5,465,349, Cl. 364-550.000.

SpaceLabs, Inc.: *See*—
Anderson, R. Carver; and Eaton, Glen, 5,464,019, Cl. 128-677.000.

Spacemaker Limited: *See*—
Nilsson, Finn, 5,463,966, Cl. 108-110.000.

Spangler, Anthony G.: *See*—
Niemann, James E.; and Spangler, Anthony G., 5,464,045, Cl. 137-801.000.

Spani, Wayne M.; and Kemper, William S., to Triton Technology, Inc. Interchangeable disposable acoustic for use with an ultrasonic flowmeter, particularly during extracorporeal measurement of blood flow. 5,463,906, Cl. 73-861.270.

Sparschuh, Stefan: *See*—
Lohberg, Peter; Bayer, Ronald; Halst, Siegfried; Kircher, Dieter; Perez, Diogenes; and Sparschuh, Stefan, 5,464,079, Cl. 188-315.000.

Specklin, Jean-Luc: *See*—
Böhringer, Markus; Hubschwerlen, Christian; Pflieger, Philippe; and Specklin, Jean-Luc, 5,464,617, Cl. 424-114.000.

Spector, George: *See*—
Marcinko, Kathleen; Piacente-Vitro, Maria; and Spector, George, 5,463,981, Cl. 119-71.000.
Santoli, Domenico; and Spector, George, 5,463,853, Cl. 56-6.000.

Spencer Industries, Inc.: *See*—
Baker, Ernest; and Harris, Charles W., 5,464,168, Cl. 242-530.100.

Sperger, Reinhard: *See*—

Rudiger, Helmut; and Sperger, Reinhard, 5,464,683, Cl. 428-216.000.

Spitz, Donald N.: *See*—
Mayo, Randall D.; and Spitz, Donald N., 5,465,107, Cl. 346-139.00R.

Spowage, Michael: *See*—
Armitage, Bernard J.; Bowen, John G.; Crossley, Malcolm J.; Hunneyball, Ian M.; Leslie, Bruce W.; Miller, Thomas K.; and Spowage, Michael, 5,464,781, Cl. 514-300.000.

Sprangers, Keith J., to U.S. Competition Arms Inc. Method of removing a hammer from a shotgun. 5,463,829, Cl. 42-42.010.

Spring, David J.; and King, John D., to Kidde-Graviner Limited; and Detector Electronics (UK) Limited. Flame sensors and methods of sensing flame. 5,464,980, Cl. 250-338.100.

Springgate, Mark E.: *See*—
Yasrebi, Mehrdad; Kemp, William W.; Sturgis, David H.; Nikolas, Douglas G.; Wright, Gary L.; Kelly, Thomas J., III; Springgate, Mark E.; and Crego, Ted R., 5,464,797, Cl. 501-103.000.

Sprotbery, Donald E. Single light valve full-color projector display. 5,465,174, Cl. 359-40.000.

Spykerman, David J.; DeShaw, Gerald M.; Gregg, Michael J.; and Eldred, Randy E., to Prince Corporation. Armrest. 5,464,272, Cl. 297-227.000.

Square D Company: *See*—
Miller, Frank D.; and Helfrich, Thomas E., 5,465,011, Cl. 307-64.000.

Squyres, Henry P.; and Campbell, Duncan B., to Simco/Ramic Corporation. Methods of separating selected items from a mixture including raisins and the selected items. 5,464,981, Cl. 250-341.800.

Srinivasan, Ananthachari: *See*—
Dunn, T. Jeffrey; Srinivasan, Aanthachari; Lyle, Leon R.; and Rajagopalan, Raghavan, 5,464,934, Cl. 530-326.000.

Srinivasan, Ramanujam: *See*—
Hutcheson, Timothy L.; Or, Wilson; Narayanan, Venkatesh; Mohan, Subramaniam; Wohlmut, Peter G.; Srinivasan, Ramanujam; Hunt, Bobby R.; and Ryan, Thomas W., 5,465,308, Cl. 382-159.000.

St. Francis Research Institute: *See*—
Boettger, Conrad H., 5,464,399, Cl. 604-283.000.

Staar S.A.: *See*—
d'Alayer de Costemore d'Arc, Stephane M. A., 5,465,246, Cl. 369-77.200.

Stabler, Stephen R.: *See*—
Cetenko, Wiaczeslaw A.; Connor, David T.; Sorenson, Roderick J.; Unangst, Paul C.; and Stabler, Stephen R., 5,464,856, Cl. 514-389.000.

Stahl, Norman O. Working tip for fragmenting and aspirating ocular tissue. 5,464,389, Cl. 604-22.000.

Standard Textile Co., Inc.: *See*—
Mills, Veronica A.; and Fazio, Bonnie F., 5,464,024, Cl. 128-849.000.

Stanek, Scott D.: *See*—
Leviton, Laurence L.; Goldberg, Paul B.; and Stanek, Scott D., 5,465,303, Cl. 382-124.000.

Stange, Thomas C.; DiNanno, James M.; Maillet, John P., Jr.; and Heino, Richard N., to Lakso Company, The. Apparatus for packaging a predetermined quantity of objects and a counting device therefor. 5,463,839, Cl. 53-54.000.

Stanglein, Daniel C.: *See*—
Alexander, Robert J.; and Stanglein, Daniel C., 5,463,847, Cl. 53-473.000.

Stanley Works, The: *See*—
Carlson, Thomas R.; and Davidian, Richard M., 5,463,795, Cl. 16-273.000.

Stapper-Druyen, Sylva: *See*—
Becker, Wolfgang; Mathis, Raymond; Stapper-Druyen, Sylva; Robrahn, Karin; Hoffmann, Rainer; and Kiray, Yasar C., 5,464,660, Cl. 427-389.000.

Starr, Frank C.: *See*—
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; and Starr, Frank C., 5,463,845, Cl. 53-459.000.
Gwiazdon, Rodney K.; Korte, John E.; Deadmond, Richard S.; Starr, Frank C.; Roloff, Robb W.; and Devlin, Robert D., 5,463,848, Cl. 53-482.000.

State of Oregon Acting By and Through the State Board of Higher Education on Behalf of The University of Oregon: *See*—
Wybourne, Martin N.; Keana, John F. W.; Cai, Sui X.; Yan, Mingdi; and Wu, Jong, 5,465,151, Cl. 356-361.000.

Stauber, Hans-Ulrich, to Ferag AG. Gathering stapler for printed products comprising folded printed sheets. 5,464,199, Cl. 270-53.000.

Staudenmayer, William J.: *See*—
Chen, Jiann H.; Fitzgerald, John J.; Vreeland, William B., II; Ferrar, Wayne T.; Roberts, Gary P.; and Staudenmayer, William J., 5,464,698, Cl. 428-421.000.

St. Clair, Terry L.: *See*—
Chang, Alice C.; and St. Clair, Terry L., 5,464,928, Cl. 528-353.000.

Steck, Alfred E.; and Wei, Jinzhu, to Ballard Power Systems Inc. Gasketed membrane electrode assembly for electrochemical fuel cells. 5,464,700, Cl. 429-30.000.

Steckel, Mark G., to Ethicon, Inc. Ligating clip. 5,464,416, Cl. 606-158.000.

Steele, Edward A.; and Niemira, James K., to S&C Electric Company. Rotating arc interrupter for loadbreak switch. 5,464,956, Cl. 218-29.000.

Steffan, Guido: *See*—
Klipper, Reinhold; Antons, Stefan; Steffan, Guido; Mitschker, Alfred; Strüver, Werner; and Lütjens, Holger, 5,464,875, Cl. 521-32.000.

Stehlin, Albert; and Maier, Thomas, to Ciba-Geigy Corporation. Mercerization wetting composition. 5,464,547, Cl. 252-8.700.

Steingard, Michael A.: *See*—
Padden, John; and Steingard, Michael A., 5,464,383, Cl. 602-20.000.

Stejskal, Elizabeth A.: *See*—
Buscemi, Paul J.; Stejskal, Elizabeth A.; Palme, Donald F., II; and Wang, Lixiao, 5,464,450, Cl. 623-6.000.

Stekelenburg, Albert, to All Line Inc. Clamp-type lamp holder. 5,464,182, Cl. 248-276.100.

Stenfors, Sven E.: *See*—
Ståhl, Lars; and Stenfors, Sven E., 5,463,989, Cl. 123-193.500.

Stepan Company: *See*—
Williams, Steve; Kaplan, Warren; Neill, Paul; and Chapa, Gerardo, 5,464,561, Cl. 252-182.270.

Stephens, James A.: *See*—
Altschuler, Barry N.; Hardy, Douglas A.; Stephens, James A.; and Kish, Joseph, III, 5,465,300, Cl. 380-30.000.

Sterling Winthrop: *See*—
Vacek, Ronald R.; Semmler, Bruce; and Owens, Edward, 5,464,111, Cl. 215-249.000.

Sterling Winthrop Inc.: *See*—
Diana, Guy D.; and Nitz, Theodore J., 5,464,848, Cl. 514-364.000.
Dunlap, Richard P.; Mura, Albert J.; Hlasta, Dennis J.; Desai, Ranjit C.; and Latimer, Lee H., 5,464,852, Cl. 514-373.000.

Sterrett, William R.: *See*—
Blalock, James L., deceased; and Sterrett, William R., 5,465,121, Cl. 348-744.000.

Stetz, Steven A.: *See*—
Upton, William K., III; Schneider, William E.; Brown, Stuart H.; Stetz, Steven A.; Gotich, Emily J.; and McCrea, Jack L., 5,464,161, Cl. 241-21.000.

Stevens, Albert F.; DeWitt, Robert R.; Lile, William R.; Mitchell, Paul R.; and Tentarelli, Stephen, to Opex Corporation. Method for the automated processing of documents and bulk mail. 5,464,099, Cl. 209-3.100.

Stevens, Deborah S.: *See*—
Stevens, Sidney V.; Stevens, Deborah S.; and Bowker, Ronald, 5,464,286, Cl. 383-75.000.

Stevens, Rick, to Unisys Corporation. Gate compensation delay and delay lines. 5,465,065, Cl. 327-276.000.

Stevens, Rodney W.: *See*—
Mano, Takashi; Stevens, Rodney W.; and Nakane, Masami, 5,464,849, Cl. 514-365.000.

Stevens, Sidney V.; Stevens, Deborah S.; and Bowker, Ronald. Ceiling tile dust & debris catcher. 5,464,286, Cl. 383-75.000.

Stewart, Charles W.: *See*—
Chapman, George R., Jr.; Crenshaw, Lewis E.; McMinn, Rita S.; Morgan, Richard A.; Priester, Donnan E.; Stewart, Charles W.; and Tarney, Robert E., 5,464,904, Cl. 525-200.000.

Stewart-Davis, Royann L.: *See*—
Athey, Patricia R.; Dauson, Douglas S.; Lecocq, David E.; Neuman, George A.; Sopko, John F.; and Stewart-Davis, Royann L., 5,464,657, Cl. 427-255.500.

Stidd Systems, Inc.: *See*—
Gezari, Walter A.; and Marotta, Christopher J., 5,463,972, Cl. 114-363.000.

Stief, Thomas; Heimburger, Norbert; and Schorlemmer, Hans U., to Behringwerke Aktiengesellschaft. Use of transglutaminases as immunosuppressants. 5,464,615, Cl. 424-94.630.

Stig, Aasmul-Olsen; Widmer, Fred; and Gauri, Kailash K., to Carbiotech, Ltd. Small peptidic compounds useful for the treatment of glaucoma. 5,464,821, Cl. 514-18.000.

Still, Danny P.: *See*—
Farquharson, Ronald H.; and Still, Danny P., 5,464,444, Cl. 623-65.000.

Stivers, Lewis E. Ion exchange methods and systems incorporating regenerant recycling. 5,464,530, Cl. 210-141.000.

St. John, James P.; Fetterhoff, John G.; Carpenter, John R.; Brown, B. Douglas; Azzara, C. Daniel; Tarka, Stanley M., Jr.; Rank, Craig; and Strohmaier, George K., to Hershey Foods Corporation. Reduced fat confectionery products and process. 5,464,649, Cl. 426-660.000.

Stöckli, Kasper: *See*—
Schärer, Paul; and Stöckli, Kasper, 5,464,299, Cl. 403-297.000.

Stoeger, Helmut. Regulating and controlling device for a fluid pressure booster installation. 5,464,328, Cl. 417-44.800.

Stofko, John J., Jr.; and Chang, Jeffery C., to Minnesota Mining and Manufacturing Company. Water soluble organosiloxane compounds. 5,464,900, Cl. 524-838.000.

Stone, Corbett W.: *See*—
Guy, Thomas D.; Granger, Richard N.; Brady, Robert H.; Webster, John; Pratt, James R.; Stone, Corbett W.; and Alesi, Thomas W., Jr., 5,464,144, Cl. 227-176.000.

Stonely, Carl J.: *See*—
Parker, Alan; Chapman, Michael C.; Pinchen, Stephen P.; and Stonely, Carl J., 5,464,151, Cl. 229-206.000.

Storage Technology Corporation: *See*—
Hoge, David T.; Konshak, Michael V.; Owens, John C.; Johnson, Michael W.; Ramboseck, George P.; and Rieger, Thomas J., 5,465,187, Cl. 360-132.000.

Storm, Shawn: *See*—
Bechtolsheim, Andreas; Frank, Edward; Testa, James; and Storm, Shawn, 5,465,229, Cl. 365-52.000.

Stossel, Thomas P.; Lind, Stuart E.; and Janmey, Paul A., to Brigham and Women's Hospital. Method for reducing the viscosity of pathological mucoid airway contents in the respiratory tract comprising administering actin-binding compounds with or without DNASE I. 5,464,817, Cl. 514-2.000.

Stout, Jay: *See*—
Coolidge, Thomas R.; Lewis, William; Schuster, Sheldon M.; Stout, Jay; van Heelze, Gino; Wylie, Dwane; and Wagner, Fred W., 5,464,759, Cl. 435-91.200.

Stowell, Davin; and Formosa, Daniel J., to General Housewares Corp. Shears. 5,463,814, Cl. 30-232.000.

Strandjord, Lee J.; and Sanders, Glen A., to Honeywell Inc. Lightwave phase control for reduction of resonator fiber optic gyroscope Kerr effect error. 5,465,149, Cl. 356-350.000.

Strategic Corporation: *See*—
Goetz, Martin; Babiarz, Joseph; Wein, Deborah S.; Anderson, Paul M.; and Lindner, Alan W., 5,465,008, Cl. 257-691.000.

Strauss, David L.: *See*—
Huisseon, Jan P.; and Strauss, David L., 5,465,037, Cl. 318-568.110.

Strayer, Brian D.: *See*—
Mowry, Gregory S.; Gorka, Phillip E.; Strayer, Brian D.; and Kracke, Alan G., 5,463,805, Cl. 29-603.000.

Strazhnik, Michael M.: *See*—
Bray, Douglas R.; and Strazhnik, Michael M., 5,465,199, Cl. 362-364.000.

Streckert, Holger H.; and Trester, Paul W., to General Atomics. Chromium surface treatment of nickel–based substrates. 5,464,663, Cl. 427-529.000.

StressGen Biotechnology Corporation: *See*—
Sanders, Brenda M.; Jenkins, Kenneth D.; Nichols, Jack L.; and Imber, Bryan E., 5,464,750, Cl. 435-7.210.

Stretch Devices, Inc.: *See*—
Newman, Donald E., 5,463,948, Cl. 101-127.100.

Strickland, S. Scott; Krietemeyer, James R.; Liao, Jing; Mead, Ian D.; and Puckett, Robert L., to Cincinnati Milacron Inc. Numerical control method and apparatus. 5,465,215, Cl. 364-474.220.

Strohl, Clair: *See*—
Epstein, Paul; Petschek, Harry; LaWhite, Eric; Strohl, Clair; Coyne, Henry; Kaleskas, Edward; and Adaniva, George, 5,464,392, Cl. 604-67.000.

Strohmaier, George K.: *See*—
St. John, James F.; Fetterhoff, John G.; Carpenter, John R.; Brown, B. Douglas; Azzara, C. Daniel; Tarka, Stanley M., Jr.; Rank, Craig; and Strohmaier, George K., 5,464,649, Cl. 426-660.000.

Stroth, Leo: *See*—
Eklund, Robert H.; Havemann, Robert H.; and Stroth, Leo, 5,465,005, Cl. 257-538.000.

Strüver, Werner: *See*—
Klipper, Reinhold; Antons, Stefan; Steffan, Guido; Mitschker, Alfred; Strüver, Werner; and Lütjens, Holger, 5,464,875, Cl. 521-32.000.

Stryker Corporation: *See*—
Arnett, Jeffrey D.; and Grulke, David H., 5,464,390, Cl. 604-35.000.

Studdiford, Robert D., to Twofish Unlimited. High performance lock mount and method. 5,464,135, Cl. 224-41.000.

Sturgis, David H.: *See*—
Yasrebi, Mehrdad; Kemp, William W.; Sturgis, David H.; Nikolas, Douglas G.; Wright, Gary L.; Kelly, Thomas J., III; Springgate, Mark E.; and Crego, Ted R., 5,464,797, Cl. 501-103.000.

Su, Anna: *See*—
Lur, Water; Su, Anna; and Shen, Neng H., 5,465,003, Cl. 257-510.000.

Subramanyam, Ravi: *See*—
Gu, Ben; Subramanyam, Ravi; and Clifton, Tanya, 5,464,554, Cl. 252-121.000.

Suchocki, Anthony J.: *See*—
Boggavarapu, Rao L.; Goldstein, Yeshayahu S. A.; Keogh, Catherine M.; Suchocki, Anthony J.; and Widner, Melvin M., 5,463,928, Cl. 89-8.000.

Suehiro, Mitsugi; Seto, Toru; Mitsuoka, Shigeaki; and Inoue, Kenji, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for purifying high-temperature reducing gas. 5,464,604, Cl. 423-570.000.

Suehle, John S.: *See*—
Gaitan, Michael; Suehle, John S.; Semancik, Stephen; and Cavicchi, Richard E., 5,464,966, Cl. 219-544.000.

Suemul, Daljit K.: *See*—
Nield, Eric; Suemul, Daljit K.; and Bovey, Denis M. H., 5,464,884, Cl. 523-400.000.

Suga, Shuzo: *See*—
Inagaki, Yoshio; and Suga, Shuzo, 5,464,734, Cl. 430-570.000.

Sugahara, Tomio, to Sugan Company Limited. Display device for bioelectrical and biophysical phenomena. 5,464,014, Cl. 128-653.200.

Sugan Company Limited: *See*—
Sugahara, Tomio, 5,464,014, Cl. 128-653.200.

Sugayama, Sakae; Asami, Takao; Kato, Kenji; and Maeta, Akira, to Sanyo Electric Co., Ltd.; Nissan Motor Co., Ltd.; Clarion Co., Ltd.; and Tottori Sanyo Electric Co., Ltd. AGC circuit for operating in accordance with the nature of the interference signal and method for controlling this circuit. 5,465,408, Cl. 455-249.100.

Sugita, Narutoshi: *See*—
Sakai, Hisao; Shimada, Hiroo; Sono, Hiroshi; Nagahiro, Kenichi; Sugita, Narutoshi; Maeda, Hirotsugu; Miyao, Masakatsu; Nakamura, Katsunori; Ogita, Yasunori; and Suzuki, Osamu, 5,463,995, Cl. 123-432.000.

Sugiura, Nobuo: *See*—
Sakurai, Katsukiyo; Sugiura, Nobuo; Kimata, Koji; and Suzuki, Sakaru, 5,464,942, Cl. 536-21.000.

Sugiura, Susumu; and Mita, Yoshinobu, to Canon Kabushiki Kaisha. Image processing method and device for the same. 5,465,164, Cl. 358-448.000.

Sugiyama, Mitsugu: *See*—
Nakazato, Yasushi; Tanaka, Makoto; Sakamoto, Kohki; Kondo, Hisayo; Kasahara, Rikio; Shibaki, Hiroyuki; and Sugiyama, Mitsugu, 5,464,200, Cl. 270-53.000.

Sullivan, Donald K.: *See*—
Rush, William B., II; Mondek, Martin J.; Sullivan, Donald K.; Walter, Mark A.; and Zdanowicz, Lawrence E., Sr., 5,463,990, Cl. 123-195.000.

Sulsky, Richard B.: *See*—
Demers, James P.; and Sulsky, Richard B., 5,464,865, Cl. 514-473.000.

Sumitomo Chemical Co., Ltd.: *See*—
Nagaoka, Kenji; and Kitadono, Kaoru, 5,464,891, Cl. 524-230.000.

Sumitomo Electric Industries, Ltd.: *See*—
Hachigo, Akihiro; Nakahata, Hideaki; Shikata, Shinichi; and Fujimori, Naoji, 5,463,901, Cl. 73-753.000.
Inada, Hiroshi; and Iiyama, Michitomo, 5,464,812, Cl. 505-237.000.
Matsuura, Takashi; and Itozaki, Hideo, 5,465,049, Cl. 324-248.000.

Sumitomo Metal Industries, Ltd.: *See*—
Nagai, Masayuki, 5,463,888, Cl. 72-157.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Hori, Shinichi; Kawasaki, Atsuko; Nakashita, Takefumi; Imai, Yoshiharu; Sakaki, Toshiaki; and Miki, Miyo, 5,464,420, Cl. 606-202.000.

Sumitomo Special Metals Co., Ltd.: *See*—
Nakanishi, Akio; Furuse, Akira; Nakagawa, Kazuo; Tsuneda, Makoto; and Nukanobu, Atsushi, 5,465,047, Cl. 324-316.000.

Sumitomo Wiring Systems, Ltd.: *See*—
Inoue, Nori; Okumura, Hitoshi; and Nakata, Hiroyuki, 5,463,912, Cl. 74-519.000.
Nebashima, Akira; Watanabe, Kaoru; and Saba, Toshikazu, 5,464,356, Cl. 439-752.000.
Oka, Tatsuya, 5,464,351, Cl. 439-372.000.
Saijo, Eiji; Saito, Masashi; and Tsuji, Takashi, 5,464,353, Cl. 439-489.000.

Sun Microsystems, Inc.: *See*—
Bechtolsheim, Andreas; Frank, Edward; Testa, James; and Storm, Shawn, 5,465,229, Cl. 365-52.000.
Kong, Shing I., 5,465,337, Cl. 395-417.000.

Sun, Shaw: *See*—
Botchan, Michael R.; Clark, Robin; Mohr, Ian J.; and Sun, Shaw, 5,464,936, Cl. 530-350.000.

Suncast Corporation: *See*—
Tisbo, Thomas A.; Whitehead, Stephen P.; and Uffner, Michael G., 5,464,115, Cl. 220-324.000.

Sundaram, Kandasamy M.: *See*—
Albano, John V.; Sundaram, Kandasamy M.; and Herrmann, Hellmut A., 5,464,057, Cl. 165-173.000.

Sundby, Donn P.: *See*—
Clare, William K.; and Sundby, Donn P., 5,465,286, Cl. 379-34.000.

Sundell, Lars-Olof: *See*—
Frostrom, Tore; Nilsson, Tomas J.; Andersson, Yngve; Carlsson, Michael M. J.; Sundell, Lars-Olof; and Uden, Jonas P., 5,465,393, Cl. 455-54.100.

Super Market Merchandising: *See*—
Knasel, Susan M., 5,463,943, Cl. 99-542.000.

Supron, Steven A.: *See*—
Foster, Dean H.; Holbrook, Russell W.; Morabito, James; Silverberg, Morton; and Supron, Steven A., 5,464,317, Cl. 414-798.200.

Surgin Surgical Instrumentation, Inc.: *See*—
Wortrich, Theodore S., 5,464,421, Cl. 606-213.000.

Surman, David H.: *See*—
Allen, Ruth A.; Goetze, Lisa M.; Nick, Jeffrey M.; Pushong, Kelly B.; Surman, David H.; and Swanson, Michael D., 5,465,359, Cl. 395-700.000.

Susaki, Seiichi: *See*—
Matsumoto, Hiroshi; Takaragi, Kazuo; Susaki, Seiichi; Maezawa, Hiroyuki; and Koizumi, Shinobu, 5,465,299, Cl. 380-23.000.

Sutcliffe, Peter H.; and Smith, Peter. Apparatus and method for receiving and processing a bet. 5,464,971, Cl. 235-379.000.

Suzuki, Hidenobu: *See*—
Okuda, Kouichi; Nakamura, Shunji; Yoshimoto, Toshio; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Fukuzawa, Daizo; Nanbu, Tomoko; and Suzuki, Hidenobu, 5,464,964, Cl. 219-497.000.

Suzuki, Katsunori, to Minolta Co., Ltd. Paper feed controlling device. 5,464,204, Cl. 271-110.000.

Suzuki, Keiji: *See*—
Narita, Izuru; Suzuki, Keiji; Mito, Toshitsugu; and Tsurukawa, Noboru, 5,465,039, Cl. 320-32.000.

Suzuki, Kenji: *See*—
Ito, Takafumi; Suzuki, Kenji; Ikeda, Takayuki; Oyama, Fumio; and Mazur, Walt, 5,465,370, Cl. 395-200.040.
Jie, Xu; and Suzuki, Kenji, 5,465,314, Cl. 385-85.000.

Suzuki, Kohei: *See*—
Morioka, Yoshihiro; Kobayashi, Masaaki; Okayama, Mutsuyuki; Nakatsu, Etsuto; and Suzuki, Kohei, 5,465,158, Cl. 358-310.000.

Suzuki, Koichi: *See*—

Makino, Ichiro; Mitsui, Akira; Takehara, Mikio; Ando, Eiichi; Ebisawa, Junichi; Suzuki, Koichi; Matsumoto, Kiyoshi; Ineda, Toru; and Suzuki, Susumu, 5,464,674, Cl. 428-694.00T.

Suzuki, Masao, to Canon Kabushiki Kaisha. Image pickup device having white balance control function. 5,465,116, Cl. 348-223.000.

Suzuki, Minoru: *See*—
Kimura, Noriyuki; and Suzuki, Minoru, 5,465,139, Cl. 355-260.000.

Suzuki, Naoyoshi, to Ajinomoto Co., Inc. Physiologically active peptide having immunoregulatory activities. 5,464,819, Cl. 514-16.000.

Suzuki, Nobuo; and Murata, Osamu, to Seiko Instruments Inc. Method of making fiber termination. 5,464,361, Cl. 451-28.000.

Suzuki, Osamu: *See*—
Sakai, Hisao; Shimada, Hiroo; Sono, Hiroshi; Nagahiro, Kenichi; Sugita, Narutoshi; Maeda, Hirotsugu; Miyao, Masakatsu; Nakamura, Katsunori; Ogita, Yasunori; and Suzuki, Osamu, 5,463,995, Cl. 123-432.000.

Suzuki, Sakaru: *See*—
Sakurai, Katsukiyo; Sugiura, Nobuo; Kimata, Koji; and Suzuki, Sakaru, 5,464,942, Cl. 536-21.000.

Suzuki, Susumu: *See*—
Makino, Ichiro; Mitsui, Akira; Takehara, Mikio; Ando, Eiichi; Ebisawa, Junichi; Suzuki, Koichi; Matsumoto, Kiyoshi; Ineda, Toru; and Suzuki, Susumu, 5,464,674, Cl. 428-694.00T.

Suzuki, Yoshihiko: *See*—
Nakagiri, Nobuyuki; Kondo, Hiroyuki; and Suzuki, Yoshihiko, 5,464,977, Cl. 250-234.000.

Suzuki, Yoshiichi: *See*—
Hirose, Katutoshi; Takagi, Yoshihiro; Otomatsu, Toshihiko; and Suzuki, Yoshiichi, 5,464,772, Cl. 435-280.000.

Svaizer, Piergiorgio: *See*—
Lazzari, Gianni; Omologo, Maurizio; and Svaizer, Piergiorgio, 5,465,302, Cl. 381-92.000.

Swaminathan, Madhavan: *See*—
Perfecto, Eric D.; Prasad, Chandrika; Prasad, Keshav; Robbins, Gordon J.; Swaminathan, Madhavan; and White, George E., 5,464,682, Cl. 428-210.000.

Swanson, David W.: *See*—
Salter, James G.; Clark, James E.; Swanson, David W.; and Nasworthy, George F., 5,464,578, Cl. 264-250.000.

Swanson, Eric A., to Massachusetts Institute of Technology. Method and apparatus for acquiring images using a ccd detector array and no transverse scanner. 5,465,147, Cl. 356-345.000.

Swanson, Michael D.: *See*—
Allen, Ruth A.; Goetze, Lisa M.; Nick, Jeffrey M.; Pushong, Kelly B.; Surman, David H.; and Swanson, Michael D., 5,465,359, Cl. 395-700.000.

Swanson, Sally A.: *See*—
Angelopoulos, Marie; Gelorme, Jeffrey D.; Labadie, Jeffrey W.; Lewis, David A.; Swanson, Sally A.; and Labianca, Nancy C., 5,464,927, Cl. 528-350.000.

Swars, Helmut: *See*—
Maus, Wolfgang; Swars, Helmut; Brück, Rolf; and Humpolik, Bohumil, 5,464,679, Cl. 428-116.000.

Swenson, Eric T.; Thomas, Riley A., III; Blanchard, Ronald L.; and Marshall, Brian P., to Navistar International Transportation Corp. Electronic interlock for multiple PTO enable switches. 5,463,992, Cl. 123-198.00R.

Swenson, John E.: *See*—
Meléndez, Luis A.; Rosenbaum, Robert E.; Vera-Garcia, Marcela A.; Olive, D. Michael; and Swenson, John E., 5,464,773, Cl. 435-304.100.

Swift, Michael R.; Kupper, Lawrence L.; and Chase, Charles L., to Swift, Michael R. Process for testing gene-disease associations. 5,464,742, Cl. 435-6.000.

SynOptics Communications, Inc.: *See*—
Smith, Robert W., 5,465,272, Cl. 375-295.000.

Synphar Laboratories, Ind.: *See*—
Noguchi, Kazuharu; Micetich, Ronald G.; and Daneshtalab, Mohsen, 5,464,616, Cl. 424-114.000.

Synthes (U.S.A.): *See*—
Curtis, Raymond L.; Schlegel, Urs; and Heldstab, Thomas, 5,464,427, Cl. 606-232.000.

Szabat, John F.: *See*—
Schilling, Steven L.; Yeater, Robert P.; Soland, Phil M.; Szabat, John F.; and Parsons, Harold R., 5,464,560, Cl. 252-182.240.

Szajewski, Richard P.; and Buchanan, John M., to Eastman Kodak Company. Method of bleaching and fixing a color photographic element containing high iodine emulsions. 5,464,728, Cl. 430-393.000.

Szelenyi, Stefan: *See*—
Kutscher, Bernhard; Niebch, Georg; Fleischhauer, Ilona; Engel, Jürgen; Achterrath-Tuckermann, Ute; and Szelenyi, Stefan, 5,464,838, Cl. 514-248.000.

Szymanski, Chester J.: *See*—
Scott, Matthew S.; McCollum, Gregory J.; Szymanski, Chester J.; and Wilson, Craig A., 5,464,887, Cl. 523-501.000.

Tachibana, Hiroshi, to Kabushiki Kaisha Tachibana Seisakusho. Automatic bending apparatus and marking device for band-shaped work. 5,463,890, Cl. 72-294.000.

Tachibana, Hiroshi; and Kizuki, Harumi, to Kabushiki Kaisha Tachibana Seisakusho. Apparatus for forming sheet materials. 5,464,341, Cl. 425-388.000.

Tada, Tatsuya: *See*—
Baba, Yoshinobu; and Tada, Tatsuya, 5,464,720, Cl. 430-122.000.

Tada, Toshihiko: *See*—
Hanafusa, Akihiko; and Tada, Toshihiko, 5,465,259, Cl. 371-22.300.

Taft, Kevin H.: *See*—
Jaskowiak, Timothy R.; Coughlin, Daniel L.; Perez, Julie A.; Gilmore, Daniel R., III; DiGravio, Thomas L.; and Taft, Kevin H., 5,465,138, Cl. 355-245.000.

Tagawa, Akira: *See*—
Koden, Mitsuhiro; Tagawa, Akira; Takeda, Hitoshi; Katsuse, Hirofumi; Shiomi, Makoto; Numao, Takaji; Gouda, Hiroshi; Katakami, Masayuki; Kondo, Naofumi; and Katayama, Mikio, 5,465,168, Cl. 359-56.000.

Taggart, Charles W.: *See*—
Rogers, Ernest, 5,464,536, Cl. 210-380.100.

Tagliaferro, Dennis C.: *See*—
Voo, Liann; Tagliaferro, Dennis C.; and Wilson, Joan B., 5,464,850, Cl. 514-372.000.

Taguchi, Masao: *See*—
Haruki, Tamae; Nakagawa, Kenji; Taguchi, Masao; Tanaka, Hiroyuki; Asai, Satoru; and Hanyu, Isamu, 5,465,220, Cl. 364-525.000.

Tai, Akiyoshi: *See*—
Kida, Shuji; Oya, Yukio; and Tai, Akiyoshi, 5,464,732, Cl. 430-505.000.

Tai, Seiji: *See*—
Watanabe, Itsuo; Kuwano, Atsushi; Taketatsu, Jun; Takane, Nobuaki; Yamada, Mitsuo; and Tai, Seiji, 5,464,673, Cl. 428-65.100.

Taikisha Ltd.: *See*—
Tanaka, Shinpei; and Morimoto, Hirofumi, 5,464,468, Cl. 96-125.000.

Taira, Hiroshi, to Brother Kogyo Kabushiki Kaisha. Plate for stencil printing. 5,463,947, Cl. 101-125.000.

Tait, Thomas M. Decorative banner mounting kit. 5,463,973, Cl. 116-173.000.

Tajima, Makoto; Araki, Shinji; and Beppu, Kei, to Calsonic Corporation. Housingless type oil cooler and method for producing the same. 5,464,056, Cl. 165-167.000.

Takabayashi, Toshiya: *See*—
Kobayashi, Akira; Yoshida, Takuji; Hattori, Hisahide; and Takabayashi, Toshiya, 5,465,244, Cl. 369-50.000.

Takagi, Yoshihiro: *See*—
Hirose, Katutoshi; Takagi, Yoshihiro; Otomatsu, Toshihiko; and Suzuki, Yoshiichi, 5,464,772, Cl. 435-280.000.

Takahashi, Hiroyuki, to NEC Corporation. Level conversion circuit for signal of BCL-level. 5,465,057, Cl. 326-66.000.

Takahashi, Kazuo; Kumata, Fumio; Nozaki, Hitoshi; Inoue, Shinichi; and Makabe, Toshiji, to Mitsubishi Oil Co., Ltd.; and Chiyoda Corporation. Process for producing spherical zeolite catalyst and apparatus for producing the same. 5,464,593, Cl. 422-224.000.

Takahashi, Mamoru: *See*—
Tsutsui, Toshiyuki; Yoshitsugu, Ken; Takahashi, Mamoru; Todo, Akira; Ohta, Seiji; and Inagaki, Hajime, 5,464,905, Cl. 525-240.000.

Takahashi, Michiaki: *See*—
Sakaguchi, Yasuo; Daimon, Katsumi; Takahashi, Michiaki; Yamasaki, Kazuo; and Yamaguchi, Yasuhiro, 5,464,717, Cl. 430-58.000.

Takahashi, Nobuyuki, to Sodick Co., Ltd. Ion exchange treatment method in producing and recycling aqueous EDM fluid. 5,464,959, Cl. 219-69.140.

Takahashi, Osamu: *See*—
Ohki, Nobutaka; Asanuma, Naoki; and Takahashi, Osamu, 5,464,731, Cl. 430-505.000.

Takahashi, Tatsuo: *See*—
Ohga, Eiji; Kawasaki, Masahiko; Sakuma, Kazushi; Takahashi, Tatsuo; and Tozaki, Ryusuke, 5,465,385, Cl. 455-6.100.

Takahashi, Toshie; Sato, Takashi; Kurumada, Toshimi; and Kokubun, Yoshiyuki, to Hitachi Telecom Technologies, Ltd. Trading telephone. 5,465,292, Cl. 379-164.000.

Takahata, Shigeru, to Shin-Etsu Chemical Co., Ltd. Method and apparatus for preparing metal-ceramic composite body. 5,464,655, Cl. 427-238.000.

Takane, Nobuaki: *See*—
Watanabe, Itsuo; Kuwano, Atsushi; Taketatsu, Jun; Takane, Nobuaki; Yamada, Mitsuo; and Tai, Seiji, 5,464,673, Cl. 428-65.100.

Takano, Hideki: *See*—
Muromura, Tadasumi; Takano, Hideki; Akie, Hiroshi; and Matsuura, Shojiro, 5,464,571, Cl. 252-638.000.

Takano, Mitsuhiro: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mitsuhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Otabe, Tetuhiro, 5,465,348, Cl. 395-182.020.

Takano, Yukiko: *See*—
Yoneda, Takashige; Wakabayashi, Tsuneo; and Takano, Yukiko, 5,464,704, Cl. 428-429.000.

Takao, Hideaki: *See*—
Asaoka, Masanobu; Takao, Hideaki; Togano, Takeshi; and Kojima, Makoto, 5,464,668, Cl. 428-1.000.

Takao, Yamada: *See*—
Koichi, Kato; Takao, Yamada; and Haruo, Onda, 5,464,939, Cl. 530-351.000.

Takarada, Mitsuhiro: *See*—
Yoshikawa, Yuji; and Takarada, Mitsuhiro, 5,464,901, Cl. 525-103.000.

Takaragi, Kazuo: *See*—
Matsumoto, Hiroshi; Takaragi, Kazuo; Susaki, Seiichi; Maezawa, Hiroyuki; and Koizumi, Shinobu, 5,465,299, Cl. 380-23.000.

Takase, Akihiko: *See*—

Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mituhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.

Takata, Inc.: *See*—
Wieczorek, Joseph P.; Halajian, Eugene M.; and Trombley, Michael, 5,464,052, Cl. 160-23.100.

Takatori, Sunao: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,465,064, Cl. 327-361.000.

Takayama, Kazutoshi: *See*—
Arakawa, Nobuyuki; Segawa, Takashi; Kaneko, Moriyoshi; Miyairi, Kazuki; and Takayama, Kazutoshi, 5,464,339, Cl. 425-186.000.

Takebe, Nobuyuki: *See*—
Nakazawa, Takayuki; Okizuka, Takafumi; Takebe, Nobuyuki; and Annen, Jinshi, 5,465,352, Cl. 395-600.000.

Takeda Chemical Industries, Ltd.: *See*—
Koichi, Kato; Takao, Yamada; and Haruo, Onda, 5,464,939, Cl. 530-351.000.
Matoba, Hiroshi; Ohmori, Shinji; Koyama, Hiroyoshi; and Kashihara, Toshio, 5,464,612, Cl. 424-78.100.
Senoo, Masaharu; Sasada, Reiko; and Igarashi, Koichi, 5,464,943, Cl. 536-23.500.

Takeda, Hisao; Koshiji, Youichi; Kubota, Hidehiro; and Iizuka, Takashi, to Hymo Corporation; and Atto Corporation. Process for producing an electrophoresis separation layer. 5,464,516, Cl. 204-182.900.

Takeda, Hitoshi: *See*—
Koden, Mitsuhiro; Tagawa, Akira; Takeda, Hitoshi; Katsuse, Hirofumi; Shioemi, Makoto; Numao, Takaji; Gouda, Hiroshi; Katakami, Masayuki; Kondo, Naofumi; and Katayama, Mikio, 5,465,168, Cl. 359-56.000.

Takeda, Kazuko; Muramatsu, Motohiko; and Koyama, Takashi, to Japan Tobacco, Inc. Cigarette. 5,464,028, Cl. 131-336.000.

Takehara, Mikio: *See*—
Makino, Ichiro; Mitsui, Akira; Takehara, Mikio; Ando, Eiichi; Ebisawa, Junichi; Suzuki, Koichi; Matsumoto, Kiyoshi; Iseda, Toru; and Suzuki, Susumu, 5,464,674, Cl. 428-694.00T.

Takeo, Hiroshi: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mituhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.

Takeshita, Kishio: *See*—
Uematsu, Kazuyoshi; Takeshita, Kishio; and Ozawa, Minoru, 5,464,225, Cl. 277-1.000.

Taketatsu, Jun: *See*—
Watanabe, Itsuo; Kuwano, Atsushi; Taketatsu, Jun; Takane, Nobuaki; Yamada, Mitsuo; and Tai, Seiji, 5,464,673, Cl. 428-65.100.

Takeuchi, Hiroshi: *See*—
Nakatani, Yasuhiro; Ichimura, Atsushi; Tanaka, Toshio; Takeuchi, Hiroshi; and Okano, Yoichi, 5,465,089, Cl. 340-995.000.

Takeuchi, Minami: *See*—
Shinohe, Takashi; Nakayama, Kazuya; Takeuchi, Minami; Yamaguchi, Masakazu; Kitagawa, Mitsuhiko; Omura, Ichiro; and Nakagawa, Akio, 5,464,994, Cl. 257-147.000.

Taligent, Inc.: *See*—
Orton, Debra L.; Rollin, Keith A.; and Gibbons, Bill, 5,465,362, Cl. 395-700.000.

Tam, Kwok C., to General Electric Company. Method and apparatus for generating radon derivative data on a near uniformly space grid in a cone beam computerized tomography implementation. 5,465,283, Cl. 378-4.000.

Tamura, Atsushi: *See*—
Tsushima, Masaki; Kano, Yuko; Iwamatsu, Katsuyoshi; Tamura, Atsushi; and Shibahara, Seiji, 5,464,829, Cl. 514-206.000.

Tanabe, Ritsushi: *See*—
Yoshihara, Kunio; Hirooka, Kazuhiko; Sakai, Masanori; Kuboki, Keiju; Nimura, Mitsuo; and Tanabe, Ritsushi, 5,465,163, Cl. 358-444.000.

Tanahashi, Ichiro: *See*—
Manabe, Yoshio; Tanahashi, Ichiro; and Mitsuyu, Tsuneo, 5,464,991, Cl. 257-53.000.

Tanaka, Akiei: *See*—
Miura, Hirohisa; Imahashi, Kunihiko; Michioka, Hirohumi; Yamada, Yasuhiro; Kusui, Jun; and Tanaka, Akiei, 5,464,463, Cl. 75-244.000.

Tanaka, Hideo: *See*—
Nakai, Satoru; Aihara, Koutoku; Tanaka, Hideo; Iba, Hitomi; Kawai, Kazuyoshi; Ichikawa, Hiroyuki; Akamatsu, Seiji; Saito, Fumio; Tominaga, Michiaki; and Adachi, Masakazu, 5,464,833, Cl. 514-251.000.

Tanaka, Hiroyuki: *See*—
Haruki, Tamae; Nakagawa, Kenji; Taguchi, Masao; Tanaka, Hiroyuki; Asai, Satoru; and Hanyu, Isamu, 5,465,220, Cl. 364-525.000.

Tanaka, Kazuhiko, to Nippon Thompson Co., Ltd. Linear motion rolling guide unit. 5,464,288, Cl. 384-15.000.

Tanaka, Kazuhiko: *See*—
Kawamoto, Masao; Tanaka, Kazuhiko; Hirakawa, Kiyoshi; and Nakamura, Eiichirou, 5,464,695, Cl. 428-370.000.

Tanaka, Makoto: *See*—
Nakazato, Yasushi; Tanaka, Makoto; Sakamoto, Kohki; Kondo, Hisayo; Kasahara, Rikio; Shibaki, Hiroyuki; and Sugiyama, Mitsugu, 5,464,200, Cl. 270-53.000.

Tanaka, Masato: *See*—
Kashizaki, Yoshio; Senoo, Akihiro; and Tanaka, Masato, 5,464,718, Cl. 430-58.000.

Tanaka, Motoharu; Hashimoto, Kyosuke; and Himono, Yusaku, to Furukawa Electric Co., Ltd., The. Multiplex transmission system. 5,465,255, Cl. 370-85.100.

Tanaka, Shinpei; and Morimoto, Hirofumi, to Taikisha Ltd. Rotary adsorption/desorption gas treating apparatus. 5,464,468, Cl. 96-125.000.

Tanaka, Teruo: *See*—
Hamanaka, Naoki; Tanaka, Teruo; Omoda, Koichiro; and Nagashima, Shigeo, 5,465,380, Cl. 395-800.000.

Tanaka, Toshio: *See*—
Nakatani, Yasuhiro; Ichimura, Atsushi; Tanaka, Toshio; Takeuchi, Hiroshi; and Okano, Yoichi, 5,465,089, Cl. 340-995.000.

Tanaka, Yasuhinori, to Fujitsu Limited. Method and device for coding and decoding speech signals using inverse quantization. 5,465,316, Cl. 395-2.280.

Tanbakuchi, Hassan, to Hewlett-Packard Company. Integrated barium-ferrite tuned mixer for spectrum analysis to 60 GHz. 5,465,417, Cl. 455-330.000.

Tang, John T., to Foster Wheeler Energy Corporation. Method for cleaning and cooling synthesized gas. 5,464,597, Cl. 423-210.000.

Tanimoto, Mie: *See*—
Nakatsuka, Takuo; Toyota, Tsuyoshi; Tanimoto, Mie; and Matsumoto, Akiko, 5,464,910, Cl. 525-486.000.

Tanio, Staoshi; and Arakawa, Naoto, to Canon Kabushiki Kaisha. Image processing system. 5,465,165, Cl. 358-448.000.

Tarka, Stanley M., Jr.: *See*—
St. John, James F.; Fetterhoff, John G.; Carpenter, John R.; Brown, B. Douglas; Azzara, C. Daniel; Tarka, Stanley M., Jr.; Rank, Craig; and Strohmaier, George K., 5,464,649, Cl. 426-660.000.

Tarney, Robert E.: *See*—
Chapman, George R., Jr.; Crenshaw, Lewis E.; McMinn, Rita S.; Morgan, Richard A.; Priester, Donnan E.; Stewart, Charles W.; and Tarney, Robert E., 5,464,904, Cl. 525-200.000.

Taruya, Masaaki; and Koiwa, Mitsuru, to Mitsubishi Denki Kabushiki Kaisha. Ignition coil unit for an internal combustion engine and manufacturing method of the same. 5,463,999, Cl. 123-647.000.

Tasaki, Kazuhiro: *See*—
Azumaya, Kengo; Hirayama, Yoshiyuki; and Tasaki, Kazuhiro, 5,465,307, Cl. 382-165.000.

Tasaki, Takaharu, to Yoshino Kogyosho Co., Ltd. Piston of pump section of trigger-type liquid dispenser. 5,464,130, Cl. 222-383.100.

Tatarek-Gintowt, Andrew R. T., to Sabre Safety Limited. Valve for use in breathing apparatus. 5,464,009, Cl. 128-205.240.

Tateno, Tomoko: *See*—
Hirai, Kenji; Yamashita, Mitsuo; Tateno, Tomoko; Ejiri, Emiko; Harasawa, Kikuko; Onji, Yuichi; Ugai, Sadayuki; and Nagato, Shoin, 5,464,811, Cl. 504-281.000.

Tatewaki, Junichi: *See*—
Hayakawa, Katsumi; Tsukuda, Masahiro; Sato, Yukiyoshi; Tatewaki, Junichi; and Yamasaka, Kazuya, 5,463,841, Cl. 53-381.200.

Taylor, Mark: *See*—
Miller, David A.; Jansen, Kenneth A.; Culley, Paul R.; Taylor, Mark; and Izquierdo, Javier F., 5,465,360, Cl. 395-700.000.

TDW Delaware Inc.: *See*—
Wilson, Michael L.; and Chan, Kenneth K., 5,464,496, Cl. 156-499.000.

TEAC Corporation: *See*—
Fujisawa, Shinobu; and Nakagawara, Kazuhiko, 5,464,167, Cl. 242-334.000.

Techno Arms (PTY) Ltd.: *See*—
Andrejevic, Ratomir, 5,463,828, Cl. 42-20.000.

Tecle, Haile: *See*—
Lauffer, David J.; and Tecle, Haile, 5,464,842, Cl. 514-299.000.

Tecumseh Products Company: *See*—
Farr, James B., 5,463,874, Cl. 62-126.000.

Tektronix, Inc.: *See*—
Seckora, Michael C., 5,465,222, Cl. 364-715.080.

Teledata Communication Ltd.: *See*—
Egozi, Avihay, 5,465,287, Cl. 379-5.000.

Telefonaktiebolaget LM Ericsson: *See*—
Frostrom, Tore; Nilsson, Tomas J.; Andersson, Yngve; Carlsson, Michael M. J.; Sundell, Lars-Olof; and Uden, Jonas P., 5,465,393, Cl. 455-54.100.
Larsson, Lars G.; and Gudmundson, Perols B. O., 5,465,276, Cl. 375-346.000.

Tension Envelope Corporation: *See*—
Kranz, Richard, 5,464,316, Cl. 414-798.200.

Tentarelli, Stephen: *See*—
Stevens, Albert F.; DeWitt, Robert R.; Lile, William R.; Mitchell, Paul R.; and Tentarelli, Stephen, 5,464,099, Cl. 209-3.100.

Terajima, Hisao: *See*—
Nishii, Teruyuki; Watanabe, Tsunehiro; and Terajima, Hisao, 5,465,162, Cl. 358-442.000.

Terashima, Mikihiko: *See*—
Nakai, Sadao; Yamanaka, Masanobu; Ishikawa, Koji; Sato, Tsuyoshi; Yamamoto, Kimiaki; and Terashima, Mikihiko, 5,465,178, Cl. 359-670.000.

Terashima, Yugi; Horinouchi, Shogo; and Matsuba, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Optical disk device. 5,465,242, Cl. 369-44.190.

Tercel, Moana: *See*—

Dobrusin, Ellen M.; Showalter, Howard D. H.; Denny, William A.; Palmer, Brian D.; Rewcastle, Gordon W.; Tercel, Moana; and Thompson, Andrew M., 5,464,861, Cl. 514-414.000.
Terrell, Joel J., III: *See*—
Clark, Robert H.; and Terrell, Joel J., III, 5,463,936, Cl. 99-327.000.
Terzaghi, André: *See*—
Davis, Stephen J.; and Terzaghi, André, 5,464,210, Cl. 273-73.00C.
Testa, James: *See*—
Bechtolsheim, Andreas; Frank, Edward; Testa, James; and Storm, Shawn, 5,465,229, Cl. 365-52.000.
Testardi, Louis R.: *See*—
Hascicek, Yusuf S.; and Testardi, Louis R., 5,464,813, Cl. 505-490.000.
Tetra Laval Holdings & Finance S.A.: *See*—
Unthank, Robert J., 5,464,497, Cl. 156-519.000.
Texaco Chemical Inc.: *See*—
Peters, Michael W.; Smith, William A.; Mueller, Mark A.; and Culbreth, William K., III, 5,464,505, Cl. 203-64.000.
Texaco Inc.: *See*—
Avetisian, Vahan; Castagnoli, Craig J.; and Cha, Suk B., 5,464,503, Cl. 201-3.000.
Brooker, Donald D.; Palaetti, James S.; Wolfenberger, James K.; and Vuong, Dinh-Cuong, 5,464,592, Cl. 422-207.000.
Texas Instruments Incorporated: *See*—
Eklund, Robert H.; Havemann, Robert H.; and Stroh, Leo, 5,465,005, Cl. 257-538.000.
Guttag, Karl M.; Simpson, Richard; and Walsh, Brendan, 5,465,224, Cl. 364-716.000.
Hynecek, Jaroslav, 5,464,996, Cl. 257-230.000.
Krenik, William R.; and Izzi, Louis J., 5,465,058, Cl. 326-83.000.
Moslehi, Mehrdad M.; Davis, Cecil J.; Jones, John; and Matthews, Robert T., 5,464,499, Cl. 216-71.000.
Polgreen, Thomas L.; Chatterjee, Amitava; and Yang, Ping, 5,465,189, Cl. 361-58.000.
Thompson, E. Earle, 5,465,401, Cl. 455-89.000.
Yaklin, Daniel A., 5,465,075, Cl. 331-8.000.
Texas Optoelectronics, Inc.: *See*—
Passib-Nia, Mohammed, 5,465,033, Cl. 318-480.000.
Theeuwes, Felix: *See*—
Haak, Ronald P.; Theeuwes, Felix; Gyory, J. Richard; and Lastin, Gary A., 5,464,387, Cl. 604-20.000.
Thepaut, André; and Ouvradou, Gerald, to France Telecom. Multiprocessor system with cascaded modules combining processors through a programmable logic cell array. 5,465,375, Cl. 395-800.000.
Thermalloy, Inc.: *See*—
Hinshaw, Howard G.; Moulton, Keith R.; and Bland, Donald L., 5,464,054, Cl. 165-80.300.
Thevenot, Rémi: *See*—
Guyot, Dominique; and Thevenot, Rémi, 5,464,641, Cl. 426-241.000.
Thiel, Rudolf; Dpell, Andreas; and Halasy-Wimmer, Georg, to ITT Automotive Europe GmbH. Floating-caliper spot-type disc brake for high-powered vehicles. 5,464,077, Cl. 188-72.500.
Thierbach, Mark E.: *See*—
Blaker, David M.; Diamondstein, Marc S.; Ellard, Gregory S.; Mobin, Mohammad S.; Sam, Homayoon; and Thierbach, Mark E., 5,465,275, Cl. 375-341.000.
Thomas, Gérard: *See*—
Jaffiol, Franck; Olivier, Jean J.; and Thomas, Gérard, 5,464,575, Cl. 264-441.000.
Thomas, Kirk R.: *See*—
Capecchi, Mario R.; and Thomas, Kirk R., 5,464,764, Cl. 435-172.300.
Thomas, Riley A., III: *See*—
Swenson, Eric T.; Thomas, Riley A., III; Blanchard, Ronald L.; and Marshall, Brian P., 5,463,992, Cl. 123-198.00R.
Thomas, Stacy L.; and Akerman, Rose. Apparatus for covering a surgical needle to protect the user. 5,464,423, Cl. 606-223.000.
Thomas, Steven D.: *See*—
Doi, Bryan C.; Thomas, Steven D.; Coli, Vincent J.; and Giglio, Vito D., 5,465,341, Cl. 395-183.060.
Thompson, Andrew M.: *See*—
Dobrusin, Ellen M.; Showalter, Howard D. H.; Denny, William A.; Palmer, Brian D.; Rewcastle, Gordon W.; Tercel, Moana; and Thompson, Andrew M., 5,464,861, Cl. 514-414.000.
Thompson, E. Earle, to Texas Instruments Incorporated. Communication system and methods for enhanced information transfer. 5,465,401, Cl. 455-89.000.
Thompson, William C., Jr.: *See*—
Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yurzis, Robert, 5,465,294, Cl. 379-207.000.
Thomsen, Joseph A.: *See*—
Garinger, Ned; Thomsen, Joseph A.; and Michelsen, Jeffery M., 5,465,339, Cl. 395-433.000.
Thomson-CSF: *See*—
Darges, Bernard, 5,465,068, Cl. 327-323.000.
Thuries, Serge: *See*—
Massies, Jean-Louis; and Thuries, Serge, 5,464,972, Cl. 235-462.000.
Timewell, Richard R.: *See*—
Oehr, Klaus H.; Timewell, Richard R.; Donahue, Harvey; Hoy, Brenda; Kim, Ronald; and Roth, Reinhold C., 5,464,510, Cl. 204-141.500.
Timmons, Terry K.; Kobylivker, Peter; Woon, Lin-Sun; Keck, Laura E.; and Jaecomb, Jerald T., to Kimberly-Clark Corporation. Nonwoven web laminates with improved barrier properties. 5,464,688, Cl. 428-298.000.
Ting, Pauline C.; Solomon, Daniel M.; and Tom, Wing C., to Schering Corporation. Tricyclic derivatives, compositions and methods of use. 5,464,840, Cl. 514-277.000.
Tisbo, Thomas A.; Whitehead, Stephen P.; and Uffner, Michael G., to Suncast Corporation. Molded plastic footlocker. 5,464,115, Cl. 220-324.000.
Toastmaster Inc.: *See*—
Clark, Robert H.; and Terrell, Joel J., III, 5,463,936, Cl. 99-327.000.
Tobin, Philip J.: *See*—
Tseng, Hsing-Huang; and Tobin, Philip J., 5,464,792, Cl. 437-160.000.
Todd, Robert E., to Cedar-Dell Limited. Multicomponent wireless system with periodic shutdown of transmitting and receiving modes. 5,465,081, Cl. 340-825.050.
Todo, Akira: *See*—
Tsutsui, Toshiyuki; Yoshitsugu, Ken; Takahashi, Mamoru; Todo, Akira; Ohta, Seiji; and Imagaki, Hajime, 5,464,905, Cl. 525-240.000.
Todoroki, Toshiya, to NEC Corporation. Error-correcting tandem encoding system. 5,465,267, Cl. 375-279.000.
Toerner, Thomas J.: *See*—
Tran, Bang T.; and Toerner, Thomas J., 5,464,886, Cl. 523-428.000.
Togano, Takeshi: *See*—
Asaoka, Masanobu; Takao, Hideaki; Togano, Takeshi; and Kojima, Makoto, 5,464,668, Cl. 428-1.000.
Tokerud, Pamela J.; and Muggli, Darrin S., to Koch Engineering Company, Inc. Liquid collector-distributor with integral exchange column and method. 5,464,573, Cl. 261-97.000.
Tokuyama Corporation: *See*—
Matsumura, Hiroshi; Shimada, Takaaki; Hisanaka, Takayuki; Ochi, Yoshiki; Kuwaki, Tetsuo; and Muta, Yoshinobu, 5,464,689, Cl. 428-317.900.
Tokyo Electron Kabushiki Kaisha: *See*—
Ohsawa, Tetsu, 5,464,313, Cl. 414-172.000.
Tokyo Electron Tohoku Kabushiki Kaisha: *See*—
Ohsawa, Tetsu, 5,464,313, Cl. 414-172.000.
Tom, Wing C.: *See*—
Ting, Pauline C.; Solomon, Daniel M.; and Tom, Wing C., 5,464,840, Cl. 514-277.000.
Toman, Lori J.: *See*—
Villagran, Maria D.; Toman, Lori J.; Byars, Kenneth D.; Dewes, Nancy C.; and Zimmerman, Stephen P., 5,464,642, Cl. 426-439.000.
Tomba, Charles P.; Scarpucci, Joseph J.; and Getzy, Andy W., to Eltech Systems Corporation. Refurbished electrode having an inner plate and outer envelope electrode. 5,464,519, Cl. 204-280.000.
Tominaga, Akira: *See*—
Nishida, Reiziro; and Tominaga, Akira, 5,464,913, Cl. 525-524.000.
Tominaga, Michiaki: *See*—
Nakai, Satoru; Aihara, Koutoku; Tanaka, Hideo; Ibe, Hitomi; Kawai, Kazuyoshi; Ichikawa, Hiroyuki; Akamatsu, Seiji; Saito, Fumio; Tominaga, Michiaki; and Adachi, Masakazu, 5,464,833, Cl. 514-251.000.
Tomiyama, Koichi; Yusa, Hiroshi; and Kobori, Takakuni, to Canon Kabushiki Kaisha. Production of toner for developing electrostatic images. 5,464,722, Cl. 430-137.000.
Tomkins, Murray R.; and Paterson, Andrew J., to Valgro, Ltd. Orifice fitting with venting passage and injection seal. 5,464,036, Cl. 137-315.000.
Tomoyuki, Yohji: *See*—
Okuda, Kouichi; Nakamura, Shunji; Yoshimoto, Toshio; Obayuka, Yasumasa; Tomoyuki, Yohji; Fukuzawa, Daizo; Nanbu, Tomoko; and Suzuki, Hidenobu, 5,464,964, Cl. 219-497.000.
Tonelli, Claudio: *See*—
Basile, Giampiero; Musso, Ezio; Tonelli, Claudio; and Girolomoni, Sauro, 5,464,882, Cl. 521-95.000.
Tong, Robert R.; Poplett, James M.; McEwen, Alan B.; Mason, Gary E.; Goodwin, Mark L.; Tsai, K. C.; Anderson, Ronald L.; and Nelson, James P., to Pinnacle Research Institute, Inc. Method to fabricate a reliable electrical storage device and the device thereof. 5,464,453, Cl. 29-25.030.
Tornblom, Lars: *See*—
Kornfeldt, Hans; Körnvik, Lars-Åke; and Tornblom, Lars, 5,464,258, Cl. 285-293.000.
Torrington Company, The: *See*—
Aureli, William D.; and Furst, Robert E., 5,463,811, Cl. 29-898.046.
Toshiba America Information Systems Inc.: *See*—
Ito, Takafumi; Suzuki, Kenji; Ikeda, Takayuki; Oyama, Fumio; and Mazur, Walt, 5,465,370, Cl. 395-200.040.
Total Compagnie Francaise des Petroles: *See*—
Mallet, Jean-Laurent, 5,465,323, Cl. 395-123.000.
Totori Sanyo Electric Co., Ltd.: *See*—
Sugayama, Sakae; Asami, Takao; Kato, Kenji; and Maeta, Akira, 5,465,408, Cl. 455-249.100.
Tournier, Hervé; Hyacinthe, Roland; and Schneider, Michel, to Bracco International B.V. Particles for NMR imaging. 5,464,696, Cl. 428-403.000.
Toyama, Tadao: *See*—
Akiyama, Keiji; Watanabe, Noriaki; Hotta, Hisashi; Toyama, Tadao; and Nishimiya, Nobuyuki, 5,464,724, Cl. 430-272.000.
Toyo Aluminum Kabushiki Kaisha: *See*—
Miura, Hirohisa; Imahashi, Kunihiko; Michioka, Hirohumi; Yamada, Yasuhiro; Kusui, Jun; and Tanaka, Akiei, 5,464,463, Cl. 75-244.000.
Toyoda Gosei Co., Ltd.: *See*—

Okuno, Hidenobu; and Watanabe, Katsunori, 5,464,582, Cl. 264-45.500.
Shinagawa, Masatoshi; and Hashimoto, Hideyuki, 5,463,831, Cl. 49-377.000.

Toyoda, Takashi: *See*—
Okutsu, Eiichi; Toyoda, Takashi; and Ito, Tadashi, 5,464,730, Cl. 430-399.000.

Toyosawa, Yoshiya: *See*—
Watanabe, Kenji; and Toyosawa, Yoshiya, 5,464,290, Cl. 400-76.000.

Toyota Jidosha Kabushikaisha: *See*—
Yada, Seiko; Ogawa, Yukihiro; Nomura, Takao; and Umemoto, Yoshiro, 5,464,892, Cl. 524-284.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Miura, Hirohisa; Imahashi, Kunihiko; Michioka, Hirokuni; Yamada, Yasuhiro; Kusui, Jun; and Tanaka, Akiei, 5,464,463, Cl. 75-244.000.
Nishimoto, Yutaka; Ikemoto, Kimikazu; Niimi, Yuji; and Asai, Akio, 5,464,474, Cl. 118-676.000.

Toyota, Tsuyoshi: *See*—
Nakatsuka, Takao; Toyota, Tsuyoshi; Tanimoto, Mie; and Matsumoto, Akiko, 5,464,910, Cl. 525-486.000.

Töyrylä, Hannu, to Nokia Telecommunications Oy. Method for setting up a group call in a cellular radio system. 5,465,391, Cl. 455-33.400.

Tozaki, Ryusuke: *See*—
Ohga, Eiji; Kawasaki, Masahiko; Sakuma, Kazushi; Takahashi, Tatsuo; and Tozaki, Ryusuke, 5,465,385, Cl. 455-6.100.

Tracy, James L., to Motorola, Inc. Front light guide for liquid crystal device with stairstep element which emits light. 5,465,193, Cl. 362-31.000.

Traini, Carlo: *See*—
de Nora, Oronzio; Nidola, Antonio; Nevosi, Ulderico; and Traini, Carlo, 5,464,507, Cl. 204-105.00R.

Tran, Bang T.; and Toerner, Thomas J. Polymer concrete coating for pipe, tubular shapes, other metal members and metal structures. 5,464,886, Cl. 523-428.000.

Transact International Inc.: *See*—
Coelln, Axel, 5,464,086, Cl. 193-35.0SS.

Transitions Optical, Inc.: *See*—
Knowles, David B.; and Gemert, Barry V., 5,464,567, Cl. 252-586.000.

Travaglini, Nick: *See*—
Brown, David; Gaul, Harald; Kushnir, Yosif; Travaglini, Nick; and Wilson, Victor, 5,464,579, Cl. 264-297.200.

Travers, John D.; and Helzner, Eileen C., to Ethicon, Inc. Use of dimercaptan acids, salts and metabolites thereof as antiretroviral treatments. 5,464,869, Cl. 514-574.000.

Trester, Paul W.: *See*—
Streckert, Holger H.; and Trester, Paul W., 5,464,663, Cl. 427-529.000.

Tri-Tech, Inc.: *See*—
Peterson, Brian, 5,465,020, Cl. 310-194.000.

Trimble Navigation Limited: *See*—
Enge, Per; Farmer, Dominic; and Westfall, Brian, 5,465,413, Cl. 455-307.000.

Trimble, Richard A.: *See*—
Boardman, John D.; Hamilton, Scott M.; Gangstead, Mervin L.; Sadler, Jimmie L.; Trimble, Richard A.; and Welch, Jeffrey P., 5,465,243, Cl. 369-49.000.

Triton Environmental Corporation: *See*—
Kozak, Andrew F., III, 5,464,529, Cl. 210-104.000.

Triton Technology, Inc.: *See*—
Spani, Wayne M.; and Kemper, William S., 5,463,906, Cl. 73-861.270.

Trombley, Michael: *See*—
Wieczorek, Joseph P.; Halajian, Eugene M.; and Trombley, Michael, 5,464,052, Cl. 160-23.100.

Trusler, James H.: *See*—
Chan, Jimmy H.; Satre, Rodrick L.; Trusler, James H.; and Memula, Sadanand G., 5,464,623, Cl. 424-405.000.

TRW Fahrwerksysteme GmbH & Co. KG: *See*—
Broszat, Lothar, 5,464,296, Cl. 403-138.000.

TRW United Carr GmbH & Co., KG: *See*—
Ruckwardt, Hans-Werner, 5,464,179, Cl. 248-68.100.

TRW Vehicle Safety Systems Inc.: *See*—
Rizzi, Douglas J.; Wipasuramonton, Pongpet P.; and Saccone, Paul T., 5,464,247, Cl. 280-737.000.

Tsai, Chao Ming: *See*—
Shiao, Shin J., 5,464,473, Cl. 106-811.000.

Tsai, Chi-Taou: *See*—
Yip, Wai-Yeung; Chandra, Arijit; and Tsai, Chi-Taou, 5,465,217, Cl. 364-489.000.

Tsai, James. Retractable handle for hand trucks or the like. 5,464,244, Cl. 280-655.000.

Tsai, K. C.: *See*—
Tong, Robert R.; Poplett, James M.; McEwen, Alan B.; Mason, Gary E.; Goodwin, Mark L.; Tsai, K. C.; Anderson, Ronald L.; and Nelson, James P., 5,464,453, Cl. 29-25.030.

Tsai, Shih-Perng; Moon, Seung H.; and Coleman, Robert, to University of Chicago. Fermentation and recovery process for lactic acid production. 5,464,760, Cl. 435-139.000.

Tschaen, David M.: *See*—
Chartrain, Michel M.; Reddy, Jayanthi; and Tschaen, David M., 5,464,762, Cl. 435-156.000.

Tseng, Ben; and Chen, Peter, to Intoplast Corporation. Method for manufacturing consecutively opened bag and bagging system. 5,464,098, Cl. 206-554.000.

Tseng, Hsing-Huang; and Tobin, Philip J., to Motorola, Inc. Process to incorporate nitrogen at an interface of a dielectric layer in a semiconductor device. 5,464,792, Cl. 437-160.000.

Tsimberg, Alexander: *See*—
Parekh, Shafi; Geiger, Bernard M.; Tsimberg, Alexander; Malik, Zaya H.; and Fowler, Reginald H., 5,463,878, Cl. 62-394.000.

Tsuboi, Toshio: *See*—
Fukushima, Shigenobu; Nakatani, Munehiro; Muramatsu, Hideo; Tsuboi, Toshio; Hamano, Hiroaki; and Hamano, Kanako, 5,465,172, Cl. 358-498.000.

Tsuji, Takeshi: *See*—
Saijo, Eiji; Saito, Masashi; and Tsuji, Takeshi, 5,464,353, Cl. 439-489.000.

Tsujimura, Takatoshi; and Kitahara, Hiroaki, to International Business Machines Corporation. Method for taper etching metal. 5,464,500, Cl. 216-34.000.

Tsukahara, Hiroshi: *See*—
Yamashita, Kazuhiro; Negishi, Toshiyuki; Sato, Masatoshi; and Tsukahara, Hiroshi, 5,465,066, Cl. 327-294.000.

Tsukuda, Masahiro: *See*—
Hayakawa, Katsumi; Tsukuda, Masahiro; Sato, Yukiyoshi; Tatewaki, Junichi; and Yamasaka, Kazuya, 5,463,841, Cl. 53-381.200.

Tsuneda, Makoto: *See*—
Nakanishi, Akio; Furuse, Akira; Nakagawa, Kazuo; Tsuneda, Makoto; and Nukanobu, Atsushi, 5,465,047, Cl. 324-316.000.

Tsunoda, Takanori: *See*—
Murakami, Tomoo; and Tsunoda, Takanori, 5,464,662, Cl. 427-510.000.

Tsurukawa, Noboru: *See*—
Narita, Izuru; Suzuki, Keiji; Mito, Toshitsugu; and Tsurukawa, Noboru, 5,465,039, Cl. 320-32.000.

Tsushima, Masaki; Kano, Yuko; Iwamatsu, Katsuyoshi; Tamura, Atsushi; and Shibahara, Seiji, to Meiji Seika Kaisha Ltd. Cephalosporin derivatives. 5,464,829, Cl. 514-206.000.

Tsutsui, Toshiyuki; Yoshitsugu, Ken; Takahashi, Mamoru; Todo, Akira; Ohta, Seiji; and Inagaki, Hajime, to Mitsui Petrochemical Industries, Ltd. Ethylene/α-olefin copolymer composition, graft modified ethylene/α-olefin copolymer composition, ethylene copolymer composition, and multi-stage olefin polymerization process. 5,464,905, Cl. 525-240.000.

Tsymbalov, Sofya: *See*—
Hallinan, E. Ann; Hagen, Timothy J.; Husa, Robert K.; Tsymbalov, Sofya; Lee, Albert C.; and Van Hoeck, Jean-Pierre, 5,464,830, Cl. 514-211.000.

Tu, Paul K.-G.: *See*—
Kable, James A.; Kau, Chiu-Cheng; Levitan, David S.; Ogden, Aubrey D.; Poursepanj, Ali A.; Tu, Paul K.-G.; and Waldecker, Donald E., 5,465,373, Cl. 395-800.000.

Tuch, Ronald J.: *See*—
Berg, Eric P.; Tuch, Ronald J.; Dror, Michael; and Wolff, Rodney G., 5,464,650, Cl. 427-2.300.

Tulipano, Francis J.: *See*—
Rossmassler, Rich; Ciebiera, Lloyd; Tulipano, Francis J.; Vinson, Sylvester; and Walters, R. Thomas, 5,464,988, Cl. 250-507.100.

Tuller, F. Norman: *See*—
Bialas, Norbert; Mathis, Raymond; Crewa, Richard P.; Mudge, Elbert H.; and Tuller, F. Norman, 5,464,546, Cl. 252-8.600.

Tuller, Harry L.: *See*—
Micak, Richard; and Tuller, Harry L., 5,464,509, Cl. 204-129.300.

Tulsa Dental Products, L.L.C.: *See*—
Heath, Derek E.; and Mooneyhan, Jerry A., 5,464,362, Cl. 451-48.000.

Tunewell Technology Ltd.: *See*—
Rimmer, Philip J., 5,465,010, Cl. 307-9.100.

Turk, Richard; and Nowaczyk, Paul, to Michigan Biotechnology Institute. Phosphors, compositions containing such phosphors and methods of use. 5,464,651, Cl. 427-64.000.

Turnbull, Ian: *See*—
McIntyre, Jonathan F.; Mahboubian-Jones, Malcolm G. B.; and Turnbull, Ian, 5,464,046, Cl. 139-455.000.

Turner, Edwin T.: *See*—
Moore, Samuel B.; Leuck, James F.; and Turner, Edwin T., 5,464,563, Cl. 252-186.290.

Turner, Lana S.: *See*—
Kuznicki, James T.; and Turner, Lana S., 5,464,619, Cl. 424-195.100.

Turner, Michael R.: *See*—
Bealkowski, Richard; Geisler, Douglas R.; and Turner, Michael R., 5,465,357, Cl. 395-700.000.

Twofish Unlimited: *See*—
Studdiford, Robert D., 5,464,135, Cl. 224-41.000.

Tyagi, Dinesh: *See*—
Wilson, John C.; and Tyagi, Dinesh, 5,464,719, Cl. 430-110.000.

Tyau, Li Yng. Multi-function energy saving power transmission mechanism. 5,463,914, Cl. 74-661.000.

U. S. Philips Corporation: *See*—
Visscher, Albert; Koster, Marinus P.; and Weekamp, Johannus W., 5,465,021, Cl. 310-328.000.

UAB Research Foundation, The: *See*—
Sommadossi, Jean-Pierre, 5,464,748, Cl. 435-7.700.

Uarco Incorporated: *See*—
Schildmeyer, John, 5,464,255, Cl. 283-116.000.

Uchikawa, Yoshio: *See*—
Fukushima, Hitoshi; Uchikawa, Yoshio; and Mizoguchi, Yoshito, 5,465,111, Cl. 347-115.000.

Uchiyama, Yoshiharu: *See*—
Nomura, Hideo; Uchiyama, Yoshiharu; and Ogawa, Tetsuo, 5,465,191, Cl. 361-681.000.
Uden, Jonas P.: *See*—
Frostrom, Tore; Nilsson, Tomas J.; Andersson, Yngve; Carlsson, Michael M. J.; Sundell, Lars-Olof; and Uden, Jonas P., 5,465,393, Cl. 455-54.100.
Ueda, Osamu: *See*—
Mori, Shinichi; Ueda, Osamu; and Yamashita, Masayuki, 5,464,989, Cl. 257-30.000.
Uematsu, Kazuyoshi; Takeshita, Kishio; and Ozawa, Minoru, to Uematsu, Kazuyoshi. Oil leakage preventive method. 5,464,225, Cl. 277-1.000.
Ueno, Shugoro, to Canon Kabushiki Kaisha. Character recognition method and apparatus for preparing a plurality of character recognition processes in parallel. 5,465,305, Cl. 382-218.000.
Ueno, Yoshiyuki; Morimoto, Masayoshi; Ootsuka, Seiji; Kawai, Tatsushi; and Saiou, Susumu, to Kajima Corporation; and Research Institute of Innovative Technology for the Earth. Process for the production of hydrogen by microorganisms. 5,464,539, Cl. 210-603.000.
Uesaka, Hiroshi: *See*—
Yamaguchi, Tadashi; Uesaka, Hiroshi; Watanabe, Kazuo; and Awaya, Juichi, 5,464,818, Cl. 514-2.000.
Uffner, Michael G.: *See*—
Tisbo, Thomas A.; Whitehead, Stephen P.; and Uffner, Michael G., 5,464,115, Cl. 220-324.000.
Ugai, Sadayuki: *See*—
Hirai, Kenji; Yamashita, Mitsuo; Tateno, Tomoko; Ejiri, Emiko; Harasawa, Kikuko; Onji, Yuichi; Ugai, Sadayuki; and Nagao, Shoin, 5,464,811, Cl. 504-281.000.
Uggeri, Fulvio: *See*—
Anelli, Pierfrancio; Brocchetta, Marino; Uggeri, Fulvio; and Visigalli, Massimo, 5,464,607, Cl. 424-9.452.
Uhlmann Pac-Systeme GmbH & Co. KG: *See*—
Bailer, Rudolf, 5,463,840, Cl. 53-117.000.
Uhrig, Dieter: *See*—
Rodi, Anton; Uhrig, Dieter; and Krestyn, Karlheinz, 5,464,206, Cl. 271-227.000.
Ukita, Nobuo: *See*—
Hanazaki, Yasumasa; and Ukita, Nobuo, 5,465,029, Cl. 315-308.000.
Ulmerich, Karlheinz: *See*—
Garcias, Brigitte; Baierweck, Petra; Plachetta, Christoph; and Ulmerich, Karlheinz, 5,464,894, Cl. 524-424.000.
Ultradent Products, Inc.: *See*—
Fischer, Dan E.; and Picavet, Fred, 5,464,348, Cl. 433-26.000.
Umemoto, Yoshiro: *See*—
Yada, Seiko; Ogawa, Yukihiro; Nomura, Takao; and Umemoto, Yoshiro, 5,464,892, Cl. 524-284.000.
Unangst, Paul C.: *See*—
Cetenko, Wiaczeslaw A.; Connor, David T.; Sorenson, Roderick J.; Unangst, Paul C.; and Stabler, Stephen R., 5,464,856, Cl. 514-369.000.
Underwood, Lorance T. Engine control device. 5,463,994, Cl. 123-398.000.
Unger, William J.; and McKinney, William, to Connelly Skis, Inc. Airfoil jump ski. 5,464,358, Cl. 441-68.000.
Uni-Charm Corporation: *See*—
Matsumura, Hiroshi; Shimada, Takaaki; Hisanaka, Takayuki; Ochi, Yoshiki; Kuwaki, Tetsuo; and Muta, Yoshinobu, 5,464,689, Cl. 428-317.900.
Uniden America Corp.: *See*—
Ono, Akira; Masaki, Tateo; and Warabi, Hironori, 5,465,402, Cl. 455-161.200.
Uniden Corporation: *See*—
Ono, Akira; Masaki, Tateo; and Warabi, Hironori, 5,465,402, Cl. 455-161.200.
Union Carbide Chemicals & Plastics Technology Corporation: *See*—
Nielsen, Kenneth A., 5,464,154, Cl. 239-1.000.
Unisys Corporation: *See*—
Stevens, Rick, 5,465,065, Cl. 327-276.000.
United Kingdom Atomic Energy Authority: *See*—
Neat, Robin J.; and Macklin, William J., 5,464,708, Cl. 429-218.000.
United Microelectronics Corporation: *See*—
Hong, Gary, 5,464,785, Cl. 437-43.000.
Lur, Water; and Wu, Jian Y., 5,464,794, Cl. 437-187.000.
Lur, Water; Su, Anna; and Shea, Nong H., 5,465,003, Cl. 257-510.000.
U.S. Competition Arms Inc.: *See*—
Sprangers, Keith J., 5,463,829, Cl. 42-42.010.
United States of America
Agriculture: *See*—
Bryant, Frank O.; and Cutler, Horace G., 5,464,771, Cl. 435-262.500.
Air Force: *See*—
Bryant, Steve M., 5,465,095, Cl. 342-159.000.
Kiel, Johnathan L.; Parker, Jill E.; and Bruno, John G., 5,464,768, Cl. 435-240.200.
Merat, Francis L.; Roumina, Kavous; Raegnegger, Steven M.; and Delvalle, Robert B., 5,465,221, Cl. 364-552.000.
Army: *See*—
Abbate, Agostino; Frankel, Julius; Scholz, Wilfried; Colangelo, Vito J.; and Korman, William J., 5,463,896, Cl. 73-81.000.
Faughn, Jim A., 5,463,926, Cl. 89-1.200.
Marinelli, Anne M. P.; and Patterson, Michael S., 5,465,050, Cl. 324-603.000.
Smith, Brian G., 5,465,030, Cl. 315-349.000.
Commerce: *See*—
Gaitan, Michael; Suehle, John S.; Semancik, Stephen; and Cavicchi, Richard E., 5,464,966, Cl. 219-544.000.
Energy: *See*—
Davidson, George S.; and Grafe, Victor G., 5,465,368, Cl. 395-800.000.
Rossmassler, Rich; Ciebiera, Lloyd; Tulipano, Francis J.; Vinson, Sylvester; and Walters, R. Thomas, 5,464,988, Cl. 250-507.100.
Health and Human Services: *See*—
Bassen, Howard I.; and Casamento, John P., 5,465,013, Cl. 307-91.000.
National Aeronautics and Space Administration: *See*—
Chang, Alice C.; and St. Clair, Terry L., 5,464,928, Cl. 528-353.000.
Garner, Charles E., 5,465,023, Cl. 313-293.000.
Kramer, Joel M., 5,464,301, Cl. 403-322.000.
Smyth, Padhraic J., 5,465,321, Cl. 395-22.000.
Navy: *See*—
Houlberg, Christian L., 5,465,274, Cl. 375-340.000.
Keller, Teddy M., 5,464,926, Cl. 528-206.000.
Sharrow, Joseph F.; and Hardy, Samuel R., 5,464,173, Cl. 244-3.300.
Upton, William K., III; Schneider, William E.; Brown, Stuart H.; Stetz, Steven A.; Gotich, Emily J.; and McCrea, Jack L., 5,464,161, Cl. 241-21.000.
Williams, Robert M.; Rogers, Ernest O.; and Sevik, Maurice M., 5,464,321, Cl. 416-93.00A.
U.S. Philips Corporation: *See*—
Antonis, Petrus H.; Schlejen, Jacob; and Konings, Leonardus U. E., 5,465,028, Cl. 315-248.000.
Boiron, Marc; and Bouvier, Stéphane, 5,465,069, Cl. 327-333.000.
Dufour, Yves, 5,465,061, Cl. 327-112.000.
Edwards, Martin J., 5,465,053, Cl. 324-770.000.
Schreurs, Jacobus C.; and Horstman, Rudolf A., 5,465,277, Cl. 375-376.000.
Van Lier, Antonius J. M., 5,465,306, Cl. 382-276.000.
United States Pipe and Foundry Company: *See*—
Weber, Joe; and Jones, Lawrence S., 5,464,228, Cl. 277-207.00A.
United States Surgical Corporation: *See*—
Guy, Thomas D.; Granger, Richard N.; Brady, Robert H.; Webster, John; Pratt, James R.; Stone, Corbett W.; and Alesi, Thomas W., Jr., 5,464,144, Cl. 227-176.000.
United Technologies Corporation: *See*—
Butler, Aaron S.; Davis, Franklin J.; and Comeau, Roger J., 5,463,864, Cl. 60-39.310.
Fowler, Donald W.; Lappos, Nicholas D.; and Edwards, Joan A., 5,465,212, Cl. 364-427.000.
Olson, Eric G., 5,464,227, Cl. 277-96.100.
Universal Ice Cream Machines S.r.l.: *See*—
Giuseppe, Caccia; and Luigi, Airoldi, 5,464,119, Cl. 221-156.000.
University Hospital, The: *See*—
Burton, James; Dong, Zhengxin; and Frigo, Timothy B., 5,464,820, Cl. 514-16.000.
University of Alabama in Huntsville, The: *See*—
Caulfield, H. John; Huang, Qiang; Putilin, Andrei; and Morozov, Valentin, 5,465,311, Cl. 385-27.000.
University of California: *See*—
Botchan, Michael R.; Clark, Robin; Mohr, Ian J.; and Sun, Shaw, 5,464,936, Cl. 530-350.000.
McConnell, Oliver J.; Saucy, Gabriel; Jacobs, Robert; and Gunasekera, Sarath P., 5,464,835, Cl. 514-254.000.
University of California, Regents of the: *See*—
Dennis, Edward A.; Reynolds, Laure J.; and Yu, Lin, 5,464,754, Cl. 435-18.000.
University of California, The Regents of the: *See*—
Hoenninger, John C., III, 5,465,361, Cl. 395-700.000.
Kossovsky, Nir; Gelman, Andrew E.; and Hnatyszyn, H. James, 5,464,634, Cl. 424-493.000.
Lehrer, Robert I.; Kokryakov, Vladimir N.; and Harwig, Sylvia S. L., 5,464,823, Cl. 514-13.000.
McEwan, Thomas E., 5,465,094, Cl. 342-28.000.
Prater, Craig B.; Massie, James; Grigg, David A.; Elings, Virgil B.; Hansma, Paul K.; and Drake, Barney, 5,463,897, Cl. 73-105.000.
van den Engh, Ger, 5,464,581, Cl. 422-82.010.
University of Chicago: *See*—
Tsai, Shih-Perng; Moon, Seung H.; and Coleman, Robert, 5,464,760, Cl. 435-139.000.
University of Florida: *See*—
Abela, George S.; Priedl, Stephen E.; and Mathews, Eric D., 5,464,404, Cl. 606-13.000.
Warren, Craig B.; Marin, Anna B.; Butler, Jerry F.; and Narula, Anubhav P. S., 5,464,626, Cl. 424-408.000.
University of Hawaii: *See*—
Huang, Alvin S.; and Hollyer, James, 5,464,646, Cl. 426-615.000.
Snoeys, Walter; and Parker, Sherwood L., 5,465,002, Cl. 257-458.000.
University of Houston, The: *See*—
Hight, Terry V. T.; Matson, Jack V.; Rakestraw, Lawrence F.; Zhang, Zhihe; and Kuechler, Thomas C., 5,464,636, Cl. 424-661.000.
University of Massachusetts Medical Center: *See*—
Karellas, Andrew, 5,465,284, Cl. 378-62.000.
University of Minnesota, Regents of the: *See*—

Khartchenko, Serguei V.; Khartchenko, Nadejda; Khartchenko, Alina; and Khartchenko, Alissa S., 5,464,608, Cl. 424-53.000.
University of Nebraska, Board of Regents of the: *See*—
Coolidge, Thomas R.; Lewis, William; Schuster, Sheldon M.; Stout, Jay; van Heeke, Gino; Wylie, Dwane; and Wagner, Fred W., 5,464,759, Cl. 435-91.200.
University of Oklahoma, Board of Regents of the: *See*—
Cummings, Richard D.; Moore, Kevin L.; and McEver, Rodger P., 5,464,778, Cl. 436-503.000.
University of Pennsylvania, Trustees of the: *See*—
Greene, Mark I.; Dobashi, Kunio; Davis, James G.; and Hamuro, Junji, 5,464,751, Cl. 435-7.230.
University of Pittsburgh: *See*—
Skeens, Joseph L.; and Miketic, Linda M., 5,464,410, Cl. 606-130.000.
University of Reading: *See*—
Potter, Ellen; Behan, Dominic P.; Fischer, Wolfgang H.; Linton, Elizabeth A.; Lowry, Philip J.; and Vale, Wylie W., Jr., 5,464,757, Cl. 435-69.100.
University of Saskatchewan: *See*—
Attree, Stephen M.; and Fowke, Lawrence C., 5,464,769, Cl. 435-240.400.
University of Utah: *See*—
Shettigar, Udipi R., 5,464,535, Cl. 210-321.890.
University of Utah Research Foundation: *See*—
Capecchi, Mario R.; and Thomas, Kirk R., 5,464,764, Cl. 435-172.300.
University Technologies International Inc.: *See*—
Shrive, Nigel G.; Damson, Erich; Meyer, Richard A.; and Iverslie, Scott P., 5,463,902, Cl. 73-781.000.
Unthank, Robert J., to Tetra Laval Holdings & Finance S.A. Apparatus for continual application on a continuous material web. 5,464,497, Cl. 156-519.000.
UOP: *See*—
Galperin, Leonid B.; Bogdan, Paula L.; and Boldingh, Edwin P., 5,464,800, Cl. 502-66.000.
Saunders, Dennis L., 5,464,526, Cl. 208-108.000.
Ward, John W., 5,464,527, Cl. 208-111.000.
Upton, William K., III; Schneider, William E.; Brown, Stuart H.; Stetz, Steven A.; Gotich, Emily J.; and McCrea, Jack L., to United States of America, Navy. Solid waste pulper. 5,464,161, Cl. 241-21.000.
Urologix, Inc.: *See*—
Reid, John M.; Kauphusman, James V.; Porter, Christopher H.; and Neilson, Bruce H., 5,464,437, Cl. 607-101.000.
Rudie, Eric N.; Neilson, Bruce H.; and Kauphusman, James V., 5,464,445, Cl. 607-101.000.
USA Digital Radio Partners, L.P.: *See*—
Hunsinger, Billie J.; Vigil, A. J.; and Solie, Leland P., 5,465,396, Cl. 455-61.000.
Usm U. Schärer Söhne Ag.: *See*—
Schärer, Paul; and Stöckli, Kaspar, 5,464,299, Cl. 403-297.000.
Usui, Minoru; Yamagishi, Kouji; Yoshino, Ken; and Mori, Hideki, to Casio Computer Co., Ltd. Image display apparatus. 5,465,102, Cl. 345-89.000.
Vacca, Frédéric, to Valeo Systemes d'Essuyage. Geared motor for driving a windshield wiper device for a motor vehicle. 5,465,017, Cl. 310-83.000.
Vacek, Ronald R.; Semmler, Bruce; and Owens, Edward, to Sterling Winthrop. Closure for medication container. 5,464,111, Cl. 215-249.000.
Vachoux, André, to Serdi - Societe D'Etudes De Realisation Et De Diffusion Industrielles. Device for removing the valves of an internal combustion engine. 5,463,802, Cl. 29-214.000.
Vader, David T.; and Vasile, Vincent C., to International Business Machines Corporation. High performance thermal interface for low temperature electronic modules. 5,463,872, Cl. 62-51.100.
Vale, Wylie W., Jr.: *See*—
Potter, Ellen; Behan, Dominic P.; Fischer, Wolfgang H.; Linton, Elizabeth A.; Lowry, Philip J.; and Vale, Wylie W., Jr., 5,464,757, Cl. 435-69.100.
Valeo Systemes d'Essuyage: *See*—
Vacca, Frédéric, 5,465,017, Cl. 310-83.000.
Valette, Gérard: *See*—
Courtemanche, Gilles; Gautier, Claudie; Gully, Danielle; Roger, Pierre; Valette, Gérard; and Wermuth, Camille G., 5,464,847, Cl. 514-342.000.
Valgro, Ltd.: *See*—
Tomkins, Murray R.; and Patterson, Andrew J., 5,464,036, Cl. 137-315.000.
Valkyrie Scientific Proprietary, L.C.: *See*—
Kaylor, Joseph B., 5,464,065, Cl. 169-44.000.
Valmet-Appleton, Inc.: *See*—
Koerber, Gregory K., 5,464,088, Cl. 198-370.070.
Valoppi, Valeri L., to BASF Corporation. 1,1,1,2-tetrafluoroethane as a blowing agent in integral skin polyurethane shoe soles. 5,464,879, Cl. 521-51.000.
Van den Bergh Foods Co., Division of Conopco, Inc.: *See*—
Weadorp, Leendert H.; Madsen, Robert A.; Norton, Ian T.; and Brown, Charles R., 5,464,645, Cl. 426-573.000.
VanBuskirk, Gregory K.; Hsieh, Chang-Li; McNulty, Kenneth J.; and Hansen, Ole V., to Koch Engineering Company, Inc. Chevron type mist eliminator and system. 5,464,459, Cl. 55-257.200.
van den Engh, Ger, to University of California, The Regents of the. Flow cytometer. 5,464,581, Cl. 422-82.010.
Vandlen, Richard L.: *See*—
Henner, Dennis J.; Vandlen, Richard L.; Wilkins, James A.; and Yansura, Daniel G., 5,464,756, Cl. 435-69.100.
Van Emmerick, David L., to Alcatel Components Limited. Electrical connector assembly. 5,464,352, Cl. 439-404.000.
van Heeke, Gino: *See*—
Coolidge, Thomas R.; Lewis, William; Schuster, Sheldon M.; Stout, Jay; van Heeke, Gino; Wylie, Dwane; and Wagner, Fred W., 5,464,759, Cl. 435-91.200.
Van Hoeck, Jean-Pierre: *See*—
Hallinan, E. Ann; Hagen, Timothy J.; Hosa, Robert K.; Tsymbalov, Sofya; Lee, Albert C.; and Van Hoeck, Jean-Pierre, 5,464,830, Cl. 514-211.000.
Van Lier, Antonius J. M., to U.S. Philips Corporation. Image storage device which stores portions of image data defining pixels making up an image, an image processing device including the image storage device. 5,465,306, Cl. 382-176.000.
Vasile, Vincent C.: *See*—
Vader, David T.; and Vasile, Vincent C., 5,463,872, Cl. 62-51.100.
Vasseur, Jean-Claude, to Sfmaid Renov'cuves. Device for the preparation of used metal barrels with a view to facilitating handling and recycling thereof. 5,463,887, Cl. 72-39.000.
Vassiliadis, Stamatis: *See*—
Blaner, Bartholomew; and Vassiliadis, Stamatis, 5,465,377, Cl. 395-800.000.
Vaynshteyn, Mikhail, to Eastman Kodak Company. Spring driven film transport system. 5,465,129, Cl. 354-170.000.
Veluwse Machibe Industrie B.V.: *See*—
De Graaf, Martin, 5,464,489, Cl. 156-126.000.
Venture Packaging, Inc.: *See*—
Anderson, Richard F., 5,464,285, Cl. 383-10.000.
Vera, Luis E.: *See*—
Popeacu, Miron G.; Bekus, David F.; Routh, Shakti; Vera, Luis E.; and Clark, Thomas A., 5,464,580, Cl. 422-34.000.
Vera-Garcia, Marcela A.: *See*—
Melendez, Luis A.; Rosenbaum, Robert E.; Vera-Garcia, Marcela A.; Olive, D. Michael; and Swenson, John E., 5,464,773, Cl. 435-306.100.
Verbeuren, Tony: *See*—
Cordi, Alex; Lacoste, Jean-Michel; Laubie, Michel; Verbeuren, Tony; and Descombes, Jean-Jacques, 5,464,859, Cl. 514-401.000.
Verkade, John G., to Iowa State University Research Foundation, Inc. Method of applying single-source molecular organic chemical vapor deposition agents. 5,464,656, Cl. 427-248.100.
Veronesi, Umberto; Chiesa, Fausto; and Costa, Alberto, to Ortho Pharmaceutical Corporation. Methods of inhibiting development of leukopiakia with fenretinide. 5,464,870, Cl. 514-617.000.
Versa Corporation: *See*—
Cullen, Steven R., 5,463,849, Cl. 53-527.000.
Cullen, Steven R., 5,464,049, Cl. 141-114.000.
Vesely, Kevin T.: *See*—
McMonagle, John J., Jr.; and Vesely, Kevin T., 5,465,296, Cl. 379-355.000.
Vicari, Richard; Kvakovszky, George; and Fruchey, Olan S., to Hoechst Celanese Corporation. Polymer compositions containing substituted biphenyl pyrazines. 5,464,923, Cl. 528-68.000.
Vicari, Richard; Kvakovszky, George; Fruchey, Olan S.; and Metz, Hans J., to Hoechst Celanese Corporation. Biphenyl pyrazine compounds. 5,464,941, Cl. 534-741.000.
Videocolor: *See*—
Roussel, Bruno; and Dumesnil, Alain, 5,465,026, Cl. 313-440.000.
Viera, Fernando M., to Cordis Corporation. Magnetic exchange device for catheters. 5,464,023, Cl. 128-772.000.
Vigil, A. J.: *See*—
Hunsinger, Billie J.; Vigil, A. J.; and Solie, Leland P., 5,465,396, Cl. 455-61.000.
Viking Metal Cabinet Co., Inc.: *See*—
Maro, Nicholas, 5,464,281, Cl. 312-257.100.
Villagran, Maria D.; Toman, Lori J.; Byars, Kenneth D.; Dawes, Nancy C.; and Zimmerman, Stephen P., to Procter & Gamble Company, The. Process for making reduced-fat fried snacks with lighter, more expanded snack structures. 5,464,642, Cl. 426-439.000.
Vinci, Alfredo: *See*—
Winston, Anthony E.; Cala, Francis R.; Dunn, Steven E.; Vinci, Alfredo; and Lajoie, M. Stephen, 5,464,553, Cl. 252-108.000.
Vinson, Sylvester: *See*—
Rossmassler, Rich; Ciebiera, Lloyd; Tulipano, Francis J.; Vinson, Sylvester; and Walters, R. Thomas, 5,464,988, Cl. 250-507.100.
Visa International: *See*—
Hilt, James J.; Hodges, Ron; Pardue, Stephen W.; and Powar, William L., 5,465,206, Cl. 364-406.000.
Visigalli, Massimo: *See*—
Aselli, Pierlucio; Brocchetta, Marino; Uggeri, Fulvio; and Visigalli, Massimo, 5,464,607, Cl. 424-9.452.
Visscher, Albert; Koster, Marinus P.; and Weekamp, Johannus W., to U. S. Philips Corporation. Electromechanical displacement device and actuator suitable for use in such a electromechanical displacement device. 5,465,021, Cl. 310-328.000.
Vivenzio, Robert L.: *See*—
Krauter, Allan I.; Vivenzio, Robert L.; and Kehoskie, Michael P., 5,464,007, Cl. 600-144.000.
Vivid Semiconductor, Inc.: *See*—

Erhart, Richard A., 5,465,054, Cl. 326-34.000.

Vlasov, Yuri G.; and Bychkov, Yeugeni A. Chalcogenide ion selective electrodes. 5,464,511, Cl. 204-153.100.

VLSI Technology, Inc.: *See*—
Doi, Bryan C.; Thomas, Steven D.; Coli, Vincent J.; and Giglio, Vito D., 5,465,341, Cl. 395-183.060.
Garinger, Ned; Thomsen, Joseph A.; and Michelsen, Jeffery M., 5,465,339, Cl. 395-433.000.

Voac Hydraulics Boras AB: *See*—
Karlsson, Hans B.; Fellinger, Lennart E.; and Micael, Axel T., 5,463,931, Cl. 91-425.000.

Vogel, Georg: *See*—
Gall, Arthur; Meier, Heinz; Kuphal, Wilko; and Vogel, Georg, 5,465,285, Cl. 378-173.000.

Vogelsang, Joerg; Greening, Giorgio; Laws, Regina; and Ittemann, Peter, to Cytec Technology Corp. Hybrid yarn comprising a core of intermixed polyamide filaments and reinforcing rilaments wherein the core is wrapped by a polyamide fiber. 5,464,684, Cl. 428-229.000.

Vogler, Erwin A.; and Graper, Jane C., to Becton, Dickinson and Company. Method for preparing a dual pathway clotting enhancer for blood collection tube. 5,464,776, Cl. 436-69.000.

Vogler, Richard G., to Boler Company, The. Suspension for light duty trucks. 5,464,245, Cl. 280-720.000.

Vollmer, John: *See*—
Bourdoulous, Robert P.; and Vollmer, John, 5,464,157, Cl. 239-424.000.

Von Duprin, Inc.: *See*—
Cohrs, Richard B.; and Mader, Gerald E., 5,464,259, Cl. 292-92.000.

von Plessen, Helmold: *See*—
Lyding, Günther; Pille, Maria; von Plessen, Helmold; and Semel, Joachim, 5,464,876, Cl. 521-46.500.

Voo, Liann; Tagliaferro, Dennis C.; and Wilson, Joan B., to Ciba Corning Diagnostics Corp. Synergistic preservative systems for chemistry reagents. 5,464,850, Cl. 514-372.000.

Vorad Safety Systems, Inc.: *See*—
Bouchard, Paul J.; Woll, Jerry D.; Woll, Bryan D.; and Asbury, Jimmie R., 5,465,079, Cl. 340-576.000.

Vorres, Carol L.: *See*—
Yuhas, Donald E.; Vorres, Carol L.; Groppi, David P.; and Konicek, Jiri D., 5,464,658, Cl. 427-385.500.

Vranas, Goulielmos: *See*—
Cook, Graeme A. C.; Vranas, Goulielmos; and McIver, Simon P., 5,464,334, Cl. 417-494.000.

Vreeland, William B.: *See*—
Ferrar, Wayne T.; Vreeland, William B.; Hewitt, Charles E.; Fitzgerald, John J.; and Binga, Tonya D., 5,464,703, Cl. 428-421.000.

Vreeland, William B., II: *See*—
Chen, Jiann H.; Fitzgerald, John J.; Vreeland, William B., II; Ferrar, Wayne T.; Roberts, Gary P.; and Staudenmayer, William J., 5,464,698, Cl. 428-421.000.

Vuong, Dinh-Cuong: *See*—
Brookes, Donald D.; Falsetti, James S.; Wolfenbarger, James K.; and Vuong, Dinh-Cuong, 5,464,592, Cl. 422-207.000.

W. L. Gore & Associates, Inc.: *See*—
Silverman, James D., 5,464,422, Cl. 606-223.000.

W. R. Grace & Co.-Conn.: *See*—
Moehlenbrock, Andrew W.; Owensby, Joseph E.; and Bagwell, Thomas H., 5,463,844, Cl. 53-436.000.

W. S. Tyler, Incorporated: *See*—
DeDeinar, Ronald B.; and Lach, Greg F., 5,464,165, Cl. 241-215.000.

Wabnitz, Benjamin, to Pacific International Pipe Enterprises, Inc. Method and apparatus for electrically isolating a rail in a precast concrete grade crossing. 5,464,152, Cl. 238-8.000.

Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH: *See*—
Wolf, Andreas; and Koeppl, Franz, 5,464,159, Cl. 241-1.000.

Wada, Hironori: *See*—
Kano, Osamu; Yasui, Koichi; Sato, Yasuyuki; Yamakoshi, Yasuhiro; Anan, Junichi; Wada, Hironori; and Yasuoka, Akio, 5,464,520, Cl. 204-298.130.

Wada, Masami: *See*—
Yamashita, Fumitoshi; and Wada, Masami, 5,464,576, Cl. 264-428.000.

Wagner, Fred W.: *See*—
Coolidge, Thomas R.; Lewis, William; Schuster, Sheldon M.; Stout, Jay; van Heeke, Gino; Wylie, Dwane; and Wagner, Fred W., 5,464,759, Cl. 435-91.200.

Wagner, Herbert, to Rhein Chemie Rheinau GmbH. Aqueous slip and mold-release agent and process for the molding and vulcanization of tires and other rubber articles. 5,464,586, Cl. 264-130.000.

Wah Lo, Allen K.; and Wu, Augustine K., to Image Technology International, Inc. 2-D and 3-D multi-lens camera with one lens having a wider plane than the other lenses. 5,465,128, Cl. 354-114.000.

Wahlstedt, David A.: *See*—
Arnold, Joseph E.; and Wahlstedt, David A., 5,464,083, Cl. 192-8.00C.

Wainwright, David, to Moli Energy (1990) Limited. Battery incorporating hydraulic activation of disconnect safety device on overcharge. 5,464,705, Cl. 429-61.000.

Waizmann, Franz; Hillenbrand, Jürgen; and Langenmayr, Manfred, to Baldwin-Gegenheimer GmbH. Printing machine spray device. 5,463,951, Cl. 101-423.000.

Wakabayashi, Tsuneo: *See*—
Yoneda, Takashige; Wakabayashi, Tsuneo; and Takano, Yukiko, 5,464,704, Cl. 428-429.000.

Waldecker, Donald E.: *See*—
Kahle, James A.; Kau, Chin-Cheng; Levitan, David S.; Ogden, Aubrey D.; Pournepanj, Ali A.; Tu, Paul K.-G.; and Waldecker, Donald E., 5,465,373, Cl. 395-800.000.

Walenty, Allen J., to General Motors Corporation. Method for determining a vehicle steering wheel center position. 5,465,210, Cl. 364-424.050.

Wallash, Albert J.: *See*—
Bajorek, Christopher H.; Erpelding, A. David; Garfunkel, Glen A.; Pattanaik, Surya; Robertson, Neil L.; and Wallash, Albert J., 5,465,186, Cl. 360-113.000.

Wallis, Frank S.: *See*—
Beck, Norman G.; Wallis, Frank S.; and Holthaus, Gary A., 5,464,332, Cl. 417-368.000.

Walsh, Brendan: *See*—
Guttag, Karl M.; Simpson, Richard; and Walsh, Brendan, 5,465,224, Cl. 364-716.000.

Walsh, P. Sean: *See*—
Reynolds, Rebecca L.; and Walsh, P. Sean, 5,464,945, Cl. 536-24.310.

Walsh, Stephen J., to International Business Machines Corporation. Dynamically adaptive set associativity for cache memories. 5,465,342, Cl. 395-446.000.

Walter, Jerry L.: *See*—
Boatwright, Darrell L.; Hanson, George E.; Miller, Phillip; Koenck, Steven E.; Walter, Jerry L.; Kubler, Joseph J.; Cargin, Keith K., Jr.; Schultz, Darald R.; Davis, Patrick H.; and Kunert, Steven R., 5,465,207, Cl. 364-424.010.

Walter, Mark A.: *See*—
Rush, William B., II; Mondek, Martin J.; Sullivan, Donald K.; Walter, Mark A.; and Zdanowicz, Lawrence E., Sr., 5,463,990, Cl. 123-195.00P.

Walters, Dale R.: *See*—
Robins, David J.; and Walters, Dale R., 5,464,873, Cl. 514-659.000.

Walters, R. Thomas: *See*—
Rossmassler, Rich; Ciebiera, Lloyd; Tulipano, Francis J.; Vinson, Sylvester; and Walters, R. Thomas, 5,464,988, Cl. 250-507.100.

Walz, Rüdiger, to Häfele GmbH & Co. Fitting, particularly fitting for connecting plates. 5,464,297, Cl. 403-231.000.

Wamprecht, Christian: *See*—
Laas, Hans-Josef; Halpaap, Reinhard; Wamprecht, Christian; Meier-Westhues, Hans-Ulrich; Schultz, Wolfgang; and Kahl, Lothar, 5,464,921, Cl. 528-67.000.

Wang, Annie Q., to Industrial Scientific Corporation. Method and apparatus for determining the concentration of a gas. 5,464,983, Cl. 250-343.000.

Wang, David W.: *See*—
Gelorme, Jeffrey D.; Skarvinko, Eugene R.; and Wang, David W., 5,464,726, Cl. 430-326.000.

Wang, Diana S.; and Williams, Marvin L., to International Business Machines Corporation. Method and system for document administration utilizing iconic representations within a data processing system. 5,465,327, Cl. 395-159.000.

Wang, Lixiao: *See*—
Buscemi, Paul J.; Stejskal, Elizabeth A.; Palme, Donald F., II; and Wang, Lixiao, 5,464,450, Cl. 623-6.000.

Wang, Shui-Mu. Variable massage drive unit for a chair-type massage apparatus. 5,464,382, Cl. 601-99.000.

Wang, Wen-Bin: *See*—
Chang, Fang-Hsiung; and Wang, Wen-Bin, 5,464,190, Cl. 251-74.000.

Warabi, Hironori: *See*—
Ono, Akira; Masaki, Taeo; and Warabi, Hironori, 5,465,402, Cl. 455-161.200.

Ward, John W., to UOP. Hydrocracking process for producing middle distillates. 5,464,527, Cl. 208-111.000.

Warden, Gerald D.: *See*—
Bowser, David; and Warden, Gerald D., 5,464,203, Cl. 271-12.000.

Warner-Lambert: *See*—
Dobrusin, Ellen M.; Showalter, Howard D. H.; Denny, William A.; Palmer, Brian D.; Rewcastle, Gordon W.; Tercel, Moana; and Thompson, Andrew M., 5,464,861, Cl. 514-414.000.

Warner-Lambert Company: *See*—
Capiris, Thomas; and Connor, David T., 5,464,855, Cl. 514-382.000.
Cetenko, Wiaczeslaw A.; Connor, David T.; Sorenson, Roderick J.; Unangst, Paul C.; and Stabler, Stephen R., 5,464,856, Cl. 514-389.000.
Hoover, Charles E.; Dennin, Randy J.; Gabor, E. Allan; Schobel, Mark; and Sorg, Albert F., 5,464,631, Cl. 424-454.000.
Lauffer, David J.; and Tecle, Haile, 5,464,842, Cl. 514-299.000.

Warren, Craig B.; Marin, Anna B.; Butler, Jerry F.; and Narula, Anubhav P. S., to International Flavors & Fragrances Inc.; and University of Florida, The. Dimethyl substituted oxymethyl cyclohexane derivatives and uses thereof for their insect attractancy properties. 5,464,626, Cl. 424-408.000.

Warren, Jerry D., Sr. Trailer wheel lock. 5,463,885, Cl. 70-18.000.

Wassmer, Karl-Heinz: *See*—
Henn, Rolf; Beaecke, Siegmund; Deckers, Andreas; Guentherberg, Norbert; Brudermueller, Martin; Nestler, Gerhard; and Wassmer, Karl-Heinz, 5,464,881, Cl. 521-60.000.

Watanabe, Itsuo; Kuwano, Atsushi; Taketatsu, Jun; Takase, Nobuaki; Yamada, Mitsuo; and Tai, Seiji, to Hitachi Chemical Co., Ltd. Information recording medium having recording layer with organic polymer and dye contained therein. 5,464,673, Cl. 428-65.100.

Watanabe, Kaoru: *See*—

Nebashima, Akira; Watanabe, Kaoru; and Saba, Toshikazu, 5,464,356, Cl. 439-752.000.
Watanabe, Katsunori: *See*—
Okano, Hidenobu; and Watanabe, Katsunori, 5,464,582, Cl. 264-45.500.
Watanabe, Kazuo: *See*—
Yamaguchi, Tadashi; Uesaka, Hiroshi; Watanabe, Kazuo; and Awaya, Juichi, 5,464,818, Cl. 514-2.000.
Watanabe, Kazushi, to Canon Kabushiki Kaisha. Image forming apparatus and process cartridge detachable thereto with charging member pressure contact release feature. 5,465,136, Cl. 355-210.000.
Watanabe, Kenji; and Toyosawa, Yoshiya, to King Jim Co., Ltd.; and Seiko Epson Corporation. Device and method for printing characters on tape having a controller to evenly space characters. 5,464,290, Cl. 400-76.000.
Watanabe, Noriaki: *See*—
Akiyama, Keiji; Watanabe, Noriaki; Hotta, Hisashi; Toyama, Tadao; and Nishimiya, Nobuyuki, 5,464,724, Cl. 430-272.000.
Watanabe, Shoji: *See*—
Enbutsu, Ichiro; Baba, Kenzi; Hara, Naoki; Yoda, Mikio; Watanabe, Shoji; and Yahagi, Hayao, 5,465,320, Cl. 395-22.000.
Watanabe, Takamoto: *See*—
Yamauchi, Shigenori; and Watanabe, Takamoto, 5,465,076, Cl. 331-179.000.
Watanabe, Takashi, to Sharp Kabushiki Kaisha. Charge detection device, a method for producing the same, and a charge transfer and detection apparatus including such a charge detection device. 5,464,997, Cl. 257-239.000.
Watanabe, Tsunehiro: *See*—
Nishii, Teruyuki; Watanabe, Tsunehiro; and Terajima, Hisao, 5,465,162, Cl. 358-442.000.
Watanabe, Yasuyuki; Ishiwata, Kazuya; and Nishida, Naoya, to Canon Kabushiki Kaisha. Process for producing color filter plate and color filter plate thus produced. 5,464,714, Cl. 430-7.000.
Watson, Rodney J.: *See*—
Liddiard, Kevin C.; Rice, Brian W.; and Watson, Rodney J., 5,465,080, Cl. 340-567.000.
Weatherford U.S., Inc.: *See*—
Blizzard, William A., Jr., 5,464,062, Cl. 166-376.000.
Webasto Sunroofs, Inc.: *See*—
Racine, Lloyd G.; Feldpausch, James F.; and Fantin, Ronald M., 5,464,267, Cl. 296-216.000.
Weber, Christian: *See*—
Weber, Hans G.; Haas, Peter; Michels, Erhard; Weber, Christian; and Brecht, Klaus, 5,464,880, Cl. 521-51.000.
Weber, Gary R.: *See*—
Kim, Young O.; Manchanda, Lalita; and Weber, Gary R., 5,464,783, Cl. 437-42.000.
Weber, Hans B.: *See*—
Long, Jack R.; and Weber, Hans B., 5,463,964, Cl. 105-187.000.
Weber, Hans G.; Haas, Peter; Michels, Erhard; Weber, Christian; and Brecht, Klaus, to Bayer Aktiengesellschaft. Process for the CFC-free production of cellular polyurethane molded parts. 5,464,880, Cl. 521-51.000.
Weber, Joe; and Jones, Lawrence S., to United States Pipe and Foundry Company. Restraining element for pressure pipe joints. 5,464,228, Cl. 277-207.00A.
Weber, Robert J.; Chung, Russell W.-C.; and Liu, Yet-zen, to Iowa State University Research Foundation, Inc. Optical modulator device using a thin film resonator. 5,465,171, Cl. 359-287.000.
Weber S.r.l.: *See*—
Moschini, Renzo, 5,464,053, Cl. 164-460.000.
Weber-Grafau, Michael: *See*—
Kirchner, Nicholas J.; and Weber-Grafau, Michael, 5,464,975, Cl. 250-283.000.
Webster, John: *See*—
Guy, Thomas D.; Granger, Richard N.; Brady, Robert H.; Webster, John; Pratt, James R.; Stone, Corbett W.; and Alesi, Thomas W., Jr., 5,464,144, Cl. 227-176.000.
Wedellsborg, Bendt W. Pressure vessel apparatus. 5,465,280, Cl. 376-294.000.
Weekamp, Johannus W.: *See*—
Visscher, Albert; Koster, Marinus P.; and Weekamp, Johannus W., 5,465,021, Cl. 310-328.000.
Wehner, Winfried: *See*—
Hamann, Ingo; Köhle, Hans-Jürgen; and Wehner, Winfried, 5,464,565, Cl. 252-546.000.
Wei, Jinzhu: *See*—
Steck, Alfred E.; and Wei, Jinzhu, 5,464,700, Cl. 429-30.000.
Weickmann, Joachim L.; and Ghosh-Dastidar, Pradip, to Xoma Corporation. DNA encoding (ASP 113) and (LYS 46, ASP 113) thaumatin I. 5,464,770, Cl. 435-254.210.
Weider, Richard: *See*—
Archey, Rick L.; Lundy, Charles E.; Meltzer, Aaron D.; Pielartzik, Harald; Fennhoff, Gerhard; Hufen, Ralf; Kircher, Klaus; Schubart, Rudiger; and Weider, Richard, 5,464,893, Cl. 524-366.000.
Wein, Deborah S.: *See*—
Goetz, Martin; Babiarz, Joseph; Wein, Deborah S.; Anderson, Paul M.; and Lindner, Alan W., 5,465,008, Cl. 257-691.000.
Weingarten, Zvi, to Bermad. Valve particularly useful in fire extinguishing systems. 5,464,064, Cl. 169-22.000.
Weir, Sam. Anemometer fabric. 5,464,675, Cl. 428-78.000.
Weisburg, William G.; and Barns, Susan M., to Amoco Corporation. Nucleic acid probes and methods for detecting cryptococcus neoformans. 5,464,743, Cl. 435-6.000.
Welch Allyn, Inc.: *See*—
Krauter, Allan I.; Vivenzio, Robert L.; and Kehoskie, Michael P., 5,464,007, Cl. 600-144.000.
Welch, Jeffrey P.: *See*—
Boardman, John D.; Hamilton, Scott M.; Gangstead, Mervin L.; Sadler, Jimmie L.; Trimble, Richard A.; and Welch, Jeffrey P., 5,465,243, Cl. 369-49.000.
Welch, Rodney M.: *See*—
Michael, Daryl A.; and Welch, Rodney M., 5,464,482, Cl. 134-25.200.
Wells, Cindie M.; Halverson, Scott A.; and Jonovic, John A., to Oscar Mayer Foods Corporation. Hot countertop self-service food station. 5,464,279, Cl. 312-128.000.
Wells, Raymond, to D.W.T. Innovative Recycling Corp. Method for repairing pavement. 5,464,303, Cl. 404-75.000.
Welscher, William L., to Sauer Inc. Method of assembling a control having a body member and a cover member with an access aperture therein. 5,463,803, Cl. 29-467.000.
Wenger Corporation: *See*—
Benting, Gary M.; and Abraham, Leslie R., 5,464,236, Cl. 280-30.000.
Wenzel, Kenneth J.: *See*—
Blander, Richard S.; Wenzel, Kenneth J.; and Piska, Venu G., 5,463,898, Cl. 73-116.000.
Wermuth, Camille G.: *See*—
Courtemanche, Gilles; Gautier, Claudie; Gully, Danielle; Roger, Pierre; Valette, Gérard; and Wermuth, Camille G., 5,464,847, Cl. 514-142.000.
Wesdorp, Leendert H.; Madsen, Robert A.; Norton, Ian T.; and Brown, Charles R., to Van den Bergh Foods Co., Division of Conopco, Inc. Process of making a water continuous dispersion with more than 50% dispersed phase and products thereof. 5,464,645, Cl. 426-573.000.
West Bend Company, The: *See*—
Belongia, David C.; and Klein, Annette T., 5,463,937, Cl. 99-348.000.
Westfall, Brian: *See*—
Enge, Per; Farmer, Dominic; and Westfall, Brian, 5,465,413, Cl. 455-307.000.
Westfall, Norman R., to Caldwell Manufacturing Company. Sash shoe system for curl spring window balance. 5,463,793, Cl. 16-197.000.
Westinghouse Electric Corporation: *See*—
Bengel, Thomas G., 5,465,279, Cl. 376-245.000.
Golynsky, Arkady; and Wimmer, Donald A., 5,464,274, Cl. 297-328.000.
Weston, Estella D.; and Cummings, Gwennette Y. Motorized jump rope apparatus. 5,464,376, Cl. 482-81.000.
Weston, John A.: *See*—
Bounds, David J.; Weston, John A.; Johnson, Anthony D.; and Campbell, Bernard J., 5,464,087, Cl. 194-200.000.
Wetenschappelijk en Technisch Centrum voor het Bouwbedrijf: *See*—
Pien, André L. J.; and De Pauw, Carlo E. M., 5,463,830, Cl. 47-9.000.
Wetterau, Douglas C.: *See*—
Close, Steven F.; and Wetterau, Douglas C., 5,464,469, Cl. 96-220.000.
Wettlaufer, David G.: *See*—
Effland, Richard C.; and Wettlaufer, David G., 5,464,846, Cl. 514-333.000.
Weyh, Werner; Schwander, Udo; Gatter, Raimond; Notar, Robert; Konopa, Helmut; and Erdmann, Klaus, to Coca-Cola Company, The ; and Bosch-Siemens Hausgerate GmbH. Apparatus for preparing and dispensing post-mix beverages. 5,464,124, Cl. 222-129.100.
Whalen Biomedical Inc.: *See*—
Whalen, Robert L.; and Dempsey, Donald, 5,464,471, Cl. 106-124.000.
Whalen, Robert L.; and Dempsey, Donald, to Whalen Biomedical Inc. Fibrin monomer based tissue adhesive. 5,464,471, Cl. 106-124.000.
Whirlpool Corporation: *See*—
Gauer, Joseph A., 5,463,821, Cl. 34-261.000.
Whisler, John W., to Alphatronix. Method and apparatus for using intercepted operator messages to control robotics. 5,465,329, Cl. 395-438.000.
White, George E.: *See*—
Perfecto, Eric D.; Prasad, Chandrika; Prasad, Keshav; Robbins, Gordon J.; Swaminathan, Madhavan; and White, George E., 5,464,682, Cl. 428-210.000.
White, Harley; and Adams, John M., to InControl, Inc. Atrial defibrillator and method providing dual reset of an interval timer. 5,464,433, Cl. 607-5.000.
White, John A.; and Maitra, Omal C. Process for preparing pork meat morsels. 5,464,368, Cl. 452-149.000.
Whitecar, John E.; and Plowdrey, Robert D., to Ford Motor Company. Automatic gain control overshoot limiter for AM receiver. 5,465,406, Cl. 455-234.100.
Whitehead, Stephen P.: *See*—
Tisbo, Thomas A.; Whitehead, Stephen P.; and Uffner, Michael G., 5,464,115, Cl. 220-324.000.
Whitson, Frederick A.; Siebert, William K.; and Raihala, Kenneth B., to Electronic Cable Specialists, Inc. Filter for mounting on an avionic line replaceable unit. 5,464,461, Cl. 55-480.000.
Whitty, Brian A., to Fin Control Systems Pty. Limited. Surf fin fixing system. 5,464,359, Cl. 441-79.000.
Wicks, William J.: *See*—
Schulte, Reinhard W.; Wicks, William J.; Meinass, Helmut J.; and Nethery, Winston J., 5,464,411, Cl. 606-130.000.
Widmer, Fred: *See*—

Stig, Aamul-Olsen; Widmer, Fred; and Gauri, Kailash K., 5,464,821, Cl. 514-18.000.

Widmer, Melvin M.: *See*—
Boggavarapu, Rao L.; Goldstein, Yeshayahu S. A.; Keogh, Catherine M.; Suchocki, Anthony J.; and Widmer, Melvin M., 5,463,928, Cl. 89-8.000.

Wieczorek, Joseph P.; Halajian, Eugene M.; and Trombley, Michael, to Takata, Inc. Security shade with a motor spring subassembly. 5,464,052, Cl. 160-23.100.

Wiedow, Oliver: *See*—
Christophers, Enno; Wiedow, Oliver; and Schroder, Jens-Michael, 5,464,822, Cl. 514-12.000.

Wiewandt, Jerald E.: *See*—
Graham, Robert W., 5,463,799, Cl. 24-704.100.

Wiggins Teape Group Limited, The: *See*—
McGuinness, Gordon B.; and Saunders, Richard D., 5,464,803, Cl. 503-213.000.

Wilch Manufacturing, Inc.: *See*—
Young, William C.; and Bamgrover, Kerwin, 5,463,877, Cl. 62-264.000.

Wild, Carl T.: *See*—
Bolognesi, Dani P.; Matthews, Thomas J.; and Wild, Carl T., 5,464,933, Cl. 530-324.000.

Wildman, Gary C.: *See*—
Hayes, Jesse C., Jr.; Dever, Gerald R.; Laughlin, Thomas J.; Schroer, Charles F., Jr.; and Wildman, Gary C., 5,464,610, Cl. 424-61.000.

Wilhelm Karmann GmbH: *See*—
Hemmie, Ludger; Overberg, Matthias; and Schröder, Burkhard, 5,464,265, Cl. 296-146.140.

Wilkins, James A.: *See*—
Henner, Dennis J.; Vandlen, Richard L.; Wilkins, James A.; and Yasuura, Daniel G., 5,464,756, Cl. 435-69.100.

Wilkins, Jesse R., to McDermott International, Inc. Apparatus for near vertical laying of pipeline. 5,464,307, Cl. 405-166.000.

Wilkison, Dennis E.; and Liu, Zhenyu L., to Cermetek Microelectronics. Solid state isolation device using opto-isolators. 5,465,298, Cl. 379-406.000.

Williams, David G., to Hanover Displays Limited. Display device. 5,463,827, Cl. 40-449.000.

Williams, Donald W.: *See*—
Cox, John D.; and Williams, Donald W., 5,464,984, Cl. 250-370.110.

Williams, Kevin: *See*—
Drucker, Steven; Goder, Alexey; Khalili, Davood; Williams, Kevin; Christensen, Ken; and Major, Emery, 5,464,982, Cl. 250-343.000.

Williams, Levi: *See*—
Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; Grubbs, Gray W.; and Kyselica, Stefan P., 5,464,958, Cl. 219-130.510.

Williams, Marvin L.: *See*—
Wang, Diana S.; and Williams, Marvin L., 5,465,327, Cl. 395-159.000.

Williams, Michael S.; and Moss, Thomas H., III, to Peach State Labs, Inc. Superior stain resistant compositions. 5,464,911, Cl. 525-502.000.

Williams, Peter D.: *See*—
Bock, Mark G.; Evans, Ben E.; Culberson, J. Christopher; Gilbert, Kevin F.; Rittle, Kenneth E.; and Williams, Peter D., 5,464,788, Cl. 514-252.000.

Williams, Richard A.: *See*—
Mancini, Alfonso R.; and Williams, Richard A., 5,464,309, Cl. 405-258.000.

Williams, Richard K., to Siliconix incorporated. Threshold adjustment in vertical DMOS devices. 5,465,000, Cl. 257-335.000.

Williams, Robert M.; Rogers, Ernest O.; and Sevik, Maurice M., to United States of America, Navy. Marine propeller. 5,464,321, Cl. 416-93.00A.

Williams, Steve; Kaplan, Warren; Neill, Paul; and Chapa, Gerardo, to Stepan Company. Methods and compositions for preparing rigid foams with non-chlorofluorocarbon blowing agents. 5,464,561, Cl. 252-182.270.

Wilson, Carolyn G.: *See*—
Bellew, William S.; and Wilson, Carolyn G., 5,463,816, Cl. 30-415.000.

Wilson, Christi L. Infant soothing seat. 5,464,381, Cl. 601-49.000.

Wilson, Craig A.: *See*—
Scott, Matthew S.; McCollum, Gregory J.; Szymanski, Chester J.; and Wilson, Craig A., 5,464,887, Cl. 523-501.000.

Wilson, Dennis R.; Siebert, Robert M.; and Lively, Pat, to Conoco Inc. Cryogenic coal bed gas well stimulation method. 5,464,061, Cl. 166-302.000.

Wilson, Greg S.; Dinsmoor, John C., III; and Miller, Russell C., to RIK Medical, L.L.C. Prosthetic device for amputees. 5,464,443, Cl. 623-37.000.

Wilson, Joan B.: *See*—
Voo, Liane; Tagliaferro, Dennis C.; and Wilson, Joan B., 5,464,850, Cl. 514-372.000.

Wilson, John C.; and Tyagi, Dinesh, to Eastman Kodak Company. Toners and developers containing ammonium tetrahaloferrate salts as charge-control agents. 5,464,719, Cl. 430-110.000.

Wilson, Michael L.; and Chan, Kenneth K., to TDW Delaware Inc. Plastic pipe butt fusion machine. 5,464,496, Cl. 156-499.000.

Wilson, Phillip D.; Serafin, Richard D.; Kelley, Paul W.; and Witkowicz, Tadeusz. Ring-type communication network. 5,465,254, Cl. 370-79.000.

Wilson, Phillip E.: *See*—
Hoyt, Matthew B.; and Wilson, Phillip E., 5,464,676, Cl. 428-85.000.

Wilson, Raymond T. Pickup-truck cargo bed, convertible from fully open to partially enclosed. 5,464,264, Cl. 296-37.600.

Wilson Sporting Goods Co.: *See*—
Shenoha, James L.; and Scheie, Carl E., 5,464,217, Cl. 273-169.000.

Wilson, Victor: *See*—
Brown, David; Gaul, Harald; Kushnir, Yosif; Travaglini, Nick; and Wilson, Victor, 5,464,579, Cl. 264-297.200.

Wimmer, Donald A.: *See*—
Golynsky, Arkady; and Wimmer, Donald A., 5,464,274, Cl. 297-328.000.

Windes, Larry C.: *See*—
Yount, Thomas L.; Adams, J. Wesley; and Windes, Larry C., 5,464,590, Cl. 422-131.000.

Wingert, Horst; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, to BASF Aktiengesellschaft. Fungicidal mixtures. 5,464,839, Cl. 514-256.000.

Winston, Anthony E.; and Jones, Keith A., to Church & Dwight Co., Inc. Soil fumigation with gasiform pesticide. 5,464,457, Cl. 47-58.000.

Winston, Anthony E.; Cala, Francis R.; Dunn, Steven E.; Vinci, Alfredo; and Lajoie, M. Stephen, to Church & Dwight Co., Inc. Low foaming effective hydrotrope. 5,464,553, Cl. 252-108.000.

Winston, Anthony E., to Church & Dwight Co., Inc. Method of controlling mildew in cultivated plants. 5,464,805, Cl. 504-101.000.

Winterbottom, Philip S., to AT&T Corp. Apparatus and methods for making a portion of a first name space available as a portion of a second name space. 5,465,365, Cl. 395-600.000.

Wipasuramonton, Pondpat P.: *See*—
Rizzi, Douglas J.; Wipasuramonton, Pondpat P.; and Saccone, Paul T., 5,464,247, Cl. 280-737.000.

Witco Surfactants GmbH: *See*—
Hamann, Ingo; Köhle, Hans-Jürgen; and Wehner, Winfried, 5,464,565, Cl. 252-546.000.

Witkowicz, Tadeusz: *See*—
Wilson, Philip D.; Serafin, Richard D.; Kelley, Paul W.; and Witkowicz, Tadeusz, 5,465,254, Cl. 370-79.000.

Witte, Franz-Otto, to Deutsche ITT Industries GmbH. Method of increasing the data-processing speed of a signal processor. 5,465,225, Cl. 364-736.000.

Witzke, Horst: *See*—
Ramanarayanan, Trikur A.; Pareek, Vinod K.; Mumford, James D., III; and Witzke, Horst, 5,464,523, Cl. 204-424.000.

WNAN, Inc.: *See*—
Pierce, Richard A., 5,464,208, Cl. 273-26.00D.

Wohlin, Donald C.: *See*—
Hansen, Dale G.; and Wohlin, Donald C., 5,464,220, Cl. 273-186.100.

Wohlmut, Peter G.: *See*—
Hutcheson, Timothy L.; Or, Wilson; Narayanan, Venkatesh; Mohan, Subramaniam; Wohlmut, Peter G.; Srinivasan, Ramanujam; Hunt, Bobby R.; and Ryan, Thomas W., 5,465,308, Cl. 382-159.000.

Wolf, Andreas; and Koeppl, Franz, to Wacker-Chemitronic Gesellschaft für Elektronik-Grundstoffe mbH. Method for the contamination-free size reduction of semiconductor material, especially silicon. 5,464,159, Cl. 241-1.000.

Wolf, Jerry M.: *See*—
Shah, Hiten T.; and Wolf, Jerry M., 5,464,952, Cl. 181-211.000.

Wolf, Robert J.; and Schuman, Leroy J. W., to Logemann Brothers Co. Rotatable bale release mechanism for a baler machine and method of baling. 5,463,944, Cl. 100-35.000.

Wolfenbarger, James K.: *See*—
Brooker, Donald D.; Falsetti, James S.; Wolfenbarger, James K.; and Vuong, Dinh-Cuong, 5,464,592, Cl. 422-207.000.

Wolff, Rodney G.: *See*—
Berg, Eric P.; Tuch, Ronald J.; Dror, Michael; and Wolff, Rodney G., 5,464,650, Cl. 427-2.300.

Woll, Bryan D.: *See*—
Bouchard, Paul J.; Woll, Jerry D.; Woll, Bryan D.; and Asbury, Jimmie R., 5,465,079, Cl. 340-576.000.

Woll, Jerry D.: *See*—
Bouchard, Paul J.; Woll, Jerry D.; Woll, Bryan D.; and Asbury, Jimmie R., 5,465,079, Cl. 340-576.000.

Womack, E. Allen, Jr.: *See*—
Kidwell, J. Jeffrey; Reed, Stuart E.; Ryan, Patrick M.; Harwig, Dennis D.; and Womack, E. Allen, Jr., 5,464,957, Cl. 219-130.010.

Wong, Chih-Hsien: *See*—
Chiou, Xian-Shun; and Wong, Chih-Hsien, 5,463,790, Cl. 15-250.290.

Wong, Chun C. D.: *See*—
Hsieh, Wen-Jai; Horng, Chi-Song; and Wong, Chun C. D., 5,465,056, Cl. 326-41.000.

Woo, Lansing S.; and Prigulti, Ronnie J. Quick release handcuff having overriding means for enabling dual use as a training and a restraining device. 5,463,884, Cl. 70-16.000.

Wood, James, to D/P, Inc. Molding assembly. 5,463,835, Cl. 52-288.100.

Woodgate, Graham J.; and Ezra, David, to Sharp Kabushiki Kaisha. Autostereoscopic display device. 5,465,175, Cl. 359-463.000.

Woon, Lin-Sun: *See*—
Timmons, Terry K.; Kobylivker, Peter; Woon, Lin-Sun; Keck, Laura E.; and Jascomb, Jerald T., 5,464,688, Cl. 428-298.000.

WorldTech Coatings, Inc.: *See*—
Hauser, Edward R.; and Lu, David D.-L., 5,464,680, Cl. 428-141.000.

Wortrich, Theodore S., to Surgin Surgical Instrumentation, Inc. Hemorrhage occluder, applicator and method. 5,464,421, Cl. 606-213.000.

Wrate, Leonard A. Multi-functional wire and cable pulling apparatus. 5,464,193, Cl. 254-134.3FT.

Wright, Gary L.: *See*—

Yasrebi, Mehrdad; Kemp, William W.; Sturgis, David H.; Nikolas, Douglas G.; Wright, Gary L.; Kelly, Thomas J., III; Springgate, Mark E.; and Crego, Ted R., 5,464,797, Cl. 501-103.000.

Wu, Augustine K.: *See*—
Wah Lo, Allen K.; and Wu, Augustine K., 5,465,128, Cl. 354-114.000.

Wu, Chengde: *See*—
Chan, Ming F.; Raju, Bore G.; Castillo, Rosario S.; Kois, Adam; Wu, Chengde; and Balaji, Vitukudi, 5,464,853, Cl. 514-378.000.

Wu, Ching-Chang. Angle-adjustable folding frame assembly for a golf cart. 5,464,238, Cl. 280-42.000.

Wu, Jiun Y.: *See*—
Lur, Water; and Wu, Jiun Y., 5,464,794, Cl. 437-187.000.

Wu, Jong: *See*—
Wybourne, Martin N.; Keana, John F. W.; Cai, Sui X.; Yan, Mingdi; and Wu, Jong, 5,465,151, Cl. 356-361.000.

Wullschleger, Richard D.; Chen, Shirley C.; Bowman, Frederick A.; and Hawblitz, Larry V., to Kellogg Company. Ready-to-eat-cereal containing psyllium and use thereof for lowering cholesterol levels. 5,464,644, Cl. 426-549.000.

Wurzer, Franz. Self-locking carabiner. 5,463,798, Cl. 24-599.500.

Wybourne, Martin N.; Keana, John F. W.; Cai, Sui X.; Yan, Mingdi; and Wu, Jong, to State of Oregon Acting By and Through the State Board of Higher Education on Behalf of The University of Oregon. Sensors employing interference of electromagnetic waves passing through waveguides having functionalized surfaces. 5,465,151, Cl. 356-361.000.

Wylie, Dwane: *See*—
Coolidge, Thomas R.; Lewis, William; Schuster, Sheldon M.; Stout, Jay; van Heeke, Gino; Wylie, Dwane; and Wagner, Fred W., 5,464,759, Cl. 435-91.200.

Xerox Corporation: *See*—
Bour, David P.; and Paoli, Thomas L., 5,465,263, Cl. 372-23.000.
Bour, David P.; and Bringans, Ross D., 5,465,266, Cl. 372-46.000.
Buhler, Steven A.; and Harris, Ellis D., 5,465,264, Cl. 372-31.000.
Carlotta, Michael; and Anderson, David G., 5,465,110, Cl. 347-104.000.
Cooper, Martin F. N.; Johnson, Walter A. L.; and Smith, Z. Erol, III, 5,465,167, Cl. 358-468.000.
Hsu, Lillian-Liu; Sathi, Kitty; Biondi, Mark C.; Zell, Thomas B.; Catapano, David A.; and Lauria, Richard T., 5,465,322, Cl. 395-114.000.
Jaskowiak, Timothy R.; Coughlin, Daniel L.; Perez, Julie A.; Gilmore, Daniel R., III; DiGravio, Thomas L.; and Taft, Kevin H., 5,465,138, Cl. 355-245.000.
Mancini, Alfonso R.; and Williams, Richard A., 5,464,309, Cl. 405-258.000.

Xoma Corporation: *See*—
Weickmann, Joachim L.; and Ghosh-Dastidar, Pradip, 5,464,770, Cl. 435-254.210.

Xu, Nelson S.: *See*—
Dinkjian, Robert M.; Heller, Lisa C.; Kordus, Steven R.; Lauricella, Kenneth A.; Seigendall, Thomas W.; Skagga, Robert A.; and Xu, Nelson S., 5,465,374, Cl. 395-800.000.

Yada, Seiko; Ogawa, Yukihiro; Nomura, Takao; and Umemoto, Yoshiro, to Nippon Zeon Co., Ltd.; Zeon Kasei Co., Ltd.; and Toyota Jidosha Kabushikaisha. Vinyl chloride resin composition for powder material. 5,464,892, Cl. 524-284.000.

Yagi, Shigeru; and Ono, Masato, to Fuji Xerox Co., Ltd. Amorphous silicon photoreceptor and electrophotographic process using the same. 5,464,721, Cl. 430-126.000.

Yahagi, Hayao: *See*—
Enbutsu, Ichiro; Baba, Kenzi; Hara, Naoki; Yoda, Mikio; Watanabe, Shoji; and Yahagi, Hayao, 5,465,320, Cl. 395-22.000.

Yaklin, Daniel A., to Texas Instruments Incorporated. Phase-locked loop circuit with minimum output jitter and maximum frequency stability. 5,465,075, Cl. 331-8.000.

Yamada, Hiromichi: *See*—
Seto, Kaoru; Kanaiwa, Kiyoshi; Itoh, Michio; Mano, Hiroshi; Yamada, Hiromichi; Kashihara, Atsushi; Kawana, Takashi; and Saito, Tetsuo, 5,465,157, Cl. 358-298.000.

Yamada, Koichiro: *See*—
Aoki, Eiji; Yamada, Koichiro; and Yukitomo, Tatsuhiko, 5,464,116, Cl. 220-586.000.

Yamada, Mitsuo: *See*—
Watanabe, Itsuo; Kurwano, Atsushi; Taketatsu, Jun; Takase, Nobuaki; Yamada, Mitsuo; and Tai, Seiji, 5,464,673, Cl. 428-65.100.

Yamada, Yasuhiro: *See*—
Miura, Hirohisa; Imahashi, Kunihiko; Michioka, Hirofumi; Yamada, Yasuhiro; Kusui, Jun; and Tanaka, Akiei, 5,464,463, Cl. 75-244.000.

Yamagishi, Kouji: *See*—
Usui, Minoru; Yamagishi, Kouji; Yoshino, Ken; and Mori, Hideki, 5,465,102, Cl. 345-89.000.

Yamaguchi, Kouichi: *See*—
Kishita, Hirofumi; Yamaguchi, Kouichi; Kobayashi, Nobuyuki; and Ishida, Kouichi, 5,464,917, Cl. 528-14.000.

Yamaguchi, Masahiro: *See*—
Ishido, Kiminori; and Yamaguchi, Masahiro, 5,464,725, Cl. 430-311.000.

Yamaguchi, Masakazu: *See*—
Shinobe, Takashi; Nakayama, Kazuya; Takeuchi, Minami; Yamaguchi, Masakazu; Kitagawa, Mitsuhiko; Omura, Ichiro; and Nakagawa, Akio, 5,464,994, Cl. 257-147.000.

Yamaguchi, Seiji: *See*—
Hirai, Koutarou; and Yamaguchi, Seiji, 5,465,344, Cl. 395-458.000.

Yamaguchi, Tadashi; Uesaka, Hiroshi; Watanabe, Kazuo; and Awaya, Juichi, to Sanwa Kagaku Kenkyusho Co., Ltd. Protein having cell growth-stimulating and macrophage chemotactic actions, preparative method therefor and use thereof. 5,464,818, Cl. 514-2.000.

Yamaguchi, Yasuhiro: *See*—
Sakaguchi, Yasuo; Daimon, Katsumi; Takahashi, Michiaki; Yamasaki, Kazuo; and Yamaguchi, Yasuhiro, 5,464,717, Cl. 430-58.000.

Yamaguchi, Yoshinori: *See*—
Shiratsuki, Yoshiyuki; Yamaguchi, Yoshinori; Hayashi, Kazuhiro; and Niitsu, Takahiro, 5,464,990, Cl. 257-40.000.

Yamagushi, Teruo: *See*—
Kajiwara, Toshiyuki; Yamagushi, Teruo; Okoshi, Hitoshi; and Nakamura, Tsuneo, 5,463,801, Cl. 26-33.00Q.

Yamaha Corporation: *See*—
Hoshi, Toshiharu; and Kamimura, Naoki, 5,464,216, Cl. 273-167.00R.
Kamiya, Ryo, 5,465,205, Cl. 364-157.000.

Yamahata, Hitoshi; and Kusuda, Masahiro, to NEC Corporation. Test signal output circuit in LSI. 5,465,257, Cl. 371-22.500.

Yamakawa, Shinji: *See*—
Kamo, Yasushi; Hayashi, Masayuki; Ito, Masaaki; Yamakawa, Shinji; and Aida, Midori, 5,465,160, Cl. 358-401.000.

Yamakoshi, Yasuhiro: *See*—
Kano, Osamu; Yasui, Koichi; Sato, Yasuyuki; Yamakoshi, Yasuhiro; Anan, Junichi; Wada, Hironori; and Yasuoka, Akio, 5,464,520, Cl. 204-298.130.

Yamamoto, Hiroyuki: *See*—
Sakai, Keiji; Yoshida, Yoshio; Yamamoto, Hiroyuki; Kurata, Yukio; Nakata, Yasuo; and Miyake, Takahiro, 5,465,315, Cl. 385-116.000.

Yamamoto, Isao. System for purifying exhaust gas. 5,464,458, Cl. 55-223.000.

Yamamoto, Kenji: *See*—
Nagamine, Masashi; Yamamoto, Kenji; Matsui, Yoshimitsu; Horiuchi, Kenji; and Yoshida, Masanori, 5,464,863, Cl. 514-443.000.

Yamamoto, Kimiaki: *See*—
Nakai, Sadao; Yamanaka, Masanobu; Ishikawa, Koji; Sato, Tsuyoshi; Yamamoto, Kimiaki; and Terashima, Mikihiko, 5,465,178, Cl. 359-670.000.

Yamamoto, Makoto: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,465,064, Cl. 327-361.000.

Yamamoto, Mitsuhiro: *See*—
Funada, Masahiro; Kitamura, Toshiyuki; Yamamoto, Mitsuhiro; and Ohta, Eiji, 5,465,161, Cl. 358-438.000.

Yamamoto, Tsuyoshi: *See*—
Okabe, Naoto; Yamamoto, Tsuyoshi; and Kato, Naohito, 5,464,992, Cl. 257-139.000.

Yamanaka, Masanobu: *See*—
Nakai, Sadao; Yamanaka, Masanobu; Ishikawa, Koji; Sato, Tsuyoshi; Yamamoto, Kimiaki; and Terashima, Mikihiko, 5,465,178, Cl. 359-670.000.

Yamanaka, Minoru, to Kabushiki Kaisha Risuron. Method of producing mat comprising filament loop aggregate. 5,464,491, Cl. 156-167.000.

Yamanaka, Naoaki: *See*—
Amemiya, Shigeo; Ogura, Takao; Chujo, Takafumi; Takeo, Hiroshi; Kusayanagi, Michio; Yamanaka, Naoaki; Sato, Yoichi; Takase, Akihiko; Shinada, Shigeo; Takano, Mituhiro; Saitou, Kiyoshi; Hohara, Kazuhiko; and Okabe, Tetuhiro, 5,465,348, Cl. 395-182.020.

Yamasaka, Kazuya: *See*—
Hayakawa, Katsumi; Tsukuda, Masahiro; Sato, Yukiyoshi; Tatewaki, Junichi; and Yamasaka, Kazuya, 5,463,841, Cl. 53-381.200.

Yamasaki, Kazuo: *See*—
Sakaguchi, Yasuo; Daimon, Katsumi; Takahashi, Michiaki; Yamasaki, Kazuo; and Yamaguchi, Yasuhiro, 5,464,717, Cl. 430-58.000.

Yamasaki, Richard: *See*—
Pan, Tzu-Wang; and Yamasaki, Richard, 5,465,059, Cl. 327-12.000.

Yamashita, Fumitoshi; and Wada, Masami, to Matsushita Electric Industrial Co., Ltd. Method of making isotropic bonded magnet. 5,464,576, Cl. 264-428.000.

Yamashita, Harushige: *See*—
Katayama, Masahide; Yamashita, Harushige; Okada, Taizo; and Morioka, Shigeo, 5,464,828, Cl. 514-60.000.

Yamashita, Hitoshi: *See*—
Ibori, Satoshi; Yamashita, Hitoshi; Baba, Shigeyuki; Fujii, Hiroshi; Kambara, Takatsugu; and Ishibashi, Akira, 5,465,202, Cl. 363-37.000.

Yamashita, Kazuhiro; Negishi, Toshiyuki; Sato, Masatoshi; and Tsukahara, Hiroshi, to Advantest Corporation. Waveform formatter. 5,465,066, Cl. 327-294.000.

Yamashita, Masayuki: *See*—
Mori, Shinichi; Ueda, Osamu; and Yamashita, Masayuki, 5,464,989, Cl. 257-30.000.

Yamashita, Mitsuo: *See*—
Hirai, Kenji; Yamashita, Mitsuo; Tateso, Tomoko; Ejiri, Emiko; Harasawa, Kikuko; Onji, Yuichi; Ugai, Sadayuki; and Nagato, Shoin, 5,464,811, Cl. 504-281.000.

Yamauchi, Shigenori; and Watanabe, Takamoto, to Nippondenso Co., Ltd. Programmable delay line programmable delay circuit and digital controlled oscillator. 5,465,076, Cl. 331-179.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Method of forming insulated gate effect transistor in a substrate depression. 5,464,780, Cl. 437-41.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Printing member for electrostatic photocopying. 5,465,137, Cl. 355-211.000.
Yan, Mingdi: *See*—
Wybourne, Martin N.; Keana, John F. W.; Cai, Sui X.; Yan, Mingdi; and Wu, Jong, 5,465,151, Cl. 356-361.000.
Yanagawa, Naoharu, to Pioneer Electronic Corporation. Optical pickup control system for an optical disc having recorded and non-recorded areas. 5,465,245, Cl. 369-58.000.
Yanagihara, Nobuaki: *See*—
Senoo, Yasutoshi; Yanagihara, Nobuaki; and Yasu, Norio, 5,464,329, Cl. 417-68.000.
Yanagimoto, Yoshiyuki, to Hewlett-Packard Company. Balanced output high-frequency transducers and mixers using the same with symmetrically located components. 5,465,416, Cl. 455-327.000.
Yang, Michael S.; and Yih, Jih-Shyr, to International Business Machines Corporation. Apparatus having three separated and decentralized processors for concurrently and independently processing packets in a communication network. 5,465,331, Cl. 395-200.080.
Yang, Peter Y., to Deposition Technologies, Inc. Enhancement of optically variable images. 5,464,710, Cl. 430-1.000.
Yang, Ping: *See*—
Polgreen, Thomas L.; Chatterjee, Amitava; and Yang, Ping, 5,465,189, Cl. 361-58.000.
Yang, Weikang: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,465,064, Cl. 327-361.000.
Yaniv, Gershon: *See*—
Castro, Myron; Yaniv, Gershon; Hardtmann, Dirk J.; and Romeo, David J., 5,464,246, Cl. 280-730.200.
Yanko, John P.; and Hall, David A., to Borg-Warner Automotive, Inc. Torsional vibration damper having helical torsion springs. 5,464,198, Cl. 267-167.000.
Yano, Sadahide, to Yugen Kaisha Yano Engineering. Extruder. 5,464,340, Cl. 425-382.300.
Yansura, Daniel G.: *See*—
Henner, Dennis J.; Vandlen, Richard L.; Wilkins, James A.; and Yansura, Daniel G., 5,464,756, Cl. 435-69.100.
Yaroschchuk, Oleg V.: *See*—
Kang, Dae S.; Park, Woo S.; Shin, Hyun H.; Kwon, Soon B.; Marusii, Tatyana Y.; Reznikov, Yuriy A.; Khizhnyak, Anatoliy I.; and Yaroschchuk, Oleg V., 5,464,669, Cl. 428-1.000.
Yashiki, Yuichi, to Fuji Xerox Co., Ltd. Image-holding member and production method thereof, method for forming image-forming master using the image-holding member and the forming apparatus, and image-forming method using them. 5,464,716, Cl. 430-41.000.
Yasotornrat, Heanstong. Three phase power factor correction device and method. 5,465,040, Cl. 323-210.000.
Yasrebi, Mehrdad; Kemp, William W.; Sturgis, David H.; Nikolas, Douglas G.; Wright, Gary L.; Kelly, Thomas J., III; Springgate, Mark E.; and Crego, Ted R., to Precision Castparts Corporation. Yttria-zirconia slurries and mold facecoats for casting reactive metals. 5,464,797, Cl. 501-103.000.
Yasu, Norio: *See*—
Senoo, Yasutoshi; Yanagihara, Nobuaki; and Yasu, Norio, 5,464,329, Cl. 417-68.000.
Yasuda, Noboru: *See*—
Higashi, Tatsuji; and Yasuda, Noboru, 5,464,686, Cl. 430-272.000.
Yasuhara, Masaki: *See*—
Ogiwara, Yoshiaki; Yasuhara, Masaki; and Matsuda, Akira, 5,464,524, Cl. 205-170.000.
Yasuhara, Masazeru, to Canon Kabushiki Kaisha. Control apparatus of robot. 5,465,036, Cl. 318-568.110.
Yasui, Koichi: *See*—
Kano, Osamu; Yasui, Koichi; Sato, Yasuyuki; Yamakoshi, Yasuhiro; Anan, Junichi; Wada, Hironori; and Yasuoka, Akio, 5,464,520, Cl. 204-298.130.
Yasuoka, Akio: *See*—
Kano, Osamu; Yasui, Koichi; Sato, Yasuyuki; Yamakoshi, Yasuhiro; Anan, Junichi; Wada, Hironori; and Yasuoka, Akio, 5,464,520, Cl. 204-298.130.
Yeater, Robert P.: *See*—
Schilling, Steven L.; Yeater, Robert P.; Soland, Phil M.; Szabat, John F.; and Parsons, Harold R., 5,464,560, Cl. 252-182.240.
Yeh, Ling, to BASF Corporation. Process for making soil and stain resistant carpet fiber. 5,464,584, Cl. 264-103.000.
Yeh, Tzu-Pin, to Pai Lung Machinery Mill Co., Ltd. Circular knitting machine with cut pile mechanism. 5,463,882, Cl. 66-92.000.
Yen, Ting P.: *See*—
Lim, Sheldon C. P.; Hellstrom, Julie W.; and Yen, Ting P., 5,465,004, Cl. 257-529.000.
Yeoman, Stanley J.: *See*—
Bessemer, Robert H.; and Yeoman, Stanley J., 5,464,335, Cl. 425-71.000.
Yih, Jih-Shyr: *See*—
Yang, Michael S.; and Yih, Jih-Shyr, 5,465,331, Cl. 395-200.080.
Yip, Kin-Fai, to Miles Inc. Dry reagent for creatinine assay. 5,464,777, Cl. 436-98.000.
Yip, Wai-Yeung; Chandra, Arijit; and Tsai, Chi-Taou, to Motorola, Inc. Method for automatic tab artwork building. 5,465,217, Cl. 364-489.000.
Yoda, Mikio: *See*—
Enbutsū, Ichiro; Baba, Kenzi; Hara, Naoki; Yoda, Mikio; Watanabe, Shoji; and Yahagi, Hayao, 5,465,320, Cl. 395-22.000.
Yokose, Kenji: *See*—
Nishino, Yoshitaka; Sawa, Toshio; Nakao, Takashi; Aizawa, Michihiko; and Yokose, Kenji, 5,463,880, Cl. 62-484.000.
Yokoyama, Yu; and Sato, Souichi, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method of uranium isotope enrichment by utilizing a photochemically selective effect. 5,464,512, Cl. 204-157.200.
Yoneda, Takashige; Wakabayashi, Tuneo; and Takano, Yukiko, to Asahi Glass Company Ltd. Surface-treated substrate. 5,464,704, Cl. 428-429.000.
Yonehara, Takao, to Canon Kabushiki Kaisha. Process for producing crystal. 5,463,975, Cl. 117-9.000.
Yoo, Jai-Heung: *See*—
Park, Sang-Rok; and Yoo, Jai-Heung, 5,464,145, Cl. 228-183.000.
Yoshida, Akihiko: *See*—
Nishino, Atsushi; Yoshida, Akihiko; Namba, Teruo; Aoki, Masaaki; and Naito, Atsushi, 5,465,091, Cl. 341-33.000.
Yoshida, Masahiko: *See*—
Sasaki, Masanori; Shibafuchi, Hiroshi; Imai, Yasushi; Yoshida, Masahiko; and Yoshie, Takehiko, 5,464,248, Cl. 280-741.000.
Yoshida, Masanori: *See*—
Nagamine, Masashi; Yamamoto, Kenji; Matsui, Yoshimitsu; Horiuchi, Kenji; and Yoshida, Masanori, 5,464,863, Cl. 514-443.000.
Yoshida, Takuji: *See*—
Kobayashi, Akira; Yoshida, Takuji; Hattori, Hisahide; and Takabayashi, Toshiya, 5,465,244, Cl. 369-50.000.
Yoshida, Toyohiko, to Mitsubishi Denki Kabushiki Kaisha. Microprocessor, coprocessor and data processing system using them. 5,465,376, Cl. 395-800.000.
Yoshida, Yoshio: *See*—
Sakai, Keiji; Yoshida, Yoshio; Yamamoto, Hiroyuki; Kurata, Yukio; Nakata, Yasuo; and Miyake, Takahiro, 5,465,315, Cl. 385-116.000.
Yoshie, Takehiko: *See*—
Sasaki, Masanori; Shibafuchi, Hiroshi; Imai, Yasushi; Yoshida, Masahiko; and Yoshie, Takehiko, 5,464,248, Cl. 280-741.000.
Yoshihara, Kunio; Hirooka, Kazuhiko; Sakai, Masanori; Kuboki, Keiju; Nimura, Mitsuo; and Tanabe, Ritsushi, to Canon Kabushiki Kaisha. Image processing method and apparatus for processing oversized original images and for synthesizing multiple images. 5,465,163, Cl. 358-444.000.
Yoshikawa, Kunihiko, to Yoshikawa Mfg. Co., Ltd. Differential spring-back action between bicycle brake arms along with spring-back stopper structure. 5,464,074, Cl. 188-24.220.
Yoshikawa Mfg. Co., Ltd.: *See*—
Yoshikawa, Kunihiko, 5,464,074, Cl. 188-24.220.
Yoshikawa, Minoru, to NEC Corporation. Cooling apparatus for integrated circuit chips for preventing forcible contact between a cooling member and the chips. 5,465,192, Cl. 361-705.000.
Yoshikawa, Yuji; and Takarada, Mitsuhiro, to Shin-Etsu Chemical Co., Ltd. Curable resin composition comprising a silicone resin having epoxy and phenyl groups in the molecule and a vinyl polymer having a group reactive with the epoxy group. 5,464,901, Cl. 525-103.000.
Yoshimoto, Toshio: *See*—
Okuda, Kouichi; Nakamura, Shunji; Yoshimoto, Toshio; Ohtsuka, Yasunaga; Tomoyuki, Yohji; Fukuzawa, Daizo; Nanbu, Tomoko; and Suzuki, Hidenobu, 5,464,964, Cl. 219-497.000.
Yoshinaka, Tadaaki, to Sony Corporation. Apparatus for recording and reproducing a digital/video signal having a reduced number of processing channels. 5,465,181, Cl. 360-36.200.
Yoshino, Ken: *See*—
Usui, Minoru; Yamagishi, Kouji; Yoshino, Ken; and Mori, Hideki, 5,465,102, Cl. 345-89.000.
Yoshino Kogyosho Co., Ltd.: *See*—
Tasaki, Takaharu, 5,464,130, Cl. 222-383.100.
Yoshioka, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Display device with coordinate input function. 5,465,103, Cl. 345-104.000.
Yoshioka, Nobuyuki; Hosono, Kunihiro; and Miyazaki, Junji, to Mitsubishi Denki Kabushiki Kaisha; and Dainippon Printing Co., Ltd. Phase shift mask and method for repairing a defect of a phase shift mask. 5,464,713, Cl. 430-5.000.
Yoshitake, Kusumichi: *See*—
Shimizu, Keishi; Shimizu, Kanzi; Mitsumachi, Masanobu; Nakajima, Masato; Ishigami, Tetsushi; and Kusamichi, Yoshitake, 5,464,370, Cl. 454-345.000.
Yoshitsugu, Ken: *See*—
Tsutsui, Toshiyuki; Yoshitsugu, Ken; Takahashi, Mamoru; Todo, Akira; Ohta, Seiji; and Inagaki, Hajime, 5,464,905, Cl. 525-240.000.
Younes, Abd El Rasoul M., to Dallah Water Saving. Level control valve arrangement and water closet cistern. 5,464,037, Cl. 137-410.000.
Young, Chung L.; and Lu, Ying-Yuh, to Minnesota Mining and Manufacturing Company. Method for making structured suspension PSA beads. 5,464,916, Cl. 526-264.000.
Young, Peter Y. S. Electrical vehicle transportation system. 5,464,082, Cl. 191-2.000.
Young, Rodney C.: *See*—
King, Francis D.; Gaster, Larraine M.; Kaumann, Alberto J.; and Young, Rodney C., 5,464,864, Cl. 514-468.000.
Young, William C.; and Barngrover, Kerwin, to Wilch Manufacturing, Inc. Dispenser having edge-lighted, transparent valve for product display. 5,463,877, Cl. 62-264.000.
Yount, Thomas L.; Adams, J. Wesley; and Windes, Larry C. Reactor trays for a vertical staged polycondensation reactor. 5,464,590, Cl. 422-131.000.
Yozan Inc.: *See*—

Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,465,064, Cl. 327-361.000.
Yu, Hei-Nan, to Lee, Kuo-Ron. Foldable exerciser horse. 5,464,378, Cl. 482-95.000.
Yu, Lin: *See*—
Dennis, Edward A.; Reynolds, Laure J.; and Yu, Lin, 5,464,754, Cl. 435-18.000.
Yudenfriend, Harry M.: *See*—
Cook, Thomas E.; Pantacone, Mark J.; Galbraith, Robert E.; Glassen, Steven G.; Meritt, Allan S.; Oakes, Kenneth J.; and Yudenfriend, Harry M., 5,465,355, Cl. 395-200.150.
Yugen Kaisha New Media Systems: *See*—
Shimizu, Keishi; Shimizu, Kanzi; Mitsumachi, Masanobu; Nakajima, Masato; Ishigami, Tetsuhi; and Kusamichi, Yoshitake, 5,464,370, Cl. 454-345.000.
Yugen Kaisha Yano Engineering: *See*—
Yano, Sadahide, 5,464,340, Cl. 425-382.300.
Yuhas, Donald E.; Vorres, Carol L.; Groppi, David P.; and Konicek, Jiri D., to AlliedSignal Inc. System of electronic laminates with improved registration properties. 5,464,658, Cl. 427-385.500.
Yukitomo, Tatsuhiko: *See*—
Aoki, Eiji; Yamada, Koichiro; and Yukitomo, Tatsuhiko, 5,464,116, Cl. 220-586.000.
Yursis, Robert: *See*—
Chapman, John M., Jr.; Decker, David N.; Diles, Sondra L.; DeVito, Nicholas P.; Leach, William C.; Lechner, Richard; Langham, Allen D.; Manning, Willard R.; Ryan, Thomas R.; Smith, Edward J.; Thompson, William C., Jr.; and Yursis, Robert, 5,465,294, Cl. 379-207.000.
Yusa, Hiroshi: *See*—
Tomiyama, Koichi; Yusa, Hiroshi; and Kobori, Takakuni, 5,464,722, Cl. 430-137.000.
Zagar, Paul S.: *See*—
Ong, Adrian E.; and Zagar, Paul S., 5,465,232, Cl. 365-189.050.
Zajaczkowski, Peter, to Paragon Trade Brands, Inc. Absorbent garment with conformable pads. 5,464,402, Cl. 604-385.100.
Zaluzec, Matthew J.; Grab, Gerald A.; and Smith, Warren A., to Ford Motor Company. Thin film brazing of aluminum shapes. 5,464,146, Cl. 228-208.000.
Zambounis, John, to Ciba-Geigy Corporation. Substituted tetracyanoquinodimethanes, processes for their preparation and their use. 5,464,697, Cl. 428-412.000.
Zambrano, Raffaele; and Palara, Sergio, to Consorzio per la Ricerca sulla Microelectronica nel Mezzogiorno. Monolithic integrated bridge transistor circuit and corresponding manufacturing process. 5,464,993, Cl. 257-140.000.
Zanarini, Gianfranco, to Biesse S.p.A. Infusion maker. 5,463,935, Cl. 99-292.000.
Zapata Technologies, Inc.: *See*—
Shapcott, Michael, 5,464,089, Cl. 198-392.000.
Zarecky, Victor K. Variable weight dumbbell. 5,464,379, Cl. 482-108.000.
Zdanowicz, Lawrence E., Sr.: *See*—
Rush, William B., II; Mondek, Martin J.; Sullivan, Donald K.; Walter, Mark A.; and Zdanowicz, Lawrence E., Sr., 5,463,990, Cl. 123-195.00P.
Zeiler, Hans-Joachim: *See*—
Petersen, Uwe; Krebs, Andreas; Schenke, Thomas; Kunisch, Franz; Philipps, Thomas; Grohe, Klaus; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl-Georg; Haller, Ingo; and Zeiler, Hans-Joachim, 5,464,796, Cl. 514-312.000.
Zell, Thomas B.: *See*—
Hsu, Lillian-Lin; Sathi, Kitty; Biondi, Mark C.; Zell, Thomas B.; Catapano, David A.; and Lauria, Richard T., 5,465,322, Cl. 395-114.000.
Zemel, Jay N.; and Hsieh, Hsin-Yi, to Gas Research Institute. Simultaneous measurement of gas thermal conductivity and mass flow. 5,463,899, Cl. 73-195.000.
Zeneca Limited: *See*—
Christophers, Bano; Wiedow, Oliver; and Schroder, Jens-Michael, 5,464,822, Cl. 514-12.000.
Coffee, Ronald A.; and Dunwell, James M., 5,464,765, Cl. 435-172.300.
Morpeth, Fraser F., 5,464,851, Cl. 514-373.000.
Zeon Kasei Co., Ltd.: *See*—
Yada, Seiko; Ogawa, Yukihiro; Nomura, Takao; and Umemoto, Yoshiro, 5,464,892, Cl. 524-284.000.
Zexel Corporation: *See*—
Nakagawa, Toshihiro; Sakai, Toshiaki; and Nozaki, Hiroaki, 5,463,810, Cl. 29-609.400.
Zhang, Zhihe: *See*—
Hight, Terry V. T.; Matson, Jack V.; Rakestraw, Lawrence F.; Zhang, Zhihe; and Kuechler, Thomas C., 5,464,636, Cl. 424-661.000.
Zhao, Xiaowei: *See*—
Baldwin, Dwight G.; Zhao, Xiaowei; Durland, Mike E.; and Rodriguez, Ernesto M., 5,465,127, Cl. 353-119.000.
Zhao, Xinxian. Pharmaceutical composition for treating gastrointestinal disease. 5,464,620, Cl. 424-195.100.
Zhong, Lingxia: *See*—
Rao, A. Gururaj; and Zhong, Lingxia, 5,464,944, Cl. 536-23.600.
Zhou, Xuesong; and Daryoush, Afshin S., to Drexel University. Self-oscillating mixer circuits and methods therefor. 5,465,418, Cl. 455-332.000.
Zicker, Robert G. Emergency cellular radiotelephone and method therefor. 5,465,388, Cl. 455-33.100.
Ziegert, Günter: *See*—
Grau, Ulrich; and Ziegert, Günter, 5,464,118, Cl. 221-5.000.
Zilinski, Stanley H. Paint roller bumper. 5,463,789, Cl. 15-248.200.
Zimmerman, Stephen P.: *See*—
Villagran, Maria D.; Toman, Lori J.; Byars, Kenneth D.; Dawes, Nancy C.; and Zimmerman, Stephen P., 5,464,642, Cl. 426-439.000.
Zimmermann, Walter, to Siemens Aktiengesellschaft. Arrangement for frequency conversion of an input signal with an oscillator signal to form an intermediate frequency signal. 5,465,419, Cl. 455-333.000.
Zink, Richard W., Jr. Sanding tool for connection with a rotating drive. 5,464,367, Cl. 451-441.000.
Zioncheck, Thomas: *See*—
Chamow, Steven; Modi, Nishit; Schwall, Ralph; and Zioncheck, Thomas, 5,464,815, Cl. 514-8.000.
Zook, Christopher P., to Cirrus Logic, Inc. Dual purpose cyclic redundancy check. 5,465,260, Cl. 371-37.700.
Zorilla, Marta: *See*—
Chantraine, Philippe; and Zorilla, Marta, 5,464,653, Cl. 427-96.000.
Zortech International Limited: *See*—
Paybarah, Ali; and McWilliams, Joseph A., 5,463,919, Cl. 82-92.000.
Zoz, Henning, to ZOZ Maschinenbau GmbH. Attritor. 5,464,163, Cl. 241-172.000.
ZOZ Maschinenbau GmbH: *See*—
Zoz, Henning, 5,464,163, Cl. 241-172.000.
Zuerner, Edwin C.; Ratzek, Robert R.; and Foster, Norman, to Nortru, Inc. Composition for the paint spray treatment using secondary alcohol esters in water. 5,464,556, Cl. 252-170.000.
Zwanzig, Joy T. Concealed type retractable suitcase handle. 5,464,081, Cl. 190-115.000.
ZymoGenetics, Inc.: *See*—
Labroo, Virender M.; Piggott, James R.; and Bain, Steven D., 5,464,862, Cl. 514-422.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7th DAY OF NOVEMBER, 1995

NOTE— Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

Fiberspar, Inc.: *See*—
Quigley, Peter A., Re. 35,081, Cl. 428-36.200.

Kuo, Tien-Hsiang, to S. R. Mickelberg Company, Inc. Vibrating and sonic device for toy gun. Re. 35,082, Cl. 446-405.000.

Nemstiel, Frank S. Vehicle visor supported interior curtain. Re. 35,080, Cl. 160-370.210.

Quigley, Peter A., to Fiberspar, Inc. Composite structural member with high bending strength. Re. 35,081, Cl. 428-36.200.

Roosevelt, Andrew. Thoracic weightlifting bench. Re. 35,083, Cl. 482-104.000.

S. R. Mickelberg Company, Inc.: *See*—
Kuo, Tien-Hsiang, Re. 35,082, Cl. 446-405.000.

Sverdlin, Anatoly. Fuel injection system for internal combustion engines. Re. 35,079, Cl. 123-467.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Endo, Kazunaka: *See*—
Saikawa, Masahiko; Kanada, Eiji; and Endo, Kazunaka, B1 4,621,041, Cl. 430-204.000.

Fairchild Semiconductor Corporation: *See*—
Rupp, Charles R.; and Stronge, William R., B1 4,882,683, Cl. 395-165.000.

Flowdata, Inc.: *See*—
LoPresti, William J., B1 4,815,318, Cl. 73-261.000.

Hitachi, Ltd.: *See*—
Okuzawa, Osamu; Matsumoto, Kazuhiko; Ikariya, Yukio; and Mochizuki, Hiroshi, B1 5,243,538, Cl. 364-489.000.

Ikariya, Yukio: *See*—
Okuzawa, Osamu; Matsumoto, Kazuhiko; Ikariya, Yukio; and Mochizuki, Hiroshi, B1 5,243,538, Cl. 364-489.000.

Kanada, Eiji: *See*—
Saikawa, Masahiko; Kanada, Eiji; and Endo, Kazunaka, B1 4,621,041, Cl. 430-204.000.

LoPresti, William J., to Flowdata, Inc. Bearing-less positive displacement flow meter. B1 4,815,318, Cl. 73-261.000.

Matsumoto, Kazuhiko: *See*—
Okuzawa, Osamu; Matsumoto, Kazuhiko; Ikariya, Yukio; and Mochizuki, Hiroshi, B1 5,243,538, Cl. 364-489.000.

Mitsubishi Paper Mills, Ltd.: *See*—
Saikawa, Masahiko; Kanada, Eiji; and Endo, Kazunaka, B1 4,621,041, Cl. 430-204.000.

Mochizuki, Hiroshi: *See*—
Okuzawa, Osamu; Matsumoto, Kazuhiko; Ikariya, Yukio; and Mochizuki, Hiroshi, B1 5,243,538, Cl. 364-489.000.

Okuzawa, Osamu; Matsumoto, Kazuhiko; Ikariya, Yukio; and Mochizuki, Hiroshi, to Hitachi, Ltd. Comparison and verification system for logic circuits and method thereof. B1 5,243,538, Cl. 364-489.000.

Prince Corporation: *See*—
Suman, Michael J.; and Zeinstra, Mark L., B1 5,113,182, Cl. 340-825.310.

Rupp, Charles R.; and Stronge, William R., to Fairchild Semiconductor Corporation. Cellular addressing permutation bit map raster graphics architecture. B1 4,882,683, Cl. 395-165.000.

Saikawa, Masahiko; Kanada, Eiji; and Endo, Kazunaka, to Mitsubishi Paper Mills, Ltd. Lithographic printing plate. B1 4,621,041, Cl. 430-204.000.

Stronge, William R.: *See*—
Rupp, Charles R.; and Stronge, William R., B1 4,882,683, Cl. 395-165.000.

Suman, Michael J.; and Zeinstra, Mark L., to Prince Corporation. Vehicle door locking system detecting that all doors are closed. B1 5,113,182, Cl. 340-825.310.

Zeinstra, Mark L.: *See*—
Suman, Michael J.; and Zeinstra, Mark L., B1 5,113,182, Cl. 340-825.310.

LIST OF DESIGN PATENTEES

Ainscough, Francis G. H., to Newell Operating Company. Hinge wing cover. 363,873, Cl. D8-323.000.

Aktiebolaget Electrolux: *See*—
Klingspor, Christan S.; and Szczepanowski, Adam, 364,013, Cl. D32-22.000.

Almborg, Stephanie K., to SKA! Design, Inc. Crib endboard. 363,845, Cl. D6-501.000.

Altman/Stage Lighting: *See*—
Lieberman, Larry; and Laverack, John, 364,001, Cl. D26-63.000.

American Racing Equipment, Inc.: *See*—
Chung, Suny, 363,910, Cl. D12-209.000.
Chung, Suny, 363,911, Cl. D12-209.000.
Chung, Suny, 363,912, Cl. D12-209.000.
Chung, Suny, 363,913, Cl. D12-209.000.

Andrus, Leonard C.; and Turner, Larry G., to Brass-Craft Manufacturing Company. Liquid soap dispenser. 363,848, Cl. D6-544.000.

Anjowa, Inc.: *See*—
Roush, Warren H.; and Roush, Anne F., 363,900, Cl. D11-218.000.

AP Parts Manufacturing Company: *See*—
Maag, Ross A., 363,908, Cl. D12-194.000.

Aronson, Ellen V. Duster. 364,016, Cl. D32-52.000.

Asics Corporation: *See*—
Tsujino, Kanzo, 363,814, Cl. D2-916.000.

Avakian, Edmond. Bracelet. 363,893, Cl. D11-4.000.

Bailey, John A.; and Staufenberg, Donald J., to Minnesota Mining and Manufacturing Company. Tape reel for a video cassette. 363,930, Cl. D14-122.000.

Baume & Mercier SA: *See*—
Bodino, Giampiero, 363,882, Cl. D10-32.000.

BBA Holdings, Inc.: *See*—
Nourse, Aagje M. T., 363,841, Cl. D6-479.000.

Beckwith, Jacqueline C. Sports bag. 363,817, Cl. D3-254.000.

Bedrosian, Bert S., to Guard-Tech Industries, Inc. Receiver base module for a security system. 363,892, Cl. D10-106.000.

Bemis Manufacturing Company: *See*—
Carlson, Arthur R., 363,897, Cl. D11-152.000.

Benson, Robert P. Combined back applicator and container therefor. 364,003, Cl. D28-7.000.

Benware, Claudia; and Jaycox, Ellen M. Food dislodger for performing the Heimlich maneuver. 363,991, Cl. D24-200.000.

Berg, Jon A.; Langlie, Ronald H.; Buelow, David F.; and Tiedemann, Larry E., to North Central Plastics, Incorporated. Stock prod. 364,011, Cl. D30-156.000.

Bergmann, Paul B. Hanging planter bag. 363,896, Cl. D11-148.000.

Berlic, France. Chair. 363,829, Cl. D6-380.000.

Biegel, Edward T.: *See*—
Bothun, Eugene L.; Mercer, Tim L.; Johnson, Alexander S.; and Biegel, Edward T., 364,012, Cl. D32-19.000.

Biller, Bruce A.; Jackson, Hiram S.; and Scherer, Henry W., to S&C Electric Company. Electrical current limiter for power distribution systems. 363,919, Cl. D13-160.000.

Bissell Inc.: *See*—
Langeland, Brenda K.; and Roberts, Kenneth L., 364,014, Cl. D32-34.000.

Bodino, Giampiero, to Baume & Mercier SA. Wristwatch. 363,882, Cl. D10-32.000.

Bonko, Mark L.; and Lopp, Loren C., Jr., to Goodyear Tire & Rubber Company, The. Tractor tire. 363,906, Cl. D12-147.000.
Bonko, Mark L., to Goodyear Tire & Rubber Company, The. Tire. 363,907, Cl. D12-151.000.
Boone, David L.; and Smeltzer, Loren, to Royal Grip, Inc. Golf club grip. 363,963, Cl. D21-222.000.
Booth, Minnie S.: *See*—
Booth, Robert L.; and Booth, Minnie S., 363,818, Cl. D3-254.000.
Booth, Robert L.; and Booth, Minnie S. Case for removable barrels for paintball guns. 363,818, Cl. D3-254.000.
Bothun, Eugene L.; Mercer, Tim L.; Johnson, Alexander S.; and Biegel, Edward T., to Windsor Industries, Inc. Floor cleaning machine. 364,012, Cl. D32-19.000.
Bourgeois, Philip: *See*—
Pratt, David S.; Bourgeois, Philip; Cornelius, Edward J., III; Lee, Chin H.; and Stoltenberg, Blaise G., 363,934, Cl. D14-229.000.
Brass-Craft Manufacturing Company: *See*—
Andrus, Leonard C.; and Turner, Larry G., 363,848, Cl. D6-544.000.
Bridisco Limited: *See*—
Gough, Keith A., 363,891, Cl. D10-106.000.
Brightbill, Keith E.; Craft, Charles W.; and Davis, Gregg M., to Rubbermaid Incorporated. Dish drainer tray. 364,018, Cl. D32-55.000.
Brown, John R.: *See*—
Nysether, Mark A.; and Brown, John R., 363,936, Cl. D14-238.000.
Bruns, Joseph D.; and Earl, Ronald R. Golf club support stand and towel holder. 363,849, Cl. D6-552.000.
Brüssing, Bernd, to Helit Innovative Buroprodukte GmbH. Wall-mount filing pockets. 363,950, Cl. D19-90.000.
Buelow, David F.: *See*—
Berg, Jon A.; Langlie, Ronald H.; Buelow, David F.; and Tiedemann, Larry E., 364,011, Cl. D30-156.000.
Buongervino, Nicholas; Edwards, Ronald; Musteric, Peter; and Mauro, Patrick, to Symbol Technologies, Inc. Cable interface assembly. 363,918, Cl. D13-147.000.
Burgess, Esther E. Broom with adjustable handle. 363,821, Cl. D4-132.000.
Burrow, Rodney D. Archery coverall. 363,811, Cl. D2-743.000.
Buse, James F. Apertured board for use in association with a bean bag tossing game. 363,953, Cl. D21-5.000.
Caprio, James J.: *See*—
Marks, Donald M.; Leiner, Melvin; Caprio, James J.; and Marks, Darren M., 363,937, Cl. D14-253.000.
Carl Zeiss Jena GmbH: *See*—
Colani, Luigi, 363,886, Cl. D10-81.000.
Carlson, Arthur R., to Bemis Manufacturing Company. Planter. 363,897, Cl. D11-152.000.
Carnett, Jessie. Magnetic gas cap. 363,909, Cl. D12-197.000.
Carsello, Anthony J., to Emhart Inc. Door lever. 363,872, Cl. D8-308.000.
Cassady, Ernie. Combined neck guard and sun visor. 363,812, Cl. D2-679.000.
Chan, Yui-Ming, to Lucky Collection Limited. Sewing machine. 363,942, Cl. D15-69.000.
Chatman, Dean A. Combined cushion, sign and sign holder. 363,951, Cl. D20-42.000.
Chen, Ming-Jing. Baking pan. 363,851, Cl. D7-361.000.
Chen, Ting-hsing, to Far Great Plastics Industrial Co., Ltd. Wheel frame of roller skate. 363,964, Cl. D21-226.000.
Cheng, Tzu-Keng. Combined acupuncture and vibrating massager. 363,994, Cl. D24-215.000.
Chiu, Ping-Jan. Stroller. 363,903, Cl. D12-129.000.
Choi, Chung-Hing, to Hing Fat Toys Manufacturer Limited. Propelling and catching device. 363,960, Cl. D21-210.000.
Chung, Suny, to American Racing Equipment, Inc. Vehicle wheel front face. 363,910, Cl. D12-209.000.
Chung, Suny, to American Racing Equipment, Inc. Vehicle wheel front face. 363,911, Cl. D12-209.000.
Chung, Suny, to American Racing Equipment, Inc. Vehicle wheel front face. 363,912, Cl. D12-209.000.
Chung, Suny, to American Racing Equipment, Inc. Vehicle wheel front face. 363,913, Cl. D12-209.000.
Citizen Watch Co., Ltd.: *See*—
Maehara, Hirofumi, 363,883, Cl. D10-39.000.
Clark, James M. Bead seal gasket. 363,979, Cl. D23-269.000.
Coggins, Darrell R. Folding knife. 363,871, Cl. D8-100.000.
Colani, Luigi, to Carl Zeiss Jena GmbH. Color measuring apparatus. 363,886, Cl. D10-81.000.
Compaq Computer Corporation: *See*—
Martin, Randall W., 363,928, Cl. D14-115.000.
Compte, Philippe, to St. Dupont S.A. Fountain pen. 363,949, Cl. D19-49.000.
Connaughty, Kenneth G.: *See*—
Johnstrud, John L.; Johnsrud, Randal J.; and Connaughty, Kenneth G., 363,941, Cl. D15-19.000.
Cook, James G. (LORIPA). Illuminable message display board. 363,952, Cl. D70-47.000.
Cooney, Brian, to Tribro Corporation. Portion of a toothbrush holder attachment for a toothpaste tube. 363,846, Cl. D6-534.000.
Corn, James F. Boat stabilizer. 363,914, Cl. D12-317.000.
Cornelius, Edward J., III: *See*—
Pratt, David S.; Bourgeois, Philip; Cornelius, Edward J., III; Lee, Chin H.; and Stoltenberg, Blaise G., 363,934, Cl. D14-229.000.
Cornell, Robert W.: *See*—
Ramsey, Charles S.; and Cornell, Robert W., 363,866, Cl. D8-57.000.
Coughlin, Kevin. Clock radio. 363,931, Cl. D14-171.000.
Cox, Marvin L.: *See*—
Israel, Gary P.; and Cox, Marvin L., 363,868, Cl. D8-83.000.
Craft, Charles W.: *See*—
Brightbill, Keith E.; Craft, Charles W.; and Davis, Gregg M., 364,018, Cl. D32-55.000.
Crane, Paul A. Locking protective cover for a videocassette. 363,874, Cl. D8-346.000.
Crouse, Helen C., to Siemens Medical Systems, Inc. Pod for coupling a plurality of sensors to a patient monitor. 363,989, Cl. D24-187.000.
CTB Inc.: *See*—
Swartzendruber, Ray E., 363,982, Cl. D23-411.000.
Cuisine de France, Ind.: *See*—
Harrison, Marc; and Vadrot, Alain, 363,867, Cl. D8-63.000.
Cutshaw, Carroll E. Automatic fish jigger. 363,970, Cl. D22-134.000.
Cytowic, LORIPA: *See*—
Cook, James G., 363,952, Cl. D70-47.000.
Cytowic, Richard E., executor: *See*—
Tatum, Michael D.; Purdom, Robert W., deceased, 363,837, Cl. D6-446.000.
Danielson, Gordon L. Desk set. 363,948, Cl. D19-36.000.
Davies, Alan, to McKechnie UK Limited. Tile edging strip. 363,996, Cl. D25-119.000.
Davis, Gregg M.: *See*—
Brightbill, Keith E.; Craft, Charles W.; and Davis, Gregg M., 364,018, Cl. D32-55.000.
Davis, James F. Combined belt and variable offset arm portion of a conveyor for supporting poultry and poultry parts. 364,025, Cl. D34-29.000.
Dee, Robert D., to Smirne Plastics, Inc. Strap holder. 363,877, Cl. D8-373.000.
DeLillo, Dominick D.; and Greco, Richard. Disposable toilet night-light. 363,998, Cl. D26-24.000.
Dickau, Ewald F.; and Honan, David G., to Loctite Corporation. Equipment housing. 363,889, Cl. D10-96.000.
DiPasquale, Charles J., to Smartel, Inc. Combined ceiling fan mounting canopy, motor and switch housing and blade irons unit. 363,983, Cl. D23-411.000.
Display Systems, Inc.: *See*—
Weshler, Benjamin S., 363,840, Cl. D6-476.000.
Donohue, Michael J. Golf training aid. 363,967, Cl. D21-234.000.
Doughty, Frederic C.; and Mark, Darren M., to Emhart, Inc. Faucet. 363,974, Cl. D23-241.000.
Doughty, Frederic C.; and Mark, Darren M., to Emhart Inc. Faucet. 363,975, Cl. D23-241.000.
Dunn, Steven B., to Munchkin Bottling, Inc. Baby bottle. 363,990, Cl. D24-197.000.
Dye, John F., to Kendall Company, The. Connector for applying compressive pressure to the leg. 363,988, Cl. D24-129.000.
Earl, Ronald R.: *See*—
Bruns, Joseph D.; and Earl, Ronald R., 363,849, Cl. D6-552.000.
Easy Systems, Inc.: *See*—
Johnstrud, John L.; Johnsrud, Randal J.; and Connaughty, Kenneth G., 363,941, Cl. D15-19.000.
Eberlen, Richard M. Electronic stringed musical instrument. 363,946, Cl. D17-14.000.
Ederle, Kimberly. Wash cloth for infants. 364,004, Cl. D28-63.000.
Edwards, Ronald: *See*—
Buongervino, Nicholas; Edwards, Ronald; Musteric, Peter; and Mauro, Patrick, 363,918, Cl. D13-147.000.
Elizabeth Arden Company, Division of Conopco, Inc.: *See*—
Wacker, Susan R., 364,005, Cl. D28-76.000.
Emhart Inc.: *See*—
Carsello, Anthony J., 363,872, Cl. D8-308.000.
Doughty, Frederic C.; and Mark, Darren M., 363,974, Cl. D23-241.000.
Doughty, Frederic C.; and Mark, Darren M., 363,975, Cl. D23-241.000.
Engdahl, Robert A. Elbow pad. 364,009, Cl. D29-121.000.
Far Great Plastics Industrial Co., Ltd.: *See*—
Chen, Ting-hsing, 363,964, Cl. D21-226.000.
Fiskars Oy Ab: *See*—
Ramsey, Charles S.; and Cornell, Robert W., 363,866, Cl. D8-57.000.
Fitch, Timothy: *See*—
Noonan, Daniel T.; Ryan, Howard S.; and Fitch, Timothy, 364,029, Cl. D34-35.000.
Florio, Louis E. Arm cover. 364,008, Cl. D29-120.000.
Forrest, Carolyn A. Micro popcorn dispenser. 363,830, Cl. D6-408.000.
Frank Wagner & Son: *See*—
Masterson, Allan L.; and Knutson, Thomas L., 363,864, Cl. D8-51.000.
Friedman, Arthur S. Portable light for laptop computer. 364,000, Cl. D25-60.000.
Frost Cutlery Company: *See*—
Ross, Glenn D., 363,869, Cl. D8-93.000.
Fuji Photo Film Co., Ltd.: *See*—
Okamoto, Eiichi; and Ohkawa, Aya, 363,885, Cl. D10-78.000.
Tanaka, Kunihiko; and Katayama, Noriko, 363,929, Cl. D14-121.000.
Gallo, John F. Cake cutter. 363,860, Cl. D7-673.000.
Gay, Kenneth M., to Schering-Plough Healthcare Products, Inc. Cushioned heel cup. 363,813, Cl. D2-915.000.
Germany, Robert S. Dresser. 363,832, Cl. D6-434.000.
Gleason, Dana W. Solar panel bag. 363,819, Cl. D3-315.000.
Goodyear Tire & Rubber Company, The: *See*—
Bonko, Mark L.; and Lopp, Loran C., Jr., 363,906, Cl. D12-147.000.

Bonko, Mark L., 363,907, Cl. D12-151.000.
Harden, Jr., Richard W.; and Schuster, Daniel E., 363,905, Cl. D12-146.000.
Lucarelli, James H., 363,815, Cl. D2-960.000.
Gough, Keith A., to Bridisco Limited. Motion detection sensor. 363,891, Cl. D10-109.000.
Greco, Richard: *See*—
DeLillo, Dominick D.; and Greco, Richard, 363,998, Cl. D26-24.000.
Greene, Thomas M.: *See*—
Krzynowek, John; and Greene, Thomas M., 363,961, Cl. D21-214.000.
Grubbs, Don. Doll stand. 363,959, Cl. D21-189.000.
Guard-Tech Industries, Inc.: *See*—
Bedrosian, Bert S., 363,892, Cl. D10-106.000.
Guderian, Bruce J. Ski pole mitt. 363,965, Cl. D21-230.000.
Guerini, Albert J.: *See*—
Iftikar, Syed H.; Thompson, Herbert E.; and Guerini, Albert J., 363,926, Cl. D14-114.000.
Guiliani, Denise M. Vase with drain. 363,895, Cl. D11-146.000.
Hansen, George B., Jr.: *See*—
Hansen, Karla R.; and Hansen, George B., Jr., 363,955, Cl. D21-36.000.
Hansen, Karla R.; and Hansen, George B., Jr. Game board. 363,955, Cl. D21-36.000.
Harden, Jr., Richard W.; and Schuster, Daniel E., to Goodyear Tire & Rubber Company, The. Tire tread. 363,905, Cl. D12-146.000.
Harrison, Marc; and Vadrot, Alain, to Cuisine de France, ltd. Knife sharpener. 363,867, Cl. D8-63.000.
Hayabusa, Shin, to Unitike Kabushiki Kaisha. Bolt, nut and washer assembly. 363,878, Cl. D8-387.000.
Helit Innovative Buroprodukte GmbH: *See*—
Brüssing, Bernd, 363,950, Cl. D19-90.000.
Hendrickson, John. Concrete form splash funnel. 363,943, Cl. D15-136.000.
Hess, Stephen C., to Winston Furniture Company of Alabama. Chair. 363,825, Cl. D6-369.000.
Highland Supply Corporation: *See*—
Weder, Donald E.; and Straeter, Joseph G., 363,898, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 363,899, Cl. D11-164.000.
Hing Fat Toys Manufacturer Limited: *See*—
Choi, Chung-Hing, 363,960, Cl. D21-210.000.
Hinklin, Darrell W., to Toro Company, The. Yard and garden tractor. 363,940, Cl. D15-15.000.
Hisashi, Shima, to International Business Machines Corporation. Personal computer. 363,923, Cl. D14-106.000.
Hollifield, Jack L.: *See*—
Hollifield, Shirley D.; and Hollifield, Jack L., 363,987, Cl. D24-122.000.
Hollifield, Shirley D.; and Hollifield, Jack L. Portable female urinal. 363,987, Cl. D24-122.000.
Honan, David G.: *See*—
Dickau, Ewald F.; and Honan, David G., 363,889, Cl. D10-96.000.
Huen, Hing W., to Quesco International (H.K.) Ltd. Hand-held shower. 363,972, Cl. D23-223.000.
Hung, Michael. Jack. 364,026, Cl. D34-31.000.
Hung, Michael. Electric winch. 364,027, Cl. D34-33.000.
Iftikar, Syed H.; Thompson, Herbert E.; and Guerini, Albert J., to Syquest Technology, Inc. Cartridge with a 1.8 inch form factor for a removable cartridge disk drive. 363,926, Cl. D14-114.000.
Imai, Toshitaka, to International Business Machines Corporation. Display for a computer. 363,925, Cl. D14-113.000.
International Business Machines Corporation: *See*—
Hisashi, Shima, 363,923, Cl. D14-106.000.
Imai, Toshitaka, 363,925, Cl. D14-113.000.
Pedinielli, Gilbert; and Richelet, Daniel, 363,921, Cl. D13-184.000.
Israel, Gary P.; and Cox, Marvin L., to Wescon Products Company. Screwdriver. 363,868, Cl. D8-83.000.
Jackson, Hiram S.: *See*—
Biller, Bruce A.; Jackson, Hiram S.; and Scherer, Henry W., 363,919, Cl. D13-180.000.
Jaycox, Ellen M.: *See*—
Benwate, Claudia; and Jaycox, Ellen M., 363,991, Cl. D24-200.000.
Johnson, Alexander S.: *See*—
Bothun, Eugene L.; Mercer, Tim L.; Johnson, Alexander S.; and Biegel, Edward T., 364,012, Cl. D32-19.000.
Johnson, Frederick M. Housing for communications equipment for a vehicle. 363,916, Cl. D12-415.000.
Johnson, Loyd D.: *See*—
McGreevy, William T., 363,935, Cl. D14-230.000.
Johnson, Samuel J. Camshaft removal kit. 364,023, Cl. D34-28.000.
Johnson, Stanley N.; and Smith, Gerald J. Inflatable shelter. 363,993, Cl. D25-19.000.
Johnsrud, Randal J.: *See*—
Johnstrud, John L.; Johnsrud, Randal J.; and Connaughty, Kenneth G., 363,941, Cl. D15-19.000.
Johnstrud, John L.; Johnsrud, Randal J.; and Connaughty, Kenneth G., to Easy Systems, Inc. Feed mixer. 363,941, Cl. D15-19.000.
Judd, Louis J., Jr.; and Judd, Susan E. H. Shield for ice fishing hole. 363,969, Cl. D21-253.000.
Judd, Susan E. H.: *See*—
Judd, Louis J., Jr.; and Judd, Susan E. H., 363,969, Cl. D21-253.000.
Juliano, Marvin L. Golf aid for putting practice. 363,966, Cl. D21-234.000.
K. W. Muth Company, Inc.: *See*—
Roberts, John K.; and Spencer, Keith R., 363,920, Cl. D13-182.000.
Kalng, Gredo W. Ladybug lawn mower. 363,938, Cl. D15-14.000.
Kamen, Melvin E., to Revlon Consumer Products Corporation. Lipstick container. 364,006, Cl. D28-88.000.
Kanou, Harumi; Matsuda, Takeshi; Nagase, Kazumi; and Kobayashi, Yoshiaki, to SMK Corporation. Charger with data receiver for barcode reader. 363,917, Cl. D13-108.000.
Katayama, Noriko: *See*—
Tanaka, Kunihiko; and Katayama, Noriko, 363,929, Cl. D14-121.000.
Kato, Hisato; and Ogasawara, Hiroyuki, to Kubota Corporation. Riding mower. 363,939, Cl. D15-15.000.
Katz, Michael. Shot glass. 363,854, Cl. D7-509.000.
Kazmark, Eugene A., Jr., to Remin Laboratories, Inc. Hand truck. 364,022, Cl. D34-26.000.
Kelly, Daniel. Toy alligator. 363,958, Cl. D21-157.000.
Kendall Company, The: *See*—
Dye, John F., 363,988, Cl. D24-129.000.
Kerr, Marilyn J. An ear ornament. 363,894, Cl. D11-40.000.
Kimball International, Inc.: *See*—
Tatum, Michael D.; Purdom, Robert W., deceased, 363,837, Cl. D6-446.000.
Kimura, Shigeru, to Tombow Pencil Co., Ltd. Plural-nibbed writing instrument. 363,947, Cl. D19-36.000.
Klingspor, Christer S.; and Szczepanowski, Adam, to Aktiebolaget Electrolux. Battery fed vacuum cleaner. 364,013, Cl. D32-22.000.
Knoss, Robert: *See*—
Krupa, Calvin S.; and Knoss, Robert, 363,879, Cl. D9-423.000.
Knutson, Thomas L.: *See*—
Masterson, Allan L.; and Knutson, Thomas L., 363,864, Cl. D8-51.000.
Kobayashi, Masahiko, to Seiko Epson Corporation. Pen based computer. 363,922, Cl. D14-100.000.
Kobayashi, Yoshiaki: *See*—
Kanou, Harumi; Matsuda, Takeshi; Nagase, Kazumi; and Kobayashi, Yoshiaki, 363,917, Cl. D13-108.000.
Koellner, Margaret M. Aquatic exercise float. 363,968, Cl. D21-236.000.
Korb, George P. Downspout hanger. 363,875, Cl. D8-373.000.
Krupa, Calvin S.; and Knoss, Robert. Blueberry container. 363,879, Cl. D9-423.000.
Krzynowek, John; and Greene, Thomas M., to Lisco, Inc. Golf club. 363,961, Cl. D21-214.000.
Kubota Corporation: *See*—
Kato, Hisato; and Ogasawara, Hiroyuki, 363,939, Cl. D15-15.000.
L. D. Kichler Co., The: *See*—
von Kluck, Kevin, 364,002, Cl. D26-88.000.
LaBree, Michael A. Camera support for attachment to a tree or post. 363,945, Cl. D16-242.000.
Langeland, Brenda K.; and Roberts, Kenneth L., to Bissell Inc. Wand handle for a liquid extractor vacuum cleaner. 364,014, Cl. D32-34.000.
Langlie, Ronald H.: *See*—
Berg, Jon A.; Langlie, Ronald H.; Buelow, David F.; and Tiedemann, Larry E., 364,011, Cl. D30-156.000.
Larkin, Robert F., to Miller Desk, Inc. Chair base. 363,842, Cl. D6-498.000.
Larkin, Robert F., to Miller Desk, Inc. Chair base. 363,843, Cl. D6-498.000.
Laverack, John: *See*—
Lieberman, Larry; and Laverack, John, 364,001, Cl. D26-63.000.
Le, Andrew D. Button. 363,901, Cl. D11-222.000.
Lee, Chin H.: *See*—
Pratt, David S.; Bourgeois, Philip; Cornelius, Edward J., III; Lee, Chin H.; and Stoltenberg, Blaise G., 363,934, Cl. D14-229.000.
Leiner, Melvin: *See*—
Marks, Donald M.; Leiner, Melvin; Caprio, James J.; and Marks, Darren M., 363,937, Cl. D14-253.000.
Lieberman, Larry; and Laverack, John, to Altman/Stage Lighting. Stage light. 364,001, Cl. D26-63.000.
Liebmann, Andrew. Pizza spacer. 363,880, Cl. D9-456.000.
Lisco, Inc.: *See*—
Krzynowek, John; and Greene, Thomas M., 363,961, Cl. D21-214.000.
Lockwood, Betty A. Ergonomical body support. 363,828, Cl. D6-375.000.
Loctite Corporation: *See*—
Dickau, Ewald F.; and Honan, David G., 363,889, Cl. D10-96.000.
Lopp, Loran C., Jr.: *See*—
Bonko, Mark L.; and Lopp, Loran C., Jr., 363,906, Cl. D12-147.000.
Lucarelli, James H., to Goodyear Tire & Rubber Company, The. Shoe sole. 363,815, Cl. D2-960.000.
Lucky Collection Limited: *See*—
Chan, Yui-Ming, 363,942, Cl. D15-69.000.
Lusignan, Richard V. Shovel. 363,862, Cl. D8-10.000.
Lyons, Norbert, to Syroco, Inc. Ottoman. 363,824, Cl. D6-349.000.
Maag, Ross A., to AP Parts Manufacturing Company. Conformal stamp formed muffler. 363,908, Cl. D12-194.000.
Madill, Jeffrey A.; and Saunders, William J., to Scientific-Atlanta, Inc. Combined multi-function remote control and overlay. 363,932, Cl. D14-219.000.
Maehara, Hirofumi, to Citizen Watch Co., Ltd. Wrist watch. 363,883, Cl. D10-39.000.
Maple, Wade A. F.; and Sauvage, Thomas, to Sunbeam Corporation. Chair back. 363,844, Cl. D6-502.000.
Mark, Darren M.: *See*—
Doughty, Frederic C.; and Mark, Darren M., 363,974, Cl. D23-241.000.
Doughty, Frederic C.; and Mark, Darren M., 363,975, Cl. D23-241.000.
Marks, Darren M.: *See*—
Marks, Donald M.; Leiner, Melvin; Caprio, James J.; and Marks, Darren M., 363,937, Cl. D14-253.000.

Marks, Donald M.; Leiner, Melvin; Caprio, James J.; and Marks, Darren M., to Sims Communications. ACDC phoen kit. 363,937, Cl. D14-253.000.
Martin, Leo, to Miami Metal Products, Inc. Dining arm chair frame. 363,826, Cl. D6-370.000.
Martin, Randall W., to Compaq Computer Corporation. Multimedia keyboard for personal computer. 363,928, Cl. D14-115.000.
Masterson, Allan L.; and Knutson, Thomas L., to Frank Wagner & Son. Rule puller for die pattern disassembly. 363,864, Cl. D8-51.000.
Mathews, Linton. Remote control device for a slot machine. 363,956, Cl. D21-48.000.
Matsick, Patricia. Container for saving a partially eaten stick-mounted sucker. 363,859, Cl. D7-629.000.
Matsuda, Takeshi: *See*—
Kanou, Harumi; Matsuda, Takeshi; Nagase, Kazumi; and Kobayashi, Yoshiaki, 363,917, Cl. D13-108.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Ueda, Yoshitaka; and Moriyama, Toshiya, 363,924, Cl. D14-107.000.
Mauro, Patrick: *See*—
Buongervino, Nicholas; Edwards, Ronald; Musteric, Peter; and Mauro, Patrick, 363,918, Cl. D13-147.000.
McCarter, Phyllis J. Oil drip pan. 363,944, Cl. D15-150.000.
McGreevy, William T., to Johnson, Loyd D. Molded housing for an antenna. 363,935, Cl. D14-230.000.
McKechnie UK Limited: *See*—
Davies, Alan, 363,996, Cl. D25-119.000.
McKenna, James M. Drain downspout. 363,978, Cl. D23-267.000.
McLaren, Gregory; and McLaren, Tamera. Finger protector. 364,007, Cl. D29-113.000.
McLaren, Tamera: *See*—
McLaren, Gregory; and McLaren, Tamera, 364,007, Cl. D29-113.000.
Mercer, Tim L.: *See*—
Bothun, Eugene L.; Mercer, Tim L.; Johnson, Alexander S.; and Biegel, Edward T., 364,012, Cl. D32-19.000.
Miami Metal Products, Inc.: *See*—
Martin, Leo, 363,826, Cl. D6-370.000.
Middlebrook, James K. Mass air flow unit. 363,887, Cl. D10-96.000.
Miller Desk, Inc.: *See*—
Larkin, Robert F., 363,842, Cl. D6-498.000.
Larkin, Robert F., 363,843, Cl. D6-498.000.
Minnesota Mining and Manufacturing Company: *See*—
Bailey, John A.; and Staufenberg, Donald J., 363,930, Cl. D14-122.000.
Moffitt, Stephen P. Paint bucket for a mini roller. 364,017, Cl. D32-53.100.
Mollenhauer, Merle. Ladder mounted tool tray. 363,995, Cl. D25-68.000.
Morissette, Brenda J. Bag holding strap for attachment to a shopping cart. 363,876, Cl. D8-373.000.
Moriyama, Toshiya: *See*—
Ueda, Yoshitaka; and Moriyama, Toshiya, 363,924, Cl. D14-107.000.
Muderlak, Kenneth J., to Technical Concepts, Inc. Aerosol spray dispenser. 363,981, Cl. D23-366.000.
Mueller, John W. Pants stretcher. 363,831, Cl. D6-411.000.
Munchkin Bottling, Inc.: *See*—
Dunn, Steven B., 363,990, Cl. D24-197.000.
Musteric, Peter: *See*—
Buongervino, Nicholas; Edwards, Ronald; Musteric, Peter; and Mauro, Patrick, 363,918, Cl. D13-147.000.
Nagase, Kazumi: *See*—
Kanou, Harumi; Matsuda, Takeshi; Nagase, Kazumi; and Kobayashi, Yoshiaki, 363,917, Cl. D13-108.000.
Newell Operating Company: *See*—
Ainscough, Francis G. H., 363,873, Cl. D8-323.000.
Nic Autotec Co., Ltd.: *See*—
Nomura, Ryoichi, 363,997, Cl. D25-122.000.
Nieman, David B. Electrical tester for trailer connection. 363,890, Cl. D10-102.000.
Nike, Inc.: *See*—
Sarkinen, Larry R.; Sell, James C., Jr.; and Roth, Steve, 363,816, Cl. D2-961.000.
Noell, Eunice. Chair. 363,827, Cl. D6-373.000.
Nomura, Ryoichi, to Nic Autotec Co., Ltd. Frame bar for constituting a frame structure. 363,997, Cl. D25-122.000.
Noonan, Daniel T.; Ryan, Howard S.; and Fitch, Timothy, to Raymond Corporation, The. Angled twist-grip handle. 364,029, Cl. D34-35.000.
North Central Plastics, Incorporated: *See*—
Berg, Jon A.; Langlie, Ronald H.; Buelow, David F.; and Tiedemann, Larry E., 364,011, Cl. D30-156.000.
Nourse, Aagje M. T., to BBA Holdings, Inc. Shelving assembly. 363,841, Cl. D6-479.000.
Nysether, Mark A.; and Brown, John R. Antenna mount. 363,936, Cl. D14-238.000.
Oberloier, Nicole A.: *See*—
Oberloier, Robert J.; and Oberloier, Nicole A., 363,870, Cl. D8-98.000.
Oberloier, Robert J.; and Oberloier, Nicole A. Adjustable clay cutter. 363,870, Cl. D8-98.000.
Ogasawara, Hiroyuki: *See*—
Kato, Hisato; and Ogasawara, Hiroyuki, 363,939, Cl. D15-15.000.
Ohkawa, Aya: *See*—
Okamoto, Eiichi; and Ohkawa, Aya, 363,885, Cl. D10-78.000.
Okamoto, Eiichi; and Ohkawa, Aya, to Fuji Photo Film Co., Ltd. Densitometer. 363,885, Cl. D10-78.000.
O'Keefe, Henry; and O'Keefe, Patricia. Support device for chairs. 364,024, Cl. D34-28.000.
O'Keefe, Patricia: *See*—
O'Keefe, Henry; and O'Keefe, Patricia, 364,024, Cl. D34-28.000.
O'Neil, Kevin M. Hanger for in-line skates. 363,822, Cl. D6-315.000.
Paus, Michael J., to Universal Furniture Industries, Inc. Cabinet. 363,833, Cl. D6-436.000.
Paus, Michael J., to Universal Furniture Industries, Inc. Cabinet. 363,835, Cl. D6-439.000.
Paus, Michael J., to Universal Furniture Industries, Inc. Chest. 363,836, Cl. D6-444.000.
Paus, Michael J., to Universal Furniture Industries, Inc. Dresser. 363,838, Cl. D6-446.000.
Paus, Michael J., to Universal Furniture Industries, Inc. Dresser. 363,839, Cl. D6-446.000.
Peddicord, Donald B.: *See*—
Peddicord, Steven M.; and Peddicord, Donald B., 363,971, Cl. D23-207.000.
Peddicord, Steven M.; and Peddicord, Donald B. Support for salt for use in a water softener. 363,971, Cl. D23-207.000.
Pedinielli, Gilbert; and Richelet, Daniel, to International Business Machines Corporation. Cabinet for housing computer equipment. 363,921, Cl. D13-184.000.
Pena, Rigoberto. Dental syringe. 363,986, Cl. D24-114.000.
Pigott, Brandon L.; Pigott, Schuyler F.; Pigott, Peter S.; and Pigott, Maurice J. Plastic pallet assembly. 364,030, Cl. D34-38.000.
Pigott, Maurice J.: *See*—
Pigott, Brandon L.; Pigott, Schuyler F.; Pigott, Peter S.; and Pigott, Maurice J., 364,030, Cl. D34-38.000.
Pigott, Peter S.: *See*—
Pigott, Brandon L.; Pigott, Schuyler F.; Pigott, Peter S.; and Pigott, Maurice J., 364,030, Cl. D34-38.000.
Pigott, Schuyler F.: *See*—
Pigott, Brandon L.; Pigott, Schuyler F.; Pigott, Peter S.; and Pigott, Maurice J., 364,030, Cl. D34-38.000.
Pratt, David S.; Bourgeois, Philip; Cornelius, Edward J., III; Lee, Chin H.; and Stoltenberg, Blaise G., to Setcom Corporation. Helmet attachment for a microphone. 363,934, Cl. D14-229.000.
Pulido, Cristobal. Rebar cutting tool. 363,865, Cl. D8-51.000.
Purdom, Robert W., deceased (by Richard E. Cytowic, executor): *See*—
Tatum, Michael D.; Purdom, Robert W., deceased, 363,837, Cl. D6-446.000.
Quesco International (H.K.) Ltd.: *See*—
Huen, Hing W., 363,972, Cl. D23-223.000.
Ramsey, Charles S.; and Cornell, Robert W., to Fiskars Oy Ab. Scissor handles. 363,866, Cl. D8-57.000.
Raymond Corporation, The: *See*—
Noonan, Daniel T.; Ryan, Howard S.; and Fitch, Timothy, 364,029, Cl. D34-35.000.
Reede, Dewayne E. Brake wear monitor. 363,884, Cl. D10-65.000.
Reibl, Bernd, to Rowenta-Werke GmbH. Steam generator for a steam iron. 364,019, Cl. D32-73.000.
Remin Laboratories, Inc.: *See*—
Kazmark, Eugene A., Jr., 364,022, Cl. D34-26.000.
Revlon Consumer Products Corporation: *See*—
Kamen, Melvin E., 364,006, Cl. D28-88.000.
Ricchio, Joseph D., Jr., to Westinghouse Electric Corporation. Chair. 363,823, Cl. D6-334.000.
Richelet, Daniel: *See*—
Pedinielli, Gilbert; and Richelet, Daniel, 363,921, Cl. D13-184.000.
Roach, Robert E., to Specific Cruise Systems, Inc. Air conditioner housing unit for the passenger compartment of a van. 363,980, Cl. D23-325.000.
Roberts, John K.; and Spencer, Keith R., to K. W. Muth Company, Inc. Electrical circuit board. 363,920, Cl. D13-182.000.
Roberts, Kenneth L.: *See*—
Langeland, Brenda K.; and Roberts, Kenneth L., 364,014, Cl. D32-34.000.
Rochester Gauges, Inc.: *See*—
Williamson, Cecil M., 363,888, Cl. D10-96.000.
Rosen, John B. Support mount for flat screen televisions. 363,927, Cl. D14-114.000.
Ross, Glenn D., to Frost Cutlery Company. Sharpening stone holder for a knife sharpener. 363,869, Cl. D8-93.000.
Roth, Steve: *See*—
Sarkinen, Larry R.; Sell, James C., Jr.; and Roth, Steve, 363,816, Cl. D2-961.000.
Rouleau, Kevin. Cement truck chute liner. 364,028, Cl. D34-35.000.
Roush, Anne F.: *See*—
Roush, Warren H.; and Roush, Anne F., 363,900, Cl. D11-218.000.
Roush, Warren H.; and Roush, Anne F., to Anjowa, Inc. Brassiere strap bridging and support member. 363,900, Cl. D11-218.000.
Rowenta-Werke GmbH: *See*—
Reibl, Bernd, 364,019, Cl. D32-73.000.
Royal Grip, Inc.: *See*—
Boone, David L.; and Smeltzer, Loren, 363,963, Cl. D21-222.000.
Rubbermaid Incorporated: *See*—
Brightbill, Keith E.; Craft, Charles W.; and Davis, Gregg M., 364,018, Cl. D32-55.000.
Ryan, Howard S.: *See*—
Noonan, Daniel T.; Ryan, Howard S.; and Fitch, Timothy, 364,029, Cl. D34-35.000.
S&C Electric Company: *See*—

Biller, Bruce A.; Jackson, Hiram S.; and Scherer, Henry W., 363,919, Cl. D13-160.000.

Sani-Grip, Inc.: *See*—
Vinal, Charles E., 363,976, Cl. D23-252.000.

Sarkinen, Larry R.; Sell, James C., Jr.; and Roth, Steve, to Nike, Inc. Bladder for a shoe sole. 363,816, Cl. D2-961.000.

Saunders, William J.: *See*—
Madill, Jeffrey A.; and Saunders, William J., 363,932, Cl. D14-219.000.

Sauvage, Thomas: *See*—
Maple, Wade A. F.; and Sauvage, Thomas, 363,844, Cl. D6-502.000.

Scherer, Henry W.: *See*—
Biller, Bruce A.; Jackson, Hiram S.; and Scherer, Henry W., 363,919, Cl. D13-160.000.

Schering-Plough Healthcare Products, Inc.: *See*—
Gay, Kenneth M., 363,813, Cl. D2-915.000.

Schindler, John W.: *See*—
Taylor, James C.; and Schindler, John W., 363,999, Cl. D26-28.000.

Schottenstein Stores Corporation: *See*—
Thompson, David W., 363,834, Cl. D6-438.000.

Schuster, Daniel E.: *See*—
Harden, Jr., Richard W.; and Schuster, Daniel E., 363,905, Cl. D12-146.000.

Scientific-Atlanta, Inc.: *See*—
Madill, Jeffrey A.; and Saunders, William J., 363,932, Cl. D14-219.000.

Seiko Epson Corporation: *See*—
Kobayashi, Masahiko, 363,922, Cl. D14-100.000.

Sell, James C., Jr.: *See*—
Sarkinen, Larry R.; Sell, James C., Jr.; and Roth, Steve, 363,816, Cl. D2-961.000.

Serrano, Anthony B. Game board. 363,954, Cl. D21-20.000.

Setcom Corporation: *See*—
Pratt, David S.; Bourgeois, Philip; Cornelius, Edward J., III; Lee, Chin H.; and Stoltenberg, Blaise G., 363,934, Cl. D14-229.000.

Shih-Hsien, Yang. Luggage cart. 364,021, Cl. D34-26.000.

Siemens Medical Systems, Inc.: *See*—
Crouse, Helen C., 363,989, Cl. D24-187.000.

Sims Communications: *See*—
Marks, Donald M.; Leiner, Melvin; Caprio, James J.; and Marks, Darren M., 363,937, Cl. D14-253.000.

SKA! Design, Inc.: *See*—
Almborg, Stephanie K., 363,845, Cl. D6-508.000.

Slaser, Roger P. Spatula. 363,861, Cl. D7-688.000.

Smartel, Inc.: *See*—
DiPasquale, Charles J., 363,983, Cl. D23-411.000.

Smeltzer, Loren: *See*—
Boone, David L.; and Smeltzer, Loren, 363,963, Cl. D21-222.000.

Smick, Ronald H. Lever for vacutube puncture. 363,984, Cl. D24-108.000.

Smirne Plastics, Inc.: *See*—
Dee, Robert D., 363,877, Cl. D8-373.000.

Smith, Bette E. Taco platter. 363,853, Cl. D7-504.000.

Smith, Gerald J.: *See*—
Johnson, Stanley N.; and Smith, Gerald J., 363,993, Cl. D25-19.000.

Smith, Warren. Wedge golf club head. 363,962, Cl. D21-220.000.

SMK Corporation: *See*—
Kanou, Harumi; Matsuda, Takeshi; Nagase, Kazumi; and Kobayashi, Yoshiaki, 363,917, Cl. D13-108.000.

Sofanou S.A.: *See*—
Streit, Bernard, 363,977, Cl. D23-263.000.

Specific Cruise Systems, Inc.: *See*—
Roach, Robert E., 363,980, Cl. D23-325.000.

Spencer, Keith R.: *See*—
Roberts, John K.; and Spencer, Keith R., 363,920, Cl. D13-182.000.

St. Dupont S.A.: *See*—
Compte, Philippe, 363,949, Cl. D19-49.000.

Standex International Corporation: *See*—
Westbrooks, John W., Jr., 363,856, Cl. D7-553.000.

Starck, Philippe, to Thomson Consumer Electronics (Societe Anonyme). Remote control. 363,933, Cl. D14-218.000.

Staufenberg, Donald J.: *See*—
Bailey, John A.; and Staufenberg, Donald J., 363,930, Cl. D14-122.000.

Stoltenberg, Blaise G.: *See*—
Pratt, David S.; Bourgeois, Philip; Cornelius, Edward J., III; Lee, Chin H.; and Stoltenberg, Blaise G., 363,934, Cl. D14-229.000.

Stoltzfus, John. Bullnose corner cleaning tool. 364,015, Cl. D32-46.000.

Stone, Heather E. Four wheeled orthopedic support. 363,904, Cl. D12-130.000.

Straeter, Joseph G.: *See*—
Weder, Donald E.; and Straeter, Joseph G., 363,898, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 363,899, Cl. D11-164.000.

Streit, Bernard, to Sofanou S.A. Connector box for tube. 363,977, Cl. D23-263.000.

Sunbeam Corporation: *See*—
Maple, Wade A. F.; and Sauvage, Thomas, 363,844, Cl. D6-502.000.

Sussman, Sy. Lap tray. 363,857, Cl. D7-553.000.

Swartzendruber, Ray E., to CTB Inc. Fan assembly motor mounting. 363,982, Cl. D23-411.000.

Sweeney, Bruce R. Double beverage carrier. 363,858, Cl. D7-608.000.

Symbol Technologies, Inc.: *See*—
Buongervino, Nicholas; Edwards, Ronald; Musteric, Peter; and Mauro, Patrick, 363,918, Cl. D13-147.000.

Syquest Technology, Inc.: *See*—
Iftikar, Syed H.; Thompson, Herbert E.; and Guerini, Albert J., 363,926, Cl. D14-114.000.

Syroco, Inc.: *See*—
Lyons, Norbert, 363,824, Cl. D6-349.000.

Szczepanowski, Adam: *See*—
Klingspor, Christan S.; and Szczepanowski, Adam, 364,013, Cl. D32-22.000.

Tanaka, Kunihiko; and Katayama, Noriko, to Fuji Photo Film Co., Ltd. Audio tape cassette. 363,929, Cl. D14-121.000.

Tatum, Michael D.; Purdom, Robert W., deceased (by Richard E. Cytowic, executor), to Kimball International, Inc. Credenza. 363,837, Cl. D6-446.000.

Taylor, James C.; and Schindler, John W., to Theodore Bargman Company. Lamp fixture. 363,999, Cl. D26-28.000.

Technical Concepts, Inc.: *See*—
Muderlak, Kenneth J., 363,981, Cl. D23-366.000.

Theodore Bargman Company: *See*—
Taylor, James C.; and Schindler, John W., 363,999, Cl. D26-28.000.

Thompson, David W., to Schottenstein Stores Corporation. Utility cabinet. 363,834, Cl. D6-438.000.

Thompson, Herbert E.: *See*—
Iftikar, Syed H.; Thompson, Herbert E.; and Guerini, Albert J., 363,926, Cl. D14-114.000.

Thomson Consumer Electronics (Societe Anonyme): *See*—
Starck, Philippe, 363,933, Cl. D14-218.000.

Tiedemann, Larry E.: *See*—
Berg, Jon A.; Langlie, Ronald H.; Buelow, David F.; and Tiedemann, Larry E., 364,011, Cl. D30-156.000.

Tipp, Raymond P. Compact tab lifting tool. 363,863, Cl. D8-40.000.

Tombow Pencil Co., Ltd.: *See*—
Kimura, Shigeru, 363,947, Cl. D19-36.000.

Toro Company, The: *See*—
Hinklin, Darrell W., 363,940, Cl. D15-15.000.

Towler, Kent F. Arrow clip. 363,850, Cl. D6-552.000.

Travic Product Design Corporation Ltd.: *See*—
Yung, Kevin L., 363,881, Cl. D10-18.000.

Tribro Corporation: *See*—
Cooney, Brian, 363,846, Cl. D6-534.000.

Triner, Robert D. Skill and amusement toy. 363,957, Cl. D21-59.000.

Tsujino, Kanzo, to Asics Corporation. Sandal. 363,814, Cl. D2-916.000.

Turner, Larry G.: *See*—
Andrus, Leonard C.; and Turner, Larry G., 363,848, Cl. D6-544.000.

Ueda, Yoshitaka; and Moriyama, Toshiya, to Matsushita Electric Industrial Co., Ltd. Combined scanner with printer. 363,924, Cl. D14-107.000.

U.S. Philips Corporation: *See*—
Vos, Maria L. J. P., 363,992, Cl. D24-210.000.

Unitite Kabushiki Kaisha: *See*—
Hayabusa, Shin, 363,878, Cl. D8-387.000.

Universal Furniture Industries, Inc.: *See*—
Paus, Michael J., 363,833, Cl. D6-436.000.
Paus, Michael J., 363,835, Cl. D6-439.000.
Paus, Michael J., 363,836, Cl. D6-444.000.
Paus, Michael J., 363,838, Cl. D6-446.000.
Paus, Michael J., 363,839, Cl. D6-446.000.

Vadrot, Alain: *See*—
Harrison, Marc; and Vadrot, Alain, 363,867, Cl. D8-63.000.

Van Blankenburg, Karl. Drink container. 363,855, Cl. D7-515.000.

Van Hovel, Dale J.; and Van Hovel, Julie M. Portable oral and dental sprayer. 363,985, Cl. D24-111.000.

Van Hovel, Julie M.: *See*—
Van Hovel, Dale J.; and Van Hovel, Julie M., 363,985, Cl. D24-111.000.

Vinal, Charles E., to Sani-Grip, Inc. Toilet seat handle. 363,976, Cl. D23-251.000.

von Kluck, Kevin, to L. D. Kichler Co., The. Lamp. 364,002, Cl. D26-88.000.

Vos, Maria L. J. P., to U.S. Philips Corporation. Tanning lamp. 363,992, Cl. D24-210.000.

Wacker, Susan R., to Elizabeth Arden Company, Division of Conopco, Inc. Cosmetic container. 364,005, Cl. D28-76.000.

Wang, Jessie L.-K. Wheeled dolly for golf bags. 364,020, Cl. D34-23.000.

Wang, Wen-Mu. Faucet. 363,973, Cl. D23-238.000.

Watts Health Foundation, Inc.: *See*—
Winge, Ralph C., 363,820, Cl. D4-108.000.

Wawzonek, Stanley M. Bird feeder. 364,010, Cl. D30-125.000.

Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 363,898, Cl. D11-164.000.

Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 363,899, Cl. D11-164.000.

Weems, Wade H. Rack for infrared receiver pods of airplanes. 363,915, Cl. D12-345.000.

Wescon Products Company: *See*—
Israel, Gary P.; and Cox, Marvin L., 363,868, Cl. D8-83.000.

Weshler, Benjamin S., to Display Systems, Inc. Display stand. 363,840, Cl. D6-476.000.

Westbrooks, John W., Jr., to Standex International Corporation. Food service tray. 363,856, Cl. D7-553.000.

Westinghouse Electric Corporation: *See*—
Ricchio, Joseph D., Jr., 363,823, Cl. D6-334.000.

Williamson, Cecil M., to Rochester Gauges, Inc. Gauge. 363,888, Cl. D10-96.000.

Windsor Industries, Inc.: *See*—

Bothun, Eugene L.; Mercer, Tim L.; Johnson, Alexander S.; and Biegel, Edward T., 364,012, Cl. D32-19.000.

Winge, Ralph C., to Watts Health Foundation, Inc. Combined brush for teeth and gums and stand therefor. 363,820, Cl. D4-108.000.

Winston Furniture Company of Alabama: *See*—
Hess, Stephen C., 363,825, Cl. D6-369.000.

Wright, John R. Sled. 363,902, Cl. D12-8.000.

Young, Brian Q. Baby juice cup lid. 363,852, Cl. D7-392.100.

Young, Ivan. Automatic toothpaste tube dispenser. 363,847, Cl. D6-541.000.

Yung, Kevin L., to Travic Product Design Corporation Ltd. Alarm clock. 363,881, Cl. D10-18.000.

LIST OF PLANT PATENTEES

Ball Seed Co.: *See*—
Hope, Claude, 9,366, Cl. Plt.-87.150.
Ball Seed Co., a Division of Geo. J. Ball, Inc.: *See*—
Hope, Claude, 9,367, Cl. Plt.-87.150.
Bradford, Lowell G.; and Bradford, Norman G. Nectarine tree 'Fire Pearl'. 9,358, Cl. Plt.-40.100.
Bradford, Lowell G.; and Bradford, Norman G. Nectarine tree 'Bright Pearl'. 9,359, Cl. Plt.-40.100.
Bradford, Lowell G.; and Bradford, Norman G. Nectarine tree 'June Pearl'. 9,360, Cl. Plt.-40.100.
Bradford, Norman G.: *See*—
Bradford, Lowell G.; and Bradford, Norman G., 9,358, Cl. Plt.-40.100.
Bradford, Lowell G.; and Bradford, Norman G., 9,359, Cl. Plt.-40.100.
Bradford, Lowell G.; and Bradford, Norman G., 9,360, Cl. Plt.-40.100.
DeVor Nurseries, Inc.: *See*—
Olesen, Pernille; and Olesen, Mogens N., 9,357, Cl. Plt.-11.000.
Evison, Raymond J., to Guernsey Clematis Nursery Limited, The. Clematis named Evithree. 9,362, Cl. Plt.-54.100.
Florfis AG: *See*—
Zerr, Katharina, 9,364, Cl. Plt.-86.400.
Floris AG: *See*—
Zerr, Katharina, 9,365, Cl. Plt.-86.400.
Guernsey Clematis Nursery Limited, The: *See*—
Evison, Raymond J., 9,362, Cl. Plt.-54.100.
Hope, Claude, to Ball Seed Co. Kalanchoe plant named 'Pico Tico Bright Pink'. 9,366, Cl. Plt.-87.150.
Hope, Claude, to Ball Seed Co., a Division of Geo. J. Ball, Inc. Kalanchoe plant named 'Pico Tico Cherry'. 9,367, Cl. Plt.-87.150.
Olesen, Mogens N.: *See*—
Olesen, Pernille; and Olesen, Mogens N., 9,357, Cl. Plt.-11.000.
Olesen, Pernille; and Olesen, Mogens N., to DeVor Nurseries, Inc. Hybrid tea rose plant named 'Poulvue'. 9,357, Cl. Plt.-11.000.
Smith, George F. 'George's Red' peach tree. 9,361, Cl. Plt.-43.200.
Tristram, David R. Spiraea plant named 'Walbuma'. 9,363, Cl. Plt.-54.100.
Warner, Chris. Climbing miniature rose plant named 'Chewizz'. 9,356, Cl. Plt.-4.000.
Zerr, Katharina, to Florfis AG. Poinsettia plant named 'Fiscor'. 9,364, Cl. Plt.-86.400.
Zerr, Katharina, to Floris AG. Poinsettia plant named 'Fisson'. 9,365, Cl. Plt.-86.400.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 7th DAY OF NOVEMBER, 1995

Allan, John L.; Katz, Leon; and Boettcher, Jeffery J., to Fiberweb North America, Inc. Meltblown fibers and webs produced from liquid crystal polymers. H1,502, Cl. 428-224.000.
Boettcher, Jeffery J.: *See*—
Allan, John L.; Katz, Leon; and Boettcher, Jeffery J., H1,502, Cl. 428-224.000.
Cramer, Jane H.: *See*—
Murray, Michael G.; Cramer, Jane H.; Romero-Severson, Jeanne; West, David; and Ma, Yu, H1,498, Cl. 47-58.000.
Fiberweb North America, Inc.: *See*—
Allan, John L.; Katz, Leon; and Boettcher, Jeffery J., H1,502, Cl. 428-224.000.
Katz, Leon: *See*—
Allan, John L.; Katz, Leon; and Boettcher, Jeffery J., H1,502, Cl. 428-224.000.
Kronenberg, Stanley, to United States of America, Army. Ultra-sensitive carbon fiber dosimeter. H1,500, Cl. 250-376.000.
Leyse, Carl F., to United States of America, Energy. Radial flow nuclear thermal rocket (RFNTR). H1,501, Cl. 376-318.000.
Ma, Yu: *See*—
Murray, Michael G.; Cramer, Jane H.; Romero-Severson, Jeanne; West, David; and Ma, Yu, H1,498, Cl. 47-58.000.
Murray, Michael G.; Cramer, Jane H.; Romero-Severson, Jeanne; West, David; and Ma, Yu. Polygenic trait determinants: maize dwarf mosaic virus. H1,498, Cl. 47-58.000.
Romero-Severson, Jeanne: *See*—
Murray, Michael G.; Cramer, Jane H.; Romero-Severson, Jeanne; West, David; and Ma, Yu, H1,498, Cl. 47-58.000.
United States of America
Army: *See*—
Kronenberg, Stanley, H1,500, Cl. 250-376.000.
Energy: *See*—
Leyse, Carl F., H1,501, Cl. 376-318.000.
Vance, Richard F., H1,499, Cl. 55-446.000.
Vance, Richard F., to United States of America, Energy. Slanted baffle mist eliminator. H1,499, Cl. 55-446.000.
West, David: *See*—
Murray, Michael G.; Cramer, Jane H.; Romero-Severson, Jeanne; West, David; and Ma, Yu, H1,498, Cl. 47-58.000.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 7, 1995

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2

144 5,463,779

CLASS 4

604 5,463,780
661 5,463,782

CLASS 5

417 5,463,783
430 5,463,784
630 5,463,781
655 5,463,785

CLASS 8

94.21 5,464,451
495 5,464,452

CLASS 14

73 5,463,786

CLASS 15

97.1 5,463,787
97.3 5,463,788
248.2 5,463,789
250.29 5,463,790
320 5,463,791
322 5,463,792

CLASS 16

197 5,463,793
225 5,463,794
273 5,463,795
383 5,463,796

CLASS 24

115 G 5,463,797
599.5 5,463,798
704.1 5,463,799

CLASS 26

33 Q 5,463,801

CLASS 27

1 5,463,800

CLASS 29

25.08 5,464,453
216 5,463,802
467 5,463,803
469.5 5,463,804
608 5,463,805
605 5,463,806
809 5,463,807
823 5,463,808
888.3 5,463,809
888.4 5,463,810
889.21 5,463,812
898.046 5,463,811

CLASS 30

43.9 5,463,813
232 5,463,814
276 5,463,815
415 5,463,816

CLASS 33

371 5,463,817
813 5,463,818

CLASS 34

135 5,463,819
235 5,463,820
261 5,463,821

CLASS 36

11.5 5,463,823
44 5,463,824
50.1 5,463,822

CLASS 40

414 5,463,825
426 5,463,826
449 5,463,827

CLASS 42

20 5,463,828
42.01 5,463,829

CLASS 44

629 5,464,454

CLASS 47

1.01 5,464,455
1.3 5,464,456
9 5,463,830
58 5,464,457

CLASS 49

377 5,463,831
479.1 5,463,832

CLASS 52

71 5,463,833
155 5,463,834
288.1 5,463,835
639 5,463,837
741.1 5,463,838

CLASS 53

54 5,463,839
117 5,463,840
381.2 5,463,841
399 5,463,842
436 5,463,844
459 5,463,845
465 5,463,846
473 5,463,847
482 5,463,848
527 5,463,849
551 5,463,850
552 5,463,851

CLASS 55

223 5,464,458
257.2 5,464,459
374 5,464,460
480 5,464,461

CLASS 56

6 5,463,852
10.2 E 5,463,854
17.2 5,463,855
62 5,463,856
238 5,463,857
327.1 5,463,858
332 5,463,859

CLASS 57

263 5,463,860
339 5,463,861

CLASS 59

7 5,463,862

CLASS 60

39.03 5,463,863
39.142 5,463,865
39.31 5,463,864
204 5,463,866
602 5,463,867

CLASS 62

6 5,463,868
24 5,463,869
25 5,463,870
38 5,463,871
51.1 5,463,872
121 5,463,873
126 5,463,874
140 5,463,875
223 5,463,876
264 5,463,877
394 5,463,878
480 5,463,879
484 5,463,880

CLASS 65

66 5,464,462

CLASS 66

31 5,463,881
92 5,463,882

CLASS 68

140 5,463,883

CLASS 70

16 5,463,884
18 5,463,885

CLASS 72

13 5,463,886
39 5,463,887
157 5,463,888
197 5,463,889
294 5,463,890
340 5,463,891
456 5,463,892

CLASS 73

4 R 5,463,893
38 5,463,894
61.71 5,463,895
81 5,463,896
105 5,463,897
116 5,463,898
195 5,463,899
261 4,815,318
469 5,463,900
753 5,463,901
781 5,463,902
861.02 5,463,903
861.24 5,463,904
861.25 5,463,905
861.27 5,463,906
862.392 5,463,907
863.83 5,463,908
864.52 5,463,909
864.87 5,463,910

CLASS 74

473 R 5,463,911
519 5,463,912
526 5,463,913
661 5,463,914
665 H 5,463,915

CLASS 75

244 5,464,463
310 5,464,464
313 5,464,465

CLASS 76

107.1 5,463,916
119 5,463,917

CLASS 81

487 5,463,918

CLASS 82

92 5,463,919

CLASS 83

56 5,463,920
151 5,463,921
622 5,463,922

CLASS 84

291 5,463,923
304 5,463,924
423 R 5,463,925
609 5,464,946
624 5,464,947
726 5,464,948

CLASS 89

1.2 5,463,926
1.801 5,463,927
8 5,463,928
29 5,463,930
36.02 5,463,929

CLASS 91

428 5,463,931

CLASS 95

45 5,464,466
98 5,464,467

CLASS 96

125 5,464,468
220 5,464,469

CLASS 99

280 5,463,932
285 5,463,933
286 5,463,934
292 5,463,935
327 5,463,936
348 5,463,937
352 5,463,938
353 5,463,939
476 5,463,940
495 5,463,941
537 5,463,942
542 5,463,943

CLASS 100

35 5,463,944
93 RP 5,463,946

CLASS 101

125 5,463,947
127.1 5,463,948
152 5,463,949
329 5,463,950
423 5,463,951
454 5,463,952
485 5,463,953

CLASS 102

202 5,463,954
275.2 5,463,955
282 5,463,956
293 5,463,957
445 5,463,958
464 5,463,959
501 5,463,960

CLASS 104

53 5,463,961
55 5,463,962

CLASS 105

168 5,463,963
187 5,463,964

CLASS 106

22 A 5,464,470
124 5,464,471
287.34 5,464,472
811 5,464,473

CLASS 108

59 5,463,945
110 5,463,966
513 5,463,965

CLASS 110

104 R 5,463,967
347 5,463,968

CLASS 114

39.001 5,463,969
105 5,463,970
311 5,463,971
363 5,463,972

CLASS 116

173 5,463,973

CLASS 117

9 5,463,975
68 5,463,976
85 5,463,977
89 5,463,978

CLASS 118

676 5,464,474
719 5,464,475
723 MP 5,464,476

CLASS 119

54 5,463,979
57.1 5,463,980
71 5,463,981
166 5,463,982
203 5,463,983
840 5,463,984
850 5,463,985

CLASS 123

41.1 5,463,986
90.15 5,463,987
90.16 5,463,988
193.5 5,463,989
195 P 5,463,990
195 R 5,463,991
198 R 5,463,992
339.2 5,463,993
398 5,463,994
432 5,463,995
446 5,463,996
460 5,463,997
467 Re.35,079
520 5,463,998
647 5,463,999
674 5,464,000

CLASS 124

25.6 5,464,001
86 5,464,002
87 5,464,003

CLASS 126

39 B 5,464,004
39 R 5,464,005
361 5,464,006

CLASS 128

205.24 5,464,009
207.11 5,464,010
207.14 5,464,011
357 5,464,694
630 5,464,012
653.1 5,464,013
653.2 5,464,014
660.07 5,464,015
662.06 5,464,016
672 5,464,017
677 5,464,019
696 5,464,020
758 5,464,022
772 5,464,023
849 5,464,024

CLASS 131

216 5,464,026
283 5,464,027
336 5,464,028

CLASS 132

73.5 5,464,029
245 5,464,030

CLASS 134

1 5,464,031
1.3 5,464,480
6 5,464,481
25.2 5,464,482
25.4 5,464,483
40 5,464,484
72 5,464,032
105 5,464,033

CLASS 135

90 5,464,034

CLASS 136

230 5,464,485

CLASS 137

78.3 5,464,044
312 5,464,035
315 5,464,036
410 5,464,037
486 5,464,038
551 5,464,039
556 5,464,040
595 5,464,041
614.2 5,464,043
801 5,464,045

CLASS 139

455 5,464,046

CLASS 141

1 5,464,047
24 5,464,048
114 5,464,049

CLASS 148

525 5,464,486
706 5,464,487

CLASS 151

209 B 5,464,050
454 5,464,051

CLASS 156

73.4 5,464,488
126 5,464,489
145 5,464,490
167 5,464,491
246 5,464,492
290 5,464,493
330 5,464,494
456 5,464,495
499 5,464,496
519 5,464,497
580.2 5,464,498

CLASS 160

23.1 5,464,052
370.21 Re.35,080

CLASS 162

6 5,464,501
60 5,464,502

CLASS 164

460 5,464,053

CLASS 165

80.3 5,464,054
167 5,464,056
173 5,464,057

CLASS 166

250.01 5,464,058
269 5,464,059
293 5,464,060
302 5,464,061
376 5,464,062
382 5,464,063

CLASS 169

22 5,464,064
44 5,464,065

CLASS 172

1 5,464,066
13 5,464,067

CLASS 174

120 R 5,464,949
256 5,464,950

CLASS 175

374 5,464,068

CLASS 178

18 5,464,951

CLASS 180

116 5,464,069

CLASS 181

211 5,464,952

CLASS 182

45 5,464,070
205 5,464,071

CLASS 187

249 5,464,072
334 5,464,073

CLASS 188

24.12 5,464,075
24.22 5,464,074
32 5,464,076
72.5 5,464,077
112 R 5,464,078
315 5,464,079

CLASS 190

18 A 5,464,080
115 5,464,081

CLASS 191

2 5,464,082

CLASS 192

8 C 5,464,083
35 5,464,084
85 R 5,464,085

CLASS 193

35 SS 5,464,086

CLASS 194

200 5,464,087

CLASS 198

370.07 5,464,088
392 5,464,089
803.01 5,464,090

CLASS 200

33 R 5,464,953
61.62 5,464,954
317 5,464,955

CLASS 201

3 5,464,503

CLASS 202

181 5,464,531

CLASS 203

3	5,464,504
64	5,464,505

CLASS 204

78	5,464,508
105 R	5,464,506
129.3	5,464,509
141.5	5,464,510
153.1	5,464,511
157.2	5,464,512
164	5,464,513
182.4	5,464,514
182.8	5,464,515
182.9	5,464,516
183.2	5,464,517
192.12	5,464,518
280	5,464,519
298.13	5,464,520
299 R	5,464,521
302	5,464,522
424	5,464,523

CLASS 205

170	5,464,524

CLASS 206

45.15	5,464,091
217	5,464,092
265	5,464,093
316.1	5,464,094
449	5,464,095
494	5,464,096
524.7	5,464,097
554	5,464,098

CLASS 208

47	5,464,525
108	5,464,526
111	5,464,527
161	5,464,528

CLASS 209

3.1	5,464,099
31	5,464,100
405	5,464,101

CLASS 210

104	5,464,529
141	5,464,530
190	5,464,532
257.1	5,464,533
321.68	5,464,534
321.89	5,464,535
380.1	5,464,536
453	5,464,537
490	5,464,538
603	5,464,539
640	5,464,540
767	5,464,541
784	5,464,542
794	5,464,543

CLASS 211

12	5,464,102
133	5,464,103
184	5,464,105

CLASS 215

12.1	5,464,106
12.2	5,464,107
207	5,464,109
223	5,464,110
249	5,464,111
254	5,464,112
386	5,464,108

CLASS 216

34	5,464,500
71	5,464,499

CLASS 218

29	5,464,956

CLASS 219

69.14	5,464,959
121.52	5,464,961
121.6	5,464,960
121.82	5,464,963
130.01	5,464,957
130.51	5,464,958
497	5,464,964
544	5,464,966
703	5,464,967
710	5,464,968
735	5,464,969

CLASS 220

9.2	5,464,113
284	5,464,114
324	5,464,115
586	5,464,116

CLASS 221

1	5,464,117
5	5,464,118
156	5,464,119

CLASS 223

1	5,464,120
83	5,464,122
83.5	5,464,123
129.1	5,464,124
156	5,464,125
162	5,464,126
181.5	5,464,127
333	5,464,128
377	5,464,129
383.1	5,464,130
391	5,464,131
484	5,464,133
507	5,464,134

CLASS 224

41	5,464,135
252	5,464,136
265	5,464,137
269	5,464,139
321	5,464,140
328	5,464,141

CLASS 225

100	5,464,142

CLASS 226

199	5,464,143

CLASS 227

176	5,464,144

CLASS 228

183	5,464,145
208	5,464,146
212	5,464,147

CLASS 229

109	5,464,148
120.27	5,464,149
120.38	5,464,150
206	5,464,151

CLASS 235

95 R	5,464,970
379	5,464,971
462	5,464,972
494	5,464,973

CLASS 238

8	5,464,152
117	5,464,153

CLASS 239

1	5,464,154
124	5,464,155
424	5,464,157
533.4	5,464,158

CLASS 241

1	5,464,159
17	5,464,160
21	5,464,161
36	5,464,162
172	5,464,163
197	5,464,164
215	5,464,165

CLASS 242

334	5,464,167
527.3	5,464,166
530.1	5,464,168
542	5,464,169
598	5,464,170
609.1	5,464,171

CLASS 244

3.1	5,464,172
3.11	5,464,174
3.3	5,464,173
12.5	5,464,175

CLASS 246

126	5,464,176
127	5,464,177

CLASS 248

50	5,464,178
68.1	5,464,179
96	5,464,180
113	5,464,181
276.1	5,464,182
311.2	5,464,183
425	5,464,184
475.1	5,464,185
524	5,464,186
635	5,464,187
678	5,464,188

CLASS 250

234	5,464,976
283	5,464,975
305	5,464,978
332	5,464,979
338.1	5,464,980
341.8	5,464,981
343	5,464,982
370.11	5,464,984
396 R	5,464,985
459.1	5,464,986
492.3	5,464,987
507.1	5,464,988

CLASS 251

4	5,464,189
74	5,464,190
129.21	5,464,191

CLASS 252

2	5,464,544
8.5	5,464,545
8.7	5,464,547
18	5,464,548
51.5 A	5,464,549
64	5,464,550
78.5	5,464,551
95	5,464,552
108	5,464,553
121	5,464,554
153	5,464,555
170	5,464,556
174.24	5,464,558
181	5,464,559
182.24	5,464,560
182.27	5,464,561
182.28	5,464,562
186.29	5,464,563
301.4 H	5,464,568
308	5,464,569
500	5,464,570
514	5,464,564
546	5,464,565
582	5,464,566
586	5,464,567
638	5,464,571

CLASS 254

30	5,464,192
134.3 FT	5,464,193

CLASS 257

30	5,464,989
40	5,464,990
53	5,464,991
139	5,464,992
140	5,464,993
147	5,464,994
192	5,464,995
230	5,464,996
239	5,464,997
316	5,464,998
322	5,464,999
335	5,465,000
370	5,465,001
458	5,465,002
510	5,465,003
529	5,465,004
538	5,465,005
557	5,465,006
584	5,465,007
691	5,465,008
723	5,465,009

CLASS 261

30	5,464,572
97	5,464,573
124	5,464,574

CLASS 264

40.5	5,464,577
45.5	5,464,582
60	5,464,583
103	5,464,584
108	5,464,585
130	5,464,586
250	5,464,578
297.2	5,464,579
428	5,464,576
443	5,464,575

CLASS 266

66	5,464,194
170	5,464,195

CLASS 267

140.13	5,464,196
155	5,464,197
167	5,464,198

CLASS 270

53	5,464,199

CLASS 271

11	5,464,202
12	5,464,203
110	5,464,204
213	5,464,205
227	5,464,206

CLASS 273

1.5 R	5,464,207
26 D	5,464,208
55 B	5,464,209
73 C	5,464,210
78	5,464,211
121 A	5,464,213
148 B	5,464,214
167 R	5,464,215
169	5,464,217
176 L	5,464,219
186.1	5,464,220
186.3	5,464,221
201	5,464,223
258	5,464,224

CLASS 277

1	5,464,225
53	5,464,226
96.1	5,464,227
207 A	5,464,228

CLASS 279

30	5,464,229
63	5,464,230
123	5,464,231
124	5,464,232
137	5,464,233

CLASS 280

5.32	5,464,234
11.2	5,464,235
30	5,464,236
42	5,464,238
284	5,464,239
281.1	5,464,240
425.1	5,464,241
602	5,464,242
638	5,464,243
655	5,464,244
720	5,464,245
730.2	5,464,246
737	5,464,247
741	5,464,248
743.1	5,464,250
777	5,464,251
805	5,464,252

CLASS 281

38	5,464,253

CLASS 283

109	5,464,254
116	5,464,255

CLASS 285

26	5,464,256
156	5,464,257
293	5,464,258

CLASS 292

92	5,464,259
201	5,464,260
251	5,464,261

CLASS 294

19.2	5,464,262
64.1	5,464,263

CLASS 296

37.6	5,464,264
146.14	5,464,265
189	5,464,266
216	5,464,267

CLASS 297

57	5,464,268
61	5,464,269
81	5,464,270
209	5,464,271
227	5,464,272
232	5,464,273
328	5,464,274

CLASS 300

21	5,464,275

CLASS 301

37.34	5,464,276
108.4	5,464,277

CLASS 303

7	5,464,278

CLASS 307

9.1	5,465,010
64	5,465,011
91	5,465,012
117	5,465,014

CLASS 310

26	5,465,015
71	5,465,016
83	5,465,017
105	5,465,018
156	5,465,019
194	5,465,020
328	5,465,021

CLASS 312

128	5,464,279
249.11	5,464,280
257.1	5,464,281

CLASS 313

144	5,465,022
293	5,465,023
309	5,465,024
318.09	5,465,025
440	5,465,026
517	5,465,027

CLASS 315

248	5,465,028
308	5,465,029
349	5,465,030
362	5,465,031
403	5,465,032

CLASS 318

480	5,465,033
560	5,465,034
561	5,465,035
568.11	5,465,036

CLASS 320

2	5,465,038
32	5,465,039

CLASS 323

210	5,465,040
312	5,465,041

CLASS 324

71.1	5,465,042
96	5,465,043
142	5,465,044
220	5,465,045
244	5,465,046
248	5,465,049
316	5,465,047
603	5,465,050
713	5,465,051
770	5,465,052

CLASS 326

34	5,465,054
41	5,465,055
66	5,465,057
83	5,465,058

CLASS 327

12	5,465,059
51	5,465,060
112	5,465,061
172	5,465,062
276	5,465,065
294	5,465,066
322	5,465,067
323	5,465,068
333	5,465,069
350	5,465,070
361	5,465,064
512	5,465,063

CLASS 329

315	5,465,071

CLASS 330

254	5,465,072
258	5,465,073
263	5,465,074

CLASS 331

8	5,465,075
179	5,465,076

CLASS 335

132	5,465,077
305	5,465,078

CLASS 340

567	5,465,080
576	5,465,079
825.05	5,465,081
825.31	5,465,083
	5,113,182
825.35	5,465,085
825.44	5,465,086
825.54	5,465,082
825.8	5,465,087
905	5,465,088
995	5,465,089

CLASS 341

22	5,465,090
33	5,465,091
118	5,465,092
122	5,465,093

CLASS 342

28	5,465,094
159	5,465,095
354	5,465,096
442	5,465,097

CLASS 343

718	5,465,098
730	5,465,099
769	5,465,100

CLASS 345

1	5,465,101
89	5,465,102
104	5,465,103
150	5,465,104
204	5,465,105

CLASS 346

139 R	5,465,107

CLASS 347

68	5,465,108
74	5,465,109
104	5,465,110
115	5,465,111

CLASS 348

4	5,465,112
5.5	5,465,113
80	5,465,114
155	5,465,115
223	5,465,116
373	5,465,117
396	5,465,118
447	5,465,119
716	5,465,120
744	5,465,121

CLASS 351

124	5,465,122
208	5,465,123
245	5,465,124

CLASS 353

26 A	5,465,125
101	5,465,126
119	5,465,127

CLASS 354

114	5,465,128
170	5,465,129
195.1	5,465,130
202	5,465,131
219	5,465,132
442	5,465,133

CLASS 355

75	5,465,134
208	5,465,135
210	5,465,136
211	5,465,137
245	5,465,138
260	5,465,139
285	5,465,141

CLASS 356

5.01	5,465,142
73.1	5,465,143
139.06	5,465,144
237	5,465,145
345	5,465,147
349	5,465,148
350	5,465,149
361	5,465,151
371	5,465,152
376	5,465,153
382	5,465,154

CLASS 358

296	5,465,156
298	5,465,157
310	5,465,158
342	5,465,159
401	5,465,160
438	5,465,161
442	5,465,162
444	5,465,163
448	5,465,164
451	5,465,166
468	5,465,167
498	5,465,172

505 5,465,155
534 5,465,173

CLASS 359

40 5,465,174
56 5,465,168
74 5,465,169
139 5,465,170
287 5,465,171
463 5,465,175
567 5,465,176
634 5,465,177
670 5,465,178

CLASS 360

8 5,465,179
19.1 5,465,180
36.2 5,465,181
73 5,465,182
78.9 5,465,183
97.01 5,465,184
113 5,465,185
132 5,465,187

CLASS 361

18 5,465,188
58 5,465,189
91 5,465,190
681 5,465,191
705 5,465,192

CLASS 362

31 5,465,193
32 5,465,194
61 5,465,195
183 5,465,196
203 5,465,197
253 5,465,198
364 5,465,199
368 5,465,200

CLASS 363

21 5,465,201
37 5,465,202
40 5,465,203

CLASS 364

152 5,465,204
157 5,465,205
406 5,465,206
424.01 5,465,207
424.05 5,465,209
424.06 5,465,211
426.01 5,465,208
427 5,465,212
468 5,465,213
472 5,465,214
474.22 5,465,215
488 5,465,216
489 5,465,217
5,243,538
498 5,465,219
525 5,465,220
550 5,465,349
552 5,465,221
715.08 5,465,222
716 5,465,224
736 5,465,225
757 5,465,226
825 5,465,227

CLASS 365

49 5,465,228
52 5,465,229
149 5,465,249
168 5,465,230
185.33 5,465,231
189.05 5,465,232
200 5,465,233
203 5,465,235
218 5,465,236
233 5,465,237
234 5,465,238

CLASS 366

83 5,464,282
152.1 5,464,283

CLASS 368

72 5,465,239

CLASS 369

1 5,465,240
44.11 5,465,241
44.19 5,465,242
49 5,465,243
50 5,465,244
58 5,465,245
77.2 5,465,246
109 5,465,247
112 5,465,248

CLASS 370

15 5,465,250
54 5,465,251
65.5 5,465,252
68.1 5,465,253
79 5,465,254
85.1 5,465,255
110.1 5,465,256

CLASS 371

22.3 5,465,259
22.5 5,465,257
37.7 5,465,260
39.1 5,465,261
49.3 5,465,262

CLASS 372

23 5,465,263
31 5,465,264
46 5,465,266
101 5,465,265

CLASS 374

131 5,464,284

CLASS 375

200 5,465,269
242 5,465,270
267 5,465,271
279 5,465,267
295 5,465,272
296 5,465,273
333 5,465,268
340 5,465,274
341 5,465,275
346 5,465,276
376 5,465,277

CLASS 376

245 5,465,278
294 5,465,280
305 5,465,281
426 5,465,282

CLASS 378

4 5,465,283
62 5,465,284
173 5,465,285

CLASS 379

5 5,465,287
34 5,465,286
58 5,465,288
59 5,465,289
67 5,465,290
164 5,465,292
189 5,465,293
207 5,465,294
211 5,465,295
355 5,465,296
387 5,465,297
406 5,465,298

CLASS 380

23 5,465,299
30 5,465,300
54 5,465,301

CLASS 381

92 5,465,302

CLASS 382

124 5,465,303
159 5,465,308
165 5,465,307
176 5,465,304
218 5,465,305
229 5,465,309
276 5,465,306

CLASS 383

10 5,464,285
75 5,464,286

CLASS 384

13 5,464,287
15 5,464,288

CLASS 385

22 5,465,310
27 5,465,311
40 5,465,312
80 5,465,313
85 5,465,314
116 5,465,315

CLASS 395

2.28 5,465,316
2.45 5,465,317
2.52 5,465,318
11 5,465,319
22 5,465,320
114 5,465,322
123 5,465,323
133 5,465,324
141 5,465,325
147 5,465,326
159 5,465,327
165 A882,683
182.02 5,465,348
182.13 5,465,328
183.06 5,465,341
200.03 5,465,366
200.04 5,465,370
200.08 5,465,331
200.15 5,465,345
231 5,465,333
296 5,465,346
310 5,465,338
375 5,465,334
404 5,465,382
417 5,465,337
433 5,465,339
438 5,465,329
439 5,465,343
446 5,465,342
458 5,465,344
550 5,465,347
600 5,465,350
650 5,465,354
700 5,465,358
750 5,465,366
800 5,465,368
824 5,465,330
842 5,465,332
846 5,465,340

CLASS 400

62 5,464,289
76 5,464,290
185 5,464,291
715 5,464,292
718 5,464,293

CLASS 401

269 5,464,294

CLASS 403

84 5,464,295
138 5,464,296
231 5,464,297
252 5,464,298
297 5,464,299
322 5,464,300
335 5,464,302
362 5,464,305

CLASS 404

6 5,464,306
75 5,464,303

CLASS 405

166 5,464,307
183 5,464,308
258 5,464,309

CLASS 406

164 5,464,310

CLASS 411

340 5,464,311

CLASS 412

7 5,464,312

CLASS 414

172 5,464,313
427 5,464,314
458 5,464,315
798.2 5,464,316

CLASS 415

28 5,464,318
55.1 5,464,319
60 5,464,320
115 5,464,322

CLASS 416

93 A 5,464,321
134 R 5,464,323
167 5,464,324
185 5,464,325
193 A 5,464,326

CLASS 417

12 5,464,327
44.8 5,464,328
68 5,464,329
245 5,464,330
364 5,464,331
368 5,464,332
420 5,464,333
494 5,464,334

CLASS 422

34 5,464,580
82.01 5,464,581
82.07 5,464,587
88 5,464,588
131 5,464,590
142 5,464,591
207 5,464,592
224 5,464,593
288 5,464,594
297 5,464,595

CLASS 423

101 5,464,596
210 5,464,597
220 5,464,598
239.1 5,464,599
300 5,464,600
303 5,464,601
488 5,464,602
501 5,464,603
570 5,464,604
579 5,464,605
635 5,464,606

CLASS 424

9.452 5,464,607
53 5,464,608
54 5,464,609
61 5,464,610
78.1 5,464,612
84 5,464,613
94.3 5,464,614
94.63 5,464,615
114 5,464,616
195.1 5,464,618
221.1 5,464,621
405 5,464,622
408 5,464,626
409 5,464,627
448 5,464,628
450 5,464,629
454 5,464,631
465 5,464,632
480 5,464,633
493 5,464,634
661 5,464,636

CLASS 425

71 5,464,335
72.1 5,464,336
172 5,464,337
145 5,464,338
186 5,464,339
382.3 5,464,340
388 5,464,341
532 5,464,635
533 5,464,342
549 5,464,343

CLASS 426

2 5,464,637
20 5,464,639
231 5,464,640
241 5,464,641
439 5,464,642
549 5,464,644
573 5,464,645
615 5,464,646
618 5,464,647
643 5,464,648
660 5,464,649

CLASS 427

2.30 5,464,650
64 5,464,651
96 5,464,653
97 5,464,652
125 5,464,654
238 5,464,655
248.1 5,464,656
255.5 5,464,657
385.5 5,464,658
387 5,464,659
389 5,464,660
409 5,464,661
510 5,464,662
529 5,464,663
535 5,464,664
570 5,464,665
576 5,464,666
577 5,464,667

CLASS 428

1 5,464,668
35.8 5,464,670
36.2 Re.35,081
40 5,464,671
65.1 5,464,673
78 5,464,675
85 5,464,676
95 5,464,677
96 5,464,678
116 5,464,679
141 5,464,680
195 5,464,681
210 5,464,682
216 5,464,683
229 5,464,684
286 5,464,687
298 5,464,688
317.9 5,464,689
334 5,464,690
336 5,464,691
343 5,464,692
344 5,464,693
370 5,464,695
403 5,464,696
412 5,464,697
413 5,464,702
421 5,464,698
429 5,464,704
607 5,464,699
694 T 5,464,674

CLASS 429

30 5,464,700
53 5,464,701
61 5,464,705
194 5,464,706
212 5,464,707
218 5,464,708
229 5,464,709

CLASS 430

1 5,464,710
5 5,464,711
7 5,464,714
22 5,464,715
41 5,464,716
58 5,464,717
110 5,464,719
122 5,464,720
126 5,464,721
137 5,464,722
200 5,464,723
204 4,621,041
272 5,464,688
311 5,464,725
326 5,464,726
347 5,464,727
393 5,464,728
396 5,464,729
399 5,464,730
505 5,464,731
507 5,464,733
570 5,464,734
574 5,464,735
581 5,464,736
619 5,464,737

CLASS 431

10 5,464,344
266 5,464,345
328 5,464,346

CLASS 433

8 5,464,347
24 5,464,348
26 5,464,341
84 5,464,350

CLASS 435

4 5,464,739
5 5,464,740
6 5,464,742
7.21 5,464,750
7.23 5,464,751
7.24 5,464,752
7.6 5,464,747
7.7 5,464,748
7.92 5,464,749
18 5,464,754
34 5,464,755
69.1 5,464,756
91.2 5,464,759
139 5,464,760
147 5,464,761
156 5,464,762
172.3 5,464,763
187 5,464,766
188 5,464,767
240.2 5,464,768
240.4 5,464,769
254.21 5,464,770
262.5 5,464,771
280 5,464,772
306.1 5,464,773

CLASS 436

63 5,464,775
69 5,464,776
98 5,464,777
503 5,464,778

CLASS 437

8 5,464,779
41 5,464,780
42 5,464,783
43 5,464,784
52 5,464,788
57 5,464,789
60 5,464,790
180 5,464,792
186 5,464,793
187 5,464,794
233 5,464,795

CLASS 439

372 5,464,351
404 5,464,352
489 5,464,353
505 5,464,354
539 5,464,355
752 5,464,358

CLASS 440

89 5,464,357

CLASS 441

68 5,464,358
79 5,464,359

CLASS 446

405 Re.35,082

CLASS 449

27 5,464,360

CLASS 451

28 5,464,361
48 5,464,362
198 5,464,363
194 5,464,364
344 5,464,365
356 5,464,366
441 5,464,367

CLASS 452

149 5,464,368

CLASS 454

256 5,464,369
345 5,464,370

CLASS 455

2 5,465,384
6.1 5,465,385
15 5,465,386
26.1 5,465,387
33.1 5,465,388
33.2 5,465,389
33.4 5,465,390
38.3 5,465,392
54.1 5,465,393
55.1 5,465,395
61 5,465,396
62 5,465,397
69 5,465,398
76 5,465,400
89 5,465,401
101.2 5,465,402
186.1 5,465,403
220 5,465,404
226.4 5,465,405
234.1 5,465,406
234.2 5,465,407
249.1 5,465,408
260 5,465,409
266 5,465,410
275 5,465,411
286 5,465,412
307 5,465,413
313 5,465,414
326 5,465,415
327 5,465,416
330 5,465,417
332 5,465,418
333 5,465,419
344 5,465,421

CLASS 460

20 5,464,371
100 5,464,372

CLASS 474

140 5,464,373
224 5,464,374

CLASS 476

10 5,464,375

CLASS 482

81 5,464,376
83 5,464,377
85 5,464,378
104 Re.33,083
108 5,464,379

CLASS 501

103 5,464,797

CLASSIFICATION OF PATENTS

CLASS 501

64 5,464,798
65 5,464,799
66 5,464,800
172 5,464,801
331 5,464,802

CLASS 503

213 5,464,803
217 5,464,804

CLASS 504

101 5,464,805
205 5,464,806
214 5,464,808
227 5,464,809
273 5,464,810
281 5,464,811

CLASS 505

237 5,464,812
490 5,464,813

CLASS 512

13 5,464,824

CLASS 514

2 5,464,816
6 5,464,814
8 5,464,815
12 5,464,822
13 5,464,823
16 5,464,819
18 5,464,821
30 5,464,826
58 5,464,827
80 5,464,828
206 5,464,829
311 5,464,830
222.8 5,464,831
138.5 5,464,832
239.2 5,464,836
242 5,464,837
248 5,464,838
251 5,464,833
252 5,464,788
254 5,464,834
256 5,464,839
277 5,464,840
279 5,464,841
299 5,464,842
300 5,464,781
301 5,464,844
312 5,464,786
326 5,464,845
333 5,464,846
342 5,464,847
364 5,464,848
365 5,464,849
372 5,464,850
373 5,464,851
378 5,464,853
381 5,464,854
382 5,464,855
389 5,464,856
398 5,464,857
399 5,464,858
401 5,464,859
404 5,464,860
416 5,464,861
422 5,464,862
443 5,464,863
468 5,464,864
471 5,464,865
480 5,464,866
524 5,464,867
530 5,464,868
574 5,464,869
617 5,464,870
630 5,464,872
859 5,464,873
777 5,464,874

CLASS 521

32 5,464,875
46.5 5,464,876
48 5,464,877
50 5,464,878
51 5,464,879
60 5,464,881
85 5,464,882

CLASS 523

161 5,464,883
400 5,464,884
423 5,464,885
428 5,464,886
501 5,464,887

CLASS 524

104 5,464,888
119 5,464,889
195 5,464,890
230 5,464,891
284 5,464,892
366 5,464,893
424 5,464,894
425 5,464,895
436 5,464,896
458 5,464,897
493 5,464,898
504 5,464,899
838 5,464,900

CLASS 525

103 5,464,901
119 5,464,902
185 5,464,903
200 5,464,904
240 5,464,905
303 5,464,907
380 5,464,908
438 5,464,909
486 5,464,910
502 5,464,911
523 5,464,912
524 5,464,913

CLASS 526

180 5,464,914
225 5,464,915
264 5,464,916

CLASS 528

18 5,464,917
24 5,464,918
40 5,464,922
60 5,464,919
67 5,464,921
68 5,464,923
103 5,464,924
170 5,464,925
205 5,464,926
350 5,464,927
353 5,464,928
361 5,464,929
371 5,464,930
389 5,464,931
399 5,464,932

CLASS 530

324 5,464,933
326 5,464,934
329 5,464,935
350 5,464,936
351 5,464,939

CLASS 534

781 5,464,941

CLASS 536

11 5,464,942
23.5 5,464,943
23.51 5,464,774
23.6 5,464,944
24.31 5,464,945

CLASS 600

144 5,464,007
157 5,464,008

CLASS 601

29 5,464,380
49 5,464,381
99 5,464,382

CLASS 602

20 5,464,383
27 5,464,384

CLASS 604

20 5,464,386
22 5,464,389
35 5,464,390
67 5,464,391
82 5,464,393
96 5,464,394
153 5,464,388
191 5,464,396
246 5,464,397
280 5,464,398
283 5,464,399
385.1 5,464,401

CLASS 606

1 5,464,403
15 5,464,404
51 5,464,405
86 5,464,406
108 5,464,408
119 5,464,409
130 5,464,410
140 5,464,412
151 5,464,413
152 5,464,414
153 5,464,415
158 5,464,416
166 5,464,417
182 5,464,418
194 5,464,419
202 5,464,420
213 5,464,421
223 5,464,422
228 5,464,424
232 5,464,425

CLASS 607

1 5,464,428
4 5,464,429
5 5,464,432
6 5,464,434
9 5,464,435
86 5,464,436
101 5,464,437
116 5,464,446
129 5,464,447
138 5,464,448

CLASS 623

1 5,464,438
6 5,464,450
16 5,464,439
27 5,464,441
37 5,464,443
65 5,464,444

CLASSIFICATION OF DESIGNS

D2 743 363,811
879 363,812
915 363,813
918 363,814
960 363,815
961 363,816
D3 254 363,817
315 363,819
D4 108 363,820
132 363,821
D6 315 363,822
334 363,823
349 363,824
369 363,825
370 363,826
373 363,827
375 363,828
380 363,829
408 363,830
411 363,831
434 363,832
436 363,833
438 363,834
439 363,835
444 363,836
448 363,837
458 363,840
479 363,841
498 363,842
502 363,844
508 363,845
534 363,846
541 363,847
544 363,848
552 363,849
D7 361 363,851
392.1 363,852
504 363,853
509 363,854
513 363,855
553 363,856
608 363,858
629 363,859
673 363,860
688 363,861
D8 10 363,862
40 363,863
51 363,864
57 363,866
63 363,867
83 363,868
91 363,869
98 363,870
100 363,871
308 363,872
323 363,873
346 363,874
373 363,875
387 363,878
D9 423 363,879
456 363,880
D10 18 363,881
32 363,882
39 363,883
65 363,884
78 363,885
81 363,886
96 363,887
102 363,890
106 363,891
D11 4 363,893
40 363,894
146 363,895
148 363,896
152 363,897
164 363,898
218 363,900
222 363,901
D12 8 363,902
129 363,903
130 363,904
146 363,905
147 363,906
151 363,907
194 363,908
197 363,909
209 363,910
317 363,914
345 363,915
415 363,916
D13 108 363,917
147 363,918
160 363,919
182 363,920
184 363,921
D14 100 363,922
108 363,923
107 363,924
113 363,925
114 363,926
115 363,928
121 363,929
122 363,930
171 363,931
218 363,933
219 363,932
229 363,934
230 363,935
238 363,936
253 363,937
D15 14 363,938
15 363,939
19 363,941
69 363,942
136 363,943
150 363,944
242 363,945
D16 14 363,946
D17 36 363,947
D19 89 363,949
90 363,950
D20 42 363,951
D21 5 363,953
20 363,954
36 363,955
48 363,956
89 363,957
157 363,958
189 363,959
210 363,960
214 363,961
220 363,962
222 363,963
226 363,964
230 363,965
234 363,966
256 363,968
253 363,969
D22 134 363,970
D23 207 363,971
223 363,972
238 363,973
241 363,974
252 363,976
263 363,977
267 363,978
269 363,979
325 363,980
366 363,981
411 363,982
D24 108 363,984
111 363,985
114 363,986
122 363,987
129 363,988
187 363,989
197 363,990
200 363,991
210 363,992
215 363,994
D25 19 363,993
68 363,995
119 363,996
122 363,997
D26 24 363,998
28 363,999
60 364,000
63 364,001
88 364,002
D28 7 364,003
63 364,004
76 364,005
88 364,006
D29 113 364,007
120 364,008
121 364,009
D30 125 364,010
156 364,011
D32 19 364,012
22 364,013
34 364,014
46 364,015
52 364,016
53.1 364,017
55 364,018
73 364,019
D34 23 364,020
26 364,021
28 364,023
29 364,025
31 364,026
33 364,027
35 364,028
38 364,030
D70 47 363,952

CLASSIFICATION OF PLANTS

PL 4 9,356
11 9,357
40.1 9,358
43.2 9,361
54.1 9,362
86.8 9,364
87.15 9,366

STATUTORY INVENTION REGISTRATIONS

47 58 H1498 | 55 446 H1499 | 250 376 H1500 | 376 318 H1501 | 428 224 H1502 |

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01	:	5,463,984		5,464,127		5,464,750		5,465,174		5,463,260	5,464,741
		[illegible]		5,464,133		5,464,754		5,465,185		5,465,338	5,464,752
		5,464,513		5,464,135		5,464,755		5,465,186	09 :	5,463,795	5,464,775
		5,464,748		5,464,138		5,464,756		5,465,204		5,463,811	5,464,813
		5,465,105		5,464,153		5,464,757		5,465,206		5,463,864	5,464,835
		5,465,311		5,464,165		5,464,770		5,465,229		5,463,873	5,464,974
02	:	5,464,407		5,464,172		5,464,774		5,465,237		5,464,086	[illegible]
04	:	5,463,791		5,464,183		5,464,790		5,465,240		5,464,142	5,465,286
		[illegible]		5,464,193		5,464,815		5,465,250		5,464,144	5,465,118
		5,463,815		5,464,196		5,464,823		5,465,261		5,464,157	5,465,144
		5,463,837		5,464,197		5,464,853		5,465,263		5,464,227	5,465,193
		5,463,859		5,464,214		5,464,871		5,465,264		5,464,312	5,465,332
		5,464,011		5,464,218		[illegible]		5,465,266		5,464,317	5,465,357
		5,464,246		5,464,234		5,464,936		5,465,268		5,464,465	[illegible]
		[illegible]		5,464,255		[illegible]		5,465,272		5,464,533	[illegible]
		[illegible]		5,464,262		[illegible]		5,465,274		[illegible]	[illegible]
		5,464,425		[illegible]		[illegible]		5,465,278		5,464,639	[illegible]
		5,464,618		5,464,301		5,464,953		5,465,280		5,464,672	13 : 5,463,910
		5,464,965		5,464,327		[illegible]		5,465,298		5,464,759	5,464,277
		5,465,054		5,464,349		[illegible]		5,465,304		5,465,020	5,464,531
		5,465,067		5,464,354		5,464,979		5,465,308		5,465,082	[illegible]
		5,465,149		[illegible]		[illegible]		5,465,321		5,465,176	[illegible]
		5,465,217		[illegible]		5,464,999		5,465,325		5,465,212	5,464,771
		5,465,253		5,464,387		5,465,000		[illegible]		5,465,273	5,464,911
		5,465,300		[illegible]		5,465,002		5,465,337		5,465,381	[illegible]
		5,465,339		5,464,403		5,465,004		5,465,341	10 :	5,464,423	5,465,128
		5,465,382		5,464,411		[illegible]		5,465,343		5,464,455	[illegible]
		5,465,420		5,464,421		5,465,011		5,465,361		[illegible]	15 : 5,464,129
06	:	Re.35,080		5,464,436		5,465,015		[illegible]		5,464,627	[illegible]
		5,463,781		5,464,439		[illegible]		5,465,363		5,464,647	16 : [illegible]
		[illegible]		5,464,441		5,465,040		5,465,367		5,464,851	[illegible]
		5,463,833		5,464,447		5,465,051		5,465,370		[illegible]	5,464,583
		5,463,879		5,464,449		5,465,052		5,465,398		5,464,918	[illegible]
		[illegible]		5,464,453		[illegible]		5,465,405	11 :	5,463,784	[illegible]
		5,463,897		[illegible]		5,465,056		5,465,413		5,464,018	[illegible]
		5,463,906		5,464,503		[illegible]		5,465,414	12 :	5,463,787	[illegible]
		5,463,908		5,464,518		[illegible]		5,465,415		5,463,794	17 : 5,463,895
		5,463,925		5,464,522		5,465,072		5,465,417		5,463,985	[illegible]
		5,463,927		5,464,526		[illegible]	08 :	5,463,797		5,463,997	[illegible]
		5,463,957		5,464,527		[illegible]		5,464,029		5,464,023	5,463,964
		[illegible]		5,464,534		5,465,085		5,464,160		5,464,136	[illegible]
		5,464,041		[illegible]		[illegible]		[illegible]		[illegible]	5,463,996
		[illegible]		[illegible]		5,465,094		[illegible]		5,464,181	[illegible]
		5,464,082		[illegible]		5,465,106		[illegible]		5,464,194	[illegible]
		5,464,095		5,464,634		5,465,119		5,464,602		[illegible]	[illegible]
		5,464,096		5,464,652		[illegible]		5,464,798		5,464,377	[illegible]
		5,464,103		[illegible]		5,465,142		5,465,006		5,464,418	5,464,115
		5,464,104		5,464,707		5,465,154		5,465,034		5,464,502	5,464,143
		5,464,121		5,464,710		5,465,167		5,465,187		5,464,555	5,464,191

5,464,217
5,464,245
5,464,281
5,464,293
5,464,345
5,464,379
5,464,381
5,464,391
[illegible]
5,464,438
5,464,483
5,464,487
5,464,501
5,464,561
5,464,594
[illegible]
5,464,746
5,464,753
5,464,760
5,464,767
[illegible]
5,464,814
5,464,830
5,464,843
5,464,919
5,464,956
5,465,014
5,465,024
5,465,025
5,465,031
5,465,041
5,465,042
5,465,078
5,465,115
[illegible]
5,465,294
5,465,313
5,465,396
5,465,397
5,465,404
5,465,410
5,465,412

18 : 5,463,808
5,463,915
5,463,956
5,463,992
5,463,994
5,464,045
5,464,259
5,464,347
5,464,406
5,464,570
5,464,739
5,464,747
5,464,777
5,464,826
5,464,845
5,464,955
5,465,249

19 : 5,463,803
[illegible]
5,464,243
5,464,372
5,464,656
5,464,944
5,465,171
5,465,207

20 : 5,463,852
5,463,855
5,463,877
5,464,285
5,464,316
5,464,338
5,464,399
5,464,459
5,464,559
5,464,573
[illegible]
5,464,603
5,464,729
5,465,211
5,465,378

21 : 5,463,842
5,464,209
5,465,107

22 : 5,463,883
[illegible]
5,464,102
5,464,320
5,464,549

24 : 5,463,926
5,464,149
5,464,161
5,464,292
5,464,528
5,464,629
5,464,645
5,464,966
5,464,985
5,465,013
5,465,030
5,465,050
5,465,095

25 : Re.35,081
5,463,822
[illegible]
5,463,921
[illegible]
5,464,015
5,464,016
5,464,091
[illegible]
5,464,141
[illegible]
5,464,219
[illegible]
5,464,264
5,464,287
5,464,337
[illegible]
5,464,392
5,464,394
5,464,404
5,464,471
[illegible]
5,464,743
5,464,744
5,464,773
5,464,817
[illegible]
[illegible]
5,464,874
[illegible]

26 : 5,463,821

27 : 5,463,805
5,463,845
[illegible]
5,463,902
5,463,909
5,464,067
5,464,083
5,464,117
5,464,236
[illegible]
5,464,430
5,464,435
5,464,437

28 :
29 :
31 :
32 :
33 :
34 :
35 :

5,464,445
5,464,448
5,464,450
5,464,532
5,464,613
5,464,650
5,464,659
5,464,667
5,464,692
5,464,723
5,464,737
5,464,738
5,464,841
5,464,900
5,464,916
[illegible]
[illegible]
5,464,035
5,464,307
5,463,785
5,463,847
5,463,936
5,463,943
5,464,139
5,464,176
5,464,207
5,464,393
5,464,424
5,464,551
5,464,569
5,464,601
5,464,701
[illegible]
5,464,934
5,465,213
[illegible]
5,464,638
5,463,820
5,464,013
5,464,012
5,464,076
5,464,125
5,464,300
5,464,661
5,465,194
5,465,290
5,463,954
5,463,968
5,463,979
5,463,986
5,464,047
5,464,057
[illegible]
[illegible]
5,464,098
5,464,099
[illegible]
5,464,122
5,464,134
5,464,170
5,464,304
5,464,457
5,464,460
5,464,464
5,464,467
5,464,523
5,464,553
5,464,554
5,464,591
5,464,597
5,464,626
5,464,631
5,464,664
5,464,675
5,464,699
5,464,761
5,464,762
5,464,783
5,464,805
[illegible]
5,464,827
5,464,840
5,464,846
5,464,854
5,464,867
5,464,929
5,464,988
5,465,113
5,465,199
5,465,286
5,465,293
5,465,295
5,465,319
5,465,365
5,465,379
5,465,387
5,465,389
5,465,046
5,465,104

36 : Re.35,083
5,463,783
5,463,793
5,463,814
5,463,853
5,463,871
5,463,876
5,463,893
[illegible]
5,463,972
5,463,981
5,464,004
5,464,007
5,464,021
5,464,030
5,464,034
5,464,071
5,464,081
5,464,109
5,464,111
5,464,213
5,464,221
5,464,343
5,464,360
5,464,374
5,464,376
5,464,389
5,464,413
5,464,498
5,464,544
5,464,568
5,464,592
5,464,596
5,464,665
5,464,682
5,464,691
[illegible]
5,464,702
5,464,703
5,464,719
5,464,726
5,464,727
5,464,728
5,464,733
5,464,735
5,464,736
5,464,740
5,464,749
5,464,825
5,464,852
5,464,865
5,464,927
5,464,930
5,464,949
5,465,012
5,465,019
5,465,060
5,465,110
5,465,124
5,465,129
5,465,134
5,465,138
5,465,152
5,465,201
5,465,230
5,465,271
5,465,281
5,465,283
5,465,296
5,465,317
5,465,322
5,465,331
5,465,333
5,465,347
5,465,353
5,465,355
5,465,359
5,465,374
5,465,377
5,465,384

37 : 5,463,807
5,464,269
5,464,452
5,464,466
5,464,545
5,464,563
5,464,584
5,464,676
5,464,677
5,464,678
5,464,742
5,464,766
5,464,776
5,464,933
5,465,329
5,465,342

39 : 5,463,799
5,463,800
5,463,818
5,463,834
5,463,865
5,463,941
5,463,974
[illegible]
5,464,024
5,464,042
5,464,050
5,464,051
5,464,107
5,464,120
5,464,177
5,464,211
5,464,275
5,464,283
5,464,332
5,464,342
5,464,401
5,464,416
5,464,519
5,464,548
5,464,609
5,464,619
5,464,642
5,464,643
5,464,709
5,464,885
5,464,899
5,464,952
5,464,957
5,464,958
5,464,962
5,465,109
5,465,215
5,465,219
5,465,221

40 : 5,463,961
5,464,061
5,464,385
5,464,496
5,464,778
5,464,931

41 : 5,463,782
5,463,824
5,463,843
5,463,849
5,464,001
5,464,049
5,464,075
5,464,254
5,464,540
5,464,797
[illegible]
5,465,151
5,465,222

42 : 5,463,779
5,463,786
5,463,789
5,463,804
5,463,823
5,463,835
5,463,854
[illegible]
[illegible]
5,463,872
[illegible]
5,463,899
[illegible]
5,463,960
5,463,987
[illegible]
5,464,092
5,464,203
5,464,210
5,464,224
5,464,274
5,464,335
5,464,346
5,464,355
5,464,410
5,464,469
5,464,470
5,464,477
5,464,484
5,464,529
5,464,564
5,464,567
5,464,580
5,464,605
5,464,622
5,464,625
5,464,630
5,464,649
5,464,657

44 : 5,463,904
45 : 5,463,816
46 : 5,464,271
47 : 5,463,780
48 : Re.35,079
49 : 5,464,044

5,464,869
5,464,887
5,464,893
[illegible]
5,464,904
[illegible]
5,464,932
5,464,935
5,464,983
5,465,256
5,465,275
5,465,279
5,465,366
5,465,418
5,463,969
5,463,844
5,464,166
5,464,229
5,464,546
5,464,685
5,464,890
5,464,610
5,464,883
[illegible]
5,465,016
5,463,792
[illegible]
5,463,903
5,463,965
[illegible]
[illegible]
5,464,054
[illegible]
5,464,060
5,464,062
5,464,063
5,464,078
5,464,188
5,464,192
5,464,212
5,464,215
5,464,331
5,464,444
5,464,456
5,464,475
5,464,479
5,464,499
5,464,504
5,464,505
5,464,525
5,464,530
5,464,624
5,464,636
5,464,687
5,464,711
5,464,768
5,464,792
5,464,831
5,464,866
5,464,878
5,464,886
5,464,912
5,464,923
5,464,941
5,464,996
5,465,005
5,465,018
5,465,033
[illegible]
[illegible]
5,465,075
5,465,121
5,465,127
5,465,155
5,465,189
5,465,224
5,465,233
5,465,243
[illegible]
5,465,327
5,465,336
5,465,346
[illegible]
5,465,373
5,465,401
5,465,402
5,465,421
5,464,093
5,464,171
5,464,240
5,464,249
5,464,280

	5,464,348			5,464,926			5,464,152			5,464,938			5,463,970			5,464,577
	5,464,481			5,464,928			5,464,168			5,464,961			5,463,982			5,464,688
	5,464,535			5,465,289			5,464,185			5,465,090			5,464,010			5,464,681
	5,464,536			5,465,297			5,464,402			5,465,238			5,464,088			5,464,745
	5,464,764			5,465,303			5,464,428			5,465,399			5,464,178			5,464,858
50	: 5,465,227	53	:	5,463,817			5,464,431	54	:	5,464,154			5,464,279			5,464,888
	5,465,262			5,463,862			5,464,432			5,464,560			5,464,289			5,464,969
51	: 5,463,945			5,463,866			5,464,433			5,464,889			5,464,330			5,464,976
	5,464,065			5,463,918			5,464,442			5,465,028			5,464,357			5,465,196
	5,464,173			5,463,932			5,464,541	55	:	5,463,829			5,464,369			5,465,203
	5,464,257			5,464,019			5,464,581			5,463,937			5,464,417			
	5,464,321			5,464,094			5,464,862			5,463,942			5,464,461			
	5,464,412			5,464,137			5,464,937			5,463,944			5,464,488			

DESIGN PATENTS

01	: 363,825			363,975			363,899			363,879	37	:	363,833			363,856
	363,874			363,979			363,919			363,896			363,835			363,970
04	: 363,892			363,985			363,931			363,910			363,836			363,987
	363,902			363,990			363,984			363,940			363,838	48	:	363,832
	363,955			364,007			364,022			363,941			363,839			363,837
	363,963			364,009			364,030			363,993			363,842			363,841
05	: 363,968			364,015	18	:	363,850			364,011			363,843			363,845
06	: 363,814			364,020			363,982	29	:	363,914			363,844			363,888
	363,820	08	:	363,854			363,999	30	:	363,819			363,909			363,928
	363,823			363,965	19	:	363,890			363,863	39	:	363,818			363,938
	363,849			364,012			363,995	32	:	363,956			363,834			363,946
	363,852	09	:	363,884			364,023			363,962			363,905			363,959
	363,853			363,889	20	:	363,868	33	:	363,815			363,906			363,971
	363,857			364,017			363,966			363,945			363,907			363,980
	363,864	12	:	363,812	23	:	363,969	34	:	364,006			363,908			363,983
	363,865			363,826	24	:	363,875	36	:	363,821			363,957			363,986
	363,872			363,829			363,948			363,838			364,002	49	:	364,003
	363,887			363,915	25	:	363,824			363,840			364,018	51	:	363,846
	363,901			363,937			363,895			363,856	41	:	363,827	53	:	363,816
	363,910			363,938			363,916			363,876			363,927			363,904
	363,911			364,016			363,961			363,918			364,024			363,936
	363,912	13	:	363,869			363,968			363,935	42	:	363,859			363,943
	363,913			363,871			363,989			363,976			363,860			364,028
	363,926			363,900	26	:	363,830			363,991			363,877	55	:	363,831
	363,934			363,932			363,848			363,998			363,894			363,866
	363,951			363,978			363,853			364,000	44	:	363,862			363,920
	363,953			364,025			364,004			364,001			363,867			363,981
	363,954	17	:	363,847			364,014			364,005	45	:	363,944			
	363,967			363,873	27	:	363,822			364,008	47	:	363,811			
	363,974			363,880			363,870			364,029			363,813			

PLANT PATENTS

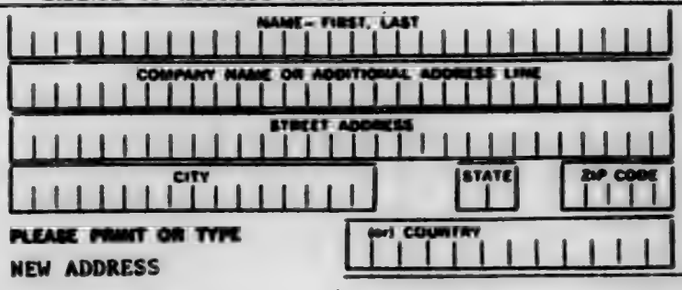
00	: 9,358			9,359			9,360	39	:	9,361					

STATUTORY INVENTION REGISTRATIONS

16	: H1501	34	:	H1500	36	:	H1499	45	:	H1502	55	:	H1498		

U.S. GOVERNMENT PRINTING OFFICE : 1995 O - 165-917 : QL 3

CHANGE OF ADDRESS FORM



PLEASE PRINT OR TYPE

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

Superintendent of Documents **Subscription** Order Form

Order Processing Code:
* **5606**

❑ **YES,** enter _____ subscription(s) to **Official Gazette of the U.S. Patent and Trademark Office: Patents** (OG) for $549 per year ($686.25 foreign).

The total cost of my order is $_____. Price includes regular shipping and handling and is subject to change. International customers please add 25%.

Company or personal name (Please type or print)

Additional address/attention line

Street address

City, State, Zip code

Daytime phone including area code

Purchase order number (optional)

For privacy protection, check the box below:
❑ Do not make my name available to other mailers

Check method of payment:
❑ Check payable to Superintendent of Documents
❑ GPO Deposit Account ☐☐☐☐☐☐☐–☐
❑ VISA ❑ MasterCard

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐ (expiration date)

Authorizing signature 4/95

Charge your order. It's easy!

MasterCard VISA

Fax your orders (202) 512–2250

Phone your orders (202) 512–1800

Thank you for your order!

Mail To: Superintendent of Documents
P.O. Box 371954, Pittsburgh, PA 15250–7954

Important: Please be sure to include this completed order form with your remittance.

Vol. 1180 Number 2

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

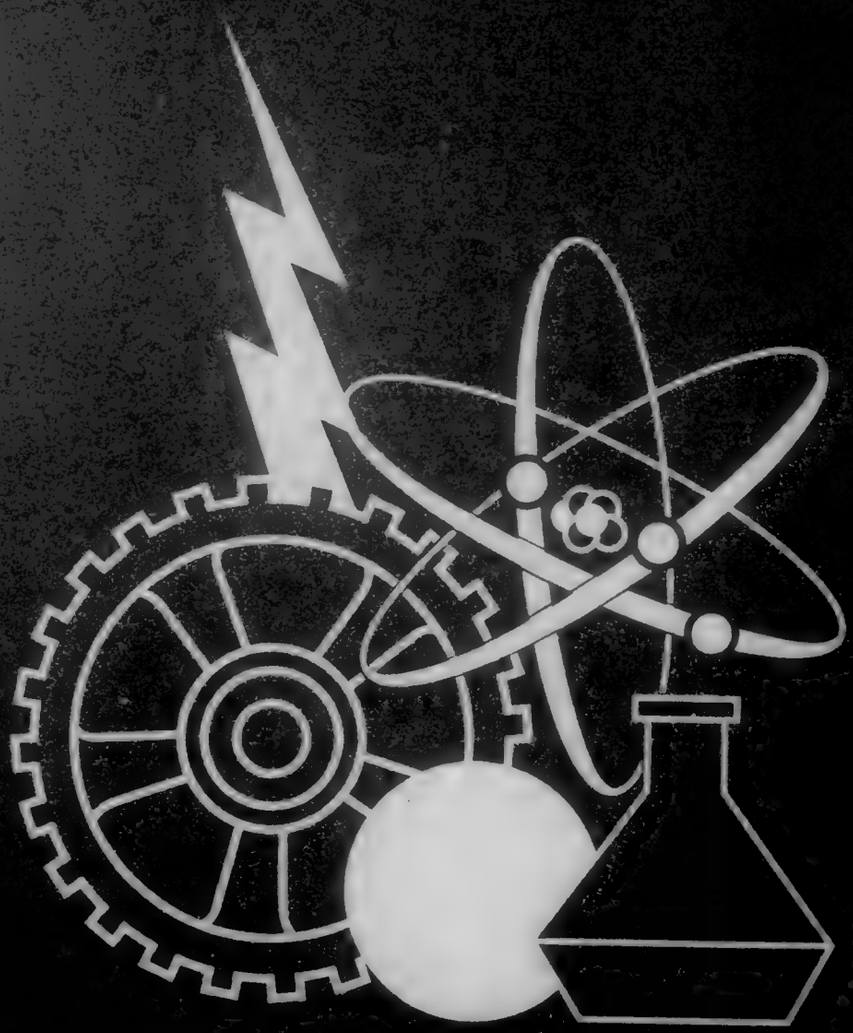
te to:

U.S.
DEPARTMENT
F COMMERCE

Patent
and
Trademark
Office

PATENTS

November 14, 1995



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

November 14, 1995 Volume 1180 Number 2

CONTENTS

			Page
Patent and Trademark Office Notices			
Patent Cooperation Treaty (PCT) Information	1180	OG	41
Notice of Maintenance Fees Payable	1180	OG	41
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee	1180	OG	42
Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 9/15/95	1180	OG	50
Errata	1180	OG	50
Reissue Applications Filed	1180	OG	50
Requests for Reexaminations Filed	1180	OG	51
Notice of Expiration of Trademark Registrations Due To Failure to Renew	1180	OG	52
Service by Publication	1180	OG	54
Patents Available for License or Sale	1180	OG	54
Disclaimers	1180	OG	55
Dedication	1180	OG	55
Disclaimer and Dedication	1180	OG	55
Patent Certificates of Correction	1180	OG	56
Special Boxes for Mail	1180	OG	57
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1180	OG	59
Patent Examining Corps	1180	OG	61
Condition of Trademark Applications	1180	OG	62
Reexaminations			613
Reissue Patents Granted (35,084)			617
Plant Patents Granted (9,368)			621
Patents Granted			
General and Mechanical (5,465,423)			623
Chemical (5,466,263)			919
Electrical (5,466,882)			1103
Design Patents Granted (364,031)			1311
Index of Patentees		PI	1
Indices of Reissue, Reexaminations, Design and Plant Patents		PI	93
Classification of			
Patents (Including Reissues and Reexaminations)		PI	101
Designs and Plants Applications		PI	105
Geographical Index of Residence of Inventors			
Patents (Including Reissues and Reexaminations)		PI	107
Designs and Plant Applications		PI	109
Change of Address Form		PI	111
Subscription Order Form		PI	113

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, to whom all subscriptions should be made payable and all communications addressed. VISA or MasterCard may be used for telephone orders, (202)-512-1800.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly. Stock No. 703-033-00000-8
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly. Stock No. 703-034-00000-4
PATENT AND TRADEMARK OFFICE NOTICES, issued weekly. Stock No. 703-035-00000-1
GENERAL INFORMATION concerning PATENTS. Stock No. 003-004-00661-7

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $3.00 each; PLANT PATENTS in color, $12.00 each; copies of TRADEMARKS at $3.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S.P.T.O.

For sale by the U.S. Government Printing Office
Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402–9328

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1178 O.G. 29, on September 12, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1174 O.G. 57, on May 9, 1995.

International fees were changed, effective on January 1, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1168 O.G. 99, on November 29, 1994.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1995, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	660.00
—Corresponding prior U.S. national application filed	430.00
—Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1722.00
International fees	
Basic fee	604.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region	
—For the first 10 national or regional offices designated	147.00
—For each designation in excess of 10 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
—Designation fee	147.00
—Confirmation fee	73.50
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	185.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—USPTO was ISA in PCT Chapter I	470.00
—Additional examination fee, per additional invention (payable only upon invitation)	140.00
—USPTO was not ISA in PCT Chapter I	710.00
—Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
—All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
—All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
—Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
—Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
—For each independent claim in excess of 3	39.00	78.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	125.00	250.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

Sept. 11, 1995

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 10, 1992 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,161,257 through 5,163,181
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 8, 1988 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,782,534 through 4,783,852
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 6, 1984 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,480,339 through 4,481,678
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED September 6, 1995
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 33,255	07/302,965	07/10/90
(4,690,223)	(06/872,920)	(09/01/87)
Re. 33,710	07/400,677	10/08/91
(4,689,932)	(06/795,534)	(09/01/87)
4,402,091	06/396,923	09/06/83
4,402,099	06/259,897	09/06/83
4,402,108	06/234,751	09/06/83
4,402,117	06/261,210	09/06/83
4,402,120	06/318,914	09/06/83
4,402,125	06/290,412	09/06/83
4,402,126	06/264,888	09/06/83
4,402,127	06/295,108	09/06/83
4,402,129	06/240,388	09/06/83
4,402,130	06/285,636	09/06/83
4,402,131	06/318,202	09/06/83
4,402,136	06/247,535	09/06/83
4,402,137	06/420,263	09/06/83
4,402,145	06/296,783	09/06/83
4,402,155	06/322,776	09/06/83
4,402,156	06/294,197	09/06/83
4,402,158	06/230,852	09/06/83
4,402,159	06/238,119	09/06/83
4,402,160	06/263,137	09/06/83
4,402,167	06/222,481	09/06/83
4,402,173	06/257,584	09/06/83
4,402,179	06/272,938	09/06/83
4,402,182	06/284,351	09/06/83
4,402,183	06/322,988	09/06/83
4,402,187	06/377,553	09/06/83
4,402,192	06/336,144	09/06/83
4,402,193	06/290,101	09/06/83
4,402,195	06/345,035	09/06/83
4,402,198	06/294,299	09/06/83
4,402,199	06/301,487	09/06/83
4,402,204	06/251,194	09/06/83
4,402,209	06/272,735	09/06/83
4,402,211	06/265,656	09/06/83
4,402,213	06/278,476	09/06/83
4,402,221	06/272,837	09/06/83
4,402,222	06/342,901	09/06/83
4,402,227	06/264,142	09/06/83
4,402,229	06/284,485	09/06/83
4,402,233	06/232,308	09/06/83
4,402,234	06/292,725	09/06/83
4,402,236	06/231,155	09/06/83
4,402,250	06/243,959	09/06/83
4,402,253	06/217,638	09/06/83
4,402,257	06/425,496	09/06/83
4,402,262	06/273,182	09/06/83

Patent Number	Serial Number	Issue Date
4,402,285	06/238,792	09/06/83
4,402,306	06/360,659	09/06/83
4,402,309	06/313,656	09/06/83
4,402,318	06/268,562	09/06/83
4,402,326	06/258,646	09/06/83
4,402,327	06/272,925	09/06/83
4,402,330	06/261,718	09/06/83
4,402,333	06/338,478	09/06/83
4,402,337	06/260,508	09/06/83
4,402,340	06/259,724	09/06/83
4,402,341	06/247,142	09/06/83
4,402,344	06/264,247	09/06/83
4,402,346	06/415,691	09/06/83
4,402,357	06/322,115	09/06/83
4,402,362	06/253,935	09/06/83
4,402,369	06/266,935	09/06/83
4,402,373	06/342,940	09/06/83
4,402,376	06/247,836	09/06/83
4,402,379	06/279,049	09/06/83
4,402,381	06/219,732	09/06/83
4,402,384	06/318,129	09/06/83
4,402,387	06/285,687	09/06/83
4,402,388	06/261,186	09/06/83
4,402,389	06/237,972	09/06/83
4,402,396	06/348,684	09/06/83
4,402,398	06/324,812	09/06/83
4,402,399	06/317,815	09/06/83
4,402,403	06/335,490	09/06/83
4,402,421	06/384,239	09/06/83
4,402,423	06/224,474	09/06/83
4,402,427	06/286,096	09/06/83
4,402,438	06/257,667	09/06/83
4,402,440	06/266,366	09/06/83
4,402,446	06/251,923	09/06/83
4,402,454	06/307,822	09/06/83
4,402,458	06/249,138	09/06/83
4,402,459	06/304,471	09/06/83
4,402,460	06/279,082	09/06/83
4,402,467	06/271,732	09/06/83
4,402,469	06/289,037	09/06/83
4,402,470	06/325,913	09/06/83
4,402,473	06/245,316	09/06/83
4,402,477	06/364,699	09/06/83
4,402,496	06/307,083	09/06/83
4,402,498	06/245,797	09/06/83
4,402,502	06/250,619	09/06/83
4,402,510	06/348,506	09/06/83
4,402,511	06/377,126	09/06/83
4,402,514	06/300,809	09/06/83
4,402,524	06/220,047	09/06/83
4,402,526	06/227,383	09/06/83
4,402,527	06/247,534	09/06/83
4,402,528	06/274,866	09/06/83
4,402,534	06/267,522	09/06/83
4,402,541	06/352,524	09/06/83
4,402,542	06/298,156	09/06/83
4,402,545	06/237,660	09/06/83
4,402,546	06/318,010	09/06/83
4,402,549	06/219,404	09/06/83
4,402,554	06/424,792	09/06/83
4,402,557	06/296,132	09/06/83
4,402,558	06/331,596	09/06/83
4,402,561	06/248,606	09/06/83
4,402,563	06/266,929	09/06/83
4,402,567	06/271,497	09/06/83
4,402,570	06/253,622	09/06/83
4,402,571	06/234,959	09/06/83
4,402,575	06/259,662	09/06/83
4,402,583	06/289,513	09/06/83
4,402,592	06/250,124	09/06/83
4,402,597	06/290,619	09/06/83
4,402,599	06/242,689	09/06/83
4,402,600	06/314,429	09/06/83
4,402,604	06/245,125	09/06/83
4,402,616	06/336,929	09/06/83
4,402,627	06/364,896	09/06/83
4,402,643	06/235,452	09/06/83
4,402,648	06/297,855	09/06/83
4,402,652	06/277,266	09/06/83
4,402,654	06/241,741	09/06/83
4,402,658	06/304,234	09/06/83
4,402,660	06/398,693	09/06/83
4,402,661	06/421,690	09/06/83
4,402,674	06/353,823	09/06/83
4,402,677	06/227,586	09/06/83
4,402,679	06/316,850	09/06/83
4,402,680	06/281,649	09/06/83
4,402,684	06/302,875	09/06/83
4,402,695	06/249,005	09/06/83
4,402,702	06/331,334	09/06/83
4,402,709	06/372,420	09/06/83
4,402,712	06/329,476	09/06/83
4,402,718	06/354,264	09/06/83
4,402,719	06/378,663	09/06/83
4,402,725	06/241,325	09/06/83
4,402,726	06/279,040	09/06/83
4,402,736	06/285,082	09/06/83
4,402,737	06/413,906	09/06/83
4,402,747	06/263,834	09/06/83
4,402,748	06/383,905	09/06/83
4,402,754	06/349,878	09/06/83
4,402,760	06/272,158	09/06/83
4,402,761	06/342,861	09/06/83
4,402,764	06/351,341	09/06/83
4,402,765	06/340,102	09/06/83
4,402,766	06/357,634	09/06/83
4,402,768	06/265,573	09/06/83
4,402,770	06/314,325	09/06/83
4,402,779	06/284,224	09/06/83
4,402,780	06/257,770	09/06/83
4,402,783	06/259,062	09/06/83
4,402,789	06/303,218	09/06/83
4,402,790	06/374,822	09/06/83
4,402,791	06/291,164	09/06/83
4,402,793	06/319,724	09/06/83
4,402,794	06/381,121	09/06/83
4,402,796	06/419,855	09/06/83
4,402,797	06/419,856	09/06/83
4,402,798	06/348,677	09/06/83
4,402,799	06/307,687	09/06/83
4,402,800	06/369,242	09/06/83
4,402,802	06/339,310	09/06/83
4,402,804	06/379,219	09/06/83
4,402,805	06/358,222	09/06/83
4,402,806	06/354,854	09/06/83
4,402,807	06/295,794	09/06/83
4,402,808	06/404,346	09/06/83
4,402,809	06/299,247	09/06/83
4,402,812	06/359,502	09/06/83
4,402,823	06/288,095	09/06/83
4,402,824	06/247,332	09/06/83
4,402,825	06/344,445	09/06/83
4,402,826	06/318,972	09/06/83
4,402,829	06/336,960	09/06/83
4,402,833	06/237,806	09/06/83
4,402,839	06/262,166	09/06/83
4,402,841	06/348,896	09/06/83
4,402,842	06/291,005	09/06/83
4,402,855	06/283,740	09/06/83
4,402,856	06/251,673	09/06/83
4,402,862	06/380,448	09/06/83
4,402,864	06/292,962	09/06/83
4,402,865	06/318,229	09/06/83
4,402,866	06/331,117	09/06/83
4,402,869	06/235,795	09/06/83
4,402,872	06/357,077	09/06/83
4,402,878	06/353,867	09/06/83
4,402,879	06/353,866	09/06/83
4,402,882	06/295,170	09/06/83
4,402,885	06/373,464	09/06/83
4,402,889	06/345,932	09/06/83
4,402,890	06/330,523	09/06/83
4,402,897	06/355,484	09/06/83
4,402,899	06/283,069	09/06/83
4,402,903	06/299,458	09/06/83
4,402,905	06/355,071	09/06/83

Patent Number	Serial Number	Issue Date
4,402,906	06/272,526	09/06/83
4,402,910	06/393,886	09/06/83
4,402,911	06/286,311	09/06/83
4,402,913	06/306,961	09/06/83
4,402,920	06/248,125	09/06/83
4,402,922	06/330,611	09/06/83
4,402,923	06/298,653	09/06/83
4,402,925	06/306,385	09/06/83
4,402,926	06/306,104	09/06/83
4,402,929	06/335,784	09/06/83
4,402,936	06/235,066	09/06/83
4,402,944	06/383,911	09/06/83
4,402,949	06/317,660	09/06/83
4,402,957	06/261,420	09/06/83
4,402,959	06/325,090	09/06/83
4,402,960	06/280,163	09/06/83
4,402,970	06/381,272	09/06/83
4,402,974	06/276,657	09/06/83
4,402,975	06/284,562	09/06/83
4,402,976	06/257,453	09/06/83
4,402,978	06/256,911	09/06/83
4,402,983	06/400,950	09/06/83
4,403,002	06/443,996	09/06/83
4,403,005	06/234,909	09/06/83
4,403,010	06/286,366	09/06/83
4,403,017	06/325,959	09/06/83
4,403,020	06/354,274	09/06/83
4,403,021	06/447,049	09/06/83
4,403,027	06/332,186	09/06/83
4,403,034	06/240,099	09/06/83
4,403,035	06/275,242	09/06/83
4,403,038	06/298,974	09/06/83
4,403,043	06/413,316	09/06/83
4,403,044	06/236,383	09/06/83
4,403,048	06/419,219	09/06/83
4,403,054	06/296,555	09/06/83
4,403,055	06/322,785	09/06/83
4,403,056	06/228,780	09/06/83
4,403,058	06/366,181	09/06/83
4,403,068	06/348,559	09/06/83
4,403,086	06/334,795	09/06/83
4,403,089	06/408,588	09/06/83
4,403,090	06/415,210	09/06/83
4,403,095	06/242,793	09/06/83
4,403,101	06/349,510	09/06/83
4,403,103	06/349,569	09/06/83
4,403,105	06/373,751	09/06/83
4,403,107	06/216,573	09/06/83
4,403,111	06/283,415	09/06/83
4,403,112	06/265,045	09/06/83
4,403,115	06/308,276	09/06/83
4,403,119	06/277,080	09/06/83
4,403,127	06/371,227	09/06/83
4,403,134	06/359,069	09/06/83
4,403,136	06/244,767	09/06/83
4,403,138	06/263,926	09/06/83
4,403,141	06/330,946	09/06/83
4,403,142	06/263,425	09/06/83
4,403,147	06/348,129	09/06/83
4,403,148	06/261,491	09/06/83
4,403,150	06/236,133	09/06/83
4,403,152	06/264,283	09/06/83
4,403,160	06/331,271	09/06/83
4,403,162	06/320,897	09/06/83
4,403,164	06/338,148	09/06/83
4,403,169	06/256,348	09/06/83
4,403,171	06/336,098	09/06/83
4,403,172	06/228,566	09/06/83
4,403,174	06/293,060	09/06/83
4,403,182	06/313,999	09/06/83
4,403,184	06/359,393	09/06/83
4,403,185	06/386,719	09/06/83
4,403,193	06/265,322	09/06/83
4,403,194	06/242,571	09/06/83
4,403,198	06/248,286	09/06/83
4,403,204	06/339,354	09/06/83
4,403,207	06/314,756	09/06/83
4,403,210	06/343,843	09/06/83
4,403,211	06/312,340	09/06/83
4,403,213	06/242,620	09/06/83
4,403,215	06/255,147	09/06/83
4,403,217	06/274,849	09/06/83
4,403,219	06/275,244	09/06/83
4,403,224	06/341,675	09/06/83
4,403,225	06/381,597	09/06/83
4,403,226	06/248,137	09/06/83
4,403,231	06/343,983	09/06/83
4,403,232	06/345,426	09/06/83
4,403,235	06/276,260	09/06/83
4,403,245	06/307,483	09/06/83
4,403,248	06/240,540	09/06/83
4,403,253	06/335,013	09/06/83
4,403,255	06/324,584	09/06/83
4,403,264	06/237,849	09/06/83
4,403,266	06/245,217	09/06/83
4,403,267	06/378,078	09/06/83
4,403,268	06/343,616	09/06/83
4,403,274	06/222,932	09/06/83
4,403,277	06/229,897	09/06/83
4,403,280	06/374,746	09/06/83
4,403,299	06/237,825	09/06/83
4,403,303	06/264,466	09/06/83
4,403,304	06/239,233	09/06/83
4,403,307	06/280,008	09/06/83
4,403,309	06/268,658	09/06/83
4,403,313	06/217,248	09/06/83
4,403,319	06/301,901	09/06/83
4,403,321	06/254,569	09/06/83
4,403,324	06/266,989	09/06/83
4,403,329	06/280,745	09/06/83
4,403,331	06/259,442	09/06/83
4,403,341	06/352,584	09/06/83
4,689,828	07/000,067	09/01/87
4,689,831	06/879,452	09/01/87
4,689,838	06/831,408	09/01/87
4,689,839	06/902,179	09/01/87
4,689,845	06/867,217	09/01/87
4,689,846	06/926,634	09/01/87
4,689,847	06/836,943	09/01/87
4,689,848	06/877,533	09/01/87
4,689,851	06/840,039	09/01/87
4,689,855	06/824,122	09/01/87
4,689,857	06/886,711	09/01/87
4,689,860	06/866,388	09/01/87
4,689,863	06/613,907	09/01/87
4,689,873	06/769,742	09/01/87
4,689,878	06/289,499	09/01/87
4,689,879	06/838,358	09/01/87
4,689,882	06/663,537	09/01/87
4,689,883	06/794,856	09/01/87
4,689,887	06/877,649	09/01/87
4,689,890	06/880,651	09/01/87
4,689,898	06/774,785	09/01/87
4,689,903	06/770,588	09/01/87
4,689,904	06/912,270	09/01/87
4,689,905	06/891,436	09/01/87
4,689,906	06/767,802	09/01/87
4,689,907	06/863,003	09/01/87
4,689,910	06/836,746	09/01/87
4,689,918	06/816,946	09/01/87
4,689,923	06/731,670	09/01/87
4,689,926	06/826,182	09/01/87
4,689,940	06/743,627	09/01/87
4,689,943	06/821,251	09/01/87
4,689,944	06/900,412	09/01/87
4,689,950	06/745,166	09/01/87
4,689,953	06/896,375	09/01/87
4,689,956	06/858,198	09/01/87
4,689,957	06/779,178	09/01/87
4,689,958	06/898,177	09/01/87
4,689,959	06/881,402	09/01/87
4,689,961	06/910,783	09/01/87
4,689,962	06/819,560	09/01/87
4,689,964	06/847,232	09/01/87
4,689,975	06/902,597	09/01/87
4,689,978	06/923,766	09/01/87

Patent Number	Serial Number	Issue Date
4,689,980	06/907,475	09/01/87
4,689,982	06/795,824	09/01/87
4,689,984	06/812,275	09/01/87
4,689,985	06/836,377	09/01/87
4,689,993	06/875,643	09/01/87
4,690,001	06/797,435	09/01/87
4,690,008	06/763,741	09/01/87
4,690,013	06/829,004	09/01/87
4,690,014	06/804,785	09/01/87
4,690,016	06/751,896	09/01/87
4,690,019	06/798,287	09/01/87
4,690,023	06/898,742	09/01/87
4,690,027	06/844,402	09/01/87
4,690,029	06/939,860	09/01/87
4,690,030	06/653,835	09/01/87
4,690,038	06/817,358	09/01/87
4,690,040	06/866,707	09/01/87
4,690,042	06/866,749	09/01/87
4,690,043	06/767,727	09/01/87
4,690,049	06/922,542	09/01/87
4,690,050	06/796,775	09/01/87
4,690,056	06/696,905	09/01/87
4,690,057	06/864,379	09/01/87
4,690,058	07/020,119	09/01/87
4,690,059	06/832,318	09/01/87
4,690,062	06/877,795	09/01/87
4,690,066	06/726,982	09/01/87
4,690,067	06/732,427	09/01/87
4,690,068	06/782,687	09/01/87
4,690,074	06/859,138	09/01/87
4,690,076	06/848,065	09/01/87
4,690,081	06/808,518	09/01/87
4,690,082	06/796,392	09/01/87
4,690,083	06/797,418	09/01/87
4,690,084	06/811,780	09/01/87
4,690,086	06/695,696	09/01/87
4,690,087	06/894,162	09/01/87
4,690,090	06/923,916	09/01/87
4,690,095	06/865,949	09/01/87
4,690,101	06/879,260	09/01/87
4,690,104	06/864,086	09/01/87
4,690,105	06/863,972	09/01/87
4,690,106	06/879,639	09/01/87
4,690,109	06/777,331	09/01/87
4,690,112	06/831,423	09/01/87
4,690,113	06/857,499	09/01/87
4,690,114	06/940,225	09/01/87
4,690,118	06/847,905	09/01/87
4,690,119	06/893,776	09/01/87
4,690,129	06/931,918	09/01/87
4,690,131	06/862,111	09/01/87
4,690,133	06/775,143	09/01/87
4,690,135	06/859,459	09/01/87
4,690,136	06/807,980	09/01/87
4,690,140	06/846,727	09/01/87
4,690,144	06/364,660	09/01/87
4,690,145	06/745,084	09/01/87
4,690,152	06/790,491	09/01/87
4,690,158	06/696,122	09/01/87
4,690,160	06/695,443	09/01/87
4,690,163	06/938,812	09/01/87
4,690,165	06/898,867	09/01/87
4,690,167	06/887,736	09/01/87
4,690,176	06/828,040	09/01/87
4,690,177	06/871,510	09/01/87
4,690,184	06/821,642	09/01/87
4,690,185	06/820,053	09/01/87
4,690,187	06/935,595	09/01/87
4,690,190	06/693,684	09/01/87
4,690,191	06/810,459	09/01/87
4,690,192	06/857,158	09/01/87
4,690,193	06/763,453	09/01/87
4,690,194	07/004,312	09/01/87
4,690,196	07/016,005	09/01/87
4,690,201	06/747,262	09/01/87
4,690,204	06/779,044	09/01/87
4,690,205	06/723,962	09/01/87
4,690,209	06/712,622	09/01/87
4,690,213	06/825,338	09/01/87
4,690,217	06/897,179	09/01/87
4,690,219	06/805,030	09/01/87
4,690,222	06/813,946	09/01/87
4,690,225	06/777,880	09/01/87
4,690,231	06/832,999	09/01/87
4,690,232	06/805,883	09/01/87
4,690,236	06/536,281	09/01/87
4,690,241	06/828,618	09/01/87
4,690,243	06/891,212	09/01/87
4,690,248	06/881,691	09/01/87
4,690,249	06/865,003	09/01/87
4,690,250	07/005,234	09/01/87
4,690,251	06/850,096	09/01/87
4,690,254	06/874,880	09/01/87
4,690,261	06/831,563	09/01/87
4,690,265	06/639,358	09/01/87
4,690,266	06/314,602	09/01/87
4,690,267	06/796,020	09/01/87
4,690,276	06/904,030	09/01/87
4,690,281	07/006,301	09/01/87
4,690,283	06/813,571	09/01/87
4,690,284	06/784,009	09/01/87
4,690,285	06/800,828	09/01/87
4,690,286	06/907,972	09/01/87
4,690,289	06/844,130	09/01/87
4,690,290	06/845,261	09/01/87
4,690,292	06/876,930	09/01/87
4,690,296	06/919,596	09/01/87
4,690,298	06/845,173	09/01/87
4,690,299	06/875,047	09/01/87
4,690,306	06/891,826	09/01/87
4,690,307	06/579,381	09/01/87
4,690,309	06/881,995	09/01/87
4,690,316	06/849,270	09/01/87
4,690,317	06/773,480	09/01/87
4,690,319	06/907,330	09/01/87
4,690,324	06/879,733	09/01/87
4,690,327	06/824,835	09/01/87
4,690,335	06/837,946	09/01/87
4,690,337	06/809,326	09/01/87
4,690,339	06/912,249	09/01/87
4,690,340	06/880,638	09/01/87
4,690,342	06/844,816	09/01/87
4,690,347	06/796,012	09/01/87
4,690,354	06/859,147	09/01/87
4,690,355	06/918,285	09/01/87
4,690,357	06/743,413	09/01/87
4,690,358	06/839,135	09/01/87
4,690,359	06/858,383	09/01/87
4,690,362	06/741,353	09/01/87
4,690,367	06/816,322	09/01/87
4,690,372	06/874,034	09/01/87
4,690,373	06/779,723	09/01/87
4,690,376	06/852,417	09/01/87
4,690,378	06/832,060	09/01/87
4,690,380	06/824,243	09/01/87
4,690,385	06/915,779	09/01/87
4,690,386	06/486,844	09/01/87
4,690,388	06/931,882	09/01/87
4,690,397	06/812,952	09/01/87
4,690,400	06/806,600	09/01/87
4,690,402	06/937,197	09/01/87
4,690,403	06/813,573	09/01/87
4,690,411	06/810,310	09/01/87
4,690,415	06/896,968	09/01/87
4,690,416	06/841,558	09/01/87
4,690,420	06/858,196	09/01/87
4,690,422	06/789,627	09/01/87
4,690,424	06/823,552	09/01/87
4,690,427	06/554,579	09/01/87
4,690,434	06/227,938	09/01/87
4,690,436	06/738,469	09/01/87
4,690,438	06/810,317	09/01/87
4,690,442	06/803,572	09/01/87
4,690,445	06/866,748	09/01/87
4,690,451	06/906,926	09/01/87
4,690,455	06/860,896	09/01/87

Patent Number	Serial Number	Issue Date
4,690,462	06/819,342	09/01/87
4,690,468	06/833,036	09/01/87
4,690,475	06/902,691	09/01/87
4,690,478	06/850,460	09/01/87
4,690,481	06/813,530	09/01/87
4,690,482	06/881,366	09/01/87
4,690,489	06/702,523	09/01/87
4,690,490	06/653,983	09/01/87
4,690,493	06/489,283	09/01/87
4,690,494	06/729,245	09/01/87
4,690,499	06/711,247	09/01/87
4,690,501	06/752,582	09/01/87
4,690,502	06/752,583	09/01/87
4,690,506	06/783,363	09/01/87
4,690,509	06/656,972	09/01/87
4,690,511	06/854,684	09/01/87
4,690,516	06/658,990	09/01/87
4,690,527	06/745,918	09/01/87
4,690,536	06/905,160	09/01/87
4,690,537	06/779,185	09/01/87
4,690,541	06/771,069	09/01/87
4,690,546	06/903,478	09/01/87
4,690,549	06/824,946	09/01/87
4,690,556	06/760,381	09/01/87
4,690,557	06/742,703	09/01/87
4,690,562	06/746,338	09/01/87
4,690,564	06/668,074	09/01/87
4,690,571	06/866,327	09/01/87
4,690,574	06/931,614	09/01/87
4,690,576	06/818,474	09/01/87
4,690,580	06/769,530	09/01/87
4,690,583	06/849,539	09/01/87
4,690,584	06/724,082	09/01/87
4,690,594	06/741,603	09/01/87
4,690,596	06/873,382	09/01/87
4,690,597	06/638,970	09/01/87
4,690,600	06/866,212	09/01/87
4,690,601	06/458,073	09/01/87
4,690,609	06/908,314	09/01/87
4,690,615	06/903,024	09/01/87
4,690,618	06/780,681	09/01/87
4,690,622	06/893,952	09/01/87
4,690,624	06/886,454	09/01/87
4,690,630	06/855,260	09/01/87
4,690,631	06/837,097	09/01/87
4,690,632	06/743,131	09/01/87
4,690,641	06/825,233	09/01/87
4,690,643	06/838,245	09/01/87
4,690,649	06/723,260	09/01/87
4,690,650	06/876,590	09/01/87
4,690,651	06/823,085	09/01/87
4,690,653	06/784,360	09/01/87
4,690,654	06/798,924	09/01/87
4,690,657	06/740,328	09/01/87
4,690,661	06/769,237	09/01/87
4,690,666	06/903,961	09/01/87
4,690,667	06/853,505	09/01/87
4,690,668	06/875,898	09/01/87
4,690,678	06/747,912	09/01/87
4,690,682	06/819,979	09/01/87
4,690,692	06/623,616	09/01/87
4,690,694	06/881,882	09/01/87
4,690,703	06/853,538	09/01/87
4,690,705	06/788,711	09/01/87
4,690,708	06/629,895	09/01/87
4,690,711	06/865,303	09/01/87
4,690,718	06/799,212	09/01/87
4,690,719	06/900,642	09/01/87
4,690,722	06/923,030	09/01/87
4,690,726	06/774,665	09/01/87
4,690,733	06/794,845	09/01/87
4,690,735	06/825,977	09/01/87
4,690,736	06/844,151	09/01/87
4,690,739	06/924,160	09/01/87
4,690,741	06/815,665	09/01/87
4,690,743	06/729,567	09/01/87
4,690,754	06/837,836	09/01/87
4,690,755	06/790,880	09/01/87
4,690,758	06/668,629	09/01/87
4,690,761	06/828,556	09/01/87
4,690,771	06/762,164	09/01/87
4,690,774	06/774,727	09/01/87
4,690,786	06/832,602	09/01/87
4,690,787	06/861,441	09/01/87
4,690,791	06/782,822	09/01/87
4,690,793	06/581,076	09/01/87
4,690,795	06/785,293	09/01/87
4,690,796	06/839,313	09/01/87
4,690,802	06/815,211	09/01/87
4,690,806	06/858,036	09/01/87
4,690,808	06/811,282	09/01/87
4,690,809	06/924,674	09/01/87
4,690,815	06/765,632	09/01/87
4,690,817	06/747,239	09/01/87
4,690,818	06/825,169	09/01/87
4,690,820	06/742,299	09/01/87
4,690,826	06/863,443	09/01/87
4,690,828	06/815,707	09/01/87
4,690,834	06/890,735	09/01/87
4,690,837	06/943,879	09/01/87
4,690,848	06/785,198	09/01/87
4,690,856	06/813,596	09/01/87
4,690,862	06/687,058	09/01/87
4,690,869	06/821,519	09/01/87
4,690,877	06/821,157	09/01/87
4,690,878	06/897,101	09/01/87
4,690,887	06/800,100	09/01/87
4,690,888	06/774,340	09/01/87
4,690,892	06/828,656	09/01/87
4,690,893	06/730,308	09/01/87
4,690,896	06/696,533	09/01/87
4,690,898	06/704,885	09/01/87
4,690,903	06/870,660	09/01/87
4,690,910	06/804,956	09/01/87
4,690,918	06/821,973	09/01/87
4,690,920	06/563,515	09/01/87
4,690,922	06/626,820	09/01/87
4,690,923	06/712,341	09/01/87
4,690,924	06/939,808	09/01/87
4,690,933	06/635,433	09/01/87
4,690,934	06/905,133	09/01/87
4,690,935	06/480,704	09/01/87
4,690,944	06/831,159	09/01/87
4,690,945	06/818,798	09/01/87
4,690,952	06/800,983	09/01/87
4,690,953	06/838,575	09/01/87
4,690,954	06/856,524	09/01/87
4,690,965	06/858,985	09/01/87
4,690,969	06/862,751	09/01/87
4,690,971	06/835,602	09/01/87
4,690,973	06/885,782	09/01/87
4,690,976	06/820,505	09/01/87
4,690,978	06/792,283	09/01/87
4,690,979	06/927,230	09/01/87
4,690,983	06/927,231	09/01/87
4,690,984	06/934,729	09/01/87
4,690,987	06/737,254	09/01/87
4,690,988	06/693,411	09/01/87
4,690,991	06/711,575	09/01/87
4,690,993	06/815,439	09/01/87
4,690,995	06/741,997	09/01/87
4,690,996	06/770,332	09/01/87
4,690,998	06/829,205	09/01/87
4,691,000	06/850,550	09/01/87
4,691,010	06/639,161	09/01/87
4,691,013	06/900,954	09/01/87
4,691,016	06/768,127	09/01/87
4,691,020	06/632,700	09/01/87
4,691,025	06/564,400	09/01/87
4,691,040	06/698,493	09/01/87
4,691,042	06/785,821	09/01/87
4,691,045	06/805,342	09/01/87
4,691,049	06/831,383	09/01/87
4,691,057	06/652,099	09/01/87
4,691,064	06/929,512	09/01/87
4,691,067	06/502,884	09/01/87

Patent Number	Serial Number	Issue Date
4,691,070	06/932,644	09/01/87
4,691,074	06/767,321	09/01/87
4,691,075	06/776,731	09/01/87
4,691,077	06/733,712	09/01/87
4,691,082	06/839,070	09/01/87
4,691,095	06/768,033	09/01/87
4,691,116	06/762,471	09/01/87
4,691,119	06/746,819	09/01/87
4,691,128	06/738,916	09/01/87
4,691,129	06/886,578	09/01/87
4,691,130	06/834,324	09/01/87
4,691,137	06/784,804	09/01/87
4,691,140	06/890,858	09/01/87
4,691,143	06/904,387	09/01/87
4,691,145	06/942,048	09/01/87
4,691,151	06/855,659	09/01/87
4,691,154	06/852,756	09/01/87
4,691,156	06/698,850	09/01/87
4,691,160	06/669,603	09/01/87
4,691,161	06/744,349	09/01/87
4,691,171	06/728,126	09/01/87
4,691,176	06/840,220	09/01/87
4,691,178	06/854,930	09/01/87
4,691,179	06/937,954	09/01/87
4,691,187	06/647,591	09/01/87
4,691,188	06/838,286	09/01/87
4,691,190	07/007,715	09/01/87
4,691,191	06/883,852	09/01/87
4,691,197	06/748,106	09/01/87
4,691,198	06/762,150	09/01/87
4,691,202	06/719,551	09/01/87
4,691,204	06/687,862	09/01/87
4,691,206	06/720,405	09/01/87
4,691,208	06/640,183	09/01/87
4,691,209	06/766,462	09/01/87
4,691,227	06/783,538	09/01/87
4,691,232	06/534,433	09/01/87
4,691,233	06/913,692	09/01/87
4,691,245	06/677,270	09/01/87
4,691,248	06/865,464	09/01/87
4,691,254	06/748,157	09/01/87
4,691,257	06/767,081	09/01/87
4,691,258	06/709,942	09/01/87
4,691,260	06/631,318	09/01/87
4,691,261	06/675,509	09/01/87
4,691,265	06/905,903	09/01/87
4,691,268	06/789,505	09/01/87
4,691,270	06/887,918	09/01/87
4,691,272	06/802,257	09/01/87
4,691,282	06/643,386	09/01/87
4,691,293	06/687,088	09/01/87
4,691,302	06/890,115	09/01/87
4,691,305	06/772,814	09/01/87
4,691,309	06/753,199	09/01/87
4,691,316	06/701,770	09/01/87
4,691,318	06/878,392	09/01/87
4,691,328	06/764,915	09/01/87
4,691,332	06/589,443	09/01/87
4,691,334	06/659,799	09/01/87
4,691,342	06/854,136	09/01/87
4,691,352	06/711,145	09/01/87
4,691,355	06/670,326	09/01/87
4,691,356	06/886,720	09/01/87
4,691,357	06/743,461	09/01/87
4,691,358	06/851,855	09/01/87
4,691,359	06/558,205	09/01/87
4,691,360	06/802,585	09/01/87
4,691,369	06/896,233	09/01/87
4,691,378	06/807,739	09/01/87
4,691,380	06/859,617	09/01/87
4,691,381	06/722,637	09/01/87
4,691,383	06/862,790	09/01/87
4,691,384	06/782,888	09/01/87
5,044,013	07/476,752	09/03/91
5,044,015	07/610,133	09/03/91
5,044,017	07/522,911	06/03/91
5,044,022	07/007,978	09/03/91
5,044,023	07/468,853	09/03/91
5,044,026	07/552,950	09/03/91
5,044,027	07/506,263	09/03/91
5,044,028	07/589,981	09/03/91
5,044,030	07/534,173	09/03/91
5,044,034	07/604,217	09/03/91
5,044,038	07/465,430	09/03/91
5,044,039	07/587,770	09/03/91
5,044,040	07/524,549	09/03/91
5,044,044	07/264,599	09/03/91
5,044,045	07/487,889	09/03/91
5,044,046	07/510,343	09/03/91
5,044,049	07/543,657	09/03/91
5,044,050	07/516,422	09/03/91
5,044,051	07/583,729	09/03/91
5,044,062	07/602,724	09/03/91
5,044,063	07/608,657	09/03/91
5,044,066	07/544,950	09/03/91
5,044,074	07/495,740	09/03/91
5,044,078	07/592,653	09/03/91
5,044,081	07/560,096	09/03/91
5,044,082	07/572,708	09/03/91
5,044,086	07/653,860	09/03/91
5,044,087	07/594,422	09/03/91
5,044,089	07/599,400	09/03/91
5,044,090	07/598,002	09/03/91
5,044,097	07/484,868	09/03/91
5,044,098	07/441,752	09/03/91
5,044,104	07/508,635	09/03/91
5,044,109	07/546,734	09/03/91
5,044,111	07/568,019	09/03/91
5,044,114	07/416,115	09/03/91
5,044,115	07/419,518	09/03/91
5,044,116	06/679,351	09/03/91
5,044,117	07/577,047	09/03/91
5,044,120	07/608,483	09/03/91
5,044,127	07/465,825	09/03/91
5,044,132	07/528,558	09/03/91
5,044,150	07/624,472	09/03/91
5,044,157	07/420,268	09/03/91
5,044,158	07/390,891	09/03/91
5,044,161	07/482,377	09/03/91
5,044,162	07/366,514	09/03/91
5,044,167	07/550,433	09/03/91
5,044,169	07/378,861	09/03/91
5,044,171	07/432,375	09/03/91
5,044,175	07/585,869	09/03/91
5,044,176	07/468,031	09/03/91
5,044,191	07/497,922	09/03/91
5,044,200	07/555,199	09/03/91
5,044,201	07/566,789	09/03/91
5,044,202	07/583,744	09/03/91
5,044,204	07/550,113	09/03/91
5,044,206	07/512,333	09/03/91
5,044,211	07/386,174	09/03/91
5,044,212	07/481,077	09/03/91
5,044,214	07/448,729	09/03/91
5,044,219	07/520,806	09/03/91
5,044,224	07/603,307	09/03/91
5,044,229	07/440,534	09/03/91
5,044,234	07/492,193	09/03/91
5,044,235	07/488,273	09/03/91
5,044,237	07/474,915	09/03/91
5,044,241	07/496,346	09/03/91
5,044,242	07/522,102	09/03/91
5,044,244	07/546,239	09/03/91
5,044,245	07/542,323	09/03/91
5,044,252	07/363,139	09/03/91
5,044,253	07/568,303	09/03/91
5,044,257	07/496,352	09/03/91
5,044,258	07/536,512	09/03/91
5,044,259	07/425,426	09/03/91
5,044,260	07/541,636	09/03/91
5,044,263	07/427,848	09/03/91
5,044,265	07/282,463	09/03/91
5,044,266	07/377,608	09/03/91
5,044,269	07/535,198	09/03/91
5,044,274	07/425,632	09/03/91
5,044,283	07/421,955	09/03/91

Patent Number	Serial Number	Issue Date
5,044,292	07/535,118	09/03/91
5,044,293	07/409,072	09/03/91
5,044,295	07/152,414	09/03/91
5,044,296	07/539,747	09/03/91
5,044,298	07/413,328	09/03/91
5,044,303	07/425,304	09/03/91
5,044,306	07/535,847	09/03/91
5,044,314	07/257,855	09/03/91
5,044,317	07/577,201	09/03/91
5,044,322	07/548,565	09/03/91
5,044,324	07/321,390	09/03/91
5,044,325	07/626,693	09/03/91
5,044,326	07/494,033	09/03/91
5,044,327	07/583,050	09/03/91
5,044,330	07/548,853	09/03/91
5,044,335	07/548,902	09/03/91
5,044,338	07/468,519	09/03/91
5,044,341	07/473,941	09/03/91
5,044,347	07/536,475	09/03/91
5,044,350	07/489,353	09/03/91
5,044,354	07/546,526	09/03/91
5,044,368	07/512,862	09/03/91
5,044,371	07/493,749	09/03/91
5,044,378	07/572,779	09/03/91
5,044,384	07/573,327	09/03/91
5,044,387	07/545,785	09/03/91
5,044,388	07/310,243	09/03/91
5,044,391	07/516,320	09/03/91
5,044,395	07/603,444	09/03/91
5,044,408	07/552,560	09/03/91
5,044,409	07/605,213	09/03/91
5,044,412	07/278,778	09/03/91
5,044,415	07/368,793	09/03/91
5,044,418	07/574,062	09/03/91
5,044,419	07/489,542	09/03/91
5,044,420	07/566,523	09/03/91
5,044,430	07/383,738	09/03/91
5,044,433	07/574,279	09/03/91
5,044,438	07/494,773	09/03/91
5,044,439	07/521,584	09/03/91
5,044,446	07/457,727	09/03/91
5,044,448	07/305,710	09/03/91
5,044,451	07/547,671	09/03/91
5,044,454	07/589,784	09/03/91
5,044,457	07/452,155	09/03/91
5,044,460	07/490,187	09/03/91
5,044,465	07/603,513	09/03/91
5,044,466	07/512,949	09/03/91
5,044,471	07/512,319	09/03/91
5,044,473	07/408,281	09/03/91
5,044,483	07/536,322	09/03/91
5,044,484	07/438,483	09/03/91
5,044,498	07/475,588	09/03/91
5,044,501	07/404,606	09/03/91
5,044,503	07/356,932	09/03/91
5,044,505	07/204,384	09/03/91
5,044,507	07/550,312	09/03/91
5,044,509	07/443,005	09/03/91
5,044,511	07/514,823	09/03/91
5,044,512	07/626,251	09/03/91
5,044,516	07/588,149	09/03/91
5,044,517	07/436,329	09/03/91
5,044,523	07/486,529	09/03/91
5,044,529	07/386,575	09/03/91
5,044,537	07/519,826	09/03/91
5,044,540	07/488,319	09/03/91
5,044,556	07/460,367	09/03/91
5,044,558	07/350,105	09/03/91
5,044,563	07/419,489	09/03/91
5,044,568	07/570,088	09/03/91
5,044,570	07/520,739	09/03/91
5,044,574	07/326,141	09/03/91
5,044,576	07/571,873	09/03/91
5,044,577	07/503,667	09/03/91
5,044,578	07/457,639	09/03/91
5,044,579	07/343,299	09/03/91
5,044,583	07/480,912	09/03/91
5,044,584	07/438,173	09/03/91
5,044,586	07/500,512	09/03/91
5,044,588	07/566,241	09/03/91
5,044,589	07/542,767	09/03/91
5,044,591	07/644,816	09/03/91
5,044,592	07/480,796	09/03/91
5,044,593	07/479,674	09/03/91
5,044,597	07/467,926	09/03/91
5,044,600	07/645,147	09/03/91
5,044,602	07/558,793	09/03/91
5,044,607	07/454,034	09/03/91
5,044,611	07/354,239	09/03/91
5,044,624	07/566,382	09/03/91
5,044,627	07/470,072	09/03/91
5,044,628	07/457,770	09/03/91
5,044,630	07/633,759	09/03/91
5,044,633	07/639,138	09/03/91
5,044,636	07/503,787	09/03/91
5,044,649	07/572,778	09/03/91
5,044,650	07/453,768	09/03/91
5,044,655	07/469,593	09/03/91
5,044,657	07/466,350	09/03/91
5,044,664	07/588,746	09/03/91
5,044,665	07/530,281	09/03/91
5,044,666	07/426,214	09/03/91
5,044,681	07/657,403	09/03/91
5,044,683	07/626,473	09/03/91
5,044,685	07/584,252	09/03/91
5,044,687	07/451,938	09/03/91
5,044,688	07/396,221	09/03/91
5,044,690	07/493,404	09/03/91
5,044,691	07/485,141	09/03/91
5,044,695	07/378,935	09/03/91
5,044,696	07/541,657	09/03/91
5,044,700	07/542,122	09/03/91
5,044,701	07/507,153	09/03/91
5,044,722	07/548,966	09/03/91
5,044,731	07/475,998	09/03/91
5,044,734	07/447,550	09/03/91
5,044,741	07/482,113	09/03/91
5,044,748	07/562,871	09/03/91
5,044,762	07/633,915	09/03/91
5,044,765	07/572,065	09/03/91
5,044,766	07/562,174	09/03/91
5,044,770	07/500,583	09/03/91
5,044,771	07/588,551	09/03/91
5,044,773	07/510,780	09/03/91
5,044,786	07/620,155	09/03/91
5,044,791	07/380,317	09/03/91
5,044,800	07/537,559	09/03/91
5,044,820	07/492,699	09/03/91
5,044,829	07/608,211	09/03/91
5,044,836	07/491,255	09/03/91
5,044,838	07/514,754	09/03/91
5,044,842	07/432,771	09/03/91
5,044,843	07/518,023	09/03/91
5,044,846	07/485,839	09/03/91
5,044,850	07/522,053	09/03/91
5,044,851	07/456,331	09/03/91
5,044,856	07/528,749	09/03/91
5,044,862	07/444,645	09/03/91
5,044,864	07/575,355	09/03/91
5,044,866	07/271,422	09/03/91
5,044,868	07/447,890	09/03/91
5,044,876	07/517,929	09/03/91
5,044,882	07/406,037	09/03/91
5,044,888	07/309,702	09/03/91
5,044,890	07/544,561	09/03/91
5,044,904	07/466,500	09/03/91
5,044,910	07/590,568	09/03/91
5,044,914	07/477,852	09/03/91
5,044,918	07/450,260	09/03/91
5,044,923	07/504,490	09/03/91
5,044,926	07/542,988	09/03/91
5,044,940	07/597,413	09/03/91
5,044,948	07/519,766	09/03/91
5,044,949	07/487,203	09/03/91
5,044,950	07/444,001	09/03/91
5,044,960	07/423,447	09/03/91

Patent Number	Serial Number	Issue Date
5,044,961	07/598,912	09/03/91
5,044,968	07/633,916	09/03/91
5,044,976	07/600,729	09/03/91
5,044,985	07/469,666	09/03/91
5,044,989	07/545,608	09/03/91
5,044,997	07/498,790	09/03/91
5,045,001	07/492,094	09/03/91
5,045,004	07/413,925	09/03/91
5,045,006	07/427,257	09/03/91
5,045,011	07/531,929	09/03/91
5,045,012	07/512,769	09/03/91
5,045,013	07/553,458	09/03/91
5,045,020	07/421,158	09/03/91
5,045,023	07/529,348	09/03/91
5,045,033	07/525,238	09/03/91
5,045,034	07/530,856	09/03/91
5,045,035	07/516,433	09/03/91
5,045,037	07/544,618	09/03/91
5,045,043	07/491,875	09/03/91
5,045,044	07/566,306	09/03/91
5,045,047	07/380,965	09/03/91
5,045,052	07/437,364	09/03/91
5,045,062	07/377,055	09/03/91
5,045,083	07/483,197	09/03/91
5,045,087	07/158,391	09/03/91
5,045,089	07/622,493	09/03/91
5,045,106	07/418,790	09/03/91
5,045,108	07/534,383	09/03/91
5,045,110	07/525,704	09/03/91
5,045,111	07/506,712	09/03/91
5,045,112	07/234,914	09/03/91
5,045,119	07/581,215	09/03/91
5,045,121	07/649,328	09/03/91
5,045,125	07/502,950	09/03/91
5,045,127	07/532,912	09/03/91
5,045,137	07/448,163	09/03/91
5,045,139	07/362,369	09/03/91
5,045,141	07/214,380	09/03/91
5,045,144	07/535,134	09/03/91
5,045,155	07/404,654	09/03/91
5,045,166	07/526,572	09/03/91
5,045,177	07/567,517	09/03/91
5,045,184	07/448,928	09/03/91
5,045,187	07/428,603	09/03/91
5,045,194	07/502,715	09/03/91
5,045,199	07/430,352	09/03/91
5,045,200	07/597,629	09/03/91
5,045,201	07/408,224	09/03/91
5,045,202	07/382,677	09/03/91
5,045,207	07/491,912	09/03/91
5,045,217	07/470,569	09/03/91
5,045,234	07/193,734	09/03/91
5,045,235	07/527,969	09/03/91
5,045,245	07/500,616	09/03/91
5,045,246	07/614,955	09/03/91
5,045,255	07/608,581	09/03/91
5,045,261	07/103,209	09/03/91
5,045,272	07/481,038	09/03/91
5,045,278	07/433,875	09/03/91
5,045,284	07/274,581	09/03/91
5,045,287	07/428,868	09/03/91
5,045,289	07/416,885	09/03/91
5,045,290	07/536,796	09/03/91
5,045,304	07/238,870	09/03/91
5,045,307	07/462,734	09/03/91
5,045,314	07/436,154	09/03/91
5,045,326	07/441,136	09/03/91
5,045,342	07/303,480	09/03/91
5,045,348	07/295,212	09/03/91
5,045,354	07/452,889	09/03/91
5,045,355	07/545,152	09/03/91
5,045,362	07/451,703	09/03/91
5,045,367	07/486,589	09/03/91
5,045,371	07/461,597	09/03/91
5,045,374	07/492,138	09/03/91
5,045,378	07/346,453	09/03/91
5,045,385	07/400,448	09/03/91
5,045,389	07/527,176	09/03/91
5,045,394	07/260,737	09/03/91
5,045,398	07/462,260	09/03/91
5,045,399	07/242,493	09/03/91
5,045,400	07/473,326	09/03/91
5,045,411	07/463,153	09/03/91
5,045,412	07/327,456	09/03/91
5,045,416	07/624,940	09/03/91
5,045,429	07/560,284	09/03/91
5,045,436	07/319,884	09/03/91
5,045,440	07/477,270	09/03/91
5,045,444	07/640,524	09/03/91
5,045,452	07/259,115	09/03/91
5,045,457	07/299,933	09/03/91
5,045,461	07/213,906	09/03/91
5,045,462	07/272,405	09/03/91
5,045,466	07/376,704	09/03/91
5,045,476	07/527,926	09/03/91
5,045,477	07/344,870	09/03/91
5,045,480	07/308,658	09/03/91
5,045,481	07/563,821	09/03/91
5,045,496	07/194,676	09/03/91
5,045,514	07/575,180	09/03/91
5,045,520	07/459,712	09/03/91
5,045,525	07/197,207	09/03/91
5,045,532	07/260,067	09/03/91
5,045,537	07/244,220	09/03/91
5,045,540	07/684,638	09/03/91
5,045,545	07/357,183	09/03/91
5,045,549	07/070,351	09/03/91
5,045,558	07/331,399	09/03/91
5,045,567	07/608,610	09/03/91
5,045,572	07/470,487	09/03/91
5,045,575	07/451,693	09/03/91
5,045,576	07/228,100	09/03/91
5,045,579	07/525,778	09/03/91
5,045,585	07/519,175	09/03/91
5,045,589	07/438,878	09/03/91
5,045,604	07/616,717	09/03/91
5,045,610	07/401,213	09/03/91
5,045,616	07/354,110	09/03/91
5,045,617	07/422,318	09/03/91
5,045,620	07/404,100	09/03/91
5,045,622	07/368,607	09/03/91
5,045,625	07/476,952	09/03/91
5,045,628	07/459,036	09/03/91
5,045,632	07/630,146	09/03/91
5,045,637	07/554,082	09/03/91
5,045,639	07/570,332	09/03/91
5,045,646	07/383,036	09/03/91
5,045,658	07/138,714	09/03/91
5,045,664	07/550,794	09/03/91
5,045,665	07/510,355	09/03/91
5,045,679	07/443,502	09/03/91
5,045,681	07/414,006	09/03/91
5,045,684	07/485,892	09/03/91
5,045,691	07/471,546	09/03/91
5,045,692	07/483,499	09/03/91
5,045,695	07/532,765	09/03/91
5,045,700	07/399,232	09/03/91
5,045,701	07/413,414	09/03/91
5,045,702	07/441,362	09/03/91
5,045,705	07/579,910	09/03/91
5,045,707	07/394,457	09/03/91
5,045,727	07/538,703	09/03/91
5,045,731	07/427,787	09/03/91
5,045,734	07/535,321	09/03/91
5,045,740	07/498,232	09/03/91
5,045,749	07/486,749	09/03/91
5,045,751	07/424,871	09/03/91
5,045,756	07/638,194	09/03/91
5,045,760	07/529,460	09/03/91
5,045,768	07/428,163	09/03/91
5,045,774	07/458,172	09/03/91
5,045,776	07/382,645	09/03/91
5,045,783	07/524,850	09/03/91
5,045,801	07/530,706	09/03/91
5,045,805	07/546,469	09/03/91
5,045,821	07/610,732	09/03/91

Patent Number	Serial Number	Issue Date
5,045,828	07/386,335	09/03/91
5,045,833	07/359,037	09/03/91
5,045,842	07/425,062	09/03/91
5,045,849	07/456,324	09/03/91
5,045,870	07/503,353	09/03/91
5,045,884	07/488,873	09/03/91
5,045,887	07/564,435	09/03/91
5,045,888	07/521,359	09/03/91
5,045,892	07/251,180	09/03/91
5,045,895	07/513,878	09/03/91
5,045,896	07/326,555	09/03/91
5,045,909	07/541,899	09/03/91
5,045,965	07/442,700	09/03/91
5,045,969	07/473,572	09/03/91
5,045,978	07/512,533	09/03/91
5,045,983	07/514,466	09/03/91
5,045,986	07/620,121	09/03/91
5,045,991	07/458,440	09/03/91
5,045,995	07/622,229	09/03/91
5,045,997	07/264,056	09/03/91
5,046,003	07/371,332	09/03/91
5,046,008	07/371,754	09/03/91
5,046,021	07/454,421	09/03/91
5,046,045	07/495,359	09/03/91
5,046,055	07/576,263	09/03/91
5,046,059	07/209,317	09/03/91
5,046,077	07/539,091	09/03/91
5,046,086	07/508,133	09/03/91
5,046,091	07/471,172	09/03/91
5,046,102	06/918,468	09/03/91
5,046,109	07/473,103	09/03/91
5,046,115	07/378,522	09/03/91
5,046,129	07/301,162	09/03/91
5,046,131	07/414,299	09/03/91
5,046,142	07/552,331	09/03/91
5,046,143	07/535,576	09/03/91
5,046,144	07/257,083	09/03/91
5,046,150	07/559,323	09/03/91
5,046,159	07/611,601	09/03/91
5,046,162	07/401,122	09/03/91
5,046,163	07/494,653	09/03/91
5,046,177	07/531,675	09/03/91
5,046,186	07/600,680	09/03/91

Patents Reinstated Due to the Acceptance of a Late Maintenance Fee From 9/15/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,553,461	06/433,651	10/12/82	11/19/85	09/22/95
4,605,050	06/639,263	08/09/84	08/12/86	09/20/95
4,619,052	06/745,180	06/17/85	10/28/86	09/22/95
4,640,365	06/726,802	04/24/85	02/03/87	09/22/95
4,641,482	06/433,001	10/06/82	02/10/87	09/20/95
4,658,242	06/742,558	06/07/85	04/14/87	09/20/95
4,820,096	07/095,911	09/14/87	04/11/89	09/20/95
4,852,874	07/229,220	08/05/88	08/01/89	09/20/95
4,859,704	07/173,299	03/25/88	08/22/89	09/20/95
4,877,027	07/202,679	06/06/88	10/31/89	09/20/95
4,948,314	07/375,638	07/05/89	08/14/90	09/21/95
4,971,263	07/269,672	11/10/88	11/20/90	09/22/95
4,975,174	07/292,771	01/03/89	12/04/90	09/20/95
5,004,553	07/421,751	10/16/89	04/02/91	09/20/95
5,024,421	07/520,478	05/08/90	06/18/91	09/20/95

Errata

In the list of patents which expired on June 06, 1993, due to failure to pay maintenance fees, in the O.G. of August 24, 1993, the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,836,328	07/042,981	06/06/89	04/27/87

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,807,600, Re. S.N. 08/446,943, May 15, 1995, Cl. 128, SPECULUM PROTECTOR, Allen Lewis Hayes, Owner of Record: *NOVA Healthcare Industries, Inc., Madison Heights, Mich.*, Attorney or Agent: David B. Ehrlinger, Ex. Gp.: 3304

5,036,858, Re. S.N. 08/490,116, June 12, 1995, Cl. 128/732, METHOD AND APPARATUS FOR CHANGING BRAIN WAVE FREQUENCY, John L. Carter, et. al., Owner of Record: *Neurotrain L.C., Galveston, Tex.*, Attorney or Agent: W. Thomas Timmons, Ex. Gp.: 3311

5,122,829, Re. S.N. 08/511,720, Aug. 7, 1995, Cl. 354, CAMERA HAVING AN AUTOMATICALLY OPERATING BUILT-IN STROBE, Satoshi Takami, Owner of Record: *Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Bruce H. Bernstein, Ex. Gp.: 2101

5,171,513, Re. S.N. 08/355,488, Dec. 14, 1994, Cl. 266/230, REFRACTORY ARTICLE FOR PREVENTING VORTEXING IN A METALLURGICAL VESSEL, Achilles Vassilicos, Owner of Record: *USX Corp., Pittsburgh, Pa.*, Attorney or Agent: John F. Carney, Ex. Gp.: 1101

5,172,413, Re. S.N. 08/356,577, Dec. 15, 1994, Cl. 380/20, SECURE HIERARCHIAL VIDEO DELIVERY SYSTEM AND METHOD, Graham C. Bradley, Owner of Record: *Sasktel, Regina, Canada*, Attorney or Agent: Eckhard H. Kuesters, Ex. Gp.: 2202

5,215,151, Re. S.N. 08/443,088, May 17, 1995, Cl. 175/45, METHOD AND APPARATUS FOR DRILLING BORE HOLES UNDER PRESSURE, Michael L. Smith, et. al., Owner of Record: *Cudd Pressure Control Inc., Houma, La.*, Attorney or Agent: William D. Jackson, Ex. Gp.: 3506

5,225,724, Re. S.N. 08/498,856, July 6, 1995, Cl. 307/481, OPERATIONAL ANALYSIS DEVICE OF THE SCAN PATH

TYPE HAVING A SINGLE SCANNING CLOCK AND A SINGLE OUTPUT PHASE FOR AN INTERGRATED CIRCUIT, Flavio Scarra, et. al., Owner of Record: *SGS-Thomson Microelectronics S.R.L., Milano, Italy,* Attorney or Agent: Bryan A. Santarelli, Ex. Gp.: 2509

5,227,161, Re. S.N. 08/492,243, June 19, 1995, Cl. 424/94.4, METHOD TO CLEAN AND DISINFECT PATHOGEN ON THE EPIDERMIS BY APPLYING A COMPOSITION CONTAINING PEROXIDASE, IODIDE COMPOUND AND SURFACTANT, Jack H. Kessler, Owner of Record: *Symbollon Corp., Framingham, Mass.,* Attorney or Agent: Eugene Lieberstein, Ex. Gp.: 1804

5,238,590, Re. S.N. 08/513,150, Aug. 9, 1995, Cl. 252/52, POLYALKYLENE GLYCOL POLYCARBONATE BASED LUBRICANT OIL COMPOSITION, Kinya Mizui, et. al., Owner of Record: *Mitsui Petrochemical Industries LTD, Tokyo, Japan,* Attorney or Agent: Alan Holler, Ex. Gp.: 1111

5,243,907, Re. S.N. 08/528,368, Sept. 14, 1995, Cl. 101/208, DIVIDER SEAL FOR SPLIT-FOUNTAIN CHAMBERED DOCTOR BLADE FOR A FLEXOGRAPHIC PRINTING PRESS, Joseph J. Weishew, Owner of Record: *Langston Corp., The Jersey Corp., Cherry Hill, N.J.,* Attorney or Agent: Gregory J. Lavorgna, Ex. Gp.: 3307

5,246,494, Re. S.N. 08/525,356, Sept. 8, 1995, Cl. 106, MIXED COUPLED AZO PIGMENTS, John H. Platman et. al., Owner of Record: *Engelhard Corp., Iselin, N.J.,* Attorney or Agent: Armand P. Boisselle, Ex. Gp.: 1108

5,271,737, Re. S.N. 08/529,671, Sept. 18, 1995, Cl. 623/20, TRIBAL PROSTHETIC IMPLANT WITH OFFSET STEM, James L. Baldwin, Owner of Record: *U.S. Medical Products, Inc., Austin, Tex.,* Attorney or Agent: J. Nevin Shaffer, Jr., Ex. Gp.: 3308

5,301,179, Re. S.N. 08/544,225, Aug. 11, 1995, Cl. 369/77.2, OPTICAL DISK DRIVE UNIT WITH A SEALING TYPE BEARING MEMBER, Akihiko Okamota, Owner of Record: *Ricoh Co., LTD., Tokyo, Japan,* Attorney or Agent: Gerard M. Wissing, Ex. Gp.: 2512

5,332,305, Re. S.N. 08/518,469, Aug. 21, 1995, Cl. 312/328, TOOL CHEST WITH TOOL PALLET, George R. Slivon, Owner of Record: *Snap-On Incorp., Kenosha, Wis.,* Attorney or Agent: J. Terry Stratman, Ex. Gp.: 3507

5,333,648, Re. S.N. 08/518,266, Aug. 23, 1995, Cl. 138/26, VARIABLE PRESSURE REDUCING DEVICE, Richard R. Henszey, et. al., Owner of Record: *Sentry Equipment Corp., Oconomowoc, Wis.,* Attorney or Agent: John E. Munger, Ex. Gp.: 3405

5,334,170, Re. S.N. 08/525,992, Sept. 8, 1995, Cl. 604/80, DYE MANAGEMENT SYSTEM INCLUDING AN ADMINISTRATION SET WITH AN IN-LINE BURETTE, Mark T. Moroski, Owner of Record: *Abbott Laboratories, Abbott Park, Ill.,* Attorney or Agent: Brian R. Woodworth, Ex. Gp.: 3306

5,355,302, Re. S.N. 08/516,173, Aug. 17, 1995, Cl. 364/410, SYSTEM FOR MANAGING A PLURALITY OF COMPUTER JUKEBOXES, John R. Martin, et. al., Owner of Record: *Arachind Inc., Rockford, Ill.,* Attorney or Agent: John J. Held, Ex. Gp.: 2311

5,387,439, Re. S.N. 08/524,219, Sept. 6, 1995, Cl. 427/376.2, PROCESS FOR MAKING A CHEMICALLY-RESISTANT PORCELAIN ENAMEL, Thomas R. Roberts, Owner of Record: *Pfaudler, Inc., Rochester, N.Y.,* Attorney or Agent: Michael L. Dunn, Ex. Gp.: 1112

5,405,068, Re. S.N. 08/518,070, Aug. 22, 1995, Cl. 224/153, MOTORCYCLE BAG, Terry Lovett, Owner of Record: *Inventor,* Attorney or Agent: Stefan J. Kirchanski, Ex. Gp.: 3105

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

D. 325,261, Reexam. No. 90/003,977, Sept. 26, 1995, Cl. D25/132, STRUCTURAL BEAM FOR CONCRETE FORM SYSTEMS, Robert G. McCracken, Owner of Record: *Wilian Holding Co., Des Moines, Iowa,* Attorney or Agent: Kent A. Herink, Davis Hockenberg Wine Brown Koehn & Shors, Des Moines, Iowa, Ex. Gp.: 2904, Requester: Symons Corp., Des Plaines, Ill., c/o Richard M. La Barge, Marshall O'Toole Gerstein Murray & Borun, Chicago. Ill.

4,066,854, Reexam. No. 90/003,967, Sept. 12, 1995, Cl. 200/005A, MEMBRANE-TYPE TOUCH PANEL EMPLOYING INSULATING GRID ANTI-SHORT MEANS, George E. Zenk, et. al., Owner of Record: *St. Clair Intellectual Property Consultants Inc., Grosse Pointe, Mich.,* Attorney or Agent: Thomas E. Baumgarten, Jr., Grosse Pointe, Mich., Ex. Gp.: 2109, Requester: Sharp Corp., Osaka, Japan; Gunze Ltd., Kyoto, Japan; Touch Panel Systems Corp., Tokyo, Japan, Terrel C. Birch & Charles Gorenstein, Birch Stewart Kolasch & Birch, Falls Church, Va.

4,673,996, Reexam. No. 90/003,979, Sept. 28, 1995, Cl. 360/103, MAGNETIC HEAD AIR BEARING SLIDER ASSEMBLY UTILIZING TRANSVERSE PRESSURIZATION CONTOURS, James W. White, Owner of Record: *Inventor,* Attorney or Agent: William J. Bohler, Townsend & Townsend Khourie & Crew, San Francisco, Calif., Ex. Gp.: 2512, Requester: Lawrence E. Laubscher, Sr., Laubscher & Laubscher, Arlington, Va.

4,686,253, Reexam. No. 90/003,972, Sept. 21, 1995, Cl. 524/044, LIGHTWEIGHT JOINT COMPOUND HAVING IMPROVED PRINTABILITY, Arthur W. Struss, et. al., Owner of Record: *U.S. Gypsum Co., Chicago, Ill.,* Attorney or Agent: David F. Janci, U.S. Gypsum Co., Chicago, Ill., Ex. Gp.: 1511, Requester: Owner

4,802,700, Reexam. No. 90/003,969, Sept. 19, 1995, Cl. 292/327, LOCKING SEAL, David L. Stevenson, et. al., Owner of Record: *E. J. Brooks Co., Newark, N.J.,* Attorney or Agent: Carella Byrne Bain Gilfillan Cecchi Stewart & Olstein, Roseland, N.J., Ex. Gp.: 3508, Requester: Owner

5,015,840, Reexam. No. 90/003,978, Sept. 26, 1995, Cl. 029/897.34, SELF-CHECKING LIGHT CURTAIN SYSTEM AND METHOD OF OPERATION, David Blau, Owner of Record: *Scientific Technologies, Inc., Hayward, Calif.,* Attorney or Agent: Richard E. Backus, Flehr Hohbach Test Albritton & Herbert, San Francisco, Calif., Ex. Gp.: 3206, Requester: Owner

5,019,450, Reexam. No. 90/003,975, Sept. 25, 1995, Cl. 428/402, FIBER REINFORCED COMPOSITIONS AND METHOD OF PRODUCING SUCH COMPOSITIONS, Frederick N. Cogswell, et. al., Owner of Record: *Imperical Chemical Industries, London, England,* Attorney or Agent: Cushman Darby & Cushman, Washington, D.C., Ex. Gp.: 1509, Requester: Kawasaki Chemical Holding Co., Inc., Wilmington, Del., c/o Panitch Schwarze Jacobs & Nadel, Philadelphia, Pa.

5,213,889, Reexam. No. 90/003,976, Sept. 25, 1995, Cl. 428/332, FIBER REINFORCED COMPOSITIONS AND METHOD FOR PRODUCING SUCH COMPOSITIONS, Frederick N. Cogswell, et. al., Owner of Record: *Imperial Chemical Industries PLC, Millbank, England,* Attorney or Agent: Cushman Darby & Cushman, Washington, D.C., Ex. Gp.: 1509, Requester: Kawasaki Chemical Holding Co., Inc., Wilmington, Del., c/o Panitch Schwarze Jacobs & Nadel, Philadelphia, Pa.

5,237,390, Reexam. No. 90/003,970, Sept. 19, 1995, Cl. 356/363, METHOD AND APPARATUS FOR MEASUREMENT OF ANGULAR DISPLACEMENT, Raymond J. Chaney, Owner of Record: *Reinshaw, Inc., Gloucestershire, United Kingdom*, Attorney or Agent: Oliff & Berridge, Alexandria, Va., Ex. Gp.: 2505, Requester: Thomas K. Stine, Wallenstein & Wagner, Chicago, Ill.

5,268,036, Reexam. No. 90/003,973, Sept. 21, 1995, Cl. 134/002, METHOD AND APPARATUS FOR CLEANING METALLIC WORKPIECES, Wilhelm Neubauer, et. al.,Owner of Record: *Aichelin GMBH, Korntal-Munchingen, Germany*, Attorney or Agent: Kukjer Kircher Bowman & Johnson, Kansas City, Mo., Ex. Gp.: 1307, Requester: Owner

5,280,135, Reexam. No. 90/003,974, Sept. 21, 1995, Cl. 174/067, OUTDOOR ELECTRICAL OUTLET COVER, Donald M. Berlin, et. al., Owner of Record: *Intermatic Inc., Spring Grove, Ill.*, Attorney or Agent: William F. Prendergast, Willian Brinks Olds Hofer Gilson & Lione, Chicago, Ill., Ex. Gp.: 2109, Requester: James W. McKee, Fay Sharpe Beall Fagan Minnich & McKee, Cleveland, Ohio

5,339,737, Reexam. No. 90/003,971, Sept. 19, 1995, Cl. 101/454, LITHOGRAPHIC PRINTING PLATES FOR USE WITH LASER-DISCHARGE IMAGING APPARATUS, Thomas E. Lewis, et. al., Owner of Record: *Presstek, Inc., Hudson, N.H.*, Attorney or Agent: Cesari & McKenna, Boston, Mass., Ex. Gp.: 3307, Requester: Owner

5,376,078, Reexam. No. 90/003,968, Sept. 13, 1995, Cl. 606/170, ROTATABLE SURGICAL CUTTING INSTRUMENT WITH POSITIONALLY ADJUSTABLE WINDOW, Fred B. Dinger, III, et. al., Owner of Record: *Linvatek Corp., Largo, Fla.*, Attorney or Agent: Edward W. Goldstein, Tobor & Goldstein, Houston, Tex., Ex. Gp.: 3309, Requester: Owner

---

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED AUGUST 21, 1995
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
101,142	71/068,617	11/17/1914
101,196	71/079,370	11/17/1914
101,229	71/079,344	11/17/1914
319,003	71/354,333	11/13/1934
319,005	71/354,262	11/13/1934
319,071	71/352,624	11/13/1934
319,089	71/354,357	11/13/1934
319,095	71/347,621	11/13/1934
319,096	71/347,619	11/13/1934
319,097	71/347,617	11/13/1934
319,098	71/347,616	11/13/1934
319,108	71/353,968	11/13/1934
319,109	71/353,928	11/13/1934
319,114	71/353,789	11/13/1934
598,061	71/656,691	11/16/1954
598,067	71/660,118	11/16/1954
598,068	71/660,479	11/16/1954
598,071	71/612,141	11/16/1954
598,083	71/659,461	11/16/1954
598,088	71/661,115	11/16/1954
598,093	71/642,492	11/16/1954
598,096	71/625,767	11/16/1954
598,099	71/646,524	11/16/1954
598,104	71/636,953	11/16/1954
598,106	71/639,945	11/16/1954
598,109	71/644,699	11/16/1954
598,110	71/645,576	11/16/1954
598,114	71/655,178	11/16/1954
598,116	71/662,256	11/16/1954
598,127	71/643,507	11/16/1954
598,141	71/653,862	11/16/1954
598,142	71/653,863	11/16/1954
598,145	71/657,326	11/16/1954
598,152	71/657,885	11/16/1954
598,163	71/659,417	11/16/1954
598,174	71/651,892	11/16/1954
598,175	71/659,192	11/16/1954
598,180	71/649,471	11/16/1954
598,183	71/663,506	11/16/1954
598,203	71/663,869	11/16/1954
598,209	71/649,064	11/16/1954
598,215	71/633,168	11/16/1954
598,216	71/641,589	11/16/1954
598,218	71/646,401	11/16/1954
598,223	71/653,728	11/16/1954
598,226	71/660,154	11/16/1954
598,227	71/660,155	11/16/1954
598,231	71/627,653	11/16/1954
598,236	71/647,695	11/16/1954
598,250	71/660,753	11/16/1954
598,252	71/661,171	11/16/1954
598,254	71/655,260	11/16/1954
598,264	71/645,090	11/16/1954
598,274	71/661,570	11/16/1954
598,283	71/656,200	11/16/1954
598,308	71/649,447	11/16/1954
598,324	71/624,966	11/16/1954
598,329	71/640,399	11/16/1954
997,810	73/001,027	11/12/1974
997,813	73/002,567	11/12/1974
997,814	73/003,664	11/12/1974
997,815	73/005,376	11/12/1974
997,818	73/008,849	11/12/1974
997,832	73/010,385	11/12/1974
997,834	73/001,375	11/12/1974
997,837	73/005,813	11/12/1974
997,840	73/001,032	11/12/1974
997,842	73/006,348	11/12/1974
997,844	73/001,283	11/12/1974
997,845	73/001,568	11/12/1974
997,846	73/003,743	11/12/1974
997,848	73/008,688	11/12/1974
997,852	73/010,220	11/12/1974
997,856	73/011,137	11/12/1974
997,859	73/012,165	11/12/1974
997,866	73/012,492	11/12/1974
997,882	73/013,554	11/12/1974
997,883	73/013,752	11/12/1974
997,884	73/003,252	11/12/1974
997,890	73/005,248	11/12/1974
997,894	73/007,299	11/12/1974
997,897	73/010,893	11/12/1974
997,900	73/013,104	11/12/1974
997,901	73/013,243	11/12/1974
997,902	73/013,332	11/12/1974
997,907	73/004,902	11/12/1974
997,908	73/005,050	11/12/1974
997,911	73/012,038	11/12/1974
997,913	73/012,986	11/12/1974
997,915	73/000,304	11/12/1974
997,918	73/000,591	11/12/1974
997,919	73/000,592	11/12/1974
997,923	73/004,849	11/12/1974
997,926	73/004,983	11/12/1974
997,927	73/005,227	11/12/1974
997,928	73/005,311	11/12/1974
997,930	73/007,780	11/12/1974

Reg. Number	Serial Number	Reg. Date
997,934	73/008,043	11/12/1974
997,937	73/009,557	11/12/1974
997,938	73/010,384	11/12/1974
997,940	73/010,725	11/12/1974
997,944	73/010,996	11/12/1974
997,947	73/012,059	11/12/1974
997,949	73/009,346	11/12/1974
997,950	73/009,776	11/12/1974
997,953	73/005,911	11/12/1974
997,955	73/001,231	11/12/1974
997,956	73/001,232	11/12/1974
997,958	73/001,802	11/12/1974
997,960	73/002,358	11/12/1974
997,963	73/004,253	11/12/1974
997,965	73/004,467	11/12/1974
997,971	73/005,914	11/12/1974
997,972	73/006,815	11/12/1974
997,976	73/004,511	11/12/1974
997,979	73/000,877	11/12/1974
997,980	73/002,751	11/12/1974
997,989	73/008,582	11/12/1974
997,990	73/008,583	11/12/1974
997,992	73/002,141	11/12/1974
997,999	73/006,328	11/12/1974
998,008	73/005,075	11/12/1974
998,009	73/013,427	11/12/1974
998,011	73/001,342	11/12/1974
998,020	73/002,888	11/12/1974
998,021	73/003,056	11/12/1974
998,025	73/010,758	11/12/1974
998,032	73/010,376	11/12/1974
998,037	72/445,286	11/12/1974
998,039	72/453,382	11/12/1974
998,040	72/454,356	11/12/1974
998,041	72/459,640	11/12/1974
998,043	72/402,322	11/12/1974
998,044	72/431,028	11/12/1974
998,050	72/427,452	11/12/1974
998,051	72/428,211	11/12/1974
998,052	72/437,077	11/12/1974
998,053	72/442,699	11/12/1974
998,054	72/448,073	11/12/1974
998,055	72/450,455	11/12/1974
998,059	72/454,476	11/12/1974
998,060	72/462,699	11/12/1974
998,062	72/465,286	11/12/1974
998,067	72/422,109	11/12/1974
998,075	72/461,252	11/12/1974
998,076	72/462,495	11/12/1974
998,077	72/421,525	11/12/1974
998,078	72/430,156	11/12/1974
998,079	72/452,317	11/12/1974
998,085	72/396,977	11/12/1974
998,086	72/396,978	11/12/1974
998,088	72/413,057	11/12/1974
998,089	72/435,333	11/12/1974
998,096	72/445,737	11/12/1974
998,097	72/447,045	11/12/1974
998,098	72/447,114	11/12/1974
998,108	72/455,073	11/12/1974
998,110	72/458,298	11/12/1974
998,113	72/459,962	11/12/1974
998,114	72/459,999	11/12/1974
998,115	72/460,000	11/12/1974
998,116	72/460,236	11/12/1974
998,120	72/462,719	11/12/1974
998,123	72/465,775	11/12/1974
998,124	72/466,057	11/12/1974
998,132	72/466,726	11/12/1974
998,134	72/423,965	11/12/1974
998,140	72/442,676	11/12/1974
998,141	72/443,212	11/12/1974
998,146	72/446,332	11/12/1974
998,149	72/451,308	11/12/1974
998,153	72/452,778	11/12/1974
998,157	72/456,009	11/12/1974
998,159	72/456,443	11/12/1974
998,160	72/457,179	11/12/1974
998,163	72/459,050	11/12/1974
998,164	72/459,115	11/12/1974
998,170	72/460,689	11/12/1974
998,171	72/461,274	11/12/1974
998,172	72/461,392	11/12/1974
998,173	72/462,247	11/12/1974
998,174	72/463,094	11/12/1974
998,179	72/464,800	11/12/1974
998,180	72/466,032	11/12/1974
998,184	72/425,319	11/12/1974
998,187	72/432,836	11/12/1974
998,189	72/440,555	11/12/1974
998,190	72/441,278	11/12/1974
998,192	72/444,373	11/12/1974
998,194	72/445,415	11/12/1974
998,196	72/446,099	11/12/1974
998,197	72/447,211	11/12/1974
998,199	72/447,772	11/12/1974
998,200	72/448,175	11/12/1974
998,201	72/449,374	11/12/1974
998,203	72/450,372	11/12/1974
998,204	72/450,677	11/12/1974
998,205	72/450,987	11/12/1974
998,210	72/455,089	11/12/1974
998,211	72/455,445	11/12/1974
998,212	72/456,553	11/12/1974
998,213	72/457,255	11/12/1974
998,216	72/458,561	11/12/1974
998,219	72/460,986	11/12/1974
998,220	72/461,110	11/12/1974
998,221	72/461,320	11/12/1974
998,222	72/461,321	11/12/1974
998,225	72/464,655	11/12/1974
998,226	72/465,947	11/12/1974
998,236	72/438,926	11/12/1974
998,238	72/459,714	11/12/1974
998,239	72/464,330	11/12/1974
998,241	72/466,407	11/12/1974
998,247	72/403,244	11/12/1974
998,251	72/462,108	11/12/1974
998,254	72/444,747	11/12/1974
998,256	72/465,807	11/12/1974
998,257	72/398,027	11/12/1974
998,261	72/441,234	11/12/1974
998,262	72/452,919	11/12/1974
998,266	72/454,847	11/12/1974
998,268	72/463,211	11/12/1974
998,272	72/457,011	11/12/1974
998,278	72/421,729	11/12/1974
998,284	72/460,896	11/12/1974
998,286	72/461,007	11/12/1974
998,289	72/463,647	11/12/1974
998,293	72/448,047	11/12/1974
998,294	72/464,268	11/12/1974
998,295	72/393,244	11/12/1974
998,298	72/462,111	11/12/1974
998,302	72/466,390	11/12/1974
998,307	72/438,158	11/12/1974
998,308	72/439,655	11/12/1974
998,311	72/452,658	11/12/1974
998,314	72/457,336	11/12/1974
998,323	72/438,209	11/12/1974
998,325	72/446,940	11/12/1974
998,328	72/458,321	11/12/1974
998,329	72/463,135	11/12/1974
998,330	72/463,431	11/12/1974
998,335	72/464,943	11/12/1974
998,336	72/321,647	11/12/1974
998,344	72/440,529	11/12/1974
998,345	72/454,005	11/12/1974
998,352	72/464,170	11/12/1974
998,353	73/003,206	11/12/1974
998,355	73/010,767	11/12/1974
998,358	73/001,263	11/12/1974
998,363	72/466,464	11/12/1974
998,369	72/435,635	11/12/1974
998,370	72/462,846	11/12/1974
998,372	72/431,516	11/12/1974

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

The Wisdom Center Inc., Miami, Fla., Reg. No. 1,864,003, for the mark "THE ORACLE", Canc. No. 23,900.

Online Computer Services, Inc., Chilton, Wis., Reg. No. 1,559,616, for the mark "MR. BILL", Canc. No. 24,007.

Foremost Dairies, Inc., La Jolla, Calif., Reg. No. 742,070 for the mark "SO•Lo", Canc. No. 23,824.

KPB Industries, Inc., Bethlehem, Pa., Reg. No. 717,150 for the mark "CARD MAGIC", Canc. No. 23,826.

Amfast Corp., Menands, N.Y., Reg. No. 1,044,653 for the mark "AMFAST", Canc. No. 23,825.

Lanotan, Inc., Miami, Fla., Reg. No. 690,670 for the mark "BLUE MINK", Canc. No. 23,722.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner for Trademarks

Patents Available for License or Sale

08/460,789 SELF-CLOSING INTERLOCKING SAND BAG

Contact: W.W. Truitt
7402 Fire Tower Rd.
Zuni, Va. 23898
(voice): (804) 380-5832
(fax): (804) 727-0329

4,423,523 OVERLAPPING BIBS ON A STRIP

Contact: B. Liebmann
3 Cumberland Ct.
Annapolis, Md. 21401
(voice): (410) 263-1434
(fax): (410) 992-3536

4,435,105 ADJUSTABLE LOCK ARRANGEMENT AND METHOD FOR MAKING SAME

Contact: Bruce Lowery, Lowery, Cotter and Associates
2959 Lucerne Se., Suite 104
Grand Rapids, Mich. 49546
(voice): (616) 949-2252
(fax): (616) 949-7303

5,020,037 MEDI-PILL ALARM

Contact: Malcolm Raven
3541 S.W. Corporate Pkwy.
Palm City, Fla. 34990
(voice): (407) 223-1111
(fax): (407) 223-1100

5,072,569 BUILDING PANELS AND METHOD THEREOF

Contact: Robert C. Martin
1030 Liberty St.
Franklin, Pa. 16323
(voice): (814) 432-2181
(fax): (814) 437-3212

5,098,223 GUTTER FERRULE

Contact: Mr. Mittelstaedt III
Shermeta, Chimko & Kil-Patrick, PC
P.O. Box 5016
Rochester Hills, Mich. 48308-5016
(voice): (810) 652-8200
(fax): (810) 652-1292

5,144,897 SHIPPING PACKAGE COMBINATION

Contact: Jim De Cesare
Dow Corning Corp.
Patent Department-CO1232
Midland, Mich. 48684-0994
(voice): (517) 496-4235
(fax): (517) 496-6354

5,226,801 SHOCK ABSORBER TYPE COMPRESSOR

Contact: Alfredo P. Cobile
94-179 Awaia St.
Waipahi, Hi. 96797

5,234,230 ANKLE AND FOOT PROTECTIVE DEVICE FOR ATTACHMENT TO A SKATE

Contact: Rebecca J. Brandau
Brandau, Kalish & Gilster
500 N. Broadway, Suite 1200
St. Louis, Mo. 63101
(voice): (314) 436-1331
(fax): (314) 436-1439

5,263,509 REFRIGERATOR WITH DOOR MOUNTED DISPENSER SUPPLY MECHANISM

Contact: H. Neil Houser
Patent Counsel GE Co
GE Appliances 2-225
Louisville, Ky. 40225
(voice): (502) 452-4653

5,280,157 POWER SWITCHING ARRANGEMENT FOR COOKING OVENS

Contact: N. Neil Houser
Patent Counsel, GE
GE Appliances 2-225
Louisville, Ky. 40225
(voice): (502) 452-4653

5,285,545 ELECTRONIC LAUNDRY CONTROL WITH FILL TIME COMPENSATION

Contact: H. Neil Houser
Patent Counsel GE
GE Appliances 2-225
Louisville, Ky. 40225
(voice): (502) 452-4653

5,301,523 ELECTRONIC WASHER CONTROL INCLUDING AUTOMATIC BALANCE, SPIN AND BRAKE OPERA-

TIONS

Contact: H. Neil Houser
Patent Counsel GE
GE Appliances 2-225
Louisville, Ky. 40225
(voice): (502) 452-4653

5,306,995 RECONFIGURABLE AUTOMATIC ELECTRONIC CONTROL SYSTEM WITH AUTOMATIC MODEL DETERMINATION, INTERNALLY RESTRUCTURABLE CONTROL AND FLEXIBLE PROGRAMMABLE TEST MODES

Contact: H. Neil Houser
Patent Counsel GE
GE Appliances 2-225
Louisville, Ky. 40225
(voice): (502) 452-4653

5,373,703 KAR-KOOL

Contact: Jay/Eco*Star
2430 E. Roosevelt St.
Ste. 935
Phoenix, Az. 85008
(voice): (602) 389-5935
(fax): (602) 258-6373

5,423,542 RANDOM INDICIA SELECTOR

Contact: Youbert Oraha
2435 Kipling Ave.
Apt. 1103
Rexdale, Ont.
M9V-1A3 Canada
(voice): (416) 747-7288

5,429,538 MECHANISM CAPABLE OF MAKING VARIATION IN RADIAL ANGLE

Contact: Chyn-Herng Hwu
901 Communication Bldg., No. 31
Aikuo Rd.
Taipei, Taiwan R.O.C.
(fax): 88627840375

5,431,129 TRANSPARENT PET CAGE WITH PIVOTING TOP PANELS

Contact: Donna Clark
426 S.W. 44th Terrace
Cape Coral, Fla. 33914-7528
(voice): (941) 549-2742

5,435,118 VACUUM SWEEPER SHREDDER ROTARY MOWER

Contact: Alfredo P. Cobile
94-179 Awaia St.
Waipahu, Hi. 96797

5,437,429 PICTURE HOOK HANGER

Contact: Jonah Atlas
7210-101 Hidden Ridge Dr.
Raleigh, N.C. 27613
(voice): (919) 543-5856
(fax): (919) 543-4202
(other) : (919) 676-6870

Disclaimers

4,465,033—Richard F. Blaser, Cape Canaveral, Fla. ENERGY CONVERSION CYCLE FOR INTERNAL COMBUSTION ENGINE AND APPARATUS FOR CARRYING OUT THE CYCLE. Patent dated August 14, 1984. Disclaimer filed September 11, 1995, by the assignee, Sonex Research, Inc.

Hereby enters this disclaimer to the remaining term of said patent.

5,332,818—Hiroshi Nagase; Koji Kawai; Shu Matsumoto, all of Kamakura; Takashi Endoh, Chigasaki; Yoshiaki Katsura, Otsu; Kohei Arakawa, Kyoto, all of Japan. IMMUNOSUPPRESSIVE AGENT AND PROCESS OF PRODUCING THE SAME. Patent dated July 26, 1994. Disclaimer filed June 27, 1995, by the assignee, Toray Industries, Inc.

Hereby enters this disclaimer to claims 3, 9, and 10 of said patent.

5,388,170—Fred L. Heismann, Freehold; Steven K. Korotky, Toms River; John J. Veselka, Freehold, all of N.J. ELECTROOPTIC DEVICE STRUCTURE AND METHOD FOR REDUCING THERMAL EFFECTS IN OPTICAL WAVEGUIDE MODULATORS. Patent dated February 7, 1995. Disclaimer filed August 4, 1995, by the assignee, AT&T Corporation.

Hereby enters this disclaimer to claims 1-11 and 13-15 of said patent.

5,396,737—Richard L. Englund, Maplewood, Minn.; Thomas W. Schwartz, Troy Township, St. Croix County, Wis. COMPOUNDING, GLAZING OR POLISHING PAD. Patent dated March 14, 1995. Disclaimer filed May 26, 1995, by the assignee, Minnesota Mining and Manufacturing Company.

Hereby enters this disclaimer to all claims of said patent.

5,446,134—Michel Armand, Saint-Martin-D'Uriage; Djamila Benrabah, Grenoble; Jean-Yves Sanchez, Saint-Ismier, all of France. BIS(PERFLUOROSULFONYL)METHANE SALTS, AND A PROCESS FOR PREPARING SAME. Patent dated August 29, 1995. Disclaimer filed September 12, 1995, by the assignee, Centre National de la Recherche Scientifique .

Hereby enters this disclaimer to the entire term of said patent.

Dedication

5,392,788—William J. Hudspeth, Radford, Va. METHOD AND DEVICE FOR INTEPRETING CONCEPTS AND CONCEPTUAL THOUGHT FROM BRAINWAVE DATA AND FOR ASSISTING FOR DIAGNOSIS OF BRAINWAVE DISFUNCTION. Patent dated February 28, 1995. Dedication filed October 11, 1995, by the inventor.

Hereby dedicates to the public the remaining term of said patent.

Disclaimer and Dedication

5,413,534—Masashi Nagano, Izumi, Japan. CHAIN SHIFT AIDING STRUCTURE FOR BICYCLE SPROCKET. Patent dated May 9, 1995. Disclaimer and dedication filed September 18, 1995, by the assignee, Shimano, Inc.

Hereby disclaims and dedicates to the public claims 1-12 of said patent.

Certificate of Correction
For Week of November 14, 1995

P. 09,193
Re. 34,900
D. 352,389
D. 359,968
D. 360,852
D. 361,886
D. 361,949
4,680,491
5,028,944
5,030,982
5,084,271
5,095,469
5,103,657
5,103,956
5,104,351
5,119,323
5,120,526
5,138,188
5,155,539
5,166,798
5,179,396
5,190,657
5,197,493
5,210,644
5,240,715
5,242,343
5,250,971
5,251,235
5,260,230
5,265,911
5,266,586
5,267,581
5,273,490
5,276,150
5,292,926
5,295,075
5,301,150
5,311,004
5,313,114
5,316,816
5,317,353
5,321,896
5,332,726
5,333,029
5,335,051
5,338,852
5,339,590
5,341,289
5,342,335
5,343,086
5,343,129
5,345,363
5,347,679
5,349,892
5,352,782
5,352,799
5,354,161
5,355,792
5,358,145
5,358,637
5,359,279
5,360,838
5,366,230
5,366,319
5,366,392
5,366,823
5,366,898
5,367,483
5,370,179
5,375,111
5,375,940
5,376,851
5,377,637
5,378,832
5,379,506
5,383,347
5,383,784
5,384,300
5,384,463
5,387,983
5,389,615
5,391,176
5,391,746
5,392,149
5,393,660
5,394,698
5,394,783
5,398,195
5,398,438
5,401,635
5,401,750
5,403,312
5,403,722
5,404,259
5,404,334
5,404,351
5,405,612
5,406,188
5,406,341
5,406,612
5,406,964
5,407,664
5,408,620
5,408,679
5,408,928
5,409,163
5,409,768
5,409,900
5,410,202
5,410,336
5,410,363
5,411,540
5,411,575
5,412,088
5,412,599
5,412,688
5,414,292
5,414,422
5,414,445
5,414,645
5,414,709
5,415,254
5,415,958
5,416,093
5,416,463
5,416,798
5,417,096
5,417,350
5,418,516
5,419,351
5,419,394
5,419,697
5,419,879
5,420,263
5,420,393
5,420,403
5,420,561
5,420,603
5,421,783
5,422,005
5,422,236
5,422,273
5,422,282
5,422,491
5,422,700
5,422,749
5,423,286
5,423,390
5,423,529
5,423,818
5,423,844
5,424,441
5,424,854
5,424,868
5,425,095
5,425,197
5,425,315
5,425,362
5,425,918
5,426,626
5,426,863
5,426,879
5,427,055
5,427,317
5,427,388
5,427,634
5,427,913
5,428,028
5,428,235
5,428,379
5,428,393
5,428,394
5,428,420
5,428,644
5,428,805
5,428,904
5,429,493
5,429,893
5,429,950
5,430,067
5,430,147
5,430,437
5,430,466
5,430,484
5,431,221
5,431,258
5,431,506
5,431,595
5,432,016
5,432,278
5,432,393
5,432,404
5,432,659
5,432,720
5,433,168
5,433,198
5,433,229
5,433,525
5,433,865
5,433,897
5,434,251
5,434,342
5,434,516
5,434,841
5,434,924
5,434,961
5,435,210
5,435,873
5,436,036
5,436,194
5,436,229
5,436,345
5,436,437
5,436,458
5,436,518
5,436,719
5,436,724
5,436,995
5,437,192
5,437,235
5,437,618
5,437,949
5,438,399
5,438,427
5,438,479
5,438,597
5,439,419
5,439,582
5,439,695
5,439,862
5,440,264
5,440,465
5,441,128
5,441,268
5,441,316
5,441,840
5,442,315
5,442,372
5,442,384
5,442,561
5,442,892
5,443,635
5,443,699
5,443,831
5,444,060
5,444,144
5,444,211
5,444,653
5,444,721
5,444,809
5,444,939
5,445,600
5,446,143
5,446,270
5,446,320
5,446,422
5,446,610
5,446,837
5,447,038
5,447,102
5,447,616
5,447,926
5,447,999
5,448,029
5,448,113
5,448,322
5,448,599
5,448,643
5,448,709
5,449,799
5,451,182
5,452,451
5,452,563
5,452,605
5,453,432
5,453,718

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box _____
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or material related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box M Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filings of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

Please address mail as follows:

Box _____
FEE (or "NO FEE")
Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOU's), and extension requests.
Box TTAB FEE	Oppositions, Cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections, and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.
Please address mail as follows:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation*; papers relating to pending litigation shall be mailed only to the Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

State	*Name of Library*	*Telephone Contact*
	New York Public Library (The Research Libraries)	(212) 930-0917
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	Not Yet Operational
	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	Not Yet Operational
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy
J.O. THOMAS, JR., Deputy Assistant Commissioner for Patent Process Services

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	05/19/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	06/23/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	08/23/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	08/25/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	03/01/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	12/06/93
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	04/19/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	06/02/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	03/26/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	04/12/94
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	03/08/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	04/18/94
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	05/09/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	05/31/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	08/16/94
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	07/14/94
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	05/30/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of October 1, 1995

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/23/95	05/25/95
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	07/03/95
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/26/95	08/21/95
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/06/95	08/14/95
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	05/01/95
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/14/95	07/03/95
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/02/95	07/24/95
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions– Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/15/95	06/17/95
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/30/95	05/30/95
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—John Walker, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	02/14/95	—0—
Renewals (All Classes)	07/25/95	—0—
Section 12(c) Publications (All Classes)	04/11/95	—0—

1. ** Assigned to all Law Office

2. Applicants with inquires concerning the status of their applications and a touch tone phone should call (703) 305–8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday thru Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquires concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

NOVEMBER 14, 1995

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,000,650 (2724th)

METHOD AND APPARATUS FOR ULTRASONIC MATERIAL LEVEL MEASUREMENT

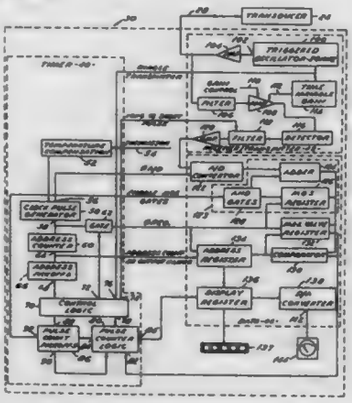
Ellery P. Snyder, Norwalk, Conn., assignor to Endress+Hauser GmbH & Co., Maulburg, Germany

Reexamination Request No. 90/003,748, Mar. 14, 1995.

Reexamination Certificate for Patent 4,000,650, issued Jan. 4, 1977, Ser. No. 560,244, Mar. 20, 1975.

Int. Cl.[6] G01F *23/28*

U.S. Cl. 73—290 V



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–46** is confirmed.

43. In a control system for use in monitoring the level of material in a storage tank including a transducer directing ultrasonic pulses toward and receiving echo response pulses reflected from the upper surface of said material, and a control circuit operatively connected to said transducer to provide an indication of material level on the basis of the round-trip transit time of an ultrasonic pulse from said transducer to said material surface and back again, the improvement wherein said control circuit comprises means converting said echo response pulses to digital signals having a numerical value indicative of the intensity of each of said echo pulses relative to one another, and level indicating means responsive to said converting means to provide said indication of material level on the basis of the relative numerical value of said digitized response pulses.

B1 4,755,741 (2725th)

Patent Not Issued For This Number

B1 4,889,602 (2726th)

ELECTROPLATING BATH AND METHOD FOR FORMING ZINC-NICKEL ALLOY COATING

Katsuhide Oshima, Tokyo; Toshiaki Murai, Chiba; Hitoshi Sakurai, Matsudo; Shuji Igarashi, Hino; Haruo Hanagata, Ebina, and Hideaato Igarashi, Tokyo, all of, Japan, assignors to Dipsol Chemicals Co., Ltd., Tokyo, Japan

Reexamination Request No. 90/003,592, Oct. 7, 1994.

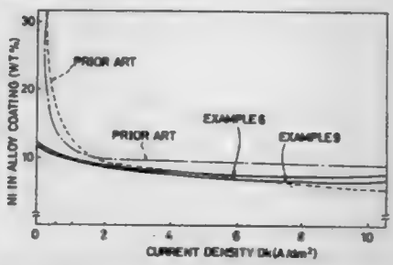
Reexamination Certificate for Patent 4,889,602, issued Dec. 26, 1989, Ser. No. 186,788, Apr. 25, 1988.

Continuation-in-part of Ser. No. 37,863, Apr. 13, 1987, abandoned.

Claims priority, application Japan, Apr. 14, 1986, 61-85253; Jun. 4, 1986, 61-129447

Int. Cl.[6] C25D *5/10;3/56;5/48*

U.S. Cl. 205—176



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–39** are cancelled.

New claims **40–64** are added and determined to be patentable.

40. An electroplating bath for forming a zinc-nickel alloy coating consisting essentially of:

a. water,

b. about 1 to 70 grams/liter of zinc,

c. about 0.6 to 118 grams/liter of nickel,

d. at least one component selected from the group consisting of:

(i) aliphatic amines in an amount not more than 16 grams/liter, and

(ii) polymers of aliphatic amines in an amount not more than about 20 grams per liter,

said at least one component being in an amount so that the electrodeposited zinc-nickel alloy coating electrodeposited from said bath has a substantially uniform zinc-nickel alloy ratio, and

e. at least one hydroxyaliphatic carboxylic acid selected from the group consisting of tartaric acid, sodium tartrate, citric acid, sodium citrate, disodium citrate, glycolic acid, sodium glycolate, and a salt thereof in an amount of from 0.01 to 2 mols/liter,

said bath having a pH of more than 11.

B1 4,961,986 (2727th)

SEALING MEMBER FOR A CONTAINER

Michael P. Galda, Acton, and Stephen H. Witt, Smithville, both of, Canada, assignors to Stanpac Inc., Canada

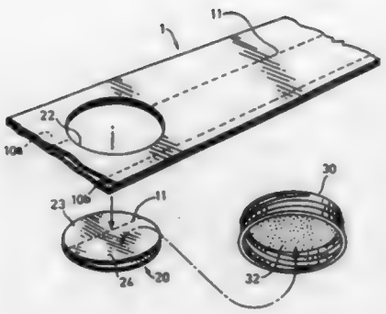
Reexamination Request No. 90/003,079, Jun. 3, 1993.

Reexamination Certificate for Patent 4,961,986, issued Oct. 9, 1990, Ser. No. 162,787, Mar. 2, 1988.

Claims priority, application Canada, Sep. 9, 1987, 546450

Int. Cl.[6] B32B *7/10;7/14;* **B65D** *41/32;43/02*

U.S. Cl. 428—201



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **31** is cancelled.

Claims **1–6, 8, 9, 17, 18, 20–22, 24** and **25** are determined to be patentable as amended.

Claims **7, 10–16, 19, 23, 26–30** and **32–35** dependent on an amended claim, are determined to be patentable.

New claims **36** and **37–41** are added and determined to be patentable.

1. A sealing member *in combination with a cap which comprises a cap body having a planar top wall and a side wall, wherein the sealing member is mounted in the cap with a side of the sealing member remote from the membrane facing and abutting an inner face of the planar top wall, the sealing member being* adapted for securing to a lip around an opening of a container to close the container, the sealing member commprising:

(*a*) a membrane having a periphery**[**, one side of which is for bonding to the lip of a container**]**;

(*b*) a first sheet *having a periphery*;

(*c*) a first layer of adhesive between the membrane and the first sheet bonding facing portions of the membrane and the first sheet together to form

(*i*) a *lip* composite portion *adjacent the peripheries of the membrane and the first sheet for extending over portions of the container lip, and*

(*ii*) a central composite portion for extending over portions of the container opening with the lip composite portion being located between the central composite portion and adjacent peripheries of the membrane and the first sheet and with the central composite portion extending over a substantial part of the sealing member, **[**whilst**]** *and* leaving at least one portion of the first sheet free **[**in a separated portion of the sealing member, the free portion of the first sheet forming**]** *of the membrane to form* a tab, wherein a part of the periphery of **[**the first sheet forming a tab, wherein a part of the periphery of**]** the membrane **[**bounding that portion of the membrane forming**]** *in* the *lip* composite portion is common with a corresponding part of the periphery of the first sheet, *with the first layer of adhesive bonding the first sheet and the membrane together so strongly that all of the first sheet and all of the membrane can be removed as a unit from the lip of the container to open the container*; and

(*d*) an additional layer of adhesive on **[**said one**]** *a* side of the membrane **[**which is adapted**]** *opposite the first sheet* for bonding *the sealing member directly* to the lip of the container**[**, with the first layer of adhesive bonding the first sheet and the membrane together so strongly that, in use, the first sheet and the membrane can be removed as a unit from the lip of the container to open the container**]**.

B1 4,997,924 (2728th)

5'-DEOXY-4',5'-UNSATURATED-5'-SUBSTITUTED ADENOSINES

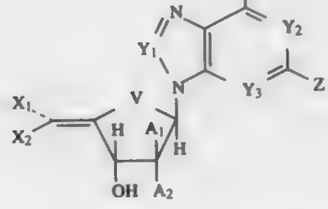
Esa T. Jarvi, Cincinnati; James R. McCarthy, West Chester, and Nell Gunja J. Prakash, Cincinnati, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Reexamination Request No. 90/003,493, Jul. 8, 1994.
Reexamination Certificate for Patent 4,997,924, issued Mar. 5, 1991, Ser. No. 445,892, Nov. 29, 1989.
Continuation of Ser. No. 89,693, Aug. 26, 1987, abandoned.
Int. Cl.[6] **C07H** *19/167;19/173*
U.S. Cl. 536—27.2

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–22** is confirmed.

1. A compound of the formula



wherein

V is oxy,

X_1 and X_2 are each independently hydrogen or halogen with the proviso that at least one of X_1 and X_2 is always a halogen atom,

A_1 and A_2 are each independently hydrogen, halogen, or hydroxy with the provisos that where A_1 is hydroxy, A_2 is hydrogen, and that where A_2 is hydroxy, A_1 is hydrogen,

Y_1 is nitrogen, a CH group, a CCl group, a CBr group or a CNH_2 group,

Y_2 and Y_3 are each independently nitrogen or a CH group,

Q is NH_2, NHOH, $NHCH_3$, or hydrogen, and

Z is hydrogen, halogen, or NH_2;

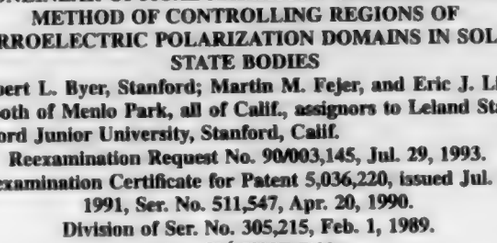
or a pharmaceutically-acceptable salt thereof.

B1 5,036,220 (2729th)

NONLINEAR OPTICAL RADIATION GENERATOR AND METHOD OF CONTROLLING REGIONS OF FERROELECTRIC POLARIZATION DOMAINS IN SOLID STATE BODIES

Robert L. Byer, Stanford; Martin M. Fejer, and Eric J. Lim, both of Menlo Park, all of Calif., assignors to Leland Stanford Junior University, Stanford, Calif.

Reexamination Request No. 90/003,145, Jul. 29, 1993.
Reexamination Certificate for Patent 5,036,220, issued Jul. 30, 1991, Ser. No. 511,547, Apr. 20, 1990.
Division of Ser. No. 305,215, Feb. 1, 1989.
Int. Cl.[6] **H03F** *7/00*
U.S. Cl. 359—328



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **3** is cancelled.

Claim **1** is determined to be patentable as amended.

Claims **2** and **4–7**, dependent on an amended claim, are determined to be patentable.

New claims **8–13** are added and determined to be patentable.

1. A nonlinear converter of electromagnetic radiation having a desired optical frequency, comprising:

a body of solid state *ferroelectric* material;

source means of electromagnetic radiation having one or more frequencies which are different than the desired optical frequency;

waveguide means [provided by] *formed on or in* said body for confining electromagnetic radiation;

means for directing electromagnetic radiation from said source means into said waveguide means; and

said waveguide means having a plurality of succeeding regions of differing compositions respectively providing differing states of [dominant electrical] *spontaneous* polarization in succeeding regions transverse to the path of radiation guided by the same for converting radiation from said source means to output radiation having said desired optical frequency.

B1 5,103,873 (2730th)

MECHANISM FOR CONTROLLING GRIFFE FRAME MOVEMENT

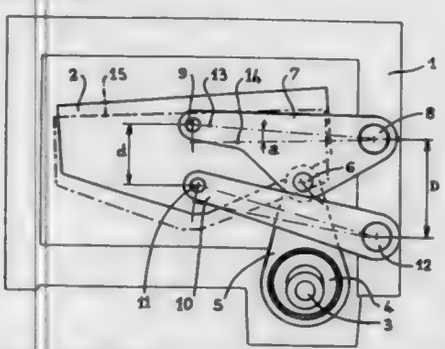
Dario Bassi, Chaponnay, France, assignor to Staubli-Verdol S.A., Chassieu, France

Reexamination Request No. 90/003,744, Mar. 3, 1995.

Reexamination Certificate for Patent 5,103,873, issued Apr. 30, 1991, Ser. No. 654,545, Feb. 13, 1991.

Int. Cl.[6] **D03C** *3/08;3/36*

U.S. Cl. 139—59



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **2**, **5** and **7** are cancelled.

Claims **1**, **4** and **6** are determined to be patentable as amended.

Claim **3**, dependent on an amended claim, is determined to be patentable.

1. In a weaving loom having a framework, a mechanism for controlling the reciprocating movement of two griffe frames of a shed-forming device, wherein the mechanism comprises, a first lever, a first pivot means for articulating one end of said first lever to the framework, and a second pivot means for articulating the other end of said first lever to one of the griffe frames, a second lever, a third pivot means for articulating one end of said second lever to the framework, and fourth pivot means for articulating the other end of said second lever to said one of the griffe frames, said first and second levers defining the first of two opposing jointless sides of a shiftable quadrilateral, a portion of the framework between said first and third pivot means and a portion of said one of [said] *the* griffe frames between said second and fourth pivot means defining a second of two opposing sides of said shiftable quadrilateral, *said first and third pivot means being spaced at a first distance with respect to one another and said second and fourth pivot means being spaced at a second distance with respect to one another, said first and second distances being such as to cause said shiftable quadrilateral to move said one of the griffe frames obliquely from said first to said second position*, and a control member connected to said first lever for reciprocally shifting said quadrilateral to thereby move said one of the griffe frames between *said* first and second positions.

B1 5,111,232 (2731th)

CAMERA HAVING FUZZY INFERENCE FUNCTION

Katsuhiko Tsunefuji, Sagamihara, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Reexamination Request No. 90/003,054, May 10, 1993.

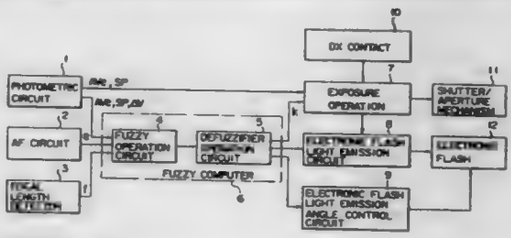
Reexamination Certificate for Patent 5,111,232, issued May 5, 1992, Ser. No. 532,916, Jun. 4, 1990.

Claims priority, application Japan, Jun. 15, 1989, 1-1529922

Int. Cl.[6] **G03B** *13/00*

U.S. Cl. 354—402

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



Claims **1**, **5–10**, **13–20** and **22–26** are determined to be patentable as amended.

Claims **2–4**, **11**, **12** and **21**, dependent on an amended claim, are determined to be patentable.

1. A camera comprising:

measuring means for outputting information associated with an object to be photographed *including brightness information related to at least a central portion and a peripheral portion of the object*;

a fuzzy computer *having a non-zero fuzziness* for receiving an output from the measuring means *including the brightness information related to said at least a central portion and a peripheral portion* as an input value, obtaining a fitting degree of the input value with respect to a then-part membership function in accordance with an if-part membership function and the then-part membership function, both of which correspond to a plurality of rules representing a degree of influence of the input value on an optimal exposure, obtaining a center of gravity value from a plurality of fitting [degree] *degrees* corresponding to the rules, and obtaining a determination value as a result of inference; and

means for determining photographic conditions *including an exposure value* from the determination value *obtained* from the fuzzy computer and the output from said measuring means.

B1 5,141,928 (2732th)

OPHTHALMIC MEDICATION

Lawrence Goldman, Tequesta, Fla., assignor to Brujo Incorporated, Austin, Tex.

Reexamination Request No. 90/003,390, Apr. 5, 1994.

Reexamination Certificate for Patent 5,141,928, issued Aug. 25, 1992, Ser. No. 453,624, Dec. 20, 1989.

Int. Cl.[6] **A61K** *31/725;31/70*

U.S. Cl. 514—54

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–12** are cancelled.

New claims **13–26** are added and determined to be patentable.

13. A method of treating an eye infection which comprises applying to the eye an amount of a glycosaminoglycan polysulfate (GAGPS) composition effective to treat the eye infection, the glycosaminoglycan polysulfate (GAGPS) being selected from the group consisting of dermatan sulfate, keratan sulfate and chondroitin sulfate, wherein the chondroitin sulfate has a molecular weight up to about 15,000.

B1 5,204,106 (2733th)

Patent Not Issued For This Number

REISSUES

NOVEMBER 14, 1995

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,084
METHOD FOR MEASURING A LENGTH AND ELECTRONIC SLIDE CALIPER

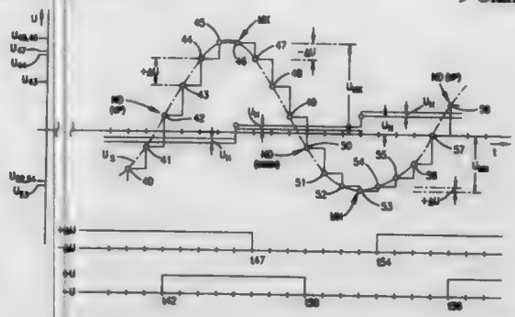
Marcel Lorenz, Gamprin, Liechtenstein, assignor to PAV Praezisions-Apparatebau Aktiengesellschaft, Liechtenstein

Original No. 5,174,041, dated Dec. 29, 1992, Ser. No. 708,894, May 31, 1991. Application for reissue Dec. 15, 1994, Ser. No. 356,494

Claims priority, application Germany, May 6, 1990, 40 17 954.0

Int. Cl.[6] **G01B** *7/02;11/04*

U.S. Cl. 33—706 **9 Claims**



1. A method for measuring a length by utilizing an electronic slide caliper having a rule and a slide arranged on said rule for displacement thereon in a longitudinal direction, a marking being provided on said rule, said marking comprising longitudinal marks distributed periodically in said longitudinal direction at a grid pitch, said caliper, further, comprising at least two sensors arranged on said slide and responding to said marking, said sensors being offset relative to each other by a predetermined amount ($n\pi \pm \pi/2$) unequal to n times half said grid pitch (π) with n being an integer number so that when said slide is displaced along said rule, periodic voltage signals (A, B) generated by said sensors are offset in phase ($\Delta\Phi$) relative to each other, said caliper also comprising computing means for numerically processing pulses derived from said signals (A, B) as a function of the sign of said phase offset ($\Delta\Phi$), the method comprising the steps of:

Scanning periodically at least one of said signals (A, B) at a predetermined scanning rate (Δt) for generating scanned signal values (U_A, U_B);

storing said scanned signal values (U_A, U_B);

comparing successive ones of said scanned signal values (U_{40}, U_{58});

generating n first characteristic value ($+\Delta U$) upon occurrence of a rise and a second characteristic value ($-\Delta U$) upon occurrence of a decrease between said successive signal values (U_{40}, U_{58});

storing of the respective last but one signal value (U_{46}, U_{53}) as a maximum (MX), upon occurrence of a transition from said first characteristic value ($+\Delta U$) to said second characteristic value ($-\Delta U$), and as a mimimum (MN), upon occurrence of a transition from said second characteristic value ($-\Delta U$) to said first characteristic value ($+\Delta U$);

generating an arithmetic mean value from successive maximum signal values (U_{46}) and minimum signal values (U_{53});

storing said arithmetic mean values as zero-voltage values (U_N);

comparing said signal values (U_{40}-U_{58}) with said respective zero-voltage value (U_N);

generating a third characteristic value (+U) during presence of signal values (U_{42}–U_{49}, U_{58}) which are above said zero-voltage value (U_N), and a fourth characteristic value (–U) during presence of signal values (U_{40}–U_{41}, U_{50}–U_{57}) being below said zero-voltage value (U_N);

storing the respective last signal value (U_{42}, U_{50}, U_{58}) as a zero transition (ND), upon occurrence of a transition between said third characteristic value (+U) and said fourth characteristic value (–U); and

counting the number of zero transitions (ND).

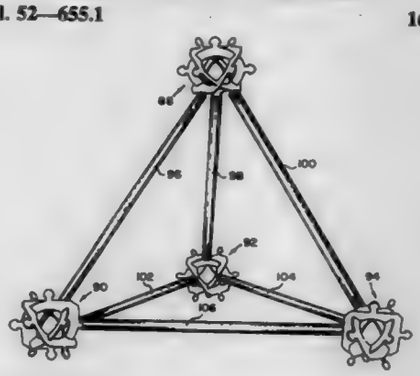
Re. 35,085
SPACE FRAME SYSTEM

Robert Sanderson, 416 Front St., Marion, Mass. 02738

Original No. 5,097,645, dated Mar. 24, 1992, Ser. No. 381,374, Jul. 17, 1989. Continuation of Ser. No. 972,584, Nov. 6, 1992. Application for reissue Apr. 13, 1994, Ser. No. 972,584

Int. Cl.[6] **E04B** *1/19;* **A63H** *33/08*

U.S. Cl. 52—655.1 **16 Claims**



16. A kit comprising:

a connector body;

a plurality of outwardly directed prongs coupled to said connector body, each of said outwardly directed prongs including:

an inner stem having a first end coupled to said connector body; and

an outer cap having a base portion coupled to a second end of said inner stem, wherein the base portion of said outer cap extends beyond said inner stem such that said outer cap forms a pair of catches; and

a deformable tube having first and second opposing ends with the first end of said deformable tube having an inner tube diameter, an outer tube diameter and a pair of opposed holes disposed therein, wherein the outer tube diameter of the first end of said deformable tube is less than the distance between the pair of catches of said prongs and the opposed holes in the first end of said deformable tube each have a diameter adapted to accept at least a portion of the catches and wherein the pair of catches of at least one prong are provided having a shape adapted to engage the opposed holes in the first end of said deformable tube and wherein the first end of said tube is sufficiently deformable to permit the pair of catches of said at least one prong to enter the inner diameter of said deformable tube and thereby engage the pair of catches in the opposed holes of the first end of said tube such that at least a portion of each of the pair of catches projects through respective ones of the pair of opposed holes in the first end of said deformable tube.

Re. 35,086

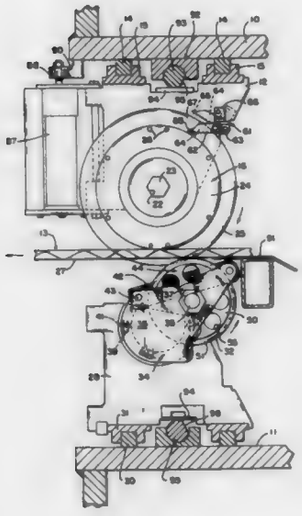
SLITTING APPARATUS FOR CORRUGATED PAPERBOARD AND THE LIKE

Richard F. Paulson, Phillips, Wis.; Kent L. Ross, Owatonna, Minn.; Timothy C. Prochnow, Phillips, Wis.; David W. Dix, L'Anse, Mich., and Luke A. Stout, Phillips, Wis., assignors to Marquip, Inc., Phillips, Wis.

Original No. 5,090,281, dated Feb. 25, 1992, Ser. No. 739,795, Aug. 1, 1991. Continuation of Ser. No. 490,793, Mar. 8, 1990, abandoned. Application for reissue Feb. 23, 1994, Ser. No. 200,225

Int. Cl.[6] B26D *1/22*

U.S. Cl. 83—13 **23 Claims**



20. A method for longitudinally slitting a moving web of corrugated paperboard manufactured from multiple paper layers glued together with a starch-based adhesive, said method comprising the steps of:

(1) mounting an annular blade above the web for rotation on an axis parallel to the web and transverse to the direction of movement thereof;

(2) providing said blade with a smooth continuous peripheral cutting edge defined by similar beveled edge faces on opposite sides of said edge;

(3) positioning said blade to extend said blade edge and edge faces beyond the bottom side of the web;

(4) mounting an idler roller having a cylindrical outer surface below the web for rotation on an axis parallel to the axis of rotation of said blade;

(5) positioning the cylindrical outer surface of said roller to make tangent contact with the underside of the web;

(6) providing the cylindrical outer surface of said roller with an annular circumferential slot having a width greater than the maximum width of said edge faces;

(7) forming a nip by positioning said roller and slot to receive therein said blade edge and edge faces;

(8) mounting said roller to position the axis of rotation thereof in the upstream direction from the rotational axis of the blade by a distance sufficient to place the line of tangent contact of said roller with the web coincident with a line normal and tangent to the blade edge;

(9) rotating said blade to move the blade edge in the direction of movement of said web and at a speed substantially greater than the speed of the web; and,

(10) lubricating the peripheral edge and edge faces of said blade with a direct contact lubricant applicator to prevent the adherence and build-up of adhesive on said blade.

Re. 35,087

SHEET SORTER WITH STAPLER

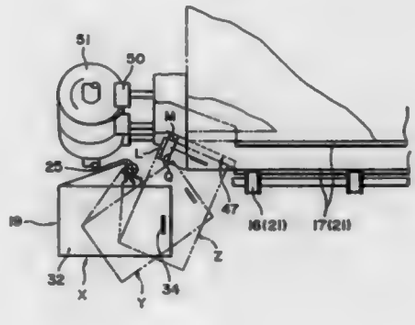
Nobutaka Uto, Yokohama; Hironori Shido, Miyazaki; Jun Saito, Kawasaki; Masakazu Hiroi, Yokohama; Kenji Kobayashi, Tokyo; Koichi Murakami, Yokohama, and Masataka Naito, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 4,928,941, dated May 29, 1990, Ser. No. 216,118, Jul. 7, 1988. Application for reissue May 29, 1992, Ser. No. 891,168

Claims priority, application Japan, Jul. 9, 1987, 62-172681; Jul. 30, 1987, 62-191934; Jul. 30, 1987, 62-191936; Aug. 10, 1987, 62-200288; Aug. 10, 1987, 62-200289

Int. Cl.[6] B42B *1/02;* **B42C** *1/12*

U.S. Cl. 270—53 **30 Claims**



16. A sheet sorting apparatus with a stapler, comprising:

a plurality of bin trays which are arranged substantially vertically with predetermined clearances between adjacent bin

trays, which are inclined to provide an inclined sheet receiving surface and which are independently movable substantially in the vertical direction;

bin tray shifting means for moving said plurality of the bin trays stepwisely substantially in the vertical direction to oppose the respective bin trays to a sheet inlet of said sorting apparatus, while expanding the clearance between the bin tray opposed to the sheet inlet and an upper adjacent bin tray to provide a larger clearance than said predetermined clearances; and

stapling means, having a stapling head movable to above the sheet receiving surface and an anvil movable to below the sheet receiving surface, for stapling the sheets interposed between the stapling head and the anvil;

wherein said bin trays are so disposed that between those ends of adjacent ones of said bin trays which are closer to the sheet inlet are deviated in the direction of movement of the sheet when seen in a direction substantially perpendicular to the sheet receiving surface, and wherein the stapling head is moved to above the sheet receiving surface using a space provided by the deviation, and wherein said expanded clearance is smaller than a height of the stapling head.

Re. 35,088

Patent Not Issued For This Number

Re. 35,089

Patent Not Issued For This Number

PLANT PATENTS

GRANTED NOVEMBER 14, 1995

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,368

CHERRY TREE 'EARLY RED'

Marvin L. Nies, 9296 E. Kettleman, Lodi, Calif. 95240

Filed Feb. 6, 1995, Ser. No. 383,925

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—37 **1 Claim**

1. A new and distinct variety of cherry tree, substantially as illustrated and described, being of medium vigor and size, the fruit strongly resembling Garnet in form, size, color and external appearance, but having a somewhat shorter thicker fruit stem, equivalent firmness of flesh and toughness of the skin, darker red flesh color and darker red juice at maturity, fruit ripening more evenly, picking ripe twelve (12) days earlier, having a lower chilling requirement, more precocious, the tree having equivalent tolerance for higher temperatures with good resistance to the development of spurs and doubles, but being more resistant to the development of sutures in warmer climates.

9,369

CHRYSANTHEMUM PLANT NAMED 'SANDUSKY'

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 1, 1994, Ser. No. 331,857

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—82.2 **1 Claim**

1. A new and distinct Chrysanthemum plant named Sandusky, as described and illustrated.

9,370

CHRYSANTHEMUM PLANT NAMED 'AMI'

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 1, 1994, Ser. No. 331,864

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—82.2 **1 Claim**

1. A new and distinct Chrysanthemum plant named Ami, as described and illustrated.

9,371

POINSETTIA PLANT NAMED FISPIC

Katharina Zerr, Simmern, Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Oct. 24, 1994, Ser. No. 328,051

Claims priority, application Germany, Dec. 29, 1993, EUP 147

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—86.4 **1 Claim**

1. A new and distinct Poinsettia plant named Fispic, as illustrated and described.

9,372

DAYLILY PLANT NAMED 'YELLOW SILK RUFFLES'

Ronald C. Iverson, Rte. 1, Box 326B, Orange, Va. 22960

Filed Dec. 12, 1994, Ser. No. 355,296

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.4 **1 Claim**

1. A new and distinct cultivar of daylily plant named Yellow Silk Ruffles, as illustrated and described.

9,373

GERANIUM PLANT NAMED FISBLIZ

Ingeborg Schumann, Albstadt, Germany, assignor to Florfis, AG, Binningen, Switzerland

Filed Dec. 21, 1994, Ser. No. 360,340

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new distinct cultivar of geranium plant named Fisbliz, as illustrated.

ERRATA–CONTINUED

For CLASS	See PATENT NO.
523–421	5,466,727
525–057	5,466,748
525–084	5,466,750
526–068	5,466,776
536–024	5,466,785
536–026	5,466,786
536–026	5,466,787
562–519	5,466,874
562–580	5,466,875
562–608	5,466,876
562–852	5,466,877
564–197	5,466,878
564–253	5,466,879
359–841	5,467,222
359–841	5,467,222
361–232	5,467,247
364–449	5,467,276
395–200	5,467,295
364–571	5,467,355
364–571	5,467,355
371–021	5,467,356
371–021	5,467,357
382–274	5,467,404
382–186	5,467,407
382–112	5,467,408
382–285	5,467,409
382–100	5,467,410
382–113	5,467,411
382–167	5,467,412
395–296	5,467,454
395–427	5,467,458
364–578	5,467,462
395–480	5,467,459
395–185	5,467,467
371–022	5,467,468
395–182	5,467,469
395–183	5,467,470
455–348	5,467,477

PATENTS

GRANTED NOV. 14, 1995

ERRATA

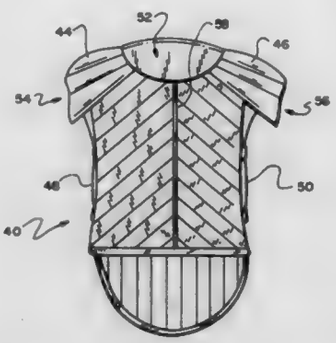
For CLASS	See PATENT NO.
029–267	5,465,430
015–246	5,465,443
024–625	5,465,472
029–006	5,465,474
049–368	5,465,528
062–051	5,465,582
083–698	5,465,641
600–223	5,465,709
600–139	5,465,710
600–207	5,465,711
165–114	5,465,784
222–095	5,465,872
224–495	5,465,883
232–001	5,465,909
242–532	5,465,919
273–121	5,465,965
280–731	5,465,998
280–733	5,465,999
303–150	5,466,054
411–433	5,466,106
411–546	5,466,107
418–268	5,466,135
607–033	5,466,216
604–317	5,466,229
106–020	5,466,287
148–306	5,466,306
216–017	5,466,331
216–017	5,466,332
264–443	5,466,401
264–408	5,466,404
514–161	5,466,436
427–384	5,466,493
435–297	5,466,602
514–057	5,466,680
514–432	5,466,709
514–573	5,466,713

PATENTS

GRANTED NOVEMBER 14, 1995

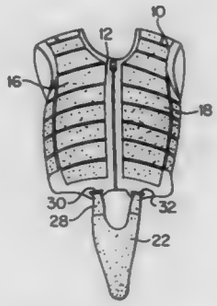
GENERAL AND MECHANICAL

5,465,423
BODY PROTECTIVE VEST
Martha Taylor-Varney, 66 Ham Rd., Barrington, N.H. 03825
Continuation of Ser. No. 833,461, Feb. 7, 1992, abandoned.
This application May 12, 1993, Ser. No. 60,687
Int. Cl.[6] A41D *13/00*
U.S. Cl. 2—2 **12 Claims**



1. A body protective vest for sports use, operable at the front, and comprising, in combination, a front panel and a back panel joined at the shoulders and side panels, wherein the front panel and back panel comprise inner and outer plies having a plurality of elongate padding inserts held in place between the inner and outer plies by line stitching, the front panel comprising two pieces joined by a central, vertically running fastening means, and wherein the padding inserts on the vest front panel extend diagonally, running from said vertically running fastening means to said back panel and side panel, and are held in place by diagonal line stitching.

5,465,424
BODY PROTECTOR
Douglas J. Cudney, and Karen E. Breitbach, both of Orangeville, Canada, assignors to Tipperary Sport Products, Inc., Ontario, Canada
Filed Sep. 21, 1993, Ser. No. 124,185
Int. Cl.[6] A41D *13/00;1/04*
U.S. Cl. 2—2 **12 Claims**



1. An articulated shock absorbing body protector in the form of a vest conformed to fit the human torso, having an upper shoulder portion, a waist portion and a lower lumbar portion, as well as a neck aperture and arm apertures in said shoulder portion, comprising:

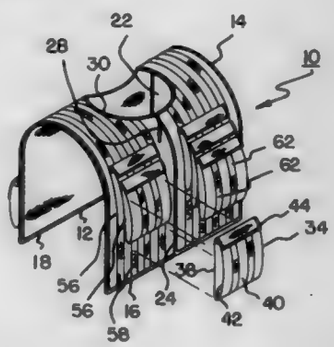
a. a back panel having upper, lower and side edges conformed to fit the human torso;

b. two side panels, each panel having upper, lower, front and back edges and conformed to fit the human torso, each side panel being joined at said upper edge to said back panel at said shoulder portion and extending over the side and front of the torso, said side panels being releasably joined to each other at said front edge at a vertical axis extending from the neck aperture to said lower edge of each side panel;

c. a plurality of shock absorbing cellular foam ribs independently and movably supported in skeletal array within said back panel and side panels, said ribs in said back and side panels being aligned with each other and being parallel to the human rib cage; and

d. a protective spinal sheath supported upon said back panel and extending from said neck aperture portion to said lumbar portion, said spinal sheath including an outer lightweight shield of flexible ballistic material tape and an inner core of shock absorbing horizontally disposed cellular foam ribs independently and movably supported and pivotable about horizontal axes adjacent said shield of flexible ballistic material tape.

5,465,425
FISHING GARMENT WITH REMOVABLE POCKETS WITH FASTENING MEANS ON BOTH POCKETSIDES
Harold D. Crispin, P.O. Box 222, Flora Vista, N.M. 87415
Filed Feb. 18, 1994, Ser. No. 198,293
Int. Cl.[6] A41D *1/04*
U.S. Cl. 2—102 **4 Claims**



1. A garment particularly adapted for wear by fishermen comprising, in combination:

a support member in a generally square configuration having side edges and end edges, an oval head opening centrally disposed therein with the larger axis of the oval being parallel with the end edges and with the smaller axis of the oval parallel with the side edges, the long axis constituting about 50 percent of the length of the end edges and the short axis constituting about 15 percent of the length of the side edges, a slit extending between the center of one of the end edges and the head opening to facilitate donning and removal of the garment with a tie string formed in the support member adjacent to the slit to facilitate opening and closing of the garment;

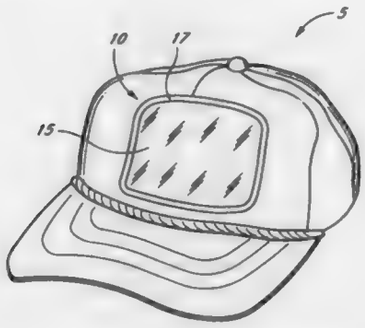
a plurality of pockets, the pockets having an interior and an exterior and also having a back face and a front face with means coupling the back face and front face along their sides and bottom extent and with a flap extending downwardly from the top of the back face over the front face;

coupling means interconnecting the support means and the pockets; and

coupling means including a plurality of strips of pile type fasteners secured to the exterior of the support member in spaced relationship parallel to the side edges and a plurality of strips of pile type fasteners secured to the interior of the pockets in spaced relationship parallel with the end edges and a plurality of strips of pile type fasteners secured to the

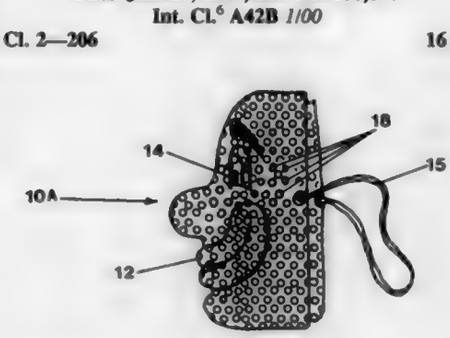
exterior of at least some pockets in spaced relationship parallel with the side edges.

5,465,426
PHOTO CAP
Edward R. Beaton, P.O. Box 1175, Orangevale, Calif. 95662
Filed Oct. 6, 1994, Ser. No. 319,078
Int. Cl.[6] A42B *1/24*
U.S. Cl. 2—195.1 **11 Claims**



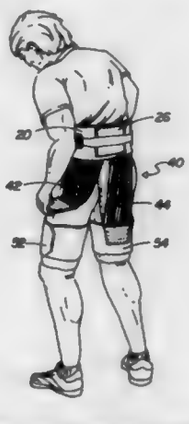
11. A cap to be worn on the head, comprising:
a generally hemispherical body having an interior surface having a top and a bottom, a peripheral edge along the bottom of said interior surface, and a cutout opening therethrough;
a transparent panel covering said cutout and fixedly attached to the interior surface of said body; and
a pocket on the interior of the body against the transparent panel, said pocket having an opening through which a photograph or work of visual art may be inserted into said pocket and held against said transparent panel to be visible through said transparent panel, wherein said opening is a slot in the interior of the cap.

5,465,427
FACIAL MASK AND METHOD
Rodney M. Shields, Danville, Calif., assignor to Creative Minds Foundation, Wilmington, Del.
Filed Jan. 27, 1994, Ser. No. 188,670
Int. Cl.[6] A42B *1/00*
U.S. Cl. 2—206 **16 Claims**



1. A facial mask comprising:
a) a sheet of formable material which is formed as a mask body sized to fit over a human face, said mask body including:
i) an inner surface for engaging a face of a wearer, said inner surface being of a dark color for absorbing light;
ii) an outer surface provided with a light color coating; and
b) a pattern of through-holes disposed in said mask body, said through-holes being sized sufficiently small in diameter and having a sufficiently tight pattern spacing to permit substantially unobstructed vision through the mask body by a wearer and at the same time substantially prevent vision into the mask body by an observer outside the mask body.

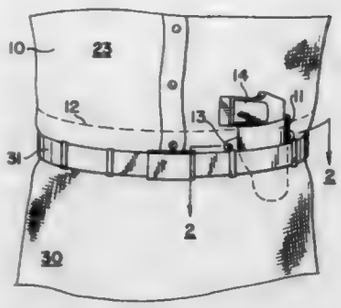
5,465,428
EXERCISE DEVICE OF ADJUSTABLE RESISTANCE FOR FLEXING OF MUSCLES OF THE LEGS AND TORSO
Michael S. Earl, 5010 Rosamond Dr., Apt. 2413, Orlando, Fla. 33808
Filed Jul. 29, 1993, Ser. No. 98,716
Int. Cl.[6] A63B *21/02*; A41D *1/08*
U.S. Cl. 2—238 **23 Claims**



1. An elasticized garment intended to provide exercise to the upper legs, hips, buttocks and abdominal muscles of a wearer, said garment being generally in an inverted, U-shaped configuration, with an upper portion of said elasticized garment to be attached to a rear waist portion of the wearer, said garment including a pair of elasticized descending members having upper and lower ends, to which upper portion of said garment, the upper ends of said pair of elasticized descending members are firmly attached, the lower end of each of said elasticized descending members having attachment means for attachment on the rear side of an upper leg portion of the wearer, said elasticized descending members utilizing a plurality of wide elastic sheets designed when in use to reside against the buttocks of the wearer, and because of their width, to provide substantial exercise to extensive portions of the buttocks, said elasticized descending members also serving to resist the wearer's forward leg motion, and thus provide a selected amount of exercise to the wearer during walking or running.

5,465,429
OUTSIDE HOLSTER AND AN INSIDE ARTICLE OF CLOTHING
William H. Rogers, and Norman E. Clifton, Jr., both of Jacksonville, Fla., assignors to Safariland Ltd., Inc., Ontario, Calif.
Filed Jan. 5, 1994, Ser. No. 176,767
Int. Cl.[6] A41F *19/00*
U.S. Cl. 2—300 **24 Claims**

1. A combination of an inside article of clothing and an outside holster for positioning a holstered object outwardly of an outwardly worn clothing of a wearer comprising an inside article of clothing for fastening around a wearer, a pair of outwardly projecting spaced pins having outer free enlarged heads and smaller shanks attached to the inside article of clothing, said enlarged heads being adapted to be engaged by spaced portions of outwardly worn clothing, a holster for carrying a holstered object, the holster including a pair of spaced keyways having enlarged openings disposed adjacent each other for receiving therethrough said enlarged heads and adapted to receive spaced portions of outwardly worn clothing of a wearer, said keyways having elongated slots extending substantially in alignment and disposed remotely



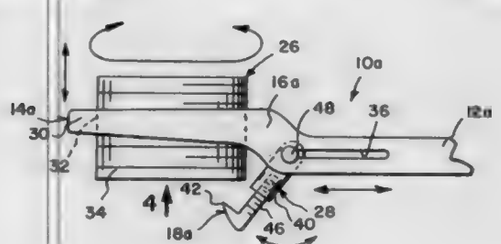
from each other for receiving therethrough said smaller shanks and adapted to receive spaced portions of outwardly worn clothing of a wearer, the holster being readily attachable to and detachable from said inside article of clothing without damaging spaced portions of outwardly worn clothing that is engageable between said pins and said keyways.

5,465,430

CAP GLIDE PULLER

Carl L. Davis, P.O. Box 486, Livingston Manor, N.Y. 12758-0486, and George Spector, 233 Broadway Rm 702, New York, N.Y. 10279

Filed Sep. 9, 1994, Ser. No. 303,732
Int. Cl.[6] B66F *15/00*
U.S. Cl. 29—267 **3 Claims**



1. A cap glide puller comprising:
a) an elongated handle;
b) a head longitudinally offset at one end of said handle;
c) a hook diagonally extending downwardly from the offset end of said handle towards said head, with said head and said hook capable of engaging a cap glide on a free end of a chair leg, so that when said handle is manually lifted up, the cap glide will be removed from the free end of the chair leg;
d) means for adjusting said head and
e) means for adjusting said hook, so as to accomodate different sized cap glides that are to be removed from the free end of the chair leg.

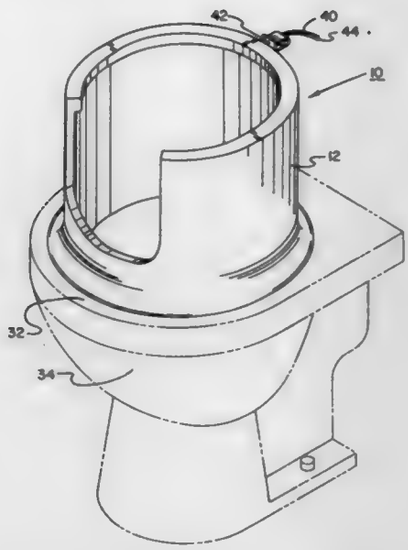
5,465,431

BOY'S URINAL TRAINER FOR A TOILET

Carl F. Wertz, 231 Tall Pines Rd., Ladson, S.C. 29456-3106

Filed Sep. 1, 1994, Ser. No. 299,522
Int. Cl.[6] E03D *9/00*
U.S. Cl. 4—300.3 **1 Claim**

1. A boy's urinal trainer for a toilet comprising, in combination:
a tubular plastic seat having a top end with an inwardly extended brim formed thereon, a bottom end with an outwardly extended and curved radial lip formed thereon, a peripheral vertical side wall interconnecting the top end with the bottom end and with a portion of the side wall having a length of about 2 feet as measured vertically between the lip and the top end, an annular integral rim extended downwards from the bottom end, a U-shaped cut out formed through the side wall and brim, a generally U-shaped channel formed within the brim and extended from a location near one side of the cut out to an opposite location on the other side of the cut out, and a plurality of outlets extended downwards from the channel with each outlet terminated at an opening near the side wall and with the lip positionable upon a top edge of a bowl of a toilet with the rim extended therein for holding the seat in a fixed configuration, the cut out receiving a boy's urine stream directed towards the bowl, and the side wall in combination with the rim used for properly directing a boy's urine downwards to the bowl for collection;
a flexible plastic tube with an inner diametric extent of about ¼ inch having a first end extended through the brim and positioned in the channel for communication therewith and a second end adapted to be connected to a water line of a toilet with the tube adapted for delivering water to the channel for allowing rinsing of the side wall through the outlets when the toilet is flushed; and
a clamp coupled to the tube and having one orientation for preventing water from being delivered to the seat and another orientation for allowing such delivery to occur.



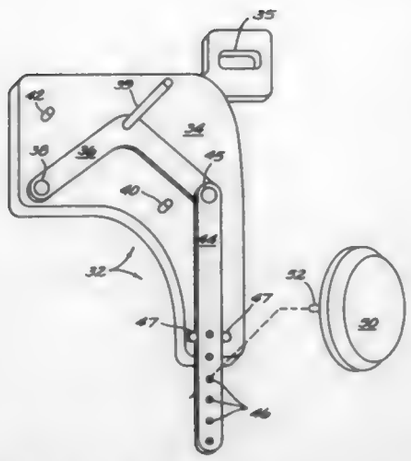
5,465,432

DEVICE TO SECURE TOILET FLUSH LEVER ARM TO EFFECT A PARTIAL FLUSH

John B. Miller, 110 W. Los Robles, Green Valley, Ariz. 85614

Filed Dec. 13, 1993, Ser. No. 165,631
Int. Cl.[6] E03D *1/14*
U.S. Cl. 4—325 **10 Claims**

1. In a dual flush mechanism for a toilet which raises the flush lever arm of a toilet tank a small distance when a partial flush handle is depressed by an operator, the flush lever arm operably connected to a flapper valve which is raised off a valve seat a similar distance to initiate the partial flush, an improvement for use with the dual flush mechanism to hold the flush lever arm in the elevated partial flush position after the operator releases the partial flush handle to effect a complete partial flush of the toilet, the improvement comprising:
a plate adapted to the operably secured to the toilet tank, said plate so situated as to be proximate the flush lever arm;
a cam pivotally attached to said plate to permit rotation of said cam, said cam rotationally engaging the flush lever arm, said cam including an outwardly protruding holding pin, said holding pin engaging the flush lever arm as said cam rotates



to hold the flush lever arm in the elevated partial flush position after the partial flush has been initiated by the operator;

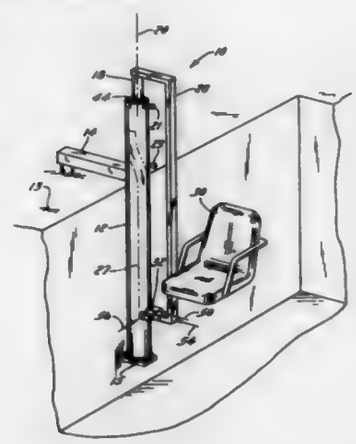
a float operably attached to said cam to cause said cam to rotationally engage the flush lever arm, said float of a size such that its buoyancy in water is sufficient to hold the flush lever arm in the elevated partial flush position after the partial flush has been initiated by the operator but not sufficiently buoyant to rotate said cam prior to the partial flush having been initiated by the operator, and to lower the flush lever arm when the partial flush has been effected to terminate the partial flush, said float having an attachment pin protruding therefrom;

an extension member, said extension member operably attached to said float and pivotally attached to said cam to cause said cam to rotate, said extension member having a plurality of attachment openings to receive said float attachment pin, said float position on said extension member adjustable to vary the duration of the partial flush; and

means to guide the movement of said extension member, said means to guide said extension member attached to said plate whereby when an operator depresses the partial flush handle to initiate the partial flush and then releases the partial flush handle, the partial flush will continue until it is completed.

5,465,433
SEAT LIFT
J. David Nolan, 132 Don Allen Rd., Louisville, Ky. 40207
Filed Jun. 6, 1994, Ser. No. 254,400
Int. Cl.[6] E04H *4/14*; A47K *3/12*
U.S. Cl. 4—496 **6 Claims**

1. A seat lift, comprising:



a cylinder having a vertically-oriented axis;

a piston movably retained in said cylinder;

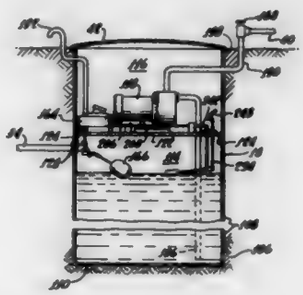
a piston rod projecting from said piston; said piston and said piston rod being movable along said vertically-oriented axis of said cylinder, and said piston rod being to rotatable about said vertically-oriented axis of said cylinder;

a frame mounted on said piston rod for receiving a seat, said frame being rotatable with said piston rod about the axis of said cylinder; and

a slide block mounted on said frame and in contact with an external surface of said cylinder, so as to support said frame horizontally with respect to said cylinder, wherein said slide block moves up and down and in a rotary manner on said external surface of said cylinder as the frame moves up and down and rotates about the axis of said cylinder.

5,465,434
WATER CONSERVATION SYSTEM FOR HOME INSTALLATION
John A. Coe, 615 Marguette St., Pacific Palisades, Calif. 90272
Division of Ser. No. 28,242, Mar. 9, 1993, Pat. No. 5,313,677, which is a continuation-in-part of Ser. No. 775,706, Oct. 10, 1991, Pat. No. 5,210,886. This application Mar. 29, 1994, Ser. No. 219,186
Int. Cl.[6] E03C *1/232*
U.S. Cl. 4—546 **11 Claims**

1. A system for recycling water from an existing bathtub/shower,



said system comprising:

a water storage tank;

a recycle water line adapted to extend between the bathtub/shower and said water storage tank;

valve means, adapted to be disposed at said bathtub/shower, for selectively directing water from the bathtub/shower into the recycle water line and into a sewer line;

handle means, connected to said valve means, for enabling manual selection of one of the recycle lines and the sewer line for receiving water from the bathtub/shower;

tank valve means, disposed in said water storage tank, for dispensing a waste water treatment fluid in response to water flowing into the tank from the recycle water line, said dispensing being proportional to the water flow into the tank;

tank means, disposed within said water storage tank, for holding a supply of the waste water treatment fluid;

pump means for removing water from said tank;

first means for electrically disconnecting the pump means when an amount of waste water treatment fluid in the tank means reaches a selected minimum amount;

second means for electrically disconnecting the pump means when a low water level in the storage tank is reached; and

single mercury switch means, in mechanical cooperation with said first and second means for interrupting electrical power to a motor driving the pump means.

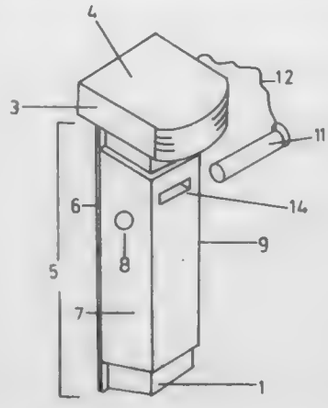
5,465,435

SHOWER STEP FOR SHAVING LEGS

Laura A. Malvaez, 25200 Cairos Bee Blvd. No. 89, Hayward, Calif. 94542, and David J. Monfredini, 407 Vicente St., San Francisco, Calif. 94116

Filed Feb. 21, 1995, Ser. No. 391,782
Int. Cl.[6] A47K *3/024*
U.S. Cl. 4—574.1 8 Claims

1. A wall mountable shower step for use in raising a user's leg



and foot above the floor level of a shower stall for the purpose of positioning the leg and foot of a user in a more accessible position for washing or shaving, said shower step comprising:

A) a base portion adapted to be mounted to a vertical wall of a shower stall,

a) said base portion having a rear wall, two side walls and a front wall, said rear, side walls and front wall being joined to provide an interior hollow space between said walls,

b) said rear wall being provided with cutout portions defining mounting holes for cooperation with means for mounting said base portion to said vertical wall of said shower stall,

c) each of said side walls having a cutout portion defining a support hole, said support holes in said side walls being horizontally aligned,

d) and a locking means adapted to pass through said support holes,

B) a movable footrest member,

a) said footrest member including a shaft having a vertical axis and a step plate,

b) said shaft being dimensioned to slideably fit within said interior hollow space in said base portion,

c) a plurality of cutout portions through said shaft defining adjustment holes, said adjustment holes being axially disposed along said shaft and being respectively horizontally alignable with said support holes in said base portion so as to adjustably position said shaft within said base portion,

d) said step plate being attached to said shaft and including a step plate head aligned at a downwardly inclined angle with respect to the vertical axis of said shaft,

C) said base portion and footrest member being adapted to be assembled with said shaft slidable through said interior hollow space of said base and to be fixed in an adjusted position by cooperation of said locking means passing through said support holes in said side walls and one of said adjustment holes in said shaft,

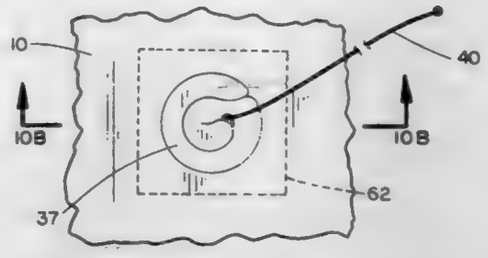
D) whereby a user of said shower step may elevate a leg and foot by placing a foot on said step plate while standing within said shower stall.

5,465,436

DISPOSABLE HYDROTHERAPY TANK LINER

Joel N. Bleicher, Rte. 3, Box 70, Council Bluffs, Iowa 51503

Continuation of Ser. No. 95,782, Jul. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 53,786, Apr. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 821,329, Jan. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 697,129, May 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 562,840, Aug. 6, 1990, abandoned. This application Dec. 29, 1994, Ser. No. 366,220
Int. Cl.[6] A47K *3/02*
U.S. Cl. 4—580 2 Claims



1. A disposable hydrotherapy tank liner for use in combination with a hydrotherapy tank having a drain hole, hydrotherapy fluids and a hydrotherapy tank turbine unit, said tank liner comprising: a sheet material impervious to liquids and having an interior surface and an exterior surface and a shape substantially conforming to the interior of a hydrotherapy tank; means for retaining said sheet material within said hydrotherapy tank;

a drain opening formed in said sheet material, means on said exterior surface surrounding said drain opening for securing said sheet material about the periphery of said drain hole,

a drain opening seal attached to said interior surface and covering said drain opening so as to retain said hydrotherapy fluids on said interior surface,

a ripcord embedded in said drain opening seal at one end and an opposite end extending above a normal fluid level of said tank,

whereby a pulling force applied to said opposite end will cause said one end to tear a hole in said seal in order to allow said fluid to pass out of said drain hole.

5,465,437

BATHING APPLIANCE FOR HANDICAPPED PERSONS

William David Herman, Dogtail Corners Rd. - R.R. 1 Box 523A, Wingdale, N.Y. 12594

Filed Aug. 12, 1994, Ser. No. 289,785
Int. Cl.[6] A47K *3/12*
U.S. Cl. 4—611 13 Claims

1. A bathing appliance for enabling a handicapped person to bathe comfortably inside a bathing enclosure having vertical side walls, an outer entry wall or step, and an inside floor bounded by said walls, comprising:

a base frame dimensioned and arranged to rest on the inside floor of said bathing enclosure;

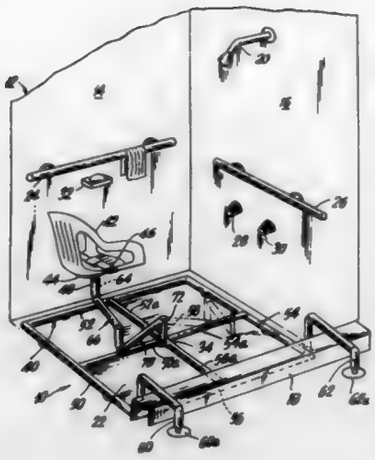
said base frame having a perimeter parts of which reach near each of the walls of the bathing enclosure when the base frame rests on said inside floor;

a chair seat on which the handicapped person can sit when entering and leaving the bathing enclosure, and while bathing inside the enclosure;

said chair seat having a bottom portion and first swivel means fixed beneath said bottom portion to allow the chair seat to be supported for relative movement over said base frame;

said base frame having

second swivel means fixed to a portion of the base frame, for forming a fixed base pivot axis that is normal to the floor of the bathing enclosure, and



an outside foot portion that extends from a part of the base frame when resting on said inside floor to span the outer entry wall or step of the bathing enclosure, said foot portion including outside floor contact means for contacting an outside floor surface next to the bathing enclosure;

extension means having third swivel means at a top end for engaging the first swivel means of said chair seat for relative swiveling movement about an extension axis parallel to the base pivot axis, and fourth swivel means at a bottom end of the extension means for engaging the second swivel means of said base frame for relative swiveling movement about the base pivot axis;

wherein said extension means is constructed and arranged to support the chair seat above the base frame while allowing the seat to be moved between a position outside the bathing enclosure at which a person can either mount or dismount said seat, and a position inside the bathing enclosure at which the person can bathe comfortably while seated.

5,465,438

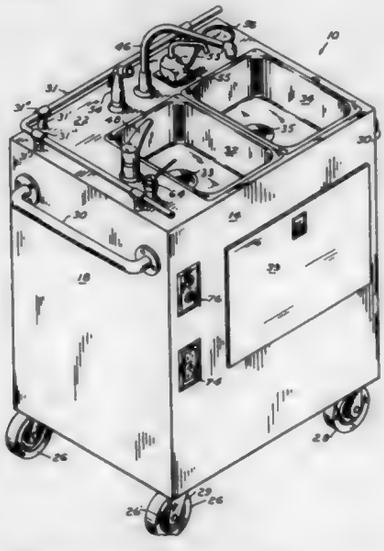
MOBILE NURSING STATION

Thomas Allman, 1423 20th Ave., SW., Puyallup, Wash. 98371, and Cathy A. Lee, P.O. Box 2347, Santa Rosa, Calif. 95405

Filed Jan. 9, 1995, Ser. No. 342,554

Int. Cl.[6] A47K *1/02*

U.S. Cl. 4—626 **5 Claims**



1. A mobile nursing station, comprising:

an assembly of components, the components including:

an upright rectangular cabinet having vertically spaced top and bottom walls and front and back and end walls extending vertically therebetween in orthogonal relationship, the top wall including a pair of juxtaposed recessed sink cavities adjacent the front wall and one end wall, each sink cavity of said pair of sink cavities having a sink cavity floor, and

each sink cavity floor of said pair of sink cavity floors having a drain outlet, and

a faucet rotatably mounted to the top wall in adjacency to the sink cavities extending over and movable from one sink cavity of the pair of sink cavities to the other one of the pair of sink cavities, and the faucet including a faucet valve to selectively direct fluid flow through the faucet, and

a rod-like L-shaped kitchen rail mounted to the top wall in adjacency to the back wall and the end wall opposite said one end wall in substantial coextensive relationship with the top wall between the cabinet end walls and between the cabinet front wall and back wall, for forming a temporary storage area between the kitchen rail and the pair of sink cavities, and the kitchen rail having a plurality of spaced-apart upright T-shaped kitchen rail mounts, each kitchen rail mount of said plurality of kitchen rail mounts having a stem portion secured to the top wall and having a tubular bar portion cooperatively axially surrounding an intermediate portion of the L-shaped kitchen rail rod, and

a plurality of caster wheels depending from said bottom wall in cabinet supporting relationship, each caster wheel of said plurality of caster wheels including a bracket secured to the cabinet bottom wall adjacent an end wall of the cabinet, the bracket having bracket legs journalling the caster wheel, and

a wheel brake for immobilizing a caster wheel secured to at least one caster wheel bracket of said plurality of caster wheels, and

the cabinet having a horizontal dividing partition forming an upper compartment an a lower compartment, and

a gray water tank having vertically spaced tank top and tank bottom walls within the upper compartment, the gray water tank top wall having a gray water inlet opening, and

sink cavity drain tubing connecting the sink cavity floor drain outlets with the gray water tank inlet opening, the gray water tank bottom wall having a gray water outlet opening, and a gray water tank valve normally closing the gray water tank drain opening, and

a fresh water reservoir having a top wall within the bottom compartment, the fresh water reservoir top wall having an inlet opening and an outlet opening, and

fresh water tubing extending between and connecting the faucet with the fresh water outlet opening, and

an electric motor driven pump interposed in the fresh water tubing, and

a source of electrical energy connected with the pump motor.

5,465,439

DEVICE FOR RETAINING A PLAYPEN IN AN EXTENDED POSITION

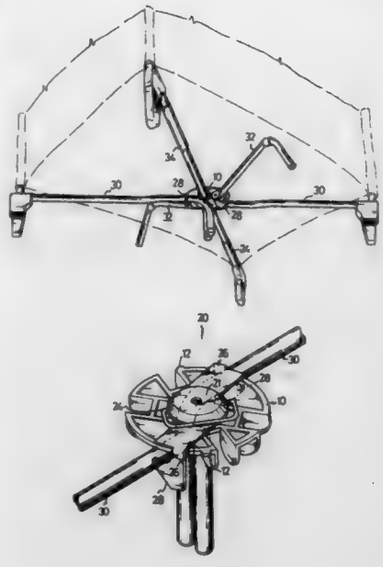
Jui-Lung Chien, Taichung, Taiwan, Prov. of China, assignor to Jina Manufacturer Thai Co., Ltd., Bangkok THX

Filed Dec. 8, 1994, Ser. No. 352,228

Int. Cl.[6] A47D *7/00*

U.S. Cl. 5—99.1 **8 Claims**

1. A playpen floor structure comprising a joint, a plurality of tubes pivotably linked to the joint and a device for retaining the playpen floor structure in an extended position, the improvement comprising that the device includes a housing rotatably mounted on the joint between a first position and a second position, two blades projecting radially from the housing in opposite directions wherein each of the blades includes a free end portion projecting downwardly therefrom wherein the free end portion of each of the blades is formed as a hook, wherein two of the tubes are engageable with the hooks in the first position, wherein the two of the tubes are disengageable from the hooks in the second position.

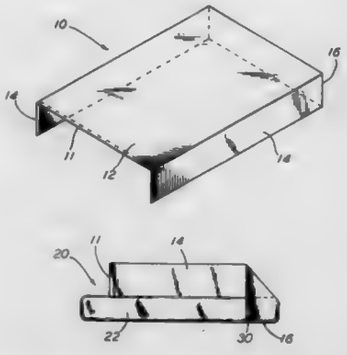


5,465,440

PARTIALLY FITTED TOP SHEET FOR BED AND METHOD OF USING AND MAKING SAME

Patricia Heptner, 301 Maple Ave., Johnstown, Pa. 15901

Filed Jun. 14, 1994, Ser. No. 259,541
Int. Cl.[6] A47G *9/04;9/02*
U.S. Cl. 5—497 8 Claims



1. A partially fitted top sheet for a bed mattress having a rectangular upper surface with a predetermined width and predetermined length, a pair of rectangular side surfaces, and a rectangular bottom side surface, each having a predetermined width defining a predetermined thickness of said bed mattress, said partially fitted top sheet comprising, a piece of fabric having;

(a) a rectangular top surface portion the dimensions of which are adapted to fit flatly over such rectangular upper surface of such bed mattress,

(b) a pair of rectangular side portions, one each extending from opposite sides of said rectangular top surface portion and adapted to hang downwardly from said rectangular top surface portion and having a width approximately equal to said predetermined thickness of such bed mattress, and

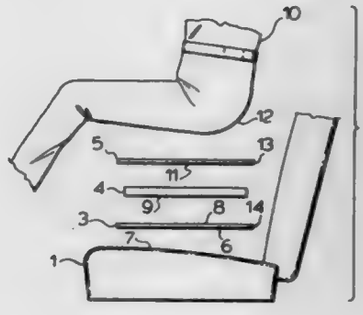
(c) a rectangular bottom portion extending from said rectangular top surface portion transversely between said pair of rectangular side portions, and having a width generally equal to said width of said pair of rectangular side portions, said rectangular bottom portion being joined to each of said rectangular side portions such that said rectangular side portions and said rectangular bottom portion form a continuous, three-sided skirt extending perpendicularly from said rectangular top surface portion whereby upon placing said top surface portion of said sheet onto such upper surface of such bed mattress and also placing the entire width of said bottom portion of said sheet under such bed mattress adjacent to such bottom side surface thereof, will cause said sheet to be held in place with said rectangular side portions hanging downwardly adjacent to such side surfaces of such bed mattress.

5,465,441

SLIDEABLE SEATING MEMBER

Bongsoo Chun, 70 Cass Avenue, Unit #93, Scarborough, Ontario, Canada

Filed Jul. 25, 1994, Ser. No. 279,351
Int. Cl.[6] A47C *27/00*
U.S. Cl. 5—653 4 Claims



1. A seating member which grips to a user and which slides on a support surface of the seating member, said seating member being made from a top element having a height co-efficient of friction top surface, a bottom element and a middle cushion between said top element and said bottom element, said bottom element comprising a layer of plastic material having a smooth bottom side and a textured upper side in engagement with and gripping on said middle cushion, and said top and bottom elements being coupled to resist rotation therebetween.

5,465,442

FASTENER SYSTEM FOR USE IN SHOE-LASTING APPLICATIONS

F. Gerard Merser, Round Pond, Me., assignor to Avery Dennison Corporation, Pasadena, Calif.

Filed Jul. 23, 1993, Ser. No. 97,261
Int. Cl.[6] A43D *5/00;9/00*
U.S. Cl. 12—142 LC 2 Claims

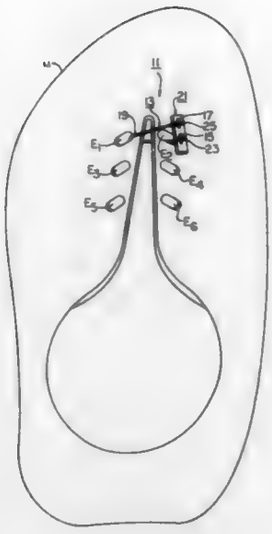
1. A method of tying together a pair of opposing shoelace eyelets of a shoe upper in such a way as to maintain the appropriate spacing between the eyelets while the shoe upper is being lasted, said method comprising the steps of:

(a) providing a fastener, said fastener having a first cross-bar at a first end, a second cross-bar at a second end and an appropriately sized filament portion interconnecting said first and said second cross-bars, said first cross-bar being sized for insertion through the pair of opposing eyelets of the shoe upper;

(b) providing a retaining tab, said retaining tab being appropriately constructed so that said first cross-bar and said second cross-bar are capable of being inserted therethrough for securement thereto;

(c) inserting said first cross-bar first through the pair of opposing eyelets of the shoe upper and then through said retaining tab; and

(d) then, inserting said second cross-bar through said retaining tab.



5,465,443

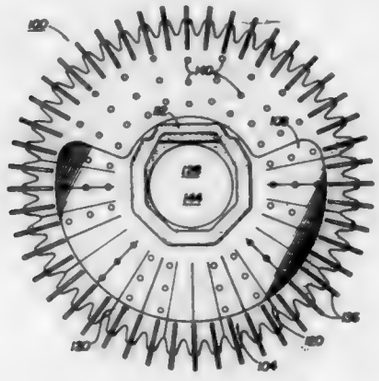
SWIMMING POOL CLEANER DISCS AND ASSEMBLIES

Chris A. Rice, Boca Raton, Fla.; Alain J. Gazziola, Lyon, France; Desroy D. Smith, Ft. Lauderdale, Fla.; John T. Evans, Frenchs Forest, and Andrew W. Dawson, Westleigh, both of, Australia, assignors to Zarina Holdings C.V., Amsterdam, Netherlands

Continuation-in-part of Ser. No. 185,451, Jan. 24, 1994, Pat. No. 5,418,995, which is a continuation-in-part of Ser. No. 103,930, Aug. 6, 1993, Pat. No. 5,421,054. This application Nov. 4, 1994, Ser. No. 334,749

Int. Cl.[6] E04H *4/16*

U.S. Cl. 15—246 10 Claims



1. A disc adapted for use as part of an automatic swimming pool cleaner, comprising:

a. an upper surface;

b. a lower surface;

c. a periphery;

d. a plurality of fins integrally formed with and extending upward from the upper surface beyond the periphery;

e. means, comprising a central aperture, for receiving a portion of the automatic swimming pool cleaner; and

f. a plurality of slits extending from at least a portion of the periphery toward, but not to, the central aperture.

5,465,444

ELECTRIC TOOTHBRUSH

Michael Bigler, Ittigen; Edgar Hommann, Grossaffoltern, both of, Switzerland, and Scott Myerly, Alpharetta, Ga., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Jul. 28, 1993, Ser. No. 99,110

Claims priority, application Germany, Jul. 31, 1992, 42 25 547.2

The portion of the term of this patent subsequent to Jan. 24, 2012, has been disclaimed.

Int. Cl.[6] A61C *17/32;* A46B *13/02*

U.S. Cl. 15—22.1 19 Claims

1. A cleaning device defining a longitudinal axis therethrough, said cleaning device comprising:

a handle segment;

a motor shaft extending substantially parallel to said longitudinal axis;

a motor mounted in said handle segment for rotating said motor shaft about the longitudinal axis of said motor shaft;

a slip-on bush assembly which is attached to said handle segment;

a reciprocable rack located in said slip-on brush assembly;

a cleaning head operatively connected into said reciprocal rack; and

a gear operatingly connecting said motor shaft to said reciprocable toothed rack, said gear converting said rotation of said motor shaft into a reciprocating stroke for said reciprocable rack, said gear being disposed in said slip-on brush assembly.

5,465,445

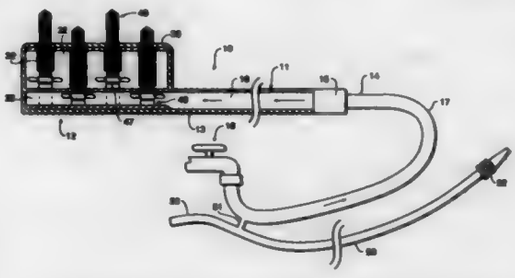
HYDRAULICALLY OPERATED TOOTHBRUSH

Richard T. Yeh, 13572 Montague St., Arleta, Calif. 91331

Filed May 4, 1994, Ser. No. 237,861

Int. Cl.[6] A61C *17/30;* A46B *13/06*

U.S. Cl. 15—29 11 Claims



1. A hydraulically operated movable bristle toothbrush comprising:

(a) an elongated handle having a longitudinal water passage, said passage being connectable to a pressurized water source;

(b) a head formed at one end of said handle having a main cavity and at least one channel with a flow cross-section smaller than said handle water passage, said channel having at least one opening into said cavity, said head having a plurality of openings for accepting bristles and a plurality of discharge openings; and

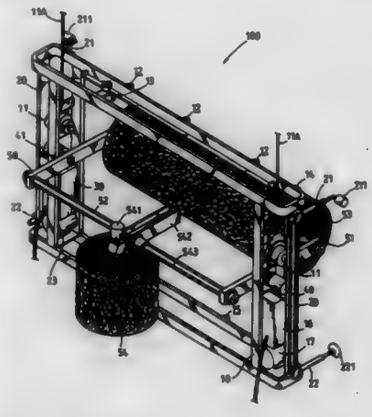
(c) a plurality of bristle means rotatably mounted in said cavity, each said bristle means including a cylindrical bristle projecting laterally through and rotatably mounted in one of said bristle openings and including a propeller, means, said propeller means including propeller blades fixedly mounted to the portion of the bristle within the cavity whereby water discharged at high pressure from said channel against the propeller blades will rotate the bristle to effect a cleaning action.

5,465,446

HIGH-RISE BUILDING CLEANING MACHINE

Kai-Kuo Chang, 1F 50, Alley 401 Lane 150 Sec. 5 Hsin I Road, Taipei, Taiwan, Prov. of China

Filed Jan. 4, 1995, Ser. No. 368,347
Int. Cl.[6] A47L *1/02*
U.S. Cl. 15—50.3 **13 Claims**



1. A high-rise building cleaning machine, comprising:

an elevator cage, taking the form of a rectangular frame, on top of which several detergent jets are installed;

at least one pair of winding machines fixed on two lateral sides of said elevator cage which supply the power for the elevation of said elevator cage;

a detergent container and a water pump, installed on one lateral side of said elevator cage, for supplying the detergent water that will be ejected through said detergent jets;

at least one pair of driving motors installed in appropriate positions on two lateral sides of said elevator cage;

a pair of rotary washing arms between which two transverse rods in parallel and in the horizontal direction are installed in 180 degrees separation about a pivot axis of said rotary arms; one side of each said rotary arm is attached to a respective lateral side of the said elevator through connecting with a rotor shaft of a respective one of said driving motors, by which said rotary arms can be driven by said driving motors to turn 180 degrees;

a vertical brush set, fixed around one said transverse rod of said rotary arm pair, which is made to perform the act of washing in the vertical direction by the rotation of the said one transverse rod, driven by one of said driving motors; and

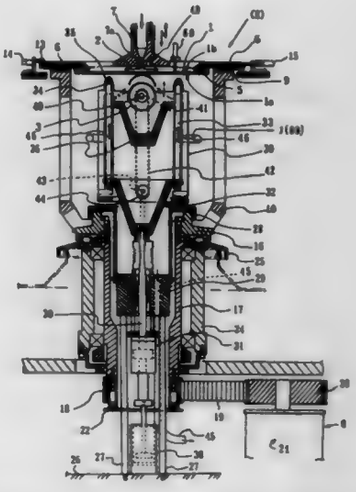
a horizontal brush set, connected to said other transverse rod, which may move along the said transverse rod to perform the act of washing in the horizontal direction; wherein said elevator cage, driven by said winding machines, moves vertically into an appropriate position for washing the outer wall of a high-rise building; being forced to touch the wall, said vertical and horizontal brush sets, fixed on said rotary washing arm pair which can be driven to turn 180 degrees by one of said driving motors, take turns to perform their respective acts of vertical and horizontal washing.

5,465,447

APPARATUS FOR SCRUBBING SUBSTRATE

Takashi Itoh; Hiroyuki Saitoh; Haruyuki Kinami; Toshinori Konaka, and Tsuyoshi Murai, all of Tokyo, Japan, assignors to M. Setek Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1994, Ser. No. 301,562
Claims priority, application Japan, Nov. 30, 1993, 5-329820; Apr. 28, 1994, 6-114779
Int. Cl.[6] B08B *11/02;3/02*
U.S. Cl. 15—88.3 **8 Claims**



1. An apparatus for scrubbing a substrate comprising:

a substrate chuck adapted to surround the substrate and having a clamp groove formed therein for receiving generally entire peripheral portion of the substrate and fluid drain through-holes provided along the clamp groove and extending from the upper surface to the lower surface thereof;

a back pressure paddle for jetting fluid for generating back pressure against the face opposite a face to be scrubbed of the substrate to apply back pressure to the substrate;

a cylindrical rotary brush adapted to contact the face to be scrubbed of the substrate for scrubbing the same; and

a rotation mechanism for rotating the substrate chuck or the cylindrical rotary brush within a plane parallel to the substrate.

5,465,448

PIPE INTERIOR CLEANING APPARATUS

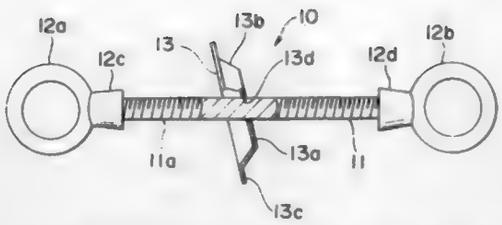
Itsuho Tajima, Tokyo, and Yoshitaka Tajima, Koshigaya, both of, Japan, assignors to Tajima Denken Co., Ltd., Koshigaya, Japan

Filed Dec. 22, 1992, Ser. No. 995,571
Claims priority, application Japan, Dec. 27, 1991, 3-347548
Int. Cl.[6] B08B *9/02*
U.S. Cl. 15—104.31 **10 Claims**

1. A pipe interior cleaning apparatus for breaking off and moving obstacles on the bore surface of a pipe, the apparatus comprising:

(a) an elongated bar having a central longitudinal axis and having a central part and opposite ends along said axis, the central part being externally threaded, the threads being axially spaced outward extending projections which define the outer diameter of the bar,

(b) a cleaning member comprising a body part with an outer edge and a generally central bore defining an inner edge, the



bore diameter being greater than the outer diameter of said central part of the bar,

(c) pulling means at each end of the bar for pulling the bar axially in the respective end directions, and

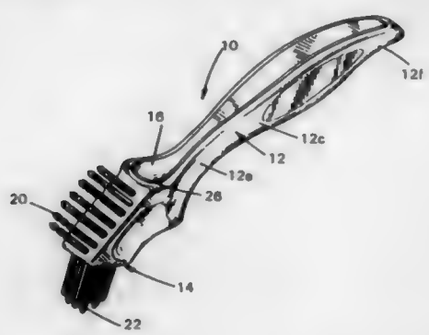
(d) a stop fixed at each end of the bar axially inward of the pulling means, each stop having an outer diameter greater than that of the bar and greater than that of the bore diameter of said cleaning member, said bar extending through the bore of said cleaning member, said cleaning member when situated upright and generally perpendicular relative to the bar's longitudinal axis having both said outer edge and said inner edge situated respectively at their maximum lateral extension from said bar,

(e) said cleaning member when oriented generally upright relative to the bar axis being easily axially movable along the length thereof, said cleaning member being inclinable relative to said upright orientation and when inclined having said lateral extension of its inner edge reduced such that said inner edge of the bore engages at least one of said outward extending projections, and subsequent axial movement of the bar drives the cleaning member similarly axially because of the engagement of said at least one of the projections with the inner edge of the bore.

5,465,449
DENTURE BRUSH

Martin Lewkowicz, Upper Montclair, N.J., assignor to Ranir/DCP Corporation, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 28,424, Sep. 14, 1994. This application Oct. 26, 1994, Ser. No. 329,461
Int. Cl.[6] A46B *5/02;9/04*
U.S. Cl. 15—106 **11 Claims**



1. A brush comprising:

an elongated handle having a front, a back and a pair of sides;

a bristle head on one end of said handle;

said handle having a narrowed neck joining said bristle head to said handle, having a narrowed distal end and having a bulbous enlarged central portion between said narrowed neck and said narrowed distal end;

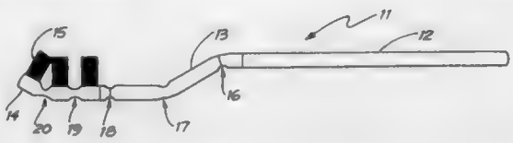
a tapered juncture between said narrowed neck and said bristle head, forming a sloped front zone and a sloped back zone, said sloped front zone and said sloped back zone having finger and thumb tip receiving depressions therein; and

said bristle head having a front bristle face including bristles therein generally normal to said sloped back zone, and having a rear bristle face including bristles therein generally normal to said sloped front zone.

5,465,450
TOOTHBRUSH

Victor A. Humphries, 83 River Road, Emu Plains, NSW 2750, Australia

Continuation of Ser. No. 829,076, Mar. 17, 1992, abandoned. This application Oct. 5, 1993, Ser. No. 131,877
Claims priority, application Australia, Jun. 15, 1990, PK0665
Int. Cl.[6] A46B *9/04*
U.S. Cl. 15—167.1 **12 Claims**

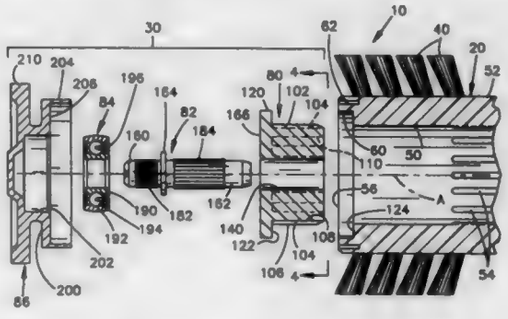


1. A toothbrush comprising an elongated handle part having a longitudinal axis, a head part, and a neck part joining the handle part and head part, wherein said handle part, said head part, and said neck part are integrally constructed, said head part including a plurality of sides with bristles projecting from at least one of said sides thereof and having at least one region thereof weakened so as to allow deformation in the head part to suit the shape of the user's dental arches, the at least one weakened region comprising a localized narrowing in the cross-section of the head part that allows the deformation to be sharp and discrete and only at the localized narrowing and not elsewhere along the head part, the localized narrowing being integrally formed with the remainder of the head part and separating the bristles into at least two bristle carrying sections of the head part, each of the bristle carrying sections being movable independently of the other by the deformation at the localized narrowing, and wherein the at least one weakened region is so formed that it allows the deformation about an axis perpendicular to the longitudinal axis of the elongated handle part and wherein said deformation of said head part remains generally stable during use.

5,465,451
BRUSHROLL

Alfred H. Stegens, Olmsted Township, Ohio, assignor to The Scott Fetzer Company, Westlake, Ohio

Continuation-in-part of Ser. No. 998,791, Dec. 29, 1992, Pat. No. 5,272,785, which is a continuation-in-part of Ser. No. 887,420, May 20, 1992, Pat. No. 5,193,243, which is a continuation of Ser. No. 456,348, Dec. 26, 1989, abandoned. This application Aug. 4, 1993, Ser. No. 101,634
Int. Cl.[6] A46B *13/02*
U.S. Cl. 15—179 **11 Claims**



1. In a vacuum cleaner brushroll including a tufted spindle supported by end assemblies having bearings that rotatably mount the spindle in a vacuum cleaner nozzle and in which rotation of the

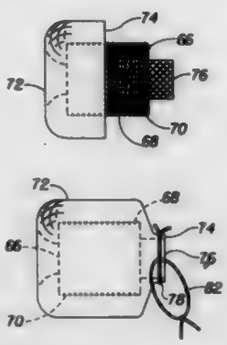
spindle is effective to pick up debris, the improvement wherein said spindle comprises a hollow tubular member and each of said end assemblies includes a plug member fitted into a respective axial end of said tubular member, each said plug member being a one-piece plastic member having ribs formed on an outer cylindrical surface for engagement with the inner surface of said hollow tubular member so as to resist relative rotation therebetween, a bearing having a first portion and a relatively rotatable second portion operably connectable with a brushroll mounting structure of the vacuum cleaner nozzle, a stub shaft, and a surface defining a bore in said plug member, said stub shaft being made from a metal material having a ribbed portion extending into fixed frictional engagement with said surface defining the bore in said plug member and a second portion for mounting said first portion of said bearing, said stub shaft having a length not more than ten percent of the length of said tubular member.

5,465,452

IMPLEMENT FOR PERSONAL CLEANSING MADE FROM EXTRUDED PLASTIC SCRIM

Richard M. Girardot; Eric J. Grosgogeat; Charles G. Yeazell, and Richard G. Bausch, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 31, 1994, Ser. No. 221,428
Int. Cl.[6] A47L *13/07*; A46D *3/00*
U.S. Cl. 15—210.1 **7 Claims**



2. A personal cleansing implement comprising:

a) expanded diamond-mesh scrim tubing forming a three-dimensional structure, said tubing gathered to form circumferential pleats, said three-dimensional structure having an outer surface and a center opening therethrough,

b) means for containing said three-dimensional structure, said containing means having a first end and a second end, said containing means passing through said opening in said three-dimensional structure and around said outer surface such that said containing means totally envelops said three-dimensional structure, said first end being cinched to said second end by a cinching means to close said containing means.

5,465,453

PAINT BRUSH PROTECTIVE COVER

Robert F. Landmeier, #2 Undine Dr., Thonotassasa, Fla. 33592

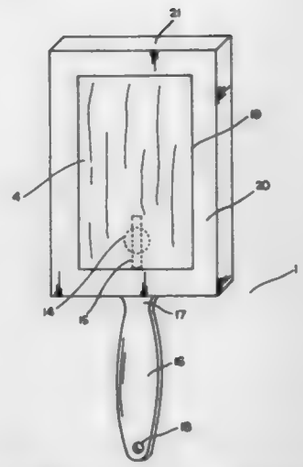
Filed Jul. 11, 1994, Ser. No. 273,310
Int. Cl.[6] B65D *75/14*
U.S. Cl. 15—247 **7 Claims**

1. An improved paint brush protective cover for protecting a plurality of bristles of a paint brush, the improved paint brush protective cover comprising:

(a) a flexible cover comprising:

(a) a back cover, substantially rectangular, having a given thickness, a top side, a bottom side, two lateral sides; and,

(b) a pair of side flaps affixed to said lateral sides of said back cover; and,



(c) a top flap affixed to said top side of said back cover; and,

(d) a bottom flap affixed to said bottom side of said back cover; and,

(e) a handle opening at said bottom side of said back cover having a given area; and,

(f) at least one vent opening at said top side of said back cover; and,

(g) a removeable affixing means affixed to said top flap; and,

(h) a removeable affixing means affixed to said bottom flap,

(b) a hard cover enclosing said flexible cover, said hard cover having a substantially rectangular body, with a given length, a given width, a given thickness,

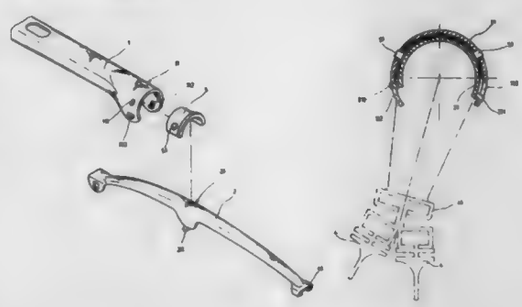
whereby said flaps of said flexible cover are wrapped around said bristles of said paint brush and affixed by said removeable affixing means, whereby said paint brush and said flexible cover are inserted into said hard cover for storage.

5,465,454

DUAL WINDSHIELD WIPER HAVING SWINGING AND PIVOTING RIBS

Tsan-Yun Chang, No. 13, Hsin Chuan, Wuchuen First Road, Wuku Industrial Area, Taipei Hsien, Taiwan, Prov. of China

Filed Oct. 11, 1994, Ser. No. 320,225
Int. Cl.[6] B60S *1/38*
U.S. Cl. 15—250.41 **3 Claims**



1. A windshield wiper for reciprocal movement over a windshield, said wiper comprising:

a) an elongated large rib having opposite ends and a longitudinal plane therein passing through said ends, each end defining a concavely curved surface;

b) at least one elongated middle rib having a middle portion with a convexly curved surface;

c) at least one small rib attached to the at least one elongated middle rib;

d) a wiper blade unit having double blade members, said unit is attached to the at least one middle rib and to the at least one small rib; and,

e) attaching means to attach the at least one middle rib to one end of the large rib such that the at least one middle rib may swing in said longitudinal plane about a swing axis and pivot with respect to the large rib about a pivot axis lying in said plane and generally perpendicular to said swing axis such that said blade members can alternatively engage the windshield during the reciprocal movement, the attaching means comprising:

i) a pad member attached to the end of the large rib on the concavely curved surface thereof, the pad member having a concavely curved surface receiving the convexly curved surface of the middle rib;

ii) transversely symmetrical holes formed in one of the middle portion of the middle rib and said one end of the large rib, each hole having an upper portion and a relatively narrower lower portion; and

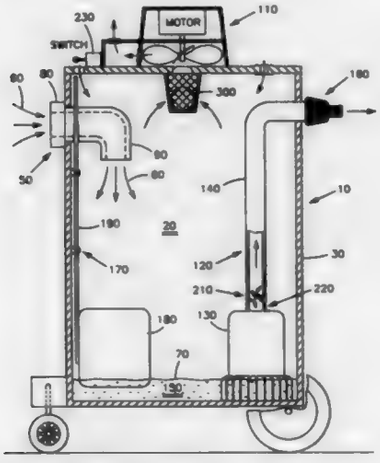
iii) laterally extending lugs extending from the other of the middle portion of the middle rib and said one end of the large rib and inserted in the transversely symmetrical holes.

5,465,455

OVERLOAD CONTROLLED WET AND DRY VACUUM APPARATUS

Harold Allen, 874 Redondo Dr., Anaheim, Calif. 92801

Filed May 27, 1994, Ser. No. 251,029
Int. Cl.[6] A47L *7/00*
U.S. Cl. 15—319 **7 Claims**



1. A vacuum apparatus comprising:

a vacuum canister providing an interior storage space for collecting dry and liquid refuse materials, the storage space enclosed by an exterior shell;

an operating electrical circuit providing power and control to the apparatus;

an inlet means providing for passage of a fluid stream of air or liquid from outside of the canister into the storage space, the liquid establishing a liquid level within the canister, and including an inlet hose connection means, inlet stream diverting means, and shutoff blade acceptance means;

a vacuum generating means positioned and fluidly communicating with the canister for sucking air out of the storage space;

an exhaust means including a pumping means and an exhaust conduit for pumping liquid refuse out of the canister, the exhaust conduit including an exhaust hose connection means;

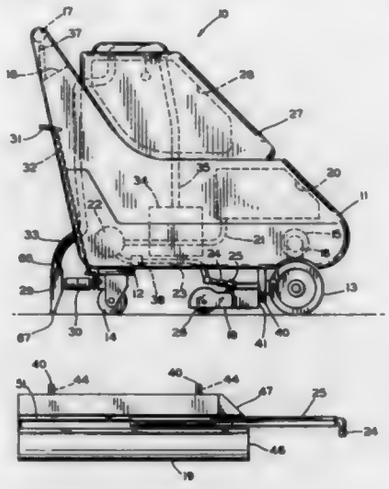
an inlet control means for throttling the inlet means in response to the liquid level in the canister, including a floatation device attached to an actuation arm with a valve blade, the arm being restricted to vertical movement, such that as the liquid level in the canister rises, the float and actuation arm are forced by buoyancy threes to move upwardly, thereby forcing the valve blade into the shutoff blade acceptance means and gradually closing down the inlet means and shutting off the fluid stream from entry into the canister and thereby controlling the liquid level in the canister to a predetermined maximum.

5,465,456

FLOOR CLEANING APPARATUS

Jeffery R. Fellhauer, Toledo, and Michael W. Savidge, Northwood, both of Ohio, assignors to National Super Service Company, Toledo, Ohio

Continuation of Ser. No. 856,560, Mar. 24, 1992, abandoned. This application Sep. 29, 1994, Ser. No. 314,931
Int. Cl.[6] A47L *7/00*
U.S. Cl. 15—320 **15 Claims**



1. A floor cleaning apparatus comprising:

a chassis;

means for facilitating movement of said chassis relative to a floor along a path of movement;

means for vacuuming the floor, said means for vacuuming including a vacuum shoe for extracting matter from the floor; and

means for releasably securing said vacuum shoe to said chassis, said means for releasably securing including a ball and socket mechanism connected between said chassis and said vacuum shoe for permitting movement of said vacuum shoe relative to said chassis, said means for releasably securing further includes a rod having a threaded end extending from said ball and socket mechanism through an aperture formed through said vacuum shoe, and an enlarged knob threaded onto said threaded end of said rod for permitting quick removal of said vacuum shoe from said chassis.

5,465,457

Patent Not Issued For This Number

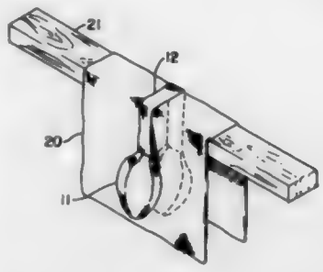
5,465,458

RETAINER FOR TOWELS, GARMENTS, AND THE LIKE

Gary S. Schlager, 5326 Connecticut Ave., NW., Washington, D.C. 20015

Filed Nov. 29, 1993, Ser. No. 158,694
Int. Cl.[6] B43M *9/00*
U.S. Cl. 16—1 R **10 Claims**

1. A retainer comprising at least two spaced or separated flexible closed receptacles, and a generally flexible, elongated, flat or strap-like interconnecting member joining said closed receptacles together and spacing them apart a predetermined length, said



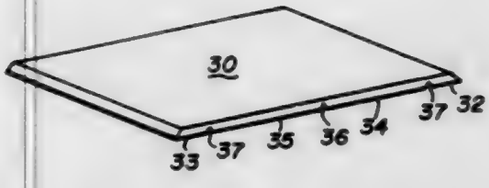
member having a length which is substantially greater than its width, said receptacles containing loose water-resistant or water-repellent pellets or granular material.

5,465,459

STAIRWAY CARPET FASTENING DEVICE

David M. Hopkins, 150 Toland St., Unit #1, San Francisco, Calif. 94124

Continuation-in-part of Ser. No. 980,366, Nov. 23, 1992, abandoned. This application Jan. 28, 1994, Ser. No. 188,502
Int. Cl.[6] A47G 27/04
U.S. Cl. 16—11 9 Claims



9. A carpet fastening device for use in carpeting a stairway having vertical risers and horizontal treads forming a crotch therebetween comprising:

(a) an L shaped member of right-angular cross section characterized by a first vertical leg and a second horizontal leg, said legs forming a crotch therebetween, said first vertical leg having a first edge region and said second horizontal leg having a second edge region, said first edge region and said second edge region positioned substantially parallel to each other and to an inner region containing said crotch between said first and second regions, and said first edge region having the form of said first leg folded over on itself and toward said inner region, and said second edge region having the form of said second leg folded over on itself and toward said inner region, said first edge region and said second edge region having double the thickness of said inner region; and

(b) a plurality of pointed holding spikes embedded in said first edge region and said second edge region, said spikes protruding away from said first edge region and said second edge region, and inclined toward said inner region, said first edge region and said second edge region having sufficient spatial clearance therebetween to allow access by a staple gun or a nail gun for securing the device to the crotch of the stairway.

5,465,460

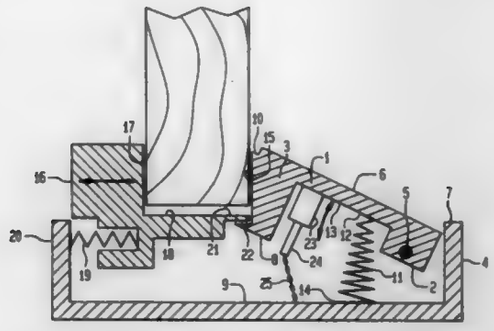
DOORSTOP

Giovanni Cantone, 1538 74th St., Brooklyn, N.Y. 11228

Filed Aug. 29, 1994, Ser. No. 297,092
Int. Cl.[6] E05F 5/02
U.S. Cl. 16—82 4 Claims

1. A doorstop comprising:

a) a case, said case having a top surface, a floor, longitudinal sidewalls, a first end, a second end; and



b) a striker block, said striker block positioned at said first end and constrained to move longitudinally from a first position to a second position in a direction from said first end towards said second end, said striker block having a portion projecting above said top surface; and

c) a means for biasing said striker block towards said second position; and

d) a retaining member, having a hinged end and a free end, said hinged end of said retaining member hingedly mounted to said case at said second end, and moveable from a down position in which said free end is below said top surface of said case to an up position in which said free end is projecting above said case; and

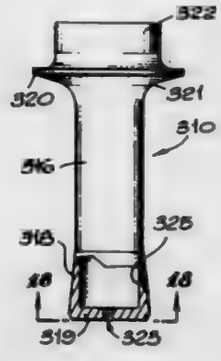
e) a means for biasing said retaining member towards said up position; wherein said striker block in said second position engaging said free end of said retaining member in said down position, preventing movement of said retaining member to said up position, said striker block in said first position, releasing said free end of said retaining member to move to said up position urged by said means for biasing said retaining member toward said up position.

5,465,461

HANDLE FOR USE WITH A DISPOSABLE COVER

Dan Sandel, Tarzana, Calif., assignor to Devon Industries, Inc., Chatsworth, Calif.

Continuation of Ser. No. 165,980, Dec. 13, 1993, which is a continuation-in-part of Ser. No. 902,942, Jun. 23, 1992, abandoned. This application Sep. 9, 1994, Ser. No. 303,429
Int. Cl.[6] A47B 95/02
U.S. Cl. 16—111 R 10 Claims



1. A sterilizable handle for attachment to a handle receiving fitting on a medical surgery room light fixture, said handle being usable with a disposable cover, said handle comprising:

a handle body including a body grip portion and a head portion adapted to engage said fitting, said body grip portion defining a hollow interior; and

means in said body grip portion for venting air trapped in a space between said cover and said body grip portion into the hollow interior of said body grip portion during fitting of said cover over said body grip portion.

5,465,462

SWINGABLE HANDLE ASSEMBLY

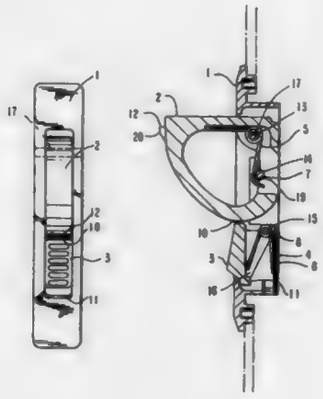
Kenichi Yamada, Tokyo, Japan, assignor to Takigen Manufacturing Co. Ltd., Tokyo, Japan

Filed Feb. 3, 1994, Ser. No. 191,805

Claims priority, application Japan, Feb. 18, 1993, 5-010986 U

Int. Cl.[6] E05C *3/04*; E05B *5/02*

U.S. Cl. 16—112 2 Claims



1. A swingable handle assembly, comprising:

a push button (3) having an arm 16 provided on the push button rear surface so as to project therefrom;

a handle (2) received in an elongated cavity (9) of a casing (1) so as to be vertically adjacent to said push button (3) in said elongated cavity (9), said handle (2) having an upper-end portion pivoted to said casing (1) through a first cross pivot (17) mounted in said casing (1);

a spring (5) pivoted on said first cross pivot (17) for biasing said handle (2) toward an outward projected position for the casing (1), said spring (5) being engaged between said handle (2) and a third cross pin (7) mounted in said casing (1);

a return spring (6) interposed between said push button (3) and said casing (1);

said push button (3) having a front-end portion of said arm (16) pivoted to said casing (1) through a second cross pivot (8) mounted in said casing (1);

said push button (3) also having a side surface provided with a projection (11) abutting against a rear surface (18) of an edge portion of said elongated cavity (9) of said casing (1); and

said handle (2) being generally ring-shaped and encircles said first cross pin (17) and said third cross pin (7), said handle (2) having a front corner portion of its lower-end portion formed into a shoulder portion (12) abutting against an upper-end projecting edge portion (10) of said push button (3), and having an inner stopper surface (19) which abuts against said third cross pin (7) of said casing (1).

5,465,463

CORNER CABINET HINGE

Reinhard Lautenschläger, Reinheim, Germany, assignor to Mepla-Werke Lautenschläger GmbH & Co. KG, Germany

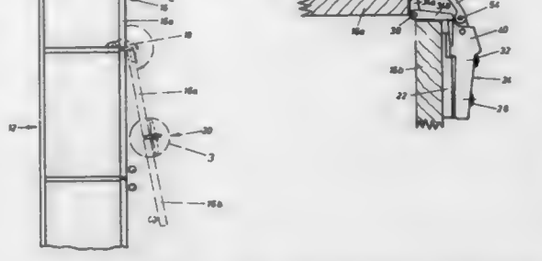
PCT No. PCT/EP93/02679, § 371 Date May 31, 1994, § 102(e) Date May 31, 1994, PCT Pub. No. WO94/11605, PCT Pub. Date May 26, 1994

PCT Filed Sep. 30, 1993, Ser. No. 244,526

Claims priority, application Germany, Nov. 17, 1992, 42 38 791.4

Int. Cl.[6] E05D *7/04*

U.S. Cl. 16—236 12 Claims



1. A hinge for hanging a second, free panel of a bipartite corner cabinet door on a first panel hinged to a supporting wall of a cabinet carcase, the first panel and the second panel being hinged together at facing front panel edges thereof,

the hinge comprising:

a first hinge leaf for securing to a first panel and a second hinge leaf for securing to a second panel, the first and second hinge leaves being pivotally connected to each other by a hinge pin passing through a first hinge bore located on the first hinge leaf and a second hinge pin located on the second hinge leaf,

whereby said panels can be turned from a closed position in which the panels are held approximately at right angles to one another to an open position in which the panels are substantially parallel and in line with one another,

the first hinge leaf having at least one angular appendage adapted to extend across a front panel edge of the first panel, and the second hinge leaf having at least one angular appendage adapted to extend across a front panel edge of the second panel,

said first hinge pin bore being provided within a first free end of the angular appendage of the first hinge leaf and said second hinge pin bore being provided within a second free end of the angular appendage of the second binge leaf, said first free end and said second free end being laterally offset from one another, wherein

the first and second hinge leaves are each in the form of an elongated supporting arm, said first hinge leaf being adjustably held on a first mounting plate and said second hinge leaf being adjustably held on a second mounting plate, said first mounting plate being fastenable on an inside face of the first panel and said second mounting plate being fastenable on an inside face of the second panel,

said first hinge leaf comprising a first link associated therewith and said second leaf comprising a second link associated therewith, a first end of said first link being articulated to the first hinge leaf and a first end of said second link being articulated to the second hinge leaf, and a second end of each of said first and second links being coupled to one another, at least one of said first and second links being articulated at the first end thereof to a thruster at an articulation point thereof, the thruster being guided for displacement in the direction of its length up to an end point defined by an abutment means, and being resiliently biased towards an end position located opposite said articulation point,

the length of each of said first and second links being such that in an outstretched, substantially aligned position associated with the closed position of the door, the first and second panels are held in the position at approximately right angles to one another, while an additional swing of the second, free panel to an intermediate open position is possible wherein the first and second panels are at an angle of less than 90° as limited by the abutment means of the thruster,

each of said first and second links being arranged such that when the first and second hinge leaves move from an angled position associated with a closed position of the door to an outstretched, substantially aligned position associated with an open position of the door, the first and second links move from an outstretched, substantially aligned position to a position wherein the first and second links move toward each other and the second end of the first link moves away from the first hinge leaf while the second end of the second link moves away from the second hinge leaf.

5,465,464

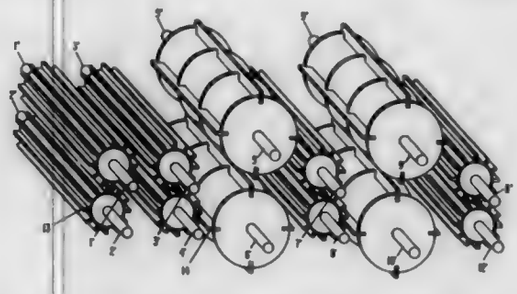
DECORTICATING MACHINE WITH VARIABLE SPEED FEED AND BEATER ROLLERS

Lung-Hua Chen, Rancho Palos Verdes, Calif.; Jonathan Pote, and Marty Fuller, both of Starkville, Miss., assignors to Mississippi State University, Mississippi State, Miss.

Filed Jun. 17, 1994, Ser. No. 261,978

Int. Cl.[6] D01B *1/22*

U.S. Cl. 19—24 **8 Claims**



1. A decortication machine for feeding stalks along a path of travel and separating the outer bast fibers of the stalks from the inner core thereof, comprising:

(a) a first set of bladed feed rollers for feeding the stalks, the blades of said first set of feed rollers intermeshing to crush the stalks and break the cores into short segments without breaking the bast fibers;

(b) a second set of bladed feed rollers positioned downstream of said first set of bladed feed rollers receiving the stalks from the first set of bladed feed rollers, the blades of said second set of bladed feed rollers intermeshing to further crush and split said stalks and further break up the inner core without breaking the bast fibers;

(c) a first set of bladed beater rollers positioned downstream of said second set of bladed feed rollers receiving the stalks from said second set of bladed feed rollers, the blades of said first set of bladed beater rollers beating alternately against the upper and lower outer surfaces of the stalks as the stalks pass therethrough to loosen and remove broken core pieces from the bast fibers;

(d) a third set of bladed feed rollers positioned downstream of said first set of bladed beater roller receiving the stalks from said first set of bladed beater rollers, the blades of said third set of bladed feed rollers intermeshing to break up core pieces remaining in the stalks after they pass through the first set of bladed beater rollers without breaking the bast fibers thereby facilitating removal of remaining core pieces from the bast fibers during subsequent processing;

(e) a second set of bladed beater rollers positioned downstream of said third set of bladed feed rollers, the blades of said second set of bladed beater rollers beating alternately against the upper and lower surfaces of the stalks to further loosen and remove broken core pieces, each roller of each of said sets of first, second, and third bladed feed rollers and each roller of each of said sets of first and second bladed beater rollers has a longitudinal axis extending perpendicular to said path of travel, the blades of each roller of said first, second, and third sets of bladed feed rollers and said first and second sets of bladed beater rollers extend radially outwardly with respect to the longitudinal axis of the respective roller, each of said blades has opposing longitudinally extending sides extending parallel to each other and an outer edge extending parallel to the longitudinal axis of the respective roller;

(f) means adapted to be connected to a prime mover for driving said first, second, and third sets of bladed feed rollers at the same tangential speed, driving said first and second sets of bladed beater rollers at a higher tangential speed than said first and second sets of bladed feed rollers and further driving one roller of each of said first sets of bladed beater rollers at a higher tangential speed than the other bladed beater roller of the respective set.

5,465,465

TWO-APRON DRAFTING UNIT COMPRISING AT LEAST ONE SLIVER GUIDE

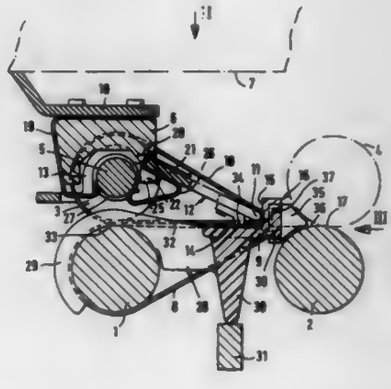
Fritz Stahlecker, Bad Überkingen, Germany, assignor to Hans Stahlecker, Germany

Filed Jun. 15, 1993, Ser. No. 76,783

Claims priority, application Germany, Jun. 27, 1992, 42 21 157.3

Int. Cl.[6] D01H *5/72*

U.S. Cl. 19—292 **8 Claims**



1. A two-apron drafting unit comprising:

an upper apron supported on an upper apron deflection guide,

a lower apron supported on a lower apron deflection guide,

a holding device arranged on a supporting part connected with the lower apron deflection guide, said supporting part including two stop faces extending substantially perpendicular to one another and engageable with the upper apron deflection guide for aligning the upper deflection guide with respect to the lower deflection guide, and

a sliver guide which projects into a wedge-shaped gap of a roller pair disposed downstream of the upper and lower apron deflection guides, said sliver guide being arranged on a slideway fixed at the holding device, which slideway extends in alignment parallel to the axis of the roller pair and in a level of a drafting zone plane, said slideway and sliver guide being configured to assure and permit non-rotational movement of the sliver guide in a direction parallel to the roller pair.

5,465,466
FASHION FRAME CHAIN HOLDERS

Kandie K. Napier, 245 Delaware St., #111, Tonawanda, N.Y. 14150

Filed Sep. 6, 1994, Ser. No. 301,247
Int. Cl.[6] A44B *21/00*
U.S. Cl. 24—3.3 **15 Claims**

1. An eyeglasses retaining assembly comprising an elongated flexible necklace with a proximal end and a distal end, a first spring ring attached to the proximal end of said necklace, a solid ring assembly attached to the distal end of said necklace, a second spring ring attached to said solid ring assembly, a first frame holder attached to said first spring ring, and a second frame holder attached to said second spring ring, wherein:

(a) said solid ring assembly is comprised of a first orifice and a ring of solid material continuously extending around said first orifice,

(b) said first frame holder is comprised of a bead with a second orifice of substantially uniform dimensions extending through it, and a non-resilient strap material extending through said second orifice to define a loop exterior of said bead through which a stem of said eyeglasses can be inserted, wherein:

1. said non-resilient strap material is comprised of a first end and a second end,

2. said first frame holder is comprised of a fastener for securing said first end and said second end of said non-resilient strap material, wherein said fastener is comprised of a third orifice and a ring of solid material continuously extending around said third orifice;

(c) said second frame holder is comprised of said bead with a second orifice of substantially uniform dimensions extending through it, and said non-resilient strap material extending through said second orifice to define a loop exterior of said bead through which a stem of said eyeglasses can be inserted, wherein said fastener is connected to a split ring, and said split ring is connected to said first spring ring.

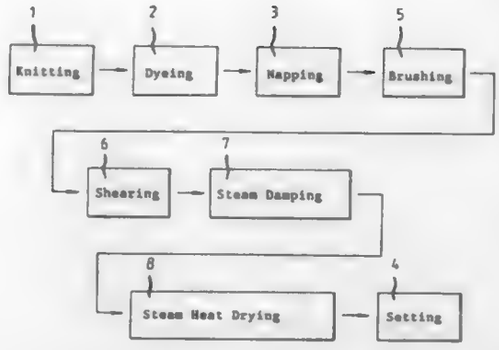
5,465,467
METHOD OF MAKING CHEMICAL FIBER KNITTED TOWELLING

Sheng-Chi Fan, No. 3-2, Alley 34, Lane 226, Huan Hsi Rd., Sec. 2, Chung Li, Taiwan, Prov. of China

Continuation-in-part of Ser. No. 87,863, Jul. 9, 1993, Pat. No. 5,369,859. This application Nov. 15, 1994, Ser. No. 340,893
The portion of the term of this patent subsequent to Dec. 6, 2011, has been disclaimed.
Int. Cl.[6] D06C *7/00*
U.S. Cl. 28—167 **9 Claims**

1. A method of making chemical fibre knitted towelling requiring the steps of knitting a fabric to produce a knitted fabric, dyeing the knitted fabric, napping the knitted fabric to raise a downy surface on the knitted fabric and heat setting to set the shape and finish the appearance of the knitted fabric the improvement comprising the following steps:

(a) brushing said knitted fabric;



(b) shearing the pile yarn of said knitted fabric to a uniform length;

(c) steaming said knitted fabric in a steam dryer to dampen; and

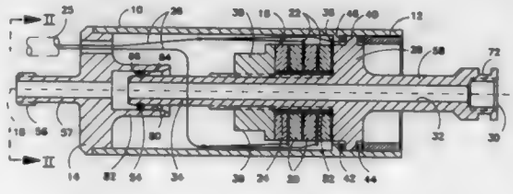
(d) drying said knitted fabric in a steam dryer;

said steps occurring after the step of napping.

5,465,468
METHOD OF MAKING AN ELECTROMECHANICAL TRANSDUCER DEVICE

Ronald R. Manna, Valley Stream, N.Y., assignor to Misonix, Inc., Farmingdale, N.Y.

Division of Ser. No. 127,641, Sep. 28, 1993, Pat. No. 5,371,429. This application Dec. 6, 1994, Ser. No. 349,968
Int. Cl.[6] H01L *41/22*
U.S. Cl. 29—25.35 **2 Claims**



1. A method for manufacturing an electromechanical transducer device, comprising the steps of:

providing the following components:

a piezoelectric crystal assembly configured to define a central channel;

a front driver having a main mass, a hollow stud integral therewith, and an annular flange extending from said main mass;

a casing having a main casing body with an inwardly extending annular rib, a rear cover and a locking ring; and

a plurality of O-ring seals;

disposing said piezoelectric crystal assembly in said main casing body;

inserting a first one of said O-ring seals into said casing so that said first one of said O-ring seals rests against said rib;

placing said front driver into said main casing body so that said stud extends through said channel and so that said first one of said O-ring seals is sandwiched between said rib and said flange;

inserting a second one of said O-ring seals into said casing so that said second one of said O-ring seals rests against said flange on a side thereof opposite said first one of said O-ring seals; and

attaching said locking ring to said main casing body so that said second one of said O-ring seals is sandwiched between said locking ring and said flange.

5,465,469

METHOD FOR MEASURING SOUND ABSORPTION POWER OF A THEATER CHAIR WITH A DUMMY REPRESENTING A HUMAN BEING SEATED THEREON

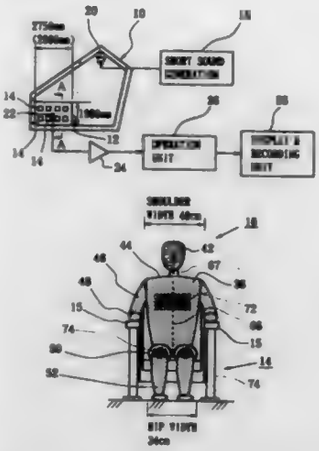
Takeshi Sakai, and Kawakami Fukushi, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 30, 1993, Ser. No. 129,261

Claims priority, application Japan, Jan. 1, 1992, 4-286589; Sep. 21, 1993, 5-257595

Int. Cl.[6] B23Q *17/00*

U.S. Cl. 29—404 4 Claims



1. A method for measuring sound absorption power of a chair a dummy sound absorber representing with a human being seated thereon; wherein the sound absorption power is obtained from a material having sound absorption properties disposed on the chair, the method comprising the steps of:

disposing the chair in a measuring environment;

disposing a dummy sound absorber in the chair, said dummy sound absorber having a shape of a human being in which it is in contact with the chair, and providing a chair pressing force defining the weight of the human being such that the dummy sound absorber simulates a human being seated on the chair;

causing changes in the chair which changes are substantially equivalent to a change in the state of the chair from a non-occupied to an occupied position and a change in the sound absorption power of the chair caused by the chair becoming occupied thereon;

generating a sound; and by a sound source away from the chair measuring the sound absorption power of the chair.

5,465,470

FIXTURE FOR ATTACHING MULTIPLE LIDS TO MULTI-CHIP MODULE (MCM) INTEGRATED CIRCUIT

Sutee Vongfuangfoo, Sunnyvale, and Robert Trabucco, Los Altos, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Aug. 31, 1994, Ser. No. 299,209

Int. Cl.[6] B25B *27/02*

U.S. Cl. 29—559 22 Claims

1. A fixture for clamping a lid onto a first surface of an integrated circuit substrate structure in a predetermined relative position such that said lid covers a cavity formed in said first surface, comprising:

a base plate having a first recess conjugate to said substrate structure, a second recess conjugate to said lid with said lid in said predetermined relative position, and a hole opening through the base plate into said second recess;

a pressure plate for pressing against a second surface of said substrate structure which is opposite to said first surface and thereby pressing said first surface against the base plate with said substrate structure fittingly retained in said first recess and said lid fittingly retained in said second recess; and

a clamp for engaging with the pressure plate and with said lid through said hole for clamping said lid onto said first surface and clamping the pressure plate against said second surface.

11. A method of clamping a lid onto a first surface of an integrated circuit substrate structure in a predetermined relative position such that said lid covers a cavity formed in said first surface, comprising the steps of:

(a) providing a base plate having a first recess conjugate to said substrate structure, a second recess conjugate to said lid with said lid in said predetermined relative position, and a hole opening through the base plate into said second recess;

(b) inserting said lid into said second recess;

(c) inserting said substrate structure into said first recess with said first surface engaging said base plate;

(d) pressing a pressure plate against a second surface of said substrate structure that is opposite to said first surface; and

(e) attaching a clamp that engages with the pressure plate and with said lid through said hole for clamping said lid onto said first surface and clamping the pressure plate against said second surface.

5,465,471

APPARATUS FOR MACHINING BARS

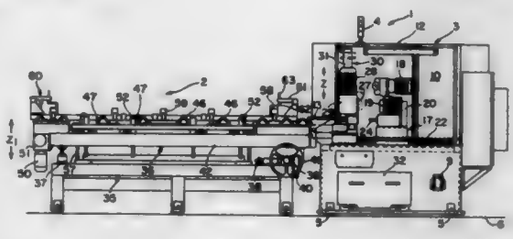
Joachim Munk, Aichhalden, Germany, assignor to Thyssen Nordseewerke GmbH, Germany

Filed Oct. 4, 1991, Ser. No. 771,343

Claims priority, application Germany, Jan. 8, 1990, 40 31 911.3

Int. Cl.[6] B23B *39/16*

U.S. Cl. 29—563 11 Claims



1. An apparatus for machining an end of bar stock comprising: a machining device; means for positioning the bar stock along a longitudinal axis such that the end of the bar stock is positioned at a desired location with respect to the machining device; means for holding the bar stock end in position at said desired location relative to the machining device; positioning means for moving

said machining device in (1) a first direction (X) toward and away from said end of bar stock and parallel to said longitudinal axis, (2) a second direction (Z) above and below said end of bar stock and perpendicular to said longitudinal axis, and (3) a third direction (Y) transversing said end of bar stock and perpendicular to said first direction (X) and said second direction (Z).

5,465,472

BUCKLE

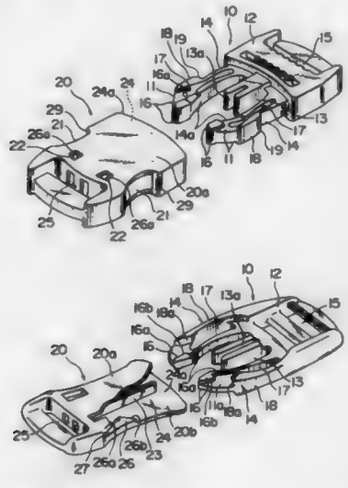
Hiroshi Matoba, Toyama, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed Sep. 30, 1994, Ser. No. 315,357

Claims priority, application Japan, Jan. 16, 1993, 5-060576; Apr. 20, 1994, 6-105945

Int. Cl.[6] A44B *11/00*

U.S. Cl. 24—625 **5 Claims**



1. A buckle comprising:

a plug member and a socket member which are releasably engageable with each other,

said plug member including a base and a pair of resiliently deflectable engaging legs projecting from said base and receivable in said socket member, said engaging legs each having a locking portion at a leading end thereof,

said socket member having a guide chamber for receptive engagement with said engaging legs, an end opening communicating with said guide chamber, and a pair of retaining portions disposed in said guide chamber for locking engagement with said locking portions of said engaging legs, respectively,

said engaging legs being curved inwardly toward each other and each having an elongated opening extending longitudinally of said engaging leg and extending through the thickness of said engaging leg.

5,465,473

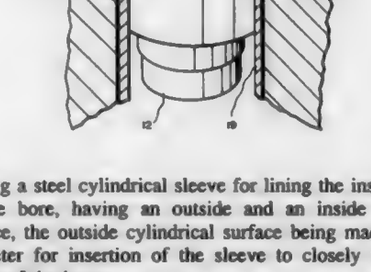
METHOD OF PROVIDING A TOOLHOLDER BODY GUIDE FOR PUNCH PRESSES

John W. Teeslink, 2184 Snoqualmie Dr., Layton, Utah 84040

Continuation-in-part of Ser. No. 878,611, May 5, 1992, Pat. No. 5,267,384. This application Sep. 7, 1993, Ser. No. 116,759

Int. Cl.[6] B23P *11/02*; B23Q *3/14*

U.S. Cl. 29—402.09 **8 Claims**



1. A method of providing a toolholder body guide for punch presses, including a turret punch press, said method comprising the steps:

providing a toolholder plate having at least one bore therethrough, having a machined generally cylindrical inside surface;

providing a steel cylindrical sleeve for lining the inside surface of the bore, having an outside and an inside cylindrical surface, the outside cylindrical surface being machined to a diameter for insertion of the sleeve to closely fit into the inside of the bore;

providing a holding mandrel assembly for final machining of the inside cylindrical surface of the sleeve, said mandrel having walls with an inside cylindrical surface machined to duplicate the diameter of the inside surface of the plate bore, said mandrel including releasable clamping means suitable for securing the sleeve within said mandrel;

inserting the sleeve into the mandrel and tightening the clamping means, to secure the sleeve within the mandrel walls;

machining the inside surface of the sleeve to a final diameter which is slightly greater than the outside diameter of a toolholder body to reciprocate therein and removing the sleeve after loosening the clamping means;

applying a coat of non-metallic potting compound to cover surfaces selected from among the outside surface of the sleeve, the inside surface of the bore and both the outside surface of the sleeve and the inside surface of the bore; and

installing the sleeve into place within the toolholder plate bore to receive the toolholder body for closely clearing reciprocal motion therein.

5,465,474

CYLINDRICALLY MACHINING APPARATUS

Tomohisa Kimura, and Akira Ikoma, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

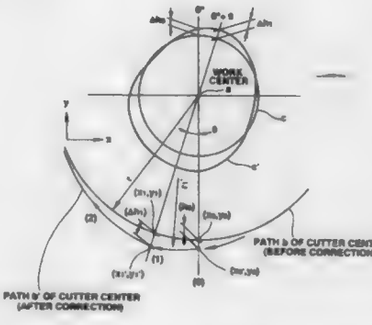
PCT No. PCT/JP93/00883, § 371 Date Feb. 25, 1994, § 102(e) Date Feb. 25, 1994, PCT Pub. No. WO94/00272, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 28, 1993, Ser. No. 199,146

Claims priority, application Japan, Jun. 29, 1992, 4-170960

Int. Cl.[6] B23Q *15/26*; B23C *3/06*; B24B *49/00*

U.S. Cl. 29—601 **5 Claims**



1. A cylindrically machining apparatus for machining a work by turning a tool along a circumference of the work so that the circumference has a target radius, comprising:

detecting means for dividing the circumference of the work into predetermined intervals and for detecting a difference between radius of the work after machined and a target radius thereof for each of the intervals;

calculating means for correcting the position of the tool at every predetermined rotation angle based on the radius difference detected by the detecting means, and for interpolation-computing a path of the tool based on the corrected position of each rotation angle; the calculating means interpolation computing the path of the tool by calculating a middle position between adjacent a two corrected positions of the tool, and by determining radius of an arc passing through these two corrected positions and the middle position as radius of the path of the tool; and

control means for turning the tool along the path calculated by the calculating means.

5,465,475

METHOD OF FORMING A THIN FILM MAGNETIC HEAD

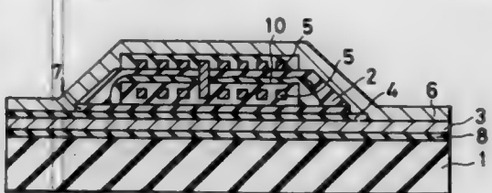
Mikio Kinoshita, Kawasaki, and Wasaburo Ohta, Yokohama, both of, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Jul. 29, 1993, Ser. No. 99,103

Claims priority, application Japan, Jul. 30, 1992, 4-203731; Mar. 12, 1993, 5-052600

Int. Cl.[6] G11B 5/42

U.S. Cl. 29—603 **18 Claims**



1. A method for forming a thin film magnetic head, comprising the steps of:

forming a lower magnetic pole on a first substrate;

forming a recessed portion on a face of a second substrate;

forming a coil within the recessed portion on the second substrate;

polishing a face of the lower magnetic pole on the first substrate and/or the face of the second substrate

adhering the first and second substrates to each other such that the face of the lower magnetic pole and the face of the coil on the second substrate come in close contact with each other;

polishing or etching another face of the second substrate;

forming a gap layer on said another face; and

forming an upper magnetic pole on said gap layer.

5,465,476

HDA HEADLOAD CARRIAGE TOOLING

Russell S. Krajec, Berthoud, and Vincent L. Preston, Longmont, both of Colo., assignors to Maxtor Corporation, San Jose, Calif.

Filed Nov. 16, 1993, Ser. No. 152,535

Int. Cl.[6] G11B 5/42

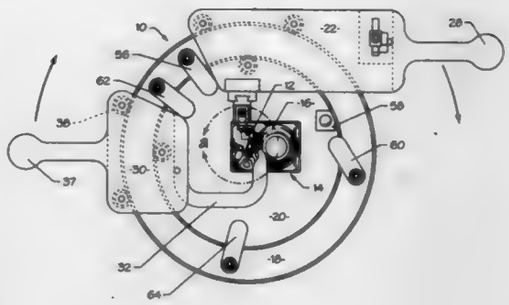
U.S. Cl. 29—759 **28 Claims**

1. An assembly station that loads at least a pair of actuator arms onto a disk of a hard disk drive, comprising:

actuator arm engagement means for engaging and separating the actuator arms;

actuator arm movement means for moving said actuator arm engagement means and the actuator arms relative to the disk; and,

actuator arm positioner means for engaging the actuator arms and moving the actuator arms away from said actuator arm engagement means.



5,465,477

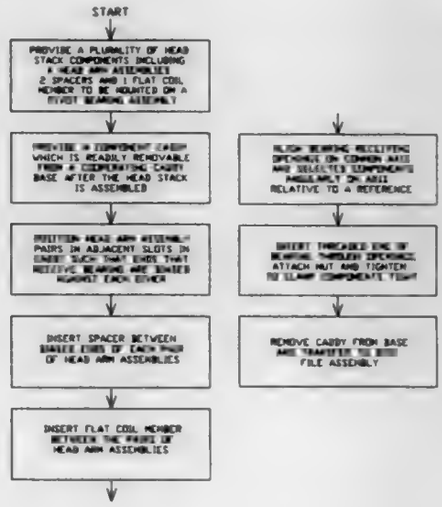
METHOD OF ASSEMBLING A HEAD ARM STACK FOR A MAGNETIC DISK DRIVE

Larry E. Tucker, Fremont, Calif., assignor to Read-Rite Corporation, Milpitas, Calif.

Filed Apr. 22, 1994, Ser. No. 231,402

Int. Cl.[6] G11B 5/127

U.S. Cl. 29—603 **9 Claims**



1. A method of assembling a head stack on a pivot bearing for use in a magnetic head positioning mechanism of a disk file in which said head stack comprises a plurality of different components disposed on an axis common to said bearing, said method comprising the steps of:

providing a plurality of head stack components each of which has an opening for receiving said bearing, including at least one pair of head arm assemblies and a flat coil member which is moved by said mechanism,

providing a component caddy for holding said components with said openings disposed on said common axis,

placing said head stack components in said caddy with said openings disposed on said common axis,

aligning selected ones of said head stack components angularly on said common axis,

inserting one end of said pivot bearing through said openings to position the axis of said bearing on said common axis, and

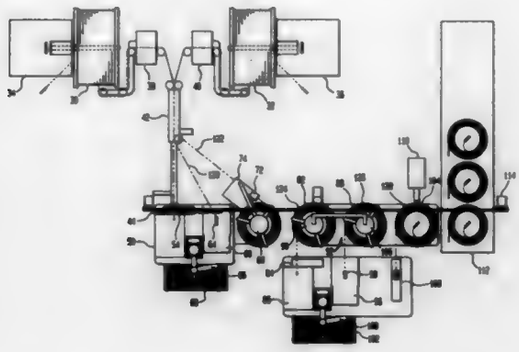
clamping said components on said bearing for conjoint movement with said flat coil member.

5,465,478

APPARATUS FOR MANIPULATING WOUND CABLES

Carl R. Anderson, Arvada, and Gary G. Seaman, Broomfield, both of Colo., assignors to AT&T IPM Corp., Coral Gables, Fla.

Filed Sep. 27, 1993, Ser. No. 127,023
Int. Cl.[6] H01R *43/28;* H01B *11/00;* B65H *1/08*
U.S. Cl. 29—748 4 Claims



1. A coiled cable handling apparatus, said apparatus comprising:

platform means for maintaining a coiled cable in a coiled configuration, said coiled cable having a coiled portion, a first end terminating in a connector and a second end, said platform means having a plurality of retractable finger means for contacting an inner perimeter of said coiled portion of said coiled cable and said platform means having a first securing means for grasping said connector; and

transport means for removing said coiled cable from said platform means after said plurality of retractable finger means releases said coiled cable and after said securing means releases said connector, said transport means having a plurality of coil pickup means for grasping said coiled portion of said coiled cable and said transport means having a first pickup means for grasping said connector.

5,465,479

LOCATING FIXTURE SYSTEM FOR ELECTRICAL CONNECTORS

David C. Bowen; Frank A. Harwath, both of Downers Grove, and Irvin R. Triner, Willowsprings, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Apr. 6, 1994, Ser. No. 223,917
Int. Cl.[6] H01R *43/01*
U.S. Cl. 29—749 12 Claims

1. A locating fixture system for aligning a multi-conductor flat electrical cable with an elongated electrical connector having a plurality of terminals for termination to the conductors of the cable, comprising:

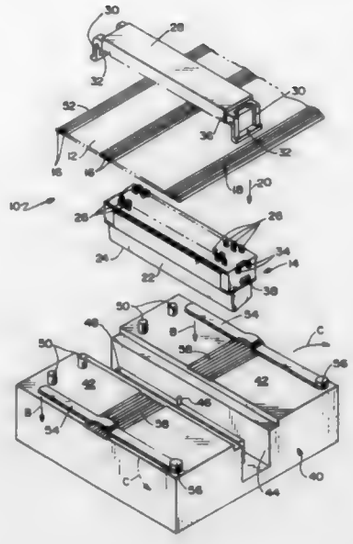
a fixture base defining a cable platform for supporting said multi-conductor flat electrical cable;

a receptacle in the base for receiving said elongated electrical connector generally transversely of the cable with the terminals projecting towards the cable platform for termination to the conductors of the cable;

complementary interengaging locating means between the base and the electrical connector intermediate opposite ends of the connector for properly locating the connector transversely of the cable; and

wherein said complementary interengaging locating means comprises a single pin projecting from inside said receptacle for insertion into a single hole in the connector; and

said hole is located equidistant from said opposite ends of the connector.

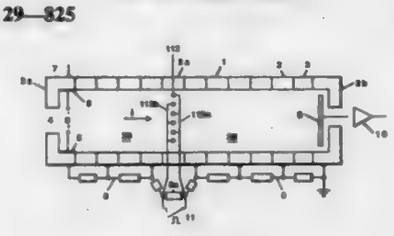


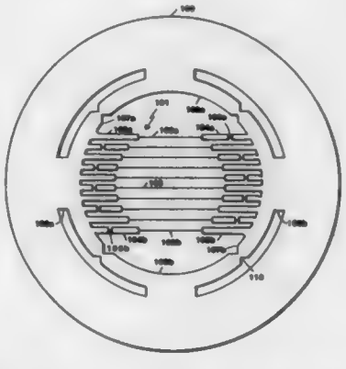
5,465,480

METHOD OF MANUFACTURING A GATING GRID

Manfred Karl, and Ralf Burgartz, both of Leipzig, Germany, assignors to Bruker-Franzen Analytik GmbH, Bremen, Germany

Filed Mar. 23, 1994, Ser. No. 216,622
Claims priority, application Germany, Mar. 27, 1993, 43 10 106.2
Int. Cl.[6] H01R *43/00*
U.S. Cl. 29—825 10 Claims





1. A method for manufacturing a gating grid for ion mobility spectrometers, the gating grid having a first and a second electrode for connecting an electrical potential to the grid, the method comprising the steps of:

A. selecting a thin, planar metal foil;

B. removing portions of the foil to form a grid pattern in the foil, the grid pattern having a first comb-like grid element set with a first plurality of grid elements arranged in parallel and spaced apart and connected to the first electrode, the first plurality of grid elements interdigitated with a second comb-like grid element set with a second plurality of grid elements arranged in parallel and spaced apart and connected to the second electrode;

C. selecting a first hollow insulating support member having a periphery with a cross-sectional area which encloses the first and the second grid element sets but excludes the first and second electrodes; and

D. affixing the foil to the periphery.

5,465,481

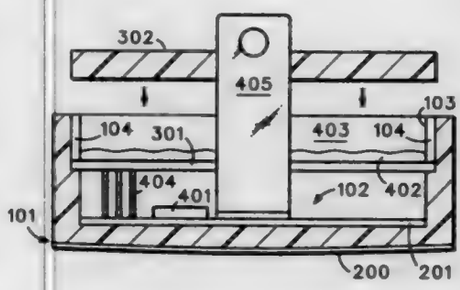
METHOD FOR FABRICATING A SEMICONDUCTOR PACKAGE

Guillermo L. Romero, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 4, 1993, Ser. No. 130,824

Int. Cl.[6] H05K *3/34*

U.S. Cl. 29—840 **14 Claims**



1. A method for fabricating a semiconductor package, the method comprising the steps of:

fabricating, from a porous matrix material, a unitary base structure that includes encircling walls and a mounting area for mounting a semiconductor device, the step of fabricating including forming an alignment mechanism in at least one of the walls for aligning the semiconductor device in the unitary base structure; and

infiltrating the unitary base structure with a conductive material to substantially fill the porous matrix material.

5,465,482

METHOD FOR MATCHING THE FLOW CAPACITY OF A RADIAL TURBINE OF A TURBOCHARGER TO A CAPACITY OF AN INTERNAL COMBUSTION ENGINE

Peter Elvekjaer, Baden, and Urs Gribi, Oberrohrdorf, both of, Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Jun. 13, 1994, Ser. No. 258,995

Claims priority, application European Pat. Off., Sep. 3, 1993, 93114120

Int. Cl.[6] B23P *15/00*

U.S. Cl. 29—889.1 **2 Claims**

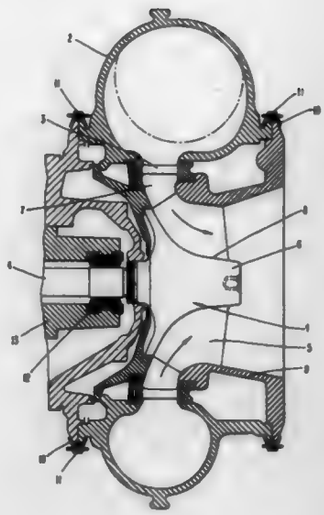
1. A method for adapting a flow capacity of a radial turbine of a turbocharger to a flow of an internal combustion engine, wherein the radial turbine comprises a gas inlet casing, a rotor having a hub and rotor blades mounted to a shaft, a gas outlet flange fastened to the gas inlet housing, means for fastening the gas outlet flange to the gas inlet casing, the hub of the rotor and the gas outlet flange defining a flow conduit having a predetermined flow capacity, and a nozzle ring disposed between the gas inlet casing and the gas outlet flange, the method comprising the steps of:

removing the gas outlet flange from the gas inlet casing;

removing the rotor from the shaft;

mounting a substitute rotor having shorter rotor blades than the removed rotor to the shaft;

fastening a substitute gas outlet flange to the gas inlet casing, the substitute gas outlet flange having contour to match the substitute rotor and define a flow conduit having a smaller flow capacity than the predetermined flow capacity.



5,465,483

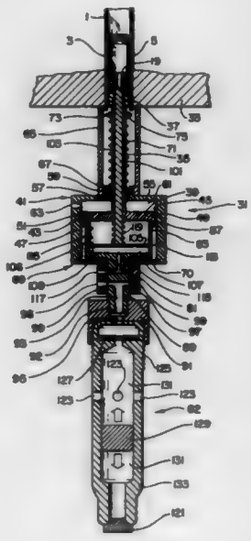
METHOD FOR REMOVING A METALLIC PLUG FROM A TUBE

David J. Fink, Greentree; James W. Everett, Hempfield Township, Westmoreland County; Annette M. Costlow, Trafford; James J. Roberts, Irwin, and Paul J. Boone, Bethel Park, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 28, 1994, Ser. No. 203,631

Int. Cl.[6] B23P *15/26*

U.S. Cl. 29—890.031 **10 Claims**



1. A method for removing a plug from engagement with an inner surface of a conduit, comprising the steps of:

pulling the plug with a repetitive impulsive force; and

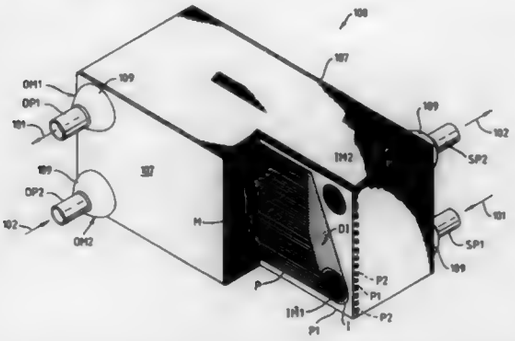
simultaneously pulling the plug with a static force, each of the repetitive impulsive force and the static force being applied in a first direction defined by a longitudinal axis of the plug.

5,465,484

HEAT EXCHANGER

Simon A. Banks; Colin I. Adderley, both of Derby; John O. Fowler, Lancashire, and James E. Boardman, Barnoldswick, all of, England, assignors to Rolls-Royce plc, London, and Rolls-Royce and Associates, Derby, both of, England

Division of Ser. No. 98,408, Aug. 4, 1993, Pat. No. 5,383,518.
This application Oct. 17, 1994, Ser. No. 323,800
Claims priority, application United Kingdom, Feb. 27, 1991, 9104155
The portion of the term of this patent subsequent to Jan. 24, 2012, has been disclaimed.
Int. Cl.[6] B21D *53/04*
U.S. Cl. 29—890.042 4 Claims



1. A method of manufacturing a heat exchanger for facilitating exchange of heat between at least two process streams, comprising the steps of:

(a) producing a plurality of heat exchange elements, each finished heat exchange element comprising a sandwich structure having two outer sheets and a core sheet structure between the outer sheets, the outer sheets providing side faces of the heat exchange element, said producing step comprising diffusion bonding the sheets of the sandwich structures together in a predetermined bonding pattern and superplastically expanding the sandwich structures where the sheets are not diffusion bonded together to produce superplastically expanded core sheet structures between the outer sheets; and

(b) bonding said heat exchange element together over at least most of the areas of their side faces to produce a matrix of heat exchange elements arranged in side-by-side heat exchange relationship, said bonding step effecting intimate thermal contact between adjacent side faces of the heat exchange elements.

5,465,485

METHOD FOR PRODUCING DAMPER PULLEY

Kazutoshi Miyake; Masato Ueno; Satomi Watanabe; Nobuaki Funahashi; Tomohito Asai, and Thoru Isono, all of Nakashima, Japan, assignors to Toyoda Gosei Co., Ltd., Aichi, Japan

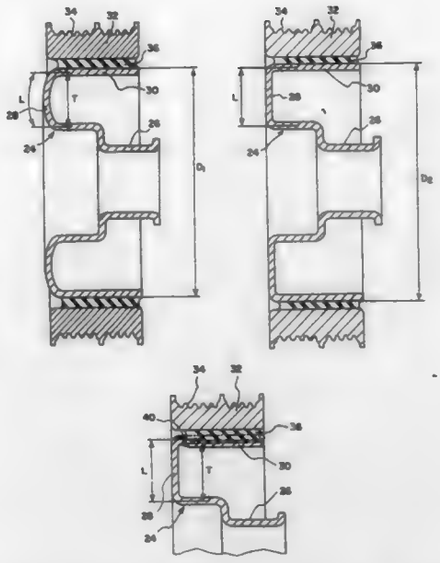
Filed Nov. 23, 1994, Ser. No. 346,288
Claims priority, application Japan, Nov. 24, 1993, 5-317303; Apr. 28, 1994, 6-114518
Int. Cl.[6] B21K *1/42*
U.S. Cl. 29—892.11 6 Claims

1. A method for producing a damper pulley having a boss portion constructed and arranged to be press-fitted onto a rotary shaft, an annular main portion extending from said boss portion, a flange portion formed along an outer periphery of said main portion, a ring-shaped damper-mass member located about said flange portion, and a rubber body interposed between said flange portion and said damper-mass member, the method comprising the sequential steps of:

forming said boss portion, said main portion and said flange portion integrally from a metallic plate such that at least one part of said main portion has a curved section and a radial length of said main portion is greater than a straight line distance between said boss portion and said flange portion;

placing said rubber body between said flange portion and said damper-mass member; and

enlarging a diameter of said flange portion to elongate said at least one part of said main portion having the curved section, thereby substantially straightening said curved section and pressing said rubber body by the enlarged flange portion.



5. A method for producing a damper pulley having a boss portion constructed and arranged to be press-fitted onto a rotary shaft, an annual main portion extending from said boss portion, a flange portion formed along an outer periphery of said main portion, a ring-shaped damper-mass member disposed about said flange portion, and a rubber body interposed between said flange portion and said damper-mass member, the method comprising the sequential steps of:

forming said boss portion, said main portion and said flange portion integrally from a metallic plate such that said flange portion has a curved part at the base end connected to a peripheral edge of said annular main portion and a radial distance between said flange portion and said boss portion is less than a radial length of said main portion;

placing said rubber body between said flange portion and said damper-mass member; and

enlarging a diameter of said flange portion to elongate and substantially straighten said curved part of said flange portion, thereby pressing said rubber body by the enlarged flange portion.

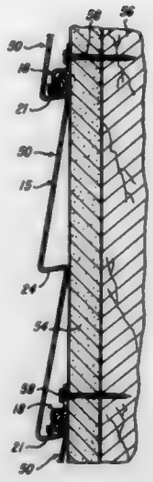
5,465,486

SIDING PANEL AND SUPPORT STRIP ASSEMBLY AND METHOD OF PRODUCTION

Daniel W. King, 113 N. Ohio Ave., Suite 208, Sidney, Ohio 45365

Continuation-in-part of Ser. No. 990,038, Dec. 14, 1992, Pat. No. 5,363,623. This application Dec. 10, 1993, Ser. No. 166,232
Int. Cl.[6] E04D *1/00*
U.S. Cl. 29—897.32 14 Claims

1. A method of continuously producing a series of elongated siding panels each having an attached longitudinally extending support strip, comprising the steps of forming a continuous support strip and a continuous siding panel each having a predetermined cross-sectional profile, notching and cutting a longitudinal portion of the siding panel and a longitudinal portion of the support strip to form longitudinally spaced slots and corresponding hook-shaped tabs with the slots being longer than the tabs, inserting the tabs into



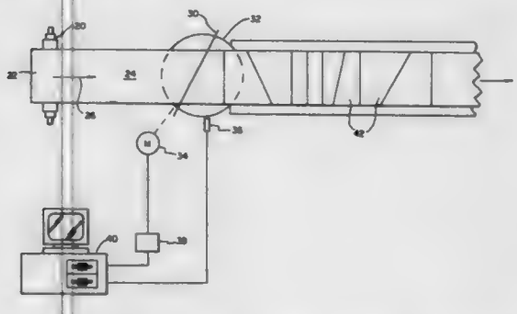
the slots to form positive connections of the support strip to the siding panel, and cutting the panel and support strip transversely at longitudinally spaced intervals to form a series of elongated siding panels and connected corresponding support strips with the connections providing for limited longitudinal movement of each siding panel relative to its corresponding support strip.

5,465,487

METHOD OF MAKING A RIGID FRAME CONSTRUCTION

Charles W. Dean, 2444 McGregor Blvd., Fort Myers, Fla. 33901

Filed Aug. 23, 1993, Ser. No. 109,923
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—897.35 **4 Claims**



1. A method of fabricating a varying modulus I-section beam comprising flanges interconnected by a web built up from a series of generally trapezoidal sections of uniformly thick metal, said method comprising steps of

determining an appropriate shape for each of said web sections,

feeding stock material from a continuous supply thereof to a shear having a rotatable platen,

controlling rotation of the platen in accordance with the web section shapes previously determined while cutting a series of web sections from the stock material,

welding the web sections thus produced together to form a built-up web, and then

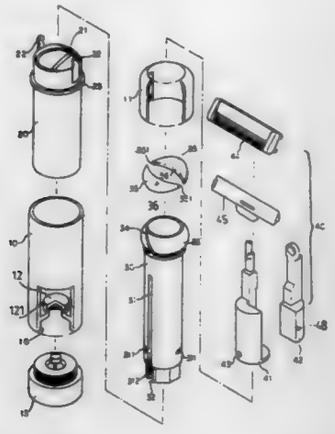
welding flanges to either side of the built-up web, to form an I-section beam.

5,465,488

FOLDING RAZOR

Ke G. Yaw, and Hsu S. Wei, both of P.O. Box 82-144, Taipei, Taiwan, Prov. of China

Filed Dec. 23, 1994, Ser. No. 362,970
Int. Cl.[6] B26B *21/00;21/14*
U.S. Cl. 30—41 **3 Claims**



1. A razor comprising:

an inner tubular member formed with two opposite longitudinal slots of different length, each of said slots being formed with an outlet at a lower end, a horizontal slot along a circumference of said inner tubular member, and an annular flange with a plurality of mortises, said inner tubular member being formed at an upper end with a spherical portion having a pair of grooves extending slantwise from an upper edge to a lower edge and then horizontally along a surface of the lower edge;

a blade assembly fitted into said inner tubular member and including a first mounting element and a second mounting element engaged with the first mounting element, said first mounting element being formed with a protuberance at a lower end;

an intermediate tubular member enclosing said inner tubular member, said intermediate tubular member being formed at an inner surface with a spiral groove adapted to receive a protuberance of said first mounting element and at an upper the end with two lugs;

an outer tubular member enclosing said intermediate tubular member and having at an inner bottom a protruded portion formed with a plurality of tenons adapted to engage the mortises of said inner tubular member; and

a cap having an opening at a center and engageable with a top end of said intermediate tubular member.

5,465,489

TOOL FOR REMOVING HIGHWAY LANE MARKING TABS

Phynes L. Meek, 2151 Halsey Dr., Medford, Oreg. 97504

Filed Jan. 30, 1995, Ser. No. 380,491
Int. Cl.[6] A47L *13/08*
U.S. Cl. 30—171 **5 Claims**

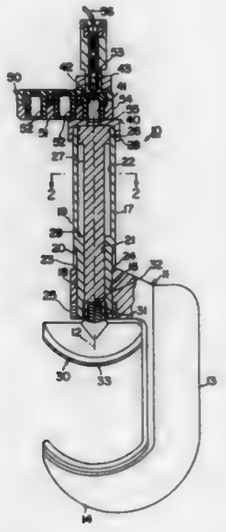
1. A tool for severing and removing non-metalic lane markers from a roadway, said tool comprising,

a base including a plate for travel in a forward direction along a roadway surface and having at least one open ended slot terminating in one direction at a leading edge of said plate, said slot substantially defined by pair of parallel upright wall surfaces for sliding contact with a marker, a beveled cutting edge defining the rearward terminus of said slot,

said base additionally including sidewalls and a rear wall to confine severed markers, and

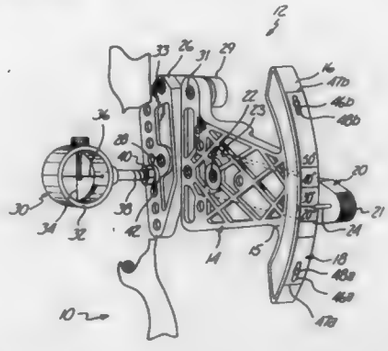
means for imparting forward travel to said base for travel along the roadway surface.

5,465,490
RESCUE CHOPPING TOOL
Walter C. Smith, Ridgecrest, and Thomas R. Mooney, Rancho Palos Verdes, both of Calif., assignors to Hi-Shear Technology Corporation, Torrance, Calif.
Filed Oct. 25, 1993, Ser. No. 142,664
Int. Cl.[6] B26B *17/00*
U.S. Cl. 30—180 7 Claims



1. A rescue tool comprising:
a body with an axis of actuation and an axially-extending bore therein;
a spacer on the body extending axially, laterally spaced from said axis;
a reaction arm extending laterally from the spacer and crossing said axis;
an actuator barrel slidably fitted in said bore, said barrel having an internal cylinder which opens toward said reaction arm, an outer cylindrical section which fits in said bore, and an enlarged external section forming a retention shoulder facing said body,
decelerator means placed around said barrel between said shoulder and the body;
a transfer shoulder in said internal cylinder having a diameter;
a piston fitted in said cylinder, and a piston rod extending from said piston, toward said reaction arm; said piston having a diameter larger than said transfer shoulder;
a chopper blade functionally joined to said piston rod aligned with and parallel to said reaction arm;
a cylinder head attached to said barrel closing said cylinder, said cylinder head having a cartridge chamber to receive a gas generating means;
a breech closure removably attached to said barrel to give access to said chamber; and
firing means to initiate a cartridge placed in said chamber.

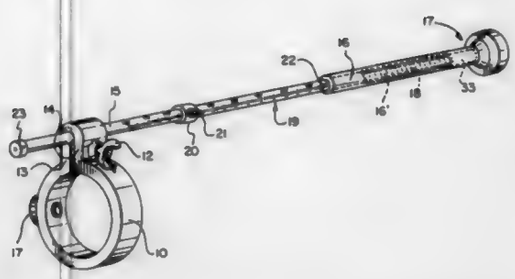
5,465,491
ADJUSTABLE YARDAGE PLATE
Dale G. Thell, 1606 E. Iowa, Saint Paul, Minn. 55106
Filed May 4, 1994, Ser. No. 237,825
Int. Cl.[6] F41G *11/67*
U.S. Cl. 33—265 11 Claims



1. An apparatus suitable for use as an adjustable sight for an archery bow used with an arrow, the apparatus comprising:
a support member fixedly mounted to the archery bow, the support member having a support front end and a support rear end;
a second member at the support rear end, the second member having a face;
a plate adjustably mounted to the face of the second member, the plate receiving removable marking calibrations, each calibration corresponding to a different target distance, the plate being slidable along the face of the second member to accomplish adjustment of the plate, wherein adjustment of the plate for a single marking calibration for its target distance causes corresponding adjustment of a remainder of the marking calibrations, so that the remainder of the marking calibrations are simultaneously calibrated for their respective target distances;
means for locking the plate to the face of the second member in an adjusted position;
a lever having an intermediate portion pivotally mounted to the support member, a lever front end, and a lever rear end, the lever rear end carrying a pointer cooperating with the plate; and
a sight unit connected to the lever proximate the lever front end such that for a uniform movement of the pointer along the plate towards an increased target distance position there is movement of the sight unit to compensate for the increase in effect of gravity due to the increased target distance.

5,465,492
ALIGNMENT DEVICE FOR A HAND TOOL
Robert F. Bond, Exeter, United Kingdom, assignor to Five Star Enterprises Limited, Channel Islands
PCT No. PCT/GB93/00099, § 371 Date Jul. 7, 1994, § 102(e) Date Jul. 7, 1994, PCT Pub. No. WO93/13914, PCT Pub. Date Jul. 22, 1993
PCT Filed Jan. 15, 1993, Ser. No. 256,316
Claims priority, application United Kingdom, Jan. 16, 1992, 9200926
Int. Cl.[6] B27G *23/00*
U.S. Cl. 33—275 R 6 Claims

1. For use with a manually manipulated tool for driving an element along a drive axis into a workpiece surface, an indicator



device for indicating the angular disposition of said drive axis relative to said workpiece surface, said indicator device having:

a head arranged to be supported in a stable position on said workpiece surface adjacent to the position at which said element is to be driven into said workpiece surface, said head including a socket having a part-spherical bearing surface; and

coupling means having a first portion for attachment to said tool and a second portion in sliding engagement with said first portion to move in a direction which is parallel to said drive axis, said second portion having a part-spherical bearing surface which is closely received in said socket to form a universal-type pivotal coupling,

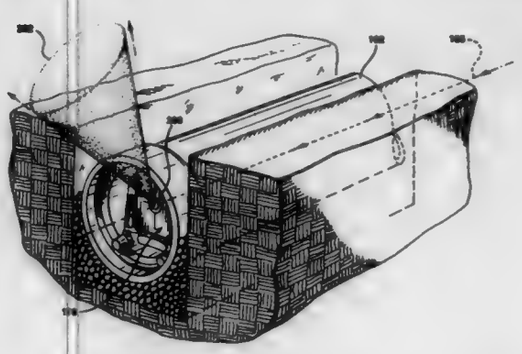
characterised in said part-spherical bearing surfaces are provided with indicia means for indicating the angular disposition of said drive axis relative to said workpiece surface, said indicia means being so located on said bearing surfaces as to be readily visible when viewed from a point substantially on said drive axis.

5,465,493

PIPE ALIGNMENT APPARATUS AND METHOD USING GREEN LIGHT

Mark D. Sobottke, Kettering, and Daniel R. Klemer, Dayton, both of Ohio, assignors to Spectra-Physics Laserplane, Inc., Dayton, Ohio

Filed Jun. 2, 1994, Ser. No. 253,073
Int. Cl.[6] G01C *15/00*; G01B *11/00*
U.S. Cl. 33—286 **20 Claims**



1. A pipe alignment system for aligning a section of pipe along a predetermined path, said system comprising:

a light transmitter for transmitting a collimated beam of light along the predetermined path, said beam of light having a wavelength substantially in the green portion of the optical spectrum; and

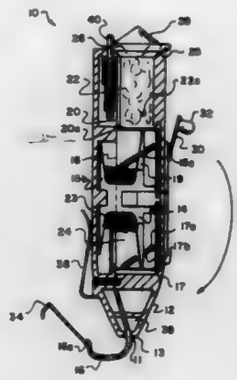
an optical target being adapted to be positioned at one end of said pipe section for visually indicating impingement of said beam of light having a wavelength substantially in the green portion of the optical spectrum, whereby said pipe section can be aligned with said beam of light.

5,465,494

TOOL FOR MARKING CHALK LINES AND PLUMB LINES

Anthony Johnston, 2 Morton St., Wilmington, Mass. 01887

Filed Oct. 28, 1994, Ser. No. 331,057
Int. Cl.[6] B44D *3/38*
U.S. Cl. 33—414 **9 Claims**



1. A chalk line tool including:

A. a housing with a first opening through which string is fed, the housing including a chalk dispensing compartment for holding a chalk stick;

B. a reel, which rotates to pull the string into and release the string from the housing;

C. a grinder connected to rotate with the reel, the grinder grinding the chalk stick into chalk dust,

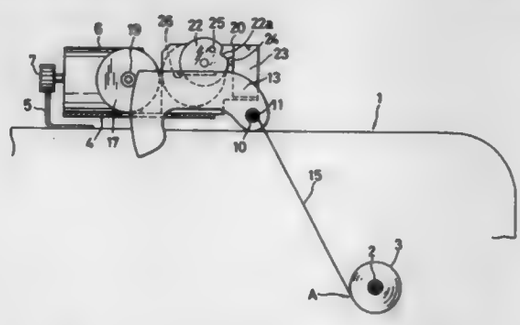
the reel being positioned relative to the grinder means such that the string released from the reel travels through the chalk dust produced by the grinder.

5,465,495

LENS SHAPE MEASURING INSTRUMENT

Sadao Takubo, Takehara, Japan, assignor to Kabushiki Kaisha Takubo Seiki Seisakusho, Takehara, Japan

Filed Jun. 2, 1994, Ser. No. 252,882
Claims priority, application Japan, Jun. 28, 1993, 5-182019
Int. Cl.[6] G01B *5/20*
U.S. Cl. 33—507 **10 Claims**



1. A lens shape measuring instrument, comprising a slide base plate slidably provided in parallel with a chucking shaft of an eyeglass lens, a rotating shaft disposed in parallel with the chucking shaft on the slide base plate, a measuring bar arranged on the rotating shaft and having a tip and a V-shaped contactor formed on said tip, a spring for applying measuring pressure disposed so that the V-shaped contactor can be pressed on the peripheral surface of the eyeglass lens, and a detector for detecting horizontal displacement of the slide base plate.

5,465,496
MEASURING APPARATUS AND METHOD

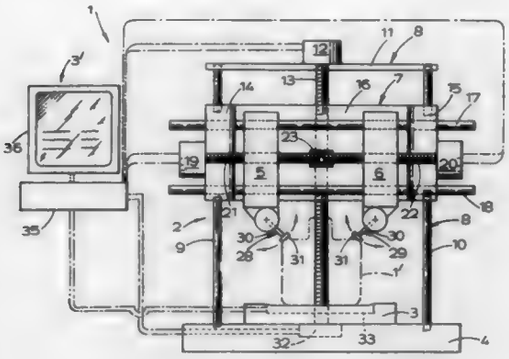
Allan Axon, Leicestershire, England, assignor to System E. Controls Limited, Warwickshire, England

Filed Feb. 10, 1994, Ser. No. 193,157

Claims priority, application United Kingdom, Sep. 19, 1991, 9120029

Int. Cl.[6] G01B 5/012;5/20;5/004

U.S. Cl. 33—522 7 Claims



1. An apparatus for measuring dimensions of an article in two inclined directions comprising:

a pair of measuring heads;

a pair of measuring probes each being operatively associated with a respective one of said measuring heads, each of said measuring probes being angularly movable relative to the associated head upon contact with the article to be measured;

a pair of contact-identifying triggers each being operatively associated with a respective one of said measuring probes for indicating contact of said probes with the article to be measured;

a base providing a planar surface upon which the article to be measured can be placed; and

first and second drive assemblies, said first drive assembly constructed and arranged to move said measuring heads towards the article in a first direction parallel to the plane of said base to enable the probes to contact the article and thereby actuate said triggers to indicate contact of said probes with the article in a direction parallel to said base, said second drive assembly constructed and arranged to move the measuring heads towards the article in a second direction inclined relative to the first direction to enable the probes to contact the article and thereby actuate said triggers to indicate contact of said probes with the article in a direction inclined relative to said base,

said first and second directions residing in a common measuring plane, and said base being rotatable about a central axis normal to the plane of the base so as to bring different portions of the article to be measured into said measuring plane,

each measuring probe being constructed and arranged to be movable angularly relative to the measuring head to actuate the associated trigger when it contacts the article as a result of movement of the measuring heads along the first direction, and to be movable angularly in an opposite direction to actuate the associated trigger when it contacts the article as a result of movement of the measuring heads along said second direction.

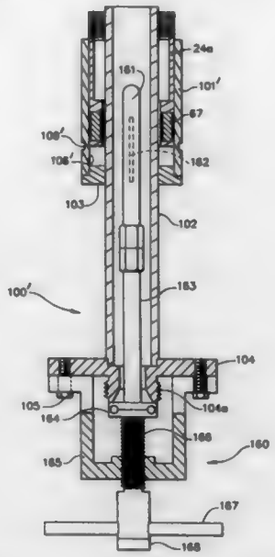
5,465,497
CONTROL ROD DRIVE UNCOUPLING TOOL GAGE

Balasubramanian S. Kowdley; Thomas A. Lewis; Robert S. Tsukida; Edward W. Saxon; Frank Ortega, all of San Jose, and Paul Debenedetto, Grass Valley, all of Calif., assignors to General Electric Company, San Jose, Calif.

Filed Feb. 22, 1994, Ser. No. 199,408

Int. Cl.[6] G01B 7/14; G21C 17/00

U.S. Cl. 33—626 8 Claims



1. A gage for checking the operating status of an uncoupling tool having a cylindrical probe with a magnet-actuatable switch for activating an indicator in response to actuation by a magnet, comprising:

first means for receiving an annular housing enclosing a ring magnet, wherein said first means has a circular cylindrical inner circumferential surface and is open at one end;

second means for receiving said probe of said un-coupling tool;

third means for abutting said uncoupling tool;

means for connecting said first means to said second means so that a center axis of said housing and a center axis of said probe are co-axial and one of said housing and said probe can be translated in a direction parallel to said center axis of said probe to an axial position whereat said magnet actuates said switch if said switch is in an operative state; and

means for connecting said second means to said third means so that abutment of said third means with said uncoupling tool establishes a fixed spatial relationship between said first means and said probe,

wherein said means for connecting said first means to said second means comprises a ring having an annular flat surface substantially perpendicular to said circular cylindrical inner circumferential surface, said annular flat surface of said ring forming a stop for said housing.

5,465,498
GAUGE FOR MEASURING THE DEGREE OF ALIGNMENT AT THE INNER SURFACES OF TWO TUBULAR MEMBERS POSITIONED END TO END

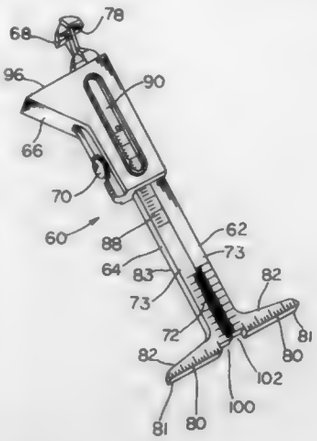
Goodwin A. Lycan, Stevensville, Mich., assignor to G.A.L. Gage Co., Stevensville, Mich.

Filed Aug. 14, 1992, Ser. No. 929,387

Int. Cl.[6] G01B 3/20;5/252

U.S. Cl. 33—645 1 Claim

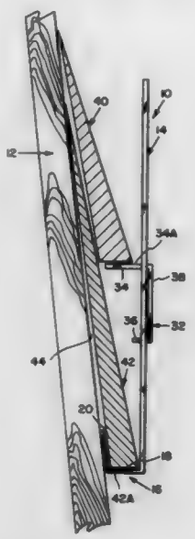
1. In a gauge for measuring the degree of alignment of two tubular members positioned end to end and joined by a consumable ring or an open butt weld, said gauge including parallel first and second bar members having mutually contacting side faces which



extend longitudinally of the members, said first bar member being shiftable lengthwise relative to said second bar member over the contacting side faces thereof, said bar members including oppositely extending foot parts, each foot part projecting at a general right angle to the longitudinal dimension of its included bar member and having a contact surface paralleling the contact surface of the foot part of the other bar member for engaging a surface of a said tubular member, the improvement wherein each foot part has a notch formed in its said contact surface at the contacting side face of its said included bar member, each notch cooperating with the other notch to define slot means for spanning said weld with the foot part contact surfaces engaging the surface of said tubular member, whereby said degree of alignment of the tubular member can be measured.

5,465,499
TOOL FOR INSTALLING SIDING
Daniel J. LaPlante, 384 Meadow Rd., Farmington, Conn. 06032

Filed Aug. 22, 1994, Ser. No. 293,293
Int. Cl.[6] G01D *21/00*
U.S. Cl. 33—647 **9 Claims**



1. A tool for installing siding strips on a building wall and comprising

a generally J-shaped bracket, the bracket having

a hook at its lower end and

a plurality of equally spaced openings longitudinally aligned along the bracket above its hook, and

an adjustable siding support releasably attachable to the bracket, the support having

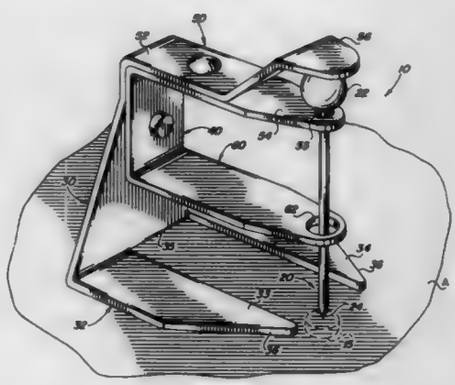
a pair of projections integrally fixed thereon and spaced apart a distance corresponding to the spacing between bracket openings,

the projections being registrable with a selected pair of bracket openings for fixing the support on the bracket in assembled relation in a predetermined position above the bracket hook,

whereby the support maintains an overlying siding strip during installation in overlapping relation to an underlying strip affixed to a building wall with the extent of overlap established by registration of the projections of the support within a selected pair of bracket openings.

5,465,500
MAGNETIC POINT IDENTIFIER
Yuji Nammoto, 14790 SW. 184 St., Miami, Fla. 33187

Filed May 27, 1994, Ser. No. 250,157
Int. Cl.[6] B25H *7/04*
U.S. Cl. 33—666 **8 Claims**



1. To be used in the construction of structures wherein a hole must be formed at a specific point in a surface of the structure, a magnetic point identifier comprising:

a small magnetic element to be disposed to correspond to the specific point in the surface of the structure,

a metallic, magnetically attractive pointer, said pointer including a suspension end and a pointed indicator end,

an indicator frame, said indicator frame including a base portion, an upstanding support member, and a horizontal suspension arm,

said base portion including a free distal end and a proximal end, said upstanding support member extending upwardly from said proximal end,

said horizontal suspension arm including a first end and a second end, and being secured to said upstanding support member at said first end so as to extend outwardly from an upper end of said upstanding support member and overhang said base portion,

said second end of said horizontal suspension arm including suspension means structured and disposed to swingably hold said pointer, at said suspension end of said pointer, such that said indicator end of said pointer freely hangs beneath said horizontal suspension arm in indicating attraction with said magnetic element so as to indicate the precise location of said magnetic element, and

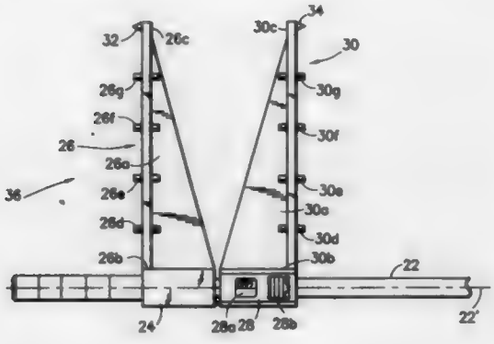
actuation means structured and disposed to push down on said suspension end of said pointer so as to downwardly bias said horizontal suspension arm and downwardly urge said pointer, such that said pointed indicator end of said pointer contacts the specific point in the surface of the structure and makes an indicating indentation in the surface of the structure.

5,465,501

GAGE WITH ADJUSTABLE DEPTH STOPS FOR MEASURING DISTANCE BETWEEN TWO SPACED SURFACES

Albert Rogler, North Scituate, R.I., assignor to Central Tools, Inc., Cranston, R.I.

Filed Feb. 24, 1994, Ser. No. 203,649
Int. Cl.[6] G01B 5/14
U.S. Cl. 33—810 16 Claims



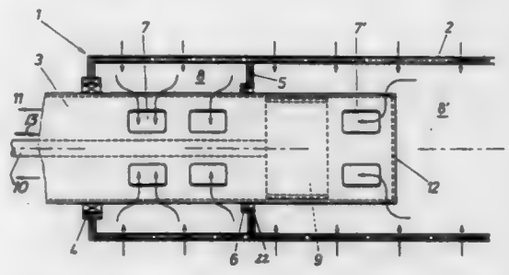
1. Gage for measuring the dimension between two spaced surfaces of a body, the measurement being made a predetermined distance along a predetermined direction from abutment surfaces on the body which are arranged in a reference plane normal to said predetermined direction, the gage comprising an elongate generally rigid bar defining a gage axis; first and second jaws extending generally transversely to said gage axis and mounted on said bar for sliding movements relative to each other in a common plane in directions along said gage axis, each of said jaws having a main transverse body portion, a proximate portion at one end of said main body portion being slidably mounted on said bar and a remote free end portion being remote from said bar; and anvil mounted on each end portion and protruding along a direction generally parallel to said gage axis, said anvils on said first and second jaws being aligned with each other along a line generally parallel to said gage axis; indicator means mounted for sliding movements on said bar with one of said jaws relative to the other of said jaws for providing an indication corresponding to the distance between said anvils; and adjustable depth control means for selectively positioning said anvils at equal distances from their associated body abutment surfaces to thereby control the positions, along said predetermined directions, at which both said anvils are positioned on the spaced surfaces, relative to said abutment surfaces, said adjustable depth control means comprising at least one pair of adjustable depth stops, permanently mounted on said jaws, one on each of said main jaw body portions being equally spaced a predetermined distance from associated anvils and each being selectively movable to clear or engage an abutment surface of the body to thereby selectively enable measurement of the dimension between said spaced surfaces at points equally spaced from said abutment surfaces, whereby said adjustable depth control means assures that each of said anvils are equally spaced from an associated body abutment surface and that said anvils are not skewed but are arranged along a line substantially normal in relation to said predetermined direction, and said spaced surfaces can be accurately measured without errors due to uneven positioning of said anvils in relation to the spaced surfaces.

5,465,502

SUCTION ROLL IN PARTICULAR FOR A PAPER WEB DRYER

Herbert Holik, Ravensburg; Werner Leitenberger, Schlier, both of, Germany, and Reinhard Pinter, Graz, Austria, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Germany

Filed Jul. 19, 1993, Ser. No. 99,026
Claims priority, application Austria, Jul. 31, 1992, 1555/92
The portion of the term of this patent subsequent to Sep. 20, 2011, has been disclaimed.
Int. Cl.[6] D21F 3/10; F26B 13/30
U.S. Cl. 34—115 20 Claims



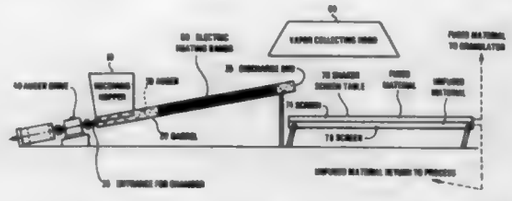
1. Suction roll for a paper web dryer, comprising a perforated roll jacket, at least one non-rotatable hollow shaft of circular cross-section communicating with an interior of the suction roll via openings, at least one closure member for partitioning off at least-one edge region of the suction roll and being displaceable in the axial direction, and at least one disk-shaped, dividing wall comprising at least one central opening located in the interior of the suction roll.

5,465,503

DRYER DENSIFIER

Ira O. L. Oates, LaGrange, Tex., assignor to The Lerio Corporation, Mobile, Ala.

Continuation of Ser. No. 897,809, Jun. 12, 1992, abandoned.
This application Jul. 12, 1993, Ser. No. 89,626
Int. Cl.[6] F26B 11/12
U.S. Cl. 34—179 26 Claims



26. A process of drying, fusing and densifying plastic material comprising:

feeding a plastic material containing at least 5 wt % water to a stationary heated chamber having a rotating auger extending from an inlet end to an outlet end of said heated chamber, said auger being spaced from said heated chamber to allow vapors from said plastic material to pass between said auger and heated chamber while conveying said plastic material;

heating and conveying said material through said heated chamber without completely melting said material and without introducing a flow of air to said chamber for preventing ignition of said plastic material and to dry and densify said material by fusing particles of said material;

discharging said dried and densified material;

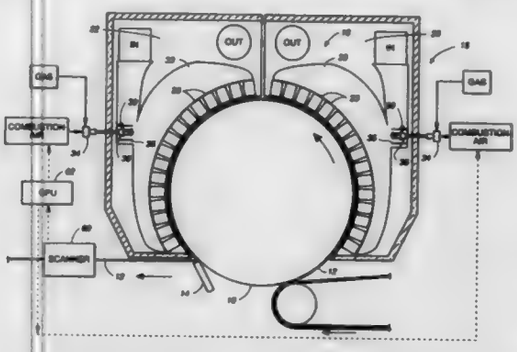
separating said dried and densified material into a first less densified fraction and a second more densified fraction; and

conveying said first fraction to said heated chamber and further densifying said fraction.

5,465,504
SYSTEM FOR MODIFYING THE MOISTURE PROFILE OF A PAPER WEB

John R. Joiner, Vancouver, Wash., assignor to James River Paper Company, Inc., Richmond, Va.

Filed Apr. 8, 1994, Ser. No. 224,735
Int. Cl.[6] F26B 3/00
U.S. Cl. 34—446 15 Claims



15. A method of modifying the moisture profile of a paper web produced on a paper making machine including a rotatable dryer drum having an outer cylindrical surface and a dryer hood partially encompassing said dryer drum and having a hood interior, said method comprising the steps of:

positioning a plurality of independently operable gas burners in the cross-machine direction adjacent to said dryer drum and extending along the length of the dryer drum, said gas burners each including a nozzle;

rotating said dryer drum to deliver the paper web in the machine direction into and through the hood interior and past the gas burner nozzles;

drying the paper web on said dryer drum outer cylindrical surface;

removing the paper web from the dryer drum;

monitoring the paper web along the width of the paper web after the paper web has been removed from said dryer drum to determine the moisture profile of the paper web after drying of the paper web; and

selectively and separately controlling the flames emitted by said gas burner nozzles as a function of the moisture profile determined during said monitoring step to direct flows of heated air to incremental width portions of said paper web while on said dryer drum to modify the moisture profile of the web produced by the paper making machine.

5,465,505
INVERTED DRYER GROUP IN A MULTI-CYLINDER DRYER IN A PAPER MACHINE

Reima Kerttula, Muurame, Finland, assignor to Valmet Paper Machinery, Inc., Helsinki, Finland

Filed Dec. 23, 1993, Ser. No. 172,590
Claims priority, application Finland, Dec. 30, 1992, 925942
Int. Cl.[6] F26B 3/00
U.S. Cl. 34—452 23 Claims

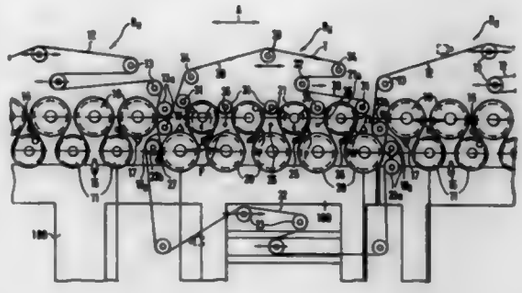
15. A method to prevent shrinkage of a paper web in an inverted dryer group having a single-wire draw, comprising

arranging steam-heated drying cylinders in a lower row,

pressing a web to be dried running on a drying wire against said drying cylinders,

arranging reversing cylinders above gaps between said drying cylinders and inside a loop of said drying wire such that the web runs on an outside curve of turning sectors of said reversing cylinders or rolls, at least one of said reversing cylinders being unheated and having a solid-mantle, and

guiding a support wire to press the web against said drying wire over a substantially large sector of said at least one reversing cylinder.

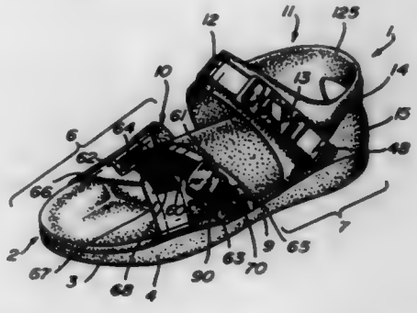


5,465,506
SANDAL FASTENING SYSTEM

Clark A. Matis, Shelburne, and Michael S. Garman, Burlington, both of Vt., assignors to Karhu USA Inc., South Burlington, Vt.

Filed Jan. 19, 1994, Ser. No. 184,007
Int. Cl.[6] A43B 3/12;11/00
U.S. Cl. 36—11.5 7 Claims

1. A sandal of the type comprising a sole and a strap system for



retaining said sole on a human foot, said human foot having a front part and a rear part,

said sole having a front portion, a heel portion, and, opposed first and second side edges,

said strap system comprising a front strap unit for securing the sandal to the front part of the human foot and an ankle strap unit for securing the sandal to the rear part of the human foot, characterized in that

at least one of said strap units comprises

a strap,

a strap fastener and

strap connector comprising an opening configured to receive said strap,

said strap connector being attached to said first side edge of said sole,

said strap fastener comprising first and second locking parts, said first and second locking parts being configured so as to be releasably interlockable,

said first locking part comprising a ladder lock member, said ladder lock member comprising at least two openings for receiving said strap,

said strap being attached to said second side edge of said sole and being threaded, in serpentine fashion, through at least two openings of said ladder lock member,

said strap being attached to said second locking part and being threaded through the opening of said strap connector such that when the first and second locking parts are interlocked, the strap defines a strap loop threaded through the opening of said strap connector,

said strap being configured so as to be threadable through said opening of the strap connector when the first and second locking parts are separated, said at least two openings of said ladder lock member being configured and disposed such that when the first and second locking parts are interlocked and the strap loop is longitudinally tensioned,

the ladder lock member grasps the strap so as to secure the strap fastener to the strap and

such that when the first and second locking parts are separated, the strap is threadable through said at least two openings of the ladder lock member for varying the size of said strap loop so as to thereby adjust the grasp of the strap to the foot.

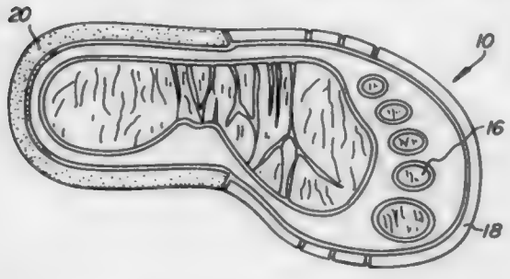
5,465,507

INTEGRAL SOLE WITH FOOTPRINT EMBOSSING

James H. Schumacher, Hot Springs, Ak., and Donald L. Mills, Monett, Mo., assignors to OSAGE Footwear, Inc., Monett, Mo.

Filed Apr. 13, 1994, Ser. No. 227,317
Int. Cl.[6] A43B *5/00;13/12*
U.S. Cl. 36—30 R **18 Claims**

1. An integrally molded sole for a shoe of a child learning to



walk comprising:

a molded base plate which is made of a molded synthetic resin material and which forms a cushioning layer, said base plate having a length and including

an upper surface to which an upper of the shoe is to be attached,

a lower surface, and

a footprint embossing extending from said lower surface opposite the position taken by a foot of a user in the upper and extending nearly the entire length of the base plate, said footprint embossing including a toe portion separated from a remainder of said footprint embossing by a space, said footprint embossing engaging a walking surface when the shoe is worn and providing traction and comfort for the footprint area of the foot of the user; and

a stabilizing plate horizontally located about and separately surrounding said toe portion and said remainder of said footprint embossing of said base plate, said stabilizing plate

filling said space between said toe portion and said remainder of said footprint embossing,

being molded to said lower surface of said base plate,

being made of a molded synthetic resin material which is harder than the synthetic resin material of said base plate,

also engaging the walking surface, and

including a bridge portion extending outwardly from said toe portion of said footprint embossing which said bridge portion provides lateral stability for the sole.

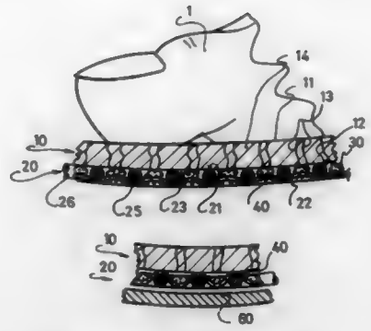
5,465,508

INSOLE FOR SPORT SHOE

Joël Bourdeau, Saint Jorioz, France, assignor to Salomon S.A., Annecy, France

Continuation of Ser. No. 833,523, Feb. 11, 1992, abandoned. This application Jun. 3, 1994, Ser. No. 253,593
Claims priority, application France, Feb. 11, 1991, 91 01785
Int. Cl.[6] A43B *13/38*
U.S. Cl. 36—44 **12 Claims**

1. Insole for shoes comprising:



(a) a first layer (**10**) facing a foot of a wearer and comprising drain-type means (**13**) allowing moisture to pass from an upper surface (**11**) to a lower surface (**12**) of said first layer; and

(b) a rigid second layer (**20**) having an upper surface (**21**) in contact with said lower surface (**12**) of said first layer (**10**), said second layer delimiting cavities (**23, 24**) which open onto said upper surface (**21**) of said second layer (**20**) to form a substantially non-deformable moisture storage volume;

(c) an absorbent material (**30**) arranged within said cavities; and

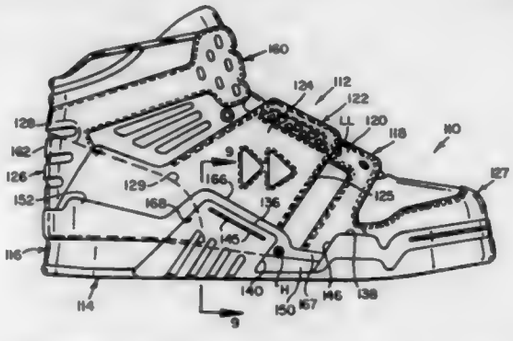
(d) a position-maintenance membrane (**40**) arranged between said first and second layers and extending on the bottom of said cavities (**23**) in said second layer, said absorbent material between said lower surface of said first layer and said position-maintenance membrane (**40**).

5,465,509

ATHLETIC SHOE WITH LATERAL STABILIZER SYSTEM

Rory W. Fuerst, Menlo Park, Calif., and James E. Granville, San Antonio, Tex., assignors to Kaepa, Inc., San Antonio, Tex.

Continuation of Ser. No. 884,219, May 11, 1992, abandoned, which is a continuation of Ser. No. 567,259, Aug. 14, 1990, abandoned, which is a continuation of Ser. No. 308,254, Feb. 9, 1989, Pat. No. 4,947,560. This application Apr. 20, 1993, Ser. No. 50,764
The portion of the term of this patent subsequent to Aug. 14, 2007, has been disclaimed.
Int. Cl.[6] A43B *7/18;7/14*
U.S. Cl. 36—88 **3 Claims**



1. An athletic shoe comprising:

(a) an upper including a heel section and a toe section and an instep section in the area corresponding generally to the arched middle portion of the foot;

(b) an outsole extending lengthwise of the upper and having a rear end and a front end and an instep area in the area corresponding generally to the arched middle portion of the foot,

(c) a first set of opposed, upwardly extending side portions formed with said outsole, and extending into the instep section of the upper above the instep area of the outsole,

(d) a midsole extending lengthwise of the upper and having a rear end and a front end and an instep area in the area corresponding generally to the arched middle portion of the foot, and

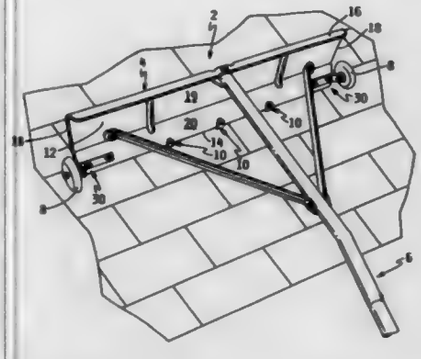
(e) a second set of opposed, upwardly extending side portions formed with said midsole and extending into the instep section of the upper above the instep area of the midsole, said first set of side portions being disposed outwardly of said second set of side portions and said first set and said second set of side portions being operatively attached to the instep section of the upper and cooperating to provide lateral stabilization and support for the shoe in the instep section of the upper above the instep area of the outsole and midsole.

5,465,510

ROOF RAKE

Scott E. Goodnough, 6049 Clinton Ave., S., Minneapolis, Minn. 55419, and Thomas F. Moren, 2212 Lakeaires Blvd., White Bear Lake, Minn. 55110

Filed Apr. 11, 1994, Ser. No. 225,886
Int. Cl.[6] E01H *5/02*
U.S. Cl. 37—285 **22 Claims**



1. A roof rake for moving snow from roofs, which comprises:

(a) a snow moving member having a snow moving surface that extends upwardly from the roof when the snow moving member is placed on the roof with the snow moving surface being effective for moving a swath of snow off the roof when the snow moving member is moved forwardly from a first position on the roof inwardly of the eaves of the roof towards the eaves of the roof;

(b) a handle assembly affixed to the snow moving member and being sufficiently long to extend outwardly past the eaves of the roof when the snow moving member is placed on the roof in the first position to allow a user who is not located on the roof to pull the snow moving member towards the eaves of the roof;

(c) a pair of wheels rotatably carried on the snow moving member and situated thereon for spacing a lower edge of the snow moving surface above the surface of the roof during forward motion of the snow moving member when the wheels are in engagement with the surface of the roof to prevent the lower edge of the snow moving surface from scraping over the surface of the roof, wherein the wheels are spaced apart relative to one another along the lower edge of the snow moving member; and

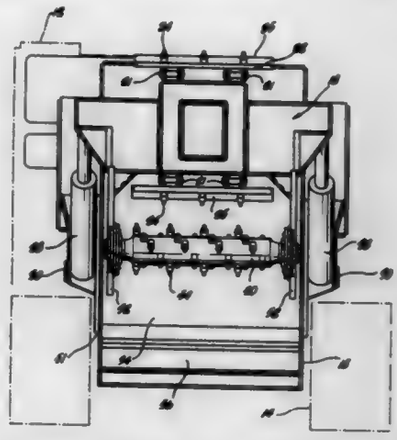
(d) at least one passive spacer member made of a low friction material fixed to the lower edge of the snow moving surface and having a portion beneath the lower edge of the snow moving surface for contacting the surface of the roof.

5,465,511

TRENCHING MACHINE

Gerald E. Umberson, Midland, Tex., assignor to Capitol Trencher Corporation, Odessa, Tex.

Filed Jul. 15, 1993, Ser. No. 92,227
Int. Cl.[6] E02F *5/06*
U.S. Cl. 37—355 **18 Claims**



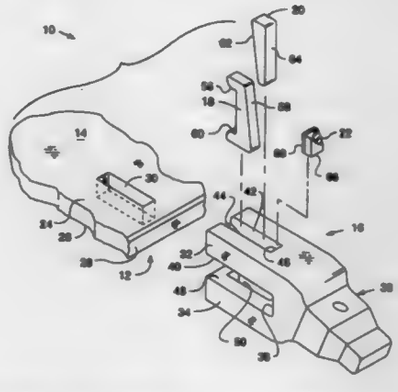
1. In a machine for digging a trench, which machine comprises a frame, a power source attached to the frame, a motive system attached to the frame for moving the machine, a trenching component attached to the frame for digging the trench, said trenching component comprising an elongated boom having a digging belt movable about its periphery, said belt having a plurality of teeth attached thereto, and dirt-removal means for moving the trenched material from the trench through the frame of the machine to the side of the trench, the improvement comprising means to crush boulders which are dislodged intact by the trenching component, said means comprising a bar-like element attached to the frame in close proximity to the digging belt between the digging belt and the ground such that dislodged boulders which are too large to be handled by the dirt removal means are prevented from entering the dirt-removal means.

5,465,512

IMPLEMENT ASSEMBLY WITH A MECHANICALLY ATTACHED ADAPTER

Richard E. Livesay, Peoria; Nathan G. Rozenboom, Metamora, and Frederick J. Shane, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jun. 28, 1994, Ser. No. 266,807
Int. Cl.[6] E02F *9/28*
U.S. Cl. 37—457 **8 Claims**



1. An implement assembly with a mechanically attached adapter, comprising:

an implement having a mounting portion with an upper surface, a lower surface, a leading surface, and a vertically oriented longitudinally extending slot defined therein spaced rearwardly from the leading surface, said slot having a forward end;

an adapter having an upper strap, a spaced apart lower strap having a force transferring surface thereon and an interconnecting abutment surface, the upper and lower straps being adapted to receive the mounting portion therebetween, the upper strap has a generally flat bottom surface on one side thereof and a vertically oriented longitudinally extending opening defined therein, a first surface is disposed on the upper strap at one end of the opening and oriented at an acute angle with respect to the generally flat bottom surface and a second surface is disposed at the other end of the longitudinally extending opening;

a clamp member disposed in the vertically oriented longitudinally extending opening and having a first surface thereon that matingly engages the first surface disposed on the upper strap at the one end of the longitudinally extending opening and a second opposed surface;

a resilient pad member disposed in the forward end of the longitudinally extending slot between the upper and lower straps of the adapter; and

a wedge member having a first surface operative to matingly engage the second opposed surface of the clamp member and a second surface spaced from and angled with respect to the first surface of the wedge member and operative to contact and compress the resilient pad member during assembly to securely retain the interconnecting abutment surface in engagement with the leading surface of the mounting portion and to contact the second surface of the longitudinally extending opening in the upper strap and the force transferring surface on the lower strap, both said wedge member and said clamp member being free of direct longitudinal engagement with the longitudinally extending slot of the mounting portion such that any motion of the adapter relative to the mounting portion is absorbed through the resilient pad member.

5,465,513

DEVICE FOR QUICK CONNECTION OF HYDRAULIC TUBINGS

John T. Sonerud, Vintervägen 30, S-824 00 Hudiksvall, Sweden

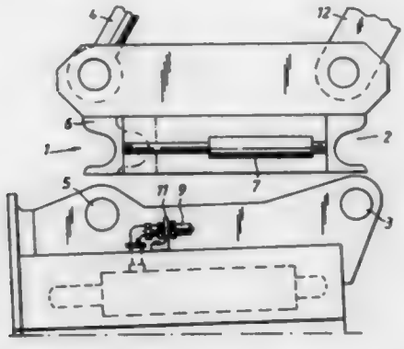
PCT No. PCT/SE92/00586, § 371 Date Mar. 8, 1994, § 102(e) Date Mar. 8, 1994, PCT Pub. No. WO94/02184, PCT Pub. Date Feb. 3, 1994

PCT Filed Aug. 25, 1992, Ser. No. 199,314

Claims priority, application Sweden, Sep. 6, 1991, 9102566

Int. Cl.[6] B66C *23/00*

U.S. Cl. 37—468 **6 Claims**



1. An arrangement for quickly coupling a working implement to a heavy-duty machine and simultaneously connecting a hydraulic power system to the implement, wherein a coupling arrangement, which functions to lock and hold the implement, carries at least one first working fluid coupling means, wherein, as the coupling arrangement locks and holds said implement, the first coupling means is connected with a second coupling means mounted on the implement so as to connect said working fluid coupling means with said implement, wherein the first fluid coupling means is fixedly mounted on a movable part of the coupling arrangement, the movable part being connected to and accompanies the movement of a locking and holding mechanism, and wherein the second fluid coupling means is fixedly connected to said implement, wherein, as the locking and holding mechanism is correctly aligned for correct coupling, said locking and holding mechanism is arranged to move, to lock and hold the implement, and at the same time the first fluid coupling means is arranged to move in parallel with the last-mentioned movement towards the second fluid coupling means to connect the first and second fluid coupling means to each other.

5,465,514

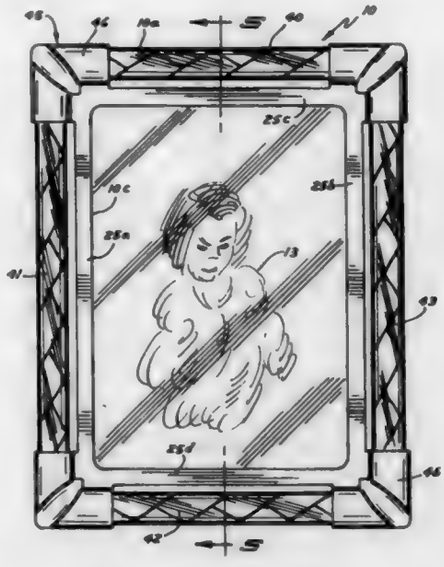
VARIABLE DECORATIVE PICTURE FRAME

Clark H. Ulysse, 3911-65th Ave. N., Brooklyn Cntr., Minn. 55428

Filed Mar. 22, 1994, Ser. No. 215,592

Int. Cl.[6] A47G *1/06*

U.S. Cl. 40—152 **5 Claims**



1. A unitary frame member structure comprising a front side, a rear side and having recessed side and end walls forming a picture display opening therebetween,

a back wall including an outer side overlying said opening and having a supporting pedestal pivoted to said outer side,

said recessed walls forming upwardly projecting side and end walls at the front side of said frame member,

right angled recessed members at each corner of said front side,

a transparent tube disposed upon each of said flanges having respective end portions extending into said angled recesses at each corner,

decorative means inserted into said tubes,

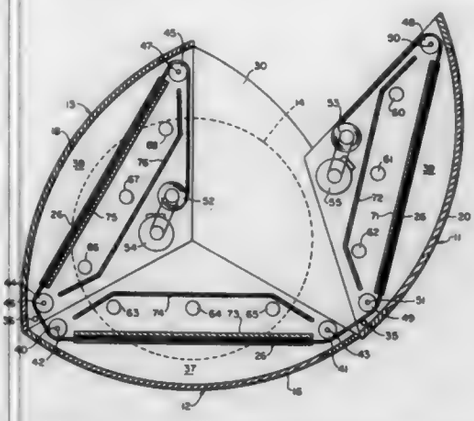
retainers adapted to overlie said corner recesses and extensions therein of said end portions of said tubes, and means securing said retainers.

5,465,515

MODULAR ADVERTISING DISPLAY APPARATUS

Fadi S. Walleddine, 10600 Wilkins Ave., #A2, Los Angeles, Calif. 90024

Filed Sep. 29, 1993, Ser. No. 142,944
Int. Cl.[6] G09F 11/18
U.S. Cl. 40—471 7 Claims



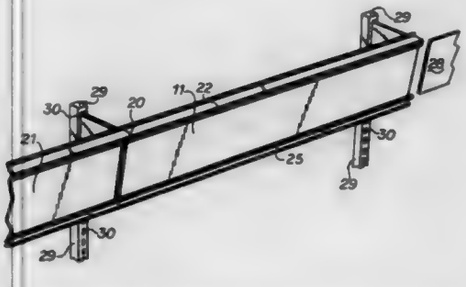
1. A modular advertising display apparatus comprising:
(a) a support base;
(b) a plurality of display modules being angularly displaced from one another, each comprising a supporting frame having a translucent viewing window therethrough and journeled idler rollers on either side of said viewing window, wherein at least one supporting frame of a display module includes a base member, a hinge secured to the support base, the base member being coupled to said hinge, whereby said display module is pivotally coupled relative to the supporting frame of an adjacent display module about said hinge;
(c) first and second drive rollers;
(d) an elongated translucent banner having first and second ends and including means for mounting advertising indicia thereto, said banner being secured to the first and second drive rollers and being in contact with each of said idler rollers;
(e) illuminating means for illuminating the advertising indicia coupled to each of the supporting frames of each plurality of display modules; and
(f) first and second rotational means coupled to the first and second drive rollers for scrolling the elongated translucent banner between said first and second drive rollers.

5,465,516

VALANCE ASSEMBLY

David J. Stabile, Atlanta, Ga., assignor to Miller/Zell, Inc., Atlanta, Ga.

Filed Mar. 15, 1994, Ser. No. 212,944
Int. Cl.[6] G09F 3/20
U.S. Cl. 40—649 18 Claims



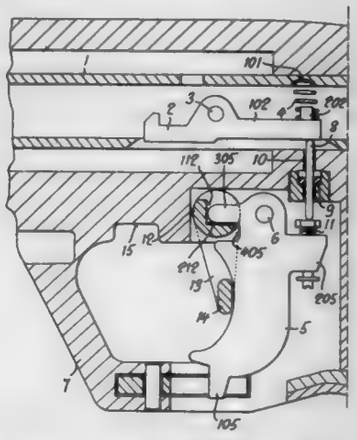
1. A valance assembly adapted to be attached to a display fixture for supporting a graphics insert, comprising:
a graphics panel having a first surface and a second surface opposing said first surface;
retaining means attached to said first surface comprising a pair of spaced guides, each defining channels for receiving respective portions of said graphics insert within said channels to hold said graphics insert between said guides; and
mounting means hingedly connected to said second surface for releasably attaching said valance assembly to said display fixture, said mounting means being selectively moveable into both a mounting position and a storage position.

5,465,517

SAFETY CATCH FOR UNDERWATER GUNS

Giovanni Garofalo, Rapallo, Italy, assignor to HTM Sport S.p.A., Italy

Filed Aug. 31, 1994, Ser. No. 297,546
Claims priority, application Italy, Sep. 29, 1993, GE93A0084
Int. Cl.[6] F41A 17/46
U.S. Cl. 42—70.06 12 Claims



1. A safety catch for an underwater gun having a body, a grip and a trigger mounted on said grip, said trigger including a finger engagement area whereby said trigger is rearwardly moveable by a user's finger for releasing a firing device of said gun, said safety catch comprising:
securing means for securing said trigger in a locked position in which movement of said trigger is prevented; and
moving means for moving said securing means between said locked position and an unlocked position in which said trigger is moveable, said moving means being positioned to be contacted by a finger of a user in said finger engagement area when said securing means is in said locked position and being positioned so as not to be contacted by a finger of a user in the finger engagement area when said securing means is in said unlocked position to allow unobstructed access to said trigger, said moving means being moveable between said locked and unlocked positions by a finger of the user located near the finger engagement area, said moving means including a member positioned to be touched by a user when in the locked position as the user normally engages the trigger.

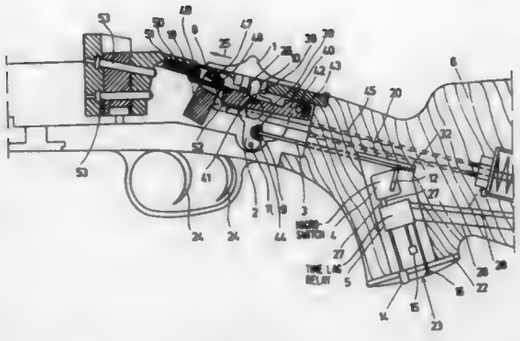
5,465,518

SHOOTING ARMS WITH A SAFETY DEVICE

Horst Blaser, Ziegelstadel 324, D-88316 Isny/Allg., Germany

Filed Apr. 20, 1994, Ser. No. 230,301
Claims priority, application Germany, Apr. 23, 1993, 43 13 261.8
Int. Cl.[6] F41A 17/76
U.S. Cl. 42—70.08 12 Claims

1. A gun comprising
a barrel assembly,



a casing containing a triggering mechanism,

a safety device operatively connected to the triggering mechanism for changing the gun between a safe and a ready-to-fire position,

a supplementary safety device comprising a sensor which detects when said gun has been changed to the ready-to-fire position, a time-lag relay which is started by the sensor when the gun is changed into the ready-to-fire position and which emits a signal after lapse of a preselected time interval, and an actuator which includes a mechanical linkage interacting with said safety device to cause said safety device to return the gun into the safe position after receiving the signal.

5,465,519

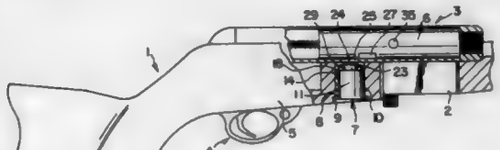
LOCKING ASSEMBLY AND METHOD FOR A FIREARM

Edward Blanck, Camarillo, Calif., assignor to Blue Sky Productions, Inc., Arlington, Va.

Filed Jun. 16, 1994, Ser. No. 261,096

Int. Cl.[6] F41A *17/42;17/02*

U.S. Cl. 42—70.11 **29 Claims**



1. A locking mechanism for a firearm having a stock, a trigger mechanism, a receiver positioned along an upper side of said stock and having an aperture in a lower wall thereof and a bolt housed within said receiver and reciprocatable therein, said locking mechanism comprising;

a lock sleeve positioned vertically in said stock forward of said trigger assembly and below said receiver, said lock sleeve having means to retain said sleeve within said stock, and

a lock body permanently retained in said lock sleeve and having means adapted to protrude through said aperture in said receiver to releasably engage said bolt;

wherein, said lock body comprises a cylindrical lock shell, a key actuated tumbler rotatable within said shell and having a keyway accessible from one end of said tumbler and a lock cam extending from the opposite end of said tumbler, whereby insertion of a key into said keyway permits rotation of said tumbler within said shell between a locked position and an unlocked position and concurrent rotation of said lock cam between a locked position and an unlocked position,

said bolt is provided with a slot capable of being positioned over said receiver aperture and of receiving said lock cam, and

wherein said receiver aperture and said lock cam have corresponding irregular shapes whereby said cam is capable of passing through said aperture only when in rotational alignment therewith and whereby said rotational alignment corresponds to the unlocked position of said tumbler mechanism, whereby said bolt is maintained in an inoperative position when said lock body is engaged.

5,465,520

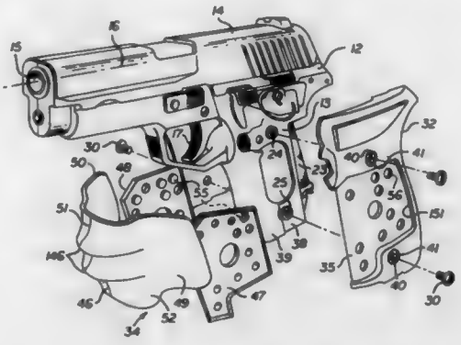
GUN GRIP

Carl J. Cupp, Hawaiian Garden, Calif., assignor to Pachmayr Ltd., Monrovia, Calif.

Filed Oct. 27, 1994, Ser. No. 330,270

Int. Cl.[6] F41C *23/10*

U.S. Cl. 42—71.02 **21 Claims**



1. A grip assembly for a gun having a downwardly projecting handle, comprising:

two body panels to be received at opposite sides of the handle;

a grip unit having two side portions to be received at outer sides of said two body panels respectively, and having a connecting portion extending between and interconnecting said side portions; and

means for securing said side portions of the grip unit to said two body panels respectively;

said body panels containing openings at locations offset from said side portions of the grip unit for receiving threaded fasteners which extend through said body panels but not through said side portions of the grip unit and which tighten said body panels against said opposite sides of the handle.

5,465,521

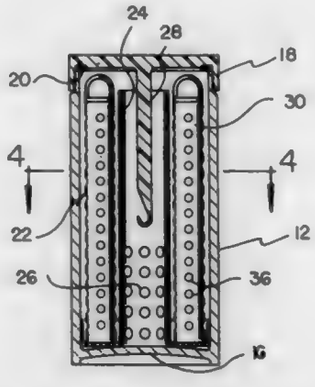
SCENTED CARTRIDGES AND CONTAINER

Jeffrey L. Baker, and Jeffrey R. Legare, both of P.O. Box 306, Athol, Mass. 01331

Filed Nov. 16, 1994, Ser. No. 340,598

Int. Cl.[6] A01M *31/00*

U.S. Cl. 43—1 **3 Claims**



1. A scented cartridges and container comprising:

a substantially cylindrical container having an open upper end;

a cap securable to said open upper end of said container to completely enclose an interior of said container, said cap having a hook depending from an interior center surface thereof; and,

a plurality of scent cartridges extending vertically within said interior of the container, wherein said hook is operable to engage an individual scent cartridge to effect manual extraction of said cartridge from said container.

5,465,522

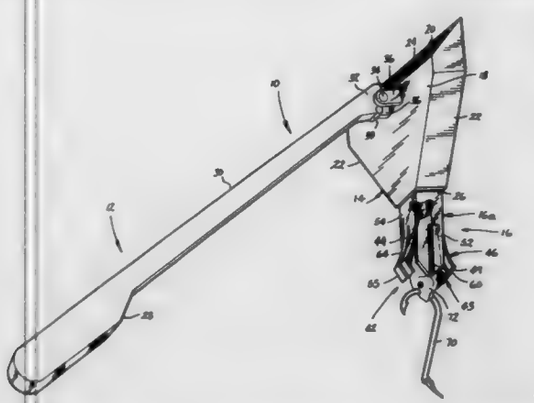
MINNOW SCOOP

Alan J. Varda, P.O. Box 2304, Kingsford, Mich. 49802

Continuation of Ser. No. 59,645, May 10, 1993, abandoned. This application Aug. 15, 1994, Ser. No. 290,214

Int. Cl.[6] A01K *97/04*

U.S. Cl. 43—4 **21 Claims**



1. A bait fish trap for use in catching bait fish in a bait container and comprising, a structurally rigid caddy body formed of axially extending walls defining a hiding place and having a flat bottom surface adapted to lie flat against a bottom of a bait container when the bait fish trap is disposed within a bait container, said caddy body having an entrance opening at one axial end through which fish can enter when the bottom surface is disposed against a bottom surface of a container and an exit opening at another axial end, and a hooking aperture body having a spring gate fitted into said exit end and defining what appears to be an exit from said hiding place, said gate comprising multiple resilient leaves for trapping and holding a bait fish exiting said caddy body, and said gate having at least one hook receiving groove for receiving a fish hook to be applied to a trapped bait fish.

5,465,523

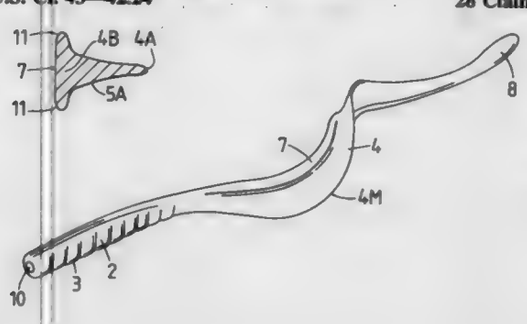
UNDULATING SINGLE TAIL FISHING LURE

Gregory C. Garst, Rte. 3, Box 478, Many, La. 71449

Filed Nov. 4, 1991, Ser. No. 787,579

Int. Cl.[6] A01K *85/00*

U.S. Cl. 43—42.24 **28 Claims**



1. A fishing lure of resilient material which, when, retrieved from a body of water successfully duplicates the natural swimming motion of an eel or a snake, and which comprises:

(a) a head portion;

(b) a mid-body portion formed in a substantially U-shaped configuration attached to said head portion such that when said fishing lure is retrieved through the body of water, said substantially U-shaped configuration imparts an undulating motion; said mid-body portion is characterized by a generally triangular cross-section with concavity on two sides while the third side forms a flat base such that a larger mass of said mid-body portion resides near said flat base; and

(c) a tail portion attached to said mid-body portion.

5,465,524

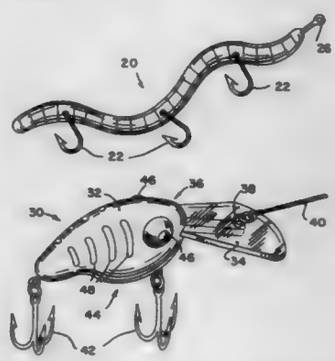
FISHING LURES HAVING LIGHT SENSITIVE COLOR CHANGE AND METHOD OF PRODUCING

Thomas R. Vallone, and Salvatore N. Vallone, both of N40 W27474 Glacier Rd., Pewaukee, Wis. 53072

Filed Feb. 14, 1995, Ser. No. 388,360

Int. Cl.[6] A01K *85/00*

U.S. Cl. 43—42.32 **14 Claims**



1. A fishing lure comprising a molded body having a photochromatic material incorporated into the molded body, the photochromatic material causing the fishing lure to reversibly change color when exposed to a light source.

3. A fishing lure comprising a rigid body having a first color and coated with a photochromatic coating capable of reversibly changing the first color of the rigid body to a second color with exposure to a light source, and in the absence of the light source, gradually changing back to the first color.

5,465,525

INTELLECTUAL WORKING ROBOT OF SELF CONTROLLING AND RUNNING

Hiroshi Mifune; Satoshi Saitoh; Teruo Kaneda, all of Tokyo; Shigetaka Tomokiyo, Matsuyama; Tsugio Adachi; Tsutomu Tanaka, both of Yamato, and Toshiharu Furudate, Niza, all of, Japan, assignors to Tomokiyo White Ant Co. Ltd., Ehime, Japan

Filed Nov. 14, 1994, Ser. No. 338,677

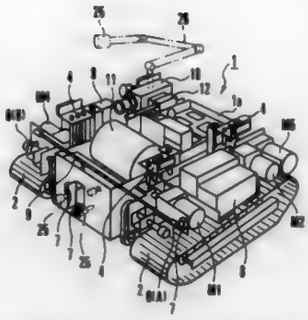
Claims priority, application Japan, Dec. 29, 1993, 5-355006

Int. Cl.[6] A01M *7/00*; **B05B** *17/00*; **E04B** *1/72*

U.S. Cl. 43—132.1 **5 Claims**

1. A robot system for spraying chemical for exterminating termite, in a place under a floor of a structure, said robot system comprising:

a moving truck including an endless track mechanism which is able to horizontally turn, a pair of rollers operatively connected to said endless track mechanism and driven by a DC geared motor, and a main body having a tank containing the chemical and a radio circuit for outputting and inputting an electrical signal thorough radio communication;



a lift mechanism operatively connected to said main body to lift said main body relative to said endless track mechanism, said lift mechanism including means for changing a distance between said moving truck main body and endless track mechanism;

a detecting mechanism including an encoder operatively connected to said rollers and arranged to detect a travel distance and a rotational angle of said moving truck;

an automatic control mechanism including an onboard computer mounted on said moving truck main body, a host computer separate from said onboard computer, and a radio modem through which said onboard computer being electrically connected to said host computer, and arranged to automatically control operations of said moving truck;

a CCD camera mounted on said truck main body to confirm the location of the objective wood section in wood structural members under the floor;

a monitoring mechanism for displaying an image of said objective wood section;

corner section detecting means for searching an approach or contact of said moving truck main body to the structural members to find a corner section of the structural member;

means for detecting a distance between said moving truck main body and said objective wood section, and including an infrared sensor; and

an automatic operation mechanism including means for memorizing a location and shape of the wood structural members after confirmation of all the wood structural members to which chemical is to be sprayed, and means for accomplishing a next time spray of chemical in accordance with a memorized data derived from a preceding time spray.

5,465,526

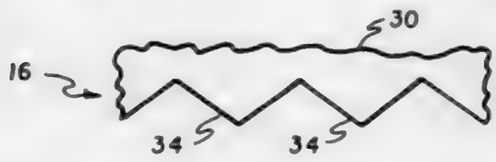
HIGH-STRENGTH LANDSCAPE RING

Bobby J. Langley, 3302 Storey Lake Dr., Tyler, Tex. 75707

Filed Sep. 23, 1994, Ser. No. 311,409

Int. Cl.[6] A01G *1/08*

U.S. Cl. 47—33 **5 Claims**



1. A high-strength landscape ring comprising:

a) a single sheet of resilient material having a first end a second end, a top, a bottom, and a reinforced upper edge at the top;

b) means for connecting said first end and said second end of said sheet of resilient material to form a cylinder, said means for connecting including,

a first support wedge having a length extending from the top of said sheet to the bottom of said sheet at the first end,

a projecting body disposed on said first support wedge and extending the entire length of said first support wedge,

a second support wedge having a length extending from the top of said sheet to the bottom of said sheet at the second end, and

a groove disposed in said second support wedge, said groove adapted to lockingly receive said projecting body, said groove extending the entire length of said second support wedge; and

c) implanting means for working said sheet of resilient material into the ground.

5,465,527

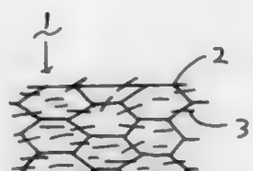
LANDSCAPING BORDER

Lyvonne Able, Columbia, S.C., assignor to Able Corporation, Columbia, S.C.

Filed Jan. 26, 1995, Ser. No. 378,632

Int. Cl.[6] A01G *1/08*

U.S. Cl. 47—33 **18 Claims**



1. A landscaping border consisting essentially of:

a tubular polyethylene mesh with a diameter of at least about 3 inches and no more than about 10 inches;

biodegradable ground cover wherein at least 80% of the total weight of said biodegradable ground cover is contained within said tubular polyethylene mesh and no more than 20% of said total weight of said biodegradable ground cover protrudes through said mesh;

a biocide.

5,465,528

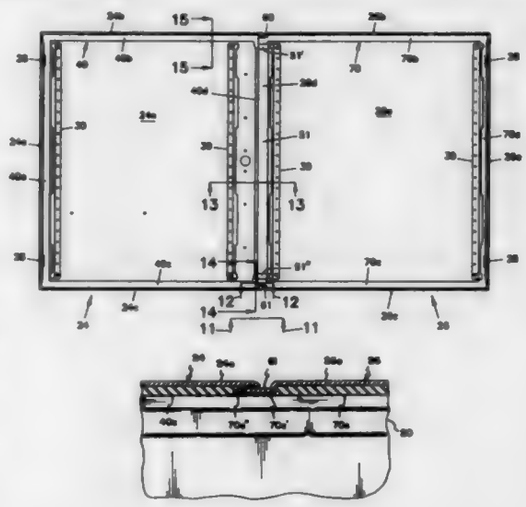
CABINET WITH OVERLAPPING DOORS

Craig E. Schinzel, Ramsey, and Robert G. Lau, Anoka, both of Minn., assignors to Federal-Hoffman, Inc., Anoka, Minn.

Filed Feb. 16, 1994, Ser. No. 197,164

Int. Cl.[6] E06B *7/16*

U.S. Cl. 49—368 **4 Claims**



1. An overlapping door for a cabinet having an outwardly protruding edge (**20**) defining a door opening, said cabinet comprising; cabinet comprising:

a first door panel (**24**) having a first hinged edge (**24***a*) pivotally secured to said cabinet on a first side thereof;

a second door panel (**26**) having a second hinged edge (**26***a*) pivotally secured to said cabinet on a second side thereof;

each of said first and second door panels (**24**, **26**) pivotable at said first and second hinged edges (**24***a*, **26***a*) for said door panels (**24**, **26**) to pivot about said hinged edges between an open position exposing said opening and a closed position covering said opening;

said first and second door panels (**24**, **26**) each having first and second spaced apart transverse edges (**24***b*, **24***c*; **25***b*, **26***c*) extending from said hinged edges (**24***a*, **26***a*) and each of said door panels (**24**, **26**) having free edges **24***d*, **26***d*) generally parallel to said hinged edges and (**24***a*, **26***a*) and joining said first and second transverse edges (**24***b*, **24***c*; **26***b*, **26***c*);

said door panel (**24**, **26**) sized for said door panels (**24**, **26**) to overlap in an overlap area at said free edges (**24***d*, **26***d*) with an interior surface of said first panel (**24**) opposing an exterior surface of said second door panel (**26**) in said overlap area;

each of said door panels (**24**, **26**) having a sealing gasket (**40**, **70**) deposited on an interior surface thereof and including a gasket (**40***b*, **40***c*; **70***b*, **70***c*) portion formed adjacent said transverse edges (**24***b*, **24***c*; **26***b*, **26** *c*), said gaskets (**40**, **70**) at said hinged edges (**24**, **26**) and said transverse edges (**24***b*, **24***c*; **26***b*, **26***c*) positioned for said gaskets to sealingly engage said outwardly protruding edge (**20**) of said cabinet when said doors (**24**, **26**) are in said closed position;

said gasket portion (**70***c*) layer on said second door panel (**26**) sized to protrude beyond said free edge (**26***d*) of said second door panel (**26**) and be in alignment with said gasket portion (**40***c*) layer of said first door panel (**24**) for said gasket portion (**70**) layer of said second door panel (**26**) to protrude beyond and engage said gasket portion (**40***c*) layer of said first second door panel (**24**) in sealing engagement upon closure of said doors (**24**, **26**);

said free edge (**26***d*) of said second door panel (**26**) including an outwardly protruding edge (**52**), said gasket (**40**) of said first door panel (**24**) including a segment (**40***d*) on an interior surface of said first panel (**24**) and extending parallel to said free edge (**24***d*) of said first door panel (**24**), said outwardly protruding edge (**52**) of said second door panel (**26**) and said gasket segment (**40***d*) of said first door panel (**24**) positioned for said outwardly protruding edge (**52**) to engage said gasket segment (**40** *d*) in sealing engagement upon closure of said doors (**24**, **26**).

5,465,529

SUPPORT STAND FOR DECORATIVE TREE

Chaan-Kyung Park, JuKong Apt. 1110-507, SunBu-Dong, AnSan-City, KyungKi-Do, Rep. of Korea

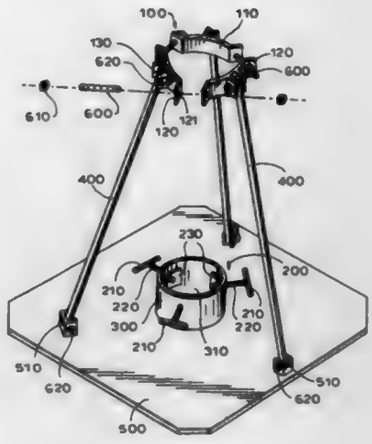
Filed Jul. 14, 1994, Ser. No. 274,864
Int. Cl.[6] A47G *7/02*
U.S. Cl. 47—40.5 **3 Claims**

1. A support stand for a decorative tree comprising:

a predetermined size of base plate, said base plate having a plurality of hinge mounts, said hinge mounts being mounted on a top surface of said base plate and spaced out at regular intervals;

a cylindrical support vessel for receiving and supporting a bottom of a tree trunk, said support vessel being medially mounted on the top surface of said base plate and opened upwardly so as to define a trunk cavity therein;

a first abutment portion including a plurality of first abutment members, each first abutment member being provided on the side wall of said support vessel and including a threaded rod threadedly penetrating the side wall of the vessel, a predetermined size of abutment collar mounted on an interior end of the threaded rod, and a rod handle mounted on an exterior end of the threaded rod, said rod handle being adapted for manual rotation of the threaded rod and for radial movement of the abutment collar with respect to its associated outer surface of the tree trunk;



a support arm portion including a plurality of support arms, each support arm being pivotally connected, at its lower end, to its associated hinge mount of the base plate; and

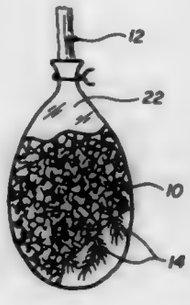
a second abutment portion including a plurality of second abutment members, each second abutment member including an abutment collar having a center extension mount, said extension mount pivotally connecting a top end of its associated support arm to each second abutment member, and said second abutment members being also connected to each other by bolts and nuts and coming into close contact with and tightly holding an upper portion of said tree trunk by tightening said bolts and nuts.

5,465,530

METHOD OF USING A PAPER PACKING PRODUCT TO STORE/SHIP PLANTS WITH EXPOSED ROOTS

Carl V. Santolemmo, Highland Heights, Ohio, assignor to Ranpak Corp., Concord, Ohio

Filed Nov. 3, 1993, Ser. No. 147,379
Int. Cl.[6] A01G *9/02*
U.S. Cl. 47—84 **11 Claims**



1. A method of packing exposed roots of a plant, said method comprising the steps of:

providing a multitude of interwined, narrow, elongated, longitudinally compressed strips of paper material, said paper strips including a plurality of transverse folds against the natural resilience of the material to form said longitudinally compressed strips;

wetting the paper strips;

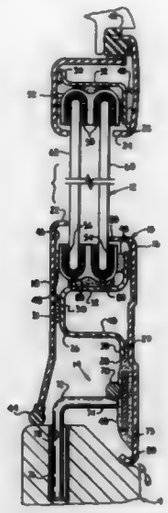
packing the paper strips around the exposed roots of said plant.

5,465,531

VEHICLE DOOR UPPER ASSEMBLY

Dennis C. Herrmeyer, Paola, Kans., assignor to Rigid Form, Inc., Paola, Kans.

Filed Nov. 1, 1993, Ser. No. 146,939
Int. Cl.[6] E06B 3/32
U.S. Cl. 49—463 19 Claims



1. A vehicle door upper assembly for removable mounting on a vehicle door lower assembly, which comprises:

(a) an outer panel including an outer panel opening;

(b) an inner panel including an inner panel opening generally aligned with said outer panel window opening;

(c) a window opening in said door upper assembly formed by said inner and outer panel opening;

(d) window means in said window opening;

(e) a panel spacer including an outer face mounting said outer panel and an inner face mounting said inner panel;

(f) upper, lower, front and rear edges;

(g) door assembly connecting means at said lower edge for removably connecting said door upper assembly to said door lower assembly and for rigidly cantilevering said door upper assembly from said door lower assembly, said door assembly connecting means including a pin comprising a separate component from said panels and said panel spacer, said pin being fixedly connected to one of said panels and depending downwardly from said lower edge, said connecting means further including a receiver formed in said vehicle door lower assembly and selectively receiving said pin;

(h) said window means including a track having outer and inner channels being mounted on said panel spacer; and

(i) said window means further including outer and inner windowpanes each slidably received in a respective track channel.

5,465,532

LOWER EDGE DOOR SEAL

Robert Varin, P.O. Box 418232, Sacramento, Calif. 95841-8232

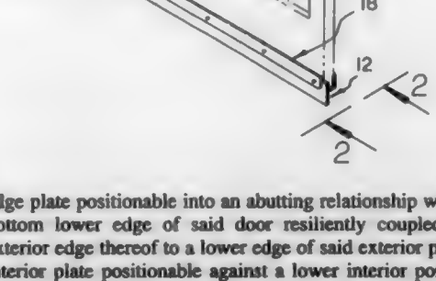
Filed Sep. 8, 1994, Ser. No. 302,218
Int. Cl.[6] E06B 7/16
U.S. Cl. 49—493.1 7 Claims

1. A lower edge door seal comprising:

a flexible seal means for sealing both a space between a lower edge of a door and an underlying ground surface, and a space between a lateral edge of said door and adjacent lateral structure; and,

a mounting means for securing said flexible seal means to a bottom lower edge of said door,

wherein said mounting means comprises an exterior plate positionable against a lower exterior portion of said door; a lower



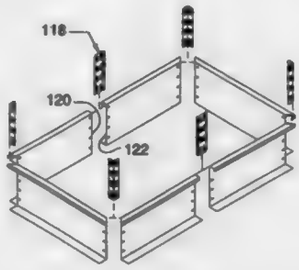
edge plate positionable into an abutting relationship with said bottom lower edge of said door resiliently coupled at an exterior edge thereof to a lower edge of said exterior plate; an interior plate positionable against a lower interior portion of said door resiliently coupled at a lower edge thereof to an interior edge of said lower edge plate; a securing plate coupled to an upper edge of said interior plate and extending substantially parallel to and coextensive with said interior plate, wherein said mounting means can receive said lower edge of said door between said exterior plate and said interior plate to position said lower edge plate into an abutting relationship with said bottom lower edge of said door, with said flexible seal means being received between said interior plate and said securing plate.

5,465,533

MODULAR ROOF CURB ASSEMBLY CONSTRUCTION AND INTERLOCKING JOINT MEANS THEREFOR

Richard J. Rummo, Jr., 31 S. Hampton Rd., Amesbury, Mass. 01913; Stephen M. Petro, 19 Midlake St., Haverhill, Mass. 01830, and John S. Desmond, 123 Farmers Cliff Rd., Concord, Mass. 01742

Filed Oct. 7, 1993, Ser. No. 132,833
Int. Cl.[6] F16M 3/00
U.S. Cl. 52—60 20 Claims



1. An assembly comprising at least two members joined together, each of the members being defined by a planar surface and a linear edge, at least one of a first fastening member being provided on each one of the members joined together, each said at least one of a first fastening member comprising a keeper defined by an inner surface and an outer surface extending outwardly from each of the planar surfaces of said two members joined together and in perpendicular disposition thereto, the inner surface of each said keeper being spaced-apart from the planar surface of the respective member joined together, said at least one first fastening member being located in a predetermined location on each one of the two members joined together, an opening being defined in each of the first fastening members by the space between the inner surface of the keeper and the planar surface of each said member joined together, the linear edge of one said two members joined together being in abutting engagement with the linear edge of the other of the two members joined together and the at least one first fastening member on each of the two members joined together

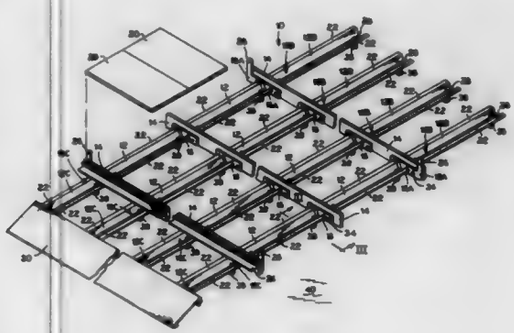
each being on the same side of each of the two members joined together, a second fastening member complementary to each said first fastening member being provided for each of said at least one first fastening members, each said second fastening member being defined by a least one planar surface, said second fastening member being defined by an opening provided in and extending through each said second fastening member, each said opening being defined by a peripheral edge and being so located on the second fastening member and of such a size as to surround the said at least one first fastening member provided on each of the two members joined together when such are in operative engagement with one another, an elongated member being provided in the opening in each of the second fastening members and extending inwardly from said peripheral edge thereof, each said elongated member extending through the opening provided by the at least one first fastening member when the said at least one planar face of the second fastening member is in surface-to-surface contact with the planar surface of each of the two members joined together whereby the two members are joined together.

5,465,534

FLOORING SUBSTRUCTURE

Douglas Mittag, Bollingbrook, Ill., assignor to Equipto, Aurora, Ill.

Filed May 26, 1994, Ser. No. 249,936
Int. Cl.[6] E04F *15/024*
U.S. Cl. 52—126.6 **20 Claims**



7. A flooring substructure comprising:

a plurality of elongated tracks arranged parallel to one another;

a plurality of brackets, each bracket having an end plate securable against one of said tracks;

a plurality of elongated channel members secured to said brackets so that said channel members are arranged perpendicularly to said tracks, said channel members configured for supporting floor panels;

a plurality of floor panels supported by said channel members;

a plurality of adjustable leveling screws threaded into said brackets so that said screws rest on a generally planar subfloor to hold said channel members horizontally above said subfloor; and

an anchor rail securable between one of said tracks and adjacent said brackets; said rail comprising:

a horizontal upper projection which is directed away from said track and configured to be substantially flush with an adjacent floor panel, but separated with said floor panel by a gap; and

a horizontal lower projection configured to be disposed over said adjacent brackets;

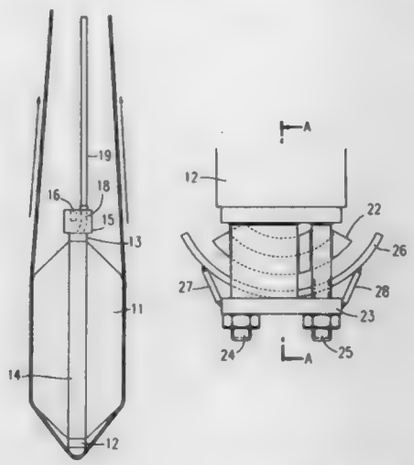
wherein a cavity is defined between said upper projection and said lower projection such that a ledge member is engageable with said anchor rail for anchoring an object to said rail.

5,465,535

METHOD OF INSTALLING A SOIL ANCHOR AND A SOIL ANCHOR

Bo T. Skogberg, Haninge, Sweden, assignor to Soilex AB, Stockholm, Sweden

Filed Dec. 30, 1993, Ser. No. 176,167
Claims priority, application Sweden, Jul. 1, 1991, 9102054
Int. Cl.[6] E02D *5/74;5/54*
U.S. Cl. 52—156 **18 Claims**



1. A soil anchor for anchoring a structure into soil, said soil anchor comprising:

an expandable anchor body configured for expanding and pressing against soil to wedge said soil anchor into soil;

a front end;

said front end comprising means for piercing and parting soil to permit said expandable anchor body to be driven into soil;

means for transmitting force from a location remote from said expandable anchor body to said expandable anchor body to drive said means for piercing and parting soil into soil;

said means for piercing and parting soil being connected to said expandable body to transport said expandable body into the soil;

means for transporting hardenable material from a location remote from said soil anchor into said expandable anchor body to expand said expandable anchor body and wedge said expandable anchor body into soil; and

means for leading at least one cable, said means for leading being disposed at said front end, said means for leading at least one cable being configured for substantially preventing contact between at least one cable and the hardenable material while said hardenable material is hardening or hardened, and for permitting movement of at least one cable adjacent said expandable anchor body while said hardenable material is hardening or hardened.

5,465,536

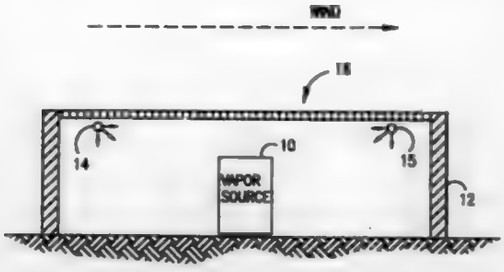
CONTAINMENT OF HEAVY VAPOR CLOUDS AND AEROSOLS

John S. Buchanan, Hamilton; Frederick J. Krambeck, Cherry Hill, and Klaus W. Schatz, lawrenceville, all of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 133,402, Oct. 8, 1993, Pat. No. 5,362,446, which is a continuation-in-part of Ser. No. 950,354, Sep. 24, 1992, Pat. No. 5,286,456. This application Jan. 27, 1994, Ser. No. 187,936
Int. Cl.[6] E04H *5/02*
U.S. Cl. 52—198 **20 Claims**

1. A system for containment of heavy vapor cloud and aerosol from a potential source of hazardous vapor comprising:

a potential hazardous vapor source; walled surfaces surrounding said vapor source;



a roof above said vapor source and forming with said walled surfaces an enclosure for said vapor source, said roof being porous with openings therethrough extending over at least about 20% of the surface area of said roof to provide access for ambient light, air and precipitation, said openings being dimensioned for minimizing wind shear and resultant wind shear eddies within said enclosure by interrupting transmission of momentum from ambient air to air within said enclosure, and

means within said enclosure for absorbing said vapor;

whereby said roof increases residence time of said vapor with said absorbing means.

5,465,537

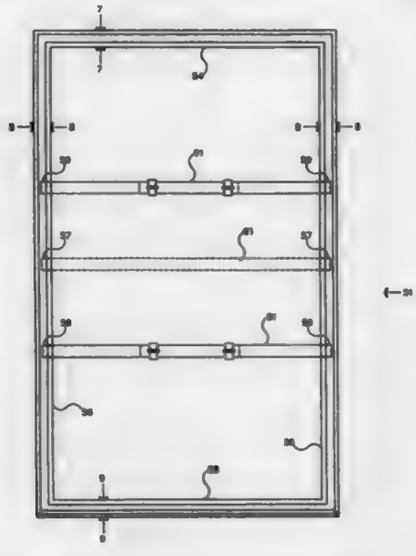
STORM SHUTTER WINDOW FRAME SYSTEM

James Fullwood, Tequesta, Fla., assignor to Duraframe Window Shutter Systems, Inc., West Palm Beach, Fla.

Continuation of Ser. No. 148,792, Oct. 29, 1993, abandoned. This application Oct. 24, 1994, Ser. No. 328,197

Int. Cl.[6] **F06B** *3/26*

U.S. Cl. 52—202 **17 Claims**



1. A portal frame structure for insert therein of a window frame and a shutter comprising:

(a) a pair of one-piece longitudinally displaced and aligned portal jamb frames, each of said portal jamb frames having a plurality of portal jamb frame sections formed each to the other in a vertically directed side by side relation including a first cross-sectionally formed U-shaped jamb frame section, a second cross-sectionally formed U-shaped jamb frame section for mounting of said window frame and having a second jamb frame section leg member in commonality with said first jamb frame section, a third cross-sectionally formed U-shaped jamb frame section having a third jamb frame section leg member and a fourth jamb frame section leg member, said third jamb frame section leg member in commonality with said second jamb frame section, a fourth cross-sectionally formed L-shaped jamb frame extending substantially perpendicular to said fourth jamb frame section leg member for receipt therein of said shutter;

(b) a longitudinally extending one-piece portal head frame having a plurality of portal head frame sections formed each to the other in a longitudinally directed side-by-side relation including a first cross-sectionally formed U-shaped head frame section, a second cross-sectionally formed U-shaped head frame section for receipt of said window frame and having a second head frame section leg member in commonality with said first head frame section, said second cross-sectionally formed U-shaped head section mounted in aligned relation with said pair of said second cross-sectionally formed U-shaped jamb frame sections for securement of said window frame thereto, a third cross-sectionally formed H-shaped head frame section having a third head frame section leg member in commonality with said second head frame section, a fourth cross-sectionally formed U-shaped head frame section having a fourth head frame section leg member in commonality with said third head frame section, said fourth head frame section forming a guide channel for insert of said shutter therein; and,

(c) a longitudinally extending one-piece portal sill frame having a plurality of portal sill frame sections formed each to the other in said longitudinally directed side-by-side relation including a first cross-sectionally formed U-shaped sill frame section, a second cross-sectionally formed U-shaped sill frame section, said second cross-sectionally formed U-shaped sill frame section mounted in aligned relation with said pair of said second cross-sectionally formed U-shaped jamb frame sections and said second cross-sectionally formed U-shaped head frame section for receipt of said window frame and having a second sill frame section leg member in commonality with said first sill frame section, a third cross-sectionally formed U-shaped sill frame section having a third sill frame section leg member in commonality with said second sill frame section, a fourth cross-sectionally formed H-shaped sill frame section having a fourth sill frame section leg member in commonality with said sill third section forming a sill shutter channel in vertical alignment with said fourth cross-sectionally formed U-shaped bead frame section for insert therein of said shutter.

5,465,538

PREFABRICATED LINTEL

John Powers, Jr., 4118 E. Elwood St., Phoenix, Ariz. 85040

Filed Sep. 7, 1993, Ser. No. 116,618

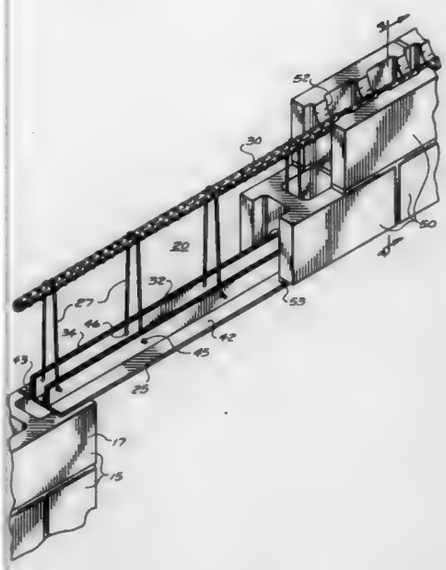
Int. Cl.[6] **E04C** *5/12;5/18*

U.S. Cl. 52—204.2 **13 Claims**

1. A prefabricated lintel comprising:

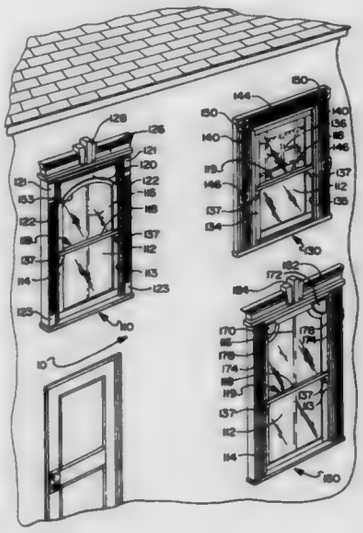
an elongated lintel with a predetermined length and at least one upstanding leg affixed thereto and extending substantially along the entire length of the lintel, said at least one upstanding leg having holes defined therethrough and spaced therealong, the lintel further having a substantially flat lower surface and an upper surface defining substantially flat, horizontal shoulders positioned on either side of said at least one upstanding leg and extending substantially the length of the lintel; and

a plurality of stirrups, each stirrup of the plurality of stirrups having a rebar receiving opening therethrough and a portion engageable in each of the holes defined in said at least one upstanding leg of the lintel, said stirrups are formed of wire with a first bend designed to engage one of said holes in said at least one upstanding leg and a second bend forming said rebar receiving opening.



5,465,539
WINDOW ASSEMBLY WITH PLANT-ON
Gary T. Rose, 38079 Klarr Dr., Northville, Mich. 48167
Filed Nov. 4, 1992, Ser. No. 971,726
Int. Cl.[6] F06B *1/04*
U.S. Cl. 52—204.53 22 Claims

1. A window for simulating at least one of a plurality of



architectures comprising:

one sash having a sash frame supporting an interior glazing and an exterior glazing in sealing engagement with a spacer frame defining an insulating chamber between the interior and exterior glazings;

a window frame dimensioned to receive said sash in a single plane position within said window frame;

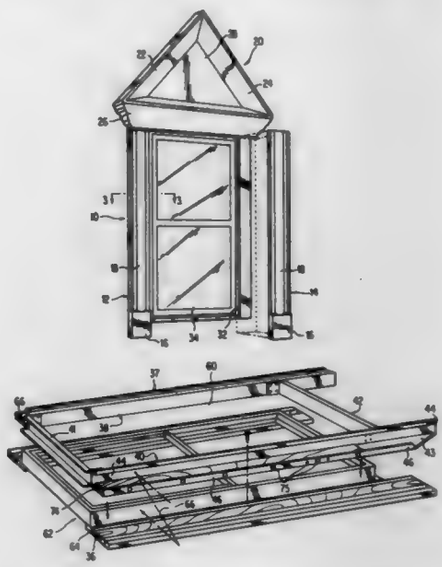
a casement window assembly for attaching the sash to the window framed the casement window assembly for moving the sash with respect to the window frame between an open position and a closed position;

at least one plant-on adjacent to one of said sash and said window frame, said plant-on having a matching dimension corresponding to a contiguous dimension of the one of said sash and said window frame; wherein a first of said at least one plant-on comprises a check rail member to simulate a double-hung window construction; and

alignment indicia positioning said matching dimension of said plant-on adjacent to said contiguous dimension of the one of said at least one sash and said window frame.

5,465,540
FACADE STRUCTURE FOR WINDOWS
Christian P. Biernazki, White Hall, Md., assignor to Fypon Inc., Stewartstown, Pa.
Filed Dec. 28, 1993, Ser. No. 174,521
Int. Cl.[6] E06B *1/04*
U.S. Cl. 52—211 4 Claims

1. A facade for a window, said facade comprising:



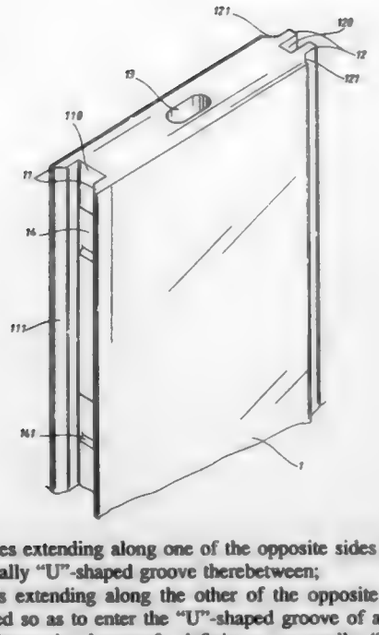
a pair of vertical side trim members and a pediment member having front and rear sides, all of said members having rear faces, said members being of foamed plastic material molded around and embedding wooden boards;

a skeleton frame including a pair of side members, each of said side members having first and second walls disposed at right angles to each other, each of said walls having a front and rear face, a pair of cross members connected to the first walls of said side members at longitudinally spaced positions to define with said first walls an opening for the reception of a window frame, said front faces of said second walls engaging the exposed rear faces of said embedded wooden boards, and fasteners extending through said second walls into said embedded boards for securing said side trim and pediment members to said skeleton frame.

5,465,541
BUILDING CONSTRUCTION OF LONGITUDINAL AND CROSS HOLLOW COMPONENTS
Yi-Chung Lin, No. 35-3, Lane 301, Fu Mei Rd., and Wen-Tien Wu, No. 6, Lane 534, Lien Cheng Rd., both of Chungho City, Taiwan, Prov. of China
Filed Mar. 9, 1994, Ser. No. 207,696
Int. Cl.[6] E04F *17/08*
U.S. Cl. 52—220.2 4 Claims

1. A building unit having opposite sides and opposite ends extending between the opposite sides and comprising;

a) at least one hollow longitudinal path extending between the opposite ends and located between the opposite sides;



b) joggles extending along one of the opposite sides defining a generally "U"-shaped groove therebetween;

c) scarfs extending along the other of the opposite sides and located so as to enter the "U"-shaped groove of an adjacent building unit, the scarfs defining a generally "U"-shaped concavity extending along the other of the opposite sides;

d) a plurality of first wiring holes extending between and communicating with the generally "U"-shaped groove and the at least one hollow longitudinal path; and,

e) a plurality of second wiring holes extending between and communicating with the generally "U"-shaped concavity and the at least one hollow longitudinal path, the plurality of second wiring holes extending generally parallel to the plurality of first wiring holes, but displaced toward one of the opposite ends so as to be out of alignment with the plurality of first wiring holes, so as to form wiring paths through the building unit extending obliquely to the opposite sides.

5,465,542

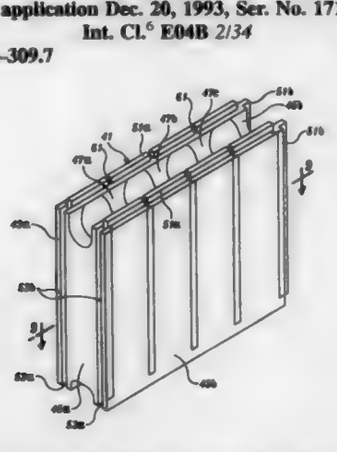
INTERBLOCKING CONCRETE FORM MODULES

Verl O. Terry, 2647 Scenic Dr., Idaho Falls, Id. 83406

Continuation of Ser. No. 891,558, May 29, 1992, abandoned. This application Dec. 20, 1993, Ser. No. 171,242

Int. Cl.[6] E04B *2/34*

U.S. Cl. 52—309.7 **15 Claims**



1. An interlocking concrete form module comprising:

a pair of side walls, each of said side walls being substantially entirely formed of a nonmetallic material and including interlocking means located along the edges of said side walls;

a plurality of webs integral with, extending between and connecting said side walls, said webs formed substantially entirely of the same nonmetallic material as said side walls; and

nonmetallic means for receiving and retaining threaded screw anchors, said nonmetallic means comprising a plurality of nonmetallic strips embedded in said side walls.

5,465,543

IMITATION WEATHERBOARD

Bernhard U. Seifert, East Kew, Australia, assignor to Tanner Bond Pty. Ltd., Mitcham, Australia

Continuation of Ser. No. 140,163, Dec. 23, 1993, abandoned. This application May 22, 1995, Ser. No. 445,582

Int. Cl.[6] E04C *1/00*

U.S. Cl. 52—309.8 **10 Claims**

1. An imitation weatherboarding assembly comprising the combination of

a preformed backing sheet and a plurality of imitation weatherboarding elements, said backing sheet having

a front surface shaped to conform to a rear surface of at least two said elements when said elements are mounted against said backing sheet and having a significant portion of said rear surface of said elements in contact with a said front surface of said backing sheet, said front surface including indentations simulating lower edges of overlapped weatherboards,

said backing sheet having means in said front surface thereof defining an edge-receiving recess extending inwardly from one of said indentations,

each of said at least two elements having an upper edge with a substantially planar edge portion and an adjacent reflexed portion forming a hook, and

a lower edge with a returned portion shaped and dimensioned to engage said hook on said upper edge of an adjacent element,

said planar edge portion of at least one of said elements engaging said edge-receiving recess in said backing sheet.

5,465,544

DECORATIVE FACINGS FOR BRICKS, CINDERBLOCKS AND THE LIKE

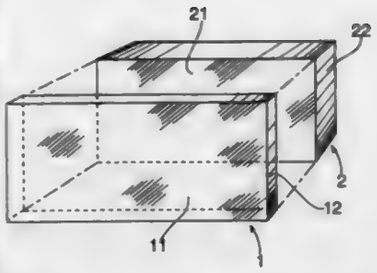
Akbar Ghahary, Ringwood, N.J., assignor to Safas Corporation, Clifton, N.J.

Filed Mar. 23, 1993, Ser. No. 35,720

Int. Cl.[6] E04F *13/00;* **B44D** *5/00*

U.S. Cl. 52—311.1 **3 Claims**

1. A decorative facing for use on a block, which comprises a sheet of material having dimensions marginally larger than the face of the block to be covered and a lip which extends beyond the edges of the sheet of material, the lip being formed so as to cover the portion of the block adjacent the face said facing comprising a composite of an acrylic resin containing from 2% to 50% of a



particulate filler in a 14 to 100 U.S. mesh size and obtained by separate compression molding.

5,465,545

WALL STRUCTURE FABRICATING SYSTEM AND PREFABRICATED FORM FOR USE THEREIN

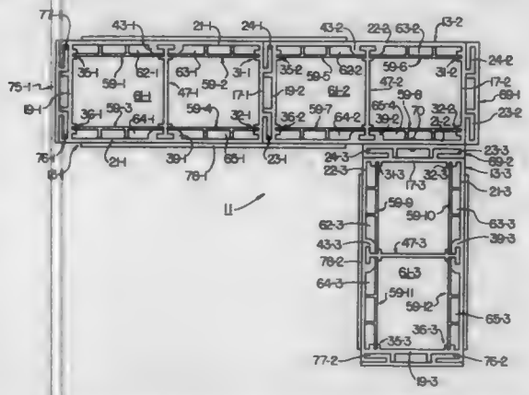
Jan P. V. Trousilek, 468 Purgatory Rd., Middletown, R.I. 02842

Continuation-in-part of Ser. No. 908,286, Jul. 2, 1992, Pat. No. 5,311,718. This application Jan. 12, 1994, Ser. No. 180,868

The portion of the term of this patent subsequent to May 17, 2011, has been disclaimed.

Int. Cl.[6] E04B *2/00*

U.S. Cl. 52—425 **20 Claims**



1. A prefabricated form for use in fabricating a wall structure, said prefabricated form comprising an elongated hollow member shaped to include a left end panel, a right end panel, and a pair of side panels, said left end panel and said right end panel being interconnectable in an end-to-end fashion, said left end panel and said right end panel each having a hole formed therein so that, when a pair of said prefabricated forms are interconnected in an end-to-end fashion by interconnecting the left end panel of one of said forms with the right end panel of the other of said forms and concrete is poured into at least one of said prefabricated forms, a monolithic concrete structure may be formed between the pair of adjacent prefabricated forms.

5,465,546

PORTABLE DANCE FLOOR

Dale C. Buse, 12880 Erin Dr., Auburn, Calif. 95603

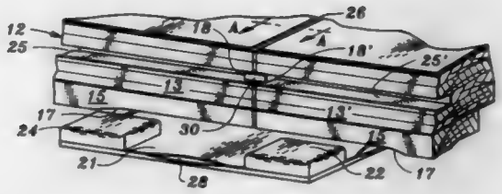
Filed May 4, 1994, Ser. No. 238,755

Int. Cl.[6] E04F *15/024*

U.S. Cl. 52—480 **16 Claims**

10. An improved portable dance floor apparatus comprising a plurality of interconnected and interlocked rectangular dance sections, each of which dance sections comprises:

a. a dance substrate having a dance surface and an underside and having a plurality of build-up strips on its underside around the periphery thereof, each of which build-up strips comprises an elongated generally rectangular portion having a bottom cutout section at each terminus and wherein each dance substrate has an inwardly directed half slot along the width's thickness;



b. a main connector plate disposed beneath at least two adjacent dance sections, each of which main connector plates has a base and four upstanding spaced blocks disposed one in each corner upon said base,

c. a spline disposed within the slot formed of two opposed half slots;

whereby when positioned beneath said dance sections, each of the spaced blocks fit behind two normally disposed build-up strips such that movement of any one dance section is impeded by any one block of said main connector plate and by the presence of an adjacent dance section wherein a V-groove is formed between any two adjacent dance sections at the dance surface along one dimension thereof and further including a reinforcing strip of an elevation equal to the build-up strips, disposed along the length on the underside of the dance substrate.

5,465,547

LIGHTWEIGHT CEMENTITIOUS ROOFING

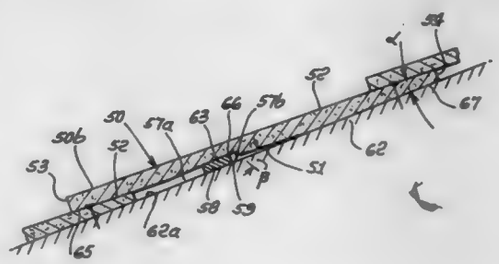
Karl W. Jakel, 3924 Park Pl., #4, Montrose, Calif. 91120

Continuation-in-part of Ser. No. 876,382, Apr. 30, 1992, Pat. No. 5,323,581. This application Jul. 20, 1993, Ser. No. 82,547

The portion of the term of this patent subsequent to May 18, 2010, has been disclaimed.

Int. Cl.[6] E04D *1/22;* **C04B** *24/00*

U.S. Cl. 52—518 **6 Claims**



1. A roofing tile or shingle having:

a) an elongated body with top and bottom surfaces which taper lengthwise of the body, said body having laterally spaced, elongated edges,

b) said body having a composition that consists essentially of the components:

i) expanded perlite in particulate form,

ii) an ingredient or ingredients selected from the group consisting of pumice and expanded shale, said ingredient or ingredients being in particulate form, and

iii) Portland cement in particulate form, said composition having been hydrated and cured,

c) said components being present in relative weight amounts:

=0.8 to 1.2 part of said ingredient or ingredients

=about 1 part of said Portland cement

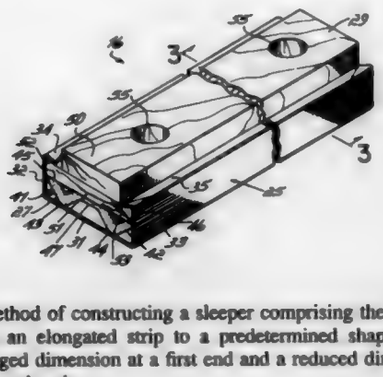
0.3 to 0.4 part of said expanded perlite.

5,465,548

PREFABRICATED SLEEPER FOR ANCHORED AND RESILIENT HARDWOOD FLOOR SYSTEM

Michael W. Niese, Cincinnati, Ohio, assignor to Robbins, Inc., Cincinnati, Ohio

Division of Ser. No. 213,947, Mar. 16, 1994, Pat. No. 5,377,471. This application Dec. 30, 1994, Ser. No. 366,685
Int. Cl.[6] E04B *1/00*
U.S. Cl. 52—741.1 **8 Claims**



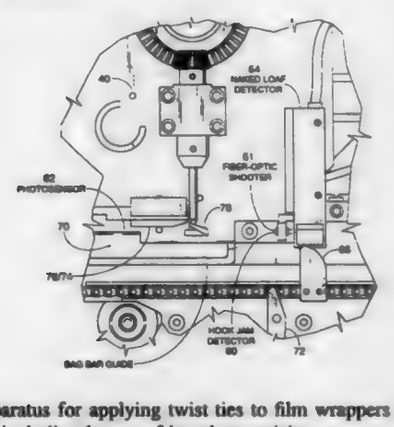
1. A method of constructing a sleeper comprising the steps of:
milling an elongated strip to a predetermined shape with an enlarged dimension at a first end and a reduced dimension at a second end;
drilling at least one access hole through the strip from the first end to the second end;
securing at least one pad to the first end of the strip at a location removed laterally from the access hole; and
locating a casing member adjacent to the secured pad and forming the member around the pad and the strip toward the second end, thereby to form a prefabricated sleeper with a channel which partially encloses the strip and the pads, but leaves the second end of the strip protruding outwardly therefrom.

5,465,549

APPARATUS FOR APPLYING TWIST TIES

Charles L. Lummus, Plano, Tex., assignor to Lummus Investment Corporation, Plano, Tex.

Continuation-in-part of Ser. No. 129,603, Sep. 30, 1993, abandoned. This application Oct. 12, 1993, Ser. No. 135,688
Int. Cl.[6] B65B *51/08*
U.S. Cl. 53—138.8 **4 Claims**



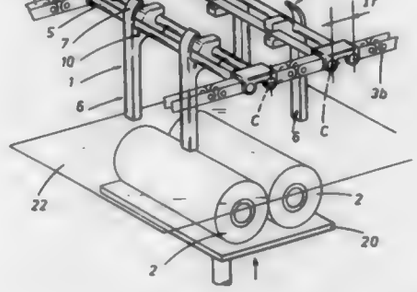
1. Apparatus for applying twist ties to film wrappers of bakery products including loaves of bread comprising:
means for sequentially receiving an open end of the film wrappers having bakery products contained therein and wherein each film wrapper has a trailing edge;
means for detecting the trailing edge of each film wrapper as the wrapper enters the apparatus;
means for severing a leading end of a length of ribbon to form a twist tie;
means for wrapping the ribbon around the open end of the film wrapper, thereby closing same and wherein the means for wrapping ribbon includes a twister hook;
naked loaf detection means for detecting an unwrapped bakery product;
hook jam detection means for detecting any debris left on the wrapping means;
programmable logic controller means responsive to the trailing edge detection means for initiating operation of the apparatus and for terminating operation of the apparatus in response to the detection of either an unwrapped bakery product or a hook jam.

5,465,550

QUICK-RELEASE CONVEYING ARM IN MACHINES FOR ASSEMBLING AND WRAPPING PACKS OF ROLLS

Davide Dall'Omo, Bologna, Italy, assignor to Wrapmatic S.p.A., Bologna, Italy

Filed Jul. 14, 1994, Ser. No. 274,778
Int. Cl.[6] B65B *11/00;35/44;49/14*
U.S. Cl. 53—233 **5 Claims**



1. A quick-release conveying arm in a machine for assembling and wrapping products in multiple packs comprising successive pluralities of arms by which the products are advanced along a predetermined feed direction, the arms of each such plurality serving to establish a plane disposed transversely to the feed direction and supported by a pair of horizontal rails spaced apart at a fixed distance between centers and extending transversely to the feed direction, suspended between looped conveying means in such a way that the arms can be advanced with the products through a succession of stations along the feed direction during the course of which the assembled products are wrapped, each arm stably associated with and singly adjustable for position on the relative pair of rails, wherein each arm comprises a first active lower portion engaging in contact with the products, also a supporting upper portion permanently associated with the first portion and embodied with two slots occupying the full width of the arm as measured transversely to the feed direction and serving to accommodate the pair of rails, of which a first slot is located in and accessible from the side of the upper portion facing the products

and provides a slidable means of supporting the arm, whilst the remaining slot is located in the rear part of the upper portion; each arm further comprising means serving to afford enhanced elastic deformability, incorporated into the upper portion and acting on the slots at least in a direction parallel to the feed direction, in such a manner as will allow the arm to be secured stably to and released from the relative pair of rails for the purposes of repositioning.

5,465,551

METHOD FOR WRAPPING AN ITEM WITH A SHEET OF MATERIAL FROM A PAD OF SHEETS OF MATERIAL

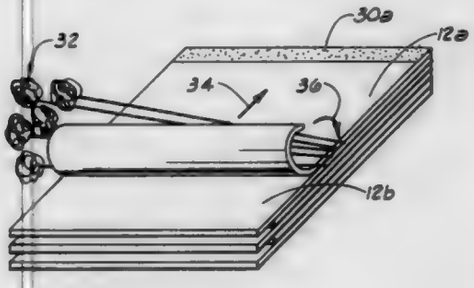
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 968,798, Oct. 30, 1992, Pat. No. 5,369,934, and a continuation-in-part of Ser. No. 965,585, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 968,798is a continuation of Ser. No. 865,563, Apr. 9, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application May 7, 1993, Ser. No. 58,591

The portion of the term of this patent subsequent to Jun. 26, 2010, has been disclaimed.

Int. Cl.[6] B65B *51/02;61/06*

U.S. Cl. 53—397 24 Claims



1. A method for wrapping an item comprising:

providing a pad comprising a plurality of sheets of material having a top sheet of material with the other sheets of material being disposed under the top sheet of material, the sheets of material being stacked one on top of the other whereby some of the sheets of material comprise even numbered sheets of material and the remaining sheets of material comprise odd numbered sheets of material, most of the odd numbered sheets of material being disposed between a pair of the even numbered sheets of material, a portion of each of the odd numbered sheets of material extending a distance beyond the even numbered sheets of material disposed on top thereof to facilitate the removal of the top sheet of material from the pad;

providing a floral grouping having a bloom end and a stem end, the floral grouping comprising the item; and

wrapping at least one of the sheets of material about the floral grouping.

5,465,552

METHOD FOR APPLYING A BAND ABOUT A SHEET OF MATERIAL AND A POT

Donald E. Weder, Highland; William F. Straeter, Breese, and Joseph G. Straeter, Highland, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.

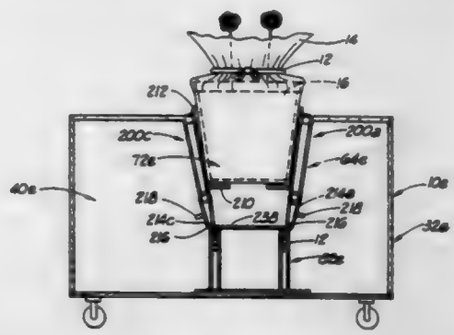
Continuation of Ser. No. 934,832, Aug. 24, 1992, Pat. No. 5,426,914, which is a continuation-in-part of Ser. No. 819,311, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned, said Ser. No. 934,832is a continuation-in-part of Ser. No. 832,096, Feb. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 765,416, Feb. 6, 0. This application Jan. 3, 1994, Ser. No. 176,931

The portion of the term of this patent subsequent to Apr. 21, 2009, has been disclaimed.

Int. Cl.[6] B65B *25/02;49/00;51/04*

U.S. Cl. 53—399 6 Claims

1. A method for placing a band about a sheet of material for



cooperating to hold the sheet of material in position extending about at least a portion of an outer peripheral surface of a pot means, the pot means having an upper end and a lower end, comprising:

providing a pot frame with a pot receiving space;

providing means for providing a plurality of bands;

placing the pot means with the sheet of material disposed about at least a portion of the pot means in the pot receiving space of the pot frame; and

removing at least one of the bands from the means for providing a plurality of bands and positioning the band about the sheet of material for cooperating to hold the sheet of material positioned about at least the portion of the outer peripheral surface of the pot means to provide a decorative cover, wherein the step of placing the pot means with the sheet of material disposed thereabout in the pot frame is defined further as comprising:

positioning automatically the sheet of material generally over the pot frame;

positioning automatically the pot means over the sheet of material;

moving automatically the pot means and the sheet of material into the pot receiving space of the pot frame; and

wherein, after the step of positioning the band about the sheet of material, the method further comprises:

removing automatically the pot means with the band disposed about the sheet of material from the pot receiving space of the pot frame.

5,465,553

METHOD FOR APPLYING A BAND ABOUT A SHEET OF MATERIAL AND A POT

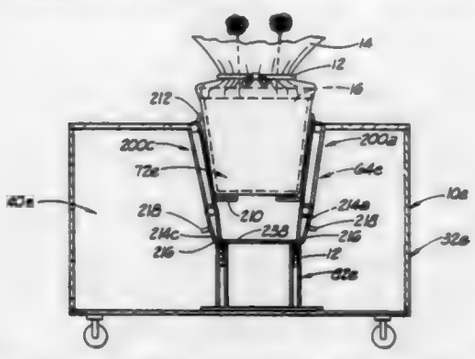
Donald E. Weder, Highland; William F. Straeter, Breese, and Joseph G. Straeter, Highland, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 934,832, Aug. 24, 1992, Pat. No. 5,426,914, which is a continuation-in-part of Ser. No. 819,311, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned, said Ser. No. 934,832is a continuation-in-part of Ser. No. 832,096, Feb. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 765,416, Feb. 6, 0, which is a continuation of Ser. No. 530,491, Feb. 6, 0, which is a continuation of Ser. No. 315,169, Feb. 6, 0. This application Feb. 25, 1994, Ser. No. 202,313

Int. Cl.[6] B65B *11/54;25/02;49/00;51/04*

U.S. Cl. 53—399 16 Claims

1. A method for placing a band about a sheet of material for



cooperating to hold the sheet of material in position extending about at least a portion of an outer peripheral surface of a pot means for containing a floral grouping, comprising:

providing the pot means;

positioning the sheet of material about the pot means so that the sheet of material provides a decorative covering for at least a portion of the outer peripheral surface of the pot means;

providing a band holder having a first end and a second end, the band holder configured to hold a plurality of bands;

placing the pot means with the sheet of material disposed about at least a portion of the outer peripheral surface of the pot means near the first end of the band holder; and

removing at least one of the bands from the band holder and positioning the band about the sheet of material for cooperating to hold the sheet of material positioned about at least the portion of the outer peripheral surface of the pot means, and wherein the step of placing the band about the sheet of material is defined further as automatically removing the band from the second end of the band holder and automatically moving the band about the outer peripheral surface of the pot means for automatically positioning the band about the sheet of material.

5,465,554

PACKAGE, AND METHOD FOR PACKAGING LOOSE LEAF MATERIAL

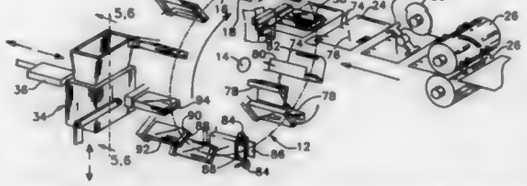
Robert T. Lewis, and Byron L. Lowe, both of Macon, Ga., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 48,987, Apr. 16, 1993, Pat. No. 5,425,215. This application Oct. 12, 1994, Ser. No. 322,063

Int. Cl.[6] B65B *11/58;63/02*

U.S. Cl. 53—438 15 Claims

1. A method of packaging loose leaf material comprising the steps of:



rotating an arbor wheel having an arbor mounted on the circumferential edge of said wheel;

feeding a sheet of innerwrap material to said arbor wheel;

wrapping said innerwrap sheet around said arbor such that said innerwrap sheet extends beyond the top end of said arbor, said top end of said arbor being the end furthest from said arbor wheel;

folding said innerwrap sheet over said top end of said arbor thereby forming a closed end package open at the opposite end of said arbor, said open end being the bottom end of said arbor;

feeding a sheet of outerwrap material to said arbor wheel;

wrapping said outerwrap sheet over said innerwrap sheet and around said arbor such that said outerwrap sheet extends beyond both ends of said arbor;

folding said outerwrap sheet over said top end of said arbor to form a dual wrapped package around said arbor, said package closed at said top end of said arbor and open at said bottom end of said arbor;

compressing loose leaf material in a compression hopper to form a plug, said compression hopper having a dimension slightly less than the dimension of said arbor;

plunging said plug from said compression hopper into said open bottom end of said arbor;

timing said compressing and plunging of said plug with said rotating of said arbor wheel such that said arbor wheel stops momentarily for said plug to be inserted into said arbor and such that said arbor wheel continues to turn only after plunging of said plug into said arbor;

removing said dual wrapped package containing said plug from said arbor and placing said package onto a conveyor system; and,

folding said outerwrap sheet at said open bottom end of said package to form a package closed at both ends.

5,465,555

APPARATUS FOR PACKAGING GRANULAR MATERIAL

Gaylard M. Morgan, Saxton, Pa.; Anthony Malczanek, New York, N.Y., and Peter J. Gould, Greenwich, Conn., assignors to Copack International Inc., Carlstadt, N.J.

Filed Sep. 27, 1994, Ser. No. 313,747

Int. Cl.[6] B65B *9/02*

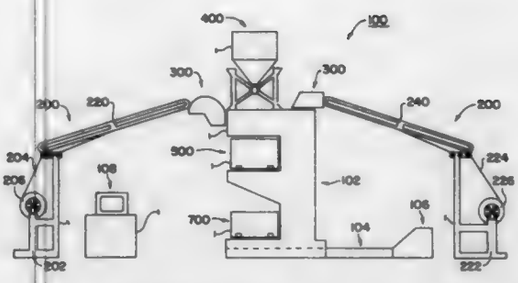
U.S. Cl. 53—451 42 Claims

1. An apparatus for packaging granular materials, said apparatus comprising:

a frame adapted to support assemblies for the sequential packaging of granular materials in the vertical direction;

a plurality of positively driven packaging material payout means, each said positively driven packaging material payout means comprising a packaging material roll stand for rotatably supporting a roll of a continuous web of packaging material and a packaging material tension control means for controlling the tension of an unwound portion of said continuous web of packaging material;

a plurality of packaging material alignment means mounted within said frame, each said packaging material alignment



means being associated with a corresponding one of said plurality of positively driven packaging material payout means, each said packaging material alignment means comprising a plurality of alignment and transfer rollers for receiving said continuous web of packaging material from said corresponding positively driven packaging material payout means and aligning the same with at least one other said continuous web of packaging material from another of said packaging material alignment means;

granular material filler means positioned medially between said plurality of packaging material alignment means, said granular material filler means comprising a granular material reservoir and a plurality of granular material dispensing heads for depositing granular material at designated locations between said aligned continuous webs of packaging material;

sealing means removably mounted within said frame, said sealing means comprising a pair of opposed sealing rollers for sealing together said aligned continuous webs of packaging material outside of said designated locations; and

severing means removably mounted within said frame vertically downward and downstream with respect to said sealing means, said severing means comprising a pair of opposed severing rollers, operating synchronously with said pair of sealing rollers, for severing individual packets of granular material from said sealed continuous webs of packaging material.

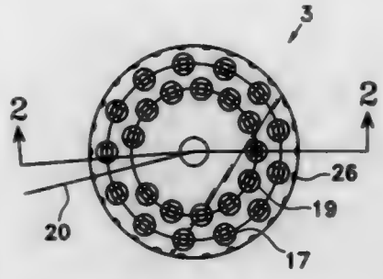
5,465,556

CONTAINER PROVIDING SELECTIVE ACCESS TO STORED OBJECTS

Sammy E. Wooldridge, Alta Loma; Jay F. Yoakum, and Hannis L. Stoddard, III, both of Norco, all of Calif., assignors to Avid Marketing, Inc., Norco, Calif.

Filed Aug. 2, 1993, Ser. No. 100,931
Int. Cl.[6] B65B *5/10;43/38*
U.S. Cl. 53—468 **21 Claims**

14. A process for allowing objects selective ingress into and



egress out of a plurality of cells, the cells being used to store objects, the process comprising the step:

(i) closing and opening the cells essentially simultaneously in accordance with a control pattern which specifies the cells to be open, the control pattern specifying that either no cells are to be open or that any combination of cells are to be open.

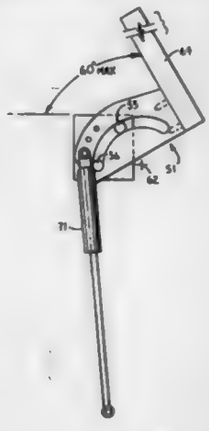
5,465,557

HINGE ASSEMBLY FOR VACUUM PACKAGING MACHINE

James R. Harte, Overland Park, Kans., assignor to Koch Supplies, Inc., Kansas City, Mo.

Filed Jun. 9, 1994, Ser. No. 257,555
Int. Cl.[6] B65B *31/00*
U.S. Cl. 53—510 **7 Claims**

1. A vacuum packaging machine including a lid, said machine



comprising:

A. a vacuum tub with a vertical front wall and a vertical rear wall and a perimeter lip, said perimeter lip including a horizontally level rear lip portion extending along and directly to the rear wall of said tub;

b. a stationary hinge plate with a pair of pins protruding therefrom, said hinge plate being connectable to said machine;

c. a movable hinge block with a curved slot formed therein, said hinge block being connectable to said lid and said curved slot being sized to accommodate and to slide along both of said protruding pins as said hinge block and said lid is moved between open and closed positions and said hinge block is positioned within a slot formed within said rear lip portion of said vacuum machine and moves in said rear lip slot as said lid is opened and closed such that a virtual pivot point is created behind said machine about which said lid pivots relative to said machine whereby said lid pivots upward and backward about said virtual pivot point, thus avoiding contact with said horizontally level rear lip portion of said tub; and

d. a spring mechanism positioned to bias said hinge block and said lid toward said open position, said spring mechanism being connectable between said machine and said hinge block whereby said spring mechanism biases said lid toward an open position.

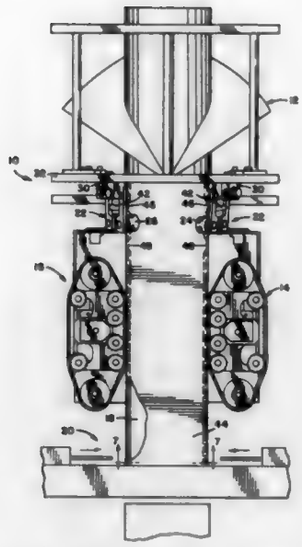
5,465,558

WEB CREASER

Douglas D. Dreger, New Holstein, Wis., assignor to Haynsen Manufacturing Company, Sheboygan, Wis.

Continuation of Ser. No. 147,153, Nov. 3, 1993, abandoned. This application May 23, 1995, Ser. No. 447,827
Int. Cl.[6] B65B *9/00;9/06*
U.S. Cl. 53—551 **8 Claims**

1. In an apparatus for forming, filling and sealing packages wherein a web of flexible packaging material is fed from a supply and formed into a continuous tube which is advanced vertically, wherein drive means is provided to advance the tube over an internal guide, and wherein product to be packaged in the packaging material is periodically introduced into the tube through the guide, the tube is sealed and the filled and sealed portion of the tube is then severed from succeeding portions of the tube, the improvement comprising means for forming at least one longitudinal crease in the tube, comprising



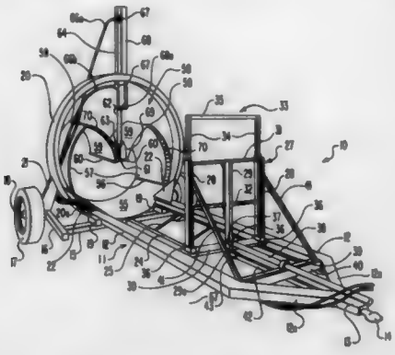
a. a pair of pinch rollers, motion for which is imparted by movement of the packaging material, located adjacent the tube and downstream of a leading edge of the internal guide,
b. means mounting said rollers for contact with one another along roller surfaces thereof, and
c. means for directing a portion of the tube between the roller surfaces of said pinch rollers to crease the tube against itself between the roller surfaces as the tube is advanced vertically.

5,465,559

HAY ROLL BAGGING SYSTEM

Hal R. Heiner, 5550 Tincup Junc. Rd., and Kendall Jenkins, P.O. Box 167, both of, Freedom, Wyo. 83120

Filed Nov. 28, 1994, Ser. No. 345,943
Int. Cl.[6] B65B *9/10;43/26*
U.S. Cl. 53—567 **13 Claims**



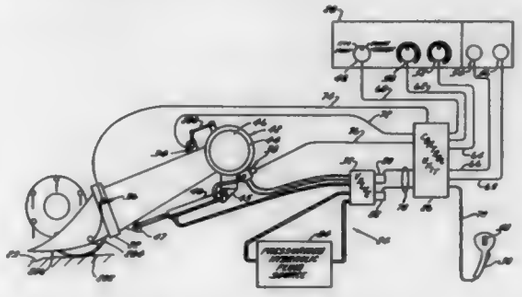
1. A hay roll bagging system comprising, transport means; a cradle means maintained on said transport means and arranged for receiving a hay roll positioned thereon where longitudinal axes of said cradle means and hay roll align; ram means disposed to a hay roll end to move said hay roll along and off a rear end of said cradle means; a collapsing ring that has a greater diameter, when erected, than said hay roll and includes a rigid arcuate bottom section having parallel sides and ends and is maintained across a cradle means rear end, opposite ends of which said bottom section mount hinge means therealong that connect to lower ends of each of a pair of arcuate pivot sides, and folding section means are disposed between upper ends of said arcuate pivot sides, completing said collapsing ring, which said folding section means is arranged to be folded upon itself, pivoting said arcuate pivot sides toward one another, to shorten said collapsing ring circumference so as to accommodate a plastic sleeve fitted thereon, and said folding section means can be unfolded to pivot said arcuate pivot sides outwardly and restore said collapsing ring to its original circumference stretching said plastic sleeve thereon; and means for folding and unfolding said folding section means upon itself.

5,465,560

ELECTRONIC COMBINE HARVESTING HEAD STATUS DISPLAY SYSTEM

Dale W. Panoushek, Orion, Ill., and Jeffery S. Milender, Valley City, N. Dak., assignors to Case Corporation, Racine, Wis.

Filed Jun. 24, 1994, Ser. No. 265,675
Int. Cl.[6] A01D *34/86;75/28*
U.S. Cl. 56—10.2 E **26 Claims**



11. An agricultural vehicle for operation on a surface, the vehicle comprising:
a support structure for supporting the components of the vehicle;
an operator cab attached to the support structure and including an interior for housing an operator of the vehicle;
an implement movably supported by the support structure;
an implement positioner coupled to the structure and the implement to move the implement relative to the vehicle in response to electric control signals;
a first transducer mechanically coupled to the implement to produce position signals representative of the locations of the implement relative to the vehicle;
a second transducer mechanically coupled to the implement to produce location signals representative of a relationship of the implement relative to the surface;
an electronic display located for viewing from within the interior of the cab; and
a control circuit coupled to the implement positioner, the first transducer, the second transducers and the electronic display, and configured to monitor the position and location signals, apply display signals representative of one of the position and location signals to the display, and apply control signals to the implement positioner, the display displaying human-recognizable characters representative of the location of the implement relative to the vehicle in response to display signals representative of the position signals and displaying human-recognizable characters representative of the relationship of the implement relative to the surface in response to display signals representative of the location signals.

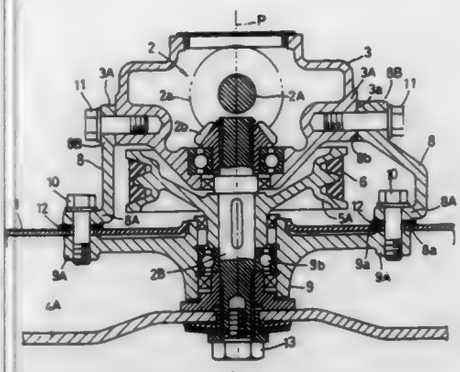
5,465,561

MOWER UNIT HAVING A BEVEL GEAR MECHANISM

Kazuo Samejima; Mitsuhiro Matsuyama; Shigeru Morita, and Masaji Kure, all of Sakai, Japan, assignors to Kubota Corporation, Japan

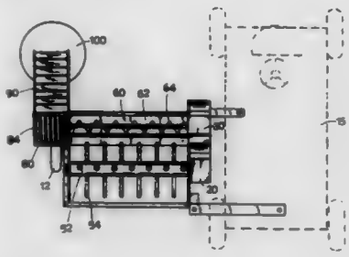
Filed Nov. 14, 1994, Ser. No. 339,344
Claims priority, application Japan, May 10, 1994, 6-096615; Jun. 7, 1994, 6-124857
Int. Cl.[6] A01D *35/00*
U.S. Cl. 56—11.8 **8 Claims**

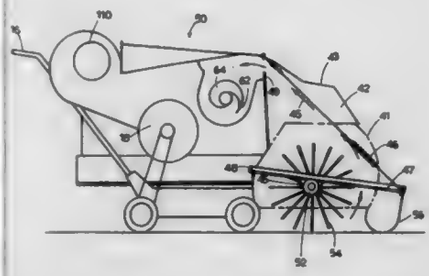
1. A mower unit having a bevel gear mechanism, comprising:
an input shaft extending substantially horizontally;



a first bevel gear mounted on said input shaft;
an output shaft extending substantially vertically;
a second bevel gear meshed with said first bevel gear and mounted on one end of said output shaft;
a blade mounted on the other end of said output shaft;
a blade housing covering said blade and defining an opening for receiving said output shaft;
a bearing holder rotatably supporting said output shaft and including first flange means defining first flange surfaces;
a bevel gear case containing said first and second bevel gears;
a pair of right and left support stays connected to said bevel gear case for mounting said bevel gear case to said blade housing, said support stays including second flange means defining second flange surfaces; and
reamer bolts interconnecting said first flange means and said second flange means, with said blade housing interposed between said first flange surfaces and said second flange surfaces.

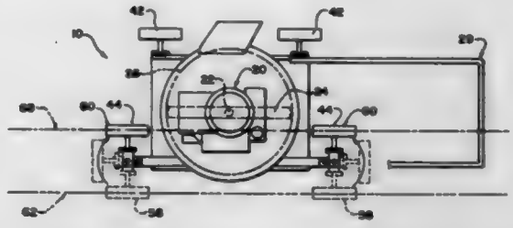
5,465,562
NUT HARVESTER
W. Jack Croft, 1631 Dayton, Wichita Falls, Tex. 76301
Filed Dec. 1, 1993, Ser. No. 159,516
Int. Cl.[6] A01D *61/00*
U.S. Cl. 56—16.4 R **8 Claims**





1. A nut harvesting apparatus for harvesting nuts and separating the nuts from debris accompanying the nuts, said nut harvesting apparatus comprising:
carrying means for carrying the nuts and the debris to an exit means, said carrying means including a screw-shaped auger rotatably supported in a trough having a longitudinal axis;
sweeping means for gleaning and casting the nuts and the debris from a supporting surface into said trough;
a first fan for producing a first air stream within said trough in a direction parallel to said longitudinal axis of said trough;
a second fan for producing a second air stream within a duct, said duct having a longitudinal axis parallel to said longitudinal axis of said trough;
a vertical chimney having a proximal end and a distal end, said proximal end communicating with said exit means and said duct, said proximal end of said chimney directing said second air stream upward through said chimney, said proximal end of said chimney communicating with a conveyer means for catching and conveying away the nuts as the nuts are separated from the debris, and said distal end of said chimney being open to allow discharge of said debris; and
an array of slanting bars provided in said proximal end of said chimney below said exit means, said slanting bars being sufficiently close together to prevent the nuts from falling through and between said slanting bars while allowing said second air stream to move upwards to meet the nuts and the debris, said slanting bars being sloped to guide the nuts toward said conveyer means, whereby
said first and second air streams merge and propel the debris upward through said chimney while the nuts fall onto said slanting bars and are guided to said conveyer means, thus separating the nuts from the debris.

5,465,563
LAWN MOWER WITH ROTATABLE WHEELS
William Heinz, 2116 Otter Lake Road, R.R.#3, Armstrong, British Columbia, Canada
Filed Nov. 3, 1994, Ser. No. 335,361
Int. Cl.[6] A01D *34/82*
U.S. Cl. 56—17.2 **4 Claims**



1. A lawn mower comprising a mower shroud having a top wall and a depending outer wall around an outer edge of the top wall for containing an area to be mowed, a drive motor mounted on the top wall and providing a drive shaft extending downwardly from the top wall, a mower blade mounted on the drive shaft for effecting mowing in a mowing area underneath the shroud, the mowing area being defined by a circle swept by the mower blade, a push handle connected to the shroud and extending upwardly and rearwardly therefrom for manually grasping by the operator for guiding the mower shroud in movement in a direction of movement across ground to be mowed, and four wheels each mounted on the shroud for supporting the shroud in said movement across the ground, a first pair of the wheels being provided on one side of the mower shroud at forward and rearward positions respectively thereon and a second pair of the wheels being provided on a second side of the mower shroud at forward and rearward positions thereon respectively, each of the second pair of wheels including mounting means for mounting the respective one of the second pair of wheels on the mower shroud so as to be adjustable from a first position in which a line of movement of the wheel lies outside of a line tangential to the swept circle and parallel to the direction of movement to a second position in which said line of movement lies inward of said line so as to define in said second position a portion of the swept circle lying outside said line of movement for trimming of an edge of an area to be mowed by said mowing area, the first pair of wheels being located at a fixed position on the shroud in which a line of movement of the first pair of wheels lies outside of a line

tangential to the swept circle and parallel to the direction of movement, said mounting means of said forward one of said second pair of wheels comprising a first horizontal bar mounted on the Shroud and extending forwardly of the shroud, said mounting means of said rearward one of said second pair of wheels comprising a second horizontal bar mounted on the shroud and extending rearwardly of the shroud, and each of said mounting means including a wheel support bracket pivotally mounted on the respective horizontal bar for pivotal movement through 180° about a vertical pivot axis so as to move the wheel from the first position to the second position.

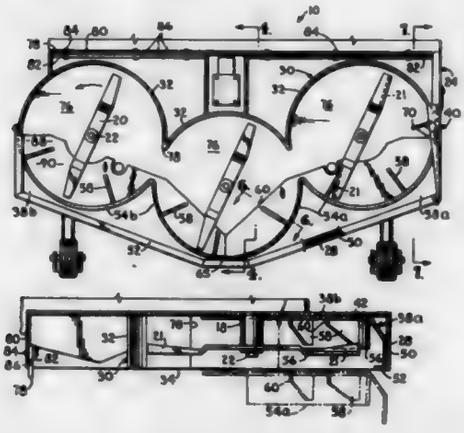
5,465,564

CONVERTIBLE MOWER DECK

Leroy F. Koehn, Moundridge, and Merlin L. Esau, Newton, both of Kans., assignors to Moridge Manufacturing, Inc., Moundridge, Kans.

Filed Dec. 12, 1994, Ser. No. 353,909
Int. Cl.[6] A01D *34/66;34/68;34/73;75/00*
U.S. Cl. 56—320.2 **16 Claims**

1. A mower deck which is convertible between a discharge



configuration wherein grass clippings are discharged from the deck and a mulching configuration wherein grass clippings are comminuted within the deck, the mower deck comprising:

a housing, said housing having a discharge port for discharging grass clippings from said housing when the deck is in its discharge configuration;

a plurality of elongated, vertically extending spindles rotatably mounted to said housing and adopted to be drivingly coupled to a drive mechanism;

a cutting blade for each spindle, said blades being attached to their corresponding spindles;

a removable shroud which can be attached to and removed from said housing, the mulching configuration of the deck corresponding to the configuration of the deck with said removable shroud attached to said housing, and the discharge configuration of the deck corresponding to the configuration thereof with said removable shroud detached from said housing;

a fixed shroud attached to said housing in disposition wherein the cutting path of said blade is substantially enshrouded by a combination of said fixed shroud and said removable shroud when said removable shroud is attached to said housing; and

at least one baffle for each blade, respectively, each baffle being attached to said removable shroud, said baffles being positioned substantially perpendicular to the cutting path of its respective blade so that the baffles facilitate zones of turbulence in the airstreams created around said blades, whereby said zones of turbulence permit grass clippings to drop to the ground.

16. A removable shroud which can be attached to and removed from a mower deck, the mower deck having a mulching configuration which corresponds to when said removable shroud is attached to the deck and a discharge configuration which corresponds to when said removable shroud is detached from the deck, the shroud comprising:

an attaching plate which, when said shroud is attached to said housing, is parallel to and juxtaposed to a generally horizontal upper plate of the mower deck;

attaching means for securing said attaching plate to the upper plate to hold the removable shroud in position;

a wall extending downwardly from said attaching plate and at least partially enshrouding the cutting path of the blade of the mower deck; and

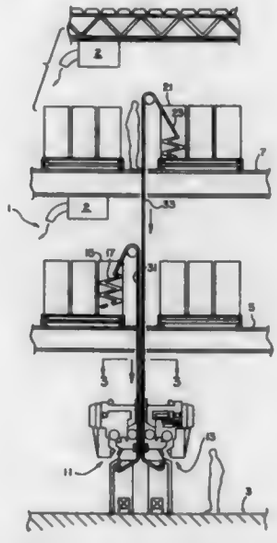
at least one baffle extending inwardly from said wall and downwardly from said attaching plate, said baffle positioned substantially perpendicular to the cutting path of said blade so that it facilitates zones of turbulence in the airstream above and around said blade, said zones of turbulence causing grass clippings to drop from said airstream to the ground, said baffle having an inner edge which terminates at a location that is removed from the center of the cutting path of the blade and a slanted edge which slopes downwardly from said inner edge toward a bottom edge of said baffle.

5,465,565

APPARATUS AND METHOD FOR DELIVERY OF SLIVER TO RINGLESS SPINNING MACHINE

Kiyohiro Tsuzuki, Greenville, S.C., assignor to TNS Mills, Greenville, S.C.

Continuation-in-part of Ser. No. 134,461, Oct. 8, 1993, Pat. No. 5,333,440, which is a continuation of Ser. No. 934,877, Aug. 21, 1992, abandoned. This application Mar. 24, 1994, Ser. No. 217,375
The portion of the term of this patent subsequent to Aug. 2, 2011, has been disclaimed.
Int. Cl.[6] D01H *13/04*
U.S. Cl. 57—90 **10 Claims**



1. In a ringless spinning apparatus having means to receive sliver for the spinning thereof into yarn, the improvement comprising:

a sliver feed tube for feeding sliver to said ringless spinning apparatus, said sliver originating from a sliver source disposed two floors above said ringless spinning apparatus;

said sliver feed tube having a vertical portion and a straight obtuse portion forming an obtuse angle with said vertical portion at a lower end of said vertical portion such that said sliver travels downwardly through said vertical portion and then through said straight obtuse portion; and

wherein said sliver feed tube includes a horizontal portion following said straight obtuse portion, such that said sliver travels down-

wardly through said vertical portion, through said straight obtuse portion, and then through said horizontal portion.

5,465,566

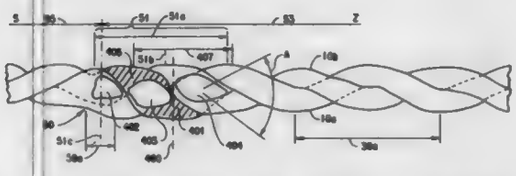
ALTERNATE TWIST-PLIED YARN

Donald W. Edwards, Wilmington; Craig A. Jackson, Seaford, both of Del.; Steven K. Shibata, Salisbury, Md., and Paul W. Yngve, Chapin, S.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 8, 1993, Ser. No. 72,642

Int. Cl.[6] D01H *13/28*; D02G *3/28*

U.S. Cl. 57—204 **7 Claims**



1. An alternate twist-plied yarn formed from a plurality of strands of filaments ply-twisted in alternating directions in lengthwise intervals of first half-cycles of ply-twist followed by second half-cycles of ply-twist with a reversal node therebetween, there being a bond formed adjacent each node wherein the first half cycle is located within the bond and the second half-cycle of ply-twist originates at one end of the bond after the adjacent node, said bond comprising:

a first dense region having filaments adhesively joined together where a first strand overlaps a strand;

a second dense region along the length of the first strand having filaments adhesively joined together where the first strand underlaps a strand; and

a third region along the length of the first strand and between the first and second dense regions where the first strand is arranged side-by-side with a strand, the third region being less dense than said first and second dense regions and having fewer of the filaments adhesively joined than in said first and second regions.

5,465,567

FIBER OPENING DEVICE FOR SEPARATING INDIVIDUAL FIBERS FROM A FIBER SLIVER

Karl-Heinz Schmolke, Calw, Germany, and Kenneth Lydall, Huddersfield, England, assignors to Carclo Engineering Group PLC., England

PCT No. PCT/GB92/01358, § 371 Date Jan. 19, 1994, § 102(e) Date Jan. 19, 1994, PCT Pub. No. WO93/02238, PCT Pub. Date Feb. 4, 1993

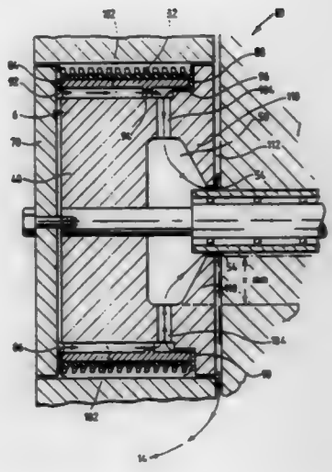
PCT Filed Jul. 23, 1992, Ser. No. 185,957

Claims priority, application Germany, Jul. 25, 1991, 41 24 714.0; United Kingdom, Feb. 27, 1992, 9204158

Int. Cl.[6] D01H *13/02;4/00*

U.S. Cl. 57—408 **14 Claims**

1. A fiber opening device for use in a discontinuous spinning process, the opening device comprising an opening roller rotatably mounted about an axis and having a cylindrical working surface which extends around said axis, opening elements being provided around said working surface and a space being defined between an axially outermost fiber opening element and an adjacent outer edge of the cylindrical working surface, wherein pressure reduction means is provided for reducing pressure in or around that space, said pressure reduction means being arranged to urge fibers into engagement with the working surface.



5,465,568

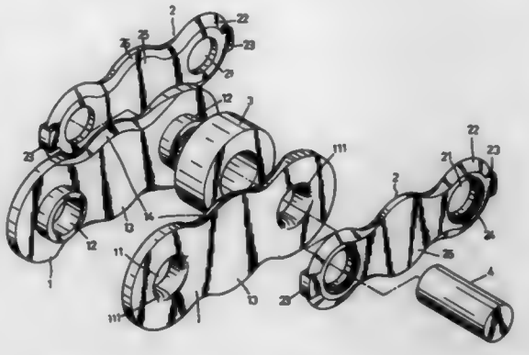
CHAIN STRUCTURE FOR BICYCLES

Wen-Bin Wang, Tainan Hsien, Taiwan, Prov. of China, assignor to Yaban Chain Industrial Co., Ltd., Tainan Hsien, Taiwan, Prov. of China

Filed Jan. 17, 1995, Ser. No. 373,057

Int. Cl.[6] F16G *13/00*

U.S. Cl. 59—4 **1 Claim**



1. A chain structure for engaging a sprocket tooth of a bicycle sprocket comprising:

(a) at least a pair of inner chain plates coupled each to the other defining a first sprocket space therebetween for removable insert therein of a sprocket tooth, each of said inner chain plates having opposing inner and outer faces defining an inner plate edge portion, each of said inner and outer faces forming an elongated planar contour having a pair of mutually distal end portions and a central portion therebetween, each of said end portions having formed therethrough a through hole, each of said inner and outer faces of each said inner chain plate having an arcuate central portion peripheral contour for lateral retention of said sprocket tooth when said sprocket tooth is inserted within said first sprocket space, said inner plate edge portion having at each section thereof proximal to said central portion at least one inner plate inclined surface adjacent said inner face and having a predetermined incline for guiding the insert of said sprocket tooth into said first sprocket space;

(b) a roller rotatably captured between opposing inner faces of said coupled pair of inner chain plates, said roller having a tubular contour defining an axial through opening, said axial through opening being axially aligned with one of said end portion through holes of each of said coupled pair of inner chain plates;

(c) at least a pair of outer chain plates respectively coupled to said outer faces of said coupled pair of inner chain plates and arranged to form therebetween a second sprocket space for

removable insert therein of said sprocket tooth, each of said outer chain plates having opposing first and second faces defining an outer plate edge portion, each of said first and second faces forming an elongated planar contour having a pair of mutually distal outer plate end portions and an outer plate central portion therebetween, each of said outer plate end portions having formed therethrough an outer plate through hole, said second face having formed therein a pair of annular recesses axially aligned, respectively, with said outer plate through holes, each of said first and second faces of each said outer chain plate having an arcuate outer plate central portion peripheral contour for retention of said sprocket tooth when said sprocket tooth is inserted within said second sprocket space, said first and second faces and said outer plate edge portion forming at the periphery of each outer plate end portion a protruding block portion, said outer plate edge portion having at each section adjacent said block portion a first outer plate inclined surface adjacent said first face and a second outer plate inclined surface adjacent said second face, said first outer plate inclined surface having a predetermined incline for guiding the insert of said sprocket into said second sprocket space; and,

(d) an assembly pin for pivotally coupling together said inner chain plates, said roller, and said outer chain plates.

5,465,569

METHOD OF ESTABLISHING PART-LOAD OPERATION IN A GAS TURBINE GROUP

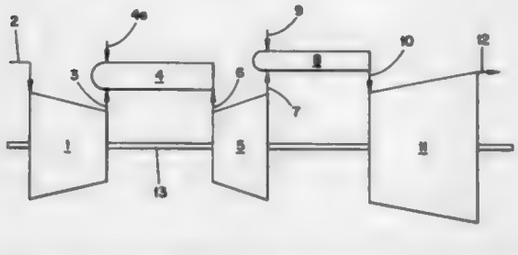
Rolf Althaus, Flawil, Switzerland; Yau-Pin Chyou, Taipei, Taiwan, Prov. of China; Hans U. Frutschi, Riniken, Switzerland; Christian Genet, Untersiggenthal, Switzerland; Peter Kamber, Simsbury, Conn.; Anders Lindvall, Baden, Switzerland; Thomas Sattelmayer, Mandach, Switzerland; Peter Senior, Mellingen, Switzerland, and Peter Ruffi, Fislisbach, Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Aug. 15, 1994, Ser. No. 290,287

Claims priority, application European Pat. Off., Sep. 6, 1993, 93114230

Int. Cl.[6] F02C *9/00*; **F02G** *3/00*

U.S. Cl. 60—39.03 **10 Claims**



1. A method of establishing part-load operation in a gas turbine group, comprising a compressor unit, a first combustion chamber downstream of the compressor unit, a first turbine downstream of the first combustion chamber, a second combustion chamber operating on self-ignition and connected downstream of the first turbine, exhaust gases of the second combustion chamber being admitted to a second turbine, and at least one generator, the method comprising the steps of:

reducing a fuel flow quantity to the second combustion chamber to zero, and

maintaining a fuel flow quantity to the first combustion chamber approximately constant while reducing the fuel quantity in the second combustion chamber so that a temperature of gases at an inlet to the first turbine remains constant.

5,465,570

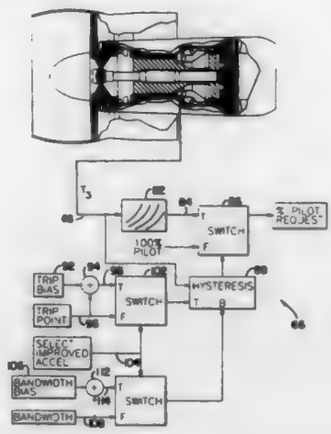
FUEL CONTROL SYSTEM FOR A STAGED COMBUSTOR

John C. Szillat; Nicola Laudadio, both of Rockville, and Teresa Chin, Manchester, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 22, 1993, Ser. No. 171,786

Int. Cl.[6] F02C *9/28*

U.S. Cl. 60—39.06 **13 Claims**



1. A method to operate a multi-stage combustor of a gas turbine engine, the gas turbine engine including a pilot combustor, a main combustor, and means to control the fuel flow W_f to the combustor in response to demands from an operator, wherein the combustor has a pilot mode characterized by fuel flowing to the pilot combustor only and a staged mode characterized by fuel flowing to both the pilot combustor and the main combustor, the method including the steps of:

generating a thrust level indicative signal;

operating the combustor in the pilot mode with thrust level less than a first predetermined threshold;

switching from pilot mode to staged mode if the thrust level is greater than a second predetermined threshold with the combustor remaining in the pilot mode until the second predetermined threshold is reached; and

switching from staged mode to pilot mode if thrust level is less than the first predetermined threshold with the combustor remaining in the staged mode until the first predetermined threshold is reached, and wherein the first predetermined threshold is less than the second predetermined threshold.

5,465,571

FUEL NOZZLE ATTACHMENT IN GAS TURBINE COMBUSTORS

Jim A. Clark, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1993, Ser. No. 171,362

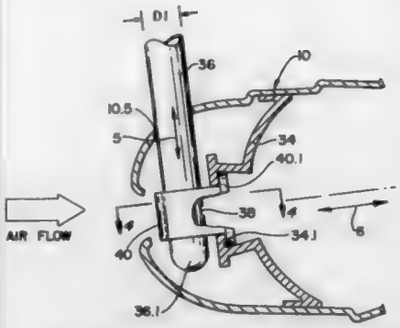
Int. Cl.[6] F02C *7/22*

U.S. Cl. 60—39.32 **7 Claims**

1. A gas turbine comprising a diffuser surrounding a combustor cowl and a fuel nozzle and swirler inside the cowl, characterized by:

a sleeve with a sleeve outlet opposite the swirler inlet and containing a sleeve flange on the periphery of the sleeve outlet, the sleeve flange extending radially normal to the axis of the swirler;

the swirler having a swirler surface around the swirler inlet and on a plane that is normal to the swirler axis, the swirler



surface being located between the sleeve flange and the sleeve; and

a linear stem that extends from a location outside the diffuser through the diffuser and the cowl into the sleeve, the outer surface of the stem being received by the inner surface of the sleeve and containing the fuel nozzle, the fuel nozzle facing the sleeve outlet.

5,465,572

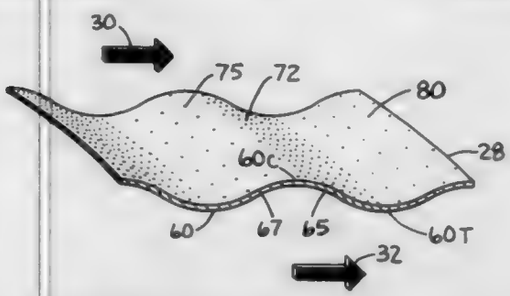
MULTI-HOLE FILM COOLED AFTERBURNER CUMBUSTOR LINER

Robert A. Nicoll, Beverly, and John W. Vdoviak, Marblehead, both of Mass., assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 667,165, Mar. 11, 1991, abandoned. This application May 21, 1993, Ser. No. 66,609

Int. Cl.[6] F02K *3/10*

U.S. Cl. 60—266 **8 Claims**



1. A cooling apparatus comprising:

a first and second wall spaced apart from each other forming, at least in part, a cooling flowpath operable to conduct a cooling flow therebetween wherein one of said walls is a coolable wall and said flow path converges in the direction of the cooling flow,

said coolable wall having a uniform thickness and a cold surface facing said cooling flowpath and a hot surface on the other side of said coolable wall and a multi-hole film cooling means disposed through said coolable wall,

said multi-hole film cooling means comprising at least one continuous pattern of small closely spaced film cooling holes that are angled sharply downstream through said wall at a slant angle to said wall from said cold surface to said hot surface,

said film cooling holes extending essentially over the entire coolable wall,

said film cooling holes having a hole diameter, said downstream slant angle, and spaced at least sufficiently close enough together to effect a cooling film on said hot side of said coolable wall during combustor operation,

at least a portion of coolable wall being corrugated so as to have a shallow wavy wall cross-section,

relatively hotter axial portions extending from crests to troughs of said corrugated coolable wall and relatively cooler axial portions extending from said troughs to said crests,

a relatively high density film cooling hole pattern disposed through said axially extending hotter portions, and

a relatively low density film cooling hole pattern disposed through said axially extending cooler portions wherein said high density pattern is disposed through said coolable wall portions from crest to trough in the direction of the cooling flow.

5,465,573

MULTI-STAGE HONEYCOMB HEATER

Abe Fumio, Handa; Tadato Ito, Nagoya, and Masato Ogawa, Komaki, all of, Japan, assignors to NGK Insulators, Ltd., Japan

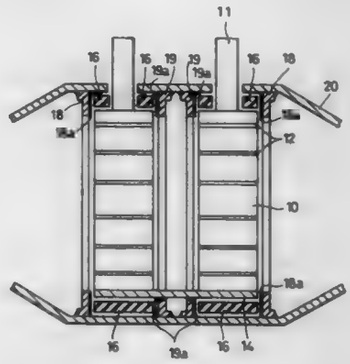
Filed Jul. 16, 1993, Ser. No. 91,917

Claims priority, application Japan, Jul. 29, 1992, 4-202061; Jul. 29, 1992, 4-202062

Int. Cl.[6] F01N *3/20;* **B60L** *1/02*

U.S. Cl. 60—274 **20 Claims**

1. A multi-stage honeycomb heater for heating fluid flowing



therethrough, comprising:

at least two honeycomb heaters electrically connected with each other to enable simultaneous energization of said at least two honeycomb heaters, which are disposed along a stream of fluid and include a furthest upstream honeycomb heater and an adjacent honeycomb heater which is adjacent to and downstream of the furthest upstream honeycomb heater;

each of said at least two honeycomb heaters having a honeycomb structure comprised of an electrically conductive material, the honeycomb structure having a periphery and two ends, including a plurality of passages which are defined by partition walls and extend in an axial direction between the ends;

the honeycomb structure of the furthest upstream honeycomb heater having at least one member selected from the group consisting of means for adjusting an electrical resistance of the honeycomb structure and means for adjusting a heat capacity of the honeycomb structure so that the ratio of applied power to heat capacity of the furthest upstream honeycomb heater is larger than the ratio of applied power to heat capacity of the adjacent honeycomb heater when said furthest upstream and adjacent honeycomb heaters are simultaneously energized.

5,465,574
CATALYTIC CONVERTER

Thomas T. Ma, South Woodham Ferrers, United Kingdom, assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/GB92/01855, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO93/07365, PCT Pub. Date Apr. 15, 1993

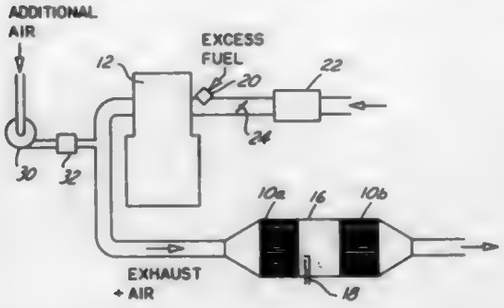
PCT Filed Oct. 12, 1992, Ser. No. 211,731

Claims priority, application United Kingdom, Jan. 12, 1992, 9121597

Int. Cl.[6] F01N *3/28*

U.S. Cl. 60—300 **6 Claims**

1. A catalytic converter for an internal combustion engine



exhaust system, having an outer housing (**110,120**), two or more matrices (**112,114**) each defining passages for the exhaust gases and carrying particles of a catalyst, the matrices (**112,114**) being arranged in series with one another in the direction of flow of engine exhaust gases through the converter, a chamber (**116**) disposed between the two matrices, and an igniter (**122**) arranged within the chamber to ignite the gaseous mixture that comprises only the gasses that have passed through the first of the two matrices, the mixture being causes to burn as a flame within the chamber so as to form an afterburner for heating the second of the matrices and thereby reducing the time taken for the second of the two matrices to reach its light-off temperature characterized in that a flame guard (**118**) is arranged upstream of and in close proximity to the igniter (**122**), the flame guard comprising at least one elongate narrow strip spanning the afterburner chamber, wherein the strip is in the form of a V-shaped channel, the vertex of the V pointing upstream.

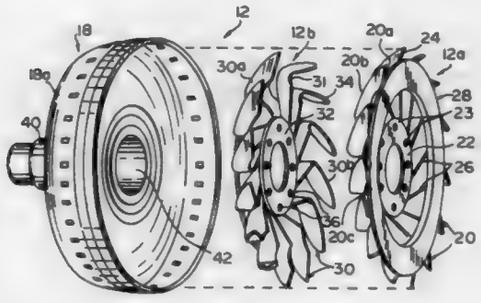
5,465,575
TORQUE CONVERTER AND METHOD FOR PRODUCING THE SAME

Dennis S. Shimmell, Hudsonville, Mich., assignor to Nelson Metal Products Corporation, Grandville, Mich.

Filed Sep. 14, 1994, Ser. No. 305,606

Int. Cl.[6] F16D *33/00*; B23P *15/02*

U.S. Cl. 60—345 **21 Claims**



1. A torque converter, comprising:
an impeller;
a turbine;
a die cast stator having blades with inner and outer ends, and an integral, die cast outer ring connected to said outer ends of said blades; and
a housing for enclosing said impeller, turbine, and stator,
at least one of said impeller, turbine, and stator having interconnected upper and lower members, each of said upper and lower members being die cast and including a plurality of integral blades whereby said upper and lower members cooperate to define a desired blade configuration, said blades each including a notch, said upper and lower members including an integral, die cast guide ring, said guide ring extending concentrically around said one member within said notches and being integrally connected to said blades of said one member.

13. A method for producing a fluid clutch device, comprising:
die casting upper and lower first component members each having a plurality of integral blades, the blades each including a notch, the upper member of the first component including an integral, die cast guide ring extending concentrically around the upper member within the notches;
interlocking the upper and lower first component members with the blades of each in nesting disposition;
die casting upper and lower second component members each having a plurality of integral blades, the blades each including a notch, the upper member of the second component including an integral, die cast guide ring extending concentrically around the upper member within the notches;
interlocking the upper and lower second component members with the blades of each in nesting disposition;
concentrically mounting the first and second components within a sealed housing filled with a fluid.

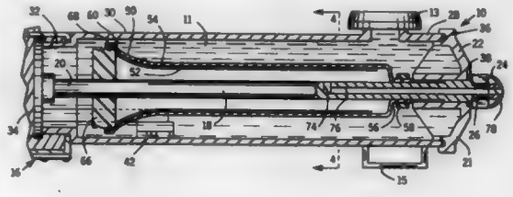
5,465,576
VENTED HYDRAULIC FLUID RESERVOIR

Douglas P. Miller, New Berlin, Wis., assignor to Applied Power Inc., Butler, Wis.

Filed Jan. 24, 1994, Ser. No. 186,404

Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—478 **6 Claims**



1. In a hydraulic fluid reservoir for a hydraulic working unit, said reservoir having an interior fluid chamber and an exterior, and being secured to said working unit by a tie rod which extends through said fluid chamber, said fluid chamber containing fluid which is drawn out or replenished according to the demands of said working unit, an improvement wherein a generally tubular flexible bladder resides in the fluid chamber of said reservoir coaxially with and around said tie rod so as to envelop a portion of said tie rod, said bladder having an exterior and an interior, said exterior being exposed to fluid in said fluid chamber and said tie rod extending through said interior and through opposed ends of said bladder, means sealing against fluid communication between said fluid chamber exterior of said bladder and said interior of said bladder, and a vent passageway in said tie rod providing fluid communication between said interior of said bladder and said exterior of said reservoir.

5,465,577

GAS TURBINE COMBUSTION CHAMBER

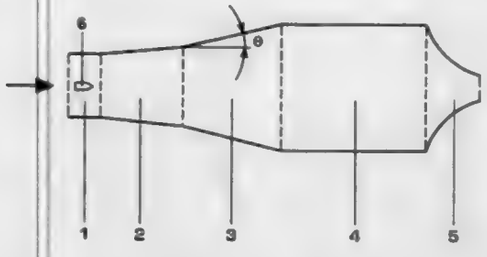
Burkhard Schulte-Werning, Basel, Switzerland, assignor to Asea Brown Boveri Ltd., Baden, Switzerland

Continuation of Ser. No. 159,555, Feb. 1, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 339,292

Claims priority, application Germany, Dec. 17, 1992, 42 42 650.2

Int. Cl.[6] F02C *1/00;* F02G *3/00*

U.S. Cl. 60—722 6 Claims



1. A gas turbine combustion chamber of the type having spontaneous combustion of a fuel and air mixture, comprising:

an inlet zone for receiving combustion air into the combustion chamber, a wall of the combustion chamber bounding the inlet zone being shaped so that the inlet zone has a predetermined cross-sectional area perpendicular to a longitudinal axis;

means for injecting a fuel in the inlet zone;

a reaction zone downstream of the inlet zone for combustion having means for maintaining a static pressure of a combusting fuel and air mixture that is constant throughout the reaction zone during combustion, a wall bounding the reaction zone diverging outwardly from the longitudinal axis of the combustion chamber at a predetermined angle for a predetermined length of the combustion chamber so that a cross-sectional area of the reaction zone increases in a flow direction over the predetermined length;

a burnout zone downstream of the reaction zone; and

a transition zone downstream of the burnout zone to direct the combustion gases to the turbine.

5,465,578

THERMOELECTRIC GAS SAMPLE COOLER

Ted Barben; Randy Carlson; Kurt Christner, and Heinz Doring, all of Carson City, Nev., assignors to Universal Analyzers, Inc., Carson City, Nev.

Filed Jan. 19, 1994, Ser. No. 183,328

Int. Cl.[6] F25B *21/02;* F25D *17/06*

U.S. Cl. 62—3.2 14 Claims

1. A thermoelectric gas sample cooler configured for cooling a sample of hot, continuously flowing gas and providing a blower element which moves cooling air in a turbulent flow path within the cooler, said cooler comprising:

a heat-conductive block including means for

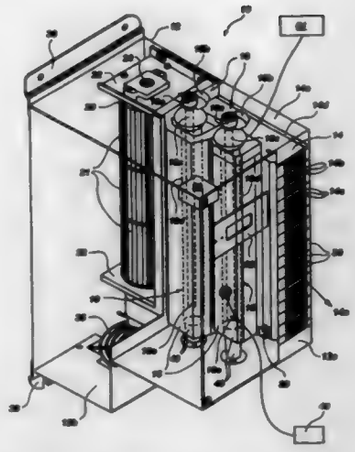
(i) receiving the flowing gas into the block to thereby transfer heat from said gas into said block to thereby cool said gas to approximately a first predetermined temperature, and

(ii) discharging the cooled gas for processing;

a thermoelectric cooling element including a hot side and an opposing cold side, said cold side being positioned against the block for mechanically removing heat therefrom to thereby cool and maintain said block at a predetermined temperature;

a heat-conductive sink having a plurality of slots extending therethrough and being positioned against the hot side of the thermoelectric cooling element for mechanically removing heat therefrom to thereby maintain the cold side at a predetermined temperature; and

an open-scroll rotational drum blower positioned adjacent to the slots of the heat sink for driving ambient air through the slots



at an air pressure sufficient to produce turbulent cooling air streams within said slots to thereby cool said heat sink and carry heat therefrom away from the cooler at a rate sufficient to permit the heat removing means to cool the gas to said first predetermined temperature.

5,465,579

GAS COMPRESSION/EXPANSION APPARATUS

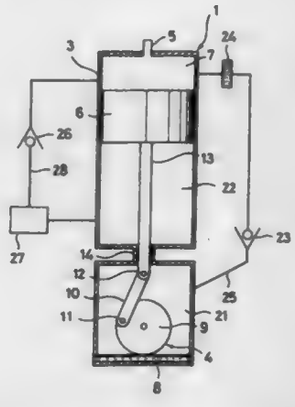
Fusao Terada, Ota; Takashi Nakazato, Chiyoda; Rikio Tadano, Ogo; Naohide Tanigawa, Oizumi; Tatuya Hirose, Oizumi; Kazuo Ikegami, Oizumi, and Kiyoshi Fukushima, Hyogo, all of, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed May 6, 1994, Ser. No. 239,415

Claims priority, application Japan, May 12, 1993, 5-132428; May 14, 1993, 5-135098; May 14, 1993, 5-135099

Int. Cl.[6] F25B *9/00*

U.S. Cl. 62—6 9 Claims



1. An apparatus for compressing/expanding a working gas including: a cylinder having a working space; a piston for compressing/expanding said working gas in said working space of said cylinder; a piston rod connected to said piston; a crank mechanism operatively connected to said piston rod for driving said piston; a crank chamber housing therein said crank mechanism and a body of lubricating oil for lubricating said crank mechanism; and an oil seal defining a passage for said piston rod and having one end communicating with said crank chamber and its other end communicating with said cylinder, said apparatus comprising:

a first tube having a first check valve for effecting a unidirectional flow of the working gas from said crank chamber to said working space in said cylinder, an oil filter in said first tube; and

a second tube having a second check valve for a unidirectional flow of the working gas from said working space behind said piston in said cylinder for establishing a higher gas pressure on the cylinder end of said oil seal than on the crank chamber end thereof to prevent the passage of lubricating oil from said crank chamber to said cylinder.

5,465,580

COOLING AND HEATING WATER CIRCULATION APPARATUS OF VUILLEUMIER HEAT PUMP

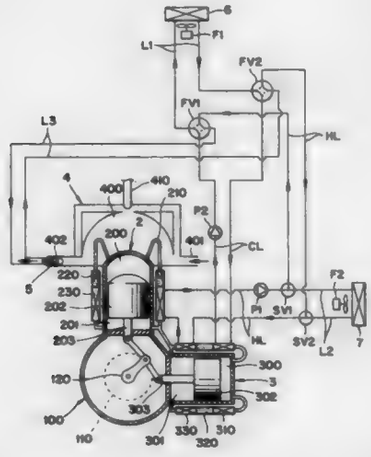
Yong-Rak Kwon, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 21, 1994, Ser. No. 230,790

Claims priority, application Rep. of Korea, Apr. 30, 1993, 1993-7576

Int. Cl.[6] F25B *9/00*

U.S. Cl. 62—6 **6 Claims**



1. Apparatus for heating and cooling a room, comprising:

A) an indoor heat exchanger;

B) an outdoor heat exchanger;

C) a Vuilleumier heat pump connected to the indoor and outdoor heat exchangers for supply heat exchange medium thereto, the heat pump comprising:

C1) a housing forming a high temperature section including:

C1a) a high temperature chamber containing heat exchange medium,

C1b) a combustion unit,

C1c) a high temperature heat exchanger connected to the high temperature chamber, and

C1d) a high temperature displacer disposed in the high temperature chamber for displacing the heat exchange medium therein,

C2) a housing forming a low temperature section including:

C2a) a low temperature chamber containing heat exchange medium,

C2b) a low temperature heat exchanger connected to the low temperature chamber, and

C2c) a low temperature displacer disposed in the low temperature chamber for displacing the heat exchange medium therein,

C3) a motor connected to the high and low temperature displacers for reciprocating the high and low temperature displacers within their respective chambers, and

C4) an auxiliary heat exchanger arranged for absorbing heat from the combustion unit; and

D) valves operable during a room-heating mode for connecting the high temperature heat exchanger in heat exchanging relationship with the indoor heat exchanger, and for connecting the low temperature heat exchanger in heat exchanging relationship with the auxiliary heat exchanger so that heat exchange medium traveling between the low temperature heat exchanger and the auxiliary heat exchanger is heated by the latter.

5,465,581

ANALYTICAL SYSTEM HAVING ENERGY EFFICIENT PUMP

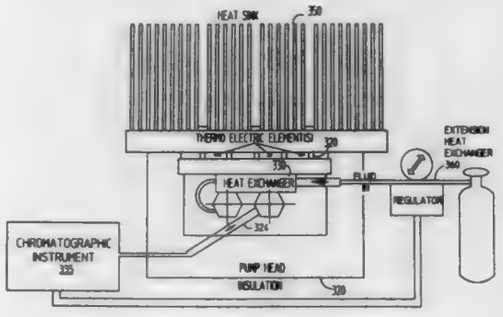
Hans-Georg Haertl, Karlsruhe, Germany, and Terry A. Berger, Newark, Del., assignors to Hewlett-Packard, Palo Alto, Calif.

Filed Aug. 24, 1993, Ser. No. 111,354

Int. Cl.[6] F17C *7/02*

U.S. Cl. 62—50.1 **10 Claims**

1. A pumping system for providing a pumping fluid at a sub-



ambient temperature comprising:

an analytical instrument having an inlet and an outlet;

a source of a first flow of the pumping fluid;

an expansion heat exchanger operatively connected to the first flow of the pumping fluid and having an inlet coupled to said analytical instrument outlet for receiving therefrom a second flow of the pumping fluid, wherein said heat exchanger transfers heat from the first flow of the pumping fluid to the second flow of the pumping fluid; and

a pump head having an inlet for receiving the first flow of pumping fluid and an outlet coupled to said analytical instrument inlet;

wherein the second flow of the pumping fluid from said analytical instrument is expanded in said expansion heat exchanger to cool the first flow of the pumping fluid to the sub-ambient temperature.

5,465,582

CRYOGENIC LIQUID DISPENSERS

Anthony P. S. Bliss, Cambridge, and Jacek T. Gabzdyl, Guildford, both of, England, assignors to The BOC Group plc, Windlesham, England

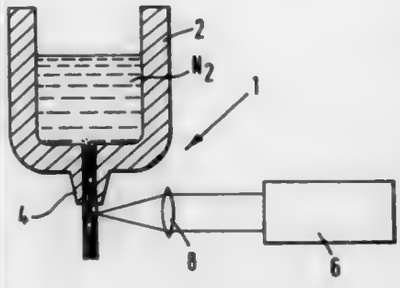
Filed May 10, 1994, Ser. No. 241,232

Claims priority, application United Kingdom, May 11, 1993, 9309637

Int. Cl.[6] F17C *7/02*

U.S. Cl. 62—51.1 **12 Claims**

1. An apparatus for dispensing a cryogenic liquid comprising a vessel for containing the liquid cryogen, an outlet from the vessel for the passage therethrough of the liquid cryogen and means for focusing a beam of energy from a source on the liquid cryogen as it passes through the outlet.



5,465,583

LIQUID METHANE FUELING FACILITY

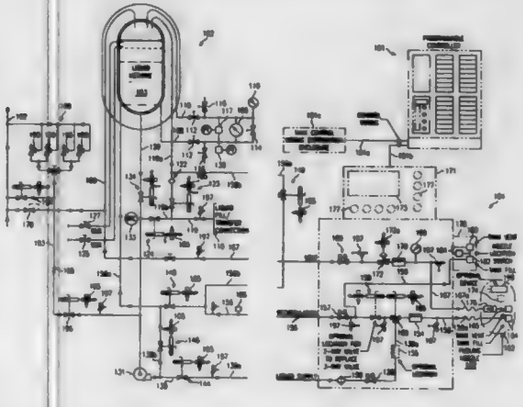
John E. Goode, Arlington, Tex., assignor to Hydra Rig, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 7,540, Jan. 22, 1993, Pat. No. 5,360,139. This application Aug. 18, 1993, Ser. No. 108,882

Int. Cl.[6] F17C *7/02;13/02;* B65B *31/00*

U.S. Cl. 62—50.2 **21 Claims**

1. A method of automatic operation of a facility for dispensing



cryogenic liquid fuel into a motor vehicle through a dispenser system from a supply stored in a cryogenic storage tank comprising the steps of:

measuring pressure of the liquid fuel stored in a cryogenic tank with a pressure sensor and communicating a signal indicative of the pressure to a controller;

measuring temperature of the liquid fuel in the cryogenic tank with a temperature sensor and communicating a signal indicative of the temperature pressure to the controller;

determining with the controller, in response to the signal indicative of temperature, a first set pressure for the liquid fuel greater than a liquid saturation pressure for the liquid fuel at the indicated temperature; and

enabling with the controller the dispenser system to permit a user to dispense on demand liquid fuel into a vehicle only if a signal from the pressure sensor indicates that the pressure of the liquid fuel is substantially at or above the first set pressure, thereby tending to assure that homogeneous phase liquid fuel is dispensed into a motor vehicle.

5,465,584

CRYOPUMP

Monika Mattern-Klosson, Roesrath; Hans-Juergen Mundinger, Bruehl, and Ferdinand Greger, Cologne, all of, Germany, assignors to Leybold Aktiengesellschaft, Cologne, Germany

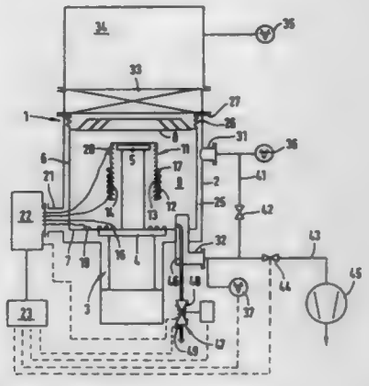
PCT No. PCT/EP92/00865, § 371 Date Mar. 8, 1994, § 102(e) Date Mar. 8, 1994, PCT Pub. No. WO93/05294, PCT Pub. Date Mar. 18, 1993

PCT Filed Apr. 18, 1992, Ser. No. 204,270

Claims priority, application Germany, Sep. 10, 1991, 9111236 U

Int. Cl.[6] B01D *8/00*

U.S. Cl. 62—55.5 **35 Claims**



1. A cryopump, comprising:

an exterior housing having an interior space formed therein;

a refrigerator at least partially located within the interior space, said refrigerator cooling said cryopump and having at least one pumping surface located within the interior space;

a heating element attached to the pumping surface for heating the pumping surface;

an inlet valve attached to the housing and opening into the interior space;

a backing pump operatively connected to the interior space; and

a regeneration valve having a heating element and a temperature sensor for controlling said heating element, and being connected by a discharge line with the interior space for the removal of precipitates formed therein.

5,465,585

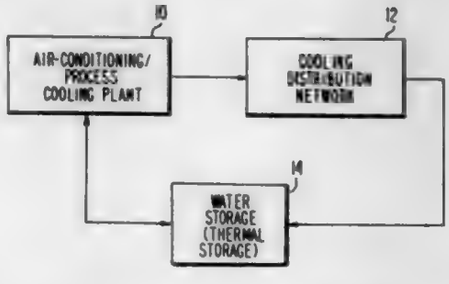
METHOD OF LOW-TEMPERATURE STRATIFIED CHILLED WATER STORAGE

Goran Mornhed, Croton Hudson, N.Y.; John Young, Halifax, and Harvey W. Thompson, Mississauga, both of, Canada, assignors to Trigen Energy Corporation, White Plains, N.Y.

Filed Jun. 16, 1994, Ser. No. 260,561

Int. Cl.[6] F25D *3/00*

U.S. Cl. 62—59 **10 Claims**



7. A method of low-temperature stratified chilled water storage in a thermal storage tank, comprising steps of:

preparing a 7% sodium nitrite, sodium nitrate and water solution;

storing the prepared solution in a storage tank;

chilling a portion of the stored, prepared solution to a temperature below 4.4° C. (40° F.); and

introducing the chilled solution at the bottom of the storage tank, whereby the tank contains a layer of the chilled solution at a temperature below 4.4° C. (40° F.) located below a layer of the prepared solution at a temperature above 40° F.

5,465,586

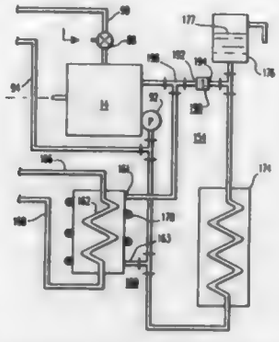
METHODS AND APPARATUS FOR OPERATING A REFRIGERATION SYSTEM CHARACTERIZED BY CONTROLLING ENGINE COOLANT

Lars I. Sjoholm; Sung L. Kwon, both of Burnsville; David H. Taylor, Minneapolis; Lee J. Erickson, Eagan, and Peter W. Freund, Bloomington, all of Minn., assignors to ThermoKing Corporation, Minneapolis, Minn.

Division of Ser. No. 182,319, Jan. 14, 1994, Pat. No. 5,408,836. This application Jan. 6, 1995, Ser. No. 369,432

Int. Cl.[6] F25B *43/02*

U.S. Cl. 62—84 **2 Claims**



1. A method of operating a refrigeration system which achieves and holds a predetermined set point temperature in a conditioned space via cooling and heating cycles, with the refrigeration system including a refrigerant compressor which includes a compressor oil cooler having an inlet and an outlet, and a compressor prime mover which includes an engine having liquid engine coolant and an engine coolant flow circuit which includes a thermostat and a radiator, characterized by the steps of:

providing a thermostat of the choke type, having a single inlet and a single outlet,

and connecting the inlet of the compressor oil cooler to the engine coolant flow circuit on the upstream side of the thermostat inlet, providing a constant flow of liquid engine coolant to the oil cooler regardless of the flow rate through the thermostat.

5,465,587

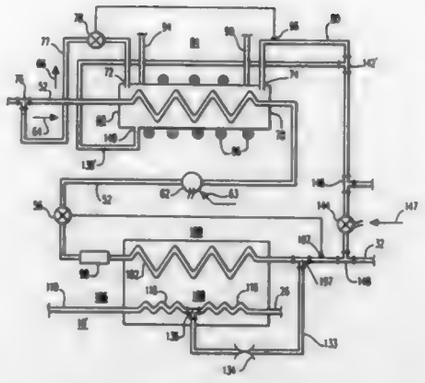
METHODS AND APPARATUS FOR OPERATING A REFRIGERATION SYSTEM CHARACTERIZED BY CONTROLLING ENGINE COOLANT

Lars I. Sjoholm; Sung L. Kwon, both of Burnsville; David H. Taylor, Minneapolis; Lee J. Erickson, Eagan, and Peter W. Freund, Bloomington, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Division of Ser. No. 182,319, Jan. 14, 1994, Pat. No. 5,408,836. This application Jan. 6, 1995, Ser. No. 369,444

Int. Cl.[6] F25B *43/02*

U.S. Cl. 62—84 **2 Claims**



1. A method of operating a refrigeration system which achieves and holds a predetermined set point temperature in a conditioned space via cooling and heating cycles, with the refrigeration system including a refrigerant compressor which includes a suction port, an intermediate pressure port, and a discharge port, a compressor prime mover, a hot gas compressor discharge line, first and second hot gas lines, first controllable valve means having first and second positions which respectively connect the hot gas compressor discharge line to the first and second hot gas lines, a main condenser connected to the first hot gas line, an evaporator associated with the conditioned space, an evaporator expansion valve, an auxiliary condenser associated with the conditioned space which is connected to the second hot gas line, economizer heat exchanger means having first and second refrigerant flow paths, including a shell defining a portion of the second refrigerant flow path, with the shell having an inlet and an outlet, an economizer expansion valve connected to the shell inlet to control the rate of refrigerant flow through the second refrigerant flow path, a main liquid line which connects the main condenser to the evaporator expansion valve via the first refrigerant flow path of the economizer heat exchanger means, an auxiliary liquid line which connects the auxiliary condenser to the economizer heat exchanger means, a main suction line which connects the evaporator to the suction port of the compressor, an auxiliary suction line which connects the shell outlet to the intermediate pressure port of the compressor, and second controllable valve means having first and second positions which respectively block and unblock the main liquid line, with the shell having oil thereon carried into the system by the compressor, characterized by the steps of:

connecting a drain line from a low point of the shell to a higher point of the auxiliary suction line,

directing the drain line upwardly in heat exchange relation with the auxiliary liquid line, to provide a percolating effect and lifting force for the liquid refrigerant-oil mixture,

returning compressor oil in the shell, along with a metered flow of liquid refrigerant, to the compressor via the drain line,

whereby oil removal from the shell improves heat transfer efficiency between the first and second refrigerant flow paths of the economizer heat exchanger, and the metered flow of liquid refrigerant into the compressor limits the discharge temperature of the compressor.

5,465,588

MULTI-FUNCTION SELF-CONTAINED HEAT PUMP SYSTEM WITH MICROPROCESSOR CONTROL

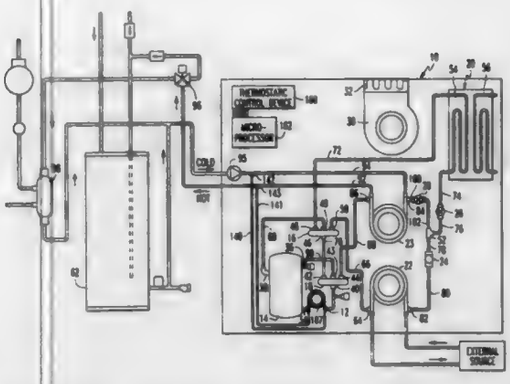
David I. McCahill, Champion, and Gary E. Valli, Export, both of Pa., assignors to Hydro Delta Corporation, Monroeville, Pa.

Filed Jun. 1, 1994, Ser. No. 252,104

Int. Cl.[6] F25B *29/00*

U.S. Cl. 62—127 **29 Claims**

1. An improved heat pump unit for heating and cooling a conditioned space and for heating potable water, said heat pump unit of the type having a recirculating refrigerant, a compressor, a refrigerant-air heat exchanger, and an external source-refrigerant heat exchanger interconnected to recirculate said refrigerant and transfer heat from a low temperature reservoir to a higher temperature reservoir, wherein the improvement comprises:



a desuperheater adapted to be connected to a reservoir of potable water through inlet and outlet pipes for passage and heating of potable water therethrough;

a refrigerant-potable water heat exchanger adapted to be connected to a reservoir of potable water through inlet and outlet pipes for passage and heating of potable water therethrough;

a valve means,

(a) when positioned for a dedicated potable water heating cycle, for circulating refrigerant from said compressor to at least one of said refrigerant-potable water heat exchanger and said desuperheater to heat potable water passing therethrough, and for then circulating said refrigerant to said external source-refrigerant heat exchanger for return to said compressor, and

(b) when positioned for a combination potable water heating and space conditioning cycle, for circulating refrigerant from said compressor to said desuperheater to heat potable water passing therethrough, and for then circulating said refrigerant to either said refrigerant-air heat exchanger to said external-source refrigerant heat exchanger for return to said compressor for a space heating cycle or to said external source-refrigerant heat exchanger to said refrigerant-air heat exchanger for return to said compressor for a space cooling cycle, and

(c) when positioned for a dedicated space cooling cycle, for circulating refrigerant from said compressor to said external source-refrigerant heat exchanger and then to said refrigerant-air heat exchanger for return to said compressor, and

(d) when positioned for a dedicated space heating cycle, for circulating refrigerant from said compressor to said refrigerant-air heat exchanger and then to said external source-refrigerant heat exchanger for return to said compressor;

a sensory network for sensing various operational parameters of said heat pump unit; and

a microprocessor, said microprocessor including a means for sensing a temperature of said reservoir of potable water and a means for sensing a temperature of said conditioned space and a means for processing and storing inputs from said sensory network, said microprocessor prioritizing simultaneous or non-simultaneous demands for potable water heating and space cooling or space heating, and activating said valve means to select between said dedicated potable water heating cycle, said combination potable water heating and space conditioning cycle, said dedicated space heating cycle and said dedicated space cooling cycle based upon said temperature of said reservoir of potable water, said temperature of said conditioned space and said operational parameters.

5,465,589

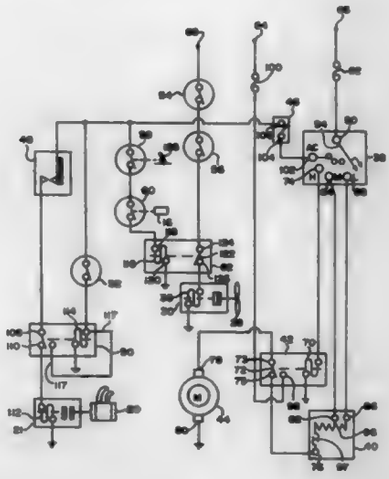
IDLE AUTOMATED A/C SYSTEM

Burnell L. Bender, Woodburn, and Brian P. Marshall, Fort Wayne, both of Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Continuation-in-part of Ser. No. 117,476, Sep. 7, 1993, abandoned. This application Jul. 21, 1994, Ser. No. 278,370

Int. Cl.[6] **F01P** *5/00;* **F25B** *39/04*

U.S. Cl. 62—133 **18 Claims**



1. In a vehicle having a heat engine for powering the vehicle, a passenger compartment, an air conditioning (A/C) system that, when selected for operation, is powered by said engine to cool said passenger compartment, heat exchange means at which heat from said engine and said A/C system is rejected to a cooling medium, fan means for moving cooling medium past said heat exchange means, and fan control means for controlling said fan means, the improvement in said fan control means which comprises:

sensing means for sensing that the vehicle is parked; and

means operatively coupled with said sensing means for causing, when said A/C system is selected for operation, said fan means to move cooling medium past said heat exchange means so long as said sensing means senses that the vehicle remains parked.

5,465,590

REFRIGERANT RECLAIM WITH AIR PURGE

Leon R. Van Steenburgh, Jr., 850 E. Lane Devils Gulch Rte., Estes Park, Colo. 80517, and David S. Brainard, Aurora C0, assignors to Leon R. Van Steenburgh, Jr., Estes Park, Colo.

Continuation-in-part of Ser. No. 7,500, Jan. 22, 1993, Pat. No. 5,291,743, which is a continuation of Ser. No. 332,235, Mar. 31, 1989, Pat. No. 5,195,333, which is a continuation of Ser. No. 109,958, Oct. 19, 1987, abandoned. This application Mar. 7, 1994, Ser. No. 207,787

The portion of the term of this patent subsequent to Mar. 8, 2011, has been disclaimed.

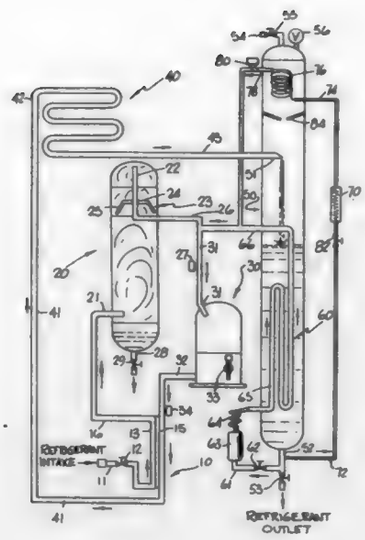
Int. Cl.[6] **F25B** *43/04*

U.S. Cl. 62—195 **6 Claims**

1. In a refrigeration system having a vaporized refrigerant and a noncondensable gas in a gaseous mixture above a liquid refrigerant within a storage tank, an air purge system comprising:

(a) means, including expansion means, for feeding liquid refrigerant from said refrigeration system into an evaporator, and an outlet conduit in fluid communication with said evaporator for returning refrigerant to the refrigeration system,

(b) means for bringing said gaseous mixture into contact with the evaporator, thereby condensing at least a portion of said



vaporized refrigerant out of the gaseous mixture and increasing the concentration of said noncondensable gas within the gaseous mixture,

(c) an air outlet in fluid communication with said evaporator for releasing the gaseous mixture out of the refrigeration system,

(d) an insulated enclosure, at least a substantial portion of the top and sides of said evaporator being enclosed therein, and

(e) isolation means for at least partially isolating the evaporator from the storage tank,

wherein the evaporator is held within the storage tank above the liquid refrigerant, and said isolation means includes a baffle disposed within the storage tank between the evaporator and the liquid refrigerant, said baffle having an opening for admitting the gaseous mixture.

5,465,591

DUAL EVAPORATOR REFRIGERATOR WITH NON-SIMULTANEOUS EVAPORATOR

Nihat O. Cur, Royalton Township, Berrien County; Steven J. Kuehl, Lincoln Township, Berrien County; Jatin C. Khanpara; Douglas D. LeClear, both of St. Joseph Township, Berrien County, and James R. Peterson, Lincoln Township, Berrien County, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation-in-part of Ser. No. 930,968, Aug. 14, 1992, abandoned. This application Jun. 21, 1993, Ser. No. 80,279

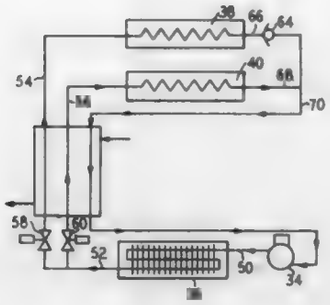
Int. Cl.[6] F25D *11/04*; **F25B** *5/00*

U.S. Cl. 62—439 **20 Claims**

1. A refrigeration appliance having at least two refrigeration compartments, each compartment having its own access door, comprising:

a first evaporator for said first compartment, said first evaporator operating at a first pressure level;

a second evaporator for said second compartment, said second evaporator operating at a pressure level higher than said first pressure level;



a single condenser;

a single compressor;

a refrigerant circuit comprising a series of conduits for providing a flow of refrigerant in a non-simultaneous manner to said first and second evaporators, said condenser and compressor;

valve means in said refrigerant circuit for directing refrigerant to a selected one of said evaporators from said condenser and for preventing a flow of refrigerant into said first evaporator when refrigerant is being directed into said second evaporator to cool said second compartment; and

means in said refrigerant circuit for evacuating refrigerant from said first evaporator after termination of flow of refrigerant to said first evaporator.

5,465,592

Patent Not Issued For This Number

5,465,593

ACUPUNCTURE POINT PUNCTURING NEEDLE AND PIERCED EARRING

Katsuya Takasu, 124-1 Aza-kamigochu, Oaza-akabane, Ishiki-cho, Hazu-gun, Aichi-ken, Japan

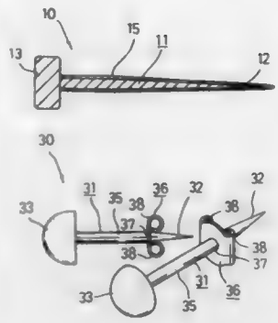
Filed Jul. 15, 1993, Ser. No. 91,273

Claims priority, application Japan, Jun. 11, 1993, 5-166311

Int. Cl.[6] A44C *7/00*

U.S. Cl. 63—12 **11 Claims**

1. A pierced earring, comprising:



a pin body of a magnetized metal which can be inserted in a pierced hole of an earlobe and which is coated with a synthetic resin layer; and

a retainer which holds the pin body.

5,465,594

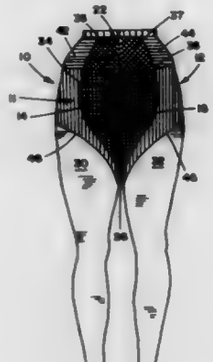
PANTY GARMENT AND METHOD FOR FORMING SAME

Walter H. Imboden, Burlington; Jonathan M. Myers, Winston-Salem, and Donald M. Caudle, Lewisville, all of N.C., assignors to Sara Lee Corporation, Winston-Salem, N.C.

Filed Aug. 8, 1994, Ser. No. 287,542

Int. Cl.[6] A41B *9/08*; D04B *11/00*; A41C *1/00*

U.S. Cl. 66—177 **8 Claims**



1. A panty garment having a panty and a waist portion comprising first and second circularly and oppositely configured knit tubes disposed side-by-side and slit at least along part of their length and joined at pairs of the edges thus formed to provide a front panty section with front panty portions extending generally downwardly from the waist portion to the joined edges and a rear panty section with rear panty portions extending downwardly from the waist portion to the joined edges, and lateral portions extending downwardly from the waist portion and each extending between a front portion on one side and a rear portion at that side, the oppositely configured knit tubes, when joined, forming a front panty section having a first shaped configuration and a back panty section having a different shaped configuration, the joined panty front and rear portions and the joined lateral portions having a multiplicity of courses of knitting, the yarns of the multiplicity of courses of the front and back panty portions being knit of different stitch patterns so that more vertical stretch is experienced in the rear panty section than in the front panty section when the garment is worn wherein the front panty portions extend generally in an S-shaped downwardly from the waist portion to the joined edge and wherein the rear panty portions extend downwardly and generally arcuately from the waist portion to the joined edges.

5,465,595

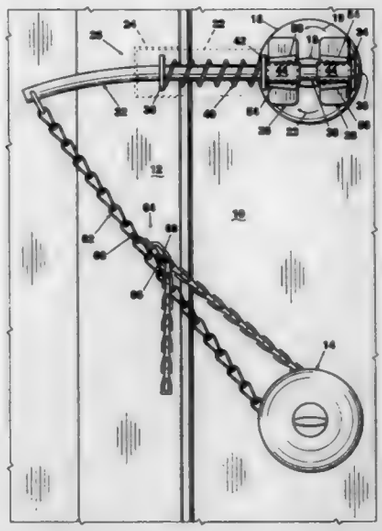
DEAD BOLT PASS KEY LOCK

Harold A. Sheppard, P.O. Box 1401, Inola, Okla. 74036

Filed May 31, 1994, Ser. No. 253,012

Int. Cl.[6] E05B *13/08*

U.S. Cl. 70—416 **6 Claims**



1. A dead bolt pass key lock for a door having inner and outer sides and having a dead bolt lock disposed above a doorknob assembly, said dead bolt having a manually operated knob having opposing end portions spaced from the inner side of the door, said knob being angularly rotatable between a dead bolt plunger thrown door locked position and a dead bolt plunger retracted door unlocked position, the improvement comprising:

an elongated support having opposite end portions;

dual sleeve means including a pair of dual sleeve members having respective confronting end surfaces slidably mounted on one of said opposite end portions of said support for movement toward and away from each other and surrounding opposing end portions of the dead bolt knob,

each dual sleeve member of said pair of dual sleeve members comprising superposed sleeves having a wall portion in common;

resilient means for biasing said sleeve means toward each other; and,

a flexible connecting means conected between the other of said opposite end portions of said support and said doorknob assembly for preventing the dead bolt knob being moved from a door locked position to an unlocked position.

5,465,596

KEY RING

James I. Park, 18511 Egret Bay No. 402, Houston, Tex. 77058

Filed Jan. 17, 1995, Ser. No. 373,563

Int. Cl.[6] A44B *15/00*

U.S. Cl. 70—458 **4 Claims**

1. A key ring formed from a continuous length of pliant spring wire of circular transverse cross section in a first configuration comprising:

a first helical spiral about a first axis forming a single coil defining a large outer loop of said key ring, said outer loop having a free end portion adapted to receive a key which has a wire accommodating hole therein whereby a plurality of keys may be mounted on said outer wire loop;

a second helical spiral continuing from said large outer loop and formed about a second axis within said large outer loop in substantially parallel relation to said first axis wherein said second helical spiral forms a first coil defining a smaller inner loop having a first arcuate locking portion thereof in overlying

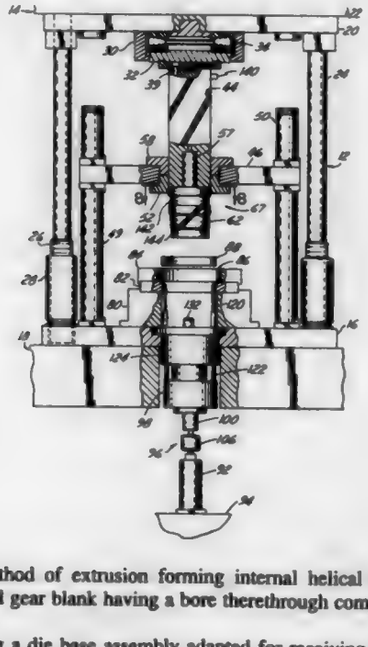
abutting relation to the free end portion of said large outer loop along the length thereof, said second helical spiral further including a second arcuate locking portion continuing from said inner coiled loop in overlying abutting relation to the upper inner surface of said first arcuate locking portion along the length thereof, said arcuate locking portions of wire forming an external locking groove adapted to receive the free end portion of said outer loop of wire which by the pliancy of said wire is adapted to be placed and seated in said groove and thereby reform said wire in a second configuration for lockingly retaining keys on said outer loop, said free end portion being readily releasable from said locking groove by squeezing said inner wire loop toward a portion of the outer wire loop which is remote from said free end portion to thereby facilitate removal of keys from said key ring.

5,465,597

EXTRUSION FORMING OF INTERNAL HELICAL SPLINES

Alexander Bajraszewski, Richmond; David H. Dodds, South Lyon; Charles E. Muessig, Novi, and Vijay Nagpal, Westland, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 18, 1994, Ser. No. 276,590
Int. Cl.[6] B21K *1/30*
U.S. Cl. 72—19 **18 Claims**



1. A method of extrusion forming internal helical teeth in a through end gear blank having a bore therethrough comprising the steps of:

providing a die base assembly adapted for receiving and aligning the gear blank;

providing a lead bar concentrically located relative to the die base assembly;

providing an extrusion mandrel assembly having helical die teeth on its external surface;

providing a chuck, coupled to the lead bar, releasably attached to the mandrel assembly;

placing the gear blank in the die base;

moving the mandrel assembly axially into the bore of the gear blank while rotating the mandrel until the mandrel assembly passes through the gear blank so as to extrude internal teeth in the gear blank, thereby forming an internal helical gear;

stopping movement of the mandrel assembly;

releasing the mandrel assembly from the chuck;

pulling the lead bar axially out of the gear;

ejecting the internal helical gear from the die base; and

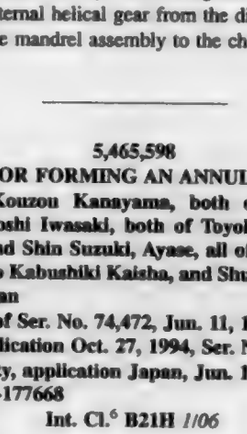
re-attaching the mandrel assembly to the chuck.

5,465,598

METHOD FOR FORMING AN ANNULAR MEMBER

Yukio Hirai; Kouzou Kanayama, both of Nagoya; Kenji Yoshii; Kiyotoshi Iwasaki, both of Toyohashi; Isao Kanai, Yokohama, and Shin Suzuki, Ayase, all of, Japan, assignors to Topy Kogyo Kabushiki Kaisha, and Shunso Ishihara, both of Tokyo, Japan

Continuation of Ser. No. 74,472, Jun. 11, 1993, abandoned. This application Oct. 27, 1994, Ser. No. 329,783
Claims priority, application Japan, Jun. 12, 1992, 4-177667; Jun. 12, 1992, 4-177668
Int. Cl.[6] B21H *1/06*
U.S. Cl. 72—84 **15 Claims**



1. A method for forming an annular member comprising the following steps of:

providing an annular member having a starting configuration; and

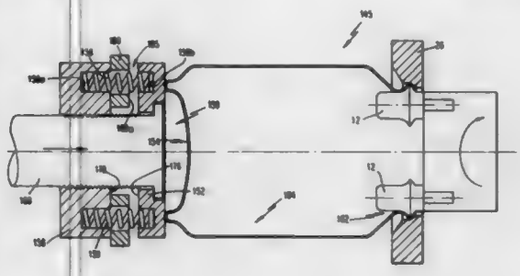
oscillation-forming the annular member from the starting configuration to an objective configuration by placing the annular member in a starting position on a first die, which includes a portion smoothly changing in diameter between a first diameter larger than a diameter of the annular member and a second diameter smaller than the diameter of the annular member, and then causing the first die to relatively approach a second die which inclines with respect to the first die by a predetermined angle thereby causing the annular member to incline relative to the first die and oscillating the second die relative to the first die wherein the annular member slides axially relative to the first die and the second die to an objective position such that axially opposed ends of the annular member are formed simultaneously so that one of the opposed ends of the annular member is enlarged in diameter by one of the first and second dies and the other of the opposed ends of the annular member is reduced in diameter by the other of the first and second dies.

5,465,599

CAN FLANGER HAVING BASE PAD WITH STOP SPACER ARRANGEMENT DETERMINING A WORKING SPRING GAP

Harry W. Lee, Jr., Chesterfield County, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed May 13, 1994, Ser. No. 242,493
Int. Cl.[6] B21D *19/04*
U.S. Cl. 72—94 20 Claims



1. A flanging apparatus, comprising:

(a) at least one flanging head assembly for forming a peripheral outwardly directed flange in a free edge portion of a can having a cylindrical can body, said assembly including a plurality of flanging rollers having profiled flange forming surfaces adapted to receive said free edge portion and spin same in a radially outward direction during relative axial movement of said free edge portion toward and against progressively larger diameter portions of said forming surfaces; a housing arrangement for mounting said flanging rollers about a central longitudinal axis thereof; a spinning arrangement for revolving said rollers about said central longitudinal axis to create spinning contact with said relatively axially advancing free edge portion, and a stop ring having a stop surface mounted adjacent a trailing end of said forming surfaces to contact the free edge of the flange as it moves off the forming surfaces to limit the diameter of the flange; and

(b) a spring loaded base pad assembly including a base pad adapted to contact the can bottom, a spring pad adjusting collar interconnected to the base pad through at least one spring having a predetermined spring force, and a spindle connected to the spring pad adjusting collar and being operable to axially advance the open end of the can body in a forward stroke of the spindle into flanging contact with the flanging rollers by advancing the base pad with the can bottom seated thereon toward the flanging head assembly;

wherein said spring-loaded base pad assembly further includes a stop spacer, mounted between the adjusting collar and the base pad to define a gap therebetween,

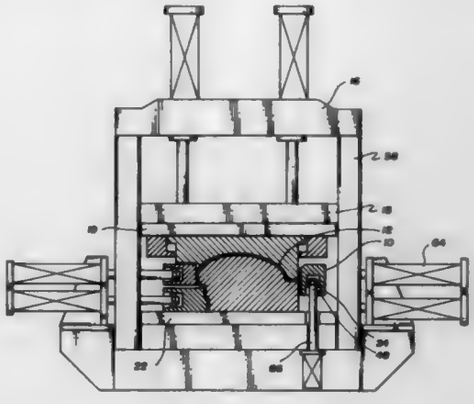
said predetermined spring force being normally sufficient during the forward stroke to urge the free edge portion of the can into contact with both the stop ring and into full contact with the profiled flange forming surfaces, without the gap being completely closed so as to form the flange, said spacer being dimensioned to close the gap during the forward stroke when said predetermined spring force is insufficient to urge the free edge portion into contact with both the stop ring and into full contact with the profiled flange forming surfaces, so that the base pad is directly moved by the spacer to deflect the free edge portion into sufficient contact with the flange forming surfaces such that the predetermined spring force is now operable to urge the free edge portion into said full contact.

5,465,600

DIE ASSEMBLY

Kenneth H. Goff, Jr., Plymouth, and William E. Schultz, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 20, 1994, Ser. No. 246,589
Int. Cl.[6] B21D *37/00*
U.S. Cl. 72—309 14 Claims



1. A die assembly for shaping a workpiece the die assembly comprising:

a die shoe attached to a bolster of a press, the die shoe defining a channel therewithin;

a hollow die head adapted to move within the channel, the die head having

a wall with an outer surface which slidably cooperates with the channel;

an axially extending chamber delimited by the wall; and

one or more passages disposed through the wall;

a locking member positionable within each passage, each of the one or more passages being provided with a reduced diameter throat portion which retains the locking members within the associated passage when the shaft is retracted; and

a shaft for transmitting a shaping force to the workpiece, the shaft having

a head portion that is locatable within the chamber, the head portion defining an annular groove, the groove being adapted to seat the locking members when the shaft retreats so that the die head and the shaft move in unison, the locking members disengaging from the shaft during retraction thereof, thereby unlocking the die head in relation to the shaft.

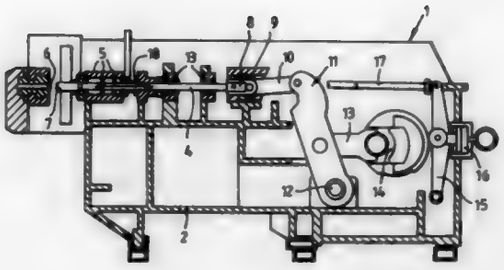
5,465,601

RAM FOR LONG STROKE PRESS

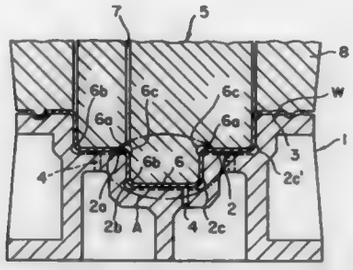
Frederick W. Jowitt, Yorkshire, and Paul Simms, West Yorkshire, both of, England, assignors to Carnaudmetalbox plc, United Kingdom

Filed Jan. 11, 1994, Ser. No. 179,915
Claims priority, application United Kingdom, Jan. 26, 1993, 9301488
Int. Cl.[6] B21D *37/01*
U.S. Cl. 72—347 43 Claims

1. A press for drawing hollow articles from sheet metal, comprising a frame to support a press tool, a ram movable towards and away from the tool support, bearings which support the ram, wherein the ram comprises a metal sleeve; a hollow core, made of a material lighter than that of the sleeve, fitted in the sleeve; a first metal end piece adapted for coupling to driving means attached to one end of ram; a second metal end piece adapted to support a punch attached to the other end of the ram, and adhesive means for attaching said metal end pieces to said hollow core.



5,465,602
PRESS DIE ASSEMBLY
Kenichi Hashimoto, Ootzumi; Toshio Maehara; Yasuo Imaizumi, both of Oota, and Tetsuo Asai, Azuma, all of, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 120,455, Sep. 14, 1993, Pat. No. 5,398,572.
This application Dec. 13, 1994, Ser. No. 357,211
Claims priority, application Japan, Sep. 18, 1992, 4-249208
Int. Cl.[6] B21D *22/00;22/20;22/22*
U.S. Cl. 72—347 2 Claims



1. A press die assembly for transforming a sheet material into a desired shape of a product by press working thereof comprising

a punch and a die,

a side wall portion provided in said die to form a recessed surface portion for slidably receiving said punch via said sheet material and for entirely surrounding a periphery of said punch;

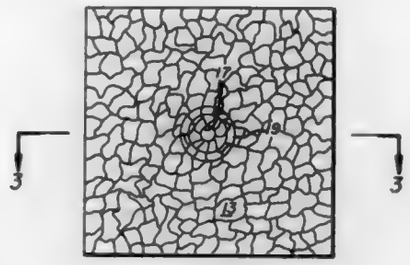
a bottom surface provided at said recessed surface portion of said die and connected to a lower end of said side wall portion for receiving a lower end portion of said punch via said sheet material; and

a corner portion interposed between said side wall portion and said bottom surface and provided with a groove whereby clearance space is provided for a cutting tool while finish machining each of said side wall portion and said bottom surface so as to easily and accurately operate said tool and to avoid interference with the punch at the corner portion.

5,465,603
OPTICALLY IMPROVED DIAMOND WIRE DIE
Thomas R. Anthony, Schenectady, N.Y.; Bradley E. Williams, Worthington, Ohio, and Karen M. McNamara, Clifton Park, N.Y., assignors to General Electric Company, Worthington, Ohio
Filed Nov. 5, 1993, Ser. No. 148,803
Int. Cl.[6] B21C *3/02*
U.S. Cl. 72—467 5 Claims

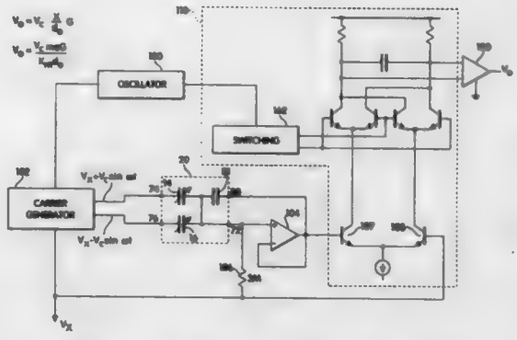
1. A die for drawing wire comprises

(1) a substantially transparent polycrystalline CVD diamond body having a thermal conductivity greater than 4 watts/cm-k and a uniform small diamond grain structure of less than about 5 microns throughout its cross section and an opening for receiving wire fed through said opening during drawing, and



(2) a support body for supporting the diamond body, whereby the wear resistance of said die is substantially improved.

5,465,604
METHOD FOR ADJUSTING SENSITIVITY OF A SENSOR
Steven J. Sherman, Andover, Mass., assignor to Analog Devices, Inc.
Division of Ser. No. 28,922, Mar. 4, 1993, Pat. No. 5,345,824, which is a continuation of Ser. No. 569,080, Aug. 17, 1990, abandoned. This application Apr. 12, 1994, Ser. No. 226,771
Int. Cl.[6] G01L *25/00*
U.S. Cl. 73—1 DV 3 Claims



1. A method for adjusting the full scale sensitivity of a capacitance-type acceleration sensor, said sensor comprising first and second capacitors, each having first and second electrodes, said first electrode of said first capacitor being coupled electrically to said first electrode of said second capacitor, forming a differential capacitor arrangement;

in each of the capacitors, a first one of the electrodes being substantially stationary and a second one of the electrodes being moveable in response to applied acceleration, whereby an accelerative force causes said moveable electrodes to move relative to said substantially stationary electrodes and alter the capacitance between each of said moveable electrodes and said corresponding substantially stationary electrodes,

resolving circuitry coupled to said moveable and substantially stationary electrodes for generating in response to movement of said moveable electrodes a signal indicative of acceleration, said resolving circuitry comprising:

means for generating first and second sinusoidal signals of equivalent amplitude and frequency and 180° out of phase with each other;

means for supplying said first sinusoidal signal to said first capacitor,

means for supplying said second sinusoidal signal to said second capacitor,

a buffer amplifier having an input coupled to said first and second capacitors and an output,

a demodulator having an input coupled to said output of said buffer amplifier and an output,

an output amplifier coupled to said output of said demodulator and having an output, and

a first resistor having a first terminal coupled to said output of said output amplifier and a second terminal coupled, through a second resistor, to said first electrodes of said capacitors,

comprising the steps of:

1) applying a specified voltage at said second terminal of said first resistor,

2) measuring an output voltage at said first terminal of said first resistor resulting from step (1),

3) changing the amplitude of the carrier signals so as to simulate a displacement of said second electrodes relative to said first electrodes,

4) measuring the resulting voltage change, ΔV_{01}, at said first terminal of said first resistor,

5) calculating a gain factor, G, based on the voltage change measured in step (4),

6) measuring a beam resonant frequency, fo,

7) calculating a capacitor gap value, between said electrodes of said capacitors for said acceleration sensor,

8) calculating a preliminary sensitivity, of said acceleration sensor, and

9) trimming said resolving circuitry based on said preliminary sensitivity so as to set a final full scale sensitivity of said acceleration sensor.

5,465,605

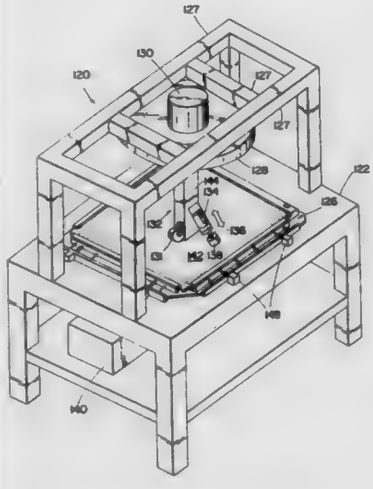
FLOOR COVERING FOOT IMPACT SIMULATOR

Gary W. H. Smith, and Garrick D. S. Smith, both of 7678 State Hwy. 89, Columbus, Wis. 53925

Filed Jul. 19, 1993, Ser. No. 93,865

Int. Cl.[6] G01N *3/56*

U.S. Cl. 73—7 **14 Claims**



1. A carpet wear testing apparatus, comprising:

(a) a frame;

(b) a table mounted on the frame;

(c) a bidirectional tensioning clamp mounted to the table, the clamp providing adjustable tensioning force along two directions for holding a carpet test specimen in a selected state of planar tension adjacent a backing material that is not placed in tension;

(d) at least one displacement detector mounted on the table and linked to the test specimen for detecting stretching in the test specimen;

(d) an impactor mounted to the frame, the impactor having a reciprocating heel for repetitively engaging the test specimen; and

(f) means for recording the stretching of the test specimen as detected by the displacement detector with respect to the number of repetitive engagements of the test specimen by the shoe.

5,465,606

SYSTEM FOR MEASURING THE EFFICIENCY OF HYDROCARBON VAPOR RECOVERY INSTALLATIONS USED IN GAS STATIONS

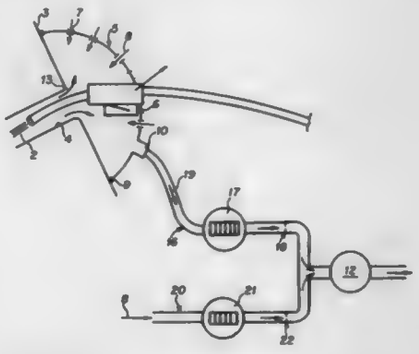
Sylvain Janssen, Neuilly s/Seine, and Jean-Pierre Campain, Clamart, both of, France, assignors to Schlumberger Industries, Montrouge, France

Filed Jul. 8, 1993, Ser. No. 88,871

Claims priority, application France, Jul. 9, 1992, 92 08657

Int. Cl.[6] B67D *5/378*

U.S. Cl. 73—23.2 **5 Claims**



1. A system for measuring the relative mass efficiency of installations for recovering hydrocarbon vapors while filling the tank of a vehicle, comprising:

one box for housing a nozzle and for placement over a filler neck of the tank,

a first conduit connected at one end to said box and at a second end to a pump provided for withdrawing hydrocarbon vapor mixed with air from said box, said first conduit having a first restriction and a first gas flow meter provided for measuring flow q_v of said hydrocarbon vapor mixed with air,

a second conduit opened at one end to ambient air and at a second end to said pump, said second conduit having a second restriction, identical to said first restriction, and a second gas flow meter provided for measuring flow q_{wo} of ambient air,

means for calculating the integral

$$i = \int_0^t (q^2_{wo}/q^2_v - 1) q_v dt$$

from the values of flows q_v and q_{wo} respectively measured by said first and second gas flow meters.

5,465,607

EXPLOSIVE DETECTION SCREENING SYSTEM

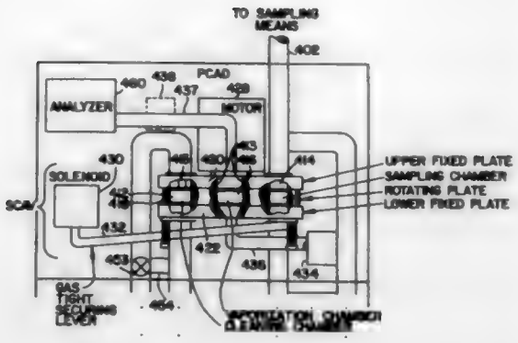
Colin Corrigan, and Lawrence Haley, both of Ottawa, Canada, assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Division of Ser. No. 859,509, Aug. 8, 1992, which is a continuation-in-part of Ser. No. 447,724, Dec. 8, 1989, Pat. No. 4,987,767, which is a continuation-in-part of Ser. No. 364,663, Jun. 9, 1989, abandoned. This application Apr. 7, 1994, Ser. No. 224,230

Int. Cl.[6] B01D *59/44;* **H01J** *49/04;* **G01K** *19/00*

U.S. Cl. 73—23.36 **36 Claims**

1. A high duty cycle system for vaporizing and detecting volatile or non-volatile molecules of interest at a predetermined frequency, said system comprising:



(a) a sampling means for periodically gathering a sample volume of air from a specific area on or near an individual or object during each sampling period;

(b) a sample collection and analysis subsystem for collecting target particulates contained in said sample volume of air, said sample collection and analysis subsystem including:

(i) at least one reusable filter element for retaining target particulates contained in said sample volume of air;

(ii) a collection chamber for receiving said sample of air, said collection chamber adapted to sequentially receive at least one of said at least one reusable filter element during each said sampling period and to enable said reusable filter element to retain said target particulate during said sampling period;

(iii) a vaporization chamber adapted to sequentially receive said at least one reusable filter element, said vaporization chamber having a means for heating said at least one reusable filter element to flash vaporize the retained target particulates into a vapor sample for analysis and entraining said molecules of interest in a moving pulse of heated carrier gas;

(c) a detector means for detecting said molecules of interest and generating an output signal with respect thereto; and

(d) control means for synchronizing the means for flash vaporization with the selection of data from said output signal to thereby optimize detection of selected molecules of interest.

5,465,608

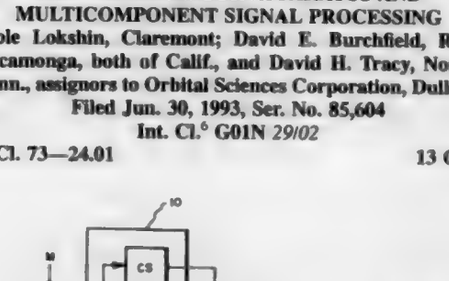
SAW VAPOR SENSOR APPARATUS AND MULTICOMPONENT SIGNAL PROCESSING

Anatole Lokshin, Claremont; David E. Burchfield, Rancho Cucamonga, both of Calif., and David H. Tracy, Norwalk, Conn., assignors to Orbital Sciences Corporation, Dulles, Va.

Filed Jun. 30, 1993, Ser. No. 85,604

Int. Cl.[6] G01N *29/02*

U.S. Cl. 73—24.01 **13 Claims**



1. A method for detecting and determining the concentration of at least one target compound in a vapor mixture of compounds of unknown concentrations comprising the steps of:

providing a pair of vapor responsive sensors whose average one cycle frequency response to a unit concentration of a selected vapor is known;

subjecting said vapor responsive sensors to a mixture of compounds of unknown concentrations which provide a frequency shift from said average frequency response to a second frequency response as a result of said mixture on said vapor responsive sensors; and

processing this frequency shift by multidimensional statistical methods to detect the target compound and determine its concentration.

5,465,609

APPARATUS FOR STUDY OF GAS MIGRATION IN CEMENT SLAG

Jacques Romieu, Bailly; Didier Degouy, Houilles; Philippe Parigot, Chevreuse, and Michel Hourcard, Paris, all of, France, assignors to Total, Puteaux, France

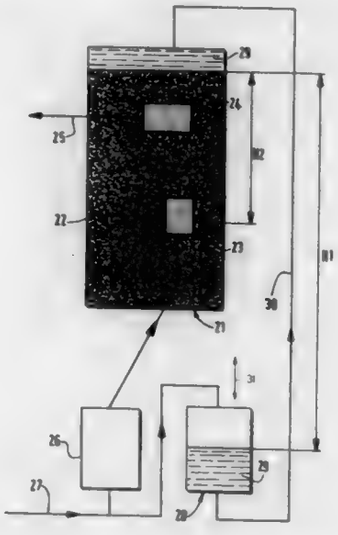
Filed Jun. 7, 1994, Ser. No. 257,091

Claims priority, application France, Jun. 7, 1993, 93 06768

Int. Cl.[6] G01N *15/08*

U.S. Cl. 73—38 **4 Claims**

1. An apparatus for studying gas migration during the cementation of a pipe in a well, said apparatus comprising:



a) a cell (**21**) adapted to be filled at least partially with a slag (**22**) to be used during cementation;

b) a first strainer (**23**) made of a sintered material which simulates a formation disposed at a first level in the cell;

c) a second strainer (**24**) made of a sintered material disposed in the cell at a second level higher than the first level, and connected to a gas-detection apparatus, the two levels at which the two strainers are positioned being such that they are embedded in the slag being studied;

d) a pressurized gas source (**27**) connected to the first strainer, and to a tank (**28**) partially filled with water (**29**), a water-gas interface in the tank being located at a level lower than that of the first strainer; and

e) means (**30**) connecting a part of the tank (**28**) filled with water to an upper part of the cell, above an upper level of the slag (**22**).

5,465,610

DEVICE FOR THE CHARACTERIZATION OF THE FOAMING PROPERTIES OF A PRODUCT WHICH IS AT LEAST PARTIALLY SOLUABLE

William G. Loisel, Nantes, France, assignor to Institut National de La Recherche Agronomique, France

PCT No. PCT/FR92/00509, § 371 Date Dec. 7, 1993, § 102(e) Date Dec. 7, 1993, PCT Pub. No. WO92/22799, PCT Pub. Date Dec. 23, 1992

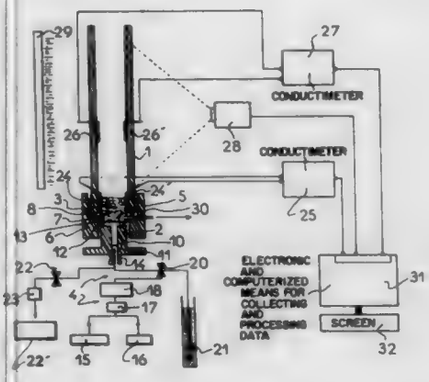
PCT Filed Jun. 5, 1992, Ser. No. 162,061

Claims priority, application France, Jun. 11, 1991, 9107269

Int. Cl.[6] G01N *13/00*

U.S. Cl. 73—60.11 8 Claims

1. A device for the characterization of the foaming properties of



a product at least partially soluble in a liquid comprising a transparent analysis column provided at its base with a porous filter to allow homogeneously introduction of a gas flow through the column to effect foaming of the product located at the base of the analysis column characterized in that it further comprises an automatic measuring system for determining the foam height in the column, an automatic measuring system for determining the volume of product to form the foam, means for visualizing and/or processing the measured data of these measuring systems, and a gas flow distribution system wherein the gas flow is distributed by a valve whose closing effects gas injection through the filter and whose opening effects connection with a device with a liquid column to provide back pressure through the filter to avoid drainage and percolation of product through the filter.

5,465,611

SENSOR HEAD FOR USE IN ATOMIC FORCE MICROSCOPY AND METHOD FOR ITS PRODUCTION

Alexander Ruf; Michael Abraham; Manfred Lacher, all of Mainz; Thomas Zetterer, Schwabenheim, and Thomas R. Dietrich, Frankfurt, all of, Germany, assignors to IMM Institut Fur Mikrotechnik GmbH, Germany

Filed Mar. 30, 1994, Ser. No. 220,157

Claims priority, application Germany, Mar. 30, 1993, 43 10 349.9

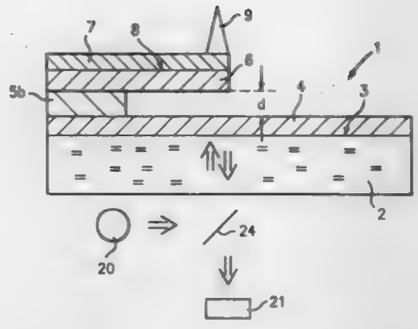
Int. Cl.[6] G01B *9/00*

U.S. Cl. 73—104 20 Claims

1. Sensor head, in particular for atomic force microscopy, comprising: a carrier element and a spring arm, wherein the spring arm is attached to the carrier element and extends at a distance over the carrier element,

wherein the spring arm is connected to the carrier element via at least one spacer consisting of a layer of defined thickness d, and

wherein the thickness d of the spacer layer(s) is an odd multiple of $\lambda/4+\phi$, wherein λ is the wavelength of electromagnetic radiation directed onto the sensor head and ϕ is a material-dependent, fixed phase shift.



5,465,612

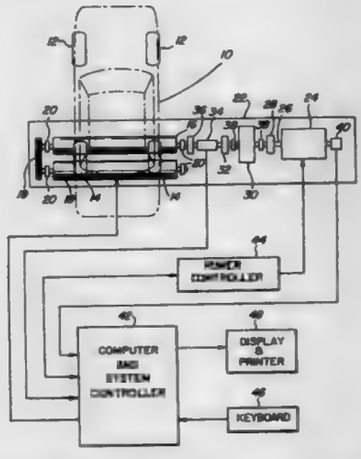
METHOD AND APPARATUS FOR TESTING MOTOR VEHICLES UNDER SIMULATED ROAD CONDITIONS

John T. La Belle, Long Beach, Calif., assignor to Clayton Industries, El Monte, Calif.

Filed Jun. 16, 1994, Ser. No. 260,887

Int. Cl.[6] G01L *3/22*

U.S. Cl. 73—117 21 Claims



1. A dynamometer apparatus for simulating an inertia and road load for a motor vehicles having at least one front and one rear wheel with at least one of the wheels being driven, comprising:

at least one roll for engaging the driven wheel of the vehicle;

a power supplying and/or absorbing unit, PAU, coupled to a driven roll, the driven roll applying a force to or receiving a force from an associated wheel in accordance with a power supplied or absorbed by the PAU;

force sensing means coupled to the driven roll, for providing a measured force signal Fm which is a function of the force supplied to or received from the vehicle wheel by the roll minus and the force attributable to parasitic losses associated with a dynamometer, the force attributable to the out-of-loop inertia of the dynamometer;

velocity sensing means coupled to the driven roll, for providing a measured speed signal Va which is a function of the speed of the roll and vehicle;

means for generating a vehicle inertia signal Iv which is a function of the force attributable to the inertia to be simulated for the vehicle being tested;

means for generating a road load signal RL which is a function of road load load forces for the vehicle;

means for generating a dynamometer parasitic loss signal PL which is a function of the force attributable to the parasitic losses of the dynamometer;

means responsive to the velocity signal, the measured force signal, the parasitic loss signal, the inertia signal and the road load signal for providing a velocity error signal Ve;

means responsive to at least the velocity signal and the inertia signal for providing a feed-forward signal Fs representative of at least a portion of the simulated inertial force required from the PAU; and

means responsive to the velocity error signal and the feed-forward signal for controlling the PAU.

5,465,613

SELF-DIAGNOSING APPARATUS FOR MOTOR VEHICLES

Katsumi Takaba, Obu, and Shuichi Fujisawa, Kariya, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

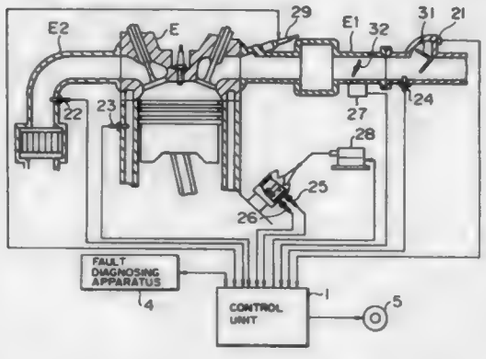
PCT No. PCT/JP93/01025, § 371 Date Apr. 8, 1994, § 102(e) Date Apr. 8, 1994, PCT Pub. No. WO94/04808, PCT Pub. Date Mar. 3, 1994

PCT Filed Jul. 22, 1993, Ser. No. 211,634

Claims priority, application Japan, Aug. 11, 1992, 4-235349

Int. Cl.[6] G01M *15/00*

U.S. Cl. 73—117.3 **13 Claims**



1. A self-diagnosing apparatus for a vehicle, comprising:

diagnostic data detecting means for detecting diagnostic data necessary for analyzing malfunctions of instruments installed in said vehicle;

storing means, in which a first storage area and a second storage area are disposed so as to correspond respectively to high and low priorities of said malfunctions of said instruments installed in said vehicle so that first and second diagnostic data respectively corresponding to said high and low priorities of said malfunctions detected by said data detecting means are updated and stored in said first and second storage areas, respectively, and said stored contents of said first and second storage areas are held even when a power supply switch is in an off state;

malfunction detecting means for detecting malfunctions of said instruments installed in said vehicle;

inhibiting means for inhibiting updating and storing of said first and second diagnostic data corresponding to said high and low priorities of said malfunctions in said first and second storage areas of said storing means, respectively, when high and low priorities of said malfunctions of said instruments installed in said vehicle are detected by said malfunction detecting means, respectively; and

diagnostic data output means for outputting said stored contents of said storing means from said first and second storage areas respectively corresponding to said high and low priorities of said malfunctions.

5,465,614

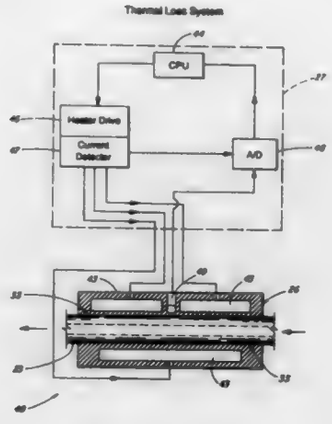
APPARATUS AND METHOD FOR NON-INTRUSIVE TESTING OF A MOTOR VEHICLE CANISTER PURGE SYSTEM

Thomas J. Fournier, Tucson, Ariz., assignor to Envirotest Systems Corp., Tucson, Ariz.

Filed Mar. 28, 1994, Ser. No. 218,281

Int. Cl.[6] G01M *15/00*

U.S. Cl. 73—118.1 **7 Claims**



1. A non-intrusive apparatus for determining an instantaneous rate of vapor flow through a purge line leading from an evaporative canister to an air/fuel intake of an engine, comprising:

a. a sensor housing, having a portion adapted for engagement with an exterior of the purge line;

b. clamping means, for temporarily securing said housing to the purge line;

c. means within said portion for measuring a vapor flow rate in proportion to changes in a temperature of the engaged purge line, said measuring means including at least one heater and at least one temperature sensor downstream from said heater, said heater and said sensor being secured in conductive relationship with the purge line.

5,465,615

LOADING ASSEMBLY FOR A VEHICLE SPINDLE TEST FIXTURE

Niel R. Petersen; Paul S. Petersen, and Joseph W. Daley, all of Minnetonka, Minn., assignors to MTS Systems Corporation, Eden Prairie, Minn.

Filed Apr. 28, 1994, Ser. No. 234,138

Int. Cl.[6] G01H *1/00;* **G01M** *19/00*

U.S. Cl. 73—118.1 **22 Claims**

1. A loading assembly used in a vehicle spindle test fixture to apply a lateral force parallel to an axis of a vehicle spindle, the loading assembly comprising:

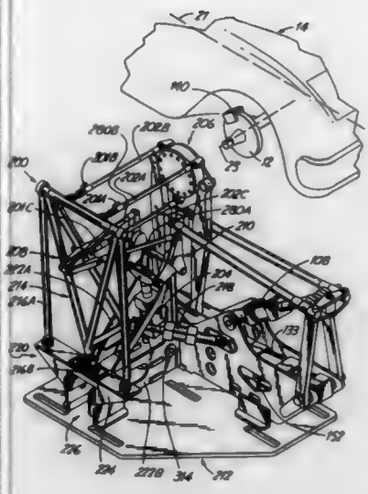
a support frame;

a wheel adapter housing mountable to the vehicle spindle;

a loading member pivotally joined to the support frame and spaced apart from the wheel adapter housing along the axis of the spindle;

a plurality of spaced apart struts connecting the loading member to the wheel adapter housing;

an actuator for applying a selected force; and connecting means for forming a pivot connection between the actuator and the loading member that is securable in one of a plurality of positions to emulate a selected rolling radius of a tire assembly mounted to the spindle.

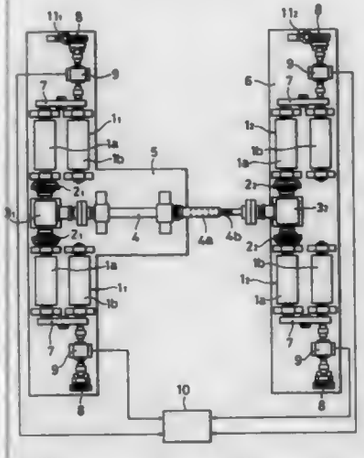


5,465,616

METHOD OF INSPECTING VARIOUS CONTROL FUNCTIONS OF A MOTORCAR

Takao Shibuyama, and Keiichiro Maekawa, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 1,292, Jan. 6, 1993, abandoned. This application Nov. 22, 1994, Ser. No. 347,178
Claims priority, application Japan, Feb. 28, 1992, 4-043997
Int. Cl.[6] G01M *15/00*
U.S. Cl. 73—118.1 3 Claims



1. A method of inspecting a plurality of control functions of a differential apparatus with a limited slip differential, a traction control system and an anti-lock brake system of a motorcar having four wheels in a condition in which the motorcar is driven while each of said four wheels is, respectively, mounted on one set of four sets of connected rolls provided in an inspection apparatus, said method comprising the steps of:

inspecting the differential apparatus with the limited slip differential mechanism by disconnecting at least one set of said four sets of rolls upon which a wheel connected to said differential mechanism to be inspected is mounted and simulating operating conditions of said differential apparatus in an accelerating process of starting and accelerating operation of the motorcar;

then reconnecting said at least one set of said four sets of rolls disconnected for said inspecting of said differential mechanism and inspecting said traction control system-by disconnecting at least one set of said four sets of rolls upon which a wheel connected to said traction control system to be inspected is mounted and simulating operating conditions of the traction control system at a time when a preset drive Speed of said wheels has been reached; and,

thereafter, reconnecting said at least one set of rolls of said four sets of rolls disconnected for said inspection of said traction control system, disconnecting all of said four sets of rolls at a time when a drive speed of the wheels has been decreased to a second set speed and inspecting the anti-locking brake system on the wheels mounted on said disconnected four sets of rolls by operating a brake of the motorcar.

2. A method of inspecting a plurality of control functions on a motorcar having four wheels, said inspection being carried out by running the motor of the motorcar while each wheel of all four wheels thereof is respectively mounted on one set of four sets of rolls provided on an inspection apparatus, comprising the steps of:

grouping said control functions into a first group having a function of accelerating at least one wheel of said four wheels and a second group, other than a brake system, having a function of decelerating at least one wheel of said four wheels;

thereafter inspecting a first control function which belongs to said first group during a process of accelerating the motorcar, while one set of rolls on which a wheel to be accelerated by the first control function is mounted is disconnected from the remaining set of rolls with the remaining of said wheels mounted thereon so that said disconnected one set of rolls is freely rotatable, said disconnected one set of rolls being reconnected to said remaining set of rolls during the step of accelerating the motorcar after said step of inspecting the control function belonging to said first group and back to a state in which all sets of rolls are connected together;

thereafter inspecting a second control function which belongs to said second group in a succeeding process of decelerating the motorcar, while one set of rolls on which a wheel to be decelerated by the second control function is mounted is disconnected from the remaining sets of rolls with the remaining of said wheels mounted thereon so that said disconnected one set of rolls with said wheel to be decelerated by said second control function mounted thereon is freely rotatable; and

thereafter inspecting the brake system while each set of rolls is disconnected from the other sets of rolls.

5,465,617

INTERNAL COMBUSTION ENGINE CONTROL

Kenneth P. Dudek, Rochester Hills; Gregory P. Matthews, Bloomfield Hills; Charles H. Folkerts, Troy, and Ronald A. Davis, Commerce Township, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 25, 1994, Ser. No. 217,824
Int. Cl.[6] G01M *15/00*
U.S. Cl. 73—118.2 8 Claims

1. A method for generating a correction factor for correcting an internal combustion engine cylinder inlet air rate estimation, comprising the steps of:

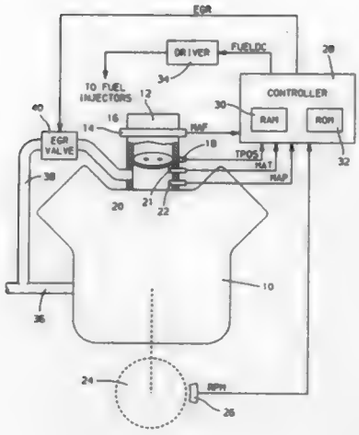
sensing engine inlet air rate;

diagnosing a steady state condition of the engine, by (a) sensing a value of a predetermined engine parameter indicative of engine intake manifold filling and depletion, (b) comparing the sensed value to a predetermined threshold value, and (c) diagnosing the steady state condition of the engine when the sensed value does not exceed the predetermined threshold value;

estimating cylinder inlet air rate when the steady state condition is diagnosed;

generating a value representing a deviation of the estimated cylinder inlet air rate away from the sensed engine inlet air rate when the steady state condition is diagnosed; and

generating a correction factor for correcting the internal combustion engine cylinder inlet air rate estimation as a predetermined function of the generated value.

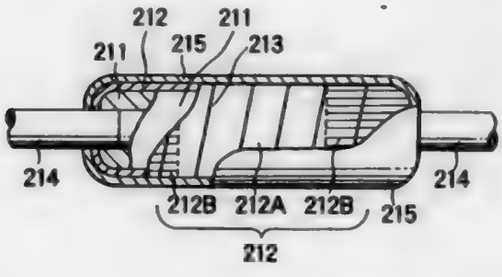


5,465,618
THERMAL FLOW SENSOR AND HEAT-SENSITIVE RESISTOR THEREFOR

Katsuaki Yasui, and Yuji Kishimoto, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 52,673, Apr. 27, 1993, abandoned.
This application Mar. 13, 1995, Ser. No. 403,133
Claims priority, application Japan, Apr. 30, 1992, 4-111535
Int. Cl.[6] G01F *1/68*
U.S. Cl. 73—204.27 **10 Claims**

1. A thermal flow sensor, comprising:



a heat-sensitive electrical resistor comprising an electrically insulating base member and a resistor element disposed thereon, the resistance of which changes with temperature at a predetermined resistance temperature coefficient;

support means for supporting said base member within a flow stream of a fluid;

a bridge circuit including said heat-sensitive resistor and a plurality of other resistors; and

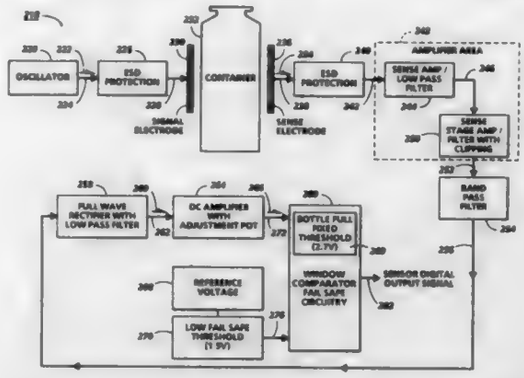
a control circuit for controlling a current in said bridge circuit in such a manner that a predetermined thermal equilibrium state is maintained and for detecting the flow of the fluid from the equilibrium state,

wherein said resistor element comprises a main section having a negative first resistance temperature coefficient and a buffer section having a positive second resistance temperature coefficient, said buffer section being positioned between said main section and said support means.

5,465,619
CAPACITIVE SENSOR

John D. Sotack, Rochester; William L. Dezen, Penfield; Lawrence R. Benedict, Rushville; Gaith O. Zayed, and Alan J. Werner, Jr., both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 118,077, Sep. 8, 1993, abandoned.
This application Aug. 12, 1994, Ser. No. 289,981
Int. Cl.[6] G01F *23/26*
U.S. Cl. 73—304 C **17 Claims**



1. An apparatus for detecting the level of material in a container, comprising:

a power source;

a first electrode, positioned adjacent the container, electrically connected to said power source;

a second electrode, spaced from said first electrode, positioned adjacent the container;

an electrical amplifier, electrically connected to the second electrode, for amplifying a current induced in said second electrode and for generating a voltage signal, said electrical amplifier maintaining said second electrode at a virtual ground to minimize environmental impedance effects;

a rectifier, electrically connected to said amplifier, for rectifying the voltage signal; and

a comparator, electrically connected to said rectifier for comparing the voltage signal to a predetermined voltage signal corresponding to the container being full with material, said comparator including a fail safe circuit that, in response to the voltage signal from said rectifier being of a voltage less than a first preselected reference voltage and less than a second predetermined voltage, generates a signal that the container is full.

5,465,620
MICROMECHANICAL VIBRATORY GYROSCOPE SENSOR ARRAY

Arthur C. Sanderson, Williamstown, Mass., and Edward W. Maby, Troy, N.Y., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Filed Jun. 14, 1993, Ser. No. 77,345
Int. Cl.[6] G01P *9/04*
U.S. Cl. 73—504 **21 Claims**

1. A micromechanical gyroscopic sensor array for detecting rotational movement, said sensor array comprising:

a plurality of vibrational microgyroscopic sensing elements fixedly oriented in a common plane relative to one another such that an in-plane direction and out-of-plane direction orthogonal thereto are defined, each microgyroscopic sensing element of said plurality of vibrational microgyroscopic sensing elements having an associated predefined out-of-plane resonant frequency;

means for driving said each microgyroscopic sensing element at a predetermined in-plane drive frequency, wherein the respective predetermined in-plane drive frequencies of said plurality of vibrational microgyroscopic sensing elements and the asso-

ciated predefined out-of-plane resonant frequencies of said plurality of vibrational microgyroscopic sensing elements are such that various frequency differences exist between the respective predetermined in-plane drive frequencies and the associated predefined out-of-plane resonant frequencies amongst said plurality of vibrational microgyroscopic sensing elements;

sensing means, associated with said each microgyroscopic sensing element of said plurality of vibrational microgyroscopic sensing elements, for sensing out-of-plane motion of said each microgyroscopic sensing element and producing a corresponding sense signal therefrom; and

signal processing means coupled to said sensing means for producing a combined signal representative of rotational movement experienced by the micromechanical gyroscopic sensor array based upon said associated sense signals produced by said sensing means from said out-of-plane motion experienced by said plurality of vibrational microgyroscopic sensing elements.

5,465,621

Patent Not Issued For This Number

5,465,622

METHOD FOR DETERMINING DEPTH VALUES OF A BODY OF WATER

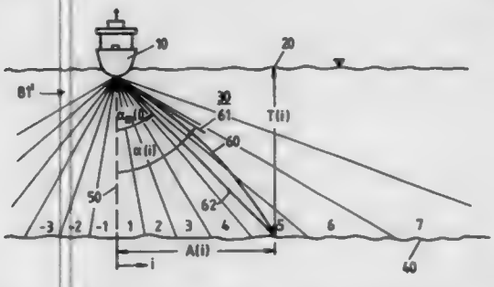
Benno Freking, Weyhe-Leeste , Germany, assignor to Atlas Elektronik GmbH, Bremen, Germany

Filed Jun. 13, 1994, Ser. No. 258,835

Claims priority, application Germany, Jun. 14, 1993, 43 19 607.1

Int. Cl.[6] G01N *9/24*

U.S. Cl. 73—597 **5 Claims**



1. A method for determining depth values of a body of water using a fan depth finder, the depth finder including a transmitting transducer, a directional receiving transducer, a velocity sensor, and data processing means for processing depth value; said method comprising the steps of:

(a) emitting pulses into the water with said transmitting transducer;

(b) receiving, with said directional receiving transducer, echo pulses that have been scattered and reflected at a floor of the body of water for a number of predetermined receiving directions i;

(c) determining, with the data processing means, the travel times of the received pulses for different receiving directions i; the actual angle $\alpha_m(i)$ from an assumed, predetermined average sound velocity c_{mw}, receiving angle $\alpha(i)$ and the sound velocity at the keel c_k which is measured with the velocity sensor; and pulse impact distances A(i) from the average sound velocity c_{mw}, the travel times, and the actual angle $\alpha_m(i)$; and

(d) determining, with the data processing means, depth values T(i) from the travel times, the receiving directions, and an assumed, predetermined, average sound velocity in the water, step (d) comprising the sub-steps of

(d-1) supplying at least one of said depth values T(i) and said pulse impact distances A(i) as input data to a regression calculator, the pulse impact distances A(i) corresponding to horizontal distances between a position directly below the depth finder and different locations on the floor of the body of water when one of said pulses emitted during step (a) is scattered and reflected by the floor,

(d-2) performing a multiple linear regression to obtain coefficients K_1, K_2, and K_3 of a compensation function, said compensation function being dependent on the average sound velocity in the water, said compensation function representing a model function of the floor profile of the body of water and approximating the depth values T(i) with minimum errors, the coefficient K_3 being a weighting factor for a partial function $x_3(i)$ of the compensation function, and

(d-3) determining a corrected average sound velocity in the water from the partial function $x_3(i)$.

5,465,623

Patent Not Issued For This Number

5,465,624

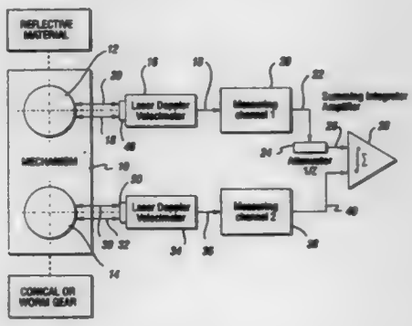
APPARATUS FOR MEASURING KINEMATIC ERRORS IN POWER TRANSMISSION MECHANISMS

Alexander S. Tseytlin, Farmington Hills, and Francis J. Brasile, Lake Orion, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 7, 1993, Ser. No. 116,649

Int. Cl.[6] G01P *1/07*

U.S. Cl. 73—653 **20 Claims**



1. An apparatus for measuring kinematic error in power transmission mechanisms including an input shaft and an output shaft, comprising:

a first angular torsional vibration meter for use as a laser doppler angular velocimeter in optical communication with the input shaft;

a first measuring channel in communication with the first torsional vibration meter;

an attenuator in communication with the first measuring channel for signal balancing;

an amplifier in communication with the attenuator;

a second angular torsional vibration meter for use as a laser doppler angular velocimeter in optical communication with the output shaft; and

a second measuring channel in communication with the second torsional vibration meter and with the amplifier;

the amplifier generating a signal indicative of the kinematic error, the apparatus being insensitive to extraneous radial or torsional motion of either shaft.

5,465,625

HEAT MEASUREMENT APPARATUS FOR INSPECTING THERAPEUTIC ENERGY WAVES

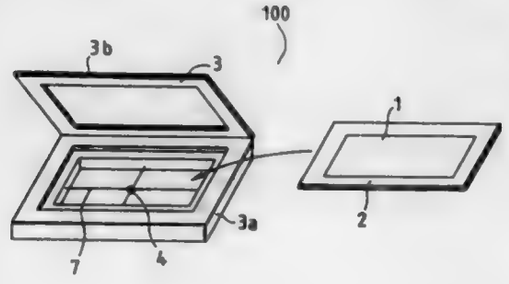
Katsuhiko Fujimoto, Kanagawa; Satoshi Aida, Tokyo; Masamichi Oyanagi, and Nobuki Kudo, both of Tochigi, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 868,657, Apr. 15, 1992, Pat. No. 5,357,805. This application Jul. 26, 1994, Ser. No. 280,546

Claims priority, application Japan, Apr. 15, 1991, 3-111045; Mar. 13, 1992, 4-055961

Int. Cl.[6] G01L *7/00*; G01K *1/08*

U.S. Cl. 73—700 **13 Claims**



1. A heat measurement apparatus for used therapeutic energy waves, comprising:

means for producing therapeutic energy waves that focus at a focal position;

a heat sensitive sheet of material having first and second opposing edges, visual properties, and electrical properties, wherein at least one of said visual properties and said electrical properties changes when heat is applied to said heat sensitive sheet;

means for mounting said heat sensitive sheet, said means for mounting located adjacent said first and second opposing edges of said heat sensitive sheet;

a marker located on said means for mounting, wherein, when said heat sensitive sheet is mounted on said means for mounting, said marker is adjacent an adjacent region of said heat sensitive sheet and can be used to indicate said adjacent region;

whereby a user may align a region of said heat sensitive sheet at said focal position of said therapeutic energy waves, at which one of said visual properties and said electrical properties of said heat sensitive sheet has been changed, with said adjacent region.

5,465,626

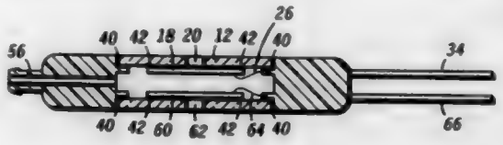
PRESSURE SENSOR WITH STRESS ISOLATION PLATFORM HERMETICALLY SEALED TO PROTECT SENSOR DIE

Clem H. Brown, Scottsdale, and David L. Vowles, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 4, 1994, Ser. No. 223,062

Int. Cl.[6] G01L *9/06*

U.S. Cl. 73—715 **15 Claims**



1. A pressure sensor, comprising:

a stress isolation platform with an opening for receiving a first pressure;

a sensor die mounted to said stress isolation platform with a first adhesive so as to receive said first pressure from said opening of said stress isolation platform, said sensor die, said stress isolation platform, and said first adhesive having similar thermal coefficients of expansion; and

a package body having an edge for mounting said stress isolation platform with a second adhesive that forms a seal to protect said sensor die located within an inner cavity of said package body.

5,465,627

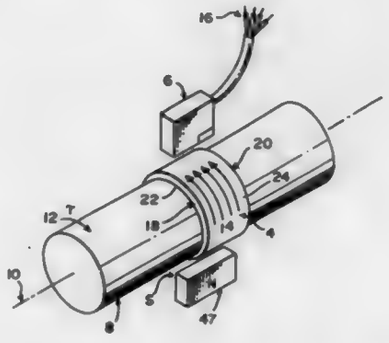
CIRCULARLY MAGNETIZED NON-CONTACT TORQUE SENSOR AND METHOD FOR MEASURING TORQUE USING SAME

Ivan J. Garshelis, Pittsfield, Mass., assignor to Magnetoelastic Devices, Inc., Pittsfield, Mass.

Division of Ser. No. 736,299, Jul. 29, 1991, Pat. No. 5,351,555. This application Mar. 24, 1994, Ser. No. 217,177

Int. Cl.[6] G01L *3/02*

U.S. Cl. 73—862.335 **19 Claims**



1. A transducing ring for attachment directly or indirectly to a member to which a torque is applied about an axis extending axially thereof such that torque applied to said member is proportionally transmitted to said ring, said ring comprising a ferromagnetic, magnetostrictive, magnetoelastically active element which is endowed with an effective uniaxial magnetic anisotropy having the circumferential direction as the easy axis and is magnetically polarized in a circumferential direction, said element having, when no torque is applied to said member, a circumferential magnetic orientation having only a circumferential component and, when a torque is applied to said member, a helical magnetic orientation having both circumferential and axial components, said ring producing a magnetic field varying with the torque applied to said member.

5,465,628

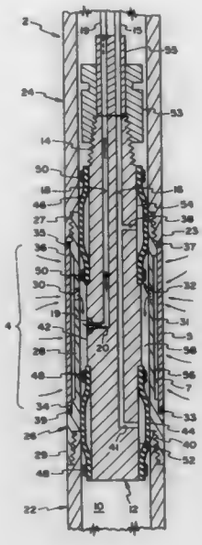
MULTIPLE SAMPLING LYSIMETER

Robert D. Timmons, R.F.D. Meadowdale Rd., Prairie Du Sac, Wis. 53578

Continuation-in-part of Ser. No. 948,520, Sep. 22, 1992, abandoned. This application Sep. 13, 1994, Ser. No. 305,364

Int. Cl.[6] E21B *49/08*

U.S. Cl. 73—864.34 21 Claims



1. A device for selectively extracting fluid samples from a desired zone within an underground formation comprising:

a) an elongated tube including a wall having internal and external surfaces;

b) said elongated tube having at least one spaced circumferential filter region disposed within said tube wall;

c) said at least one filter region provided with a circumferential recess portion having an elongated wall extending within said tube external surface;

d) said at least one filter region including a filter having internal and external surfaces, said filter positioned within said at least one filter region circumferential recess portion;

e) said filter external surface and said tube cooperating to form a substantially uniform outside diameter portion of said tube whereby said outside diameter portion provides means for contacting the formation when fluid samples are extracted;

f) said elongated wall of said at least one filter region is spaced from said respective filter internal surface forming a chamber therebetween;

g) said internal surface of said elongated tube having at least one passageway extending therethrough and opening to said chamber;

h) means slidable within said elongated tube and selectively positionable about said at least one filter region for sealing said at least one filter region from the remainder of said elongated tube; and

i) means associated with said slidable means for extracting a fluid sample through said at least one filter region by applying a vacuum thereto when said elongated tube is disposed within an underground formation.

5,465,629

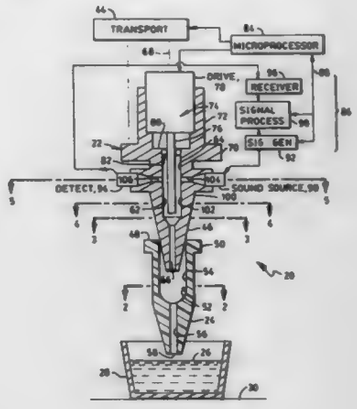
LIQUID DISPENSING SYSTEM WITH ACOUSTIC SENSING MEANS

John E. Waylett, Jr., Marshfield, Mass., assignor to Behring Diagnostics Inc., Westwood, Mass.

Continuation of Ser. No. 894,863, Jun. 8, 1992, abandoned. This application Apr. 11, 1994, Ser. No. 225,494

Int. Cl.[6] B01L *3/02*

U.S. Cl. 73—864.24 18 Claims



1. Apparatus for aspirating and/or dispensing liquid through the use of a disposable pipette tip of the type having a rearwardly extending cavity for receiving liquid through a channel which connects the cavity to the forward end of the tip, said apparatus comprising:

a selectively moveable holder adapted to temporarily engage said pipette tip, said holder having a central chamber which communicates with the cavity of the pipette tip, which is engaged by said holder and means for creating a vacuum within the combined space defined by said central chamber and said pipette tip cavity when the forward end of said pipette tip is restricted or closed off when in proximity to a surface,

means for selectively introducing an initial acoustic signal into said central chamber such that said initial acoustic signal generates an acoustic return signal at a predetermined location within said central chamber, said acoustic return signal having a characteristic signature which varies in phase and/or amplitude in accordance with the presence or absence of said pipette tip on said holder, the proximity of said holder and pipette tip to a surface, and/or the presence and amount of liquid in said pipette tip channel and cavity;

means, located at said predetermined location within said central chamber, for detecting said acoustic return signal;

means for analyzing said acoustic return signal for the properties of said characteristic signature of said acoustic return signal, including phase and/or amplitude of said characteristic signature, and providing an output response which indicates the presence or absence of said pipette tip, the proximity of said pipette tip to the surface, and/or the amount of liquid present in said pipette tip engaged by said holder;

transport means for moving said holder on a path of travel toward and away from the surface; and

said means for analyzing said acoustic return signal being operationally engaged to said transport means to stop movement of the pipette tip toward the surface prior to contact of the pipette tip with the surface.

5,465,630

DRIVE TRANSMITTING APPARATUS FOR A WORKING VEHICLE

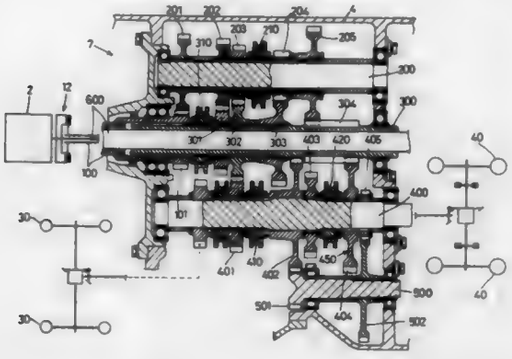
Masatoshi Iwamoto, Sakai, Japan, assignor to Kubota Corporation, Japan

Filed Jul. 12, 1994, Ser. No. 273,768

Claims priority, application Japan, Sep. 14, 1993, 5-229080; Sep. 14, 1993, 5-229081

Int. Cl.[6] F16H *3/08*

U.S. Cl. 74—331 4 Claims



1. An apparatus for transmitting drive from an engine through a main clutch to front or rear wheels of a working vehicle, comprising:

main change speed means including:

a first shaft connected at one end thereof to said clutch, and having a gear mounted at the other end in an interlocked state;

an intermediate shaft having, mounted thereon, an intermediate shaft gear group formed of a plurality of gears, and a first shift clutch, said first shift clutch being switchable among a first speed position corresponding to a first speed stage of said main change speed means, a second speed position corresponding to a second speed stage of said main change speed means, and a neutral position; and

a main shaft disposed coaxially with said first shaft and having, mounted thereon, a main shaft gear group formed of a plurality of gears, and a second shift clutch, said second shift clutch being switchable among a third speed position corresponding to a third speed stage of said main change speed means, a neutral position, and a fourth speed position corresponding to a fourth speed stage of said main change speed means; and

auxiliary change speed means including:

an output shaft having, mounted thereon, an output shaft gear group formed of a plurality of gears, a third shift clutch and a fourth shift clutch, said third shift clutch being switchable among a high speed position corresponding to a high speed state of said auxiliary change speed means, an ultralow speed position corresponding to an ultralow speed state of said auxiliary change speed means, and a neutral position, said fourth shift clutch being switchable among a low speed position corresponding to a low speed state of said auxiliary change speed means, a backward drive position corresponding to a backward drive state of said auxiliary change speed means, and a neutral position; and

a creep shaft disposed parallel to said output shaft and having, mounted thereon, a creep gear group formed of a plurality of gears, said creep gear group transmitting drive from said main shaft to said output shaft when said third shift clutch is operated to said ultralow speed position.

5,465,631

SHAFT WITH A WORM FORMED ONTO IT, AND MILLING MACHINE FOR MANUFACTURING A WORM

Robert Klinar, Bietigheim-Bissingen, Germany, assignor to ITT Automotive Europe GmbH, Germany

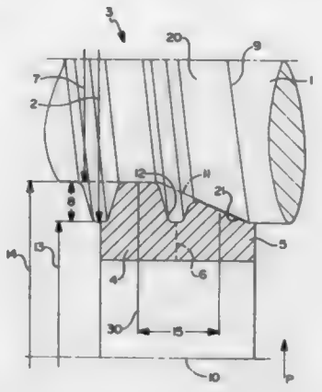
PCT No. PCT/EP92/01735, § 371 Date Jun. 15, 1994, § 102(e) Date Jun. 15, 1994, PCT Pub. No. WO93/03297, PCT Pub. Date Feb. 18, 1993

PCT Filed Jul. 31, 1992, Ser. No. 190,154

Claims priority, application Germany, Aug. 6, 1991, 41 26 026.0

Int. Cl.[6] F16H *55/08;* B23F *21/14*

U.S. Cl. 74—458 7 Claims



1. A rotor shaft of an electric motor, of the type including a milled worm formed onto an end of the shaft, and the root line diameter of the worm being smaller than a shaft diameter directly adjoining the worm, comprising:

a tapered groove at an end portion of said worm, said tapered groove defining a first flank of a first worm tooth and also defining a bottom surface tapering from a first diameter at the first flank of the first worm tooth to a larger second diameter at an end portion of the shaft, the tapered groove extending circumferentially a distance equal to a circumference of the worm minus a portion of the circumference corresponding to a runout angle of the milling machine; and

a full depth groove defining a second flank of the first tooth and also defining a bottom surface between the first tooth and a second tooth at a root circle of the worm.

5,465,632

STEERING WHEEL HAVING A STATIONARY DISPLAY

T. Jack Oki, and Martin D. Oki, both of 96 Banbury Road, Don Mills, Ont., Canada

Filed May 5, 1994, Ser. No. 238,425

Int. Cl.[6] B62D *1/18*

U.S. Cl. 74—493 8 Claims

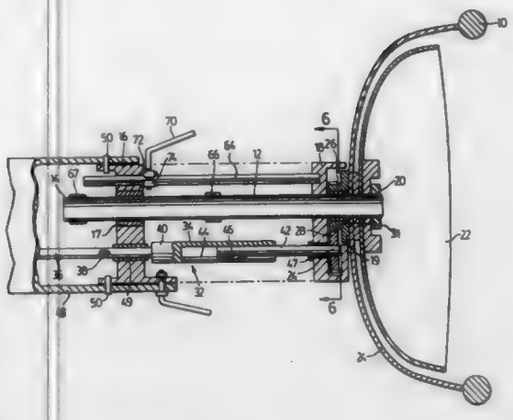
1. A multi-function steering mechanism for a motor vehicle including a display console, comprising a rotatable steering wheel for the motor vehicle and a steering shaft parallel with and offset from a support shaft;

a display panel being located within the periphery of the steering wheel and being non-rotatably mounted on the support shaft;

the steering shaft comprising a telescopic first shaft part one end of which is rotatably supported to mesh with gearing of a hub of the steering wheel and the other end of which is connected through a universal joint to a second shaft part;

a bearing member supported by a housing for the steering shaft, the support shaft being slidably mounted in the bearing member so that a free end extends therethrough, and the telescoping first shaft part being mounted in the bearing member to be rotatable therein;

the bearing member being pivoted to the housing through a pair of pivots aligned with the universal joint.



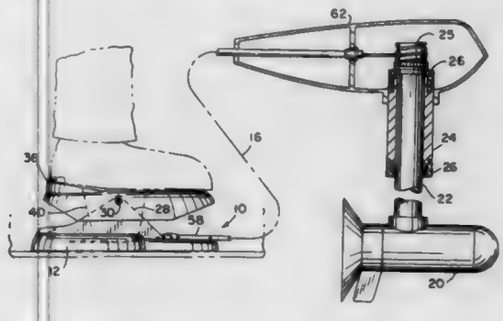
5,465,633

FOOT ACTUATED TROLLING MOTOR CONTROL

Darrel A. Bernloehr, Mankato, Minn., assignor to Johnson Fishing, Inc., Mankato, Minn.

Filed Feb. 7, 1994, Ser. No. 192,504
Int. Cl.[6] G05G *1/14;* F16C *1/10;* B60L *15/20*
U.S. Cl. 74—512 8 Claims

1. A pull-pull foot control device for controlling the angular



position of a trolling motor, said device comprising a base mounted in a spaced relation to the trolling motor, a pedal pivotally mounted on the base, a pulley mounted on the base in spaced relation to the foot pedal, a first cable having one end connected to one end of said foot pedal and the other end operatively connected to the trolling motor, a second cable wrapped around said pulley with one end connected to the other end of said foot pedal and the other end operatively connected to the trolling motor, whereby pivotal motion of the foot pedal in one direction will pull the trolling motor in one direction and pivotal motion of the foot pedal in the opposite direction will pull the motor in the opposite direction.

5,465,634

HANDLEBAR ASSEMBLY FOR CYCLES

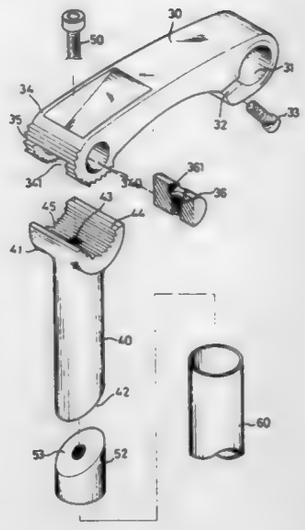
Chin-pei Chen, No. 198 Feng-Chou Rd., Shen-Kang Hsiang, Taichung, Taiwan, Prov. of China

Filed Mar. 15, 1994, Ser. No. 212,845
Int. Cl.[6] G05G *1/14*
U.S. Cl. 74—551.3 1 Claim

1. A handlebar assembly for attachment to a steering tube of a cycle, the assembly comprising:

a) a post for engaging the steering tube of the cycle, the post including a bore formed therein, a bottom end having a first tapered surface formed thereon, and an upper portion;

b) a support provided on the upper portion of the post, the support including a concave surface formed in the upper portion and a plurality of first teeth formed in the concave surface;



c) a shank including a first end for supporting a handlebar stem and a second end for engagement with the support, the second end including an orifice extending laterally therethrough, an opening formed therein, the opening and orifice intersecting each other, and a plurality of second teeth formed thereon, the first and second teeth being selectively engageable with each other for retaining the shank in a desired position relative to the support;

d) a stub rotatably supported in the orifice and including a threaded passage therethrough;

e) means for securing the stub and the post together, the securing means including a threaded wedge having a second tapered surface for engaging the first tapered surface of the post, and a threaded bolt extending through the threaded passage of the stub, the bore of the shank and the threaded wedge, the bolt being threadedly engaged with both the stub and the wedge; and

f) wherein rotation of the threaded bolt causes the threaded wedge to move radially outwardly to secure the assembly to the steering tube and the shank in the desired position relative to the support.

5,465,635

CRANKSHAFT ASSEMBLY FOR INTERNAL COMBUSTION ENGINE

Satoshi Kono; Shizuaki Hidaka, and Tetsu Takahashi, all of Kanagawa, Japan, assignors to Atsugi Unisia Corporation, Japan

Continuation of Ser. No. 485,659, Feb. 27, 1990, abandoned.
This application May 16, 1994, Ser. No. 243,526
Claims priority, application Japan, Feb. 28, 1989, 1-48816; Feb. 28, 1989, 1-48817
Int. Cl.[6] F16C *3/04;* G05G *1/00*
U.S. Cl. 74—595 12 Claims

1. A flywheel for a power transmission system for transmitting engine torque to a driven unit, comprising:

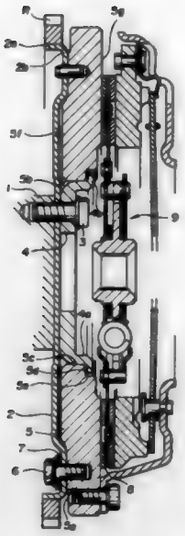
an elastic plate secured to a crankshaft to rotate therewith;

a flywheel body secured to said elastic plate and having an engageable surface for engaging with a clutch disc; and

a reinforcing member for reinforcing said elastic plate at a portion of said elastic plate which is secured to said crankshaft;

said elastic plate having an axial rigidity in the range of 600 kg/mm to 2200 kg/mm so as to ensure transmission of engine torque to said driven unit, while decreasing noise produced by a bending vibration of said crankshaft;

wherein each of said elastic plate, said flywheel body and said reinforcing member comprises a first portion, said first portion



of said flywheel body being placed axially between said first portions of said elastic plate and said reinforcing member, and said first portions of said elastic plate, said flywheel body and said reinforcing member defining clearances for allowing said first portion of said flywheel body to move axially between said first portions of said elastic plate and said reinforcing member.

5,465,636

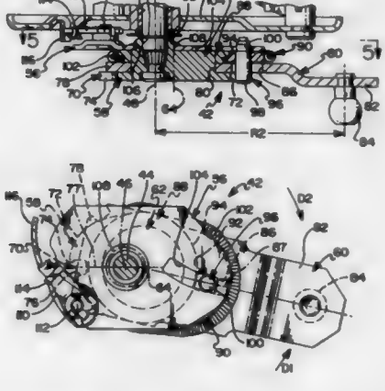
DEPRESSED PARK WINDSHIELD WIPER MECHANISM

Christopher H. Jones, Dayton; Lloyd L. R. Kuck, Beavercreek, both of Ohio, and Frank R. Lombardo, Rochester, N.Y., assignors to ITT Automotive Electrical Systems Inc., Auburn Hills, Mich.

Continuation of Ser. No. 88,465, Jul. 7, 1993, Pat. No. 5,388,482. This application Sep. 14, 1994, Ser. No. 306,234

Int. Cl.[6] B60S *1/24;* F16H *21/20*

U.S. Cl. 74—602 8 Claims



1. In a windshield wiper system on a vehicle body including

a windshield wiper arm pivotable on the vehicle body about a pivot axis,

a lower arm fixed relative to the wiper arm at a first end for pivoting the wiper arm,

a drive link having a first end pivotally connected to a second end of the lower arm, and

an electric motor drive having a drive shaft rotatable about a drive axis in a first direction and an opposite second direction,

a variable length crank arm comprising:

an eccentric driver fixed to the drive shaft for unitary rotation therewith and defining a first annular surface eccentric to the drive shaft and defining a notch in a perimeter of the eccentric driver;

an output arm having a first end defining a second annular surface rotatably engaging the first annular surface of the eccentric driver and having a pivot member at a second end pivotally connected to a second end of the drive link wherein relative rotation between the output arm and the eccentric driver changes a distance between the drive axis and the pivot member from a first length associated with a folded position and a longer second length associated with an extended position;

an engaging member rotating with the output arm operably engaging the notch in the eccentric driver to hold the output arm in the folded position when the drive shaft is rotated in the first direction;

a spring functionally disposed between the engaging member and the eccentric driver, biasing the engaging member towards the perimeter of the eccentric driver; and

a cam member rotatably mounted on the drive shaft axis and rotatable thereabout relative to the eccentric driver and the output arm, having a cam surface operably engaging the engaging member when both the cam member is fixed relative to the body and the eccentric driver is rotated by the drive shaft in the second direction wherein continuing rotation of the drive shaft in the second direction forces the engaging member along the cam surface thereby lifting the engaging member out of the notch to rotatively free the eccentric driver from the output arm, with yet further rotation of the drive shaft in the second direction extending the crank arm to the extended length.

5,465,637

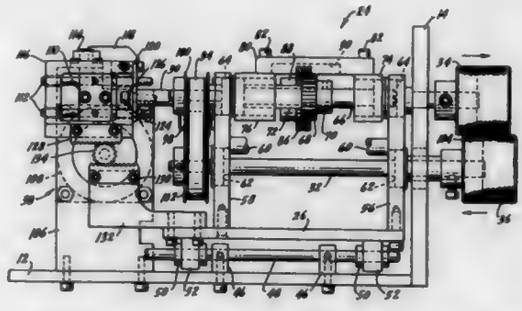
WIRE STRIPPING METHOD AND MACHINE

Bruce P. Konen, Aurora, and Robert W. Van Naarden, Hinckley, both of Ill., assignors to Ideal Industries, Inc., Sycamore, Ill.

Filed Apr. 5, 1994, Ser. No. 223,228

Int. Cl.[6] H02G *1/12*

U.S. Cl. 81—9.51 7 Claims



6. A wire processing machine for removing insulation from wires, comprising:

a frame;

cutting means mounted on the frame and movable radially of the wire to a selectably adjustable depth for cutting through less than the full circumference of the wire's insulation;

a table mounted for reciprocating motion on the frame;

a first drive shaft mounted on the table for rotation about an axis of the first drive shaft and reciprocation relative to the table along said axis;

a second drive shaft mounted on the table for rotation about the second drive shaft's axis;

wire rotation means mounted on the frame and connected in driving relation to the table and first drive shaft to cause reciprocating motion of the table relative to the frame in one direction and the first drive shaft relative to the table in the opposite direction;

turning means mounted on the table for rotating the first and second drive shafts;

first and second feed wheels mounted on the first and second drive shafts respectively, the feed wheels being engageable with a wire to be stripped for moving the wire axially toward and away from the cutting means and for rotating the wire.

5,465,638

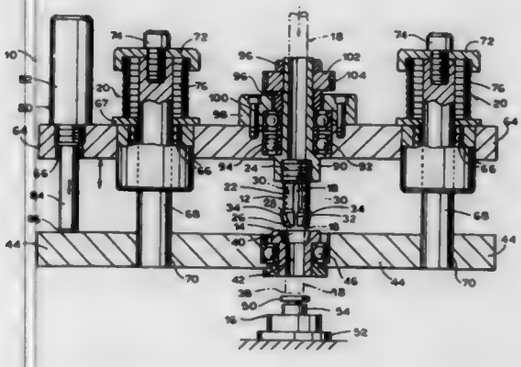
PUSH-TYPE COLLET AND SEAT ASSEMBLY

Larry P. Mesmer, Cedar Grove, N.J., assignor to Metal Cutting Corp., Cedar Grove, N.J.

Filed Nov. 4, 1994, Ser. No. 334,541

Int. Cl.[6] B23B *13/12*

U.S. Cl. 82—127 **21 Claims**



1. A push-type collet and seat assembly for use with a workpiece having a front end, comprising:

(A) a push-type collet including an elongated cylindrical body member having a rear end portion, a front end portion tapering inwardly towards a front end thereof, an opening extending longitudinally through said collet, and slot means extending longitudinally through at least said collet front end portion in communication with said opening to divide said collet front end portion into separated compressible portions;

(B) a seat partially receiving said collet therein so that, when said collet front end portion is forcibly wedged against said seat, said compressible portions of said collet front end portion are squeezed against a workpiece to fix the workpiece relative to said collet;

(C) a stationary stop disposed a predetermined distance forwardly of said seat and adapted to receive the workpiece front end without moving so that, when workpiece inserted in said opening of said collet extends forwardly of said compressible portions of said front end portion, the workpiece front end is forcibly wedged against said stop and said stop limits forward movement of the workpiece; and

(D) drive means for generally simultaneously moving the workpiece forwardly against said stop to forcibly wedge the workpiece front end thereagainst and moving said collet forwardly against said seat to forcibly wedge said collet front end portion thereagainst, such that the workpiece abuts against said stop prior to said collet fixing said workpiece relative to the collet.

5,465,639

METHOD AND APPARATUS FOR CUTTING A BELT-SHAPED MEMBER

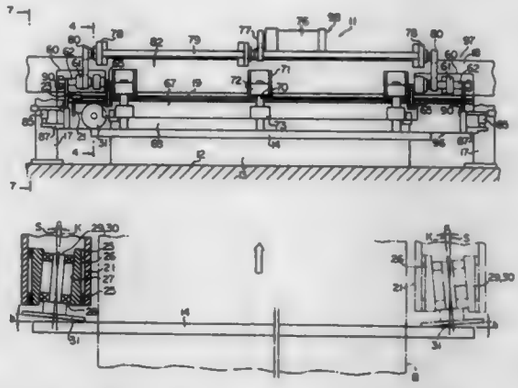
Takashi Senbokuya, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Jul. 7, 1993, Ser. No. 87,000

Claims priority, application Japan, Jul. 7, 1992, 4-203156; Jul. 21, 1992, 4-215548

Int. Cl.[6] B26D *1/18;1/20*

U.S. Cl. 83—34 **14 Claims**



1. A method for cutting a belt-shaped member, comprising the steps of:

cutting the belt-shaped member substantially transversely by moving a cutter along a lower blade from a first end of said lower blade to a second end of said lower blade while said cutter is held in contact with said lower blade in a state in which said cutter is inclined at a first small angle with respect to said lower blade such that a side of said cutter closest to the second end of said lower blade is located closer to said lower blade than a side of said cutter farthest from the second end of said lower blade, so as to effect an advance cutting step;

causing said cutter to undergo precession about an axis of revolution which intersects an axis of rotation of said cutter by maintaining a second small angle to the axis of rotation of said cutter so that the cutter is inclined first with respect to said lower blade such that a side of said cutter closest to the first end of said lower blade is located closer to said lower blade than a side of said cutter farthest from the first end of said lower blade, and feeding the belt shaped member by a predetermined length, so as to effect an inverting step;

cutting the belt-shaped member substantially transversely by moving said cutter along said lower blade from the second end to the first end of said lower blade while said cutter is being held in contact with said lower blade, so as to effect a return cutting step; and

causing said cutter to undergo precession about the axis of revolution to reset a direction and an angle of inclination of said cutter with respect to said lower blade to those persisting in the advance cutting step, and feeding the belt-shaped member by the predetermined length, so as to effect a resetting step.

4. An apparatus for cutting a belt-shaped member, comprising:

a lower blade disposed immediately below the belt-shaped member and extending perpendicular to a longitudinal direction of the belt-shaped member;

a disk-shaped cutter adjacent the lower blade for cutting the belt-shaped member in cooperation with said lower blade as a portion of said cutter is brought into contact with said lower blade, and wherein said cutter is inclined while maintaining a first small angle with respect to said lower blade;

a holder rotatably supporting said cutter;

carriage means for supporting said holder so that said holder is free to rotate about an axis of revolution intersecting an axis of rotation of said cutter and maintains a second small angle to the axis of rotation of said cutter;

rotating means for rotating said holder about the axis of revolution with respect to said carriage to cause said cutter to

undergo precession about the axis of revolution, a direction of inclination of said cutter being set such that, when the belt-shaped member is cut from a first end of said lower blade toward a second end of said lower blade, a side of said cutter closest to the second end of said lower blade is located closer to said lower blade than a side of said cutter farthest from the second end of said lower blade, while when the belt-shaped member is cut from the second end toward the first end of said lower blade, a side of said cutter closest to the first end of said lower blade is located closer to said lower blade than a side of said cutter farthest from the first end of said lower blade; and

moving means for moving said carriage to move said cutter and said holder along said lower blade so as to cut the belt-shaped member by means of said lower blade and said cutter.

5,465,640

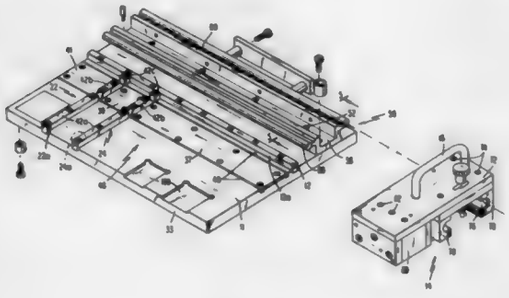
CUTTER INSTRUMENT FOR PRECISION CUTTING OF RECTANGULAR SHAPES FROM A CORRUGATED CARDBOARD SHEET

William H. Bory, Baltimore, Md., assignor to Chesapeake Corporation, Baltimore, Md.

Continuation of Ser. No. 896,780, Jun. 10, 1992, Pat. No. 5,325,752. This application Nov. 16, 1993, Ser. No. 152,785

Int. Cl.[6] B26D *1/04*

U.S. Cl. 83—36 **3 Claims**



1. A method for precision cutting a piece of corrugated cardboard into a rectangular test specimen utilizing a cutter instrument having a cutter including a pair of cutting blades movably mounted on a support base, comprising the steps of:

a) positioning said piece on said support base;

b) cutting a pair of parallel cut lines in said piece by simultaneously moving said cutting blades along a top surface of said piece to form a pair of parallel cut edges of said test specimen;

c) positioning at least one of said parallel cut edges against a guide extending perpendicular to a path of said cutting blades; and

d) cutting a second pair of parallel cut lines through by simultaneously moving said cutting blades along said top surface to intersect the first pair of parallel cut lines and thereby completely form said test specimen now having two pairs of parallel cut edges, all of which cut edges are square and perpendicular to both faces of said specimen.

5,465,641

CYLINDER FOR PROCESSING

Josef Herd, Munster, Germany, assignor to Maschinenfabrik Goebel GmbH, Germany

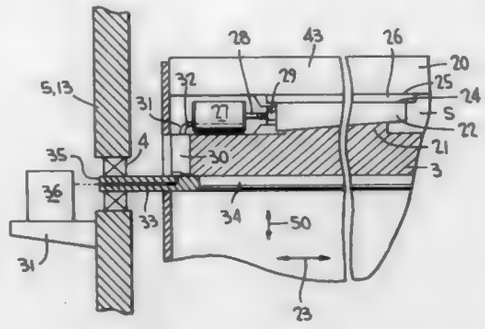
PCT No. PCT/DE93/00282, § 371 Date Sep. 30, 1993, § 102(e) Date Sep. 30, 1993, PCT Pub. No. WO93/19904, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 25, 1993, Ser. No. 122,541

Claims priority, application Germany, Apr. 3, 1992, 42 11 187.0

Int. Cl.[6] B26D *1/62*

U.S. Cl. 83—698.61 **7 Claims**



1. A knife cylinder for processing a continuous web, said cylinder being mounted on a frame for rotation about an axis of rotation of said cylinder and comprising:

a cylinder surface portion having at least one open slot formed therein for receiving and positioning at least one knife substantially parallel to said axis of rotation;

means within said slot distributed over the length of said knife for pressing said knife against the knife cylinder;

at least one motor means on said cylinder within said open slot for rotation together therewith for finely adjusting said knife in a radial direction to a predetermined adjusted position during rotation of said cylinder and for retaining said knife in said adjusted position;

said cylinder having a hollow central axle along said axis of rotation;

means operatively connected with said hollow axle for rotation together with said cylinder for actuating said motor means to control the radial adjustment of said knife, and

stationary means located outside said cylinder for operating said actuating means.

5,465,642

NECK STRAIGHTENER FOR STRINGED INSTRUMENT

Masaki Goto, Gunma, Japan, assignor to Gotoh Gut Yugen Kaisha, Gunma, Japan

Filed Dec. 21, 1994, Ser. No. 361,221

Claims priority, application Japan, Dec. 30, 1993, 5-355240

Int. Cl.[6] G10D *3/00*

U.S. Cl. 84—293 **9 Claims**

1. A neck straightener for a stringed instrument, said straightener comprising:

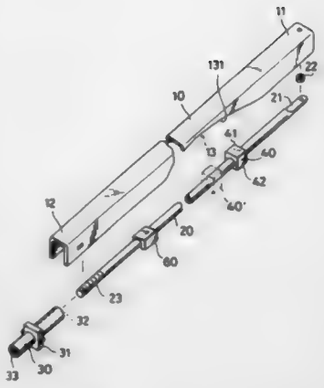
a reinforcing member with a U-shaped section and made of a resilient material having a high degree of rigidity;

an actuating rod made of a resilient material having a high degree of rigidity, said rod including an extreme end part joined with an end of said reinforcing member and accommodated therein in parallel therewith;

means for fixing a base end of said reinforcing member in an elongate groove of a neck part of the stringed instrument;

adjusting means provided at a base end of said actuating rod to increase and decrease the length thereof relative to said reinforcing member;

at least one pushing block provided on said actuating rod at a location thereon to correspond to a center of warp of the neck



part, said pushing block having a first pushing surface coming into contact with an internal surface of said reinforcing member; and

a partly cutaway part formed at each of opposite sides of said reinforcing member, each said partly cutaway part being formed to have a length to be aligned with said pushing block, and an edge of each said partly cutaway part being formed as a continuously arc-shaped edge.

5,465,643

GUITAR STRING SUPPORT

David Beeson, 6 Long Ley, Church Lane, Cheddington, Nr Leighton Buzzard, Bedfordshire LU7 OSU, Great Britain

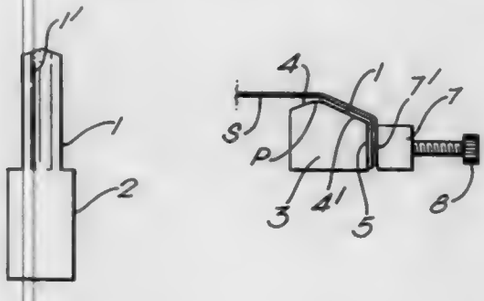
PCT No. PCT/GB93/01249, § 371 Date Feb. 1, 1995, § 102(e) Date Feb. 1, 1995, PCT Pub. No. WO93/25994, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 11, 1993, Ser. No. 351,415

Claims priority, application United Kingdom, Jun. 12, 1992, 9212545

Int. Cl.[6] G10D *3/00*

U.S. Cl. 84—297 R **4 Claims**



1. A guitar string support insert for the string support saddle block of a guitar tremolo equipped with a saddle block and a vice grip for retaining the guitar strings to the saddle block in a string-receiving groove therein and wherein the insert is formed of a malleable metallic material softer than the metallic material of the saddle block and guitar strings and having a front section provided with an axially formed groove for lodging in the string receiving groove of the saddle block, and a rear section for insertion between the surface of the saddle block and the guitar string held in the vice grip.

5,465,644

STAND STRUCTURE FOR A KEYED INSTRUMENT

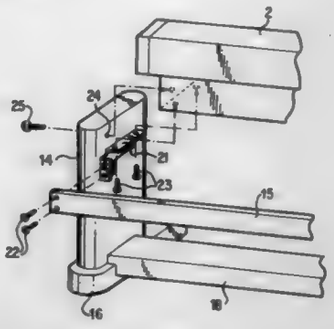
Yoshiaki Shimoda, and Masaji Kimura, both of Hamamatsu, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka, Japan

Continuation of Ser. No. 17,152, Feb. 12, 1993, abandoned. This application May 26, 1994, Ser. No. 250,334

Claims priority, application Japan, Mar. 31, 1992, 4-026541 U

Int. Cl.[6] G10D *13/02*

U.S. Cl. 84—423 R **2 Claims**



1. A stand structure for a keyed instrument having a main body with a keyboard at a front thereof, said structure comprising:

first and second side plates;

first and second single securing members respectively secured to inner surfaces of said first and second side plates;

a back plate arranged between said first and second side plates and secured to said first and second single securing members, respectively, for reinforcing said first and second side plates;

a pair of screw means, each of the screw means extending laterally through one of sad first and second side plates; and

said first and second side plates being adapted for supporting the main body, by placing the main body on said first and second side plates, arranging at least a lower portion of the main body between said first and second side plates, connecting the main body to said first and second side plates through said first and second single securing members, respectively, and screwing said pair of screw means into said lower portion of the main body so as to secure the main body to said first and second side plates.

5,465,645

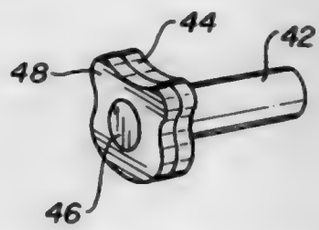
RECOIL BUFFER FOR SEMI-AUTOMATIC PISTOL

Joseph E. Cominolli, 624 Cherry Rd., Syracuse, N.Y. 13219

Filed Oct. 19, 1994, Ser. No. 325,614

Int. Cl.[6] F41C *3/00*

U.S. Cl. 89—198 **15 Claims**



1. In a live-fire, semi-automatic pistol having a frame with a first abutment surface, a slide with a second abutment surface, said slide being moveable from a forward to a rearward position wherein impact is delivered to said first abutment surface in response to firing said pistol, a coil spring compressible by movement of said slide to said rearward position and expansible to return said slide to said forward position, and a guide rod having front and rear ends, a stem extending axially from said rear end

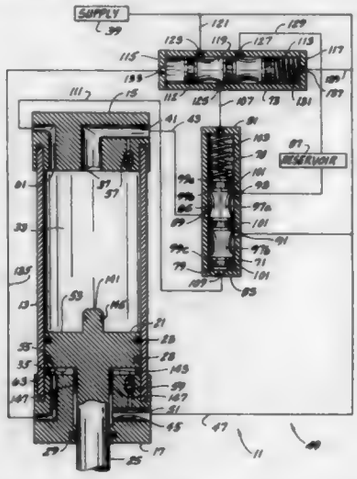
and a flange having forward and rear surfaces, said flange extending radially outwardly from said rear end, the improvement consisting of first and second annular washers of resilient, impact-absorbing material mounted in encircling relation to said stem and said rod in contact with said rear and forward surfaces of said flange, respectively, said first washer further being disposed in covering, contacting relation to said first abutment surface, whereby upon movement of said slide to said rearward position said impact is delivered to said first abutment surface through said first and second washers.

5,465,646

HYDRAULIC MOTOR

Leonard J. DiCarlo, St. Louis, Mo., assignor to McNeil (Ohio) Corporation, St. Paul, Minn.

Filed Feb. 23, 1994, Ser. No. 200,622
Int. Cl.[6] F01L *25/02*
U.S. Cl. 91—308 **7 Claims**



1. A hydraulic motor comprising a cylinder having a head end and a rod end,

a piston reciprocable in the cylinder dividing it into a first expansible chamber toward the head end and a second expansible chamber toward the rod end,

a piston rod extending from the piston through the rod end of the cylinder,

the cylinder having a transfer port at each end for delivery of pressurized fluid from a source to and exhaust of fluid from the respective chambers,

the piston having a first area exposed to the pressure of fluid under pressure in the first chamber tending to drive the piston toward the rod end of the cylinder and a second and smaller area exposed to the pressure of fluid under pressure in the second chamber tending to drive the piston toward the head end of the cylinder,

a hydraulic circuit including a source of fluid under pressure and a line directly connecting said source to the transfer port at the rod end of the cylinder,

means comprising a valve for controlling delivery of fluid under pressure from said source through the transfer port at the head end of the cylinder and exhaust of fluid from the first chamber,

said valve of the controlling means comprising means movable between a first position for delivery of fluid under pressure from said source to the transfer port at the head end of the cylinder and a second position for venting of fluid from said first chamber via said transfer port at the head end of the cylinder,

whereby with said valve of the controlling means in its second position, fluid under pressure from said source via said transfer port at the rod end of the cylinder drives the piston toward the head end of the cylinder, fluid being vented from the first chamber via the transfer port at the head end of the cylinder, and with said valve of the controlling means in its first position, fluid under pressure is delivered to said first chamber to drive the piston toward the rod end of the cylinder, with exhaust of fluid from said second chamber via said transfer port at the rod end of the cylinder,

means for shifting the said movable means of the valve of the controlling means from its first to its second position in response to the piston nearing the end of its stroke in the direction toward the rod end of the cylinder, and shifting the said movable means of the valve of the controlling means from its second to its first position in response to the piston nearing the end of its stroke in the direction toward the head end of the cylinder,

said cylinder having an exhaust port at each end for exhaust of pressurized fluid from the respective chamber,

said shifting means comprising first valve means for blocking the transfer port at the head end of the cylinder before the piston reaches the head end during its stroke to fully retract said rod, whereby when said first valve means is blocking the transfer port of the head end of the cylinder, the fluid in the first chamber is exhausted through the exhaust port of the head end of the cylinder and delivered to said valve of the controlling means for shifting the said movable means of said valve of the controlling means to its first position thereby delivering pressurized fluid from said source to the first chamber for reversing the direction of the piston,

wherein said shifting means further comprises a relay valve for operatively shifting the said movable means of the valve of said controlling means, and second valve means for blocking the transfer port of the rod end of the cylinder before the piston reaches the rod end of the cylinder during its stroke to fully extend said rod, whereby when said second valve means is blocking the transfer port of the rod end of the cylinder, the fluid in the second chamber is exhausted through the exhaust port of the rod end of the cylinder and delivered to said relay valve for delivery of fluid under pressure from said source to said valve of the controlling means thereby shifting the said movable means of said valve of the controlling means to its second position in which fluid from the first chamber is exhausted for reversing the direction of the piston.

5,465,647

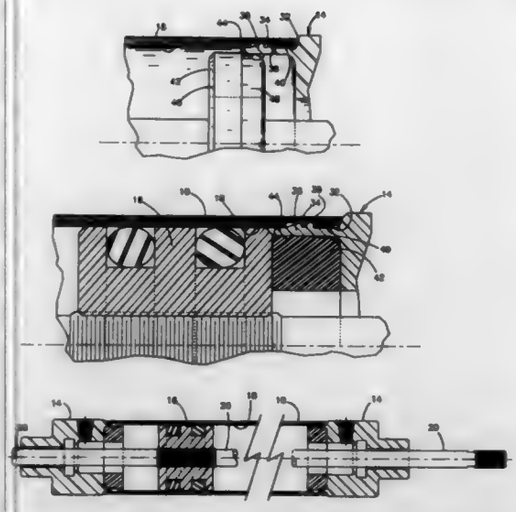
FLUID CYLINDER END CAP ASSEMBLY

Elson B. Fish, Lakeville, Ind., assignor to Polygon Company, Walkerton, Ind.

Filed Nov. 14, 1994, Ser. No. 338,037
Int. Cl.[6] F01B *29/00*
U.S. Cl. 92—128 **16 Claims**

1. An end cap assembly for a fluid cylinder comprising a cylindrical casing having open ends, a pair of end caps closing the open ends of said cylindrical casing, at least one of said end caps comprising a closure unit having an axially-extending, cup-shaped annular skirt having an outer cylindrical surface telescoped within an open end of said casing, said annular skirt having an annular barb radially projecting from said outer cylindrical surface, said casing having an inside cylindrical surface having an annular groove which receives said annular barb to axially retain said annular skirt within said open end, and a retaining ring within said cup-shaped annular skirt providing an interference fit with an inside cylindrical surface of said skirt to radially urge said barb into interlocking engagement with said annular groove.

13. A method of assembling an end cap on an open end of a tubular pressure cylinder comprising the steps of providing a cylindrical casing having an open end, providing a closure unit for said open end, said closure unit having an axially-extending, cup-shaped annular skirt having an outer cylindrical surface, said annular skirt having an annular barb radially projecting from said outer cylindrical surface, said casing having an inside cylindrical surface having an annular groove adjacent said open end which is adapted to receive said annular barb, positioning a retaining ring



within said cylinder, said retaining ring having an outside diameter adapted to form an interference fit with an inside cylindrical surface of said skirt, positioning a piston head within said inside cylindrical surface of said cylinder so that said retaining ring is positioned between said piston head and said one of said open ends, telescoping said annular skirt into said open end of said cylindrical casing until said annular barb seats within said annular groove, and driving said piston head against said retaining ring to force said retaining ring along said inside cylindrical surface of said annular skirt and to seat said retaining ring within said cup-shaped annular skirt with an interference fit.

5,465,648

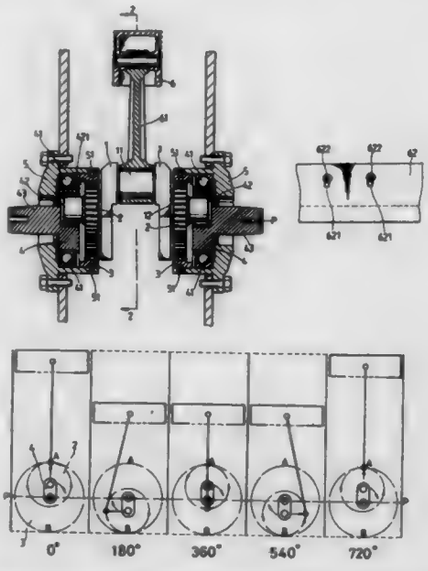
CYLINDER HAVING A PISTON ASSEMBLY CAPABLE OF STOPPING ONCE WHEN HAVING MOVED UP AND DOWN EVERY TIME

Chiou C. Cy, P.O. Box 82-144, Taipei, Taiwan, Prov. of China

Filed Jan. 4, 1995, Ser. No. 368,369

Int. Cl.[6] F01B *9/00*

U.S. Cl. 92—140 **2 Claims**



1. A cylinder having a piston assembly capable of stopping once when having moved up and down every time comprising:

a housing having a cavity;

a gear ring fixedly within the cavity of said housing;

a main crankshaft fitted within the cavity of said housing and provided with an eccentric recess;

a gear meshed with said gear ring;

an auxiliary crankshaft including an upper axle and a lower axle, said upper axle being connected with the piston assembly via connecting rod and having a center tanget to a pitch circle of said gear, said lower axle being pivotally connected with the eccentric recess of said main crankshaft;

said gear meshed with said gear ring and fixedly mounted on the lower axle of said auxiliary crankshaft and having gear ratio of 2:3 to said gear ring.

2. A cylinder having a piston assembly capable of stopping once when having moved up and down every time comprising:

a pinion;

a gear;

a linking rod;

a main crankshaft;

an auxiliary crankshaft;

a dovetail guide plate;

wherein said pinion is rigidly fixed to said gear, said gear being mounted on said auxiliary crankshaft, said linking rod having two ends respectively connected with said main crankshaft and said auxiliary crankshaft so as to mesh said gear with said pinion, said main crankshaft being used for power input or power output, said auxiliary crankshaft being provided with two dovetail ends slidably connected with said dovetail guide plate, said dovetail guide plate being constituted by a base and an adjusting block which has a screw for adjusting distance between said dovetail end of said auxiliary crankshaft and said dovetail guide plate.

5,465,649

APPARATUS FOR PREPARING BEVERAGES SUCH AS COFFEE, SOUP, TEA OR THE LIKE

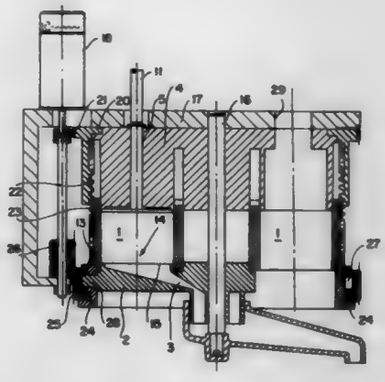
Jan A. Muis, Odijk, Netherlands, assignor to Sara Lee/De N.V., Keulsekade, Netherlands

Filed Nov. 30, 1993, Ser. No. 159,270

Claims priority, application Netherlands, Dec. 1, 1992, 9202085

Int. Cl.[6] A23F *5/24*; A47J *31/10*

U.S. Cl. 99—280 **13 Claims**



1. An apparatus for preparing beverages, including coffee, tea, and soup, through extraction, said apparatus comprising:

a first housing part with a plurality of chambers receiving a starting product to be extracted and having equal dimensions, each of said chambers includes an axial end with an opening which is closable with a cover comprising an extract discharge opening;

a plurality of pistons each being slidable in an axial direction of a respective chamber, each said piston confines in a respective chamber an amount of starting product to be extracted, each said chamber being bounded by chamber walls, the cover and a respective piston;

at least one liquid supply device comprising a meter for measuring a parameter corresponding with an amount of liquid supplied and at least one shut-off valve for interrupting the supply device, said at least one shut-off valve is connected by an inlet to a liquid supply system and connected by an outlet to a respective liquid supply duct supplying liquid to a respective chamber; and,

a control means for controlling at least one said liquid supply device based on said parameter measured, said control means ensures a predetermined desired duration of contact between the liquid and the product to be extracted for a specified desired amount of extract.

5,465,650

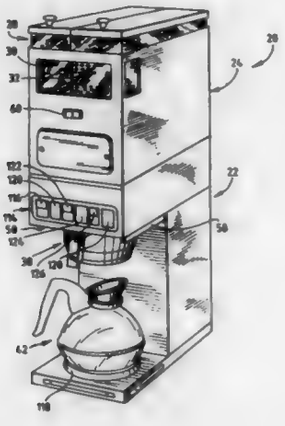
COMBO GRINDER AND BREWER

Brent R. Friedrich, Springfield, and John T. Knepler, Chatham, both of Ill., assignors to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Jan. 11, 1995, Ser. No. 371,293

Int. Cl.[6] A47J *31/42*

U.S. Cl. 99—286 **22 Claims**



1. A beverage brewing apparatus including beverage brewing means and brewing substance dispensing means, said beverage brewing apparatus comprising:

a receptacle for retaining a beverage brewing substance;

said brewing substance dispensing means being operatively associated with said receptacle for controllably dispensing brewing substance into said receptacle;

a chute positioned between said substance dispensing means and said receptacle for selectively directing brewing substance from said substance dispensing means to said receptacle;

water dispensing means operatively associated with said beverage brewing means and selectively communicating with said receptacle for delivering water to a brewing substance retained in said receptacle; and

drive means for selectively alternately moving one of said water dispensing means and said chute for controllably displacing the other of said water dispensing means and said chute, whereby said water dispensing means and said chute controllably, individually communicate with said receptacle.

5,465,651

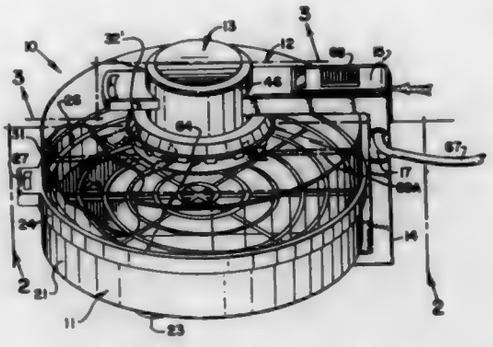
RAPID COOKING DEVICE

Chad Erickson, Plymouth; David Dornbush, Prior Lake, and John Finn, Minneapolis, all of Minn., assignors to American Harvest, Inc., Chaska, Minn.

Continuation of Ser. No. 134,385, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 13,709, Feb. 4, 1993, Pat. No. 5,403,607, which is a division of Ser. No. 902,531, Jun. 22, 1992, abandoned, which is a continuation of Ser. No. 325,157, Mar. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 14,997, Feb. 17, 1987, Pat. No. 4,817,509. This application Mar. 21, 1995, Ser. No. 407,189

Int. Cl.[6] A47J *27/00;37/00*

U.S. Cl. 99—330 **3 Claims**



1. A device for rapidly cooking food, comprising:

an upper enclosure member and a lower enclosure member, the lower enclosure member comprising a circumferential side wall and an interconnected lower wall, wherein the upper and lower enclosure members form a cooking chamber;

air-moving means for moving air inside the cooking chamber;

heating means for heating the air inside the cooking chamber;

a food rack located inside the cooking chamber which defines a cooking surface for supporting the food; and

a hold down rack for holding down food supported on the cooking surface, the hold down rack comprising a hold down surface and a plurality of legs attached thereto for holding the hold down rack at a height above the cooking surface.

5,465,652

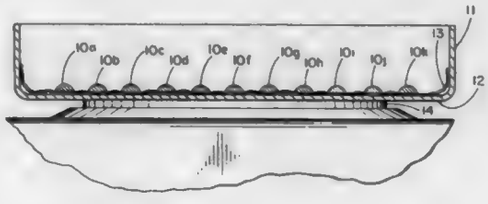
COOKING APPARATUS AND METHOD

Richard H. Hymes, 130 Sunrise Ave., Tonka Bay, Minn. 55331

Filed Feb. 16, 1994, Ser. No. 197,265

Int. Cl.[6] A47J *37/07*

U.S. Cl. 99—400 **6 Claims**



1. In combination:

(a) an array of metallic bars comprising a plurality of unconnected heat-conductive bar members configured to lie at the bottom of a cooking vessel, each of said bar members having an upper food supporting surface and a lower surface, said bar members each being adapted for transferring thermal energy by conduction from a heated base through a thermally conductive liquid impervious barrier to said bar members;

(b) said thermally conductive liquid impervious barrier being located between and in contact with the lower surface of said bar members and a cooking surface;

(c) said thermally conductive liquid impervious barrier being adapted:

(i) to retain liquids released from food supported on said upper food supporting surface of said bar members; and

(ii) to stabilize said bar members.

5,465,653

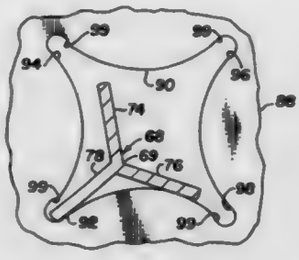
SPIT USED IN COOKING APPARATUS

Renato Riccio, 11350 Pagemill, Dallas, Tex. 75243

Division of Ser. No. 942,622, Sep. 9, 1992, Pat. No. 5,361,685, which is a continuation of Ser. No. 684,576, Apr. 12, 1991, Pat. No. 5,184,540. This application Jan. 21, 1993, Ser. No. 6,501

Int. Cl.[6] A47J *37/04*

U.S. Cl. 99—421 H **12 Claims**



1. A spit for cooking apparatus using a rotisserie, comprising: a body having a periphery; and at least three driven shoulders disposed around the periphery of said body, the at least three driven shoulders being adapted for rotating said body in the rotisserie.

5,465,654

PAN FOR BAKING, FRYING, AND BRAISING, AND PAN STACKING SYSTEM

Rauno A. Lampi, Westboro, Mass.; John N. Bindon, Sunnyvale, Calif.; Anthony J. G. Bowles, Orinda, Calif., and Thomas R. Parks, Sunnyvale, Calif., assignors to Food and Agrosystems, Inc., Sunnyvale, Calif.

Filed Nov. 19, 1993, Ser. No. 154,961

Int. Cl.[6] A47J *37/10*

U.S. Cl. 99—422 **7 Claims**

1. A cooking container for use in a convection oven wherein high temperature air is circulated at high speed around said cooking container to transfer heat to said cooking container and to cook articles contained within the interior of said cooking container, said cooking container comprising:

a) a pan having a bottom wall and a continuous sidewall, said bottom wall and pan sidewall defining interior and exterior surfaces of a base of said container,

b) a continuous pan flange formed about the periphery of said continuous pan sidewall, said pan flange extending outwardly from said sidewall to form a flanged base for said container,

c) a pan lid having a top wall and a continuous sidewall, said top wall and pan lid sidewall defining interior and exterior surfaces of a mating pan lid for said pan,

d) a continuous pan lid flange formed about the periphery of said continuous sidewall of said pan lid, said pan lid flange extending outwardly from said pan lid sidewall to form a flanged cover for said container,

e) said pan bottom wall and said pan lid top wall being substantially flat, smooth and of uniform thickness,

f) said pan flange and said pan lid flange being formed with cooperating hinge structures adapted to permit said pan and pan lid to be hinged into mating alignment and to be moved with respect to each other to permit access to said interior of said container,

g) a projection extending from said pan lid flange, a notch in said pan flange, said projection and notch being adapted to cooperate to align said pan lid against said pan when said pan lid and pan are moved about said cooperating hinge structure to mate said pan lid against said pan,

h) said pan and said pan lid being fabricated of laminated metals with said exterior surface of said pan and pan lid being high thermal conductivity metal and said interior surface of said pan and pan lid being a metal suitable for direct contact with foods to be cooked within said container,

i) and said pan and pan lid when mated with each other defining a cooking container having a pan/lid depth.

5,465,655

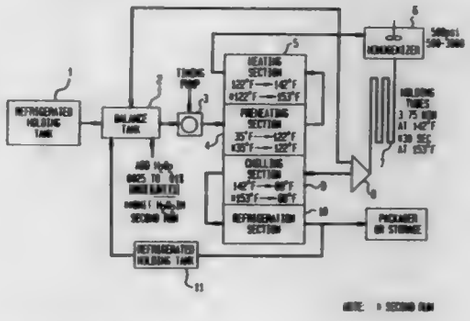
APPARATUS OF PRODUCING EXTENDED REFRIGERATED SHELF LIFE BAKEABLE LIQUID EGG

Stephen T. Papetti, Hillside, N.J., assignor to Papetti's Hygrade Egg Products, Inc., Elizabeth, N.J.

Division of Ser. No. 191,724, Feb. 4, 1994, which is a continuation of Ser. No. 74,788, Jun. 10, 1993, abandoned, which is a continuation of Ser. No. 892,163, Jun. 2, 1992, abandoned, which is a continuation of Ser. No. 705,087, May 24, 1991, Pat. No. 5,167,976. This application Jan. 24, 1995, Ser. No. 377,162

Int. Cl.[6] A23B *5/05*

U.S. Cl. 99—455 **15 Claims**



1. An apparatus for continuously producing pasteurized liquid egg having extended refrigerated shelf-life and retained baking functionality, comprising:

(a) a means for pasteurizing liquid egg adapted to heat said liquid egg to a first temperature and maintain said liquid egg at said first temperature for a first period sufficient to allow for pasteurization, and

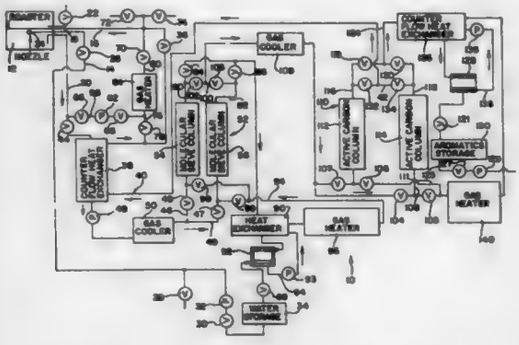
(b) said pasteurizing means in fluid communication with a means for providing additional microbial kill, said means for providing additional microbial kill adapted to heat said pasteurized liquid egg to a second temperature which is higher than said first temperature by contacting said liquid egg with a heated surface and maintaining said pasteurized liquid egg at said second temperature for a second period of time which is less than said first period and which is between about 2 seconds and 2 minutes.

5,465,656

METHOD AND APPARATUS FOR MAKING INSTANT COFFEE

Ralph Ogden, 8803 Parkway Dr., Highland, Ind. 46322

Division of Ser. No. 941,810, Sep. 8, 1992, Pat. No. 5,332,591.
This application Jun. 24, 1994, Ser. No. 264,929
Int. Cl.[6] A47J 31/42
U.S. Cl. 99—485 19 Claims



1. Apparatus for producing aromatic compounds for use in instant coffee, said apparatus comprising:

a) means for receiving and roasting ground coffee beans;

b) means for collecting aromatic compounds driven off of said coffee beans during roasting, said means for collecting positioned in fluid flow communication with said means for roasting;

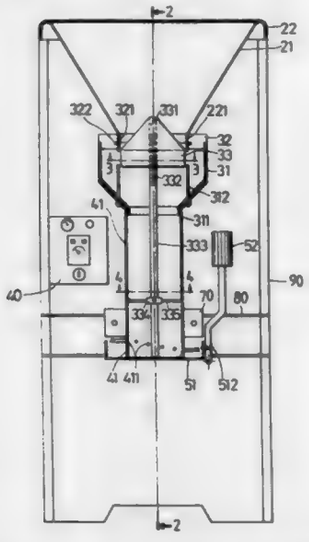
c) first pump means connected to said means for collecting, said first pump means operable for the selective introduction of said aromatic compounds into non aromatic water soluble coffee components at a preselected time after roasting.

5,465,657

DEVICE FOR REMOVING OUTER MEMBRANE OF SCALLION HEAD OR GARLIC HEAD

Hsiu-Liang Wu, 58, Ma Yuan West St., Taichung, Taiwan, Prov. of China

Filed Feb. 13, 1995, Ser. No. 387,121
Int. Cl.[6] A23N 7/00;15/08
U.S. Cl. 99—584 5 Claims



1. A device for removing outer membrane of objects comprising:

a barrel including an open bottom and including a lower portion having air holes formed therein for supplying air into said barrel and for generating air eddy within said barrel, and including an upper portion for receiving said objects, and

a shutter pivotally coupled to said lower portion of said barrel for enclosing said open bottom of said barrel and for maintaining said objects within said barrel,

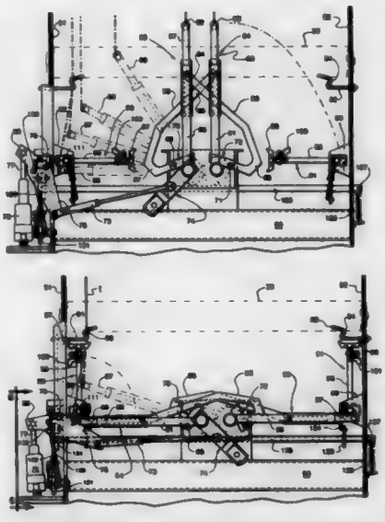
said air eddy being provided for removing said outer membrane from said objects.

5,465,658

TWINE CUTTING APPARATUS FOR ROUND BALER

Robert A. Wagstaff, Lancaster, and John R. McClure, New Holland, both of Pa., assignors to New Holland North America, Inc., New Holland, Pa.

Filed May 2, 1994, Ser. No. 236,833
Int. Cl.[6] B65B 13/18
U.S. Cl. 100—5 14 Claims



1. In a round baler comprising a chamber for forming a cylindrical package of crop material, a generally transverse crop infeed opening in said chamber, a pair of sidewalls, a twine handling assembly mounted between said sidewalls and forwardly of said opening, said twine handling assembly including at least one twine arm having a twine dispensing end from which twine is dispensed in the vicinity of said infeed opening and fed therethrough for applying a plurality of helical wraps on the cylindrical package of crop material formed in said chamber, said twine handling assembly further including means for controllably moving said twine arm to dispense twine across said opening from said twine dispensing end, and twine cutting apparatus having a twine cutting mechanism for cutting the twine, the improvement comprising

said twine cutting apparatus including means for transferring said twine cutting mechanism from a remote inoperative position to an operative position adjacent one of said sidewalls.

5,465,659

AUTOMATIC MACHINE FOR BINDING BUNDLES OF PIPES OR THE LIKE

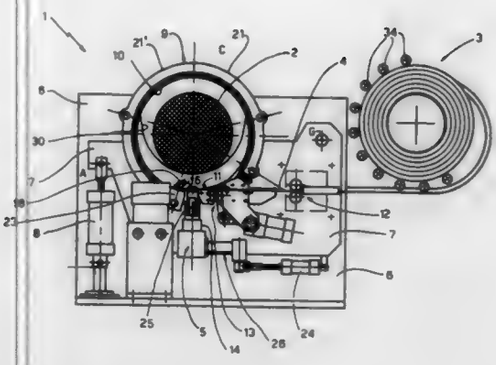
Ettore Minen, Manzano, Italy, assignor to Engen Meccanica Di Minen Ettore, Manzano, Italy

Filed Mar. 7, 1994, Ser. No. 206,942
Claims priority, application Italy, Mar. 17, 1993, UD93A043
Int. Cl.[6] B65B 13/34;13/14
U.S. Cl. 100—30 5 Claims

1. An automatic machine for binding pipes, comprising:

a support for groups of pipes;

a roll of tape for winding around and binding the pipes;



a fixed-position frame of the machine;

a mobile support plate, mounted on the fixed frame;

a guide ring solidly connected to the mobile support plate, said ring including an internal surface scored by a channel, a circumferential first aperture, the tape passing through the first aperture in order to be inserted in the channel, and a second aperture;

a shoe movable between a first position at which said shoe receives an end of the tape and a second position in which the end of the tape is folded back; said shoe is also movable between an internal position in which it is internal of the ring and an external position in which it is external of the ring, at which external position the tape is disengaged from the shoe;

a mobile tape sealing group arranged in proximity to the second aperture, for positioning an open tape clasp therein and for compressing an open tape clasp on the tape and buckling it thereon once the tape has been wound around the pipes;

a bi-directional entrainer for inserting the tape through the first aperture and into the channel and for recalling the tape so that the tape is tensioned after the tape has been wound about the pipes; and

a shears group to cut the tape after the tape has been tensioned;

wherein the guide ring comprises at least two semi-rings which are mobile between a closed configuration, in which they form a closed ring, and an open configuration.

5,465,660

AIRCRAFT TRASH COLLECTION AND COMPACTING APPARATUS

Walter Conti, Woodside; William R. Feemster, Malibu; Jeffrey L. Felts, Poppy Meadow; Antony J. Fields, San Francisco; Robert W. Henderson, Claremont; Paul L. Howard, Palo Alto; Kevin F. Kaub, Palmdale; Joel A. Lederman, Canoga Park; Thomas M. Lee, Sherman Oaks; Gilbert Martinez, Castaic; Mark H. Mathews, Northridge; Ravi V. Patel, Newhall; Michael W. Waldrep, Santa Clarita, and John E. Wetzel, Glendora, all of Calif., assignors to Aero-Design Technology, Valencia, Calif.

Filed Feb. 16, 1994, Ser. No. 198,072

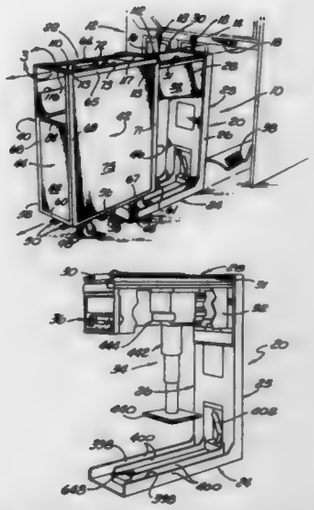
Int. Cl.[6] B30B *15/06*

U.S. Cl. 100—48 **79 Claims**

1. A trash collection and compacting apparatus primarily intended for use on board a passenger aircraft during flight, said apparatus comprising:

a trash compactor unit including:

a rigid metal frame defining generally horizontal elongated upper and lower vertically spaced frame sections, said lower frame section adapted to support said compactor unit on a floor in an aircraft, and said upper frame section having a pair of horizontally disposed and laterally spaced elongated support rails; and a compaction ram mounted to said upper frame section and disposed to project downwardly therefrom below said support rails, said compaction ram including an extendable and retractable compaction platen; and



a trolley unit having a generally rectangular shaped horizontal bottom with upstanding sides defined by front and rear end panels, and left and right side panels, and including:

at least one upwardly open trash chamber formed between said bottom, said end panels and said side panels;

wheels rotatably attached to said bottom for moving said trolley unit through the aircraft for collection of trash in said chamber;

a pair of generally horizontally disposed elongated top rails secured to said side panels and extending between said end panels, said top rails being adapted to mate with said support rails of said compactor unit with said compaction ram disposed to vertically overlie said chamber; and

a removable upwardly open trash bin disposed within said chamber and within which trash is collected, whereby upon mating of said top rails of said trolley unit with said support rails of said compactor unit, extension of said compactor platen will move said platen downwardly into said chamber and said bin, thereby to compact the trash collected therein.

5,465,661

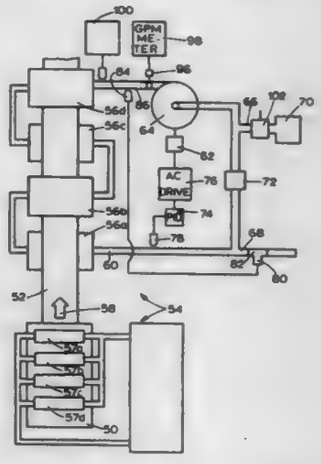
PRINTING PRESS TEMPERATURE ADJUSTMENT SYSTEM

Jason K. White, Fontana, Calif., assignor to R. R. Donnelley & Sons Company, Lisle, Ill.

Filed Oct. 11, 1994, Ser. No. 321,212

Int. Cl.[6] B41F *13/22*

U.S. Cl. 101—219 **20 Claims**



1. A printing press temperature adjustment system, comprising:

circulating means, including a pump operable at a variable speed, for circulating a fluid to a printing press component at one of a plurality of non-zero, steady-state flow rates, wherein the flow rate is related to the speed of the pump;

detecting means for detecting a temperature of the fluid; and

controlling means responsive to the detecting means for controlling the circulating means.

5,465,662

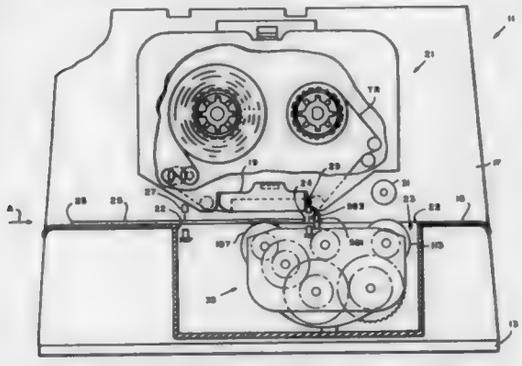
ENVELOPE POSITIONING ASSEMBLY

Wing-Kwong Keung, Wilton, and Walter J. Kulpa, Trumbull, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 4, 1994, Ser. No. 334,097

Int. Cl.[6] B41F *13/24*

U.S. Cl. 101—235 **6 Claims**



1. An envelope positioning assembly for a postage meter, wherein said postage meter includes a registration wall, a deck, and a printing means for printing a postage indicia on an envelope having a leading edge positioned on said deck, said envelope positioning assembly comprising:

a pin fixably mounted to said registration wall and generally aligned perpendicular to said deck;

a stop having an obstructing surface and a cutout, said stop slidably mounted on said pin to move between a first position where said obstructing surface extends above said deck and provides an obstruction to said envelope and a second position where said cutout extends above said deck and does not obstruct said envelope;

positioning means for moving said stop between said first and said second positions; and

microcontroller means in communication with said positioning means for causing said positioning means to move said stop to said second position upon initiation of a print cycle.

5,465,663

SHEET-GUIDING DRUM FOR PRINTING MACHINES

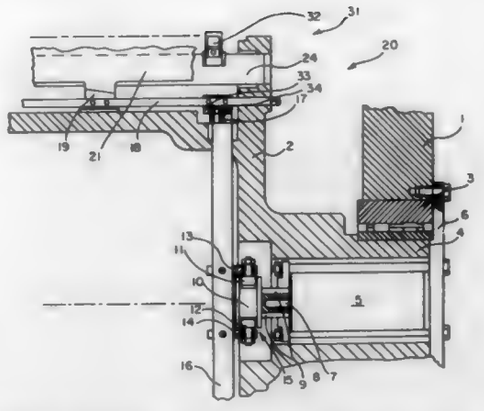
Harald Bayer, Rodgau, and Klemens Kemmerer, Seligenstadt, both of, Germany, assignors to MAN Roland Druckmaschinen AG

Filed Nov. 1, 1994, Ser. No. 332,695

Claims priority, application Germany, Nov. 4, 1993, 43 37 578

Int. Cl.[6] B41F *21/04*

U.S. Cl. 101—409 **9 Claims**



1. A sheet-guiding drum for use in a printing machine, said drum including at least one gripper link having grippers and having a radially adjustable gripper contact strip, said drum having a journal for rotatably supporting the drum, said drum being characterized by a drive located in said journal and having an output producing motion in a direction non-radially of the drum, and means connected between said output and said gripper contact strip for converting the non-radial motion of said output into radial movement of said gripper contact strip thereby to radially adjust said strip.

5,465,664

FUEL AND EXPLOSIVE COMPOSITION WITH FERRIC OR CUPRIC ION AND REDUCING SUGARS

Warren O. Fey, 11092 E. Harvard Dr., Aurora, Colo. 80014

Filed May 3, 1993, Ser. No. 55,545

Int. Cl.[6] C06D *5/06*

U.S. Cl. 102—290 **34 Claims**

1. A fuel composition comprising:

(a) The reaction products of $Fe(NO_3)_3.9H_2O$ and a sugar selected from the group commonly known as reducing sugars, and

(b) Degradation products of a sugar, and

(c) Any remaining unreacted sugar.

5,465,665

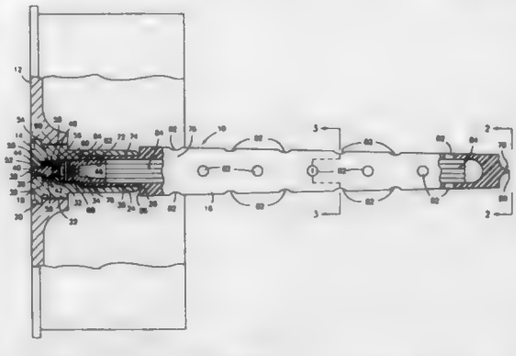
PRIMER

Steven F. Diehl, Mulberry, Fla., assignor to Olin Corporation, St. Petersburg, Fla.

Filed Oct. 29, 1993, Ser. No. 145,891

Int. Cl.[6] F42B *5/26;* **C06C** *7/00*

U.S. Cl. 102—470 **12 Claims**



1. A primer assembly comprising:

a. a primer head assembly attached to a cartridge case base,

b. a hollow tubular one-piece body containing an ignition charge and extending into a propellant charge contained within the cartridge case base, an open rearward end of said body connected to said primer head assembly and an opposing closed forward end of said body terminating at a blade-shaped tip, and

c. said body being comprised of a molded thermoplastic composite material.

5,465,666

METHOD FOR CHANGING RAILWAY SLEEPERS AND EQUIPMENT FOR APPLYING THE METHOD

Jaakko Niiranen, Nallenpolku 1, FIN-70400 Kuopio, Finland

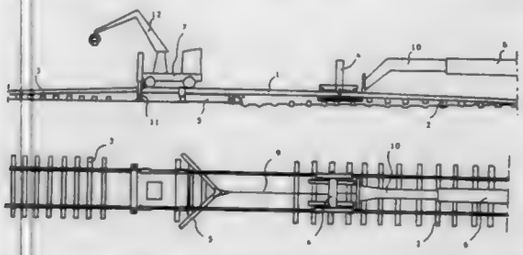
PCT No. PCT/FI92/00197, § 371 Date Dec. 27, 1993, § 102(e) Date Dec. 27, 1993, PCT Pub. No. WO93/00477, PCT Pub. Date Jan. 7, 1993

PCT Filed Jun. 23, 1992, Ser. No. 167,975

Claims priority, application Finland, Jun. 24, 1991, 913063

Int. Cl.[6] E01B 27/00

U.S. Cl. 104—7.3 17 Claims



9. Apparatus for changing a railway sleeper, the apparatus comprising:

a lifting device for lifting and simultaneously unfastening the sleeper from rails when the lifting device is disposed on top of the rails;

a plough for leveling a surface under the rails and supporting the rails during sleeper replacement when the plough is positioned under the rails; and

a first working machine having supporting stands for placing replacement sleepers under the rails when the first working machine is disposed on top of the rails.

5,465,667

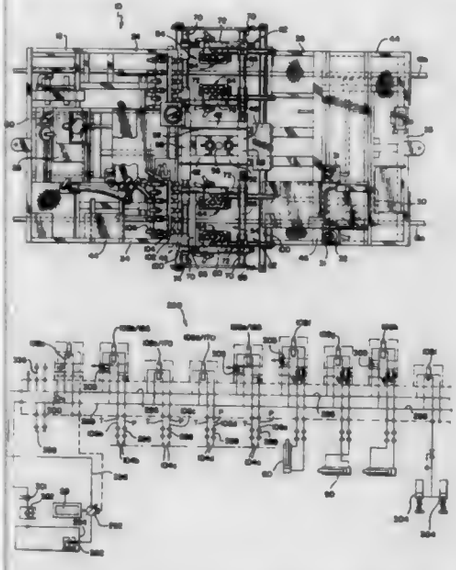
MODULAR RAILWAY MAINTENANCE SYSTEM

Jack K. Hosking, Waukesha, and Gunars Eidemanis, Franklin, both of Wis., assignors to Oak Industries, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 103,056, Aug. 6, 1993, Pat. No. 5,398,616. This application Dec. 21, 1993, Ser. No. 171,112

Int. Cl.[6] E01B 29/00

U.S. Cl. 104—17.2 3 Claims



1. A modular railway maintenance system for performing at least one of a plurality of right-of-way maintenance tasks on a railroad track, comprising;

a base unit including a frame having a plurality of wheels for rotatably engaging the railway track, a first side corresponding to a first rail of the railroad track, and a second side corresponding to a second rail of the railroad track, said frame defining two operational zones for accommodating modules therein;

a first task-oriented module connected to said base unit on said first side in a first said operational zone and a second task-oriented module connected to said second side in a second said operational zone, said first module being configured for performing a maintenance task which is distinct from the task performed by said second module, each of said first and second modules including a spotting carriage portion for locating said module relative to said frame and to the corresponding rail in at least one of a transverse and a parallel direction, a task portion attached to, and suspended from said carriage portion and configured for performing a specific railway maintenance operation on a corresponding side of the track, and at least one control line for connecting said first and second modules to said base frame;

carriage support means on said base unit for engaging said carriage portion and supporting said first and second modules on both of said first and second sides regardless of the specific task performed by said task portion; and

positioning and operational control means on said base unit for engaging said at least one control line and controlling the operation of said task portion and said carriage portion on each of said first and second modules regardless of the task performed by said task portion.

5,465,668

OVERHEAD CABLE TRANSPORT INSTALLATION HAVING TWO CABLES

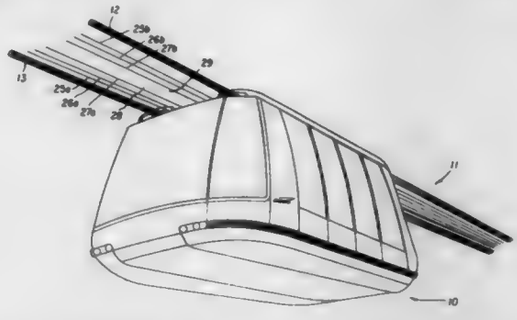
Serge Turassoff, and Georges Toyre, both of Seyssinet-Pariset, France, assignors to Pomagalski S.A., France

Filed Jan. 4, 1995, Ser. No. 368,620

Claims priority, application France, Jan. 13, 1994, 94 00558

Int. Cl.[6] B61B 7/02

U.S. Cl. 104—95 6 Claims



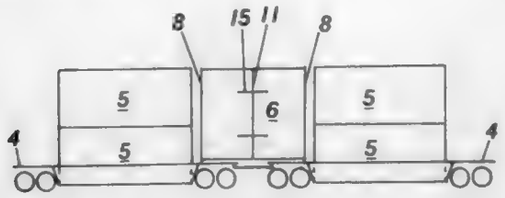
1. An overhead passenger transport installation comprising at least one independent passive vehicle each having a vehicle roof and side walls, a track whereon the vehicle runs, successive stations located along the track, traction cables for driving the vehicle which runs on the track, coupling means in the form of a detachable grip fixed on the vehicle above the vehicle roof and capable of coupling and uncoupling the vehicle onto and from the traction cables for driving the vehicle from one said station to another said station and for stopping the vehicle in the stations, where the vehicle is uncoupled from the traction cables, said track comprising two laterally spaced, parallel track cables extending at the same height between the stations and track cable bearing shoes, each vehicle having supporting wheels running on the track cables and fixed to the vehicle above the vehicle roof so as to provide a clearance between the horizontal plane containing the track cables and the vehicle roof, said clearance having a constant height adapted for housing therein the track cable bearing shoes and the traction cables, between the two track cables.

5,465,669

INTERMODAL RAIL DRAG REDUER WITH FLEXIBLE ENCLOSURE BETWEEN CWS

Paul G. L. Andrus, 650 Dunbar Road, Kitchener, Ontario, Canada

Filed Nov. 29, 1994, Ser. No. 351,031
Int. Cl.[6] B61D *17/02*
U.S. Cl. 105—1.1 2 Claims



1. A container carrying vehicle drag reducing system comprising:

at least two vehicles, each vehicle having at least one container disposed thereon, each said container having a top surface and first and second side surfaces;

enclosing means for substantially enclosing the air-space between adjacent ones of said at least two vehicles, said enclosing means comprising:

a sheet of flexible material having a top face substantially planar with the top surface of said at least one container on each of said adjacent ones of said vehicles, and

first and second side faces, said first side face being substantially planar with said first side surface and said second side face being substantially planar with said second side surface, of said at least one container on each of said adjacent ones of said vehicles, and

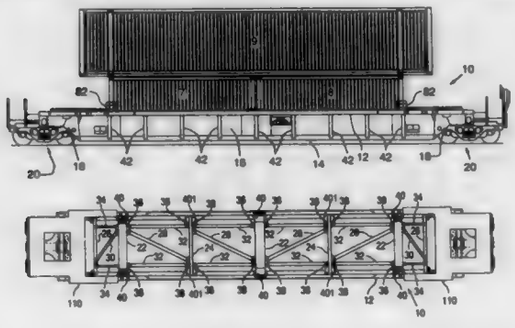
mounting means for mounting said enclosing means to said adjacent ones of said at least two vehicles, said mounting means comprising rigid mounting poles connected at one end to said adjacent ones of said at least two vehicles, and a rope and pulley mechanism connected at the other end of said mounting poles for suspending said top face from said mounting poles, said rope and pulley mechanism enabling said top face to be raised and lowered along said poles.

5,465,670

RAILROAD FREIGHT CAR HAVING AN IMPROVED STRUCTURAL SUPPORT

Ronald S. Butcher, Burlington, Canada, assignor to National Steel Car Limited, Hamilton, Canada

Filed Apr. 8, 1994, Ser. No. 224,839
Int. Cl.[6] B61D *3/00*
U.S. Cl. 105—355 9 Claims



1. A railroad freight car including a longitudinal well for carrying intermodal cargo containers, comprising:

a structural frame integrally comprising reinforced side walls, end structures and a floor, said reinforced side walls connected to said end structures at opposite ends of said reinforced side walls, each of said side walls having an upper chord and a lower chord, said floor extending between said lower chords of side walls,

said floor comprising

a plurality of load supporting transverse members spaced along said car body at container support points, said load supporting traverse members extending transversely between container supporting brackets mounted on said lower chords of said side walls,

a plurality of intermediate transverse members, each intermediate transverse member is spaced between adjacent ones of said load supporting transverse members, said intermediate transverse member extending transversely between said lower chords of said side walls,

two end sills connecting ends of each of said lower chords together,

a plurality of diagonal members, a one of said diagonal members being rigidly connected between each of said load supporting transverse members and an adjacent one of said intermediate transverse members and another one of said diagonal members being rigidly connected between each of said end sills and an adjacent one of said load supporting transverse members for resisting lateral loads and providing a safety support for an intermodal cargo container,

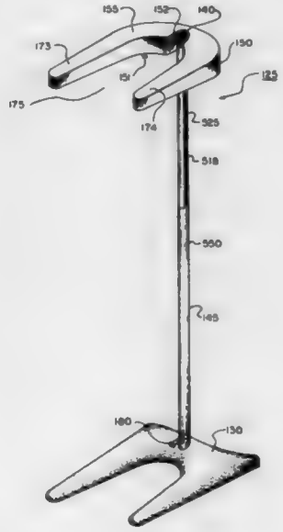
said end structures each having a transversely extending body bolster connected to a longitudinally extending stub center sill and to said upper chords, said stub center sill having a coupler for coupling said railroad freight car to other railroad cars, said body bolster pivotally connected to a railroad truck for rolling along railroad tracks, a shear plate forming a top surface of said body bolster and said stub center sill, a bottom flange connecting an underside of said body bolster at each end thereof to said end sill, said bottom flange extending substantially parallel to said shear plate and then bending downwardly to said end sill, a reinforcing flange for reinforcing said bottom flange at said bend, a bulkhead wall connected between said end sill and said shear plate, said opposing side walls, said floor and said bulkhead wall define a well for receiving an intermodal cargo container.

5,465,671

ADJUSTABLE HEIGHT TRAY STAND WITH TRAY TOY OPENING FOR EASIER LOADING/UNLOADING OF SERVICE TRAYS

Nelson J. Genest, 14 Fontaine St., Augusta, Me. 04330

Division of Ser. No. 960,556, Oct. 13, 1992, Pat. No. 5,408,938.
This application Mar. 2, 1994, Ser. No. 205,207
Int. Cl.[6] A47B *23/00*
U.S. Cl. 108—43 12 Claims



1. A portable, self-standing tray stand used while serving food to restaurant customers by resting a service tray on an upper surface of a tray-supporting top, which top has, relative to the user, a forward facing cut-out section that allows an extended hand and arm of the user to enter beyond the forward edge of the top and into the top's cut-out section in order to deposit a tray thereon while allowing the user's hand to remain essentially at the center of gravity for said tray, said stand comprising:

a base section;

an adjustable rigid upright post section extending upwardly from said base section from about table height to about a user's shoulder height;

means for trapping a column of air within said post as said post is manually lifted;

pneumatic air lock means for maintaining said post at a lifted position in response to said trapped column of air;

a flat horizontal, rigid tray-receiving top mounted on the upper end of said upright post section, with said rigid top having a flat, rigid, horizontal upper tray-receiving surface constructed of material capable of supporting a loaded service tray resting thereon, and said rigid top further having a forward facing cut-out section extending from the forward edge of the top back beyond a center point for said top;

arm receiving means defined by said cut-out section in said rigid top for allowing a user's hand and arm to freely enter past said forward facing front edge of said top and into said cut-out section near said center point thereof, in order to deposit a tray on said flat, tray-receiving surface, and to withdraw his hand and arm without disturbing a deposited tray which rests on said flat surface of said rigid top; and

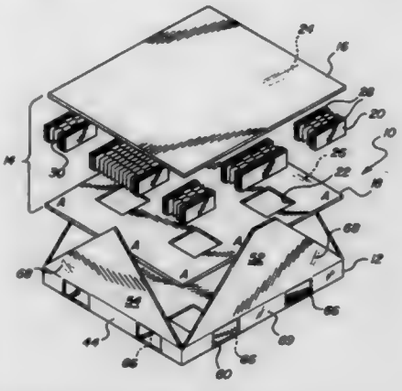
said post comprising means for controllably releasing some of the air within said trapped column of air and thereby lowering said post in response to a user-operated air release height adjustment for said post.

5,465,672

WRAPPED DECK PALLET

George C. Boyse, Rocklin, Calif., and Steven R. Morgan, Hurricane, W. Va., assignors to Down River International, Inc., Sacramento, Calif.

Filed May 16, 1994, Ser. No. 243,383
Int. Cl.[6] B65D *19/00*
U.S. Cl. 108—51.3 **27 Claims**



1. A paperboard deck pallet assembly comprising:

a one-piece envelope including an upper panel, a lower panel and corrugated components disposed therebetween that define flutes extending in a first direction of said envelope, said envelope further having a base portion that is smooth, four integrally formed side wall portions extending vertically from said base and four tab portions that abut one another to define a smooth continuous top surface;

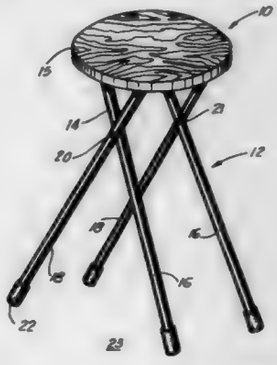
a reinforcing structure disposed within said envelope for adding rigidity to the pallet assembly and supporting said top surface in spaced relationship to said base, whereby said base, said side walls and said tabs share continuous flutes, and when in a folded condition the flutes of said base and said side walls being oblique with one another, the flutes of said side walls and said tabs being oblique with one another, and the flutes of said base and said tabs being perpendicular to one another.

5,465,673

COLLAPSIBLE STOOL OR TABLE APPARATUS WITH HANDLE PORTION

Mark Ma, 1415 Martens Dr., Hammond, La. 70401

Continuation-in-part of Ser. No. 129,944, Sep. 30, 1993, abandoned. This application Feb. 22, 1994, Ser. No. 199,059
Int. Cl.[6] A47B *3/02*
U.S. Cl. 108—118 **6 Claims**



1. A collapsible stool apparatus, comprising:

a) support means comprising a first and second pair of leg members for moving from a first closed parallel position to a second opened position with the first and second pair of leg means crossing to form an "X" configuration;

b) an upper seat further comprising a wooden seat attached directly to the support means;

c) attachment means positioned intermediate the leg members and the seat portion for allowing the leg members to swivel from the first parallel position to the second "X" configured opened position;

d) a handle member attached to and extending from a lower face of the seat for allowing the apparatus to be carried by a user while the apparatus is in the closed position and is positioned beneath the seat when the apparatus is in the opened position; and

e) locking means for engaging the upper leg members against the seat means so as to avoid the leg members from inadvertently moving to the second open position when the stool is sat upon, the locking means further comprising a removable pin member engageable into a pair of bores in the leg members so that once engaged, engages the leg members to the upper support portion, and prevents the leg members from moving from the first closed position to the second open position.

5,465,674

OVEREDGE STITCH SEWING DEVICE

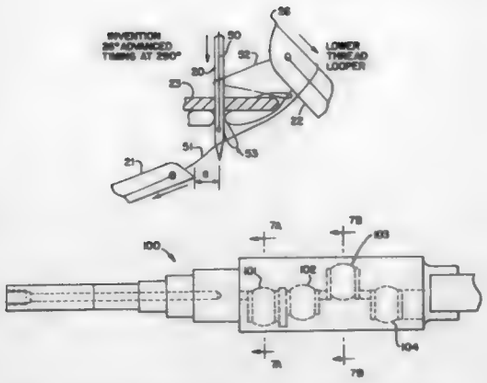
Matt J. Gosche, Woodstock, Ill., assignor to Union Special Corporation, Huntley, Ill.

Continuation of Ser. No. 926,755, Aug. 7, 1992, abandoned. This application Jul. 12, 1994, Ser. No. 273,774
Int. Cl.[6] D05B *1/20*
U.S. Cl. 112—162 **5 Claims**

1. An overedge stitch sewing device comprising:

a sewing surface;

a crankshaft mounted for rotation on said device, said crankshaft including a needle eccentric, a lower looper eccentric and an



upper looper eccentric that rotate with the crankshaft, said crankshaft having a zero degree reference point;

a straight sewing needle mounted on said device to reciprocate through a cycle, defining a reciprocating path, commencing from a position where the sewing needle is below said sewing surface to a mid point in the cycle where the sewing needle is above said sewing surface and then back to the starting point, said sewing needle being drivingly connected to said needle eccentric, said needle eccentric being secured to said crankshaft such that said sewing needle cycle commences at the zero degree reference point of the crankshaft;

a lower looper mounted on said device, below the sewing surface, for oscillation through a cycle describing an arc that crosses the reciprocating path of said sewing needle, said lower looper being drivingly connected to said lower looper eccentric, said lower looper eccentric being secured to said crankshaft such that said lower looper cycle commences prior to the cycle of said sewing needle, such that said lower looper has an advanced timing with respect to the sewing needle; and

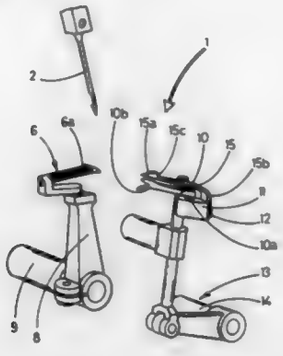
an upper looper mounted on said device for oscillating movement through a cycle from below the sewing surface to above the sewing surface, said upper looper being drivingly connected to said upper looper eccentric, said upper looper eccentric being connected to said crankshaft such that said upper looper cycle commences at the same time as the cycle of said sewing needle.

5,465,675

OVEREDGE SEWING MACHINE INCLUDING AN UPPER LOOPER WITH A HOOKED MEMBER

Giuseppe Pozzi, and Roberto Sanvito, both of Milan, Italy, assignors to Rimoldi Necchi, S.R.L., Milan, Italy

Filed Jul. 28, 1994, Ser. No. 281,751
Claims priority, application Italy, Jan. 27, 1993, MI93A2278
Int. Cl.[6] D05B *1/20;57/06*
U.S. Cl. 112—162 **5 Claims**



1. An apparatus for executing overedge stitch seams in trimming sewing machines, comprising:

at least one needle (**2**) carrying a respective sewing thread (**3**) and reciprocated with a rectilinear motion through a workpiece (**5**) moving according to a given sewing direction ("F");

a lower looper (**6**) carrying a respective interlacing thread (**7**), which looper operates under the workpiece (**5**) and performs a reciprocating motion in a direction transverse to the sewing direction ("f") so that said lower looper cyclically engages through a loop (**16**) formed by the sewing thread (**3**) inserted through the workpiece (**5**);

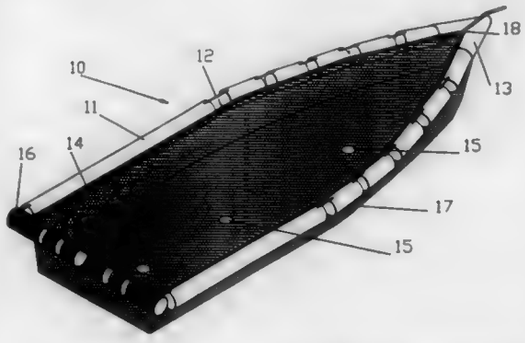
an upper looper (**10**) reciprocated according to a curved trajectory extending on either side of a lateral edge (**5***a*) of the workpiece (**5**), to engage the interlacing thread (**7**) and arrange the lateral edge over the workpiece (**5**) so that said interlacing thread is interlooped by the sewing needle (**2**) moving towards said workpiece, said apparatus further comprises at least one hooked element (**15**) rigidly carried by the upper looper (**10**) to engage the sewing thread (**3**) at a portion thereof extending from the workpiece (**5**) to the needle (**2**), in order to drag along said sewing thread beyond said lateral edge (**5***a*) of the workpiece (**5**) during the movement carried out by the upper looper (**10**) away from the needle (**2**).

5,465,676

BARNACLE SHIELD

Steven M. Falcaro, 1741 Braman Ave., Fort Myers, Fla. 33901

Filed Mar. 24, 1995, Ser. No. 409,596
Int. Cl.[6] B63B *59/00*
U.S. Cl. 114—222 **3 Claims**



1. A system for discouraging and inhibiting the growth of the entire marine fouling community onto a boat's underwater hull surface comprising:

flotation means, the shape of said flotation means approximating the shape of the boat at the water line,

an envelope of flexible, buoyant material, being of a size and shape complementary to the underwater part of a boat's hull from its bow to its stern, said buoyant material having a top edge and a bottom end and said buoyant material being affixed at said top edge to, and supported by, said flotation means,

fresh water input means, affixed to said flotation means, for injecting fresh washdown water into said envelope for washing the boat's underwater hull surface and providing a fresh water marine growth inhibitor, and,

valve means mounted in said bottom end of said buoyant material for eliminating said wash down water contained in said envelope,

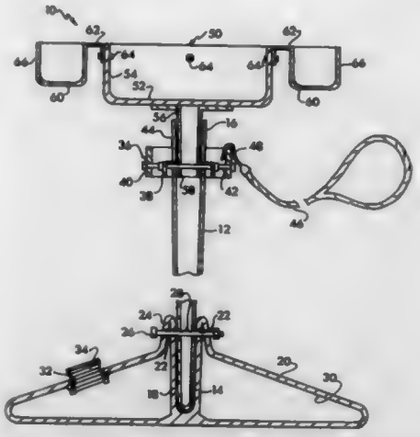
said buoyant material having sufficient buoyancy, when combined with the weight of the boat, to apply sufficient pressure to squeeze the water out of the envelope created by said buoyant material and through said valve means.

5,465,677

FLOAT POST APPARATUS

Sheldon Alter, 48 S. Masters Dr., Homosassa, Fla. 34446

Filed Nov. 7, 1994, Ser. No. 335,172
Int. Cl.[6] B63B *21/00*
U.S. Cl. 114—230 18 Claims



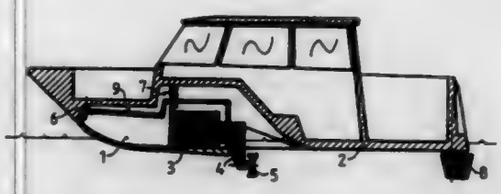
1. Float post apparatus comprising an elongated post having first and second opposite ends, a tether having first and second ends, tether mounting means attached to the post adjacent the second end, the first end of the tether having attachment means to attach the tether to the tether mounting means and the second end of the tether having attachment means to attach the tether to a person, the first end of the post adapted to be anchored at the bottom of a body of water, a mounting stand having a post receiving seat adapted to receive the first end of the float post, the mounting stand having a neck portion and having the post receiving seat formed in the neck portion, an aperture formed through the neck portion and a corresponding aperture formed through the post adjacent the first end of the post and being in alignment with the aperture in the neck when the post is received in the post receiving seat, and a locking member received in the apertures to lock the post to the mounting stand and a storage locker mounted on the second end of the post.

5,465,678

PIECE OF HULL FOR BOATS AND VESSELS

Christer V. Ekman, Aisagatan 8 A 2, Fin-20780, St. Karins, Finland

PCT No. PCT/FI92/00318, § 371 Date May 25, 1994, § 102(e) Date May 25, 1994, PCT Pub. No. WO93/11039, PCT Pub. Date Jun. 10, 1993
PCT Filed Nov. 25, 1992, Ser. No. 244,418
Claims priority, application Finland, Nov. 26, 1991, 915548
Int. Cl.[6] B63B *1/22*
U.S. Cl. 114—284 8 Claims



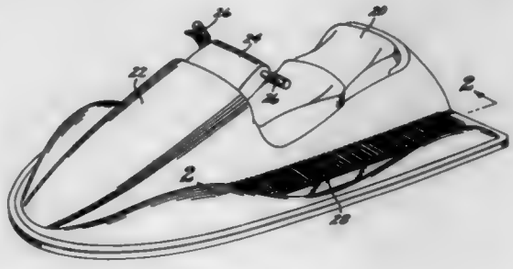
1. Additional hull in a boat unit, vessel or other preferably monohull construction designed to travel over water, said additional hull comprising at least an additional hull section, a drive unit of the boat with possible transmission mechanism and a propulsion mechanism; said additional hull section attached to a main hull section of the boat unit by joint means allowing pivotal inter-hull movement between the additional hull section and the main hull section while substantially eliminating longitudinal movement between the additional hull section and the main hull section; said additional hull section forming a portion of the bottom flow surface of the total hull against the water, characterized in that said additional hull section is for the greater part located in the bow half of the total hull, forms an integral part of said total hull and that said joint means between the additional and main hull sections comprise at least a suspension means allowing the motion of the additional hull section, while the boat is travelling, relative to the main hull section within the limits defined by the waves and the boat travelling counterforces, attenuating the motion of the main hull section.

5,465,679

PERSONAL WATERCRAFT AND BOAT WITH SHOCK ABSORBING FLOORBOARDS

Albert Mardikian, Corona Del Mar, Calif., assignor to Mardikian 1991 Irrevocable Trust, Corona Del Mar, Calif.

Continuation of Ser. No. 65,619, May 21, 1993, abandoned.
This application Apr. 25, 1994, Ser. No. 232,675
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—363 9 Claims



1. A personal watercraft comprising:

a hull,

a seat configured for seating the driver while the driver drives the watercraft;

two floor boards, the two floor boards disposed on the respective sides of the seat and forming a support surface on which the driver rests his or her feet while driving the watercraft, the floor boards extending from the front of the seat to the rear of the seat and

shock absorbing spring means for mounting the floor boards to the hull in a position wherein the floor boards are capable of limited motion in an up-and down direction relative to the hull and are spring biased in an upwardly direction whereby the floor boards act to substantially absorb waves and bumps of the water and act as shock absorber while the watercraft travels on water, the shock absorbing spring means include a base which is disposed substantially parallel with an upper base surface of the hull and is fixedly attached thereto, a plurality of shafts movably affixed to the base and fixedly attached to the floor boards and a plurality of coil springs, each coil spring being mounted on one shaft and biasing the floor board in an upwardly direction.

5,465,680

METHOD OF FORMING CRYSTALLINE SILICON CARBIDE COATINGS

Mark J. Loboda, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Jul. 1, 1993, Ser. No. 84,914
Int. Cl.[6] C30B *25/02*
U.S. Cl. 117—84 16 Claims

1. A method of growing an epitaxial silicon carbide film on a silicon substrate comprising:

forming a silicon carbide buffer layer on the silicon substrate;

heating the silicon substrate having the silicon carbide buffer layer to a temperature in the range of about 650° to 1000° C.; and

contacting the heated silicon substrate having the silicon carbide buffer layer with a gas comprising trimethylsilane for a time sufficient to grow the epitaxial silicon carbide film.

5,465,681

COATING ROLL DRIVE

Julius Pasztor, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 2, 1994, Ser. No. 204,701
Int. Cl.[6] B05C *11/00*
U.S. Cl. 118—680 **4 Claims**

1. An apparatus for conveying a web through a bead coating

station, comprising:

a hopper for applying coating onto the web, the hopper having a plurality of parallel metering slots between a plurality of hopper elements which form an inclined surface, the inclined surface terminating at a lip;

a coating roll for conveying the web, the coating roll having an axis parallel to the metering slots and being spaced apart a distance from the lip;

electromagnetic bearings for radially and axially supporting said coating roll by magnetic forces without contacting said coating roll;

sensors for detecting the distance between said coating roll and the lip and generating a signal in response to the distance; and

control circuitry responsive to the signal from said sensors for controlling currents flowing to said electromagnetic bearings wherein the distance between the lip and said coating roll is controlled to predetermine value.

5,465,682

MODULAR EXERCISE, PLAY, AND LIVING STRUCTURE FOR DOMESTIC CATS

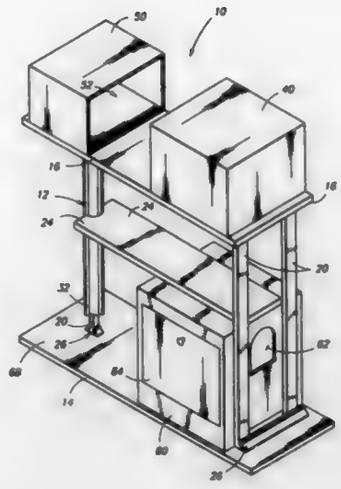
Eusevio Chavallo, Jr., 1327 N. 24th, Apt. 7A, Pasco, Wash. 99301

Filed Sep. 15, 1993, Ser. No. 122,780
Int. Cl.[6] A01K *15/02*
U.S. Cl. 119—19 **30 Claims**

1. A modular exercise, play, and living apparatus for cats, comprising:

a support frame having a base and at least one upstanding frame member which extends upwardly from the base; the support frame including at least one slidably interlocking joint connecting the upstanding frame member and the base to allow interlocking assembly and subsequent disassembly of the support frame, thereby allowing the support frame to be disassembled and arranged in a knocked-down shipping arrangement; said support frame further comprising an elevated platform; and wherein there are a plurality of upstanding frame members extending upwardly from the base; each of said upstanding frame members being connected to the base and to the elevated platform by slidably interlocking joints; the slidably interlocking joints allowing the support frame to be disassembled and arranged in a knocked-down shipping arrangement; and

at least one compartment which is supported by the support frame, the compartment having an access opening to allow ingress and egress by a cat.



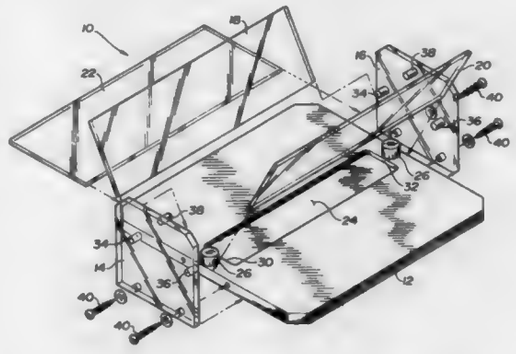
5,465,683

BIRD FEEDER AND METHOD OF MAKING

Alfred Reisdorf, 2604 - 41 Street, Edmonton, Alberta, Canada

Filed Sep. 16, 1994, Ser. No. 307,168
Claims priority, application Canada, Nov. 10, 1993, 2102829
Int. Cl.[6] A01K *39/00*
U.S. Cl. 119—52.2 **2 Claims**

1. A method of building a bird feeder, comprising:



a. providing a substantially planar base having an elongate central slotted trough-like depression with vertically extending pins adjacent opposed ends of the depression;

b. providing a pair of supports vertically securable to the base, each support having three projecting pins that extend horizontally when each support is vertically positioned on the base, two of the three horizontally projecting pins being spaced apart on a common horizontal plane and one of the three horizontally projecting pins being positioned adjacent a top of each support intermediate the other two horizontally projecting pins; and

c. providing three rectangular plates;

d. assembly comprising the steps of securing the supports vertically onto the base, resting two of the rectangular plates upon the base above the slotted depression, the plates extending upwardly at an angle from the base angularly supported by two of the three horizontally projecting pins on the supports, the plates being positioned above the depression spaced apart by the pins that extend vertically from the base, one of the plates extending horizontally over and being supported by the other two of the rectangular plates, the horizontal plate being held in place by the one of the three horizontally projecting pins positioned adjacent the top of each support.

5,465,684

HAY FEEDER FOR LIVESTOCK

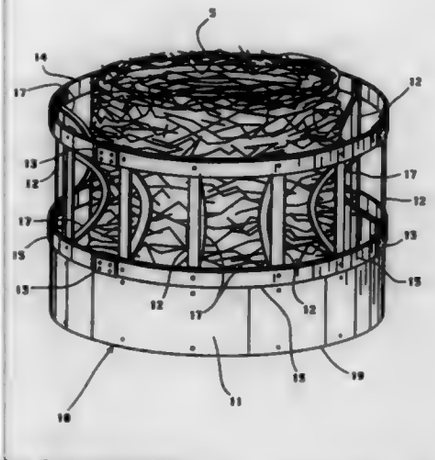
Karen Dyson, P.O. Box 279, Silver Lake, Ind. 46982

Continuation of Ser. No. 144,346, Nov. 1, 1993, Pat. No. 5,337,699. This application Aug. 10, 1994, Ser. No. 288,482

The portion of the term of this patent subsequent to Aug. 16, 2011, has been disclaimed.

Int. Cl.[6] A01K *1/10*

U.S. Cl. 119—60 **16 Claims**



1. A hay feeder comprising:

a cylindrical frame having a cross sectional shape with a substantially constant circumference, a peripheral edge, an upper portion and a lower portion, said upper portion including a plurality of openings large enough for the head and neck of an animal to pass through, said lower portion including a cylindrical skirt relatively impervious to hay; and

deformable means, attached to said cylindrical frame, for resiliently maintaining hay positioned within said cylindrical frame away from said peripheral edge.

5,465,685

ANIMAL COAT DEODORIZER AND INSECT REPELLENT

John Dotolo, Clearwater, and Ronnie E. Bayless, Plat City, both of Fla., assignors to Citra Science Ltd., Largo, Fla.

Filed Aug. 2, 1994, Ser. No. 285,124

Int. Cl.[6] A01N *25/00*; A01K *13/00*

U.S. Cl. 119—159 **21 Claims**

1. A sprayable liquid insect repellent and deodorizer, consisting of:

from about 0.5 to about 40 weight percent d-limonene;

from about 3.5 to about 41 weight percent surfactant;

from about 1.5 to about 19 weight percent hexylene glycol;

from about 0.1 to about 1.2 weight percent triethanolamine; and

the balance water.

5,465,686

COLLAPSIBLE HOUSE FOR PETS

Steven A. Monetti, and Catherine J. Monetti, both of 14 Crestwood Dr., Mountain Lakes, N.J. 07046

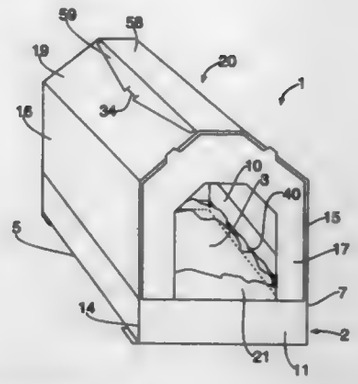
Filed Sep. 14, 1994, Ser. No. 305,592

Int. Cl.[6] A01K *29/00*

U.S. Cl. 119—168 **15 Claims**

1. A disposable, collapsible pet house foldable from a unitary blank of material received in a flat state, said house being foldable from said blank between a collapsed state for shipping, storage and disposal and an enclosed, erect state for use, said house comprising:

a container portion having



a bottom means,

a pair of oppositely opposed sidewalls extending upwardly from and integral with said bottom means, and

a pair of oppositely opposed end walls extending upwardly from and integral with said bottom means, said pair of end walls being connected to said pair of sidewalls;

a pair of sidewall panels, each integral with a different one of said pair of sidewalls;

a pair of end wall panels, each integral with a different one of said pair of end walls, at least one of said pair of end wall panels having an opening therein for ingress and egress of a pet when said house is in said erect state;

a pair of roof panels, each integral with a different one of said pair of sidewall panels, one of said pair of roof panels overlapping a portion of the other of said pair of roof panels when said house is in said erect state; and

releasable means associated with each of said pair of roof panels and said pair of end wall panels to interconnect the same to provide said house with stability in said erect state;

said pair of end wall panels and said other of said pair of roof panels and its associated one of said pair of sidewall panels being foldable into said container portion and said one of said pair of roof panels and its associated one of said pair of sidewall panels being foldable to cover said pair of end wall panels and said other of said pair of roof panels and its associated one of said pair of sidewall panels and extend over one of said pair of sidewalls and a portion of said bottom means to be in an interlocking relation with said bottom means when in said collapsed state.

5,465,687

ANIMAL CONTROL APPARATUS

Daniel A. Custer, Southborough, Mass., assignor to DogWatch, Inc., Wayland, Mass.

Continuation of Ser. No. 79,205, Jun. 16, 1993, Pat. No. 5,353,744, which is a continuation of Ser. No. 998,878, Dec. 29, 1992, abandoned, which is a continuation of Ser. No. 884,843, May 13, 1992, abandoned, which is a continuation of Ser. No. 700,015, May 14, 1991, abandoned. This application Jun. 28, 1994, Ser. No. 267,451

The portion of the term of this patent subsequent to Oct. 11, 2011, has been disclaimed.

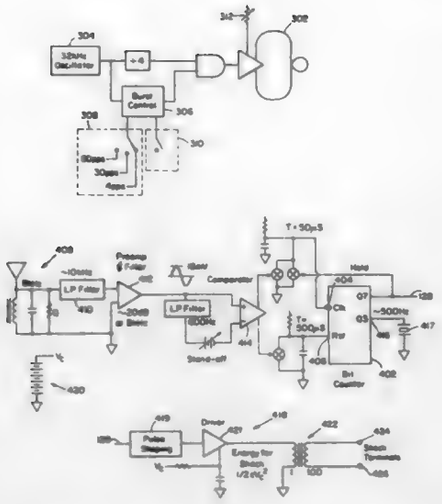
Int. Cl.[6] A01K *15/00*

U.S. Cl. 119—719 **10 Claims**

1. An apparatus for confining the movement of an animal to a defined area, comprising:

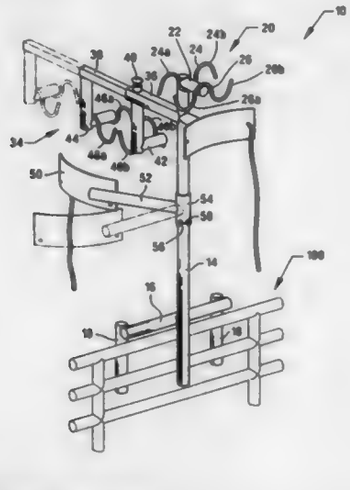
a) a transmitter having means for generating unattendedly a coded radio signal through an antenna defining said area, said means for generating unattendedly said coded radio signal including means for modifying the code of said coded radio signal, which regulates the type, rate and/or intensity of a stimulus provided to said animal;

b) a portable radio receiver for decoding said coded radio signal for said type, rate and/or intensity of stimulus provided to said animal;



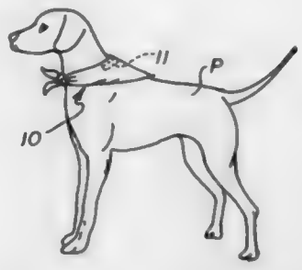
c) means for delivering said stimulus to said animal; and
d) means for attaching to said animal said portable radio receiver and said means for delivering said stimulus.

5,465,688
PIG HOLDER
Donald Hatcher, Rte. 2, Box 283-1, Wallace, N.C. 28466
Filed Jun. 7, 1993, Ser. No. 72,226
Int. Cl.[6] A01K *15/06*
U.S. Cl. 119—728 **11 Claims**



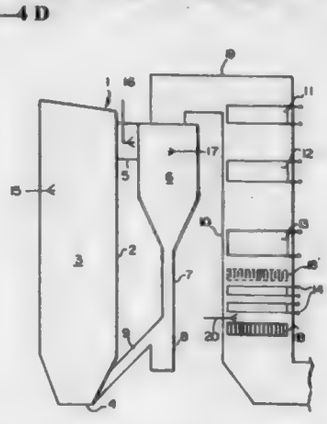
1. A pig holder comprising:
(a) a support frame;
(b) mounting means engagable with the rails of a ferring crate for mounting the support frame to the ferring crate;
(c) a leg holder assembly secured to the support frame for holding a pig by its hind legs, said leg holder assembly including two sets of hooks disposed in side-by-side relationship for engagement with respective hind legs of the pig, each said sets of hooks including a first upwardly disposed hook for engaging one side of the pig's hind legs and a second downwardly disposed hook spaced from said first hook for engaging the opposite side of the pig's hind legs such that the pig is retained in the hooks by gravity;
(d) a support plate mounted to the support frame adjacent to the leg holder assembly for engagement with the body of the pig, wherein the support plate is pivotally mounted to the support frame so as to be movable between a first position to permit placement of the pig within the leg holder assembly, and a second position in which the support plate is in contact with the pig; and
(e) a retaining strap for extending around the body of the pig to hold the pig in contact with the support plate.

5,465,689
FLEA AND TICK REPELLENT BANDANNA FOR PETS
Forrest Winder, P.O. Box 1646, Santa Fe, Tex. 77510
Filed Dec. 9, 1994, Ser. No. 353,506
Int. Cl.[6] A01K *29/00;27/00*
U.S. Cl. 119—861 **20 Claims**



1. A flea and tick repellent bandanna for pets comprising;
a sheet of woven material formed into a triangular shape having a base edge with lateral apices forming lateral ends and convergent side edges which meet at an apex,
said base edge of sufficient length to encircle the neck of an animal when said lateral ends are tied together, and
an elongate flexible porous sheath filled with a flea and tick repellent material contained within said base edge and attached thereto.

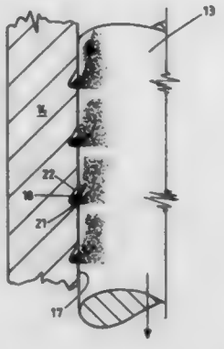
5,465,690
METHOD OF PURIFYING GASES CONTAINING NITROGEN OXIDES AND AN APPARATUS FOR PURIFYING GASES IN A STEAM GENERATION BOILER
Charles Viel Lamare; Matti Hiltunen, both of Karhula, Finland, and Yam Lee, San Diego, Calif., assignors to A. Ahlstrom Corporation, Noormarkku, Finland
Filed Apr. 12, 1994, Ser. No. 226,483
Int. Cl.[6] C01B *21/00;* **F22B** *1/00*
U.S. Cl. 122—4 D **23 Claims**



1. A method of purifying combustion gases from a steam generation plant, the plant comprising a fuel reaction chamber and a flue gas convection section operatively connected to the reaction chamber, the convection section having heat transfer elements for extracting heat from the gases, the method comprising the steps of:

(a) maintaining combustion reactions in the reaction chamber resulting in the production of hot gases containing nitrogen oxides;
(b) discharging the hot gases from the reaction chamber and leading them into the convection section;
(c) cooling the gases in the flue gas convection section;
(d) reducing nitrogen oxides in a first reducing stage by bringing the hot gases into contact with a reducing agent; and then
(e) reducing nitrogen oxides in a second reducing stage by subjecting the gases containing the reducing agent of the first reducing stage to a catalytic NO_x reduction in the flue gas convection section while maintaining the temperature of the gases in the second reducing stage within the range of about ±25° C. of the optimum working temperature of the catalyst.

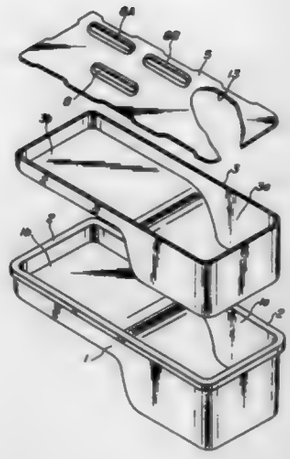
5,465,691
VALVE GUIDE
Richard G. Capaldo, 97 West Street, Torrensville, South Australia, Australia
Filed Mar. 8, 1995, Ser. No. 400,653
Int. Cl.[6] F01L *3/08*
U.S. Cl. 123—188.9 **4 Claims**



1. A valve guide for guiding a valve stem of a headed poppet valve for slidable movement in an internal combustion engine, comprising an inner bearing surface of generally cylindrical shape, a groove surface defining a spiral lubricant passage from an end of the guide towards the valve head extending for at least part of the length of bearing surface,
the cross-sectional shape of said spiral groove comprising an axially inner groove surface portion closest the head of said valve which extends generally radially outwardly from said bearing surface to be effective in scraping lubricant from said valve stem into said groove upon stem movement in a valve opening direction,
and said shape also comprising an axially outer groove surface portion more distant from said valve head defining an acute angle with said valve stem to be effective in causing entrainment of lubricant from said groove by said stem upon stem movement in a valve closure direction.

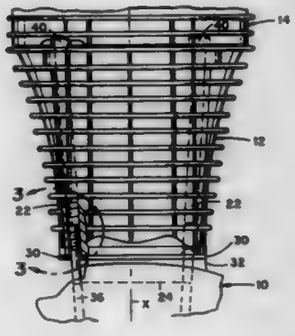
5,465,692
CONSTRUCTION OF OIL PAN FOR INTERNAL COMBUSION ENGINE
Yoichi Uraki, Yokohama; Takao Kubozuka, Yokosuka; Masuhiko Kondo, Yokohama; Hiroshi Miyakubo, and Hisafumi Usuki, both of Yokosuka, all of, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Jun. 21, 1994, Ser. No. 267,014
Claims priority, application Japan, Jun. 30, 1993, 5-161144
Int. Cl.[6] F02F *7/00*
U.S. Cl. 123—195 C **18 Claims**

1. An oil pan structure for an internal combustion engine, comprising:



an outer pan attachable at an open upper side thereof to a lower portion of a cylinder block of said internal combustion engine; and
an inner pan disposed within said outer pan so as to float freely in a fluid contained in said outer pan,
wherein a space is defined between an inner side of said outer pan and an outer side of said inner pan, said fluid occupying said space.

5,465,693
MOTORCYCLE ENGINE IMPROVEMENT
Laurance L. Poole, 6417 Beaver Ridge Rd., Knoxville, Tenn. 37931
Filed Apr. 28, 1994, Ser. No. 234,053
Int. Cl.[6] F01M *11/02*
U.S. Cl. 123—196 CP **16 Claims**



1. An oil circulation system for an internal combustion engine comprising the unitized assembly of crankcase means, cylinder body means and cylinder head means, said oil circulation system comprising a pumped oil supply to an overhead valve assembly within said cylinder head means and gravity drained crankcase return oil conduit means routed from said cylinder head means, through said cylinder body means across a gasket sealed interface between opposing gasket faces respective to said crankcase means and said cylinder body means, the improvement comprising a short length of taper terminated internal screw thread in said cylinder body advanced from said gasket face along said return oil conduit, said screw thread receiving therein an interface bridging length of malleable tubing having at least one end thereof formed with corresponding external screw thread and internal socket tool surfaces.

5,465,694

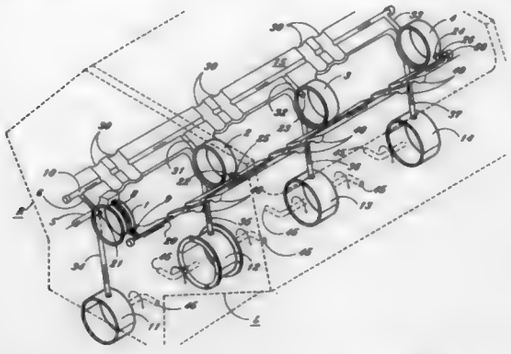
V-BLOCK ENGINE LUBRICATION DEVICE

Stanley A. Agarrat, 3660 NW. 17 St., Ft. Lauderdale, Fla. 33311

Filed Mar. 22, 1995, Ser. No. 408,374

Int. Cl.[6] F01M *11/02*

U.S. Cl. 123—196 R 2 Claims



1. A semi-ring lubrication circuit device for a V-block, cam in block, internal combustion engine comprising:

an internal combustion V-block having a front, a back, a right side, and a left side;

an inlet oil passage formed in said V-block at said front;

a right side oil supply passage formed in said V-block and extended substantially the entire length of said V-block on said right side and in communication with said inlet oil passage;

a first, a second, a third, and a fourth cam bearing colinearly positioned and operationally spaced from said front to said back of said V-block with said first, said second, said third, and said fourth cam bearings positioned first, second, third, and fourth nearest said front of said V-block;

said first, second, third, and fourth cam bearings each having a port means to receive oil;

a first, a second, a third, and a fourth crankshaft bearing positioned below said cam bearings and colinearly positioned and operationally spaced from said front to said back of said V-block with said first, said second, said third, and said fourth crankshaft bearings positioned first, second, third, and fourth nearest said front of said V-block;

said inlet oil passage in communication with said first cam bearing through said port means and in communication with said first crankshaft bearing through a first crankshaft interconnecting oil passage;

said first cam bearing having an oil passage groove means;

a left side oil passage formed in said V-block and extended substantially the entire length of said V-block on said left side and in communication with said inlet oil passage through said first cam bearing oil passage groove means;

said left side oil passage in communication with said second cam bearing through said port means and through a second cam interconnecting oil passage formed in said V-block;

said left side oil passage in communication with said fourth cam bearing through said port means and through a fourth cam interconnecting oil passage formed in said V-block;

six left side lifter bores in communication with said left side oil passage;

said right side oil passage in communication with said third cam bearing through said port means and through a third cam interconnecting oil passage formed in said V-block and in communication with said third crankshaft bearing through a third crankshaft interconnecting oil passage formed in said V-block;

said right side oil passage in communication with said second crankshaft bearing through a second crankshaft interconnecting oil passage formed in said V-block;

said right side oil passage in communication with said fourth crankshaft bearing through a fourth interconnecting oil passage formed in said V-block;

six right side lifters bores in communication with said right side oil passage.

5,465,695

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

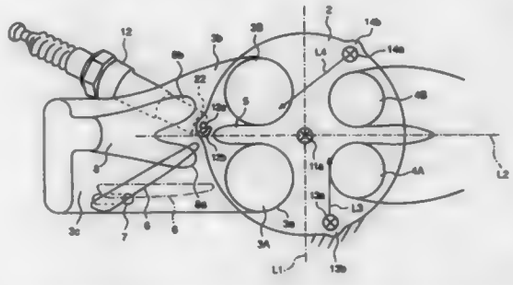
Hiroyuki Yamamoto; Noriyuki Ota, and Toshiyuki Terashita, all of Yokohama, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 936,397, Aug. 31, 1992, abandoned. This application Jun. 30, 1994, Ser. No. 268,875

Claims priority, application Japan, Aug. 30, 1991, 3-245233; Aug. 30, 1991, 3-245234

Int. Cl.[6] F02B *19/12;* F02P *15/02*

U.S. Cl. 123—256 4 Claims



1. An ignition system for an internal combustion engine having a plurality of combustion chambers, each of which is defined by a generally cylindrical inner wall, comprising:

a plurality of peripheral ignition spark gaps arranged at circumferential separations along said inner wall of each of said combustion chambers; and

means for enriching a fuel and gas mixture between two adjacent peripheral ignition spark gaps separated by a circumferential distance which is larger than that between any other two adjacent peripheral ignition spark gaps.

2. An ignition system for an internal combustion engine having a plurality of combustion chambers, each of which is defined by a generally cylindrical inner wall, comprising:

a plurality of peripheral ignition spark gaps arranged at circumferential separations along said inner wall of each of said combustion chambers; and

plug bores for receiving two adjacent peripheral ignition spark gaps separated by a circumferential distance which is larger than that between any other two adjacent peripheral ignition spark gaps;

wherein said plug bores are formed so as to direct flames produced by said two adjacent peripheral spark gaps toward a volume between said two adjacent peripheral spark gaps.

5,465,696

THROTTLE APPLIANCE FOR AN INTERNAL COMBUSTION ENGINE AND METHOD OF MANUFACTURING METERING WALLS IN THE THROTTLE APPLIANCE

Karl Gmelin, Flein, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE93/01069, § 371 Date Jul. 28, 1994, § 102(e) Date Jul. 28, 1994, PCT Pub. No. WO94/12781, PCT Pub. Date Jun. 9, 1994

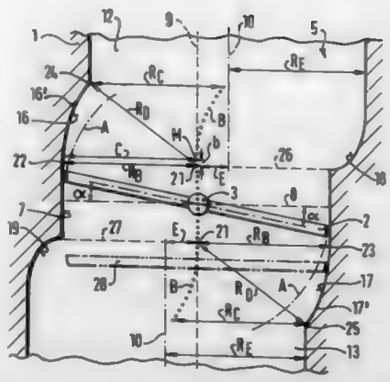
PCT Filed Nov. 10, 1993, Ser. No. 256,836

Claims priority, application Germany, Nov. 28, 1992, 42 40 127.5

Int. Cl.[6] F02D *9/10*

U.S. Cl. 123—337 4 Claims

1. A throttle appliance for an internal combustion engine with a casing, an induction duct extending in the casing, a throttle butter-



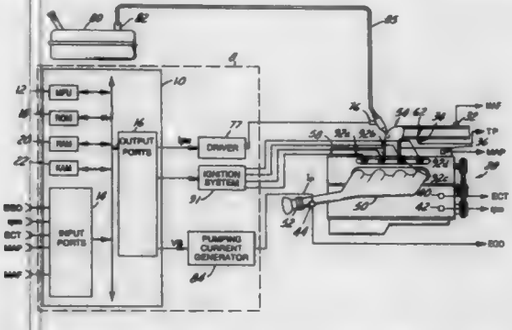
fly shaft rotatably supported in the casing and protruding transversely through the induction duct and a throttle butterfly fastened to the throttle butterfly shaft in the induction duct, the induction duct (5) has a cylindrical region (7) with a longitudinal axis (9), the throttle butterfly (2) is embodied in oval shape and in a closed position is located completely in said cylindrical region (7), metering walls (16, 17) follow upstream and downstream of the cylindrical region (7), which determines the air throughput in the induction duct (5) because of their contours due to an interaction with the throttle butterfly (2) on opening of the latter, the contours of the metering walls (16, 17) following at an increasing distance a path (A) of a periphery of the throttle butterfly (2) in order to achieve a slight and well-metered increase in the air quantity with an increasing opening angle of the throttle butterfly (2), and the metering walls (16, 17) are machined by a chip-cutting rotating element (20), the rotation of the chip-cutting element (20) taking place about a center (M) which is moved radially and axially along a previously calculated locus (B) which deviates from a longitudinal axis (9).

5,465,697

COLD START ENGINE AIR/FUEL CONTROL SYSTEM

Douglas R. Hamburg, Bloomfield; Eleftherios M. Logothetis, Birmingham, and Daniel L. Meyer, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 6, 1994, Ser. No. 350,437
Int. Cl.[6] F02P 5/15; F02D 41/14
U.S. Cl. 123—424 **18 Claims**



1. An air/fuel control system for an engine having its exhaust coupled to a catalytic converter, comprising:

an exhaust gas oxygen sensor positioned in the engine exhaust;

a current generating circuit coupled to an electrode of said exhaust gas oxygen sensor for coupling current thereto in a direction to shift an output of said exhaust gas oxygen sensor in a lean air/fuel direction;

a modulating circuit for modulating said current; and

a fuel controller commencing a feedback control mode when a monitoring signal derived from an output of said exhaust gas oxygen sensor satisfies a threshold value, said fuel controller adjusting a fuel delivery signal in response to a feedback variable derived from said exhaust gas oxygen sensor output during said feedback control; and

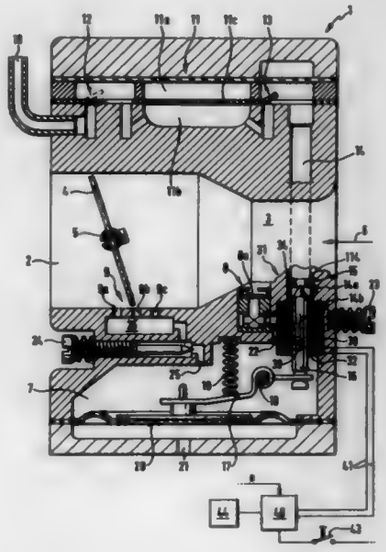
a fuel delivery system providing fuel to the engine in response to said fuel delivery signal.

5,465,698

MEMBRANE CARBURETOR

Martin Benholz, Oppenweiler, Germany, assignor to Andreas Stihl, Waiblingen, Germany

Filed Aug. 29, 1994, Ser. No. 294,834
Int. Cl.[6] F02M 7/12
U.S. Cl. 123—38 **6 Claims**



1. A membrane carburetor for an internal combustion engine of a work apparatus such as a motor-driven chain saw, hedge trimmer or the like, the membrane carburetor comprising:

a carburetor housing having an interior space;

a movable regulating membrane mounted in said space so as to partition the same into a control chamber on one side of said membrane and into an additional chamber on the other side of said membrane;

a fuel channel communicating with said control chamber;

a valve seat in said fuel channel;

a valve needle mounted in said control chamber to define a valve with said valve seat;

a control lever pivotally mounted in said control chamber and connected to said regulating membrane and to said valve needle so as to permit said membrane to actuate said valve needle;

a solenoid for moving said valve needle away from said valve seat thereby opening said valve to permit fuel to enter said control chamber; and,

said solenoid including a coil mounted in the region of said valve and an armature defined by said valve needle.

5,465,699

INTAKE PIPE ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE HAVING INDIVIDUAL ARC-SHAPED CYLINDER INTAKE PIPES

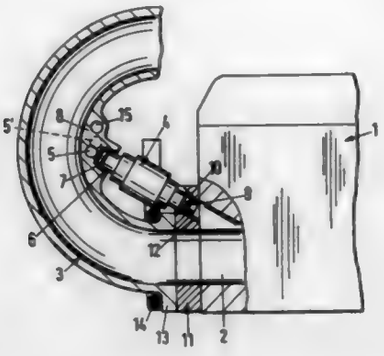
Dieter Voigt, Wolfsburg, Germany, assignor to Volkswagen AG, Wolfsburg, Germany

Filed Apr. 25, 1994, Ser. No. 232,618

Claims priority, application Germany, Jun. 1, 1993, 43 18 159.7

Int. Cl.[6] F02M *37/04*

U.S. Cl. 123—470 **6 Claims**



1. An intake pipe arrangement for an internal combustion engine having a cylinder head comprising a plurality of individual arc-shaped cylinder intake pipes communicating with corresponding inlet channels in the cylinder head, each of the intake pipes having an arc-shaped portion with an enlarged inner wall region facing the cylinder head, a corresponding plurality of fuel-supplying injection valves having injection end regions projecting toward recesses in the inlet channels in the cylinder head to supply fuel thereto, a plurality of recesses in the enlarged inner wall regions of the arc-shaped intake pipes coaxial to the cylinder head recesses in which the opposite ends of the fuel-injection valves are received, and an intermediate flange having through-bores axially aligned with the inlet channel recesses to receive the injection end regions of the injection valves adjacent to the cylinder head after insertion of the injection valves into the recesses on the cylinder head-side ends of the intake pipes, the intermediate flange, the plurality of intake pipes and the plurality of fuel-injection valves forming a subassembly mountable as a unit on the cylinder head of an internal combustion engine.

5,465,700

FUEL INJECTION DEVICE FOR AN ENGINE WITH OPTIMIZED CONTROL OF A FUEL INJECTION AMOUNT AFTER ACCELERATION

Koji Nishimoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1994, Ser. No. 194,057

Claims priority, application Japan, May 31, 1993, 5-129025

Int. Cl.[6] F02D *41/10*

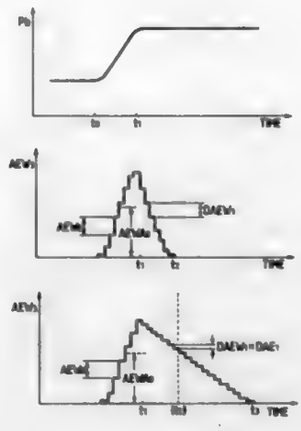
U.S. Cl. 123—492 **6 Claims**

1. An electronically controlled fuel injection device for an engine, comprising:

first judging means for judging whether the engine is in an acceleration state of a degree higher than a predetermined degree;

means for increasing a fuel injection amount at a rate in accordance with the degree of acceleration when the first judging means judges that the engine is in the acceleration state of the degree higher than the predetermined degree; and

means for decreasing the fuel injection amount from a level of an end of the acceleration state with a decreasing gradient that is set in accordance with the degree of acceleration so as to be larger when the acceleration degree is higher.



5,465,701

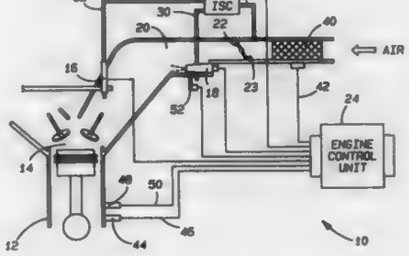
INTERNAL COMBUSTION FUEL CONTROL SYSTEM

Frank Hunt, Walled Lake, Mich., assignor to Hitachi America, Ltd., Tarrytown, N.Y.

Filed Dec. 27, 1993, Ser. No. 172,749

Int. Cl.[6] F02M *23/00*

U.S. Cl. 123—531 **16 Claims**



1. For use with an internal combustion engine having at least one combustion chamber, an intake air passage means, a multipoint fuel injector associated with each engine combustion chamber and a cold start fuel injector having a fuel outlet open to the intake air passage means, said cold start fuel injector providing fuel to each combustion chamber during a cold start engine operating condition, a fuel control system comprising:

air valve means having an air inlet fluidly connected to said intake air passage means and an air outlet fluidly connected to the cold start fuel injector,

said air valve means being movable between an open position and a closed position, wherein in said open position air flow through said cold start fuel injector enhances atomization of fuel injected from said cold start fuel injector,

means for detecting a cold engine operating condition and for generating a cold start output signal representative thereof,

means responsive to said cold start output signal for selectively actuating said air valve means to said open position,

a fuel vaporizer for vaporizing fuel from said cold start fuel injector, wherein said fuel vaporizer comprises an electric heater,

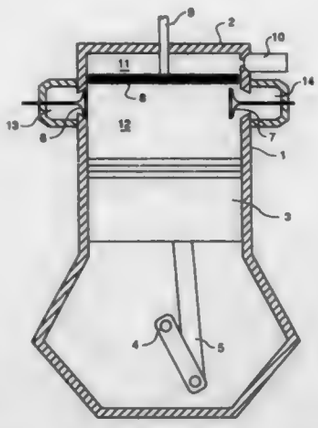
wherein the cold start fuel injection supplies all of the fuel to the engine during a cold start engine condition.

5,465,702

REGENERATED ENGINE WITH IMPROVED HEATING AND COOLING STROKES

Allan J. Ferrenberg, Rte. 2, Box 394, Swall Meadows, Bishop, Calif. 93514

Filed May 27, 1994, Ser. No. 250,163
Int. Cl.[6] F02G 5/00
U.S. Cl. 123—543 5 Claims



1. An internal combustion, reciprocating, regenerated engine having a number of similar working units, each working unit comprising:

a) a cylinder, closed at one end by a cylinder head and containing a movable piston which moves in a reciprocating manner and is connected to a power output shaft;

b) intake means for permitting the flow of fresh working fluid into said cylinder during a predetermined time during each operating cycle;

c) exhaust means to permit the flow of exhaust fluid from said cylinder during a second predetermined time during each operating cycle;

d) a thermal regenerator located within said cylinder and between said piston and said cylinder head, said regenerator being an alternating flow heat exchanger which can be moved between said piston and said cylinder head;

the movement of said regenerator including a regenerative heating stroke which begins during the last quarter of said piston's compression stroke and ends after expansion has begun and during the first quarter of said piston's expansion stroke, said regenerative heating stroke also being of sufficient speed and timing so as to maintain, to the greatest extent possible, a flow of working fluid out of said regenerator, through said regenerator's hot surface and into the hot volume, throughout said regenerative heating stroke;

the movement of said regenerator also including a regenerative cooling stroke which begins during the middle half of the piston's expansion stroke and is completed prior to, or just slightly after, the opening of said exhaust means;

e) means for moving said regenerator during additional predetermined times during the engine's operating cycle; and

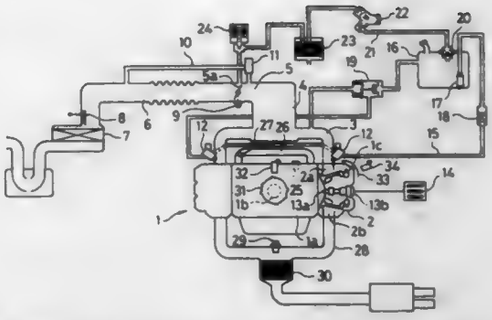
f) means for introducing fuel into said cylinder.

5,465,703

CONTROL METHOD FOR PURGING FUEL VAPOR OF AUTOMOTIVE ENGINE

Kiyomi Abe, Kokubunji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1993, Ser. No. 79,909
Claims priority, application Japan, Jul. 9, 1992, 4-182534
Int. Cl.[6] F02M 41/14
U.S. Cl. 123—674 8 Claims



6. A method for controlling canister purge of an internal combustion engine having a purge control system for controlling purging of fuel vapor vaporized in a fuel tank, an air-fuel feedback control system for controlling air-fuel ratio at a desired value based on a basic fuel injection amount, corrected fuel injection amount corrected by detected engine operating conditions, and an air fuel ratio learning control system storing a plurality of air-fuel ratio learning values at each address of a memory to correct a deviation of a centerline of the feedback control in a plurality of operating conditions, the method comprising:

storing fuel purge control signals for said plurality of operating conditions:

detecting an engine stop;

calculating a plurality of deviations of air-fuel ratio learning value derived from said fuel purge control signals for all addresses corresponding to said plurality of operating conditions at an engine stop;

averaging said plurality of deviations of air-fuel ratio learning value;

subtracting an averaged deviation from each of said air-fuel ratio learning value for all addresses; and

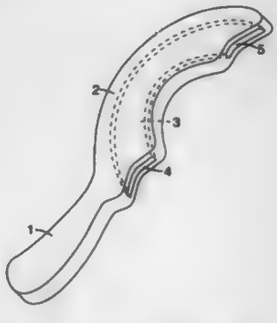
storing said subtracted air fuel ratio learning value to each corresponding address of said memory so as to improve startability of the engine.

5,465,704

DISC LAUNCHER

William K. Kohl, Haiku, Hi., assignor to Testy Putts Corporation, Haiku, Hi.

Filed Mar. 25, 1994, Ser. No. 218,119
Int. Cl.[6] F41B 3/00; F41J 9/18
U.S. Cl. 124—5 19 Claims



11. A disc launching toy device comprising:

(a) a handle:

(b) means engaging said handle for launching a disc comprising:

an arcuate portion connected with one end of said handle portion and extending laterally and curvingly away therefrom, said arcuate portion comprising a curved first wall portion and second and third spaced wall portions extending radially inward from said first wall portion, said first, second and third wall portions defining therebetween a space configured to receive said disc therein,

said arcuate portion having a radial inward wall portion covering the radial inward end of said space, said arcuate

portion having a proximal and distal end and an opening in each of said ends communicating with said space, said proximal and distal openings being configured to permit the passage of said disc therethrough.

5,465,705

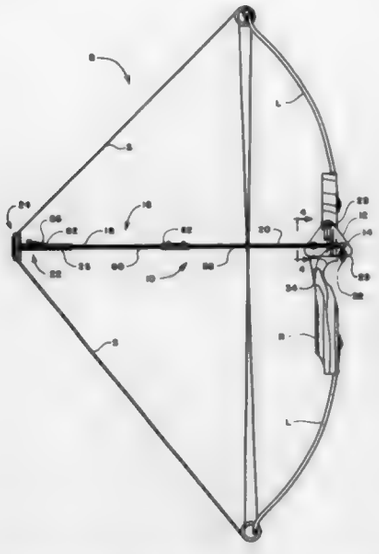
PRE-COOKING ASSEMBLY FOR USE WITH AN ARCHERY BOW

Clifford E. Baeseman, 862 W. 17th St., Edgar, Wis. 54426

Filed Jun. 7, 1994, Ser. No. 255,953

Int. Cl.[6] F41B 5/18

U.S. Cl. 124—88 9 Claims



1. A pre-cocking assembly for an archery bow having a bowstring comprising:

an elongated rod having a bow end and a head end;

means for pivotally connecting said bow end of said elongated rod to a midpoint of the archery bow;

a head member, said head member including a rod-accepting tubular portion, said rod-accepting tubular portion including a first end rotatably mounted on said head end of said elongated rod, and a second end opposite said first end, said head member rotatable from a string retaining position to a retracted position free of said bowstring;

head member biasing means for providing force to rotate said head member from the string retaining position to the retracted position;

stopping means for stopping the rotation of said head member at the retracted position;

head member locking means for securing said head member in the string retaining position;

retaining arm means for retaining the bowstring in a precocked position, said retaining arm means attached to said second end of said rod-accepting tubular portion, said retaining arm means movable from an arm-stopped position to an arm-flexed position, whereby said retaining arm means retains the bowstring when said head member is in the string retaining position and said retaining arm means is in the arm-stopped position; and,

retaining arm biasing means for providing force to motivate said retaining arm means from said arm-flexed position to said arm-stopped position.

5,465,706

SAW

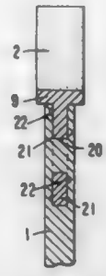
Wlodzimier Sawluk, Hamburg, Germany, assignor to Ernst Winter & Sohn GmbH & Co., Humburg, Germany

Continuation of Ser. No. 75,811, Jun. 11, 1993, Pat. No. 5,408,983, which is a continuation of Ser. No. 400,467, Aug. 28, 1989, abandoned. This application Oct. 7, 1994, Ser. No. 319,973

Claims priority, application Germany, Aug. 27, 1988, 38 29 160.6; Sep. 10, 1988, 38 30 819.3

Int. Cl.[6] B28D 1/12

U.S. Cl. 125—15 8 Claims



1. A saw, comprising a saw blade having an edge; and a cutting coating arranged on said edge of said saw blade and selected from the group consisting of a diamond-containing coating and a cubic crystalline boron nitride-containing coating, said cutting coating being subdivided into a plurality of individual cutting segments, said saw blade being composed of a synthetic plastic reinforced with a fiber material composed of a plurality of fibers selected from the group consisting of carbon fibers and graphite fibers with a volume fraction of 30–70%, said cutting segments being provided with carriers which are molded into said saw blade and bonded thereto.

5,465,707

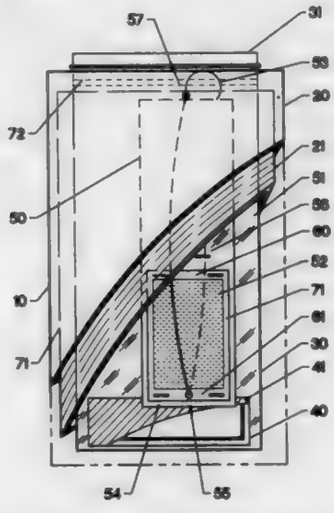
SELF HEATING INDIVIDUAL MEAL PACKAGE

Fred Fulcher, 222 Central Ave. #313, Los Angeles, Calif. 90012, and Andrew B. Huang, 28442 Lomo Dr., Rancho Palos Verdes, Calif. 92075

Filed Jun. 15, 1994, Ser. No. 260,323

Int. Cl.[6] F24J 1/00

U.S. Cl. 126—263.08 29 Claims



1. A self-heating individual meal package comprising:

(a) an outer pouch formed from a folded sheet of flexible, liquid impermeable, laminated material with a thermal insulated layer and liquid-tight seams;

(b) a foodstuff pouch formed from a folded heat resistant, durable, liquid impermeable plastic sheet material with liquid-tight seams, said foodstuff pouch enclosed within much of said outer pouch;

(c) an exothermic pack enclosed in the bottom of the space between said outer pouch and said foodstuff pouch, said exothermic pack contains an exothermic reagent activated by a solvent;

(d) a solvent bag, said solvent bag affixed to a trigger mechanism means, where said trigger mechanism means includes a pull tab means, said trigger mechanism means dimensioned to fit within said meal package space, said solvent bag and said trigger mechanism means enclosed in said space between said outer thermal insulated pouch and said foodstuff pouch,

(e) said trigger mechanism means including a rigid member and a pull-tab means connected to said rigid member and said solvent bag for tearing said solvent bag with said rigid member acting as a guide and support member for the pull-tab means, said solvent bag tearing and the escaping solvent contacting said exothermic pack and thereby initiating an exothermic reaction to heat the enclosed foodstuff.

5,465,708

TROUGH-SHAPED COLLECTOR

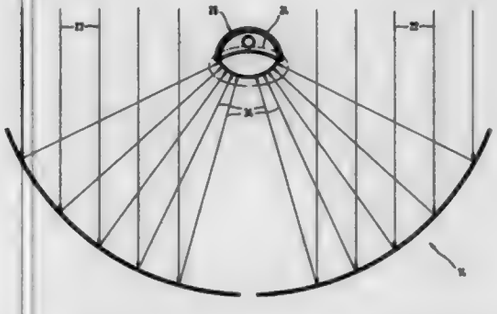
Olaf Goebel, Stuttgart, and Klaus Hennecke, Lohmar, both of, Germany, assignors to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Bonn, Germany

Filed Sep. 16, 1994, Ser. No. 307,904

Claims priority, application Germany, Sep. 18, 1993, 43 31 785.5

Int. Cl.[6] F24J *2/32*

U.S. Cl. 126—635 **11 Claims**



1. An elongated collector for collecting solar radiation for steam generation, said collector comprising:

(a) a trough-shaped mirror extending in a longitudinal direction for reflecting solar radiation into a focus region extending in the longitudinal direction;

(b) an absorber line comprising:

(1) a longitudinally extending support having a recess with longitudinally extending edges; and

(2) an absorber surface extending across and along said recess of said support and joining to said longitudinal edges to form an inner surface of said recess, said absorber surface extending in the focus region so as to intercept radiation reflected from said trough-shaped mirror;

(c) a steam generator tube extending longitudinally within said absorber line for generating steam from water guided therein in said longitudinal direction, and

(d) a heat pipe structure between said absorber line and said steam generator tube for transferring heat transversely from said absorber surface to said steam generator tube, said absorber surface being the heat source and said steam generator tube being the heat sink of said heat pipe structure.

5,465,709

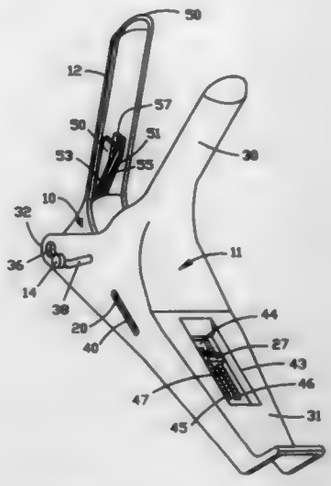
ILLUMINATED VAGINAL SPECULUM

Robert G. Dickie, Newmarket, and Michael J. Phillips, Mississauga, both of, Canada, assignors to Advanced Medical Products Inc., King City, Canada

Filed Nov. 10, 1993, Ser. No. 150,521

Int. Cl.[6] A61B *1/06;1/32*

U.S. Cl. 600—223 **3 Claims**



1. A speculum comprising

a first paddle member having a longitudinal axis, an interior surface, and an exterior surface;

a second paddle member opposite and operatively associated with said first paddle member, said second paddle member having a longitudinal axis, an exterior surface and an interior surface wherein the interior surfaces of said first and second paddle members are positioned in opposite spaced relation to each other, said first and second paddle members being adapted for insertion into and dilation of the opening of a body cavity so as to permit examination of the interior of the body cavity;

a light tube holder for retaining a chemically florescent light tube, said light tube holder comprising two planar retention walls positioned in opposite spaced relation on one of said interior surfaces and extending outwardly therefrom, each of said retention walls having a proximal edge, an inner planar surface, an outer planar surface, said inner and outer surfaces extending between said proximal and distal edges, and at least one ridge, said at least one ridge extending outwardly from said inner surface and being disposed at an angle to the longitudinal axis of said one of said interior surfaces.

5,465,710

ENDOSCOPE

Kunihiko Miyagi, and Toshio Chikama, both of Tokyo, Japan, assignors to Machida Endoscope Co., Ltd., Tokyo, Japan

Filed May 5, 1994, Ser. No. 238,747

Claims priority, application Japan, May 12, 1993, 5-029560 U; May 12, 1993, 5-132366

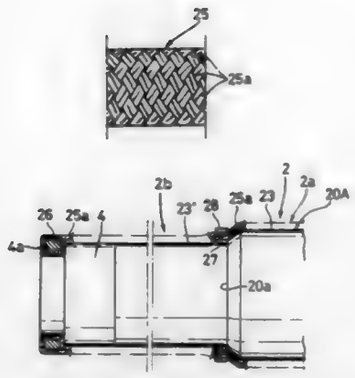
Int. Cl.[6] A61B *1/00*

U.S. Cl. 600—139 **11 Claims**

1. An endoscope comprising an operating body and a flexible insert tube structure extending from said operating body, said insert tube structure comprising:

(a) a flexible insert body; and

(b) a jacket disposed on an outer periphery of said insert body, said jacket being formed in a cylindrical braid by braiding a plurality of straps which are flat in cross-section, said straps being formed of a resin having a small coefficient of friction, in which an intermediate portion of said straps is folded back



at a ring disposed at one end of said jacket, to thereby incorporate said ring in said one end of said jacket.

5,465,711

SURGICAL PROCEDURES USING ENDOSCOPIC INFLATABLE RETRACTION DEVICES

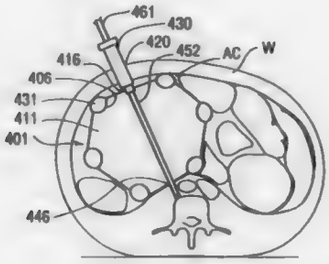
Frederic H. Moll; Charles Gresl, Jr., both of San Francisco; Albert K. Chin, Palo Alto, and Philip K. Hopper, Laverne, all of Calif., assignors to Origin Medsystems, Inc., Menlo Park, Calif.

Division of Ser. No. 794,590, Nov. 19, 1991, Pat. No. 5,309,896, which is a continuation-in-part of Ser. No. 706,781, May 29, 1991, abandoned. This application Aug. 13, 1993, Ser. No. 106,285

The portion of the term of this patent subsequent to May 10, 2011, has been disclaimed.

Int. Cl.[6] A61M *29/02*

U.S. Cl. 600—207 **14 Claims**



1. A method for retracting the bowel to provide anterior access to organs lying outside the peritoneum for a surgical instrument, the organs including the spinal column, the aorta and the kidneys, the method comprising steps of:

providing an inflatable retractor including a main envelope enclosing a main chamber, the main envelope being in a collapsed state;

placing the main envelope of the retractor adjacent the bowel;

inflating the main chamber to an expanded state to retract the bowel;

piercing an aperture in the main envelope to provide access for the surgical instrument passed into the main chamber to contact the peritoneum overlying the organ to be treated; and

maintaining the main chamber in the expanded state notwithstanding the aperture pierced in the main envelope.

5,465,712

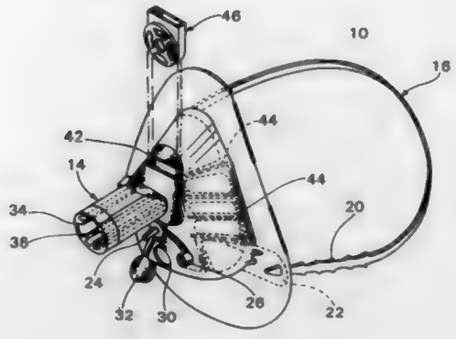
RESUSCITATION MASK HAVING RIBS IN THE AIR FLOW CONDUIT AND MASK BODY

Jerry Malis, King of Prussia, Pa.; Jonathan J. Rosen, Alpharetta, Ga.; Martin T. Mortimer, Telford, Pa., and Alfred V. Vasconcellos, Cranston, R.I., assignors to Valley Forge Scientific Corporation, Oaks, Pa.

Filed Jul. 30, 1993, Ser. No. 100,592

Int. Cl.[6] A62B *18/02;18/10*

U.S. Cl. 128—205.25 **10 Claims**



1. A resuscitation mask comprising:

a mask wall defining an interior region between the mask wall and a patient's face;

a mouthpiece conduit extending out from said mask wall and defining a first flow passage from outside the mask wall to the interior region, said mouthpiece conduit having spacer ribs disposed therein, said spacer ribs preventing collapse of said mouthpiece conduit;

a one-way valve removably inserted into said mouthpiece conduit, said one-way valve restricting air flow through said mouthpiece conduit from said interior region to outside the mask;

an oxygen port having a removable cap, said oxygen port extending out from said mask wall and defining a second flow passage from outside said mask wall and the interior region;

means for acting as an air flow barrier and for preventing air from being drawn into said mask by a venturi effect caused by a high flow of oxygen through the oxygen port, said air flow barrier means comprising reinforcing ribs surrounding said oxygen port; and

a patient breathing port having a removable cap, said patient breathing port with its associated cap removed adapted to permit a patient to breathe ambient air.

5,465,713

ENERGY-ASSISTED TRANSDERMAL COLLECTION PATCH FOR ACCELERATED ANALYTE COLLECTION AND METHOD OF USE

Donald W. Schoendorfer, Santa Ana, Calif., assignor to Sudor Partners, Santa Ana, Calif.

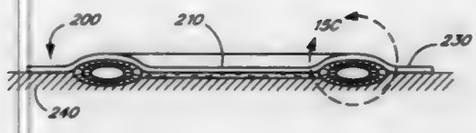
Continuation-in-part of Ser. No. 39,631, Mar. 30, 1993, which is a continuation-in-part of Ser. No. 989,204, Dec. 11, 1992, which is a continuation-in-part of Ser. No. 569,007, Aug. 15, 1990, Pat. No. 5,203,327, which is a continuation-in-part of Ser. No. 241,707, Sep. 8, 1988, Pat. No. 4,957,108. This application Jul. 20, 1993, Ser. No. 94,787

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—632 **20 Claims**

1. A method of collecting an analyte contained in the perspiration of a mammal using a dermal patch, comprising the steps of:

a. placing a dermal patch on the skin of a mammal, wherein said patch comprises an absorbent material for collecting analytes contained in the perspiration of said mammal;



b. generating heat by means of a chemical composition in order to heat the skin of said mammal underneath said dermal patch, wherein perspiration flows through the skin of said mammal

c. collecting an analyte present in the perspiration of said mammal in said absorbent material of said patch;

d. removing said patch after a sufficient period of time has elapsed following the initial application of heat to the skin of said mammal to allow said analyte to be detected in said patch by an assay for said analyte; and

e. detecting the presence of said analyte in said patch.

5,465,714

ELECTRO-OPTICAL SENSOR FOR SPECTROPHOTOMETRIC MEDICAL DEVICES

Richard S. Scheuing, Ann Arbor, Mich., assignor to Somanetics Corporation, Troy, Mich.

Continuation of Ser. No. 65,140, May 20, 1993, abandoned. This application Jul. 11, 1994, Ser. No. 273,366

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—633 **35 Claims**

1. An electro-optical sensor for spectrophotometric-type clinical examination devices, comprising in combination: a thin, flexible, lightweight, elongated support frame having at least a pair of integral mounting bases, each particularly shaped and located to separately receive, support and position a particular one of at least a pair of structurally independent and mutually free-standing electro-optical components including a light source and detector, each of said integral mounting bases including cup-like walls defining sockets of predetermined configuration of varying diameter to nestingly receive its correspondingly configured electro-optical component; an attachment device securing each such component in its nested position at its respective one of said mounting bases; a plurality of discrete flexible electrical conductors extending along said support frame, each such conductor being connected to at least one of said components to electrically enable the same for operation; a shield for shielding at least some of said conductors connected to said detector from ambient sources of electrical and/or magnetic noise; and a softly compliant outer cover disposed over said support frame, said mounted components, conductors and shield, said cover having light-passing portions overlying said components for passage of light from said source outwardly of said sensor and reception of resulting light from beyond said sensor by said detector; said support frame and combined elements providing the structural support to hold and maintain said electro-optical components in predetermined particular relative locations and orientations during use of said sensor in said clinical examinations.

5,465,715

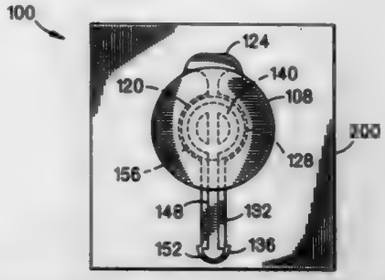
POSITIVE LOCKING BIOMEDICAL ELECTRODE AND CONNECTOR SYSTEM

Joseph N. Lyons, Wilbraham, Mass., assignor to Ludlow Corporation, Exeter, N.H.

Continuation-in-part of Ser. No. 106,140, Aug. 13, 1993, Pat. No. 5,372,125. This application Nov. 14, 1994, Ser. No. 338,391

Int. Cl.[6] A61B *5/04*

U.S. Cl. 128—640 **19 Claims**



1. A biomedical electrode for sensing an electrical signal on the skin of a human or for impinging an electrical signal through the skin of a human, comprising:

a. a foundation component having a pair of opposing sides, a first side adapted to face the skin and a second side adapted to face away from the skin, the foundation component comprising a flexible material, the foundation component including:

i. a top portion for facilitating the removal of the electrode from a carrier sheet, for facilitating the holding of the electrode while positioning the electrode on the skin, and for facilitating the removal of the electrode from the skin;

ii. a center portion connected to the top portion;

iii. a stem portion connected to the center portion and extending away from the center portion; and

iv. a head portion disposed at an end of the stem portion, at least a part of the held portion being larger in width than a width of the stem portion;

b. a conductive component that is electrically-conductive and has a pair of opposing sides, a first side adapted to face the skin and a second side adapted to face away from the skin, the conductive component including:

i. a sensor portion whose second side is disposed adjacent to and in an abutting relationship to the center portion on the first side of the foundation component;

ii. a neck portion integrally connected with the sensor portion and whose second side is disposed adjacent to and in an abutting relationship to the stem portion on the first side of the foundation component; and

iii. a head end portion integrally connected with the neck portion and whose second side is disposed adjacent to and in an abutting relationship to the head portion of the first side of the foundation component, at least a part of the head end portion being larger in width than a width of the neck portion; and

c. a conductive media that is electrically-conductive and is disposed adjacent to and in abutting contact with the first side of at least a portion of the sensor portion of the conductive component.

5,465,716

CATHETER CONTROL HANDLE

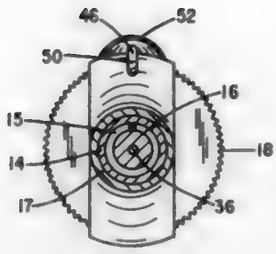
Boaz Avitall, 4868 N. Ardmore Ave., Milwaukee, Wis. 53217

Filed Nov. 22, 1993, Ser. No. 156,284

Int. Cl.[6] A61B *17/36*

U.S. Cl. 128—642 **15 Claims**

1. A catheter system for precise spatial placement of a catheter tip in an organ or vessel of interest by controlling the operation of an associated control element, being operable using one hand, comprising:



(A) a catheter having a working tip including a working tip area;
(B) a control system connected to the catheter for controlling the working tip;
(C) a handle housing means for carrying the control system configured to be gripped and operated with one hand;
wherein said control system comprises
(1) single operating knob means for manipulating an associated control element, said operating knob means being connected to said handle housing means and also connected to a proximal end of the catheter to be controlled, said operating knob means further being carried by said handle housing means and mounted for translational and rotational motion relative thereto, said operating knob means including means for allowing the passage of an associated control element therethrough;
(2) control element mounting means for receiving and fixing an associated control element to said handle housing means;
(3) an associated control element having a proximal and a distal end and being fixed at the proximal end to said control element mounting means and being fixed at the distal end to the working tip area of said catheter;
(D) wherein translational movement of said operating knob means produces relative transitional movement between the catheter connected to and moving with said operating knob means and said associated control element thereby deflecting said working tip area of said catheter; and
(E) wherein rotational movement of said operating knob means also causes said associated control element to rotate with said operating knob means to radially adjust said working tip area.

5,465,717

APPARATUS AND METHOD FOR VENTRICULAR MAPPING AND ABLATION

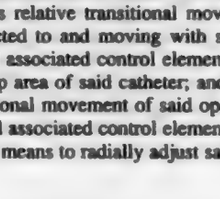
Mir A. Imran, Palo Alto; Mark L. Pomeranz, Los Gatos, and Gholam-Reza Zadno-Azizi, Newark, all of Calif., assignors to Cardiac Pathways Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 44,255, Apr. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 983,968, Dec. 1, 1992, Pat. No. 5,327,889, which is a continuation-in-part of Ser. No. 656,764, Feb. 15, 1991, Pat. No. 5,156,151. This application Aug. 15, 1994, Ser. No. 290,391

Int. Cl.[6] A61B *5/04; A61N 1/05*

U.S. Cl. 128—642 **29 Claims**

1. An apparatus for mapping electrical signals arising in a wall



of a heart forming a chamber in the heart, comprising a flexible shaft having proximal and distal extremities and a basket assembly, the basket assembly comprising a plurality of circumferentially spaced-apart longitudinally extending arms having proximal and distal extremities and having an outwardly facing surface, means securing the proximal extremities of the arms to the distal extremity of the shaft, each of said arms including a member formed of an elastic material having a recoverable strain of more than 1.0% and having an outwardly bowed shape memory, a plurality of electrodes on each of the arms, means carried by each of said arms for mounting said electrodes in spaced-apart positions longitudinally of each arm so that they are insulated from each other and are exposed solely in a direction extending from the outwardly facing surface of each arm and adapted to face only the wall of the chamber and conductor means on the arms connected to the electrodes carried by the arm for conducting electrical signals detected by the electrodes.

5,465,718

SOLID TUMOR, CORTICAL FUNCTION, AND NERVE TISSUE IMAGING METHODS AND DEVICE

Daryl Hochman, 22933 Edmonds Way, Edmonds, Wash. 98020, and Michael M. Haglund, 1647 N. 197th Pl., Seattle, Wash. 98133

Continuation-in-part of Ser. No. 894,270, Jun. 8, 1992, which is a continuation-in-part of Ser. No. 565,454, Aug. 10, 1990, Pat. No. 5,215,095. This application Jun. 7, 1993, Ser. No. 73,353

Int. Cl.[6] A61B *5/00; G01N 21/00*

U.S. Cl. 128—653.1 **4 Claims**

1. A method for imaging tumor tissue adjacent to nerve tissue to aid in selective resection of tumor tissue without destroying nerve tissue, comprising:
(a) illuminating an area of interest with a source of electromagnetic radiation (emr) containing wavelengths of emr absorbed by a dye;
(b) obtaining a video signal of the area of interest as a series of frames and processing the series of frames into an averaged control image;
(c) stimulating the nerve with an appropriate paradigm to activate the nerve;
(d) obtaining a nerve subsequent series of frames at the time of stimulation and processing the nerve subsequent series of frames into a nerve subsequent averaged image;
(e) obtaining a nerve difference image by subtracting the averaged control image from the nerve subsequent averaged image to image the active nerve;
(f) administering the dye into vasculature perfusing the area of interest;
(g) obtaining a tumor subsequent series of frames and processing the tumor subsequent series of frames into a tumor subsequent averaged image; and
(h) obtaining a tumor difference image by subtracting the averaged control image from the tumor subsequent averaged image to visualize the tumor.

5,465,719

NUCLEAR MAGENTIC RESONANCE IMAGING APPARATUS

Hiroyuki Itagaki; Yo Taniguchi, both of Kokubunji; Hidemi Shiono, Akigawa; Kenji Takiguchi, Kashiwa, and Etsuji Yamamoto, Akishima, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

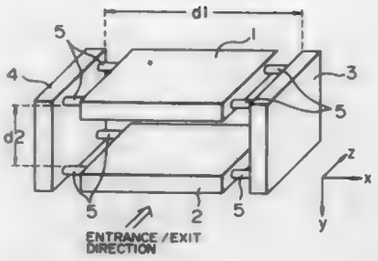
Filed Jul. 29, 1993, Ser. No. 98,775

Claims priority, application Japan, Aug. 6, 1992, 4-210065

Int. Cl.[6] A61B *5/055*

U.S. Cl. 128—653.5 **13 Claims**

1. A nuclear magnetic resonance imaging apparatus comprising:
static magnetic field generating means for generating a uniform static magnetic field in a first direction;



first gradient magnetic field generating means including a plurality of coils for generating a first gradient magnetic field in said first direction;

second gradient magnetic field generating means including a plurality of coils for generating a second gradient magnetic field in a second direction;

third gradient magnetic field generating means including a plurality of coils for generating a third gradient magnetic field in a third direction;

radio-frequency magnetic field generating means for generating a radio-frequency magnetic field;

signal detection means for detecting a nuclear magnetic resonance signal from an inspection object on a bed;

a computer for computing detections signals of said signal detection means; and

output means for outputting a computation result of said computer;

wherein said first, second and third directions are orthogonal to each other, and at least one of said first, second and third gradient magnetic field generating means includes a first bobbin for holding at least one of the plurality of coils of said first, second and third gradient magnetic field generating means, said first bobbin comprising a plurality of separable bobbin segments, and said at least one of the plurality of coils of said first, second and third gradient magnetic field generating means comprises a plurality of separable coil segments, and at least one of the plurality of bobbin segments of said first bobbin holds at least one of the coil segments of said at least one of the plurality of coils of said first, second and third gradient magnetic field generating means.

5,465,720

AUTOMATED QUALITATIVE IMAGE QUALITY FOR ULTRASOUND IMAGES

David W. Kurzynski, Waukesha, and Susan Pourjavid, Milwaukee, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 25, 1994, Ser. No. 344,928

Int. Cl.[6] A61B *8/00*; G01N *29/00*

U.S. Cl. 128—660.01 **2 Claims**

1. An automated qualitative image quality method for an ultrasound imaging system comprising the steps of:

using a wire-in-water phantom ultrasound imaging system having a wire target to imitate the ultrasound imaging system;

determining an impulse response of the system, including the steps of

putting the wire target in a water tank,

setting a transducer to be perpendicular to an axis of the wire target to display a cross-section of the wire,

transmitting sound waves into the cross-section of the wire,

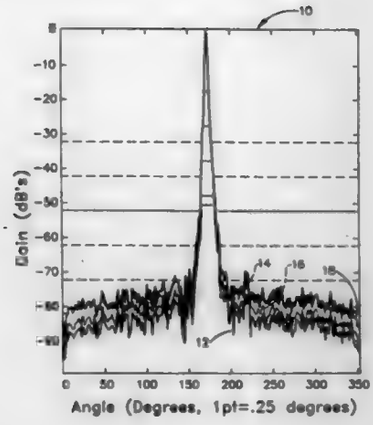
receiving reflected echoes at different gain settings,

using curve fitting to form a system beam profile, and

determining acoustic peak to noise and detail resolution qualitative image quality measurements using the system beam profile;

determining a cystic filling of the system; and

using the impulse response and the cystic filling of the system to achieve improved image quality for the ultrasound imaging system.



5,465,721

ULTRASONIC DIAGNOSTIC APPARATUS AND ULTRASONIC DIAGNOSIS METHOD

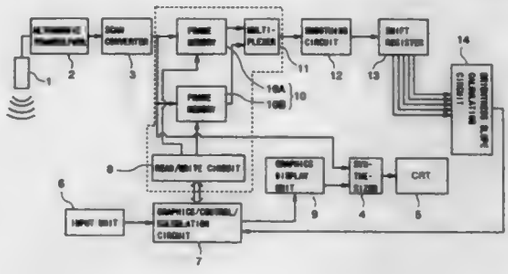
Shinji Kishimoto, Ibaraki; Masa Harashima, Kashiwa; Hiroshi Kanda, Tokorozawa; Akira Sasaki, Ichikawa; Kori Tanabe, Kashiwa; Kenji Nosaka, Kodaira; Satoru Hanasaka, Kashiwa, and Ken Ishihara, Takarazuka, all of, Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Mar. 8, 1995, Ser. No. 400,845

Claims priority, application Japan, Apr. 22, 1994, 6-084289; Apr. 22, 1994, 6-084290; Jun. 24, 1994, 6-142967; Aug. 3, 1994, 6-182079

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—660.07 **17 Claims**



1. An ultrasonic diagnostic apparatus comprising:

means for radiating an ultrasonic wave to a patient and receiving a reflected ultrasonic wave;

means for generating a real time two-dimensional echogram of an organ from said reflected, received ultrasonic wave and displaying said real time two-dimensional echogram on a display device;

means for designating a line segment on said display device;

means for obtaining a pair of intersections between the wall of said two-dimensional echogram and said line segment;

means for measuring the length between said pair of intersections;

means for calculating the area of a cross section of said organ and/or said volume of said organ, by using said measured length; and

means for displaying said calculated area and/or volume on said display device,

wherein said area and/or said volume is calculated and displayed substantially in real time.

5,465,722

SYNTHETIC APERTURE ULTRASOUND IMAGING SYSTEM

J. Robert Fort, 24001 Muirlands, #318, El Toro, Calif. 92630; Norman S. Neidell, 315 Vanderpool, Houston, Tex. 77024; Douglas J. Morgan, 2475 El Amigo Rd., Del Mar, Calif. 92014, and Phillip C. Landmeier, 1520 N. Appaloosa, Pahrump, Nev. 89041

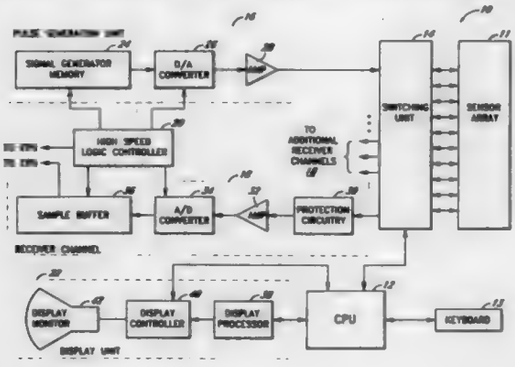
Continuation of Ser. No. 111,160, Aug. 24, 1993, abandoned, which is a continuation of Ser. No. 806,084, Dec. 11, 1991, Pat. No. 5,269,309. This application Sep. 20, 1994, Ser. No. 308,953

The portion of the term of this patent subsequent to Dec. 14, 2010, has been disclaimed.

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—661.01 9 Claims

1. A method of mapping inhomogeneities in tissue comprising



the steps of:

transmitting acoustic energy into said tissue from a first plurality of locations;

receiving reflections of said acoustic energy at a second plurality of locations; and

reconstructing a wavefield representation with a common depth point velocity analysis of the reflections of said acoustic energy to generate a mapping of said inhomogeneities in tissue.

5,465,723

METHOD AND APPARATUS FOR ULTRASOUND IMAGING

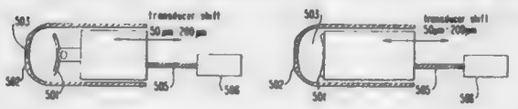
Bjorn Angelsen, and Michael Nickel, both of Trondheim, Norway, assignors to Vingmed Sound A/S, Horten, Norway

Filed Jun. 2, 1994, Ser. No. 252,951

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—661.02 24 Claims

1. A method of reducing transducer-object reverberation noise



from scanline signals returning from an object as echoes of ultrasound pulses emitted by a transducer and directed against the object for ultrasound imaging of the object, comprising the steps of:

(A) receiving a first scanline signal from a first ultrasound pulse directed against the object along a beam direction;

(B) receiving a second scanline signal from a second ultrasound pulse directed against the object along said beam direction; and

(C) selectively combining said first and second scanline signals so as to substantially reduce from said signals reverberation echoes between the transducer and the object and thereby define a reverberation-suppressed signal for use in imaging of the object.

5,465,724

COMPACT ROTATIONALLY STEERABLE ULTRASOUND TRANSDUCER

John W. Sliwa, Jr., Palo Alto; Thomas G. Cooper, Menlo Park, and Sevig Ayter, Cupertino, all of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Filed May 28, 1993, Ser. No. 69,092

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—662.03 91 Claims

1. An ultrasonic probe for use with a remote ultrasonic imaging

system comprising:

a multielement transducer having an upper surface and a lower surface;

a substantially uninterrupted ultrasonically attenuative backing material adjacent to the lower surface of the multielement transducer;

a container having a wall and a bottom, the attenuative backing material being disposed within the container;

a track connected to the container, wherein the track positions the container for rotation about an axis;

a flexible assembly attached to the container; and

a carrier band having a distal end that is attached to the container, the carrier band operable to rotate the container about the axis defined by the track.

5,465,725

ULTRASONIC PROBE

Mir S. Seyed-Bolorforosh, Palo Alto, Calif., assignor to Hewlett Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 203,216, Feb. 28, 1994, Pat. No. 5,438,554, and a continuation-in-part of Ser. No. 319,344, Oct. 6, 1994, Pat. No. 5,460,181, which is a continuation-in-part of Ser. No. 77,530, Jun. 15, 1993, Pat. No. 5,434,827. This application Jan. 30, 1995, Ser. No. 381,607

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—662.03 20 Claims

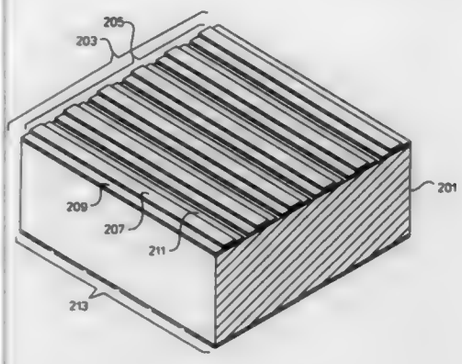
1. An ultrasonic probe for coupling a beam of acoustic signals between the probe and a medium, the probe comprising:

a body of piezoelectric material, the body having a first surface and an opposing surface;

a first electrode coupled with the first surface of the body;

a second electrode coupled with the first surface of the body and arranged so that the second electrode substantially overlaps the first electrode; and

a third electrode coupled with the opposing surface of the body.



5,465,726

ULTRASOUND IMAGING AND CATHETERS FOR USE THEREIN

Robert J. Dickinson, London, and Richard I. Kitney, Fulham, both of, United Kingdom, assignors to Intravascular Research Limited, London, United Kingdom

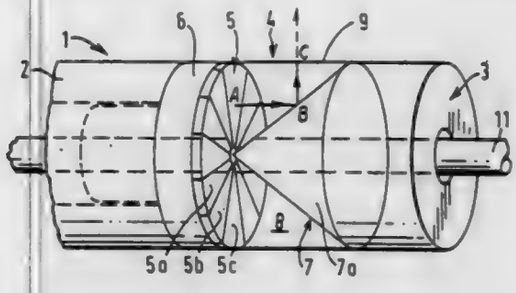
PCT No. PCT/GB93/00188, § 371 Date Jul. 27, 1994, § 102(e) Date Jul. 27, 1994, PCT Pub. No. WO93/15419, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 28, 1993, Ser. No. 256,955

Claims priority, application United Kingdom, Jan. 30, 1992, 9201983

Int. Cl.[6] A61B 8/12

U.S. Cl. 128—663.01 19 Claims



1. A catheter including an ultrasonic transducer element positioned in relation to the catheter to emit an ultrasonic signal substantially parallel to or co-axial with the axis of the catheter and a mirror arranged within the catheter to deflect the ultrasonic signal in a substantially radial direction in relation to the axis of the catheter, the path length of the ultrasonic signal within the catheter being such that it overcomes the "ringdown" problem, characterised by the following features:

a) the transducer includes a disc that lies in a substantially diametral plane of the catheter;

b) the mirror comprises a substantially conically shaped reflecting interface located within the catheter at a specified distance from the transducer; and

c) the specified distance and the dimensions of the transducer and the conical interface are so selected that the initial path of the emitted ultrasonic signal and the final path of the returning ultrasonic echo signal are contained within the catheter itself so as to overcome the "ringdown" problem.

5,465,727

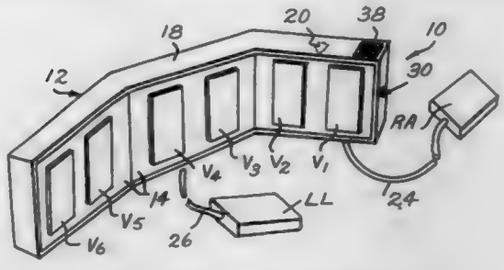
TWELVE-LEAD PORTABLE HEART MONITOR

Herbert E. Reinhold, Jr., Rockville, Md., assignor to Brunswick Biomedical Corporation, Marlboro, Mass.

Filed Aug. 26, 1994, Ser. No. 303,755

Int. Cl.[6] A61B 5/0404

U.S. Cl. 128—710 29 Claims



1. An apparatus for obtaining electrical heart activity of an individual in a form capable of producing a twelve-lead electrocardiogram of an individual, said apparatus including:

a right arm electrode;

a left arm electrode;

at least one leg electrode;

a portable electrode support having at least seven precordial electrodes fixed thereon, said at least seven precordial electrodes extending laterally across the support so as to assume different lateral positions across a human chest when said support is positioned over the human chest; and

circuitry provided in electrically connected relation to said right arm electrode, said left arm electrode, said at least one leg electrode, and said precordial electrodes, said circuit being capable of selectively operating a selected six of said at least seven precordial electrodes at positions corresponding to six Wilson precordial leads for the individual, said circuitry being constructed and arranged to convert the electrical heart activity of the individual obtained by said electrodes into a form capable of producing a twelve-lead electrocardiogram.

5,465,728

BREATH COLLECTION

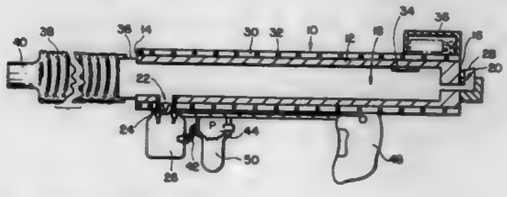
Michael Phillips, 156 Center Ave., Chatham, N.J. 07928

Filed Jan. 11, 1994, Ser. No. 179,918

Int. Cl.[6] A61B 5/097

U.S. Cl. 128—730 12 Claims

1. Apparatus for the collection of alveolar breath from a mammal for analysis, which comprises;



A. a fluid reservoir tubular container having

(a) a first end;

(b) a second end;

(c) a container body extending from the first end to the second end, and which with the first and second ends defines an interior chamber with a capacity of about 3 liters, said body being of a tubular configuration whereby breath introduced into the first end will travel to the second end when the second end is vented;

(d) a breath entry portal in the body, proximal to the first end distal, to the second end;

(e) a breath exit portal in the body, proximal to the second end and distal to the first end and open to the atmosphere; and

(f) a sampling portal in the body of the reservoir container, at a point between the entry and the exit portals;

B. means for maintaining said chamber at a temperature sufficient to prevent condensation of water and volatile compounds in the mammal's breath, associated with the reservoir container;

C. means for sealed coupling of the reservoir container entry portal to the pulmonary airway of the mammal, whereby exhaled breath is directly delivered at full, undiluted concentration of compounds contained in the breath, to the reservoir container;

D. a sample container means for holding samples of the breath exhaled by the mammal into the reservoir container and selected for analysis to determine quantitative presence of those compounds of interest;

E. valve means between the sampling portal of the reservoir container means and the sample container for selectively directing breath samples from the reservoir container to the sample container;

F. means for maintaining the selected breath at a temperature sufficient to prevent water condensation in the sample contained and the valve means for directing samples to the sample containers means; and

G. pump means for moving selected samples of the breath from the reservoir's container into the sample container means.

5,465,729

METHOD AND APPARATUS FOR BIOFEEDBACK

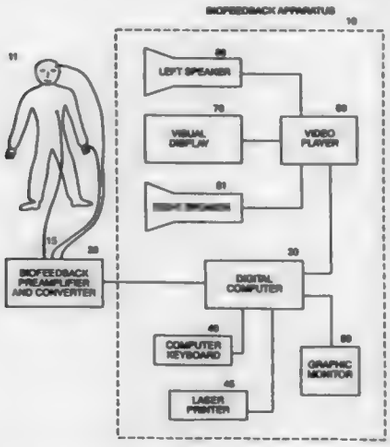
Barry B. Bittman, Meadville, Pa., and Jeffrey R. Cram, Nevada City, Calif., assignors to Mindscope Incorporated, Meadville, Pa.

Division of Ser. No. 850,673, Mar. 13, 1992, Pat. No. 5,343,871. This application Feb. 10, 1994, Ser. No. 194,260

Int. Cl.[6] A61B *5/0482*

U.S. Cl. 128—732 **11 Claims**

1. A method of altering the reality of the visual images and



stereophonic audio sounds of a recorded audio-visual scene depicting objects, comprising the steps of:

a) performing a plurality of operations from the group consisting of changing the focusing of the images, altering a color content of the images, altering an apparent distance to the objects in the images and altering a position of at least one object in the images; and

b) performing a plurality of operations from the group consisting of altering a degree of stereophonic separation of the sounds, altering the audio volume of the sounds, altering an amplitude of at least one frequency component of the sounds above a selected frequency, moving an apparent acoustic position of at least one object by altering a relative audio amplitude contribution from said object to at least two channels of the stereophonic sound.

5,465,730

ELECTRICAL IMPEDANCE TOMOGRAPHY

Mohsen Zadehkoochak, Marlow; Barry H. Blott, Southampton, and Geoffrey J. Daniell, Nr Romsey, all of, England, assignors to British Technology Group Ltd., London, United Kingdom

Filed Jan. 25, 1994, Ser. No. 185,855

Claims priority, application United Kingdom, Jul. 26, 1991, 9116215

Int. Cl.[6] A61B *5/05*

U.S. Cl. 128—734 **6 Claims**

1. A method of producing an electrical impedance tomographic

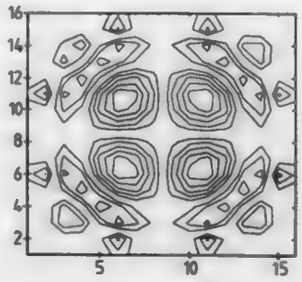


image of an object, comprising the steps of:

positioning a plurality of electrodes peripherally of the object in electrical contact therewith;

applying an electrical signal between the ones of the plurality of electrodes of a group of at least two selected ones of the plurality of electrodes and measuring respective resulting electrical potentials at the ones of the plurality of electrodes other than the group of selected ones;

successively repeating the step of applying an electrical signal, selecting the group of at least two selected ones of the plurality of electrodes to be different ones 0f said plurality of electrodes for each successively repeated step of applying an electrical signal;

registering the measured respective electrical potentials as measured data obtained during each of a plurality of different applications of the electrical signal; and

processing the measured data to provide data defining an electrical impedance tomographic image of the object comprising the steps of:

using a spectral expansion of a matrix representation of a sensitivity of a measurement process of an a priori assumed approximation of the object to provide data defining a series of mutually orthogonal basis images, and

deriving from the measured data relative weightings in accordance with which at least some of the basis images are to be combined to provide a reconstructed image constituting the electrical impedance tomographic image of the object.

5,465,731

SPECIMEN RETRIEVAL POUCH AND METHOD FOR USE

Mace Bell, Rowayton; Vinod Nagori, Trumbull, and Darren E. Zinner, Norwalk, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 906,794, Jun. 30, 1992, abandoned. This application Oct. 7, 1993, Ser. No. 133,547

Int. Cl.[6] A61B *10/00*

U.S. Cl. 128—749 **22 Claims**

1. A surgical apparatus for removing body tissue from an interior portion of a body in a minimally invasive surgical procedure, which comprises:

a) an endoscopic portion having a longitudinally extending bore and configured and dimensioned to be at least partially insertable through a cannula;

b) a pouch assembly movable between a proximal location at least partially within said endoscopic portion and a distal

location at least partially exterior to said endoscopic portion, said pouch assembly including a support and a pouch removably attached to said support, said pouch having a first end movable between an open configuration and a closed configuration, and a closed second end;

b) a drive member slidably disposed within said bore for moving said pouch from said proximal location to said distal location, said support being attached to a distal end of said drive member;

c) means associated with said pouch for detaching said pouch from said support;

d) closing means for moving said first end of said pouch from said open configuration to said closed configuration; and

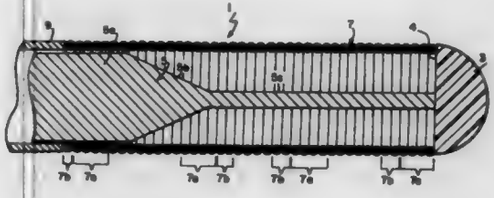
e) gaseous seal means for preventing passage of fluid or gases through said apparatus.

5,465,732

FLUOROSCOPICALLY VIEWABLE MULTIFILAR CALIBRATED GUIDEWIRE AND METHOD OF MEASURING OCCLUSIONS WITH CALIBRATED GUIDEWIRES

John E. Abele, Concord, Mass., assignor to Boston Scientific Corporation, Natick, Mass.

Filed Mar. 31, 1992, Ser. No. 861,293
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—772 **13 Claims**



1. A guidewire for use in determining the magnitude of arterial occlusions in the body, said guidewire comprising:

a flexible sleeve having a distal end;

a tip for said guidewire;

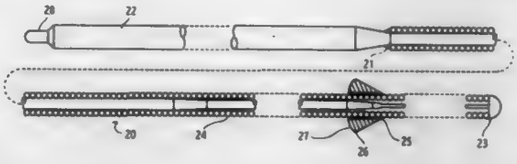
a hollow multifilar flexible coil, said coil being disposed between the distal end of said sleeve and said tip, said coil having a uniform outer diameter and being formed by two sets of different wires, one of said sets being radiotransparent wires and the other being radiopaque, the spacings between each of the sets being identical and being defined by the widths of each of the sets whereby to provide regularly spaced radiotransparent areas of indicia, both sides of which are observable in a fluoroscopic image to enable the user to measure of the magnitude of an occlusion in a tubular structure in the body, the multifilar construction extending the entire length of said coil between the sleeve and the tip.

5,465,733

GUIDE WIRE FOR CATHETERS AND METHOD FOR ITS USE

Tomoaki Hinohara, 40 Los Charos La., Portola Valley, Calif. 94028, and James W. Vetter, 1812 Sand Hill Rd. #201, Palo Alto, Calif. 94303

Filed Oct. 14, 1993, Ser. No. 137,321
Int. Cl.[6] A61M *25/00*
U.S. Cl. 128—772 **20 Claims**



1. In combination:

a catheter, said catheter having a proximal end and a distal end, said catheter having an internal lumen communicating with at least said distal end of said catheter, said internal lumen having an internal diameter, said distal end of said catheter having an external diameter, said internal lumen of said catheter extending substantially the full length of said catheter,

a guide wire, said guide wire comprising an elongate guide wire body having a proximal end and a distal end, and a tapered transition device attached to said guide wire body intermediate said proximal and distal ends of said guide wire body, said guide wire body having a proximal external diameter proximal to said tapered transition device which is less than said internal diameter of said internal lumen, said guide wire body having a distal external diameter distal to said tapered transition device and said tapered transition device having a diameter which is greater than said distal external diameter of said guide wire body, said tapered transition device having a distal edge which is tapered to provide a smooth transition between said diameter of said tapered transition device and said distal external diameter of said guide wire body,

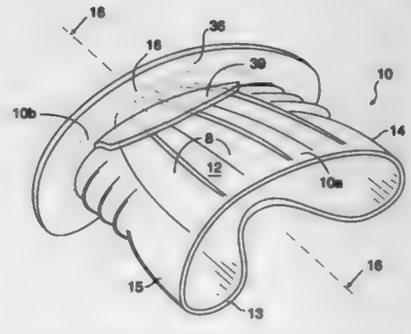
and a maneuvering handle having a gripping means for gripping said guide wire body and a bearing means for rotatably bearing against said proximal end of said catheter and a spring means for exerting a force between said bearing means and said gripping means.

5,465,734

ADJUSTABLE TONGUE POSITIONING DEVICE AND METHOD

Ramiro M. Alvarez, Fremont, and Susan J. Lea, Berkeley, both of Calif., assignors to Snorex, Inc., Reno, Nev.

Continuation-in-part of Ser. No. 180,262, Jan. 12, 1994, abandoned. This application Apr. 5, 1994, Ser. No. 223,332
Int. Cl.[6] A61F *5/56*
U.S. Cl. 128—848 **33 Claims**



1. In a tongue positioning apparatus, the combination comprising

a) a tongue sleeve having a top surface, configured for reception and retention of the forward extent of the user's tongue, and configured to be retained by the user's mouth,

b) an airway on the tongue sleeve having an outlet positioned on the top surface of the tongue sleeve and an inlet, wherein the inlet communicates from the exterior of the user's mouth to the outlet in the interior of the user's mouth when the apparatus is retained by the user's mouth,

c) a removable shield means shaped to be received and retained outwardly of the user's lip having a shelf unitary with the shield means and extending at an angle from the shield which is configured to receive the user's lips, and

d) an attachment means for attaching the shield means to said tongue sleeve to permit positioning the shield means and the shelf relative to the tongue forward extent whereby the tongue may be comfortably positioned and retained in said tongue sleeve, whereby snoring is reduced as the tongue is brought forward, out of the mouth, and forward movement of the shield means will move the tongue so as to provide lessened airway obstruction.

5,465,735

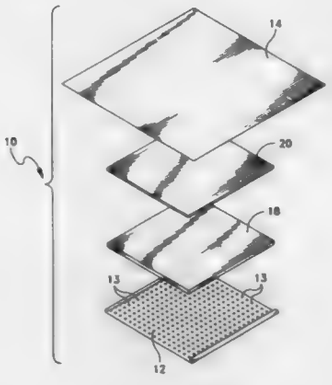
WOUND DRESSING

Harish A. Patel, Norfolk, Mass., assignor to The Kendall Company, Mansfield, Mass.

Filed Dec. 1, 1994, Ser. No. 347,661

Int. Cl.[6] A61F *13/00*

U.S. Cl. 128—888 **6 Claims**



1. A wound dressing comprising an absorbent material for receiving and retaining wound fluids sandwiched between opposed first and second outer sheet materials,

the first sheet material for placement over a wound being a perforated non-adherent film for preventing the dressing from sticking to the wound;

the second sheet material being characterized as being bacteria-impermeable;

the absorbent material being a multilayer structure comprising first and second absorbent layers, the first layer being a low density absorbent fabric having optimum absorption capacity for receiving wound fluids diffusing from the wound through the first sheet material, the second layer being a high density absorbent fabric exhibiting optimum spreading or wicking characteristics for receiving and retaining wound fluid diffusing through the low density absorbent fabric, whereby to inhibit maceration caused by pooling of wound fluid on the wound surface.

5,465,736

METHOD AND MEANS FOR PREVENTING SKIN ABRASIONS FOR PATIENTS HAVING LEGS SUBSTANTIALLY LOCKED IN JUXTAPOSITION

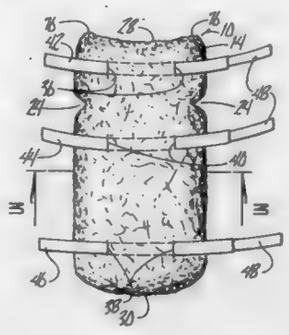
Robert Lonardo, Treasure Island, Fla., assignor to Restorative Care of America Incorporated, Clearwater, Fla.

Continuation of Ser. No. 107,980, Oct. 14, 1987, abandoned. This application Feb. 3, 1989, Ser. No. 306,808

The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.

Int. Cl.[6] A61F *13/06*

U.S. Cl. 128—892 **1 Claim**



1. The method of preventing skin abrasions and the like in patients whose legs are substantially positioned in overlapping condition, comprising,

taking an elongated flexible uncontoured pad having a length extending from above the patient's knees to the bottom of the patient's feet, having an empty interior compartment and having a width of approximately one-half of the girth of one of the patient's legs,

maintaining said flexible pad in a planar position free from preformed indentations,

placing said pad between the patient's legs so that opposite sides of the pad cover the inner surface of at least one leg from a point above the knee to a point substantially to the bottom of the foot of said one leg, to permit all pressure points that exist between the patient's two legs at the heels, ankles and knees to be covered,

affixing said pad to said one leg, by straps having opposite ends, at points above the knee at a position above the kneecap and below the quadriceps muscle of said one leg, and above the ankle of said one leg to hold said pad against any substantial movement with respect to said one leg, such that said pad partially encompasses said one leg, and to equalize the pressure exerted by the weight of one leg on the other and to relieve the high pressure points between the opposite heels, ankles, and knees of the patient when said heels, ankles or knees are in overlapping condition,

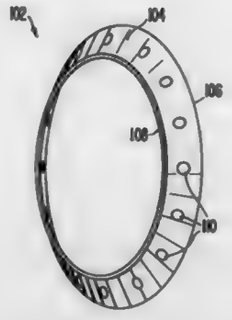
conforming the flexible planar pad to the shape of the patient's leg to which it is attached by said straps, and maintaining said straps free from contact with the portion of the patient's legs that are normally in contact with each other by reason of said overlapping condition by threading said straps through said interior compartment, and then securing the ends of said respective straps together outside said interior compartment and on the side of said one leg that is free from contact with said other leg.

5,465,737

TREATMENT OF PRESBYOPIA AND OTHER EYE DISORDERS

Ronald A. Schachar, 7224 Winding Creek Rd., Dallas, Tex. 75251

Continuation-in-part of Ser. No. 139,756, Oct. 22, 1993, which is a continuation of Ser. No. 913,486, Jul. 15, 1992, Pat. No. 5,354,331. This application Jan. 30, 1995, Ser. No. 380,666
Int. Cl.[6] A61B *19/00*
U.S. Cl. 128—898 43 Claims



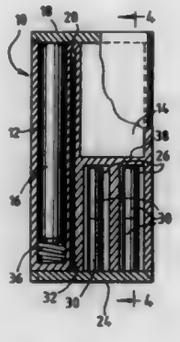
1. A method of increasing the amplitude of accommodation in a human eye having a crystalline lens and a ciliary muscle comprising increasing the effective working distance of the ciliary muscle by decreasing the equatorial diameter of the crystalline lens of the eye by using a surgical procedure selected from the group consisting of shrinking said crystalline lens and ablating said crystalline lens.

5,465,738

SMOKING SYSTEM

Richard K. Rowland, Franklin, Tenn., assignor to Music City Marketing, Inc., Nashville, Tenn.

Continuation of Ser. No. 865,836, Apr. 9, 1992, abandoned. This application Dec. 23, 1994, Ser. No. 364,029
Int. Cl.[6] A24F *23/04*
U.S. Cl. 131—329 21 Claims



1. A smoking system comprising:

a receptacle having a top, a bottom, and at least three cavities; said top accessing at least one of said cavities, and said bottom accessing at least one other of said cavities, at least one of said cavities adapted for storing smoking filters; each of said cavities being accessible exclusively from said bottom or said top, but not both;

smoking device means removably disposed in another of said cavities, said smoking device means being suitable for use with smoking filters; and

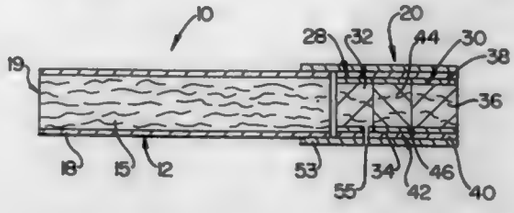
means for cleaning said smoking device means, said cleaning means removably disposed in yet another of said cavities.

5,465,739

CIGARETTE AND CIGARETTE FILTER ELEMENT THEREFOR

Thomas A. Perfetti; Dennis L. Carespodi, both of Winston-Salem; Barry L. Saintsing, Lexington, and Matthew S. Koschak, Pfafftown, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 868,925, Apr. 15, 1992, abandoned. This application Sep. 15, 1992, Ser. No. 945,042
Int. Cl.[6] A24D *3/00*
U.S. Cl. 131—335 7 Claims



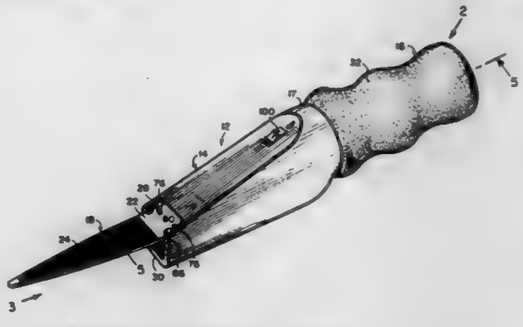
1. A cigarette having a charge of smokable material including tobacco cut filler wrapped in a circumscribing paper wrapping material to form a smokable rod; the cigarette comprising a filter element positioned adjacent one end of the smokable rod; the filter element including a thermoplastic filter material in intimate contact with polyethylene glycol in an amount of at least about 0.001 percent, based on the weight of the filter material, the polyethylene glycol having a molecular weight above about 400, and with an acidic material having a pK_a at 25° C. of less than about 3, wherein the acidic material includes phosphoric acid.

5,465,740

BATTERY OPERATED NAIL FILE APPARATUS

Tae S. Kim, 122-12 20th Ave., College Point, N.Y. 11356

Filed Apr. 25, 1994, Ser. No. 231,732
Int. Cl.[6] A45D *29/05;29/18*
U.S. Cl. 132—73.6 1 Claim



1. A nail file apparatus which comprises:

a) a housing;

b) a handle extending from a rear portion of said housing including a padded hand grip having an undulating surface, so that it can be grasped securely by the hand of the person, said handle being hollow, having a rear open end and includes a padded end cap with a collar that fits into the rear open end of said handle, so as to form a compartment within said handle;

c) a nail file having a tip portion, a heel portion and ridges therebetween;

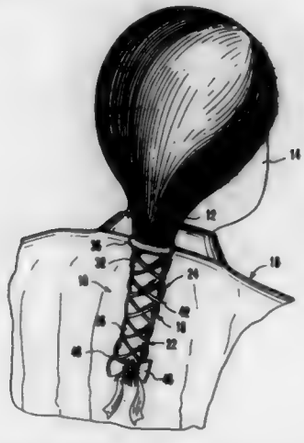
d) means within said housing, for causing a reciprocating movement including an electric motor, a portable power source comprising a battery inserted into the compartment within said handle electrically connected to said electric motor, a drive shaft extending from said electric motor, a worm on said drive shaft, a worm gear engaging with said worm, a piston, and means for pivotally connecting in an offset manner, said piston to said worm gear, so that when said worm gear is turned by said worm on said drive shaft which is rotatable by

said electric motor, said piston will move horizontally back and forth, said pivotally connecting means including a pin mounted offset to a side of said worm gear, a roller on said pin, and a follower mounted to said piston which engages said roller;

e) means for coupling the heel portion of said nail file to said reciprocating movement means at a front portion of said housing so as to support said nail file at one end only, so that a person can grip said handle and activate said reciprocating movement means to operate said nail file extending therefrom, in which the ridges will automatically smooth, polish and shape fingernails, said coupling means including said housing having a socket formed in the front portion thereof, and a nail file holder integral with a forward end of said piston at said socket in said housing, so that the heel portion of said nail file can be retained by said nail file holder; and

f) said nail file holder including a hollow shaft having a slot therethrough, a first member having a pair of spaced apart upstanding hooks attached transversely to a forward end of said hollow shaft, said hooks facing forward, a member movable with respect to said hollow shaft having an upstanding hook facing rearwardly, said movable member riding within said hollow shaft with said upstanding hook through said slot, a spring carried within said hollow shaft between said first member and said movable member, so as to bias said movable member away from said stationary member, and said nail file having three apertures through the heel portion, so that when the heel portion is inserted through said socket in said housing, the hooks on said stationary member and the hook on said movable member will engage with said three apertures in the heel portion of said nail file, and a back up bracket for supporting said piston and a rear portion of said hollow shaft, said back up bracket having a plurality of holes therethrough, and a plurality of fasteners to extend through said holes for securing said back up bracket within said gear casing, so that a forward portion of said hollow shaft can extend through said gear casing and into said socket of said housing, said nail file projecting from said apparatus being supported only at the heel portion thereof.

5,465,741
HAIR WRAP DEVICE
Sherry L. Dvorak, 12 Terilyn Dr., Jackson, Tenn. 38305
Filed Mar. 25, 1994, Ser. No. 217,729
Int. Cl.[6] A45D *8/00;8/34*
U.S. Cl. 132—275 **5 Claims**



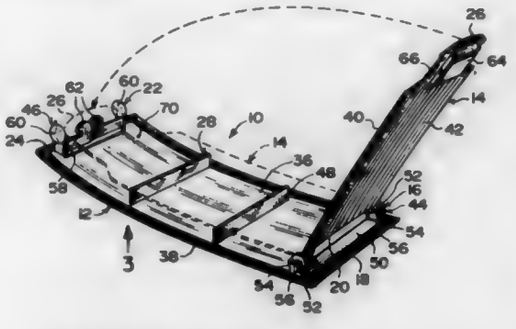
1. A hair wrap device for a ponytail on a head of a woman which comprises:

a) means for covering the ponytail, said covering means being a thin piece of flexible material, said thin piece of flexible material being a fabric sheet, said fabric sheet being rectangular having two opposite long sides and two opposite short sides, so as to be of a size to fit over the length of the ponytail, said fabric sheet including a heading across said first short side thereof, said heading being fabricated by folding over said first short side of said fabric sheet and then sewn together by thread stitching thereacross;

b) means for attaching a top portion of said covering means to the ponytail, said attaching means being an elastic band that extends through said heading to engage with the ponytail, so that said fabric sheet can hang down therefrom; and

c) means for wrapping the rest of said covering means about the ponytail, said wrapping means including an elongated lace member, and means for affixing said lace member at its mid point location to a back surface of said fabric sheet directly below the center of said heading, so that said lace member can be wrapped around said fabric sheet and the ponytail to form a bow at said second short side of said fabric sheet.

5,465,742
BRAID AID HAIR CLIP
Diane J. Dudley, Rte. 1, Box 351, Lawrenceville, Va. 23868
Filed Jun. 13, 1994, Ser. No. 258,677
Int. Cl.[6] A45D *8/26*
U.S. Cl. 132—279 **7 Claims**



1. A braid aid hair clip which comprises:

a) an elongated body member of rectangular configuration having a pair of short ends;

b) a clasp;

c) means on a first short end of said elongated body member for pivoting a first end of said clasp;

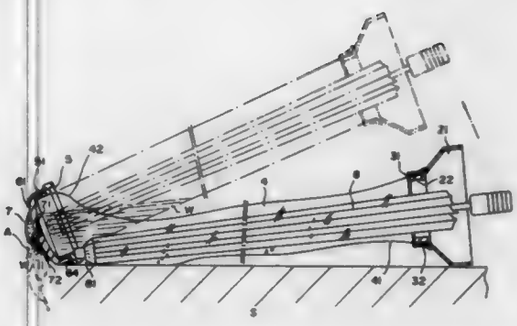
d) means on the opposite second short end of said elongated body member for holding a second end of said clasp in a closed position; and

e) means on said elongated body member for preparing a head of hair for braiding by automatically dividing said hair placed between said elongated body member and said clasp into three equal sections when said clasp is in the closed position comprising a pair of elongated partitions extending substantially the full width of said body member, parallel to and equally spaced between the short ends of said elongated body member to establish three identically sized, parallel sections of hair for braiding.

5,465,743
SHEATHING DEVICE FOR UMBRELLA
Min-Tsang Sheu, No. 156, Cheng Kung Road, Chang Hua City, and Mon-Teng Liu, No. 15, 314 Lane, An Pyng Load, Tainan City, both of, Taiwan, Prov. of China
Filed Sep. 22, 1994, Ser. No. 310,704
Int. Cl.[6] A45B *15/00*
U.S. Cl. 135—34.2 **8 Claims**

1. A sheathing device for receiving an umbrella comprising:

a flexible tubular member for receiving said umbrella and including a first end and a second end;



a handle member secured to said first end of said tubular member wherein said handle member includes a first thread means formed thereon and includes a first lock ring having a second thread means for engaging with said first thread means of said handle member so as to attach said first end of said tubular member thereto; and,

a cap secured to said second end of said tubular member and including an enclosed end portion, wherein said cap includes a third thread means formed thereon and includes a second lock ring having a fourth thread means for engaging with said third thread means of said cap so as to attach said second end of said tubular member thereto, the second lock ring having a recess to accept a portion of the first lock ring to facilitate storage of the sheathing device.

5,465,744

MOBILITY ASSIST DEVICE

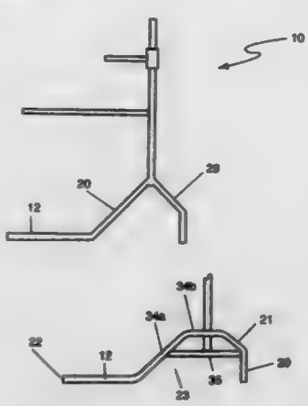
U. Grant Browning, Nashville, Tenn., assignor to My Independence, Inc., Nashville, Tenn.

Continuation-in-part of Ser. No. 883,134, May 13, 1992, Pat. No. 5,305,773. This application Mar. 17, 1994, Ser. No. 210,007

The portion of the term of this patent subsequent to Apr. 26, 2011, has been disclaimed.

Int. Cl.[6] A61G *7/10*; A61H *3/00*

U.S. Cl. 135—67 **18 Claims**



1. A portable device for assisting a user in rising from a workpiece stationary on a floor, said device comprising:

a. first and second uprights extending vertically from and positioned horizontally along a base for allowing said user to grasp said uprights and pull outwardly and upwardly from a seated positioned on said workpiece;

b. said base adapted to allow leverage against said floor, said base having a front end and a rear end and a clearance between said front end and said rear end;

c. braces attached to said base and attached to said uprights, said braces positioned vertically along said uprights and horizontally along said base whereby when said device is positioned proximate to a workpiece for use, said braces contact a portion of the workpiece to provide leverage against said workpiece while said user is rising from said workpiece and to space said uprights away from the user whereby the arms of the user must be extended to grasp said uprights; and

d. legs attached to said braces such that said clearance occurs between said base and said legs.

5,465,745

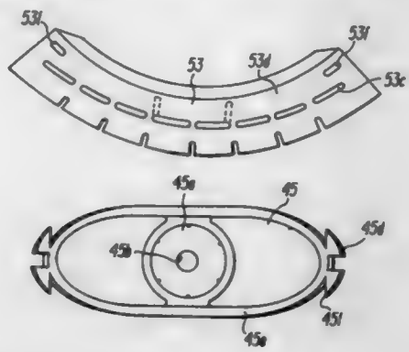
CRUTCH

Richard C. Davis, Palm Harbor, Fla., assignor to Trek Medical Corporation, Tampa, Fla.

Division of Ser. No. 260,813, Jun. 16, 1994, Pat. No. 5,417,234, which is a continuation-in-part of Ser. No. 152,500, Nov. 16, 1993, Pat. No. 5,411,045, and Ser. No. 18,550, Feb. 17, 1993, Pat. No. 5,353,825. This application Mar. 20, 1995, Ser. No. 407,073

Int. Cl.[6] A45B *9/04*

U.S. Cl. 135—82 **3 Claims**



1. A radial crutch tip assembly comprising:

a crutch tip base having outwardly and downwardly tapered front and rear surfaces, side surfaces and a convex base bottom surface forming an approximate arch which curves in a direction of elongation, said base further including a lip protruding outwardly adjacent said base bottom surface;

a resilient boot defining the shape of a rocker, said resilient boot defining a mounting cavity for receiving said base bottom surface and said lip for holding said boot on said base, said boot further having a sole forming a bottom wall thereof, said sole having a sole top surface in said cavity directed towards said base bottom surface, there being locking holes in said boot;

wherein said lip on the crutch tip base includes outwardly protruding tips which engage in said locking holes extending into the resilient boot for preventing separation between the crutch tip base and the resilient boot.

5,465,746

PNEUMATIC CIRCUIT TO PROVIDE DIFFERENT OPENING AND CLOSING SPEEDS FOR A PNEUMATIC OPERATOR

Peter F. Ebbing, Los Altos, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Jan. 13, 1994, Ser. No. 181,518

Int. Cl.[6] F15B *13/04*

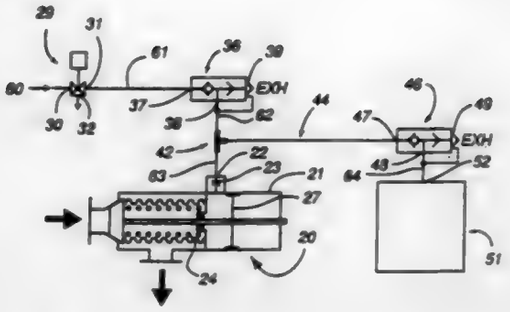
U.S. Cl. 137—14 **5 Claims**

5. A method of pressurizing a pneumatic device at a first rate and de-pressurizing a pneumatic device at second rate, different from said first rate, comprising the steps of:

pressurizing the pneumatic device at the first rate by:

providing gas flow through a solenoid/vent valve simultaneously to a pressurization opening of the pneumatic device and an accumulator;

routing said gas flow through a main quick exhaust valve;



routing an accumulator portion of said gas flow through an accumulator quick vent valve to said accumulator;

de-pressurizing the pneumatic device at a second rate by:

releasing gas pressure from a vent port of said solenoid/vent valve

routing gas flow from said pneumatic device through a main quick exhaust valve to a vent port of said valve; and

routing gas flow from said accumulator to through said accumulator quick vent valve to a vent port of said valve.

5,465,747

PRESSURE VALVE ASSEMBLY FOR USE IN GAS-LIFT PRODUCING OIL-WELLS

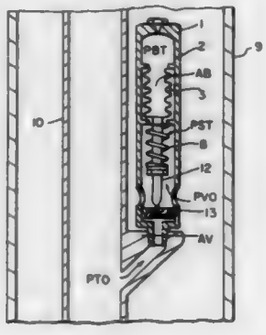
Alcino R. de Almeida, Rio de Janeiro, Brazil, assignor to Petroleo Brasileiro S.A.-Petrobras, Rio de Janeiro, Brazil

Filed Jan. 26, 1994, Ser. No. 186,474

Claims priority, application Brazil, Jan. 27, 1993, 9300293

Int. Cl.[6] F04F *1/08*

U.S. Cl. 137—155 **2 Claims**



1. A pressure valve assembly for use in gas-lift producing oil wells comprising a cylindrical body, a first pressure chamber including bellows located in said body, a second pressure chamber in said body having a first port for communication with gas pressure in a lining, a second port for communicating said second chamber with a pipe in the lining, a valve stem connected to said bellows for movement in said second chamber and a gate valve assembly in said second chamber connected to said stem for controlling gas flow between said first and second ports, wherein said gate valve assembly is comprised of a valve seat body having a gas passage extending therethrough and a flat plate-like gate valve member connected to said valve stem for movement through said body transversely of said passage.

5,465,748

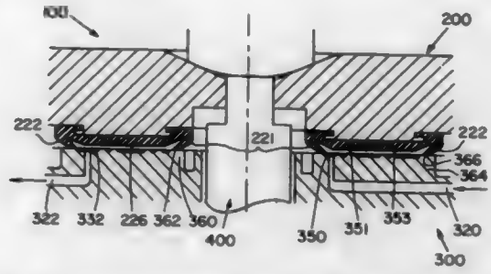
SANITIZABLE SLIDER DIAPHRAGM VALVE

William F. Bowers, Topsfield, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed May 24, 1994, Ser. No. 248,138

Int. Cl.[6] F16K *11/074*

U.S. Cl. 137—240 **19 Claims**



17. In a multi-port sliding valve of the type having a linear slider, a stator having a plurality of connection ports and associated channels in liquid communication with external fluid sources and separation means, the improvement comprising:

a. a sealing means comprising

a diaphragm, the diaphragm having at least one slider port sealing means;

b. at least one connection port capable of being in fluid communication with a source of SIP fluid, and ports comprising channels through the stator body fluidly connected to respective connection ports; and

c. orthogonal separation means for partially separating the stator body from the slider body thereby allowing flushing of sanitizing fluid across the stator face without loss of fluid to the outside.

5,465,749

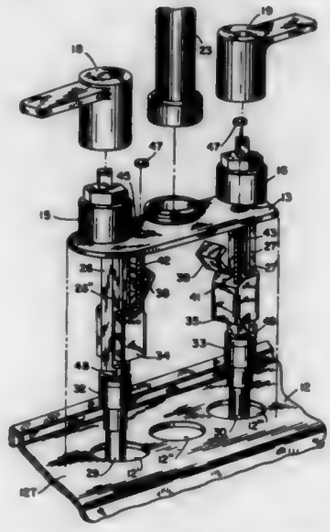
TOP MOUNTING FAUCET ASSEMBLY

Bruce M. Sauter, Elgin; Kevin G. Short, Modlothian, and Peter P. Beltemacchi, Chicago, all of Ill., assignors to Sterling Plumbing Group, Inc., Rolling Meadows, Ill.

Filed Dec. 2, 1994, Ser. No. 348,634

Int. Cl.[6] F16L *5/00*

U.S. Cl. 137—359 **14 Claims**



1. A valve assembly for mounting on a support, the support having a wall with an opening, a supporting surface at one side, and a clamping surface at an opposite side, the valve assembly comprising:

a riding member having at least one pivot arm adapted to be extended and retracted, said riding member adapted to be inserted through said opening when said pivot arm is in a retracted position;

a valve body adapted to be positioned on said supporting surface;

a threaded actuating member extending through a portion of said valve body for actuation from a position on said supporting surface at said one side and also threadably engaging said riding member; and

a guide member connected to said valve body and extendable through the support wall such that the riding member is operatively guided by said guide member;

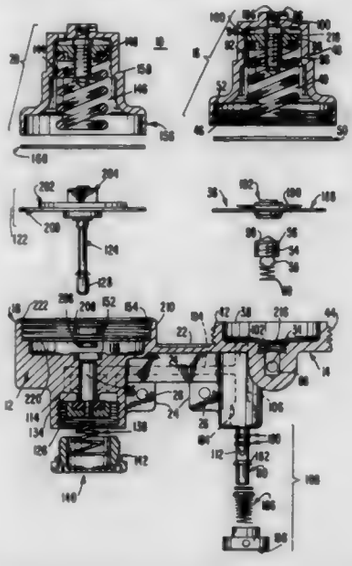
whereby rotation of said threaded actuating member can effect movement of said riding member toward said clamping surface and engagement of said pivot arm in an extended and blocking position that can restrict movement of said riding member through the supporting surface.

5,465,750

TWO-STAGE REGULATOR

Yushan Wang, Howell, N.J., assignor to Standard Keil Industries, Inc., Allenwood, N.J.

Filed May 17, 1994, Ser. No. 243,968
Int. Cl.[6] G05D *16/06*
U.S. Cl. 137—484.8 **23 Claims**



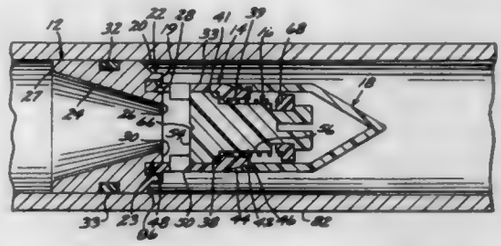
1. A two-stage gas regulator for providing a low-pressure flow output from a high-pressure flow input, comprising: a unitary base, said base including a first section forming a lower portion of a first regulator unit and a second section forming a lower portion of a second regulator unit, each of said lower portions including a gas inlet and a gas outlet for each of said regulator units; a channel coupling said outlet of said first regulator unit to said inlet of said second regulator unit; first and second regulator bonnets mounted to said first and second lower portions, respectively, to form respective housings for said first and second regulator units., said first and second bonnets being of the same size, said first bonnet having interior threads for mounting upon said first base section and said second bonnet having exterior threads for mounting upon said second base section; and pressure control means comprising a diaphragm mounted within each of said first and second regulator unit housings for regulating a flow of gas passing therethrough, the pressure control means of said first regulator unit adapted to transform said high-pressure input to an intermediate pressure flow, the pressure control means of said second regulator unit adapted to transform said intermediate pressure flow to said low-pressure output, the surface area of said diaphragm unit being about 25 percent greater than the surface area of said diaphragm of said first regulator unit.

5,465,751

EXCESS FLOW VALVE

Edward K. Newton, Westminster, Calif., assignor to R.W. Lyall & Company, Inc., Corona, Calif.

Filed Dec. 14, 1994, Ser. No. 355,699
Int. Cl.[6] F16K *17/34*
U.S. Cl. 137—498 **22 Claims**



1. An excess flow control valve for telescopical receipt in a cylindrical housing to control fluid flow downstream thereof and comprising:

a cylindrical pressure reducer fitting for mounting in said housing and formed with an annular seat facing upstream and an axial venturi nozzle diverging downstream from said seat;

a valve barrel mounted from said fitting, upstream thereof and formed with a central chamber including a peripheral wall formed with inlet fluid flow passages disposed upstream of said fitting, said barrel further including an annular flange configured with a first abutment ring facing upstream and including a gland formed with an first annular shoulder facing downstream;

a poppet in said chamber, including a base received in said chamber formed with a second annular shoulder facing upstream for abutting said first shoulder and a poppet surface facing downstream, a stem projecting upstream from said base disposed in said gland, and a stop ring on its upstream end formed with a third annular shoulder facing downstream; and

a coil compression spring surrounding said stem and interposed between said first and third shoulders for biasing said poppet away from said seat whereby as fluid flow increases through said inlets said fluid will be caused to flow downstream through said venturi nozzle to establish a pressure drop across said nozzle thereby reducing the pressure on the downstream side of said base causing said spring to contract thereby providing for said poppet surface to be drawn toward said seat to reduce the volumetric flow of fluid between said poppet surface and seat.

5,465,752

MULTI-FUNCTION VALVE FOR A RISER IN A SPRINKLER SYSTEM

Gary Higgins, 985 Capistrano, Laguna Beach, Calif. 92651

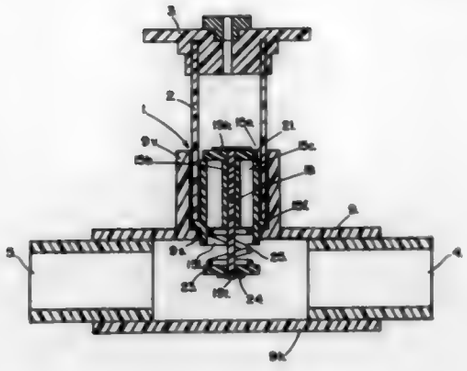
Filed Mar. 7, 1994, Ser. No. 206,406
Int. Cl.[6] F16K *17/30*
U.S. Cl. 137—512.5 **8 Claims**

1. A valve for installation in a riser of a sprinkler system to provide both automatic flow stop and back flow prevention, the valve comprising:

a main body having a generally cylindrical portion;

means comprising a circumferential flange projecting from the body for securing the main body in a fixed position within the riser;

the main body having an inlet end which defines a flow-stop valve seat, an outlet end which defines a back-flow valve seat, means defining a bore extending between the inlet and outlet



ends, and channel means in parallel with the bore defining a flow path for water flow during normal sprinkling operations;

a shaft which extends through the bore and which is movable between opposite end positions;

a pair of annular members fixed to shaft at spaced-apart locations such that translatory motion of the shaft toward the outlet end causes one of the annular members to be moved into abutment with the flow-stop valve seat and close the flow-stop valve, and such that translatory motion of the shaft toward the inlet end causes the other annular member to be moved into abutment with the back-flow valve seat and close the back-flow valve;

a spring surrounding the shaft, the spring having opposite ends;

the main body having a surface bearing against one end of the spring, one of the annular members bearing against the opposite end of the spring;

the spring having a spring constant such that the spring is forced into limited compression in the presence of normal water flow though the flow path, and such that an abnormally high flow rate causes sufficient compression that the flow-stop valve closes.

5,465,753

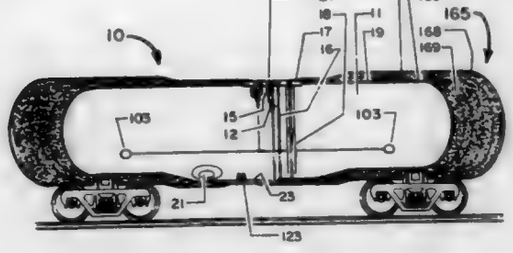
SAFETY VESSEL AND VALVE ASSEMBLY

John E. Schwartz, 1642 Buckhorn La., Billings, Mont. 59105

Filed Jun. 21, 1994, Ser. No. 263,568

Int. Cl.[6] A01M *7/00*

U.S. Cl. 137—587 **20 Claims**



1. A safety vessel and valve assembly comprising:

a vessel functioning as a storage or transport container for fluids and gases, said vessel having a generally smooth exterior shell surface and at least one opening therein;

a series of valves for regulating the flow of fluids and gases into and out of said vessel, said valves being mounted to and through said vessel shell to the interior of said vessel;

a reinforcement means including a mounting plate mounted entirely within said openings of said vessel, said mounting plate substantially increasing the thickness and strength of said vessel shell for protecting said valves; and,

a protective means for preventing ruptures in said vessel.

5,465,754

VALVE ARRANGEMENT

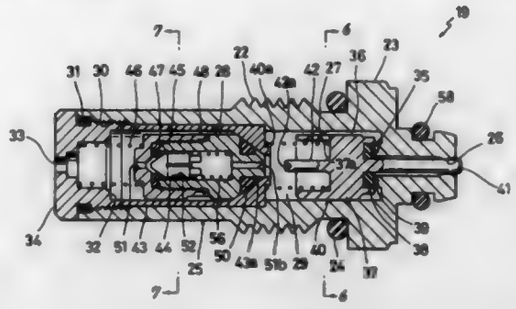
Kiyoshi Sudo, Tokyo, and Masakazu Ookubo, Saitama, both of, Japan, assignors to Showa Tansan Co., Ltd., Tokyo, and Daito Valve Seisakusho Co., Ltd., Saitama, both of, Japan

Filed Nov. 7, 1994, Ser. No. 335,534

Claims priority, application Japan, May 11, 1994, 6-121740

Int. Cl.[6] F16L *37/28*

U.S. Cl. 137—614.2 **3 Claims**



1. In a valve arrangement to be attanched to a mouth tap secured to the opening of a pressure vessel, a valve arrangement characterized in that said valve arrangement comprises: a valve body which is screwed in and fixed at said mouth tap so as to close the passage of said mouth tap; a passage formed on the valve body composed of a nozzle hole, a main valve operating bore communicating with the nozzle hole, and a follower valve operating bore communicating with said main valve operating bore; a main valve mounted to be able to slide within said main valve operating bore, which is capable of opening and closing said nozzle hole but will not close said main valve operating bore; a pressure-exerting spring of the main valve provided within said main valve operating bore and applying force to said main valve in order to close said nozzle hole; a plunger which is integrally formed with said main valve and positioned within said nozzle hole; a fitting metal which is screwed in and attached to said valve body at the end of said follower valve operating bore and which includes a pass hole communicating with said follower valve operating bore; a follower valve mounted to be able to slide within said follower valve operating bore, said follower valve can open and close the passage between said main valve operating bore and said follower valve operating bore and said pass hole, but will not close said follower valve operating bore if either of the above is not closed; a communicating bore formed in the follower valve and communicating with said main valve operating bore and the pass hole of said fitting metal; a check valve which is provided within said communicating bore and permits gas to pass from the pass hole of said fitting metal to said main valve operating bore but prevents it from passing to the pass hole from said main valve operating bore; a pressure-exerting spring of the follower valve provided within said follower valve operating bore and applying force to said follower valve in such a direction as the passage between said follower valve operating bore and said main valve operating bore is closed; and a check valve operating rod which is secured to said main valve and releases said follower valve when it is extended towards said follower valve operating bore and the nozzle hole is opened with said plunger pushed in.

5,465,755

THREE-POSITION, FOUR-WAY ROTARY VALVE WITH PISTOL GRIP ACTUATOR

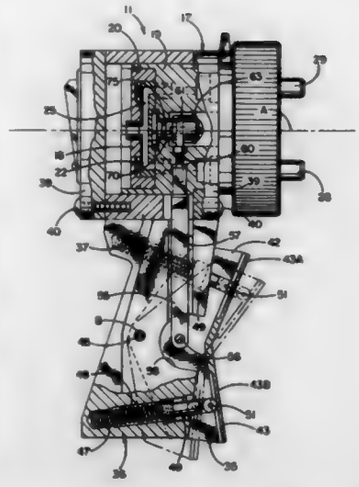
Ellsworth W. Lapp, Naples, Fla., assignor to Hydraulic Tool Engineering, Inc., Naples, Fla.

Filed Jun. 13, 1994, Ser. No. 259,051

Int. Cl.[6] F15B *13/04*

U.S. Cl. 137—625.21 **4 Claims**

1. A three-position, four-way rotary valve, said valve comprising a housing, a valve member supported in said housing to rotate



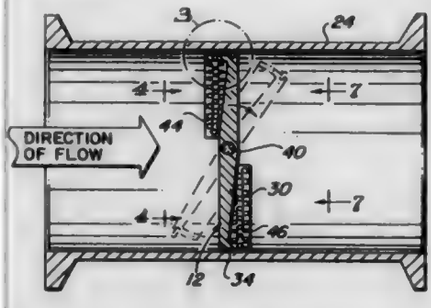
about a first predetermined axis, said valve member normally being disposed in a neutral position and being rotatable in one direction about said axis from said neutral position to a first active position, said valve member being rotatable in the opposite direction about said axis from said neutral position to a second active position, a manually operable actuator located outside of said housing and supported to pivot relative to said housing about a second predetermined axis offset from and extending substantially perpendicular to said first axis, means biasing said actuator to a normal unactuated position while enabling said actuator to be pivoted in one direction about said second axis from said unactuated position to a first actuated position and oppositely about said second axis from said unactuated position to a second actuated position, said biasing means returning said actuator to said normal position when said actuator is manually released after being moved to either of said actuated positions, and means connecting said actuator to said valve member and operable to rotate said valve member about said first axis to said first and second active positions in response to pivoting of said actuator about said second axis to said first and second actuated positions, respectively.

5,465,756

BUTTERFLY VALVE PLATE FOR A PNEUMATIC SURGE VALVE

Charles M. Royalty, Tempe; William Traxler, and Joseph W. Hough, both of Phoenix, all of Ariz., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Dec. 21, 1994, Ser. No. 361,066
Int. Cl.[6] F16K *1/22*
U.S. Cl. 137—625.31 **20 Claims**



1. A butterfly valve plate, comprising:

a generally circular valve disk having an upstream side and a downstream side;

means for mounting said valve disk within a flow conduit for movement between a closed position and an open position respectively to substantially prevent and permit fluid flow through the flow conduit, said mounting means including a generally diametrically extending stem hub on said valve disk for receiving an actuator shaft for rotatably supporting said valve disk within the flow conduit, said stem hub defining a smoothly contoured and generally convex protrusion on at least a portion of said downstream side of said valve disk; and

a pair of perforated, part-circular acoustic fences disposed generally at the periphery of said valve disk respectively on said upstream and downstream sides thereof, said fences being positioned generally in symmetric relation to and on opposite sides of a central axis defined by said stem hub;

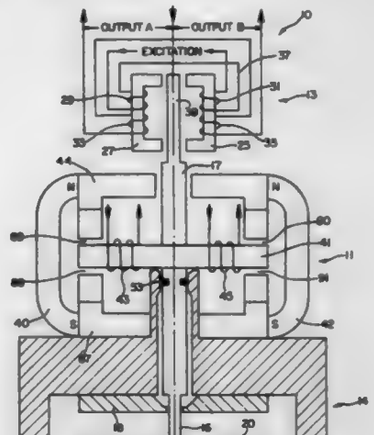
said stem hub including a noise reduction collar of generally convexly curved shape on said downstream side of said valve disk generally at the periphery thereof and having a size and shape to substantially fill the space between said stem hub and the adjacent end of said downstream-side acoustic fence.

5,465,757

ELECTRO-HYDRAULIC FLUID METERING AND CONTROL DEVICE

Norman K. Peters, South Bend, Ind., assignor to AlliedSignal Inc., Morristown, N.J.

Filed Oct. 12, 1993, Ser. No. 134,770
Int. Cl.[6] F15B *13/044*; **G05B** *11/60*
U.S. Cl. 137—625.65 **6 Claims**



1. An electro-hydraulic fluid metering and control device having a sensor section, a torque motor section, and a valve section, the improvement comprising:

a valve body in said valve section having a plurality of ports and channels for the flow of fluid through said valve section in response to movement of a valve;

a torque motor in said torque motor section and mounted on said valve body to define a center line for said sensor section, a torque motor section, and a valve section, said torque motor having a pair of permanent magnets located in a plane of geometric symmetry around said center line, an armature having a first magnetic portion located between pole pieces of one of said pair of permanent magnets and a second magnetic portion located between pole pieces of the other of said pair of permanent magnets, a pair of torque motor coils positioned around said first and second magnetic portions, said armature having a first extension that extends into said sensor section and a second extension that extends into said valve section, said first extension being magnetic and said second extension being non-magnetic, spring means for supporting said armature to define a bending axis of pivoture along a plane perpendicular to the geometric symmetry of said pair of permanent magnets; said spring means positioning said sec-

ond extension to with respect to said valve such that movement thereof meters fluid from an inlet port to an outlet port;

a position sensor located in said sensor section and having a pair of magnetic cores positioned in said plane of geometric symmetry around said center line with said first magnetic extension being equally located between said magnetic cores, said sensor having first and second excitation coils connected in series and located around said first and second magnetic cores, respectively and first and second signal coils located around said first and second magnetic cores;

actuation means responsive to a demand signal and connected to supply said torque motor coils and said first and second excitation coils with actuation signals; said torque motor coils on actuation causing first and second magnetic portions to moves- with respect to said pole pieces of said pair of permanent magnets and pivot said armature in said plane of geometric symmetry to provide corresponding movement through said non-magnetic extension for moving said valve to meter fluid though said outlet port and for said magnetic extension to move toward and away from said magnetic coils to create separate and independent signals from said signal coils; and

control means connected to said actuation means and responsive to said independent signals from said first and second signal coils for selectively modifying said actuation signals as a function of said independent signals to assure said actuation signal supplied to said torque motor moves said valve to meet said demand signal.

5,465,758

APPARATUS FOR SEALING LEAKAGE POINTS IN PIPES FROM THE INSIDE OF THE PIPE, AND A METHOD OF SEALING THE LEAKAGE POINTS

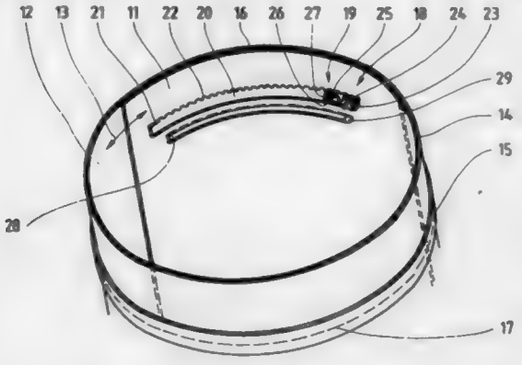
Eckhard Graf; Jürgen Graf, both of Oberbaldingen, and Hubert Mauz, Donaueschingen, all of, Germany, assignors to Uhrig Kanaltechnik GmbH, Geisingen, Germany

Filed Nov. 17, 1994, Ser. No. 343,901

Claims priority, application Germany, Dec. 3, 1993, 9318409 U; Jan. 19, 1994, 44 01 318.3

Int. Cl.[6] F16L *55/162*

U.S. Cl. 138—98 **14 Claims**



1. In an apparatus for sealing leakage points in pipes from the inside of the pipe; the apparatus having a sealing sleeve widenable in the circumferential direction at the leakage point and a mounting cart directable to the leakage point; the sealing sleeve being a widenable, resilient band bent into a ring-shape; the band having two band ends overlapping in a circumferential direction, the sleeve being completely surrounded by a hose made of rubber-elastic material and supporting a stopping device that holds the sleeve in a widened state thereof; the mounting cart having an undercarriage provided with wheels; the improvement wherein the sealing sleeve has at least one widening device that can be operated by the mounting cart; the stopping device being connected with the widening device; and wherein the mounting cart has an operating device for the widening device and a raising and lowering device for the operating device.

5,465,759

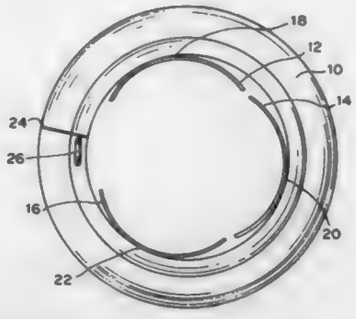
VARIABLE DIAMETER PIPE PROTECTOR

Douglas W. Carlson, and Stephen P. Simmons, both of Kingwood, Tex., assignors to Hydril Company, Houston, Tex.

Filed Mar. 22, 1994, Ser. No. 215,903

Int. Cl.[6] F16L *57/00*

U.S. Cl. 138—110 **9 Claims**



6. A pipe protector comprising

a generally cylindrical metal member with an opening of interlocking teeth the length of the cylindrical metal member;

a rubber tubular member surrounding and covering the metal member whereby the metal member is an insert in the rubber tubular member;

said rubber tubular member with an inner diameter sized to the approximate outer diameter of the pipe and having an opening the length of the tubular member capable of separation at the opening to facilitate the introduction of a length of pipe;

said opening of the tubular member formed of interlocking rubber teeth covering the teeth of the metal member;

a closing means to secure the tubular member around the pipe; and

multiple detachable rubber flaps attached to the inside surface of the tubular rubber member by an adhesive and extending the length of the tubular rubber member.

5,465,760

MULTI-LAYER THREE-DIMENSIONAL FABRIC AND METHOD FOR PRODUCING

Mansour H. Mohamed, and A. Kadir Bilisik, both of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Oct. 25, 1993, Ser. No. 142,864

Int. Cl.[6] D03D *41/00;47/04;13/00*

U.S. Cl. 139—11 **10 Claims**

1. A three-dimensional fabric formed from five yarn systems comprising:

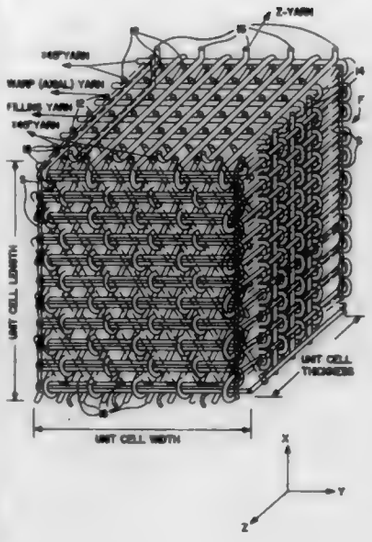
(a) a plurality of warp thread layers comprising a plurality of warp threads arranged in parallel with a longitudinal direction of said fabric and defining a plurality of rows and columns wherein said rows define a front and a back surface;

(b) at least one first pair of bias thread layers positioned on the front surface of said plurality of warp yarn layers and comprising a plurality of continuous bias threads arranged so that each layer is inclined symmetrically with respect to the other layer and inclined with respect to the warp threads;

(c) at least one second pair of bias thread layers positioned on the back surface of said plurality of warp yarn layers and comprising a plurality of continuous bias threads arranged so that each layer is inclined symmetrically with respect to the other layer and inclined with respect to the warp threads;

(d) a plurality of threads arranged in a thicknesswise direction of said fabric and extending between said first and second pair of bias thread layers and perpendicularly intersecting the warp threads between adjacent columns thereof; and

(e) a plurality of weft threads arranged in a widthwise direction of said fabric and perpendicularly intersecting the warp threads between adjacent rows thereof.



5,465,761

SINGLE RAPIER WOVEN FACE-TO-FACE CARPET FABRIC IN ONE-SHOT-WEAVE

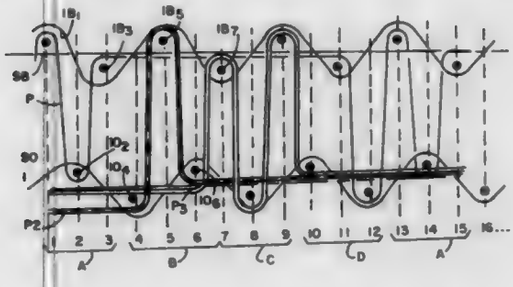
Nico Gheysen, Ledegem, Belgium, assignor to N.V. Michel Van de Wiele, Kortrijk-Marke, Belgium

Filed Apr. 27, 1992, Ser. No. 874,088

Claims priority, application Belgium, May 21, 1991, 09100477

Int. Cl.[6] D03D *27/10*

U.S. Cl. 139—21 11 Claims



1. Method for weaving a face-to-face pile fabric, with a one shot-weave, woven with single rapier or double rapier with weft elimination, where a lower and an upper backing fabric are formed by successively inserting a weft end (I)—each insertion being called a pick—alternately on an upper and a lower level, to form a weft with plural tight warp ends (SB), (SO) and plural binding warp ends, extending on the upper and the lower levels, whereas positions of the weft ends in relation to the tight warp ends are repeated after a number of picks, called a working repeat, and where at least one pile warp end is alternately woven-in into the upper and the lower backing fabric, the position in relation to the wefts each time being imposed for an equal number of successive picks, called the imposed working repeat, characterized in that the imposed working repeat for the pile warp ends only goes over three picks, while the working repeat of the backing fabric goes over a repeat length different from 3 picks, over four picks.

5,465,762

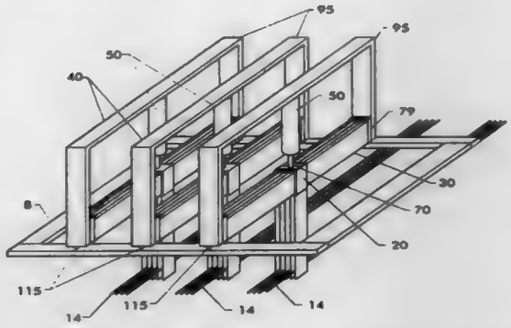
ADJUSTABLE REED FOR WEAVING NET-SHAPED TAILORED FABRICS

Gary L. Farley, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 10, 1994, Ser. No. 260,162

Int. Cl.[6] D03D *49/68*

U.S. Cl. 139—192 27 Claims



1. An adjustable reed for weaving warp and fill yarn fibers into fabrics, comprising:

a reed frame having at least two substantially parallel sides;

a plurality of group frames wherein each group frame further comprises:

at least two substantially vertical end legs, each leg having a top end, a bottom end and an inner surface; and

a linear actuator interconnecting the two end legs near the top ends of each end leg, and the bottom of the end legs of the reed group frame are movably disposed on the reed frame;

a plurality of reed rails wherein each reed rail is mounted at each end to the inner surface of each of the end legs of the group frames such that each group frame contains a plurality of reed rails;

a plurality of reed sliders wherein each reed slider is slidably mounted on a corresponding reed rail;

a plurality of reed wires wherein each reed wire is attached to a corresponding reed slider such that the reed wires extend below the reed sliders and are interposed between the warp yarns to guide the warp yarns during weaving;

means interconnecting the rail sliders within each group frame such that the rail sliders within each group frame move along the length of the rails in unison;

means interconnecting the linear actuator and the rail slider interconnecting means such that activation of the linear actuator causes the rail sliders within the group frame to be pulled along the lengths of the reed rails; and

means for moving each group frame along the reed frame in a direction perpendicular to the warp yarn axis to vary warp yarn spacing during weaving.

5,465,763

THREAD HOLDER FOR A GRIPPER LOOM

Anton Egloff, Galgenen, Switzerland, assignor to Sulzer Rueti AG, Rueti, Switzerland

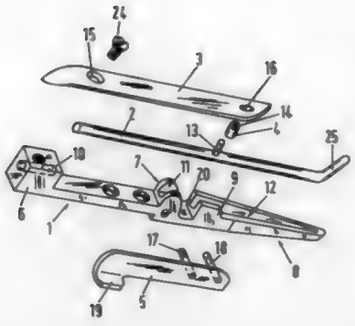
Filed May 5, 1994, Ser. No. 238,408

Claims priority, application European Pat. Off., May 12, 1993, 93810344

Int. Cl.[6] D03D *47/20*

U.S. Cl. 139—196.2 10 Claims

1. A thread holder for a gripper of a gripper loom comprising first and second retention members extending in a longitudinal direction, lying at least partially inside one another and having opposing faces which define between them a rectilinear gap having a curved cross-sectional shape, means movably mounting the second retention member on the first retention member so that the members are movable relative to each other in the longitudinal



direction and so that the opposing faces provide the gap with a constant width in the longitudinal direction and with a cross-sectional contour which continuously increases in an effective direction, the size of the gap being such that a weft thread inserted therein will be held by frictional force.

5,465,764

PAPERMAKING DRYER FABRIC WITH GROUPS OF ABUTTING MACHINE DIRECTION THREADS

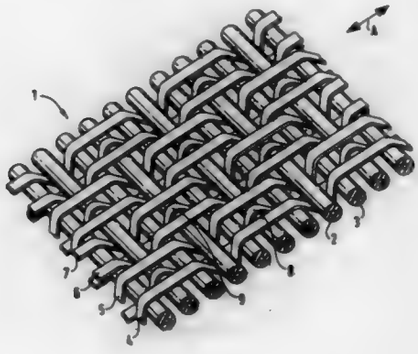
Sylvester Eschmann, Mönchengladbach; Martin Hüser, and Walter Halterbeck, both of Düren, all of, Germany, assignors to Thomas Josef Heimbach GmbH & Co., Duren, Germany

Filed Jan. 25, 1994, Ser. No. 188,330

Claims priority, application Germany, Jan. 26, 1993, 43 02 031.3

Int. Cl.[6] D03D *1/00*

U.S. Cl. 139—383 A **22 Claims**



1. A dryer screen having a paper side and a machine side comprising:

a) a plurality of machine direction threads extending in the machine direction of the screen, said machine direction threads arrayed in first and second groups and the threads of said groups are bound to the screen through different binding pattern repeats;

b) a plurality of cross threads extend generally transverse to said machine direction threads;

c) the threads of said first group are arrayed in first and second subgroups offset with respect to the machine direction of the screen, and each subgroup comprises at least two abutting contiguous machine direction threads having a binding pattern repeat floating on the paper side over a predetermined plurality of cross threads; and

d) the machine direction threads of said second group each having a portion interposed between the threads of one of said first and second subgroups and a cross thread.

5,465,765

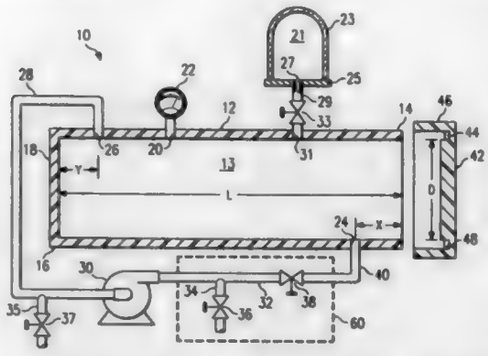
VACUUM APPARATUS FOR DEVELOPING FINGERPRINTS

Jack E. Martindale, 407 County Line Rd., Royce City, Tex. 75089

Filed Apr. 15, 1994, Ser. No. 228,099

Int. Cl.[6] A61B *5/117*

U.S. Cl. 141—65 **13 Claims**



1. A vacuum chamber to use in the developing of latent fingerprints comprising:

(a) a wall defining a volume having a first and second end, said wall also defining a vacuum gauge passageway, an inlet passageway, and an outlet passageway;

(b) an end plate connected to the first end of said wall forming a substantially airtight seal;

(c) a removable second end plate for sealing said second end of said wall to form a substantially airtight seal;

(d) an outlet conduit attached to said outlet passageway;

(e) a vacuum pump having an inlet and an outlet, said vacuum pump connected to the outlet conduit;

(f) a vacuum outlet conduit attached to the outlet of said vacuum pump and connected to said inlet passageway and having a valve assembly interposed therein to selectively vent air from the chamber formed by said wall and end pieces to the atmosphere, or to recycle gases remaining in the chamber; and

(g) a vacuum gauge attached to said vacuum gauge passageway.

5,465,766

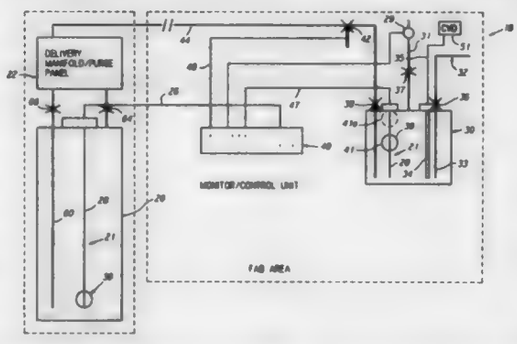
CHEMICAL REFILL SYSTEM FOR HIGH PURITY CHEMICALS

Stephen H. Siegele, Campbell; Craig M. Noah, Mountain View, and John N. Gregg, San Jose, all of Calif., assignors to Advanced Delivery & Chemical Systems, Inc., San Jose, Calif.

Filed Apr. 28, 1993, Ser. No. 54,597

Int. Cl.[6] F17C *13/00*

U.S. Cl. 141—198 **3 Claims**



1. A chemical refill system for high purity chemicals comprising:

a. a refillable ampule;

b. a bulk container containing a high purity source chemical;

c. a refill line interposed between and communicating with said ampule and said bulk container for transferring the high purity source chemical from said bulk container to said ampule;

d. an inert gas pressure source communicating with the interior of said bulk container to transfer the high purity source chemical from said bulk container to said ampule through said refill line;

e. a first metallic float sensor inside said ampule having a trigger point for detecting a level of the high purity source chemical;

f. a control unit electronically communicating with said metallic float and having an indicator that provides a signal to indicate that the high purity source chemical in said ampule is at said level when the level of the high purity source chemical in said ampule reaches said trigger point of said first metallic float sensor;

g. a first valve in said refill line in communication with and controlled by said control unit, and wherein:

i. said control unit opens said valve to allow the transfer of the high purity source chemical from said bulk container to said ampule; and

ii. said control unit closes said valve when the level of source chemical in said ampule reaches said trigger point of said first metallic float sensor, thereby terminating the transfer of the high purity source chemical;

h. a second valve in a pressurization line communicating with said ampule, said second valve communicating with and controlled by said control unit; and,

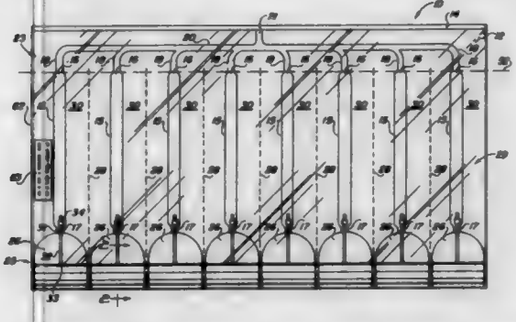
i. a pressure sensor in said pressurization line, said pressure sensor communicating with said control unit, and wherein said control unit closes said second valve and opens said first valve when said pressure sensor detects a specified pressure in said ampule, thereby allowing the transfer of the source chemical from said bulk container to said ampule.

5,465,767

PREMEASURED FLUIDS PACKAGING, STORING AND DISPENSING APPARATUS AND METHOD

Frank H. Harms, Marietta, Ga., and Edwin D. Neas, Ft. Collins, Colo., assignors to LifeSource Advanced Bloodbank Systems, Inc., Atlanta, Ga.

Filed Feb. 1, 1994, Ser. No. 189,980
Int. Cl.[6] B65B *1/04;3/04*
U.S. Cl. 141—237 **20 Claims**



1. Apparatus for packaging, storing and dispensing discrete quantities of fluid, said apparatus comprising:

front and back flexible sheets of fluid impervious material;

a plurality of tubular containment channels including discharge ports and defined by first seal lines bonding said sheets together;

means, including a common fill port and defined by second seal lines bonding said sheets together, for filling said channels with fluid introduced at said common fill port;

dispensing tubes, respectively fluidically connected with said channels at said discharge ports, for dispensing said fluid from said channels through said discharge ports;

valve means for selectively controlling said dispensing by said dispensing tubes; and

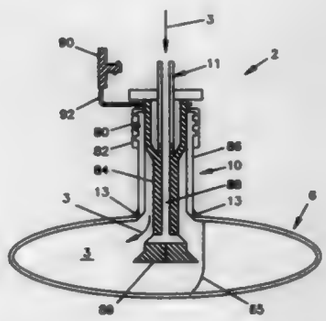
cuffs, respectively surrounding said dispensing tubes and defined by third seal lines bonding said sheets together, said cuffs being dimensioned, configured and adapted for surrounding an opening of a destination container when said corresponding dispensing tube is inserted into said opening for said dispensing.

5,465,768

FLUID TRANSPORT CONTAINER

Bradley G. DeRoos, 41 James St., Sequim, Wash. 98382; John P. Downing, Jr., 260 Kala Heights Dr., Port Townsend, Wash. 98368, and Michael P. Neal, 921 Amberly Pl., Columbus, Ohio 43220

Filed Mar. 1, 1994, Ser. No. 204,579
Int. Cl.[6] G01N *1/00*
U.S. Cl. 141—329 **4 Claims**



1. A sample fluid container for the collection, storage, transport, and distribution of a fluid sample, comprising:

(a) a sample bag;

(b) a fitment assembly having a male fitment slidably disposed within a female fitment;

(c) said female fitment being sealably attached to said sample bag;

(d) said male fitment having a flow port, and further having an insertion member with an insertion tip,
said insertion tip having a tip sealing surface
disposed toward a female fitment sealing surface;

(e) a closure nut having threads on a closure nut interior surface that are mutually compatible with threads on an exterior surface of the female fitment, said threads being mutually engaged;

(f) said male fitment slidably attached to said closure nut;

(g) wherein transverse circular motion of the closure nut causes vertical motion of the male fitment with respect to the female fitment;

(i) motion in first direction of said closure nut causing the insertion tip of the male fitment to move toward and puncture the fluid sample bag for fluid sample collection, said fluid sample flowing into said sample bag;

(ii) motion in a second direction of said closure nut causing the insertion tip of said male fitment to move toward said female fitment sealing surface,

thereby sealing said sample fluid container.

5,465,769

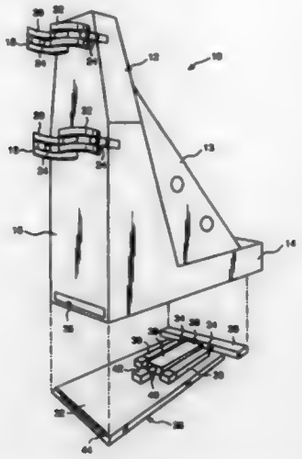
Patent Not Issued For This Number

5,465,770

TREE HARVESTING APPARATUS WITH IMPACT HAMMER

John B. Lansberry, Woodland, Pa., assignor to Stone & Wood, Inc., Woodland, Pa.

Filed Nov. 15, 1994, Ser. No. 341,905
Int. Cl.[6] A01G 23/08
U.S. Cl. 144—336 16 Claims



11. An apparatus for severing a standing tree at a trunk portion thereof, comprising:

a housing constructed and arranged to mounted to a wheeled carrier so as to be movable to a tree harvesting location;

a cutting blade mounted so as to be movable between retracted and extended positions with respect to a standing tree;

impact hammer structure operatively coupled to said cutting blade such that successive impacts generated by said impact hammer structure on said cutting blade move said cutting blade progressively through the trunk portion of the tree; and

actuating structure operatively associated with said cutting blade and constructed and arranged to move said cutting blade between its retracted and extended positions such that when said cutting blade is in an extended position and in engagement with the trunk portion, the successive impacts move the cutting blade to sever the standing tree.

5,465,771

WOOD PROCESSING APPARATUS WITH IMPACT HAMMER

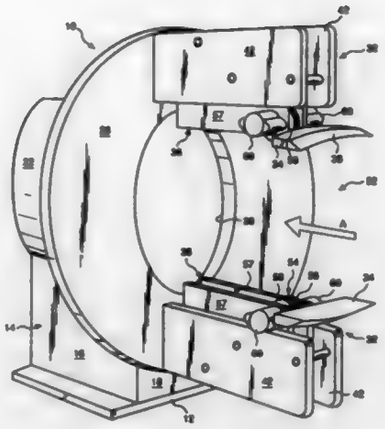
John B. Lansberry, Woodland, Pa., assignor to Stone & Wood, Inc., Woodland, Pa.

Filed Nov. 15, 1994, Ser. No. 341,904
Int. Cl.[6] B27L 1/00; A01G 23/02;23/08
U.S. Cl. 144—343 10 Claims

10. A method of delimbing a felled tree with a cutting apparatus, the cutting apparatus including support and feeding structure constructed and arranged to support and feed a stem portion of the tree in an axial direction through the cutting apparatus, said cutting apparatus including blade structure and impact hammer structure associated therewith, the method comprising the steps of:

feeding the stem portion axially into said cutting apparatus by said support and feeding structure, and

operating the impact hammer structure to progressively move the blade structure through limbs disposed about the periphery of the tree so as to remove the limbs at points substantially adjacent the stem portion as the stem portion is moved through the cutting apparatus.

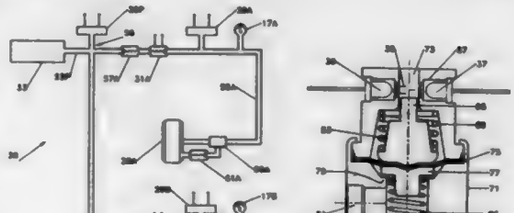


5,465,772

CONTROLLING AND MAINTAINING AIR-PRESSURE IN VEHICLE TIRES

Rolando D. Sartor, Curitiba, Brazil, assignor to Col-Ven S.A., Provincia de Santa Fe, Argentina

Continuation-in-part of Ser. No. 380,620, Jul. 14, 1989, abandoned. This application Apr. 14, 1993, Ser. No. 47,240
Claims priority, application Brazil, Jul. 14, 1988, 8803606
Int. Cl.[6] B60C 23/00
U.S. Cl. 152—416 6 Claims



1. Apparatus in a vehicle having a plurality of axles and a compressor, said compressor for outputting air at a nominal pressure, at least a pair of wheels mounted on each axle, a tire mounted to each wheel and normally pumped up with air to at least a set pressure less than said compressor nominal pressure, said apparatus controlling and maintaining air pressure in said tires and comprising:

a plurality of pneumatic tire circuits, each of said tires associated with a respective one of said pneumatic circuits, each pneumatic circuit including tubing means for monitoring and carrying air to said associated tire;

means for distributing pressurized air from said compressor to each of said tubing means;

each of said pneumatic circuits further comprising:

electrovalve means in the associated tubing means;

rotary coupling means mounted to the associated axle for coupling said pressurized air between said tubing and said tire;

pressure sensor means connected to a point on the associated tubing intermediate said electrovalve means and said tire, said pressure sensor means each including light emitting means and associated phototransistor means positioned whereby light from said emitting means may impinge on said phototransistor means to generate an electrical signal indicative of whether air pressure in said tire is higher or lower than said set pressure; and

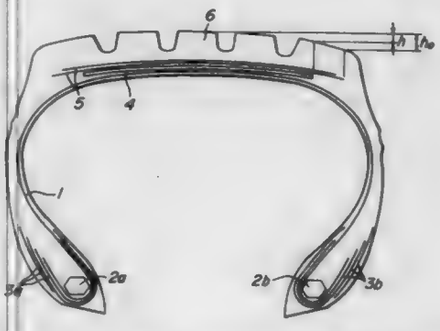
electronic circuit means including operational amplifier means having an input connected to the associated phototransistor means and an output for generating an active signal in response to said tire air-pressure being less than said set pressure, whereby said electronic circuit means is responsive to said air-pressure indicative signal to cause said electrovalve to open when and while said tire air-pressure is substantially lower than said set pressure.

5,465,773

PNEUMATIC RADIAL TIRES WITH ZIGZAG BELT AND RUBBERIZED CARD PLY BELT REINFORCING LAYER

Kuninobu Kadota, Higashimurayama; Hiroyuki Koseki, and Kenji Toyoda, both of Kodaira, all of, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Apr. 19, 1994, Ser. No. 229,749
Claims priority, application Japan, Apr. 30, 1993, 5-104397
Int. Cl.[6] B60C *3/00;9/18*
U.S. Cl. 152—454 **7 Claims**



1. A pneumatic radial tire comprising a radial carcass toroidally extending between a pair of bead cores, a belt superimposed about the carcass, a belt reinforcing layer laid on the belt and a tread laid thereon, the belt formed by zigzag and continuously extending a rubberized strip containing one or more cords therein substantially in a circumferential direction of the tread to slantly extend with respect to an equatorial plane of the tire from one end to the other end at both side edges of the belt through an axially bent state at each side edge, and the belt reinforcing layer is comprised of at least one rubberized cord ply containing plural cords slantly arranged with respect to the equatorial plane in a region corresponding to at least each side region of the tread, and the belt and the belt reinforcing layer satisfy a relationship that a distance from an intersection point between a normal line of a rotational axis of the tire passing through an outermost widthwise end of the belt and an outer surface of the tread to a position of maximum tire diameter is not more than 65% of a distance from an intersection point between a normal line of a rotational axis of the tire passing through an outermost widthwise end of the belt reinforcing layer and an outer surface of the tread to a position of maximum tire diameter.

5,465,774

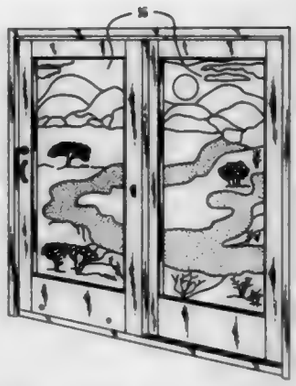
SLIDING GLASS DOOR PRIVACY SCREENS

Mary A. Smith, 41 Parkside La., Bayonne, N.J. 07002

Filed Apr. 11, 1994, Ser. No. 225,617
Int. Cl.[6] E06B *3/32*
U.S. Cl. 160—90 **1 Claim**

1. A sliding closure in combination with a privacy screen comprising:

at least one closure member comprising a substantially rigid first frame having opposed outer surfaces and inner edges defining a perimeter, and a transparent panel located within said first frame and extending between said perimeter, said panel being recessed with respect to at least one of the outer surfaces of said frame, one portion of each of a plurality of fasteners being fixed at spaced locations on said transparent panel;



at least one screen member comprising a second frame and a flexible decorative sheet fitted thereon, said sheet being of a material to at least partially prevent viewing therethrough, said second frame being substantially the same size as said transparent panel and having the other portion of said fastener fired at spaced locations on said covered fragile corresponding to the locations of the portion of said fastener fixed to said transparent panel,

said second frame has a thickness equal to or less than the recess dimensions of said closure member,

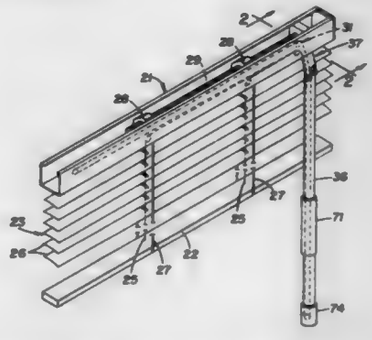
wherein, said second frame is removably mounted on said first frame by said fasteners such that said second frame is located within said perimeter and does not extend beyond a respective said outer surface.

5,465,775

VENETIAN BLIND WITH WAND OPERATOR

Scott I. Biba, Mazomanie, and John R. Genova, Madison, both of Wis., assignors to Springs Window Fashions Division, Inc., Middleton, Wis.

Continuation-in-part of Ser. No. 266,125, Jun. 27, 1994. This application Sep. 12, 1994, Ser. No. 304,512
Int. Cl.[6] E06B *9/30*
U.S. Cl. 160—168.1 **22 Claims**



1. A window blind comprising: a headrail, a bottom rail, expandable and contractable shade means between the headrail and bottom rail, an elongated wand having a lengthwise extending wand passage and wand connector means for mounting the upper end of the wand on the headrail, flexible cord means providing an endless cord operating loop, loop guide means including at least one loop guide in the headrail and a loop guide on the wand for guiding the endless cord operating loop in a closed loop path extending from the headrail and into the wand passage, lift cord means attached to the bottom rail and extending from the bottom rail into the headrail, means connecting the lift cord means to the endless operating loop, a handle member mounted for movement along an outer side of the wand and cord grip means on the handle member operable to

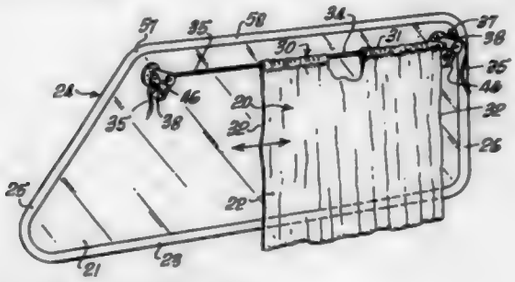
grip a portion of the operating loop in the wand passage and move the operating loop in one direction to raise the bottom rail when the handle member is moved in one direction along the wand, and cord lock means for releasably retaining the bottom rail in raised positions.

5,465,776

WINDOW SHADE

Fernand Mirza, 13506 Hartland, Van Nuys, Calif. 91405

Filed Feb. 22, 1994, Ser. No. 199,092
Int. Cl.[6] E06B *9/00*
U.S. Cl. 160—368.1 **23 Claims**



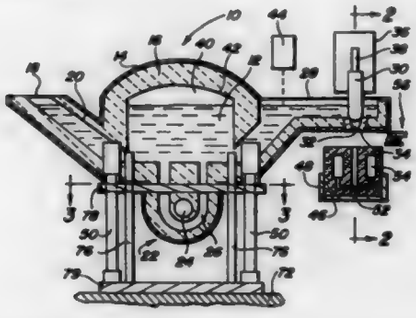
1. A window shade comprising
a curtain having lateral edges,
cord means having opposing ends,
means for maintaining said cord means on said curtain,
extensions on each said cord means ends projecting past a respective one of said lateral edges,
means for applying the shade to a window pane mounted on each of said extensions,
adjusting means mounted to each of said extensions on side of said applying means opposite to a respective lateral edge for producing a desired slack or tension on the portion of the cord means disposed between said applying means, said adjusting means comprising means for releasably gripping a corresponding one of said extensions.

5,465,777

CONTACT POURING

Donald G. Brunner, North Fort Myers, Fla., assignor to The Budd Company, Troy, Mich.

Filed May 18, 1994, Ser. No. 245,705
Int. Cl.[6] B22D *41/00;41/16;43/00*
U.S. Cl. 164—136 **23 Claims**



1. A contact pouring vessel for pouring molten metal directly into a mold, said contact pouring vessel comprising:
a pouring vessel for holding the molten metal in a molten state;
a nozzle within the pouring vessel having an orifice through which the molten metal exits the pouring vessel;
flow control means for controlling the flow of the molten metal out the orifice of the nozzle and directly into the mold;
cleaning means for automatically cleaning the nozzle each time a mold is filled to prohibit an unwanted buildup on the nozzle; and
elevating means for controllably raising and lowering the pouring vessel, wherein said elevating means raises the pouring vessel to accommodate the positioning of the mold adjacent the nozzle and lowers the pouring vessel to position the nozzle flush with the mold.

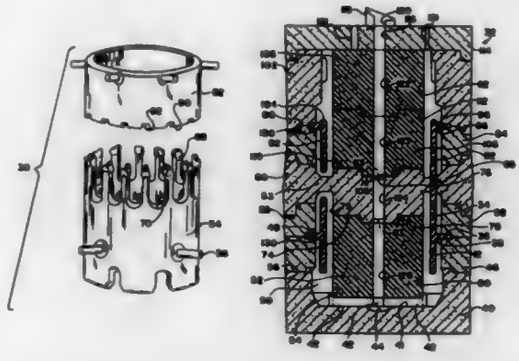
21. A method of directly pouring molten metal into a mold, said method comprising the steps of:
providing a pouring vessel for holding the molten metal in a molten state;
providing a nozzle within the pouring vessel having an orifice through which the molten metal can flow;
elevating the pouring vessel to accommodate the positioning of the mold adjacent the nozzle;
positioning the mold under the nozzle of the pouring vessel;
lowering the pouring vessel to position the nozzle of the pouring vessel flush with the mold;
filling the mold with the molten metal through the orifice of the nozzle;
elevating the pouring vessel; and
automatically cleaning the nozzle within the pouring vessel.

5,465,778

METHOD OF CASTING ONE PIECE CYLINDER LINER INCORPORATING A DRAFTLESS WATER JACKET

Richard J. Clark; Richard K. Clark, both of Gilman, and Dennis E. Clark, Onarga, all of Ill., assignors to Clark Industries, Inc., Gilman, Ill.

Division of Ser. No. 29,625, Mar. 11, 1987, Pat. No. 5,337,709.
This application Jul. 15, 1994, Ser. No. 275,507
Int. Cl.[6] B22D *33/04*
U.S. Cl. 164—137 **1 Claim**



1. A method of vertically casting a one piece cylinder liner including a water jacket therein, the method comprising the steps of:
creating a mold base having a center hollow and a plurality of radial passages extending outwardly from said hollow;
creating a first thick walled cylindrical mold section which engages within said mold base and has a center bore therein which aligns with the center hollow of the mold base and setting the mold section within the mold base;
creating a first ring like mold section having slots on an upper surface thereof and engaging same upon an upper peripheral surface of said mold base;
creating a first cylindrical core piece having a predetermined diameter, the core piece having a plurality of radial fingers extending radially outwardly therefrom at a predetermined distance from a bottom edge thereof, said fingers being positioned to engage within the slots of the first ring like mold section and said core piece having a predetermined plurality of towers having a predetermined height extending upwardly from a top edge thereof;

engaging the core piece upon the first ring like mold section within the mold radially outwardly of the first thick walled cylindrical mold section;

creating a second ring like mold section which seats on said first ring like mold section and accommodates the radial fingers of said bottom core piece and engaging same upon an upper peripheral surface of said first ring like section;

creating a wheel like mold section having a cylindrical outer wall and a hub having outer cylindrical wall sections and opposed planar surfaces, each planar surface thereof being radially stepped about a center throughbore thereof and said hub outer cylindrical wall sections having an outer diameter equal to the outer diameter of said thick walled mold section, the outer wall of said wheel like mold section and said hub being joined to one another by a predetermined plurality of spokes, the spokes having separations therebetween sized and configured to allow the towers on said core bottom piece to pass therethrough;

engaging said wheel like mold section onto said second ring like mold section in a manner aligning said center throughbore thereof with said center throughbore of said thick walled mold section;

creating a third ring like mold section which engages upon said cylindrical outer wall of said wheel like mold section and having a plurality of slots at predetermined positions in an upper wall thereof, and setting the mold section on the wheel like mold section;

creating a second cylindrical core piece having a predetermined diameter which is equal to the diameter of said first core piece, the second core piece having a plurality of radial fingers extending radially outwardly therefrom at a predetermined distance from a top edge of the core piece, said fingers being positioned to engage within the slots in said third ring like mold section, and said core piece having a predetermined plurality of slots having a predetermined depth extending downwardly from a bottom edge thereof;

engaging the core piece upon the engaged third ring like mold section by engaging the radial fingers of the core piece within the mold section slots;

creating a fourth ring like mold section which seats on said third ring like mold section and also accommodates the radial fingers of said upper core piece with an undercut area provided in a bottom surface thereof;

creating substantially identical second and third vertically nesting thick walled cylindrical mold sections, a bottom one of which engages within said hub of said wheel like mold section, each section having a center bore therein which aligns with the center bore of the first cylindrical mold section and setting the second and third mold sections upon the hub of the wheel like mold section;

placing said fourth ring like mold section over said third ring like mold section;

creating a mold top section having a center opening therethrough which aligns with the center bore in said thick walled mold sections, an inner wall of all contiguous mold sections defining an outer wall of said liner and an outer surface of said thick walled mold sections and said hub defining a center bore of said liner, and said hub spokes defining air port openings extending through the entire thickness of said liner, and said towers defining paths extending between said air ports; and

placing said top mold section and a pour trough over said fourth ring like mold section and pouring hot metal into the trough and created mold.

5,465,779

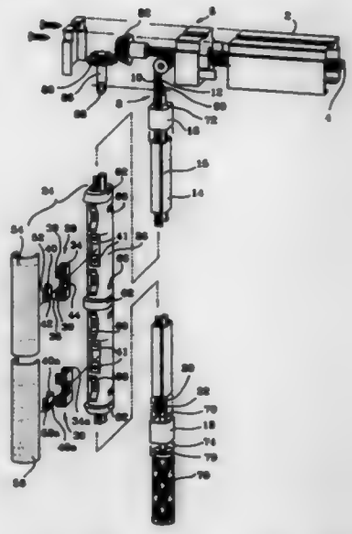
INTEGRATED CORD LOOP DRIVE MEANS AND HOUSING FOR WINDOW COVERING

David Rozon, 538 Chartrand Street, Russell, Ontario, Canada

Filed Jul. 22, 1994, Ser. No. 278,834

Int. Cl.[6] E06B *9/30*

U.S. Cl. 160;168.1— 17 Claims



1. An integrated cord loop drive means and enclosure for enclosing and driving the cord loop of a window covering, said cord loop comprising first and second strands depending from said window covering, said drive means and enclosure comprising:

a) an elongate wand-shaped housing for enclosing said first and second strands, said housing having upper and lower portions and an axial slot extending generally the length of said housing through the wall of said housing;

b) a cord guide mounted at said lower portion of said housing, adapted to retain the lower end of said cord loop within said housing and to permit said cord loop to cycle through said housing; and

c) a cord grip member engaged to said housing and slideably displaceable between said upper and lower portions, said cord grip member comprising first and second clamps disposed within said housing and first and second actuators external to said housing, each clamp being linked to a respective actuator through said axial slot, said first clamp being adapted to releasably grip said first strand when actuated by said first actuator and said second clamp adapted to releasably grip said second strand when actuated by said second actuator, said cord grip member adapted to permit a user to drive said cord loop through said housing in a first or second direction, when said first or second clamp is actuated, respectively.

5,465,780

LASER MACHINING OF CERAMIC CORES

Michael S. Muntner, Killingworth, and James S. Perron, Madison, both of Conn., assignors to AlliedSignal Inc., Morris Township, N.J.

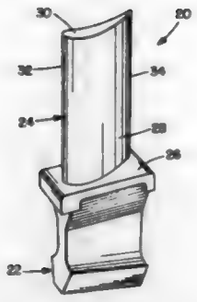
Filed Nov. 23, 1993, Ser. No. 157,228

Int. Cl.[6] B22C *9/00;9/10;* B22D *31/00*

U.S. Cl. 164—516 62 Claims

1. A method of producing a core for making a hollow blade comprising the steps of:

(a) molding a green ceramic core having outer surfaces generally contoured to produce the intended interior surfaces of the completed blade;



(b) heating the green ceramic core to a sufficient extent to produce a fired core; and

(c) operating on the fired core with a laser to modify the characteristics of the fired core.

5,465,781

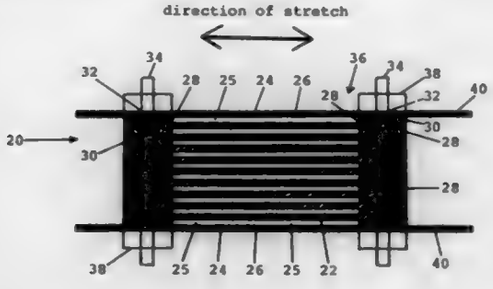
ELASTOMER BED

Anthony J. DeGregoria, Madison, Wis., assignor to ElasTek, Inc., Madison, Wis.

Division of Ser. No. 968,341, Oct. 29, 1992, Pat. No. 5,339,653. This application Apr. 12, 1994, Ser. No. 226,479

Int. Cl.[6] F23L *15/02*

U.S. Cl. 165—8 **18 Claims**



1. A method of refrigeration of the type employing a elastomeric element, a regenerator and a single-phase heat transfer fluid at temperatures T_C and T_H, respectively, the method comprising:

(a) stretching the elastomeric element to increase the average temperature of the element by ΔT;

(b) flowing the fluid at a temperature substantially T_C through the element so that the fluid flows out of the element at about $T_H + \Delta T$,

(c) contracting the element to decrease the average temperature of the element by ΔT,

(d) flowing the fluid through the element in the reverse direction at T_H so that the fluid flows out of the element at about $T_C - \Delta T$, and

(e) transferring heat from the emerging fluid during steps (b) and transferring heat to the emerging fluid during step (d) to objects to be temperature affected thereby.

5,465,782

HIGH-EFFICIENCY ISOTHERMAL HEAT PIPE

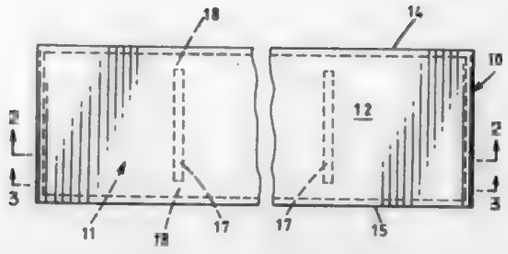
Jyi-Yu Sun; Tao Chian; Di-Kon Shih, and Chih-Yao Wang, all of Hsinchu, Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Taiwan, Prov. of China

Filed Jun. 13, 1994, Ser. No. 259,003

Int. Cl.[6] F28D *15/00*

U.S. Cl. 165—104.26 **4 Claims**

1. A high-efficiency isothermal heat pipe for use in electronic equipment to be in contact with electronic elements or electronic equipment composed of electronic elements so that heat generated



in a certain part of the electronic elements may be speedily distributed through said heat pipe to prevent partial overheat in the electronic equipment, said heat pipe comprising:

a plate body, the interior thereof forming a hollow enclosed inner chamber, said body having an upper wall and a lower wall, a front end and a rear end, and inner walls with a plurality of grooves extending from said front end to said rear end for producing capillary action; and

at least a dividing wall disposed in said inner chamber of said body, said dividing wall extending in the direction from said front end of said body to said rear end of said body and being parallel to said grooves in said inner walls of said body, while keeping a suitable distance from said front end of said body or said rear end of said body for forming a fluid channel, wherein

said dividing wall extends from said upper wall of said body to said lower wall of said body to divide said inner chamber into at least two fluid zones which are interconnected by said fluid channel, and

said inner chamber of said body is filled with a working fluid under a state of being vacuum.

5,465,783

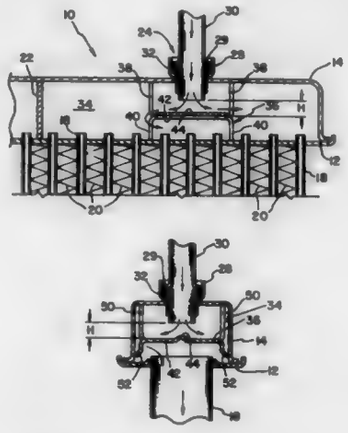
SACRIFICIAL EROSION BRIDGE FOR A HEAT EXCHANGER

Timothy J. O'Connor, North Tonawanda, N.Y., assignor to FEDCO Automotive Components Company, Inc., Buffalo, N.Y.

Filed Mar. 4, 1994, Ser. No. 206,122

Int. Cl.[6] F28F *19/00*

U.S. Cl. 165—134.1 **16 Claims**



1. A heat exchanger comprising:

an aluminum alloy tank member having an inlet through which a coolant flows into the heat exchanger;

a header attached to the tank member so as to form a chamber therewith, the header having a plurality of apertures formed therein;

a plurality of tubes received in the apertures of the header such that an end of each of the tubes projects into the chamber formed by the tank member and the header; and

an aluminum alloy sacrificial erosion member brazed to the tank member so as to be disposed within the chamber downstream of the inlet, such that the coolant entering the heat exchanger through the inlet impinges the sacrificial erosion member and is thereby deflected away from the ends of the tubes, so as to reduce erosion of the ends of the tubes, the sacrificial erosion member having a first support member and an oppositely disposed second support member, the first support member engaging the tank member and spacing the sacrificial erosion member from the tank member, the second support member spacing the sacrificial erosion member from the header, the first and second support members cooperating to immobilize the sacrificial erosion member within the chamber.

5,465,784

STEAM CONDENSER

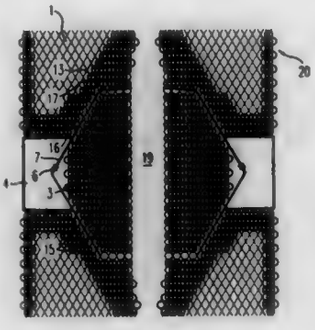
Francisco Biangetti, Baden; Andreas Kost, Herznach, both of, Switzerland, and Gunter Volks, Lauchringen, Germany, assignors to ABB Management AG, Baden, Switzerland

Filed Apr. 5, 1994, Ser. No. 222,918

Claims priority, application Germany, Apr. 5, 1993, 43 11 118.1

Int. Cl.[6] F28B *9/10*

U.S. Cl. 165—114 **3 Claims**



1. A steam condenser, which comprises: a plurality of tubes on which steam is precipitated and through which cooling water flows wherein said tubes are gathered into separate bundles, each of said bundles including support plates which divide each of said bundles into compartments wherein said support plates are arranged perpendicularly to the tubes and the tubes are arranged in rows in each of said bundles and said tubes enveloping a cavity;

a cooler comprising a plurality of tubes compartmentalized by walls from the condenser, said cooler being disposed in said cavity for non-condensible gases and having orifices formed therein, said cooler having an open portion facing said cavity; and

at least one suction channel common to each of the compartments wherein the non-condensible gases flow from the cooler via the orifices to the suction channel and wherein the suction channel extends the entire length of the tubes wherein the suction channel is directly attached to the walls of the cooler and wherein the cooler has orifices dimensioned in such a manner that a local, non-condensible mass flow is withdrawn from the cooler due to locally available pressure difference.

5,465,785

HEAT EXCHANGER

Colin I. Adderley, Derby; John O. Fowler, Lancashire, and Michael F. Wignall, Derbyshire, all of, England, assignors to Rolls-Royce plc, Derby, England

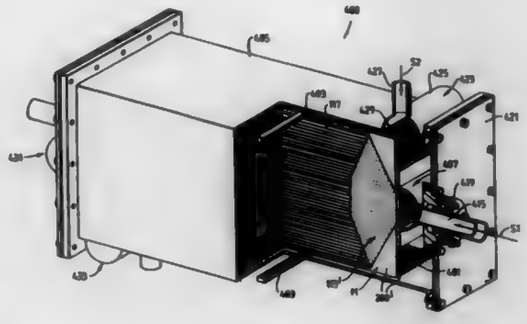
PCT No. PCT/GB92/00301, § 371 Date Aug. 23, 1993, § 102(e) Date Aug. 23, 1993, PCT Pub. No. WO92/15829, PCT Pub. Date Sep. 17, 1992

PCT Filed Feb. 20, 1992, Ser. No. 107,781

Claims priority, application United Kingdom, Feb. 27, 1991, 9104156

Int. Cl.[6] F28F *3/14*

U.S. Cl. 165—166 **6 Claims**



1. A plate-fin type of heat exchanger for facilitating exchange of heat between at least two process streams, comprising

a matrix of heat exchange plate elements arranged in side-by-side spaced apart relationship,

metal jacket means enclosing the matrix of heat exchange plate elements,

process stream inlet and outlet manifold means for passing the process streams through the metal jacket to and from the matrix of heat exchange plate elements,

first heat exchange flow passage means for at least a first process stream, the first flow passage means being defined between adjacent plate elements,

second heat exchange flow passage means within the plate elements for at least a second process stream, and

inlet and outlet means at edge locations of the plate elements, the inlet and outlet means being connected to the second flow passage means and to the inlet and outlet manifold means for flow of at least the second process stream; therethrough;

wherein the plate elements comprise diffusion bonded stacks of metal sheets having a superplastically expanded internal core structure defining heat exchange flow passage means for at least the second process stream, said inlet and outlet manifold means for flow of at least the second process stream comprising projecting edge portions of the plate elements which define slot-shaped inlet or outlet means for flow of at least the second process stream through the plate elements, and

a manifold with wall means having slots therethrough, the projecting edge portions of the plate elements being secured in the slots such that process stream flow can occur between the manifold and the interior of the plate elements.

5,465,786

SUBSURFACE TUBING SAFETY VALVE

Neil H. Akkerman, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

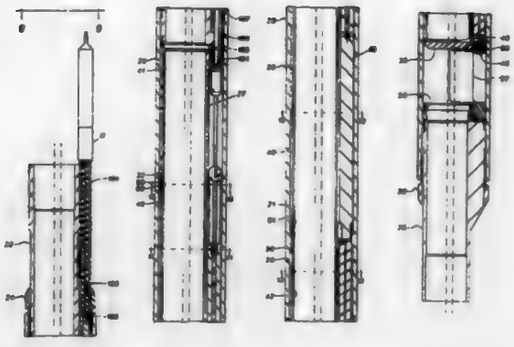
Filed May 27, 1994, Ser. No. 250,510

Int. Cl.[6] E21B *34/06*

U.S. Cl. 166—66.4 **10 Claims**

1. A subsurface tubing safety valve, comprising

an elongate housing connectible as part of a tubing string disposable within a well bore and having a flowway therethrough and a diametrically enlarged portion intermediate its ends,



upper and lower guide bodies received in the enlarged portion of the housing each having bores therethrough aligned with the flowway,

a flapper pivotally mounted on the housing for swinging between a first position to open the flowway and a second position to close the flowway,

spring means acting between the housing and flapper to urge it closed,

a lower plate above the lower guide body and having a bore therethrough aligned with the bore of the lower guide body,

an upper plate below the upper guide body and having a bore therethrough aligned with the bore of the upper guide body,

a flow tube secured to the upper plate and extending through the bores in the lower plate and lower guide body for reciprocating therein so that, when lowered, its lower end moves the closed flapper to open position,

piston means sealably reciprocable within the lower guide body so as to be urged upwardly in response to well pressure beneath them,

first, second and third rods extending upwardly from the lower plate through the upper plate and into the upper guide body,

an opening coil spring about the second rod and extending through the upper plate to engage at opposite ends with the lower plate and upper guide body,

a closing coil spring about the third rod to engage at opposite ends with the upper and lower plates,

a control rod extending within the first rod for rotation with respect thereto,

means on the upper guide body and control rod yieldably urging the control rod in one direction to a first limited rotational direction,

means on the control rod and second rod for rotating the control rod in the other direction to a second limited rotational position upon raising of the second rod as the pistons are raised in response to an increase in differential across the closed flapper,

means operable, upon rotation of the control rod to its second position, and lowering of the pressure differential, to prevent downward movement of the second rod with respect to the upper plate and thus to store energy in both springs as they are compressed by raising of the lower plate, and

a control mechanism mounted on the housing including means activated in response to a signal representing a controlled condition so as to prevent rotation of the control rod in the other direction, whereby, as long as said means is activated, the pressure differential may be reduced to permit the opening spring to lower the lower plate and pistons and thus the flow tube to open the flapper,

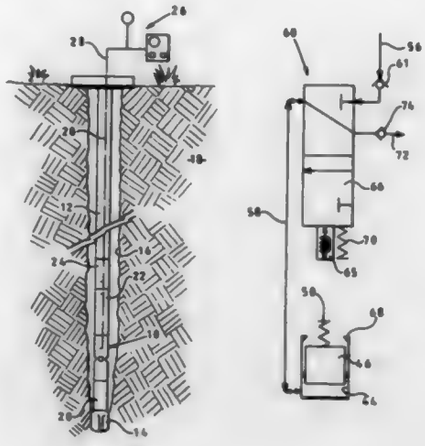
the deactivation of the signal releasing the second rod from the upper plate to permit the closing spring to raise the flow tube and thus permit the flapper to close.

5,465,787

FLUID CIRCULATION APPARATUS

Brian A. Roth, The Woodlands, Tex., assignor to Camco International Inc., Houston, Tex.

Filed Jul. 29, 1994, Ser. No. 282,795
Int. Cl.[6] E21B *4/04*
U.S. Cl. 166—66.4 **7 Claims**



1. A fluid circulation apparatus for interconnection with a wellbore tubing string, comprising:

a tubular body member having a longitudinal bore extending therethrough, and having means for interconnection with a tubing string;

at least one fluid communication port extending through a sidewall of the tubular body member;

valve means for selectively permitting and preventing fluid flow through the fluid communication port;

means for biasing the valve means in a normally closed position; and

fluid control means comprising an electrically operated valve mounted within a space within the tubular body member, and adapted to selectively apply hydraulic fluid sent through a control line from the earth's surface to operate the valve means in response to electrical signals sent by wires to the control means from the earth's surface.

5,465,788

TUBING STRING HANGING APPARATUS

Andrew Wright, Sherwood Park, Canada, assignor to 569,396 Alberta Ltd., Edmonton, Canada

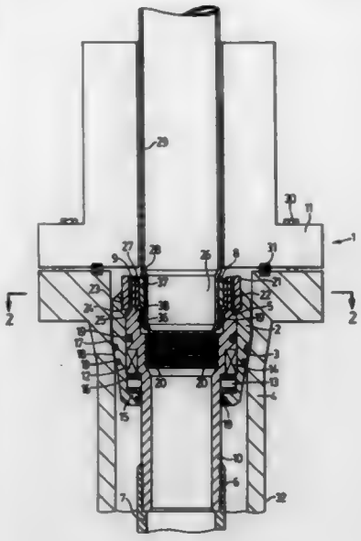
Filed Feb. 1, 1995, Ser. No. 382,205
Int. Cl.[6] E21B *33/04;17/046*
U.S. Cl. 166—78.1 **28 Claims**

1. An apparatus for rotatably hanging a tubing string in a well casing having a wellhead, the apparatus comprising:

a tubing hanger shell having means for engagement with said wellhead;

a mandrel rotatably mounted within said tubing hanger shell, said mandrel having an upper end and a lower end, said lower end having engagement means fur connection to said tubing string and said upper end engaging coupling means which connects said mandrel to a tubing rotator, said coupling means providing means to transfer rotational energy from said tubing rotator to said mandrel while allowing for the disengagement of said tubing rotator from said mandrel through the application of force, and through movement, in a direction parallel to the longitudinal axis of said tubing string; and

bearing means disposed between said tubing hanger shell and said mandrel to facilitate in the rotation of said mandrel within said tubing hanger shell.



5,465,789

APPARATUS AND METHOD OF MAGNETIC WELL STIMULATION

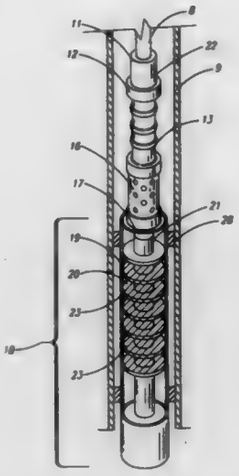
James O. Evans, P.O. Box 876, Pampa, Tex. 79066-0876

Continuation-in-part of Ser. No. 19,155, Feb. 17, 1993, Pat. No. 5,323,855. This application May 31, 1994, Ser. No. 250,929

The portion of the term of this patent subsequent to Jun. 28, 2011, has been disclaimed.

Int. Cl.[6] E21B *43/24*

U.S. Cl. 166—248 10 Claims



1. An apparatus to extract magnetically susceptible fluids and magnetically susceptible particles from a subterranean well having a shaft or tube extending from the surface into a fluid containing formation and an elongated rod within said shaft or tube, which apparatus comprises:

at least one permanent magnet attached to said rod;

at least one stationary coil within said well;

means to reciprocate said rod to reciprocate said permanent magnet in relation to said coil in order to induce electric current in said coil; and

means to attract and repel said magnetically susceptible fluids and magnetically susceptible particles by production of intermittently reversing magnetic flux.

5,465,790

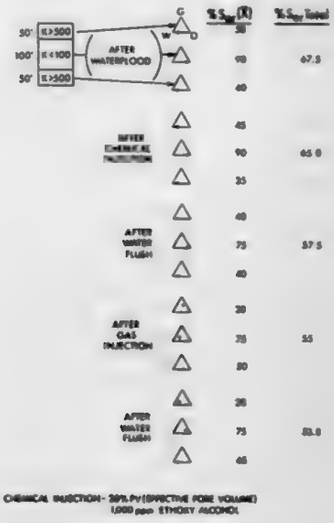
ENHANCED OIL RECOVERY FROM HETEROGENEOUS RESERVOIRS

Donald C. McClure, Parker, and Hiemi K. Haines, Englewood, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Apr. 11, 1994, Ser. No. 226,189

Int. Cl.[6] E21B *43/22*

U.S. Cl. 166—273 14 Claims



1. A process for enhanced recovery of hydrocarbons from a subterranean formation, penetrated by at least one injection well and at least one production well in fluid communication with the formation, the formation having heterogeneous permeability with an aqueous fluid present in the higher permeability layers and oil present in the lower permeability layers, the steps comprising:

injecting an aqueous surfactant solution into the formation via the at least one injection well, said surfactant solution having a surfactant dissolved therein in an amount effective to imbibe into and create an interface tension gradient within the lower permeability layers, the interface tension gradient causing displacement of a first quantity of oil from the lower permeability layers into the higher permeability layers;

injecting a first aqueous fluid into the formation via the at least one injection well, thereby sweeping at least a portion of the first quantity of oil from the higher permeability layers to the at least one production well;

injecting a gas into the formation via the at least one injection well, a portion of the gas entering the lower permeability layers by gravity segregation, thereby displacing a second quantity of oil from the lower permeability layers to the higher permeability layers;

injecting a second aqueous fluid into the formation via the at least one injection well thereby sweeping at least a portion of the second quantity of oil from the higher permeability layers to the at least one production well; and

recovering the portions of the first and second quantities of oil from the at least one production well.

5,465,791

RESILIENT SPIDER FOR WELL INSTALLATION

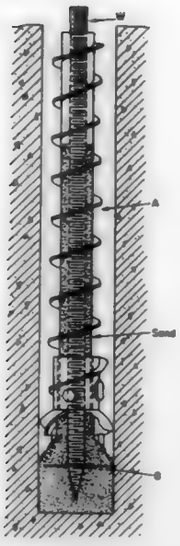
Joel S. Loitherstein, 76 Warren Rd., Ashland, Mass. 01722

Filed Aug. 16, 1994, Ser. No. 291,375

Int. Cl.[6] E21B *43/04*

U.S. Cl. 166—278 6 Claims

4. A method of installing a well pipe in a borehole made by an auger, the auger having inner walls and an outer rim, comprising the steps of:



mounting a spider circumferentially on a lower section of the well pipe, wherein the spider comprises a circular planar base having an opening for such mounting and a plurality of resilient arms integral to the base and extending radially outwardly therefrom which in one operating condition are adapted for frictionally engaging the inner walls of the auger and opposing an upward buoyant force of groundwater located in the borehole, and in another operating condition are adapted for overlapping the rim of the lower end of the auger and being circumdisposed thereto;

pushing the well pipe with the spider mounted thereupon downward through the auger located in a borehole such that the inner walls of the auger are frictionally engaged by the spider arms; and

positioning the spider mounted on the well pipe below the lower end of the auger such that the well pipe is supported against the rim of the lower end of the auger by the upward buoyant force of the groundwater located in the borehole.

5,465,792

METHOD OF CONTROLLING PRODUCTION OF EXCESS WATER IN OIL AND GAS WELLS

Jeffrey C. Dawson, Spring, and Hoang Van Le, Houston, both of Tex., assignors to BJ Services Company, Houston, Tex.

Filed Jul. 20, 1994, Ser. No. 277,955
Int. Cl.[6] E21B *33/138*
U.S. Cl. 166—295 **36 Claims**

1. A method of selectively reducing production of aqueous fluids from a reservoir within subterranean formations having low permeabilities, the method comprising the steps of:

introducing a non-aqueous, hydrocarbon fluid containing discrete unswollen, submicron water absorbing particles which are dispersed throughout the hydrocarbon fluid into pore channels of the formation, at least some of the pore channels being aqueous fluid conducting pore channels, the absence of aqueous fluid within the hydrocarbon fluid serving to retain the particles in an unswollen state, and wherein each particle consists essentially of hydratable polymers which are cross-linked so that the polymers are insoluble in water; and

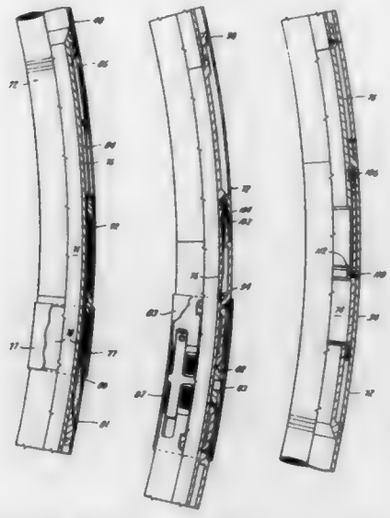
allowing the particles to absorb water within the aqueous fluid conducting pore channels so that the particles swell within the aqueous fluid conducting pore channels and restrict the flow of fluids through the aqueous fluid conducting pore channels.

5,465,793

SPOOLABLE FLEXIBLE HYDRAULIC CONTROLLED ANNULAR CONTROL VALVE

Ronald E. Pringle, Houston, Tex., assignor to Camco International Inc., Houston, Tex.

Division of Ser. No. 146,344, Nov. 1, 1993, Pat. No. 5,411,085.
This application Jul. 21, 1994, Ser. No. 278,582
Int. Cl.[6] E21B *34/10*
U.S. Cl. 166—319 **6 Claims**



1. A spoolable flexible hydraulic controlled annular control valve positioned in a coiled tubing for controlling fluid flow between the valve and an outer concentric well conduit, comprising,

a housing having a bore extending therethrough for the passage of wireline tools,

an expandable flexible cup seal having a sealing lip and positioned around the housing for sealing between the housing and said well conduit,

hydraulic piston and cylinder means for retracting the cup seal,

expandable slip means positioned around the body for gripping the interior of the well conduit,

second hydraulic piston and cylinder means for expanding the slip means,

said flexible cup and said slip means being initially retracted to an outer dimension substantially equal to the outside diameter of the coiled tubing, and

said control valve being longitudinally flexible for allowing bending about the longitudinal axis of the control valve for allowing the valve to be spooled on a coiled tubing reel.

5,465,794

HYDRAULIC SEAL BETWEEN TUBING HANGER AND WELLHEAD

Brett R. McConaughy, Jurong, Singapore; Norman Brammer, Aberdeen, Scotland, and James A. Gariepy, Houston, Tex., assignors to ABB Vetco Gray Inc., Houston, Tex.

Filed Aug. 23, 1994, Ser. No. 294,679
Int. Cl.[6] E21B *34/10*
U.S. Cl. 166—375 **7 Claims**

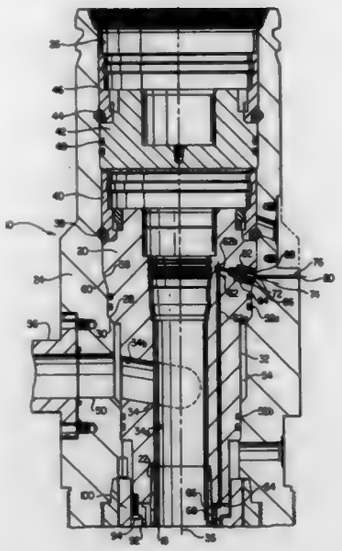
1. A well production assembly comprising in combination:

a wellbore extending from the earth's surface downward to a fluid bearing formation located below the earth's surface;

at least one casing string suspended within the wellbore;

a production tubing string extending concentrically within the casing string, the production tubing string conveying production fluids from the fluid bearing formation to the earth's surface;

an annular wellhead member located at an upper end of the wellbore and having an concave, frusto-spherical inner mating



surface and a hydraulic fluid passage extending laterally through the wellhead member and having an inboard opening at the inner mating surface;

a tubing hanger connected to the upper extremity of the production tubing string and landed concentrically within the wellhead member for suspending the production tubing string within the wellbore, the tubing hanger having a convex, frusto-spherical outer mating surface which mates with the inner mating surface of the wellhead member;

a production fluid passage extending through the tubing hanger for placing the production tubing string in communication with a production line;

a hydraulically actuated downhole safety valve connected into the production tubing string for selectively interrupting fluid flow through the production tubing string;

a hydraulic line extending upward from the downhole safety valve to the tubing hanger;

a tubing hanger hydraulic fluid passage extending through the tubing hanger, a lower portion of the tubing hanger hydraulic fluid passage extending parallel and offset from an axis of the tubing hanger, an upper portion of the tubing hanger hydraulic fluid passage extending laterally through the tubing hanger, the tubing hanger hydraulic fluid passage having a lower opening and an outboard opening, the lower opening being connected to the hydraulic line and being in communication with the downhole safety valve, the outboard opening being located on the outer mating surface of the tubing hanger, registering with the inboard opening of the wellhead member hydraulic fluid passage, and being in communication with a hydraulic supply line, wherein hydraulic fluid is supplied from the exterior of the wellhead member to the downhole safety valve;

rotational alignment means for aligning the outboard opening of the tubing hanger hydraulic fluid passage and the inboard opening of the wellhead member hydraulic fluid passage;

a circular seal recess formed in a selected one of the mating surfaces, the recess having an axis concentric with an axis of the opening in said selected one of the mating surfaces and surrounding the opening in said selected one of the mating surfaces; and

a circular seal ring concentrically located in the seal recess for providing a sealing connection between the tubing hanger hydraulic fluid passage and the wellhead member hydraulic fluid passage.

5,465,795

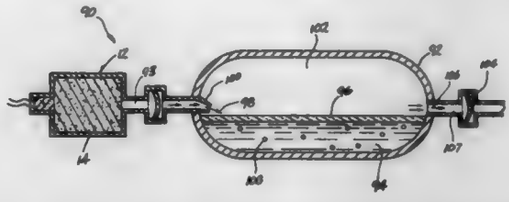
FIRE SUPPRESSING APPARATUS FOR GENERATING STEAM FROM A WATER-ICE MIXTURE

Lyle D. Galbraith, Redmond; Gary F. Holland, Snohomish; Donald R. Poole, Woodinville, and Robert M. Mitchell, Issaquah, all of Wash., assignors to Olin Corporation, Redmond, Wash.

Division of Ser. No. 248,932, May 25, 1994, Pat. No. 5,423,384, which is a continuation-in-part of Ser. No. 82,137, Jun. 24, 1993. This application Apr. 3, 1995, Ser. No. 415,802

Int. Cl.[6] A62C *35/02*

U.S. Cl. 169—11 **10 Claims**



1. An apparatus for suppressing a fire, said apparatus comprising:

a gas generator containing a propellant and a fire suppressant;

a tank containing a mixture of water and ice;

a first conduit providing a passageway between said gas generator and said tank; and

a second conduit providing a passageway between said tank and said fire.

5,465,796

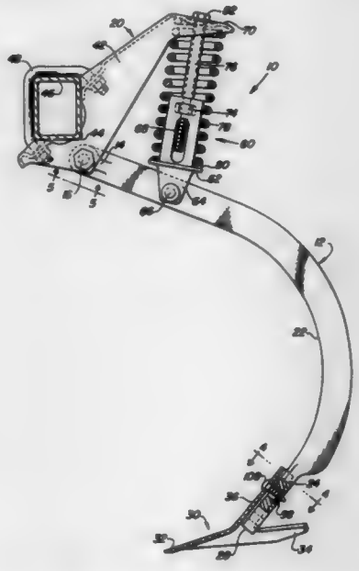
SHANK ASSEMBLY WITH KNOCK-ON SWEEP

Melvin H. Buescher, Urbandale, and David H. Bucher, Des Moines, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 22, 1994, Ser. No. 232,541

Int. Cl.[6] A01B *39/20*

U.S. Cl. 172—762 **13 Claims**



1. A shank assembly adapted for forward movement through the soil to work the soil, the assembly comprising:

an upright shank having a lower tapered end narrowing in the downward direction, the tapered end including a hole;

an earthworking tool having a tapered attaching portion adapted for receipt by the tapered end to provide a self-locking fit between the tool and the shank as the tool is moved through

the soil and the tool is urged in the upward direction on the tapered end, the tool including an aperture which generally aligns with the hole in the tapered end when the tool is received by the tapered end; and

a pin insertable through the hole and aperture for temporarily maintaining the tool on the tapered end when the self-locking fit is not provided, wherein the pin is fabricated from an easily frangible material to facilitate downward removal of the tool from the tapered end without need to remove the pin from the hole and aperture.

5,465,797

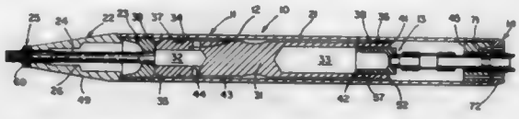
PNEUMATIC GROUND PIERCING TOOL WITH DETACHABLE HEAD

Steven W. Wentworth, Brookfield; Jon A. Haas, Oconomowoc; Robert F. Crane, Mequon, and Payce D. Reynolds, Oconomowoc, all of Wis., assignors to Earth Tool Corporation, Oconomowoc, Wis.

Filed Feb. 22, 1994, Ser. No. 199,397

Int. Cl.[6] E21B *4/06;11/02*

U.S. Cl. 173—91 **18 Claims**



1. A pneumatic ground piercing tool, comprising:

an elongated tubular housing having front and rear openings;

a head assembly including an anvil mechanically secured in the front opening of the housing and having a forwardly extending central rod, a detachable head mounted on the rod, the head having a central opening through which the rod extends, and a releasable locking mechanism that clamps the detachable head between the releasable locking mechanism and the housing and secures the head over the front opening of the housing;

a striker disposed for reciprocation within an internal chamber of the housing to impart impacts to a rear impact surface of the anvil for driving the tool through the ground;

an air distributing mechanism for effecting reciprocation of the striker; and

a tail assembly mounted in a rear end opening of the housing that secures the striker and air distributing mechanism in the housing.

5,465,798

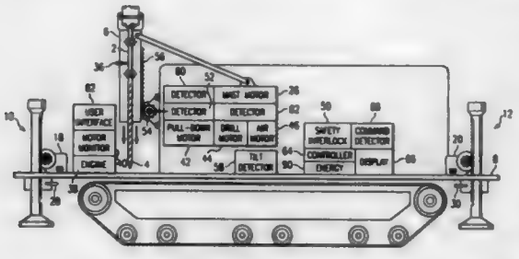
DRILL AUTOMATION CONTROL SYSTEM

Hans E. Edlund, Sherman, Tex., and Marvin L. Haines, Roanoke, Va., assignors to Reedrill, Inc., Denison, Tex.

Continuation of Ser. No. 127,262, Sep. 27, 1993, Pat. No. 5,358,058. This application Oct. 25, 1994, Ser. No. 328,667

Int. Cl.[6] E21B *44/00*

U.S. Cl. 175—24 **1 Claim**



1. In a rotary blasthole drilling apparatus comprising a rotary blasthole drill having a pull-down motor driven by a pump to provide a pull-down force to a drill string and a drill motor to provide rotary force to rotate a drill bit of the drill string, the improvement comprising:

means for setting a rotary torque set point that determines an amount of torque applied to the drill bit by the drill motor;

means for detecting pressure in the pump during a drilling operation;

processor means, operative under the control of a program stored therein and responsive to signals from the setting means and the detecting means for generating an error signal;

means responsive to the error signal for adjusting a stroke of the pump; and

interface means for displaying the rotary torque set point.

5,465,799

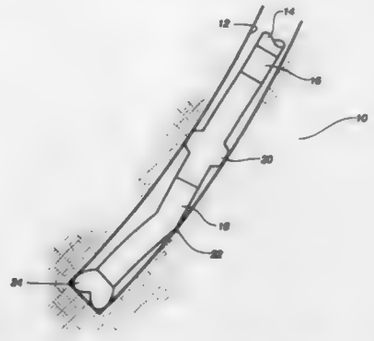
SYSTEM AND METHOD FOR PRECISION DOWNHOLE TOOL-FACE SETTING AND SURVEY MEASUREMENT CORRECTION

Hwa-Shan Ho, P.O. Box 11170, Spring, Tex. 77391-1170

Filed Apr. 25, 1994, Ser. No. 231,817

Int. Cl.[6] E21B *7/04;7/08*

U.S. Cl. 175—61 **18 Claims**



1. A method of determining a tool face angle in a well bore comprising the steps of:

determining an apparent tool face angle;

measuring torque at least at one axial location along a drillstring in the well bore;

correlating a change in said apparent tool face angle relative to a change in the torque so as to produce a graphical curve of the correlation; and

identifying a slope discontinuity along said graphical curve, said slope discontinuity being indicative of a contact resistance between the drillstring and the well bore.

5,465,800

ROLLING CUTTER DRILL BITS

David E. Pearce, Spring, and Thomas A. Wick, Houston, both of Tex., assignors to Camco International Inc., Houston, Tex.

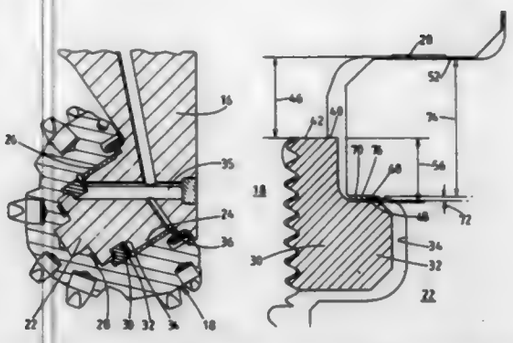
Filed Aug. 24, 1993, Ser. No. 111,373

Claims priority, application United Kingdom, Aug. 26, 1992, 9218100

Int. Cl.[6] E21B *10/20*

U.S. Cl. 175—368 **26 Claims**

26. A rolling cutter drill bit comprising a bit body, a plurality of cutter assemblies each comprising a cutter journal on the bit body, a cutter rotatably mounted on the cutter journal, a thrust bearing between adjacent surfaces on the journal and cutter, and a retention assembly mounted on one of said journal and cutter and having a first contact face opposed to a second contact face on the other of said journal and cutter, whereby relative axial displacement between each cutter and journal is limited in one direction by said thrust bearing and in the opposite direction by contact between said first and second contact faces, the thrust bearing including a thrust washer which is mounted between opposed surfaces on the cutter



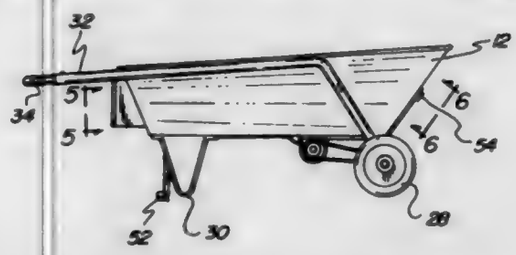
and journal respectively, and the axial distance between said first and second contact faces of each cutter assembly, when said thrust bearing is fully engaged, being accurately determined by selection of the thickness of the thrust washer to adjust the axial distance between the first and second contact faces to be in the range of about 0.002 to 0.010 inches, thereby limiting the maximum permitted axial displacement between the cutter and journal.

5,465,801

MOTORIZED WHEELBARROW

Terry A. Hoover, 5047 Willie Rd., Orangeburg, S.C. 29115

Filed Mar. 21, 1994, Ser. No. 210,472
Int. Cl.[6] B62D *51/04*
U.S. Cl. 180—19.1 **4 Claims**



1. A motorized wheelbarrow for transporting materials placed therein from one location to another comprising, in combination:

a rigid and elongated container having a front portion, a rear portion, a lower portion, an opened upper portion, and a hollow space disposed between the portions adapted for holding materials to be transported;

an elongated axle coupled to the lower portion of the container adjacent to the front portion thereof, the axle further having a drive sprocket coupled thereto;

a pair of wheels, each wheel rotatably coupled to an end of the axle;

a pair of spaced and rigid V-shaped legs extending downwards from the lower portion of the container adjacent to the rear portion thereof for holding the container in a generally level and stationary position;

a pair of handles, each handle formed of a rod wherein the rod is of a generally rigid material, each rod having a lower end, an upper end, and an intermediate location therebetween, the rod further having a lower segment and an upper segment, the lower end coupled to an end of the axle with the lower segment extended angularly upwards from the axle to the intermediate location, the upper segment extended from the intermediate location to the upper end such that the upper end is offset from the rear portion of the container, each handle including a grip formed on the upper end adapted for allowing a user a firm hold for lifting the handles upward to raise the rear portion of the container, thereby enabling the container to be transported from one location to another;

a motor having a fixed stator and a rotatable rotor with the stator coupled to the lower portion of the container, the motor further having three modes of operation for producing forward rotation of the stator in a forward mode, reverse rotation of the stator in a reverse mode, and no rotation of the stator in a neutral mode;

a belt coupled around the rotor of the motor and the drive sprocket on the axle for transferring rotational motion from the motor to the axle and wheels for transporting the container;

a hollow battery box coupled to the rear portion of the container, the battery box having an opening and a lid pivotally coupled thereto for sealing the opening;

a battery disposed in the battery box for energizing the motor;

a pair of foot pedal switches connected between the motor and battery, each foot pedal switch coupled to one of the legs and extending downwards therefrom, each foot pedal switch operable in an extended orientation to energize the motor when the handles are lifted upwards and a retracted orientation to de-energize the motor when the handles are released;

a level control switch connected between the motor and the battery and coupled to the front portion of the container, the switch having an elongated and essentially vertical cavity with liquid mercury disposed therein, the switch operable in a tilted orientation to energize the motor when the handles are lifted upwards and a leveled orientation to deenergize the motor when the handles are released; and

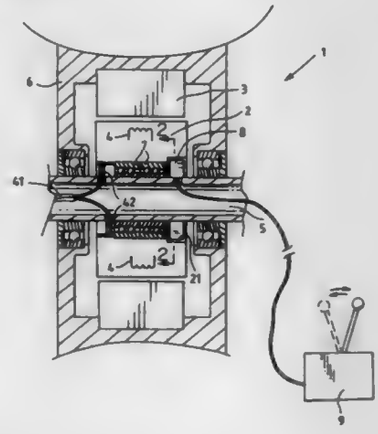
a control switch connected between the motor and the battery and coupled to one of the handles, the control switch operable in a first orientation to place the motor in the forward mode, a second orientation to place the motor in the reverse mode, and a third orientation to place the motor in the neutral mode.

5,465,802

ELECTROMOTIVE WHEEL WITH A DISENGAGEABLE STATOR

Chen-Chi Yang, P.O. Box 10780, Taipei, Taiwan, Prov. of China

Filed Jun. 16, 1994, Ser. No. 260,785
Int. Cl.[6] B60K *1/00*
U.S. Cl. 180—65.5 **5 Claims**



1. A disengageable electromotive wheel comprising:

a stator provided with a plurality of coil windings;

a coupling device for coupling said stator to a wheel axle including:

a bearing element fixed on said wheel axle, supporting said stator for rotation with respect to said wheel axle, and

a brake element fixed on said wheel axle for engaging and disengaging said stator, said brake element being controlled by a clutch switch such that said brake element may be maintained in a first engaging position to brake said stator

firmly preventing said stator from rotating, or in a second position to release said stator permitting said stator to rotate about said wheel axle;

a permanent magnet rotor fixedly provided inside a wheel frame of a wheel supported on said wheel axle, and facing said stator;

power supply means for supplying electric current to said coil windings of said stator so that an electromagnetic force is generated between said stator and said rotor;

said wheel frame rotating about said wheel axle by means of the electromagnetic force generated between said stator and said rotor, after said coil windings have received power supplied by said power supply means.

5,465,803

HOOD FOR A MOBILE EXCAVATOR

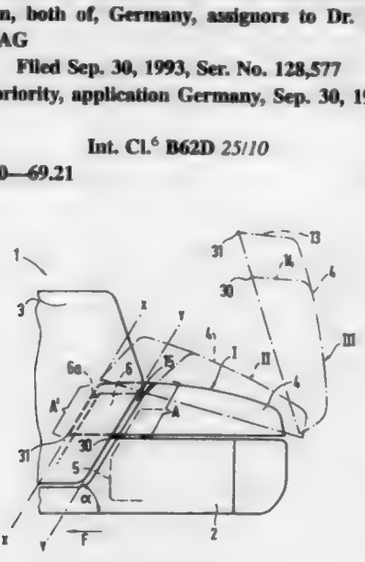
Günter Kircher, Tiefenbronn, and Heinz-Peter Küsters, Vaihingen, both of, Germany, assignors to Dr. Ing. h.c.F. Porsche AG

Filed Sep. 30, 1993, Ser. No. 128,577

Claims priority, application Germany, Sep. 30, 1992, 42 32 698.2

Int. Cl.[6] B62D 25/10

U.S. Cl. 180—69.21 **11 Claims**



1. A mobile excavator assembly comprising:

a hood arranged behind an excavator driver's cab of an excavator body, as considered in a forward excavator driving direction, said hood having a first forward end wall which faces the driver's cab and a second forward end wall set back rearwardly of the first forward end wall to form an offset area to accommodate an offset section of the driver's cab, said first and second forward end walls being disposed in respective substantially parallel planes extending obliquely toward the rear at an acute angle with respect to the local horizontal when said hood is in a closed in-use position,

a pair of exterior side levers and a center lever pivotally connected to the hood and to relatively fixed excavator parts and serving to controllably support the hood for movement between a closed position and an open position, said levers and said hood together forming a four bar linkage by way of which lower boundary edges of the first and second forward end walls during the swivelling in an overlapping area with the driver's cab and a tank can be moved within a gap as well as along a front wall of the tank on a straight course along the planes.

5,465,804

COMBINATION OF A POWER STEERING PUMP AND AIR CONDITIONING COMPRESSOR IN AN AUTOMOTIVE VEHICLE

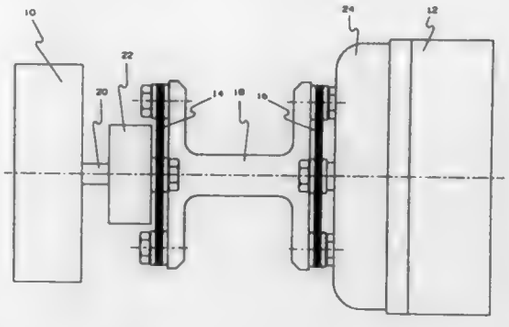
John S. Malik, New Braunfels, Tex., assignor to T. B. Wood's Sons Company, Chambersburg, Pa.

Filed Apr. 25, 1994, Ser. No. 231,802

Int. Cl.[6] F16D 3/52

U.S. Cl. 180—133 **3 Claims**

1. In an automotive vehicle, the combination of:



a power steering pump;

an air conditioning compressor axially aligned with the power steering pump;

and means inter-connecting the power steering pump and the air conditioning compressor to deliver power from the power steering pump to the air conditioning compressor;

said means having two axially spaced flexible discs separated by a spacer.

5,465,805

POWER STEERING SYSTEM

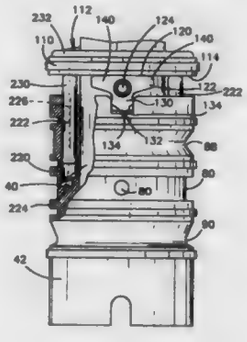
Henry C. Sangret, St. Clair Shores, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Sep. 3, 1993, Ser. No. 116,378

Int. Cl.[6] B62D 5/06

U.S. Cl. 180—143 **39 Claims**

1. A steering system for a vehicle, said steering system compris-



ing:

first and second valve members which are rotatable relative to each other to port fluid to a vehicle power steering motor;

a rocker arm pivotally connected to said first valve member, said rocker arm being pivotal relative to said first valve member by said second valve member upon relative rotation between said first and second valve members; and

means for applying force to said rocker arm to resist pivoting of said rocker arm relative to said first valve member by said second valve member to thereby resist relative rotation between said first and second valve members.

5,465,806

ELECTRIC VEHICLE

Hiromasa Higasa; Fumihiko Ishikawa; Shigenori Matsumura; Hidetoshi Nasu, all of Kagawa, and Kazunobu Sato, Tokushima, all of, Japan, assignors to Kabushiki Kaisha Shikoku Sogo Kenkyujo, Kagawa, and Kazunobo Sato, Tokushima, both of, Japan

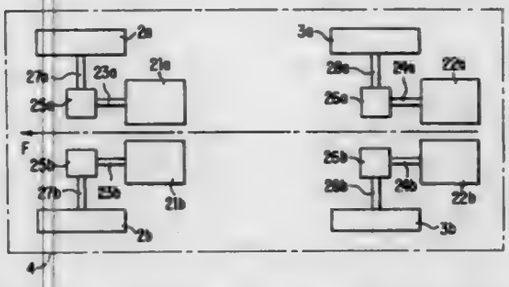
Continuation-in-part of Ser. No. 613,756, Jan. 29, 1991, Pat. No. 5,222,568. This application May 11, 1993, Ser. No. 59,335

Claims priority, application Japan, Mar. 31, 1989, 1-83374; Dec. 6, 1989, 1-317345

Int. Cl.[6] B60K *8/00*

U.S. Cl. 180—165 **2 Claims**

1. An electric vehicle having a body, battery and driving wheels



at both sides of said body of said vehicle, the vehicle comprising sensor means for generating control signals based on the travel of said vehicle, and a plurality of driving/braking motor means, each driving/braking motor means being connected to a respective driving/braking wheel, said battery and said sensor means, for independently driving and regeneratively braking said respective one of said driving/braking wheels in response to said signals; wherein said sensor means comprises wheel rotation sensors each detecting the rotation of a respective one of said driving/braking wheels, steering angle sensors each detecting the steering angle of a respective one of said driving/braking wheels, acceleration sensors each detecting the acceleration of a respective one of said driving/braking wheels, and braking sensors each detecting the braking of a respective one of said driving/braking wheels.

5,465,807

SAFETY GUARD FOR HAND TRUCKS OR LIFT GATES

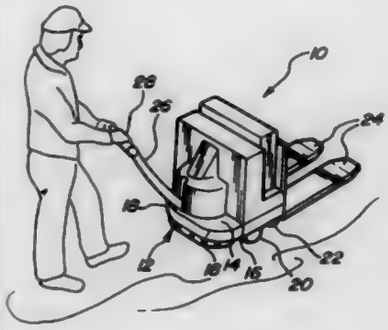
Harold Josephs, 25311 Ronald Ct., Oak Park, Mich. 48237, assignor to Harold Josephs, Oak Park, Mich.

Filed Jun. 27, 1994, Ser. No. 266,726

Int. Cl.[6] B60K *28/10*

U.S. Cl. 180—274 **5 Claims**

1. A pedestrian-operated industrial lift truck adapted to be operated on a floor comprising:



a platform body supported over the floor on a plurality of wheels, said platform body and said floor defining a gap therebetween;

a driving motor supported by the platform body and operatively connected in a driving relationship to at least one of said wheels;

a switch electrically connected to the driving motor, said switch being actuable to selectively stop operation of the driving motor; and

an actuator coupled to said switch and mounted under a floor facing surface of the platform body, said actuator extending from the floor facing surface towards the floor for engaging a foreign object in the gad between said platform body and said floor whereby said actuator actuates said switch when said platform body overruns foreign objects on the floor which are of sufficient height to contact the actuator.

5,465,808

ELEVATING SYSTEM

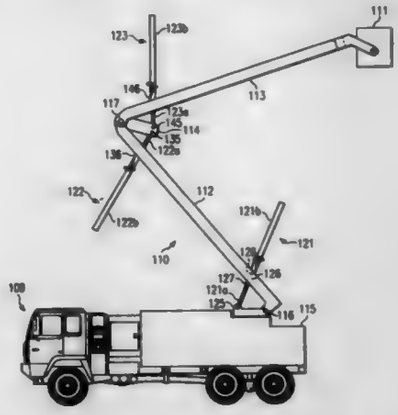
Robert G. Musgrove, Arlington, Tex., assignor to Loral Vought Systems Corporation, Grand Prairie, Tex.

Filed May 24, 1993, Ser. No. 66,526

Int. Cl.[6] E04G *5/00*

U.S. Cl. 182—2 **28 Claims**

1. An apparatus comprising a frame, an elongated element



mounted on said frame, and an elevating system for moving said elongated element between a first element position and a second element position, said elongated element having a first end portion and a second end portion, said elevating system comprising:

an extendable actuator rod having a stowed position in which said extendable actuator rod has a first length, an operational position in which said extendable actuator rod has a second length greater than said first length, and a fully-deployed position in which said extendable actuator rod has a third length greater than said second length, said extendable actuator rod comprising a casing and a rod element,

said casing having a rod end portion and a distal end portion with a longitudinal axis extending through said rod end portion of said casing and said distal end portion of said casing;

said rod element having a head end portion and a distal end portion, said head end portion of said rod element being mounted in said casing with said rod element extending through said rod end portion of said casing for movement of said rod element relative to said casing along a path substantially parallel to said longitudinal axis of said casing in order to effect longitudinal elongation of said extendable actuator rod;

a first one of said distal end portion of said rod element and said rod end portion of said casing being pivotably mounted directly to said frame about a first, fixed axis; and

a link having a first end portion and a second end portion, said first end portion of said link being pivotably mounted to said elongated element about a second axis, said link being pivotably mounted to a second one of said distal end portion of said rod element and said rod end portion of said casing at a point spaced from said first end portion of said link,

whereby said link causes said extendable actuator rod to move from said stowed position to said operational position as said extendable actuator rod is elongated from said first length to said second length without imparting substantial lifting forces to the elongated element, and

whereby said extendable actuator rod and said link move said elongated element from said first element position to said second element position when said extendable actuator rod is elongated from said second length to said third length.

5,465,809

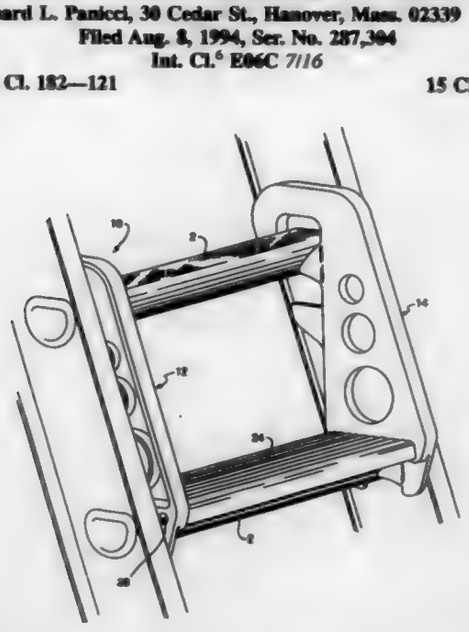
SAFETY PLATFORM ATTACHMENT APPARATUS

Richard L. Panicci, 30 Cedar St., Hanover, Mass. 02339

Filed Aug. 8, 1994, Ser. No. 287,304

Int. Cl.[6] E06C *7/16*

U.S. Cl. 182—121 **15 Claims**



1. A safety platform attachment apparatus for use with ladders having a plurality of rungs spaced a selected distance from one another comprising first and second torque arms each having an upper and a lower terminus portion and having a platform fixedly attached and extending between the arms, ladder rung receiving seats formed at the upper and lower terminus portions of each torque arm, the seats having opposite sides and opening in a downward direction, locking means comprising first and second flexible ears extending from the opposite sides of each respective seat toward one another, the ears extending out of a plane in which a respective torque arm lies in a direction toward the other torque arm, the locking means of the upper terminus portion spaced from the locking means of the lower terminus portion a distance essentially equal to the selected distance.

5,465,810

MULTI-PHASE LUBRICANT AND APPARATUS FOR THE DISPENSING THEREOF

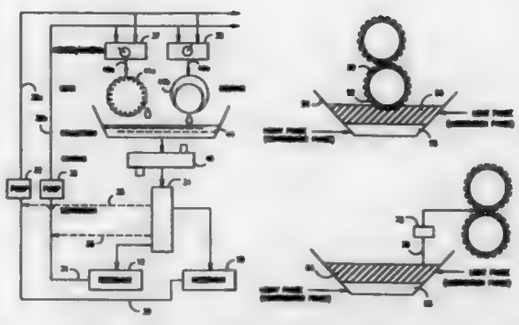
Brian K. Peterson, Yardley, Pa., and Andrew Jackson, Pennington, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Oct. 7, 1994, Ser. No. 319,767

Int. Cl.[6] F01M *3/00*

U.S. Cl. 184—6.21 **20 Claims**

1. An apparatus for lubricating an operating component of a system in which the operating component is exposed to range of operating conditions which benefits from adjustment of at least one physical property of a lubricant which lubricates the component during its operation, comprising:



(a) an at least partial immiscibility zone which contains a first lubricant and a second lubricant, the second lubricant having at least one property which is different from a property of the first lubricant;

(b) a dispenser which is operatively connected to the at least partial immiscibility zone, the dispenser for supplying an amount of the first lubricant and/or the second lubricant from the at least partial immiscibility zone to a mixing zone, the dispenser comprising at least one flow controller which controls the relative proportion of the first lubricant and the second lubricant dispensed to the mixing zone, the mixing zone being suitable for mixing the first lubricant and the second lubricant to produce a third lubricant, the mixing zone being positioned to supply the third lubricant to the operating component;

(c) a condition sensor which is in communication with the operating component, the sensor comprising a device for detecting a change in the operating condition of the component during its operation; and

(d) an actuator which is in communication with the flow controller and which is responsive to the condition sensor, the actuator activates the flow controller to change the relative proportion of the first lubricant and the second lubricant dispensed to the mixing zone in response to a change in the operating condition which requires adjustment of at least one physical property of the third lubricant.

5,465,811

SELF-CONTAINED GAS CYLINDER

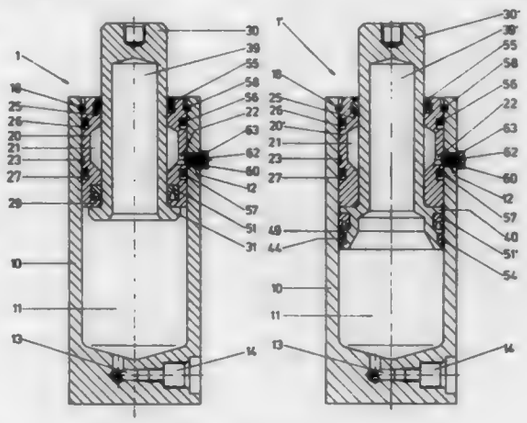
Wolfgang Katz, Dauchingen, Germany, assignor to Danly Corporation, Coconut Grove, Fla.

Filed Apr. 15, 1994, Ser. No. 228,555

Claims priority, application Germany, Jan. 17, 1994, 9400669 U

Int. Cl.[6] F16N *1/00*

U.S. Cl. 184—24 **10 Claims**



1. A gas cylinder element comprising:

a cylinder having an annular bore (11);

a piston rod capable of a sliding movement axially within and relative to the cylinder;

a guide bushing (**20**, **20'**) seated at one end face of the cylinder for sealingly engaging said piston rod and through which said piston rod extends into said cylinder;

said guide bushing, cylinder, and piston rod defining an enclosed working space for containing gas under pressure, against which pressure the piston rod can be urged to provide a spring effect;

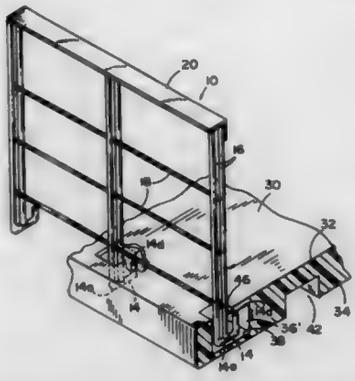
wherein said guide bushing (**20**, **20'**) is provided with an annular recess (**21**) facing the piston rod for receiving lubricant, said guide bushing further having an annular passage through which the piston rod passes with small radial tolerance between the piston rod and guide bushing, the guide bushing (**20**, **20'**) further being provided with an essentially radially extending lubricant channel (**22**), which at one end is in communication with the recess (**21**) and at the other end is in communication with a closeable lubricant supply inlet borehole (**12**) extending essentially radially through the cylinder (**10**).

5,465,812

PALLET GUARD

Jay C. Petter, Pentwater, Mich., assignor to Pentwater Wire Products, Inc., Pentwater, Mich.

Filed May 31, 1994, Ser. No. 251,608
Int. Cl.[6] B66B *9/20*
U.S. Cl. 187—237 **33 Claims**



1. A pallet guard to be secured to a pallet having upper and lower support surfaces, comprising:

an upright load restraining panel for extending upwardly of and normal to the pallet on at least one end of the pallet, said panel having a plurality of feet extending downwardly therefrom and spaced from each other to extend below the upper support surface of the pallet and engage the pallet below the upper support surface adjacent the one end of the pallet, said feet having pallet engagement portions positioned and configured to engage the upper support surface of the pallet and by such engagement below the upper support surface and at the upper support surface retain said panel upright against outward movement to restrain articles from falling off the pallet.

5,465,813

BRAKE UNIT

Nicholas J. Lichter, Kenosha, Wis., assignor to ATC Leasing Company, Kenosha, Wis.

Continuation of Ser. No. 121,551, Sep. 16, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 331,163
Int. Cl.[6] B60T *7/02*
U.S. Cl. 188—3 H **2 Claims**

1. A device for use in connection with a towing vehicle and a towed vehicle wherein the towed vehicle includes a brake pedal

and wherein the towing vehicle includes an air brake system having a brake, a reservoir of compressed air, and a power brake operator operable to supply compressed air from the reservoir to the brake of the towing vehicle, said device comprising:

a first piston-cylinder assembly having a first piston reciprocable within a first cylinder member and a first piston rod member extending from said first piston beyond an end of said first cylinder member;

a first spring urging said first piston rod member in a direction to extend the length of said first piston-cylinder assembly;

a second piston-cylinder assembly having a second piston reciprocable within a second cylinder member and a second piston rod member extending from said second piston beyond an end of said second cylinder member;

a second spring urging said second piston rod member in a direction to reduce the length of said second piston-cylinder assembly;

said first and second piston-cylinder assemblies being aligned and connected together end to end;

a first air line adapted to lead from the reservoir of compressed air to said first cylinder member to subject said first piston therein to reservoir air pressure and thereby move said first piston in a direction to reduce the overall length of said first piston-cylinder assembly against the action of said first spring;

a second air line adapted to lead from said power brake operator to said second cylinder member to subject said second piston therein to operating air under pressure when said power brake operator is actuated and thereby move said second piston in a direction to extend the overall length of said second piston-cylinder assembly against the action of said second spring;

the remote ends of said piston-cylinder assemblies being connectable respectively to the brake pedal of the towed vehicle and to a relatively fixed support on said towed vehicle so that said first piston-cylinder assembly is extended by said first spring in response to a loss of pressure in the reservoir and said second piston-cylinder assembly is extended by operating air under pressure in response to actuation of the power brake operator so that the brake pedal of the towed vehicle is depressed in response to either a loss of pressure in the reservoir or to actuation of the power brake operator.

5,465,814

COLLAPSIBLE WHEEL CHOCK APPARATUS

Michael P. Ziaylek, 15 Cold Spring Ave., Yardley, Pa. 19067, assignor to Theodore Ziaylek, Jr., and Michael P. Ziaylek, both of Yardley, Pa.

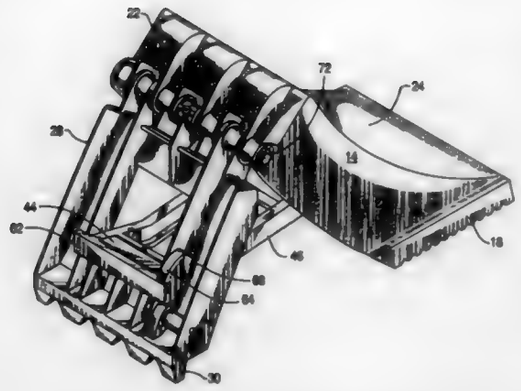
Filed Oct. 13, 1994, Ser. No. 322,671
Int. Cl.[6] B60T *3/00*
U.S. Cl. 188—32 **20 Claims**

1. A collapsible wheel chock apparatus positioned upon a vehicle support surface in abutment against a vehicle wheel for restricting movement thereof, said collapsible wheel chock apparatus comprising:

A. a main body member adapted to be positioned upon a vehicle support surface in abutment with a vehicle wheel for restricting movement thereof, said main body member including;

(1) a first main body end means adapted to be positioned in abutment with a vehicle support surface for supporting of said collapsible wheel chock apparatus;

(2) a second main body end means spatially disposed along said main body member from said first main body end means and extending outwardly therefrom;



(3) a wheel engagement surface positioned on said main body member between said first main body end means and said second main body end means for abutment against a vehicle wheel for restricting movement thereof;

B. a swing arm member pivotally secured to said second main body end means of said main body member, said swing arm member including:

(1) a first swing arm end means adapted to directly engage the adjacent ground surface to facilitate support of said collapsible wheel chock apparatus between a vehicle support surface and a vehicle wheel;

(2) a second swing arm end means spatially disposed from said first swing arm end means along said swing arm member and pivotally secured with respect to said second main body end means of said main body member;

(3) said swing arm member defining a locking slot means therein having a first locking slot end means and a second locking slot end means;

C. a cross bar member pivotally secured with respect to said main body member and movably secured with respect to said swing arm member extending through said locking slot means of said swing arm member, said cross bar member including:

(1) a first cross bar end means pivotally secured with respect to said main body member;

(2) a second cross bar end means spatially disposed from said first cross bar end means on said cross bar member and movably secured with respect to said swing arm member; and

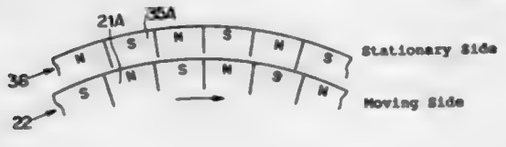
(3) a central cross bar strut means extending from said first cross bar end means through said locking slot means to said second cross bar end means, said central cross bar strut means of said cross bar member being moveable within said locking slot means between a collapsed position adjacent said first locking slot end means and a raised position adjacent said second locking slot end means, said central cross bar strut means being selectively engageable with respect to said swing arm member adjacent said second locking slot end means for selectively locking thereof in the raised position.

5,465,815

MAGNETIC BRAKE

Iwao Ikegami, 1421-223, Nanjo, Nirayama-cho, Tagata-gun, Shizuoka-ken 410-21, Japan

Filed Jan. 10, 1994, Ser. No. 179,136
Int. Cl.[6] H02K *1/06*
U.S. Cl. 188—164 **15 Claims**



1. A brake apparatus applying a braking force from a stationary member to a moving member adapted to move along a predetermined orbit relative to the stationary member wherein

said stationary member carries thereon a row of at east one magnet such that a plurality of magnetic poles are arranged along the orbit of said moving member,

said moving member carries thereon a row of at least one permanent magnet such that a plurality of magnetic poles are arranged along the orbit of said moving member and such that the plurality of magnetic poles face the magnetic poles of the magnet row on said stationary member when said moving member moves,

at least one magnet row of the magnet row on said stationary member and the magnet row on said moving member, on its side facing the other magnet row, has magnetic poles of opposite sign alternately arranged in the direction of said orbit,

either one magnet row of the magnet row on said stationary member and the magnet row on said moving member is fixedly secured to the member carrying it, and

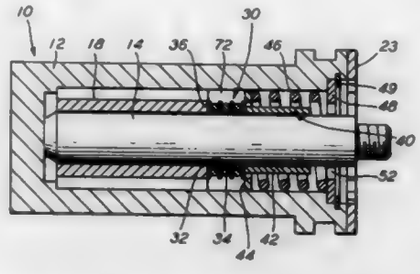
the other magnet row or each magnet therein is coupled to the member carrying it through a selective interlocking means such that when a magnetic attractive force and a magnetic repulsive force between the magnetic poles of the other magnet row and the magnetic poles of the one magnet row acts in a direction to accelerate motion of said moving member, said other magnet row or each magnet is allowed for movement relative to the member carrying it in a direction including the direction of the magnetic attractive force and magnetic repulsive force acting, and when a magnetic attractive force and a magnetic repulsive force between the magnetic poles of the other magnet row and the magnetic poles of the one magnet row acts in a direction to decelerate motion of said moving member, said other magnet row or each magnet is restrained from movement relative to the member carrying it in a direction including the direction of the magnetic attractive force and magnetic repulsive force acting.

5,465,816

SLACK ADJUSTING BRAKE CYLINDER FOR A BRAKE UNIT ON A RAILWAY TRANSIT VEHICLE

Roland S. Moore, Taylors, and Howard T. Tran, Greenville, both of S.C., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jul. 20, 1994, Ser. No. 277,837
Int. Cl.[6] F16D *65/38*
U.S. Cl. 188—196 P **15 Claims**



1. A slack adjusting brake cylinder for use in a fluid brake unit of a railway transit vehicle comprising:

(a) a support rod, a first end of which is securable to a base portion of a brake piston receiving cavity of such brake unit, such that said support rod extends from such base portion along an axial center of such brake piston receiving cavity;

(b) a brake piston slidably mounted on said support rod and adapted for reciprocal motion along said support rod and within such brake piston receiving cavity;

(c) at least one friction/load ring slidably mounted on said support rod, a first side of which is adapted to be an abutment stop to limit the extent of return of said brake piston along

said support rod, said friction/load ring adapted to tightly engage said support rod so as to be slidable on said support rod only in response to fluid brake pressure forces;

(d) a spring loaded compression member engaged with a second side of said at least one friction/load ring, adapted for limited compression between said brake piston and said at least one friction/load ring when applied brake forces move said brake piston outwardly along said support rod and return said brake piston into engagement with said at least one friction/load ring when such applied brake forces are released, and further adapted to move said at least one friction/load ring outwardly on said support rod after such limited compression has been attained; wherein said spring loaded compression member comprises a sleeve having a flange thereon and a compression spring, said sleeve being slidably positioned on said support rod, the outer surface of said flange being engaged with said second side of said at least one friction/load ring, and the inner surface of said flange being engaged with said compression spring.

5,465,817

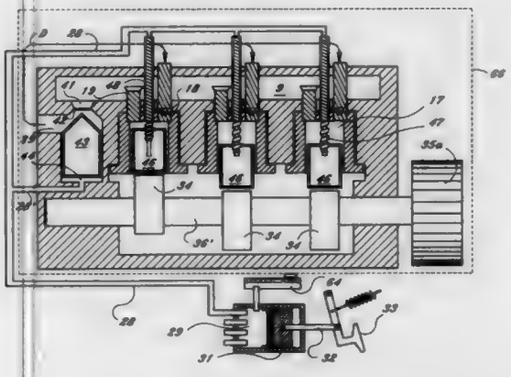
HYDRAULIC BRAKE PUMP WITH ECCENTRIC CAM AND RECIPROCATING PISTON

Ralph P. Muscatell, 2007 NE. 20th Ave., Ft. Lauderdale, Fla. 33305

Continuation-in-part of Ser. No. 149,564, Nov. 9, 1993, Pat. No. 5,373,921, which is a continuation of Ser. No. 982,617, Nov. 27, 1992, abandoned. This application Dec. 5, 1994, Ser. No. 349,547

Int. Cl.[6] F16D *57/06*

U.S. Cl. 188—295 **18 Claims**



1. A hydraulic brake coupled to a rotary shaft, comprising a hydraulic piston pump connected to the shaft, the pump having a pump inlet, and pump outlet, a hydraulic loop having an inlet part connected to said pump outlet and an outlet part connected to said pump inlet, flow control means disposed in said hydraulic loop between said inlet part and said outlet part for controlling flow of hydraulic fluid in said hydraulic loop, and a brake actuator connected via brake connecting means to the flow control means for controlling the flow of hydraulic fluid in response to operation of said brake actuator the hydraulic pump including at least one pump cylinder, said pump piston being in said pump cylinder, a one way inlet valve in said pump cylinder fluidly communicating with said hydraulic loop outlet part, a one way outlet valve in said pump cylinder fluidly communicating with said hydraulic loop inlet part, reciprocating means in operative engagement with said pump piston for reciprocatingly moving said pump piston in said pump cylinder, the reciprocating means being coupled to the rotary shaft, the reciprocating means including a camshaft, at least one eccentric cam on said camshaft in operative engagement with said pump piston for reciprocatingly moving said pump piston in said pump cylinder.

5,465,818

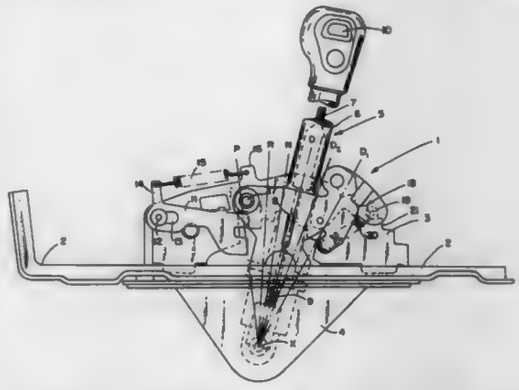
PARK LOCK MECHANISM WITH MEANS TO PREVENT LOCKOUT MEMBER FROM ACCIDENTIALLY BECOMING INOPERATIVE

Charles Osborn, Spring Lake, and Robert M. Medema, Muskegon, both of Mich., assignors to Grand Haven Stamped Products Div of JSJ Corporation, Grand Haven, Mich.

Filed Jan. 7, 1994, Ser. No. 178,876

Int. Cl.[6] B60K *41/26*

U.S. Cl. 192—4 A **19 Claims**



1. A vehicle transmission shifter for a vehicle having a brake, said vehicle transmission shifter having a brake/park lock mechanism for preventing the shifting of said transmission shifter from park position to another gear position unless the brakes of the vehicle are applied, comprising:

a shifting lever movable from a park position to at least one other gear position;

a detent plate and detent pawl associated with said shifting lever for releasably holding said lever in said park position;

actuator means for actuating said pawl to release said shifting lever for movement to said other gear position;

a lockout arm movable in opposite first and second directions along a given path by said pawl when said pawl is actuated by said actuator means;

said actuator means provided to actuate said pawl to move said lockout arm in said first direction to an unlocked position permitting said shifter to be moved from said park position to said other gear position;

said actuator means also being adapted to actuate said pawl to move said lockout arm in said second direction to a lock position wherein said lockout arm locks said pawl in park position;

an electrically operated control module including a locking member movable between an extended position wherein it locks said lockout arm in said lock position and a retracted position wherein it permits said lockout arm to move to said unlocked position permitting said pawl to escape from park position;

said locking member of said control module being biased to one of said extended position or retracted position and moved by said electrically operated control module to the other of said extended position or retracted position in response to a driver applying the brakes of said vehicle;

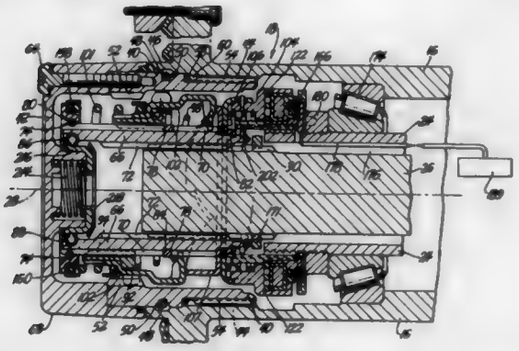
said locking member and lockout arm being positioned relative to each other whereby when said lockout arm is in said unlocked position and a driver is not applying the brakes, said locking member is forced against said lockout arm but retained in distended position, the improvement comprising:

means for permitting said pawl when in said other gear position to move said lockout arm when in said locked position from said lock position to a third position permitting movement of said pawl into said park position when said lockout arm has accidentally moved from unlocked position to lock positions wherein said locking member is in an extended position prohibiting pivoting of said lockout arm to said second release position.

5,465,819
POWER TRANSMITTING ASSEMBLY

David R. Weilant, Muncie, Ind., and Craig Fowler, Maumee, Ohio, assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Continuation-in-part of Ser. No. 954,855, Sep. 29, 1992, abandoned, and Ser. No. 111,190, Aug. 27, 1993, abandoned. This application Feb. 14, 1994, Ser. No. 195,922
Int. Cl.[6] F16D 27/04
U.S. Cl. 192—35 51 Claims



1. A power transmitting assembly having a first drive member and a second drive member that are mounted on a fixed support and selectively locked together for rotation in unison with respect to the support, the power transmitting assembly comprising:

a first rotatable assembly in communication with the first drive member,

a second rotatable assembly in communication with the second drive member, the second rotatable assembly including an axially movable rotating member,

means for moving the rotating member axially between a first position where the first rotatable assembly operatively engages the second rotatable assembly for locking the drive members together and a second position where the first rotatable assembly disengages from the second rotatable assembly; and

an electromagnetic clutch having a non rotatable coil attached to the fixed support for nonrotation with respect to the first drive member and the second drive member for activating the moving means.

5,465,820
CLUTCH ACTUATING DEVICE FOR USE IN A VEHICLE DRIVETRAIN SUBASSEMBLY

Wesley M. Dick, Ft. Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Jul. 12, 1994, Ser. No. 273,868
Int. Cl.[6] B60K 23/08
U.S. Cl. 192—35 13 Claims

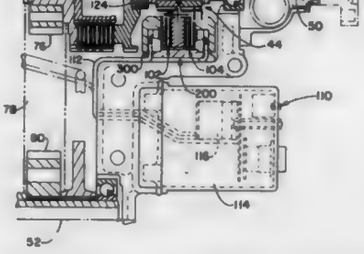
1. A clutch actuating device for use in a vehicle drivetrain subassembly having a clutch, comprising:

first and second rotating members rotatably mounted to a drive member of a vehicle drivetrain subassembly, said first and second rotating members being rotatable relative to said drive member and to each other;

first and second clutch loading means rotatably mounted to said drive member and being rotatable relative to one another, said first and second clutch loading means engaging one another to cause axial translation relative to one another upon relative rotation between said first and second clutch loading means;

first and second pilot clutches comprising at least one rotatable plate, said at least one plate of each pilot clutch being coupled to one of said first or second rotating members; and,

means for selectively activating said first and second pilot clutches so as to selectively ground said first and second pilot clutches, wherein activating one of said first and second pilot clutches creates relative rotation between said first and second

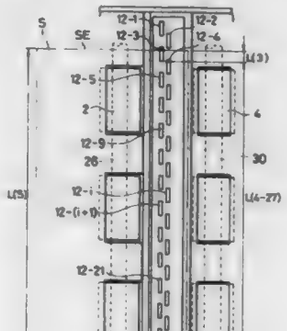


rotating members and correspondingly between said first and second clutch loading means to cause axial translation of said first clutch loading means relative to said second clutch loading means so as to engage the drivetrain subassembly clutch, and wherein activating the other of said first and second pilot clutches causes disengagement of the drivetrain subassembly clutch.

5,465,821
SHEET DISCRIMINATING APPARATUS

Takao Akioka, Sanda, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1994, Ser. No. 197,488
Claims priority, application Japan, Feb. 18, 1993, 5-029121
Int. Cl.[6] G07F 7/04; G06K 9/28
U.S. Cl. 194—207 17 Claims



1. A sheet discriminating apparatus for discriminating sheets by kind comprising:

a plurality of light emitting elements arranged in a plurality of lines in the direction perpendicular to a sheet conveyance direction,

a plurality of light receiving elements each being positioned to face an associated one of said light emitting elements, each of said light receiving elements receiving light emitted from the associated light emitting element, said light receiving elements being arranged such that at least one light receiving element receives light emitted from said associated light emitting element and is partially screened by the side edge of the conveyed sheet,

a sheet length detecting means for detecting the length of the sheet in the direction perpendicular to said conveyance direction based upon the ratio of the outputs of the light receiving elements which are completely screened by the conveyed

sheet to those of other light receiving elements which are partially screened by said conveyed sheet, and

a pattern comparing means for determining pattern data of said sheet in accordance with time series outputs of said light receiving elements and for comparing said pattern data with a reference pattern data selected from a plurality of reference pattern data each corresponding to a kind of sheet,

said kind of sheet being discriminated in accordance with the length of the sheet detected by said sheet length detecting means and the result obtained by said pattern comparing means.

5,465,822

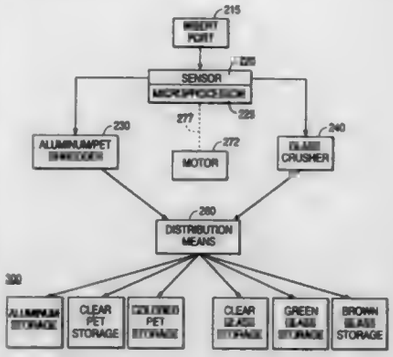
COMMODITY DENSIFICATION ASSEMBLY HAVING A MULTIPLE PATH DISTRIBUTION DEVICE

Bruce H. DeWoolfson; Ken R. Powell, both of Fairfax, Va., and Warner Schumacher, Kansas City, Kans., assignors to Environmental Products Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 132,233, Oct. 6, 1993, Pat. No. 5,355,987, which is a continuation of Ser. No. 851,494, Mar. 16, 1992, abandoned. This application Feb. 22, 1994, Ser. No. 199,395

Int. Cl.[6] G07F *7/06*

U.S. Cl. 194—209 **40 Claims**



1. A commodity densification and distribution assembly, comprising:

a housing having an insert port for receiving a commodity;

sensor means disposed in the housing for sensing a feature of the commodity, and for determining whether the commodity belongs to a first group of commodities or a second group of commodities according to the sensed feature of the commodity;

densification means disposed in the housing downstream of the sensor means for densifying the commodity into densified material; and

densified material distribution means for distributing densified material from the first group of commodities into a first path, and for distributing densified material from the second group of commodities into a second path, the distribution means including a plate rotatably mounted in the housing beneath the densification means, a collection member mounted on the plate and having an inlet and an outlet, the collection member collecting the densified material from the densification means at the inlet and distributing the densified material at the outlet, and drive means, responsive to the sensor means, for driving the plate to a first predetermined position to distribute the densified material into the first path, and for driving the plate to a second predetermined position to distribute the densified material into the second path.

5,465,823

HANDRAIL INLET ELEMENT OF AN ESCALATOR, A MOVING WALKWAY OR THE LIKE

Klaus Schoeneweiss, Hattingen, Germany, assignor to O&K Orenstein & Koppel AG, Berlin, Germany

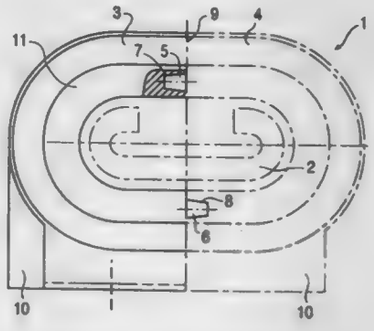
PCT No. PCT/EP93/01455, § 371 Date Jun. 23, 1994, § 102(e) Date Jun. 23, 1994, PCT Pub. No. WO94/05584, PCT Pub. Date Mar. 17, 1994

PCT Filed Jun. 9, 1993, Ser. No. 256,072

Claims priority, application Germany, Sep. 8, 1992, 42 29 994.2

Int. Cl.[6] B65G *17/00*

U.S. Cl. 198—338 **11 Claims**



1. A handrail inlet element for an escalator having a handrail, said handrail inlet element being positioned in a lower banister area of the escalator and comprising:

two separate elements arranged around the handrail, one of said separate elements including a recess, and the other of said separate elements including a corresponding projection for engaging the recess to fix said two separate elements together, each said separate element including a retaining element and an elastically deformable bellows section connected to said retaining element.

5,465,824

STACKING DEVICE

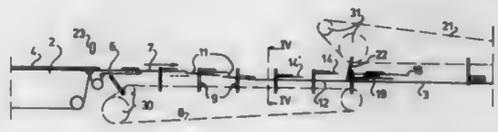
Johannes D. Van Maanen, Berkel En Rodenrijs, Netherlands, assignor to Klöckner Hänsel Tevopharm B.V., Netherlands

Filed Mar. 11, 1994, Ser. No. 212,587

Claims priority, application Netherlands, Mar. 11, 1993, 9300442

Int. Cl.[6] B65G *57/11*

U.S. Cl. 198—418.4 **21 Claims**



10. Apparatus for stacking articles as they travel in a downstream direction in a production line, comprising:

first means for supporting articles on a first level;

second means for supporting articles on a second level lower than said first level, said second supporting means disposed downstream of said first supporting means;

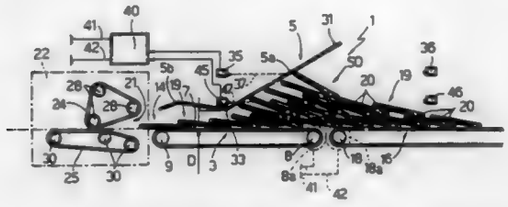
a stationary track disposed between said first and second supporting means, sloping downward in the downstream direction, and defining a slot oriented transversely to the length of said track; and

a moveable plateau capable of supporting an article and adapted to convey an article along a path passing through said slot in the downstream direction.

5,465,825
MAIL FLOW COMPENSATING DEVICE

Mauro Levaro, Genoa, and Giuseppe Sofia, Genova Sestri Ponente, both of, Italy, assignors to Finmeccanica S.p.A., Rome, Italy

Filed Nov. 26, 1993, Ser. No. 157,265
Claims priority, application Italy, Nov. 27, 1992, TO92A0966
Int. Cl.[6] B65G *43/00*
U.S. Cl. 198—444 **18 Claims**

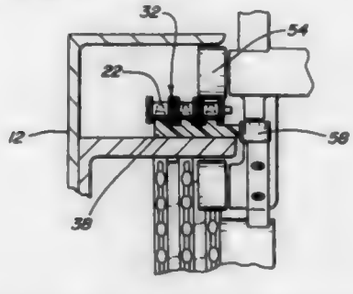


1. A flow compensating device for mail articles, comprising:
a) a first conveyor;
b) a first drive means for driving said first conveyor;
c) said first conveyor including an input end for receiving a stream of articles, said stream providing a substantially constant height under normal supply conditions;
d) said first conveyor including an output end for discharging the articles at a substantially constant speed;
e) means operably associated with said first conveyor for intercepting the articles when the height of said stream exceeds a predetermined value so that the articles are discharged by said output end at said substantially constant speed;
f) said intercepting means remaining stationary relative to said first conveyor;
g) said intercepting means comprises a stop wall;
h) said stop wall slopes downwardly relative to said first conveyor in the moving direction of said first conveyor;
i) said stop wall includes an end portion facing said first conveyor;
j) means for supplying a stream of articles to said first conveyor; and
k) first sensor means for detecting the presence of any articles accumulated against said stop wall and emitting a signal for stopping said supply means.

5,465,826
CONVEYOR SYSTEM

Andrew Noestheden, Tecumseh, Canada, assignor to Valiant Machine & Tool, Inc., Windsor, Canada

Filed Feb. 24, 1994, Ser. No. 201,265
Int. Cl.[6] B65G *47/04*
U.S. Cl. 198—465.3 **17 Claims**

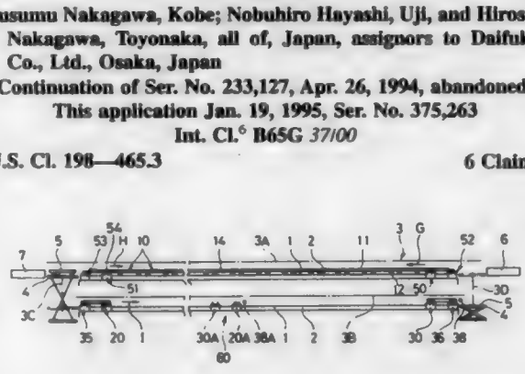


1. A conveyor system for transporting workpieces comprising
an elongated frame having an inlet end and an outlet end,
an endless member forming a closed loop,
means for rotatably mounting said endless member to said inlet and said outlet ends of said frame so that said endless member forms both an upper and a lower section extending between said ends of said frame,
means for driving said endless member so that said upper section moves from said inlet end towards said outlet end and so that said lower section simultaneously moves from said outlet end towards said inlet end,
at least one pallet adapted to support the workpiece,
means for slidably mounting said pallet to said endless member so that said pallet can move relative to said endless member,
means at said inlet end of said frame for lifting said pallet from said lower section to said upper section of said endless member,
means at said outlet end of said frame for lowering said pallet from said upper section to said lower section of said endless member,
wherein said frame comprises an elongated extrusion having a horizontally extending leg which supports said endless member,
an elongated slide block interposed between said horizontal leg and said endless member,
wherein said extending leg includes an upwardly and longitudinally extending guide ridge, said guide ridge being received in a guide channel formed in said guide block.

5,465,827
TRANSPORT ARRANGEMENT FOR MOVABLE MEMBERS

Susumu Nakagawa, Kobe; Nobuhiro Hayashi, Uji, and Hiroshi Nakagawa, Toyonaka, all of, Japan, assignors to Daifuku Co., Ltd., Osaka, Japan

Continuation of Ser. No. 233,127, Apr. 26, 1994, abandoned.
This application Jan. 19, 1995, Ser. No. 375,263
Int. Cl.[6] B65G *37/00*
U.S. Cl. 198—465.3 **6 Claims**



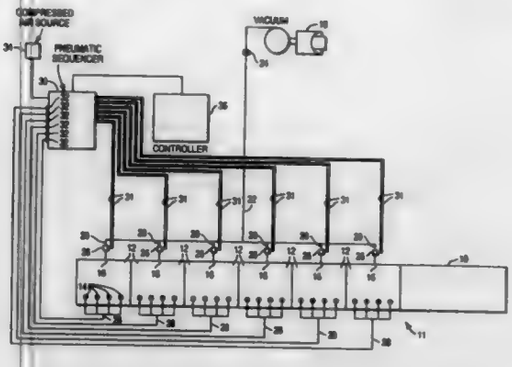
1. A movable member transport arrangement, comprising a movable member supported and guided by guide means for movement on a predetermined track;
a pressure receptor portion formed on both sides of the movable member, right and left, to face laterally outward;
accelerating means disposed at the upstream side of a horizontally held particular track portion of the predetermined track to be adapted to act upon the pressure receptor portion to apply high speed transport force to the movable member;
decelerating means disposed at the downstream side of the horizontally held particular track portion of the predetermined track to be adapted to act upon the pressure receptor portion to decelerate the movable member;
said accelerating means and decelerating means each having a pair of rollers disposed on both sides of the particular track portion, right and left, at least one of said pair of rollers being a drive roller;
said particular track portion including the distance between said accelerating means and said decelerating means so defined as to be longer than the length of two movable members together, whereby a single movable member is capable of moving therebetween in the particular track portion at a high speed by the high speed transport force transmitted from the accelerating means; and
stopper means disposed on the downstream side of the decelerating means to be adapted for abutment by the movable member which has been transported at a high speed and then decelerated by the decelerating means.

5,465,828

AUTOMATED MAIL PROCESSING CLEANING SYSTEM

Donald Thomas, Woodside; Steve Ellis, Sacramento; Paul Kriz, South San Francisco, and Gordon Scott, Los Altos, all of Calif., assignors to Thomas Air Systems, Inc., South San Francisco, Calif.

Filed Jul. 20, 1994, Ser. No. 277,930
Int. Cl.[6] B65G 45/00
U.S. Cl. 198—495 15 Claims



1. A cleaning system for mail processing equipment having a conveyor for transporting mail, the system comprising:

air supply means for directing a supply of air at locations along the length of the conveyor where particulate from the mail tends to accumulate;

vacuum means at locations along the length of the conveyor and spaced apart from the air supply means for creating a vacuum near the air supply means and for collecting and removing the accumulated mail particulate from the equipment;

a controller for actuating the vacuum means during operation of the air supply means;

wherein the air supply means includes a plurality of spaced apart air nozzles near the conveyor for directing a plurality of air streams toward the accumulated particulate, wherein the vacuum means includes a vacuum plenum having a plurality of spaced apart vacuum ports near the conveyor for collecting the accumulated particulate, wherein the mail processing equipment includes a plurality of processing stations, wherein at least one air nozzle and at least one vacuum port are disposed at each station, and wherein the nozzles are spaced apart from the vacuum ports; and

a sequencer in communication with the controller for sequentially actuating the air nozzle(s) and the vacuum port(s) of each station, wherein accumulated particulate is sequentially removed along the length of the conveyor.

5,465,829

PALLET WITH HOPPER AND AUGUER AND METHOD FOR DISTRIBUTING PARTICULAR MATERIAL

Larry D. Kruse, Boyden, Iowa, assignor to Sudenga Industries, Inc., George, Iowa

Continuation of Ser. No. 189,195, Jan. 31, 1994, abandoned. This application Feb. 15, 1995, Ser. No. 389,556
Int. Cl.[6] B65G 21/10
U.S. Cl. 198—538 24 Claims

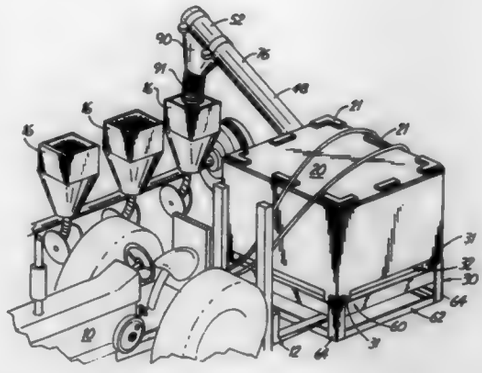
1. A pallet for supporting a container containing a particulate material and for transporting the particulate material, the container having a gate thereon for releasing the particulate material from the container, the pallet comprising:

a frame member for supporting the container;

a first hopper mounted to the frame member and arranged with respect to the gate to receive the particulate material from the container when the gate is open;

a conveyor having a feed end and a discharge end, the feed end of the conveyor being fixedly mounted to the hopper for transporting the particulate material from the hopper to the discharge end of the conveyor to fill a desired target with the particulate material; and

drive means for driving the conveyor.

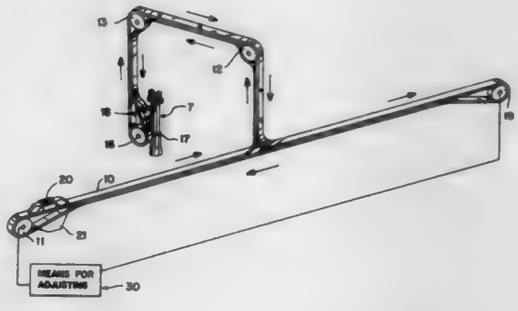


5,465,830

CONVEYOR FOR LOADING AND UNLOADING MATERIAL WITHIN A VERY WIDE AREA, WHICH CONVEYOR INCLUDES A SINGLE ENDLESS BELT

Lennart Tingskog, Kattegattsgatan 23, S-253 71 Helsingborg, Sweden

PCT No. PCT/SE93/00112, § 371 Date Aug. 9, 1994, § 102(e) Date Aug. 9, 1994, PCT Pub. No. WO93/15983, PCT Pub. Date Aug. 19, 1993
PCT Filed Feb. 12, 1993, Ser. No. 256,908
Claims priority, application Sweden, Feb. 14, 1992, 9200447
Int. Cl.[6] B65G 15/12
U.S. Cl. 198—819 10 Claims



1. A conveyor for feeding out or feeding in goods within an elongated area, said conveyor comprising:

a tower movable along a path located at a long side of the elongated area;

an arm mounted on the tower and having a free end which extends into said area;

a feed-out device or a feeding device mounted at the free end of the arm:

a single endless conveyor belt which is closed but can be opened for feeding out or feeding in the goods;

belt-guiding means for guiding the conveyor belt from a first terminal point of the path, along this and up to the tower,

up along the tower and out along the arm to the feed-out device or the feed-in device, back along the arm and the tower down to the path, further along this to a second terminal point thereof, and in a return path back to the first terminal point; and

a feed-in or feed-out station arranged at one of the terminal points or at a point along the return path.

5,465,831

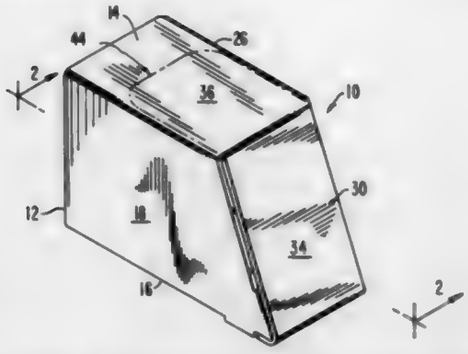
TRANSPORT/DISPLAY PACKAGE

Jeffrey A. Smith, Clark, N.J., assignor to Squire Corrugated Container Corp., Linden, N.J.

Filed Oct. 6, 1994, Ser. No. 319,432

Int. Cl.[6] **B65D** *5/52*

U.S. Cl. 206—44 R **8 Claims**



1. A package convertible from a transport condition to a display condition, comprising:

a) an upright, generally planar, back wall;

b) a pair of generally planar, top and bottom walls extending in mutual parallelism along a longitudinal direction away from the back wall, said bottom wall being longer than the top wall;

c) a pair of upright, generally planar, side walls extending between the top and bottom walls in mutual parallelism along a transverse direction generally perpendicular to the longitudinal direction;

d) an inclined, generally planar, front wall extending between the side walls, and also extending from the bottom wall at an acute angle of inclination in a direction generally toward the back wall and the top wall, said front wall terminating short of the top wall to bound a front opening; and

e) a cover having a bottom part at least partly overlying the bottom wall in the transport condition, a front part overlying the front opening and the front wall in the transport condition, and a detachable top part generally co-planar with the top wall in the transport condition and detached from the top wall to form a top opening in the display condition, said cover being removable from the package to expose both the top and front openings.

5,465,832

CARD READER CASE

James K. Kennedy, Round Rock, Tex., and James A. Wilson, North St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 12, 1993, Ser. No. 147,831

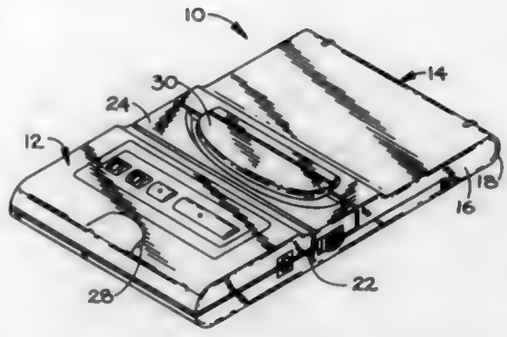
Int. Cl.[6] **B65D** *85/30*

U.S. Cl. 206—45.23 **16 Claims**

1. A device for storing and displaying a generally planar substrate, comprising:

a generally planar body having a first end;

a cover member attached to said body at said first end thereof and movable between an open position and a closed position, said cover member having an upper portion which overlaps



said first end of said body when said cover member is in said closed position, and a lower portion which extends away from said body when said cover member is in said open position such that said lower portion elevates said first end of said body when the device is placed on a support surface,

electronic means for remotely interfacing with an external apparatus, said interfacing means being attached to said cover member at said upper portion thereof; and

means for storing a plurality of the substrates in stacked relationship with said cover member such that a top one of the substrates is visible when said cover member is in said open position.

5,465,833

DENTAL IMPRESSION MATERIAL PACKAGE

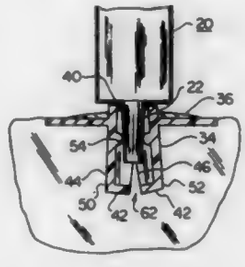
Norman D. Tarter, 70 41st St., Hickory, N.C. 28601

Filed Apr. 1, 1993, Ser. No. 41,828

Int. Cl.[6] **A61B** *19/02;* **B65D** *25/08;30/24;* **F16K** *51/00*

U.S. Cl. 206—63.5 **4 Claims**

1. A dental impression powder package comprising:



(a) a bag enclosing dental impression powder; and

(b) a valve extending through said bag including a valve tube having a top end, a bottom end, a wall extending between the top and bottom ends, and a slit extending along a section of the wall and openable to open said valve, said valve being adjustable between an open state and a closed state and including a first flange disposed adjacent the valve tube, the first flange positionable against the valve tube to selectively open the valve tube,

wherein fluid is selectively insertable into the bag through the valve when the valve is in the open state by pressing the first flange against the valve tube and injecting fluid from a water delivery device into the bag, fluid is blocked from flowing through the valve when the valve is in the closed state so that a fluid can be selectively introduced into the bag for mixture with said powder to produce a mixed impression material and mixed impression material within the bag is extractable from the bag through the valve tube by pressing the first flange against the valve tube and squeezing the bag.

5,465,834

FOLDING BOX WITH A SUBDIVIDED INTERIOR

Helmut Sieber; Ferdinand Schilling, both of Heidenheim; Günter Hagen, Leverkusen; Roland Kleinendorf, Bergisch Gladbach, and Johannes Michaelis, Köln, all of, Germany, assignors to Carl Edelmann GmbH, Heidenheim, and Bayer Aktiengesellschaft, Leverkusen, both of, Germany

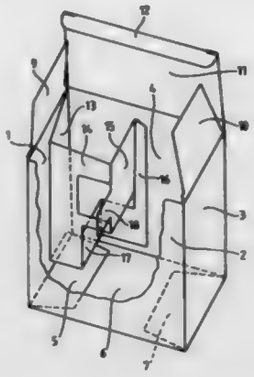
Filed Oct. 28, 1994, Ser. No. 330,760

Claims priority, application Germany, Nov. 2, 1993, 43 37 382.8

Int. Cl.[6] B65D 75/00

U.S. Cl. 206—193 5 Claims

1. Folding box for the reception of two bottles of different



diameters and heights, consisting of a cuboid carcass formed from two main zones (2, 4) and from two side zones (1, 3) connecting these to one another, of folding flaps (5, 7, 9, 10) which are attached to the side zones (1, 3) and are located at the two respective ends of the side zones (1, 3) and which are delimited from the side zones (1, 3) by folding lines (e, f), of a bottom flap (6; 8) on at least one of the main zones (2, 4), the bottom flaps and lid flaps being delimited from the respective main zone (2, 4) by folding line (e, f), and of a first adhesive tab which is attached laterally to one of the carcass zones (4) and is delimited from this by means of a folding line (d) and which is bonded to one (1) of the said side zones (1, 3) which is attached only to the other main zone (2) via a folding line (a), characterized in that there is attached to the edge of the first adhesive tab (13), which is located opposite that edge at which the first adhesive tab (13) is connected to the main zone (4), a first partition zone (14) which is delimited from the adhesive tab (13) at the respective edge by a folding line (h), and in that there is attached to the first partition zone (14) a second partition zone (15) which, in its portion facing the lid flap (11), is delimited from the first partition zone (14) by a folding line (i) which runs parallel to the folding line (h) delimiting the first adhesive tab (13) from the first partition zone (14), and in that the second partition zone (15) has, at its end facing away the first partition zone (14), a second adhesive tab (16) which is delimited from the second partition zone (15) by means of a folding line (j) and which is bonded to the main zone (4) to which the first adhesive tab (13) is attached, the first and second adhesive tabs (13, 16) being at a distance from one another which is as large as the distance between the folding lines (h, i) which delimit the first partition zone (14), and in that a straight (first) cut line (A) extends perpendicularly to the said folding lines underneath the upper portion of the second partition zone (15) over the entire width of the latter and continuously over approximately half the width of the first partition zone (14) at a predetermined distance from the bottom of the folding box, and at the end of this cut line, in the first partition zone (14) and approximately in the middle of the width of the second partition zone (15), in each case one folding line (k, l), starting from the cut line (A) extends continuously in the direction of the bottom of the folding box, the last-mentioned folding lines (k, l) limiting between them a non-folded web (17) which divides the lower portion of a chamber delimited in the folding box from the partition zones (14, 15).

5,465,835

BOTTLE CLOSURE CAP FOR TWO-COMPONENT PACKINGS

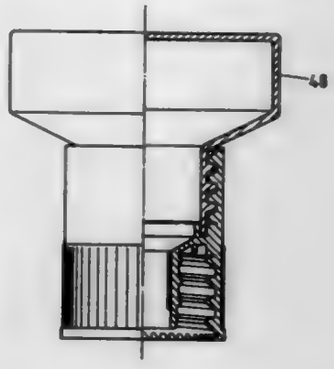
Clemens Schumacher, Sundern, and Arthur Ziegler, Kirschroth, both of, Germany, assignors to Robert Fluke GmbH & Co. KG, Finnentrop, Germany

Continuation of Ser. No. 922,529, Jul. 29, 1992, abandoned, which is a continuation of Ser. No. 906,303, Jun. 29, 1992, abandoned. This application Jun. 13, 1994, Ser. No. 259,269

Claims priority, application Germany, Jun. 28, 1991, 41 21 540.0

Int. Cl.[6] B65D 25/08

U.S. Cl. 206—221 6 Claims



1. A bottle closure cap for a two-component packing containing a first component and a second component, wherein the two-component packing comprises a bottle for receiving the first component and the closure cap for receiving the second component, the bottle having a neck and screw-on thread threaded in a first direction for receiving the closure cap, the closure cap having a screw-on thread threaded in said first direction for attachment to the screw-on thread of the bottle, the closure cap comprising:

a collar having an inner portion which extends into the neck of the bottle upon attachment of the cap to the screw-on thread of the bottle, the cap screw-on thread being located on said collar;

a cover to be received by a first end of said collar distant from said inner portion of said collar, and a beaker supported by said inner portion of the collar for receiving the second component, the beaker connecting with the collar via a thread which is threaded in a second direction opposite to said first direction of the bottle screw-on thread, the beaker being located within the bottle upon attachment of the cap to the bottle;

wherein said inner portion of the collar has a wall of reduced diameter for extending into the bottle neck, the collar including a transition zone and a cylindrical wall of larger diameter, said cylindrical wall of larger diameter extending between said transition zone and said first end of said collar;

the reduced-diameter wall passes outwardly via the transition zone into the cylindrical collar wall of larger diameter, the collar with its reduced-diameter wall and its larger-diameter wall defining a receiving space for storing of the second component;

the receiving space is closable on said first end of said collar opposite the beaker by the cover, the cover being disposed on the larger-diameter wall of the collar; and

said collar wall of larger diameter has form-locking means for inhibiting an unscrewing of said cover from said collar.

5,465,836

PACK FOR CIGARETTES

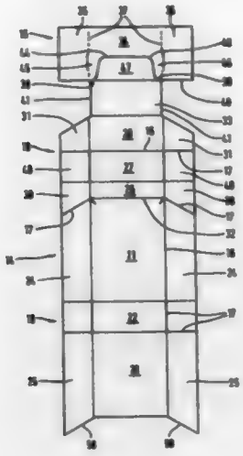
Heinz Focke, Verden, Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Germany

Continuation-in-part of Ser. No. 941,799, Sep. 8, 1992, Pat. No. 5,325,963. This application Mar. 15, 1994, Ser. No. 212,929

Claims priority, application Germany, Sep. 6, 1991, 41 29 609.5

Int. Cl.[6] B65D 5/66

U.S. Cl. 206—264 13 Claims



1. A hinge-lid pack for a group of cigarettes (10), comprising:

a pack part (18) and a lid (19) hinged thereto; and

a collar (15) having a collar from wall (34) and collar side tabs (35, 36), the collar (15) being surrounded by the lid (19) in a closed position of the lid;

wherein the collar (15) and the lid (19) are connected to one another by residual connections (38, 39) which are made from packaging material, and which are severable when opening the lid (19) for the first time, and

wherein the residual connections (38, 39) are formed at an upper free edge (40) of the collar and connect the collar with a lid inner tab (33) which adjoins the inner side of a lid front wall (28).

5,465,837

PACKS FOR CIGARETTES

Heinz Focke, Verden, Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Sep. 14, 1993, Ser. No. 120,428

Claims priority, application Germany, Sep. 21, 1992, 42 31 591.3

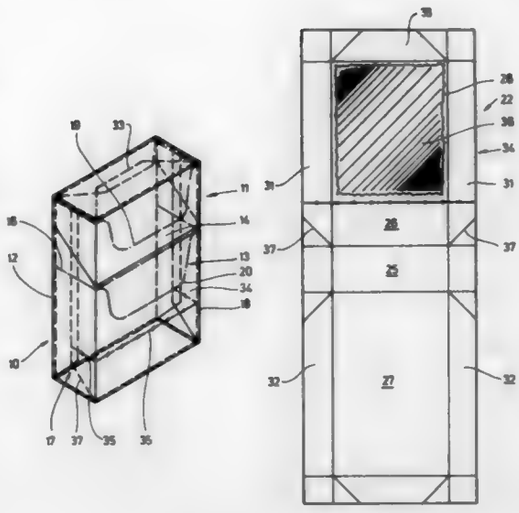
Int. Cl.[6] B65D 85/10

U.S. Cl. 206—268 4 Claims

1. A package for a group of cigarettes including an inner wrapper and a box, said box including a front wall, a rear wall, side walls, and top and bottom walls, said box being closed by a lid hinged to said rear wall, said lid, in a closed condition of said box, providing a continuation of said front wall of said box, the improvement comprising:

said wrapper being comprised of at least one length of wrapping material sufficient to encircle said group of cigarettes, and including a removable pull-off flap, said pull-off flap having a printed image, positioned thereon.

said pull-off flap being integral with said wrapper, and being separable therefrom at a line of perforations extending transversely of the length of said wrapper, and located at a position adjacent said bottom wall of said box when said wrapped said group of cigarettes is housed in said box.



5,465,838

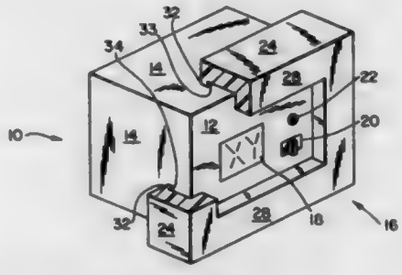
PROTECTIVE IDENTIFYING SHIELD AND PROTECTED INSTRUMENT CASE

Milton B. Hollander, Stamford; David R. Jacobs, Norwalk, and Janice E. Angrave, Stamford, all of Conn., assignors to Omega Engineering, Inc., Stamford, Conn.

Filed Mar. 2, 1993, Ser. No. 24,936

Int. Cl.[6] B65D 85/38

U.S. Cl. 206—305 17 Claims



1. A protected instrument case comprising:

an instrument housing having a front panel surface of given dimensions with side surface portions extending rearwardly from the edges of said front panel surface in substantially perpendicular relationship thereto;

a shield having a continuous peripheral band of resiliently deformable and elastically stretchable material defining a central opening having unstretched dimensions less than the said given dimensions of said front panel surface surrounding and elastically engaging the side surface portions of said instrument housing in stretched condition immediately adjacent to said front panel surface;

said peripheral band having a forward edge proximal said front panel surface and a rearward edge remote therefrom in a rearward direction;

said shield further having a first inwardly extending flange projecting from at least a portion of said forward edge of said peripheral band in substantially parallel, overlying relationship with the said front panel surface of said instrument housing and

visible means on said shield providing a distinctive visual identification for distinguishing said shield from other shields and instruments.

8. An identifying and protective shield for an instrument case having a housing with a front panel and side surface portions extending rearwardly from the edges of said front panel in substantially perpendicular relationship thereto, said shield comprising:

a unitary body portion in the form of a continuous peripheral band of resiliently deformable and elastically stretchable material for surrounding and elastically engaging the side surface portions of an instrument case immediately adjacent to its front panel surface, said peripheral band having a forward edge and a rearward edge;

a first inwardly extending flange projecting from at least a portion of the forward edge of said peripheral band to lie in substantially parallel, overlying relationship with the front panel of an instrument case;

a second inwardly extending flange projecting from at least a portion of the rearward edge of said peripheral band, said second inwardly extending flange having an inner edge for frictionally engaging the adjacent side surface portion of an instrument case and tending to create a confined space between the side surface portion of the instrument and a portion of the inner surface of said peripheral band immediately adjacent to said second inwardly extending flange; and

visible means on said shield providing a distinctive visual identification for distinguishing said shield from other shields and instruments.

5,465,839

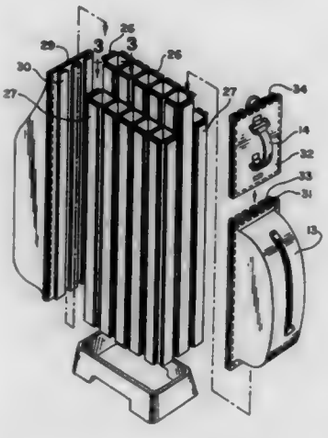
GOLF BAG FORMED FROM INTERLOCKING TUBES

Jon J. Gretz, Springfield, Tenn., assignor to Wilson Sporting Goods Co., Chicago, Ill.

Continuation of Ser. No. 114,639, Sep. 2, 1993, abandoned. This application Aug. 29, 1994, Ser. No. 297,129

Int. Cl.[6] A63B *55/00*

U.S. Cl. 206—315.3 **17 Claims**



8. A golf bag comprising a plurality of interconnected elongated tubes, each of the tubes including connecting means extending along the length of the tube on at least two sides thereof for connecting the tube to adjacent tubes, and a side panel and connecting means on the side panel which is connected to the connecting means of at least one of the tubes.

5,465,840

GOLF BAG, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

William K. Joh, 6852 Vachon Dr., Bloomfield Hills, Mich. 48301

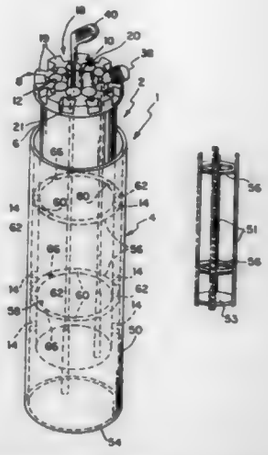
Continuation-in-part of Ser. No. 43,861, Apr. 7, 1993, abandoned. This application Jan. 26, 1994, Ser. No. 188,463

Int. Cl.[6] A63B *55/00*

U.S. Cl. 206—315.6 **19 Claims**

1. Apparatus for supporting golf clubs, comprising:

holder means having a plurality of separate storage compartments defined therein for receiving a plurality of golf clubs,



respectively, each said storage compartment being adapted to isolate a golf club received therein from contact with other golf clubs received in other said storage compartments, and each said storage compartment having a lower portion for receiving a shaft of one of the golf clubs and an upper portion for receiving a head of the one golf club; and

container means for containing and supporting the holder means in multiple, longitudinally separate positions of the holder means, said holder means being movable with respect to said container means.

5,465,841

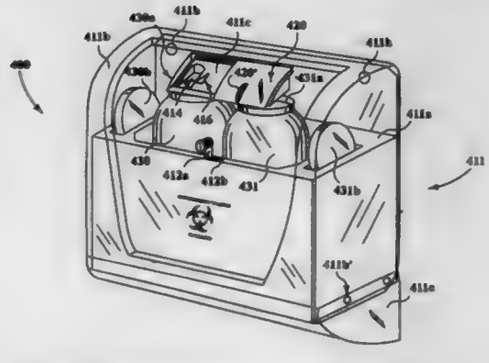
MEDICAL WASTE COLLECTION AND TREATMENT STATION

Joseph H. Wilson, Speedway; David B. Mennel, and Jeffrey C. Rapp, both of Greenwood, all of Ind., assignors to Ecomed, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 882,915, May 19, 1992, Pat. No. 5,236,135, which is a continuation-in-part of Ser. No. 704,455, May 23, 1991, Pat. No. 5,240,187. This application Jun. 8, 1993, Ser. No. 73,758

Int. Cl.[6] B65D *83/10;43/16*

U.S. Cl. 206—366 **22 Claims**



1. A medical waste collection station comprising:

a station enclosure for supporting and enclosing at least two waste containers arranged side by side, said station enclosure having a top opening formed therein;

at least two waste containers supported side by side within said station enclosure, each of said at least two waste containers having an open top and being supported by said station enclosure with their open tops below and adjacent the top opening of said station enclosure; and

a movable element carried by said station enclosure adjacent the top opening for limiting access to only the open top of a single medical waste container through the top opening of

said station enclosure, said movable element being movable between a plurality of positions, each position allowing access to a different single waste container and otherwise blocking access to the other waste containers.

8. A medical waste collection station, comprising:

first means for supporting a plurality of medical waste containers;

a plurality of separately removable medical waste containers supported by said first means, each said medical waste container having an open top; and

second means, carried by said first means, that limits access to each of said medical waste containers to that medical waste container at any one time.

5,465,842

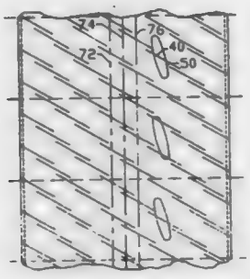
COMPOSITE ENDLESS FORM FOR MAKING FLEXIBLE, WINDOWED, FORM, FILL AND SEAL BAGS

Wayne S. Utley, Portsmouth, Va., assignor to Vitex Packaging, Inc., Granby, Conn.

Division of Ser. No. 230,512, Apr. 20, 1994, Pat. No. 5,410,857. This application Nov. 28, 1994, Ser. No. 348,967

Int. Cl.[6] B65D *33/04*

U.S. Cl. 206—390 **1 Claim**



1. A composite endless form for making flexible, windowed, form, fill and seal bags for containing perishable and/or nonperishable goods, said composite endless form comprising;

An endless strip of flexible, substantially opaque, paper-like material having a print side thereon with printed indicia thereon and an adhesive side opposite said print side having an adhesive thereon, said endless-strip of paper-like material comprising individual bag forms attached side-to-side, each to be used for making a windowed bag, said endless-strip of paper-like material having a window opening cut in each individual bag form, said window openings being oblong and extending diagonal to a direction of elongation of said composite endless form;

A heat-sealable film adhered to said endless-strip of paper-like material on said adhesive side thereof by said adhesive, said heat-sealable film covering substantially all of said adhesive side;

Said composite endless form being in a roll to be fed to a form, fill and seal machine for making windowed bags for containing perishable and/or nonperishable goods.

5,465,843

NESTABLE DISPLAY CRATE FOR BOTTLES OR THE LIKE

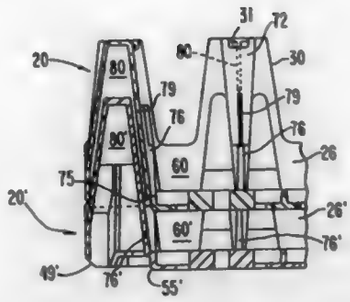
Gerald R. Koefelda, Atlanta, Ga., assignor to Rehrig Pacific Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 18,317, Feb. 3, 1994. This application Jun. 30, 1994, Ser. No. 268,997

Int. Cl.[6] B65D *21/04*

U.S. Cl. 206—507 **20 Claims**

1. A crate for containers, the crate having a floor and a wall structure integral with the floor, the floor having a floor top surface and floor bottom surface, the floor top surface having thereon a



plurality of support areas for supporting an array of containers, the wall structure integral with the floor and extending around the periphery thereof, the improvement comprising:

a lower wall portion adjacent and integral with the floor, wherein said lower wall portion is of double-walled construction and includes an interior lower wall portion and an exterior lower wall portion connected by a top surface; and

a plurality of tapered pylons extending up from the floor and beyond the top of said lower wall portion, said pylons spaced along the periphery of the floor and defining spaces therebetween through which containers loaded in said crate are visible, and wherein the interior surfaces of said pylons are integral with said interior lower wall portion and the exterior surfaces of said pylons are integral with said exterior lower wall portion.

5,465,844

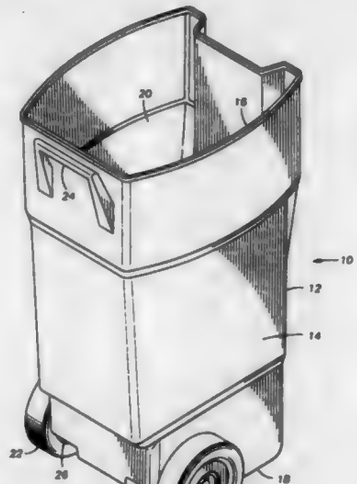
WHEELED NESTABLE REFUSE CONTAINER

Norman C. Lee, Greensboro, N.C., assignor to Compagne Plastic Omnium, Lyons, France

Filed Apr. 28, 1994, Ser. No. 234,550

Int. Cl.[6] B62B *1/00*

U.S. Cl. 206—515 **14 Claims**



1. A wheeled container adapted to be nestable with like containers for storage and shipment, comprising a container body defining an interior receiving area, a lower end of the container body being closed and an upper end of the container body being open to define an access opening into the interior receiving area, and axle means mounting the wheels to the container body, adjacent the lower end for selective movement of the wheels between a retracted position, wherein the wheels are disposed beneath the lower end of container body and do not interfere with nested insertion of the lower end of the container body through the access opening and into the interior receiving area of a like container, and an operable position,

wherein said axle means is horizontally oriented and the wheels are disposed laterally outwardly of the lower end of the container body for rotational rolling support of the container body.

5,465,845

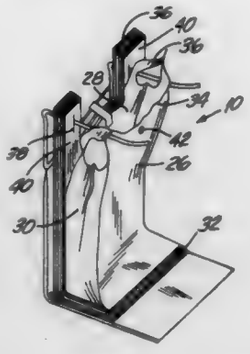
GROCERY BAG DISPENSING AND LOADING SYSTEM

Allen J. Norby, and Randolph D. Prader, both of Fairport, N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 62,028, May 17, 1993, abandoned, which is a continuation of Ser. No. 607,941, Nov. 1, 1990, abandoned. This application Feb. 9, 1994, Ser. No. 194,787

Int. Cl.[6] B65D *85/162*

U.S. Cl. 206—554 **17 Claims**



17. A system for bag pack support, easy dispensing, loading and removal of grocery bags comprising in combination:

a) A pack of a plurality of stacked thermoplastic film undershirt type grocery bags, each bag comprising front, rear, gusseted side walls, a closed bottom and an open mouth top portion, said open mouth portion being free of any integral extension header of the film at the top center of the front and rear walls; said top portion having a pair of spaced double film loop handles as integral extensions of said walls at opposite ends of said mouth, said handles having support orifices in association therewith located between the top and base of said handles;

b) a rack for said bag pack comprising a pair of horizontal parallel support rods having free outer ends cantilevered from a pair of vertical rods, said vertical rods extending upwardly from a horizontal base plate, said horizontal rods functioning to (1) vertically support said bag pack from the support orifices of said handles, (2) permit expansion of the loop handles thereby separating the front wall from the rear wall of a lead bag and (3) facilitate removal of loaded bags by sliding said handles off said support rods;

c) a horizontal cross brace extending between said pair of vertical rods; and

d) a restraining member in association with said rack, said restraining member having a first and a second end, wherein said first end is fixed to said horizontal cross brace midway between said vertical rods and consisting essentially of a flat member extending horizontally and outwardly from said cross brace and having a right angle downwardly disposed bend at said second end, said restraining member extending beyond and over the open top mouth of at least some of said bags to thereby contact said front of at least some of said bags and cause some opposing resistance to horizontal movement of said pack during bag mouth opening of a lead bag of said pack.

5,465,846

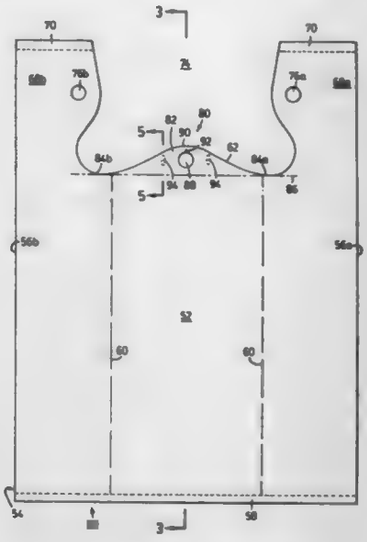
BAG DISPENSING SYSTEM

David Blyth; David Granovsky, both of Toronto; Greg Ledger, and Bruce Smith, both of Scarborough, all of, Canada, assignors to Atlantic Packaging Products Ltd., Scarborough, Canada

Filed Mar. 8, 1994, Ser. No. 207,462

Int. Cl.[6] B65D *1/34*

U.S. Cl. 206—554 **14 Claims**



1. A bag pack comprised of a plurality of bags weakly attached together to form a stack, each said bag comprising:

integral front, back and side walls formed from thermoplastic film, said walls being joined along a bottom edge to form a closed bottom on said bag, and said walls having an upper edge which defines an open top, said bag having an inside bag surface and an outside bag surface;

a tear away section including at least one centrally located, generally rounded support finger receiving opening having a cut edge substantially around the full perimeter of the opening which is separated from said upper edge by a tear through portion and two pressure points located closely adjacent and on either side of said opening said tear away section being configured to tear off a central support finger without leaving any thermoplastic film on said central support figure and including a slit substantially extending between said generally rounded support finger receiving opening and said upper edge of said bag, and

a pair of opposed handles extending upwardly from opposed sides of said open top, each handle having a join line along a top edge and forming a closed loop for lifting said bag, each handle further including a side support rod receiving opening formed on an axis transverse to said closed loop,

wherein said bag pack has successive overlying layers of thermoplastic film, forming successive outside bag surface to outside bag surface contacts alternating with inside bag surface to inside bag surface contacts, and each layer of said bag pack is weakly joined to both adjacent layers without adhesive, said weak joints between layers being of alternating strengths wherein said outside bag surface to outside bag surface weak joint is stronger than said inside bag surface to inside bag surface weak joint.

5,465,847

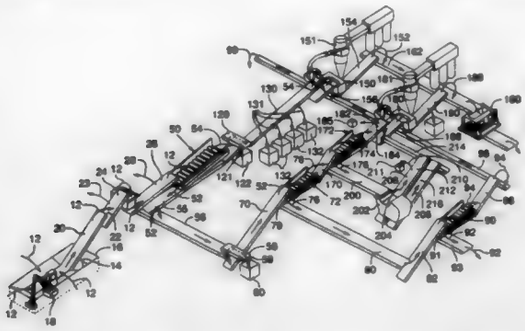
REFUSE MATERIAL RECOVERY SYSTEM

Larry J. Gilmore, 17555 S.E. Braden, Gladstone, Oreg. 97027

Filed Jan. 29, 1993, Ser. No. 11,160

Int. Cl.[6] B07B *9/00*

U.S. Cl. 209—12.1 **4 Claims**



1. A refuse material recovery system for receiving a flow of refuse material and extracting therefrom recoverable items, the system comprising:

a primary size classification portion providing an unders flow and an overs flow, the unders flow comprising items generally smaller than a given item dimension magnitude and the overs flow comprising items generally larger than said given item dimension;

a sorting portion including manual sorting facilities receiving said overs flows and providing opportunity for manual sorting of recoverable items from said overs flow;

a density classification portion receiving the remaining uncollected overs flow and providing a heavies flow and a lights flow, the heavies flow being provided as an unusable system output and the lights flow being provided as a usable system output;

a second size classification portion receiving said unders flow and producing a second overs flow and a second unders flow as a function of a second given item dimension magnitude; and

a third size classification portion receiving said second overs flow and producing a third overs flow and a third unders flow as a function of a third given item dimension magnitude, the third unders flow being directed to a second density classification portion producing a second heavies flow and a second lights flow, the second heavies flow being applied to an eddy current portion to eject material including aluminum.

5,465,848

FLOTATION CELL AND INJECTOR

Gerhard Veh, Höchstädt; Peter Schweib, Elchingen, and Hans-Dieter Dörflinger, Heidenheim, all of, Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany

Filed Mar. 23, 1994, Ser. No. 216,800

Claims priority, application Germany, Mar. 26, 1993, 43 09 918.1

Int. Cl.[6] B03D *1/24*

U.S. Cl. 209—170 **7 Claims**

1. In a flotation cell comprising at least one injector for introducing a fluid into the cell and aspirating air into the fluid, the injector having a conduit with an air inlet and a substantially planar multi-hole aperture plate disposed in the conduit, the improvement comprising:

a plurality of tube sections disposed in the conduit, each tube having an upstream end located downstream of the aperture plate with respect to the direction of fluid flow therethrough and at a distance from the plate equal to at least about 0.1 times a diameter of a hole of the plate, the tube sections each defining an axis disposed substantially perpendicular to the aperture plate and each tube having a downstream end opening into a mixing tube.

5,465,849

COLUMN AND METHOD FOR SEPARATING PARTICLES IN ACCORDANCE WITH THEIR MAGNETIC SUSCEPTIBILITY

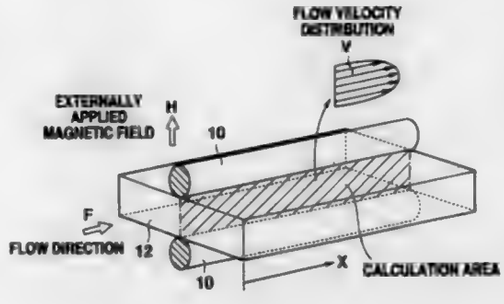
Yukio Wada, Mito; Kazunori Yamamoto, Naka; Osami Tsukamoto, Mitaka; Takeshi Ohara, Tsukuba; Chie Miyake, Toyonaka, and Sadao Mori, Nagoya, all of, Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Sep. 12, 1994, Ser. No. 304,179

Claims priority, application Japan, Feb. 24, 1994, 6-051305

Int. Cl.[6] B03C *1/00*

U.S. Cl. 209—214 **8 Claims**



1. A column for separating particles contained in a suspension and having different magnetic susceptibilities, comprising:

(a) a pair of wall plates having at least one flat and plane surface in which a plurality of ferromagnetic narrow wires are buried in parallel, said wall plates being positioned in parallel to each other, and with a predetermined distance therebetween, with said flat surfaces being opposed to each other;

(b) a channel formed between the pair of wall plates; and

(c) means for applying a magnetic field to the wall plates in the direction perpendicular both to the wall plates and the length of the ferromagnetic wires,

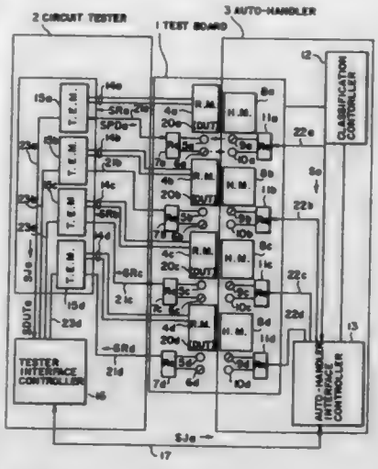
said suspension flowing through the channel along the longitudinal direction of the ferromagnetic wires in a laminar state with different flow velocities, and particles having higher magnetic susceptibility being drawn nearer to the flat surfaces of the wall plates, thereby separating particles in accordance with the magnet susceptibility interacting with the flow velocity.

5,465,850
INTEGRATED CIRCUIT TEST SYSTEM

Seiichi Kase, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 5, 1993, Ser. No. 27,239
Claims priority, application Japan, Mar. 11, 1992, 4-052106
Int. Cl.[6] B07C 5/344; G01R 15/00
U.S. Cl. 209—573 **7 Claims**

1. An integrated circuit test system comprising: a test board



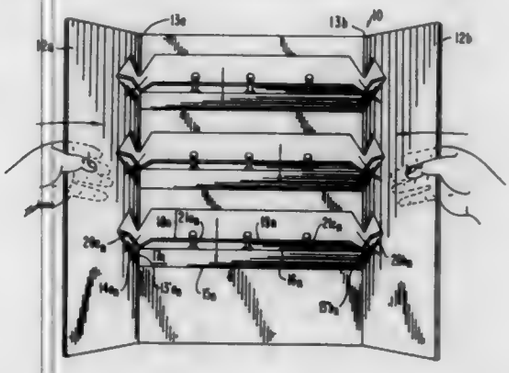
having a plurality of receiving members each for receiving a device under test and a set of measurement signal lines connected to said device; a circuit tester for supplying measurement signals and receiving resultant signals through said measurement signal lines for obtaining individual test results of respective ones of said devices; an auto-handler for classifying said devices based on respective ones of said test results; first transmission means for transmitting signals of said test results in sequence from said circuit tester to said auto-handler; second transmission means disposed correspondingly to respective ones of said receiving members, said second transmission means transmitting an individual device identification signal corresponding to each of said devices from said circuit tester through said test board to said auto-handler, said device identification signals being synchronized with said respective signals of said individual test results.

5,465,851
SUSPENSION-TYPE DISPLAY STAND

Michael J. Smith, Orangeburg, N.Y., assignor to Arrow Art Finishers, Inc., Bronx, N.Y.

Filed Nov. 9, 1994, Ser. No. 336,773
Int. Cl.[6] A47F 5/00
U.S. Cl. 211—59.1 **10 Claims**

1. An erectable stand for displaying objects, comprising:

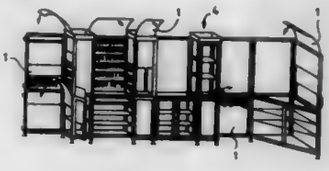


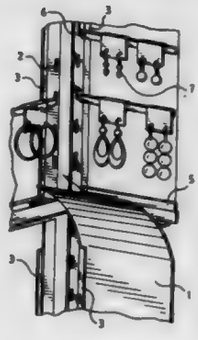
a) a generally planar back panel;
b) at least one mounting flap having an exposed edge portion;
c) at least one peg separate from and mounted on said mounting flap and having a suspending portion projecting past said exposed edge portion for suspending at least one object therefrom;
d) means for connecting said mounting flap to said back panel for movement relative thereto between a collapsed position in which said mounting flap is substantially coplanar with said back panel and said peg is situated adjacent said back panel, and an erected position in which said exposed edge portion is remote from said back panel and said peg projects generally perpendicularly of said back panel;
e) means for jointly moving said mounting flap and peg between said collapsed and erected positions thereof; and
f) means for keeping said mounting flap and peg in said erected position thereof for maintaining the object suspended from said suspending portion of said peg when the stand is in use.

5,465,852
DISPLAY FRAME FOR SMALL ARTICLES

Maarten Koks, Prinsenbeck, Netherlands, and Franz Titulaer, Holmenvn 15, Lier N-3400, Norway, assignors to Franz Titulaer, Holmenvn, and Birgit Loltegaard, Lier, both of, Norway

PCT No. PCT.NO93/00053, § 371 Date Dec. 1, 1993, § 102(e) Date Dec. 1, 1993, PCT Pub. No. WO93/19652, PCT Pub. Date Oct. 14, 1993
PCT Filed Apr. 2, 1993, Ser. No. 162,032
Claims priority, application Norway, Apr. 2, 1992, 921289
Int. Cl.[6] A47B 47/00
U.S. Cl. 211—87 **4 Claims**





1. A display frame for the display of small articles and having an interchangeable rear wall, said display frame comprising:
a frame which includes two parallel sides and top and bottom edges;
a first guide track positioned on one of said top and bottom edges;
a second and third guide track positioned on said two parallel sides of said frame, respectively;
a flexible and bendable rear plate which is movably and slidably mounted in said second and third guide tracks;
said second and third guide tracks having terminal ends which terminate a distance prior to one of said top and bottom edges so that said flexible rear plate is bendable and removable between said terminal ends of said second and third guide tracks and said one of said top and bottom edges of said frame;
means for holding displayed articles in front of said rear plate so that said rear plate is removable from said frame without

disturbing said displayed articles, said holding means not being attached to said rear plate.

5,465,853

Patent Not Issued For This Number

5,465,854

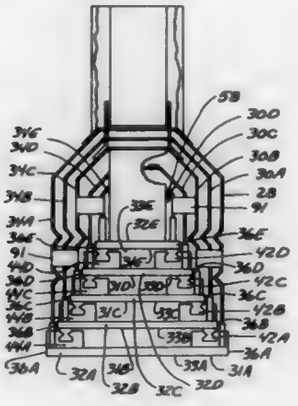
TELESCOPING TUBE ASSEMBLY

Albert J. Sturm, Stillwater, and Thomas E. Marrinan, Minneapolis, both of Minn., assignors to Par Systems, Inc., Shoreview, Minn.

Continuation of Ser. No. 100,911, Jul. 30, 1993, abandoned. This application Apr. 21, 1995, Ser. No. 426,634

Int. Cl.[6] B66C *17/06*

U.S. Cl. 212—319 **23 Claims**



1. A vertically extensible telescoping tube assembly comprising:

a frame supporting an elevated mounting platform;

telescoping tube means supported from the mounting platform to extend vertically therefrom along a reference axis perpendicular to the mounting platform, the telescoping tube means comprises:

a fixed longitudinal tube section adapted for vertical support from the mounting platform;

a second longitudinal tube section telescoping relative to the fixed longitudinal tube section;

wherein each longitudinal tube section includes a U-shaped housing having two spaced apart longitudinal edges and a rigid support plate of thickness greater than the U-shaped housing joined to the spaced apart longitudinal edges to form a tube, the rigid support plate being parallel to the reference axis; and

guide means joining each of the support plates for facilitating telescopic movement of the second longitudinal tube section parallel to the fixed longitudinal tube section, the guide means consisting of a guide mechanism that makes contact with and guides only the rigid support plate of the second longitudinal tube section relative to the rigid support plate of the fixed longitudinal tube section, whereby the guide means contacting the rigid support plates is the sole guide for the telescoping tube means.

5,465,855

TELESCOPING CRANE ARM

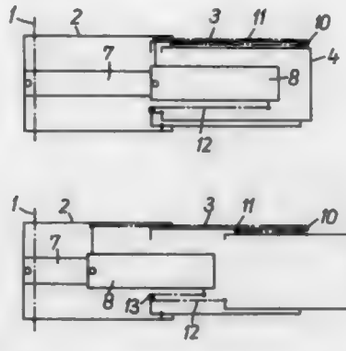
Gerd Erdmann, Oldenburg, Germany, assignor to Fried. Krupp AG Hoesch-Krupp, Essen, Germany

Filed Apr. 11, 1994, Ser. No. 226,074

Claims priority, application Germany, Apr. 10, 1993, 43 11 964.6

Int. Cl.[6] B66C *23/04*

U.S. Cl. 212—349 **9 Claims**



9. A telescoping crane arm assembly comprising

(a) a base body;

(b) a power cylinder extendable from and retractable into said base body;

(c) a plurality of crane arm segments extendable from and retractable into one another and said base body;

(d) releasable locking means having a first state for locking said crane segments to said power cylinder to immobilize said crane arm segments relative to one another and said power cylinder, whereby said crane arm segments move as a unit together with said power cylinder upon displacement of said power cylinder and a second state for releasing a first and a second of said crane arm segments from one another and from said power cylinder, whereby said first and second crane arm segments are movable relative to one another and said power cylinder upon displacement of said power cylinder;

(e) extending cable means for extending said first and second crane arm segments relative to one another when said releasable locking means is in said second state and said power cylinder is moved from an extended position to a retracted position; and

(f) retracting cable means for retracting said first and second crane arm segments relative to one another when said releasable locking means is in said second state and said power cylinder is moved from a retracted position to an extended position, whereby a power cylinder displacement composed of an extension and an ensuing retraction of said power cylinder relative to said base body effects two consecutive, extending displacements of said second arm crane segment relative to said base body and whereby a power cylinder displacement composed of a retraction and an ensuing extension of said power cylinder relative to said base body effects two consecutive, retracting displacements of said second crane arm segment relative to said base body.

5,465,856

PLASTIC CONTAINER HAVING INJECTION-MOLDED CONTAINER COMPONENTS

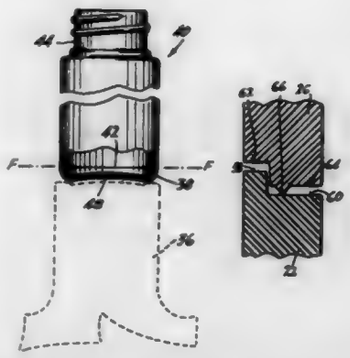
Robert J. Sheffler, Morganville, N.J., assignor to Brent River Packaging Corporation, Flemington, N.J.

Filed Jul. 1, 1993, Ser. No. 84,926

Int. Cl.[6] B65D *8/04;8/22*

U.S. Cl. 215—370 **16 Claims**

1. A plastic container constituted of two, separately injection-molded plastic parts having two adjoining cylindrical portions attached to each other at a joint, the plastic substances of each of



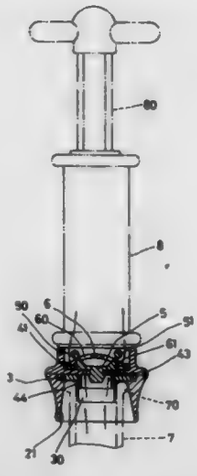
said parts having the property of enabling discrete particles thereof to be securely joined together under the application of heat and pressure, said two adjoining cylindrical portions of said container at said joint constituting aligned extensions of each other and further constituting a two-part, jointed cylindrical container side wall of substantially uniform thickness both at said joint and beyond said joint, said container parts having been previously separately injection-molded so as to form a pair of continuous mating edges which form said joint, said mating edges initially having configurations enabling them to be mutually abutted without jutting out one from the other and said edges after being so abutted having been subjected to heat and pressure of a magnitude sufficient to cause them to melt and merge into each other to form the said joint which constitutes the uniform thickness side wall of said container, said joint in the container having smooth, flush exterior adjoining cylindrical surfaces constituting essentially stepless continuations of one another.

5,465,857

VACUUM CAP FOR LIQUOR BOTTLES

Heng-Te Yang, 20-1, Hsin Ho Heng Rd., Tainan, Taiwan, Prov. of China

Filed Sep. 24, 1993, Ser. No. 125,748
Int. Cl.[6] B65D *51/16*
U.S. Cl. 215—228 **2 Claims**



1. A vacuum cap assembly for a liquor bottle comprising:

a) a hollow cylindrical body including an open top, an open bottom, an upper annular recess, and an annular wall diverging towards the open bottom;

b) a resilient T-shaped gasket engaged with the annular upper recess of the cylindrical body and including a central hole extending axially therethrough;

c) a lower cap body engageable on the open top of the cylindrical body and including a central upper recess, a central through hole, a plurality of air holes spaced around the central through hole, a downwardly and axially extending annular wall, and an outer annular edge surrounding the annular wall, the outer annular edge being engaged within the upper annular recess of the cylindrical body;

d) an air valve disposed in the central upper recess of the lower cap body and including a pair of upwardly and outwardly extending projections, a downwardly extending projection disposed through the central through hole of the lower cap body, and an annular stop groove engaged by a periphery of the central through hole; and

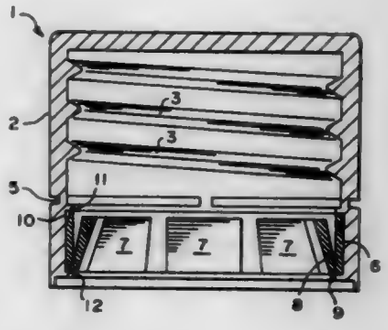
e) an upper cap body disposed in the central upper recess of the lower cap body and over the air valve, the upper cap body including a pair of opposed slots, and the pair of projections of the air valve protruding through the opposed slots to permit air to flow therethrough.

5,465,858

TAMPER-EVIDENT CLOSURE

Frank V. Gargione, Egg Harbor, N.J., assignor to Comar, Inc., Buena, N.J.

Filed Feb. 10, 1995, Ser. No. 386,770
Int. Cl.[6] B65D *41/04*
U.S. Cl. 215—252 **3 Claims**



1. A tamper-evident closure for a container having a threaded neck portion including a breaker ledge, said closure comprising, a cap having a skirt portion, internal threads provided in said skirt portion, a ring positioned at the lower end of said skirt portion, a frangible connection connecting said ring to the lower end of said skirt portion, a separate annular collar, and a plurality of circumferentially spaced, inwardly and upwardly extending resilient tabs positioned within said collar, the lower outer ends of said tabs being integrally connected to the inner peripheral surface of said collar, said collar and associated tabs being snap fit into said ring, whereby when the closure is threaded onto the neck of the container, the inner upper ends of the resilient tabs being engageable to the lower surface of the breaker ledge to lock the ring, collar and associated tabs on the neck of the container, the frangible connection being broken when the cap is twisted to remove the closure from the neck of the container.

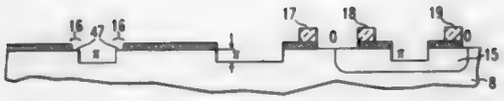
5,465,859

DUAL PHASE AND HYBRID PHASE SHIFTING MASK FABRICATION USING A SURFACE ETCH MONITORING TECHNIQUE

Jonathan D. Chapple-Sokol, Poughkeepsie; Louis L.-C. Hsu, Fishkill; Paul J.-M. Tsang, Poughkeepsie, all of N.Y., and Chi-Min Yuan, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1994, Ser. No. 234,899
Int. Cl.[6] B44C *1/22*; C23F *1/02*
U.S. Cl. 216—12 **10 Claims**

1. A method for making a lithographic phase shift mask comprising



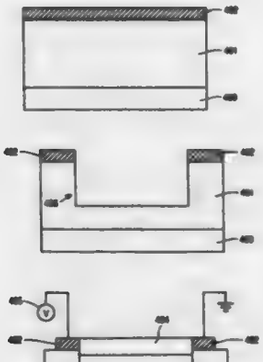
providing a substrate,
placing opaque material in a pattern over said substrate,
mounting a sacrificial etch monitor first film solely on said opaque material,
masking selected portions of said first film,
in a first etching step, simultaneously etching said first film where unmasked and the exposed portions of said substrate until said unmasked first film is entirely removed, comprising,
detecting when said unmasked film is entirely removed and,
stopping said etching thereupon,
said masked film remaining on said material when said etching is stopped.

5,465,860

METHOD OF FORMING AN INTEGRATED CIRCUIT WAVEGUIDE

Harry H. Fujimoto, and Siddhartha Das, both of Sunnyvale, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jul. 1, 1994, Ser. No. 270,051
Int. Cl.[6] C23F *1/02*
U.S. Cl. 216—24 **19 Claims**



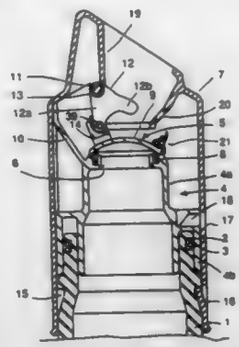
1. A method of forming a self-aligned, active waveguide channel for gap-poling, said method comprising the steps of:
(a) forming a cladding layer over a substrate;
(b) forming a conductive layer over said cladding layer;
(c) etching an opening in said conductive layer;
(d) etching a trench in said cladding layer through said opening in said conductive layer;
(f) forming an active waveguide polymer within at least a portion of said trench; and
(g) etching said conductive layer so as to electrically separate a first portion of said conductive layer residing on one side of said trench from a second portion of said conductive layer residing on the other side of said trench such that said active waveguide polymer may be poled.

5,465,861

CLOSURE FOR CLOSING THE ORIFICE OF A SOCKET-PIECE

Josef G. Kunz, Rosenheim, and Angelika B. M. Temmesfeld, Raubling, both of, Germany, assignors to temtec Fahrzeugtechnik Entwicklungsgesellschaft mbH, Raubling, Germany

Filed Dec. 9, 1993, Ser. No. 164,882
Claims priority, application Germany, Dec. 16, 1992, 42 42 598.0
Int. Cl.[6] B65B *3/04*; B65D *51/04*
U.S. Cl. 220—260 **17 Claims**



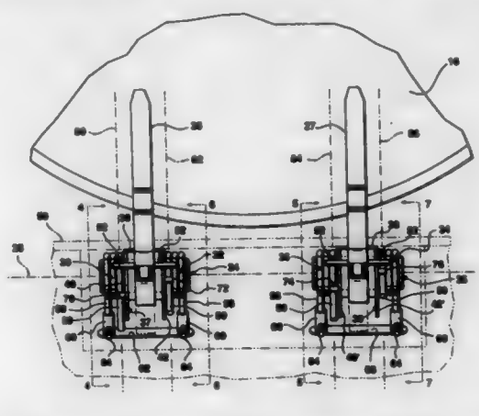
1. Closure for closing the orifice (6) of a socket-piece (4) having an outer wall with a closure part (5) which is able to depart from its closure seat by swiveling, wherein a constraining guide is provided for the closure part (5), by means of which the closure part (5) is so guided that during the opening procedure it lifts from its closure seat in an approximately axial direction and, continuing on from this axial movement, tilts away laterally to the outer wall of the socket-piece (4), wherein the constraining guide is at least one coulisse guide, which includes two complementary parts, namely grooves (24,25) and pegs (31,32,33,34) which engage into the grooves.

5,465,862

AIRCRAFT SERVICING PIT LID WITH LIFT CONTROL

Mike Devlin, Anaheim, Calif., assignor to Dabico, Inc., Costa Mesa, Calif.

Filed Aug. 25, 1994, Ser. No. 294,802
Int. Cl.[6] B65D *43/24*; E05F *1/08*
U.S. Cl. 220—335 **18 Claims**



1. In a closure apparatus for a subsurface pit for servicing aircraft located beneath an aircraft servicing surface across which aircraft travel wherein said pit has a hollow body, a lid mounting frame thereabove located flush with said aircraft servicing surface and defining a pit access opening into said hollow body, a lid strong enough to withstand the weight of the tires of an aircraft

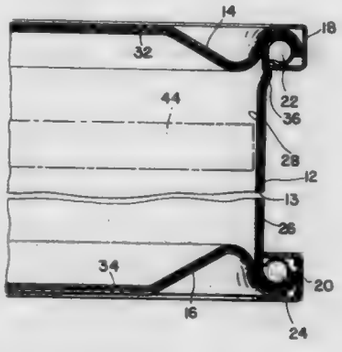
traveling thereacross and a hinge mechanism secured to said lid and secured relative to said hollow pit body at the periphery of said lid for carrying said lid in rotation about a horizontal axis between a horizontal position seated on said mounting frame and a fully raised position in which said lid resides at an angle relative to said aircraft servicing surface, the improvement comprising a plurality of biasing means interposed between said hollow pit body and said pit lid wherein all of said biasing means are arranged so as to initially urge said pit lid from said horizontal seated position toward said fully raised position, and means for disengaging at least one of said biasing means when said lid reaches an intermediate position as a result of a manual lifting force applied thereto in moving from said horizontal seated position toward said fully raised position and reengaging said at least one of said biasing means when said lid reaches said intermediate position in moving from said fully raised position toward said horizontal seated position.

5,465,863

RECYCLABLE STEEL DRUM FOR HOT FLOW PRODUCTS

Thomas Seick, Hoffman Estates, Ill., and Rex E. Wagers, Kingsport, Tenn., assignors to Greif Bros. Corporation, Delaware, Ohio

Filed Mar. 10, 1993, Ser. No. 29,184
Int. Cl.[6] B65D *25/16*
U.S. Cl. 220—403 **17 Claims**



1. A reusable drum comprising:

a metal cylindrical shell having an open top and bottom ends and an interior surface with an outwardly extending circumferential groove disposed adjacent to the top end;

a releasable liner disposed on said interior surface and having a top end, and extending axially from said groove to the bottom end, the liner top end being disposed in said groove, said liner being impervious to the passage of material being contained in the drum,

whereby said groove is disposed adjacent the top end of said shell to receive said liner top end so that said liner does not interfere with a plunger as it moves within the drum to selectively dispense its contents;

top and bottom covers; and

releasable means for securing said covers to said shell to close said open ends;

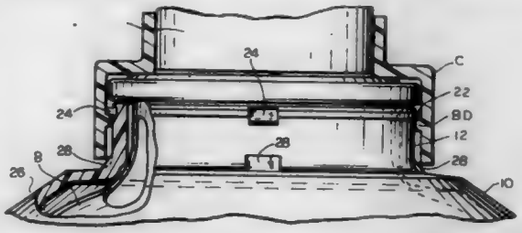
whereby after the contents of the drum has been emptied, the liner is removed and another liner is applied on said interior surface prior to reuse of the drum.

5,465,864

VENTING THERMOPLASTIC CONTAINER FOR A PACKAGE WITH A BLADDER SYSTEM

Craig E. McClean, Toledo, Ohio, assignor to Owens-Illinois Plastic Products Inc., Toledo, Ohio

Filed Jul. 15, 1994, Ser. No. 272,983
Int. Cl.[6] B65D *83/00*
U.S. Cl. 220—403 **20 Claims**



1. A container having an annular open neck with a rim and being adapted to receive a collapsible bladder through said open neck, the bladder being adapted to have a fluid packaged therein after the bladder is inserted into said container and having an annular ferrule at an opening thereinto, the ferrule being adapted to seat on said open neck of said container, said container comprising:

vent means formed in said open neck of said container below the portion of said open neck against which the ferrule is adapted to seat, said vent means permitting the escape of air from said container as the bladder is being filled with the fluid to be packaged therein;

wherein said vent means comprises a plurality of arcuately-extending bosses projecting upwardly from said rim in a direction extending generally parallel to a longitudinal central axis of said container, the adjacent ends of adjacent bosses in said plurality of bosses being spaced apart from one another to define a plurality of slots in said rim; and

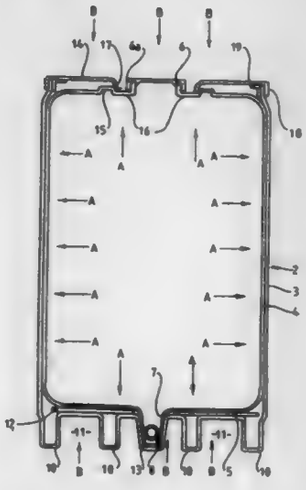
wherein said container is formed from a thermoplastic material by molding.

5,465,865

STACKABLE BULK TRANSPORT CONTAINER

Ian R. Coombes, 47 Longhurst Terrace, Christchurch, New Zealand

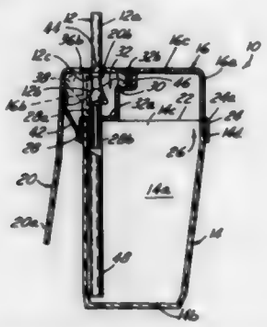
Continuation-in-part of Ser. No. 110,534, Aug. 24, 1993, abandoned. This application Sep. 30, 1994, Ser. No. 316,209
Int. Cl.[6] B65D *21/02*
U.S. Cl. 220—410 **7 Claims**



1. A stackable re-usable intermediate-bulk transport composite container which includes an inner and an outer container, the base of the outer container being provided with fork-lift tine pockets

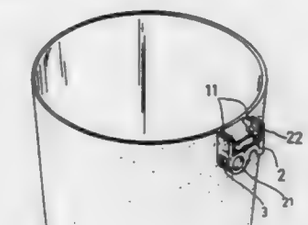
and further includes means for filling and means for emptying the inner container, characterized in that the inner container is cylindrical in shape and is made of corrosion-resistant plastics material, said inner container having walls of a thickness capable of fully supporting the pressures of any contained liquid; the outer container encloses the inner container, said outer container being made of corrosion resistant plastics material and being of rectangular cross-section, said outer container being of a strength adequate for withstanding stacking pressures but inadequate for withstanding the pressures of the contained liquid in the absence of the inner container, the outer container being provided with a plurality of spaced inwardly projecting ribs in supportive contact with the outer wall of the inner container; and both filling and emptying means are accessible from the exterior of the outer container.

5,465,866
AUTOMATICALLY SEALING CUP
Domenic Belcastro, 32011 Distefano, Fraser, Mich. 48026
Filed Jul. 11, 1994, Ser. No. 273,218
Int. Cl.[6] A47G *19/22*
U.S. Cl. 220—709 **11 Claims**



1. An automatically sealing cup that is selectively unsealable by a user, comprising:
a cup body, said cup body having a mouth;
a lid;
means for releasably connecting said lid in sealing relation with respect to said cup body, said lid selectively sealing said mouth;
a liquid access port connected with said lid;
sealing means for selectively sealing said liquid access port, said mouth being sealed by said lid when said liquid access port is sealed, said sealing means comprising:
a flexible tube connected with said liquid access port; and
pinching means for selectively pinching closed said flexible tube responsive to said biasing means and said control means;
biasing means for resiliently biasing said sealing means to automatically seal said liquid access port;
control means for providing user control of said sealing means responsive to continuously applied pressure thereto by the user, wherein said control means and said pinching means comprise:
a handle pivotally connected to said lid, said handle being pivotal from a first position to a second position, said handle comprising a first handle segment and a second handle segment, said second handle segment having an opening, said flexible tube passing through said opening; and
stop means for providing a fixed length of said flexible tube between said second handle segment and said liquid access port;
wherein when said handle is at said first position said flexible tube is foldably pinched closed between said second handle segment and said liquid access port, and wherein when said handle is at said second position said flexible tube is unpinched between said second handle segment and said liquid access port;
wherein said biasing means biases said handle to said first position;
wherein the applied pressure is applied by the user to said first handle segment in a direction that moves said handle toward said second position; and
wherein when the user ceases application of the applied pressure said biasing means automatically causes said sealing means to seal said liquid access port.

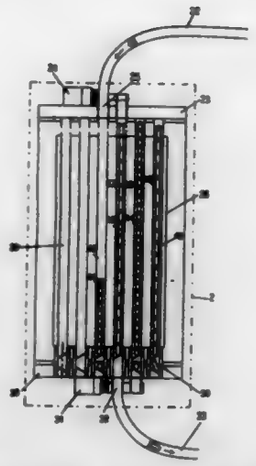
5,465,867
LITTER BIN
Robert Yown, P.O. Box 82-144, Taipei, Taiwan, Prov. of China
Filed Aug. 22, 1994, Ser. No. 294,246
Int. Cl.[6] B65D *25/20*
U.S. Cl. 220—735 **2 Claims**



1. A litter bin comprising:
a container formed with a pair of lugs each having a center opening, an upper hole above the center opening, a lower hole below the center opening, and an intermediate hole located between said upper hole and said lower hole and at an outer side of said center opening; and
a tape holder having a pair of upwardly extending arms and a seat at a lower portion, said arms each having a cylindrical portion engaging the center opening of each of said lugs and a protuberance located under the cylindrical portion and engageable with the upper hole, the intermediate hole and the lower hole of each of said lugs.

5,465,868
AUTOMATIC SYSTEM FOR SELECTING AND FEEDING PREORIENTED RIVETS TO RIVETING MACHINES
Giovanni B. Bonomi, Caorso, Italy, assignor to Bears S.r.l., Milan, Italy
Filed Mar. 18, 1994, Ser. No. 214,465
Claims priority, application Italy, Mar. 22, 1993, MI93A0540
Int. Cl.[6] B65H *9/00*
U.S. Cl. 221—165 **16 Claims**

1. A system for selecting and automatically feeding preoriented fasteners to one or more riveting machines, said system comprising:
a respective mobile buffer magazine associated with each riveting machine, and comprising a plurality of stationary individual magazines each configured to contain a plurality of preoriented fasteners of the same kind and the same grip length;
a main feed station remote from said buffer and including a plurality of rivet orienting means each for orienting fasteners from an unorganized stack of fasteners and separating them one-by-one from each other;



first transporting means for transferring fasteners one-by-one from the main feed station to said mobile buffer magazine;

second transporting means for transferring fasteners from the mobile buffer magazine to the automatic riveting machine associated therewith;

said mobile buffer magazine including first positioning means for moving an outlet of said first transporting means into coaxial alignment with an inlet of a desired one of any of said individual;

magazines, and second positioning means for moving an inlet of said second transporting means into coaxial alignment with an outlet of a desired one of any of said individual magazines; and

a control unit connected to said plurality of rivet orienting means, and said first and said second positioning means.

5,465,869

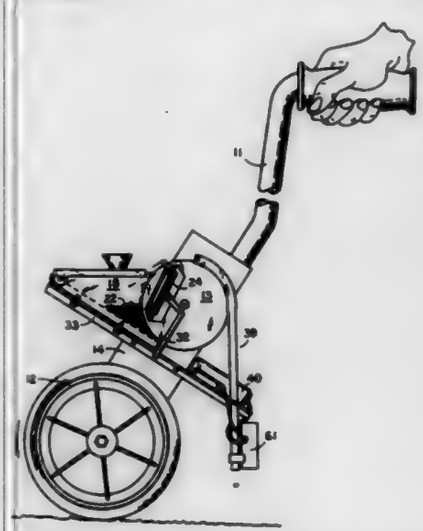
GARDEN SEEDER

Israel D. Schleicher, 10901 Bahia Ct., Bakersfield, Calif. 93311, and Yaacov Schleicher, 2701 S. Fairview St. #P-3, Santa Ana, Calif. 92704

Filed Jul. 18, 1994, Ser. No. 276,537

Int. Cl.[6] A01C *7/04*

U.S. Cl. 221—185 **4 Claims**



1. A tool for seeding crop seeds in prepared furrow comprising a chassis supporting a first ground engaging wheel, a second wheel, and a seed container holding seeds, said chassis adapted to be held and moved thus transferring rolling motion to said first wheel, first mechanical coupling means between said first wheel and said second wheel to transfer the rolling motion of said first wheel to a rotational motion of said second wheel, said second wheel in contact with said seeds through a slot in said container, a suction aperture having a size smaller than a single seed at the circumference of said second wheel and in communication with a suction bellow mounted on said second wheel, second mechanical coupling means between said bellow and said chassis to translate the rotation of said second wheel into an oscillatory expansion and contraction motion of said bellow, said expansion motion prevailing when said suction aperture is within said seed container causing suction which picks up seed, the picked seed is carried upwards and outside said container by the motion of said second wheel, said contraction motion prevailing when said suction aperture is outside said seed container causing expulsion which releases the picked seed, said seed received by a duct, said duct guides the seed downwards to the soil.

5,465,870

CUP-TYPE VENDING SYSTEM

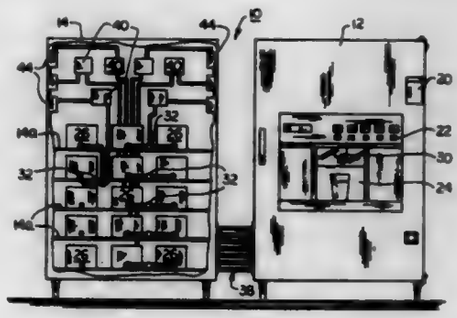
Sean S. Sizemore, 1509 Salem Lake Rd., Winston-Salem, N.C. 27107

Continuation of Ser. No. 2,268, Jan. 8, 1993, Pat. No. 5,341,957. This application Aug. 30, 1994, Ser. No. 298,058

The portion of the term of this patent subsequent to Aug. 30, 2011, has been disclaimed.

Int. Cl.[6] B67D *5/10*

U.S. Cl. 222—2 **8 Claims**



1. A beverage vending system for successively outputting beverages into cups, comprising:

(a) a vending machine having a currency input device and for automatically mixing and outputting a beverage into a cup in response to an operator's payment and selection of a beverage;

(b) a disposable container of beverage syrup connected to a supply conduit for continuously supplying syrup to the vending machine, said container being of a type that include both syrup and air; and

(c) a dispensing system for drawing syrup from the disposable container and selectively dispensing a pre-defined amount of syrup through an output nozzle and into said cup, the dispensing system including:

(1) a first pumping stage including a first pump for drawing the syrup from the disposable container and pumping the syrup downstream through a feed conduit under pressure towards the output nozzle,

(2) a vent valve disposed in said feed conduit for removing air as the syrup moves through the feed conduit; and

(3) a fluid flow restricting means disposed between said vent valve and said output nozzle for regulating the flow of syrup pumped from the first pumping stage.

5,465,871

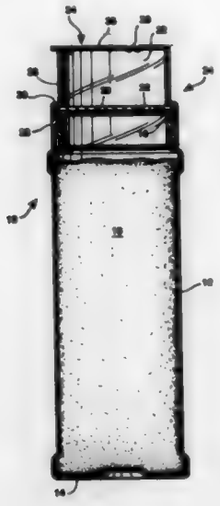
SPICE JAR AND ASSOCIATED DISPENSER CAP

Edward S. Robbins, III, 2802 E. Avalon Ave., Muscle Shoals, Ala. 35661

Continuation of Ser. No. 979,042, Nov. 19, 1992, abandoned. This application May 3, 1994, Ser. No. 237,336

Int. Cl.[6] B67D 5/33

U.S. Cl. 222—023 13 Claims



1. A measuring/dispensing jar comprising a container body having a bottom wall and a peripheral side wall extending upwardly from said bottom wall and terminating at an upper open end defined by a rim; said upper open end including first means for receiving a cap; and

a measuring/dispensing cap including a substantially planar top wall having at least one dispensing door pivotally mounted by an integral hinge within said top wall and including a free edge at the periphery of the top wall, a peripheral depending skirt extending downwardly from said top wall, said peripheral skirt being divided into upper and lower portions, said lower portion including second means cooperable with said first means for removably securing the measuring/dispensing cap on the upper open end of the container body;

a substantially parallel partition disk having at least one dispensing aperture therein, said dispensing aperture defined in part by a straight edge lying in the plane of said disk, said partition disk located between said upper and lower portions of said skirt to thereby form in combination with said top wall and said upper portion of said peripheral skirt one unobstructed, substantially cylindrical volumetric space for receiving contents from said container body, and wherein said straight edge of said dispensing aperture and said free edge of said dispensing door are located on opposite sides of a horizontal center line through the cap in a direction parallel to said integral hinge, thereby enabling container contents to be transferred to said volumetric space and to be subsequently discharged from said dispensing door without additional container contents spilling into said volumetric space; and wherein volumetric indicators are provided on said cap and located and arranged to permit a user to determine an exact amount of container contents transferred to said volumetric space while said container body is in a horizontal orientation.

5,465,872

PRODUCT DISPENSING UNIT WITH MOVABLE DISPENSING DEVICE AND CAP

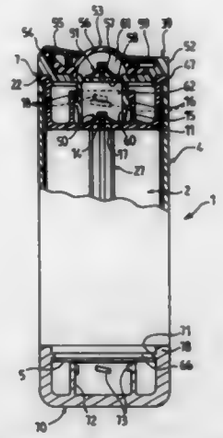
Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Filed Apr. 4, 1994, Ser. No. 222,389

Claims priority, application France, Apr. 28, 1993, 93 05029

Int. Cl.[6] B67D 5/42; G01F 11/02

U.S. Cl. 222—95 24 Claims



1. Unit for dispensing a product of liquid or pasty consistency, comprising:

a receptacle for the product which is equipped with a base to receive a dispensing device, the base and the dispensing device including complementary securing means which enable the base and the dispensing device to be connected and disconnected; and

a cap including securing means which are identical to the securing means of the base,

wherein the dispensing device and the cap can be connected to form a dispensing subunit.

5,465,873

POT FOR THE METERED DISPENSING A FLUID SUBSTANCE

Pascal Mejean, Quintal, and Christian Peyrot, Annecy le Vieux, both of, France, assignors to Reboul-SMT, Créteil, France

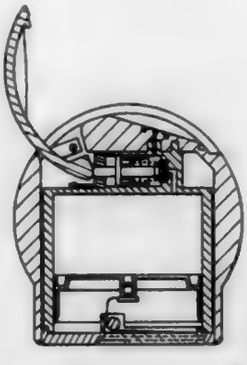
PCT No. PCT/FR93/00536, § 371 Date Feb. 14, 1994, § 102(e) Date Feb. 14, 1994, PCT Pub. No. WO93/25447, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 4, 1993, Ser. No. 193,121

Claims priority, application France, Jun. 12, 1992, 92 07098

Int. Cl.[6] B67D 5/22

U.S. Cl. 222—47 19 Claims



1. Distributing-measuring pot for dispensing a fluid substance, comprising a body, a container, an incorporated measuring pump

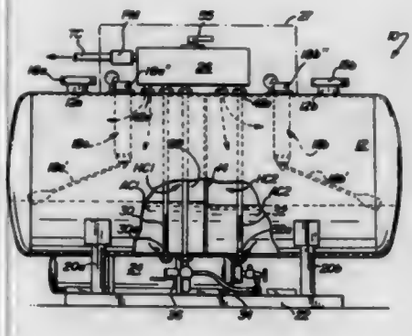
and a cover pivoted to the body, characterized in that the container includes a movable wall in communication with a suction side of the incorporated measuring pump capable of delivering the substance into an incorporated receptacle covered at rest by the cover; a reversible pivot actuation of the cover, initially clears an access to the receptacle and then actuates the measuring pump; and in that the pot includes an incorporated gauge indicating a level of the substance available in the container by means of a physical element of connection between the movable wall of the container and a window formed in the body for viewing a part of said element of connection.

5,465,874

PORTABLE MULTI-COMPARTMENT CHEMICAL STORAGE AND MIXING TANK

Matthew N. Roach, Apex; Neil P. Stapensea, Raleigh, and Jon Webster, Cary, all of N.C., assignors to BASF Corporation, Mount Olive, N.J.

Filed Nov. 17, 1993, Ser. No. 153,052
Int. Cl.[6] B65D *83/14*
U.S. Cl. 222—51 **17 Claims**



1. A portable holding and mixing tank system for at least two dissimilar liquids comprising:

at least two fluid-isolated holding compartments each of which is adapted to hold a respective dissimilar liquid;

a source of pressurizing fluid;

a manifold assembly which includes a housing block integrally defining a liquid channel for the dissimilar liquids and a pressurization fluid channel for said pressurizing fluid, said liquid channel and said pressurization fluid channel being fluid-connected to each of said holding compartments;

a pressurizing supply conduit which fluid-connects said source of pressurizing fluid to said pressurizing fluid channel;

liquid supply risers each of which is disposed in a respective one of said holding compartments and thereby fluid-connect said respective one of said holding compartments to said liquid channel defined by said housing block of said manifold assembly; and

a liquid discharge port fluid-connected to said liquid channel defined by said housing block of said manifold assembly; wherein

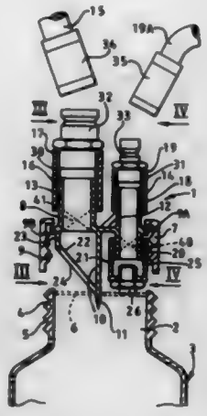
said at least two dissimilar liquids within each said holding compartment are capable of being forcibly introduced by means of said pressurizing fluid therewithin into said liquid channel defined by said housing block of said manifold assembly and thereby mixable with one another within said liquid channel prior to discharge through said discharge port.

5,465,875

CLOSED TRANSFER DEVICES FOR AGRICULTURAL CHEMICALS AND THE LIKE

Richard H. Garnett, Hereford, Great Britain, assignor to Wisdom Agricultural Investment Limited, Hereford, Great Britain

Continuation of Ser. No. 50,081, Apr. 27, 1993, abandoned. This application Jul. 29, 1994, Ser. No. 282,456
Claims priority, application United Kingdom, Nov. 20, 1990, 9025265
Int. Cl.[6] B67D *1/08*
U.S. Cl. 222—148 **4 Claims**



1. A closed transfer device for agricultural chemicals comprising a container having an outlet for containing a quantity of fluid, and a supply cap connected to the outlet so as to permit supply of fluid under the action of gravity from within the container to a supply conduit in a sealed manner when the container is inverted so that the outlet is at its bottom, the supply cap including a connector body which is sealingly engaged with the outlet, an outlet duct extending through the connector body so as to be in fluid communication with the fluid within the container and provided for the passage of fluid out of the container when the container is inverted, an inlet duct extending through the connector body so as to be in fluid communication with the fluid within the container and provided for the passage of air into the container to displace fluid supplied by way of the outlet duct, nozzle means communicating with the same said inlet duct for distributing rinsing liquid supplied by way of the inlet duct within the container in the form of a spray, both said air and said rinsing liquid passing through the same said inlet duct, and coupling means mounted on the connector body for sealingly coupling the outlet duct to the supply duct such that, when the supply duct is connected to the coupling means, supply of fluid from the outlet duct to the supply conduit under the action of gravity is permitted when the container is inverted, whereas, when the supply conduit is disconnected from the coupling means, the outlet duct is closed off.

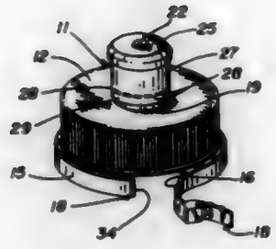
5,465,876

CONTAINER AND CLOSURE RESEALABLE BOTTLE CAP WITH PUSH PULL CLOSURE

Robert E. Crisci, New Castle, Pa., assignor to Portola Packaging, Inc., San Jose, Calif.

Filed Jun. 9, 1994, Ser. No. 258,201
Int. Cl.[6] B67D *5/32*
U.S. Cl. 222—153.1 **6 Claims**

4. A combination of a resilient molded plastic resealable bottle cap having a top portion, an annular depending flange depending from said top portion, a tamper evident thin flexible annular ring on a plurality of circumferentially spaced radially outwardly extending frangible elements on said depending flange, said flexible annular ring having spaced first and second ends, said second end extending radially outwardly of and overlapping said first end,



said second end being frangibly attached to said first end to define a tab for removal of said ring from said depending flange, a plurality of circumferentially spaced radially inwardly extending angular projections on said flexible annular ring, said angular projections being spaced circumferentially from said frangible elements and a resealable pour spout on said top portion, said pour spout having a secondary top portion having an aperture registerable with said pour spout, a closure plug in spaced relation from said secondary top portion, a top cap movably positioned on said pour spout having an opening registering with said plug and defining a resealable closure when said top cap is in a first position, a tamper evident ring having a plurality of frangible elements integrally connecting said ring with said top cap in said first position, an annular flange on said pour spout retaining said ring in said first position when said top cap is moved away from said first position.

5,465,877

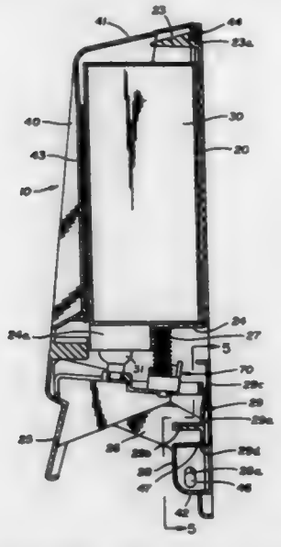
ADJUSTABLE STROKE PUMP DISPENSER

Ronald F. Bell, Uniontown, and J. Christopher Wysocki, Stow, both of Ohio, assignors to GOJO Industries, Inc., Cuyahoga Falls, Ohio

Division of Ser. No. 941,726, Sep. 8, 1992, abandoned. This application Jan. 31, 1994, Ser. No. 188,694

Int. Cl.[6] B65D *35/28*; B67D *5/06*

U.S. Cl. 222—181.2 **10 Claims**



1. A dispenser of the type wherein material is dispensed through a collapsible dispensing member by engaging the dispensing member with a pressure member, comprising:

a) an adjustable control member disposed between the pressure member and a portion of the dispenser to control the range of movement of the pressure member relatively of the collapsible dispensing member during the dispensing operation;

b) said control member is carried by the pressure member; and

c) the pressure member including an elongate unitary body pivotally mounted on the dispenser in engagement with the collapsible dispensing member, whereby the pressure member activates the collapsible dispensing member to dispense material upon the application of pressure thereto and returns the collapsible dispensing member to its starting position upon release of pressure on the pressure member.

5,465,878

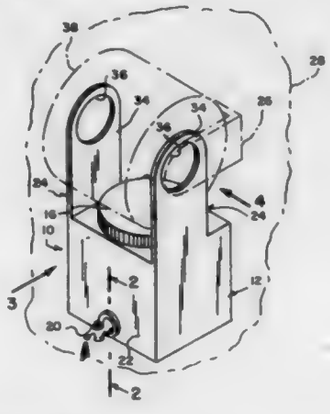
PORTABLE HOUSEHOLD WATER DISPENSER

Orlando M. Armijo, 7100 Constitution NE.#42, Albuquerque, N.M. 87110, and George Spector, 233 Broadway Rm 702, New York, N.Y. 10279

Filed Oct. 31, 1994, Ser. No. 332,367

Int. Cl.[6] B67D *5/06*

U.S. Cl. 222—181.2 **1 Claim**



1. A water caddy comprising:

a) a box-shaped housing having front, rear, side and top walls, a threaded neck in said top wall for the insertion of water therein;

b) a lid having internal threads to engage with said threaded neck;

c) a spout on a lower portion of a front wall of said housing, for dispensing the water out of said housing, so that the water can be used for washing and drinking;

d) means on said housing for connecting said housing to a toilet paper holder, so that in a first instance said housing can hang down vertically against a wall and cabinet and in a second instance the holder can be used as a handle for a person to carry said housing; further including:

e) said front wall having an internal threaded aperture in the lower portion;

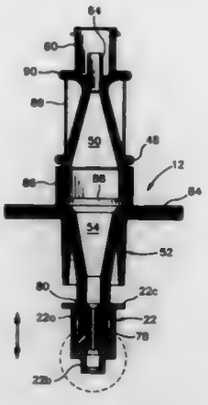
f) said spout having an external threaded sleeve, so that said sleeve can be screwed into said internal threaded aperture, wherein said connecting means includes a pair of spaced parallel arms, with each said arm having a rearwardly extending L-shaped slot therethrough, so that said arms can be mounted quickly to the toilet paper holder without having to dismantle the holder from the wall and cabinet; wherein said arms extend from and in vertical alignment with said front and side walls, each said arm having a rear edge vertically spaced forward from said rear wall providing convenient access to said lid and whereby said housing will hang vertically.

5,465,879

DISPOSABLE NOZZLE ASSEMBLY FOR HIGH SPEED VISCOUS MATERIAL DROPLET DISPENSER

Duong La, San Diego; Carlos E. Bouras; Mark S. Meier, both of Encinitas, and Thomas J. Roetker, San Diego, all of Calif., assignors to Asymptotic Technologies, Inc., Carlsbad, Calif.

Filed Jan. 27, 1994, Ser. No. 187,644
Int. Cl.[6] B67D 5/58
U.S. Cl. 222—189.06 20 Claims



1. A nozzle assembly for connection to the lower end of a syringe in a viscous material dispensing apparatus, comprising:

a nozzle portion having an internal cylindrical pressurizing and drop generation chamber and an exit orifice;

a cylindrical feed tube having a central feed passage and a lower end that extends within and reciprocally mounts the cylindrical pressurizing and drop generation chamber;

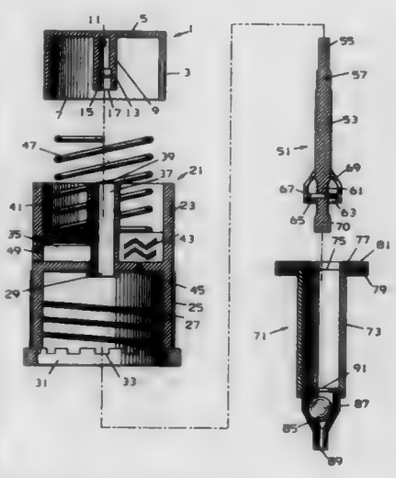
means for providing a dynamic seal between the lower end of the feed tube and an inner wall of the cylindrical drop generation chamber.

5,465,880

DOUBLE ACTION SPRAY DISPENSER

Kenneth P. Glynn, Raritan Township, Hunterdon County, N.J., assignor to Ideal Ideas, Inc., Flemington, N.J.

Filed Jun. 9, 1994, Ser. No. 257,548
Int. Cl.[6] G01F 11/00
U.S. Cl. 222—321.8 17 Claims



1. A continuous action spray dispenser for spraying liquid material therefrom, which comprises:

a) a main housing which is vertically elongated and hollow and has vertical walls and has an upper end with a housing outlet and a lower end with a housing inlet, said main housing being adapted to receive a pumping rod therein;

b) a pumping rod which is at least partially located within said main housing so as to be vertically reciprocally movable therein, said pumping rod having a predetermined shape, volume and displacement and having a first position and a second position within said main housing, said first position resulting from upward movement and establishing a minimum portion of volume of said rod within said main housing and permitting a predetermined maximum available volume within said main housing for liquid material, said second position resulting from downward movement and establishing a maximum portion of volume of said rod within said main housing and permitting a predetermined minimum available volume within said main housing for liquid material due to volume displacement by said pumping rod, and said pumping rod including thereon a valve seat and one way valve such that said valve seat and one way valve both move together with the pumping rod when said pumping rod is moved, said one way valve permitting liquid material to pass therethrough in a relative direction toward said main housing outlet, but not toward said main housing inlet, both said valve seat and said one way valve being located on said pumping rod such that when said pumping rod is at least partially located within said main housing, said valve seat and said one way valve are also located within said main housing and such that said one way valve does not contact said main housing vertical walls when said pumping rod is located within said housing;

c) an inlet valve seat and valve connected to the inlet of said main housing and arranged so as to permit flow of fluid material into, but not out of, said main housing inlet;

d) a top housing connected to the upper end of said main housing and having a portion of said pumping rod pass therethrough for connection to, and for reciprocal movement with, an activator, said top housing establishing a liquid seal about said main housing and said pumping rod, said top housing having an attachment mechanism for attachment of said dispenser to a container;

e) an activator located above said top housing for reciprocation relative thereto, said activator being connected to said pumping rod for reciprocal movement therewith, said activator having a first position and a second position corresponding to said pumping rod first position and second position;

f) an outlet channel and spray nozzle, said outlet channel having a lower end connected to said main housing outlet and having an upper end connected to said nozzle, said outlet channel and spray nozzle being located on one of said top housing and said activator; and,

g) a spring mechanism cooperatively located between said activator and said top housing and biasing said activator and pumping rod to their first position;

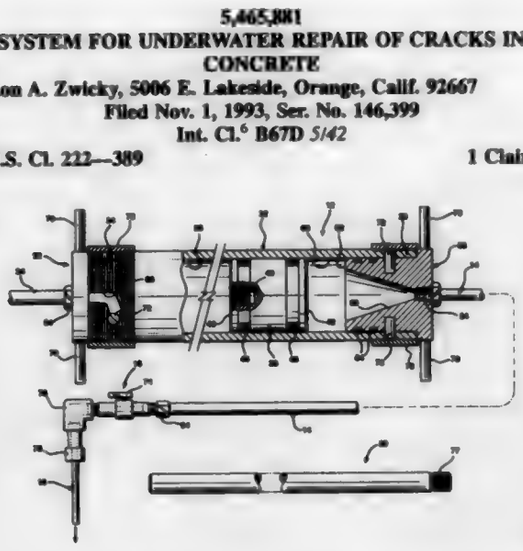
such that when said main housing is connected to a container having liquid therein and said activator is reciprocated to prime, when said activator and therefore said pumping rod is then moved from said first position to said second position, liquid material in said main housing is displaced and the displaced liquid material passes through said pumping rod one way valve and seat and at least a portion thereof exits through said main housing outlet, outlet channel and nozzle for spraying, and when said activator and therefore said pumping rod is then returned from said second position to said first position via return of said spring mechanism, liquid material in said main housing above said pumping rod one way valve and seat exits through said main housing outlet, outlet channel and nozzle for spraying, and said pumping rod and closed one way valve and seat simultaneously also act to pump liquid material from said container to said main housing, thereby loading said main housing for a next reciprocal cycle, and thereby creating continuous action spray on upstrokes end downstrokes of said pumping rod.

5,465,881

SYSTEM FOR UNDERWATER REPAIR OF CRACKS IN CONCRETE

Ron A. Zwicky, 5006 E. Lakeside, Orange, Calif. 92667

Filed Nov. 1, 1993, Ser. No. 146,399
Int. Cl.[6] B67D 5/42
U.S. Cl. 222—389 **1 Claim**



1. Apparatus for delivering an underwater sealant composition comprising:

a sealant reservoir formed with a cylindrical barrel having open, opposing, delivery and pressure application ends and camlock grooves defined therein at each end thereof and wherein said outer wall of said barrel is externally threaded at both of said ends, a piston having opposite pressurized fluid and sealant composition end faces and disposed for reciprocal movement within said barrel, a pressure application end plug removably secured to said pressure application end of said barrel in fluid tight engagement therewith and having a duct therethrough to convey fluid under pressure into said barrel to bear against said pressurized fluid end face of said piston, and a sealant composition delivery end plug removably secured to said delivery end of said barrel in fluid tight engagement therewith and having an extrusion orifice therein, and wherein said plugs both have radially outwardly projecting camlock pins engageable in said camlock grooves to releasably secure said plugs to said barrel ends,

annular internally threaded reinforcing sleeves threadably engaged on said outer wall of said barrel in longitudinal alignment with said camlock grooves to radially reinforce said barrel externally thereabout,

a source of fluid under pressure coupled to provide fluid under pressure to said sealant reservoir through said pressure application end plug,

a flexible delivery hose having one end connected to said sealant composition delivery end plug and an opposite end,

a manually operable metering valve coupled to said opposite end of said delivery hose, and

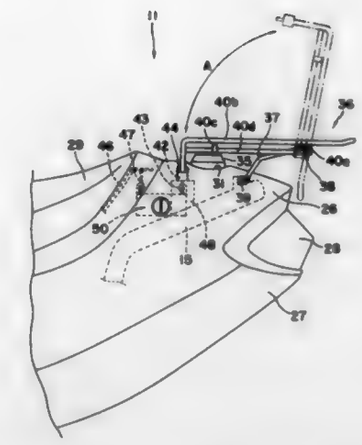
a hollow injection needle connected to said manually operable metering valve.

5,465,882

CARRIER FOR SCOOTER-TYPE VEHICLE

Kazunori Shinobara, Shizuoka, Japan, assignor to Suzuki Kabushiki Kaisha, Shizuoka, Japan

Filed Sep. 24, 1993, Ser. No. 125,739
Claims priority, application Japan, Dec. 18, 1992, 4-338898; Feb. 4, 1993, 5-017678
Int. Cl.[6] B62J 7/04
U.S. Cl. 224—39 **7 Claims**



1. A carrier for holding baggage on a scooter-type vehicle, the vehicle having an outer cover on a body of the vehicle, at least a portion of the outer cover being located rearward of a rider's seat on the vehicle, the vehicle having a fuel tank located rearward of the rider's seat and beneath said cover, the vehicle having a fuel inlet port for the fuel tank extending through the portion of the outer cover and rearward of the rider's seat, and the vehicle being adapted to receive the carrier above the portion of the outer cover, the carrier comprising:

a carrier base that is a fixed frame portion adapted to be fixed to the portion of the outer cover, said carrier base comprising a U-shaped structure having opposite ends adapted to be secured to the portion of the outer cover and a central portion intermediate said opposing ends,

hinge means connected to the central portion of the carrier base; and

a rotatable frame portion adapted to be disposed directly above the fuel inlet port, said rotatable frame portion including:

a first carrier part connected to the hinge means and thereby rotatably connected to the carrier base, the first carrier part having opposing distal bent end portions adapted to extend downward, and

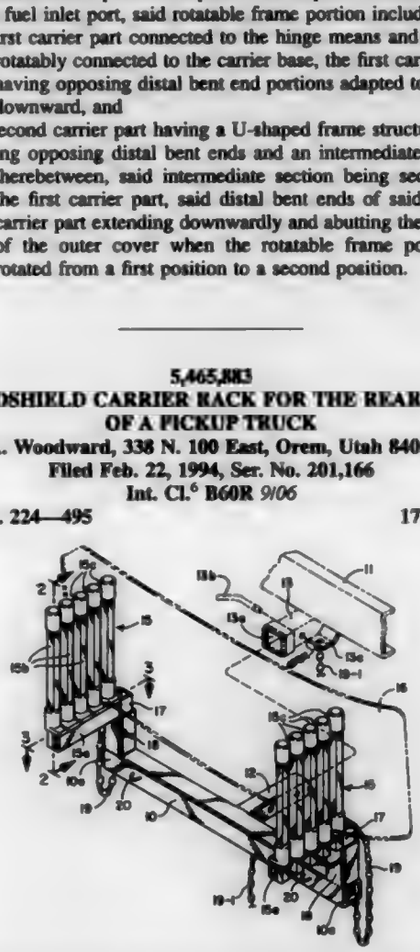
a second carrier part having a U-shaped frame structure having opposing distal bent ends and an intermediate section therebetween, said intermediate section being secured to the first carrier part, said distal bent ends of said second carrier part extending downwardly and abutting the portion of the outer cover when the rotatable frame portion is rotated from a first position to a second position.

5,465,883

WINDSHIELD CARRIER RACK FOR THE REAR END OF A PICKUP TRUCK

Jerry A. Woodward, 338 N. 100 East, Orem, Utah 84057

Filed Feb. 22, 1994, Ser. No. 201,166
Int. Cl.[6] B60R 9/06
U.S. Cl. 224—495 **17 Claims**



1. A carrier rack device for automotive windshields, comprising mounting structure adapted for quick and easy attachment to and

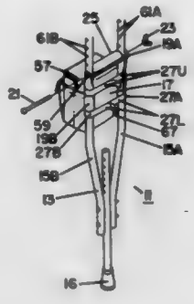
removal from the rear end of an automotive vehicle so as to extend transversely of said rear end; and a pair of mutually independent, elongate carrier parts constructed to extend longitudinally rearwardly of said vehicle from attachment only at their forward ends to said mounting structure in mutually spaced relationship transversely of said rear end of the automotive vehicle and individually cantilevered from said mounting structure, said carrier parts as so attached providing respective elongate series of upstanding pockets for receiving and securely holding a corresponding series of upstanding automotive windshields to be carried, said series of pockets each extending longitudinally of the corresponding elongate carrier part.

5,465,884

CRUTCH PACK

Eric E. Bohl, 5920 Walraven Cir., Fort Worth, Tex. 76133; Brent Hale, 902 Haden, Tyler, Tex. 75701, and Tim Parker, 12640 J. Rewan Rd., Burleson, Tex. 76028

Filed May 25, 1994, Ser. No. 248,959
Int. Cl.[6] A45B *1/00*
U.S. Cl. 224—407 **14 Claims**



1. A carrying pack for attachment to a crutch, comprising:

a) a bag having plural walls coupled together about a cavity with a pouch opening in at least one of said walls, where said pouch opening communicates with said cavity, said cavity being capable of receiving items for storage through said pouch opening, one of said walls being a first wall;

b) first and second flaps coupled to a first wall of said bag extending along said first wall and extending out from said first wall, said first and second flaps being spaced apart to receive said crutch therebetween;

c) a first opening located in said first flap for receiving a crutch handle bolt therethrough when said first flap is located along a first arm of said crutch;

d) a second opening located in said second flap opposing said first opening in said first flap, said second opening being positioned to receive said crutch handle bolt therethrough when said second flap is located along a second arm of said crutch;

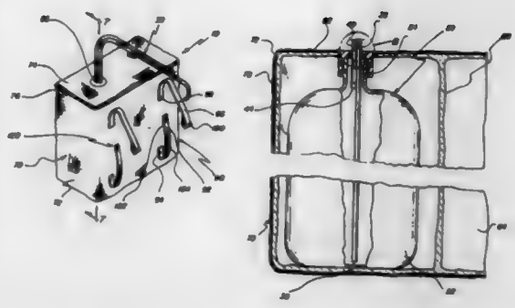
e) a support strap coupled to said first wall and extending outwards from said first wall, said strap having coupling means for coupling said strap about said crutch to stabilize said bag on said crutch.

5,465,885

INSULATED BACKPACK WITH DRINKING LIQUID CONTAINER

William R. Wyatt, 14230 E. Oro Escondido, Tucson, Ariz. 85747

Filed Apr. 25, 1994, Ser. No. 231,929
Int. Cl.[6] A45F *3/04*
U.S. Cl. 224—148 **6 Claims**



2. A combination insulated backpack and drinking liquid container whereby a user may drink fluid through a drinking tube while carrying the backpack, the insulated backpack with drinking liquid container comprising:

a thermally insulated backpack having at least two interior compartments therein, the thermally insulated backpack comprising plurality of thermally insulated fabric panels that are joined together to form a soft-walled thermally insulated backpack body, the backpack body having a backstrap, an interior surface and an exterior surface, a thermally insulated fabric top closure flap with securement means formed as a zipper for gaining access to the interior compartments of the backpack body, the top closure flap having an aperture therethrough opening into one of the at least two interior compartments, the backstrap further comprising a pair of vertically oriented horizontally spaced apart elongated adjustable flexible straps for extending over the shoulders and under the arms of the user thereby supporting the weight of the backpack on the user's shoulders;

a fluid container for holding drinking liquid removedly disposed within one of the at least two interior compartments;

the fluid container comprising a resilient hollow plastic container body having an upwardly extending hollow neck communicating with a threaded mouth, the container being removedly disposed within the compartment adjacent the aperture through the closure flap such that the neck and threaded mouth align with the aperture; and

a drinking tube assembly extending from inside the fluid container at the distal end thereof to a point in space near a user's mouth at the proximal end thereof when the backpack is mounted on the user's back, the drinking tube assembly having control means for enabling and disabling the flow of fluid through the tube assembly.

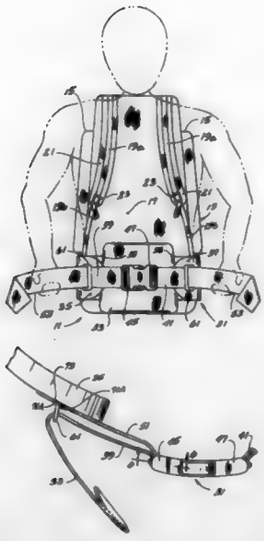
5,465,886

PACK

Michael J. Scherer, Boulder, Colo., assignor to American Recreation Products, Inc., St. Louis, Mo.

Filed Mar. 15, 1994, Ser. No. 213,909
Int. Cl.[6] A45F *3/04*
U.S. Cl. 224—215 **15 Claims**

1. A pack comprising a load carrier and a belt attached to the load carrier for releasably securing the pack around a torso of a person, said belt comprising a first flexible belt portion extending forwardly from the load carrier at one side of the torso of said person and terminating at a free end, and a second flexible belt portion extending forwardly from the load carrier at the other side of the torso of said person and terminating at a free end, a connecting device on each flexible belt portion for releasably connecting the belt portions to secure the belt around the torso of said person, the free end of the first belt portion extending from the connecting device on the first belt portion after the connecting devices on the belt portions have been connected, said connecting device on the first belt portion being movable longitudinally along the length of the first belt portion for shortening and lengthening the first belt portion when tightening the belt about the person's torso, said pack further comprising a rigid loop affixed to the first belt portion rearwardly of the connecting device on the first belt portion, the first belt portion having a length such that when said connecting devices are interengaged to secure the belt around the



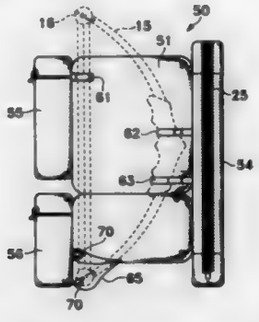
torso of said person, the free end of the first belt portion can be inserted through the rigid loop and then pulled generally forwardly against the loop thereby to cause relative movement between the first belt portion and its respective connecting device to cinch the belt tight around the person's torso.

5,465,887

ARCHERY BOW BACKPACK CARRIER

Keith Hudson, 9920 Tulwar Dr., Chugiak, Ak. 99567

Filed Aug. 26, 1993, Ser. No. 112,129
Int. Cl.[6] A45F *3/04*
U.S. Cl. 224—209 **18 Claims**



1. A backpack for carrying archery bows capable of being disassembled into individual parts, each having an upper portion, a lower portion, and a central portion comprising:

a) a frame;

b) a main sack compartment being generally rectangular in shape and having a bottom and two sides, and being attached to said frame;

c) a bow pocket, fixedly attached to one side of said main sack, said bow pocket having means fixedly installed therein to hold the disassembled bow portions;

d) means to close said bow pocket;

e) an arrow pocket having an interior;

f) means to access the interior of said arrow pocket;

g) a frame fixedly placed within said arrow pocket, having means for holding an arrow shaft;

h) means for protecting an arrow head fixedly placed within said arrow pocket;

i) means for protecting arrow fletching, fixedly placed within said arrow pocket; and

j) means for carrying said backpack, fixedly attached to the frame to permit said backpack to be carried.

5,465,888

CHILD CARE ACCESSORY CYCLING BELT

Kathleen P. Owens, 2567 Landview Cir., Virgina Beach, Va. 23454

Filed Jan. 31, 1994, Ser. No. 189,146
Int. Cl.[6] H45F *5/00*
U.S. Cl. 224—224.0 **7 Claims**

1. A cycling belt for use when cycling with a child in a child carrier seat comprising:

a band portion having two ends;

a fastener for removably fastening said two ends of said band portion together to form a continuous loop;

means for adjusting the length of said band portion to vary the size of said continuous loop;

a pouch depending from said band portion, said pouch having a top, a bottom, a back wall, and an outer wall, said back wall connected to said top at a back upper edge thereof and connected to said bottom at a back lower edge thereof, said outer wall connected to said bottom at an outer lower edge thereof and releasably fastened to said top at an outer upper edge thereof, said back wall of said pouch permanently attached adjacent said back upper edge to said band portion such that said back lower edge of said back wall hangs below said band portion;

a plurality of expansible pockets attached to said outer wall of said pouch, at least one of said pockets having a bottom edge extending below the outer lower edge of said outer wall;

a rigid ring attached to said outer lower edge of said outer wall of said pouch; and

at least a first tether including:

a line having a first end and a second end,

a fastener attached to said first end of said line, said fastener being releasably attached to said rigid ring,

a loop integral with said second end of said line, said loop having a circumference, and

means for selectively varying the circumference of said loop.

5,465,889

PURSE ASSEMBLY

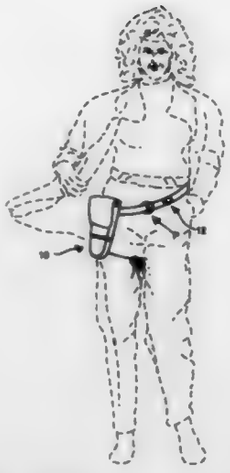
Abram W. Smith, 40825 Avenida Califa, Palm Desert, Calif. 92260

Continuation of Ser. No. 85,726, Jul. 6, 1993, abandoned. This application Aug. 29, 1994, Ser. No. 297,011
Int. Cl.[6] A45F *3/00*
U.S. Cl. 224—224 **10 Claims**

1. A purse assembly adapted to provide a simulated appearance of a gun holster and thereby provide a western-style dress motif to the wearer, said purse assembly comprising:

a) a belt adapted to be worn at least partially about the waist of the wearer, and slung downwardly at one lateral side of the wearer so that the belt is hung below the waist of the wearer at this lateral side and at the hip region of the wearer at this lateral side;

b) a purse connected to said belt and adapted to be worn adjacent to the hip of the wearer at the side of the wearer, said purse having front and rear walls and connecting side walls forming an interior of the purse, each of said front and rear



walls and each of said side walls being trapezoidal in shape and being tapered progressively downwardly so that the front and rear walls and the side walls of the purse appear generally trapezoidal in shape both in front elevation and side elevation, thereby providing an appearance of a gun holster although functioning as a purse and being sized for the holding of women's or men's accessory articles which are not firearms;

c) an interior vertically arranged partition dividing the interior of the purse into first and second compartments for the storage of articles;

d) means for providing an access to the interior compartments of said purse for storage of the personal articles of the wearer;

e) closure means for closing and opening the purse to obtain an access to the interior compartments and which closure means is openable and closable at the option of the wearer; and

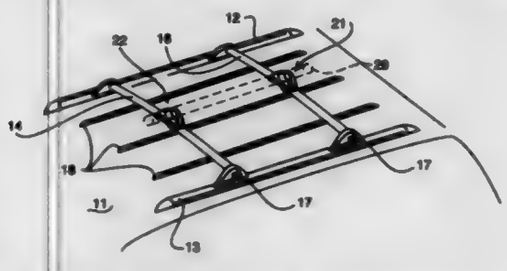
f) said purse having an outer appearance and shape similar to that of a revolver type hand gun holster and being adapted to be slung over the hip of the wearer at the lateral side of the wearer, much in the same manner as a gun slinger would wear a gun holster to thereby aid in the simulation of the wearer appearing as a gun slinger although the purse contains only non-firearms accessories.

5,465,890

AUTOMOTIVE VEHICLE RACK MAST HOLDER

Scott R. Allen, Yuba City, Calif., assignor to Mascotech Accessories, Inc., Port Huron, Mich.

Filed Oct. 28, 1993, Ser. No. 145,985
Int. Cl.[6] B60R *9/00*
U.S. Cl. 224—324 **17 Claims**



1. A holder for reliably securing an elongated object to an automotive vehicle rack, comprising:

(a) a cradle having a material defining an object rest selected to be sufficiently pliable to conform generally to the exterior shape of an object expected to be carried thereby, said cradle including a support structure at least partially surrounding said material, said support structure having ends on opposite sides of said object rest;

(b) a first flexible strap for securing an object in said rest, said first strap having a first end attached to one of said ends of said support structure and a second end attached to an opposite end to said support structure whereby said strap squeezes said support structure to conform said material to the shape of an object secured therein; and

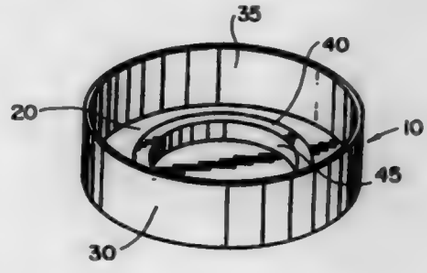
(c) means for securing said cradle to a bar of said automotive vehicle rack.

5,465,891

BEVERAGE CONTAINER HOLDER

John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Inc., Nashville, Tenn.

Continuation of Ser. No. 704,024, May 22, 1991, abandoned.
This application Nov. 23, 1992, Ser. No. 980,113
Int. Cl.[6] B60R *11/00*
U.S. Cl. 224—566 **45 Claims**



1. A beverage container holder, comprising:

base support means for supporting a beverage container, the container having a base including a substantially vertical surface disposed inwardly from a container outer surface and extending upwardly from a container lower surface;

a wall connected to said base support means and forming therewith a cavity for receiving therein the base of the beverage container, said wall being configured such that the base of the beverage container is loosely disposed in said cavity and removable from said cavity in a vertical direction without substantial frictional resistance, said wall having a top surface; and

wedging means secured to said base support means for providing a wedging action upon tilting of the beverage container resting on said base support means, said wedging means having a top surface, said wedging means top surface being spaced a distance below said wall top surface such that wedging between at least the substantially vertical surface of the beverage container and said wedging means thereby restrains the beverage container from further tilting and prevents contents therein from spilling;

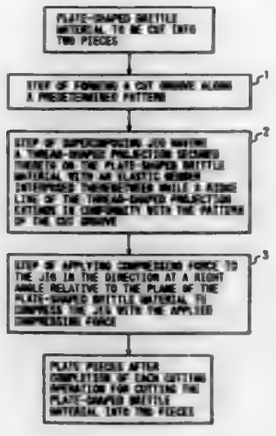
wherein said wedging means and said wall are configured and dimensioned relative to one another such that tilting of the beverage container in said cavity causes engagement between the beverage container and said holder at two spaced points of contact occurring at said wall and said wedging means, said two spaced points of contact including a first contact point located at an inner surface of said wall and a second contact point located at an outer surface of said wedging means and at a height a distance below the height of said first contact point; and said wedging means comprises a rib disposed in said cavity and projecting upwards from said base support means.

5,465,892

METHOD AND APPARATUS FOR CUTTING PLATE-SHAPED BRITTLE MATERIAL

Kengo Shinozaki, Tokyo; Kimihiro Wakabayashi, Kanagawa; Hiroki Murakami, Kanagawa, and Masaaki Araki, Kanagawa, all of, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 84,069, Jun. 30, 1993, Pat. No. 5,398,857.
This application Jan. 13, 1994, Ser. No. 181,309
Claims priority, application Japan, Jun. 30, 1992, 4-172813
Int. Cl.[6] C03B 33/03
U.S. Cl. 225—2 4 Claims



1. A method of cutting a plate-shaped brittle material into two plate pieces, comprising the steps of:

forming a cut groove on a first surface of said plate-shaped brittle material in conformity with a predetermined pattern;

placing said plate-shaped brittle material on a flat surface of a press table, the first surface of said plate-shaped brittle material facing the surface of said press table, the surface of said press table remaining flat such that said plate-shaped brittle material does not bend;

superimposing a jig having a thread-shaped projection secured thereto on a second surface of said plate-shaped brittle material opposite to the first surface of said plate-shaped brittle material with an elastic member interposed between said plate-shaped brittle material and said jig, a ridge line of said thread-shaped projection extending in conformity with said predetermined pattern of said cut groove with a constant height as measured in a direction perpendicular to the first surface and the second surface of said plate-shaped brittle material; and

applying a predetermined intensity of compressing force across said elastic member at a right angle relative to the first surface of said plate-shaped brittle material via said jig and said plate-shaped brittle material,

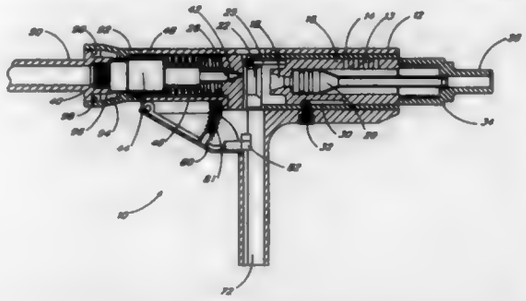
whereby said compressing force generates first tensile stresses in said elastic member, said first tensile stresses generate second tensile stresses in said plate-shaped brittle material by friction between said elastic member and said plate-shaped brittle material, and said second tensile stresses fracture said plate-shaped brittle material in conformity with said predetermined pattern.

5,465,893

IMPACT ACTUATED TOOL FOR DRIVING FASTENERS WITH SAFETY MECHANISM

William J. Thompson, 2120 Mendocino St., Fullerton, Calif. 92631

Division of Ser. No. 147,935, Nov. 5, 1993, Pat. No. 5,425,488.
This application Jan. 20, 1995, Ser. No. 376,016
Int. Cl.[6] B25C 1/08
U.S. Cl. 227—8 20 Claims



1. An impact actuated tool for driving a fastener into a substrate, the tool comprising:

a housing means, the housing means including axially extending first and second bores seperated by a firing chamber, the first bore having no passages formed therein solely for conveying combustion gases into or out of the housing means;

a barrel having an axially extending bore therethrough, the barrel being slidably mounted within the first bore of the housing, the barrel having a breech at one end and a muzzle at the other end for receiving the fastener, and a plurality of ports extending through a sidewall of the barrel, the plurality of ports being located between the breech and the muzzle;

first biasing means for biasing the barrel away from the firing chamber;

a piston slidably mounted within the bore of the barrel;

means for advancing an explosive cartridge into a firing position in the firing chamber;

a firing pin slidably mounted within the second bore of the housing;

second biasing means biasing the firing pin away from the firing chamber;

an extended handle operationally connected to the firing pin, the tool being impact actuatable, without a pistol-type trigger means, so that the handle, when pushed inwardly, displaces the barrel toward the firing chamber until the breech is in sealing relationship with the cartridge, and displaces the firing pin into contact with the cartridge to fire the explosive cartridge and drive the fastener into the substrate; and

safety means for preventing the axial movement of the handle when the muzzle of the tool is in a first orientation and for allowing the axial movement of the handle when the muzzle of the tool is in a second orientation.

5,465,894

SURGICAL STAPLING INSTRUMENT WITH ARTICULATED STAPLING HEAD ASSEMBLY ON ROTATABLE AND FLEXIBLE SUPPORT SHAFT

George A. Clark, East Windsor; Malcolm C. Burwell, Princeton; John A. Gola, Bordentown; Christopher Robinson, Lawrenceville, and Fred E. Snyder, Princeton Junction, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Dec. 6, 1993, Ser. No. 162,737
Int. Cl.[6] A61B 17/068
U.S. Cl. 227—175 19 Claims

1. A surgical instrument for applying one or more surgical fasteners to tissue, comprising:

a fastener applying assembly including a fastener holder for receiving one or more surgical fasteners, an anvil for clamping the tissue against said fastener holder, and a driver for

driving the fasteners from said fastener holder into the tissue clamped by said anvil against said fastener holder;

an actuator handle assembly including a housing and means for actuating said driver; and

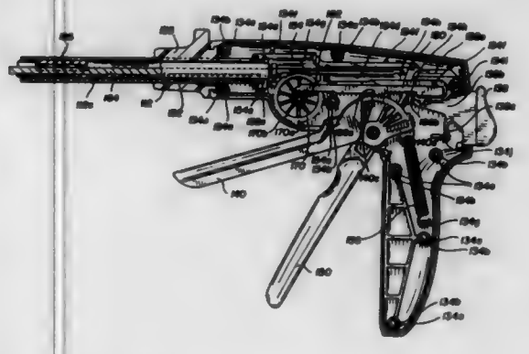
a shaft assembly for mounting said fastener applying assembly to said housing and said actuator handle assembly, said shaft assembly having a longitudinal axis and having proximal and distal ends and including a rigid support shaft section not enclosed by said housing, said rigid support shaft section connected to a flexible shaft section adapted to be bent in any radial direction relative to the longitudinal axis of said shaft assembly.

5,465,895

SURGICAL STAPLER INSTRUMENT

Bryan D. Knodel, Cincinnati; Richard P. Nuchols, and Warren P. Williamson, IV, both of Loveland, all of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Filed Feb. 3, 1994, Ser. No. 191,412
Int. Cl.[6] A61B *17/068*
U.S. Cl. 227—176 **15 Claims**



1. A surgical instrument comprising:

a handle portion;

an implement portion having first and second implements capable of performing a function during a surgical procedure;

a reciprocating section adapted to move back and forth along an axis of said implement portion, said reciprocating section including a work portion capable of causing said first and second implements to perform said function;

a reciprocating drive member;

a movable actuator associated with said handle portion and engaged with said drive member such that motion of said actuator causes said drive member to move back and forth between first and second drive positions separated by a first distance; and,

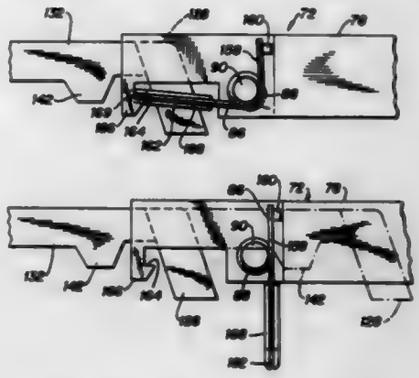
a multiplier associated with said reciprocating section and said drive member for causing said reciprocating section to move back and forth between first and second reciprocating positions in response to movement of said drive member, said first and second reciprocating positions being separated by a second distance which differs from said first distance.

5,465,896

LINEAR SURGICAL STAPLING INSTRUMENT

William J. Allen, Stratford; Jeffrey A. Stein, Milford; Paul DiCesare, Norwalk, all of Conn.; Paul Malhauser, and Doug Spranger, both of New York, N.Y., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 789,166, Nov. 7, 1991, abandoned. This application Jul. 5, 1994, Ser. No. 270,399
Int. Cl.[6] A61B *17/072*
U.S. Cl. 227—176 **10 Claims**



1. An apparatus for applying surgical staples to body tissue comprising:

a) a cartridge assembly containing a plurality of surgical staples;

b) an anvil having a plurality of staple deforming pockets defined therein, the anvil and cartridge assembly being relatively movable between a first spaced apart position and a second position in close cooperative alignment with one another;

c) an actuation mechanism configured to advance through the cartridge assembly to sequentially eject the plurality of staples from the cartridge assembly to be driven against the anvil and deformed within the pockets;

d) a cutting blade support member supporting a cutting blade operatively associated with the actuation mechanism and configured to advance through the cartridge assembly in conjunction with the actuation mechanism; and

e) a blocking member for preventing movement of the cartridge assembly and the anvil into close cooperative alignment after the plurality of staples have been ejected from the cartridge assembly, the blocking member mounted for deployment into a blocking position in response to the cutting blade support member moving toward and contacting the blocking member as the cutting blade support member advances through the cartridge assembly.

5,465,897

BONDED ULTRASONIC TRANSDUCER AND METHOD FOR MAKING

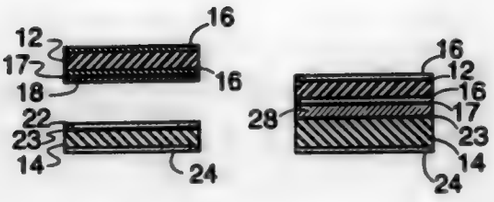
Raymond D. Dixon; Lawrence H. Roe, both of Los Alamos, and Albert Migliori, Santa Fe, all of N.M., assignors to The Regents of the University of California, Office of Technology Transfer, Alameda, Calif.

Filed Mar. 29, 1994, Ser. No. 220,306
Int. Cl.[6] B23K *1/19;101/36*
U.S. Cl. 228—121 **4 Claims**

1. A method for fabricating an ultrasonic transducer, including the steps of:

depositing over at least one surface of a piezoelectric crystal a first film of silver to a thickness effective for diffusion bonding and less than about 0.012 mm;

depositing over at least one surface of a ceramic backing a second film of silver to a thickness effective for diffusion bonding and less than about 0.012 mm; and



solid state metal diffusion bonding together said first and second films of silver.

5,465,898

PROCESS FOR PRODUCING A METAL-CERAMIC SUBSTRATE

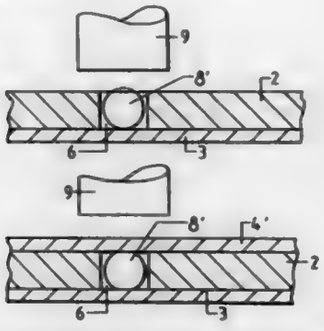
Jurgen Schulz-Harder, Hugo-Dietz-Strasse 32, D-91207 Lauf, and Peter H. Maier, Hugo-Dietz-Strasse 19, D-19207 Lauf, both of, Germany

Filed May 31, 1994, Ser. No. 250,904

Claims priority, application Germany, Jun. 1, 1993, 43 18 061.2

Int. Cl.[6] B23K *1/008*

U.S. Cl. 228—122.1 **12 Claims**



1. A process for producing a ceramic metal substrate having at least one ceramic layer (2) and at least two metal layers (3, 4) disposed one each on either side of said ceramic layer (2) and at least one electric through connection (5) where said at least two metal layers (3, 4) are connected to one another by a metal bridge (7) at an opening (6) in said at least one ceramic layer, comprising the steps of:

attaching metal foils (3', 4') on said sides of said ceramic layer by a direct bonding process to form said at least two metal layers (3, 4), said metal foils having surfaces formed by a chemical compound and a reactive gas and

producing said through connection (5) by placing metal, to form said bridge (7), in said opening (6) so that said at least two metal layers (3, 4) are electrically connected to one another by a direct bonding process, wherein a metal body (8, 8') is inserted into said opening (6) to almost completely fill said opening (6), a surface of said metal body being provided with a layer of chemical compound of metal and reactive gas.

5,465,899

METHOD AND APPARATUS FOR FINE PITCH WIRE BONDING USING A SHAVED CAPILLARY

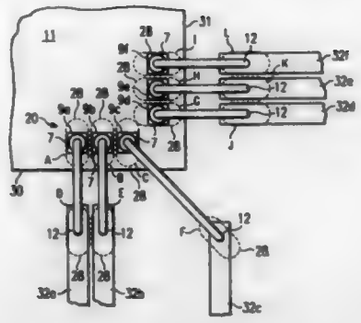
Roderick L. Quick, DeSoto, and John W. Orcutt, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 14, 1994, Ser. No. 323,329

Int. Cl.[6] H01L *21/603*

U.S. Cl. 228—180.5 **19 Claims**

1. A method for wire bonding using a capillary having a bore and first and second opposed side walls and third and fourth



opposed side walls, said third and fourth side walls being curved and spaced apart by a longitudinal dimension along a first axis through said bore, said first and second side walls spaced apart by a lateral dimension along a second axis through said bore perpendicular to said first axis, said lateral dimension being less than said longitudinal dimension, comprising the steps of:

forming a ball bond with a first end of a wire on a first surface at a first location with said capillary;

moving said capillary to a second surface at a second location so that said wire extends from said first location to said second location;

performing relative rotation of said capillary with respect to said second surface so that said wire extends from beneath one of said third and fourth side walls;

forming a stitch bond on said second surface at said second location.

5,465,900

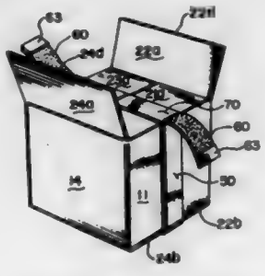
PRETAPED CONTAINER BLANKS

Eugene L. Baratto, Somerset, Wis.; John R. David, Stillwater, Minn.; Curtis L. Larson, Hudson, Wis.; Thomas L. Nelson, Woodbury, and Norbert E. Wrobel, Marine on the St. Croix, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 132,805, Oct. 7, 1993, abandoned. This application Jan. 13, 1995, Ser. No. 372,850

Int. Cl.[6] B65D *5/42*

U.S. Cl. 229—125.39 **36 Claims**



1. A pretaped container blank for assembly into a three-dimensional container, comprising:

(a) a container blank including (i) a plurality of laterally interconnected panels, including a primary panel, each of said panels including first and second longitudinal ends defining first and second laterally extending edges respectively, and (ii) a first set of closure flaps, including at least one first primary closure flap, each flap of the closure flaps having a proximal edge hingedly connected to an adjoining one of the first laterally extending edges of the panels and a distal edge longitudinally spaced from the panels wherein the closure flaps are in paired relationship with the panels; and

(b) a tape structure attached to the container blank and including at least (i) a release surface extending longitudinally along the primary closure flap from proximate the proximal edge to proximate the distal edge of the primary closure flap, and (ii)

a length of closure adhesive tape, wherein a first portion of the closure adhesive tape is mounted on the release surface and extends over substantially the entire length of the primary closure flap and a second portion of the closure adhesive tape is mounted a distance across the adjoining panel sufficient for the closure adhesive tape to remain attached to the container blank upon removal of the first portion from the primary closure flap;

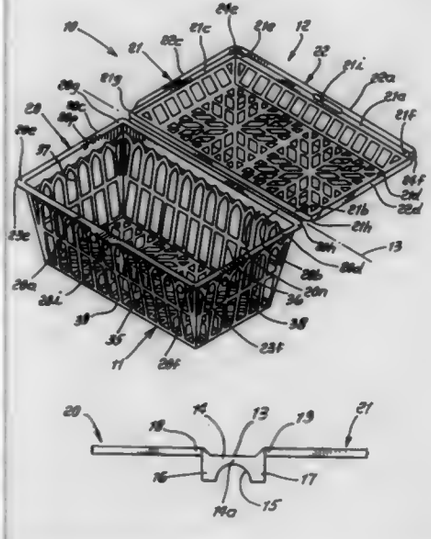
wherein the tape structure is positioned along the proximal edge of the primary closure flap such that the closure adhesive tape can secure the first set of closure flaps in an overlapping closed position in the assembled container by peeling the tape from the primary closure flap, folding the closure flaps in an overlapping relationship with the closure flaps positioned immediately to either side of the primary closure flap closed last, and the closure tape adhesively applied to the last closed closure flaps over its original position on the primary closure flap.

5,465,901

BASKET FOR PRODUCE

Derrick Paine, Jr., 3889 Karen Lynn Dr., Glendale, Calif. 91206

Filed Dec. 1, 1994, Ser. No. 352,148
Int. Cl.[6] B65D *1/34;1/138*
U.S. Cl. 229—407 **12 Claims**



1. A produce basket, comprising:

a) a plastic openwork receptacle and a plastic openwork cover therefor, said receptacle and cover having plastic hinge interconnection,

b) said receptacle having an upper rectangular ledge, facing upwardly, and said cover having a lower rectangular ledge facing downwardly, in closed connection, said upper and lower ledges sized to register upon closing of the cover over the receptacle, each ledge having two laterally spaced longitudinally elongated first sections, and two longitudinally spaced laterally extending second sections, each first section being about twice the length of each second section; there being four corners formed by intersecting of said first and second sections of each ledge,

c) there being a primary tongue and groove interconnection of said ledges at a first pair of said corners formed by said ledges, and a secondary tongue and groove interconnection of said ledges at a second pair of said corners formed by said ledges,

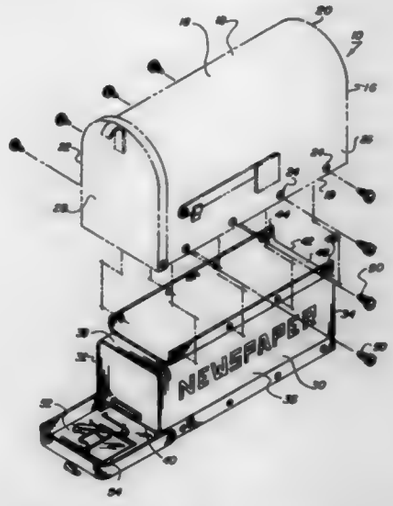
d) and there being a tertiary tongue and groove interconnection of said ledges at an elongated location along two of said longitudinally elongated ledge sections, intermediate said first and second pairs of corners.

5,465,907

MULTI-FUNCTIONAL MAILBOX

Terry E. Hanson, 5045 Hanson Rd., Hermantown, Minn. 55810

Filed May 9, 1994, Ser. No. 239,909
Int. Cl.[6] B65D *91/00*
U.S. Cl. 232—33 **7 Claims**



1. A new and improved mailbox improvement comprising in combination:

a mail housing having an open first end, a closed second end, an intermediate extent therebetween, the mail housing having a recessed flat bottom and an arced top, a right sidewall extending below the recessed flat bottom intermediate the open first end and the closed second end, a plurality of apertures formed along the right sidewall, a left sidewall extending below the recessed flat bottom intermediate the open first end and the closed second end, a plurality of apertures formed along the left sidewall;

a mail housing lid hingedly secured to the open first end of the mail housing;

a newspaper housing having an open first end, a closed second end, and an intermediate extent therebetween, the newspaper housing having a flat top and a flat bottom, a U-shaped piece having a first extension, a second extension, and a planar portion therebetween, the planar portion secured to the flat top of the newspaper housing, the U-shaped piece dimensioned to be received within the recessed bottom of the mail housing; fastening means securing the first extension of the U-shaped piece to the right sidewall of the mail housing and the second extension of the U-shaped piece to the left sidewall of the mail housing;

a newspaper housing lid hingedly secured to the open first end of the newspaper housing; and

a sliding indicator means secured within the newspaper housing lid, the sliding indicator means having a first position indicating the presence of mail and a second position indicating the absence of mail.

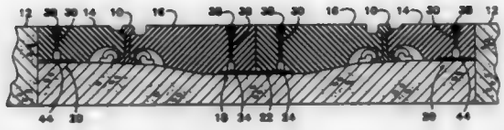
5,465,983

MOUNTING PLATE FOR FIXING ELASTOMERIC GRADE CROSSING PANELS TO TIES

R. Andrew Davis, Lake Oswego, and Rolf Heineman, Portland, both of Oreg., assignors to Riedel Omni Rubber Products, Inc., Portland, Oreg.

Filed Feb. 3, 1992, Ser. No. 829,709
Int. Cl.[6] E01B *21/00*
U.S. Cl. 238—8 **8 Claims**

1. A system for mounting a railroad grade crossing, of the type where a plurality of side-by-side elastomeric field panels are located between each rail and the edge of the roadway that crosses



the rails and a plurality of side-by-side elastomeric gauge panels are located between the rails, without penetrating the ties that support the rails, said panels having a lower surface that rests on the ties and an upper surface that supports vehicles passing over the grade crossing, said system comprising:

(a) a plurality of plates that rest on selected ties and have upwardly-extending projections;

(b) means associated with said projections for threadedly receiving bolts;

(c) the panels having openings extending therethrough, the portions of said openings adjacent to the lower surfaces of the panels defining recesses that matingly receive said projections, and the portions of said openings adjacent to the upper surfaces of the panels defining counterbores;

(d) bolts that extend through said openings into threaded engagement with said engagement means in said projections, said bolts having heads that fit within said counterbores below said upper surfaces of the panels; wherein

(e) each of said plates contains projections that mate with recesses in two or more side-by-side panels.

5,465,904

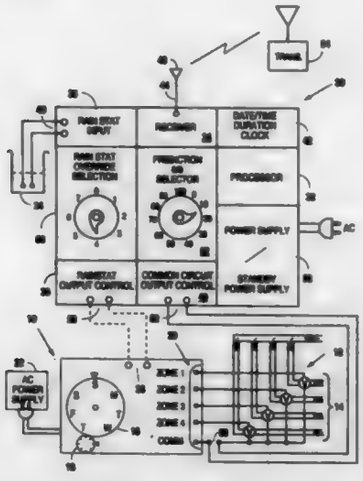
DOMESTIC WATERING AND AGRICULTURAL IRRIGATION CONTROL SYSTEM

Donald B. Vaello, 12000 Crown Point Dr., Suite 175, San Antonio, Tex. 78233

Filed Dec. 3, 1993, Ser. No. 161,722

Int. Cl.[6] B05B *1/12;* **A01G** *25/16*

U.S. Cl. 239—69 **9 Claims**



1. A system for controlling the distribution of water for lawn care or for agricultural operations in an irrigation system, wherein said system utilizes measured rainfall data, predictive rainfall data and restrictive watering data to control said distribution of water and wherein said predictive rainfall data and said restrictive watering data are received as a coded signal from a remote, centralized signal transmitter, said system, comprising:

a timer means for periodically activating a flow of water in said irrigation system;

a rain stat for obtaining measured rainfall data and a means for communicating a level of rainfall within said rain stat to a processor means;

a signal receiver capable of receiving a signal transmitted by said signal transmitter and capable of decoding said signal and a means for communicating said decoded signal to said processor means, wherein said decoded signal provides said predictive rainfall data and said restrictive watering data;

a prediction percentage selector which can be preset at the percentage level for the chance of rain at which normal operation of said timer means should be interrupted when said predictive rainfall data exceeds said preselected percentage level;

said processor means utilizing said measured rainfall data, said predictive rainfall data and said restrictive watering data to determine appropriate interruptions in said periodic activation of said irrigation system effected by said timer means;

wherein said processor means interrupts the normal operation of said timer means when at least one of said measured rainfall data and said predictive data exceeds a preselected level and said restrictive data indicates that watering restrictions are in effect which makes unnecessary a timed irrigation.

5,465,905

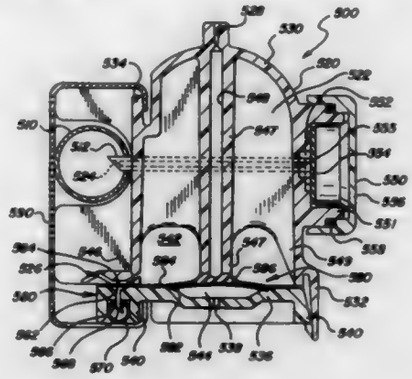
IRRIGATION SYSTEM WITH MULTI-FUNCTIONAL IRRIGATION CONTROL VALVES

Jack E. Elder, Rochester, Mich., assignor to Mister Dripper Company, LLC, Richmond, Ind.

Filed Mar. 17, 1994, Ser. No. 214,813

Int. Cl.[6] B05B *1/08;1/12;1/16*

U.S. Cl. 239—75 **33 Claims**



1. An irrigation control valve in an irrigation system comprising:

at least one tube supplying a liquid at a pressure;

a control valve body having an inlet port coupled to said at least one tube and in fluid communication with said liquid therein, a first end portion having a drip port provided therein for providing drip irrigation and a second end portion having a mist port provided therein for providing mist irrigation; and

a displaceable structure disposed within said control valve body and responsive to a remotely-generated control signal;

whereby the irrigation control valve alternately provides drip irrigation when said control signal is in a first control state and mist irrigation when said control signal is in a second control state.

5,465,906

ELECTROMAGNETICALLY ACTUATABLE INJECTION VALVE HAVING SWIRL CONDUITS

Waldemar Hans, Bamberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

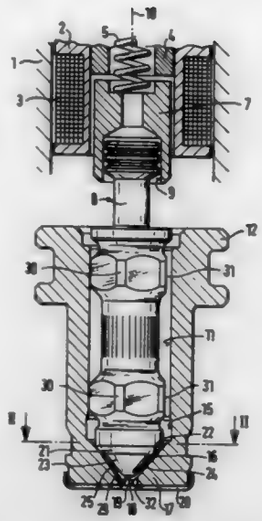
Continuation of Ser. No. 947,599, Sep. 21, 1992, abandoned. This application Feb. 21, 1995, Ser. No. 391,304

Claims priority, application Germany, Sep. 21, 1991, 41 31 499.9

Int. Cl.[6] F02M *51/06;61/18*

U.S. Cl. 239—489 **6 Claims**

1. An electromagnetically actuatable injection valve for fuel injection systems of internal combustion engines, having a core, a



magnet coil and an armature, an actuatable conical valve closing member comprising a first cone (21) and downstream thereof a second cone (23), said first cone (21) cooperating with a conical sealing face of a conical valve seat face (16) of a nozzle body, said second cone (23) extends as far as said valve seat face extends, an injection conduit (18) is disposed downstream of the valve seat face in said nozzle body, said injection conduit having an inlet at a downstream end of said valve seat face and has an outlet downstream of said inlet and the valve seat face, which forms a terminal port (19) at said outlet, the valve seat face (16) downstream of the sealing face (22), has at least one swirl conduit (29) which opens toward the second cone (23) on said closing member, said at least one swirl conduit is located in a swirl segment (25) of said nozzle body and extends in said nozzle body down to the terminal port (19) of the injection conduit (18).

5,465,907

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

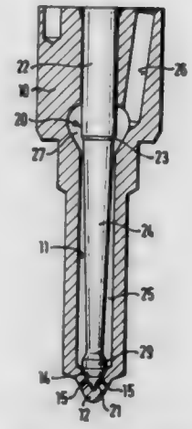
Karl Hofmann, Remseck, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 3, 1994, Ser. No. 176,995

Claims priority, application Germany, Feb. 10, 1993, 43 03 813.1

Int. Cl.[6] F02M *61/20*

U.S. Cl. 239—533.9 **4 Claims**



1. A fuel injection nozzle for self-igniting internal combustion engines, comprising a nozzle body having a blind bore, a conical valve seat face in a bottom end portion of said blind bore, injection ports which begin in said conical valve seat face are formed in said bottom end portion of said blind bore, a valve needle loaded by a closing force, the valve needle being displaceably guided by a guide segment (22) in an inlet region of the nozzle body, said valve needle includes a closing cone on a free end of a following segment (24) of reduced diameter of said valve needle that adjoins the guide segment (22) and the closing cone, the following segment (24) tapers conically toward the closing cone (21) and the closing cone cooperates with the conical valve seat face in the bottom end portion of said blind bore to close and open said injection ports that begin in said conical valve seat face.

5,465,908

GAS-FEEDING NOZZLE

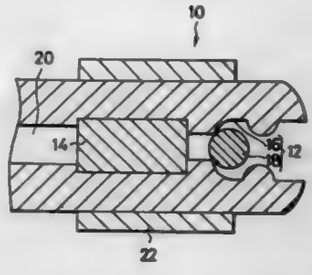
Akimasa Kaneishi, and Akinori Toyota, both of Hiratsuka, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

Filed Feb. 23, 1994, Ser. No. 200,517

Claims priority, application Japan, Mar. 5, 1993, 5-045116; Jan. 19, 1993, 5-261176

Int. Cl.[6] B05B *1/32*

U.S. Cl. 239—571 **5 Claims**



1. A gas-feeding nozzle for use in a mold of an injection molding machine for introducing a pressurized gas into a molten resin injected into a cavity in the mold, to produce a molded article having a hollow structure, the gas-feeding nozzle comprising a non-return valve and a filter to prevent the inflow of molten resin, wherein the non-return valve is provided at an outlet end of the gas-feeding nozzle, and wherein the filter is provided upstream of the non-return valve relative to the flow direction of the pressurized gas and has a multiplicity of openings through which the pressurized gas is to be passed.

5,465,909

TALKING CONTRIBUTION BOX

Rudolf Roth, 3556 Boutwell Rd., Lake Worth, Fla. 33461

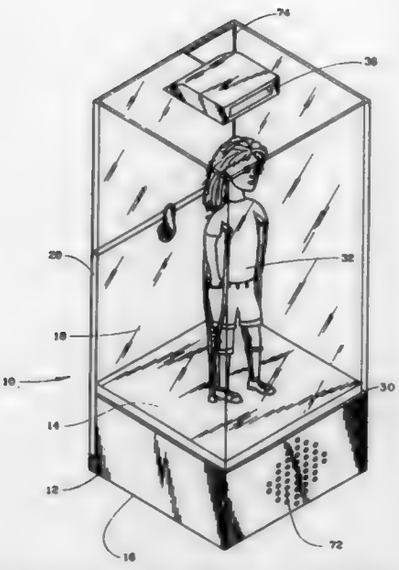
Continuation of Ser. No. 827,369, Jan. 29, 1992, abandoned. This application May 13, 1993, Ser. No. 61,775

Int. Cl.[6] A47C *1/12*; B65D *91/00*

U.S. Cl. 232—10 **5 Claims**

1. An improved portable talking contribution box for soliciting monetary contributions for a specific predetermined cause having an opaque, substantially square pedestal having a top wall and a bottom wall separated by four equal sized sidewalls defining an interior chamber therebetween, said top wall disposed horizontal to said bottom wall, a transparent enclosure having a substantially square cover bounded along its outer edges by four equally sized sidewalls extending upwardly from said pedestal sidewalls defining an interior chamber for placement over said top wall of said pedestal, said cover having a slot located therein for insertion of currency and coins from above, said interior chamber receiving and retaining said currency and coins, one of said side walls of said enclosure including a hingedly connected access door having a means for locking, said contribution box comprising:

an exchangeable visual display embodying a specific contributable cause disposed within said interior chamber of said enclosure supported by said top wall of said pedestal;



a playing means having at least two independently programmable channels, one channel having a programmed message to assimilate said visual display and said contribution cause for acknowledging receipt of a contribution logistically located in said interior chamber of said pedestal and actuated by insertion of currency in said slot; and

a means for detecting enclosure movement operatively associated with said playing means for activation of a second channel having a prerecorded warning message;

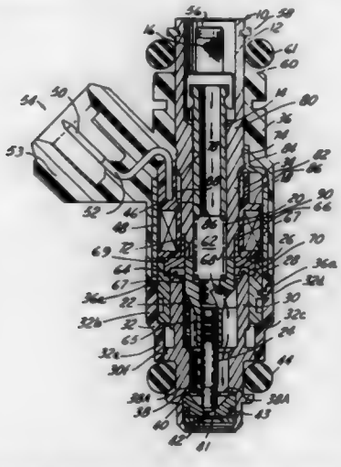
whereby placement of the visual display within the interior of said enclosure visually illustrates said cause of the request for contribution and wherein insertion of money through said slot is acknowledged by use of said programmed message assimilating the visual display and said contribution cause.

5,465,910

OVERMOLDED COVER FOR FUEL INJECTOR POWER GROUP AND METHOD

Bryan C. Hall; David P. Wieczorek, both of Newport News; Gordon H. Wyant, Hampton; Ramond T. Wildeson, Yorktown, and Debora E. Nally, Williamsburg, all of Va., assignors to Siemens Automotive Corporation, Auburn Hills, Mich.

Filed Aug. 18, 1994, Ser. No. 292,459
Int. Cl.[6] F16K *31/06*
U.S. Cl. 239—585.4 **5 Claims**



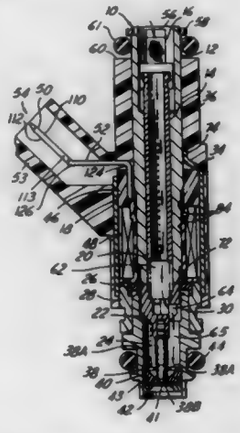
1. An electrically operated fuel injector for injecting fuel into an internal combustion engine comprising a fuel inlet via which fuel enters the fuel injector, a nozzle via which fuel is injected into an engine from the fuel injector, an internal passage within said fuel injector for conveying fuel that has entered said fuel inlet to said nozzle, at least a portion of said internal passage being within a metallic valve body structure of the fuel injector that contains said nozzle, a mechanism, comprising an electrical actuator and a valve, for selectively opening and closing said internal passage in accordance with selective energizing of said electrical actuator, a non-metallic cover on an exterior of said fuel injector having a sidewall extending axially in covering relation to said actuator and to a portion of a cylindrical metallic part that extends toward said nozzle and to which said valve body structure is joined, said sidewall of said non-metallic cover leaving another portion of said cylindrical metallic part exposed, and a groove extending circumferentially around an outside of said another portion of said cylindrical metallic part.

5,465,911

ANGLED TERMINAL/COIL DESIGN FOR SMALL DIAMETER FUEL INJECTOR

Bryan C. Hall, Newport News, Va., assignor to Siemens Automotive L.P., Auburn Hills, Mich.

Filed Aug. 18, 1994, Ser. No. 292,460
Int. Cl.[6] F16K *31/06*
U.S. Cl. 239—585.4 **17 Claims**



1. An electrically operated fuel injector for injecting fuel into an internal combustion engine comprising a fuel inlet via which fuel enters the fuel injector, a nozzle via which fuel is injected from the injector, an internal passage within said fuel injector for conveying fuel from said fuel inlet to said nozzle, a mechanism comprising a solenoid-operated valve for selectively opening and closing said internal passage in accordance with selective energizing of an electromagnetic coil of an electromagnetic coil assembly that, in addition to said coil, comprises a pair of electrical terminals that form terminations for said coil and are spaced circumferentially from each other about said coil assembly, said stator comprising a circular cylindrical side wall disposed in a central through-hole in said electromagnetic coil assembly, each of said pair of terminals being a length of formed metal having a first section of its length extending from said coil generally parallel to said circular cylindrical side wall of said stator and spaced slightly radially outwardly of said circular cylindrical side wall of said stator, each of said first sections of said terminals having a transverse cross section of a shape that provides each of said first sections with a flat planar surface that faces, and extends lengthwise parallel with, said circular cylindrical side wall of said stator, each of said pair of terminals further having a second section of its length spaced from its respective first section and adapted for making contact with a respective mating terminal for connecting the fuel injector to a control circuit for selectively energizing said coil, wherein said surfaces of said first sections of said terminals that face said circular cylindrical side wall of said stator are disposed in respec-

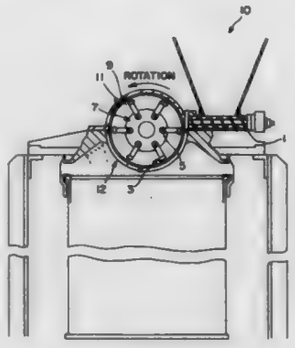
tive imaginary planes that intersect each other at a location that is circumferentially between them and further radially outwardly from said circular cylindrical side wall of said stator than any portion of either of said flat planar surfaces of said first sections of said terminals.

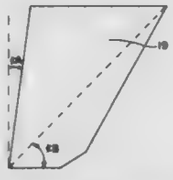
5,465,912

PULVERIZING AND GRINDING HAMMER

James B. Graybill, Berkeley Heights; Larry M. Hixon, Pittstown, and Ching-Chung Huang, Summit, all of N.J., assignors to Hosokawa Micron International Inc., New York, N.Y.

Filed Mar. 11, 1994, Ser. No. 212,590
Int. Cl.[6] B02C *13/04;13/28*
U.S. Cl. 241—27 **16 Claims**





12. A method of grinding and pulverizing a material in a hammer mill, comprising the steps of:

providing a plurality of hammers each comprising a head for impacting material within the hammer mill, two parallel legs extending from the bottom of each head, and a metallic insert attached to a portion of an impact surface of each head, said metallic insert having a substantially trapezoidal cross section in which the top and bottom are approximately parallel, the front edge and bottom edge form an acute angle of approximately 75 degrees or more, and the rear edge and bottom edge form an angle greater than 105 degrees, so that the top surface initially has more surface area than the bottom surface;

pivotally attaching the two parallel legs of said hammers to the rotor of the hammer mill;

feeding material to be ground and pulverized into the hammer mill; and

rotating the rotor to grind and pulverize the material.

5,465,913

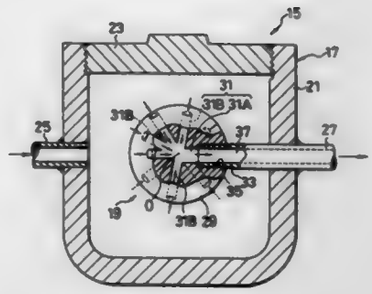
ATOMIZER

Tomihisa Naito, Tokyo, Japan, assignor to Nanomizer, Inc., Tokyo, Japan

Filed Sep. 30, 1994, Ser. No. 315,919
Claims priority, application Japan, Jan. 1, 1993, 5-246658
Int. Cl.[6] B02C *19/06*
U.S. Cl. 241—39 **20 Claims**

1. An atomizer for atomizing a material into fine particles thereof, comprising

an atomizing unit comprising:



a container having an inner space;

an inlet for communicating the inner space of the container to the outside thereof;

a honeycomb body being provided in the inner space of the container at a distance from the container and having a peripheral surface, a plurality of first holes and a second hole, each of the first holes and the second hole being inwardly bored from the peripheral surface to connect with one another at the inside of the honeycomb body; and

an outlet tube being connected to the honeycomb body and extending to the outside of the container for communicating the second hole and the outside of the container, and

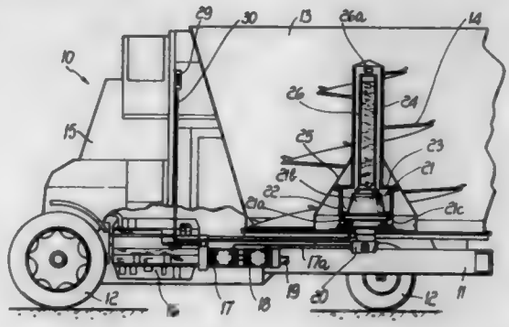
a pump for forcibly supplying the material with a liquid medium into the inner space of the container through the inlet, so that the material is forcibly supplied into the inner space through the inlet and passes through the inner space, the first holes and the second hole of the honeycomb body, and the outlet tube.

5,465,914

TRANSMISSION FOR COMBINED SHREDDING AND MIXING TRUCKS FOR FIBROUS ZOOTECHNICAL PRODUCTS

Tiziano Faccin, Via Padova 102, 35026 Conselve (Prov. of Padova), Italy

Filed Dec. 27, 1993, Ser. No. 172,951
Int. Cl.[6] B02C *19/00*
U.S. Cl. 241—101.71 **11 Claims**



1. A transmission in a combined shredding and mixing truck for fibrous zootechnical products, the truck comprising a wheeled chassis that is towed or independently powered and supports a substantially inverted frustum-shaped container which is open at the top and contains a scroll with a vertical axis for shredding and mixing said fibrous products, the transmission comprising an epicyclic reduction unit mounted on said chassis and a vertically upstanding shaft having a first free end thereof projecting towards said open top of the container, said shaft supporting said scroll thereby said scroll extending upwardly from said reduction unit, wherein said reduction unit is substantially composed of two parts that are rotatably coupled to one another on a same axis, a first part being bolted to the bottom of said container and a second part being axially connected to a second lower end of said shaft for rotating therewith, and said shaft supporting said scroll.

5,465,915

APPARATUS FOR DIVIDING A FLOW OF FIBROUS MATERIAL INTO AT LEAST TWO EQUALLY METERED FLOWS

Arne Ahlen, Roswell; Anders Mokvist, Snellville, both of Ga., and Thor Johansen, Prior Lake, Minn., assignors to Sunds Defibrator Industries Aktiebolag, Sweden

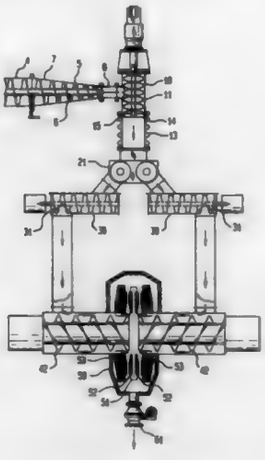
PCT No. PCT/SE92/00801, § 371 Date Jul. 19, 1994, § 102(e) Date Jul. 19, 1994, PCT Pub. No. WO93/11295, PCT Pub. Date Jun. 10, 1993

PCT Filed Nov. 23, 1992, Ser. No. 256,749

Claims priority, application Canada, Nov. 25, 1991, 2-056092

Int. Cl.[6] B02C *23/02*

U.S. Cl. 241—247 9 Claims



1. Apparatus for controlling the flow of fibrous material comprising a substantially horizontal feeder press including an inlet end and an outlet end for feeding a plug of said fibrous material therebetween, a vertical housing having a lower outlet end, at least one rotatable spreader screw disposed in said vertical housing, said outlet end of said feeder press connected to said vertical housing so that the plug contacts said spreader screw, a metering housing having an inlet end in flow communication with said outlet end of said vertical housing and an outlet end, at least two metering screws disposed in said metering housing, said metering screws being disposed below said outlet end of said vertical housing, and spreader disk means disposed at said outlet end of said vertical housing for disintegrating said fibrous material and distributing said disintegrated fibrous material to said metering housing containing said metering screws.

5,465,916

WINDING UP AT LEAST ONE SYNTHETIC-RESIN YARN

Günter König, Uhingen-Baiereck, Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Germany

Filed Sep. 29, 1993, Ser. No. 128,846

Claims priority, application Germany, Jan. 6, 1992, 42 33 638.4

Int. Cl.[6] B65H *54/00;75/28*

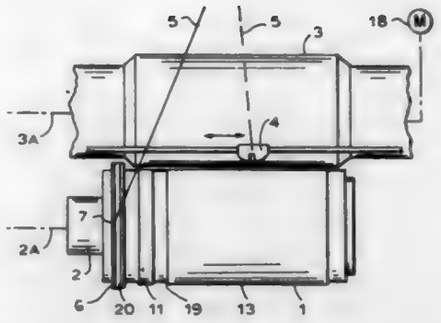
U.S. Cl. 242—18 PW 15 Claims

1. An apparatus for winding a synthetic-resin yarn on a spool of predetermined outside diameter, the apparatus comprising:

a friction drive roller rotatable about a drive axis and having a substantially cylindrical outer surface of predetermined length centered on the drive axis;

means for continuously rotating the drive roller about the drive axis at a substantially constant speed;

a support adjacent the friction roller holding the spool for rotation about a spool axis generally parallel to the drive axis and with the spool in radial contact with the surface of the drive roller;



a radially outwardly projecting ridge carried on the support axially offset from the surface of the friction roller and of greater outside diameter than the spool; and

guide means for feeding the yarn initially to the ridge for winding of the yarn thereon and for thereafter for feeding the yarn to the spool for winding of the yarn on the spool.

5,465,917

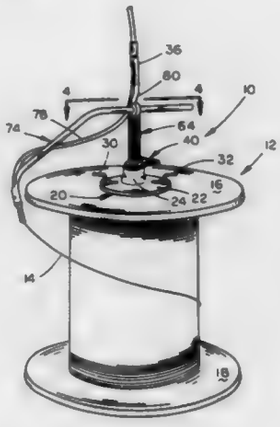
WELDING WIRE DISPENSER WITH ADJUSTABLE BRAKE

Delmar D. Koech, 1730 Woodland Dr., Columbus, Nebr. 68601

Filed May 23, 1994, Ser. No. 247,859

Int. Cl.[6] B65H *49/00*

U.S. Cl. 242—128 6 Claims



1. A welding wire dispenser for dispensing welding wire wound upon a welding wire spool to a welder, said welding wire spool having an upper plate, comprising:

a support base secured to said upper plate of said spool and including an upstanding hub;

a vertically disposed shaft having its lower end rotatably mounted in said hub;

an arm having inner and outer ends;

said arm having its inner end rotatably mounted on said shaft above said hub and extending outwardly therefrom;

a brake operatively interconnecting said arm and said hub for yieldably resisting the rotation of said arm with respect to said hub;

a spring mounted on said shaft and having upper and lower ends;

the lower end of said spring being in operative engagement with said arm wherein rotational movement of said shaft in one direction will cause said lower end of said spring means to rotate said arm in said one direction against the yieldable resistance of said brake;

a let-off arm secured to said shaft for rotation therewith;

said let-off arm extending outwardly from said shaft;

said let-off arm rotating with respect to said hub in one direction as the welding wire is pulled from the spool;

a welding wire guide secured to said let-off arm for guiding the wire being pulled from the welding wire spool;

the upper end of said spring being operatively secured to said let-off arm whereby the rotation of said let-off arm in said one direction, as welding wire is pulled from the spool, will cause said spring to be at least partially compressed against the yieldable resistance of said brake, so that said spring will maintain tension in the welding wire between said welding wire guide and the spool so that the coils of wire on the spool will not shingle when the pulling force on the welding wire is discontinued.

5,465,918

CURRENT SUPPLY CIRCUIT AND CONTROL METHOD FOR SUPPLY CURRENT IN A MAGNETIC TAPE APPARATUS

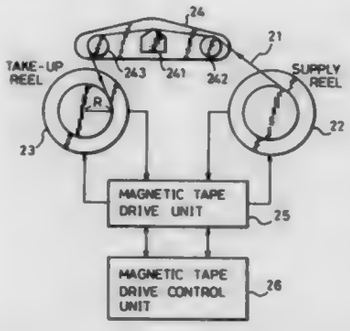
Shuko Watanabe, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 927,613, Aug. 10, 1992, abandoned. This application Oct. 4, 1994, Ser. No. 317,845

Claims priority, application Japan, Aug. 13, 1991, 3-202910

Int. Cl.[6] G11B *15/43*

U.S. Cl. 242—334.2 **12 Claims**



1. A current supply circuit for supplying a current to a reel-drive motor in a magnetic tape apparatus, comprising:

a conversion table storing a digital command representing a relationship between a radius of the magnetic tape wound on a reel and a target current to be supplied to the reel-drive motor, and the target current being converted to a digital command;

a correction table storing a digital correction value representing a relationship between the digital command and an actual current flowing in the motor when the digital command is applied to the motor, the actual current being converted to a digital value;

command means for outputting the digital command corresponding to the target current in accordance with the conversion table;

supply current control means for supplying an analog current converted from the digital command to the motor;

first correction means for applying a first correction signal to the supply current control means in response to the actual current flowing in the motor; and

second correction means for supplying, separately from the first correction signal, a second correction signal to the supply current control means in accordance with the digital correction value stored in the correction table, the digital correction value corresponding to the digital command being applied to the current control means.

5,465,919

STRIP WINDING MECHANISM

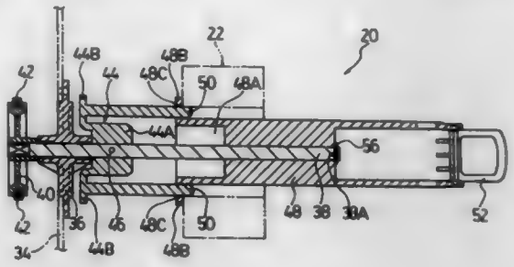
Koji Kikuchi, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Oct. 18, 1994, Ser. No. 325,030

Claims priority, application Japan, Jan. 18, 1993, 5-061047 U

Int. Cl.[6] B65H *18/10;75/28*

U.S. Cl. 242—532.6 **18 Claims**



1. A strip winding mechanism comprising:

a rotary shaft;

a rotary member fixed on the rotary shaft and having at least one projecting pin member extending parallel to the rotary shaft; and

a rotary core slidably supported on the rotary shaft and engageable with the rotary member to be rotatable integrally therewith;

the rotary core being adapted to receive a strip to be wound thereon, the strip being wound on the rotary core by engaging the rotary core with the rotary member, inserting a leading end of the strip between the pin member and a surface of the rotary core and rotating the rotary member to wind the strip onto the rotary core over the pin member, a roll of strip wound on the rotary core being made removable therefrom by sliding the rotary core in a direction away from the rotary member to at least partly disengage it from the rotary member, thereby extracting the pin member from the roll of strip and relaxing its winding tension.

5,465,920

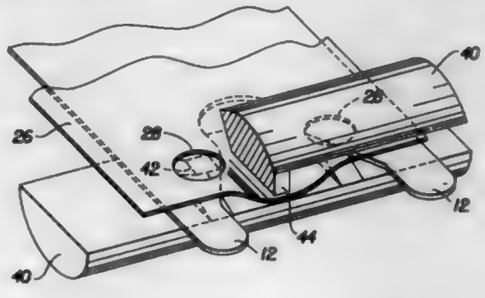
TOOL AND METHOD FOR DETACHING A TRAILING END PORTION OF A FILMSTRIP FROM AT LEAST ONE HOOK ATOP A RAMP ON A FILM SPOOL INSIDE A FILM CARTRIDGE

Thomas C. Merle; Dale W. Ryan, and David L. Rowden, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 27, 1993, Ser. No. 98,112

Int. Cl.[6] G03B *1/56*

U.S. Cl. 242—348.1 **7 Claims**



1. A tool for detaching a trailing end portion of a filmstrip from at least one hook atop a ramp on a film spool inside a film cartridge, when said tool is inserted inwardly through a film ingress/egress slot in the cartridge, said tool comprising:

a flexible element having a leading first portion followed by a wider second portion each configured to be successively inserted inwardly through the slot of the cartridge beneath a film section in the slot such that when the wider second portion is forced to slide up the ramp on the spool the leading first portion will push the trailing end portion of the filmstrip off the hook atop the ramp, wherein an end of said first portion away from said second portion is rounded such that said first portion can be inserted into said film ingress/egress slot without becoming jammed.

5,465,921

BRAKE DEVICE FOR VIDEO CASSETTE TAPE RECORDER

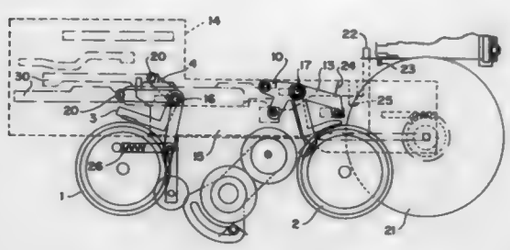
In K. Cheon, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 30, 1993, Ser. No. 176,570

Claims priority, application Rep. of Korea, Dec. 31, 1992, 1992-27118

Int. Cl.[6] G11B *15/48*

U.S. Cl. 242—355.1 **2 Claims**



1. A brake device for a video cassette tape recorder, said recorder having a supply reel and a take-up reel rotatably mounted on a base plate, comprising:

a wheel driven by a motor, said motor including a rotating force transmitting means:

a first brake and a first main brake both rotatably mounted on a common shaft at a side of said supply reel;

a second brake and a second main brake both rotatably mounted on a common shaft at a side of said take-up reel;

a resilient means for providing different brake forces to the first and second brakes and the first and second main brakes, said resilient means being mounted on the common shafts of said supply reel and said take-up reel;

a function means having guide grooves formed therein, for driving the first and second brakes, said function means being linearly movable by a movement of the wheel; and

an actuating means operatively in contact with the function means, said actuating means being operated by the rotating force transmitting means of the motor.

5,465,922

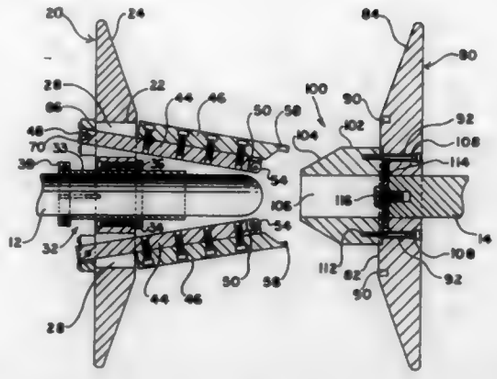
MANDREL WITH SELF-ALIGNING FLANGE

Lawrence Vander Groef, North Haledon, N.J., assignor to Communication Cable, Inc., Sanford, N.C.

Filed Jul. 26, 1993, Ser. No. 96,429

Int. Cl.[6] B65H *75/24*

U.S. Cl. 242—573 **14 Claims**



1. A mandrel for a winding machine comprising:

(a) a first flange adapted to be fixedly secured to a spindle of a winding machine;

(b) a core including a plurality of individual core segments pivotally secured at one end to the first flange and having a projection at the opposite end, said core segments being moveable between an expanded position and a collapsed position;

(c) a removable flange having a circumferential groove adapted to mate with the projections on the core segments when the core segments are in an expanded position;

(d) a guide member mounted to the inner surface of the removable flange, said guide member including an inclined surface for engaging the core segments and moving the core segments to the expanded position when the removable flange is moved in an axial direction towards the fixed flange so that the projections on the core segments are aligned with the circumferential groove in the removable flange; and

(e) a roller mounted on each of the core segments for engaging the inclined surface of the guide member.

5,465,923

VERTICAL TAKE-OFF/LANDING OF AIRCRAFT

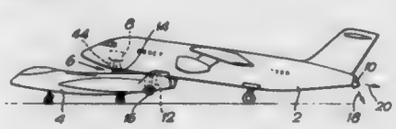
Paul Milner, Preston, Great Britain, assignor to British Aerospace PLC, London, England

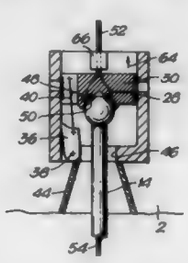
Filed Jul. 23, 1993, Ser. No. 95,438

Claims priority, application United Kingdom, Jul. 25, 1992, 9215846

Int. Cl.[6] B64C *37/02;* **B64D** *5/00*

U.S. Cl. 244—2 **5 Claims**





1. A composite aircraft comprising:

a fixed wing carrier aircraft constructed and arranged to provide in use a first component of lift,

another aircraft provided with propulsive force applying means for providing in use a second component of lift substantially equal in magnitude to said first component,

a connector comprising a connecting member constructed and arranged to extend from said carrier aircraft to said another aircraft,

respective attachment means, at least one of which is releasable, for attaching said carrier aircraft and said another aircraft to said connecting member, and

control means for controlling the releasable attachment means such that said carrier aircraft and said another aircraft are connected from takeoff until a predetermined stage of flight

during which period they are lifted and sustained in an airborne state as a composite aircraft by a combination of said first and said second components of lift, thereby allowing said another aircraft to takeoff substantially vertically, whereafter said another aircraft and said carrier aircraft are disconnected and are each able to continue flight separately,

wherein the connector comprises data transmission means for transmitting data between said carrier aircraft and said another aircraft.

5,465,924

INERTIAL STABILIZING SYSTEM

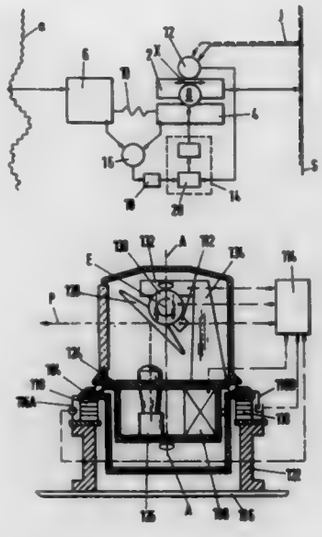
Heinrich Schneider, München, Germany, assignor to Deutsche Aerospace AG, Germany

Filed Nov. 15, 1993, Ser. No. 152,000

Claims priority, application Germany, Nov. 14, 1992, 42 38 512.1

Int. Cl.[6] B64D *47/08*

U.S. Cl. 244—118.1 **8 Claims**



1. An inertial stabilizing system for a platform which is supported on a carrier moved dynamically in a high-frequency and low-frequency manner, comprising:

a base between the carrier and the platform;

a damping device which connects the base to the carrier in a high-frequency vibration-insulated manner; and

at least one control circuit, coupled to the platform, the platform being arranged on the base and movable relative thereto in response to the control circuit, the control circuit including an inertial sensor which senses actual movements of the platform, a controller which forms an adjusting signal in response to a difference between an actual position and a desired position of the platform, and an adjusting device which is controlled by the adjusting signal and controls relative movement between the base and the platform;

wherein said control also includes a further sensor which senses low-frequency motion components of the damping device between the carrier and the base and generates a corresponding output signal, and a control circuit element which is connected to the output of the further sensor and reduces the difference between the actual position and the desired position according to the output signal of the further sensor.

5,465,925

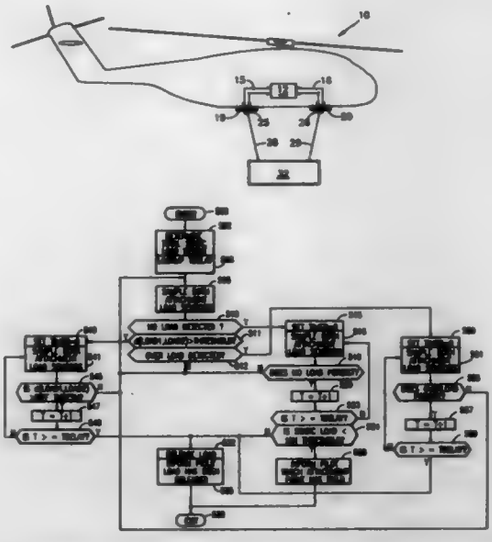
AUTOMATIC RELEASE OF A LOAD FROM A HELICOPTER EXTERNAL CARGO SUSPENSION SYSTEM

Christopher J. Connolly, Stamford; Thomas H. Lawrence, Seymour; Joseph J. Mankaukas, Ansonia; John J. Pawlowski, Shelton, and Matthew T. Smith, Milford, all of, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 27, 1994, Ser. No. 250,988

Int. Cl.[6] B64D *1/12*

U.S. Cl. 244—137.1 **25 Claims**



1. A helicopter external cargo suspension system, comprising:

at least one suspension point for externally suspending cargo from the helicopter;

each suspension point having a load sensor for sensing the weight exerted by cargo at each suspension point and for providing weight signals indicative thereof;

each suspension point having disconnect means responsive to the absence of a disconnect signal for maintaining a connection between the helicopter and cargo via said suspension point and responsive to the presence of said disconnect signal for disconnecting cargo from the helicopter;

signal processing means responsive to said weight signals for determining if a failure mode has occurred, and for providing a disconnect signal to all of said disconnect means if a failure mode is determined.

5,465,926

CODED TRACK CIRCUIT REPEATER HAVING STANDBY MODE

James P. Brown, Allison Park, Pa., assignor to Union Switch & Signal Inc., Pittsburgh, Pa.

Continuation of Ser. No. 958,501, Oct. 8, 1992, abandoned. This application Jun. 16, 1994, Ser. No. 260,537

Int. Cl.[6] B61L *21/08;23/22*

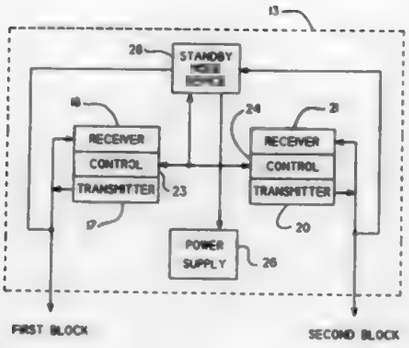
U.S. Cl. 246—34 B **15 Claims**

1. A coded railway track circuit apparatus electrically connectable to rails in first and second track blocks, said apparatus to communicate railway signal information including vehicle presence during normal operation, said apparatus comprising:

first transmitter means for transmitting coded track signals onto said first block;

first receiver means for receiving coded track signals from said first block;

second transmitter means for transmitting coded track signals onto said second block;



second receiver means for receiving coded track signals from said second block;

power supply means for providing operational power to said apparatus;

standby means for placing said apparatus in a reduced power standby mode upon occurrence of a preselected standby initiation signal by operably interrupting normal operation of said power supply means; and monitor means active during the standby mode for returning said apparatus to normal operation upon occurrence of a preselected wake-up signal.

5,465,927

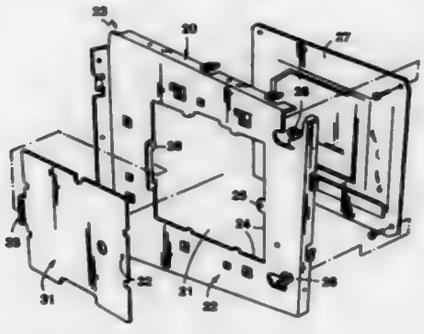
METAL BRACKET FOR A PRINTED CIRCUIT BOARD

Cho Chun-Jung, Taoyuan, Taiwan, Prov. of China, assignor to Acer Peripherlas, Inc., Taoyuan, Taiwan, Prov. of China

Filed Nov. 5, 1993, Ser. No. 147,629

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—271 **6 Claims**



1. A metal bracket for a printed circuit board, the printed circuit board defining a major board plane and generating an electromagnetic wave when operating, comprising: a bracket plate having a first surface on an internal side and a second surface on an external side, both of the first and second surfaces being substantially parallel to said major board plane, a window with an inner rim being formed on a substantially central area of the bracket plate for allowing a repair tool to access said major board plane of the printed circuit board, the inner rim having at least a first connecting means and at least a second connecting means connected to the first surface for securing the printed circuit board with the bracket plate;

a removable cover plate having a third connecting means coupled to the first connecting means for securing the cover plate with the bracket plate, the cover plate substantially covering the window on the external side preventing the leakage of the electromagnetic wave emitted from the printed circuit board.

5,465,928

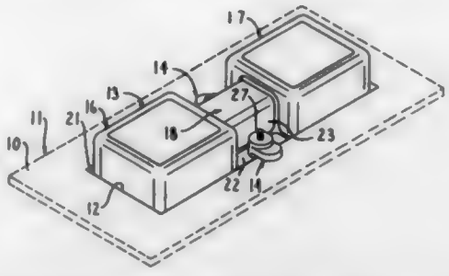
MOUNTING CLIP

Joseph E. Massie, Benton Harbor, Mich., assignor to E.I. Partners, Eau Claire, Mich.

Filed Aug. 5, 1994, Ser. No. 286,659

Int. Cl.[6] G12B *9/00*

U.S. Cl. 248—27.1 **4 Claims**



1. A combination of an assemblage and at least one mounting clip for mounting said assemblage into an opening of a finite size in a panel having frontwardly facing and rearwardly facing surfaces to facilitate a display of a front face of the assemblage from the frontwardly facing surface of the panel, wherein said assemblage comprises:

a) a first body member having said front face thereon which defines a frontwardly facing display surface having a cross-sectional area adapted to be larger than a cross-sectional area of the opening in the frontwardly facing surface of the panel;

b) a second body member projecting from a side remote from said frontwardly facing display surface, said second body member adapted to have a cross-sectional area less than a cross-sectional area of the opening and at least one region thereon defining a cavity between a side facing wall on said region of a rearwardly projecting part mutually opposing and adapted to be parallel to an edge surface of the opening; and

c) means defining a first hole extending through said front face of said first body member, an axis of said first hole being aligned with said side facing wall of said second body member and extending into said cavity;

and wherein said mounting clip comprises:

d) a third body member having a first body part received in said cavity and between said edge surface and said side facing wall and having a peripheral surface extending generally parallel to said edge surface and said side facing wall, means defining a generally arcuate surface extending partially on said peripheral surface, said third body member having a flange extending outwardly from said peripheral surface and adapted to overlie the rearwardly facing surface of the panel, said peripheral surface further having means defining a flat surface extending in a tangentially parallel relation to said arcuate surface outwardly beyond a theoretical continuation of said arcuate surface so as to define a stop adapted to engage at least one of said edge surface and said side facing wall on said region of said second body member;

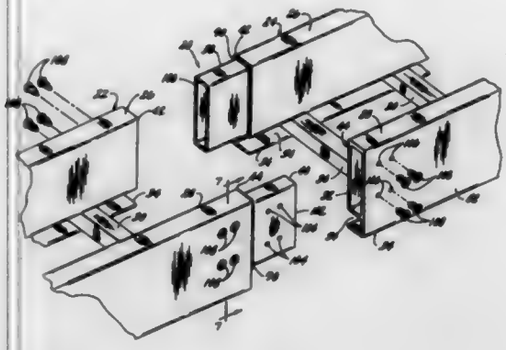
e) means defining an axially extending through second hole in said first body part, an axis of said second hole being parallel to said arcuate surface and congruent with a centerline for said arcuate surface and axially aligned with said first hole; and

f) externally threaded fastener means received in said first and second holes, a frictional resistance between said fastener means and said third body member causing said third body member to rotate about said axes of said first and second holes to bring said flange into a position overlying the rearwardly facing surface and said stop into engagement with at least one of said edge surface and said side facing wall of said second body member so as to prevent continued rotation of said second body member, a continued rotation of said externally threaded fastener means causing a clamping of the panel between a part of said display surface facing said panel and said flange and a fixed holding of the assemblage to the panel.

5,465,929
LADDER-TYPE CABLE TRAY SYSTEM

David M. Dooley, Lafayette, La., assignor to B-Line Systems, Inc., Highland, Ill., and Tray-Safe Inc., Lafayette, La.

Filed Aug. 19, 1993, Ser. No. 110,306
Int. Cl.[6] F16L 3/22
U.S. Cl. 248—681 18 Claims



1. A ladder-type cable tray system including,

a first cable tray section,

a second cable tray section,

each cable tray section comprising first and second rails extending lengthwise of the section at opposite sides of the section and a plurality of rungs adapted to extend between the rails at intervals spaced lengthwise of the section,

each of said first and second rails having a tubular portion forming a hollow beam extending the length of the rail, said tubular portion having open ends at opposite ends of the rail, and a rung-supporting portion integrally formed as one piece with said tubular portion, said rung-supporting portion depending from said tubular portion, said rung-supporting portion being generally L-shaped in a cross-section taken generally transversely with respect to the rail,

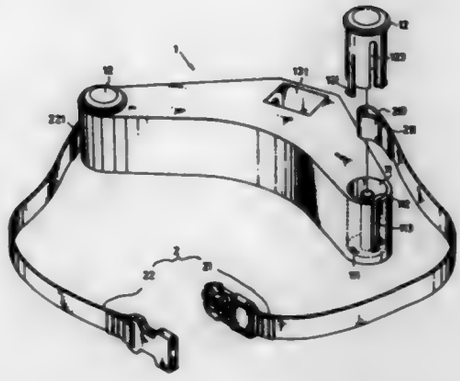
means for securing said rungs to said rung-supporting portions of said first and second rails in a position wherein the rungs span said rung-supporting portions, and

a plurality of splices for connecting said first and second cable tray sections end to end, said splices including a first splice sized and shaped for a snug telescoping fit within adjacent open ends of the tubular portions of said first rails of the two cable tray sections, and a second splice sized and shaped for a snug telescoping fit within adjacent open ends of the tubular portions of said second rails of the two cable tray sections, each rail of said first and second rails having a transverse cross sectional shape different from the transverse cross sectional shapes of said rungs and splices.

5,465,930
GOLF BAG CRADLE ASSEMBLY

Ching-Chang Wu, No. 35-1, Jih Hsin Street, Tu Cheng Hsiang, Taipei Hsien, Taiwan, Prov. of China

Filed Mar. 23, 1994, Ser. No. 216,318
Int. Cl.[6] A63B 55/00
U.S. Cl. 248—96 2 Claims



2. A golf bag cradle assembly comprising a golf bag cradle having two ends for mounting around a frame member of a golf cart, two straps for securing a golf bag to said golf bag cradle, two plug caps respectively fastened to said two ends of said golf bag cradle respectively holding said two straps in place,

said golf bag cradle including two recessed strap mounting holes respectively receiving said plug caps and arranged at two opposite locations; each said mounting hole including an elongated side slot providing said mounting hole with an opening extending outside of said golf bag cradle, a center including an upright post, and a bottom with a retaining holes,

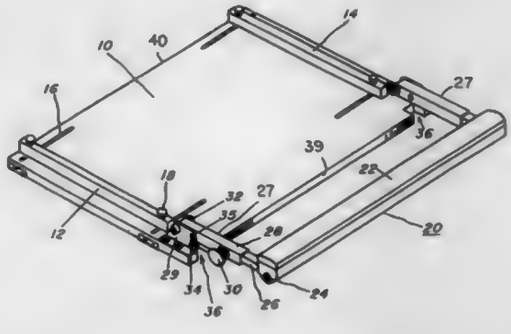
each said plug cap including a bottom with a hook hooked in said retaining hole of a respective said mounting hole, a peripheral wall surrounding a respective said upright post, a top over a respective said upright post, and a side slot disposed in parallel with a respective elongated side slot on said golf bag cradle; and

each said strap having a rear end terminating in a loop mounted around a respective said upright post, and a front end extending out of a respective said elongated side slot of said mounting holes and coupled with a strap connector.

5,465,931
MECHANISM FOR RELIEVING STRESS ON THE HANDS OF A PERSON OPERATING A COMPUTER KEYBOARD

Ray C. MacDonald, R.F.D. #3, Box 804, Skowhegan, Me. 04972

Filed Apr. 11, 1994, Ser. No. 225,771
Int. Cl.[6] B63G 5/00
U.S. Cl. 248—118.3 9 Claims



1. A mechanism for relieving stress on the hands of a person operating a computer keyboard, comprising:

a panel adapted to underlie a computer keyboard;

means carried by said panel for releasably anchoring the keyboard on the panel;

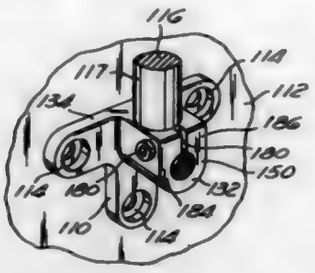
said panel having a front edge paralleling the front edge of the keyboard when the keyboard is positioned on the panel;

two parallel spaced arm structures, each arm structure having a rear end located above the panel, and a front end located forwardly beyond the panel front edge;

pivot means carried by said panel at the rear end of each arm structure for swingably adjusting said arm structures in vertical planes normal to the panel front edge; and

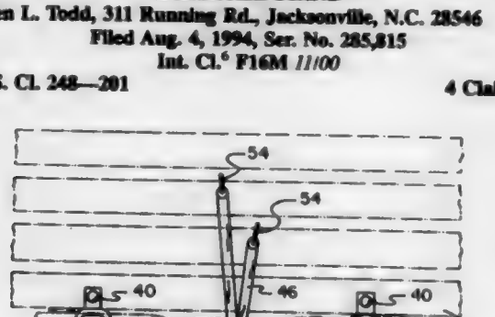
a horizontal hand-support bar extending between the front ends of said arm structures, whereby said bar is raisable or lowerable in front of the keyboard when said arm structures are swingably adjusted.

5,465,932
FLEXIBLE TELEPHONE MOUNT
Gary L. Richter, 1485 Southern Way, Sparks, Nev. 89431
Filed Mar. 25, 1993, Ser. No. 37,237
Int. Cl.[6] F16M 13/00
U.S. Cl. 248—160 6 Claims



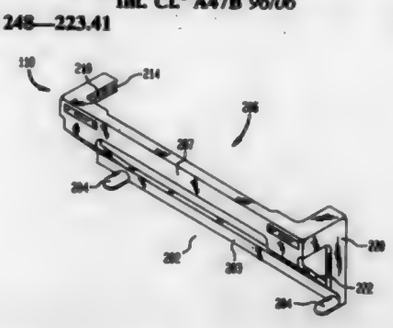
1. A flexible mount assembly for mounting a telephone within an automobile, said flexible mount assembly comprising:
a) a flexible elongate member having first and second male members formed upon ends thereof;
b) a base comprising:
(i) a flange having a plurality of mounting apertures formed therein for utilizing fasteners to attach said base to a support surface within the automobile;
(ii) a boss formed upon said base;
(iii) a first bore formed in said boss perpendicular to said flange;
(iv) a second bore formed in said boss perpendicular to said first bore;
(v) a split-yoke clamp formed in said boss and having a set screw, said split-yoke clamp being configured such that tightening the set screw results in tightening both the first and second bores to allow the flexible elongate member to be attached to the base by inserting the flexible elongate member into either bore;
c) a head comprising:
(i) a flange having a plurality of mounting apertures formed therein for utilizing fasteners to attach said head to a telephone;
(ii) a boss formed upon said flange;
(iii) a bore formed in said boss perpendicular to said flange;
(iv) a split-yoke clamp having a set screw formed in said body and configured such that tightening the set screw results in tightening of the bore about the second male member of said flexible elongate member; and
(v) a slot formed in said body at the base of said clamp to facilitate clamping action thereof.

5,465,933
TREE STAND BOW HOLDER RELEASABLY COUPLED TO A TREE STAND
Glen L. Todd, 311 Running Rd., Jacksonville, N.C. 28546
Filed Aug. 4, 1994, Ser. No. 285,815
Int. Cl.[6] F16M 11/00
U.S. Cl. 248—201 4 Claims



1. A new and improved tree stand bow holder releasably coupled to a tree stand comprising, in combination:
a pair of spaced U-shaped brackets, each with parallel legs, positionable in a common plane and attachable to a lower portion of the tree stand, the parallel legs of each U-shaped member constituting a bow rest fabricated of steel with a plastic coating, the brackets also including a plate with an aperture mountable to the bottom edge of the tree stand with the legs in a outwardly facing horizontal orientation;
a bow holder associated with one bracket, the bow holder consisting of a disk having a tube with threaded apertures therethrough, formed with the disk as a threaded cylindrical extension projecting from the disk, the disk being positionable on the top side of the legs with a threaded tube extending therethrough for coupling purposes by a threaded rod adapted to be threadably secured into the stabilizer hole of a bow;
a bolt and an associated wing nut extending through the aperture of the plate adapted to be coupled through an aperture in the bottom edge of the tree stand;
an elastic strap having opposed ends, each opposed end having an aperture with an s-shaped hook removably secured therethrough, the s-shaped hooks adapted to be suspended to a tree stand with the central extent of the strap extending down and around the central extent of the bow; and
rubber protective pads with peel-off plastic strips to expose self-sticking adhesive secured to the bottom edge of the tree stand to constitute a surface to protect the bow against abrasion from the tree stand.

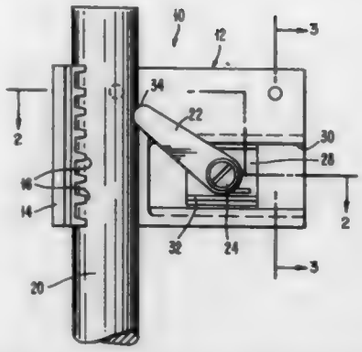
5,465,934
BRACKET FOR A CPU DAUGHTER CARD
Adolpho Gonzalez, San Jose, Calif., assignor to Silicon Graphics, Inc., Mountain View, Calif.
Filed Dec. 17, 1993, Ser. No. 168,165
Int. Cl.[6] A47B 96/06
U.S. Cl. 248—223.41 17 Claims



1. A bracket for securing a daughter card within a computer housing having a housing base, the bracket comprising:
a base having a base tab for slidably securing the bracket to the housing base; and
a securing means, coupled to said base, for engaging the daughter card and for securing the daughter card, said securing means having a slot for accepting an edge of the daughter card and a tab adjacent to said slot, said tab having a raised portion for securing the daughter card in said slot.

5,465,935
HOLDING MEANS FOR IMPLEMENT SHAFTS
Alfred Wilbs, Wutöschingen, Germany, assignor to Bajo Trading Anstalt, Balzers, Liechtenstein
Filed May 4, 1994, Ser. No. 237,696
Claims priority, application Germany, May 5, 1993, 43 14 770.4
Int. Cl.[6] A47G 1/10
U.S. Cl. 248—316.3 1 Claim

1. Holding means for shafts and tubes of implements comprising: a plate-shaped carrier to be fastened to a building wall and



having a plane; a resting jaw with at least one vertical resting face in a working position projecting from said carrier; a spring-loaded clamping jaw capable of being swivelled about a swivelling axis at right-angles to the plane of the plate-shaped carrier, said clamping jaw having a clamping face facing the resting jaw, a distance of said clamping face from the swivelling axis being greater than a distance of a shaft or tube resting against the resting jaw from the swivelling axis with the consequence that, when the holding means is in its working position, the clamping face of the clamping jaw is at a height above a height of the swivelling axis and the difference in height between said clamping face and the swivelling axis is smaller than the height of the resting face; a rubber belt ring wrapped around the entire clamping jaw under a pretension and active as an anti-slip device; the carrier defining a guide rail comprising a longitudinal guide slot; a slide piece displaceably guided within the guide slot, the slide piece having a thread hole, the clamping jaw having a bearing hole at an end thereof which is opposite the clamping face thereof; a spiral spring arranged between the slide piece and the clamping jaw, one end of the spiral spring resting against a floor projection of the slide piece and the other end of the spiral spring resting against a supporting face of the clamping jaw; and a bearing pin defining said swivelling axis and passing through the bearing hole of the clamping jaw and through the spiral spring and screwed with a threaded end of the pin through said slide piece, whereby an end face of the bearing pin pressing against a bottom face of the guide slot thereby firmly clamping the bearing pin itself and the slide piece at the guide rail and at the same time mounting the clamping jaw for swivelling movement.

5,465,936

ROTATABLE BRACKET OF A MONITOR

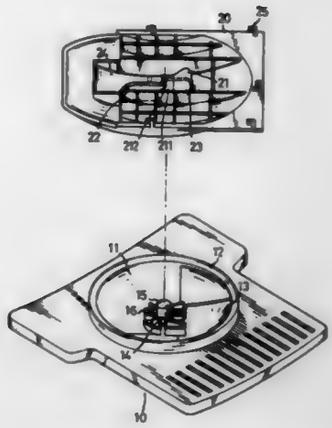
Tsong L. Wang, No. 3, Hsing Yeh St., Kuei Shan Hsiang, Tao Yuan, Taiwan, Prov. of China

Filed Aug. 16, 1994, Ser. No. 291,162
Int. Cl.[6] F16M *11/00*
U.S. Cl. 248—371 **3 Claims**

1. A rotatable bracket comprising a base plate and an upper plate rotatably engaged on the base plate;

said base plate defining a hemispherical recess at substantially a central portion thereof, an annular protrusion projecting from an upper surface of said base plate substantially enclosing said hemispherical recess, a boss projecting upward from substantially a central point of said hemispherical recess, a post extending upward from said boss, a plurality of wings radially extending from substantially an upper periphery of said boss thus defining a space between said wings and a surface of said hemispherical recess;

said upper plate comprising a hemispherical protrusion extending downward from a bottom side thereof thus simultaneously defining a concave hemispherical surface at an opposite side of said hemispherical protrusion, an elongated hole and a substantially square hole being defined in said upper plate and being in communication with each other, a hook extending upward from the hemispherical surface of the upper plate substantially extended upward from a wall of the substantially



square hole including a flat head which defines a semicircular cutout at one end thereof;

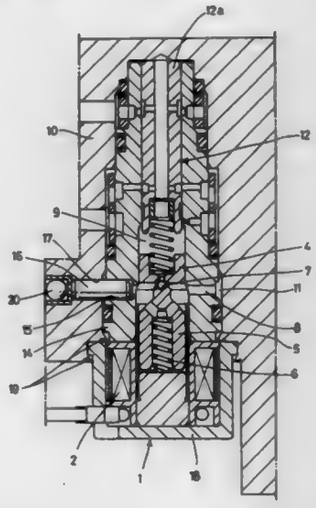
whereby said wings of said base plate are forcibly passed through the substantially square hole of the upper plate and two elongated plate portions along the elongated hole are allowed to be manually slid with respect to the wings of the base plate, meanwhile said upper plate is permitted to be rotated with respect to the boss of the base plate.

5,465,937

FLUID PRESSURE CONTROL DEVICE

Seiji Nokubo, and Teruhisa Kohno, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed May 18, 1994, Ser. No. 245,629
Claims priority, application Japan, May 21, 1993, 5-119869
Int. Cl.[6] F16K *31/06*
U.S. Cl. 251—129.15 **12 Claims**



1. A fluid pressure control device, comprising:

a housing having a bore therein having one end open and a pin hole in said housing opening onto said bore;

a solenoid valve disposed in said housing, said solenoid valve comprising a frame and a valve portion provided in said frame, wherein said frame is mounted in said bore such that said frame forms a liquid tight seal of said open end of said bore in said housing, said frame has a space defined therein communicating with said pin hole of said housing, and said frame has a hole formed therein communicating said valve portion in said frame with said pin hole of said housing;

a pin supported by said housing in said pin hole, said pin extending from said pin hole into said space in said frame such that said solenoid valve is retained in said housing; and

a gap in said pin hole defined by said pin hole around said pin therein, said gap communicating with said hole of said frame such that said gap and said hole of said frame together define a fluid passage, said fluid passage being openable and closeable by said valve portion of said solenoid valve.

5,465,938

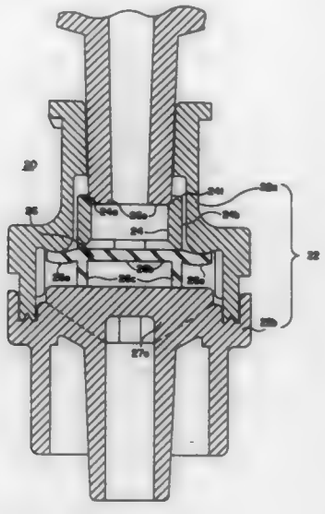
UNIVERSAL FLUID FLOW CONTROL

Robert W. Werge, 60 Ballouville Rd., Dayville, Conn. 06241, and Peter N. Kotsifas, 7 Lakewood Trail, Sturbridge, Mass. 01518

Continuation-in-part of Ser. No. 804,811, Dec. 9, 1991, Pat. No. 5,190,067, which is a continuation-in-part of Ser. No. 530,097, May 29, 1990, Pat. No. 5,070,905. This application Mar. 2, 1993, Ser. No. 25,021

Int. Cl.[6] F16K *15/14*

U.S. Cl. 251—149.1 **11 Claims**



1. A flow control device comprising

(a) a housing with internal walls defining a channel with a step change from a first diameter to a second, larger diameter for the flow of fluid, providing a valve seat at said step change, and providing a buttress in said channel axially spaced from said valve seat;

(b) a resilient valve element in the shape of a disk of a diameter greater than said first diameter and less than said second diameter with an annular extension extending axially from one face and the opposite face being essentially flat, said valve element situated in said channel with said flat face seated against said valve seat and said annular extension pressed against said buttress for controlling flow therethrough; and

(c) a plunger reciprocatingly situated within the first diameter portion of said channel for engaging and applying pressure to unseat said valve element from said valve seat.

5,465,939

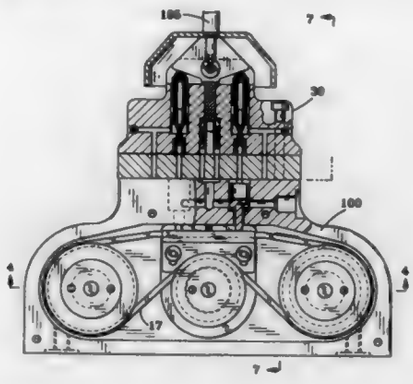
DIRECTIONAL CONTROL ASSEMBLY FOR AN AIR WINCH

Leslie J. Sell, Bothell, Wash., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Oct. 22, 1993, Ser. No. 141,836

Int. Cl.[6] B66D *1/48;1/10;* F16K *31/44*

U.S. Cl. 254—276 **13 Claims**



1. A directional control assembly for controlling operation of a motive device within adjustable limits comprising:

a continuous belt driven in direct proportion to operation of said device;

means for positioning said belt relative to a determined position of said device; and

means on said belt for establishing a signal indicative of said determined position Of said device.

5,465,940

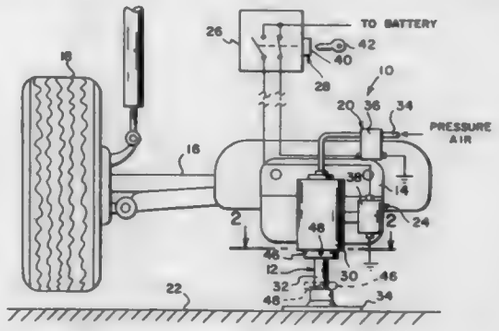
EASY JACK

Paulino A. Guzman, P.O. Box 16, Lovelady, Tex. 75851, and George Spector, 233 Broadway Rm 702, New York, N.Y. 10279

Filed Sep. 9, 1994, Ser. No. 303,733

Int. Cl.[6] B60S *9/02*

U.S. Cl. 254—423 **2 Claims**



1. A pneumatic jack system for a motor vehicle .comprising

a) a pneumatic jack;

b) a bracket for mounting said pneumatic jack to a suspension assembly of the motor vehicle between two wheels;

c) means for extending said pneumatic jack to the ground to raise the motor vehicle;

d) means for retracting said pneumatic jack from the ground to lower the motor vehicle;

e) a control switch in the interior of the motor vehicle, for operating said extending means and said retracting means;

f) means for looking said control switch to prevent an unauthorized operation of said pneumatic jack;

g) a piston housing

h) a piston rod extending downwardly from said housing;

i) a base plate connected to a distal end of said piston rod, which will contact the ground when said piston rod is extended; wherein said extending means includes:

j) an air hoes line connected to said piston housing, for supplying pressurized air thereto;

k) a pressure solenoid valve located in said air hose line and electrically connected to said control switch, so that when said control switch is turned in one direction compressed air will enter said piston housing, causing said piston rod to be extended from said piston housing; wherein said retracting means includes a release solenoid valve coupled to said piston housing and electrically connected to said control switch, so that when said control switch is turned in an opposite direction, the compressed air will exit said piston housing, causing said piston rod to be retracted back into said piston housing; wherein said locking means includes:

l) a lock mechanism connected to said control switch;

m) a key for engaging said lock mechanism to prevent operation of said control switch; further including:

n) said piston rod having an indent that is exposed when said piston rod is in its extended position;

o) a collar that slides upon said piston rod;

p) a cylinder lock having a keyway and a finger, said cylinder lock is mounted within said collar and

q) a key insertable into the keyway of said cylinder lock to cause said finger to project into said indent in said piston rod, to prevent said piston rod from retracting back into said piston housing.

5,465,941

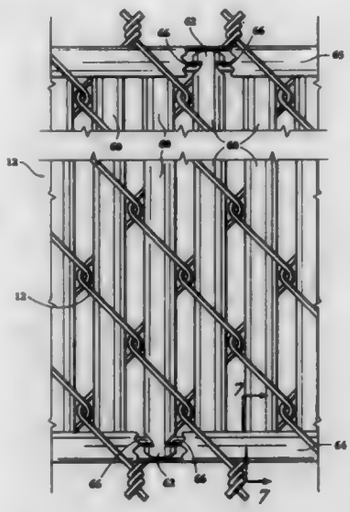
FENCE SLAT LOCKING SYSTEM AND METHOD

Joshua B. Abbott, 10020 Portland Rd. N.E., Brooks, Oreg. 97305

Filed Jun. 4, 1993, Ser. No. 72,171

Int. Cl.[6] B21F *27/00*

U.S. Cl. 256—34 **15 Claims**



1. A system for locking slats into a chain link fence, comprising:

at least one slat elongated along a central longitudinal axis for weaving between consecutive links in the chain link fence having a predefined cross-sectional width and at least one wall curved at the lateral sides with a first and second longitudinal end, the slat also having a first and second notch each having an upper and lower edge and located on opposite lateral sides directed toward the center longitudinal axis of the slat above the first longitudinal end, the lateral sides of the slat between the first and second notch and the first longitudinal end defining a set of slat ears at the first end; and

a rail for weaving between the links of the chain link fence and attaching with the first end of each slat, the rail having a fastening wall, at least one support wall, and at least one retaining section, the fastening wall and the support wall coupled together at the bottom edges by a base section to form a rail channel and the retaining section coupled to the top edge of the fastening wall and slanting downward from the top edge of the fastening wall into the rail channel;

wherein inserting the first end of the slat between the retaining section and the support wall reduces the cross-sectional width of the slat ears and inserting the slat further into the rail channel allows the slat ears to retain their cross-sectional width causing the slat ears to slide underneath the retaining section and automatically seat the retaining section into the first and second notch.

5,465,942

TUYERE ARRANGEMENT FOR THE INTRODUCTION OF AGENTS INTO A MOLTEN BATH AND METHOD OF OPERATING SUCH A TUYERE ARRANGEMENT

William Wells, Devon, England; Georg Raidl, Vienna, and Walter Schmelzer, Langenzersdorf, both of, Austria, assignors to Kortec AG, Zug, Switzerland

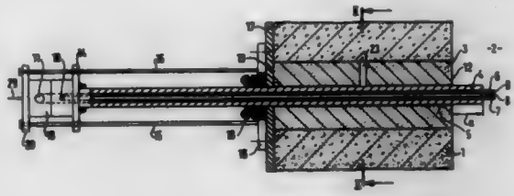
PCT No. PCT/EP92/02520, § 371 Date Mar. 2, 1994, § 102(e) Date Mar. 2, 1994, PCT Pub. No. WO93/09255, PCT Pub. Date May 13, 1993

PCT Filed Nov. 3, 1992, Ser. No. 87,728

Claims priority, application Germany, Nov. 6, 1991, 41 36 552.6

Int. Cl.[6] C21B *7/10;7/16*

U.S. Cl. 266—46 **18 Claims**



1. A tuyere arrangement for the introduction of agents into a molten bath and having a distal tip for facing into the interior of a vessel and a proximal end for facing outwardly from the vessel,

comprising an apertured block of refractory material, which can be fitted into the wall of a vessel and

which axially slidably accommodates a cylindrical body of a refractory material with an axial bore for introduction of the gas or the treatment agent,

which cylindrical body has an outer end projecting out of the apertured block relative to said proximal tuyere end and at that outer end is provided with a first pressure plate for axial displacement of the cylindrical body,

the cylindrical body surrounds a tuyere means having an outer metal tuyere tube and at least one inner metal tuyere tube concentrically spaced from said outer metal tuyere tube to form a central duct and a least one annular duct that surrounds said central duct and wherein

the outer tuyere tube is axially slidably disposed in said cylindrical body and includes sealing means for forming a fluid seal between said, outer tuyere tube and said cylindrical body, and wherein

said ducts are provided with an inlet for receiving an agent to be introduced.

5,465,943
BOTTOM OR WALL STRUCTURE FOR A METALLURGICAL VESSEL

Johann Rinnhofer, Vienna; Robert Schmidberger, Trofaiach; Volker Pawliska, Millstatt, all of, Austria, and Giorgio Cappelli, Basiglio, Italy, assignors to Veitsch-Radex Aktiengesellschaft fur feuerfeste Erzeugnisse, Vienna, Austria

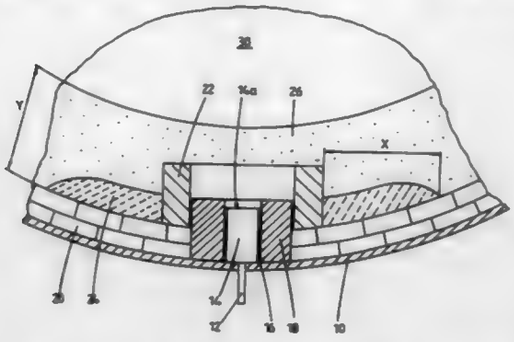
PCT No. PCT/EP91/02305, § 371 Date Jun. 7, 1993, § 102(e) Date Jun. 7, 1993, PCT Pub. No. WO92/10593, PCT Pub. Date Jun. 25, 1993

PCT Filed Dec. 4, 1991, Ser. No. 70,395

Claims priority, application Austria, Dec. 7, 1990, 2483/90; Germany, Feb. 2, 1991, 41 03 156.3

Int. Cl.[6] B22D *41/00*

U.S. Cl. 266—220 **25 Claims**



1. Bottom or wall structure for a metallurgical vessel with a refractory lining (**20**, **26**), which is adjacent to an outer metallic envelope (**10**) of the vessel and which has, on the side facing away from the metallic envelope (**10**), a wear lining (**26**), which is permeable to gas in at least some of its sections, and which covers with its gas-permeable section at least one gas purging device (**14**, **14***a–e*) with an associated gas feed line (**12**), wherein the gas purging device (**14**, **14***a–e*) is surrounded at least circumferentially by a gastight receptacle (**18**, **18'**, **18''**), which projects over the gas purging device (**14**, **14***a–e*) in the upward direction into the area of the wear lining (**26**), wherein the area of the gas-permeable wear lining surrounded by the receptacle is free of baffle plates.

5,465,944
BUFFER

Ronald C. Page, Coventry; John J. Buchnell, Southam, and Raymond B. Stephens, Alcester, all of, United Kingdom, assignors to Oleo International Holdings Limited, Coventry, United Kingdom

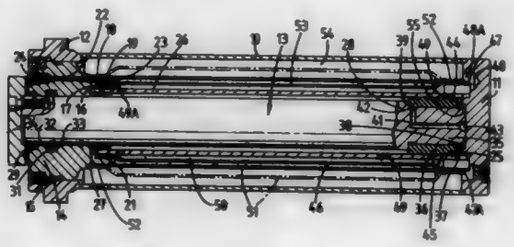
PCT No. PCT/GB92/02314, § 371 Date Jun. 13, 1994, § 102(e) Date Jun. 13, 1994, PCT Pub. No. WO93/12361, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 14, 1992, Ser. No. 244,391

Claims priority, application United Kingdom, Dec. 13, 1991, 9126506; May 27, 1992, 9211231

Int. Cl.[6] B60G *13/00*

U.S. Cl. 267—217 **10 Claims**



1. A buffer comprising:

a plunger and cylinder unit, the plunger being forced into the cylinder when a load is applied to the buffer to thereby displace liquid from a compression chamber within the cylinder into a relatively low pressure reservoir flow resisting means which provide dynamic resistance to movement of the plunger;

said flow resisting means being ports of flow restricting dimensions at axially spaced location along the length of a ported tube, which also comprises the cylinder;

wherein a part of the boundary of the reservoir is formed by a tubular membrane of radially deformable material, said tubular membrane being fixedly mounted at each end thereof to the cylinder, there being within the membrane a tubular member of substantially rigid, liquid-impermeable material which circumferentially surrounds said ported tube and axially extends to cover all said ports thereof to thereby protect the membrane from damage by streams of liquid which emerge from said ports during a compression stroke;

said membrane being deformable radially relative to said tubular member to thereby form an annular space of variable volume between the membrane and said tubular member.

5,465,945
LAMINATED RUBBER SUPPORT AND METHOD OF DESIGNING THE SAME

Hiroomi Matsushita; Teruo Sasaki, and Kazuhiro Fujisawa, all of Hyogo, Japan, assignors to Sumitomo Rubber Industries, Inc., Kobe, Japan

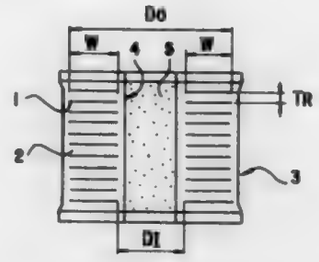
PCT No. PCT/JP92/01050, § 371 Date Mar. 19, 1993, § 102(e) Date Mar. 19, 1993, PCT Pub. No. WO93/04301, PCT Pub. Date Mar. 4, 1993

PCT Filed Aug. 19, 1992, Ser. No. 30,001

Claims priority, application Japan, Aug. 23, 1991, 3-212124

Int. Cl.[6] F16F *1/40*

U.S. Cl. 267—294 **2 Claims**



1. A laminated rubber support wherein rigid plates and rubber-like elastic plates are alternately laminated to each other to form a laminate having a vertically extending hollow portion centrally formed therein, with a viscoelastic body or plastic body fitted in said hollow portion, said laminated rubber support comprising:

an internal size of the rigid plates is determined from an external size of the rigid plates based on a width of the rigid plates determined by

$$\sigma_g/S \leq A_4 + A_2[(W/X_0)+B_1]^{-0.5} + A_3(W/X_0)$$

$$\sigma_g/S \geq A_5 + A_2[(S/X_0)+B_2]^{-0.5} + A_3(S/X_0)$$

(where A_2, A_3, A_4, A_5, B_1, B_2 are constants)

$$\sigma_g/S \geq \sigma_s/S$$

$$0 < W \leq D_0/2$$

where W is the width of the rigid plates, S is a secondary shape coefficient, σ_0 is a standard surface pressure, X_0 is a design displacement, a is a safety factor, σ_g is a buckling surface pressure, σ_s is a design buckling surface pressure, and D_0 is the external size of the rigid plates.

5,465,946

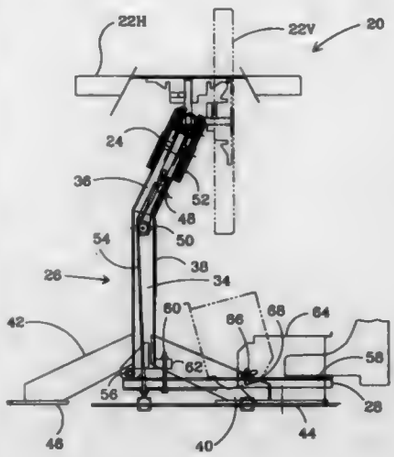
POSITIONING FIXTURE FOR WELDING OPERATIONS HAVING A LOCKABLE BALL JOINT

Dresden G. Smith, 1621 English Dr., San Jose, Calif. 95129

Continuation-in-part of Ser. No. 634,565, Dec. 27, 1990, Pat. No. 5,280,892. This application Jan. 24, 1994, Ser. No. 185,504

Int. Cl.[6] B23Q *1/32*

U.S. Cl. 269—75 **12 Claims**



1. A positioning fixture comprising:

a tiltable working surface, said tiltable working surface having means for attaching at least one workpiece to said tiltable working surface,

a base for supporting said tiltable working surface,

a lockable ball joint connecting said tiltable working surface to said base, said lockable ball joint having two states; a locked state in which said tiltable working surface is locked in a desired position with respect to said base, and an unlocked state in which said tiltable working surface is able to be tilted and rotated with respect to said base,

said lockable ball joint comprising:

a housing having a through bore, a first conical surface located within said through bore, a second conical surface slidingly received within said through bore, means for attaching said housing to said base,

a ball positioned between said first conical surface and said second conical surface, means for attaching said tiltable working surface to said ball,

a spring means for urging said second conical surface against said ball when said lockable ball joint is in said locked state,

and a compressing means for compressing said spring means and withdrawing said second conical surface from said ball when said lockable ball joint is in said unlocked state, comprising:

a tensile member attached to said second conical surface,

and a force multiplying pedal means for applying tension to said tensile member.

5,465,947

APPARATUS FOR DISCHARGING SHEETS FROM A SORTER

Keiji Okumura; Takeshi Aoki; Yoshio Sugishima; Satoru Hayama; Keiichi Taguchi; Yuichiro Iwase, and Noriaki Okamoto, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 18, 1994, Ser. No. 214,452

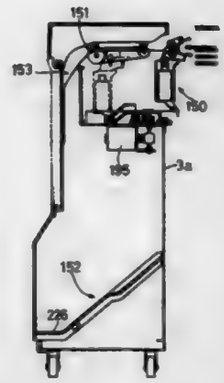
Claims priority, application Japan, Mar. 23, 1993, 5-064420

Int. Cl.[6] B42C *1/12*; B65H *31/30*

U.S. Cl. 270—58 **41 Claims**

1. A sheet stack discharging apparatus, comprising:

a multistacker having a body;



a sheet stack storage portion, disposed in a bottom portion of said multistacker body, for storing sheet stacks discharged from a copy sheet sorter of a photocopier wherein copy sheets are transportable in a sheet transport stream through the photocopier and into the sorter;

a sheet stack transport guide disposed in said multistacker body for guiding copy sheet stacks from said copy sheet sorter into said sheet stack storage portion, said sheet stack transport guide at least partially defining a transverse guide path extending transversely to a direction of the sheet transport stream, and said transverse guide path being positioned above said sheet stack storage portion;

a sheet stack grasping mechanism disposed in an upper portion of said multistacker body adjacent said transverse guide path, for grasping a sheet stack from an adjacent bin of a sorting bin unit of said copy sheet sorter and introducing the sheet stack into said transverse guide path, said stack grasping mechanism being retractable into a position beneath said transverse guide path, wherein

said stack grasping mechanism is movable in two directions generally orthogonol to each other, one being generally parallel, and the other generally perpendicular, to said sheet transport stream; and

a sheet stack discharging mechanism for conveying a sheet stack from said stack grasping mechanism through said transverse guide path.

5,465,948

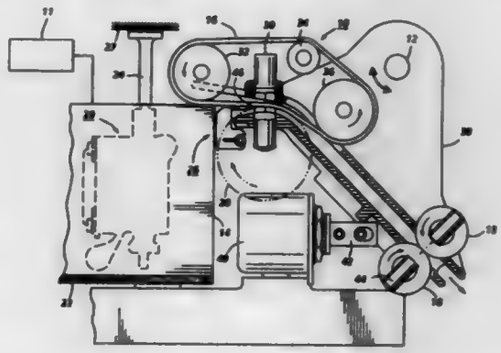
SHEET FEEDING AND SEPARATING APPARATUS

Richard G. Weller, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 23, 1993, Ser. No. 125,725

Int. Cl.[6] B65H *3/04*; *3/52*

U.S. Cl. 271—34 **4 Claims**



1. An apparatus for separating and advancing sheets from a stack of sheets, including:

a tray for supporting the stack of sheets:

an endless belt mounted in engagement with a sheet of the stack of sheets to advance the sheet from the stack of sheets;

a retard member engaging said endless belt to define a nip therebetween for separating any overlap sheets reaching the nip, said retard member including a roll having a curvilinear portion thereof deformably engaging said belt;

a stationary guide member, interposed between said retard member and said tray, and adapted to be engaged by the sheet to guide the sheet toward the nip, said guide member includes an integrally molded, multi-piece guide, said molded guide includes:

a thin flexible film;

a generally planar, high friction urethane portion with said film extending from one end thereof; said having one end secured to said urethane portion with the other end being free and extending into the nip to shield the sheet from said retard member and guide the sheet into the nip; and

a polycarbonate portion extending from the other end of said urethane portion and being transverse thereto;

means for supporting and moving said endless belt in a recirculating path; and

means for moving the stack of sheets upwardly so as to position the outermost sheet of the stack of sheets in engagement with said endless belt.

5,465,949

AUTOMATIC SHEET FEEDING DEVICE WITH SELECTIVELY APPLIED PRESSURE MEMBER

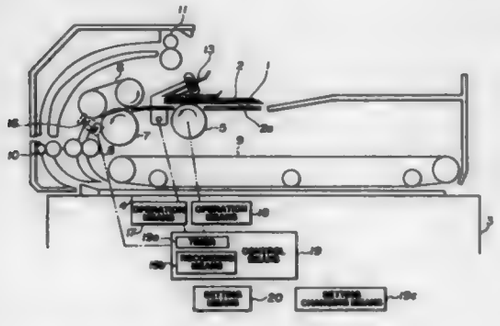
Takeshi Yamada, Segamihara, and Katsuaki Hirai, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 260,836, Jun. 16, 1994, abandoned. This application Mar. 28, 1995, Ser. No. 412,105

Claims priority, application Japan, Jun. 24, 1993, 5-177281

Int. Cl.[6] B65H *7/08*

U.S. Cl. 271—110 **20 Claims**



1. An automatic sheet feeding device, comprising:

mounting means for mounting a stack of sheets; feeding means for feeding each sheet of the stack of sheets from the stack;

pressing means for pressing against the stack of sheets after a start of a sheet feeding operation, thereby urging the stack of sheets against said feeding means;

recording means for recording a number of operations of said pressing means; and

control means for controlling operation of said pressing means, wherein said pressing means operates when a sheet feeding operation of the feeding means starts after the number of operations of the pressing means recorded by said recording means has reached a predetermined number.

5,465,950

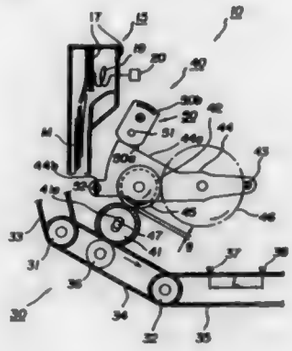
PAPER SHEET CONVEYING AND ARRANGING APPARATUS

Takatoshi Takemoto; Kazunari Kawashima, both of Tokyo; Hideyuki Kadomatsu, Odawara; Moriyuki Aoyama, Okazaki, and Takaharu Nakamura, Toyohashi, all of, Japan, assignors to Kabushiki Kaisha Ace Denken, Tokyo, Japan

Filed Dec. 20, 1993, Ser. No. 167,948

Int. Cl.[6] B65H *3/52*

U.S. Cl. 271—125 **12 Claims**



1. A paper sheet conveying and arranging apparatus to be used with a conveyer which successively conveys paper sheets sideways in an upright posture, to be located adjacent to one end of the conveyer for properly arranging the successive paper sheets which are received in a partially overlapping relationship from the conveyer, and for letting the received paper sheets fall into a proper arrangement, comprising:

a low-friction paper sheet guide member located adjacent to said one end of the conveyer from which the paper sheets are successively received, the guide member being disposed to have a surface in a parallel relationship to a paper sheet advancing direction; and

a spiral contact having an axis of rotation which is inclined at an angle θ with respect to a horizontal plane toward an upstream side from a line perpendicular to the paper sheet advancing direction and passing on the upstream side of said guide member, said spiral contact being rotatable so that a distal end of the spiral contact is frictionally engageable with said surface of said guide member and so as to contact and move the successively received paper sheets downwardly away from said one end of the conveyer.

5,465,951

FABRIC PIECE HANDLING SYSTEM

Donald E. Burt, Danvers; Jeffrey T. Boot, Sudbury; Matthew D. Bouche, Chelmsford, and Carl Moeller, Duxbury, all of Mass., assignors to Design Technology Corporation, Billerica, Mass.

Filed Jan. 19, 1994, Ser. No. 183,496

Int. Cl.[6] B65H *1/04*

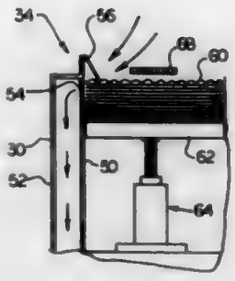
U.S. Cl. 271—167 **20 Claims**

1. A fabric piece handling apparatus, said apparatus comprising:

(a) a pickup assembly;

(b) a magazine for supplying a stack of fabric pieces having a plurality of plys to said pickup assembly, said magazine including inner walls, outer walls, and a top, said magazine defining a plenum having a perforated aperture located in said inner wall adjacent to the upper surface of the stack of fabric pieces located adjacent to said top, wherein said magazine includes a flexible flap having one edge attached to said inner wall adjacent to said perforated aperture and the opposite edge extending to the surface of said stack of fabric pieces located adjacent to said top; and

(c) a source of vacuum connected to said plenum for providing a stream of air through said perforated aperture adjacent to the



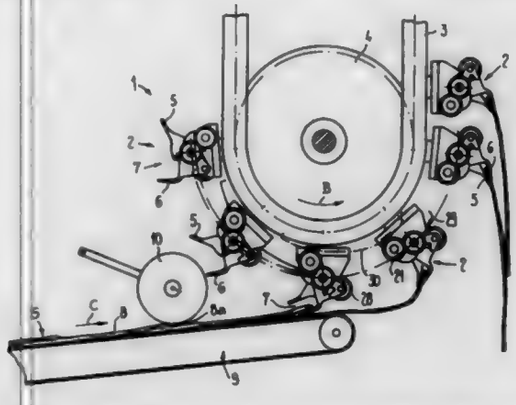
upper surface of the stack of fabric pieces, thereby causing said fabric pieces beneath the top ply of fabric and adjacent to said perforated aperture to remain stationary and allowing the top ply of fabric to be removed by said pickup assembly.

5,465,952

GRIPPER FOR A CONVEYING DEVICE FOR CONVEYING SINGLE-SHEET OR MULTIPLE-SHEET PRINTED PRODUCTS

Jurg Eberle, Hinwil, and Bruno Weber, Berg, both of, Switzerland, assignors to Ferag AG, Switzerland

Continuation of Ser. No. 18,701, Feb. 17, 1993, Pat. No. 5,356,128. This application Oct. 17, 1994, Ser. No. 324,256
The portion of the term of this patent subsequent to Oct. 18, 2011, has been disclaimed.
Int. Cl.[6] B65H *29/04*
U.S. Cl. 271—204 **14 Claims**



1. A gripper for a conveying device for conveying single-sheet or multiple-sheet printed products, such as newspapers, magazines and parts thereof, comprising:

a) a first gripper part and a second gripper part which can be moved relative to one another, the first gripper part being mounted to pivot about a pivot axis such that it can be pivoted from an open position to a clamping position in which it interacts with the second gripper part to clamp a printed product under a spring force;

b) a pivotably mounted closing lever which interacts with a fixed closing cam arranged along the path of travel of the gripper to pivot the first gripper part into the clamping position;

c) a locking device for blocking the first gripper part in its clamping position, the locking device being releasable by a stationary opening arrangement along the path of travel of the gripper;

d) a further gripper part which is coupled to the closing lever for common pivotal movement with the closing lever; and

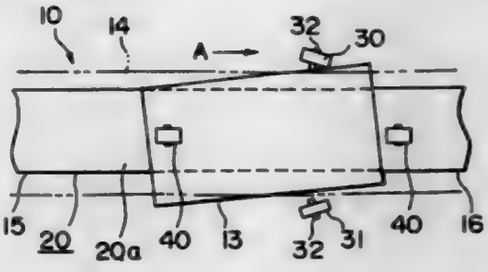
e) a spring element which is arranged between the first gripper part and the further gripper part which is coupled with the closing lever for common pivotal movement, the spring element being tensioned during the closing movement of the gripper, the spring element transmitting the pivot movement of the closing lever to the first gripper part, and the spring element generating the closing force when the first gripper part is blocked in its clamping positions.

5,465,953

BANK NOTE CONVEYING EQUIPMENT

Takatoshi Takemoto, Tokyo; Noriaki Kano; Eiji Ito, both of Hanamaki, and Kozo Sekimoto, Sendai, all of, Japan, assignors to Kabushiki Kaisha Ace Denken, Japan

Filed Mar. 22, 1994, Ser. No. 215,682
Int. Cl.[6] B65H *9/00*
U.S. Cl. 271—234 **6 Claims**



1. A bank note conveying equipment for conveying a bank note comprising:

an endless belt forming a bank note conveying path, said belt being positioned to contact a surface of said bank note;

an endless belt driving mechanism for rotating said endless belt;

at least one pinch roller pair, one pinch roller of said pair being positioned to oppose said endless belt and contact another surface of said bank note; and

a pair of modifying rollers spaced from said belt in the widthwise direction thereof, said pair of modifying rollers holding a part of a bank note deviating from said bank note conveying path therebetween;

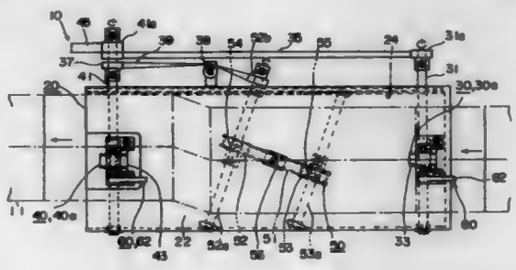
a modifying roller driving mechanism for rotating one of said modifying rollers of said pair so that the peripheral velocity of said one modifying roller may be faster than the velocity of said endless belt, so that the deviated bank note may be rotated back into alignment with said bank note conveying path.

5,465,954

PAPER MONEY CONVEYING EQUIPMENT

Takatoshi Takemoto, Tokyo, and Yoshio Ito, Iwate, both of, Japan, assignors to Kabushiki Kaisha Ace Denken, Tokyo, Japan

Filed Mar. 3, 1994, Ser. No. 205,391
Claims priority, application Japan, Mar. 4, 1993, 5-043619
Int. Cl.[6] B65H *9/16*
U.S. Cl. 271—251 **2 Claims**



1. A paper money conveying equipment for conveying paper money from a conveying starting point to a conveying destination along a conveying path comprising:

a conveying path forming member for forming said conveying path, and

a paper money conveying mechanism for conveying said paper money in said conveying path toward said destination,

said paper money conveying mechanism including;

a driving roller which is provided at a position where it contacts one surface of said paper money in said conveying path and adapted to be rotated for conveying the paper money toward said destination;

a roller drive mechanism for rotating said driving roller;

a driven roller which is provided at a position opposite to said driving roller and contactable with the other surface of said paper money in said conveying path for conveying said paper money towards said destination in cooperation with said driving roller;

a driven roller support member for supporting said driven roller, allowing movement between a first position where the driven roller is contactable with the driving roller and a second position where the driven roller is apart from the driving roller;

an urging member for urging said driven roller in said first position where said driven roller is contactable with the driving roller; and

a lifting member for moving said driven roller from said first position to said second position against the urging force of said urging member;. driven roller comprising:

a cylindrical roller body whose periphery comes into contact with another surface of said paper money, and

a rotary shaft provided at a central axis of said roller body;

said driven roller support member comprising a contacted support portion with which said lifting member comes into contact;

said lifting member comprising:

a shaft fixing portion to which said rotary shaft of said driven roller is to be fixed,

a contacting section to contact said contacted support portion of said driven roller support member, and

an operation section formed on a side opposite to said contacting portion with respect to said shaft fixing portion located therebetween, and provided at a position farther from said shaft fixing portion than said contacting portion from said shaft fixing section;

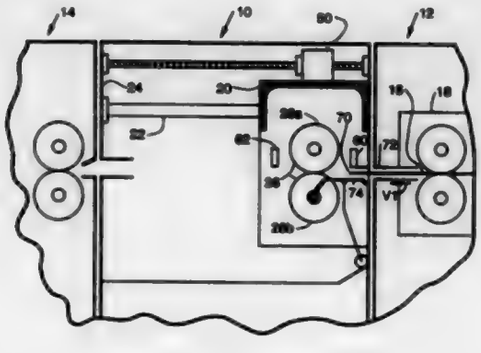
said lifting member is a lifting lever which is swingable around a fulcrum point of said contacted support portion, when said operation portion is held up to move, said driven roller positioned at said first position to said second position.

5,465,955

METHOD AND APPARATUS FOR AN EXTERNAL MEDIA BUFFER

Libor Krupica, Methuen, and William L. McElwain, Lowell, both of Mass., assignors to Bayer Corporation, Wilmington, Mass.

Filed Aug. 8, 1994, Ser. No. 287,436
Int. Cl.[6] B65H 7/02
U.S. Cl. 271—265.02 **14 Claims**



1. An apparatus for buffering a sheet of media having a leading end and a trailing end, between a first media handling station and a second media handling station, comprising:

a. gripping means for gripping the leading end of the sheet as the sheet advances at a first speed from the first media handling station;

b. first transporting means for transporting said gripping means and the leading end of the sheet at a second speed from the first media handling station to the second media handling station, the second speed being slower than the first speed such that the sheet of media forms a slack loop during transportation of said gripping means and the leading end of the sheet to the second media handling station until the trailing end of the sheet advances out from the first media handling station; and

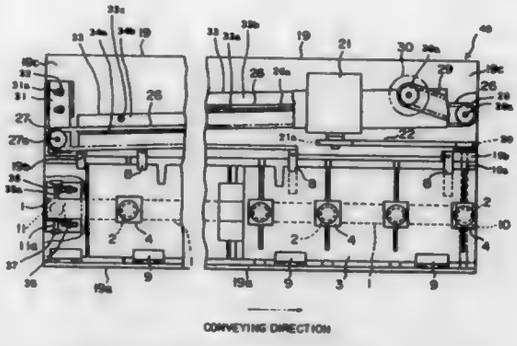
c. second transporting means for transporting the leading end of the sheet to the second media handling station upon said gripping means releasing said leading end.

5,465,956

ENDLESS BELT BANK NOTE CONVEYING DEVICE WITH BALL SUPPORTS FOR THE BANK NOTES

Takatoshi Takemoto; Toshikazu Chida, both of Tokyo; Noriaki Kano, Hanamaki; eiei Ito, Hanamaki; Koji Murakami, Hanamaki; Takasi Itagaki, Hanamaki; Kozo Sedimoto, Senda, and Masanori Suzuki, Hanamaki, all of, Japan, assignors to Kabushiki Kaisha Ace Denken, Japan

Filed Sep. 29, 1994, Ser. No. 321,120
Int. Cl.[6] B65H 5/02
U.S. Cl. 271—274 **4 Claims**



1. A bank note conveying device comprising:

an endless belt having a flat outer periphery for contacting one of the major faces of a bank note to be conveyed and an inner periphery having a plurality of teeth formed thereon;

a drive pulley and a driven pulley, both being cylindrical and having a plurality of gear teeth formed on their respective outer peripheries so that they may engage said plurality of teeth of said endless belt;

said endless belt being tensioned between said drive pulley and said driven pulley;

a rotary shaft penetrating the center of each of said cylindrical pulleys;

a belt driving mechanism for rotating said rotary shaft of said drive pulley;

a plurality of balls which are spaced along said endless belt for contacting another major face of the bank note to be conveyed;

ball holders for respectively rotatably supporting each of said balls;

a plurality of cylindrical belt supporting pulleys, each having a plurality of gear teeth formed on an outer periphery thereof so that they may be engageable with said plurality of teeth of said endless belt, said pulleys being respectively disposed at positions opposing said plurality of said balls with said endless belt therebetween; and

a plurality of rotary shafts for rotatably supporting said plurality of belt supporting pulleys, respectively;

wherein each of said cylindrical drive pulley, said cylindrical driven pulley, and said plurality of cylindrical belt supporting pulleys have a pair of end portions, some of the pulleys having a flange at only one end portion thereof, others of the pulleys having a flange at only another end portion thereof, each of said flanges having a larger outer diameter than that of the associated pulley.

5,465,957

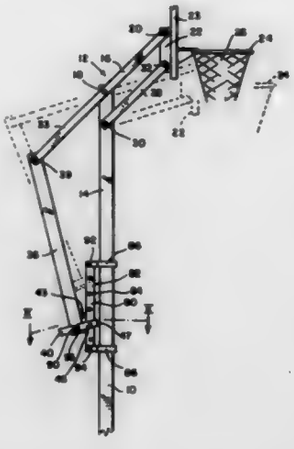
RETAINER FOR ADJUSTABLE BASKETBALL BACKBOARDS

Edward A. Schroeder, Marengo, Ill., assignor to Porter Athletic Equipment Company, Broadview, Ill.

Continuation-in-part of Ser. No. 921,645, Jul. 30, 1992. This application Jan. 14, 1994, Ser. No. 181,436

Int. Cl.[6] A63B *71/02*

U.S. Cl. 273—1.5 R **9 Claims**



1. An adjustable basketball backboard support system comprising:

basketball backboard;

a support member;

a parallelogram linkage system including at least two parallel links pivotally interconnecting the basketball backboard and the support member;

an adjustment link connected at one end to one of said links and adjustably connected at the other end to the support member to determine the height of the basketball backboard;

a slide on the adjustment link and a guide on the support member upon which said slide moves; and

a handle connected to and forming a unit with said slide and being adjacent to the side of the adjustment link farthest from the support member.

5,465,958

OFF-ICE HOCKEY SHOOTING PRACTICE DEVICE

Paul E. Brun, 253 Jean-Darois, Dieppe, New Brunswick, Canada

Filed Jan. 19, 1995, Ser. No. 374,881

Int. Cl.[6] A63B *69/00*

U.S. Cl. 273—57.2 **19 Claims**

1. An off-ice hockey practice shooting device for use by a player on a playing surface, the device comprising a shooting station on the playing surface, a target surface remote from the station, and a puck device connected to a generally linear guideline means extending between the station and the target, wherein the guideline means comprises a linear guide and a flexible tether slidably connecting the puck device to the guide.

5,465,959

GOLF CLUB BODY MADE OF COMPOSITE MATERIAL AND HAVING A BENT FRONT SECTION

Cheng-Hsien Cheng, Kaohsiung, Taiwan, Prov. of China, assignor to Advanced Composite Designs Co., Ltd., Kaohsiung, Taiwan, Prov. of China

Filed Dec. 16, 1994, Ser. No. 357,311

Int. Cl.[6] A63B *53/02*

U.S. Cl. 273—80 B **5 Claims**

1. A golf club body for coupling a handle to a striking head of a golf club and formed of composite material and having a bent front section comprising:

(a) a longitudinally-extending, straight, tapered hollow body section formed of said composite material;

(b) a bent section formed of said composite material and having a first end for connecting said striking head thereto and an opposing second end, said second end being laterally offset from said first end and being coupled to a tapered end of said hollow body section, said bent section further having a recess circumferentially formed within an inner wall of said second end thereof and axially extending toward said first end; and,

(c) a substantially uniform diameter link for fixedly coupling said hollow body section to said bent section, said link diameter being substantially equal to an inner diameter of said tapered end of said hollow body section and to an inner diameter of said recess of said bent section, one end of said link being engaged within said recess formed at said second end of said bent section and an opposing end of said link fixedly engaged within said tapered end of said hollow body section.

5,465,960
BATON WITH EXTENSIBLE HANDLE AND FOLDABLE CROSSHANDLE

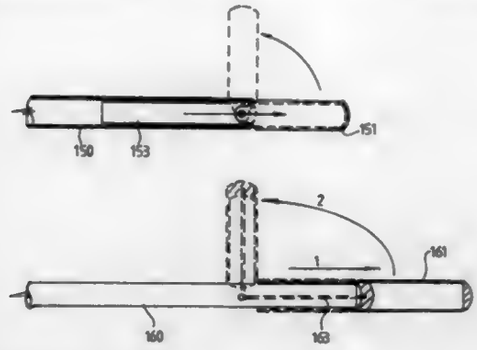
David J. Bickerton, Keynsham, and David Wakefield, Great Barr, both of, United Kingdom, assignors to Hiatt and Company Limited, United Kingdom

Filed Sep. 30, 1994, Ser. No. 315,527

Claims priority, application United Kingdom, Jan. 1, 1993, 9320320

Int. Cl.[6] F41B *15/02*

U.S. Cl. 273—84 R **13 Claims**



1. A baton comprising:
a shaft having a longitudinal shaft axis;
a first handle having a longitudinal first handle axis;
means mounting the first handle to the shaft and providing for movement of the first handle relative to the shaft between a first position wherein the first handle axis is in line with the shaft axis and a second position wherein the first handle axis extends transversely to the shaft axis;
a further handle having a longitudinal further handle axis;
means telescopically mounting said further handle relative to said shaft with said further handle axis in line with said shaft axis, said means providing for movement of said further handle between an extended position and a retracted position; and
said further handle when in its extended position occupying said first position of said first handle.

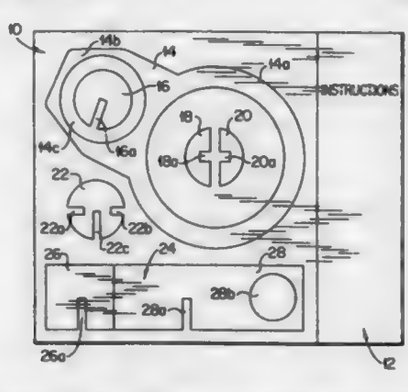
5,465,961
PUNCH-OUT GAME

Ronald P. Burtch, Stouffville, Canada, assignor to Ronald P. Burtch & Associates Limited, Canada

Continuation-in-part of Ser. No. 241,693, May 12, 1994. This application May 31, 1994, Ser. No. 251,681

Int. Cl.[6] A63F *7/06*; **A63H** *33/08*

U.S. Cl. 273—85 R **21 Claims**



1. A novelty punch-out game card comprising punch-out elements for, when assembled, simulating elements of a sporting game, said punch-out card comprising a card member including a plurality of elements adapted to be punched out of the card member, said elements including a mountable element including affixing means for, in use after said mountable element is punched out of said card member, affixing the mountable element to a support item; a target element integral with or affixable to said mountable element so as to, in use, form a target after being punched out of said card member; and at least one projectile element for, in use after being punched out of said card member, forming a projectile adapted to be propelled at said target.

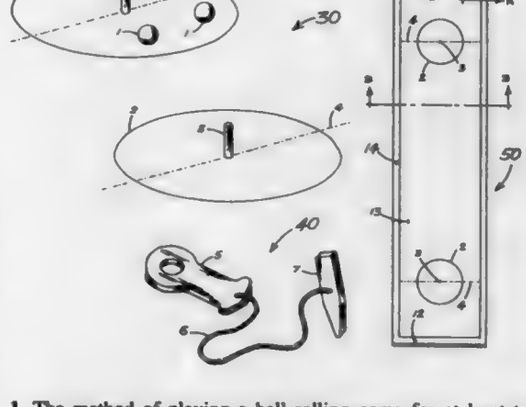
5,465,962
BALL ROLLING GAME

Franklin R. Hiserman, Rte. 1 Box 417, Waynesboro, Va. 22980

Filed Oct. 14, 1993, Ser. No. 136,532

Int. Cl.[6] A63F *7/00*

U.S. Cl. 273—118 R **7 Claims**



1. The method of playing a ball rolling game for at least two players having:
a court area, said court area having a playing surface,
a pair of circular areas, said circular areas being spaced a predetermined distance from one another within said playing surface,
a pair of roll lines, each of said pair of roll lines bisecting and extending beyond said circular areas, said roll lines being approximately parallel to one another,
a pair of stakes, said stakes having a first end and a second end, said stakes being placed in the center of said circular area,
a plurality of pairs of balls, each said pairs having the same color and each of said pairs of balls having contrasting colors to said other pairs of balls,
a pair of measuring means, having:
a collar portion, said collar portion having a first end and a second end, said first end containing a circular hole portion, said circular hole portion having a diameter slightly greater than the diameter of said pair of stakes, and said second end containing a string receiving portion,
a length of string, said length of string having a first end, a second end, said length being equal to the radius of said circular area,
a marking means, said marking means having a point and a string receiving area,
said first end of said string being affixed to said string receiving portion of said collar portion and said second end of said string being attached to said string receiving area of said marking means,
setting up the court area comprising the steps of:
i) determining the court area,
ii) placing a first stake approximate the first end of said court area,
iii) placing said collar of said measuring means over said stake,
iv) extending said string to its maximum length and scribing a circle around said stake using said marking means,

v) placing a second stake approximate the second end of the court area,

vi) repeating steps iii and iv,

playing the ball rolling game comprising the steps of:

a) choosing a pair of identical colored balls,

b) said players standing behind said roll line of the first circular area,

c) the first of said players rolling the first of said pair of balls toward said stake in the second circular area, attempting to cause said ball to stop close to said stake,

d) repeating step c by each player,

e) the first of said players rolling the second of said pair of balls toward said stake in the second circular area, attempting to cause said ball to stop close to said stake,

f) repeating step e by each player,

g) said players proceeding to said second circular area,

h) measuring the distance between the closest balls and the stake using said measuring means,

i) determining if any player's ball is within one ball width from said stake,

j) if a player has a ball within one ball width of said stake, awarding said player two points,

k) if no player has a ball within one ball's width of said stake, determining which player's ball is closest,

l) awarding the player whose ball is the closest to the stake with one point,

m) said players standing behind said roll line of the second circular area,

n) the first of said players rolling the first of said pair of balls toward said stake in the first circular area, attempting to cause said ball to stop close to said stake,

o) repeating step p by each player,

p) the first of said players rolling the second of said pair of balls toward said stake in the first circular area, attempting to cause said ball to stop close to said stake,

q) repeating step p by each player,

r) said players proceeding to said first circular area,

s) measuring the distance between the closest balls and the stake using said measuring means,

t) determining which, if any, player's ball is within one ball width from said stake,

u) if a player has a ball within one ball width of said stake, awarding said player two points,

v) if no player has a ball within one ball's width of said stake, determining which player's ball is closest,

w) awarding the player whose ball is the closest to the stake with at least one point,

x) repeating steps b–w until one player has a predetermined number of points.

5,465,963

HEIGHT ADJUSTABLE PINBALL GAME CABINET

James A. Patla, Sr., Rolling Meadows, Ill., assignor to Williams Electronics Games, Inc., Chicago, Ill.

Filed May 17, 1994, Ser. No. 243,965

Int. Cl.[6] A63F *7/40*

U.S. Cl. 273—118 R **1 Claim**

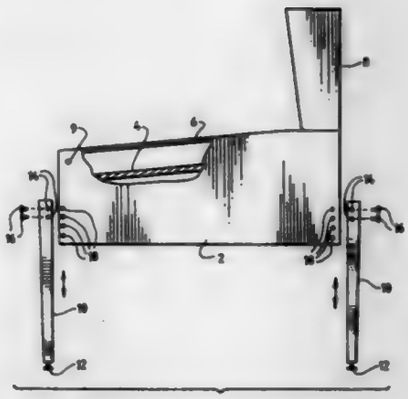
1. A height adjustable pinball game, comprising:

a) a cabinet for supporting the game;

b) a plurality of legs for supporting the cabinet in an elevated position; and

c) means for securing the legs to the cabinet at different locations on the cabinet to permit the cabinet to be supported in a plurality of elevated positions, said securing means including:

i) two through holes on each of said legs and at least three vertically arranged threaded receptacles corresponding thereto on said cabinet, said threaded receptacles being spaced from one another the same distance as the distance between said through holes such that the through holes can be aligned with different pairs of said threaded receptacles, and



ii) a plurality of threaded fasteners for engaging the through holes and the aligned threaded receptacles to securely attach the legs to the cabinet

whereby the length of the leg extending beyond the cabinet and, therefore, the height of the cabinet can be adjusted.

5,465,964

CURLING HACK

Albert N. Thompson, Winnipeg, Canada, assignor to Thompson Broom Manufacturers Ltd., Winnipeg, Canada

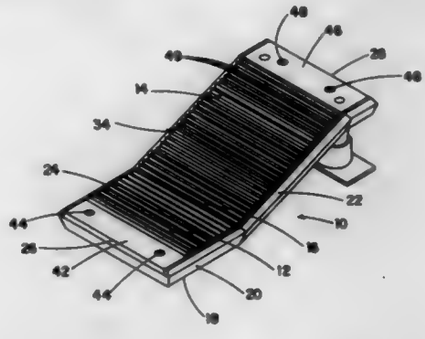
PCT No. PCT/CA91/00284, § 371 Date Mar. 1, 1993, § 102(e) Date Mar. 1, 1993, PCT Pub. No. WO92/03193, PCT Pub. Date Mar. 5, 1992

PCT Filed Aug. 15, 1991, Ser. No. 979,880

Claims priority, application Canada, Aug. 15, 1990, 2023342

Int. Cl.[6] A63B *67/14;* **A63C** *19/10*

U.S. Cl. 273—126 R **16 Claims**



1. A curling hack comprising:

a base adapted to be anchored in a sheet of ice;

a grip pad of a material having a high coefficient of friction at low ambient temperatures; and

means comprising interengaging formations on a top face of the base and a bottom face of the grip pad for detachably securing the grip pad to a top surface of the base.

5,465,965

ROTATING PINBALL BRIDGE AND DROP

Norman R. Wurz, Chicago, Ill., assignor to Sega Pinball, Inc., Melrose Park, Ill.

Filed Mar. 18, 1994, Ser. No. 214,456

Int. Cl.[6] A63F *7/30*

U.S. Cl. 273—121 A **7 Claims**

1. A pinball machine comprising:

a playfield;

one or more pinballs;

a pinball ramp disposed above said playfield;

a pinball bridge and drop disposed in said ramp comprising a cylindrically shaped tube with openings at each end and a hole in the wall of said tube said hole being sized and placed so as to alternatively allow a ball to be carried through the length of said tube or to drop through said hole in the wall of said tube; and

a drive attached to said tube to rotate said tube about its longitudinal axis.

5,465,966

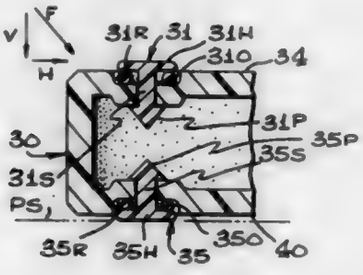
STREET OR COURT HOCKEY PUCK

Michael La Savio, 4506 Ellenwood Dr., Eagle Rock, Calif. 90041

Filed Aug. 9, 1993, Ser. No. 104,180

Int. Cl.[6] A63B *71/00*

U.S. Cl. 273—128 R **9 Claims**



1. A roll resistant hockey puck for use on a playing surface comprising a body having a cylindrical edge surface and a pair of generally planar faces;

at least one depression formed in each of said faces;

axially movable members in said depression having an area less than the total area of each said planar face; and

resilient members in said depression urging said axially movable members outwardly of said depression and permitting said axially movable members to move toward said body to absorb energy having a component normal to said planar faces.

5,465,967

UNIVERSAL GRIP WITH ADJUSTABLE BACKWEIGHTING CAPABILITY

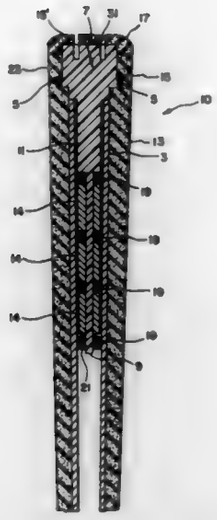
Herbert Boeckenhaupt, 116-A Whiskey Creek Rd., Hollywood, Md. 20636-9530

Filed Oct. 31, 1994, Ser. No. 331,466

Int. Cl.[6] A63B *53/14*

U.S. Cl. 273—162 R **17 Claims**

17. An athletic implement backweighting assembly for use with a hollow shafted athletic implement comprising:



a) a grip having a hollow interior terminating in a through opening in a proximal end of said grip, said through opening including an internally threaded portion therein; and

b) a backweighting assembly for attachment to said grip and insertion in a portion of said hollow shaft, said backweighting assembly further comprising:

i) an insert having an externally threaded portion sized to engage said internally threaded portion of said grip and a pair of recesses in a proximal end thereof;

ii) a shaft extending from said first externally threaded portion;

iii) a plurality of weights attachable to said shaft;

iv) at least one damper washer sized to fit on said shaft and between adjacent ones of said weights;

v) a fastener sized to secure said weights and said at least one damper washer to said shaft;

vi) a grip end cap sized to surround said proximal end of said insert, said end cap having bores therethrough which are aligned with respective said recesses to facilitate rotation of said insert; and

vii) wherein said externally threaded portion of said insert is attached to said internally threaded portion of said grip such that said shaft extends within the hollow shaft of an athletic implement handle surrounded by said grip.

5,465,968

GOLF CLUBHEAD HAVING BERYLLIUM FACE PLATE

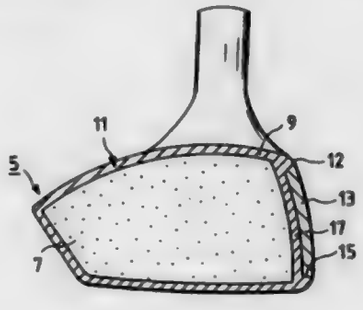
Yuichi Aizawa, and Yutaka Oku, both of Tokyo, Japan, assignors to Daiwa Golf Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1994, Ser. No. 219,892

Claims priority, application Japan, Mar. 31, 1993, 5-015749 U

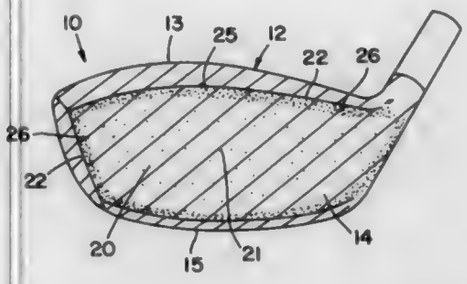
Int. Cl.[6] A63B *53/04*

U.S. Cl. 273—167 H **13 Claims**



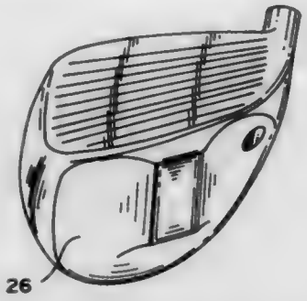
1. A golf clubhead comprising:
a metal head body having an open face portion;
a cavity portion in said face portion, said cavity portion having a face plate supporting wall at a bottom of said cavity portion, said face plate support wall closes said face portion; and
a face plate composed of substantially pure beryllium with a specific gravity no greater than 2 and a modulus of elasticity at least 294×10^9 N/m^2 is mounted in said cavity portion.

5,465,969
FOAMED CORE GOLF CLUB
Lauro C. Cadorniga, Piedmont, S.C., assignor to Dunlop Slazenger Corporation, Greenville, S.C.
Filed Jan. 18, 1994, Ser. No. 182,771
Int. Cl.[6] A63B 53/04
U.S. Cl. 273—167 R 7 Claims



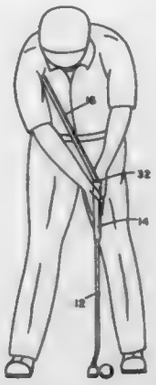
1. A metal wood golf club head comprising a hollow metal head body, the hollow metal head body filled with a filler composition comprising a central to peripheral ascending gradient density composition.

5,465,970
METAL WOOD GOLF CLUB HEAD
Byron H. Adams, Dallas, Tex., and Chia W. Lee, Kaohsiung, Taiwan, Prov. of China, assignors to Adams Golf, Inc., Richardson, Tex.
Filed Nov. 4, 1994, Ser. No. 336,660
Int. Cl.[6] A63B 53/04
U.S. Cl. 273—169 6 Claims



1. A metal wood golf club head comprising a metal shell having a hosel, ball striking face, heel, toe, upper surface, bottom surface, side and rear walls; said club head characterized by an upright trapezoidal geometry wherein said bottom surface has a greater area than said top surface and said side and rear walls are angled upwardly and inwardly from an outer periphery of said bottom surface to an outer periphery of said top surface.

5,465,971
PUTTING TRAINING DEVICE
Edward A. Tischler, 350 Auwinala Rd., Kailua, Hi. 96734
Filed Nov. 7, 1994, Ser. No. 334,961
Int. Cl.[6] A63B 69/36;53/14
U.S. Cl. 273—186.2 19 Claims



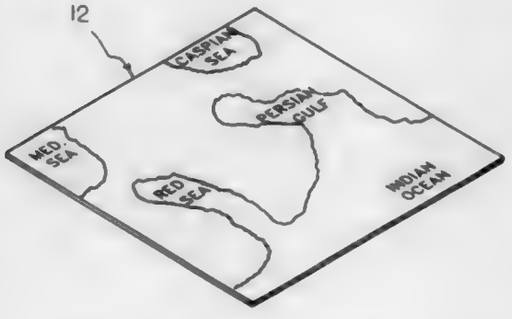
1. A putting training device for a golfer, said device being affixed to a handle end of a putter such that said device projects upwardly from said handle end, said device comprising:
a semi-rigid elongated rod, including:
an insertion post for securing said elongated rod within said handle end of said putter; and
a crutch-arm extending from said insertion post, said crutch-arm projecting at an obtuse angle from said handle end of said putter when said elongated rod is inserted into said handle end, whereby said crutch-arm engages a rearward armpit of a golfer when the golfer grips said handle end of said putter.

5,465,972
GOLF PUTTING AID
Jerry W. Cornett, P.O. Box 1242, Seminole, Tex. 79360
Filed Jan. 26, 1995, Ser. No. 378,834
Int. Cl.[6] A63B 69/36
U.S. Cl. 273—186.3 16 Claims

1. A method of practicing a golf stroke comprising:
a) removably attaching a switch to a handle of a golf club by unassisted manual operation;
b) attaching a laser unit to a shaft of the golf club by unassisted manual operation;

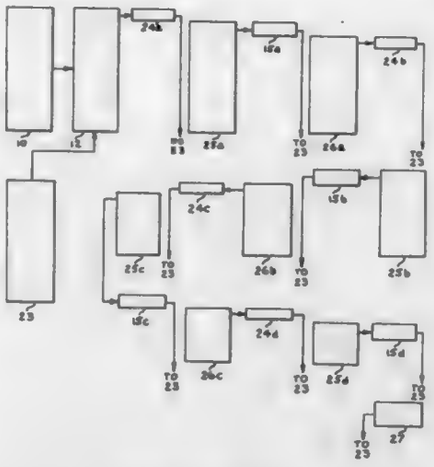
c) connecting the switch to the laser unit;
d) adjusting the laser unit so that a laser beam points onto a ground surface in an optimum direction with respect to a ball striking surface of the golf club;
e) placing the ball striking surface of the golf club adjacent to a golf ball,
f) activating the switch to produce a laser beam,
g) adjusting the position of the golf club so that the laser beam is aligned with a target;
h) swinging the club, thereby
i) hitting the golf ball with the ball striking surface; and
j) repeating steps e through i until satisfied with both consistency and result.

5,465,973
WAR GAME APPARATUS
Scott C. Anderson, 2601 Colley Rd. #123, Beloit, Wis. 53511
Continuation of Ser. No. 214,096, Mar. 17, 1994, abandoned. This application Mar. 7, 1995, Ser. No. 400,502
Int. Cl.[6] A63F *3/00*
U.S. Cl. 273—262 **14 Claims**



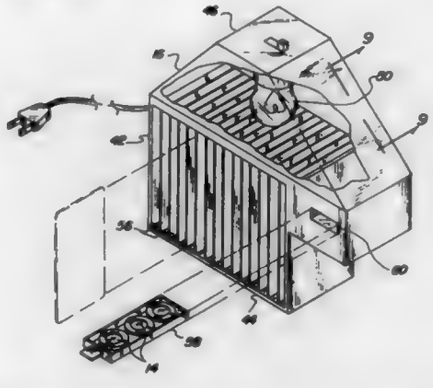
1. A method of playing a war game comprising the steps of:
(a) providing a map divided into a plurality of spaces, the spaces including state spaces and water spaces;
(b) providing a plurality of color coded game pieces, the plurality of color coded game pieces including ships placed on the water spaces and land pieces placed on the state spaces, the land pieces including: a plurality of airplanes; a plurality of soldiers; a plurality of Scud missiles; a plurality of Scud missile launchers; a plurality of Tomahawk missiles; and a plurality of Patriot missiles.
(c) providing a pair of chance selection devices
(d) providing a plurality of instruction cards for directing play action when a player takes a turn;
(e) assigning a color to each player;
(f) assigning a plurality of soldiers, and a plurality of instruction cards to each player;
(g) initially awarding to each player and positioning a plurality of soldiers upon a plurality of state spaces of the map;
(h) awarding a player a plurality of soldiers at a beginning of a turn;
(i) drawing a plurality of instruction cards by a player, the player doing one of the steps selected from the group consisting of: passing play to another player; attacking an opposing player; and moving a soldier from one state space to another state space wherein the player is entitled to a predetermined total of soldier-space moves defined as a number of soldiers moved multiplied by a number of spaces moved;
wherein a state space is owned by a player having at least one land piece on the state space.

5,465,974
METHOD OF DEALING PLAYING CARDS
Herbert H. Adise, 65 Dickenson Pl., Great Neck, N.Y. 11023
Filed Sep. 9, 1994, Ser. No. 303,324
Int. Cl.[6] A63F *1/00*
U.S. Cl. 273—292 **11 Claims**



8. A method for dealing playing cards in a twenty-one game comprising the steps of:
a) removing more than three said playing cards face down from a stack of playing cards when dealing out each and every round of game play, and placing the removed face down playing cards out of play, and
b) dealing out cards from the stack remaining after step (a) for the play of each and every round of said twenty-one game in accordance with the normal rules, whereby players are effectively prevented from deducing the composition of the stack during game play and gaining advantage thereby.

5,465,975
DEAD HAND CARD GAME AND METHOD OF USE
Naomi S. Shull, 4222 Martha Ct., Pascagoula, Miss. 39581, and Mary L. Shoun, Rte. 5, Box 120, Mountain City, Tenn. 37683
Filed Mar. 4, 1994, Ser. No. 205,559
Int. Cl.[6] A63F *1/00*
U.S. Cl. 273—295 **1 Claim**



1. A card game apparatus played with a dead hand comprising:
a deck of cards, the deck being divided into four sets, indicia on the back side of each card representative of the sets, such back side indicia including four celestial objects, indicia on the front side of each card including one of the four types of back side indicia plus the numbers 2 through 14 plus two trump cards marked with a T, the cards formed of a relatively flexible material;

a plurality of tokens with alignment apertures through each token adjacent to diametrically opposed edges; and

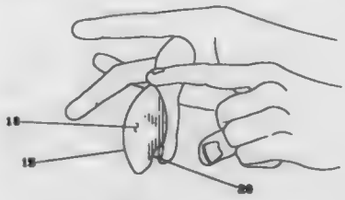
florescent material formed on the surface of each token adapted to irradiate light during the play of the game and subsequent to being exposed to light.

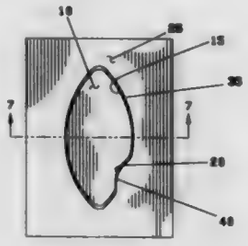
5,465,976

GAMEPIECE WITH PROTECTOR

Mark A. Gonzalez, Plano, Tex., assignor to MGwhiz, Inc., Plano, Tex.

Filed Dec. 19, 1994, Ser. No. 358,478
Int. Cl.[6] A63F 9/00
U.S. Cl. 273—317 14 Claims





1. A gamepiece, comprising:

a substantially planar gamepiece, the gamepiece having an outer perimeter, the outer perimeter being of substantially elliptical shape, the substantially elliptical shape of the outer perimeter having two vertices; and

the outer perimeter also having at least one indentation therein, the indentations being located at predetermined positions around the outer perimeter, the predetermined positions of the indentations around the outer perimeter being selected so that the gamepiece flies with optimum loft and accuracy when the gamepiece is stood upright on one of the two vertices and a blow is struck to one of the indentations;

whereby the accuracy of propelling the gamepiece through the air may be enhanced by striking one of the indentations in the gamepiece's outer perimeter.

5,465,977

ARCHERY TARGET STOP

Daniel Mann, 1719 Monroe St., Shelton, Wash. 98584

Filed Apr. 22, 1994, Ser. No. 231,279
Int. Cl.[6] F41J 3/00
U.S. Cl. 273—408 5 Claims

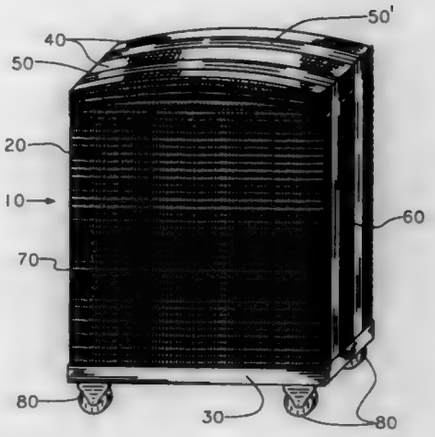
1. An archery target stop, comprising:

a flat base;

a stack of carpet strips placed upon the base; and

at least one band wrapped around the stack tightly enough to maintain the stack under compression;

wherein the stack of carpet strips includes in alternating sequence strips of 20 ounce commercial grade carpet, strips of 40 ounce plush carpet, and strips of 60 ounce plush carpet, the carpet strips are rectangular, having a parallel pair of relatively long edges defining the front and rear faces of the stack, and a parallel pair of relatively short edges defining the left and right sides of the stack, and each band is wrapped around the top, left and right sides of the stack, and around the base;



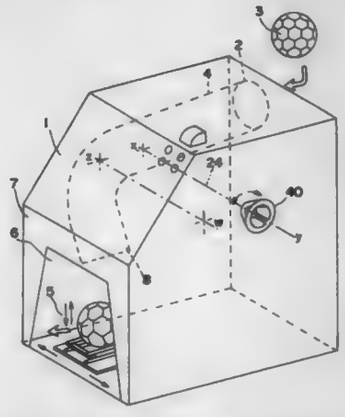
whereby, in use, an arrow shot at the stop will be caught between the strips of carpet.

5,465,978

TRAINING APPARATUS FOR LAUNCHING SOCCER BALLS

Jean-Pierre Magnone, 47 boulevard J.D. Blanqui, 06340 La Trinite, France, and Roberto Uttinacci, Via Verbano, 6, I-28041 Arona, Italy

PCT No. PCT/FR92/00568, § 371 Date Dec. 20, 1993, § 102(e) Date Dec. 20, 1993, PCT Pub. No. WO93/00138, PCT Pub. Date Jan. 7, 1993
PCT Filed Jun. 23, 1992, Ser. No. 167,911
Claims priority, application France, Jun. 24, 1991, 91 07846
Int. Cl.[6] A63B 69/00
U.S. Cl. 273—411 5 Claims



1. Training apparatus for launching balls, comprising: means for supplying a plurality of balls to a chute for gravity feeding the balls one at a time to a launching station, said chute having a lower end which opens at the level of the launching station and includes a single ball distributor, said distributor comprising an articulated lever actuated by an electromagnet so as to free said balls one at a time as they descend by gravity through the chute, said launching station including an ejection arm for striking said balls at a striking point with an adjustable force, said ejection arm being fixedly mounted on an axle mounted on bearings, said axle having a return spring attached thereto and a launching arm mounted thereon, said launching arm being actuated by an operatively associated rotatable drive arm which rotates the launching arm about said axle, said drive arm including adjustment means for varying the radius of the drive arm so as to stress the return spring and thereby generate said adjustable force, said launching station comprising a cradle for receiving a ball at said striking point, first cradle adjust-

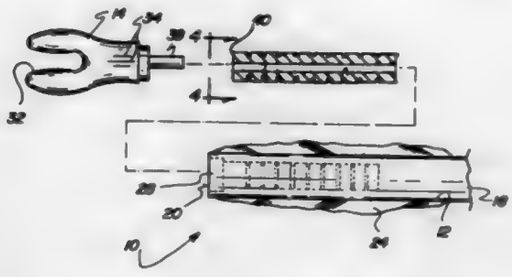
ment means for adjusting said cradle in a horizontal direction, and second cradle adjustment means for adjusting said cradle in a vertical direction.

5,465,979

ARROWS WITH REDUCED DIAMETER NOCKS

Clayton K. Buhler, Box 136, Laglace, Alberta, Canada

Filed Feb. 22, 1994, Ser. No. 199,424
Int. Cl.[6] F42B 6/06
U.S. Cl. 273—416 2 Claims



1. A new and improved arrow with a reduced diameter nock comprising, in combination:

a cylindrical arrow shaft (12) in a tubular configuration having a pointed end and a fletching end and an exterior diameter and an interior diameter;

fletching extending outwardly from the arrow shaft from the fetching end;

a cylindrical bore (28) extending into the arrow shaft at the fletching end, the bore having an internal diameter;

a nock having a forward end and a rearward end, the rearward end having a diameter essentially equal to the exterior diameter of the arrow shaft, the forward end having a first cylindrical portion (30) abutting the rearward end and extending forwardly therefrom, the first cylindrical portion having an exterior diameter to frictionally fit into the bore (28) of the arrow shaft, the forward end having a second slender cylindrical portion (38) extending forwardly from the first cylindrical portion, the second cylindrical portion having an external diameter less than that of the bore (28) and the first cylindrical portion, thereby forming a bearing shoulder at the junction of the first and second portions; and

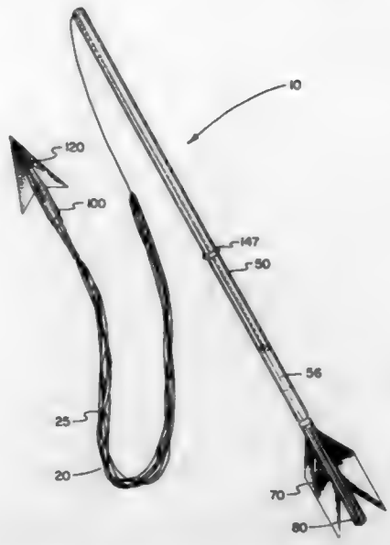
a cylindrical supplemental shaft (42) positioned in the arrow shaft at the fletching end ahead of the nock, the supplemental shaft having a second cylindrical bore (40), the external diameter of the second cylindrical portion of the forward end of the nock being such that the second cylindrical portion has a frictional fit in the bore of the supplemental shaft thereby to insure proper bonding and rotational adjustability of the nock.

5,465,980

ARROW WITH DEPLOYABLE SNARE

Edward E. Maurin, R.d. #2, Box 363A, Carmichaels, Pa. 15320

Continuation-in-part of Ser. No. 172,185, Dec. 23, 1993, abandoned. This application Feb. 1, 1995, Ser. No. 381,747
Int. Cl.[6] F42B 6/04
U.S. Cl. 273—416 5 Claims



1. A new and improved arrow with deployable snare comprising:

a first tubular shaft having an outside diameter, the first shaft also having an inside diameter wherein a hollow space is formed, the first shaft further having a wall defined by the difference between the outside diameter and the inside diameter, the first shaft additionally having feathered stabilizer means fixedly attached to one end, the first shaft also having a nock fixedly attached to the same end as the feathered stabilizer means, the first shaft having an open end opposite the nock;

a second tubular shaft having essentially the same outside diameter as the first shaft, the second shaft also having essentially the same inside diameter as the first shaft wherein a hollow space is formed, the second shaft further having a wall defined by the difference between the outside diameter and the inside diameter, the second shaft further having an arrowhead fixedly attached to one end, the second shaft additionally having an open end opposite the arrowhead;

coupler means to releasably couple the first shaft to the second shaft so when the first and second shafts are in coupled relationship they are aligned colinearly, the coupler means comprising:

a cylindrical first element having a body with an outside diameter essentially the same as the inside diameter of the first shaft, the first element being fixedly attached to the open end of the first shaft so the body is contained entirely within the hollow space of the first shaft, the first element also having a flange formed external to the first shaft to stop the arrow from passing entirely through a target thereby preventing loss of the target and the arrow, the first element additionally having a longitudinal tapered hole therethrough, the tapered hole having a fixed taper angle, the tapered hole also having an inside diameter, the tapered hole having a largest opening at the end of the element having the flange, the longitudinal hole also hang two spaced annular grooves formed therein;

a second cylindrical element having a body with an outside diameter essentially the same as the inside diameter of the second shaft, the second element fixedly attached to the open end of the second shaft so the body is contained entirely within the hollow space of the second shaft, the second element also having a tapered rod having a common axis with the body of the second cylindrical element, the tapered rod also having an outside diameter and a taper angle essentially complimentary to the inside diameter and taper angle of the first element's longitudinal tapered hole, the tapered rod additionally having two spaced annular rings formed thereon, the annular rings being configured to cooperatively releasably snapidly engage with the annular grooves of the first coupler element when the tapered rod is forcibly inserted into the tapered hole, the second cylindrical element also having an inertial coupler releasing means comprising:

a longitudinal cavity formed within the body of the second element, a weight loosely disposed within the longitudinal cavity so as to slide freely along the entire length of the cavity, the weight having a magnitude of heaviness such that sufficient inertial energy is released to disengage the annular rings of the second element from the annular grooves of the first element when the arrow impacts the target stopping quickly by the action of the first element's flange thereby causing the weight to rapidly slide forward within the cavity stopping abruptly against the front extent of the cavity

whereby the forward motion of the weight is transferred to the second coupler element independently of the first coupler element thereby causing separation of the second coupler element from the first coupler element; and

snare means comprising:

a plurality of flexible filaments fixedly attached to each other at both ends, the filaments also being attached at one end to the tapered rod of the second coupler element, the filaments further being fixedly attached at the other end to the inside of the hollow space of the first shaft such that the filaments can be stored inside the hollow space while the arrow shafts are coupled, the filaments also being of appropriate strength and dimension to deploy outside the hollow space of the first shaft upon separation of the arrow shafts whereby entangling the target with itself and surrounding brush and other objects thereby preventing loss of the target and the arrow.

5,465,981

FLEDGING VANE

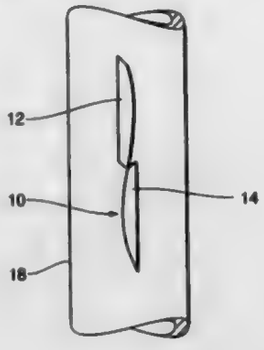
Emmerich Klaus, Veltsbronn, Germany, assignor to "Amerika-Bogen" Handelsgesellschaft mbH, Duisburg, Germany

Filed Jan. 13, 1995, Ser. No. 374,509

Claims priority, application Germany, Apr. 23, 1992, 9205525 U

Int. Cl.[6] F42B *6/06*

U.S. Cl. 273—423 **7 Claims**



1. Fledging vane consisting of elastically deformable material characterized in that the vane is cut-out of a material web and comprises a vane body and two fastening flaps being arranged one behind the other in arrow shaft direction and being bent-in opposite directions to each other.

5,465,982

METHOD AND APPARATUS FOR DISCLOSING A TARGET PATTERN FOR IDENTIFICATION

George J. Rebane, Topanga, Calif., assignor to Reznev Partners, Topanga, Calif.

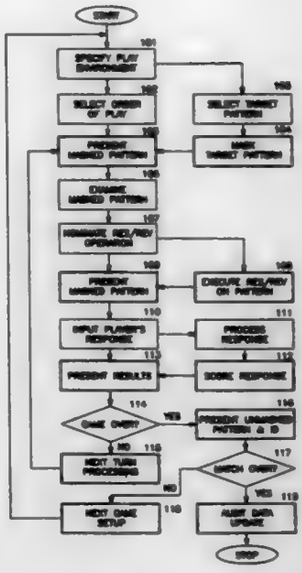
Continuation-in-part of Ser. No. 166,365, Dec. 14, 1993, abandoned. This application Dec. 23, 1993, Ser. No. 172,224

Int. Cl.[6] A63F *9/24*

U.S. Cl. 273—433 **15 Claims**

1. A method of presenting an audio target pattern to be perceived by a listener for identification of the audio target pattern comprising the steps of:

masking the audio target pattern to make it imperceptible to the listener;



repetitively and non-sequentially unmasking portions of the audio target pattern according to preselected steps; and

continuing to unmask the audio target pattern until a completion criterion is met.

5,465,983

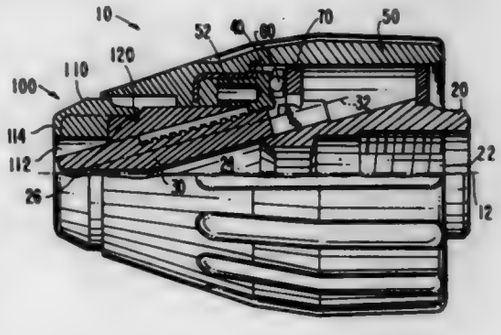
REMOVABLE NOSEPIECES FOR CHUCKS AND SIMILAR TOOL HOLDERS

Valerie Owens, Townville; Louis M. Shadeck, Anderson, and Robert O. Huff, Piedmont, all of S.C., assignors to Jacobs Chuck Technology Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 167,429, Dec. 15, 1993, Pat. No. 5,409,243. This application Nov. 22, 1994, Ser. No. 344,350

Int. Cl.[6] B23B *31/12*

U.S. Cl. 279—157 **24 Claims**



1. A plastic nosepiece for a chuck comprising:

a toroidal member of plastic removably mounted on a distal portion of said chuck so that when said member is mounted on said chuck, said member is substantially concentric with a tool inserted in said chuck and a distal surface of said member becomes the distal-most surface of said chuck.

5,465,984

BRAKING DEVICE PARTICULARLY FOR SKATES

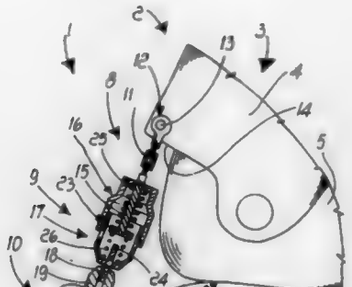
Alfred Pellegrini, Jr., Montebelluna; Andrea Tormena, Crocetta del Montello; Alessandro Pozzobon; Claudio Zorzi, both of Paderno di Ponzano Veneto, and Peter Edauw, S. Zenone Degli Ezzelini, all of, Italy, assignors to Nordica S.p.A., Montebelluna, Italy

Continuation-in-part of Ser. No. 51,404, Apr. 23, 1993, Pat. No. 5,374,070, and a continuation-in-part of Ser. No. 51,421, Apr. 23, 1993, Pat. No. 5,388,844. This application Sep. 1, 1993, Ser. No. 115,416

Claims priority, application Italy, Sep. 1, 1992, TV92A0097; Nov. 11, 1992, TV92A0136; Nov. 30, 1992, TV92A0150; Jun. 14, 1993, TV93A0001

Int. Cl.[6] A63C *17/14*

U.S. Cl. 280—11.2 35 Claims



1. In a skate comprising a shell, a longitudinally-extending frame associated with said shell and adapted to support a plurality of wheels, and a quarter mounted for pivotal movement relative to said shell about a first axis generally transverse to said frame, a braking device comprising:

a braking element pivotally connected to and extending rearwardly with respect to said frame for pivotal movement relative to said frame about a second axis generally parallel to said first axis, said braking element comprising

a support having a pivot and pivotally attached to said frame and as extending portion extending rearwardly, with respect to said frame, from said pivot end, and

at least one brake pad supported by said support at a point spaced rearwardly from said second axis and having a braking surface adapted to interact with the ground; and,

an actuator including at least one rod-like member, said actuator having an upper end connected to a rear portion of said quarter and extending downwardly and rearwardly from said rear portion of said quarter, and a lower end connected to said braking element at a point rearwardly of said second axis and above said braking surface, such that rearward pivoting of said quarter causes downward movement of said lower end of said actuator and said extending portion of said support and causes said braking surface of said brake pad to move into ground engagement and forward pivoting of said quarter causes said braking surface of said brake pad to move away from ground engagement.

5,465,985

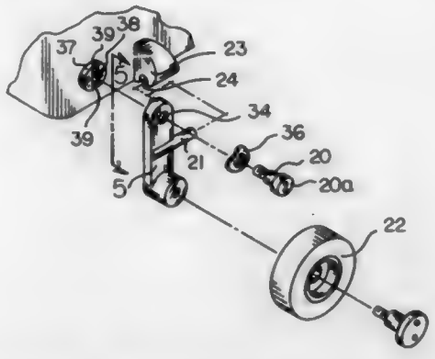
WHEELED PORTABLE COOLER

Colleen M. Devan, and William M. Devan, both of 113 Pondview Rd., Weare, N.H. 03281

Filed Apr. 13, 1994, Ser. No. 226,989

Int. Cl.[6] B62B *3/02*

U.S. Cl. 280—30 6 Claims



1. (Amended) A wheeled portable cooler comprising:

an insulated container body, having a front wall spaced from a rear wall, a first side wall spaced from a second side wall, with said front wall and said rear wall intersecting said first side wall at first corners, and said front wall and said rear wall intersecting said second side wall at second corners;

a lid pivotally mounted to said container body;

latch means mounted to said lid for securement of said lid to said front wall;

a plurality of flange plates, each of said flange plates having a plate first end spaced from a plate second end, with an abutment lug projecting laterally of said flange plate between said flange plate first end and said flange plate second end, with each of said flange plates being pivotally mounted at said first end thereof to an individual one of said corners of said container body;

a plurality of wheel members, with each wheel member being rotatably mounted to an individual one of said flange plates adjacent said second end of said flange plate;

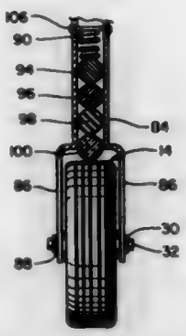
a plurality of lug members, each of said lug members mounted to said container body adjacent a respective one of said flange plates, with each of said lug members having a socket to receive said abutment lug when said flange plate is arranged in a lowered position extending beneath said container body; wherein each of said flange plates includes a flange plate front wall and a flange plate rear wall, said flange plates each having a flange plate bore extending therethrough at said first end thereof, with said rear wall of each of said flange plates having a plurality of ribs longitudinally aligned on diametrically opposed sides of said flange plate bore, and further comprising a plurality of pivot axles each having a pivot axle head, with each pivot axle projecting through said flange bore of an individual one of said flange plates, a plurality of axle bosses each having an axle boss bore and longitudinally aligned axle boss grooves positioned on diametrically opposed sides of said axle boss bore, said axle bosses being fixedly mounted to said container body proximate an individual one of said corners thereof, and each axle boss bore receiving an individual one of said pivot axles to pivotally mount said flange plates to said container body, and a plurality of spring washers with each spring washer interposed between an individual one of said pivot axle heads and an individual one of said flange plates to bias said ribs into said grooves.

5,465,986

WHEEL RESTRAINING DEVICE FOR A SHOPPING CART OR A PORTABLE VEHICLE

Elwyn F. MacRae, 309 Skylark Dr., Bloomingdale, Ill. 60108

Filed May 24, 1993, Ser. No. 65,494
Int. Cl.[6] B62B 3/00
U.S. Cl. 280—33.994 12 Claims



1. In combination, a shopping cart supported on a set of wheels, said wheels each having an axle with each wheel being mounted on the axle, said wheels being rotatable as the cart is moved on its wheels, tubular yokes, said tubular yokes being secured at corners of the cart to the cart, said wheels being rotatable about the axle as the cart is moved on its wheels, and brake means mounted on the cart and operatively connected to said wheels, said brake means exerting a force against an outer portion of an associated one of the wheels through an open end supported by a tubular yoke being a pintle axle of the associated wheel to inhibit rotation of the axle and the wheels supported thereon, said tubular yokes having yoke legs positioned on opposite sides of each wheel, said tubular yokes having a lower open end for overlying the outer circumference of the wheel, said brake means is mounted inside the tubular yokes, said brake means comprising a compression spring, friction means positioned beneath said compression spring inside the tubular yoke, shoulder means mounted above said compression spring holding said spring in place, said friction means exerting a force against the wheel through the open end supported by the tubular yoke, said friction means is a material selected from the group consisting of a series of weighted spherical balls and a solid tubular plunger, said friction means being positioned to rub against the outer circumference of the wheels and to inhibit rotation of the wheels, the force exerted by the brake means being such that when the shopping cart is standing free and unattended, such as in a parking lot, the force is sufficient to prohibit the shopping cart from freely rolling around, the force, however, being insufficient to curb the movement of the cart when being pushed by a user.

5,465,987

FOLDING HANDTRUCK ATTACHMENT

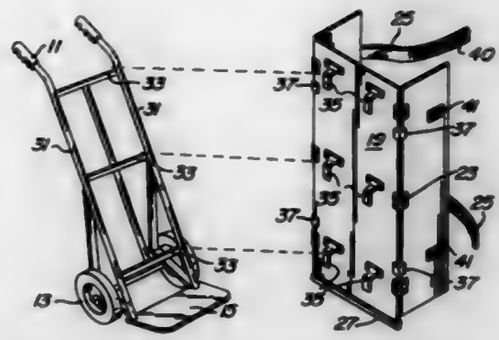
Joseph A. DellaVecchia, 3734 Orchard Ave., Bensalem, Pa. 19020

Filed Oct. 24, 1994, Ser. No. 327,702
Int. Cl.[6] B62B 1/12
U.S. Cl. 280—47.28 6 Claims

1. A handtruck, comprising:

a vertical, ladder-back frame including a plurality of horizontal cross-braces extending between vertical side rails, said frame having handles at a top and a pair of axle-mounted wheels at a bottom;

a toe plate affixed to the bottom of said frame and extending substantially horizontally from the front of the frame;



three panels, including a back panel and two side panels, said side panels connected to said back panel by hinges, said panels being detachably secured to and quickly removable by lift release from, at least one of said horizontal cross-braces by a plurality of vertically-extending hang brackets fastened to the rear of said back panel, said back panel covering the entire space between all cross-braces; and a shock-absorbing bumper along the bottomed edge of said back panel to vertically support said back panel against said toe plate and to reduce vibration and rattle of the panels.

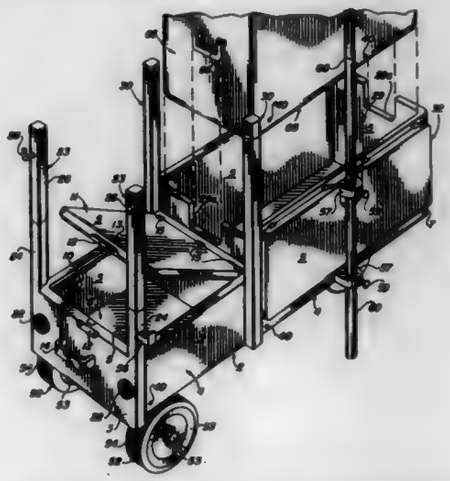
5,465,988

UTILITY CART

Macy S. Dennis, 221 N. Demanade, Lafayette, La. 78503

Continuation of Ser. No. 949,074, Sep. 21, 1992, Pat. No. 5,380,022. This application Oct. 5, 1994, Ser. No. 318,547
Int. Cl.[6] B62B 3/12
U.S. Cl. 280—47.35 1 Claim

1. A utility cart comprising a frame having a front end and a rear



end; a pair of wheels fixedly mounted on the rear end of said frame in rotatable relationship; a front wheel carried by a front wheel bracket pivotally mounted to the front end of said frame, said front wheel bracket having a pair of open channels extending therethrough with the front wheel mounted therebetween; a towing handle having a pair of laterally spaced parallel extensions members slidably received within said pair of open channels, each extension member having a forward extension portion and a rearward extension portion interconnected by a hinge, stop means provided on a rearward end of each rearward extension portion for terminating extension of said extension members from said front wheel bracket and grip means connected between opposite forward ends of said forward extension portions for extending said handle extension members with respect to the wheeled frame and said front wheel bracket for guiding and towing said utility cart; an ice

chest receptacle provided on said front end of said frame for receiving a removable ice chest and an ice chest lid hingedly carried by said ice chest receptacle for selectively opening and closing access to the ice chest, said ice chest receptacle having forward and rearward walls with slots formed along upper edge portions thereof for receiving handles located on end walls of said removable ice chest; at least two table tops hingedly carried by said ice chest receptacle on each side of said ice chest receptacle and table top support means pivotally carried by said ice chest receptacle for selectively engaging said table tops and supporting said table tops in extended, substantially horizontal relationship; a storage compartment provided on said rear end of said frame and a storage compartment lid hingedly carried by said frame for selectively opening and closing said storage compartments; and a plurality of chair supports disposed in upward, free-standing relationship on said frame, with at least two of said chair supports characterized by a fixed segment carried by said frame and a removable segment removably carried by said fixed segment, for loading, unloading, supporting and carrying chairs on said utility cart.

5,465,989

HAND-POWERED AND CONTROLLED TWO-WHEELED CYCLE FOR THE DISABLED

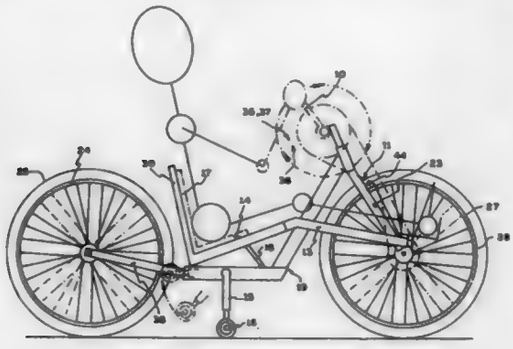
William D. Grove, 1154 Cortland Dr., Lemont, Pa. 16851

Filed Nov. 17, 1993, Ser. No. 153,746

Int. Cl.[6] B62M *1/14*; B62K *3/16*; B62H *1/12*

U.S. Cl. 280—250 **20 Claims**

1. A two-wheeled, hand-powered and hand-controlled cycle for



leg disabled riders having a front wheel and a rear wheel arranged in the same vertical plane and axially in the same horizontal plane comprising:

(a) a rigid support frame having a low center of gravity;

(b) a combination manual steering and powering means for said front wheel of said cycle having hand cranks which extend one from each side of a transverse axles of said steering and powering means and which include handle end knobs which are aligned axially with each other permitting rotary power motion and steering;

(c) a retractable wheeled outrigger assembly;

(d) a seating means; and

(e) a rigid full leg support means for said rider comprising two bars extending from the seating means to its terminus where the feet of said rider rest whereby the seating means is supported by the two bars.

5,465,990

LOCKING SYSTEM FOR A SEMITRAILER SLIDING UNDERCARRIAGE

Larry L. Wessels, 549 S. Xenon Ct., Lakewood, Colo. 80228

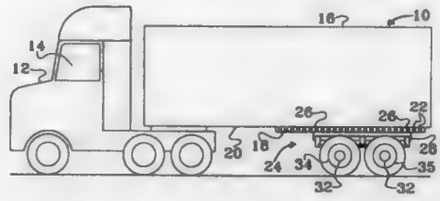
Continuation of Ser. No. 151,349, Nov. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 996,580, Dec. 24, 1992, Pat. No. 5,314,201. This application Jan. 31, 1995, Ser. No. 381,290

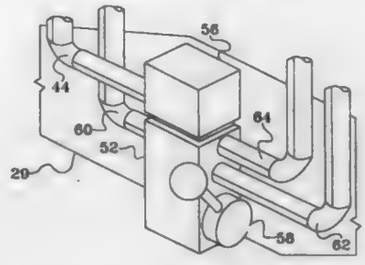
The portion of the term of this patent subsequent to May 24, 2011, has been disclaimed.

Int. Cl.[6] B62D *53/06*

U.S. Cl. 280—407.1 **16 Claims**

1. A locking system for mounting on a sliding undercarriage of a





semitrailer, the semitrailer pulled by a tractor, the locking system used for securing and releasing the sliding undercarriage from a pair of parallel rails mounted on an underside of the semitrailer, the parallel rails having spaced apart locking pin holes along the length thereof, the sliding undercarriage having semitrailer spring operated air brakes operated from an air brake line connected to a pressurized air tank on the semitrailer, the locking system comprising:

a pair of air cylinders with pistons, said air cylinders mounted on the sliding undercarriage and disposed next to the parallel rails;

locking pins attached to said pistons, a portion of said locking pins inserted into selected locking pins holes in the parallel rails;

a 4-way valve connected to said air cylinders and to an air line connected to the air tank on the semitrailer, said air valve directing pressurized air to said air cylinders for retracting and extending said pistons in said cylinders;

an air pressure switch connected to the air brake line semitrailer and connected to said air valve for automatically controlling the operation of opening and closing of said air valve during the retracting of said locking pins from the locking pin holes and allowing pin retraction only when air pressure is released via the air brake line to the semitrailer air brakes and the spring brakes are set on the sliding undercarriage, said air pressure switch sensing pressurization or release of air pressure through the air brake line to the semitrailer's air brakes;

an air valve operating means connected to said air valve for operating said air valve and retracting said locking pins from the locking pin holes and extending said locking pins in the locking pin holes when air pressure is released via the air brake line to the semitrailer air brakes and the spring brakes are set on the sliding undercarriage; and

said air pressure switch preventing operation of said air valve operating means and said air valve when air pressure is applied to the air brake line and allowing only for said air valve to provide air pressure to said air cylinders for extending the pistons in said cylinders.

5,465,991

WEIGHT DISTRIBUTING HITCH

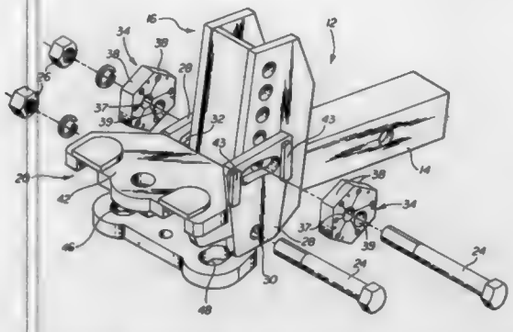
John J. Kass, Granger, Ind.; Philip K. Hoopes, Union, Mich.; Wayne E. Sously, Elkhart, Ind., and Graeme H. Aspinall, Scoresby, Australia, assignors to Reese Products, Inc., Elkhart, Ind.

Continuation-in-part of Ser. No. 138,172, Oct. 15, 1993, Pat. No. 5,375,867. This application Dec. 13, 1994, Ser. No. 355,376

Claims priority, application Australia, Sep. 21, 1994, 74128/94

Int. Cl.[6] B60D *1/42*

U.S. Cl. 280—457 9 Claims



1. A weight distributing hitch assembly for towing a trailer behind a vehicle, comprising:

a hitch bar for mounting to the vehicle;

a ball mount head for mounting on the hitch bar at a selected tilt angle;

spring bar means for distributing weight of the trailer relative to the vehicle;

adjustment means for selectively adjusting the tilt angle of said ball mount head relative to said hitch bar;

means for fixing said adjustment means relative to one of said hitch bar and said ball mount head;

a cooperating stop fixed to the other of said hitch bar and said ball mount head; and

said adjustment means being characterized by an eccentric member having (1) a cam surface for engaging said cooperating stop on the other of said hitch bar and said ball mount head in order to provide a fixed relationship between said hitch bar and said ball mount head and (2) a pair of spaced, off-center apertures, said fixing means being selectively received through one of said off-center apertures whereby it is possible to provide the selected tilt angle of said ball mount head on said hitch bar for desired distribution of the tongue weight of the trailer.

5,465,992

ALIGNING DEVICE FOR HITCHING A TOWED VEHICLE

Ronald G. Anderson, 3710 S.E. Hillside Dr., Milwaukie, Oreg. 97267

Filed Dec. 8, 1994, Ser. No. 351,936

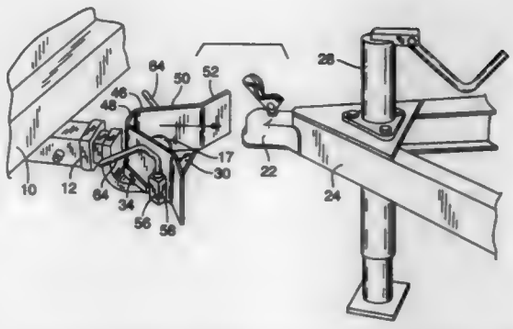
Int. Cl.[6] B60D *1/06*

U.S. Cl. 280—477 6 Claims

1. An aligning device capable of use with a drawbar of a type that is mounted on a towing vehicle and arranged for hitching engagement with a ball socket on a tongue of a towed vehicle, the drawbar being of the type having a flat surface and a hitch ball with a threaded stem arranged to be bolted in a ball mounting aperture in the drawbar, said aligning device comprising:

a base plate having front and rear edges and top and bottom surfaces,

an aperture in said base plate disposed between said front and rear edges,



said base plate being capable of being removably bolted flatwise on said drawbar solely by the stem of a hitch ball upon alignment of said aperture in said base plate with the ball mounting aperture in the drawbar,

an integral laterally extending U-shaped wall projecting upwardly from the front edge of said base plate and having a rearwardly facing wall surface,

said U-shaped wall being of limited height for allowing side-to-side swinging movement of a trailer tongue over the top of said U-shaped wall,

a trailer tongue guide having top and bottom edges,

said tongue guide being U-shaped and facing the rear for guiding the ball socket of the tongue of a towed vehicle over a hitch ball of a towing vehicle into engagement with said front integral wall,

said guide being arranged to be seated with said bottom edge thereof seated on the top surface of said base plate in contact with the rearwardly facing wall surface of said front wall for aligning the ball socket of a towed vehicle over the hitch ball of a towing vehicle,

and locking means releasably locking said guide in place on said base plate,

said locking means comprising a vertical pivoted lever having a bottom horizontal latch finger that extends at an angle from said pivoted lever whereby in a rotative position of the lever said finger engages against the bottom surface of said base plate in a clamping engagement.

5,465,993

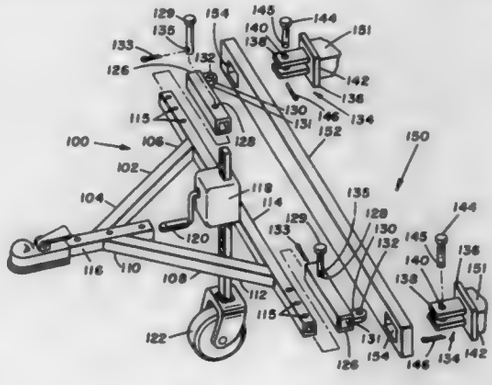
PORTABLE TONGUE FOR TRAILERS

Calvin J. Gee, Somerville, and John M. Matkin, Boaz, both of Ala., assignors to GMT, Inc., Boaz, Ala.

Continuation-in-part of Ser. No. 5,789, Jan. 19, 1993, Pat. No. 5,348,333. This application Mar. 14, 1994, Ser. No. 209,241

Int. Cl.[6] B60D *1/167*

U.S. Cl. 280—491.5 15 Claims



1. A detachable hitch apparatus for releasably coupling a vehicle and a trailer frame, said hitch apparatus comprising: a coupling assembly having first and second end portions and vehicular secur-

ing means secured to said first end portion for releasably securing said coupling assembly to a vehicle; a pair of arms extending in a direction opposed to said vehicular securing means, each of said arms having a first end and a second end, said first end of each said arm being secured to said vehicular securing means; releasable attachment means associated with each said second end of said arms for releasably securing said pair of arms to the frame, said releasable attachment means comprising first coupling means including a first transverse support member extending outwardly from said second ends of said arms, a second transverse member disposed adjacent said first transverse support member, said second transverse member having a pair of spaced openings therein, an extendible member at opposite ends of said first transverse support member, and locking means for adjustably securing each said extendible member to said first transverse support member, each said extendible member having a first projection thereon; a pair of second coupling means, each including a second projection disposed for extending through one of said openings in said second transverse member for engaged, secured, relation with said first projection of a respective said extendible member; means for securing said first and second projections in releasably coupled relation; and, means for securing said second coupling means to the frame.

5,465,994

DEVICE FOR DAMPING SKI VIBRATIONS

Philippe Commier, Annecy, and Jacques Le Masson, Cran Gevrier, both of, France, assignors to Salomon S.A., Chavanod, France

Filed Feb. 4, 1994, Ser. No. 191,466
Claims priority, application France, Feb. 5, 1993, 93 01427
Int. Cl.[6] A63C *5/075*
U.S. Cl. 280—602 **13 Claims**

1. A device for dampening vibration of a ski having a central zone in which bindings are mounted and front and rear points of contact with the skiing surface, said device comprising:

(a) at least one flexible blade having a first portion and a second portion, said blade extending between said central zone and one of said front and rear points of contact;

(b) at least two dampening connection devices spaced apart longitudinally and affixed to said ski to allow said flexible blade to move longitudinally in its entirety over its entire length with respect to said ski upon flexion, said dampening connection devices being selected from the group consisting of:

(i) an interface of at least one layer of a viscoelastic material welded or adhesively bonded to at least one of said first and second portions of said flexible blade;

(ii) a frictional connection whereby at least one of said first and second portions of said flexible blade comprises at least one surface in a longitudinal friction sliding relationship, with respect to a surface of said dampening connection device affixed with respect to said ski, during use of said ski, at least one of said surfaces comprising a surface of a friction layer having a high coefficient of friction; and

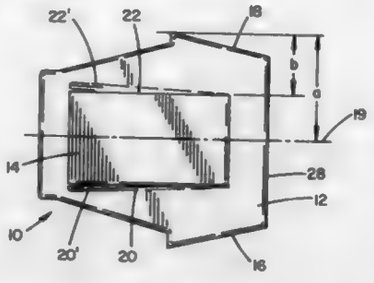
(iii) a viscous connection whereby at least one of said first and second portions of said flexible blade comprise at least one surface in a longitudinal viscous friction sliding relationship with respect to a surface of said dampening connection device affixed with respect to said ski, during use of the ski, said viscous connection comprising at least one layer of a viscous material and a sleeve affixed to said ski and having a sliding housing containing said viscous material.

5,465,995

PEDAL FOR SKI BRAKES

Gerhard Sedlmair, Farchant, Germany, assignor to Marker Deutschland GmbH, Germany

Filed Sep. 9, 1993, Ser. No. 118,569
Claims priority, application Germany, Sep. 9, 1992, 9212157 U
Int. Cl.[6] A63C *7/10*
U.S. Cl. 280—605 **10 Claims**



1. A pedal for operating a ski brake for a ski, the ski brake having at least one movable lever in the form of a brake spur, said pedal comprising:

a tread portion having a longitudinal axis and bounded by lateral edges; and

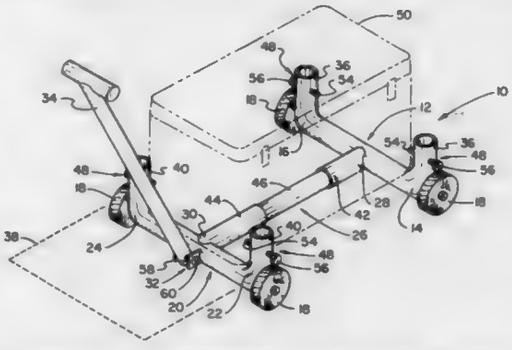
an inclined raised portion integrated with said tread portion, said inclined raised portion comprised of at least one inclined plane having generally longitudinally extending lateral edges, for facilitating the operational engagement of a ski boot heel and said pedal, wherein the ratio of the distance between the generally longitudinally extending lateral edge of said raised portion and the furthest extending position along the generally longitudinally extending lateral edge of said tread portion, to the maximum width of said tread portion located perpendicularly to the longitudinal axis of said tread portion is between approximately 0.2 and 0.3.

5,465,996

COOLER CARRIER APPARATUS

William Wisz, 81 Liddell St., Buffalo, N.Y. 14212

Filed May 5, 1994, Ser. No. 238,512
Int. Cl.[6] B62B *3/02*
U.S. Cl. 280—651 **7 Claims**



1. A new and improved container carrier apparatus, comprising:

a first support assembly which includes a first end portion and a second end portion,

a second support assembly which includes a first end portion and a second end portion,

a third support assembly connected between said first support assembly and said second support assembly, said third support assembly including a first end and a second end, said first end of said third support assembly connected to said first support assembly at a mid-portion of said first support assembly and said second end of said third support assembly connected to

said second support assembly at a midportion of said second support assembly, said third support assembly connected to said first support assembly and said second support assembly such that said third support assembly, said first support assembly, and said second support assembly are coplanar in a support plane,

a pair of first lateral retention assemblies connected to said first support assembly, wherein one of said first lateral retention assemblies is connected to said first end portion of said first support assembly, wherein another of said first lateral retention assemblies is connected to said second end portion of said first support assembly, and wherein said first lateral retention assemblies project perpendicularly from said support plane,

a pair of second lateral retention assemblies connected to said second support assembly, wherein one of said second lateral retention assemblies is connected to said first end portion of said second support assembly, wherein another of said second lateral retention assemblies is connected to said second end portion of said second support assembly, and wherein said second lateral retention assemblies project perpendicularly from said support plane,

a hinge assembly connected to either said first support assembly or said second support assembly,

a handle assembly connected to said hinge assembly,

four wheels attached to said respective end portions of said respective first and second support assemblies, wherein said wheels rotate around axes which project from said respective end portions of said respective first and second support assemblies, and

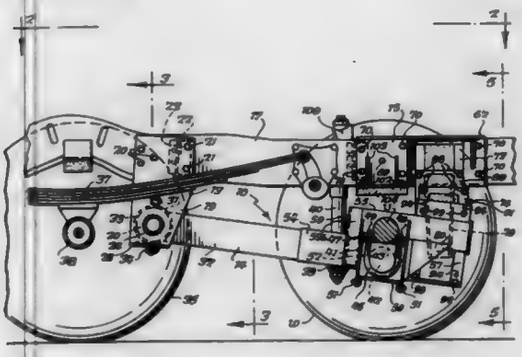
clamping assemblies connected to said first lateral retention assemblies and to said second lateral retention assemblies for clamping a container between said respective lateral retention assemblies, wherein each of said clamping assemblies includes a pair of threaded apertures in said lateral retention assemblies, and a complementarily threaded bolt adapted to be screwed through said threaded apertures and to extend to directly contact and directly clamp a container supported by said first, second, and third support assemblies, wherein said threaded bolts on said first lateral retention assemblies clamp the container therebetween, and wherein said threaded bolts on said second lateral retention assemblies clamp the container therebetween.

5,465,997

RUBBER SPRING TAG AXLE SUPENSION

David E. Heitzmann, Union, Mich., assignor to MOR/ryde International, Inc., Elkhart, Ind.

Filed Mar. 2, 1994, Ser. No. 204,681
Int. Cl.[6] B60G *11/24;11/22*
U.S. Cl. 280—716 **25 Claims**



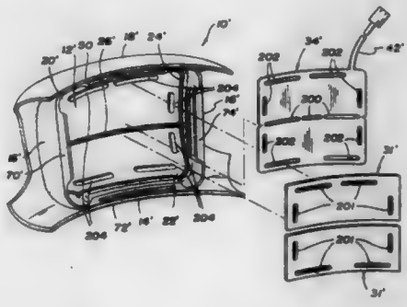
1. In a vehicle having first and second spaced frame members, an axle mounted between said first and second frame members, and wheels mounted at opposite ends of said axle, a tag axle suspension for mounting behind said axle comprising first and second front hanger assemblies attached to said first and second spaced frame members, respectively, a shaft coupled between said first and second front hanger assemblies, first and second beam assemblies having first and second ends, said first ends of said first and second beam assemblies being mounted on said shaft proximate said first and second frame members, respectively, first and second rear hanger assemblies attached to said first and second frame members, respectively, first and second rubber springs mounted on said first and second rear hanger assemblies, respectively, and attached to said second ends of said first and second beam assemblies, respectively, and a second axle attached between said second ends of said first and second beam assemblies for supporting a pair of wheels.

5,465,998

AIR BAG COVER HAVING A TEAR SEAM MEMBRANE SWITCH

David J. Davis, Troy, Mich., assignor to Larry J. Winget, Leonard, Mich.

Filed Mar. 17, 1995, Ser. No. 405,846
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—731 **7 Claims**



1. A plastic molded air bag cover mountable onto an air bag assembly, the cover comprising:

a front cover having inner and outer surfaces adapted to overlie an uninflated air bag and being separable along a first prescribed tear pattern upon deployment of the air bag;

a switch assembly which includes a flexural material lying behind the inner surface of the front cover; and

a pair of spaced rear panels secured to the inner surface of the front cover to form a pair of hollow compartments to receive the switch assembly therein, wherein the switch assembly includes a second prescribed tear pattern aligned with a portion of the first prescribed tear pattern the switch assembly being separable along said second prescribed tear pattern upon deployment of the air bag, the second prescribed tear pattern being located between the pair of spaced rear panels.

5,465,999

INFLATABLE SEAT BELT HAVING DEFINED SHAPE

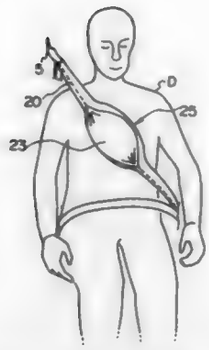
Yoshihiko Tanaka, Tokyo; Tsuneo Chikaraishi, Hikone, and Nobuya Osada, Kouga, all of, Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Jun. 30, 1994, Ser. No. 269,367
Int. Cl.[6] B60R *21/18*
U.S. Cl. 280—733 **7 Claims**

1. An inflatable seat belt for restraining movement of an occupant in a vehicle, comprising:

a webbing attached to the vehicle and extending for restraining movement of the occupant;

an inflatable portion fixed to the webbing and contacting the occupant when the webbing is worn, said inflatable portion including an elastic inflatable tube having an elongated shape and heat resistance, and fixed to the webbing; a knitted member in a flat form and connected at both longitudinal ends



to the webbing to entirely cover the inflatable tube, said knitted member having elasticity in a direction perpendicular to a longitudinal direction of the webbing and non-elasticity in the longitudinal direction of the webbing; and a non-expandable cover for substantially completely covering the knitted member and having a joining portion extending along the longitudinal direction of the webbing without connecting to the knitted member, said joining portion having a first part corresponding to a chest of the occupant and at least one second part situated adjacent to the first part, said first part being weaker than the second part in strength;

a tongue fixed to the inflatable portion and having a gas flow path therein; and

a buckle attached to the vehicle and engagable to the tongue, said buckle having a port to supply a gas to the inflatable portion through the gas flow path of the tongue so that when the inflatable tube is inflated by the gas, the knitted member expands laterally at the portion corresponding to the first part while breaking the first part, expansion of the knitted member being restricted by the second part.

5,466,000

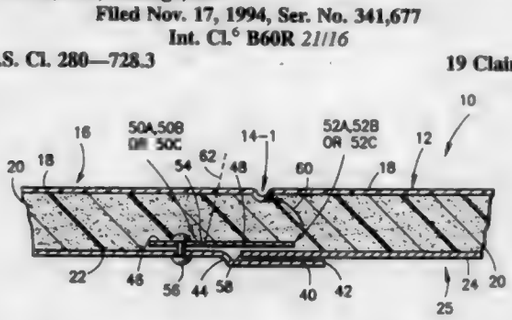
FLAT-LYING CUTTER/RIPPER FOLDABLE INTO UPSTANDING POSITION DURING DEPLOYMENT OF A VEHICLE AIRBAG FOR DETACHING A DEPLOYMENT DOOR FROM A PANEL

Timothy J. Leonard, Stuttgart, Germany, and Daniel W. Anderson, South Weber, Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Nov. 17, 1994, Ser. No. 341,677

Int. Cl.[6] B60R *21/16*

U.S. Cl. 280—728.3 **19 Claims**



1. In a vehicle airbag installation wherein a panel has front and rear surfaces, with said front surface being exposed to a passenger compartment in the vehicle, and wherein the panel has at least one tear region therein associated with a deployment door which is integral with the panel and wherein, during deployment of an airbag module located rearwardly from said deployment door, said deployment door becomes detached at the tear region from a remaining area of the panel for providing a doorway outlet through the panel through which the airbag during its inflation deploys into the passenger compartment,

apparatus for detaching the deployment door at the tear region comprising:

at least one cutter/ripper,

said cutter/ripper having first and second portions,

said cutter/ripper having an intermediate region intermediate said first and second portions,

said intermediate region being bendable,

said second portion of the cutter/ripper being flat and having cutting means,

mounting means for mounting said first portion in fixed position relative to said panel with said cutter/ripper being positioned at said tear region and with said second portion and said cutting means lying flat relative to the front surface of the panel near said tear region, and

said intermediate region being bendable forwardly sufficiently during deployment for swinging said cutting means forwardly into an active upright orientation for detaching said deployment door at said tear region.

5,466,001

AIR BAG SYSTEM FOR AN AUTOMOTIVE VEHICLE

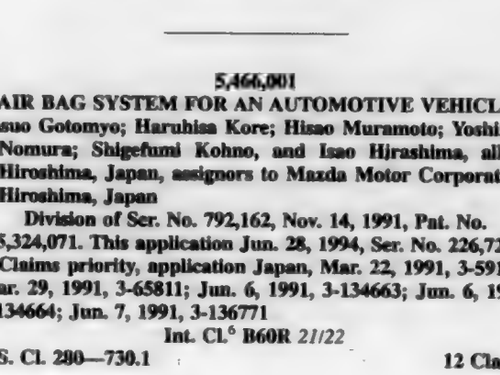
Yasuo Gotomyo; Haruhisa Kore; Hisao Muramoto; Yoshinbu Nomura; Shigefumi Kohno, and Isao Hirashima, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Division of Ser. No. 792,162, Nov. 14, 1991, Pat. No. 5,324,071. This application Jun. 28, 1994, Ser. No. 226,720

Claims priority, application Japan, Mar. 22, 1991, 3-59103; Mar. 29, 1991, 3-65811; Jun. 6, 1991, 3-134663; Jun. 6, 1991, 3-134664; Jun. 7, 1991, 3-136771

Int. Cl.[6] B60R *21/22*

U.S. Cl. 280—730.1 **12 Claims**



1. An air bag system for an automotive vehicle having an air bag unit disposed on a front seat so as to expand an air bag accommodated in the air bag unit toward a passenger seated on a rear seat upon impact of the automotive vehicle, comprising:

front seat status adjusting means for adjusting a seat status of the front seat;

passenger determining means for determining if the passenger is seated on the rear seat; and

inhibition means for inhibiting alteration of the seat status of the front seat beyond a predetermined range by controlling the front seat status adjusting means in response to a signal from the passenger determining means, when it is determined by the passenger determining means that the passenger is seated on the rear seat.

5,466,002

INFLATABLE SEAT BELT WITH LEAK DETECTION DEVICE

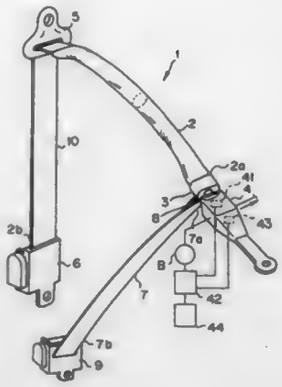
Yoshihiko Tanaka, Koutou; Tsuneo Chikaraishi, and Muneharu Tomie, both of Hikone, all of, Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Jun. 30, 1994, Ser. No. 269,364

Int. Cl.[6] B60R *21/18*

U.S. Cl. 280—733 **9 Claims**

1. An inflatable seat belt apparatus for restraining movement of an occupant in a vehicle, comprising:



a webbing attached to the vehicle and extending for restraining movement of the occupant;

an inflatable portion having an elongated shape and being formed over at least a part of the webbing, said inflatable portion contacting the occupant when the webbing is worn and having an elastic inflatable tube;

a tongue fixed to the elastic inflatable tube and having a gas flow path therein;

a buckle attached to the vehicle and engagable to the tongue, said buckle including a gas path having one end engagable to the gas flow path of the tongue;

first gas generating means connected to the gas path of the buckle, said first gas generating means providing a gas to the elastic inflatable tube to fully inflate the elastic inflatable tube when the vehicle receives a predetermined deceleration;

second gas generating means attached to the gas path of the buckle, said second gas generating means providing a gas for a leak test to the elastic inflatable tube at a pressure less than that supplied by the first gas generating means when the tongue is engaged with the buckle; and

gas leak detecting means disposed adjacent to the gas path of the buckle, said gas leak detecting means checking leakage of the gas in the elastic inflatable tube when the gas from the second gas generating means is supplied to the elastic inflatable tube so that the leakage of the elastic inflatable tube is inspected.

5,466,003

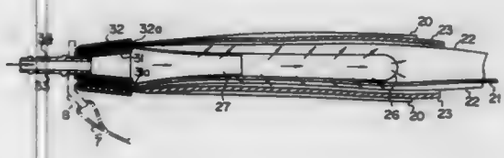
INFLATABLE SEAT BELT HAVING BAG FILTER

Yoshihiko Tanaka, Tokyo; Yoshinori Ohishi, Ohtsu, and Tsuneo Chikarnishi, Hikone, all of, Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Jun. 30, 1994, Ser. No. 269,365

Int. Cl.[6] B60R *21/18*

U.S. Cl. 280—733 **6 Claims**



1. An inflatable seat belt for restraining movement of an occupant in a vehicle, comprising:

a webbing attached to the vehicle and extending for restraining movement of the occupant;

an inflatable portion formed over a part of the webbing and contacting the occupant when the webbing is worn, said inflatable portion including a cylindrical skirt disposed on one side of the webbing and formed of a heat resisting material; a filter directly attached to and completely surrounding the skirt; an elastic inflatable tube having an elongated shape and completely surrounding the webbing and the filter containing the skirt, said elastic inflatable tube having heat resistance and being fixed to the webbing; and a knitted member in a flat form and connected to the webbing to cover the entire inflatable tube, said knitted member having an elasticity in a direction perpendicular to a longitudinal direction of the webbing;

a tongue fixed to the skirt and having a gas flow path therein; and

a buckle attached to the vehicle and engagable to the tongue, said buckle having a port to supply hot gas to the inflatable portion through the gas flow path of the tongue, said hot gas flowing through the skirt and passing through the filter to lower temperature of the hot gas so that the inflatable tube is inflated by the gas while the knitted member is expanded by enlargement of the tube.

5,466,004

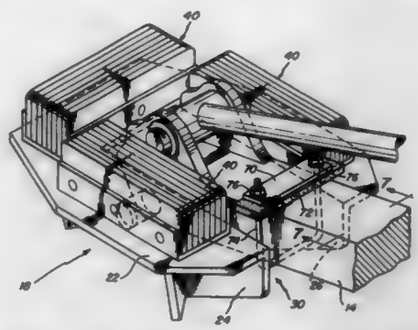
STABILIZER PAD FOR EARTH MOVING APPARATUS

Andry Lagadin, 54 King Hill Rd., Hanover, Mass. 02339

Filed Jul. 29, 1994, Ser. No. 283,247

Int. Cl.[6] B60S *9/02*

U.S. Cl. 280—763.1 **15 Claims**



1. A stabilizer for an earth moving apparatus comprising;

an arm extending from said earth moving apparatus,

a stabilizer pad having a plate having first and second ground contact faces and pivotably coupled to said arm such that said plate can rotate about said arm over a predetermined range of rotation to engage a ground surface with either ground contact face, and

friction means fixedly coupled to one of said arm and said pad and positioned so as to engage the other of said arm and said pad over at least a portion of the range of rotation of said pad and provide a frictional resistance to rotation of said pad relative to said arm in a first direction.

5,466,005

MOTOR VEHICLE

Hans-Heinrich Kohlmeier, Kolitzheim, and Fritz Gerber, Walheim, both of, Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Germany

Filed Dec. 23, 1993, Ser. No. 172,210

Claims priority, application Germany, Dec. 24, 1992, 42 44 216.8

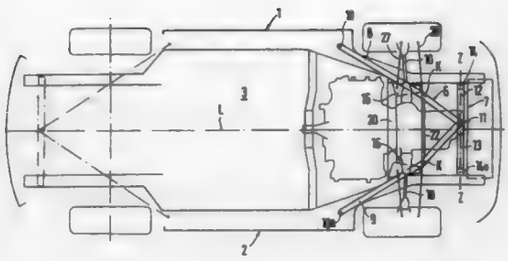
Int. Cl.[6] B62D *21/00*

U.S. Cl. 280—781 **12 Claims**

1. A motor vehicle having a vehicle body comprising:

outer lateral side rails in a passenger compartment area having a right-angle bend;

vehicle body reinforcing elements connected with the lateral side rails, wherein the reinforcing elements include a first V-shaped strutting which extends in an approximately horizontal plane in a longitudinal direction of the vehicle and a



second V-shaped strutting, connected to the first strutting and which extends in a substantially perpendicular plane transverse with respect to the longitudinal direction of the vehicle, the first strutting having free ends fastened to the side rails with the apex of the first strutting fastened to the second strutting at its apex, the second strutting having free ends fastened to the side rails so as to support the second strutting on the side rails.

5,466,006

MOTOR VEHICLE HAVING AN ENGINE WITH A COLLISION ENERGY CONVERSION ARRANGEMENT

Joachim Neumann, Braunschweig, Germany, assignor to Volkswagen AG, Wolfsburg, Germany

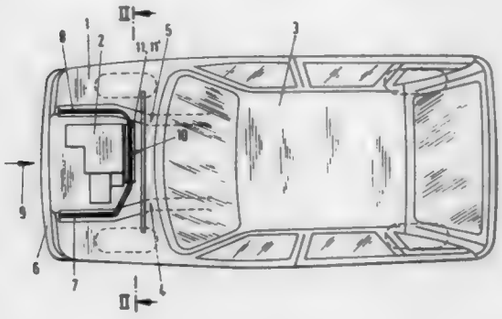
Filed Dec. 14, 1993, Ser. No. 166,537

Claims priority, application Germany, Dec. 17, 1992, 42 42 711.8

Int. Cl.[6] B62D *21/15*

U.S. Cl. 280—784 **6 Claims**

1. A motor vehicle comprising a vehicle having a passenger



compartment, an end portion adjacent to the passenger compartment and longitudinally-extending frame members having deformable end regions within the end portion of the vehicle, the deformable end regions being adapted to absorb by length reduction kinetic energy resulting from a longitudinally-directed collision impact, an engine within the end portion of the vehicle, and coupling means extending between the engine and the passenger compartment and affixed to the deformable end regions of the longitudinally-extending frame members forwardly of the engine for coupling the engine and the deformable end regions to transmit kinetic energy resulting from collision impact from the engine to the deformable end regions of the longitudinally-extending frame members to cause longitudinal deformation thereof.

5,466,007

VEHICLE SUSPENSION SYSTEM

Wilfred W. Smith, Coventry, Great Britain, assignor to Dunlop Limited, United Kingdom

PCT No. PCT/GB92/01687, § 371 Date Mar. 11, 1994, § 102(e) Date Mar. 11, 1994, PCT Pub. No. WO93/05970, PCT Pub. Date Jan. 4, 1993

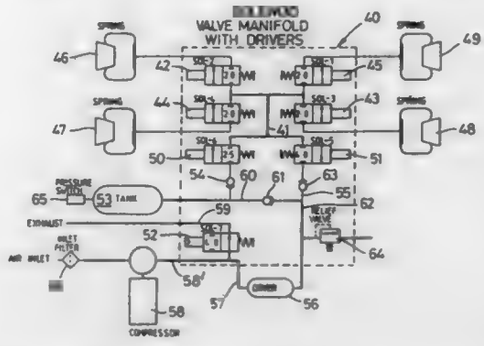
PCT Filed Sep. 14, 1992, Ser. No. 196,209

Claims priority, application United Kingdom, Sep. 13, 1991, 9119534

Int. Cl.[6] B60G *17/015*

U.S. Cl. 280—840 **14 Claims**

1. A vehicle suspension of variable sensitivity comprising in



combination vehicle speed sensing means,

suspension units associated with respective vehicle wheels and selectively controllable to vary the ride height of the vehicle,

each suspension unit incorporating an electrical height sensing device responsive to departure of the ride height from a predetermined height datum which is a function of the vehicle speed and to provide a signal related thereto to control movement of at least one suspension unit, thereby to tend to move at least a part of the vehicle to said predetermined height datum and

timer means whereby the movement of a suspension unit in response to a signal from a height sensing device is inhibited as a function of the magnitude of until a signal of at least a predetermined magnitude has persisted for at least a prescribed part of a prescribed period of time.

5,466,008

FILE SHEET STORING DEVICE

Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan

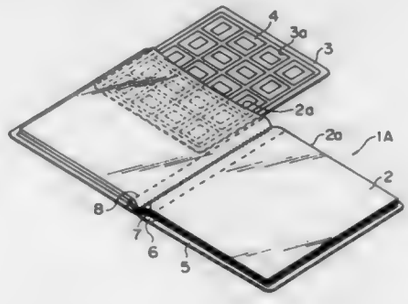
Filed Jan. 25, 1994, Ser. No. 186,416

Claims priority, application Japan, Feb. 1, 1993, 5-014773

Int. Cl.[6] B42D *3/00*

U.S. Cl. 281—31 **5 Claims**

1. A file sheet storing device comprising:



a plurality of transparent bag-shaped covers each being adapted for storing a file sheet for storing a plurality of planar information carrying mediums in rows and columns in a plane,

each of the covers including a first sheet adapted for covering one side surface of the file sheet and a second sheet adapted for covering the other side surface of the file sheet, the first and second sheets being connected together at three edge portions to form a configuration of a bag with opening means formed along the remaining edge portion for inserting the file sheet, each of the covers being provided with binding means to bind the cover in a book-shaped binder along one edge portion other than the remaining edge portion where the opening means is provided, such that the opening means is formed substantially along an edge portion of the cover that is perpendicular to the edge portion where the binding means is provided, and

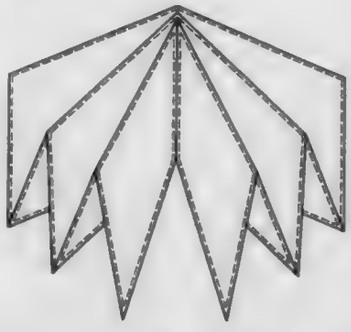
prevention means provided in each of the covers for preventing a file sheet stored in the cover from being displaced toward the edge portion of the cover where the binding means is formed, the prevention means being formed by a line of attachment between the first and the second sheets of the cover, the line extending substantially in parallel with and spaced by a predetermined distance from the binding means, wherein the line of attachment is located closer to the edge portion where the binding means is provided at a location adjacent to the opening means to provide a wider opening for the insertion of the file sheet and extending gradually away from the binding means along the direction of insertion of the file sheet through the opening means to narrow the space for inserting the file sheet into the cover.

5,466,009

FLIP-FLOP FLOAT CHART

James L. Brown, 31971 County Rte. 4, Cape Vincent, N.Y. 13618

Filed Apr. 5, 1993, Ser. No. 76,952
Int. Cl.[6] G09B *29/00*
U.S. Cl. 283—34 **11 Claims**



1. A laminated epicycle folding navigation chart consisting in combination of at least a first, second, third, fourth, fifth, sixth, seventh, eighth, ninth, and tenth relatively thin, rigid, resilient panels of a nearly rectangular configuration; said panels are aligned in a combination of at least two rows of five panels each; the first top row consisting of from left to right a first, second, third, fourth, and fifth panel; the second bottom row consisting of from left to right a sixth, seventh, eighth, ninth, and tenth panel; each panel consists of first and second nearly even parallel horizontal lateral edges of approximately equal length and first and second vertical major edges of approximately equal length; each of these panels includes navigation datum located on the front and back surfaces of said panel; each panel consisting of a fraction navigation datum sheet enveloped by transparent sheets of film laminated to each datum sheet; said panels are joined by flexible transparent couplings of approximately the full length of the horizontal lateral edge and of approximately the full length of the vertical major edge; said first flexible transparent coupling connecting said top row first left end panel second vertical edge to said top row second left panel first vertical edge; a said second flexible transparent coupling connecting said top row second left panel second vertical edge to said top row third middle panel first vertical edge; a said third flexible transparent coupling connecting said top row third middle panel second vertical edge to said top row fourth right panel first vertical edge; a said fourth flexible transparent coupling connecting said top row fourth right panel second vertical edge to said top row fifth right end panel first vertical edge; a said fifth flexible transparent coupling connecting said bottom row sixth end left panel second vertical edge to said bottom row seventh left panel first vertical edge; a said sixth flexible transparent coupling connecting said bottom row seventh left panel second vertical edge to said bottom row eighth middle panel first vertical edge; a said seventh flexible transparent coupling connecting said bottom row eighth middle panel second vertical edge to said bottom row ninth right panel first vertical edge; a said eighth flexible transparent coupling connecting said bottom row ninth right panel second vertical edge to said bottom row tenth right end panel first vertical edge; a said ninth flexible transparent coupling connecting said bottom row sixth left end panel top lateral horizontal edge to said top row first left end panel bottom lateral horizontal edge; a said tenth flexible transparent coupling connecting said bottom row seventh left panel top lateral horizontal edge to said top row second left panel bottom lateral horizontal edge; a said eleventh flexible transparent coupling connecting said bottom row eighth middle panel top lateral horizontal edge to said top row third middle panel bottom lateral horizontal edge; a said twelfth flexible transparent coupling connecting said bottom row ninth right panel top lateral horizontal edge to said top row fourth right panel bottom lateral horizontal edge; a said thirteenth flexible transparent coupling connecting said bottom row tenth right end panel top lateral horizontal edge to said top row fifth right end panel bottom lateral horizontal edge; said panels are reinforced at their junctions with alignment flexible transparent couplings; said couplings being of sufficient length to superimpose over the junctions and be overlapping; said first horizontal alignment flexible transparent coupling connecting said top row first left end panel top right corner to the said top row second left panel top left corner; a said second horizontal alignment flexible transparent coupling connecting said top row second left panel top right corner to the said top row third middle panel top left corner; a said third horizontal alignment flexible transparent coupling connecting said top row third middle panel top right corner to the said top row fourth right panel top left corner; a said fourth horizontal alignment flexible transparent coupling connecting said top row fourth right panel top right corner to the said top row fifth right end panel top left corner; a said fifth horizontal alignment flexible transparent coupling connecting the said top row first left end panel bottom right corner to the said top row second left panel bottom left corner and connecting the said bottom row sixth left end panel top right corner to the said bottom row seventh left panel top left corner; a said sixth horizontal alignment flexible transparent coupling connecting the said top row second left panel bottom right corner to the said top row third middle panel bottom left corner and connecting the said bottom row seventh left panel top right corner to the said bottom row eighth middle panel top left corner; a said seventh horizontal alignment flexible transparent coupling connecting the said top row third middle panel bottom right corner to the said top row fourth right panel bottom left corner and connecting the said bottom row eighth middle panel top right corner to the said bottom row ninth right panel top left corner; a said eighth horizontal alignment flexible transparent coupling connecting the said top row fourth right panel bottom right corner to the said top row fifth right end panel bottom left corner and connecting the said bottom row ninth right panel top right corner to the said bottom row tenth right end panel top left corner; a said ninth horizontal alignment flexible transparent coupling connecting the said bottom row sixth left end panel bottom right corner to the said bottom row seventh left panel bottom left corner; a said tenth horizontal alignment flexible transparent coupling connecting said bottom row seventh left panel bottom right corner to said bottom row eighth middle panel bottom left corner; a said eleventh horizontal alignment flexible transparent coupling connecting said bottom row eighth middle panel bottom right corner to said bottom row ninth right panel bottom left corner; a said twelfth horizontal alignment flexible transparent

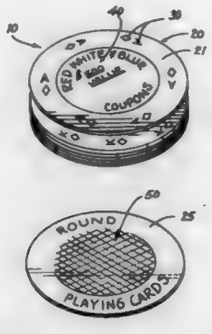
coupling connecting said bottom row ninth right panel bottom right corner to said bottom row tenth right end panel bottom left corner; a said thirteenth vertical alignment flexible transparent coupling connecting the said bottom row sixth left end panel top left corner to the top row first left end panel bottom left corner; a said fourteenth vertical alignment flexible transparent coupling connecting said bottom row tenth right end panel top right corner to the top row fifth right end panel bottom right corner; and said first, sixth conjugate panels being pivotal vertically may be folded vertically over either face of said second, seventh conjugate panels and said panels may be folded vertically over either face of said third, eighth conjugate panels and said panels may be folded vertically over either face of said fourth, ninth conjugate panels and said panels may be folded vertically over either face of fifth, tenth conjugate panels whereby said conjugate panels may be folded vertically in a clockwise, counter clockwise, or alternate rotation or may be folded vertically over any pair of other said conjugate panels in a random rotation; and said first, second, third, fourth, fifth, conjugate panels may be folded horizontally over either face of said sixth, seventh, eighth, ninth, tenth conjugate panels; and any pair of said conjugate panels may be folded horizontally over remaining conjugate panels, while the chart is in a full opened position, partially closed or fully closed position, allowing any one panel face of ten panels comprising 20 faces to be easily visible to the observer.

5,466,010

CARDS USED AS BOTH COUPONS AND PLAYING CARDS AND THEIR METHOD OF MANUFACTURE AND USE

James J. Spooner, 16203 E. Glendora Dr., Fountain Hills, Ariz. 85268-3108

Filed Dec. 17, 1993, Ser. No. 169,979
Int. Cl.[6] B42D *15/00*
U.S. Cl. 283—67 **19 Claims**



1. A method of using a plurality of cards as both a playing card set and a coupon set wherein each card has printed on a face thereof a coupon message from a vendor and at least one playing card indicia for allowing the card to be presentable by a consumer for a type of good or service and to be used as a playing card, comprising the steps of:

using each card as a playing card according to the playing card indicia printed on the face of the card; and

presenting each card to the vendor for obtaining the type of good or service according to the coupon message printed on the face of the card; and

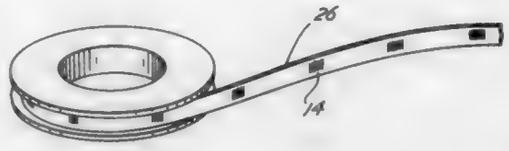
wherein the step of presenting each card further comprises the step of invalidating the card as a coupon when the good or service has been provided by the vendor so that the consumer can still retain the card for use as a playing card.

5,466,011

CABLE IDENTIFICATION SYSTEM

David L. Cohn, 17801 Waxwing La., South Bend, Ind. 46635

Filed Apr. 6, 1994, Ser. No. 223,994
Int. Cl.[6] B43D *15/00*
U.S. Cl. 283—67 **8 Claims**



1. A method for associating information with a segment of a medium, comprising the steps of:

marking the medium with a plurality of unique markings;

defining a length of the medium as a segment, the segment having a first end and second end;

defining a first marking as the marking closest to the first end of the segment and defining a second marking as the marking closest to the second end of the segment;

defining a range of markings starting with the first marking and ending with the second marking;

recording the range together with the information in a data base;

reading any marking from any segment;

locating the entry in the data base whose range includes the reading; and

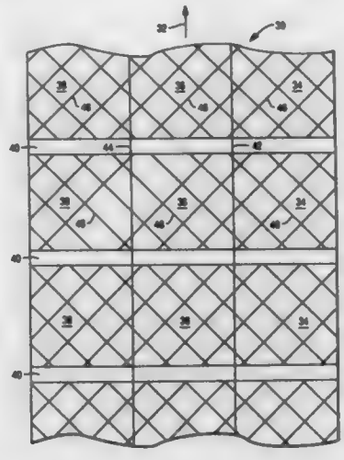
accessing the information associated with the range.

5,466,012

FACSIMILE SECURITY SYSTEM

Richard D. Puckett, Miamisburg; Thomas J. Obringer, Vandalia, and Thomas C. Miller, Kettering, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 983,349, Jan. 7, 1993, abandoned.
This application Apr. 19, 1994, Ser. No. 229,858
Int. Cl.[6] B42D *15/00*
U.S. Cl. 283—67 **16 Claims**



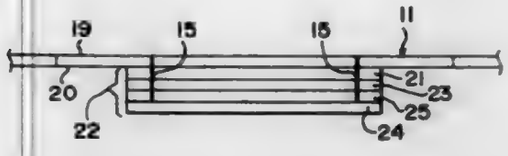
1. A security system for a facsimile document, comprising:

a base sheet capable of having confidential information printed thereon for sending by a facsimile process; and

a cover sheet laminated to said base sheet, said cover sheet having a plurality of sections with imprinted lines spaced from one another and forming an obscuring pattern in a repeated arrangement over the confidential information printed thereon and said imprinted lines being separated by portions of said cover sheet without imprinted lines also formed in a repeated arrangement.

5,466,013
CARD INTERMEDIATE AND METHOD

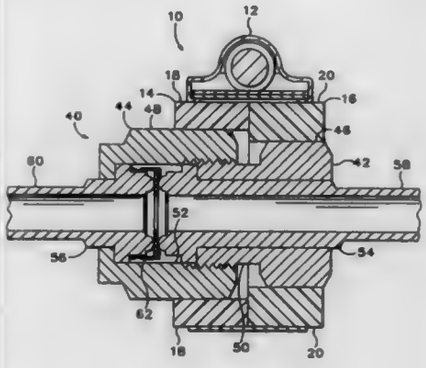
Ronald R. Garrison, Batavia, Ill., assignor to Wallace Computer Services, Inc., Hillside, Ill.

Continuation-in-part of Ser. No. 159,294, Nov. 30, 1993. This application Feb. 18, 1994, Ser. No. 198,612
Int. Cl.[6] B42D *15/00*
U.S. Cl. 283—107 **8 Claims**

1. A card intermediate comprising a length of paper having top and bottom surfaces and a generally rectangular die cut extending therethrough between said surfaces to define a card, a film laminate adhesively secured to said bottom surface and extending beyond the diecut on all sides thereof, said laminate including first and second film layers adhesively united in superposed relation, said first film layer being positioned in contact with said bottom surface and said second film layer being positioned remote from said bottom surface, said diecut extending through said first film layer but not through said second film layer, said paper length top surface within said diecut being equipped with first and second printed indicia.

5,466,014
CLAMP FOR LINE FITTING

Dave Cummings, 8493 SW. 184th Loop, Aloha, Oreg. 97007

Filed Oct. 21, 1994, Ser. No. 327,434
Int. Cl.[6] F16L *35/00*
U.S. Cl. 285—92 **22 Claims**

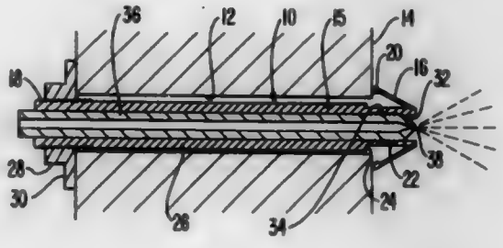


1. A clamped line fitting for a first and second line comprising:
(a) a first nut having an outer surface;
(b) a second nut having an outer surface and wherein the second nut is matingly connected to the first nut;
(c) a first ring having an inner surface that is matingly compatible with the outer surface of the first nut, the first ring being fitted onto the first nut;
(d) a second ring having an inner surface that is matingly compatible with the outer surface of the second nut, the second ring being fitted onto the second nut; and
(e) an annular band having an engagement means for engaging both the first and second rings thereby preventing the first nut from rotating relative to the second nut.

5,466,015
APPARATUS AND METHOD FOR MOUNTING ITEMS AT AN INACCESSIBLE WALL SURFACES

Allen Berenter, 11380 Prosperity Farms Rd. Suite 110-B, Palm Beach Gardens, Fla. 33410

PCT No. PCT/US92/09613, § 371 Date Apr. 26, 1994, § 102(e) Date Apr. 26, 1994, PCT Pub. No. WO93/10316, PCT Pub. Date May 27, 1993
PCT Filed Nov. 13, 1992, Ser. No. 232,062
Int. Cl.[6] F16L *3/04*
U.S. Cl. 285—158 **21 Claims**



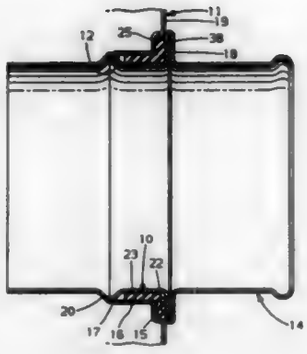
1. A device for securing an item in an opening through a wall of a building having a relatively accessible interior surface and an opposite relatively inaccessible exterior surface, said device comprising:
a) an elongate sleeve adapted to be inserted through said opening in said wall of said building from said accessible interior surface, said sleeve having an outer peripheral boundary and an axial passage extending entirely through the sleeve to receive said item from said accessible interior surface and to define opposite first and second open ends on the sleeve;
b) a resilient, radially constrictible flange on said first open end of said sleeve, said flange having an expanded condition in which said flange radially extends beyond said outer peripheral boundary of said sleeve to engage said inaccessible exterior surface at a location plural stories above ground level;
c) a radially reduced dimension portion of said sleeve for accommodating said flange within said outer peripheral boundary of said sleeve, said flange having a radially constricted condition in which said flange is entirely within said outer peripheral boundary of said sleeve; and
d) engagement means at said second open end of said sleeve for securing said sleeve to said wall of said building at said accessible interior surface without preventing said axial passage from receiving said item.

5,466,016
SOLDERLESS FILLER NECK JOINT

Paul P. Briody, Grand Blanc, and Randy C. Cable, deceased, late of Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 11, 1994, Ser. No. 225,680
Int. Cl.[6] F16L *5/00*
U.S. Cl. 285—204 **8 Claims**

1. A filler neck assembly comprising:
a tank having a wall with an opening through the wall;
a pipe extending through the opening in the tank including an annular stop bead projecting radially outward from the pipe outside the tank wall and an annular lock bead projecting radially outward from the pipe formed inside the tank wall to lock the pipe to the tank, the annular stop bead and the annular lock bead in cooperation providing the sole means for securing the pipe within the opening; and
a resilient annular seal interposed in the opening between the tank wall and the pipe wherein limited rotational movement of the filler neck relative to the tank is possible while maintaining the filler neck assembly in a securely sealed condition.

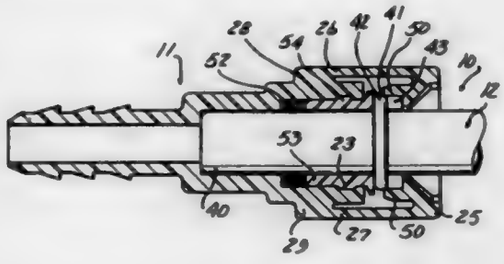


5,466,017

SQUEEZE-TO-RELEASE QUICK CONNECTOR

George Szabo, Ortonville, and Gary Zelinski, Sterling Heights, both of Mich., assignors to ITT Corporation, New York, N.Y.

Filed Sep. 17, 1993, Ser. No. 122,925
Int. Cl.[6] F16L 35/00
U.S. Cl. 285—319 31 Claims



1. A squeeze-to-release quick connector adapted for selective locking engagement with a male member defining an outwardly extending abutment surface, said quick connector comprising:

a generally cylindrical, elongated body portion open at one end for receiving said male member and forming a conduit receiving adapter at an opposite end;

an annular retaining ring disposed concentrically with said body portion axially spaced from said open end;

two circumferentially opposed, generally parallel, axially elongated beam members interconnecting said retaining ring and body portion, each said beam member affixed at one end thereof to said retaining ring and at an opposed end thereof to said body portion; and

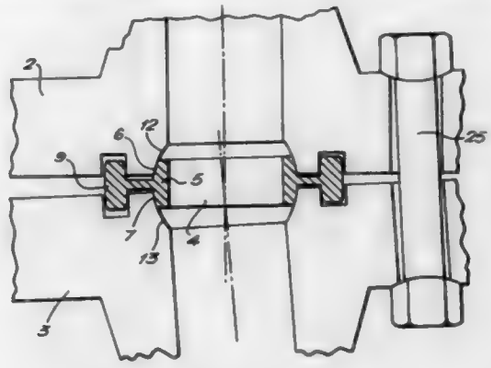
at least two circumferentially spaced detents extending inwardly from said retaining ring to capture said abutment surface to effect positive engagement of said quick connector and male member, the detents extending from the opposed end of the beam members and radially spaced from said beam members by a slot, means, formed on and extending axially from each detent and spaced from the adjacent beam member for exhibiting radially inward bending movement into engagement with a male member inserted into the body portion to resist pulloff of the male member when the retaining ring is in a normal state, said retaining ring being adapted to be squeezed at angularly offset locations from said beam members to release said abutment surface of a male member from engagement with said detents for removal of said male member.

5,466,018

SEAL RING AND JOINT

John Stobbart, Sketty, United Kingdom, assignor to Techlok Limited, Port Talbot, United Kingdom

PCT No. PCT/GB93/00493, § 371 Date Sep. 8, 1994, § 102(e) Date Sep. 8, 1994, PCT Pub. No. WO93/18331, PCT Pub. Date Sep. 16, 1993
PCT Filed Mar. 9, 1993, Ser. No. 302,659
Claims priority, application United Kingdom, Mar. 12, 1992, 9205404; Nov. 30, 1992, 9224993
Int. Cl.[6] F16L 25/00
U.S. Cl. 285—334.2 19 Claims



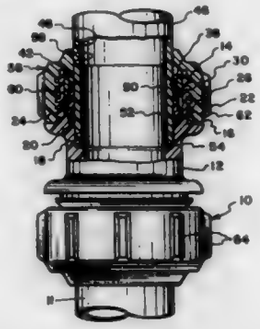
1. An annular metallic seal ring substantially solid in cross-section and comprising a sealing portion, spigot portion and interconnecting web portion all formed integrally with one another, said sealing portion comprising a pair of annular seal lips facing the spigot portion and extending in a transverse direction to said web portion, which web portion extends radially outwardly from said pair of seal lips to said spigot portion, which spigot portion is provided with spigot projections projecting in mutually opposed directions transversely to the web portion, wherein the thickness of said spigot portion in the radial direction is at least 1.25 times the thickness of the web portion in the transverse direction, and each respective seal lip is arranged to project transversely from said web portion by a distance which is substantially greater than the thickness of said web portion in said transverse direction.

5,466,019

PIPE COUPLING

Naris Komolrochanaporn, 119 Soi Wat suthavas, Bukkalo, Dhonburi THX

Filed Sep. 26, 1994, Ser. No. 132,055
Int. Cl.[6] F16L 19/12
U.S. Cl. 285—343 3 Claims



1. A pipe coupling for interconnecting a pair of slightly spaced apart first and second pipe sections, each said pipe section having a longitudinal center axis, each said longitudinal center axis of said pipe sections being in substantial alignment, said pipe coupling comprising:

a connector, said first pipe section being inserted within said connector and fixedly secured thereto, said connector having an outer open end defining an internal bore which is surrounded by an externally threaded section;

a thin walled grip ring mounted within said internal bore, said grip ring having a plurality of independently movable biting members, said biting members being located in a circle about said second pipe section, said biting members facing said longitudinal center axis, said grip ring having an inner surface and an outer surface, said inner surface located closest to the wall of said second pipe section;

a compressible rubber washer mounted within said internal bore, said washer located radially between said inner surface of said grip ring, and the second pipe section, said washer being spaced from said biting members, said washer providing inward resilient support for said grip ring;

a wedge ring mounted within said internal bore, said wedge ring located against said outer surface of said grip ring, said wedge ring being located directly adjacent said biting members; and

a retaining nut mounted around said second pipe section, said retaining nut having an internally threaded section, said internally threaded section to engage with said externally threaded section of said connector and upon tightening of said retaining nut cause said wedge ring to apply force against said biting members of said grip ring causing said biting members to embed said second pipe section.

5,466,020

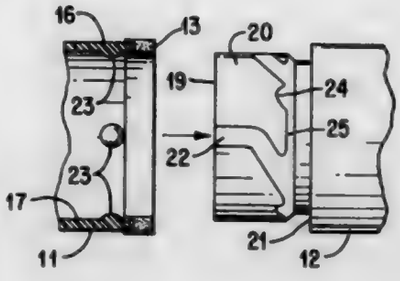
BAYONET CONNECTOR FOR SURGICAL HANDPIECE

Jon P. Page, Broomfield, and Robert B. Stoddard, Louisville, both of Colo., assignors to Valleylab Inc., Boulder, Colo.

Filed Dec. 30, 1994, Ser. No. 367,420

Int. Cl.[6] F16L *19/00*

U.S. Cl. 285—361 **16 Claims**



1. A connection apparatus for fluid tight attachment of members of a medical device, the apparatus comprising:

a first member having a first body and a first connecting end, the first connecting end having an inner surface;

a second member having a second body and a second connecting end, the second connecting end having a distal face and an outer surface shaped for telescoping into the inner surface of the first connecting end;

a shoulder located on the second members

a groove in the outer surface of the second connecting end extending from the distal face thereof to said shoulder;

a raised nub of material on the inner surface of the first connecting end, the raised nub positioned radially inward to engage the groove;

a gasket, the gasket positioned to bear against the shoulder, the gasket to be compressed between the first body and the second body, the gasket made from an elastomeric material;

an engaging trough in the groove, the engaging trough positioned along the groove to properly hold the first connecting end against the second connecting end thereby compressing said gasket, the engaging trough shaped to stably hold the nub against the engaging trough by the compression force of the gasket;

an indexing trough in the groove, the indexing trough positioned along the groove beyond the engaging trough, the indexing trough shaped to allow the nub to follow the indexing trough in a manner that will increase compression on the gasket by further loading the first connecting end towards the shoulder; and

the indexing trough further shaped to extend about the outer surface in a manner that will prevent over torquing the connection apparatus when the nub is forced past the engaging trough and moved within the groove while the first connecting end and the second connecting end are in telescopic relationship.

5,466,021

DOOR CLOSING DEVICE

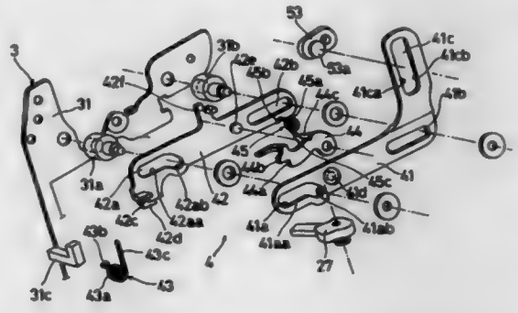
Hiroshi Ishihara, and Yoshinobu Ogura, both of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 30, 1993, Ser. No. 99,666

Claims priority, application Japan, Jul. 30, 1992, 4-204098; Sep. 14, 1992, 4-244967

Int. Cl.[6] E05C *3/06*

U.S. Cl. 292—201 **9 Claims**



1. A door closing device comprising:

a door-lock mechanism provided adjacent a door and a body, and including a striker secured to the body and a latch member provided on the door, the latch member being secured to a latch lever, the latch lever and the latch member being rotatable together in a first plane;

a driving mechanism; and

a door-closing mechanism for establishing a fully closed condition of the door relative to the body when the striker is received in a groove formed in the latch member, the door-closing mechanism including a passive-lever driven by the driving mechanism for being moved in a second plane which is substantially perpendicular to the first plane and for being moved linearly in order to be brought into direct engagement with a lengthwise side of the latch member.

5,466,022

SAFETY CABLE LOCK FOR KNOB-OPERATED DOOR

Jay S. Derman, P.O. Box 949, Redondo Beach, Calif. 90277

Filed Nov. 19, 1993, Ser. No. 155,576

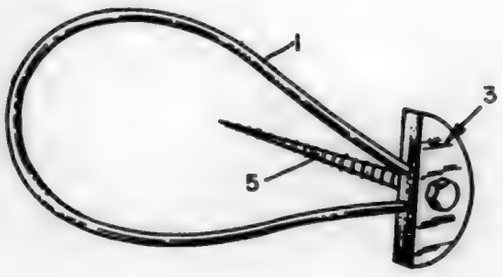
Int. Cl.[6] E05C *19/10*

U.S. Cl. 292—246 **2 Claims**

1. A safety cable locking device for a knob-operated door which is mounted in a wooden door frame including a framing stud, said safety cable locking device comprising:

(a) a plastic covered wire cable, said cable being formed in a loop and having its two cable ends made to be nearly parallel to each other;

(b) an anchor member, said anchor member being a piece of metal sheet folded into three portions and having a "U" shape cross-section end view, the first and third portions thereof



being parallel to each other and separated by a space allowing for the thickness of said cable, the second portion thereof being at 90 degrees to said first and third portions; said second portion having a first and second hole cut to receive said cable ends; said first and third portions having a third and fourth hole cut to receive a lag bolt, said third and fourth holes located such that their hole center axis passes between said first and second holes at an angle of approximately 90 degrees relative to the axis of said first and second holes;

(c) a bushing, said bushing being placed inside said anchor member between said third and fourth holes, such that the axis of said bushing is in line with the center of said third and fourth holes; said bushing having an outer rim with serrated or pointed edges for the purpose of impinging on the surface of said cable; said bushing diameter selected such that when said bushing is in place and said cable ends are inserted inside said anchor member first and second holes, said bushing diameter will force said cable ends apart at an included angle of 15 to 30 degrees; and

(d) a lag bolt extending through said third and fourth holes in said anchor member, through said bushing and into said door frame framing stud in a position allowing the loop of said cable to fit over a knob on said knob-operated door;

whereby said cable ends are positioned inside said anchor member at an angle with the horizontal, such that when said door is pushed open and tension pull is thereby applied to said cable, the edges of said first and second holes in said anchor member will bite deeply into the surface of said cable, strongly restraining any outward movement of said cable and preventing said door from being opened further.

5,466,023

SECURITY DOOR BAR SYSTEM AND METHOD OF USE

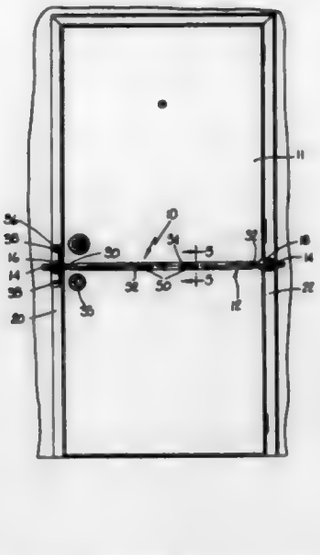
Christopher H. Williamson, 9121 Stuart St., Westminster, Colo. 80030

Filed May 2, 1994, Ser. No. 236,889
Int. Cl.[6] E05C *19/18*
U.S. Cl. 292—259 R **18 Claims**

1. An energy absorbing security door bar system comprising:

a generally straight hollow elongate member having oppositely facing free ends and the ability to resiliently flex from a straight resting position to a bowed position wherein straight lines drawn through the free ends of said elongate member form an included angle of between 120 and 170 degrees; and

anchoring means for releasably anchoring said free ends of said elongate member to opposite sides of a door's frame to prevent the door from being opened.



5,466,024

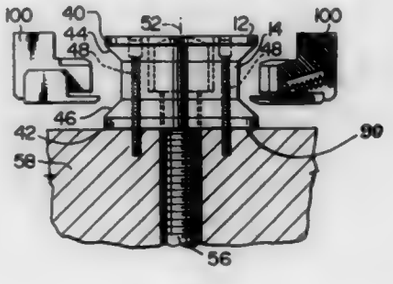
Patent Not Issued For This Number

5,466,025

END EFFECTOR CLAMPING JAW INTERFACE FOR ATTACHMENT TO AN ORBITAL REPLACEMENT UNIT

Frances H. A. Mee, Alliston, Canada, assignor to Canadian Space Agency/Agence Spatiale Canadienne, Canada

Filed Jan. 15, 1993, Ser. No. 5,066
Int. Cl.[6] B66C *1/62*; B64G *4/00*
U.S. Cl. 294—1.1 **11 Claims**



1. A clamping jaw interface for attachment to a unit such as an orbital replacement unit to enable clamping jaws to couple to such unit comprising:

(a) two substantially rigid body portions positioned about a central axis, each body portion having an upper ramp, a lower ramp, and a reduced waist section located between the upper and lower ramps,

(b) said waist section on each body portion having side faces which converge to form laterally extending, substantially V-shaped clamping faces on opposite sides of the central axis of the interface;

(c) the upper and lower ramps of each body portion being inclined inwardly towards the side faces of the waist section;

(d) each body portion having coupling and torque transmitting means located below the waist section for releaseably attaching said portions to said unit, said coupling and torque transmitting means of each body portion including a passageway displace from said central axis and including shaft means which extends through said passageway for engagement with a corresponding recess in said unit;

whereby:

i) the inwardly inclined ramps will effect vertical engagement of said clamping jaws with said unit against dislodgement by vertical loads applied therebetween, and

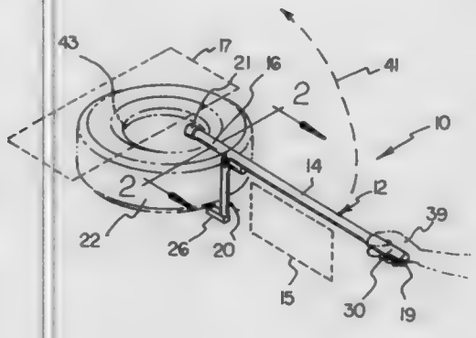
ii) the substantially V-shaped clamping faces will effect lateral engagement of said clamping jaws with said unit against dislodgement by a torque applied therebetween.

5,466,026

TIRE LIFTER APPARATUS

Timothy L. Steiner, 125 Greenfield La., Bismark, N. Dak. 58501

Filed Nov. 10, 1994, Ser. No. 337,042
Int. Cl.[6] B65G 7/08
U.S. Cl. 294—17 **3 Claims**



1. A tire lifter apparatus, comprising:

a lever member which includes a proximal end and a distal end, wherein said lever member includes a first lever arm portion adjacent to said proximal end and a second lever arm portion adjacent to said distal end, wherein said second lever arm portion lies within an apparatus plane,

a fulcrum assembly connected to said lever member such that said fulcrum assembly divides said lever member into said first lever arm portion and said second lever arm portion, wherein said fulcrum assembly projects outward from a first side of said lever member, wherein said fulcrum assembly is within the apparatus plane,

a clamp assembly pivotally connected to said fulcrum assembly, wherein said clamp assembly lies within the apparatus plane, and wherein said clamp assembly includes a first clamp member connected to said fulcrum assembly, wherein said first clamp member is oriented substantially perpendicular to said lever member in said apparatus plane when said clamp assembly is installed on a tire, and a jaw member connected at a perpendicular orientation to said first clamp member at a distal end of said first clamp member in said apparatus plane, wherein said jaw member extends from said first clamp member in a direction toward said distal end of said lever member, wherein said jaw member includes a pointed end adapted to grip a tire, such that said clamp assembly is adapted to clamp onto a tire which is within a tire plane, wherein said tire plane is perpendicular to said apparatus plane,

a stop member connected to said first lever arm portion of said lever member adjacent to said fulcrum assembly and in contact with said first clamp member when said clamp assembly is in a vertical orientation, wherein said stop member is in said apparatus plane, and

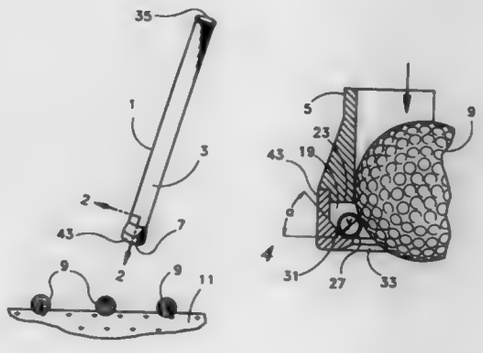
wherein said fulcrum assembly is connected to said lever member by a first connection, and said fulcrum assembly is connected to said clamp assembly by a second connection which is a pivotal connection.

5,466,027

BALL RETRIEVING AND STORAGE DEVICE

Edward J. Hockey, 4513 Cove Dr., #9, Carlsbad, Calif. 92008

Filed Apr. 25, 1995, Ser. No. 428,333
Int. Cl.[6] A63B 47/02
U.S. Cl. 294—19.2 **20 Claims**



1. A ball retrieving and storage device comprising:

a) an elongated hollow tube opened at one end for reception of a ball;

b) said tube having formed in said opened end a circumferential groove concentrically arranged therewith opening inwardly toward the hollow interior of said tube and defined by upper and lower groove side surfaces;

c) a yieldable ring of measured thickness concentrically located in said groove, said ring having an internal diameter slightly smaller than the outside diameter of the ball to be retrieved;

d) wherein said groove is wider than the thickness of said ring to allow said ring to be moveable therein and displacable upward therein in response to the upward pressure of a to-be-retrieved ball from below when said opened end of said tube is passed over the ball; and,

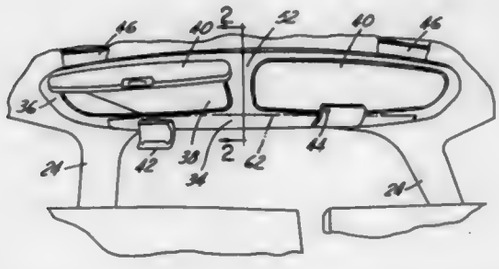
e) wherein said groove has a first depth, in the area of natural repose of the ring, and a second depth in the area of said upward displacement thereof, wherein said second depth is greater than said first depth to allow said ring to expand under said upward pressure of the ball and allow passage of the ball therethrough into storage in said tube and to prevent said ring from thereafter expanding under downward pressure of the ball and bar retractive passage of the ball out through said tube opened end.

5,466,028

STORAGE COMPARTMENT FOR AN AUTOMOTIVE VEHICLE

Michael D. Nicopolis, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 27, 1993, Ser. No. 172,783
Int. Cl.[6] B60R *7/04*
U.S. Cl. 296—37.7 **20 Claims**



1. An auxiliary storage compartment for an automotive vehicle having two longitudinally spaced seating positions, a cargo storage area spaced longitudinally rearwardly of said seating positions and a transversely mounted header member across the most rearward portion of the cargo storage area and having a lowermost surface, said compartment comprising:

a compartment body having a pair of side portions and a substantially horizontal floor portion forming a U-shaped opening, said compartment body rigidly attached to the roof and substantially extending across the width of the vehicle above the cargo storage area, said side portions, floor portion, the vehicle roof, and transversely mounted header member defining a compartment therebetween, said floor portion having a lower surface substantially coplanar with said lowermost surface of said transversely mounted header member said floor portion extending horizontally from and fixedly attached to the transversely mounted header member;

a bezel member connected to said compartment body and enclosing said U-shaped opening between the roof and said compartment body and having at least one opening therein;

at least one door movably attached to said bezel in said opening for enclosing and providing access to said compartment; and

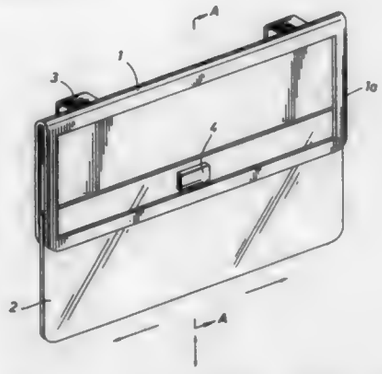
latching mechanism on said door for securing said door in a closed position.

5,466,029

SUNVISOR

Karl E. Zetterlund, 12625 Memorial Dr. #3, Houston, Tex. 77024

Filed Nov. 1, 1994, Ser. No. 333,136
Int. Cl.[6] B60J *3/02*
U.S. Cl. 296—97.8 **3 Claims**



1. An auxiliary sun visor adapted to be removably mounted on a main sun visor of a motor vehicle or airplane comprising:

a metal panel folded to form an inverted U-shape having a forward and a rearward, generally rectangular leg, said rearward leg having a generally rectangular cut out therethrough, said cut out forming a frame;

a sliding panel of a shape generally conforming to and received between the legs of the metal panel, said sliding panel having a slot with an operating knob therein, said knob having a portion which extends rearwardly through the frame of the metal panel and a portion comprising a magnet which faces forwardly for magnetic attraction to the forward leg of the metal panel, said sliding panel being formed from sunglare absorbing, reflecting, photochromatic, tinted transparent, or opaque material;

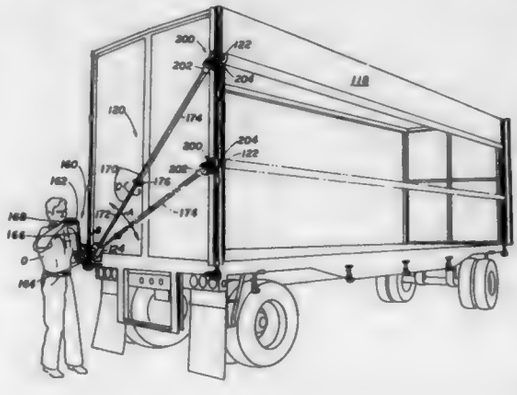
whereby the sliding panel is positionable by the operating knob in any position including left, right and vertically so that the operating knob is within the frame formed by the cut out in the metal panel, said panel being held in any position desired by the magnetic attraction of the knob to the forward leg of the metal panel wherein glare is reduced for the operator of the motor vehicle or airplane.

5,466,030

SIDE LOADING VEHICLE: APPARATUS AND METHOD

Martin W. Harris, and John J. Cambra, both of Manteca, Calif., assignors to Tuff Boy Holding, Inc., Manteca, Calif.

Filed Nov. 9, 1993, Ser. No. 149,451
Int. Cl.[6] B60P *7/04*
U.S. Cl. 296—98 **33 Claims**



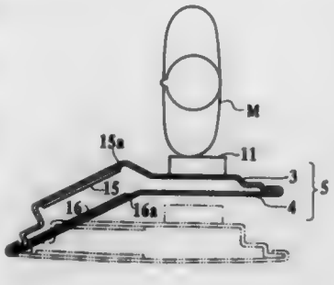
1. A side loading vehicle, comprising in combination:
a wheeled body having an upper surface upon which cargo is to be placed,
a framework extending up from said upper surface,
a shroud draped on said framework,
scrolling means coupled to said shroud including drive means for raising and lowering said shroud to provide or occlude access to the upper surface of the wheeled body,
said scrolling means includes a scrolling rod extending through said shroud at a lower longitudinal edge thereof, said drive means operatively coupled to said scrolling rod for rotation of said scrolling rod to raise and lower said shroud by rolling up said shroud,
said drive means further includes a gear box operatively coupled to a crank and,
a driving rod having a first driving arm and a second driving arm,
said first driving arm telescopically disposed within said second driving arm, and
said second driving arm communicating with said scrolling rod by means of a knuckle joint.

5,466,031

DOOR STRUCTURE FOR VEHICLE

Katsuyoshi Uchida, and Eiji Murakami, both of Sagamihara, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 16, 1994, Ser. No. 260,816
Claims priority, application Japan, Jun. 24, 1993, 5-153582
Int. Cl.[6] B60R *21/04*
U.S. Cl. 296—146.6 **2 Claims**



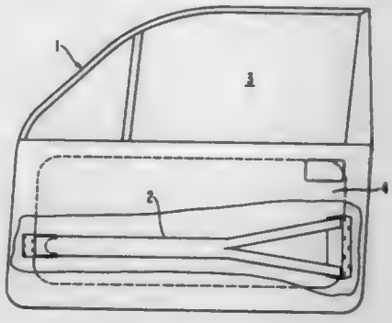
1. A door structure for a vehicle, comprising:
a door body including an inner panel arranged on the interior side of said vehicle and an outer panel arranged on the outside of said inner panel, said door body having a waist opening in an upper part thereof, through which a window panel rises and falls, said waist opening being defined by said inner panel and said outer panel;
an inner reinforcement secured on said inner panel in said door body to extend along said waist opening; and
an outer reinforcement secured on said outer panel in said door body to extend along said waist opening;
wherein a rear end of either said inner reinforcement or outer reinforcement is positioned in front of said passenger's position.

5,466,032

INTRUSION BEAM FOR REINFORCING BODY PANELS OF A VEHICLE AND A VEHICLE DOOR PROVIDED WITH SUCH BEAM

Edvin L. Clausen, Tønder, Denmark, and Julian Happian-Smith, Near Crewe, Great Britain, assignors to Norsk Hydro a.s., Oslo, Norway

PCT No. PCT/NO92/00141, § 371 Date Mar. 7, 1994, § 102(e) Date Mar. 7, 1994, PCT Pub. No. WO93/04886, PCT Pub. Date Mar. 18, 1993
PCT Filed Sep. 4, 1992, Ser. No. 204,213
Claims priority, application Norway, Sep. 6, 1991, 913527
Int. Cl.[6] B62D *25/02*
U.S. Cl. 296—188 **28 Claims**



14. An assembly of a motor vehicle body panel having mounted therein an intrusion beam for reinforcing said body panel, said beam comprising:
an integral and one piece extruded elongated member having opposite first and second ends fixed to respective frames of said body panel, said member defining therein at least first and second elongated internal chambers;
said member being split longitudinally from said first end for a predetermined distance into first and second branches having defined therein said first and second chambers, respectively;
said first and second branches diverging from each other at an acute angle; and
at least one of said branches extending at an acute angle to a longitudinal axis of said beam.

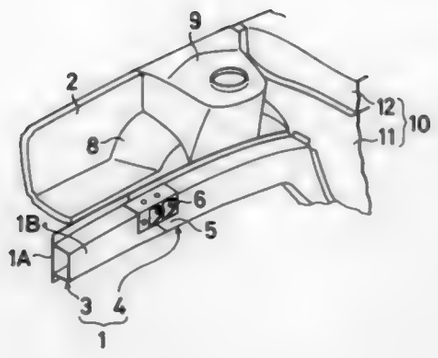
5,466,033

FRONT BODY STRUCTURE OF A VEHICLE AND A METHOD FOR ASSEMBLING A FRONT BODY OF A VEHICLE

Tetsuya Murakami; Masahiro Osumi; Toshisuke Nakanishi, and Shigeaki Watanabe, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 12, 1993, Ser. No. 59,579
Claims priority, application Japan, May 14, 1992, 4-121667
Int. Cl.[6] B62D *27/00;* **B60R** *27/00*
U.S. Cl. 296—189 **17 Claims**

1. A front body structure of a vehicle having a front side frame positioned at a lower side of a wheel apron forming a side part of an engine room and extending substantially straight in a longitudinal direction of the vehicle, comprising:
a front frame composing a front part of said front side frame, said front frame extending in a substantially longitudinal direction of the vehicle; and
a rear frame composing a rear part of said front side frame, said rear frame having a higher rigidity than said front frame with said rear frame extending in a substantially longitudinal direction of the vehicle, wherein each of said front frame and said rear frame have closed cross-sections and an open part of a front end part of said rear frame is joined by a butt joint to an open part of a rear end part of said front frame.



5,466,034

ASSEMBLY FOR VEHICLE BODY PANELS

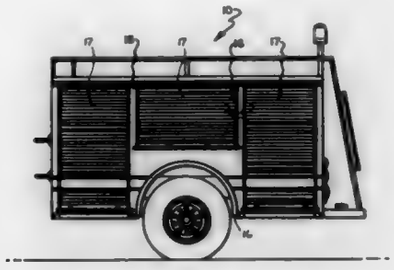
William A. Savage, 3592 Lakeview Rd., Hamburg, N.Y. 14075

Filed Sep. 30, 1993, Ser. No. 129,769

Int. Cl.[6] B60J 5/04

U.S. Cl. 296—191 18 Claims

1. A vehicle body panel assembly comprising:



a specially configured base panel, said base panel having an interior portion and a perimeter portion thereabout;

positioning means selectively interposed along said perimeter of said base panel at preselected points thereon;

a specially configured covering panel of substantially identical dimension to said base panel, said covering panel replaceably interfaces with said base panel and to be secured and positioned on said base panel by said positioning means and wherein said covering panel is able to expand or contract while interfacing with said base panel and secured by said positioning means;

facing means engaging said positioning means and further secures and positions said covering panel to said base panel and another portion of said vehicle body.

5,466,035

IMPROVED VEHICLE FRONT-END SUPPORT STRUCTURE FOR A PASSENGER CAR

Ulrich Klages, Lenting; Alois Feldschmid, Ingolstadt; Gundolf Kreis, Oberstimm, and Heinrich Timm, Ingolstadt, all of, Germany, assignors to Audi AG, Ingolstadt, Germany

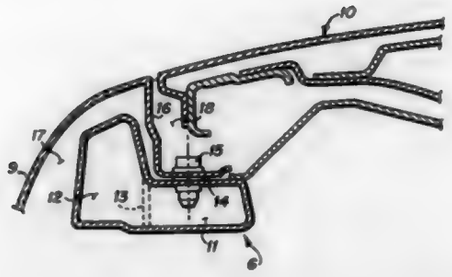
PCT No. PCT/EP91/02230, § 371 Date Jun. 18, 1993, § 102(e) Date Jun. 18, 1993, PCT Pub. No. WO92/11161, PCT Pub. Date Jul. 9, 1992

PCT Filed Nov. 26, 1991, Ser. No. 78,199

Claims priority, application Germany, Dec. 20, 1990, 40 40 951.1

Int. Cl.[6] B65D 25/08

U.S. Cl. 296—205 10 Claims



1. In a motor vehicle front end having a supporting structure comprising a plurality of light-alloy extruded section frame members connected together along adjoining ends thereof by cast light-alloy junction elements and which includes one junction element disposed along a forward A pillar assembly of a motor vehicle between a first, lower and generally vertically oriented forward door pillar portion and a second, upper and obliquely oriented roof pillar portion, and wherein the one junction element further includes means for receivingly engaging a forward cross member which forms a lower frame boundary for a front windshield, wherein the improvement comprises:

a) a light-metal alloy extruded hollow-section, unitary construction, generally horizontally oriented, fender support brace having an enclosed, constant, generally L-shaped profile in cross section which includes:

i) a first rearward end receivingly engaged in said one junction element, and

ii) a second, forward end extending from said one junction element towards the vehicle front end;

iii) said L-shaped profile having a first, generally vertically oriented, hollow-cheered leg portion having a top wall, a bottom wall, and spaced exterior and interior side walls, said walls being planar, said exterior side and top walls being disposed outwardly adjacent a front fender panel and being inclined obliquely to form an enlarged outer surface contour which substantially conforms to a surrounding interior surface contour of the front fender panel hereby substantially utilizing a space between said interior contour and said outer surface contour to provide an enlarged cross-sectional area of said L-shaped profile thereby increasing a stiffness of said fender support brace, and

iv) a second, generally horizontally oriented, hollow-chambered leg portion of approximately rectangular cross section disposed at a lower end of said interior side wall and which extends inwardly toward a longitudinal center axis of the vehicle, said second leg portion having a top wall, a bottom wall, and an interior side wall, said top wall thereof having an exterior top surface, said fender panel being connected to said exterior top surface;

v) said bottom wall of said second leg portion being vertically offset from said bottom wall of said first leg portion, and said interior side wall of said second leg portion being inclined to form an acute angle with said bottom wall of said second leg portion; and

b) an obliquely oriented light-alloy extruded wheel housing support member disposed forwardly of said one junction element and having a first end connected to said fender support brace and a second end connected to said lower forward door pillar portion;

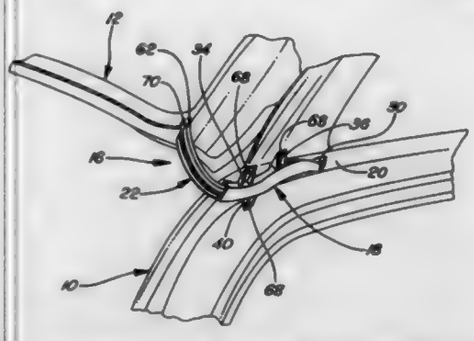
c) said wheel housing support member having a selected length and oblique orientation to form a triangular supporting structure with said fender support brace and said lower forward door pillar portion, and said triangular supporting structure occupying a maximum available space between said one junction element and a vehicle tire disposed forwardly thereof to provide improved force transmission and impact energy distribution characteristics through the vehicle front end in the event of a frontal impact.

5,466,036

VEHICLE WIRE ROUTING APPARATUS

Kurt H. Stroeters, Clawson; Dean B. Clark, Pontiac, and Glen A. DeGrendel, Sterling Heights, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 9, 1994, Ser. No. 239,789
Int. Cl.[6] B60J 5/10
U.S. Cl. 296—208 5 Claims



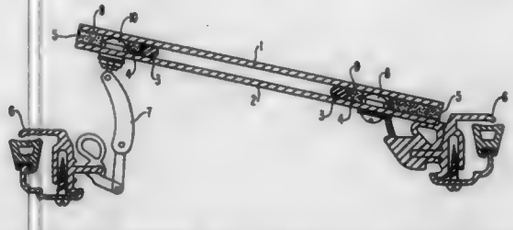
1. A wire routing harness apparatus for use between two relatively movable elements, said apparatus comprising a sheet-like body secured to one of said elements, adapted to covering a portion of a wire from a remote location in said one of said elements, and a hollow body secured to the other of said elements and slidably mounted on said sheet-like body and adapted to having said wire extended therethrough, wherein said two relatively movable elements are a vehicle body and a liftgate pivotally mounted thereon, wherein said sheet-like body conforms to the shape of a portion of said vehicle body, and is mounted to be spaced apart therefrom to receive said portion of a wire therebetween.

5,466,037

MOVABLE TRANSPARENT PANEL STRUCTURE TO CLOSE THE ROOF OF AN AUTOMOBILE

Oscar De Lena, Termoli, Italy, assignor to Societa Italiana Vetro - SIV S.p.A., San Salvo CH, Italy

Filed Jul. 27, 1993, Ser. No. 97,204
Claims priority, application Italy, Jul. 28, 1992, RM92A0577
Int. Cl.[6] B60J 7/00
U.S. Cl. 296—211 1 Claim



1. A panel for assembly into an aperture in the roof of a vehicle so as to be capable of closing and opening the aperture, said panel comprising:

a double-glazed structure including external and internal sheets of transparent material confronting and spaced a predetermined distance from each other so as to define a gap therebetween, said internal and external sheets having substantially the same outer perimeter;

of said internal and external sheets, only said internal sheet having assembly holes therethrough;

a continuous adhesive bead contacting said external and internal sheets and extending along the edge of said double-glazed structure, said bead delimiting the gap of said double-glazed structure, said bead holding said sheets together and said bead spacing said sheets by said predetermined distance, said assembly holes being provided on the opposite side of said bead with respect to said gap;

mechanical assembly elements extending through said assembly holes and mounted to said internal sheet for use in fixing the panel to the roof of the vehicle, whereby said mechanical elements will connect the internal sheet to the roof of the vehicle; and

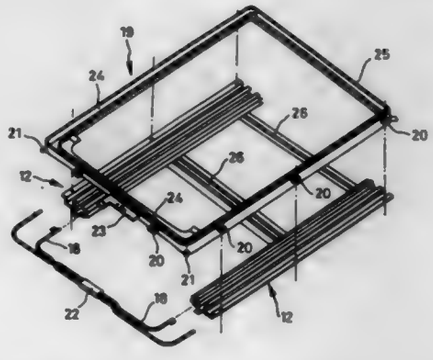
a bead of sealing adhesive contacting said external and said internal sheets, said sealing adhesive being provided on the opposite side of said assembly holes with respect to said adhesive bead, and said sealing adhesive sealing portions of said assembly elements extending between said sheets from the environment outside the double-glazed structure.

5,466,038

SLIDING ROOF DEVICE

Naofumi Fujie, Nagoya; Kenichi Fukura, Toyota; Koichi Ito, Anjyo; Tetsuya Hirata, Kariya, and Naoto Nishio, Toyota, all of, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 118,177, Sep. 9, 1993, abandoned.
This application Dec. 12, 1994, Ser. No. 355,414
Claims priority, application Japan, Sep. 16, 1992, 4-270778; Jul. 23, 1993, 5-201994
Int. Cl.[6] B60J 7/04
U.S. Cl. 296—213 11 Claims



1. A sliding roof device for vehicles which possess a roof and an opening in the roof having opposed side walls, comprising:

a pair of guide rails each of which is positionable along one of the opposed side walls of the opening;

a roof panel slidable along the pair of guide rails for opening and closing the opening in the vehicle roof;

drive means connected to the roof panel for slidably moving the roof panel in a reciprocating manner along the guide rails;

extension means formed integrally with and manufactured in one piece with each of the guide rails for defining an extension of each respective guide rail, each extension means including a linear extension portion extending from the guide rail and a vertical extension portion extending from the linear extension portion; and

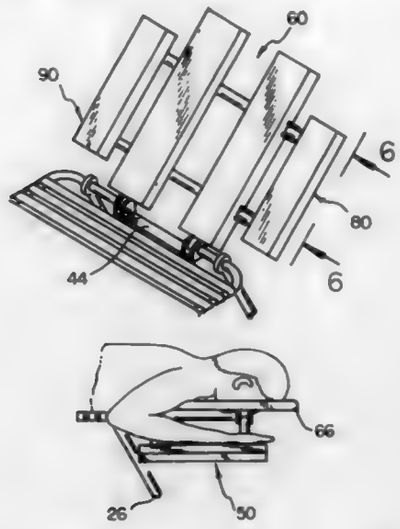
a rain gutter having a channel which is U-shaped in cross-section and which is provided on the extension means of each guide rail, the rain gutter including a pair of side portions which are each positioned in one of the extension means and an end portion integral with the pair of side portions, the end portion of the rain gutter being provided with a bracket for attachment of said drive means.

5,466,039

FOLDABLE LOUNGE WITH COMBINATION HEADREST AND BACKREST

Gloria J. Umbrianna, 407 W. Elm St., Pembroke, Mass. 02359

Filed Mar. 14, 1994, Ser. No. 209,301
Int. Cl.[6] A47C 1/14;7/54
U.S. Cl. 297—116 7 Claims



1. A new foldable lounge for providing a portable chaise lounge with a headrest adaptable to support a recumbent prone user's face in a downward position without the necessity of turning the head sideways whereby the user's neck and spine remain straight without pressing the face into a backrest, the headrest additionally including foldable armrests positionable to comfortably support the recumbent prone user's arms, the foldable lounge comprising:

a base portion for supporting the lower body of a user, the base portion comprising: a rectangular frame constructed of tubular material separated laterally into a seat portion with an end and a leg rest portion, the seat portion and the leg rest portion being hingedly connected together to lie adjacent the seat portion when inoperative, the leg rest portion also being pivotally extendable to lie essentially coplanar the seat portion during use; a first U-shaped leg member constructed of tubular material cooperatively hingedly connected to the hinged connection of the frame portions such that the first leg member may be pivoted to lie adjacent the seat portion when inoperative, the first leg member also being pivotally extendable downwardly at a slight angle from the frame during use; a second U-shaped leg member constructed of tubular material hingedly connected to the end of the seat portion such that the second leg member may be pivoted to lie adjacent the seat portion when inoperative, the second leg member also being pivotally extendable downwardly at a slight angle from the frame during use whereby, in combination with the first leg member, the frame may be elevated above and essentially parallel to a supporting surface; support means comprising a plurality of closely spaced apart resilient straps stretched laterally across the rectangular frame, the strap forming a resilient essentially planar surface whereupon the lower body of the user may be comfortably supported; and

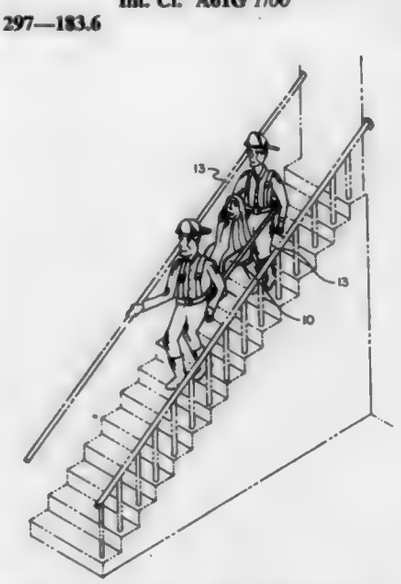
a backrest portion for supporting in a generally upright position the upper body of the user seated on the base portion, the backrest portion adaptable for supporting in a generally horizontal position the upper body of a supine user, the backrest portion also adaptable for supporting in a generally horizontal position the face and arms of a prone user, the backrest portion comprising: a rectangular backrest frame constructed of tubular material hingedly connected at one end thereof to the end of the base frame seat portion such that the backrest frame may be pivoted forward downward to lie adjacent the seat portion when inoperative, the backrest frame also being pivotally movable to any of a plurality of discrete angular positions relative to the plane of the seat portion ranging from a lowest position essentially coplanar the seat portion for supporting supine and prone users to a highest position essentially normal the seat portion for supporting seated users, the backrest frame having a hingedly connected U-shaped extension member projecting laterally from both sides thereof, the extension members being identical to each other, the extension members being positionable in a first position coplanar with the backrest frame for use as a conventional backrest for supporting seated and supine users, the extension members additionally being pivotable to a downwardly sloping second position relative to the backrest frame for supporting the arms of prone users; cushioning means for relieving pressure from the back of a seated or supine user, the cushioning means also adapted to receive the downwardly positioned face and pronated arms of a prone user, the cushioning means comprising an identical pair of spaced apart resilient elongated backrest pads fixedly attached to the backrest frame such that the backrest pads lie between the user and the backrest frame, the backrest pads being oriented longitudinal with respect to the base portion and spaced apart to contact and support the back of seated and supine users, the backrest pads also being spaced apart for contacting and supporting the sides of a prone user's face such that the nose, mouth, and eyes may project downwardly therebetween, the arm pads being oriented parallel with the backrest pads and the cushioning means also including a resilient elongated arm pad fixedly attached to the end of both extension members for providing additional back support when the extension members are in the first position, the arm pads being adaptable to support a prone user's arms when the extension members are in the second position.

5,466,040

HIGH RISE EVACUATION CHAIR

Henry Fainsztein, 8582 Keel Dr., Huntington Beach, Calif. 92646

Filed Jan. 27, 1994, Ser. No. 186,857
Int. Cl.[6] A61G 1/00
U.S. Cl. 297—183.6 3 Claims



1. A high rise evacuation chair which comprises: a supporting seat for victims to be carried thereby; a pair of rigid longitudinal shafts; means for adjustably securing said supporting seat to said pair of shafts; a plurality of handle members with one handle member oriented at each end of said pair of shafts; a plurality of raised circular detent members extending exteriorly from each end of each of said handle members; and a pair of flexible shoulder

harnesses removably attached to said handle members, one harness at each end of said shafts and associated handle members, whereby the weight of said seat and its encompassed victim as well as that of said shafts is supported solely by said shoulder harnesses thus freeing the hands of persons carrying such chair and wearing said harnesses;

said means adjustably securing said supporting seat to said pair of shafts comprises a plurality of externally threaded bolts with one of said bolts extending through one of the sides of said supporting seat and an internally threaded receptacle for such bolt extending through each of said pair of rigid longitudinal shafts and engaging with said externally threaded bolts, each of said sides having a longitudinal slot to adjustably receive one of said bolts.

5,466,041

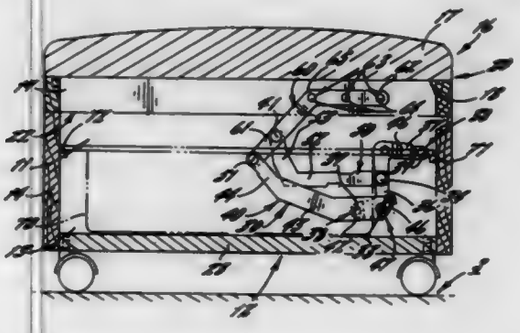
OTTOMAN INCLUDING STORAGE RECEPTACLE

D. Stephen Hoffman, and Charles F. Lowe, both of High Point, N.C., assignors to Ultra-Mek, Inc., Denton, N.C.

Continuation of Ser. No. 84,511, Jun. 29, 1993. This application Jan. 12, 1995, Ser. No. 371,928

Int. Cl.[6] A47C *7/62*

U.S. Cl. 297—188.1 **11 Claims**



1. An ottoman comprising:

(a) a base configured to rest on an underlying surface and including upright wall means;

(b) a removable cover having a lower portion and a rear edge portion; and

(c) four-bar linkage means pivotally interconnected with said base and said cover for moving said removable cover between a closed position, wherein said removable cover is generally horizontally disposed above said upright wall means of said base, and an open position, wherein said cover is disposed generally vertically, said lower portion of said cover confronts said wall means, and said rear edge portion of said cover is adjacent the underlying surface.

5,466,042

BICYCLE SEAT POST WITH AN ADJUSTING MECHANISM

William P. Herman, Marblehead, Mass., assignor to Hsin Lung Accessories Co. Ltd., Taipei Hsien, Taiwan, Prov. of China

Filed Mar. 11, 1994, Ser. No. 209,996

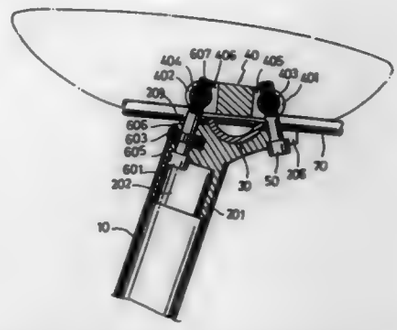
Int. Cl.[6] B62J *1/00*

U.S. Cl. 297—215.15 **6 Claims**

1. A seat post assembly for adjustably mounting a seat of a bicycle to a frame of the bicycle, said seat post assembly comprising:

a tube member capable of being received in the frame of the bicycle so as to have an upper end and a lower end spaced along an axis of said tube member;

a clamp base having a depending, hollow, flange portion which is received in said upper end of said tube member, said clamp base having a top portion with an upwardly open, arcuately



curved clamp track lying in a first axis that is transverse with respect to said axis of said tube member, said top portion of said clamp base having a generally round end lying to one side of said clamp track along a second axis that is transverse with respect to said axis of said tube member and having a generally tapered end lying to the other side of said clamp track along said second transverse axis, said clamp base having a through bore commencing inside said flange portion and extending upwardly through said clamp base to open at said round end, said clamp base having a chamber exposed to the exterior thereof and intersecting said through bore, said tapered end having a cut-out portion defined therein;

a lower clamp member having an arcuately curved bottom portion received in said clamp track for arcuate movement with respect thereto, said lower clamp member having a pair of ends each having a lower vise portion for a rail of the seat;

an upper clamp member positioned on top of said lower clamp member, said upper clamp member having a pair of ends each having an upper vise portion for the seat rails mating with a lower clamp portion, said upper clamp member having a pair of sides each having a lug member forming a channel extending along the side of the upper clamp member parallel to said first transverse axis, each of said lug members having a slot lying across to the direction of extension of said channel;

an upper clamp pivot member rotatably received in said channel of each of said lug members, each of said upper clamp pivot members having a threaded hole exposed through said slot of said lug member;

an adjustment mechanism comprising a bolt assembly and a second bolt member, said bolt assembly including a first bolt member lying in said through bore of said clamp base, said first bolt member having a threaded end portion received in the threaded hole of one of said upper clamp pivot members for pivotally retaining said upper clamp member on said lower clamp member, said first bolt member extending through and being affixed to a spur wheel lying in said chamber so that said first bolt member may be rotated by manipulating said spur wheel, said second bolt member having a threaded end portion received in the threaded hole of the other of said upper clamp pivot members, said second bolt member being received in said cut-out portion of said tapered end, said second bolt member being pivotally movable with respect to said tapered end to remove said second bolt member from said cut-out.

5,466,043

TRANSLATING HEADREST

Jeffrey T. Lambert, Commerce Township, and Edward J. Walblay, Brighton, both of Mich., assignors to Atoma International Inc., Newmarket, Canada

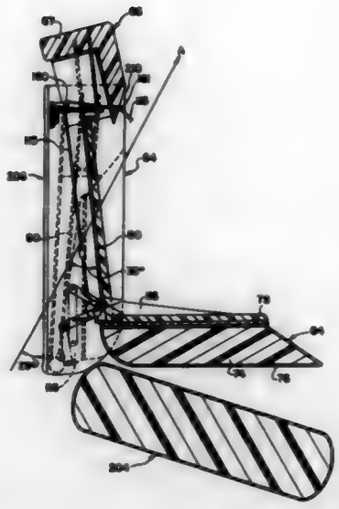
Filed Feb. 25, 1994, Ser. No. 202,182

Int. Cl.[6] B60N *2/30*

U.S. Cl. 297—238 **35 Claims**

1. A motor vehicle seat providing an integrated child seat comprising:

a seat frame assembly for securement within the motor vehicle interior;



a seat cushion carried by said seat frame assembly in a position to enable an adult occupant of the motor vehicle to sit thereon;

a seat back frame assembly mounted in operative relation with respect to said seat frame assembly;

side cushions carried by said seat back frame assembly in positions to be engaged by the back of an adult seat occupant sitting on said seat cushion, said side cushions being spaced apart a distance sufficient to define a space therebetween of a size to enable a child to be disposed therebetween;

a plurality of cushion assemblies constructed and arranged to be moved between i) an adult mode position wherein said cushion assemblies are disposed within said space and provide support to the back of an adult seat occupant sitting on said seat cushion and ii) a child mode position wherein said cushion assemblies provide a cushioned child seat, a cushioned child seat back, and a cushioned child head support for supporting the seat, back and head of a child seat occupant respectively, said plurality of cushion assemblies including (1) a movable first cushion assembly mounted for movement between (a) said adult mode position wherein said movable first cushion assembly is disposed within said space and provides a cushioned adult seat back lower portion for engaging the lower back of an adult seat occupant sitting on said seat cushion, and (b) said child mode position wherein said movable first cushion assembly is disposed in a position so as to provide a child's seat support in overlying relation to said seat cushion, and (2) a movable second cushion assembly including an upper cushioned pad disposed in said space and providing support to an adult seat occupant sitting on said seat cushion when said cushion assemblies are in said adult mode position,

an interconnecting assembly operatively connecting said movable second cushion assembly to said first cushion assembly so that movement of said movable first cushion assembly causes responsive movement of at least said upper cushioned pad of said movable second cushion assembly, said upper cushioned pad being moved i) upwardly by said interconnecting assembly so as to project above the adult seat back in response to movement of said first cushion assembly from said adult mode position to said child mode position so that said upper cushioned pad provides support to the back of the head of a child seat occupant sitting on said movable first cushion assembly providing said child's seat support in said overlying relation to said seat cushion, and ii) downwardly in response to movement of said first cushion assembly from said child mode position to said adult mode position so that said upper cushioned pad provides support to an adult seat occupant sitting on said seat cushion when said cushion assemblies are in said adult mode position; and

a harness assembly constructed and arranged for extension over the shoulders of a child seat occupant sitting on the child seat when said plurality of cushion assemblies are in said child mode position, said harness assembly having an anchor point disposed between the legs of a child seat occupant.

5,466,044

CHILD SAFETY SEAT

Geoffrey W. Barley, Pitton, and Norman Morton, Driffield, both of, England, assignors to Britax-Excelsior Limited, England

Filed Sep. 6, 1994, Ser. No. 300,950

Claims priority, application United Kingdom, Sep. 30, 1993, 9320169

Int. Cl.[6] A47C *1/08*

U.S. Cl. 297—252 **4 Claims**

1. A child safety seat in combination with a vehicle, the vehicle having:

an adult vehicle seat with a seat portion and a backrest portion,

a rear anchorage unit rigidly secured to the vehicle at the bottom of the backrest portion of the vehicle seat, and

a front anchorage unit rigidly secured to the vehicle below the front edge of the vehicle seat;

the child safety seat comprising:

a seat body,

a rear releasable fastener projecting from the rear of the seat body for attachment to the rear anchorage unit,

a front releasable fastener on the other end of seat body for attachment to the front anchorage unit, and

a coupling arm having one end secured to the front releasable fastener and its other end pivotally attached to the seat body below the front thereof for angular movement between a first position in which the front releasable fastener engages with the front anchorage unit and an intermediate portion of the coupling arm is located in front of both ends thereof, and a second position in which both the front releasable fastener and said intermediate portion are located in front of the seat body so as to obstruct occupancy thereof.

5,466,045

LUMBAR SUPPORT DEVICE

Hiroaki Akima, Akishima, Japan, assignor to Tachi-S Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1994, Ser. No. 318,293

Int. Cl.[6] A47C *3/00*

U.S. Cl. 297—284.8 **12 Claims**

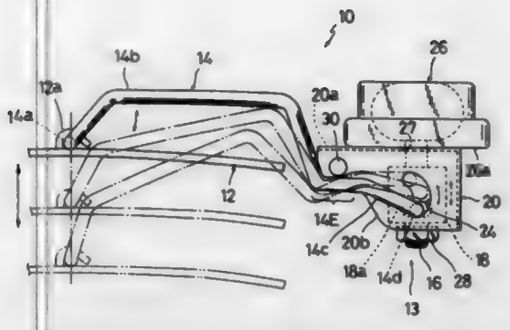
1. A lumbar support device for a seat, comprising:

a lumbar plate to support a lumbar part of an occupant sitting on the seat;

an arm means having a free end portion on which said lumbar plate is supported, an intermediate portion and a base end portion;

a bracket means;

a fulcrum means which so disposed at said bracket means as to receive said intermediate portion of said arm means in such a



way that said arm means intermediate portion is in a slidable contact with said fulcrum means;

a threaded drive mechanism provided in said bracket means, said threaded drive mechanism being operatively connected with said base end portion of said arm, whereby said arm base end portion is caused to move in a direction forwardly and backwardly of the seat; and

a guide means workable in conjunction with said threaded drive mechanism to guide said arm base end portion along a predetermined locus, whereby said free end portion of said arm is displaced on a straight line in said direction forwardly and backwardly of the seat,

wherein operation of said threaded drive mechanism causes displacement of said lumbar plate on said straight line in a direction towards and away from said lumbar part of said occupant on the seat.

5,466,046

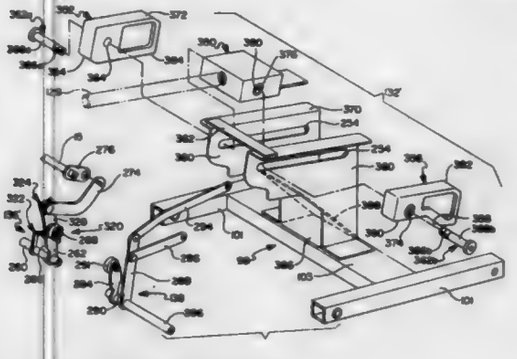
LINEAR ACTUATION DRIVE MECHANISM FOR POWER-ASSISTED CHAIRS

Karl J. Komorowski, Petersburg; Jonathan R. Saul, LaSalle; Larry P. LaPointe, Temperance, and Richard E. Marshall, Monroe, all of Mich., assignors to La-Z-Boy Chair Co., Monroe, Mich.

Continuation-in-part of Ser. No. 951,902, Sep. 28, 1992, Pat. No. 5,314,238, which is a continuation-in-part of Ser. No. 774,536, Oct. 8, 1991, Pat. No. 5,215,351, which is a continuation of Ser. No. 613,355, Nov. 14, 1990, Pat. No. 5,061,010, which is a continuation-in-part of Ser. No. 425,384, Oct. 18, 1989, Pat. No. 4,993,777, which is a continuation of Ser. No. 196,750, May 20, 1988, abandoned. This application Nov. 19, 1993, Ser. No. 154,977

Int. Cl.[6] A47C *1/02*

U.S. Cl. 297—325 **26 Claims**



1. A power-assist chair comprising:

a base assembly;

a chair frame pivotally supported on said base assembly;

a rotatable drive shaft extending transversely between opposite side portions of said chair frame;

a leg rest assembly supported from said chair frame and operatively coupled to said drive shaft for movement from a retracted position to an extended position in response to rotation of said drive shaft in a first direction;

follower means supported for pivotal movement on said base assembly and operably interconnected to said drive shaft; and

actuation means for actuating said leg rest assembly, said actuation means including a driven member, power operated means for causing movement of said driven member relative to said follower means, and a cam member supported for pivotable movement on said driven member, said cam member adapted to engage and pivot said follower means in response to movement of said driven member for causing corresponding rotation of said drive shaft in said first direction so as to extend said leg rest assembly.

5,466,047

BACK-REST HINGE FOR A VEHICLE SEAT WITH A SEAT SUPPORT AND A BACK-REST HINGED TO IT

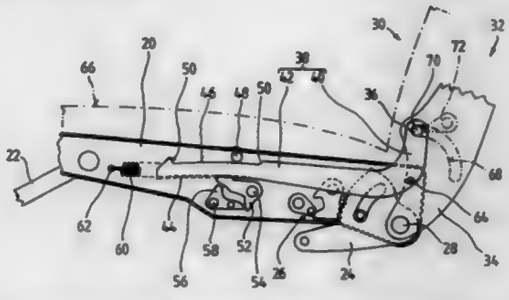
Heinz Bauer; Burckhard Becker, and Ernst-Reiner Frohnhaus, all of Solingen, Germany, assignors to Firma C. Rob. Hammerstein GmbH, Germany

Filed Nov. 17, 1993, Ser. No. 154,213

Claims priority, application Germany, Nov. 17, 1992, 42 38 756.6; Sep. 7, 1993, 43 30 250.5

Int. Cl.[6] B60N *2/22*

U.S. Cl. 297—367 **17 Claims**



1. Back-rest hinge for a vehicle seat with a back-rest and a seat support, with a back-rest hinged to the seat support by means of a swivel joint and with a locking mechanism for adjusting the angle of inclination of the back-rest in relation to the seat support, said back-rest having a lengthwise direction and comprising a back-rest support, and said locking mechanism comprising a locking lever, wherein the locking lever is hinged to the back-rest support at a hinge point in such a way that the hinge point is at a distance from the swivel joint along the lengthwise direction of the back-rest, the locking lever has a locking area which extends in the longitudinal direction of the seat support, so that a prolongation of the locking area points toward a front edge of this seat support, and interlock means comprising an activation lever is provided on the seat support for releasably fixing the locking area, so that the locking lever cannot move relative to the seat support, which interlock means is normally in interlocking engagement with a locking area and can be released by the activation lever, the locking area being curved so as to retain the orientation of the locking area relative to the interlock means substantially independent of the position of the back-rest.

5,466,048

BACKREST RELEASE MECHANISM

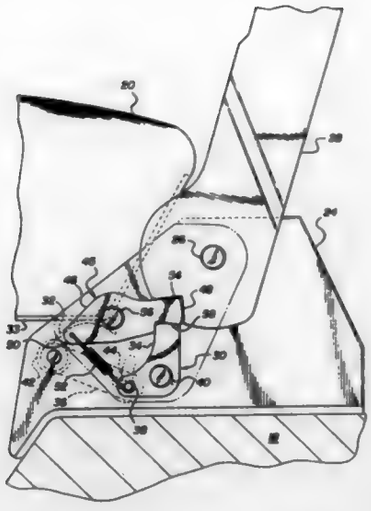
Thomas J. Fowler, Canton, and Liviu Rus, Troy, both of Mich., assignors to Lear Seating Corporation, Southfield, Mich.

Filed Jun. 16, 1994, Ser. No. 260,999

Int. Cl.[6] B60N *2/02;2/20*

U.S. Cl. 297—378.12 **18 Claims**

1. A vehicular seat assembly (**14**) adapted for attachment to a floor (**16, 18**) of a vehicle (**10**), said vehicular seat assembly (**14**) comprising:



a seat cushion (**20**) and a seat back (**22**) supported for independent pivotal movement into and out of a seat forming position, said seat forming position defined by said seat cushion (**20**..) in a generally horizontal position adjacent to said floor (**16**, **18**) and said seat back (**22**) in a generally upright vertical position;

positioning means (**45**) operatively coupled to said seat back (**22**) for positioning said seat back (**22**) in said seat forming position;

seat cushion receiving means (**32**) for receiving said seat cushion (**20**) in said seat forming position, said vehicular seat assembly (**14**) characterized by:

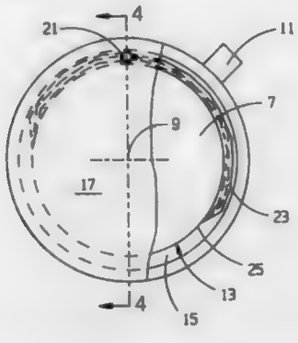
locking means (**30**) operatively connected between said positioning means (**45**) and said receiving means (**32**) for selectively engaging said positioning means (**45**) with said seat back (**22**) to lock said seat back (**22**) in said seat forming position in response to said seat cushion (**20**) pivoted to said horizontal position and received on said seat cushion receiving means (**32**) and for selectively unlocking said seat back (**22**) from said seat forming position in response to said independent pivotal movement of said seat cushion (**20**) away from said receiving means (**32**) and out of said seat forming position.

5,466,049

BALANCING RING

Arlyn Harmsen, Rte. 2, Box 462, Church Rd., Waupun, Wis. 53963-9802

Filed Jan. 27, 1992, Ser. No. 826,103
Int. Cl.[6] F16F *15/023*
U.S. Cl. 301—5.22 **5 Claims**



1. A balancing ring for balancing an imbalanced object that is rotatable about an axis of rotation comprising:

a. an annular chamber formed in the object generally concentric with the axis of rotation thereof;

b. a predetermined amount of a selected gel material placed in the annular chamber, the material automatically distributing itself within the annular chamber to a location that balances the object when the object is rotated; and

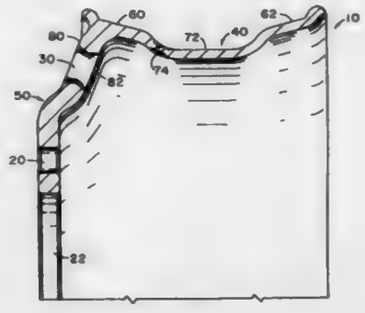
c. hardener means for permanently maintaining the gel material at the location that balances the object.

5,466,050

VEHICLE WHEEL AND ASSOCIATED METHODS OF MAKING A VEHICLE WHEEL

Ralph C. Botterman, Strongsville, and Michael J. Doran, Lakewood, both of Ohio, assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 927,947, Aug. 11, 1992, Pat. No. Des. 356,538, and a continuation-in-part of Ser. No. 927,948, Aug. 11, 1992, Pat. No. Des. 358,797, and a continuation-in-part of Ser. No. 1,806, Aug. 24, 1992, Pat. No. Des. 358,360, and a continuation-in-part of Ser. No. 1,807, Aug. 24, 1992, Pat. No. Des. 360,867, and a continuation-in-part of Ser. No. 16,870, Dec. 28, 1993, and a continuation-in-part of Ser. No. 19,091, Feb. 3, 1994, Pat. No. Des. 361,052.
This application Mar. 16, 1994, Ser. No. 214,640
Int. Cl.[6] B60B *3/10*
U.S. Cl. 301—65 **15 Claims**



1. A vehicle wheel having a hand hole extending from a first surface to a second surface wherein said hand hole has a zone of a minimum dimension intermediate said first surface and said second surface, said hand hold being defined by a generally continuous wall which has a first section that extends from said first surface to said minimum dimension zone and a second section that extends from said second surface to said minimum dimension zone, said first section tapering from said first surface to said minimum dimension zone and said second section tapering from said second surface to said minimum dimension zone with the lines used to generate said first and second sections being generally straight and intersecting at an intersection region which is generally arcuate in shape.

5,466,051

RELEASABLE WHEEL ASSEMBLY FOR GOLF CART

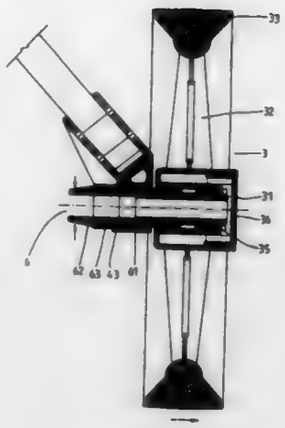
Gordon Liao, Taipei, Taiwan, Prov. of China, assignor to Unique Product & Design Co., Ltd., Tainan Hsien, Taiwan, Prov. of China

Filed Jun. 30, 1994, Ser. No. 269,802
Int. Cl.[6] B60B *35/02*
U.S. Cl. 301—111 **2 Claims**

1. A releasable wheel assembly for a golf cart comprising:

a wheel body including a hub portion, an axle being rotatably supported in said hub portion,

a leg attachment member includes a hole formed therein, said hole being of a shape conforming to that of an engaging



member, said hole releasably receiving said engaging member to releasably secure said wheel assembly to said golf cart; wherein

said engaging member includes a pair of opposing catches extending therefrom, said catches being compresses when inserted into said hole of said leg attachment member, a depression in said engaging member fitting in an interior of said leg attachment member, the catches returning to their extended position after they have passed through said hole in said leg attachment member and abutting an inner side of a projection on said leg attachment member, a lower portion of said engaging member abutting an outer side of said projection means on said leg attachment member, so that said wheel assembly is inhibited from lateral movement,

said wheel assembly being released by a user compressing said catches with his hand, thereby enabling the wheel assembly to be pulled from the leg attachment member.

5,466,052

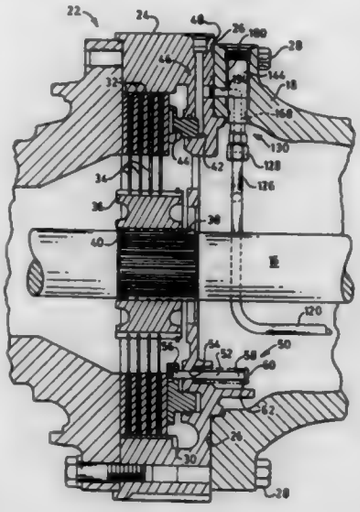
A FLUID CONNECTING DEVICE

Mark E. Tietje, Batavia, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 937,070, Aug. 31, 1992, abandoned. This application Apr. 15, 1994, Ser. No. 231,363

Int. Cl.[6] F16L *41/00*

U.S. Cl. 303—1 **12 Claims**



1. A fluid connecting device for directing pressurized fluid through a housing member, comprising:

a housing defining an internal cavity, and a threaded mounting bore having a first end portion that opens onto an outer surface thereof and a second end portion that opens into the internal cavity, and an exhaust/inlet port communicating with the mounting bore;

a connecting stem having a first, disc-shaped end portion defining an outer surface, a second end portion and an internal passageway, said connecting stem being positioned within the mounting bore with the first end portion threadably engaged with the first end portion of the mounting bore in a manner wherein the outer surface of the first end portion is positioned in generally flush relationship to the outer surface of the housing and the second end portion thereof extending into the internal cavity, said internal passageway being positioned to communicate fluid between the second end portion of the connecting stem and the exhaust/inlet port;

a fluid conduit assembly releasably connected to the second end portion of the connecting stem and being sufficient for communicating pressurized fluid to the internal passageway; and

means for rotating the connecting stem with respect to the mounting bore, said rotating means being positioned on the second end portion of the connecting stem and being engageable from within the internal cavity to secure and release the threaded engagement between the connecting stem and the mounting bore.

5,466,053

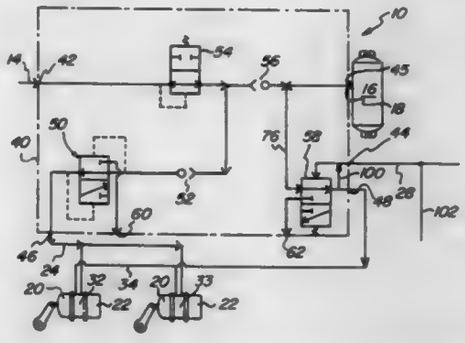
FULL-FUNCTION VALVE FOR TANDEM TRAILER BRAKE SYSTEM

Robert L. Koelzer, Kearney, Mo., assignor to Midland Brake, Inc., Kansas City, Mo.

Continuation-in-part of Ser. No. 149,287, Nov. 9, 1993, Pat. No. 5,417,479. This application Sep. 12, 1994, Ser. No. 304,393

Int. Cl.[6] B60T *13/40*

U.S. Cl. 303—7 **13 Claims**



10. In a full-function valve, comprising: a valve housing having a plurality of ports therein, said ports comprising a supply air inlet, a control air inlet, at least one spring brake outlet, at least one service brake outlet, a reservoir outlet, a spring brake exhaust, and a service brake exhaust; said ports extending through an outer wall of said housing; a pressure protection valve in fluid communication with a passageway connected to said supply air inlet, said pressure protection valve being openable at a selected supply air pressure to provide fluid communication between said supply air inlet with a first check valve and a reservoir check valve; a spring brake quick release valve having a spring brake pressurizing mode when a pressure at an inlet side thereof sufficient to open said valve to provide fluid communication between said supply air inlet with said spring brake outlet, said quick release valve having an exhaust mode when a pressure at an inlet side thereof is less than a pressure required to open said quick release valve to provide fluid communication between said spring brake outlet with said spring brake exhaust; and a relay valve in fluid communication with said control air inlet, said relay valve being normally located to provide fluid communication between said service brake outlet and said service

brake exhaust, and being operable when pressurized control air is supplied thereto to provide fluid communication between said reservoir and said service brake outlet; the improvement comprising:

a passageway providing fluid communication between said control air inlet and said supply air service air outlet when pressurized control air is supplied to said relay valve, to thereby feed supply air to said control air inlet to boost the pressure of said control air.

5,466,054

ANTI-SKID BRAKE SYSTEM WITH COEFFICIENT OF FRICTION COLLECTION

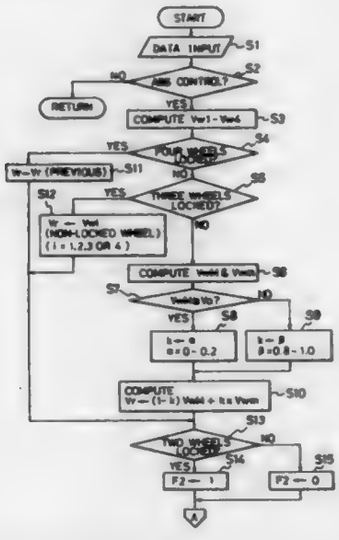
Haruki Okazaki, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Apr. 15, 1994, Ser. No. 228,018

Claims priority, application Japan, Apr. 16, 1993, 5-113881

Int. Cl.[6] B60T 8/58

U.S. Cl. 303—150 **38 Claims**



1. An anti-skid brake system comprising:

at least one wheel speed detecting means for detecting a rotational speed of each of a plurality of wheels separately;

a ground friction coefficient estimating means for estimating a ground friction coefficient μ based on a rate of change of signals relating to the wheel speeds detected by said at least one wheel speed detecting means;

a braking force adjusting means for adjusting a braking force applied to each wheel;

an anti-skid control means for controlling said braking force adjusting means to prevent the wheels from being locked in accordance with the ground friction coefficient μ estimated by said ground friction coefficient estimating means;

a locked wheel detecting means for detecting a number of locked wheels at least based on the wheel speeds detected by said at least one wheel speed detecting means; and

an estimation process altering means for altering an estimation process for estimating the ground friction coefficient μ by said ground friction coefficient estimating means in accordance with the number of the locked wheels detected by said locked wheel detecting means.

5,466,055

ELECTROHYDRAULIC UNIT FOR REGULATING THE PRESSURE IN VEHICLE BRAKING SYSTEMS

Edgar Schmitt, Vaihingen/Enz; Heinz Siegel, Stuttgart; Robert Mergenthaler, Markgröningen, and Helmut Deringer, Erligheim, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

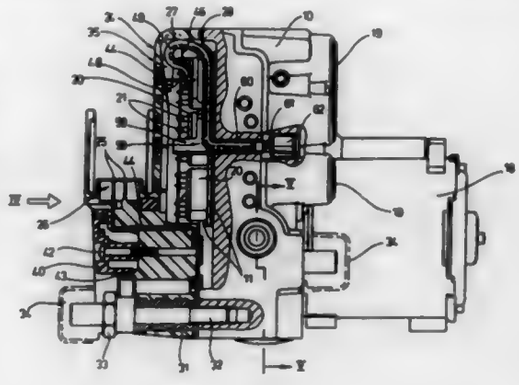
PCT No. PCT/DE92/00738, § 371 Date Oct. 12, 1993, § 102(e) Date Oct. 12, 1993, PCT Pub. No. WO93/00850, PCT Pub. Date Apr. 29, 1993

PCT Filed Sep. 3, 1992, Ser. No. 133,069

Claims priority, application Germany, Jan. 12, 1991, 41 33 879.0

Int. Cl.[6] B60T 8/36

U.S. Cl. 303—119.2 **26 Claims**

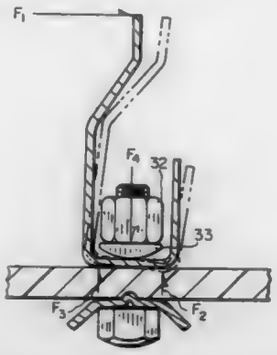


1. An electrohydraulic unit for controlling a fluid pressure in vehicle braking systems, having a hydraulic block that includes fluid magnet valves with electromagnets which protrude from one side of the hydraulic block, fluid pumps, fluid chambers and corresponding fluid conduits, an electric motor mounted on the hydraulic block for driving the fluid pumps and secured on an opposite side of the hydraulic block, two electrical relays for magnet valves and the electric motor that are disposed on the side of the hydraulic block supporting the electromagnets, and having a cover that protects the electromagnets and relays, on which at least one connector group is disposed that is accessible from the outside and has a plurality of connectors for attaching an electrical connector, whose connector connections are connected to the electrical connections of the electromagnets, the relays and the electric motor, the cover (24) is subdivided into a connector base (27) that includes the connector group (26) with connectors (25) and their connector connections, and a covering hood (40) that can be attached to the connector base (27); the connector base (27) is seated flush on one side of the hydraulic block (10) and has a hollow space (35) in a region of the electromagnets (20) that receives said electromagnets; an electrical circuit between the connector connections and the electrical connections (21) of the electromagnets (20) is completed by means of a contact foil (46); the connector base (27) has two connector receptacles (36, 37) one each for each of two relays (23), disposed symmetrically to an axis of the housing and spaced from the hollow space (35) at a distance from a center of the connector base, that the two connector receptacles are embodied as electrically connected connector bushings (38) for connection pins (22) of the relays (23); and that the covering hood (40) that can be attached to the connector base (27) is embodied such that the covering hood overlaps the two relays (23) inserted into the connector receptacles (36, 37) and secures them against axial displacement.

5,466,056
CLEAT RETAINING ASSEMBLY FOR VEHICLE ENDLESS TRACK

M. Elmer James, Mendon, and Micheal G. Beeley, Logan, both of Utah, assignors to LMC Operating Corp., Logan, Utah

Continuation of Ser. No. 96,187, Jul. 26, 1993, abandoned. This application Nov. 21, 1994, Ser. No. 342,907
Int. Cl.[6] B62D 55/28
U.S. Cl. 305—54 10 Claims



1. A cleat assembly to be mounted upon the flexible belting of a vehicle endless track, said track comprising at least one endless flexible belt carrying longitudinally spaced sets of holes for mounting the cleat assembly transversely to the belt, said cleat assembly comprising:

an elongate grouser plate having a generally planar belt contacting portion, having mounting holes therethrough matching the holes of one of the sets of holes carried by the belt;

an elongate backing plate laterally spanning the belt, and having holes matching the mounting holes of the grouser;

a mounting bolt operable through each of the matching holes to secure the backing plate, the belt and the grouser together, said bolt having an enlarged head portion and an elongate shank with at least an end portion carrying external threads;

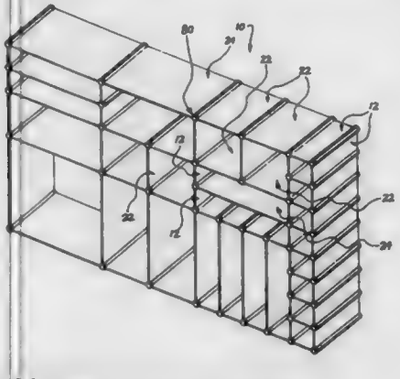
a torque nut having a body with a bore, at least a portion of said bore carrying internal threads engaged with the external threads of the bolt shank; and

a member clamped by the bolt and torque nut to bear against the upper surface of the grouser, said clamped member being shaped and positioned to contact said surface only along a single line aligned with the centers of the grouser mounting holes.

5,466,057
MODULAR STORAGE APPARATUS

Karl Blankenburg, 32131 Claeys Dr., Warren, Mich. 48093

Filed Mar. 16, 1994, Ser. No. 213,987
Int. Cl.[6] A47B 87/00; F16B 12/00
U.S. Cl. 312—108 24 Claims



1. A modular storage apparatus comprising:

a plurality of planar panel members each having opposed side edges and opposed end edges surrounding opposed exterior faces; and

a plurality of edge connectors capable of interconnecting the side edges of a plurality of adjacent disposed panel members into a peripherally closed structure having at least one storage compartment formed between the panel members;

each edge connector including:

an elongated body having a central, elongated spine and a plurality of circumferentially spaced, longitudinally extending arms extending radially outward from the central spine, the arms being spaced apart to form channels between adjacent arms complementary to the shape of the side edges of the panel members for receiving a side edge of a panel member therein;

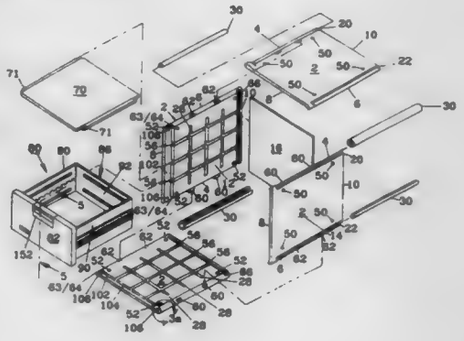
the arms further including a pair of arm side walls joined at a common edge to the central spine and having outer edges circumferentially spaced from each other; and

an outer wall extending and connected between the outer edges of each of the arm side walls.

5,466,058
STACKABLE INTERLOCKING MODULAR STORAGE SYSTEM

Shiu C. Chan, Agoura Hills, Calif., assignor to One Two One Systems, Inc., Agoura Hills, Calif.

Filed Aug. 15, 1994, Ser. No. 291,127
Int. Cl.[6] F16B 12/00
U.S. Cl. 312—111 11 Claims



1. A modular storage unit that includes a plurality of interlocking panels, each panel comprising:

a rectangular-shaped panel member having beveled top and bottom edges, front and rear edges and inner and outer walls;

a top retaining groove in said outer wall that is parallel to and spaced apart from said top edge;

a bottom retaining groove in said outer wall that is parallel to and spaced apart from said bottom edge;

a tab on one of said beveled edges;

a notch complementary to said tab on the other one of said beveled edges;

a channel in said inner wall that is parallel to said top and bottom edges for slidably engaging a drawer or shelf;

said panels being positioned with their bottom edges adjacent another one of said panels' top edges to form said modular storage unit such that said tabs and notches are engaged, thus preventing transverse movement of said panels; and

a plurality of curved moldings, each molding slidably engaging said top retaining groove in one of said panels and said bottom retaining groove in another adjacent one of said panels.

5,466,059

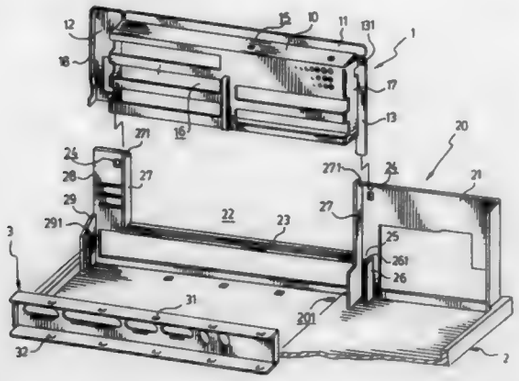
INTERFACE SEAT FOR A PERSONAL COMPUTER

Morgan C. Liu, Taoyuan, Taiwan, Prov. of China, assignor to Enlight Corporation, Taoyuan, Taiwan, Prov. of China

Filed Feb. 25, 1993, Ser. No. 22,370

Int. Cl.[6] A47B 77/08;81/00

U.S. Cl. 312—223.2 1 Claim



1. An interface seat for a computer casing, the interface seat comprising:

a base plate having an upper flange, a lower flange and first and second opposite-side flanges, each of the flanges extending perpendicularly from the base plate in a same direction, the upper flange having an upper stop strip extending outwardly of the base plate and perpendicularly to the upper flange, the first side flange having a first side stop strip extending from one side outwardly of the base plate and perpendicularly to the first side flange and a perpendicular flange extending perpendicularly from an opposite side of the first side stop strip back toward the base plate, the second side flange having a second side stop strip extending from one side outwardly of the base plate and perpendicularly to the second side flange and having an end portion extending parallel to the base plate and past the lower flange, the first and second side stop strips having respective tabs nearer the upper flange than the lower flange and inclined from the respective one of the first and second side stop strips away from the base plate, there being respective gaps between the lower flange and the first and second side flanges, and the one sides of the first and second stop strips having respective lugs extending parallel to the base plate and towards each other.

5,466,060

DRAWER SLIDE WITH ACCESS HOLES

Keith A. Hoffman, Hudsonville, Mich., assignor to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 934,423, Aug. 24, 1992, Pat. No. 5,316,389, and a continuation-in-part of Ser. No. 932,718, Aug. 20, 1992, abandoned. This application Aug. 20, 1993, Ser. No. 109,739

Int. Cl.[6] A47B 88/00

U.S. Cl. 312—334.8 16 Claims

1. A drawer slide assembly for suspending a drawer in a cabinet, comprising:

a cabinet channel mountable to a cabinet;

a drawer channel mountable to a drawer, said drawer channel including at least two mounting holes in spaced relation;

a center channel interconnecting and telescopically engaged with said cabinet and drawer channels such that said drawer slide assembly is movable between a retracted closed position and an extended open position, said center channel including at least one access opening;

a bearing retainer assembly slidably engaged with said center channel and said drawer channel, said bearing retainer assembly including a body and bearings, and said bearing retainer assembly including at least one outer flange for holding said bearings, said body including an access opening having the capacity to be positioned in alignment with said at least one access opening in said center channel and a plurality of mounting holes in said drawer channel;

a holding member supported on one of said channels engagable with said retainer body for holding said retainer body when said drawer slide assembly is in said open position, said holding member including at least one projection which retainably engages said at least one outer flange when said drawer slide assembly is in said open position.

5,466,061

CORNER CONNECTING HARDWARE FOR DRAWERS

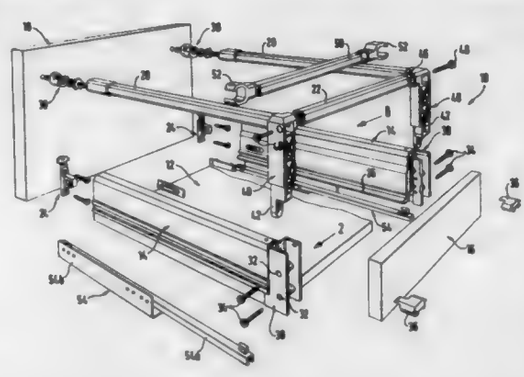
Horst Lautenschläger, Reinheim, Germany, assignor to MEPLA-Werke Lautenschläger GmbH & Co. KG, Germany

Filed Sep. 9, 1994, Ser. No. 303,454

Claims priority, application Germany, Sep. 11, 1993, 43 30 919.4

Int. Cl.[6] A47B 88/00

U.S. Cl. 312—348.2 15 Claims



1. Corner-connecting hardware kit for a drawer for connecting an inside end of a drawer side with an associated end of a drawer back, in the form of a corner-connecting assembly extending above the height of the drawer back and drawer side and oriented parallel to said ends thereof, the drawer having a side rail parallel to and spaced above the side wall, the side being fastened to a drawer front, the drawer further having a back rail parallel to and spaced above the drawer back, the kit comprising

(1) a corner piece having means for fastening the corner piece to the inside end of the drawer side and to the associated end of the drawer back, the corner piece having an interior that is at least partially hollow, and

(2) an elongated rail support having a tenon extending longitudinally from a bottom end of the rail support, the tenon being insertable into the interior of the corner piece through an upper end of the corner piece to thereby form a corner-connecting assembly comprising the corner piece and the rail support, the rail support having at a top end thereof means for

receiving and retaining in perpendicular orientation thereto the side rail and the back rail

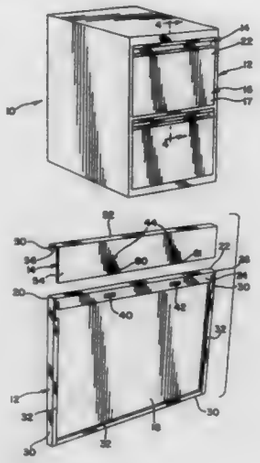
---

5,466,062

DRAWER FRONT

James I. McPherson, Muskegon; Daniel R. Kinney, Grand Haven; William E. Jeannot, Jr., Muskegon, and Thomas R. Karel, Ravenna, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Feb. 12, 1993, Ser. No. 17,506
Int. Cl.[6] A47B *88/00*
U.S. Cl. 312—348.6 **13 Claims**



1. A drawer front comprising;

a front panel having a front wall with a top flange extending rearwardly from a top portion of said front wall and a back flange extending downward from said top flange; and

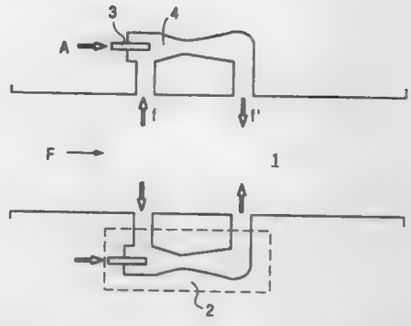
a pull having a generally inverted J-shaped cross-section being attached to said front panel which comprises a front portion for a user to grasp with his fingers, a rear portion spaced apart from said front portion, a middle portion interconnecting said front portion and said rear portion, and a locking element attached to one of said back flange of said front panel and said rear portion of said pull and a first aperture on the other of said back flange of said front panel and said rear portion of said pull, said locking element is received within said aperture and secured to said back flange in a snap-fit relationship to thereby secure said pull to said front panel.

5,466,063

DEVICE FOR CONTINUOUSLY MIXING LIQUID ADDITIVES INTO A FLUID

Georges Poyet, Les Loges en Josas; Frédéric Badier, Buc, and Dominique Guillot, Saint Etienne, all of, France, assignors to Dowell Schlumberger Incorporated, Sugar Land, Tex.

PCT No. PCT/FR93/00256, § 371 Date Sep. 23, 1994, § 102(e) Date Sep. 23, 1994, PCT Pub. No. WO93/18848, PCT Pub. Date Sep. 30, 1993
PCT Filed Mar. 15, 1993, Ser. No. 313,034
Claims priority, application France, Mar. 23, 1992, 92 03577
Int. Cl.[6] B28C *5/46;* **B01F** *15/02*
U.S. Cl. 366—6 **6 Claims**



5. A method of preparing one of a cement slurry and drilling mud, comprising the steps of:

providing a continuous mixer with a conduit;

circulating a fluid through the conduit;

arranging at least one jet eductor on a periphery of the conduit;

drawing a portion of the fluid from the conduit into the jet eductor;

mixing the portion with an additive in the jet eductor to obtain a mixture; and

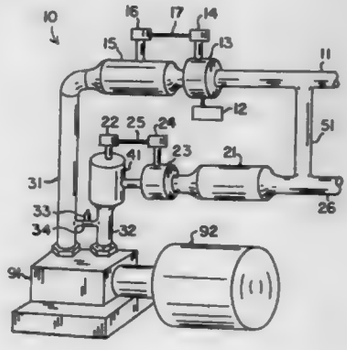
continuously injecting the mixture from the jet eductor into the fluid to form the one of cement slurry and drilling mud.

5,466,064

FUEL HOMOGENIZATION SYSTEM WITH DUAL COMPENSATING HOMOGENIZATION VALVES

Dannie B. Hudson, Jacksonville, Fla., assignor to ENRJ Ltd., Grand Bahama, Bahamas

Filed May 23, 1995, Ser. No. 447,792
Int. Cl.[6] B01F *5/08*
U.S. Cl. 366—132 **22 Claims**



1. A homogenization apparatus for homogeneously intermixing insoluble components comprising:

(A) a first component inlet conduit for supplying a first component to the apparatus;

(B) a second component inlet conduit supplying a second component to the apparatus;

(c) a first homogenization orifice for intermixing said first component and said second component;

(D) pump means to move said first and second components through said apparatus;

(E) a high pressure chamber to receive said intermixed first and second components at an elevated pressure;

(F) a second homogenization orifice for further intermixing said first and second components:

(G) an outlet conduit for removing said intermixed first and second components from said apparatus;

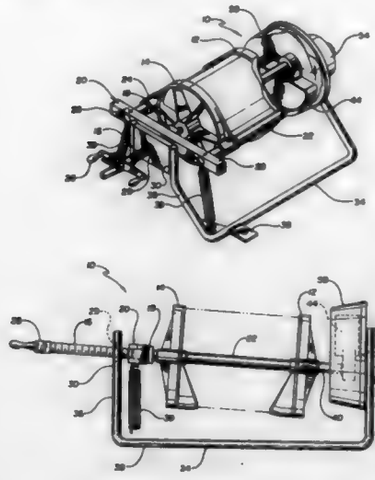
(H) conduit means for fluidly connecting said first component inlet conduit, said second component inlet conduit, said first homogenization orifice, said pump means, said high pressure chamber, said second homogenization orifice, and said outlet conduit.

5,466,065

CONICAL MOTION MIXING MACHINE

George T. Catrombon, 103 Union Rd., Frenchtown, N.J. 08825

Filed Apr. 13, 1994, Ser. No. 227,205
Int. Cl.[6] B01F 9/00
U.S. Cl. 366—209 23 Claims



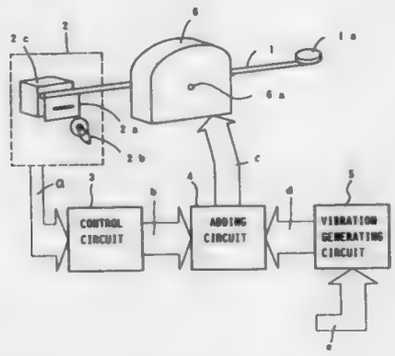
1. Mixing apparatus for mixing a medium in a vessel comprising:
releasable fixing means for releasably fixing the vessel to the apparatus;
drive means connected to said releasable fixing means for moving the vessel in a path defining a cone;
the releasable fixing means further including a shaft extending to the vertex of the cone; and
fixed supporting means for supporting said releasable fixing means and said drive means wherein said supporting means further includes means for supporting said shaft at the vertex of said cone.

5,466,066

THERMOGRAVIMETRIC APPARATUS WITH A BALANCE ARM VIBRATING FUNCTION

Akihiko Hidaka, Tokyo, Japan, assignor to Seiko Instruments Inc., Tokyo, Japan

Filed Jan. 21, 1994, Ser. No. 184,027
Claims priority, application Japan, Jan. 21, 1993, 5-008504
Int. Cl.[6] G01N 25/00;5/00
U.S. Cl. 374—14 2 Claims



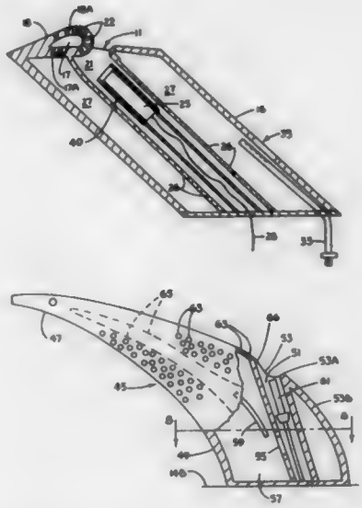
1. A thermogravimetric apparatus comprising;
a balance-arm having a sample holder,
a detector for detecting an amount of deviation of the balance-arm from a balanced position,
a control circuit for producing a control signal for controlling equilibrium of the balance-arm,
a driving part for moving the balance-arm to the balanced position,
a vibration generating circuit for generating a vibration signal having a frequency, and
an arithmetic device connected for receiving the control signal and the vibration signal and for performing an arithmetic operation on the control signal and the vibration signal to produce a driving signal which is supplied to said driving part for vibrating said balance-arm.

5,466,067

MULTIFUNCTIONAL AIR DATA SENSING PROBES

Floyd W. Hagen, Eden Prairie; Gregg A. Hohenstein, Bloomington; John A. Severson, Eagan, and Pennelle J. Trongard, Savage, all of Minn., assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 17, 1993, Ser. No. 122,222
Int. Cl.[6] G01K 13/02;1/14
U.S. Cl. 374—138 15 Claims



1. An air data probe for sensing a parameter of a fluid moving relative to the probe, wherein the probe is free of a forward-facing scoop to collect the fluid, comprising:
a strut having a first end having an external surface along which fluid flows, and a second end for mounting the strut, a primary fluid cavity formed in the strut, an inlet opening formed through the exterior surface of the first end of the strut and facing in a direction generally transverse to the direction of fluid flow to fluidly couple the primary fluid cavity to the fluid moving relative to the strut;
temperature sensing means disposed in the primary fluid cavity for detecting a temperature parameter of the fluid in the primary fluid cavity and providing a temperature output signal thereof;
a turning plate having fluid carrying passageways therethrough located upstream from the inlet opening on the first end of the strut for bleeding boundary layer fluid upstream of the inlet opening, the turning plate passageways opening to an area of reduced fluid pressure, the strut having at least one exhaust port coupled to the primary cavity positioned so that fluid is drawn through the inlet opening and exhausted therefrom; and
a ramp surface portion on the first end located downstream of the inlet opening and tapering toward a surface in which the strut is mounted.

5,466,068

ARTICULATED BEARING FOR HEAVY LOADS

Hans P. Andrä, Im Betzengaiern 40, and Wolfhart Andrä, Dornhalde 16, both of D-7000 Stuttgart, Germany

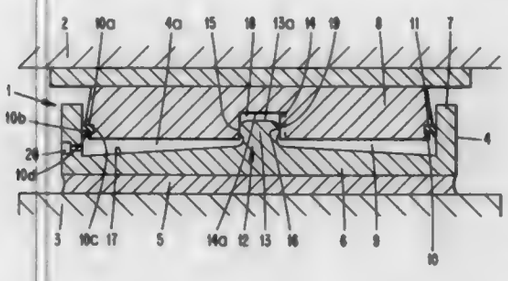
PCT No. PCT/EP92/01311, § 371 Date Jan. 6, 1994, § 102(e) Date Jan. 6, 1994, PCT Pub. No. WO92/22708, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 11, 1992, Ser. No. 162,082

Claims priority, application Germany, Jun. 13, 1991, 41 19 458.6

Int. Cl.[6] F16C *29/02*

U.S. Cl. 384—36 **22 Claims**



1. An articulated bearing for the articulated transfer of heavy loads from an upper supported member and a lower supporting member, said bearing comprising:

a bearing pot mounted to one of said supporting member and said supported member and including a generally horizontal end wall and a generally vertical side wall forming a space, said space having an opening situated opposite said end wall;

a cover mounted on the other of said supporting member and said supported member and including a portion extending into said space through said opening to close said space;

a seal formed between said side wall and an outer periphery of said cover portion; and

a deformable medium filling said space and being loaded vertically by said supported member;

one of said cover portion and said end wall including a recess disposed substantially centrally in said space;

the other of said cover portion and said end wall including a bearing journal extending into said recess along only a portion of the height of said recess to form a vertical gap between said bearing journal and said recess, said gap filled by said medium and being in communication with said space.

5,466,069

LINEAR MOTION GUIDE UNIT WITH END RECESSED RETAINER

Norimasa Agari, Seki, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

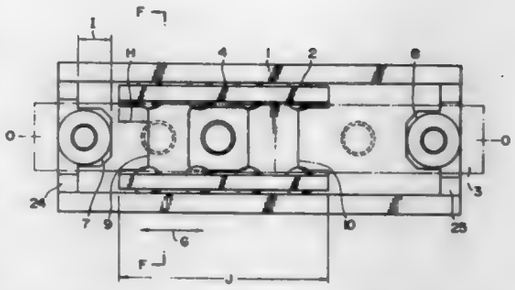
Division of Ser. No. 41,917, Apr. 2, 1993, Pat. No. 5,384,202, which is a continuation of Ser. No. 815,019, Dec. 26, 1991, abandoned. This application Nov. 9, 1994, Ser. No. 336,626

Claims priority, application Japan, Dec. 28, 1990, 2-405624 U

Int. Cl.[6] F16C *29/02*

U.S. Cl. 384—49 **4 Claims**

1. In combination, a linear motion guide unit which unit includes a rail, a slider, a plurality of rolling members interposed between said rail and said slider and a retainer for the rolling members comprising an elongated body having a pair of opposite ends, each of which is formed with an open recessed portion which is engageable with a stopper provided at each end of said guide unit, said retainer being formed from a stock retainer member comprising an elongated horizontal section and a pair of vertical sections extending vertically from opposite sides of said horizontal section, thereby defining a substantially U-shaped cross section, said horizontal section of said stock retainer member being non-symmetrical end-to-end and formed with a plurality of enclosed generally rectangular windows, each generally rectangular window having substantially identical end shapes, wherein the distance between the end peripheries of one generally rectangular window differs from the distance between the end peripheries of an immediately adjacent generally rectangular window along the longitudinal axis of the horizontal section and wherein one of said end shapes of one generally rectangular window forms one of said recessed portions of said retainer and one of said end shapes of another generally rectangular window forms the other of said recessed portions of said retainer and wherein the stock retainer member is cutable transversely of at least one of said windows between the end peripheries thereof to provide a retainer of a desired length and to define said recessed portions.



5,466,870

DYNAMIC FLUID BEARING ROTATING APPARATUS

Mikio Nakasugi, Chofu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

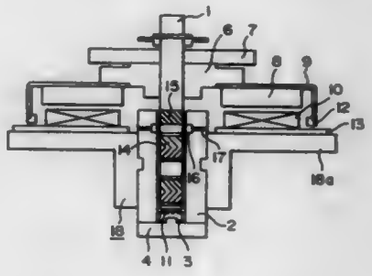
Continuation of Ser. No. 135,431, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 691,424, Apr. 25, 1991, abandoned. This application Apr. 17, 1995, Ser. No. 425,249

Claims priority, application Japan, Apr. 17, 1990, 2-110359

Int. Cl.[6] F16C *17/10*

U.S. Cl. 384—112 **6 Claims**

1. A dynamic fluid bearing rotating apparatus comprising:



a shaft;

a fixed member formed of a resin material;

a sleeve rotatably fitted to said shaft, said sleeve having been insert-molded integrally with said fixed member;

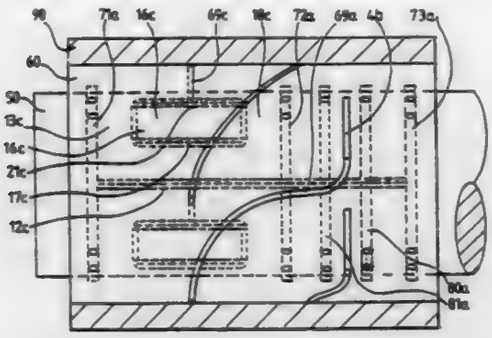
driving means for rotating said shaft, with a part of said driving means being mounted on said fixed member; and

a shallow groove for dynamic thrust bearing provided in a surface of said fixed member opposite to an end portion of said shaft, said shallow groove being formed in said fixed member upon the insert-molding of said sleeve.

5,466,071
HIGH SPEED HYDROSTATIC SPINDLE DESIGN

Alexander Slocum, Concord, N.H., assignor to Advanced Engineering Systems, Operations & Products, Inc., Concord, N.H.

Filed Mar. 10, 1994, Ser. No. 209,384
Int. Cl.[6] F16C *32/06*
U.S. Cl. 384—118 **16 Claims**



1. A hydrostatic bearing assembly comprising a cylindrical shaft and a concentrically surrounding bearing housing that transfers radial forces, without mechanical contact, between the said shaft and the housing by two pairs of opposed pressurized bearing pockets of fluid filling the gap therebetween wherein the fluid flow to a cylindrical bearing pocket on one region of the shaft is regulated by a bearing cylindrical compensation section located at a region of the shaft opposite to said pocket, such that displacements of the bearing caused by applied loads cause the bearing gap to decrease in the region of said pocket, in turn causing the bearing gap to increase in the region of said fluid flow compensation section; said compensation section comprising a central aperture region that is connected to said pocket and is coplanar with a land region that surrounds said central aperture region, said pocket being surrounded by grooves having gradually sloped side walls and which are connected to a fluid pressure source, and in which the connection from said compensation section to said pocket, is made at an angle that directs the flow in a direction substantially tangent to the said shaft and generally in the direction of the surface velocity vector of said shaft.

5,466,072
METHOD AND APPARATUS FOR RECORDING AND TRANSLATING SHORTHAND NOTES

Keith A. McCready, Chicago, Ill., assignor to Stenograph Corporation, Del.

Continuation of Ser. No. 4,916, Jan. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 822,293, Jan. 17, 1992, abandoned. This application Jan. 13, 1994, Ser. No. 181,386
Int. Cl.[6] B41J *3/26*
U.S. Cl. 400—91 **45 Claims**

1. A method of organizing a non-redundant binary tree look-up table to store electric signals representing groups of one or more entry symbols, and electric signals representing translation symbols corresponding to the groups of entry symbols, the steps comprising:

providing a main level of memory locations;

storing particular sublevel pointer addresses in selected ones of said main level memory locations;

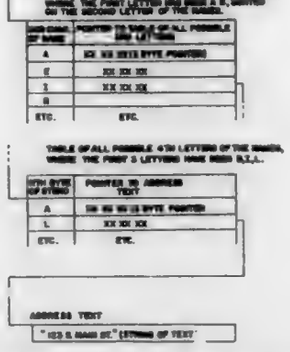
providing a plurality of sublevels of memory locations;

associating selected sublevels with selected ones of said sublevel pointer addresses located in said main level;

storing particular pointer addresses in selected memory locations in said plurality of sublevels;

associating selected ones of said plurality of sublevels with selected ones of said sublevel pointer addresses located in said sublevel memory locations such that selected sublevels are associated with selected other sublevels thereby forming a binary tree; and

allocating no more than one of the entry symbols from the groups of entry symbols to said main level and sublevel memory locations containing pointer addresses.

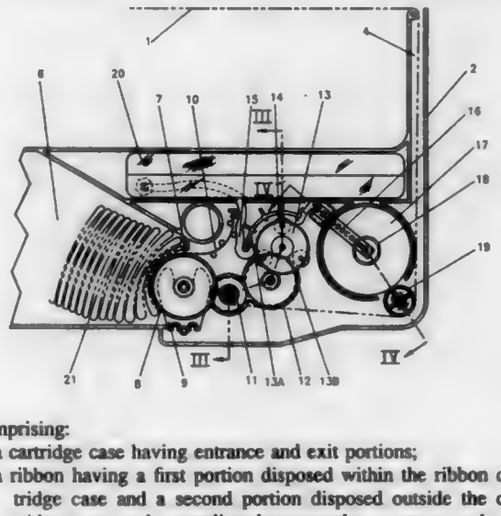


5,466,073
PRINTER RIBBON CARTRIDGE WITH RE-INKING RESERVOIR AND PUMP

Giorgio Rossi; Michael L. Ritrovato, both of Hummelstown, and Gregory E. Johnson, Halifax, all of Pa., assignors to Advanced Supplies, Inc., Middletown, Pa.

Filed Oct. 21, 1994, Ser. No. 327,850
Int. Cl.[6] B41J *31/00;32/02*
U.S. Cl. 400—197 **6 Claims**

1. A ribbon cartridge for a printing device, the ribbon cartridge



comprising:

a cartridge case having entrance and exit portions;

a ribbon having a first portion disposed within the ribbon cartridge case and a second portion disposed outside the cartridge case and extending between the entrance and exit portions;

an ink reservoir disposed within the cartridge case;

a capstan for receiving motive power from the printing device;

ribbon re-inking means, disposed within the cartridge case, for supplying ink from the ink reservoir to the ribbon; and

a pump, disposed within the cartridge case and connected to receive motive power from the capstan, for pumping the ink from the ink reservoir to the ribbon re-inking means.

5,466,074

RECORDING APPARATUS WITH MECHANISM FOR SHIFTING INK RIBBON CASSETTES

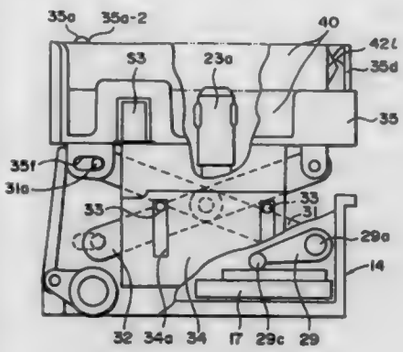
Osamu Asakura, Tokyo; Yoshio Uchikata, Yokohama; Kenji Kawazoe, and Yuji Kanome, both of Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 76,706, Jun. 15, 1993, abandoned, which is a continuation of Ser. No. 924,567, Aug. 5, 1992, abandoned, which is a continuation of Ser. No. 663,373, Mar. 1, 1991, abandoned, which is a division of Ser. No. 553,370, Jul. 17, 1990, Pat. No. 5,017,942, which is a continuation of Ser. No. 158,671, Feb. 22, 1988, abandoned. This application Nov. 23, 1994, Ser. No. 348,133

Claims priority, application Japan, Feb. 27, 1987, 62-043091; Jun. 26, 1987, 62-159248; Dec. 4, 1987, 62-307326; Dec. 4, 1987, 62-307327; Dec. 4, 1987, 62-307328

Int. Cl.[6] B41J 35/22

U.S. Cl. 400—206 11 Claims



1. A recording apparatus for recording information on a recording medium supported by a platen with an ink ribbon on one of a plurality of stacked ink ribbon cassettes, said recording apparatus comprising:

recording means, including a recording head, for recording on the recording medium;

a base member for carrying the stack of ink ribbon cassettes, each of the ink ribbon cassettes having a substantially box-shaped casing with an upper case and a lower case connected to each other at their vertical walls, the casing having a first side wall facing the platen and a second side wall opposing the first side wall, a recessed portion formed in one end of the first side wall and capable of receiving said recording head, an engaging portion provided on the second side wall, a pair of through-holes formed in portions of the upper and lower cases adjacent to the first side wall, with the ink ribbon extended along the first side wall so as to avoid the pair of through-holes;

a displacing mechanism for displacing said base member upwardly and downwardly to displace one of the ink ribbon cassettes in the stack to be used for recording to a recording position, said displacing mechanism including a pair of assemblies each comprised of a pair of rod members intersecting at a pivot point to form an X and displaceable below said base member, a rotatable shift shaft operably engaged to said assemblies and a shift lever secured to said shift shaft, such that rotation of said shift shaft by actuation of said shift lever operates said assemblies to vertically displace said base member by changing an angle of intersection between each said pair of rod members in synchronism with each other;

color detecting means, disposed downstream from said recording means along a conveyance route of an ink ribbon, for detecting the color of the ink ribbon in the recording position;

power supply means for supplying power to operate said displacing mechanism;

a pair of locating members projecting from said base member and adapted to be received in the pair of through-holes in each cassette; and

engaging members projecting from said base member and having claws for engagement with the engaging portion of the casing, wherein

said pair of locating members holds all of the ink ribbon cassettes in the stack.

5,466,075

COLOR THERMAL PRINTER

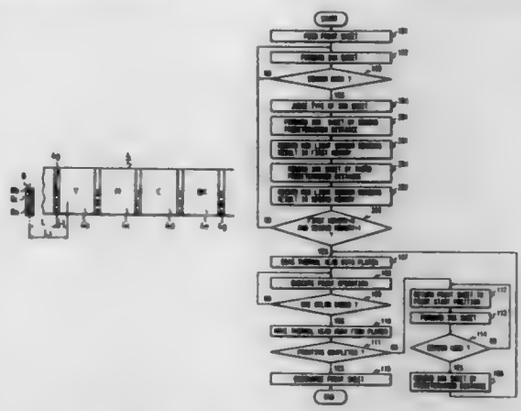
Fumio Kouzai; Susumu Tokumaru, and Syozo Kitamura, all of Hiroshima, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1994, Ser. No. 275,421

Claims priority, application Japan, Nov. 30, 1993, 5-300035

Int. Cl.[6] B41J 33/51

U.S. Cl. 400—240.3 13 Claims



1. A color thermal printer using an ink sheet having a set of three or four colorants coated or printed thereon so as to correspond to a print area and having sensor marks arranged at boundaries between the colorants, said color thermal printer comprising:

a plurality of sensors for sensing said sensor marks on said ink sheet, said plurality of sensors being disposed within a print width of a thermal head and located a predetermined distance downstream from a heat line of the thermal head;

means for rewinding the ink sheet by said predetermined distance when said sensors have sensed the sensor marks; and

printing means for causing printing to be effected after said rewinding means have rewound said ink sheet by said predetermined distance.

5,466,076

INK RIBBON CASSETTE FOR USE IN TRANSFER PRINTER

Hiroshi Kobayashi, Tamayama; Ikuo Hibino, Takizawa; Takahito Maruyama, Morioka; Fumihisa Hori, Takizawa; Tadashi Nakamura; Takanobu Matsuura, both of Morioka, and Chikashi Ohsakama, Iwate, all of, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 40,777, Mar. 31, 1993. This application Mar. 9, 1994, Ser. No. 208,154

Claims priority, application Japan, Apr. 6, 1992, 4-20591 U; Apr. 23, 1992, 4-104539; Apr. 23, 1992, 4-104540; Jun. 15, 1992, 4-155167; Jul. 23, 1992, 4-51927 U; Jul. 31, 1992, 4-205262; Aug. 20, 1992, 4-221467

Int. Cl.[6] B41J 35/28

U.S. Cl. 400—248 3 Claims

1. A ribbon cassette detachably mountable onto a carriage of a thermal transfer printer, the thermal transfer printer including a platen located adjacent to the carriage, the thermal printer also including a thermal head movably mounted on the carriage between a printing position adjacent the platen and a retracted position away from the platen, the ribbon cassette comprising:

a case having a front portion including first and second arms fixedly connected to and extending from the case, each of the first and second arms having a tip, the front portion also defining a concave portion formed between the first and second arms;

first and second guide rollers rotatably mounted on the respective tips of the first and second arms; and

an ink ribbon disposed in the case and having an exposed portion extending across the concave portion such that, when the ribbon cassette is mounted on the carriage and the thermal head is in the retracted position, the first and second guide rollers are positioned between the platen and the exposed portion of the ink ribbon;

wherein the first and second guide rollers are mounted on the first and second arms such that, when the ribbon cassette is mounted on the carriage, outer peripheral portions of the first and second guide rollers are located between the platen and portions of the tips closest to the platen.

5,466,077

SPLIT BUSHING MOUNTING OF A PRINTER CARRIAGE WITH PRE-LOAD

Abdolreza Movaghar, San Diego; W. Wistar Rhoads, Escondido, both of Calif., and Michael A. Nguyen, Singapore, Singapore, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 56,335, Apr. 30, 1993, Pat. No. 5,348,404, which is a continuation-in-part of Ser. No. 965,480, Oct. 23, 1992, Pat. No. 5,346,320. This application Sep. 20, 1994, Ser. No. 308,902

The portion of the term of this patent subsequent to Sep. 20, 2011, has been disclaimed.

Int. Cl.[6] B41J *11/22*

U.S. Cl. 400—354 **13 Claims**

1. A printer carriage for holding a plurality of inkjet print nozzles comprising a support system including a slider rod receptacle and a pair of C-shaped bearings having axially extending gaps therein, said bearings being located in said receptacle for supporting said carriage for sliding movement on a carriage support rod extending transversely across a path of paper travel, said rod being positioned to be in close proximity to the printhead nozzles, said support system further comprising a lubricous carriage pre-load pad in said slider rod receptacle and supported on said carriage for movement relative to said carriage in a direction transverse to said rod, said pad being slideably engageable with said support rod at a location between said pair of C-shaped bearings, and a spring supported on said carriage for biasing said pad into sliding engagement with said support rod.

5,466,078

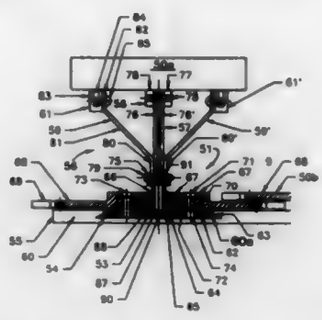
INPUT KEYBOARD APPARATUS FOR INFORMATION PROCESSING AND OTHER KEYBOARD DEVICES

Jeffrey P. Szmanda, Milwaukee, and William J. Szmanda, Menomonee Falls, both of Wis., assignors to Health Care Keyboard Company, Menomonee Falls, Wis.

Continuation of Ser. No. 39,266, Apr. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 376,690, Jul. 7, 1989, Pat. No. 5,067,834. This application Aug. 18, 1994, Ser. No. 292,488

Int. Cl.[6] B41J *5/10;* **F16M** *13/00*

U.S. Cl. 400—489 **15 Claims**



1. A keyboard apparatus including a key support structure including a left hand and a right hand section, each of said sections including a plurality of individual keys located in a substantially common plane, the improvement in a separate support unit for each of said sections, each said support unit comprising a universal pivot unit permitting optimum positioning of said section, a linear support unit having a base and a linear moving member movably secured to said base for rectilinear positioning of said section on said base, said universal pivot unit including a rotational unit permitting unrestricted angular orientation of said section relative to said linear support unit, and a vertical support unit interconnected to said universal pivot unit and said linear support unit for raising and lowering of said section relative to said base, and a locking unit coupled to said linear support unit and to said universal pivot unit and to said vertical support unit to simultaneously lock said units in position, and wherein said vertical support unit includes a three-point linkage connected to said universal pivot unit, said linkage including a fixed pivoted leg and a pair of sliding pivotal legs, said fixed and sliding pivotal legs having a common pivot end and individual pivoted and spaced opposite ends.

5,466,079

APPARATUS FOR DETECTING MEDIA LEADING EDGE AND METHOD FOR SUBSTANTIALLY ELIMINATING PICK SKEW IN A MEDIA HANDLING SUBSYSTEM

Jason Quintana, Vancouver, Wash. 98684, assignor to Hewlett-Packard Company, Palo Alto, Calif.

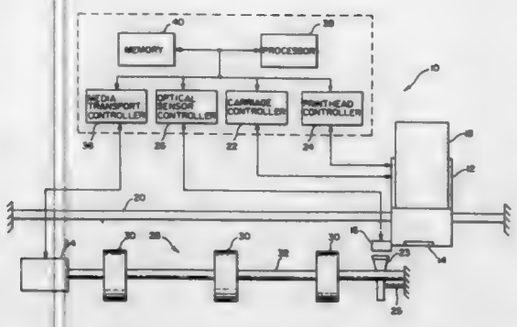
Filed Jan. 27, 1995, Ser. No. 379,238

Int. Cl.[6] B41J *11/55*

U.S. Cl. 400—579 **11 Claims**

1. A method for substantially eliminating pick skew in a media handling subsystem, comprising the steps of:

actuating a media pick cycle during which a media sheet is picked and moved toward a first roller along a media path;



detecting with an optical sensor that a leading edge of the picked media sheet has reached a known position;

backing the media sheet out from the first roller;

squaring the media sheet relative to the media path;

moving the squared media sheet back upon the first roller;

detecting with the optical sensor a top edge of the squared media sheet;

detecting with the optical sensor a side edge of the squared media sheet; and

feeding the squared media sheet into position for receiving print markings.

5,466,080

FINGER PAINTING APPARATUS

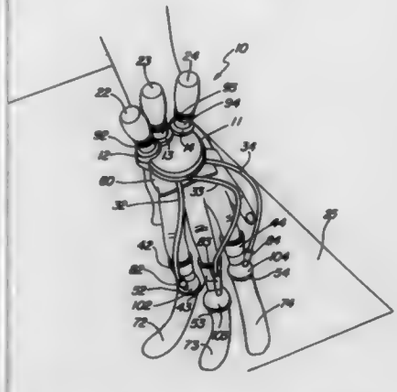
Sean S. Lee, Hermosa Beach, Calif., assignor to Mattel, Inc., El Segundo, Calif.

Filed Sep. 22, 1994, Ser. No. 310,543

Int. Cl.[6] B43K *8/02*

U.S. Cl. 401—7 **6 Claims**

1. A finger painting apparatus comprising:



a housing having a plurality of paint bottle receptacles formed thereon;

attachment means for securing said housing to a user's hand;

a plurality of pad housings each having finger tip attachment means, coupling means, and an undersurface;

a plurality of porous pads supported upon said undersurfaces;

a plurality of paint bottles each having interior cavities for receiving a liquid and each having an open end;

a plurality of nozzles each coupled to said open ends of said paint bottles; and

a plurality of flexible tubes each having one end coupled to one of said nozzles and another end coupled to one of said coupling means of said pad housings.

5,466,081

MATERIAL APPLICATION WITH EJECTABLE HEAD

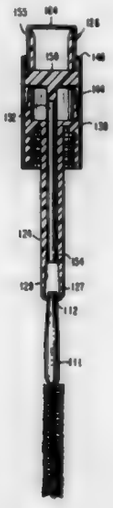
Volker Schrepf, East Islip, N.Y., assignor to Henlopen Manufacturing Co., Inc., Melville, N.Y.

Filed May 10, 1994, Ser. No. 241,135

Int. Cl.[6] A45D *40/00;40/20*

U.S. Cl. 401—129 **10 Claims**

1. A hand-held applicator for liquid material and pasty material,



comprising:

(a) a handle dimensioned to be grasped by the fingers of a user's hand;

(b) a stem having a proximal end and a distal end, mountable in said handle such that the distal end extends therefrom; and

(c) an applicator head carried by said stem at the distal end thereof;

wherein the improvement comprises:

(d) retaining means comprising an open-ended socket mounted in said handle for engaging a proximal end portion of said stem to releasably secure the stem to the handle, said proximal end portion being spaced a distance along said stem from said distal end and said proximal end portion and retaining means being mutually shaped and dimensioned to enable insertion of the proximal end of the stem into the retaining means and disengagement of the stem from the retaining means by force exerted on the proximal end of the stem in a direction toward the distal end of the stem; and

(e) manually operable plunger means carried by the handle for engaging and exerting said force on the proximal end of said stem, when the proximal end of the stem is engaged by the retaining means, to eject the stem from the handle.

5,466,082

IN-LINE SAFETY SHACKLE

James R. Sherar, Arden, N.C., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 30, 1993, Ser. No. 159,168

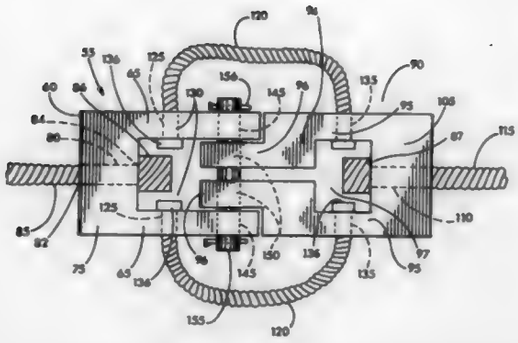
Int. Cl.[6] F16D *9/00*

U.S. Cl. 403—2 **9 Claims**

1. An in-line safety shackle device for a cable system including a first cable and a second cable comprising:

a. a first member adapted to engage an end of the first cable;

b. a second member adapted to engage an end of the second cable, wherein the second member releasably interfits with the first member to move between an interfitting and released positions, the released position providing a greater separation between the ends of the first and second cables compared with the interfitting position;



c. at least one auxiliary cable securing the first member to the second member and permitting movement between the interfitting and released positions; and

d. means releasably holding the first member and the second member in the interfitting position only if a force applied to move the first and second members to the released position is less than a predetermined amount which is less than a strength of the first and second cables, the means being provided with a predetermined shear force sufficient to release the first member from the second member before the first or second cable breaks.

5,466,083

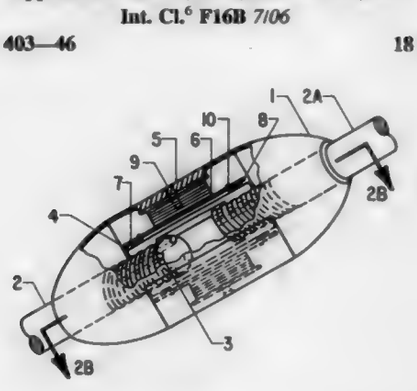
ELECTRICALLY OPERATED MOTORIZED TURNBUCKLE

John M. Hogg, 122 King William, San Antonio, Tex. 78204

Continuation-in-part of Ser. No. 134,845, Oct. 12, 1993. This application Nov. 18, 1994, Ser. No. 342,359

Int. Cl.[6] F16B *7/06*

U.S. Cl. 403—46 **18 Claims**



1. A turnbuckle connection comprising:

a first shaft having a threaded end portion with first threads of a first type;

a second shaft having a threaded end portion with second threads of a different type than said first threads;

a turnbuckle having a first end threaded to receive said first threads and a second end threaded to receive said second threads, the difference in said first and second threads being such as to cause the ends of said shafts to be drawn closer together when said turnbuckle is rotated in a first direction and pushed further apart upon rotation of said turnbuckle in a second direction; and

said turnbuckle further including remotely controlled means for causing said turnbuckle to rotate relative to said shafts so that the distance between said shaft ends can be adjusted.

5,466,084

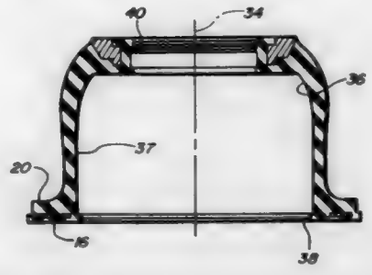
DUST BOOT RETAINER RING

Shane J. Brueggen, Cashion, and Alan Martin, Blanchard, both of Okla., assignors to Dana Corporation, Toledo, Ohio

Filed Jun. 16, 1994, Ser. No. 260,947

Int. Cl.[6] F16C *11/00*

U.S. Cl. 403—134 **10 Claims**



1. A boot assembly for use with a joint assembly comprising:

an elastomeric boot being approximately cup shaped having an axis and defining a cavity therealong with a substantially coaxial first aperture at a base portion thereof; and

an annularly shaped substantially flat retainer ring secured to the boot at the base portion and being substantially concentric with the first aperture and having a plurality of radially inwardly extending fingers with a finger aperture in each finger, wherein the finger apertures reduce a bending strength of the fingers in response to an axial force thereagainst.

5,466,085

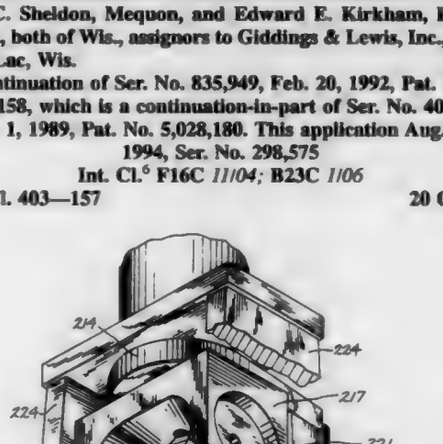
GIMBAL ASSEMBLY FOR SIX AXIS MACHINE TOOL

Paul C. Sheldon, Mequon, and Edward E. Kirkham, Brookfield, both of Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

Continuation of Ser. No. 835,949, Feb. 20, 1992, Pat. No. 5,354,158, which is a continuation-in-part of Ser. No. 401,909, Sep. 1, 1989, Pat. No. 5,028,180. This application Aug. 31, 1994, Ser. No. 298,575

Int. Cl.[6] F16C *11/04*; B23C *1/06*

U.S. Cl. 403—157 **20 Claims**



1. A pivotable joint, comprising:

a central block;

a first yoke pivotably connected to the central block for pivotable motion about a first axis; and

a second yoke pivotably connected to the central block for pivotable motion about a second axis, wherein the central block includes an opening having a cross-sectional area and extending therethrough between a first surface and a second surface, the cross-sectional area of the opening decreasing from the first surface and the second surface towards a region

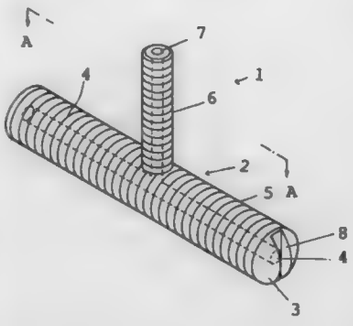
located between the first surface and the second surface, wherein the opening is oblong at the first surface and the second surface.

5,466,086

CONNECTOR, METHOD FOR CONNECTING STRUCTURAL MEMBERS WITH CONNECTOR AND CONNECTION STRUCTURE BETWEEN STRUCTURAL MEMBERS

Yasuo Goto, Oita, Japan, assignor to Home Co., Ltd., Oita, Japan

Filed May 26, 1993, Ser. No. 67,576
Claims priority, application Japan, May 30, 1992, 4-164402
Int. Cl.[6] F16B *11/00*
U.S. Cl. 403—268 **20 Claims**



1. A connection between structural members comprising a T shaped tubular connector comprising a branch pipe and a transverse tubular member a plurality of solid structural members defining a groove for receiving said branch pipe, and a pair of connecting bore holes at abutting surfaces of said structural members and an adhesive agent dispensed between an outer surface of said connector and the circumferential walls of said connecting bore holes thereby surrounding said tubular member.

19. A method for connecting structural members comprising the steps of boring into opposite faces of said structural members a pair of opposing connecting holes for embedding a connector in said structural members, forming a groove on the surface of said opposite faces to receive a branch pipe, said groove radially extending from one of said connecting holes to the edge of one of said faces, mounting said connector in said one of said holes with a branch pipe positioned in said groove, bringing the structural member in which is mounted the connector into contact with the other one of said connecting holes, introducing an adhesive into the branch pipe of said connector until the adhesive flows back towards said groove which receives said branch pipe.

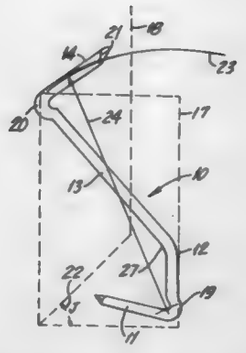
5,466,087

TIMBER CONNECTORS

Kevin G. Doole, Broads Road, Closeburn, Queensland 4520, Australia

Continuation-in-part of Ser. No. 836,336, Mar. 2, 1992, abandoned. This application Sep. 30, 1993, Ser. No. 129,648
Int. Cl.[6] F16B *15/00*
U.S. Cl. 403—406.1 **11 Claims**

1. A unitary connector of a type suitable for connecting together abutting timber components of a wall frame or cross-over junction, said unitary connector having a cranked stem forming opposed straight stem portions extending away from a crank or bend, each said stem portion extending to and adjoining a respective one of two terminating spikes, each said terminating spike having a respective centreline and being adapted to penetrate a respective one of adjacent orthogonal side faces of abutting components, characterized in that:



each said stem portion includes a centreline which is contained in a common plane which also contains said centreline of one said spike, which constitutes an anchoring spike, and

said centreline of the other said spike lies in a second plane which contains said centreline of said stem portion adjoining said other spike, and said second plane forming an included acute angle with said common plane whereby said other spike is inclined towards said anchoring spike, and

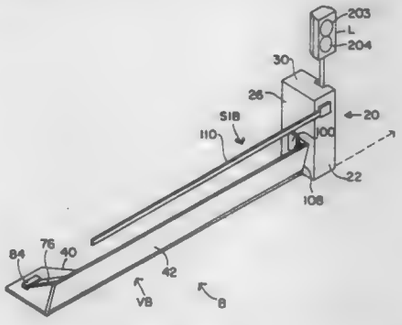
said centreline of said other spike forms an included acute angle with said centreline of the adjoining said stem portion.

5,466,088

VEHICLE BARRIER HAVING A PIVOTAL VEHICLE BARRICADE AND A COOPERATING PIVOTAL SIGNAL BARRIER

Ralph G. Nasatka, 8405 Dangerfield Pl., Clinton, Md. 20735-2814

Filed Jan. 24, 1994, Ser. No. 185,247
Int. Cl.[6] E01F *13/06;13/08*
U.S. Cl. 404—6 **29 Claims**



1. A vehicle barrier having a vehicle barricade and a cooperating signal barrier for a roadway, said vehicle barrier comprising:

a) a housing;

b) a vehicle barricade pivotally connected to said housing and pivotal between a first generally horizontal position permitting vehicle passage and a second angularly disposed position preventing vehicle passage;

c) a signal barrier cooperating with said vehicle barricade pivotally connected to said housing and pivotal between a first generally vertical position and a second generally horizontal position;

d) a linear movement actuator operably associated with said housing; and

e) a transmission operably associated with said linear movement actuator and with said vehicle barricade and said signal barrier for converting linear movement of said actuator into pivotal movement of both said vehicle barricade and said signal barrier so that said vehicle barricade and said signal barrier simultaneously pivot between said respective first and second positions.

5,466,089

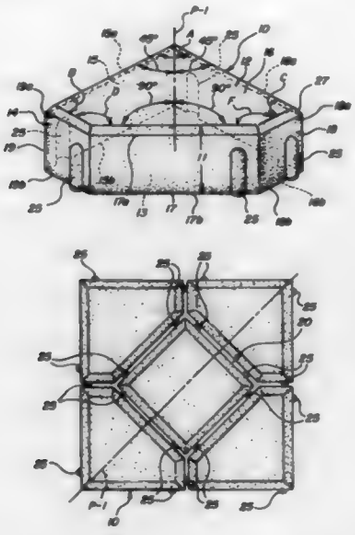
GROUND AND FLOOR COVERING BLOCK

Dean Jurik, 5131 N. 15 Rd., Mesick, Mich. 49668

Filed Jan. 3, 1995, Ser. No. 368,011

Int. Cl.[6] E01C *5/00*

U.S. Cl. 404—34 **36 Claims**



1. A paving block for covering the ground, floor, and like surfaces comprising a body having a five-sided planar upper surface and corresponding parallel five-sided planar lower surface and five vertical side surfaces extending between said upper and lower surfaces at each of the corresponding sides thereof, said side surfaces including three longer side surfaces, two of said longer side surfaces being of essentially equal length with the third longer side surface being at least as long as said two equal longer side surfaces, and two shorter side surfaces of essentially equal length, two of said longer side surfaces of equal length being joined at one end at a 90° internal angle and each being further joined at its opposite end to an end of one of said shorter side surfaces at a 90° internal angle, with the opposite ends of said shorter side members each being joined at a 135° internal angle by a third opposing longer side surface at least as long as said equal longer side surfaces, said opposing longer side surface being perpendicular to and bisected by a vertical plane bisecting the 90° internal angle between said equal adjoining longer side surfaces.

5,466,090

Patent Not Issued For This Number

5,466,091

SURFACE DRAINAGE APPARATUS

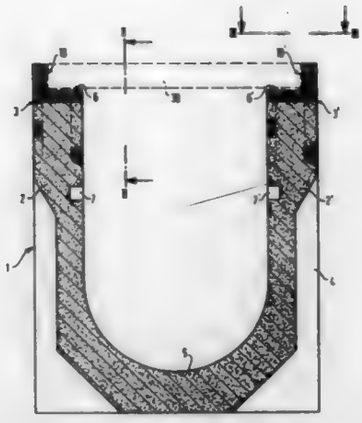
Heinrich Sauerwein, Nubbel, and Wolfgang Arm, Rendsburg, both of, Germany, assignors to ACO Severin Ahlmann GmbH & Co., KG, Rendsburg, Germany

Filed Dec. 3, 1993, Ser. No. 162,438

Claims priority, application Germany, Dec. 10, 1992, 42 41 703.1

Int. Cl.[6] E02B *11/00*

U.S. Cl. 405—36 **29 Claims**



1. Surface drainage apparatus comprising

a channel body defining a drainage channel,

a cover for the drainage channel defining apertures for passing drainage into said drainage channel,

a fixing means for attachment of said cover to said channel body comprising a first fixing element for attachment to said channel body and a complementary second fixing element for attachment to said cover,

said channel body defining at least one universal receiving aperture for installing a first fixing element of a plurality of differently constructed first fixing elements and for replacing said first fixing element by a differently constructed first fixing element both before and after installation of said surface drainage apparatus.

5,466,092

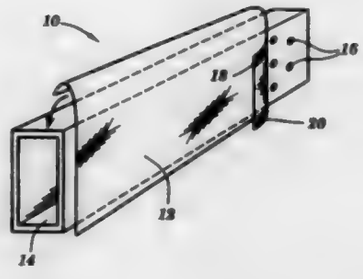
FORM-DRAIN FILTER

Christopher G. Semenza, 101 Boyack Rd., and Richard Tremblay, 6 Hiawatha Dr., both of Clifton Park, N.Y. 12065

Filed Oct. 25, 1993, Ser. No. 142,516

Int. Cl.[6] E02B *11/00;* **E02D** *31/02*

U.S. Cl. 405—45 **7 Claims**



1. An improved drain and filter combination for providing footing drainage in fine soils or sand, said combination comprising:

at least one foraminous footing form-drain element that is part of a footing/foundation system and is emplaced conterminous with and in permanent contact with a footing; and

at least one strip of nonforaminous, porous filter fabric, said fabric having at a first face thereof at least one first longitudinal margin bearing thereon a water-impervious, non-biogradable adhesive fillet, said first longitudinal margin fixed by said adhesive fillet longitudinally along a portion of said element so that a principal portion of said fabric effects coverage of a plurality of foramens in said element.

5,466,093

METHOD AND APPARATUS FOR REMOVING CONTAMINANTS FROM A DUCT OR PIPE

Carl E. Keller, P.O. Box 9827, Santa Fe, N.M. 87504-9827

Filed May 16, 1994, Ser. No. 243,179
Int. Cl.[6] E21D *11/00*
U.S. Cl. 405—152 **8 Claims**

1. A method for removing contaminants from a duct or pipe, having walls defining first and second open ends, comprising the steps of:

forming an inverted first everting membrane assembly consisting of a tube of porous material having an insertion end and a retainer end and saturated with a strip-coat fluid and a first everting membrane containing said tube;

everting said first membrane assembly into said first open end of said duct and through said second end to urge said tube against said walls of said duct;

securing said retainer end of said tube to said second open end of said duct while inverting said first membrane from within said tube;

curing said strip-coat fluid to adhere contaminants on said walls of said duct to said tube;

everting a second everting membrane into said first open end of said duct within said insertion end of said tube and through said second open end; and

inverting said second everting membrane to withdraw said tube and said contaminants from said duct.

7. An everting membrane system for removing contaminants from a duct or pipe, having walls defining first and second open ends, said system comprising:

a first everting membrane having a length effective for everting said membrane from said first open end of said duct to extend through said second open end; and

a tube of porous material saturated with a strip-coat fluid and having an insertion end for accepting said first membrane and a retainer end for securing to said second open end of said duct.

5,466,094

METHOD OF SETTING, RESETTING AND PROTECTING POLES IN THE GROUND WITH FOAM POLYURETHANE RESINS

Norman R. Kirby, Alvin, and Richard S. Schmidt, Houston, both of Tex., assignors to Forward Enterprises, Houston, Tex.

Filed Jan. 13, 1994, Ser. No. 180,951
Int. Cl.[6] F02D *7/00*
U.S. Cl. 405—232 **6 Claims**

1. In the method of setting and resetting poles in the earth and encapsulation of pole treatment chemicals or the like by positioning the poles and forming a foamed polyurethane composition in situ around the poles, the improvement comprising: the step of forming the foamed polyurethane composition in situ by mixing a first component and a second component for an appropriate time and at an appropriate temperature, wherein the first component is comprised of:

polyisocyanate;

an organic active hydrogen-containing component;

a liquid hydrocarbon; and

a hydrocarbon compatible solvent;

and the second component is comprised of:

an amine phenolic or polyetherpolyol or a combination thereof,

a non-ionic surfactant;

a catalyst; and

a blowing agent;

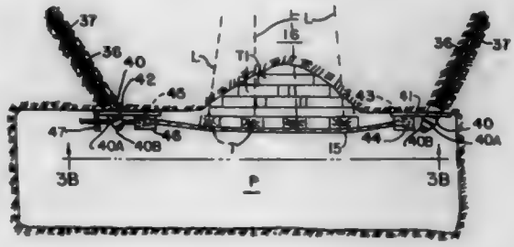
wherein the composition has a density of 3.5 to 4 pounds per cubic foot and a compressive strength of at least approximately 65 to 75 PSI.

5,466,095

UNDERGROUND SUPPORT SYSTEM AND METHOD OF SUPPORT

James J. Scott, Phelps County, Mo., assignor to Scott Investment Partners, Rolla, Mo.

Continuation-in-part of Ser. No. 74,365, Jun. 10, 1993, abandoned. This application Sep. 17, 1993, Ser. No. 122,337
Int. Cl.[6] E21D *21/00*
U.S. Cl. 405—302.2 **2 Claims**



1. A construction for staged underground supporting of geologic structures exposed within the formation of passages in such geologic structure, the supporting construction comprising:

a) spaced apart anchor means inserted into the geologic structure and having end portions exposed in the passage;

b) support means connected to each of the exposed end portion of the spaced apart anchor means to engage the geologic structure and supply a first stage of support through said support means; and

c) flexible cable means to supply a second stage of support for the geologic structure, said flexible cable means having one end secured to one of said spaced apart anchor means and having an opposite end adjustably connected to the other one of said spaced apart anchor means, the adjustable connection to said other one of said anchor means enabling varying the tension in said cable means.

5,466,096

PRESSURIZED AIR CONVEYOR

Brian K. Hilbish; Arnold C. Burgess, both of Bedford, and Michael A. Wilson, Big Island, all of Va., assignors to Simplimatic Engineering Company, Lynchburg, Va.

Filed Nov. 1, 1993, Ser. No. 146,320
Int. Cl.[6] B65G *51/03*
U.S. Cl. 406—84 **13 Claims**

1. An air conveyor for articles comprising:

a plenum chamber having a deck plate on a side thereof;

a plurality of holes in said deck plate for directing air from said plenum chamber toward the articles to move them along a conveyor path;

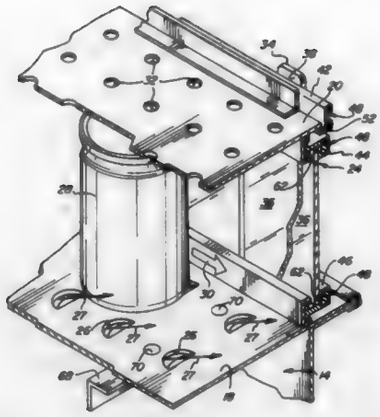
a holddown plate mounted spaced apart from said deck plate to form an article transport zone therebetween;

side walls enclosing said article transport zone; and

a plurality of holes in said holddown plate of an area density sufficiently low to provide a pressure within said article transport zone high enough to permit deflection of air directed from said deck plate holes off of stopped articles and back in a direction substantially opposite the conveyor path to slow moving articles as they approach the stopped articles; and wherein said deck plate is connected to support bars by a plurality of rivets countersunk into said deck plate.

8. An air conveyor for articles comprising:

a plenum chamber having a deck plate on a side thereof;



a plurality of holes in said deck plate for directing air from said plenum chamber toward the articles to move them along a conveyor path;

a holddown plate mounted spaced apart from said deck plate to form an article transport zone therebetween;

side walls enclosing said article transport zone, said side walls including side brackets and doors mounted to said side brackets, said doors being openable to remove damaged articles; and

a plurality of holes in said holddown plate of an area density sufficiently low to provide a pressure within said article transport zone high enough to permit deflection of air directed from said deck plate holes off of stopped articles and back in a direction substantially opposite the conveyor path to slow moving articles as they approach the stopped articles.

5,466,097

CUTTING INSERT WITH TWISTED CHIP SURFACE

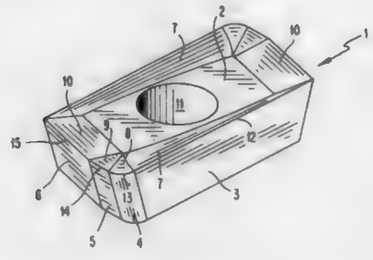
Lars-Gunnar Wallström, Sandviken, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Jan. 24, 1994, Ser. No. 185,214

Claims priority, application Sweden, Jan. 27, 1993, 9300238

Int. Cl.[6] B23C *5/02*

U.S. Cl. 407—113 **6 Claims**



6. A cutting insert for a chip forming milling cutter, comprising an upper surface, a lower planar bottom surface which is adapted to be located in abutment with a cooperating surface of the milling cutter, side surfaces extending between the upper and bottom surfaces and forming acute angles with the upper surface, a chip surface extending from the upper surface of the insert and adjoining a first side surface at a main cutting edge, a second side surface adjoining the upper surface along a secondary cutting edge and a third edge, wherein the secondary cutting edge and the third edge are non-collinear, an operative cutting insert corner connecting said main cutting edge and said secondary cutting insert edge, said main cutting edge having a chip angle between the chip surface and the first side surface increases toward the operative cutting corner, such that the cutting edge is stronger closer to the operative cutting insert corner, where the work load is the largest, and the decreased chip angle is present where the work load is smaller.

5,466,098

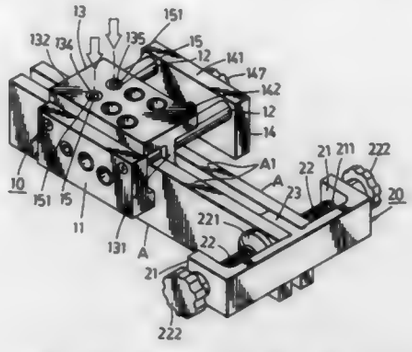
DRILL BIT GUIDING DEVICE

Bor-Chang Juang, No. 3, Lane 14, Chen-Hsing Rd., Tai Ping Hsiang, Taichung Hsien, Taiwan, Prov. of China

Filed Nov. 21, 1994, Ser. No. 343,720

Int. Cl.[6] B23B *47/28*

U.S. Cl. 408—115 R **10 Claims**



1. A drill bit guiding device for guiding axial movement of a drill bit, comprising:

an end block having a flat end face and a plurality of through-holes which are formed through said end block and which extend respectively and perpendicularly to said flat end face;

a pair of guide rods, each having a first end portion mounted perpendicularly to said flat end face of said end block and a second end portion;

a mounting block mounted perpendicularly to said second end portions of said guide rods, thereby retaining said pair of guide rods between said end block and said mounting block;

a slide member mounted between said end block and said mounting block and integrally having a first portion being passed perpendicularly through by and which is slidable along said pair of guide rods, and a second portion disposed parallel to said pair of guide rods, said slide member further having a plurality of through-holes formed through said second portion, each of said through-holes in said second portion corresponding with a respective one of said through-holes in said end block and further having an axis transverse to an axis of said corresponding one of said through-holes in said end block; and

a pushing screw passing threadedly and perpendicularly through said mounting block and having a first end portion provided with an abutting member which moves towards or away from said slide member upon rotation of said pushing screw.

5,466,099

CUTTER SHELL FOR FORMING HOLES OF IMPROVED CYLINDRICALITY

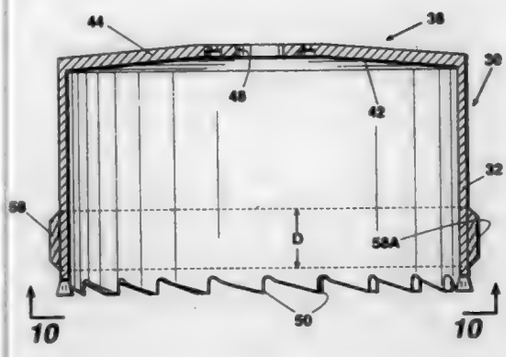
James B. Sullivan, and Michael L. Wilson, both of Tulsa, Okla., assignors to TDW Delaware, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 166,503, Dec. 13, 1993, Pat. No. 5,360,300. This application Oct. 12, 1994, Ser. No. 322,058

Int. Cl.[6] B23B *51/04*

U.S. Cl. 408—206 **10 Claims**

1. An improved cutter shell for cutting a circular opening in a metal object by use of a boring machine having a boring bar that rotates about its rotational axis, the boring bar being axially advanceable and the boring bar having means at an operating end to receive the attachment of the cutter shell so that the cutter shell is rotatable about the boring bar rotational axis and is axially advanced as the boring bar is axially advanced, the improved cutter shell comprising:



a metallic member having:

(a) a tubular boring portion having a tubular axis, a tubular sidewall, an external circumferential surface, a circumferential forward end and a circumferential rearward end, the forward end having cutting teeth formed thereon, the teeth being of selected width measured in planes having said cylindrical axis therein, the tubular sidewall being of generally uniform thickness not greater than the width of said teeth;

(b) a head portion having an outer circular perimeter, the outer circular perimeter being secured to said tubular boring portion rearward circumferential end, the head portion external surface having means in the center thereof for attachment to a boring bar; and

(c) an abrasive band secured to said tubular boring portion external circumferential surface spaced from said teeth, the abrasive band serving to engage said metal object as a hole is cut therein by said teeth to slightly enlarge and round said hole.

5,466,100

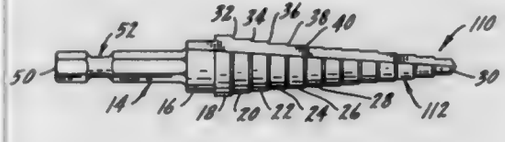
MULTI-STEPPED POWER DRILL BIT HAVING HANDLE CHUCK ADAPTOR

Diljit S. Ahluwalia, Chicago, Ill., assignor to Alfa Manufacturing Industries, Inc., Skokie, Ill.

Filed Oct. 24, 1994, Ser. No. 328,043

Int. Cl.[6] B23B *51/02*

U.S. Cl. 408—224 **3 Claims**



1. A power drill bit of stepped construction having a shank at one end and a series of at least ten generally cylindrical outer surfaces of incrementally decreasing diameter from the shank end to a tip end, each of said at least ten cylindrical surfaces have an axial length of one-eighth inch or less, said power drill bit comprising a beveled conical surface interconnecting each adjacent pair of cylindrical surfaces, at least one flute, each said at least one flute having at least one essentially radially and axially extending surface, said at least one flute being machined longitudinally into sides of the drill bit to provide at least one cutting edge for each diameter defined by the intersection of said one surface of each of said at least one flute, each of said cylindrical surfaces and each of said conical surfaces, and said shank having a non-circular cross-section and a groove extending circumferentially about the shank, said groove including an essentially flat center portion and at least one radius portion intersecting the non-cylindrical surface of said shank.

5,466,101

DEVICE ON HAND POWER TOOLS FOR DRIVING TOOLS

Hans-Peter Meyen, Filderstadt, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 27, 1994, Ser. No. 331,345

Claims priority, application Germany, Nov. 30, 1993, 43 40 726.9

Int. Cl.[6] B23B *51/00;31/10*

U.S. Cl. 408—226 **15 Claims**

6. A tool for a device for driving impact and/or drilling tools on hand power tools having a tool holder with at least two axially extending drivers projecting inwardly from a receiving opening of a tool receptacle of the tool holder and also having a radial throughgoing opening for receiving a locking body provided with an axially extending, strip-shaped radial projection, the tool comprising a tool shaft having a shaft end; grooves which open toward said shaft end and in which said drivers engage; an elongated locking trough provided in said tool shaft in which said locking body engages for limiting an axial movement of the tool, said at least one locking trough being provided with an axially extending, groove-shaped radial depression which is closed at least at a rear end and in which said radial projection engages for forming an additional drive flank.

5,466,102

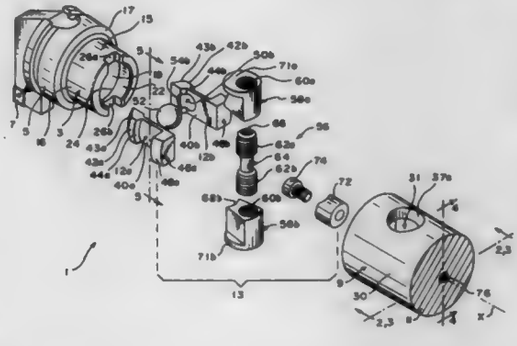
SYSTEM FOR COUPLING MACHINE TOOLS

Robert A. Erickson, Raleigh, N.C., assignor to Kennametal Inc., Latrobe, Pa.

Filed Dec. 16, 1993, Ser. No. 168,802

Int. Cl.[6] B23B *31/103*

U.S. Cl. 409—232 **30 Claims**



1. A coupling system for lockably coupling together machine tool components, comprising:

(a) a male coupling having a recess at a distal end that includes follower surfaces;

(b) a female coupling comprised of:

(i) a body having an axis,

(ii) an opening disposed along said axis for receiving the distal end of said male coupling and having walls,

(iii) a plurality of lugs within said opening extending from said walls, and

(iv) a plurality of opposing jaw members movably mounted in said opening and having feet which engage said lugs to limit axial travel of said members and said jaw members further having cam surfaces for engaging said follower surfaces and urging said surfaces both radially outwardly from said axis and longitudinally along said axis when said jaw members are moved apart orthogonally with respect to said axis to mate said male and female couplings together, and

(c) a drive train for moving said jaw members apart, including:

(i) an axially movable drive element for driving said jaw members apart,

(ii) a pair of opposing wedge members orthogonally movable with respect to said axis for moving said drive element axially, and

(iii) a screw member for driving said wedge members orthogonally with respect to said axis toward and away from one another.

5,466,103

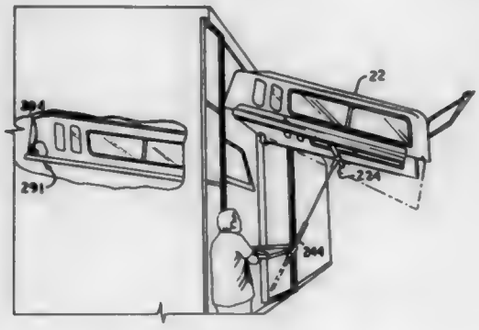
ARTICLE UNLOADING SYSTEM AND METHOD

Dennis C. Herrmeyer, Paola, Kans., assignor to Rigid Form, Inc., Paola, Kans.

Continuation-in-part of Ser. No. 11,895, Feb. 1, 1993, Pat. No. 5,273,337. This application Jun. 23, 1993, Ser. No. 82,023

Int. Cl.[6] B60P *7/12*

U.S. Cl. 410—33 **24 Claims**



23. An article unloading system for unloading pickup covers from an article rack, said article rack being adapted to hold a plurality of said pickup truck covers in a like plurality of article holding slots, at least some of said slots being vertically stacked on said rack, comprising:

(a) an unloading ramp means, said ramp means comprises a pair of unloading ramps connected by a cross member;

(b) means for removably and pivotably attaching a first end of said ramp means to said article rack at a respective pivot point, said pivot point being positioned below a topmost slot on said rack;

(c) means attached to said ramp means for selectively changing the angle of said ramp means relative to said article rack;

(d) article securing means attached to at least one of said unloading ramps near said first end; and

(e) means attached to said at least one ramp for selectively releasing said article securing means, said means for selectively releasing including a release mechanism positioned near a second end of said at least one ramp;

(f) a pivotable clamp for securing a rear wall of said pickup truck cover when said pickup truck cover is positioned within said topmost slot, said means for securing being positioned near a rear wall of said article slot; and

(g) means for remotely releasing said means for securing, said means for releasing being positioned near a front wall of said article slot and comprising an elongate rod attached at one end to said pivotable clamp and at the other end to a handle which handle is pivotably attached beneath said topmost article slot.

5,466,104

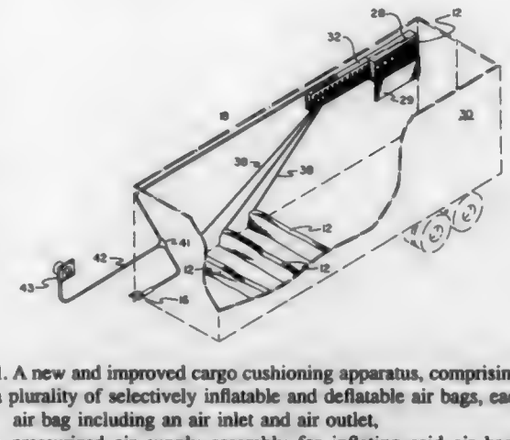
CARGO CUSHIONING APPARATUS

Millard E. Gatwood, 4151 Pace La., Pace, Fla. 32571

Filed Jul. 19, 1993, Ser. No. 92,966

Int. Cl.[6] B60P *7/18;* **B61D** *45/00*

U.S. Cl. 410—156 **7 Claims**



1. A new and improved cargo cushioning apparatus, comprising:

a plurality of selectively inflatable and deflatable air bags, each air bag including an air inlet and air outlet,

a pressurized air supply assembly for inflating said air bags, wherein each of said air bags is adapted to be folded up when deflated,

a storage container for storing a plurality of said air bags when they are deflated and folded up, wherein said storage container is adapted to be installed in a cargo container, wherein said storage container includes a plurality of storage cubicles, each storage cubicle being adapted to receive a respective deflated and folded up air bag, and

a manifold assembly connected to said pressurized air supply assembly, said manifold assembly including a plurality of individually controlled bag inflation modules, wherein said respective bag inflation modules include respective independently controllable valves connected to a supply of pressurized air supplied from said pressurized air supply assembly and include respective air hoses connected to said respective valves, wherein there is a one-to-one correspondence between respective inflation modules and respective air bags.

5,466,105

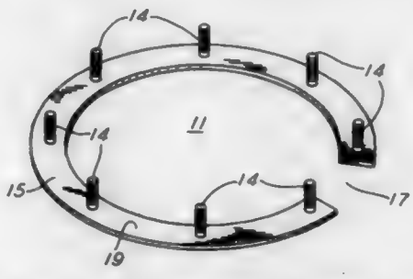
FASTENER ASSEMBLY FOR INSTALLING VALVE DEVICES AND THE LIKE

Albert A. McKay, Stoney Creek, Canada, and James E. Hart, Trafford, Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jun. 9, 1994, Ser. No. 257,758

Int. Cl.[6] F16B *27/00;35/02;39/00*

U.S. Cl. 411—84 **18 Claims**



1. For securing a first member to a second member on which the first member is mountable by means of at least two screw members that project from corresponding through holes in the first and second members that are without threads, a fastener assembly comprising;

a) an annular fastener plate having a single separation therein;
b) said at least two screw members being affixed to one side of said annular fastener plate so as to project from said through holes when said one side of said annular fastener plate is engaged with a face of said first member opposite the mating face thereof with which a mating face of said second member is engageable; and
c) a corresponding nut member for said at least two screw members having screw-threaded engagement therewith.

5,466,106

CLAMP NUT

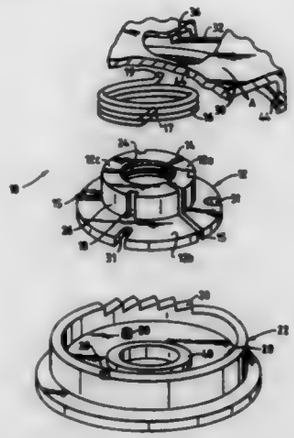
Daniel Bone, and Kevin Stones, both of Durham, England, assignors to Black & Decker Inc., Newark, Del.

Filed Jun. 30, 1994, Ser. No. 269,475

Claims priority, application United Kingdom, Jul. 1, 1993, 9313633

Int. Cl.[6] F16B *37/08;39/36*

U.S. Cl. 411—433 **12 Claims**



1. A clamp nut comprising a split threaded nut for engaging a threaded spindle, a coiled spring closely encircling the split nut, means for holding the spring coiled around the split nut and a cap, engaging the spring, which can be turned in a first direction to engage the spring with said holding means and in a reverse direction to release the holding means thereby enabling loosening of the spring around the split nut and whereby the split nut can expand radially to facilitate removal of the clamp nut from the threaded spindle.

5,466,107

SPACER WASHER FOR BOLTED JOINT

Harry D. Percival-Smith, Manchester, England, assignor to Hydra-Tight Limited, United Kingdom

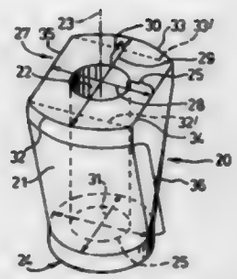
Filed Jan. 21, 1994, Ser. No. 183,749

Claims priority, application United Kingdom, Feb. 5, 1993, 9302301

Int. Cl.[6] F16B *43/02*

U.S. Cl. 411—546 **12 Claims**

7. A spacer washer for a bolted joint of the type in which a threaded bolt or stud element, extending from an apparatus, is held in tension by means of a nut carried by the element and bearing against the apparatus by way of a spacer washer, having been put into tension by hydraulic bolt tensioning means reacting against the apparatus by way of a bridge straddling the nut, said nut having a radially extending face defining a footprint by which the nut bears against the spacer washer, said spacer washer comprising an elongate body having a longitudinal axis therethrough, a through aperture of uniform diameter and coaxial with the longitudinal axis, to provide a clear fit for the body over said element, a foot



end arranged to bear against the apparatus, and a head end against which a cooperating nut bears, spaced from the foot end along the longitudinal axis, the body wall at said foot end being of substantially uniform thickness and the body wall at said head end having a thickness not less than the thickness at the foot end in a first direction and a greater thickness in a second direction than in said first direction.

5,466,108

PROCESS AND APPARATUS FOR FEEDING FRAGMENTED MATERIAL INTO A CONTAINER UNDER PRESSURE

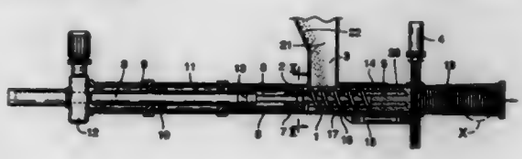
Jozsef Piroska, Järfälla, Sweden, assignor to Vattenfall Energisystem AB, Vallingby, Sweden

Filed Jun. 3, 1994, Ser. No. 244,585

Claims priority, application Sweden, Dec. 5, 1991, 9103622-8

Int. Cl.[6] B01J *3/02*

U.S. Cl. 414—218 **12 Claims**



3. An apparatus for pulsing in-feed of disintegrated material into a container under pressure, comprising:

a screw piston having a preselected pitch and operably positioned within an elongate input chamber defined by a cylindrical interior wall, said screw piston being axially movable in said chamber and having a receiving position at one end of the chamber;

a closable inlet defined in the interior wall opposite the receiving position of the screw piston;

a receiving space located ahead of the receiving position of the screw piston in an opposite end of the chamber that is delimited by a closed output valve;

a longitudinal guideway formed in said interior wall;

a guide piston mounted in the chamber and engaging the guideway for axial movement, and the screw piston having a driveshaft that is rotatably carried within the guide piston; and

the screw piston operable to rotate in a first direction to receive material from the inlet, to transport the material axially toward the receiving space and to compact the material within the receiving space, the output valve being openable and the screw piston axially but non-rotatably displaceable through the receiving space to discharge the material through the open output valve.

5,466,109

LOAD STORING EQUIPMENT

Yukio Iizuka, Inuyama, Japan, assignor to Daifuku Co., Ltd., Osaka, Japan

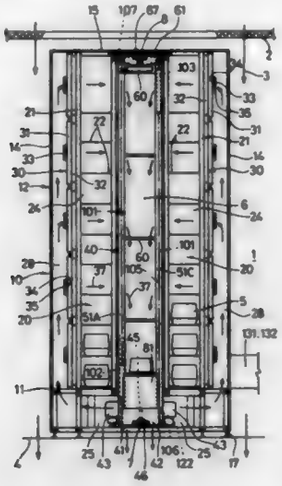
Filed Sep. 16, 1994, Ser. No. 307,306

Claims priority, application Japan, Feb. 18, 1994, 6-020706

Int. Cl.[6] B65G *1/133*

U.S. Cl. 414—283 **5 Claims**

1. A load storing equipment having a cleaned compartment in



which are disposed shelves and a carrying in-and-out device, said carrying in-and-out device comprising a lower main body supported and guided by a transverse floor rail, four posts erected on the lower main body, each of said posts having upper and lower ends, an upper frame connecting the upper ends of the posts, a carriage capable of vertical movement between opposed surfaces of the posts, a carrying in-and-out tool disposed on the carriage, and at least one carriage lifting device disposed to extend from the posts to the lower main body, wherein

said upper frame is provided with guided assemblies to be guided by a ceiling rail, upper fans having suction ports directed to the guided assemblies and delivery ports directed to the upper ends of the posts, and

said lower main body is provided with lower fans having suction ports directed to the lower ends of the posts.

5,466,110

LIFTING DEVICE

John W. Redding, Conselice, Italy, assignor to Perkins Manufacturing Company, Chicago, Ill.

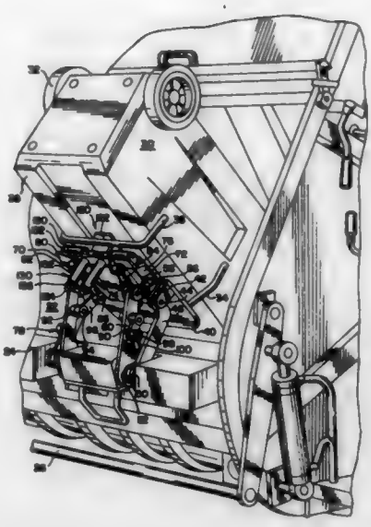
Filed Sep. 1, 1993, Ser. No. 115,931

Int. Cl.[6] B65F *3/02*

U.S. Cl. 414—421 **4 Claims**

1. Receptacle dumping apparatus for dumping refuse receptacle having upper and lower engagement surfaces spaced a certain distance apart, said receptacle dumping apparatus comprising:

a receptacle lifter comprising upper and lower engagement members, said upper and lower engagement members being relatively slidably movable between a first spaced apart position, wherein said engagement members are spaced apart a distance less than the certain distance between the upper and lower engagement surfaces of the receptacle, and a second



spaced apart position, wherein said engagement members are spaced farther apart than in said first spaced apart position so as to capture the engagement surfaces of the receptacle to prevent the receptacle from falling from said lifter when inverted;

a mounting support;

a drive arm having first and second ends, said first end being pivotally carried on said mounting support and said second end being pivotally carried on said lifter;

a follower arm having first and second ends, said first end of said follower arm being pivotally carried on said mounting support and said second end of said follower arm being pivotally carried on said lifter;

means for pivoting said drive arm about said first end thereof to move said lifter between a lower first position, wherein said engagement members are in said first spaced apart position for initially engaging a refuse receptacle, and a raised and inverted second position wherein said engagement members are in said second spaced apart position for dumping a refuse receptacle; and

a plurality of linkages pivotally connected to said mounting support, to one of said drive and follower arms and to one of said engagement members to cause relative movement of said engagement members between said first and second spaced apart positions as said lifter moves between said lower first position and a position intermediate said lower first position and said raised inverted second position, said linkages maintaining the distance between said upper and lower engagement members in said second spaced apart position essentially constant as said lifter moves between said intermediate position and said raised inverted second position.

5,466,111

WHEELCHAIR AND LIFTING APPARATUS FOR HANDICAPPED PERSONS DRIVING AUTOMOBILES

Rudolf X. Meyer, 16966 Livorno Dr., Pacific Palisades, Calif. 90272

Filed Mar. 3, 1995, Ser. No. 398,157

Int. Cl.[6] A61G *3/08*

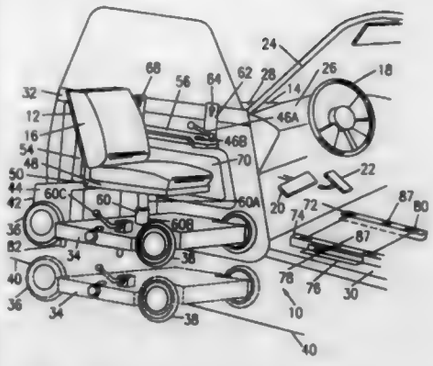
U.S. Cl. 414—462 **15 Claims**

9. A wheelchair and lifting apparatus for use in combination with a vehicle for loading said wheelchair and a wheelchair occupant into said vehicle, comprising:

a door hinged on the vehicle for swinging between open and closed positions;

said vehicle having a wheelchair position inside the vehicle alongside the closed position of said door;

said wheelchair having a base, a plurality of wheels rotatably mounted on said base, a seat for holding the occupant, and a



seat-height adjustment mechanism for raising and lowering said seat and the occupant relative to said base;

means for securing said wheelchair to said door when the latter is in said open position and the wheelchair is alongside the door and outside of the vehicle; and

said seat-height adjustment mechanism being operable to raise said seat relative to said base to a predetermined height for attachment to said door, and also being operable to raise said base relative to said seat, while the seat is attached to the door, to a height enabling the wheelchair to enter the vehicle as the door is closed, whereby the closing of the door will swing the wheelchair into the wheelchair position in the vehicle.

5,466,112

COMBINED DUMP TRUCK AND SPREADER APPARATUS

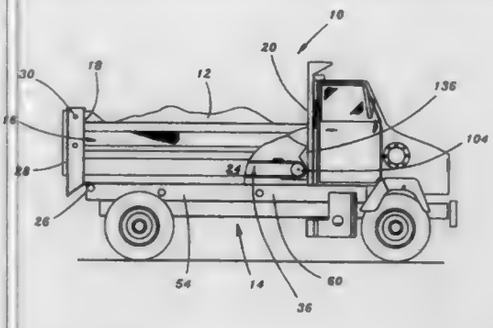
Richard L. Feller, 1051 W. 7th St., Monroe, Wis. 53566

Filed Mar. 11, 1994, Ser. No. 209,569

Int. Cl.[6] B60P *1/04;1/36*

U.S. Cl. 414—528 **18 Claims**

1. A combined dump truck and spreader apparatus for selectively



dumping and spreading materials, said apparatus comprising:

a truck chassis;

a body for receiving and dispensing the materials, said body having a first and a second end and a first and a second side, said body being pivotally secured to said chassis about a pivotal axis;

dumping means extending between said body and said chassis for selectively pivoting said body about said pivotal axis;

a tailgate pivotally secured to said first end of said body ,about a further pivotal axis for selectively permitting dumping of the materials therethrough when said body is pivoted about said pivotal axis;

first and second conveyor means disposed within said body and extending between said first and second ends thereof for conveying the materials along said body;

said tailgate defining a first and a second opening which co-operate respectively with said first and second conveyor means for permitting the flow therethrough of the materials, the arrangement being such that selective spreading and dumping of the materials from at least one of said openings is permitted;

said tailgate further including:

deflector means secured to a bottom edge of said tailgate for deflecting the materials within said body towards said first conveyor means;

said deflector means including:

a gate means for selectively controlling said flow of materials through said first opening;

further deflector means secured to said bottom .edge of said tailgate for deflecting the materials within said body towards said second conveyor means;

said further deflector means including:

a further gate means for selectively controlling Said flow of materials through said second opening; and

sloping guide means extending between said conveyor means and extending between said first and second ends thereof for guiding and evenly deflecting all of the materials within said body towards said conveyor means along the entire length of said conveyor means for evenly distributing the materials to both of said conveyor means.

5,466,113

ARRANGEMENT FOR THE RETENTION OF AN IMPLEMENT TO A LIFTING GEAR

Lars G. Norberg, Zweibrücken, Germany, assignor to Deere & Company, Moline, Ill.

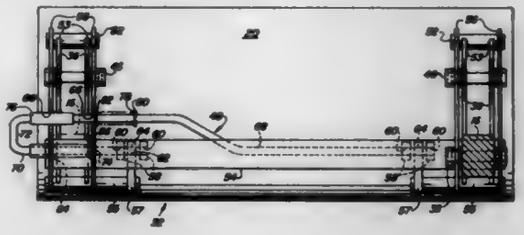
Filed Jun. 24, 1994, Ser. No. 265,179

Claims priority, application Germany, Aug. 19, 1993, 43 27 942.2

Int. Cl.[6] E02F *3/80*

U.S. Cl. 414—723 **6 Claims**

1. In an arrangement for detachably securing an implement to an



implement carrier of a type having right and left implement holders, comprising: an elongate lock reciprocally mounted to one of said right and left implement holders for movement as a unit in opposite directions along a horizontal, transverse axis between a latched position and an unlatched position; said lock having first and second, pin-shaped locking components spaced from each other along the length of said lock and located along said axis; said carrier including a pair of attaching points comprising first and second pairs of carrier openings aligned with and spaced transversely from each other and adapted for being placed next to and aligned with first and second implement openings; said first and second pairs of carrier openings being located along said axis and respectively receiving said first and second locking components when the lock is in its latched position; said lock including a handgrip located on an opposite side of said one of said right and left holders from said first and second pairs of carrier openings whereby the handgrip may be pulled away from said one of said right and left holders to move said lock to its unlatched position to simultaneously remove said first and second locking components from at least one of each of said first and second pairs of carrier openings.

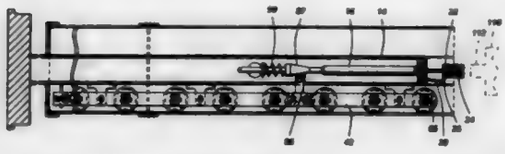
5,466,114

SYSTEM FOR SUPPORTING HOLLOW CYLINDERS

Eugene A. Swain, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 548,312, Jul. 2, 1990, abandoned.
This application Jan. 5, 1993, Ser. No. 837
Int. Cl.[6] B21C *37/30*
U.S. Cl. 414—746.5 13 Claims

1. Apparatus for supporting hollow cylinders comprising a can-



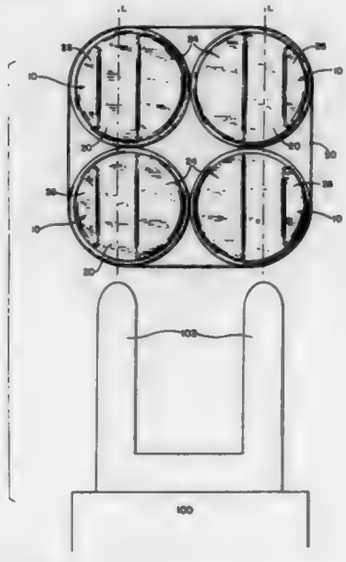
tilevered arm having a supported end and an unsupported free end and a plurality of independently rotatable wheels having centers intersecting the outer periphery of an imaginary sleeve coaxial with the longitudinal axis of said arm, said wheels being rotatable around and supported by axles extending through the center of said wheels, said axles being supported by said arm, each of said axles being transverse to said longitudinal axis of said arm and tangent to said outer periphery of said imaginary sleeve, said wheels having an outer periphery adapted to receive, contact and support the interior of at least one hollow cylinder, said wheels having an outer periphery adapted to provide the sole contact with the interior of at least one hollow cylinder and said wheels providing the sole support of said at least one hollow cylinder.

5,466,115

FEED BARREL

Robert Thornberg, Walhalla, N. Dak., assignor to Harvest Fuel, Inc., Walhalla, N. Dak.

Division of Ser. No. 822,298, Jan. 17, 1992, Pat. No. 5,332,099.
This application Jul. 26, 1994, Ser. No. 280,388
Int. Cl.[6] B65D *19/08*
U.S. Cl. 414—786 3 Claims



1. A method of transporting goods comprising the steps of:

a) providing a plurality of containers, each of the containers comprising a generally cylindrical wall having upper and lower ends and a generally circular floor integrally formed with the wall to define an interior cavity for containing the goods, the lower end of the wall meeting the periphery of the floor to define a curved edge of the container; the floor having a channel formed therein which extends through a portion of said wall adjacent its lower end to define a notch therein, the channel serving to divide the floor into unequally sized first and second sections;

b) positioning a pair of said containers in side-by-side abutment with the first sections of their respective floors adjacent one another and the channels disposed generally parallel to one another;

c) attaching the paired containers to one another;

d) placing the fork of a forklift in each of the channels of the paired containers;

e) lifting the attached containers with the forklift and transporting them to a position adjacent a desired final location;

f) lowering the containers to rest upon the ground, removing the fork of the forklift from the channels and detaching the paired containers from one another;

g) tipping one of the containers onto its side such that its wall rests upon the ground;

h) rolling the container along the ground until the container is positioned immediately adjacent its desired final location; and

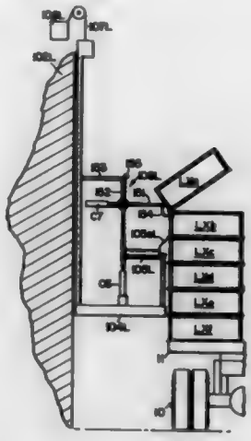
i) turning the container upright so that the floor rests upon the ground in the desired final location.

5,466,116

METHOD FOR UNLOADING CONTENT OF MULTILAYER CONTAINERS

Wallace H. Jerome, 1480 E. Maple Ave., Barron, Wis. 54812

Division of Ser. No. 33,767, Mar. 18, 1993, Pat. No. 5,388,948.
This application Oct. 25, 1994, Ser. No. 328,890
Int. Cl.[6] G65G *65/04;65/34*
U.S. Cl. 414—786 23 Claims



1. A method of unloading a multilayered container having a plurality of similar containers vertically aligned upon one another to form an integral vertical container column, wherein successive ones of said vertically aligned containers are hinged along horizontal axes to one another along one side of the column, defining a discharge side of the column, with the lowermost container being hinged to a support base for the column, comprising:

(a) arranging a discharge collector of a type suitable to collect the contents of the containers in general vertical alignment at said discharge side, with a bottom of the uppermost container;

(b) opening the discharge side of the uppermost container to expose its contents to the discharge collector;

(c) tilting the uppermost container about its lower hinged edge at its discharge side to a tilted position, thereby causing the contents thereof to gently move by gravity from the tilted container and into said discharge collector;

(d) moving said discharge collector into general vertical alignment at said discharge side with a bottom of the next lower container;

(e) opening the discharge side of the next lower container;

(f) tilting the next lower container about its lower hinged end at its discharge side to a tilted position, thereby causing the contents thereof to move by gravity from the tilted container and into said discharge collector; and

(g) successively repeating the steps of: moving and aligning the discharge collector to successively lower containers; opening the discharge sides of those

containers with which the discharge collector is aligned; and tilting those containers having opened discharge sides about their lower hinged ends to discharge their contents into the discharge collector, until the contents of the entire container column have been emptied into the discharge collector.

5,466,117

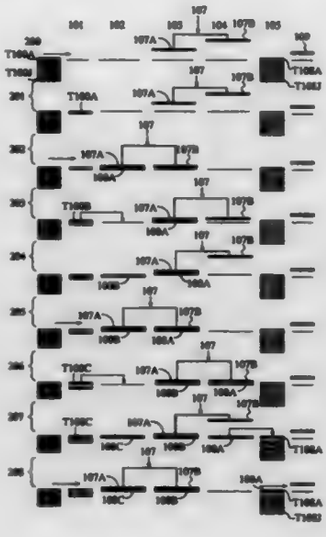
DEVICE AND METHOD FOR PROGRAMMING MULTIPLE ARRAYS OF SEMICONDUCTOR DEVICES

Edwin W. Resler, San Jose; Vincent L. Tong, Fremont; Russell C. Swanson, and W. Scott Bogden, both of San Martin, all of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Filed Jun. 10, 1993, Ser. No. 74,190

Int. Cl.[6] B65G *1/18*

U.S. Cl. 414—799 **18 Claims**



1. A device for moving a plurality of semiconductor devices comprising:

a base;

a first arm having three dimensional movement for moving semiconductor devices into an array configuration;

an array mover having two dimensional movement capable of moving arrays of semiconductor devices, wherein said array mover includes a first head for moving one array of semiconductor devices and a second head for moving another array of semiconductor devices, wherein said first head and said second head are capable of moving independently from one another in at least one dimension, and are coupled to move together in another dimension; and

a second arm having three dimensional movement for moving semiconductor devices from said array configuration, wherein said first arm, said array mover, and said second arm are operatively positioned on said base.

5,466,118

CENTRIFUGAL COMPRESSOR WITH A FLOW-STABILIZING CASING

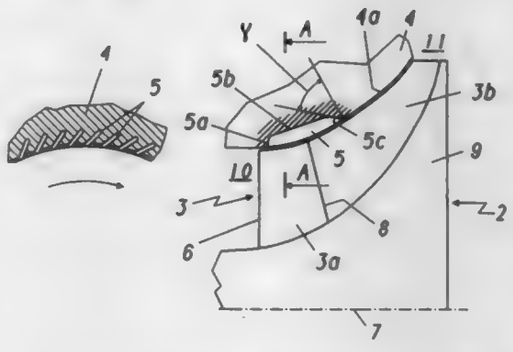
Klaus Heinrich, Nussbaumen, Switzerland, assignor to ABB Management Ltd., Baden, Switzerland

Filed Feb. 4, 1994, Ser. No. 191,523

Claims priority, application Germany, Mar. 4, 1993, 43 06 689.5

Int. Cl.[6] F04D *29/42*

U.S. Cl. 415—58.6 **14 Claims**



1. A centrifugal compressor with a flow-stabilizing casing, comprising:

(a) an impeller rotatably supported about a machine axis and having a hub with a plurality of impeller vanes mounted on a periphery;

(b) a compressor casing, which encloses the impeller, an inner casing contour being matched to an outer contour of the impeller vanes, the inner casing contour and the hub defining a flow duct extending between an axial inlet and a radial outlet; and

(c) a plurality of elongated stabilizer slots formed in the casing on an inner surface of the casing, each of the stabilizer slots having a bottom extending in a flow direction in the inlet region of the flow duct, and being distributed over an inner periphery of the inner casing contour; wherein

(d) each stabilizer slot is positioned relative to the impeller vanes so that a front end toward the axial inlet is located at a predetermined distance downstream of a vane leading edge.

5,466,119

SPACER OF ADJUSTABLE THICKNESS

Jean-Claude Boivin, Poisy; Jean-Emile Chollet, Annecy Le Vieux; Pierre Falcoz, Alby Sur Cheran, and Luc Mathieu, Annecy Le Vieux, all of, France, assignors to Societe Anonyme Dite: Alcatel Cit, Paris, France

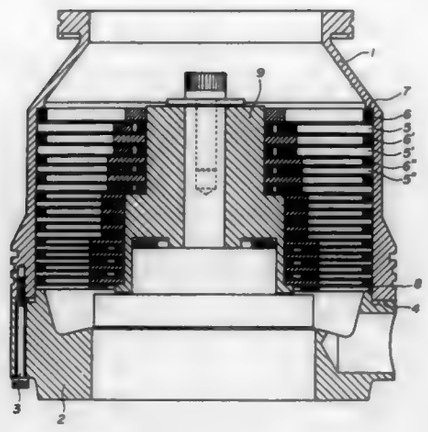
Continuation of Ser. No. 970,792, Nov. 3, 1992, abandoned. This application Apr. 25, 1994, Ser. No. 231,909

Claims priority, application France, Nov. 4, 1991, 91 13562

Int. Cl.[6] F16B *43/00*; F04D *29/54*;*19/04*

U.S. Cl. 415—90 **3 Claims**

1. A one-piece spacer of adjustable thickness for constituting a component of a stack of elements (5, 5', 5", 6', 6") between two abutment surfaces (7, 8) of two parts (1, 2) that are to be assembled together, said abutment surfaces (7, 8) being at a fixed distance apart, said spacer (10, 12) including a deformable portion (11, 13) capable of being plastically deformed in the stacking direction, the dimensions of the deformable portion (11, 13) being such that, before the stack is installed between the two parts (1, 2) to be assembled together, the overall height of the stack is greater than said fixed distance between said abutment surfaces, whereby the deforming of said portion of the spacer (10, 12) enables the dimensional tolerances to be taken up while accurately fitting the stack of elements between said abutment surfaces (7, 8) and mechanically preventing the stack from rotating or moving in translation;



wherein said two parts are, respectively, a casing (1) of a pump unit, and a pump body (2), and wherein said elements comprise stator disks (5, 5', 5") of a stator of the pump unit, and non-adjustable spacers between adjacent disks.

5,466,120

BLOWER WITH BENT STAYS

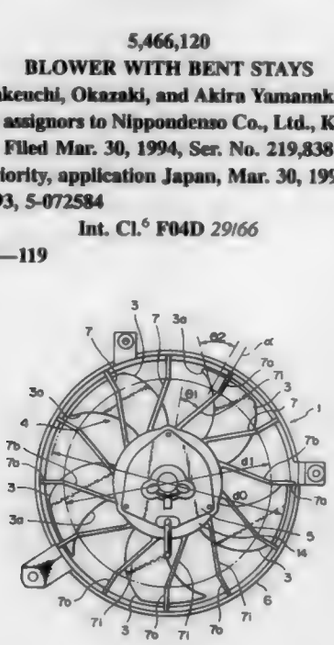
Kazuhiro Takeuchi, Okazaki, and Akira Yamanaka, Gifu, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 30, 1994, Ser. No. 219,838

Claims priority, application Japan, Mar. 30, 1993, 5-072582; Mar. 30, 1993, 5-072584

Int. Cl.[6] F04D 29/66

U.S. Cl. 415—119 7 Claims



1. A blower comprising an axial-flow fan having an axis, a plurality of vanes arranged about said axis and defining an outer periphery of the fan, and a suction side:

driving means for driving the fan for inducing a flow of air through the fan;

support means for supporting the driving means at a central region of the fan;

a generally cylindrical shroud covering the outer periphery of the fan;

a plurality of bent stays arranged on the suction side of the fan and integrally formed with the support means and the shroud for connecting the support means to the shroud; and

each of the stays comprising an outer portion near the shroud extending along a radial line about the axis of the fan, and an inner portion near the support means extending at an inclination to a radial line about the axis of the fan.

5,466,121

HYDRAULIC ADJUSTMENT DEVICE

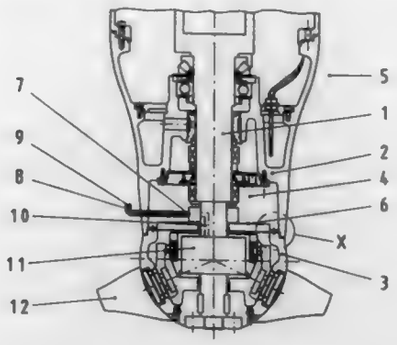
Horst Schäfer, Rhade, and Günter Schaaf, Bremen, both of, Germany, assignors to KSB Aktiengesellschaft, Frankenthal, Germany

Filed Feb. 23, 1994, Ser. No. 200,237

Claims priority, application Germany, Feb. 27, 1993, 43 06 140.0

Int. Cl.[6] F03B 03/06

U.S. Cl. 415—129 5 Claims



1. A hydraulic adjustment device for adjusting a pitch of at least one blade of a variable-pitch propellers of a turbo-engine comprising:

a shaft for driving said variable-pitch propeller;

a plurality of transmission elements for feeding and draining, as well as for guiding a hydraulic fluid being disposed in said shaft;

a rotation passage for said hydraulic fluid being disposed in a chamber, which surrounds said shaft, said chamber is disposed adjacent to the variable-pitch propeller and is in fluid communication with a transport medium, said hydraulic fluid being harmonious to said transport medium.

5,466,122

TURBINE ENGINE STATOR WITH PIVOTING BLADES AND CONTROL RING

Jean-Louis Charbonnel, Boissise Le Rot; Philippe Guerout, Chartrettes; Jacques L. Happey, Voisenon; Frédéric G. J. Mainfroy, Corbeil Essonnes; Jacky Naudet, Bondoufle, and Jean-Claude Porcher, Gretz-Armainvilliers, all of, France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA" , Paris, France

Filed Jul. 27, 1994, Ser. No. 281,036

Claims priority, application France, Jul. 28, 1993, 93 09266

Int. Cl.[6] F01D 17/16

U.S. Cl. 415—160 6 Claims

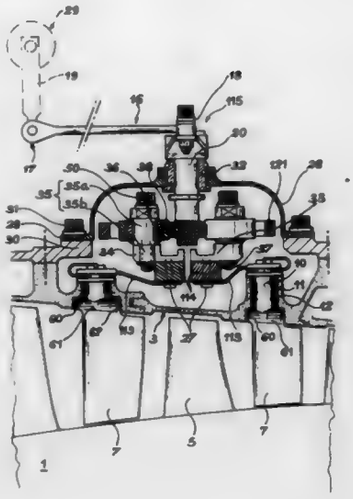
1. Turbine engine stator, which comprises:

an envelope having a plurality of bearings;

a plurality of blades respectively pivotable about pivots engaged with said bearings of said envelope wherein said envelope includes flanges axially juxtaposed by assemblies allowing relative axial displacement of the flanges and the envelope defines a gas stream in which the blades extend;

a casing surrounding the envelope and having a casing bearing wherein the pivots are joined by links to at least a sector of at least one control ring positioned outside the envelope; and

at least one control mechanism controlling the control ring wherein the control ring includes a spindle which engages the casing bearing wherein the flanges comprise angular sectors which are respectively separated by clearances, wherein joint members respectively seal said clearances and wherein the envelope comprises a composite material and the casing comprises titanium.



5,466,123

GAS TURBINE ENGINE TURBINE

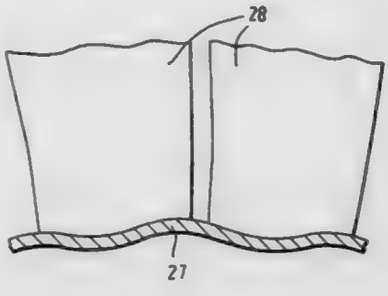
Martin G. Rose, Derby, England, assignor to Rolls-Royce plc, London, England

Filed Jun. 7, 1994, Ser. No. 255,970

Claims priority, application United Kingdom, Aug. 20, 1993, 9317410

Int. Cl.[6] F04D *29/28*

U.S. Cl. 415—182.1 7 Claims



1. A turbine suitable for a gas turbine engine comprising an annular array of aerofoil members and an annular platform, at least the radially inner extents of said aerofoil members being interconnected by said annular platform, said annular platform providing variation in the static pressure of the gases which operationally flow across said aerofoil members in such a manner that the static pressure of said gases in the field immediately downstream of said annular array is generally circumferentially uniform, said annular platform having an axial extent including a radially outer surface, portions of at least part of said axial extent of said radially outer surface being one of a convex and concave shape in the direction of flow of said gases across said aerofoil members to provide variation in the static pressure of the gases which operationally flow over said aerofoil members, said convex and concave portions of said radially outer surface circumferentially alternating with each other.

5,466,124

DEVICE FOR GENERATING AN INVERSION-KINEMATIC MOVEMENT

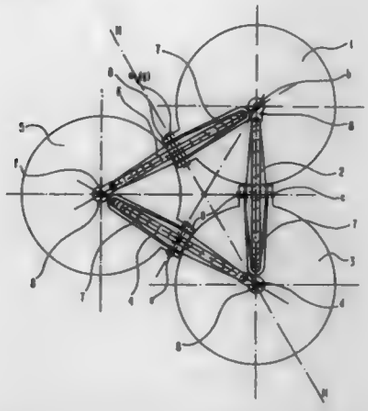
Hermann Dettwiler, Hauptstrasse 45, Ziefen, Switzerland

Filed Sep. 8, 1993, Ser. No. 117,960

Claims priority, application Switzerland, Mar. 5, 1993, 00651/93

Int. Cl.[6] B63H *1/30;* F04D *11/00*

U.S. Cl. 416—82 10 Claims



1. Device for converting a rotational movement for directing displacement of a flowable medium, which at least partially surrounds the device, with a mount (m) and with two rotatably mounted fixed axles (x, y) which are arranged at a distance from one another on the mount (m) and on which are articulated two end portions of a half cube-linkage chain having two lateral members (o, p) and a middle member (n), the two lateral members (o, p) being connected to the fixed axles (x, y) and to the middle member (n) by means of pivot axles (a to f) which are successively offset relative to one another by in each case 90°, characterized in that the middle member (n) and at least one of the two lateral members (o, p) of the half cube-linkage chain cooperate to form sheet-like driving elements for displacing flowable substances, and in that at least one of a pair of adjacent driving elements (1 to 6; 11, 12; 15, 16; 26, 27, 28, 29) possesses a free zone which is directed at a right angle to one of the pivot axles (a to g) associated with the other Of the pair of adjacent driving elements and into which the other of the pair of adjacent driving elements projects in a rotating manner for an unimpeded movement therein during an inversion-kinematic movement cycle, whereby the driving elements are provided with uncomplicated shapes and effectuate large-area substance displacements and a mutual stripping of said flowable substances therefrom.

5,466,125

ROTORS FOR GAS TURBINE ENGINES

David S. Knott, Derby, England, assignor to Rolls-Royce plc, London, England

PCT No. PCT/GB93/00372, § 371 Date Sep. 16, 1994, § 102(e) Date Sep. 16, 1994, PCT Pub. No. WO93/21425, PCT Pub. Date Oct. 28, 1993

PCT Filed Feb. 23, 1993, Ser. No. 307,643

Claims priority, application United Kingdom, Apr. 16, 1992, 9208409

Int. Cl.[6] F01D *5/22*

U.S. Cl. 416—193 A 6 Claims

1. A rotor for a gas turbine engine comprising a rotor disc having a radially outer face on which a plurality of radially extending blades are mounted with a space between adjacent blades, a separate wall member being provided to bridge said space between adjacent blades to define an inner wall of a flow annulus through the rotor, each of the wall members having a plurality of hooks which extend radially inwardly to engage correspondingly shaped hooks provided on the radially outer face of the disc, at least one

further hook being provided on each of the wall members which extends in a first direction generally radially inwardly and then generally axially so as to underlie in a radial sense an annular member so as to engage said annular member mounted on said rotor adjacent said disc to ensure engagement of the hooks on the wall member with the hooks on the radially outer face of the disc by radially outward movement of at least a portion of said one further hook under the action of centrifugal force when the engine is operating.

5,466,126

BEARING FOR THE IMPELLER OF A FLUID METER

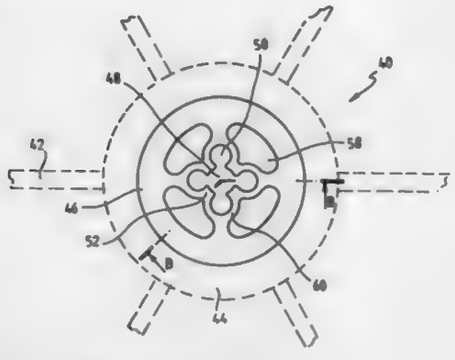
Hervé Brochette, Gumbrechtshoffen, France, assignor to Schlumberger Industries, S.A., Montrouge, France

Filed Jan. 13, 1994, Ser. No. 182,907

Claims priority, application France, Jan. 14, 1993, 93 00383

Int. Cl.[6] F04D *29/04*

U.S. Cl. 416—244 R **18 Claims**



1. An impeller for a fluid meter, comprising:

a one piece bearing including a central recess for receiving a pivot, said bearing further comprising:

a plurality of open-ended flutes located about a periphery of the central recess with adjacent flutes being separated by ribs; and

axial passages distributed around the flutes, with each passage conducting a larger flow of fluid through said passage than a flow of fluid through each of the flutes.

5,466,127

DEVICE FOR SWITCHING A SUBMERSIBLE MOTOR-DRIVEN PUMP ON AND OFF

Kurt W. Arnswald, Lohmar, Germany, assignor to WILO GmbH, Dortmund, Germany

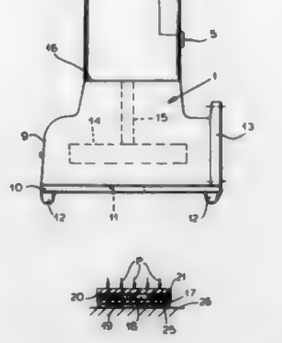
Filed Sep. 20, 1993, Ser. No. 124,275

Claims priority, application Germany, Dec. 30, 1992, 42 44 417.9

Int. Cl.[6] F04B *49/00*

U.S. Cl. 417—38 **7 Claims**

1. A submersible pump, comprising:



a pump housing member having an intake and an outlet and means in said housing member for displacing a liquid in which the pump is submerged from said intake to said outlet;

an electric motor having a motor casing member connected to said housing member, said motor being operatively connected to said means in said housing member for driving same;

a pressure sensor on one of said members and comprising a pressure-sensitive ohmic resistance; and

circuitry connected between said motor and said sensor for controlling energization of said pump, said pressure-sensitive ohmic resistance having two uniformly spaced apart conductors bridged by a polymeric foil decreasing in ohmic resistance upon application of pressure normal to said foil.

5,466,128

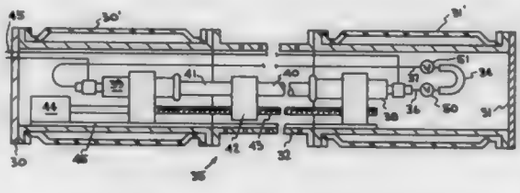
HIGH ASPECT RATIO, REMOTE CONTROLLED PUMPING ASSEMBLY

Steve B. Brown, Livermore, and Fred P. Milanovich, Lafayette, both of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Jul. 21, 1993, Ser. No. 95,297

Int. Cl.[6] F04B *25/00*; **F01B** *9/04*

U.S. Cl. 417—254 **23 Claims**



1. A pump assembly comprising:

a pair of pump units mounted in a back-to-back relation;

each of said pump units including a movable member connected to an actuator;

means operatively connected to said actuator for simultaneously moving said movable members in opposite directions; and

means for supplying material to be pumped to said pair of pump units;

whereby a first of said pair of pump units is filling while a second of said pair of pump units is discharging;

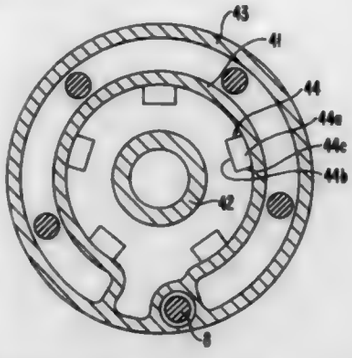
said means for supplying material including a sensor containing said material; and

each of said pair of pump units being operatively connected with said sensor for directing material into and withdrawing material from said sensor.

5,466,129
VALVED DISCHARGE MECHANISM OF A REFRIGERANT COMPRESSOR

Isamu Fukai, Fujioka, Japan, assignor to Sanden Corporation, Tokyo, Japan

Filed Oct. 28, 1993, Ser. No. 142,076
Claims priority, application Japan, Jan. 28, 1992, 4-000268 U
Int. Cl.[6] F04B 1/16
U.S. Cl. 417—269 13 Claims

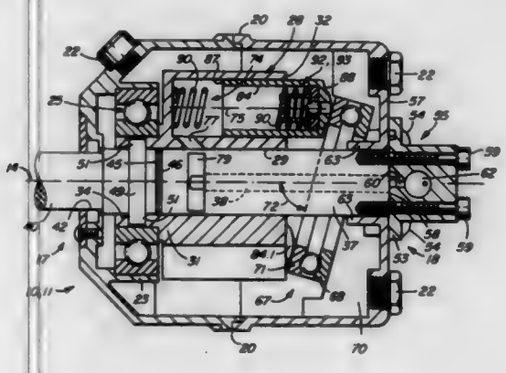


1. A refrigerant compressor comprising:
a first chamber and a second chamber, said first and second chambers being separated at least partially by a valve plate;
a port communicating said first chamber with said second chamber;
a valve member adjacent to said port for selectively opening and closing said port, said valve member having a predetermined spring constant such that said port remains closed until a pressure in said second chamber reaches a predetermined value;
gasket means disposed between said valve plate and said first chamber, said gasket means having at least one rib extending radially outward from the center of said gasket means for limiting the magnitude of an opening motion of said valve member;
at least one housing contacting said gasket means; and
a projection extending from said housing into said first chamber, said projection disposed adjacent to said rib of said gasket means.

5,466,130
HELM PUMP

Jacob Kobelt, 1654 Ocean Park Road, Surrey, British Columbia, Canada

Filed Jul. 26, 1994, Ser. No. 280,536
Int. Cl.[6] F04B 1/20
U.S. Cl. 417—269 16 Claims

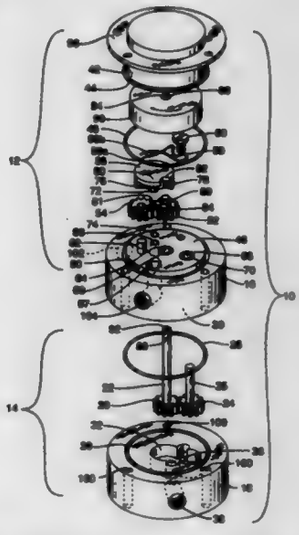


1. A swash plate pump comprising:
(a) a pump housing having a longitudinal housing axis extending between opposite first and second end portions of the housing,
(b) a pump rotor journalled for rotation relative to the housing about the housing axis, the pump rotor having a plurality of cylinders therein,
(c) a plurality of pistons, each piston having inner and outer ends and being slidable within a respective cylinder of the rotor along a respective cylinder axis,
(d) a swash plate having a bearing plate engaging the outer ends of the pistons, the bearing plate being inclined at a swash plate angle to the longitudinal housing axis,
(e) inlet and outlet conduits communicating with the cylinders, the conduits having respective valves for supplying fluid to and for discharging fluid from each cylinder, and
(f) bleed conduits for bleeding the cylinders, a bleed conduit being provided in the outer end of each respective piston, each bleed conduit having an opening disposed on the respective cylinder axis, the outer end of each piston being partially conical and having a truncated conical end wall extending around the bleed conduit to provide access to the bleed conduit between the bearing plate and the outer end of the piston, and to provide line contact between the truncated conical end wall and the bearing plate of the swash plate.

5,466,131
MULTIPLE-CHAMBER GEAR PUMP WITH HYDRAULICALLY CONNECTED CHAMBERS

Tim J. Altham, Castle Bytham, England, and Paul A. Johnson, Vancouver, Wash., assignors to Micropump Corporation, Vancouver, Wash.

Filed Mar. 22, 1994, Ser. No. 215,924
Int. Cl.[6] F04B 17/00;21/00;23/04; F01C 1/24
U.S. Cl. 417—420 7 Claims



1. A multiple-chamber pump head, comprising a first gear-pump chamber and a second gear-pump chamber,
(a) the first gear-pump chamber comprising
a first housing defining a first pump cavity,
a first driving gear situated within the first pump cavity and rotatable about a first axis that is fixed relative to the first housing,
a first driven gear situated within the first pump cavity and rotatable about a second axis so as to mesh with the first driving gear and contrarotate about the second axis relative to the first driving gear whenever the first driving gear is rotating about the first axis,
a first inlet allowing fluid to enter the first pump cavity so as to be propelled by the rotating first driving and driven gears through the first pump cavity, and

a first outlet allowing fluid, propelled through the first pump cavity by the rotating meshed first driving and driven gears, to exit the first pump cavity;

(b) the second gear-pump chamber comprising

a second housing defining a second pump cavity,

a second driving gear situated within the second pump cavity and axially connected to the first driving gear so as to be rotatable about the first axis synchronously with the first driving gear,

a second driven gear situated within the second pump cavity and rotatable about a third axis fixed relative to the second housing so as to mesh with the second driving gear and contrarotate relative to the second driving gear whenever the second driving gear is rotating about the first axis,

a second inlet allowing fluid to enter the second pump cavity so as to be propelled by the meshed second driving and driven gears through the second pump cavity, and

a second outlet allowing fluid, propelled through the second pump cavity by the rotating second driving and driven gears, to exit the second pump cavity; and

(c) the first and second pump cavities being interconnected by a fluid conduit coaxial with the first axis, the conduit allowing, whenever the first and second gear-pump chambers are pumping fluid so as to generate a higher pressure in the first pump cavity relative to the second pump cavity, fluid to pass from the first pump cavity to the second pump cavity so as to maintain hydraulic prime of both the first and second pump cavities.

5,466,132

PUMP HAVING A ROTARY DISTRIBUTOR

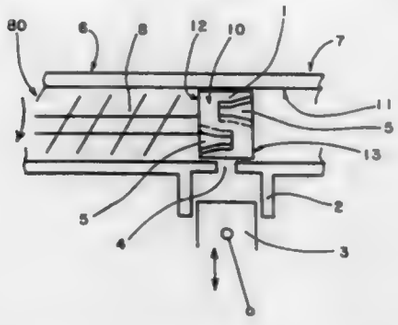
Michel Deal, St-Remy-En-Rollat, France, assignor to Sedepro, Paris, France

Filed Dec. 28, 1993, Ser. No. 174,141

Claims priority, application France, Dec. 31, 1991, 92 16053

Int. Cl.[6] F04B *7/00*

U.S. Cl. 417—519 **10 Claims**



1. A pump for viscous material comprising an admission and a discharge, a pumping chamber, at least one piston sliding in the pumping chamber and reciprocating between two extreme positions, feed means arranged in the admission assuring a forced mechanical transfer of the material from the admission towards the said pumping chamber, a rotary distributor between the admission and the said pumping chamber, the distributor having piercings arranged and distributed so as, successively, to place the pumping chamber in communication with the admission and to place the pumping chamber in communication with the discharge, and means for controlling the continuous movement of rotation of the distributor over a complete revolution in synchronism with movement of the piston.

5,466,133

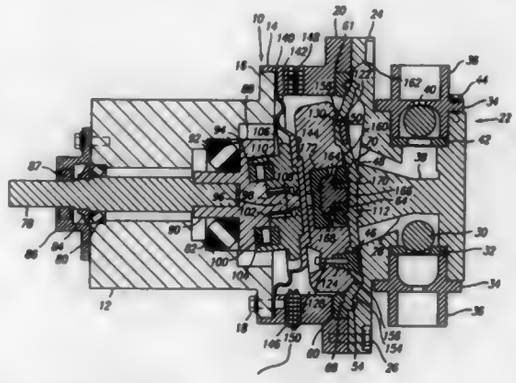
PERISTALTIC PUMP AND DIAPHRAGM THEREFOR

Alan D. Tuck, Jr., 5536 Canvasback Rd., Blaine, Wash. 98230

Filed Jun. 30, 1994, Ser. No. 269,249

Int. Cl.[6] F04C *5/00;15/00*

U.S. Cl. 418—2 **48 Claims**



1. A pump comprising

a housing;

a shaft rotatably mounted about an axis of rotation in the housing and including a rotor with a drive coupling inclined to the axis of rotation;

a pump casing fixed to the housing facing the drive coupling;

an inlet through the pump casing;

an outlet through the pump casing;

a mount mounted relative to the housing;

a wobble plate mounted on a first side on the mount and coupled with the drive coupling on a second side for nutation about the axis of rotation;

a diaphragm between the pump casing and the wobble plate.

5,466,134

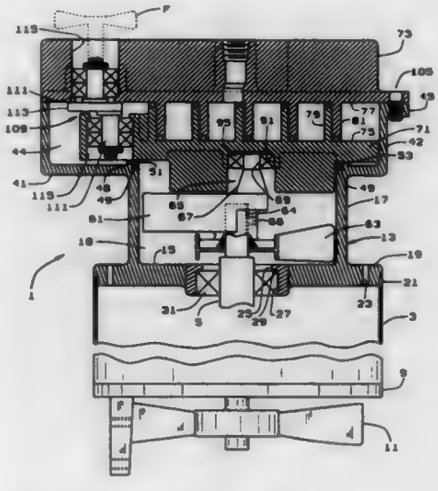
SCROLL COMPRESSOR HAVING IDLER CRANKS AND STRENGTHENING AND HEAT DISSIPATING RIBS

Robert W. Shaffer, Hamilton, Ohio; Kyle Adriance, and Charles D. Kimbro, both of St. Charles County, Mo., assignors to Puritan Bennett Corporation, Lenexa, Kans., and Air Squared, Inc., Hamilton, Ohio

Filed Apr. 5, 1994, Ser. No. 223,039

Int. Cl.[6] F04C *18/04;29/04*

U.S. Cl. 418—15 **30 Claims**



1. A scroll compressor comprising:

a motor housed in a motor shell and having a motor shaft extending axially from said motor shell;

a compressor housing secured to said motor shell, said housing having a circumferential side wall and a bottom, said bottom defining a boss; said motor shaft being rotatably journaled in said boss and extending through said boss into said housing;

an eccentric mounted on said motor shaft within said housing for rotation with said shaft;

an orbiting scroll member mounted on said eccentric to be orbitally driven by said motor shaft when said motor shaft rotates, said orbiting scroll including a plate having an inboard surface and an outboard surface and an involute extending from said inboard surface, said plate being mounted to said eccentric;

a fixed scroll secured to said housing, said fixed scroll including a plate having an inboard surface and an outboard surface and defining an inlet and an outlet and an involute extending from said inboard surface of said fixed scroll plate; said fixed scroll involute meshing with said orbiting scroll involute to define suction zones at outer ends of the involutes and fluid pockets, said fluid pockets being reduced in size as said scroll compressor is operated to compress a fluid;

at least two idler crank assemblies, each idler crank assembly extending between said fixed and orbiting scrolls;

means for maintaining the running clearance between said fixed scroll and said orbiting scroll;

sealing means for providing a seal between a tip of one involute and the plate of its opposing scroll member;

rib means on at least one surface of said scroll members for strengthening said scroll members and for dissipating heat, said rib means includes ribs formed on an outboard surface of said orbiting scroll member, said ribs extending from said motor shaft boss at other than a right angle to said motor shaft boss.

5,466,135

ROTARY VANE-CELL PUMP

Günter Draskovits, and Johann Merz, both of Schwäbisch Gmünd, Germany, assignors to ZF Friedrichshafen AG, Germany

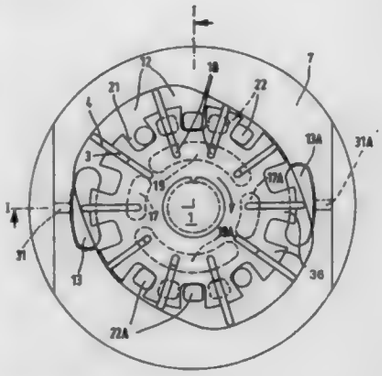
PCT No. PCT/EP93/00679, § 371 Date Jul. 27, 1994, § 102(e) Date Jul. 27, 1994, PCT Pub. No. WO93/19297, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 20, 1993, Ser. No. 256,954

Claims priority, application Germany, Mar. 26, 1992, 42 09 840.8

Int. Cl.[6] F04C *2/00*

U.S. Cl. 418—268 **2 Claims**



1. A rotary pump comprising:

a housing (8, 8A) having front and back plates (5 and 6) defining an inner chamber therebetween;

a cam ring (7) stationarily supported in said inner chamber (8, 8A) between said front and back plates (5 and 6), said cam ring (7) having an inner peripheral cam surface alternately defining pressure and suction zones in said inner chamber;

an input shaft (1) passing through said back plate (6) and having a rotor (2) non-rotatably fixed thereto, said rotor (2) being supported in said housing (8, 8A) between said front and back plates (5 and 6) and inside said cam ring (7), said rotor having radially extending vane slots (3) in an outer peripheral surface thereof with vanes (4) being radially slidably mounted in said vane slots (3), said vanes (4) defining a plurality of working chambers between each pair of adjacent vanes (4) and outer radial edges of said vanes slidably contacting said cam surface of said cam ring (7);

an inlet opening 13 in said front plate (5), said inlet opening being located in said suction zone for communicating said working chambers (12) with an inlet port, when said working chambers (12) are in said suction zone, and feeding fluid from said inlet port into said working chambers (12);

a plurality of outlet openings (22 and 22A) in said front plate, said outlet openings being located in said pressure zone for communicating said working chambers (12) with an outlet port, when said working chambers are in said pressure zone, and delivering pressurized fluid from said working chambers (12) into said outlet port;

a plurality of feed passages (20) in said front plate (5) communicating said outlet port with an inner radial portion of each said vane slot (3), for pressurizing said inner portion of said vane slots (3) and urging said vanes (4) radially outward and maintaining said vanes (4) in contact with said cam surface; wherein

a valve disc (23), having a plurality of resilient tongues (25, 25A), is mounted to said front plate on a side of said front plate that is remote from said rotor (2), said tongues resiliently seal each of said outlet openings for preventing reflux of pressurized fluid delivered to said outlet port back into said working chambers (12); and

a plurality of control slots (21) in an outer peripheral surface of said rotor that define a plurality of teeth (36) around the circumference of said rotor (2), each said tooth contains one of said vane slots and supports one of said vanes (4), and a width of each said tooth (36) is wider than each said outlet opening (22, 22A), whereby each said outlet opening can only communicate with one of said-working chambers (12) at a time.

5,466,136

SCROLL COMPRESSOR HAVING A GAS LIQUID SEPARATOR

Sadayuki Yamada, Ootsu; Shigeru Muramatsu, Kusatsu; Takeshi Hashimoto, Kyoto, and Hiroyuki Fukuhara, Ootsu, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 26, 1994, Ser. No. 233,799

Claims priority, application Japan, Apr. 26, 1993, 5-099172

Int. Cl.[6] F01C *1/04*

U.S. Cl. 418—55.6 **6 Claims**

1. A scroll compressor, comprising:

a closed container accommodating compressor means;

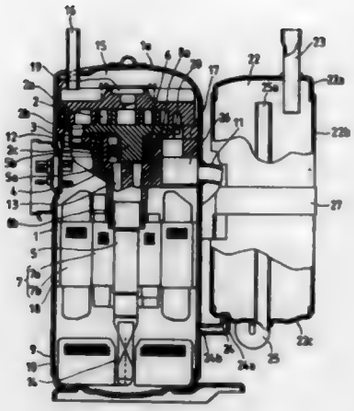
said compressor means including a stationary scroll, a movable scroll meshing with said stationary scroll, a crank shaft causing an eccentric revolving motion of said movable scroll with respect to said stationary scroll, and bearing means supporting said crank shaft;

an electric motor associated with said crank shaft, said electric motor including a rotor connected with said crank shaft and a stator secured to said closed container;

an oil storage provided at a lower part of said closed container for reserving lubricating oil;

a gas-liquid separator connected to said closed container;

an intake gas connecting pipe having one end connected to said closed container at a portion spaced from the lower part of said closed container and the other end connected to said gas-liquid separator; and



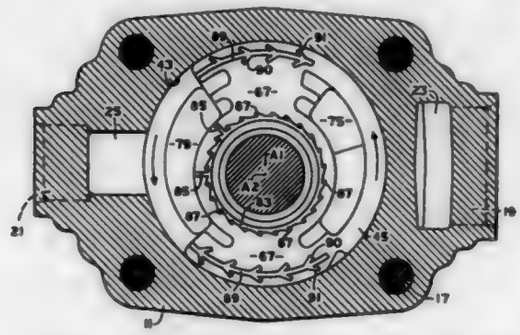
a connecting pipe having one end connected to a bottom part of said gas-liquid separator and the other end connected to the vicinity of said oil storage.

5,466,137

ROLLER GEROTOR DEVICE AND PRESSURE BALANCING ARRANGEMENT THEREFOR

John C. Bierlein, Shelby Township, Mich.; Wayne B. Wenker, Minnetonka, and Jerry L. Yobo, Eden Prairie, both of Minn., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 15, 1994, Ser. No. 306,802
Int. Cl.[6] F01C *11/13;21/00*
U.S. Cl. 418—75 **13 Claims**



1. A rotary fluid displacement mechanism of the type comprising housing means defining a fluid inlet port and a fluid outlet port; a gear set operably associated with said housing means and including a first rotor and a second rotor, each of said first and second rotors defining teeth whereby rotation of said rotors defines an expanding volume chamber in fluid communication with said fluid inlet port and a contracting volume chamber in fluid communication with said fluid outlet port; said housing means defining a first wear surface disposed axially adjacent a first axial end surface of said first and second rotors, and in sealing engagement therewith; characterized by:

(a) said first wear surface cooperating with one of said first and second rotors to define a first generally annular fluid passage in fluid communication with one of said fluid inlet port and said fluid outlet port;

(b) said first wear surface further defining a first plurality of fluid grooves, each of said fluid grooves being in fluid communication with said first annular fluid passage at least a terminal portion of each of said fluid grooves being disposed to be adjacent said first axial end surface of one of said first and second rotors, as said rotors rotate;

(c) each of said terminal portions of said fluid grooves becoming progressively shallower in the direction of rotation of said one of said rotors; and

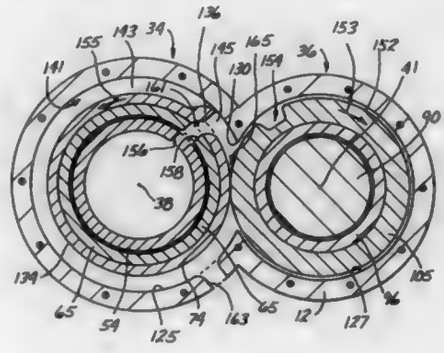
(d) said first fluid passage, said first plurality of fluid grooves, and said terminal portions thereof, being disposed adjacent said first axial end surface of said first and second rotors, and blocked thereby from direct fluid communication with said expanding and contracting volume chambers.

5,466,138

EXPANSIBLE AND CONTRACTIBLE CHAMBER ASSEMBLY AND METHOD

Mark A. Gennaro, 27795 Abadejo, Mission Viejo, Calif. 92692

Filed Jul. 22, 1993, Ser. No. 95,413
Int. Cl.[6] F01C *21/00*
U.S. Cl. 418—188 **16 Claims**



1. Apparatus defining an expansible/contractible chamber, including:

a housing including a first housing portion having a first axis and an inner surface with a first radius, and a second housing portion having a second axis and an inner surface with a second radius;

a first chamber wall disposed on one side of the first and second housing portions;

a second chamber wall disposed on an opposing side of the first and second housing portions;

a first stationary shaft extending along the first axis between the first chamber wall add the second chamber wall;

a second stationary shaft extending along the second axis between the first chamber wall and the second chamber wall;

a third shaft rotatable relative to the first stationary shaft within the first housing portion and about the first axis;

a fourth shaft rotatable relative to the second stationary shaft within the second housing portion and about the second axis;

a rotor having a fixed relationship with the third shaft and rotatable with the third shaft about the first axis, the rotor having an outer surface with a third radius less than the first radius of the first housing portion;

a block having a fixed relationship with the fourth shaft and rotatable with the fourth shaft about the second axis, the block having an outer surface with a fourth radius less than the second radius of the second housing portion;

a vane disposed on the rotor and defining with the outer surface of the rotor, the inner surface of the first housing portion, the outer surface of the block, the first chamber wall and the second chamber wall, a chamber having a volume variable with the angular position of the rotor relative to the housing;

portions of the block defining a recess sized and configured to receive the vane of the rotor;

means for introducing a fluid into the chamber; and

means for exhausting the fluid from the chamber.

5,466,139

VULCANIZER

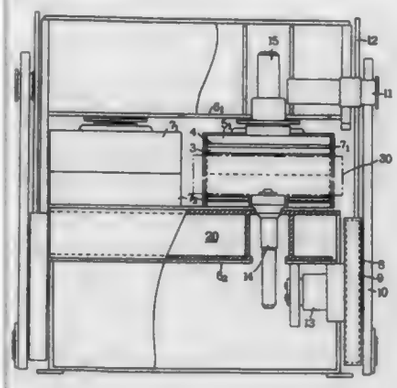
Yoshitada Komatsubara, Ageo, Japan, assignor to Bridgestone Cycle Co., Ltd., Japan

Filed Jul. 13, 1994, Ser. No. 275,044

Claims priority, application Japan, Jul. 14, 1993, 5-043448 U

Int. Cl.[6] B29C *35/02*

U.S. Cl. 425—35 **5 Claims**



1. In a vulcanizer comprising:

an upper mold;

a lower mold disposed below said upper mold so as to correspond to said upper mold;

an upper frame for supporting said upper mold;

a lower frame for supporting said lower mold; and

an opening and closing mechanism which opens and closes, and tightens said upper and lower molds by vertically sliding said upper frame via a link connecting said opening and closing mechanism and said upper frame, and which is provided on the side of said lower frame in a vicinity of said upper and lower molds, wherein the improvement comprises:

a platform placed between said lower mold and said lower frame, said platform having a height sufficient to raise the level of the lowermost point of said lower mold higher than the uppermost point of said opening and closing mechanism, but not affecting the spatial relationship between said upper and lower molds.

5,466,140

TIRE PRESS WITH IMPROVED SEGMENTED MOLD OPERATOR

Donald C. Imler, Volant, Pa., and Dirk A. Keller, Salem, Ohio, assignors to National Feedscrew & Machining Industries, Inc., Massillon, Ohio

Continuation of Ser. No. 58,468, May 6, 1993, abandoned. This application Oct. 25, 1994, Ser. No. 328,611

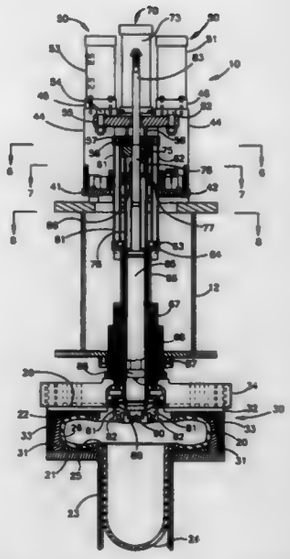
Int. Cl.[6] B29D *30/06*

U.S. Cl. 425—38 **8 Claims**

1. An operating mechanism for a tire press that includes a fixed lower side wall mold, a movable upper side wall mold having a central axis and a segmented tread mold assembly, said molds and mold assembly having a closed position that defines a molding cavity, mold carrier means for moving said upper side wall mold and said segmented tread mold assembly from said closed position to an open tire discharge position and a forming bladder adapted to be inflated within an uncured tire carcass positioned within the molding cavity; said mechanism comprising:

bearing sleeve means coaxial with said central axis and fixedly mounted on said mold carrier means;

an outer tubular operating sleeve slidably received in said bearing sleeve means and extending therethrough, the outer sleeve having a lower end: said outer sleeve being operatively connected to said segmented tread mold assembly at the lower end thereof;



a plurality of first reciprocating drive means mounted on said mold carrier means and symmetrically spaced about said central axis;

crosshead means connected to all of said reciprocating means and adapted to be moved linearly thereby along said central axis, said crosshead means being operatively connected to said outer sleeve;

an elongated inner tubular operating member slidably received in said outer sleeve and extending therethrough;

a second reciprocating drive means mounted on said crosshead means and operatively connected to said inner member for moving said inner member relative to said outer tubular operating sleeve along said central axis;

another tubular sleeve slidably received within said tubular inner member, said other tubular sleeve being adapted, when extended downwardly along said central axis, to engage said forming bladder and force said bladder from the interior of a tire in said molding cavity;

fluid pressure means including fluid passage means within said other tubular sleeve, for moving said other sleeve axially within said tubular inner member;

chuck means operatively mounted on said lower end portion of said tubular inner member; and

means mounted on the lower end of said other tubular sleeve and engageable with said chuck means for operating said chuck means in response to axial movement of said other tubular inner sleeve relative to said tubular inner member.

5,466,141

DEVICE FOR INJECTION MOLDING ARTICLES OF PLASTICS MATERIAL WHICH CONTAIN HOLLOW SPACES

Helmut Eckardt, Meinerzhagen; Jürgen Ehritt, Hilchenbach, and Michael Renger, Meinerzhagen, all of, Germany, assignors to Battenfeld GmbH, Meinerzhagen, Germany

Continuation of Ser. No. 911,268, Jul. 7, 1992, which is a continuation of Ser. No. 607,233, Oct. 31, 1990, abandoned. This application Jun. 13, 1994, Ser. No. 258,914

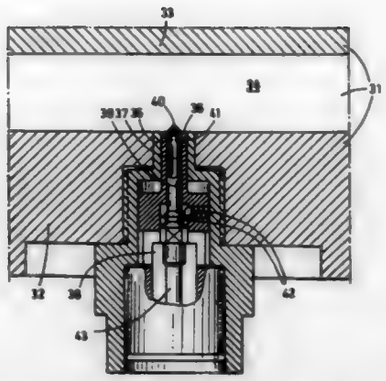
Claims priority, application Germany, Nov. 1, 1989, 39 36 289.2

Int. Cl.[6] B29C *45/20*

U.S. Cl. 425—130 **6 Claims**

1. A device for injection molding of articles of plastics material having hollow spaces, comprising:

a molding tool having a mold cavity for receiving the plastics material and an opening for introducing a low viscosity plastic material melt into said mold cavity;



means for introducing a pressurized medium into said mold cavity, said introducing means comprising:

a hollow needle for extending into the mold cavity, at a location spaced from the introducing opening and having a free end thereof washed with the plastic material melt;

a needle core mounted within the hollow needle, and defining therewith a variable size outlet aperture at the free end of said hollow needle for introducing the pressurized medium into said mold cavity;

means for displacing said needle core and said hollow needle relative to each other for varying the size of the variable size outlet aperture; and

a body having a first length portion extending from the free end of the hollow needle and an inner diameter along the first length portion corresponding to the outer diameter of the needle core, so that the hollow needle and the needle core have sliding contact along the first length portion;

said body having a second length portion extending from an end of the first length portion remote from the free end of the hollow needle and having a second inner diameter selected such that a radial gap is maintained between the hollow needle and the outer diameter of the needle core, the needle core having a core body which extends from its free end to the second length portion of the hollow needle and has, on an outer surface thereof, at least one longitudinally extending recess for conducting the pressurized medium from the radial gap to the variable size opening.

5,466,142

TWO-COMPONENT EXTRUSION HEAD, HAVING A SPINNERET WITH HIGH PERFORATION DENSITY

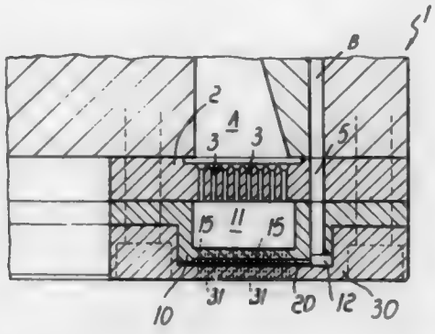
Mario Miani, Via E. Fermi 9, 20017 RHO (Province of Milan), Italy

Filed Sep. 30, 1993, Ser. No. 128,413

Claims priority, application Italy, Jan. 19, 1992, MI92A2396

Int. Cl.[6] D01D *4/06;5/30*

U.S. Cl. 425—131.5 **8 Claims**



1. Extrusion head for two-component threads comprising;

a distribution plate (**10**) having a center and a periphery;

a spinneret (**30**);

a transit region (**21**) defined between said distribution plate (**10**) and said spinneret (**30**);

a first tank (**11**) defined by said distribution plate (**10**) for containing a first component (A) of a two-component thread;

a plurality of distribution holes (**15**) formed in said distribution plate (**10**) and extending from said tank (**11**) to said transit region (**21**);

an annular tank (**12**) defined by said distribution plate (**10**) surrounding said distribution holes for containing a second component (B) of a two-component thread;

a plurality of radial passages (**20**) defined on said distribution plate and extending at right angles with respect to said distribution holes (**15**), said radial passages (**20**) extending from said annular tank (**12**) and through said transit region (**21**) between said distribution plate (**10**) and said spinneret (**30**), said radial passages communicating with said transit region, and;

a plurality of extrusion holes (**31**) formed in said spinneret (**30**) and communicating with said transit region (**21**) for extrusion of two-component threads;

wherein said extrusion holes (**31**) are formed in said spinneret with a perforation density of from 10 to 200 extrusion holes (**31**) per square centimeter, and wherein said radial passages (**20**) are spaced from said distribution holes (**15**) by a circumferential distance which decreases from said periphery towards said center of said distribution plate (**10**), whereby progressive pressure drop occurring as fluid (B) passes radially along any of said radial passages (**20**) towards the center of said distribution plate (**10**) is compensated by a progressively smaller circumferential distance separating each of said radial passages (**20**) from said distribution holes (**15**).

5,466,143

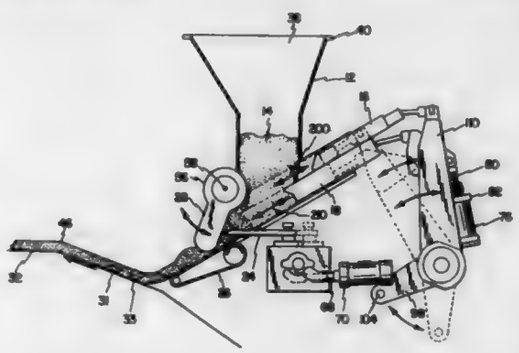
DOUGH SHEET FORMER WITH CLOSED LOOP CONTROL

Minoru Suzuki, and Yoshikazu Iguchi, both of Kanagawa, Japan, assignors to Oshikiri Machinery Ltd., Japan

Filed Sep. 29, 1993, Ser. No. 128,519

Int. Cl.[6] A21C *3/04*

U.S. Cl. 425—140 **21 Claims**



14. A dough extruder for extruding a sheet of dough, comprising:

a hopper for holding dough to be extruded;

a plurality of rams, independently reciprocable within a chamber, the chamber having an entrance for receiving dough from the hopper and an exit, reciprocation of the rams driving the dough from the entrance out the exit to form the sheet of dough;

a driver, coupled to the rams, for driving reciprocation of the rams;

a sensor, coupled proximate the exit, for sensing a characteristic of the sheet of dough and generating sensor signal based on the characteristic sensed; and

a controller, coupled to the sensor and the driver, for receiving the sensor signal and controlling the driver based on the sensor signal.

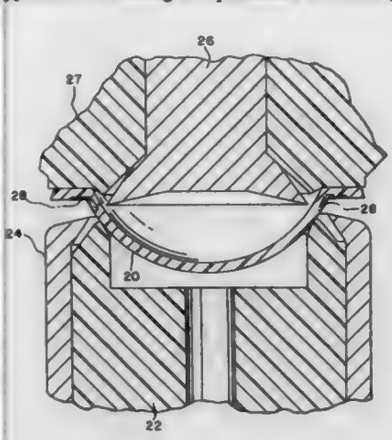
5,466,144

APPARATUS FOR TREATING AN OPHTHALMIC LENS MOLD

Jonathan P. Adams, Jacksonville; Edmund C. Rastrelli, and John C. Heaton, both of Atlantic Beach, all of Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Division of Ser. No. 992,884, Dec. 21, 1992, Pat. No. 5,326,505. This application Mar. 30, 1994, Ser. No. 220,079
Int. Cl.[6] B29D *11/00*
U.S. Cl. 425—174.4 1 Claim

1. An apparatus for treating an ophthalmic lens mold,



wherein the mold has a surface energy which indicates whether materials will adhere to a surface of the mold,

wherein the mold comprises at least two separable pieces,

wherein each mold piece has a first surface and a second surface opposite the first surface,

wherein a lens may be molded between the mold pieces by inserting a lens material therebetween and curing it, and

wherein excess lens material forms and cures adjacent the lens, the apparatus comprising:

a. means for increasing the surface energy of at least one of the lens mold pieces by directing electrons thereto, comprising:

1. an electrode proximate the first surface of the mold piece to be treated,

2. a counter-electrode on or near the second surface of the mold piece to be treated, and

3. a source of electrical power with a voltage about or greater than 10 kV at a frequency about or greater than 20 kHz, the source electrically connected to the electrode and the counter-electrode, and

b. means for directing said electrons toward a portion of the first surface of at least one mold piece, wherein the lens is separated from the excess lens material by preferentially retaining the excess lens material to the mold piece having electrons directed thereto.

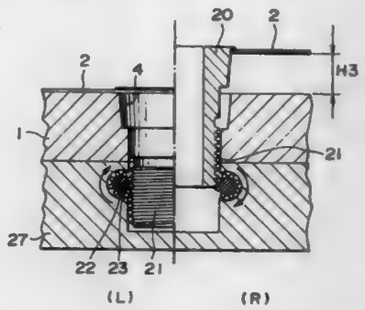
5,466,145

DISC BASE BOARD MOLDING DIE INCLUDING STAMPER PLATE ATTACHING/DETACHING DEVICE

Mitsuo Takahashi, Matsudo, Japan, assignor to Seikoh Giken Co., Ltd., Matsudo, Japan

Filed Mar. 16, 1994, Ser. No. 213,574
Claims priority, application Japan, Apr. 23, 1993, 5-120464
Int. Cl.[6] B29C *45/00*
U.S. Cl. 425—190 11 Claims

1. In a disc base board molding die including a stamper plate



attaching and detaching device wherein a stamper plate is firmly placed on a die cavity located in a die assembly, the cavity having a sectional shape corresponding to a disc base board to be molded, each disc base board being molded by injecting a molten synthetic resin into said die cavity, the improvement comprising;

a stamper plate attaching and detaching bush linearly received in and removed from a bush fitting hole formed in one of a stationary die half and a movable die half, said stamper plate attaching and detaching bush including a first end part having a flange portion for removably holding said stamper plate around an outer periphery thereof, and a second opposite end part having a rack, said rack including a plurality of annular gear teeth formed therearound,

an actuating rod arranged in a tangential relationship relative to a center axis of said stamper plate attaching and detaching bush for linearly displacing said stamper plate attaching and detaching bush by rotating said actuating rod with an operator's hand, said actuating rod including a pinion gear at an end portion thereof to mesh with said rack of said stamper plate attaching and detaching bush, and

a lock nut having a plurality of female threads formed therein for immovably holding said actuating rod during a series of molding operations.

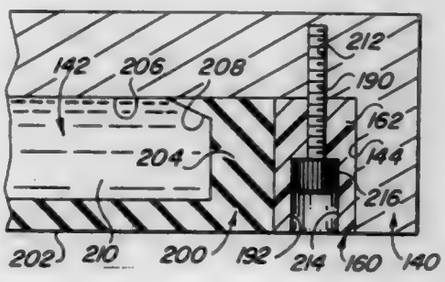
5,466,146

HYDROFORMING PLATEN AND SEAL

Michael L. Fritz, 2440 E. Dahlia, Phoenix, Ariz. 85032, and Alton L. Fritz, 12121 N. 83rd Ave., Peoria, Ariz. 85345

Continuation of Ser. No. 905,766, Jun. 29, 1992, abandoned. This application May 6, 1994, Ser. No. 239,258
Int. Cl.[6] B29C *59/00*
U.S. Cl. 425—389 12 Claims

1. Apparatus for hydroforming sheet material in conformance



with a mold having contours, said apparatus comprising in combination:

a) a platen having a cavity formed therein adjacent a face of said platen, said cavity including a bottom surface and a circumscribing sidewall;

b) means for pumping hydraulic fluid into said cavity;

c) a table for supporting the mold and the sheet material placed upon the mold:

d) a diaphragm at least partially located in and extending into said cavity for containing the hydraulic fluid in said cavity, said diaphragm being flexibly responsive to the hydraulic fluid pumped into said cavity and into contact with said diaphragm to develop a pressure within said cavity to cause said diaphragm to form the sheet material in conformance with the contours of the mold;

e) means for sealing said diaphragm with said cavity to prevent seepage of hydraulic fluid intermediate said diaphragm and said circumscribing sidewall of said cavity; and

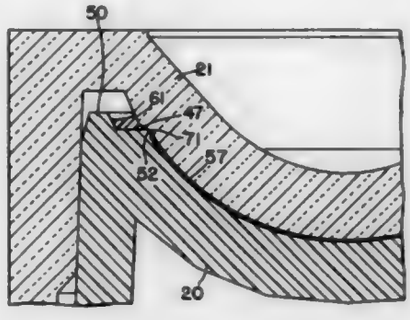
f) said sealing means including a sealing member circumscribing said diaphragm, said sealing member comprising a plurality of rails disposed within said cavity adjacent said circumscribing sidewall of said cavity and conforming with the adjacent surfaces of said cavity and said circumscribing sidewall of said diaphragm.

5,466,147

APPARATUS FOR MOLDING LENSES

William J. Appleton; Dennis Hahn, both of Rochester; William E. Moucha, Bergen; Dominic V. Ruscio, Webster; John H. Shannon, Hamlin; Steven D. Silbermann, Rochester, and Edwin W. Weaver, Jr., Caledonia, all of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Division of Ser. No. 758,046, Sep. 12, 1991, Pat. No. 5,271,875.
This application Sep. 29, 1993, Ser. No. 128,930
Int. Cl.[6] B29C *39/28;39/40*
U.S. Cl. 425—412 **40 Claims**



1. A mold assembly for molding lenses comprising first and second mold sections having respective first and second mold cavity defining surfaces forming a mold cavity therebetween, and cooperating centering means provided for each of said first and second mold sections,

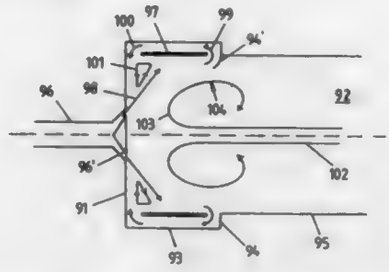
wherein the first mold cavity defining surface of the first mold section terminates in a deformable, encircling peripheral rim, and the second mold cavity defining surface terminates in a reversely angled deformable mating surface disposed at a diameter corresponding to said peripheral rim.

5,466,148

LOW NOX COMBUSTOR

Gustaaf J. Witteveen, Stationsstraat 41, 6584 AS Molenhoek, Netherlands

Filed Nov. 19, 1993, Ser. No. 154,547
Claims priority, application Netherlands, Nov. 20, 1992, 9202022; Feb. 3, 1993, 9300213
Int. Cl.[6] F23L *7/00*
U.S. Cl. 431—116 **7 Claims**



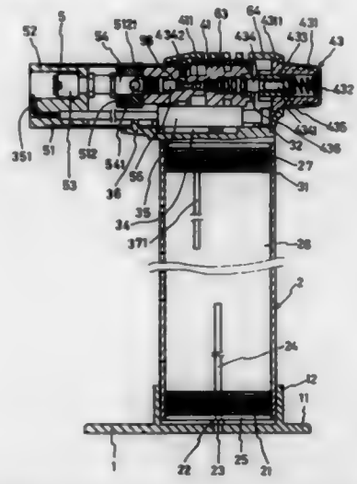
1. Combuster having a flame room having a cylindrical outer wall and provided with a cylindrical guiding element spaced from said cylindrical outer wall to form a back flow passage, said flame room having an end wall with a central opening provided with feed means for a combustible fuel mixture, a conical member located adjacent said central opening forming the combustible fuel mixture into a hollow conical flow directed at said cylindrical guiding element thus causing recirculation of gases through said back flow passage and a central back flow of gases within said hollow conical flow of combustible fuel mixture.

5,466,149

HEATING TORCH

Chin-Lin Tsai, 3F, No. 94, Sec. 4, Chung Hsin Rd., San Chung City, Taipei Hsien, Taiwan, Prov. of China

Filed Feb. 2, 1995, Ser. No. 382,628
Int. Cl.[6] F23D *14/28*
U.S. Cl. 431—344 **6 Claims**



1. An improved heating torch including a barrel for containing fuel gas, a top mounting on said barrel, a gas release device mounted on said top mounting, a flame device mounted on said top mounting, and a casing unit mounted on said top mounting and covering said gas release device,

said gas release device comprising a gas core seat, a laterally oriented pressure regulating valve seat and a switch seat, said gas core seat being a hollow tubular structure connecting said flame device to said switch seat, a socket arranged on a side of said gas core seat to which said pressure regulating valve

seat is connected, said pressure regulating valve seat being connected to a gas outlet in the top mounting via a soft tube and a connecting shaft, said pressure regulating valve seat being further connected to a relay connector insertably disposed in a connecting hole of a pressure regulating seat, said pressure regulating seat accommodating two copper sheets and a pressure regulating sponge held therebetween for controlling the pressure of fuel gas, said pressure regulating seat being laterally and threadably connected to a control core and a control cap which is exposed on said casing unit, so that turning said control core moves it forward or backward for controlling the opening or closing of said connecting hole, thereby regulating the fuel gas flow, the other side of said pressure regulating seat being connected to said socket on the side of said gas core seat; and

said switch seat comprising a switch core shaft having an E-ring thereon, an end of said switch core shaft passing into a hole of a switch rotor and secured therein with a securing screw, said switch core shaft and said gas core seat being threadably engaged so that a switch end of said switch core shaft extends beyond said socket in said gas core seat, a switch button lockingly engaged for turning with said switch rotor so that turning said switch button controls the opening or closing of said socket for controlling the flow of gas, and said switch button is adapted for slidable movement on said switch rotor for igniting said flame device by a button rim thereof pressing against a piezoelectric ignition device disposed adjacent said switch seat.

5,466,150

SAGGER WALL FOR A RING PIT FURNACE

Gernot Albersdörfer, Lauf, and Reiner Swoboda, Eckental, both of, Germany, assignors to Riedhammer GmbH und Co. KG, Nuremberg, Germany

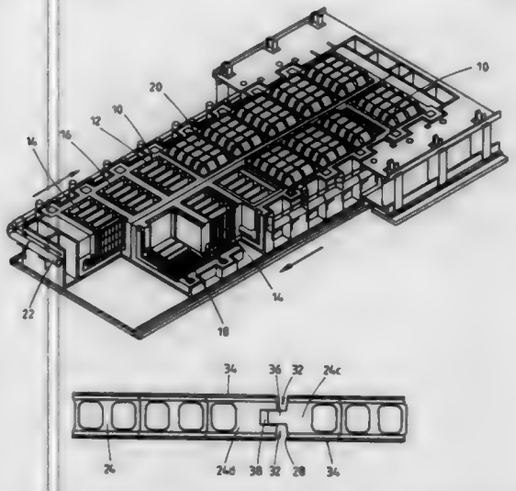
PCT No. PCT/DE92/00298, § 371 Date Dec. 8, 1993, § 102(e) Date Dec. 8, 1993, PCT Pub. No. WO92/22780, PCT Pub. Date Dec. 23, 1992

PCT Filed Apr. 12, 1992, Ser. No. 157,187

Claims priority, application Germany, Jun. 12, 1991, 41 19 320.2

Int. Cl.[6] F27B *7/00*

U.S. Cl. 432—192 **8 Claims**



1. Modular wall composed of a plurality of segments for a modular furnace, wherein at least some of the segments have openings which complement one another to form vertically extending, continuous flue gas channels when said segments are placed in position to form said modular wall,

wherein at least two adjacent segments along each horizontal row of segments form an expansion joint, said adjacent segments comprising complementing front surface profiles having a surface parallel to the plane of the wall and a surface transverse to the plane of the wall, said front surfaces being constructed and arranged to overlap at their parallel surfaces to form a closed connection area in the direction at right angles to the plane of the wall, and constructed and arranged to form expansion spaces between opposed transverse surfaces, the width of said expansion spaces expanding in the direction proceeding outwardly from said parallel surfaces to the outer surface of said adjacent elements.

5,466,151

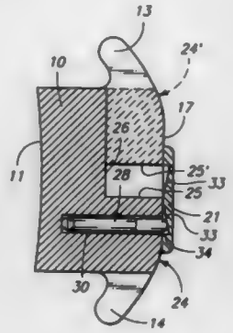
SPRING-LOCKED ORTHODONTIC BRACKET

Dwight H. Damon, Spokane, Wash., assignor to Damon Family Limited Partnership, Spokane, Wash.

Continuation-in-part of Ser. No. 140,690, Oct. 20, 1993, Pat. No. 5,429,500, which is a continuation of Ser. No. 45,529, Apr. 8, 1993, Pat. No. 5,275,557. This application Jun. 28, 1994, Ser. No. 267,188

Int. Cl.[6] A61C *3/00*

U.S. Cl. 433—10 **40 Claims**



1. A self-locking orthodontic bracket, comprising:

a bracket base having a posterior surface adapted to be bonded to a tooth;

a bracket projecting anteriorly from the bracket base;

the bracket including an anterior surface interrupted by an opening leading to an archwire slot;

a movable cover having a posterior surface overlapping the anterior surface of the bracket;

opposed guides on the cover that slidably support it on opposed side surfaces of the bracket for alternately positioning the cover in a first position clear of the archwire slot or a second position spanning the archwire slot;

the bracket having a recess open to its anterior surface;

a resilient flat spring mounted within the recess, the spring having a protruding section normally positioned beyond the anterior surface of the bracket;

the posterior surface of the cover including an indentation sized and positioned to receive the protruding section of the spring, the cover being releasably maintained in one of its first or second positions by engagement of the protruding section of the spring within the indentation.

5,466,152

METHOD FOR CREATING A DENTAL MODEL

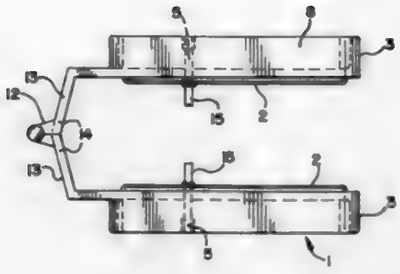
Jose Walter, Fairfax, Va., assignor to Accu Bite Dental Supply Company, Williamston, Mich.

Filed Nov. 2, 1993, Ser. No. 144,558

Int. Cl.[6] A61C *11/00;19/00*

U.S. Cl. 433—60 **20 Claims**

1. A dental articulator for creating a pinned model of a patent's mandibular and maxillary dental arches from previously made negative impression molds the articulator comprising:



mandibular and maxillary tray support members, each mandibular and maxillary tray support member having raised opposite ends, raised side walls, and a bottom, thereby forming a recessed body into which a casting material may be poured,

a hinge means for connecting the two tray support members at one of their ends leaving the other end free to rotate about the hinge means with respect to each other,

a plurality of indexing holes passing through the mandibular and maxillary tray support members,

indexing pins having head and a base portion which is placed in the indexing holes of the mandibular and maxillary tray support members,

the base portion of the pin retained in the tray support member and the head of the pin protruding into the casting material, and

positioning means on the maxillary and mandibular tray support members for accurately and precisely placing the impression molds onto the tray support members,

whereby the base portion of the indexing pins are inserted into selected indexing holes, casting material is poured into either the maxillary and mandibular tray support members or the negative impression mold, the maxillary and mandibular support tray members are then placed over the negative impression mold, the casting material allowed to harden with the pins therein, such that when the hardened casting material is removed from the tray support members, the indexing pins are retained in the casting material coinciding exactly with the indexing holes on the tray support members.

5,466,153

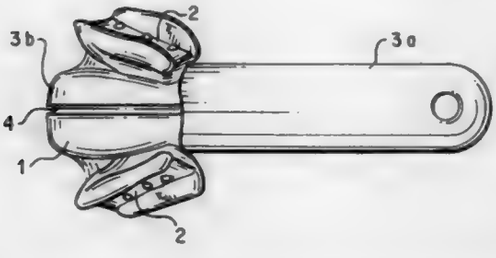
PROP FOR USE IN DENTISTRY AND ORAL SURGERY

Forrest R. Poindexter, 7729 Jewelweed Ct., Springfield, Va. 22152

Continuation-in-part of Ser. No. 824,159, Jan. 22, 1992, abandoned. This application Mar. 16, 1994, Ser. No. 213,729

Int. Cl.[6] A61C *5/00*

U.S. Cl. 433—140 **17 Claims**



1. A prop comprising a bite block having an anterior surface and two bite surfaces and an elongated portion that extends from said anterior surface of said bite block wherein said elongated portion is deflected to provide a turn of about 180°.

5,466,154

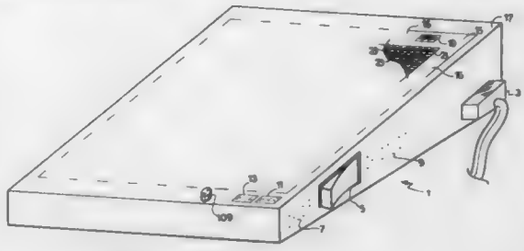
BRAILLE BOARD WITH MOVABLE DOT PINS

James M. Thompson, 12961 S. Indian River Dr., Jensen Beach, Fla. 34957-2225

Filed Jul. 26, 1993, Ser. No. 95,545

Int. Cl.[6] G09B *21/00*

U.S. Cl. 434—114 **6 Claims**



1. A braille board display device comprising:

data input means for accessing alpha-numeric information from an outside source;

data conversion means for translating said alpha-numeric information into at least one page of braille text, each of said at least one page of braille text containing one-thousand braille cell locations configured into forty columns of cells across and twenty-five lines of cells down, each of said cells having a plurality of dot pin locations to represent one alpha-numeric character, said data conversion means utilizing the maximum number of cells per line in accordance with the last word which will fit on that line; and means for displaying said at least one page of braille text;

said means for displaying includes a braille board reading surface portion having a plurality of apertures therethrough, each of said plurality of apertures being located through said braille board reading surface portion at each of said dot pin locations for each of said one thousand braille cells, a plurality of dot pins, each one thereof being located within each of said plurality of apertures, said plurality of dot pins having a lowered state residing below said braille board reading surface portion and a raised state wherein a portion thereof resides a predetermined distance above said braille board reading surface portion, a plurality of actuators, each one thereof being connected to each one of said plurality of dot pins for selectively placing each one thereof into said raised and lowered states;

each of said plurality of actuators includes a solenoid having a solenoid winding located about a permanently magnetized actuating rod, one of said plurality of dot pins being located at a top end thereof, and a flanged stop being located at a bottom end thereof, each of said solenoids of each of said plurality of actuators being soldered to a top portion of a first circuit board such that a first lead of each of said solenoid windings have a connection to a first set of solder connections of said first circuit board and a second lead of each of said solenoid windings have a connection to a second set of solder connections of said first circuit board, said first circuit board further having a plurality of holes therethrough for allowing a bottom portion of each of said permanently magnetized actuating rods to pass through one of said plurality of holes such that each of said flanged stops connected to the bottom ends of each of said permanently magnetized actuating rods abut a portion of a bottom portion of said first circuit board located about each of said holes when the dot pin connected to the top end of each of said permanently magnetized actuating rods is in said raised state, each of said dot pins abutting a top portion of one of said solenoid windings when located in said lowered state;

each of said first solder connections having a first prong lead in electrical communication therewith, each of said first prong

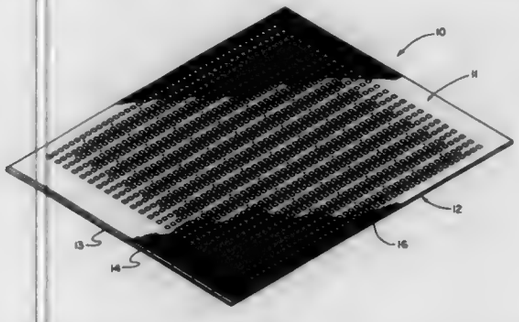
leads extending down from said first circuit board a first predetermined distance to form an electrical communication between said first circuit board and a second circuit board, each of said second solder connections having a second prong lead in electrical communication therewith, each of said second prong leads extending down a second predetermined distance through said second circuit board to form an electrical communication between said first circuit board and a third circuit board.

5,466,155

LAPTOP BRAILLE SLATE

Susan K. Fay; Frank J. Fay, both of 966 S. Garfield St., and C. Don Weston, 120 N. Dudley St., all of Macomb, Ill. 61455

Filed Mar. 10, 1994, Ser. No. 208,368
Int. Cl.[6] G09B *21/02*
U.S. Cl. 434—115 **6 Claims**



1. A laptop braille slate comprising:

a first plate having a first plate first end spaced from a first plate second end, said first plate having a matrix of openings directed through the first plate, with each of the openings of the matrix including six relief gaps, the relief gaps being oriented so as to extend in aligned spaced and parallel columns of three relief gaps within each column and to extend in aligned spaced and parallel rows of two relief gaps within each row, the relief gaps each being shaped so as to define a semi-circular edge extending about a portion of a periphery of the respective opening;

a second plate having a second plate first end spaced from a second plate second end, the second plate having a second plate top surface, with a matrix of cells directed into the top surface, with each cell of the matrix of cells having six cell recesses, the cell recesses being oriented so as to extend in aligned spaced and parallel columns of three cell recesses within each column and to extend in aligned spaced and parallel rows of two cell recesses within each row, the cell recesses each being shaped so as to define a circular upper edge, with each cell recess arranged for alignment with an individual one of said relief gaps such that the semi-circular edge of each relief gap is aligned with and positioned directly above a portion of an arc of the circular upper edge of a corresponding one of the cell recesses; and,

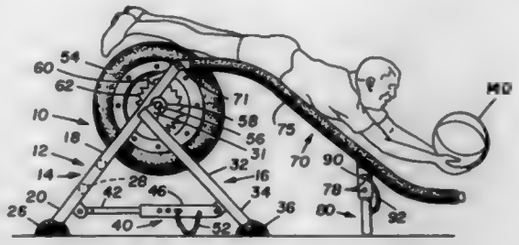
a hinge mounted to the first plate first end and the second plate first end to permit pivoting of the first plate relative to the second plate, with the first plate arranged in a coextensive contiguous communication with the second plate when the first plate is in contact with the second plate in a first position, with the first plate spaced from the second plate in second position to receive a paper web therebetween and wherein said first plate first end and said second plate second end are mutually coextensive.

5,466,156

DEVICE FOR TEACHING VOLLEYBALL HITTING TECHNIQUES

Angel L. P. Ramirez, 2815 Holiday Dr., Huntsville, Ala. 35805

Filed Sep. 26, 1994, Ser. No. 312,039
Int. Cl.[6] A63B *69/00*
U.S. Cl. 434—247 **15 Claims**



1. A device for assisting in the instruction of persons learning techniques associated with playing volleyball, said device comprising:

a frame having an upper section, an intermediate section and a lower section;

a curved support means;

means for securing said curved support means to said frame; and

a slide having an upper end section, an upper intermediate section, a lower intermediate section and a lower section, said upper end section being pivotally secured to said upper section of said frame.

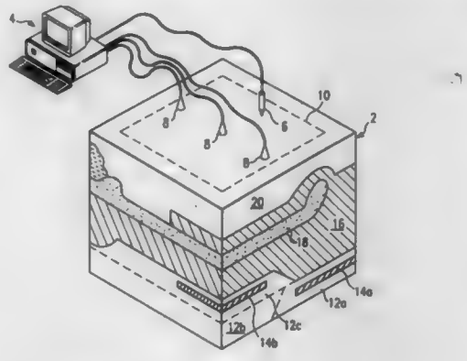
5,466,157

METHOD OF SIMULATING A SEISMIC SURVEY

Gerald J. Henderson; Peter C. Johnson, and Lawrence B. Sullivan, all of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation of Ser. No. 714,272, Jun. 12, 1991, abandoned. This application Feb. 2, 1995, Ser. No. 384,356
Int. Cl.[6] G01V *1/00*
U.S. Cl. 434—299 **16 Claims**

1. A method of constructing a model of the earth for simulating



a seismic survey, comprising:

storing, in a computer data base, information corresponding to a plurality of model layers;

fabricating said plurality of model layers from said stored information, first and second ones of said plurality of model layers being in solid form and having acoustic velocities differing from one another; and

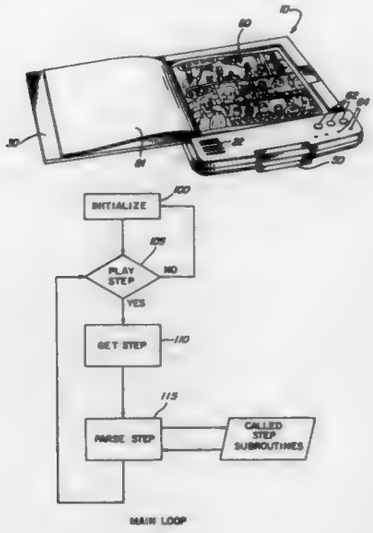
after the fabricating step, stacking said plurality of model layers, including said first and second ones of said plurality of model layers, in a preselected order.

5,466,158
INTERACTIVE BOOK DEVICE

Jay Smith, III, 348 Bentel Ave., Los Angeles, Calif. 90049

Filed Feb. 14, 1994, Ser. No. 196,023
Int. Cl.[6] G09B 5/00
U.S. Cl. 434—317 29 Claims

1. An interactive system for allowing a reader to have interactions with a printed comic book, the interactions being determined according to a story depicted in the book and the interactions affecting an outcome of the story, the system comprising:



a base unit having a plurality of switches assembled in an array and means for providing audio output of varying frequencies from audio signals;

a comic book having a plurality of pages positioned to overlay the array of switches, at least some of the pages having indicia correspondingly arrayed to coordinate with specific switches of the array so that the reader can activate a specific switch by interacting with the corresponding indicium; and

control means for determining a sequence of switches according to the story and responsive to an activation of the sequence of switches to enable a series of outputs associated with a specific switch, the outputs including audio signals for the audio output means to output.

23. A method of providing interactive responses between a reader and a story presented in printed materials for maintaining proper synchronization between the responses so that the reader progresses in a predetermined direction through the materials, and for allowing the reader to alter an outcome of the story, the method comprising the steps of:

providing a surface divided into a plurality of locations and capable of producing signals which can be used for detecting physical interaction with said surface and for detecting at which location on said surface the physical interaction occurs;

specifying which locations will produce a response upon physical interaction with said locations and specifying what the response will comprise;

overlaying a first printed page of a book on the surface, the page presenting a Story and having at least one region delineated to accept reader interaction;

using the surface to detect when and at what location the reader interacts with the first page; and

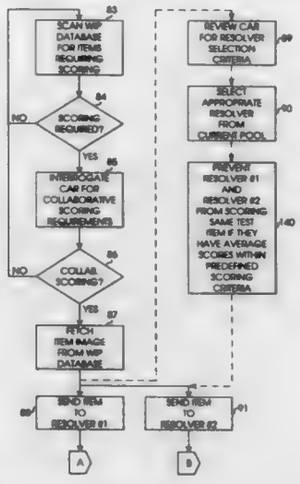
producing a predetermined response to the interaction, said response including specifying which subsequent location will produce a response upon physical interaction with said location so that the reader must move in one direction through the pages of the book and so that the reader's response will affect the outcome of the story.

5,466,159
COLLABORATIVE AND QUALITY CONTROL SCORING SYSTEM

Jay V. Clark, West Liberty; William L. Bramlett, Jr., Swisher, and Judith Moyer, Iowa City, all of Iowa, assignors to National Computer Systems, Inc., Eden Prairie, Minn.

Division of Ser. No. 14,176, Feb. 5, 1993. This application Aug. 12, 1994, Ser. No. 290,019
Int. Cl.[6] G09B 3/00
U.S. Cl. 434—322 12 Claims

1. A system for verifying test answers between two or more test resolvers, the system comprising:



a) first receive means for electronically receiving an answer to a test question, the answer comprising an electronic representation of at least a portion of a test answer sheet;

b) transmit means for electronically transmitting the answer to first and second test resolver terminals to be scored by first and second test resolvers;

c) second receive means for electronically receiving first and second test scores for the answer, as determined by the first and second test resolvers, from the first and second test resolver terminals; and

d) verification means for electronically comparing the first and second test scores and for selectively recording a value related to the first and second test scores if the first and second test scores did not contain a discrepancy based on predefined criteria.

5,466,160
SURFACE MOUNT TYPE RECEPTACLE OF COAXIAL CONNECTOR AND MOUNTING ARRANGEMENT FOR MOUNTING RECEPTACLE OF COAXIAL CONNECTOR ON SUBSTRATE

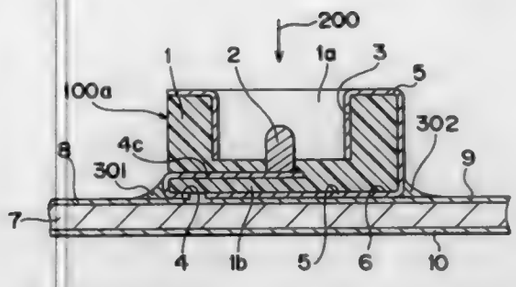
Hiromi Ogura, Ishikawa, Japan, assignor to Murata Mfg. Co., Ltd., Japan

Filed Nov. 7, 1994, Ser. No. 335,043
Claims priority, application Japan, Nov. 8, 1993, 5-303460
Int. Cl.[6] H01R 9/09
U.S. Cl. 439—63 12 Claims

1. A surface mount type receptacle of a coaxial connector mounted on a substrate having a hot-line pattern conductor and a top earth pattern conductor formed on a top surface of said substrate, and a bottom earth pattern conductor formed on a bottom surface of said substrate, said receptacle comprising:

a case of an electrically insulating material having a top surface, side surfaces and a bottom surface to be mounted on the top surface of the substrate, said case having a concavity formed so as to extend from the top surface of said case toward a center of said case;

an inner conductor arranged in said concavity of said case;



an outer conductor arranged in said concavity of said case;

at least one hot-line terminal formed in said case so as to be electrically connected to said inner conductor and extend from said inner conductor through the side surface of said case to the bottom surface of said case; and

an earth terminal formed in said case so as to be electrically connected to said outer conductor and extend from said outer conductor to the bottom surface of said case, said earth terminal having a main portion thereof provided in said case so as to oppose to the bottom surface of said case;

wherein said earth terminal is formed on the bottom surface of said case between a main portion of said hot-line terminal and the top surface of said substrate so as to decrease an area where said hot-line terminal opposes to said bottom earth pattern conductor when said receptacle is mounted on the top surface of said substrate.

5,466,161

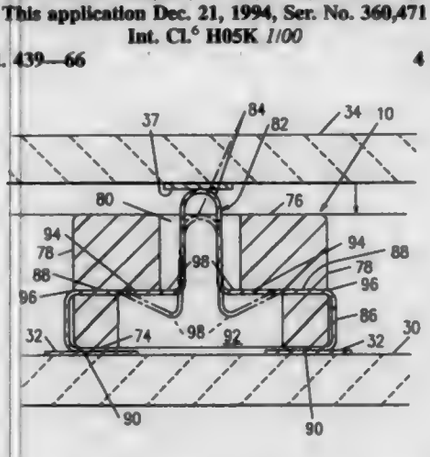
COMPLIANT STACKING CONNECTOR FOR PRINTED CIRCUIT BOARDS

George Yumibe, Huntington Beach; Paul Gratzinger, Moreno Valley; Thanh Nguyen, Pomona, and Duane Wisner, Riverside, all of Calif., assignors to Bourns, Inc., Riverside, Calif.

Division of Ser. No. 131,257, Oct. 1, 1993, Pat. No. 5,378,160. This application Dec. 21, 1994, Ser. No. 360,471

Int. Cl.[6] H05K *1/00*

U.S. Cl. 439—66 **4 Claims**



1. A device for electrically connecting a first plurality of conductors on a first printed circuit board to a second plurality of conductors on a second printed circuit board, comprising:

a housing having a mounting surface configured to be mounted on the first printed circuit board, an exposed surface opposite the mounting surface, and at least one opposed pair of side walls extending between the mounting surface and the exposed surface, the side walls each having an interior wall surface;

a plurality of channels opening through the exposed surface, each of the channels having an interior defined between the interior wall surfaces of the side walls; and

a plurality of compliant contact elements mounted in the housing, each of the contact elements formed as an integral conductive element, comprising:

a first end portion disposed adjacent to the mounting surface so as to establish electrical contact with one of the first plurality of conductors when the housing is mounted on the first printed circuit board;

a lead portion extending from the first end portion along an adjacent one of the side walls toward the exposed surface and then through the adjacent side wall and the interior wall surface of that wall into the interior of an adjacent one of the channels;

a supporting portion extending within the interior of the adjacent one of the channels; and

a substantially finger-shaped portion having at least one side flexibly joined to the supporting portion, the finger-shaped portion having a rounded tip and extending outwardly from the adjacent one of the channels beyond the exposed surface so as to establish electrical contact between the tip and a corresponding one of the second plurality of conductors when the second printed circuit board is located adjacent to the first printed circuit board.

5,466,162

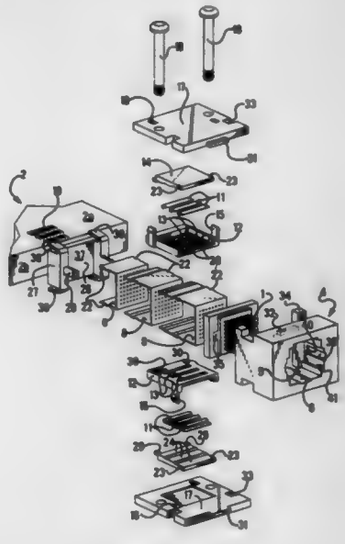
REMOVABLE HIGH DENSITY CONNECTOR

Richard C. Schroepfer, Thompsontown, and Tracy L. Smith, Harrisburg, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Sep. 30, 1993, Ser. No. 129,826

Int. Cl.[6] H01R *9/09*

U.S. Cl. 439—79 **9 Claims**



1. An electrical connector comprising:

overlapping layers of flexible film insulated from each other, each said layer carrying electrically conductive traces, and each said layer having differing and sufficient length to make individual contact with connection pads on a printed circuit board surface,

connector pins passing through said layers,

selective electrical connections between said pins and said traces,

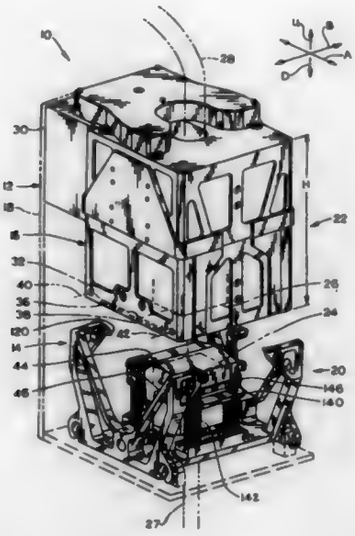
cylindrical elastometric bodies having parallel spaced apart conductors thereon, and

a quality of said bodies corresponding to the quantity of said layers wherein, said conductors simultaneously engage said traces and said pads.

5,466,163
UMBILICAL MECHANISM

Daniel R. Barron, Huntington Beach; Vytas Jasulaitis, Los Angeles, and Brion F. Morrill, Huntington Beach, all of Calif., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.

Filed Apr. 6, 1994, Ser. No. 223,650
Int. Cl.[6] H01R *13/44*
U.S. Cl. 439—138 **10 Claims**



1. Apparatus for automatically mating a pair of connectors, comprising:

a housing that includes lower and upper housing parts and a connecting structure that connects said housing parts, and lower and upper connectors coupled to corresponding ones of said housing parts, said lower and upper connectors having corresponding mating ends facing in largely vertical mating directions toward each other at least in an initial position of said apparatus;

a motor device;

a carrier mounted on said upper housing part, said motor device being coupled to said carrier to move said carrier largely vertically toward and away from said first housing part between an initial position and a fully mated position, with said upper connector coupled to said carrier to move substantially with said carrier;

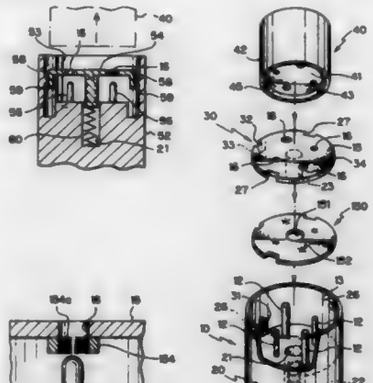
a plurality of force-transmitting pin and socket elements mounted on said housing parts, with said elements arranged in engagable pairs, with the different elements of each pair coupled to different ones of said housing parts;

at least one movable member which is movably mounted on said upper housing part and which is coupled to said carrier, with one element of each of a plurality of said pairs mounted on said movable member, said at least one movable member being movable between an initial position wherein the elements of said pairs lie away from each other when said carrier is in said initial position, and a second position wherein the elements of said pairs of elements engage one another, with said movable member reaching said second position prior to said carrier reaching said fully mated position, with said pin and socket elements being spaced about said connectors, and with each pair of engaged elements having abutting locations facing at least partially in said mating and unmating directions to transfer at least some mating reaction forces through said at least one movable member between said first and second housing parts.

5,466,164
CONNECTOR HAVING A PROTECTIVE HOOD

Sho Miyazaki; Hisashi Konoya; Yoshihiro Tanaka; Mitsuhiro Fujitani, and Kazumoto Konda, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Filed Mar. 7, 1994, Ser. No. 207,360
Claims priority, application Japan, Mar. 9, 1993, 5-076134; Mar. 31, 1993, 5-098556
Int. Cl.[6] H01R *13/453*
U.S. Cl. 439—140 **10 Claims**



1. A connector wherein a plurality of male terminals is provided on the interior of a hood adapted to receive a female connector having a plurality of female terminals comprising:

a lid plate provided with a plurality of terminal through-holes through each of which one of said male terminals can pass, said lid plate received in said hood movably in the inserting and detaching directions;

said lid plate being biased toward a protection position in which said lid plate covers an open end of said hood;

said lid plate being restrained from falling off said hood;

a positioning device for locating said lid plate when it is at said protection position in the hood so that said terminal through-holes face said male terminals;

said lid plate having, on a peripheral edge, two resilient locking fingers each with an arcuate cross section and extending inwardly, each said resilient locking finger being provided on its outer face with a groove extending parallel to said male terminals, said groove having a stop shoulder at its end,

a connector body of said connector having an arcuate groove for receiving said resilient locking fingers, a compression coil spring in said arcuate groove in said connector body, said compression coil spring biases the distal end of said resilient locking fingers so that said lid plate is biased toward said protection position,

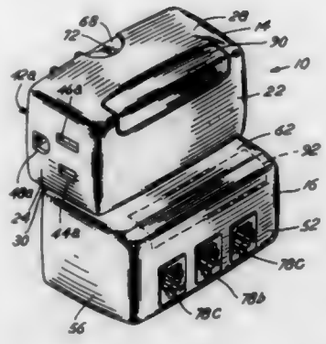
a limit projection on the inner periphery of said arcuate groove, said limit projection engaging said groove in said resilient locking finger to prevent said lid plate from rotating in said hood and permit said lid plate to move in a direction parallel to said male terminals, said limit projection preventing said lid plate from falling off said hood when said stop shoulder abuts said limit projection.

5,466,165
PORTABLE OUTLET ADAPTER

George F. W. Boesel, Canton, Mass., and Mark W. Geis, Carmel, Ind., assignors to Woods Industries, Inc., Carmel, Ind.

Continuation of Ser. No. 178,127, Jan. 6, 1994, abandoned. This application Mar. 13, 1995, Ser. No. 402,547
Int. Cl.[6] H01R *13/44*
U.S. Cl. 439—142 **17 Claims**

1. A portable outlet adapter for use with a standard electrical plug having a plurality of blades, comprising:



a housing having first and second exterior faces, at least one electrical outlet mounted in said housing and presenting outlet apertures on said first exterior face, said electrical outlet being adapted to receive the blades of a standard electrical plug;

an electrical plug mounted in said housing and having at least two electrical prongs extending from said second exterior face, said electrical prongs being adapted to deliver electricity to said electrical outlet; and

a prong cover rotatably connected to said housing and being pivotally movable between a first position at which said prong cover encloses said prongs and a second position at which said prongs are exposed and insertable into a powered outlet.

5,466,166

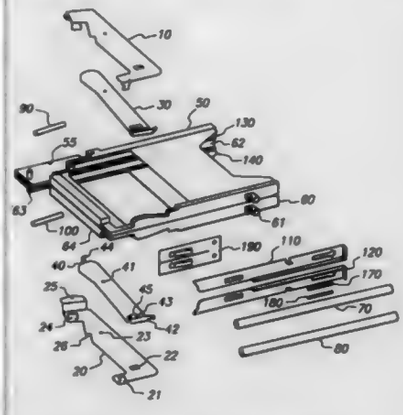
EJECTION MECHANISM

David Law, Burlingame; Dennis Boyle, Palo Alto, and Matt Herron, Menlo Park, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Aug. 13, 1993, Ser. No. 107,185

Int. Cl.[6] H04R *13/62*

U.S. Cl. 439—159 **12 Claims**



1. An ejection mechanism for ejecting electronically active cards from a housing capable of holding at least one electronically active card, the housing having a first card slot for inserting electronically active cards and a rear end having at least one connector for coupling the electronically active card to a computing device, the ejection mechanism comprising:

a first lever arm mounted on the housing by a first pivot, the first lever arm pivoting about the first pivot towards the rear end as an electronically active card is inserted into the first card slot;

a first ejection spring coupled to the housing and the first lever arm, the first ejection spring being tensioned as the electronically active card is inserted into the first card slot;

a second lever arm, the second lever arm being mounted on the first lever arm by a second pivot, the second lever arm pivoting about the second pivot;

a severable coupling mounted on the first and second lever arms, the severable coupling holding the first and second lever arms together as an electronically active card is inserted into the housing;

a latch mounted on the housing, the latch releasably engaging the second lever arm when the electronically active card has coupled with the connector; and

means for severing the severable coupling, the means for severing the coupling being triggered by a user of the computing device, the severing of the coupling allowing the first lever arm to pivot about the first pivot, forcing the electronically active card towards and out of the first card slot.

5,466,167

SELF-TERMINATING PHONE PLUG AND METHOD OF MANUFACTURE

John Scherer, 720 Serena Dr., Pacifica, Calif. 94044

Division of Ser. No. 856,353, Mar. 23, 1992, Pat. No. 5,238,422. This application Mar. 11, 1993, Ser. No. 29,684

Int. Cl.[6] H01R *29/00*

U.S. Cl. 439—188 **7 Claims**

1. An armature for a switch to be used in combination with an electrical plug having an outer tubular shaft member and a coaxial inner cylindrical shaft member, comprising in combination;

an electrically conductive strip of a length sufficient to span the distance between inner shaft member and the outer shaft member: and

a split ring securing member having a pair of opposing arcuate legs integrally connected to one end of said strip wherein the diameter of said split ring securing member is less than the diameter of the inner shaft such that it is necessary to spread apart the arcuate legs to fit around the inner shaft.

5,466,168

PLUG CONNECTOR WITH SHORT-CIRCUIT BRIDGE

Ernst Liebich, Geltendorf/Hausen; Rony Van Houdenhove, München; Miroslav Smoravek, Seefeld, and Richard Flieger, Stammham, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 30, 1994, Ser. No. 219,779

Claims priority, application Germany, Sep. 30, 1991, 9112178 U

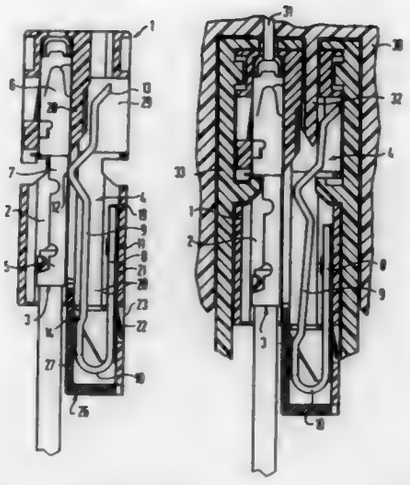
Int. Cl.[6] H01R *29/00*

U.S. Cl. 439—188 **20 Claims**

1. A plug connector, comprising:

a housing being made of insulating material and having contact chambers and an outer wall with an inner surface; contact elements being disposed in said contact chambers in a row and having a terminal region, a contact region and a transitional region being formed as a contact region between

said terminal region and said contact region; at least one contact spring disposed in a row parallel to said contact elements, each contact spring connecting two of said contact elements with one another as a short-circuit bridge and including a spring base resting on said inner surface of said outer wall and at least one freely yielding contact leg having a projection in the form of a contact point being aimed at said contact elements, said projection resting contactingly directly on said transitional region of two of said contact elements, said contact leg having one end with a bend having a U-shaped cross section and being connected to said spring base, and said



contact leg having a free end and defining a lever arm between said projection and said free end; and

a plug body being made of insulating material and having a row of contact pins or contact blades to be inserted into said contact elements and a contact breaker element made of insulating material in a row parallel to said row of contact pins for each short-circuit bridge;

said contact breaker element lifting a contact spring from said interconnected contact elements when said housing and said plug body are coupled together, and said contact breaker element being introduced into said housing at said free end of said contact leg and being thrust onto said lever arm at a point forward of said contact point, for pressing said lever arm and said free end to the side during the coupling and lifting said projection from said transitional region.

5,466,169

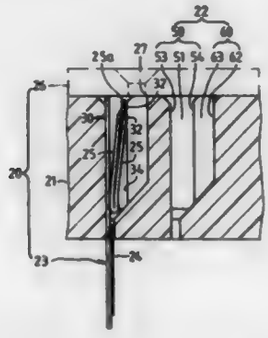
ZERO INSERTION FORCE SOCKET

Kuang-Chih Lai, No. 2, Lane 10, Sheng-Li Street, Tu-Cheng, Taiwan, Prov. of China

Filed Aug. 3, 1994, Ser. No. 285,151

Int. Cl.[6] H01R *13/62*

U.S. Cl. 439—264 **4 Claims**



1. A zero insertion force socket comprising:

a socket housing having multiple insertion holes, each of said insertion holes including:

a first insertion space having a front wall, first and second locating walls lying on a common plane opposite to said front wall and separated from each other, a first side wall one side of which adjoins one side of said front wall and the other side of which adjoins one side of said first locating wall, and a second side wall one side of which adjoins the other side of said front wall and the other side of which adjoins one side of said second locating wall; and

a second insertion space adjacent to and communicating with said first insertion space through an opening defined between said first and second locating walls, said second insertion space having a back wall opposite to said front wall, a third side wall one side of which adjoins the other side of said first locating wall while the other side of which adjoins one side of said back wall, and fourth side wall one side of which adjoins the other side of said second locating wall while the other side of which adjoins the other side of said back wall;

a movable plate having multiple through holes corresponding to said insertion holes of said housing respectively, said movable plate being disposed over said housing and slidable along a surface of said housing in specified directions between a released position and a locked position by a lever means; and

multiple contacts installed in said insertion holes of said housing respectively, each of said contacts including an insertion leg and an elastic engaging portion extending from said insertion leg, on two sides of a free end of said elastic engaging portion being formed two stopping portions, a width of said elastic engaging portion at said stopping portions being larger than a width of said opening while smaller than a distance between said first and second side walls, whereby said two stopping portions are adapted to abut against said first and second locating walls respectively and in a free state, a normal distance between said free end of said elastic engaging portion and said insertion leg is larger than a distance between said front wall of said first insertion space and said locating walls so that after said contact is inserted into said first insertion space, said elastic engaging portion is biased against as well as pre-loaded and accurately located by said first and second locating walls of said first insertion space so as to accurately exert a sufficient contacting pressure on a contact terminal of a device inserted in said second insertion space and moved toward said first insertion space when the device is positioned on the socket and moved by said lever means.

5,466,170

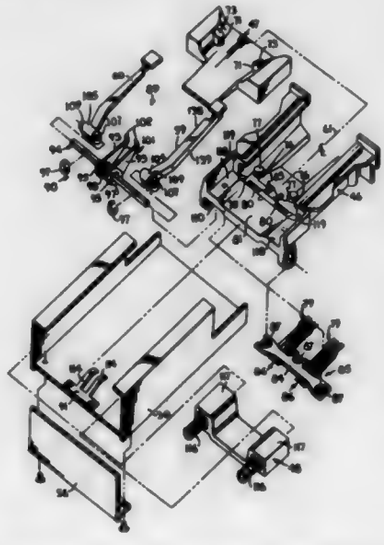
END-INSERTION DATA TERMINAL DOCK WITH POSITIVE DATA TERMINAL LOCK AND BOUNCE-PREVENTING CONTACT ENGAGEMENT BIAS

John G. Pavek, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Filed Nov. 2, 1993, Ser. No. 146,882

Int. Cl.[6] H01R *13/64*

U.S. Cl. 439—374 **13 Claims**



1. An end-insertion docking device for a data collection terminal comprising:

a docking channel having an insertion opening at an insertion end thereof and having a retention end opposite the insertion end, the docking channel having a base wall and having terminal retention surface caps disposed spacedly opposite the base wall, forming a retention cavity therebetween;

an electrical spring contact assembly disposed at the retention end, the electrical spring contact assembly having spring contacts extending through the base wall of the docking channel into the retention cavity to move into electrical contact with surface contacts on a data collection terminal; and

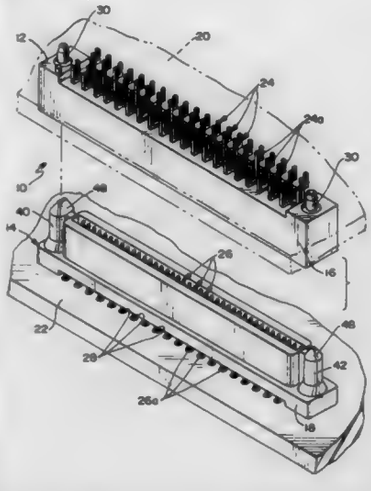
means for engaging an inserted data collection terminal when fully inserted into the retention cavity, the engaging means having means for positively latching an inserted data collection terminal into the fully inserted position and for urging an inserted and latched data collection terminal in a direction away from the spring contacts and against the retention surface caps, whereby any movement due to shock or vibration moves an inserted data collection terminal toward engagement with the spring contact to thereby eliminate contact opening between the spring contacts and surface contacts on an inserted data collection terminal.

5,466,171

POLARIZING SYSTEM FOR A BLIND MATING ELECTRICAL CONNECTOR ASSEMBLY

Graig Bixler, Elmhurst, and Richard A. Nelson, Glen Ellyn, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Sep. 19, 1994, Ser. No. 308,225
Int. Cl.[6] H01R *13/629;13/64*
U.S. Cl. 439—378 **11 Claims**



1. A polarizing system for a blind mating electrical connector assembly which includes first and second electrical connectors respectively having first and second dielectric housings mateable along a separable mating interface, with each housing being elongated and including a pair of generally parallel sides with a longitudinal axis generally midway between said sides, comprising:

a pair of polarizing posts spaced longitudinally of the first connector generally at opposite ends thereof and projecting from the first housing and being integrally formed therewith at the mating interface, the posts being centered generally on the longitudinal axis of the first housing, and one of the posts being wider than the other post in a direction normal to said longitudinal axis;

a pair of polarizing receptacles spaced longitudinally of the second connector for receiving the polarizing posts of the first connector, the receptacles being centered generally on the longitudinal axis of the second housing and being integrally formed therewith, and one of the receptacles being wider than the the receptacle in a direction normal to said longitudinal axis for receiving said one post, each receptacle being dimensioned to substantially surround its receptacle polarizing post upon mating of said first and second electrical connectors; and

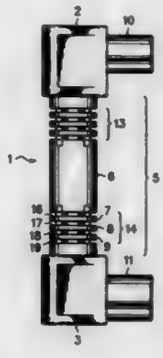
at least one of the tips of the posts and the mouths of the receptacles being bevelled to facilitate blind mating of the connectors.

5,466,172

INTER-MODULE SEMI-RIGID CABLE CONNECTOR AND CONFIGURATION OF MODULES EMPLOYING SAME

Robert J. Carstens, Phoenix; John E. Gatti, Scottsdale, both of Ariz.; Thomas M. Shoda, Foster City, and John W. Toor, Palo Alto, both of Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 14, 1993, Ser. No. 91,505
Int. Cl.[6] H01R *31/08*
U.S. Cl. 439—509 **16 Claims**



1. A cable connector for operatively coupling adjacent electrical modules comprising:

a first head member having a first set of contacts;

a second head member having a second set of contacts; and

a semi-rigid member for physically connecting said first and second head members and comprising

a cable;

a rigid member affixed to a first longitudinal section of said cable; and

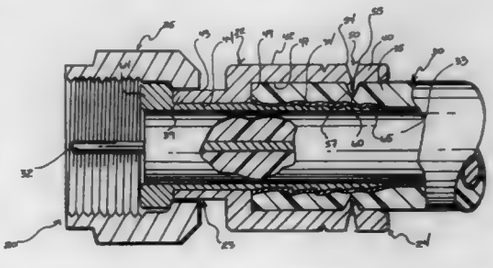
a flexible member affixed to a second longitudinal section of said cable.

5,466,173

LONGITUDINALLY COMPRESSIBLE COAXIAL CABLE CONNECTOR

William J. Down, 8732 W. Weldon Ave., Phoenix, Ariz. 85037

Filed Sep. 17, 1993, Ser. No. 123,006
Int. Cl.[6] H01R *9/07*
U.S. Cl. 439—584 **28 Claims**



1. A connector for securing a coaxial cable to a selected device, said connector comprising:

an outer member having a rearward end, a forward end, an outer surface and a bore defined by an inner surface, for receiving said coaxial cable; a coupling member attached to said forward end of said outer member for securing said coaxial cable to a selected device; and

securement means carried by said outer member including a compression groove being deformable in a substantially uniformly radially inward direction, forming a continuous annular seal, mechanically and sealingly engaging said coaxial cable in response to a longitudinal compressive force.

5,466,174

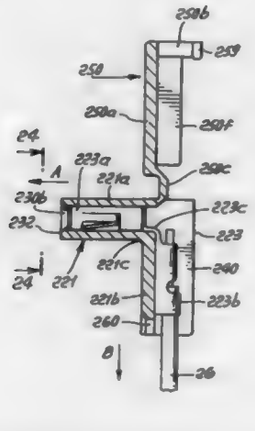
APPARATUS TO CONNECT LEDS AT DISPLAY PANEL TO CIRCUIT BOARD

John M. Savage, Jr., 538-B Via De La Valle, Solana Beach, Calif. 92075

Continuation-in-part of Ser. No. 82,963, Jun. 29, 1993, Pat. No. 5,368,503. This application Oct. 29, 1993, Ser. No. 142,938

Int. Cl.[6] H01R *13/506*

U.S. Cl. 439—596 **17 Claims**



1. In apparatus to connect an LED to a post of a printed circuit board, the LED having at least one terminal, the combination comprising:

a) a terminal connector having a first end connectible to the board post, and a second end electrically connectible to circuitry leading to the LED terminal,

b) said first and second ends projecting in directions A and B, respectively, where A and B define an angle less than 180°,

c) and L-shaped housing means for said terminal connector having housing extents projecting in said A and B directions, and a housing cap removably connectible to one of said housing extents,

d) said cap having removable connection with the housing extent projecting in direction B, said cap having hinge connection to an end of the housing extent projecting in direction A, and at a location spaced from said first and second ends of the terminal connector, said housing extent projecting in said B direction having a sideward opening to sidewardly expose said second terminal connector, and said housing cap being elongated to cover said sideward opening,

e) said hinge connection being in substantial alignment with a wall of said housing extent projecting in direction A, when the cap is closed to cover said sideward opening.

5,466,175

SHIELD CONNECTOR CONNECTING SHIELD CABLES

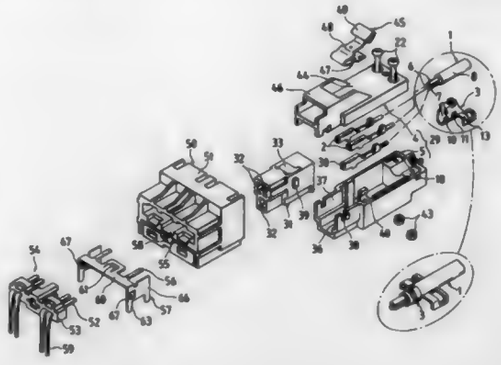
Katsuhiko Onoda, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 21,119, Feb. 23, 1993, abandoned. This application Jul. 14, 1994, Ser. No. 275,326

Claims priority, application Japan, Feb. 27, 1992, 4-009215 U; Mar. 13, 1992, 4-055275

Int. Cl.[6] H01R *9/03*

U.S. Cl. 439—610 **13 Claims**



1. A shield electrical connector which is mateable with a terminal member, comprising:

a plurality of first terminals for transmitting a signal;

a plurality of second terminals constituting grounding terminals;

a plurality of inner housings each for receiving said first and second terminals;

a plurality of first outer housings for respectively receiving said plurality of inner housings; and

a second outer housing receiving said plurality of first outer housings and said plurality of inner housings, said plurality of first outer housings being engaged with said second outer housing, wherein substantially entire surfaces of said first and second outer housings are electrically conductive and wherein said second terminals are respectively electrically coupled to said electrically conductive surfaces of said first outer housings such that said second terminals can be grounded through said first and second outer housings.

5,466,176

CABLE CLAMP WITH MOISTURE RESISTANT SHIELD AND METHOD FOR USING SAME

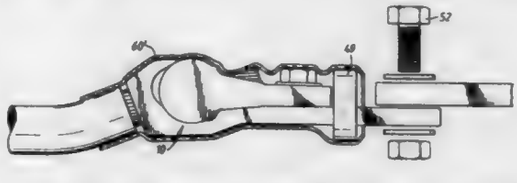
Paul A. Cornell, Waterford, and Roy K. Warner, Cork, both of, Ireland, assignors to Pan Electric Corporation, Carson City, Nev.

Filed Feb. 14, 1994, Ser. No. 195,271

Claims priority, application United Kingdom, Mar. 17, 1993, 9305487

Int. Cl.[6] H01R *4/02*

U.S. Cl. 439—789 **15 Claims**



1. A cable clamp comprising first and second jaws configured to clamp a cable in a clamping region, said first jaw having a length less than that of the second jaw, said second jaw comprising an attachment structure adapted to permit attachment of said cable clamp to an external surface, said cable clamp further comprising a shield member secured in a substantially water-tight manner to the

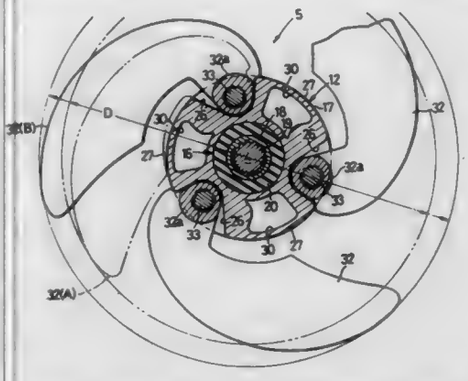
second jaw to protrude outwardly therefrom, said shield member positioned between the attachment structure and the clamping region and comprising a sealing surface, said shield member having a circumference defining a sealing surface positioned radially outwardly with respect to the attachment structure, whereby in use the clamping structure may be provided with a cover sealed to said shield member to inhibit moisture penetration into a clamped cable.

5,466,177

VARIABLE PROPELLER FOR BOAT

Takao Aihara; Taro Fukuda, and Hideaki Takada, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1994, Ser. No. 364,203
Claims priority, application Japan, Dec. 27, 1993, 5-331600
Int. Cl.[6] B63H *3/00*
U.S. Cl. 440—50 **3 Claims**



1. A variable propeller for a boat, comprising a propeller shaft supported on a body of a propelling device to project rearwardly of said body and a propeller boss rotatably disposed around said propeller shaft, said propeller shaft being connected to said propeller boss through a torque limiting device which produces a slipping if said device receives a torque equal to or more than a predetermined value, said propeller boss having a plurality of propeller blades displaceably mounted thereon, wherein

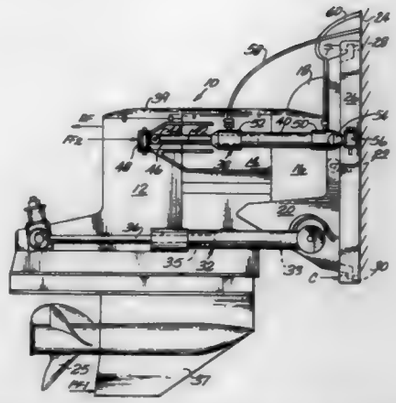
said torque limiting device and the propeller boss are disposed in concentrically superposed relation about the propeller shaft, the propeller boss is provided with a plurality of recesses whose bottom surfaces are arranged circumferentially in proximity to the torque limiting device, and a boss for each of said propeller blades is rotatably supported, in the recess, by a blade shaft carried by both front and rear end walls of the recesses in parallel to the propeller shaft such that a propeller diameter is variable.

5,466,178

LOAD-RELIEVING EXTERNAL STEERING SYSTEM FOR MARINE OUTDRIVE UNITS

Frederick R. Inman, Sr., and Frederick R. Inman, Jr., both of Glendora, Calif., assignors to Inman Marine Corporation, San Dimas, Calif.

Filed Nov. 15, 1994, Ser. No. 339,961
Int. Cl.[6] B63H *20/12*
U.S. Cl. 440—61 **23 Claims**



1. An external steering system for use with a marine outdrive unit disposed rearwardly of a transom of a vessel and comprising:

a first hydraulic steering ram attached to one side of the outdrive unit at one end and attached to an adjacent portion of the transom at an opposite end;

a second hydraulic steering ram attached to an opposite side of the outdrive unit at one end, and attached to an adjacent portion of the transom at an opposite end, wherein each first and second steering ram comprises:

a cylinder forming with a piston a front hydraulic chamber and rear hydraulic chamber;

a piston disposed partially within the cylinder, a drive end portion disposed within the cylinder which with the cylinder defines the front and rear hydraulic chambers;

means for providing hydraulic fluid at a constant pressure to each rear hydraulic chamber to cause each steering ram to impose a forwardly directed force on the outdrive unit;

means for providing hydraulic fluid at a variable pressure to a front hydraulic chamber of a predetermined steering ram to cause an outwardly directed displacement of the piston thereof from the cylinder thereof.

5,466,179

SELF INFLATABLE FLOTATION DEVICE

Lawrence W. Jeffrey, Sr., 842 E. Alosta, #18, Glendora, Calif. 91740

Filed Dec. 21, 1993, Ser. No. 172,021
Int. Cl.[6] B63C *9/08*
U.S. Cl. 441—108 **1 Claim**

1. A self inflating flotation device comprising:

a pouch having an inner compartment and a strap connected thereto for wearing the pouch about the waist of a user;

at least one elongated inflatable chamber, said chamber having a strap secured at one end to said pouch, and automatic self inflating means coupled to said chamber in fluid communication therewith for automatically inflating the same, said chamber, when in its uninflated state, and said automatic self inflating means, being receivable in the interior of said pouch;

a pair of chambers, each of said pair of chambers being in fluid communication with a manifold chamber, said automatic self inflating means being in fluid communication with said manifold chamber, and a pair of one-way valves, one of said valves being in fluid communication at one end with said manifold chamber and at the other end with one of said pair of

chambers, the other of said valves being in fluid communication at one end with said manifold chamber and at the other end with the other of said pair of chambers, each of said valves comprising a triangularly shaped chamber having an apex extending into the interior of its respective chamber with a hole therein, and a resilient member extending along the longitudinal axis thereof normally retaining said triangularly shaped chamber in a position wherein said apex is folded about itself closing off said hole therein whereby, when air passes through each of said valves from said manifold chamber, said folded apex opens to allow air to pass through said pair of chambers, said apex returning to its normal folded position when air in said chambers stabilizes.

5,466,180

PROCESS AND DEVICE FOR MAGNETIZING A MAGNET RING IN THE NECK OF A COLOR PICTURE TUBE

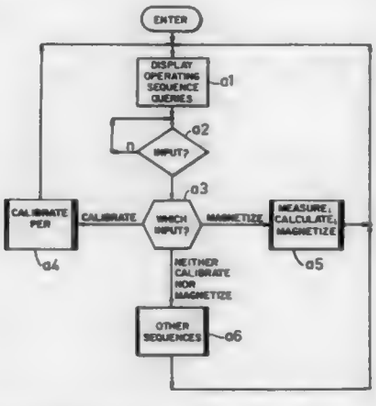
Joachim Hassler; Rudi Lenk, and Michael Neusch, all of Esslingen, Germany, assignors to Nokia Technology GmbH, Pforzheim, Germany

Filed Jun. 7, 1993, Ser. No. 72,834

Claims priority, application Germany, Jun. 13, 1992, 42 19 517.9

Int. Cl.[6] H01J 9/42

U.S. Cl. 445—3 **20 Claims**



1. Process for magnetizing a magnet ring in the neck of a color picture tube with a plurality of electron beams, hereafter called a production tube, with the said magnetization occurring by means of a magnetizing unit and comprising the following sequences:

calibrate the magnetizing unit having m coils using a calibration tube, so as to determine which currents through the magnetizing unit cause which beam displacements;

measure deviations between beam positions and reference positions;

calculate magnetizing currents for the magnetizing unit based on the measured deviations and the calibration values, so that magnetization of the magnet ring using the magnetizing currents will deflect the beams into the reference positions; and

magnetize the magnet ring using the magnetizing currents; wherein

the calibration sequence is as follows:

operate a respective coil m with a calibration current i_m, in order to generate a calibration magnetizing field;

impress the magnetic field generated by the respective coil into the magnet ring of the calibration tube by means of an auxiliary field that has essentially the same profile in time and space as one that is used to magnetize the magnet ring of a production tube;

measure the beam displacements Sn of all the electron beams for two directions perpendicular to one another, these beam displacements being produced by magnetization of the previously unmagnetized magnet ring;

calculate the adjustment sensitivity Emn for each electron beam, in each case for the two spacial directions perpendicular to one another, with $Emn=S_n i_m$;

the measurement sequence comprises measuring the beam deviations of all the beams of said production tube from a respective reference position, in the two spacial directions that are perpendicular to one another;

the calculation sequence for the magnetizing currents takes place by linear superimposition of the individual currents required, on the basis of the adjustment sensitivities, to move each of the beams into its reference position; and

the magnetization sequence is performed by

operating the coils with the calculated magnetizing currents in order to generate an applied magnetizing field; and

generating an auxiliary field whose amplitude decreases over time and whose position in time and space changes so that averaged over time, it acts essentially identically, with regard to impression of the applied magnetizing field into the magnet ring of the production tube, in all spacial directions of that field.

5,466,181

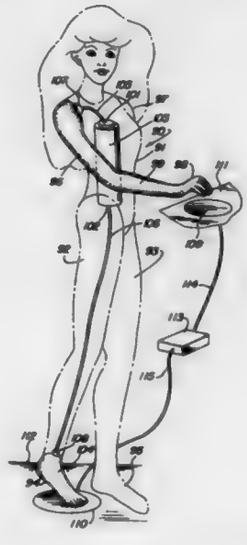
DOLL HAVING CONDUCTIVE OUTER SKIN AREAS AND INTERNAL BATTERY SUPPLY

Linda K. Bennett, Marina Del Rey, and Joseph Feldman, Los Angeles, both of Calif., assignors to Mattel, Inc., El Segundo, Calif.

Filed May 31, 1994, Ser. No. 251,156

Int. Cl.[6] A63H 3/28;33/26

U.S. Cl. 446—297 **7 Claims**



1. A doll and interactive electrical toy combination comprising:

a doll having a body defining a hand, a foot, outer surfaces and an interior cavity;

a plurality of electrically conductive areas supported upon at least a portion of said outer surfaces including a conductive area on said hand and said foot;

a battery power source supported within said interior cavity;

means for electrically coupling said battery power source to said conductive areas to provide an incomplete electrical circuit; and

an electrical toy having a plurality of electrically conductive portions and an electrically powered device coupled to said electrically conductive portions in an incomplete electrical circuit,

said doll being positionable to place said plurality of electrically conductive areas in contact with said plurality of electrically conductive portions to complete an electrical circuit between

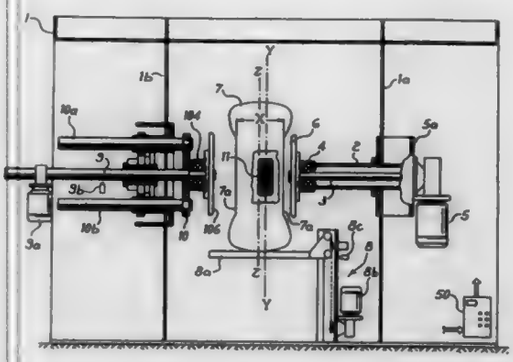
said battery power source and said electrically powered device thereby causing said electrically powered device to operate.

5,466,182

MACHINE FOR SCRAPING TIRES WITH CONTROLLABLE RELATIVE POSITIONING OF TIRE AND WORK TOOL

Giorgio Marangoni, Rovereto, Italy, assignor to Margangoni Meccanica S.p.A., Italy

Filed May 12, 1994, Ser. No. 241,497
Claims priority, application Italy, May 21, 1993, MI93A1059
Int. Cl.[6] B24B 5/00
U.S. Cl. 451—254 8 Claims



1. An automated machine for scraping tires, comprising:

a frame;

first means for handling the tire, the first handling means rotatably mounted on the frame and fixed in translation with respect to the horizontal axis of the first handling means, the first handling means thereby defining a reference point;

second means for handling the tire, the second handling means rotatably mounted on the frame and further mounted for horizontal movement along the horizontal axis of the first handling means;

a work tool movably mounted on the frame for movement in a horizontal direction parallel to the horizontal axis of the first handling means;

a tire lifting device for positioning the tire approximately between the first and second handling means;

means for actuating the horizontal movement of the second handling means toward the first handling means so as to position the vertical axis (z-z) of symmetry of the tire to be aligned with respect to the reference point and to secure the tire between the first and second handling means;

means for measuring the movement of the second handling means with respect to the reference point to provide the width dimension (x) of the tire, the measuring means also for measuring the movement of the lifting device;

means for actuating the work tool for positioning the vertical axis (y-y) of the work tool to be aligned with respect to the reference point a distance based on the measured width dimension (x) of the tire;

means for measuring the movement of the work tool; and

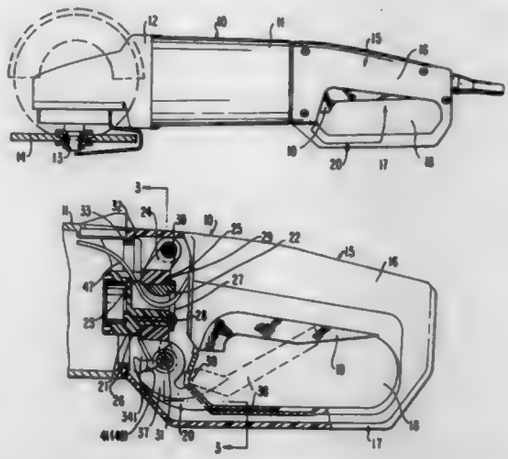
means for controlling the machine coupled to the measuring means and actuating means whereby the means for actuating the work tool positions the vertical axis of symmetry (y-y) of the work tool in superposition with the vertical axis of symmetry (x-x) of the aligned tire.

5,466,183

HAND HELD POWER TOOL WITH LOCKING ROTATABLE APPENDAGE

Manfred Kirn, Stuttgart; Erich Borst, Leinfelden-Echterdingen; Guenter Schaal, Leinfelden-Echterdingen; Manfred-Wilhelm Staebler, Leinfelden-Echterdingen, and Bernard Eicher, Filderstadt, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE91/00988, § 371 Date Jul. 23, 1993, § 102(e) Date Jul. 23, 1993, PCT Pub. No. WO92/13678, PCT Pub. Date Aug. 20, 1992
PCT Filed Dec. 18, 1991, Ser. No. 94,149
Claims priority, application Germany, Jan. 31, 1991, 41 02 838.4
Int. Cl.[6] B24B 23/00;23/02
U.S. Cl. 451—359 7 Claims



1. A hand-held power tool, comprising a device housing having a motor housing receiving an electric drive, a gear head arranged at one end of said motor housing and having a projecting drive spindle for a tool, and a handle attached to another end of said motor housing and having a switch strip for switching said electric drive on and off, said handle being rotatable relative to said motor housing around a longitudinal axis of said motor housing; a manually actuated positioning device for fixing said handle in at least two different rotational positions, said motor housing being provided with a central bearing neck, said handle being provided with a rotating cross which is received on said bearing neck so as to be rotatable and secured against axial displacement, said positioning device being formed to cause a positive-locking engagement between said motor housing and said rotating cross; a manually actuated catch lever including a locking cam at one end of the lever, the lever having a locking and an unlocking position, the lever in the locking position via the locking cam causes a positive-locking engagement between said motor housing and said rotating cross and in the unlocking position, the lever projects out of said handle, said catch lever being formed so that it covers said stirrup on a side facing said switch strip in its locking position, said catch lever being in the range of fingers of a hand of a user holding said handle and being in disengaging position blocking said handle from a gripping hand.

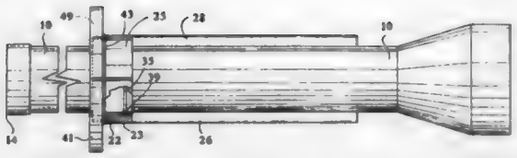
5,466,184

DEVICE FOR REMOVING SURFACE AIR IN CASINGS

Dennis J. May, Pittsboro, N.C., assignor to Delaware Capital Formation, Inc., Apex, N.C.

Filed Mar. 11, 1994, Ser. No. 212,007
Int. Cl.[6] A22C 11/00
U.S. Cl. 452—38 3 Claims

1. A product stuffing horn assembly for filling a flowable product into a flexible casing to provide a product, the product stuffing horn assembly comprising, in combination:



a stuffing horn having a product outlet end for directing product therefrom, said stuffing horn also having an outer surface, an outer diameter, and defining a longitudinal axis, said stuffing horn further having an elongated horn body which extends axially, along said longitudinal axis, for receipt of rucked casing that may be withdrawn over the product outlet end as product is discharged from the stuffing horn at the product outlet end to fill the casing;

a vacuum ring affixed to the stuffing horn body against the outer surface of the stuffing horn and spaced from the product outlet end of the stuffing horn, said vacuum ring being annular, having a face toward the product outlet end of the stuffing horn generally perpendicular to the stuffing horn axis, an outer diameter greater than the outer diameter of the stuffing horn and less than the maximum diameter over which the rucked casing may pass, and having a generally smooth circular outside surface for coacting with casing thereover to generally provide a seal therebetween, said vacuum ring having at least one vacuum passageway therethrough from the vacuum ring face toward the opposite end of the vacuum ring, said vacuum ring otherwise forming a barrier to fluid flow;

a vacuum source; and

a vacuum conduit from the vacuum passageway of the vacuum ring to the vacuum source, said vacuum conduit positioned generally against the stuffing horn body to permit rucked casing to be positioned over the vacuum conduit and stuffing horn body;

the stuffing horn, vacuum ring, vacuum source and vacuum conduit sized and cooperating such that the casing rucked on the stuffing horn body may be fitted over the vacuum ring for withdrawal at the stuffing horn product outlet end and a region is defined between the casing fitted over the vacuum ring and the stuffing horn that is subject to at least partial vacuum to thereby withdraw air and gases from the casing as it is being filled;

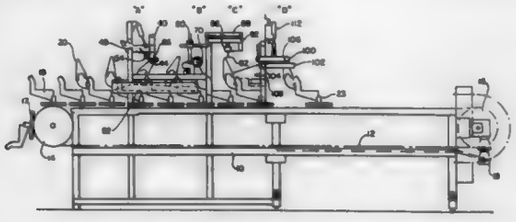
wherein the vacuum ring comprises an inner, annular member sealed on the horn comprised of first and second semi-cylindrical ring members fastened together and sealed against the outside surface of the stuffing horn, which define a land, and an outer, annular member mounted on the land and sealed to the inner, annular member.

5,466,185

REMOVING BREAST MEAT FROM POULTRY

Eugene Martin, Denver, and Scott Cook, Strasburg, both of Pa., assignors to Foodcraft Equipment Company, Lancaster, Pa.

Filed Aug. 8, 1994, Ser. No. 286,238
Int. Cl.[6] A22C *21/00*
U.S. Cl. 452—165 **23 Claims**



1. A machine for partially removing breast meat from a poultry carcass, comprising

a series of fixtures, each adapted to fit within the rib cage of a carcass,

means for moving the fixtures along a predetermined path,

a shoulder cutting device for separating the shoulder joints and a portion of the tissues surrounding the joints, while leaving each wing attached to the breast meat, and

means for peeling the breast meat from the rib cage by pulling the partially severed wings downward along the rib cage,

the shoulder cutting device including:

a pair of stationary jaws,

means for positioning the stationary jaws in the path of the respective shoulder joints of carcasses mounted on the fixtures,

a pair of curved movable jaws, each mounted for pivoting movement relative to a respective stationary jaw, each movable jaw having a beveled edge for wedging a respective shoulder joint apart as the jaws are closed,

means for pivoting the movable jaws relative to the stationary jaws to separate the joints, and

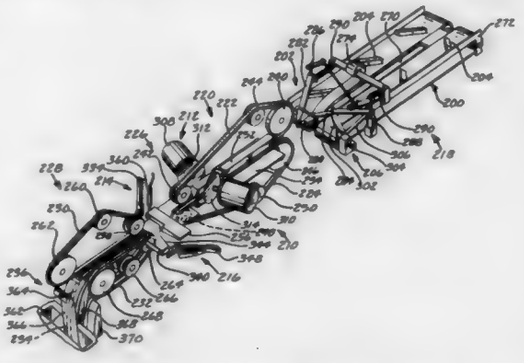
means for withdrawing the jaws from the joints following separation.

5,466,186

DEVICE FOR PROCESSING FLAT FISH

Jens Hjorth, Seattle, Wash., assignor to Royal Seafoods, Inc., Seattle, Wash.

Continuation of Ser. No. 97,966, Jul. 27, 1993, Pat. No. 5,378,194. This application Nov. 15, 1994, Ser. No. 340,149
Int. Cl.[6] A22C *25/14*
U.S. Cl. 452—170 **20 Claims**



1. An apparatus for processing a flat fish comprising:

(a) measuring means for taking one or more fish measurements as the fish is advanced in a downstream direction along a processing path and for producing an output indicative of the fish measurement;

(b) controller means for determining the approximate geometry of the fish in response to the output from the measurement means and for producing an output signal; and

(c) at least one rotating fin cutter that moves transversely relative to the processing path toward and away from the fish, following the approximate geometry of the fish to remove one or more fins of the fish in response to the output signal as the fish is advanced along the processing path.

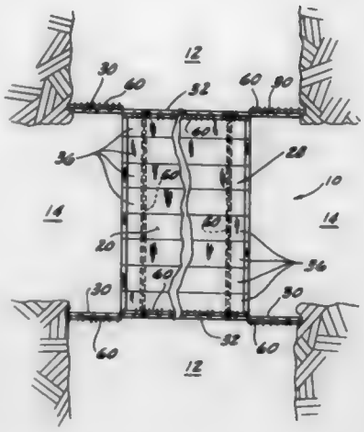
5,466,187

MINE VENTILATION STRUCTURE

John M. Kennedy, and William R. Kennedy, both of Taylorville, Ill., assignors to Jack Kennedy Metal Products and Buildings, Inc., Taylorville, Ill.

Continuation of Ser. No. 706,036, May 28, 1991, abandoned. This application Jun. 14, 1993, Ser. No. 77,128
Int. Cl.[6] E21F *1/14*
U.S. Cl. 454—169 **13 Claims**

1. A mine ventilation structure for installation at the intersection of first and second passageways in a mine, said ventilation struc-



ture defining a first passage communicating with said first passageway and a second passage communicating with said second passageway, said ventilation structure comprising,

a pair of generally parallel, spaced-apart side walls defining the side walls of said first passage,

a plurality of elongate unitary deck panels extending between the side walls and forming the roof of one of said first and second passages and the floor of the other of said first and second passages, each deck panel spanning the full distance between the side walls and being constructed to support its own weight, the weight of accumulated debris from the mine ceiling and the weight of mine personnel,

each unitary deck panel being formed as a one-piece sheet metal panel generally of inverted channel shape in transverse cross section to have a generally planar upper web and side flanges extending down from the upper web at opposite sides of the web,

the deck panels being adapted to be placed on the side walls in a side-by-side relation with the side flanges of the panels closely adjacent one another so that the webs of the panels form a substantially continuous planar surface, the deck panels so placed being capable of independently supporting their own weight, the weight of accumulated debris from the mine ceiling and the weight of mine personnel.

5,466,188

METHOD OF DECORTICATING FLAX AND A FLAX DRESSING MACHINE FOR CARRYING OUT THIS METHOD

Walter Schnal, Harsewinkel, and Horst Weigelt, Guetersloh, both of, Germany, assignors to Claas OHG, Harsewinkel, Germany

Filed Dec. 14, 1993, Ser. No. 162,171

Claims priority, application Germany, Jun. 15, 1991, 41 19 749.6

Int. Cl.[6] A01F *11/02;12/42*

U.S. Cl. 460—24 **51 Claims**

6. A flax dressing machine for decorticating a tangled mass of flax, comprising:

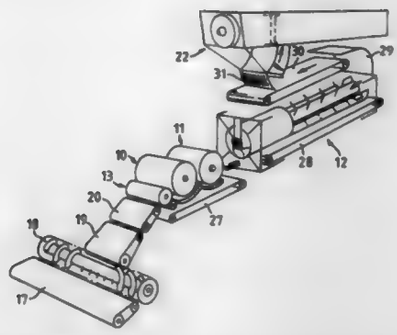
a first breaking edge located adjacent to an entrance into an interior of said flax dressing machine;

a first breaker comprising a plurality of stationary plate-shaped elements arranged to form a plurality of parallel gaps, and a plurality of rotatable plate-shaped elements forming a plurality of parallel and radially arranged gaps and being rotatable about a first axis arranged transverse to a direction of flow of the flax, each of the gaps formed by said stationary and said rotatable plate-shaped elements extending essentially in a direction of flow of the flax;

a second breaker comprising a drum rotatable about a second axis parallel to the first axis and arranged transverse to the direction of flow of the flax, said drum having a plurality of beating tools attached to an outer circumference thereof, and a peripherally arranged bottom region forming with the outer circumference a peripheral gapped region for accommodating the flax, said bottom region having a plurality of stationary rubbing tools attached thereto and cooperating with the beating tools attached to said drum, wherein one of said first and second breakers is located adjacent to said first breaking edge;

a second breaking edge located between and adjacent to said first breaker and said second breaker; and

a fine-breaking and fiber-cleaning device having an elongated rotor rotatable about at least one third axis essentially transverse to the first and second axis and extending in the direction of flow of the flax, and being comprised of means for conveying, loosening, separating, and cleaning the flax, said fine-breaking and fiber-cleaning device being located subsequent to said first and second breakers relative to the direction of flow of the flax.



5,466,189

CLEANER FOR A ROTATING SCREEN ON A HARVESTER

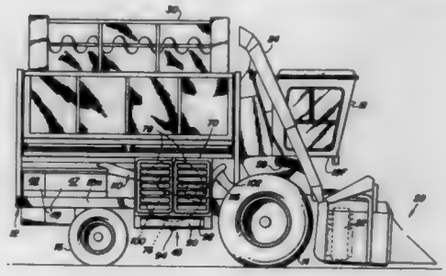
Timothy A. Deutsch, Newton, and Lowell H. Neumeyer, Des Moines, both of Iowa, assignors to Deere & Company, Moline, Ill.

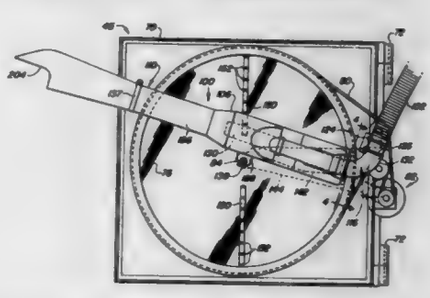
Filed Aug. 18, 1994, Ser. No. 292,667

Int. Cl.[6] A01F *12/54*

U.S. Cl. 460—100 **20 Claims**

4. In a harvester having a source of pressurized air and operating in an environment laden with material such as lint and debris, the harvester including an engine compartment with a power system in the compartment which is cooled at least in part by a flow of air,





the harvester also including a screen for separating the material from the flow of air, a cleaner for removing the material from the screen, comprising:

venturi structure connected to the source of pressurized air and having a low pressure area located adjacent the screen for vacuuming the material from the screen, the venturi structure including an outlet directing pressurized air away from the screen and propelling the material vacuumed from the screen away from the engine compartment;

a rake supported for movement relative to the venturi structure to prevent the lint and debris from clumping adjacent the venturi structure and

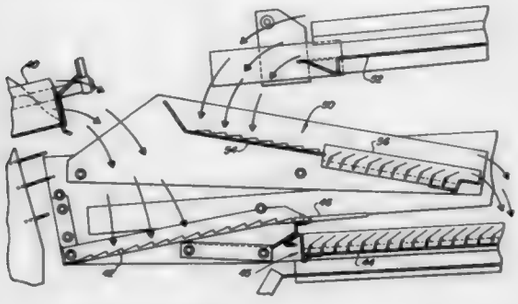
wherein the venturi structure includes a flat wall located closely adjacent and generally parallel to the screen, and the rake includes ribs projecting towards the flat wall.

5,466,190

PRECLEANER FOR A CLEANING SHOE

David A. Skinner, Moline, Ill., and Mark L. Pearson, LeClaire, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jul. 25, 1994, Ser. No. 280,231
Int. Cl.[6] A01F *12/44*
U.S. Cl. 460—101 **5 Claims**



1. An agricultural combine for harvesting and threshing a crop in a field, the combine comprising:

a supporting structure having ground engaging wheels;

a harvesting assembly for harvesting a crop and directing it into the supporting structure;

a threshing assembly for threshing a harvesting crop producing a grain rich mixture of grain and chaff, the threshing assembly is mounted to the supporting structure;

a separating assembly for separating a threshed crop producing a chaff rich mixture of grain and chaff, the separating assembly is mounted to the supporting structure;

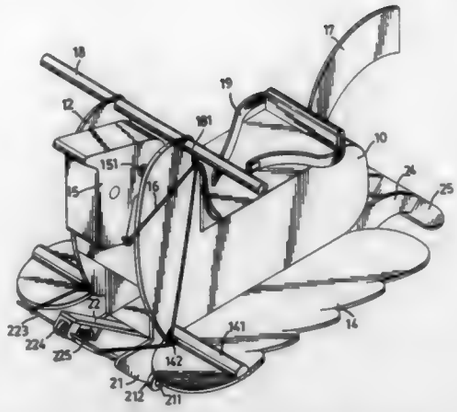
a cleaning assembly for cleaning a harvested and threshed crop, the cleaning assembly is provided with a chaffer having a upstream end, the grain rich mixture from the threshing assembly is directed to the upstream end of the chaffer, whereas the chaff rich mixture from the separating assembly is directed to a precleaner which is mounted to and moves with the chaffer, the precleaner directs the high chaff mixture to the chaffer downstream from the upstream end where the grain rich mixture is introduced.

5,466,191

IMPULSE DRIVEN ROCKING APPARATUS INSTALLED WITH ELLIPTICALLY-SHAPED SPRINGS

Fountain Chang, No. 30, Hsi-Ning S. Rd., Taipei, Taiwan, Prov. of China

Filed Apr. 14, 1994, Ser. No. 227,400
Int. Cl.[6] A63G *17/00*
U.S. Cl. 472—95 **15 Claims**



1. A rocking apparatus comprising a rocking base and a user support body mounted on said rocking base,

said rocking base having a front end with a front strut fixed thereto, said front strut inclining upwardly by a predetermined angle and having a first wheel unit provided thereon,

said rocking base further having two curved rocking plates and a second wheel unit mounted on front ends of said rocking plates, hard forward rocking movement of said rocking apparatus resulting in said first and second wheel units contacting a support surface at the same time and said rocking plates separating from the support surface to permit forward movement of said rocking apparatus,

said user support body being hollow and having a vertical cross-section that is generally inverted U-shaped, said user support body including a horizontal top plate and two side plates that extend along two sides of said top plate,

said rocking base having a narrow upper portion that extends into said user support body and a wide lower portion that extends out of said user support body, said rocking base including a horizontal base plate at said upper portion, said rocking plates being disposed at said lower portion,

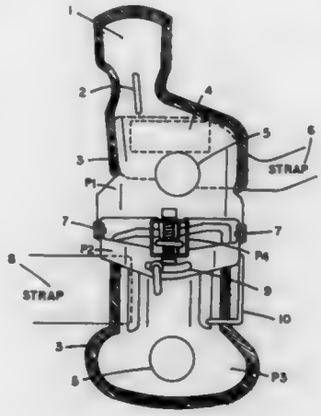
said rocking apparatus further comprising at least one spring unit interposed between said top plate of said user support body and said base plate of said rocking base.

5,466,192

ADJUSTABLE HINGED BOWLING WRIST SUPPORT

Rodrigo L. Castolo, and Thomas S. Castillo, both of 707 Continental Cir. #212, Mountain View, Calif. 94040

Filed Mar. 3, 1994, Ser. No. 165,019
Int. Cl.[6] A63B *69/00;* **A61F** *5/04*
U.S. Cl. 473—62 **8 Claims**



1. A moveable bowling wrist support device that prevents the hand from adjustably limiting the breaking backward motion while still allowing for free unlimited motion in a foward direction comprising:

a substantially planar hand back up portion element P1 having a means for attaching it to a back of a hand of a user,

a substantially planar arm portion element P3 having a means for attaching to the back of a wrist in a location of a direction of the arm of a user,

a substantially planar element P2 having a wing type structure and having a means for attaching P1 to P3,

a first means for movably connecting P2 to P3, for movement about a perpendicular axis on a same plane wherein P2 is pivotally connected on top of a front end part which is located within the wrist area such that they can pivot indefinitely sideways with respect to each other and a second means for pivotally connecting P1 to P2 about a coplanar axis having P3 on the same plane of P2 such that P1 can pivot indefinitely in a foward and backward motion with respect to each other,

said second means having a stopping mechanism P4 connected permanently on top of P2 with an adjusting means for adjustably limiting the breaking backward motion of P1 while still allowing for free unlimited motion in a foward direction,

said second means having a stopping mechanism P4 comprising an adjustable screw, a guiding rod and a stopping lock wherein if the adjustable screw is turn, the stopping lock moves and is guided by the guiding rod,

said second means having a stopping mechanism P4 that has a stopping lock that serves as an impact or stopping point of P1 as it moves on a backward motion in a direction of the stopping mechanism,

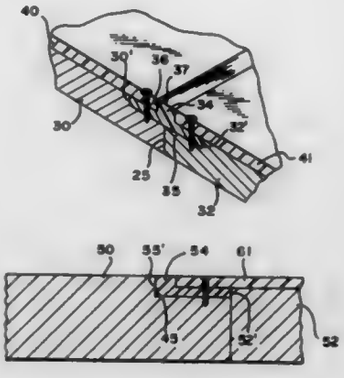
said second means having a stopping mechanism P4 which has a guiding rod that prevents the stopping lock from turning when the adjustable screw is turned.

5,466,193

T-SHAPED FOUL LINE CONSTRUCTION JOINING LANE SECTIONS

Kenneth L. Hixson, Mechanicsville, Va., assignor to AMF Bowling Inc., Mechanicsville, Va.

Filed Jun. 2, 1994, Ser. No. 253,082
Int. Cl.[6] A63D *1/00*
U.S. Cl. 473—115 **3 Claims**



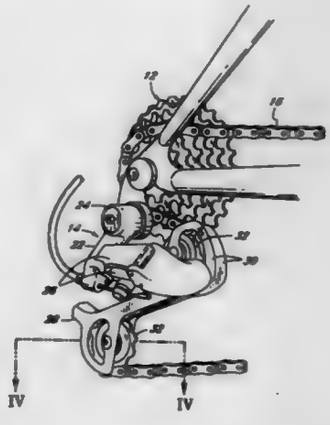
1. In a bowling alley of the type having an approach section, a lane section and a foul line separating the approach and lane sections and a synthetic panel covering one of the sections, the improvement comprising an elongated transversely extending foul line coupling having an inverted T-shaped cross-section including an elongated relatively flat base portion having a height and a pair of ends and an upwardly and transversely extending riser disposed between said ends of said base portion and extending across said lane and said approach sections, each of said approach and said lane sections including a groove and a shoulder with said grooves adjacent to said foul line and in which a height of said shoulder is essentially equal to the height of said base portion and with a first of said ends of said base portion extending into said groove and abutting said shoulder in said approach section and a second of said ends of said base portion extending into said groove and abutting said shoulder in said lane section, said riser including a top surface and two sides, said synthetic panel having a thickness which is approximately equal to a height of said riser, abutting said riser and extending over a portion of said base portion on said foul line coupling, and fastening means passing through a proximal end of said synthetic panel, through the base portion of said foul line coupling and into one of the sections of the alley.

5,466,194

JOCKEY WHEEL ASSEMBLY

John D. Steinberg, and Eric T. Saltzman, both of Huntington Beach, Calif., assignors to Bebop Incorporated, Huntington Beach, Calif.

Filed Jun. 29, 1994, Ser. No. 267,587
Int. Cl.[6] F16H *9/24;59/00*
U.S. Cl. 474—80 **14 Claims**



1. A jockey wheel for a derailleur of a bicycle, the bicycle having a drive chain, and the jockey wheel including:

a rolling bearing having an inner race adapted to receive a shaft, an outer race and rolling elements between the inner race and outer race;

a ring gear lying within a plane and having an inner opening sized to receive the outer race of the rolling bearing, and an outer periphery including gear projections shaped to mesh with the drive chain of the bicycle, the gear projections defining the plane of the ring gear;

first means attaching the ring gear to the outer race of the rolling bearing; and

second means for attaching the inner race of the rolling bearing to the shaft to permit lateral movement of the inner race relative to the shaft but to impede rotational movement of the inner race relative to the shaft, the plane of the ring gear being transverse to the longitudinal axis of the shaft.

5,466,195

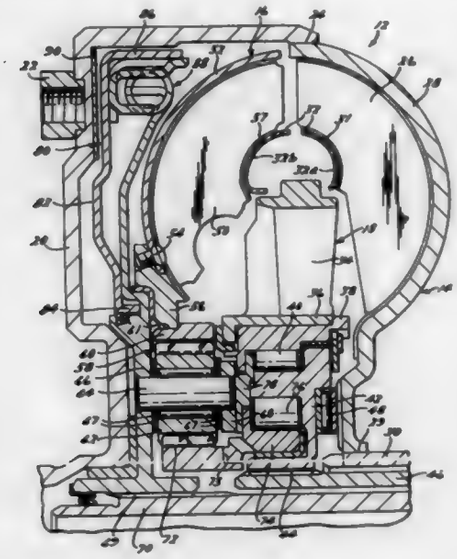
INPUT COMPOUNDING TORQUE CONVERTER

Thomas D. Nogle, Troy; Willem S. Haven, Waterford, and Tomasz K. Kietlinski, Grosse Pointe, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation-in-part of Ser. No. 123,768, Sep. 17, 1993, abandoned, which is a continuation of Ser. No. 960,326, Oct. 13, 1992, abandoned. This application Jul. 29, 1994, Ser. No. 282,249

Int. Cl.[6] F16H *3/44*

U.S. Cl. 475—55 20 Claims



1. An input compounding torque converter for converting and multiplying torque from a prime mover to an input shaft of a transmission, said input compounding torque converter comprising:

an impeller operatively connected for rotation with a prime mover;

a turbine fluidly connected in driving relationship with said impeller for receiving torque from said impeller;

a stator fluidly connected between said impeller and said turbine;

a planetary gear assembly interconnecting said turbine and an input shaft of a transmission for multiplying torque from said turbine to the input shaft;

said planetary gear assembly including an annulus gear connected to said turbine, a planetary carrier connected to the input shaft, a sun gear, and a plurality of planetary pinion gears rotatably supported on said planetary carrier and engaging said sun and annulus gears;

means for locking and unlocking said planetary carrier and the input shaft to the prime mover to provide a single path for transmitting torque from the prime mover to the input shaft through said planetary carrier during locking operation and from said turbine to said planetary carrier through said planetary gear assembly during unlocking operation;

a first one way clutch for holding stationary said stator against rotation in the direction of said impeller and allowing freewheeling motion of said stator in the opposite direction of said impeller, said first one way clutch including a plurality of rollers;

a second one way clutch for holding stationary said sun gear against rotation in a direction opposite of said impeller and allowing freewheeling motion of said sun gear in the same direction as said impeller, said second one way clutch including a plurality of rollers spaced radially with respect to said rollers of said first one way clutch; and

a stationary reaction member fixedly secured to a stationary portion of the transmission and including an intermediate portion disposed between said radially spaced rollers of said first and second one way clutches.

5,466,196

STEPLESS AUTOMATIC VARIABLE TRANSMISSION

Jong O. Ra, Seoul; Joon Y. Lim, Kyungki-Do, and Wan M. Yoo, Incheon, all of, Rep. of Korea, assignors to Hae Sung Engineering Co., Ltd., Rep. of Korea

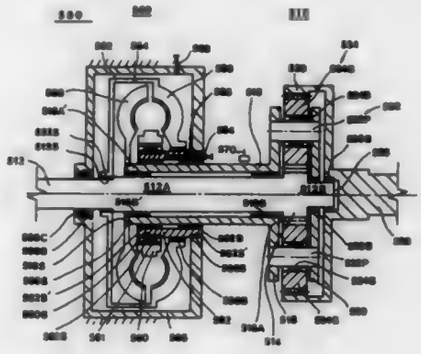
Division of Ser. No. 166,921, Dec. 10, 1993, Pat. No. 5,415,597. This application Feb. 24, 1995, Ser. No. 394,150

Claims priority, application Rep. of Korea, May 29, 1993, P93-9404; Jun. 9, 1993, U.M.93-9946

Int. Cl.[6] F16H *37/06*

U.S. Cl. 475—59 2 Claims

1. A speed change system and speed controlling system, comprising:



an input shaft **512** for receiving rotational input with a first section **512A** and a terminal section **512B** and an input sun gear **514** integrally formed between said first section **512A** and said terminal section **512B** of said input shaft to enable simultaneous rotation with said input shaft;

a speed change control shaft **516** with a first end **516A** and a second end **516A'** coaxially and rotatably mounted on said input shaft **512** to enable independent rotation about said input shaft and a plurality of splines **516S** formed at the second end **516A'** of the speed change control shaft **516**;

a carrier **518** integrally formed at said first end **516A** of said speed change control shaft **516** to enable simultaneous rotation with said speed change control shaft **516**;

a carrier **520** rotatably mounted on said terminal section **512B** of said input shaft to enable independent rotation about said terminal section **512B**;

a plurality of locking pins **522** with each said locking pin **522P** secured to and interlinking said carriers **518**, **520** to enable simultaneous rotation of said carriers about said speed change control shaft and said input shaft, respectively;

a plurality of planetary gears **524** with each said planetary gear **524G** being rotatably mounted on each said locking pin **522P** and being meshed with said input sun gear **514**;

an output ring gear **530** coaxially and rotatably mounted on said terminal section **512B** of said input shaft, and being meshed with each said planetary gear **524G** and terminating in an output shaft **528**;

a fixed shaft **562** coaxially and rotatably mounted on said speed change control shaft **516** to enable said speed change control shaft **516** to rotate independently of said fixed shaft and further including a fluid passageway **565** formed therein with said fluid passageway in fluid communication with a fluid inlet **564**;

a cover **552** secured to said first section **512A** of said input shaft to enable simultaneous rotation therewith and having a plurality of fluid outlets **554** formed therethrough;

an impeller **556** integrally formed with said cover **552** and being rotatably mounted on said fixed shaft **562**;

a turbine **558** operatively positioned opposite said impeller **556** and secured to said second end **516A'** of said speed change control shaft **516**;

a stator **560** positioned between said turbine **558** and said impeller **556** and mounted on said fixed shaft **562** to permit oneway rotation about said fixed shaft **562** and with said fluid passageway **565** terminating between said stator **560** and said impeller **556**; and

a housing **566** for operatively enclosing said turbine **558**, said impeller **556** and said stator **560**, mounted to said fixed shaft **562** and rotatably secured to said input shaft **512** to permit independent rotation of said input shaft **512** and having a fluid outlet **568** formed in said housing to enable, in use, fluid to circulate therethrough and with said housing operatively secured to prevent rotation.

5,466,197

MECHANICAL-HYDRAULIC TRANSMISSION

Hiroyuki Mitsuya; Hideki Yamada; Ryoichi Maruyama, and Tsutomu Ishino, all of Ishikawa, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP91/01674, § 371 Date May 24, 1993, § 102(e) Date May 24, 1993, PCT Pub. No. WO92/09830, PCT Pub. Date Jun. 11, 1992

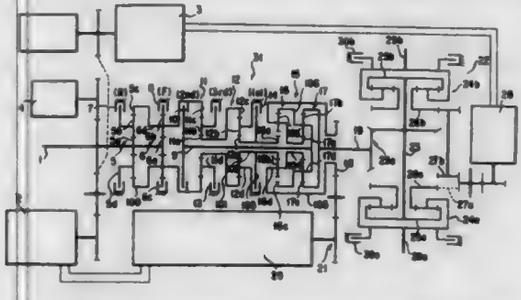
PCT Filed Nov. 29, 1991, Ser. No. 64,002

Claims priority, application Japan, Nov. 30, 1990, 2-330214

Int. Cl.[6] F16H *47/04*

U.S. Cl. 475—72 **3 Claims**

1. A mechanical - hydraulic transmission including a mechanical



power transmitting device and a static hydraulic power transmitting device arranged in parallel between a prime mover and an output shaft, in order to transmit power from said prime mover to said output shaft in an infinitely variable-speed transmitting manner, wherein said mechanical power transmitting device has a plurality of columns of planetary gear trains connected to a power input shaft directly connected to the prime mover, and said static hydraulic power transmitting device has a variable displacement type hydraulic pump driven by power from said power input shaft and a hydraulic motor unit driven by said pump to output power thereof to one of the planetary gear trains of said mechanical power transmitting device, characterized in that said mechanical power transmitting device is provided with three shafts concentrically arranged in three-piece fashion with respect to a concentric direction, including said power input shaft, an intermediate shaft and said output shaft; that said power input shaft is provided with a forward-rotation and a reverse-rotation input means in which forward-rotation and reverse-rotation planetary gear devices are concentrically arranged and effective to change the input rotating direction of the power of the prime mover to a forward rotating direction and a reverse rotating direction for selectively outputting power to the intermediate shaft; that said intermediate shaft is provided with a power transmitting system including said intermediate shaft, a planetary gear transmitting system containing said planetary gear trains arranged on said intermediate shaft concentrically thereto, and a planetary differential gear for connecting output sides of the respective planetary gear trains contained in the planetary gear transmitting system to said output shaft through a plurality of columns of planetary gear elements arranged concentrically with respect to said intermediate shaft; that said static hydraulic power transmitting device is provided with a gear train connecting an output shaft of the hydraulic motor unit to a planetary gear element of said planetary differential gear; and that the planetary gear transmitting system on said intermediate shaft is provided with clutch means for driving the output shaft only by the planetary differential gear operated by the static hydraulic power transmitting device in one driving mode, and clutch means for selecting both change of a rotational direction performed by said forward and reverse input means and a change in speed which is performed by the power transmitting system including the intermediate shaft, the planetary gear transmitting system and the planetary differential gear, whereby a forward- and reverse-rotation input means is provided and the entire mechanical power transmitting device is arranged on a single axis.

5,466,198

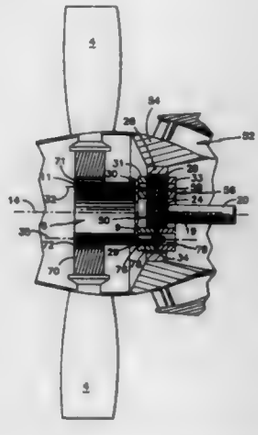
GEARED DRIVE SYSTEM FOR A BLADED PROPULSOR

Albert H. McKibbin, Cromwell, and Jon D. Burno, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 11, 1993, Ser. No. 75,827

Int. Cl.[6] F16H *1/28*

U.S. Cl. 475—346 **11 Claims**



1. A geared drive system for a bladed propulsor, comprising:

a planetary gear train including

a sun gear assembly comprising a sun gear,

a ring gear assembly comprising a ring gear, a planet gear assembly comprising a plurality of planet gears mounted in a planet carrier and disposed mechanically intermediate of and in meshing engagement with the sun gear and the ring gear, the planet carrier having a forward end plate and a rear end plate abuttingly mated to each other, the abutting contact between the plates extending over a substantial portion of the circumference of the carrier, the forward end plate also having a plurality of apertures,

wherein one of the sun gear assembly, ring gear assembly, and planet gear assembly is an input gear assembly receiving torque from a source thereof and at least one of the remaining of the sun gear assembly, ring gear assembly and planet gear assembly is an output gear assembly for delivering the torque to a load; and

a torque transfer structure having a first end terminating in a series of discrete, independently flexible arms, each arm having a proximal end and a distal end, each arm projecting axially through a corresponding end plate aperture, the distal ends of the arms being joined to the planet gear assembly by a plurality of joints, at least a portion of the distal end of each arm being at a radius greater than that of the planet gear axes, each of said joints being, with respect to a load path through the gear train, mechanically intermediate the torque transfer

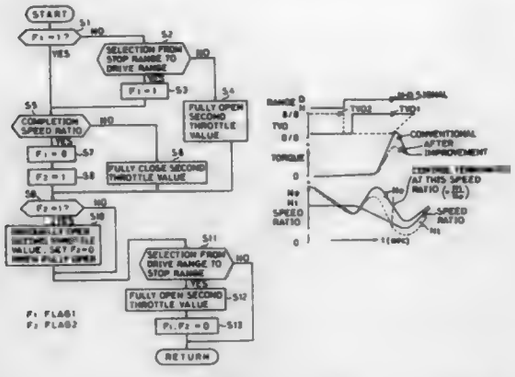
structure and the planet gear assembly wherein each joint is pivotable about at least a radial axis.

5,466,199

METHOD AND APPARATUS FOR CONTROLLING, DURING N-D OR P-D SHIFT, THE ENGINE OUTPUT BY A SECOND THROTTLE VALVE OF A VEHICLE FITTED WITH AN AUTOMATIC TRANSMISSION

Hirohisa Kobayashi, and Masuo Kashiwabara, both of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan

PCT No. PCT/JP93/01076, § 371 Date Mar. 28, 1994, § 102(e) Date Mar. 28, 1994
PCT Filed Jul. 30, 1993, Ser. No. 211,482
Claims priority, application Japan, Jul. 30, 1992, 4-203922
Int. Cl.[6] B60K *20/00*; F02D *41/04*
U.S. Cl. 477—107 **8 Claims**



1. An apparatus for controlling an output of an engine of a vehicle fitted with an automatic transmission including a torque converter, wherein the engine has an intake system which includes a first throttle valve connected to an accelerator operation of the vehicle, and a second throttle valve not connected to the accelerator operation and normally maintained in a fully opened state, the apparatus comprising:

selector operation detection means for detecting a selector operation from one of a neutral (n) range and a parking (p) range to a drive range of the automatic transmission;

speed ratio detection means for detecting a speed ratio corresponding to an output rotational speed of the torque converter with respect to an input rotational speed of the torque converter; and

engine output control means for placing and maintaining the second throttle valve in a fully closed state from when the selector operation was detected until when the detected speed ratio has fallen below a predetermined value, wherein the output of the engine is controlled as a result thereof.

5,466,200

INTERACTIVE EXERCISE APPARATUS

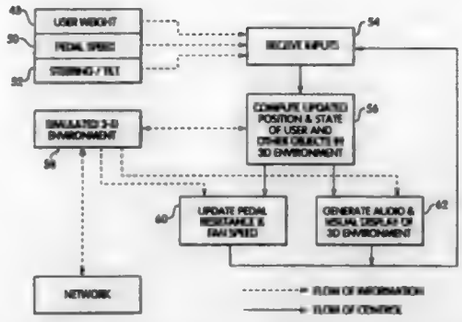
W. Thatcher Ulrich, Boston; Harvey A. Koselka; Aaron F. Bobick, both of Newton, and Michael H. Benjamin, Quincy, all of Mass., assignors to CyberGear, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 12,305, Feb. 2, 1993, abandoned. This application Feb. 1, 1994, Ser. No. 189,896
Int. Cl.[6] A63B *21/00*
U.S. Cl. 482—4 **24 Claims**

1. A networkable exercise apparatus, comprising:

an exercise mechanism which a user manipulates to achieve exercise;

a steering mechanism disposed proximate the exercise mechanism which the user manipulates to indicate direction of motion;



a computer for generating a simulated environment and for monitoring user manipulation of the exercise mechanism and the steering mechanism to determine user position in the simulated environment, the computer including a network interface to allow communication over a communication channel with at least one other such exercise apparatus; and

a display system spaced from the user and coupled to the computer for providing a visual display of at least the user's position in the simulated environment;

the computer being configured to enable the user to (i) travel substantially unrestricted throughout the simulated environment by manipulating the exercise mechanism and the steering mechanism, (ii) modify user's course while traveling within the simulated environment, and (iii) participate in user selectable activities within the simulated environment.

5,466,201

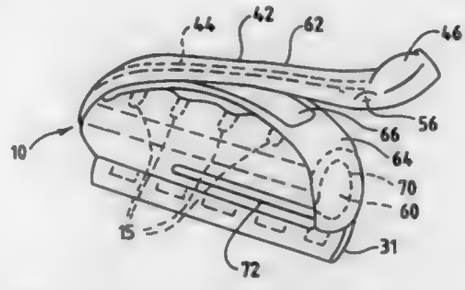
Patent Not Issued For This Number

5,466,202

INFLATABLE HAND ORTHOSIS

Martin L. Stern, Auburn, Ala., assignor to Orthotic Rehabilitation Products, Inc., Tampa, Fla.

Continuation of Ser. No. 31,676, Mar. 15, 1993, Pat. No. 5,383,827. This application Oct. 19, 1994, Ser. No. 325,883
Int. Cl.[6] A63B *23/16*
U.S. Cl. 482—47 **17 Claims**



1. An inflatable apparatus for assisting the therapeutic exercise of the fingers and thumb of a user's hand, said apparatus comprising:

an inflatable bladder made of a flexible material and sealed around the peripheral edge thereof to form a hollow interior for receiving and holding an inflating fluid;

partition means forming interconnected and communicating fluid passageways within said hollow interior of said bladder;

a plurality of exterior finger receiving channels formed by said partition means between said fluid passageways, said finger receiving channels adapted for positioning between the fingers and the palm of a user's hand with individual fingers in

alignment with said finger receiving channels and overlying said partition means, whereby inflation of said interconnected passageways will extend the fingers and abduct the thumb;

means for inflating said interconnected passageways of said inflatable bladder;

means for deflating said interconnected passageways of said inflatable bladder; and

means for attaching said inflatable bladder to the hand.

5,466,203

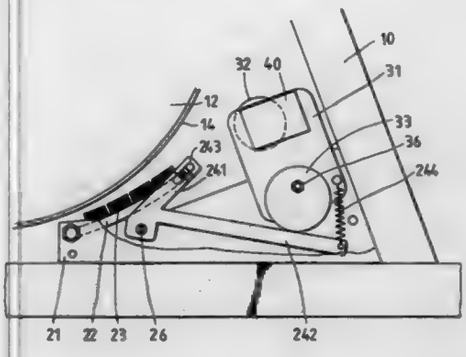
MAGNETICALLY CONTROLLED LOAD ADJUSTING STRUCTURE OF GYMNASTIC APPARATUS

George Chen, No. 20, Lane 1265, Chung Cheng Road, Wu Feng, Taichung, Taiwan, Prov. of China

Filed Mar. 30, 1994, Ser. No. 219,889

Int. Cl.[6] A63B *69/16;21/24*

U.S. Cl. 482—63 **3 Claims**



1. A magnetically controlled load-adjusting means of a gymnastic apparatus comprising:

a load wheel having a circumferential surface, said wheel being mounted on a frame of a gymnastic apparatus, said circumferential surface of said load wheel having a thin metal piece fastened thereto;

a base frame having a first end and a second end, said frame being mounted on said frame of said gymnastic apparatus;

a swivel seat having a first end and a second end, said swivel seat having a first end being pivotally mounted to said base frame,

an arresting means including a rocking arm, said rocking arm being pivotally attached to said base frame, said rocking arm further including a first support arm and a second support arm, said first support arm being pivotally attached to a second end of said swivel seat;

an elastic element;

a drive mechanism;

a wheel eccentrically mounted to said drive mechanism, wherein tension is applied to said second support arm by said elastic element, to urge said second support arm against said circumferential surface of said eccentrically mounted wheel,

said eccentrically mounted wheel being driven by said drive mechanism so as to change a distance between said arresting means and the axial center of said eccentric wheel for angularly pivoting said swivel seat about its first end, thereby resulting in a change in a magnetic flux of said load wheel so as to bring about a change in a magnetic flux, being the component of a magnetic field arising from a magnetic means mounted on said swivel seat.

5,466,204

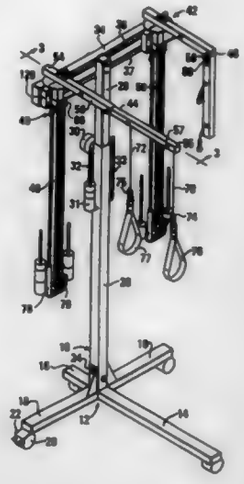
UPPER BODY EXERCISE APPARATUS

Charles H. Nearing, Redwood Falls, Minn., assignor to Activeaid, Inc., Redwood Falls, Minn.

Filed Feb. 15, 1994, Ser. No. 196,575

Int. Cl.[6] A63B *21/062;23/12*

U.S. Cl. 482—102 **36 Claims**



1. Exercise apparatus for supportively aiding a patient's therapeutic upper limb movements, comprising a skeletal frame and two exercise assemblies mounted on said frame, each said exercise assembly comprising a substantially horizontal boom having a rearward end and a forward end, a first vertically movable weight resistance assembly associated in depending relationship to the rearward end of said boom, primary guide members carried on said boom and including at least a first rearward guide and a first forward guide, a first flexible connecting line having a rearward end fastened to said first weight assembly and a terminal forward end adapted to receive means for supporting the upper limb of a user patient, said first line having a portion extending upwardly from said first weight assembly and a portion guided along said horizontal boom by said primary guide members, a depending leg to which said boom is pivotally mounted at its rearward end for pivot swinging adduction and abduction movement of the boom in a horizontal plane about a generally vertical axis at said pivot mounting, adjustable stop means associated with said boom pivot mounting for step-wise setting of stop limits for defining a selected range of adduction and abduction pivot swinging exercise movement of said boom during exercise use of said exercise assembly, and a keeper member mounted on said depending leg and through which said first connecting line is slidably mounted, said keeper member being for guiding the movement of a portion of said first connecting line between said first weight assembly and said first rearward guide.

5,466,205

TRACTION DEVICE WITH A SELF CLAMPING RETAINER

Michael J. McLane, and Maxine L. Duckworth, both of 17434 Rancho de La Angel, Ramona, Calif. 92065

Continuation-in-part of Ser. No. 147,291, Jun. 14, 1993, abandoned. This application Aug. 16, 1994, Ser. No. 291,363

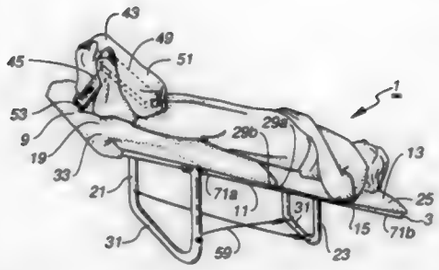
Int. Cl.[6] A63B *26/00*

U.S. Cl. 482—140 **23 Claims**

1. A traction device comprising in combination:

a) an elongated flat surface defined by spaced-apart sides including a foot-end and a head-end arranged in a spaced-apart relationship;

b) means for elevating said foot-end above said head-end in a tilted fashion; and,



c) a foot retainer pivotally attached about said foot-end for retaining the patient's feet therein;

d) wherein said elongated flat surface is coated with a lubricant that provides an extremely low coefficient of friction for allowing the patient's body to stretch and slide freely downward therealong under its own weight when pitched in a head-down position.

5,466,206

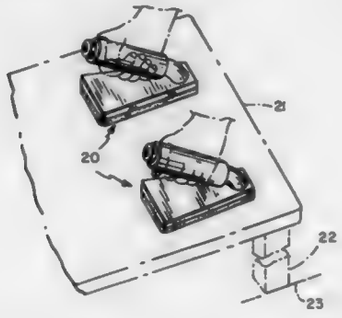
EXERCISE AIDS

John P. Fleming, 142 Packard Way, Brockton, Mass. 02401

Filed Apr. 29, 1994, Ser. No. 236,484

Int. Cl.[6] A63B *26/00*

U.S. Cl. 482—141 **4 Claims**



1. An exercise kit including a pair of exercise aids, each independent of the other, for positioning on a flat surface, each aid comprising a base member having two ends, a slip resistant surface attached to the bottom of the base member, an inclined handle bar having two ends and having a center line and joined at only one end to the base member and unconnected at the other end, said inclined handle bar having a center line being at an angle of about 30°±5° respect to the surface of the aid for positioning on a flat surface, said handle bar extending from near one end of the base member towards said second end of said base member, each of the handle bars terminates substantially near the opposite end of said base member from said connected end add each handle bar having an area for gripping by a user.

5,466,207

DIE CHANGE APPARATUS FOR RECIPROCATING PRESS

Cornelus G. Arens, 9001 Hubbell St., Detroit, Mich. 48228

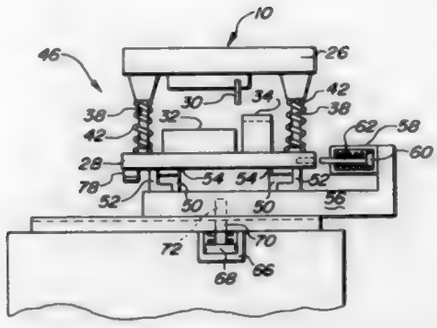
Filed Dec. 20, 1993, Ser. No. 169,208

Int. Cl.[6] B23Q *3/155*

U.S. Cl. 483—28 **8 Claims**

1. A reciprocating press for cutting a workpiece placed therein including a reciprocable carriage movable in a longitudinal direction wherein the invention comprises:

a first pair of laterally oriented rails aligned transverse to said longitudinal direction disposed on said carriage and engageable with a second pair of cooperating rails disposed on a lower die shoe of a die assembly permitting translation thereof;



a third pair of laterally oriented rails extending from at least one side of said carriage and alignable with said first pair;

means for maintaining a first position of said reciprocable carriage in which said first and said third pair of rails are aligned; and

means for maintaining a second position of said die assembly translated to a predetermined lateral position.

5,466,208

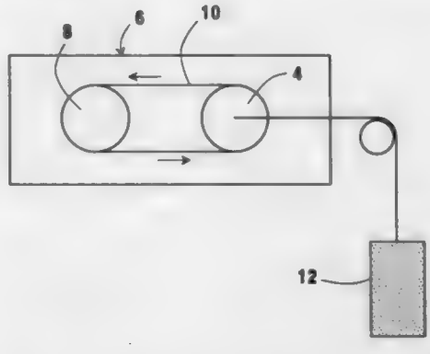
HEARTH ROLL

John E. Jackson, Brownsburg, Ind.; Hideo Nitta, Higashi-Matsumaya, Japan; Katoh Shoichi, Okegawa, Japan; Masahiko Amano; Yasushi Kurisu, both of Futtsu, Japan, and Keiichiro Ohno, Kimitsu, Japan, assignors to Praxair S.T. Technology, Inc., Danbury, Conn.

Division of Ser. No. 967,334, Oct. 28, 1992, Pat. No. 5,304,519. This application Dec. 10, 1993, Ser. No. 164,870

Int. Cl.[6] B23P *15/00*

U.S. Cl. 492—53 **3 Claims**



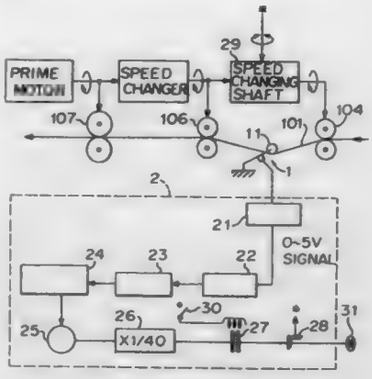
1. An article comprising a metal substrate and a thermally sprayed coating having a refractory oxide layer which by x-ray phase analysis comprises ZrO_2 substantially in the cubic and tetragonal phases, at least one oxide selected from the group consisting of CaO, Y_2O_3, MgO, CeO_2:,HfO_2 and a rare earth oxide, and at least one compound selected from the group consisting of SiO_2 and $ZrSiO_4$.

5,466,209

CIGARETTE FILTER-ROD MANUFACTURING DEVICE

Masaharu Takegawa, Osaka; Motoharu Kotani, Nagano, and Hiromu Yokota, Sakai, all of, Japan, assignors to Daicell Chemical Industry Co., Ltd., Sakai, Japan

Filed Oct. 21, 1993, Ser. No. 140,212
Claims priority, application Japan, Jan. 21, 1992, 4-307627
Int. Cl.[6] B65H 59/18
U.S. Cl. 493—4 3 Claims



1. In an apparatus for manufacturing cigarette filters, incorporating an improved automatic weigh control device; and having a tow processing device, a pair of pretension rollers, a pair of feed rollers, a pair of delivery rollers, a guide arm located above a tow bale, and which performs a first processing step including drawing tow into said tow processing device from said pretension rollers through said guide arm and stretching said tow between said pretension rollers and said feed rollers, and a second processing step including relaxing said tow between said feed rollers and said delivery rollers: said improved automatic weight control device of said apparatus comprising:

a microcomputer; a tension gauge for measuring tension of said tow in said first processing step; and a tow tension control means for regulating the tension of said tow at a predetermined constant level in said first processing step by increasing the speed of the said pretension rollers based on signals generated by said tension gauge so that the tension in said tow is maintained substantially constant and said signals are converted to electrical signals and automatically processed by said microcomputer for controlling the tow stretching in said first processing step; and

said tow tension control means being provided with a load cell for transforming strains measured by said tension gauge to electric signals; an A-D converter converting said electric signals of said load cell to digital signals; and said microcomputer having a predetermined control program; and a pulse motor and a pulse motor controller operated by said microcomputer, and a speed changer for increasing rotational speed of said pair of pretension rollers, said speed changer being driven through the pulse motor controller activated by said microcomputer, said pulse motor being driven by signals received from said pulse motor controller;

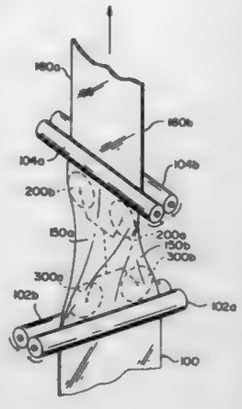
and a speed reduction gear, electromagnetic clutch, and connecting gear, said_ speed reduction gear being connected between said clutch and connecting gear; whereby substantially all cigarette filter-rods made by said apparatus have a uniform specified weight.

5,466,210

APPARATUS FOR OPENING TUBE MATERIAL

Karl M. Wilcox, Chesterfield, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Mar. 23, 1994, Ser. No. 216,443
Int. Cl.[6] B65B 43/26;65/00; B31B 23/36
U.S. Cl. 493—309 3 Claims



1. An apparatus for opening tube material traveling in a longitudinal direction, comprising:

first and second pairs of parallel rollers between which the tube material travels;

first and second pairs of rotatable wheels which are to be located at upstream and downstream positions within the tube material, respectively, and between said first and second pairs of parallel rollers, wherein each rotatable wheel is to peripherally contact the tube material;

a first mount to which said first pair of rotatable wheels are mounted so as to apply lateral tension to the tube material in one direction, and a second mount to which said second pair of rotatable wheels are mounted so as to apply lateral tension to the tube material in a different direction;

first and second sets of three positioning rollers respectively mounted to said first and second mounts so as to be respectively positioned between rotatable wheels of the first and second pairs of rotatable wheels, wherein a middle positioning roller of the first set of positioning rollers is offset with respect to other positioning rollers of said set so as to oppose a first roller of the first pair of parallel rollers and the other positioning rollers of said first set of positioning rollers oppose a second roller of the first pair of parallel rollers, and a middle positioning roller of the second set of. positioning rollers is offset with respect to other positioning rollers of said set so as to oppose a first roller of the second pair of parallel rollers and the other positioning rollers of said second set of positioning rollers oppose a second roller of the second pair of parallel rollers; and

a strut connected to and separating said first mount and said second mount.

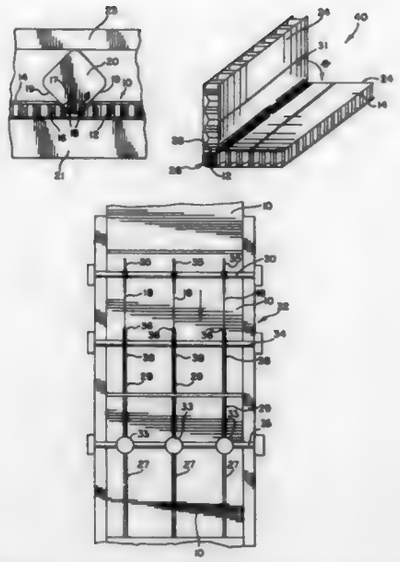
5,466,211

METHOD AND APPARATUS FOR MANUFACTURING ARTICLES EMPLOYING FOLDED HONEYCOMB PANELS

Dale W. Komarek, Arlington Heights, Ill., and Paul Moser, Milford, Conn., assignors to Hexacomb Corporation, Lincolnshire, Ill.

Continuation-in-part of Ser. No. 840,768, Feb. 24, 1992, abandoned. This application Jan. 28, 1993, Ser. No. 12,148
Int. Cl.[6] B31D 5/04; B31F 1/10
U.S. Cl. 493—355 16 Claims

1. A method of folding a honeycomb panel along a predetermined line, the method comprising:



a) partially cutting a slit into the honeycomb panel along the predetermined line;
b) providing a wedge having an angle and a vertex;
c) driving the wedge having the vertex into the honeycomb panel along the predetermined line to crush a portion of the honeycomb panel, the crushed portion of the honeycomb panel forming an angle that is less than the wedge angle and forming a hinge;
d) folding the honeycomb panel along the hinge to a folded position; and
e) providing adhesive means to hold the hinge in a folded position.

5,466,212

DEVICE FOR TROUBLE-FREE CONVEYANCE OF PRODUCTS IN A FOLDING APPARATUS

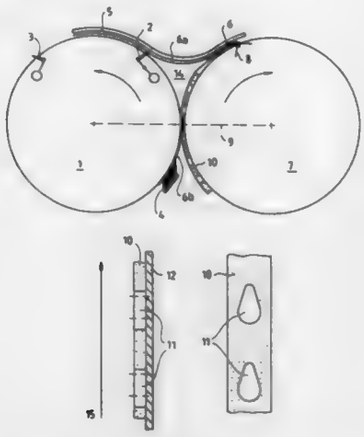
Johannes Springer, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Oct. 12, 1993, Ser. No. 135,268

Claims priority, application Germany, Jan. 12, 1992, 42 34 307

Int. Cl.[6] B65H *45/16*; B31B *1/12*

U.S. Cl. 493—434 **8 Claims**



1. A device for trouble-free conveyance of sheet-like material in a folding apparatus, comprising:

two sheet-guiding cylinders defining a nip at which a sheet enters in between said cylinders,

a sheet-guiding device disposed adjacent said cylinders such that said cylinders and said sheet-guiding device together define a wedge region at which said sheet exits from between said cylinders, said wedge being bounded laterally by circumferential surfaces of said cylinders and by said sheet-guiding device,

a compressible covering having a plurality of holes formed thereon said compressible covering disposed on a respective outer circumferential surface of one of said cylinders, wherein each hole forms a chamber bounded by respective sides of the hole and by the circumferential surface of the cylinder for suctionally gripping the sheet-like material.

5,466,213

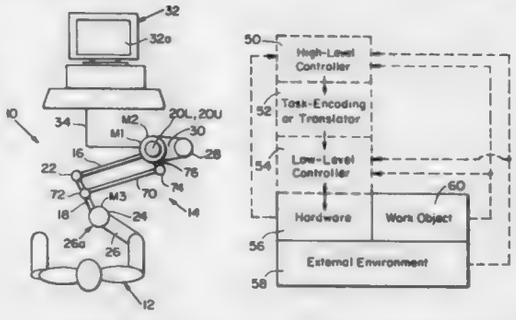
INTERACTIVE ROBOTIC THERAPIST

Neville Hogan, Sudbury; Hermano I. Krebs, Somerville; Andre Sharon, Newton, and Jain Charnnarong, Charleston, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 87,666, Jul. 6, 1993, abandoned. This application Jan. 6, 1994, Ser. No. 178,182

Int. Cl.[6] A61H *1/00*

U.S. Cl. 601—33 **20 Claims**



1. An interactive robotic therapist system comprising at least one interactive robotic therapist including:

a robotic moveable member for interacting with a patient to shape the patient's motor skills, the moveable member including an end-effector with a limb coupler for securing a patient's limb to the moveable member at the end-effector, the moveable member being capable of guiding the patient's limb along a desired path through a series of desired exercises;

a drive system coupled to the moveable member for driving the moveable member, the drive system being configured such that force exerted by the patient's limb on the moveable member is capable of altering the desired path of the moveable member while the moveable member is guiding the patient's limb through the exercises without changing the series of the desired exercises wherein the patient can be safely connected with the moveable member since the patient can temporarily alter the desired path of the moveable member; and

a controller coupled to the drive system for providing the drive system with commands to direct the moveable member through the series of desired exercises.

5,466,214

DYNAMIC HARNESS FOR HUMAN SPINE

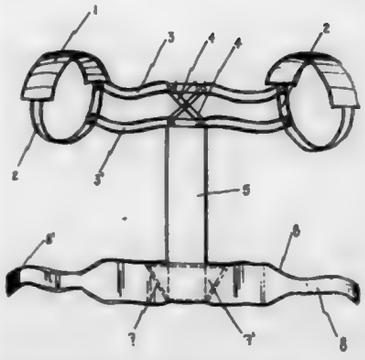
Jose Calderon-Garcidueñas, Paris #17 Col. Mirador, Monterrey, NL., Mexico

Filed Jun. 2, 1994, Ser. No. 253,285

Int. Cl.[6] A61F *5/00*

U.S. Cl. 602—19 **3 Claims**

1. A dynamic orthopedic harness for supporting the human spine in bearing loads and for orthopedic correctional purposes, said



harness having a set of interconnected elastically flexible parts for contacting the human body in a support configuration on the shoulders, back and lumbar region of a user, and configured for the user's arms, shoulders, back and waist, comprising in combination:

a pair of scapulothoracic rings for surrounding the user's arms adjacent the shoulders,

interconnection means for holding the rings in place, comprising transverse upper and lower elastic straps secured to the rings for resting in a substantially parallel configuration upon the user's back, and crossed suspender straps secured to the upper and lower straps midway to rest upon the user's back,

an elastic waistband for disposal about the user's waist to support the lumbar region, and

a connection elastic strap respectively secured to the lower transverse elastic strap and the waistband to reside vertically on the back along the spine of the user,

said elastic straps and waistband forming a mechanical harness support for fitting on the user to share with the body loads carried by the user and to feedback harness pressures to the user to aid the user in attaining correct posture.

5,466,215

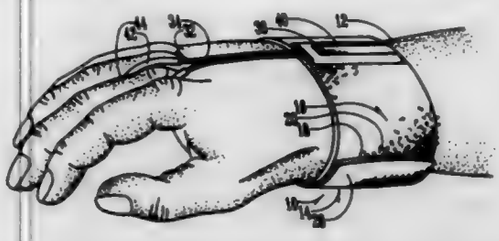
METHOD OF USING A CARPAL TUNNEL PROTECTION DEVICE

Christopher L. Lair, Wichita, Kans.; Ivan E. Brown, Spirit Lake, and Douglas G. Brown, Hartley, both of Iowa, assignors to Brown Medical Industries, Hartley, Iowa

Continuation-in-part of Ser. No. 112,252, Aug. 26, 1993, abandoned. This application Oct. 19, 1994, Ser. No. 326,038

Int. Cl.[6] A61F *5/00*; A41D *19/00*

U.S. Cl. 602—21 **11 Claims**



1. A method of protecting a person against carpal tunnel syndrome comprising treating a person with carpal tunnel syndrome:

providing said person with a wristlet adapted to encircle the wrist of said person and adjustably fastenable by a D-ring;

engaging the base of at least one finger on the hand adjacent to said wrist with a finger loop end of a flexible restraining harness strap of small diameter cord, said strap being attached to said wristlet, said finger loop having a comfort sleeve of inert polymeric plastic material and;

adjusting said harness strap so that said one finger is restrained and said hand is restrained to restrict excessive flexion of the wrist, but at the same time allows some wrist flexion to occur within the functional ranges necessary to perform most daily activities, thus restraining said hand from fetal drop and from backflip, while still allowing full finger movement so that the median nerve remain open.

5,466,216

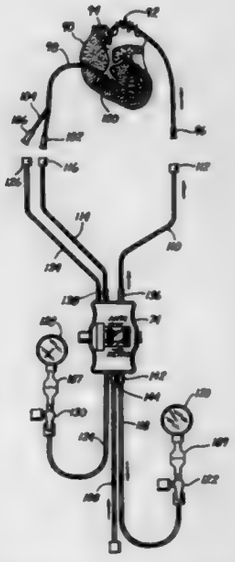
ANTEGRADE/RETROGRADE CARDIOPLEGIA METHOD AND SYSTEM

Jack W. Brown, Santa Ana; Brian Strauss, Mission Viejo, and George W. White, Lake Forest, all of Calif., assignors to Gish Biomedical, Inc., Irvine, Calif.

Filed Apr. 11, 1994, Ser. No. 225,586

Int. Cl.[6] A61M *1/00;5/00*

U.S. Cl. 604—33 **19 Claims**



1. An antegrade/retrograde cardioplegia system comprising in combination:

at least one reservoir for cardioplegic solution;

at least one reservoir for blood;

flow control means;

pump means for pumping cardioplegic solution and blood;

mixing means in communication with said pump means for mixing cardioplegic solution and blood;

heat exchange means in communication with said mixing means for heating or cooling cardioplegic solution and blood;

an antegrade/retrograde valve in communication with said mixing means;

aortic root cannula means in communication with said valve;

coronary sinus cannula means in communication with said valve;

aortic root pressure sensing means;

coronary sinus pressure sensing means;

at least one means for fluid communication between said at least one reservoir for blood, said at least one reservoir for cardioplegic solution, said pump means, said mixing means, said heat exchange means, and said antegrade/retrograde valve;

at least one means for fluid communication between said antegrade/retrograde valve and said aortic root cannula means and said coronary sinus cannula means, and,

wherein said antegrade/retrograde valve comprises:

a housing having an inner chamber;

a plurality of conduits within said inner chamber comprising at least one first conduit in communication with said inner chamber and with said mixing means for introduction of cardioplegic solution and blood into said inner chamber;

at least one second conduit in communication with said inner chamber for communication with said aortic root pressure sensing means;

at least one third conduit in communication with said inner chamber for communication with said aortic root cannula means;

at least one fourth conduit in communication with said inner chamber for communication with said coronary sinus cannula means and with said coronary sinus pressure sensing means;

a sliding member disposed within said inner chamber for sliding to at least one position to provide selective fluid communication between said at least one first conduit, said at least one second conduit, and said at least one third conduit for antegrade infusion and aortic root pressure monitoring and for sliding to at least one other position to provide selective fluid communication between said at least one first conduit and said at least one fourth conduit for retrograde infusion and coronary sinus pressure monitoring.

5,466,217

IONTOPHORETIC DRUG DELIVERY APPARATUS

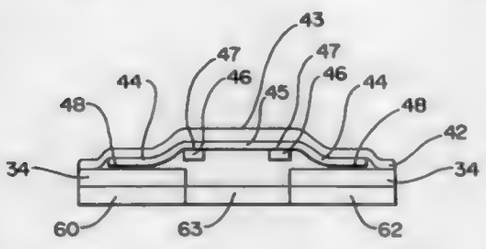
Robert M. Myers, Stanford; Ronald P. Haak, San Jose, and Richard W. Phue, San Francisco, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 889,950, Jun. 2, 1992, Pat. No. 5,312,326. This application Apr. 4, 1994, Ser. No. 222,122

The portion of the term of this patent subsequent to May 17, 2011, has been disclaimed.

Int. Cl.[6] A61N *1/30*

U.S. Cl. 604—20 **2 Claims**



1. A flexible, electrically-powered iontophoresis apparatus for delivery of an agent through a body surface comprising:

a flexible, non-conductive substrate having opposing major surfaces, one of the major surfaces being oriented to face the body surface, the other surface being oriented to face away from the body surface;

a substantially planar, conductive, electronic pathway disposed on the major surface of the substrate facing the body surface, the electronic pathway including an input means and an output means which are electronically connected, the output means being electrically connected to an electrode means and the input means being electronically connected to a source of electrical energy; whereby electrical and physical connection is achieved between the conductive pathway and the electrode in the absence of conductive pathway stress due to folding of the pathway.

5,466,218

METHOD OF CLEANING AN IMPLANTED MEDICATION INFUSION PUMP WITH DISCHARGE SIDE PORT

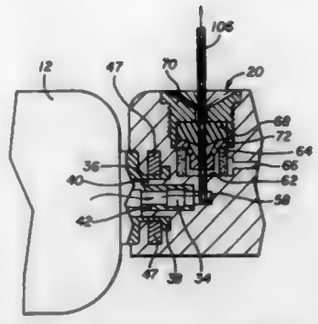
Chad Srisathapat, Sun Valley, and Virote Indravudh, Saugus, both of Calif., assignors to MiniMed, Inc., Sylmar, Calif.

Division of Ser. No. 221,569, Apr. 1, 1994. This application Mar. 9, 1995, Ser. No. 401,177

Int. Cl.[6] A61M *31/00;* **A61K** *9/22*

U.S. Cl. 604—49 **1 Claim**

1. In an implantable medication infusion pump having a pump housing with a medication-receiving reservoir and-pump means for



delivering medication through a pump outlet port, a refill port on the pump housing to permit transcutaneous needle access to refill the reservoir with the medication, a catheter coupled to the pump outlet port and cooperating therewith to define a discharge flow path for flow passage of the medication to a patient, and a side access port to permit transcutaneous needle access to the discharge flow path, a method of cleaning the pump without requiring explantation of the pump from the patient, said method comprising the steps of:

operating the pump means to deliver residual medication from the reservoir to the discharge flow path, while aspirating the delivered medication from the patient via a needle coupled through said side access port to the discharge flow path;

delivering a selected cleaning agent to the reservoir via said refill port;

operating the pump means to deliver the cleaning agent from the reservoir to the discharge flow path, while aspirating the delivered cleaning agent from the patient via said side access port; and

refilling the reservoir with the medication via said refill port.

5,466,219

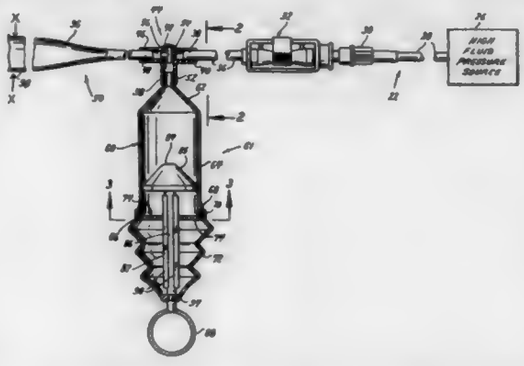
BLOOD ASPIRATION ASSEMBLY COMPONENTS AND BLUNT NEEDLE ASPIRATORS

Lawrence A. Lynn, 862 Curleys Ct., Worthington, Ohio 43085, and James E. Cole, Ventura, Calif., assignors to Lawrence A. Lynn, Worthington, Ohio

Division of Ser. No. 594,677, Oct. 10, 1990, Pat. No. 5,178,607, which is a continuation of Ser. No. 302,835, Jan. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 80,406, Jul. 31, 1987, Pat. No. 4,838,855. This application Aug. 27, 1992, Ser. No. 935,907

Int. Cl.[6] A61M *37/00*

U.S. Cl. 604—86 **54 Claims**



1. In a fluid-filled extra-corporeal blood aspiration system for sampling pressurized blood from the human body, the system being for connection to a catheter having a bore in fluid communication with a pressurized blood vessel, the system having means for elevating the fluid pressure above the pressure within said blood vessel so that fluid flows from the system into the blood

vessel and the system having means for reducing said fluid pressure below the pressure within said blood vessel so that blood flows from said blood vessel into said system, the improvement comprising:

an aspirator receiver forming part of the blood aspiration system and including a housing having a flow channel for communication with the human vasculature for flowing blood therethrough, said housing carrying a receiver portion penetrable by a cannula to place a bore of the cannula in communication with said flow channel and to allow sampling of blood;

said receiver portion having an open receiver channel formed therein upon penetration thereof by the cannula, said receiver portion being formed of a resilient material whereby said open receiver channel will be normally closed following removal of the cannula;

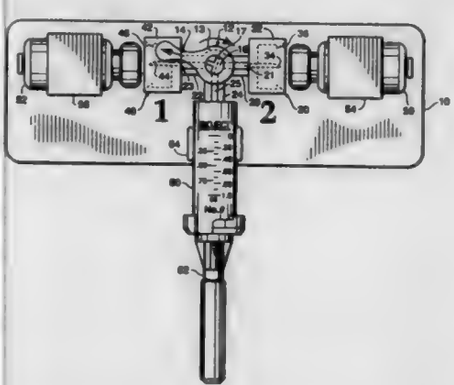
said receiver portion having an upper portion and a lower portion, said upper portion being more compliant than said lower portion whereby said upper portion is penetrated by the cannula with the application of a lesser force thereto than that required to penetrate the lower portion.

5,466,220

DRUG VIAL MIXING AND TRANSFER DEVICE

Rodney Brenneman, Lake Oswego, Oreg., assignor to Bioject, Inc., Portland, Oreg.

Filed Mar. 8, 1994, Ser. No. 208,620
Int. Cl.[6] A61M *37/00*
U.S. Cl. 604—87 **13 Claims**



1. A drug mixing and transfer device comprising:

a base;

a valve attached to said base;

a plurality of ports with fluid passageways extending generally outwardly from said valve, said valve enabling fluid communication between the fluid passageways of said plurality of ports;

a piercing connector attached to each of said plurality of ports, said piercing connector being adapted to receive and penetrate a vial and to retain the vial in place during operation of the drug mixing and transfer device;

a retainer attached to said base and located in spaced relation to said piercing connector, said retainer being adapted to maintain the vial in spaced relation with said piercing connector prior to operation of the drug mixing and transfer device; and

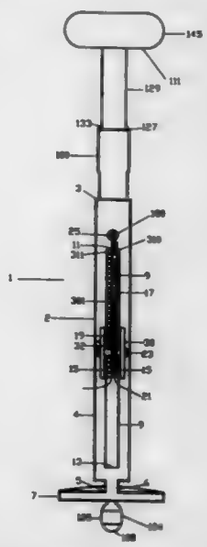
a syringe attaching port having a fluid passageway and extending generally outwardly from said valve, said valve enabling fluid communication between the fluid passageway of said syringe attaching port and the fluid passageways of said plurality of ports.

5,466,221

PERCUTANEOUS CARDIAC PUMP FOR CARDIOPULMONARY RESUSCITATION

Filiberto P. Zadini, 16814 Rayen St., North Hills, Calif. 91343, and Giorgio C. Zadini, 2237 Hilltop La., Camarillo, Calif. 93012

Filed Aug. 3, 1992, Ser. No. 924,301
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—96 **63 Claims**



1. A cardiac pump comprising:

an expandable member placeable inside a chest cavity adjacent to a heart, and

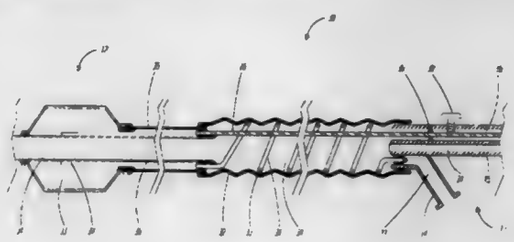
means for periodically displacing said expandable member toward the heart and away from the heart by applying and releasing mechanical pressure to said expandable member, said expandable member periodically applying and releasing said mechanical pressure to an exterior surface of the heart for compressing and decompressing the heart to effect pumping of the heart.

5,466,222

LONGITUDINALLY COLLAPSIBLE AND EXCHANGEABLE CATHETER

Thomas V. Ressemann, St. Cloud, and David J. Blaeser, Champlin, both of Minn., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.

Filed Mar. 30, 1994, Ser. No. 220,752
Int. Cl.[6] A61M *29/00;25/00*
U.S. Cl. 604—96 **24 Claims**



1. A catheter system, comprising:

(a) an elongate shaft having a proximal end, a distal end, and a separate inflation lumen extending therethrough, the elongate shaft including a longitudinally collapsible section having a longitudinally collapsible guide wire lumen extending therethrough;

(b) an inflatable balloon connected to the distal end of the elongate shaft, and;

(c) a removable guide wire extending through the guide wire lumen.

5,466,223

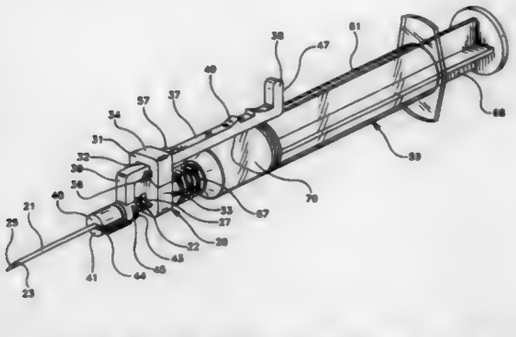
NEEDLE ASSEMBLY HAVING SINGLE-HANDEDLY ACTIVATABLE NEEDLE BARRIER

Peter Bressler, Philadelphia, Pa.; Niall Sweeney, Rutherford, N.J.; Daniel Hicswa, Carlstadt, N.J., and James A. Burns, Elizabeth, N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Jun. 20, 1994, Ser. No. 262,806

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—110 **27 Claims**



1. A needle assembly having a single-handedly activatable needle barrier comprising:

a needle cannula having a proximal end, a distal end and a lumen therethrough;

a needle hub having an interior cavity terminating at an open proximal end of said hub, said hub connected to said needle cannula so that said lumen is in fluid communication with said interior cavity;

a guide element connected to said needle hub having an aperture therethrough;

an elongate barrier arm having a proximal end and a distal end, said distal end of said barrier arm including a barrier element having a distal end, a proximal end and a needle passageway therethrough, said barrier arm positioned within said aperture of said guide element and said needle cannula positioned at least partially within said needle passageway of said barrier element, said barrier arm being movable from at least a first retracted position wherein said distal end of said cannula passes completely through said barrier element so that said distal end of said needle cannula is exposed, to a second extended position wherein said barrier element surrounds said distal end of said cannula to prevent incidental contact with said distal end of said cannula;

locking means for preventing the movement of said barrier arm from said second extended position, said locking means being activated by movement of said barrier arm into said second extended position;

and finger contact surface on said barrier arm for applying digital pressure to said barrier arm to move said barrier arm into said second extended position.

5,466,224

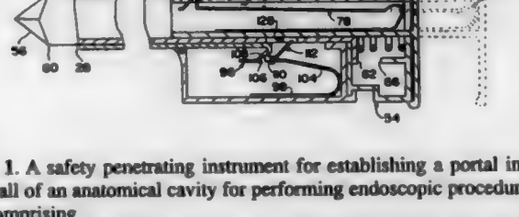
SAFETY PENETRATING INSTRUMENT HAVING A TRIGGERED PORTAL SLEEVE FOR ESTABLISHING AN ENDOSCOPIC PORTAL IN AN ANATOMICAL CAVITY WALL

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Continuation-in-part of Ser. No. 628,899, Dec. 18, 1990, Pat. No. 5,226,426, and a continuation-in-part of Ser. No. 817,113, Jan. 6, 1992, Pat. No. 5,350,393. This application Jun. 29, 1993, Ser. No. 83,728

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—165 **17 Claims**



1. A safety penetrating instrument for establishing a portal in a wall of an anatomical cavity for performing endoscopic procedures comprising

an elongate, tubular portal sleeve for introducing medical instruments into the anatomical cavity, said portal sleeve having a distal end for positioning in the anatomical cavity and a proximal end for positioning externally of the anatomical cavity wall;

a penetrating member disposed in said portal sleeve and having a distal end for penetrating tissue said penetrating member being removable from said portal sleeve;

housing means receiving said portal sleeve proximal end for mounting said portal sleeve to be movable relative to said housing means between an extended position where said portal sleeve distal end protrudes distally from said penetrating member distal end and a retracted position where said portal sleeve distal end is disposed proximally of said penetrating member distal end to expose said penetrating member distal end;

bias means for biasing said portal sleeve to move distally toward said extended position and for permitting said portal sleeve to move proximally toward said retracted position;

handle means coupled with said portal sleeve for manually moving said portal sleeve proximally to said retracted position;

locking means for engaging said portal sleeve to lock said portal sleeve in said retracted position; and

releasing means responsive to entry of said safety penetrating instrument into the anatomical cavity for triggering release of said locking means to permit said bias means to move said portal sleeve to said extended position.

5,466,225

SURGICAL NEEDLE ASSEMBLY

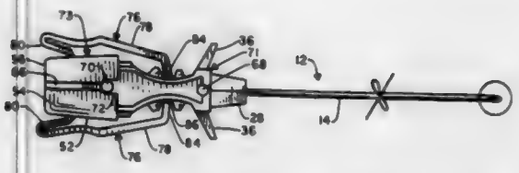
Richard E. Davis, Grand Rapids, and William J. Greenhoe, Rockford, both of Mich., assignors to Medtronic, Inc., Minneapolis, Minn.

Division of Ser. No. 930,098, Aug. 13, 1992, Pat. No. 5,336,191. This application May 27, 1994, Ser. No. 250,046

Int. Cl.[6] A61M *5/32;5/158*

U.S. Cl. 604—165 **20 Claims**

1. In a surgical needle including a cannula member and a stylet member, the cannula member comprising a cannula handle and a cannula having a proximal end affixed to the cannula handle and a distal end opposite from the cannula handle, the stylet member comprising a stylet handle and a stylet having a proximal end affixed to the stylet handle and a distal end opposite from the stylet handle, the stylet being removably receivable within the lumen of



the cannula, the axial dimensions of the stylet and the cannula being so related that when the stylet is fully received within the cannula with the handles adjacent to each other the distal ends are coterminous, the distal ends being respectively contoured to form a predetermined needle tip configuration when the stylet is fully received in the lumen of the cannula in predetermined angular relation therewith, the handles including respective indicators for determining the angular relation of the cannula and the stylet, the improvement wherein the indicators comprise a detent carried on a flexible arm extending from one of the handles in a direction to overlie the other of the handles when the stylet is fully received in the lumen of the cannula, and a depression provided in said other handle in a position aligned with the detent when the stylet and the cannula are in said predetermined angular relation.

5,466,226

INJECTION ASSEMBLY WITH A SUCTION NEEDLE AND A RETRACTABLE INJECTION NEEDLE

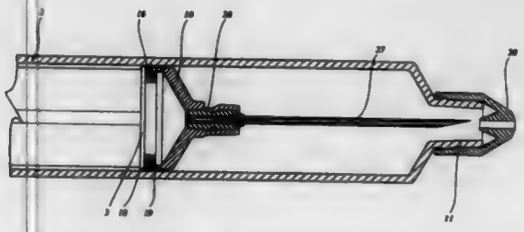
Abraham van den Haak, Eesergroen, Netherlands, assignor to A.P.I.S. Medical B.V., Eesergroen, Netherlands

Filed Aug. 10, 1994, Ser. No. 288,105

Claims priority, application Netherlands, Jul. 15, 1994, 9401174

Int. Cl.[6] A61M *5/32*

U.S. Cl. 604—192 **20 Claims**



1. In an injection assembly that includes:

a liquid container with an outflow opening,

a piston displaceable in said liquid container, wherein

a suction needle with a needle fitting is adapted to be releasably fitted on the outflow opening of the liquid container, and

an injection needle with a needle fitting which is adapted to be permanently fixed on the outflow opening of the liquid container, the piston comprising:

(a) first coupling means which are adapted to be coupled directly with the needle fitting of the injection needle, so as to allow the injection needle to be retracted into the liquid container after use;

(b) safety means preventing the first coupling means of the piston from forming a coupling during displacement of the piston in the presence of the suction needle; and

an auxiliary coupling part including second coupling means which are coupled with the first coupling means of the piston in the presence of the injection needle, but which cannot couple with the first coupling means in the presence of the suction needle.

5,466,227

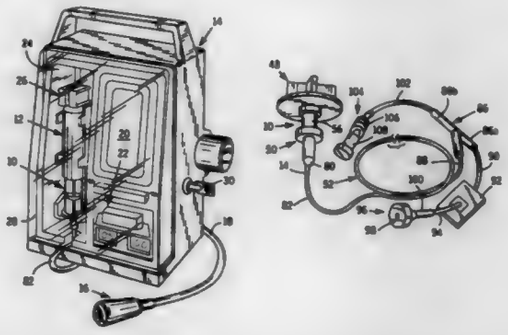
PATIENT CONTROLLED ANALGESIC INJECTOR ASSEMBLY AND METHOD OF ASSEMBLING SAME TO AN INFUSER UNIT

Peter Kessenich, Waukegan, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Jan. 10, 1994, Ser. No. 179,295

Int. Cl.[6] A61M *37/00*

U.S. Cl. 604—246 **9 Claims**



1. A one-piece injector assembly for use with a replaceable vial having an open end and a closed end, the open end sealed by a slidable stopper, the vial containing a desired drug for controlled administration by an infuser unit, said injector assembly comprising:

a reusable injector element having first and second portions thereof with a cannula extending therebetween, said first portion having a threaded recess for threaded connection with complimentary threads on said slidable stopper of the vial, the connection between said first portion of said injector element and said stopper causing the cannula to piece said stopper so as to cause the drug to flow out of the vial through said stopper and said cannula from said first portion to said second portion upon advancement of said injector element and said stopper within the vial by the infuser unit; and

a drug administration set permanently connected to said second portion of said reusable injector element for receiving the drug from said cannula so that after the stopper has been advanced from the open end of the vial to the closed end of the vial the empty vial can be removed from said injector element and a full vial can be connected to said injector element without having to provide an additional injector element and disconnect and re-connect said drug administration set from said injector element thereby reducing changeover time, the risk of contamination, the risk of a needle stick and the amount of non-recyclable waste and storage space as a result of eliminating replacement of said injector element each time a vial is replaced.

5,466,228

FLUID CONTROL APPARATUS

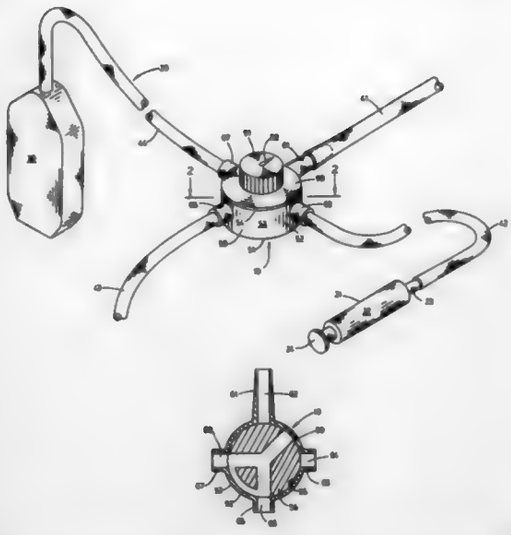
John M. Evans, Fresno, Calif., assignor to California State University, Fresno Foundation, Fresno, Calif.

Continuation of Ser. No. 22,606, Feb. 17, 1993, abandoned, which is a continuation of Ser. No. 645,806, Jan. 25, 1991, abandoned. This application Nov. 24, 1993, Ser. No. 157,647

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—248 **6 Claims**

1. A fluid control apparatus for interconnecting at any one time any two, but not more than two, of a plurality of individual sources of fluid and receptacles for fluid, the fluid control apparatus comprising a housing having a wall enclosing a substantially cylindrical interior substantially concentric to a longitudinal axis and having four housing ports extending through the wall and communicating with the interior of the housing, said housing ports spaced from each other ninety degrees (90°) about the wall relative to said longitudinal axis so that each of said housing ports is in axial



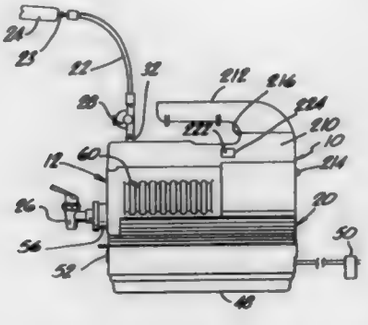
alignment with a housing port on the opposite side of the housing through said interior thereof; means for individually connecting each of said housing ports to one of the sources of fluid or receptacles for fluid; and a valve member mounted in said interior of the housing for movement therewithin substantially about said longitudinal axis and having a substantially cylindrical external surface disposed in facing engagement with said wall of the housing, a first valve port, individually positionable in fluid transferring relation with each of said housing ports, an elongated second valve port, extending approximately ninety degrees (90°) about the periphery of the valve member to opposite ends and disposed on the opposite side of the valve member from said first valve port, and a passage extending through the valve member interconnecting the first valve port and the second valve port and wherein said passage has a "Y" shaped configuration having two portions thereof disposed at a right angle to each other interconnecting the opposite ends of the second valve port whereby said valve member can selectively be positioned in a plurality of fluid transferring positions but in each of said fluid transferring positions can connect only two of said four housing ports at any one time through the passage thereof.

5,466,229

FLUID COLLECTION SYSTEM

Edward E. Elson, Anaheim, and David H. Kuntz, Los Angeles, both of Calif., assignors to Davstar, Inc., Costa Mesa, Calif.

Filed Aug. 6, 1993, Ser. No. 103,444
Int. Cl.[6] A61M *1/00*
U.S. Cl. 604—317 **18 Claims**



1. A fluid collection apparatus for removing liquid from a collection pad attached to a living body, the fluid collection apparatus comprising:

a carrier having a collection vessel removably mounted thereon, a vacuum pump mounted in the carrier, and means for powering the vacuum pump for continuous operation mounted thereto,

a) the collection vessel being a container having an internal space for collection of fluid, the collection vessel having

i) an inlet port in a first upper portion of the collection vessel, said inlet port being sealed by a removable attached inlet connector having a flow channel therethrough, said inlet connector containing a one way valve which prevents fluid in the vessel from passing through the inlet connector, and

ii) a sealable drainage port located in a surface of the vessel,

b) the vacuum pump having an inlet port connected by a tubular conduit to a vacuum port located in a second upper portion of the vessel so that operation of the vacuum pump creates a vacuum characterized as a pressure within the vessel which is less than ambient pressure, and

c) a gas pervious but liquid impervious material interposed between the vessel interior and the pump inlet to prevent liquid in the vessel from exiting the vessel through the tubular conduit,

the carrier further including a level sensing switch operatively connected to the vacuum pump, the switch functioning to shut off the pump if the vessel is tilted beyond a preset angle from its normal resting orientation,

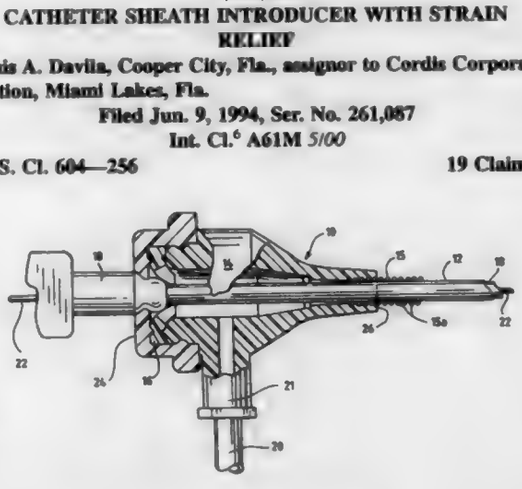
the fluid collection apparatus being operatively connected to a collection pad by a drain tube having a first end attached to the pad and a second end attached to the inlet connector so that the vacuum in the vessel will cause liquid to flow from the pad through the drain tube and be deposited in the vessel.

5,466,230

CATHETER SHEATH INTRODUCER WITH STRAIN RELIEF

Luis A. Davila, Cooper City, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Jun. 9, 1994, Ser. No. 261,087
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—256 **19 Claims**



1. A catheter sheath introducer comprising:

a hub;

a hemostasis valve within said hub;

a tubular sheath having a proximal end and a distal end;

said proximal end of said tubular sheath being molded to said hub;

a coil spring having a smaller length than the length of said tubular sheath;

said coil spring tightly and unattachedly overlying said proximal end of said tubular sheath;

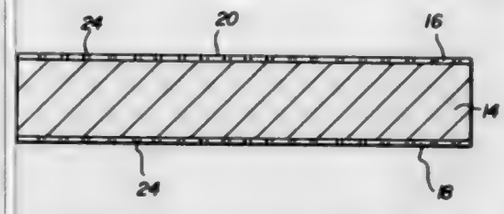
said coil spring being molded to said hub such that said proximal end of said tubular sheath and coil spring extend within said hub and extend out from said distal end of said hub whereby the strain produced when said tubular sheath and hub are moved relative to one another is relieved.

5,466,231

LAMINATED SPONGE DEVICE

Ronald J. Cercone, East Lyme, Conn.; Scott J. Quaratella, Westerly, R.I., and Arthur A. Gertzman, Woodbridge, Conn., assignors to Merocel Corporation, Mystic, Conn.

Filed Nov. 4, 1993, Ser. No. 145,515
Int. Cl.[6] A61F 13/15;13/20
U.S. Cl. 604—369 20 Claims



1. A surgical sponge device for insertion into a body cavity with a wound comprising:

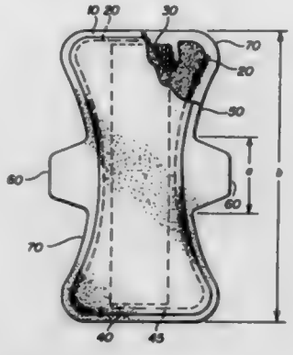
a sterile compressed planar surgical sponge device body constructed of an open cell foam material having a pore diameter size which is not greater than 1.2 mm and having instantaneous wicking properties allowing the body to swell and be free standing inside said cavity, at least two opposing surfaces of said body being laminated with a generally hydrophobic smooth surfaced polymeric film layer having a thickness ranging from 0.0005 to 0.0030 inches for placement against a wound area in said body cavity, said polymeric film layers being pierced with a plurality of holes having a average size not greater than 0.70 mm for fluid absorption providing controlled absorbency into said open cell material and forming a substantially closed outer surface in relation to said open cell foam material reducing tissue attachment and device removal shear forces.

5,466,232

UNITIZED SANITARY NAPKIN

Serge Cadieux, Pierrefonds, and Yvon Levesque, Montreal, both of, Canada, assignors to Johnson & Johnson Inc., Canada

Continuation of Ser. No. 727,703, Jul. 10, 1991, abandoned, which is a continuation of Ser. No. 581,851, Sep. 13, 1990, abandoned, which is a continuation of Ser. No. 242,273, Sep. 12, 1988, abandoned. This application Nov. 20, 1992, Ser. No. 979,366
Int. Cl.[6] A61F 13/15
U.S. Cl. 604—378 6 Claims



1. A sanitary napkin comprising:

a fluid permeable cover,

a fluid impermeable backing sheet,

an absorbent system disposed between said cover and said backing sheet, said absorbent system comprising a hydrophilic fluid transfer layer adjacent said cover and coextensive with a primary absorbent layer adjacent said backing sheet, said primary absorbent layer having a peripheral edge, wherein said fluid transfer layer extends beyond the peripheral edge of the absorbent layer,

said sanitary napkin when viewed in plan having a major and a minor axis and longitudinal sides and a generally hourglass-shaped perimeter defined by the longitudinal sides of said napkin being generally and symmetrically concave relative to said major axis,

said minor axis being disposed perpendicular to said major axis at the narrowest point of bioconcavity between said longitudinal sides,

said cover being sealed to said backing around the perimeter of said napkin,

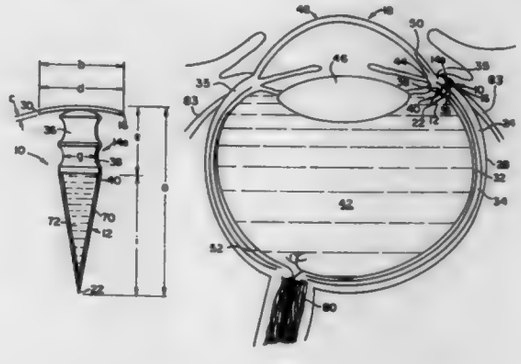
and said primary absorbent layer having a pore size distribution in the wet state such that about 90% of the pores are less than 300 μm in radius and about 10% of the pores are greater than 300 μm in radius.

5,466,233

TACK FOR INTRAOCULAR DRUG DELIVERY AND METHOD FOR INSERTING AND REMOVING SAME

Alan L. Weiner, Cranbury, N.J.; Kevin Sinnett, Mukwonago, Wis., and Sterling Johnson, Skillman, N.J., assignors to Escalon Ophthalmics, Inc., Skillman, N.J.

Filed Apr. 25, 1994, Ser. No. 232,895
Int. Cl.[6] A61M 35/00
U.S. Cl. 604—890.1 36 Claims



1. A tack for intraocular drug delivery, comprising:

(a) a post including a drug to be administered, the post having a first end and a second end, the first end for being positioned within a vitreous region of an eye, the post having a length measured parallel to a longitudinal axis of the tack, the length being determined according to a dosage of the drug to be administered and such that obstruction of vision through a lens of the eye is minimized;

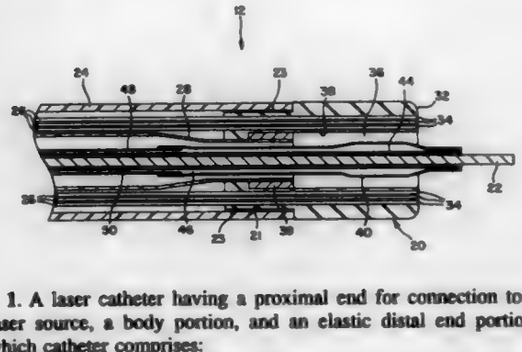
(b) an anchoring region affixed to the second end of the post, the anchoring region including a width measured perpendicularly to the longitudinal axis of the tack, said width varying to provide the anchoring region with a configuration which anchors the tack within at least one of a sclera, a retina and a choroid; and

(c) a head extending radially outwardly from the anchoring region such that upon insertion of the anchoring region and post within the eye, the head remains external to the eye and abuts a scleral surface of the eye.

5,466,234
EXPANDABLE LASER CATHETER

Marvin P. Loeb, Huntington Beach; Samuel M. Shaolian, Laguna Niguel; Vahid Saadatmanesh, Irvine; Jeffrey J. Giba, Moreno Valley, and To V. Pham, Trabuco Canyon, all of Calif., assignors to Trimedyne, Inc., Irvine, Calif.

Filed Jan. 31, 1994, Ser. No. 189,375
Int. Cl.[6] A61B *17/36*
U.S. Cl. 606—15 **27 Claims**



1. A laser catheter having a proximal end for connection to a laser source, a body portion, and an elastic distal end portion, which catheter comprises:

(a) a plurality of optical fibers having exposed optical fiber end faces situated in the elastic distal end portion and arranged in at least two substantially concentric annular arrays;

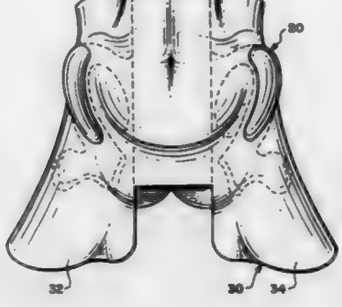
(b) a hollow, flexible shaft centrally situated within the catheter and defining a central channel therethrough; and

(c) an inflatable means for expanding the elastic distal end portion of the laser catheter to increase the spaces between the optical fibers in said annular arrays and force at least some of the underlying optical fibers into the spaces created thereby.

5,466,235
FEMALE FUNCTIONAL MANNEQUIN

Steven A. Shubin, Sr., 2373 Teller Rd., Suite 104, Newbury Park, Calif. 91320

Filed Mar. 27, 1995, Ser. No. 411,270
Int. Cl.[6] A61F *5/00*
U.S. Cl. 600—38 **9 Claims**



1. A female functional mannequin comprising:

a torso having a rigid frame duplicating the pelvis of a human female, said torso having a crotch;

a muscle layer totally surrounding said rigid frame, said muscle layer comprising a flexible resilient material, said muscle layer duplicating the form of the human female;

an outer skin layer attached to said muscle layer, said outer skin layer totally covering said muscle layer, said outer skin layer comprising a flexible resilient material duplicating human skin;

a cavity formed in said crotch;

a cartridge being connected with said cavity in a snug fitting manner, said cartridge being removable, said cartridge having a rigid exterior wall surrounding an interior chamber;

a quantity of an elastomer filling said interior chamber, said elastomer having a frontal surface formed to duplicate the shape of the vulva of a human female, an opening formed within said elastomer, said opening being open at said frontal surface, said opening being longitudinally located within said cartridge, said opening forming a thin slit at said frontal surface, whereby upon an exterior object being inserted within said opening said slit expands to the cross sectional size of said exterior object.

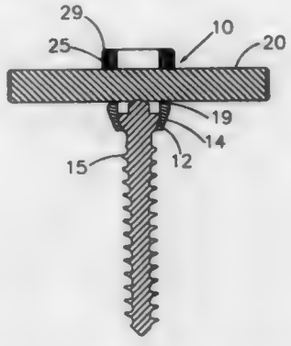
5,466,236

Patent Not Issued For This Number

5,466,237
VARIABLE LOCKING STABILIZER ANCHOR SEAT AND SCREW

J. Abbott Byrd, III, Virginia Beach, Va.; Rolando M. Puno, Prospect, Ky., and Philip Mellinger, Worthington, Ohio, assignors to Cross Medical Products, Inc., Columbus, Ohio

Filed Nov. 19, 1993, Ser. No. 155,431
Int. Cl.[6] A61B *17/70;17/86*
U.S. Cl. 606—61 **16 Claims**



1. A bone interface anchor for use with an elongated stabilization member said anchor comprising;

a seat means having retaining means for retaining said stabilization member and compression means for compressively securing said stabilization member within said retaining means, and

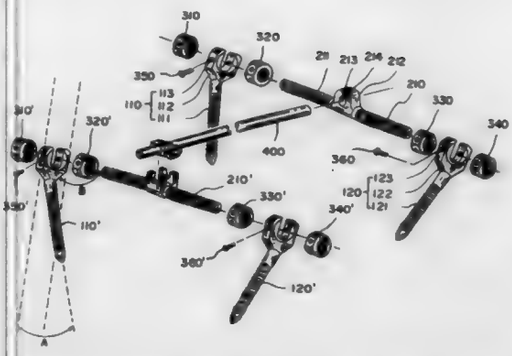
bone fixation means which secure said anchor member relative to said bone interface, said seat means having a means to form a mating cooperation with said fixation means such that said seat means can be variably positioned relative to said fixation means, and said seat means and said fixation means having means to form a locking interface whereby said stabilization member may be selectively compressively loaded into a cooperation with said fixation means by said compression means so as to lock the relative position between said seat means and said fixation means.

5,466,238
VERTEBRAL LOCKING AND RETRIEVING SYSTEM HAVING A FIXATION CROSSBAR

Chih-I Lin, 513 S. Golden Pardos Dr., Diamond Bar, Calif. 10765

Continuation of Ser. No. 112,517, Aug. 27, 1993, abandoned. This application Dec. 22, 1994, Ser. No. 361,480
Int. Cl.[6] A61B *17/70*
U.S. Cl. 606—61 **11 Claims**

1. A vertebral locking and retrieving system comprising:



first and second fixing screws, each of which is composed of a horizontal fixing portion and a threaded portion, said first and second fixing screws being adapted to be fastened onto a single vertebra;

a first fixation crossbar including a bar portion and at least one longitudinal fixing portion located at a mid-section of said bar portion having both ends which are fastened respectively with said horizontal fixing portion of each of said first and second fixing screws; and

first and second sets of fasteners for fastening respectively said horizontal fixing portion of said each of said first and second screws to said both ends of said bar portion of said first fixation crossbar;

wherein said threaded portion and said horizontal fixing portion of said each of said first and second fixing screws form an angle ranging between 3 degrees and 30 degrees, and the threaded portions of said first and second fixing screws are adapted to be arranged opposite to and angled toward each other.

5,466,239

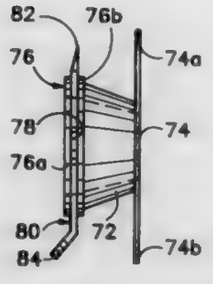
MYRINGOTOMY VENTILATION TUBE AND ASSOCIATED METHOD

James Z. Cinberg, 167 N. Ridgewood Rd., South Orange, N.J. 07079, and Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023

Continuation-in-part of Ser. No. 959,672, Oct. 13, 1992, Pat. No. 5,254,120, which is a continuation-in-part of Ser. No. 921,308, Jul. 28, 1992, Pat. No. 5,207,685. This application May 12, 1993, Ser. No. 60,811

Int. Cl.[6] A61F *17/00*; A61B *17/00*

U.S. Cl. 606—109 **21 Claims**



1. A tympanic ventilation tube for releasing fluid from the middle ear, comprising:

a tubular member;

a distal flange connected to one end of said tubular member; and

a blade member having a cutting edge and removably attached to said tubular member at an end thereof opposite said distal flange, said blade member extending substantially laterally from said tubular member, said blade member facilitating the incising of the tympanic membrane during the insertion of the tubular member, wherein said distal flange is adapted to seat against an inner side of the membrane following the insertion.

5,466,240

Patent Not Issued For This Number

5,466,241

LIGATURE AND/OR SUTURE SYSTEM FOR ENDOSCOPIC SURGERY

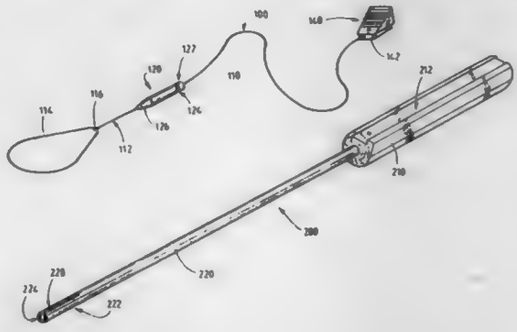
Joël Leroy, Boulevard Lamendin, 62160 Bully les Mines, and Gilles Catteau, 1 Rue Charles Chamberland, 28630 Barjouville, both of, France

Filed Apr. 21, 1994, Ser. No. 230,668

Claims priority, application France, Apr. 23, 1993, 93 04839

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—139 **21 Claims**



1. A ligature and/or suture system for endoscopic surgery, comprising, in combination:

a length of suture having proximal and distal ends slidably mounted in the longitudinal channel of a separate tubular endpiece; and

a rigid support including a handle secured to an elongate rod which is provided at its distal end remote from the handle with a reception cradle suitable for removably receiving the tubular endpiece, and with a through lateral window, whereby said cradle is placed on the outer surface of said support to enable the suture to pass therethrough and said support configured such that traction exerted on the proximal end of the suture by said support serves to tighten the suture.

5,466,242

STENT FOR BILIARY, URINARY OR VASCULAR SYSTEM

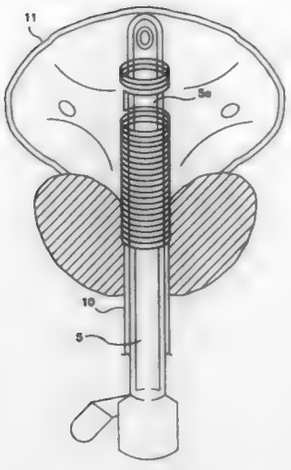
Katsushi Mori, 3-1-810, Nishimidorigaoka 1-chome, Toyonaka-shi, Osaka, Japan

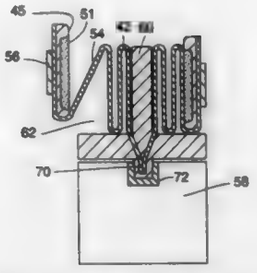
Filed Feb. 2, 1994, Ser. No. 190,303

Int. Cl.[6] A61F *2/06*

U.S. Cl. 606—198 **9 Claims**

1. A stent for a biliary, urinary or vascular system, the stent being made of a shape memory alloy having an Austenite finished temperature ranging from 41° to 43° C. and having a first configuration at a temperature below the Austenite finished temperature and a second expanded configuration at or above the Austenite finished temperature and wherein in the first configuration, a proximal cylindrical portion (1), a distal cylindrical portion (2) and an interspace (3) connecting the two portions (1 ,2) therebetween, through which a portion of a catheter is bulged out to facilitate positioning of the stent in the system, and in the second configuration, the distal portion (2) expands in diameter, the proximal portion (1) is flared away from the expanded distal portion (2), and the interspace (3) is reduced to be absorbed into a shape directly combining the portions (1, 2) so that the stent becomes funnel-shaped to be reliably anchored by the flared proximal portion (1) after the positioning.





an electrode disposed on the substrate and electrically connected to the conductor;

the substrate comprising an adhesive area and a release area permanently attached to the substrate and adhered to the adhesive area,

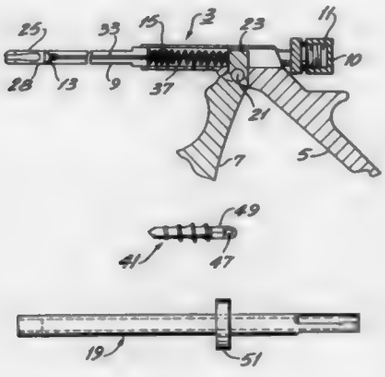
the electrode being disposed against the release area.

5,466,243

METHOD AND APPARATUS FOR INSTALLING A SUTURE ANCHOR THROUGH A HOLLOW CANNULATED GRASPER

Reinhold Schmieding, Naples, Fla., and Stefan Krupp, Munich, Germany, assignors to Arthrex, Inc., Naples, Fla.

Filed Feb. 17, 1994, Ser. No. 197,829
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—232 **12 Claims**



1. A method for installing a suture anchor threaded with suture through tissue and into bone using a hollow grasping means, the method comprising the steps of:

(a) grasping the tissue with the hollow grasping means;

(b) introducing the threaded suture anchor to the tissue through the hollow grasping means;

(c) installing the threaded suture anchor through the tissue and into the bone; and

(d) removing the hollow grasping means for the repair site, leaving the threaded suture anchor installed in the bone.

5,466,244

DEFIBRILLATOR ELECTRODE SYSTEM

Carlton B. Morgan, Bainbridge Island, Wash., assignor to Heartstream, Inc., Seattle, Wash.

Filed May 18, 1993, Ser. No. 63,759
Int. Cl.[6] A61N *1/04*
U.S. Cl. 607—5 **28 Claims**

1. A medical electrode system comprising:

a flexible substrate;

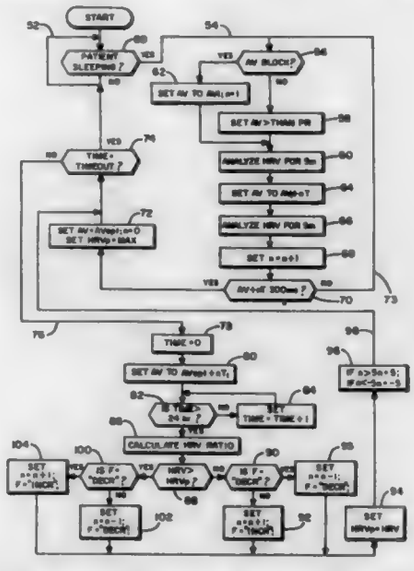
a conductor disposed on the substrate;

5,466,245

METHOD AND APPARATUS TO CONTINUOUSLY OPTIMIZE THE A-V DELAY IN A DUAL CHAMBER PACEMAKER

Julio C. Spinelli, Shoreview, and Jan P. Heemels, Minneapolis, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Nov. 15, 1994, Ser. No. 339,815
Int. Cl.[6] A61N *1/368*
U.S. Cl. 607—17 **22 Claims**



1. Cardiac stimulating apparatus for use with a patient comprising, in combination:

(a) means for sensing atrial depolarization signals;

(b) means for sensing ventricular depolarization signals;

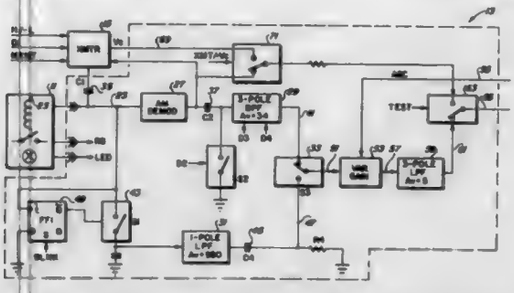
(c) means for stimulating ventricular tissue; and

(d) microprocessor-based controller means coupled to said means for sensing ventricular depolarization signals for determining a heart rate variability index (HRV_i) during a predetermined time interval, said controller means further being coupled to said means for sensing atrial depolarization signals for establishing an optimum A-V delay interval corresponding to a minimum HRV_i, said controller means coupled in controlling relation to said means for stimulating ventricular tissue for causing said ventricular tissue to be stimulated in at least one ventricular chamber after expiration of said optimum A-V delay interval following the sensing of an immediately preceding atrial depolarization signal.

5,466,246
TELEMETRY RECEIVER FOR IMPLANTABLE DEVICE, INCORPORATING DIGITAL SIGNAL PROCESSING

Sergio Silvian, La Crescenta, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Jul. 29, 1994, Ser. No. 282,997
Int. Cl.[6] A61N 1/362
U.S. Cl. 607—32 **18 Claims**



1. Apparatus for receiving a modulated data signal transmitted from an implantable device, wherein the modulated data signal is modulated by a digital or an analog data signal in any of a plurality of distinct modulation modes, the apparatus comprising:

front-end receiving means for receiving the modulated data signal from the implantable device, the front-end receiving means including means for amplifying and antialias filtering the received signal;

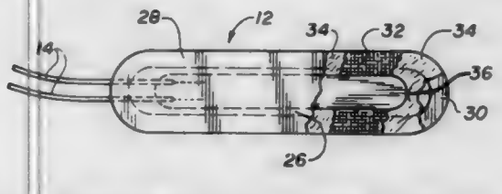
analog-to-digital converter means for sampling the amplified modulated data signal to produce a sequence of digitized samples; and

digital signal processing means for filtering the sequence of digitized samples using at least one of a plurality of bandpass filters and for demodulating the filtered sequence of digitized samples using at least one of a plurality of demodulators, including an amplitude demodulator, a frequency demodulator, and a phase demodulator, to produce a demodulated data signal.

5,466,247
SUBCUTANEOUS ELECTRODE FOR STIMULATING SKELETAL MUSCULATURE

Avram Scheiner, University Heights, and Ernest B. Marsolais, Shaker Heights, both of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Continuation of Ser. No. 884,723, May 18, 1992, abandoned. This application Oct. 21, 1993, Ser. No. 140,815
Int. Cl.[6] A61N 1/04
U.S. Cl. 607—48 **17 Claims**



1. An implantable device for electrically stimulating skeletal musculature or sensing electrical potential, comprising:

an electrode subcutaneously implantable beneath the skin and physically separated from the skeletal musculature and nerves controlling the skeletal musculature, said electrode comprising a single sheet of electrically conductive material having a first surface adapted to face the skeletal musculature and an opposite surface adapted to face away from the skeletal musculature, said electrode defined by an outer perimetric edge;

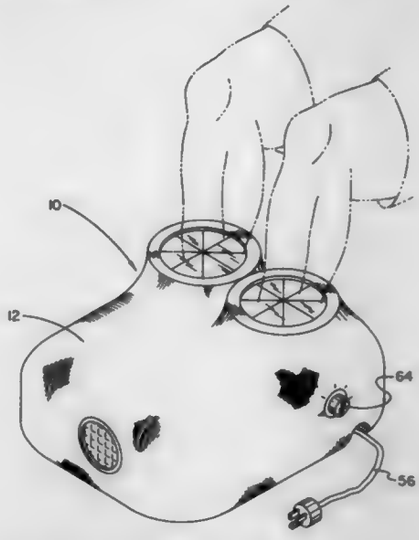
a flexible casing comprising (i) a first layer of flexible biocompatible material adjacent to and substantially covering said opposite surface of said electrically conductive sheet, and (ii) a second layer of flexible biocompatible material covering a portion of said first surface of said electrode and provided with at least one central opening therein for exposing said first surface of said sheet of electrically conductive material, said electrically conductive sheet having a surface area sufficiently large to maintain a charge density of no more than 0.25 $\mu C/mm^2$ so as to prevent corrosion of the electrode and damage to surrounding tissue; and

at least one electrical lead attached at one end to said electrically conductive sheet and attachable at an opposite end to an electrical current source.

5,466,248
FOOT GHOST ENDER

Jayne C. Whitson-Newman, 121 New St., Hellertown, Pa. 18055

Filed Aug. 31, 1994, Ser. No. 298,853
Int. Cl.[6] A61N 5/06
U.S. Cl. 607—88 **5 Claims**



1. A new and improved tanning device for the feet and ankles that tans the users feet and ankles comprising, in combination:

a rounded steel shell having a front, a back, a left sidewall, a right sidewall, an open top, a closed bottom, an inner surface, and an outer surface, an aperture formed in the right sidewall, an extension integral with the open top, the extension having an open circular top, a soft cuff secured to the open circular top, a molded rubber top secured to the soft cuff, the molded rubber top having a plurality of sections functioning to receive a foot;

a plurality of rubber ribs secured to the outer surface of the closed bottom of the rounded steel shell, the rubber ribs functioning to prevent the rubber steel shell from sliding on a floor;

a plurality of tanning lamps secured to the inner surface of the rounded steel shell with at least one lamp secured to each of the front, the back, the right sidewall, and the left sidewall;

an intermediate base secured to the inner surface of the rounded steel shell parallel to the closed bottom and above the aperture formed in the right sidewall;

an adjustable foot rest secured to the inner surface of the rounded steel shell, a pressure activated toggle switch having a first end and a second end, the first end secured to the adjustable foot rest, the second end secured to the intermediate base, the pressure activated toggle switch electrically cooperating with the plurality of tanning lamps;

a retractable power cord having a first end, a second end, and an intermediate extent therebetween, the first end received through the aperture formed within the right sidewall of the

rounded steel shell, a three-prong polarized plug secured to the first end, the second end electrically secured to the pressure activated toggle switch, the intermediate extent inactively stored between the closed bottom of the rounded steel shell and the intermediate base; and

a control panel with adjustable timer secured to the right sidewall of the rounded steel wall, the adjustable timer functioning to turn off the plurality of tanning lamps after a preset period of time.

5,466,249

OPERATING LAMP DEVICE

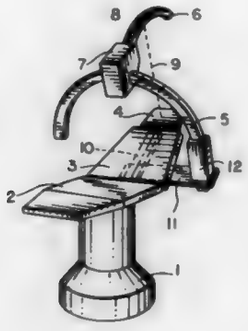
Cornelis de Putter, Mozartlaan 53, 3603 BE Maarssen, Netherlands

Filed Dec. 13, 1993, Ser. No. 166,708

Claims priority, application Netherlands, Dec. 15, 1992, 9202166

Int. Cl.[6] A61N *5/06*

U.S. Cl. 607—90 **8 Claims**



1. Operating lamp device comprising a light source and means for directing a light beam emitted by said light source towards a pre-determined treatment area of a patient lying on an operating table or sitting in a treatment chair and for maintaining the light beam on said treatment area during a movement of said operating table or treatment chair, characterised in that the means comprise a guiding apparatus for the light source, which has a stationary position relative to the operating table or treatment chair and which offers to said light source a spherical cap-shaped area of movement, wherein the centre of curvature of the spherical cap coincides with the treatment area of the patient, and the light source being provided with proximity switches for causing a motion of the light source along the guiding apparatus.

5,466,250

AUTOMATIC FLUID COMPRESS AND CIRCULATING SYSTEM

Glenn W. Johnson, Jr., Summit, and Henry J. McVicker, Chatham, both of N.J., assignors to Aircast, Inc., Summit, N.J.

Continuation-in-part of Ser. No. 737,402, Jul. 29, 1991, Pat. No. 5,230,335, which is a continuation-in-part of Ser. No. 644,835, Jan. 23, 1991, Pat. No. 5,314,455, and a continuation-in-part of Ser. No. 968,287, Oct. 29, 1992, abandoned. This application Aug. 19, 1993, Ser. No. 109,382

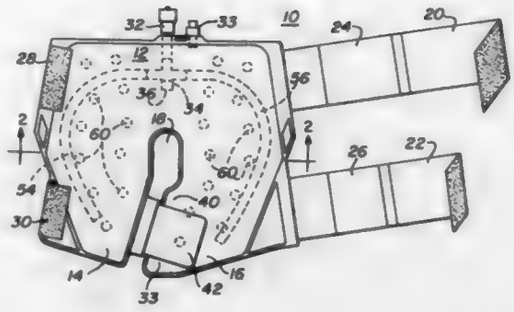
The portion of the term of this patent subsequent to Jul. 27, 2010, has been disclaimed.

Int. Cl.[6] A61F *7/00*

U.S. Cl. 607—104 **29 Claims**

1. A device for treating an injured knee of a leg comprising:

a substantially U-shaped hollow chamber having first and second walls and for applying therapeutic fluid cold and compression only to the general area of the suprapatellar pouch and the general area alongside the knee; and



compression controlling means forming part of the hollow chamber for providing substantially simultaneously a first compression to the general area of the leg alongside and below the knee, a second, substantially higher level of compression to the general area of only the suprapatellar pouch, and a third level of compression at the back of the leg opposite the suprapatellar pouch that is significantly less than the second level of compression applied to the suprapatellar pouch.

5,466,251

THERAPEUTIC SLEEVE

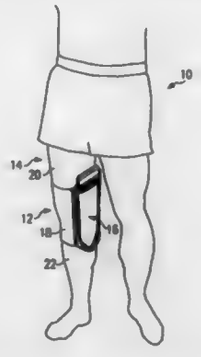
Kevin K. Brunson, Argyle, and Anthony B. Benson, Arlington, both of Tex., assignors to Tecnol Medical Products, Inc., Fort Worth, Tex.

Filed Jul. 8, 1994, Ser. No. 273,094

Int. Cl.[6] A61F *7/00*

U.S. Cl. 607—112 **6 Claims**

1. A stretchable therapeutic sleeve, comprising:



a thin sheet of relatively wide elastic material, said sheet including a first side, a second side opposing said first side, a top edge and a bottom edge; and

a heat or cold pack container, said container including a third side and a fourth side opposing said third side, said first side fixedly joined to said third side, and said second side fixedly joined to said fourth side, wherein a thickness of said sheet proximate said top edge is greater than a thickness of said sheet proximate said bottom edge so as to allow an upper portion of said sheet to be grasped firmly to facilitate pulling the sleeve onto a user's limb.

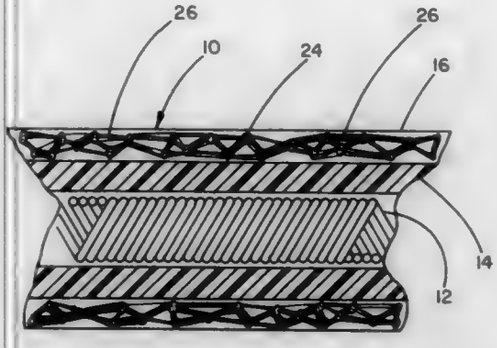
5,466,252

IMPLANTABLE LEAD

Thomas M. Soukup, and Richard A. Staley, both of Flagstaff, Ariz., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Oct. 2, 1992, Ser. No. 955,611
Int. Cl.[6] A61N *1/04*; H01B *7/08*
U.S. Cl. 607—116 24 Claims

1. An implantable lead comprising:



a) at least one helically wound electrical conductor;

b) a tubular covering of an elastomeric polymer having a length, said tubular covering of an elastomeric polymer coaxially surrounding the at least one helically wound electrical conductor, wherein said tubular covering of an elastomeric polymer is substantially impervious to body fluids; and

c) an exterior tubular covering of porous polytetrafluoroethylene having a length and having a microstructure of nodes interconnected by fibrils wherein the exterior tubular covering of porous polytetrafluoroethylene coaxially surrounds the tubular covering of an elastomeric polymer, and wherein the exterior tubular covering of porous polytetrafluoroethylene is pervious to body fluids.

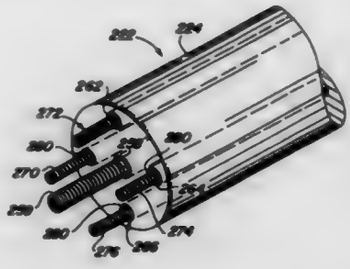
5,466,253

CRUSH RESISTANT MULTI-CONDUCTOR LEAD BODY

Phong D. Doan, Stevenson Ranch, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Apr. 27, 1993, Ser. No. 54,571
Int. Cl.[6] A61B *5/04*
U.S. Cl. 607—122 8 Claims

1. A method of preventing fatigue and tensile mechanical dam-



age to conductors in a pacing lead having a lead body wherein the conductors are protected within an insulation sheath extending between and interconnecting a connector at a proximal end and an electrode at a distal end, comprising:

a) assembling said pacing lead; and

b) injecting a flexible insulative material into the insulation sheath, whereby said flexible insulative material surrounds the conductors.

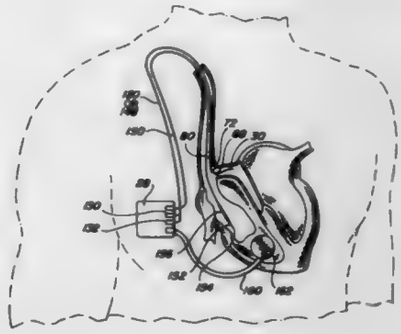
5,466,254

CORONARY SINUS LEAD WITH ATRIAL SENSING CAPABILITY

John R. Helland, Issaquah, Wash., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Sep. 22, 1993, Ser. No. 125,447
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—123 22 Claims

1. An apparatus for pacing, cardioverting or defibrillating a heart



comprising:

an implantable pulse generator;

a coronary sinus lead connected at a proximal end to said pulse generator comprising a lead body including at least two conductors encased within an insulation material, said coronary sinus lead having a coronary sinus defibrillating electrode at its distal end, the coronary sinus defibrillating electrode including an electrically conductive coil wrapped about an electrically conductive sleeve, at least one of said conductors of said lead body extending into said electrically conductive sleeve and electrically connected thereto; and

sensor means for sensing physical or electrical parameters in the atrial cavity, said sensor means attached to said coronary sinus lead.

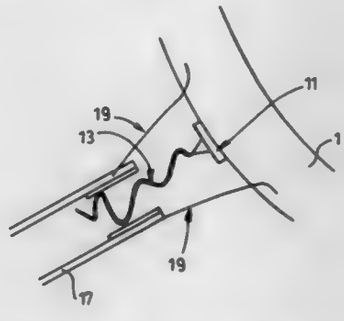
5,466,255

PROBE FOR CARDIAC PACEMAKER

Pierre Franchi, Vitry/Seine, France, assignor to ELA Medical, Montrouge, France

Filed Apr. 30, 1993, Ser. No. 56,259
Claims priority, application France, Apr. 30, 1992, 92 05356
Int. Cl.[6] A61N *1/05*
U.S. Cl. 607—128 49 Claims

24. A probe for connecting a cardiac pacemaker to cardiac tissue



for monitoring and stimulating cardiac activity comprising:

a sensor having an electrode and means for catching the sensor to the cardiac tissue;

a catheter interposed between the pacemaker and the cardiac tissue having a distal end; and

means for securing the catheter to the cardiac tissue with the distal end spaced a distance from the sensor so as not to apply any mechanical stress on the sensor.

5,466,256

MULTI-FUNCTION MULTI-ELECTRODE DEVICE

Eric T. McAdams, Ormsdale, 52 Cable Road, Whitehead, County Antrim, Ireland; John M. Anderson, 16 Torgrange, Hollywood, County Down, BT18 0NG, Ireland, and James A. McLaughlin, 9 Hampton Gardens, Hampton Court Village, Belfast, BT7 2DF, Ireland

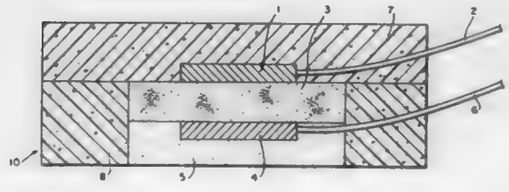
Filed Nov. 12, 1993, Ser. No. 150,980

Claims priority, application Ireland, Nov. 13, 1992, 922818

Int. Cl.[6] A61N *1/04*

U.S. Cl. 607—142 **17 Claims**

1. A multi-function multi-electrode cardiac device for applying



electrical signals to a living body, comprising: first and second substantially planar, electrically conductive electrodes disposed in a substantially parallel spaced apart relationship, a first gel pad disposed between facing sides of the first and second electrodes, a second gel pad disposed on an opposite side of the second electrode and having an exposed surface for making contact with a patient, each of the first and second gel pads having an area greater than that of the second electrode such that the first and second gel pads contact one another laterally of the second electrode, and means for individually making direct electrical connection to each of the electrodes, wherein the first electrode and the first and second gel pads comprise a cardiac pacing electrode assembly and the second electrode and the second gel pad comprise a cardiac defibrillation electrode assembly.

5,466,257

Patent Not Issued For This Number

5,466,258

ORBITAL IMPLANT

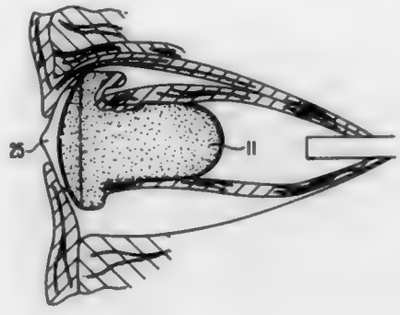
Peter A. D. Rubin, Boston, Mass., assignor to Porex Surgical, Inc., College Park, Ga.

Filed Nov. 12, 1993, Ser. No. 151,373

Int. Cl.[6] A61F *2/14*

U.S. Cl. 623—4 **21 Claims**

1. An orbital enucleation implant for replacing a volume of an



eyeball in an anophthalmic eye socket of an eye comprising a body of biocompatible material, said body being shaped to have a generally elongated body defining a posterior conical projection extending along an axis and shaped to parallel bony orbital contours of a posterior portion of the eye socket and, an anterior surface shaped, sized and positioned to be coupled to an ocular prosthesis which will extend under and be overlapped by upper and lower eyelids of the eye when open, a superior projection on said body posterior to said ocular prosthesis extending on an axis arranged at approximately 90 degrees to the axis of said posterior projection, said superior projection sized, shaped and positioned to engage and support a levator muscle of the upper eyelid and prevent a superior sulcus deformity behind the upper eyelid.

5,466,259

ORBITAL IMPLANT AND METHOD

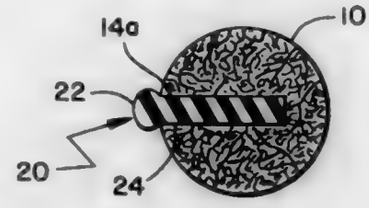
Jean-Francois Durette, 1170 East, Henri-Bourassa Blvd., Montreal, Quebec, Canada

Filed Mar. 7, 1994, Ser. No. 206,956

Int. Cl.[6] A61F *2/14*

U.S. Cl. 623—4 **7 Claims**

1. An orbital implant for coupling with an ocular prosthesis to



replace an eye following evisceration or enucleation, said implant comprising a sphere having an anterior surface and a posterior

surface when implanted, the sphere being formed of braided threads of a microporous material that provide a plurality of voids for tissue ingrowth.

5,466,260

ADJUSTABLE DEVICES FOR CORNEAL CURVATURE ADJUSTMENT

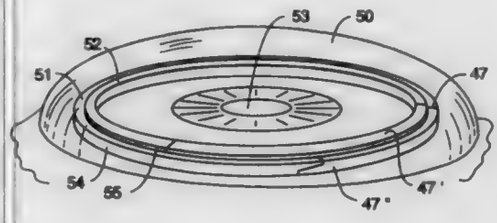
Thomas Silvestrini, Alamo; Mark Mathis, Fremont, and Bryan Loomas, Santa Clara, all of Calif., assignors to KeraVision, Inc., Fremont, Calif.

Division of Ser. No. 948,079, Sep. 21, 1992, Pat. No. 5,300,118. This application Oct. 22, 1993, Ser. No. 141,813

Int. Cl.[6] A61M *31/00*

U.S. Cl. 623—5 **11 Claims**

1. A method for adjusting the shape of the cornea of an eye,



comprising the steps of:

cutting an initial incision into the cornea of the eye;

continuing to separate into the cornea of the eye from the point of the initial incision in a circular direction from the incision beneath the surface of the cornea so as to provide a complete annular channel within the cornea;

inserting into the initial incision an end of an intrastromal corneal ring having an adjustable thickness, the ring being comprised of an elongated, flexible annular body;

progressively moving the inserted end of the ring into the initial incision in a circular path within the annular channel until the ring is fully inserted; and

adjusting the thickness of the ring and thereby adjusting the shape of the cornea to focus light entering the eye.

5,466,261

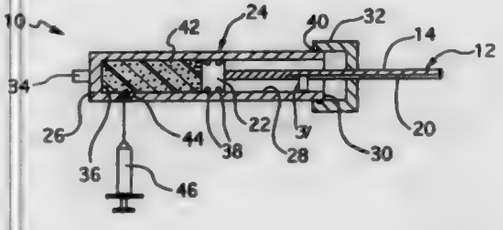
NON-INVASIVE EXPANDABLE PROSTHESIS FOR GROWING CHILDREN

Marc E. Richelsoph, Cordova, Tenn., assignor to Wright Medical Technology, Inc., Arlington, Tenn.

Filed Nov. 19, 1992, Ser. No. 979,508

Int. Cl.[6] A61F *2/28;5/04*

U.S. Cl. 623—16 **10 Claims**



1. An adjustable length prosthetic implant comprising:

a stem including a rod portion having a first end portion adapted for connection to a base end and a second end portion including a piston, said base end being shaped, sized and configured to be connected to a group consisting of a bone and a bone prosthesis;

a sleeve including a closed end and an inner chamber extending to an opposite open end and defining an axial dimension, the chamber containing the piston for sliding movement therethrough and extension of the first end portion of the stem from the open end of the sleeve, the closed end including an outer surface having a mounting component thereon for mounting on a base and an inner surface cooperating with the piston to define an axially expandable pocket therebetween;

axially expandable means disposed within the pocket and axially expandable relative to the axis defined by the chamber upon contact with a fluid for forcing extension of the stem from the open end of the sleeve; the axially expandable means being hydrogel which expands upon contact with the fluid; and

valve means for controlling the flow of the fluid to the expandable means.

5,466,262

MALLEABLE FRACTURE STABILIZATION DEVICE WITH MICROPORES FOR DIRECTED DRUG DELIVERY

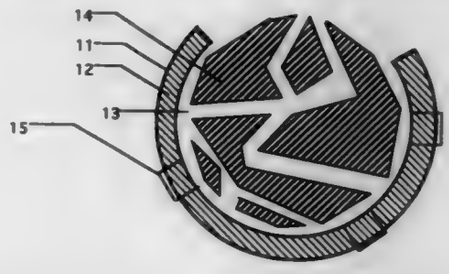
Bruce N. Saffran, 110 Riviera Cir., Larkspur, Calif. 94939

Filed Aug. 30, 1993, Ser. No. 114,745

Int. Cl.[6] A61F *2/28*

U.S. Cl. 623—16 **20 Claims**

1. A flexible fixation device for implantation into human or



animal tissue to promote healing of a fractured tissue comprising:

a first layer of flexible material that is minimally-porous to macromolecules, being capable of shaping in three dimensions by manipulation by human hands, having a first and second major surface,

a second layer of flexible material that is microporous being capable of shaping in three dimensions by manipulation by human hands, having a first and second major surface,

at least part of the second layer containing at least one treating material,

the first layer being substantially impermiable to at least one treating material contained in the second layer,

the first major surface of the second layer being adapted to be adjacent the fractured tissue, the second major surface of the second layer being adjacent to a major surface of the first layer,

the device being flexible in three dimensions by manipulation by human hands,

the second layer having material release means for release of the at least one treating material in a directional manner when placed adjacent to a major surface of the first layer.

5,466,263

PROCESS FOR DYEING FUR SKINS WITH OXIDATION DYES

Hubert Herdt, Offenbach, and Josef Hurt, Hofheim, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jul. 7, 1994, Ser. No. 271,176

Claims priority, application Germany, Jul. 10, 1993, 43 23 123.3

Int. Cl.[6] D06P *3/00;5/00*

U.S. Cl. 8—404 18 Claims

1. A process for mordanting fur skins which comprises the steps of:

combining at least one metal salt and glyoxylic acid, to form a mordanting solution wherein the metal salt is an iron salt, a copper salt, a copper-iron salt, a chromium-copper salt, an iron-chrome alum salt, a copper-chrome alum salt, potassium dichromate, sodium dichromate, or mixtures thereof;

bringing said fur skins into contact with said mordanting solution for a time sufficient to effect a mordanting pretreatment of the fur skins with the mordanting solution that contains glyoxylic acid and introducing the fur skins into a dyebath.

5,466,264

Patent Not Issued For This Number

5,466,265

LITHIUM-CONTAINING ASSISTANTS FOR DYEING AND PRINTING OF CELLULOSIC AND/OR REGENERATED CELLULOSIC MATERIALS

Martin Riegels, Leichlingen, and Joachim Grütze, Odenthal, both of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 13, 1994, Ser. No. 242,760

Claims priority, application Germany, May 21, 1993, 43 17 075.7

Int. Cl.[6] D06P *3/60;1/44*

U.S. Cl. 8—594 6 Claims

1. In the dyeing or printing of a cellulose-containing material, wherein a cellulose-containing material is first wet with a liquid containing a dyeing assistant, and the wet material is thereafter contacted with a dye, the improvement wherein the material is contacted with a lithium cation-containing compound prior to contact with the dye.

5,466,266

CLOSED SYSTEM MULTISTAGE SUPERPURIFICATION RECRYSTALLIZATION

Kenneth F. Griffiths, 415 Whitewater Ave., Fort Atkinson, Wis. 53538

Filed Jun. 17, 1993, Ser. No. 79,000

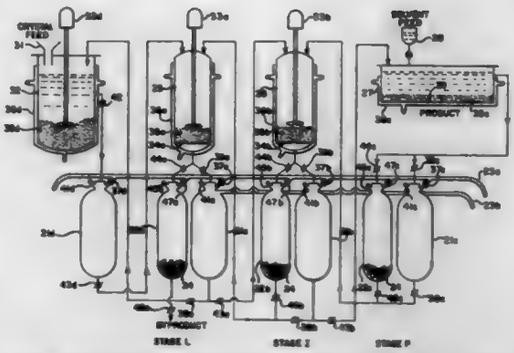
The portion of the term of this patent subsequent to Jul. 7, 2009, has been disclaimed.

Int. Cl.[6] C03B *7/08*

U.S. Cl. 23—295 R 24 Claims

1. A method for superpurifying crystallizable substances by a multistage recrystallization procedure, comprising:

providing a plurality of stages having vessels with crystallizable substances therein and operating said stages by proceeding with a sequence of steps in a cyclic manner through a plurality of substantially duplicate cycles conducted substantially simultaneously within each stage such that the crystallizable substance is dissolved in each stage beginning with a least pure stage, transferred as a fully dissolved component of a new solution to the next purer stage, and recrystallized in the next purer stage until superpurified through recrystallization in the purest stage, the sequence of steps including:



(a) transferring a quantity of mother liquor containing crystals of the crystallizable substance and a solvent for the crystallizable substance from a liquid receiver of each stage into a processor having crystallizing capabilities of each next less pure stage;

(b) dissolving the crystals of step (a) within the mother liquor of step (a) to form a new solution in each processor of the next less pure stage;

(c) transferring each new solution formed in step (b), while avoiding transfer of crystallized material apart from said new solution, to the processor of the next purer stage;

(d) crystallizing crystallizable material within each new solution of each processor to form crystals, said crystals of the most pure stage being a recrystallized superpurified substance;

(e) separating the crystals formed in step (d) from its mother liquor in at least the processors of stages other than the most pure stage to provide separated crystals, and collecting the thus separated mother liquor for subsequent use in step (a) of a next cycle; and

(f) discharging mother liquor as a byproduct from the least pure stage.

5,466,267

OLIGOMERIC/POLYMERIC MULTIFUNCTIONAL ADDITIVES TO IMPROVE THE LOW-TEMPERATURE PROPERTIES OF DISTILLATE FUELS

David J. Baillargeon, Cherry Hill; Angeline B. Cardis, Florence; Dale B. Heck, West Deptford, all of N.J., and Susan W. Johnson, Centreville, Va., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Sep. 17, 1992, Ser. No. 946,223

The portion of the term of this patent subsequent to Dec. 21, 2010, has been disclaimed.

Int. Cl.[6] C10L *1/18*

U.S. Cl. 44—386 24 Claims

1. A multifunctional low-temperature-modifying distillate fuel additive consisting of a polymeric and/or oligomeric ester additive product of reaction prepared by polymerizing or oligomerizing a suitable combination of monomers selected from a member of the group consisting of: (1) at least one C_{12} long-chain epoxide or a diol having at least 12 carbon atoms that is capable of producing a related condensation product of reaction and; (2) at least one aromatic anhydride or a diacid capable of reacting with said epoxide or diol, or mixtures of (1) and (2); or (3) a suitable material reactive with (1) and (2) or mixtures thereof selected from the group consisting of isocyanates, diisocyanates, epoxy halides, carbamates, diepoxides, dianhydrides or polyols, in varying molar ratios under suitable conditions of time, temperature and pressure which material functions as a chain modifier or cross-linking agent and wherein the molar ratios of reactants vary from equimolar to more than molar to less than molar, at temperatures varying from about 50° to about 250° C. and with pressures varying from ambient to autogenous for times varying from about an hour to about 48 hours thereby producing the desired ester additive product said product containing polymeric structures having ester functions and R, R_1, R_2, R_3 or R_4 hydrocarbyl groups each having 1 to 300 carbon atoms independently and regularly spaced along the polymer/oligomer backbone and wherein said ester additive product is (4) optionally post reacted with suitable amines, alcohols or

a mixture of such amines and alcohols to provide additional functionality to said additive product.

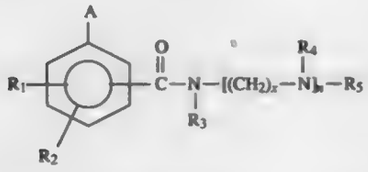
5,466,268

POLYALKYL AND POLYALKENYL AROMATIC AMIDES AND FUEL COMPOSITIONS CONTAINING THE SAME

Richard E. Cherpeck, Cotati, Calif., assignor to Chevron Chemical Company, San Ramon, Calif.

Filed Dec. 30, 1994, Ser. No. 366,528
Int. Cl.[6] C10L *1/22; C07C 237/28*
U.S. Cl. 44—419 **52 Claims**

1. A compound of the formula:



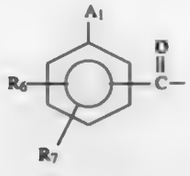
or a fuel-soluble salt thereof;

wherein A is hydroxy, nitro, amino, N-alkylamino wherein the alkyl group contains 1 to 6 carbon atoms, or N,N-dialkylamino wherein each alkyl group independently contains 1 to 6 carbon atoms;

R_1 and R_2 are each independently hydrogen, hydroxy, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;

R_3 is hydrogen or lower alkyl having 1 to 6 carbon atoms;

R_4 is hydrogen or an acyl group of the formula:



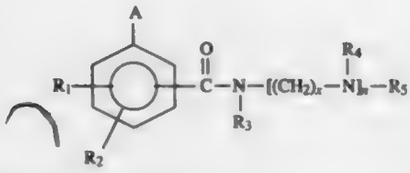
wherein A_1 is hydroxy, nitro, amino, N-alkylamino wherein the alkyl group contains 1 to 6 carbon atoms, or N,N-dialkylamino wherein each alkyl group independently contains 1 to 6 carbon atoms;

R_6 and R_7 are each independently hydrogen, hydroxy, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;

R_5 is a polyalkyl or polyalkenyl group having an average molecular weight in the range of about 450 to 5,000;

n is an integer from 0 to 2; and x is an integer from 2 to 5.

18. A fuel composition comprising a major amount of hydrocarbons boiling in the gasoline or diesel range and an effective detergent amount of a compound of the formula:



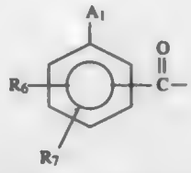
or a fuel-soluble salt thereof;

wherein A is hydroxy, nitro, amino, N-alkylamino wherein the alkyl group contains 1 to 6 carbon atoms, or N,N-dialkylamino wherein each alkyl group independently contains 1 to 6 carbon atoms;

R_1 and R_2 are each independently hydrogen, hydroxy, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;

R_3 is hydrogen or lower alkyl having 1 to 6 carbon atoms;

R_4 is hydrogen or an acyl group of the formula:



wherein A_1 is hydroxy, nitro, amino, N-alkylamino wherein the alkyl group contains 1 to 6 carbon atoms, or N,N-dialkylamino wherein each alkyl group independently contains 1 to 6 carbon atoms;

R_6 and R_7 are each independently hydrogen, hydroxy, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;

R_5 is a polyalkyl or polyalkenyl group having an average molecular weight in the range of about 450 to 5,000;

n is an integer from 0 to 2; and x is an integer from 2 to 5.

5,466,269

POLYCRYSTALLINE CUBIC BORON NITRIDE ABRASIVE PARTICLES AND ABRASIVE TOOLS MADE THEREFROM

Frank Corrigan; Sam Anthony, and Barbara Sweeting, all of Franklin, Ohio, assignors to General Electric Company, Worthington, Ohio

Continuation-in-part of Ser. No. 735,503, Jul. 25, 1991, Pat. No. 5,194,071. This application Nov. 30, 1992, Ser. No. 983,359
Int. Cl.[6] C09C *1/68*
U.S. Cl. 51—307 **8 Claims**

1. A polycrystalline cubic boron nitride (CBN) abrasive compact, obtained by converting a pressed pill having a density greater than 2.00 gm/cc and comprising catalyst material and hexagonal boron nitride (HBN) particles having an average particle size of 10–1000 μm to a mass of polycrystalline cubic boron nitride under conditions of high pressure and temperature sufficient to convert HBN to CBN.

5,466,270

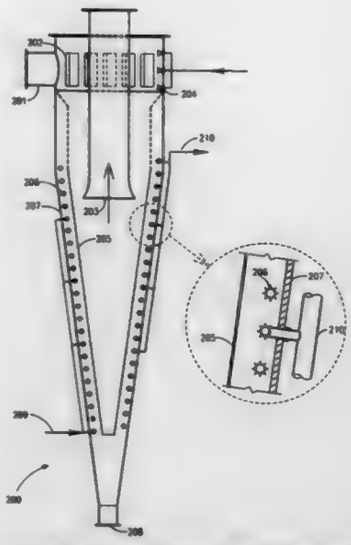
CYCLONIC CENTRIFUGAL GAS SEPARATOR - ABSORBER APPARATUS FOR BOILER FLUE GAS CLEANING

Fawzy T. Abdelmalek, 12807 Willowyck Dr., St. Louis, Mo. 63146

Continuation-in-part of Ser. No. 977,138, Nov. 16, 1992, Pat. No. 5,321,946, and Ser. No. 11,870, Feb. 1, 1993, Pat. No. 5,403,569. This application May 31, 1994, Ser. No. 251,277
Int. Cl.[6] B01D *45/16;47/06*
U.S. Cl. 55—238 **1 Claim**

1. A cyclonic flue gas centrifugal separator-absorber apparatus for separating and discharging a relatively heavier gas fraction laden with a rich sulfur dioxide absorbent liquor flowing downwardly along its perimeter to a bottom outlet, and venting a relatively lighter gas fraction flowing upwardly from its center to a top outlet; said centrifugal separator-absorber structure comprises:

a. A cylindrical inlet chamber having means for receiving a tangential flow pattern of a flue gas stream flowing under relatively higher inlet pressure through a set of aerodynamic guide vanes positioned to cause a directional outward centrifugal effect;



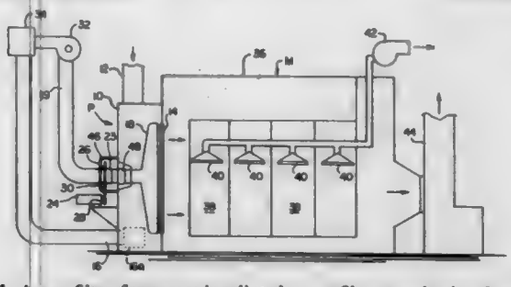
b. A rectangular inlet part having means for directions said relatively higher pressure flue gas stream to enter tangentially into said cylindrical inlet chamber;
c. A lean sulfur dioxide absorbent liquor atomizing nozzles system, placed along the perimeter of said inlet chamber;
d. A cyclone part having means for causing a spiral downward gas flow pattern;
e. A diffusing screen mounted inside the cyclone part to cause mass diffusion of a heavier gas fraction laden with said absorbent liquor into a perimeter space enclosed between the diffusing screen and the outer wall of the cyclone under the effect of a steep centrifugal pressure gradient;
f. A cooling system utilizing a low temperature heat transfer fluid circulating in a spiral coil placed behind the diffusing screen to cause cooling effect and condense vapors contained in the centrifugally diffused heavier gas fraction and cause thermal diffusion to enhance migration of the heavier gas fraction into said perimeter space along the outer wall of the cyclone;
g. A bottom cyclone outlet to allow discharge of the relatively heavier gas fraction laden with the sulfur dioxide absorbent liquor to exit downwardly at a lower gas pressure relative to its higher inlet pressure;
h. Said top outlet comprising a top round outlet having a bell shaped inlet protruding inside the said cyclone to allow discharge of the relatively lighter gas fraction exiting upwardly at a lower gas pressure relative to its higher inlet pressure.

5,466,271

PRE-FILTER WITH ROTATING NOZZLE

Ivan J. Horvat, 1109 S. Belvidere Ave., Gastonia, N.C. 28054

Filed Apr. 29, 1994, Ser. No. 236,549
Int. Cl.[6] B01D *41/00*
U.S. Cl. 55—294 **10 Claims**



1. A pre-filter for removing lint, longer fibers, and other larger particles from an air stream entering a primary filter system comprising:

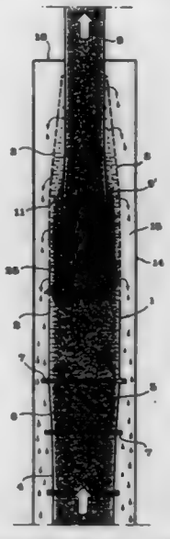
(a) an enclosed housing having an air inlet for receiving contaminated air from a remote manufacturing source and an air outlet in communication with said primary filter system;
(b) a collection screen covering said air outlet, said collection screen having a pore size such that larger particles are collected thereon and smaller particles and dust pass therethrough into said primary filter system, said screen having an interior surface within said housing and an exterior surface in the direction of said filter system;
(c) a particle removal nozzle within said housing, said nozzle having a large particle inlet adjacent said screen interior surface;
(d) an air conduit having an intake opening communicating with said nozzle;
(e) an exhaust fan having an intake opening communicating with said air conduit to draw lint containing air from said nozzle through said air conduit; and
(f) drive means for moving said nozzle across the interior surface of said screen.

5,466,272

SEPARATOR

Rolf L. Karlsson; Hernan Tinoco, and Mats E. Henriksson, all of Alvkarleby, Sweden, assignors to Vattenfall Utveckling AB, Sweden

PCT No. PCT/SE92/00447, § 371 Date May 2, 1994, § 102(e) Date May 2, 1994, PCT Pub. No. WO93/05339, PCT Pub. Date Mar. 18, 1993
PCT Filed Jun. 18, 1992, Ser. No. 196,065
Claims priority, application Sweden, Sep. 3, 1991, 9102519
Int. Cl.[6] B01D *45/16*
U.S. Cl. 55—457 **10 Claims**



1. In a separator for separating two phases in a mixture of a gaseous medium and a liquid medium, the separator comprising a main tube having an inside tube wall and a substantially cylindrical section merging into a tapering section, the separator further having blade means with a plurality of blades, said blade means housed within a central body within said main tube for revolving the two-phase mixture passing through said blade means to cause the liquid in the mixture to be applied against said inside wall of said main tube thus forming a film thereon, an outlet tube located at the tapering portion of said main tube and coaxial therewith for evacuating gas, a plurality of perforations located in said main tube wall through which the liquid from the film can escape while being separated from the gas, said outlet tube having a cross sectional area smaller than that of said cylindrical section, the improvement wherein:

each of said plurality of blades of said blade means has an axial extension at least twice as large as the largest width of said

blades and a curvature of such a degree that a trailing edge of one of said plurality of blades is angularly offset past an imaginary radial plane in the axial extension of a leading edge of an adjacent blade;

said perforations are located along said tapering section of said main tube and along said cylindrical section of said main tube; and

the total area of said perforations being from about 50 to about 65% of the cross-sectional area of said cylindrical portion of said main tube to form a coherent film on the inside of said tube wall.

5,466,273

METHOD OF TREATING ORGANIC MATERIAL

Larry V. Connell, 309 N. 84th Ave., Yakima, Wash. 98908

Filed Apr. 28, 1994, Ser. No. 234,228

Int. Cl.[6] C05F *3/00;11/00;11/02*

U.S. Cl. 71—11 **12 Claims**

1. A method of treating organic material to form a final product comprising the steps of:

a first step of creating an admixture comprising admixing organic material with water and an acid, said acid equivalent to 5 to 12% by total weight 100% sulfuric acid;

a second step of creating a resulting admixture comprising increasing the pH of said admixture by adding a base, while simultaneously introducing steam into said admixture, the amount of said steam being up to 5% by weight; and

a last step comprising heating and drying the resulting admixture into the final product.

5,466,274

ABRASION RESISTANT COATINGS FOR FERTILIZERS

Alice P. Hudson, Jupiter; Fred E. Woodward, deceased, late of West Palm Beach, both of Fla.; by Sam Woodward, executor, Westfield, N.J.; Richard J. Timmons, and Harvey M. Goertz, both of Marysville, Ohio, assignors to OMS Investments, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 74,141, Jun. 9, 1993, Pat. No. 5,300,135, which is a continuation of Ser. No. 655,157, Feb. 14, 1991, abandoned. This application Apr. 4, 1994, Ser. No. 222,669

The portion of the term of this patent subsequent to Apr. 5, 2011, has been disclaimed.

Int. Cl.[6] C05C *9/00;* C05G *3/10*

U.S. Cl. 71—28 **14 Claims**

1. An abrasion resistant, free-flowing, non-smearing, essentially dustless slow release fertilizer composition consisting essentially of:

a particulate water soluble fertilizer core having a sulfur coating layer applied directly onto the surface of said fertilizer core,

said sulfur coating layer being coated with from about 0.75 to about 10 percent (by weight of the fertilizer composition) of a topcoating composition which is essentially non-flowable at ambient temperature and has a melting point of from about 60° C. to about 105° C.,

said topcoating composition providing a hard ,outer coating over said sulfur coating layer and being non-smearing at ambient temperature whereby said sulfur coated fertilizer composition is rendered essentially dust-free on handling,

said topcoating composition comprising a mixture of about 5 to about 50 percent (by weight of the topcoating composition) of a polymer and about 95 to about 50 percent (by weight of the topcoating composition) of a hydrocarbon wax;

said polymer being selected from the group consisting of ethylene-vinyl acetate copolymers; ethylene-acrylic acid copolymers; ethylene-ethyl acrylate copolymers; ethylene-vinyl alcohol copolymers; ethylene-vinyl alcohol-vinyl acetate terpolymers and mixtures thereof; and

said hydrocarbon wax being selected from the group consisting of natural petroleum waxes having drop melting points between about 60° C. and 80° C., containing less than about 5% oil as determined by ASTM method D721, and being essentially free of aromatic or cyclic structures; synthetic hydrocarbon waxes melting between about 60° C. and 105° C., and having molecular weights between about 400 and 600 and mixtures thereof.

5,466,275

METHOD AND APPARATUS FOR DESULPHURIZING IRON WITH MINIMAL SLAG FORMATION

Anton More, Marienbergstrasse 48c, D-84489 Burghausen, Germany

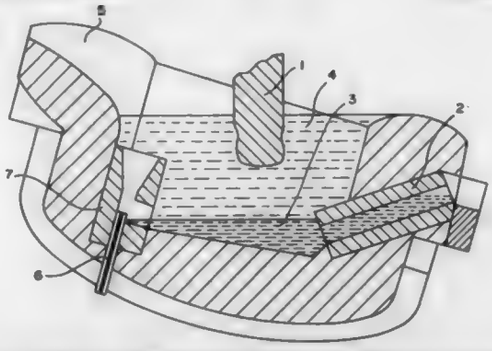
PCT No. PCT/DE93/00165, § 371 Date Aug. 29, 1994, § 102(e) Date Aug. 29, 1994, PCT Pub. No. WO93/17131, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 25, 1993, Ser. No. 295,733

Claims priority, application Germany, Feb. 27, 1992, 42 06 091.5

Int. Cl.[6] C21C *1/02*

U.S. Cl. 75—10.46 **12 Claims**



1. A method for desulphurizing sulphur-containing iron comprising: melting and heating to a temperature of 1400° to 1800° C. a desulphurization slag comprising a composition by weight of no more than 20% SiO_2, no more than 30% Al_2O_3, about 5–40% SiO_2, Al_2O_3, and TiO_2 combined, no more than 2% FeO, no more than 1.5% MnO, about 25–65% CaO, MgO, BaO, Na_2O, and K_2O combined, no more than 20% MgO, no more than 10% Na_2O and K_2O combined, no more than 60% CaF_2, and about 50–85% CaO, MgO, BaO, Na_2O, K_2O and CaF_2 combined, said slag having a ratio of CaO and MgO to SiO_2 and $\frac{1}{2}Al_2O_3$ of at least 2 and having a ratio of Na_2O and K_2O to SiO_2 of no more than 1;

adding said iron to said slag in an amount sufficient to maintain a ratio of not more than 10 parts by weight of iron to desulphurization slag;

mixing said sulphur-containing iron with said molten slag to desulphurize said sulphur-containing iron;

discharging said desulphurized iron from beneath said slag.

5,466,276

VALVE SEAT MADE OF SECONDARY HARDENING-TYPE HIGH TEMPERATURE WEAR-RESISTANT SINTERED ALLOY

Katsuaki Sato; Katsuhiko Tominaga; Tsutomu Saka, all of Wako; Osamu Kawamura, Shimotsuga; Teruo Takahashi, Shimotsuga, and Arata Kakiuchi, Shimotsuga, all of, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, and Nippon Piston Ring Co., Ltd., both of, Japan

Continuation of Ser. No. 840,828, Feb. 25, 1992, Pat. No. 5,273,570. This application Jul. 7, 1993, Ser. No. 87,079

Claims priority, application Japan, Feb. 27, 1991, 3-055806; Jan. 21, 1992, 4-030162

Int. Cl.[6] C22C *28/00*

U.S. Cl. 75—231 **7 Claims**

1. A valve seat for a cylinder head of an internal combustion engine, comprising:

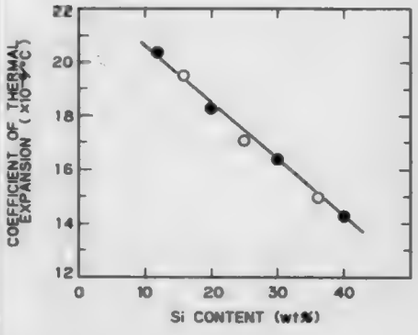
a secondary hardening type high temperature wear resistant sintered alloy comprising a matrix of (a) 0.4 to 15 wt. % of at least one metal carbide forming element selected from the group consisting of W, Mo, V, Ti, Nb, Ta and B, (b) 5 to 35 wt. % of an austenite forming element selected from the group consisting of Ni, Co, Cu and Cr, (c) 0.2 to 1.2 wt. % of C, and (d) a remainder substantially composed of Fe, the matrix comprising mainly an austenite phase which is capable of martensitic transformation during use in such an internal combustion engine, said austenite phase being contained in the matrix in a requisite amount to secondarily harden the high temperature wear resistant sintered alloy, said valve seat being formed by forming a mixture of materials (a), (b), (c) and (d) in powder form, compressing the mixture to form a compressed body, and sintering the compressed body, said austenite phase being produced by one of adjusting a cooling rate in a sintering process and subjecting the sintered alloy to a solution treatment.

5,466,277

STARTING POWDER FOR PRODUCING SINTERED-ALUMINUM ALLOY, METHOD FOR PRODUCING SINTERED PARTS, AND SINTERED ALUMINUM ALLOY

Shin Miura, Saitama; Youichi Hirose, Saitama, and Mitsuaki Sato, Saitama, all of, Japan, assignors to Showa Denko K.K., Tokyo, Japan

Continuation of Ser. No. 725,806, Jul. 10, 1991, abandoned. This application Mar. 30, 1994, Ser. No. 219,700
Claims priority, application Japan, Jul. 10, 1990, 2-183638
Int. Cl.[6] B22F *1/00*; C22C *21/02*
U.S. Cl. 75—255 **16 Claims**



1. An aluminum-alloy starting powder mixture for producing liquid-phase sintered aluminum-alloy parts having a near net shape produced by a powder compaction using a die and liquid, phase sintering, which consists of an unsintered physical mixture of at least two powders of (1) 80% or more of an aluminum-alloy main powder consisting of from 10.0 to 22% by weight of Si, from 0.2 to 2.0% by weight of Cu, and the balance Al and unavoidable impurities and (2) 20% or less of at least one metal or mother-alloy powder selected from groups (a)–(i) in such an amount and combination that the composition of the mixture is from 0.2 to 2.0% by weight of Mg, from 10.0 to 22% by weight of Si, from 0.2 to 4.0% by weight of Cu, and the balance being Al and unavoidable impurities, wherein

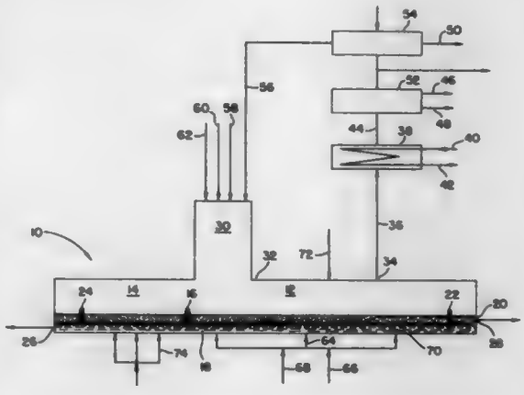
(a) Mg powder
(b) Al—Mg powder
(c) Al—Cu powder
(d) Al—Mg—Si powder
(e) Al—Cu—Si powder
(f) Al—Mg—Cu powder
(g) Al—Mg—Cu—Si powder
(h) Mg—Cu powder
(i) Mg—Cu—Si powder.

5,466,278

PROCESS FOR THE MANUFACTURE OF STEEL

Paul E. Queneau, Cornish, N.H., and Martin Hirsch, Friedrichsdorf, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 77,757, Jun. 15, 1993, abandoned, which is a continuation of Ser. No. 625,857, Dec. 11, 1990, abandoned. This application Apr. 6, 1994, Ser. No. 223,833
Int. Cl.[6] C21B *13/14*
U.S. Cl. 75—501 **32 Claims**



1. A direct and continuous process for steel making with a carbon content of less than 1.0 wt.-% by reducing iron ore and refining the hot metal, comprising:

introducing iron ore and carbonaceous fuel into a reduction zone of an approximately horizontally disposed tiltable reactor having a round cross section;

forming an iron melt made of hot metal covered by a liquid layer of slag in the reduction zone;

injecting by a submerged injection an oxygen-rich gas and solid carbon-containing fuel into the iron melt in the reduction zone;

blowing an oxygen-rich gas onto the slag layer without penetrating the slag layer in the reduction zone;

passing the iron melt from the reduction zone into a refining oxidation zone of the reactor, the slag layer from the refining zone flows into the reduction zone;

withdrawing the liquid slag from the reduction zone;

supplying substantially nitrogen-free oxygen gas by submerged injection into the iron melt in the refining zone wherein liquid steel is formed;

withdrawing liquid steel from the refining oxidation zone; and

removing gaseous reaction products formed in the reduction and refining zones from the reduction zone as an exhaust gas.

5,466,279

ELECTRIC DUST COLLECTOR SYSTEM

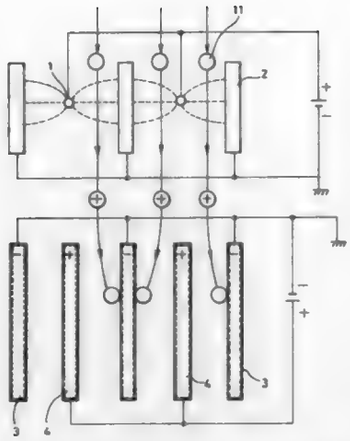
Takao Hattori, Yotsukaido; Takaki Iwanaga, and Toru Yamaguchi, both of Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 800,075, Nov. 29, 1991, abandoned. This application Jan. 21, 1994, Ser. No. 183,797
Claims priority, application Japan, Nov. 30, 1990, 2-330333
Int. Cl.[6] B03C *3/45*; *3/60*
U.S. Cl. 96—69 **20 Claims**

1. An electric dust collector system for collecting dust particles in the air utilizing electric field, comprising:

charging means for charging the dust particles; and

collector means for collecting the charged dust particles wherein a plurality of electrodes therefor include a metallic oxide semiconductive layer which is formed inwardly from the surface of the electrodes by an oxidation treatment, and



wherein said metallic oxide semiconductive layer is formed inwardly over the whole surface of said electrodes.

5,466,280

INORGANIC COATING COMPOSITION HAVING HIGH-HEAT-RESISTING, ANTI-RUSTING AND ANTI-CORROSIVE PROPERTIES

Chwen-Chern Lee, 4F, No. 7, Lane 60, Sec. 1, Chung-She Rd., Shih-Lin Dist., Taepei City, and Show-Wei Lee, No. 33, Lane 47, Sec. 1, Hsin-Sheng N. Rd., Chung-Shan Dist., Taipei City, both of, Taiwan, Prov. of China

Filed Feb. 24, 1994, Ser. No. 201,260

Int. Cl.[6] C09D *5/00;1/02*

U.S. Cl. 106—14.12 **4 Claims**

1. An inorganic coating composition comprising:

a curable powder containing a hydraulic calcium aluminate compound, a metallic oxide reinforcing agent and a pigment, said metallic oxide reinforcing agent being in an amount of 5–50 parts by weight and said pigment being in an amount of 1–10 parts by weight based on 100 parts by weight of said hydraulic calcium aluminate compound, said metallic oxide reinforcing agent being selected from the group consisting of a composite oxide and a mixture of at least two oxides of different metals, said composite oxide being selected from the group consisting of spinel ($MgO.Al_2O_3$), zircon ($ZrO_2.SiO_2$), mullite ($3Al_2O_3.2SiO_2$), calcined talc ($3MgO.4SiO_2$), and ceramic fibers, said oxides of different metals being selected from the group consisting of silica, zirconia, titanium oxide, calcined fired clay, aluminum oxide, chromium oxide, ferric oxide, cobalt oxide, nickel oxide, magnesium oxide, hard-burned lime (CaO), and manganese oxide; and

a binder solution containing an aqueous alkali-metal silicate solution and a soluble phosphate, wherein the aqueous alkali-metal silicate in said aqueous alkali-metal silicate solution has a concentration of 20–57% by weight of the aqueous alkali-metal silicate solution, the alkali-metal silicate of said aqueous alkali-metal silicate solution being selected from the group consisting of sodium silicate having a mole ratio of SiO_2/Na_2O from 2.1 to 3.9, potassium silicate having a mole ratio of SiO_2/K_2O from 3.1 to 3.9 and lithium silicate having a mole ratio of SiO_2/Li_2O from 4.5 to 8.5, said soluble phosphate being in an amount of 1–40 parts by weight based on 100 parts by weight of said aqueous alkali-metal silicate solution and being selected from the group consisting of sodium phosphate and potassium phosphate;

wherein 100 parts by weight of said curable powder is present in said inorganic coating composition for every 50–100 parts by weight of said binder solution.

5,466,281

WATER-BASED INK COMPOSITION FOR BALL-POINT PEN

David E. Hanke, Escondido; Bruce Gindelberger, San Diego, and Saul Heiman, La Jolla, all of Calif., assignors to National Ink Incorporated, El Cajon, Calif.

Filed Jul. 11, 1994, Ser. No. 273,338

Int. Cl.[6] C09D *11/02;11/10;11/14*

U.S. Cl. 106—20 R **19 Claims**

1. An ink composition comprising

a) 69 to 92 parts by weight of a polar non-aqueous liquid based on 100 parts by weight of the total composition;

b) 4 to 25 parts by weight of water based on 100 parts by weight of the total composition;

c) an effective amount of a polymeric material to provide a shear-thinning fluid; and

d) 3 to 35 parts by weight of a colorant based on 100 parts by weight of the total composition.

5,466,282

AZO DYE COMPOUND, INK CONTAINING THE SAME, AND RECORDING METHOD AND INSTRUMENT USING THE INK

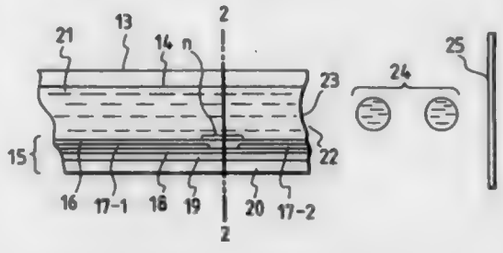
Tsuyoshi Eida, Yokohama; Osamu Nishiwaki, Atsugi; Takao Yamamoto, Isehara, and Kumiko Mafune, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 12, 1994, Ser. No. 241,592

Claims priority, application Japan, May 18, 1993, 5-116075; May 18, 1993, 5-116076; May 18, 1993, 5-116185; May 18, 1993, 5-116186

Int. Cl.[6] C09D *11/02*

U.S. Cl. 106—22 K **47 Claims**



1. A monoazo dye compound having a structural unit represented by the following formula in its molecule:

$$—X—Y—(R_1)(R_2)(R_3)_k \qquad [I]$$

wherein Y is a 6-membered ring containing 2 to 3 nitrogen atoms, X is a linking group for bonding a main body of the dye molecule to Y, R_1 is the first amino acid residue, R_2 is an atomic group selected from the following group A, R_3 is another atomic group selected from the following group BB, and k is a number of 0 or 1:

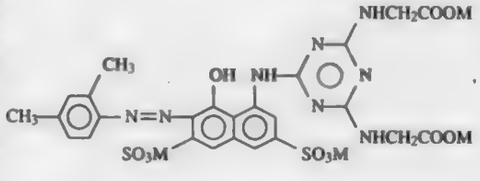
Group A: H, OH, NH_2, CN, =O and the second amino acid residue;

Group BB: H, OH, NH_2, CN and =O,

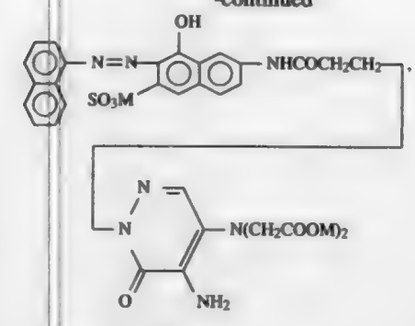
the first and second amino acid residues being identical with or different from each other, and

which is selected from the group consisting of the following compounds I-1 to I-11:

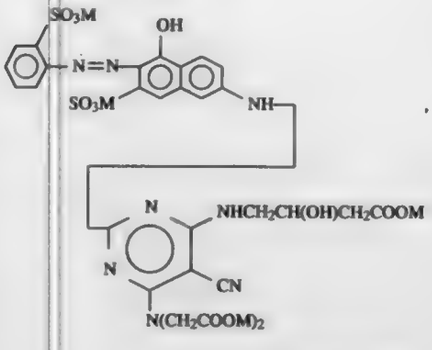
No. I-1



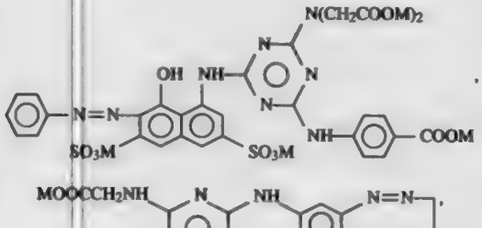
-continued



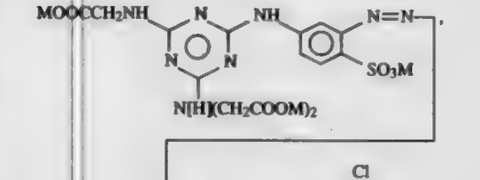
No. I-2



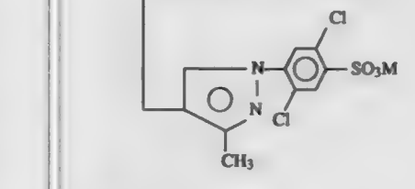
No. I-3



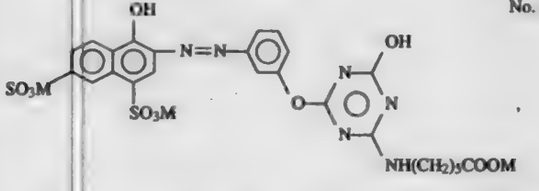
No. I-4



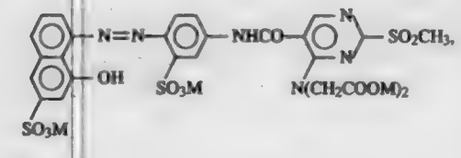
No. I-5



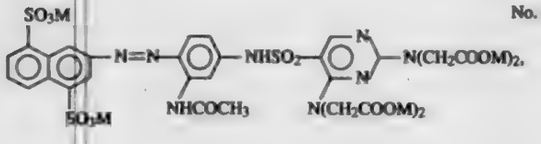
No. I-6



No. I-7

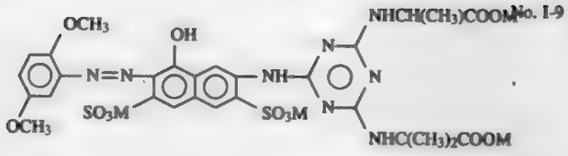


No. I-8

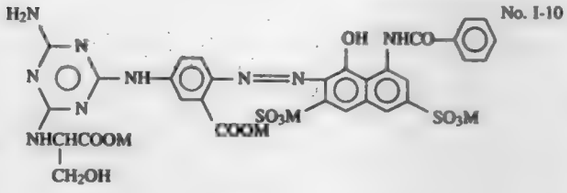


-continued

No. I-9

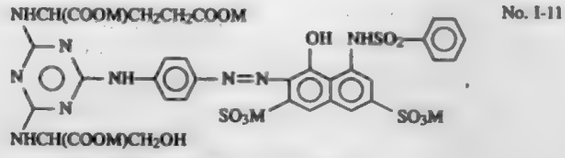


No. I-10



and

No. I-11



in which M is Na, K or ammonium.

5,466,283

AQUEOUS INK COMPOSITION FOR WRITING INSTRUMENT

Masahiro Kondo, Hashima, and Nobuo Matsubara, Nagoya, both of, Japan, assignors to Pilot Ink Co., Ltd., Nagoya, Japan

Filed Sep. 3, 1993, Ser. No. 115,560

Claims priority, application Japan, Sep. 7, 1992, 4-265509

Int. Cl.[6] C09D *11/14*

U.S. Cl. 106—25 R **4 Claims**

1. An aqueous ink composition, comprising from 1–25 wt. % of a coloring material, and from 0.01–8 wt. % of an organic acid-modified heteropolysaccharide having an average molecular weight of about 1 to 8 million, said organic acid-modified heteropolysaccharide comprising a basic unit of glucose/galactose/pyruvic acid or salt thereof/succinic acid or salt thereof/acetic acid having a molar ratio of 5–8/1–2/0.5–2/0.5–2/0.5–1, said ink composition further comprising an aqueous medium containing water and water-soluble organic solvent said aqueous medium comprising at least 50 wt. % water.

5,466,284

UNIVERSAL BLACK INK

Gene D. Carlson, Crocker Township, Iowa, and Alfredo R. Dela Cruz, Alpharetta, Ga., assignors to Frye Copysystems, Inc., Des Moines, Iowa

Filed Aug. 22, 1994, Ser. No. 293,485

Int. Cl.[6] C09D *11/12*

U.S. Cl. 106—31 R **22 Claims**

1. A carbon paper ink comprising:

a montan wax with melt point of 160°–190° F.;

a 2200–3000 seconds heavy oil at 60° F.;

a paraffin slack wax with melt point of 120°– 140° F. and oil content of 1–30%; and carbon black.

5,466,285

DENTAL PORCELAIN MATERIAL PREVENTING YELLOW COLORATION AND METHOD FOR PRODUCING SAME

Tadao Kamiya, Aichi; Motoyuki Inoue, Munakata, and Hiroshi Inada, Nagoya, all of, Japan, assignors to Noritake Co., Limited, Nagoya, Japan

Continuation of Ser. No. 854,555, Mar. 19, 1992, abandoned. This application Apr. 7, 1995, Ser. No. 418,878

Int. Cl.[6] C09K *3/00;* C04B *35/00*

U.S. Cl. 106—35 29 Claims

1. A method for producing a dental porcelain material comprising:

providing a powder mixture by adding to a porcelain starting frit material 0.1 to 2.0 wt % of powders of antimony trioxide and 0.01 to 5 wt % of at least one nitric acid component selected from the group consisting of nitric acid and salts thereof, based on the total weight of the porcelain starting frit material,

heat-treating said powder mixture at a temperature not lower than the softening temperature of said powder mixture to produce a fused mass, and

pulverizing and water-washing said fused mass in which 0.01 to 5 wt %, based on the total weight of the powder mixture, of at least one further nitric acid component selected from the group consisting of nitric acid and salts thereof is further added to said fused mass during said pulverizing step, said dental porcelain material having resistance to yellow coloration after repeated firings exceeding at least five times.

5,466,286

STABLE AUTOMOTIVE AQUEOUS METALLIC-FLAKE TINT DISPERSION

Robert C. Briselli, Broomall, and James F. Matthews, Berwyn, both of Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 27, 1994, Ser. No. 250,261

Int. Cl.[6] C09C *1/62*

U.S. Cl. 106—404 8 Claims

1. A stable waterborne tint composition for use on automotive substrates comprising, by weight of the tint composition, as follows:

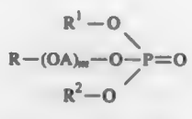
(a) 2 to 15 percent of a metallic flake;

(b) 5 to 30 percent of an aqueous-dispersible polymeric binder;

(c) 0.1–3.0% by active weight of an organically-modified phosphoric-acid ester; and

(d) 55 to 90 percent of an aqueous solvent comprising at least 50 percent water, the balance comprising C_2 to C_8 alcohol;

wherein the composition is made by adding a resin dispersion comprising 70 to 95 percent water and 5 to 30 percent polymeric material to a solventborne dispersion of the metal flake containing said organically modified phosphoric-acid ester having the formula:



wherein R represents an alkyl group having 12 to 24 carbon atoms or a substituted aryl group, containing at least one alkyl substituent, having 12 to 24 carbon atoms, and wherein the group A represents an alkylene group having 2 to 4 carbon atoms, m represents an integer from 1 to 20, and R^1 and R^2 independently represent hydrogen, an alkyl group having 12 to 24 carbon atoms, or R—(OA)m wherein R, A, and m are the same as set forth above; and

wherein composition stability is evidenced by substantially non-floating metallic flake.

5,466,287

INK COMPOSITION

Peter J. Lyon, Whitefield, England, assignor to Willett International Limited, United Kingdom

Continuation of Ser. No. 104,051, Aug. 13, 1993, abandoned. This application Feb. 7, 1995, Ser. No. 385,067

Claims priority, application United Kingdom, Feb. 16, 1991, 9103327

Int. Cl.[6] C09D *11/02*

U.S. Cl. 106—20 R 7 Claims

1. An ink composition suitable for application through the nozzle of an ink jet printer, which ink composition comprises an image forming ingredient dissolved or dispersed in a carrier medium, comprising a mixture of a lower alkanol and a lower alkyl ester of a lower alkyl carboxylic acid, wherein:

a. the alkanol contains from 1 to 4 carbon atoms, the ester is ethyl acetate and the total number of carbon atoms in the alkyl moieties of both the alkanol and the ester is from 5 to 8; and

b. the alkanol and the ester are present in weight proportions of from 65:35 to 35:65; and

c. the composition has a viscosity of less that 40 Cps at 25° C.

5,466,288

MATERIAL FOR USE AS SOIL STABILIZER AND AS SOIL SUBSTITUTE

John D. Derr, Akron, Ohio, assignor to Wessco, Inc., Norton, Ohio

Division of Ser. No. 206,739, Mar. 7, 1994, Pat. No. 5,397,392. This application Dec. 5, 1994, Ser. No. 319,133

Int. Cl.[6] C04B *14/10*

U.S. Cl. 106—486 8 Claims

1. A method of preparing a soil substitute comprising the steps of:

admixing from about 2 to about 9 parts by weight of crushed fired brick, from about 5 to about 25 parts by weight of a filler material selected from the group consisting of sawdust, grain hulls, silica and calcium carbonate, from about 60 to about 90 parts by weight of raw clay, and from about 0 to about 3 parts by weight of a cellulose material, to form a dry mix intermediate;

admixing 100 parts by weight of said dry mix intermediate with from about 5 to about 18 parts by weight of water, to form a hydrated mix; and,

compressing said hydrated mix at a pressure of from about 3500 to about 5000 pounds per square inch, to form a compressed mix.

5,466,289

ULTRA HIGH-STRENGTH HYDRAULIC CEMENT COMPOSITIONS

Toshio Yonezawa; Kenrou Mitsui; Makoto Nakazima, all of Tokyo; Mitsuo Kinoshita, Aichi; Toshihide Shimono, Aichi, and Tsuneo Yamamoto, Aichi, all of, Japan, assignors to Takenaka Corporation, and Takemoto Yushi Kabushiki Kaisha, both of, Japan

Filed Sep. 17, 1993, Ser. No. 123,461

Claims priority, application Japan, Sep. 30, 1992, 4-286762; Aug. 30, 1993, 5-238740

Int. Cl.[6] C04B *24/16*

U.S. Cl. 106—809 16 Claims

1. An ultra high-strength hydraulic cement composition comprising:

a binder comprising cement or a mixture of cement and a microscopic powder admixture containing at least one kind selected from the group consisting of silica fume, blast-furnace slag and fly ash;

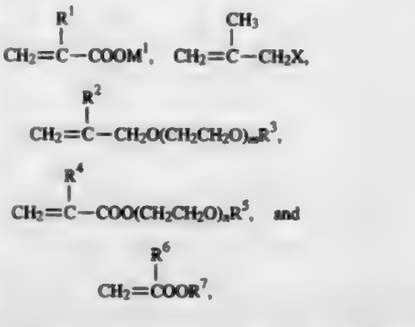
water;

aggregates; and

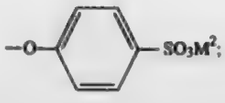
a cement dispersion agent comprising water-soluble vinyl copolymer obtained by aqueous solution radical copolymer-

ization of a first monomer given by Formula (1), a second monomer given by Formula (2), a third monomer given by Formula (3), a fourth monomer given by Formula (4) and a fifth monomer given by Formula (5) at copolymerization ratio of 45–65/8–23/3–25/5–25/0.1–15 in molar %;

Formulas (1), (2), (3), (4) and (5) being given respectively by



where R^1 R^2 R^3 R^4 and R^6 are each H or CH_3; R^5 and R^7 are each an alkyl group with 1–3 carbon atoms; M^1 is an alkali metal, an alkaline earth metal, ammonium or organic amine; m is an integer 1–30; n is an integer 5–25; and X is $—SO_3M^2$ or an organic group shown by



where M^2 is one selected from the group consisting of alkali metals, alkaline earth metals, ammonium and organic amines;

the unit content of said binder being 400–1300kg/m^3, the ratio of water to said binder being 10–30%, and the content of said cement dispersion agent being 0.1–2.0 weight parts with respect to 100 weight parts of said binder.

5,466,290

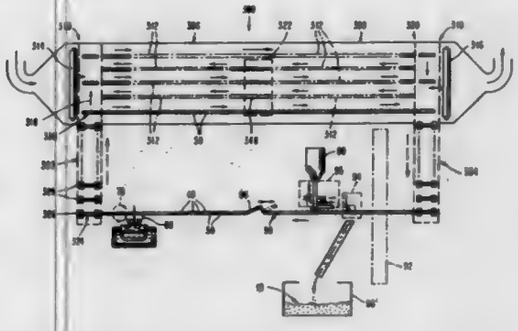
DRYING SYSTEMS FOR APPARATUS FOR GELATIN COATING TABLETS

Norbert I. Berta, Devon, Pa., assignor to McNeil-PPC, Inc., Milltown, N.J.

Continuation-in-part of Ser. No. 609,482, Nov. 5, 1990, Pat. No. 5,228,916. This application Jan. 12, 1993, Ser. No. 3,347

Int. Cl.[6] A23G *3/24;* **B05C** *3/02;13/02;* **F26B** *19/00*

U.S. Cl. 118—20 **22 Claims**



1. An apparatus for coating a product comprising:

one or more plate means for receiving and retaining a plurality of product;

conveyor means for incrementally advancing said one or more plate means;

a coating tank;

dipping means for lowering and raising at least one of said one or more plate means into said coating tank for forming a coating on at least a portion of the product;

rotating means for rotating at least one of said one or more plate means containing said coated product after said coating is formed on at least a portion of the product;

dryer means for drying said coating and having a first section and a second section;

a plurality of space guide means disposed in each of said first and second sections of said dryer means;

first elevator means for transferring said one or more plate means from said conveyor means to said dryer means;

transporting means for transporting said one or more plate means through said first and second sections of said dryer means, said transporting means comprises means for transporting said one or more plate means in a substantially horizontal first direction along a first of said plurality of spaced guide means, and in a second opposite, substantially horizontal direction along a second of said spaced guide means, and for transferring said one or more plate means between said first and second spaced guide means; and

second elevator means for transferring said one or more plate means from said dryer means to said conveyor means.

5,466,291

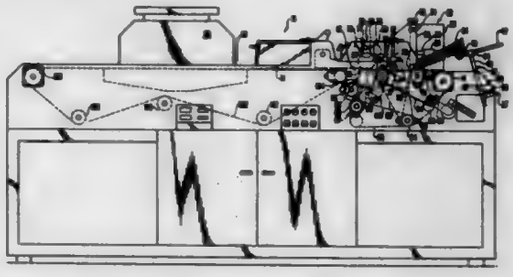
STAND ALONE COATING APPARATUS FOR PRINTED MATERIAL AND METHOD OF OPERATION THEREOF

Mark A. DiRico, Quincy, Mass., assignor to MMT Manufacturing Corp., Marietta, Ga.

Filed Dec. 29, 1993, Ser. No. 175,273

Int. Cl.[6] B05C *1/08*

U.S. Cl. 118—244 **20 Claims**



1. A stand alone coating system for coating a first face of sheets on which printing may be printed previously by a printer not associated with the coating system comprising:

a feeding mechanism for feeding the sheets to be coated from an infeed position to a coating zone at which the sheets are coated to an outfeed position;

a driven application roller, disposed within the coating zone and having a peripheral surface which contacts the first face of the sheets fed along the coating zone, for transferring coating material disposed on the peripheral surface to the first face;

a metering device, disposed within the coating zone and facing the peripheral surface of the application roller, for transferring a uniform thickness of coating material to the peripheral surface of the application roller;

a driven impression roller, disposed within the coating zone and having a peripheral surface opposed to the peripheral surface of the application roller, which contacts a second face of the sheets opposed to the first face and which contacts the peripheral surface of the application roller at least at gaps disposed between the sheets during feeding of the sheets along the coating zone which transfers the coating material to the peripheral surface of the impression roller;

a coating material removing mechanism, contacting the peripheral surface of the impression roller, for removing coating material from the peripheral surface of the impression roller to prevent transfer of the coating material to the second face of the sheets; and

a coating material recirculation system for catching any coating material dropping from the metering device during coating of the first face of the sheets and for catcning any coating material dropping from the coating material removing mechanism and for recirculating the coating material caught from the metering device and coating material removing mechanism to the metering device.

5,466,292

APPARATUS FOR COATING TRAVELING WEBS OF PAPER OR CARDBOARD

Martin Kustermann, Heidenheim, Germany, assignor to J.M Voith GmbH, Germany

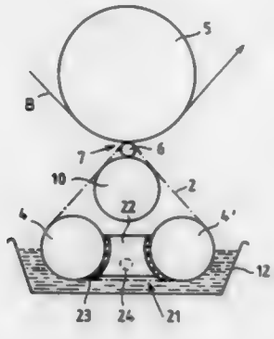
PCT No. PCT/DE93/00329, § 371 Date Dec. 15, 1993, § 102(e) Date Dec. 15, 1993, PCT Pub. No. WO93/21385, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 10, 1993, Ser. No. 167,804

Claims priority, application Germany, Apr. 15, 1992, 42 12 611.8

Int. Cl.[6] B05C *1/14*

U.S. Cl. 118—257 **23 Claims**



1. An applicator for coating a web of paper or cardboard, comprising:

a belt having an outer surface for carrying coating material from a supply of coating material to a web to be coated, and the belt outer surface cooperating with a web on a backing roll for applying the coating material to the web; the belt having an inner surface;

a drive roll engaging the inner surface of the belt for driving the belt to move past the web for delivering coating material to the web, the drive roll having a first diameter;

a support roll also engaging the inner surface of the belt and located at the web and opposed to the backing roll for supporting the belt to define a coating nip between the belt and the web at the backing roll; the support roll having a second diameter which is relatively smaller than the first diameter of the drive roll; and

at least one supplemental support roll in contact with the support roll for supporting the support roll against the belt, the belt being thereby pressed against the web and the backing roll at the nip.

5,466,293

COATING APPARATUS FOR PROVIDING A SUPERFICIAL PROTECTIVE LAYER ON A CARD

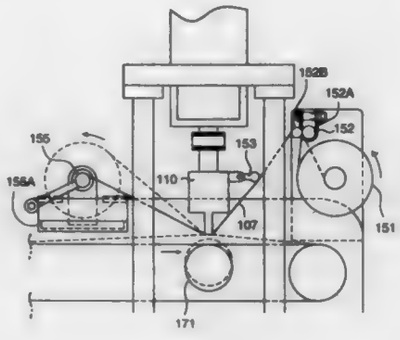
Takeshi Tanaka; Daiki Minamino; Akira Yoshizaki, and Nakaya Nakano, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 17, 1993, Ser. No. 169,588

Claims priority, application Japan, Jan. 14, 1993, 5-000710 U; Jan. 21, 1993, 5-008570; Jan. 25, 1993, 5-010093; Jan. 26, 1993, 5-10900

Int. Cl.[6] B05C *1/00*

U.S. Cl. 118—264 **26 Claims**



1. An apparatus for forming a protective layer on a card by use of a resin solution, comprising;

coating means for coating the resin solution on the card, the coating means including a coating head which has a fiber member to which the resin solution is fed, and the coating means being relatively positioned on the card so as to be brought in contact with a portion of a surface of the card so that the resin solution is transferred onto the contact portion of the card through the fiber member;

moving means coupled to the coating means for selectively moving at least one of the coating head and the card so as to move the contact portion along the surface of the card so that the surface of the card is coated with the resin solution; and

wherein the fiber-member comprises a velvet material that is formed into a web-shaped member which extends between a supply reel and a take-up reel; and the web-shaped member is arranged to be associated with a periphery of the coating head between the supply reel and the take-up reel so that the web-shaped member is sequentially used at the periphery of the coating head.

5,466,294

SUGAR BEET JUICE PURIFICATION PROCESS

Michael M. Kearney; Vadim Kochergin; Kenneth R. Peterson, and Larry Velasquez, all of Twin Falls, Id., assignors to The Amalgamated Sugar Company, Ogden, Utah

Filed Dec. 14, 1993, Ser. No. 168,065

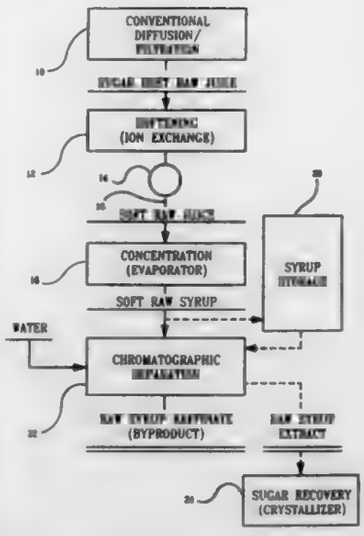
Int. Cl.[6] C13J *1/06*; C13F *1/02*; B01D *15/00*

U.S. Cl. 127—42 **30 Claims**

1. A process for purifying the raw juice obtained from sugar beets, comprising:

subjecting said raw juice to a softening procedure to remove calcium equivalents, whereby to produce a soft raw juice;

concentrating said soft raw juice by the removal of water to produce a soft raw syrup; and



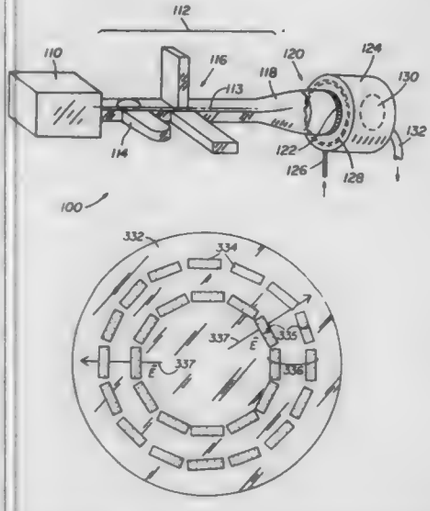
subjecting said soft raw syrup to a chromatographic separation procedure, whereby to obtain a raw syrup extract containing less than about half of the nonsucrose dissolved solids constituents contained by said raw juice.

5,466,295

ECR PLASMA GENERATION APPARATUS AND METHODS

Ward D. Getty, Ann Arbor, Mich., assignor to Board of Regents Acting for the Univ. of Michigan, Ann Arbor, Mich.

Filed Oct. 25, 1993, Ser. No. 142,731
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—723 MA **33 Claims**



1. A device useful in forming a resonance surface proximate to a waveguide output for the purpose of plasma generation, comprising:

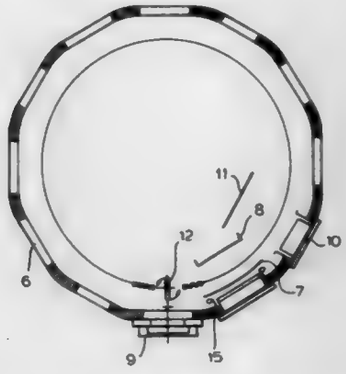
a plurality of magnetized elements disposed in spaced-apart relation across the output of the waveguide in a plane parallel to the cross-section of the waveguide at the output, each element having a length and a central axis, the elements being magnetized in such a manner that their fields combine to form a substantially continuous resonance surface characterized in having a magnetic induction value sufficient to support ECR plasma generation.

5,466,296

THIN FILM DEPOSITION APPARATUS, MAINLY DEDICATED TO PECVD AND SPUTTERING TECHNIQUES AND RESPECTIVE PROCESSES

Carlo Misiano; Enrico Simonetti, both of Rome, and Giovanni Taglioni, Tivoli, all of, Italy, assignors to CE.TE.V Centro Technologie Del Vuoto, Carsoli, Italy

Filed Apr. 4, 1994, Ser. No. 222,690
Claims priority, application Italy, Apr. 6, 1993, RM93A0216
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—723 MP **2 Claims**



1. An apparatus for applying thin films to substrates, comprising:

a polygonal coating chamber having a multiplicity of vertical walls, and a cover;

a substrate carrier mounted on said cover and provided with a drive for rotating said substrate carrier in said chamber;

at least one substrate rotating device on said substrate carrier positionable by said drive at each of said vertical walls in succession, said substrate rotating device being constructed to receive a respective substrate and to rotate the respective substrate through 180° about a vertical axis of said substrate rotating device;

PECVD electrodes and PECVD counter electrodes at at least some of said walls for PECVD coating of a substrate on one side and on an opposite side in successive operations upon rotation of a substrate about the axis of the device;

at least one magnetron at a respective another of said walls for treating said substrates as said substrates are positioned at said other wall;

means for evacuating said chamber;

means for admitting gas to said chamber; and

screens at some of said walls for shielding said substrates.

5,466,297

PROCESS FOR REMOVAL OF PRIMARILY IRON OXIDE DEPOSITS

Walter H. Goodman, Lisle; Narasimha M. Rao, Naperville, and Donald A. Johnson, Batavia, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 742,789, Aug. 8, 1991, abandoned. This application Dec. 4, 1992, Ser. No. 985,703
Int. Cl.[6] C23G *1/02*; C02F *1/42*
U.S. Cl. 134—3 **8 Claims**

1. A method for cleaning a corroded ferrometal system which comprises:

1) adding to said system in sufficient volume to contact all ferrometal surfaces in said system a treating formulation having a pH of from 1.0 to 5.0 and comprising:

ingredient	amount
water soluble iron complexing agent	1.0–20.0 wt. %
ferric iron reducing agent	0–5.0 wt. %
copper corrosion inhibitor	0–0.1 wt. %
acid corrosion inhibitor	0–0.2 wt. %
water	remainder

and then,

2) circulating said treating formulation at temperatures ranging from 20° C.–90° C. through said system while monitoring and maintaining pH within the range of 1.0 to 5.0; thereby forming a system formulation

and then,

3) monitoring said system formulation for total soluble iron content, and when said iron content reaches a level of at least 1,000 ppm, continuously or intermittently removing at least a portion of said system formulation and contacting same with a metal ionic exchange resin, said resin having an equal or greater affinity for ferrous ion, ferric ion, or mixtures thereof than does the iron complexing agent of the treating formulation, thereby forming both

(a) an iron-resin adduct, and

(b) a recovered wearing formulation having at least about 90 % of each ingredient originally present in the treating formulation;

and then,

4) recycling said recovered treating formulation back to the ferrometal system and continuing cleaning steps 2 through 4 inclusive,

and then,

5) when iron is detected at levels of at least 10% of the system formulation iron content in the recovered treating formulation, removing said resin from contact with the system formulation and contacting said resin with a strong inorganic acid, thereby forming a regenerated metal ionic exchange resin and a concentrated iron waste stream,

and then,

6) placing said regenerated exchange resin back into contact with said system formulation, as in step 3 above, and

7) discarding the concentrated iron waste stream.

5,466,298

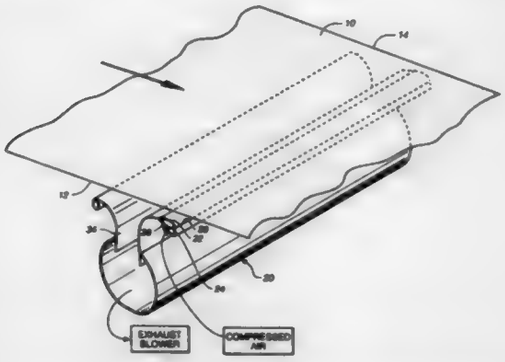
WEB CLEANING METHOD

Rodney E. Pollock, Camas, Wash., assignor to James River Paper Company, Inc., Richmond, Va.

Filed Oct. 1, 1993, Ser. No. 130,460

Int. Cl.[6] B08B *5/02*

U.S. Cl. 134—15 **1 Claim**



1. A method of cleaning a moving web of sheet material having associated thereon dust or other particulate materials, moving in a direction of web movement along a web path, said moving web of sheet material further having spaced edges and a substantially planar surface bordering a boundary layer of air entrained by said moving web of sheet material and moving in said direction of web movement, said method comprising the steps of:

flowing gas under a pressure within the range of from about 2 psig to about 10 psig through an elongated, narrow slit having a substantially uniform width within the range of from about 0.002 inches to about 0.02 inches extending completely across said moving web of sheet material from edge to edge thereof and at right angles to said direction of web movement at a speed within the range of from about 29,800 fpm to about 66,600 fpm;

changing the direction of flow of said gas after said gas has passed through said elongated, narrow slit by attaching said gas to an elongated, curved foil surface due to the Coanda effect and then flowing said gas along said elongated, curved toil surface at a high rate of speed and in a direction opposed to said direction of web movement, said curved foil surface being located adjacent to said substantially planar surface of said moving web of sheet material, a gap being formed between said elongated, curved foil surface and said substantially planar surface of said moving web, which gap diminishes in size in said direction of web movement, said curved foil surface extending completely across said moving web of sheet material from edge to edge thereof and at right angles to said direction of web movement;

entraining ambient air with said gas as said gas flows along said elongated, curved foil surface at a high rate of speed whereby the ambient air entrained with said gas moves in a direction opposed to said direction of web movement along with said gas;

impacting said boundary layer of air and dust or other particulate materials entrained by said moving web of sheet material in said gap with said gas and said ambient air entrained thereby while said gas and ambient air are moving in said direction opposed to said direction of web movement;

mixing said boundary layer of air and dust or other particulate materials, said gas and said ambient air entrained by said gas in said gap under turbulent conditions to form a mixture;

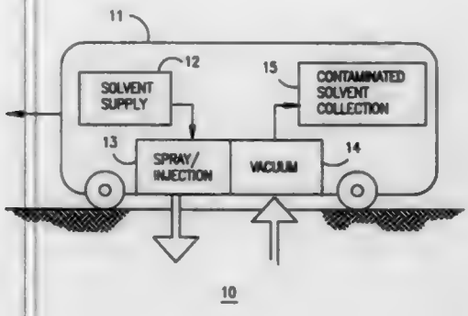
substantially simultaneously with the step of mixing to form said mixture, causing said boundary layer of air and dust or other particulate materials to reverse direction and move in said direction opposed to said direction of web movement; and

applying a vacuum to said mixture to change the direction of said mixture and redirect said mixture to a location spaced from both said web of sheet material and said elongated, curved foil surface, thereby removing said dust or other particulate materials from association with said web, said mixture being redirected along a mixture flow path at least partially defined by a curved discharge surface curving away from said elongated, curved foil surface and said moving web toward a discharge chute, said mixture flow path extending from edge to edge of said moving web of sheet material and extending away from and generally perpendicular to the substantially planar surface of said moving web of sheet material, said curved discharge surface having an entry end offset from said elongated, curved foil surface and located a greater distance from said substantially planar surface of said moving web of sheet material than the distance between said elongated, curved foil surface and said substantially planar surface of said moving web of sheet material, and said mixture engaging said offset entry end upon moving away from said elongated, curved foil surface to promote turbulence of said mixture.

5,466,299
METHOD FOR REMOVING A CONTAMINANT FROM A CONTAMINATED SURFACE SOIL

Raymond J. Jan, Dallas, Tex., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed May 2, 1994, Ser. No. 236,817
Int. Cl.[6] B08B *3/00;5/04*
U.S. Cl. 134—21 **5 Claims**



1. A method for removing a contaminant from a contaminated surface soil, comprising the steps of:

a) treating said contaminated surface soil to increase permeability of said soil by contacting with an additive or by plowing and leveling said soil;

b) contacting said contaminated surface soil with a solvent in which said contaminant is soluble; and

c) vacuuming said solvent with said contaminant dissolved therein from said contaminated surface soil.

5,466,300
METHOD FOR REMOVING AND RECLAIMING EXCESS UNCURED PAINT FROM PAINT SPRAY BOOTH

William C. Walsh, Archbold, Ohio, and Lawrence E. James, Grosse Ile, Mich., assignors to BASF Corporation, Mt. Olive, N.J.

Division of Ser. No. 970,330, Nov. 2, 1992, abandoned. This application Apr. 4, 1994, Ser. No. 222,564
The portion of the term of this patent subsequent to Aug. 2, 2011, has been disclaimed.
Int. Cl.[6] B08B *5/00*
U.S. Cl. 134—38 **8 Claims**

1. A method for removing and reclaiming excess uncured over-sprayed paint particles from a paint spray booth comprising the steps of:

(a) entraining uncured over-sprayed paint particles in a stream of air passing through the paint spray booth;

(b) causing the entrained over-sprayed paint particles to come into contact with a flowing aqueous flood sheet within the paint spray booth such that a substantial portion of said paint particles are solubilized within said flowing aqueous flood sheet and thereby removed from said stream of air, and wherein said flowing flood sheet consists essentially of:

(i) between about 10 to 45 percent by weight of an N-methyl pyrrolidone;

(ii) between about 15 to about 40 percent by weight of at least one alkyl glycol ether having 1 to 4 carbon atoms in its alkyl moiety; and

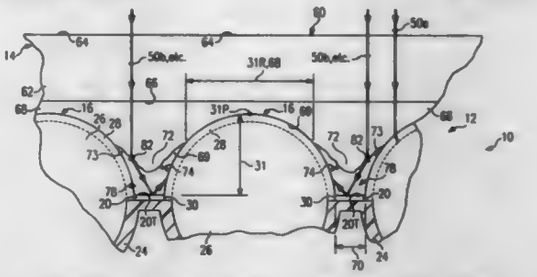
(iii) about 0.1 to about 2.0 percent by weight of a non-ionic linear alcohol ethoxylate surfactant sufficient to reduce the flood sheet vapor pressure; and

(c) separating and collecting said solubilized uncured paint particles from said aqueous flood sheet, whereby said paint particles are reclaimed for future use.

5,466,301
SOLAR CELL HAVING AN OUTPUT-INCREASING, PROTECTIVE COVER

Milfred D. Hammerbacher, Dallas, and Russell R. Schmit, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 29, 1994, Ser. No. 267,633
Int. Cl.[6] H01L *31/048;31/052;31/0384;31/18*
U.S. Cl. 136—246 **44 Claims**



1. A photovoltaic cell having a cover, the cell including a plurality of spaced semiconductor particles having portions extending away from a reflective surface so that the particle portions are exposed to radiant energy directed at the cell; a substantial amount of the radiant energy which impinges on the reflective surface between adjacent particle portions being wasted due to its being reflected so as to not fall upon the particle portions, the cover comprising:

a layer of radiant energy-transparent material having a free surface and an opposed surface on which is a radiation energy-transparent adhesive having a free surface,

first portions of the free surface of said adhesive conforming to the polar regions of adjacent particle portions, and

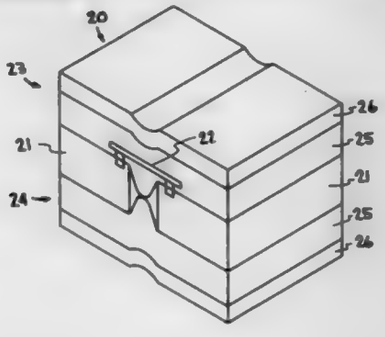
second portions of the free surface of said adhesive between the pole-conforming portions thereof extending toward the reflective surface and having surfaces which are non-perpendicular to the direction of the otherwise wasted radiant energy, spaces being defined between the second portions and the reflective surface;

both (a) the angular relationship between the surfaces of the second portions and the otherwise wasted radiant energy and (b) the refractive indices of the adhesive and the spaces being such that a significant amount of the otherwise wasted radiant energy which passes through the layer of energy-transparent material, the adhesive and each adhesive-space interface between adjacent particles is reflected by the reflective surface onto the particle portions.

5,466,302
SOLAR CELL ARRAY INTERCONNECTS

Paul G. Carey, Mountain View; Jesse B. Thompson, Brentwood; Nicolas J. Colella, Livermore, and Kenneth A. Williams, Livermore, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed May 9, 1994, Ser. No. 239,866
Int. Cl.[6] H01L *31/05;31/18*
U.S. Cl. 136—251 **16 Claims**



1. A plurality of solar cells electrically interconnected by at least one conductive metal strip and a silver based low temperature bonding material between the conductive metal strip and at least one electrode of the solar cells.

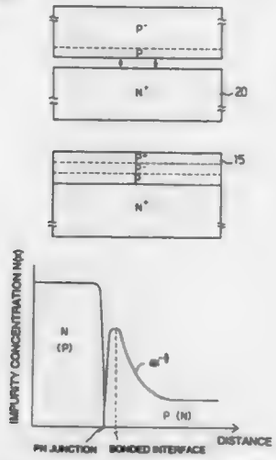
2. The plurality of solar cells of claim 1, laminated between sandwiched layers of fluoropolymer/adhesive material which encapsulate and hermetically seal the solar cells therein.

5,466,303

SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREFOR

Hitoshi Yamaguchi, Nagoya; Seiji Fujino, Toyota, and Tadashi Hattori, Okazaki, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 24, 1995, Ser. No. 410,366
Claims priority, application Japan, Mar. 25, 1994, 6-055780
Int. Cl.[6] H01L *21/20*
U.S. Cl. 148—33 **13 Claims**



9. A manufacturing method for a semiconductor device comprising the steps of:

forming an insulating film on a first semiconductor substrate of a first conductivity type;

implanting impurities of the first conductivity type through the insulating film into the first semiconductor substrate so that impurity distribution can abruptly lowers in a depth direction from a main surface side;

removing the insulating film;

bonding the main surface of the first semiconductor substrate and a main surface of a second semiconductor substrate of a second conductivity type to each other; and

forming a PN junction between the first semiconductor substrate and the second semiconductor substrate by heat treating the bonded first semiconductor substrate and second semiconductor substrate.

5,466,304

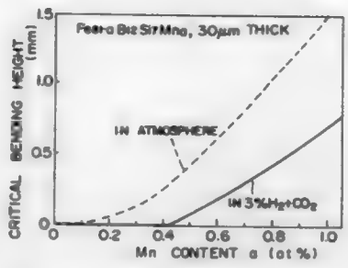
AMORPHOUS IRON BASED ALLOY AND METHOD OF MANUFACTURE

Fumio Kogiku; Masao Yukumoto, and Seiji Okabe, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Japan

Filed Nov. 22, 1994, Ser. No. 343,728
Int. Cl.[6] H01F *1/153*
U.S. Cl. 148—100 **1 Claim**

1. A method of manufacturing an amorphous iron based alloy having excellent magnetic characteristics and bendability without breaking, comprising: quenching and solidifying a molten alloy having the formula $Fe_xB_YSi_ZMn_a$ in approximate proportions wherein:

$75 \leqq X \leqq 82$ at %,



$7 \leqq Y \leqq 15$ at %,

$7 \leqq Z \leqq 17$ at %, and

$0.2 \leqq a \leqq 0.5$ at %, and

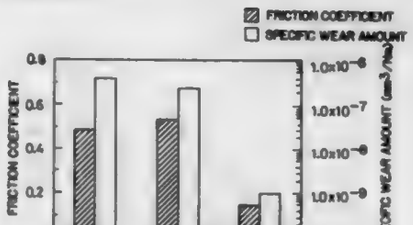
effecting said quenching and solidifying steps in a CO_2 atmosphere containing H_2 in an amount of about 1–4% by volume.

5,466,305

METHOD OF TREATING THE SURFACE OF TITANIUM

Yukihiro Sato, Amagasaki; Takumi Sone, Osaka; Sachio Nagata, Takarazuka; Tetsuhiro Sakata; Kei Demizu, both of Suita, and Shinichi Tanaka, Osaka, all of, Japan, assignors to Tanaka Limited, and Osaka Prefecture, both of Osaka, Japan

Filed Sep. 21, 1994, Ser. No. 307,447
Claims priority, application Japan, Sep. 21, 1993, 5-234735
Int. Cl.[6] C23C *8/36*
U.S. Cl. 148—222 **2 Claims**



1. A method of treating the surface of titanium comprising:

placing titanium in an atmosphere containing a surface cleaning gas to remove oxides on the titanium surface and

subjecting the titanium to plasma-carburizing in an atmosphere containing hydrocarbon gas at a pressure of 0.5–15 Torr and a temperature of 700°–1100° C.

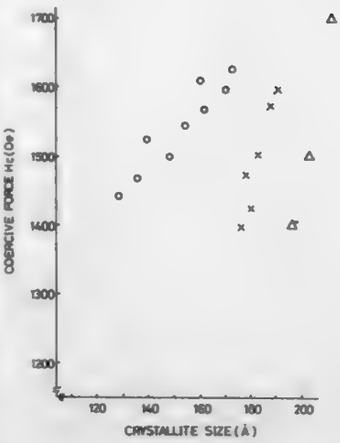
5,466,306

SPINDLE-SHAPED MAGNETIC IRON BASED ALLOY PARTICLES

Akio Mishima; Toshiharu Harada, both of Hiroshima; Mamoru Tanihara, Osaka; Yasutaka Ota, Hatsukaichi; Kenji Okinaka; Kohji Mori, both of Hiroshima; Hirofumi Kawasaki, Aki; Norimichi Nagai, Hiroshima; Katsunori Fujimoto, Ube, and Yoshiro Okuda, Hiroshima, all of, Japan, assignors to Toda Kogyo Corp., Hiroshima, Japan

Continuation of Ser. No. 712,882, Jun. 11, 1991, abandoned. This application Sep. 9, 1993, Ser. No. 118,287
Claims priority, application Japan, Jun. 26, 1990, 2-168684; Jun. 29, 1990, 2-173871
Int. Cl.[6] H01F *1/06*
U.S. Cl. 148—306 **4 Claims**

4. Spindle-shaped magnetic iron based alloy particles containing at least one selected from the group consisting of Ni, Al, Si, P, Co, Mg, B and Zn which have a particle length of 0.05 to 0.40 μm, a crystallite size of 110 to 180 Å, a specific surface area of 30 to 60



m^2/g, a coercive force of 1,300 to 1,700 Oe provided said crystallite size, said specific surface area and said coercive force simultaneously satisfy the following relationships:

$$-8 \times \text{crystallite size(Å)} + \text{coercive force (Oe)} \geqq 110, \text{ and}$$

$$\text{crystallite size(Å)} + 2 \times \text{specific surface area}(m^2/g) \leqq 290$$

and a saturation magnetization (σs) of 100 to 140 emu/g and wherein the amount of saturation magnetization degradation, following exposure to 70% relative humidity at 40° C. for four days, is not more than 12%, said spindle-shaped magnetic particles produced by the process off

(a) adding an aqueous alkali carbonate solution or a mixture of an aqueous alkali carbonate solution and an aqueous alkali hydroxide solution to an aqueous ferrous salt solution to prepare a suspension containing $FeCO_3$ or an Fe-containing precipitate;

(b) aging the thus-obtained suspension containing $FeCO_3$ or an Fe-containing precipitate;

(c) oxidizing the suspension by passing an oxygen-containing gas into the aged suspension containing $FeCO_3$ or an Fe-containing precipitate in the presence of 0.1 to 10.0 mol % of propionic acid or a salt thereof based on Fe at 35 to 70° C. to obtain spindle-shaped goethite particles;

(d) coating the thus-obtained spindle-shaped goethite particles with at least one compound selected from the group consisting of Ni, Al, Si, P, Co, Mg, B and Zn compounds; and

(e) heat-treating the coated particles in a reducing gas.

5,466,307
RARE EARTH MAGNETIC ALLOY POWDER AND ITS PREPARATION

Tong Maofu; Xiong Jiancheng, and Geng X. Dong, all of Shanghai, China, assignors to Shanghai Yue Long Non-Ferrous Metals Limited, China

Filed Jul. 6, 1993, Ser. No. 87,648

Claims priority, application China, Jul. 7, 1992, 92105673.7

Int. Cl.[6] H01F *1/057*

U.S. Cl. 148—302 **1 Claim**

1. A novel rare earth permanent magnet alloy, the composition of said alloy consisting essentially of the elements of the formula

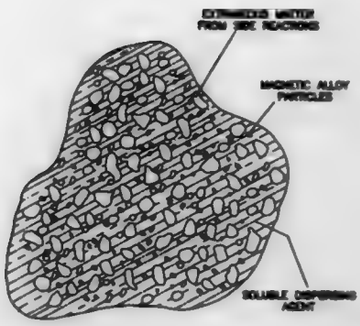
$$R_x(Co_{1-a-b-c-d}Fe_aCu_bM_cE_d)_w$$

wherein

R is one or more of the rare earth elements selected from the group consisting of Sm, Pr and Ce;

M is one or more of the refractory elements selected from the group consisting of Zr, Hf, Nb, V and Ti;

E is one or more of the boron group elements selected from the group consisting of B, Ga, and In;



and $0.01 \leqq a \leqq 0.4$, $0.02 \leqq b \leqq 0.20$, $0.001 \leqq c \leqq 0.10$, $0.0015 \leqq d \leqq 0.01$, and $12 \leqq w \leqq 17$.

5,466,308
MAGNETIC PRECURSOR MATERIALS FOR MAKING PERMANENT MAGNETS

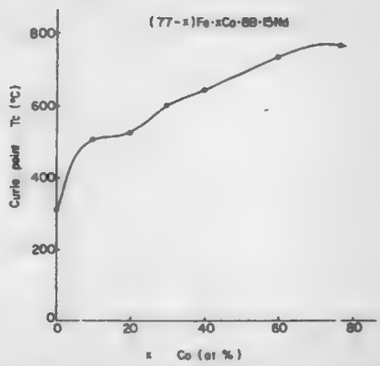
Setsuo Fujimura, Kyoto; Yutaka Matsuura, Hyogo, and Masato Sagawa, Kyoto, all of, Japan, assignors to Sumitomo Special Metals Co. Ltd., Osaka, Japan

Continuation of Ser. No. 15,886, Feb. 10, 1993, abandoned, which is a continuation of Ser. No. 794,673, Nov. 18, 1991, abandoned, which is a continuation of Ser. No. 286,637, Dec. 19, 1988, abandoned, which is a division of Ser. No. 516,841, Jul. 25, 1983, Pat. No. 4,792,368, and a continuation-in-part of Ser. No. 224,411, Jul. 26, 1988, Pat. No. 5,096,512, which is a division of Ser. No. 13,165, Feb. 10, 1987, Pat. No. 4,770,723, which is a continuation of Ser. No. 510,234, Jul. 1, 1983, abandoned. This application Feb. 10, 1994, Ser. No. 194,647

Claims priority, application Japan, Aug. 21, 1982, 57-145072; Aug. 27, 1982, 57-166663; Nov. 15, 1982, 57-200204; Jan. 19, 1983, 58-5813; Jan. 19, 1983, 58-5814; Mar. 8, 1983, 58-37896; Mar. 8, 1983, 58-37897; Mar. 8, 1983, 58-37898; Mar. 8, 1983, 58-37899; May 31, 1983, 58-94876; May 14, 1983, 58-84858; May 14, 1983, 58-84859; May 14, 1983, 58-84860

Int. Cl.[6] C22C *38/10*

U.S. Cl. 148—302 **28 Claims**



1. A crystalline permanent magnet alloy pre-cursor material for making permanent magnets comprising a major phase of an (Fe,Co)-B-R compound wherein R is one or two of Nd and Pr, and wherein the (Fe,Co)-B-R compound is formed by substituting Co for a part of Fe in a base Fe-B-R compound containing no Co, said (Fe,Co)-B-R compound being stable at room temperature or above, having a Curie temperature higher than room temperature and higher than that of the base Fe-B-R compound and having magnetic anisotropy, and the alloy consisting essentially of, by atomic percent of the entire alloy, 8–30 percent R, 2–28 percent B and the balance being Fe and Co, provided that at least 42 percent of the entire alloy is Fe,

wherein crystal grains of said (Fe, Co)-B-R compound are isolated by a nonmagnetic boundary phase.

5,466,309
METAL STRIP TREATMENT INSTALLATION

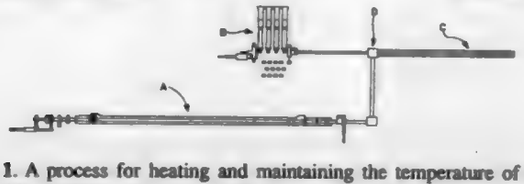
Jean Davene, Marly le Roi; Sylvie Rachenne, Paris, and Jean-Jacques Douvry, Neuilly Sur Seine, all of, France, assignors to Clecim, Cergy Pontoise Cedex, France

Filed Feb. 9, 1994, Ser. No. 194,056

Claims priority, application France, Feb. 12, 1993, 93 01623; Feb. 12, 1993, 93 01624

Int. Cl.[6] C23G *3/02*

U.S. Cl. 148—508 **19 Claims**



1. A process for heating and maintaining the temperature of a pickling solution in a metal strip treatment installation comprising a cold rolling mill including at least one rolling stand comprising a plurality of rolls and means for spraying rolling fluid onto the rolls and strip, and a pickling line made up of a series of tanks filled with a pickling solution and through which the strip is continuously passed, each tank being associated with means for heating the solution, said process comprising the steps of

(a) heating said pickling solution and starting and operating said installation in stable fashion;

(b) maintaining said pickling solution in each tank at a required temperature through the cooperation of a heat pump supplying a relatively stable energy level and an additional heating means supplying an additional level of energy that can be permanently adjusted in order to adapt, at all times, to variations in overall energy requirements resulting from changes in production conditions; and

(c) cooling said rolling fluid simultaneously by said heat pump and an additional cooling means allowing the temperature of said rolling fluid to be reduced to a desired level before being recycled.

5,466,310
PRODUCTION OF METAL AND METALLOID NITRIDES

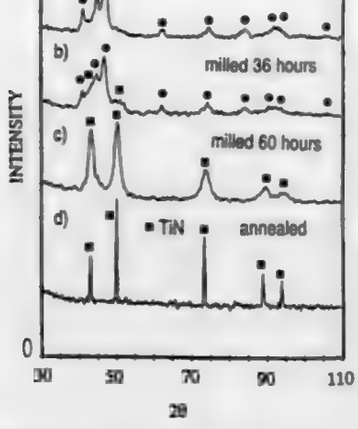
Barry W. Ninham, Cook; Andrzej Calka, Ainslie, and James S. Williams, Holder, all of, Australia, assignors to The Australian National University, Acton, Australia

Filed Aug. 18, 1993, Ser. No. 107,812

Claims priority, application Australia, Feb. 19, 1991, PK4679

Int. Cl.[6] B22F *1/00*

U.S. Cl. 148—513 **16 Claims**



1. A method of forming a metal or metalloid nitride, said method comprising subjecting a powder of the metal or metalloid to ball milling in an atmosphere of, or containing, nitrogen for a period of time sufficient to ensure the production of a powder composition which contains a pre-determined proportion of the nitride of the metal or metalloid.

13. A method of forming a mixture of carbide and nitride of a metal or metalloid, said method comprising subjecting a powder of the metal or metalloid to ball milling with an organic chemical containing both carbon and nitrogen for a period sufficient to ensure the production of a powder composition which contains a pre-determined proportion of the carbide and nitride of the metal or metalloid.

5,466,311
METHOD OF MANUFACTURING A NI-A1 INTERMETALLIC COMPOUND MATRIX COMPOSITE

Chen-Ti Hu, Taipei, and Wen-Chih Chiou, Miaoli, both of, Taiwan, Prov. of China, assignors to National Science Council, Taipei, Taiwan, Prov. of China

Filed Feb. 10, 1994, Ser. No. 196,012

The portion of the term of this patent subsequent to Oct. 17, 2012, has been disclaimed.

Int. Cl.[6] B22F *1/00;3/12*

U.S. Cl. 148—513 **37 Claims**

1. A method of manufacturing an Ni—Al intermetallic compound matrix composite comprising steps of:

a) providing an aluminum powder;

b) providing a reinforced material;

c) providing a reducing solution containing a reducing agent and nickel ions to be reduced;

d) adding said aluminum powder and said reinforced material into said reducing solution; and

e) permitting said reducing agent to reduce said nickel ions to be reduced to be respectively deposited on said aluminum powder and said reinforced material.

5,466,312
METHOD FOR MAKING ALUMINUM FOIL AND CAST STRIP STOCK FOR ALUMINUM FOILMAKING AND PRODUCTS THEREFROM

Bennie R. Ward, Jr.; Sander A. Levy, both of Richmond, Va., and George A. Sloan, Garland County, Ark., assignors to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 3,075, Jan. 11, 1993, abandoned. This application Jul. 15, 1994, Ser. No. 276,190

Int. Cl.[6] C22F *1/04*; C22C *21/00*

U.S. Cl. 148—551 **19 Claims**

16. A method of making an aluminum alloy cast strip as stock for aluminum foil making comprising the steps of:

a) providing a molten aluminum-based alloy consisting essentially of:
about 0.08 to 0.20 wt. % silicon;
about 0.24 to 0.50 wt. % iron;
about 0.21 to 0.30 wt. % copper; with
the balance aluminum and inevitable impurities, said impurities being less than 0.15 total wt. % and the ratio of iron to silicon being between about 3:1 and 4:1;
b) wherein said providing step includes adding copper in an amount sufficient to increase the copper content of a starting alloy to about 0.21 to 0.30 wt. %;
c) continuously casting said molten aluminum alloy on a unitary rotating and cooled casting surface to form a cast strip, said cast strip having a thickness range between 0.030 and 0.070 inches.

5,466,313

GAS-PRODUCING MATERIAL

Uwe Brede, Fürth; Rainer Hagel, Erlangen, and Klaus Redecker, Nürnberg, all of, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Feb. 4, 1994, Ser. No. 192,283

Claims priority, application Germany, Feb. 4, 1993, 43 03 169.2

Int. Cl.[6] C06B *47/00*

U.S. Cl. 149—1 **22 Claims**

1. A gas-producing material for a gas generator for use with an airbag of a vehicle, which comprises a liquefied gas mixture capable of forming an ignitable gas mixture, said liquefied gas mixture comprising nitrous oxide and at least one fuel selected from the group consisting of ethers, olefins, ammonia and hydrogen in proportions that provide the ignitable gas mixture.

5,466,314

SMOKE CHARGE AND METHOD FOR ITS PREPARATION

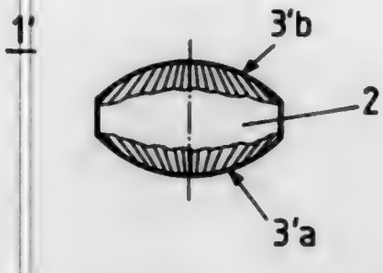
Walter Rauber, Gwatt, and Markus Tobler, Seftigen, both of, Switzerland, assignors to Schweizerische Eidgenossenschaft Vertreten Durch Die Eidg. Munitionsfabrik Thun der Gruppe fur Rustungsdienste, Thun, Switzerland

Filed Sep. 23, 1994, Ser. No. 311,164

Claims priority, application Switzerland, Jan. 1, 1993, 02959/93

Int. Cl.[6] C06B *31/28*

U.S. Cl. 149—46 **17 Claims**



1. A smoke charge comprising an ignition layer and a pyrotechnical combustion charge comprising a hydroscopic, inorganic oxidizing agent, a carbon-containing reducing agent, and a polar solvent to bind the oxidizing agent to the reducing agent, the combustion charge being in the form of a briquette having a diameter of about 13 mm and a height of about 10 mm, said ignition layer coating at least one surface of said briquette.

5,466,315

NON-TOXIC PRIMER FOR CENTER-FIRE CARTRIDGES

Jack A. Erickson, Andover; Robert L. Kramer, Minneapolis, and John M. Hallis, Buffalo, all of Minn., assignors to Federal-Hoffman, Inc., Anoka, Minn.

Filed Sep. 6, 1994, Ser. No. 301,347

Int. Cl.[6] C06B *25/18*

U.S. Cl. 149—96 **33 Claims**

1. A non-toxic primer composition for small arms center-fire cartridges which is void of metallic oxidizing compounds and of hygroscopic compounds, comprising: a mixture of about 10–30% by weight of a suitable propellant; approximately 30–75% by weight of at least two percussion-sensitive compounds selected from a group consisting of a diazo, a triazole and a tetrazole compound; and 10–30% by weight calcium silicide.

5,466,316

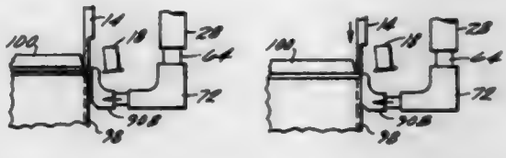
WELDING METHOD

James S. Hardigg, Conway, and Edward W. Turner, Deerfield, both of Mass., assignors to Hardigg Industries, Inc., South Deerfield, Mass.

Continuation of Ser. No. 132,843, Oct. 7, 1993, abandoned, which is a division of Ser. No. 12,873, Feb. 3, 1993, Pat. No. 5,296,075. This application Nov. 14, 1994, Ser. No. 337,967

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—69 **3 Claims**

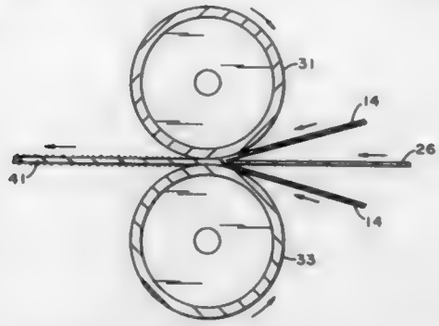


1. A method of welding plastic battery covers onto plastic battery jars to form a closed container, said method comprising the steps of:
receiving a battery jar on which a battery cover has been positioned at a load station and moving the jar with cover thereon to a weld station;
lowering a welding head assembly comprising heating means and clamping and pressing means over the upper portion of said container so that one of the separate heating means and clamping and pressing means is positioned adjacent each side of said container;
clamping the sides of the container with said clamping and pressing means;
securing the battery cover to the welding head assembly;
raising the battery cover a predetermined distance to create a gap between said battery cover and said battery jar;
inserting said heating means into the gap between said battery cover and said battery jar along each side of the container so that said heating means comes into contact with both the battery cover and the battery jar;
heating the periphery of the battery cover and the battery jar with said heating means to melt a portion of the peripheries thereof;
removing the heating means from each side of the container;
disengaging the clamping and pressing means from each side of the container;
engaging the battery cover and the battery jar at the interface between them with said clamping and pressing means to minimize the flow of bead-forming plastic melt outwardly of said container; and then
clamping the battery cover and the battery jar together for a predetermined period of time to insure welding of the battery cover to the battery jar to form said closed container.

5,466,317
LAMINATED BUILDING PANEL AND METHOD FOR ITS PRODUCTION

Herb Lause; Sylvia Moore, both of Sidney, Ohio; Clif Seltzer, Evansville, Ind.; Cliff Taylor, and Dan King, both of Sidney, Ohio, assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 52,951, Apr. 23, 1993. This application Jan. 5, 1994, Ser. No. 177,437
Int. Cl.[6] B32B *5/18;31/14;* B29C *47/00;* D21B *1/04*
U.S. Cl. 156—79 15 Claims

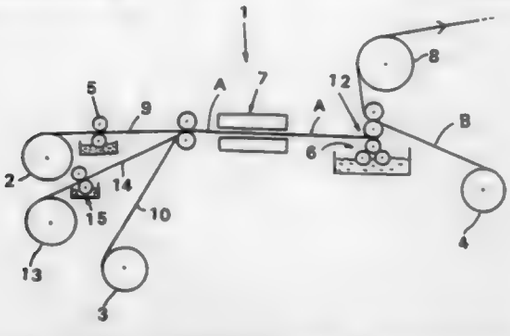


1. A method of forming a building panel comprising:
extruding a molten polymer to form a molten web;
positioning a mat of fibrous material against said molten web;
pressing said mat against said molten web before the web has solidified so that the fibrous material in the mat is partially embedded in the web and partially projecting from a face of the web;
cooling the polymer to form an outer facing sheet;
applying a foamable plastic formulation against the face of said facing sheet having fibrous material projecting therefrom with said projecting fibrous material wetted by and contained in said formulation; and
foaming and polymerizing said formulation to form a rigid foam layer mechanically bonded to said facing sheet by said fibrous material.

5,466,318
METHOD FOR MANUFACTURING A FABRIC-LIKE LAMINATE AND A PRODUCT MANUFACTURED ACCORDING TO SAID METHOD

Bengt Björk, Saffle, Sweden, assignor to Duni AB, Sweden

PCT No. PCT/SE92/00882, § 371 Date Jun. 20, 1994, § 102(e) Date Jun. 20, 1994, PCT Pub. No. WO93/12936, PCT Pub. Date Jul. 8, 1993
PCT Filed Dec. 18, 1992, Ser. No. 244,986
Claims priority, application Sweden, Dec. 20, 1991, 9103810
Int. Cl.[6] B31F *1/12;* B32B *7/14*
U.S. Cl. 156—183 9 Claims

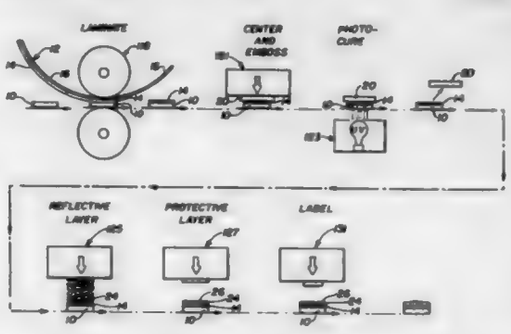


1. A method for manufacturing a laminate of creped tissue paper, which is wet-strength-treated and which has the required qualities for table-cloths, the method comprising the steps of:
applying an adhesive to a first piece of tissue paper in patterns to form a first web;
laminating said web to a second tissue paper web by means of a water-based adhesive compound containing a dispersion adhesive mixed with a large amount of filler, said first web and said second web each having surface layers, said compound making the adhesive only penetrate to a limited depth into the respective surface layers of the first and second webs directed towards each other.

5,466,319
METHOD FOR MAKING OPTICALLY READABLE MEDIA CONTAINING EMBOSSED INFORMATION

Stephen A. Zager, Newark, and Felix P. Shvartsman, Wilmington , both of Del., assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 375,100, Jun. 30, 1989, abandoned. This application Jun. 19, 1991, Ser. No. 719,067
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—220 7 Claims



1. A method of making an optically readable medium containing a relief information track comprising the sequential steps of
(a) laminating a dry photohardenable film having a creep viscosity of 20–200 megapoise to a surface of a dimensionally stable optically transparent substrate;
(b) optionally forming a reflective layer on the exposed surface of the dry photohardenable film;
(c) embossing the surface of the dry photohardenable film opposite to that laminated to the surface of the substrate with the relief information track by applying to the surface of the photohardenable film opposite to that laminated to the substrate, at room temperature and under pressure, a stamper containing a relief image of the information track;
(d) passing actinic radiation through the transparent substrate and the photohardenable film to effect hardening of the photohardenable film while it is in contact with the stamper;
(e) separating the stamper from the resultant embossed surface of the photohardened film; and
(f) forming an optically reflective layer on the embossed surface of the photohardened film, if such a reflective layer was not formed prior to step (c).

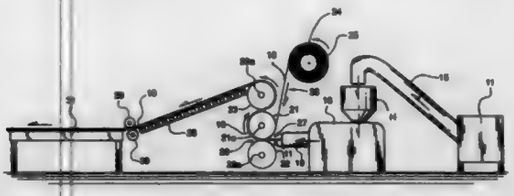
2. A method for making an optically readable medium containing a relief information track comprising the sequential steps of
(a) applying a reflective layer to one surface of a dry photohardenable film having a creep viscosity of 20–200 megapoises;
(b) laminating the non-reflective surface of the photohardenable film to a surface of a dimensionally stable optically transparent substrate;
(c) embossing the exposed reflective surface of the photohardenable film with the relief information track by applying thereto at room temperature under pressure a stamper containing a reverse relief image of the information track;
(d) passing actinic radiation through the transparent substrate and the photohardenable film to effect hardening of the photohardenable film while it is in contact with the stamper; and
(e) separating the stamper from the embossed photohardened film.

5,466,320

MAKING A CUSHIONY DECORATIVE TILE OR COVER PRODUCT FROM EXTRUDED RECYCLED MEMBRANE WITH DISCRETE FIBERS RANDOMLY DISPERSED THEREIN

John R. Burt; Kenneth A. Szabo, both of Saginaw, and Ronald L. Stewart, Oscoda, all of Mich., assignors to Oscoda Plastics, Inc., Oscoda, Mich.

Filed May 9, 1994, Ser. No. 239,510
Int. Cl.[6] B29C *47/14;* B29B *17/00*
U.S. Cl. 156—244.19 **15 Claims**



1. A method of continuously fabricating a cushiony tough vinyl plastic floor or wall cover product having a decorative top side comprising the steps of:

(a) in an extruder, extruding a single-ply sheet, made up substantially of recycled membrane and comprising a proportion of discrete tough fibres, sufficient to create a cushion effect in the product fabricated, randomly dispersed in a vinyl substrate, at an extruding temperature in the range of 300° F.–350° F. in which the single ply sheet is in a soft plasticized hot state, of a semi-solidity in which it can be drawn under tensile load without substantially reducing in thickness;

(b) reducing said fibres principally to the one-eighth to three-eighths of an inch range in length by cooling the sheet extrudate produced in step (a), chopping the sheet extrudate into particles in which the discrete fibres are reduced in length, and then passing said chopped extrudate into said extruder to repeat step (a) and reextrude it;

(c) immediately moving the single ply sheet while at a temperature in the said range continuously into the nip between a pair of heat radiating laminating rolls;

(d) passing a solid state compatible polymer top side cover film selected from the group comprising transparent sheet, colored sheet and transparent sheet with decorative imprinting on one surface, closely alongside one of said laminating rolls to apply radiant preheat to it, and then passing it continuously into said nip with the single ply sheet;

(e) utilizing heat in said single ply sheet and the heat imparted by said one of said laminating rolls to bring said cover film to bonding temperature while applying compressive pressure to autogeneously heat weld said single ply sheet and cover film in surface to surface sealed contact, without the imposition of air bubbles or wrinkles between them, to form a welded product; and

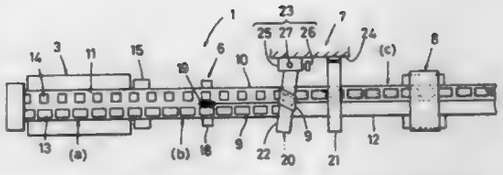
(f) cooling said welded single ply sheet and cover film and cutting it into discrete sizes, which can function as very durable, tough, cushiony floor or wall covering.

5,466,321

METHOD OF AND APPARATUS FOR SUPERPOSING STRIP MEMBERS

Hiroshi Miyaji, Higashi-Osaka, Japan, assignor to Sanki Machinery Co., Ltd., Osaka, Japan

Filed Dec. 17, 1993, Ser. No. 168,188
Int. Cl.[6] B32B *31/04;31/18;35/00*
U.S. Cl. 156—260 **11 Claims**



1. A method of superposing strip members comprising the steps of:

conveying first and second strip members arranged in two rows and side by side in the widthwise direction thereof in parallel to each other, from an upstream side toward a downstream side in the longitudinal direction thereof, said first and second strip members each including a label paper and a release paper releasably affixed to a reverse surface of said label paper;

looping the label paper of said first strip member around a winding rod in a manner to describe a spiral whose axis extends in a direction intersecting the longitudinal direction of the strip member to be looped, thereby delivering the looped label paper in a row of the second strip member;

releasing said release paper from said first label paper at the same time that said first label paper is looped around said winding rod;

adjusting an intersecting angle of said winding rod relative to the longitudinal direction to thereby change the spiral center of the first strip member; and

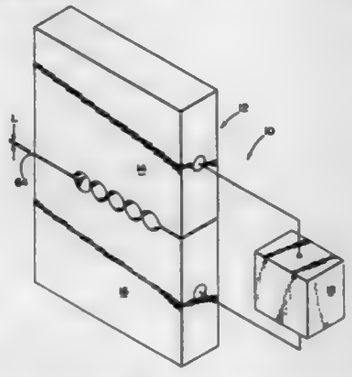
superposing the first and second strip members thus rearranged into a single row so as to be integrated.

5,466,322

METHOD FOR MAKING AN ELONGATED PLASTIC MEMBER ASSEMBLY

John M. Munsch, Libertyville, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 13,447, Feb. 4, 1993, abandoned.
This application Sep. 1, 1994, Ser. No. 299,800
Int. Cl.[6] B29C *65/00;65/04*
U.S. Cl. 156—273.3 **11 Claims**



1. A method of making a peelable tube assembly having a plurality of adjacent tube portions joined by intermittent breakable webs of plastic allowing the individual portions to be peeled from the tube assembly, said method comprising the steps of:

(a) providing a plurality of plastic tube portions each having a tube wall defining a flow passage;

(b) aligning the tube portions adjacent to one another in a die assembly having compression channels;

(c) defining narrow confined flow chambers between adjacent compression channels and in between the ends of the tube walls;

(d) radially compressing the portions of the tube walls without occluding the flow passage;

(e) heating and plasticizing with RF energy while compressing small compressed portions of the tube walls proximate the flow chambers; and

(f) flowing the plasticized tube walls portions into the flow chambers between the adjacent tube portions to fuse the adjacent tube portions together with intermittent webs joining the tubular portions until the webs are broken when peeling a tubular portion from the tube assembly.

5,466,323
PREPARING EPOXY RESIN/HARDENER/ AMINOPOLYSILOXANE COMPOSITE

Gary T. Decker; Gerald A. Gornowicz, both of Midland County, Mich., and Kuniaki Tobukuro, Otsu, Japan, assignors to Toray Industries, Tokyo, Japan

Division of Ser. No. 338,080, Nov. 14, 1994, Pat. No. 5,431,765, which is a division of Ser. No. 262,289, Jun. 20, 1994, Pat. No. 5,405,688, which is a division of Ser. No. 226,908, Apr. 13, 1994, Pat. No. 5,378,532, which is a division of Ser. No. 92,105, Jul. 16, 1993, Pat. No. 5,362,821, which is a division of Ser. No. 811,276, Dec. 20, 1991, Pat. No. 5,262,507, which is a division of Ser. No. 580,741, Sep. 11, 1990, Pat. No. 5,135,993. This application Mar. 21, 1995, Ser. No. 407,821

Int. Cl.[6] C09J *5/06;163/02;183/06*

U.S. Cl. 156—307.4 **1 Claim**

1. A process of preparing cured, reinforced, toughened epoxy resin-containing composites, said process comprising:

(I) blending an aminofunctional silicone resin with at least one curable epoxy resin and at least one epoxy hardener, said aminofunctional silicone resin having an —NH— equivalent in the range of from 350 to 100 and comprising the units

(i) $PhSiO_{3/2}$

(ii) R_2SiO and

(iii) aminofunctional siloxy units selected from the group consisting of

a. $H_2NR'SiO_{3/2}$,

b. $R''HNR''SiO_{3/2}$,

c. $(R''HNR'')_{3-y}(R^v)_ySiO_{1/2}$,

d. $(H_2NR')_{3-x}(R^v)_xSiO_{1/2}$ and

e. mixtures of a, b, c and d,

wherein Ph is the phenyl radical; each R is independently selected from the group consisting of phenyl and alkyl groups of 1 to 3 carbon atoms, with the proviso that when R in (ii) is an alkyl radical in each case, there can be no more than 10 weight percent of (ii) in the silicone resin, and with the further proviso that when R in (ii) is an alkyl radical and one R in (ii) is a phenyl redical on the same silicone atom, there can be no more than 15 weight percent of (ii) present in the silicone resin; R' is a divalent hydrocarbon radical selected from the group consisting of alkylene, arylene, alkarylene, and aralkylene groups having from 1 to 10 carbon atoms, and $R''NHR'''$, wherein R'' and R''' are each independently selected from the group consisting of alkylene, arylene, alkarylene, and aralkylene groups having from 1 to 10 carbon atoms; each of x and y have a value of 0, 1 or 2; R^{iv} is selected from the group consisting of methyl, ethyl, propyl and phenyl; and R^v is selected from the group consisting of methyl and phenyl;

(II) impregnating reinforcing fibers with said blend;

(III) laying up at least two layers of the impregnated fibers;

(IV) heating the layed-up laminate at a temperature sufficient and for a length of time sufficient to cure the epoxy resin, whereby a cured, reinforced, toughened epoxy resin-containing composite is obtained.

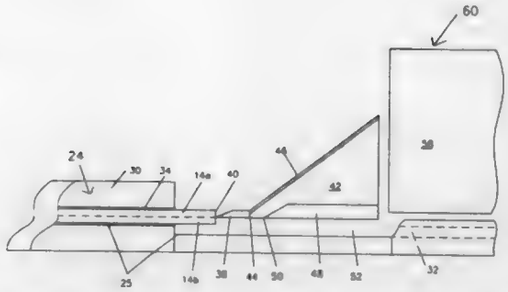
5,466,324
APPARATUS AND PROCESS FOR SEPARATION OF LAMINAE

Dennis R. Mailloux, Westminster, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 29, 1993, Ser. No. 158,644

Int. Cl.[6] B32B *35/00*

U.S. Cl. 156—344 **15 Claims**



14. Apparatus for separating a first flexible lamina of predetermined thickness from a second lamina to which the first lamina is secured along a secured edge, the first and second laminae also being adhered to each other along an adhered edge different from the secured edge, the apparatus comprising:

a channel member having walls defining a channel having a thickness not substantially greater than the combined thickness of the first and second laminae, the channel having an outlet opening at one end;

impeller means for impelling the first and second laminae together through the channel and out of the outlet opening in a direction substantially parallel to the secured edge;

cutter means disposed adjacent the outlet opening such that, as the laminae are impelled through the outlet opening, the cutter means contacts the adhered edge adjacent the line of adhesion between the laminae, thereby separating the laminae;

wedge means disposed adjacent the cutter means on the opposed side thereof from the outlet opening, the cross-section of the wedge means increasing with distance from the cutter means, the wedge means being arranged so that as the first and second laminae are separated by the cutter means and are impelled past the wedge means, the two laminae pass on opposed sides of the wedge means, thereby increasing the separation between the laminae;

first and second guide means disposed on the opposed side of the wedge means from the cutter means, the first guide means being arranged to receive an edge of the first lamina remote from the secured edge thereof, and the second guide means being arranged to receive an edge of the second lamina remote from the secured edge thereof, such that the first and second guide means hold the first and second laminae apart at an angle of at least about 30° to each other.

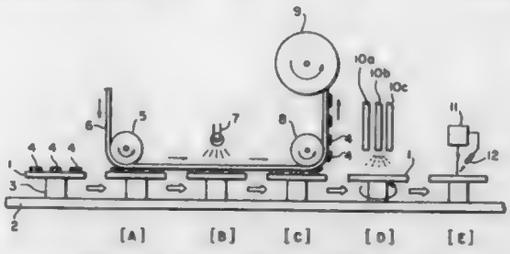
5,466,325
RESIST REMOVING METHOD, AND CURABLE PRESSURE-SENSITIVE ADHESIVE, ADHESIVE SHEETS AND APPARATUS USED FOR THE METHOD

Fumio Mizuno; Noboru Moriuchi; Seiichiro Shirai, all of Tokyo; Yutaka Moroishi, Osaka; Makoto Sunakawa, Osaka, and Michirou Kawanishi, Osaka, all of, Japan, assignors to Nitto Denko Corporation, Osaka, and Hitachi Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 70,299, Jun. 2, 1993, abandoned. This application Aug. 11, 1994, Ser. No. 288,988

Int. Cl.[6] B32B *7/10;31/00*

U.S. Cl. 156—344 **2 Claims**



1. A resist-removing method, which comprises:

a step of adhering an adhesive tape having a curable pressure-sensitive adhesive layer which contains a non-volatile compound having a good affinity with a resist material and wherein said pressure sensitive adhesive layer has an initial modulus of elasticity of at least 0.5 g/mm^2, and is prepared such that its modulus of elasticity after curing is at least 5 times its modulus of elasticity before curing, on an upper surface of a resist pattern formed on an article,

a step of transferring and diffusing the non-volatile compound into the resist pattern,

a step of applying a curing treatment to the adhesive after the step of adhering the adhesive tape, and

a step of peeling off the resist pattern together with the adhesive tape.

5,466,326

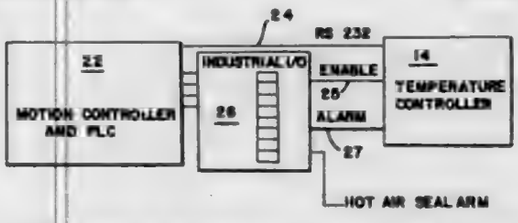
CONTINUOUS MOTION HEAT SEAL CONTROL

Dale M. Cherney, Howards Grove, Wis., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Continuation of Ser. No. 961,124, Oct. 14, 1992, abandoned. This application Oct. 6, 1994, Ser. No. 319,466

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—359 **12 Claims**



1. In an apparatus for sealing a continuously moving web of film requiring one surface to be sealed to another, heat applying means for applying sufficient forced hot air energy to the film to make a seal as the film is moving through the apparatus, means for setting a change to a desired velocity of the movement of the film through the apparatus, and control means responsive to setting of said desired velocity for simultaneously determining the amount of forced hot air energy to be applied to the area to be sealed by said heat applying means, said control means being connected to said heat applying means so that said heat applying means varies the amount of forced hot air energy applied to the area to be sealed in accordance with a substantially constant, predetermined linear relationship, which is proportional to the desired velocity of the movement of the film through the apparatus.

5,466,327

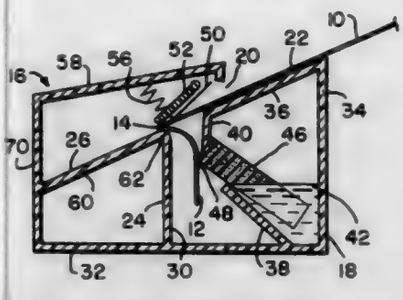
ENVELOPE-FLAP SEALING DEVICE

Tadeusz Staniszewski, Budd Lake, N.J., assignor to Shap, Inc., Demarest, N.J.

Filed Oct. 14, 1994, Ser. No. 322,983

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—441.5 **7 Claims**



1. An envelope flap sealing device, comprising:

a housing having a slot formed between an upper wall and a planar surface of said housing; wherein

said planar surface defines a path of envelope travel, and comprises two aligned plates separated therebetween by a gap; and

envelope flap moistening means located under said gap;

a flexible deflecting means, located above said gap, and secured at one end thereof to an upper portion of said housing, for deflecting an envelope flap through said gap and into contact with said moistening means; and

a planar element, located behind said deflecting means in said path of envelope travel, and pivotably mounted to said upper portion of said housing, for pressing the moistened flap closed.

5,466,328

RECORDED SHEET PROCESSING UNIT FOR IMAGE FORMING APPARATUS

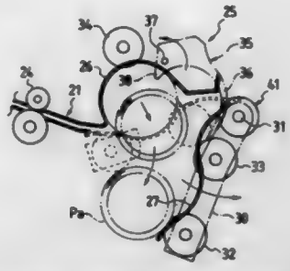
Atsushi Nagashima, Iwatsuki, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1993, Ser. No. 113,062

Claims priority, application Japan, Aug. 31, 1992, 4-255951; Aug. 31, 1992, 4-255952; Aug. 31, 1992, 4-255953; Aug. 31, 1992, 4-255954

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—443 **11 Claims**



1. A recorded sheet processing unit for an image forming apparatus for producing a large size recorded sheet by setting a wide rolled sheet of the large size to a sheet feed section thereof and cutting the sheet fed out of the sheet feed section in accordance with the size, the recorded sheet processing unit comprising:

a post-processing unit connected to a sheet discharge section of the image forming apparatus, the post-processing unit including:

a sheet rolling unit;

means for discharging a recorded sheet in the form of a rolled sheet having a predetermined diameter; and

means for directly discharging an unrolled recorded sheet through a sheet guide path of the sheet rolling unit, the sheet rolling unit including:

guide members for guiding the recorded sheet of a large size, which is to be discharged in the form of a rolled sheet, into a section for rolling the sheet into a cylindrical form and for guiding a recorded sheet which is to be discharged in the form of an unrolled sheet through the sheet guide path, the guide members in the sheet rolling unit are formed by combining an upper guide member and a lower guide member, the upper guide member being arranged at a fixed position and the lower guide member being arranged so as to be opened and closed, the upper guide member and the lower guide member being spaced to make a first opening for receiving the recorded sheet and a second opening for discharging the unrolled sheet when the lower guide member is closed;

drive roller members for forwarding the recorded sheet along the guide members;

a gate member swingable in the sheet rolling unit among a first position, a second position and a third position, the gate member including a gate arm and, when the gate member is placed in the first position and the lower guide member is closed, the gate arm of the gate member is placed across the upper guide member and the lower guide member to block the second opening for preventing the recorded sheet from passing through the second opening and for assisting in forming the rolled sheet, when the gate member is placed in the third position and the lower guide member is closed, the gate arm is placed above the lower guide member for allowing the recorded sheet to pass between the gate arm and the lower guide member and through the second opening, and, when the

gate member is placed at the second position and the lower guide member is open, the gate arm is placed away from a path for discharging the rolled sheet and the rolled sheet is pushed out of the guide members by a pushing arm disposed on the gate member; and

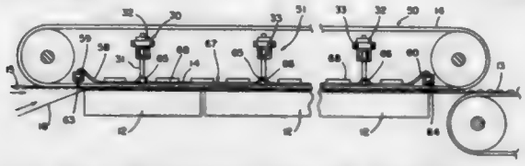
a sealing mechanism for sticking an adhesive tape to the cylindrically formed sheet, the guide members for guiding the sheet so as to be cylindrical having a mechanism for discharging the rolled sheet by opening a part of the guide members.

5,466,329

ADJUSTABLE BALLAST SYSTEM FOR THE HOLDDOWN BELT IN A DOUBLE FACER

Carl R. Marschke, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.

Filed Jun. 3, 1994, Ser. No. 253,647
Int. Cl.[6] B31F *1/20;1/24*
U.S. Cl. 156—470 **8 Claims**



1. A system for selectively varying the vertical ballast load applied to an upper surface of a moving holddown belt and an underlying corrugated paperboard web traveling therewith over a plurality of heating units positioned in the direction of web movement in a double facer, said system comprising:

a plurality of rows of belt engaging ballast members, each row extending over the heating units, and said plurality of rows positioned in parallel side-by-side relation transversely across the belt and underlying web;

each row including a plurality of segments, each segment overlying a heating unit and having a length approximately equal to the length of a heating unit;

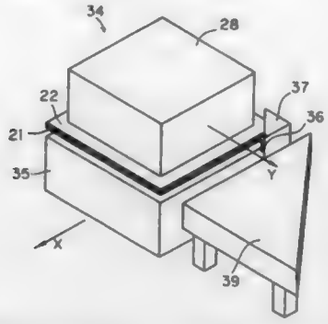
a vertical actuator for each of said segments, said actuator operable to move each said segment between a lower full load ballast position and an upper no load position independently of any other segment and without altering the load imposed by any other segment on the holddown belt.

5,466,330

HANDLING APPARATUS FOR CERAMIC GREEN SHEET

Norio Saka; Tsuyoshi Saitoh; Yoshikatsu Nakayama, and Akihiko Kamada, all of Kyoto, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 14, 1994, Ser. No. 182,286
Claims priority, application Japan, Jan. 14, 1993, 5-004755
Int. Cl.[6] B32B *35/00*
U.S. Cl. 156—584 **8 Claims**



1. A handling apparatus for a ceramic green sheet for separating a carrier film from a rectangular ceramic green sheet formed on said carrier film, said handling apparatus comprising:

an attracting head having an attracting surface for attracting said ceramic green sheet with said carrier film to said attracting surface;

a holding member for holding said carrier film at a position corresponding to one corner portion of said ceramic green sheet; and

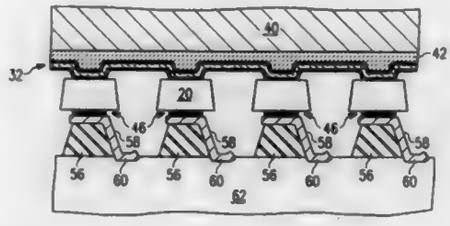
a mechanism for relatively moving said attracting head and said holding member diagonally or substantially diagonally with respect to said ceramic green sheet to separate said carrier film from said green sheet by folding back said carrier film directly over itself without any intervening member between said carrier film and said green sheet.

5,466,331

ELEVATED THIN FILM FOR CERAMIC MATERIALS

James F. Belcher, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1994, Ser. No. 222,144
Int. Cl.[6] B44C *1/22;* **C03C** *15/00*
U.S. Cl. 216—17 **23 Claims**



1. A method of forming a microelectronic structure, said method comprising steps:

(a) providing a ceramic substrate having a front side and a back side;

(b) forming trenches having a depth and a first pattern on said front side of said ceramic substrate;

(c) filling said trenches with a filler material;

(d) forming an elevation layer having a second pattern on said front side of said substrate, said elevation layer substantially aligned with said trenches and covering at least said filler material in said trenches;

(e) depositing a thin front layer on said front side of said substrate and on said elevation layer, thereby forming elevated portions of said thin front layer above said front side;

(f) thinning said ceramic substrate by mechanically polishing said back side of said ceramic substrate to a thickness less than said depth of said trenches;

(g) removing said filler material from said trenches; and

(h) removing said elevation layer, thereby forming isolated islands of said ceramic substrate connected by said thin front layer, whereby the thin front layer remains substantially undamaged, having not been exposed to the removing process of step (g).

5,466,332

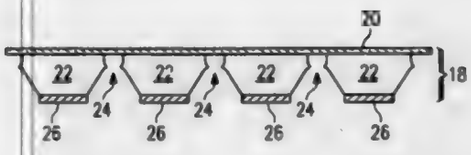
DUAL ETCHING OF CERAMIC MATERIALS

Robert A. Owen, Rowlett, and James F. Belcher, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 4, 1994, Ser. No. 223,087
Int. Cl.[6] B44C *1/22;* **C03C** *15/00*
U.S. Cl. 156—630 **19 Claims**

1. A method of forming a microelectronic structure, said method comprising steps:

(a) providing a ceramic substrate having a front side and a back side;



(b) etching a first pattern partially into said front side of said substrate, thereby forming etch stop trenches having said first pattern;

(c) filling said etch stop trenches with an etch stop material;

(d) depositing a thin front layer on said front side of said substrate;

(e) etching a second pattern into said back side of said substrate, said second pattern substantially the same as said first pattern, and substantially aligned with said etch stop trenches on said front side, thereby forming cavities extending down to and partially into said etch stop material, but not extending to said thin front layer; and

(f) removing said etch stop material, thereby forming isolated islands of said ceramic substrate connected by said thin front layer, whereby the thin front layer remains substantially undamaged, having not been exposed to the etching processes of steps (b) and (e).

5,466,333

PROCESS FOR RECYCLING PRINTED AND PLASTIC COATED PAPER

Alvin Guttag, Apt. No. 108, 415 Russell Ave., Gaithersburg, Md. 20877

Continuation-in-part of Ser. No. 517,801, May 2, 1990, abandoned, which is a division of Ser. No. 213,342, Jun. 30, 1988, Pat. No. 4,952,426. This application Mar. 4, 1994, Ser. No. 205,641

Int. Cl.[6] D21C *5/02*

U.S. Cl. 162—6 **10 Claims**

1. A process of recycling printed paper containing a coating of a plastic olefin polymer, comprising either:

(A) deinking said printed paper to form a deinked paper slurry, then treating said deinked paper slurry with an oxidizing agent, and then reforming said deinked paper slurry into recycled paper, or

(B) deinking said printed paper to form a deinked paper slurry, then reforming said deinked paper slurry into recycled paper, and then treating said recycled paper with an oxidizing agent,

said deinked paper consisting essentially of a member of the group consisting of

(1) fibers containing both (a) cellulose and (b) a plastic olefin polymer;

(2) fibers which are a mixture of (a) cellulose fibers and (b) fibers containing both (i) cellulose and (ii) a plastic olefin polymer;

(3) fibers which are a mixture of (a) cellulose fibers, (b) fibers of a plastic olefin polymer, and (c) fibers containing both (i) cellulose and (ii) a plastic olefin polymer; and

(4) fibers which are a mixture of (a) fibers of a plastic olefin polymer and (b) fibers containing both (i) cellulose and (ii) a plastic olefin polymer,

wherein at least some of said plastic olefin polymer is exposed to the surface of said deinked paper and recycled paper of steps (A) or (B),

said oxidizing agent treatment being sufficient to increase the adhesion of said exposed plastic olefin polymer to printing ink,

followed by printing on said recycled paper.

5,466,334

METHOD AND APPARATUS FOR MIXING A TREATMENT AGENT WITH A PULP SUSPENSION

Börje Fredriksson, Sundsvall, and Kjell Forslund, Sundsbruk, both of, Sweden, assignors to Sunds Defibrator Industries Aktiebolag, Sundsvall, Sweden

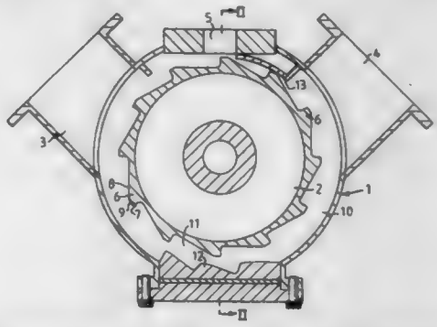
PCT No. PCT/SE92/00557, § 371 Date Feb. 28, 1994, § 102(e) Date Feb. 28, 1994, PCT Pub. No. WO93/04772, PCT Pub. Date Mar. 18, 1993

PCT Filed Aug. 19, 1992, Ser. No. 199,239

Claims priority, application Sweden, Sep. 5, 1991, 9102551

Int. Cl.[6] D21B *1/34*

U.S. Cl. 162—56 **26 Claims**



1. A method for mixing a treatment agent with a pulp suspension comprising supplying said pulp suspension to a mixing chamber defined by a housing having stationary mixing means along a portion thereof and a width, moving said pulp suspension through a mixing zone within said mixing chamber by rotating a cylindrical rotor having mixing members mounted thereon within said housing, said mixing zone having a height defined by the distance between said mixing members and said stationary mixing means, and supplying said treatment agent to said moving pulp suspension across said entire width of said mixing chamber prior to said mixing zone, said height of said mixing zone being such that said pulp suspension and said treatment agent are subjected to kneading within said mixing zone in order to repeatedly stretch and compress fiber flocks in said pulp suspension.

5,466,335

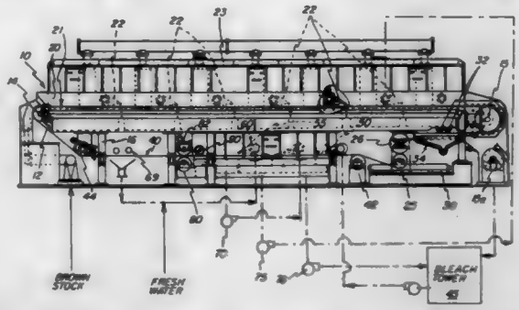
PAPER PULP WASHING

Clinton R. Parks, Hamilton, Ohio, assignor to The Black Clawson Company, Middletown, Ohio

Division of Ser. No. 877,716, May 4, 1992, Pat. No. 5,225,024. This application Nov. 9, 1993, Ser. No. 149,472

Int. Cl.[6] D21C *9/02*

U.S. Cl. 162—60 **2 Claims**



1. A continuous process of washing paper making pulp in combination with a driven foraminous wire having outer and inner surfaces and forming a loop enclosing and supported by horizontally spaced breast and couch rolls and including upper and lower wire runs traveling in opposite directions toward and away from said couch roll respectively, comprising the steps of:

supplying a liquid suspension of pulp to be washed to said outer surface of said upper wire run adjacent said breast roll,

causing liquid in said suspension to drain through said upper wire run and thereby forming a pulp mat thereon,
applying washing liquid from above to said mat as said mat travels on said upper wire run toward said couch roll,
draining said washing liquid through said upper wire run to form thereon a mat of washed pulp,
repeating said liquid applying and draining steps at a plurality of stages located between said rolls,
collecting said drained liquid within said loop at each of said stages and applying said collected liquid to said mat at the immediately preceding stage,
removing said washed pulp from said wire as said wire wraps said couch roll,
adding liquid to said collected pulp and delivering the resulting suspension to said inner surface of said lower wire run within said loop at a position adjacent said couch roll,
draining liquid from said delivered suspension through said lower wire run to form thereon a mat of further washed pulp,
applying additional washing liquid to said further washed pulp mat from above as said mat travels on said lower wire run toward said breast roll,
draining said washing liquid through said lower wire run, and
removing the resulting further washed pulp from said lower wire run and from within said loop.

5,466,336

PROCESS FOR MAKING A PAPER BASED PRODUCT EMPLOYING A POLYMERIC LATEX BINDER

Homan B. Kinsley, Jr., Powhatan, Va., assignor to CPG Holdings Inc., Richmond, Va.

Continuation-in-part of Ser. No. 833,165, Feb. 10, 1992, Pat. No. 5,328,567. This application Aug. 9, 1993, Ser. No. 103,133
The portion of the term of this patent subsequent to Jul. 12, 2011, has been disclaimed.
Int. Cl.[6] D21H *13/10;17/10*
U.S. Cl. 162—146 **27 Claims**

1. A process for making a paper based product which comprises
(i) preparing a slurry comprised of a cellulosic pulp and a polymeric latex binder;
(ii) breaking the stability of the polymeric latex so that the polymer particles are able to be deposited on the fibers of the cellulosic pulp;
(iii) draining the liquid from the slurry to form a web; and
(iv) drying the web;
with a release effecting amount of an emulsion comprised of lecithin and a fatty acid or derivative thereof, the amount of lecithin being sufficient to provide a stable emulsion with the fatty acid or derivative thereof, being added to the slurry or the web prior to drying.

5,466,337

REPULPABLE WET STRENGTH PAPER

William B. Darlington, Chillicothe, Ohio, and William G. Lanier, Marietta, Ga., assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 192,144, Feb. 4, 1994, Pat. No. 5,427,652. This application Mar. 17, 1995, Ser. No. 406,175
Int. Cl.[6] D21H *21/20*
U.S. Cl. 162—164.3 **8 Claims**

1. A method for recycling paperboard which comprises providing a recyclable paperboard product formed from an aqueous dispersion of cellulosic fibers treated with a temporary cationic wet strength agent and a permanent wet strength agent; said temporary cationic wet strength agent being a glyoxylated vinylamide wet strength resin and said permanent wet strength agent being selected from the group consisting of polyamine epichlorohydrin, polyamide epichlorohydrin and polyamine-amide epichlorohydrin resins, wherein the amount of the temporary cationic wet strength agent is at least 0.05 wt % and the amount of the permanent wet strength agent is at least about 0.01 wt %; repulping said paperboard; and recovering the cellulosic fibers.

5,466,338

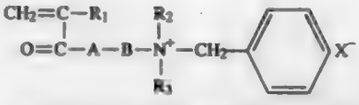
USE OF DISPERSION POLYMERS FOR COATED BROKE TREATMENT

Jon E. Pearson, Aurora, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Filed Nov. 17, 1993, Ser. No. 153,506
Int. Cl.[6] D21H *17/45*
U.S. Cl. 162—168.2 **13 Claims**

1. A process for treating a repulped coated broke slurry which comprises adding to such slurry a water soluble dispersion polymer at a level of from 0.2 to 10 pounds polymer contained in such dispersion per ton of total broke solids, said water soluble dispersion polymer containing:

A. from about 5 to about 100 mole percent of a monomer represented by Formula I:



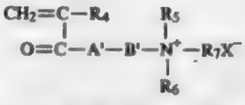
(I)

wherein R_1 is H or CH_3; each of R_2 and R_3 is an alkyl group having from 1 to 3 carbon atoms; A is an oxygen atom or NH; B is an alkylene group having from 2 to 4 carbon atoms or a hydroxypropylene group; and X^- is an inorganic anionic counterion;

B. from about about 0 to about 50 mole percent of a second water soluble cationic monomer; and,

C. from about 0 to about 95 mole percent (meth)acrylamide; and wherein said water soluble polymer is prepared in an aqueous solution of a polyvalent anion salt in the presence of from 1 to 10% by weight based on the total weight of monomers A, B, and C of an organic high molecular weight multivalent cation comprising a water soluble polymer containing at least 20 mole percent of:

a) either at least one monomer represented by Formula II:



(II)

wherein R_4 is H or CH_3; each of R_5 and R_6 is an alkyl group having from 1 to 2 carbon atoms; R_7 is H or an alkyl group having from 1 to 2 carbon atoms; A' is an oxygen atom or NH; B' is an alkylene group of 2 to 4 carbon atoms or a hydroxypropylene group; and X^- is an anionic counterion; or,

b) an alkyl ester of acrylic acid.

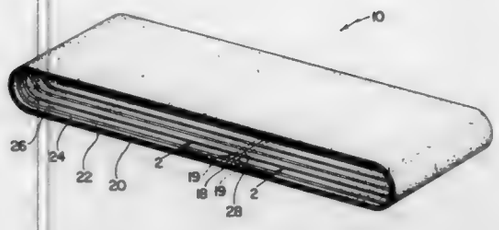
5,466,339

METHOD OF MAKING AND USING A PAPER MAKER FELT

Robert W. Legge, W. Bridgewater, Mass., assignor to Tamfelt, Inc., Canton, Mass.

Division of Ser. No. 973,689, Nov. 9, 1992, abandoned. This application Jul. 29, 1994, Ser. No. 283,398
Int. Cl.[6] D21F *7/10;7/08*
U.S. Cl. 162—200 **1 Claim**

1. A method of making and using a papermaker felt, wherein the felt includes a fabric composed of yarns and fibrous batt materials and that is formed with spaced opposed ends having exposed end loops that are formed by the yarns that extend outwardly of said



opposed ends, the opposed ends being secured together by a pintle that extends through said loops to form a pin seam area through which a loop channel extends for receiving said loops therein, and said fabric further including an outer surface and an inner surface, comprising the steps of locating said felt at a plastic extrusion station in endless form with the pintle inserted into said channel that receives said loops in the seam area and with the inner surface of said felt facing outwardly, covering the loops in the seam area with a protective overlay, extruding a plurality of resinous plastic monofilaments in molten form onto said inner surface of said fabric in spaced parallel relation to define a plurality of water conducting channels, wherein said plastic monofilaments extend over said seam area, said protective overlay preventing said molten resinous material from entering into and interfering with the integrity of the loop channel at said seam area, placing a soluble material selected from the group consisting of soluble resin, soluble fiber, and soluble putty over said seam area to form said protective overlay prior to the extrusion of said plastic monofilament onto the inner surface of said fabric, severing said plastic monofilaments at the seam area to form adjacent severed ends of said plastic monofilaments, extracting said pintle from said seam area, cleaning extraneous fibrous batt material from the loop channel at said seam area, separating the two opposing ends of the fabric for the installation of the fabric on a papermaking machine by locating the inner surface thereof and the plastic monofilaments thereon facing inwardly and inserting said pintle through said loops in said seam area to unite the opposed ends of said felt on said papermaking machine, wherein the severed ends of said plastic monofilaments are disposed in adjacent relation and provide for continuity of said parallel extending channels that form water removal conduits on the underside of said felt when said fabric is passed through rollers of a press section of the papermaking machine, said plastic monofilaments further acting to protect said pin seam area and providing a wear-resistant overlay therefor during the use of the felt in the papermaking machine.

5,466,340

PAPER MACHINE HEADBOX AND METHOD OF CONTROLLING PULP MATERIAL PARAMETERS

Ulrich Begemann, Leonberg; Helmut Heinzmann, Böhmenkirch, and Wolfgang Ruf, Heidenheim, all of, Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany

Filed May 11, 1994, Ser. No. 240,878

Claims priority, application Germany, May 13, 1993, 43 16 054.9

Int. Cl.[6] D21F *1/02*

U.S. Cl. 162—216 **16 Claims**

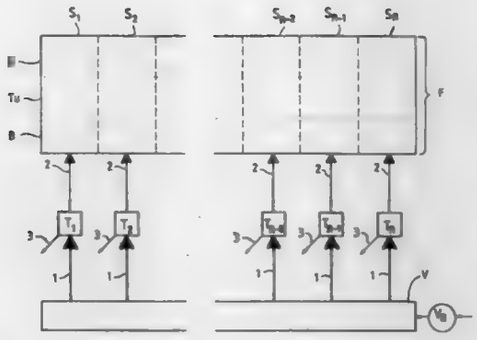
1. In a paper machine having a headbox with a plurality of divided sections for feeding pulp suspensions with different properties through said sections, the improvement comprising:

(a) an inlet line for directing the flow of a pulp suspension therethrough;

(b) a plurality of feed lines connected to the inlet line;

(c) at least one separation device connected to each feed line for selectively separating certain pulp suspension components from the pulp suspension flowing from the feed line and through the separation device;

(d) a discharge line connected to each separation device for conveying separated pulp suspension components from said separation device; and



(e) at least one continuing feed line connected to each separation device, said continuing feed line connected to a particular section of the headbox for conveying remaining pulp suspension from the separation device into said headbox section.

5,466,341

METHOD FOR DRAINING WATER FROM A PAPER WEB

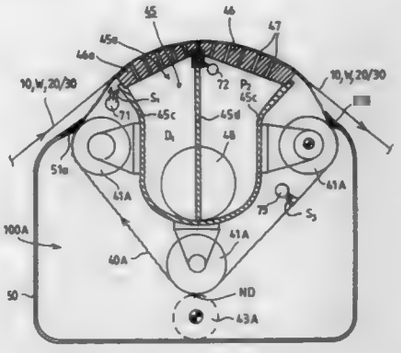
Matti Kankaanpää, Espoo, Finland, assignor to Valmet Paper Machinery, Inc., Helsinki, Finland

Division of Ser. No. 128,470, Sep. 28, 1993. This application Feb. 28, 1995, Ser. No. 396,379

Claims priority, application Finland, Jul. 7, 1993, 933112

Int. Cl.[6] D21F *1/48*

U.S. Cl. 162—217 **10 Claims**



1. A method for draining water from a paper web running on a wire, comprising

engaging the wire and web thereon with a substantially water-receiving fabric-sock mantle loop,

passing a region of the loop engaged with said wire and web thereon over a stationary suction shoe having a curved surface,

guiding the mantle loop in a substantially circular path over the suction shoe such that an inner face of the loop region glides against the curved surface of the suction shoe,

applying a negative pressure through the suction shoe to draw water from the web, and

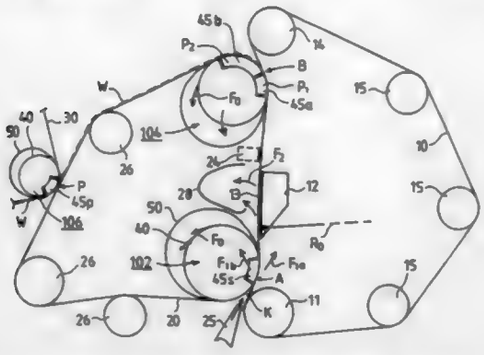
driving the loop around the suction shoe to separate said wire and web thereon from the loop after passing over the suction shoe.

5,466,342

SUCTION ROLL IN A TWIN-WIRE ZONE OF A WEB FORMER AND A TWIN-WIRE WEB FORMER

Matti Kankaanpää, Espoo, Finland, assignor to Valmet Paper Machinery, Inc., Helsinki, Finland

Division of Ser. No. 128,470, Sep. 28, 1993. This application Feb. 28, 1995, Ser. No. 395,629
Claims priority, application Finland, Jul. 7, 1993, 933112
Int. Cl.[6] D21F *1/48;1/60*
U.S. Cl. 162—301 **17 Claims**



1. A twin-wire web former of a paper machine, comprising

a covering wire and a carrying wire which define a twin-wire forming zone,

at least one forming roll constituting a suction roll and arranged in said twin-wire zone to dewater a paper web running on said covering and carrying wires, said forming roll comprising a substantially circular water-receiving fabric-sock mantle loop and a stationary suction shoe arranged in said loop, said suction shoe having a permeable, curved guide deck, said loop revolving about said suction shoe such that an inner face of said loop glides against said guide deck, and

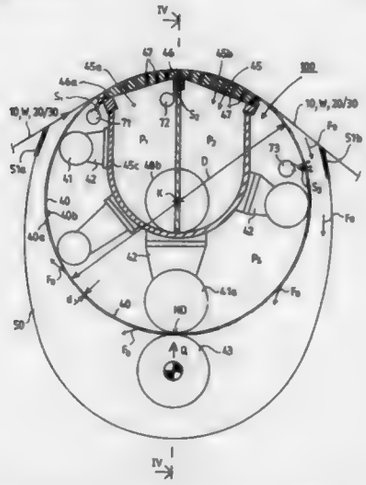
detachment means for detaching the web from the carrying wire and transferring the web further into the paper machine.

5,466,343

SUCTION ELEMENT FOR A PAPER MACHINE

Matti Kankaanpää, Espoo, Finland, assignor to Valmet Paper Machinery, Inc., Helsinki, Finland

Filed Sep. 28, 1993, Ser. No. 128,470
Claims priority, application Finland, Jul. 7, 1993, 933112
Int. Cl.[6] D21F *1/48;3/10*
U.S. Cl. 162—357 **25 Claims**



1. A suction roll for a paper machine, comprising

a substantially circular, water-receiving fabric-sock mantle loop, and

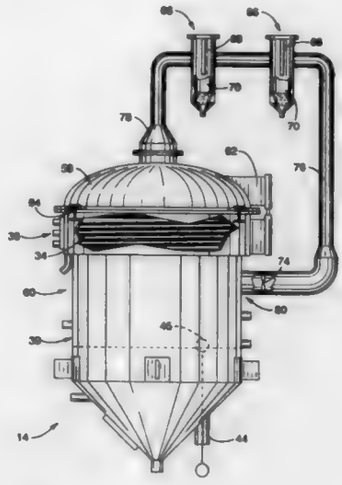
a stationary suction shoe arranged in said loop, said suction shoe being connected to a source of negative pressure to thereby provide suction and comprising a permeable, curved guide deck, said loop revolving about said suction shoe such that an inner face of said loop glides against said guide deck.

5,466,344

METHOD AND APPARATUS FOR CONTROLLING WATER-BASED LIQUID WASTE

Paul A. Lindke, Penn Valley, Calif., assignor to Houston Fearless 76, Inc., Compton, Calif.

Filed Apr. 11, 1994, Ser. No. 225,738
Int. Cl.[6] B01D *3/10;3/42;* C02F *1/04*
U.S. Cl. 202—205 **10 Claims**



1. A waste control system for the recovery and concentration of water-based pollutant materials, comprising:

(a) A low-temperature distillation vessel for separating said pollutant materials into a vapor component and a sludge component;

(b) said distillation vessel having a top portion and a bottom portion, an inside perimeter and an outside perimeter, said distillation vessel further having means for uncoupling said top portion from said bottom portion;

(c) electric resistance heating means for heating said pollutant materials to a sufficient boiling temperature;

(d) a first, energy-dependent condensation means for condensing said vapor component into a liquid component, said first condensation means coupled to said inside perimeter of said distillation vessel;

(e) a liquid recovery tray for capturing said liquid component from said first condensation means, said liquid recovery tray coupled to said inside perimeter of said distillation vessel in direct alignment below said first condensation means;

(f) a second, energy-free condensation means for condensing said vapor component into a liquid component, said second condensation means communicating with said distillation vessel to receive a steady flow of said vapor component;

(g) purification means for purifying said liquid component received from said first and second condensation means;

(h) aspiration vacuum means for drawing said liquid component recovered from said first and second condensation means into said purification means;

(i) said aspiration vacuum means additionally providing a vacuum inside said distillation vessel;

(j) pH control means for controlling the pH of said pollutant material at a level whereby maximum boiling efficiency is achieved.

10. A zero discharge system for controlling water-based liquid waste, comprising:

(a) A low-temperature distillation vessel for separating said liquid waste into a vapor component and a sludge component, said distillation vessel being substantially circular in cross section;

(b) said distillation vessel having a top portion and a bottom portion, an inside circular perimeter and an outside circular perimeter, said distillation vessel further having means for uncoupling said top portion from said bottom portion;

(c) electric resistance heating means for heating said liquid waste to a sufficient boiling temperature;

(d) a plurality of condenser tubes for condensing said vapor component into a liquid component, said condenser tubes formed in a substantially circular shape to couple with said circular inside perimeter of said distillation vessel, said condenser tubes coupled to a refrigeration unit;

(e) a liquid recovery tray for capturing said liquid component, said liquid recovery tray coupled to said inside perimeter of said distillation vessel in direct alignment below said condenser tubes;

(f) a plurality of condensing vanes for condensing said vapor component into a liquid component, said condensing vanes communicating with said distillation vessel through a ventilation circuit to receive a steady flow of said vapor component;

(g) Purification means for purifying said liquid component received from said condenser tubes and said condensing vanes, said purification means including a reverse osmosis unit, a deionizer unit or an activated carbon filter;

(h) aspiration vacuum means for drawing said liquid component recovered from said condenser tubes and said condensing vanes into said purification means;

(i) said aspiration vacuum means additionally providing a vacuum inside said distillation vessel;

(j) pH control means for controlling the pH level of said liquid waste to a range of between 5.5 to 6.5, prior to its introduction into said distillation vessel;

(k) ozone and nitrogen gas infusion means for controlling bio-slime within said liquid component;

(l) ozone and nitrogen gas infusion means and liquid component chilling means for controlling escape of hazardous gasses from said system;

(m) microprocessor control means for controlling the operation or said distillation vessel.

5,466,345

SEPARATION OF O-XYLENE FROM P-XYLENE AND M-XYLENE BY AZEOTROPIC DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed May 31, 1995, Ser. No. 454,624
Int. Cl.[6] B01D *3/36;* **C07C** *7/06*
U.S. Cl. 203—57 **1 Claim**

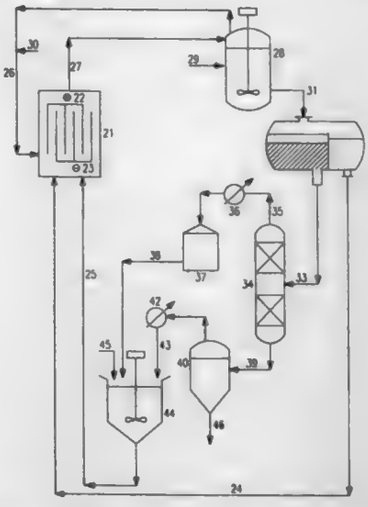
1. A method for recovering o-xylene from a mixture of o-xylene, p-xylene and m-xylene which comprises distilling a mixture of o-xylene, p-xylene and m-xylene in the presence of an azeotrope forming agent, recovering the p-xylene, the m-xylene and the azeotrope forming agent as overhead product and obtaining the o-xylene as bottoms product, wherein said azeotrope forming agent consists of one material selected from the group consisting of methanol, ethanol, isopropanol, cyclopentanol, 1-butanol, n-amyl alcohol, 3-methyl-1-butanol, methyl acetate, methyl trimethyl acetate, propyl formate, methyl propionate, methyl pivalate, butyl formate, methyl lactate, n-pentyl propionate, butyl benzoate, methyl butyrate, isobutyl acetate, acetal, dimethyl carbonate, diethyl carbonate, propyl propionate, 2,3-butanedione, chloroform, methylene chloride, trichloroethylene, 1,1,2-trichloroethane, tetrahydrofuran, t-butyl methyl ether, t-amyl methyl ether, isopropyl ether, butyraldehyde oxime, benzyl cyanide, 2-butanone, 3-pentanone, 1,1,1-trichloroethane, butyraldehyde and 1-methyl piperazine.

5,466,346

QUINONE SYNTHESIZED FROM AN AROMATIC COMPOUND IN AN UNDIVIDED ELECTROCHEMICAL CELL

Tse-Chuan Chou, Tainan, Taiwan, Prov. of China, assignor to National Science Council, Taipei, Taiwan, Prov. of China

Filed May 2, 1994, Ser. No. 236,639
Int. Cl.[6] C25B *3/00;3/02*
U.S. Cl. 204—72 **20 Claims**



1. A method for synthesizing a quinone compound from an aromatic compound using a paired redox electrochemical reaction, comprising the steps of:

(a) creating a mixture of a redox mediator having a metal component at a lower valence state of a redox mediator couple and an aromatic compound in an electrolyte solution in a single undivided electrochemical cell having a cathode and an anode;

(b) supplying electricity to said cathode and anode;

(c) bubbling oxygen into said mixture near the bottom of said cathode to form H_2O_2; and

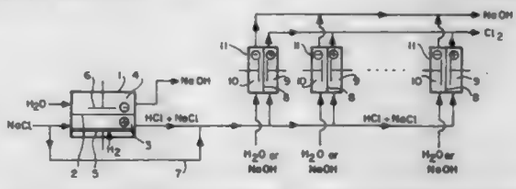
(d) isolating said quinone compound formed.

5,466,347

METHOD FOR ELECTROLYZING AQUEOUS SOLUTION OF ALKALI CHLORIDE

Takayuki Shimamune, and Yasuo Nakajima, both of Tokyo, Japan, assignors to Permelec Electrode, Ltd., Kanagawa, Japan, and De Nora Permelec S.p.A., Milan, Italy

Filed Dec. 7, 1993, Ser. No. 162,761
Claims priority, application Japan, Dec. 10, 1992, 4-352630
Int. Cl.[6] C25B *1/46*
U.S. Cl. 204—98 **4 Claims**



1. A method for electrolyzing an aqueous solution of alkali chloride, comprising the steps of:

feeding a portion of an original aqueous solution of alkali chloride into an auxiliary electrolytic cell containing a cation exchange membrane in which the anode is a hydrogen gas electrode, thereby effecting electrolysis and generating a hydrochloric acid-containing aqueous solution of alkali chloride in an anode compartment of said auxiliary electrolytic cell and alkali hydroxide and hydrogen gas in the cathode compartment of said auxiliary electrolytic cell; and

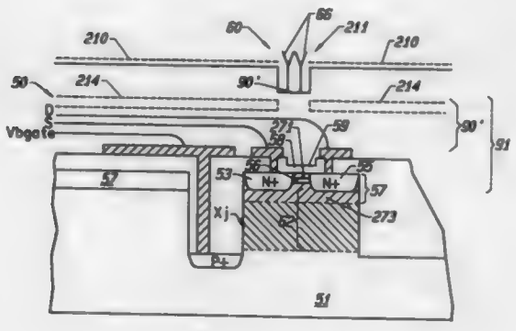
feeding the hydrochloric acid-containing aqueous solution of alkali chloride, together with the remainder of the original aqueous solution of alkali chloride, into a main electrolytic cell having a diaphragm of cation exchange membrane, thereby producing chlorine in an anode compartment of said main electrolytic cell and alkali hydroxide in a cathode compartment of said main electrolytic cell.

5,466,348

METHODS AND DEVICES FOR ENHANCED BIOCHEMICAL SENSING

James W. Holm-Kennedy, 3215 Pacific Heights, Honolulu, Hi. 96813

Continuation-in-part of Ser. No. 781,479, Oct. 21, 1991, abandoned. This application Mar. 12, 1993, Ser. No. 30,791
Int. Cl.[6] G01N *27/26*
U.S. Cl. 204—153.1 **50 Claims**



33. A method for detecting the presence of a target particle in a solution by use of a field effect device that includes a surface to which a target particle bindingly attaches, the method comprising the following steps:

exposing said device to said solution said attachment leading to an alteration of at least one parameter of said device from a preattachment state;

removing said device from said solution;

measuring, in an environment, said at least one parameter to determine whether attachment of said target particle occurred;

wherein said environment is selected from the group consisting of (a) a gas, (b) a liquid, and (c) a solution.

5,466,349

POTENTIOMETRIC EVALUATION OF SUBSTRATE OXIDATION AND COATING POROSITY

D. Morgan Tench, Ventura, and Petra V. Jambazian, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Jan. 6, 1995, Ser. No. 369,844
Int. Cl.[6] G01N *27/26*
U.S. Cl. 204—153.1 **20 Claims**

1. A method of determining oxidation of a substrate having a coating, comprising the steps of:

placing the coated substrate in contact with an electrolytic solution, said solution for dissolving oxides of said substrate;

placing a reference electrode in contact with said solution;

measuring open circuit potential of said coated substrate with respect to said reference electrode while in contact with said solution; and

measuring time for said open circuit potential to reach a steady-state voltage to determine oxidation of said substrate.

5,466,350

SELECTIVE ELECTROCHEMICAL DETECTOR FOR NITRIC OXIDE AND METHOD

Charles K. Baker, 902 Riverstone, San Antonio, Tex. 78258; Mohan R. A. Ram, 1455 Cable Ranch Rd., #2113, San Antonio, Tex. 78254, and Stephen T. Willingboff, 7718 Henbrook, San Antonio, Tex. 78250

Division of Ser. No. 126,233, Sep. 24, 1993, Pat. No. 5,409,591. This application Apr. 25, 1994, Ser. No. 232,378
Int. Cl.[6] G01N *27/26*
U.S. Cl. 204—153.14 **6 Claims**

1. A method of selectively detecting nitric oxide in a fluid comprising the steps of:

(a) positioning a mobile cation solid electrolyte that is highly selective to nitrosonium cations between a first working electrode, a second working electrode, a reference electrode, and a counter electrode such that the electrodes are arranged in a bipotentiostat configuration, whereby the voltages at the first and second working electrodes are independently controlled;

(b) exposing the first working electrode to a fluid;

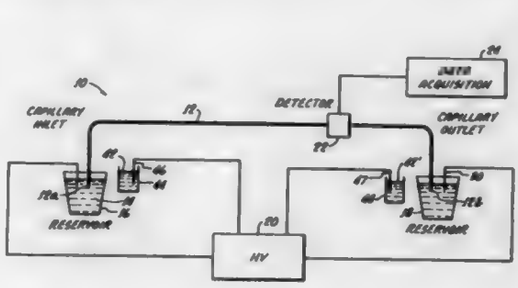
(c) setting the first working electrode at a potential sufficient to oxidize nitric oxide to nitrosonium cations and the second working electrode at a potential sufficient to reduce nitrosonium cations to nitric oxide, whereby nitric oxide in the fluid is oxidized to nitrosonium cations that migrate through the mobile cation solid electrolyte to the second working electrode where the nitrosonium cations are reduced back to nitric oxide, the voltage-current characteristics of the electrodes and the mobile cation solid electrolyte indicating the presence of nitric oxide in the fluid.

5,466,351

CAPILLARY ELECTROPHORETIC SYSTEM FOR SEPARATION OF SAMPLES CONTAINING BOTH POSITIVELY AND NEGATIVELY CHARGED COMPONENTS

Sushma Rampal; Jang B. Rampal, both of Yorba Linda, and James C. Osborne, Orange, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 31, 1995, Ser. No. 414,684
Int. Cl.[6] G01N *27/26;27/447*
U.S. Cl. 204—180.1 **6 Claims**



1. An electrophoretic method comprising the steps of:

providing a capillary having a first and a second opening that are spaced apart from each other, said capillary containing an electrolyte between the two openings;

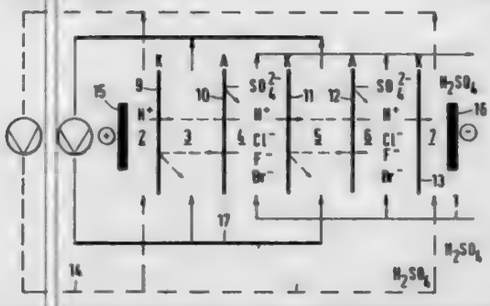
introducing a first sample into the capillary through the first opening and a second sample through the second opening; and

applying an electric field gradient in the electrolyte between the two openings to cause the two samples to migrate in the capillary in opposite directions and to separate into components, wherein an electroosmotic flow, if any, present between the two openings is such that it will not overcome the effect of the electric field gradient so as to cause a reversal of migration direction of the two samples or portions thereof.

5,466,352
METHOD AND APPARATUS FOR PROCESSING WASTE SULFURIC ACID

Volker Brücken, Königstein; Manfred Pötzschke, Kronberg; Bernd Langner, Winsen, and Michael Stelter, Winsen/Scharmbeck, all of, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 950,387, Sep. 23, 1992, abandoned. This application Jun. 17, 1994, Ser. No. 261,658
Claims priority, application Germany, Sep. 24, 1991, 41 31 794.7
Int. Cl.[6] B01D *61/44*
U.S. Cl. 204—182.4 9 Claims



1. A method for processing waste sulfuric acid by electrodialysis wherein said waste acid is derived from the purification of a sulfur dioxide containing gas which is contaminated with hydrohalic acids and has an acid content in the order of magnitude of 1.85% up to 40% which comprises subjecting the waste sulfuric acid to an electrodialysis in which the electric field causes the univalent halides to permeate through an anion exchange membrane and to be selectively removed while the divalent sulfate ions of the sulfuric acid are retained, the sulfuric acid leaving the electrodialyzer being almost entirely free of halides, the permeate containing the separated halides in the form of hydrohalic acids, and recovering said permeate wherein said permeate is recycled.

5,466,353
ELECTRIC POWER DISTRIBUTION SYSTEM FOR ACTIVE CATHODIC PROTECTION OF REINFORCED CONCRETE CONSTRUCTIONS

Soeren E. Westermann, Hellerup, and Erik Schultz, Ballerup, both of, Denmark, assignors to Cyberdan A/S, Holte, Denmark

PCT No. PCT/EP92/02629, § 371 Date May 13, 1994, § 102(e) Date May 13, 1994, PCT Pub. No. WO93/11279, PCT Pub. Date Jun. 10, 1993
PCT Filed Nov. 16, 1992, Ser. No. 244,056
Claims priority, application Denmark, Nov. 28, 1991, 1929/91
Int. Cl.[6] C23F *13/00*
U.S. Cl. 204—196 20 Claims

1. An electric power distribution system for active cathodic protection of reinforced concrete structures, comprising:

converting means (A) for converting a main supply into low voltage electric power;

computational means (B) operatively coupled to the converting means (A);

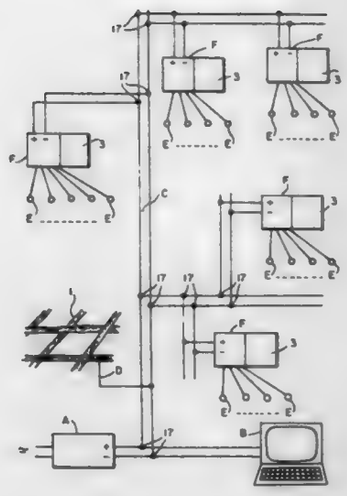
a cabling system (C) leading said electric power from the converting means (A) to respective portions of the reinforced concrete structures that need active cathodic protection;

providing means (D) for providing electrical contact from the converting means (A) to reinforcing iron (1);

contact means (E) for providing electrical contact with a respective concrete mass; and

means (F) for locally distributing said electric power to said contact means (E), said distributing means (F) further comprising a built-in digital control section including a unique address;

wherein only one cabling system (C) is provided,



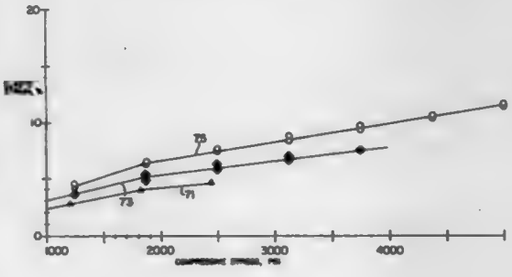
wherein said computational means (B) is capable of sending and receiving digitally coded and addressed information via said cabling system (C), and

wherein said digital control section is also capable of sending and receiving said digitally coded and addressed information via said cabling system (C).

5,466,354
METAL COMPRESSION PAD FOR AN ELECTROLYSIS CELL

Andrei Leonida, West Hartford; Lawrence C. Moulthrop, Windsor, and Kurt M. Critz, Enfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 991,906, Dec. 17, 1992, Pat. No. 5,366,823. This application Sep. 20, 1994, Ser. No. 309,258
The portion of the term of this patent subsequent to Jun. 28, 2011, has been disclaimed.
Int. Cl.[6] H01M *2/00*
U.S. Cl. 204—252 18 Claims



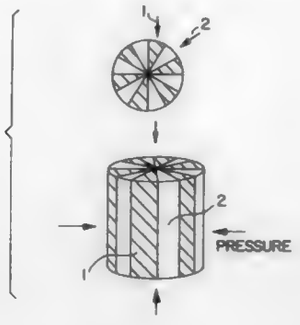
1. An improved electrolysis cell having an anode electrode, a cathode electrode, and an electrolyte disposed therebetween, wherein the improvement comprises: a compression pad for compensating for component dimensional variations at pressures exceeding about 1,500 psig, said compression pad comprising: a metal having sufficient porosity to attain an elastic strain between about 3% and about 40% at about 2,500 psig.

5,466,355

MOSAIC TARGET

Tateo Ohhashi; Koichi Nakashima; Hideaki Fukuyo, and Takakazu Seki, all of Kitaibaraki, Japan, assignors to Japan Energy Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 268,052, Jun. 29, 1994, abandoned. This application Feb. 22, 1995, Ser. No. 392,458
Claims priority, application Japan, Jul. 15, 1993, 5-196712
Int. Cl.[6] C23C *14/34*
U.S. Cl. 204—298.13 4 Claims



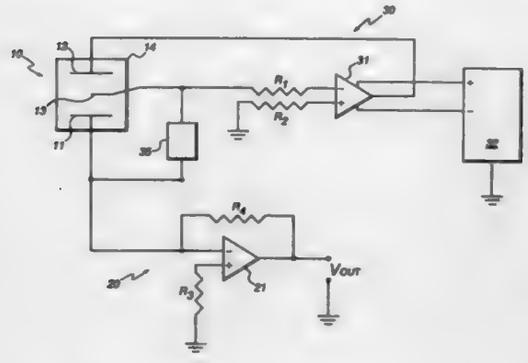
1. A mosaic target comprising a plurality of target block pieces of different kinds of materials selected from the group consisting of Ta, Mo, Ti, W, Zr, Nb and Si, and their alloys and compounds, characterized in that said target block pieces of different kinds of materials have their abutting interfaces which have been solid-phase bonded at a temperature no more than the melting points of the target block piece materials.

5,466,356

POTENTIOSTAT CIRCUIT FOR ELECTROCHEMICAL CELLS

Alan A. Schneider, Wexford, and Towner B. Scheffler, Butler, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Apr. 29, 1994, Ser. No. 235,379
Int. Cl.[6] G01N *27/26;27/00*
U.S. Cl. 204—406 8 Claims



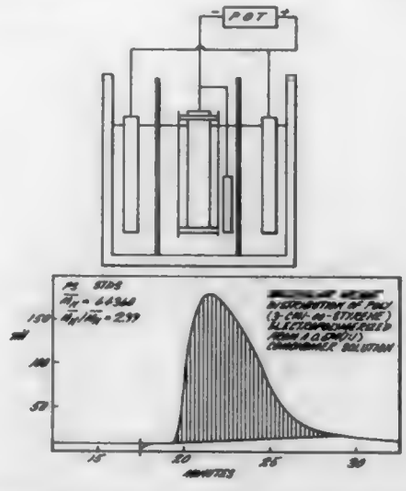
1. In an electrochemical cell having a housing; a sensing electrode, a counter electrode and a reference electrode such that all three electrodes are contained within the housing; an electrolyte contained within the housing and contacting each electrode; and a potentiostat circuit connected to the reference and counter electrodes; the improvement comprising having a direct current path between the sensing electrode and the reference electrode during normal operation of the electrochemical cell.

5,466,357

ELECTROPOLYMERIZATION METHOD AND PRODUCT

James P. Bell, Storrs, Conn.; Jude O. Iroh, Cincinnati, Ohio; Daniel A. Scola, Glastonbury, Conn., and Jengli Liang, Auburn, Ala., assignors to The University of Connecticut, Storrs, Conn.

Division of Ser. No. 898,911, Jun. 12, 1992, Pat. No. 5,232,560, , which is a continuation of Ser. No. 665,943, Mar. 5, 1991, abandoned, said Ser. No. 898,911is a continuation of Ser. No. 366,933, Jun. 19, 1989, abandoned. This application Jun. 22, 1993, Ser. No. 80,674
Int. Cl.[6] C25B *3/00*
U.S. Cl. 205—50 22 Claims



1. A product made from the process of forming a thermoplastic matrix prepreg composite consisting essentially of the steps of:

electropolymerizing at least one carboxy group containing monomer onto electrically conductive filler material in a substantially aqueous solution having a monomer concentration and over a time period effective to form a coating of thermoplastic polymer matrix on said material, said coating having a thickness of greater than two microns or a thickness effective to provide at least about 30 weight percent of thermoplastic polymer coating per unit weight of conductive filler material, said aqueous solution including at least one organic solvent, said at least one monomer being moderately soluble in said organic solvent-containing aqueous solution and said at least one monomer being permeable to ions diffusing as a result of said electropolymerization step.

5,466,358

METHOD OF FORMING A FLUORESECENT SCREEN BY ELECTRODEPOSITION ON A SCREEN PANEL OF A FIELD EMISSION DISPLAY

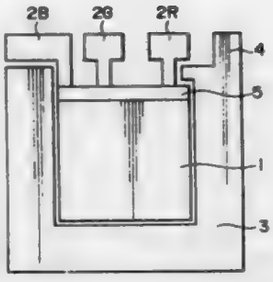
Tadashi Kiyomiya, Saitama; Toshio Ohoshi, Tokyo, and Masami Okita, Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 15, 1994, Ser. No. 290,102
Claims priority, application Japan, Aug. 18, 1993, 5-225204
Int. Cl.[6] C25D *13/02;15/00*
U.S. Cl. 205—96 5 Claims

1. A method of forming a fluorescent screen for a field emission display by depositing particles of a fluorescent material on the inner surface of a screen panel by an electrodeposition process, said method comprising:

forming a transparent solid electrode in an effective area, and a guard electrode in an ineffective area surrounding the effective area on the inner surface of a screen panel for a field emission display; and

an electrodeposition process for forming a solid fluorescent film, comprising steps of:



immersing the screen panel provided with the transparent solid electrode and the guard electrode in an electrodeposition solution containing dispersed particles of a fluorescent material,

applying a voltage to the transparent solid electrode and a reverse bias voltage of a polarity reverse to that of the voltage applied to the transparent solid electrode to the guard electrode,

controlling the reverse bias voltage so that particles of the fluorescent material will not be deposited on the guard electrode, and

washing and drying the screen panel after the solid fluorescent film has been formed.

5,466,359

METHOD OF MANUFACTURING MICROWAVE TUBE COLLECTOR

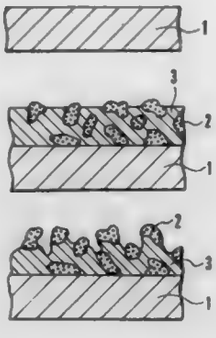
Toshihiro Kabei, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 4, 1994, Ser. No. 317,330

Claims priority, application Japan, Jan. 7, 1993, 5-251263

Int. Cl.[6] C25D *5/48*; C25F *3/04*; C23C *14/14*

U.S. Cl. 205—109 **5 Claims**



1. A method of manufacturing a microwave tube collector, comprising the steps of:

forming, on a surface of a collector electrode, a copper plating layer in which there are powder particles of a material having a secondary electron emissivity of not more than 1 are dispersed and precipitated; and

selectively etching only said copper plating layer to increase a degree of exposure and a surface area of said powder particles of the material having the secondary electron emissivity of not more than 1 in said copper plating layer.

5,466,360

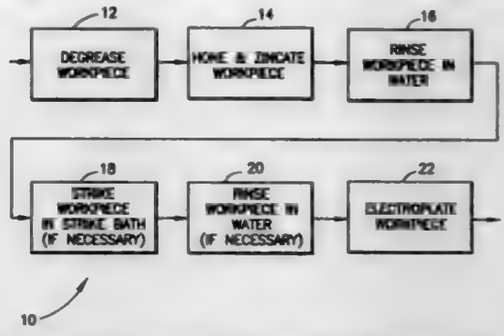
METHOD FOR PREPARING ALUMINUM FOR SUBSEQUENT ELECTROPLATING

Robert F. Ehrsam, Shelton, Conn., and Robert Z. Reath, 275 West Rd., Easton, Conn. 06612, assignors to Robert Z. Reath, Easton, Conn.

Filed Oct. 13, 1994, Ser. No. 322,930

Int. Cl.[6] C25D *5/22*; *5/10*; *5/44*

U.S. Cl. 205—170 **11 Claims**



1. A method for preparing a surface of an aluminum or aluminum alloy work piece for subsequent electroplating, the method comprising the step of honing the surface of the aluminum or aluminum alloy work piece while the surface is immersed in a zincate solution so as to substantially remove any aluminum oxide layer and deposit a layer of zinc on the surface.

5,466,361

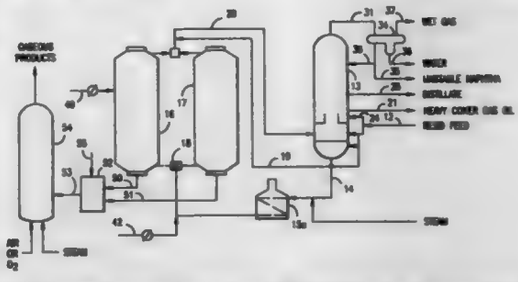
PROCESS FOR THE DISPOSAL OF AQUEOUS SULFUR AND CAUSTIC-CONTAINING WASTES

Roland H. Heck, Pennington, N.J.; Heinz Heinemann, Oakland, Calif.; P. T. Reischman, Lambertville, N.J.; Paul B. Venuto, Yardley, Pa., and D. Duayne Whitehurst, Titusville, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 896,848, Jun. 12, 1992, abandoned. This application Oct. 28, 1993, Ser. No. 118,902

Int. Cl.[6] C10G *9/00*

U.S. Cl. 208—131 **19 Claims**



1. A coking process which may be used for the disposal of an aqueous waste material, comprising the following steps:

(a) reacting a coker feedstock under coking reaction conditions in the presence of an aqueous waste material, wherein the waste material is a caustic soda, caustic potash, or a mixture of both resulting from the refining of heavy hydrocarbons to lighter hydrocarbon products, containing from 0.4 wt % to 25 wt % of at least one sulfur-containing component, wherein the sulfur-containing component is selected from the group consisting of alkaline sulfide, hydrosulfide or mixture of both, which on gasification converts to hydrogen sulfide and at least one alkali-metal containing component, wherein the component is an alkali metal oxide, to provide a sulfur-containing and alkali metal containing coke product, wherein the coker feedstock comprises a hydrocarbon fraction having a boiling point of at least about 650° F. and wherein said coking reaction conditions include a temperature of from about 800° F. to about 930° F.; and

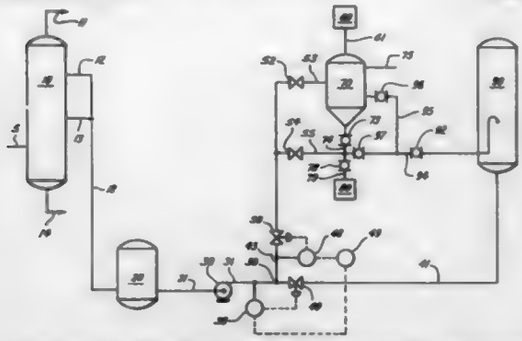
(b) gasifying the coke product under gasification conditions in the presence of a catalyst, said catalyst comprising at least one metal oxide selected from the group consisting of alkali metal oxide and alkaline earth metal oxide, in order to convert (i) the coke to gaseous products (ii) the sulfur-containing component to hydrogen sulfide and (iii) the alkali metal -containing component to a solid residue.

5,466,362

PROCESS AND SYSTEM FOR CATALYST ADDITION TO AN EBULLATED BED REACTOR

Robert M. Steinberg, and John C. Strickland, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 19, 1992, Ser. No. 978,614
Int. Cl.[6] C10G *35/00*
U.S. Cl. 208—157 **7 Claims**



1. An ebullated bed process for hydrotreating a continuous distillate hydrocarbon feedstock flow in an ebullated bed of particulate catalyst at catalytic reaction conditions, characterized in:

a. measuring an amount of addition catalyst,

b. setting a flow rate (F1) of the total feedstock flow to the ebullated bed,

c. withdrawing from the total feedstock flow, a minor feedstock portion at a minor portion rate (F2) and mixing addition catalyst at a flow rate (F3) with the minor feedstock portion to form an addition catalyst slurry, and passing the addition catalyst slurry to the ebullated bed at a flow rate (F2+F3),

thereby maintaining a constant flow rate (F1) of the total feedstock flow to the ebullated bed.

5,466,363

INTEGRATED PROCESS FOR HYDROTREATING HEAVY OIL, THEN MANUFACTURING AN ALLOY OR STEEL USING A CARBON-BASED CATALYST

Costandi A. Audeh, Princeton, and Lillian A. Rankel, Pennington, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Feb. 10, 1994, Ser. No. 194,598
Int. Cl.[6] C10G *45/04*
U.S. Cl. 208—251 H **20 Claims**

1. A method comprising:

(a) a process for hydrotreating a hydrocarbon oil feedstock, said process comprising hydrotreating said feedstock in the presence of a catalyst composition, the catalyst composition being selected from the group consisting of neat activated carbon and metal impregnated activated carbon, the metal impregnated activated carbon being one that is impregnated with (a) a molybdenum or tungsten component and (b) a cobalt or nickel component, the activated carbon of the neat activated carbon and the metal impregnated activated carbon consisting essentially of an activated carbon possessing a pore volume in the 100 Å to 400 Å pore diameter range of at least about 0.08 cc/g and an average pore diameter of from about 20 to 64 Å;

(b) recovering the catalyst composition;

(c) partially gasifying the catalyst composition to produce synthesis gas and a catalyst residue;

(d) manufacturing an alloy or steel using said catalyst residue by a method selected from the group consisting of (a) adding the catalyst residue to a molten bath used to produce the steel or alloy and (b) extracting at least one of the metals present on the catalyst residue and then incorporating the extracted metal into the steel or alloy.

5,466,364

PERFORMANCE OF CONTAMINATED WAX ISOMERATE OIL AND HYDROCARBON SYNTHESIS LIQUID PRODUCTS BY SILICA ADSORPTION

Bal K. Kaul, Randolph; Craig Y. Sabottke, Morristown; Rocco A. Fiato, Basking Ridge, and Edward Niessen, Passaic, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 2, 1993, Ser. No. 87,309
Int. Cl.[6] C10G *25/00*
U.S. Cl. 208—307 **7 Claims**

1. A method for the production of a lubricating or specialty oil resistant to deterioration upon exposure to light, heat, and air, and which passes engine performance, foaming, and color tests, which process comprises contacting a hydrocarbon oil selected from wax isomerate oil, and hydrocarbon synthesis liquid product produced by the Fischer Tropsch process, and mixtures thereof with a silica adsorbent, said silica adsorbent being characterized by possessing a pore size of at least 100 Å, an alkali/alkaline earth ion concentration, excluding sodium, of greater than about 125 ppm, an iron content of less than about 40 ppm, and a zirconium content of less than about 130 ppm, said contacting being conducted at a silica loading level of greater than about 1 ml/gram, separating the oil from the adsorbent and recovering the oil as product for use as base oils or additive oils in the production of lube or specialty oils.

5,466,365

PROCESS FOR DEASPHALTING AND DEMETALLIZING PETROLEUM RESIDUES

Cesar Savastano, Zelo Buon Persico, and Roberto Cimino, Milan, both of, Italy, assignors to Enitricerche S.p.A., Milan, Italy

Filed Feb. 16, 1994, Ser. No. 197,281
Claims priority, application Italy, Feb. 24, 1993, MI93A0347
Int. Cl.[6] C10G *21/00*
U.S. Cl. 208—309 **8 Claims**

1. A process for deasphalting and demetallizing petroleum vacuum distillation residues using dimethylcarbonate in the presence of an overpressure of carbon dioxide and comprising the following steps:

a) mixing a vacuum distillation residue with dimethylcarbonate under a pressure of CO_2, under temperature and pressure conditions such as to maintain the dimethylcarbonate in a prevalently liquid state, with the formation of a homogeneous solution;

b) cooling said homogeneous solution to a temperature within the miscibility gap of the dimethylcarbonate/deasphalted and demetallized oil (DAO) system but lower than the boiling point of dimethylcarbonate at atmospheric pressure, with the formation and gravimetric stratification of three phases, namely:

1) an oil-rich light liquid phase;

2) a dimethylcarbonate-rich intermediate liquid phase;

3) a semisolid heavy phase containing essentially all the asphaltenes and a substantial part of the metals initially present in the vacuum distillation residue, in addition to a small amount of oil;

c) then venting the CO_2 at a temperature essentially equal to the temperature of step b) until a pressure close to atmospheric is reached;

d) recovering a deasphalted and partly demetallized primary oil from the light liquid phase;

e) recovering a deasphalted and partly demetallized secondary oil from the intermediate liquid phase;

f) recovering, and possibly reusing, the dimethylcarbonate from the light liquid phase, from the intermediate liquid phase and from the asphaltenic phase.

5,466,366

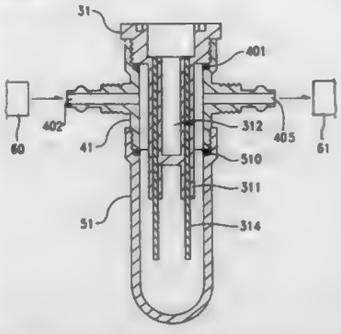
WATER TEMPERATURE AND CONDUCTIVITY DETECTOR FOR REVERSE-OSMOSIS WATER PURIFIER SYSTEMS

Huang Chia-ching, Hsinchu City, Taiwan, Prov. of China, assignor to New Gulf Measurement Instrument Ltd. Company, Hsinchu City, Taiwan, Prov. of China

Filed Feb. 1, 1994, Ser. No. 189,634

Int. Cl.[6] B01D *61/10;17/12*

U.S. Cl. 210—85 **4 Claims**



1. A water temperature and conductivity detector comprising:

a detector unit, which comprises a head and a stepped cylinder extended from said head and having a heat sensitive resistor received in a hole thereof and two electrodes extended out of a bottom end thereof, said stepped cylinder comprising an upper cylinder section and a lower cylinder section extended from said upper cylinder section, the outer diameter of said lower cylinder section being smaller than that of said upper cylinder section;

a socket connector fastened around said upper cylinder section of said stepped cylinder of said detector unit and spaced from said lower cylinder section, said socket connector having a water inlet tube and a water outlet tube respectively constructed and arranged for connecting to a water outlet port of a water supply system and a water inlet port of a reverse-osmosis water purifier system;

a cup-shaped bottom shell having a top orifice fastened around the bottom of said socket connector; and

wherein when water from said water supply system flows through said water inlet tube of said socket connector and a space defined within said cup-shaped bottom shell and said water outlet tube of said socket connector to said reverse-osmosis water purifier system, the conductivity of the flow of water is detected by said electrodes, and the temperature is compensated by said heat sensitive resistor.

5,466,367

INDUSTRIAL WASTE WATER TREATMENT

Robert B. Coate, Waco, and John T. Towles, Bruceville, both of Tex., assignors to Environmental Restoration Services, Inc., Waco, Tex.

Filed Apr. 6, 1994, Ser. No. 223,584

Int. Cl.[6] C02F *1/78*

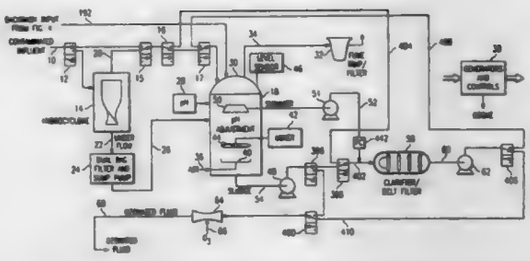
U.S. Cl. 210—96.1 **13 Claims**

1. Apparatus for removing contaminants from influent streams of water comprising, in combination:

a source of ozone;

a source of pressurized air;

a source of electricity;



an input conduit for receiving influent contaminated water to be cleaned;

hydrocyclone apparatus connected to said input conduit for receiving the stream of water to be cleaned, said hydrocyclone apparatus including overflow and underflow output conduits;

first filter means connected to said underflow output conduit of said hydrocyclone apparatus for separating incoming underflow water from contaminants of greater than a given size contained therein and outputting a stream of water less any separated contaminants;

pH adjusting tank means connected for receiving water from said filter means and from said overflow output of said hydrocyclone apparatus, said pH adjusting tank means including at least one liquor output and being adapted for receiving at least one of acid and base compounds to cause adjustment of pH of water flowing therethrough;

means connecting said source of pressurized air to said pH adjusting tank means at a point near the bottom thereof for aerating the liquor therein from bottom to top;

second filter means connected to said at least one liquor output of said pH adjusting tank means for removing any precipitates induced by said pH adjustment and aeration, said second filter means including liquor output means;

first venturi injection means, connected to said liquor output means of said second filter means and to said source of ozone, for ozonating the output of said second filter means, said first venturi injection means including liquor output means;

ozonation treatment tank means, connected to said liquor output means of said first venturi injection means for receiving the liquor therefrom at a point near the bottom of said closed container ozonation treatment tank means, said ozonation treatment tank means including off gassing output means, liquor skimming output means and sludge output means;

third filter means connected to said liquor skimming output means and said sludge output means of said ozonation treatment tank means for removing any precipitates induced by said ozonation, said third filter means including liquor output means;

flow control means, including liquor input means and liquor output means;

flow sensor means, including liquor input means and liquor output means;

second venturi ozone injection means, including liquor input means and liquor output means;

ultraviolet light means, including liquor input means and liquor output means;

magnetic means, including liquor input means and liquor output means;

first conduit and valving means connecting said flow control means, said flow sensor means, said second venturi injection means and said ultraviolet light means in series between said liquor output means of said third filter means and said liquor input means of said magnetic means whereby said ultraviolet light means can be optionally bypassed when the turbidity of said liquor exceeds a given value;

residual ozone monitor means connected to said first conduit and valving means for monitoring the ozone levels of said liquor;

flocculation settling tank means including diffuser and magnetic metal recovery trap liquor input means and sludge output means;

final filtration bypass liquor output means;

electrochemical flocculation means including liquor input means and liquor output means;

second conduit and valving means connected to said final filtration bypass liquor output means and connecting said electrochemical flocculation means between said liquor output means of said magnetic means and said liquor input means of said flocculation settling tank means and having valving such that said electrochemical flocculation means can optionally be bypassed with the liquor flow being to either one of said flocculation settling tank means and a conveyance means final filtration bypass liquor output means;

fourth filter means connected to said liquor output means of said flocculation settling tank means for removing any precipitates induced by previous treatments, said fourth filter means including liquor output means;

treated effluent output means;

ozonation means;

silica sand filter means;

charcoal filter means;

biologically activated charcoal filter means;

third conduit and valving means interconnecting said silica sand filter means, said ozonation means, said charcoal filter means and said biologically activated charcoal filter means between said liquor output means of said fourth filter means and said treated effluent output means for selectively performing final stage filtering of the liquor output from said fourth filter means;

fourth conduit and valving means optionally interconnecting an output of said sand filter through said ultraviolet light means to an input of said charcoal filter when said liquor is too turbid to be treated by ultraviolet light after ozonation by said second venturi injection means;

fresh water supply means; and

fifth conduit and valving means interconnecting said silica sand filter means, said charcoal filter means and said biologically activated charcoal filter means between said fresh water supply means and said pH adjusting tank means for backflushing said sand and charcoal filter means into said pH adjusting tank means.

5,466,368

ANION EXCHANGER

Lars-Erik Arvidsson, Storvreta; Hans Berg, Uppsala; Björn Engström, Sundsvall, and Gunnar Hagström, Uppsala, all of, Sweden, assignors to Pharmacia LKB Biotechnology AB, Uppsala, Sweden

Continuation of Ser. No. 202,008, Feb. 25, 1994, abandoned, which is a continuation of Ser. No. 859,723, Jun. 12, 1992, abandoned. This application Oct. 4, 1994, Ser. No. 317,982

Claims priority, application Sweden, Dec. 21, 1990, 9004129

The portion of the term of this patent subsequent to Sep. 15, 2009, has been disclaimed.

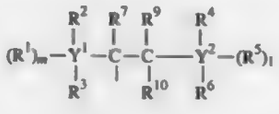
Int. Cl.[6] B01D *15/08*

U.S. Cl. 210—198.2 **8 Claims**

1. An ion exchanger for chromatographic separation, having the structure

P—S—A

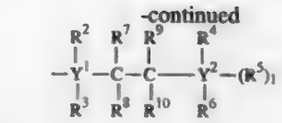
wherein P is an insoluble support suitable for use in chromatographic procedures, S is a spacer, and A is a functional ligand, wherein said functional ligand A has the formula:



(IA)

or

-continued

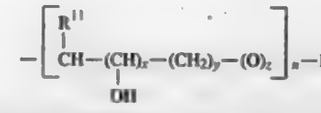


(IB)

wherein

Y^1 and Y^2 independently of each other are positively charged nitrogen or sulphur,

R^1, R^2, R^3, R^4, R^5 and R^6 independently of each other are represented by the formula (II):



(II)

R^7, R^8, R^9 and R^{10} independently of each other are hydrogen or C_{1-4}alkyl, C_{1-4}alkoxyalkyl or hydroxy-C_{1-4}alkyl;

R^{11} is hydrogen, C_{1-6}alkyl, C_{1-6}alkoxyalkyl or hydroxy-C_{1-6}alkyl;

R^{12} is hydrogen, hydroxy or C_{1-4}alkyl;

l is 0 or 1;

m is 0 or 1;

n is 1 to 5;

x is 0 or 1;

y is 0 or 1;

z is 0 or 1;

with the provisos that:

l is 0 when Y^2 is sulphur;

m is 0 when Y^1 is sulphur;

l and m are 1 when both Y^1 and Y^2 are positively charged nitrogens;

z is 0 when R^{12} is hydroxy;

R^2 together with R^4 and/or R^3 together with R^6 may form an ethylene group in which one or both carbon atoms may be mono- or disubstituted by C_{1-4}alkyl, C_{1-4}alkoxy, C_{1-4}alkoxyalkyl or hydroxy-C_{1-4}alkyl; and

A cannot be 4-methyl,1-4-diazabicyclo-(2.2.2)octan-1-yl, 1,4,4-trimethylpiperazinium-1-yl, 1,4-dimethyl-1,4-diazabicyclo-(2.2.2)octan-2-yl, or 1,1,4,4,4-pentamethyl-1,4-diazabutan-1-yl.

5,466,369

LIQUID CIRCULATING DEVICE

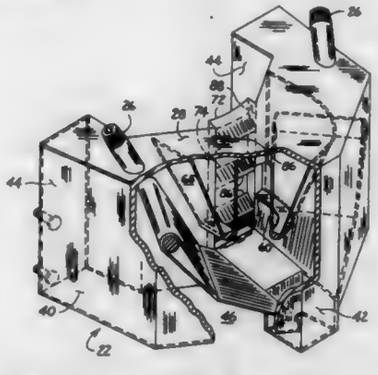
Irwin H. Hess, 12700 Lake Ave., Ste. 2712, Lakewood. Ohio 44107, and Leo D. Weber, 345 Parkside Dr., Erie, Pa. 16511

Continuation-in-part of Ser. No. 919,263, Jul. 27, 1992, abandoned. This application Oct. 19, 1994, Ser. No. 325,492

The portion of the term of this patent subsequent to Jul. 28, 2009, has been disclaimed.

Int. Cl.[6] B01F *3/04*; C02F *3/28*

U.S. Cl. 210—220 **4 Claims**



1. In a device for submersible placement in a holding tank containing a body of substantially liquid material for generating a

continuous circulation of the material, the device comprising an elongated stackpipe having a stackpipe opening, a bubble generator secured to the stackpipe and in flow communication with the stackpipe opening for delivering bubbles into the stackpipe in order to propel the material up through the stackpipe, the generator including a pair of spaced-apart, oppositely-disposed baffle members located within the generator and a cone-shaped member disposed between the baffle members for assisting bubble formation, the cone-shaped member including an inner cavity in flow communication with the stackpipe opening so that liquid material and bubbles can pass from the generator into the stackpipe, the improvement comprising:

a back plate secured to the bubble generator, the back plate including an elongated slot which is in flow communication with the stackpipe opening and the inner cavity of the cone-shaped member; and

a plurality of spaced-apart vane guides attached to the back plate and extending transversely across the slot for facilitating the lateral transfer of bubbles from the bubble generator into the stackpipe.

5,466,370

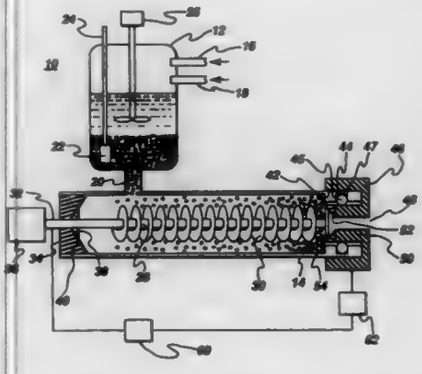
APPARATUS FOR ISOLATING SOLIDS FROM FLUIDS

James Day, Scotia; Ganesh Kailasam, Schenectady, and Godavarthi S. Varadarajan, Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 30, 1994, Ser. No. 268,367

Int. Cl.[6] B01D *29/02;35/027*

U.S. Cl. 210—298 **11 Claims**



1. An apparatus for isolating solids from fluids, said apparatus comprising:

a. mixing vessel attached to a barrel by means of a particle passage and said barrel comprises:

(i) an internal auger with a posterior shaft, flights and anterior and posterior conical ends;

(ii) an external surface with anterior external threads;

(iii) internal anterior and posterior annular seats;

(iv) a movable cap having an opening to the atmosphere, wherein said movable cap comprises internal threads complementary to the external threads of the barrel and an inner section having an anterior annular seat attached thereto; and

(v) a first motor drive connected to the posterior shaft of the auger.

5,466,371

CYTOCENTRIFUGATION DEVICE

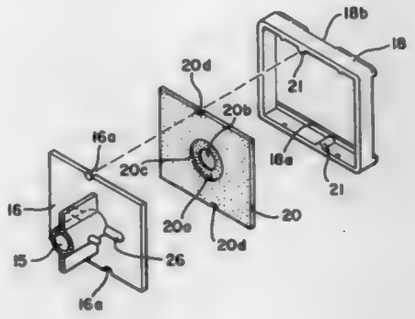
Wayne K. Barlow, Providence, and Carmelo G. Quirante, Logan, both of Utah, assignors to Wescor, Inc., Logan, Utah

Continuation-in-part of Ser. No. 788,310, Nov. 5, 1991, Pat. No. 5,252,228. This application Oct. 8, 1993, Ser. No. 134,083

Int. Cl.[6] B04B *5/02*

U.S. Cl. 210—361 **21 Claims**

1. For use in cytocentrifugation apparatus, a cytocentrifugation



device comprising: a conduit having a central axis and an outwardly flanged discharge end defining a discharge opening for delivering a cell-containing sample liquid to the confronting face of a microscope slide, the flange of said outwardly flanged discharge end having a clamping face directed oppositely of said discharge opening; an elongate holder for an absorption pad extending transversely across said discharge end of said conduit so that a hole through the absorption pad received by said holder will be aligned with said discharge opening, said holder being adapted to receive said flanged discharge end of said conduit so as to confront a filter pad received by said holder; and oppositely arranged sets of mating alignment members on said flanged discharge end of said conduit and on said holder, respectively, for positively insuring proper alignment of said conduit, of said holder, and of an absorption pad held by said holder and provided with cooperative mating alignment members, when said conduit, said holder, and said absorption pad are clamped together with a microscope slide within cytocentrifugation apparatus, said sets of mating alignment members each comprising an elongate tongue secured to said holder internally thereof and having a major axis extending parallel to the central axis of said conduit; and a correspondingly oriented, tongue-receiving groove formed in an edge margin of the flange of the flanged discharge end of the conduit.

5,466,372

CYCLONE INCLUDING AN INLET DIFFUSER TUBE

Michael Jerabek, Bernstadt; Wolfgang Ruf, Heidenheim, and Thomas Martin, Langenau, all of, Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany

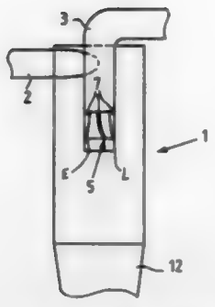
Filed Mar. 23, 1994, Ser. No. 216,921

Claims priority, application Germany, Mar. 26, 1993, 43 09 920.3

Int. Cl.[6] B01D *21/26*

U.S. Cl. 210—512.1 **10 Claims**

1. In a wet cyclone having a substantially slender body having a truncated cone at an end thereof and a cylindrical immersion tube extending into another end thereof, a heavy fraction outlet end at an apex of the truncated cone, and a diffuser disposed within the immersion tube for deflecting flow within said tube for recovering pressure head wherein the immersion tube is adapted for the withdrawal of a substantially non-gaseous light fraction, the improvement wherein the diffuser is disposed at a distance from an inlet end of the immersion tube of at least about half an inside diameter of the immersion tube and wherein the diffuser comprises



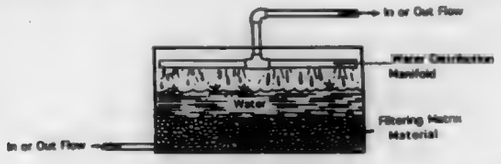
a plurality of vanes, each vane having a radial extent of between about 15% and about 30% of the inside diameter of the immersion tube.

5,466,373

MAINTENANCE-FREE ENHANCEMENT OF AQUATIC BIOLOGICAL FILTERS USING AMPHIPODS

Thomas S. Handwerker, Salisbury, and Clement L. Counts, III, Berlin, both of Md., assignors to University of Maryland Eastern Shore, Princess Anne, Md.

Filed Apr. 22, 1994, Ser. No. 231,088
Int. Cl.[6] C02F *3/32*
U.S. Cl. 210—602 **17 Claims**



1. A method for maintenance-free treatment of flowing water in a managed aerobic water system for an aquiculture application of an aquatic specie, the method reduces undesirable biofloc materials from forming on surfaces of a means for filtering, the method comprising the steps of:

(a) inoculating the means for filtering with an amphipod colony;

(b) incorporating the means for filtering in a section of the water system and a means for protecting the amphipod colony from depredations by the aquatic specie;

(c) circulating the system's water through the means for filtering; and

(d) maintaining aerobic conditions throughout the system wherein the amphipod colony remains self-sustaining and maintenance-free,

whereby the amphipod colony's feeding activities prevent accumulations of anaerobic layers on the means for filtering which in turn minimizes: i) clogging of the filtering means and ii) undesirable anaerobic flora from occurring in the water system.

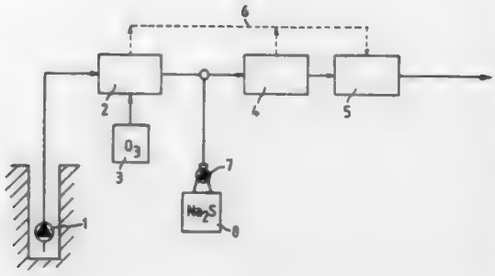
5,466,374

PROCESS FOR TREATING ORGANICALLY POLLUTED WATER

Bruno Bachhofer, Saentisstrasse 85, 88213 Ravensburg, and Anton Locher, Bergstrasse 6, 88214 Ravensburg, both of, Germany

Filed Jul. 26, 1994, Ser. No. 280,830
Claims priority, application Germany, Jul. 31, 1993, 43 25 803.4
Int. Cl.[6] C02F *9/00;1/78*
U.S. Cl. 210—610 **8 Claims**

1. A process for purifying organically polluted water containing organic nutrients for microorganisms, the process comprising:



a. mixing the organically polluted water intensively with ozone in an ozone treatment unit;

b. adding to the water of step (a) at least one compound containing sulfur which is selected from the group consisting of hydrogen sulfide, sodium sulfite, and sodium thiosulfate, which is bioavailable for assimilation by aerobic mircoorganisms, and which is added in an amount which is effective to at least eliminate sulfur deficiency o the aerobic microorganisms and promote growth of a biofilm in a filter; and

c. passing the water of step (b) through a filter comprised of a plurality of different layer, wherein a biofilm of the aerobic microorganisms develops in the filter and contributes to biological mineralization of the organic nutrients.

5,466,375

LIQUID-LIQUID EXTRACTION

George M. Galik, 3236 Falcon Ridge Rd., Diamond Bar, Calif. 91765

Filed Jul. 21, 1993, Ser. No. 95,302
Int. Cl.[6] B01D *11/02*
U.S. Cl. 210—634 **8 Claims**

8. A liquid-liquid extraction process for transferring copper ions in an aqueous ammoniacal solution of ammonium chloride (first liquid) to an organic liquid (second liquid) which contains an ion exchange material for copper ions and is substantially immiscible in the first liquid, the process comprising the steps of:

mixing the first and second liquids in an extractor unit to transfer copper ions from the first to the second liquid;

flowing second liquid to which copper ions have been transferred through a first membrane permeable to the second liquid and copper ions and substantially impermeable to water;

thereafter mixing the second liquid to which copper ions have been transferred with a stripper liquid which contains sulfate ions and which contacts the second liquid to transfer copper ions from the second liquid to the stripper liquid to form a regenerated second liquid;

flowing second liquid after copper ions have been removed by contact with stripper liquid through a second membrane permeable to the second liquid and substantially impermeable to the stripper liquid;

flowing stripper liquid to which copper ions have been transferred from the second liquid through a third membrane permeable to the stripper liquid and substantially impermeable to the second liquid;

flowing first liquid from which copper ions have been removed through a fourth membrane permeable to water and ammonium and chloride ions and substantially impermeable to the second liquid;

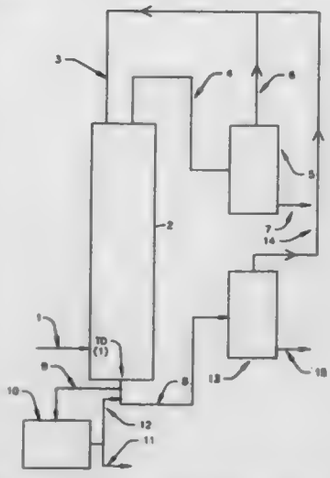
collecting as raffinate first liquid which has passed through the fourth membrane from which copper ions have been removed;

and flowing collected raffinate through a fifth membrane permeable to water and ammonium, chloride and hydroxyl ions, and substantially impermeable to sulfate ions so an aqueous solution of ammonium chloride flows through the membrane substantially free of sulfate ions.

5,466,376
ON-LINE ANALYSIS FOR CONTINUOUS MEASUREMENT OF PRESENCE OF CARRYUNDER IN LIQUID-LIQUID EXTRACTION

Joseph P. Boyle; Gordon C. Camano; Randall S. Lachine; Howard R. Lingley, all of Sarnia, and Raymond W. Saunders, Petrolia, all of, Canada, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 29, 1994, Ser. No. 236,906
Int. Cl.[6] B01D *11/04*
U.S. Cl. 210—634 **4 Claims**



1. A method for operating an extraction tower under solvent extraction conditions comprising the steps of:

(a) introducing a feed to be separated into components into one end of an extraction tower having a top end and a bottom end, the bottom being fitted with a temperature sensing means;

(b) introducing a selective extraction solvent at a point on the end of the tower opposite the end at which the feed is introduced;

(c) maintaining a temperature gradient across the height of the tower such that the temperature at the end of the tower at which the solvent is introduced is the same or higher than the temperature at the other end of the tower where the feed is introduced, the temperature at the end opposite the solvent introduction end being called the tower bottom temperature;

(d) recovering a raffinate from a raffinate outlet at a point on the end of the tower opposite the end at which the feed was introduced;

(e) recovering an extract through an extract outlet at a point on the end of the tower opposite the end at which the raffinate is recovered;

(f) taking a sample of extract from the extract outlet;

(g) passing the sample of extract through a filter to remove entrained solid particles;

(h) passing the filtered extract sample to a recirculating loop fitted with a recirculating pump means, heating/cooling means, a temperature sensing means matched to the temperature sensing means fitted in the tower and a turbidity analyzer means;

(i) subjecting the filtered, recirculating extract sample to repeated heating/cooling steps centered around the tower bottoms temperature, such heating and cooling being to temperatures about 5° to 100° F. above or below the tower bottoms temperature;

(j) passing the sample during the repeated heating and cooling steps through the turbidity analyzer means which analyzes for the presence of a second phase in the extract sample, the turbidity analyzer triggering a signal if a second phase is detected when the temperature of the sample is above the tower bottoms temperature thereby indicating the presence of carryunder in the extract;

(k) adjusting the tower operating conditions to reduce or eliminate the carryunder;

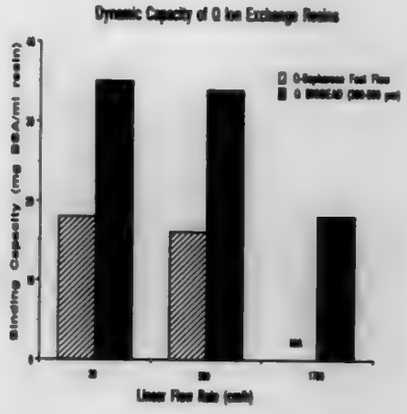
(l) opening the control valve to flush the sample from the loop;

(m) repeating steps (f) through (m).

5,466,377
CHROMATOGRAPHY MEDIA AND THEIR USES

Peter Grandics, and Susan Szathmary, both of P.O. Box 1924, Arcadia, Calif. 91077

Filed Jan. 19, 1994, Ser. No. 183,365
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—635 **21 Claims**



1. A method for the direct capture of soluble product from an unclarified process liquor using large bead chromatography media in packed bed columns comprising the steps of:

(a) packing a large bead capture chromatography medium into low pressure chromatography columns;

(b) conditioning an unclarified process liquor having a high physiological ionic strength and containing a desired soluble product so that the product can be adsorbed onto the capture chromatography medium;

(c) applying the conditioned process liquor mixed with the processing aid onto the chromatography column under conditions such that the soluble product adsorbs to the capture chromatography medium;

(d) allowing particulate materials in the unclarified process liquor to exit the column in the interparticle space;

(e) removing residual entrapped particles from the column via high speed reverse wash pulses; and

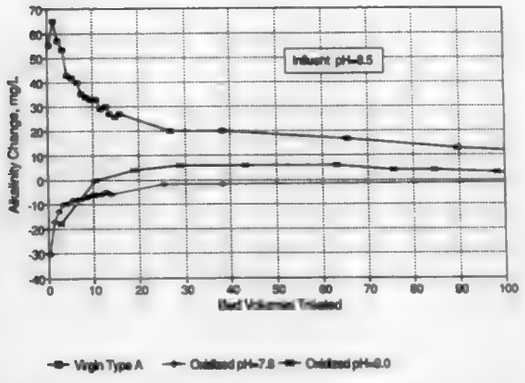
(vi) eluting product from the capture chromatography medium by changing binding conditions so that the product is removed from the column.

5,466,378
OXIDIZED ACTIVATED CARBON FOR THE CONTROL OF PH AND ALKALINITY IN WATER TREATMENT APPLICATIONS

Bertrand W. Dussert, Pittsburgh; Richard W. Farmer, Gibsonia, and Richard A. Hayden, Pittsburgh, all of Pa., assignors to Calgon Carbon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 60,590, May 19, 1993, Pat. No. 5,368,738. This application Aug. 11, 1994, Ser. No. 289,234
The portion of the term of this patent subsequent to Nov. 29, 2011, has been disclaimed.
Int. Cl.[6] C02F *1/28*
U.S. Cl. 210—660 **2 Claims**

1. In a method for treating water with activated carbon, the improvement comprising controlling pH and alkalinity changes



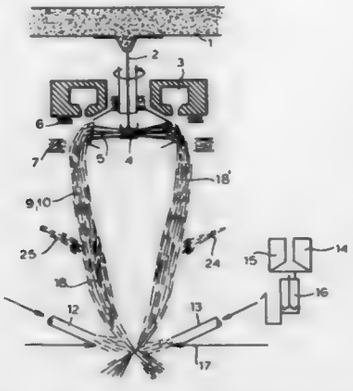
during operation of said water treatment by contacting said water with an oxidized activated carbon having a contact pH below 9.5.

5,466,379

METHOD OF REMOVING OIL AND OIL LIKE ENVIRONMENTAL CONTAMINANTS FROM WATER OF GROUND SURFACES

Helmut Schiwek, Am Waldessaum 3, Duisburg, Germany

Filed Dec. 13, 1993, Ser. No. 166,981
Int. Cl.[6] C02F *1/42*
U.S. Cl. 210—680 **6 Claims**



1. A method of removing oil from water, comprising the steps of;

(a) forming a glass-wool mat consisting of soft-glass glass fibers of a diameter of substantially 5 to 7 μm;

(b) spraying onto said mat a hydrophobizing and binder mixture consisting of 94% to 96% by weight of starch and 6% to 4% by weight of a silicone, to coat the fibers of said mat with said mixture, said mixture being sprayed onto said mat in a quantity such that the starch and silicone together are present in an amount of 7% to 10% of the weight of the mat;

(c) thereafter baking said mat with said mixture sprayed onto the fibers thereof at a temperature of about 150° C. to dry said mat, to bond said mixture to said fibers and to bond said fibers together in a liquid-permeamble latticework;

(d) repeatedly applying said latticework to a surface of a body of water contaminated with said oil substances, to take up said oil substances in said latticework, thereby saturating said latticework with said oil;

(e) upon each saturation of said latticework with said oil removing said latticework from said body of water and extracting said oil therefrom; and

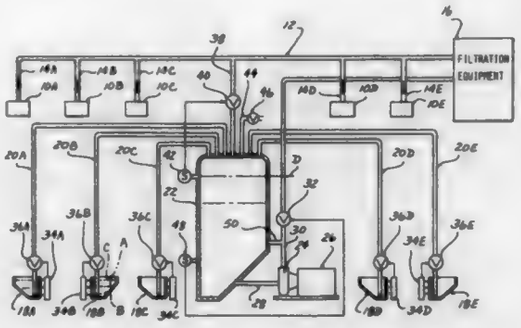
(f) subsequently burning said latticework to destroy it at a temperature sufficient to burn off said starch and silicone and to melt said glass fibers, enabling environmentally sound destruction of the mat.

5,466,380

SUMP SYSTEM AND METHOD FOR COLLECTING LIQUID TO BE FILTERED

Jack R. Bratten, 5970 St. James Dr., West Bloomfield, Mich. 48393

Filed Jun. 20, 1994, Ser. No. 262,143
Int. Cl.[6] B01D *37/00;36/00*
U.S. Cl. 210—741 **7 Claims**



6. A method of collecting liquid from a plurality of locations to be filtered in filtration equipment, said method comprising:

disposing an individual sump at each location so as to receive said liquid to be filtered;

providing a single sealed collection tank and connecting all of said individual sumps with said sealed collection tank with draw pipes having one end extending into said sealed collection tank;

pumping liquid from said sealed collection tank back to said filtration equipment to allow drawing liquid from each sump into said sealed collection tank and back to said filtration equipment;

controlling communication of each draw pipe with said sealed collection tank by opening a valve whenever the liquid level reaches a predetermined level in a respective sump, said predetermined level above the level of said one end of each draw pipe; and

maintaining a vacuum in said sealed collection tank within a predetermined range by appropriately controlling the pumping of liquid out of said sealed collection tank so as to maintain said vacuum level.

5,466,381

METHOD OF SCAVENGING OXYGEN FROM AN AQUEOUS MEDIUM

Alan E. Goliaszewski, The Woodlands, Tex.; Michael A. Cady, Yardley, Pa.; Paul R. Burgmayer, Wayne, Pa.; Sydia B. Anderson, Doylestown, Pa.; William S. Carey, Ridley Park, Pa., and Roger D. Moulton, Yardley, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Oct. 20, 1994, Ser. No. 326,451
Int. Cl.[6] C02F *5/02*
U.S. Cl. 210—750 **6 Claims**

1. A method of reducing the amount of oxygen in an oxygen containing aqueous medium comprising adding to said oxygen containing aqueous medium an amount, effective for the purpose, of a disubstituted, water soluble azo compound.

5,466,382

SYNERGISTIC MICROBICIDAL COMBINATIONS CONTAINING 4,5-DICHLORO-2-N-OCTYL-3-ISOTHIAZOLONE AND CERTAIN COMMERCIAL BIOCIDES

Angela B. Downey, Lansdale; Valerie S. Frazier, Wyndmoor, and Gary L. Willingham, Glenside, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed May 3, 1994, Ser. No. 237,538
Int. Cl.[6] A61K *31/425*
U.S. Cl. 210—764 13 Claims

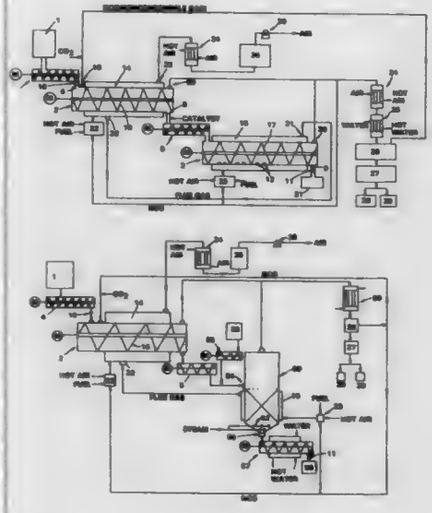
1. A composition comprising at least two components the first component of which is 4,5-dichloro-2-n-octyl-3-isothiazolone and the second component of which is selected from one or more of the following compounds: 2-methylthio-4-tert-butylamino-6-cyclopropylamino-s-triazine and N,N-dimethyl-N'-phenyl-(N'-fluorodichloromethylthio)sulfamide; wherein the first component and second component act synergistically with each other and are present in a weight ratio of first component to second component is in the range of from about 60:1 to about 1:500.

5,466,383

PROCESS FOR TREATING SLUDGES

Kunmo Lee, Seoul, Rep. of Korea, assignor to Samsung Engineering & Construction Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 6, 1994, Ser. No. 178,164
Claims priority, application Rep. of Korea, Nov. 30, 1993, 26193
Int. Cl.[6] C02F *1/00*
U.S. Cl. 210—774 1 Claim



1. A process of treating sludge containing organic material comprising:

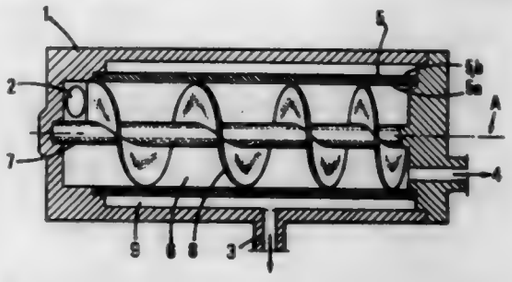
indirectly heating the sludge in the absence of oxygen to a temperature of from 300° C. to 550° C. for volatilization of the organic material, thereby producing combustible gaseous products and a residual char, and indirectly heating the residual char in the absence of oxygen for the gasification of nonvolatile organic carbons in the char, which do not create pollution, wherein the char is indirectly heated to a temperature of from 750° C. to 1000° C. with superheated stem injected in the range of 5 to 10 times as much as the amount of organic carbons contained in the char, whereby the organic carbons are converted into combustible gaseous products and heavy metals remain in the ash as insoluble metal-sulfide complexes.

5,466,384

DEVICE AND PROCESS FOR CARRYING OUT PHASE SEPARATION BY FILTRATION AND CENTRIFUGATION

Isabelle Prevost, and Alexandre Rojey, both of Rueil Malmaison, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Nov. 5, 1993, Ser. No. 147,542
Claims priority, application France, Nov. 5, 1992, 92 13359
Int. Cl.[6] B01D *21/20*
U.S. Cl. 210—787 15 Claims



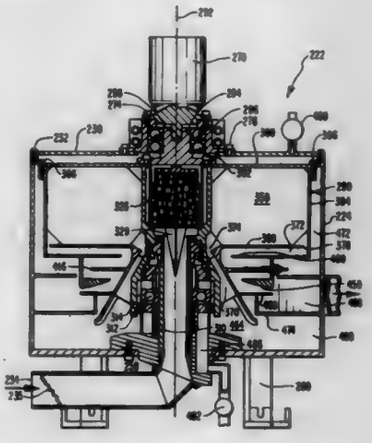
11. A process for separating a mixture comprised of at least a continuous phase I and at least a disperse phase II, at least one of the continuous and disperse phases being a heavy phase and the other being a light phase, which comprises introducing the mixture into a helical passage formed by at least a solid wall, a filtering wall consisting of a membrane and a helical-shaped part, so that the flow of said phases I and II along said passage causes a rotational motion leading to a differential displacement of the light phase and of the heavy phase and the continuous phase I flows at least partly through the filtering wall; said helical passage having a section of flow that decreases in a direction of the flow of the mixture.

5,466,385

GAS SPURGED CONTRIFUGATION METHOD

Ernest E. Rogers, Pleasant Grove, and Kevin E. Collier, Kaysville, both of Utah, assignors to Charles W. Taggart, Salt Lake City, Utah

Division of Ser. No. 149,994, Nov. 10, 1993, Pat. No. 5,387,342, which is a continuation-in-part of Ser. No. 896,185, Jun. 10, 1992. This application Feb. 6, 1995, Ser. No. 383,891
Int. Cl.[6] B01D *21/26*
U.S. Cl. 210—787 10 Claims



1. A method of separating into its component parts a mixture including a first liquid and a second liquid, the first liquid having a viscosity greater than the second liquid, comprising the steps of:

dispersing bubbles of a gas into the liquid mixture to produce a gas-entrained liquid mixture;

introducing the gas-entrained liquid mixture into a separator including:

a separation chamber mounted for rotation about an axis of rotation, the separation chamber including an inlet passageway, a first fluid outlet passageway, and a second fluid outlet passageway;

a first weir positioned in fluid communication with the first fluid outlet passageway of the separation chamber; and

a second weir positioned in fluid communication with the second fluid outlet passageway of the separation chamber;

spinning the gas-entrained liquid mixture in the separation chamber about the axis of rotation to force the first liquid and the gas to migrate radially inwardly in the separation chamber while the second liquid and any remaining gas migrates radially outwardly in the separation chamber;

permitting at least a portion of the gas and the first liquid to exit the separation chamber by passing over the first weir and out the first fluid outlet passageway; and

permitting at least a portion of the second liquid and any remaining gas to exit the separation chamber by passing over the second weir and out the second fluid outlet passageway.

5,466,386

FIRE EXTINGUISHING COMPOSITIONS

Harry E. Stewart, Malvern, and Donald B. MacElwee, Wayne, both of Pa., assignors to POWSUS, Inc., Malvern, Pa.

Filed May 3, 1993, Ser. No. 56,956

Int. Cl.[6] A62C *1/00;1/06*

U.S. Cl. 252—2 **9 Claims**

1. A non-aqueous fire extinguishing composition, which consist essentially of;

A. a plurality of particles of ammonium bromide, said particles being surface-coated with from 0.5 to 5 percent by weight of the particles of a solid film of a water-repelling, non-inflammable, organometallic abherent, dispersed in

B. a volatile organic liquid fire-extinguishing agent gelled with

C. a gelling agent selected from the group consisting of fumed silica and fumed alumina.

5,466,387

OIL-SOLUBLE ADDUCTS OF DISUCCINIMIDES AND ANHYDRIDES OF UNSATURATED BICARBOXYLIC ALIPHATIC ACIDS

Orazio Pianta, Santo Stefano Ticino, and Paolo Koch, Melegnano, both of, Italy, assignors to Agip Petroli S.p.A., Rome, Italy

Filed Jun. 2, 1994, Ser. No. 253,054

Claims priority, application Italy, Jun. 16, 1993, MI93A1293

Int. Cl.[6] C10M *133/56*

U.S. Cl. 252—51.5 A **8 Claims**

1. An oil-soluble additive with dispersant properties inert towards fluoroelastomers, prepared by reacting:

a) at least one alkyl or alkenyl disuccinimide having at least one basic nitrogen, with

b) at least one anhydride of an unsaturated bicarboxylic aliphatic acid or the corresponding acid, at a temperature of between 130° and 170° C., the molar ratio of anhydride to disuccinimide being between 1.2 and 1.6.

5,466,388

MATERIAL FOR MAGNETOSTATIC-WAVE DEVICES

Takashi Fujii; Masaru Fujino, both of Ohtsu; Takenori Sekijima, Nagaokakyo, and Hiroshi Takagi, Ohtsu, all of, Japan, assignors to Murata Mfg. Co., Ltd., Japan

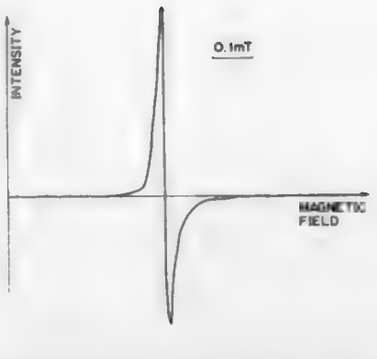
Filed May 4, 1994, Ser. No. 238,252

Claims priority, application Japan, May 7, 1993, 5-131400

Int. Cl.[6] C04B *35/26*

U.S. Cl. 252—62.59 **6 Claims**

1. A material for magnetostatic wave devices, comprising a thin single-crystalline magnetic film consisting essentially of a magnetic garnet containing iron, and at least one element of zirconium and hafnium incorporated therein wherein the content of said at least one element of zirconium and hafnium is less than or equal to 1000 wt.ppm and wherein said magnetic garnet is an yttrium-based magnetic garnet of the general formula: $(Y_{3-x}Me_x)(Fe_{5-y}Me'_y)O_{12}$ where Me is at least one trivalent element selected from the group consisting of Bi, Sb, and lanthanoid (La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu), Me' is at least one metal selected from the group consisting of Ga and Al and x and y take a value within the respective following ranges: $0 \leqq x \leqq 1.0$, and $0 \leqq y \leqq 1.0$.



5,466,389

PH ADJUSTED NONIONIC SURFACTANT-CONTAINING ALKALINE CLEANER COMPOSITION FOR CLEANING MICROELECTRONICS SUBSTRATES

Joseph M. Ilardi, Sparta; George Schwartzkopf, Franklin Township, both of N.J., and Gary G. Dailey, Easton, Pa., assignors to J. T. Baker Inc., Phillipsburg, N.J.

Filed Apr. 20, 1994, Ser. No. 230,132

Int. Cl.[6] C11D *7/06;7/08;1/66;* **C23G** *1/14*

U.S. Cl. 252—156 **38 Claims**

1. An alkaline cleaning solution for microelectronics substrates comprising from about 0.1% to about 25% by weight of an aqueous, metal ion free, base, from about 0.1% to about 5% by weight of a nonionic surfactant and an effective amount of a pH reducing chemical buffering component to reduce and control the pH of the cleaning solution to a pH within the range of from about pH 8 to about pH 10, wherein said pH reducing chemical buffering component is selected from the group consisting of inorganic mineral acids and their salts, ammonium hydroxide and its salts, acetic acid and its salts, and mixtures thereof.

5,466,390

LIQUID CLEANING PRODUCTS

Mark P. Houghton, Rotterdam, and Charles C. Verburg, Vlaardingen, both of, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

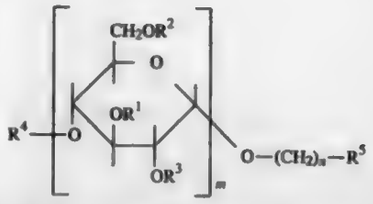
Filed Jul. 7, 1993, Ser. No. 88,455

Claims priority, application European Pat. Off., Jul. 8, 1992, 92202078

Int. Cl.[6] C11D *1/66*

U.S. Cl. 252—174.17 **9 Claims**

1. A substantially non-aqueous liquid cleaning composition comprising a non-aqueous liquid phase, which liquid phase comprises a partial ether of a C_1 to C_4 alkyl group and alkylpolyglucoside wherein the general formula (I) of the partial ether is as follows:



(I)

wherein R^1–R^5 independently represent hydrogen or C_{1-4} alkyl groups, with the proviso that on average in the bulk alkylpolyglucoside partial ether of formula (I), from 10% to 90% of the molecules will have at least one of R^1 to R^4 representing an alkyl group;

m has an average value of from 1 to 3;

n has an average value of from 5 to 20; and

which alkylpolyglucoside partial ether is a liquid or is soluble in the remainder of the liquid phase at 25° C.

5,466,391

GRANULATED AGENT AND CATALYST USED FOR OXYGEN GENERATION

Ueno Shinji, Tokyo, Japan, assignor to Genox Co. Ltd., Seoul, Rep. of Korea

Filed Jun. 21, 1994, Ser. No. 264,163

Int. Cl.[6] C09D *101/28;* **C11D** *7/54*

U.S. Cl. 252—186.27 **4 Claims**

1. An oxygen generating agent comprising:

sodium carbonate peroxyhydrate, as an oxygen generating source; and

calcium carboxymethyl cellulose as a bonding agent.

5,466,392

ORGANIC ELECTROLUMINESCENCE DEVICE AND COMPOUND HAVING AN ALUMINUM COMPLEX STRUCTURE

Yoshio Hironaka; Hiroaki Nakamura, and Tadashi Kusumoto, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

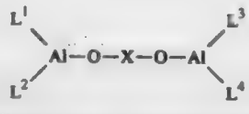
Filed Jun. 2, 1994, Ser. No. 253,052

Claims priority, application Japan, Jun. 2, 1993, 5-131875

Int. Cl.[6] C07K *11/06;* **C07F** *5/06*

U.S. Cl. 252—301.16 **15 Claims**

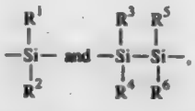
1. An organic electroluminescence device comprising a layer containing a compound having an aluminum complex structure placed between a pair of electrodes wherein said compound is represented by the following general formula (I):



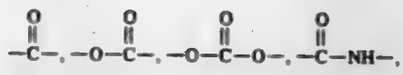
(I)

wherein X indicates a group represented by one of the formulae:

—Ar^1—Y—Ar^2—

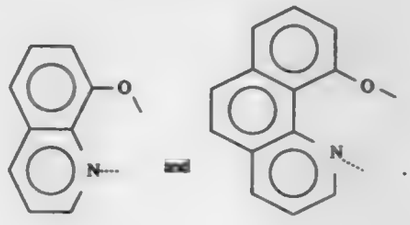


wherein Ar^1 and Ar^2 indicate each independently a substituted or unsubstituted aromatic ting having 6 to 24 carbon atoms, Y is an alkylene group, a cycloalkylene group, an alkylidene group, a cycloalkylidene group, an arylenedioxy group, an alkylenedioxy group,



—O—, —S—, —SO— or —SO_2—, and R^1 to R^6 indicate each independently an aryl group having 6 to 12 carbon atoms, an alkyl group having 1 to 12 carbon atoms or a cycloalkyl group having 5 to 12 carbon atoms; and

L^1 to L^4 indicate each independently a substituted or unsubstituted ligand having one of the formulae:



5,466,393

FOAMING AGENT

Ricardo Diez, Burlington; John Pidnebesny, Hope Township, and Susanna Ng, Brampton, all of, Canada, assignors to Stepan Company, Northfield, Ill.

Continuation-in-part of Ser. No. 643,228, Jan. 22, 1991, Pat. No. 5,240,639, which is a continuation-in-part of Ser. No. 333,078, Apr. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 179,842, Apr. 11, 1988, abandoned. This application Aug. 24, 1993, Ser. No. 111,202

Claims priority, application Canada, Apr. 7, 1988, 563517

The portion of the term of this patent subsequent to Aug. 31, 2010, has been disclaimed.

Int. Cl.[6] B01F *17/02;* **C04B** *11/024;24/16*

U.S. Cl. 252—307 **20 Claims**

1. A foaming agent alkylene glycol composition comprising

(a) a glycol species selected from the group consisting of alkylene glycols, alkylene glycol ethers and polyalkylene glycol ethers; and

(b) a mixture of surfactants of the formula

$$R_x(OCH_2CH_2)_yOSO_3M$$

wherein

R_x represents linear and/or branched chain hydrocarbons having an average of x carbon atoms where at least about 80% of x is between about 8 and 10;

y represents the average number of moles of ethylene oxide per mole of hydrocarbon R_x and is between about 0.4 and 1.3;

M represents a cation capable of producing a water-soluble surfactant; and

the amount of surfactant in the mixture having y=0 plus y=1 is between about 44 and 85 weight percent of the foaming agent and the amount of surfactant having y=0 is from about 25 to 85 weight percent of the foaming agent.

5,466,394
STABLE, AQUEOUS LAUNDRY DETERGENT COMPOSITION HAVING IMPROVED SOFTENING PROPERTIES

Francesco de Buzzaccarini, Fairfield; Timothy J. Farwick, Cincinnati, and Yueqian Zhen, West Chester, all of Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed Apr. 25, 1994, Ser. No. 232,925
Int. Cl.[6] C11D *1/29;1/62;1/65*
U.S. Cl. 252—547 **23 Claims**

1. A substantially clear, aqueous, isotropic heavy duty liquid laundry detergent composition comprising, by weight of the composition:

a) from about 10% to about 40% of an anionic surfactant component which comprises, by weight of the composition:

(i) from about 5% to 40% of alkyl polyethoxylate sulfates wherein the alkyl group contains from 10 to 22 carbon atoms and the polyethoxylate chain contains from 1 to 15 ethylene oxide moieties; and

(ii) no more than about 5% of alkyl benzene sulfonates; and

b) from about 1% to about 10% of quaternary ammonium fabric-softening agent having the formula

wherein R_1 and R_2 are individually selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 hydroxy alkyl, benzyl, and $-(C_2H_4O)_xH$ where x has a value from 2 to 5; X is an anion; and (1) R_3 and R_4 are each a C_8–C_{14} alkyl or (2) R_3 is a C_8–C_{22} alkyl and R_4 is selected from the group consisting of C_1–C_{10} alkyl, C_1–C_{10} hydroxy alkyl, benzyl, and $-(C_2H_4O)_xH$ where x has a value from 2 to 5; provided that the anionic surfactant and quaternary ammonium fabric-softening agent are present in a weight ratio of at least about 3:1; wherein said composition is free from suspended crystals, precipitates or more than one liquid or liquid crystalline phase.

5,466,395
LIQUID DETERGENT COMPOSITION

Masaki Tosaka, Oyama; Hiroyuki Saijo; Haruki Kawano, both of Utsunomiya; Yutaka Hayakawa, Kawachimachi, and Toshiaki Ohi, Ichikaimachi, all of, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 953,876, Sep. 30, 1992, abandoned. This application Jul. 6, 1994, Ser. No. 269,900
Claims priority, application Japan, Jan. 3, 1991, 3-256700; Jan. 3, 1991, 3-256703; Jan. 24, 1991, 3-277538
Int. Cl.[6] C11D *1/29;3/20;3/22*
U.S. Cl. 252—551 **5 Claims**

1. A liquid detergent composition comprising:

(A) a surface active agent wherein said surface active agent is a mixture of

(i) an anionic surface active agent, and

(ii) a nonionic surface active agent or an amphoteric surface active agent,

wherein said anionic surface active agent is a compound represented by the following formula:

$$R^1O(CH_2CH_2O)_nSO_3M \quad (I)$$

wherein R^1 represents an alkyl or an alkenyl group of C_{8-18}, n has an average value of from 1 to 7, and M denotes an alkali metal, an alkaline earth metal, ammonium or alkanolamine,

(B) 3–20% by weight of a pearlescent agent wherein said pearlescent agent is a partial ester of a glycerol and a C_{16}–C_{24} fatty acid, and has a melting point of 30° C. or higher, and

(C) 0.1–10% by weight of a viscosity modifier,

wherein the ratio (B)/(A) is in the range of from 0.05–1, wherein said liquid detergent composition exhibits an opaque appearance, and has a viscosity of 200–4000 cps at 20° C. and a Brookfield yield value of 5–100 p,

said anionic surface active agent (i) is present in an amount of 5–30% by weight, and

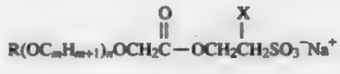
said nonionic or amphoteric surface active agent (ii) is present in an amount of 1–10% by weight.

5,466,396
ISETHIONATE ESTERS OF ALKYL ALKOXY CARBOXYLIC ACID

Stephen A. Madison, New City; Michael Massaro, Congers, both of N.Y.; Gail B. Rattinger, Teaneck, and Christine Wenzel, Ridgewood, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Nov. 19, 1993, Ser. No. 154,897
Int. Cl.[6] C11D *1/28;3/50;3/20*
U.S. Cl. 252—557 **3 Claims**

1. A compound having the formula:



wherein

R is a C_8 to C_{24} alkyl or alkenyl group;

m is 1 to 3;

n is 1 to 5; and

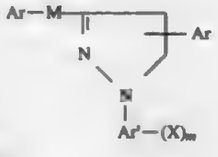
x is hydrogen or a C_1 to C_3 hydrocarbon.

5,466,397
NONLINEAR OPTICALLY ACTIVE PYRAZOLINES AND POLYMERIC COMPOSITIONS CONTAINING MOIETIES DERIVED THEREFROM

Stephen E. Bales; David J. Brennan; Robert J. Gulotty, Jr.; Muthiah N. Inbasekaran; Michael N. Mang, and Mark D. Newsham, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

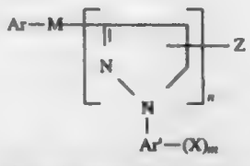
Filed Nov. 29, 1993, Ser. No. 159,010
Int. Cl.[6] F21V *9/00;* **C08F** *2/46*
U.S. Cl. 252—582 **19 Claims**

1. A nonlinear optical medium comprising an oriented polymeric composition comprising moieties obtained by condensation polymerization of a compound corresponding to the Formula:



(I)

or to the Formula:



(II)

wherein Ar is independently at each occurrence an aromatic hydrocarbyl radical substituted with from zero to three polymerizable OR groups and optionally substituted with inert substituents, R is a hydrogen, an epoxy, or an alkylepoxy; Ar' is an aromatic hydrocarbyl radical containing up to 30 non-hydrogen atoms; X is an electron withdrawing group; M is a covalent bond or a divalent

conjugated group; Z is a divalent or a trivalent aromatic carbocyclic radical or a substituted divalent or a trivalent aromatic carbocyclic radical containing up to 30 non-hydrogen atoms, or a covalent bond; n is 2 or 3; and m is an integer from 1 to 3; provided that there are at least two aromatically substituted OR groups present in the compound.

5,466,398

PHOTOCHROMIC SUBSTITUTED NAPHTHOPYRAN COMPOUNDS

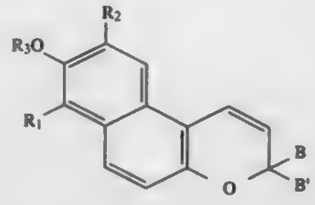
Barry Van Gemert, Murrysville, and Anil Kumar, Pittsburgh, both of Pa., assignors to Transitions Optical, Inc., Pinellas Park, Fla.

Filed Jun. 21, 1993, Ser. No. 80,246

Int. Cl.[6] G02B *5/23;27/00;* **C07D** *311/92;407/04*

U.S. Cl. 252—586 **22 Claims**

6. A photochromic article comprising an organic host material and a photochromic amount of a naphthopyran compound represented by the following graphic formula:



wherein:

(a) R_1 is hydrogen or a C_1–C_6 alkyl; R_2 is hydrogen or the group, -C(O)W, W being $-OR_4$ or $-N(R_5)R_6$, wherein R_4 is hydrogen, allyl, C_1–C_6 alkyl, phenyl, C_1–C_6 monoalkyl substituted phenyl, C_1–C_6 monoalkoxy substituted phenyl, phenyl(C_1–C_3)alkyl, C_1–C_6 monoalkyl substituted phenyl(C_1–C_3)alkyl, C_1–C_6 monoalkoxy substituted phenyl(C_1–C_3)alkyl, C_1–C_6 alkoxy(C_2–C_4)alkyl, or C_1–C_6 monohaloalkyl, and wherein R_5 and R_6 are each selected from the group consisting of hydrogen, C_1–C_6 alkyl, C_5–C_7 cycloalkyl, phenyl and mono- or di-substituted phenyl, or R_5 and R_6 together with the nitrogen form a mono- or di-substituted or unsubstituted heterocyclic group selected from the group consisting of indolinyl, morpholino, piperidino, 1-pyrrolidyl, 1-pyrrolinyl, 1-imidazolidyl, 2-imidazolin-1-yl, 2-pyrazolidyl, and 1-piperazinyl, said phenyl and heterocyclic ring substituents being selected from C_1–C_6 alkyl and C_1–C_6 alkoxy and said halo substituent being chloro or fluoro; R_3 is hydrogen, C_1–C_6 alkyl, phenyl(C_1–C_3)alkyl, C_1–C_6 monoalkyl substituted phenyl(C_1–C_3)alkyl, C_1–C_6 monoalkoxy substituted phenyl(C_1–C_3)alkyl, C_1–C_6 alkoxy(C_2–C_4)alkyl, C_5–C_7 cycloalkyl, C_1–C_4 monoalkyl substituted C_5–C_7 cycloalkyl, C_1–C_6 monohaloalkyl, allyl or the group, -C(O)X, wherein X is a C_1–C_6 alkyl, phenyl, C_1–C_6 mono-or C_1–C_6 di-alkyl substituted phenyl, C_1–C_6 mono- or C_1–C_6 di-alkoxy substituted phenyl, C_1–C_6 alkoxy, phenoxy, C_1–C_6 mono- or C_1–C_6 di-alkyl substituted phenoxy, C_1–C_6 mono- or C_1–C_6 di-alkoxy substituted phenoxy, C_1–C_6 alkylamino, phenylamino, C_1–C_6 mono- or C_1–C_6 di-alkyl substituted phenylamino, or C_1–C_6 mono- or C_1–C_6 di-alkoxy substituted phenylamino, and said halo substituent being chloro, fluoro or bromo, provided that one of R_1 and R_2 is hydrogen; and

(b) B and B' are each selected from the group consisting of the substituted or unsubstituted aryl groups phenyl and naphthyl, said aryl substituents being selected from the group consisting of hydroxy, C_1–C_5 alkyl, C_1–C_5 haloalkyl, C_1–C_5 alkoxy, C_1–C_5 alkoxy(C_1–C_4)alkyl, C_1–C_5 dialkylamino, acryloxy, methacryloxy, and halogen, said halogen or (halo) groups being fluoro, chloro, or bromo, provided that at least one of B and B' is a substituted or unsubstituted phenyl.

5,466,399

PROCESS, INSTALLATION AND DEVICE FOR ENRICHING VENTILATION OR AIR-CONDITIONING AIR WITH AROMATIC SUBSTANCES

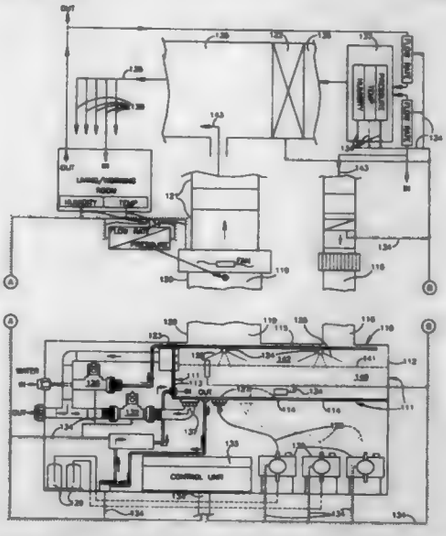
Diotima Von Kempski, Beckergasse 2, D-4000 Dusseldorf 1, and Wolfgang H. Mahl, Cyriakusstrasse 4, D-41462 Neuss, both of, Germany

Continuation-in-part of Ser. No. 941,038, Dec. 10, 1992, abandoned. This application Nov. 14, 1994, Ser. No. 339,458

Claims priority, application Germany, Apr. 10, 1990, 40 11 5143

Int. Cl.[6] B01F *3/04*

U.S. Cl. 261—27 **23 Claims**



1. A method for the enrichment of ventilation or air-conditioning air with a fragrance comprising the steps of:

providing a ventilation or air-conditioning air stream;

providing a mixture of a fragrance and a dilution liquid for the fragrance;

positioning the mixture in at least one vessel wherein the mixture has a free evaporation surface;

feeding an induced air flow across the free evaporation surface of the mixture for evaporation of fragrance from the mixture into the induced air flow;

combining the induced air flow with the ventilation or air-conditioning air stream in an amount which is a fraction of the ventilation or air-conditioning air stream; and

controlling the quantity of the induced air flow across the free-evaporation surface per unit of time in response to sensored process data.

5,466,400

PROCESS FOR DRIP CASTING SILICON NITRIDE SLURRIES

Vimal K. Pujari, Northborough, and Gulio Rossi, Shrewsbury, both of Mass., assignors to Norton Company, Worcester, Mass.

Division of Ser. No. 197,040, Feb. 16, 1994, abandoned, which is a division of Ser. No. 1,367, Jan. 7, 1993, Pat. No. 5,312,517. This application Oct. 17, 1994, Ser. No. 323,970

Int. Cl.[6] B29B *9/10*

U.S. Cl. 264—13 **10 Claims**

1. A process comprising the steps of:

a) producing a slurry comprising silicon nitride powder and a first liquid,

b) dripping the slurry into a second liquid which is immiscible in the first liquid to form a sphere of the slurry,

c) drying the sphere to produce a silicon nitride green body, and

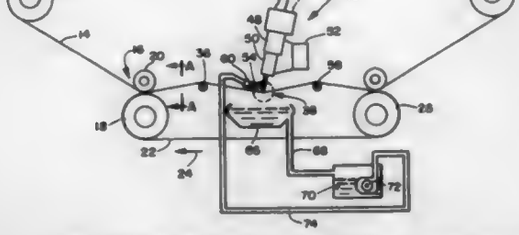
d) sintering the silicon nitride green body to produce a sintered silicon nitride sphere.

5,466,401

PROCESS FOR HYDROSONICALLY AREA THINNING THIN SHEET MATERIALS

Bernhard Cohen, Berkley Lake, and Lee K. Jameson, Roswell, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 767,727, Sep. 30, 1991, Pat. No. 5,314,737. This application May 4, 1994, Ser. No. 238,602
Int. Cl.[6] B06B *3/00*; B29C *59/00*
U.S. Cl. 264—443 24 Claims



1. A method for forming thinned areas in a thin sheet material having a thickness of about 10 mils or less wherein the area of each of the thinned areas is generally greater than about 10 square micrometers, the method comprising the steps of:

(a) placing the thin sheet material on a pattern anvil having a pattern of raised areas wherein the height of the raised areas is generally less than the thickness of the thin sheet material:

(b) conveying the thin sheet material, while placed on the pattern anvil, through an area where a fluid is applied to the thin sheet material; and

(c) subjecting the thin sheet material to a sufficient amount of ultrasonic vibrations in the area where the fluid is applied to the thin sheet material to area thin the thin sheet material; and

whereby the thin sheet material is area thinned in a pattern generally the same as the pattern of raised areas on the pattern anvil.

5,466,402

GAP ADJUSTMENT OF A PLASTIC FLOW CHANNEL IN A PLASTIC PART FORMING DEVICE

Manfred A. A. Lupke, Thornhill, Canada, assignor to Corma Inc., Concord, Canada

Filed May 13, 1994, Ser. No. 242,339
Int. Cl.[6] B29C *47/22*
U.S. Cl. 264—39 16 Claims

1. A method of adjusting gap of a plastic flow channel in a plastic part forming device settable to an operative mode for the production of plastic parts and also settable to an inoperative mode when such production is discontinued, said device having a first body part adjacent one side of and adjustable relative to the channel, and a second body part on which the first body part is mounted by a tight fitting between the first and second body parts, said method comprising subjecting one of said body parts to a first temperature change only when said device is in the inoperative mode producing a temporary temperature differential and a loosening of the fitting between the body parts, adjusting positioning of said first body part on said second body part while the fitting is loosened and then subjecting the one body part to a second temperature change opposite to said first temperature change which offsets the temperature differential and restores the tight fitting which is maintained between the body parts when said device is in the operative mode.

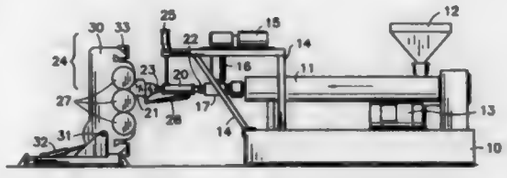
5. A plastic part forming device which is settable to an operative mode for the production of plastic parts and also settable to an inoperative mode in which such production is discontinued, said device having an adjustable gap liquid plastic flow path, a first body part adjacent one side of said liquid flow path, and a second body part on which the first body part is mounted by a fitting which is tight and prevents movement between said first and second body parts when said device is in the operative mode, said device including a temperature control in one of said body parts and which is only activated when said device is in the inoperative mode to produce a temperature differential and a loosening of the fitting between said first and second body parts such that said first body part is movable on said second body part to adjust the gap of the plastic flow path.

5,466,403

APPARATUS AND METHOD FOR EXTRUDING AND COOLING A POLYMERIC SHEET

Frank R. Nissel, Ambler, Pa., assignor to Welex Incorporated, Blue Bell, Pa.

Filed May 31, 1994, Ser. No. 251,573
Int. Cl.[6] B29C *47/16;47/88*
U.S. Cl. 264—39 18 Claims



1. In an apparatus for extruding a polymeric sheet and for feeding said sheet to a collecting device, which apparatus comprises an extruder connected to feed polymer through a rigid conduit and to and through a sheet die movably positioned adjacent said collecting device, polymer sheet feed control apparatus comprising: a pair of spaced-apart polymer-sealed swivels positioned in said rigid conduit between said extruder and said sheet die;

one said polymer-sealed swivel being connected to permit independent swinging movement of said sheet die up and down relative to said extruder;

another said polymer-sealed swivel being connected to permit independent tilting movement of said sheet die angularly relative to said rigid conduit, and

power means connected for actuating movement of said sheet die relative to said swivels independently upwardly and downwardly and in said tilting movement to conform the height and attitude of the sheet die to the specific height and inclination of the central axis of a roll nip into which said sheet is introduced.

13. In a method of attaining cooling uniformity when using a cooling roll stack nip for continuously cooling a hot continuously extruded polymeric sheet from the outlet of a polymer sheet die, the steps which comprise:

(a) tilting said stack to an optimum nip roll angle for the particular sheet,

(b) changing the elevation and angle of tilt of said sheet die to conform to the tilt of said stack, and

(c) positioning the outlet of said sheet die immediately adjacent to said nip.

5,466,404

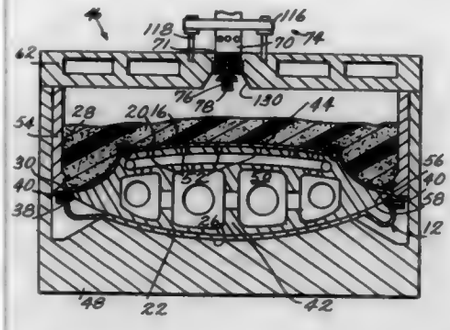
CONTROLLED VENTING DURING MOLDING OF POLYURETHANE FOAM

Gerry D. Kiefer, Ellisville, Mo., assignor to Atoma International Inc., Newmarket, Canada

Filed Oct. 6, 1993, Ser. No. 132,249

Int. Cl.[6] B29C *44/14;44/60*

U.S. Cl. 264—408 4 Claims



1. A method for molding a foam product comprising the steps of:

providing a plurality of mold portions cooperable to form a foam mold assembly defining a mold cavity therein having at least one vent hole in an upper portion thereof;

providing said mold cavity with an expandable foamable material during a filling cycle;

reactively expanding said expandable foamable material within said mold cavity so as to be molded into the shape of said mold cavity during a foaming cycle;

said expandable foamable material approaching said vent hole while expanding within said mold cavity during said foaming cycle, and said at least one vent hole providing a passage through which air and reaction product gases introduced into said mold cavity as a byproduct of said reactive expanding of said expandable foamable material can escape to atmosphere from said mold cavity during said foaming cycle;

electrically sensing the presence of said expandable foamable material at a predetermined proximity to said at least one vent hole by detecting a predetermined change in dielectric characteristics within said mold cavity proximate said at least one vent hole during said foaming cycle,

generating a signal when the presence of said expandable foamable material is sensed at said predetermined proximity to said at least one vent hole; and

sealing said at least one vent hole to close said passage when said signal is generated when the presence of said expandable foamable material is sensed at said predetermined proximity to said at least one vent hole to prevent said expandable foamable material approaching said at least one vent hole from escaping said mold cavity through said passage.

5,466,405

METHOD FOR THE MANUFACTURE OF A SUN VISOR

Lothar Viertel, Altlorweiler, Germany; Patrick Welter, La chambre, France; René Lercorvaisier, Hombourg-Houts; Serge Mosser, Bambiderstroff, France, and Karl-Heinz Pompino, Wuppertal, Germany, assignors to Gerb. Happich GmbH, Germany

Division of Ser. No. 25,884, Mar. 3, 1993, Pat. No. 5,308,137. This application Sep. 1, 1993, Ser. No. 115,909

Claims priority, application Germany, Dec. 18, 1992, 42 42 939.0

Int. Cl.[6] B29C *43/04;44/44*

U.S. Cl. 264—45.4 6 Claims

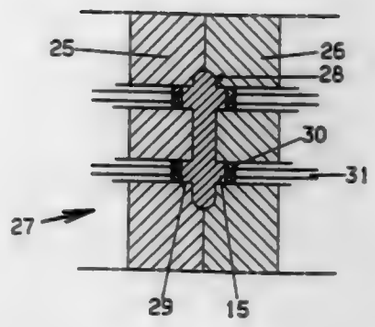
1. A method of manufacturing a sun visor comprising the steps of:

(a) producing a sun-visor body by introducing a filling of polypropylene particles into a mold cavity of a mold, and heating the particles by the introduction of steam or hot air into the mold so that the particles soften, expand and weld to each other;

(b) subjecting the sun-visor body obtained in step (a) to a compressing of the material by the action of a pressure generally perpendicular to a central plane of the sun-visor body to form at least one stiffening; and

(c) providing the sun-visor body with a covering,

wherein step (a) comprises producing a sun-visor body having two halves which are connected to each other by a film hinge; one half of the two halves being formed with at least one bead and the other half with at least one groove; and step (b) comprises subjecting only the bead to the action of pressure so as to reduce the height thereof with the formation of a stiffening; the method further comprising the step of removing the sun-visor body after cooling from the mold and introducing the bead into the groove by swinging the sun-visor body halves together.



5,466,406

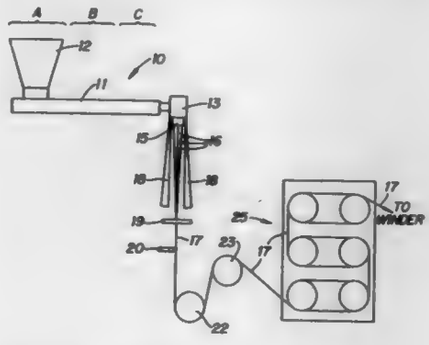
PROCESS OF TREATING FILAMENTS

Cheng-Kung Liu, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Division of Ser. No. 989,069, Dec. 11, 1992, abandoned. This application Jun. 7, 1994, Ser. No. 254,982

Int. Cl.[6] B29C *71/00;* D01D *10/06;* D06M *13/148*

U.S. Cl. 264—103 15 Claims



1. A method of treating filaments comprising:

spinning one or more filaments; and

applying to said one or more filaments a spin finish comprising a compound of the formula $HOCH_2CH(OH)CH_2OH$, said applying step being performed on said one or more filaments as spun.

5,466,407

INCINERATION RESIDUE TREATMENT PROCESS

James J. Downs, Narberth, and William A. Roberts, Berwyn, both of Pa., assignors to Rolite, Inc., Wayne, Pa.

Continuation of Ser. No. 877,329, May 1, 1992, Pat. No. 5,286,430, which is a continuation-in-part of Ser. No. 731,528, Jul. 17, 1991, abandoned, which is a continuation of Ser. No. 366,158, Jun. 14, 1989, Pat. No. 5,037,286, which is a continuation-in-part of Ser. No. 211,267, Jun. 24, 1988, abandoned. This application Feb. 10, 1994, Ser. No. 195,295

Int. Cl.[6] B29B *9/08;* B29C *43/02;67/02*

U.S. Cl. 264—115 21 Claims

1. A process for disposing of untreated residue produced by the incineration of commercial, industrial or municipal waste, the process comprising:

(a) mixing the untreated residue with Portland cement;

(b) aggregating the mixture of the residue and the Portland cement into a free-flowing, granular treated residue;

(c) shaping the treated residue; and

(d) permitting the shaped residue to cure into a cohesive mass.

3. A process for producing a product for disposing of untreated residue produced by the incineration of commercial, industrial or municipal waste and for increasing the hydraulic conductivity of the untreated residue, the process comprising:

(a) mixing the untreated residue with Portland cement to provide a mixture, the mixture initially including free water, the initial free water content of the mixture being less than that sufficient to fully cure the cement, the ratio of Portland cement to untreated residue being selected to control reduction of the surface area of the product formed by reducing the fines within the product formed;

(b) aggregating the mixture of the residue and the Portland cement into a free-flowing, granular treated residue, the mixture being aggregated within a pelletizing apparatus to give a product having no more than about five percent by weight fines.

5,466,408

PROCESS FOR THE MANUFACUTRE OF A BASKET FOR DOMESTIC CENTRIFUGE

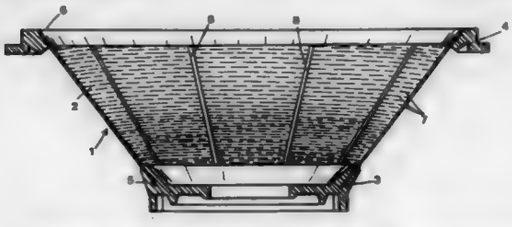
Michel R. M. Assier, Alencon, France, assignor to Moulinex (Societe Anonyme), Bagnolet, France

Division of Ser. No. 71,388, Jun. 2, 1993, Pat. No. 5,386,926. This application Sep. 8, 1993, Ser. No. 117,705

Claims priority, application France, Jun. 5, 1992, 92 06886

Int. Cl.[6] B29C *45/14*

U.S. Cl. 264—156 2 Claims



1. Process for the production of a basket for a domestic centrifuge, which comprises:

providing a strip of plastic material having a surface;

displacing said strip by a certain longitudinal interval to different machining stations;

perforating said strip in a first station to provide anchoring holes;

punching the strip in a second station to provide perforations, said step of punching being carried out by a tool comprising at least two rows of punchers and driven sequentially so as to sweep the surface to be perforated;

precisely cutting out a screen in a third station by providing in ends of the screen tenons and mortices to constitute a mutual interlocking device;

maintaining the screen in its shape of revolution via said mutual interlocking device; and

thereafter molding rings and ribs on the screen.

5,466,409

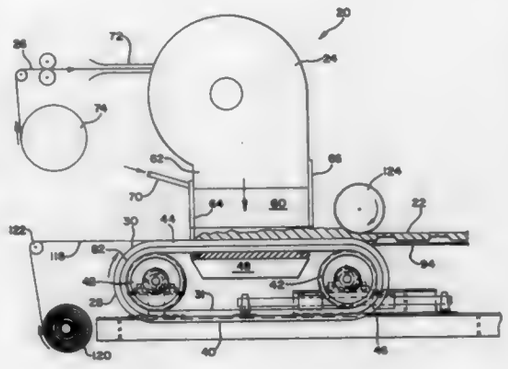
FORMING BELT FOR THREE-DIMENSIONAL FORMING APPLICATIONS

Mary E. Partridge, Appleton; Timothy J. Blenke, Neenah, both of Wis.; Stephen R. Everson, Danbury, Conn.; Carl G. Schroth, Kimberly, and Michael B. Venturino, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Oct. 19, 1993, Ser. No. 139,461

Int. Cl.[6] B29C *43/02;43/06;43/08*

U.S. Cl. 264—165 26 Claims



14. A method for forming a layer structure comprising the steps of:

(a) supplying a particulate material;

(b) providing a substantially endless foraminous forming belt constructed of a honeycomb material which provides an open area of at least about 75%, said forming belt having an appointed outward surface, a minimum thickness of at least about 3/16 in, and having a selected contour formed into said outward surface at selected locations distributed along a length-wise machine-direction of said forming belt honeycomb material;

(c) configuring said forming belt to flex along a thickness direction thereof and to recoverably bend and substantially straighten when traveling along a selected belt path circuit, wherein said forming belt has a thickness dimension which remains substantially underformed when moving through curved portions of said belt path;

(d) conveying said forming belt past said supplying step (a) along a forming path section of said belt circuit which is substantially straight, and along a return path section of said belt circuit which includes curved portions therein;

(e) drawing a flow of air through said thickness of said forming belt to lay said particulate material onto said forming belt to form a particulate layer structure having a top surface and belt-side surface thereof, thereby producing a contoured layer structure with a selected nonuniform thickness contour which is formed along said belt-side surface of said contoured layer structure;

(f) driving said forming belt along said machine-direction at a selected speed;

(g) restraining said forming belt at a location along a thickness location thereof to maintain a selected length dimension of said forming belt, said location approximately coinciding with a bending neutral axis of said forming belt; and

(h) transporting said contoured layer structure from said forming belt.

5,466,410

PROCESS OF MAKING MULTIPLE MONO-COMPONENT FIBER

William H. Hills, Melbourne Village, Fla., assignor to BASF Corporation, Parsippany, N.J.

Division of Ser. No. 893,286, Jun. 4, 1992, Pat. No. 5,344,297, which is a continuation-in-part of Ser. No. 394,259, Aug. 7, 1989, Pat. No. 5,162,074, which is a continuation-in-part of Ser. No. 103,594, Oct. 2, 1987, abandoned. This application May 11, 1994, Ser. No. 241,299

Int. Cl.[6] D01F *8/04*

U.S. Cl. 264—172.11 11 Claims

1. A method of forming multiple mono-component synthetic fibers from plural respective different molten/solution polymer components, said method comprising the steps of:

(a) flowing said plural components, mutually separated, into a structure having plural parts;

(b) in said structure, distributing each component to a respective array of inlet holes for multiple spinneret orifices in a spinneret plate such that each component flows into its own respective array of inlet holes without any other component to provide multiple mono-component fiber streams flowing through said spinneret orifices, said spinneret being one of said plural parts of said structure; and

(c) issuing multiple mono-component fibers in a first direction as streams from said structure through said spinneret orifices;

wherein said step (b) comprises the steps of:

(b.1) forming multiple distribution flow paths in at least one disposable distributor plate, having upstream and downstream surfaces;

(b.2) disposing transversely to said first direction said at least one distributor plate in said structure to require said plural components to flow through said distribution flow paths; and

(b.3) delivering the mutually separated components to prescribed locations through said distribution flow paths from a primary distribution means to preselected points at said respective arrays of inlet holes.

5,466,411

PRODUCTION OF FIBERS CONTAINING MAINLY POLYPROPYLENE

Dieter Butterfass, Boehl-Iggelheim; Hans-Joachim Schuhmacher, Neustadt, and Michael W. Mueller, Plankstadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed May 12, 1994, Ser. No. 241,583

Claims priority, application Germany, May 12, 1993, 43 15 875.7

Int. Cl.[6] D01D *1/04;5/08*

U.S. Cl. 264—176.1 7 Claims

1. A process for producing fibers by melt spinning, which comprises melting a nonwoven consisting essentially of:

a) fibers containing at least 80% by weight of polymers containing at least 95% by weight of propylene in polymerized form, and

b) from 5 to 60% by weight, based on the fibers a), of a polymeric binder containing at least 70% by weight of a C_2–C_4-olefin in polymerized form, and spinning the melt into fibers.

5,466,412

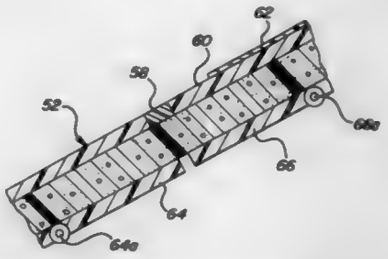
METHOD FOR FORMING AN OUTER SKIN FOR A COVER ASSEMBLY

Thomas Parker, Strafford, and Peter Iannazzi, Hampton, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Division of Ser. No. 951,874, Sep. 28, 1992, Pat. No. 5,288,103. This application Dec. 2, 1993, Ser. No. 161,872

Int. Cl.[6] B29C *39/12;41/04;41/08;41/22*

U.S. Cl. 264—255 10 Claims



2. A method for forming an outer skin of a cover assembly for an air bag unit having a deployable air bag, wherein the outer skin comprises a smooth uninterrupted outer surface, the method comprising the steps of:

forming an outer skin of generally uniform thickness from a first thermoplastic material, the outer skin having a deployment opening formed therein of predetermined configuration corresponding to a desired tear seam configuration;

closing off and concealing the deployment opening by filling the opening with a filler strip of a second thermoplastic material of relatively lesser strength than said first thermoplastic material to provide the outer skin of the cover assembly with a smooth uninterrupted outer surface, the filler strip being bonded to the outer skin and defining a separable tear seam in the outer skin that is relatively weaker than the outer skin surrounding the filler strip, along which tear seam the outer skin immediately separates and reopens upon deployment of the air bag.

5,466,413

METHOD AND APPARATUS FOR BLOW MOLDING A PLASTIC DRINKING VESSEL

Simon J. Richter, Marietta, Ga.; Frank G. Hohmann, Tenafly, and Ernst Vesely, Sussex, both of N.J., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Aug. 26, 1993, Ser. No. 111,923

Int. Cl.[6] B29C *49/50;49/64*

U.S. Cl. 264—521 4 Claims

UP/SEVERING POSITION

1. A method for forming a plastic drinking vessel by blow molding, said drinking vessel including a rim with a bead thereon the rim having internal and external surfaces, comprising the steps of:

forming a substantially cylindrical plastic parison;

introducing the parison into a blow mold having internal walls with a shape corresponding to that of the desired drinking vessel including a peripheral recess for forming the bead;

expanding the parison within the blow mold against said internal walls to form said vessel and the bead;

providing a cutter head assembly adjacent the peripheral recess in said blow mold and axially spaced therefrom, said cutter head assembly including an annular cutter blade with an outside diameter slightly less than the inside diameter of wall surfaces of the blow mold adjacent to said peripheral recess, said cutter blade and cutter head assembly forming a dome-shaped top in response to expansion of the parison,

said dome-shaped top having sidewalls connected at the external surface of the rim at said bead;

moving the cutter blade and cutter head assembly axially of the vessel into the blow mold in order to curl the sidewalls of the dome-shaped top inwardly into contact with the interior of the vessel rim at a region just below the peripheral recess in the walls of the blow mold;

controlling the temperature of the cutter blade at said region to thereby soften and secure the sidewalls of the dome-shaped top at said region; and

retracting the cutter blade and cutter head assembly axially from the blow mold to thereby sever the dome-shaped top from the vessel;

whereby the curl formed from the dome-shaped sidewalls forms a smooth internal surface of the vessel rim.

5,466,414

PROCESS FOR FABRICATION OF SINTERED METAL COMPONENTS

Bjorn O. A. Pettersson, Huntsville, Ala., assignor to TecSyn, Inc., St. Catharines, Canada

Division of Ser. No. 855,881, Mar. 23, 1993, Pat. No. 5,346,529. This application Sep. 1, 1994, Ser. No. 299,441

Int. Cl.[6] B22F *3/12*

U.S. Cl. 419—11 **15 Claims**

1. A method of making a sintered metallic alloy from a dry mixture comprising between 0.9 and 1.3% of weight of graphite; between 0.8 and 3.0% by weight of copper; between 0.01 and 5.0% by weight of a lubricant; up to 98.28% by weight of iron having a predetermined particle size with an oxide content less than 0.3% by weight; and, between 0.01 and 50% of a carbide alloy selected from those commercially available powders designated by the American Steel and Iron Institute as M2, M3, and T15, said method comprising the steps of mixing said powdered mixture to obtain a substantially uniform dispersion of the constituents within the mixture, placing said mixture into a mold conforming to a desired geometry, isostatically compacting said mixture, and sintering said mixture.

5,466,415

EXTRUSION OF METAL HONEYCOMBS

Kevin R. Brundage, and Lawrence S. Rajnik, both of Corning, N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 20, 1994, Ser. No. 326,380

Int. Cl.[6] B22F *7/02;* **B29C** *47/00*

U.S. Cl. 419—67 **12 Claims**

8. A method for making a metal honeycomb body comprising a honeycomb core and an outer skin layer by extruding a plasticized powder metal batch material through an extrusion die and annular mask, the honeycomb core having cell walls formed by a plurality of intersecting discharge slots opening onto a main outlet portion of an outlet face on the die, and the annular mask having a central opening for extrusion of the core and a blocking surface for blocking portions of the discharge slots extending from the main outlet portion into a peripheral portion of the outlet face covered by the mask, wherein:

batch material discharged outwardly from discharge slots near the mask blocking surface is discharged both into an annular extrudate reservoir in the blocking surface of the mask and into a skinforming gap between the outlet face and the mask; and

batch material collected in the extrudate reservoir is discharged into the skinforming gap though a reservoir gap between the peripheral outlet face portion and the mask;

batch material discharged through the reservoir gap combines with batch material discharged into the skinforming gap to form a thickened integral outer skin layer on the honeycomb core, such thickened outer skin layer having a thickness at least twice the thickness of the cell walls of the core.

5,466,416

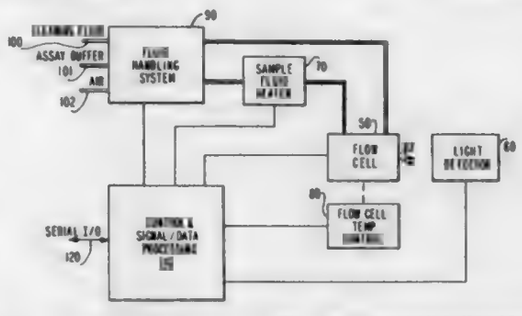
APPARATUS AND METHODS FOR CARRYING OUT ELECTROCHEMILUMINESCENCE TEST MEASUREMENTS

Ali Ghaed, 4605 S. Chelsea La., Bethesda, Md. 20814; Jonathan K. Leland, 14236 Amberleigh Ter., Silver Spring, Md. 20905; Glenn D. Zoski, 10308 Tamarack Dr., Vienna, Va. 22181; Jack E. Goodman, 3011 Third St. North, Arlington, Va. 22201, and John T. Grosser, 6 Colony Brook La., Derry, N.H. 03038

Filed May 14, 1993, Ser. No. 61,676

Int. Cl.[6] G01N *21/76;21/66*

U.S. Cl. 422—52 **10 Claims**



1. An apparatus for use in carrying out electrochemiluminescence test measurements, comprising:

a cell for containing an electrochemiluminescent sample fluid;

a working electrode having an electrode surface within the cell;

a supply of electrical energy coupled with the working electrode for supplying electrical energy to the electrochemiluminescent sample fluid within the cell;

output signal producing means for producing an output signal representing a detected value based on light produced through electrochemiluminescence of the sample fluid within the cell; and

temperature effect adjustment means for carrying out at least one of adjusting a temperature of the electrochemiluminescent sample fluid to a value at least within a predetermined range of temperature values, and adjusting the output signal based on the temperature of the electrochemiluminescent sample fluid to produce a temperature effect adjusted output signal.

5,466,417

STERILIZER USING HIGH TEMPERATURE STEAM

Masahiro Seki, Tokyo, Japan, assignor to Tomi Seiko Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1993, Ser. No. 151,378

Claims priority, application Japan, Nov. 13, 1992, 4-303595

Int. Cl.[6] G05D *23/32;* **G05B** *15/00;* **A61L** *2/06;* **B01B** *1/00*

U.S. Cl. 422—109 **3 Claims**

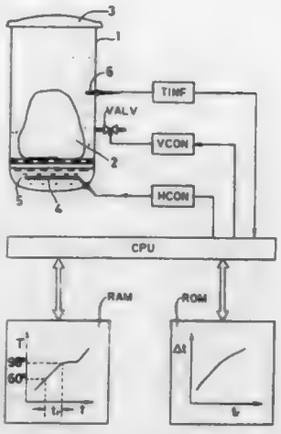
1. A sterilizer using steam comprising

a pressure vessel for holding a thing to be sterilized,

a steam generator having a heater for generating steam in the pressure vessel,

a temperature sensor for measuring the temperature in the pressure vessel, and

a valve for controlling the communication between the inside and outside of the pressure vessel, whereby, when heating



with the valve closed, the temperature in the pressure vessel is maintained at a predetermined value during a predetermined sterilization time for perfect sterilization of the thing to be sterilized, said sterilizer including:

a RAM for storing data of a time sequence of the temperature of the steam in the vessel,

a ROM with data, stored as a function of time, of the retardation time of rising temperature at the inside of the thing to be sterilized compared with the rising temperature of the steam, and

a Central Control Circuit which:

calculates the period for the rising temperature of the steam in the vessel from a predetermined starting temperature to a predetermined end temperature, from data stored in the RAM,

reads out the retardation time of rising temperature from said ROM on the basis of said calculated period for the rising temperature,

determines a period of time, according to the retardation time of rising temperature, in which the steam temperature is to be maintained at the boiling temperature after reaching said boiling temperature,

sends a signal to close said valve to a valve controller after maintaining the boiling temperature for said determined period of time, and

sends a signal to a heater controller to continue heating said vessel up to the predetermined sterilizing temperature and to maintain the predetermined sterilizing temperature during said predetermined sterilizing period after reaching the sterilizing temperature.

5,466,418

SYSTEM FOR THE REMEDIATION OF HIGHLY CONTAMINATED SOILS

Malcolm L. Swanson, Chickamauga, Ga.; Wendell R. Feltman, Chattanooga, Tenn., and Robert E. Schreter, Roswell, Ga., assignors to Astec Industries, Inc., Chattanooga, Tenn.

Filed Jul. 13, 1993, Ser. No. 91,339

Int. Cl.[6] B01J *8/08*

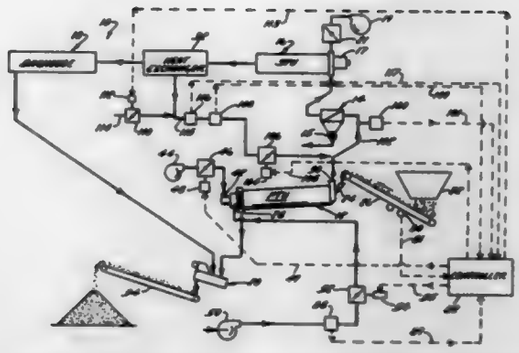
U.S. Cl. 422—111 **15 Claims**

1. A system for the remediation of highly contaminated soil, comprising:

a primary treatment unit having a contaminated soil inlet, a remediated soil outlet, and an exhaust gas outlet;

a burner which heats the interior of said primary treatment unit to vaporize contaminants in said soil; and

an air injection system which injects air into said primary treatment unit between said inlet and said outlet so as to oxidize at least some of said vaporized contaminants within said primary treatment unit.



5,466,419

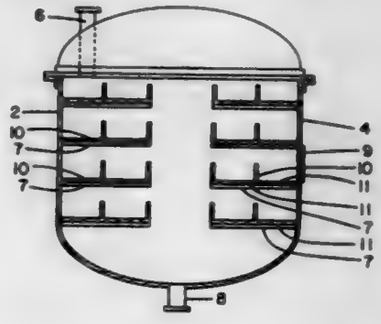
SPLIT FLOW REACTOR TRAYS FOR VERTICAL STAGED POLYCONDENSATION REACTORS

Thomas L. Yount, 3208 Nola La.; Larry C. Windes, 1212 Jerry La., and J. Wesley Adams, 4000 Grey Fox Dr., all of Kingsport, Tenn. 37664

Filed May 2, 1994, Ser. No. 238,037

Int. Cl.[6] C08F *2/00*; **B01D** *11/04*; **F02M** *29/04*

U.S. Cl. 422—131 **9 Claims**



1. A polymerization reactor having a vertically disposed outer shell, a liquid polymer reactor inlet near the top of the reactor, a liquid polymer reactor outlet near the bottom of the reactor, and a vapor outlet,

comprising a plurality of vertically spaced, horizontally disposed, essentially circular split-flow tray assemblies which are fully enclosed within said reactor, and which extend to and are circumferentially attached to the outer shell;

each tray assembly having a central open section forming a portion of a common vapor chimney connected to the vapor outlet, with open access to the liquid polymer surface on each tray afforded by vertical spacing between successive tray assemblies;

each tray assembly having at least one aperture providing a free passageway to permit the discharge of a downwardly flowing liquid to the tray immediately below;

each tray assembly constructed to facilitate traversal of at least two streams of liquid polymer over the floor of the tray in a plurality of flow channels from at least one tray inlet to at least one tray outlet;

wherein flow of the liquid polymer is accomplished by means of a hydraulic gradient wherein the height of the fluid surface at the tray inlet is greater that the height of the fluid surface at the tray outlet, and the flow channels are defined by baffle walls having sufficient height to prevent spillage of liquid polymer, said baffle walls forming at least two flow channels each having at least two curved subsections, wherein each stream of the liquid polymer flows between subsections through a channel section defined by a substantially semi-

circular turnaround region wherein the angular direction of the flow of liquid polymer within the channel is reversed.

5,466,420

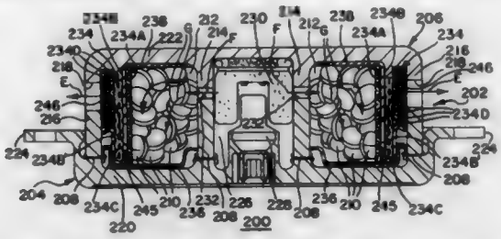
AIR BAG INFLATOR

Todd S. Parker, Centerville; Brian T. Snyder, Hooper, and Brian H. Fulmer, Farr West, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Jul. 26, 1994, Ser. No. 280,486

Int. Cl.[6] B60R *21/16*

U.S. Cl. 422—164 **20 Claims**



1. An air bag inflator designed for the rapid generation of gas when activated for inflating an air bag associated therewith, comprising:

a housing having an outer peripheral side wall with a plurality of spaced apart diffuser ports therein for directing gas outwardly to inflate said air bag;

said housing including a top wall and a spaced apart bottom wall joined respectively to opposite end portions of said outer peripheral side wall and a single, inner side wall extending between and joined to said top and bottom wall within said outer peripheral side wall and including a plurality of spaced apart ignition ports therein for directing hot ignition gas outwardly toward said outer peripheral side wall;

ignition means in a first ignition chamber defined within said inner side wall for generating hot ignition gases to flow out said ignition ports; and

a second chamber around said inner side wall containing gas generating material adapted to be ignited by said ignition gas for generating gas to inflate said air bag and filter means for entrapping solid contaminants from said gas flowing outwardly of said gas generating material toward said diffuser ports, said filter means extending around said gas generating material between said top and bottom walls and having an inner periphery in direct contact with said gas generating material and an outer periphery adjacent an inside surface of said peripheral side wall.

5,466,421

APPARATUS FOR THE CATALYTIC CONVERSION OF WASTE GASES CONTAINING HYDROCARBON, HALOGENATED HYDROCARBON AND CARBON MONOXIDE

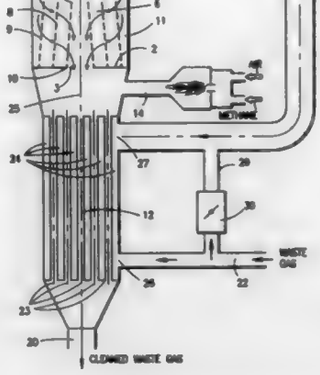
Klaus Deller, Hainburg; Hans Moesinger, Rodenbach; Herbert Mueller, Karlstein a. Main; Josef Riedl; Wenzel Kuehn, both of Burgkirchen, and Rudolf Spielmannleitner, Altoetting, all of, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 826,591, Jan. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 595,845, Oct. 11, 1990, Pat. No. 5,108,717, which is a division of Ser. No. 247,297, Sep. 21, 1988, Pat. No. 4,983,366. This application Dec. 28, 1993, Ser. No. 172,870

Claims priority, application Germany, Sep. 27, 1987, 37 31 688.5

Int. Cl.[6] B01J *8/04*

U.S. Cl. 422—171 **2 Claims**



1. An apparatus for purifying waste gases comprising a cylindrical reactor housing (1'), a heat exchanger (12'), a supply pipe (22') for supplying untreated waste gas to said heat exchanger, and an exhaust pipe (20') for conveying cleaned waste gas from said housing; said heat exchanger (12') having primary passageways (23') and secondary passageways (24') in close thermal contact;

said reactor housing (1') having an upper portion forming a head chamber (15') and a lower portion forming a heating chamber! (25'), wherein said heating chamber (25') is connected via said primary passageways (23') of said heat exchanger (12') with said exhaust pipe (20');

said supply pipe (22') being connected with an inlet port (26') of said secondary passageways (24'); said head chamber (15') being connected via another pipe (28') with an outlet port (27') of said heat exchanger (12');

said secondary passageways (24') being bypassed by a shunt pipe (29') running from said supply pipe (22') directly to said another pipe (28'), wherein said shunt pipe (29') has a throttling member (30');

said reactor housing (1') including a catalytic material holding section being separated from said heating chamber (25') by an annular bottom (2') having a central hole (3') with a circumferential edge (10'), wherein the outer periphery of said annular bottom (2') is connected to said cylindrical reactor housing (1'), and wherein said catalytic material holding section is separated from said head chamber (15') by common plate (4') and outer wall member (9'); the boundaries of said catalytic material holding section being said annular bottom (2'), said outer wall member (9'), and said common plate (4');

said reactor housing (1'), including an arrangement of two coaxial annular cages constructed for holding separate catalyst layers (5', 6'); said annular cages (5',6') being formed by three conical wall members (7',8',9') including an inner wall (7'), a separating wall (8'), and said outer wall (9');

said conical wall members being perforated and resting with their bases on said annular bottom (2') of said catalytic material holding section and being closed at the top by said common plate (4');

said conical wall members (7', 8', 9') being sealed to said annular bottom (2') in a gas tight manner whereby said inner wall (7') forms a circumferential border on said annular bottom (2') which coincides with said circumferential edge (10') of said central hole (3'); said reactor housing (1') and said outer wall (9') forming an annular space (11') with increasing cross section from the bottom to the top of said catalytic material holding section due to the decreasing diameter of said outer wall (9'); said heating chamber (25') being laterally connected to a pipe (14') for the supply of a gaseous heating medium;

said common plate (4') closing the central hole so as to downwardly force waste gas coming into said annular space (11') through said catalytic material holding section and through

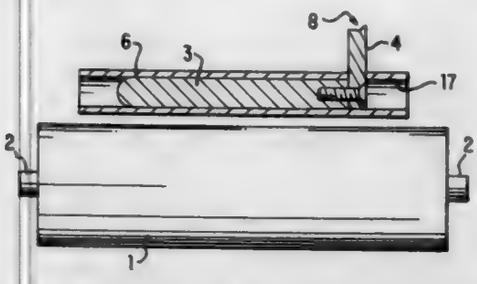
said central hole (3') via said primary passageways (23') of said heat exchanger (12') towards said exhaust pipe (20').

5,466,422

DIELECTRIC-FORMING SHEATH FOR ELECTRODES FOR CORONA PRE-TREATMENT INSTALLATIONS

Jurmin von Leeuwen, Aichach, Germany, assignor to Sutter Apparatebau AG, Switzerland

Filed Apr. 16, 1993, Ser. No. 48,862
Claims priority, application Switzerland, Apr. 21, 1992, 01294/92
Int. Cl.[6] B01J 19/08
U.S. Cl. 422—186.05 5 Claims



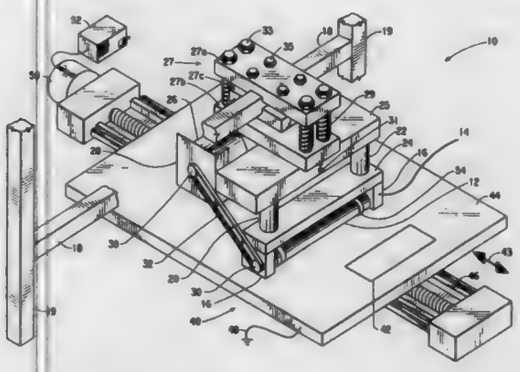
1. In a dielectric sheath (6) for an electrode (3) of a corona pre-treatment installation comprising at least one said electrode with an electrode mounting (4) which maintains said at least one electrode (3) at a defined distance from grounded cylinder, the improvement comprising: the dielectric sheath (6) comprising a ceramic sleeve longer than the electrode (3) and, and with at least one recess through said sleeve (17), through which the electrode mounting (4) is guidable.

5,466,423

APPARATUS FOR CORONA DISCHARGE TREATMENT OF AN ARTICLE

David L. Brinton, Newark, and George K. Kodokian, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 21, 1993, Ser. No. 170,968
Int. Cl.[6] B01J 19/08
U.S. Cl. 422—186.05 9 Claims



1. An apparatus for corona discharge treatment of an article, comprising:

(a) a first, rotating electrode for supplying a high-frequency voltage to the article;

(b) a second electrode for providing a return path to ground; and

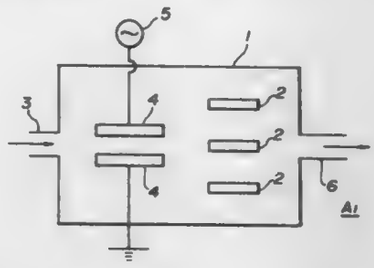
(c) means for adjusting the spacing between the first electrode and the article in response to varying elevations in the surface of the article, thereby providing a constant gap therebetween.

5,466,424

CORONA DISCHARGE SURFACE TREATING METHOD

Yukihiro Kusano, Kokubunji; Tomoko Inagaki; Masato Yoshikawa, both of Kodaira; Setsuo Akiyama, Sagamihara, and Kazuo Naitoh, Kawasaki, all of, Japan, assignors to Bridgestone Corporation, and Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1993, Ser. No. 174,436
Claims priority, application Japan, Dec. 28, 1992, 4-361089
Int. Cl.[6] B01J 19/08; B05D 3/06
U.S. Cl. 422—186.05 21 Claims



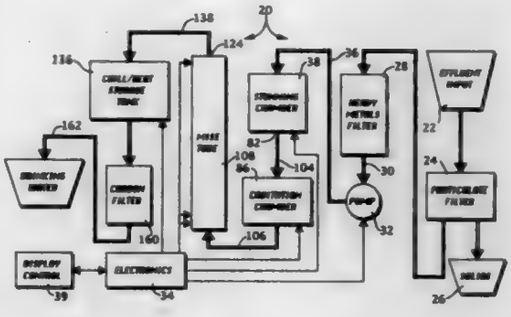
1. A surface treating method comprising the steps of: applying between electrodes, a potential sufficient to cause corona discharge to occur at an absolute pressure of 300 to 4000 Torr in the presence of a gas which comprises molecules containing at least one atom selected from the group consisting of halogen atom, oxygen atom and nitrogen atom; and subjecting an object to surface treatment with the resulting gas generated by the discharge, said object being outside said electrodes and separated from said electrodes at a distance in the range of 10 mm to 5 m.

5,466,425

BIOLOGICAL DECONTAMINATION SYSTEM

Billy J. Adams, Usk, Wash., assignor to Amphion International, Limited, Dublin, Ireland

Filed Jul. 8, 1994, Ser. No. 273,102
Int. Cl.[6] C02F 1/32; B01J 19/12
U.S. Cl. 422—186.3 40 Claims



1. A system for sterilizing water including:

a flow path for the water;

an inlet for said flow path;

an outlet for said flow path;

stun means in said flow path downstream from said inlet to apply an electrical potential across the flow path of sufficient strength to rupture cell membranes of cellular organisms thereat and to disable defense mechanisms of viral organisms to ultraviolet light; and

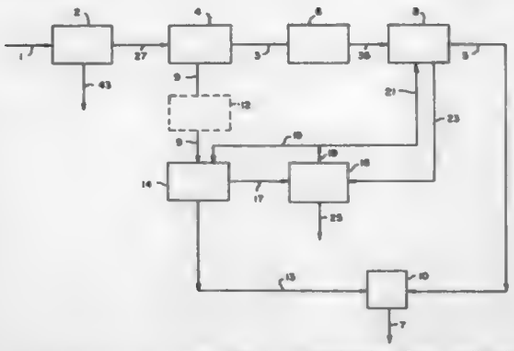
sterilizing means positioned in said flow path downstream of said stun means and upstream of said outlet to apply a lethal frequency range and power of ultraviolet radiation to viral organisms with disabled defense mechanisms, whereby water at said outlet is sterilized.

5,466,426

METHOD AND APPARATUS FOR REMOVING METAL CONTAMINATION FROM SOIL

William E. Fristad; Jeffrey L. Narum; Phillip L. Mattison; Michael J. Virnig, all of Santa Rosa, Calif., and John Fast, Littleton, Colo., assignors to Cognis, Inc., Santa Rosa, Calif.

Filed Aug. 11, 1993, Ser. No. 104,979
Int. Cl.[6] C22B *11/00*
U.S. Cl. 423—98 22 Claims



1. A process for removing lead contamination from soil which comprises:

(a) providing a lead contaminated fine fraction of the contaminated soil;

(b) passing the lead contaminated fine fraction to a first leaching zone to contact a lean leach solution consisting essentially of from about 2 to about 10% by weight of calcium chloride at a pH of from 1.5 to 5, to remove lead contaminant from the fine fraction, and provide a fine fraction with reduced lead contamination and a rich leach solution;

(c) separating the fine fraction with reduced lead contamination from the rich leach solution;

(d) passing the rich leach solution from the first leaching zone to a metal recovery zone to remove at least a portion of the lead from the rich leach solution to provide a lean leach solution and a lead containing composition; and

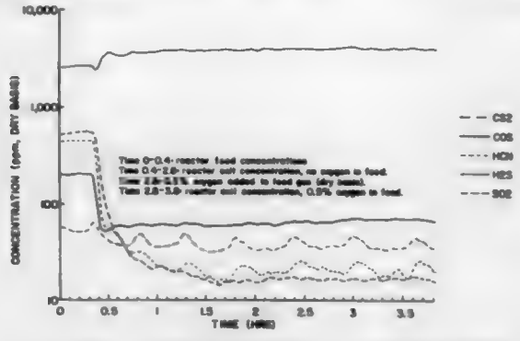
(e) separating the lead containing composition from the leach solution and recycling the lean leach solution to the leaching zone.

5,466,427

CATALYSIS AND TREATMENT OF GASES WITH THE CATALYSTS

Frederick H. Rumpf, Billerica, Mass., and Jonathan B. Scher, Portsmouth, N.H., assignors to Cabot Corporation, Boston, Mass.

Division of Ser. No. 91,796, Jul. 14, 1993, abandoned. This application Aug. 11, 1994, Ser. No. 288,765
Int. Cl.[6] B01D *53/86*
U.S. Cl. 423—210 6 Claims



1. A method comprising contacting a gas stream containing at least one component selected from the group consisting of a carbon sulfide and hydrogen cyanide with a catalyst comprising a metal oxide selected from the group consisting of cobalt oxide (CoO), nickel oxide (NiO), or mixtures thereof, in an amount ranging from about 0.5 to about 5.0% by weight; molybdenum trioxide (MoO_3) in an amount ranging from about 1.5 to about 15% by weight; and titanium dioxide (TiO_2) in an amount ranging from about 70 to 98% by weight, wherein the gas stream contains a sufficient amount of water vapor and/or hydrogen to convert carbon sulfides to hydrogen sulfide and hydrogen cyanide to ammonia.

5,466,428

MORPHOLOGICALLY IMPROVED CERIC OXIDE PARTICULATES

Claire David, Paris, and Francoise Seon, Montreuil, both of, France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Continuation of Ser. No. 963,266, Oct. 19, 1992, abandoned, which is a continuation of Ser. No. 671,944, Mar. 19, 1991, abandoned, which is a continuation of Ser. No. 556,438, Jul. 24, 1990, abandoned, which is a division of Ser. No. 211,896, Jun. 27, 1988, Pat. No. 4,965,057. This application Feb. 10, 1994, Ser. No. 194,733
Claims priority, application France, Jun. 26, 1987, 87 09020
Int. Cl.[6] C01F *17/00*
U.S. Cl. 423—263 9 Claims

1. Unground, calcined and aggregated ceric oxide particulates having a grain size distribution such that the mean diameter of the aggregates thereof ranges from 0.2 to 0.4 μm, the aggregates having a dispersion index ranging from 0.3 to 0.4.

5,466,429

PROCESS FOR PREPARING ISOCYANIC ACID FROM CYANURIC ACID

Johannes Lercher, Vienna, Austria, and Zhan Zhaoqui, Enschede, Netherlands, assignors to Chemie Linz GmbH, Linz, Austria

Filed Sep. 8, 1994, Ser. No. 302,321
Claims priority, application Austria, Sep. 9, 1993, 1818/93
Int. Cl.[6] C01C *3/14*
U.S. Cl. 423—365 8 Claims

1. Process for preparing isocyanic acid, wherein cyanuric acid is brought into contact at temperatures of from 300° to 600° C. with an aluminum catalyst, after which the isocyanic acid formed is isolated or used directly for further reaction.

5,466,430

METALLO-CARBOHEDRENES M_8C_{12}

Albert W. Castleman, Jr., State College, and Baochuan Guo, University Park, both of Pa., assignors to The Penn State Research Foundation, University Park, Pa.

Continuation-in-part of Ser. No. 850,539, Mar. 13, 1992, abandoned. This application Apr. 5, 1993, Ser. No. 42,977
Int. Cl.[6] C01B *31/00*
U.S. Cl. 423—440 1 Claim

1. A metallo-carbohedrene composition having the formula Ti_8C_{12}.

5,466,431

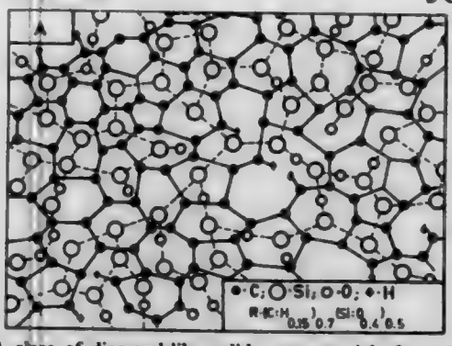
DIAMOND-LIKE METALLIC NANOCOMPOSITES

Veniamin Dorfman, 8 Norman Dr., Shoreham, N.Y. 11786, and Boris Pypkin, Moscow, U.S.S.R., assignors to Veniamin Dorfman, Shoreham, N.Y.

Division of Ser. No. 695,552, May 3, 1991, Pat. No. 5,352,493. This application May 25, 1994, Ser. No. 249,167

Int. Cl.[6] C01B *31/06*

U.S. Cl. 423—446 3 Claims



1. A class of diamond-like solid state materials formed from interpenetrating networks of carbon, hydrogen and alloying alloying elements, comprising a first network of predominantly sp^3 bonded carbon in a diamond-like carbon network stabilized by hydrogen, and at least one network made from alloying elements, including a second silicon network stabilized by oxygen and, optionally, a third metal network of metal elements from groups 1–7b and 8b of the periodic table wherein the carbon content of the solid state material is at least 40 atomic % of the sum of carbon and the other alloying elements, the hydrogen content is up to about 40 atomic % of the carbon concentration, and the sum of concentration of alloying elements is greater than about 2 atomic % of the sum of carbon, hydrogen, and the alloying elements.

5,466,432

CRYSTALLINE ZEOLITE-LIKE GALLOSILICATE, AND METHOD FOR ITS SYNTHESIS

Martin Wallau, Mainz; Rudolf Spichtinger, Frankfurt; Klaus K. Unger, Bensheim; Arno Tissler, Bonn, and Roland Thome, Bonn, all of, Germany, assignors to VAW Aluminium AG, Bonn, and Veba Oel AG, Gelsenkirchen-Hassel, both of, Germany

Division of Ser. No. 903,792, Jun. 24, 1992, Pat. No. 5,365,002. This application Aug. 8, 1994, Ser. No. 287,232

Claims priority, application Germany, Jun. 25, 1991, 41 20 847.1

The portion of the term of this patent subsequent to Dec. 28, 2010, has been disclaimed.

Int. Cl.[6] C01B *39/06;39/36*

U.S. Cl. 423—700 16 Claims

1. A method of synthesizing a crystalline structure having a gallosilicate composition, said structure belonging to the crystallographic family of tectosilicates and built up from TO_4 tetrahedra that are connected via oxygen atoms, said structure having an outer surface, said outer surface having an Si to Ga atomic ratio that is less than or equal to the average Si to Ga atomic ratio for the whole crystal, said method comprising hydrothermally crystallizing an essentially inorganic reaction mixture having the following chemical composition molar ratios:

$SiO_2/Ga_2O_3 \geqq 5$

$OH/SiO_2 = 0.05–1.0$

$H_2O/SiO_2 = 10–1{,}000$,

and recovering said gallosilicate structure, wherein said structure displays X-ray diffractions corresponding to at least the interlattice plane distances (d) listed below:

d (Angstroms)
11.2±0.2
10.0±0.2
6.4±0.1
5.95±0.1
5.6±0.1
3.87±0.05
3.83±0.05
3.76±0.05
3.74±0.05
3.66±0.05
2.01±0.02
1.99±0.02.

5,466,433

POLYIODINATED AROYLOXY ESTERS

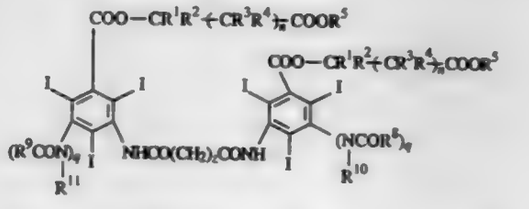
Edward R. Bacon, Audubon, Pa.; Sol J. Daum, Albany, and Paul P. Spara, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 990,987, Dec. 16, 1992, Pat. No. 5,322,679. This application Jun. 20, 1994, Ser. No. 261,794

Int. Cl.[6] A61K *49/04*

U.S. Cl. 424—9.451 9 Claims

1. A compound having the structure



wherein z is an integer from 1 to 10; q is 0 or 1; n is an integer from 1 to 20;

R^1 and R^2 are independently H, alkyl, fluoroalkyl, cycloalkyl, aryl, aralkyl, alkoxy or aryloxy;

R^3 and R^4 are independently H, alkyl, fluoroalkyl, cycloalkyl, aryl, aralkyl, alkoxy, aryloxy, halogen, hydroxy or acylamino;

R^5 is H, alkyl, cycloalkyl, aryl, aralkyl, alkoxyalkyl or acetamidoalkyl;

R^8 and R^9 are independently alkyl, cycloalkyl, aryl or aralkyl; and

R^{10} and R^{11} are independently H or —COR^8; said compound comprising at least 40% iodine by weight.

5,466,434

METHOD OF DIAGNOSING FATTY ACID METABOLISM OR ABSORPTION DISORDERS USING LABELED TRIGLYCERIDE OILS PRODUCED BY CULTIVATION OF MICROORGANISMS

David J. Kyle, Catonsville, Md., assignor to Martek Corporation, Columbia, Md.

Division of Ser. No. 936,248, Sep. 24, 1992, Pat. No. 5,376,540, which is a division of Ser. No. 525,820, May 21, 1990, Pat. No. 5,164,308. This application Nov. 10, 1994, Ser. No. 338,755

Int. Cl.[6] C12Q *1/64;1/02;* C12P *7/64*

U.S. Cl. 424—9 11 Claims

1. A method of diagnosing fatty acid metabolism or absorption disorders in a patient, comprising:

(a) administering to said patient a triglyceride oil randomly labeled with ^{13}C produced by a process comprising

(1) providing to microorganisms in a controlled environment a carbon substrate enriched in ^{13}C,

(2) cultivating said microorganisms,

(3) inducing said microorganisms to produce an oil randomly labeled with ^{13}C and

(4) recovering said oil, and

(b) monitoring said patient's breath to determine the rate of appearance of labeled CO_2.

5,466,435

COMPOSITIONS OF IODOPHENOXY ALKYLENE ETHERS AND CELLULOSE DERIVATIVES FOR VISUALIZATION OF THE GASTROINTESTINAL TRACT

Edward J. Baker, Northumberland, England; Edward R Bacon, Audubon, Pa.; Carl R. Illig, Phoenixville, Pa.; Thomas J. Caulfield, Audobon, Pa.; Brent D. Douty, Coatesville, Pa.; Kurt A. Josef, Wayne, Pa.; John L. Toner, Downingtown, Pa., and Robert W. Lee, Gilbertsville, Pa., assignors to Sterling Winthrop Inc., Malvern, Pa.

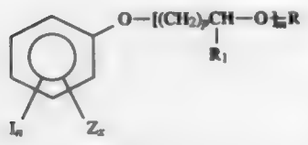
Continuation-in-part of Ser. No. 29,485, Mar. 11, 1993, Pat. No. 5,348,727. This application Apr. 4, 1994, Ser. No. 222,787

Int. Cl.[6] A61K *49/04*

U.S. Cl. 424—9.45 **16 Claims**

1. An x-ray contrast composition for oral or retrograde examination of the gastrointestinal tract comprising:

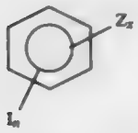
(a) from about 0.01 to 200 mg of iodine per ml of the composition of an x-ray contrast producing agent having the formula, or a pharmaceutically acceptable salt thereof



wherein

Z is H, halo, C_1–C_{20} alkyl, cycloalkyl, lower alkoxy, alkoxycarbonyl, cyano, where the alkyl and cycloalkyl groups can be substituted with halogen or halo-lower-alkyl groups;

R is C_1–C_{25} alkyl, cycloalkyl,



halo-lower-alkyl; each of which may be optionally substituted with halo, fluoro-lower-alkyl, aryl, lower-alkoxy, hydroxy, carboxy, lower-alkoxy carbonyl or lower-alkoxycarbonyloxy;

$(CR_1R_2)_p$—$(CR_3{=}CR_4)_m$Q, or $(CR_1R_2)_p$—C≡C—Q;

R_1, R_2, R_3 and R_4 are independently H or lower-alkyl, optionally substituted with halo;

x is 1–4;

n is 1–4;

m is 1–15;

p is 1–20; and

Q is H, lower-alkyl, lower-alkenyl, lower-alkynyl, lower-alkylene, aryl, or aryl-lower alkyl;

(b) from 0.05 to 10% w/v of a cellulose derivative selected from the group consisting of methylcellulose, carboxymethylcellulose, sodium carboxymethylcellulose, hydroxyethyl methylcellulose, hydroxypropyl methylcellulose and microcrystalline cellulose;

(c) from 0 to 55% w/v of an oily vehicle;

(d) from 0 to 20% w/v of a surfactant selected from the group consisting of nonionic, anionic, cationic and zwitterionic surfactants;

(e) from 0 to 15% w/v of a viscosity modifying excipient; and

(f) water to make 100% by volume.

5,466,436

MEDICAMENTS FOR TREATING INFLAMMATORY CONDITIONS OR FOR ANALGESIA

Roger Stables, Ware, Great Britain, assignor to Glaxo Group Limited, London, England

Continuation of Ser. No. 986,019, Dec. 4, 1992, abandoned. This application Dec. 17, 1993, Ser. No. 168,231

Claims priority, application United Kingdom, Dec. 6, 1991, 9126027; Mar. 20, 1992, 9206083

Int. Cl.[6] A61K *49/00;31/62;31/555*

U.S. Cl. 514—161 **15 Claims**

1. A method of treating inflammatory conditions or for analgesia in a human or animal subject, which comprises administering to said subject effective amounts of (i) ranitidine bismuth citrate and (ii) a non-steroidal anti-inflammatory drug, wherein the compounds (i) and (ii) are administered as separate compositions, and wherein the method significantly reduces mucosal lesions caused by said non-steroidal anti-inflammatory drug.

5,466,437

ANTIBACTERIAL ANTIPLAQUED ORAL COMPOSITION MOUTHWASH OR LIQUID DENTIFRICE

Abdul Gaffar, Princeton; Nuran Nabi, No. Brunswick; John Affiitto, Brookside; John Affiitto, Brookside, all of N.J., and Orum Stringer, Yardley, Pa., assignees to Colgate Palmolive Company, Piscataway, N.J.

Division of Ser. No. 961,976, Oct. 16, 1992, Pat. No. 5,294,431, which is a division of Ser. No. 398,593, Aug. 28, 1989, Pat. No. 5,188,821, which is a continuation-in-part of Ser. No. 291,712, Dec. 29, 1988, Pat. No. 4,894,220, and a continuation-in-part of Ser. No. 346,258, May 1, 1989, Pat. No. 5,043,154, which is a continuation of Ser. No. 8,901, Jan. 30, 1987, abandoned, said Ser. No. 291,712is a continuation-in-part of Ser. No. 8,901, Jan. 30, 0. This application Dec. 3, 1993, Ser. No. 161,013

The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.

Int. Cl.[6] A61K *7/16;7/18;7/26*

U.S. Cl. 424—52 **25 Claims**

1. Oral composition mouthwash or liquid dentifrice comprising an aqueous vehicle, an effective antiplaque amount of a substantially water insoluble noncationic antibacterial agent, said oral composition comprising at least one of a surface active agent, a flavoring oil and a non-toxic alcohol and about 0.005–4% by weight of an antibacterial-enhancing agent having an average molecular weight of about 100 to 1,000,000 which contains at least one carboxylic delivery-enhancing functional group and at least one organic retention-enhancing group, wherein said delivery-enhancing group enhances delivery of said antibacterial agent to oral tooth and gum surfaces and said retention-enhancing group enhances attachment, adherence or bonding of said antibacterial agent on oral tooth and gum surfaces, wherein said oral composition mouthwash or liquid dentifrice is free of polyphosphate anticalculus agent in an effective anticalculus amount.

5,466,438

LIPOSOLUBLE COMPOUNDS USEFUL AS MAGNETIC RESONANCE IMAGING AGENTS

Evan C. Unger, and DeKang Shen, both of Tucson, Ariz., assignors to ImaRx Pharmaceutical Corp., Tucson, Ariz.

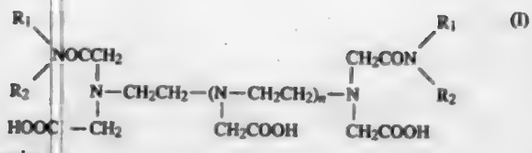
Division of Ser. No. 887,290, May 22, 1992, Pat. No. 5,312,617, which is a continuation-in-part of Ser. No. 704,542, May 23, 1991, abandoned. This application Dec. 27, 1993, Ser. No. 173,649

The portion of the term of this patent subsequent to May 17, 2011, has been disclaimed.

Int. Cl.[6] A61B *5/055*

U.S. Cl. 424—936.5 **61 Claims**

1. A contrast agent for magnetic resonance imaging comprising a paramagnetic ion in combination with a compound of the formula



(I)

wherein:

each R_1 is, independently, a substituted or unsubstituted C_7–C_{30} straight chain or cyclic compound;

each R_2 is, independently, a substituted or unsubstituted C_1–C_{30} straight chain or cyclic compound; and

n is 0 to 1.

5,466,439

POLYMERIC CONTRAST ENHANCING AGENTS FOR MAGNETIC RESONANCE IMAGES

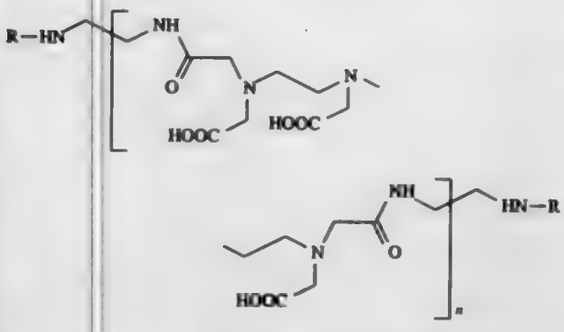
Wendell A. Gibby, Mapleton, and N. Rao Puttagunta, Provo, both of Utah, assignors to Magnetic Research, Inc., Provo, Utah

Continuation-in-part of Ser. No. 975,607, Nov. 12, 1992, Pat. No. 5,330,743. This application Jul. 7, 1994, Ser. No. 272,762

Int. Cl.[6] A61B *5/055*

U.S. Cl. 424—9.365 **18 Claims**

1. A magnetic resonance contrast enhancing agent comprising a chelating agent represented by the formula:



where n≥2, and R is selected from the group consisting of a polyamide co-polymer of an aminopolycarboxylate, and a diamine.

5,466,440

FORMULATIONS OF ORAL GASTROINTESTINAL DIAGNOSTIC X-RAY CONTRAST AGENTS IN COMBINATION WITH PHARMACEUTICALLY ACCEPTABLE CLAYS

Stephen B. Ruddy, Schwenksville; W. Mark Eickhoff, Downingtown; Gary Liversidge, West Chester, and Eugene R. Cooper, Berwyn, all of Pa., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 30, 1994, Ser. No. 367,407

Int. Cl.[6] A61K *49/04*

U.S. Cl. 424—9.411 **8 Claims**

1. An orally/rectally administrable gastrointestinal diagnostic x-ray contrast formulation comprising:

of from about 4 to about 45% w/v of an essentially water-insoluble particulate radiopaque crystalline material having an effective average particle size of less than about 2,000 nm;

of from about 0.5 to about 10% w/v of a bioadhesive surfactant stabilizer selected form the group consisting of: polyethylene-polypropylene glycol block polymers of the formula (i)

(i) $(polyethylene\ oxide)_a$ - $(polypropylene\ oxide)_b$ - $(polyethylene\ oxide)_c$ *wherein*

a is 46, 52, 62, 75, 97, 98, 122 and 128;

b is 16, 30, 35, 39, 47, 54 and 67; and

c is 46, 52, 62, 75, 97, 98, 122 and 128;

(ii) polyvinyl alcohol,

(iii) polyvinyl pyrrolidone,

(iv) hydroxypropyl methylcellulose, and

(v) polyoxyethylene sorbitan mono-oleate;

from about 0.1 to 10% of a pharmaceutically acceptable clay selected from the group consisting of: montmorillonite, beidelite, nontronite, hectorite and saponite; and

water to make 100% w/v.

5,466,441

NAIL POLISH DRYING METHOD

Frances E. Fisher, and Joseph S. Fisher, 4502 Meager Clr., Port Charlotte, Fla. 33948

Filed Jun. 29, 1994, Ser. No. 265,255

Int. Cl.[6] A61K *7/04*

U.S. Cl. 424—61 **4 Claims**

1. A rapid method of drying a nail polish composition on a nail which consists of:

a) applying on said nail a base coat, two coats of nail polish and a top coat;

b) waiting one minute after application of said nail polish and top coat;

c) brushing on said nail and over said nail polish and top coat, a processed cotton seed oil, wherein said processed cotton seed oil is produced by pressing said oil from cotton seeds, refining said oil with diatomaceous earth and flux calcined, and preventing rancidity by a treatment with a combination of BHA, propyl gallate, citric acid and propylene glycol.

5,466,442

CHOLESTERYL SILICONE DERIVATIVE AND COSMETIC COMPOSITION COMPRISING THE SAME

Yukihiro Ohashi, and Akira Kawamata, both of Utsunomiya, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 913,719, Jul. 16, 1992, abandoned. This application Dec. 27, 1993, Ser. No. 173,471

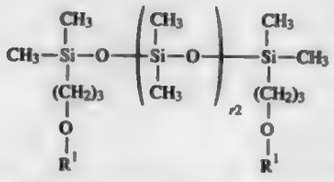
Claims priority, application Japan, Jul. 19, 1991, 3-179695

Int. Cl.[6] A61K *7/06*

U.S. Cl. 424—70.12 **6 Claims**

1. A silicone derivative (1) having polysiloxane units represented by the following general formula (1b):

(1b)



wherein R^1 is a cholesteryl or dihydrocholesteryl group, and r2 is a number of 9–160 on the average, said silicone derivative having an average molecular weight of 1,000 to 20,000.

5,466,443

HERBAL-BASED ORAL COMPOSITION AND PROCESS FOR PRODUCING THE SAME

Shu K. Ho, No. 3, Kam Lam St., Kwong Fung Building, 13th Floor, Flat K, Mongkok, Kowloon, Hong Kong, and Yi F. Yao, Shijiazhuang, China, assignors to Shu K. Ho, Kowloon, Hong Kong

Filed May 31, 1994, Ser. No. 252,101

Int. Cl.[6] A61K *7/06;35/78*

U.S. Cl. 424—70.6 **3 Claims**

1. An herbal-based oral composition for periodic retention within the oral cavity of a human, comprising:

a mixture of herbs included at a level of from 2.5 to 15% of the total composition weight, the mixture comprising *Radix Polygoni Multiflori, Rhizoma Drynariae, Rhizoma Ligustici Chuanxiong, Calculus Bovis, Indigo Naturalis, Herba Ecliptae, Pericarpium Trichosanthis, Radix Sophorae Flavescentis, Spina Gleditsiae, Radix Angelicae Sinensis,* and *Fructus Mori,* and Halitum; and

an oral retention base selected from the group consisting of gels, pastes and gums.

5,466,444

RESORBABLE, BIOCOMPATIBLE COPOLYMERS AND THEIR USE

Christian Jurgens, Hochallee 19, 2000 Hamburg 13, Germany

Filed Jun. 29, 1992, Ser. No. 906,319

Int. Cl.[6] A61K *31/74;* **C08G** *63/08;63/82*

U.S. Cl. 424—78.08 **15 Claims**

1. A preparation for application to the skin comprising:

a solvent, and

a copolymer dispersed in said solvent, prepared by the reaction of racemic lactide and a monomer selected from the group consisting of ε-caprolactone, δ-valerolactone, γ-decalactone or β-hydroxybutyric acid, wherein the lactide is reacted with the monomer in a molar ratio of approximately 95–70 to 5–30 in the presence of a metal carboxylate, wherein the lactide is reacted to the monomer at a temperature of approximately 150° C., the lactide being reacted for approximately 16 to 48 hours and wherein the metal carboxylate is present in a ratio of lactide and monomer to carboxylate of from about 100:1 to 500:1.

5,466,445

METHODS FOR REDUCING SALMONELLA IN CHICKENS

Robert L. Hunter, Tucker, Ga., assignor to Emory University, Atlanta, Ga.

Continuation-in-part of Ser. No. 714,258, Jun. 12, 1991, Pat. No. 5,234,683, which is a continuation of Ser. No. 107,358, Oct. 9, 1987, Pat. No. 5,114,708, which is a continuation-in-part of Ser. No. 90,795, Aug. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 872,111, Jun. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 787,770, Oct. 15, 1985, abandoned, which is a continuation-in-part of Ser. No. 745,917, Jun. 18, 1985, abandoned. This application Jul. 21, 1993, Ser. No. 74,069

The portion of the term of this patent subsequent to Feb. 2, 2010, has been disclaimed.

Int. Cl.[6] A61K *31/74;31/075*

U.S. Cl. 424—78.31 **25 Claims**

1. A method for reducing microorganisms in the gut of an animal comprising,

orally administering to an animal an effective amount of a biologically active copolymer sufficient to reduce the number of microorganisms in the gut of the animal, said biologically active copolymer comprising an octablock copolymer having the following formula:

wherein:

the mean aggregate molecular weight of the portion of the octablock copolymer represented by polyoxypropylene is between approximately 5000 and 7000 Daltons;

a is a number such that the portion represented by polyoxyethylene constitutes between approximately 10% to 40% of the compound by weight; and

b is a number such that the polyoxypropylene portion of the total molecular weight of the octablock copolymer constitutes between approximately 60% and 90% of the compound by weight.

5,466,446

TOPICAL COMPOSITIONS CONTAINING BENSOYL PEROXIDE AND CLINDAMYCIN AND METHOD OF USE THEREOF

Werner K. Stiefel, Coral Gables, Fla., and Karl F. Popp, Schodack Landing, N.Y., assignors to Stiefel Laboratories, Inc., Coral Gables, Fla.

Filed Feb. 16, 1994, Ser. No. 197,076

Int. Cl.[6] A61K *31/70;31/74;31/78;31/075*

U.S. Cl. 424—78.37 **2 Claims**

1. A topical gel composition for treating skin disorders involving the sebaceous glands and follicles in humans, said composition consisting essentially of an effective amount of a mixture of: (i) at least 4.5% by weight of benzoyl peroxide, and (ii) at least 0.9% by weight of clindamycin, admixed with a topically acceptable pharmaceutical carrier consisting essentially of about 0.04% disodium monolaurel sulfosuccinate, about 2.0% of a carbomer, about 0.1% of disodium ethylene diaminetetraacetic acid, about 0.1% of dimethicone, about 0.25% of hydrated silica, about 0.20% of poloxamer 182 and about 0.31% of sodium hydroxide by weight of said composition, wherein the composition is stable for at least 3 months at ambient temperature.

5,466,447

METHOD FOR TREATING PSORIASIS

Robert I. Abels, Westfield, and Karen Reilly, Cranford, both of N.J., assignors to Amgen Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 762,667, Sep. 18, 1991, abandoned, which is a continuation of Ser. No. 213,194, Jun. 29, 1988, abandoned. This application Apr. 21, 1994, Ser. No. 230,662

Int. Cl.[6] A61K *45/05*

U.S. Cl. 424—85.2 **16 Claims**

1. A therapeutic method of treating a human subject for a pre-existing condition of psoriasis, comprising administering to the subject having such pre-existing condition a daily dose of a pharmaceutical composition comprising (1) an amount of interleukin-2 from at least 1,000 units to about 40,000 units per kilogram of body weight sufficient to cause at least partial regression of such condition and (2) a pharmaceutically acceptable carrier.

5,466,448

BIOLOGICAL CONTROL OF ORTHOPTERA PEST INSECTS

Grover C. Smart, Jr., and Khuong B. Nguyen, both of Gainesville, Fla., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.

Continuation of Ser. No. 3,574, Jan. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 957,771, Oct. 7, 1992, abandoned, which is a division of Ser. No. 453,806, Dec. 20, 1989, Pat. No. 5,165,930, which is a continuation-in-part of Ser. No. 406,825, Sep. 12, 1989, abandoned, which is a continuation of Ser. No. 895,385, Aug. 11, 1986, abandoned. This application Apr. 28, 1994, Ser. No. 235,137

The portion of the term of this patent subsequent to Nov. 24, 2009, has been disclaimed.

Int. Cl.[6] A61K *35/56;* A01N *63/00*

U.S. Cl. 424—93.1 2 Claims

1. A method of biologically controlling pest insects in the order Orthoptera selected from the group consisting of grasshoppers, cockroaches, field crickets and house crickets comprising contacting so as to infect said insects with an insecticidal amount of infective third stage of *Steinernema scapterisci* nematodes having ATCC Deposit No. 75197.

5,466,449

ANTIBACTERIAL COMPOSITION AND METHOD OF USE

Witold Kiczka, Princeton, N.J., assignor to Nika Health Products, Ltd., Vaduz, Liechtenstein

Division of Ser. No. 459,738, Jan. 26, 1990, Pat. No. 5,200,182. This application Apr. 8, 1992, Ser. No. 865,002

Claims priority, application WIPO, May 26, 1988, 88/01785

Int. Cl.[6] A61K *38/46*

U.S. Cl. 424—94.61 17 Claims

1. A method of treating a bacterial infection comprising administering to a human or animal patient in need of such treatment an effective amount of a composition of a dimer of lysozyme and a pharmaceutically acceptable carrier.

5,466,450

ANTIVIRAL ANTIBIOTIC BU-4224V

Mitsuaki Tsunakawa, Kamiooka; Tetsuro Yamasaki, Kohoku; Koji Tomita, Tokyo, and Osamu Tenmyo, Midori, all of, Japan, assignors to Bristol-Myers Squibb Co., New York, N.Y.

Division of Ser. No. 559,864, Jul. 27, 1990, Pat. No. 5,256,646. This application Jul. 20, 1993, Ser. No. 95,435

Int. Cl.[6] A61K *35/00*

U.S. Cl. 424—118 5 Claims

1. The compound BU-4224 V A characterized as follows:

(a) appearance: white amorphous powder

(b) melting point: 77°–78° C.

(c) optical rotation: $[\alpha]_D^{25}$–13° (c 0.5, MeOH)

(d) elemental analysis: C, 46.02%, H 7.30%

(e) secondary ion mass spectrum: m/z 1743, 1683, 1647

(f) IR (KBr): 3410, 2930, 2850, 1735, 1720(sh), 1640, 1460, 1360, 1200–1000

(g) thin-layer chromatography: R_f=0.47, R_f=0.42 (EtOAc-MeOH-H_2O=10:3:1)

(h) UV in MeOH: No absorption maxima above 210 nm.

5. A method for treating a mammalian host affected by bacterial infections, which method comprises administering to said host an effective amount of the compound of claim 1.

5,466,451

PHARMACEUTICALLY ACTIVE COMPOSITION EXTRACTED FROM TANACETUM PARTHENIUM, PROCESS FOR ITS EXTRACTION, AND PHARMACEUTICAL COMPOSITION CONTAINING SAME

Norbert Beuscher, Salzgitter, and Ingo Willigmann, Goslar, both of, Germany, assignors to Schaper & Bruemmer GmbH & Co., KG, Salzgitter, Germany

Filed Jan. 29, 1993, Ser. No. 11,526

Claims priority, application Germany, Jan. 31, 1992, 42 02 657.1

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 19 Claims

1. A pharmaceutical composition having improved stability comprising a pharmaceutically acceptable carrier in combination with an extract obtained from *Tanacetum parthenium* containing sesquiterpene lactone parthenolide compounds, said extract obtained by a process consisting essentially of:

a.) finely milling *Tanacetum parthenium;*

b.) extracting the finely milled *Tanacetum parthenium* with CO_2 in the supercritical state at a temperature of from 32° to 60° C. and under a pressure from 150 to 350 bars; and

c.) isolating the extract thereof.

5,466,452

PHARMACEUTICAL COMPOSITIONS FOR THE TREATMENT OF SKIN DISORDERS

Brian A. Whittle, Hornsea, United Kingdom, assignor to Phytopharm Ltd., North Humberside, United Kingdom

PCT No. PCT/GB92/00359, § 371 Date Aug. 26, 1993, § 102(e) Date Aug. 26, 1993, PCT Pub. No. WO/9215314, PCT Pub. Date Sep. 17, 1992

PCT Filed Feb. 28, 1992, Ser. No. 108,640

Claims priority, application United Kingdom, Feb. 28, 1991, 9104286

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 24 Claims

1. A process to make a composition for treating eczema, psoriasis, pruritis and inflammatory reactions of the skin which comprises:

(a) subjecting a plurality of herbs having anti-inflammatory activity, adrenocortical stimulating activity and corticosol-protecting activity to steam distillation and decoction, to produce an extract of the herbs;

(b) reducing the amount of polysaccharides and/or sugars, in the extract to less than 5% by weight under conditions which do not substantially reduce the content of glycosides which are present in said material by one or more of:

(i) fermenting with barley malt or with a microorganism which produces amylase and/or saccharolytic enzymes or by using isolated amyolytic or saccharolytic enzymes,

(ii) extracting with a solvent having a polarity in the range E° 0.4 to 0.99, or a mixture of solvents at least one of which has a polarity within said range,

(iii) precipitating the polysaccharide and/or sugar with an inorganic compound; and

(c) concentrating the active agents present in the extracted material by further extracting with a solvent having a polarity in the range E° 0.4 to 0.99, or a mixture of solvents, at least one of which has a polarity within said range,

wherein the herbs are selected from the group consisting of *Potentilla chinensis* (Bai Tai Weng), *Rehmannia glutinosa* (Dihuang), *Radix paeoniae lactiflorae/veitchii* (Chi Shao), *Dictamnus augustifolia* (Bai Xan Pi), *Glycyrrhiza uralensis* (Gan Cao), *Ledebouriella sesloides* (Fang Feng), *Tribulus terrestris* (Ci Ji Li), *Lopatheri gracile* (Dan Zhu Ye), *Schizonepeta tenuifolia* (Jing Jie Sui), and *Akebia trifoliata* (Mu Tong).

5,466,453

METHOD FOR IMPROVING THE TASTE OF PINE EXTRACT, AND ORALLY ADMINISTRABLE PRODUCT OBTAINED THEREBY

Yukio Uchida; Satoshi Iritani, and Toshio Miyake, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Continuation of Ser. No. 42,110, Apr. 2, 1993, abandoned. This application May 26, 1994, Ser. No. 249,661
Claims priority, application Japan, Apr. 2, 1992, 4-126605
Int. Cl.[6] A61K *35/78*
U.S. Cl. 424—195.1 **9 Claims**

1. A method for improving the taste of a pine extract, comprising adding to 0.01–5 w/w % of a pine extract a bamboo extract in an amount of 0.1–20-fold that of said pine extract and a Japanese apricot extract in an amount of 1–200-fold that of said pine extract wherein the amounts of said pine extract, bamboo extract and Japanese apricot extract are based on their dry solids weight.

5,466,454

METHOD AND APPARATUS FOR PRODUCING HERBAL CONCENTRATE

William Chang, 1015 S. Nogales St., Suite 120, Rowland Heights, Calif. 91748

Continuation of Ser. No. 71,701, Jun. 4, 1993, abandoned. This application Dec. 20, 1994, Ser. No. 361,452
Int. Cl.[6] A61K *35/78*
U.S. Cl. 424—195.1 **11 Claims**

1. An improved extraction process of the type including the steps of boiling herbs in a solvent to produce an herbal liquid and concentrating the herbal liquid to produce an herbal extract, the improved process comprising the steps of:

(a) boiling the herbs in a solvent in an extraction vessel at a temperature in the range of approximately 60° to 70° Centigrade to produce an herbal vapor and an herbal liquid;

(b) conducting the herbal vapor from the extraction vessel towards a collection vessel to collect a resulting herbal condensate therein;

(c) periodically adding collected herbal condensate back into the herbal liquid in the extraction vessel while continuing to boil the herbs;

(d) conducting a batch of the herbal liquid from the extraction vessel to a concentration vessel;

(e) concentrating the batch of herbal liquid to form herbal extract;

(f) continuing steps (a)–(c) while the batch of herbal liquid is being concentrated;

(g) conducting a second batch of the herbal liquid from the extraction vessel to the concentration vessel after herbal condensate has been added a second plurality of times to the extraction vessel; and

(h) concentrating the second batch of herbal liquid to form herbal extract.

5,466,455

POLYPHASE FLUID-EXTRACTION PROCESS, RESULTING PRODUCTS AND METHODS OF USE

Miles C. Huffstutler, Jr., 1608 W. 155th St., Burnsville, Minn. 55306, and Gary M. Steuart, P.O. Box 356, Harmony, Minn. 55939

Continuation-in-part of Ser. No. 980,839, Nov. 24, 1992, Pat. No. 5,330,756, which is a continuation-in-part of Ser. No. 599,616, Oct. 18, 1990, abandoned. This application Sep. 15, 1993, Ser. No. 120,988
The portion of the term of this patent subsequent to Jul. 19, 2011, has been disclaimed.
Int. Cl.[6] A61K *35/78;* **A01N** *25/02*
U.S. Cl. 424—401 **15 Claims**

1. A process for preparation of concentrated fluid therapeutic extracts, cfte, by extracting bioactive components from plant tissue comprising the following steps:

(a) selecting live, healthy plants or vital cultured tissue from one or more wild or non-wild chemotaxonomically-classified plant species from the group consisting of:

Agauria salicifolia, Albizia amara, Allium sativum, Anemarrhena asphodeliodes, Archangelica officinalis, Artemenisia annua, Artemisia annua, Aster scaber, Azadirachta indica, Bixa orellana, Bryophyllium pinnatum, Bupleuri radix, Calophyllum lanigerum, Calubrina (mabi), *Camellia sinesis* (green tea), *Cassia alata, Coccinia indica, Dallium guincese, Desmos chinensis,* Eleutherococcus, *Eleutherococcus senticosus, Ephedra sinica, Erythrina costaricensis, Fusarium acuminatum, Galphimia glauca, Gardeniae fructus, Ginko bilboa, Glycrrhizae radix, Himanthalia elongata, Hypericum perforatum, Ipomoea tricolor, Jatropha curcas, Kigelia pinnata, Lactocuccus lactis, Lathyrus sativus, Ledum palustre, Lepechinia hastata, Mentha arvensis, Mirabilis jalapa, Momordica charantia, Notopterygium forbesii, Notopterygium incisium, Ocimum gratissimum, Origanum cordifolium, Panax japonicum, Panax japonicus, Panax notoginseng, Panax quinquefolium, Panax shinseng, Parietaria judaica, Phoenix dactylifera, Phyllanthrus amarus, Phyllanthrus maderapatensis, Picrorhiza kurroa, Piper methysticum, Pisum sativum, Plumbago rosea, Policias fruticosum* (Dihn-lang), *Pongamia pinnata, Psidium guajava, Rhododendron luteum, Rhododendron ponticum, Rosmarinus officinalis, Salvia officinalis, Saraka asoca, Slavia miltiorrhzia, Symphytum officinale, Symphytum asperum, Symphytum armeniacum, Symphytum tauricum, Symphytum sylvaticum, Symphytum peregrinum, Symphytum anatolicum, Symphytum icaricum, Symphytum orientale, Symphytum kurdicum, Symphytum pseudobulbosum, Symphytum uplandicum, Symphytum circinale, Symphytum ottomanum, Symphytum icaricum, Symphytum brachycalyx, Symphytum aintabicum, Symphytum longisetum, Symphytum bornmuelleri, Symphytum tuberosum, Symphytum bulbosum, Symphytum ibericum,* Symphytum longipetiolatum, Taxus baccata, Taxus brevifolia, Taxus canadensis, Taxus chinesis, Taxus cuspidata, Taxus floridana, Teucrium cyprium, Teucrium divaricatum*_canescens, Teucrium micropdioides, Veronia amygdalina, and Waldstenia fragarioides;*

(b) harvesting viable tissue from one or more plant parts of said selected plant species said parts selected from the group consisting of roots, rhizomes, stems, petioles, cultured tissues, leaves, needles, anthers, buds, fruit, nuts, seeds, pollen and blooms;

(c) charging said harvested viable tissues immediately into a protective, closed chamber, which is radiation-opaque, and which provides a controlled chemical and thermal environment defined by temperature, fluid composition, and total pressure to preserve said viable tissue and the bioactive agents contained therein and prevent degradation by air oxidation or photochemical processes;

(d) removing said charged viable tissue from said protective chamber and comminuting it immediately within said controlled chemical and thermal environment into a length or thickness dimension of approx. 1 mm to stimulate the development of phytoalexins;

(e) charging said comminuted parts within a time period of approximately 0–2 hours into a closed, extraction apparatus

adapted to provide controlled chemical and physical environment with specific ranges of internal pressure, temperature and a forced-convection-contact-velocity differential between said comminuted parts and a poly-phase extraction fluid for an extended diffusion time;

(f) charging an extraction fluid into said extraction apparatus wherein said extraction fluid is selected from the group consisting of chemical compounds, a single phase, multiple phases, vapor solution, liquid solution, emulsion, and suspension, while the mass ratio of said extraction fluid to said comminuted plant tissue is held in the range 0.01 to 1000 wherein said extraction fluid is selected from the group consisting of

(f1) single- or two- phase water;

(f2) single- or two- phase aqueous solutions with one or more biocompatible solutes;

(f3) two-phase, single-component organic solvents having a liquid and vapor phase in equilibrium;

(f4) multi-phase, multi-component biocompatible solution-emulsions with one or more dispersed liquid phases and an equilibrium vapor phase; and

(f5) multi-phase, multi-component biocompatible solution-emulsions with one or more dispersed liquid phases, and a non-equilibrium vapor phase containing dispersed droplets, particles, or vesicles;

(g) extracting, by diffusional transfer, biologically active species into said extraction fluid from said comminuted plant tissue in said extraction apparatus for a total diffusion time in the range 0.1–200 hours while said forced-convection-contact-velocity differential is maintained within the range 0.5–3 meter/sec; and internal temperature is in the range 20–400 deg. K and an absolute internal pressure is in the range 1–5000 kPa;

(h) separating solid plant tissue residues from said resulting extract by physical means selected from the group consisting of solvent extraction, sedimentation, coagulation, distillation, centrifugation and filtration through microporous, adsorbent media.

5,466,456

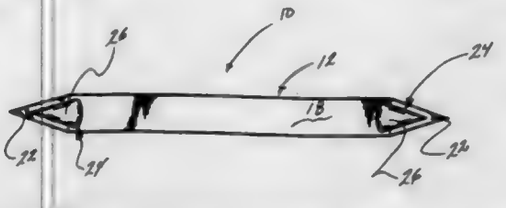
FACIAL CLEANSER

Morris S. Glover, 6033 Bear Creek Dr., Apt. 104, Bedford Heights, Ohio 44046

Continuation of Ser. No. 800,600, Nov. 27, 1991, abandoned. This application Jul. 12, 1993, Ser. No. 90,565

Int. Cl.[6] A61K *7/00;9/70*

U.S. Cl. 424—401 **5 Claims**



1. A facial cleanser adapted for cleansing a person's nose comprising:

an elongate strip having pointed ends and which is about 3.0 inches long, 1.0 inch wide and 0.27 inch thick and that can be bend about its mid-point to form a bight portion and a pair of wing portions extending from the bight portion, the strip being formed of a material suitable for scraping one's skin, said material being selected from the group consisting of polyethylene, polypropylene, polyvinyl chloride, metal and rubber;

the strip including a first surface and an opposed second surface;and

gripping means for gripping the strip, the gripping means being disposed at the end of each wing portion, the gripping means being in the form of indentations in the first surface that extend through the strip so as to form raised portions on the second surface; and

an absorbent pad attached to the second surface of said strip, the pad being impregnated with a topically effective agent for application to the surface of the skin being cleansed.

5,466,457

COSMETIC STICKS

Günther Schneider, Hamburg; Manfred Klier, Aumühle; Marta Aul, Buchholz, all of, Germany, and Stephan Teichmann, Tokyo, Japan, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany

Filed Feb. 28, 1994, Ser. No. 203,085

Claims priority, application Germany, Mar. 1, 1993, 43 06 068.4

Int. Cl.[6] A61K *7/00;7/025*

U.S. Cl. 424—401 **10 Claims**

1. A uniform composition for an emulsion cosmetic stick, by weight consisting of

a) 0.5 to 50% beeswax,

b) 0.5 to 50% of at least one ester of a saturated carboxylic acid and a saturated alcohol,

ba) the acid having 10–19 carbon atoms and the alcohol 14–40 carbon atoms, or

bb) the acid having 20–40 carbon atoms and the alcohol having 35–40 carbon atoms,

c) 0.1 to 20% of water, and

d) optionally one member selected from the group consisting of an emulsifier, perfume oil, pigment, light stabilizer, moisturizer, vitamin, and preservative

the composition being substantially free of paraffins and the ratio of (a):(b) ranging from 1:1 to 1:5.

5,466,458

EMULSIFIED SPRAY FORMULATIONS

Robert Martin; George R. Cayley, both of Hertfordshire, England; Jonathan R. M. Thacker, Paisley, Scotland; Franklin R. Hall, Wooster, Ohio; Denise K. North, Hertfordshire, England; John M. Groome, Hertfordshire, England, and David A. Jeffries, Hertfordshire, England, assignors to Rousel Uclaf, France

Continuation-in-part of Ser. No. 979,452, Nov. 20, 1992, abandoned, and Ser. No. 78,212, Jun. 17, 1993, abandoned, said Ser. No. 979,452is a continuation of Ser. No. 845,804, Mar. 9, 1992, abandoned, which is a continuation of Ser. No. 438,399, Dec. 27, 1989, abandoned. This application Feb. 15, 1994, Ser. No. 196,809

Int. Cl.[6] A01N *25/00*

U.S. Cl. 424—405 **25 Claims**

1. A formulation suitable for spraying or for dilution with water to form a sprayable preparation, the formulation consisting essentially of an active ingredient, an emulsifier and an evaporation retardant, wherein the formulation satisfies the following formula:

$$\frac{\text{mass of oil phase}}{\text{mass of retardant}} \leq \frac{M_{oil}}{M_{retardant}} \times \mathrm{Exp}\,\frac{\ln(L/4) + C\ln(AX^{B})}{C}$$

where L is less than or equal to 15, A=700376, B=−1.51, C=0.8472, the oil phase is the liquid non-aqueous phase containing the active ingredient, solvent if present and the emulsifier, provided those components are not miscible with water at the dilution level employed,

M_{oil} is the weighted average relative molar mass of the oil phase,

$M_{retardant}$ is the weighted average relative molar mass of the retardant, and

$$X = \frac{(M_{oil})^{1.8}}{Y}$$

where Y is the molar solubility ratio of the formulation, defined as the minimum number of moles of the oil phase which will dissolve the retardant, divided by the number of moles of retardant,

provided that, in the Formula above, any solvent which has no liquid phase at 27° C. at atmospheric pressure is excluded, and wherein the active ingredient is sprayable in a water-based formulation and is an insecticide, acaricide, herbicide, fungicide, plant growth regulator, insect behavior modifier, biological control agent, dye, perfume, bactericide, lubricant, medicament, paint, polish, lacquer or textile treatment, the emulsifier is an anionic compound, a cationic compound, a nonionic compound or mixtures thereof having a hydrophilic/lipophilic balance of 8 to 18, and the evaporation retardant is a C_{16-20} alkanol, 1-hexadecylamine, 1-heptadecylamine or 1-octadecylamine and

wherein the formulation optionally also contains a carrier or solvent for the active ingredient.

5,466,459

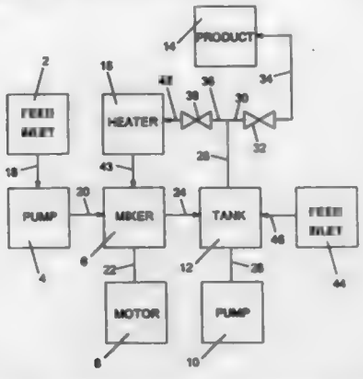
WAX AND CAPSAICIN BASED PESTICIDE

Walter R. Wilson, Pulaski, Pa., assignor to Wilder Agricultural Products Co., Inc., Pulaski, Pa.

Continuation of Ser. No. 903,501, Jun. 24, 1992, abandoned. This application Nov. 3, 1993, Ser. No. 147,463

Int. Cl.[6] **A01N** *25/32;65/00*

U.S. Cl. 424—407 **7 Claims**



1. A topically applied non-penetrating pesticide containing only natural ingredients with no phytotoxicity to a host plant consisting essentially of:

(a) an aliphatic hydrocarbon microcrystalline waxy base, from 9 to 40% by total weight, impregnated with a sufficient quantity of water such that as the water evaporates, the base will contract;

(b) an irritant, from 10 to 33% by total weight, which is a hot pepper extract selected from the group consisting of capsaicins, C.frutescens and C. annuum dispersed throughout the waxy base; and

(c) at least one scent, from 1 to 2% by total weight, selected form the group consisting of a tincture of garlic, onion, parsley, basil, thyme, coriander, cumin, mustard, rosemary, orange and lemon, the scent having

(1) an alcohol soluble oil phase, and

(2) a water soluble component,

wherein an interaction of an alcoholic part of the tincture facilitates the migration of the scent to an exterior surface of the wax, the scent which has a lower vapor pressure than the alcohol, being transported through the waxy matrix through its solubilization in alcohol, which has a higher vapor pressure, thereby permitting additional scent to reach the exterior surface than would otherwise be possible if the scent was used alone, the waxy base, irritant, and scent combination being capable of being washed from the plant or fruit without any deleterious effect on the plant in that the treatment is non-invasive and non-penetrating, the pesticide having been prepared by the steps of:

(i) suspending the microcrystalline waxy base in a spinning vortex that produces a venturi of water using a centrifugal velocity mixing technique;

(ii) adding the irritant to the waxy base, the irritant having been previously extracted with at least one extracting agent, heated for at least 24 hours, and strained to produce the irritant essentially free of extraneous vegetative matter;

(iii) adding the water-soluble scent to the waxy base, the scent having been previously extracted with at least one extracting agent, heated for at least 24 hours, and strained to produce the water soluble component of the scent essentially free of extraneous vegetative matter;

(iv) adding the alcohol soluble oil phase of the scent, the extraneous vegetative matter of the previous step having previously been diluted with alcohol to make the alcohol soluble oil component, the addition of the irritant and the scent extract occurring in a centrifugal mixer to produce a rotating suspension of the pesticide, a speed of the rotating suspension insuring a good mechanical attachment of the irritant and the scent to the waxy base; and

(v) straining the pesticide under pressure.

5,466,460

CONTROLLED RELEASE MICROCAPSULES

William A. McMahon; Chel W. Lew, both of San Antonio, Tex., and Keith L. Branly, Brandon, Fla., assignors to Micro Flo Company, Mulberry, Fla.

Division of Ser. No. 858,130, Mar. 27, 1992, Pat. No. 5,292,533. This application Dec. 2, 1993, Ser. No. 160,276

Int. Cl.[6] **A01N** *25/28*

U.S. Cl. 424—408 **13 Claims**

1. A method of controlling the release of a chemical agent comprising:

encapsulating in a microcapsule having a core material surrounded by a shell wall, wherein said core material comprises a chemical agent selected from the group consisting of insecticides, herbicides, plant growth regulators, insect attractants, and insect repellents, and said shell wall comprises a glutaraldehyde cross-linked gelatin which contains a feeding deterrent comprising a cucurbitacin and at least one water soluble plasticizer selected from the group consisting of starches, sugars, cyclodextrins, maltodextrins and sorbitol, wherein the core material is a dry hydrophilic material, a hydrophilic material in a hydrophobic carrier, or a hydrophobic material whereby said plasticizer renders the shell wall impermeable to the core material until said plasticizer is removed by contact with water, and

contacting the microcapsule with water at a desired time and location to remove said at least one water soluble plasticizer and form a microcapsule having a porous shell wall whereby the core material from said core permeates through said shell wall.

5,466,461

POLYSACCHARIDE ESTERS

Francesco della Valle, Padua, and Aurelio Romeo, Rome, both of, Italy, assignors to Fidia, S.p.A., Abano Terme, Italy

Division of Ser. No. 350,920, May 12, 1989, Pat. No. 5,122,598. This application Apr. 2, 1992, Ser. No. 862,370

Claims priority, application Italy, May 13, 1988, 47963/88

Int. Cl.[6] **A61F** *13/15;* **A61K** *9/08;9/48;* **C08B** *37/08*

U.S. Cl. 424—423 **19 Claims**

1. A sanitary or surgical article containing a total or partial ester of an acidic polysaccharide selected from the group consisting of carboxymethylcellulose, carboxymethyl starch and carboxymethyl-

chitin, said total or partial ester being produced by a process which comrises esterifying a quaternary ammonium salt of said acidic polysaccharide with an alcohol selected from the group consisting of a C_{1-36} aliphatic alcohol, an araliphatic alcohol having one benzene ring on a C_{1-4} aliphatic chain, a cycloaliphatic alcohol having a maximum of 34 carbon atoms, and a heterocyclic alcohol having a maximum of 34 carbon atoms, or a salt of such partial esters with inorganic or organic bases, with the exception of partial esters of carboxymethylcellulose with ethylene glycol, partial esters of carboxymethylcellulose with propylene glycol, partial esters of carboxymethyl starch with methanol, partial esters of carboxymethyl starch with benzyl alcohol, total esters of carboxymethylcellulose with ethylene glycol, total esters of carboxymethylcellulose with propylene glycol, total esters of carboxymethyl starch with methanol, and total esters of carboxymethyl starch with benzyl alcohol.

5,466,462

HETEROMORPHIC SPONGES CONTAINING ACTIVE AGENTS

Arthur L. Rosenthal, Arlington, Tex.; Nicholas D. Light, Perthshire, and Carla A. Haynes, Glasgow, both of, United Kingdom, assignors to Johnson & Johnson Medical, Inc., Arlington, Tex.

Filed Mar. 22, 1993, Ser. No. 35,013

Claims priority, application United Kingdom, Mar. 25, 1992, 9206509

Int. Cl.[6] A61F *2/02;13/15;* **A01N** *25/34;* **A61K** *47/38*

U.S. Cl. 424—426 **6 Claims**

1. A bioabsorable heteromorphic sponge comprising: a matrix structure of sponge, at least one macroscopic substructure and at least one pharmacologically active agent, wherein the matrix structure and the said at least one macroscopic substructure are formed of bioabsorable biopolymer materials and said at least one substructure is selected from the group consisting of milled freeze-dried sponges, powders, films, flaked or broken films, aggregates, microspheres, fibres, fibre bundles, and mixtures thereof.

5,466,463

VIRACIDAL, BACTERICIDAL AND SPERMICIDAL VAGINAL SUPPOSITORY

Larry C. Ford, Irvine, Calif., assignor to Lafor Laboratories Limited, Newport Beach, Calif.

Continuation-in-part of Ser. No. 161,659, Dec. 3, 1993, abandoned. This application Sep. 7, 1994, Ser. No. 301,966

Int. Cl.[6] A61F *13/20;6/08;* **C12N** *11/04*

U.S. Cl. 424—433 **35 Claims**

1. A vaginal pessary comprising:

an effective amount of a pharmaceutically acceptable, topically usable antimicrobial agent;

at least approximately 10^3 viable bacteria of the *lactobacillus acidophilus* species or of its *lactobacillus rhamnosus* variant, said bacteria being micro encapsulated whereby the bacteria stay viable during storage of the pessary in spite of presence of the antimicrobial agent, the substance providing the encapsulating coating for the bacteria being such that it releases bacteria upon prolonged exposure to moisture in the vaginal environment, and

a pharmaceutically acceptable excipient thoroughly admixed with the antimicrobial agent and the micro encapsulated bacteria.

5,466,464

INTRABUCCALLY DISINTEGRATING PREPARATION AND PRODUCTION THEREOF

Katsuhiro Masaki, and Kazutoshi Ban, both of Shizuoka, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP92/01631, § 371 Date Jun. 22, 1994, § 102(e) Date Jun. 22, 1994, PCT Pub. No. WO93/12769, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 15, 1992, Ser. No. 256,034

Claims priority, application Japan, Dec. 24, 1991, 3-356898; Nov. 20, 1992, 4-335076

Int. Cl.[6] A61K *47/26*

U.S. Cl. 424—434 **6 Claims**

1. An intrabuccally disintegrating solid preparation which comprises an active ingredient, a sugar comprising lactose and/or mannitol, and an agar in an amount of from 0.12 to 1.2 w/w% based on the solid components, said preparation having a density of from 400 mg/ml to 1,000 mg/ml and a sufficient strength to withstand removal from a Press Through Pack (blister packaging) without disintegrating.

5,466,465

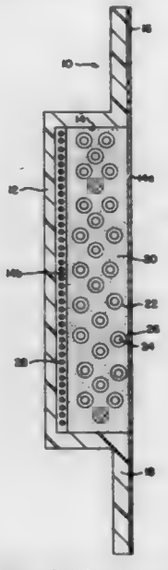
TRANSDERMAL DRUG DELIVERY SYSTEM

Robert B. Royds, Plainsboro, N.J.; John Lim, Newtown, and Joel D. Rosen, Langhorne, both of Pa., assignors to Harrogate Holdings, Limited, Hamilton, Bermuda

Filed Dec. 30, 1993, Ser. No. 176,396

Int. Cl.[6] A61F *13/00*

U.S. Cl. 424—449 **16 Claims**



1. A drug delivery system for the delivery of a drug across the skin of a user comprising:

a shell, said shell providing an occlusive covering on the skin of the user to enhance the hydration of the skin, said shell comprising a reservoir having a first face and a second face, said reservoir having therein a matrix adapted to absorb moisture from the skin and hydrate the skin to facilitate penetration of the skin by a drug, said reservoir further having therein a plurality of microcapsules, said microcapsules being dispersed within said matrix and having contained therein an effective concentration of a drug and a coating formulated to be susceptible to penetration by moisture;

means on said first face of said reservoir for adhering said shell to the skin; and

a visible indicator operatively associated with said second face of said reservoir, said indicator comprising a reagent formulated to visibly change in response to the presence of moisture, electrolytes or other secretions in said matrix, said vis-

ible indicator comprising a first indicator and at least a second indicator, said first indicator providing a first visible change indicative of a first event in relation to delivery of said drug, and said second indicator providing a second visible change indicative of a second event in relation to delivery of said drug.

5,466,466

THERAPEUTIC SYSTEM FOR THE RETARDED AND CONTROLLED TRANSDERMAL OR TRANSMUCOUS ADMINISTRATION OF ACTIVE SUBSTRATES II

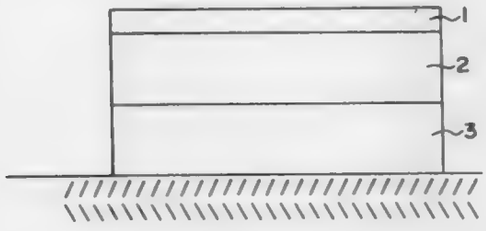
Walter Müller, Neuwied, Germany, assignor to LTS Lohmann Therapie-Systeme GmbH & Co. KG, Neuwied, Germany

Continuation of Ser. No. 961,215, Oct. 15, 1992, abandoned, which is a continuation of Ser. No. 785,897, Oct. 31, 1991, abandoned, which is a continuation of Ser. No. 478,322, Feb. 12, 1990, abandoned. This application Apr. 20, 1994, Ser. No. 230,448

Claims priority, application Germany, Feb. 18, 1989, 39 05 050.5

Int. Cl.[6] **A61F** *13/02*; **A61K** *9/70*; **A61L** *15/16*

U.S. Cl. 424—449 **16 Claims**



1. A method for the retarded and controlled transdermal or transmucous administration of a bioactive agent to the skin, comprising assembling an impermeable backing layer, an auxiliary substance reservoir, a bioactive agent reservoir and a removable protective layer,

an acid or basic bioactive agent contained in the bioactive agent reservoir being bonded to a polymer incapable of diffusion, and thus being present in immobilized form as a salt of a polymeric polybase or polyacid, respectively,

the auxiliary substance contained in the auxiliary substance reservoir being an acid or a base to convert the bioactive agent salt into a form capable of diffusion when in use the auxiliary substance reservoir and the bioactive agent reservoir are brought into contact,

the bioactive agent reservoir and the auxiliary agent reservoir not contacting each other at least until application of the system,

removing the protective layer, applying the bioactive agent reservoir to the skin, and contacting the auxiliary substance reservoir with the bioactive agent reservoir.

5,466,467

LIPOSOMES CONTAINING POLYMERIZED LIPIDS FOR NON-COVALENT IMMOBILIZATION OF PROTEINS AND ENZYMES

Alok Singh, Spring Field, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

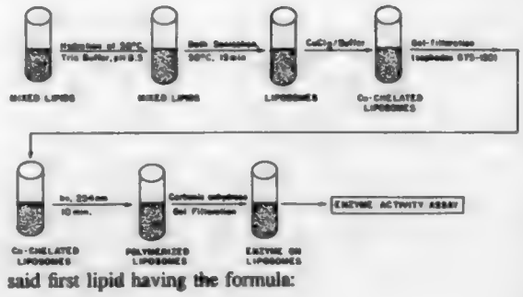
Filed Mar. 30, 1994, Ser. No. 220,124

Int. Cl.[6] **A61K** *9/127*

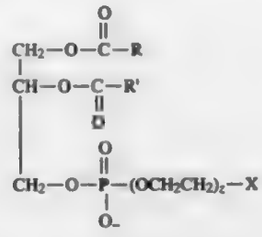
U.S. Cl. 424—450 **17 Claims**

1. A liposome, said liposome comprising:

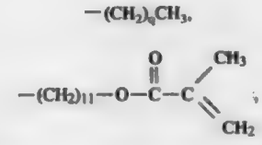
a first lipid,



said first lipid having the formula:



wherein at least one of R and R' of said first lipid is selected from the group consisting of:



$-(CH_2)_qCH_3$,

$-(CH_2)_m-C\equiv C-C\equiv C-(CH_2)_n-CH_3$, and

and

wherein n, m and q are integers,

wherein n is an integer from 1 to 27, including 1 and 27,

wherein m is an integer from 2 to 28, including 2 and 28,

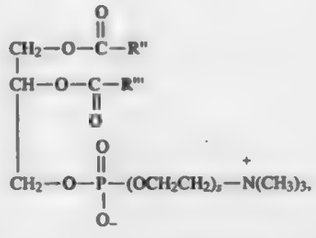
wherein (n+m) is greater than or equal to 3 and 29 is greater than or equal to (n+m),

wherein q is an integer from 1 to 20, including 1 and 20,

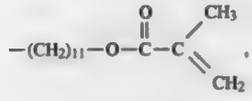
wherein X is a group having a terminal iminodiacetic acid moiety,

wherein z is an integer from 1–20 including 1 and 20, and a second lipid,

said second lipid having the formula:



wherein at least one of R" and R"' of said second lipid is selected from the group consisting of:



$-(CH_2)_qCH_3$, and

-continued

wherein n' and m' are integers,
wherein n' is an integer from 1 to 27, including 1 and 27,
wherein m' is an integer from 2 to 28, including 2 and 28,
wherein (n'+m') is greater than or equal to 3 and 29 is greater than or equal to (n'+m'),
wherein q' is an integer from 1 to 20, including 1 and 20, and wherein s is an integer from 1–20 including 1 and 20.

5,466,468

PARENTERALLY ADMINISTRABLE LIPOSOME FORMULATION COMPRISING SYNTHETIC LIPIDS

Peter Schneider, Bottmingen; Peter van Hoogevest, Riehen; Hans G. Capraro, Rheinfelden, all of, Switzerland, and Ute Isele, Bad Bellingen, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 124,111, Sep. 20, 1993, abandoned, which is a division of Ser. No. 988,399, Dec. 9, 1992, Pat. No. 5,270,053, which is a continuation of Ser. No. 795,406, Nov. 20, 1991, abandoned, which is a continuation-in-part of Ser. No. 674,644, Mar. 25, 1991, abandoned. This application Oct. 28, 1994, Ser. No. 331,244

Claims priority, application Switzerland, Apr. 3, 1990, 01104/90

Int. Cl.[6] A61K *9/127*

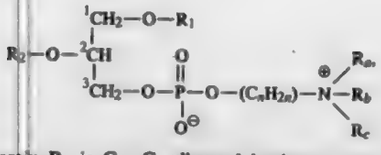
U.S. Cl. 424—450 **2 Claims**

1. A method of treating tumors which respond to photodynamic chemotherapy consisting essentially of administering an amount effective to therapeutically treat a tumor of a pharmaceutical liposome composition to an animal in need thereof, said composition comprising:

a) the zinc-phthalocyanine complex in an amount of 0.1 to 5% by weight based on the total amount of the phospholipid (b) dissolved in N-methyl-2-pyrrolidone;

b) at least one synthetic, substantially pure phospholipid dissolved in tert-butanol, said phospholipid selected from the group consisting of

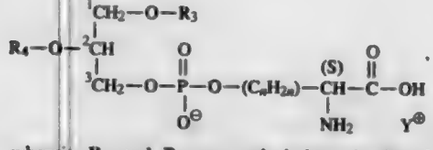
i) a phospholipid of formula I



(I)

wherein R_1 is C_{10}–C_{20}alkanoyl having an even number of carbon atoms, R_2 is C_{10}–C_{20}alkenoyl having an even number of carbon atoms, R_a, R_b and R_c are hydrogen or C_1–C_4alkyl and n is an integer from two to four, and

ii) a phospholipid of formula II



(II)

wherein R_3 and R_4 are each independently of the other C_{10}–C_{20}alkenoyl having an even number of carbon atoms, n is an integer from one to three and $Y^{\oplus}$ is the cation of a pharmaceutically acceptable base; and

c) a pharmaceutically acceptable carrier liquid.

5,466,469

GRANULAR DRUG DELIVERY SYSTEM

Eric H. Kuhrts, Santa Barbara, Calif., assignor to Cibus Pharmaceutical, Inc., Redwood City, Calif.

Continuation of Ser. No. 891,772, Jun. 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 440,656, Nov. 22, 1989, Pat. No. 5,118,510, which is a continuation-in-part of Ser. No. 212,715, Jun. 28, 1988, Pat. No. 4,965,252, and a continuation-in-part of Ser. No. 440,728, Nov. 22, 1989, Pat. No. 5,023,245. This application Mar. 28, 1994, Ser. No. 218,840

Int. Cl.[6] A61K *9/48*

U.S. Cl. 424—451 **20 Claims**

1. A granular drug delivery composition that forms a uniform dispersion upon admixture with a liquid, wherein the composition consists of granules and said granules of said composition consist essentially of:

a) a pharmaceutically-active compound; and

b) a gel forming dietary fiber;

wherein each of said granules ranges in size from 30 to 110 mesh and is coated with at least one of a gel forming dietary fiber, a starch and a protein.

5,466,470

CO-MICRONIZED BICARBONATE SALT COMPOSITIONS

M. Stephen Lajoie, Basking Ridge, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Division of Ser. No. 90,957, Jul. 13, 1993, Pat. No. 5,424,077. This application May 25, 1994, Ser. No. 248,686

Int. Cl.[6] A01N *59/16;59/00;25/08*

U.S. Cl. 424—641 **5 Claims**

1. A co-micronized bicarbonate salt composition comprising (1) at least one crystalline compound ingredient selected from the group consisting of alkali metal and ammonium bicarbonates, and (2) between about 10–50 weight percent of at least one crystalline inorganic metal oxide compound ingredient having a Mohs hardness value between about 3–7; wherein the crystalline ingredients of the composition have an average particle size in the range between about 0.01–1.0 micron which is obtained by mill co-micronization of the crystalline ingredients, and the composition is free-flowing and essentially free of agglomerated particles.

5,466,471

CHEWING GUM CONTAINING ASPARTAME AND MALTODEXTRIN OR PURIFIED MALTODEXTRIN

Robert J. Yatka, Orland Park, Ill., assignor to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Jul. 18, 1994, Ser. No. 276,251

Int. Cl.[6] A23G *3/30*

U.S. Cl. 426—3 **20 Claims**

1. A chewing gum composition comprising sweetness imparting amounts of unencapsulated aspartame and an effective amount of maltodextrin to stabilize said aspartame against decomposition during storage at 85° F. for six weeks whereby at least 5% less aspartame decomposes into non-sweetening derivatives that would have decomposed if the maltodextrin were not included in the gum composition.

5,466,472
PROCESS FOR THE PRODUCTION OF A CULTURED MILK BEVERAGE

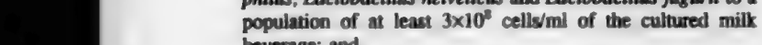
Yoshiharu Kuma; Tamotsu Setoyama; Hideaki Maruyama, and Makiko Kawai, all of Tokyo, Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Aug. 7, 1992, Ser. No. 925,662
Claims priority, application Japan, Aug. 23, 1991, 3-235667
Int. Cl.[6] A23C *9/12*
U.S. Cl. 426—43 **5 Claims**

1. A process for the production of a cultured milk beverage, which comprises:

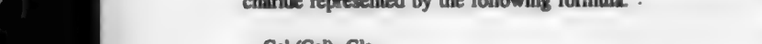
culturing at least one lactic acid bacterium selected from the group consisting of *Lactobacillus casei, Lactobacillus acidophilus, Lactobacillus helveticus* and *Lactobacillus jugurti* to a population of at least 3×10^8 cells/ml of the cultured milk beverage; and

adding to the resultant culture a mixture of a galactooligosaccharide represented by the following formula:



$$Gal\text{-}(Gal)_n\text{-}Glc$$

wherein Gal means a galactose residual group, Glc denotes a glucose residual group, and n stands for an integer of 1–4, and a galactosyldisaccharide represented by the following formula:



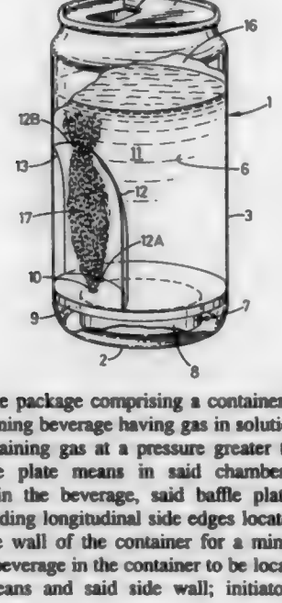
$$Gal\text{-}R$$

wherein R means a galactose residual group or a glucose residual group, and Gal has the same meaning as defined above, said galactosyldisaccharide being other than lactose, in an amount effective to improve the flavor and taste of said cultured milk beverage.

5,466,473
BEVERAGE PACKAGE WITH BAFFLE PLATE TO REDUCE FROTH PRODUCTION

Alan J. Forage, Buckinghamshire, and Robert Purdham, West Hendon, both of, Great Britain, assignors to Guiness Brewing Worldwide Limited, London, United Kingdom

Filed Nov. 1, 1993, Ser. No. 146,410
Claims priority, application United Kingdom, Nov. 10, 1992, 9223518
Int. Cl.[6] B65B *31/00;* B65D *17/00;25/00*
U.S. Cl. 426—115 **10 Claims**

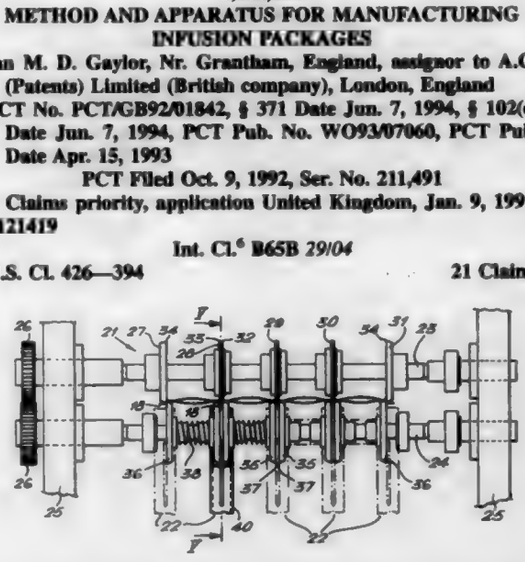


1. A beverage package comprising a container having a sealed chamber containing beverage having gas in solution and forming a headspace containing gas at a pressure greater than atmospheric pressure; baffle plate means in said chamber and extending upwardly within the beverage, said baffle plate means having upwardly extending longitudinal side edges located adjacent to an upstanding side wall of the container for a minor proportion by volume of the beverage in the container to be located between said baffle plate means and said side wall; initiator means located within the chamber submerged in the beverage, and which in response to a pressure differential developed on opening the headspace to atmospheric pressure, causes gas in solution to be liberated from beverage in said minor proportion between the baffle plate means and the side wall for said liberated gas to develop froth in the headspace, and wherein said baffle plate means acts to restrain or impede the development of bubble formation for said froth development by the initiator means to the liberation of gas from a minor proportion by volume of the volume of beverage in the chamber.

5,466,474
METHOD AND APPARATUS FOR MANUFACTURING INFUSION PACKAGES

Ian M. D. Gaylor, Nr. Grantham, England, assignor to A.G. (Patents) Limited (British company), London, England

PCT No. PCT/GB92/01842, § 371 Date Jun. 7, 1994, § 102(e) Date Jun. 7, 1994, PCT Pub. No. WO93/07060, PCT Pub. Date Apr. 15, 1993
PCT Filed Oct. 9, 1992, Ser. No. 211,491
Claims priority, application United Kingdom, Jan. 9, 1991, 9121419
Int. Cl.[6] B65B *29/04*
U.S. Cl. 426—394 **21 Claims**



1. A method of manufacturing infusion packages provided with a cover which projects laterally beyond the package and has a pair of joined leaves, comprising the steps of forming in a travelling two-ply porous web, successive rows of infusion containing pockets extending transversely to the direction of travel of the web and spaced apart by transversely extending sealed regions of the web, removing a continuous strip of web material from the longitudinal sealed region extending between respective pockets of said rows to form a plurality of parallel transversely spaced travelling strips of infusion pockets, cutting said strips along the transversely extending sealed regions to form the pockets into individual infusion packages, and attaching a cover to said packages.

5,466,475
METHOD OF FRYING NOODLES

Masahiro Yamasaki; Masaru Chiba, both of Shiga; Takashi Yokogoshi, Kyoto; Kenji Kodama; Tatsuo Yamaya, both of Shiga, and Masakazu Yokoyama, Osaka, all of, Japan, assignors to Nissin ShokuhinKabushiki Kaisha, Osaka, Japan

Filed May 19, 1993, Ser. No. 64,509
Claims priority, application Japan, May 21, 1992, 4-128487
Int. Cl.[6] A23L *1/16*
U.S. Cl. 426—439 **4 Claims**

1. A method for filling noodles cut to a fixed length into a fry retainer, comprising the steps of;

placing the cut noodles into a fry retainer, and

pressing downwardly on the top of the noodles held in said fry retainer and forming a space between an upper portion of the noodles and a lid of said fry retainer by means of a pressure member having an outer dimension which is smaller than an inner dimension of said fry retainer, by descending said pressure member into said fry retainer against the noodles.

5,466,476

PASTRY CRUST AND PASTRY CRUST DOUGH

Gilbert Finkel, Morristown, N.J., and Katherine L. Moore, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 495,872, Mar. 19, 1990, abandoned. This application Sep. 3, 1991, Ser. No. 754,149

Int. Cl.[6] A21D *8/00;13/08*

U.S. Cl. 426—556 23 Claims

1. A process for making a pie crust having from about 20% to about 30% fat comprising:

a) preparing a first phase comprising;

1) from about 20% to about 45% shortening;

2) from about 55% to about 80% ungelatinized starch;

3) from about 0.8% to about 5% polyol; and

b) preparing a second phase comprising;

1) mixing from about 20% to about 80% flour with from about 10% to about 30% water and 0.5% to about 2% salt; said flour having from about 3% to about 14% protein; and

2) adding from about 15% to about 30% oil and/or shortening to make a cohesive dough;

3) holding said dough for at least one hour;

c) sheeting said second phase dough;

d) applying said first phase to the surface of the sheeted second phase and folding the combined phases to make a laminated product, said product comprising from about 10% to about 35% first phase and from about 65% to about 90% second phase, the first phase being present in discrete regions.

5,466,477

PREPARATION OF PROCESS CHEESE USING LIQUID SODIUM PHOSPHATE

John R. Sevenich, Mendota Heights, Minn., assignor to Hawkins Chemical, Inc., Minneapolis, Minn.

Filed Nov. 8, 1993, Ser. No. 148,390

Int. Cl.[6] A23C *19/082*

U.S. Cl. 426—582 1 Claim

1. A method of preparing process cheese comprising the steps of:

(a) contacting a liquid sodium phosphate, wherein the liquid sodium phosphate is stored at a temperature between about 40° to 100° F., has a crystallization temperature less than about 115° F., has an acidic pH less than about 6.5, and has a greater concentration of monosodium phosphate than disodium phosphate, with an effective amount of sodium hydroxide to give a liquid phosphate composition, wherein the weight ratio of the liquid sodium phosphate composition to the weight of sodium hydroxide is between 1:2 and 4:1; and

(b) combining a process cheese precursor with the liquid phosphate composition.

5,466,478

GLAZING AGENT

Jeroen J. Brockhus, Breda; Jeanette D. Moree, Gouda, both of, Netherlands; Jannes G. Lammers, Ganderkesee, Germany, and Tileman Rodenburg, Vlaardingen, Netherlands, assignors to Unilever Patent Holdings B.V., Vlaardingen, Netherlands

Continuation of Ser. No. 88,653, Jul. 9, 1993, abandoned. This application Nov. 18, 1994, Ser. No. 344,612

Claims priority, application European Pat. Off., Jul. 10, 1992, 92202112; Jan. 14, 1993, 93200088

Int. Cl.[6] A23D *7/005*

U.S. Cl. 426—602 12 Claims

1. Ready-to-use, sprayable, sterilized glazing agent having an ambient shelf-life of more than three months and having a viscosity at 20° C. of $1–10^5$ mPa.s. consisting essentially of an oil-in-water emulsion having a composition consisting essentially of:

5–15 wt. % of a liquid vegetable oil;

5–15 wt. % of casein or its salts;

0.005–10 wt. % of an emulsifier selected from the group consisting of fatty acid monoglycerides and diglycerides from C_{14}–C_{22} fatty acids;

0.1–8.0 wt. % of a composition giving a browning upon heating by a Maillard-type reaction; and

balance: water.

5,466,479

FAT AND OIL REPLACEMENTS AS HUMAN FOOD INGREDIENTS

Cecil L. Frye, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 252,415, Sep. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 862,175, May 12, 1986, abandoned, which is a continuation-in-part of Ser. No. 743,171, Jun. 10, 1985, abandoned. This application Aug. 27, 1991, Ser. No. 750,848

Int. Cl.[6] A23D *9/0007*

U.S. Cl. 426—611 54 Claims

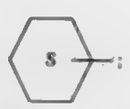
1. A food composition for human consumption comprising oil and non-oil components wherein the oil component comprises polyorganosiloxanes having an organic carbon content of at least fifteen weight percent, wherein the carbon is linked to silicon by silicon-carbon bonds; all molecular components of said polyorganosiloxanes having a molecular weight of at least 500 g/mole and having the general formula

$$\{R_3SiO_{1/2}\}_a\{R_2SiO_{2/2}\}_b\{RSiO_{3/2}\}_c\{SiO_{4/2}\}_d-$$
$$-\{R_fSi(O_{\frac{3-f}{2}})A(O_{\frac{3-g}{2}})SiR_g\}_e$$

wherein each R is individually selected from the group consisting of

(i) CH_2═CH—;

(ii)



(iii) alpha phenylethyl;

(iv) beta phenylethyl;

(v) alkyl groups of 1 to 20 carbon atoms;

(vi) hydrogen;

(vii) hydroxyl;

(viii) R'$(CH_3)_2SiO$—;

(ix) R'$OOC(CH_2)_h$—

wherein each R' is individually selected from the group consisting of hydrogen and an alkyl radical of 1 to 20 carbon atoms, wherein h is an integer of from 2 to 10;

(x) R''$O(C_2H_4O)_n(C_3H_6O)_m(CH_2)_p$——;

wherein n and m each have an average value of from 1 to 25 and R is an integer of from 2 to 6, and R'' has the same meaning as R, above;

(xi) R''$O(C_2H_4O)_n(CH_2)$——;

(xii) R''$O(C_3H_6O)_m(CH_2)$——;

wherein in each case n and m each have an average value of from 1 to 25 and p is an integer of from 2 to 6, and R'' has the same meaning as R, above, and,

(xiii) 2-phenylpropyl;

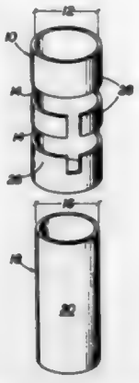
A is a hydrolyrically stable divalent hydrocarbon radical attached to two silicon atoms by silicon-carbon bonds; a, b, c, d, e, f, and g have mole fraction values respectively ranging from 0-1, 0-1, 0-1, 0-0.75, 0-1, 0-3, and 0-3.

5,466,480

METHOD FOR MAKING AN NMR COIL

Dawei Zhou; Thomas Mareci, both of Gainesville, Fla.; Michael Burns, Mountain View, and Ward Ruby, San Jose, both of Calif., assignors to University of Florida, Gainesville, Fla.

Filed Nov. 12, 1993, Ser. No. 152,752
Int. Cl.[6] B05D 1/32;1/36;5/12
U.S. Cl. 427—63 14 Claims



1. A method for making an NMR coil on an electrically non-conductive

outer surface of an NMR tube, comprising the steps of:

a. applying a first mask to the outer surface such that the first mask divides the surface area of the tube into a first masked portion and a first unmasked portion, wherein the first unmasked portion defines a first preselected pattern;

b. depositing a first layer of conducting material onto the first unmasked portion to form a first conducting layer in the first preselected pattern;

c. removing the first mask from the tube;

d. depositing a layer of an insulating material onto the outer surface to form an insulation layer, wherein the insulation layer is superimposed onto the first conducting layer so as to continuously cover the first conducting layer except at at least one preselected point;

e. applying a second mask to the outer surface such that the second mask divides the surface area into a second masked portion and a second unmasked portion, wherein the second unmasked portion defines a second preselected pattern and wherein the second unmasked portion is superimposed over at least a portion of the first conducting layer; and

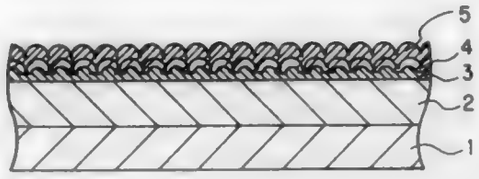
f. depositing a second layer of conducting material onto a third unmasked portion to form a second conducting layer, wherein the second conducting layer is superimposed onto the insulation layer and wherein the first conducting layer, the insulation layer and the second conducting layer form an integrated resonance circuit having at least one inductor and at least one capacitor located on the outer surface of the NMR tube.

5,466,481

SUBSTRATE FOR MAGNETIC DISK

Masao Nishikawa, and Nobuyuki Fujii, both of Ibaragi, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 153,964, Nov. 18, 1993, abandoned. This application Jan. 6, 1995, Ser. No. 369,337
Claims priority, application Japan, Nov. 18, 1992, 4-308404
Int. Cl.[6] B05D 5/12
U.S. Cl. 427—130 2 Claims



2. A method for making a magnetic disk comprising steps of:

forming a Ni—P intermediate layer by Ni—P plating on an aluminum substrate;

processing said Ni—P intermediate layer;

dipping said substrate in a plating solution to effect palladium plating to form a Pd plating layer;

forming a Ni—P plating layer to form semi-spherical raised portions over an entire surface of said Pd plating layer;

forming a Co—P magnetic plating layer as a magnetic film on the surface of said substrate by a non-electrolytic plating process;

forming a SiO_2 protective film on said Co—P magnetic plating layer by coating an isopropyl alcohol solution containing tetrahydroxysilane dissolved therein by a spin coat process and sintering the coating; and

forming on said protective film a lubrication film layer by spin coating a fluorine oil lubricant.

5,466,482

PHOSPHORIC ACID MONOESTERS USEFUL FOR SURFACE TREATMENT OF PIGMENTS FOR WATERBORNE COATINGS

Mark W. Johnson, Goose Creek, S.C., assignor to Bayer Corporation, Pittsburg, Pa.

Filed Dec. 15, 1994, Ser. No. 356,940
Int. Cl.[6] B05D 7/00
U.S. Cl. 427—212 9 Claims

1. A process for surface treating organic pigments comprising applying to the surface of an organic pigment

(a) 0.5 to 15 percent by weight, relative to the pigment, of a phosphoric acid monoester having the formula

wherein

R is

(i) a saturated C_5–C_{40} aliphatic group or a saturated C_5–C_{40} aliphatic group in which one or more aliphatic carbon atoms is substituted with halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, a C_6–C_{10} aromatic hydrocarbon group or a C_6–C_{10} aromatic hydrocarbon group substituted with a C_1–C_{12} alkyl group, or —$COOR^a$ (wherein R^a is hydrogen, metal, ammonium, C_1–C_6 alkyl, or C_6–C_{10} aryl), optionally wherein one or more non-adjacent aliphatic backbone carbon atoms are replaced with O, S, or NR^b (wherein R^b is C_1–C_6 alkyl or C_6–C_{10} aryl), or

(ii) an unsaturated C_5–C_{40} aliphatic group or an unsaturated C_5–C_{40} aliphatic group in which one or more aliphatic carbon atoms is substituted with halogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, a C_6–C_{10} aromatic hydrocarbon group or a C_6–C_{10} aromatic hydrocarbon group substituted with one or more C_1–C_6 alkyl groups, or —$COOR^a$ (wherein R^a is hydrogen, metal, ammonium, C_1–C_6 alkyl, or C_6–C_{10} aryl), optionally wherein one or more non-adjacent aliphatic backbone carbon atoms are replaced with O, S, or NR^b (wherein R^b is C_1–C_6 alkyl or C_6–C_{10} aryl), and

M is hydrogen, metal, or ammonium;

in admixture with

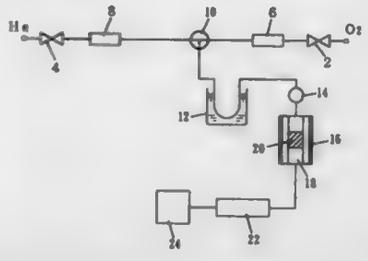
(b) 0 to 10 percent by weight, relative to the phosphoric acid monoester, of a process additive.

5,466,483

METHOD FOR PRODUCING A SILICA MASK ON METAL OXIDE SURFACE

Miki Niwa, Nishi 4-chome 110, Koyama-cho, Tottori, 680; Nobuaki Kodakari, Tottori; Hisato Funabiki, Himeji, and Naosobu Katada, Tottori, all of, Japan, assignors to Miki Niwa, Tottori, and Figaro Engineering Inc., Osaka, both of, Japan

Filed Jun. 15, 1994, Ser. No. 260,986
Claims priority, application Japan, Feb. 4, 1994, 6-032892
Int. Cl.[6] B05D 3/02
U.S. Cl. 427—226 7 Claims



1. A method for producing a silica mask on a metal oxide surface comprising:

adsorbing acidic molecules, selected from at least one member of the group consisting of aromatic carboxylic acids and aromatic aldehydes on a metal oxide surface on which said acidic molecules can be adsorbed, which surface is neutral or alkaline in that it comprises molecules which are capable of adsorbing said acid molecules, at a density of less than that of a mono-molecular layer of the acidic molecules on the surface, whereby forming a coating of said acidic molecules on a portion, which is less than all, of said metal oxide surface,

after the adsorption of said acidic molecules on said metal oxide surface, depositing molecules which are a precursor of silica on at least the portion of the metal oxide surface which does not contain said adsorbed acidic molecules,

thereafter removing the acidic molecules from the metal oxide surface leaving the silica precursor molecules on a portion of the metal oxide surface, and

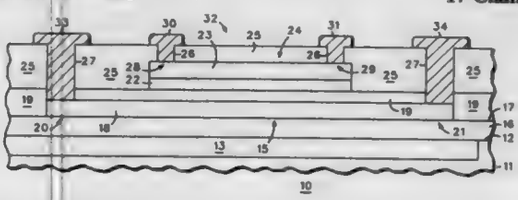
decomposing the silica precursor molecules into silica as a mask on said metal oxide surface with gaps in said silica mask where said adsorbed acidic molecules had been.

5,466,484

RESISTOR STRUCTURE AND METHOD OF SETTING A RESISTANCE VALUE

Gary L. Spraggins, Tempe; Martin J. Abresch, Mesa; William B. Newton, Phoenix, and Renwin J. Yee, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 29, 1993, Ser. No. 128,282
Int. Cl.[6] H01L 21/465;27/02; G01K 7/00; H01C 10/00
U.S. Cl. 437—228 17 Claims



1. A method for setting a resistance value of a resistor, comprising the steps of:

providing a substrate having a major surface;

forming a heating element on the major surface;

forming an isolation layer over the heating element;

forming the resistor on the isolation layer, wherein a portion of the isolation layer is sandwiched between the resistor and the heating element;

providing a current which flows through the heating element, wherein heat is generated in response to the current flowing through the heating element; and

annealing the resistor to set the resistance value of the resistor using the heat generated by the current flowing through the heating element, wherein the resistance value of the resistor remains set after removal of the heat.

5,466,485

PROCESS FOR BATCH-PLATING ARAMID FIBERS

Che-Hsiung Hsu, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1995, Ser. No. 380,530
Int. Cl.[6] B05D 1/00;3/10
U.S. Cl. 427—306 18 Claims

1. In a process for batchwise electroless plating of the entire surface of aramid fibers with a durable metal coating comprising the steps of immersing the fibers in an acid treatment liquid, contacting the fibers with a sensitizing solution, and plating the fibers in a solution of metal cations to be plated;

the improvement which comprises,

(a) immersing the aramid fibers for 2 to 60 seconds at a temperature in the range from 10° to 100° C. in an acid solution selected from the group consisting of; 83 to 90% aqueous sulfuric acid, 86 to 91% aqueous nitric acid, 1 to 5% chlorosulfonic acid in an organic liquid, and 1 to 5% fluorosulfonic acid in an organic liquid;

(b) washing the acid-immersed fibers with water until substantially all of the acid is removed;

(c) knitting the washed aramid fibers into a loose tube of material such that the surface of the fibers is exposed except at fiber crossover points in the knitted tube;

(d) contacting the knitted fibers with the sensitizing solution;

(e) plating the sensitized aramid fibers except at the fiber crossover points in the tube;

(f) deknitting the tube of plated fibers;

(g) reknitting the plated fibers into a loose tube of materials with unplated fiber crossover points now exposed;

(h) plating the aramid fibers of the reknitted tube,

whereby, without additional acid immersion and without additional contact with the sensitizing solution, an evenly plated aramid fiber is produced.

5,466,486

CHEMICALLY ADSORBED MONOMOLECULAR LAMINATION FILM

Kazufumi Ogawa, Hirakata; Norihisa Mino, Settsu, and Mamoru Soga, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Division of Ser. No. 37,727, Mar. 26, 1993, Pat. No. 5,380,585, which is a continuation of Ser. No. 781,407, Oct. 23, 1991, abandoned. This application Sep. 30, 1994, Ser. No. 316,105
Claims priority, application Japan, Jan. 25, 1990, 2-289128; Dec. 25, 1990, 2-405754; Jan. 23, 1991, 3-024025; Jan. 23, 1991, 3-024026; Jan. 28, 1991, 3-008321; Feb. 6, 1991, 3-038137
Int. Cl.[6] B05D 3/02
U.S. Cl. 427—352 8 Claims

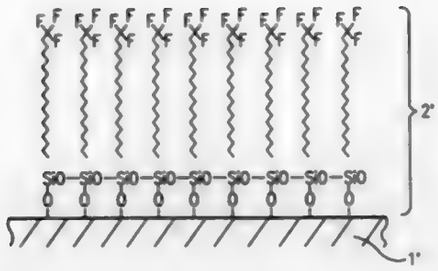
1. A method of manufacturing a chemically adsorbed monomolecular lamination film comprising:

contacting a substrate having hydroxyl groups on the surface with a non-aqueous solution containing a material having plural chlorosilane groups;

removing said unreacted material remaining on the substrate by washing the substrate using a non-aqueous organic solvent;

forming on the substrate a siloxane-based film comprising a compound containing a silanol group by reacting the chlorosilane groups with water after said removing step; and

adsorbing a chlorosilane-based surface active agent having a straight hydrocarbon chain and a chlorosilane group at one



end onto the substrate after said siloxane-based film forming step to form the adsorbed monomolecular lamination film.

5,466,487

CHEMICALLY ADSORBED FILM AND METHOD OF MANUFACTURING THE SAME

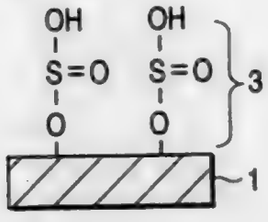
Tadashi Ohtake; Norihisa Mino, and Kazufumi Ogawa, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 912,688, Jul. 13, 1992, Pat. No. 5,356,703. This application Sep. 30, 1994, Ser. No. 316,106

Claims priority, application Japan, Jul. 17, 1991, 3-176708; Jul. 17, 1991, 3-176709

Int. Cl.[6] B05D *3/02*

U.S. Cl. 427—352 **5 Claims**



4. A method of producing a chemical adsorption film comprising:

(A) contacting a substrate containing hydroxl groups present at the substrate surface with a non-aqueous solvent containing a material having a thionyl halide group or sulfuryl halide group;

(B) removing unreacted surface active material remaining on the substrate surface by washing the substrate with a non-aqueous organic solution to form an adsorbed monomolecular precursor film;

(C) reacting unreacted surface active material remaining on the adsorbed monomolecular precursor film with water; and

(D) drying the adsorbed monomolecular film.

5,466,488

METHOD OF MAKING GLAZED ALN SUBSTRATE WITH AN AL_2O_3-SIO_2 INTERFACIAL LAYER

Seiji Tuyoda; Kunio Sugamura, both of Saitama, and Hideaki Yoshida, Tokyo, all of, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Feb. 8, 1994, Ser. No. 193,291

Claims priority, application Japan, Feb. 8, 1993, 5-043267

Int. Cl.[6] B05D *3/02*

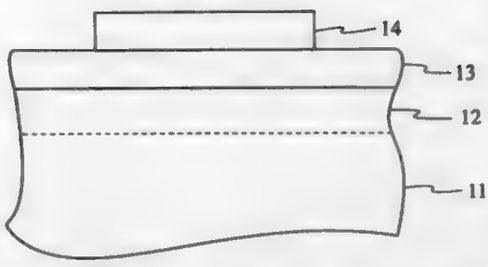
U.S. Cl. 427—376.2 **18 Claims**

1. A method for producing a glazed AlN substrate, comprising:

preparing an AlN sintered body;

thermally oxidizing said AlN sintered body to form a surface oxidized layer thereon, wherein said surface oxidized layer ranges in thickness from 0.2 to 20 μm;

forming an Al_2O_3—SiO_2 layer on said surface oxidized layer;



said Al_2O_3—SiO_2 layer includes from about 20 to about 50% Al_2O_3 weight percent;

said Al_2O_3—SiO_2 layer includes from about 80 to about 50% SiO_2 weight percent; and

forming a glass layer on said Al_2O_3—SiO_2 layer.

5,466,489

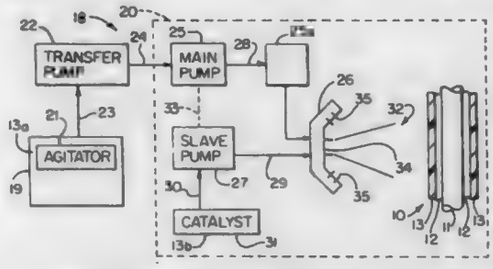
ENVIRONMENTAL NON-TOXIC ENCASEMENT SYSTEMS FOR COVERING IN-PLACE ASBESTOS AND LEAD PAINT

Joel S. Stahl, 530 E. Central Blvd. Suite 1504, Orlando, Fla. 32801

Filed May 19, 1993, Ser. No. 64,548

Int. Cl.[6] B05D *1/02*

U.S. Cl. 427—421 **25 Claims**



1. A method of coating a substrate using an airless spray system comprising an airless spray gun, the method comprising:

dispersing particulate solids comprising at least one hydrated crystalline salt in at least one liquid thermosetting resin to form a dispersion, about 100% of said solids having a U.S. Standard mesh size of about 225 mesh or smaller and at least about 80% of said solids having a U.S. Standard mesh size of about 325 mesh or smaller;

spraying said dispersion from said spray gun on to said substrate; and

injecting at least one catalyst into said dispersion at the outlet of said spray gun, the amount of said catalyst being sufficient to cure said resin, and curing said resin.

5,466,490

PRECURSOR COATING COMPOSITIONS CONTAINING WATER AND AN ORGANIC COUPLING SOLVENT SUITABLE FOR SPRAYING WITH SUPERCRITICAL FLUIDS AS DILUENTS

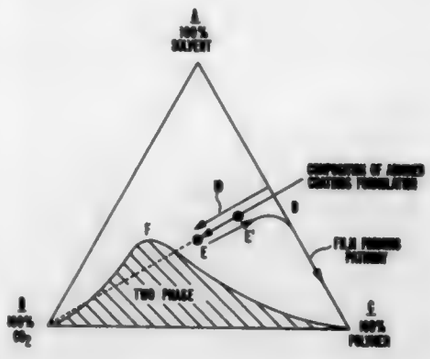
Chasrles W. Glancy, South Charleston, and David C. Busby, Cross Lanes, both of W. Va., assignors to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Division of Ser. No. 683,497, Apr. 10, 1991, Pat. No. 5,374,305, which is a continuation of Ser. No. 327,274, Mar. 22, 1989, abandoned. This application Sep. 1, 1994, Ser. No. 299,510

Int. Cl.[6] B05D *1/02;1/04*

U.S. Cl. 427—422 **58 Claims**

1. A process for the liquid spray application of coatings to a substrate, which comprises:



(a) forming a liquid mixture in a closed system, said liquid mixture comprising:

(i) a solids fraction containing at least one polymeric compound capable of forming a coating on a substrate;

(ii) a solvent fraction containing at least one coupling solvent in which said at least one polymeric compound is at least partially soluble and which is at least partially miscible with water wherein said solvent fraction composition contains a weight percent solvent distribution and relative evaporation rate of:

Wt. % of Total Solvent Fraction	RER
30–100%	<50
0–70%	50–100
0–40%	101–250
<10%	>250;

(iii) water, which is present in an amount of less than about 30% by weight based on the weight of the solvent fraction; and

(iv) at least one supercritical fluid, in at least an amount which when added to (i), (ii), and (iii) is sufficient to render the viscosity of said mixture to a point suitable for spray application, where the amount of solvent that is present in the liquid mixture is less than or equal to 650 grams of solvent per liter of liquid mixture; and

(b) spraying said liquid mixture onto a substrate to form a liquid coating thereon.

5,466,491

RADIATION CURABLE SILICON CONTAINING POLYARCYLATE HARDCOAT COMPOSITIONS, METHOD FOR MAKING, AND USE

Arnold Factor, and Larry N. Lewis, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 12, 1994, Ser. No. 304,300

Int. Cl.[6] B05D *3/06*; B32B *9/04*

U.S. Cl. 427—515 **25 Claims**

1. A method for making a composite comprising (A) an organic substrate and (B) a cured silicon containing polyacrylate hardcoat composition, which method comprises,

(i) treating at least a portion of the surface of the organic substrate with a devolatilized radiation curable silicon containing polyacrylate hardcoat composition, and,

(ii) effecting the radiation cure of the devolatilized curable silicon containing polyacrylate hardcoat composition,

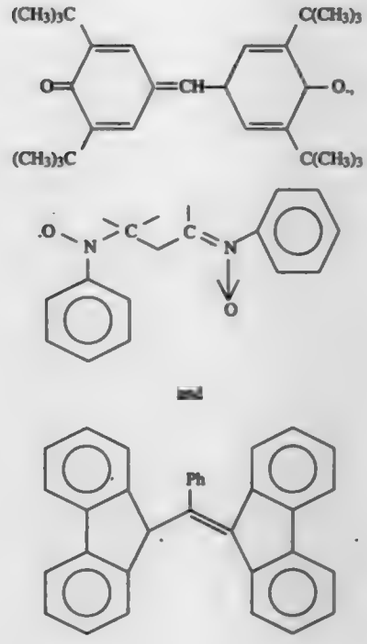
where the radiation curable silicon containing polyacrylate hardcoat composition comprises the devolatilized product of reaction at a temperature of about 25° C. to 100° C. of a mixture comprising by weight,

(iii) 100 parts of a water miscible solvent;

(iv) about 75 parts of silylated colloidal silica silylated with alkoxysilylacrylate,

(v) 10 to about 400 parts of a reactive polyfunctional acrylic monomer, and

(vi) an effective amount of anaerobic gelation inhibitor selected from the group consisting of 2,2,6,6-tetramethylpiperidinyloxy, 4-hydroxy-2,2,6,6-tetramethylpiperidinyloxy, bis(4-hydroxy-2,2,6,6-tetramethylpiperidinyloxy sebacate diradical, 2,2-diphenyl-1-picrylhydrazyl, 1,3,5-triphenylverdazyl, 1-nitroso-2-naphthol, a nitrone,



5,466,492

PROCESS FOR FIXING WOUND ITEMS WITH RADICALLY POLYMERISABLE COMPOUNDS

Gerhard Kießling, Hattingen; Raimund Pillath, Wuppertal; Stefan Reuther, Wuppertal, and Anja Richter, Wuppertal, all of, Germany, assignors to Herberts GmbH, Wuppertal, Germany

Filed Sep. 9, 1994, Ser. No. 303,709

Claims priority, application Germany, Sep. 11, 1993, 43 31 086.9

Int. Cl.[6] C05F *2/46*

U.S. Cl. 427—522 **13 Claims**

1. A process for impregnating wire windings of electrical equipment with a free radical polymerizable and heat curable composition, which process comprises

(a) impregnating said windings with said composition by the technique of immersion, flow coating, vacuum impregnation, vacuum pressure impregnation, or impregnation through trickle nozzles;

(b) thermal curing said applied composition; and

(c) during or after said thermal curing further curing the applied composition by exposure to high energy radiation.

5,466,493

NON-SKID SURFACE COMPOSITION FOR PAPER PRODUCTS

John J. Mefford, Florence, Ky., and John B. Homoelle, Cincinnati, Ohio, assignors to Michelman, Inc., Cincinnati, Ohio

Filed Oct. 26, 1994, Ser. No. 329,446

Int. Cl.[6] C09K 3/14

U.S. Cl. 427—384 15 Claims

9. A method of increasing the coefficient of friction of the surface of a cellulosic substrate comprising the steps of applying a non-skid surface composition consisting essentially of an aqueous suspension of glycerine with at least one material selected from the group consisting of colloidal silica and alumina, and wherein the ratio of said material to glycerine is between about 1:1 to 5:1, to the surface of said substrate and evaporating the water therefrom.

5,466,494

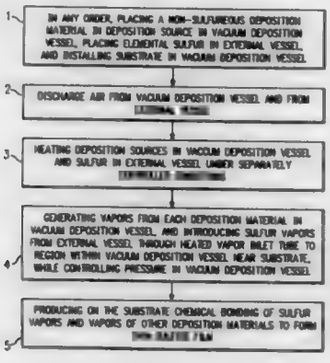
METHOD FOR PRODUCING THIN FILM

Akira Matsuno, and Takashi Nire, both of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 29, 1993, Ser. No. 10,765

Int. Cl.[6] C23C 16/00

U.S. Cl. 427—561 16 Claims



1. A method of producing a thin film on a substrate using a vacuum deposition vessel containing a substrate holder and at least one source of first deposition material, said method comprising:

positioning a substrate on said substrate holder;

providing first deposition material in said at least one source of first deposition material;

providing second deposition material in an external vessel which is located outside of said vacuum deposition vessel;

discharging air from the vacuum deposition vessel and from the external vessel;

generating in said vacuum deposition vessel vapors of said first deposition material;

generating in said external vessel vapors of said second deposition material;

introducing said vapors of said second deposition material from said external vessel into said vacuum deposition vessel through a vapor inlet tube which projects inwardly into said vacuum deposition vessel and has an outlet positioned adjacent to said substrate holder in order to form an atmosphere of vapors of said second deposition material within said vacuum deposition vessel concentrated in the vicinity of said substrate; and

producing chemical bonding, on said substrate, of the vapors of said first deposition material and the vapors of said second deposition material to form a thin film on said substrate.

5,466,495

METHOD OF MANUFACTURING A MAGNETIC HEAD

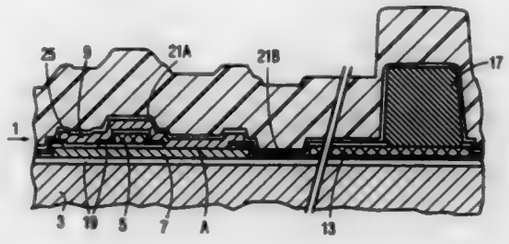
Franciscus A. Pronk; Thijs W. Bril; Peter S. A. Knapen; Arie H. Van Heeren, and Laurens J. Rhijnsburger, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 8, 1993, Ser. No. 148,813

Claims priority, application European Pat. Off., Nov. 19, 1992, 92203426

Int. Cl.[6] B05D 3/06

U.S. Cl. 427—576 24 Claims



1. A method of manufacturing a magnetic head, comprising forming at least a thin-film structure including a transducing element on a substrate, resulting in an uneven surface of the structure formed, remote from the substrate, and coating the uneven surface, characterized in that the coating is a thick film provided by PE-CVD, and having a thickness which is minimally equal to the distance between an area of said surface which is farthest remote from the substrate and an area which is most proximate to the substrate.

5,466,496

LIQUID CRYSTAL-DISPERSED POLYMERIC FILM

Yong W. Jin, Seoul, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyunggi, Rep. of Korea

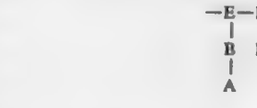
Continuation-in-part of Ser. No. 982,868, Nov. 30, 1992, abandoned. This application Apr. 13, 1994, Ser. No. 227,060

Claims priority, application Rep. of Koren, Nov. 30, 1991, 91-21869

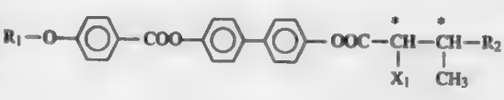
Int. Cl.[6] C09K 19/44

U.S. Cl. 428—1 12 Claims

1. A liquid crystal-dispersed polymeric film having improved response properties and view angle, said film comprising a ferroelectric liquid crystalline compound of formula (II) or (III) dispersed in a polymer matrix of formula (I):

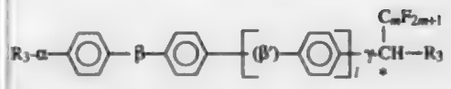


(I)



(II)

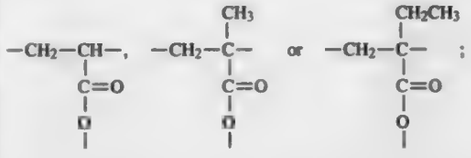
-continued



(III)

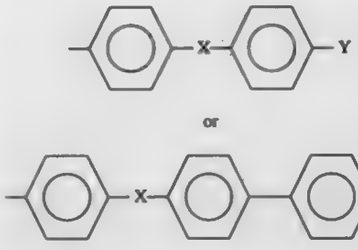
wherein $\overset{*}{C}$ stands for asymmetric carbon;

E stands for

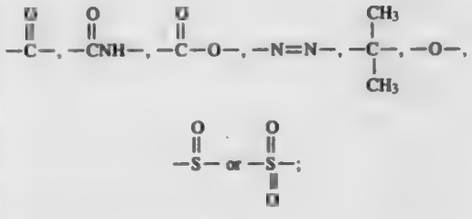


B stands for $-(CH_2)_n-$ or $-(CH_2-CH_2-O)_n-$ (wherein n denotes an integer of from 1 to 20);

A stands for

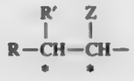


X stands for



Y stands for CN or OCH_3;

D stands for



(wherein R and R' are different from each other and independently represent CH_3, C_2H_5 or C_3H_7, and Z represents F, Cl, $-OCH_3$, $-OC_2H_5$ or $-CF_3$);

R_1 stands for $CH_3(CH_2)_{n1}$ (wherein n1 represents an integer of up to 20);

X_1 stands for F, Cl or CF_3;

R_2 stands for $C_{n'}H_{2n'+1}$ (wherein n' represents an integer of from 2 to 20);

R_3 stands for C_1–C_{12} alkyl radical;

α stands for —COO— or —OCO—;

β and β' independently stand for —COO— or $-OCH_2-$;

γ stands for —OCO— or —COO— ; and

l and m independently stand for an integer of up to 10.

5,466,497

FUR FABRIC AND METHOD OF PRODUCTION

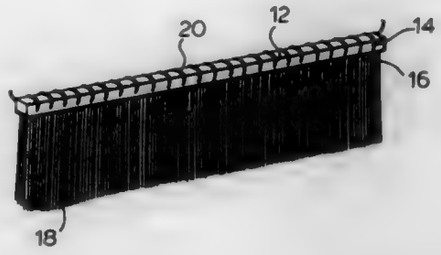
Michel Mosier, Toronto, Canada, assignor to R. B. Management Inc., Toronto, Canada

Filed Oct. 13, 1993, Ser. No. 135,342

Claims priority, application Canada, May 19, 1993, 2096577; Jun. 14, 1993, 2098352

Int. Cl.[6] C14B *15/08;* **A41H** *41/00*

U.S. Cl. 428—15 **13 Claims**



1. A fabric having a furry surface made from an elongated strip of a hair-coated skin of a fur-bearing animal, said strip consisting essentially of a base skin layer and a hair coating such that said base layer provides a hair-free body portion extending the length of said strip and said hair coating provides a hair-bearing portion extending the length of the strip at a lower part thereof such that the hair extends from said lower part substantially in a single plane; and a non-furry thread of reinforcing material sewn into and extending the length of said hair-free body portion in such a manner so as to be free from contact with said hair bearing portion.

5,466,498

PASTEURIZABLE, COOK-IN MULTILAYER SHRINK FILM

Roberto Forloni, Nerviano, and Mario Paleari, Pogliano, both of, Italy, assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Oct. 21, 1993, Ser. No. 140,342

Int. Cl.[6] B29D *22/00*

U.S. Cl. 428—36.7 **19 Claims**

1. A pasteurizable or cook-in multilayer shrink film, comprising an outer sealing layer comprising ethylene-butyl acrylate-maleic anhydride copolymer, and an outer or abuse shrink layer.

5,466,499

HEAT-SHRINKABLE POLYSTYRENE TUBE

Jun Takagi, and Hirotsugu Fujita, both of Nagahama, Japan, assignors to Mitsubishi Plastics Industries Limited, Tokyo, Japan

Filed Apr. 5, 1994, Ser. No. 222,834

Claims priority, application Japan, Jun. 11, 1993, 5-140288

Int. Cl.[6] B29D *23/00*

U.S. Cl. 428—36.9 **11 Claims**

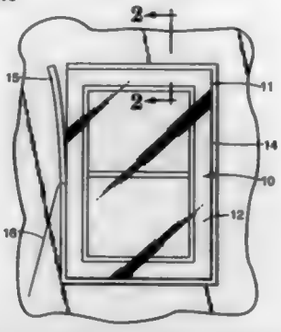
1. A heat-shrinkable polystyrene tube made of a composition comprising, as main components, an unhydrogenated block copolymer consisting essentially of styrene, o-, p- or α-methyl styrene hydrocarbon blocks and a conjugated diene selected from the group consisting of butadiene, isoprene and 1,3-pentadiene hydrocarbon blocks, and a polymer containing a styrene hydrocarbon, wherein the conjugated diene blocks in the block copolymer constitute from 5 to 40 wt % of the entire composition and from 60 to 80% of the block copolymer and the polymer containing a styrene hydrocarbon is a random copolymer having a glass transition temperature of from 40° to 90° C., a high-impact polystyrene having conjugated diene hydrocarbon polymer particles dispersed therein or mixtures thereof.

5,466,500

DOUBLE-COATED PRESSURE-SENSITIVE ADHESIVE TAPE INCORPORATING A STRONG, FLEXIBLE THREAD

Arthur W. Pluim, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 16, 1994, Ser. No. 198,229
Int. Cl.[6] C09J *7/02*
U.S. Cl. 428—40 **20 Claims**



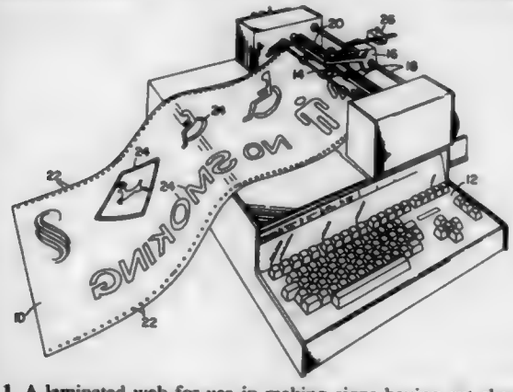
1. A double-coated pressure-sensitive adhesive tape comprising an elongate flexible carrier web, a layer of pressure-sensitive adhesive covering each major surface of the carrier web, one of said layers of pressure-sensitive adhesive being protected by a disposable low-adhesion liner, leaving the other layer exposed, and at least one strong, flexible thread of low elongation embedded in the tape adjacent one major surface of the carrier web and extending parallel to and spaced from the edges of the tape over its full length, the physical properties of said thread, carrier web, and layers of adhesive causing the thread to cut through the carrier web along its length when the layer of adhesive along said one surface is adhered to a substrate and one end of the thread is pulled away from the substrate.

5,466,501

SIGN MAKING WEB WITH TACK KILLING OVERCOAT REMOVABLE BY WASHING AND RELATED METHOD

David J. Logan, Bloomfield, and Leonard G. Rich, W. Hartford, both of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

Continuation of Ser. No. 773,710, Oct. 9, 1991, Pat. No. 5,344,680. This application Apr. 5, 1994, Ser. No. 223,156
The portion of the term of this patent subsequent to Sep. 6, 2011, has been disclaimed.
Int. Cl.[6] B32B *3/00*
U.S. Cl. 428—40 **15 Claims**



1. A laminated web for use in making signs having cut shapes adhesively attached to a supporting surface, said web comprising:

a base layer of sheet material having a first face and an oppositely disposed second face;

a plastic layer of sign material in sheet form superimposed on said base layer and having a third face facing said second face of said base layer and a fourth face facing away from said base layer, said third face of said sign material being a good or glossy face of said sign material, said fourth face of said sign material being a non-glossy or roughened face of said sign material;

a first layer of permanently tacky adhesive interposed between said base and said layer of sign material;

said adhesive of said first layer of permanently tacky adhesive adhering more strongly to said second face of said base layer than to said third face of said layer of sign material allowing said layer of sign material to be peeled from said first layer of permanently tacky adhesive with the adhesive of said first layer permanently tacky adhesive in the course of such peeling remaining on said base layer and coming completely free of said third face of said sign material;

a second layer of permanently tacky adhesive superimposed on said fourth face of said sign material with said second layer of permanently tacky adhesive defining an outwardly directed tacky surface facing away from said layer of sign material;

the adhesive of said second layer of permanently tacky adhesive having a more aggressive tack than said adhesive of said first layer of permanently tacky adhesive; and

a layer of water soluble vinyl polymer formed on the outwardly facing tacky surface of said second layer of permanently tacky adhesive for temporarily deadening the tack of the outwardly disposed tacky surface of said second adhesive layer yet allowing the tacky characteristic of said outwardly directed surface to be regenerated by the application of water capable of dissolving said water soluble vinyl polymer layer,

said second layer of permanently tacky adhesive being of such a tackiness when exposed that when a) a closed shape is cut in the laminated web by cutting through a said water soluble vinyl polymer layer through said second adhesive layer and said layer of sign material and no more than partially into said base layer, b) the surrounding portions of said closed shape of the layer of sign material defining the closed shape are removed, c) the adhesive of said second layer of permanently tacky adhesive overlapping the closed shape is thereafter exposed by applying an appropriate solvent to the water soluble vinyl polymer layer and bringing the exposed outwardly directed tacky surface of said second adhesive layer into engagement with a supporting surface, d) the adhesive of said second permanently tacky layer being pressed downwards toward the supporting surface by a force applied to said first face of said base layer in the area overlapping the closed shape, and e) the remainder of said web is then peeled from the supporting surface the portion of the layer of sign material defining the closed shape will remain on the supporting surface and be free of the remainder of the web due to the relative adhesive strengths of the first and second adhesive layers and the adherent properties of the supporting surface taken relative to the third face of the sign material.

5,466,502

DUAL-PLY RESPOSITIONAL WINDOW PRICING LABEL HAVING SEPARABLE RECORD SHEET

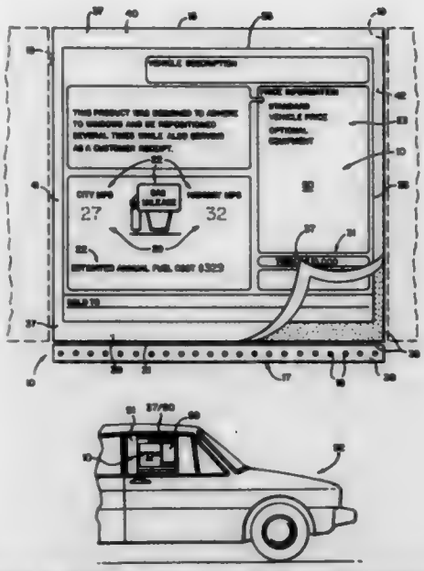
Stephen C. Wilkinson, Jefferson City, Mo., and Randy A. Thorman, Omaha, Nebr., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Continuation of Ser. No. 174,348, Dec. 28, 1993, abandoned. This application Dec. 13, 1994, Ser. No. 358,589
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—40 **13 Claims**

1. A window sticker composite comprising:

a front sheet having first and second faces, said front sheet having a front window sticker at least partially surrounded by a front border, indicia printed on said front window sticker of the first face of the front sheet;

a backing sheet underneath said front sheet, said backing sheet having a first face coated with a repositional adhesive adhering to said second face of said front sheet and the backing sheet being segregated into a back window sticker separable from a surronding back border, wherein the front window



sticker is superimposed over the back window sticker and an inner rim of the back border and wherein said front border being removable to expose a portion of the corresponding adhesive coated back border.

5,466,503

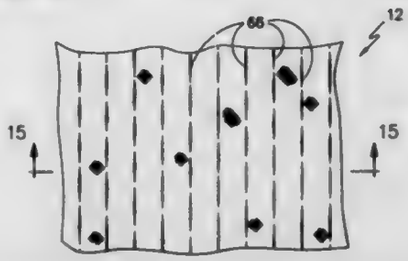
ENERGY ABSORPTION OF A HIGH TENACITY FABRIC DURING A BALLISTIC EVENT

Louis Dischler, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 7, 1992, Ser. No. 880,045

Int. Cl.[6] B32B *3/04;3/26*

U.S. Cl. 428—43 **30 Claims**



1. A ballistic-resistent fabric comprising of a sheet of fabric made from fibers having a tenacity of at least ten grams/denier, said sheet of fabric having at least one perforation therein thereby creating of portion of said sheet of fabric with a ballistic failure ratio less than one for an impact with a projectile having a velocity of about at least five hundred feet per second, and a ratio of said length of said portion of fabric to said width of said portion of fabric greater then a reciprocal squared of said ballistic failure ratio.

5,466,504

FIBROUS GLASS INSULATION ASSEMBLY

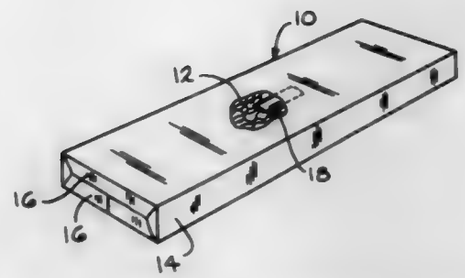
Patrick M. Gavin, Newark; Jean E. Schelhorn, Granville; David P. Aschenbeck, Newark, and Carl R. Strauss, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Filed May 2, 1994, Ser. No. 236,068

Int. Cl.[6] B32B *1/06*

U.S. Cl. 428—74 **15 Claims**

1. An improved fibrous glass insulation package comprising, a fibrous glass body in a recoverable compressed state, a plastic



outer layer enclosing said fibrous glass body and a desiccant positioned within said plastic outer layer adjacent said fibrous glass body, said desiccant being adapted for removing a sufficient amount of moisture from said fibrous glass body to improve the recovery performance of said fibrous glass body from a compressed state to an uncompressed state.

5,466,505

NAPPED FABRIC AND PROCESS FOR ITS PRODUCTION

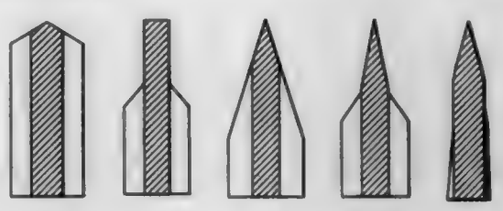
Keiji Fukuda, Kurashiki; Isao Tokunaga, Okayama-Pref., and Takao Akagi, Kurashiki, all of, Japan, assignors to Kuraray Company Limited, Kurashiki, Japan

Division of Ser. No. 19,346, Feb. 18, 1993, abandoned, which is a continuation of Ser. No. 654,049, Feb. 12, 1991, abandoned. This application Dec. 21, 1993, Ser. No. 170,636

Claims priority, application Japan, Mar. 2, 1990, 2-52292; Jul. 6, 1990, 2-180319

Int. Cl.[6] B32B *33/00;* **D06C** *11/00;* **D02G** *3/00*

U.S. Cl. 428—91 **5 Claims**



1. A napped fabric comprising naps of a tapered fiber comprising a sheath-core composite polyester fiber tapered to at least one end thereof, said fiber satisfying the following conditions:

a) the ratio of the rates of alkali hydrolysis between the sheet component and the core component is:

$$1.1 \leq \frac{\text{alkali hydrolysis rate of sheet component}}{\text{alkali hydrolysis rate of core component}} \leq 15;$$

b) the core contains 0 to 0.2% by weight of a delusterant and the sheath at least 0.3% by weight thereof;

c) the tapered part other than that with exposed core forms an irregularly roughened surface with the recisions having a diameter measured in a circumferential direction perpendicular to the fiber axis of 0.2 to 0.7 μ and being present in a density of 10 to 1,000 pieces/100 μ^2; and

d) the fiber has its core exposed at the end and is tapered to the end in a length of at least 20% of its whole raised length;

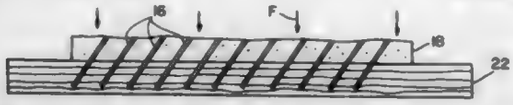
wherein said naps have a nap length of not more than 5 mm.

5,466,506

TRANSLAMINAR REINFORCEMENT SYSTEM FOR Z-DIRECTION REINFORCEMENT OF A FIBER MATRIX STRUCTURE

Glen Freitas, Foxboro; Joseph S. Boyce, Hanover, and Constance Magee, Wilmington, all of Mass., assignors to Foster-Miller, Inc., Waltham, Mass.

Continuation of Ser. No. 967,192, Oct. 27, 1992, abandoned.
This application Aug. 26, 1994, Ser. No. 297,415
Int. Cl.[6] D03D 41/00; B32B 5/07
U.S. Cl. 428—105 18 Claims



1. A translaminar reinforcement apparatus for inserting reinforcing elements into a fiber matrix structure, the apparatus comprising:

a body of compactible material that has spaced opposing surfaces; and

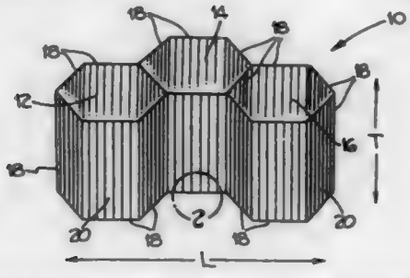
a plurality of reinforcing elements disposed in said body and extending in at least one direction and oriented in at least one acute angle to one of said surfaces, said body for supporting said reinforcing elements as said reinforcing elements are driven into a fiber matrix structure.

5,466,507

HIGH THERMAL CONDUCTIVITY NON-METALLIC HONEYCOMB WITH LAMINATED CELL WALLS

Stephen C. Darfler, Castro Valley, Calif., assignor to Hexcel Corporation, Pleasanton, Calif.

Filed Oct. 14, 1993, Ser. No. 136,957
Int. Cl.[6] B32B 3/12
U.S. Cl. 428—116 10 Claims



1. A high thermal conductivity non-metallic honeycomb structure comprising:

a plurality of interconnected walls which define a plurality of interconnected honeycomb cells having a lengthwise direction which extends transversely relative to said walls and a thickness direction which extends parallel relative to said walls, said call walls comprising:

a first low thermal conductivity structural layer comprising a plurality of non-metallic fibers having low thermal conductivity, said first structural layer having an interior and an exterior surface;

a second low thermal conductivity structural layer comprising a plurality of non-metallic fibers having low thermal conductivity, said second structural layer having an interior and an exterior surface;

a thermally conductive layer sandwiched between the interior surfaces of said first and second structural layers, said thermally conductive layer comprising a plurality of non-metallic fibers having high thermal conductivity to provide directionally controlled heat conductance through said honeycomb structure;

a first non-porous and non-metallic layer which is laminated to the exterior surface of said first structural layer; and

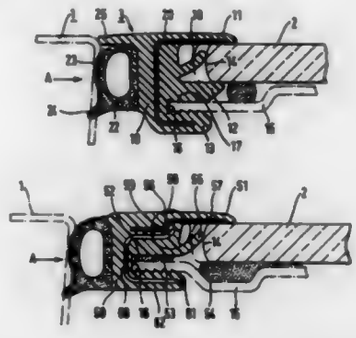
a second non-porous and non-metallic layer which is laminated to the exterior surface of said second structural layer.

5,466,508

SEAL FOR A RIGID PANEL FOR A VEHICLE ROOF OPENING

Rolf Brocke, Wangen, and Klaus Glagow, Wasserburg, both of, Germany, assignors to Metzeler Automotive Profiles, GmbH, Lindeu Bodensee, Germany

Filed Mar. 14, 1994, Ser. No. 213,114
Claims priority, application Germany, Mar. 15, 1993, 43 08 214.9
Int. Cl.[6] B60J 10/12; E06B 7/23;3/62
U.S. Cl. 428—122 10 Claims



1. A seal for a glass panel for a roof opening of a vehicle roof, the glass panel having a base frame glued to and underlying the glass panel at a rim area and having an edge that projects beyond and parallel to the rim of the glass panel, comprising:

an elastomeric gap seal having an inner profile encompassing the rim of the glass panel and the edge of the base frame, and a hollow sponge rubber chamber seal;

the inner profile comprising first, second and third ridges extending laterally, the first and second ridges covering the rim of the glass panel and the second and third ridges forming a groove encompassing and securing the edge of the base frame;

a sealing lip disposed between the first and second ridges forming a seal against the rim of the glass panel;

a U-shaped reinforcement within the inner profile extending from the first ridge to the third ridge, encompassing the rim of the glass panel and the edge of the base frame;

the gap seal having first and second open ends adapted to be flexed between a spaced apart configuration for allowing the gap seal to be fitted to the glass panel and base frame and a close fitting configuration engaging the glass panel for allowing the ends to be connected together to secure the seal to the glass panel and base frame.

5,466,509

TEXTURED, POROUS, EXPANDED PTFE

Rajagopal R. Kowligi, Phoenix, Ariz.; John M. Bibeau, Burlington, Mass., and Howard H. Taylor, Tempe, Ariz., assignors to IMPRA, Inc., Tempe, Ariz.

Filed Jan. 15, 1993, Ser. No. 5,482
Int. Cl.[6] B32B 27/16
U.S. Cl. 428—141 14 Claims

1. An expanded polytetrafluoroethylene sheet produced by the process of extruding a mixture of polytetrafluoroethylene and a lubricant into a sheet; forming a pattern of defect sites in said sheet by one of impressing an external pattern into said sheet; high energy bombardment with solids, etching, laser irradiation and actinic irradiation; expanding said sheet; and sintering said sheet,

whereby the expanded polytetrafluoroethylene sheet is characterized by having internodal distances non-uniformly distributed across the range of 10–200 microns.

5,466,510

STRUCTURE, METHOD OF PREVENTING ADHESION OF ADHESIVE SUBSTANCE, AND METHOD OF PREVENTING ADHESION OF NON-VULCANIZED RUBBER

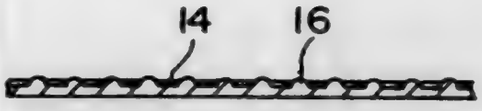
Isamu Oikawa, and Katsuhiko Maeda, both of Saitama, Japan, assignors to Tokyo Silicone Co., Ltd., Saitama, Japan

Continuation of Ser. No. 694,407, May 1, 1991, abandoned. This application Jun. 8, 1994, Ser. No. 257,440

Claims priority, application Japan, May 11, 1990, 2-49400 U; Feb. 26, 1991, 3-830900

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—172 **6 Claims**



1. A structure comprising a base body with a surface having a ragged surface profile having peaks and depressions, and a non-adhesive layer made of a non-adhesive high polymer, said non-adhesive layer being fixed to at least the depressions of the ragged surface of said base body such that said ragged profile of said base body is present on the outer surface, for preventing adhesion of an adhesive substance on said surface, wherein said ragged surface of said base body and said non-adhesive layer has a mean surface roughness Ra that falls within the range of from 0.5 μm to 20 μm and a mean distance Z between adjacent peaks that falls within the range of from 20 μm to 1000 μm.

5,466,511

COATED TRANSFER SHEET AND LAMINATE PRODUCED THEREFROM

Robin D. O'Dell, and Joseph Lex, both of Pasadena, Md., assignors to Nevamar Corporation, Odenton, Md.

Continuation-in-part of Ser. No. 731,981, Jul. 18, 1991, Pat. No. 5,266,384. This application Sep. 2, 1993, Ser. No. 115,062

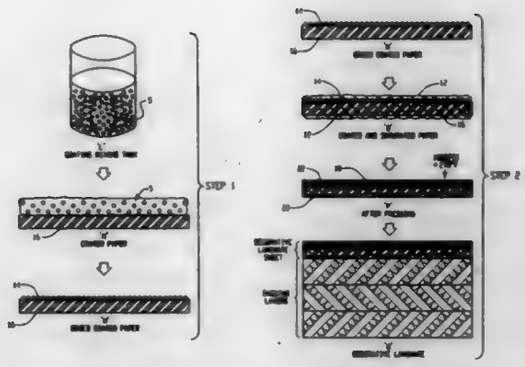
Int. Cl.[6] B32B *3/10;27/42*

U.S. Cl. 428—207 **5 Claims**

1. A coated transfer sheet for use with a decorative facing sheet to provide a decorative laminate sheet suitable for pressing, comprising:

(a) a transfer release sheet having two exterior surfaces; and

(b) a coating applied to one surface of the transfer release sheet, said coating comprising a surface coating resin that melts and flows under heat and pressure during lamination to impart one



or more of the following properties: enhanced wearbility, chemical, thermal, or ultra-violet radiation resistance or abrasion resistance.

5,466,512

FLAME RETARDANT ORGANOSILICON POLYMER COMPOSITION, PROCESS FOR MAKING SAME, AND ARTICLE PRODUCED THEREFROM

Laura M. Babcock; John K. Bard, and Raymond T. Leibfried, Sr., all of New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 839,610, Feb. 21, 1992, Pat. No. 5,298,536. This application Sep. 24, 1993, Ser. No. 125,806

Int. Cl.[6] B32B *25/20;* **C08F** *283/12;* **C08L** *83/04*

U.S. Cl. 428—209 **50 Claims**

1. An article of manufacture comprising a cured crosslinked organosilicon polymer wherein the article of manufacture is selected from the group consisting of an electronic component which comprises, or an electronic component coated or encapsulated with, the crosslinked organosilicon polymer and the crosslinked organosilicon polymer comprises residues of at least one silicon-containing compound and at least one polycyclic polyene compound linked through carbon to silicon bonds, wherein the silicon-containing compound comprises at least one member selected from the group consisting of:

A. cyclic polysiloxane compounds containing at least two hydrosilation reactive ≡SiH groups;

B. tetrahedral siloxysilane compounds containing at least two hydrosilation reactive ≡SiH groups; and

C. linear poly(organohydrosiloxane) polymers containing at least two hydrosilation reactive ≡SiH groups;

wherein the polycyclic polyene compound contains at least two hydrosilation reactive carbon-carbon double bonds;

wherein at least a substantial portion of at least one member selected from the group consisting of the silicon compound and the polycyclic polyene compound has more than two reactive sites; and wherein the composition further comprises at least one halogen containing flame retardant.

5,466,513

MULTI-LAYER ABSORBENT COMPOSITE

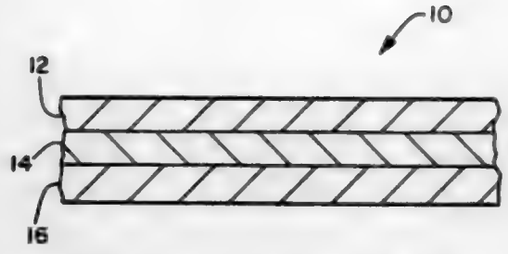
M. Chris Wanek, Marietta, Ga.; Thomas W. Van Den Bogart, Appleton, Wis.; William A. Georger, Canton, Ga.; Brendon F. Ribble, Menasha, Wis.; Billie J. Matthews, Woodstock, Ga.; Lawrence H. Sawyer, Roswell, Ga.; Frank P. Abuto, Alpharetta, Ga., and Edward E. Werner, Oshkosh, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 993,245, Dec. 18, 1992, Pat. No. 5,294,478. This application Feb. 14, 1994, Ser. No. 196,926

Int. Cl.[6] A41B *13/02;* **B32B** *5/26;7/02*

U.S. Cl. 428—218 **23 Claims**

1. An absorbent structure, said absorbent structure comprising:



a first surge management layer comprising a fibrous web, said first surge management layer having a basis weight of from about 20 to about 200 grams per square meter, and a density of from about 0.01 to about 0.12 gram per cubic centimeter;

a second surge management layer comprising a fibrous web, said web comprising hydrophilic fibers, said second surge management layer having a basis weight of from about 20 to about 350 grams per square meter and a density of from about 0.04 to about 0.25 gram per cubic centimeter; and

an absorbent layer located between and in liquid communication with said first and second surge management layers, said absorbent layer comprising means for containing a high-absorbency material and from about 50 to about 100 weight percent, based on total weight of said absorbent layer, of a high-absorbency material contained by said means for containing a high-absorbency material, said absorbent layer having a basis weight of from about 200 to about 1000 grams per square meter and a density of from about 0.06 to about 0.4 gram per cubic centimeter wherein the density of said absorbent layer is greater than the density of said first and second surge management layers and the density of the first surge management layer is different than the density of said second surge management layer.

5,466,514

HIGH-DENSITY TEXTILE FABRIC

Takayuki Katsuoka, Osaka; Ryuji Uemura, Fukui; Shunzo Kawasaki, Mishima, and Fumio Shibata, Uji, all of, Japan, assignors to Teijin Limited, Osaka, Japan

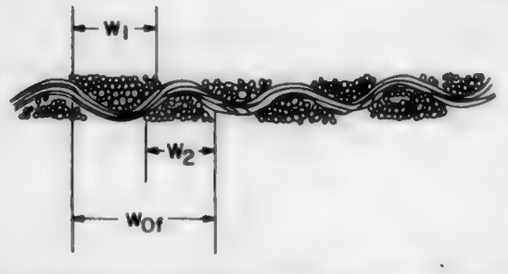
PCT No. PCT/JP94/00414, § 371 Date Nov. 10, 1994, § 102(e) Date Nov. 10, 1994, PCT Pub. No. WO94/21848, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 15, 1994, Ser. No. 335,717

Claims priority, application Japan, Mar. 16, 1993, 5-055587

Int. Cl.[6] D03D *3/00*

U.S. Cl. 428—229 **11 Claims**



1. A high-density textile fabric produced by arranging, as warps and wefts, identical or different continuous filaments yarn at least 40% by weight of which are formed of filaments having a filament denier of 1.1 or less and which have a total denier of 120 or less, wherein cross-sectional overlaying coefficients, W_p and W_f, of the warps and wefts constituting said textile fabric simultaneously satisfy the following (a) and (b),

(a) $.30 \geq W_p \geq 1.10$

(b) $.20 \geq W_f \geq 0.85$

(wherein the cross-sectional overlaying coefficients, W_p and W_f, are defined as follows;

$W_{p=w1}/W_{0f}$

$W_{f=w1_f}/W_{0p}$

W_{0f}: a width of minimum repeating units in a cross section of a textile fabric along a bisecting line in the length direction of any wefts in the minimum repeating units of the textile fabric,

W_{1f}: a sum of widths of warps contained in the minimum repeating units in the cross section of the above W_{0f},

W_{0p}: a width of minimum repeating units in a cross section of a textile fabric along a bisecting line in the length direction of any warps in the minimum repeating units of the textile fabric,

W_{1f}: a sum of widths of wefts contained in the minimum repeating units in the cross section of the above W_{0f}.

5,466,515

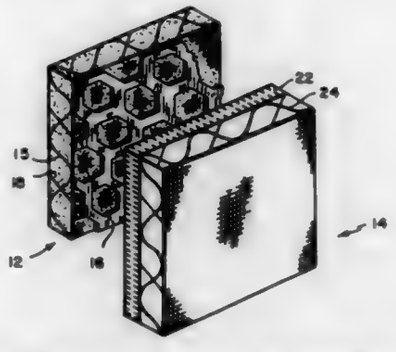
WEATHER PROTECTIVE FABRIC COMBINATION, OUTERWEAR CONSTRUCTED THEREFROM

Stephen Blauer, and Charles Blauer, both of Lexington, Mass., assignors to Blauer Manufacturing Company, Inc., Boston, Mass.

Filed Apr. 4, 1994, Ser. No. 222,524

Int. Cl.[6] B32B *7/00*

U.S. Cl. 428—252 **31 Claims**



1. A fabric structure comprising a shell and a lining secured in close proximity to each other:

(a) said shell including an outer woven synthetic fabric, an intermediate inner connected pattern imprinted on the inner face thereof, and release agent impregnation thereof;

(b) said lining including an intermediate outer synthetic polymer water-vapor permeable membrane, and an inner synthetic polymer fabric;

(c) said pattern being adapted to maintain the shape of said shell.

5,466,516

THERMOPLASTIC FIBER LAMINATE

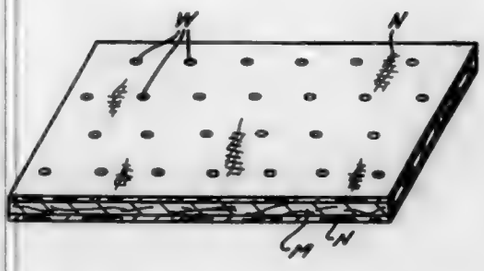
Thomas H. Lutzow, Milwaukee, and Daniel E. Ryan, Brookfield, both of Wis., assignors to Matarah Industries, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 597,811, Oct. 15, 1990, abandoned. This application Sep. 10, 1993, Ser. No. 120,040

Int. Cl.[6] B32B *5/22;27/00;3/06;* **D04H** *1/16*

U.S. Cl. 428—282 **9 Claims**

1. A laminated sheet of thermoplastic material comprising a separate inner layer of meltblown fibers sandwiched between two separate outer layers of needle punched fibers and bonded together at a number of discrete points across the length and width of the laminated sheet, wherein the two outer layers are each comprised of a full width sheet of needle punched material, and the inner layer is comprised of a set of meltblown sheets of material, the



meltblown sheets being separated by narrow strips of needle punched fibrous material.

5,466,517

SPUNBONDED FABRICS COMPRISING BIODEGRADABLE POLYCAPROLACTONE FILAMENTS AND PROCESS FOR ITS MANUFACTURE

Helmut Eschwey, Gorxheimertal; Monika Giesen-Wiese, Hoechst/Odw.; Maria Grill, Koblenz-Metternich; Ararad Emirze; Hans-Peter Seidler, both of Kaiserslautern; Bernhard Klein, Birkenau-Löhrbach, and Michael Kauschke, Waldfischbach-Burgalben, all of, Germany, assignors to Carl Freudenberg, Weinheim/Bergstr, Germany

Filed Jun. 12, 1992, Ser. No. 897,500

Claims priority, application Germany, Jun. 13, 1991, 41 19 455.1

The portion of the term of this patent subsequent to May 31, 2011, has been disclaimed.

Int. Cl.[6] D04H *1/58;1/04;* **B29C** *47/38;47/60*

U.S. Cl. 428—288 **5 Claims**

1. A spunbonded fabric comprising a multiplicity of individual continuous thermoplastic filaments, said filaments comprising at least 50 weight % biodegradable polycaprolactone which has a mean molecular weight of from 35,000 to 70,000, with the individual filaments adhering to one another at their intersections without binders.

5,466,518

BINDER COMPOSITIONS AND WEB MATERIALS FORMED THEREBY

Robert L. Isaac, Bethesda, Md., and Bernard Cohen, Berkeley Lake, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 17, 1993, Ser. No. 107,490

Int. Cl.[6] D04H *1/58*

U.S. Cl. 428—288 **19 Claims**

1. A fibrous web adapted to disintegrate in distilled water in 30 seconds or less when subjected to agitation, the web comprising:

a plurality of fibers; and

from about 0.20 to about 15 percent, by weight, of a binder joining the fibers together, the binder comprising:

from about 10 to about 40 weight percent of a water dispersible polymer selected from the group consisting of high molecular weight amorphous polyester having one or more ionic substituents attached thereto;

from about 10 to about 40 weight percent of an elastomeric latex emulsion;

from about 20 to about 40 weight percent of a xerogellant; and

from about 5 to about 20 weight percent of a plasticizing agent.

5,466,519

SUPPORT FOR A PHOTOGRAPHIC PRINTING PAPER AND A MANUFACTURING PROCESS THEREFOR

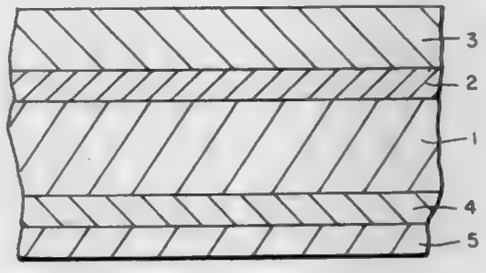
Yuji Shirakura; Hisamasa Abe; Teruo Yamashita; Tatsuo Shimizu; Sei Kawahara; Takahito Miyoshi, and Yasuo Nishikawa, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 28, 1994, Ser. No. 233,975

Claims priority, application Japan, Apr. 28, 1993, 5-128020; May 17, 1993, 5-114928; Jun. 2, 1993, 5-132037; Aug. 30, 1993, 5-239094

Int. Cl.[6] B32B *5/16*

U.S. Cl. 428—323 **25 Claims**



1. A support for a photographic printing paper comprising a substrate and waterproof resin coating layers provided on both sides of the substrate, wherein at least the waterproof resin coating provided on the side of the substrate on which an emulsion for forming an image is to be coated comprises i) a lowermost melt-extruded waterproof resin coating layer contacting the substrate and ii) at least one melt-extruded upper coating layer containing a waterproof resin capable of being melt-extruded at a temperature of from 170° to 290° C. and containing uniformly dispersed titanium dioxide

wherein the lowermost melt-extruded waterproof resin coating layer contains at least one additive selected from the group consisting of a tackifier, an adhesive resin, talc, kaolin and calcium carbonate.

5,466,520

PAPER-LIKE WHITE-OPAQUE HEAT-SEALABLE POLYPROPYLENE FILM

Anton Krallmann, Fallingbostel; Ulrich Reiners, Neuenkirchen; Eberhard Albinus; Jürgen Böhner, both of Bomlitz, and Neele Neelen, Fallingbostel, all of, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Filed Apr. 28, 1994, Ser. No. 234,202

Claims priority, application Germany, Apr. 30, 1993, 43 14 213.3

Int. Cl.[6] B32B *5/16*

U.S. Cl. 428—323 **7 Claims**

1. A white-opaque biaxially oriented multilayer film with good heat-sealing properties and with a paper-like appearance on at least one side, comprising an opaque core and at least one outer layer the core comprising a polypropylene and a filler, the outer layer comprising

10–15% by weight of an isotactic polypropylene having a density of 0.9–0.91 g/cm^3 and a melt-flow index of 0.5 g/10 min to 8 g/10 min at 230° C. under 21.2 N load,

5–15% by weight of a low-density linear ethylene/maleic acid anhydride polymer blended with rubber (MSA content 0.1–2.5% by weight, rubber content 5–35%),

40–80% by weight of a statistical propylene/ethylene copolymer with 2 to 6% by weight of ethylene, or a statistical terpolymer of propylene, ethylene and butylene with an ethylene content of <15% by weight and a butylene content of<7% by weight, and

5–15% by weight of an inorganic filler.

5,466,521

FILM FOR HIGH HEAT-SENSITIVE STENCIL PAPER

Yoshinori Sato, Yamato; Megumi Komiyama, Tokyo; Kazuo Endo, and Masashi Tate, both of Yokohama, all of, Japan, assignors to Diafoil Hoechst Company, Ltd., Tokyo, Japan

Filed Mar. 23, 1994, Ser. No. 216,118

Claims priority, application Japan, Mar. 25, 1993, 5-066783

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[6] B32B 5/06

U.S. Cl. 428—330 19 Claims

1. A film for heat-sensitive stencil paper, comprising a biaxially oriented film having a thickness of 0.5 to 6.0 μm and formed from a polyester composition comprising polybutylene terephthalate and another polyester, wherein:

said polybutylene terephthalate comprises 20 to 80% by weight of said polyester composition,

wherein: said another polyester comprises a dicarboxylic acid component and a glycol component,

the maximum value of average heat shrinkage stresses in the machine and transverse directions of the film measured at a film temperature of 60° to 140° C. is more than 300 g/mm$_2$,

the heat shrinkage of the film by treatment at 100° C. for 3 minutes is not less than 20%,

the melting point of the film measured by differential scanning calorimetry is in the range of 150° to 240° C., and

the film has at least two melting heat absorption peaks in differential scanning calorimetry, the difference in temperature between said heat absorption peaks being not less than 5° C.

5,466,522

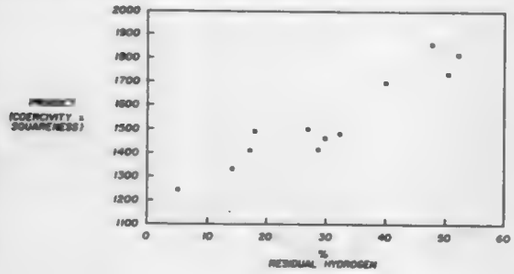
COBALT PLATINUM MAGNETIC FILM AND METHOD OF FABRICATION THEREOF

Dennis R. Freeman, Spencerport, and Richard C. Soper, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 905,026, Jun. 26, 1992, abandoned. This application May 5, 1994, Ser. No. 238,358

Int. Cl.[6] B32B 5/16; G11B 5/66

U.S. Cl. 428—332 16 Claims



1. An improved magnetic film comprising:

a substrate;

an underlayer deposited on said substrate; and

a CoPt film sputter deposited following glow discharge on said underlayer, wherein the coercivity of said magnetic film is greater than 2000 Oersteds and the squareness ratio of said magnetic film is greater than 0.72, and the thickness of said CoPt film is at least 400 nm and wherein said CoPt film is sputter deposited or said glow discharge is executed in an atmosphere containing at least 30 mole percent hydrogen gas.

5,466,523

HYDROPHILIC CHEMICALLY ADSORBED FILM

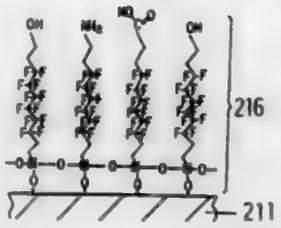
Kazufumi Ogawa, Hirakata; Norihisa Mino, Settu, and Mamoru Soga, Osaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 872,836, Apr. 23, 1992, abandoned. This application May 31, 1994, Ser. No. 250,943

Claims priority, application Japan, Apr. 30, 1991, 3-098906; Apr. 30, 1991, 3-098918; Jun. 14, 1991, 3-143499

Int. Cl.[6] B32B 7/04

U.S. Cl. 428—333 4 Claims



1. A hydrophilic chemically adsorbed film comprising a straight fluorocarbon chain having one end bonded by covalent Si bonds to a substrate surface, wherein said chemically adsorbed film contains hydrophilic functional groups at the outermost surface, and said hydrophilic functional groups include at least one functional group selected from the group consisting of —SCN, —NH_2, =NH, —N^{30} R_3X^-, —NO_2, —SH, and —SO_3H groups, where X represents a halogen atom, R represents a methyl group, and the hydrogen atoms in the SO_3H groups are substituted by an alkali metal or an alkali earth metal.

5,466,524

BARIUM HEXAFERRITE-SILICON NITRIDE-CARBON MAGNETIC RECORDING MEDIUM

Youichi Hoshi, Kanagawa, Japan; Dennis E. Speliotis, Lexington, Mass., and Jack H. Judy, Roseville, Minn., assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 879,422, May 7, 1992, abandoned. This application Mar. 1, 1994, Ser. No. 203,760

Int. Cl.[6] G11B 5/66

U.S. Cl. 428—336 6 Claims

1. A magnetic recording medium, comprising:

(a) an amorphous carbon substrate;

(b) a silicon nitride layer formed on said carbon substrate, said silicon layer having a thickness sufficient to prevent diffusion of carbon atoms from the said carbon substrate into a subsequently deposited magnetic recording layer; and

(c) a continuous crystalline hexagonal barium hexaferrite magnetic recording layer deposited on said silicon nitride layer.

5,466,525

MULTIFILAMENT YARN OF POLYETHYLENE NAPHTHALATE AND METHOD FOR PRODUCING SAID YARN

Christinan J. Maria, Ellecom; Anton P. De Weijer, Nijmegen; Hendrik Middeljans, Dieren, and Herman M. Heuvel, Rheden, all of, Netherlands, assignors to Akzo Nobel N.V., Netherlands

Filed Jun. 20, 1994, Ser. No. 262,549

Claims priority, application Germany, Jun. 22, 1993, 43 20 593.3

Int. Cl.[6] D07G 3/00

U.S. Cl. 428—357 17 Claims

1. Multifilament yarn, monofilament, or film comprising polyethylene naphthalate, with a tearing strength of at least 400 mN/tex, wherein said multifilament yarn, monofilament, or film

has a DSC melting point of at least 292° C. where the DSC melting point is measured on a sample quantity of 2.5 mg at a heating rate of 20° C. per min.

5,466,526

FAR INFRARED RADIANT COMPOSITE FIBER CONTAINING METAL

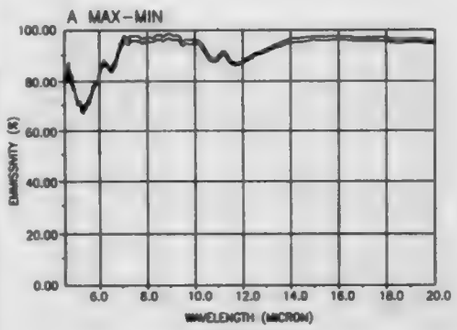
Katsumi Magata, 16-18, Shinashiyakami, Suita City, Osaka, Japan

Continuation-in-part of Ser. No. 930,132, Oct. 8, 1992, abandoned, and a continuation-in-part of Ser. No. 930,131, Oct. 8, 1992, abandoned. This application Sep. 12, 1994, Ser. No. 304,307

Claims priority, application Japan, Jul. 16, 1992, 4-213557; Jul. 16, 1992, 4-213558

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—372 **1 Claim**



1. A far infrared radiant composite fiber comprising polyurethane elastic material:

said fiber including platinum and at least one metal oxide selected from the group comprising alumina, silica, and titania, the platinum and at least one metal oxide being distributed throughout said fiber;

said polyurethane elastic material facilitating the escape of heat from said composite fiber;

said composite fiber having a far infrared emissivity of at least 80% on average in the spectral range from 6.0 um to 20.0 um at 30 degrees C.

5,466,527

STAIN RESISTANCE OF NYLON CARPET

William G. Jenkins, Lexington, Va., assignor to Burlington Industries, Greensboro, N.C.

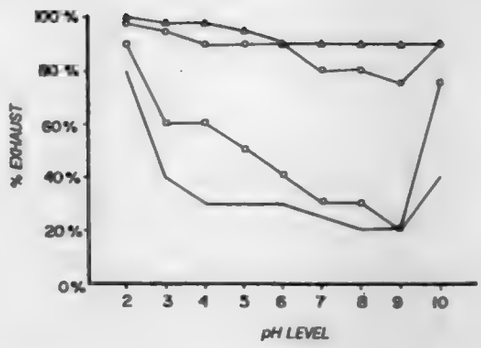
Continuation of Ser. No. 51,682, Apr. 23, 1993, abandoned, which is a continuation-in-part of Ser. No. 787,220, Nov. 4, 1991, abandoned, which is a division of Ser. No. 552,178, Jul. 12, 1990, Pat. No. 5,085,667, which is a continuation-in-part of Ser. No. 519,237, May 4, 1990, abandoned. This application Nov. 3, 1994, Ser. No. 336,951

The portion of the term of this patent subsequent to Feb. 4, 2009, has been disclaimed.

Int. Cl.[5] D02G *3/00;* **D06P** *3/06*

U.S. Cl. 428—375 **57 Claims**

1. A process of dyeing cationic-dyeable nylon fibers comprising dyeing said fibers in a dyebath with a premetallized acid dye at a



pH of from about 2.0 to about 6.5 and fixing the dye to the fibers.

5,466,528

CHEMICALLY TREATED GLASS TYPE SUBSTRATES WITH VINYL POLYMER COMPATIBILITY

Mikhail M. Girgis, Wexford, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 934,093, Aug. 21, 1992, abandoned. This application Oct. 17, 1994, Ser. No. 324,432

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—391 **20 Claims**

1. Glass fibers having applied thereto the dried residue of an aqueous coating composition that is compatible with poly(vinyl chloride), wherein the coating composition comprises:

(a) at least one starch;

(b) at least 47 weight percent of the chemical treatment composition on a non-aqueous basis of at least one wax;

(c) about 3 to about 20 weight percent of the chemical treatment composition on a non-aqueous basis of a cationic lubricant;

(d) about 3 to about 20 weight percent of the chemical treatment composition on a non-aqueous basis of at least one organofunctional silane coupling agent;

(e) up to about 20 weight percent of the chemical treatment composition on a non-aqueous basis of a polymer adhesion promoter selected from the group consisting of an ester and an anhydride of a carboxylic acid:

(f) at least one material selected from the group consisting of:

(1) about 1 to about 15 weight percent of the chemical treatment composition on a non-aqueous basis of a polymeric film forming material other than starch, wherein the amount of the polymeric film forming material is less than the amount of the wax; and

(2) about 1 to about 20 weight percent of the chemical treatment composition on a non-aqueous basis of a condensation product of a polyamine and a fatty acid; and

(g) a carrier for application of the chemical treatment composition to the glass fibers, wherein the chemical treatment composition is essentially free of mono-, di- and triglycerides.

5,466,529

POLYSILOXANES HAVING ANIONIC CARBOXY, PHOSPHONIC OR CARBOXY AND SULFONATE GROUPS USEFUL AS AN ANTISTAIN FINISH FOR NYLON

Anna M. Czech, Peekskill, N.Y., assignor to OSi Specialties, Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 953,017, Sep. 29, 1992, abandoned. This application Jun. 2, 1993, Ser. No. 71,293

Int. Cl.[6] B32B *27/34;9/04*

U.S. Cl. 428—395 **4 Claims**

1. A method for imparting stare resistance to a polyamide substrate which method comprises contacting the polyamide substrate with a polysiloxane having the formula:

wherein

each R is the same or different and is a monovalent hydrocarbon radical;

R^1 is selected from the group consisting of (i) an alkylene group having 1 to 20 carbon atoms, (ii) an acylalkylene or alkalylene group having 7 to 25 carbon atoms, (iii) an alkenylene group having 2 to 20 carbon atoms, (iv) an organic group selected from groups (i) through (iii) herein and containing a group selected from the group consisting of an ether group, an ester group, a hydroxide group, a keto group and a carboxyl group;

wherein if R^1 contains an ester group, the polysiloxane is prepared by reacting a hydroxy modified polysiloxane with a cyclic anhydride to form a corresponding carboxy-polysiloxane;

X is selected from the group consisting of a carboxy group, a phosphonic acid group or a phosphonic salt group;

m has a value from about 1 to 500;

n has a value from about 0 to 500;

the ratio of n to m is from about 0 to 15, in an amount such that 0.25 to 6.0 percent of polysiloxane by weight of the dry substrate remains on the substrate.

5,466,530

BIOCOMPATIBLE COMPONENTS FABRICATED FROM A SUBSTANTIALLY CONSOLIDATED STOCK OF MATERIAL

Garry L. England, Winona Lake, and Joel C. Higgins, Claypool, both of Ind.

Filed Jan. 21, 1993, Ser. No. 6,747

Int. Cl.[6] B32B *27/32*

U.S. Cl. 428—411.1 **6 Claims**

1. A biocompatible component resistant to wear fabricated from a substantially consolidated stock of material, said biocompatible component formed by the steps of:

preparing said substantially consolidated stock from an ultra high molecular weight polyethylene powder by:

(a) subjecting said powder to a cold isostatic pressure treatment thereby forming an incompletely consolidated stock from said powder,

(b) subjecting said incompletely consolidated stock to a hot isostatic pressure treatment to form said substantially consolidated stock from said incompletely consolidated stock while controlling crystallinity so as to substantially avoid increasing the crystallinity of the substantially consolidated stock above that of the powder; and

machining said substantially consolidated stock to form said biocompatible component.

5,466,531

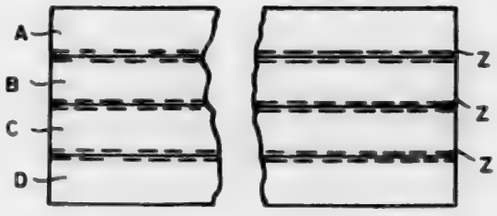
POLYTETRAFLUOROETHYLENE LAMINATE AND METHOD OF PRODUCING SAME

Stephen W. Tippett, Bedford, and Robert C. Ribbans, Amherst, both of N.H., assignors to Textiles Coated International, Amherst, N.H.

Continuation-in-part of Ser. No. 104,731, Aug. 10, 1993, abandoned. This application Aug. 3, 1994, Ser. No. 283,095

Int. Cl.[6] B32B *31/00;27/00;* **B29C** *65/00*

U.S. Cl. 428—422 **16 Claims**



1. A flexible fluoroplastic chemical barrier laminate having improved toughness, said laminate comprising a plurality of axially oriented unsintered polytetrafluoroethylene films laminated directly together without entrapped air or the interposition of an adhesive therebetween at a temperature above the melt temperature of said films but below 900° F., said films being sintered during lamination and remaining axially oriented following lamination, with at least one of said films having its direction of orientation disposed angularly with respect to that of at least one other of said films adjacent to said one film.

5,466,532

SOLVENTLESS OR HIGH SOLIDS-CONTAINING SILICONE PRESSURE SENSITIVE ADHESIVE COMPOSITIONS

Jeffrey H. Wengrovius, 822 Charles St., Schenectady, N.Y. 12302; Timothy B. Burnell, 127 N. College St., Schenectady, N.Y. 12305, and Virginia M. Van Valkenburgh, Box 133 Schoolhouse Rd., West Lebanon, N.Y. 12195

Filed Mar. 26, 1991, Ser. No. 675,380

Int. Cl.[6] B32B *27/08*

U.S. Cl. 428—447 **34 Claims**

1. An organopolysiloxane composition curable to produce a pressure sensitive adhesive having high tack and peel adhesion, comprising by weight:

(A) from about 50 to about 75 parts by weight of a toluene soluble, resinous copolymer comprising $R_3SiO_{1/2}$ units and $SiO_{4/2}$ units wherein R is a monovalent hydrocarbon radical having from 1 to about 6 carbon atoms, the resinous copolymer comprising from about 0.2% to about 5.0% by weight, based on the total weight of the copolymer, of hydroxyl radicals, at least 95% of all R groups being alkyl group, the total number of R radicals that are alkenyl radicals being 0–0.5% of all R radicals, the molar ratio of $R_3SiO_{1/2}$ units to $SiO_{4/2}$ units being from 0.6 to about 0.9 inclusive;

(B) an alkenyl-terminated polydiorganosiloxane having the general formula

$$R^2R^1{}_2SiO(R^1{}_2SiO)_m(R^2R^1SiO)_nSiR^1{}_2R^2 \quad (I)$$

wherein each R^1 is independently an alkyl group having from to about 10 carbon atoms or an aryl group, R^2 is an alkenyl group having from 1 to about 10 carbon atoms, "m" and "n" are numbers such that the sum of "m"+"n" is equal to number in the range of from about 1 to about 300;

(C) an organohydrogenpolysiloxane compatible with the mixture of (A) and (B) and having the general formula

$$R^3{}_2HSiO(R^3HSiO)_a(R^3{}_2SiO)_bSiHR^3{}_2 \quad (II)$$

wherein each R^3 is independently an alkyl group having from 1 to about 10 carbon atoms or an aryl group, "a" and "b" each are numbers such that the sum of "a"+"b" is a number in the range of from 1 to about 300, there being greater than two silicon-bonded hydrogen atoms per molecule of (C), no silicon atom bearing more than one silicon bonded hydrogen atom; the total of (B) and (C) being from about 25 to about 50 parts by weight; the total (A(, (B), and (C) being 100 parts by weight; the molar ratio of silicon-bonded hydrogen groups in (C) to silicon-bonded alkenyl groups in (B) being in the range of from about 0.8:1 to about 1.5:1; with proviso that the total crosslink density of (B) and (C) is from about 3.0 to about 5.0%, and with the further proviso that the combined viscosities of (B) and (C) are from about 15 to about 25 centipoises at 25° C.;

(D) a catalytic amount of a hydrosilation catalyst; and

(E) from 0 to about 10% by weight of an organic solvent.

5,466,533

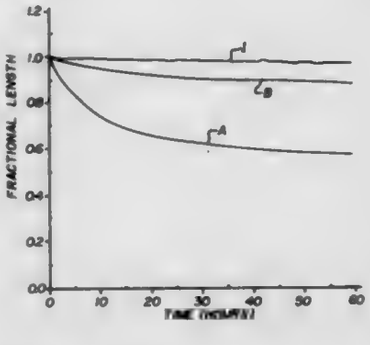
ZINC OXIDE FILLED DIPHENYLSILOXANE-DIMETHYLSILOXANE FUSER MEMBER FOR FIXING TONER TO A SUBSTRATE

John J. Fitzgerald, Webster; Wayne T. Ferrar, Fairport; Tonya D. Binga, and Michael W. Fichtner, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 29, 1994, Ser. No. 268,136

Int. Cl.[6] B32B *9/04*

U.S. Cl. 428—447 **20 Claims**



1. A fuser member comprising a core and a layer overlying said core, said layer comprising: a crosslinked polydiphenylsiloxane-poly(dimethylsiloxane) elastomer, said layer having filler dispersed therein in a concentration of from 20 to 40 percent of the total volume of said layer, said filler consisting essentially of zinc oxide particles, said crosslinked polydiphenylsiloxane-poly(dimethylsiloxane) elastomer having a number average molecular weight of from 400 to 310,000.

5,466,534

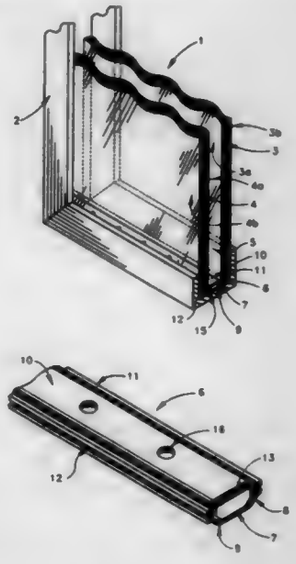
METAL-POLYMER COMPOSITE INSULATIVE SPACER FOR GLASS MEMBERS AND INSULATIVE WINDOW CONTAINING SAME

Charles D. Newby, Bexley, Ohio, assignor to Crane Plastics Company Limited Partnership, Columbus, Ohio

Continuation of Ser. No. 870,018, May 18, 1992, abandoned. This application Aug. 17, 1994, Ser. No. 297,396

Int. Cl.[6] B32B *15/04*; E06B *3/24*

U.S. Cl. 428—457 **26 Claims**



1. A spacer member for use between two glass members, said spacer member comprising a metal-polymer composite, said composite comprising:

(i) a metal substrate; and

(ii) a polymer disposed on said metal substrate and adhered to said metal substrate with a heat-activated adhesive so as to form said metal-polymer composite, said polymer selected from the group consisting of polyvinylchlorides and chloropolyvinylchlorides.

5,466,535

POLYMERIC FILM

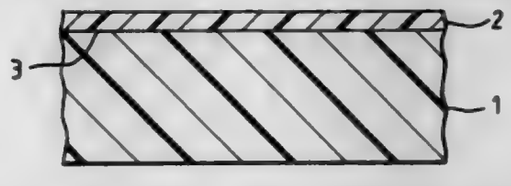
David E. Higgins, Whitby, and Martin Wright, Bishop Auckland, both of, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 15, 1993, Ser. No. 76,590

Claims priority, application United Kingdom, Jun. 17, 1992, 9212838

Int. Cl.[6] B32B *27/36;27/08;27/30*; C08K *5/12*

U.S. Cl. 428—483 **13 Claims**



1. In a polymeric film comprising a self supporting substrate layer of polyester material having on at least one surface thereof a cross-linked adherent layer comprising an acrylic resin, the improvement wherein said adherent layer includes a phthalate ester, the phthalate ester being present in an amount effective to improve the adhesion of said adherent layer to the substrate layer of polyester material.

5,466,536
REVERSE SIDE COATING FOR PHOTOGRAPHIC SUPPORT

Hans-Ulrich Berner, Hilter; Rolf Ebisch, Osnabrück; Eckehard Saverin, Osnabruck, and Udo Tyrakowski, Hasbergen, all of, Germany, assignors to Felix Schoeller jr Papierfabriken GmbH & Co. KG, Osnabruck, Germany

Filed Mar. 8, 1994, Ser. No. 207,549
Claims priority, application Germany, Mar. 16, 1993, 43 08 274.2
Int. Cl.[6] G03C *1/85*
U.S. Cl. 428—522 24 Claims

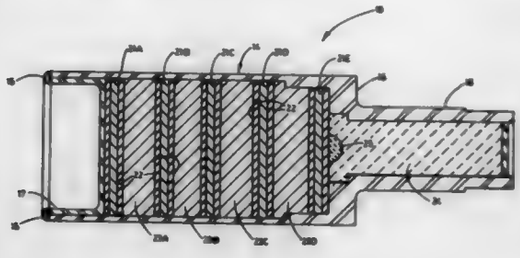
1. A photographic support material comprising a base material having a front side and a reverse side opposite the front side, said front side being adapted to receive a light sensitive layer, wherein the improvement comprises:

said reverse side having a layer applied directly thereon comprising a bonding agent including a copolymer comprising a mixture of styrene, alkylstyrene, (alkyl)acrylic acid and (alkyl)acrylic acid alkylester.

5,466,537
INTERMETALLIC THERMAL SENSOR

Amos J. Diede, and William H. McCune, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 12, 1993, Ser. No. 45,147
Int. Cl.[6] B22F *3/02*
U.S. Cl. 428—548 26 Claims



1. A fast, intermediate, and slow cookoff thermal sensor, comprising:

a hermetically sealed housing;

a layer of electronegative metal disposed in said housing; and

a layer of an active metal disposed in said housing, said layer disposed in abutting interface with said layer of electronegative metal,

so that, when the sensor is heated to a predetermined temperature at which said active metal melts, an exothermic intermetallic reaction occurs between said electronegative metal and said active metal.

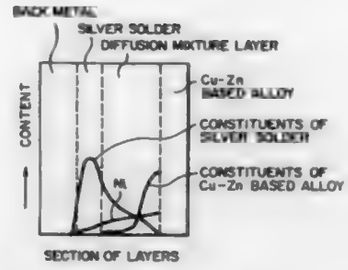
5,466,538
MULTI-LAYER SLIDING MEMBER

Tadashi Tanaka; Masaaki Sakamoto, and Tohru Kato, all of Nagoya, Japan, assignors to Daido Metal Company Ltd., Nagoya, Japan

Filed Nov. 8, 1994, Ser. No. 337,488
Claims priority, application Japan, Dec. 28, 1993, 5-336531
Int. Cl.[6] F16C *33/12*
U.S. Cl. 428—610 8 Claims

1. A multi-layer sliding member comprising a back metal, a brazing material bonded to said back metal, a diffusion mixture layer bonded to said brazing material, and a sliding layer of a Cu—Zn-based alloy bonded to said diffusion mixture layer;

said diffusion mixture layer being a layer in which Ni not less than 10 wt %, components of said Cu—Zn-based alloy sliding layer and components of said brazing material are diffused to



and mixed with one another, said diffusion mixture layer having a thickness of 5–300 μm.

5,466,539
HIGH PERMEABILITY IRON-BASED ALLOY

Shinji Takayama, Mitaka, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 7, 1994, Ser. No. 179,002
Claims priority, application Japan, Jan. 14, 1993, 5-004763
Int. Cl.[6] G11B *5/706*
U.S. Cl. 428—611 24 Claims

$(Fe_{90}Ta_{10})_{95}N_5$	1.7	0.83	4000
$(Fe_{95}B_2)_{98}N_2$	2.1	0.85	3000
$(Fe_{89}Nb_{12})_{95}N_5$	1.8	0.83	3500
$(Fe_{95}Zr_3)_{98}N_2$	2.0	0.88	3500
$(Fe_{89}Hf_{12})_{95}N_5$	1.7	0.84	3000
$(Fe_{90}V_{10})_{95}N_5$	1.9	0.83	3500
$(Fe_{95}B_2)_{98}O_2$	1.8	0.87	3000
$(Fe_{90}Nb_3)_{95}O_5$	1.8	0.83	3500
$(Fe_{90}Ta_{10})_{95}O_5$	1.7	0.84	3000
$(Fe_{90}Ta_5Nb_5)_{95}N_5$	1.8	0.83	3500
$(Fe_{95}Zr_3Nb_2)_{98}N_2$	1.8	0.82	4000
$(Fe_{95}B_3Zr_2)_{98}O_2$	1.8	0.85	3000
$(Fe_{90}Hf_5Nb_5)_{95}O_5$	1.8	0.84	3000
$(Fe_{95}Si_3)_{98}O_2$	2.0	0.83	2500

21. A data storage system comprising:

a magnetic storage medium having a recording surface;

a slider for supporting a magnetic head assembly in close proximity to said recording surface, said magnetic head assembly including a thin-film magnetic read head comprising,

a first shielding layer,

a read gap of insulating material formed on said first shielding layer,

a magnetoresistive stripe disposed within said read gap and including a biasing layer of soft magnetic material, said soft magnetic material comprising,

an Fe-based alloy having a composition consisting of $(Fe_aM_{(100-a)})_{(100-b)}O_b$, wherein M represents at least one element selected from the group consisting of Nb, V, and Ta, and wherein a and b are atomic percentages having values such that $85<=a<=97$ and $4<=b<=12$,

first and second conductive elements coupled to said magnetoresistive stripe, and

a second shielding layer formed over said read gap and electrically isolated from said magnetoresistive stripe and said first and second conductive elements; and

means for providing relative motion between said magnetic head assembly and said recording surface.

5,466,540

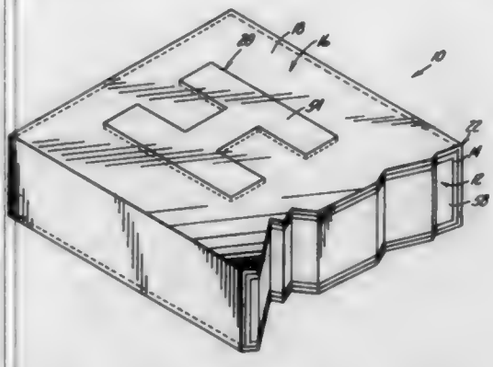
MARK OF AN ELECTRONIC COMPONENT LID

Deepak K. Pai, Bloomington; Lowell D. Lund, Eden Prairie, and Gene A. Maday, Spring Lake Park, all of Minn., assignors to Ceridian Corporation, Bloomington, Minn.

Filed Feb. 14, 1994, Ser. No. 195,262

Int. Cl.[6] B32B 5/14;15/00

U.S. Cl. 428—614 4 Claims



1. An article having a mark, the article comprising a metallic coating with a first portion and a second portion, the mark comprising an alloy of a first metal component and a second metal component, the first portion of the metallic coating comprising the first metal component and the second portion of the metallic coating comprising the alloy, the article further comprising a conductive carrier layer removably attached to the mark.

5,466,541

LUMINESCENT RADIOGRAPHIC SYSTEM COMPRISING A SUPPORT, A PHOSPHOR-BINDER LAYER AND A PRIMER LAYER THEREBETWEEN

Jan E. Van Havenbergh, Zwijndrecht; Josef R. Aertbelien, Schilde, and Philip Dooms, Edegem, all of, Belgium, assignors to AGFA-Gevaert. N.V., Mortsel, Belgium

Filed Jun. 3, 1992, Ser. No. 892,921

Claims priority, application European Pat. Off., Jul. 12, 1991, 91201827

The portion of the term of this patent subsequent to Aug. 23, 2011, has been disclaimed.

Int. Cl.[6] G01J 1/58; B32B 31/00

U.S. Cl. 428—690 12 Claims

1. A luminescent radiographic system comprising a support, a non-cured phosphor-binder layer, and between said support and phosphor-binder layer a primer layer, wherein said primer layer consists essentially of a matrix of at least one addition polymerized monomer having molecularly distributed in said matrix at least one member selected from the group consisting of polymer (i) which is a linear copolyester of isophthalic acid and at least one other dibasic carboxylic acid with an aliphatic diol, said copolyester being soluble in methyl methacrylate for at least 10 g per 100 ml at 20° C., and polymer (ii) which is a linear polyester of terephthalic acid, said polyester being soluble in methyl methacrylate for at least 10 g per 100 ml at 20° C.; and wherein said matrix has been formed by said monomer(s) in which at least one of said polymers (i) and (ii) were dissolved in a 20 to 70% by weight ratio with respect to the totality of said polymer(s) and monomer(s).

5,466,542

A MAGNETIC RECORDING MEDIUM

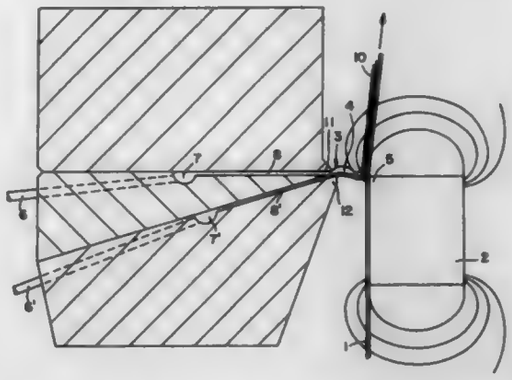
Reinhard Kraetschmer, Landsberg; Albert Pertzsch, and Josef Schelble, both of Munich, Germany, assignors to BASF Magnetics GmbH, Mannheim, Germany

Filed Dec. 21, 1993, Ser. No. 170,728

Claims priority, application Germany, Dec. 23, 1992, 42 43 846.2

Int. Cl.[6] H01F 10/02

U.S. Cl. 428—694 BS 2 Claims



1. A magnetic recording medium comprising a non-magnetic substrate and a plurality of magnetizable layers on said substrate, said magnetizable layers being formed by a wet-on-wet method by means of a sheet extruder having an extruder orifice with upper and lower lips and having at least two slot dies for the wet-on-wet application of the plurality of magnetizable layers one on top of the other onto the substrate, the upper lip of the extruder orifice of the slot dies being recessed relative to the lower lip and a cuboid magnet whose upper edge is opposite the extruder orifice being arranged behind the substrate and parallel thereto, wherein

at least one magnetizable layer not immediately adjacent to the substrate contains, as magnetizable pigments, predominantly metal powders or metal powder alloys which are dispersed in a polymeric binder and the magnetizable layer immediately adjacent to the substrate contains, as magnetizable pigments, predominantly metal powders or metal alloy powders which are dispersed in a polymeric binder and further additives which give the desired performance characteristics of the magnetic recording medium, including, as conductivity-increasing or transparency-reducing additives, carbon black in an amount of from 5 to 10% by weight, based on the magnetizable pigment, this carbon black being contained only in the magnetizable lever immediately adjacent to the substrate.

5,466,543

NICKEL POSITIVE ELECTRODE FOR USE IN ALKALINE STORAGE BATTERY AND NICKEL-HYDROGEN STORAGE BATTERY USING THE SAME

Munehisa Ikoma, Nara; Kimie Muramatsu, Kyoto; Hiromu Matsuda, Hyogo; Norikatsu Akutsu, Tokyo, and Isao Matsumoto, Osaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 8,798, Jan. 25, 1993, abandoned.

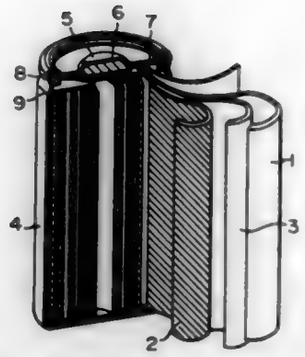
This application Mar. 9, 1994, Ser. No. 208,080

Claims priority, application Japan, Sep. 18, 1992, 4-248973

Int. Cl.[6] H01M 4/32

U.S. Cl. 429—59 24 Claims

1. A pasted nickel positive electrode for use in alkaline storage batteries comprising an active material containing a major component of nickel oxide, and a support selected from the group consisting of a bulk porous body, porous plate and a plate supporting said active material and imparting electroconductivity thereto, wherein said active material contains at least one compound



selected from the group consisting of compounds of yttrium, indium and antimony.

5,466,544

METHOD FOR MANUFACTURING A HYDROGEN-OCCLUSION-ALLOY ELECTRODE

Jun Furukawa, Iwaki, Japan, assignor to Furukawa Denchi Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1994, Ser. No. 217,943
Claims priority, application Japan, Mar. 30, 1993, 5-071419
Int. Cl.[6] H01M *4/04*
U.S. Cl. 429—59 **8 Claims**

1. A method for manufacturing a hydrogen-occlusion-alloy electrode, comprising the steps of:

mechanically crushing an ingot of a hydrogen-occlusion-alloy to form an alloy powder;

washing the alloy powder with water to remove dust-sized particles having a diameter of approximately 10 μm or less from the alloy powder and separating a wet alloy powder from the wash water; thereafter preparing a slurry of said wet alloy powder by mixing the wet alloy powder in water; and supporting the slurry on a current collector.

5,466,545

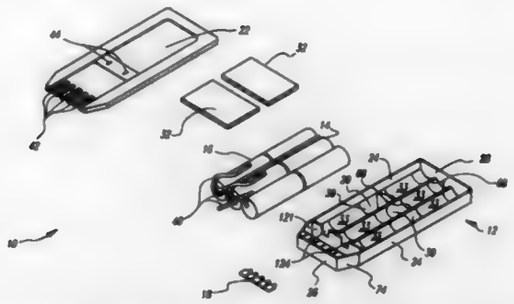
COMPACT, SHOCK RESISTANT BATTERY PACK

Craig P. Chamberlain, Seattle; Dennis Lamb, Stanwood; William J. Lamby, Mukilteo, and Howard T. Voorhels, Everett, all of Wash., assignors to Fluke Corporation, Everett, Wash.

Filed Jan. 27, 1995, Ser. No. 379,165
Int. Cl.[6] H01M *2/10*
U.S. Cl. 429—99 **23 Claims**

1. A battery pack comprising:

(a) a case comprising a generally rectangular enclosure, said enclosure formed by a bottom wall and a generally planar top wall, said top and bottom walls being separated by a pair of parallel side walls that are normal to said top and bottom walls, and first and second parallel end walls that are normal to said top, bottom, and side walls, said top wall being longer than said bottom wall at said first end wall, and a portion of said first end wall that intersects said top wall being positioned farther from said second end wall than a portion of said first end wall that intersects said bottom wall;



(b) a battery assembly comprising a plurality of battery cells housed in said case; and

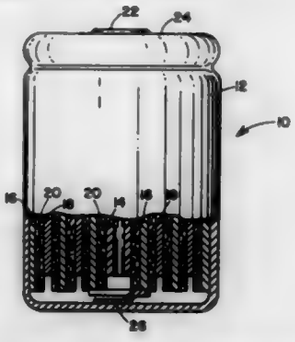
(c) two or more generally planar electrical contacts, the plane of each of said electrical contacts generally parallel to the plane of said top wall, each of said electrical contacts being positioned in a notch in a portion of said top wall extending past said bottom wall and recessed under an outer surface of said top wall, each of said electrical contacts functioning as positive and negative terminals connected to said battery assembly.

5,466,546

POSITIVE NICKEL ELECTRODE FOR NICKEL METAL HYDRIDE CELLS

Saverio F. Pensabene, and Vincent J. Puglisi, both of Gainsville, Fla., assignors to Everendy Battery Company, Inc., St. Louis, Mo.

Filed Mar. 1, 1993, Ser. No. 24,148
Int. Cl.[6] H01M *4/32*
U.S. Cl. 429—223 **13 Claims**



1. A positive electrode for use in a rechargeable nickel metal hydride cell comprising:

an electrically conductive substrate;

an electrochemically active material comprising nickel hydroxide carried by said substrate; and

a calcium-containing compound deposited onto said active material.

5,466,547

ENTERIC COATED PAPAIN-CONTAINING FOOD SUPPLEMENT FOR CONTROLLING AUTO IMMUNE DISEASES

Teng H. Khoe, Marco Polorede 16,, 2725 KR Zoetermeer, Netherlands

Filed Oct. 18, 1993, Ser. No. 137,359
Claims priority, application Netherlands, Jan. 23, 1992, 9201842
Int. Cl.[6] A61K *37/54;47/22*
U.S. Cl. 424—439 **13 Claims**

1. A food supplement for controlling auto immune disease, said food supplement comprising an enteric composition comprising

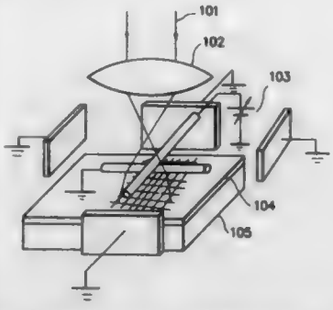
papain and Vitamin E, said papain being present in an effective amount for administering to a patient having an auto immune disease.

5,466,548

METHOD FOR PRODUCING NANOMETER ORDER DOT PATTERN BY ELECTRON HOLOGRAPHY AND DRAWING APPARATUS FOR THE SAME

Shinji Matsui, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 29, 1994, Ser. No. 281,980
Claims priority, application Japan, Jul. 29, 1993, 5-205570
Int. Cl.[6] H01L *21/20*
U.S. Cl. 430—1 **4 Claims**



1. A method for producing a nanometer order dot pattern by electron holography using an electron beam high of coherency, comprising the steps of:

applying electric potentials to a pair of multi-biprisms integrated as a unit so as to mutually cross, each multi-biprism including a plurality of biprisms arranged in parallel;

passing the electron beam through the multi-biprisms which divide the electron beam into at least four separate electron beams; and

changing the potentials of the multi-biprisms independently to produce a dot pattern on an electron sensitive material from the four electron beams, with a controlled pattern pitch.

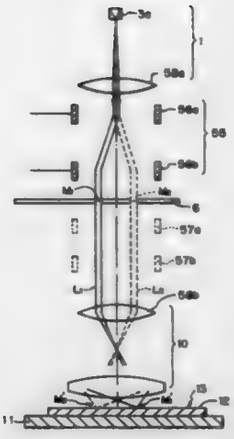
5,466,549

METHOD OF DETECTING AND ADJUSTING EXPOSURE CONDITIONS OF CHARGED PARTICLE EXPOSURE SYSTEM

Akio Yamada, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 621,811, Dec. 4, 1990, abandoned.
This application Apr. 5, 1993, Ser. No. 43,941
Claims priority, application Japan, Dec. 4, 1989, 1-313443
Int. Cl.[6] G03F *7/20*; H01J *37/30*
U.S. Cl. 430—30 **6 Claims**

1. A method of detecting exposure conditions of a charged particle exposure system which includes an electron gun that emits charged electron beams along an optical axis, a stage, a stencil mask positioned between the electron gun and the stage and having a surface which traverses the optical axis, an irradiation optical system positioned between the electron gun and the stencil mask, an incident mask deflector positioned between the electron gun and the stencil mask and which deflects electron beams from the optical axis towards the surface of the stencil mask, the electron beams passing through the stencil mask and being directed away from the optical axis after passing through the stencil mask, a reduction optical system positioned between the stencil mask and the stage, and an irradiation deflector positioned between the stencil mask and the stage and which deflects electron beams passing through the stencil mask towards the optical axis, the stencil mask having two mark patterns in a positional relationship, the method comprising the steps of:



(a) operating the incident mask deflector to apply charged electron beams emitted by the electron gun to each of the mark patterns of the stencil mask;

(b) projecting the electron beams passed through the mark patterns onto the surface of the sample through the reduction optical system and undeflected by the irradiation deflector to form images of the mark patterns on the surface of the sample, the images being in a positional relationship;

(c) computing the positional relationship of the images; and

(d) comparing the positional relationship of the images with the positional relationship of the mark patterns on the stencil mask, thereby to detect a reduction ratio of the images on the surface of the sample and a rotational angle of the images.

5,466,550

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER AND ELECTROPHOTOGRAPHIC APPARATUS, DEVICE UNIT AND FACSIMILE MACHINE USING THE SAME

Tetsuro Kanemaru, Tokyo; Hideyuki Takai, Yokohama; Itaru Yamazaki, Kawasaki, and Kazushi Iuchi, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 832,596, Feb. 7, 1992, abandoned.
This application Oct. 25, 1994, Ser. No. 329,381
Claims priority, application Japan, Feb. 8, 1991, 3-037907
Int. Cl.[6] C08G *5/14*
U.S. Cl. 430—58 **19 Claims**

1. An electrophotographic photosensitive member, comprising a conductive support and a photosensitive layer thereon, said photosensitive layer having a charge generating layer and a charge transporting layer, said charge generating layer containing an acetal resin obtained from a reaction of polyvinyl alcohol, alkyl aldehyde having a structure shown in Formula (1) below, and aryl aldehyde having a structure shown in Formula (2) below:

R—CHO (1)

wherein R is a substituted or unsubstituted propyl group or a cyclohexyl group, and

Ar—CHO (2)

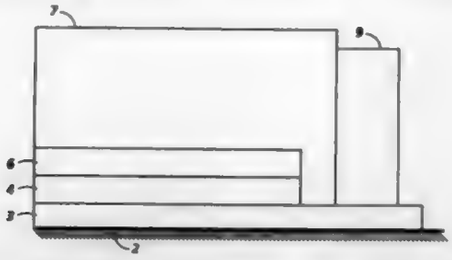
wherein Ar is an aryl group substituted by a halogen atom or a nitro group.

5,466,551

IMAGE MEMBER INCLUDING A GROUNDING LAYER

Huoy-Jen Yuh, Pittsford; John W. Spiewak; Christine J. Tarnawskyj, both of Webster; Steven J. Grammatica, Penfield; Cindy C. Chen, Rochester, and Leon A. Teuscher, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 15, 1994, Ser. No. 339,869
Int. Cl.[6] G03G 5/14
U.S. Cl. 430—63 14 Claims



1. An electrostatographic imaging member comprising:
(a) a supporting substrate including an electrically conductive surface;
(b) a charge generating layer;
(c) a charge transport layer; and
(d) an electrically conductive grounding layer in contact with the conductive surface of the substrate and the charge transport layer, wherein the grounding layer comprises electrically conductive particles; alkyl acrylamidoglycolate alkyl ether polymer which is interfacially bonded with the conductive surface of the substrate, thereby improving adhesion between the grounding layer and the substrate conductive surface; and a second polymer which is interfacially bonded with the charge transport layer, thereby improving adhesion between the grounding layer and the transport layer.

5,466,552

FERRITE CARRIER FOR ELECTROPHOTOGRAPHIC DEVELOPER AND DEVELOPER CONTAINING THE CARRIER

Yuji Sato; Toshio Honjo; Kanao Kayamoto; Masahiro Ogata, and Kouichi Shimizu, all of Kashiwa, Japan, assignors to Powdertech Co., Ltd., Kashiwa, Japan

Filed Aug. 19, 1994, Ser. No. 292,886
Claims priority, application Japan, Jun. 7, 1994, 6-147008
Int. Cl.[6] G03G 9/107
U.S. Cl. 430—106.6 6 Claims

1. A ferrite carrier for electrophotographic developers which comprises a lithium ferrite having the formula

$$(Li_2O)_x(Fe_2O_3)_{100-x}$$

wherein x is not more than 16.7 mole % and 3 to 15 mole %, based on said lithium ferrite, of Li_2O and/or Fe_2O_3 is substituted with at least one member selected from the group consisting of alkaline earth metal oxides.

5,466,553

TONER FOR DEVELOPING ELECTROSTATIC IMAGE

Haruo Okutani; Toshio Tagami; Hideki Kurebayashi, and Kazue Nakadera, all of Shizuoka, Japan, assignors to Tomoegawa Paper Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1994, Ser. No. 216,270
Claims priority, application Japan, Mar. 25, 1993, 5-090747; Jun. 28, 1993, 5-178595
Int. Cl.[6] G03G 9/087
U.S. Cl. 430—109 4 Claims

1. A toner for developing an electrostatic image, which comprises a binder resin and a colorant as main components, said binder resin containing, as a main component, a phenolic hydroxyl group-containing polyester resin obtained by polycondensing a diol component (A), a dicarboxylic acid or a lower alkyl ester thereof (B), and a phenolic hydroxyl group-containing dicarboxylic acids, tricarboxylic acids, di- and tri- carboxylic acids or a lower alkyl ester thereof (C), wherein the amount of the component (C) is 5 to 90 mol % of the total amount of the component (B) and the component (C).

5,466,554

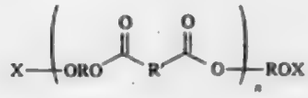
TONER COMPOSITIONS WITH MODIFIED POLYESTER RESINS

Guerino G. Sacripante, Oakville; Richard P. N. Veregin, Mississauga, and Maria N. V. McDougall, Burlington, all of, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed May 31, 1994, Ser. No. 251,430
Int. Cl.[6] G03G 9/087;9/097
U.S. Cl. 430—110 21 Claims

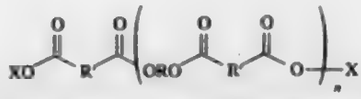
1. A toner composition consisting essentially of pigment, an optional charge enhancing additive, optional wax, and a polyester resin containing a hydrophobic end group, which polyester is free of acid end groups and is of the formula

I



or

II



wherein R is an alkylene group, an alkyleneoxylated bisphenol, or a cyclohexylene; R' is an aryl group an olefinic group, or an alkylene group; X is an hydroxyalkylsiloxane; and n represents the number of segments.

7. A toner composition in accordance with claim 1 wherein a positive or negative charge enhancing additive is present in an amount of from about 0.05 to about 5 weight percent.

5,466,555

RELEASING COMPOSITION AND BINDER RESIN COMPOSITION FOR ELECTROPHOTOGRAPHIC TONER, AND TONER CONTAINING THE SAME

Takayuki Taguchi, Shiga; Kenichi Hasegawa, Kyoto; Sohkichi Baba, Osaka, and Yoshitsugu Takai, Kyoto, all of, Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Jul. 11, 1994, Ser. No. 272,822
Claims priority, application Japan, Apr. 13, 1994, 6-100646
Int. Cl.[6] G03G 9/087
U.S. Cl. 430—110 17 Claims

1. A releasing composition for electrophotographic toner, which comprises 60–99.5% by weight of a low molecular weight polypropylene (A) which has a melt viscosity of 15–2,000 cps at 160° C., and 0.5–40% by weight of at least one modified polyolefin (B), selected from the group consisting of:
(B1) a modified polypropylene, comprising a low molecular weight polypropylene (a1) having a melt viscosity at 160° C. higher than that of said polypropylene (A), modified with an ethylenically unsaturated carboxylic acid or an anhydride thereof (b1), and
(B2) a modified polyethylene, comprising a low molecular weight polyethylene (a2) having a melt viscosity of 10–8,000 cps at 140° C., modified with an ethylenically unsaturated carboxylic acid or an anhydride thereof (b2).

5,466,556

PHOTOSENSITIVE MICROENCAPSULATED TONER

Kouji Inaishi, Okazaki, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 8, 1994, Ser. No. 225,298
Claims priority, application Japan, May 14, 1993, 5-113223
Int. Cl.[6] G03G 9/093
U.S. Cl. 430—138 20 Claims

1. Photosensitive microencapsulated toner, comprising:

an outer shell; and

a photocurable composition filled in the outer shell, the photocurable composition comprising:

(a) a radical polymerizable unsaturated group-containing compound,

(b) metal arene compound as a photopolymerization initiator,

(c) a spectral sensitizing dye, and

(d) photosensitizer that is not a spectral sensitizing dye,

wherein said photocurable composition is curable with light of a wavelength not lower than 600 nm.

5,466,557

RADIATION-SENSITIVE COMPOSITION CONTAINING A RESOLE RESIN, A NOVOLAC RESIN, A LATENT BRONSTED ACID, AN INFRARED ABSORBER AND TEREPHTHALALDEHYDE AND USE THEREOF IN LITHOGRAPHIC PRINTING PLATES

Neil F. Haley, Wellington, and Steven L. Corbiere, Windsor, both of Colo., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 29, 1994, Ser. No. 298,472
Int. Cl.[6] G03C 1/76
U.S. Cl. 430—278 27 Claims

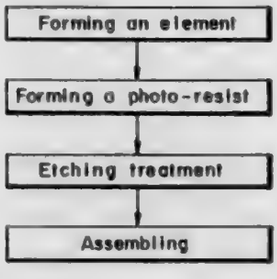
1. A radiation-sensitive composition comprising (1) a resole resin, (2) a novolac resin, (3) a latent Bronsted acid, (4) an infrared absorber, and (5) terephthalaldehyde.

5,466,558

METHOD OF MANUFACTURING A LIGHT RECEIVING MODULE WITH OPTICAL FIBER COUPLING

Goro Sasaki, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 953,082, Sep. 29, 1992, Pat. No. 5,357,103.
This application Jul. 26, 1994, Ser. No. 280,838
Claims priority, application Japan, Jan. 3, 1991, 3-256525; Jan. 7, 1991, 3-255382
Int. Cl.[6] H01L 21/18; G03F 7/00
U.S. Cl. 430—321 7 Claims



7. A method of manufacturing a light receiving module comprising the steps of:

forming a light receiving element on a front surface of a semiconductor substrate;

photolithographically masking a back surface of said semiconductor substrate with a predetermined pattern;

forming a groove by etching the back surface of said semiconductor substrate; and

placing an optical fiber in the groove, whereby light input from one end of the optical fiber is transmitted to said light receiving element through said semiconductor substrate.

5,466,559

AQUEOUS DEVELOPER FOR LITHOGRAPHIC PRINTING PLATES WHICH EXHIBITS REDUCED SLUDGE FORMATION

Gary R. Miller; John E. Walls, both of Fort Collins, and Melanie A. Felker, Loveland, all of Colo., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 992,212, Dec. 17, 1992, abandoned.
This application Jun. 29, 1994, Ser. No. 268,100
The portion of the term of this patent subsequent to Jan. 10, 2012, has been disclaimed.
Int. Cl.[6] G03F 7/32
U.S. Cl. 430—331 29 Claims

1. An aqueous alkaline developing composition that is useful in developing negative-working lithographic printing plates, said composition comprising:

(1) an organic solvent,

(2) an anionic surface active agent,

(3) an alkali metal tetraborate,

(4) an alkali metal salt of an aliphatic monocarboxylic acid,

(5) an alkali metal salt of an aliphatic dicarboxylic acid,

(6) an alkali metal citrate,

(7) a poly(alkylene glycol),

(8) the disodium salt of 4,5-dihydroxy-1,3-benzenedisulfonic acid, and

(9) an alkaline buffering system in an amount sufficient to provide a pH in the range of from 8 to 12.

5,466,560

LIMITED USE CAMERAS AND FILMS

Allan F. Sowinski; Richard P. Szajewski, and James P. Merrill, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 13, 1993, Ser. No. 135,700
Int. Cl.[6] G03C 1/1005;1/1035; G03B 17/28;17/02
U.S. Cl. 430—347 40 Claims

1. A camera comprising:

a film container;

a color negative film contained in said film container which has a green density MTF value of above 1.25 for a spatial frequency in the range of 15 to 25 lines/mm after imagewise exposure and processing;

a taking lens mounted on said film container to expose said film, said taking lens having a green light MTF value of less than about 0.8 at a spatial frequency of 20 lines/mm;

said color negative film comprising a red light sensitive color record, a green light sensitive color record and a blue light sensitive color record, and having a photographic sensitivity of greater than ISO 100.

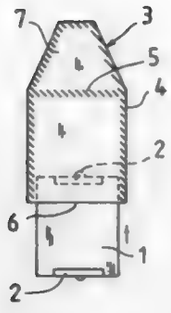
5,466,561

IMAGE PLATE FOR DENTAL X-RAY PHOTOGRAPHY AND A METHOD OF TAKING IT OUT OF ITS SHIELD

Matti Rantanen, Kirkkonummi, Finland, assignor to Orion-Yhtyma Oy, Finland

PCT No. PCT/FI93/00072, § 371 Date Sep. 2, 1994, § 102(e) Date Sep. 2, 1994, PCT Pub. No. WO93/18435, PCT Pub. Date Sep. 16, 1993
PCT Filed Mar. 1, 1993, Ser. No. 295,808
Claims priority, application Finland, Mar. 2, 1992, 920937
Int. Cl.[6] A61B 6/14; G03B 42/02;42/04; G03C 3/00
U.S. Cl. 430—347 20 Claims

1. A shielded image plate for use in intra-oral dental Xray photography comprising an image plate having a substantially rigid



substrate plate and a stimulable material on its surface, an inner shield bag enveloping said image plate, said inner shield bag being of a material pervious to X-rays but impervious to visible light, and a closed outer shield bag enclosing said inner shield bag, said outer shield bag being of plastic membrane.

5,466,562

METHOD OF PHOTOGRAPHIC PROCESSING

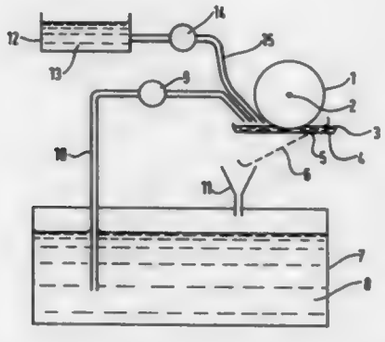
Peter D. Marsden, Middlesex, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 15, 1994, Ser. No. 275,888

Claims priority, application United Kingdom, Jul. 30, 1993, 9315769

Int. Cl.[6] G03C *7/407;* **G03D** *13/02*

U.S. Cl. 430—373 **10 Claims**



1. A method of processing an imagewise exposed photographic silver halide colour material by a redox amplification method in which the colour material is treated with a colour developing agent in the presence of an oxidant

in which a processor is used which comprises means for applying a relatively small volume of processing solution to an imagewise exposed silver halide material and in which the relatively small volume of solution is supplied from a reservoir of relatively large volume and, while processing, the processing solution being used is isolatable from said reservoir and,

wherein either a colour developer solution without oxidant or an oxidant solution without colour developing agent is held in the reservoir and

wherein the oxidant (or colour developing agent) respectively needed for amplification is introduced into the processing solution while it is isolated from said reservoir and

wherein the developer/amplifier solution formed in situ is discarded into said reservoir after use where any unused introduced oxidant (or colour developing agent) is destroyed by a compound present in the reservoir.

5,466,563

METHOD OF PROCESSING SILVER HALIDE PHOTOGRAPHIC MATERIAL

Takatoshi Ishikawa, Minami-ashigara, Japan, and Bryan A. L. Snelling, Overijse, Belgium, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 26, 1991, Ser. No. 798,135

Claims priority, application Japan, Nov. 27, 1990, 2-324606; Nov. 27, 1990, 2-324607

Int. Cl.[6] G03C *5/31;5/395*

U.S. Cl. 430—398 **16 Claims**

1. A method for continuous processing of a silver halide photographic material comprising passing a belt for conveying an imagewise exposed silver halide photographic material through a plurality of processing tanks including a development tank, carrying such a silver halide photographic material on the belt, and processing the material in the processing tanks while replenishing the processing tanks with constant amounts of replenishing solution per unit area of silver halide photographic material, wherein the constant amounts of replenishing solution range from 30 to 100 ml/m^2 of the photographic material to be processed, and wherein the method further comprises detecting a level of processing solution in at least one of the processing tanks and supplying the at least one processing tank with additional processing solution when the level of processing solution falls to a predetermined level corresponding to a drop in the level of the development tank of 1% to 20% of the capacity of the development tank.

5,466,564

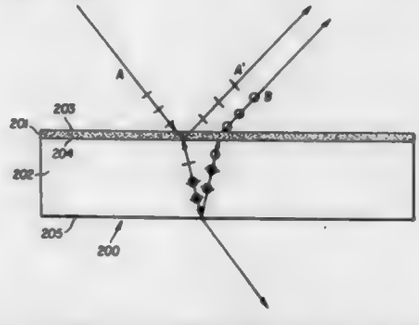
CONTROL OF NON-CONTACT INTERFERENCE FRINGES IN PHOTOGRAPHIC FILMS

Richard N. Blazey, Penfield, and Andy H. Tsou, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 8, 1994, Ser. No. 351,995

Int. Cl.[6] G03C *1/76;5/08;* **G03B** *27/72;27/32*

U.S. Cl. 430—403 **14 Claims**



11. A process for substantially eliminating non-contact interference fringes in an imaged photographic film, which comprises:

(a) providing a photographic film useful for imaging by exposing with polarized electromagnetic radiation characterized by a wavelength and an incident polarization angle, said film serving to transmit or reflect a portion of said exposing radiation and comprising a silver halide emulsion layer on a birefringent support, said support being characterized by a thickness, an emulsion layer interface, an air interface, and birefringence that is dependent on the wavelength of said exposing radiation; wherein said support thickness and birefringence are selected such that exposing radiation which penetrates said film and reflects from said air interface exits said support at said emulsion layer interface polarized at an angle substantially perpendicular to said incident polarization angle;

(b) exposing said photographic film to said polarized electromagnetic radiation; and

(c) subjecting the exposed film to photographic development processing, thereby producing an image substantially without non-contact interference fringes.

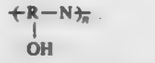
5,466,565

COLOR DEVELOPMENT COMPOSITION AND PROCESS

Nobuki Shigemori, and Hisao Kamo, both of Matsudo, Japan, assignors to Chugai Phote Chemical Co., Ltd., Nihonbashi, Japan

Filed Mar. 18, 1994, Ser. No. 210,986
Int. Cl.[6] G03C 7/407
U.S. Cl. 430—444 3 Claims

1. A color-development composition used for color debelopment processing of exposed silver halide color sensitized material, said composition comprising an alkaline agent; a sulfite, hydrogensulfite, or a metahydrogen sulfite; an alkali metal halide, a color developing agent and water, and having a pH of at least 9.5,



(I)

R in said formula (I) represents an alkylene group, which may be substituted by a hydroxyl group, a carboxyl group, or a sulfo group and may contain carbonyl linkage, ehter linkage, or a double bond, and may also have a cyclic structure; and "n" in said formula (I) represents an integer in the range from 10 to 10,000.

5,466,566

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Mamoru Tashiro, and Seiji Ichijima, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 23, 1993, Ser. No. 94,958
Claims priority, application Japan, Jul. 23, 1992, 4-216606
Int. Cl.[6] G03C 1/46
U.S. Cl. 430—505 5 Claims

1. A silver halide color photographic material having at least one cyan dye-forming coupler-containing red-sensitive silver halide emulsion layer, at least one magenta dye-forming coupler-containing green-sensitive silver halide emulsion layer and at least one yellow dye-forming coupler-containing blue-sensitive silver halide emulsion layer on a support, in which the green-sensitive silver halide emulsion layer contains a colored coupler of the following general formula (2) and contains an emulsion of tabular silver halide grains having a mean aspect ratio of 3.0 or more:

(2)

where

A_2 represents a magenta coupler group;

L represents a timing group;

n represents 0 or 1; and

DY2 represents a cyan dye group.

3. The silver halide color photographic material as claimed in claim 1, which contains a colored coupler of the following general formula (3) in the green-sensitive layer.

(3)

where

A_3 represents a coupler group which substantially does not leave a dye in the photographic material;

L represents a timing group;

n represents 0 or 1; and

DY_1 represents a magenta dye group or a cyan dye group.

5,466,567

IMAGING ELEMENT COMPRISING AN ELECTRICALLY-CONDUCTIVE LAYER CONTAINING CONDUCTIVE FINE PARTICLES, A FILM-FORMING HYDROPHILIC COLLOID AND PRE-CROSSLINKED GELATIN PARTICLES

Charles C. Anderson; Yongcai Wang, both of Penfield; James L. Bello, Rochester; Ibrahim M. Shalhoub, Pittsford, and Douglas D. Corbin, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1994, Ser. No. 330,409
Int. Cl.[6] G03C 1/85
U.S. Cl. 430—530 20 Claims

1. An imaging element for use in an image-forming process; said imaging element comprising a support, an image-forming layer, and an electrically-conductive layer; said electrically-conductive layer comprising electrically-conductive fine particles, a film-forming hydrophilic colloid and pre-crosslinked gelatin particles.

5,466,568

PHOTOGRAPHIC ELEMENT CONTAINING AN AZOPYRAZOLONE MASKING COUPLER EXHIBITING REDUCED FOG

Daniel L. Kapp; Robert J. Roos; Janet N. Younathan, all of Rochester, and Stephen P. Singer, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 30, 1993, Ser. No. 130,071
Int. Cl.[6] G03C 1/08;7/26;7/32
U.S. Cl. 430—551 17 Claims

1. A photographic element comprising a light sensitive silver halide emulsion layer containing as components dissolved in a coupler solvent: (1) an azopyrazolone masking coupler and (2) an aromatic nitro compound having a reduction peak potential that is more positive than −1.3 V vs. SCE and which is ballasted to insure that it remains dispersed in the coupler solvent.

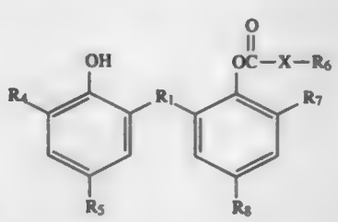
5,466,569

COLOUR PHOTOGRAPHIC RECORDING MATERIAL

Beate Weber, Leichlingen; Jörg Hagemann, Köln, and Markus Geiger, Langenfeld, all of, Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany

Filed Jun. 9, 1994, Ser. No. 257,532
Claims priority, application Germany, Jun. 21, 1993, 43 20 444.9
Int. Cl.[6] G03C 1/08;7/26;7/32
U.S. Cl. 430—551 5 Claims

1. A color photographic material which contains on a support at least one blue-sensitive silver halide emulsion layer containing at least one yellow coupler, at least one green-sensitive silver halide emulsion layer containing at least one magenta coupler, at least one red-sensitive silver halide emulsion layer containing at least one cyan coupler, at least one non-light-sensitive layer, characterised in that at least one layer contains a compound of the formula (II)



(II)

in which

R_4, R_5, R_7 and R_8 are the same or different and are alkyl,

R_6 means alkyl, cyclohexyl, acryloxyethyl or methacryloxyethyl

X means —NH—, —NR— or —O—,

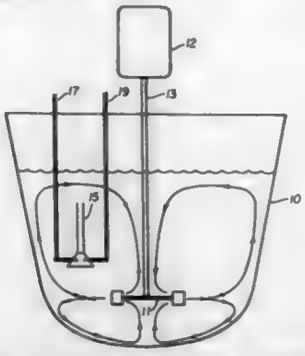
R_1 means a chemical bond, alkylene, alkylidene, SO_2, O or S.

5,466,570

SONIC MICRO REACTION ZONES IN SILVER HALIDE EMULSION PRECIPITATION PROCESS

Seshadri Jagannathan, Rochester; David F. Mahar, Avon, and Rajendrakumar V. Mehta, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 21, 1995, Ser. No. 391,747
Int. Cl.[6] G03C *1/015;1/025;* B01F *11/02*
U.S. Cl. 430—569 4 Claims



1. A process for the preparation of a silver halide photographic emulsion comprising:

introducing an aqueous silver nitrate solution into a first zone;

introducing an aqueous halide salt solution into the first zone wherein precipitation of silver halide particles occurs;

mixing the first zone using ultrasonic energy wherein the precipitation of silver halide particles occurs forming a mixture of silver halide particles;

mixing a bulk zone surrounding the first zone wherein the mixture of silver halide particles are introduced.

5,466,571

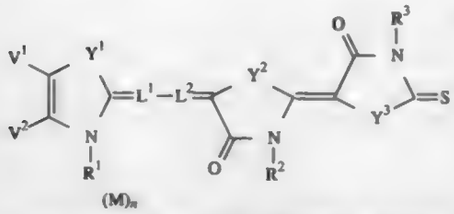
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Tsuyoshi Mitsuhashi, and Nobuaki Kagawa, both of Hino, Japan, assignors to Konica Corporation, Japan

Continuation of Ser. No. 223,286, Apr. 5, 1994, abandoned. This application Apr. 12, 1995, Ser. No. 420,626
Claims priority, application Japan, Apr. 14, 1993, 5-087394
Int. Cl.[6] G03C *1/08;1/22*
U.S. Cl. 430—578 11 Claims

1. A silver halide photographic light-sensitive material comprising a support and provided thereon, a light-sensitive silver halide emulsion layer containing silver halide grains, wherein said silver halide grains are chemically sensitized by a selenium compound and spectrally sensitized by a dye represented by formula (S-I):

formula (S-I)



wherein y^1, y^2 and y^3 independently represent a —N(R)— group, an oxygen atom, a sulfur atom or a selenium atom; R^1 represents an aliphatic group having not more than 10 carbon atoms and having a water solubilizing group; R, R^2 and R^3 independently represent an aliphatic group, an aryl group or a heterocyclic ring, provided that at least two of R, R^2 and R^3 have a water solubilizing group; V^1 and V^2 independently represent a hydrogen atom, an alkyl group, an alkoxy group or an aryl group, provided that V^1 and V^2 may combine each other to form a condensed ring with an azole ring; L^1 and L^2 independently represent a substituted or non-substituted methine group; M represents an ion necessary for neutralizing a charge of the molecule; and n represents a number necessary for neutralizing a charge of the molecule.

5,466,572

HIGH SPEED FLOW CYTOMETRIC SEPARATION OF VIABLE CELLS

Dennis T. Sasaki, Mountain View, Calif.; Gerrit J. Van den Engh, Seattle, Wash., and Anne-Marie Buckie, Margate, United Kingdom, assignors to Systemix, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 940,097, Sep. 3, 1992, abandoned. This application Apr. 25, 1994, Ser. No. 233,115
Int. Cl.[6] A01N *1/02*
U.S. Cl. 435—2 8 Claims

1. In a method for separating a viable hematopoietic cell population subset from a mixture of cells using flow cytometry, wherein the improvement comprises:

contacting said mixture of cells with a fluorescent labeled molecule which specifically binds a surface membrane protein of said subset; and

passing a stream of said cells through a nozzle having a diameter of from about 25 to 100 μm at a pressure in the range of about 30–100 psi to provide a jet velocity in the range of about 15 to 30 m/s and a droplet frequency in the range of about 50 to 100 KHz, wherein the resulting sample flow rate will be in the range of about 10,000 to 35,000 events per second; and

isolating a viable cell population subset.

5,466,573

PLATELET STORAGE METHOD IN A MEDIUM CONTAINING ACETATE AND PHOSPHATE

Scott Murphy, Ardmore, Pa., and Tetsuo Shimizu, Kasugai, Japan, assignors to Thomas Jefferson University, Philadephia, Pa.

Division of Ser. No. 984,272, Dec. 1, 1992, Pat. No. 5,376,524, which is a continuation of Ser. No. 678,699, Apr. 1, 1991, abandoned. This application Aug. 5, 1994, Ser. No. 286,627
Int. Cl.[6] A01N *1/02*
U.S. Cl. 435—2 17 Claims

1. A method for storing platelets in an essentially plasma-free aqueous medium for subsequent intravenous transfusion to humans, consisting essentially of:

(a) adding human blood platelets to said medium to form a platelet concentrate, said medium comprising

(1) a sugar, capable of promoting the formation of adenosine triphosphate, consisting of glucose;

(2) 3–20 mM phosphate; and

(3) 3–20 mM acetate as a substrate for oxidative phosphorylation and for providing buffering upon oxidation;

wherein the pH of said medium is from about 6.8–7.2; and

(b) storing said platelets in said medium as said platelet concentrate for at least one day.

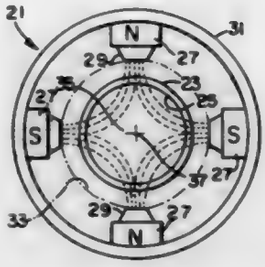
5,466,574

APPARATUS AND METHODS FOR MAGNETIC SEPARATION FEATURING EXTERNAL MAGNETIC MEANS

Paul A. Liberti, Churchville; Yuzhou Wang, Wayne; Weixin Tang, Devon; Brian P. Feeley, Easton, and Dhanesh L. Gohel, Philadelphia, all of Pa., assignors to Immunivest Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 674,678, Mar. 25, 1991, Pat. No. 5,186,827. This application Jan. 15, 1993, Ser. No. 6,071
Int. Cl.[6] C12Q *1/70;* G01N *33/553*
U.S. Cl. 435—5 36 Claims

1. A method for magnetically separating a target substance from a non-magnetic test medium in a magnetic separator comprising a



container having a peripheral wall and magnetic means positioned outside of said container, the method comprising the steps of:

a) contacting a quantity of magnetic particles having a receptor thereon which specifically binds to said target substance with said test medium, resulting in target substance-bearing magnetic particles;

b) introducing said test medium containing said magnetic particles into said container; and

c) positioning said container holding said test medium with the peripheral wall of said container adjacent to said magnetic means;

d) generating, in said test medium, a magnetic field that is substantially uniform along said peripheral wall and having a gradient in which the magnetic field is stronger in the test medium adjacent to said wall of the container than in the test medium more distant from the wall and is operative upon the magnetic particles to attract said magnetic particles toward said wall and cause such particles to be adhered to said wall, and

e) controlling the quantity of magnetic particles introduced into said container relative to the surface area of said wall exposed to the test medium and controlling the orientation of the exposed surface area relative to said magnetic means, thereby to cause adherence of said particles to the exposed wall surface in a substantially single layer to substantially prevent entrapment of interfering substances.

5,466,575

PROCESS FOR THE MANUFACTURE OF WHOLLY MICROFABRICATED BIOSENSORS

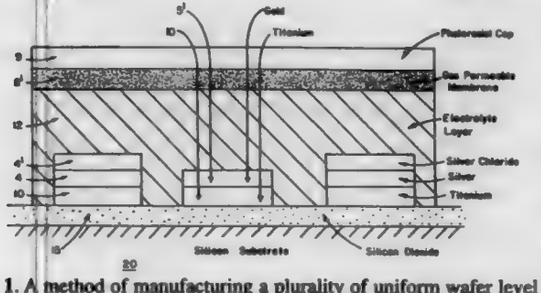
Stephen N. Cozzette, Nepean, Canada; Graham Davis, Plainsboro, N.J.; Imants R. Lauks, Yardley; Randall M. Mier, Morrisvile, both of Pa.; Sylvia Piznik, Jackson; Nicolaas Smit, Hightstown, both of N.J.; Paul Van Der Werf, Princeton Junction, N.J., and Henry J. Wieck, Plainsboro, N.J., assignors to i-Stat Corporation, Princeton, N.J.

Division of Ser. No. 432,714, Nov. 7, 1989, Pat. No. 5,200,051, which is a continuation-in-part of Ser. No. 381,223, Jul. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 270,171, Nov. 14, 1988, abandoned. This application Sep. 10, 1992, Ser. No. 943,345

The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.

Int. Cl.[6] G01N *33/543*

U.S. Cl. 435—6 **51 Claims**



1. A method of manufacturing a plurality of uniform wafer level microfabricated sensing devices which comprises:

(a) applying a plurality of base sensors on a substrate wafer;

(b) applying a permselective layer, superimposed over at least a portion of each base sensor, having a thickness sufficient to exclude substantially all molecules having a molecular weight of greater than about 120 while allowing the free permeation of molecules having a molecular weight of about 50 or less;

(c) applying a matrix, superimposed over at least a portion of said permselective layer and each of said base sensors, which matrix is selected from the group consisting of a photoformable proteinaceous material, a film-forming latex, and combinations thereof, and which is capable of incorporating a bioactive agent; and

(d) incorporating into said matrix an amount of said bioactive agent sufficient to selectively interact with a particular analyte species, to form a plurality of uniform wafer level microfabricated sensing devices.

5,466,576

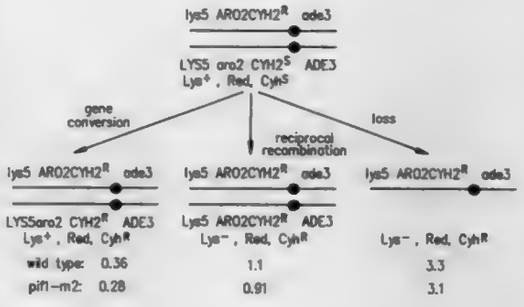
MODULATION OF PIF-1-TYPE HELICASES

Vincent P. Schulz, and Virginia A. Zakian, both of Seattle, Wash., assignors to Fred Hutchinson Cancer Research Center, Seattle, Wash.

Filed Jul. 2, 1993, Ser. No. 86,993

Int. Cl.[6] C12Q *1/68;* C12N *9/00;9/10;15/54*

U.S. Cl. 435—6 **8 Claims**



1. A method for identifying a modulator of telomere formation or elongation, comprising the steps of:

contacting a potential modulator of telomere formation or elongation with a PIF-1-type helicase in the presence of cells, and assaying the activity of said PIF-1-type helicase in vitro or in vivo, wherein said modulator specifically increases or decreases said activity and thereby modulates said telomere formation or elongation.

5,466,577

NUCLEIC ACID PROBES FOR THE DETECTION OF LYME DISEASE SPIROCHETES

William G. Weisburg, Milford, Mass., assignor to Amoco Corporation

Continuation of Ser. No. 773,351, Oct. 8, 1991, abandoned, which is a continuation of Ser. No. 416,072, Oct. 2, 1989, abandoned. This application Oct. 27, 1993, Ser. No. 144,212

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **16 Claims**

1. An isolated nucleic acid probe consisting of a nucleotide sequence identical or fully complementary to a region of the 16S rRNA of *Borrelia burgdorferi* bounded by nucleotide positions 63 to 106, 178 to 194, 416 to 450, 453 to 481, 829 to 866, 1122 to 1156, or 1414 to 1475, which nucleic acid probe preferentially hybridizes to the 16S rRNA or rDNA of Borrelia bacteria over the 16S rRNA or rDNA of non-Borrelia bacteria.

5,466,578

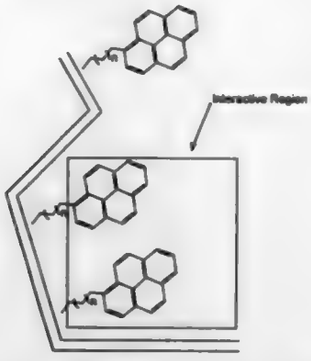
SURFACTANT-ENHANCED LIGHT EMISSION- OR ABSORBANCE-BASED BINDING ASSAYS FOR POLYNUCLEIC ACIDS

David A. Kidwell, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 4,009, Jan. 15, 1993, Pat. No. 5,332,659, which is a continuation-in-part of Ser. No. 865,526, Apr. 9, 1992, Pat. No. 5,314,802. This application Jul. 26, 1994, Ser. No. 280,537

Int. Cl.[6] **C12Q** *1/68;* **G01N** *21/64*

U.S. Cl. 435—6 **18 Claims**



1. A method for detecting the presence of a target polynucleic acid strand having a specified nucleotide sequence in an aqueous matrix suspected of including said target polynucleic acid strand, comprising the steps of:

adding to the matrix a strand of polynucleic acid at least substantially complementary to said target polynucleic acid strand, said at least substantially complementary polynucleic acid strand having attached thereto, at least two labels comprising fluorophore moieties, each attached to a corresponding internucleotide phosphate group, or between the phosphorus atoms of said at least substantially complementary polynucleic acid, so that when said at least substantially complementary polynucleic acid strand is not bound with said target polynucleic acid strand, said at least two fluorophore moieties are significantly more likely to electronically interact with each other to form an excimer and thus vary the wavelength dependance of their spectra than they would be if said at least substantially complementary polynucleic acid strand were bound to said target polynucleic acid, each of said at least two fluorophore moieties including at least one polycyclic aromatic groups;

adding a quaternary ammonium surfactant having an at least C4 alkyl chain to said aqueous matrix in a concentration that significantly enhances the fluorescence of said fluorophore moieties or said excimer; and

detecting said variation in the emission or absorption spectra, wherein said variation in the emission or absorption spectra indicates the presence of said target polynucleic acid strand.

5,466,579

HAIR ANALYSIS METHOD

Werner A. Baumgartner, Malibu, Calif., assignor to Psychemedics Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 737,703, Jul. 30, 1991, which is a continuation-in-part of Ser. No. 285,123, Dec. 16, 1988, Pat. No. 5,324,642, which is a continuation-in-part of Ser. No. 215,591, Jul. 6, 1988, abandoned, which is a continuation-in-part of Ser. No. 138,515, Dec. 28, 1987, abandoned. This application Feb. 3, 1993, Ser. No. 12,724

Int. Cl.[6] **G01N** *33/53*

U.S. Cl. 435—7.1 **6 Claims**

1. A method for the detection of marijuana intake by an individual which comprises:

(a) chemically treating a sample of hair from the individual in a manner that releases an analyte which has become embedded in the hair from the bloodstream of the subject as a result of marijuana ingestion to form a test solution; said solution containing an interfering cross reacting substance naturally found in hair;

(b) preparing a suspension of an ion exchange resin in a concentration and amount sufficient to remove the interfering substance from the test solution such that the analyte may be detected by immunoassay using an antibody which specifically binds to cannabinoids;

(c) mixing the test solution and the suspension sufficient to remove the interfering substance from the test solution; and

(d) after the interfering substance has been substantially removed from the test solution, subjecting a portion of the solution to analysis by immunoassay using an antibody which specifically binds to cannabinoids to detect the analyte if present.

5,466,580

METHOD FOR QUANTIFYING BPI IN BODY FLUIDS

Mark L. White, Sonoma; Stephen F. Carroll, Walnut Creek, and Jeremy K. Ma, Sanramon, all of Calif., assignors to XOMA Corporation, Berkeley, Calif.

Filed Sep. 22, 1993, Ser. No. 125,677

Int. Cl.[6] **G01N** *33/53;33/543;33/68;* **C12Q** *1/00*

U.S. Cl. 435—7.1 **3 Claims**

1. In an immunoassay method for quantifying the presence of extracellular BPI in a blood sample, said immunoassay comprising the steps of contacting said blood sample with antibodies which specifically bind to BPI and detecting said BPI bound to said antibodies, the improvement comprising using blood plasma as said blood sample.

5,466,581

METHOD FOR QUANTIFYING BPI IN BODY FLUIDS

Mark L. White, Sonoma; Stephen F. Carroll, Walnut Creek, and Jeremy K.-k. Ma, San Ramon, all of Calif., assignors to XOMA Corporation, Berkeley, Calif.

Continuation-in-part of Ser. No. 125,677, Sep. 22, 1993. This application Dec. 29, 1993, Ser. No. 175,276

Int. Cl.[6] **G01N** *33/53;33/543;33/68;* **C12Q** *1/00*

U.S. Cl. 435—7.32 **3 Claims**

1. An immunoassay method for screening for gram-negative sepsis in a subject comprising determining the concentration of extracellular BPI in a plasma sample obtained from said subject, wherein said immunoassay comprises the steps of obtaining said plasma sample from said subject, contacting said plasma sample with antibodies which specifically bind to BPI, detecting said BPI bound to said antibodies to determine the concentration of said BPI in said sample, and comparing said concentration with a standard concentration of BPI indicative of gram-negative sepsis.

5,466,582

THROMBOCYTOPENIA DETERMINATION

Jean Amiral, Franconville, France, assignor to Serbio, Gennevilliers, France

Continuation of Ser. No. 844,607, Apr. 8, 1992, abandoned. This application Sep. 27, 1994, Ser. No. 313,391

Claims priority, application France, Aug. 9, 1990, 90 10190

Int. Cl.[6] **G01N** *33/535;33/536;33/541*

U.S. Cl. 435—7.9 **11 Claims**

1. A method of diagnosing heparin-induced thrombocytopenia induced by a heparin drug, Hep, selected from the group consisting of heparin, metal heparinates, heparinoids, and heparin fragments, wherein the heparin fragments have an average molecular weight of less than 6,000 daltons,

said method comprising:

taking a sample suspected of containing heparin-induced anti(Ag-Hep) antibodies from a patient, wherein Hep is the heparin drug defined above, Ag is an antigenic substance that forms an Ag-Hep complex with Hep, and Ag represents an antigenic substance selected from the group consisting of

(a) platelet factor 4 (pF4),

(b) fractions containing pF4,

(c) recombinant pF4,

(d) synthetic peptides corresponding to the carboxy-terminal amino acids 1–13 or 13–24 of pF4,

(e) proteoglycan,

(f) proteoglycan-pF4 complexes, and

(g) mixtures thereof;

admixing with the sample an Ag-Hep complex as defined above; and detecting a reaction between the anti(Ag-Hep) antibodies in the sample and the Ag-Hep complex which indicates heparin-induced thrombocytopenia.

5,466,583

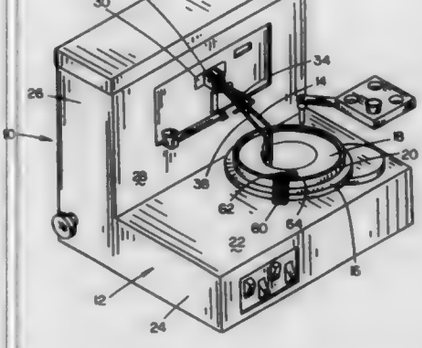
METHOD AND APPARATUS FOR PERFORMING 3-DIMENSIONAL ANTIBIOTIC SUSCEPTIBILITY TESTS

Kenneth S. Thomson, and Susan A. Thomson, both of 1282 S. 164th St., Omaha, Nebr. 68130

Filed May 1, 1991, Ser. No. 694,438

Int. Cl.[6] C12Q *1/24;1/18;* C12M *1/26*

U.S. Cl. 435—30 **4 Claims**



1. An apparatus for performing 3-dimensional antibiotic susceptibility tests, comprising:

a plate for receiving and holding a culture medium;

a culture medium on said plate of sufficient quantity to cover said plate, said culture medium having a top surface, and a bottom surface in contact with the plate;

cutting means for cutting a slit having a pair of vertical walls in said culture medium, through the top surface of the culture medium;

means for moving said culture medium with respect to said cutting means to form a slit having a length in said culture medium;

an inoculum dispensing means for dispensing a uniform stream of inoculum into and along the length of said slit, having a dispensing end located so as to dispense inoculum into the formed slit;

means contacting the culture medium for forcing the vertical walls of the slit into abutting contact, rearwardly of the inoculum dispensing means.

5,466,584

OXYTOCIN RECEPTOR AND DNA CODING THEREFOR

Osamu Tanizawa, Osaka; Hiroto Okayama, Mino; Fumitaka Saji, Nishinomiya; Chihiro Azuma, Osaka, and Tadashi Kimura, Suita, all of, Japan, assignors to Rohto Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 8, 1992, Ser. No. 960,985

Claims priority, application Japan, Jan. 9, 1991, 3-262167; Mar. 27, 1992, 4-071258

Int. Cl.[6] C07H *21/00*

U.S. Cl. 435—69.1 **5 Claims**

1. An isolated DNA segment encoding the amino acid sequence given in SEQ ID NO: 1.

5,466,585

INTERFERON-INDUCED HUMAN PROTEIN IN PURE FORM, MONOCLONAL ANTIBODIES THERETO, AND TEST KITS CONTAINING THESE ANTIBODIES

Michel A. Horisberger, Allschwil; Heinz-Kurt Hochkeppel, Aesch, both of, Switzerland, and Jean Content, Rhode-St-Genèse, Belgium, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 983,177, Nov. 30, 1992, abandoned, which is a division of Ser. No. 810,580, Dec. 19, 1991, Pat. No. 5,198,350, which is a continuation of Ser. No. 497,748, Mar. 19, 1990, abandoned, which is a continuation of Ser. No. 37,754, Apr. 13, 1987, abandoned. This application Jun. 13, 1994, Ser. No. 258,902

Claims priority, application United Kingdom, Apr. 15, 1986, 8609162; Jan. 23, 1986, 8625381

Int. Cl.[6] C12P *21/02;* C12N *15/00;15/02;15/70*

U.S. Cl. 435—69.1 **19 Claims**

1. A process for the preparation of an essentially pure protein which

(1) is present in human cells induced by interferon α or β,

(2) has a molecular weight of approximately 78 kDa as determined by sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE),

(3) has an isoelectric point of approximately 6.3,

(4) has a partial N-terminal amino acid sequence

Val—Val—Ser—Glu—Val—Asp—Ile—Ala—Lys—Ala—,

said process comprising the steps of culturing cells producing said protein, isolating said protein from a supernatant of said cells or from a lysis mixture of said cells, and purifying said protein by precipitation and chromatographic methods.

5,466,586

METHOD FOR THE SYNTHESIS OF RIBONUCLEIC ACID (RNA)

Cheryl Davey, Toronto; Lawrence T. Malek, Brampton, both of, Canada; Peter F. Lens, Amsterdam, and Frits Wielaard, Den Boech, both of, Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Continuation of Ser. No. 67,156, May 24, 1993, abandoned, which is a continuation of Ser. No. 941,846, Sep. 8, 1992, abandoned, which is a continuation of Ser. No. 521,292, May 9, 1990, abandoned. This application Feb. 7, 1994, Ser. No. 192,756

Claims priority, application Netherlands, May 10, 1989, 8901172

Int. Cl.[6] C07H *21/00;* C12N *15/10;* C12P *19/34;* C12Q *1/68*

U.S. Cl. 435—91.21 **3 Claims**

1. A method for the synthesis of ribonucleic acid (RNA) from single stranded or double stranded deoxyribonucleic acid (DNA) in which a target sequence is present, comprising:

treating the DNA with one or more restriction enzymes to thereby generate a free 3' end of the target sequence;

rendering the DNA thus obtained single stranded;

hybridizing a single nucleic acid primer comprising a T7 promoter coupled to the 5' of a nucleic acid sequence that is complementary to the 3' end, including the ultimate nucleotide, of one of the strands of the target sequence;

extending the 3' ends of the resulting hybrid DNA molecules with DNA polymerase to produce a functional double stranded DNA template, in the absence of an additional primer, for synthesizing RNA; and

transcribing said template by incubating it with an RNA polymerase that recognizes the T7 promoter sequence to obtain RNA.

5,466,587

METHOD FOR INTRODUCING A BIOLOGICAL SUBSTANCE INTO A TARGET

Sandra G. Fitzpatrick-McElligott, Media; John G. Lavin, Swarthmore; Germain F. Rivard, Philadelphia, all of Pa., and Shekhar Subramoney, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 85,696, Jun. 30, 1993, abandoned. This application Sep. 29, 1994, Ser. No. 315,309

Int. Cl.[6] C12N *15/00;15/87*

U.S. Cl. 435—172.1 **3 Claims**

1. A method for introducing a biological substance into a biological target which comprises:

(a) adsorbing the biological substance onto a particle encapsulating a dense metallic core and having a substantially pure carbonaceous surface, said particle having a size sufficiently small to penetrate a target without rendering the target nonfunctional, said biological substance selected from the group consisting of nucleic acids, genetic constructs, and proteins, said biological target being selected from the group consisting of germ cells, microbes, microalgae, plants, organelles, cells, animals, organoids, and tissues, and

(b) inserting the particle of step(a) into the target by accelerating the particle and propelling the particle at the target whereby said particle penetrates the target.

5,466,588

PRODUCTION OF HIGH OPTICAL PURITY D-LACTIC ACID

Michio Kosaki, Tokyo, and Kimitoshi Kawai, Ibo, both of, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 925,240, Aug. 4, 1992, abandoned, which is a continuation of Ser. No. 633,156, Dec. 21, 1990, abandoned, which is a continuation of Ser. No. 822,348, Jan. 24, 1986, abandoned. This application May 26, 1994, Ser. No. 250,094

Claims priority, application Japan, Feb. 8, 1985, 60-22907; Jun. 21, 1985, 60-135657; Jun. 21, 1985, 60-135658

Int. Cl.[6] C12P *7/56*

U.S. Cl. 435—139 **2 Claims**

1. A process for the production of D-lactic acid having a high optical purity comprising the steps of:

inoculating a glucose-yeast extract-peptone medium with *Sporolactobacillus inulinus* ATCC 15538 bacterium and culturing the bacterium therein to produce a culture broth;

inoculating a glucose-yeast extract-peptone medium containing 1% $CaCO_3$ with the culture broth and culturing the culture broth therein to produce a seed culture;

inoculating a glucose-yeast extract medium containing 100 g/l glucose, 5 g/l yeast extract, 0.2 g/l $MgSO_4 \cdot 7H_2O$, 10 mg/l $FeSO_4 \cdot 7H_2O$0, 10 mg/l $MnSO_4 \cdot 4.5H_2O$, 10 mg/l NaCl and 60 g/l $CaCO_3$ with the seed culture and conducting fermentation therein to produce a fermentation broth;

adding the fermentation broth to a glucose-yeast extract medium containing 100 g/l glucose, 7.5 g/l yeast extract, 0.2 g/l $MgSO_4 \cdot 7H_2O$, 10 mg/l $FeSO_4 \cdot 7H_2O$, 10 mg/l $MnSO_4 \cdot 4.5H_2O$, 10 mg/l NaCl and 60 g/l $CaCO_3$ and conducting fermentation therein to produce D-lactic acid of a high optical purity; and

recovering said D-lactic acid.

5,466,589

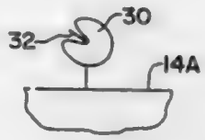
COATED SUBSTRATES EMPLOYING ORIENTED LAYERS OF MUTANT HEME PROTEINS AND METHODS OF MAKING AND USING SAME

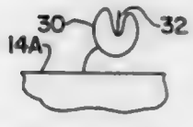
Jill M. Olinger, Fishers, Ind.; Stephen G. Sligar, Urbana, Ill.; Mark A. McLean; Paul W. Bohn, both of Champaign, Ill., and Patrick Stayton, Seattle, Wash., assignors to Biotechnology Research & Development Corporation, Peoria, Ill.

Continuation-in-part of Ser. No. 615,046, Nov. 19, 1990, abandoned. This application Sep. 11, 1992, Ser. No. 945,291

Int. Cl.[6] C12N *11/02;* **C12M** *1/14;* **G01N** *27/327;21/41*

U.S. Cl. 435—174 **17 Claims**





1. A coated substrate comprising

a substrate having at least a first portion having a surface; and

a plurality of mutant heme protein molecules having heme prosthetic groups and preferential binding sites, wherein said preferential binding site of each mutant heme protein molecule was provided by replacement of a surface amino acid residue and said preferential binding site is a reacted amino acid residue coupled with a functional group of said surface of said first portion, such that a coating of said mutant heme protein molecules is formed on said surface of said first portion, and the heme prosthetic groups of said coating of said

surface of said first portion have the same spatial relationship with respect to to said surface of said first portion.

5,466,590

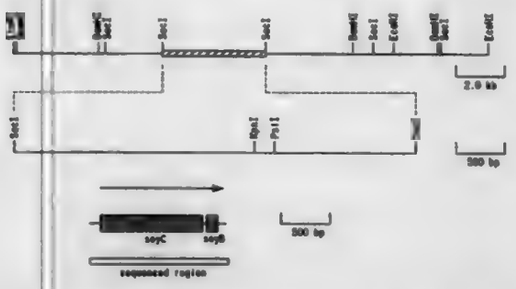
CONSTITUTIVE EXPRESSION OF P450SOY AND FERREDOXIN-SOY IN STREPTOMYCES

Fateme S. Sariaslani, Newark, Del.; Michael K. Trower, Cambridge, England, and Charles A. Omer, Downingtown, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 807,001, Dec. 16, 1991, abandoned. This application Aug. 6, 1993, Ser. No. 102,863

Int. Cl.[6] C12P *21/06;* C12N *1/20;15/00;* C07H *15/12*

U.S. Cl. 435—189 7 Claims



1. A purified nucleic acid fragment comprising a SacI restriction fragment which encodes a cytochrome P-450soy gene which expresses biologically active P-450soy in any Streptomyces species, further comprising a promoter region selected from *Streptomyces griseolus, Streptomyces coelicolor Streptomyces azureus* or *Streptomyces lividans,* the promoter region operably linked to the 5' end of the SacI fragment and further comprising a region coding for ferredoxin soy.

5,466,591

5' TO 3' EXONUCLEASE MUTATIONS OF THERMOSTABLE DNA POLYMERASES

Richard D. Abramson, and David H. Gelfand, both of Oakland, Calif., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

PCT No. PCT/US91/07035, § 371 Date Feb. 23, 1993, § 102(e) Date Feb. 23, 1993, PCT Pub. No. WO92/06200, PCT Pub. Date Apr. 16, 1992

Continuation-in-part of Ser. No. 590,213, Sep. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 590,466, Sep. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 590,490, Sep. 28, 1990, abandoned, which is a continuation-in-part of Ser. No. 746,121, Aug. 15, 1991, abandoned, said Ser. No. 590,213and Ser. No. 590,466, Aug. 15, 0, and Ser. No. 590,490, Aug. 15, 0, each , Aug. 15, 0is a continuation-in-part of Ser. No. 523,394, May 15, 1990, Pat. No. 5,079,352, which is a continuation-in-part of Ser. No. 143,441, Jan. 12, 1988, abandoned, which is a continuation-in-part of Ser. No. 63,509, Jun. 17, 1987, Pat. No. 4,889,818, which is a continuation-in-part of Ser. No. 899,241, Aug. 22, 1986, abandoned, said Ser. No. 746,121is a continuation-in-part of Ser. No. 585,471, Sep. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 455,611, Dec. 22, 1989, which is a continuation-in-part of Ser. No. 143,441, Jan. 12, 1988, abandoned, said Ser. No. 746,121is a continuation-in-part of Ser. No. 609,157, Nov. 2, 1990, abandoned, which is a continuation-in-part of Ser. No. 557,517, Jul. 24, 1990, abandoned. This PCT application Sep. 30, 1991, Ser. No. 977,434

Int. Cl.[6] C12N *9/12;15/54*

U.S. Cl. 435—194 4 Claims

1. A recombinant thermostable DNA polymerase enzyme which is characterized in that:

(a) in its native form said polymerase comprises a 5' to 3' exonuclease domain providing 5' tO 3' exonuclease activity, wherein said domain comprises an amino acid sequence selected from the group consisting of: A(X)YG wherein X is V or T (SEQ ID NO: 15),

(b) said amino acid sequence is mutated in said recombinant enzyme by means other than N-terminal deletion, and

(c) said recombinant enzyme has a lesser amount of 5' to 3' exonuclease activity than that of the native form of said enzyme.

5,466,592

METHOD FOR MAKING STABLE, EXTRACELLULAR TYROSINASE AND SYNTHESIS OF POLYPHENOLIC POLYMERS THEREFROM

Guy R. della-Cioppa; Stephen J. Garger, Jr.; Richard B. Holtz; Michael J. McCulloch, and Genadie G. Sverlow, all of Vacaville, Calif., assignors to Biosource Technologies, Inc., Vacaville, Calif.

Division of Ser. No. 982,095, Nov. 25, 1992, Pat. No. 5,340,734. This application Nov. 17, 1993, Ser. No. 154,171

The portion of the term of this patent subsequent to Aug. 23, 2011, has been disclaimed.

Int. Cl.[6] C12N *9/48;9/74;* A61K *7/42;* C12P *21/06*

U.S. Cl. 435—212 14 Claims

1. An in vitro method for producing polyphenolic polymers ("PPP") comprising the steps of:

producing extracellular recombinant tyrosinase in a microorganism selected from the group consisting of Streptomyces, Escherichia, Bacillus, Streptococcus, Salmonella, Staphylococcus, and Vibrio, wherein said microorganism contains an expression vector with polynucleotides encoding tyrosinase, and microorganism is grown in the presence of 20–90% dissolved oxygen in a low casein containing medium as nitrogen source, wherein the casein is selected from the group consisting of casein, casein hydrolysate or casein peptone and mixtures thereof, and said tyrosinase is harvested when the extracellular tyrosinase activity, in units/ml, stops increasing;

reacting tyrosinase substrates with said tyrosinase to form PPP; and

recovering the PPP so produced.

5,466,593

HEPATOCYTE GROWTH FACTOR ACTIVATING PROTEASE AND GENE ENCODING THE PROTEASE

Takeshi Shimomura, Machida; Kazunori Yamada, Yokohama; Yuuki Morimoto, Machida; Naomi Kitamura, Moriguchi, and Keiji Miyazawa, Ashiya, all of, Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Filed Nov. 5, 1993, Ser. No. 148,910

Claims priority, application Japan, Nov. 5, 1992, 4-296133; Nov. 20, 1992, 4-312234; Nov. 20, 1992, 4-312242

Int. Cl.[6] C12N *15/57;15/63;5/10*

U.S. Cl. 435—219 12 Claims

1. A DNA fragment comprising a gene encoding a protein having the amino acid sequence of SEQ ID NO: 1.

5,466,594

ALKALINE PROTEASE *BACILLUS SP.* JP 395, METHOD OF MAKING AND DETERGENT COMPOSITIONS

Helle Outtrup, Ballerup; Claus Dambmann, Soeborg; Margrethe Christiansen, Klampenborg, and Dorrit A. Aaslyng, Roskilde, all of, Denmark, assignors to Nove Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK92/00105, § 371 Date Sep. 23, 1993, § 102(e) Date Sep. 23, 1993, PCT Pub. No. WO92/17578, PCT Pub. Date Oct. 15, 1992

PCT Filed Apr. 3, 1992, Ser. No. 119,193

Claims priority, application Denmark, Apr. 3, 1991, 0585/91

Int. Cl.[6] C12N *9/52;9/54;1/70;* C11D *9/40*

U.S. Cl. 435—221 **10 Claims**

1. An isolated protease obtained from Bacillus sp. IP 395 which has:

(a) an apparent molecular weight of 30 kD, as determined by SDS-PAGE;

(b) a pH optimum in the range of from pH 9 to 11 at 25° C.;

(c) a temperature optimum in the range of from 50° to 65° C. at pH 9.5; and

(d) an isoelectric point of above 9.5.

5,466,595

CALCIUM INDEPENDENT CYTOSOLIC PHOSPHOLIPASE A2/B ENZYMES

Simon Jones, Somerville, and Jin Tang, Canton, both of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Filed Jul. 27, 1994, Ser. No. 281,193

Int. Cl.[6] C07H *21/04*

U.S. Cl. 435—240.2 **9 Claims**

1. An isolated polynucleotide comprising a nucleotide sequence selected from the group consisting of:

(a) the nucleotide sequence of SEQ ID NO:1;

(b) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2;

(c) a nucleotide sequence and which hybridizes under stringent conditions with the sequence of (a) or (b); and

(d) allelic variants of the sequence of (a).

5,466,596

TISSUE SPECIFIC TRANSCRIPTIONAL REGULATORY ELEMENT

Martin L. Breitman, Willowdale; Daniel Dumont, Oakville, and Gerard G. Gradwohl, Toronto, all of, Canada, assignors to Mount Sinai Hospital Corporation, Toronto, Canada

Filed Aug. 25, 1992, Ser. No. 934,393

Int. Cl.[6] C12N *5/10;15/11*

U.S. Cl. 435—240.2 **10 Claims**

1. An isolated transcriptional regulatory element comprising (a) a nucleotide sequence having nucleotides 1 to 560 of the sequence as shown in SEQ. ID. NO. 5, and (b) nucleotide sequences complementary to (a).

5,466,597

***BACILLUS THURINGIENSIS* STRAINS AND THEIR GENES ENCODING INSECTICIDAL TOXINS**

Marnix Peferoen, Gent; Bart Lambert, Beernem, and Katrien Van Audenhove, Brugge, all of, Belgium, assignors to Plant Genetic Systems, N.V., Belgium

PCT No. PCT/EP91/00791, § 371 Date Nov. 17, 1992, § 102(e) Date Nov. 17, 1992, PCT Pub. No. WO91/16433, PCT Pub. Date Oct. 31, 1991

PCT Filed Apr. 24, 1991, Ser. No. 952,755

Claims priority, application United Kingdom, Apr. 26, 1990, 90401144; Dec. 20, 1990, 90403724

Int. Cl.[6] C12N *1/21;* A01N *63/00;* C07H *17/00*

U.S. Cl. 435—252.3 **8 Claims**

6. An isolated btI109P gene encoding a btI109P protein comprising the amino acid sequence of SEQ. ID. No. 1 or an insecticidally effective part of the BtI109P protein of SEQ. ID. No. 1 or a truncated BtI109P protein of SEQ. ID. No. 1 having at least the activity of the BtI109P protein.

7. A transformed microorganism comprising one of the genes of claim 6.

5,466,598

DEACETYLCEPHALOSPORIN C ACETYLTRANSFERASE FROM *ACREMONIUM CHRYSOGENUM*

Akio Matsuda, Fuji, and Kenji Matsuyama, Shiraoi, both of, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 661,615, Feb. 28, 1991, abandoned. This application Jan. 7, 1994, Ser. No. 178,606

Claims priority, application Japan, Mar. 2, 1990, 2-49434

Int. Cl.[6] C12N *1/14;9/10;15/54;* C12P *35/06*

U.S. Cl. 435—254.11 **11 Claims**

1. An isolated DNA consisting of a gene coding for deacetylcephalosporin C acetyltransferase from *Acremonium chrysogenum.*

5,466,599

ASTAXANTHIN OVER-PRODUCING STRAINS OF PHAFFIA RHODOZYMA

Gunnard K. Jacobson, Brown Deer; Setsuko O. Jolly, Glendale; Joseph J. Sedmak, Brookfield; Thomas J. Skatrud, Menomonee Falls, and John M. Wasileski, Brown Deer, all of Wis., assignors to Universal Foods Corporation, Milwaukee, Wis.

Filed Apr. 19, 1993, Ser. No. 49,825

Int. Cl.[6] C12N *1/16;* C12P *23/00*

U.S. Cl. 435—255.1 **5 Claims**

1. A strain of *Phaffia rhodozyma* selected from the group consisting of *Phaffia rhodozyma* ATCC-74218, ATCC-74219, ATCC-74220, ATCC-74221 and mutants thereof which retain the astaxanthin-producing capability.

5,466,600

USE OF CARBON MONOXIDE DEHYDROGENASE FOR BIOREMEDIATION OF TOXIC COMPOUNDS

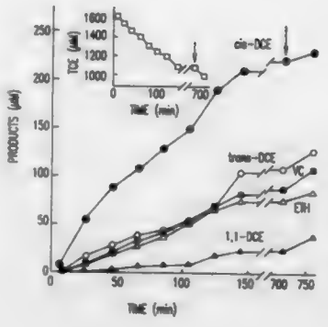
Peter E. Jablonski, Moscow, Id., and James G. Ferry, Blacksburg, Va., assignors to The Center for Innovative Technology, Herndon, Va.

Filed Aug. 12, 1993, Ser. No. 106,349

Int. Cl.[6] C12P *5/00;* C12N *9/02;* C12S *13/00;* B09C *1/10*

U.S. Cl. 435—262.5 **3 Claims**

1. A method for reductively dechlorinating chlorinated chemical species, comprising the steps of:



adding carbon monoxide dehydrogenase to a solution which includes chlorinated chemical species, said chlorinated chemical species being selected from the group consisting of single carbon chlorinated compounds, trichloroethylene and chlorodecone;

adding a reducing agent, which is then oxidized by said carbon monoxide dehydrogenase; to said solution; and

maintaining said solution under sufficient anaerobic conditions for a time sufficient for said carbon monoxide dehydrogenase to reductively dechlorinate said chlorinated chemical species.

5,466,601

SELECTIVELY REMOVING EMBEDDED LINT PRECURSORS WITH CELLULASE

Terry L. Jenkins, Columbus; Michael L. McAbee, Catoula, both of Ga., and Joe W. Richardson, Jr., Alexander, Ala., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation-in-part of Ser. No. 866,828, Apr. 10, 1992, abandoned. This application Jan. 26, 1994, Ser. No. 188,051

Int. Cl.[6] **C12S** *11/00;3/04;* **C09B** *67/00;* **D01B** *1/04*

U.S. Cl. 435—263 **16 Claims**

1. A process for selectively removing embedded lint precursors with a cellulase enzyme during a continuous manufacturing process, having at least formation, preparation, dyeing, and finishing steps, for an open end cotton fabric, untreated with a swelling agent, comprising the steps of:

(a) preparing at least one aqueous cellulase solution comprising cellulase and a nonionic surfactant;

(b) continually adding the at least one cellulase solution, in a step of the process, in a fixed, limited path, with no substantial agitation or recirculation, in an amount and under conditions sufficient for hydrolyzing embedded lint precursors, to the open end cotton fabric comprising digestible cellulosic fibrils and non-digestible cellulosic fibrils, the digestible cellulosic fibrils being embedded lint precursors within the path travelled by the cellulase, and the nondigestable cellulosic fibrils being located outside the path travelled by the cellulase; and

(c) removing the embedded lint precursors by cellulase digestion of the embedded lint precursors.

5,466,602

APPARATUS FOR GROWING TISSUE CULTURES IN VITRO

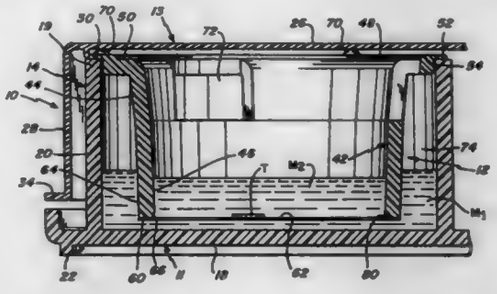
George Lyman, Cape Porpoise, Me.; Gregory Mathus, Concord, and David Root, Lexington, both of Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Continuation of Ser. No. 835,136, Mar. 18, 1992, abandoned, which is a continuation of Ser. No. 695,300, May 3, 1991, Pat. No. 5,215,920, which is a continuation of Ser. No. 841,562, Mar. 20, 1986, Pat. No. 5,026,649. This application Jan. 13, 1994, Ser. No. 180,695

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[6] **C12M** *3/06*

U.S. Cl. 435—297.1 **3 Claims**



1. A device for growing cells or tissues for use with a well having a well housing having at least one side wall and a well bottom defining a well chamber for receiving media, comprising:

a housing having a wall, a top end, a bottom end, and a flange, said bottom end having a permeable membrane, said permeable membrane having a top surface and a bottom surface, said top surface for receiving one or more cells for culture, and said bottom surface for positioning in a juxtaposed spaced relationship to said well bottom to allow said cells to receive media held in said well through said permeable membrane, said wall capable of being received within said well chamber, in spaced relationship with said side walls of said well to define an annular space which annular space does not allow capillary action with aqueous fluid, and said flange extending radially from the top end of said wall and capable of being received on said well housing to suspend said wall within said well chamber, said flange having a rim capable of being received by said side wall to preclude lateral movement of said housing in said well chamber for positioning said wall in said well chamber to maintain said annular space, and said spaced relationship between said well bottom and said bottom surface of said permeable membrane.

5,466,603

TEMPERATURE REGULATED HYBRIDIZATION CHAMBER

Brian W. Meehan, 616 Wildwood, East Lansing, Mich. 48823; Uwe Heine, Department of HLA/Paternity Roche Biomedical Laboratories, Inc. 1447 York Ct., Burlington, N.C. 27215, and James M. Mason, 50 Driftwood Ct., Gibsonville, N.C. 27249

Filed Feb. 15, 1994, Ser. No. 196,626

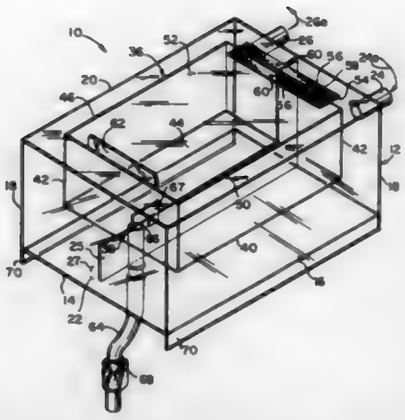
Int. Cl.[6] **C12M** *1/38;1/02*

U.S. Cl. 435—285.1 **16 Claims**

1. A temperature regulated hybridization chamber for hybridization of DNA membranes comprising:

an outer container including a bottom wall having a periphery and an outer container side wall extending generally upwardly from said periphery, said outer container bottom wall and said outer container side wall defining a first chamber for receiving a first fluid having a predetermined temperature;

an inner container including a bottom wall having a periphery and an inner container side wall extending generally upwardly



from said periphery of said inner container bottom wall, said inner container bottom wall and said inner container side wall defining a second chamber for receiving a second fluid and said DNA membranes, said inner container being positioned within said first chamber with said inner container bottom wall and inner container side wall being spaced from said outer container bottom wall and outer container side wall, respectively, such that when the first fluid is positioned within said first chamber the first fluid is in engagement with said inner container bottom wall and inner container side wall;

a drain conduit in fluid communication with said second chamber for removing the second fluid from said second chamber, said drain conduit being offset from a center of said bottom wall of said inner container and positioned such that the second fluid and not the DNA membranes flows through said drain conduit due to the force of gravity whereby the second fluid in said inner chamber is maintained at a temperature which is about equal to the predetermined temperature of the first fluid;

a block member positioned over at least a portion of said drain conduit also for preventing DNA membranes from flowing into said drain conduit;

an inlet conduit in fluid communication with said first chamber for allowing the first fluid to flow into said first chamber; and

an outlet conduit in fluid communication with said first chamber for removing the first fluid from said first chamber.

5,466,604

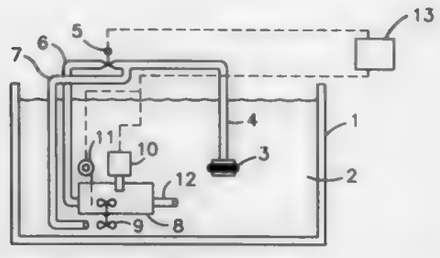
APPARATUS FOR MONITORING BIOLOGICAL ACTIVITY IN WASTEWATER AND CONTROLLING THE TREATMENT THEREOF

Xin Yang, Holland; Jaw E. Lee, Berwyn; William Armiger, Wayne; Sergey K. Maneshin, Upper Holland, and Marcus E. Kolb, Phoenixville, all of Pa., assignors to BioChem Technology, Inc., King of Prussia, Pa.

Filed Mar. 8, 1994, Ser. No. 208,020

Int. Cl.[6] C12M *1/34*

U.S. Cl. 435—286.1 **17 Claims**



1. Apparatus for monitoring biological activity in a fluid treatment process comprising:

a fluid sample container having a fluid flow opening connected to a fluid supply;

a sample agitator connected to said container wherein flow of fluids in and out of said container is assisted by said agitator;

a container door positioned adjacent said opening and adapted to move toward and away from said opening;

a radiation source positioned relative to said container to irradiate a sample of fluid in said container with radiation of a selected wavelength;

a probe positioned relative to said sample to detect changes in fluorescence emitted by NADH in microorganisms within said sample in response to said radiation;

means for analyzing changes in NADH fluorescence detected by said probe; and

a controller connected to said analyzing means to introduce samples into and remove samples from said container at selected time intervals.

5,466,605

METHOD FOR DETECTION OF CHEMICAL COMPONENTS

William Glaunsinger, Chandler; Ian Sorensen, Phoenix; Qingcheng Bao, Tempe, and Michael J. McKelvy, Mesa, all of Ariz., assignors to Arizona Board of Regents, Tempe, Ariz.

Filed Mar. 15, 1993, Ser. No. 31,610

Int. Cl.[6] G01N *27/12*

U.S. Cl. 436—6 **10 Claims**

1. A method for detecting the presence of a chemical constituent in an open ambient environment, comprising the steps of:

A. providing a switch element made of a noble metal or noble metal alloy material which is substantially inert, unreactive to primary constituents in the open ambient environment in which the switch element resides, but selectively and irreversibly reactive only with a chemical constituent to be detected in an open ambient environment, said material being selected and arranged so as to provide a binary electrical response to said chemical reaction;

B. exposing said switch element to the open ambient environment, thereby causing a reaction between said switch element and the chemical constituent, if present in the open ambient environment; and

C. measuring said electrical response of the switch element to determine the presence of the chemical constituent.

5,466,606

USE OF N-METHYLFORMAMIDE AS SOLVENT FOR THE KARL FISCHER TITRATION

Eugen Scholz, Garbsen, Germany, assignor to Riedel-De Haen Aktiengesellschaft, Seelze, Germany

Filed Aug. 22, 1994, Ser. No. 293,312

Claims priority, application Germany, Aug. 31, 1993, 43 29 287.9

Int. Cl.[6] G01N *33/18*

U.S. Cl. 436—42 **12 Claims**

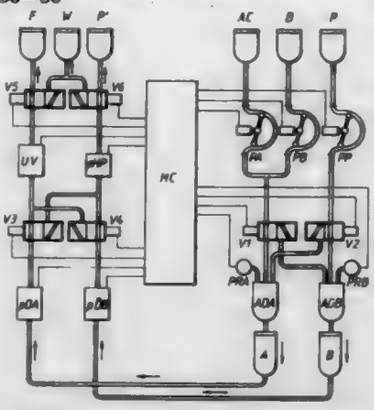
1. In a method for determining water content of a sample using the Karl Fischer reaction including the titration of a water containing sample with a Karl Fischer reagent comprising sulphur dioxide at least one Karl Fischer base; an iodide or iodine and a solvent wherein the improvement comprises the use of a solvent containing N-methylformamide.

5,466,607

SYSTEM AND METHOD FOR TREATMENT OF A BIOLOGICAL LIQUID

Per Andersson-Schager, Kaglinge; Ingemar Johansson; Willy Larsson, both of Sodra Sandby, and Erik Lindmark, Lund, all of, Sweden, assignors to Excorim AB, Lund, Sweden

Filed Apr. 13, 1994, Ser. No. 146,058
Claims priority, application Sweden, May 10, 1991, 9101413
Int. Cl.[6] A61M *1/03*
U.S. Cl. 436—50 29 Claims



1. A method for the treatment of a first liquid which is a plasma of human blood in a treatment device comprising the steps of:

cyclically feeding said first liquid and a second liquid to said treatment device, measuring a component of said first and second liquids whereby a ratio between said first and second liquids being determined by a measuring arrangement, transferring said first and second liquids to predetermined collection points by initiating and terminating a collection of said first liquid during one of said feeding cycles based on said ratio between said first and second liquids, measuring the volume of at least said first liquid conveyed to said treatment device during said one of said cycles by a volume measuring arrangement, and determining a theoretical time between said initiating and said terminating of said collection of said first liquid based thereon.

5,466,608

PROCESS AND APPARATUS FOR HETEROGENEOUS PHASE SYNTHESIS OF MACROMOLECULES SUCH AS PEPTIDES, POLYNUCLOETIDES OR OLIGOSACCHARIDES

Gerard Lapluye, Versailles, and Roger Poisson, Les-Clayes-sous-Bois, both of, France, assignors to Rhôn-Poulenc Rorer S.A., Anthony, France

PCT No. PCT/FR92/00197, § 371 Date Sep. 7, 1993, § 102(e) Date Nov. 8, 1993, PCT Pub. No. WO92/15867, PCT Pub. Date Sep. 17, 1992
PCT Filed Mar. 4, 1992, Ser. No. 117,003
Claims priority, application France, Mar. 6, 1991, 91 02645
Int. Cl.[6] G01N *33/68*
U.S. Cl. 436—86 22 Claims

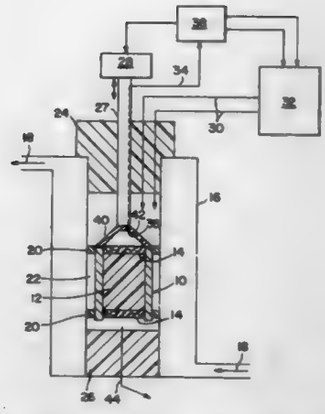
1. A process for the heterogeneous phase synthesis of macromolecules, including peptides, polynucleotides or oligosaccharides, comprising:

(A) providing a tubular reactor having an upper end and a lower end and a solid support, the upper and lower ends of the reactor comprising filters which retain the solid support and which allow liquids to pass therethrough;

(B) sequentially dosing and introducing reagent liquids into the reactor successively to effect coupling and stripping reactions;

(C) causing the reagent liquid to circulate repeatedly and alternately in the reactor and through the filters for each reaction to be performed;

(D) monitoring the development of the ongoing reaction by detecting the variations in temperature of the reagent liquid



associated with its passages in the reactor and outside the reactor, the end of the reaction corresponding to a substantially zero value of these variations in temperature after a progressive decrease over a predetermined period of time; and

(E) alternating the coupling and stripping reactions with operations of washing and rinsing the reactor and the solid support.

5,466,609

BIODEGRADABLE GELATIN-AMINODEXTRAN PARTICLE COATINGS OF AND PROCESSES FOR MAKING SAME

Olavi Siiman, Davie; Alexander Burshteyn, Hialeah, and Ravinder K. Gupta, Pembroke Pines, all of Fla., assignors to Coulter Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 607,253, Oct. 31, 1990, Pat. No. 5,169,754. This application Oct. 29, 1992, Ser. No. 968,158
Int. Cl.[6] G01N *33/531;33/543;33/548*
U.S. Cl. 436—518 41 Claims

1. Colloidal particles having a plurality of pendent functional groups on an exterior coating of aminodextran in which each particle comprises a solid metallic core coated with a first gelatin layer of type B, alkali cured gelatin of Bloom in the range 60 to 225 and a second layer of an aminodextran, said layers having been either (a) crosslinked by the action of a chemical crosslinking agent or (b) joined by a condensation reaction between said gelatin and said aminodextran, such that said so layered particles can be stored as predominantly discrete colloidal particles having pendent functional groups.

5,466,610

IMMUNOASSAYS FOR INSULIN SENSITIVITY ENHANCERS, INSULIN SENSITIVITY ENHANCER ANTIBODIES, AND NON-THIAZOLIDINEDIONE INSULIN SENSITIVITY ENHANCER COMPOSITIONS

Stuart W. Bright; Gerald Gold; Scott W. Sage, all of Indianapolis, Ind., and John R. Sportsman, Palo Alto, Calif., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 7, 1993, Ser. No. 117,447
Int. Cl.[6] G01N *33/577;* C07K *16/44*
U.S. Cl. 436—518 7 Claims

1. A method for using antibodies to detect non-thiazolidinedione and thiazolidinedione insulin sensitivity enhancer compounds in a sample, comprising the steps of:

(a) providing a sample containing a non-thiazolidinedione or thiazolidinedione compound suspected to have thiazolidinedione insulin sensitivity enhancer activity;

(b) incubating said sample with a first antibody to a thiazolidinedione insulin sensitivity enhancer and a substrate-bound second antibody conjugate to form a complex of first antibody with said non-thiazolidinedione or thiazolidinedione insulin sensitivity enhancer, said first antibody of said complex bound

to said second antibody of said conjugate, said first antibody having an IC50 of 200 nmol/l or less for thiazolidinedione ISE CS-045, an IC50 of 520 nmol/l or less for thiazolidinedione ISE LY 282449, and an IC50 of 1160 nmol/l or less for ciglitazone, said first antibody being a monoclonal antibody produced by hybridoma cell line 13E3 (ATCC Deposit No. HB 11359);

(c) adding a labeled thiazolidinedione insulin sensitivity enhancer compound conjugate to said sample, said labeled thiazolidinedione insulin sensitivity enhancer conjugate forming a complex with said first antibody which is bound with said second antibody conjugate; and

(d) measuring the amount of labeled thiazolidinedione insulin sensitivity enhancer first antibody complex bound with second antibody conjugate to determine the presence of a non-thiazolidinedione or thiazolidinedione insulin sensitivity enhancer in said sample.

5,466,611

METHOD FOR THE DETERMINATION OF ANTIGENS OR ANTIBODIES IN THE PRESENCE OF AN IMMUNE COMPLEX

Tibor Toth, Marburg, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Germany

Filed Jan. 28, 1993, Ser. No. 10,327

Claims priority, application Germany, Feb. 1, 1992, 42 02 923.6

Int. Cl.[6] G01N *33/546;33/564*

U.S. Cl. 436—534 **20 Claims**

1. A method for the immunochemical detection of an analyte contained in a biological sample by means of a latex agglutination reaction, comprising the steps of

(a) contacting said sample with an immune complex which does not contain antibodies/antigens that are specific for said analyte to eliminate interference by rheumatoid factors;

(b) incubating the mixture obtained in step (a) with at least one specific binding partner of said analyte wherein, said specific binding partner is immobilized on a latex particle; and

(c) detecting the presence or absence of a complex formed between said analyte and said binding partner.

5,466,612

METHOD OF MANUFACTURING A SOLID-STATE IMAGE PICKUP DEVICE

Genshu Fuse, Toyonaka, and Katuya Ishikawa, Kyoto, both of, Japan, assignors to Matsushita Electronics Corp., Osaka, Japan

Continuation of Ser. No. 26,951, Mar. 5, 1993. This application Jun. 24, 1993, Ser. No. 82,626

Claims priority, application Japan, Mar. 11, 1992, 4-52376

Int. Cl.[6] H01L *21/339*

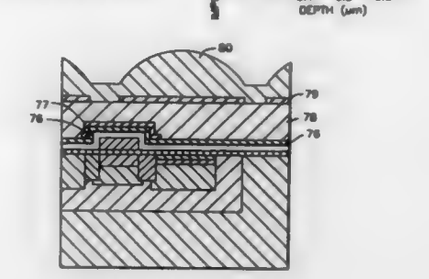
U.S. Cl. 437—3 **2 Claims**

1. A method of manufacturing a semiconductor device comprising:

at least a step of forming a photo diode of one conductive type on a semiconductor substrate,

a step of forming an impurity layer of opposite conductive type of said photo diode on a surface of said photo diode formed on said semiconductor substrate, and

a step of implanting fluorine ions into the impurity layer, wherein said fluorine ions are implanted through a dielectric film formed on said semiconductor substrate, and the fluorine ion implantation is effected at such an acceleration energy that a maximum dose of the fluorine ion implantation appears in said dielectric film while a substantial implant dose of the fluorine ion appears in said impurity layer.



5,466,613

METHOD OF MANUFACTURING A CAMERA DEVICE

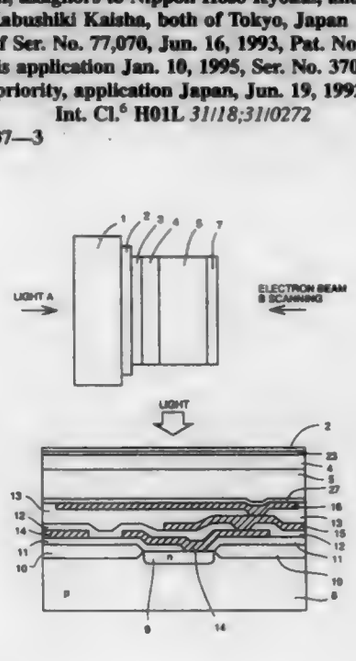
Fumihiko Andoh; Kazunori Miyakawa, both of Tokyo; Hidekazu Yamamoto, and Masao Yamawaki, both of Hyogo, all of, Japan, assignors to Nippon Hoso Kyokai, and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Division of Ser. No. 77,070, Jun. 16, 1993, Pat. No. 5,399,882. This application Jan. 10, 1995, Ser. No. 370,958

Claims priority, application Japan, Jun. 19, 1992, 4-161053

Int. Cl.[6] H01L *31/18;31/0272*

U.S. Cl. 437—3 **2 Claims**



1. A method of manufacturing a camera device, comprising the steps of:

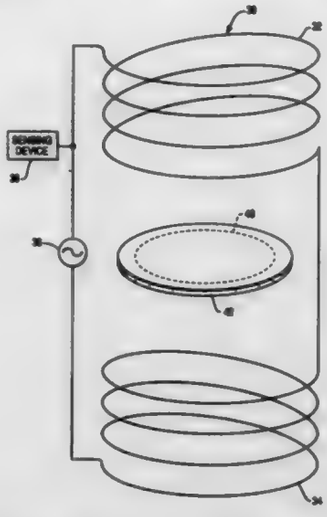
forming a first photoelectric converting layer having first spectral sensitivity characteristics by including selenium on a hole injection stop layer for preventing external injection of holes; and

forming a second photoelectric converting layer having second spectral sensitivity characteristics which are different from those of said first photoelectric converting layer by including a material other than said selenium on said first photoelectric converting layer at a temperature condition of at most 100° C.

5,466,614
STRUCTURE AND METHOD FOR REMOTELY MEASURING PROCESS DATA

James P. Yakura, Colorado Springs; Richard K. Cole, Woodland Park; Matthew S. Von Thun, Colorado Springs; Crystal J. Hass, Colorado Springs, and Derryl D. J. Allman, Colorado Springs, all of Colo., assignors to AT&T Global Information Solutions Company, Dayton, Ohio, and Hyundai Electronics America, Milpitas, Calif.

Filed Sep. 20, 1993, Ser. No. 123,664
Int. Cl.[6] H01L 21/66
U.S. Cl. 437—8 26 Claims



26. Apparatus for sensing process conditions during a process in which a plurality of silicon wafer elements are being fabricated, comprising:

a primary inductor structure having a primary coil, a current source and at least one sensor for measuring electrical values in said inductor structure; and

a silicon wafer monitor element which is similar in material and shape to the silicon wafer elements being fabricated, said monitor element being included in a batch of said silicon wafer elements being fabricated and including a current loop structure which acts as a secondary coil in cooperation with said primary inductor structure, whereby conditions of said primary coil are measured to indicate data concerning the silicon wafer elements being fabricated.

5,466,615
SILICON DAMAGE FREE PROCESS FOR DOUBLE POLY EMITTER AND REVERSE MOS IN BICMOS APPLICATION

Nun-Sian Tsai, Hsinchu, Taiwan, Prov. of China, assignor to Taiwan Semiconductor Manufacturing Company Ltd., Hsinchu, Taiwan, Prov. of China

Filed Aug. 19, 1993, Ser. No. 108,225
Int. Cl.[6] H01L 21/265;21/70
U.S. Cl. 437—31 17 Claims

1. The method of forming self-aligned transistors, each of which has a first element, second element and third element, on a monocrystalline semiconductor substrate, comprising:

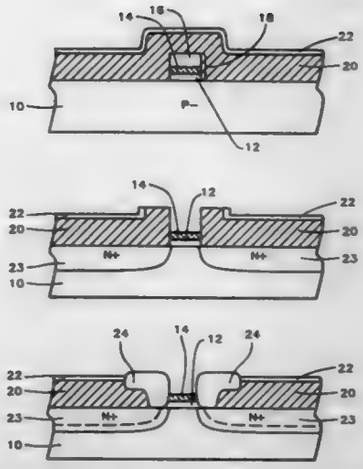
forming a first insulator layer over said monocrystalline semiconductor substrate;

forming a second insulator layer over said first insulator layer;

forming a third insulator layer over said second insulator layer;

patterning said first, second and third insulator layers to form a protective block at location of said first element, whereby said third insulator layer establishes a horizontal plane;

forming a doped conductive layer of one conductivity type, upon said monocrystalline semiconductor substrate which has opposite conductivity type to said one conductivity type, and upon said protective block;



forming a fourth insulator layer on said doped conductive layer;

removing those portions of said doped conductive layer and said fourth insulator layer above said horizontal plane;

removing said third insulator layer from said protective block;

forming said second and third elements in said monocrystalline semiconductor substrate by heating said doped conductive layer, whereby said second and third elements are formed by outdiffusion;

oxidizing said doped conductive layer to form oxide spacers adjacent to said protective block, whereby said fourth insulator layer prevents oxidation of said doped conductive layer in regions beyond where said oxide spacers are formed, and said oxide spacers extend down to said substrate;

removing said protective block;

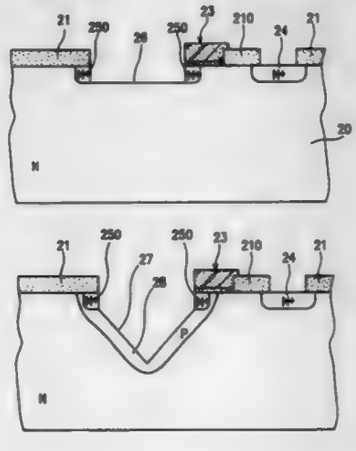
forming and patterning a second conductive layer at the former location of said protective block; and

completing the elements of said transistors and forming electrical contacts to said elements of said self-aligned transistors.

5,466,616
METHOD OF PRODUCING AN LDMOS TRANSISTOR HAVING REDUCED DIMENSIONS, REDUCED LEAKAGE, AND A REDUCED PROPENSITY TO LATCH-UP

Sheng-Hsing Yang, Hsinchu, Taiwan, Prov. of China, assignor to United Microelectronics Corp., Hsinchu, Taiwan, Prov. of China

Filed Apr. 6, 1994, Ser. No. 223,985
Int. Cl.[6] H01L 21/265
U.S. Cl. 437—40 7 Claims



1. A method of forming an LDMOS transistor on a substrate of a first conductivity type, comprises the following steps:

(a) forming field oxide on said substrate to define an active region of said LDMOS transistor and forming a floating region insulator on an floating region of the active region;

(b) forming a gate for said LDMOS transistor at a location near the floating region insulator;

(c) implanting impurities of said first conductivity type into said first conductivity type substrate to form a first region of the first conductivity type and a second region of the first conductivity type, the first region of the first conductivity type forming a drain for said LDMOS transistor;

(d) forming a first trench in the second region of the first conductivity type to define residual portions of second region of the first conductivity type as a source for said LDMOS transistor;

(e) forming a second trench on the first trench, the second trench being formed in a direction from the first trench into the substrate, the second trench having at least two planes;

(f) implanting and diffusing impurities of a second conductivity type into the second trench to form a body region of the second conductivity type, the body region of the second type enclosing the source; and

(g) forming drain and source contacts on said drain and source, respectively.

5,466,617

MANUFACTURING ELECTRONIC DEVICES COMPRISING TFTS AND MIMS

John M. Shannon, Whyteleafe, England, assignor to U.S. Philips Corporation, New York, N.Y.

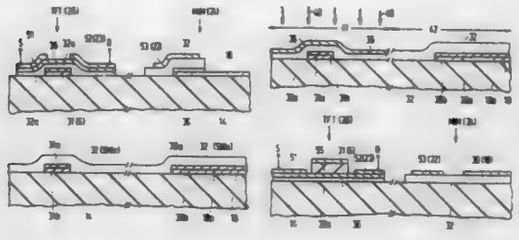
Continuation of Ser. No. 25,546, Mar. 3, 1993, abandoned.

This application Jun. 15, 1994, Ser. No. 260,502

Claims priority, application United Kingdom, Mar. 20, 1992, 9206086

Int. Cl.[6] H01L *21/786*

U.S. Cl. 437—40 **29 Claims**



1. A method of manufacturing an electronic device comprising at least one high mobility semiconductor device which has a body portion of high mobility semiconductive material of crystalline silicon, wherein the high mobility semiconductive crystalline material is formed by depositing a layer on a substrate and annealing at least a part of the layer only, with an energy beam, which method is characterized in that the layer is deposited as a layer of an insulating non-stoichiometric compound material of silicon alloyed with at least one other element, and that at least a part of the layer of the insulating non-stoichiometric material only is converted into the body portion of high mobility semiconductive crystalline material by heating only that part with the energy beam.

5,466,618

METHOD FOR FABRICATING A THIN FILM TRANSISTOR FOR A LIQUID CRYSTAL DISPLAY

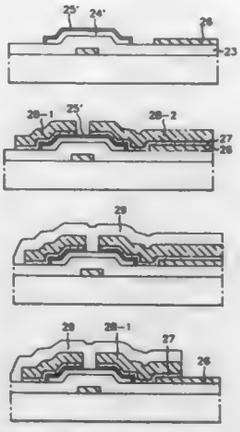
Jin H. Kim, Kyungki, Rep. of Korea, assignor to Goldstar Co., Ltd., Youngdungpo, Rep. of Korea

Filed Dec. 29, 1994, Ser. No. 366,224

Claims priority, application Rep. of Korea, Dec. 29, 1993, 30957/1993

Int. Cl.[6] H01L *21/786*

U.S. Cl. 437—40 **1 Claim**



1. A method for fabricating a thin film transistor for a liquid crystal display, comprising:

forming a gate electrode on a transparent glass substrate;

forming a gate insulation film over the glass substrate;

forming a first semiconductor layer over the gate insulation film;

forming an impurity doped second semiconductor layer over the surface of the first semiconductor layer;

patterning the semiconductor layers so that the semiconductor layer and the impurity doped semiconductor layer are left on a part of the gate insulation film over the gate electrode;

forming a pixel electrode on a part of the gate insulation film offset from the gate electrode;

forming a metal barrier layer and source/drain electrodes over the surface of the glass substrate;

patterning the metal barrier layer and the source/drain electrodes to expose the impurity doped semiconductor layer over the gate electrode while covering the surface of the pixel electrode;

exposing the semiconductor layer under the impurity doped semiconductor layer by selectively etching the exposed impurity doped semiconductor layer with the metal barrier layer and the source/drain electrodes used as masks;

forming a protective insulation layer over the whole surface of the substrate; and,

exposing the pixel electrode by selectively removing the protective insulation layer, the metal barrier layer and the source/drain electrodes over the pixel electrode.

5,466,619

METHOD FOR FABRICATING A THIN FILM TRANSISTOR

Jong M. Choi, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd.

Filed Mar. 9, 1994, Ser. No. 208,647

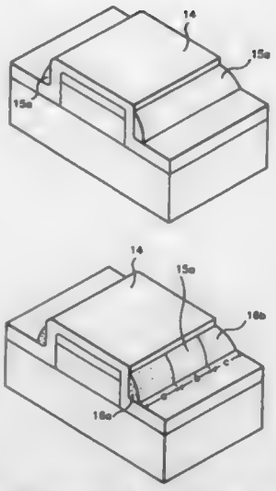
Claims priority, application Rep. of Korea, Feb. 1, 1994, 1994-1813

Int. Cl.[6] H01L *21/266;21/84*

U.S. Cl. 437—41 **14 Claims**

1. A method for fabricating a thin film transistor, comprising the steps of:

forming a gate electrode on a substrate;



successively and conformally depositing a gate insulation layer and a semiconductor layer on the substrate and on the gate electrode;

forming sidewall spacers from the semiconductor layer on portions of the gate insulation layer formed on sidewalls of the gate electrode by an anisotropic dry etching process; and

forming source and drain junctions in the same semiconductor sidewall spacer by implanting ions into the semiconductor sidewall spacers.

5,466,620

METHOD FOR FABRICATING A LIQUID CRYSTAL DISPLAY DEVICE

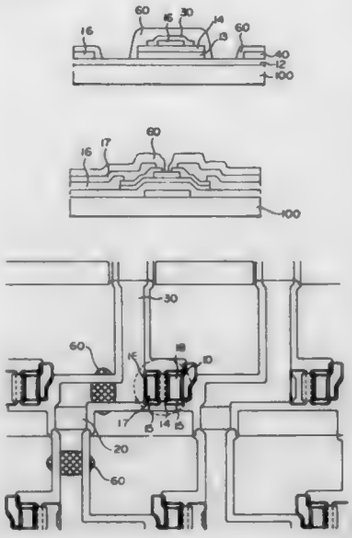
Young U. Bang, Kyungki-do, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea

Filed Dec. 14, 1994, Ser. No. 356,000

Claims priority, application Rep. of Korea, Dec. 14, 1993, 27653/1993

Int. Cl.[6] **H01L** *21/786*

U.S. Cl. 437—51 **4 Claims**



1. A method for fabricating a liquid crystal display device which comprises a substrate; a plurality of thin film transistors formed on the substrate, each of the thin film transistors being including a gate electrode formed on the substrate in a matrix, a gate insulating layer, a semiconductor layer, a channel protecting layer, an ohmic layer and a source/drain electrode; a plurality of pixel electrodes arranged alternately with respect to the thin film transistors; a plurality of gate bus lines commonly connected to the gate electrodes of the thin film transistors arranged in the same row; and a plurality of data bus lines formed in zigzag form between the pixel electrodes and commonly connected to source electrodes of the thin film transistors arranged in the same column; the method including the steps of:

forming the gate bus lines and the gate electrodes on the substrate;

sequentially depositing the gate insulating layer, an amorphous silicon layer and an insulating layer on the substrate, including on the gate electrode;

etching back the insulating layer to form the channel protecting layer on the amorphous silicon layer at a position corresponding to the gate electrode;

forming a conductive amorphous silicon layer on the amorphous silicon layer, including on the channel protecting layer;

sequentially etching the amorphous silicon layers to form the ohmic and semiconductor layers corresponding to the gate electrode;

selectively removing the ohmic layer only on a center portion of the channel protecting layer, using the channel protecting layer as an etch stopper;

forming an ITO film on previously formed layers and patterning the film to form the pixel electrodes and an ITO pattern for redundancy on both side surfaces of the ohmic layer and on the gate insulating layer;

forming a source/drain electrode thereon to form the data bus lines on the ITO pattern;

depositing a photoresist layer on the previously formed layers;

etching the photoresist layer to remove a photoresist portion formed between the data bus line and the pixel electrodes arranged in columns adjacent to each other, a photoresist portion formed between the source and drain electrodes of the thin film transistor, a photoresist portion formed between the pixel electrode and the data bus line arranged in the same row, a photoresist portion formed between the pixel electrode and the gate bus line arranged the same row, and a photoresist portion formed between the thin film transistor arranged in rows adjacent to each other and the pixel electrode;

repairing short-circuited portions of the removed photoresist portions;

removing the photoresist layer; and

forming a protecting layer on the previously formed layers.

5,466,621

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING SILICON ISLANDS

Dai Hisamoto, Kokubunji; Toru Kaga, Urawa; Shinichiro Kimura, Hachioji; Masahiro Moniwa, Hannou; Haruhiko Tanaka, Kokubunji; Atsushi Hiraiwa, Kodaira, and Eiji Takeda, Koganei, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 845,063, Mar. 3, 1992, Pat. No. 5,346,834, which is a division of Ser. No. 742,196, Aug. 5, 1991, Pat. No. 5,115,289, which is a continuation of Ser. No. 438,016, Nov. 20, 1989, abandoned. This application Oct. 25, 1993, Ser. No. 141,027

Claims priority, application Japan, Nov. 21, 1988, 63-292499; Feb. 28, 1989, 1-45403

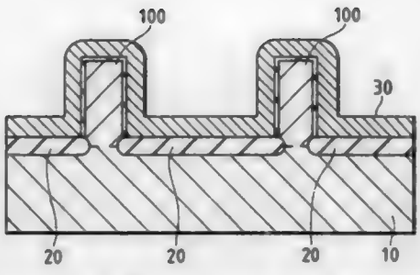
Int. Cl.[6] **H01L** *21/70;27/00*

U.S. Cl. 437—52 **20 Claims**

16. A method of manufacturing a semiconductor device, comprising the steps of:

(a) providing a silicon substrate having projections of silicon extending from a surface thereof, a remaining portion of the silicon substrate not having the projections extending from the surface thereof, the projections respectively forming silicon islands;

(b) after step (a), forming a silicon oxide film between the silicon islands, on the remaining portion of the silicon substrate, the silicon oxide film extending beneath the silicon islands;



(c) forming gate electrodes on said silicon islands, said gate electrodes being formed on upper and side surfaces of the silicon islands, the gate electrodes being gate electrodes of transistors; and

(d) forming impurity-doped semiconductor regions of the semiconductor device in the silicon islands by employing said gate electrodes as masks, the semiconductor regions being regions of semiconductor elements of the semiconductor device.

5,466,622

PROCESS FOR FABRICATING INTEGRATED DEVICES INCLUDING NONVOLATILE MEMORIES AND TRANSISTORS WITH TUNNEL OXIDE PROTECTION

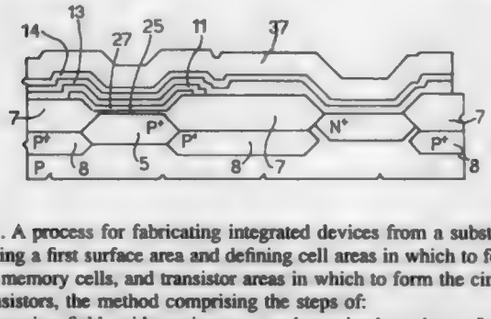
Paolo G. Cappelletti, Seveso, Italy, assignor to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

Filed Feb. 15, 1994, Ser. No. 196,634

Claims priority, application European Pat. Off., Feb. 17, 1993, 93830057

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—52 **14 Claims**



1. A process for fabricating integrated devices from a substrate having a first surface area and defining cell areas in which to form the memory cells, and transistor areas in which to form the circuit transistors, the method comprising the steps of:

growing field oxide regions on predetermined portions of said first surface area of said substrate;

masking said substrate in the diode areas in which the diodes are to be formed;

forming channel regions in said cell areas after said step of masking said substrate;

forming a gate oxide layer on said first surface area of said substrate, in said transistor areas after said step of forming channel regions;

forming a tunnel oxide layer on said first surface area of said substrate, in cell areas after said step of forming channel regions;

depositing a first polycrystalline silicon layer over the tunnel oxide layer and the gate oxide layer;

selectively removing portions of said first polycrystalline silicon layer about said cell areas;

depositing a layer of dielectric material over the first polycrystalline silicon layer

removing said layer of dielectric material from said transistor areas;

depositing a second polycrystalline silicon layer over the layer of dielectric material remaining in said cell areas;

masking and selectively removing said second polycrystalline silicon layer and said underlying dielectric layer at the sides of said cell areas, and said second and first polycrystalline silicon layers and said gate oxide layer about said transistor areas for shaping the control gate regions of said cells and the gate regions of said circuit transistors;

using a same mask for selectively removing said first polycrystalline silicon layer and said tunnel oxide layer about said cell areas for shaping the floating gate regions of the memory cells; and

prior to said step for masking and selectively removing said second polycrystalline silicon layer and said dielectric layer, forming diodes in the substrate connecting said second polycrystalline silicon layer to said substrate.

5,466,623

METHOD OF MAKING SEMICONDUCTOR INTEGRATED CIRCUIT HAVING ISOLATION OXIDE REGIONS WITH DIFFERENT THICKNESS

Masahiro Shimizu, and Katsuhiro Tsukamoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 75,912, Jun. 14, 1993, abandoned, which is a continuation of Ser. No. 747,591, Aug. 20, 1991, abandoned, which is a division of Ser. No. 213,497, Jun. 30, 1988, Pat. No. 5,061,654. This application Aug. 29, 1994, Ser. No. 296,940

Claims priority, application Japan, Jul. 1, 1987, 62-164428; Sep. 8, 1987, 62-225023

Int. Cl.[6] H01L *21/8239*

U.S. Cl. 437—52 **9 Claims**

1. A method of manufacturing a semiconductor memory device having a plurality of devices on a main surface of a semiconductor substrate, said substrate having an impurity concentration of a selected conductivity type and having a first function region operative at a first voltage level and a second function region operative at a voltage level lower than said first voltage level, comprising the steps of:

forming an oxide layer on said first function region and said second function region;

forming a first mask layer on said oxide layer on said first function region and said second function region;

removing portions of said mask layer on said first function region and said second function region, and forming inversion preventing layers on said main surface at the removed mask layer portions;

forming isolation oxide layers at said substrate main surface for isolation between devices adjacent said inversion preventing layers;

removing said first mask layer on said first function region and on said second function region;

forming a second mask layer on said first function region; and

removing said oxide layer and portions of said isolation oxide layers on said second function region;

whereby the thickness of said isolation oxide layers formed on said first function region is thicker than the thickness of said isolation oxide layer formed on said second function region;

introducing a first impurity through said isolation oxide layers of the second function region into said inversion preventing layers to increase impurity concentration of said inversion preventing layers of the second function region;

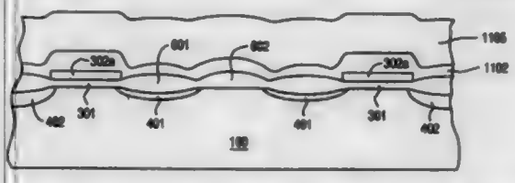
and an additional step of introducing second impurity from above said isolation oxide layers of the second function region into said substrate.

5,466,624

ISOLATION BETWEEN DIFFUSION LINES IN A MEMORY ARRAY

Tong-Chern Ong, and Daniel N. Tang, both of San Jose, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 30, 1994, Ser. No. 315,876
Int. Cl.[6] H01L 21/8247
U.S. Cl. 437—52 20 Claims



1. A method of forming a memory device comprising the steps of:

forming substantially parallel spaced apart first strips on a semiconductor substrate;

forming first oxide regions between said first strips;

forming substantially parallel spaced apart second strips on said substrate, said second strips oriented substantially perpendicular to said first strips, said second strips comprising a first conductive layer and a first masking layer; and,

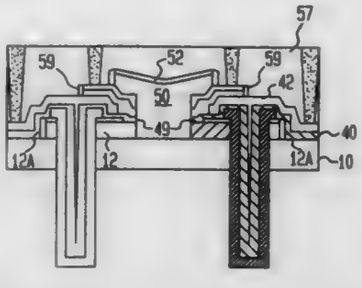
forming electrical isolation between adjacent diffusion lines by oxidizing said conductive layer of a first set of said second strips comprising at least two of said second strips, said first set separated by a second set of said second strips comprising at least two of said second strips.

5,466,625

METHOD OF MAKING A HIGH-DENSITY DRAM STRUCTURE ON SOI

Chung-Ming Hsieh; Louis L. C. Hsu, both of Fishkill, and Seiki Ogura, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 900,041, Jun. 17, 1992. This application Nov. 22, 1994, Ser. No. 346,207
Int. Cl.[6] H01L 21/8242
U.S. Cl. 437—52 3 Claims



3. A method of forming an integrated circuit cell for dynamic random access memories, comprising the steps of:

patterning a silicon source layer on a silicon-on-oxide wafer comprised of an oxide layer on the upper surface of an underlying support wafer;

etching a capacitor trench that extends through said patterned silicon source layer and said oxide layer and into said underlying support wafer;

conformally depositing a first capacitor plate layer on the wall of said capacitor trench, said first capacitor plate layer extending to and connected with said silicon source layer;

forming a capacitor dielectric layer on said first capacitor plate layer;

conformally forming an silicon channel layer over said capacitor dielectric layer and overlying a region of said silicon source layer, said silicon channel layer forming a second capacitor plate and a channel layer;

depositing a polysilicon drain layer overlying said silicon channel layer in said region where said silicon channel layer overlays said silicon source layer;

etching a vertical opening extending through silicon source layer, said silicon channel layer, and said polysilicon drain layer, said vertical opening forming a wall surface in the region where the layers overlay one another with an edge in each layer respectively aligned vertically along said wall surface;

forming a gate dielectric covering said wall surface; and

forming a vertical gate in said opening in contact with said gate dielectric.

5,466,626

MICRO MASK COMPRISING AGGLOMERATED MATERIAL

Michael Armacost, Wallkill, N.Y.; A. Richard Baker, Jr., Burlington; Wayne S. Berry, Essex Junction, both of Vt.; Daniel A. Carl, Poughkeepsie, N.Y.; Donald M. Kenney, Shelburne, Vt., and Thomas J. Licata, Lagrangeville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1993, Ser. No. 168,703
Int. Cl.[6] H01L 21/8242
U.S. Cl. 437—60 16 Claims

1. A method of forming recesses in a substrate, said method comprising the steps of:

selecting a substrate having a surface thereof;

sputter depositing a pattern of agglomerated material, which comprises a compound conductor, on said surface of said substrate; and

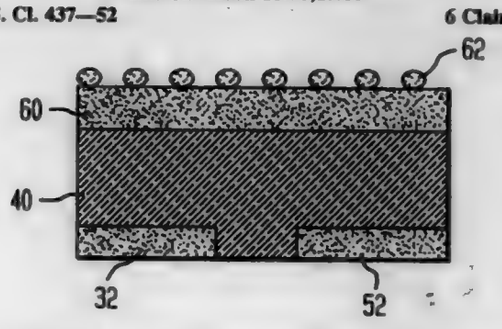
selectively etching said substrate using said agglomerated material as a mask so as to form recesses in said substrate.

5,466,627

STACKED CAPACITOR PROCESS USING BPSG PRECIPITATES

Water Lur, Taipei; Jenn-Tarng Lin, Wann Hwa Area, and Hsiaw-Sheng Chin, Bann-Chyau, all of, Taiwan, Prov. of China, assignors to United Microelectronics Corporation, Hsin-Chu, Taiwan, Prov. of China

Filed Mar. 18, 1994, Ser. No. 214,608
Int. Cl.[6] H01L 21/70;27/00
U.S. Cl. 437—52 6 Claims



1. A method for making a capacitor for use in a DRAM cell comprising the steps of

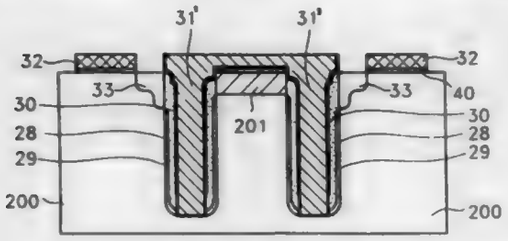
a) forming a conductive polysilicon layer on a silicon substrate,
b) forming a glass layer on the polysilicon layer containing a precipitable material,
c) treating the glass layer so that said precipitable material is precipitated out of the glass layer to form precipitates thereon,
d) using the precipitates as a mask, etching the glass layer to form glass islands,
e) using the glass islands as a mask, etching the polysilicon layer to from a plurality of pillars,
f) depositing a dielectric layer on the etched polysilicon layer, and
g) depositing a second polysilicon layer on the dielectric layer.

5,466,628

METHOD OF MANUFACTURING TRENCH CAPACITOR WITH A RECESSED FIELD OXIDE LAYER

Joo-young Lee, Kwacheon, and Kyu-pil Lee, Suwon, both of, Rep. of Korea, assignors to Samsung Electronics Co, Ltd., Suwon, Rep. of Korea

Division of Ser. No. 33,721, Mar. 18, 1993, abandoned. This application Jul. 11, 1994, Ser. No. 272,528
Claims priority, application Rep. of Korea, Mar. 19, 1992, 92-4560
Int. Cl.[6] H01L *21/8242*
U.S. Cl. 437—60 **29 Claims**



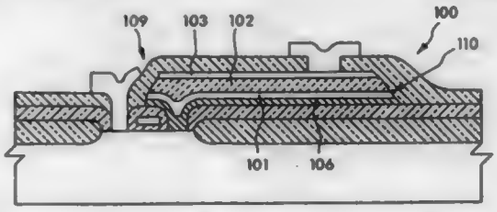
1. A method for manufacturing a trench capacitor in a semiconductor device, comprising the steps of:
forming a recessed field oxide layer in a surface region of a semiconductor substrate;
forming a first insulating layer on a major surface of said semiconductor substrate and an upper surface of said recessed field oxide layer;
forming an opening in said first insulating layer to expose said upper surface of said recessed field oxide layer, wherein there exists a height difference between an upper surface of said first insulating layer and said upper surface of said recessed field oxide layer;
forming a second insulating layer on said first insulating layer and said upper surface of said recessed field oxide layer;
forming a trench in said semiconductor substrate by selectively removing a portion of said second insulating layer disposed above a first portion of said recessed field oxide layer and on a marginal edge portion of said second insulating layer adjacent to said recessed field oxide layer, and underlying portions of said first insulating layer, said recessed field oxide layer, and said semiconductor substrate, said trench being adjacent to a remaining, second portion of said recessed field oxide layer and having a first depth;
removing remaining portions of said second insulating layer, to thereby expose an upper surface of said second portion of said recessed field oxide layer;
forming a spacer on an outer sidewall of said trench spaced-apart from said second portion of said recessed field oxide layer;
removing a portion of said semiconductor substrate beneath a bottom surface of said trench, to thereby extend said trench to a second depth greater than said first depth;
forming a leakage current prevention layer on exposed portions of sidewalls and said bottom surface of said trench;
removing said spacer, to thereby expose a contact window portion of said trench;
forming a first conductive layer on said leakage current prevention layer and said exposed contact window portion of said trench;
forming a dielectric film on said first conductive layer, said exposed upper surface of said second portion of said recessed field oxide layer, and said first insulating layer;
forming a second conductive layer on said dielectric film, to completely fill said trench;
removing portions of said second conductive layer and said dielectric film disposed on underlying portions of said first insulating layer, wherein a remaining portion of said second conductive layer disposed above said trench has an exposed surface which is planar, due to said height difference; and,
removing said underlying portions of said first insulating layer, to thereby complete the formation of a trench capacitor including said first conductive layer as a first electrode, said dielectric film, and said second conductive layer as a second electrode.

5,466,629

PROCESS FOR FABRICATING FERROELECTRIC INTEGRATED CIRCUIT

Takashi Mihara, Iruma; Hiroyuki Yoshimori, Fujino; Hitoshi Watanabe, Tokyo, all of, Japan; Larry D. McMillan, and Carlos P. De Araujo, both of Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo., and Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 276,474, Jul. 18, 1994, which is a division of Ser. No. 919,186, Jul. 23, 1992, abandoned. This application Feb. 3, 1995, Ser. No. 383,575
Int. Cl.[6] H01L *21/70;27/00*
U.S. Cl. 437—60 **6 Claims**



1. A method of fabricating an integrated circuit comprising:
providing a semiconducting wafer including a semiconducting substrate;
forming a bottom capacitor electrode, a ferroelectric layer, and a top capacitor electrode without intervening photo-mask steps;
patterning said ferroelectric capacitor circuit to provide an edge having an outer bottom capacitor electrode portion, an outer ferroelectric layer portion, and a top capacitor electrode portion, said bottom capacitor electrode portion extending outwardly beyond said top capacitor electrode portion for a sufficient distance to place said bottom electrode portion within an angle drawn from a point on said top capacitor electrode portion, said angle ranging from 30° to 70° relative to a perpendicular line taken from one of said electrodes.

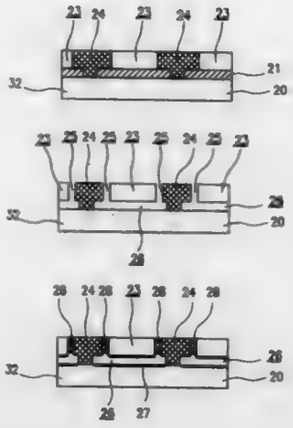
5,466,630

SILICON-ON-INSULATOR TECHNIQUE WITH BURIED GAP

Water Lur, Taipei, Taiwan, Prov. of China, assignor to United Microelectronics Corp., Hsinchu, Taiwan, Prov. of China

Division of Ser. No. 215,228, Mar. 21, 1994. This application Aug. 5, 1994, Ser. No. 286,341
Int. Cl.[6] H01L *21/76*
U.S. Cl. 437—62 **17 Claims**

1. A method of forming an isolated structure on a semiconductor substrate, which method comprises the steps of:
(a) forming a buried layer in said substrate to divide said substrate into a surface portion and a bottom portion;



(b) forming a plurality of supporting pillars at positions in the surface portion and buried layer to support the surface portion on the bottom portion, the supporting pillars being formed of an insulating material which is different insulating material forming the buried layer; and

(c) removing the remaining buried layer.

5,466,631

METHOD FOR PRODUCING SEMICONDUCTOR ARTICLES

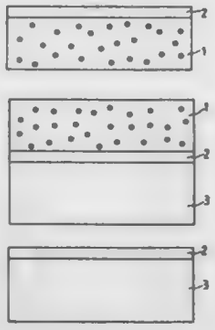
Takeshi Ichikawa, Zama; Takao Yonehara; Masaru Sakamoto, both of Atsugi; Yasuhiro Naruse, Aiko; Jun Nakayama, Atsugi; Kenji Yamagata, Kawasaki, and Kiyofumi Sakaguchi, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 959,105, Oct. 9, 1992, abandoned. This application Feb. 23, 1995, Ser. No. 392,685

Claims priority, application Japan, Jan. 11, 1991, 3-292255; Jan. 11, 1991, 3-292256; Nov. 25, 1991, 3-334574; Jan. 28, 1992, 4-035732; Jan. 31, 1992, 4-041951; Jan. 31, 1992, 4-046301

Int. Cl.[6] H01L *21/76*

U.S. Cl. 437—62 **52 Claims**



1. A method for producing a semiconductor article, comprising, in sequence, the steps of:

(i) preparing a first substrate having a non-porous semiconductor layer on a porous semiconductor region;

(ii) forming unevenness on the surface at the side of said semiconductor layer of said first substrate;

(iii) bonding the surface of said first substrate having said unevenness formed thereon to the surface of a second substrate so as to be in contact with each other; and

(iv) removing said porous semiconductor such that said semiconductor layer is bonded to said second substrate to thereby transfer said semiconductor layer from said first substrate onto said second substrate.

5,466,632

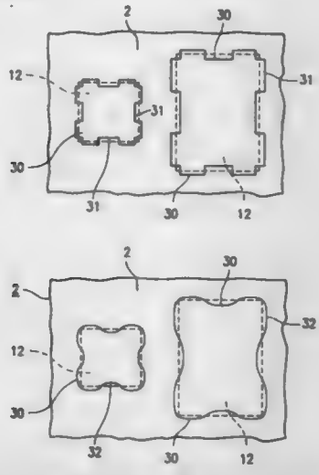
FIELD OXIDE WITH CURVILINEAR BOUNDARIES AND METHOD OF PRODUCING THE SAME

Water Lur, Taipei, and Jiun Y. Wu, Yun-Lin Hsien, both of, Taiwan, Prov. of China, assignors to United Microelectronics Corp., Hsinchu City, Taiwan, Prov. of China

Filed May 26, 1994, Ser. No. 249,632

Int. Cl.[6] H01L *21/76*

U.S. Cl. 437—69 **5 Claims**



1. A method of forming a curvilinear field oxide between two active regions on a substrate, which method comprises the following steps:

(a) forming shields with uneven boundaries on said active regions, said uneven boundaries being patterned along an entire periphery of each of said two active regions; and

(b) oxidizing said substrate.

5,466,633

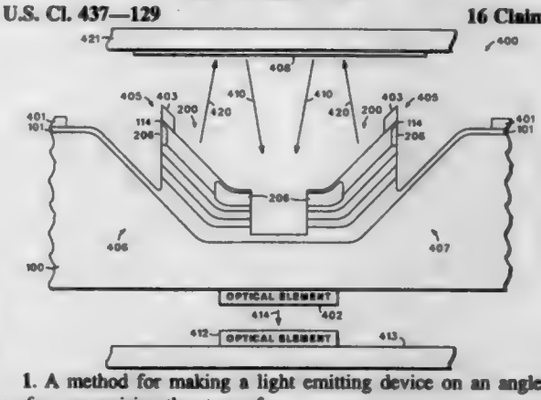
OPTICAL READING HEAD AND METHOD FOR MAKING SAME

Donald E. Ackley, Lambertville, N.J.; Michael S. Lebby, Apache Junction, and Gary F. Witting, Scottsdale, both of Ariz., assignors to Motorola, Schaumburg, Ill.

Division of Ser. No. 12,488, Feb. 2, 1993, Pat. No. 5,349,210. This application Apr. 25, 1994, Ser. No. 232,972

Int. Cl.[6] H01L *21/20*

U.S. Cl. 437—129 **16 Claims**



1. A method for making a light emitting device on an angled surface comprising the steps of:

providing a substrate having at least a first surface and a second surface, wherein the first surface and the second surface are joined, and wherein the first surface is positioned in a normal plane and the second surface is positioned at an angle from the first surface;

forming a plurality of layers having an upper portion, a middle portion, and a lower portion that are optically active on the first and the second surfaces of the substrate, thereby forming

a third surface and a fourth surface that correspond to the first and the second surfaces of the substrate, respectively;

masking portions of the fourth surface of the plurality of layers, thereby exposing portions of the plurality of layers while other portions of the fourth surface of the plurality of layers are unexposed;

implanting ions into the exposed portions of the plurality of layers, thereby generating impurity regions that optically deactivate the exposed portions of the plurality of layers;

removing the masking portions from the plurality of layers, thereby exposing the third and forth surfaces of the plurality of layers;

forming a first ohmic contact to the upper portion of the fourth surface of the plurality of layers; and

forming a second ohmic contact to the lower portion of the plurality of layers, thereby generating a light emitting device.

5,466,634

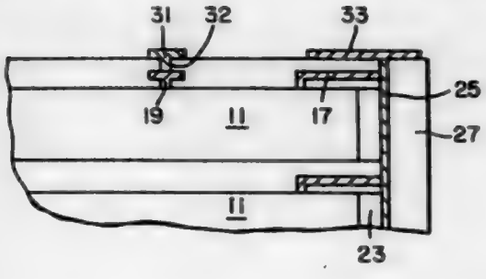
ELECTRONIC MODULES WITH INTERCONNECTED SURFACE METALLIZATION LAYERS AND FABRICATION METHODS THEREFORE

Kenneth E. Beilstein, Jr., Essex Junction; Claude L. Bertin, So. Burlington; John E. Cronin, Milton; Wayne J. Howell, Williston; James M. Leas, So. Burlington, all of Vt., and Robert B. Phillips, Staatsburg, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1994, Ser. No. 359,982

Int. Cl.[6] H01L *21/44*

U.S. Cl. 437—180 **32 Claims**



1. A method for forming an electronic module comprising the steps of:

(a) providing a stack comprising a plurality of stacked integrated circuit ("IC") chips, each IC chip having an edge surface, said edge surfaces at least partially defining a first surface of said stack;

(b) forming a first thin-film metallization layer on said first surface of said stack;

(c) forming a first insulating layer on said first thin-film metallization layer; and

(d) forming a second thin-film metallization layer above a second surface of said stack, said second surface being perpendicular to said first surface of said stack, wherein said first thin-film metallization layer extends to said second surface of said stack and said second thin-film metallization layer extends beyond said first surface of said stack so as to electrically connect to said first thin-film metallization layer.

5,466,635

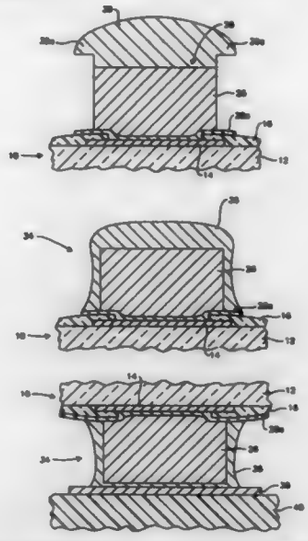
PROCESS FOR MAKING AN INTERCONNECT BUMP FOR FLIP-CHIP INTEGRATED CIRCUIT INCLUDING INTEGRAL STANDOFF AND HOURGLASS SHAPED SOLDER COATING

Brian Lynch, Milpitas, and Patrick O'Brien, Palo Alto, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Jun. 2, 1994, Ser. No. 252,691

Int. Cl.[6] H01L *21/283;21/441*

U.S. Cl. 437—183 **7 Claims**



1. A method of fabricating an interconnect bump on a substrate structure, comprising the steps of:

(a) forming a standoff on the substrate structure;

forming a cap on the standoff having a peripheral portion that extends laterally external of the standoff, the cap having a lower melting point than the standoff:

(c) applying heat that is sufficient to cause the cad to melt over and coat the standoff and insufficient to cause the standoff to melt; and

(d) prior to step (c), forming a base under the standoff having a peripheral portion that extends laterally external of the standoff, the base being wetted by the cap in step (c);

in which step (d) comprises the substeps of:

(e) forming a base layer on the substrate structure;

(f) forming a photoresist section on a portion of said base layer corresponding to said peripheral portion of the base using said peripheral portion of the cap as a self-aligned mask;

(g) removing said base layer except under said photoresist section to form the base; and

(h) removing said photoresist section.

5,466,636

METHOD OF FORMING BORDERLESS CONTACTS USING A REMOVABLE MANDREL

John E. Cronin, Milton; Carter W. Kaanta, Colchester; Donald M. Kenney, Shelburne; Michael L. Kerbaugh, Jericho; Howard S. Landis, Underhill; Brian J. Machesney, Burlington, all of Vt.; Paul Parries, Wappingers Falls, N.Y.; Rosemary A. Previti-Kelly, Richmond, Vt., and John F. Rembetski, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 17, 1992, Ser. No. 946,993

Int. Cl.[6] H01L *21/44*

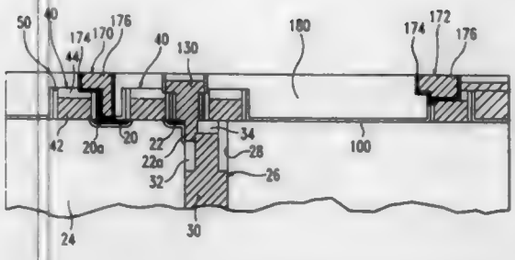
U.S. Cl. 437—187 **24 Claims**

1. A semiconductor fabrication process comprising the steps of:

(a) forming a mandrel on a surface;

(b) removing a first portion of said mandrel to form a first opening;

(c) depositing a conductive material in said first opening;



(d) removing a second portion of said mandrel to form a second opening; and

(e) removing said mandrel and replacing it with a solid dielectric material.

5,466,637

METHOD OF MAKING A SELF-ALIGNED CONTACT IN SEMICONDUCTOR DEVICE

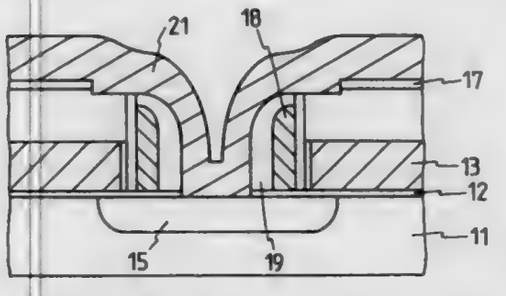
Jae K. Kim, Kyoungki, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki, Rep. of Korea

Filed Sep. 8, 1993, Ser. No. 118,458

Claims priority, application Rep. of Korea, Sep. 9, 1992, 92-16544

Int. Cl.[6] H01L *21/283*

U.S. Cl. 437—187 **6 Claims**



1. A method of making a self-aligned contact in a semiconductor device comprising the steps of:

a) forming sequentially a first dielectric layer, a second conductive line, and a second dielectric layer on a semiconductor substrate;

b) forming a contact hole by successively removing the second dielectric layer, the second conductive line and the first dielectric layer from above a region of the semiconductor substrate, thereby exposing the semiconductor substrate, said contact hole thereby having an inner wall surface that includes a sidewall of the second conductive line and a sidewall of the second dielectric layer;

c) forming a first conductive line by depositing impurities into the exposed semiconductor substrate;

d) forming an oxide layer at the side wall of the second conductive line within said contact hole and on the first conductive line;

e) forming a nitride layer on the surface of the oxide layer and the second dielectric layer, the nitride layer thereby having a nitride wall portion within said contact hole, said nitride wall portion On the oxide layer at the sidewall of the second conductive line and on the sidewall of the second dielectric layer;

f) forming a silicon spacer on the nitride wall portion;

g) forming a thermal oxide by thermally oxidizing said silicon spacer to a desired thickness;

h) exposing the first conductive line by removing said nitride layer, oxide layer, and a portion of the thermal oxide layer which are exposed to the inside of the contact hole, and also by removing said nitride layer and the second dielectric layer outside of the contact hole an appropriate thickness, while leaving a substantial thickness of the second dielectric layer and of the thermal oxide formed on the surface of the silicon spacer; and

i) forming a third conductive line contacted with the exposed first conductive line.

5,466,638

METHOD OF MANUFACTURING A METAL INTERCONNECT WITH HIGH RESISTANCE TO ELECTROMIGRATION

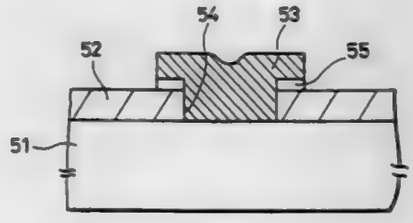
Koji Eguchi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 936,060, Aug. 28, 1992, Pat. No. 5,373,192, which is a continuation of Ser. No. 708,037, May 31, 1991, abandoned. This application Aug. 16, 1994, Ser. No. 292,542

Claims priority, application Japan, Jun. 26, 1990, 2-167282

Int. Cl.[6] H01L *21/283;21/324*

U.S. Cl. 437—193 **6 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

providing a conductive layer;

depositing an insulating film on a surface of the conductive layer;

forming a silicon layer comprising one of polysilicon or amorphous silicon on a surface of the insulating film;

forming a contact hole at a selected position through both said silicon layer and said insulating layer so as to expose a portion of the surface of said conductive layer;

forming a conductive metal interconnection layer on a surface of said silicon layer including an internal surface of said contact hole, said conductive metal interconnection layer and said silicon layer each being formed according to a pattern; and

applying a thermal treatment for forming said silicon layer to be in one of a single crystal form or a polycrystalline form having a grain size of at least 10 μm after the step of forming said silicon layer and before the step of forming said conductive metal interconnection layer.

5,466,639

DOUBLE MASK PROCESS FOR FORMING TRENCHES AND CONTACTS DURING THE FORMATION OF A SEMICONDUCTOR MEMORY DEVICE

Philip J. Ireland, Nampa, Id., assignor to Micron Semiconductor, Inc., Boise, Id.

Filed Oct. 6, 1994, Ser. No. 319,217

Int. Cl.[6] H01L *21/44;21/48*

U.S. Cl. 437—195 **20 Claims**

1. A method for forming contact to a semiconductor device feature comprising the following steps:

a) forming a first dielectric layer over a feature to be contacted;

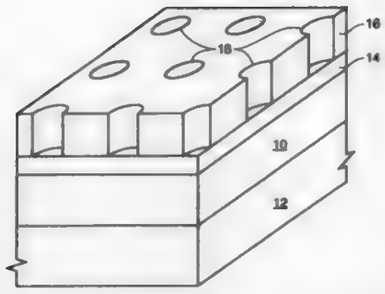
b) forming a mask over said first dielectric layer;

c) forming a first patterned resist layer on said mask;

d) patterning said mask using said first resist layer as a pattern;

e) removing said first resist layer; then

f) forming a second dielectric layer over said mask;



g) forming a second patterned resist layer over said second dielectric layer;

h) etching said second dielectric layer using said second resist layer as a pattern; then

i) etching said first dielectric layer using said mask as a pattern.

5,466,640

METHOD FOR FORMING A METAL WIRE OF A SEMICONDUCTOR DEVICE

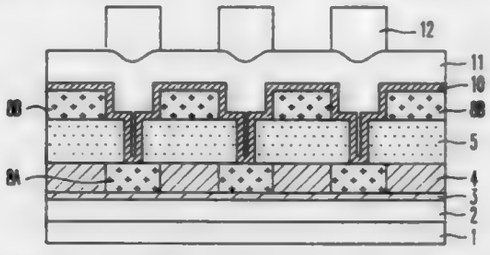
Yang K. Choi, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Feb. 15, 1995, Ser. No. 388,685

Claims priority, application Rep. of Korea, Feb. 15, 1994, 94-2578

Int. Cl.[6] H01L *21/3205*

U.S. Cl. 437—195 **12 Claims**



1. A method for forming a metal wire of a semiconductor device, comprising the steps of;

forming a first insulation film which electrically insulates elements on a wafer, and forming an etching barrier layer on said first insulation film;

sequentially forming second and third insulation films having different wet etching selection ratios on said etching barrier layer;

coating a negative photoresist film on said third insulation film, and opening the portions of said negative photoresist film corresponding to the portions, where lower metal wires are to be formed, by the lithography process utilizing a first photomask in which Chrome patterns are formed to correspond to portions where said lower metal wires are to be formed;

forming a plurality of trenches by sequentially etching said third and second insulation films until said etching barrier layer is exposed by an anisotropic etching process utilizing said negative photoresist film having opened portions;

removing said negative photoresist film, and forming undercuts in said trenches by selectively horizontally etching said second insulation film consisting inner walls of said plurality of trenches to a predetermined depth with reference to said etching stop layer and said third insulation film;

depositing conductor on said third insulation film including said trenches in which said undercuts are formed;

coating a positive photoresist film on said conductor, and leaving the portions of said positive photoresist film corresponding to the portions, where upper metal wires are to be formed, in the form of patterns by the lithography process utilizing a second photomask in which Chrome patterns are formed to correspond to portions where said upper metal wires are to be formed; and

forming said upper metal wires on said third insulation film and said lower metal wires of said metal wire on the portions of said undercut of said trenches by over etching said conductors up to the upper part of the undercut of said trenches by the anisotropic etching process utilizing the patterned positive photoresist film, whereby said metal wires are alternately formed on different levels having the third insulation film between said metal wires.

5,466,641

PROCESS FOR FORMING POLYCRYSTALLINE SILICON FILM

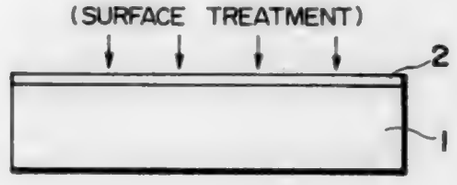
Tetushi Shimizu, Utsunomiya; Munetaka Koda, Chiba; Yoshikatsu Shida, Chiba; Jun-ichi Kawaguchi, Chiba, and Yoshio Kaneko, Chiba, all of, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Jun. 14, 1993, Ser. No. 79,123

Claims priority, application Japan, Jun. 15, 1992, 4-155442; Jan. 29, 1993, 5-013743

Int. Cl.[6] H01L *21/469*

U.S. Cl. 437—233 **23 Claims**



1. A process performing a polycrystalline silicon film comprising:

surface-treating a surface of a silicon oxide film as a substrate to increase the amount of OH-groups on the surface of the silicon oxide film;

subsequently depositing an amorphous silicon film on the surface of the silicon oxide film; and

annealing the amorphous silicon film to form a polycrystalline silicon film.

5,466,642

WEAR RESISTANT CUBIC-BORON-NITRIDE-BASED CUTTING TOOL

Itsurou Tajima, Urawa, and Fumihiro Ueda, Omiya, both of, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Mar. 31, 1994, Ser. No. 221,160

Claims priority, application Japan, Apr. 1, 1993, 5-098856

Int. Cl.[6] C04B *35/5831*

U.S. Cl. 501—96 **8 Claims**

1. A wear-resistant cutting tool made of a cubic-boron-nitride-based material (C-BN-based) comprising, in weight percent:

from about 10 to about 40 percent of at least one of a carbide, nitride, and carbon nitride of Ti;

from about 5 to about 25 percent of a compound including at least one of Ti and Al;

from about 0.5 to about 2 percent of tungsten carbide;

from about 2 to about 10 percent of Al_2O_3; and

a balance being C-BN and incidental impurities.

5,466,643

HIGH ZIRCONIA FUSED CAST REFRACTORIES

Toshihiro Ishino; Otojiro Kida, and Yoshihisa Beppu, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Feb. 1, 1994, Ser. No. 189,735
Claims priority, application Japan, Feb. 3, 1993, 5-039424
Int. Cl.[6] C04B *35/48;35/484*
U.S. Cl. 501—105 **9 Claims**

1. High zirconia fused cast for refractories comprising, in weight %, 85 through 91% of ZrO_2, 7.0 through 11.2% of SiO_2, 1.1 through 3.0% of Al_2O_3, 0.05 through 1.0% of P_2O_5, 0.05 through 1.0% of B_2O_3 and 0.01 through 0.12% of a summed amount of K_2O and Na_2O, wherein the weight % of K_2O is not smaller than the weight % of Na_2O;

wherein said high zirconia fused cast refractories have a volume increase smaller than 10% after 40 thermal cycles between 800° C. and 1250° C.

5,466,644

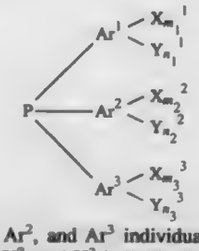
REACTIVATION OF WATER-SOLUBLE HYDROFORMYLATION CATALYSTS

Werner Konkol, Oberhausen; Helmut Bahrmann, Hamminkeln; Wolfgang A. Herrmann, Giggenhausen, and Christian Kohlpaintner, Stephanskirchen, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 174,607, Dec. 28, 1993, abandoned, which is a continuation of Ser. No. 960,899, Oct. 14, 1992, abandoned. This application Jan. 19, 1995, Ser. No. 378,861
Claims priority, application Germany, Jan. 24, 1991, 41 35 050.2
Int. Cl.[6] B01J *38/62*
U.S. Cl. 502—28 **10 Claims**

1. A process for regenerating a water-soluble hydroformylation catalyst system in a hydroformylation reaction system, said reaction system comprising an aqueous phase, containing said catalyst system, and an organic phase, containing an olefin,

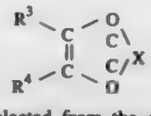
said catalyst system comprising a rhodium, hydrogen-carbonyl complex of rhodium and compounds of Formula I



I

wherein Ar^1, Ar^2, and Ar^3 individually represent phenyl or naphthyl, Y^1, Y^2, and Y^3 individually represent a substituent selected from the group consisting of alkyl and alkoxy of 1 to 4 carbon atoms, halogen, —OH, —CN, —NO_2 and R^1R^2N—, in which R^1 and R^2 individually represent alkyl of 1 to 4 carbon atoms X^1, X^2, and X^3 individually represent carboxylate (—COO^-) or sulfonate (—SO_3^-), m_1, m_2, and m_3 individually represent integers of 0 to 3, at least one of m_1, m_2, or m_3 being equal to or greater than 1, and n_1, n_2, and n_3 individually represent integers of 0 to 5,

said regeneration being achieved by adding at least one compound selected from the group consisting of maleic acid, fumaric acid, and olefinically unsaturated compounds of Formula II



II

wherein X is selected from the group consisting of O, S, —N_1—R^5 or —P—R^5, R^3, R^4, and R^5 individually representing hydrogen, alkyl, or aryl, to said aqueous phase in an amount sufficient to permit removal of sulfonated or carboxylated alkyl-arylphosphanes,

whereby said catalyst system is regenerated without having to remove said reaction products from said aqueous phase.

5,466,645

METHOD FOR REACTIVATING NITROGEN-TREATED CARBON CATALYSTS

Richard A. Hayden, Pittsburgh, Pa., assignor to Calgon Carbon Corporation, Pittsburgh, Pa.

Filed Mar. 29, 1994, Ser. No. 219,207
Int. Cl.[6] B01J *38/02;38/00*
U.S. Cl. 502—56 **6 Claims**

1. A method for restoring the catalytic activity of a deactivated nitrogen-treated carbonaceous char prepared by treatment of a carbonaceous material at temperatures above 700 C. in the presence of nitrogen-containing compounds, said method comprising exposing said deactivated nitrogen-treated carbonaceous char to temperatures greater than 700° C. for a period of time sufficient to reactivate said carbonaceous char.

5,466,646

PROCESS FOR THE PREPARATION OF SOLID STATE MATERIALS AND SAID MATERIALS

William R. Moser, Hopkinton, Mass., assignor to Worcester Polytechnic Institute, Worcester, Mass.

Filed Aug. 18, 1992, Ser. No. 931,766
Int. Cl.[6] B01J *29/04*
U.S. Cl. 502—60 **22 Claims**

1. A process for producing solid state materials having a phase purity greater than about 99% and less than 1% in discrete separate phase compounds comprising (1) mixing together a metal containing solution and a second solution containing a precipitating agent to form a mixed solution, (2) pressurizing the mixed solution to a pressure in the range from about 1,000 to about 50,000 psig, (3) passing the mixed solution into a fluidizing apparatus wherein high shear forces act on the mixed solution, (4) depressurizing the mixed solution so as to cause cavitation, and (5) separating a solid state material from the cavitated mixed solution.

5,466,647

TERTIARY AMINO-ALUMINOXANE HALIDES

Samuel A. Sangokoya, Baton Rouge, La., assignor to Albemarle Corporation, Richmond, Va.

Division of Ser. No. 87,444, Jul. 9, 1993, Pat. No. 5,412,131. This application Jan. 31, 1995, Ser. No. 381,365
Int. Cl.[6] C08F *4/02;4/60*
U.S. Cl. 502—113 **6 Claims**

1. An olefin polymerization catalyst comprising a metallocene and a tertiary amino-aluminoxane halide composition which comprises the reaction product obtained by reacting an aluminoxane and from about 0.005 to less than about 0.15 mole per mole of aluminum in said aluminoxane of a tertiary amine hydrohalide in an inert organic solvent at a temperature of from about 25° to 90° C.

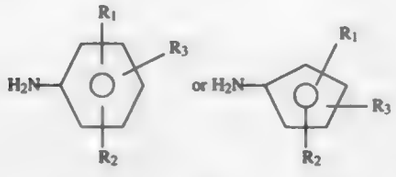
5,466,648

SUPPORTED ALPHA-OLEFIN DIMERIZATION CATALYST

Linda N. Winslow, Cincinnati, Ohio, assignor to Quantum Chemical Corporation, Cincinnati, Ohio

Filed Jun. 28, 1994, Ser. No. 268,097
Int. Cl.[6] B01J *31/00*
U.S. Cl. 502—117 **35 Claims**

1. A supported tungsten-containing catalyst component useful for the dimerization of alpha-olefins comprising (a) an organic or inorganic support material; (b) a tungsten salt; and (c) an amine compound having one of the following formulas:



wherein R_1, R_2, and R_3 are the same or different and are selected from the group consisting of hydrogen and alkyls containing from 1 to 4 carbon atoms, and

represents a cyclopentadiene moiety having two double bonds.

5,466,649

POLYMERIZATION CATALYST SYSTEMS, THEIR PRODUCTION AND USE

Moses O. Jejelowo, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Wilmington, Del.

Filed Oct. 15, 1993, Ser. No. 138,818
Int. Cl.[6] C08F *4/18;4/42*
U.S. Cl. 502—120 **25 Claims**

1. A catalyst system comprising:

a) at least one first component consisting essentially of a majority of at least one supported metallocene; and separately

b) at least one second component consisting essentially of a majority of at least one supported cocatalyst or activator for said metallocene.

5,466,650

CATALYST FOR THE DEHALOGENATION OF ALPHAHALOGENATED CARBOXYLIC ACIDS AND ITS USE FOR PURIFYING MONOCHLOROACETIC ACID

Yves Correia, Chateau Arnoux, France, assignor to Societe Elf Atochem S.A., Puteaux, France

Division of Ser. No. 20,944, Feb. 19, 1993, Pat. No. 5,414,116. This application Sep. 2, 1994, Ser. No. 300,247
Claims priority, application France, Feb. 19, 1992, 92 01876
Int. Cl.[6] B01J *21/18*
U.S. Cl. 502—185 **5 Claims**

1. Catalyst consisting essentially of an active charcoal support in the form of particles having a specific surface area between about 600 m^2/g and 1300 m^2/g, wherein said particles are in the form of cylinders having a diameter from 0.3 to 1.5 mm and a length of 0.3 to 5 mm, or spheres having a diameter from 0.3 to 2 mm, the said particles being loaded with a precious metal from group VIII of the Periodic Table of Elements.

5,466,651

CATALYTIC METHOD

William C. Pfefferle, 51 Woodland Dr., Middletown, N.J. 07748

Continuation-in-part of Ser. No. 661,386, Feb. 26, 1991, Pat. No. 5,342,591, which is a division of Ser. No. 273,343, Nov. 18, 1988, Pat. No. 5,051,241. This application May 18, 1994, Ser. No. 245,429
Int. Cl.[6] B01J *23/10;23/34;23/40*
U.S. Cl. 502—304 **16 Claims**

1. A monolithic catalytic article for use in catalytic chemical conversions, which comprises;

a nonporous catalyst support having a metallic surface; and

a catalytically active surface layer of from fifty monolayers to one micron in thickness bonded to the support by sputtering, said catalytically active layer comprising an admixture of a precious metal and a base metal oxide.

5,466,652

PROCESS FOR THE PREPARATION OF VINYL ACETATE CATALYST

Christos Paparizos, Willowick; Dev D. Suresh, Hudson, both of Ohio, and Michael F. Lemanski, Chester, N.Y., assignors to The Standard Oil Co., Cleveland, Ohio

Filed Feb. 22, 1994, Ser. No. 200,130
Int. Cl.[6] B01J *23/04;23/44;23/52*
U.S. Cl. 502—330 **12 Claims**

1. A process for the manufacture of a Au/Pd/Alkali metal containing fluid bed catalyst useful in the manufacture of vinyl acetate comprising impregnating a support with a solution comprising an hydroxy-free metal salt of Pd and Au substantially free of barium and halide selected from the group consisting of dimethyl gold acetate, palladium nitrate and palladium acetate and mixtures thereof, reducing the metal salts to form a deposit of Pd and Au on the surface of the support and impregnating the support with a halide-free metal salt of the alkali metal.

5,466,653

METHOD FOR PREPARING NEGATIVE-WORKING WASH-OFF RELIEF IMAGES AND NON-PHOTOSENSITIVE ELEMENTS FOR USE THEREIN

Sheau-Hwa Ma, Chadds Ford, Pa., and Michael W. J. West, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 29, 1994, Ser. No. 268,757
Int. Cl.[6] B41M *5/20;5/24*
U.S. Cl. 503—200 **22 Claims**

19. An aqueous, developable element containing a latent image, said element comprising:

(a) a non-photosensitive layer comprising (i) a substantially non-crystalline polymer consisting of an acid containing polymer and (ii) a latent image in the form of a stable, water-insoluble polymer blend, said latent image having been formed by imagewise applying a layer of ink comprising an esterification agent to said non-photosensitive layer; and

(b) optionally a substrate.

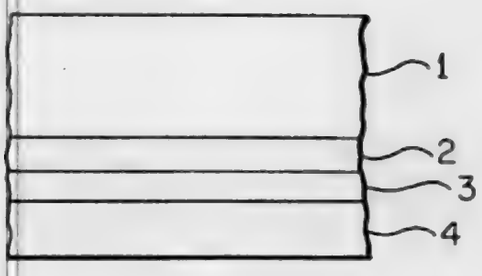
5,466,654

ERASABLE DISPLAY MEDIUM

Eiichi Akutsu; Hiroh Soga; Shigehito Ando; Susumu Hirakata, and Kazuo Maruyama, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 995,336, Dec. 23, 1992, abandoned. This application Aug. 3, 1994, Ser. No. 284,999
Claims priority, application Japan, Dec. 24, 1991, 3-355579
Int. Cl.[6] B41M *5/40*
U.S. Cl. 503—206 **16 Claims**

1. An erasable display medium for displaying images in response to a signal current, comprising:



a heating resistive layer having a first layer as a current path area for said signal current and a second layer as a converting area for converting said signal current into thermal energy;

a conductive layer formed on said second layer of said heating resistive layer, said conductive layer comprising a current returning portion for returning said signal current to a ground portion; and

an erasable thermochromic layer comprising a low molecular weight organic material having particles dispersed in a macromolecular matrix material, wherein said erasable thermochromic layer is formed on said conductive layer for forming an image having an opaque portion and a transparent portion by said thermal energy being passed through said conductive layer.

5,466,655

HEAT-SENSITIVE RECORDING MATERIAL

Naomasa Koike; Akira Nakano; Takao Kosaka, and Naoya Sakata, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

Filed Jun. 21, 1994, Ser. No. 267,030

Claims priority, application Japan, Jun. 21, 1993, 5-149013; Jan. 25, 1993, 5-266328; Nov. 18, 1993, 5-289233; Jan. 28, 1994, 6-008666

Int. Cl.[6] B41M *5/40*

U.S. Cl. 503—209 **25 Claims**

1. A heat-sensitive recording material, comprising:

a support and a heat-sensitive recording layer containing a leuco dye and a developer selected from the group consisting of a phenol derivative, an aromatic carboxylic acid derivative, and a polyvalent metal salt of an organic compound, formed on one side of the support, wherein the heat-sensitive recording layer contains an ultraviolet ray-absorbing agent, said ultraviolet ray-absorbing agent being a dimer ultraviolet ray-absorbing agent.

5,466,656

HEAT SENSITIVE RECORDING MATERIAL

Tomoyuki Okimoto, Yokohama; Kazumi Maki, Neyagawa, and Katsuhiko Ishida, Kashiwa, all of, Japan, assignors to New Oji Paper Company, Ltd., Tokyo, Japan

Filed Sep. 22, 1994, Ser. No. 310,500

Claims priority, application Japan, Sep. 22, 1993, 5-236765

Int. Cl.[6] B41M *5/30*

U.S. Cl. 503—217 **4 Claims**

1. A heat sensitive recording material comprising a recording layer formed on a substrate and containing a colorless or light-colored basic dye and a color acceptor, the material being characterized in that the basic dye is 3-(N-ethyl-N-p-tolyl)amino-6-methyl-7-p-toluidinofluoran, the color acceptor is bis(3-allyl-4-hydroxyphenyl)sulfone and/or 4-hydroxy-4'-isopropoxydiphenylsulfone.

5,466,657

HEAT TRANSFER IMAGE-RECEIVING SHEETS

Noritaka Egashira, and Yoshinori Nakamura, both of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Jun. 13, 1990, Ser. No. 537,132

Claims priority, application Japan, Jun. 16, 1989, 1-152299

Int. Cl.[6] B41M *5/20;5/24;* **B32B** *3/00*

U.S. Cl. 503—227 **9 Claims**

1. A heat transfer image-receiving sheet comprising:

a substrate sheet;

a dye-receiving layer formed on at least one side of said substrate sheet; and

a release layer formed on the surface of said dye-receiving layer, said release layer consisting essentially of a mixture of a reactive curing release agent and a non-reactive release agent.

5,466,658

THERMAL DYE TRANSFER RECEIVING ELEMENT FOR MORDANTING IONIC DYES

Daniel J. Harrison; William H. Simpson, both of Pittsford; Wayne A. Bowman, Walworth; Kristine B. Lawrence, Rochester, and Helmut Weber, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 16, 1994, Ser. No. 358,123

Int. Cl.[6] B41M *5/035;5/038*

U.S. Cl. 503—227 **20 Claims**

8. A process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising an ionic dye dispersed in a polymeric binder and transferring a dye image to a dye-receiving element to form said dye transfer image, said dye-receiving element comprising a support having thereon a dye image-receiving layer, wherein said dye image-receiving layer comprises an elastomeric binder with a Tg of less than 25° C. and a polymeric mordant for said ionic dye dispersed in said binder.

5,466,659

TRICLOPYR BUTOXYETHYL ESTER COMPOSITIONS COMPRISING VEGETABLE OIL ESTERS AS CARRIERS

F. Nelson Keeney, and John L. Troth, both of Carmel, Ind., assignors to DowElanco, Indianapolis, Ind.

Continuation of Ser. No. 6,101, Jan. 15, 1993, abandoned.

This application May 10, 1994, Ser. No. 240,797

Int. Cl.[6] A01N *25/02;43/40*

U.S. Cl. 504—130 **34 Claims**

1. A nonaqueous herbicide formulation composition comprising, as the active ingredient, a herbicidally effective amount of triclopyr BEE, in admixture with one or more esters of vegetable oils as the carrier.

5,466,660

TETRAZOLINONES AS HERBICIDES FOR USE IN PADDY

Toshio Goto; Hidenori Hayakawa, both of Tochigi; Yukiyoshi Watanabe, Saitama; Shin-ichi Narabu, Ibaragi, and Akihiko Yanagi, Tochigi, all of, Japan, assignors to Nihon Bayer Agrochem K.K., Tokyo, Japan

Division of Ser. No. 86,606, Jul. 1, 1993, Pat. No. 5,347,010.

This application Apr. 21, 1994, Ser. No. 230,949

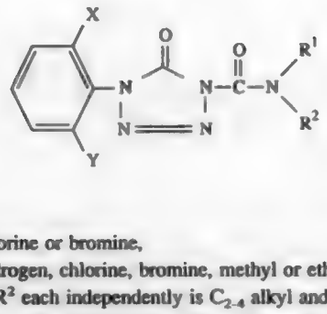
Claims priority, application Japan, Jul. 9, 1992, 4-204271; Jan. 29, 1992, 4-312607

Int. Cl.[6] A01N *43/713*

U.S. Cl. 504—134 **17 Claims**

1. A herbicidal composition comprising

(A) a tetrazolinone of the formula



wherein

X is chlorine or bromine,

Y is hydrogen, chlorine, bromine, methyl or ethyl, and

R^1 and R^2 each independently is C_{2-4} alkyl and

(B) at least one herbicide selected from the group consisting of a sulfonamide pyrazole propionanilide, triazine, carbamate, diphenyl ether and acid amide.

5,466,661

BENZALDEHYDE OXIME DERIVATIVES, PRODUCTION AND USE THEREOF

Akira Takase, Otsu; Hiroyuki Kai, Yamatokoriyama; Kuniyoshi Nishida, Koka; Koichi Morita, Koka; Michio Masuko, Koka; Kinya Ide, and Yoshito Ueyama, both of Kusatsu, all of, Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

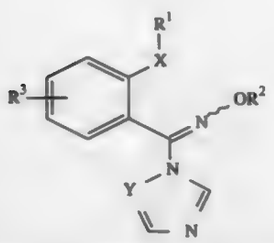
Filed Jul. 8, 1994, Ser. No. 271,941

Claims priority, application Japan, Jul. 9, 1993, 5-170235

Int. Cl.[6] C07D *401/10;* A01N *43/50*

U.S. Cl. 504—253 **16 Claims**

1. A compound of the formula (I):



wherein R^1 is selected from the group consisting of pyridyl, substituted pyridyl, pyridyl alkyl, and substituted pyridyl alkyl, wherein the alkyl group contains 1 to 4 carbon atoms; R^2 is selected from the group consisting of hydrogen, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, halogenated C_{1-6} alkyl, halogenated C_{2-6} alkenyl, halogenated C_{2-6} alkynyl, C_{3-8} cycloalkyl, phenyl, substituted phenyl, benzyl and substituted benzyl; R^3 is selected from the group consisting of hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy and halogen; X is 0 or S; Y is CH or N; and – represents any configuration of the E-isomer, Z-isomer or a mixture of E- and Z-isomers; wherein the substituted pyridyl, substituted pyridyl alkyl, substituted phenyl, and substituted benzyl have 1 to 5 substituents selected from the group consisting of C_{1-5} alkyl, C_{1-4} alkoxy, phenyl, phenoxy, benzyloxy, C_{1-4} alkylthio, C_{1-3} alkylsulfonyl, cyano, nitro, halogen, halogenated C_{1-3} alkyl, and halogenated C_{1-3} alkoxy; or a salt thereof.

5,466,662

USE OF 4-CHLORO-3-(4-CHLORO-2-FLUOROPHENYL)-5-DIFLUOROMETHOXY-1-METHYL-1H-PYRAZOLE AS AN HERBICIDAL TREATMENT

Harjinder Singhbanssal, Bracknell, and John C. Ormrod, Farnborough, both of, United Kingdom, assignors to Zeneca Limited, London, United Kingdom

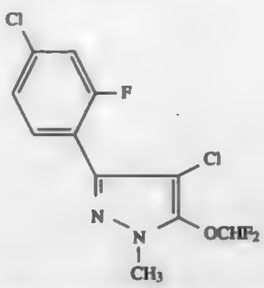
Filed Apr. 26, 1994, Ser. No. 233,191

Claims priority, application United Kingdom, May 10, 1993, 9309542

Int. Cl.[6] A01N *43/56*

U.S. Cl. 504—202 **21 Claims**

1. A method for killing or controlling weeds in a soya crop, which method comprises applying to the crop or to the location thereof a compound of formula (I):



(I)

in an amount sufficient to kill the weeds but insufficient to kill the crop.

5,466,663

TETRAHYDROPHTHALIMIDE DERIVATIVES AND THEIR USE AS HERBICIDES

Mitsunori Hiratsuka, Oita; Minoru Takano, Kameoka; Masayuki Enomoto, Takarazuka; Satoru Kizawa, Kakogawa, and Kazuo Saitoh, Toyonaka, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

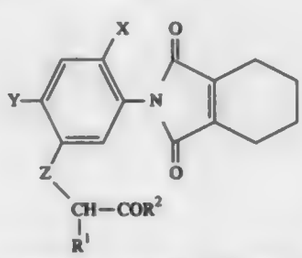
Filed Aug. 18, 1994, Ser. No. 292,189

Claims priority, application Japan, Aug. 19, 1993, 5-204961

Int. Cl.[6] A01N *43/38;* C07D *209/48*

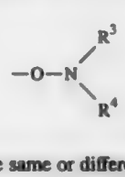
U.S. Cl. 504—286 **7 Claims**

1. A compound of the formula:



(I)

wherein X is hydrogen or halogen; Y is halogen; Z is oxygen or sulfur; R^1 is hydrogen or alkyl; and R^2 is a group of the formula:



wherein R^3 and R^4 are the same or different, and each is hydrogen, alkyl, cycloalkyl or benzyl, or R^3 and R^4 may combine to form an alkylene group.

5,466,664

METHOD FOR MANUFACTURING A SUPERCONDUCTING DEVICE HAVING A THIN SUPERCONDUCTING CHANNEL FORMED OF OXIDE SUPERCONDUCTOR MATERIAL

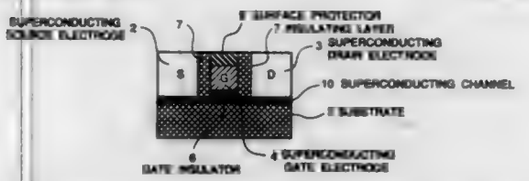
Hiroshi Inada; Takao Nakamura, and Michitomo Iiyama, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 97,613, Jul. 26, 1993, Pat. No. 5,416,072, which is a continuation of Ser. No. 797,740, Nov. 1, 1991, abandoned. This application Jul. 26, 1994, Ser. No. 280,833

Claims priority, application Japan, Nov. 1, 1990, 295659; Nov. 1, 1990, 295660

Int. Cl.[6] H01L *39/24;* **B05D** *5/12*

U.S. Cl. 505—330 **4 Claims**



1. A method of manufacturing a superconducting device, comprising the steps of:

forming a first oxide superconductor thin film on a surface of a substrate,

forming a superconducting gate electrode of the oxide superconductor on a portion of said oxide superconductor thin film,

etching portions of said oxide superconductor thin film at sides of the superconducting gate electrode using the superconducting gate electrode as a mask, so that a superconducting channel of an oxide superconductor thin film having a thickness in a direction perpendicular to said substrate surface is formed under the superconducting gate electrode,

forming a step portion on an upper surface of the superconducting channel and under the superconducting gate electrode,

heating the substrate under high vacuum so that oxygen of the oxide superconductor of the step portion escapes and the oxide superconductor of the step portion is converted into an oxide insulating material and the step portion is changed to a gate insulator, and

growing a second oxide superconductor thin film on the exposed surface of the superconducting channel by using the gate electrode as a mask, so that a superconducting source electrode and a superconducting drain electrode, each having a thickness greater than the thickness of the channel in said direction, are formed at opposite sides of the superconducting gate electrode and electrically isolated from the gate electrode.

5,466,665

METHOD OF MANUFACTURING Y-BA-CU-O SUPERCONDUCTING THIN FILM

Yukihisa Yoshida; Wataru Ito, and Tadataka Morishita, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha; Nippon Steel Corporation, and International Superconductivity Technology Center, all of Tokyo, Japan

Filed Jun. 16, 1994, Ser. No. 263,957

Claims priority, application Japan, Jun. 24, 1993, 5-153824

Int. Cl.[6] H01L *39/24;* **C23C** *14/34*

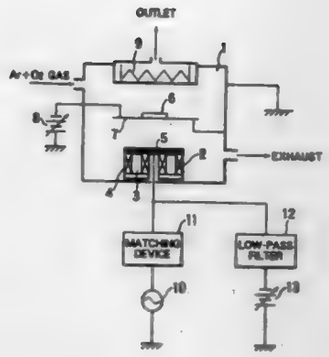
U.S. Cl. 505—476 **11 Claims**

1. A method of manufacturing Y—Ba—Cu—O superconducting thin film on a substrate by using a parallel plate sputtering method comprising the steps of:

placing an electrically conductive YBCO target on a cathode electrode inside a film formation chamber in a low vacuum and placing said substrate directly above said target via a substrate holder;

superimposing a high-frequency voltage on a negative DC voltage and applying them on said cathode electrode;

applying a negative DC voltage on said substrate holder; and



controlling film formation conditions on the basis of a difference between voltage drop across an ion sheath formed at said substrate and across an ion sheath formed directly above the YBCO target.

5,466,666

AMORPHOUS MONOSPHERIC FORMS OF INSULIN DERIVATIVES

Rainer Obermeier, Hattersheim; Walter Sabel, Bad Camberg; Peter Dell, and Karl Geisen, both of Frankfurt am Main, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 25, 1994, Ser. No. 233,617

Claims priority, application Germany, Apr. 27, 1993, 43 13 702.4

Int. Cl.[6] A61K *38/28;* **C07K** *14/62*

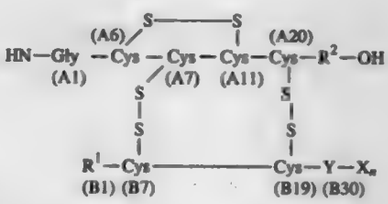
U.S. Cl. 514—3 **8 Claims**

1. An amorphous monospheric form of an insulin derivative, obtained by

A) dissolving an insulin derivative in an n-propanol/buffer mixture in which the n-propanol content relative to water is more than 15% and the pH is from 4.5 to 6.5, forming a solution and

B) diluting the solution with water so that the n-propanol content relative to water is less than 15%, whereupon the insulin derivative precipitates out of the solution in an amorphous monospheric form

wherein the insulin derivative that is used has an A chain and a B chain and is of the formula I



in which

X is a genetically encodable amino acid residue,

n is an integer from 1 to 10,

Y is a genetically encodable amino acid residue,

R^1 is a phenylalanine residue or a hydrogen atom,

R^2 is a genetically encodable amino acid residue and residues A2–A20 correspond to the amino acid sequence of the A chain of human insulin, animal insulin or an insulin derivative, and residues B2–B29 correspond to the amino acid sequence of the B chain of human insulin, animal insulin or an insulin derivative.

5,466,667

PROPHYLACTIC AND THERAPEUTIC METHODS FOR TREATING EDEMA WITH ANTAMANIDES

David Shepro, Boston, Mass., and J. Steven Alexander, Nashville, Tenn., assignors to Trustees of Boston University, Boston, Mass.

Continuation of Ser. No. 810,546, Dec. 19, 1991, abandoned, which is a continuation of Ser. No. 417,121, Oct. 4, 1989, abandoned, which is a continuation-in-part of Ser. No. 185,650, Apr. 25, 1988, abandoned. This application Sep. 22, 1993, Ser. No. 124,849

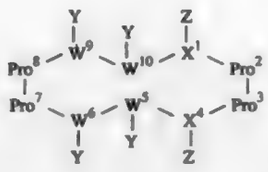
The portion of the term of this patent subsequent to Jan. 11, 2011, has been disclaimed.

Int. Cl.[6] A61K *38/03;* **C07K** *7/64*

U.S. Cl. 514—11 **6 Claims**

1. A method for therapeutically reducing lung endothelial permeability in a living subject, said method comprising the step of:

intravenously administering an effective amount of an antamanide compound to the living subject after occurrence of an increased endothelial permeability to fluids and protein in the lung, said antamanide compound having the formula



wherein W individually is an amino acid having at least one ring structure comprised of not more than 6 carbon atoms;

X individually is an acrylic amino acid comprised of 3–9 carbon atoms;

Y individually is omittable entirely but when present is selected from the group consisting of hydrogen, a hydroxyl group, a halogen, and a hydrocarbon moiety; and;

Z individually is omittable entirely but when present is selected from the group consisting of hydrogen, a halogen, and a hydrocarbon moiety.

5,466,668

SUPERIOR THROMBOMODULIN ANALOGS FOR PHARMACEUTICAL USE

Charles B. Glaser; Michael J. Morser, both of San Francisco, and David R. Light, San Mateo, all of Calif., assignors to Schering Aktiengesellschaft, Berlin, Germany

Continuation of Ser. No. 568,456, Aug. 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 506,325, Apr. 9, 1990, Pat. No. 5,256,770, which is a continuation-in-part of Ser. No. 406,941, Sep. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 345,374, Apr. 28, 1989, abandoned. This application Nov. 22, 1993, Ser. No. 155,346

Int. Cl.[6] A61K *35/14*

U.S. Cl. 514—12 **26 Claims**

1. A method of treating a thrombotic disease or condition by administering a therapeutically effective dose of a purified thrombomodulin analog, wherein said analog comprises a polypeptide having an amino acid sequence corresponding to the six epidermal growth factor and the O-linked glycosylation domains of native thrombomodulin, and wherein the O-lined glycosylation domain is modified by:

a. modification of the amino acid sequence of the O-linked glycosylation domain or deletion of an amino acid residue forming a glycosylation site,

b. removal of sulfate substituents on sugars in the O-linked glycosylation domain, or

c. deletion of the O-linked glycosylation domain, whereby addition of glycosaminoglycan to serine or threonine residues in the 0linked glycosylation domain is attenuated, said analog having approximately native ability to potentiate thrombin-mediated activation of protein C and having a reduced ability to inactivate thrombin-mediated conversion of fibrinogen to fibrin, each ability as compared with native thrombomodulin.

5,466,669

IMMUNOSTIMULATORY AGENT

Wolfgang Konig, Bochum, Germany; Mamoru Tomita; Seiichi Shimamura, both of Yokohama, Japan; Kozo Kawase, Urawa, Japan; Mitsunori Takase, Omiya, Japan, and Wayne R. Bellamy, Zama, Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP92/00275, § 371 Date Feb. 19, 1993, § 102(e) Date Feb. 19, 1993, PCT Pub. No. WO93/18061, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 7, 1992, Ser. No. 971,981

Int. Cl.[6] A61K *38/00;* **C07K** *5/00;7/00;17/00*

U.S. Cl. 514—12 **11 Claims**

1. A medicament for promoting the release of leukotriene B4 from polymorphonuclear neutrophils or histamine from mast cells in animals or humans comprising effective amounts of a substantially purified and isolated peptide having the amino acid sequence: Phe-Lys-Cys-Arg-Arg-Trp-Gln-Trp-Arg-Met-Lys-Lys-Leu-Gly-Ala-Pro-Ser-Ile-Thr-Cys-Val-Arg-Arg-Ala-Phe to accomplish said release of leukotriene B4 and histamine, or derivatives of said peptide having minor amino acid substitutions which do not abolish the capacity of the peptide to release leukotriene B4 and histamine, and a pharmacologically acceptable carrier therefor.

5,466,670

USE OF IGF-1

David B. Dunger, Oxford; Martin O. Savage, and Peter H. Sönksen, both of London, all of, Great Britain, assignors to PHARMACIA AB, Sweden

PCT No. PCT/SE93/00425, § 371 Date Feb. 1, 1994, § 102(e) Date Feb. 1, 1994, PCT Pub. No. WO93/23071, PCT Pub. Date Nov. 25, 1993

PCT Filed May 14, 1993, Ser. No. 175,404

Claims priority, application Sweden, May 19, 1992, 9201573

Int. Cl.[6] A61K *38/05;38/06;* **C07K** *5/00*

U.S. Cl. 514—12 **13 Claims**

1. Method for treating Type 1 diabetes mellitus by subcutaneously administering to a patient suffering from Type 1 diabetes mellitus, IGF-1 in a dose effective to achieve an IGF-1 serum level of up to 400 ng/ml that is characteristic in healthy individuals.

5,466,671

APIDAECIN-TYPE PEPTIDE ANTIBIOTICS WITH IMPROVED ACTIVITIES AND/OR DIFFERENT ANTIBACTERIAL SPECTRUM

Paul Tempst, New York, N.Y., and Peter Casteels, Erpe-Mere, Belgium, assignors to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Filed Mar. 2, 1994, Ser. No. 205,938

Int. Cl.[6] A01N *63/02;* **A61K** *38/10;* **C07K** *7/00;7/08*

U.S. Cl. 514—13 **15 Claims**

1. A purified polypeptide having antibacterial activity, comprising:

a first sequence Pro-Arg-Pro-Pro-His-Pro-Arg-(Ile/Leu) (SEQ ID NO: 1);

optionally, a second sequence immediately adjacent to the N-terminal amino acid residue of the first sequence, wherein the second sequence is selected from the group consisting of:

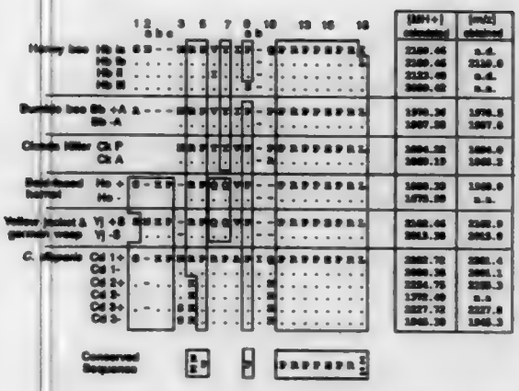
Pro;

Ala;

Gln;

Ile-Gln; and

Ile-Lys;



a third sequence immediately adjacent to the second sequence, or immediately adjacent to the N-terminal amino acid residue of the first sequence when the polypeptide does not contain a second sequence, wherein the third sequence has the following formula:

X2-Pro-X3-X4-X5-Pro (SEQ ID NO: 2), wherein

X2 is Arg or Lys;

X3 is Thr, Gln or Arg;

X4 is Tyr, Gln or Pro; and

X5 is Val or Ala; and

a fourth sequence immediately adjacent to the third sequence, wherein the fourth sequence is selected from the group consisting of:

Asn;

(Gly/Phe)-Lys-Pro;

Ser-Asn-Lys-Pro (SEQ ID NO: 42); and

Gly-Lys-Pro-(Asn/Ser) (SEQ ID NO: 43);

wherein the fourth sequence is truncated by zero to four amino acid residues at its N-terminus; and wherein the number of amino acid residues in the polypeptide is the sum of the number of second sequence residues, the number of fourth sequence residues, and fourteen.

5,466,672

THERAPEUTIC USE OF CLOSTRIDIUM DIFFICILE TOXIN A

Vladimir M. Kushnaryov, Milwaukee; Philip N. Redlich, Shorewood; Sidney E. Grossberg, Milwaukee, and J. James Sedmak, Brookfield, all of Wis., assignors to Ophidian Pharmaceuticals, Inc., Madison, Wis.

Continuation-in-part of Ser. No. 985,321, Dec. 4, 1992. This application Apr. 8, 1993, Ser. No. 44,631

Int. Cl.[6] C07K *7/08;14/195;* **A61K** *38/10;39/08*

U.S. Cl. 514—14 **7 Claims**

1. A method of treating gastrointestinal cancer, comprising contacting tumor tissue with a preparation comprising *Clostridium difficile* toxin A.

5,466,673

METHOD OF INHIBITING CALCIUM PRECIPITATION IN AN INTRAOCULAR IRRIGATING SOLUTION

Shinji Ohmori, Okayama; Kazumi Ogata, Toyonaka; Hideki Tsutsuka, Kawanishi, and Takahiro Sakaue, Itami, all of, Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

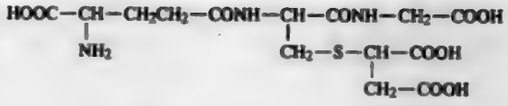
Filed Jun. 3, 1994, Ser. No. 253,304

Claims priority, application Japan, Jun. 7, 1993, 5-135909

Int. Cl.[6] A61K *38/04;* **C07K** *5/037*

U.S. Cl. 514—18 **11 Claims**

1. A method of inhibiting precipitation of calcium in an intraocular irrigating solution which contains calcium ions by incorporating therein a compound of the formula



or a pharmacologically acceptable salt thereof.

5,466,674

BIRD AVERSION COMPOUNDS

Marvin F. Preiser, Middletown, N.Y., and Peter F. Vogt, Loveland, Ohio, assignors to PMC Specialties Group Inc., Rocky River, Ohio

Division of Ser. No. 8,675, Jan. 25, 1993, abandoned. This application Jul. 13, 1994, Ser. No. 274,408

Int. Cl.[6] A01N *25/00;25/24;25/26;25/34*

U.S. Cl. 514—23 **20 Claims**

1. A bird aversion emulsion miscible with water and capable of forming a polymeric film when applied to a source, consisting essentially of:

a bird aversion agent in an amount of from 5 to 30% by weight of a total weight of the emulsion;

a terpene selected from the group consisting of terpene hydrocarbons, oxygenated terpenes and a mixture of terpene hydrocarbons and oxygenated terpenes in an amount of from 5 to 10% by weight of a total weight of the emulsion;

gums selected from the group consisting of polysaccharides, pectins, gelatins, xanthans, cellulose derivatives and alginate in an amount of from 0.5 to 10% by weight of a total weight of the emulsion; and

water in an amount of from 70 to 80% by weight of a total weight of the emulsion.

5,466,675

IMMUNOLOGICAL ACTIVITY OF RHAMNOLIPIDS

Goran Piljac, and Vinja Piljac, both of 2323 Shasta Dr., Apt. 40, Davis, Calif. 95616

Continuation-in-part of Ser. No. 866,691, Apr. 10, 1992, abandoned. This application Jul. 20, 1994, Ser. No. 277,975

Claims priority, application Belgium, Feb. 4, 1992, 9200115

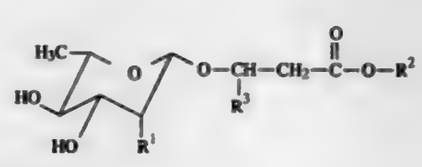
The portion of the term of this patent subsequent to Apr. 10, 2009, has been disclaimed.

Int. Cl.[6] A61K *31/715*

U.S. Cl. 514—25 **13 Claims**

1. A method for treating an autoimmune disease, comprising:

administering, to a subject in need thereof, an effective amount of a pharmaceutical composition comprising, as active ingredient, one or more rhamnolipids of formula (I):



(I)

wherein

R^1 is H or α-L-rhamnopyranosyl;

R^2 is H or —CH(R^4)—CH_2—COOH;

R^3 is (C_5–C_{20})-saturated, mono or polyunsaturated hydrocarbyl and

R^4 is (C_5–C_{20})-saturated, mono or polyunsaturated hydrocarbyl, and a pharmaceutically acceptable carrier.

5,466,676
SATELLITE CELL PROLIFERATION IN ADULT SKELETAL MUSCLE

Frank W. Booth, Houston, Tex.; Donald B. Thomason, Memphis, Tenn.; Paul R. Morrison, Indianapolis, Ind., and George M. Stancel, Houston, Tex., assignors to Board of Regents, The University of Texas at Austin

Continuation of Ser. No. 479,065, Feb. 12, 1990, abandoned. This application Jan. 23, 1992, Ser. No. 823,783

Int. Cl.[6] C12N *15/00*

U.S. Cl. 514—44 **14 Claims**

1. A method for enhancing incorporation of a foreign gene into a tissue and expressing the incorporated foreign gene comprising:

inducing a mitotically-active state in a tissue in vivo to provide tissue with enhanced receptivity to the incorporation of a foreign gene;

preparing a retroviral vector capable of infecting a eucaryotic stem cell, said vector comprising a foreign gene; and

injecting the tissue in vivo with the retroviral vector;

wherein said method results in incorporation and expression of the gene.

5,466,677
DINUCLEOSIDE PHOSPHINATES AND THEIR PHARMACEUTICAL COMPOSITIONS

Anthony D. Baxter, Northwich; Eric K. Baylis, Stockport; Stephen P. Collingwood, Westhoughton; Roger J. Taylor, Stretford, all of, England; Alain De Mesmaeker, Kaiserkinden, and Chantal Schmit, Basel, both of, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

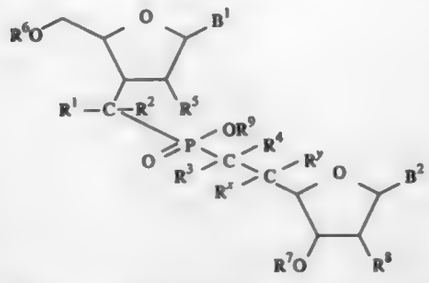
Filed Feb. 28, 1994, Ser. No. 204,020

Claims priority, application United Kingdom, Mar. 6, 1993, 9304618

Int. Cl.[6] A61K *31/70;* **C07H** *21/02;21/04*

U.S. Cl. 514—44 **11 Claims**

1. A dinucleotide analogue of formula



I

where

B^1 and B^2 are each independently a monovalent nucleoside base radical;

R^1 is R^1_a or Z;

R^1_a, R^2, R^3 and R^4 are each independently hydrogen, halogen or hydroxy;

R^5 is R^5_a or Z;

R^6 is hydrogen or R^6_a;

R^7 is hydrogen, alkyl-N,N-dialkylphosphoramidyl or R^7_a, R^8 is R^8_a or Z, or the indicated R^7O and R^8 together denote an isopropylidenedioxy group;

R^5_a and R^8_a are each independently hydrogen, halogen, hydroxy, $—OR^{10}$, $—OCOR^{10}$ or silyloxy substituted by three C_1–C_{15} hydrocarbyl groups;

R^6_a and R^7_a are each independently a C_1–C_{10} aliphatic radical, a C_6–C_{15} aromatic radical, a C_7–C_{30} araliphatic radical, $—COR^{11}$, $—SO_2R^{11}$ or silyl substituted by three C_1–C_{15} hydrocarbyl groups;

R^9 is hydrogen, a C_1–C_8 aliphatic radical, a C_3–C_8 cycloaliphatic radical, a C_6–C_{15} aromatic radical, a C_7–C_{13} araliphatic radical, an alkali metal ion or an ammonium ion;

R^{10} and R^{11} are each independently a C_1–C_{10} aliphatic radical, a C_3–C_8 cycloaliphatic radical, a C_6–C_{15} aromatic radical or a C_7–C_{16} araliphatic radical;

R^x and R^y are independently hydrogen, halogen, hydroxy, a C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_3–C_8 cycloalkyl, C_6–C_{15} aryl, C_7–C_{16} aralkyl, C_1–C_{10} alkoxy, C_2–C_{10} alkenoxy, C_6–C_{10} aryloxy or C_7–C_{16} aralkyloxy group, which is substituted or unsubstituted, or $—OCOR^z$;

R^z is a substituted or unsubstituted C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_3–C_8 cycloalkyl, C_6–C_{15} aryl or C_7–C_{16} aralkyl group; and

Z is C_6–C_{10} aryloxythiocarbonyloxy, the C_6–C_{10} aryl group being substituted or unsubstituted.

5,466,678
CO-ADMINISTRATION OF S-ADENOSYL-L-METHIONINE TO REDUCE THE NEPHROTOXICITY OF CISPLATIN THERAPY

Hironori Kawabata; Koei Moriguchi, and Takeshi Endo, all of Nakanikawa, Japan, assignors to Fuji Kagaku Kogyo Kabushiki Kaisha, Toyama, Japan

PCT No. PCT/JP93/01250, § 371 Date Apr. 7, 1994, § 102(e) Date Apr. 7, 1994, PCT Pub. No. WO94/05299, PCT Pub. Date Mar. 17, 1994

PCT Filed Sep. 3, 1993, Ser. No. 211,544

Claims priority, application Japan, Sep. 4, 1992, 4-263243

Int. Cl.[6] A61K *31/70*

U.S. Cl. 514—46 **6 Claims**

1. A method of reducing the nephrotoxicity of cisplatin therapy comprising administering to a patient receiving cisplatin therapy an effective amount of S-adenosyl-L-methionine or a pharmaceutically acceptable salt thereof.

4. A method of enhancing the effect of cisplatin therapy against tumors comprising administering to a patient receiving cisplatin therapy an effective amount of S-adenosyl-L-methionine or a pharmaceutically effective salt thereof.

5,466,679
CARBORANYL URIDINES AND THEIR USE IN BORON NEUTRON CAPTURE THERAPY

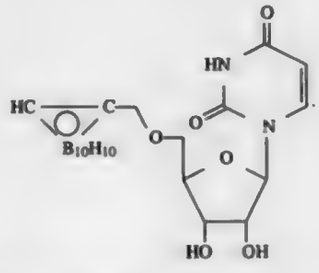
Albert H. Soloway, Worthington; Rolf F. Barth, Columbus; Abul K. Anisuzzaman, Westerville, all of Ohio; Werner Tjarks, Bremen, Germany; Feng-Guang Rong, and Iwona M. Wyzlic, both of Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Continuation of Ser. No. 63,913, May 17, 1993, abandoned. This application Mar. 7, 1994, Ser. No. 206,750

Int. Cl.[6] A61K *31/70;33/22;* **C07H** *19/06;23/00*

U.S. Cl. 514—50 **10 Claims**

1. A carboranyl uridine of the structure



4. A method of boron neutron capture therapy of mammalian tumor cells comprising:

a) introducing to mammalian tumor cells by injection or intraarterial infusion a boron-containing nucleoside compound selected from the group consisting of 5'-carboranyl uridine,

5-carboranyl substituted-2'-deoxyuridine, and 5-S-alkyl carboranyl uridine, in which the boron moiety is tethered to the nucleoside through a flexible linear organic chain selected from the group consisting of methylene groups, an ether linkage, an ester linkage, an amide linkage, and an alkyl sulfide group, wherein the tether is from about 5 to about 20 Ångstroms in length, in a manner and for a time effective to be retained by the tumor cells; and

b) exposing to neutron radiation said boron-containing nucleoside compound retained in said tumor cells.

5,466,680

METHOD AND COMPOSITIONS FOR ENHANCING WHITE BLOOD CELL FUNCTIONING ON A MUCOSAL OR CUTANEOUS SURFACE

Michael A. Rudy, Rochester, N.Y., assignor to Cytologics, Inc., Rochester, N.Y.

Filed Mar. 26, 1992, Ser. No. 858,290
Int. Cl.[6] A61K *31/70;31/195;38/00*
U.S. Cl. 514—57 **98 Claims**

1. A method for treating or preventing a condition in a mammal caused by the presence of a disease causing agent on a mucosal surface or a cutaneous surface wherein said disease causing agent can be diminished by the actions of the white blood cells of a mammal comprising contacting the mucosal surface or the cutaneous surface of said mammal in need of said treatment or prevention with an effective amount to treat or prevent said condition of a composition comprising:

(a) an energy source for white blood cells;

(b) a source of cations to provide a cation selected from the group consisting of sodium, potassium, magnesium, calcium and mixtures thereof; and

(c) a source of anions to provide an anion selected from the group consisting of chloride, sulfate, phosphate, bicarbonate, and mixtures thereof;

wherein the pH of said composition is from about 4 to about 10 and the osmolality of said composition is from about 140 mOsm/kg to about 2,000 mOsm/kg; with the proviso that said mucosal surface is not the oral cavity.

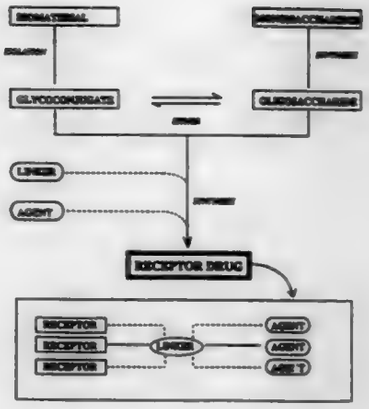
5,466,681

RECEPTOR CONJUGATES FOR TARGETING PENICILLIN ANTIBIOTICS TO BACTERIA

Howard C. Krivan, Derwood, Md., and A. Lennart L. Blomberg, Lund, Sweden, assignors to MicroCarb, Inc., Gaithersburg, Md.

Continuation of Ser. No. 484,568, Feb. 23, 1990, abandoned. This application Jan. 12, 1994, Ser. No. 180,397
Int. Cl.[6] A61K *31/715;31/705;39/00*
U.S. Cl. 514—54 **10 Claims**

1. A microorganism receptor-antibiotic conjugate, comprising an asialoganglioside coupled to a penicillin antibiotic, wherein said asialoganglioside selectively binds a microorganism which is a bacterium.



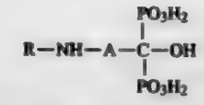
5,466,682

ACYLAMINO-ALKYLIDEN-HYDROXY-BISPHOSPHONIC ACIDS ESTERS AND SALTS THEREOF, WHEREIN THE ACYL GROUP IS DERIVED FROM AN ACID HAVING ANTIINFLAMMATORY ACTIVITY

Sergio Rosini, and Maurizio Mian, both of Pisa, Italy, assignors to Istituto Gentili S.p.A., Pisa, Italy

PCT No. PCT/EP92/00102, § 371 Date Jul. 26, 1993, § 102(e) Date Jul. 26, 1993, PCT Pub. No. WO92/13864, PCT Pub. Date Aug. 20, 1992
PCT Filed Jan. 20, 1992, Ser. No. 94,160
Claims priority, application Italy, Feb. 1, 1991, MI91A0254
Int. Cl.[6] A61K *31/66;37/02;* **C07F** *9/572;9/38;9/40;9/65*
U.S. Cl. 514—76 **6 Claims**

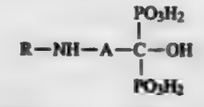
1. A compound of formula (I)



(I)

wherein A is a $—(CH_2)_n—$ wherein n is between 1 and 10; R is an acyl radical from a known anti-inflammatory compound which is a member selected from the group consisting of salicylic acid, acetylsalicylic acid, 5-aminosalicylic acid, diflunisal, ibuprofen, ketoprofen, naproxen, ibufenac, indomethacin, diacerhein and thiorhein and R is a member selected from the group consisting of 5-(2,4-difluorophenyl)-2-hydroxy benzoyl; (4-isobutylphenyl)-acetyl; (4-isobutylphenyl)-propionyl; (6-methoxy-naphthyl)-propionyl; [1-(4-chlorobenzoyl)-2-methyl-5-methoxy-2-indolyl]-acetyl and 2-acetoxybenzoyl.

4. The method of treatment of osteoarticular and connective tissue disorders in a living subject in need of treatment which consists of administering to said living subject an effective amount of a compound of formula:



(I)

wherein A is $—(CH_2)—_5$ or $—(CH_2)_3—$ and R is a member selected from the group consisting of 2-acetoxybenzoyl, 5-(2,4-difluorophenyl)-2-hydroxy benzoyl; (4-isobutylphenyl)-acetyl; (4-isobutylphenyl)-propionyl; (6-methoxy-naphthyl)-propionyl and [1-(4-chlorobenzoyl)-2-methyl-5-methoxy-2-indolyl]-acetyl.

5,466,683

WATER-SOLUBLE ANALOGS OF CARBAMAZEPINE

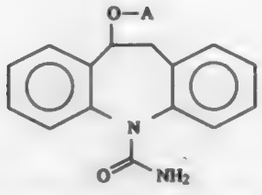
Jeff Sterling, Jerusalem, and Yaacov Herzig, Raanana, both of, Israel, assignors to Teva Pharmaceutical Industries Ltd., Netanya, Israel

Filed Aug. 25, 1994, Ser. No. 296,363

Int. Cl.[6] A61K *31/55;31/675;* C07D *223/28;* C07F *9/553*

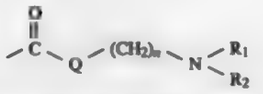
U.S. Cl. 514—80 17 Claims

1. A compound of general formula I;



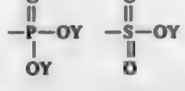
I

wherein A is an amino acyl moiety of formula II:



II

or a phosphonyl or sulphonyl group of formula III:.



III

wherein Q is a phenylene group or CHR; R is hydrogen or a C_1–C_4 alkyl group; n is from 0 to 4; R_1 and R_2 are each independently hydrogen or a C_1–C_4 alkyl group; and Y is hydrogen or an alkali metal.

5,466,684

7-(SUBSTITUTED)-9-[(SUBSTITUTED GLYCYL)AMIDO]-6-DEMETHYL-6-DEOXYTETRACYCLINES

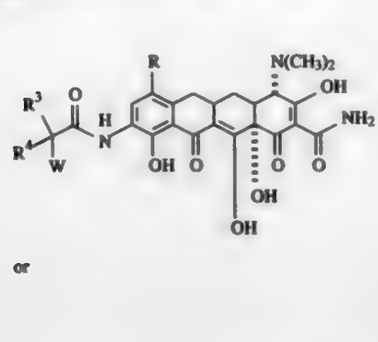
Phaik-Eng Sum, Pomona; Ving J. Lee, Monsey, both of N.Y., and Raymond T. Testa, Cedar Grove, N.J., assignors to American Cyanamid Company, Wayne, N.J.

Division of Ser. No. 205,009, Mar. 2, 1994, Pat. No. 5,380,888, which is a division of Ser. No. 928,589, Aug. 13, 1992, Pat. No. 5,328,902. This application Sep. 12, 1994, Ser. No. 304,731

Int. Cl.[6] A61K *31/65*

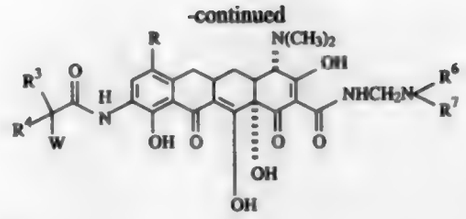
U.S. Cl. 514—152 2 Claims

1. A method for the treatment or control of bacterial infections in warm-blooded animals which comprises administering to said animal a pharmacologically effective amount of a compound of the formula:



or

-continued



wherein:

R is a halogen selected from bromine, chlorine, fluorine and iodine; or R=—NR^1R^2 and R^1 is selected from hydrogen, methyl, ethyl, n-propyl, 1-methylethyl, n-butyl or 1-methylpropyl and R^2 is selected from methyl, ethyl, n-propyl, 1-methylethyl, n-butyl, 1-methylpropyl, 2-methylpropyl, 1,1-dimethylethyl with the proviso that when R=—NR^1R^2 and R^1=hydrogen, R^2=methyl, ethyl, n-propyl, 1-methyl-ethyl, n-butyl, 1-methylpropyl, 2-methylpropyl or 1,1-dimethylethyl; and when R^1=methyl or ethyl, R^2=methyl, ethyl, n-propyl, 1-methylethyl, n-butyl, 1-methylpropyl or 2-methylpropyl; and when R^1=n-propyl, R^2=n-propyl, 1-methylethyl, n-butyl, 1-methylpropyl or 2-methylpropyl; and when R^1=1-methylethyl, R^2=n-butyl, 1-methylpropyl or 2-methylpropyl; and when R^1=n-butyl, R^2=n-butyl 1-mthylpropyl or 2-methylpropyl; and when R^1=1-methylpropyl, R^2=2-methylpropyl;

R^3 is selected from hydrogen; straight or branched (C_4–C_8)alkyl group selected from butyl, isobutyl, pentyl, hexyl, heptyl and octyl; α-mercapto(C_1–C_4)alkyl group selected from mercaptomethyl, α-mercaptoethyl, α-mercapto-1-methylethyl and α-mercaptopropyl; α-hydroxy(C_1–C_4)alkyl group selected from hydroxymethyl, α-hydroxyethyl, α-hydroxy-1-methylethyl and α-hydroxypropyl; carboxyl(C_1–C_8)alkyl group; (C_6–C_{10})aryl group selected from phenyl, α-naphyhyl and β-naphthyl; substituted (C_6–C_{10})aryl group with substitution selected from hydroxy, halogen, (C_1–C_4)alkoxy, trihalo(C_1–C_3)alkyl, nitro, amino, cyano, (C_1–C_4)alkoxycarbonyl, (C_1–C_3)alkylamino and carboxy; (C_7–C_9)aralkyl group selected from benzyl, 1-phenylethyl, 2-phenylethyl and phenylpropyl; substituted (C_7–C_9)aralkyl group with substitution selected from halo, (C_1–C_4)alkyl, nitro, hydroxy, amino, mono- or di-substituted (C_1–C_4)alkylamino, (C_1–C_4)alkoxy, (C_1–C_4)alkylsulfonyl, cyano and carboxy; R^4 is selected from hydrogen and (C_1–C_8)alkyl selected from methyl, ethyl, propyl, isopropyl, butyl, isobutyl, pentyl and hexyl; when R^3 does not equal R^4 the stereo-chemistry of the carbon bearing the substituent W may be either the racemate (DL) or the individual enatiomers (L or D);

W is selected from hydroxylamino; (C_7–C_{12}) straight or branched alkyl monosubstituted amino group with substitution selected from heptyl, octyl, nonyl, decyl, undecyl, dodecyl and the diastereomers and enantiomers of said branched alkyl monosubstituted amino group; (C_1–C_4) straight or branched fluoroalkylamino group selected from trifluoromethylamino, 2,2,2-trifluoroethylamino, 3,3,3-trifluoropropylamino, 3,3,3,2,2-pentafluoropropylamino, 2,2-difluoropropyl-amino, 4,4,4-trifluorobutylamino and 3,3-difluorobutylamino; (C_3–C_8)cycloalkkyl monosubstituted amino group with substitution selected from cyclopropyl, trans-1,2-dimethylcyclopropyl, cis1,2-dimethylcyclopropyl, cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, cyclooctyl, bicyclo[2.2.1]hept-2-yl, bicyclo[2.2.2]oct-2-yl and the diastereomers and enatiomers of said (C_3–C_8)cycloalkyl monosubstituted amino group; [(C_4–C_{10})cycloalkyl]alkyl monosubstituted amino group with substitution selected from (cyclopropyl)methyl, (cyclopropyl)ethyl, (cycobutyl)methyl, (trans-2-methylcyclopropyl)-methyl, and (cis-2-methylcyclobutyl)methyl; (C_3–C_{10})alkenyl and alkynyl monosubstituted amino group with substitution selected from allyl, 3-butenyl, 2-butenyl (cis or trans), 2-pentenyl, propynyl, 4-octenyl, 2,3-dimethyl-2-butenyl, 3-methyl-2-butenyl,

2-cyclopentenyl and 2-cyclohexenyl; (C_6–C_{10})aryl monosubstituted amino group with substitution selected from phenyl and naphthyl; (C_7–C_{10})aralkylamino group selected from benzylamino, 2-phenylethylamino, 1-phenylethylamino 2-(naphthyl)-methylamino, 1-(naphthyl)methylamino and phenylpropylamino; substituted (C_6–C_{10})aryl monosubstituted amino group with substitution for the (C_6–C_{10})aryl group selected from (C_1–C_5)acyl, (C_1–C_5)acylamino, (C_1–C_4)alkyl, mono or disubstituted (C_1–C_8)alkylamino, (C_1–C_4)alkoxy, (C_1–C_4)alkoxycarbonyl, (C_1–C_4)alkylsulfonyl, amino, carboxy, cyano, halogen, hydroxy, nitro and trihalo (C_1–C_3)alkyl; straight or branched symmetrical disubstituted (C_6–C_{14})alkylamino group with substitution selected from dibutyl, diisobutyl, di-s-butyl, dipentyl, diisopentyl, di-s-pentyl, dihexyl, diisohexyl and di-s-hexyl; symmetrical disubstituted (C_6–C_{14})cycloalkylamino group with substitution selected from dicyclopropyl, dicyclobutyl, dicyclopentyl, di(dicyclopropyl)methyl, dicyclohexyl and dicycloheptyl; straight or branched unsymmetrical di-substituted (C_1–C_{14})alkylamino group wherein the total number of carbons in the substitution is no more than 14; unsymmetrical disubstituted (C_4–C_{14})cycloalkylamino group wherein the total number of carbons in the substitution is no more than 14; (C_1–C_8)azacycloalkyl and substituted (C_2–C_8)azacycloalkyl group selected from 4-methylpiperidine, 4-hydroxypiperidine, 4-(hydroxymethyl)piperidine, 4-(aminomethyl)piperidine, cis-3,4-dimethylpyrrolidinyl, trans-3,4-dimethyl-pyrrolidinyl, 2-azabicyclo[2.1.1]hex2-yl, 5-azabicyclo[2.1.1]hex-5-yl, 2-azabicyclo[2.2.1]hept-2-yl, 7-azabicyclo[2.2.1]hept-7-yl, 2-azabicyclo[2.2.2]oct-2-yl and the diastereomers and enantiomers of said (C_2–C_8)azacycloalkyl and substituted (C_1–C_8)azacycloalkyl group; substituted 1-azaoxacycloalkyl group selected from 2-(C_1–C_3)alkylmorpholinyl, 3-(C_1–C_3)alkylisoxazolidinyl, tetrahydroox-azinyl and 3,4-dihydrooxazinyl; [1,n]-diazacycloalkyl and substituted [1,n]-diazacycloalkyl group selected from piperazinyl, 2-(C_1–C_3)alkylpiperazinyl, 4-(C_1–C_3)alkyl-piperazinyl, 2,4-dimethylpiperazinyl, 4-(C_1–C_4)alkoxypiperazinyl, 4-(C_6–C_{10})aryl-oxypiperazinyl, 4-hydroxypiperazinyl, 2,5-diazabicyclo[2.2.1]hept-2-yl, 2,5-diaza-5-methylbicyclo[2.2.1]hept-2-yl, 2,3-diaza-3-methylbicyclo[2.2.2]oct-2-yl, 2,5-diaza-5,7-dimethylbicyclo[2.2.2]oct-2yl and the diastereomers or enantiomers of said [1,n]-diazacycloalkyl and substituted [1,n]diazacycloalkyl group, 1-azathiacycloalkyl and substituted 1-azathiacycloalkyl group selected from thiomorpholinyl, 2-(C_1–C_3)alkylthiomorpholinyl and 3-(C_3–C_6)cycloalkylthiomorpholinyl; N-azolyl and substituted N-azolyl group selected from 1-imidazolyl, 2-(C_1–C_3)alkyl-1-imidazolyl, 3-(C_1–C_3)alkyl-1-imidazolyl, 1pyrrolyl, 2-(C_1–C_3)alkyl-1-pyrrolyl, 3-(C_1–C_3)alkyl-1-pyrrolyl, 1-pyrazolyl, 3-(C_1–C_3)alkyl-1-pyrazolyl, indolyl, 1-(1,2,3-trizaolyl), 4-(C_1–C_3)alkyl-1 (1,2,3-triazolyl), 5-(C_1–C_3)alkyl-1(1,2,3-triazolyl), 4-(1,2,4-triazolyl), 1-tetrazolyl, 2-tetrazolyl and benzimidazolyl; (heterocycle) amino group and substituted (heterocycle) amino said heterocycle selected from 2- or 3-furanyl, 2- or 3-thienyl, 2-, 3- or 4-pyridyl, 2- or 5-pyridazinyl, 2-pyrazinyl, 2-(imidazolyl), (benzimidazolyl), and (benzothiazolyl) and substitution selected from straight or branched (C_1–C_6)alkyl; (heterocycle)methylamino group selected from 2- or 3-furylmethylamino, 2- or 3-thienylmethylamino, 2-, 3- or 4-pyridylmethylamino, 2- or 5-pyridazinylmethylamino, 2-pyrazinylmethylamino, 2-(imidazolyl)methylamino, (benzimidazolyl) methylamino, and (benzothiazolyl)methylamino and substituted (heterocycle)methylamino group as defined hereinabove with substitution selected from straight or branched (C_1–C_6)alkyl; carboxy(C_2–C_4)alkylamino group selected from aminoacetic acid, α-aminopropionic acid, α-aminopropionic acid, α-butyric acid, β-aminobutyric acid and the enantiomers of said carboxy(C_2–C_4)alkkylamino group; 1,1-di-substituted hydrazino group selected from 1,1-dimethylhydrazino, N-aminopiperidinyl, 1,1-diethylhydrazino, and N-aminopyrrolidinyl; (C_1–C_4)alkoxyamino group selected from methoxyamino, ethoxymino, n-propoxyamino, 1-methylethoxyamino, n-butoxyamino, 2-methylpropoxyamino, and 1,1-dimethylethoxyamino; (C_3–C_8)cycloalkoxyamino group selected from cyclopropoxyamino, trans-1,2-dimethylcyclopropoxyamino, cis-1,2-dimethylcyclopropoxyamino, cyclobutoxyamino, cyclopentoxyamino, cyclohexoxyamino, cycloheptoxyamino, cyclooctoxyamino, bicyclo [2.2.1]hept-2-yloxyamino, bicyclo[2.2.2]oct-2-yloxy amino and the diastereomers and enantiomers of said (C_3–C_8)cycloalkoxyamino group; (C_6–C_{10})aryloxyamino group selected from phenoxyamino, 1-naphthyloxyamino and 2-naphthyloxyamino; (C_7–C_{11})aralalkoxyamino group selected from benzyloxy amino, 2-phenylethoxyamino, 1-phenylethoxyamino, 2-(naphthyl)methoxyamino, 1-(naphthyl)methoxyamino and phenylpropoxyamino; [β or γ-(C_1–C_3)acylamido]alkylamino group selected from 2-(formamido)ethylamino, 2-(acetamido)ethylamino, 2-(propionylamido)ethylamino, 2-(acetamido)propylamino, 2-(formamido)propylamino and the enantiomers of said [β or γ-(C_1–C_3)acylamido]alkylamino group; β or γ-(C_1–C_3)alkoxyalkylamino group selected from 2-methoxethylamino, 2-ethoxyethylamino, 2,2-diethoxyethylamino, 2-methoxypropylamino, 3-methoxypropylamino, 3-ethoxypropylamino, 3,3-diethoxypropylamino and the enantiomers of said β or γ-(C_1–C_3)alkoxyalkylamino group; β, γ, or δ(C_2–C_4)hydroxyalkylamino group selected from 2-hydroxyethylamino, 2-hydroxypropylamino, 3-hydroxypropylamino and 4-hydroxybutylamino;

or R^3 and W taken together are selected from —$(CH_2)_n(R^5)N$—, n=3–4, and —CH_2C—$H(OH)CH_2(R^5)N$—, wherein R^5 is selected from hydrogen and (C_1–C_3)acyl, the acyl selected from formyl, acetyl, propionyl and (C_2–C_3)haloacyl selected from chloroacetyl, bromoacetyl, trifluoroacetyl, 3,3,3-trifluoropropionyl and 2,3,2-trifluoropropionyl;

R^6 is selected from hydrogen; straight or branched (C_1–C_3)alkyl group selected from methyl, ethyl, n-propyl or 1-methylethyl; (C_6–C_{10})aryl group selected from phenyl, α-naphthyl or β-naphthyl; (C_7–C_9)aralkyl group selected from benzyl, 1-phenylethyl, 2-phenylethyl or phenylpropyl; a heterocycle group selected from a five membered aromatic or saturated ring with one N, O, S or Se heteroatom optionally having a benzo or pyrido ring fused thereto selected from pyrrolyl, N-methylindolyl, indolyl, 2-pyrrolindinyl, 3-pyrolidinyl, 2-pyrrolinyl, tetrahydrofuranyl, furanyl, benzofuranyl, tetrahydrothienyl, thienyl, benzothienyl or selenazolyl, or a five membered aromatic ring with two N, O, S or Se heteroatoms optionally having a benzo or pyrido ring fused thereto selected from imidazolyl, pyrazolyl, benzimidazolyl, oxazolyl, benzoxazolyl, indazolyl, thiazolyl, benzothiazolyl, 3-alkyl-3H-imidazo[4,5-b]pyridyl or pyridylimidazolyl, or a five membered saturated ring with one or two N, O, S or Se heteroatoms and an adjacent appended O heteroatom selected from γ-butyrolactam, γ-butyrolactone, imidazolidinone or N-aminoimidazolidinone, or a six membered aromatic ring with one to three N heteroatoms selected from pyridyl, pyridazinyl, pyrazinyl, symtriazinyl, unsymtriazinyl, pyrimidinyl or (C_1–C_3)alkylthiopyridazinyl, or a six membered saturated ring with one or two N, O, S or Se heteroatoms and an adjacent appended O heteroatom selected from 2,3-dioxo-1-piperazinyl, 4-ethyl-2,3-dioxo-1-piperazinyl, 4-methyl-2,3-dioxo-1-piperazinyl, 4-cyclopropyl-2-dioxo-1-piperazinyl, 2-dioxomorpholinyl, 2-dioxothiomorpholinyl; or —$(CH_2)_m$—$COOR^8$ where m=0–4 and R^8 is selected from hydrogen; straight or branched (C_1–C_3)alkyl group selected from methyl, ethyl, n-propyl or 1-methylethyl; or (C_6–C_{10})aryl group selected from phenyl, α-naphthyl, or β-naphthyl;

R^7 is selected from hydrogen; straight or branched (C_1–C_3)alkyl group selected from methyl, ethyl, n-propyl or 1-methylethyl; (C_6–C_{10})aryl group selected from phenyl, α-naphthyl or β-naphthyl; (C_7–C_9)aralkyl group selected from benzyl, 1-phenylethyl, 2-phenylethyl or phenylpropyl; a heterocycle group selected from a five membered aromatic or saturated ring with one N, O, S or Se heteroatom optionally having a benzo or pyrido ring fused thereto selected from pyrrolyl,

N-methylindolyl, indolyl, 2-pyrrolidinyl, 3-pyrrolindinyl, 2-pyrrolinyl, tetrahydrofuranyl, furanyl, benzofuranyl, tetrahydrothienyl, thienyl, benzothienyl or selenazolyl, or a five membered aromatic ring with two N, O, S or Se heteroatoms optionally having a benzo or pyrido ring fused thereto selected from imidazolyl, pyrazolyl, benzimidazolyl, oxazolyl, benzoxazolyl, indazolyl, thiazolyl, benzothiazolyl, 3-alkyl-3H-imidazo[4,5b]pyridyl or pyridylimidazolyl, or a five membered saturated ring with one or two N, O, S or Se heteroatoms and an adjacent appended O heteroatom selected from γ-butyrolactam, γ-butyrolactone, imidazolidinone or A-aminoimidazolidinone, or a six membered aromatic ring with one to three N heteroatoms selected from pyridyl, pyridazinyl, pyrazinyl, sym-triazinyl, unsumtriazinyl, pyrimidinyl or $(C_1–C_3)$alkylthiopyridazinyl, or a six membered saturated ring with one or two N, O, S or Se heteroatoms and an adjacent appended O heteroatom selected from 2,3-dioxo-1-piperazinyl, 4-ethyl-2,3-dioxo-1-piperazinyl, 4-methyl-2,3-dioxo-1-piperazinyl, 4-cyclopropyl-2-dioxo-1-piperazinyl, 2-dioxomorpholinyl, 2-dioxothiiomorpholinyl; or —$(CH_2)_m$—$COOR^8$ where m=0–4 and R^8 is selected from hydrogen; straight or branched $(C_1–C_3)$alkyl selected from methyl, ethyl, n-propyl or 1-methylethyl; or $(C_6–C_{10})$aryl selected from phenyl, α-naphthyl or β-naphthyl; with the proviso that R^6 and R^7 cannot both be hydrogen;

or R^6 and R^7 taken together are —$(CH_2)_2B(CH_2)_2$—, wherein B is selected from $(CH_2)_q$ and q=0–1, —HN, —$N(C_1–C_3)$alkyl straight or branched, —$N(C_1–C_4)$alkoxy, oxygen, sulfur or substituted congeners selected from (L or D) proline, ethyl(L or D)prolinate, morpholine, pyrrolidine or piperidine; and the pharmacologically acceptable organic and inorganic salts or metal complexes.

5,466,685

INHIBITION OF EXPRESSION OF BETA-LACTAMASE USING ESTERS OF FATTY ACID ALCOHOLS

Susan Brown-Skrobot, Hamilton, N.J.; Richard P. Novick, and Steven J. Projan, both of New York, N.Y., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed May 13, 1993, Ser. No. 61,222

Int. Cl.[6] A61K *31/43;31/22;31/225;31/20*

U.S. Cl. 514—199 **20 Claims**

1. A method for inhibiting beta-lactamase expression in bacteria, comprising the step of:

exposing said bacteria to a composition comprising an ester formed from a fatty acid and a polyhydric aliphatic alcohol, wherein said ester is supplied in said composition in quantities sufficient to inhibit beta-lactamase expression in said bacteria.

5,466,686

AMIDES OF 4-OXO-AZETIDINE-2-SULFONIC ACIDS AND SALTS THEREOF, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Mice Kovacevic, Slavenskog; Jure J. Herak, Slovenska; Zoru Mandic, Vramceva; Irena Lukic, Veslacka; Mirjana Tomic, Zagreb, and Zinka Brkic, Gajnice, all of, Croatia, assignors to PLIVA and PLIVA Handels GmbH, Germany

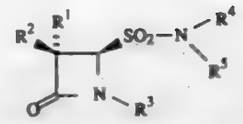
Filed Sep. 3, 1993, Ser. No. 115,538

Claims priority, application Germany, Sep. 8, 1992, 42 30 053.3

Int. Cl.[6] A61K *31/395;* **C07D** *205/095;417/12;413/12*

U.S. Cl. 514—210 **29 Claims**

1. Oxo-azetidine-2-sulfonic acid amides and their salts of formula I



I

selected from the group consisting of compounds wherein R^1 stands for hydrogen, R^2 stands for hydrogen, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_5$, R^4 stands for hydrogen and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for hydrogen, R^2 stands for hydrogen, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_5$, R^4 stands for sodium and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for hydrogen, R^2 stands for hydrogen, R^3 stands for hydrogen, R^4 stands for hydrogen and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for bromine, R^2 stands for hydrogen, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_5$, R^4 stands for hydrogen and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for hydrogen, R^2 stands for bromine, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_5$, R^4 stands for hydrogen and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for bromine, R^2 stands for bromine, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_5$, R^4 stands for hydrogen and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for bromine, R^2 stands for bromine, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_5$, R^4 stands for sodium and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for hydrogen, R^2 stands for hydrogen, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_5$, R^4 stands for hydrogen and R^5 stands for 5-methyl-isoxazol-3-yl;

wherein R^1 stands for bromine, R^2 stands for bromine, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_5$, R^4 stands for hydrogen and R^5 stands for 5-methyl-isoxazol-3-yl;

wherein R^1 stands for hydrogen, R^2 stands for $C_6H_5OCH_2CONH$, R^3 stands for $Me_2C{=}C{-}COOMe$, R^4 stands for hydrogen and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for hydrogen, R^2 stands for $C_6H_5OCH_2CONH$, R^3 stands for $Me_2C{=}C{-}COOMe$, R^4 stands for hydrogen and R^5 stands for 5-methyl-isoxazol-3-yl;

wherein R^1 stands for hydrogen, R^2 stands for phthalimido, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_4NO_2$-p, R^4 stands for hydrogen and R^5 stands for 5-methyl-isoxazol-3-yl;

wherein R^1 stands for hydrogen, R^2 stands for $C_6H_5CH_2CONH$, R^3 stands for hydrogen, R^4 stands for hydrogen and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for hydrogen, R^2 stands for $C_6H_5CH_2CONH$, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_4NO_2$-p, R^4 stands for hydrogen and R^5 stands for 5-methyl-isoxazol-3-yl;

wherein R^1 stands for hydrogen, R^2 stands for $C_6H_5CH_2CONH$, R^3 stands for $Me_2C{=}C{-}COOH$, R^4 stands for hydrogen and R^5 stands for 5-methyl-isoxazol-3-yl;

wherein R^1 stands for hydrogen, R^2 stands for hydrogen, R^3 stands for $Me_2C{=}C{-}COOH$, R^4 stands for hydrogen and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for hydrogen, R^2 stands for 3-o-chlorophenyl-5-methyl-isoxazol-4-yl, R^3 stands for $H_2C{=}C(Me){-}CH{-}COOCH_2C_6H_4Me$-m, R^4 stands for hydrogen and R^5 stands for 5-methyl-isoxazol-3-yl;

wherein R^1 stands for hydrogen, R^2 stands for o-MeNHCOC$_6$H$_4$CONH, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_4NO_2$-p, R^4 stands for hydrogen and R^5 stands for methyl;

wherein R^1 stands for hydrogen, R^2 stands for o-MeNHCOC$_6$H$_4$CONH, R^3 stands for $H_2C{=}C(Me){-}CH{-}COOCH_2C_6H_4NO_2$-p, R^4 stands for hydrogen and R^5 stands for methyl;

wherein R^1 stands for hydrogen, R^2 stands for o-MeNHCOC$_6$H$_4$CONH, R^3 stands for $Me_2C{=}C{-}COOH$, R^4 stands for hydrogen and R^5 stands for methyl;

wherein R^1 stands for hydrogen, R^2 stands for $C_6H_5CH_2CONH$, R^3 stands for $Me_2C{=}C{-}COOH$, R^4 stands for hydrogen and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for hydrogen, R^2 stands for $C_6H_5CH_2CONH$, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_4NO_2$-p, R^4 stands for hydrogen and R^5 stands for $C_6H_5CH_2$;

wherein R^1 stands for hydrogen, R^2 stands for $C_6H_5CH_2CONH$, R^3 stands for $Me_2C{=}C{-}COOCH_2C_6H_4NO_2$-p, R^4 stands for hydrogen and R^5 stands for methyl;

wherein R^1 stands for hydrogen, R^2 stands for $C_6H_5CH_2CONH$, R^3 stands for $Me_2C{=}C{-}COOH$, R^4 stands for hydrogen and R^5 stands for methyl;

wherein R^1 stands for hydrogen, R^2 stands for hydrogen, R^3 stands for $Me_2C{=}C{-}COOH$, R^4 stands for hydrogen and R^5 stands for 5-methyl-isoxazol-3-yl;

wherein R^1 stands for bromine, R^2 stands for bromine, R^3 stands for $Me_2C{=}C{-}COOH$, R^4 stands for hydrogen and R^5 stands for $C_6H_5CH_2$; and

wherein R^1 stands for hydrogen, R^2 stands for $C_6H_5OCH_2CONH$, R^3 stands for $Me_2C{=}C{-}$ COOH, R^4 stands for hydrogen and R^5 stands for 5-methyl-isoxazol-3-yl.

5,466,687

ARYLIDENE-1-AZACYCLOALKANES AND ARYLALKYL-1-AZACYCLO-ALKANES, THEIR SALTS, MEDICAMENTS CONTAINING THESE COMPOUNDS AND THEIR USE, AND PROCESSES FOR THEIR PREPARATION

Roland Maier, Biberach; Peter Müller, Mittelbiberach; Eberhard Woitun, Biberach; Rudolf Hurnaus, Biberach; Michael Mark, Biberach; Bernhard Eisele, Biberach; Ralph-Michael Budzinski, Biberach, and Gerhard Hallermayer, Maselheim-Sulmingen, both of, Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Germany

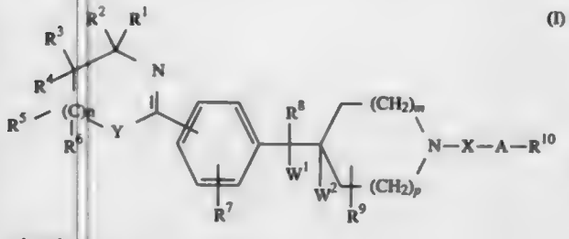
Continuation-in-part of Ser. No. 139,255, Oct. 20, 1993, abandoned. This application Mar. 25, 1994, Ser. No. 218,092

Claims priority, application Germany, Jan. 22, 1992, 42 35 590.7; Feb. 10, 1993, 43 03 840.9

Int. Cl.[6] A61K *31/55;31/54;* **C07D** *405/10;279/06*

U.S. Cl. 514—212 **17 Claims**

1. An arylidene-1-azacycloalkane or arylalkyl-1-azacycloalkane of the formula I



(I)

wherein:

n denotes the numbers 0 or 1;

m denotes the numbers 1 or 2;

p denotes the numbers 0 or 1;

A denotes a single bond, a straight-chained or branched C_{1-17}-alkylene group, a C_{2-17}-alkenylene group or a C_{2-4}-alkynylene group;

W^1 and W^2 each denote a hydrogen atom or together denote a carbon-carbon bond;

X denotes a carbonyl or sulphonyl group;

Y denotes an oxygen or sulphur atom or an $>NR^{11}$ group;

R^1 to R^6 in each case denote a hydrogen atom, or

one, two or three of the groups R^1 to R^6, which groups may be identical or different, denote a straight-chained or branched C_{1-4}-alkyl group which may be substituted by a hydroxy, alkoxy, alkylthio or dialkylamino group or by a phenyl group which is optionally substituted by a halogen atom or an alkyl group, or denote an alkoxycarbonyl group and the remaining groups R^1 to R^6 each denote a hydrogen atom;

whilst one, two or all three of the groups R^1, R^3 and R^5 may also denote a phenyl group which is optionally substituted by an alkyl group or by a halogen atom;

R^7 denotes a hydrogen or halogen atom, or an alkyl or alkoxy group;

R^8 and R^9 independently of one another each denote a hydrogen atom or an alkyl group;

R^{10} denotes a hydrogen atom, a C_{3-6}-cycloalkyl group, a phenyl group optionally substituted by a halogen atom, by a straight-chained or branched C_{1-4}-alkyl group, or by a trifluoromethyl, alkoxy, cyano, nitro, alkylsulphonyl or phenyl group, or R^{10} denotes a phenyl group substituted by two trifluoromethyl groups, by two to five halogen atoms or by a halogen atom and an alkyl group, or R^{10} denotes a naphthyl or tetrahydronaphthyl group optionally substituted by a fluorine atom, or R^{10} denotes a pyridyl group or a thienyl group optionally substituted by a halogen atom or by an alkyl group; and

R^{11} denotes a hydrogen atom or an alkyl group;

whilst A cannot be a single bond if X denotes the sulphonyl group and R^{10} denotes a hydrogen atom, and

wherein, unless otherwise stated, the above mentioned alkyl, alkoxy, alkylthio and alkylsulphonyl groups each contain 1, 2 or 3 carbon atoms and the above mentioned halogen atoms are selected from fluorine, chlorine and bromine,

or a pharmaceutically acceptable salt thereof.

5,466,688

PYRIDO[3,4-B]INDOLE DERIVATIVES AS SEROTONERGIC AGENTS

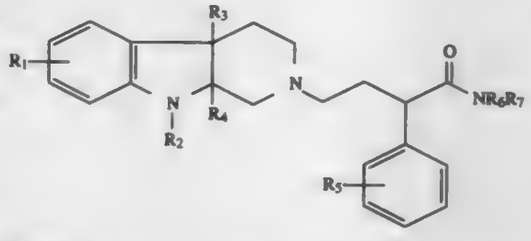
Thomas J. Commons, Wayne; Christa M. LaClair, Newtown, both of Pa., and Susan Christman, Edison, N.J., assignors to American Home Products Corporation, Madison, N.J.

Filed Oct. 20, 1994, Ser. No. 326,435

Int. Cl.[6] A61K *31/445;* **C07D** *471/04;401/14*

U.S. Cl. 514—212 **8 Claims**

1. A compound of the formula:



A

where

R_1 and R_5 are independently hydrogen, fluorine, chlorine, bromine, iodine, trifluoromethyl, cyano, nitro, CO_2H, C_1–C_6 alkyl, C_2–C_{10} alkenyl, C_1–C_5 alkoxy, C_3–C_8 cycloalkyl, cycloalkylalkyl where the alkyl group is of 1 to 6 carbon atoms and the cycloalkyl group has 3 to 8 carbon atoms, C_3–C_8 cycloalkyloxy, C_2–C_7 alkylcarbonyl, C_2–C_7 alkylcarbonyloxy, C_2–C_7 alkoxycarbonyl, mono- or di-alkylaminocarbonyl in which each alkyl group, independently, contains 1 to 6 carbon atoms, tetrazolyl, —OH, $-(CH_2)_{1-6}OH$, —SH, $—NH_2$ or $-(CH_2)_{1-6}NR_8R_9$ where R_8 is hydrogen, C_1–C_6 alkyl, C_2–C_7 alkylcarbonyl, C_2–C_7 alkoxycarbonyl and R_9 is hydrogen or C_1–C_6 alkyl;

R_2 is hydrogen or C_1–C_6 alkyl;

R_3 and R_4 are hydrogen or taken together with the carbon atoms to which they are attached form a double bond;

R_6 and R_7 are independently H, C_1–C_{10} alkyl, C_2–C_{10} alkenyl, C_3–C_8 cycloalkyl, cycloalkylalkyl where the alkyl group is 1 to 6 carbon atoms and the cycloalkyl group is 3 to 8 carbon atoms; or

R_6 and R_7 taken together are polymethylene, which, with the nitrogen atom to which they are attached, form a ring of 3 to 8 atoms; or a pharmaceutically acceptable salt thereof.

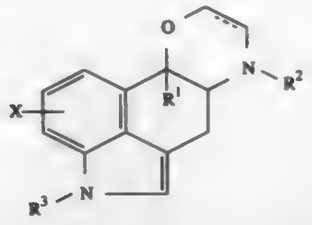
5,466,689

MORPHOLINE DERIVATIVES AND THEIR USE

Mitsuo Yamamoto; Takayuki Doi, both of Osaka, and Kaneyoshi Kato, Hyogo, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Feb. 2, 1994, Ser. No. 190,610
Claims priority, application Japan, Feb. 8, 1993, 5-020340
Int. Cl.[6] A61K *31/535;* C07D *498/06*
U.S. Cl. 514—229.5 11 Claims

1. A compound of the formula



wherein X is hydrogen, lower alkyl, lower alkoxy or halogen; R^1 is (i) residue lower alkyl optionally substituted with halogen, (ii) lower alkenyl, (iii) lower alkynyl or (iv) aryl optionally substituted with lower alkyl, lower alkenyl, lower alkynyl, cycloalkyl, cyano, nitro, sulfonyl, amino, lower monoalkylamino, lower dialkylamino, arylamino, hydroxy, lower alkoxy, halogen, carbamoyl, carboxyl, alkylthio, aralkyl, aryl, lower alkyl carbamoyl, arylcarbamoyl, acyl, methylenedioxy, or heterocyclic ring; R^2 is hydrogen or lower alkyl optionally substituted by halogen, aryl, cycloalkyl, heterocyclic ring, aralkyl or acyl, wherein the aryl and heterocyclic ring may be substituted on the lower alkyl through an oxygen, sulfur or nitrogen atom; R^3 is hydrogen, lower alkyl optionally substituted by halogen, or arylsulfonyl optionally substituted by lower alkyl; and —— shows a single bond or a double bond, or a pharmacologically acceptable acid addition salt thereof.

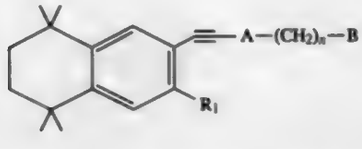
5,466,690

ACETYLENES DISUBSTITUTED WITH A HETEROAROMATIC GROUP AND A TETRALIN GROUP AND HAVING RETINOID LIKE ACTIVITY

Roshantha A. S. Chandraratna, Mission Viejo, Calif., assignor to Allergan, Inc., Irvine, Calif.

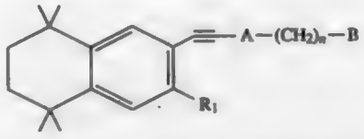
Division of Ser. No. 84,843, Jun. 29, 1993, Pat. No. 5,354,776, which is a division of Ser. No. 947,681, Sep. 21, 1992, Pat. No. 5,246,962, which is a division of Ser. No. 25,434, Mar. 13, 1987, Pat. No. 5,149,705. This application Jul. 18, 1994, Ser. No. 276,385
Int. Cl.[6] C07D *239/26;239/28;237/08;233/06;241/12;* A61K *31/415*
U.S. Cl. 514—247 6 Claims

1. A compound of the formula



where R is hydrogen or lower alkyl; A is pyridazinyl, pyrimidinyl, or pyrazinyl; n is 0–5; and B is H, —COOH or a pharmaceutically acceptable salt, or ester of saturated aliphatic alcohols of ten or fewer carbon atoms, or the cyclic or saturated aliphatic cyclic alcohols of 5 to 10 carbon atoms, or phenol, or amide or mono- or disubstituted amide of saturated aliphatic amines of 10 or fewer carbon atoms, or the cyclic or saturated aliphatic cyclic radicals of 5 to 10 carbon atoms thereof, —CH_2OH or a lower alkyl ether or ester of saturated aliphatic acids of ten or fewer carbon atoms or the cyclic or saturated aliphatic cyclic acids of 5 to 10 carbon atoms, or benzoic acid thereof, or —CHO or a lower alkyl acetal derivative thereof, or —COR_1 or a lower alkyl ketal derivative thereof where R_1 is $(CH_2)_mCH_3$ where m is 0–4; or a pharmaceutically acceptable salt thereof.

6. A method of treating psoriasis in a mammal which method comprises administering alone or in conjunction with a pharmaceutically acceptable excipient, a therapeutically effective amount of a compound of the formula



where R is hydrogen or lower alkyl; A is pyridazinyl, pyrimidinyl, or pyrazinyl; n is 0–5; and B is H, —COOH or a pharmaceutically acceptable salt, or ester of saturated aliphatic alcohols of ten or fewer carbon atoms, or the cyclic or saturated aliphatic cyclic alcohols of 5 to 10 carbon atoms, or phenol, or amide or mono- or disubstituted amide of saturated aliphatic amines of 10 or fewer carbon atoms, or the cyclic or saturated aliphatic cyclic radicals of 5 to 10 carbon atoms thereof, —CH_2OH or a lower alkyl ether or ester of saturated aliphatic acids of ten or fewer carbon atoms or the cyclic or saturated aliphatic cyclic acids of 5 to 10 carbon atoms, or benzoic acid thereof, or —CHO or a lower alkyl acetal derivative thereof, or —COR_1 or a lower alkyl ketal derivative thereof where R_1 is $(CH_2)_mCH_3$ where m is 0–4; or a pharmaceutically acceptable salt thereof.

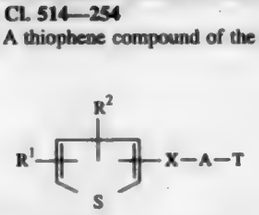
5,466,691

THIOPHENE COMPOUND

Tohru Nakao; Ono Yuji; Tanaka Hiroshi; Obata Minoru, all of Fukuoka, and Morimoto Yasuto, Osaka, all of, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP92/01002, § 371 Date Mar. 30, 1993, § 102(e) Date Mar. 30, 1993, PCT Pub. No. WO93/03025, PCT Pub. Date Feb. 18, 1993
PCT Filed Aug. 5, 1992, Ser. No. 39,100
Claims priority, application Japan, Aug. 9, 1991, 3-225230; Jan. 23, 1992, 4-032611
Int. Cl.[6] C07D *409/00;419/00;411/00;* A61K *31/495;31/445*
U.S. Cl. 514—254 9 Claims

1. A thiophene compound of the formula



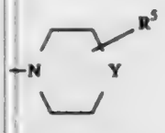
(I)

wherein
R^1 and R^2 are the same or different and each
(1) hydrogen,
(2) halogen,
(3) nitro,
(4) amino,
(5) cyano,
(6) alkyl of 1 to 8 carbon atoms,
(7) mono- or di-alkylamino wherein the alkyl moiety is of 1 to 4 carbon atoms,
(8) formyl,
(9) -$COOR^3$ wherein R^3 is hydrogen, alkyl of 1 to 8 carbon atoms or an ester residue hydrolyzable in the body,
(10) alkoxy of 1 to 8 carbon atoms,
(11) hydroxyalkyl of 1 to 4 carbon atoms,
(12) haloalkyl of 1 to 4 carbon atoms,
(13) haloalkoxy of 1 to 4 carbon atoms,
(14) alkanoyl of 2 to 5 carbon atoms,

(15) benzoyl,
(16) naphthoyl,
(17) phenylalkanoyl wherein the alkanoyl moiety has 2 to 5 carbon atoms,
(18) alkanoyloxyalkyl wherein the alkanoyl moiety has 1 to 5 carbon atoms and the alkyl moiety has 1 to 4 carbon atoms,
(19) benzoyloxyalkyl wherein the alkyl moiety has 1 to 4 carbon atoms,
(20) formylamino,
(21) alkanoylamino having 2 to 5 carbon atoms,
(22) phenylalkanoylamino wherein the alkanoyl moiety has 2 to 5 carbon atoms,
(23) benzoylamino,
(24) naphthoylamino,
(25) formylaminoalkyl wherein the alkyl moiety has 1 to 4 carbon atoms,
(26) alkanoylaminoalkyl wherein the alkanoyl moiety has 2 to 5 carbon atoms and the alkyl moiety has 1 to 4 carbon atoms,
(27) haloalkanoylaminoalkyl wherein the alkanoyl moiety has 2 to 5 carbon atoms and the alkyl moiety has 1 to 4 carbon atoms,
(28) phenylalkanoylaminoalkyl wherein the alkanoyl moiety has 2 to 5 carbon atoms and the alkyl moiety has 1 to 4 carbon atoms,
(29) benzoylaminoalkyl wherein the alkyl moiety has 1 to 4 carbon atoms,
(30) phenylalkyl wherein the alkyl moiety has 1 to 6 carbon atoms,
(31) carbamoyl,
(32) carbamoyl mono- or di-substituted by alkyl of 1 to 4 carbon atoms, cyclohexyl, phenyl or benzyl,
(33) carbamoylalkyl wherein the alkyl moiety has 1 to 4 carbon atoms,
(34) carbamoylalkyl mono- or di-substituted by alkyl of 1 to 4 carbon atoms or benzyl and the alkyl moiety having 1 to 4 carbon atoms,
(35) aminoalkyl wherein the alkyl moiety has 1 to 4 carbon atoms,
(36) aminoalkyl mono- or di-substituted by alkyl of 1 to 4 carbon atoms and the alkyl moiety having 1 to 4 carbon atoms,
(37) alkylsulfonylaminoalkyl wherein the alkyl moieties respectively have 1 to 4 carbon atoms,
(38) hydroxyiminoalkyl wherein the alkyl moiety has 1 to 4 carbon atoms, or
(39) alkoxyiminoalkyl wherein the alkoxy and alkyl moieties respectively have 1 to 4 carbon atoms;

X is (1) -S $(O)_n$- wherein n is 0, 1 or 2,
(2) -CO-,
(3) -CH(OR^{10})- wherein R^{10} is hydrogen, alkyl of 1 to 8 carbon atoms, alkanoyl of 2 to 5 carbon atoms or benzoyl, or
(4) -CH_2-;

A is alkylene of 1 to 10 carbon atoms; and
T is



wherein
R^5 is hydrogen, and
Y is (a) C(R^6) (R^7) wherein
R^6 is hydrogen, and
R^7 is 1,2-benzisothiazol or 1,2-benzisoxazol which groups are unsubstituted or are substituted by 1 to 3 substituents selected from the group consisting of halogen, nitro, amino, cyano, haloalkyl of 1 to 4 carbon atoms, hydroxy, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms and phenyl, or R^6 and R^7 taken together form
(1) diphenylmethylene,
(2) bis(4-fluorophenyl)methylene, or
(3) bis (4-chlorophenyl)-methylene, or
(b) N-R^8 wherein R^8 is phenyl, pyrimidinyl, 1,2-benzisothiazol or 1,2-benzisoxazol which groups are unsubstituted or are substituted by 1 to 3 substituents selected from the group consisting of halogen, nitro, amino, cyano, haloalkyl of 1 to 4 carbon atoms, hydroxy, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms and phenyl;

with the proviso that when
X is -CO-, -CH (OR^{10}) -, -CH_2-, -C(=NOR^{11}) - or -CH(NH_2)
wherein R^{10} and R^{11} are as defined above, and
Y is one of the following
(i) C (R^6) (R^7) wherein R^6 and R^7 together form diphenylmethylene, bis (4-f luorophenyl)methylene or bis (4 -chlorophenyl)methylene, or
(ii) N-R^8 wherein R^8 is phenyl which is unsubstituted or is substituted by 1 to 3 substituents selected from the group consisting of halogen, nitro, amino, cyano, haloalkyl of 1 to 4 carbon atoms, hydroxy, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, and phenyl

then, in such case, at least one of R^1 and R^2 is a group other than hydrogen, halogen, nitro, alkyl of 1 to 8 carbon atoms and alkoxy of 1 to 8 carbon atoms,
or a pharmaceutically acceptable salt of said thiophene compound.

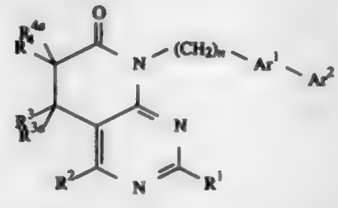
5,466,692

SUBSTITUTED PYRIDOPYRIMIDINES AND ANTIHYPERTENSIVES

John W. Ellingboe, Princeton, N.J., assignor to American Home Products Corporation, Madison, N.J.

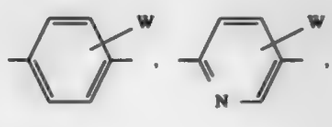
Continuation-in-part of Ser. No. 36,615, Mar. 24, 1993, abandoned. This application Jan. 10, 1994, Ser. No. 179,461
Int. Cl.[6] A61K *31/505;33/24;* **C07D** *471/04;* **C07F** *7/22*
U.S. Cl. 514—258 **15 Claims**

1. A compound of formula I



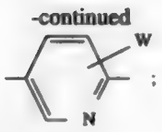
I

wherein
n is 0to 3;
R^1 and R^2 are, independently, H, C_1–C_6alkyl, hydroxy C_1–C_6alkyl, formyl, C_1–C_6alkylcarbonyl, carboxy, or carboxyC_1–C_6alkyl;
R^3 and R^4 are, independently, H, C_1–C_6alkyl, or hydroxy;
R^{3a} and R^{4a} are H, or one of —CR^3R^{3a} and —CR^4R^{4a} is a carbonyl group;
with the proviso that at least one of the groups R^1 and R^2 must be hydroxyC_1–C_6alkyl, formyl, C_1–C_6alkylcarbonyl, carboxy, or carboxyC_1–C^6alkyl; or one of R_3 and R^4 must be hydroxy; or one of —CR^3R^{3a} and —CR^4 R^{4a} must be a carbonyl group;
Ar^1 is



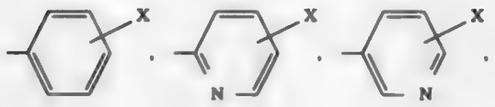
or

-continued

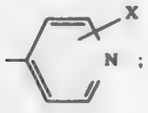


wherein W is H, C_1–C_6alkyl, halogen, hydroxy, or C_1–C_6alkoxy;

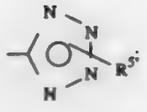
Ar^2 is



or



wherein X is



wherein R^5 is H, CH_3, tert-butyl, tri-n-butylstannyl, or triphenylmethyl; or a tautomer of said compound,

or a pharmaceutically acceptable salt of said compound or tautomer.

5,466,693

GRANULAR FUNGICIDAL COMPOSITION FOR APPLICATION TO AN AQUATIC ENVIRONMENT

Roger P. Warrington, Wokingham; Guy Ramsay, Bracknell, both of, England, and Neal R. Bird, Richmond, Calif., assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 570,588, Aug. 21, 1990, abandoned. This application Sep. 23, 1993, Ser. No. 125,702

Claims priority, application United Kingdom, Sep. 1, 1989, 8919833; Apr. 9, 1990, 9007995

Int. Cl.[5] A01N *43/54;25/12;25/14*

U.S. Cl. 514—269 **7 Claims**

1. A granular fungicidal composition for application to an aquatic environment, the composition comprising a solid carrier, methyl (E)-2-[2-[6-(2 -cyanophenoxy)pyrimidin-4-yloxylphenyl]-3-methoxyacrylate as a fungicidal active ingredient, and an oil with which the said active ingredient is miscible or in which it is capable of being dispersed, said oil being water-immiscible, having a specific gravity of less than 1 and a boiling point at atmospheric pressure of greater than 150° C., and the oil comprises one or more of a straight or branched chain, saturated or unsaturated C_{8-18} alcohol or a lower alkyl ester of a straight or branched chain, saturated or unsaturated C_{8-18} monocarboxylic acid.

5,466,694

COMPOSITIONS FOR SLOWING DOWN HAIR LOSS AND FOR INDUCING AND STIMULATING ITS GROWTH, BASED ON 2,4-DIAMINO-PYRIMIDINE 3-OXIDE DERIVATIVES, AND NEW 2,4-DIAMINOPYRIMIDINE 3-OXIDE DERIVATIVES

Eric Terranova, Asnières; Jean B. Galey; Michel Hocquaux, both of Paris; Jean Maignan, Tremblay-les-Gonesse, and Rémy Tuloup, Miniac-sous-Bécheral, all of, France, assignors to L'Oreal, Paris, France

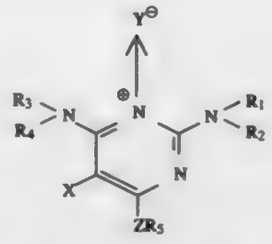
Filed Jul. 13, 1992, Ser. No. 912,512

Claims priority, application France, Jul. 11, 1991, 91 08764

Int. Cl.[6] A61K *9/10;9/06*

U.S. Cl. 514—272 **16 Claims**

1. A composition for slowing down hair loss and for inducing and stimulating its growth, which comprises, in a physiologically acceptable medium, between 0.1 and 10% by weight relative to the total weight of the composition of at least one compound corresponding to the following formula:



(I)

in which:

R_1 and R_3 denote a hydrogen atom;

R_2 and R_4, which are identical or different, represent a hydrogen atom or a C_1–C_4 alkyl group;

R_5 denotes a hydrogen atom, a C_1–C_{12} alkyl radical, a C_3–C_{12} alkenyl radical, a C_3–C_8 cycloalkyl radical, an aryl radical, an arylalkyl radical or a hydroxyalkyl or aminoalkyl radical in which the alkyl radical has 1 to 6 carbon atoms;

X denotes a hydrogen atom, a halogen atom, a C_1–C_6 alkyl radical, a nitro group, a benzoyloxy group or a group —NHR_6 in which R_6 denotes a hydrogen atom, an acyl radical or a C_1–C_6 alkyl radical;

Z denotes sulfur or oxygen, with the proviso that Z denotes sulfur when X denotes hydrogen or when R_5 denotes an aryl radical;

Y denotes oxygen or OSO_3; as well as its addition salts with physiologically acceptable acids.

5,466,695

METHOD FOR STIMULATING HAIR GROWTH WITH CATIONIC DERIVATIVE OF MINOXIDIL USING THERAPEUTIC IONTOPHORESIS

Charles W. Poulos, Claremore; George M. Brenner, Jenks; Loyd V. Allen, Jr., Midwest City; Vilas A. Prabhu, and Pedro L. Huerta, Jr., both of Weatherford, all of Okla., assignors to Tulsa Forte Pharmacy Enterprises, Inc., Tulsa, Okla.

Continuation of Ser. No. 15,396, Feb. 9, 1993, abandoned. This application Jul. 11, 1994, Ser. No. 272,880

Int. Cl.[6] A61K *31/505*

U.S. Cl. 514—275 **15 Claims**

9. A method of promoting mammalian hair growth comprising the steps of applying to a treatment area a cationic derivative of Minoxidil in pharmaceutically effective solutions, said cationic derivative of Minoxidil formed by mixing solutions of Minoxidil with an organic acid selected from the group consisting of:

(R-(R*,R*))-2,3-dihydroxybutanedioic acid (also known as d-tartaric acid);

2,4,6(1H,3H,5H)-pyrimidinetrione (also known as barbituric acid);

3,4-dihydroxybenzoic acid (also known as protocatechuic acid);

2,3,4-trihydroxybenzoic acid;

3,4,5-trihydroxybenzoic acid (also known as gallic acid);

5-nitro-2-furoic acid; and

5,5-dimethyloxazolidine-2-4-dione (also known as dimethadione); and

applying said solution to the treatment area electrical current to create iontophoresis and thereby transport Minoxidil molecules to hair follicles.

5,466,696

TACRINE AND CYTOCHROME P450 OXIDASE INHIBITORS AND METHODS OF USE

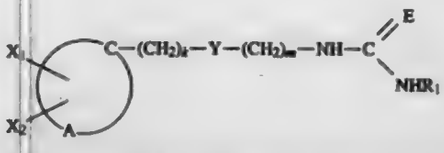
Thomas F. Woolf, Dexter, Mich., assignor to Warner Lambert Company, Morristown, N.J.

Continuation-in-part of Ser. No. 943,323, Sep. 10, 1992, Pat. No. 5,422,350. This application Aug. 9, 1993, Ser. No. 100,917

Int. Cl.[6] A61K *31/44;31/415;31/505;31/495*

U.S. Cl. 514—297 **27 Claims**

1. A composition comprising tacrine and an effective oxidase inhibiting amount of a P450 1A2 inhibitor of Formula 8,



(II)

wherein A is such that there is formed together with the carbon atom shown an unsaturated heterocyclic nucleus, which comprises at least one nitrogen and may comprise a further hetero atom such as sulphur and oxygen, said unsaturated heterocyclic nucleus, being an imidazole, pyrazole, pyrimidine, pyrazine, pyridazine, thiazole, isothiazole, oxazole, isoxazole, triazole, thiadiazole, benzimidazole or 5,6,7,8-tetrahydroimidazo[1,5-a]pyridine ring; X_1 is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or

X_2 is hydrogen or when X_1 is lower alkyl, lower alkyl or halogen; k is 0 to 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is oxygen, sulphur or NH; E is NR_2; R_1 is hydrogen, lower alkyl or di-lower alkylamino-lower alkyl; and R_2 is hydrogen, nitro or cyano or a pharmaceutically acceptable addition salt thereof.

5,466,697

8-PHENYL-1,6-NAPHTHYRIDIN-5-ONES

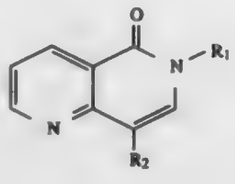
Robert S. Wilhelm, Mountain View, and Bradley E. Loe, Santa Cruz, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 13, 1994, Ser. No. 274,615

Int. Cl.[6] A61K *31/435;* C07D *471/04*

U.S. Cl. 514—300 **29 Claims**

1. A compound of the formula



wherein:

R_1 is hydrogen, alkyl, lower-alkyl, cycloalkyl, heteroalkyl, heterocycloalkyl, aryl, heteroaryl, cycloalkyl lower-alkyl, heterocycloalkyl lower-alkyl, aralkyl or heteroaralkyl; and

R_2 is aryl; or a pharmaceutically acceptable salt or N-oxide thereof.

5,466,698

SUBSTITUTED TETRAHYDROPHYRIDINES AND HYDROXYPIPERIDINES AS CENTRAL NERVOUS SYSTEM AGENTS

Shelly Glase, Ann Arbor; Juan C. Jaen, Plymouth, both of Mich.; Sarah J. Smith, Boulder, Colo., and Lawrence D. Wise, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 778,248, Oct. 24, 1991, Pat. No. 5,273,977, which is a continuation-in-part of Ser. No. 609,274, Nov. 5, 1990, abandoned. This application Sep. 29, 1993, Ser. No. 128,923

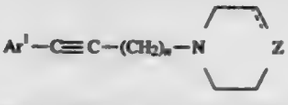
The portion of the term of this patent subsequent to Dec. 28, 2010, has been disclaimed.

Int. Cl.[6] C07D *211/74;211/22;* A61K *31/44;31/445*

U.S. Cl. 514—318 **7 Claims**

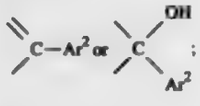
1. A compound of Formula I:

wherein the dotted line represents a single or double bond;



I

wherein n is an integer of 2, 3, or 4; Z is



Ar^2 is

aryl, or

aryl substituted by one to four substituents selected from the group consisting of

lower alkyl,

lower alkoxy,

lower thioalkoxy,

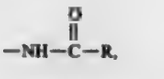
hydroxy,

lower acyloxy,

amino,

lower alkyl amino,

nitro,



wherein R is aryl, lower alkyl, trifluoromethyl or a —NH—SO_2R, wherein R is as defined above or —N—$(SO_2R)_2$, wherein R is as defined above;

Ar^1 is 2-, 3-, or 4-pyridinyl, or

2-, 3-, or 4-pyridinyl substituted by

halogen,

lower alkyl,

lower alkoxy,

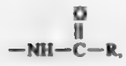
hydroxy,

lower acyloxy,

amino,

lower alkyl amino,

nitro,



wherein R is as defined above,
—N—$(SO_2R)_2$, wherein R is as defined above, or
—NH—SO_2R, wherein R is as defined above
or a pharmaceutically acceptable acid addition salt thereof.

5,466,699

INDOLYL COMPOUNDS FOR TREATING MIGRAINE

Alan D. Robertson; Alan P. Hill; Robert C. Glen, and Graeme R. Martin, all of Beckenham, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 838,233, Mar. 3, 1992, Pat. No. 5,399,574. This application Dec. 5, 1994, Ser. No. 341,206

Claims priority, application United Kingdom, Jun. 7, 1990, 9012672; Feb. 1, 1991, 9102182

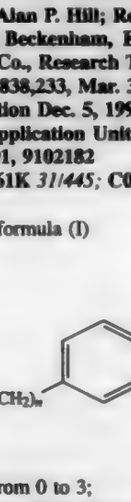
Int. Cl.[6] A61K *31/445;* **C07D** *401/14;403/14*

U.S. Cl. 514—323 **11 Claims**

1. A compound of formula (I)

(I)

wherein
n is an integer of from 0 to 3;
W is a group of formula (i), (ii), or (iii)

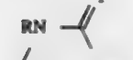


(i)

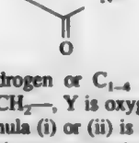
(ii)

(iii)

wherein R is hydrogen or C_{1-4} alkyl, X is —O—, —S—, —NH—, or —CH_2—, Y is oxygen or sulphur and the chiral center * in formula (i) or (ii) is in its (S) or (R) form or is a mixture thereof in any proportions; and
Z is a group of formula (iv) or (vi)



(iv)



(vi)

wherein R^1 and R^2 are independently selected from hydrogen and C_{1-4} alkyl and R^3 is hydrogen or C_{1-4} alkyl; or a physiologically acceptable salt or solvate thereof.

5,466,700

ANESTHETIC USE OF N-PHENYL-N-(4-PIPERIDINYL)AMIDES

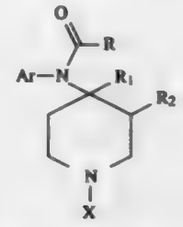
Randal L. Batenhorst, and Anthony W. Fox, both of Raleigh, N.C., assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

Filed Aug. 30, 1993, Ser. No. 114,032

Int. Cl.[6] A61K *31/445;31/55;31/08*

U.S. Cl. 514—329 **27 Claims**

1. A method for providing anesthesia in a mammal comprising administering to such mammal a compound having the Formula (I):



(I)

wherein X is a member selected from the group consisting of alkoxycarbonyl-lower alkyl, lower alkyl-carbonyloxy-lower alkyl, alkenyloxycarbonyl-lower alkyl, and (C_{1-2})alkoxy-(C_{1-2})alkoxycarbonyl-lower alkyl; Ar is a member selected from the group consisting of phenyl and mono-,di- and tri-substituted phenyl, wherein each substituent is independently selected from the group consisting of halo, lower alkyl, lower alkoxy and trifluoromethyl; R is a member selected from the group consisting of lower alkyl and lower alkoxy-lower alkyl; R^1 is a member selected from the group consisting of hydrogen and lower alkoxycarbonyl; and R^2 is a member selected from the group consisting of hydrogen and methyl; and the optically active and cis-trans isomers thereof and the acid addition salts thereof; said compound being administered to said mammal in an amount in excess of an amount effective for analgesia in order to induce or maintain anesthesia.

5,466,701

SACCHARIN DERIVATIVE PROTEOLYTIC ENZYME INHIBITORS

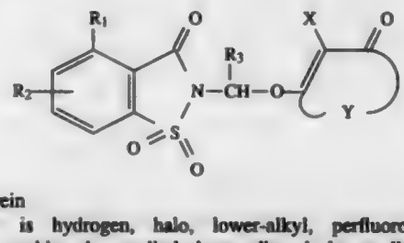
Dennis J. Hlasta, Lower Salford Township, Montgomery County, Pa.; James H. Ackerman, Albany; Albert J. Mura, Rochester, both of N.Y., and Ranjit C. Desai, Towamencin Township, Montgomery County, Pa., assignors to Sterling Winthrop Inc., New York, N.Y.

Division of Ser. No. 66,805, May 25, 1993, Pat. No. 5,378,720, which is a continuation-in-part of Ser. No. 810,265, Dec. 19, 1991, abandoned. This application Jun. 22, 1994, Ser. No. 263,643

Int. Cl.[6] A61K *31/425;* **C07D** *275/06;213/16;239/70*

U.S. Cl. 514—373 **47 Claims**

1. A compound having the structural formula:



Formula I

wherein
R_1 is hydrogen, halo, lower-alkyl, perfluoro-lower-alkyl, perchloro-lower-alkyl, lower-alkenyl, lower-alkynyl, cyano, amino, lower-alkylamino, di-lower-alkylamino, lower-alkoxy, benzyloxy, lower-alkoxycarbonyl or phenyl; and
R_2 is from one to three substituents at any or all of the 5-, 6- and 7-positions and is selected from the group consisting of

hydrogen, lower-alkyl, cycloalkyl, amino-lower-alkyl, lower-alkylamino-lower-alkyl, di-lower-alkylamino-lower-alkyl, hydroxy-lower-alkyl, lower-alkoxy-lower-alkyl, perfluoro-lower-alkyl, perchloro-lower-alkyl, formyl, cyano, carboxy, aminocarbonyl, R-oxycarbonyl, B=N, 1-lower-alkyl-2-pyrrolyl, lower-alkylsulfonylamino, perfluoro-lower-alkylsulfonylamino, perchloro-lower-alkylsulfonylamino, nitro, hydroxy, R-carbonyloxy, lower-alkoxy, cycloalkoxy, B=N-lower-alkoxy, hydroxy-lower-alkoxy, poly-hydroxy-lower-alkoxy or acetal or ketal thereof, lower-alkoxy-lower-alkoxy, poly-lower-alkoxy-lower-alkoxy, hydroxy-poly-lower-alkylenoxy, lower-alkoxy-poly-lower-alkylenoxy, B=N-carbonyloxy, carboxy-lower-alkoxy, R-oxycarbonyl-lower-alkoxy, methylenedioxy, di-lower-alkylphosphonyloxy, R-thio, R-sulfinyl, R-sulfonyl, perfluoro-lower-alkylsulfonyl, perchloro-lower-alkylsulfonyl, aminosulfonyl, lower-alkylaminosulfonyl, di-lower-alkylaminosulfonyl, halo, B=N—$(CH_2)_p$C(O)O$(CH_2)_{p'}$—O—, —O—$(CH_2)_p$—(5-($(CH_2)_{p'}$—B=N—2-furanyl), and R-oxylower-alkoxy wherein p and p' are integers from 1 to 4, R is lower-alkyl, phenyl or phenyl-lower-alkyl, phenyl can have from one to three substituents selected from the group consisting of lower-alkyl, B=N-carbonyl, B=N, lower-alkoxy, B=N-lower-alkoxy and halo and B=N is amino, lower-alkylamino, di-lower-alkylamino, carboxy-lower-alkylamino, 1-pyrrolidinyl, 1-piperidinyl, 1-azetidinyl, 4-morpholinyl, 1-piperazinyl, 4-lower-alkyl-1-piperazinyl, 4-benzyl-1-piperazinyl or 1-imidazolyl;

R_3 is hydrogen, lower-alkyl or phenyl;

X is hydrogen, nitro, halo, lower-alkyl, perfluoro-lower-alkyl, perchloro-lower-alkyl, phenyl, phenyl-lower-alkyl, phenylcarbonyl, pyridyl-lower-alkyl, formyl, lower-alkanoyl, carboxy, lower-alkoxycarbonyl, aminocarbonyl, lower-alkylaminocarbonyl, di-lower-alkylaminocarbonyl, cyano, B=N, B=N-lower-alkyl, B=N-lower-alkanoyl, B=N-lower-alkoxycarbonyl, hydroxy, lower-alkoxy, phenyloxy, B=N-lower-alkoxy, lower-alkylthio, phenylthio, lower-alkylsulfonyl, phenylsulfonyl or B=N-sulfonyl wherein phenyl is unsubstituted or has from one to three substituents selected from the group consisting of lower-alkyl, lower-alkoxy and halo and B=N is amino, lower-alkylamino, di-lower-alkylamino, carboxy-lower-alkylamino, 1-pyrrolidinyl, 1-piperidinyl, 1-azetidinyl, 4-morpholinyl, 1-piperazinyl, 4-lower-alkyl-1-piperazinyl, 4-benzyl-1-piperazinyl or 1-imidazolyl; and

—Y— is the remaining atoms of a 5- or 6-membered monocyclic or 9- or 10-membered bicyclic, substituted or unsubstituted nitrogen containing heterocyclic ring system;

or a pharmaceutically acceptable acid addition salt thereof if the compound has a basic functional group or a pharmaceutically acceptable base addition salt thereof if the compound has an acidic functional group.

5,466,702

ANTI-NEOPLASTIC, ANTI-VIRAL AND RIBONUCLEOTIDE REDUCTASE ACTIVITY AFFECTING PHARMACEUTICAL COMPOSITIONS AND METHODS OF TREATMENT

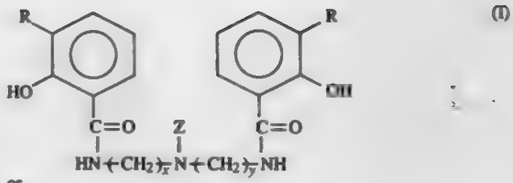
Raymond J. Bergeron, Gainesville, Fla., assignor to University of Florida Research Foundation, Inc., Gainesville, Fla.

Division of Ser. No. 124,557, Sep. 22, 1993, which is a division of Ser. No. 993,620, Dec. 21, 1992, Pat. No. 5,292,775, which is a division of Ser. No. 645,644, Jan. 25, 1991, Pat. No. 5,173,505, which is a division of Ser. No. 313,734, Feb. 22, 1989, Pat. No. 5,128,353, which is a continuation-in-part of Ser. No. 746,672, Jun. 20, 1985, abandoned. This application Sep. 2, 1994, Ser. No. 299,126

Int. Cl.[6] A01N *43/76;* A61K *31/42*

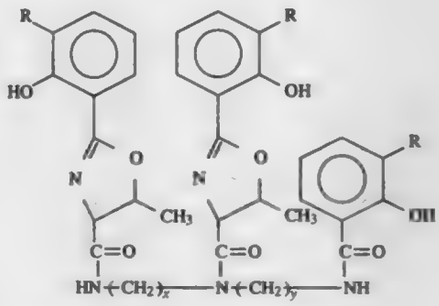
U.S. Cl. 514—374 **10 Claims**

1. A method for treating a human or non-human animal afflicted with malignant cells comprising administering thereto an antineoplastic effective amount of a compound of the formula:

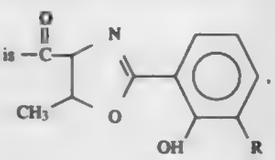


(I)

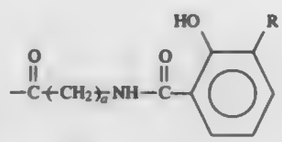
or



Wherein: Z is



or



R is H or OH,

x is 3 or 4,

y is 3 or 4, and

a is 1, 2 or 3, or excluding parabactin

a pharmaceutically acceptable salt or complex thereof.

5,466,703

INSECTICIDAL AND MITICIDAL COMPOSITION

Kichizo Kudoh; Yasuo Kikuchi; Tatsuya Ishida; Tatsufumi Ikeda, all of Nagano, and Hiroaki Fujimoto, Toyonaka, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sep. 22, 1994, Ser. No. 310,326

Claims priority, application Japan, Sep. 22, 1993, 5-257495

Int. Cl.[6] A01N *37/34;43/76;53/00*

U.S. Cl. 514—374 **11 Claims**

1. An insecticidal and miticidal composition comprising, synergistic effective amounts of 2-(2,6-difluorophenyl)- 4-(2-ethoxy-4-tertiarybutylphenyl)-2-oxazoline and at least one pyrethroid compound selected from the following compound group consisting of

(1) cyano(3-phenoxyphenyl)methyl 2,2-dimethyl-3-[3-oxo-3-{2,2,2-trifluoro-1-(trifluoromethyl)ethoxy}-1-propenyl] cyclopropanecarboxylate,

(2) α-cyano-3-phenoxybenzyl 2,2,3,3-tetramethylcyclopropanecarboxylate,

(3) α-cyano-3-phenoxybenzyl N-(2-chloro-α,α,α-trifluoro-p-tolyl) valinate, and

(4) 2-methylbiphenyl-3-ylmethyl 3-(2-chloro-3,3,3-trifluoroprop-1-enyl)-2,2-dimethylcyclopropanecarboxylate wherein 0.01–30 parts by weight of the pyrethroid compound is mixed with 1 part of the oxazoline compound.

5,466,704

N-SUBSTITUTED IMIDAZOLE AND BENZIMIDAZOLE DERIVATIVES USEFUL AS ANGIOTENSON II ANTAGONISTS

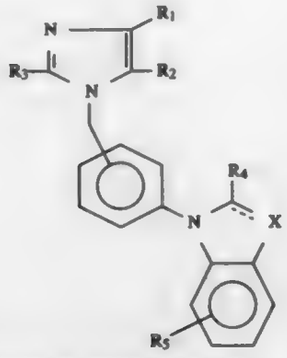
Michael A. Puss, Lawrenceville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 847,381, Mar. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 661,288, Feb. 16, 1991, abandoned. This application Jun. 22, 1994, Ser. No. 263,582

Int. Cl.[6] A61K *3/41;31/415;31/50;* C07D *487/04;471/04;497/12*

U.S. Cl. 514—381 12 Claims

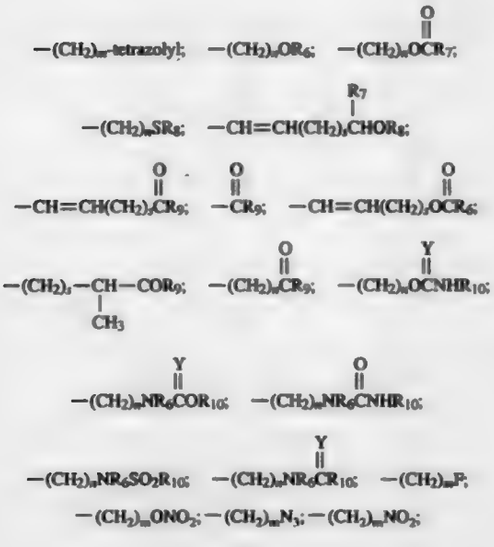
1. A compound of the formula



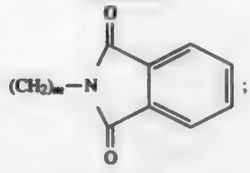
I

pharmaceutically acceptable salt thereof;
where X is —N— or

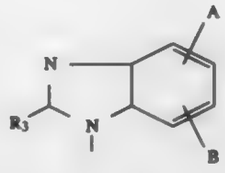
when X=N, the double bond is always present;
R_1 is hydrogen, halogen, $—NO_2$, $—CF_3$ or —CN;
R_2 is H, CN, alkyl of 1 to 10 carbon atoms, alkenyl of 3 to 10 carbon atoms, or the same groups substituted with F; phenylalkenyl wherein the aliphatic portion is 2 to 6 carbon atoms; $—(CH_2)_m$-imidazol-1-yl; $—(CH_2)_m$-1,2,3-triazolyl unsubstituted or substituted with one or two groups selected from $COOR_7$ or alkyl of 1 to 4 carbon atoms;



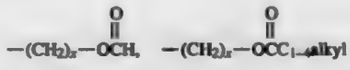
-continued



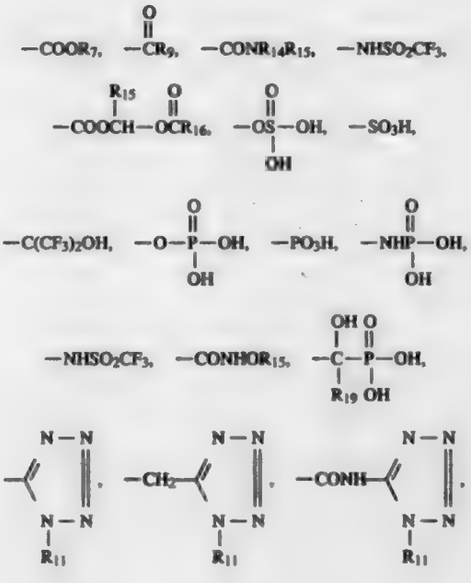
or R_1 and R_2 taken together with the carbon atoms of the imidazole nucleus to which they are attached form a benzimidazole shown as



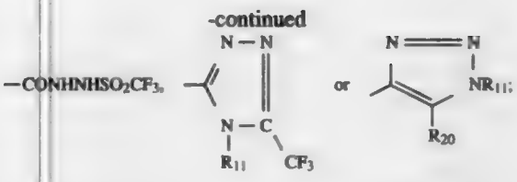
wherein A is hydrogen, alkyl, C_xF_{2x+1}, C_6F_5, halogen, C_{1-6}alkoxy, $—(CH_2)_xOH$, $—(CH_2)_{x—OC1-4}$alkyl,

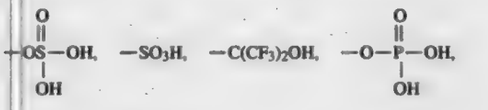


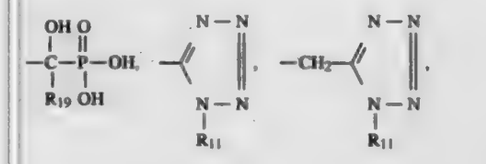
or —COR_9 and B is hydrogen, alkyl, C_xF_{2x+1}, C_6F_5, halogen or C_{1-6}alkoxy;
R_3 is alkyl of 2 to 10 carbon atoms, alkenyl or alkynyl of 3 to 10 carbon atoms or the same groups substituted with F or CO_2R_7; cycloalkyl of 3 to 8 carbon atoms, cycloalkylalkyl of 4 to 10 carbon atoms; cycloalkylalkenyl or cycloalkylalkynyl of 5 to 10 carbon atoms; $—(CH_2)_xZ(CH_2)_mR'$ (wherein R' is H, C_{1-6}alkyl, C_{3-6}cycloalkyl, C_{2-4}alkenyl or C_{2-4}alkynyl) unsubstituted or substituted with F or CO_2R_7; benzyl or benzyl substituted on the phenyl ring with 1 or 2 halogens, alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms or nitro;
R_4 and R_4' are independently selected from hydrogen, alkyl, aryl, cycloalkyl, aralkyl,



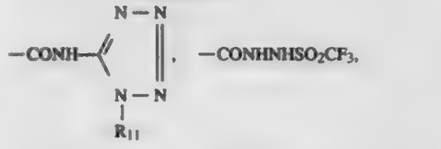
-continued

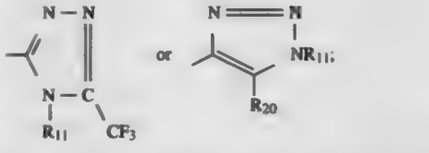






-continued





R_6 is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyl;

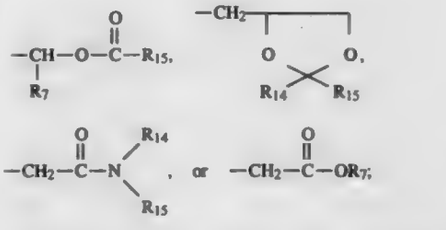
R_7 is H, alkyl or perfluoroalkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl or benzyl;

R_8 is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, benzyl, acyl of 1 to 4 carbon atoms, phenacyl;

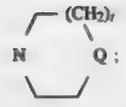
R_9 is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, $(CH_2)_pC_6H_5$, OR_{11} or $NR_{12}R_{13}$;

R_{10} is alkyl of 1 to 6 carbon atoms or perfluoroalkyl of 1 to 6 carbon atoms, 1-adamantyl, 1-naphthyl, 1-(1-naphthyl)ethyl, or $(CH_2)_pC_6H_5$;

R_{11} is H, alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, aryl, arylalkyl, a 5- to 7-membered carbocyclic ring or a 5- to 7-membered carbocyclic ring having another 5- to 7-membered carbocyclic ring fused thereto,



R_{12} and R_{13} independently are H, alkyl of 1 to 4 carbon atoms, phenyl,

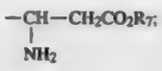


benzyl, α-methylbenzyl, or taken together form a ring of the formula

Q is NR_{14}, O or CH_2;

R_{14} and R_{15} are independently H, alkyl, aryl, aralkyl or cycloalkyl;

R_{16} is C_{1-6}alkyl, $—NR_{17}R_{18}$ or



R_{17} and R_{18} are independently H, C_{1-6}alkyl, benzyl or taken together are 3 to 6 carbon atoms forming a 4- to 7-membered ring with the nitrogen atom to which they are attached;

R_{19} is H, C_{1-5}alkyl, phenyl;

R_{20} is —CN, $—NO_2$ or $—CO_2R_7$;

Y═O or S;

Z═O,NR_6 or S;

m═is 1–5;

n is 1–10;

p is 0–3;

q is 2–3;

r is 0–2;

s is 0–5;

t is 0 or 1; and

x is 1 to 6.

5,466,705

TRIAZOLE DERIVATIVES PEST CONTROLLING AGENT AND PEST CONTROL METHOD

Masami Ozaki; Atsuhiko Ikeda; Takashi Yumita; Reijiro Honami; Naokazu Minoguchi; Hiroyuki Yano; Norihiko Izawa, all of Shizuoka, and Tadayoshi Hirano, Kakegawa, all of, Japan, assignors to Kumiai Chemical Industry Co., Ltd., and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

PCT No. PCT/JP93/01022, § 371 Date Jan. 21, 1994, § 102(e) Date Jan. 21, 1994, PCT Pub. No. WO94/02471, PCT Pub. Date Feb. 3, 1994

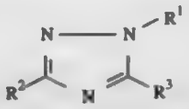
PCT Filed Jul. 22, 1993, Ser. No. 182,091

Claims priority, application Japan, Jul. 24, 1992, 4-198618; Jul. 24, 1992, 4-198619; Jul. 31, 1992, 4-223651

Int. Cl.[6] A01N *43/653;* C07D *249/08*

U.S. Cl. 514—383 **4 Claims**

1. A triazole derivative represented by a general formula:



[I]

wherein R^1 is an alkyl (C1-C4) group, R^2 is a phenyl group which may be substituted with a halogen atom, an alkyl (C1-C4) group, an alkoxy (C1-C4) group, a nitro group, a cyano group or a trifluoromethyl group (these substituents in the phenyl group may be 1-5, and a combination thereof may be same or different), and R^3 is an alkenyl (C3-C15) group substituted with 1-4 halogen atoms.

5,466,706

9H-IMIDAZO[1,2-A]BENZIMIDAZOLE-3-ACETAMIDE DERIVATIVES, THEIR PREPARATION AND THEIR THERAPEUTIC APPLICATION

Pascal George, St Arnoult en Yvelines; Danielle De Peretti, Antony; Jocelyne Roy, Ris-Orangis; Jean-Paul Schmitt, Arpajon, and Mireille Sevrin, Paris, all of, France, assignors to Synthelabo, Le Plessis Robinson, France

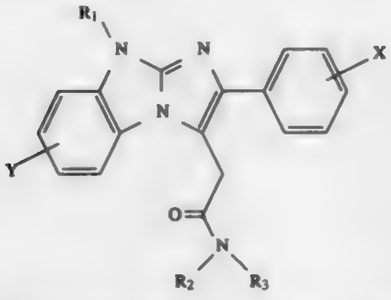
Filed Jan. 14, 1994, Ser. No. 180,998

Claims priority, application France, Jan. 15, 1993, 93 00337; Jul. 22, 1993, 93 09013

Int. Cl.[6] A61K *31/415*; C07D *487/04*

U.S. Cl. 514—394 7 Claims

1. A Compound of the formula:



(I)

in which

X represents one or more atoms or groups chosen from hydrogen, fluorine, chlorine, bromine, (C_1–C_3)alkyl, trifluoromethyl, (C_1–C_3)alkoxy, (C_1–C_3)alkylthio, methylsulphonyl, cyano, ethoxycarbonyl, aminocarbonyl and carboxy,

Y represents one or more atoms or groups chosen from hydrogen, fluorine, chlorine, bromine, (C_1–C_4)alkyl, trifluoromethyl, methoxy and trifluoromethoxy,

R_1 represents hydrogen atom, (C_1–C_3)alkyl, phenylmethyl, 2-phenylethyl, acetyl, or (C_1–C_3)alkoxycarbonyl,

R_2 and R_3 are the same or different and each represents: hydrogen; (C_1–C_5)alkyl which is linear, branched or cyclic, and optionally substituted by one or more fluorine atoms, or by methoxy, phenoxy, dimethylamino, phenyl, prop-2-enyl; prop-2-ynyl; phenyl in the form of a free base or an acid addition salt.

5,466,707

DIMERCAPTO-1,3-DITHIOLO-2-ONE OR THIONE MALEIMIDES, COMPOSITIONS CONTAINING THEM AND THEIR USE AS ANTIMICROBIAL AND MARINE ANTIFOULING AGENTS

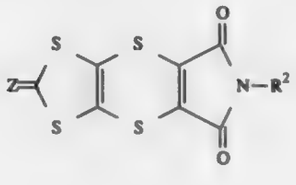
Weishi W. Wu; Ravi B. Shankar; Duane R. Romer, and R. Garth Pews, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 21, 1994, Ser. No. 360,490

Int. Cl.[6] A01N *43/72*; C07D *513/14*

U.S. Cl. 514—411 24 Claims

1. A 4,5-dimercapto-1,3-dithiolo-2-one (or thione) maleimide compound corresponding to the formula



wherein R^2 represents C_3–C_{10} cycloalkyl, C_1–C_{10} straight or branched chain alkoxy, C_3–C_{10} cycloalkoxy, an ester of the formula —CH_2CH_2O—C(O)—R^1, wherein R^1 represents C_1–C_5 straight or branched chain alkyl or C_3–C_5 cycloalkyl and Z represents oxygen or sulfur.

5,466,708

OXETANONES

Romano Derungs, Riehen; Hans P. Märki; Henri Stalder, both of Basel, and André Szente, Riehen, all of, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

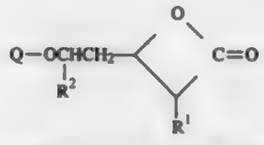
Division of Ser. No. 77,490, Jun. 19, 1993, Pat. No. 5,376,674, which is a division of Ser. No. 928,907, Aug. 12, 1992, Pat. No. 5,260,310, which is a continuation of Ser. No. 653,847, Feb. 11, 1991, abandoned. This application Sep. 19, 1994, Ser. No. 308,717

Claims priority, application Switzerland, Feb. 26, 1990, 604/90; Dec. 17, 1990, 4005/90

Int. Cl.[6] A61K *31/365*; C07D *305/12*

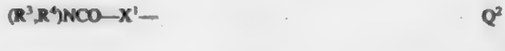
U.S. Cl. 514—449 9 Claims

6. A pharmaceutical composition which comprises a therapeutically effective amount of compound having the formula



I

wherein Q is a group having the formula



Q^2

and

R^1 and R^2 each are independently alkyl with up to 18 C atoms substituted by 1 to 3 -halogen atoms or alkyl, alkenyl, alkynyl or alkadienyl groups with up to 20 C atoms optionally interrupted by a 1,4-arylene group, optionally substituted by an aryl group in the ω-position and optionally substituted by an aryl-C_{1-4}-alkyl group, whereby R^1 can be interrupted by an O or S atom or by a sulphinyl or sulphonyl group in a position other than the α-position to an unsaturated C atom, or R^1 is an aryl-NH— or aryl-C_{1-4}-alkyl-OCONH— group,

R^3 and R^4 each are independently hydrogen or C_{1-4}-alkyl or together with the N atom to which they are attached form a unsubstituted saturated 3- to 6-membered ring optionally containing an O or S atom in a position other than the α-position to the N atom and

X^1 is an alkylene group containing up to 6 C atoms which can be substituted by a C_{1-6}-alkoxy, aryl, aryloxy, arylthio, aryl-C_{1-6}-alkyl, aryl-C_{1-4}-alkoxy or aryl-C_{1-4}-alkylthio group or by one or two C_{1-6}-alkyl groups, whereby two C_{1-6}-alkyl groups attached to adjacent C atoms can form a 3- to 7-membered ring, and a therapeutically inert carrier.

5,466,709
RING-SUBSTITUTED 2-AMINO-1,2,3,4-TETRAHYDRONAPHTHALENES, 3-AMINOCHROMANES, AND 3-AMINOTHIOCHROMANES

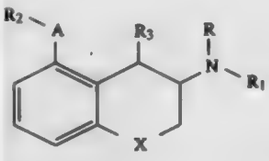
John M. Schaus, Zionsville; Craig S. Hoechstetter, Indianapolis; Diane Huser, Indianapolis; Charles J. Paget, Indianapolis, and Robert D. Titus, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 168,794, Dec. 16, 1993, Pat. No. 5,426,229, which is a division of Ser. No. 48,553, Apr. 16, 1993, Pat. No. 5,286,753, which is a continuation of Ser. No. 567,985, Aug. 15, 1990, abandoned. This application Mar. 14, 1995, Ser. No. 404,391

Int. Cl.[6] A61K *31/35;31/38;* C07D *311/04;335/06*

U.S. Cl. 514—432 2 Claims

1. A compound of the formula



in which R is C_1–C_4 alkyl, C_3–C_4 alkenyl, or cyclopropylmethyl;

R_3 is hydrogen;

R_1 is —COR_4

R_4 is hydrogen, C_1–C_4 alkyl, C_1–C_4alkoxy, or phenyl;

X is —O—, —S—, >SO, or $>SO_2$;

A is >C(O);

R_2 is C_1–C_8 alkyl, substituted C_1–C_8 alkyl, C_2–C_4 alkenyl, aryl, substituted aryl, aryl(C_1–C_4 alkyl), substituted aryl(C_1–C_4 alkyl), C_3–C_7 cycloalkyl-substituted methyl, or C_3–C_7 cycloalkyl;

and pharmaceutically acceptable acid addition salts thereof.

5,466,710
HETEROBICYCLOALKANES AS PESTICIDAL COMPOUNDS

John B. Weston; John P. Larkin, and Ian H. Smith, all of Berkhamsted, England, assignors to Rousel Uclaf, France

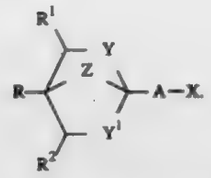
Continuation of Ser. No. 843,195, Feb. 28, 1992, abandoned, which is a division of Ser. No. 222,405, Jul. 21, 1988, Pat. No. 5,116,862, which is a continuation-in-part of Ser. No. 171,311, Mar. 21, 1988, abandoned. This application Oct. 6, 1993, Ser. No. 132,488

The portion of the term of this patent subsequent to Jun. 25, 2008, has been disclaimed.

Int. Cl.[6] A01N *43/32;* C07D *323/04;339/08;* A61K *31/655;31/335*

U.S. Cl. 514—452 14 Claims

1. A compound of the formula:



wherein R is a C_{2-10} non-aromatic hydrocarbyl group or a C_{2-10} non-aromatic hydrocarbyl group substituted by cyano, halo, C_{1-4} alkoxy, C_{1-4} haloalkoxy, or a group $S(O)_mR^3$ where R^3 is C_{1-4} alkyl or C_{1-4} haloalkyl, and m is 0, 1 or 2; R^1 and R^2 are the same or different, and each is hydrogen, halo, or a C_{1-3} aliphatic group or a C_3 aliphatic group substituted by halo, cyano, C_{1-5} alkoxycarbonyl, C_{1-4} alkoxy or a group $S(O)_{m'}R^4$ wherein m' is 0 1 or 2 and R^4 is C_{1-4} alkyl, cyano, gem dimethyl or C_{1-5} alkoxycarbonyl, or R^1 and R^2 and the carbon atoms to which they are attached form a C_{5-7} carbocyclic ring or a C_{5-7} carbocyclic ring substituted by halo, or a C_{1-3} aliphatic or alkoxy group;

A-X is a group:

(i) A' C═CX in which A' is a C_{3-6} alkyl, alkenyl or alkynyl group or C_{3-6} alkyl, alkenyl or alkynyl group which contains one to three hetero atoms selected from oxygen, sulphur, nitrogen, fluoro, or chloro, or A' is a C_{3-10} cycloalkyl or cycloalkenyl group or a C_{3-10} cycloalkyl or cycloalkenyl group which contains an oxygen, sulphur, nitrogen, fluoro or chloro atom;

(ii) BX in which B is a group $(CH_2)_2O$ or $(CH_2)_2S(O)_n$ wherein Z is 1 or 2 and n is 0, 1 or 2 or a C_{2-6} alkyl, alkenyl or alkynyl group or a C_{2-6} alkyl, alkenyl or alkynyl group which contains one or two oxygen and sulfur hetero atoms or double bonds but not triple bonds or both hereto atoms and double bonds interspersed in the chain or a C_{2-6} aliphatic chain substituted by one to four substituents which may be the same or different and are each independently selected from hydroxy, oxo, halo, C_{1-4} alkyl, C_{1-4} alkoxy, an acyl group derived from a C_{1-4} carboxylic acid, epoxy, a C_{1-4} alkylidene group, a C_{1-6} alkoxycarbonyl group, C_{1-4} haloalkyl or cyano; X is hydrogen, halo, a group $SiR^5R^6R^7$ or $SnR^5R^6R^7$ wherein R^5 R^6 R^7 are the same or different and are each a hydrocarbyl group containing up to 8 atoms or a hydrocarbyl group containing up to 8 atoms and substituted by one to three halo, C_{1-6} alkoxy, C_{1-6} alkylthio, C_{1-6} alkyl sulphinyl, C_{1-6} alkylsulphonyl, cyano, C_{1-6} acyloxy or a C_{1-6} alkoxycarbonyl group or, when one or more of R^5 to R^7 is alkynyl, the alkynyl group is unsubstituted or substituted by silyl or silyl substituted by three C_{1-4} alkyl groups, or X is a group $CR^8R^9R^{10}$ wherein R^8 and R^9 are the same or different and are each independently selected from hydrogen, halo, cyano, C_{1-5} alkoxycarbonyl, C_{1-4} alkyl, C_{1-4} alkyl substituted by one to three halo atoms, cyano, C_{1-6} alkoxycarbonyl, C_{1-4} alkoxy or a group $S(O)_{m''}R^{11}$ wherein M'' is 0, 1 or 2 and R^{11} is C_{1-4} alkyl, C_{1-4} alkoxy or $S(O)_{m''}R^{12}$ wherein m'' is 0, 1 or 2 and R^{12} is C_{1-4} alkyl or C_{1-4} alkyl substituted by one to three fluoro atoms, or R^8 and R^9 and the carbon atom to which they are attached form a C_{3-6} cycloalkyl ring, and R^{10} is hydrogen, halo, hydroxy, cyano, C_{1-4} alkoxy, C_{1-4} acyloxy, C_{1-5} alkoxycarbonyl, a C_{1-9} hydrocarbyl group or a C_{1-9} hydrocarbyl group substituted by hydroxy, cyano, C_{1-4} alkoxy, C_{1-4} acyloxy, C_{1-4} alkoxycarbonyl, one to three halo atoms or a group $S(O)_{m'''}R^{13}$ wherein m''' is 0, 1 or 2 and R^{13} is C_{1-4} alkyl or R^{10} is a group $S(O)_{m''''}R^{13}$ wherein m'''' is 0, 1 or 2 and R^{14} is C^{1-4} alkyl or a C_{1-4}alkyl substituted by one to three fluoro atoms;

Y and Y' are both $S(O)_{n'}$ wherein n' is 0, 1 or 2; and Z is $CH_2S(O)_{n''}$; wherein n'' is 0, 1 or 2;

provided that when A does not contain a C═ fragment, X is a group $CR^8R^9R^{10}$ wherein R^8, R^9, R^{10} are as defined except that R^8 and R^9 are not hydrogen.

5,466,711
MEDICAMENTS

Victoria S. Latter; Winston E. Gutteridge, and Alan T. Hudson, all of Beckenham, England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 394,224, Aug. 15, 1989, Pat. No. 5,206,268. This application May 20, 1992, Ser. No. 886,028

Claims priority, application United Kingdom, Aug. 16, 1988, 8819478; Aug. 16, 1988, 8819479; Aug. 16, 1988, 8819480

Int. Cl.[6] A61K *31/21*

U.S. Cl. 514—510 1 Claim

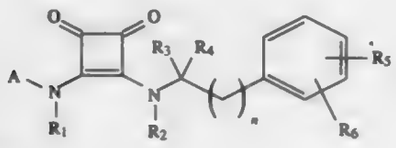
1. A method of treating a mammal suffering from or preventing in an immunocompromised mammal *Pneumocystis carinii* infections which comprises administering to said mammal an effective amount of 2-acetoxy-3-[trans-4-(4-chlorophenyl)cyclohexyl] -1,4-naphthoquinone.

5,466,712
SUBSTITUTED N-ARYL-1,2-DIAMINOCYCLOBUTENE-3,4-DIONES

John A. Butera, Clarksburg; Schuyler A. Antane, Lawrenceville, and Bradford H. Hirth, Monmouth Junction, all of N.J., assignors to American Home Products Corporation, Madison, N.J.

Filed Nov. 4, 1994, Ser. No. 334,475
Int. Cl.[6] C07C 225/08; A61K 31/275;31/135
U.S. Cl. 514—524 20 Claims

18. A method for reducing the adverse effects of smooth muscle contractions which comprises administering, orally or parenterally, to a patient in need thereof, a compound of the formula:



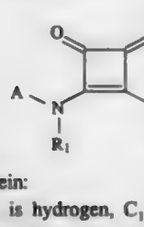
(I)

wherein:

R_1 is hydrogen, C_{1-10} straight or branched chain alkyl, C_{3-10} cyclic or bicyclic alkyl, alkanoyl of 2 to 7 carbon atoms, alkylsulfonyl of 1 to 7 carbon atoms, aroyl of 7 to 12 carbon atoms, arylalkenoyl of 9 to 20 carbon atoms, arylsulfonyl of 6 to 12 carbon atoms, arylalkanoyl of 8 to 12 carbon atoms or arylalkylsulfonyl of 7 to 12 carbon atoms;

R_2 is hydrogen, C_{1-10} straight or branched chain alkyl or C_{3-10} cyclic or bicyclic alkyl;

A is a substituted phenyl group of the following formula:



wherein:

R_7 and R_8, independent from each other, are selected from the following: cyano, nitro, amino, C_{1-6} alkyl, C_{1-6} perfluoroalkyl, C_{1-6} alkoxy, C_{1-6} perfluoroalkoxy, amino, C_{1-12} mono- or dialkylamino, sulfonamide, C_{1-6} alkylsulfonamido, C_{6-12} arylsulfonamido, C_{1-6} alkylcarboxamido, C_{6-12} arylcarboxamido, C_{1-6} alkylsulfonyl, C_{1-6} perfluoroalkylsulfonyl, C_{6-12} arylsulfonyl, chloro, bromo, fluoro, iodo, 1-imidazolyl, carboxyl, carboalkoxy of 2 to 7 carbon atoms, hydroxyl or hydrogen;

n is an integer from 0 to 6;

R_3 and R_4 are, independent from each other, hydrogen, C_{1-10} straight or branched chain alkyl, or C_{3-10} cyclic or bicyclic alkyl; C_{1-10} perfluoro alkyl, C_{1-10} hydroxyalkyl, C_{1-10} alkoxyalkyl, fluoro; or, when taken together, form a spirocyclic ring containing a total of 3–7 carbon atoms;

R_5 and R_6, independent from each other, are selected from the following: cyano, nitro, amino, C_{1-6} alkyl, C_{1-6} perfluoroalkyl, C_{1-6} alkoxy, C_{1-6} perfluoroalkoxy, amino, C_{1-12} mono- or dialkylamino, sulfonamide, C_{1-6} alkylsulfonamido, C_{6-12} arylsulfonamido, C_{1-6} alkylcarboxamido, C_{6-12} arylcarboxamido, C_{1-6} alkylsulfonyl, C_{1-6} perfluoroalkylsulfonyl, C_{6-12} arylsulfonyl, chloro, bromo, fluoro, iodo, 1-imidazolyl, carboxyl, carboalkoxy, hydroxyl, or hydrogen;

or a pharmaceutically acceptable salt thereof.

5,466,713
ILOPROST WITH ACTION AGAINST CEREBRAL MALARIA

Eveline Blitstein-Willinger, and Karin Sliwa-Hähnle, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/DE92/00091, § 371 Date Dec. 3, 1993, § 102(e) Date Dec. 3, 1993
PCT Filed Feb. 7, 1992, Ser. No. 104,068
Claims priority, application Germany, Feb. 12, 1991, 41 04 606.4
Int. Cl.[6] A61K 31/19;31/557
U.S. Cl. 514—573 9 Claims

1. A method of treating cerebral malaria, comprising administering to a patient in need thereof a composition comprising an effective amount of iloprost or a physiological salt thereof.

5,466,714
SPERMICIDAL AND CYTOCIDAL FATTY ACID COMPOSITIONS

Charles E. Isaacs, Manalapan, N.J.; Kwang S. Kim, and Henryk M. Wisniewski, both of Staten Island, N.Y., assignors to Research Foundation For Mental Health Hygiene, Inc., Albany, N.Y.

Continuation-in-part of Ser. No. 896,121, Jun. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 543,111, Jun. 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 365,291, Jun. 12, 1989, abandoned, which is a continuation-in-part of Ser. No. 140,078, Dec. 31, 1987, Pat. No. 4,997,851. This application May 28, 1993, Ser. No. 70,086
Int. Cl.[6] A61K 31/20;31/22;31/23
U.S. Cl. 514—558 1 Claim

1. A method of preventing or treating a sexually transmitted disease in a host human or warm-blooded animal in need thereof which comprises perorally, parenterally, topically, intravenously, vaginally, or rectally administering to said host an effective amount of one or more compounds selected from the group consisting of 1-O-decyl-sn-glycerol, 1-O-lauryl-sn-glycerol, 1-O-octyl-sn-glycerol, 1-O-oleyl-sn-glycerol, L-α -lysophosphatidylcholine caproyl, L-α-lysophosphatidylcholine decanoyl, and L-α-lysophosphatidylcholine lauroyl.

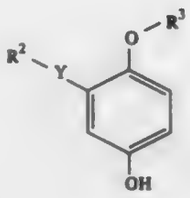
5,466,715
3,4-DISUBSTITUTED PHENOLS-IMMUNOMODULATING AGENTS

William N. Washburn, Titusville, N.J.; Barbara B. Lussier, Rochester, N.Y.; Carl R. Illig, Phoenixville, and Lee H. Latimer, Wayne, both of Pa., assignors to Sterling Winthrop Inc., New York, N.Y.

Continuation-in-part of Ser. No. 81,900, Jun. 25, 1993, abandoned, which is a division of Ser. No. 816,503, Dec. 31, 1991, Pat. No. 5,258,407. This application Mar. 8, 1994, Ser. No. 208,396
Int. Cl.[6] A61K 31/165;31/16
U.S. Cl. 514—618 12 Claims

1. A method for inducing the production of interleukin-2 in a warm-blooded animal in need of such interleukin-2 production to combat bacterial or viral infections which comprises parenterally administering an effective amount of a compound of formula (I) or a pharmaceutically acceptable salt thereof:

FORMULA I



wherein
Y is

R^2 is H or substituted or unsubstituted C_6–C_{10} aryl, wherein said substituents are selected from the group consisting of lower alkyl, lower alkoxy, amino, lower alkyl amino, lower alkyl mercapto, hydroxy or hydroxy lower alkyl; and
R^3 is a lipophilic moiety selected from the group consisting of substituted C_1–C_{10} alkyl, C_5–C_{16} cycloalkyl and 2,4-di-t-pentylphenyl.

5,466,716

LIPOSOMAL TRIMETHYLSPHINGOSINE

Yasuyuki Igarashi; Mohammad N. Ahmad; Hirofumi Okoshi, and Sen-itroh Hakomori, all of Seattle, Wash., assignors to The Biomembrane Institute, Seattle, Wash.

Continuation-in-part of Ser. No. 81,383, Jun. 30, 1993, Pat. No. 5,331,014, which is a continuation-in-part of Ser. No. 724,625, Jul. 2, 1991, Pat. No. 5,151,360, which is a continuation-in-part of Ser. No. 636,353, Dec. 31, 1990, Pat. No. 5,137,919. This application Apr. 1, 1994, Ser. No. 221,788
The portion of the term of this patent subsequent to Aug. 11, 2009, has been disclaimed.
Int. Cl.[6] A61K *47/00;31/14*
U.S. Cl. 514—642 **4 Claims**

1. N,N,N-Trimethylsphingosine contained within a liposome.

5,466,717

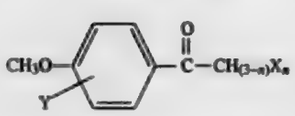
HALOGENATED 4'-METHOXYACETOPHENONES AS MICROBICIDES AND PRESERVATIVES

S. Rao Rayudu; Joseph G. Fenyes, both of Germantown, and Thomas E. McNeel, Memphis, all of Tenn., assignors to Buckman Laboratories Int'l, Inc., Memphis, Tenn.

Continuation of Ser. No. 879,982, May 8, 1992, abandoned. This application Dec. 15, 1993, Ser. No. 166,907
Int. Cl.[6] A01N *31/14;35/00;* A61K *31/12*
U.S. Cl. 514—689 **27 Claims**

1. A method for inhibiting the growth of a microorganism in an aqueous system comprising the step of adding to said aqueous system a halogenated 4'-methoxyacetophenone of formula I:

(I)



wherein
X is a halogen;
Y is a halogen; and
n is 2;
in an amount effective to inhibit the growth of said microorganism.

5,466,718

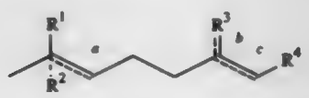
TYROSINASE INHIBITORS

Tetsuo Nakatsu, Walnut Creek; Kok Lean R. Kang, Oakland; Kelly L. McAlister, and Jianabeng Huang, both Conrad, all of Calif., assignors to Takasago Institute for Interdisciplinary, Walnut Creek, Calif.

Filed Apr. 2, 1993, Ser. No. 41,771
Int. Cl.[6] A61K *31/045;31/01;31/19*
U.S. Cl. 514—724 **8 Claims**

1. A method for inhibiting melanin-formation in a host in need thereof, which comprises administering to the host an effective amount of at least one melanin-formation inhibiting compound selected from the group consisting of compounds of formula (I) and compounds of formula (II):

(I)



(II)

wherein the dotted lines at a, b, c, d, e, f, g, represent an optional double bond, provided that double bonds are not at both b and c, or at both f and g, at the same time; R^1, R^5, R^6, and R^7 are each hydrogen or methyl; R^2 and R^8 are each no group, Or each hydrogen or hydroxyl when there is no double bond at a and at f, respectively; R^3 is methylene when there is a double bond at b, or hydrogen or methyl when there is no double bond at b; R^4 is formyl or $—(CH_2)_n—R^{10}$, wherein R^{10} is hydrogen, hydroxyl, acyloxy, or cyano and n is an integer of from 1 to 3; and R^9 is methylene when there is a double bond at g, or $—(CH_2)_n—R^{10}$ when there is no double bond at g.

5,466,719

POLYGLYCEROL FATTY ACID ESTER MIXTURE

Gerald Jakobson; Werner Siemanowski, both of Rheinberg, and Karl-Heinz Uhlig, Krefeld-Traar, all of, Germany, assignors to Solvay Fluor und Derivate GmbH, Hanover, Germany

Filed Aug. 4, 1993, Ser. No. 101,075
Claims priority, application Germany, Aug. 7, 1992, 42 26 174.0
Int. Cl.[6] A61K *31/23*
U.S. Cl. 514—785 **42 Claims**

1. A polyglycerol fatty acid ester mixture of mono-, di- and polyesters of a polyglycerol having a degree of polymerization of 2 to 8 and at least one fatty acid selected from the group consisting of saturated and unsaturated, branched and unbranched C_6- to C_{14}-fatty acids containing less than 10 wt-% of fatty acids having more than 14 carbon atoms, wherein said polyglycerol fatty acid ester mixture has an HLB of greater than 8 and contains
0 to 5 parts by weight diglycerol fatty acid esters,
20 to 65 parts by weight triglycerol fatty acid esters,
20 to 50 parts by weight tetraglycerol fatty acid esters, and
5 to 40 parts by weight higher polyglycerol fatty acid esters,
in a total of 100 parts by weight of said ester mixture.

5,466,720

METHOD OF PRODUCING DIMETHYL ETHER

Kaoru Fujimoto, 18-1-1031, Minami-Ooi 6-chome, Shinagawa-ku, Tokyo 140; Tsutomu Shikada, Tokyo; Yojiro Yamaoka, Tokyo, and Takashi Sumigama, Tokyo, all of, Japan, assignors to Kaoru Fujimoto, and NKK Corporation, Tokyo, both of, Japan

Continuation of Ser. No. 87,757, Jul. 9, 1993, Pat. No. 5,389,689. This application Oct. 12, 1994, Ser. No. 321,521

Claims priority, application Japan, Nov. 11, 1991, 3-294630; Nov. 11, 1991, 3-294631

Int. Cl.[6] C07C *41/01*

U.S. Cl. 518—700 3 Claims

1. A method of producing dimethyl ether which comprises streaming a mixed gas containing carbon monoxide and either or both of hydrogen and water vapor or a mixed gas of them further containing carbon dioxide into a slurry of a mixed catalyst suspended in a solvent, wherein the mixed catalyst comprises a mixture of zinc oxide, copper oxide and alumina, and is prepared by co-pulverizing to a degree of pulverization of about 0.1 to 20 μm in grain size.

5,466,721

CITRAL ACETAL ETHERS OF ALPHA-HYDROXY PHENYL KETONES AND RADIATION CURABLE COMPOSITIONS THEREOF

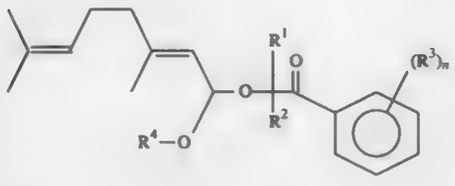
Paul E. Share, Berwyn, Pa., assignor to Henkel Corporation, Plymouth Meeting, Pa.

Continuation of Ser. No. 73,007, Jun. 4, 1993, abandoned. This application Jun. 13, 1994, Ser. No. 258,917

Int. Cl.[6] C08F *2/50;* C08G *59/17;* C07C *49/255*

U.S. Cl. 522—34 68 Claims

1. A compound of the formula:



wherein:

R^1 and R^2 are independently selected from the group consisting of a hydrogen atom, an aliphatic group, a hetero-aliphatic group, an aromatic group, and a heterocyclic group, provided that R^1 and R^2 may together form a divalent radical selected from the group consisting of an aliphatic radical and hetero-aliphatic group;

each R^3 is independently selected from the group consisting of an aliphatic group, a hetero-aliphatic group, an aromatic group, and a heterocyclic group;

R^4 is selected from the group consisting of an aliphatic group, a hetero-aliphatic group, an aromatic group, and a heterocyclic group; and

n is an integer from 0 to 5.

5,466,722

ULTRASONIC POLYMERIZATION PROCESS

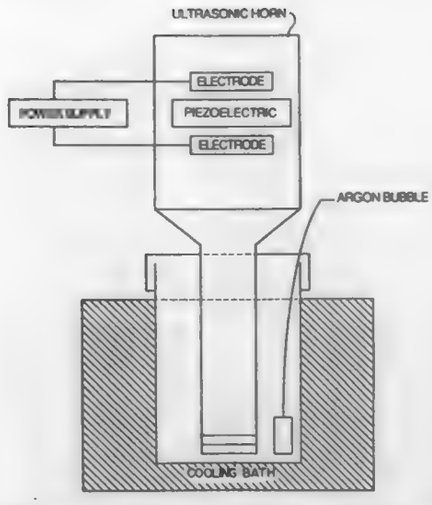
James O. Stoffer, 16 Laird, and Oliver C. Sitton, R.R. 1 Box 227F, both of Rolla, Mo. 65401

Continuation-in-part of Ser. No. 933,387, Aug. 21, 1992, abandoned. This application Jan. 27, 1994, Ser. No. 188,215

Int. Cl.[6] C08F *2/56*

U.S. Cl. 522—51 25 Claims

1. A process for polymerizing at least one ethylenically unsaturated monomer comprising providing a mixture of the monomer and a non-polymeric initiator which responds to ultrasonic energy



to form free radicals, and subjecting the mixture of monomer and initiator to sufficient ultrasonic energy to cause the initiator to form free radicals, the process being carried out at a bulk temperature below 40° C. to produce at least 20% conversion of monomer to polymer.

6. The process of claim 1 wherein the initiator is chosen from the group consisting of surfactants, peroxides, peracids, and benzyl disulfide.

7. The process of claim 6 wherein the initiator is chosen from the group consisting of 1-dodecanethiol, sodium lauryl sulfate, hydrogen peroxide, peracetic acid, and benzyl disulfide.

5,466,723

RADIATION CURABLE ADHESIVE FOR LAMINATING A LINEFORM IMAGE TO A LENTICULAR ARRAY SHEET

Billy R. Dotson, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 17, 1994, Ser. No. 323,966

Int. Cl.[6] G03C *7/14;* C09J *175/16;175/06*

U.S. Cl. 522—96 7 Claims

1. In a process for laminating a lineiform image to a lenticular array sheet the improvement which comprises bonding a lineiform image to a lenticular array sheet with a radiation curable composition which comprises from 15 to 50 percent by weight of beta-carboxyethyl acrylate and from 50 to 15 percent by weight of 2-phenoxyethylacrylate and from 30 to 70 percent by weight of a viscosity control additive, the viscosity control additive being an oligomer containing ethylenically unsaturated sites, based on the total weight of the composition.

5,466,724

ADHESIVE COMPOSITION FOR A WOUND DRESSING

Robert W. Volke, and Debashish Chakravarthy, both of Garrettsville, Ohio, assignors to Variseal Corporation, Parkman, Ohio

Continuation-in-part of Ser. No. 276,443, Jul. 18, 1994, which is a division of Ser. No. 69,784, Jun. 1, 1993, abandoned. This application Mar. 20, 1995, Ser. No. 406,742

Int. Cl.[6] C08L *9/26;3/02;5/04;* A61F *13/02*

U.S. Cl. 523—111 9 Claims

1. A wound dressing comprising:

a plastic film layer; and

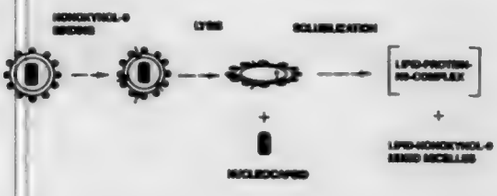
an adhesive bonded to one side thereof, said adhesive comprising a mixture of polyisobutylene and a rubber polymer selected from the group consisting of solution-polymerized random styrene butadiene copolymers, said adhesive having at least one hydrocolloid dispersed therein.

5,466,725

ANTI-VIRAL MATERIALS

Jean Kersten, Villers St. Amand., and Yves Delmotte, Tertre, both of, Belgium, assignors to Baxter International, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 759,695, Sep. 9, 1991, Pat. No. 5,181,276, which is a continuation of Ser. No. 484,137, Feb. 22, 1990. This application Dec. 4, 1991, Ser. No. 802,350
The portion of the term of this patent subsequent to Jan. 26, 2010, has been disclaimed.
Int. Cl.[6] A01N *25/08;25/34;* C08L *27/06*
U.S. Cl. 523—122 4 Claims



1. Polymeric material containing a pool of viricidal agents made by the process comprising; mixing a molten blend of polyvinyl chloride and a viricidal nonionic surfactant having Hydrophilic Lipophilic Balance of between 12 and 20, said compound consisting of: R_1—O—$((CH_2)\ a_i$—O)$_n$—R_2 where R_1 is a saturated or unsaturated hydrocarbon radical, the constituent elements selected from the group consisting of carbon, hydrogen or oxygen; a_i is, for i=to $_n$ an integer greater or equal to 2; R_2 is an organic radical, the constituent elements selected from the group consisting of carbon, hydrogen or oxygen and n is an integer selected so that the Hydrophilic Lipophilic Balance of said compound is between 12 and 20, the improvement comprising adding a sufficient amount of a plasticizer having a molecular weight of at least 300 to the molten blend to increase the viricidal activity of said compound.

5,466,726

ANTIBACTERIAL, ANTIFUNGAL SILICONE RUBBER COMPOSITION

Yoshio Inoue; Sekiguchi Susumu, both of Annaka, and Yasuo Kurihara, Minato, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1994, Ser. No. 297,522
Claims priority, application Japan, Aug. 27, 1993, 5-235798
Int. Cl.[6] C08K *3/34;3/10*
U.S. Cl. 523—122 5 Claims

1. An antibacterial, antifungal silicone rubber composition comprising

an organopolysiloxane of the average compositional formula:

$$R_n^1SiO_{(4-n)/2} \quad (1)$$

wherein R^1, which may be identical or different, is a substituted or unsubstituted monovalent hydrocarbon group and n is a positive number of 1.98 to 2.02, an organic peroxide or an organohydrogen polysiloxane and platinum catalyst as a curing agent, and

a zeolite containing 0.1 to 15% by weight of a silver ion, based on the weight of the zeolite,

said composition being prepared by milling substantially all of the organopolysiloxane and substantially all of the zeolite by a three-roll mill.

5,466,727

PRIMER COMPOSITION FOR IMPROVING THE BONDING OF A URETHANE ADHESIVE TO NON-POROUS SUBSTRATES

Harry W. Hsieh, Troy, Mich., assignor to Essex Specialty Products, Inc., Clifton, N.J.

Continuation-in-part of Ser. No. 72,208, Jun. 3, 1993, abandoned. This application Aug. 5, 1994, Ser. No. 286,295
Int. Cl.[6] C08L *33/08;83/08*
U.S. Cl. 523—421 11 Claims

1. A primer composition which comprises a solution or dispersion of:

(a) about 2 percent to about 30 percent by weight, based on the weight of the composition, of a film-forming resin;

(b) about 2 percent to about 80 percent by weight, based on the weight of the composition, of a reaction product of an epoxy silane and an amino silane, wherein the amino silane contains at least two amine groups per molecule, which is prepared by (1) contacting neat an amino silane and epoxy silane in amounts such that the molar ratio of epoxy silane to amino silane is less than about 1.8:1; and then (2) adding additional epoxy silane so that the molar ratio of epoxy silane to amino silane is at least about 2:1; and

(c) at least about 5 percent by weight, based on the weight of the composition, of a volatile organic solvent;

with the proviso that the reaction product of a polyisocyanate and a compound containing at least one silane group and at least one isocyanate reactive group is not present.

5,466,728

FLAME RETARDANT ORGANOSILICON POLYMER COMPOSITION, PROCESS FOR MAKING SAME, AND ARTICLE PRODUCED THEREFROM

Laura M. Babcock; John K. Bard, and Raymond T. Leibfried, Sr., all of New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 839,610, Feb. 21, 1992. This application Sep. 24, 1993, Ser. No. 125,887
Int. Cl.[6] C09K *21/14;* C08F *283/00;* G08G *77/06*
U.S. Cl. 523—179 33 Claims

1. An organosilicon composition comprising at least one member selected from the group consisting of an organosilicon polymer and an organosilicon prepolymer, wherein the organosilicon polymer or prepolymer comprises residues of at least one silicon-containing compound and at least one polycyclic polyene compound linked through carbon to silicon bonds, wherein the silicon-containing compound comprises at least one member selected from the group consisting of:

A. cyclic polysiloxane compounds containing at least two hydrosilation reactive ≡SiH groups;

B. tetrahedral siloxysilane compounds containing at least two hydrosilation reactive ≡SiH groups; and

C. linear poly(organohydrosiloxane) polymers containing at least two hydrosilation reactive ≡SiH groups;

wherein the polycyclic polyene compound contains at least two hydrosilation reactuve carbon-carbon double bonds; wherein at least a substantial portion of at least one member selected from the group consisting of the silicon compound and the polycyclic polyene compound has more than two reactive sites; and wherein the composition further comprises about 2 to about 90 weight percent, based on the weight of the organosilicon composition, of at least one phosphorus containing flame retardant.

5,466,729

AQUEOUS SILYLATED EPOXY RESIN DISPERSION FROM SECONDARY SILANES

Antoine J. E. Guillet, Divonne-Les-Bains, France, and Remy C. H. Gauthier, Geneva, Switzerland, assignors to OSi Specialties, Inc., Danbury, Conn.

Continuation of Ser. No. 38,027, Mar. 29, 1993, abandoned. This application Oct. 21, 1994, Ser. No. 327,340

Int. Cl.[6] C08G 59/50;59/40; C03C 25/02; C08J 3/03

U.S. Cl. 523—421 6 Claims

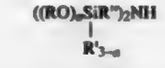
1. A method for sizing glass fibers which consists essentially of contacting the fibers with a size consisting essentially of a stable dispersion comprising:

(a) 40–70 weight percent of the total of (a) and (b) of water; and

(b) and 30–60 weight percent of the total of (a) and (b) of a silylated epoxy resin prepared by reacting:

(i) a silane having at least two silicon atoms each bearing at least one hydrolyzable group and each silicon atom attached to a secondary amine by a hydrocarbon moiety; and

(ii) a resin containing at least two epoxy groups at or near room temperature to about 150° C. such that the epoxy resin contains from about 1 to 50 weight percent of silane based on the total silylated epoxy resin, wherein said silane has the formula



wherein a is 1, 2 or 3; each R abd R' is an alkyl group having 1 to 6 carbon atoms; and R" is selected from the group consisting of (i) 3 to 8 carbon alkylene (ii) 7 to 10 carbon aralkylene and (iii) 6 to 10 carbon arylene.

5,466,730

Patent Not Issued For This Number

5,466,731

FIBRE AND FILM OF A WATER-ABSORBENT WATER-INSOLUBLE MATERIAL HAVING A MATRIX OF A COPOLYMER

Paul J. Akers, Coventry, and William Brunskill, Hinckley, both of, United Kingdom, assignors to Courtaulds Fibres (Holdings) Limited, London, United Kingdom

PCT No. PCT/GB93/01012, § 371 Date Nov. 16, 1994, § 102(e) Date Nov. 16, 1994, PCT Pub. No. WO93/24684, PCT Pub. Date Dec. 9, 1993

PCT Filed May 18, 1993, Ser. No. 338,604

Claims priority, application United Kingdom, May 22, 1992, 9210955

Int. Cl.[6] C08J 5/02

U.S. Cl. 524—52 18 Claims

1. Fibre or film of a water-absorbent water-insoluble material having a matrix of a crosslinked copolymer formed from 50 to 95 % by weight of ethylenically unsaturated carboxylic monomer and 5 to 50% by weight of copolymerisable ethylenically unsaturated monomer, the matrix containing regions of a dispersed polymeric material, the matrix copolymer and the dispersed polymeric material being mutually immiscible and chemically substantially non-reactive under ambient conditions.

5,466,732

POLYIMIDE PRECURSOR SOLUTION, PROCESS FOR PRODUCING THE SOLUTION AND MOLDINGS AND COATINGS OBTAINED THEREFROM

Isao Tomioka, Kyoto; Takeshi Nakano, Ibaraki; Mikio Furukawa, and Yoshiaki Echigo, both of Kyoto, all of, Japan, assignors to Unitika Ltd., Hyogo, Japan

Continuation of Ser. No. 935,962, Aug. 27, 1992, abandoned. This application Mar. 25, 1994, Ser. No. 217,767

Claims priority, application Japan, Aug. 28, 1991, 3-244646; Sep. 30, 1991, 3-280862; Sep. 30, 1991, 3-280863; Jan. 25, 1991, 3-306706; Jan. 22, 1992, 4-032657; Jan. 24, 1992, 4-034524; Jan. 24, 1992, 4-034525; Apr. 23, 1992, 4-131842; Jul. 2, 1992, 4-200626

Int. Cl.[6] C08J 3/11; C08K 5/15

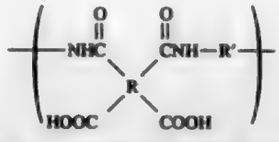
U.S. Cl. 524—113 40 Claims

1. A polyimide precursor solution which comprises a polyimide precursor and a solvent, wherein

(1) said polyimide precursor does not dissolve in tetrahydrofuran, and has

(a) a chemical structure represented by the repeating unit (1)

(1)



wherein R is a tetravalent aromatic radical having 1 to 5 benzenoid-unsaturated rings of 6 carbon atoms, the four carbonyl .group being directly bonded to different carbon atoms in a benzene ring of the R radical and each pair of carbonyl groups is bonded to adjacent carbon atoms in the benzene ring of the R radical and wherein R' is a divalent aromatic radical having 1 to 5 benzenoid-unsaturated rings of 6 carbon atoms, the amino groups being directly bonded to different carbon atoms in a benzene ring of the R' radical, and

(b) a solubility in tetrahydrofuran of 1 g/100 ml or less and

(2) said solvent is selected from the group consisting of (a) a mixture of at least two different components selected from the group consisting of (i) at least one water soluble ether compound, (ii) at least one water soluble aliphatic alcohol compound, (iii) at least one water soluble ketone compound and (iv) water, and (b) a compound which has an ether group and an alcoholic hydroxyl group in the same molecule.

5,466,733

THERMOPLASTIC COMPOSITION WITH BORON COMPOUNDS

Theodorus L. Hoeks; Christianus A. A. Claesen, both of Bergen op Zoom; Johannes H. G. M. Lohmeijer, Hoogerheide, all of, Netherlands, and James E. Pickett, Schenectady, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 989,734, Dec. 10, 1992, abandoned, which is a continuation of Ser. No. 814,308, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 511,159, Apr. 19, 1990, abandoned. This application Jan. 24, 1994, Ser. No. 185,725

Claims priority, application Netherlands, May 1, 1989, 8901093

Int. Cl.[6] C08K 5/523;3/38

U.S. Cl. 524—141 4 Claims

1. A method for making a thermoplastic composition comprising

(A) at least 20% by weight of a polyphenylene ether resin;

(B) a polystyrene resin;

(C) a phosphate compound;

(D) a boron compound, said method comprising the steps of

(i) mixing the phosphate compound and the polystyrene to make a master batch, and

(ii) compounding the master batch with the polyphenylene ether resin and the boron compound;

wherein said phosphate compound is tetraphenyl resorcinol diphosphate and said boron compound is boric acid.

5,466,734

AQUEOUS COLD SEAL RELEASE LACQUER

Robert J. Catena, Belleville, and Prasad K. Adhikari, Carlstadt, both of N.J., assignors to Sun Chemical Corporation, Fort Lee, N.J.

Filed Sep. 13, 1994, Ser. No. 305,224

Int. Cl.[6] C08K *5/20*

U.S. Cl. 524—230 **11 Claims**

1. A process for the preparation of an aqueous cold seal release varnish comprising the steps of:

(a) preparing a polyamide block copolymer having an acid value of 30–45, a weight average molecular weight of 3000–5000, a number average molecular weight of 2000–4000 and a melting point range of 110°–125° C.;

(b) mixing 30–50 parts of the polyamide block copolymer with 1–5 parts of an amide wax, 10–20 parts of at least one C_1–C_4 alkanol, 5–10 parts of an amine and 15–55 parts of water; and

(c) heating the mixture at a temperature of 75°– 85° C. for a period of time of not more than 90 minutes.

5,466,735

AQUEOUS EMULSION AND EASILY MACERATING MOISTURE-PROOF PAPER

Akitoshi Takahira, Kyoto, and Yuuzi Yoshii, Chiba, both of, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Apr. 8, 1993, Ser. No. 44,059

Claims priority, application Japan, Apr. 23, 1992, 4-104498

Int. Cl.[6] C08L *23/00*

U.S. Cl. 524—273 **11 Claims**

1. An aqueous emulsion comprising components (A), (B), and (C) described below at the weight ratio of (A)/(B)/(C)=100/(50 to 95)/(5 to 30), wherein maximum amounts of the components (B) and (C) to be added to the composition are 95 parts by weight and 30 parts by weight, respectively, per 100 parts by weight of component (A);

Component (A): Ethylene-vinyl chloride series copolymer comprising from 3 to 40% by weight of ethylene, from 25 to 90% by weight of vinyl chloride, and from 0 to 73% by weight of vinyl acetate and having a glass transition temperature of from −15° to 35° C.,

Component (B): Emulsion of a rosin ester having a softening point of from 110° to 150° C.,

Component (C): Emulsion of a wax having a melting point of from 50° to 110° C.

5,466,736

ELECTROSTATIC SPRAY PAINT

Mark J. Spowage, Leeds; Julia P. Grayson, Sheffield; Alan C. Outhwaite, Wakefield, and Nighat Ahmed, Bristol, all of, United Kingdom, assignors to The Morgan Crucible Company PLC, Windsor, England

PCT No. PCT/GB92/01839, § 371 Date Jun. 16, 1994, § 102(e) Date Jun. 16, 1994, PCT Pub. No. WO93/07226, PCT Pub. Date Apr. 15, 1993

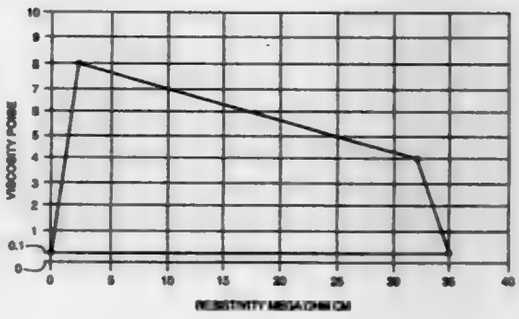
PCT Filed Oct. 9, 1992, Ser. No. 211,643

Claims priority, application United Kingdom, Jan. 9, 1991, 9121411

Int. Cl.[6] B32B *9/04;* **C09D** *101/18;175/04;167/08;133/10;133/08*

U.S. Cl. 524—315 **20 Claims**

1. A paint formulation of pigment, resin and solvent, for electrostatic spraying, based on one of the following resins and having a



film-forming solids content, according to the base resin, as follows:

Resin	Formulation Solids (by weight)
alkyd	55% to 90%
acrylic	20% to 40%
nitrocellulose	17.5% to 25%
polyurethane	50% to 70%

together with viscosity/resistivity values which in a rectangular plot of resistivity (ohm cm×10^6) and viscosity (P) fall within the rectilinear-sided operating envelope defined by the points x/y 0.25×10^6/0.1, 2×10^6/8, 32×10^6/4 and 35×10^6/0.1.

8. A method of spray painting comprising the steps of forming a spray cloud by the application of a high electric potential to a liquid paint formulation at a paint-supply head thereby breaking said paint up into charged droplets by electrostatic forces, and spraying the charged droplets whereby the droplets are attracted to a work to be painted to form a film, the liquid paint formulation having a film-forming solids content by weight, according to the resin system, selected from:

alkyd	55% to 90%
acrylic	20% to 40%
nitrocellulose	17.5% to 25%
polyurethane	50% to 70%

and viscosity/resistivity values which in a rectangular plot of resistivity (ohm cm×10^6) and viscosity (P) fall within the rectilinear-sided operating envelope defined by the points x/y 0.25×10^6/0.1, 2×10^6/8, 32×10^6/4 and 35×10^6/0.1.

5,466,737

POLYIMIDE RESIN COMPOSITION FOR SLIDING MEMBERS

Yoshio Oki, Yokkaichi, and Takumi Shimokusuzono, Inabe, both of, Japan, assignors to NTN Corporation, Osaka, Japan

Filed Dec. 23, 1993, Ser. No. 172,237

Claims priority, application Japan, Dec. 24, 1992, 4-344700

Int. Cl.[6] C08K *3/04*

U.S. Cl. 524—495 **7 Claims**

1. A resin composition for sliding members comprising 100 parts by weight of:

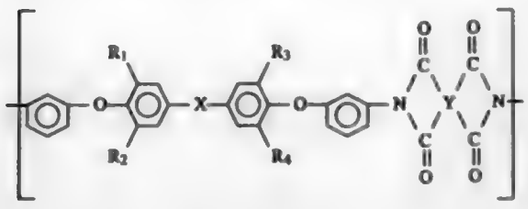
a polyimide resin composition comprising:

50–90% by weight of a thermoplastic polyimide resin made up of repeating units represented by the following formula, and

50–10% by weight of graphite obtained by graphitizing a non-phenolic resin material and containing 97% or more of fixed carbon;

5–20 parts by weight of tetrafluoroethylene resin; and

5–30 parts by weight of a powdery hardened phenolic resin



wherein X is a member selected from the group consisting of a direct bond, a hydrocarbon group having a carbon number of 1–10, a hexafluorinated isopropylidene group, a carbonyl group, a thio group and a sulfone group; R1 –R4 are the same or different and are at least one of hydrogen, a lower alkyl group, a lower alkoxy group, chlorine or bromine; and Y is a quadrivalent group selected from the group consisting of an aliphatic group having a carbon number of two or more, a cyclic aliphatic group, a monocyclic aromatic group, a condensed polycyclic aromatic group, and a non-condensed polycyclic aromatic group in which aromatic groups are bonded together directly or through an intermediary moiety.

5,466,738

MIXTURES OF LIQUID CRYSTALLINE COPOLYMERS AND FLUOROTHERMOPLASTICS, AND USE THEREOF

Michael Römer, Gross-Gerau; Andreas Schleicher, Einhausen, and Peter Stamprech, Burgkirchen, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Continuation of Ser. No. 981,767, Nov. 25, 1992, abandoned. This application Jul. 19, 1994, Ser. No. 277,367

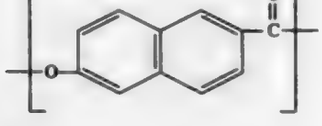
Claims priority, application Germany, Nov. 30, 1991, 41 39 547.6

Int. Cl.[6] C08L *67/03;67/04;77/12*

U.S. Cl. 524—508 **17 Claims**

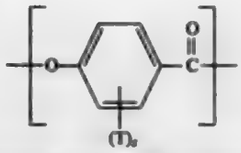
1. A molded article formed from a mixture of two thermoplastic materials, said mixture consisting essentially of:

A) 80 to about 97%, by weight of the mixture, of a liquid crystalline copolymer containing recurring units of the formulae



(I)

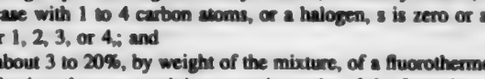
or



(II)

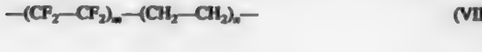
wherein the T radicals are identical or different and each is selected from the group consisting of an alkyl radical, an alkoxy radical, in each case with 1 to 4 carbon atoms, or a halogen, s is zero or an integer 1, 2, 3, or 4,; and

B) about 3 to 20%, by weight of the mixture, of a fluorothermoplastic polymer containing recurring units of the formulae:



(VIII)

or



(IX)

wherein m and n are numbers from 0.01 to 0.99, the sum of m and n always being 1.

5,466,739

WATER-BASED MASKANT COMPOSITION AND CHEMICAL MILLING METHOD USING THE SAME

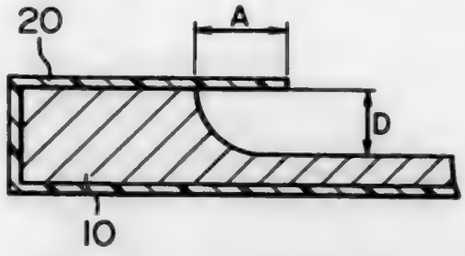
Tukasa Maeda; Yasuhiko Sasagawa; Yorinobu Ikeda, and Teruo Hiraharu, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 53,391, Apr. 28, 1993, abandoned. This application Oct. 14, 1994, Ser. No. 323,056

Claims priority, application Japan, Apr. 28, 1992, 4-135879; Sep. 24, 1992, 4-279347

Int. Cl.[6] C08K *3/34;* **C08L** *9/08;7/02*

U.S. Cl. 524—525 **10 Claims**



1. A water-based maskant composition for chemical milling, which consists essentially of 100 parts by weight (as solids) of a latex constituent consisting of (a) 5–60 parts by weight (as solids) of a copolymer latex obtained by emulsion-polymerization of a monomer mixture consisting of 30–70% by weight of an aliphatic conjugated diene compound, 20–70% by weight of an aromatic vinyl compound, 0–10% by weight of an ethylenically unsaturated carboxylic acid and 0–50% by weight of a vinyl compound copolymerizable therewith and (b) 95–40 parts by weight (as solids) of a natural rubber latex; 10–500 parts by weight of talc; and 0.1–10 parts by weight of a thickener selected from the group consisting of polyvinyl alcohol, sodium salt of polycarboxylic acid, potassium salt of polycarboxylic acid, ammonium salt of polycarboxylic acid, cross-linking acrylic emulsion and carboxymethylcellulose, wherein the viscosity at 25° C. is 500– 5,000 cps as measured by BH type rotor at 20 rpm at a solids concentration of 50% by weight, the pH is 7–9, and the tensile strength and elongation of a film obtained from the composition are 50–150 kgf/cm^2 and 100–800%, respectively, as measured according to JIS K 6301.

5,466,740

STABILIZED, HALOGEN-CONTAINING RESIN COMPOSITION, AND COMPOSITE METAL OXIDE AND PROCESS FOR THE PRODUCTION THEREOF

Shigeo Miyata, Kagawa, Japan, assignor to Kabushiki Kaisha Kaisui Kagaku Kenkyojo, Fukuoka, Japan

Filed May 3, 1994, Ser. No. 238,021

Claims priority, application Japan, May 6, 1993, 5-129925

Int. Cl.[6] C08K *3/22;* **C01G** *49/00*

U.S. Cl. 524—399 **8 Claims**

1. A halogen-containing resin composition comprising

(a) 0.1 to 10 parts by weight of at least one of a calcium-based composite metal hydroxide of the formula (1),

$$Ca_{1-x}M^{2+}_x(OH)_2 \quad (1)$$

wherein M^{2+} is at least one divalent metal ion selected from the group consisting of Mg^{2+}, Mn^{2+}, Fe^{2+}, Co^{2+}, Ni^{2+}, Cu^{2+} and Zn^{2+} and x is a number int he range of $0.005<x<0.5$

and a calcium-based composite metal oxide of the formula (2),

$$Ca_{1-x}M^{2+}_xO \quad (2)$$

wherein M^{2+} and x are as defined in the formula (1),

(b) 0.01 to 2 parts by weight of a β-diketone compound or a metal salt thereof,

(c) 0 to 2 parts by weight of an organic acid salt of zinc, and

(d) 100 parts by weight of a halogen-containing resin derived from an ethylenically unsaturated monomer.

7. A composite metal oxide which is a calcium oxide-containing solid solution having the formula (2),

$$Ca_{1-x}M^{2+}_xO \quad (2)$$

wherein M^{2+} is at least one divalent metal ion selected from the group consisting of Mg^{2+}, Mn^{2+}, Fe^{2+}, Co^{2+}, Ni^{2+}, Cu^{2+} and Zn^{2+} and x is a number in the range of $0.005<x<0.5$

and having a BET specific surface area ranging from 5 to 300 m^2/g.

5,466,741

FLAME-RETARDANT, NONCORROSIVE POLYAMIDE COMPOSITIONS

Yves Bonin, Brignais, and Jack LeBlanc, St-Genis-Laval, both of, France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Feb. 18, 1993, Ser. No. 19,438

Claims priority, application France, Feb. 18, 1992, 92 02067

Int. Cl.[6] C08K *3/38;3/10*

U.S. Cl. 524—405 **14 Claims**

1. A composition of matter comprising (a) a polyamide, (b) an effective flame-retardant amount of red phosphorus therefor, and (c) an effective corrosion/migration-reducing amount of zinc borate.

5,466,742

AQUEOUS OUTSIDE RELEASE AGENT COMPRISING DIATOMACEOUS EARTH AND PYROGENIC HYDROPHOBIC SILICA FOR MOLDING AND VULCANIZING TIRES AND OTHER RUBBER ARTICLES

Herbert Wagner, Bad Schönborn, and Karl-Heinrich Schuhmacher, St. Leon, both of, Germany, assignors to Rhein Chemie Rheinau GmbH, Mannheim, Germany

Continuation of Ser. No. 891,397, May 29, 1992, abandoned. This application Jan. 14, 1994, Ser. No. 182,451

Claims priority, application Germany, Jun. 4, 1991, 41 18 234.0

Int. Cl.[6] C08J *5/10;* C08K *3/34;* C08L *25/14*

U.S. Cl. 524—448 **23 Claims**

1. Aqueous outside release agent for the production of tires and other rubber articles, comprising

A) 5 to 35% by wt. diatomaceous earth,

B) 0.5 to 6% by wt. pyrogenic hydrophobic silica,

C) 0.1 to 2% by wt. nonionic surfactant,

D) 0.2 to 3% by wt. of a binder selected from the group consisting of:

a) polymers and salts thereof comprising carboxyl radicals in an amount sufficient to render said polymers or salts thereof water-soluble,

b) esters, dispersed in water, of the polymers according to a),

c) casein, albumin, or a combination thereof dissolved in water,

d) cellulose and

e) mixtures of two or more binders according to a)–d),

E) 0.1 to 3% by wt. dye,

F) 0 to 5% by wt. ethyl alcohol, and

G) the remainder water.

5,466,743

POLYETHYLENE-BASED SKI COATING

Robert Schamesberger, Eisenstadt, Austria, assignor to Isosport Verbundbauteile Gesellschaft m.b.H., Austria

Filed May 27, 1993, Ser. No. 64,166

Claims priority, application Austria, Jan. 3, 1991, 1981/91

Int. Cl.[6] C08K *5/02*

U.S. Cl. 524—462 **7 Claims**

1. A snow ski coating comprising polyethylene with a slide enhancing amount up to 5% by weight of the coating of a fluorinated additive incorporated therein such that the coating contains a proportion of fluorine from 0.01 to 2% by weight of the coating.

5,466,744

POLYMERIZATION OF MACROCYCLIC POLY(ALKYLENE DICARBOXYLATE) OLIGOMERS

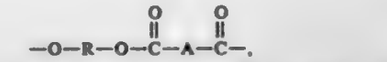
Thomas L. Evans, Clifton Park; Daniel J. Brunelle, Scotia; Jean E. Bradt, Esperance; Eric J. Pearce, Clifton Park, and Paul R. Wilson, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 702,577, May 20, 1991, abandoned, which is a continuation-in-part of Ser. No. 608,767, Nov. 5, 1990, Pat. No. 5,039,783. This application Jan. 9, 1995, Ser. No. 369,986

Int. Cl.[6] C08K *5/16*

U.S. Cl. 524—714 **31 Claims**

1. A method for converting a mixture consisting essentially of macrocyclic polyester oligomers comprising structural units of the formula



(I)

wherein R is an alkylene or mono- or polyoxyalkylene radical containing a straight chain of about 2–8 atoms and A is an m- or p-linked monocyclic aromatic or alicyclic radical, to a linear polyester which comprises contacting said mixture with a macrocyclic polyester oligomer polymerization catalyst at a temperature within the range of about 160°–300° C.

5,466,745

EMULSIFIABLE COMPOSITIONS, CURABLE EMULSIONS THEREOF AND USES OF SUCH CURABLE EMULSIONS

Denise E. Fiori, Trumbull, and Richard J. Quinn, Bethel, both of Conn., assignors to Cytec Technology Corporation, Wilmington, Del.

Continuation of Ser. No. 181,949, Jan. 14, 1994, abandoned. This application Apr. 10, 1995, Ser. No. 419,344

Int. Cl.[6] C08F *2/32;* C08L *75/12;* C08G *18/28;18/48*

U.S. Cl. 524—801 **80 Claims**

1. An oil-in-water emulsion comprising an aqueous medium having substantially homogeneously emulsified therein a non-aqueous substantially homogeneous emulsifiable composition comprising a mixture of:

(1) an unblocked polyisocyanate crosslinking agent containing at least two reactive isocyanate groups, at least one of which is a non-primary isocyanate group, and which in and of itself is substantially hydrophobic and non-dispersible in water; and

(2) a surface active isocyanate reactive material.

5,466,746

EMULSIONS OF ORGANOPOLYSILOXANES CONTAINING POLAR GROUPS WITH ALKYL POLYGLYCOSIDES AS EMULSIFIERS

Michael Geck; Bernward Deubzer, both of Burghausen; Christine Baumgartner, Burgkirchen; Hans-Jürgen Lautenschlager, Haiming, and Johann Sejpka, Marktl, all of, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Mar. 3, 1994, Ser. No. 205,078

Claims priority, application Germany, Mar. 4, 1993, 43 06 796.4

Int. Cl.[6] C08L *83/04;* **B01J** *13/00*

U.S. Cl. 524—837 **4 Claims**

1. An aqueous emulsion comprising

(a) 100 parts by weight of an organopolysiloxane which contains polar groups on Si—C-bonded hydrocarbon radicals and

(b) at least 5 parts by weight but not more than 50 parts by weight of an alkyl polyglycoside.

5,466,747

GRAFT COPOLYMERS AND GRAFT COPOLYMER/ PROTEIN COMPOSITIONS

Richard J. Rolando, Oakdale; Patrick L. Coleman, Minneapolis; Steven L. Kangas, Woodbury, and Thomas A. Kotnour, Faribault, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 71,327, Jun. 2, 1993, Pat. No. 5,364,907, which is a continuation of Ser. No. 595,275, Oct. 10, 1990, abandoned. This application Sep. 26, 1994, Ser. No. 283,976

Int. Cl.[6] G01N *33/53;* **C12Q** *1/00*

U.S. Cl. 525—54.1 **4 Claims**

1. A process for preparing a uniform, homogeneous thermoplastic graft copolymer comprising the steps of:

1) feeding to a reactor materials consisting essentially of

a) polyethylene,

b) an effective amount of a free radical initiator system comprising two free radical initiators, each having a decomposition rate significantly different from the decomposition rates of the other initiator(s) in the initiator system, and

c) a grafted monomer selected from the group consisting of 1-vinylimidazole, hydroxyethyl methacrylate, polyethylene glycol monomethacrylate, N-vinyl pyrrolidone, N,N-dimethylacrylamide and mixtures thereof effective to increase protein binding to the graft copolymer as compared with polyethylene.

5,466,748

RESIN COMPOSITION

Kaoru Ikeda; Toshiaki Sato, both of Kurashiki, and Kazuhige Ishiura, Ibaragi, all of, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 8, 1994, Ser. No. 208,025

Claims priority, application Japan, Mar. 15, 1993, 5-054124; Jul. 14, 1993, 5-174335; Jul. 19, 1993, 5-178360

Int. Cl.[6] C08L *29/02;29/04*

U.S. Cl. 525—57 **2 Claims**

1. A resin composition comprising an EVOH (A) and a thermoplastic polymer (B) essentially incompatible with EVOH and having at least one functional group selected from the group consisting of boronic acid group, borinic acid group and boron-containing group convertible into boronic acid groups in the presence of water.

5,466,749

GRAFT COPOLYMERS AND GRAFT COPOLYMER/ PROTEIN COMPOSITIONS

Richard J. Rolando, Oakdale; Patrick L. Coleman, Minneapolis; Steven L. Kangas, Woodbury, and Thomas A. Kotnour, Faribault, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 71,327, Jun. 2, 1993, Pat. No. 5,364,907, which is a continuation of Ser. No. 595,275, Oct. 10, 1990, abandoned. This application Sep. 14, 1994, Ser. No. 283,500

Int. Cl.[6] C08G *63/48;63/91;* **C08F** *8/00;* **C08L** *39/04*

U.S. Cl. 525—54.1 **10 Claims**

1. A graff copolymer/protein composition comprising

i) a uniform, homogeneous thermoplastic graff copolymer consisting essentially of a base polymer selected from the group consisting of polyethylene, polypropylene, polystyrene, and mixtures thereof and an amount of an olefinic monomer grafted to the base polymer effective to increase protein binding to the graft copolymer as compared with protein binding only to the base polymer, wherein the olefinic monomer is a) selected from the group consisting of 1-vinylimidazole, hydroxyethyl methacrylate, N,N-dimethylacrylamide, polyethylene glycol monomethacrylate, N-vinylpyrrolidone, and mixtures thereof when the base polymer is polyethylene, b) 1-vinylimidazole when the base polymer is polypropylene, c) 1-vinylimidazole when the base polymer polystyrene, or d) 1-vinylimidazole when the base polymer is a mixture of any two or more of polyethylene, polypropylene or polystyrene, and,

ii) a protein, wherein the protein is immobilized on a surface of the graft copolymer.

5,466,750

NONFLAMMABLE INJECTION-MOLDING RESIN COMPOSITION

Ikuhiro Mishima; Munehiro Ikeda, and Hideki Hosoi, all of Hyogo, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 678,424, Apr. 1, 1991, abandoned. This application Mar. 25, 1994, Ser. No. 217,759

Claims priority, application Japan, Mar. 30, 1990, 2-87023

Int. Cl.[6] C08L *55/02;27/06;25/12;33/08*

U.S. Cl. 525—84 **3 Claims**

1. A nonflammable injection-molding resin composition superior in impact strength, non-peeling property, and moldability, said resin composition consisting of 100 parts by weight of a nonflammable composition of

(i) 15 to 80 parts by weight of a copolymer (A) being composed of 60 to 85% by weight of α-methylstyrene monomer units, 15 to 35% by weight of vinyl cyanide monomer units, and 0 to 20% by weight of units of another copolymerizable vinyl monomer, said copolymer (a) having a methyl ethyl ketone-soluble portion having a reduced viscosity of 0.12 to 0.5 dl/g in N,N-dimethylformamide at a temperature of 30° C. and a concentration of 0.3 g/dl,

(ii) 5 to 40 parts by weight of a graft copolymer (B) prepared by graft-copolymerizing, onto 40 to 90 parts by weight of a rubbery polymer, 10 to 60 parts by weight of a monomer mixture comprising 10 to 90% by weight of a vinyl cyanide monomer and/or an alkyl (meth) acrylate monomer, 10 to 90% by weight of an aromatic vinyl monomer, and 0 to 20% by weight of another vinyl monomer copolymerizable therewith,

(iii) 20 to 70 parts by weight of a post-chlorinated vinyl chloride resin (C) containing chlorine in an amount of 58 to 65% and prepared by chlorinating a vinyl chloride resin having a polymerization degree of 400 to 800, and

(iv) 0.5 to 10 parts by weight of a copolymer (E) comprising 5 to 40% by weight of vinyl cyanide monomer units, 30 to 95% by weight of alkyl acrylate monomer units, and 0 to 65% by weight of units of another copolymerizable vinyl monomer.

5,466,751

PLASTICIZED POLYMER MOLDINGS MADE FROM MODIFIED POLYVINYL BUTYRALS

Matthias Gutweiler, Taunusstein, and Matthis Kroggel, Kelkheim, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Jul. 7, 1994, Ser. No. 271,737

Claims priority, application Germany, Jul. 16, 1993, 43 23 897.1

Int. Cl.[6] C08L *29/02;29/04*

U.S. Cl. 525—58 19 Claims

1. A plasticized polymer molding, comprising: a plasticizer and polyvinyl butyral which comprises comonomer units carrying sulfonate groups in the main polymer chain of said polyvinyl butyral, wherein said comonomer units carrying sulfonate groups comprise comonomer units of ethene sulfonate in the main polymer chain of said polyvinyl butyral.

5,466,752

NONCYCLIC ANHYDRIDE, EPOXY POLYMER AND CATALYTIC MACROMONOMER-GRAFTED ACRYLIC COPOLYMER

Robert J. Barsotti, Franklinville, N.J.; Charles T. Berge, and Christopher Scopazzi, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 272,342, Jul. 8, 1994, Pat. No. 5,412,039.

This application Feb. 1, 1995, Ser. No. 382,116

Int. Cl.[6] C08F *265/02;* C08L *33/14;67/00*

U.S. Cl. 525—65 8 Claims

1. A sprayable, curable, coating composition comprising organic solvent and binder, the binder comprising:

(a) anhydride resin having a molecular weight of less than about 3,000 that contains (1) a central moiety, and (2) on average, more than one pendant, non-cyclic anhydride moiety bonded to each central moiety;

(b) coreactant polymeric resin having a molecular weight of about from 1,000 to 20,000 and comprising at least about 30% by weight of copolymerized ethylenically unsaturated monomer containing at least one epoxy moiety; and

(c) at least one catalytic composition comprising a catalyst reacted with the acid functionality of a core of a branched acrylic copolymer which is insoluble in a non-polar organic solvent and formed from the polymerization of an ethylenically unsaturated monomer with at least about 5% by weight of acid functionality, and grafted to the core, one end of an acrylic stabilizer in the form of a macromonomer, said acrylic stabilizer being soluble in an organic solvent, wherein the ratio of equivalents of epoxy to anhydride is about from 0.5 to 1.8:1.

5,466,753

PROPYLENE COPOLYMERS GRAFTED WITH MONOMALEIMIDES

Bernd L. Marczinke, Speyer, and Hans-Joachim Müller, Grünstadt, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sep. 20, 1994, Ser. No. 309,442

Claims priority, application Germany, Sep. 25, 1993, 43 32 734.6; Jan. 2, 1993, 43 33 670.1

Int. Cl.[6] C08F *8/00*

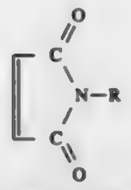
U.S. Cl. 525—193 9 Claims

1. A grafted propylene copolymer having a melt flow index of from 0.1 to 100 g/10 min, at 230° C. and under a weight of 2.16 kg, comprising

a_1) a polymer comprising from 25 to 97% by weight of a propylene copolymer (I), which contains from 0.1 to 15% by weight of copolymerized C_2-C_{10}-alk-1-enes, and from 3 to 75% by weight of a further propylene copolymer (II) which contains from 15 to 80% by weight of copolymerized C_2-C_{10}-alk-1-enes, or comprising

a_2) a polymer comprising from 25 to 97% by weight of a propylene homopolymer and from 3 to 75% by weight of a propylene copolymer containing copolymerized C_2-C_{10}-alk-1-enes, the comonomer content being from 15 to 80% by weight, based on the latter component, and

b) a monomaleimide compound of the following formula (I)



(I)

where R has the following meanings:

C_1-C_{10}-alkyl, C_1-C_{10}-alkyl interrupted by one or more oxygen atoms, C_5-C_{10}-cycloalkyl, C_6-C_{12}-aryl, C_7-C_{18}-arnlkyl, and a radical of the following formula (II)

$$R^1\text{-}X \qquad \text{(II)}$$

where R^1 is a C_1-C_{10}-alkyl radical and X is one of the following functional groups:

-COOH, -$COOR^2$, OH, OR^3, NH_2, NHR^4, NR^5R^6 and where the radicals R^2, R^3, R^4, R^5 and R^6 in each case are C_1-C_{10}-alkyl groups,

obtainable by reacting the polymer a_1) or a_2) with the monomaleimide compound b) at from 180° to 280° C. and from 1 to 100 bar and with average residence times of the reaction mixture of from 0.2 to 10 minutes.

5,466,754

CURABLE RESIN COMPOSITION

Takao Morimoto, Suita, and Shinji Nakano, Takatsuki, both of, Japan, assignors to Nippon Paint Co., Ltd., and Daicel Chemical Industries, Ltd., both of Osaka, Japan

Filed Jan. 27, 1995, Ser. No. 379,956

Claims priority, application Japan, Jan. 28, 1994, 6-026038

Int. Cl.[6] C08L *37/00;33/14;* C08F *124/00;120/28*

U.S. Cl. 525—206 10 Claims

1. A curable resin composition comprising

(a) (i) a mixture of a compound or polymer having a plurality of 6-membered cyclic alkylenecarbonate groups and a polymer having a plurality of alcoholic hydroxyl groups, or (ii) a polymer having pluralities of said cyclic alkylenecarbonate groups and said hydroxyl groups in a single entity; and

(b) an amount of an acid catalyst effective to promote the addition reaction between said cyclic alkylenecarbonate group and said alcoholic hydroxyl group.

5,466,755

OPTICAL FILTER

Teruo Sakagami; Takeo Ogihara, both of Iwaki; Yasufumi Fujii, Fukui, and Hiroki Katono, Iwaki, all of, Japan, assignors to Kureha, Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 106,976, Aug. 16, 1993, abandoned. This application Mar. 14, 1994, Ser. No. 208,890

Claims priority, application Japan, Aug. 20, 1992, 4-242585; Mar. 18, 1993, 5-082527

Int. Cl.[6] C08F *2/44;* C08K *5/098*

U.S. Cl. 525—326.6 5 Claims

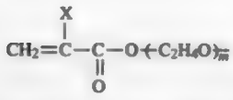
1. An optical filter having transmittance of not more than 15% in the near infrared region of 700 to 1000 nm, said optical filter comprising:

a resin material obtained by copolymerizing 200 parts by weight of a monomer mixture composed of a monomer represented

by the following formula (I) and a monomer copolymerizable therewith in the presence of 0.1 to 40 parts by , weight of a metallic compound, based on 100 parts by weight of the resin material, mainly composed of a copper compound;

$$PO(OH)_n R_{3-n} \quad (I)$$

wherein R represents



in which X represents a hydrogen atom or a methyl group, and m is an integer of 0 to 5, and n is 1 or 2,

wherein acid component produced from the reaction of a phosphorous group in the resin material and the metallic compound have been removed.

5,466,756

METHYL METHACRYLATE COMPOSITIONS

Donald E. Roach, Willingboro, N.J., and Paul J. Keating, NewportVille, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 930,496, Aug. 17, 1992, abandoned, which is a division of Ser. No. 739,027, Aug. 1, 1991, abandoned, which is a division of Ser. No. 577,821, Jul. 26, 1990, Pat. No. 5,061,747, which is a continuation of Ser. No. 385,139, Jul. 25, 1989, abandoned, which is a continuation-in-part of Ser. No. 276,850, Nov. 28, 1988, abandoned. This application Sep. 15, 1994, Ser. No. 307,992

Int. Cl.[6] C08F *8/12*

U.S. Cl. 525—330.6 **9 Claims**

1. A polymeric composition in the form of a molded object, extruded sheet, or cast sheet, consisting essentially of:

a) a polymer comprising predominantly units of methyl methacrylate and

b) from about one-half to about two percent by weight, of at least one alcohol, the alcohol containing no more than ten carbon atoms, wherein the at least one alcohol is admixed with the polymer subsequent to its preparation.

5,466,757

PROCESS FOR PRODUCTION OF CHLORINATED ETHYLENE-PROPYLENE COPOLYMERS

Naotoshi Watanabe, Kawasaki; Tsuyoshi Masukawa, Ayase; Kenji Ozaki, Yokohama, all of, Japan, and Noboru Moriwaki, Jurong, Singapore, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 683,530, Apr. 9, 1991, which is a continuation of Ser. No. 122,717, Nov. 18, 1987. This application Dec. 11, 1991, Ser. No. 804,737

Claims priority, application Japan, Nov. 18, 1986, 61-273000; Nov. 18, 1986, 61-273002; Nov. 18, 1986, 61-273004; Dec. 18, 1986, 61-300159; Dec. 18, 1986, 61-300160; Dec. 18, 1986, 61-300161; Mar. 28, 1987, 62-65806

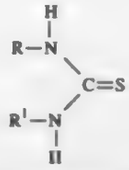
Int. Cl.[6] C08F *8/34*

U.S. Cl. 525—352 **2 Claims**

1. A chlorinated ethylene-propylene copolymer composition comprising

(A) 100 parts by weight of a chlorinated ethylene-propylene copolymer haing a chlorine content of 20 to 45% by weight and a Mooney viscosity (ML_{1+4}, 100° C.) of 10 to 150 obtained by chlorinating an ethylene-propylene copolymer wherein the propylene content is 22 to 38% by weight, the melt flow index (MFR) is 0.01 to 5.0 g/10 minutes, the melting peak as measured by differential scan calorimeter (DSC) is 80° C. or more, the crystallinity as measured by X-rays is 3% or more, the index of $\overline{M}_W/\overline{M}_N$ of the distribution of the molecular weight, determined by gel permeation chromatography (GPC), is greater than 4, and the Mooney viscosity (ML_{1+4}, 100° C.) is 10 to 180,

(B) 1.0 to 10.0 parts by weight of a thiourea compound represented by the general formula (I):



(I)

wherein, R and R^1, which may be the same or different, are hydrocarbon groups of at most 18 carbon atoms,

(C) 0.1 to 10.0 parts by weight of sulfur and/or a sulfur donor, and

(D) 1.0 to 15.0 parts by weight of a metal compound acting as an acid accepting agent.

5,466,758

PROCESS FOR PREPARING POLYSTYRENES HAVING β HYDROXY GROUP AND POLYGLYCOL-GRAFTED POLYSTYRENES THEREOF

Lee Yoon-Sik, 10-104 Hyundai Apartment, Kwanyang-dong, Anyang-shi, Kyungki-do, 430-060; Park Byeong-Deog, 251-111 Shinlim 9-dong, Kwanak-ku, Seoul, 151-019, and Lee Hyoung-Ik, 192-14, Upnae-ri, Dangjin-up, Dangjin-kun, Chungcheongnam-do, 343-800, all of, Rep. of Korea

Filed Apr. 13, 1994, Ser. No. 226,942

Int. Cl.[6] C08F *8/00*

U.S. Cl. 525—384 **11 Claims**

1. A process for preparing polystyrene having a hydroxy group at a β position in relation to aromatic ring, which comprises the steps of

(a) swelling polystyrene crosslinked with divinylbenzene in solvent,

(b) adding Lewis acid catalyst, and

(c) adding ethylene oxide and/or propylene oxide to the mixture.

5,466,759

POLYETHER GLYCOLS AND ALCOHOLS DERIVED FROM 3,4-EPOXY-1-BUTENE

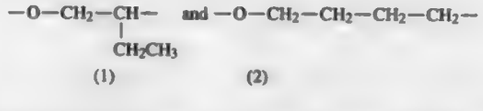
James C. Matayabas, Jr., and Stephen N. Falling, both of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Continuation-in-part of Ser. No. 181,734, Jan. 18, 1994, abandoned. This application Oct. 24, 1994, Ser. No. 327,951

Int. Cl.[6] C08G *65/14;65/20;* C07C *43/10;43/13*

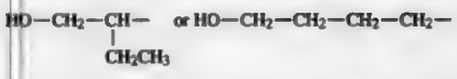
U.S. Cl. 525—403 **5 Claims**

1. A polyether containing terminal hydroxyl groups comprising n units of residue (1) and m units of residue (2), wherein (i) residues (1) and (2) have the structures:



(1) (2)

(ii) the total value of n+m is 2 to 70 and m/(n+m) is 0.05 to 0.98; (iii) at least 98 percent of the terminal hydroxyl groups of the polyether have the structure:



and (iv) residues (1) and (2) constitute at least 80 weight percent of the polyether.

5,466,760

COPOLYMERS OF POLYASPARTIC ACID

Louis L. Wood, Rockville, Md., assignor to SRCHEM, Inc., Elkridge, Md.

Division of Ser. No. 261,425, Jun. 17, 1994, Pat. No. 5,391,642, , ,. This application Jan. 17, 1995, Ser. No. 373,088

The portion of the term of this patent subsequent to Oct. 18, 2011, has been disclaimed.

Int. Cl.[6] C08G *69/48*

U.S. Cl. 525—435 **3 Claims**

1. A process for the preparation of copolymers of polysuccinimide comprising reacting maleic acid, ammonia and a polyamine at temperatures greater than 120° C.

5,466,761

NYLON ALLOYS

Howard A. Scheetz, Lancaster, and Gerhardus J. A. deBrught, Wyomissing, both of Pa., assignors to DSM N.V., Heerlen, Netherlands

Filed Oct. 29, 1993, Ser. No. 144,707

Int. Cl.[6] C08L *77/00*

U.S. Cl. 525—432 **14 Claims**

1. A nylon alloy consisting of (a) nylon 4.6, (b) at least one nylon selected from the group consisting of nylon 6 and nylon 6.6 and (c) an alloying nylon copolymer.

5,466,762

BLOCK COPOLYACETALS, PREPARATION THEREOF AND USE THEREOF IN DETERGENTS AND CLEANERS

Matthias Kroner, Elsenberg; Gunnar Schornick, Neuleiningen; Richard Baur, Mutterstadt; Volker Schwendemann, Neustadt, and Heinrich Hartmann, Limburgerhof, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 13, 1995, Ser. No. 397,051

Claims priority, application Germany, Nov. 5, 1992, 42 37 337.9

Int. Cl.[6] C08L *61/02*

U.S. Cl. 525—472 **5 Claims**

1. Block copolyacetals, obtained by cationically initiated polyaddition of

(A) polyacetals containing acetaldehyde acetal units and having at least 2 OH groups in the molecule and

(B) polyacetals containing acetaldehyde acetal units and having at least 2 vinyl ether groups in the molecule,

in a molar ratio of the OH groups in the polyacetals (A) to the vinyl ether groups in the polyacetals (B) of from 2:1 to 1:2.

5,466,763

HIGH PERFORMANCE EPOXY RESIN MODIFIED BY A POLYSULFIDE POLYMER DERIVED FROM THE HEAVY ENDS WASTE OF CHLORINATED HYDROCARBON PRODUCTION

Chester C. Lee, North Plainfield, N.J.; Tao C. Chang, Port Lavaca, Tex., and Yung-Hui Huang, Parsippany, N.J., assignors to Formosa Plastics Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 329,532, Oct. 26, 1994, Pat. No. 5,432,257. This application Nov. 8, 1994, Ser. No. 336,259

Int. Cl.[6] C08F *283/00*

U.S. Cl. 525—523 **20 Claims**

1. A process for preparing a polysulfide-epoxy prepolymer using a heavy ends waste generated in chlorinated hydrocarbon production, which comprises:

(a) distilling said heavy ends waste to form an enriched heavy ends waste with an ethylene dichloride content less than 10% by weight;

(b) reacting said enriched heavy ends waste with an alkaline polysulfide within a temperature range of about 50° C. to about 150° C. to form a polysulfide polymer mixture; and

(c) co-reacting between about 5 and about 30 parts of said polysulfide polymer mixture with a hundred parts by weight of an epoxy resin to form a polysulfide-epoxy prepolymer.

5,466,764

ADHESIVE COMPOSITION COMPRISING A CYANOACRYLATE AND AN EPOXY ADDUCT

Soichiro Hiraoka, Otsuki, Japan, assignor to Three Bond Co., Ltd., Japan

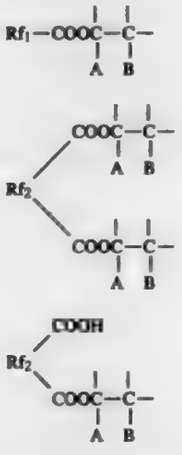
Filed Sep. 16, 1994, Ser. No. 307,368

Claims priority, application Japan, Sep. 17, 1993, 5-253611

Int. Cl.[6] C08F *283/00*

U.S. Cl. 525—530 **10 Claims**

1. An adhesive composition comprising a 2-cyanoacrylate and 0.001 to 10 parts by weight based on 100 parts by weight of the 2-cyanoacrylate of a fluorine-containing carboxylic acid epoxy adduct having at least one of groups represented by the formulae



wherein A is a hydrogen atom and B is a hydroxy group, or A is the hydroxyl group and B is the hydrogen atom; Rf_1 is a perfluoroalkyl group in which an alkyl group has 1 to 12 carbon atoms or a pentafluorophenyl group; and Rf_2 is a perfluoroalkylene group in which an alkylene group has 2 to 12 carbon atoms or a tetrafluorophenylene group.

5,466,765

VACCUM SYSTEM FOR CONTROLLING PRESSURE IN A POLYESTER PROCESS

Douglas M. Haseltine; Thomas L. Yount, and Jimmy L. Ryans, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Mar. 9, 1995, Ser. No. 401,375
Int. Cl.[6] C08F 2/00; C08G 63/00
U.S. Cl. 526—65 9 Claims

1. A polymerization process having at least first and second reaction chambers in which the pressure is decreased successively from said first chamber to a final chamber, said process comprising the steps of:

maintaining a vacuum in said final chamber by removing final chamber vapors therefrom via a final chamber ejector connected thereto by a vacuum line;

directing discharge from said final chamber ejector into a first chamber precondenser to produce first chamber non-condensed materials and condensed first chamber ejector motive fluid;

directing said first chamber ejector non-condensed materials from said first chamber precondenser to a second ejector connected thereto by a vacuum line;

directing discharge from said second ejector into a second condenser to produce second condenser non-condensed materials and condensed second ejector motive fluid; wherein said second condenser is connected to a vacuum pump.

5,466,766

METALLOCENES AND PROCESSES THEREFOR AND THEREWITH

Konstantinos Patsidis; Bernd Peifer, both of Bayreuth, Germany; Syriac J. Palackal, Bartlesville, Okla.; Helmut G. Alt, Bayreuth, Germany; M. Bruce Welch, Bartlesville, Okla.; Rolf L. Geerts, Bartlesville, Okla.; Darryl R. Fahey, Bartlesville, Okla., and Harold R. Deck, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 75,712, Jun. 11, 1993, Pat. No. 5,399,636, and a continuation-in-part of Ser. No. 75,931, Jun. 11, 1993, Pat. No. 5,347,026, and a continuation-in-part of Ser. No. 984,054, Nov. 30, 1992, Pat. No. 5,393,911, and a continuation-in-part of Ser. No. 734,853, Jul. 23, 1991, Pat. No. 5,436,305, which is a continuation-in-part of Ser. No. 697,363, May 9, 1991, Pat. No. 5,191,132. This application Nov. 17, 1993, Ser. No. 154,224
The portion of the term of this patent subsequent to Mar. 21, 2012, has been disclaimed.
Int. Cl.[6] C08F 4/642
U.S. Cl. 526—129 29 Claims

1. A process for preparing a supported cyclopentadiene-type compound comprising contacting a cyclopentadiene-type compound having an active halogen with an inorganic support having surface hydroxyl groups under suitable conditions to cause a reaction between the active halogen and a hydroxyl group on the support so that the cyclopentadiene-type group becomes chemically bound to the support.

23. A process for producing a metallocene comprising reacting the supported cyclopentadienyl-type product produced by the process of claim 1 with a transition metal compound.

24. A supported metallocene produced by the process of claim 23 wherein the cyclopentadienyl-type product is produced by reacting a bridged cyclopentadienyl-type compound in which the bridge contains an active halogen with said inorganic support.

25. A process for polymerizing an olefin comprising contacting said olefin under suitable polymerization conditions with the supported metallocene of claim 24.

5,466,767

SHAPED ORGANOSILOXANE POLYCONDENSATES, PROCESS FOR THEIR PREPARATION AND USE

Stefan Wieland, Offenbach; Peter Panster, Rodenbach, and Horst Grethe, Hanau, all of, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany

Continuation-in-part of Ser. No. 97,197, Jul. 27, 1993, abandoned. This application Nov. 15, 1994, Ser. No. 340,877
Claims priority, application Germany, Aug. 6, 1992, 42 25 978.9
Int. Cl.[6] C08G 77/26;77/30;77/22
U.S. Cl. 528—9 24 Claims

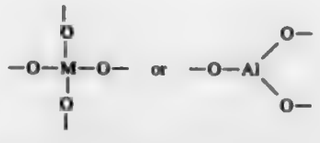
1. A shaped organosiloxane polycondensate comprising units of the formula (I):

$$X—R^1 \quad (I)$$

and/or the formula (II):

$$R^2—Y—R^3 \quad (II);$$

and the formula (III):



(III)

and optionally units of the formula (IV):

(IV)

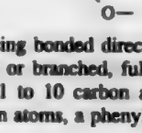
in which the ratios

(I):(III) are in the range from 95:5 to 5:95 mol % or

(II):(III) or the sum of (I) plus (II):(III) are from 90:10 to 10:90 mol % and

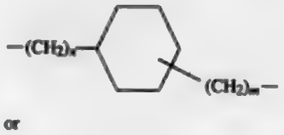
with the ratio of the sum of (I), (II) and (III):(IV) of 100:0 to 50:50 mol %,

wherein R^1 to R^3 are identical or different and represent a group of the formula (V):

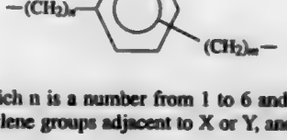


(V)

R^4 being bonded directly to the group X or Y and representing a linear or branched, fully saturated or unsaturated alkylene group with 1 to 10 carbon atoms, a cycloalkylene group with 5 to 8 carbon atoms, a phenylene group or a unit of the formula



or

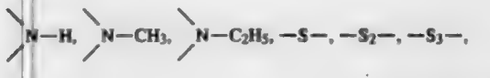


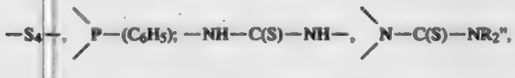
in which n is a number from 1 to 6 and represents the number of methylene groups adjacent to X or Y, and m is a number from 0 to

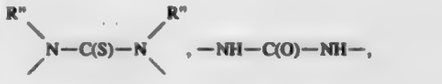
6, wherein M is a Si, Ti or Zr atom, and R' is a linear or branched alkyl group with 1 to 5 carbon atoms or a phenyl group, and X in formula (I) represents

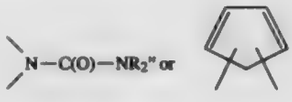
—H, —Cl, —Br, —I, —CN, —SCN, —N_3, —OR", —SH, —COOH, —$P(C_6H_5)_2$, —NH_2, —$N(CH_3)_2$, —$N(C_2H_5)_2$, —NH—$(CH_2)_{2}$—NH_2, —NH—$(CH_2)_2$—NH—$(CH_2)_2$—NH_2, —NH—C(S)—NR_2", —NH—C(O)—NR_2", —NR"—C(S)—NR_2", —O—C(O)—$C(CH_3)$=CH_2, —CH_2—CH=CH_2, —CH_2—CH_2—CH=CH_2, or

and Y in formula (II) represents







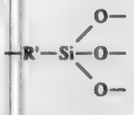


wherein R" is H or represents a linear or branched alkyl group with 1 to 5 carbon atoms,

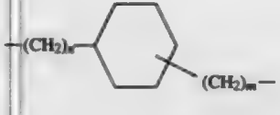
wherein said shaped organosiloxane polycondensate is a macroscopic spherical particle with a diameter of 0.01 to 2.5 mm, a specific surface area of 0.01 to 1000 m^2/g, a specific pore volume of 0.01 to 5 ml/g, and a bulk density of 50 to 1000 g/l;

with the provisio that said shaped organosiloxane polycondensate is not a formed, spherical, polymeric metal complex of iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium and/or platinum formed from the reaction of hydrous or anhydrous compounds of iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium and/or platinum with the components of the organosiloxane; and

with the provisio that said shaped organosiloxane polycondensate does not contain components of NR_3 wherein the R groups are identical or different and represent a group of the formula:

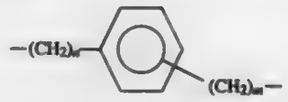


R' being bonded directly to the nitrogen atom and represents a linear or branched alkylene group with 1 to 10 carbon atoms, a cycloalkylene group with 5 to 8 carbon atoms, or a unit of the formula



-continued

or



in which n is a number from 1 to 6 and represents the number of methylene groups bonded to nitrogen and m is a number from 0 to 6.

5,466,768

ULTRAVIOLET LIGHT ABSORBING COMPOUNDS, SILICONE COMPOSITIONS AND METHODS FOR MAKING SAME

Shih-Liang S. Yang, Laguna Hills, Calif., assignor to Allergan, Inc., Irvine, Calif.

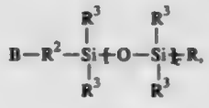
Division of Ser. No. 969,912, Nov. 2, 1992, Pat. No. 5,352,753, which is a continuation-in-part of Ser. No. 691,149, Apr. 25, 1991, Pat. No. 5,164,462, which is a continuation-in-part of Ser. No. 959,394, Oct. 9, 1992, Pat. No. 5,376,737. This application May 6, 1994, Ser. No. 239,175

The portion of the term of this patent subsequent to Nov. 17, 2009, has been disclaimed.

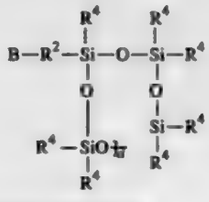
Int. Cl.[6] C07F 7/10

U.S. Cl. 528—15 **17 Claims**

1. A compound having one of the following formulas

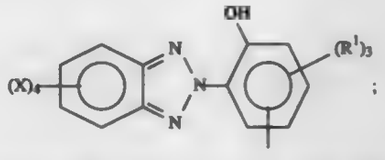


(1)



(2)

and mixtures thereof, wherein B is



each x is independently selected from the group consisting of H, monovalent hydrocarbon radicals, monovalent substituted hydrocarbon radicals, hydroxyl radicals, amino radicals, carboxyl radicals, alkoxy radicals, substituted alkoxy radicals, and halogen radicals; each R^1 is independently selected from the group consisting of H, alkyl radicals, alkoxy radical, hydroxyl radicals, amino radicals and carboxyl radicals; R^2 is selected from the group consisting of divalent hydrocarbon radicals, divalent substituted hydrocarbon radicals, oxo, divalent oxyhydrocarbon radicals and divalent substituted oxyhydrocarbon radicals; each R^3 is independently selected from the group consisting of alkyl radicals, substituted alkyl radicals, alkoxy radicals, substituted alkoxy radicals, H, alkenyl radicals, substituted alkenyl radicals, R^2-B, aryl radicals, substituted aryl radicals and fluoro radical; R is selected from the group consisting of H, alkenyl radicals and substituted alkenyl radicals, alkenoxy radicals, substituted alkenoxy radicals, acryloxy alkyl radicals and substituted acryloxy alkyl radicals; each R^4 is

independently selected from the group consisting of R and R^3, provided that at least one of the R^4's is R; c is an integer in the range of 1 to about 10,000; and d is an integer in the range of 0 to about 100.

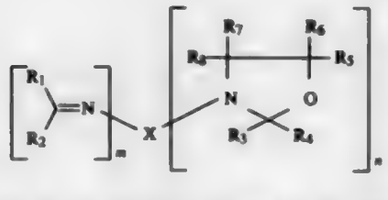
5,466,769

REACTIVE DILUENT ALDIMINE OXAZOLIDINES

Chih-Yuch Chou, Elk Grove, Ill., assignor to ANGUS Chemical Company, Buffalo Grove, Ill.

Filed Oct. 26, 1993, Ser. No. 143,470
Int. Cl.[6] C08G 18/10
U.S. Cl. 528—60 24 Claims

1. A composition comprising an isocyanate and an aldimine oxazolidine compound having the formula:



wherein: R_1, R_2, R_3, R_4, R_5, R_6, R_7 and R_8 are, individually, a hydrogen atom, a methyl or methylol group, an ethyl or ethylol group, a straight chain or branched chain alkyl or alkanol group, a cycloalkyl group, or an aryl group, including any of the above groups substituted by nitro, halogen, thiol and amino functional groups, such that when R_5, R_6, R_7 and R_8 are hydrogen atoms, R_3 and R_4 are not hydrogen atoms, further, R_7 and R_8 cannot simultaneously be hydrogen atoms; m and n are integers of one to three, and m+n is between two and four; and X is a covalent bond between the nitrogen atom of the aldimine group and the nitrogen atom of the oxazolidine group or an (m+n)-valent methylene group, ethylene group, straight chain or branched chain alkylene group, cycloalkylene group, or arylene group, including any of the above X groups substituted by nitro, halogen, thiol and amino functional groups.

5,466,770

FLUORINE-EFFICIENT OIL- AND WATER-REPELLENT COMPOSITIONS

Frans A. Audenaert, Kaprijke; Rudolf J. Dams, Zwijndrecht, both of, Belgium, and Robert F. Kamrath, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 26, 1994, Ser. No. 249,798
Int. Cl.[6] C08G 18/30
U.S. Cl. 528—60 20 Claims

1. A fluorine-efficient oil- and water-repellent treatment composition comprising:

(A) a fluorochemical oil- and water-repellent agent; and

(B) a polymer extender comprising a saturated carbon-carbon backbone chain and at least one percent by weight, based on the weight of the extender, of interpolymerized units derived from ethylenically-unsaturated monomer containing at least one blocked or masked isocyanato group or function.

5,466,771

COATING COMPOSITIONS BASED ON ALDIMINES AND POLYISOCYANATES CONTAINING ALLOPHANATE GROUPS

Sharon D. Hicks, Pittsburgh; Douglas A. Wicks, Mt. Lebanon, and John H. Hunter, Cornopolis, all of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Dec. 21, 1993, Ser. No. 171,281
Int. Cl.[6] C08G 18/32
U.S. Cl. 528—64 9 Claims

1. A coating composition which has a long pot life, may be rapidly cured under ambient conditions to provide coatings with improved optical properties and contain as binder

a) a polyisocyanate component containing

i) 5 to 100% by weight of a monoallophanate and

ii) 0 to 95% by weight of another polyisocyanate adduct, and

b) an aldimine based on the reaction product of a polyamine having 2 or more primary amino groups with an aldehyde corresponding to the formula:

wherein R_1 and R_2 may be the same or different and represent hydrocarbon radicals, or R_1 and R_2 together with the β-carbon atom form a cycloaliphatic or heterocyclic ring,

wherein components a) and b) are present in an amount sufficient to provide an equivalent ratio of isocyanate groups to aldimine groups of 0.5:1 to 20:1.

5,466,772

UNSATURATED POLYURETHANES AND THEIR USE AS DISPERSANTS FOR ALKYD RESINS

Karl-Hans Angelmayer, Eltville; Gerd Walz, Wiesbaden, and Joachim Zoeller, Mainz, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Mar. 3, 1994, Ser. No. 205,680
Claims priority, application Germany, Mar. 5, 1993, 43 06 946.0
Int. Cl.[6] C08G 18/28
U.S. Cl. 528—73 6 Claims

1. An unsaturated polyurethane containing from 20 to 80% by weight of polyethylene glycol units, which polyurethane is prepared by reacting

a) at least one organic polyisocyanate,

b) an unsaturated fatty alcohol or its polyalkylene glycol ether, an unsaturated fatty amine or a reaction product of an unsaturated fatty acid and a monoepoxide,

c) a compound which contains not only two groups which react with isocyanate groups but also at least one group which is ionic or a structural element which can be converted into an ionic group,

d) a polyalkylene glycol having a molecular mass of from 750 to 10,000, and optionally

e) a compound containing from three to six hydroxyl or amino groups,

the ratio of the isocyanate groups in a) to the hydroxyl and amino groups in the remaining components being from 0.7:1 to 1.2:1.

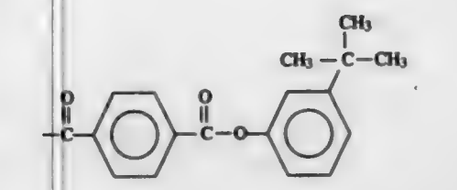
5,466,773

LIQUID CRYSTALLINE POLYESTER RESIN

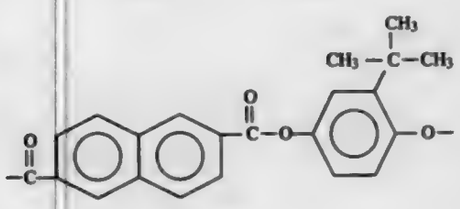
Michael R. Samuels, Wilmington, and Marion G. Waggoner, Hockessin, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 28, 1995, Ser. No. 396,032
Int. Cl.[6] C08G 63/18
U.S. Cl. 528—194 6 Claims

1. A thermotropic liquid crystalline polymer consisting essentially of the repeat units

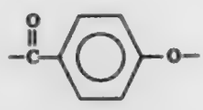


(I)



(II)

and



(III)

wherein

the molar ratio of (I):(II) is about 1:9 to about 9:1; and

the molar ratio of [(I)+(II)]:(III) is about 4:1 to about 1:2.

5,466,774

(CO) POLYCARBONATE AND PROCESS FOR PRODUCING THE SAME

Tatsuya Kamo; Yutaka Hukuda, and Yasuhiro Oshino, all of Hyogo, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Jan. 28, 1994, Ser. No. 188,194

Claims priority, application Japan, Jan. 29, 1993, 5-013688; Mar. 1, 1993, 5-039606; Apr. 16, 1993, 5-089919

Int. Cl.[6] C08G *64/00*

U.S. Cl. 528—199 10 Claims

1. In a process for producing a (co)polycarbonate having a terminal hydroxyl group concentration of from 8 to 30% by mol, by the melt-polycondensation of a dihydroxy compound with a carbonic diester, the improvement comprising conducting said melt-polycondensation at a temperature of 180°–300° C. and a pressure of atmospheric to 0.1 Torr in the presence of a transesterification catalyst selected from the group consisting of a nitrogen-containing basic compound, an alkali metal borate and an alkaline earth metal borate, said catalyst being present in an amount of 10^{-9}–10^{-3} mol per mol of dihydroxy compound, and an ester compound present in an amount of 10^{-4}–10^{-2} mol per mol of dihydroxy compound, said ester compound having the formula R_aCOOR_b, wherein R_a is a phenyl group which may be substituted with a straight-chain or branched alkyl group having 1 to 10 carbon atoms or an aryl group having 6 to 12 carbon atoms and R_b is a phenyl group, a straight-chain or branched alkyl group having 1 to 10 carbon atoms or a cyclic alkyl group having 3 to 8 carbon atoms.

5,466,775

PROCESS FOR THE PREPARATION OF POLYCARBONATE

Tatsuya Kamo, and Yutaka Fukuda, both of Hyogo, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 132,132, Oct. 5, 1993, abandoned. This application Mar. 11, 1994, Ser. No. 209,820

Claims priority, application Japan, Jan. 14, 1992, 4-275720; Dec. 24, 1992, 4-344854; Apr. 16, 1993, 5-89916; Apr. 16, 1993, 5-89918; Jul. 7, 1993, 5-167658; Jul. 7, 1993, 5-167659; Jul. 7, 1993, 5-167660

Int. Cl.[6] C08G *63/06*

U.S. Cl. 528—207 5 Claims

1. A process for preparing a polycarbonate consisting essentially of a step of melt-polycondensing a dihydric phenol with a carbonic diester substantially free from phenyl salicylate, o-phenoxybenzoic acid and phenyl o-phenoxybenzoate at a temperature of from 100°–300° C. and in the presence of an alkali metal compound and an alkaline earth metal compound as a catalyst.

5,466,776

PROCESS FOR THE MULTISTAGE GENERATION OF VACUUM FOR POLYESTER PRODUCTION

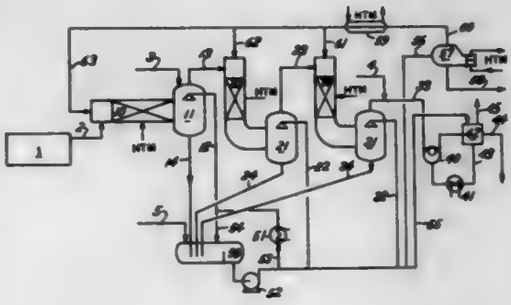
Juergen Krautstrunk, and Klaus Mackensen, both of Frankfurt am Main, Germany, assignors to Zimmer Aktiengesellschaft, Frankfurt, Germany

Filed Feb. 9, 1995, Ser. No. 386,113

Claims priority, application Germany, Jun. 3, 1994, 44 19 397.1

Int. Cl.[6] C08F *2/00*; C08G *85/00*;*63/00*

U.S. Cl. 526—68 13 Claims



1. In a process for multi-stage vacuum generation and condensation and recycling of the vapors withdrawn from the polycondensation of polyester precondensates in a polyester process, said withdrawn vapors containing at least one C_2 to C_4 alkyl glycol, higher boiling reaction by-products and lower boiling reaction by-products, including water, which process comprises a last stage compressing to atmospheric pressure consisting of a liquid ring pump, a cooler and a degasifier tank, and at least two preceding stages consisting each of a glycol vapor jet and a downstream glycol spray condenser, the improvement comprising

operating said glycol vapor jets with superheated glycol vapor having a pressure in the range of 0.8 to 1.0 bar absolute,

condensing a maximum of said alkyl glycol and of said higher boiling by-products in said glycol spray condensers, while a maximum of said lower boiling by-products, including water, remains in the gas phase,

condensing said lower boiling by-products in said last stage, and recycling the condensates from the spray condensers within said process.

5,466,777

XANTHENE POLYMERS, AND COPOLYMERS, AND METHOD FOR MAKING

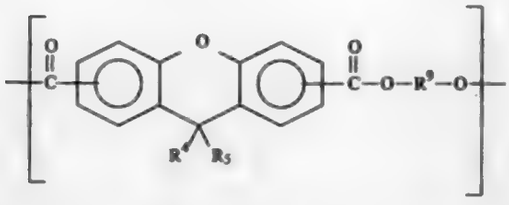
Andrew J. Caruso, and Julia L. Lee, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 218,383, Mar. 28, 1994, abandoned. This application Dec. 15, 1994, Ser. No. 354,356

Int. Cl.[6] C08G 63/18

U.S. Cl. 528—298 12 Claims

1. A xanthene polyester comprising chemically combined xanthene units of the formula,



where R^4 and R^5 are selected from the same or different $C_{(1-20)}$ organic radicals, R^9 is divalent organic radical selected from the group consisting of a $C_{(2-10)}$ alkenyl radical, a $C_{(4-10)}$ cycloaliphatic radical and a $C_{(6-20)}$ aromatic radical.

5,466,778

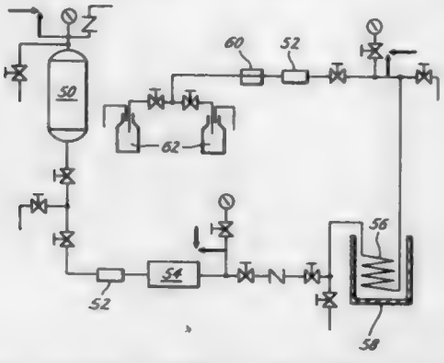
PROCESS FOR POLYMERIZATION OF TETRAHYDROFURAN USING ACIDIC ZEOLITE CATALYSTS

Timothy L. Lambert, and John F. Knifton, both of Austin, Tex., assignors to Huntsman Corporation, Salt Lake City, Utah

Filed Oct. 19, 1993, Ser. No. 138,026

Int. Cl.[6] C08G 63/66

U.S. Cl. 528—361 1 Claim



1. In a process for producing a tetrahydrofuran polymer, an improvement providing a substantial increase in yield and narrower molecular weight range which comprises premixing in acidic, dealuminated Y-zeolite and carboxylic anhydride and subsequently adding tetrahydrofuran, wherein the dealuminated Y-zeolite has a silica-to-alumina molar ratio of about 45.7 and a unit cell size of about 24.26Å.

5,466,779

PRODUCTION OF POLYSUCCINIMIDE

Robert J. Ross, Elmhurst, Ill., assignor to Donlar Corporation, Bedford Park, Ill.

Filed May 17, 1994, Ser. No. 243,955

Int. Cl.[6] C08G 69/00;73/10

U.S. Cl. 528—363 13 Claims

1. A method for preparing a polysuccinimide which comprises the steps of:

(a) contacting ammonia gas with liquid maleic anhydride at a reaction temperature above the melting point of maleic anhydride and below the boiling point of liquid maleic anhydride while maintaining said maleic anhydride molten for a time period sufficient to produce a reaction product;

(b) discontinuing said introduction of ammonia gas; and

(c) then polymerizing the reaction product obtained in step (a) by heating said reaction product to a polymerization temperature and maintaining said polymerization temperature for a time period sufficient to effect polymerization of said reaction product to polysuccinimide.

5,466,780

PROCESS FOR CONVERTING POLYKETONES TO POLYESTERS

Palanisamy Arjunan, Houston, Tex., assignor to Exxon Chemical Patents Inc., Wilmington, Del.

Filed Mar. 30, 1994, Ser. No. 220,774

Int. Cl.[6] C08F 8/06; C08K 5/06

U.S. Cl. 528—494 21 Claims

1. A process for converting polyketones to polyesters comprising contacting at least one polyketone, at least one peroxidizing agent and a liquid carrier in a slurry oxidation reaction.

5,466,781

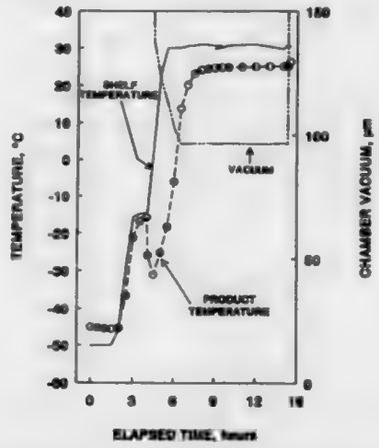
PROCESS FOR PURIFYING BACTERIALLY PRODUCED M-CSF

Glenn Dorin, San Rafael; David R. Gray, El Cerrito; Byeong S. Chang, Orinda; Cynthia A. Cowgill, and Robert J. Milley, both of Berkeley, all of Calif., assignors to Chiron Therapeutics, Emeryville, Calif.

Continuation-in-part of Ser. No. 705,399, May 24, 1991, abandoned. This application Mar. 8, 1993, Ser. No. 28,375

Int. Cl.[6] C07K 14/53;1/14;1/34; C12P 21/02

U.S. Cl. 530—351 23 Claims



1. A process for purifying macrophage colony stimulating factor (M-CSF) from bacterial contaminants, including proteins, nucleic acids, and non-proteinaceous compounds, when the M-CSF has been produced in the form of refractile bodies, the process comprises:

a) isolating M-CSF containing refractile bodies from bacteria;

b) suspending and agitating the refractile bodies in 1% (v/v) Triton® X-100 and sodium citrate;

c) centrifuging the suspended and agitated refractile bodies;

d) resuspending the centrifuged refractile bodies in sodium acetate, NaCl, and ethylenediaminetetroacetic acid (EDTA);

e) diafiltering the refractile body suspension from step (d) against sodium acetate, NaCl, and EDTA and subsequently diafiltering the refractile body suspension against water; and

f) recovering the refractile bodies from step (e) for further treatment.

5,466,782

METHOD FOR SEPARATING A COMPOUND CONTAINING GLYCOLIPIDS, LYSOPHOSPHOLIPIDS, SPHINGOLIPIDS AND CERAMIDES OF PLANT ORIGIN

Gerard Rousset, Wissous, France, assignor to Laboratoires Inocosm, Chatenay Malabry, France

PCT No. PCT/FR92/00182, § 371 Date Apr. 22, 1994, § 102(e) Date Apr. 22, 1994, PCT Pub. No. WO92/21321, PCT Pub. Date Dec. 10, 1992

PCT Filed Feb. 27, 1992, Ser. No. 150,150

Claims priority, application France, May 27, 1991, 91 06336

Int. Cl.[6] A61K *7/48;* C07H *1/08;* C07K *14/415;* C11B *1/10*

U.S. Cl. 530—374 14 Claims

1. Method for separating a composition containing glycolipids, lysophospholipids, sphingolipids and ceramides of plant origin, characterized in that a liquid alcohol is heated to a temperature of between 50° and 80° C., a plant composition or a plant extract is introduced into the alcohol under intensive stirring to form a mixture, stirring is continued, and the mixture is left to stand whilst the temperature is maintained, then it is hot-filtered so as to separate a filtrate from a dilapidated filter cake and the alcohol is evaporated from the filtrate such that a lipid residue which contains glycolipids, lysophospholipids, sphingolipids and ceramides of plant origin and which can be used in cosmetology or dermatology is obtained.

5,466,783

HUMAN TISSUE FACTOR INHIBITOR

Tze-Chein Wun, St. Louis; Kuniko K. Kretzmer, Eureka, and George J. Broze, Jr., St. Louis, all of Mo., assignors to Monsanto Company, and Washington University, both of St. Louis, Mo.

Continuation of Ser. No. 566,280, Aug. 13, 1990, abandoned, which is a division of Ser. No. 123,753, Nov. 23, 1987, Pat. No. 4,966,852, which is a continuation-in-part of Ser. No. 77,366, Jul. 23, 1987, abandoned. This application Jul. 15, 1993, Ser. No. 93,285

Int. Cl.[6] C07K *13/00*

U.S. Cl. 530—380 2 Claims

1. Human tissue factor inhibitor in essentially pure form apart from its naturally occurring admixtures and having the protein amino acid sequence as shown in FIG. 3 of the drawings.

5,466,784

MONOCLONAL ANTIBODIES TO SALINOMYCIN AND METHOD FOR DETECTING THE SAME

Larry H. Stanker; Marcel H. Elissalde, Jr.; Ross C. Beier, all of College Station; Loyd D. Rowe, Jr., Bryan, and John R. DeLoach, College Station, all of Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 23, 1993, Ser. No. 81,591

Int. Cl.[6] C07K *16/00;* C12N *5/18*

U.S. Cl. 530—388.9 4 Claims

1. A hybridoma cell line ATCC HB 11954 which produces and secretes monoclonal antibody SAL02 which specifically binds to salinomycin, and wherein said hybridoma cell line is produced using an immunization preparation comprising salinomycin conjugated at its number 1 carbon to an immunogenic carrier.

5,466,785

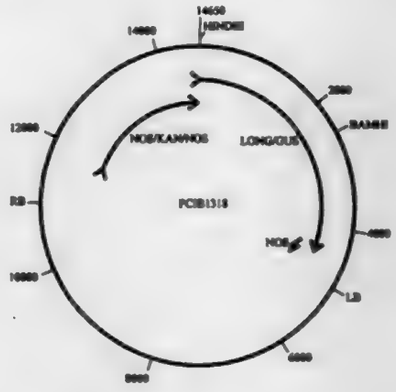
TISSUE-PREFERENTIAL PROMOTERS

Annick J. de Framond, Durham, N.C., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 71,209, Jun. 2, 1993, abandoned, which is a continuation of Ser. No. 508,207, Apr. 12, 1990. This application Oct. 13, 1994, Ser. No. 322,962

Int. Cl.[6] C12N *15/11;15/32*

U.S. Cl. 536—24.1 6 Claims



2. A chimeric gene comprising:

a) the promoter sequence located at nucleotide positions 1 to 2564 of the gene set forth in SEQ ID NO:1;

b) a coding sequence of interest; and

c) a 3' terminal sequence;

wherein said promoter sequence directs the transcription of said coding sequence.

5,466,786

2'MODIFIED NUCLEOSIDE AND NUCLEOTIDE COMPOUNDS

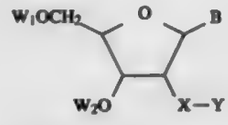
Chris A. Buhr, Daly City, and Mark Matteucci, Burlingame, both of Calif., assignors to Gilead Sciences, Foster City, Calif.

Continuation of Ser. No. 425,857, Oct. 24, 1989, abandoned. This application May 10, 1994, Ser. No. 240,506

Int. Cl.[6] C07H *19/00*

U.S. Cl. 536—26.26 8 Claims

1. A monomer having the formula:



(I)

wherein

B is a purine or pyrimidine moiety;

W_1 is H, $(PO_3)_m^{-2}$ wherein m is an integer of 1–3; a protecting group, or an intermediate moiety in the formation of an internucleotide link which when reacted with the appropriate —OH results in Z wherein Z is selected from the group consisting of P(O)O⁻, P(O)S, $P(O)NR_2$, P(O)R, P(O)OR', CO, and CNR_2, wherein R is H or alkyl (1–6 C) and R' is alkyl (1–6 C);

W_2 is H, PO_3^{-2} a protecting group or an intermediate moiety in the formation of an internucleotide link which when reacted with the appropriate —OH results in Z wherein Z is selected from the group consisting of P(O)O⁻, P(O)S, $P(O)NR_2$, P(O)R, P(O)OR', CO, and CNR_2, wherein R is H or alkyl (1–6 C) and R' is alkyl (1–6 C);

X is O, S, NR, or CR_2 wherein each R is independently H or alkyl (1–6 C);

Y is a drug moiety selected from the group consisting of netropsin, anthramycin, quinoxaline antibiotics, actinomycin, and pyrrolo (1–4) benzodiazepine.

5,466,787

PROCESS FOR PREPARING AZT

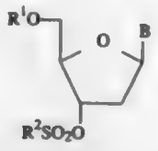
Bang-Chi Chen, East Syracuse, and Sandra L. Quinlan, Manlius, both of N.Y., assignors to Bristol-Myers Squibb Company, Del.

Filed Nov. 15, 1993, Ser. No. 152,803

Int. Cl.[6] C07H *1/00;19/173*

U.S. Cl. 536—55.3 **20 Claims**

14. A process for preparing a nucleoside of the following formula I:



(I)

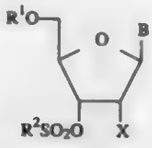
wherein

R^1 is hydrogen or a hydroxyl protecting group

R^2 is C_1–C_{12}alkyl or C_6–C_{30}aryl

B is a pyrimidine base;

comprising reacting a compound of the formula II:



(II)

with

a tri(C_1–C_{12}alkyl) tin hydride reducing agent and a catalytic amount of a radical initiator in a ether, ester, or ketone solvent under suitable conditions to yield a nucleoside of formula I, and wherein X is Cl, Br, or I.

5,466,788

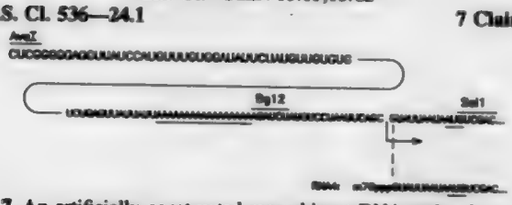
SUBGENOMIC PROMOTER

Paul G. Ahlquist, Madison, Wis., and Roy C. French, Lincoln, Nebr., assignors to Mycogen Plant Science, Inc., San Diego, Calif.

Continuation of Ser. No. 197,222, Feb. 16, 1994, abandoned, which is a continuation of Ser. No. 69,457, Jun. 1, 1993, abandoned, which is a continuation of Ser. No. 683,516, Apr. 8, 1991, abandoned, which is a continuation of Ser. No. 168,691, Mar. 16, 1988, abandoned, and a continuation-in-part of Ser. No. 368,939, Jun. 19, 1989, abandoned, which is a continuation of Ser. No. 709,181, Mar. 7, 1985, abandoned. This application Aug. 25, 1994, Ser. No. 296,080

Int. Cl.[6] C12N *15/11;15/82*

U.S. Cl. 536—24.1 **7 Claims**



7. An artificially constructed recombinant DNA molecule comprising a subgenomic promoter, wherein said subgenomic promoter comprises a nucleotide sequence from brome mosaic virus from a BstXI site to a SalI site of the cDNA corresponding to the RNA of FIG. 2, and duplicate copies of an activating domain of brome mosaic virus, wherein said duplicate sequence is from an AvaI site to a BglII site of the cDNA corresponding to the RNA of FIG. 2, wherein said duplicate activating domain sequence is located about 220 nucleotides upstream of a subgenomic transcription start site, said subgenomic promoter further comprising a consensus sequence selected from the group consisting of AUCUAUGUU and sequences having a single mismatch thereto, and said recombinant DNA molecule further comprising a plant-expressible gene under the regulatory control of said subgenomic promoter.

5,466,789

POLYUNSATURATED DIAZONIUM COMPOUNDS

John R. Wade, Leeds; Michael J. Pratt, Ilkley, and Jianrong Ren, Leeds, all of, United Kingdom, assignors to Du Pont (UK) Limited, Seacroft Leeds, United Kingdom

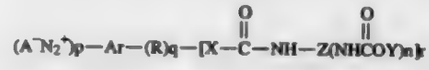
Filed Jan. 21, 1993, Ser. No. 6,862

Claims priority, application United Kingdom, Jan. 21, 1992, 9201237

Int. Cl.[6] C07C *245/20*

U.S. Cl. 534—560 **6 Claims**

1. A polyunsaturated diazonium compound having the formula:



where p and q are integers ranging from 1 to 5 and r is an integer ranging from 1 to 10; and in which Ar represents a substituted or unsubstituted divalent or polyvalent radical derived from an aromatic or heteroaromatic compound; X represents O, S or a secondary or tertiary amino group; R represents a single bond or a substituted or unsubstituted divalent or other polyvalent radical and may be the same or different when q is greater than 1; A^- represents an anion; Z represents the residue of a polyisocyanate having 2 or 3 isocyanate groups; n is 1 or 2; and Y is the residue of a monohydroxy compound containing at least two ethylenically unsaturated double bonds.

5,466,790

AZO DYES WITH AN ACETALIZED DIAZO COMPONENT OF THE THIOPHENE OR THIAZOLE SERIES

Sabine Gruettner-Merten, Mutterstadt; Helmut Reichelt, Neustadt; Arno Lange, Bad Duerkheim, and Helmut Begen, Frankenthal, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/01043, § 371 Date Sep. 30, 1994, § 102(e) Date Sep. 30, 1994, PCT Pub. No. WO93/23479, PCT Pub. Date Nov. 25, 1993

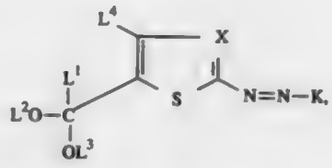
PCT Filed Apr. 30, 1993, Ser. No. 307,794

Claims priority, application Germany, May 12, 1992, 42 15 495.2

Int. Cl.[6] C09B *29/033;29/042;67/48;* **D06P** *1/18*

U.S. Cl. 534—753 **6 Claims**

1. An azo dye of the formula I



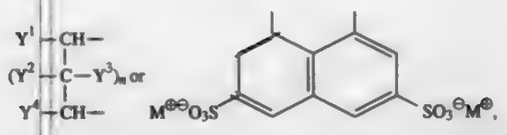
(I)

where

L^1 is hydrogen, C_1–C_8-alkyl or phenyl,

L^2 and L^3 are identical or different and each is independently of the other C_1–C_8-alkyl, which may be substituted and may be interrupted by 1 or 2 oxygen atoms in ether function, or

together are a radical of the formula



where n is 0, 1 or 2, Y^1 and Y^4 are identical or different and each is independently of the other hydrogen, hydroxymethyl, 1,2-dihydroxyethyl or a radical of the formula $COO^{\ominus}M^{\oplus}$ or $SO_3^{\ominus}M^{\oplus}$, Y^2 and Y^3 are identical or different and are each independently of the other halogen or hydroxymethyl, and $M^{\oplus}$ is the equivalent of a cation,

L^4 is hydrogen, C_1–C_8-alkyl, which may be interrupted by 1 or 2 oxygen atoms in ether function and may be substituted, substituted or unsubstituted phenyl, halogen, C_1–C_8-alkoxy, substituted or unsubstituted phenoxy, C_1–C_8-alkylthio, C_1–C_8-alkylsulfonyl, substituted or unsubstituted phenylthio, substituted or unsubstituted phenylsulfonyl, C_1–C_8-alkoxycarbonyl, C_3–C_6-alkenyloxycarbonyl or phenoxycarbonyl,

X is nitrogen or the radical C—L^5, where L^5 is cyano, C_1–C_8-alkoxycarbonyl, C_3–C_6-alkenyloxycarbonyl, phenoxycarbonyl, C_1–C_8-alkanoyl, benzoyl, carbamoyl, mono- or di(C_1–C_4-alkyl)carbamoyl, phenylcarbamoyl, C_1–C_8-alkylsulfonyl or substituted or unsubstituted phenylsulfonyl, and

K is the radical of a coupling component.

5,466,791

MONOAZO DYES, THEIR PREPARATION AND USE

Ulrich Bühler, Alzenau; Reinhard Kühn, Frankfurt, and Margareta Boos, Hattersheim, all of, Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Germany

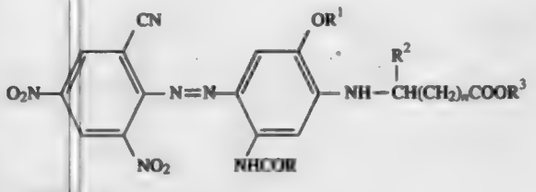
Continuation of Ser. No. 276,765, Jul. 18, 1994, abandoned, which is a continuation of Ser. No. 641,913, Jan. 16, 1991, abandoned. This application Feb. 13, 1994, Ser. No. 387,365

Claims priority, application Germany, Jan. 22, 1990, 40 01 671.4

Int. Cl.[6] **C09B** *29/00;49/00*

U.S. Cl. 534—854 **15 Claims**

1. Azo dye of the general formula I



(I)

in which

R is methyl or ethyl,

R^1 is methyl, ethyl, methoxyethyl or ethoxyethyl,

R^2 is methyl or ethyl, if n is equal to 0, and hydrogen, if n is equal to 1,

R^3 is methyl, ethyl, n-propyl or i-propyl and

n is 0 to 1.

5,466,792

RI T-DNA PROMOTERS

Jerry L. Slightom, Kalamazoo, Mich., and David A. Tepfer, Paris, assignors to Mycoen Plant Science, Inc., San Diego, Calif.

Division of Ser. No. 8,216, Jan. 25, 1993, Pat. No. 5,366,887, which is a division of Ser. No. 725,368, Apr. 22, 1985, Pat. No. 5,182,200. This application Nov. 8, 1994, Ser. No. 336,346

Int. Cl.[6] **C07H** *17/00*

U.S. Cl. 536—23.7 **20 Claims**

1. An isolated nucleic acid molecule designated pRi T_L-DNA and having the nucleic acid sequence of Sequence ID No. 19.

5,466,793

PROCESS FOR PREPARING 2', 3'- DIDEOXYINOSINE

Yutaka Honda; Hiroshi Shiragami; Hisao Iwagami, and Masayuki Arai, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Kawasaki, Japan

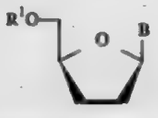
Continuation of Ser. No. 575,569, Aug. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 317,567, Mar. 1, 1989, Pat. No. 5,290,927. This application Mar. 30, 1992, Ser. No. 860,605

Claims priority, application Japan, Mar. 1, 1988, 48425; Jul. 11, 1988, 170963; Dec. 9, 1988, 310131; Dec. 19, 1988, 320046

Int. Cl.[6] **C07H** *19/173;19/073*

U.S. Cl. 536—55.3 **19 Claims**

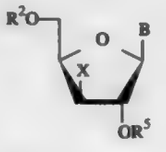
1. A process for producing a 2',3'-dideoxynucleoside of the formula (X):



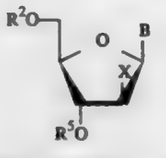
(X)

wherein B is hypoxanthine; R^1 is hydrogen, C_{1-12} acyl, C_{1-12} alkyl, C_{7-8} aralkyl or a silyl protective group which can be readily removed; said process comprising:

(i) reducing a nucleoside of the formula (IIIa) or (IIIb):



(IIIa)



(IIIb)

wherein R^2 is hydrogen, C_{1-12} acyl, C_{1-12} alkyl, C_{7-8} aralkyl or a silyl protective group which can be readily removed; X is Cl, Br or I; R^5 is C_{1-12} acyl and B is hypoxanthine;

with hydrogen in the presence of a palladium catalyst; wherein said reducing is conducted in a solvent containing an organic or inorganic base and wherein said solvent is acetonitrile, aqueous acetonitrile, aqueous ethyl acetate or aqueous methanol; and

(ii) recovering said compound of the formula (X) from said solvent.

5,466,794

THERMOPLASTIC CELLULOSE ETHER ESTER GRAFT COPOLYMERS AND PROCESS FOR THEIR PRODUCTION

Jochen Kalbe, Essen; Hanns P. Müller, Odenthal; Rainhard Koch, Köln; Jürgen Engelhardt; Wolfgang Koch, both of Bomlitz; Klaus Szablikowski, Walsrode, and Gunter Weber, Fallingbostel, all of, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Filed May 17, 1994, Ser. No. 245,350

Claims priority, application Germany, May 24, 1993, 43 17 231.8

Int. Cl.[6] **C08B** *13/00;* **C08L** *1/26;* **D01F** *2/28;* **C08F** *251/02*

U.S. Cl. 536—66 **6 Claims**

1. Thermoplastic, water-insoluble, cellulose hydroxyalkyl hydroxycarboxylic acid esters of the general structure:

Cell—O—R

where Cell—O represents the substituted OH groups of a polymeric cellulose unit and each R is either a monomeric hydroxyalkylether hydroxycarboxylic acid ester or a polymeric hydroxyalkylether hydroxycarboxylic acid ester of the structure X:

X=—A—B—

in which A is a linear polyether chain:

A=(—D—O—)$_n$

in which D signifies a linear aliphatic branched or unbranched chain with 2 to 11 C atoms and n is a whole number equal to or greater than 1, and B is a linear polyester chain:

B=(—C(=O)—E—O—)$_m$H

in which E signifies a linear aliphatic branched or unbranched chain with 2 to 5 C atoms and m is a whole number equal to or greater than 1, or R is equal to A B, X or a combination thereof or R is equal to H (hydrogen), according to the degree of substitution per anhydroglucose unit (max. 3) with A, B or X.

5,466,795

PROCESS FOR THE MANUFACTURE OF MANNITOL

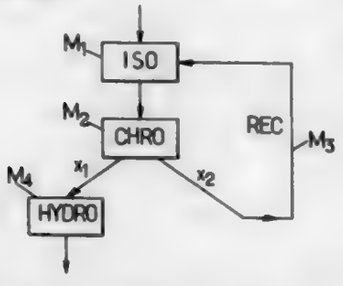
Francis Devos, Morbecques, France, assignor to Roquette Freres, Lestrem, France

Filed Jul. 12, 1993, Ser. No. 90,615

Claims priority, application France, Jul. 22, 1992, 92 09053

Int. Cl.[6] **C07H** *1/06;* **C07C** *31/18;* **C12P** *19/24*

U.S. Cl. 536—125 **15 Claims**



1. Process for the manufacture of mannitol comprising:

in a first step, subjecting a fructose syrup containing less than 15% glucose to an enzymatic isomerization using one mannose isomerase capable of interconverting fructose and mannose, the said enzymatic isomerization resulting in the production of a mixture of fructose and mannose containing between 15% and 29% of mannose,

in a second step, subjecting the said mixture to a chromatographic separation treatment so as to obtain at least two fractions one of which (fraction X1) is highly enriched with mannose and the other of which (fraction X2) is highly enriched with fructose,

in a third step, at least partially recycling fraction X2 to the top of the enzymatic isomerization step,

in a fourth step, hydrogenating fraction X1, highly enriched with mannose, so as to obtain a mannitol-rich syrup capable of being crystallized in a single crystallization operation.

5,466,796

ALKOXY-BRIDGED METALLOPHTHALOCYANINE DIMERS

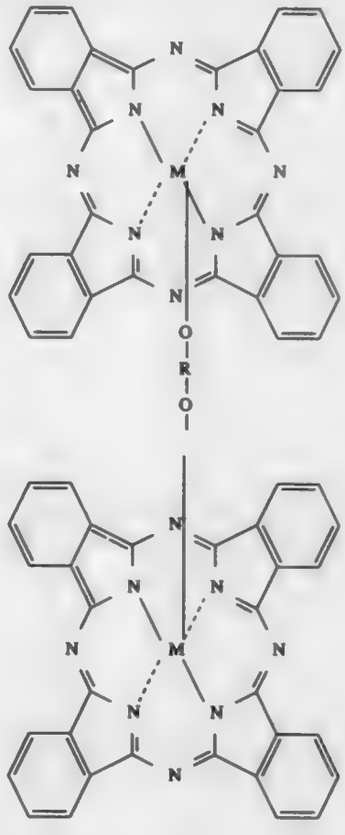
Richard A. Burt, Oakville; George Liebermann; Gordon K. Hamer, both of Mississauga; Sandra J. Gardner, Willowdale; Carol A. Jennings, Mississauga, all of, Canada; Katsumi Daimon, and Katsumi Nukada, both of Minami Ashigara, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 26, 1994, Ser. No. 239,432

Int. Cl.[6] **C09B** *47/04*

U.S. Cl. 540—139 **23 Claims**

1. Alkoxy-bridged metallophthalocyanine dimers of the formula $C_{32}H_{16}N_8MOROMN_8H_{16}C_{32}$, or of the formula



wherein M is a metal, and R is an alkyl or an alkyl ether.

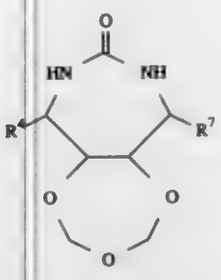
5,466,797

INTERMEDIATES FOR THE PREPARATION OF CYCLIC UREA

Lucius T. Rossano, Newark, and Young S. Lo, Hockessin, both of Del., assignors to The Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Filed Jun. 30, 1994, Ser. No. 268,702
Int. Cl.[6] C07D 243/04
U.S. Cl. 540—503 4 Claims

1. The compounds of the formulae:



wherein:

R^4 and R^7 are independently selected from the group:
hydrogen;
C_1–C_8 alkyl substituted with 0–3 R^{11};
C_3–C_{14} carbocyclic ring system substituted with 0–3 R^{11} or 0–3 R^{12};
a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–2 R^{12};

R^{11} is selected at each occurrence from the group:
H, $—CH_2NR^{13}R^{14}$, $—NR^{13}R^{14}$, $—OR^{13}$, $—S(O)_mR^{13}$, $—NR^{14}SO_2NR^{13}R^{14}$, $—NR^{14}SO_2R^{13}$, $—SO_2NR^{13}R^{14}$, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_6 cycloalkylmethyl, benzyl, phenethyl, phenoxy, benzyloxy, nitro, C_7–C_{10} arylalkyl, boronic acid, C_3–C_6 cycloalkoxy, C_1–C_4 alkyl substituted with $—NR^{13}R^{14}$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, 2-(1-morpholino)ethoxy, azido;
C_3–C_{10} cycloalkyl substituted with 0–2 R^{12};
C_1–C_4 alkyl substituted with 0–2 R^{12};
aryl(C_1–C_3 alkyl)-, substituted with 0–2 R^{12};
C_2–C_6 alkoxyalkyl-, substituted with 0–2 R^{12};
C_5–C_{14} carbocyclic residue substituted with 0–3 R^{12};
a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–3 R^{12};

R^{12}, when a substituent on carbon, is independently selected at each occurrence from the group:
phenyl, benzyl, phenethyl, phenoxy, benzyloxy, nitro, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, C_1–C_4 alkoxy, C_3–C_6 cycloalkoxy, $—OR^{13}$, C_1–C_4 alkyl substituted with $—NR^{13}R^{14}$, $—NR^{13}R^{14}$, C_2–C_6 alkoxyalkylene optionally substituted with $—Si(CH_3)_3$, methylenedioxy, ethylenedioxy, $—S(O)_mR^{13}$, $—SO_2NR^{13}R^{14}$, $—NHSO_2R^{14}$, 2-(1-morpholino)ethoxy; or
a 5- or 6-membered heterocyclic ring containing from 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur;
or R^{12} may be a 3- or 4-carbon chain attached to adjacent carbons on the ring to form a fused 5- or 6-membered ring, said 5- or 6-membered ring being optionally substituted on the aliphatic carbons with C_1–C_4 alkyl, C_1–C_4 alkoxy; or $—NR^{13}R^{14}$; or
when R^{12} is attached to sulfur it may be =O;

R^{12}, when a substituent on nitrogen, is independently selected at each occurrence from the group:
phenyl, benzyl, phenethyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, $—CH_2NR^{13}R^{14}$, $—NR^{13}R^{14}$, C_2–C_6 alkoxyalkyl;

R^{13} is independently selected at each occurrence from the group:
H; phenyl; benzyl; C_1–C_6 alkyl;
an amine protecting group when R^{13} is bonded to N;
a hydroxy protecting group when R^{13} is bonded to O;

R^{14} is independently selected at each occurrence from the group:
hydrogen, hydroxy, C_1–C_6 alkyl substituted with 0–3 groups selected from OH, C_1–C_4 alkoxy, NH_2, $—NH(C_1$–C_4 alkyl), C_1–C_6 alkoxy, C_2–C_6 alkenyl, phenyl, benzyl, an amine protecting group when R^{14} is bonded to N, a hydroxy protecting group when R^{14} is bonded to O;

R^{13} and R^{14} can alternatively join to form $—(CH_2)_4—$, $—(CH_2)_5—$, $—CH_2CH_2N(R^{15})CH_2CH_2—$, or $—CH_2CH_2OCH_2CH_2—$;

R^{13A} and R^{14A} are independently selected at each occurrence from the group: H, C_1–C_6 alkyl;

R^{13A} and R^{14A} can alternatively join to form $—(CH_2)_4—$, $—(CH_2)_5—$, $—CH_2CH_2N(R^{15})CH_2CH_2—$, or $—CH_2CH_2OCH_2CH_2—$;

R^{15} is H or CH_3.

5,466,798

SYNTHESIS OF LITHIUM AMINOBOROHYDRIDES AND REACTIONS THEREOF

Bakthan Singaram, Santa Cruz; Gary B. Fisher, Boulder Creek; Joseph C. Fuller; John Harrison, both of Santa Cruz, all of Calif., and Christian T. Goralski, Midland, Mich., assignors to The Regents of the University of California, Oakland, Calif.

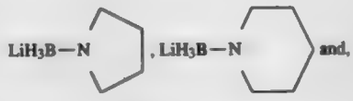
Continuation of Ser. No. 848,427, Mar. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 847,171, Mar. 6, 1992, abandoned. This application Oct. 15, 1993, Ser. No. 138,612
Int. Cl.[6] C07D 223/02;207/00; C07F 5/02
U.S. Cl. 540—541 12 Claims

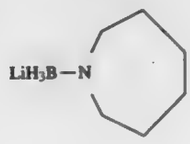
1. A substantially pure lithium aminoborohydride having a purity of about 92% or higher purity of the structure:

$$Li^{+-}BH_3NR^1R^2$$

wherein

R^1 and R^2 are each moleties selected from:
alkyl having from 2 to 20 carbon atoms;
aryl having from 6 to 20 carbon atoms; and
R^1 and R^2 together form a cyclic ring having 4, 5, or 6 carbon atoms producing a lithium aminoborohydride selected from the group consisting of





5,466,799

SYNTHESIS OF BENZODIAZEPINES

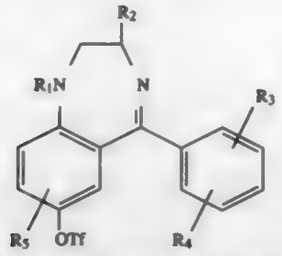
George A. Kraus, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 8, 1994, Ser. No. 286,929

Int. Cl.[6] C07D *243/20;243/16*

U.S. Cl. 540—573 **8 Claims**

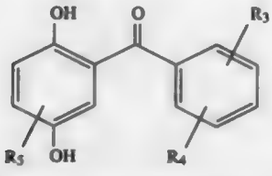
1. A method for preparing a compound of the formula (I):



(I)

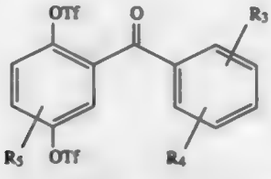
wherein R_1 is H or (C_1–C_4)alkyl, optionally substituted by CF_3 or $N(R)_2$ wherein each R is individually H, phenyl, or (C_1–C_4)alkyl, R_2 is H, (C_1–C_4)alkyl optionally substituted by (C_1–C_4)alkoxy, (C_1–C_4)alkoxycarbonyl, phenyl or OY wherein Y is (C_1–C_4)alkyl or an acid-labile hydroxy protecting group, R_3, R_4 and R_5 are individually H, halo, (C_1–C_4)alkoxy, nitro, CF_3 or OCF_3 and Tf is trifluoromethylsulfonyl, comprising:

(a) bis-triflating a compound of formula (II):



(II)

wherein R_3, R_4 and R_5 are as defined above, to yield a compound of formula (III):



(III)

wherein R_3, R_4, R_5, and Tf are as defined, above; and (b) reacting compound III with a 1,2-bisaminoethane of formula (IV): $(R_1)(H)NCH_2CH(R_2)NH_2$ (IV) to yield the compound of formula (I) wherein R_1, R_2, R_3, R_4, R_5 and Tf are as defined above.

5,466,800

PROCESS FOR THE PREPARATION OF 2,5-DISUBSTITUTED PYRIDINES

Helmut Kraus, Köln, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

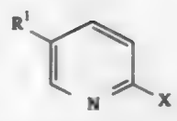
Filed Jul. 6, 1993, Ser. No. 87,641

Claims priority, application Germany, Jul. 13, 1992, 42 23 013.6

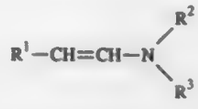
Int. Cl.[6] C07D *413/04;401/04;213/09;211/06*

U.S. Cl. 544—82 **15 Claims**

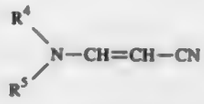
1. A process for the preparation of a 2,5-disubstituted pyridine of the formula



wherein 0.2–5 mol of an enamine of the formula



is reacted with 1 mol of a β-amino-acrylonitrile of the formula



in which formulae

R^1, R^2, R^3, R^4 and R^5 independently of one another, represent straight-chain or branched C_1–C_8-alkyl, C_2–C_8-alkenyl, C_2–C_8-alkoxyalkyl, C_3–C_8-alkoxyalkenyl, C_3–C_8-cyloalkyl C_6–C_{12}-aryl, C_7–C_{10}-aralkyl or a morpholine ring, or R^2 and R^3 or R^4 and R^5, in each case together but independently of one another, with the N atom which they are attached form a heterocyclic ring. selected from the group consisting of of piperzine, morpholine, pyrrolidine and piperidine optionally substituted on the N atom by C_1–C_4-alkyl or -hydroxy-C_1–C_4-alkyl;

X represents chlorine, bromine, hydroxyl or amino,

in the temperature range of from −70° C. to +50° C. in liquid phase and in the presence of 0.7–20 equivalents of a C_1–C_8-carboxylic acid to give an open chain intermediate, followed by a ring-closure reaction with 0.7–12 equivalents of a C_1–C_8-carboxylic acid, a halogenated hydrocarbon, an alcohol, an amide or a mixture thereof.

5,466,801

PROCESS FOR THE PREPARATION OF 3-, 6-SUBSTITUTED 2,5-MORPHOLINEDIONES

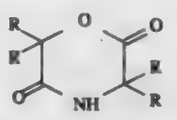
Charles E. Nakamura, Claymont; Robert Di Cosimo, Wilmington, both of Del., and John R. Moran, Charleston, S.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 923,705, Jul. 31, 1992, abandoned. This application Aug. 26, 1993, Ser. No. 110,602

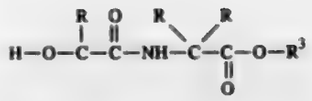
Int. Cl.[6] C07D *265/32*

U.S. Cl. 544—173 **16 Claims**

1. A process for making 2,5-morpholinediones of the structure:



wherein each R is independently hydrogen, C_1–C_{12} hydrocarbyl, or substituted hydrocarbyl and at least one R is C_1–C_{12} hydrocarbyl or C_1–C_{12} substituted hydrocarbyl, by reacting an ester or free acid of an N-(α-hydroxyacyl)-α-amino acid substrate of the structure:



wherein each R and R^3 is independently hydrogen, C_1–C_{12} hydrocarbyl or C_1–C_{12} substituted hydrocarbyl and wherein at least one R is C_1–C_{12} hydrocarbyl or C_1–C_{12} substituted hydrocarbyl, over a fixed bed catalyst, wherein the catalyst has a surface area greater than 1 m^2/g, the reaction being carried out at about 150° C. to about 350° C., wherein the reaction takes place in the vapor phase, followed by collection of the effluent product.

5,466,802

DETERGENT COMPOSITIONS WHICH PROVIDE DYE TRANSFER INHIBITION BENEFITS

Rajan K. Panandiker, West Chester, Ohio; William C. Wertz, Lawrenceburg, Ind., and Larry J. Hughes, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 10, 1993, Ser. No. 150,644
Int. Cl.[6] C07D 251/20
U.S. Cl. 544—193.2 **19 Claims**

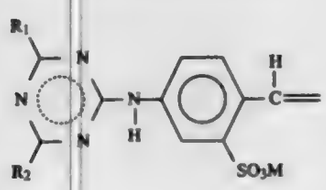
1. A laundry detergent composition that provides especially effective inhibition of dye transfer between fabrics being laundered in aqueous washing solutions formed from such a composition, which composition comprises:

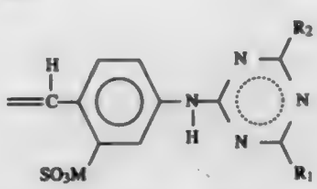
(a) from about 1% to about 80% of a detersive surfactant;

(b) from about 0.1% to about 80% of detergent builder component;

(c) from about 0.01% to 10% by weight of a polymeric dye transfer inhibiting agent selected from the group consisting of polyamine N-oxide polymers, copolymers and N-vinylpyrrolidone and N-vinylimidazole and combinations of said polymers and copolymers; and

(d) from about 0.005% to 5% by weight of a hydrophilic optical brightener having the formula:





wherein R_1 is selected from the group consisting of anilino, N-2-bis-hydroxyethyl and NH-2-hydroxyethyl; R_2 is selected from the group consisting of N-2-bis-hydroxyethyl, N-2-hydroxyethyl-N-methylamino, morphilino, chloro and amino; and M is a salt-forming cation.

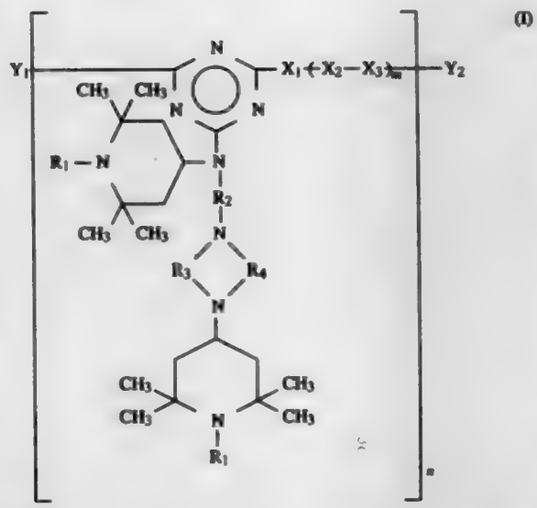
5,466,803

PIPERIDINE-TRIAZINE COMPOUNDS SUITABLE FOR USE AS STABILIZERS FOR ORGANIC MATERIALS

Valerio Borzatta, Bologna, and Graziano Vignali, Sasso Marconi - Bologna, both of, Italy, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Feb. 3, 1994, Ser. No. 191,575
Claims priority, application Italy, Feb. 11, 1993, MI93A0247
Int. Cl.[6] C07D 251/42;251/48;251/54;251/66
U.S. Cl. 544—198 **6 Claims**

1. A compound of formula (I)



(I)

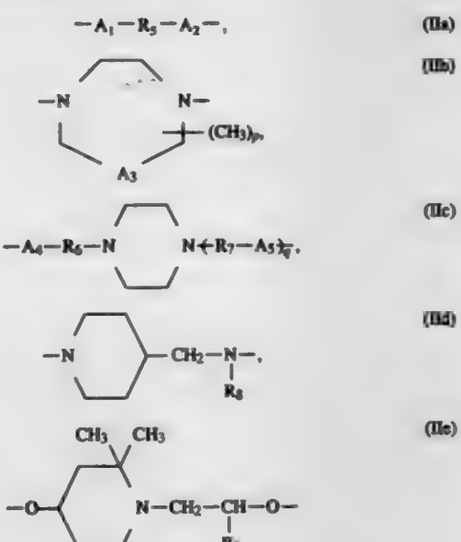
in which

R_1 is hydrogen, C_1–C_8alkyl, O., OH, CH_2CN, C_1–C_{18}alkoxy, C_5–C_{12}cycloalkoxy, C_3–C_6alkenyl, or C_7–C_9phenylalkyl, which is unsubstituted or substituted on the phenyl by 1, 2 or 3 C_1–C_4alkyls, or C_1–C_8acyl;

R_2 and R_3, which may be identical or different, are C_2–C_3alkylene;

R_4 is —CO—, —COCO—, —$COCH_2CO$— or —CH_2CO—;

X_1 and X_3, which may be identical or different, are one of the groups of the formula (IIa)–(IIe)



(IIa)

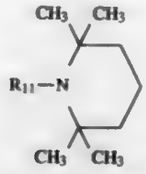
(IIb)

(IIc)

(IIe)

in which A_1, A_2, A_4 and A_5, which may be identical or different, are —O— or

where R_{10} is hydrogen, C_1–C_{18}alkyl, C_5–C_{12}cycloalkyl which is unsubstituted or substituted by 1, 2 or 3 C_1–C_4alkyls, C_7–C_9phenylalkyl which is unsubstituted or substituted on the phenyl by 1, 2 or 3 C_1–C_4alkyls, or a group of the formula (III)



(III)

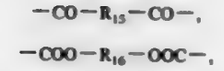
where R_{11} has any one of the meanings given for R_1; R_5 is C_2–C_{12}alkylene, C_6–C_{12}alkylene interrupted by 1, 2 or 3 oxygen atoms or by 1 or 2

groups, where R_{12} has any one of the meanings given for R_{10} or is C_1–C_8acyl or (C_1–C_8alkoxy)carbonyl, or R_5 is C_5–C_7cycloalkylene, C_5–C_7cycloalkylenedi(C_1–C_4alkylene), C_1–C_4alkylenedi(C_5–C_7cycloalkylene), C_2–C_4alkylidenedi(C_5–C_7cycloalkylene), phenylene, phenylenedi(C_1–C_4alkylene), C_1–C_4alkylenediphenylene or C_2–C_4alkylidenediphenylene, each phenylene group being unsubstituted or substituted by 1 or 2 C_1–C_4alkyls, or R_5 is a group of the formula (IV)

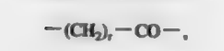
(IV)

where R_{13} is C_2–C_6alkylene; A_3 is a direct bond or —CH_2—, p is zero, 1, 2 or 3; R_6 and R_7, which may be identical or different, are C_2–C_6alkylene, q is zero or 1; R_8 is as defined above for R_{10} and R_9 is hydrogen or C_1–C_4alkyl; X_2 is C_2–C_{12}alkylene, C_4–C_{12}alkylene interrupted by 1, 2 or 3 oxygen atoms, 2-hydroxytrimethylene, phenylenedimethylene, carbonyl or one of the groups of the formula (Va)–(Ve)

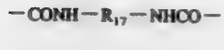
(Va)



(Vb)



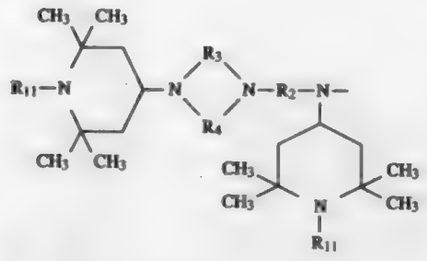
(Vc)



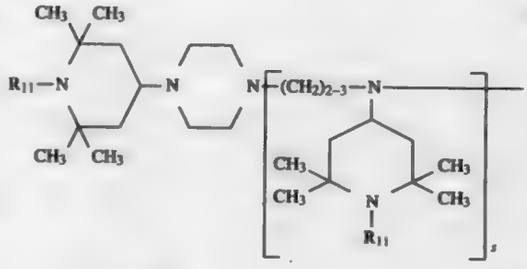
(Vd)

(Ve)

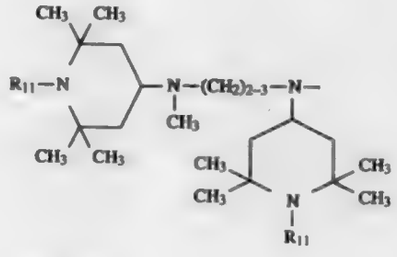
in which R_{14} is one of the groups of the formula (VIa)–(VId)



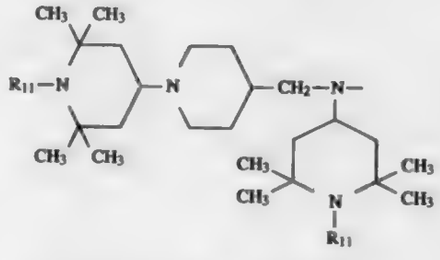
(VIa)



(VIb)

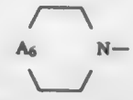


(VIc)



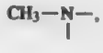
(VId)

where R_2, R_3, R_4 and R_{11} are as defined above and s is zero or 1, or R_{14} is a group of formula (VII)



(VII)

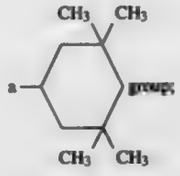
where A_6 is a direct bond, —O—, —CH_2—, —CH_2CH_2— or



or R_{14} is an $R_{18}O$— or

group, where R_{18}, R_{19} and R_{20}, which may be identical or different, have any one of the meanings given for R_{10} or are C_3–C_{18}alkenyl, tetrahydrofurfuryl, phenyl which is unsubsti-

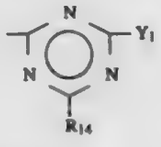
tuted or substituted by 1, 2 or 3 C_1–C_4alkyls or by C_1–alkoxy, or C_{12}–C_{20}alkyl which is substituted in the 2, 3 or 4-position by C_1–C_8alkoxy or by di(C_1–C_8alkyl)amino or by a group of formula (VII); R_5 is a direct bond, C_1–C_{12}alkylene, C_2–C_{20}alkylidene, cyclohexylene, methylcyclohexylene or phenylene; R_{16} has any one of the meanings given for R_3, r is an integer from 1 to 10 and R_{17} has any one of the meanings given for R_5 or is



group;

m is zero, 1,2, 3 or 4 and n is a number from 1 to 50 with the restriction that n is 1 only if m is other than zero;

Y_1 is Cl, OH, ONa, OK, an R_{14} group or a —X_1Z or —X_3Z group, where Z is hydrogen, methyl, benzyl, C_1–C_8acyl or (C_1–C_8alkoxy)carbonyl and Y_2 is Z, a



group or an —X_2OH group.

5,466,804

SILVER-CARBOXYLATE/1,2-DIAZINE COMPOUNDS AS SILVER SOURCES IN PHOTOTHERMOGRAPHIC AND THERMOGRAPHIC ELEMENTS

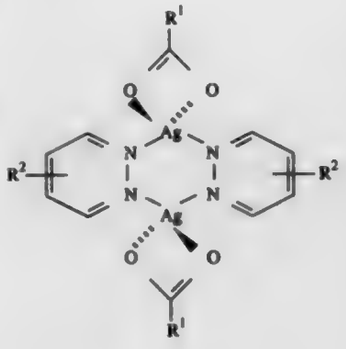
David R. Whitcomb, Woodbury, and William C. Frank, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing, Saint Paul, Minn.

Division of Ser. No. 183,486, Jan. 19, 1994, Pat. No. 5,350,669. This application Jun. 6, 1994, Ser. No. 254,552

Int. Cl.[6] **C07F** *1/10;* **G03C** *1/498*

U.S. Cl. 544—225 **4 Claims**

1. A silver-carboxylate/1,2-diazine compound having the formula:



wherein:

R^1 is either an alkyl, aralkyl, cycloalkyl, or alkenyl group of up to 29 carbon atoms; or an aryl group of up to 14 carbon atoms; and

and R^2 represents either hydrogen, an alkyl group, a cycloalkyl group fused to the 1,2-diazine ring, or the atoms necessary to complete a 6-membered aromatic ring fused to the 1,2-diazine ring;

wherein one or more of said groups of R^1 and R^2 may be substituted with hydroxyl, alkoxy, vinyl, phenyl, halogen, cyano, nitro, amino, or carboxyl.

5,466,805

PERINONE DYESTUFFS FOR BULK DYEING OF PLASTICS

Peter Roschger, Koeln, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

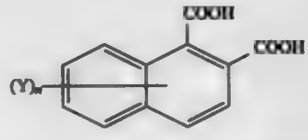
Continuation of Ser. No. 62,636, May 14, 1993, abandoned. This application Dec. 1, 1994, Ser. No. 348,510

Claims priority, application Germany, May 21, 1992, 42 16 761.2

Int. Cl.[6] **C07D** *239/70;* **C09B** *57/12*

U.S. Cl. 544—245 **3 Claims**

1. A dyestuff produced by the reaction of a naphthalene-1,2-dicarboxylic acid of the formula (II)



(II)

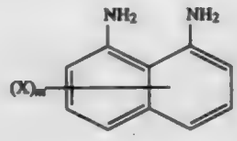
or anhydride thereof, wherein

Y represents C_1–C_6-alkyl, phenyl or a tetramethylene group which is fused on the 5,6- or 7,8-position,

n is a number between 0 and 5 and for n<1,

Y can in each case have different or the same above-mentioned meanings,

with a napthalene-1,8-diamine of the formula (III)



(III)

in which

X represents C_1–C_6-alkyl or a dimethylene group which is fused on the 4,5-position,

m is a number between 0 and 4, and, for m>1,

X can in each case have different or the same above-mentioned meanings,

in the melt or in a solvent at a temperature between 20° and 220° C.

5,466,806

PROCESSES FOR PREPARING SUBSTITUTED 1,3-OXATHIOLANES WITH ANTIVIRAL PROPERTIES

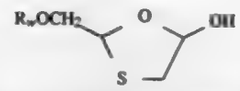
Bernard Belleau, deceased, late of Westmount; Tarek Mansour, Montreal; Allan Tse, Ville St-Laurent; Colleen A. Evans, Montreal; Haolun Jin, Pierrefonds; Boules Zacharie, Laval des Rapides, and Nghe Nguyen-Ba, La Prairie, all of, Canada, assignors to Biochem Pharma Inc., Laval, Canada

Continuation-in-part of Ser. No. 564,160, Aug. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 308,101, Feb. 8, 1989, Pat. No. 5,047,407, and Ser. No. 546,676, Jun. 29, 1990, Pat. No. 5,041,449. This application Mar. 29, 1993, Ser. No. 40,163

Int. Cl.[6] **C07D** *411/04;409/00;* **C07F** *5/02*

U.S. Cl. 544—310 **8 Claims**

1. A process for preparing a compound of formula (XIII):



(XIII)

comprising the step of reacting a mercaptoacetaldehyde with a compound having the formula R_wOCH_2CHO under neutral or basic conditions, wherein R_w is hydrogen or a hydroxyl protecting group.

5,466,807

PERYLENE COMPOUNDS CONTAINING SULFONIC ACID GROUPS PROCESS FOR PREPARING THEM AND THEIR USE

Erwin Dietz, Kelkheim, and Manfred Urban, Wiesbaden, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

PCT No. PCT/EP90/01312, § 371 Date Mar. 9, 1992, § 102(e) Date Mar. 9, 1992, PCT Pub. No. WO91/02032, PCT Pub. Date Feb. 21, 1991

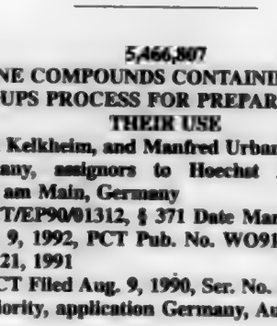
PCT Filed Aug. 9, 1990, Ser. No. 829,045

Claims priority, application Germany, Aug. 11, 1989, 39 26 563.3

Int. Cl.[6] **C09B** *5/62;* **C07D** *471/06*

U.S. Cl. 546—6 **15 Claims**

1. A perylene compound containing one or two sulfonic acid groups, of the formula I



(I)

in which

A is a bivalent radical $>NR^1$ or $>N—R^2—SO_3^-X^+$ and

B is the bivalent radical $>N—R^2—SO_3^{-X+}$,

D is a chlorine or bromine atom or a combination thereof, and

n is a number from 1 to 8;

in which, in the above radicals A and B,

R^1 is a hydrogen atom or a C_1–C_{30}-alkyl group or an aryl group, which can be unsubstituted or mono- or polysubstituted by halogen, sulfo, C_1–C_4-alkyl, C_1—C_4-alkoxy or phenylazo,

R^2 is a straight-chain or branched C_1–C_6-alkylene group, and

X^+ is the hydrogen ion H^+ or the equivalent M^{m+}/m of a metal cation from main group 1 to 5 or from sub-group 1 or 2 or 4 to 8 of the periodic system of the chemical elements, in which m is one of the numbers 1, 2 or 3; or an ammonium ion $N^+R^3R^4R^5R^6$, in which the substituents R^3, R^4, R^5 and R^6 on the quaternary N atom independently of one another are each selected from the group consisting of a hydrogen atom, C_1–C_{30}-alkyl, C_1–C_{30}-alkenyl, C_5–C_{30}-cycloalkyl, unsubstituted or by C_1–C_8-alkylated phenyl and a (poly)alkyleneoxy group $—(CHR^7—CH_2—O—)_k—H$, in which R^7 is hydrogen or C_1–C_4 alkyl and k is a number from 1 to 30, and in which alkyl, alkenyl, cycloalkyl, phenyl or alkylphenyl identified as R^3, R^4, R^5 and/or R^6 can moreover optionally be substituted by amino, hydroxyl and/or carboxyl; or in which the substituents R^3 and R^4, together with the quaternary N atom, can form a five- to seven-membered saturated ring system, which optionally also contains further hetero atoms; or in which the substituents R^3, R^4 and R^5, together with the quaternary N atom, can form a five- to seven-membered aromatic ring system, which optionally also contains further hetero atoms, and to which additional rings are optionally fused.

5,466,808

8-SULFO-3-QUINOLINE CARBOXYLIC ACIDS AND PROCESS THEREFOR

John C. Saukaitis, East Greenwich, R.I., assignor to Hoechst Celanese Corporation, Somerville, N.J.

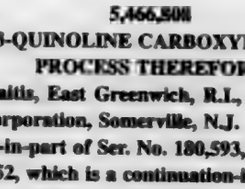
Continuation-in-part of Ser. No. 180,593, Jan. 13, 1994, Pat. No. 5,430,152, which is a continuation-in-part of Ser. No. 17,583, Feb. 16, 1993, abandoned. This application Aug. 10, 1994, Ser. No. 288,374

The portion of the term of this patent subsequent to Jul. 4, 2012, has been disclaimed.

Int. Cl.[6] **C07D** *215/233*

U.S. Cl. 546—153 **6 Claims**

1. A method for preparing an 8-sulfo-3-quinolinic carboxylic acid and derivatives thereof which comprises heating an ester in a reaction medium selected from chlorosulfonic acid, oleum and mixtures thereof wherein said ester has the following formula:



wherein:

R_1 and R_2 are hydrogen;

R_3 is hydrogen or chloro;

R_4 is hydrogen, chloro or fluoro;

R_5 is hydrogen, F, Cl, B, I, C_1-C_5 alkyl, a halogen substituted C_1 to C_5 alkyl, C_1 to C_5 alkoxy, NO_2—, R_nN— wherein R is independently hydrogen or C_1 to C_5 alkyl and n=2;

R_6 is hydrogen, C_1-C_5 alkyl, C_3-C_6 cyclo alkyl or phenyl;

R_7 is hydrogen, C_1-C_5 alkyl, alkoxycarbonyl wherein said alkoxy portion is a C_1-C_5 alkoxy or a C_2-C_6 cycloalkoxy, a phenoxycarbonyl; and

R_8 is hydrogen or C_1-C_5 alkyl.

5,466,809

PROCESS FOR THE PREPARATION OF IMMUNOSTIMULATING SWAINSONINE ANALOGS

David Dime, Toronto, Canada, assignor to Toronto Research Chemicals, Inc., Downsview, Canada

PCT No. PCT/CA92/00479, § 371 Date Jul. 12, 1994, § 102(e) Date Jul. 12, 1994, PCT Pub. No. WO93/09117, PCT Pub. Date May 13, 1993

Continuation-in-part of Ser. No. 788,583, Nov. 6, 1991, abandoned. This PCT application Nov. 2, 1992, Ser. No. 232,231

Int. Cl.[6] C07D *471/04*

U.S. Cl. 546—183 12 Claims

1. A method of synthesizing swainsonine or an analog of swainsonine from a 3-amino six carbon sugar precursor, said method utilizing an intramolecular Horner-Emmons Wittig Type reaction, said swainsonine or swainsonine analog being selected from the group consisting of:

Swainsonine (1S-8a-β-octahydroindolizine-1-alpha-2-alpha-8-β-triol),

1S-8a-β-2-alpha-trimethysilyloxyoctahydroindolizine-1-alpha-8-β-diol,

1S-8a-β-2-alphn-succinyloxyoctahydroindolizine-1-alpha-8-β-diol,

1S-8a-β-2-alpha-benzoyloxyoctahydroindolizine-1-alpha-8-β-diol,

1S-8a-β-2-alpha-p-toluoyloxyoctahydroindolizine-1-alpha-8-β-diol,

1S-8a-β-2-alpha-p-nitrobenzoyloxyoctahydroindolizine-1-alpha-8-β-diol,

1S-8a-β-2-alpha-octanoyloxyoctahydroindolizine-1-alpha-8-β-diol,

1S-8a-β-2-alpha-butanoyloxyoctahydroindolizine-1-alpha-8-β-diol,

(1S,2R,8R,8aR)-1,2,8-trihydroxy-1,2,3,5,8,8a-hexahydro-5-oxyindolizine,

(1S,2R,8R,8aR)-1,2,8-triacetoxy-1,2,3,5,8,8a-hexahydro-5-oxyindolizine,

7-ethoxy-(1S,2R,8R,8aR)-1,2,8-trihydroxy-octahydro-5-oxyindolizine,

7-ethoxy-(1S,2R,8R,8aR)-1,2,8-trihydroxy-octahydroindolizine (7-ethoxyswainsonine),

1S-7-β-bromo-1-alpha-2-alpha-6-alpha-8β-tetraacetoxy-8a-β-octahydro-5-oxyindolizine,

1S-6-β-bromo-1-alpha-2-alpha-7-alpha-8β-tetraacetoxy-8a-β-octahydro-5-oxyindolizine,

1S-7-β-bromo-1-alpha-2-alpha-6-alpha-8β-tetrahydroxy-8a-β-octahydroindolizine,

1S-1-alpha-2-alpha-6-alpha-8β-tetra-O-acetyl-8a-β-octahydro-5-oxyindolizine,

1S-1-alpha-2-alpha-6-alpha-8β-tetrahydroxy-8a-β-octahydroindolizine,

1S-1-alpha-2-alpha-7-alpha-8β-tetra-O-acetyl-8a-β-octahydro-5-oxyindolizine,

1S-6-alpha,7β-dibromo-1-alpha-2alpha-8β-tri-O-acetyl-8a-β-octahydro-5-oxyindolizine,

1S-6-alpha, 7β-dibromo-1-alpha-2-alpha-8β-trihydroxy-8a-β-octahydroindolizine,

1S-6β,7β-dihydroxy-1-alpha-2-alpha-8β-tri-O-acetyl-8a-β-octahydro-5-oxyindolizine,

1S-1-alpha-2-alpha-6β,7β-8β-penta-O-acetyl-8a-β-octahydro-5-oxyindolizine,

1S-1-alpha-2-alpha-6β,7β-8β-pentahydroxy-8a-β-octahydroindolizine,

1S-1-alpha-2-alpha-8β-trihydroxy-8a-β-octahydro-5-oxy-indolizine,

1S-5-ethoxy-1-alpha-2-alpha-8β-trihydroxy-8a-β-octahydroindolizine,

1S-8a-β-octahydroindolizine-1-alpha-8-β-diol-2-alpha-(2-acetamido-2-deoxy-β-D-glucopyranoside),

1S-8a-β-octahydroindolizine-1-alpha-8-β-diol-2-alpha-(2-acetamido-2-deoxy-3,4,6-tri-O-acetyl-β-D-glucopyranoside).

5,466,810

2-AMINO-3-AROYL-BENZO{β}THIOPHENES AND METHODS FOR PREPARING AND USING SAME TO PRODUCE 6-HYDROXY-2-(4-HYDROXYPHENYL)-3-[4-(2-AMINOETHOXY)-BENZOYL]BENZO{β}THIOPHENES

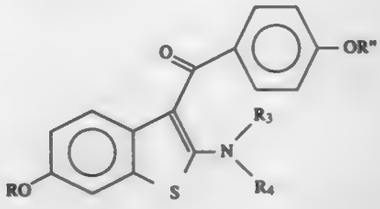
Alexander G. Godfrey, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 10, 1994, Ser. No. 257,859

Int. Cl.[6] C07D *409/02;333/64;333/66*

U.S. Cl. 546—202 7 Claims

1. A compound of the formula:



or pharmaceutically acceptable salts thereof; wherein

R represents C_1–C_6 alkyl;

R" represents C_1–C_6 alkyl or $—(CH_2)_nN(R_1)(R_2)$ where n is an integer of 1 to 4, and R_1 and R_2 are independently C_1–C_6 alkyl, or R_1 and R_2 combine to form C_4–C_6 polymethylene or $—(CH_2)_2O(CH_2)_2—$; and

R_3 and R_4 are independently C_1–C_6 alkyl or combine to form C_4–C_6 polymethylene.

5,466,811

DIOXOLENYLMETHYL CARBAMATES PRO MOIETIES FOR AMINE DRUGS

Jose Alexander, Lawrence, Kans., assignor to Merck & Co., Inc., Rahway, N.J.

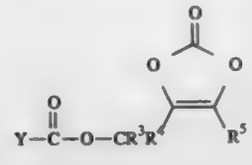
Filed Jul. 18, 1994, Ser. No. 276,220

Int. Cl.[6] C07D *405/12;317/08;413/12;277/20*

U.S. Cl. 546—283 5 Claims

1. A prodrug moiety which comprises a derivatized 4-hydroxymethyl-2-oxo-1,3-dioxol-4-ene of Formula II:

Formula II



where

R^3 is hydrogen, straight or branched chain C_1 to C_6 alkyl, straight or branched chain C_1 to C_6 alkenyl, phenyl, substituted phenyl wherein the substitutents are fluoro, chloro, bromo, iodo, nitro, C1 to C6 carboxyalkyl, or C1 to C6 alkyloxy;

R4 is hydrogen, straight or branchanged chain C_1 to C_6 alkyl, straight or branched chain C_1 to C_6 alkenyl, phenyl, substituted phenyl wherein the substitutents are fluoro, chloro, bromo, iodo, nitro, C1 to C6 carboxyalkyl, or C1 to C6 alkyloxy;

R5 is hydrogen, straight or branchanged chain C_1 to C_6 alkyl, straight or branched chain C_1 to C_6 alkenyl, phenyl, substituted phenyl wherein the substitutents are fluoro, chloro, bromo, iodo, nitro, C1 to C6 carboxyalkyl, or C1 to C6 alkyloxy; and

where Y is halo, p-nitro phenoxy, dinitrophenoxy, pentachlorophenoxy, or pentafluorophenoxy, pyridinium ion or 4-dimethyl amino pyridinium ion.

5,466,812
PREPARATION OF N-AMINOPYRIDONES

Stefan Beckmann, Mannheim, and Ernst Schefczik, Ludwigshafen, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

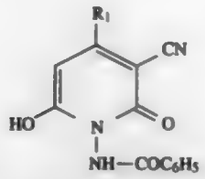
Filed Jun. 7, 1994, Ser. No. 255,752

Claims priority, application Germany, Jun. 14, 1993, 43 19 675.6

Int. Cl.[6] C07D *213/57;213/84;213/85*

U.S. Cl. 546—288 **2 Claims**

1. A process for preparing the pyridone of the formula IV



(IV)

wherein R_1 is a C_1–C_4-alkyl, comprising the steps of:

(a) reacting a C_1–C_4-alkyl cyanoacetate with hydrazine in water as reaction medium to form a cyanoacetic hydrazide;

(b) treating said cyanoacetic hydrazide of step (a) with benzoyl chloride in the presence of a buffer system to form an N-benzoylcyanoacetic hydrazide, and thereafter;

(c) reacting said N-benzoylcyanoacetic hydrazide of step (b) with a C_1–C_4-alkyl acetate in the presence of both a base and a phase transfer catalyst to produce said pyridone of formula IV;

wherein step (c) is maintained at a basic pH; and

wherein said phase transfer catalyst is a quaternary ammonium phase transfer catalyst.

5,466,813
IMINE DYE AND PHOTOGRAPHIC ELEMENTS CONTAINING SAME

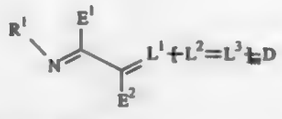
Donald R. Diehl; Margaret J. Helber, both of Rochester, N.Y., and Hugh Williamson, London, United Kingdom, assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 945,804, Sep. 16, 1992, Pat. No. 5,260,179. This application Jul. 20, 1993, Ser. No. 94,596

Int. Cl.[6] C07D *277/62;233/30;487/00;239/02;* **C07C** *255/00*

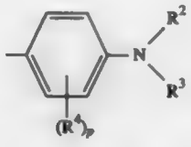
U.S. Cl. 548—179 **12 Claims**

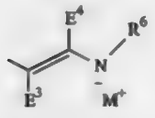
1. A dye having the formula

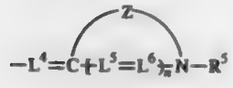


(I)

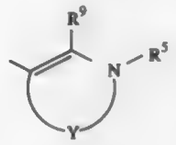
wherein D is selected from

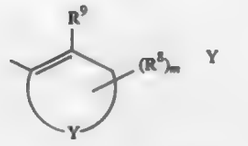


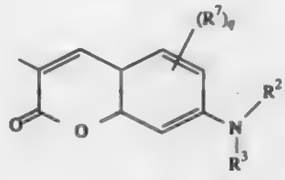


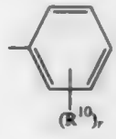


-continued

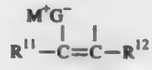








or



and wherein E^1, E^2, E^3 and E^4 each individually represents strongly electron-withdrawing groups; R^1 and R^6 each individually represents an alkyl group of 1 to 8 carbon atoms, an aralkyl or cycloalkyl group of 5 to 10 carbon atoms, an aryl group of 6 to 14 carbon atoms; R^2, R^3, and R^{11} each individually represents an alkyl group of 1 to 8 carbon atoms, or an alkenyl group of 2 to 8 carbon atoms, or an aryl, aralkyl, or cycloalkyl group of 5 to 14 carbon atoms; or R^2 and R^3 individually represent the non-metallic atoms necessary to form a pyrrole ring fused with the phenyl ring to which the nitrogen is attached; R^4, R^7, R^8, R^9, and R^{10} each individually represents hydrogen, or an alkyl, aralkyl, cycloalkyl, alkoxy, alkylamino, or alkylthio group of 1 to 10 carbon atoms; R^5 represents an alkyl group of 1 to 8 carbon atoms, or an aralkyl or cycloalkyl group of 5 to 10 carbon atoms; R^{12} represents cyano, or an aryl, aminocarbonyl, or alkoxycarbonyl group of 2 to 8 carbon atoms, or an alkylsulfonyl, arylsulfonyl, or sulfamoyl group of 1 to 8 carbon atoms; or R^{11} and R^{12} together represent the non-metallic atoms necessary to complete a ring system having a 5- or 6-membered heterocyclic or unsaturated alicyclic nucleus wherein the heterocyclic nucleus contains from 1 to 2 heteroatoms selected from 1 to 2 N atoms, 1 to 2 O atoms, 1 N and 1 O or 1 S atoms, or 1 S atom; G represents O or $C(CN)_2$, Y and Z each individually represents the non-metallic atoms necessary to complete a substituted or unsubstituted ring system having a 5- or 6-membered heterocyclic nucleus which when the nucleus is 5-membered contains, in addition to the N atom shown, 0 or 1 heteroatoms selected from O, N, S, or Se, and when the nucleus is 6-membered the N atom is the only heteroatom; M^+ is a cation; L^1 through L^6 each individually represents unsubstituted or substituted methine groups; m is 0, 1, 2,or 3; n is 0 or 1; p is 0, 1, 2, 3, or 4; g is 0, 1, 2, or 3; and r is 0, 1, 2, 3, 4, or 5.

5,466,814
ISOTHIAZOLINONE SOLUTIONS

Frank S. Moffatt, Reading, and David Winstanley, Bury, both of, England, assignors to Zeneca Limited, London, England

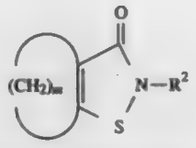
Division of Ser. No. 971,809, Nov. 5, 1992, Pat. No. 5,336,777, which is a continuation of Ser. No. 582,261, Sep. 13, 1990, abandoned. This application Apr. 21, 1994, Ser. No. 230,691

Claims priority, application United Kingdom, Sep. 20, 1989, 8921220

Int. Cl.[6] A01N *43/80*

U.S. Cl. 548—209 **11 Claims**

1. An aqueous solution comprising an isothiazolinone of formula I:



I

wherein

R^2 is hydrogen or optionally substituted hydrocarbyl;

m is 3 or 4; and a salt of formula 2

$$MOCOR^5 \qquad 2$$

wherein

M is an alkali metal; and

R^5 is C_{1-12}-alkyl.

5,466,815
TETRAZOLE DERIVATIVES OF BILE ACIDS, AND THEIR USE AS LIPID LEVEL LOWERING MEDICAMENTS

Alfons Enhsen, Büttelborn; Heiner Glombik, Hofheim; Werner Kramer, Mainz, and Günther Wess, Erlensee, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 5, 1994, Ser. No. 238,741

Claims priority, application Germany, May 8, 1993, 43 15 368.2

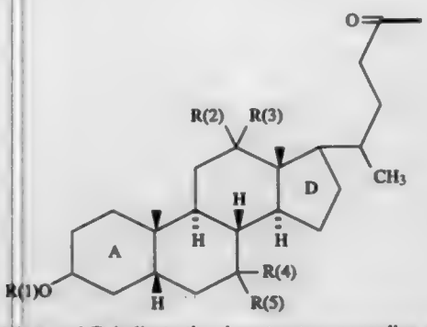
Int. Cl.[6] C07D *257/06*; A61K *31/41*

U.S. Cl. 548—252 **8 Claims**

1. A tetrazole-bile acid derivative of the formula I

$$G1—X—G2$$

in which G1 is H or a radical of the formula II



II

in which A and D indicate the ring structure according to IUPAC nomenclature rules,

R(1) is H;

an alkyl radical or alkenyl radical having up to 10 carbon atoms, which is branched or unbranched;

a cycloalkyl radical having 3 to 8 carbon atoms;

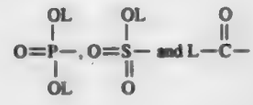
a benzyl radical which is unsubstituted or mono- to tri-substituted by F, Cl, Br, $(C_1–C_4)$-alkyl or $(C_1–C_4)$-alkoxy;

a diphenylmethyl radical which is unsubstituted or mono- to tri-substituted by F, Cl, Br, $(C_1–C_2)$-alkyl or $(C_1–C_4)$-alkoxy;

a triphenylmethyl radical which is unsubstituted or mono- to trisubstituted by F, Cl, Br, $(C_1–C_4)$-alkyl or $(C_1–C_4)$-alkoxy;

a $(C_1–C_4)$-alkoxymethyl or a tetrahydroxylamyl radical; or

a radical selected from the group consisting of



in which L is H;

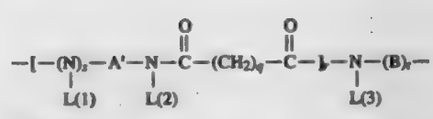
an alkyl or alkenyl radical having up to 10 carbon atoms, which is branched or unbranched;

a cycloalkyl radical having 3 to 8 carbon atoms;

a phenyl radical which is unsubstituted or mono- to trisubstituted by F, Cl, Br, $(C_1–C_4)$-alkyl or $(C_1–C_4)$-alkoxy; or

a benzyl radical which is unsubstituted or mono- to trisubstituted by F, Cl, Br, $(C_1–C_4)$-alkyl or $(C_1–C_4)$-alkoxy;

X is a single bond or a bridge group of the formula III



III

in which

A' is a $(C_1–C_6)$-alkylene chain which is branched or unbranched and can optionally be interrupted 1 to 3 times by —O—, —S— or phenylene, the linkage to the phenylene ring being in the ortho-, meta- or para- position;

B is a $(C_1–C_6)$-alkylene chain, which is branched or unbranched and can optionally be interrupted 1 to 3 times by —O—, —S—, or phenylene, the linkage to the phenylene ring being in the ortho-, meta- or para- position;

L(1), L(2) and L(3) are identical or different and have the meaning of L;

q is 0 to 5;

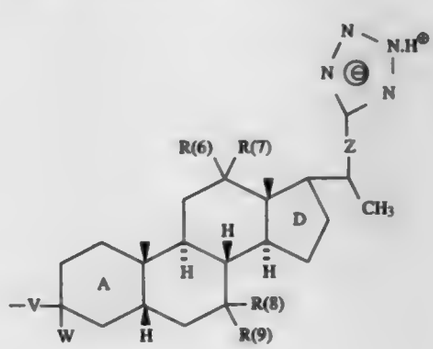
r is 0 or 1;

s is 0 or 1;

t is 0 or 1;

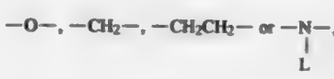
R(2) and R(3) or R(4) and R(5) in each case together are the oxygen of a carbonyl group, or individually and in each case independently of one another are H, —OL, —SL, —NHL, tetrahydropyranyloxy or $C_1–C_4$-alkoxymethoxy, in which L has the above-mentioned meaning; and

G2 is a radical of the formula IV



in which Z is

where m is 0 to 4;
n is 0 or 1; and
o is 0 to 4;
V is attached to X and is selected from the group consisting of



in which W is H; or if V is —CH_2— or —CH_2CH_2—, W is H or OH; and
R(6) to R(9) have the same meaning given for R(2) to R(5),
A and D indicate the ring structure according to the IUPAC nomenclature rules, and
the linkage of G1 and G2 is via the ring D of G1 and the ring A of G2.

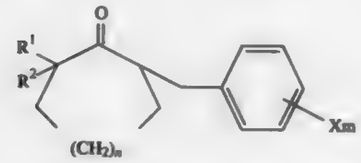
5,466,816

PROCESS FOR PREPARATION OF AZOLYLMETHYLCYCLOALKANOL DERIVATIVES

Eyji Yoshida; Nobuyuki Kusano, and Satoru Kumazawa, all of Iwaki, Japan, assignors to Kureha Chemical Industry Co., Ltd., Tokyo, Japan

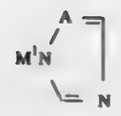
Filed Nov. 10, 1994, Ser. No. 337,275
Claims priority, application Japan, Nov. 11, 1993, 5-305816
Int. Cl.[6] C07D *249/08;233/60*
U.S. Cl. 548—267.8 **4 Claims**

1. A process for preparing a derivative of azolylmethylcycloalkanol of the following formula (I) comprising,
providing a solid-liquid two-phase mixture of a cycloalkanone derivative of formula (II), an azole compound of formula (III), a metal oxide of formula (IV), and an organic solvent, and
adding a sulfonium compound of formula (V) to said solid-liquid two-phase mixture under heating while stirring,



(II)

+



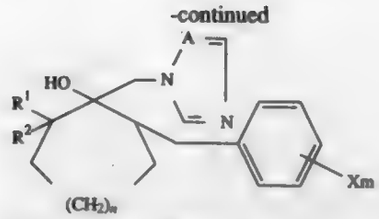
(III)

+

M^2O (IV)

$(CH_3)_3S^+(O)pY^-$ (V)

-continued



(I)

wherein R^1 and R^2 individually represent a hydrogen atom or an alkyl group; X is a halogen atom, an alkyl group, a haloalkyl group, a phenyl group, a cyano group, or a nitro group; m is an integer of 0 to 5; n is an integer of 0 to 2 (when m is 2 or larger, Xs may be either the same or different); A represents a nitrogen atom or a group CH; M^1 represents an alkali metal atom or an alkaline earth metal atom; M^2 represents an alkaline earth metal atom, a zinc atom, or two alkali metal atoms; Y represents a halogen atom or a C_1–C_4 alkoxysulfonyloxy group; and p denotes an integer of 0 or 1.

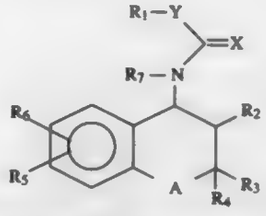
5,466,817

BENZOPYRAN DERIVATIVES AND HETEROCYCLIC ANALOGS THEREOF AS ANTIISCHEMIC AGENTS

Karnail Atwal, Newtown, Pa., assignor to E.R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 901,443, Jun. 19, 1992, Pat. No. 5,276,168, which is a continuation-in-part of Ser. No. 630,472, Dec. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 540,423, Jun. 18, 1990, abandoned. This application Oct. 13, 1993, Ser. No. 135,817
Int. Cl.[6] C07D *405/04*
U.S. Cl. 548—305.1 **5 Claims**

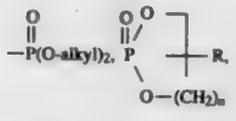
1. A compound of the formula



I

or pharmaceutically acceptable salts thereof, wherein A is —O—;
X is oxygen or sulfur;
Y is —NR_8;
R_2 is hydrogen, hydroxy,

R_3 and R_4 are independently hydrogen, alkyl or arylalkyl; or, R_3 and R_4 taken together with the carbon atom to which they are attached form a 5- to 7-membered carbocyclic ring;
R_5 is hydrogen, alkyl, haloalkyl, alkenyl, alkynyl, cycloalkyl, arylalkyl, cycloalkylalkyl, —CN, —NO_2, —COR, —COOR, —CONHR, —$CON(R)_2$, —CF_3, S-alkyl, —SOalkyl, —SO_2alkyl, —$P(O\text{-alkyl})_2$,



halogen, amino, substituted amino, O-alkyl, OCF_3, OCH_2CF_3, —OCOalkyl, —OCONRalkyl, —NRCOalkyl,

NRCOOalkyl or NRCON(R)$_2$ wherein R in each of the above groups is hydrogen, alkyl, aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl or haloalkyl;

R_6 is hydrogen, alkyl, halo, OH, O-alkyl, amino, substituted amino,, OCOalkyl, OCONRalkyl, NRCOalkyl, NRCOOalkyl or NRCON(R)$_2$ wherein R in each of the above groups is hydrogen, alkyl, aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl or haloalkyl;

R_1 and R_7 or R_7 and R_8 taken together with the N—C—N atoms to which they are attached form an imidazolidinyl ring or a 2,3-dihydro-1H-benzimidazole ring, provided that when R_1 and R_7 taken together with the N—C—N atoms to which they are attached form a ring, R_8 is hydrogen, alkyl or arylalkyl, and when R_7 and R_8 taken together with the N—C—N atoms to which they are attached form a ring, R_1 is aryl or arylalkyl; and

n is 1, 2 or 3.

5,466,818

3-ISOTHIAZOLONE BIOCIDE PROCESS

Ramesh B. Petigara, Hatfield, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 31, 1994, Ser. No. 220,763
Int. Cl.^{6} C07D *275/03*
U.S. Cl. 548—213 **14 Claims**

1. A process for producing either (a) substantially separated CMI and MI from a mixture of their HCl salts, or (b) a special mixture of CMI and MI which is higher in CMI:MI ratio than in said mixture of their HCl salts, comprising preparing a mixture of CMI.HCl and MI.HCl as a slurry in an organic solvent selected from the group consisting of acetate esters, chlorinated aliphatic hydrocarbons, aromatic hydrocarbons, and chlorinated aromatic hydrocarbon; and refluxing said slurry for a controlled period of time sufficient to fully dissociate said CMI.HCl, but insufficient to fully dissociate said MI.HCl.

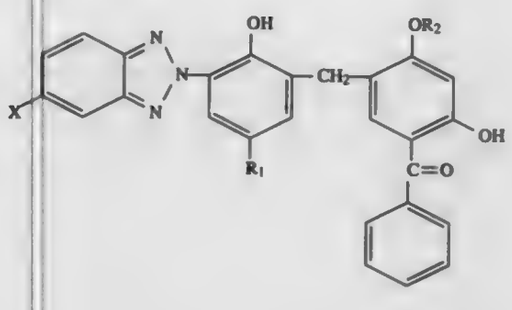
5,466,819

COUPLED BENZOTRIAZOLE AND BENZOPHENONE UV ABSORBERS

William E. Leistner, Atlantic Beach, N.Y., and Semyon Moshchitsky, Old Bridge, N.J., assignors to Fairmount Chemical Company, Inc., Newark, N.J.

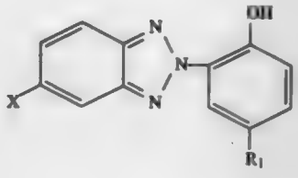
Division of Ser. No. 69,000, May 27, 1993, Pat. No. 5,362,881.
This application Jul. 6, 1994, Ser. No. 271,155
Int. Cl.^{6} C07D *249/20*
U.S. Cl. 548—259 **15 Claims**

1. A process for the preparation of diphenylmethane compounds having the formula:

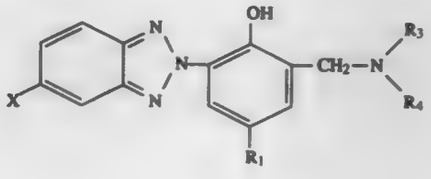


which comprises:

a.) reacting a 4-hydrocarbyl-6-benzotriazolylphenol having the formula:

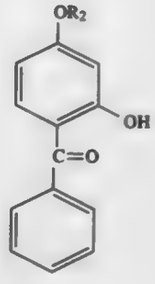


with an amine having the formula HNR_3R_4 and formaldehyde in an organic solvent to produce a Mannich base having the formula:



and

b.) reacting the Mannich base, in the presence of an alkaline catalyst, with a 2-hydroxy-4-alkoxybenzophenone of the formula



wherein

R_1 and R_2 are independently C_1 to C_8 alkyl, cyclopentyl, cyclohexyl or cumyl;

X is selected from the group consisting of hydrogen, halogen, C_1 to C_{12} alkyl and C_1 to C_{12} alkoxy; and

R_3 and R_4 are selected from the group consisting of C_1 to C_6 alkyl, and groups where R_3 and R_4 taken together form a

four to six member heteroalicyclic ring including a nitrogen atom, provided that at least one of R_3 and R_4 is not hydrogen.

5,466,820

PRODUCTION OF DI OR TRI-AZOLYL SUBSTITUTED 5-KETO AZOLE COMPOUNDS

Katsumi Itoh, Toyono; Kenji Okonogi, Mishima, and Norikazu Tamura, Kobe, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

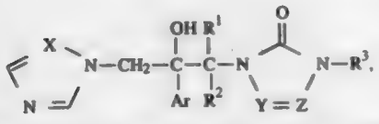
Division of Ser. No. 53,239, Apr. 28, 1993, Pat. No. 5,371,181. This application Aug. 19, 1994, Ser. No. 293,066

Claims priority, application Japan, Apr. 28, 1992, 4-110400; Feb. 10, 1993, 5-022623

Int. Cl.[6] C07D *403/06*

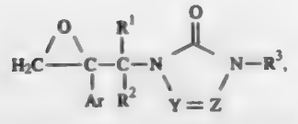
U.S. Cl. 548—263.2 **2 Claims**

1. A process for preparing a compound of the formula (I'):



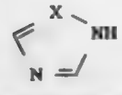
(I')

wherein Ar is a substituted phenyl group: R^1 and R^2 independently are a hydrogen atom or a lower alkyl group, or R^1 and R^2 may combine together to form a lower alkylene group; R^3 is an optionally substituted aliphatic or aromatic hydrocarbon residue or an optionally substituted aromatic heterocyclic group; X is a nitrogen atom or a methine group; and Y and Z independently are a nitrogen atom or a methine group which may optionally be substituted with a lower alkyl group, or a salt thereof, which is characterized by reacting a compound represented by the formula (II):



(II)

wherein the symbols have the same meanings as defined in the formula (I'), with a compound represented by the formula (III):



(III)

wherein the symbols have the same meanings as defined in the formula (I') in a solvent selected from the group consisting of sulfoxides, amides and ureylenes in the presence of a base selected from the group consisting of alkali metal hydrides, alkali metal carbonates and tetrabutylammonium fluoride.

5,466,821

HETEROCYCLIC COMPOUNDS

Paul A. Worthington, Berkshire, England, assignor to Zeneca Limited, London, United Kingdom

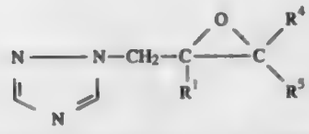
Continuation of Ser. No. 704,216, Feb. 22, 1985, Pat. No. 5,395,942, which is a division of Ser. No. 353,941, Mar. 2, 1982, abandoned, and a continuation-in-part of Ser. No. 269,581, Jun. 2, 1981, Pat. No. 4,416,682. This application Nov. 7, 1994, Ser. No. 336,691

Claims priority, application United Kingdom, Mar. 18, 1981, 8108412; Jan. 16, 1981, 8131301; Jan. 29, 1981, 8132682

Int. Cl.[6] C07D *405/06*

U.S. Cl. 548—268.8 **3 Claims**

1. A compound of formula (VIa):



(VIa)

wherein R^1 is phenyl optionally substituted by halogen, nitro, C1–5 alkyl, halo(C1–4)alkyl, C1–4 alkoxy, halo(C1–4)alkoxy, phenyl or halophenyl; R^4 is hydrogen; and R^5 is phenyl optionally substituted by halogen, C1–5 alkyl, halo(C1–4)alkyl, C1– 4 alkoxy, halo(C1–4)alkoxy, nitro, cyano, phenyl, phenoxy, benzyl, benzyloxy (any of the latter four groups may be ring substituted with halogen), amino, mono- or di- (C1–4)alkylamino or hydroxy.

5,466,822

BENZIMIDAZOLOCARBOCYANINE DYE AND SILVER HALIDE PHOTOGRAPHIC MATERIAL CONTAINING SAID DYE

Toshiki Fujiwara, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

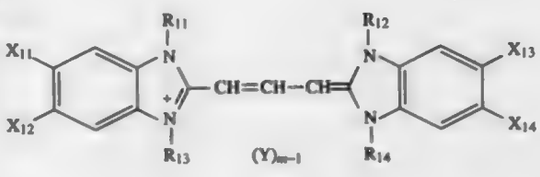
Filed Apr. 28, 1994, Ser. No. 233,435

Claims priority, application Japan, Apr. 28, 1993, 5-102930

Int. Cl.[6] C07D *235/02*

U.S. Cl. 548—305.7 **10 Claims**

1. A benzimidazolocarbocyanine dye represented by the following formula (I):



(I)

wherein R_{11}, R_{12}, R_{13}, and R_{14} each represents an alkyl group, provided that at least one of R_{11} and R_{12} is a 2-ethoxyethyl group, a 2-methoxyethyl group, a 2-propoxyethyl group, an ethoxymethyl group or a methoxymethyl group and provided that at least one R_{13} and R_{14} is a 2-sulfoethyl group, a 3-sulfopropyl group or a 4-sulfobutyl group; one of X_{11} and X_{13} is a hydrogen atom, and the other of X_{11} and X_{13} is a halogen atom, an unsubstituted alkyl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a cyano group or a halogen-substituted alkyl group; X_{12} and X_{14} may be the same or different, and each represents a hydrogen atom, a halogen atom, an unsubstituted alkyl group,

an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a cyano group or a halogen-substituted alkyl group; Y represents an ion required for balancing charge; and m represents 1 or 2, and when the compound forms an inner salt, m is 1.

5,466,823

SUBSTITUTED PYRAZOLYL BENZENESULFONAMIDES

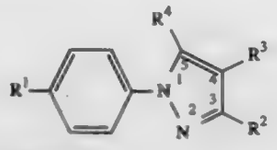
John J. Talley, St. Louis, Mo.; Thomas D. Penning, Elmhurst; Paul W. Collins, Deerfield, both of Ill.; Donald J. Rogier, Jr., St. Louis, Mo.; James W. Malecha, Libertyville; Julie M. Miyashiro, Chicago, both of Ill.; Stephen R. Bertenshaw, Brentwood, Mo.; Ish K. Khanna, Vernon Hills, Ill.; Matthew J. Graneto, St. Louis, Mo.; Roland S. Rogers, Richmond Heights, Mo., and Jeffery S. Carter, Chesterfield, Mo., assignors to G.D. Searle & Co., Chicago, Ill.

Filed Nov. 30, 1993, Ser. No. 160,594

Int. Cl.[6] C07D *231/12;413/10*

U.S. Cl. 548—377.1 **13 Claims**

1. A compound of Formula I



(I)

wherein R^1 is sulfamyl;

wherein R^2 is haloalkyl;

wherein R^3 is selected from hydrido, and alkyl; and

wherein R^4 is selected from aryl, cycloalkyl, and cycloalkenyl; wherein R^4 is optionally substituted at a substitutable position with one or more radicals selected from halo, alkylthio, alkylsulfinyl, alkyl, alkylsulfonyl, cyano, carboxyl, alkoxycarbonyl, amido, N-monoalkylamido, N-monoarylamido, N,N-dialkylamido, N-alkyl-N-arylamido, haloalkyl, hydroxyl, alkoxy, hydroxyalkyl, haloalkoxy, sulfamyl, N-alkylsulfamyl, amino, N-alkylamino, N,N-dialkylamino, heterocyclic, nitro and acylamino;

or a pharmaceutically-acceptable salt thereof.

5,466,824

DIVALENT METAL COMPLEXES OF INDOMETHACIN, COMPOSITIONS AND MEDICAL METHODS OF USE THEREOF

Hubertus L. Regtop, and John R. Biffin, both of New South Wales, Australia, assignors to Biochemical Veterinary Research Pty. Ltd., Australia

Continuation-in-part of Ser. No. 773,601, Jan. 15, 1992, Pat. No. 5,310,936. This application Mar. 24, 1994, Ser. No. 217,520

Claims priority, application Australia, May 22, 1989, PJ4328

Int. Cl.[6] C07D *209/28;* **A61K** *31/555*

U.S. Cl. 548—402 **14 Claims**

11. A complex of indomethacin and a divalent transition metal selected from the group consisting of copper, zinc, cobalt and nickel, the complex having the formula

$$[M]_b[\text{indomethacin}]_a[X]_n$$

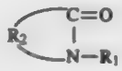
wherein

M is the divalent transition metal;

X is a tertiary amide of the following formula:

$$R_1—CO—N—(R_1)_2$$

or an N-substituted lactam of the following formula:



wherein R_1 is an alkyl having from 1 to 4 carbon atoms, and each R_1 may be the same or different, and R_2 is an alkylene having from 2 to 7 carbon atoms; and

n is 2 or 3.

5,466,825

ARYL IMIDO SUBSTITUTED PEROXYCARBOXYLIC ACIDS

Graham Carr, Woolton; Paul R. Harrison, Penketh, and Alun P. James, Blundellsands, all of, England, assignors to Solvay Interox Limited, Warrington, England

PCT No. PCT/GB91/02280, § 371 Date Jun. 18, 1993, § 102(e) Date Jun. 18, 1993, PCT Pub. No. WO92/11238, PCT Pub. Date Jul. 9, 1992

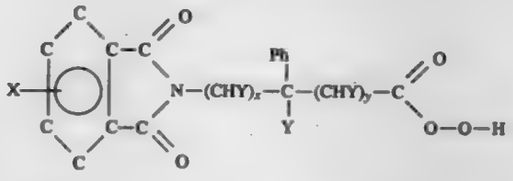
PCT Filed Dec. 19, 1991, Ser. No. 78,172

Claims priority, application United Kingdom, Dec. 22, 1990, 9027975

Int. Cl.[6] C07D *209/48*

U.S. Cl. 548—479 **16 Claims**

1. An organic peroxyacid which satisfies formula (1):



in which X represents hydrogen or a compatible non-released substituent, Y represents a group of formula $(CH_2)_zH$, x, y and z are either 0, 1 or 2, and x+y+z =1 or 2, and Ph represents a phenyl substituent, optionally substituted by a compatible non-released substituent.

5,466,826

PROCESS FOR PREPARING A PHYSICAL FORM OF PHARMACEUTICAL AGENT

Murray W. Cuthbert, Macclesfield, England, assignor to Imperial Chemical Industries, PLC, London, England

Division of Ser. No. 940,138, Sep. 3, 1992, Pat. No. 5,352,694. This application Jun. 17, 1994, Ser. No. 261,607

Claims priority, application United Kingdom, Sep. 5, 1991, 9119061

Int. Cl.[6] C07D *209/14*

U.S. Cl. 548—511 **10 Claims**

1. A process for preparing a physical form of the compound (R)-3-methoxy- 4-[1-methyl-5-(2-methyl-4,4,4-trifluorobutylcarbamoyl)indol-3-ylmethyl] -N-(2-methylphenylsulphonyl)benzamide, which form is crystalline, has an X-ray powder diffraction pattern with specific peaks at 2Θ=14.0°, 19.4°, 22.0°, 22.4° and 24.7°, has an infra-red spectrum (0.5% in KBr) having sharp peaks at 3390, 1620, 1250 and 885 cm^{-1} and has a melting point of 180°–183° C., which process consists essentially of forming crystals from a solution of the said compound in a solvent selected from methanol, propanol, isopropanol, ethyl acetate, acetonitrile and dimethoxyethane.

5,466,827

USE OF THIOALKANEDIONES AS AROMA SUBSTANCES

Heinz-Jürgen Bertram; Roland Emberger; Matthias Güntert, all of Holzminden, and Peter Werkhoff, Höxter, all of, Germany, assignors to Haarmann & Reimer GmbH, Holzminden, Germany

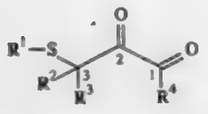
Filed Sep. 28, 1993, Ser. No. 128,440

Claims priority, application Germany, Jan. 5, 1992, 42 33 350.4

Int. Cl.[6] C07D *333/32;307/02;* **C07C** *319/00;49/105*

U.S. Cl. 549—66 **5 Claims**

1. A method of imparting a meaty aroma to a material which comprises applying thereto an amount effective therefor of a compound of the formula



(I)

wherein

R^1 denotes C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl, C_2–C_{12}-alkinyl, C_5–C_{12}-cycloalkyl, C_6–C_{12}-ar-C_1–C_6-alkyl, optionally substituted C_6–C_{12}-aryl, thienyl and furyl which can be substituted by 1 to 3 C_1–C_3-alkyl groups; or thienyl and furyl methyl,

R^2 denotes hydrogen or C_1–C_4-alkyl and

R^3 and R^4 independently of one another denote hydrogen, C_1–C_8-alkyl, C_2–C_8-alkenyl, C_2–C_8-alkinyl, C_5–C_{12}-cycloalkyl or C_6–C_{12}-aryl or

R^2 and R^3 together or

R^3 and R^4 together denote a divalent alkylene radical which, with the C atom 3 or with the C atoms 1, 2 and 3, forms a 5- to 7-membered carbon ring.

5,466,828

CHIRAL 3-CYANO-1-SUBSTITUTED-PYRROLIDINES

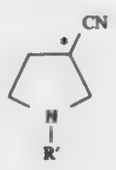
Victor Fedij, Holland, Mich.; Mark J. Suto, San Diego, Calif.; James N. Wemple, and James R. Zeller, both of Holland, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 88,464, Jul. 7, 1993, Pat. No. 5,347,017. This application May 5, 1994, Ser. No. 238,404

Int. Cl.[6] C07D *207/46;207/09*

U.S. Cl. 548—566 **2 Claims**

1. A chiral compound of the formula



in which * denotes an asymmetric carbon atom having the R configuration, and R' is p-methoxybenzyl, methoxy, ethoxy, or dimethylamino.

5,466,829

NEW GINKGOLIDE DERIVATIVES AND A PROCESS FOR PREPARING THEM

Hwa K. Park; Suk K. Lee, both of Kyonggi; Pyeong U. Park, Seoul, and Wie J. Kwan, both of Seoul, all of, Rep. of Korea, assignors to Sunkyong Industries Co., Ltd., Rep. of Korea

PCT No. PCT/KR92/00043, § 371 Date Jul. 5, 1994, § 102(e) Date Jul. 5, 1994, PCT Pub. No. WO93/06107, PCT Pub. Date Apr. 1, 1993

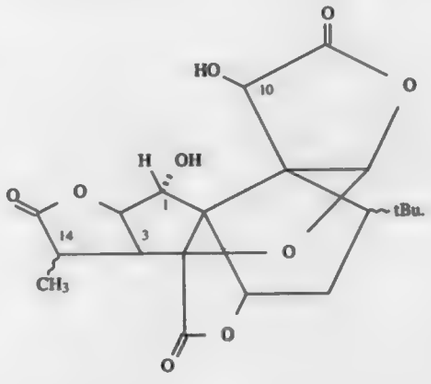
PCT Filed Sep. 18, 1992, Ser. No. 204,169

Claims priority, application Rep. of Korea, Sep. 18, 1991, 91-16260; Jan. 17, 1991, 91-18268

Int. Cl.[6] C07D *313/06;307/93;493/22*

U.S. Cl. 549—297 **6 Claims**

1. A new Ginkgolide B derivative of the formula (I) as below



(I)

5,466,830

INHIBITION OF BONE LOSS BY 4-ARYLOXY-5-HYDROXY-2(5H)-FURANONES

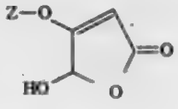
Joseph P. Sabatucci, Cranbury, N.J., assignor to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 101,885, Aug. 4, 1993, Pat. No. 5,336,687. This application May 18, 1994, Ser. No. 245,388

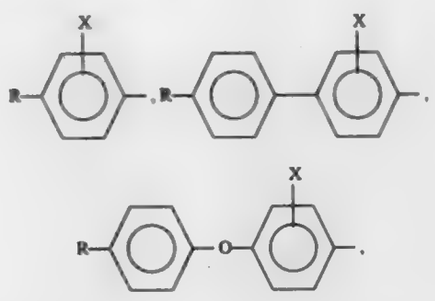
Int. Cl.[6] C07D *307/62*

U.S. Cl. 549—315 **1 Claim**

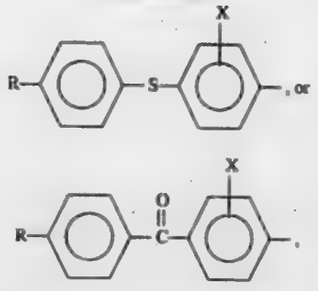
1. A process for the preparation of a compound of the formula:



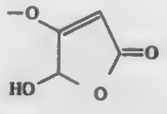
where Z is selected from:



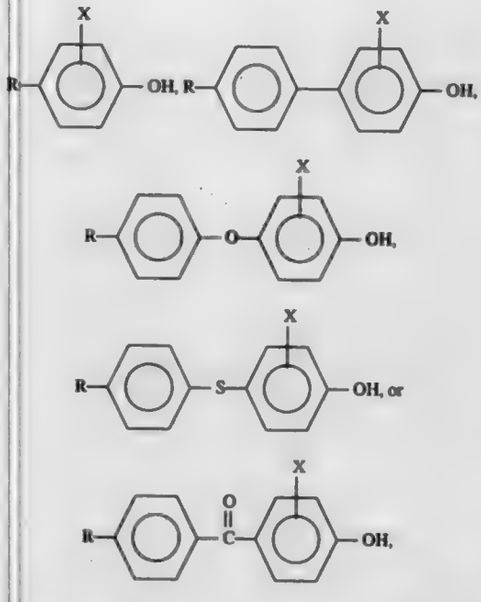
-continued



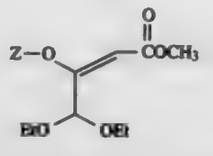
where R is H, C_1–C_8 alkyl, C_3–C_8 cycloalkyl, halogen, trifluoromethyl, or



and X is H, C_1–C_8 alkyl, —O—C_1–C_8 alkyl or halogen which comprises reaction of a phenol or substituted phenol of the formula:



where R is H, halogen, C_1–C_8 alkyl, C_3–C_8 cycloalkyl, or trifluoromethyl and X is H, C_1–C_8 alkyl, —O—C_1–C_8 alkyl or halogen with a 4-dialkyoxy-2-butynoic acid alkyl ester, preferably 4,4-diethoxy-2-butynoic acid methyl ester, in the presence of potassium hydroxide and 18-crown-6 catalyst in tetrahydrofuran to form an intermediate of the formula



which upon treatment with dilute mineral acid, preferably hydrochloric acid, undergoes acetal hydrolysis and cyclization to obtain an invention compound.

5,466,831

PREPARATION OF 3-(2-ACYLOXYETHYL)-DIHYDRO-2(3H)FURANONES

Werner Schnurr, Herxheim; Rolf Fischer, Heidelberg; Norbert Goetz, Worms, and Thomas Kuekenhoehner, Boehl-Iggelheim, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

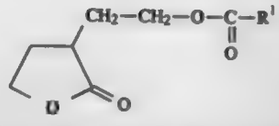
Filed Jul. 29, 1993, Ser. No. 99,232

Claims priority, application Germany, Aug. 28, 1992, 42 28 668.9

Int. Cl.[6] C07D *307/12*

U.S. Cl. 549—323 **11 Claims**

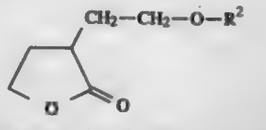
1. A process for the selective preparation in high yields of at least 65% of a 3- (2'-acyloxyethyl)-dihydro-2(3H)furanone of the formula



I

in which R^1 denotes C_1–C_{12}-alkyl, C_5–C_8-cycloalkyl, aryl, C_7–C_{12}-aralkyl, or C_7–C_{12}-alkylaryl, which comprises:

reacting a 3-(2'-oxyethyl)-dihydro-2(3H)furanone of the formula



II

in which R^2 denotes C_1–C_{12}-alkyl, C_5–C_8-cycloalkyl, aryl, C_7–C_{12}-aralkyl, or C_7–C_{12}-alkylaryl, with a compound bearing the acyl group R^1CO—, where R^1 has the meanings given above, and being selected from the group consisting of carboxylic acids, carboxylic anhydrides and acyl halides, in the presence of an acid catalyst at a temperature of from 50° to 250° C. and a pressure of from 0.1 to 100 bar.

5,466,832

PROCESS FOR THE MANUFACTURE OF 2,5-DIHYDROFURANS FROM γ, δ-EPOXYBUTENES

Gerald C. Tustin, Kingsport, Tenn., assignor to Eastman Chemical Company, Kingsport, Tenn.

Filed Feb. 13, 1995, Ser. No. 388,004

Int. Cl.[6] C07D *307/28;493/00*

U.S. Cl. 549—330 **8 Claims**

1. Process for the preparation of a 2,5-dihydrofuran compound which comprises contacting at elevated temperature a γ,δ-epoxyalkene compound with a catalytic amount of a copper salt dissolved in an inert, organic solvent.

5,466,833

A PROCESS FOR THE PREPARATION OF 13,14-DIHYDRO-15(R)-17-PHENYL-18,19,20-TRINOR-$PGF_{2\alpha}$ ISOPROPYL ESTER

József Ivanics; Tibor Szabó; István Hermecz; Gyula Dalmadi; Józsefné Ivanics; GábornéKovács, all of Budapest, Hungary, and Resul Bahram, Uppsala, Sweden, assignors to Kabi Pharmacia AB, Uppsala, Sweden, and Chinoin Ltd., Budapest, Hungary

Continuation of Ser. No. 30,440, Mar. 24, 1993, abandoned. This application Oct. 6, 1994, Ser. No. 319,327

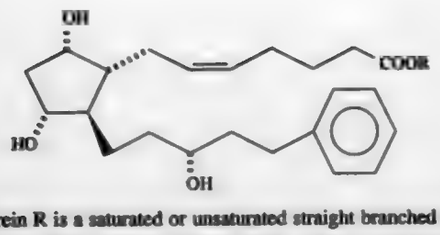
Claims priority, application Hungary, Jun. 24, 1991, 2092/91

Int. Cl.[6] C07D *307/02*

U.S. Cl. 549—475 **8 Claims**

1. A process for the preparation of a compound of the Formula (I)

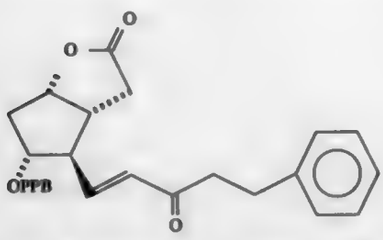
(I)



wherein R is a saturated or unsaturated straight branched or cyclic C_1 to C_7 alkyl, phenyl or benzyl group, which comprises the steps of:

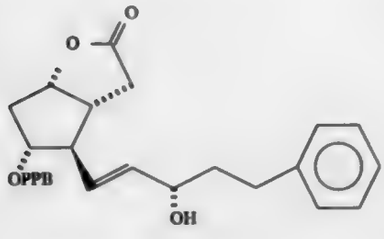
(a) selectively reducing a compound of the Formula (VII)

(VII)



wherein PPB stands for 4'-phenylbenzoyl, using lithium tri(secbutyl)borohydride or sodium borohydride to reduce the oxo group on the side chain of the compound of the Formula (VII) to yield a mixture containing a compound of the Formula (VI):

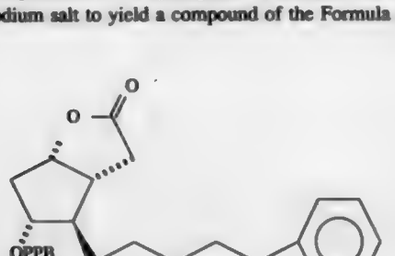
(VI)



(b) chromatographically separating the compound of the Formula (VI) from the mixture formed during step (a) to obtain the compound of the Formula (VI) having the following physical characteristics: m.p. 129° to 130° C., $[\alpha]$=–108° (C=1, ethylacetate;

(c) hydrogenating the compound of the Formula (VI) step (b) in the presence of a hydrogenation catalyst and a base or a sodium salt to yield a compound of the Formula (V)

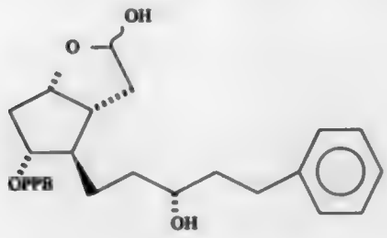
(V)



having an IR spectrum (taken on a Zeiss Specord M-80 type spectrometer) KBr, cm^{-1}: 3500 (OH), 3080, 3020 (CH aromatic), 2940, 2860 (CH aliphatic), 1770, 1710 (c=o), 1610, 1500 (aromatic ring vibration), 1290, 1190, 1100 (c—o—c), 850 (p-subst. aromatic), 750, 700 (monoubst. aromatic);

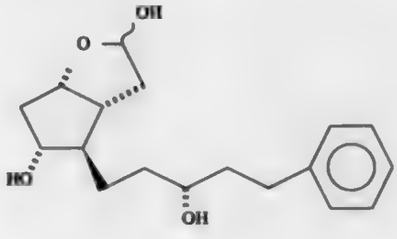
(d) reducing the compound of the Formula (V) using diisobutylaluminum hydride to obtain a compound of the Formula (IV)

(IV)



(e) removing the 4'-phenyl-benzoyl protecting group from the compound of the Formula (IV) by using a mixture of potassium carbonate and methanol to yield a compound of the Formula (III)

(III)

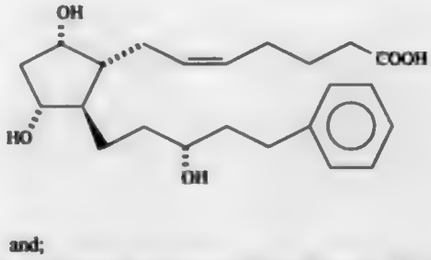


having the following physical characteristics melting point 103° to 106° C., $[\alpha]_D$=–47° (C=1, ethyl acetate), and the following spectral data:

IR spectrum (taken on a Zeiss Specord M-80 type spectrometer) (KBr cm^{-1}: 3380 (OH), 3030 (CH aromatic), 2980 2960, 2920, 2860 (CH aliphatic) 1600, 1590, 1570, 1500 (aromatic ring vibration), 1090 (c—o—c), 1000 [c—o—(H)], 750, 700 (monosubst. aromatic) ^{1}H-NMR spectrum (taken on a Bruker WP 80 device, $CDCl_3$, TMS standard, δ ppm): 7.23 (s, 5H, aromatic H), 5.64, 5.51 (d,1H,3-H), 4.63 (m, 1H, 1-H), 3.90 (1H,7-H), 3.60 (1H, 3'-H) :

(f) reacting the compound of the Formula (III) with 4-carboxybutyl-triphenyl-phosphonium bromide in the presence of potassium tert-butoxide in an ether-type solvent to obtain a compound of the Formula (II)

(II)



and;

(g) esterifying the compound of the Formula (II) with a compound of the Formula

R—X

wherein X is halogen, sulfate, mesyl, or tosyl, in the presence of potassium carbonate in an organic solvent to obtain the compound of the Formula (I).

5,466,834

PREPARATION OF SUBSTITUTED ISOSERINE ESTERS USING METAL ALKOXIDES AND β-LACTAMS

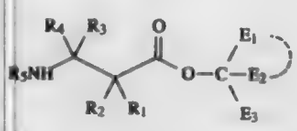
Robert A. Holton, Tallahassee, Fla., assignor to Florida State University, Tallahassee, Fla.

Continuation of Ser. No. 949,107, Sep. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 863,849, Apr. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 862,955, Apr. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 763,805, Sep. 23, 1991, abandoned. This application Sep. 28, 1994, Ser. No. 314,532

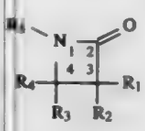
Int. Cl.[6] C07D *305/14*

U.S. Cl. 549—510 15 Claims

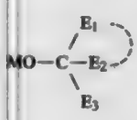
1. A process for the preparation of an isoserine ester having the formula



comprising reacting a β-lactam with the metal alkoxide of a secondary or tertiary alcohol, the β-lactam having the formula



and the alkoxide having the formula



wherein

R_1 is $—OR_6$, $—SR_7$, or $—NR_8R_9$;

R_2 is hydrogen, alkyl, alkenyl, alkynyl, aryl, or heteroaryl;

R_3 and R_4 are independently hydrogen, alkyl, alkenyl, alkynyl, aryl, heteroaryl, or acyl, provided, however, that R_3 and R_4 are not both acyl;

R_5 is $—COR_{10}$, $—COOR_{10}$, $—COSR_{10}$, $—CONR_8R_{10}$, $—SO_2R_{11}$, or $—POR_{12}R_{13}$,

R_6 is hydrogen, alkyl, alkenyl, alkynyl, aryl, heteroaryl, or a hydroxy protecting group,

R_7 is alkyl, alkenyl, alkynyl, aryl, heteroaryl, or sulfhydryl protecting group,

R_8 is hydrogen, alkyl, alkenyl, alkynyl, aryl, or heteroaryl;

R_9 is an amino protecting group;

R_{10} is alkyl, alkenyl, alkynyl, aryl, or heteroaryl,

R_{11} is alkyl, alkenyl, alkynyl, aryl, heteroaryl, $—OR_{10}$, or $—NR_8R_{14}$,

R_{12} and R_{13} are independently alkyl, alkenyl, alkynyl, aryl, heteroaryl, $—OR_{10}$, or $—NR_8R_{14}$, and

R_{14} is hydrogen, alkyl, alkenyl, alkynyl, aryl, or heteroaryl;

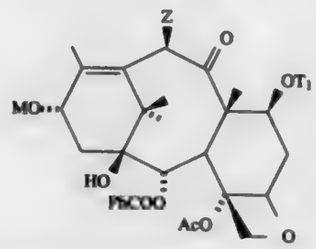
M is a Group IA, IIA, IIIA, IVA, VA, VIA or transition metal, zinc, or cadmium;

E_1 and E_2 and the carbon to which they are attached comprise a carbocyclic or heterocyclic skeleton containing about 6 to 20 ring atoms, the hetero atoms being oxygen; and

E_3 is hydrogen or a hydrocarbon.

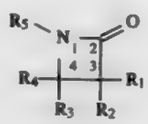
15. A process for the preparation of taxol comprising reacting a metal alkoxide with a β-lactam wherein,

the metal alkoxide has the formula



(3)

the β-lactam has the formula:



Z is $—OCOCH_3$ or $—OT_2$,

T_1 is a hydroxy protecting group,

T_2 is a hydroxy protecting group,

Ph is phenyl,

Ac is acetyl,

M is a Group IA, IIA, IIIA, IVA, VA or VIA or transition metal, zinc, or cadmium,

R_1 is $—OR_6$,

R_2 is hydrogen,

R_3 is phenyl,

R_4 is hydrogen,

R_5 is $—COR_{10}$,

R_6 is a hydroxy protecting group, and

R_{10} is phenyl.

5,466,835

TITANOSILICATE AS AN EPOXIDATION CATALYST FOR OLEFINS

Laszlo T. Nemeth, Palatine; Thomas P. Malloy, Lake Zurich, and Richard R. Jones, Bensenville, all of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 172,314, Dec. 23, 1993, Pat. No. 5,354,875. This application May 9, 1994, Ser. No. 239,801

The portion of the term of this patent subsequent to Oct. 11, 2011, has been disclaimed.

Int. Cl.[6] C07D *301/12;301/14;301/19;303/04*

U.S. Cl. 549—531 17 Claims

1. A process for the epoxidation of a carbon-carbon double bond in an olefinic compound comprising reacting under epoxide-forming conditions the olefinic compound with a hydroperoxide in the presence of a catalyst comprising a mixture of first particles of a titanium silicalite and second particles of titania, said first and second particles having an average particle size no more than about 0.5 microns in diameter.

7. The process of claim 1 where the olefinic compound is an alkene or cycloalkene.

8. The process of claim 7 where the alkene is propylene.

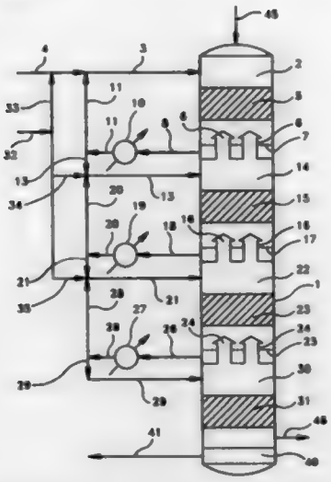
5,466,836
CATALYTIC CONVERTER AND METHOD FOR HIGHLY EXOTHERMIC REACTIONS

John C. Jubin, Jr., West Chester, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Continuation-in-part of Ser. No. 171,144, Dec. 20, 1993, abandoned. This application Sep. 22, 1994, Ser. No. 310,546

Int. Cl.[6] C07D *301/12;303/04;* B01J *8/04*

U.S. Cl. 549—531 6 Claims



1. A continuous process for the exothermic reaction of propylene and hydrogen peroxide in the liquid phase to produce propylene oxide in a series of separate reaction zones each containing a packed bed of solid catalyst, wherein a reaction liquid comprised of propylene, hydrogen peroxide and propylene oxide as well as a vapor purge stream is passed through the bed of the solid catalyst at reaction conditions in each of the reaction zones, the resulting mixture is separated in each zone into a vapor stream which passes to the next reaction zone and a reaction liquid stream, the reaction liquid stream from each zone is removed and separately cooled to remove exothermic heat of reaction generated in the zone from which the liquid was removed, 60–90% of the cooled liquid is recycled to the zone from which it was removed and 10–40% of the cooled liquid is passes to the next in the series of reaction zones.

5,466,837
PROCESS FOR THE PRODUCTION OF HYDROCARBON PARTIAL OXIDATION PRODUCTS

Ramakrishnan Ramachandran, Allendale, and Loc H. Dao, Bound Brook, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Continuation-in-part of Ser. No. 129,911, Sep. 30, 1993, abandoned. This application Apr. 22, 1994, Ser. No. 232,544

Int. Cl.[6] C07C *253/26;47/22;17/08;* C07D *301/10*

U.S. Cl. 549—533 41 Claims

1. A process for the production of a partial oxidation product comprising the steps:

(a) selectively adsorbing propylene from a propylene-propane gas mixture by passing said gas mixture through an adsorption zone containing an adsorbent which selectively adsorbs propylene;

(b) regenerating said adsorbent, thereby producing propylene-enriched gas;

(c) contacting said propylene-enriched gas with an oxygen-containing gas in a reaction zone in the presence of an appropriate oxidation catalyst under conditions which result in the production of a gaseous product containing the desired partial oxidation product; and

(d) recovering said partial oxidation product from the gaseous product.

5,466,838
PROCESS FOR PRODUCING EPOXIDE

Shun-Ichi Murahashi, Ikeda, and Yoshiaki Oda, Toyonaka, both of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

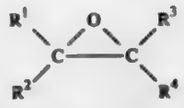
Division of Ser. No. 968,414, Oct. 29, 1992, Pat. No. 5,367,087. This application Jul. 19, 1994, Ser. No. 275,727

Claims priority, application Japan, Jan. 30, 1991, 3-284651; Mar. 11, 1992, 4-052438; Mar. 11, 1992, 4-052441

Int. Cl.[6] C07D *301/06;303/04*

U.S. Cl. 549—533 12 Claims

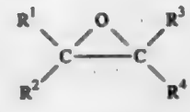
1. A process for producing an epoxide represented by the formula (2)



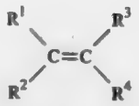
wherein R^1, R^2, R^3 and R^4 may be the same or different and each denotes a hydrogen atom, (C_1–C_{20}) alkyl group, alkyl group substituted with a halogen, hydroxy, alkoxy, phenoxy, acyloxy, acyl, alkoxycarbonyl or phenoxycarbonyl; phenyl group, phenyl group substituted with a halogen, alkyl, alkoxy, phenoxy, acyloxy, acyl, alkoxycarbonyl or phenoxycarbonyl; phenylalkyl group, phenylalkyl group substituted with a halogen, alkyl, alkoxy, phenoxy, acyloxy, acyl, alkoxycarbonyl, or phenoxycarbonyl; acyl group, alkoxycarbonyl group or phenoxycarbonyl group; provided that R^1 and R^2 or R^3 and R^3 may combine with each other to form a ring, or R^1, R^2 and R^3 may combine altogether to form a condensed ring, which comprises reacting an olefin represented by the formula (1)

wherein R^1, R^2, R^3 and R^4 are the same as defined above, with oxygen in the presence of a (C_3–C_7) aldehyde and a catalyst which is CuO, is a member selected from the group consisting of Cu, $Cu(OH)_2$, and Cu_2O, or is a CuO-free mixture of copper-containing compounds containing at least one member selected from the group consisting of Cu, $Cu(OH)_2$, and Cu_2O.

2. A process for producing an epoxide represented by the formula (2)



wherein R^1, R^2, R^3 and R^4 may be the same or different and each denotes a hydrogen atom, (C_1–C_{20}) alkyl group, alkyl group substituted with a halogen, hydroxy, alkoxy, phenoxy, acyloxy, acyl, alkoxycarbonyl or phenoxycarbonyl; phenyl group, phenyl group substituted with a halogen, alkyl, alkoxy, phenoxy, acyloxy, acyl, alkoxycarbonyl or phenoxycarbonyl; phenylalkyl group, phenylalkyl group substituted with a halogen, alkyl, alkoxy, phenoxy, acyloxy, acyl, alkoxycarbonyl, or phenoxycarbonyl; acyl group, alkoxycarbonyl group or phenoxycarbonyl group; provided that R^1 and R^2 or R^3 and R^3 may combine with each other to form a ring, or R^1, R^2 and R^3 may combine altogether to form a condensed ring, which process comprises the step of reacting an olefin represented by the formula (1)



wherein R^1, R^2, R^3 and R^4 are the same as defined above, with oxygen in the presence of a (C_3–C_7) aldehyde and a catalyst which consists of at least one member selected from the group consisting of Cu, $Cu(OH)_2$, Cu_2O, CuO, CuCl, $CuCl_2 \cdot nH_2O$, CuBr, $CuBr_2$, CuI, CuF_2, $CuSO_4 \cdot nH_2O$, $Cu(NO_3)_2 \cdot nH_2O$, $Cu(ClO_4)_2 \cdot nH_2O$, $Cu(OCH_3)_2$, $Cu_3(PO_4)_2 \cdot nH_2O$, and $Cu(OAc)_2 \cdot nH_2O$.

5,466,839

PREPARATION OF P-FUCHSONES AND SYNTHESIS OF P-DIHYDROXYLATED AROMATIC COMPOUNDS THEREFROM

Michel Costantini, Lyons; Daniel Manaut, Meyzieu, and Daniel Michelet, Saint-nom-la-Breteche, all of, France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Jan. 10, 1994, Ser. No. 179,234

Claims priority, application France, Jan. 8, 1993, 93 00119; Jan. 8, 1993, 93 00120; Jan. 8, 1993, 93 00121; Sep. 22, 1993, 93 11262

Int. Cl.[6] C07C *45/45*

U.S. Cl. 552—304 **30 Claims**

1. A process for the preparation of a p-fuchsone, comprising reacting a phenolic compound having at least one hydrogen atom in the para-position to the hydroxyl function with a non-enolizable ketonic compound, in the presence of a catalytically effective amount of an acid catalyst and, optionally, a cocatalytically effective amount of an ionizable sulfur-containing compound.

5,466,840

PROCESS FOR PREPARING PURIFIED ALKALI METAL SALTS OF 4-SULFOPHENYL-[(1-OXYALKANOYL)AMINO]ALKANOATE WITHOUT ISOLATION OF INTERMEDIATES

Gary P. Lutz; George C. Zima, and Rex Bernard, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Aug. 22, 1994, Ser. No. 294,236

Int. Cl.[6] C07C *231/00*

U.S. Cl. 554—70 **21 Claims**

1. A process for preparing a purified alkali metal salt of 4-sulfophenyl-[(1-oxyalkanoyl)amino]alkanoate in one vessel without isolation of intermediates comprising the steps of:

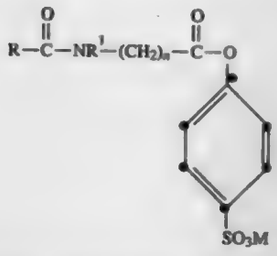
(A) reacting an alkali metal salt of 4-hydroxybenzenesulfonic acid with a C_2 to C_4 carboxylic anhydride at a sufficient temperature and time in a solvent to form a alkali metal salt of 4-acyloxybenzenesulfonic acid and a C_2 to C_4 carboxylic acid, wherein the alkali metal salt of 4-hydroxybenzenesulfonic acid and C_2 to C_4 carboxylic anhydride are present in a mole ratio of 1:1 to 1:40, respectively, and the solvent is present in a weight ratio of 2:1 to 50:1 based on the weight of the alkali metal salt of 4-hydroxybenzenesulfonic acid, provided that excess carboxylic anhydride is removed under reduced pressure from the reaction vessel;

(B) adding an [(1-oxyalkanoyl)amino]alkanoic acid and at least one transesterification catalyst to the reaction product of Step (A) and heating at a temperature of 150° C. to 250° C. for 0.5 to 10 hours and pressure sufficient to maintain reflux of the solvent and to remove the C_2 to C_4 carboxylic acid from the reaction vessel, to form a reaction mixture containing an alkali metal salt of 4-sulfophenyl-[(1oxyalkanoyl)amino]alkanoate, wherein the moles of the [(1-oxyalkanoyl)amino]alkanoic acid added is 0.7 to 5 times the moles of the alkali metal salt of 4-hydroxybenzenesulfonic acid used in Step (A);

(C) removing solvent from the reaction mixture containing the alkali metal salt of 4-sulfophenyl-[(1oxyalkanoyl)amino]alkanoate formed in Step (B);

(D) mixing the alkali metal salt of 4-sulfophenyl-[(1oxyalkanoyl)amino]alkanoate product of Step (C) with acetic acid; and

(E) separating the alkali metal salt of 4-sulfophenyl-[(1-oxyalkanoyl)amino]alkanoate of Step (D) from the acetic acid to obtain a purified alkali metal salt of 4-sulfophenyl-[(1oxyalkanoyl)amino]alkanoate and an acetic acid filtrate, said purified alkali metal salt of 4-sulfophenyl-[(1-oxyalkanoyl)amino]alkanoate has the general formula:



wherein R is selected from the group consisting of C_5-C_{21} alkyl, C_5-C_{21} alkenyl, chlorinated C_5-C_{21} alkyl, and phenyl; R^1 is selected from the group consisting of hydrogen and a C_1-C_3 alkyl; M is selected from the group consisting of hydrogen, ammonium, and an alkali metal atom; and n is an integer from 1 to 8.

5,466,841

FORMULATIONS CONTAINING UNSATURATED FATTY ACIDS

David F. Horrobin, Guildford; Austin McMordie, and Mehar S. Manku, both of Carlisle, all of, England, assignors to Scotia Holdings PLC, Surrey, England

Filed Jan. 27, 1994, Ser. No. 187,042

Claims priority, application United Kingdom, Jan. 27, 1993, 9301629

Int. Cl.[6] C07F *9/02*

U.S. Cl. 554—79 **16 Claims**

1. A phospholipid comprising two different unsaturated fatty acids, the fatty acids being linked to the glycerol backbone at the 1- and 2-positions and selected from the twelve n-6 and n-3 essential fatty acids, oleic acid, parinaric acid and columbinic acid, the two fatty acids linked together with a phospholipid selected from the group consisting of serine, choline, ethanolamine and inositol.

5,466,842

PROCESS FOR THE ISOLATION OF LIPID FRACTIONS FROM EGG PRODUCTS IN POWDER FORM

Jürgen Heidlas, Trostberg; Jan Cully, Garching; Franz Michlbauer, Kirchweidach, and Heinz-Rüdiger Vollbrecht, Altenmarkt, all of, Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Germany

Filed Mar. 15, 1994, Ser. No. 213,410

Claims priority, application Germany, Mar. 15, 1993, 43 07 950.6

Int. Cl.[6] C07F *9/02*

U.S. Cl. 554—83 **10 Claims**

1. A method for isolating a lipid fraction of triglycerides and phospholipids from an egg product in powdered form consisting essentially of:

(a) exposing said egg product to an extraction mixture of an aliphatic alcohol having from 1 to 4 carbon atoms and liquid

propane at a pressure of ≦200 bar and a temperature of ≦70° C. to obtain an extraction residue of said egg product and an extracted mixture containing said aliphatic alcohol, liquid propane, and lipid fraction; and

(b) isolating said lipid fraction from said extracted mixture obtained in step (a).

5,466,843

PROCESS FOR PREPARING A C_{12}–C_{24} SATURATED FATTY ACID ESTERIFIED ALKOXYLATED POLYOL

Charles F. Cooper, Paoli, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Apr. 29, 1994, Ser. No. 235,751

Int. Cl.[6] C07C 51/367

U.S. Cl. 554—149 **23 Claims**

1. A process for preparing a C_{12}–C_{24} saturated fatty acid-esterified alkoxylated polyol comprising the steps of:

(a) reacting an alkoxylated polyol with a fatty acid source comprised of C_{12}–C_{24} saturated fatty acid to form a crude reaction product comprised of unreacted C_{12}–C_{24} saturated fatty acid and the C_{20}–C_{24} saturated fatty acid-esterified alkoxylated polyol;

(b) combining the crude reaction product with an aliphatic hydrocarbon;

(c) precipitating the unreacted C_{12}–C_{24} saturated fatty acid to form a biphasic mixture comprised of the precipitated C_{12}–C_{24} saturated fatty acid and a liquid phase comprised of the aliphatic hydrocarbon and the C_{12}–C_{24} saturated fatty acid-esterified alkoxylated polyol;

(d) separating the precipitated C_{12}–C_{24} saturated fatty acid from the liquid phase; and

(e) separating the aliphatic hydrocarbon from the C_{12}–C_{24} saturated fatty acid-esterified alkoxylated polyol.

5,466,844

FERROCENE DIPHOSPHINES AS LIGANDS FOR HOMOGENEOUS CATALYSTS

Felix Spindler, Starrkirch-Wil, Switzerland; Amina Wirth-Tijani, Burnhaupt-le-Haut, France, and Heidi Landert, Rheinfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

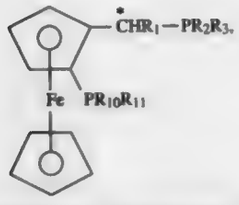
Continuation of Ser. No. 200,133, Feb. 22, 1994, abandoned. This application Sep. 27, 1994, Ser. No. 313,484

Claims priority, application Switzerland, Feb. 26, 1993, 592/93

Int. Cl.[6] C07F 17/02;15/02

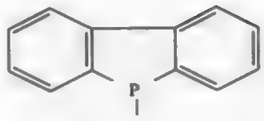
U.S. Cl. 556—11 **17 Claims**

1. A compound of formula I



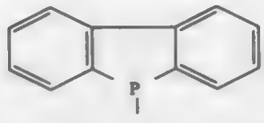
(I)

wherein R_1 is C_1–C_8alkyl, phenyl or phenyl which is substituted by 1 to 3 C_1–C_4 alkyl or C_1–C_4alkoxy groups; R_2 and R_3 are each independently of the other C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl, phenyl, C_1–C_4alkyl- or C_1–C_4alkyl- or C_1–C_4alkoxy-substituted C_5–C_{12}cycloalkyl, or phenyl which is substituted by one to three identical or different members selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, $-SiR_4R_5R_6$, halogen, $-SO_3M$, $-CO_2M$, $-PO_3M$, $-NR_7R_8$ and $-[^{\oplus}NR_7R_8R_9]X^{\ominus}$; or the group $-PR_2R_3$ is a radical of formula II



(II)

and R_4, R_5 and R_6 are each independently of one another C_1–C_{12}alkyl or phenyl, R_7 and R_8 are H, C_1–C_{12}alkyl, phenyl or R_7 and R_8, taken together, are tetramethylene, pentamethylene or 3-oxa-1,5-pentylene, R_9 is H or C_1–C_4alkyl, R_{10} and R_{11} are identical and are C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl, C_1–C_4alkyl-or C_1–C_4alkoxy-substituted C_5–C_{12}cycloalkyl or phenyl which is substituted by 1 to 3 identical or different members selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, $-SiR_4R_5R_6$, halogen, $-SO_3M$, $-CO_2M$, $-PO_3M$, $-NR_7R_8$ or $-[^{\oplus}NR_7R_8R_9]X^{\ominus}$; or R_{10} and R_{11} are different and are C_1–C_{12}alkyl, C_5–C_{12}cycloalkyl, C_1–C_4alkyl- or C_1–C_4alkoxy-substituted C_5–C_{12}cycloalkyl, phenyl or phenyl which is substituted by 1 to 3 identical or different members selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, $-SiR_4R_5R_6$, halogen, $-SO_3M$, $-CO_2M$, $-PO_3M_2$, $-NR_7R_8$ or $-[^{\oplus}NR_7R_8R_9]X^{\ominus}$; or the group $-PR_{10}R_{11}$ is a radical of formula II



(II)

M is H or an alkali metal, $X^{\ominus}$ is the anion of a monobasic acid, and * is a stereogenic carbon atom, in the form of the racemates or diastereoisomers thereof or of a mixture of diastereoisomers.

5,466,845

SULFONIUM SALTS AND PROCESS FOR THEIR PREPARATION

Christian Herzig, Taching am See, Germany, assignor to Wacker-Chemie GmbH, Munich, Germany

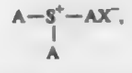
Filed Oct. 20, 1994, Ser. No. 325,193

Claims priority, application Germany, Jun. 12, 1992, 42 19 376.1

Int. Cl.[6] C07F 9/66;9/90;19/00;7/02

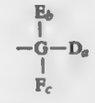
U.S. Cl. 556—12 **6 Claims**

1. A sulfonium salt of the general formula



(I)

in which each A is identical or different and is a monovalent radical of the general formula



in which

G is an aromatic hydrocarbon radical having 6 to 14 carbon atoms per radical or is an aromatic hydrocarbon radical having 5 to 14 ring atoms per radical which contains at least one oxygen and/or sulfur atom, with the proviso that one hydrogen atom in the radical G is replaced by a chemical bond to the sulfur atom, and D, E and F are each substituents of G, where

D is a radical of the formula

$$-(O)_x-(R)_y-SiR^3_3,$$

E is a radical of the formula

$$-OR^2,$$

F is a radical of the formula

$$-R^3,$$

a is 1, 2 or 3,
b is 0, 1 or 2,
c is 0, 1 or 2,
x is 0 or 1,
y is 0 or 1,
R is a divalent hydrocarbon radical having 1 to 18 carbon atoms per radical, which is optionally interrupted by at least one oxygen atom and/or one sulfur atom and/or one carboxyl group,
R^1 is identical or different and is a monovalent hydrocarbon radical having 1 to 18 carbon atoms per radical, which is optionally interrupted by at least one oxygen atom,
R^2 is a monovalent hydrocarbon radical having 1 to 18 carbon atoms per radical, which is optionally interrupted by an leash one oxygen atom,
R^3 is a monovalent hydrocarbon radical having 1 to 10 carbon atoms per radical, which is optionally interrupted by at least one oxygen atom and/or one sulfur atom, and
X^- is a halide ion Z^-, a tosylate anion or a weakly nucleophilic or non-nucleophilic anion Y^- selected from the group consisting of $CF_3CO_2^-$, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, ClO_4^-, HSO_4^- and $F_{(2n+1-m)}H_m—SO_3^-$,
in which n is an integer from 1 to 12 and
m is 0 or an integer of up to 2n–1.

5,466,846

PROCESS FOR PREPARATION OF STABLE AQUEOUS SOLUTIONS OF ZIRCONIUM CHELATES

Sharif Sharif, El-Kaherah, Egypt, assignor to Benchmark Research and Technology, Inc., San Antonio, Tex.

Filed Nov. 16, 1994, Ser. No. 340,661
Int. Cl.[6] C07F 7/00
U.S. Cl. 556—55 **10 Claims**

1. A method of preparing solutions of aqueous zirconium chelates, comprising:

a. reacting ammonium hydroxide, sodium hydroxide, potassium hydroxide, water soluble amines or amine derivatives or alkali metal carbonates or bicarbonates with an alpha hydroxy carboxylic acid to prepare substantially neutral solutions of the corresponding alpha-hydroxycarboxylic salt;

b. adding said alpha-hydroxycarboxylic salt to a slurry of zirconium basic sulfate or a solution of zirconium orthosulfate or zirconium sulfate and mixtures thereof to form a zirconium chelate.

6. A method of preparing zirconium chelates which comprises:

a. dissolving an alpha-hydroxycarboxylic salt of sodium, potassium, ammonia or a water soluble amine or amine derivative in water to form clear solution; and

b. adding said alpha-hydroxycarboxylic salt while mixing to a slurry of zirconium basic sulfate or a sloution of zirconium orthosulfate or zirconium sulfate and mixtures thereof to form a zirconium chelate.

5,466,847

PROCESS FOR PREPARING HEXAMETHYLCYCLOTRISILAZANE

Toshio Shinohara; Akio Yokoo; Muneo Kudo; Motoaki Iwabuchi, and Kazuyuki Matsumura, all of Usui, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1994, Ser. No. 330,948
Claims priority, application Japan, Jan. 29, 1993, 5-294194; Feb. 28, 1994, 6-054480
Int. Cl.[6] C07F 7/10
U.S. Cl. 556—409 **10 Claims**

1. A process for preparing hexamethylcyclotrisilazane which comprises heating octamethylcyclotetrasilzane in the presence or ammonium sulfate catalyst in an atmosphere of an inert gas.

5,466,848

PROCESS FOR THE PREPARATION OF SILANE POLYSULFIDES

Thomas E. Childress, Newport, Ohio, assignor to OSi Specialties, Inc., Danbury, Conn.

Filed Sep. 28, 1994, Ser. No. 314,204
Int. Cl.[6] C07F 7/04
U.S. Cl. 556—427 **10 Claims**

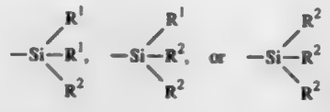
1. A process for the preparation of silane polysulfides, the process comprising:

(a) contacting hydrogen sulfide gas with an active metal alkoxide solution,

(b) reacting elemental sulfur with the product of step (a), and

(c) reacting the product of step (b) with a halohydrocarbylalkoxysilane of the formula Q—R—X

in which Q is



and in which

R^1 is an alkyl group of 1 to 4 carbon atoms or phenyl, and

R^2 is an alkoxy group with 1 to 8, preferably 1 to 4, carbon atoms, a cycloalkoxy group including 5 to 8 carbon atoms, or a straight or branched chain alkylmercapto group with 1 to 8 carbon atoms,

wherein the various R^1 and R^2 groups can be the same or different,

R is a divalent hydrocarbyl group including 1 to 18 carbon atoms, and

X is a halogen, to produce a compound of of the formula Q—R—S_n—R—Q

in which Q and R are as defined above, and n is an integer of from 2 to 9.

5,466,849

SILOXANE DERIVATIVES, PRODUCING METHOD THEREOF AND AGENTS INCLUDING SILOXANE DERIVATIVE

Yasushi Shioya, Chiba; Yuji Suzuki, Sakura; Ken Takeuchi, Ichikaimachi; Koji Yoshino, and Akira Kawamata, both of Utsunomiya, all of, Japan, assignors to Kao Corporation, Tokyo, Japan

Division of Ser. No. 193,746, Feb. 9, 1994, abandoned, which is a division of Ser. No. 926,186, Aug. 7, 1992, Pat. No. 5,306,838, which is a continuation of Ser. No. 750,535, Aug. 27, 1991, Pat. No. 5,144,054. This application Jun. 7, 1994, Ser. No. 255,753

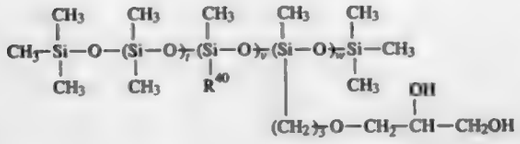
Claims priority, application Japan, Aug. 30, 1990, 2-228958; Sep. 26, 1990, 2-256732

The portion of the term of this patent subsequent to Apr. 26, 2011, has been disclaimed.

Int. Cl.[6] C07F *7/08*

U.S. Cl. 556—445 **5 Claims**

1. A siloxane of the formula



wherein R^{40} represents an alkyl group having 2 to 30 carbon atoms, t is a number of 0 to 1,000, w is a number of 1 to 1,000, and v is a number of 1 to 1,000.

5,466,850

PROCESS FOR THE PREPARATION OF FLUOROSILANES

Adam C. Alty, Gainesville, and Simon F. Sellers, Hawthorne, both of Fla., assignors to PCR, Inc., Gainesville, Fla.

Filed Apr. 7, 1995, Ser. No. 418,272

Int. Cl.[6] C07F *7/08*

U.S. Cl. 556—477 **13 Claims**

1. A process for producing fluorosilanes, said process comprising

(a) reacting

(i) a substrate compound having one or more silicon hydride bonds selectively with

(ii) hydrogen fluoride, alone, or in admixture with an inert gas, under hydrogen eliminating conditions until the reaction is substantially complete; and

(b) recovering

(i) a reacted substrate compound having one or more silicon fluoride bonds,

(ii) a mixture of such reacted substrate compounds or

(iii) an oligomeric derivative of (i) or (ii).

5,466,851

DETERGENT PRODUCTION

Amanda J. Adams; Philip S. Jackson; Howard N. Moulden; David W. Roberts, all of Wirral, and Keith Watkin, Surrey, all of, United Kingdom, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Dec. 14, 1993, Ser. No. 167,260

Claims priority, application United Kingdom, Dec. 14, 1992, 9226003

Int. Cl.[6] C07C *305/06*

U.S. Cl. 558—21 **8 Claims**

1. A method of preparing primary alkyl sulphuric acid having the formula:

$ROSO_3H$

where R is a straight or branched saturated primary alkyl group of 8 to 22 carbon atoms which method comprises sulphating a feedstock comprising the corresponding primary alcohol of formula:

ROH

to produce a sulphated reaction product,

and incorporating in the reaction product as a stabilising agent a compound or mixture of compounds of the formula:

$R^1(A)_nOX$

where

R^1 is a straight or branched primary alkyl group of 8 to 22 carbon atoms,

A is a lower alkylene oxide residue containing 2 to 4 carbon atoms,

n is in the range 0.5 to 4, and

X is hydrogen, $—OSO_3H$ or an alkyl group of 1 to 8 carbon atoms

the proportion by weight of the alcohol ROH in the feedstock exceeding the proportion by weight, if any, of compounds which include alkylene oxide residues or hydroxyalkyleneoxy groups in the feedstock.

5,466,852

PROCESS FOR THE PRODUCTION OF S,S,S-TRIBUTYLPHOSPHOROTRITHIOATE

Vidyanatha A. Prasad, and Peter E. Newallis, both of Leawood, Kans., assignors to Bayer Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 89,157, Jul. 8, 1993, abandoned. This application Aug. 30, 1994, Ser. No. 298,501

Int. Cl.[6] C07F *9/11*

U.S. Cl. 558—122 **8 Claims**

1. A process for the production of S,S,S-tributylphosphorotrithioate in which S,S,S-tributylphosphorotrithioite is oxidized with a perborate or a percarbonate at a temperature of from about 40° to about 65° C. and at a pH of from about 6 to about 12.

5,466,853

DIESTER MONOMER, ITS POLYMER, WATER-CONTAINING SOFT CONTACT LENS, AND PROCESSING SOLUTION FOR CONTACT LENS

Yasumi Koinuma; Takeo Matsumoto; Nobuharu Nakada, all of Tsukuba; Nobuo Nakabayashi, Matsudo, and Kazuhiko Ishihara, Kodaira, all of, Japan, assignors to NOF Corporation, Tokyo, Japan

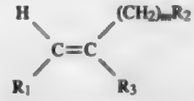
Filed Jul. 19, 1993, Ser. No. 94,293

Claims priority, application Japan, Jul. 23, 1992, 4-197235; Jul. 23, 1992, 4-197236; Jul. 23, 1992, 4-197237; Jul. 23, 1992, 4-197238; Jul. 24, 1992, 4-198633; Jul. 24, 1992, 4-198634

Int. Cl.[6] C07F *9/10*

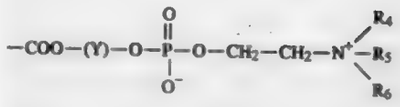
U.S. Cl. 558—169 **2 Claims**

1. An itaconate diester monomer having a phosphorylcholine derivative group represented by the formula (I)

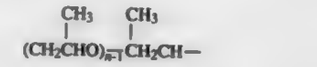


(I)

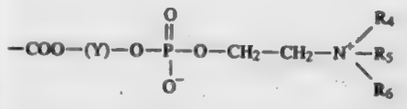
wherein R_1, represents a hydrogen atom, and R_2 and R_3 denote the same or different groups and represent an alkoxy carbonyl group having 1 to 20 carbon atoms, an alkenyloxy carbonyl group having 1 to 20 carbon atoms or a hydroxyalkyloxy phosphorylcholine derivative group of the formula

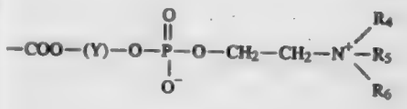


wherein Y denotes $-(CH_2)_n-$, $-(CH_2CH_2O)_nCH_2CH_2-$ or



n denotes an integer of from 1 to 8, m is an integer of 1, R_4, R_5 and R_6 each denote an alkyl group having 1 to 8 carbon atoms, an aryl group having 1 to 8 carbon atoms or a hydroxyalkyl group having 2 to 20 carbon atoms; on the proviso that at least one of R_2 and R_3 denotes





as given above.

5,466,854

PROCESSES FOR PREPARATION OF DITHIOCARBAZATES

Jong K. Choi; In B. Jhung; Jae C. Lee; Jong S. Su; Sung J. Jo, and Jin H. Cho, all of Daejeon, Rep. of Korea, assignors to Lucky Ltd., Seoul, Rep. of Korea

Division of Ser. No. 166,864, Dec. 15, 1993, Pat. No. 5,405,965. This application Feb. 10, 1995, Ser. No. 386,867

Claims priority, application Rep. of Korea, Dec. 17, 1992, 92-24734; Dec. 17, 1992, 92-24736; Dec. 22, 1992, 92-25112; Mar. 9, 1993, 93-3512

Int. Cl.[6] C07C *333/28*

U.S. Cl. 558—233 **5 Claims**

1. A process for preparation of dithiocarbazate derivatives of formula(II) by reacting an alkyl hydrazine with carbon disulfide in an aqueous base solution and then esterifying the resulting product with an electrophilic substance (R—Cl, R—Br or R_2SO_4), characterized in that the esterification reaction is carried out in the presence of a non-polar solvent and a phase-transfer catalyst:

(II)

wherein

represents C_1–C_4 alkyl, C_2–C_4 alkenyl, aralkyl or aryl, and

R^2 represents hydrogen, C_1–C_4 alkyl, or a phenyl group which can contain one or more substituent selected from the group consisting of halogen, nitro and methyl at an optional position.

5,466,855

FUNCTIONALIZED PEROXIDES FOR POLYMERIZATION REACTIONS

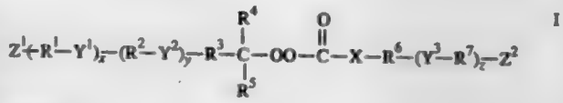
Daryl L. Stein, Bolingbrook, Ill., assignor to Elf Atochem North America, Inc., Philadelphia, Pa.

Division of Ser. No. 908,576, Jun. 25, 1992, Pat. No. 5,319,130, which is a continuation of Ser. No. 577,977, Sep. 5, 1990, abandoned. This application Mar. 17, 1994, Ser. No. 214,938

Int. Cl.[6] C07C *69/96*

U.S. Cl. 558—263 **3 Claims**

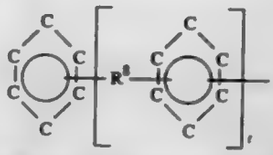
1. A compound having the following Formula I:



I

wherein

R^1, R^2, R^6 and R^7 are independently a substituted or unsubstituted alkyl diradical of 1 to 18 carbons, a substituted or unsubstituted cycloalkyl diradical of 5 to 18 carbons, a substituted or unsubstituted bicycloalkyl diradical of 7 to 12 carbons, a substituted or unsubstituted bicycloalkenyl diradical of 7 to 12 carbons, a substituted or unsubstituted alkenyl diradical of 2 to 18 carbons, a substituted or unsubstituted alkynyl diradical of 2 to 18 carbons, a substituted or unsubstituted aralykl diradical of 7 to 18 carbons, a substituted or unsubstituted naphthyl diradical or a substituted or unsubstituted diradical having the following Formula II:



II

R^3 is a substituted or unsubstituted alkyl diradical of 1 to 18 carbons, a substituted or unsubstituted aralkyl diradical of 7 to 18 carbons, a substituted or unsubstituted naphthyl diradical or the substituted or unsubstituted diradical having the Formula II;

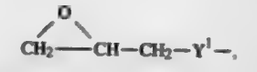
R^4 and R^5 are independently a substituted or unsubstituted alkyl radical of 1 to 10 carbons;

R^8 is a direct bond, —O—, —S—, $-S(=O)_2-$, —C(=O)—, —C(=O)—O—, —O—C(=O)—, —O —C(=O)—, —NH—C(=O)—, —C(=O)—NH—, —NH— C(=O)—NH— or a substituted or unsubstituted alkyl diradical of 1 to 6 carbons;

X is —O—;

Y^1, Y^2 and Y^3 are independently —O——S—, $-S(=O)_2-$, —C(=O)—, —C(=O)—O—, —O—C(=O)—, —O—C(=O)—O—, —NH—C(=O)—, —C(=O)—NH—, —NH—C(=O)—O—, —O—C(=O)—NH—, —NH—C(=O)—NH—, —C(=O)—C(=O)—, —O—C(=O)—C(=O)—O —, —NH—C(=O)—C(=O)—NH—, —NH—C(=O)—C(=O)—O— or —O—C(=O)—C(=O)—NH—;

Z^1 and Z^2 are independently H_2N-, O=C=N—, Cl—C(=O)—, Br—C(=O)—, HO—C(=O)—,



$H_2N-C(R^9)(R^{10})-(CH_2)_w-Y^1-$ or $R^{11}-O-C(=O)-$;

R^9 and R^{10} are independently hydrogen or a substituted or unsubstituted alkyl radical of 1 to 4 carbons;

R^{11} is an alkyl radical of 1–4 carbons, benzyl or phenyl;

t, x, y and z are independently 0 or 1;

w is an integer from 1 to 12; and

substituents for any of R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, R^9 or R^{10} are independently one or more of chloro, bromo, fluoro,

cyano, hydroxy, amino, sulfo, carboxy, nitro, alkoxy of 1 to 12 carbons, alkylamino of 1 to 12 carbons, acyloxy of 1 to 12 carbons, alkenoyloxy of 3 to 12 carbons, alkenoylamino of 3 to 12 carbons, aroyloxy of 7 to 15 carbons, aroylamino of 7 to 15 carbons, phthalimido, alkoxycarbonyloxy of 2 to 13 carbons, alkoxycarbonylamino of 2 to 13 carbons, alkenyloxycarbonyloxy of 3 to 12 carbons, alkenyloxycarbonylamino of 3 to 12 carbons, aryloxycarbonyloxy of 7 to 15 carbons, alkylaminocarbonyloxy of 2 to 13 carbons, arylaminocarbonyloxy of 7 to 15 carbons, aralkylaminocarbonyloxy of 7 to 16 carbons, alkylsulfonyloxy of 1 to 8 carbons, alkylsulfonylamino of 1 to 8 carbons, arylsulfonylamino of 6 to 11 carbons or epoxyalkoxycarbonyl of 2 to 13 carbons.

5,466,856

METHOD OF PRODUCING CARBONIC DIESTERS

Akira Horiguchi, Otake, and Shingo Oda, Himeji, both of, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 112,144, Aug. 26, 1993, abandoned. This application Aug. 3, 1994, Ser. No. 283,907

Claims priority, application Japan, Aug. 26, 1992, 4-252161

Int. Cl.[6] C07C *69/96*

U.S. Cl. 558—277 **24 Claims**

1. A method of producing a carbonic diester, having improved selectivity to said carbonic diester, comprising the step of:

contacting a reactor feed gas comprising oxygen, 1 to 20% by volume of an alcohol and 70 to 95% by volume of carbon monoxide with a solid catalyst containing copper which is effective for catalyzing oxidative carboxylation, wherein said catalyst is selected from the group consisting of a copper-containing inorganic compound, a copper alkoxy halide, a copper alkoxycarbonyl halide, a copper carboxylate, a salt of copper with a phenol, and a complex compound containing copper atom which is formed between an inorganic or organic copper compound and either an organophosphorus compound or a nitrile whereby said alcohol reacts with said carbon monoxide and said oxygen in a gas phase to produce said carbonic diester, wherein carbon monoxide and alcohol are present in the feed gas at a molar ratio (CO/alcohol) within the range of 3.5 to 95 and carbon monoxide and oxygen are present in the feed gas at a molar ratio (CO/O_2) within the range of 15 to 150.

5,466,857

PROCESS FOR REDUCTION OF WASTE MATERIAL DURING MANUFACTURE OF ACRYLONITRILE

Vincent G. Reiling, Shaker Heights, Ohio; Jeffrey E. Rinker, Victoria, Tex.; Timothy R. McDonel, Brecksville, Ohio, and Joseph C. Sarna, Victoria, Tex., assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 10, 1994, Ser. No. 288,118

Int. Cl.[6] C07C *253/18;253/24;253/26*

U.S. Cl. 558—319 **18 Claims**

1. A method of reducing the amount of unreacted ammonia exiting the reactor during the manufacture of acrylonitrile comprising introducing into the lower portion of a fluid bed reactor ammonia, oxygen and a hydrocarbon selected from the group consisting of propylene and propane, to react in the presence of a fluid bed catalyst to produce acrylonitrile, introducing an additional amount of oxygen free of any oxygenate compound into the upper portion of the fluid bed reactor at a point where the additional oxygen does not substantially affect the reaction to produce acrylonitrile but reacts with at least some of the unreacted ammonia present in the reactor to reduce the amount of free ammonia present in the reactor effluent exiting said reactor, passing the reactor effluent containing acrylonitrile into a quench column to cool the reactor effluent with water to remove unwanted impurities and recovering the acrylonitrile from the quench column.

5,466,858

METHOD OF PRODUCING STRAIGHT-CHAIN ACRYLONITRILE DIMERS

Ryoji Sugise; Kouichi Kashiwagi; Masashi Shirai, and Toshihiro Shimakawa, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Aug. 30, 1994, Ser. No. 298,113

Claims priority, application Japan, Sep. 3, 1993, 5-220266; Sep. 3, 1993, 5-220268; Sep. 3, 1993, 5-220270; Jul. 5, 1994, 6-153278

Int. Cl.[6] C07C *253/30*

U.S. Cl. 558—364 **23 Claims**

1. A method of producing straight-chain acrylonitrile dimers including 1,4-dicyano-butene, 1,4-dicyanobutadiene and adiponitrile, comprising dimerizing acrylonitrile at a temperature of 70° to 220° C. and under a pressure of from 50 mmHg to 100 kg/cm^2G, in the presence of a catalyst. consisting essentially of at least one ruthenium compound selected from the group consisting of ruthenium salts of inorganic salts, ruthenium slats of organic acids and ruthenium coordination compounds in which a ruthenium atom serves as a coordination center atom, and in an amount of 0.0001 to 10 molar % based on the molar amount of acrylonitrile and in the additional presence of a straight-chain dimer selectivity-enhancing agent consisting essentially of at least one member selected from the group consisting of:

(A) substituted benzoic acids having a benzene ring structure, and a carboxyl group and at least one additional substituent attached to the benzene ring structure, and selected from the group consisting of one or two halogen atoms, haloalkyl groups, a cyano group acetyl groups, benzoyl groups, carboalkoxyl groups, a phenyl group, alkoxyl groups, an amino group, N-methyl amino group, N-ethyl amino group, N,N-dimethyl amino group, N,N-diethyl amino groups, alkylthio groups and alkylsulfinyl groups;

(B) hetero atom-containing acyclic carboxylic acids having a main hydrocarbon structure with 1 to 6 carbon atoms, a carboxyl group attached to a carbon atom in the main hydrocarbon structure, and at least one additional substituent selected from the group consisting of the groups of the formula:

$$-SR^1, \text{ and } -NR^2R^3$$

wherein R^1, R^2, and R^3 respectively and independently from each other represent a member selected from the group consisting of a hydrogen atom, alkyl groups having 1 to 15 carbon atoms, alkenyl groups having 2 to 15 carbon atoms, aryl groups having 6 to 15 carbon atoms, acyl groups having 2 to 15 carbon atoms and carboalkoxyl groups having 2 to 15 carbon atoms, the additional substituent being attached to a carbon atom contained in the main hydrocarbon structure and located in an α or β-position with respect to the carboxyl group; and

(C) five to twelve membered heterocyclic carboxylic acids having a 5 to 12 membered heerocyclic structure including a hetero atom selected from the group consisting of oxygen, sulfur and nitrogen atoms, and a carboxyl group attached to a carbon atom contained in the heterocyclic structure and located in an α-position with respect to the hetero atom, the straight-chain dimer selectivity-enhancing agent being present in a molar amount of 0.0001 to 5 times the molar amount of acrylonitrile.

5,466,859

PROCESS FOR PREPARING FLUOROBENZONITRILES

Thomas Schach, Gernsheim; Theodor Papenfuhs, Frankfurt am Main, and Ralf Pfirmann, Griesheim, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Jul. 19, 1994, Ser. No. 277,518

Claims priority, application Germany, Jul. 21, 1993, 43 24 368.1

Int. Cl.[6] C07C 253/30

U.S. Cl. 558—425 18 Claims

1. A process for replacement, with fluorine, of at least one chlorine atom of a compound of the formula (4)

(4)

in which

a is a number from 1 to 5 and

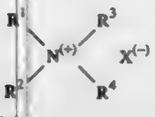
b is a number from 0 to 3,

said process comprising

reacting said compound of formula (4) with an alkali metal fluoride at a reaction temperature in the range of from 80 to 220° C. in the presence of:

(1) 0 to 30% by weight aprotic or 0 to 5% by weight of a protic solvent, based on the weight of said compound of formula (4),

(2) from 1 to 35% by weight, based on the weight of the compound of formula (4), of a catalyst, said catalyst comprising at least 5% by weight, based on the total catalyst, of a quaternary ammonium compound of the formula (1)



(1)

in which

R^4 is a linear or branched alkoxypolyoxyalkyl radical of the formula $(C_mH_{2m}O)_pR^5$, in which R^5 is a hydrogen or a linear or branched alkyl radical having from 1 to 16 carbon atoms, m is a number from 1 to 10, and p is a number from 1 to 15;

R^1, R^2, and R^3 are the same or different and are: a linear or branched alkoxypolyoxyalkyl radical of the formula $(C_mH_{2m}O)_pR^5$, in which R^5, m, and p are as previously defined; a linear or branched alkyl radical having from 1 to 30 carbon atoms; or a phenyl or naphthyl radical which is unsubstituted or substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, nitro, or cyano;

$X^{(-)}$ is an inorganic anion.

5,466,860

PROCESS FOR THE PREPARATION OF BLOCKED ISOCYANATES

Carmen Flosbach; Dieter Philipp, and Walter Schubert, all of Wuppertal, Germany, assignors to Herberts Gesellschaft mit beschrankter Haftung, Wuppertal, Germany

Filed Feb. 8, 1995, Ser. No. 385,444

Claims priority, application Germany, Feb. 17, 1994, 44 05 042.9

Int. Cl.[6] C07C 229/24

U.S. Cl. 560—43 8 Claims

1. A process for the preparation of blocked isocyanates by reaction of free isocyanates under water-free conditions with blocking agents containing acid hydrogen in the presence of basic catalysts, characterised in that one or more alkali hydroxides are used as basic catalysts.

5,466,861

BRIDGED BICYCLIC AROMATIC COMPOUNDS AND THEIR USE IN MODULATING GENE EXPRESSION OF RETINOID RECEPTORS

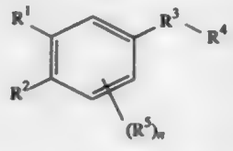
Marcia L. Dawson, Menlo Park; James F. Cameron, Palo Alto; Peter D. Hobbs, Moss Beach; Ling Jong, Sunnyvale; Magnus Pfahl, Solana Beach; Xiao-kun Zhang, La Jolla, and Jürgen M. Lehmann, Solana Beach, all of Calif., assignors to SRI International, Menlo Park, and La Jolla Cancer Research Foundation, La Jolla, both of Calif.

Filed Nov. 25, 1992, Ser. No. 982,305

Int. Cl.[6] C07C 69/76;63/36

U.S. Cl. 560—100 23 Claims

1. A bicyclic aromatic compound having the structural formula



(I)

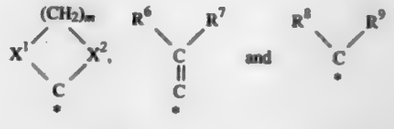
wherein:

R^1 is selected from the group consisting of lower alkyl and adamantyl;

R^2 is —O—R^{13} or —S—R^{13} where R^{13} is lower alkyl; or

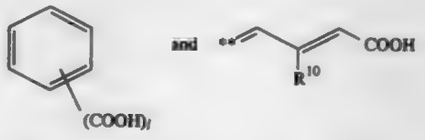
where R^1 is ortho to R^2, R^1 and R^2 may be linked together to form a 5- or 6-membered cycloalkylene ring, either unsubstituted or substituted with 1 to 4 lower alkyl groups, and optionally containing 1 or 2 heterocyclic atoms selected from the group consisting of O, S and NR where R is hydrogen or lower alkyl;

R^3 is selected from the group consisting of carbonyl,



in which X^1 and X^2 are both methylene, m is 2 or 3, R^6, R^7, R^8 and R^9 are independently hydrogen or lower alkyl, or R^8 and R^9 may be linked together to form a cycloalkylene ring containing 3 to 6 carbon atoms, and * represents the point of attachment of the R^3 substituent to the remainder of the molecule;

R^4 is selected from the group consisting of



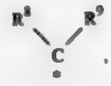
in which R^{10} is hydrogen or methyl, l is 0 or 1, and ** represents the point of attachment of the R^4 substituent to the remainder of the molecule;

the R^5 are independently selected from the group consisting of lower alkyl and lower alkoxy; and

n is 0, 1, 2 or 3,

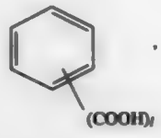
with the provisos that: (a) when n is 0, R^3 is other than carbonyl, $^{+}C{=}CH_2$ or CH_2; (b) when n is 0, and R^3 is

R^6 and R^7 are not both hydrogen; (c) when n is 0, and R^3 is



R^8 and R^9 are not both hydrogen; and (d) when R^3 is

in which one of R^8 and R^9 is hydrogen or lower alkyl and the other is lower alkyl, either (i) R^1 and R^2 are such that they are not linked together to form a cycloalkyl ring, or (ii) R^4 is other than



and the pharmaceutically acceptable ester, amides and salts of the compound.

5,466,862

LOW MOLECULAR WEIGHT POLYACETALS AND POLYALDEHYDES

Gary T. Martino, Plainsboro, and Martin M. Tessler, Edison, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Division of Ser. No. 74,278, Jun. 8, 1993, Pat. No. 5,386,040, which is a continuation of Ser. No. 889,548, May 27, 1992, abandoned. This application Sep. 22, 1994, Ser. No. 310,451

Int. Cl.[6] C07C *37/00*

U.S. Cl. 560—152 **5 Claims**

1. A polyaldehyde having a molecular weight of about 200–3000 and the general structure R_3—(R_4—CHO)$_x$, wherein R_3 is the residue from a polyamide or the residue from a polyester; R_4 is a divalent organic group; and x is 2 to less than 20.

5,466,863

THERMOSETTING COATING COMPOSITIONS

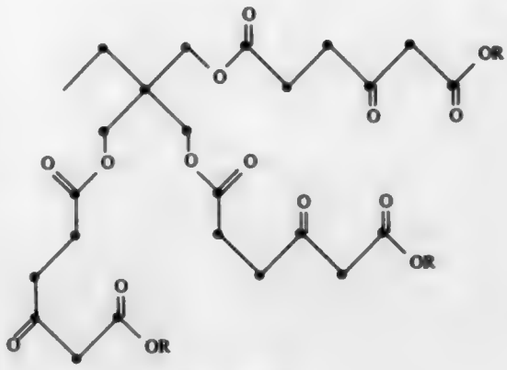
Philip C. Heidt; Charles H. Foster, both of Kingsport, Tenn.; J. Stewart Witzeman, Den Haag, Netherlands, and Allen L. Crain, Church Hill, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Division of Ser. No. 139,661, Oct. 22, 1993, Pat. No. 5,412,151. This application Feb. 6, 1995, Ser. No. 384,094

Int. Cl.[6] C07C *59/305*

U.S. Cl. 560—176 **3 Claims**

1. A compound of formula (3)



(3)

wherein R is C_1–C_6 alkyl or phenyl.

5,466,864

METHOD FOR RECOVERING L-PHENYLALANINE

Tadashi Takemoto; Toyoto Hijiya; Teruo Yonekawa, and Chiaki Mochizuki, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Feb. 2, 1994, Ser. No. 190,450

Claims priority, application Japan, Feb. 25, 1993, 5-036880; Feb. 25, 1993, 5-036881; Mar. 22, 1993, 5-061972

Int. Cl.[6] C07C *53/134*

U.S. Cl. 562—445 **8 Claims**

1. A method for recovering L-phenylalanine from an aqueous solution containing L-phenylalanine, comprising the steps of:

esterifying L-phenylalanine with methanol in the presence of sulfuric acid to produce a solution of L-phenylalanine methyl ester;

neutralizing said solution of L-phenylalanine methyl ester with a base in the presence of water to form a solution containing L-phenylalanine and L-phenylalanine methyl ester;

extracting said L-phenylalanine methyl ester from said neutralized solution with an organic solvent to form an aqueous solution containing L-phenylalanine;

contacting said aqueous solution containing L-phenylalanine with monomethyl sulfuric acid to form crystals of L-phenylalanine monomethyl sulfate;

separating said crystals from said aqueous solution; and

removing monomethyl sulfuric acid from said separated crystals to recover L-phenylalanine.

5,466,865

NEOMORPHIC IBUPROFEN AND METHODS OF USING SAME

Robert P. Geyer, Brookline, Mass., and Vinod V. Tuliani, Media, Pa., assignors to Ibah, Inc., Blue Bell, Pa.

Continuation-in-part of Ser. No. 87,573, Jul. 2, 1993, Pat. No. 5,310,961, and a continuation-in-part of Ser. No. 86,922, Jul. 2, 1993, Pat. No. 5,310,960. This application Dec. 17, 1993, Ser. No. 169,672

The portion of the term of this patent subsequent to May 18, 2070, has been disclaimed.

Int. Cl.[6] C07C *53/134*

U.S. Cl. 562—496 30 Claims

1. A method of treating an animal for the reduction of pain, fever, or for an inflammatory condition, comprising administering to an animal a therapeutically effective amount of a neomorphic ibuprofen composition comprising amorphous ibuprofen.

5,466,866

PROCESS FOR THE PURIFICATION OF AROMATIC POLYCARBOXYLIC ACIDS

James F. White, Hudson, Ohio, assignor to Engelhard Corporation, Iselin, N.J.

Filed Dec. 20, 1994, Ser. No. 360,855

Int. Cl.[6] C07C *51/42*

U.S. Cl. 562—485 8 Claims

1. In a process for the purification of impure aromatic polycarboxylic acids produced by the catalytic oxidation of polyalkylaromatic hydrocarbons which comprises contacting said impure acid with hydrogen and at least one hydrogenation catalyst, the improvement comprising said catalyst having a water insoluble and non-brittle coating of at least one polymeric material.

5,466,867

METHOD FOR PRODUCING [S,S]-ETHYLENEDIAMINE-N,N'-DISUCCINIC ACID FROM ITS CALCIUM SALT

Ronny W. Lin, Baton Rouge; Eldon E. Atkinson, Jr., Greenwell Springs, and William J. Layman, Jr., Baton Rouge, all of La., assignors to Albemarle Corporation, Richmond, Va.

Filed Jul. 11, 1994, Ser. No. 272,469

Int. Cl.[6] C07C *227/18;227/28;229/06*

U.S. Cl. 562—554 16 Claims

1. A method for converting calcium [S,S]-ethylenediamine-N,N'-disuccinic acid salt to a [S,S]-ethylenediamine-N,N'-disuccinic acid precipitate, the method comprising; co-feeding, to a volume of water, calcium [S,S]-ethylenediamine-N,N'-disuccinic acid salt and aqueous mineral acid, the mineral acid having a dissociation constant within the range of from about 1.0×10^{-5} to about 1.0×10^{-10}, wherein the feed rates of the calcium salt and the aqueous mineral acid are controlled so that the volume of water has a pH within the range of from about 1.4 to about 7 at least substantially throughout the co-feed period.

9. A method for converting calcium [S,S]-ethylenediamine-N,N'-disuccinic acid salt to a [S,S]-ethylenediamine-N,N'-disuccinic acid precipitate, the method comprising: co-feeding, to a volume of water, calcium [S,S]-ethylenediamine-N,N'-disuccinic acid salt and aqueous mineral acid, the mineral acid having dissociation constant within the range of from about 1.0×10^{-5} to about 1.0×10^{10}, wherein the feed rates of the calcium salt and the aqueous mineral acid are controlled so that the volume of water has a pH within the range of from about 3 to about 6.6 at least substantially throughout the co-feed period; and, subsequent to the co-feeding period, adding additional aqueous mineral acid to the volume of water to reduce its pH so that it is within the range of from about 1.8 to about 2.4.

5,466,868

PROCESS FOR THE PREPARATION OF AN ENRICHED 2,2'-OXYDISUCCINATE REACTION MIXTURE BY REMOVAL OF CALCIUM MALATE

Shang-Ren Wu, Mahwah; Donna Wu, North Bergen, and Eddie N. Gutierrez, Midland Park, all of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Oct. 14, 1994, Ser. No. 323,301

Int. Cl.[6] C07C *51/42;51/43*

U.S. Cl. 562—580 10 Claims

1. A process for preparing the alkaline earth metal salts of 2,2'-oxydisuccinic acid in high purity comprising:

(i) preparing a reaction mixture of said alkaline earth metal salt combined with malate, maleate and fumarate salts in the substantial absence of any alkali metal ion or salts;

(ii) adding sufficient acidifying agent to said reaction mixture to achieve a pH of about 8.7 to 8.9 to form a slurry;

(iii) precipitating the alkaline earth metal salt of malic acid from the slurry;

(iv) separating the alkaline earth metal salt of malic acid from the slurry to form an enriched mixture of 2,2'oxydisuccinic alkaline earth metal salt in the slurry.

5,466,869

PROCESS FOR PERPARING 4-HYDROXYACETOPHENONE OXIME

Kenneth G. Davenport, Corpus Christi, Tex.; Roger A. Sheldon, Rijswijk; Joel Le Bars, Den Haag, both of, Netherlands, and Werner H. Mueller, Charlotte, N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Filed Oct. 31, 1994, Ser. No. 332,240

Int. Cl.[6] C07C *249/04*

U.S. Cl. 564—265 10 Claims

1. A process for preparing 4-hydroxyacetophenone oxime which comprises reacting 4-hydroxyacetophenone with ammonia and hydrogen peroxide at a temperature from about 25° C. to about 150° C. in the presence of a catalyst comprising a titanium-containing molecular sieve.

5,466,870

PROCESS FOR REDUCING THE LEVELS OF NITRITE CONTAMINANTS IN AMINE OXIDE SURFACTANTS

Larry E. Miller, Cincinnati; Gene P. Hawkins, Oregonia, and Bernard G. Durham, Mason, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 145,257, Oct. 29, 1993, abandoned. This application Aug. 5, 1994, Ser. No. 286,844

Int. Cl.[6] C07C *209.90*

U.S. Cl. 564—298 4 Claims

1. In a process for preparing amine oxide surfactants of the formula $R\ R^1\ R^2N\rightarrow O$ wherein R is a C_8 to C_{18} alkyl or alkenyl substituent and R^1 and R^2 are each C_1–C_4 alkyl or hydroxyalkyl substituents by the oxidation, using hydrogen peroxide or a source of hydrogen peroxide, of the corresponding amine of the formula $R\ R^1R^2N$, the improvement which comprises conducting the oxidation in the presence of either citrate or a chelating compound comprising a chelating active selected from the group consisting of water-soluble ethylenediaminetetraacetates, diethylenetriaminepentaacetates, nitriloacetates, and mixtures thereof, and a chelating co-active selected from the group consisting of malates, maleates, succinates, and mixtures thereof, wherein said process is carried

out at a pH of from 6 to 8, whereby contamination of the amine oxide surfactant by nitrites is substantially decreased for at least about 4 weeks.

5,466,871

PROCESS FOR PREPARING NITROANILINE DERIVATIVES

Shinzo Seko, Osaka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

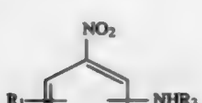
Filed Jul. 11, 1994, Ser. No. 272,847

Claims priority, application Japan, Jul. 22, 1993, 5-181637; Nov. 24, 1993, 5-293056; Dec. 10, 1993, 5-310285; Mar. 7, 1994, 6-035831; Mar. 7, 1994, 6-035834

Int. Cl.[6] C07C *209/02*

U.S. Cl. 564—395 **19 Claims**

1. A process for preparing a nitroaniline derivative of the general formula:

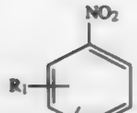


(I)

wherein R_1 and R_2 independently represent a hydrogen atom, a halogen atom, a cyano group, a nitro group, an aryl group, a di-lower alkylamino group, a lower alkyl group optionally substituted with halogen atoms or lower alkoxyl groups, a lower alkoxyl group optionally substituted with halogen atoms, an aryloxy group, a lower alkylmercapto group, an arylmercapto group, a lower alkylsulfonyl group, an arylsulfonyl group, a lower alkyl sulfonate group, or an alkenyl group optionally substituted with lower alkyl groups or aryl groups, or

R_1 and R_2 may form together a cycloalkyl group, an $—O—(CX_2)_n—O—$ group, a $—CX_2—O—CX_2—$ group wherein X represents a hydrogen atom or a halogen atom and n is 1 or 2, or a condensed aromatic carbon ring when R_1 and R_2 are positioned at the ortho positions in an aromatic ring to each other; and

R_3 represents a hydrogen atom, a lower alkyl group, an arylmethyl group or a cycloalkyl group having 3 to 8 carbon atoms, comprising a step of reacting an aromatic nitro compound of the general formula:



(II)

wherein R_1 and R_2 are the same as defined above, with an O-alkylhydroxylamine of the general formula:

$$R_3NHOR_4 \quad \text{(III)}$$

wherein R_3 are the same as defined above and R_4 represents a lower alkyl group or a benzyl group, or a salt thereof in the presence of a base.

5,466,872

POLY (OXYALKYLENE) AROMATIC ETHERS

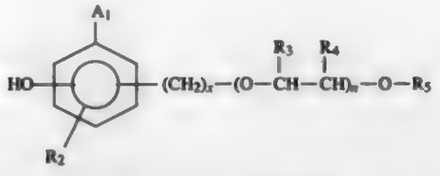
Richard E. Cherpeck, Cotati, Calif., assignor to Chevron Chemical Company, San Ramon, Calif.

Division of Ser. No. 144,858, Oct. 28, 1993, Pat. No. 5,409,507. This application Feb. 21, 1995, Ser. No. 395,368

Int. Cl.[6] C07C *215/76;215/78*

U.S. Cl. 564—443 **12 Claims**

1. A compound of the formula:

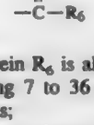


wherein A_1 is nitro, amino, N-alkylamino wherein the alkyl group contains 1 to 6 carbon atoms, or N,N-dialkylamino wherein each alkyl group independently contains 1 to 6 carbon atoms;

R_2 is hydrogen, hydroxy, lower alkyl having 1 to 6 carbon atoms, or lower alkoxy having 1 to 6 carbon atoms;

R_3 and R_4 are independently hydrogen or lower alkyl having 1 to 6 carbon atoms and each R_3 and R_4 is independently selected in each $—O—CHR_3—CHR_4—$ unit;

R_5 is hydrogen, alkyl having 1 to 100 carbon atoms, phenyl, aralkyl having 7 to 100 carbon atoms, alkaryl having 7 to 100 carbon atoms, or an acyl group having the formula:



wherein R_6 is alkyl having 1 to 30 carbon atoms, phenyl, aralkyl having 7 to 36 carbon atoms or alkaryl having 7 to 36 carbon atoms;

n is an integer from 5 to 100; and x is an integer from 0 to 10.

5,466,873

PROCESS FOR PREPARING ARYLKETOAMINES

Ahmed M. Tafesh; George Kvakovszky, both of Corpus Christi, and Charlet R. Lindley, Portland, all of Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 294,527, Aug. 23, 1994, which is a division of Ser. No. 246,892, May 20, 1994, Pat. No. 5,399,764, which is a division of Ser. No. 191,849, Feb. 4, 1994, Pat. No. 5,349,090. This application Nov. 30, 1994, Ser. No. 347,007

Int. Cl.[6] C07C *45/00;721/00*

U.S. Cl. 568—312 **3 Claims**

1. A method of preparing a substituted or an unsubstituted phenylglyoxal from a corresponding substituted or unsubstituted acetophenone, comprising the step of reacting said acetophenone in water with a source of a nitrosonium ion in the presence of a strong acid.

5,466,874

POLYMERIC CARBONYLATION CATALYST SYSTEM

Mark O. Scates, Pearland; R. Jay Warner, and G. Paull Torrence, both of Corpus Christi, all of Tex., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Division of Ser. No. 938,787, Aug. 31, 1992, Pat. No. 5,281,359. This application Aug. 24, 1993, Ser. No. 110,999

Int. Cl.[6] C07C *51/12;53/08*

U.S. Cl. 562—519 **25 Claims**

1. In a process for the carbonylation of an alcohol, ether or ester to products comprising a carboxylic acid, the anhydride thereof or

coproduction of said carboxylic acid and anhydride thereof under carbonylation conditions in a reaction medium containing a rhodium catalyst and an iodide promoter, the improvement which comprises using as said rhodium catalyst a polymer containing pendant pyrrolidone groups, said pyrrolidone groups supporting a rhodium species.

5,466,875

PROCESS FOR THE PURIFICATION OF ALKALINE EARTH METAL SALTS OF 2,2'-OXYDISUCCINATE BY ACIDIFICATION

Eddie N. Gutierrez, Midland Park, and Shang-Ren Wu, Mahwah, both of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Oct. 14, 1994, Ser. No. 323,320
Int. Cl.[6] C07C *51/43*
U.S. Cl. 562—580 **11 Claims**

1. A process for preparing the alkaline earth metal salt of 2,2'-oxydisuccinic acid in high purity comprising:

(i) preparing an aqueous solution of said alkaline earth metal salt in a reaction mixture;

(ii) adding sufficient acidifying agent to said reaction mixture to achieve a pH of about 3.8 to 4.2 to form an acidified reaction mixture;

(iii) heating said acidified reaction mixture to a temperature of 90° C. to 100° C. for at least 2 hours to form the alkaline earth metal salt of ODS;

(iv) precipitating the alkaline earth metal salt of ODS;

(v) recovering the alkaline earth metal salt of ODS as a product.

5,466,876

PROCESS FOR THE REMOVAL OF CORROSION METAL CONTAMINANTS FROM LIQUID COMPOSITIONS

Andrew R. McClarron, Beverley; Stephen J. Smith, Hull; Derrick J. Watson, Hornsea; Bruce L. Williams, Elloughton, all of, United Kingdom, and Euan S. Ross, Grand Bahama, Bahamas, assignors to BP Chemicals Limited, London, England

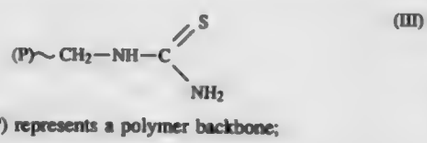
Filed Mar. 4, 1994, Ser. No. 206,072
Claims priority, application United Kingdom, Mar. 22, 1993, 9305902
Int. Cl.[6] C07C *51/12;53/08;* B01J *31/30*
U.S. Cl. 562—608 **20 Claims**

1. A process for the removal of corrosion metal contaminants from a liquid composition comprising a carboxylic acid, an anhydride thereof or a mixture thereof, a rhodium carbonylation catalyst, a carbonylation catalyst co-promoter and corrosion metal contaminants which process comprises contacting the liquid composition with a chelating resin selective for the retention of corrosion metals and recovering a liquid composition having a reduced corrosion metal contaminant concentration, wherein said chelating resin is selected from the group consisting of chelating resins having:

(a) iminodiacetate functional groups;

(b) aminophosphonic acid functional groups;

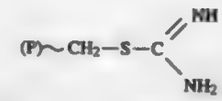
(c) functional groups represented by the general formula



(III)

wherein (P) represents a polymer backbone;

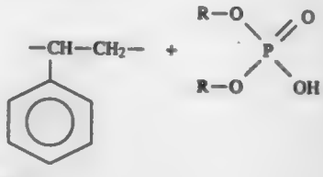
(d) functional groups represented by the general formula:



(IV)

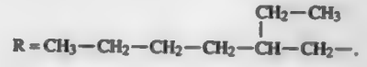
wherein (P) represents a polymer backbone; and

(e) functional groups represented by the general formula:



(V)

wherein



5,466,877

PROCESS FOR CONVERTING PERFLUORINATED ESTERS TO PERFLUORINATED ACYL FLUORIDES AND/OR KETONES

George G. I. Moore, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 15, 1994, Ser. No. 213,109
Int. Cl.[6] C07C *51/58;53/00*
U.S. Cl. 562—852 **24 Claims**

1. A process for converting perfluorinated carboxylic acid esters to perfluorinated acyl fluorides and/or perfluorinated ketones comprising the step of combining at least one perfluorinated carboxylic acid ester with at least one initiating reagent selected from the group consisting of gaseous, non-hydroxylic nucleophiles; liquid, non-hydroxylic nucleophiles; and mixtures of at least one non-hydroxylic nucleophile and at least one solvent which is inert to acylating agents.

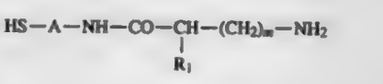
5,466,878

REDUCING COMPOSITION FOR THE PERMANENT DEFORMATION OF HAIR CONTAINING AS A REDUCING AGENT, AN AMINO MERCAPTOALKYLAMIDE OR A SALT THEREOF

Alex Junino, Livry Gargan, and Gérard Maile, Villiers S/Morin, both of, France, assignors to L'Oreal, Paris, France

Division of Ser. No. 615,626, Nov. 19, 1990, Pat. No. 5,085,860. This application Oct. 18, 1991, Ser. No. 778,664
Claims priority, application France, Nov. 20, 1989, 89 15182
Int. Cl.[6] C07C *323/41*
U.S. Cl. 564—197 **2 Claims**

1. A compound having the formula



(IV)

wherein

A represents a divalent radical —$(CH_2)_n$— wherein n is a whole number ranging from 2 to 5, or a divalent radical —$(CH_2)_z$—O—$(CH_2)_z$—,

m is 0 or a whole number ranging from 1 to 4,

(i) when m is O, R_1 represents hydrogen, methyl, ethyl, isopropyl, isobutyl, 2-methyl butyl, benzyl, 4-amino butyl,

[3-guanidino propyl]3-guanidino propyl, 2-methylthioethyl, carboxymethyl or 2-carboxyethyl, and

(ii) when m is a whole number ranging from 1 to 4, R_1 represents hydrogen or lower alkyl having 1–5 carbon atoms with the exception of compounds wherein

(i') A represents $—(CH_2)_2—$, m is 0 or 1 and R_1 represents hydrogen, linear or branched alkyl having 1 to 5 carbon atoms, benzyl or 2-carboxyethyl and

(ii') A represents $—(CH_2)_3—$, m is 1 and R_1 represents hydrogen,

and the salt of said compound of formula (IV).

5,466,879

PRODUCTION OF HEXAFLUOROACETONE AND ITS OXIME

Yuri Cheburkov, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 202,999, Feb. 28, 1994, abandoned. This application Nov. 18, 1994, Ser. No. 341,838

Int. Cl.[6] C07C *249/06*

U.S. Cl. 564—253 **16 Claims**

1. A process for the production of hexafluoroacetone, which comprises heating hexafluoroacetone oxime, or hexafluoroacetone oxime complexed with an organic solvent wherein the organic solvent is selected from the group comprising nitriles, tertiary amines, dialkylamides, ketones, simple ethers, alcohols, and esters, and organic acids containing from 1 to 4 nonhalogenated aliphatic carbon atoms the skeletal chain of which may contain one or more catenary heteroatoms, with concentrated mineral acid to hydrolyze the oxime, and recovering the resulting hexafluoroacetone.

5,466,880

PROCESS FOR PREPARING KETONE ENANTIOMER

George J. Quallich, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/US92/07654, § 371 Date Jun. 9, 1994, § 102(e) Date Jun. 9, 1994, PCT Pub. No. WO93/12062, PCT Pub. Date Jun. 24, 1993

PCT Filed Sep. 15, 1992, Ser. No. 244,832

Int. Cl.[6] C07C *45/45*

U.S. Cl. 568—319 **25 Claims**

1. A process for preparing the (4S)-enantiomer of 4 -(3,4-dichlorophenyl)-3,4-dihydro-1(2H)-naphthalenone in a highly-optically pure form, starting from 4-(3,4 -dichlorophenyl)-4-ketobutanoic acid, which comprises the sequential series of steps that involve:

(a) first esterifying 4-(3,4-dichlorophenyl)-4 -ketobutanoic acid with isopropylene or isobutylene in a reaction-inert aprotic organic solvent in the presence of an acidic catalyst to form the corresponding isopropyl or tert.-butyl 4-(3,4 -dichlorophenyl)-4-ketobutanoate;

(b) reducing the 4-ketobutanoic acid ester obtained in step (a) with an appropriate asymmetric carbonyl reducing agent in a reaction-inert polar or non-polar aprotic organic solvent at a temperature ranging from about –15° C. up to about 40° C., until the reduction reaction to form the desired chiral isopropyl or tert.-butyl 4-(3,4-dichlorophenyl) -(4R)-hydroxybutanoate intermediate is substantially complete;

(c) sulfonylating the (4R)-hydroxybutanoic acid ester compound formed in step (b) with an organic sulfonyl halide of the formula RX, wherein R is methanesulfonyl, benzenesulfonyl or p-toluenesulfonyl and X is chlorine or bromine, in a reaction-inert organic solvent at a temperature ranging from about –20° C. up to about +40° C. in the presence of a standard base to yield the corresponding isopropyl or tert.-butyl 4-(3,4 -dichlorophenyl)-(4R)-sulfonyloxybutanoate;

(d) subjecting the (4R)-sulfonyloxybutanoic acid ester obtained in step (c) to a copper-coupling reaction with dilithium diphenyl(cyano)cuprate of the formula $\phi_2Cu(CN)Li_2$ in a cyclic or lower dialkyl ether at a temperature ranging from about –80° C. up to about 20° C. to effect a stereochemical displacement of the organic (4R)-sulfonyloxy group of the (4R)-sulfonyloxybutanoic acid ester by the phenyl group of the dilithium diphenylcuprate reagent and so selectively form the corresponding isopropyl or tert.-butyl 4-(3,4-dichlorophenyl) -(4R)-phenylbutanoate ester; and

(e) thereafter cyclizing the stereospecific (4R) -phenylated n-butanoic acid ester product of step (d) in a reaction-inert aprotic organic solvent in the presence of a protic or Lewis acid catalyst at a temperature ranging from about –20° C. up to about 180√ C. to finally yield the desired (4S)-4-(3,4 -dichlorophenyl)-3,4-dihydro-1(2H)-naphthalenone compound in a highly optically-pure form.

22. A compound selected from the group consisting of 4-(3,4-dichlorophenyl)-(4R)-phenylbutanoic acid and the isopropyl and tert.-butyl esters of said acid.

5,466,881

PROCESS FOR PREPARING M-CHLOROAROMATICS

Michael Pies, Duisburg; Helmut Fiege, Leverkusen; Lothar Puppe, Burscheid, and Josef Kisbauer, Wermelskirchen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

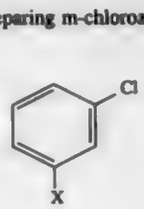
Filed Apr. 22, 1994, Ser. No. 232,550

Claims priority, application Germany, Apr. 30, 1993, 43 14 299.0

Int. Cl.[6] C07C *17/00;25/00*

U.S. Cl. 570—202 **8 Claims**

1. A process for preparing m-chloroaromatics of the formula (I)

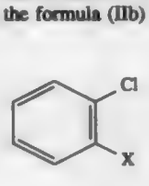


(I)

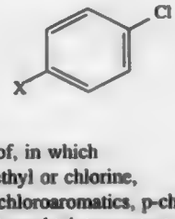
in which

X represents methyl or chlorine,

by isomerizing o-chloroaromatics of the formulae (IIa) or p-chloroaromatics of the formula (IIb)



(IIa)



(IIb)

or a mixture thereof, in which

X represents methyl or chlorine,

comprising that o-chloroaromatics, p-chloroaromatics or said mixtures thereof are brought into contact with a zeolite at elevated temperature in the liquid phase and in the presence of from 1 to 30 mol % of hydrogen, based on the chloroaromatics used.

5,466,882

METHOD AND APPARATUS FOR PRODUCING AN ELECTRONIC REPRESENTATION OF A MUSICAL SOUND USING EXTENDED COERCED HARMONICS

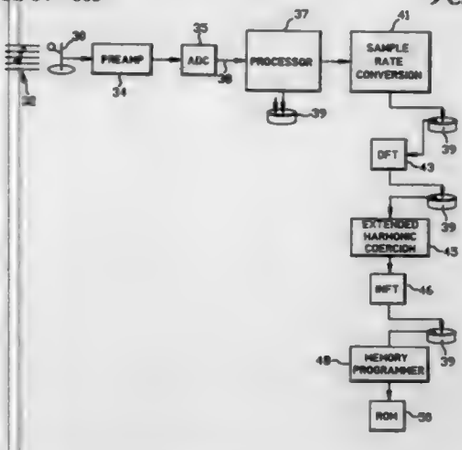
J. Robert Lee, San Diego, Calif., assignor to Gulbransen, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 34,527, Mar. 22, 1993, abandoned, which is a continuation of Ser. No. 633,475, Dec. 20, 1990, Pat. No. 5,196,639. This application Jan. 11, 1994, Ser. No. 179,923

The portion of the term of this patent subsequent to Mar. 23, 2010, has been disclaimed.

Int. Cl.[6] G10H *1/057;7/08*

U.S. Cl. 84—603 9 Claims



1. A method of creating and preserving a counterpart of a sound having a fundamental frequency, the method utilizing a memory device and comprising the steps of:

generating a sequence of original time domain samples of the sound, the sequence including successive adjacent portions in which a first portion exhibits aperiodic fluctuations of amplitude of the sound, a second portion, following the first portion, exhibits decreasing aperiodic fluctuations of amplitude of sound, and a third portion, following the second portion, exhibits substantially periodic fluctuations of amplitude of the sound;

transforming the sequence of original time domain samples to frequency domain values including a set of frequency values representing component frequencies of the sound, the frequency domain values including the fundamental frequency and a plurality of related frequencies;

from the beginning of the second portion, changing the related frequencies in the set of frequency values such that the related frequencies are substantially integral multiples of the fundamental frequency by the end of the second portion;

from the beginning of a first loop portion, maintaining the related frequencies in the set of frequency values as substantially integral multiples of the fundamental frequency for a time substantially corresponding to one period of the fundamental frequency;

from the beginning of a fourth portion following the first loop portion, changing amplitudes of the related frequencies in the set of frequency values;

from an end of the fourth portion, maintaining the amplitudes and frequencies of the related frequencies in the set of frequencies for a time substantially corresponding to one period of the fundamental frequency; and

transforming the frequency domain values to a sequence of adjusted time domain values and storing the sequence of adjusted time domain values in the memory device.

5,466,883

KARAOKE REPRODUCING APPARATUS

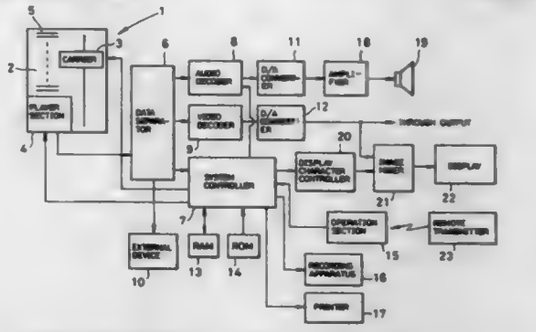
Masahiko Miyashita, Tokorozawa; Tatsuyuki Miyazawa; Hiroshi Fujii, both of Tokyo; Sumio Hosaka, Tokorozawa; Kouichi Ono, and Yoshiaki Moriyama, both of Tsurugashima, all of, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed May 25, 1994, Ser. No. 249,036

Claims priority, application Japan, May 26, 1993, 5-124070

Int. Cl.[6] G10H *1/26;1/36*

U.S. Cl. 84—610 2 Claims



1. A karaoke reproducing apparatus comprising:

a recording medium having a main channel on which signals each representing instrumental accompaniment of each of a plurality of pieces of music are recorded, and two subchannels for multi-audio music having two vocal parts, included in said plurality of pieces of music, one of said subchannels being recorded with a signal representing at least vocal sounds of one of two parts and the other subchannel being recorded with a signal representing at least vocal sounds of the other one of said two parts;

means for generating a music selection instruction indicating one piece of music among said plurality of pieces of music in accordance with an operation;

playing means for playing said recording medium for said one piece of music specified by said music selection instruction;

discrimination means for discriminating whether or not said one piece of music specified by said music selection instruction is a multi-audio type;

means for designating one of vocal parts of two parts or both vocal parts thereof when said one piece of music specified by said music selection instruction is determined as a multi-audio type by said discrimination means; and

reproducing means for reproducing a signal on at least one of said main channel and said two subchannels corresponding to the designated vocal part or vocal parts, when said recording medium is played by said playing means.

5,466,884

MUSIC SYNTHESIZER SYSTEM AND METHOD FOR SIMULATING RESPONSE OF RESONANT DIGITAL WAVEGUIDE STRUCK BY FELT COVERED HAMMER

Scott A. Van Duyne, Stanford, and Julius O. Smith, III, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed May 10, 1994, Ser. No. 240,866

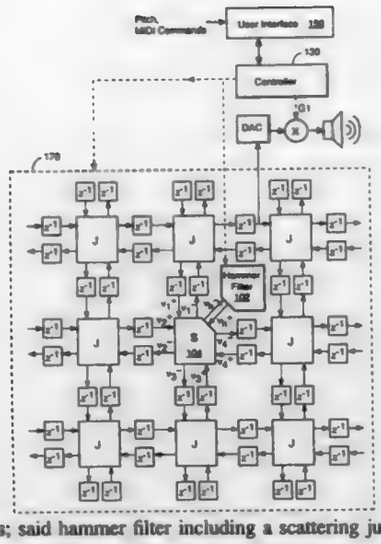
Int. Cl.[6] G10H *5/00;1/12;* H03H *7/01*

U.S. Cl. 84—661 8 Claims

1. A musical sound synthesizer that simulates interaction of a hammer having a compressible striking surface with a resonating medium, comprising:

a digital waveguide resonator that simulates operation of said resonating medium and generates digital resonator waveforms representing signals propagating in said digital waveguide resonator; and

a hammer filter that simulates said hammer striking said resonating medium by generating first and second hammer wave-



forms; said hammer filter including a scattering junction that couples said hammer filter to said digital waveguide resonator;

said hammer filter including:

a compression function that generates from said first and second hammer waveforms a compression value corresponding to compression of said simulated hammer;

a stiffness function that generates a time varying stiffness coefficient as a function of said compression value;

a excitation signal function that generates a hammer excitation signal as a function of hammer strike impulses; and

a hammer function that generates said first hammer waveform as a function of said compression value, said hammer excitation signal and said second hammer waveform;

wherein said scattering junction transmits said digital resonator waveforms received from said digital waveguide resonator, unchanged by said first hammer waveform, back into said digital waveguide resonator when said compression value corresponds to said hammer not being compressed, and otherwise transmits into said digital waveguide resonator a first time varying portion of said first digital resonator waveform combined with a second time varying portion of said digital resonator waveforms, wherein said first and second time varying portions of said first digital waveguide waveform and said digital resonator waveforms, respectively, are functions of said compression value.

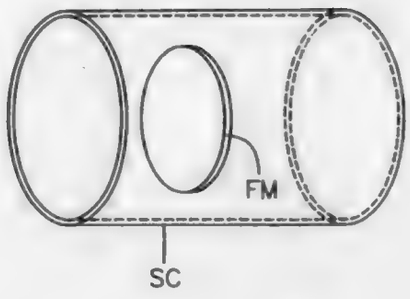
5,466,885

MAGNETICALLY SHIELDING STRUCTURE

Daiichi Irisawa, Kanagawa, Japan, assignor to Furukawa Denki Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 853,725, May 27, 1992, abandoned.
This application Jul. 21, 1994, Ser. No. 277,274
Claims priority, application Japan, Sep. 27, 1990, 2-255255
Int. Cl.[6] H05K *9/00*
U.S. Cl. 174—35 MS **6 Claims**

1. A magnetically shielding structure comprising a cylindrical shielding body of a superconductive material which manifests Meissner effect after transition from a normal conductive state to a superconductive state when said body is cooled below a predetermined critical temperature, and a high permeability member disposed in the vicinity of an opening end of said body and spaced by a gap from an inner wall of said body.

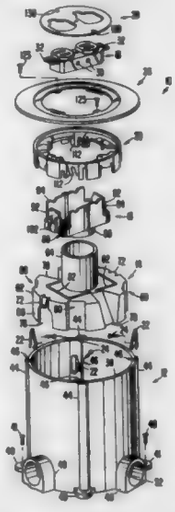


5,466,886

ELECTRICAL OUTLET BOX ASSEMBLY FOR POWER AND COMMUNICATION WIRES

Szabolcs G. Lengyel, Monroe, and Thomas C. Murphy, Jr., Milford, both of Conn., assignors to Hubbell Incorporated, Orange, Calif.

Continuation of Ser. No. 522,823, May 14, 1990, abandoned.
This application Jun. 15, 1993, Ser. No. 76,692
Int. Cl.[6] H02G *3/12*
U.S. Cl. 174—48 **69 Claims**



1. An electrical outlet box assembly for electrical wires, the combination comprising:

a housing having a base, a side wall coupled to said base to form a box with an open end, and at least one aperture extending through said housing for receiving a portion of the electrical wires into said housing; and

leveling means, coupled to said housing, for coupling an electrical receptacle to said housing, said leveling means including

a receptacle mounting member having mounting means for releasably coupling the electrical receptacle thereto, and

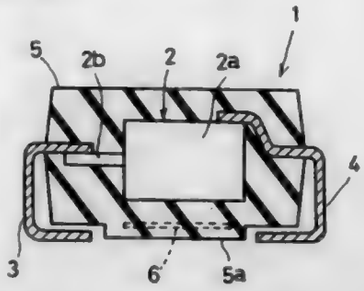
adjusting means, coupled between said housing and said receptacle mounting member, for releasably and tiltably coupling said receptacle mounting member to said housing, said adjusting means including a plurality of retaining clips adjustably coupled along said side wall of said housing.

5,466,887

RESIN-PACKAGED ELECTRONIC COMPONENT

Miki Hasegawa, Kyoto, Japan, assignor to Rohm Co. Ltd., Kyoto, Japan

Filed Aug. 23, 1994, Ser. No. 294,012
Claims priority, application Japan, Aug. 26, 1993, 5-211720
Int. Cl.[6] H01L 23/28
U.S. Cl. 174—52.2 6 Claims



1. A resin-packaged electronic component comprising an electronic element enclosed in a thermosetting resin package having a mounting face,

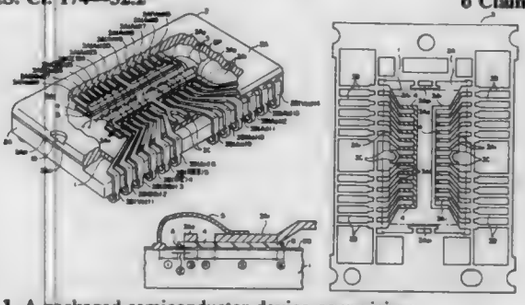
wherein the package has at least one lateral face which is formed with a stress concentrating groove extending substantially in parallel to the mounting face and contained in an imaginary plane extending between the electronic element and the mounting face, the stress concentrating groove having a depth direction extending substantially in parallel to the mounting face.

5,466,888

PACKAGED SEMICONDUCTOR DEVICE HAVING STRESS ABSORBING FILM

Lim T. Beng; Chai T. Chong, both of Singapore, Singapore; Masazumi Amagai, Ushiku, Japan; Ichiro Anjoh, Koganei, Japan; Junichi Arita, Musashino, Japan; Kunihiro Tsubosaki, Hino, Japan; Masahiro Ichitani, Kodaira, Japan, and Darvin Edwards, Dallas, Tex., assignors to Hitachi, Ltd., Tokyo, Japan, and Texas Instruments, Inc., Dallas, Tex.

Continuation of Ser. No. 198,389, Feb. 18, 1994, Pat. No. 5,406,028, which is a continuation of Ser. No. 855,842, Mar. 20, 1992, abandoned. This application Feb. 7, 1995, Ser. No. 384,836
Claims priority, application Japan, Mar. 20, 1991, 3-057476; Mar. 20, 1991, 3-057477; Mar. 20, 1991, 3-081451
Int. Cl.[6] H01L 23/28
U.S. Cl. 174—52.2 6 Claims



1. A packaged semiconductor device comprising:

a semiconductor chip having a rectangularly shaped main surface in which an electronic device is formed;

a stress absorption film formed on said main surface of said semiconductor chip for absorbing stress which may be produced in the packaged semiconductor device when subjected to variations of an ambient temperature, said stress absorption film having a tensile strength of at least 120 MPa;

an electrically insulating film provided on said stress absorption film and having an electrically insulating base film, said insulating film being comb-shaped to include a bar portion extending in a first direction substantially parallel with a pair of parallel sides of said main surface of said chip and a plurality of substantially parallel finger portions extending from said bar portion in a second direction substantially perpendicular to said bar portion, said stress absorption film having a thermal expansion coefficient not smaller than that of said semiconductor chip and not larger than that of said electrically insulating film;

a common inner lead bar formed on said bar portion of the insulating film;

a plurality of leads each including an inner lead portion and an outer lead portion continuing from said inner lead portion, first parts of the inner lead portions of the leads being respectively formed on said finger portions of the insulating film; and

a packaging material with which said semiconductor chip, said electrically insulating film, said common inner lead bar and said inner lead portions are sealed, said outer lead portions protruding from said packaging material,

wherein said bar portion of the insulating film has an area large enough to provide a first insulating peripheral area portion not covered by said common inner lead bar, said first insulating peripheral area portion extending around said common inner lead bar,

wherein each of said finger portions of the insulating film has another area large enough to provide a second insulating peripheral area portion not covered by said first part of its associated inner lead portion, said second insulating peripheral area portion extending around said first part of its associated inner lead portion, and

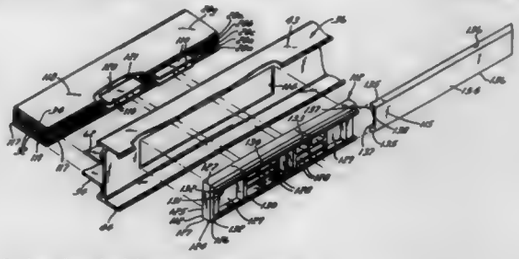
wherein each of said first and second insulating peripheral area portions have widths set to increase adherence of said comb-shaped insulating film to said packaging material and to said semiconductor chip to prevent cracks in said packaging material adjacent to said common inner lead bar and said plurality of leads.

5,466,889

ELECTRICAL POWER BUSWAY AND INSULATOR ASSEMBLY

Nathan H. Faulkner, Pauline, and Ronald D. Nordenbrock, Moore, both of S.C., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Mar. 25, 1993, Ser. No. 37,205
Int. Cl.[6] H02G 5/00
U.S. Cl. 174—68.2 13 Claims



1. An electrical busway comprising:

a plurality of conductive busbars each including at least one plug-in tab extending therefrom;

an elongate busway housing including a housing opening along its length, where the busbars are supported within the housing such that the tabs are disposed adjacent to the opening;

an insulator base fabricated from an insulating material defining first and second surfaces offset from and parallel to each other, wherein the insulator base further defines a plurality of tab openings each disposed about a respective tab extending perpendicular to and between the first and second surfaces, the tabs are substantially perpendicular to their respective busbars and the first and second surfaces, and the insulator base includes at least a first track member extending from the first surface;

means for attaching the base to the housing at the housing opening such that the second surface abuts the housing and each tab opening permits access to at least one of said tabs through the housing opening; and

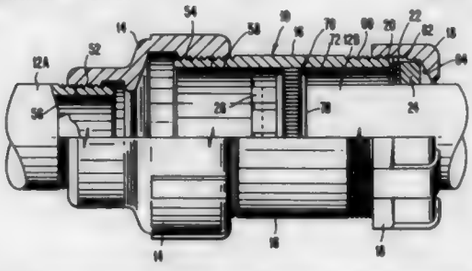
an insulator cover fabricated from an insulating material and defining a second track member configured to slidably engage the first track member such that the insulator cover is slidable relative to the insulator between a first position and a second position, where the insulator cover further defines a cover portion which covers the tab openings when the cover is in the first position and permits access to the tab openings when the cover is in the second position.

5,466,890

EXPANSION JOINT FOR AN ELECTRICAL CONDUIT WHICH IS ELECTRICALLY GROUNDED THROUGH THE EXPANSION JOINT

Brian M. Stagnitti, Midvale, Utah, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Mar. 22, 1994, Ser. No. 215,530
Int. Cl.[6] H02G *15/08*
U.S. Cl. 174—84 R **22 Claims**



1. An electrical conduit structure comprising an expansion joint interconnecting coaxial first and second sections of an electrical conduit to permit relative axial movement between said first and second conduit sections; said expansion joint being affixed to a first end portion of said first conduit section and including an electrically conductive internal surface defining an internal space in which a second end portion of said second conduit section is disposed for axial movement relative to said internal surface; electrical grounding means for establishing an electrical ground between said first and second conduit sections through said expansion joint, said electrical grounding means comprising an electrically conductive ring-shaped grounding element mounted coaxially on said second end portion so as to be movable axially therewith relative to said internal surface; an outer periphery of said ring shaped grounding element disposed in sliding contact with said internal surface.

5,466,891

CONICAL COMPOSITE SF_6 HIGH VOLTAGE BUSHING WITH FLOATING SHIELD

Willie B. Freeman, Irwin; David S. Johnson, Greensburg, both of Pa., and Klaus B. Froehlich, Baden, Switzerland, assignors to ABB Power T&D Company Inc., Stamford, Conn.

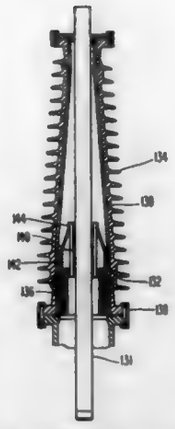
Filed Apr. 8, 1994, Ser. No. 225,239
Int. Cl.[6] H01B *17/26*
U.S. Cl. 174—142 **18 Claims**

1. A high voltage bushing having a hollow elongated insulative housing such that a high voltage conductor can be longitudinally disposed within said housing, the bushing comprising:

a ground shield disposed within said housing for substantially shielding a base section of said housing;

a floating shield disposed within said housing for substantially shielding a middle section of said housing;

a support means at least partly disposed between said ground shield and said housing for supporting said floating shield; and



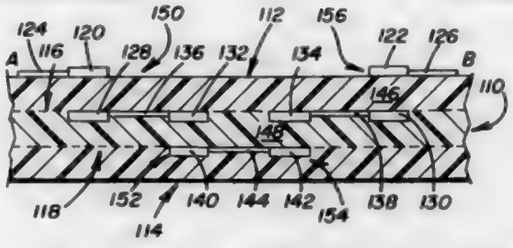
means for connecting said floating shield to said support means at a location within said housing in which the electrical stress is substantially lower than the electrical stress in unshielded areas of the base and middle sections of the bushing.

5,466,892

CIRCUIT BOARDS INCLUDING CAPACITIVE COUPLING FOR SIGNAL TRANSMISSION AND METHODS OF USE AND MANUFACTURE

James R. Howard, Santa Clara, and Gregory L. Lucas, Newark, both of Calif., assignors to Zycon Corporation, Santa Clara, Calif.

Filed Feb. 3, 1993, Ser. No. 13,076
Int. Cl.[6] H05K *1/16*
U.S. Cl. 174—261 **14 Claims**



1. A circuit board for mounting electrical components and having conductive layers spaced apart and electrically insulated from each other, and at least one circuit for transmitting AC signals from one layer to another, the AC signal transmitting circuit comprising

a conductive signal pad formed by a first conductive layer in the circuit board and adapted for coupling with means for generating an AC signal,

a conductive receptor pad formed by a second conductive layer in the circuit board and adapted for coupling with means for responding to the AC signal, and

a dielectric layer arranged between the signal and receptor pads, the thickness and dielectric constant of the dielectric layer and the respective areas of the signal and receptor pads being selected for developing effective capacitive coupling between the signal and receptor pads in order to electrostatically transmit the AC signal from the signal pad to the receptor pad,

the signal and receptor pads and the dielectric layer having electrical characteristics approaching a resonant frequency condition in the AC signal transmitting circuit whereby capacitive reactance and inductive reactance approach equality in order to optimize capacitive coupling.

5,466,893

PRINTED CIRCUIT BOARD HAVING ENHANCED EMI SUPPRESSION

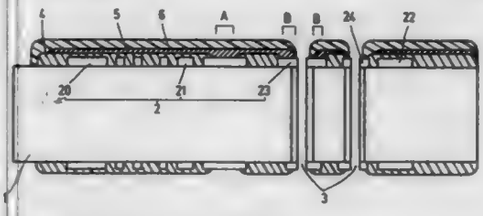
Fumio Nakatani, Yamatokoriyama; Shinichi Wakita, Akashi; Hisatoshi Murakami, Higashiosaka; Tsunehiko Terada, Ikeda, and Shohei Morimoto, Higashiosaka, all of, Japan, assignors to Tatsuta Electric Wire & Cable Co., Ltd., Osaka, Japan

Division of Ser. No. 477,322, Feb. 8, 1990, Pat. No. 5,341,274. This application Mar. 30, 1994, Ser. No. 219,790

Claims priority, application Japan, Feb. 21, 1989, 1-019218; Feb. 21, 1989, 1-019219

Int. Cl.[6] H05K *1/00*

U.S. Cl. 174—261 7 Claims



1. A printed circuit board, comprising:

a substrate., including a plurality of through-holes;

a circuit pattern formed on the substrate, the circuit pattern including a signal line pattern and a reference potential setting line pattern in which a reference potential is set for the signal line pattern, said circuit pattern also including a plurality of IC pin lands surrounding said through-holes of said substrate to receive IC pins;

an insulation layer formed on the substrate so as to cover the circuit pattern excepting at least a part of the reference potential setting line pattern; and

a conductive layer formed on the insulation layer so as to be connected to an uninsulated part of the reference potential setting line pattern, said conductive layer overlying at least a portion of said substrate and said circuit pattern between said plurality of IC pin lands and the pin insertion through-holes without contacting an IC pin land.

5,466,894

METHOD FOR SUPPLYING PRE-DEFINED FILLING QUANTITIES OF BULK MATERIAL BY EXACT WEIGHT AS WELL AS FILLING APPARATUS

Peter Naef, Helden, Switzerland, assignor to Buehler AG, Uzwil, Switzerland

PCT No. PCT/CH92/00006, § 371 Date Sep. 14, 1992, § 102(e) Date Sep. 14, 1992, PCT Pub. No. WO92/12899, PCT Pub. Date Jun. 8, 1992

PCT Filed Jan. 13, 1992, Ser. No. 927,275

Claims priority, application Switzerland, Jan. 29, 1991, 272/91; Mar. 15, 1991, 795/91

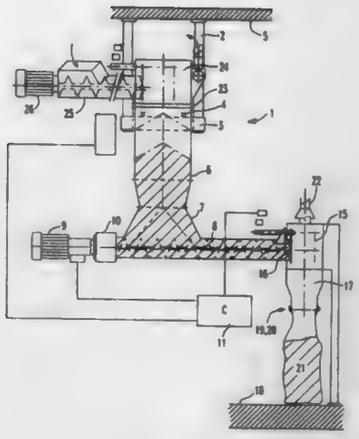
Int. Cl.[6] G01G *13/16*

U.S. Cl. 177—59 20 Claims

1. An automatic filling apparatus for preparing a multiplicity of portions of bulk material from a material feeder and for filling each portion in shipping packages, each filled package having a predetermined exact weight, the apparatus comprising:

a packing device for holding the shipping packages;

at least one differential weigher, the weigher including a controllable product discharge device fixedly attached thereto, the discharge device being arranged horizontally and having a distal end with an opening adjacent and above the packing device wherein the bulk material is discharged from the at least one differential weigher through the packing device and directly into the shipping packages.



5,466,895

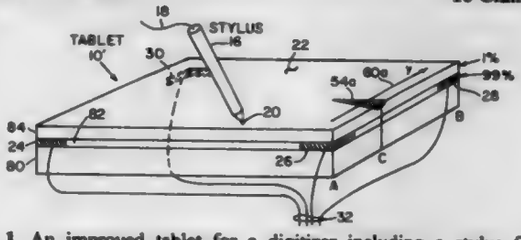
WEAR RESISTANT IMPROVED TABLET FOR A DIGITIZER

James D. Logan, Windham, N.H., assignor to MicroTouch Systems, Inc., Methuen, Mass.

Filed Jan. 7, 1994, Ser. No. 178,500

Int. Cl.[6] G08C *21/00;* G09G *3/02*

U.S. Cl. 178—18 16 Claims



1. An improved tablet for a digitizer including a stylus for digitizing stylus position on the improved tablet as a function of the stylus current distribution over the improved tablet comprising:

a first resistive coating on the face of the improved tablet for conducting stylus current to a plurality of current sensors about the periphery of the improved tablet; and

a second resistive coating, covering said first resistive coating and connected electrically in parallel with said first resistive coating, for providing an additional wearing layer to protect and prolong the life of said first resistive coating, said second resistive coating having a resistance value higher than said first resistive coating.

5,466,896

POSITION DETECTOR

Azuma Murakami, c/o Wacom Co. Sakurada 5-chrome, Washinomiya-sho; Tsuguya Yamanami, and Takahiko Funahashi, both of c/o Wacom Co., Ltd. Sakurada 5-chome, Washinomiya-cho, all of Kitakatsushika-gun, Saitama 340-02, Japan

PCT No. PCT/JP90/01397, § 371 Date Apr. 29, 1992, § 102(e) Date Apr. 29, 1992, PCT Pub. No. WO91/6907, PCT Pub. Date May 16, 1991

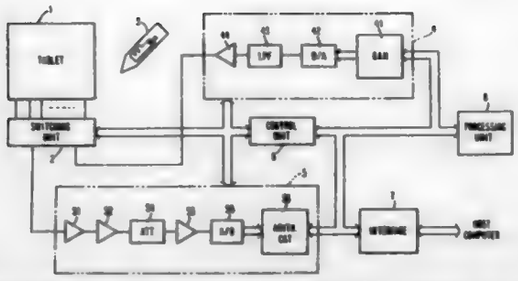
PCT Filed Oct. 31, 1990, Ser. No. 849,414

Claims priority, application Japan, Nov. 1, 1989, 1-282852

Int. Cl.[6] G08C *21/00*

U.S. Cl. 178—19 16 Claims

1. A position detector for determining the coordinate values of a position specified by a position indicator using an electromagnetic effect between a sensing unit including plural groups of several loop coils juxtaposed in the direction of position detection, the position indicator having at least one coil, comprising a selection means for simultaneously selecting a loop coil from each of the



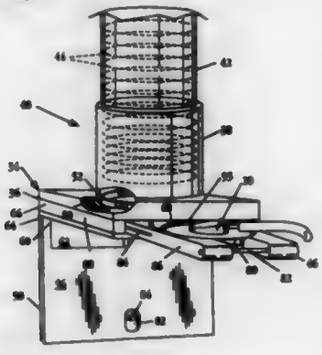
plural groups including loop coils juxtaposed in sequence out of said several loop coils whereby the relative positions of selected coils are not identical or symmetrical in each group or between groups except those within a predetermined limit, and an identifying means for identifying the loop coil on which the position indicator is located in response to a pattern of signal amplitudes obtained by said loop coil selection means.

5,466,897

STETHOSCOPE DIAPHRAGM DISPENSER AND METHOD

James B. Ross, Livermore; Gary L. Christiansen, Mountain View, and Ronald Chang, Redwood City, all of Calif., assignors to Modern Medical Devices, Fremont, Calif.

Filed Jun. 8, 1994, Ser. No. 255,481
Int. Cl.[6] A61B 7/02
U.S. Cl. 181—131 **6 Claims**



1. In combination,

a) a disposable stethoscope diaphragm for removable attachment to a stethoscope head;

b) a dispenser for use in dispensing disposable stethoscope diaphragms, where the diaphragms are supplied in a stacked array in a tube, said dispenser comprising

a base defining an opening for receiving such diaphragms therethrough,

means on said base for supporting such a tube in an upright position, and positioned with respect to said opening to allow a diaphragm in the tube immediately adjacent said opening to be received through said opening, when such a tube is supported on the base by said means,

a dispensing plate slidably mounted on said base for movement between retracted and extended positions, and

a cradle formed in said plate for receiving a single diaphragm through said opening, when the dispensing plate is in its retracted position,

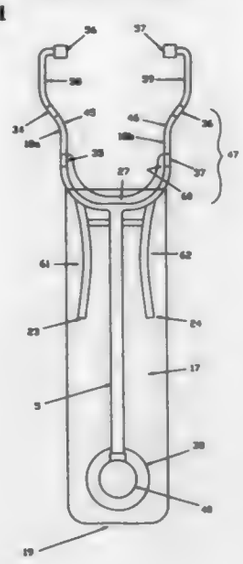
wherein movement of the dispensing plate from its retracted to extended position is effective to place a diaphragm in said recess in a position that allows the diaphragm to be attached to a stethoscope head by pressing the stethoscope head against the diaphragm.

5,466,898

STETHOSCOPE ISOLATION SYSTEM

Edwin E. Gilbert, 1512 Severn Ave., Metairie, La. 70001, and Timothy J. Foret, 557 Hospital Dr., Raceland, La. 70394

Filed Mar. 20, 1992, Ser. No. 855,613
Int. Cl.[6] A61B 7/02
U.S. Cl. 181—131 **7 Claims**



1. In association with the use of a medical stethoscope having a first, head end to be positioned during use in juxtaposition to a patient, a medial sound tube portion, a tube separation portion, and a second rear end comprising first and second ear tubes to be positioned during use in juxtaposition to each one of the user's ears, respectively, a method of preventing the passing of contamination between the patient and the user during the use of the medical stethoscope, comprising the following steps:

(a) providing a stethoscope isolation system to be used on the stethoscope during use of the stethoscope on the patient, including

a sleeve having a first, closed end and a second, open end forming a mouth, and wall portions forming a cavity of sufficient size to allow the first, head end of the stethoscope to be placed therein, said sleeve having a sufficient length and scope to envelope the first, head end and the medial sound tube portion of the stethoscope, up to at least about the tube separation portion of the stethoscope, said sleeve being comprised of acoustically transparent, biologically impermeable material, and attachment means associated with said sleeve to at least temporarily attach the sleeve to the stethoscope while the stethoscope is in use on the patient;

(b) placing the first, head end of the stethoscope in said second, open end of said sleeve;

(c) moving the first, head end of the stethoscope into and through said cavity until the first, head end of the stethoscope is in juxtaposition to said first, closed end of said sleeve and at least the medial sound tube portion is substantially within said sleeve and is covered over by said sleeve up to at least about said tube separation portion; and

(d) using said sleeve on the stethoscope to isolate, both directly and in reverse, the patient and the user from passing any contamination between them through mutual contact with the stethoscope while the stethoscope is in use on the patient.

5,466,899

ARRANGEMENT FOR ACTIVE SOUND DAMPING

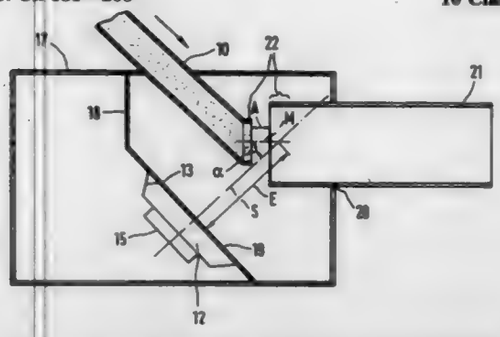
Stefan Geisenberger, Straubing, Germany, assignor to Nokia Technology, Pforzheim, Germany

Filed Dec. 2, 1994, Ser. No. 348,739

Claims priority, application Germany, Dec. 10, 1993, 43 42 133.4

Int. Cl.[6] F01N *1/06*

U.S. Cl. 181—206 10 Claims



1. An active sound damping system for gas exhaust installations, with at least one loudspeaker (**12**) placed into the dividing wall (**18**) of a loudspeaker box (**17**) that operates in accordance with the double chamber principle, where one of the volumes formed by the dividing wall (**18**) is equipped with a sound outlet opening (**20**) into which a tube (**21**) is placed, and with a gas exhaust tube (**10**) ending in the volume formed by the dividing wall (**18**), which is equipped with the sound outlet opening (**20**), where the facing ends of both tubes (**10, 21**), which share the same center line M at least in their outlet area (**22**), are separated from each other by space A, characterized in that the dividing wall (**18**) is arranged so that the radiation axis S of a loudspeaker (**12**) inserted into the dividing wall (**18**) intersects the part of the center line M that runs outside of the outlet area (**22**) of the gas exhaust tube (**10**), and that the distance E between the area of the dividing wall (**18**), in which the loudspeaker (**12**) is located, and the intersection point on the center line M of the radiation axis S of loudspeaker (**12**), is a maximum of 75% of the largest extension of the loudspeaker diameter.

5,466,900

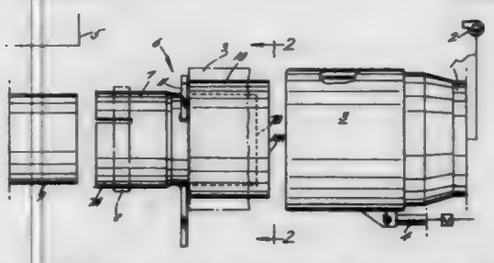
TAIL PIPE ADAPTER

William Knapp, 23950 S. Central Point Rd., Canby, Oreg. 97013

Filed Mar. 4, 1994, Ser. No. 205,650

Int. Cl.[6] F01N *7/08*

U.S. Cl. 181—227 6 Claims



1. An adapter for attachment to the end of an automotive engine tail pipe to facilitate the attachment of an exhaust conduit to said end, said adapter including:

a tail pipe extension for attachment to the tail pipe, a sleeve,

means mounting said sleeve about said extension in radially spaced relationship with the extension, and

limit stop means on said extension and projecting in a radial manner outwardly beyond the exterior of said sleeve to limit the travel of the conduit applied in an axial direction to the sleeve.

5,466,901

KEYSWITCH ASSEMBLY HAVING MECHANISM FOR CONTROLLING TOUCH OF KEYS

Isao Mochizuki, Gifu, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

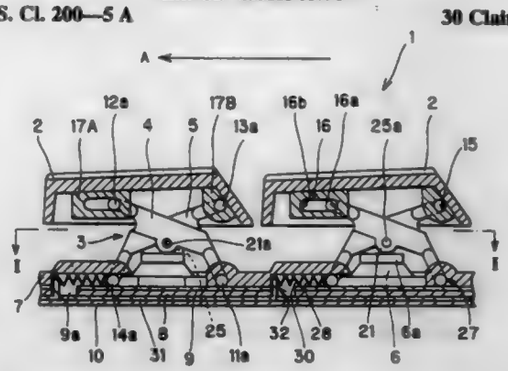
Continuation of Ser. No. 70,252, Jun. 2, 1993, Pat. No. 5,382,762. This application Oct. 5, 1994, Ser. No. 318,104

Claims priority, application Japan, Jun. 9, 1992, 4-46375; May 14, 1993, 5-25135

The portion of the term of this patent subsequent to Jan. 17, 2012, has been disclaimed.

Int. Cl.[6] H01H *13/70*

U.S. Cl. 200—5 A 30 Claims



1. A keyswitch assembly comprising:

a key having a lower surface and movable between an upper position and a lower position;

a holder member positioned below the key;

a key support assembly provided between the key and the holder member for guiding vertical movement of the key, the key support assembly comprising a first link and a second link intersecting with the first link and pivotally connected thereto at their intersecting portion;

a switching portion disposed below the key for switching action actuated upon depression of the key, the key support assembly bearing on the switching portion when the key is moved to the lower position; and

an urging member for urging one of the first and second links in a horizontal direction to move the key to the upper position.

5,466,902

SWITCH OPERATOR AND INTERLOCK MECHANISM

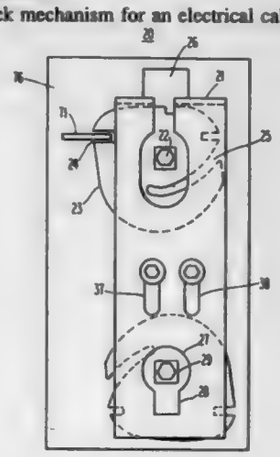
Leo E. Blom, Sanford, and Eldridge R. Byron, Lake Mary, both of Fla., assignors to ABB Power T&D Company Inc., Blue Bell, Pa.

Filed Nov. 23, 1993, Ser. No. 157,385

Int. Cl.[6] H01H *9/20;33/46*

U.S. Cl. 200—50 AA 3 Claims

1. An interlock mechanism for an electrical cabinet having first



and second switches and a door, said door having a hasp, said interlock mechanism comprising:

switch interlock means for preventing the actuation of said second switch as a function of said first switch; and

prevention means for preventing the opening of said door as a function of the position of said first switch, said prevention means comprising a cam having a hook for engaging the hasp of said door, the hook being adapted to engage the hasp of said door when said first switch is in a first position, but to disengage the hasp when said first switch is in a second position,

said cam having a slot, and said interlock mechanism further comprising: a plunger having a spring and a first extension for engaging the slot of said cam as a function of the position of said first switch, and a second extension for engaging said door as a function of the position of the door.

5,466,903

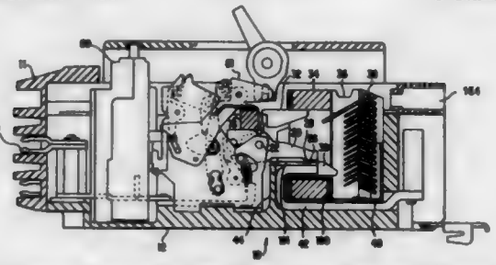
CURRENT LIMITING CIRCUIT BREAKER

Timothy R. Faber, Marion, and Tak M. Wong, Cedar Rapids, both of Iowa, assignors to Square D Company, Palatine, Ill.

Division of Ser. No. 155,411, Nov. 19, 1993, Pat. No. 5,418,343, which is a continuation of Ser. No. 781,055, Oct. 18, 1991, Pat. No. 5,278,373. This application Mar. 10, 1995, Ser. No. 401,834

Int. Cl.[6] H01H *5/00*

U.S. Cl. 200—400 **6 Claims**



1. A circuit breaker having a stationary contact, a movable contact, a blade having said movable contact attached at one end, said blade being movable between an open position and a closed position, wherein said movable contact engages said stationary contact when said blade is in the closed position, an operating mechanism for moving said blade between the open position and the closed position, thereby opening and closing said contacts, a main latch for holding the operating mechanism in the closed position, and a trip system for sensing current flowing through the contacts and initiating separation of the contacts by said operating mechanism when the current exceeds a predetermined amount, said trip system comprising:

a housing;

a current path within said housing;

a magnetic adjust cross bar rotationally secured in said housing for adjusting the level of the predetermined amount of current at which said trip system initiates separation of the contacts;

a trip cross bar rotationally secured in said housing;

a magnetic circuit comprising a metallic yoke which surrounds said current path and an armature plate physically coupled to said magnetic adjust cross bar and magnetically coupled to said yoke whereby when current flows through said current path a magnetic flux is generated that flows through said yoke and said armature plate generating a magnetic force which pulls said armature plate towards said yoke, as the current flowing through the current path increases and exceeds the predetermined amount the magnetic force increases causing said armature plate to move closer to said yoke and pulling an armature hook, which is attached to said armature plate, into engagement with said trip cross bar thereby causing said cross bar to rotate and thereby actuate said operating mechanism to initiate the separation of the contacts; and

adjustment means for linearly adjusting the amount of predetermined current at which said trip system initiates separation of the contacts.

5,466,904

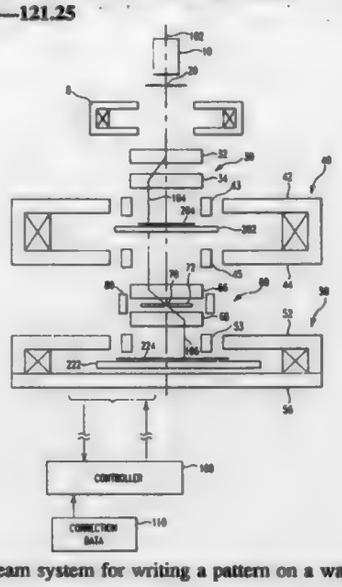
ELECTRON BEAM LITHOGRAPHY SYSTEM

Hans C. Pfeiffer, and Werner Stickel, both of Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1993, Ser. No. 173,305

Int. Cl.[6] B23K *15/08;* **H01J** *37/147;37/305*

U.S. Cl. 219—121.25 **23 Claims**



1. An E-beam system for writing a pattern on a wafer comprising:

an electron source and means for accelerating an electron beam (**10**) along a system axis (**102**) and through an illuminating aperture (**20**);

first magnetic focus means, having a first focal length, (**8**) disposed along said system axis, having a first magnetic symmetry axis, and intercepting said electron beam for operating on said electron beam emerging from said illuminating aperture;

first and second deflection means (**32, 34**) disposed along said system axis between said first magnetic focus means and said reticle for displacing said electron beam so that said electron beam travels along a reticle axis (**104**) parallel to said system axis and intersecting an nth reticle subfield;

a first section of a second magnetic focus means (**40**), having a second focal length, and disposed along said system axis between said first magnetic focus means and a reticle, having a second magnetic symmetry axis, and intercepting said electron beam, said first magnetic focus means and said first section of said second focus means cooperating to focus said displaced electron beam to form an image of said illuminating aperture on a reticle (**204**), said image of said illuminating aperture covering said nth reticle subfield of a plurality of N noncontiguous reticle subfields of said reticle that are separated from one another by a subfield separation distance, said nth subfield intercepting said reticle axis and containing at least 10^4 pixels, whereby all of said pixels of said nth subfield are exposed to said beam simultaneously, a second section of said second magnetic focus means disposed along said system axis between said reticle and said wafer for operating on said electron beam from said subfield;

third deflection means (**66**) disposed along said system axis and intercepting said electron beam from said third focus means travelling along said reticle axis for deflecting said electron beam back toward said system axis and through a pivot point on said system axis;

fourth deflection means (**68**) disposed along said system axis and intercepting said electron beam for deflecting said electron beam from said third deflection means to a wafer axis (**106**) parallel to said system axis and on the opposite side of said system axis from said reticle axis;

third magnetic focus means (**52**) disposed along said system axis, having a third magnetic symmetry axis and intercepting said electron beam from said fourth deflection means, said third magnetic focus means cooperating with said second section of said second magnetic focus means to focus an image of said reticle subfield carried by said electron beam on a corresponding nth wafer subfield of a plurality of N contiguous wafer subfields on a wafer (**224**), each of said second and third magnetic focus means including magnetic axis-shifting means (**43, 45, 53**) for controllably translating magnetic fields of said magnetic focus means such that said magnetic fields are substantially parallel to and azimuthally symmetric about said reticle axis and said wafer axis, respectively, whereby said second magnetic symmetry axis is coincident with said reticle axis and said third magnetic symmetry axis is coincident with said wafer axis; and

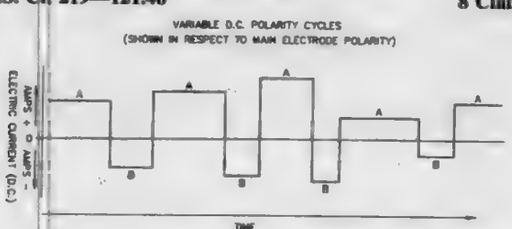
a controller connected to said source, said second magnetic focus means, and said third magnetic focus means for controlling the electron beam duration, said first, second, third, and fourth beam deflection means and said magnetic fields of said second and third magnetic focus means and said magnetic axis-shifting means.

5,466,905

LOW ELECTRIC D.C., LOW TIME RATE POLARITY REVERSING ARC WELDING METHOD

Gilbert E. Flowers; Joel H. Cohen, both of Cincinnati; Earl L. Kelly, Jr., West Chester; Levi Williams, Milford, all of Ohio, and Gray W. Grubbs, Burlington, Ky., assignors to General Electric Company, Cincinnati, Ohio

Filed Apr. 5, 1994, Ser. No. 223,199
Int. Cl.[6] B23K *10/00*
U.S. Cl. 219—121.46 **8 Claims**



1. In a method in which a direct current electric arc is provided between an electrode and an electrically conductive workpiece surface, the steps of:

providing the electrode with a first electric polarity and the workpiece surface with a second electric polarity opposite the first electric polarity in a low electric current range of about 0.5–45 amps;

reversing the electric polarities between the electrode and the workpiece surface, in said electric current range;

again reversing the electric polarities between the electrode and the workpiece surface in said electric current range to provide the electrode with said first electric polarity and the workpiece surface with said second electric polarity opposite said first electric polarity to define a polarity cycle; and,

repeating the reversing of polarities in a pattern preselected based on workpiece material and geometry at a low reversing time frequency in the range of about. 1–1000 cycles per second to establish a series of polarity cycles in at least some of which the workpiece surface is positive for a first period of time which is less than a second period of time during which the polarity of the wokpiece surface is negative,

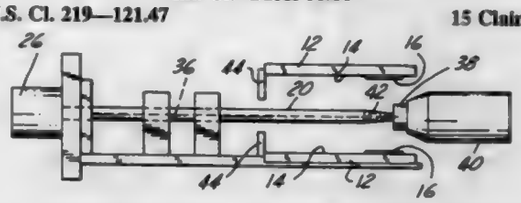
whereby a low heat input to the workpiece surface is maintained, and anodic cleaning of the workpiece surface occurs when the polarity of the workpiece surface is positive.

5,466,906

PROCESS FOR COATING AUTOMOTIVE ENGINE CYLINDERS

Robert C. McCune, Jr., Southfield, Mich.; Michael R. Kim, Marlton, N.J., and Ronald W. Smith, Blue Bell, Pa., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 8, 1994, Ser. No. 225,277
Int. Cl.[6] B23K *10/00*
U.S. Cl. 219—121.47 **15 Claims**



1. A method for applying a wear-resistant coating to the inner wall of a cylinder, the method comprising the steps of:

positioning a transferred arc torch within said cylinder;

introducing an argon oxygen gas mixture at the rate of approximately 28 liters per minute argon gas and 14 liters per minute oxygen gas for production of a plasma gas;

striking a plasma arc between said torch and a consumable feedstock rod, such that the arc end of said rod melts;

rotating said rod to eject molten droplets from said arc end of said rod to said cylinder inner diameter; and

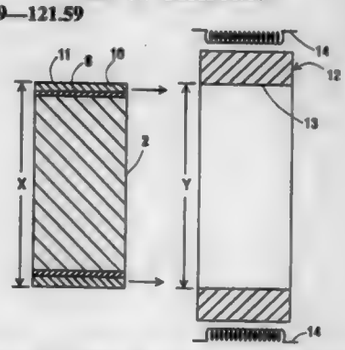
translating said rod and said torch generally along the central axis of said cylinder such that said droplets impact the wall of said cylinder in a molten state to form an evenly distributed coating on said cylinder.

5,466,907

PROCESS FOR COATING THE INTERNAL SURFACES OF HOLLOW BODIES

Jacques M. Vuitton, Saint Jean de Gonville, France, assignor to Praxair S.T. Technology, Inc., Danbury, Conn.

Filed Sep. 16, 1993, Ser. No. 121,484
Int. Cl.[6] B23K *10/00*
U.S. Cl. 219—121.59 **16 Claims**



1. A process for coating the internal surface of a hollow body comprising the steps:

(a) preparing a hollow body for receiving on at least a portion of its internal surface a coating;

(b) preparing a substrate having at least a portion of its external surface shaped to correspond to the internal surface of the hollow body to be coated;

(c) depositing on at least a portion of the external surface of the substrate at least one layer of a coating to a desired thickness and composition;

(d) inserting the coated substrate into the hollow body so that the coated surface of the substrate contacts the internal surface of the hollow body; and

(e) removing the substrate from the hollow body by means selected from the group consisting of mechanical means, thermal means and chemical means while leaving the at least one layer of coating in contact with the internal surface of the hollow body thereby providing said hollow body with an internal coating.

5,466,908

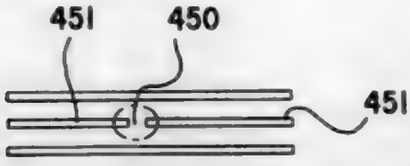
METHOD AND APPARATUS FOR CUTTING PATTERNS OF PRINTED WIRING BOARDS AND METHOD AND APPARATUS FOR CLEANING PRINTED WIRING BOARDS

Kimio Hosoya; Yoshihiro Teruya, and Yasushi Kobayashi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 18,269, Feb. 16, 1993, Pat. No. 5,319,183. This application Feb. 23, 1994, Ser. No. 200,654

Claims priority, application Japan, Feb. 18, 1992, 4-031044; Mar. 18, 1992, 4-060784; Jun. 8, 1992, 4-147686; Aug. 21, 1992, 4-222873

Int. Cl.[6] B23K *26/00*

U.S. Cl. 217—121.68 **9 Claims**

1. A printed wiring board cleaning method for a cleaning apparatus which includes actuating means for holding and moving a printed wiring board, and laser beam irradiation means for irradiating a laser beam onto the printed wiring board held by the actuating means, comprising the steps of:

operating the actuating means such that a portion of the printed wiring board to be cleaned with the laser beam faces the laser beam irradiation means and is moved transversely relative to said laser beam;

emitting the laser beam from the laser beam irradiation means and shaping the laser beam emitted from each of the laser beam irradiation means into strips such that the portion of the printed wiring board to be cleaned is irradiated with laser beam strips obliquely from two directions relative to the transversely moving portion to be cleaned, to thereby dry-clean said portion of said printed wiring board to be cleaned.

5,466,909

LASER ROBOT WITH APPROACH TIME FROM ORIGIN TO A STARTING POSITION MINIMIZED

Ryo Nihei; Akihiro Terada, both of Fujiyoshida, and Yasuo Sasaki, Minamitsuru, all of, Japan, assignors to Fanuc Ltd, Yamanashi, Japan

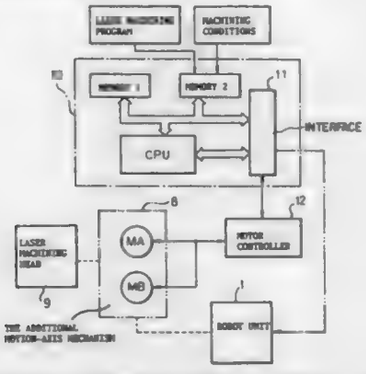
PCT No. PCT/JP93/01798, § 371 Date Aug. 10, 1994, § 102(e) Date Aug. 10, 1994, PCT Pub. No. WO94/13425, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 10, 1993, Ser. No. 284,431

Claims priority, application Japan, Dec. 14, 1992, 4-333036

Int. Cl.[6] B23K *26/00*

U.S. Cl. 219—121.72 **5 Claims**



1. A laser-beam machining method in which a laser beam projecting nozzle of a laser robot is fed by two feed motors for a straight approach travel along a straight approach path from a position corresponding to a predetermined position of origin on a workpiece to a position corresponding to a starting position of a desired machining locus, and subsequently the laser beam projecting nozzle is fed from the starting position along the desired machining locus, comprising:

presetting a distance R of the straight approach travel, a quick-feed speed V0, a machining speed V1, respective time constants indicating respective times necessary for the feed speed to increase from zero to the set quick-feed speed, and necessary for the machining speed to increase from zero to the set machining speed as machining conditions;

calculating, on the basis of the machining conditions, a first approach time necessary for machining the workpiece by a laser beam from the position of origin selected as a piercing position where the laser beam projected from the laser beam projecting nozzle pierces the workpiece to the starting position set on the desired machining locus at a predetermined machining speed along a straight approach path;

calculating, on the basis of the machining conditions, a second approach time necessary for selecting a predetermined piercing position near the starting position set on the straight approach path, quick-feeding the laser beam projecting nozzle from a position corresponding to said position of origin to a position corresponding to said predetermined piercing position at a quick-feed speed faster than said predetermined machining speed, and carrying out laser-beam machining after piercing the workpiece from a predetermined point on said straight approach path to said starting position at said machining speed by feeding the laser beam projecting nozzle along a straight path;

comparing said first and second approach times; and

quick-feeding the laser beam projecting nozzle from the position corresponding to said position of origin to the position corresponding to said predetermined piercing position only when said second approach time is shorter than said first approach time.

5,466,910

METHOD OF TESTING WELD SEAMS USING AN EDDY-CURRENT TECHNIQUE

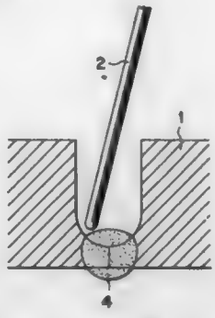
Wilhelm Ebeling, Rohr; Guy Faber, Oberrohrdorf; Gottfried Kuhnen, Oberrohrdrof, and Arthur Scholz, Wettingen, all of, Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Nov. 10, 1994, Ser. No. 338,763

Claims priority, application Germany, Nov. 22, 1993, 43 39 720.4

Int. Cl.[6] B23K *9/095*

U.S. Cl. 219—130.01 **3 Claims**



1. A method of testing large volume, coarse-grain size weld seams during a welding operation, comprising the steps of:

(a) applying a layer on a weld seam in a workpiece;

(b) scanning a surface of the layer as it is formed with an eddy-current probe coil, wherein the workpiece is at a temperature of up to 350° C.;

(c) determining a location of defects in the first layer from an output signal of the probe;

(d) applying an additional layer to the weld seam; and

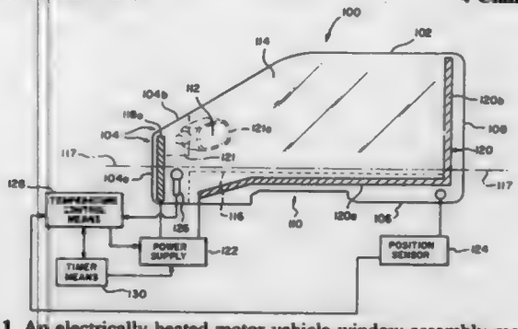
(e) repeating steps (b), (c) and (d) until the weld is completed.

5,466,911

WINDOW ASSSEMBLY AND METHOD FOR ELECTRICALLY HEATING VEHICLE SIDE LITE

Robert A. Spagnoli, Fort Gratiot, and Philip D. Janson, Lincoln Park, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 6, 1993, Ser. No. 86,258
Int. Cl.[6] H05B *3/26*
U.S. Cl. 219—203 **4 Claims**



1. An electrically heated motor vehicle window assembly movably mounted in a front door of a motor vehicle, said window assembly comprising:

a window having a front edge, a bottom edge and a rear edge;

a first bus bar having an arcuately-shaped member positioned adjacent said front edge of said window, said first bus bar being adapted to connect to a power supply;

a second bus bar having a first section positioned along said bottom edge of said window and a section positioned along said rear edge of said window so as to be beneath the nominal door line of the front door, said first and second sections being electrically interconnected, said second bus bar being adapted to connect to said power supply; and

an electrically conductive transparent film on said window which electrically interconnects said first bus bar and said window is heated when said first bus bar and said second bus bar are connected to said power supply, said conductive coating having a nonconductive break therein for electrically isolating said first section of said second bus bar from said first bus bar;

wherein the front door has a rear mirror mount assembly having an exterior rear view mirror mounted thereon, the rear mirror mount assembly enclosing a portion of said front edge of said window when said window is closed, and

said first bus bar is positioned along said front edge of said window such that said first bus bar is enclosed by the rear mirror mount assembly.

5,466,912

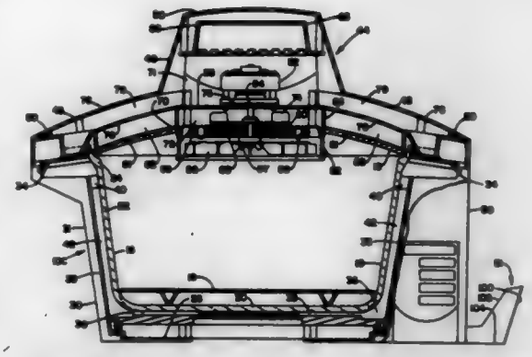
CONVECTION OVEN

David A. Dornbush, Prior Lake; Chad S. Erickson, Plymouth; Troy M. Iverson, Chaska; Jeffrey E. Sandahl, Burnsville; Kevin B. Moore, Chaska; Neal P. Barnes, Maple Grove; James B. Easley; Richard C. Jackson, both of Minneapolis, and Andrew L. Von Duyke, Greenwood, all of Minn., assignors to American Harvest, Inc., Chaska, Minn.

Continuation-in-part of Ser. No. 50,918, Apr. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 42,839, Apr. 13, 1993, abandoned. This application Jul. 27, 1993, Ser. No. 337,692
Int. Cl.[6] F27D *7/04*
U.S. Cl. 219—400 **91 Claims**

1. A convection oven for cooking food, comprising:

a cooking chamber for holding the food to be cooked, the cooking chamber comprising an upper enclosure member and



a lower enclosure member, the upper enclosure member having an upper surface and an outer edge;

a housing attached to the upper enclosure member, the housing comprising a central portion and at least one arm extending outwardly from the central portion to beyond the outer edge of the upper enclosure member;

heating means attached to the housing for heating air within the cooking chamber; and

air-moving means attached to the housing for moving air within the cooking chamber;

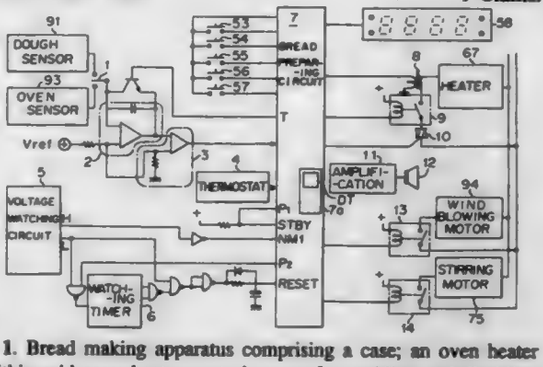
wherein the housing is configured so that cool air flows from a peripheral portion of the arm into the central portion of the housing, then flows from the central portion of the housing back into the arm, and then is expelled from the arm over the upper surface of the upper enclosure member.

5,466,913

BREAD MAKING APPARATUS AND ITS TEMPERATURE CONTROL METHOD

Toshinobu Tanimoto; Yoshikatsu Okamoto; Shinji Yoshida, and Yasumasa Hironaka, all of Daito, Japan, assignors to Funai Electric Co., Ltd., Daito, Japan

Filed Nov. 13, 1992, Ser. No. 975,865
Claims priority, application Japan, Nov. 15, 1991, 3-300044; Jul. 10, 1992, 4-207222; Aug. 12, 1992, 4-237678
Int. Cl.[6] H05B *1/02*
U.S. Cl. 219—492 **9 Claims**



1. Bread making apparatus comprising a case; an oven heater within said case; heater control means for enabling and disabling said heater in accordance with a stored preset baking time setting; on-off cycle detecting means for detecting when said heater is enabled and disabled by the passing of current through said heater; and master control means for sequentially performing kneading, fermenting and baking of bread materials placed within said case, said master control means automatically controlling baking as a function of the on/off cycle information detected by said detecting means and said preset baking time to change said preset baking time as a function of the on/off cycle and terminating current flow to said heater when the baking time exceeds said stored preset baking time.

5,466,914

RECORDING-REPRODUCING APPARATUS WITH A MECHANISM FOR PREVENTING SUCCESSIVE INSERTION OF TWO CARDS

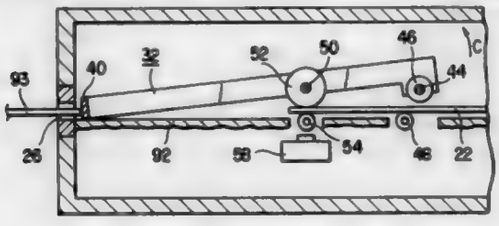
Toshihiro Kitahara, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1993, Ser. No. 52,164

Claims priority, application Japan, Apr. 24, 1992, 4-132017

Int. Cl.[6] G06K *13/06*

U.S. Cl. 235—483 6 Claims



1. A recording-reproducing apparatus for transferring an information recording card along a card passageway having a proximal end and a distal end, and for recording and/or reproducing information on and/or from said information recording card, the apparatus comprising:

a housing having a card insertion slot defining said proximal end of said card passageway;

transferring means for transferring said information recording card along said card passageway;

a head movable across said card passageway, for recording and/or reproducing information on and/or from said information recording card;

a lever having a first end facing said card insertion slot and a second end facing said distal end of said card passageway, said lever being rotatable in a vertical direction between respective positions having a first angle and a second angle with respect to said card passageway and said lever being vertically rotatable around a substantially horizontal axis extending substantially perpendicularly to said card passageway, and said axis being disposed between said first and second ends of said lever;

means for urging said lever to said first angle position at which said first end of said lever does not block said card insertion slot;

said transferring means including a motor which is operative responsive to the presence of said card in said card passageway for reciprocally transferring said card along said passageway said lever remaining in said second angle position during said reciprocal transferring;

a contact member provided on said second end of said lever, said contact member being arranged to abut against said information recording card which is being transferred along said card passageway, for vertically rotating said lever from said first angle position to said second angle position, against an urging force of said urging means, when said contact member is contacted by and moved by said card which is being transferred along said card passageway; and

a stop member provided on said first end of said lever, said stop member being disposed on said first end of said lever so as to block said card passageway when said lever is vertically rotated to be at said second angle position, for thereby preventing insertion of a further information recording card into said insertion slot, thus preventing two information recording cards from being inserted in succession into said housing from said card insertion slot.

5,466,915

TRAY TRANSPORT CART HAVING ELECTROMAGNETIC INDUCTION HEATERS FOR HEATING MEALS TO BE PLACED ON THE TRAYS

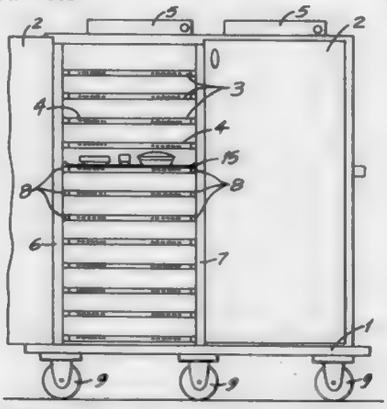
Herman Meier, Littau, and Martin Witzig, Horgen, both of, Switzerland, assignors to Berndorf Luzern A.G., Littau, Switzerland

Filed Oct. 7, 1993, Ser. No. 133,710

Claims priority, application Switzerland, Jan. 7, 1992, 3129/92

Int. Cl.[6] H05B *6/12*

U.S. Cl. 219—622 10 Claims



1. Tray transport cart accommodating a plurality of trays arranged in rows comprising:

a movable cart body;

an HF generator for connection to a power source;

a plurality of tray carriers for supporting said trays and being mounted in rows on said cart body said tray carriers having induction coils connected to said generator for generating a local alternating electromagnetic field at said tray carriers;

said trays being configured to support thereon dishes for containing meals, selectively above or next to said coils;

said dishes being at least partially provided with a first current-conducting layer and with an insulating cover, to an inner side of which a second current-conducting layer is applied;

said generator including circuit means for maintaining a total inductance of said coils of said plurality of tray carriers in a range between 32 μH and 76 μH regardless of the number of said plurality of tray carriers in actual use, a desired induction current being generated in said conducting layers that are in use.

5,466,916

METHOD AND APPARATUS FOR JOINT RESIN PIPES USING HIGH-FREQUENCY ELECTRIC INDUCTION HEATING

Atsushi Iguchi; Atsushi Akabane; Takehiro Yamashita, all of Kyoto, and Koichi Matsuoka, Nobeoka, all of, Japan, assignors to Hidec Co., Ltd., Kyoto, and Asahi Yukizai Kogyo Co. Ltd., Nobeoka, both of, Japan

Filed Jul. 25, 1994, Ser. No. 279,797

Claims priority, application Japan, Sep. 24, 1993, 5-237564; May 23, 1994, 6-108066

Int. Cl.[6] H05B *6/10*

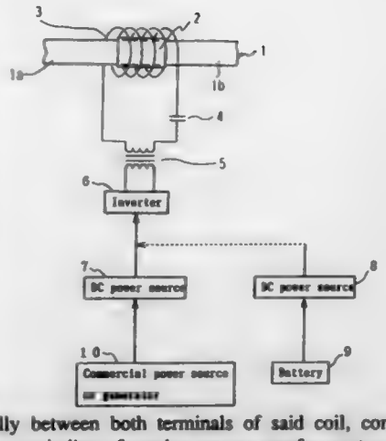
U.S. Cl. 219—633 20 Claims

1. A method of connecting resin pipes, comprising the steps of:

(a) contacting two resin pipes positioned end to end to be connected to form an area of contact,

(b) disposing a cylindrical metallic heater along the contact area between said resin pipes, wherein at least one material of said heater is selected from the group consisting of stainless steel, brass, and aluminum, and said heater has an axial length of from about ¼ to ⅔ of a nominal diameter of said resin pipes,

(c) surrounding said heater with a coil, connecting a resonance capacitor and a secondary winding of an output transformer



serially between both terminals of said coil, connecting a primary winding of another output transformer to an inverter which converts direct electric power from a power source into alternating electric power with a predetermined voltage and frequency, and connecting said inverter to said power source, wherein said heater is excited by high-frequency electric current heating said heater by induction heating and said joint between said resin pipes is welded together,

(d) exciting said heater by high-frequency electric current, heating said heater by induction heating, wherein said contact between said resin pipes is welded together, and simultaneously said cylindrical metallic heater is fixed to the outer surface of said resin pipes.

5,466,917

MICROWAVE-ABSORPTIVE HEAT-GENERATING BODY AND METHOD FOR FORMING A HEAT-GENERATING LAYER IN A MICROWAVE-ABSORPTIVE HEAT-GENERATING BODY

Masaharu Matsuki; Toshiaki Yoshihara, and Sumihiko Kurita, all of Saga, Japan, assignors to Kabushiki Kaisha Kouransha, Saga, Japan

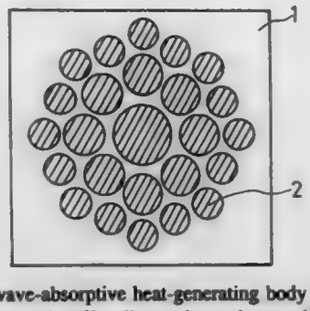
PCT No. PCT/JP92/00723, § 371 Date Feb. 25, 1993, § 102(e) Date Feb. 25, 1993, PCT Pub. No. WO92/22179, PCT Pub. Date Dec. 10, 1992

PCT Filed Jun. 4, 1992, Ser. No. 965,286

Claims priority, application Japan, Jun. 5, 1991, 051045 U; Jan. 21, 1992, 4-006677 U

Int. Cl.[6] H05B *6/80*

U.S. Cl. 219—730 **18 Claims**



1. A microwave-absorptive heat-generating body comprising

a conductive coating film disposed on a heat resistant sheet-like base material, wherein said conductive coating film comprising:

a crystalline carbon as its principal component,

a filler selected from the groups consisting of at least one of silica and alumina, and

a hardened reaction product of an inorganic bonding agent comprising a phosphate bonding agent, with a hardening agent comprising Fe_3O_4.

5,466,918

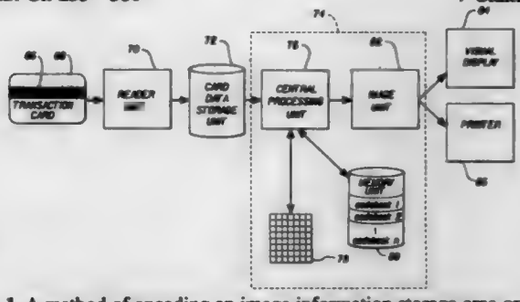
METHOD AND APPARATUS FOR IMAGE COMPRESSION, STORAGE, AND RETRIEVAL ON MAGNETIC TRANSACTION CARDS

Lawrence A. Ray; Richard N. Ellson, and Bhavan R. Gandhi, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1993, Ser. No. 145,051

Int. Cl.[6] G06K *19/12*

U.S. Cl. 235—380 **7 Claims**



1. A method of encoding an image information storage area on a transaction card, the method comprising the steps of:

representing said image by a multiplicity of pixels;

dividing said pixels into pixel groups, wherein said pixel groups are ordered according to a location in said image;

comparing each of said pixel groups with a plurality of reference pixel groups wherein each reference pixel group represents a location, each of said reference pixel groups having a bit group associated therewith;

based on said comparing step, selecting a bit group; and

storing each said bit group in a position on said storage area determined by an image location of said associated pixel group.

7. An apparatus for reading a stored compressed image from a storage medium, said apparatus comprising:

a reading unit for reading a multiplicity of identifying signal groups from said storage medium;

a storage unit having stored therein a plurality of groups of sets of reference pixel elements corresponding to a portion of like original images with the plurality of groups corresponding in number to the number of portions forming the like original images;

a retrieval unit for retrieving from said storage unit reference pixel element sets associated with each of said retrieved identifying signal groups; and

an original image replicator for assembling each of the retrieved reference pixel elements in a predetermined image location to form a replicated original image from the assembled reference pixel elements.

5,466,919

CREDIT/CHARGE CARD SYSTEM ENABLING PURCHASERS TO CONTRIBUTE TO SELECTED CHARITIES

Henry Hovakimian, 9635 La Cima Dr., Whittier, Calif. 90603

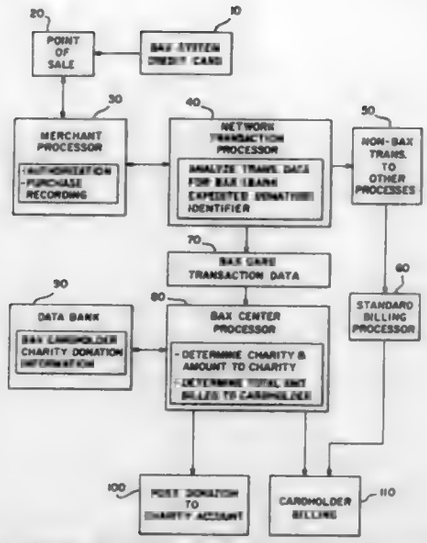
Continuation-in-part of Ser. No. 19,412, Apr. 2, 1993, abandoned. This application Feb. 28, 1994, Ser. No. 202,735

Int. Cl.[6] G06K *5/00*

U.S. Cl. 235—380 **4 Claims**

1. A method of billing for use of a credit card-issuing organization, which enables an authorized cardholder to make a contribution to a charity of his choice when making a purchase using a credit card, the method comprising the steps of:

(a) assigning to said authorized cardholder, a charity code of alphanumeric combination which identifies said authorized cardholder as having previously selected a charity or charities for donations, providing said credit card-issuing organization with cardholder files which list said charity or charities under



said charity code; said charity code being magnetically encoded in track data on a magnetic stripe affixed to one side of said credit card;

(b) storing charity information obtained from said cardholder files, including said charity code, in a database so that the charities listed in said cardholder files can be accessed and identified;

(c) purchasing goods or services for said cardholder using said credit card;

(d) scanning said credit card at a point-of-sale terminal for credit card authorization data and entering purchase transaction data in a merchant processor;

(e) communicating said card authorization and purchase transaction data to a card-issuing organization network transaction processor;

(f) analyzing said card authorization and purchase transaction data by said network transaction processor for presence of said charity code, and transmitting transaction data including a charity code to a special processor dedicated to transactions involving donations;

(g) interrogating said data base and using said charity code to identify a charity account of said cardholder to be credited, an amount to be contributed to said selected charity or charities, and total amounts to be billed to said cardholder;

(h) posting a contribution amount to said selected charity account or accounts; and

(i) billing said cardholder for the amount authorized at the time of the purchase transaction plus any amounts for donations made specifically by said cardholder.

5,466,920

REAL TIME DECODING FOR CARD TRANSACTION TERMINAL

Parameswaran B. Nair, Acworth; Kumar S. Choudhuri, Kennesaw; James T. Stills, and John C. Evans, both of Atlanta, all of Ga., assignors to MicroBilt Corporation, Atlanta, Ga.

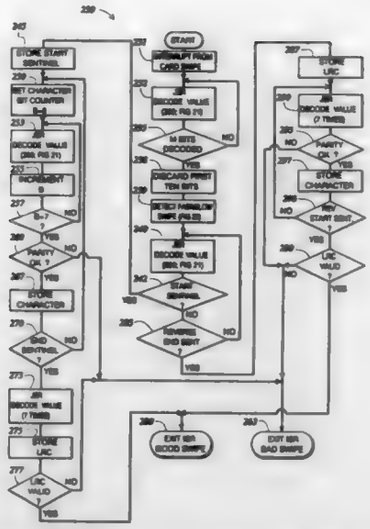
Filed Nov. 8, 1991, Ser. No. 790,658

Int. Cl.[6] **G06K** *7/08;* **H03M** *7/12*

U.S. Cl. 235—449 **79 Claims**

25. A method for reading data characters encoded on a magnetic stripe on a card and forming decoded data characters in real time in response to a swipe of said card through a card stripe read station in a transaction terminal, said transaction terminal including a programmed microcomputer, a memory, and read station electronic circuitry for generating a self clocking signal corresponding to said encoded data characters during the swipe of the card through the swipe station, comprising the steps of:

(1) decoding said self clocking signal to provide data bits corresponding to said encoded data characters;



(2) detecting a first sentinel character in said data bits;

(3) storing in said memory a decoded data character including a predetermined number of said data bits provided subsequent to said first sentinel character, said decoded data character corresponding to one of said encoded data characters; and

(4) repeating step (3) until a second sentinel character is detected, thereby storing all decoded data characters located between said first sentinel character and said second sentinel character without interim storage of said self clocking signal.

5,466,921

SCANNER TO COMBINE PARTIAL FRAGMENTS OF A COMPLETE CODE

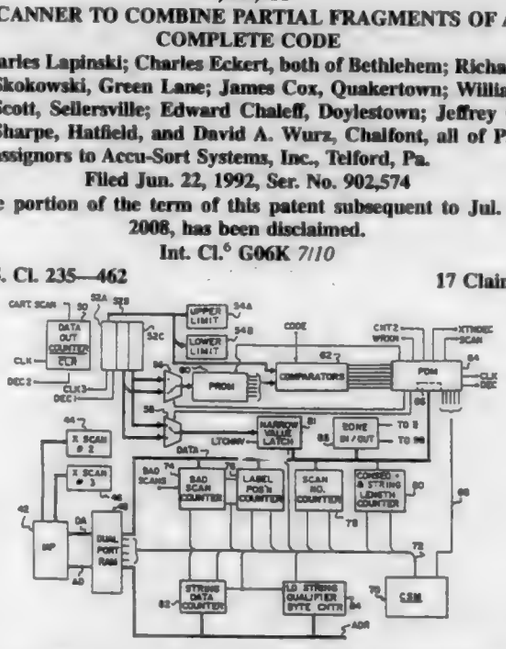
Charles Lapinski; Charles Eckert, both of Bethlehem; Richard Skokowski, Green Lane; James Cox, Quakertown; William Scott, Sellersville; Edward Chaleff, Doylestown; Jeffrey G. Sharpe, Hatfield, and David A. Wurz, Chalfont, all of Pa., assignors to Accu-Sort Systems, Inc., Telford, Pa.

Filed Jun. 22, 1992, Ser. No. 902,574

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.[6] **G06K** *7/10*

U.S. Cl. 235—462 **17 Claims**



1. A scanner for reading machine-readable code on an object, comprising:

scanning means for repetitively scanning said code and providing a scan signal including data fragments that are a portion of said code;

data means for receiving and storing the data fragments; and

reconstruction means coupled to said data means for reconstructing a portion of said code from at least two of the data fragments each having a common subinterval, shifting the fragments to a position where the common subintervals are

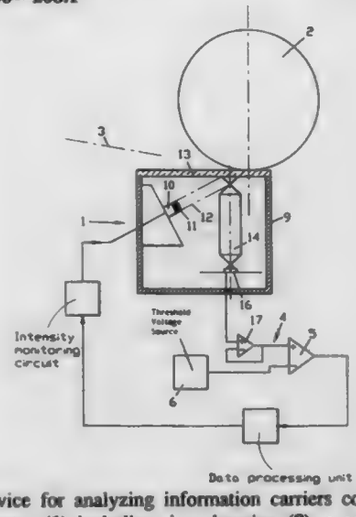
overlaid in registration and combining the registered fragments into a data string representing the reconstructed portion of the code.

5,466,922

DEVICE FOR ANALYZING INFORMATION CARRIERS PROVIDED WITH MEANS OF COMPENSATION OF ITS OUTPUT SIGNALS

Jean-Marie Gatto, and Dominique Bertrand, both of Paris, France, assignors to Internationale Des Jeux, France

Filed Jun. 13, 1994, Ser. No. 258,865
Claims priority, application France, Jun. 29, 1993, 93 07916
Int. Cl.[6] G01J *1/32*
U.S. Cl. 250—208.1 11 Claims



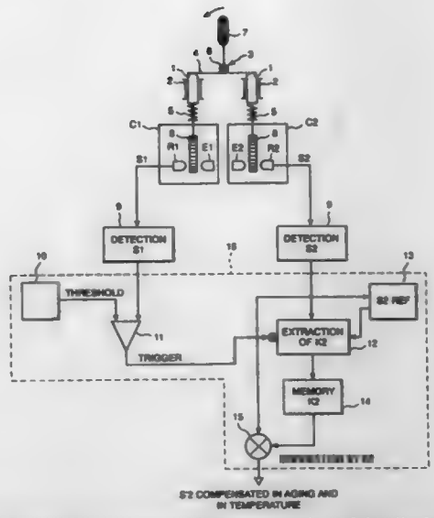
1. A device for analyzing information carriers comprising an image detector (1) including, in a housing (9), a series of light sources (10) each of which is associated a photosensitive element (16), the light sources (10) and the photosensitive elements (16) being arranged in two rows along the length of the image detector (1), the device furthermore comprising a threshold voltage source (6) and means (5) for comparing the output signals from each of the photosensitive elements (16) with the threshold voltage (Vs) of said threshold voltage source (6), characterized in that it moreover includes compensation means (20, 21, 22, 23, 24, 25) for adjusting each of the output signals to compensate for parameters including the responsiveness of each photosensitive element (16) and the intensity of the light signal emitted by the associated light source (10) in order to obtain a uniform response from all the light source (10)/photosensitive elements (16) pairs of the image detector (1).

5,466,923

METHOD AND CIRCUIT FOR COMPENSATING THE DRIFT OF THE OUTPUT SIGNAL OF A PHOTOELECTRIC SENSOR IN AN ELECTRICAL REMOTE CONTROL APPARATUS, AND REMOTE CONTROL APPARATUS REALIZING THIS METHOD AND THIS ARRANGEMENT

Didier Merletti, Mormant, France, assignor to Rexroth Sigma, Venissieux, France

Filed Jan. 28, 1994, Ser. No. 188,321
Claims priority, application France, Jan. 28, 1993, 93 00879
Int. Cl.[6] H01J *40/14*
U.S. Cl. 250—214 PR 47 Claims



1. A method for compensating an output signal of a photoelectric sensor having a drift due to aging and a drift in temperature, in an electrical proportional remote control apparatus of the manipulation or analog type comprising an actuation member or actuation part for progressive displacement functionally associated with at least one photoelectric sensor adapted to generate an electrical signal of which one parameter is representative of the displacement and/or the position of said actuation member, the method comprising the steps of:

(A) detecting a neutral position of the actuation member wherein said photoelectric sensor is not functionally activated by said actuation member

(B) detecting, as a neutral value, the value of a signal that has a unique relation to said output signal of said photoelectric sensor while said sensor is in said neutral position

(C) comparing said detected neutral value to an earlier detected neutral value stored in a memory,

(D) determining an updated correction factor for said sensor, and

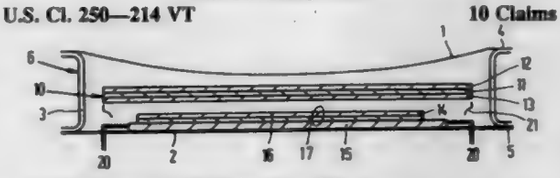
(E) when the sensor is again functionally activated by a displacement of the actuation member, correcting with said updated correction factor the signal of said sensor that has a unique relation to the output signal of said sensor in order to obtain an output signal that is compensated as a function of aging and of the temperature.

5,466,924

IMAGE INTENSIFIER TUBE WITH ENTRANCE SCREEN PHOTOCATHODE WHICH IS INSENSITIVE TO LIGHT EMITTED BY THE EXIT SCREEN PHOSPHOR LAYER

Gerardus Van Aller, Waalre, Netherlands, assignor to U.S. Philips Corporation, Tarrytown, N.Y.

Filed Jul. 13, 1994, Ser. No. 275,047
Claims priority, application Germany, Jul. 13, 1993, 09 30 072.1
Int. Cl.[6] H01J *40/14*
U.S. Cl. 250—214 VT 10 Claims



1. An image intensifier tube comprising:

an entrance screen having a photocathode which emits photoelectrons in response to radiation incident thereon having a wavelength within a predetermined wavelength range; and

an exit screen having a phosphor layer which emits radiation in response to photoelectrons from the photocathode, and further having an image detection matrix for deriving an electronic signal in response to the radiation from the phosphor layer;

the phosphor layer being composed of a phosphor material such that the radiation emitted thereby is principally outside said predetermined wavelength range;

whereby feedback of the radiation from the phosphor layer to the photocathode does not cause increased emission of photoelectrons by the photocathode.

5,466,925

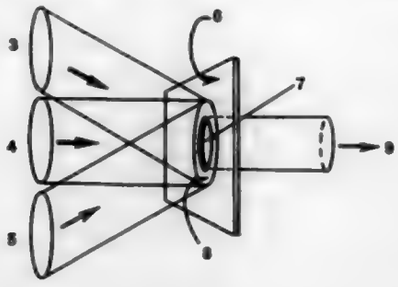
AMPLITUDE TO PHASE CONVERSION LOGIC

John N. Hait, Missoula, Mont., assignor to Rocky Mountain Research Center, Missoula, Mont.

Continuation-in-part of Ser. No. 357,460, Dec. 16, 1994. This application Mar. 27, 1995, Ser. No. 413,130

Int. Cl.[6] G06G *7/00*; G06E *1/04*

U.S. Cl. 250—216 8 Claims



1. A method of providing at least one phase-modulated output from at least one amplitude-modulated input comprising the following steps:

providing a bias beam set having at least one beam of energy of at least one wavelength maintained at a substantially constant level;

providing at least one input beam set, having at least one amplitude-modulated beam of energy of said at least one wavelength out of phase with said bias beam set, and having an energy sum;

superpositioning said bias beam set with said at least one input beam set to produce interference at at least one location when both said beam sets are on, and

separating energy from said at least one location to provide at least one phase modulated output,

thereby providing an amplitude modulation-to-phase modulation converter wherein the phase of said at least one phase-modulated output has a first phase when said energy sum is greater than the level of said bias beam set, and has a second phase when said energy sum is smaller than said bias beam set.

5,466,926

COLORED MICROLENS ARRAY AND METHOD OF MANUFACTURING SAME

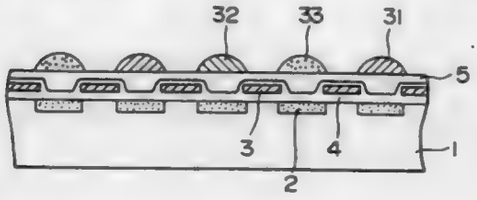
Nobusuke Sasano, Tokyo, and Tadashi Enomoto, Kawasaki, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 27, 1993, Ser. No. 10,002

Claims priority, application Japan, Jan. 27, 1992, 4-012373

Int. Cl.[6] H01J *3/14*

U.S. Cl. 250—216 2 Claims



1. A colored microlens array, comprising:

a transparent basic layer; and

a plurality of colored microlenses of different colors, each colored microlens serving as a color filter, formed on said transparent basic layer in a two dimensional arrangement in accordance with at least one basic color arrangement pattern, wherein a thickness of said transparent basic layer differs according to a color of a colored microlens formed thereon such that foci of said colored microlenses are located substantially on the same plane.

5,466,927

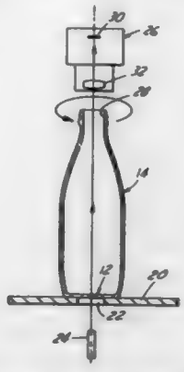
INSPECTION OF TRANSLUCENT CONTAINERS

Timothy A. Kohler, and James A. Ringlien, both of Maumee, Ohio, assignors to Owens-Brockway Glass Container Inc., Toledo, Ohio

Filed Apr. 8, 1994, Ser. No. 224,208

Int. Cl.[6] G01N *21/41*; B07C *5/00*

U.S. Cl. 250—223 B 8 Claims



1. Apparatus for inspecting the bottom of a container having an open mouth and a central axis, said apparatus comprising:

light sensing means positioned to view the container bottom through the container mouth,

a light source positioned externally of the container on a side of the container bottom opposite the container mouth,

said light source as viewed by said light sensing means through the container bottom being characterized by having an illumination angle radially of the container bottom such that variations in the container bottom that refract light radially of the container bottom are transparent as viewed by said light sensing means through the container mouth and an illumination angle transversely of the container bottom such that variations in the container bottom that refract light laterally of the container bottom produce a dark image at said light sensing means, and

means for detecting commercial variations in the container bottom as a function of light energy incident on said sensing means.

5,466,928

LIGHT DETECTION DEVICE BONDED TO AN OPTICS HOUSING WHICH INCLUDES TAPERED CAVITIES FOR DELIVERING ADHESIVE TO THE BONDING SURFACE

Hiroaki Takahara, Matsudo, and Masami Moriya, Kawasaki, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed May 11, 1994, Ser. No. 241,393

Claims priority, application Japan, May 20, 1993, 5-118062; May 24, 1993, 5-121150

Int. Cl.[6] H01J *5/02*

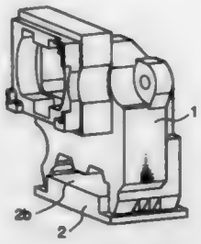
U.S. Cl. 250—239 7 Claims

1. A light-receiving detection device comprising:

an optical system for transmitting light;

a light-receiving surface for receiving light transmitted through the optical system;

a holder for holding the optical system, the holder being provided with at least one side surface having at least one mounting surface, depending from the at least one side surface, to which the light-receiving surface is bonded, each side surface being provided with at least one concavity for receiv-



ing adhesive to bond said light-receiving surface to the at least one mounting surface, the concavity having at least two inner surfaces, at least one of the inner surfaces being tapered so as to broaden at a lower part.

5,466,929

APPARATUS AND METHOD FOR SUPPRESSING ELECTRIFICATION OF SAMPLE IN CHARGED BEAM IRRADIATION APPARATUS

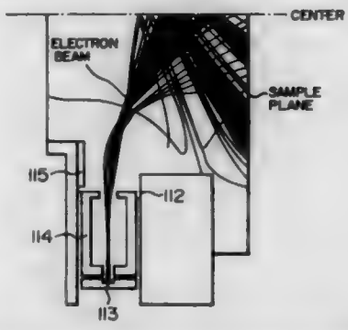
Katsuhiko Sakai, Mito; Osamu Nasu, Katsuta, and Yoichi Ose, Mito, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 22, 1993, Ser. No. 20,802

Claims priority, application Japan, Feb. 21, 1992, 4-033787; Jun. 8, 1992, 4-147195; Jul. 30, 1992, 4-202782

Int. Cl.[6] H01J *37/30;* H05H *3/00*

U.S. Cl. 250—251 **17 Claims**



1. An electrification suppressing apparatus comprising,

a charged beam irradiation apparatus for irradiating a charged beam on a sample to change it physically,

gas diffusion suppression means for suppressing diffusion of gas, generated from the surface of the sample when said charged beam is irradiated on said sample, from the vicinity of the surface of said sample,

a charged particle source for generating charged particles of opposite polarity to that of said charged beam, and

deflection means for deflecting the charged particles generated by said charged particle source to direct them toward said sample surface so as to combine with the charged beam and enable neutralization.

5,466,930

SOLID SCINTILLATORS FOR DETECTING RADIOACTIVE IONS IN SOLUTION

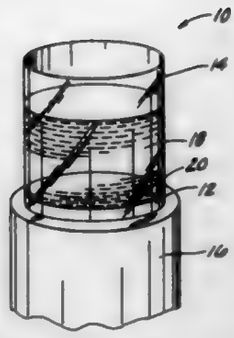
Joseph B. Schlenoff, Tallahassee, Fla., assignor to Florida State University, Tallahassee, Fla.

Filed Feb. 23, 1994, Ser. No. 200,213

Int. Cl.[6] G01T *1/20*

U.S. Cl. 250—252.1 **27 Claims**

1. A light source for calibration of imaging devices, the light source comprising a solid scintillator; an ionic layer on a surface of and in contact with the solid scintillator, the ionic layer including anions or cations; radioactive ions bound to the anions or the



cations of the ionic layer, forming a radioactive surface; and an absorbent layer which covers the radioactive surface and absorbs radiation emitted from the radioactive ions such that radiation is contained within the light source.

5,466,931

MASS SPECTROMETRY METHOD USING NOTCH FILTER

Paul E. Kelley, San Jose, Calif., assignor to Teledyne ET a div. of Teledyne Industries, Mountain View, Calif.

Continuation of Ser. No. 90,474, Jul. 12, 1993, Pat. No. 5,345,078, which is a continuation of Ser. No. 920,953, Jul. 27, 1992, abandoned, which is a continuation of Ser. No. 662,217, Feb. 28, 1991, Pat. No. 5,134,286. This application Aug. 30, 1994, Ser. No. 298,388

Int. Cl.[6] H01J *49/42*

U.S. Cl. 250—282 **4 Claims**

1. A mass spectrometry method, including the steps of:

(a) establishing a three-dimensional trapping field capable of storing ions having mass-to-charge ratio within a selected range within a three-dimensional trap volume bounded by a set of electrodes,

(b) generating a notched broadband signal composed of a sum of frequency components, said notched broadband signal comprising a sufficient number of said frequency components to be capable of resonating out of the trap volume unwanted ions having mass-to-charge ratio within at least a portion of said range; and

(c) applying the notched broadband signal to at least one of the electrodes to resonate out of the trap volume unwanted ions having mass-to-charge ratio within said portion of said range.

5,466,932

MICRO-MINIATURE PIEZOELECTRIC DIAPHRAGM PUMP FOR THE LOW PRESSURE PUMPING OF GASES

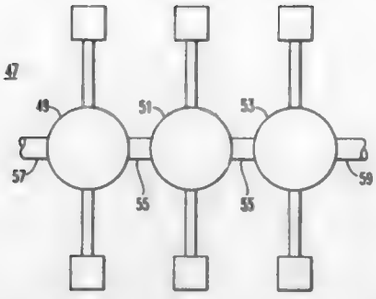
Robert M. Young, Pittsburgh; Carl B. Freidhoff, Murrysville, both of Pa.; Dennis L. Polla, Brooklyn Park, and Peter J. Schiller, Plymouth, both of Minn., assignors to Westinghouse Electric Corp., Baltimore, Md.

Continuation-in-part of Ser. No. 124,873, Sep. 22, 1993, Pat. No. 5,386,115. This application Oct. 7, 1994, Ser. No. 320,614

Int. Cl.[6] H01J *49/24;* F04B *17/00*

U.S. Cl. 250—289 **29 Claims**

1. A pump for use in a solid state mass spectrograph for analyzing a sample gas, said mass spectrograph being formed from



a semiconductor substrate having a cavity with an inlet, a gas ionizing section adjacent said inlet, a mass filter section adjacent said gas ionizing section and a detector section adjacent said mass filter section, said pump being connected to said cavity, said pump comprising at least one piezoelectrically-actuated diaphragm means, said diaphragm means accomplishing one of a suction stroke and a compression stroke upon piezoelectrical actuation, whereby said suction stroke evacuates said cavity and draws said sample gas into said cavity and said compression stroke increases the gas pressure within said pump and ejects said sample gas from said pump and said mass spectrograph.

5,466,933

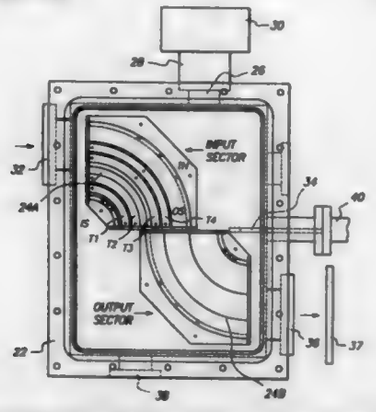
DUAL ELECTRON ANALYZER

Charles E. Bryson, III, Santa Clara, and Michael A. Kelly, Portola Valley, both of Calif., assignors to Surface Interface, Inc., Mountain View, Calif.

Continuation of Ser. No. 980,390, Nov. 23, 1992, abandoned. This application Aug. 8, 1994, Ser. No. 287,103

Int. Cl.[6] H01J *49/48*

U.S. Cl. 250—305 **13 Claims**



1. An energy analyzer for separation of a collimated stream of electrons while preserving the spatial relationship between the electrons, comprising:

inlet means for receiving the stream of electrons to be analyzed;

a first arcuate energy analyzer means in communication with the inlet means for receiving, focusing and dispersing the collimated stream of electrons;

a second arcuate, complementary and opposed energy analyzer means abutting the first energy analyzer means for receiving the electron stream from the first energy analyzer means and canceling the dispersive effects of the first energy analyzer means to restore the same spatial relationship between the electrons in the electron stream as existed at the inlet means; and

outlet means for receiving the electron stream from the second energy analyzer means to provide an exit image in which the electrons have substantially the same spatial relationship to each other as in the stream received at the inlet means.

5,466,934

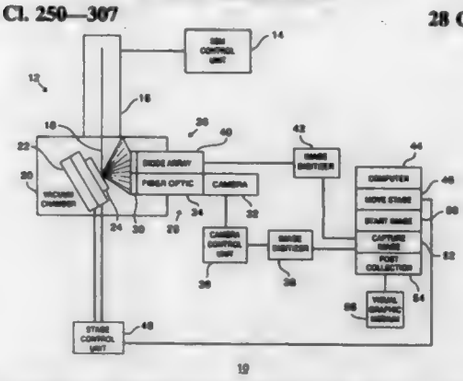
METHOD AND APPARATUS FOR IDENTIFICATION OF CRYSTALLOGRAPHIC DEFECTS

Brent L. Adams, 3808 Kim La., Gibsonia, Pa. 15044; David J. Dingley, 4099 S. 550 East #15F, Salt Lake City, Utah 84107, and David P. Field, 628 E. 630 North, Pleasant Grove, Utah 84062

Filed Jan. 18, 1995, Ser. No. 374,214

Int. Cl.[6] G01N *23/203*

U.S. Cl. 250—307 **28 Claims**



1. A method of identifying crystallographic defects comprising the steps of:

a) illuminating a first point on a material sample;

b) collecting a backscatter diffraction image in response to said step a);

c) illuminating a second point on said material sample;

d) collecting a backscatter diffraction image in response to said step c);

e) determining whether change between said images collected in said steps b) and d) exceeds a predetermined level; and

f) identifying coordinates of said second point on said material sample as belonging to a crystallographic defect when said step e) determines that said change between said images exceeds said predetermined level.

5,466,935

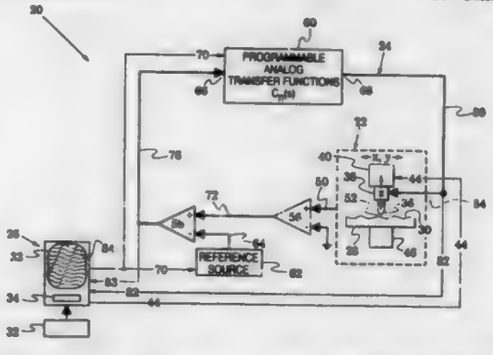
PROGRAMMABLE, SCANNED-PROBE MICROSCOPE SYSTEM AND METHOD

David J. Ray, Agoura Hills, and Robert S. Harp, Westlake Village, both of Calif., assignors to Quesant Instrument Corporation, Agoura Hills, Calif.

Filed Jan. 20, 1995, Ser. No. 377,025

Int. Cl.[6] H01J *37/28*

U.S. Cl. 250—307 **39 Claims**



1. A method of controlling a tip-to-surface interaction between a sample surface and a probe tip of a scanned-probe microscope wherein said microscope has an output signal that is a function of said interaction and said interaction is a function of a signal at a microscope control port, the method comprising the steps of:

comparing said output signal with a predetermined reference signal to obtain an error signal;

electronically programming a control loop to choose any one of a plurality of selectable analog transfer functions;

processing said error signal with said programmed analog control loop to obtain an analog control signal; and

applying said control signal to said microscope control port.

5,466,936

CHARGED PARTICLE MICROSCOPE

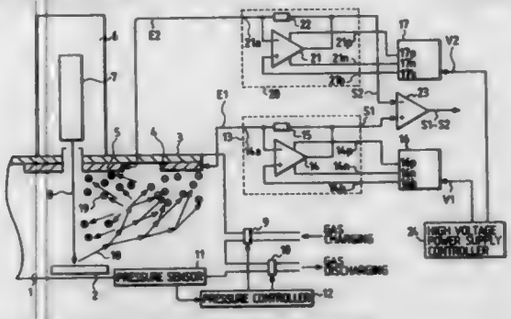
Yoshiaki Kohama, and Kaoru Ohmori, both of Kawasaki, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Nov. 17, 1993, Ser. No. 153,029

Claims priority, application Japan, Nov. 30, 1992, 4-319980

Int. Cl.[6] H01J *37/26*

U.S. Cl. 250—310 **8 Claims**



1. A charged particle microscope comprising:

(a) a sample chamber for containing a sample and into which a gas for gas amplification is charged, said sample being irradiated by a charged particle beam to generate secondary electrons;

(b) a first electrode provided in the sample chamber, to which a first voltage is applied;

(c) a second electrode provided in the sample chamber, to which a second voltage different from the first voltage is applied;

(d) the first voltage and the second voltage being such that one of said first and second electrodes detects secondary electrons gas-amplified by said gas and the other of said first and second electrodes detects cations generated in the course of gas amplification, in which secondary electrons collide with gas molecules; and

(e) a difference detector which detects a difference between a signal obtained from the first electrode and a signal obtained from the second electrode to produce a picture signal.

5,466,937

ADDITIVE COMPOSITION OF DEFOCUSING IMAGES IN AN ELECTRON MICROSCOPE

Pieter Kruit, Delft, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 6, 1994, Ser. No. 301,444

Claims priority, application Belgium, Sep. 3, 1993, 09300907

Int. Cl.[6] H01J *37/26*

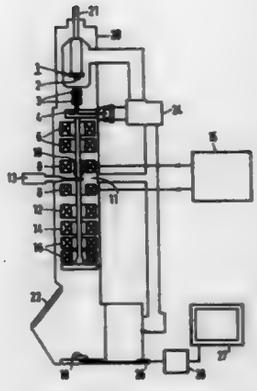
U.S. Cl. 250—311 **12 Claims**

1. A method of forming an image of an object in a particle-optical instrument by way of a number of sub-images formed by means of an imaging lens system, which method comprises:

the formation of a number of successive sub-images, utilizing a different defocusing adjustment of the imaging lens system for each sub-image,

the assignment of a weighting factor to each sub-image thus obtained, the dependence of the weighting factor as a function of the defocusing being an oscillating function,

the addition of the sub-images multiplied by the weighting factors, characterized in that the value of the oscillating function has the same sign throughout the entire defocusing range.



5,466,938

CORONA DISCHARGE DEVICE

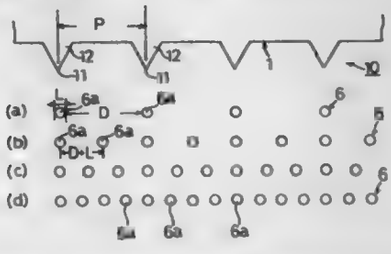
Yasunori Nakayama; Noboru Yonekawa; Kouji Matsushita; Yasuhiro Nakagami, and Shizuo Yuge, all of Toyokawa, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Sep. 28, 1994, Ser. No. 314,086

Claims priority, application Japan, Sep. 30, 1993, 5-245158; Feb. 25, 1994, 6-027120

Int. Cl.[6] H01T *19/04;* **G03G** *15/02*

U.S. Cl. 250—326 **14 Claims**



1. A corona discharge device used in an image forming apparatus to apply a uniform charge to an image bearing surface, comprising:

a discharge member having a plurality of projecting discharge ends;

a voltage power source adapted to supply energy to said discharge member; and

a screen member placed between said discharge member and said image bearing surface and having a plurality of grid wires arranged in a longitudinal direction, wherein a positional relation between any one of said plurality of projecting discharge ends and adjacent grid wires is the same as a positional relation between any other of said plurality of discharge ends and adjacent grid wires.

5,466,939

NUCLEAR MEDICINE IMAGING APPARATUS

Yoshihiko Kumazawa, Kameoka, and Kazumi Tanaka, Otsu, both of, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

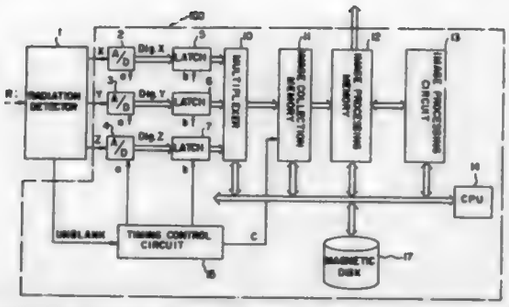
Filed Sep. 22, 1993, Ser. No. 124,860

Claims priority, application Japan, Sep. 24, 1992, 4-280475; Mar. 31, 1993, 5-098632

Int. Cl.[6] G01T *1/166*

U.S. Cl. 250—363.04 **16 Claims**

2. A nuclear medicine imaging apparatus having a scatter correcting device for processing radiation detected after being released by radioactive substances introduced into a body examined, said apparatus comprising:



radiation detecting means for generating two-dimensional position signals indicating positions of incident radiation, and an energy signal indicating energy level of said radiation;

image data collecting and storing means for collecting three-dimensional image data at addresses provided by digital values of said two-dimensional position signals and said energy signal;

filter means for effecting two-dimensional low-pass filter processing for said three-dimensional image data collected; and

data correcting means for effecting a scatter correction with energy weighted acquisition for each pixel by using an energy weighting function prepared and stored in advance, and comparing said function and a predetermined value with respect to each energy channel in each pixel, such that, for an energy range having a value of said function over or equal to a predetermined value, said function is applied to data not processed by said filter means, and for an energy range having a value of said function below said predetermined value, said function is applied to data processed with said filter by said filter means.

7. A nuclear medicine imaging apparatus having a scatter correcting device for processing radiation detected after being released by radioactive substances introduced into a body examined, said apparatus comprising:

radiation detecting means for generating two-dimensional position signals indicating positions of incident radiation, and an energy signal indicating energy level of said radiation;

first image data collecting and storing means for collecting two-dimensional image data at addresses provided by digital values of said two-dimensional position signals, respectively;

second image data collecting and storing means for collecting three-dimensional image data at addresses provided by upper bits of said digital values of said two-dimensional position signals and by digital values of said energy signal;

pulse amplitude analyzing means for analyzing said energy signal to allow said first image data collecting and storing means to carry out data correction when said energy signal has a pulse height falling within a predetermined window; and

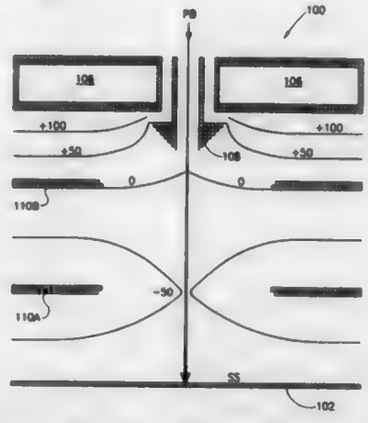
image processing means for effecting a scatter correction with energy weighted acquisition for the data collected in said second image data collecting and storing means, obtaining a first correction coefficient for each pixel in said second image data collecting and storing means by computing, for each pixel, a ratio between data resulting from the correction and data within said window of the data collected in said second image data collecting and storing means prior to the correction, obtaining a second correction coefficient for each pixel in said first image data collecting and storing means by interpolating said first correction coefficient, and applying said second correction coefficient to the data collected in said first image data collecting and storing means, thereby to correct said image data collected in said first image data collecting and storing means.

5,466,940

ELECTRON DETECTOR WITH HIGH BACKSCATTERED ELECTRON ACCEPTANCE FOR PARTICLE BEAM APPARATUS

Alon Litman, Nes Ziona; Alexander Goldenstein, Holon, and Steven R. Rogers, Emek Sorek, all of, Israel, assignors to Opal Technologies Ltd., Nes Ziona, Israel

Filed Jun. 20, 1994, Ser. No. 262,285
Int. Cl.[6] H01J 37/244
U.S. Cl. 250—397 29 Claims



1. An electron detector for detecting backscattered electrons emitted from a specimen, the electron detector comprising:

(a) an electron multiplier having a front surface directed toward the specimen, said front surface releasing Type A secondary electrons on impingement of Type A backscattered electrons thereon, said Type A secondary electrons having trajectories away from said front surface; and

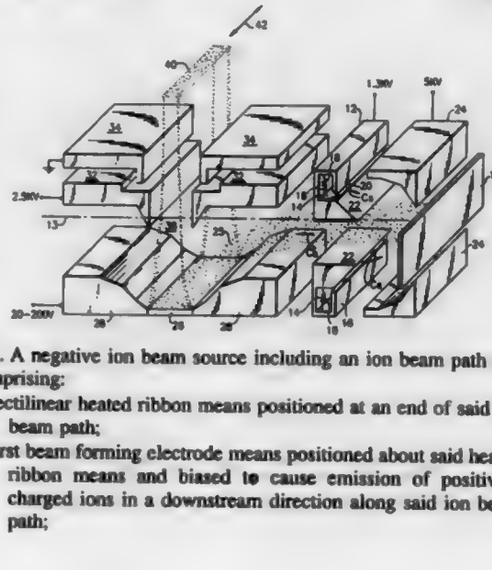
(b) an electrode deployed between said electron multiplier and the specimen, said electrode being biased at a negative potential with respect to both said front surface and the specimen and spaced from said front surface at a distance selected so as to generate an electric field which diverts said Type A secondary electrons towards said front surface.

5,466,941

NEGATIVE ION SPUTTERING BEAM SOURCE

Seong I. Kim, 438 Andre Ave., North Vale, N.J. 07647

Filed Jul. 27, 1994, Ser. No. 281,480
Int. Cl.[6] H01J 27/02;27/26
U.S. Cl. 250—423 R 8 Claims



1. A negative ion beam source including an ion beam path and comprising:

rectilinear heated ribbon means positioned at an end of said ion beam path;

first beam forming electrode means positioned about said heated ribbon means and biased to cause emission of positively charged ions in a downstream direction along said ion beam path;

first extraction electrode means positioned downstream along said ion beam path from said rectilinear heated ribbon means and having an aperture for passage of a beam of positively charged ions, and further including cesium chamber means with at least one opening directed upstream along said ion beam path towards said rectilinear heated ribbon means;

heater means for heating said cesium chamber means to cause an expulsion upstream along said ion beam path of cesium neutral species towards a surface of said rectilinear heated ribbon means, said cesium neutral species, upon contact with said surface of said rectilinear heated ribbon means, converted to Cs^+ ions, said Cs^+ ions acted upon by said first beam forming electrode means and first extraction electrode means to create a Cs^+ ion beam traveling in said downstream direction;

a target;

second beam forming electrode means positioned along said ion beam path and biased to enable emission of negative ions which are produced when said target is bombarded by said Cs^+ ion beam; and second extraction electrode means positioned along said ion beam path and biased to direct said Cs^+ ion beam towards said target and to attract negative target ions emitted from said target and to form said negative target ions into a negative ion beam.

5,466,942

CHARGED BEAM IRRADIATING APPARATUS HAVING A CLEANING MEANS AND A METHOD OF CLEANING A CHARGED BEAM IRRADIATING APPARATUS

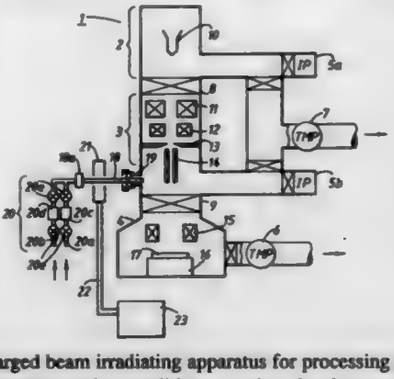
Itsuko Sakai; Nobuo Hayasaka, both of Kanagawa, and Haruo Okano, Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Division of Ser. No. 907,570, Jul. 2, 1992, Pat. No. 5,312,519. This application Dec. 10, 1993, Ser. No. 164,753

Claims priority, application Japan, Jul. 4, 1991, 3-163208

Int. Cl.[6] H01J *37/00*

U.S. Cl. 250—492.2 **16 Claims**



1. A charged beam irradiating apparatus for processing semiconductor substrates under conditions causing development of contaminants, the apparatus comprising:

means for generating a charged beam;

a vacuum chamber enclosing at least one part of the apparatus exposed by the charged beam and thus subject to deposit of the contaminants thereon;

a gas introducing system connected to the chamber, the gas introducing system including means for producing electrically neutral active species and other species including at least one of electrons and positive ions, and for introducing a selected carried species, including substantially only the neutral active species, into the chamber to remove the contaminants from the at least one part; and

a system for exhausting the removed contaminants from the chamber.

5,466,943

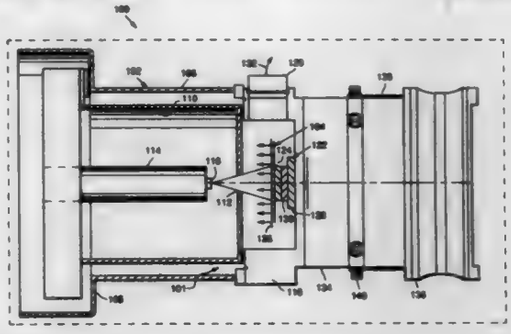
EVACUATED TESTING DEVICE HAVING CALIBRATED INFRARED SOURCE

Paul D. Green, Redondo Beach, and Stefan T. Baur, Rancho Palos Verdes, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 16, 1993, Ser. No. 123,021

Int. Cl.[6] G21G *4/00*; G01J *5/00*

U.S. Cl. 250—493.1 **18 Claims**



1. A device for testing an object comprising:

a housing providing a test chamber therein;

first means for retaining said object within said test chamber;

second means positioned within said test chamber for generating and transmitting uniform electromagnetic radiation to said object; and

third means disposed within said test chamber in thermal communication with said second means for varying the temperature thereof.

5,466,944

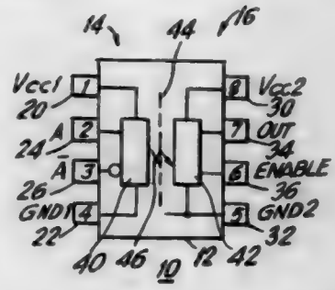
OPTICALLY-COUPLED DIFFERENTIAL LINE RECEIVER

Robert Krause, Menlo Park, Calif., assignor to Siemens Components, Inc., Cupertino, Calif.

Filed Sep. 30, 1993, Ser. No. 129,639

Int. Cl.[6] H01F *40/14*; G08B *17/12*

U.S. Cl. 250—551 **18 Claims**



1. A self-contained apparatus for optically isolating at least one discrete input from at least one discrete output, comprising:

input means, responsive to an input electrical signal having two predetermined electrical states, for generating an optical signal having two corresponding optical levels; and

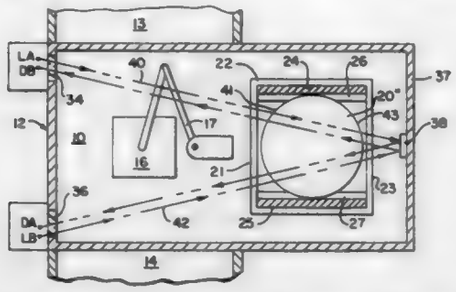
output means, responsive to the optical signal generated by the input means, for generating an output electrical signal having a plurality of states, where at least two of the states correspond to the two predetermined electrical states of the input electrical signal.

5,466,945

APPARATUS FOR DETECTING PROPER POSITIONING OF OBJECTS IN A HOLDER

Christopher G. Brickell, Mukilteo, and Kenneth A. Langland, Seattle, both of Wash., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 23, 1994, Ser. No. 216,748
Int. Cl.[6] G01N 21/86
U.S. Cl. 250—559.12 20 Claims



1. A system for detecting positions of a plurality of objects in a holder having first and second opposite sides, which apparatus comprises:

a first emitter located on the first side of the holder to produce a first radiation beam directed through the holder;

a reflector located on the second side of the holder to at least partially reflect the first radiation beam back through the holder, wherein reflection by said reflector imparts a V-shape to a path of the first radiation beam;

a first detector located on the first side of the holder for receiving the first radiation beam after reflection by said reflector and producing a first signal that indicates an intensity of radiation which strikes said detector;

a mechanism for scanning the plurality of objects in the holder with the first radiation beam; and

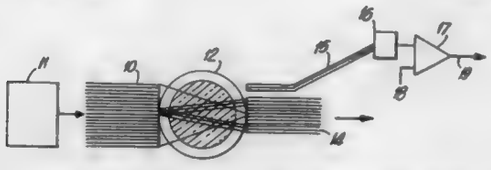
an electronic circuit receiving the first signal from said detector and in response thereto producing an indication of whether the objects are properly positioned in the holder.

5,466,946

METHOD AND APPARATUS FOR DISCRIMINATING BETWEEN LIQUIDS AND GASES

David Kleinschmitt; Maroun Touma, and George E. Zabetakis, all of Bethel, Conn., assignors to Miles, Inc., Tarrytown, N.Y.

Continuation of Ser. No. 106,255, Aug. 13, 1993, abandoned.
This application Dec. 2, 1994, Ser. No. 349,143
Int. Cl.[6] G01N 15/06
U.S. Cl. 250—577 13 Claims



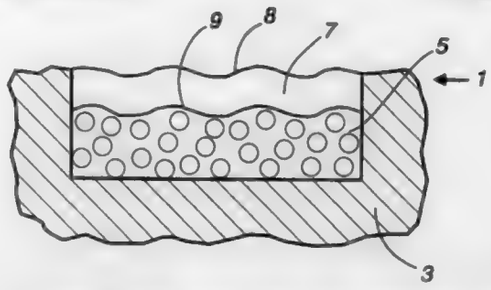
1. An apparatus for detecting a liquid/gas interface flowing in a transparent tube, comprising: means for directing light through a transparent tube orthogonal to a longitudinal axis thereof such that the directed light passing through the tube when filled with liquid thereat will extend substantially within a predetermined zone and when filled with gas thereat will extend beyond the predetermined zone comprising a first fiber optic bundle; a second fiber optic bundle disposed diametrically opposite to said first fiber optic bundle parallel thereto and positioned beyond said predetermined zone for receiving only light passing through the tube and extending beyond said predetermined zone; and means solely responsive to the amount of light received by the second fiber optic bundle for producing an output signal representative of a liquid/gas interface flowing in the tube.

5,466,947

PROTECTIVE OVERLAYER FOR PHOSPHOR IMAGING SCREEN

Gordon E. Fleig, Oakland, and Donald E. Gueffroy, Davis, both of Calif., assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Mar. 18, 1994, Ser. No. 215,127
Int. Cl.[6] G03B 42/00
U.S. Cl. 250—582 33 Claims



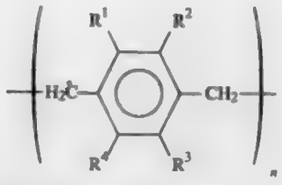
1. A phosphor imaging screen having high sensitivity to light and weak β radiation, comprising, in order:

(a) a support;

(b) a phosphor layer containing a stimulable phosphor in particulate form forming an uneven surface; and

(c) a substantially continuous, protective coating of uniform thickness which conforms substantially to the surface of the stimulable phosphor;

wherein said protective coating comprises an optionally substituted parylene polymer having the structure shown below:



wherein R^{1-4} are selected independently from the group consisting of hydrogen, alkyl, aryl, heteroaryl, alkenyl, cyano, alkoxyl, hydroxyl, aryloxyl, carboxyl, carboxyalkyl, carboxyaryl, halogen, amino, and nitro; and n is at least about 1000.

5,466,948

MONOLITHIC SILICON OPTO-COUPLER USING ENHANCED SILICON BASED LEDS

Eugene R. Worley, Irvine, Calif., assignor to John M. Baker, Corona, Calif.

Filed Oct. 11, 1994, Ser. No. 320,232
Int. Cl.[6] H01L 31/12;31/16
U.S. Cl. 257—3 7 Claims

1. A monolithic opto-coupler employing silicon-on-insulator technology comprising:

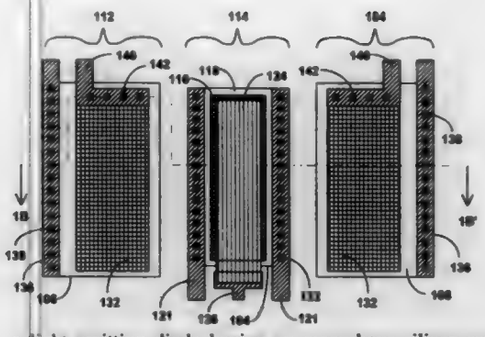
a substrate including an insulating layer disposed on a bulk silicon support layer;

a least two p-type silicon islands disposed on said insulating layer;

a light emitting diode having enhanced light emitting efficiency formed on one of said islands, said light emitting diode being selected from the group of

a light emitting diode having the surface of said p-type silicon island being electrochemically etched to provide a porous silicon layer,

a light emitting diode having carbon implanted in damaged silicon, and



a light emitting diode having an amorphous silicon-carbide layer;

a silicon diode detector being formed on one of said islands; and

a waveguide means for coupling light generated in said light emitting diode to said silicon junction diode.

5,466,949

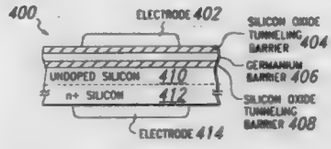
SILICON OXIDE GERMANIUM RESONANT TUNNELING

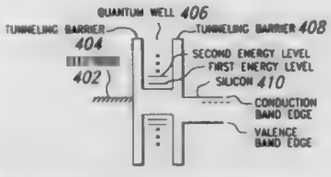
Yasutoshi Okuno, Tsukuba, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 4, 1994, Ser. No. 286,067

Int. Cl.[6] H01L *29/16;29/737*

U.S. Cl. 257—25 **5 Claims**





1. A resonant tunneling diode, comprising:

(a) first and second tunneling barriers, said first tunneling barrier including a silicon-oxygen compound;

(b) a quantum well between said first and second tunneling barriers, said quantum well including germanium;

(c) a first terminal abutting said first tunneling barrier; and

(d) a second terminal abutting said second tunneling barrier.

5,466,950

SEMICONDUCTOR LIGHT EMITTING DEVICE WITH SHORT WAVELENGTH LIGHT SELECTING MEANS

Hideto Sugawara, and Kazuhiko Itaya, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 22, 1994, Ser. No. 309,491

Claims priority, application Japan, Sep. 24, 1993, 5-237061

Int. Cl.[6] H01L *33/00*

U.S. Cl. 257—94 **18 Claims**

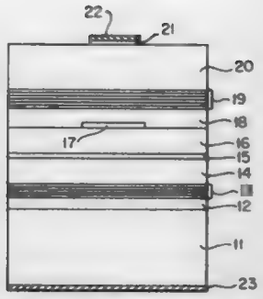
1. A semiconductor light emitting device, comprising:

a substrate of n-type GaAs;

a buffer layer of n-type GaAs semiconductor on said substrate;

a first reflective layer of n-type semiconductor on said buffer layer;

a first clad layer of n-type InAlP semiconductor on said first reflective layer;



an active layer of undoped InGaAlP semiconductor on said first clad layer, into which enough tensile strain to split an emission spectrum of said active layer is induced;

a second clad layer of p-type InAlP semiconductor on said active layer;

a current blocking layer of n-type semiconductor on a central portion on said second clad layer;

a first current spreading layer of p-type GaAlAs semiconductor on said second clad layer and said current blocking layer;

a second reflective layer comprising a p-type semiconductor on said first current spreading layer;

a second current spreading layer of p-type GaAlAs semiconductor on said second reflective layer;

a contact layer of p-type GaAs semiconductor on said second current spreading layer above said current blocking layer;

a first electrode formed on said contact layer; and

a second electrode on said substrate, wherein said emission spectrum has peaks of short wavelength light and long wavelength light, a reflectivity of said first reflective layer for said short wavelength light is larger than that for said long wavelength light, and a reflectivity of said second reflective layer for said long wavelength light is larger than that for said short wavelength light.

5,466,951

CONTROLLABLE POWER SEMICONDUCTOR ELEMENT WITH BUFFER ZONE AND METHOD FOR THE MANUFACTURE THEREOF

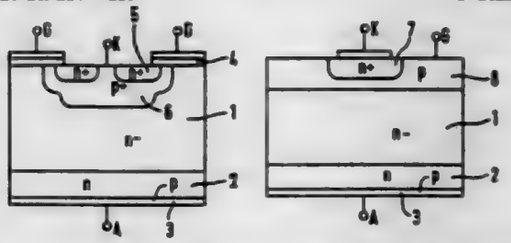
Heinrich Brunner, and York C. Gerstenmaier, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 22, 1994, Ser. No. 343,670

Claims priority, application Germany, Dec. 8, 1993, 43 41 879.1

Int. Cl.[6] H01L *29/08;29/78*

U.S. Cl. 257—139 **3 Claims**



1. A controllable power semiconductor component, comprising:

in sequence, a cathode-side structure having a cathode terminal and a gate terminal, an n^--base zone, an n-buffer zone, a p-emitter zone, and an anode terminal electrically contacted to the p-emitter zone;

said n-buffer zone having a thickness between 20 and 80 μm and a doping concentration at an anode side edge of 8×10^{13} through 5×10^{14} cm^{-3};

said p-emitter zone having a thickness of 400–1000 nm and a doping concentration at an anode side edge of 10^{17} through 10^{18} cm^{-3}; and

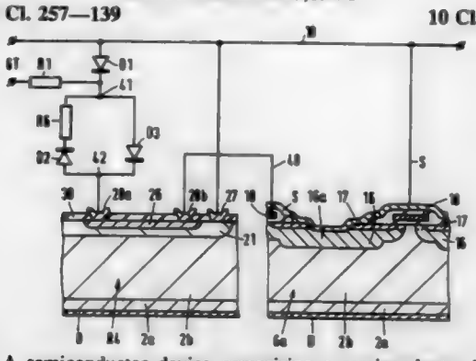
said n^--base zone having a life expectancy of charge carriers that is longer than 10 μsec.

5,466,952

SEMICONDUCTOR DEVICE HAVING AN IGET AND A CONTROL OR PROTECTION COMPONENT

Paul T. Moody, Oldham, Great Britain, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1994, Ser. No. 269,810
Claims priority, application United Kingdom, Jul. 1, 1993, 9313651
Int. Cl.[6] H01L 29/10;29/78
U.S. Cl. 257—139 10 Claims



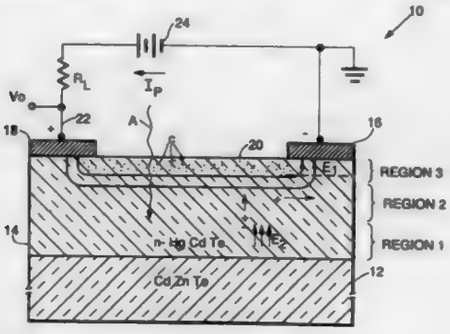
1. A semiconductor device comprising a semiconductor body having first and second major surfaces with a first region of one conductivity type adjacent the first major surface, an insulated gate field effect transistor formed within the first region and having source and drain electrodes and an insulated gate electrode, at least one further component coupled between the insulated gate electrode of the insulated gate field effect transistor and a gate input terminal, the further component having a second region of the opposite conductivity type provided within the first region so that a further region of the further component, the second region and the first region form a parasitic bipolar transistor and, provided on an insulating layer on the first major surface, a first rectifying element coupled between a base region of the parasitic bipolar transistor and the gate input terminal and a second rectifying element coupled between an emitter region of the parasitic bipolar transistor and the gate input terminal for causing, when a voltage between a source and an insulated gate electrode reverses polarity, the first and second rectifying elements in series with a base and an emitter region of the parasitic bipolar transistor to become forward-biased to reduce a voltage between the base and emitter regions of the parasitic bipolar transistor.

5,466,953

DENUDED ZONE FIELD EFFECT PHOTOCONDUCTIVE DETECTOR

Joseph P. Rosbeck, Santa Barbara, and Charles A. Cockrum, Goleta, both of Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed May 28, 1993, Ser. No. 70,072
Int. Cl.[6] H01L 27/14;31/00
U.S. Cl. 257—185 18 Claims



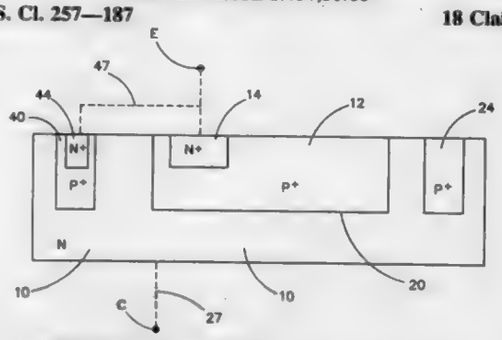
1. A radiation detector comprising:
a substrate having a surface; and
a semiconductor body that is disposed upon said surface, said semiconductor body being differentiated into a plurality of regions, said plurality of regions including,
a semiconductor region that is compositionally graded through a thickness thereof from a wider bandgap semiconductor material to a narrower bandgap semiconductor material, the wider bandgap semiconductor material being adjacent to said surface of said substrate, wherein a portion of said narrower bandgap semiconductor material is substantially undoped and has a minimal amount of impurities therein, and
a surface region overlying said portion of substantially undoped semiconductor material, said surface region being compositionally graded through a thickness thereof from said narrower bandgap semiconductor material to a wider bandgap semiconductor material at a radiation receiving surface of said detector, the compositional grading of said surface region being sufficient to getter impurities from said substantially undoped region and to reduce surface recombination effects.

5,466,954

SHUNT PHOTOTRANSISTOR WITH REVERSE BIAS PROTECTION

Jose J. Aizpuru, Garland, and Walter T. Matzen, Richardson, both of Tex., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 21, 1994, Ser. No. 360,486
Int. Cl.[6] H01L 27/14;31/00
U.S. Cl. 257—187 18 Claims



1. A phototransistor, comprising:
a transistor having an emitter, a collector and a base;
a diode having an anode and a cathode, said anode being connected in electrical communication with said base, said cathode being connected in electrical communication with said collector;
a first resistor connected in electrical communication between said anode and said emitter, said first resistor creating a PN junction relationship, said PN junction relationship being disposed in parallel electrical relationship with said diode and said first resistor; and
a second resistor connected in electrical communication between said first resistor and said emitter, said second resistor being connected between said emitter and said PN junction relationship.

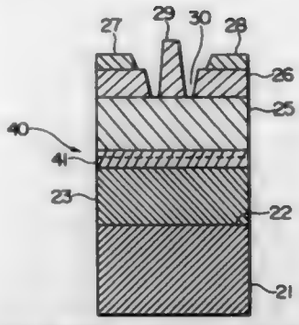
5,466,955

FIELD EFFECT TRANSISTOR HAVING AN IMPROVED TRANSISTOR CHARACTERISTIC

Kenichi Maruhashi; Kazuhiko Onda, and Masaaki Kuzuhara, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Continuation of Ser. No. 167,407, Dec. 14, 1993, abandoned.
This application Jan. 30, 1995, Ser. No. 380,251
Claims priority, application Japan, Dec. 17, 1992, 4-337287
Int. Cl.[6] H01L 27/02
U.S. Cl. 257—192 25 Claims

1. A field effect transistor comprising a first semiconductor layer, a second semiconductor layer formed on said first semiconductor



layer, and a heterojunction structure formed between said first semiconductor layer and said second semiconductor layer, wherein:

said first semiconductor layer being composed of InGaAs;

said second semiconductor layer being composed of InAlGaP,

said first semiconductor layer comprising an undoped film; and a doped film in which a first impurity is doped; and

said second semiconductor layer being further composed of a second impurity which is doped in said second semiconductor layer.

5,466,956

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE WITH ELECTRODE FOR MEASURING INTERLAYER INSULATOR CAPACITANCE

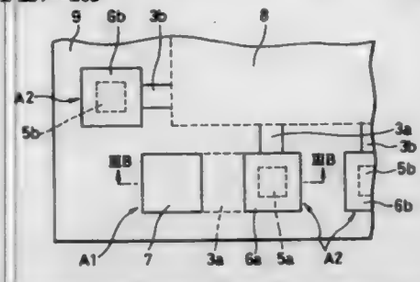
Nobuaki Aeba, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Nov. 17, 1994, Ser. No. 341,492

Claims priority, application Japan, Nov. 18, 1993, 5-288924

Int. Cl.[6] H01L *27/02;27/10*

U.S. Cl. 257—203 **4 Claims**



1. A semiconductor integrated circuit device comprising:

an internal circuit area provided on a semiconductor substrate, internal circuits being provided in said internal circuit area;

an I/O area provided on said substrate, I/O terminals being provided in said I/O area;

said I/O area having a first bonding pad area that is redundant for said device and second bonding pad areas used for said I/O terminals;

an insulator film formed on said substrate in said I/O area;

a first wiring conductor formed on said insulator film over said I/O area, said first wiring conductor being electrically connected to said internal circuits;

said first wiring conductor extending from said first bonding pad area to said internal circuit area through an adjacent one of said second bonding pad areas;

second wiring conductors formed on said insulator film over said I/O area, said second wiring conductors being electrically connected to said internal circuits, respectively;

said second wiring conductors extending from said respective second bonding pad areas to said internal circuit area;

an interlayer insulator film formed to cover said first wiring conductor and said second wiring conductors;

a first bonding pad formed on said interlayer insulator film as one of said I/O terminals, said first bonding pad being provided over a corresponding one of said second bonding pad areas electrically connected to said first wiring conductor;

second bonding pads formed on said interlayer insulator film as the other of said I/O terminals, said second bonding pads being provided over said second bonding pad areas, except for said second bonding pad area corresponding to said first bonding pad being electrically connected to said second conductors, respectively; and

an electrode for capacitance measurement provided over said first bonding pad area opposite to said first wiring conductor through said interlayer insulator film, said electrode being isolated from said first wiring conductor and said second wiring conductors;

wherein a capacitance of said interlayer insulator film is measured by using said electrode and said first bonding pad.

5,466,957

TRANSISTOR HAVING SOURCE-TO-DRAIN NONUNIFORMLY-DOPED CHANNEL AND METHOD FOR FABRICATING THE SAME

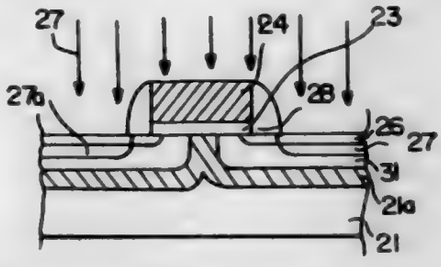
Masaru Yuki, and Kenichi Tanaka, both of Fukuyama, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1992, Ser. No. 969,325

Claims priority, application Japan, Jan. 31, 1991, 3-286646; Apr. 10, 1992, 4-089179

Int. Cl.[6] H01L *29/10;29/78*

U.S. Cl. 257—344 **4 Claims**



1. A semiconductor device comprising:

a substrate of a first conductivity type,

an insulating film stacked on the substrate,

a gate electrode stacked on the insulating film,

source and drain regions of a second conductivity type in a surface of the substrate and in proximity to the gate electrode,

a high concentration layer of the first conductivity type having an impurity concentration higher than that of the substrate and surrounding the entire drain region up to the surface of the substrate, and

a low concentration layer of the first conductivity type lying between the drain region and the high concentration layer, having an impurity concentration lower than that of the high concentration layer and surrounding the entire drain region up to the surface of the substrate.

5,466,958

MOS-TYPE SEMICONDUCTOR DEVICE HAVING ELECTRODE STRUCTURE CAPABLE OF COPING WITH SHORT-CHANNEL EFFECT AND MANUFACTURING METHOD THEREOF

Masakazu Kakumu, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Nov. 1, 1993, Ser. No. 146,717

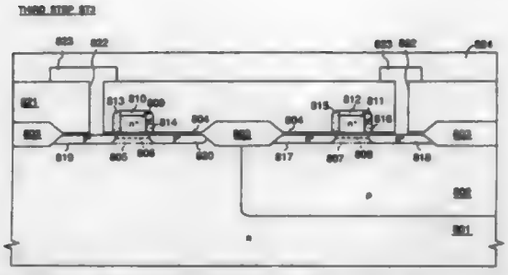
Claims priority, application Japan, Jan. 30, 1992, 4-292774

Int. Cl.[6] H01L *29/10;29/78*

U.S. Cl. 257—345 **3 Claims**

1. A semiconductor device comprising:

a substrate formed of semiconductor having a first conductive type;



an element dividing insulation layer that divides the substrate into element regions and insulation regions between the element regions;

a gate insulation layer formed on the element regions;

a channel formation layer disposed within an element region between the substrate and the gate insulation layer;

a source electrode formed on one side of the channel formation layer and having a high concentration of impurities of a second conductivity type;

a drain electrode formed on an other side of the channel formation layer and having a high concentration of impurities of the second conductivity type;

said channel formation layer comprising a first impurity addition layer for preventing punch through positioned between the substrate and the gate insulation layer, said channel formation layer further comprising a second impurity addition layer positioned between the first impurity addition layer and the gate insulation layer, wherein the second impurity addition layer comprises a central portion for regulating a threshold voltage and being supplied a voltage in excess of the threshold value and edge portions which are supplied a voltage of a second predetermined value less than the threshold value; and

a gate electrode formed on the gate insulation layer and including a first polysilicon layer having a high concentration of impurities of the first conductivity type and positioned at a portion corresponding to the center portion of the second impurity addition layer and an oxide layer stacked on the first polysilicon layer, the gate electrode further including second polysilicon layers having a high concentration of impurities of the second conductivity type and positioned along either side of the first polysilicon layer and the oxide layer, wherein the second polysilicon layers are positioned over portions of the source and drain electrodes and over the edge portions of the second impurity addition layer.

5,466,959

SEMICONDUCTOR DEVICE FOR INFLUENCING THE BREAKDOWN VOLTAGE OF TRANSISTORS

Alfred Goerlach, Kusterdingen; Hartmut Michel, Reutlingen, and Anton Mindl, Tuebingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 5, 1994, Ser. No. 349,720

Claims priority, application Germany, Dec. 17, 1993, 43 43 140.2

Int. Cl.[6] H01L *29/72;29/40*

U.S. Cl. 257—361 **8 Claims**

1. A semiconductor device for influencing a breakdown voltage of a transistor, comprising:

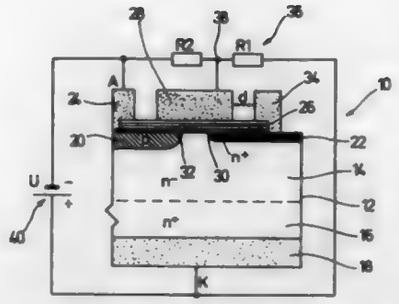
a surface electrode arranged over a space charge region of a silicon chip, the surface electrode having a potential between a base and a collector determined by a voltage divider; and

an oxide layer separating the surface electrode and the space charge region;

wherein the surface electrode includes first and second electrode plates insulated from one another, with:

the first electrode plate extending over a first junction between a first n^+ collector region and an n^- collector region of the silicon chip, over the n^- collector region, and over a second junction between the n^- collector region and a p-type base region; and

the second electrode plate being bonded partly over the oxide layer and partly with the first n^+ collector region.



5,466,960

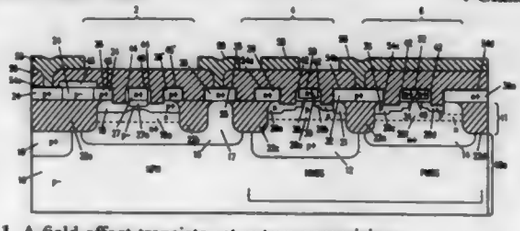
BICMOS DEVICE HAVING SELF-ALIGNED WELL TAP AND METHOD OF FABRICATION

Vida Ilderem, Puyallup, and Steven M. Leibiger, Graham, both of Wash., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 503,345, Apr. 2, 1990, Pat. No. 5,079,182. This application Aug. 20, 1991, Ser. No. 753,272

Int. Cl.[6] H01L *27/02*

U.S. Cl. 257—369 **4 Claims**



1. A field effect transistor structure comprising:

a substrate having source and drain regions with upper surfaces;

a first well region of said substrate substantially surrounding at least portions of said source and drain regions, said well region having a first conductivity type;

a channel region adjacent said source and drain regions;

a gate oxide layer formed on the surface of said substrate adjacent at least a portion of said channel region;

a polysilicon gate formed over said oxide layer, said gate having an upper surface and at least one sidewall, an oxide spacer being positioned on said sidewall of said gate, said source and drain regions and said gate defining a first field effect device;

a first polysilicon region having said first conductivity type at least partially adjacent an upper surface of at least one of said source and drain regions, said first polysilicon region having upper and sidewall surfaces;

a connective region formed in said substrate of said first conductivity type adjacent at least a portion of said source and drain regions and adjacent at least a portion of said first polysilicon region, said connective region providing at least a portion of a substantially conductive pathway between said first polysilicon region and said first well region, to configure said first polysilicon region as a well tap; and

metal silicide substantially coating at least said upper surface and at least one sidewall surface of said first polysilicon region and extending over at least a portion of said upper surface of said one of said source and drain regions substantially from said sidewall of said first polysilicon region to said oxide on said sidewall of said gate, without said metal silicide directly contacting said first well region said metal silicide providing a substantially conductive pathway between said one of said source and drain regions and said first polysilicon

region to configure said first polysilicon region as a contact for said one of said source and drain regions.

5,466,961

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

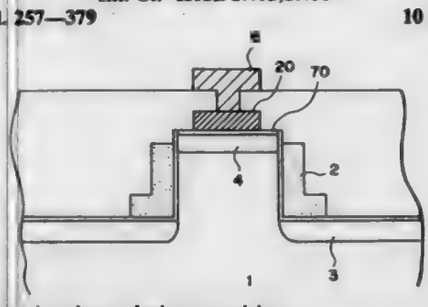
Shin Kikuchi, Isehara; Mamoru Miyawaki, Tokyo; Genzo Monma, Hiratsuka; Hayao Ohzu, Kawasaki; Shunsuke Inoue, Yokohama; Yoshio Nakamura, Atsugi; Takeshi Ichikawa, Zama; Osamu Ikeda, Tokyo, and Tetsunobu Kohchi, Hiratsuka, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1992, Ser. No. 872,295

Claims priority, application Japan, Apr. 23, 1991, 3-92304; Apr. 23, 1991, 3-92305; Apr. 26, 1991, 3-97243; Jun. 28, 1991, 3-184168; Jun. 28, 1991, 3-184169; Jun. 28, 1991, 3-184170; Jun. 28, 1991, 3-184171

Int. Cl.[6] H01L *27/02;29/10*

U.S. Cl. 257—379 **10 Claims**



1. A semiconductor device comprising:

an insulated gate type transistor having a columnar semiconductor region formed on a main side of a semiconductor substrate, and a gate electrode formed on a side surface of said columnar semiconductor region while interposing a gate insulating film and two main electrode regions respectively formed above and below said columnar semiconductor region; and

a memory element layer which is formed on said main electrode region and which can be broken electrically,

wherein said memory element layer has an area which is the same as or smaller than an area of an upper surface of said main electrode region, and said memory element layer does not extend beyond the area of the upper surface.

5,466,962

LIGHT-RECEIVING SEMICONDUCTOR DEVICE WITH PLURAL BURIED LAYERS

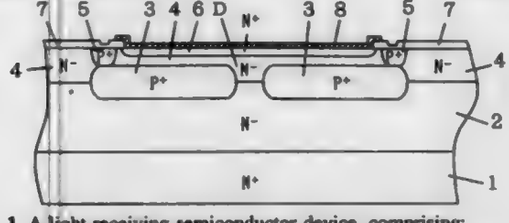
Motohiko Yamamoto, and Masaru Kubo, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Apr. 15, 1994, Ser. No. 227,878

Claims priority, application Japan, Apr. 19, 1993, 5-091269

Int. Cl.[6] H01L *27/14;31/00*

U.S. Cl. 257—437 **8 Claims**



1. A light receiving semiconductor device, comprising:

a semiconductor substrate of a rest conductivity type having a two dimensional surface defining a horizontal plane,

a plurality of buried layers of a second conductivity type formed along said horizontal plane of said substrate and divided by a dividing region,

a surface semiconductor layer of the first conductivity type covering said buried layers and said substrate,

a connection semiconductor region of the second conductivity type extending from each of said plurality of buried layers to a surface of said surface semiconductor layer, and

an anti-light-reflecting film formed on a surface of said surface semiconductor layer covering a region above said dividing region and extending above a substantial portion of each said plurality of buried layers,

wherein said plurality of buried layers of the second conductivity type form plural light responsive elements with said substrate of the first conductivity type along said horizontal plane.

5,466,963

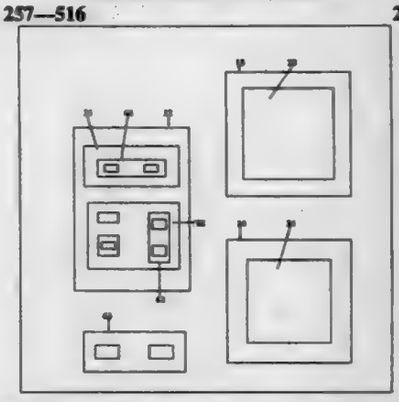
TRENCH RESISTOR ARCHITECTURE

James D. Beasom, Melbourne Village, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 13, 1994, Ser. No. 180,737

Int. Cl.[6] H01L *27/12;27/02*

U.S. Cl. 257—516 **24 Claims**



1. A semiconductor device comprising a semiconductor substrate subdivided by a trench pattern into a plurality of spaced-apart semiconductor islands, such that respective ones of said spaced-apart semiconductor islands are surrounded laterally by respective continuous trenches of said trench pattern, said respective continuous trenches of said trench pattern having bottom and sidewalls thereof coated with dielectric material, whereby said spaced-apart semiconductor islands are dielectrically isolated from one another, and wherein at least one island of said spaced-apart semiconductor islands or a portion of said substrate other than said islands has a resistor device defined by a resistor trench strip formed therein, said resistor trench strip containing bottom and sidewalls thereof coated with dielectric material, and wherein said respective continuous trenches of said trench pattern and said resistor trench strip have the same trench fill material formed on said dielectric material, and further including spaced-apart resistor contacts ohmically contacting the trench fill material of said resistor trench strip.

5,466,964

SEMICONDUCTOR DEVICE CAPABLE OF INCREASING RELIABILITY

Masato Sakao, and Shuichi Ohya, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 7, 1993, Ser. No. 116,569

Claims priority, application Japan, Sep. 7, 1992, 4-237948

Int. Cl.[6] H01L *27/02;29/68;29/78*

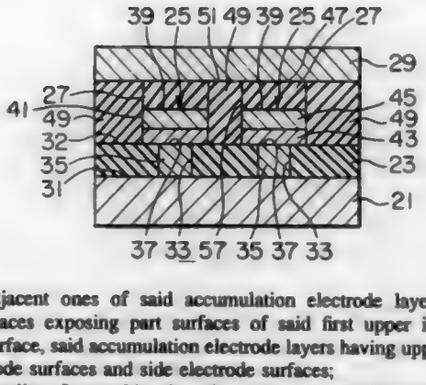
U.S. Cl. 257—532 **3 Claims**

1. A semiconductor device comprising:

a semiconductor substrate having a principal surface;

a first insulator layer overlying said principal surface and having a first upper insulator surface;

a plurality of accumulation electrode layers overlying said first upper insulator surface with spaces being formed between



adjacent ones of said accumulation electrode layers, said spaces exposing part surfaces of said first upper insulator surface, said accumulation electrode layers having upper electrode surfaces and side electrode surfaces;

a plurality of second insulator layers overlying said part surfaces and being in contact with said side electrode surfaces, said second insulator layers having second upper insulator surfaces, each of said second insulator layers having a primary dielectric constant;

a dielectric layer overlying said upper electrode surfaces and said second upper insulator surfaces and having an upper dielectric surface and a secondary dielectric constant which is higher than said primary dielectric constant; and

an opposed electrode layer overlying said upper dielectric surface; and

wherein said primary dielectric constant is from 3 to 30, said second dielectric constant being from 200 to 2,000.

5,466,965

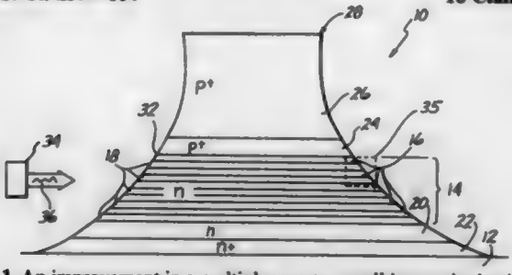
HIGH EFFICIENCY, HIGH POWER MULTIQUANTUM WELL IMPATT DEVICE WITH OPTICAL INJECTION LOCKING

Charles C. Meng, Los Angeles, and Harold R. Fetterman, Pacific Palisades, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Dec. 2, 1992, Ser. No. 994,148

Int. Cl.[6] H01L *29/90;31/10*

U.S. Cl. 257—604 **16 Claims**



1. An improvement in a multiple quantum well impact ionization avalanche transit time device (IMPATT) having a P+ substrate, a P+ buffer disposed adjacent to said P+ substrate, at least one N type heterojunction disposed adjacent to said P+ buffer, an N type drift region disposed adjacent to said at least one N type heterojunction, and an N+ type cap layer disposed adjacent to said N type drift layer,

wherein said at least one heterojunction further comprises the improvement of a plurality of N type heterojunctions having an energy bandgap greater than the energy bandgap of said P+ buffer to form a corresponding plurality of quantum wells disposed adjacent to said P+ buffer, said plurality of quantum wells comprising a plurality of pairs of layers forming each junction, one layer of said pair being a barrier layer and the other layer of said pair being a quantum well layer, the thickness of said layers having a length of approximately comparable to the energy relaxation length of electrons and holes,

whereby a high power high efficiency multiple quantum well IMPATT device is provided.

5,466,966

METHOD OF MANUFACTURING LEAD FRAME, AND LEAD FRAME

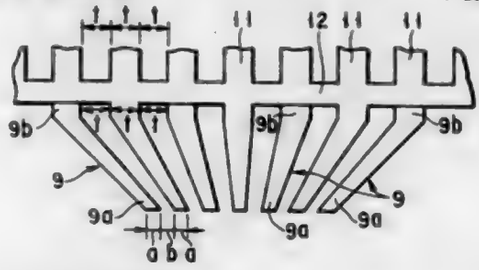
Seigo Ito, Souka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 191,203, Feb. 3, 1994, abandoned. This application Apr. 14, 1995, Ser. No. 422,647

Claims priority, application Japan, Feb. 5, 1993, 5-018594

Int. Cl.[6] H01L *23/48;29/44;29/52;29/60*

U.S. Cl. 257—666 **7 Claims**



1. A lead frame comprising:

a lead frame block formed of a metal plate material having first and second opposite surfaces;

a plurality of leads projecting from the lead frame block having proximal end portions attached to the lead frame block, each proximal end portions having a thickness "t," and opposite distal end portions, the proximal end portions of the plurality of leads being attached at predetermined intervals alternately to the first and second surfaces of the lead frame block, the distal end portions being substantially the same height and being aligned with one another with each two adjacent distal end portions spaced from one another by an interval "b," wherein "t" is greater than "b".

5,466,967

LEAD FRAME FOR A MULTIPLICITY OF TERMINALS

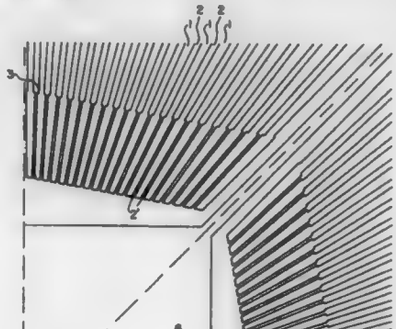
Hugo Westerkamp, Wolfenbuettel-Salzdahlum, Germany, assignor to LSI Logic Products GmbH, Braunschweig, Germany

Continuation of Ser. No. 141,986, Oct. 28, 1993, abandoned, which is a continuation of Ser. No. 952,473, Sep. 28, 1992, Pat. No. 5,270,570, which is a continuation of Ser. No. 626,720, Dec. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 419,168, Oct. 10, 1989, abandoned. This application Jan. 19, 1995, Ser. No. 375,273

Claims priority, application Germany, Jan. 10, 1988, 38 34 361.4

Int. Cl.[6] H01L *23/48;29/46;29/54;29/62*

U.S. Cl. 257—666 **7 Claims**



1. An apparatus, comprising:

a bonding pad for receiving a semiconductor chip having a plurality of terminals;

a lead frame for connection to said terminals, said lead frame being arranged in a very confined space and comprising a plurality of metallic conductors of uniform thickness which can be connected to the terminals, the metallic conductors having a relatively large spacing between them in an outer region and a relatively narrow spacing between them in an inner region adjacent said bonding pad, said relatively large spacing being produced by a first lead forming technique and said narrow spacing being produced by laser cutting a uniform metallic material, said narrow spacing having a width which is smaller than the minimum spacing producible by said first lead forming technique,

wherein the metallic conductors are produced over the majority of their length by the first lead forming technique,

wherein said relatively large spacings and said relatively small spacings are uniform, and

wherein said conductors have respective longitudinal axes, each of which extends in a single straight line from said inner region to said outer region.

5,466,968

LEADFRAME FOR MAKING SEMICONDUCTOR DEVICES

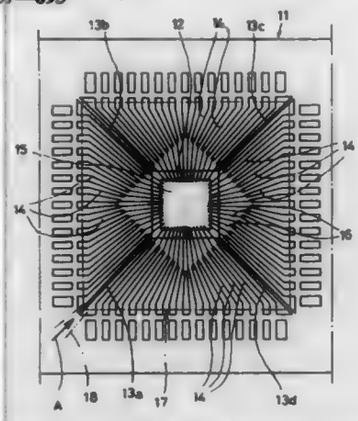
Hiroshi Okumura, and Atsuhito Negoro, both of Kyoto, Japan, assignors to Rohm Co. Ltd., Kyoto, Japan

Filed Nov. 1, 1994, Ser. No. 327,835

Claims priority, application Japan, Nov. 2, 1993, 5-274117

Int. Cl.[6] H01L *23/48;29/44;29/52*

U.S. Cl. 257—693 **2 Claims**



1. A leadframe for making at least one semiconductor device comprising:

at least one island arranged centrally widthwise of the leadframe and having four corner portions;

four bridging legs radially extending from the respective corner portions of the island, the bridging legs being integral with the leadframe and island; and

a multiplicity of leads radially extending toward but spaced from the island, the leads being integral with the leadframe;

wherein the leads have respective tips which are progressively closer to the island toward the respective bridging legs;

wherein the respective tips of the leads located between each bridging leg and a middle point of each two adjacent bridging legs are arranged on a straight line which is inclined relative to a corresponding side of the island; and

wherein the straight line is inclined relative to the corresponding side of the island by 45 degrees.

5,466,969

INTELLIGENT POWER DEVICE MODULE

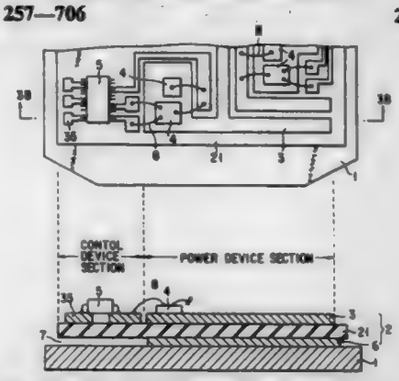
Tetsujiro Tsunoda, Fujisawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 972,310, Nov. 5, 1992, Pat. No. 5,384,683. This application Sep. 29, 1994, Ser. No. 314,626

Claims priority, application Japan, Nov. 7, 1991, 3-318550

Int. Cl.[6] H01L *39/02;23/02;23/16*

U.S. Cl. 257—706 **20 Claims**



1. A semiconductor device module comprising:

a mounting board including an insulating substrate having an electrically insulating property, an electric wiring pattern provided on one side surface of said insulating substrate, and a metal layer having a cutaway portion and provided on another side surface opposite to said one side surface of said insulating substrate;

a power device section including a power device electrically connected to said electric wiring pattern, said power device section being provided above said metal layer;

a control device section including a control device electrically connected to said electric wiring pattern, for controlling said power device of said power device section, said control device section being provided above said cutaway portion; and

a metal plate joined to said metal layer.

5,466,970

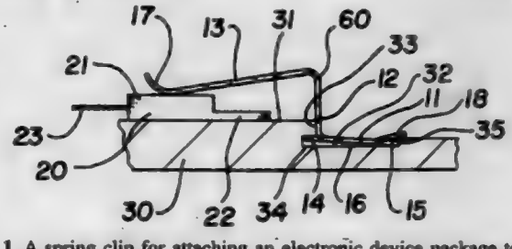
HOOKED SPRING CLIP

Matthew C. Smithers, Lewisville, Tex., assignor to Thermalloy, Inc., Dallas, Tex.

Filed Aug. 24, 1992, Ser. No. 933,781

Int. Cl.[6] H01L *23/34;23/06*

U.S. Cl. 257—712 **12 Claims**



1. A spring clip for attaching an electronic device package to a heat sink comprising a unitary body defining:

(a) a base portion having first and second ends extending in opposite directions from and substantially coplanar with a substantially flat face;

(b) a spring portion extending from said base portion intermediate said first and second ends and projecting in a direction opposite said substantially flat face; and

(c) a finger portion extending from said spring portion and adapted to mate with an electronic device package and urge the device package into contact with a heat sink;

wherein said substantially flat face lies in a first plane and said finger portion projects from said spring portion toward said first plane.

5,466,971

SEMICONDUCTOR DEVICE HAVING A MULTILAYER INTERCONNECTION LAYER

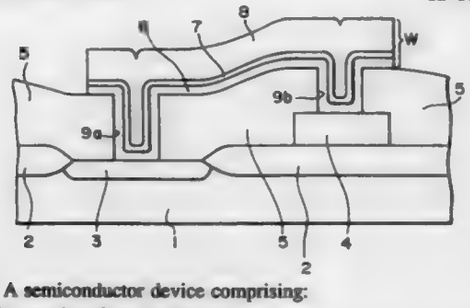
Toshihiko Higuchi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 86,897, Jul. 7, 1993, abandoned. This application Oct. 31, 1994, Ser. No. 332,455

Claims priority, application Japan, Jul. 8, 1992, 4-181221; Jun. 2, 1993, 5-156195

Int. Cl.[6] H01L *23/48;23/46;29/54*

U.S. Cl. 257—751 12 Claims



1. A semiconductor device comprising:

(a) a semiconductor substrate;

(b) a conductive region substantially made of a semiconductor substance;

(c) an insulating layer covering a surface of said semiconductor substrate at an area including said conductive region;

(d) a contact hole formed in said insulation layer to electrically connect with said conductive region, said contact hole formed by removing a part of said insulating layer; and

(e) a multilayer interconnection layer electrically connecting to said conductive region through said contact hole, said multilayer interconnection layer comprising:

a conductive layer substantially made of polycrystalline silicon formed over said conductive region, said conductive layer formed along an inside wall of said contact hole and having a thickness smaller than a half length of a diameter of said contact hole,

a refractory metal filling a recess of said contact hole over said conductive layer formed along the inside wall of said contact hole,

a barrier metal layer formed over said refractory metal filling the recess of said contact hole, and

a metal wiring layer made chiefly of aluminum formed over said barrier metal layer.

5,466,972

METALLIZATION FOR POLYMER-DIELECTRIC MULTICHIP MODULES INCLUDING A TI/PD ALLOY LAYER

Aaron L. Frank, Malden, Mass.; Ajibola O. Ibidunni, Litchfield, N.H.; Douglas B. Johnson, Hampstead, N.H.; Dennis L. Krause, Atkinson, N.H., and Trac Nguyen, Haverhill, Mass., assignors to AT&T Corp., Murray Hill, N.J.

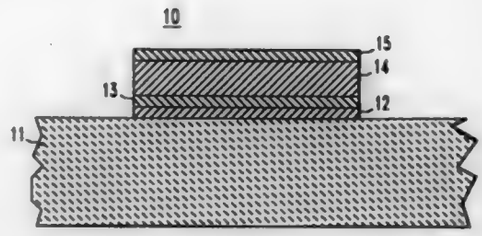
Filed May 9, 1994, Ser. No. 239,797

Int. Cl.[6] H01L *29/46;29/54;29/62*

U.S. Cl. 257—764 8 Claims

1. A circuit including thin film elements and electrical interconnections on the major surface of an insulating substrate, said interconnections comprising in an ascending order from the substrate

a first metal layer comprising titanium;



a second metal layer comprising an alloy of titanium and palladium, said alloy comprising 0.3 to 14 weight percent palladium based on the weight of the alloy;

a third metal layer comprising copper; and

a fourth metal layer comprising an alloy of titanium and palladium, said alloy comprising 0.3 to 14 weight percent palladium based on the weight of the alloy.

5,466,973

DELIVERY POINT VOLTAGE REGULATION IN ELECTRIC ENERGY DISTRIBUTION NETWORKS

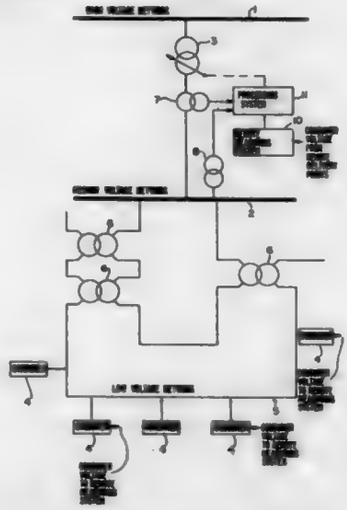
Jan H. Griffioen, Pijnacker, Netherlands, assignor to N.V. Geb Zuid-Holland West, The Hauge, Netherlands

Filed Apr. 29, 1993, Ser. No. 54,613

Claims priority, application Netherlands, Apr. 29, 1992, 9200783

Int. Cl.[6] H02J *3/00*

U.S. Cl. 307—17 7 Claims



1. A method for regulating the voltage at which electric energy is supplied at the delivery points in a network for distributing electricity, whereby the voltage of electric energy supplied through a high-voltage network is reduced to a voltage suitable for a medium-voltage network by means of at least one variable transformer, whilst the voltage of the electric energy in the medium-voltage network is reduced, by means of at least one transformer, to a voltage suitable for a low-voltage network supplying the electric energy to the consumers, whereby the adjustment of the variable transformer between a high-voltage network and a medium-voltage network is influenced by the actual voltage measured and the current or load at the output side of the variable transformer, characterized in that the voltage prevailing at the delivery point is measured at the location of at least a number of consumers and that the variable transformer is set also in dependence on the voltage thus measured at the consumers' location.

5,466,974

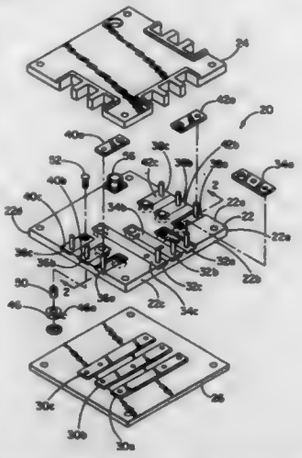
ELECTRIC POWER DISTRIBUTION MODULE FOR AN ELECTRIC POWER GENERATION AND DISTRIBUTION SYSTEM

Thomas Sutrina, Rockford; Lawrence E. Crowe, Lindenwood; Edward W. Smith, Pecatonica; Ronald F. Peterson, and Richard J. Hoppe, both of Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 19, 1993, Ser. No. 19,507

Int. Cl.[6] H02J 1/00

U.S. Cl. 307—38 47 Claims



1. An electric power distribution module comprising:

a generally planar, electrically insulative support structure having first and second generally parallel faces,

the first face of the support structure including a plurality of non-intersecting channels for receipt therein of a plurality of bus bars,

the second face of the support structure including a plurality of non-intersecting grooves oriented transversely to the channels for receipt therein of a plurality of bus connector straps,

the support structure thus providing electrical isolation between the bus bars and the bus connector straps,

the support structure further including a hole extending through the support structure at a crossing of a bus bar and a bus connector strap for receipt therein of connection means adapted to pass through the hole and to electrically connect the bus connector strap to the bus bar,

the bus bars, connector straps, and connection means in combination providing electrically conductive bus means having an input and an output and defining a circuit for directing a flow of electrical current from the input to the output; and

current sensing means within insulative support structure for sensing a flow of electrical current in the circuit.

5,466,975

SWITCHED TERMINATION FOR BUS TAP-OFF LINE

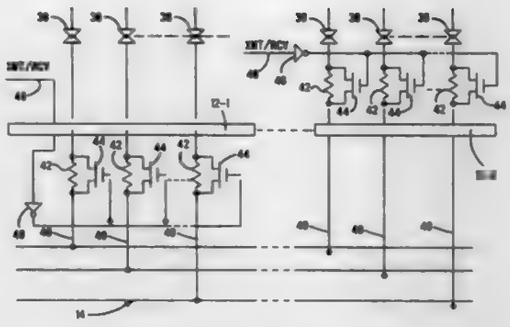
Kenneth B. Wratten, San Jose, Calif., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Aug. 13, 1993, Ser. No. 107,351

Int. Cl.[6] H03K 17/00;19/0175

U.S. Cl. 307—100 4 Claims

1. An arrangement for terminating a tap-off line (40) between a bus line (14) and a bi-directional signal driver (38), comprising a resistor (42) serially connected in the tap-off line between a bus line (14) and a bi-directional signal driver (38); controllable switch means (44) connected across said resistor for selectively bypassing said resistor; and means (46, 48) for controlling said switch means to bypass said resistor when said bi-directional signal driver transmits signals to said bus.



5,466,976

TIME CONSTANT DETECTING CIRCUIT AND TIME CONSTANT ADJUSTING CIRCUIT

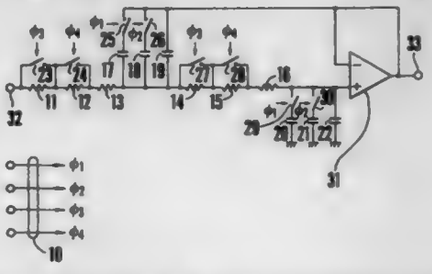
Masaki Ichihara, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 28, 1992, Ser. No. 997,500

Claims priority, application Japan, Dec. 26, 1991, 3-357891

Int. Cl.[6] H03H 11/12

U.S. Cl. 307—112 20 Claims



1. A time constant detecting circuit incorporated in an LSI, as part of an associated circuit, the time constant detecting circuit comprising:

a resistance voltage dividing circuit including:

a pseudo-resistor formed by a switched capacitor circuit having a capacitor having one end connected to a ground and an ordinary resistor connected in series With said pseudo-resistor for dividing an applied predetermined DC voltage; and

a smoothing capacitor for smoothing voltage divided by said resistance dividing circuit.

5,466,977

METHODS FOR PRODUCING BEARING SURFACES

Jack G. Bitterly, Woodland Hill, and Steven E. Bitterly, Agoura, both of Calif., assignors to American Flywheel Systems, Inc., Bellevue, Wash.

Division of Ser. No. 848,879, Mar. 10, 1992, Pat. No. 5,268,608, which is a division of Ser. No. 640,282, Jan. 11, 1991, Pat. No. 5,124,605. This application Sep. 10, 1993, Ser. No. 119,707

Int. Cl.[6] H02K 7/02;5/16;7/08

U.S. Cl. 310—74 5 Claims

1. In a system comprising:

a shaft which defines an axis of rotation; and

a body adapted to rotate around said axis wherein:

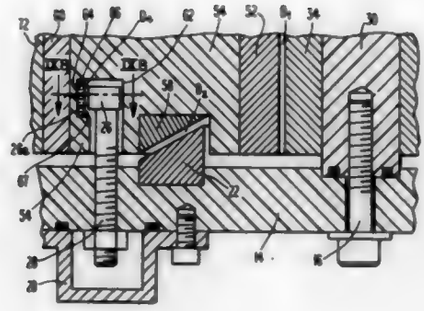
said body comprises at least one continuous surface which faces toward the axis; and

a portion of said body is disposed between said continuous surface and said shaft;

a process for producing a bearing surface, comprising the steps of:

placing a liquid proximate the continuous surface;

rotating the body around the axis such that the liquid forms a substantially uniform layer in contact with the continuous surface; and



positioning a member opposite the bearing surface.

5,466,978

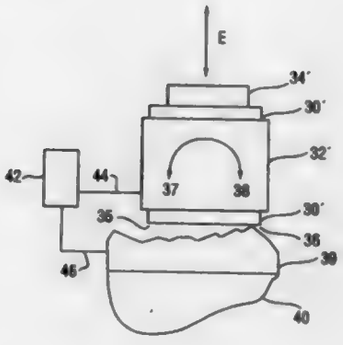
Patent Not Issued For This Number

5,466,979

METHODS AND APPARATUS TO REDUCE WEAR ON SLIDING SURFACES

Michael D. Bryant, Austin, Tex., and Jau-Wen Lin, Changhua City, Taiwan, Prov. of China, assignors to Board of Regents, The University of, Austin, Tex.

Filed Mar. 3, 1993, Ser. No. 26,676
Int. Cl.[6] H02K *13/00*; H01R *39/18;39/24*
U.S. Cl. 310—248 **24 Claims**



1. Apparatus for reducing wear on first and second surfaces in substantially sliding contact at a zone of contact, the zone comprising a reference plane of contact, and relative movement between the surfaces having a direction of movement, the apparatus comprising

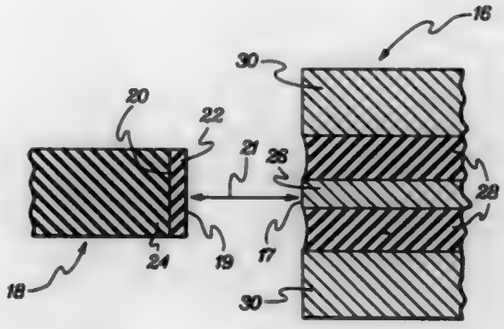
a vibration force actuator coupled to the first surface to impart a vibratory movement to the first surface, said vibratory movement being substantially perpendicular to the reference plane of contact and substantially nonuniform across the zone of contact, wherein the nonuniform movement across the zone of contact being a greater movement of one surface with respect to the other in some portion of the zone, relative to the analogous movement in another portion of the zone.

5,466,980

CHARGED ROTOR POLE MICROMACHINE MOTOR

Michael D. Potter, Grand Isle, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 29, 1994, Ser. No. 346,063
Int. Cl.[6] H02N *1/00*
U.S. Cl. 310—309 **20 Claims**



1. An electrostatic micromachine motor, comprising:

a rotor having a hub and one or more rotor poles extending radially outward from a central axis of said hub; and

an electron trap region formed near an exposed end of said one or more rotor poles, said electron trap region being formed between a first layer and a second layer, with said first layer being the exposed end of said pole.

5,466,981

INTEGRAL REFLECTOR LAMP

Larry R. Fields, Richmond, Ky.; Jerald D. Will, Bath, N.Y., and Mark S. Rense, Richmond, Ky., assignors to Philips Electronics North America Corporation, New York, N.Y.

Continuation of Ser. No. 129,793, Sep. 30, 1993, abandoned, which is a continuation of Ser. No. 629,880, Dec. 19, 1990, abandoned. This application Jul. 1, 1994, Ser. No. 269,975
Int. Cl.[6] H01J *17/18;61/34*
U.S. Cl. 313—113 **10 Claims**

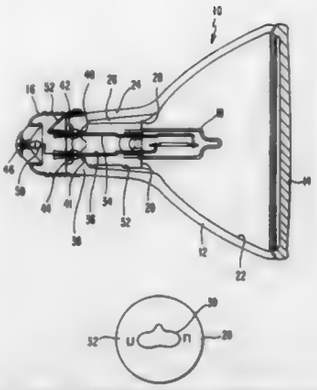
1. A reflector lamp comprising:

a reflector housing, having a reflector portion and a neck portion, said neck portion including seating means disposed at a predetermined location;

a base joined to said reflector housing for mounting to an external fixture;

a light source element having leads extending rearwardly therefrom for electrical connection to said base;

a positioning member, constructed of deformable material, for mounting said light source element within said reflector housing, said positioning member having an opening for receiving



said light source element, said positioning member being received by said seating means of said housing; and

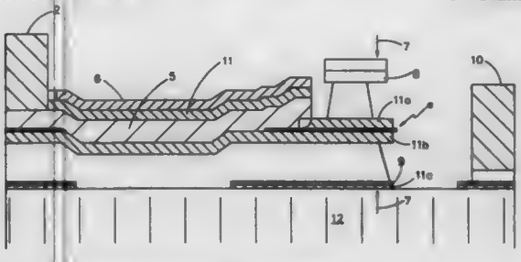
said housing further including means for holding said electrical leads of said light source element under tension so as to deform said positioning member and hold same in engagement with said seating means to position said positioning member and said light source element within said reflector housing.

5,466,982

COMB TOOTHED FIELD EMITTER STRUCTURE HAVING RESISTIVE AND CAPACITIVE COUPLED INPUT

Akintunde I. Akinwande, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 18, 1993, Ser. No. 101,123
Int. Cl.[6] H01J *1/30*
U.S. Cl. 313—309 **17 Claims**



1. A field emitter structure comprising:

a flat emitter structure, having an outer emitter edge constructed of thin film layered material;

a resistive element constructed of thin film layered material formed next to and connected in series with the flat emitter structure;

a lead-in conductor partially formed on and connected to the resistive element; and

a conductive element constructed of thin film layered material formed on a dielectric layered material which is in turn formed on the resistive element to form a capacitor element, so arranged and disposed such that said conductive element is capacitively coupled to the emitter edge; and

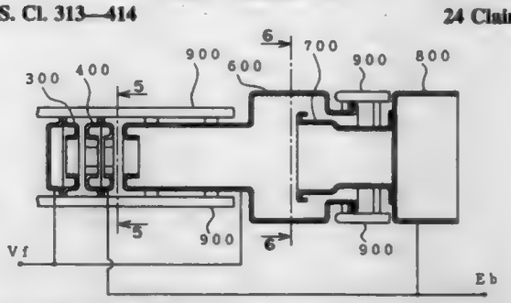
wherein the outer emitter edge, opposite that of the lead-in conductor, is segmented into a plurality of long strips resembling comb elements.

5,466,983

CATHODE RAY TUBE WITH IMPROVED RESOLUTION

Shoji Shirai, Mobara; Kenichi Watanabe, Ohtaki, and Shoichi Wakita, Ichihara, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1994, Ser. No. 194,500
Claims priority, application Japan, Feb. 24, 1993, 5-035497
Int. Cl.[6] H01J *29/46*
U.S. Cl. 313—414 **24 Claims**



1. A cathode ray tube having an electron gun comprising:

a beam generating section to generate a plurality of horizontally arranged and controlled electron beams;

a plurality of electrodes including electrodes which are arranged opposed to each other and coaxially with said electron beam generating section to form a main lens section; and

said main lens section focusing said plurality of electron beams from said beam generating section onto a phosphor screen;

wherein at least one pair of electrodes among said electrodes that form said main lens section and are opposed to each other are horizontally elongated in a transverse cross section where an end of one electrode of said at least one pair of electrodes forms a lens in cooperation with an other electrode of said at least one pair of electrode;

said one electrode of said at least one pair of electrodes is impressed with a low voltage and said other electrode of said at least one pair of electrodes is impressed with a high voltage;

said main lens section has electrode means for elongating horizontally a cross section of said electron beams entering said at least one pair of electrodes;

at least one of electrodes that make up said electrode means for elongating is impressed with said low voltage; and

an elongating strength of said electrode means for elongating said electron beam decreases as said low voltage increases.

5,466,984

IMPLOSION-RESISTANT BAND WITH STACK RETAINER

Hiroyuki Gotoh, Gihu, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 995,148, Dec. 22, 1992, abandoned.
This application Oct. 12, 1994, Ser. No. 321,590
Claims priority, application Japan, Dec. 26, 1991, 3-344499
Int. Cl.[6] H01J *29/87*
U.S. Cl. 313—477 R **15 Claims**

1. An implosion-resistant band for use on a screen panel of a cathode-ray tube body, comprising:

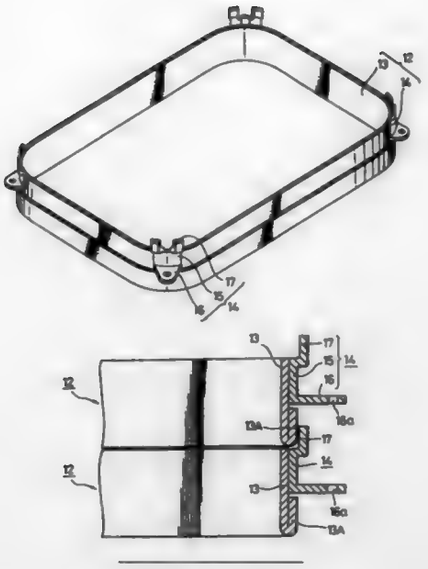
a metallic band element having a plurality of corners; and

a plurality of holders mounted respectively on said corners, each of said holders comprising:

a flange held against and welded to one of said corners;

an attachment arm bent from one edge of said flange, said attachment arm having an aperture for receiving a fastener and extending perpendicularly from a central portion of a width of said metallic band element; and

a stack retainer extending from an opposite edge of said flange and offset radially away from said metallic band element, and said retainer extending axially outwardly of said metallic band element.

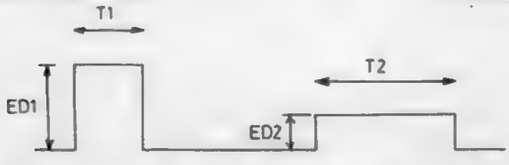


5,466,985

METHOD FOR NON-DESTRUCTIVELY DRIVING A THICKNESS SHEAR MODE PIEZOELECTRIC ACTUATOR

Masahiko Suzuki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 252,165, May 31, 1994, abandoned. This application Mar. 15, 1995, Ser. No. 405,400
Claims priority, application Japan, Jun. 30, 1993, 5-161519
Int. Cl.[6] H01L *41/09*
U.S. Cl. 310—333 10 Claims



1. A piezoelectric actuator driving method for applying an electric field to a polarized piezoelectric material in a direction perpendicular to a polarization direction of the piezoelectric material, the method comprising the steps of:

applying a cyclic electric field to said piezoelectric material as said electric field, the cyclic electric field having a maximum period of 100 ms per cycle; and

driving said piezoelectric actuator with the cyclic electric field, a duty ratio DR of said cyclic electric field determined by:

$$DR<[\{(T_C-T_D)/(T_C-273)\}\times\{(|E_C|-|E_D|)/|E_C|\}]^{\wedge}$$

where T_C is a Curie temperature of said piezoelectric material in ° K; E_C is a coercive electric field of said electric field; T_D is a driving temperature in ° K; and E_D is a driving voltage of the cyclic electric field.

5,466,986

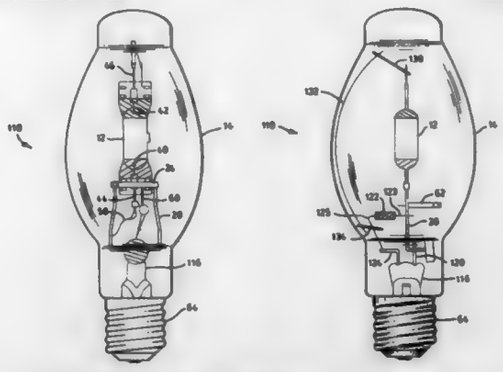
Patent Not Issued For This Number

5,466,987

RIGID MOUNTING FOR ARC DISCHARGE LAMP ARC TUBE

Glen P. Williamson, Manchester, N.H., assignor to Osram Sylvania Inc., Danvers, Mass.

Filed Dec. 23, 1991, Ser. No. 812,672
Int. Cl.[6] H01J *61/34*
U.S. Cl. 313—25 7 Claims



1. An arc discharge lamp comprising:

an light-transmissive lamp envelop;

a arc tube located within the lamp envelope for generating light when electrical energy is applied thereto, said arc tube including an arc generating and sustaining medium therein and having first and second main electrodes oppositely mounted therein and an auxiliary electrode positioned adjacent said first electrode;

a lamp stem sealed to the lamp envelope and having first and second substantially rigid stem leads extending therethrough;

a frame member mechanically connecting said first stem lead and a first end of said arc tube for providing a first means of support for said arc tube;

means for electrically connecting said first stem lead to said first main electrode;

means for connecting said second stem lead to said second main electrode; and

a second arc tube supporting means including a resistor having substantially rigid leads connected between said auxiliary electrode and said second stem lead.

5,466,988

HIGH PRESSURE DISCHARGE LAMP HAVING IMPROVED CONVECTION REGULATING MEANS

Makoto Horiuchi, Osaka; Kazutaka Koyama, Nishinomiya; Takayuki Kamitani, Osaka, and Masataka Ozawa, Takarazuka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 7, 1993, Ser. No. 59,218
Claims priority, application Japan, May 11, 1992, 4-117175; Nov. 16, 1992, 4-304313
Int. Cl.[6] H01J *7/24;61/52*
U.S. Cl. 313—35 17 Claims

1. A high pressure discharge lamp comprising:

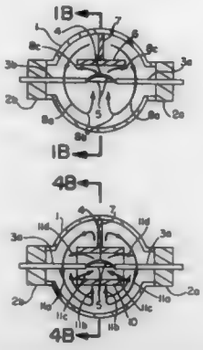
a discharge tube which is filled with gas;

a first electrode having a first end, said first electrode being provided in said discharge tube; and

a second electrode having a second end which is positioned away from said first end by a certain distance, said second electrode being provided in said discharge tube,

wherein arc discharge is induced by a voltage applied between said first end of said first electrode and said second end of said second electrode,

said high pressure discharge lamp further comprising convection regulating means which is electrically insulating and provided in said discharge tube, said convection regulating means suppressing the deformation of said arc discharge caused by the convection of said gas in said discharge tube, and



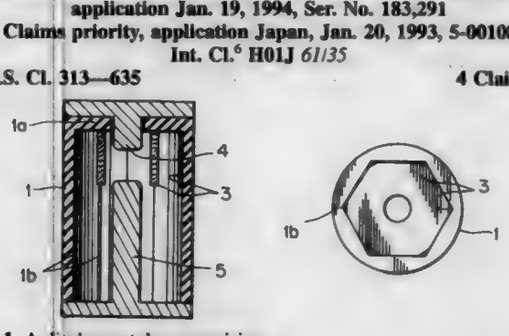
wherein a virtual straight line connecting said first end of said first electrode to said second end of said second electrode is set substantially horizontal such that during normal operation said lamp is in an overall substantially horizontal position, and wherein said convection regulating means is provided on at least one of upper and lower sides of said straight line.

5,466,989

DISCHARGE TUBE

Takashi Sato; Takahisa Suzuki; Hiromitsu Tsuchiya, and Tetsuya Mitani, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 127,275, Sep. 27, 1993. This application Jan. 19, 1994, Ser. No. 183,291
Claims priority, application Japan, Jan. 20, 1993, 5-001086
Int. Cl.[6] H01J *61/35*
U.S. Cl. 313—635 **4 Claims**



1. A discharge tube comprising:
a cylinder made of an insulation tube;
a pair of discharge electrodes provided at opposite ends of said cylinder, one of said electrodes being an anode and the other of said electrode being a cathode;
a plurality of grooves formed on the inner surface of said cylinder around the regions surrounding said cathode and a discharge space within said cylinder; and
a plurality of insulation coated lines containing a gas-ionization accelerator therein formed in each of said grooves, said insulation coated lines being provided in a substantially same distance with respect to a center axis of said cylinder.

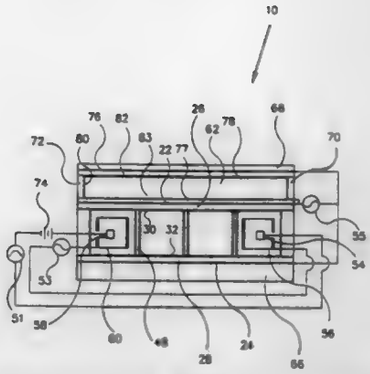
5,466,990

PLANAR FLUORESCENT AND ELECTROLUMINESCENT LAMP HAVING ONE OR MORE CHAMBERS

Mark D. Winsor, Olympia, Wash., assignor to Winsor Corporation, Olympia, Wash.

Continuation of Ser. No. 816,034, Dec. 31, 1991, Pat. No. 5,319,282. This application Feb. 10, 1994, Ser. No. 195,122
Int. Cl.[6] H01J *7/44*
U.S. Cl. 315—56 **22 Claims**

1. A fluorescent lamp, comprising:
a first sealed chamber having a gas of first selected pressure therein, said gas including mercury vapor that emits ultraviolet light when subjected to an electrical signal;



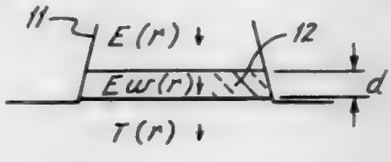
a plurality of interior walls within the first chamber, extending from a sidewall and terminating within the chamber to form a serpentine channel region within the first chamber to provide an extended length discharge path;
a first pair of electrodes positioned to apply an electrical potential to said gas within said first sealed chamber for causing said gas to emit ultraviolet light;
an ultraviolet light transparent member forming a top wall portion of said first sealed chamber, such that ultraviolet light that is emitted in said first sealed chamber passes through said light transparent member;
a second chamber above said first chamber and positioned above said ultraviolet light transparent member such that ultraviolet light emitted from said first sealed chamber passes through said ultraviolet light transparent member and into said second chamber;
a visible light transparent member forming a top wall portion of said second chamber to permit visible light to pass out of the top wall portion of said second chamber; and
a phosphor layer within said second chamber and positioned to receive ultraviolet light emitted from said first chamber and emit visible light when ultraviolet light impinges on said phosphor layer such that visible light is emitted by said phosphors in said second chamber as caused by ultraviolet light generated in said first sealed chamber that passed through said ultraviolet light transparent member.

5,466,991

OPTIMIZED ECR PLASMA APPARATUS WITH VARIED MICROWAVE WINDOW THICKNESS

Lee A. Berry, Oak Ridge, Tenn., assignor to Sematech, Inc., Austin, Tex.

Continuation of Ser. No. 129,211, Sep. 29, 1993, abandoned, which is a division of Ser. No. 916,317, Jul. 17, 1992, Pat. No. 5,306,985. This application Nov. 15, 1994, Ser. No. 340,140
Int. Cl.[6] H01J *7/24*
U.S. Cl. 315—111.41 **6 Claims**



1. An electron cyclotron resonance (ECR) plasma apparatus for processing a specimen comprising:
a plasma reactor for having said specimen disposed therein and in which an ECR zone is formed for discharge of plasma to process said specimen;

an electrical energy source for providing incident microwave energy to generate an electric field component for formation of said ECR zone in said reactor;

a microwave window coupled between said plasma reactor and said electrical energy source for directing said incident microwave energy as transmitted microwave energy to said ECR zone;

at least one main magnetic coil coupled about said reactor for generating a magnetic field component for formation of said ECR zone in said reactor;

said microwave window having a radial profile variation in effective thickness, which is measured in wavelengths, that corresponds to a non-uniform radial profile of amplitude of said incident microwave energy across said microwave window, wherein said radial profile variation of said microwave window attenuates or reflects said incident microwave energy correspondingly across its radial profile, such that said transmitted microwave energy from said window is compensated by said microwave window to have a substantially uniform amplitude across its radial profile in order to provide uniform absorption of said transmitted microwave energy by said plasma across its radial profile so as to provide uniform density plasma formation for discharge to said specimen.

5,466,992

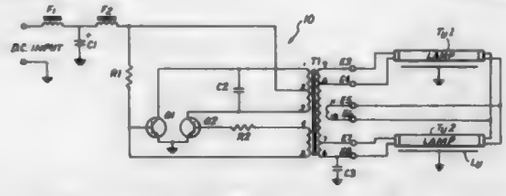
INVERTER BALLAST CIRCUIT FEATURING CURRENT REGULATION OVER WIDE LAMP LOAD RANGE

Arthur T. Nemirow, Silver Springs, and James C. Harper, Reno, both of Nev., assignors to Bruce Industries, Inc., Dayton, Nev.

Filed Aug. 19, 1992, Ser. No. 932,708

Int. Cl.[6] H05B *41/16*

U.S. Cl. 315—276 **10 Claims**



1. A ballast circuit for driving one or more fluorescent lamps constituting a fluorescent lamp load, comprising:

a transformer having a primary winding coupled to a secondary winding means by a magnetic core;

an inverter circuit including a resonant tank circuit wherein said primary winding constitutes the sole inductive load of said inverter;

said secondary winding including filament windings for supplying current to cathode filaments of said lamps and a high voltage winding for supplying a lamp current to said lamps;

characterized in that said transformer is physically constructed, configured and arranged to enhance the leakage inductance of said secondary winding sufficiently to obtain a reflected impedance of said high voltage winding upon said primary winding at least 6.5 times greater than the reflected impedance upon said primary winding of a selected maximum fluorescent lamp wattage load, thereby to maintain said lamp current approximately constant for lamp wattage loads smaller than said selected maximum over a range of lamp load wattages of at least 3 to 1.

5,466,993

DEFLECTION APPARATUS FOR RASTER SCANNED CRT DISPLAYS

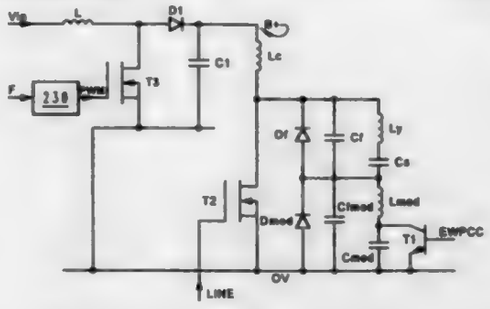
David Leaver, Keymer Hassocks, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1994, Ser. No. 214,725

Claims priority, application United Kingdom, May 26, 1993, 9310853

Int. Cl.[6] H01J *29/70*; G09G *1/04*

U.S. Cl. 315—411 **8 Claims**



1. A deflection apparatus for a raster scanned cathode ray tube display, the apparatus comprising:

a ramp generator having a flyback circuit including a first inductor connected in series with a first transistor switch, the first transistor switch being responsive to a line drive signal to alternately open and close a current path through the first inductor between a first voltage level and a second voltage level lower than the first voltage level to generate a raster scan current signal in a raster deflection coil of the display, the amplitude of the raster scan current signal being determined as a function of the first voltage level and the frequency of the line drive signal;

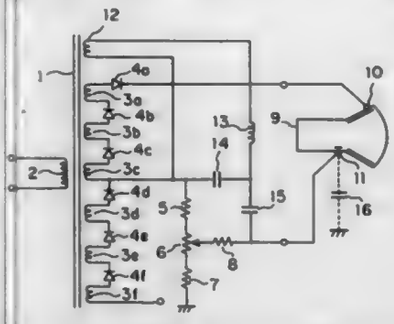
a boost circuit connected to the flyback circuit, the boost circuit comprising a second inductor connected in series with a second transistor switch, the second transistor switch being responsive to a pulse signal synchronized to the line drive signal to alternately open and close a current path through the second inductor between the second voltage level and a third voltage level higher than the second voltage level to generate the first voltage level, the first voltage level being determined as a function of the third voltage level and the width of the pulses of the pulse signal; and

a regulator connected to the flyback circuit and the boost circuit for varying the width of the pulses of the pulse signal as a function of the amplitude of the raster scan current signal to maintain a constant raster line width as the frequency of the line drive signal is varied, wherein the regulator includes a feedback circuit connected to the flyback circuit for generating a feedback signal as a function of the amplitude of the raster scan current signal, an error amplifier connected to the feedback circuit for generating an error signal as a function of the difference between the feedback signal and a reference level, and a pulse width modulator connected to the error amplifier and the boost circuit for modulating the width of the pulse signal as a function of the error signal, wherein the pulse width modulator includes a current sensor connected to the boost circuit for generating a ramp signal as a function of current flowing in the current path through the second inductor; a comparator connected to the error amplifier for generating an output signal when the ramp signal exceeds the error signal; and a latch connected to the boost circuit and the comparator for generating the pulse signal at the control electrode of the second transistor switch, the latch being set in response to the rising edge of the line drive signal, and the latch being reset in response to the output signal from the comparator.

5,466,994
FLY-BACK TRANSFORMER

Katsuyuki Akimoto; Takahiro Machida, and Yoshinori Ishii, all of Kyoto, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1994, Ser. No. 279,891
Int. Cl.[6] H01J *29/70*
U.S. Cl. 315—411 **22 Claims**



1. A fly-back transformer for generating a focus voltage to be applied to a cathode-ray tube, comprising:

an iron core;

a primary coil wound on said iron core for receiving a pulse voltage generated during a fly-back period of a horizontal sweep signal for said cathode-ray tube;

D.C. voltage generating means including at least one secondary coil wound on said iron core, for generating, in response to said pulse voltage, a D.C. voltage;

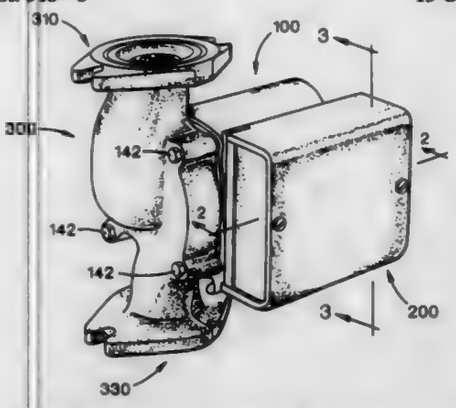
superimposing voltage generating means for generating a superimposing voltage, said superimposing voltage generating means including a third coil wound on said iron core and having a first and second end, said first end of said third coil being connected to an end of said at least one secondary coil supplying said D.C. voltage; and

superimposing means for superimposing said superimposing voltage on said D.C. voltage to generate said focus voltage.

5,466,995
ZONING CIRCULATOR CONTROLLER

Richard A. Genga, East Greenwich, R.I., assignor to Taco, Inc., Cranston, R.I.

Filed Sep. 29, 1993, Ser. No. 128,831
Int. Cl.[6] H02K *7/14*
U.S. Cl. 318—3 **15 Claims**



1. A zoning circulator for circulating fluid within a hydronic heating or cooling system, the zoning circulator comprising:

a wet-rotor circulator motor, the circulator motor comprising:

a motor housing,

a stator disposed within the motor housing and sealed from the circulating fluid,

a rotor housing disposed within the motor housing within the stator, the rotor housing being unsealed from the circulating fluid so that the fluid enters the rotor housing,

a rotor disposed within the rotor housing and in contact with the fluid, and

an impeller affixed to one end of the rotor, the stator and rotor configured with respect to one another so that the rotor is caused to rotate when the stator is energized;

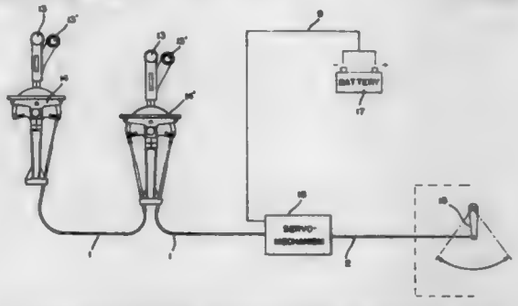
an impeller casing fastened to the motor housing, the impeller casing including an inlet end for accepting the circulating fluid flowing into the impeller casing, an impeller zone into which the impeller extends from the motor, the impeller zone being in fluid communication with the inlet of the impeller casing, and an outlet end for discharging the circulating fluid flowing from the impeller casing, and

a circulator controller physically attached to the circulator motor and including a speed regulating circuit for providing electrical drive signals to the motor to operate the motor, the speed regulating circuit controlling a rate at which the electrical drive signals are provided to the motor, the rate being representative of a preselected speed across a range of speed settings between a predetermined minimum speed setting and a predetermined maximum speed setting, wherein the speed regulating circuit operates the circulator motor for a predetermined initial period at a speed setting sufficient to generate a torque to overcome frictional resistances in the circulator motor and thereafter operates the circulator motor at the preselected speed setting of the speed regulating circuit.

5,466,996
ELECTROMECHANICAL REMOTE-CONTROL DEVICE

Giorgio Gai, and Walter Trivella, both of Genoa, Italy, assignors to Ultraflex S.r.L., Genoa, Italy

Filed Apr. 28, 1994, Ser. No. 233,958
Claims priority, application Italy, Dec. 16, 1993, GE93A0108
Int. Cl.[6] H02P *7/00*
U.S. Cl. 318—16 **9 Claims**



1. An electromechanical remote-control device comprising:

a first flexible control cable arranged in an external sheath and connected to an actuator of a control assembly;

a second driven flexible cable arranged in an external sheath and connected to an application that is to be controlled; and

a servomechanism powered by a power source for transmitting movements of said first control cable to said second driven cable and thus from the actuator to the application, wherein said servomechanism includes,

two coaxial neutral levers with two corresponding bodies, respectively, each body having a cylindrical sector which covers an arc of a circle that is slightly less than 180° including 180°-2α, where a first one of said levers is attached to said first control cable and a second one of said levers is attached to said second driven cable,

a drive shaft arranged coaxially inside the bodies of said levers,

a spiral spring arranged between the bodies of said levers and said drive shaft, said spiral spring having outward-facing opposing ends that extend between edges of said bodies, wherein said spring is tightly wound on said drive shaft,

a cursor attached to a sheath of said first control cable for effecting movements (X, Y) that are smaller in size and opposite in direction to the movement of said control cable in push or in pull,

a transducer connected to said cursor for detecting said movements (X, Y) of said cursor, and

an electronic control unit connected to said drive shaft in the two directions of rotation depending on movements (X, Y) of said cursor such that said remote control can be effected electromechanically or, in the event that the electromechanical components malfunction, mechanically, thus guaranteeing that control can be effected at all times.

5,466,997

SPIN MOTOR CONTROL SYSTEM FOR A HARD DISK ASSEMBLY

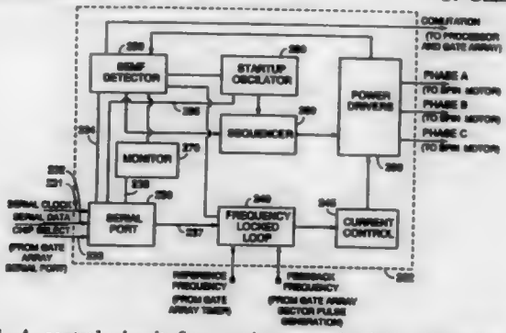
Michael R. Utenick, Niwot, and John H. Blagaila, Boulder, both of Colo., assignors to Integral Peripherals, Inc., Boulder, Colo.

PCT No. PCT/US91/09184, § 371 Date Jun. 15, 1993, § 102(e) Date Jun. 15, 1993

Continuation-in-part of Ser. No. 630,470, Dec. 19, 1990, Pat. No. 5,258,695. This PCT application Dec. 18, 1991, Ser. No. 75,572

Int. Cl.[6] H02P *6/14;6/20*

U.S. Cl. 318—254 **17 Claims**



1. A control circuit for a spin motor having a plurality of windings, said control circuit comprising:

a back EMF sensing circuit connectable to at least one winding of said spin motor wherein said back EMF sensing circuit in response to a back EMF induced in said at least one winding generates a back EMF output signal;

a first counter circuit having an input line coupled to said back EMF sensing circuit and an output line coupled to a spin motor sequencer circuit wherein said first counter circuit generates a signal on said output line that is used to commutate a phase of said spin motor;

a second counter circuit having an input line coupled to said back EMF sensing circuit and an output line coupled to said spin motor sequencer circuit wherein said second counter circuit generates a signal on said output line that is used to commutate said phase of said spin motor; and

a microprocessor interface coupled to said first and second counter circuit, for programming a first count value in said first counter circuit, and for programming a second count value in said second counter circuit.

10. A startup control circuit for a spin motor comprising:

a BEMF generating circuit having an input line coupled to said spin motor so that said input line receives a BEMF signal and an output line wherein said BEMF generating circuit generates a BEMF commutation pulse on said output line in response to said BEMF signal on said input line;

a counter circuit having an input line, a count direction control terminal, and an output line;

wherein said counter circuit changes a count value in response to a signal on said input line;

a startup pulse is generated on said output line upon said count value equaling a predetermined value; and

a signal on said count direction control terminal determines the direction of change of said count value;

a logic circuit having (i) an input line coupled to said output line of said BEMF generating circuit and (ii) an output line connected to said input line of said counter circuit;

a counter direction control circuit having an input line connected to said output line of said BEMF generating circuit and an output line connected to said count direction control terminal of said counter circuit;

wherein upon startup of said spin motor, said counter direction control circuit generates a signal having a first level on said output line so that said count value of said counter circuit changes value in a first direction in response to each clock pulse generated on said output line by said logic circuit; and

in response to said BEMF commutation pulse, said counter direction control circuit generates a signal having a second level to said count direction control terminal of said counter circuit so that said count value changes in a second direction different from said first direction.

5,466,998

ELECTRIC SYSTEM FOR AN ELECTRIC VEHICLE

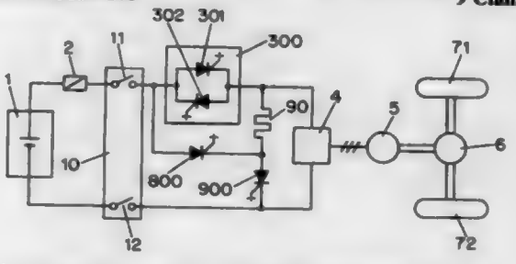
Shigenori Kinoshita; Takao Yanase, and Koetsu Fujita, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 18, 1994, Ser. No. 210,021

Claims priority, application Japan, Mar. 19, 1993, 5-085536

Int. Cl.[6] H02P *5/40;* **B60L** *7/22;* **G01R** *27/26*

U.S. Cl. 318—375 **9 Claims**



1. An electric system for an electric vehicle, comprising:

an AC motor for driving one or more wheels of the vehicle;

a battery having a DC output;

power converter means having a DC side operatively coupled to the battery and an AC side operatively coupled to the motor, for converting DC power from the battery to AC power for the motor, and having a regenerative function for rectifying AC power from the motor to DC power to the battery, and comprising an input smoothing capacitor connected to the DC side;

an initial charging circuit connected between the battery and the input smoothing capacitor, for charging the input smoothing capacitor and for starting the power converter means, and comprising a charging resistor and a charging switch which is switched on for charging the input smoothing capacitor when the power converter means is started;

a main circuit switch, connected between the battery and the power converter means in parallel to the initial charging circuit, which is switched on when the power converter means converts DC power to AC power and when the power converter means regenerates DC power from the motor to the battery;

a rheostatic breaking circuit connected to the DC side of the power converter means in parallel to the battery, for braking the electric vehicle when the voltage of the battery exceeds a level above which DC power from the power converter means can not be regenerated to the battery, and comprising a braking resistor for dissipating DC power from the power converter means and a braking switch connected in series to the braking resistor, which is switched on to connect the DC power from the power converter means to the braking resistor,

wherein a single resistor serves as charging resistor and as braking resistor.

5,466,999

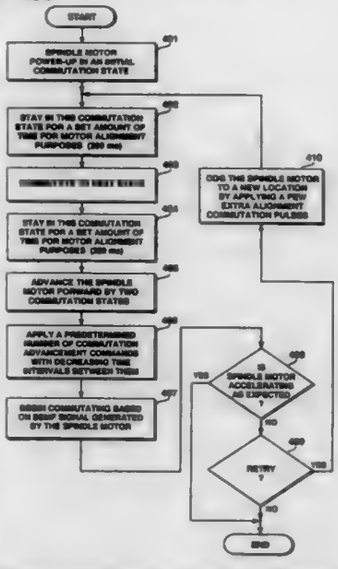
SPINDLE MOTOR START CONTROL PROCESS AND APPARATUS

Larry Hutsell, Longmont, Colo., assignor to Maxtor Corporation, San Jose, Calif.

Filed Aug. 15, 1994, Ser. No. 290,370

Int. Cl.[6] H02P 6/20

U.S. Cl. 318—431 15 Claims



1. A method for starting spin-up of a spindle motor in a hard disk drive, said method comprising the steps of:

initially applying power to said spindle motor;

setting said spindle motor to a first commutation state;

maintaining said spindle motor in said first commutation state for a first pre-determined period of time;

advancing said spindle motor to a second commutation state after said first pre-determined period of time has elapsed;

maintaining said spindle motor in said second commutation state for a second pre-determined period of time;

advancing said spindle motor two successive commutation states after said second pre-determined period of time has elapsed.

9. An apparatus for controlling start-up of a three-phase motor, comprising:

a memory for storing a set of instructions specifying commutations for said three-phase motor;

a processor coupled to said memory and said three-phase motor, said processor controlling said three-phase motor according to said set of instructions stored in said memory, wherein said processor includes:

logic for setting said three-phase motor to a first commutation state and for maintaining said three-phase motor at said first commutation state for a first pre-determined length of time when current is initially applied to said motor;

logic for setting said three-phase motor to a second commutation state and for maintaining said three-phase motor at said second commutation state for a second pre-determined length of time;

logic for advancing said spindle motor two successive commutation states.

5,467,000

METHOD AND APPARATUS FOR CURRENT REGULATING IN A VOLTAGE-INJECTING CONVERTER

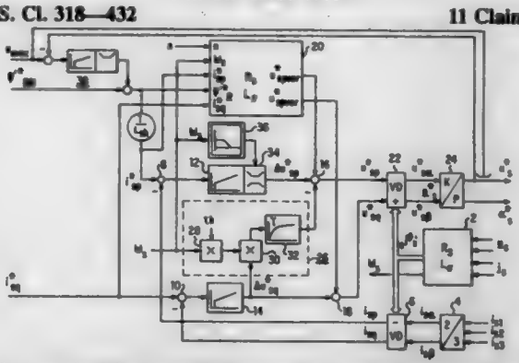
Franz Bauer, Herzogenaurach, and Hubert Schierling, Erlangen, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jul. 8, 1994, Ser. No. 272,718

Claims priority, application European Pat. Off., Jul. 9, 1993, 93111046

Int. Cl.[6] H02P 7/00

U.S. Cl. 318—432 11 Claims



1. A method for regulating current in a voltage-injecting converter using an actual current vector, wherein the voltage-injecting converter includes a precontrol network, said method comprising the steps of:

(a) determining an actual flux-producing current component and an actual torque-producing current component of the actual current vector;

(b) regulating said actual flux-producing current component to a desired flux-producing current component of a set current vector, wherein a flux-producing manipulated variable is superimposed with a first precontrol value provided by the precontrol network; and

(c) regulating said actual torque-producing current component to a desired torque-producing current component of said set current vector, wherein a torque-producing manipulated variable is superimposed with a second precontrol value provided by the precontrol network, said torque-producing manipulated variable acting in a delayed manner on said flux-producing manipulated variable as a function of a frequency value generated from a time constant, an amplification factor and a stator frequency

---

5,467,001

CONTROL METHOD FOR AN ALTERNATING CURRENT MOTOR

Yasusuke Iwashita, Minamitsuru, Japan, assignor to Fanuc Ltd., Minamitsuru, Japan

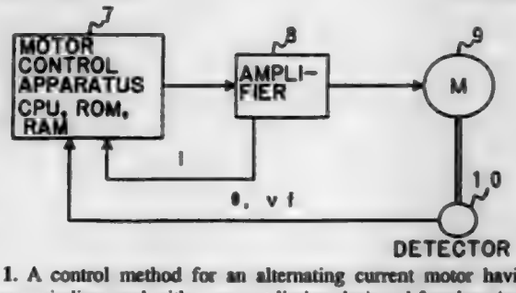
PCT No. PCT/JP93/01420, § 371 Date Jun. 6, 1994, § 102(e) Date Jun. 6, 1994, PCT Pub. No. WO94/08389, PCT Pub. Date Apr. 14, 1994

PCT Filed Oct. 4, 1993, Ser. No. 244,636

Claims priority, application Japan, Jan. 7, 1992, 4-291935

Int. Cl.[6] H02K 17/32

U.S. Cl. 318—434 16 Claims



1. A control method for an alternating current motor having phase windings and with a current limiter designed for clamping a

torque command at a limit value when the torque command exceeds the limit value so that the torque command which has been processed by the current limiter is provided as an amplitude of a current command to current loops of respective phase windings, said control method comprising the steps of:

obtaining an amplitude of total actual current by measuring the actual current of each phase winding;

correcting the limit value of current based on a ratio of said current command of the current loops to said amplitude of the total actual current; and

clamping said torque command at said limit value of current corrected in correcting step, so as to provide the amplitude of the current command to be supplied to the current loops.

5,467,002

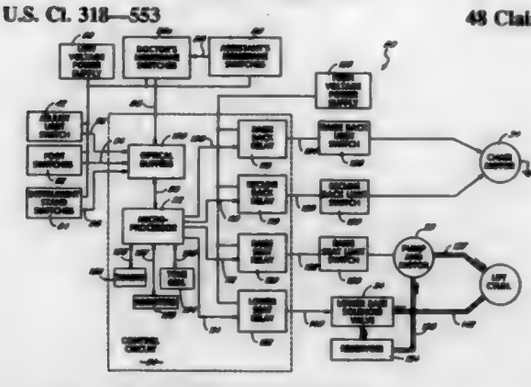
ADJUSTABLE CHAIR HAVING PROGRAMMABLE CONTROL SWITCHES

David M. Brooks, Cincinnati, Ohio, assignor to Reliance Medical Products, Inc., Mason, Ohio

Filed Nov. 5, 1993, Ser. No. 147,941

Int. Cl.[6] H02P *1/00*

U.S. Cl. 318—553 **48 Claims**



1. A powered adjustable chair comprising:

a seat connected to a base for vertical movement with respect thereto and having a surface for supporting a patient;

a back forming part of said chair and secured proximate one edge of said seat, said back having a surface for supporting a patient;

a powered motion mechanism operatively connected to at least one of said seat and said back;

a first power supply connected to said powered motion mechanism for supplying power thereto at a first predetermined voltage;

a control electrically coupled to said powered motion mechanism for controlling the operation thereof, said control including a switch plate operatively connected to a microprocessor, said switch plate including a plurality of flat, tactile-feel membrane switches each including a flat outer surface exposed on an outside surface of said seat back for allowing an operator to directly depress said flat outer surface and direct the operation of said control and to thereby also direct desired powered movement of said chair; and,

a second power supply connected to said control for supplying power to said control including said membrane switches at a second predetermined voltage which is less than said first predetermined voltage.

5,467,003

CONTROL METHOD AND CONTROL APPARATUS FOR A ROBOT WITH SENSOR

Tetsuya Kosaka, and Eiichi Kobayashi, both of Oshino, Japan, assignors to Fanuc Ltd., Minamitsuru

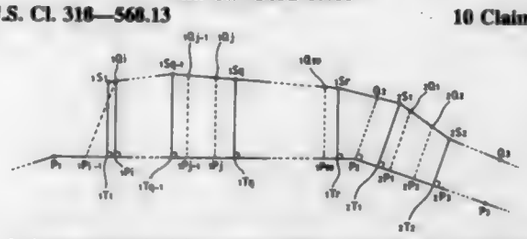
PCT No. PCT/JP94/00762, § 371 Date Jan. 12, 1995, § 102(e) Date Jan. 12, 1995, PCT Pub. No. WO94/27199, PCT Pub. Date Nov. 24, 1994

PCT Filed May 11, 1994, Ser. No. 367,218

Claims priority, application Japan, May 12, 1993, 5-132327

Int. Cl.[6] G05B *19/00*

U.S. Cl. 318—568.13 **10 Claims**



1. A control method for a robot with sensor means, comprising the steps of:

(a) obtaining sensed data by detecting an operation line position in a region on the travel direction side of a tool supported by a robot;

(b) converting said sensed data into coordinate data representing said operation line position on a coordinate system set in the robot;

(c) obtaining processed data by processing said coordinate data converted in said step (b), using data of a taught path segment relating to said region being for detection among path data taught in advance;

(d) storing said processed data obtained in said step (c) in memory means;

(e) reading at least part of the data stored in said step (d), and preparing correction data for correcting said taught path, when said tool approaches a point just before said detected operation line position; and

(f) correcting said taught path data based on said correction data to generate a control output for moving said tool toward a target position.

5,467,804

MOTOR SPEED CONTROL APPARATUS FOR KEEPING THE SPEED OF THE MOTOR FIXED IN THE PRESENCE OF A DISTURBANCE TORQUE

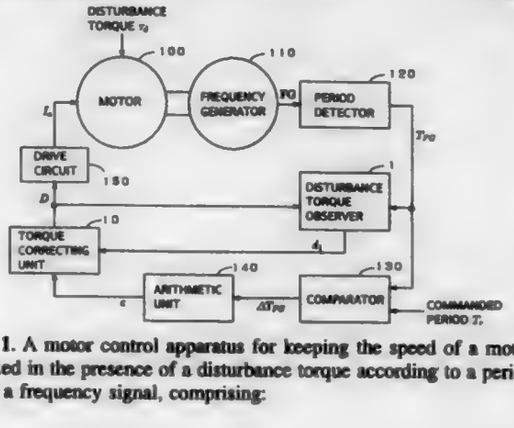
Keisuke Matsuo, Neyagawa, and Toshio Inaji, Minoo, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1993, Ser. No. 153,102

Claims priority, application Japan, Nov. 24, 1992, 4-313066; Jan. 28, 1993, 5-012288; Jan. 28, 1993, 5-012289

Int. Cl.[6] H02K *29/10*

U.S. Cl. 318—807 **17 Claims**



1. A motor control apparatus for keeping the speed of a motor fixed in the presence of a disturbance torque according to a period of a frequency signal, comprising:

a frequency generator for generating a frequency signal whose frequency is in proportion to the speed of the motor;

a period detector for detecting the period of said frequency signal;

a comparator for producing a period error signal corresponding to a difference between a desired period and a detected period sinal from said period detector;

an arithmetic unit for calculating a control signal in accordance with said period error signal;

a motor drive circuit for supplying the motor with electric power according to a drive signal;

a disturbance torque observer for producing an estimated disturbance torque signal from said detected period signal and said drive signal, said estimated disturbance torque signal being a conversion of the disturbance torque applied to the motor into an electrical signal and;

a torque correcting unit for producing said drive signal by adding said control signal to said estimated disturbance torque signal.

5,467,005

BATTERY CHARGER WHICH ACCOUNTS FOR INITIAL SURGE IN BATTERY VOLTAGE AND WHICH IS IMMUNE TO NOISE DURING COMPLETION OF CHARGING

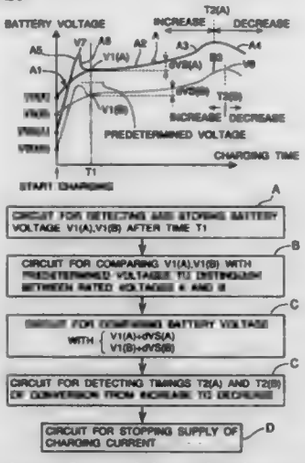
Toshio Matsumoto, and Hideki Watanabe, both of Anjo, Japan, assignors to Makita Corporation, Japan

Filed Aug. 4, 1993, Ser. No. 101,749

Claims priority, application Japan, Aug. 11, 1992, 4-236459; May 10, 1993, 5-108298; May 18, 1993, 5-115993

Int. Cl.[6] H02J *7/00;* **H01M** *10/44*

U.S. Cl. 320—20 **4 Claims**



1. A battery charger for supplying a charging current to a battery for charging the same, comprising:

first means for detecting a battery voltage (V1);

second means for storing the battery voltage (V1) detected by said first means when a predetermined time (T1) has elapsed after starting a charging operation;

third means for comparing said battery voltage (V1) with a predetermined voltage and for distinguishing the battery with respect to a rating voltage;

fourth means for detecting a timing of conversion from an increasing tendency to a decreasing tendency of the battery voltage, said fourth means being activated when the battery voltage detected by said first means exceeds the sum of a predetermined potential difference (dVS) and said battery voltage (V1) detected by said first means when said predetermined time (T1) has elapsed; and

fifth means for stopping supply of the charging current when said fourth means has detected said timing of conversion;

said predetermined time (T1) being determined to be substantially equal to the time when an abrupt variation expected to be produced in the battery voltage at the beginning of the charging operation of an over-discharged battery is substantially diminished;

said predetermined potential difference (dVS) being determined according to the rating voltage of the battery to be charged; and

wherein said fourth means for detecting said timing of conversion includes means for detecting the battery voltage at intervals of a predetermined period, and means for extracting a maximum voltage from among the detected battery voltages and for storing said maximum voltage; and

wherein said timing is detected based on a determination as to whether a battery voltage equal to or less than said maximum voltage has been detected; and

wherein said determination of detection of the battery voltage equal to or less than said maximum voltage is performed by counting the number of times of detection of the battery voltage, and wherein detection of the battery voltage equal to said maximum voltage is counted as one time and detection of the battery voltage less than said maximum voltage is counted as at least two times.

5,467,006

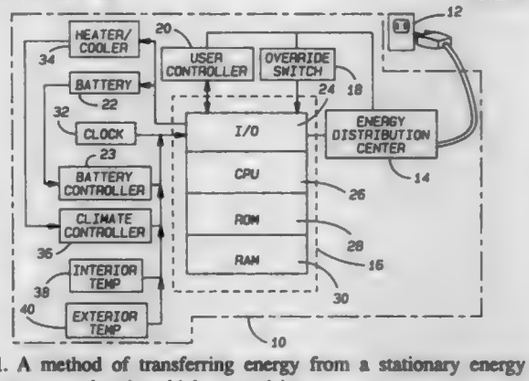
ENERGY TRANSFER DEVICE AND METHOD

Ronald I. Sims, Saline, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 21, 1992, Ser. No. 993,760

Int. Cl.[6] H02J *7/04*

U.S. Cl. 320—22 **7 Claims**



1. A method of transferring energy from a stationary energy source to an electric vehicle comprising:

analyzing a usage log;

determining an energy requirement of said electric vehicle based on said usage log;

deriving an energy transfer rate based on said usage log; and

transferring energy from said source to said electric vehicle at said rate to operate vehicle components such as a climate control device of said electric vehicle to achieve a desired interior compartment temperature.

5,467,007

CHARGING APPARATUS

Kiyoshi Hyakutake, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 29, 1993, Ser. No. 38,830

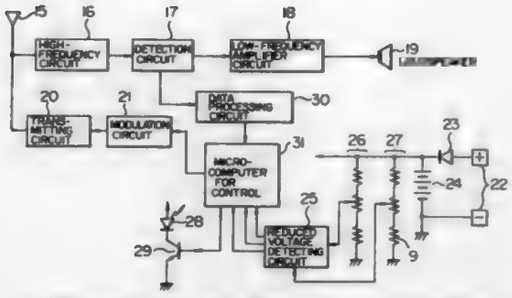
Claims priority, application Japan, Sep. 16, 1992, 4-246218

Int. Cl.[6] H02J *7/10;7/02*

U.S. Cl. 320—22 **6 Claims**

1. An apparatus for charging a battery of a cordless subtelephone set, said apparatus comprising:

charging means for selectively charging said battery in one of (i) a normal charging mode wherein charging current flows to said battery to increase a charge quantity of said battery and (ii) a trickle charging mode wherein charging current flows to



said battery to maintain said charge quantity of said battery at a predetermined value;

determining means for determining said charge quantity of said battery; and

control means, operatively associated with said charging means and said determining means, for controlling said charging means, in response to said determination by said determining means, to operate in said normal charging mode for a particular amount of time and thereafter operate in said trickle charging mode, wherein:

said cordless sub-telephone includes a transmitting unit which transmits the charge quantity of said battery, and

said apparatus further comprises a receiving means for receiving and supplying said transmitted charge quantity to said determining means.

5,467,008

ELECTRONIC CONTROL DEVICE FOR CONTROLLING THE ALTERNATOR AND THE IDLING RPM OF AUTOMOTIVE ENGINE

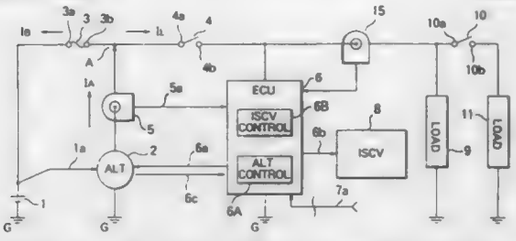
Masanobu Uchinami, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 23, 1993, Ser. No. 95,983

Claims priority, application Japan, Jul. 29, 1992, 4-202075

Int. Cl.[6] H02J *7/14*

U.S. Cl. 322—27 **7 Claims**



1. An electronic control device for controlling an alternator driven by an automotive engine system, including a battery, comprising:

detector means connected in series with the alternator and the battery for detecting an increase of a load current flowing through a load coupled to said alternator;

comparator means, coupled to said detector means, for comparing said increase of the load current with a threshold level; and

control means, coupled to said comparator means, for controlling a current supply to a field coil of said alternator, said control means reducing said current supply to a first predetermined level for a first predetermined interval of time when said increase of said load current is greater than or equal to said threshold level, and thereafter gradually increasing said current supply over a second interval of time.

5,467,009

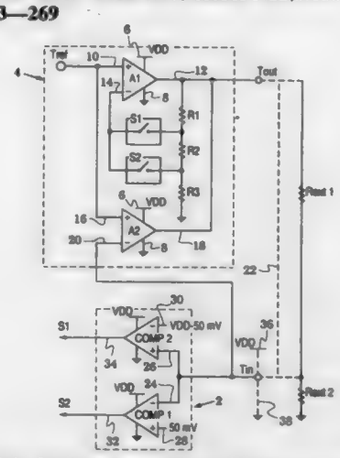
VOLTAGE REGULATOR WITH MULTIPLE FIXED PLUS USER-SELECTED OUTPUTS

Gerard F. McGlinchey, Enniskerry, Ireland, assignor to Analog Devices, Inc., Norwood, Mass.

Filed May 16, 1994, Ser. No. 243,454

Int. Cl.[6] G05F *1/40;* **H03K** *5/22;5/153*

U.S. Cl. 323—269 **16 Claims**



1. A multiple fixed plus user-selectable output voltage regulator, comprising:

a voltage window comparator having a voltage range with upper and lower window limits,

an input terminal connected to supply an input voltage to said window comparator,

an output terminal, and

an output circuit connected to receive control inputs from said input terminal and said window comparator, said output circuit having first and second output states in which it supplies first and second respective fixed output voltages to said output terminal, and a third output state that enables the voltage at said output terminal to be externally set, said output circuit responding to input voltages in ranges above, below and within said window voltage range by entering a different output state for each different input voltage range,

wherein said output circuit comprises first and second amplifier circuits, said window comparator produces a control signal in response to the input voltage being within a first of said input voltage ranges to cause said first amplifier circuit to produce said first fixed output voltage at said output terminal, said window comparator produces a control signal in response to the input voltage being within a second of said input voltage ranges to cause said first amplifier circuit to produce said second fixed output voltage at said output terminal, and said input terminal is connected to control said second amplifier to enable the externally set output voltage in response to the input terminal voltage being within a third of said input voltage ranges.

5,467,010

VOLTAGE REGULATOR CONTROL CIRCUIT

Neil A. Quarmby, and David W. Eddowes, both of Bedford, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 17, 1992, Ser. No. 991,884

Claims priority, application United Kingdom, Dec. 18, 1991, 9126789

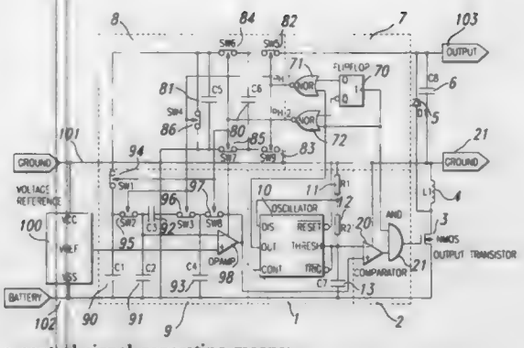
Int. Cl.[6] H02M *3/06*

U.S. Cl. 323—284 **12 Claims**

1. A voltage regulator control circuit for controlling an output voltage from a voltage regulator comprising:

a controlled-voltage input port for receiving an output voltage from a voltage regulator which is to be controlled by the voltage regulator control circuit;

a reference input port for receiving an input reference voltage;



a control signal generating means;

a capacitor network including a plurality of capacitors;

a switching network interposed between the capacitors of said capacitor network and each of said controlled-voltage input port, said reference input port and said control signal generating means and providing controllable connections among the capacitors of said capacitor network with said controlled-voltage input port, said reference input port, and said control signal generating means; and

means controlling the operation of said switching network to alter the controllable connections of said switching network in a repeating sequence;

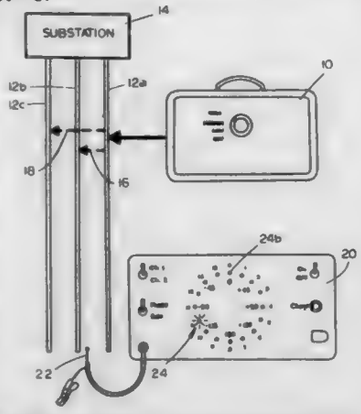
said control signal generating means being responsive to the repeating sequence of the controllable connections of said switching network to produce an output control signal which is a measure of the difference between the input reference voltage and the controlled voltage.

5,467,011

SYSTEM FOR DETECTION OF THE PHASE OF AN ELECTRICAL SIGNAL ON AN ALTERNATING CIRCUIT POWER LINE

Paul C. Hunt, Brainerd, Minn., assignor to National Rural Electric Cooperative Assn., Washington, D.C.

Continuation of Ser. No. 879,204, May 6, 1992, abandoned.
This application Jun. 1, 1994, Ser. No. 252,075
Int. Cl.[6] G01R *19/145;25/00;* H04B *3/54*
U.S. Cl. 324—67 **10 Claims**



1. A system for detecting a modulated signal on a remote local power line supplied with power from a main power line having an alternating voltage, said alternating voltage having a known phase defined as a reference phase comprising:

a transmitter for generating a first signal having a stable frequency and modulated with a second signal derived from the reference phase voltage of the main power line;

said transmitter operably connected to said main power line for transmitting said modulated first signal over said power line;

a receiver operable to receive said first signal and its modulation to detect therefrom modulating second signal derived from the reference phase voltage for phase comparison with the phase of an alternating voltage on the local power line:

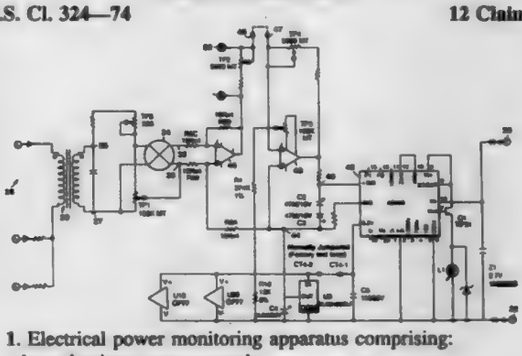
said receiver being operably connected to said remote power line spaced apart from the location at which the transmitter is connected to said main power line.

5,467,012

POWER MONITORING

Robert W. Nystrom, Oxford, Mass., assignor to Load Controls Incorporated, Sturbridge, Mass.

Filed May 10, 1994, Ser. No. 240,323
Int. Cl.[6] G06F *15/46*
U.S. Cl. 324—74 **12 Claims**



1. Electrical power monitoring apparatus comprising:

a loop, having a power supply,

a first conductor,

a current sensor coupled to said first conductor for providing a current signal that is representative of the current in said first conductor,

a reference terminal,

a voltage sensor coupled at least to said first conductor for providing a voltage signal that is representative of the voltage on said first conductor relative to that on said reference terminal,

a multiplier coupled to said loop, said current sensor and said voltage sensor and having a power output for providing a power signal that is proportional to the instantaneous value of electrical power carried by said first conductor,

a calibration circuit in said loop having an input coupled to said power output and having an adjustable output,

and a current regulator in said loop responsive to said power signal having an input coupled to said adjustable output for maintaining the current in said loop between predetermined minimum and maximum loop current values,

said power supply furnishing all the d-c power required by said multiplier.

5,467,013

RADIO FREQUENCY MONITOR FOR SEMICONDUCTOR PROCESS CONTROL

Norman Williams, and James Spain, both of Austin, Tex., assignors to Sematech, Inc., Austin, Tex.

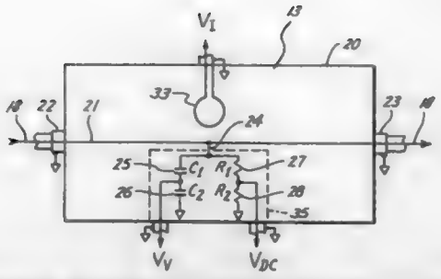
Filed Dec. 7, 1993, Ser. No. 163,221
Int. Cl.[6] G01R *1/20;21/01*
U.S. Cl. 324—127 **10 Claims**

1. A radio frequency (RF) sensor, coupled to a transmission line disposed between a plasma reactor and an electrical source providing RF voltage and current to said plasma reactor, for monitoring said RE voltage and current on said transmission line comprising:

a first capacitance coupled between a first node and said transmission line;

a second capacitance coupled between said first node and a second node;

said first and second capacitances providing a capacitive voltage divider network wherein a first voltage output at said first node is a proportional representation of said RF voltage on said transmission line;



a wire loop disposed next to said transmission line at a point on said transmission line where said first capacitance is coupled but having an air gap between said loop and said transmission line, such that electromagnetic field lines generated by current flow in said transmission line is inductively coupled to said loop, wherein voltage induced in said loop by said current flow provides a second voltage output which is a proportional representation of said RF current on said transmission line;

an electromagnetic shielding, disposed around said first and second capacitances, inhibits electromagnetic interference from interacting with said first and second capacitances which interference can cause erroneous first voltage output at said first node;

said first and second voltage outputs providing for accurate measurement of said RF voltage and current and said measurement is also used to accurately determine a phase relationship between said RF voltage and current.

5,467,014

DEVICE FOR MEASURING THE THICKNESS OF A LAYER OR COATING ON A FERROUS AND/OR NON-FERROUS SUBSTRATE

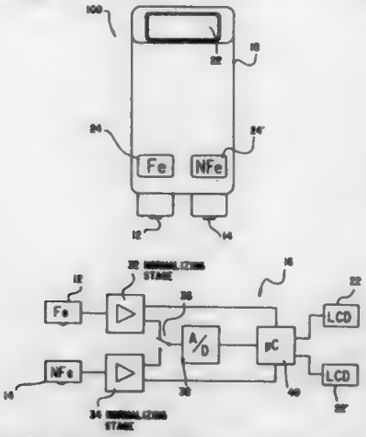
Norbert Nix, Robert-Perthel-Strasse 2, 5000 Köln 60, Germany

Filed Dec. 9, 1992, Ser. No. 987,869

Claims priority, application European Pat. Off., Jul. 3, 1992, 92111332

Int. Cl.[6] G01B 7/06; G01R 33/12

U.S. Cl. 324—230 **10 Claims**



1. A device for measuring the thickness of a layer or coating on a metal substrate, said device comprising:

(a) a housing;

(b) a first magnetoinductive probe means mounted on said housing for measuring the thickness of the layer on a metal substrate containing iron;

(c) a second eddy current probe means mounted on said housing for measuring the thickness of the layer on a metal substrate which does not contain iron;

(d) wherein said first and second probe means are physically separated from each other on said housing; and

(e) calculating circuit means for receiving the output of one of said first and second probe means and calculating the thickness of the layer as a function of the output of said one of said first and second probe means; and

(f) display means coupled to said calculating circuit means, for displaying the thickness of the layer being measured.

5,467,015

SUPERCONDUCTING MAGNETOMETER HAVING INCREASED BIAS CURRENT TOLERANCE AND PRODUCING DIGITAL OUTPUT

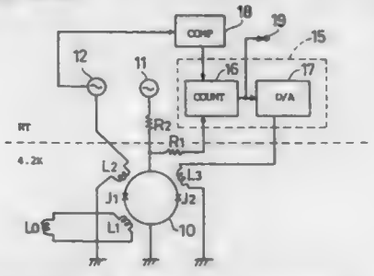
Kohtaroh Gotoh, Kawasaki, Japan, assignor to Fujistu Limited, Kawasaki, Japan

Filed Sep. 24, 1993, Ser. No. 125,792

Claims priority, application Japan, Mar. 17, 1993, 5-057525

Int. Cl.[6] G01R 33/035

U.S. Cl. 324—248 **11 Claims**



1. A superconducting magnetometer, comprising:

a superconducting magnetic sensor for interlinking with an external magnetic flux, said superconducting magnetic sensor being supplied with a first A.C. bias current for producing output voltage pulses in response to said first A.C. bias current, said superconducting magnetic sensor having a flux versus critical current characteristic describing a relationship between a magnetic flux acting upon said superconducting magnetic sensor and said first A.C. bias current, said flux versus bias current characteristic defining a first region in which said superconducting magnetic sensor assumes a zero voltage state and a second region surrounding said first region and in which said superconducting magnetic sensor assumes a finite voltage state, said superconducting magnetic sensor producing said output voltage pulse in response to a transition from said zero voltage state to said finite voltage state;

first biasing means for supplying said first A.C. bias current with a first frequency;

feedback means supplied with said voltage pulses from said superconducting magnetic sensor for counting up the number of said voltage pulses, said feedback means further producing a feedback current in response to the number of said voltage pulses;

first superconducting magnetic coupling means coupled magnetically to said superconducting magnetic sensor, said first superconducting magnetic coupling means being supplied with said feedback current from said feedback means for producing a counter-acting magnetic flux in response to said feedback current, said superconducting magnetic coupling means coupling said counter-acting magnetic flux to said superconducting magnetic sensor;

second biasing means for producing a second A.C. bias current having a second frequency different from said first frequency; and

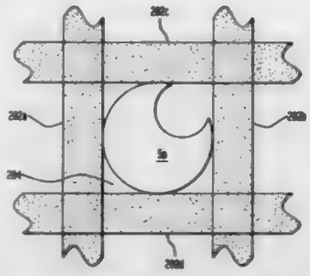
second superconducting magnetic coupling means coupled magnetically to said superconducting magnetic sensor, said second superconducting magnetic coupling means being supplied with said second A.C. bias current from said second biasing means for producing a modulation magnetic flux in response to said second A.C. bias current, said second superconducting magnetic coupling means coupling said modulation magnetic flux to said superconducting magnetic sensor.

5,467,016

SATURATION SELECTIVE SPECTROSCOPIC IMAGING

David M. Thomasson, Edison, N.J., assignor to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Apr. 20, 1993, Ser. No. 49,466
Int. Cl.[6] G01V 3/00
U.S. Cl. 324—309 4 Claims



1. A method of identifying nuclear magnetic resonance spectra in a spatially selectable examination region of an examination subject, comprising the steps of:

a) selectively saturating solvent signals over the entire examination subject;

b) selectively saturating volume regions of the examination subject which are not to be evaluated;

c) applying an RF readout pulse so as to generate an FID signal;

d) for each of steps a, b and c applying a field gradient pulse so as to phase encode examination region signals;

e) transforming the phase encoded signals to their respective spatial locations; and,

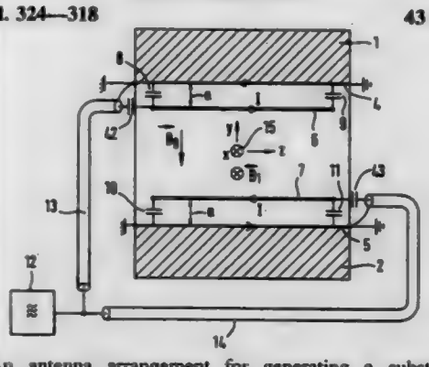
f) transforming the FID signal into spectral data corresponding to the examination region.

5,467,017

ANTENNA ARRANGEMENT FOR A NUCLEAR MAGNETIC RESONANCE APPARATUS

Wilhelm Duerr, Erlangen, Germany; Norihiko Mikoshiba, Ebina, Japan, and Yutaka Watanabe, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 30, 1993, Ser. No. 129,314
Claims priority, application Germany, Sep. 30, 1992, 42 32 884.5
Int. Cl.[6] G01R 33/28
U.S. Cl. 324—318 43 Claims



1. An antenna arrangement for generating a substantially homogenous radio-frequency field in a nuclear magnetic resonance apparatus having means for generating a basic magnetic field between two pole plates, said antenna arrangement comprising:

a sub-antenna disposed at each pole plate;

each sub-antenna having a grounded shielding substantially impermeable to radio frequency fields, facing the pole plate at which the sub-antenna is disposed, and a conductor structure formed by at least one flat electrical conductor disposed a distance from said shielding and extending substantially parallel thereto; and

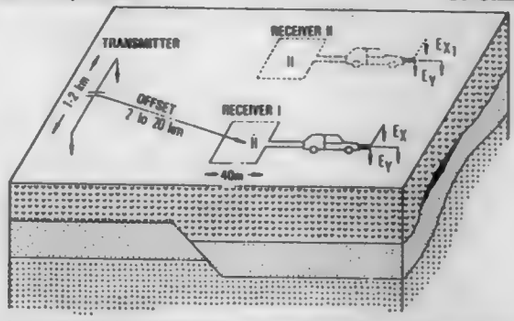
means for feeding said sub-antennas with high-frequency current flowing in opposite directions in the respective conductor structures.

5,467,018

METHOD OF PROCESSING TRANSIENT ELECTROMAGNETIC MEASUREMENTS IN GEOPHYSICAL ANALYSIS

Horst Ruter, Witten, and Kurt-Martin Strack, Cologne, both of, Germany, assignors to Bergwerksverband GmbH, Germany

PCT No. PCT/DE91/00238, § 371 Date Nov. 12, 1992, § 102(e) Date Nov. 12, 1992, PCT Pub. No. WO91/14954, PCT Pub. Date Oct. 3, 1991
PCT Filed Mar. 20, 1991, Ser. No. 927,417
Claims priority, application Germany, Mar. 21, 1990, 40 09 055.8
Int. Cl.[6] G01V 3/02;3/08
U.S. Cl. 324—336 20 Claims



1. A method for obtaining data from subsoil using a geophysical exploration installation having a transmitter in a grounded dipole, a central processing unit for processing the obtained data, and a plurality of recording units connected to the central processing unit by a telemetric link, each of the recording units having a plurality of measuring points, the method comprising the steps of:

transmitting electromagnetic transients into the subsoil from the transmitter;

receiving and measuring expanding induction currents using the plurality of recording units to obtain measuring values, the expanding induction currents being produced in the subsoil as a result of the electromagnetic transients transmitted into the subsoil from the transmitter;

digitizing and storing the measuring values as stored data in each recording unit at the measuring points; and

transmitting the stored data from one recording unit at a time to the central processing unit in a predetermined sequence via the telemetric link for further geophysical processing.

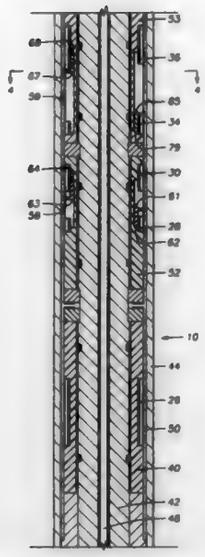
5,467,019

METHOD AND APPARATUS FOR BALANCING THE ELECTRICAL OUTPUT OF THE RECEIVER COILS OF AN INDUCTION LOGGING TOOL BY USE OF A SLIDABLE MAGNETIC ROD FOR ELIMINATING DIRECT COUPLING

Robert A. Lester; David Beard, and Milton E. Cram, all of Houston, Tex., assignors to Western Atlas International Inc., Houston, Tex.

Filed Mar. 1, 1994, Ser. No. 203,809
Int. Cl.[6] G01V 3/10; G01N 27/72
U.S. Cl. 324—339 6 Claims

1. In an induction logging tool for measuring formation conductivity components including an elongated mandrel, a transmitting coil axially mounted of said mandrel, at least one set of two spaced-apart receiver coils wound in series, co-axially mounted on said mandrel and longitudinally spaced from said transmitter coil, an improved vernier calibration method, comprising:



exciting said receiver coils with electromagnetic radiation originating from said transmitter coil;

nulling the total directly-coupled output signal from said receiver coils by controllably altering the magnetic flux distribution associated with said receiver coils including the step of selectively positioning a magnetic signal equalization body that is longitudinally slidingly mounted between said receiver coils, said magnetic signal equalization body being a magnetic rod having an aspect ratio selected to minimize the dependence of the effective permeability of the rod on the initial permeability of the rod.

5,467,020

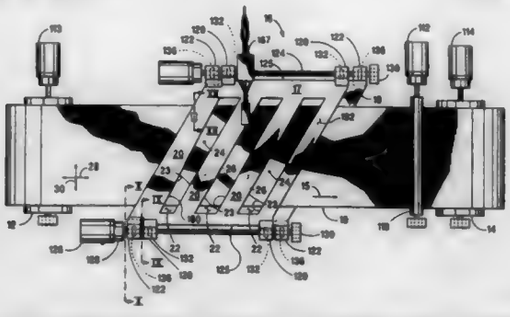
TESTING FIXTURE AND METHOD FOR CIRCUIT TRACES ON A FLEXIBLE SUBSTRATE

James E. Boyette, Jr., Delray Beach, and James C. Mahlbacher, Lake Worth, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1994, Ser. No. 219,610

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—537 **21 Claims**



1. Apparatus for testing circuit traces extending along a flexible substrate, wherein said apparatus comprises:

an upper plate including a plurality of transversely extending upper apertures separated by transversely extending upper segments of said upper plate;

a lower plate including lower segments extending individually under said upper apertures and lower apertures extending transversely between said lower segments; and

plate mounting means for holding said upper and lower plates in a spaced-apart relationship to form upper and lower surfaces of a substrate receiving slot, while allowing movement of said flexible substrate in a longitudinal feed direction through said substrate receiving slot, wherein said plate mounting means includes lower plate moving means for moving said lower plate between a lower plate closed position, in which said lower plate is held upward to clamp said substrate extending within said substrate receiving slot and a lower plate open position, in which said lower plate is lowered, releasing said substrate to move between said upper and lower plates, wherein said plate mounting means additionally includes upper plate moving means for moving said upper plate between an upper plate closed position, in which said upper plate is held downward to clamp said substrate extending within said substrate receiving slot, and an upper plate closed position, in which said upper plate is raised, releasing said substrate to move between said upper and lower plates, wherein said upper plate moves from said upper plate closed position to said upper plate open position as said lower plate moves from said lower plate closed position to said lower plate open position; and wherein said upper plate moves from said upper plate open position to said upper plate closed position as said lower plate moves from said lower plate open position to said lower plate closed position.

5,467,021

CALIBRATION METHOD AND APPARATUS

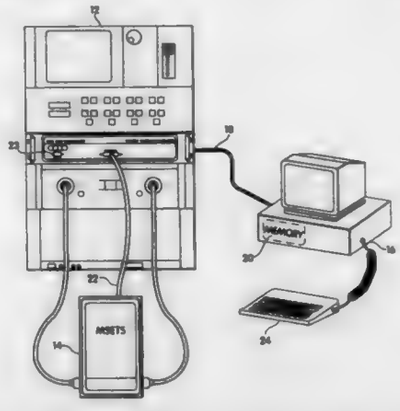
Vahe A. Adamian, Lexington; Michael T. Falcinelli, Andover, and Peter V. Phillips, Leominster, all of Mass., assignors to ATN Microwave, Inc., Billerica, Mass.

Continuation-in-part of Ser. No. 66,534, May 24, 1993. This application Nov. 22, 1993, Ser. No. 156,277

The portion of the term of this patent subsequent to Jul. 18, 2012, has been disclaimed.

Int. Cl.[6] G01R *35/00*

U.S. Cl. 324—601 **38 Claims**



1. A calibration device including a first port and second port, at least one of the first port and the second port being coupled to a first port and a second port of a network analyzer, respectively, the calibration device comprising:

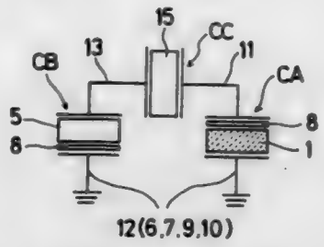
a multistate transfer standard that generates a plurality of conditions as necessary to calibrate the network analyzer, to at least one reference plane, the plurality of conditions being generated free of connecting or disconnecting additional calibration standards to either one of the first port and the second port of the network analyzer; and

wherein the multistate transfer standard further comprises at least two single pole, multi-throw switches, each throw connected to a complex impedance and each pole forming an end of a circuit, each end being interconnected, respectively, to one of the first port and the second port of the multistate transfer standard.

5,467,022
DIELECTRIC DETECTING SYSTEM

Kouji Aoki, and Masaru Yokochi, both of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 15, 1993, Ser. No. 5,083
Claims priority, application Japan, Jan. 16, 1992, 4-005766
Int. Cl.[6] G01R *31/02*; G08B *13/26*
U.S. Cl. 324—661 **2 Claims**

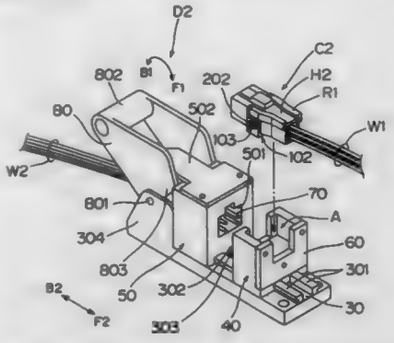


1. A dielectric detecting system comprising:
an earth electrode;
a sensor electrode opposed to the earth electrode for constituting a first condenser therebetween whose electric capacitance varies in dependence on an existence of a dielectric;
a medium electrode positioned between the earth electrode and the sensor electrode for constituting a second condenser between the medium electrode and the earth electrode and for constituting a third condenser between the medium electrode and the sensor electrode in such a manner that one of an electric capacitance of the second condenser and an electric capacitance of the third condenser serves for detecting an other dielectric; and
an equalizing means for equalizing electric potential of the medium electrode to that of the sensor electrode.

5,467,023
CONNECTOR INSPECTING APPARATUS HAVING SIZE REGULATING MEMBER FOR RETAINER TEST FITTING PROBES EXTERNAL TO THE CONNETOR FOR RETAINER INTEGRITY DETECTION

Jun Takeyama, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed Aug. 22, 1994, Ser. No. 294,728
Claims priority, application Japan, Aug. 24, 1993, 5-046059
Int. Cl.[6] G01R *1/04;31/04*
U.S. Cl. 324—754 **8 Claims**

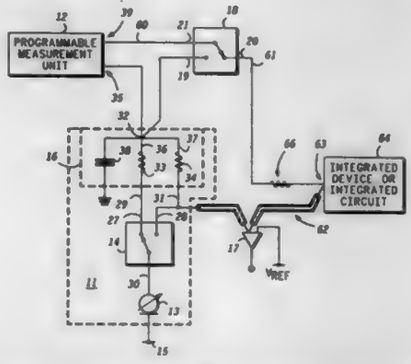


1. A connector inspecting apparatus for inspecting a connector having a retainer which fixes, in an assistant manner, terminal metal fittings mounted on a housing at predetermined positions thereof, comprising:
an inspecting portion having detecting pieces which are disposed as corresponding to the terminal metal fittings to be inspected and which are adapted to be electrically connected to the terminal metal fittings when the detecting pieces are brought into contact therewith by a predetermined contact pressure;
a receiving portion adapted to receive the housing such that the terminal metal fittings are opposite to the detecting pieces and such that the housing is movable toward and away from the detecting pieces;
means for moving the inspecting portion to a predetermined position in close proximity to the connector held in the receiving portion and also for returning the inspecting portion from the proximate position to the original position; and
a size regulating member integrally formed at the receiving portion for positioning, through the retainer of the connector, the housing with respect to the inspecting portion located in the proximate position.

5,467,024
INTEGRATED CIRCUIT TEST WITH PROGRAMMABLE SOURCE FOR BOTH AC AND DC MODES OF OPERATION

Mavin C. Swapp, Gilbert, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1993, Ser. No. 143,949
Int. Cl.[6] G01R *31/28*
U.S. Cl. 324—771 **15 Claims**



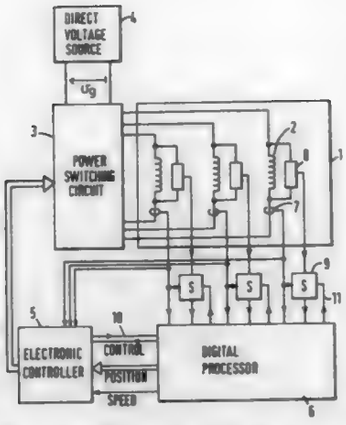
1. A system for testing an integrated circuit device having AC and DC measurement modes of operation, comprising:
a drive circuit having first and second ports, wherein the drive circuit comprises a switch having at least two terminals, a first terminal of the at least two terminals coupled to the first port, a second terminal of the at least two terminals for coupling to the second port, wherein the switch is capable of switching at a frequency of at least 400 MHz; and
a programmable supply having a force terminal and a sense terminal, wherein the force terminal supplies one of a voltage or a current to the first port, and wherein one of a voltage measurement or a current measurement is made via the second port during the AC and DC measurement modes of operation.

5,467,025
SENSORLESS ROTOR POSITION MEASUREMENT IN ELECTRIC MACHINES

William F. Ray, Attenborough, England, assignor to Switched Reluctance Drives Limited, Leeds, England

Filed Jun. 2, 1993, Ser. No. 70,190
Claims priority, application United Kingdom, Jun. 3, 1992, 9211685
Int. Cl.[6] G01R *31/34*; H02P *6/00*
U.S. Cl. 324—772 **22 Claims**

1. A rotor position sensing system for an electric machine with at least one phase associated with at least one monitored phase winding, the rotor position sensing system comprising:
at least one current measurement device to derive measurement of current in the at least one monitored phase winding;
means for deriving measurement of magnetic flux linking the at least one monitored phase winding;



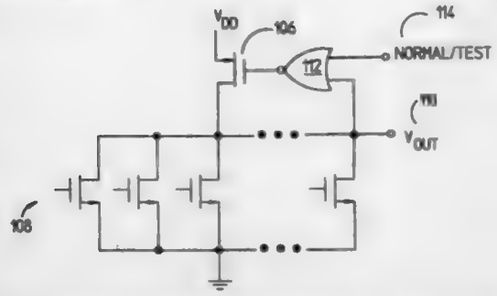
control means for determining rotor angular error between a predicted rotor angular position and a reference rotor angular position for the at least one monitored phase winding, the control means 1) directing the at least one current measurement device and the means for deriving measurement of magnetic flux to provide single, simultaneous current and magnetic flux measurements for the at least one monitored phase winding at the predicted rotor angular position, 2) using one of the current and magnetic flux measurements to determine a partial derivative of rotor angle, and 3) using the other of the current and magnetic flux measurements, an expected value of the other of the current and magnetic flux measurements, and the partial derivative of rotor angle to determine rotor angular error.

5,467,026

PSEUDO-NMOS LOGIC CIRCUITS WITH NEGLIGIBLE STATIC CURRENT DURING QUIESCENT CURRENT TESTING

Barry J. Arnold, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 18, 1994, Ser. No. 183,539
Int. Cl.[6] H03K *19/00;17/16*
U.S. Cl. 326—16 **2 Claims**



1. A method for minimizing current flow through a logic gate during quiescent current testing, the logic gate having a power supply terminal, and an output capable of being in a true logical state or a false logical state, the method comprising the following steps:

a. connecting a switchable load between the power supply terminal and the output, the switchable load capable of being switched to an open state or to a closed state;

b. switching the switchable load to the closed state if the output is at the true logical state; and

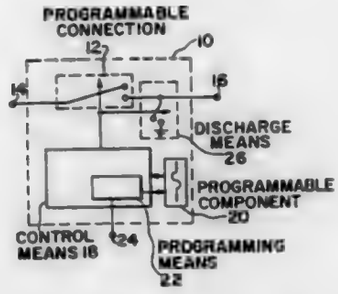
c. switching the switchable load to the open state if the output is at the false logical state.

5,467,027

PROGRAMMABLE CELL WITH A PROGRAMMABLE COMPONENT OUTSIDE THE SIGNAL PATH

Edward A. Burton, Lindon, and Jeffrey A. West, Pleasant Grove, both of Utah, assignors to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 709,241, Jun. 3, 1991, abandoned.
This application Jan. 25, 1993, Ser. No. 191,557
Int. Cl.[6] H03K *19/693*
U.S. Cl. 326—38 **22 Claims**



1. An electronic circuit having an input and an output, said circuit comprising:

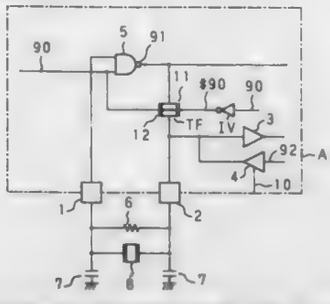
a programmable cell interposed between the input and the output, said cell including a connection that is electrically programmable through a programmable component, the programmable component being located outside the connection, said cell comprising control means for providing a control signal in response to a user-programmable signal that is indicative of a states of component, the connection including transmission means for, under control of the control signal, connecting the input to the output, and the cell comprising discharge means for, under control of the control signal, discharging the output.

5,467,028

SEMICONDUCTOR INTEGRATED CIRCUIT WITH PLURAL USE OF A TERMINAL

Hironari Yoshida, and Yuji Hino, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1994, Ser. No. 337,423
Claims priority, application Japan, Nov. 10, 1993, 5-281069
Int. Cl.[6] H03K *19/173*
U.S. Cl. 326—38 **3 Claims**



1. A semiconductor integrated circuit with an oscillator connected between two terminals, comprising:

an amplifier circuit interposed between said two terminals for amplifying a signal supplied from said oscillator;

a switching element interposed between said amplifier circuit and one of said two terminals and including transistors having a resistance which increases as a power supply voltage decreases; and

at least one of an input buffer and an output buffer connected to said switching element and to said one of said terminals which is connected to an external circuit,

wherein at least one of said transistors of said switching element has a threshold voltage lower than the threshold voltage of any other transistor used in said semiconductor integrated circuit except for those used in said switching element.

5,467,029

OR ARRAY ARCHITECTURE FOR A PROGRAMMABLE LOGIC DEVICE

Norman P. Tuffe, San Jose; Stephen M. Douglass, Saratoga, and Hagop Nazarian, San Jose, all of Calif., assignors to Cypress Semiconductor Corp., San Jose, Calif.

Filed Oct. 28, 1993, Ser. No. 144,663
Int. Cl.[6] H03K *19/173*
U.S. Cl. 326—41 **24 Claims**

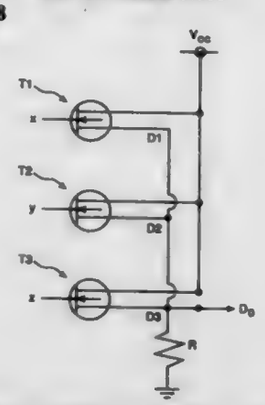
1. An OR array in a programmable logic device comprising:
a) a first programmable element coupled to a first product term signal;
b) a second programmable element coupled to a second product term signal and to a third product term signal;
c) a third programmable element coupled to the second product term signal and the third product term signal and;
d) a fourth programmable element coupled to a fourth product term signal;
e) a first OR device having inputs coupled to the first programmable element and the second programmable element; and
f) a second OR device having inputs coupled to the third programmable element and the fourth programmable element.

5,467,030

CIRCUIT FOR CALCULATING A MAXIMUM VALUE

Guoliang Shou; Weikang Yang; Wiwat Wongwarawipat; Sunao Takatori, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan Inc., and Sharp Corporation, both of Tokyo, Japan

Continuation of Ser. No. 986,767, Dec. 8, 1992, abandoned.
This application Oct. 12, 1994, Ser. No. 322,408
Claims priority, application Japan, Aug. 26, 1992, 4-252048
Int. Cl.[6] H03K *5/153*
U.S. Cl. 327—58 **1 Claim**



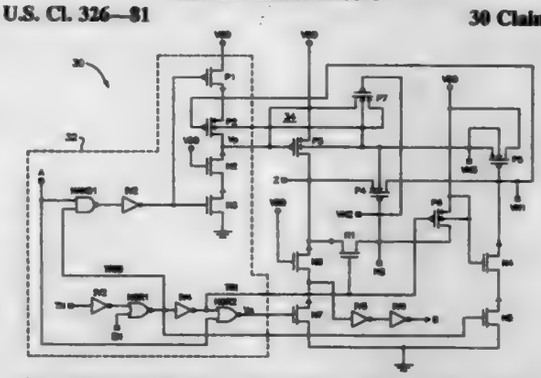
1. A circuit for outputting a maximum voltage of one of a plurality of inputs comprising:
a common output;
a resistance having a first terminal which is grounded and a second terminal; and
a plurality of nMOS transistors, wherein each one of said plurality of nMOS transistors corresponds to one of said plurality of inputs, and wherein each said nMOS transistor comprises:
a transistor drain connected to a common power source;
a transistor source connected to said second terminal and to said common output; and
a transistor gate connected to said corresponding one of said plurality of inputs; and
wherein one of said plurality of transistors that receives a maximum voltage of said plurality of inputs conducts, causing said maximum input voltage to be applied to said source of each remaining transistor so that each remaining transistor becomes non-conductive because each gate voltage becomes lower than a source voltage for each remaining transistor, and wherein said nMOS transistors are connected within said circuit such that a minimal amount of current is drawn therethrough.

5,467,031

3.3 VOLT CMOS TRI-STATE DRIVER CIRCUIT CAPABLE OF DRIVING COMMON 5 VOLT LINE

Trung Nguyen, San Jose, and Hung Luong, Cupertino, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Sep. 22, 1994, Ser. No. 310,941
Int. Cl.[6] H03K *19/0175*
U.S. Cl. 326—81 **30 Claims**



1. A driver circuit that is powered by a supply voltage and drives an output terminal in a drive mode, the output terminal being connected to receive an external voltage that can be higher than said supply voltage in a high impedance mode, comprising:
a pull-up transistor that is connected between said supply voltage and the output terminal and includes a substrate terminal;
a switch transistor that is connected between the substrate terminal and said supply voltage; and
a pass-gate transistor that is connected between the output terminal and the switch transistor and is biased to turn off the switch transistor when said external voltage is higher than substantially said supply voltage in said high impedance mode.

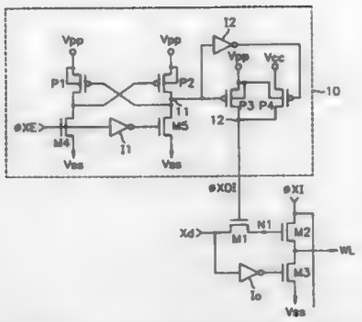
5,467,032

WORD LINE DRIVER CIRCUIT FOR A SEMICONDUCTOR MEMORY DEVICE

Jae-Hyeong Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 2, 1994, Ser. No. 332,794
Claims priority, application Rep. of Korea, Nov. 9, 1993, 1993-23695
Int. Cl.[6] H03K *19/017*; **G11C** *8/00*
U.S. Cl. 326—88 **18 Claims**

1. A word line driver circuit for use in a semiconductor memory device for driving a word line of the memory device to a word line driving voltage greater than a power supply voltage of the memory device, the word line driver circuit comprising:
a pull-up transistor having a first electrode coupled to the word line driving voltage, a second electrode coupled to the word line, and a gate electrode;



a transfer transistor having a first electrode coupled to a row decoding signal, a second electrode coupled to said gate electrode of said pull-up transistor, and a gate electrode;

a gate node intermediate said second electrode of said transfer transistor and said gate electrode of said pull-up transistor; and,

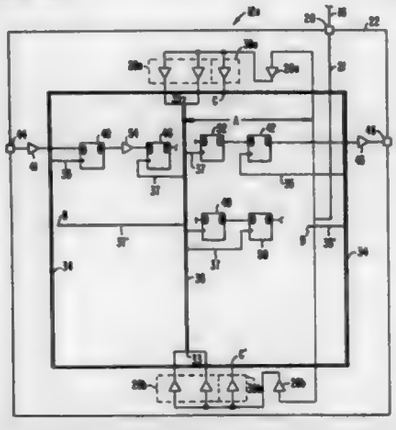
a control circuit responsive to a control signal for generating a transfer output signal coupled to said gate electrode of said transfer transistor, wherein said transfer output signal has a voltage level greater than the power supply voltage by at least an amount equal to a threshold voltage of said transfer transistor.

5,467,033

CHIP CLOCK SKEW CONTROL METHOD AND APPARATUS

Linda Y. Yip, Milpitas, and Kinying Kwan, San Jose, both of Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

Filed Jul. 2, 1993, Ser. No. 87,226
Int. Cl.[6] H03K *19/096*
U.S. Cl. 326—93 **20 Claims**



1. A system for distributing a master clock signal to plurality of clocked devices formed on an integrated circuit chip, the plurality of clocked devices including clocked input/output devices for temporarily storing data communicated between the integrated circuit chip and elements external to the integrated circuit chip, and internal clocked devices, the system comprising:

an input formed on the integrated circuit chip to receive the master clock signal;

a first path formed on the integrated circuit chip proximate the periphery thereof to communicate a first clock signal, the first path being configured as a closed loop;

a second path formed separate from the first path on the integrated circuit chip substantially in a middle portion of the integrated circuit chip, the second path including a trunk path and a number of tributary paths extending from the trunk path;

first clock buffer means intercoupling the input and the first path for communicating the master clock signal to the first path as the first clock signal;

second clock buffer means intercoupling the input and the second path to communicate the master clock signal to the second path as a second clock signal;

first means coupling the first clock signal to the clocked input/output devices; and

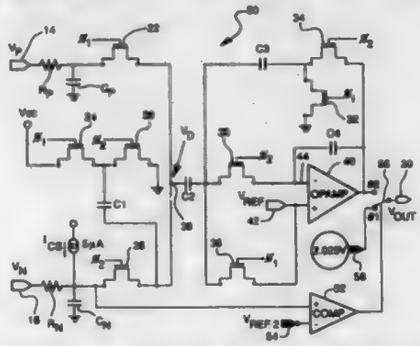
second means coupling selected ones of the number of tributary paths to corresponding ones of the internal clocked devices.

5,467,034

OXYGEN SENSOR INTERFACE CIRCUIT WITH OPTIMIZED GAIN CHARACTERISTICS

Gregory J. Manlove, and Donald A. Hitko, both of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Dec. 5, 1994, Ser. No. 349,573
Int. Cl.[6] H03K *5/22;* **G06G** *7/18*
U.S. Cl. 327—63 **12 Claims**



1. A sensor interface circuit for amplifying and processing sensor output signals, said circuit comprising:

first and second inputs for receiving an output signal from a sensor;

a first RC filter network coupled to the first input, said first RC filter network having a first resistor coupled in series to the first input and a first capacitor coupled between the first input and ground;

a second RC filter network coupled to the second input, said second RC filter network having a second resistor coupled in series to the second input and a second capacitor coupled between the second input and ground;

means for joining the first and second inputs so as to provide a differential voltage representative of a voltage potential between said first and second inputs;

an amplifier having a first input for receiving the differential voltage, and an output for providing an amplified output signal;

current source means for supplying a predetermined current to a selected one of said first and second RC filter networks;

voltage source means for supplying a voltage potential to the differential voltage, said voltage potential substantially compensating for any voltage offset introduced by said first and second RC filter networks;

comparator means for comparing a voltage potential on said selected one of said first and second inputs with a predetermined reference voltage and providing an output; and

switch means coupled to an interface circuit output for selectively switching between the output of said amplifier and a predetermined voltage output in response to the comparator output.

5,467,035

SAMPLE-AND-HOLD CIRCUIT

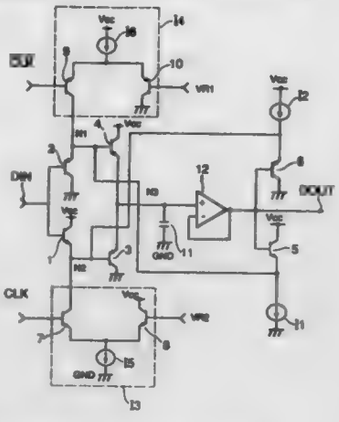
Susumu Ohi, and Hiroshi Shiba, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 39,796, Mar. 30, 1993. This application Sep. 30, 1994, Ser. No. 315,716

Claims priority, application Japan, Mar. 30, 1992, 4-071838

Int. Cl.[6] G11C *27/02*; H03K *5/00*

U.S. Cl. 327—94 6 Claims



1. A sample-and-hold circuit, comprising:

a capacitor;

a push-pull circuit directly connected to the capacitor for charging and discharging the capacitor;

control means for receiving a sample signal to be sampled and a sampling clock signal, for controlling the push-pull circuit so that a voltage at a connection point of the push-pull circuit and the capacitor is equal to a voltage of the sample signal when the sampling clock signal indicates a sampling, and for turning off the push-pull circuit to isolate the capacitor from the sample signal when the sampling clock signal indicates a hold; and

an output buffer coupled to the capacitor for outputting a hold voltage of the capacitor.

5,467,036

INTEGRATED CIRCUIT DEVICE FOR DRIVING ELEMENTS AND LIGHT EMITTING DEVICE

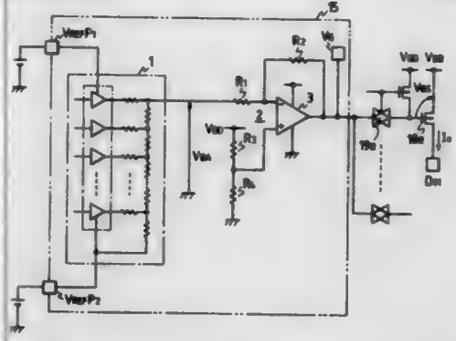
Hideki Sawada, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jun. 22, 1994, Ser. No. 263,529

Claims priority, application Japan, Sep. 1, 1993, 5-217098; Sep. 6, 1993, 5-220351

Int. Cl.[6] H03K *3/00*

U.S. Cl. 327—108 8 Claims



1. An integrated circuit device for driving elements, comprising:

driver circuits for individually driving a plurality of elements to be driven;

a selector circuit for supplying a set voltage to said driver circuits;

first and second external reference voltage terminals for supplying voltage to said selector circuit as a reference voltage; and

an inverting circuit in the selector circuit comprising an operational amplifier having an inversion input terminal to receive reference voltage supplied from the first and second external reference voltage terminals and a noninversion input terminal to receive voltage from a voltage divider connected between a supply voltage and ground and an output terminal for providing said set voltage.

5,467,037

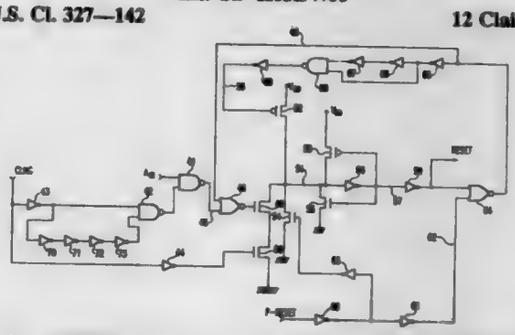
RESET GENERATION CIRCUIT TO RESET SELF RESETTING CMOS CIRCUITS

Manoj Kumar; George M. Lattimore, and Joseph M. Poplawski, Jr., all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1994, Ser. No. 342,967

Int. Cl.[6] H03L *7/00*

U.S. Cl. 327—142 12 Claims



1. A RESET circuit for a self resetting CMOS (SRCMOS) circuit comprising:

a charging means connected between a source of voltage and a node in the RESET circuit for charging said node to a predetermined voltage in response to a RESET signal;

a discharge means connected between said node and ground, said discharge means including ground interrupt means for preventing a discharge of said node;

a latch connected to said node for generating said RESET signal in response to a discharge of said node; and

a clock input circuit having multiple paths, a first path being connected to said ground interrupt means and a second path being connected to said discharge means, said ground interrupt means further enabling a discharge of said node in response to said RESET signal, said first path comprising a greater time delay than said second path so that said ground interrupt means prevents discharging of said node while said charging means charges said node.

5,467,038

QUICK RESOLVING LATCH

Gordon W. Motley; Peter J. Meier, and Brian C. Miller, all of Ft. Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 15, 1994, Ser. No. 196,327

Int. Cl.[6] H03K *3/356*

U.S. Cl. 327—185 20 Claims

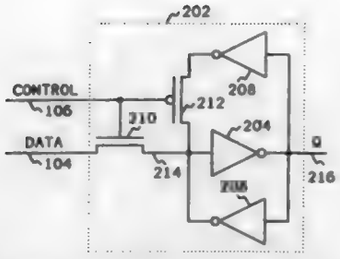
1. A latch circuit for storing data in a digital circuit, said latch circuit comprising:

a feed-forward inverter circuit;

a first feedback inverter circuit having an input connected to an output of said feed-forward inverter circuit and having an output connected to an input of said feed-forward inverter circuit;

control means for connecting an input signal to said input of said feed-forward inverter circuit;

a second feedback inverter connected in parallel to said first feedback inverter; and



switching means having an input connected to said control means, said switching means connected to switch said second feedback inverter out of said latch circuit when said control means is activated to connect said input signal to said input of said feed-forward inverter circuit.

5,467,039

CHIP INITIALIZATION SIGNAL GENERATING CIRCUIT

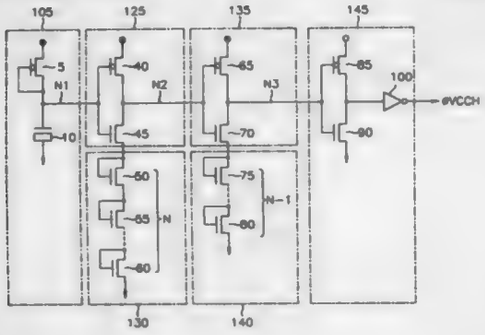
Myung-Ho Bae, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 6, 1994, Ser. No. 268,523

Claims priority, application Rep. of Korea, Jul. 8, 1993, 12807/1993

Int. Cl.[6] H03K *17/22;5/153;17/687*

U.S. Cl. 327—198 **8 Claims**



1. A circuit, comprising:

a time delay circuit for generating a second signal a predetermined time after a first signal is applied thereto;

a first inverter circuit coupled to said second signal for generating a third signal, said third signal having a first logic level when said second signal is below a trip point level, and a second logic level when said second signal is above said trip point level;

a trip point level raising circuit coupled to said first inverter circuit for raising said trip point level, said trip point level raising circuit being comprised of N diode-connected MOS transistors coupled in series between a reference potential and a first electrode of a MOS transistor of said first inverter circuit, where N is greater than or equal to three; and,

a second inverter circuit coupled to said third signal for generating a fourth signal having a logic level which is the inverse of said third signal;

a direct current path cutoff circuit comprised of N−1 diode-connected MOS transistors coupled in series between said reference potential and a first electrode of a MOS transistor of said second inverter circuit.

5,467,040

METHOD FOR ADJUSTING CLOCK SKEW

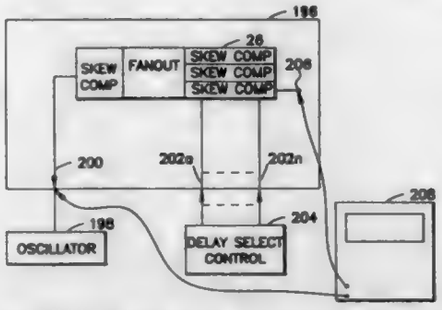
Stephen E. Nelson, Chippewa Falls; David L. Duxstad, Eau Claire, and Galen C. Flunker, Menomonie, all of Wis., assignors to Cray Research, Inc., Eagan, Minn.

Division of Ser. No. 465,947, Jan. 16, 1990, Pat. No. 5,258,660.

This application Jul. 28, 1993, Ser. No. 98,204

Int. Cl.[6] H03H *11/26;* **H03K** *1/04*

U.S. Cl. 327—276 **4 Claims**



1. A method of adjusting signal delay on an electronic module for a system, wherein the electronic module is comprised of a clock input port, a test point, a skew compensator located electrically between the clock input port and the test point, and a storage device for storing delay codes, wherein a desired delay is selected so that the desired delay is equal to or greater than a longest delay path expected on any module in the system, the method comprising the steps of:

(a) injecting a test signal into the clock input port of the module;

(b) measuring a delay for the test signal between the clock input port and the test point;

(c) comparing the measured delay to the desired delay;

(d) calculating an amount of adjustment needed to cause the measured delay to equal the desired delay;

(e) selecting a delay code that reflects the calculated amount of adjustment; and

(f) programming the skew compensator according to the selected delay code.

5,467,041

VARIABLE DELAY BUFFER CIRCUIT

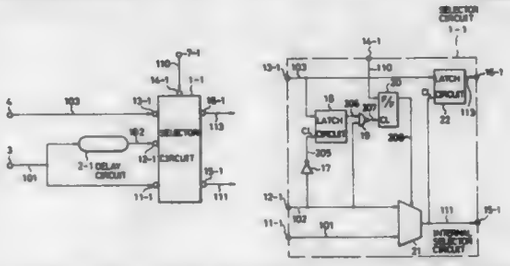
Mitsuo Baba, and Yasushi Aoki, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 23, 1994, Ser. No. 264,617

Claims priority, application Japan, Jun. 23, 1993, 5-176052

Int. Cl.[6] H03K *5/13;* **H03L** *7/00*

U.S. Cl. 327—276 **7 Claims**



1. A variable delay buffer circuit including a cascade of variable delay buffers, each of said variable delay buffers comprising:

(a) a delay circuit for delaying in time an input digital signal to produce a delayed digital signal

(b) a selector circuit for selecting one of said input digital signal and said delayed digital signal in response to a delay control signal supplied to said selector circuit and for outputting one of said signals thus selected as a selector circuit output signal;

(c) said selector circuit comprising:

a delay control signal actuation control means for controlling a timing of an actuation of said delay control signal in response to a timing control signal supplied to said selector circuit;

an internal selection means for selecting one of said input digital signal and said delayed digital signal in response to an activation timing control signal generated by said actuation timing control means, said internal selection means outputting said output signal of said selector circuit; and

a timing control signal output means for receiving said timing control signal and for outputting a timing control signal to be synchronized with said output signal from said internal selection means.

5,467,042

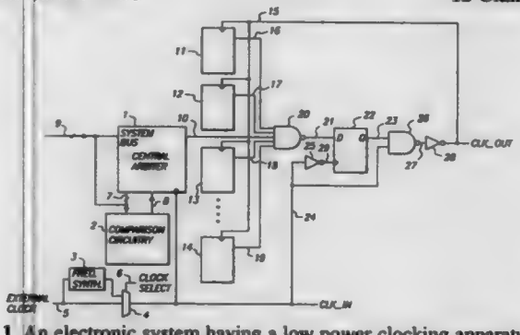
LOW POWER CLOCKING APPARATUS AND METHOD

Stephen A. Smith, Palo Alto; Bryan Richter, Fremont, and Dave M. Singhal, San Jose, all of Calif., assignors to Cirrus Logic, Inc., Freemont, Calif.

Filed Nov. 8, 1993, Ser. No. 149,107

Int. Cl.[6] H03K *3/00*

U.S. Cl. 327—293 **12 Claims**



1. An electronic system having a low power clocking apparatus, the electronic system comprising:

a. a clock signal;

b. a plurality of sub-circuits, each sub-circuit configured to operate under control of the clock signal and further including a selection apparatus for keeping or rejecting the clock signal; and

c. an arbiter for disabling the clock signal to all sub-circuits once each sub-circuit rejects the clock signal.

5,467,043

SIGNAL LEVEL CONVERTING CIRCUIT FOR LIQUID CRYSTAL DISPLAY DEVICE RECEIVING ANALOG COLOR SIGNAL

Susumu Ohi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 1, 1994, Ser. No. 189,743

Claims priority, application Japan, Feb. 1, 1993, 5-014380

Int. Cl.[6] H03L *5/00*

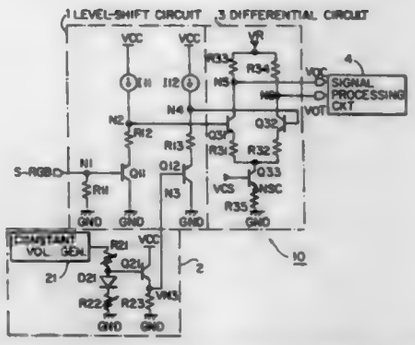
U.S. Cl. 327—333 **15 Claims**

1. A signal level converting circuit comprising:

an input terminal supplied with an input signal;

a reference terminal supplied with a reference voltage, said reference voltage being a dc voltage and having such a level that is a center level of an amplitude of said input signal;

a differential circuit including first and second input nodes, a current source, a first transistor having a base connected to said first input node, an emitter connected through a first resistor to said current source and a collector connected through a second resistor to a bias line, a second transistor having a base connected to said second input node, an emitter connected through a third resistor to said current source and a collector connected through a fourth resistor to said bias line,



and first and second output terminals coupled respectively to the collectors of said first and second transistors;

a first level-shift circuit coupled between said input terminal and the first input node of said differential circuit to level-shift said input signal by a first level-shift amount and supply a level-shifted signal to said first input node; and

a second level-shift circuit coupled between said reference terminal and the second input node of said differential circuit to level-shift said reference voltage by a second level-shift amount and supply a level-shifted reference voltage to said second input node, said second level-shift amount being equal to said first level-shift amount so that said level-shifted reference voltage has such a level that is a center level of an amplitude of said level-shifted signal.

5,467,044

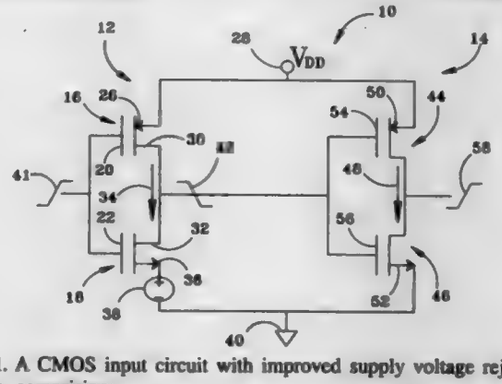
CMOS INPUT CIRCUIT WITH IMPROVED SUPPLY VOLTAGE REJECTION

James Ashe, Saratoga, and Derek F. Bowers, Sunnyvale, both of Calif., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Nov. 28, 1994, Ser. No. 345,579

Int. Cl.[6] H03L *5/00;* **H03K** *19/0175*

U.S. Cl. 327—333 **14 Claims**



1. A CMOS input circuit with improved supply voltage rejection, comprising:

a high voltage node for receiving a high supply voltage V_{DD};

a low voltage node for receiving a low supply voltage V_{LS};

an input node for receiving an input voltage signal that has a high logic value of at least V_H and a low logic value of at most V_L;

a first PMOS transistor having a gate with a predetermined geometry, a drain and a source, said PMOS gate being connected to said input node and said PMOS source being electrically coupled to said high voltage node;

a first NMOS transistor having a gate with a predetermined geometry, a drain and a source, said NMOS gate being connected to said input node and said NMOS drain being connected to the PMOS drain so that said transistors conduct a common drain current;

a voltage offset element that is connected between the NMOS source and said low voltage node to set the voltage at the

source of the first NMOS transistor at an offset voltage V_{off} above the low supply voltage;

said input circuit establishing a threshold voltage V_T that is a function of said high and low supply voltages, said offset voltage and the PMOS and NMOS gate geometries so that (a) when said input signal voltage exceeds V_T said first NMOS transistor is relatively more conductive than said first PMOS transistor such that said common drain current flowing through said transistors produces an output voltage signal at their drain connection, said output voltage signal having a low logic value of approximately said offset voltage above the low supply voltage, and (b) when said input signal voltage is less than V_T said first PMOS transistor is relatively more conductive than said first NMOS transistor such that said common drain current produces said output voltage signal with a high logic value of approximately said high supply voltage, the transistors' having gate geometries that set the gate-to-source voltage required to saturate the first NMOS transistor at a low enough value to offset the effect of said voltage offset element on V_T so that $V_T > V_L$ over a predetermined range of high supply voltages, where said range is larger than it would be absent said voltage offset element,; and

a logic circuit that is connected between said high and low voltage nodes and is driven by said output voltage signal to produce a CMOS compatible voltage signal that has a high logic value of approximately said high supply voltage and a low logic value of approximately said low supply voltage.

5,467,045

INTEGRATOR INCLUDING AN OFFSET ELIMINATING CIRCUIT AND CAPABLE OF OPERATING WITH LOW VOLTAGE

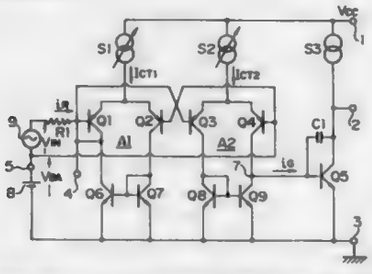
Hiroshi Tanigawa, Tsurugashima, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Oct. 26, 1994, Ser. No. 329,204

Claims priority, application Japan, Jan. 29, 1993, 5-294185

Int. Cl.[6] G06G 7/64

U.S. Cl. 327—336 **1 Claim**



1. An integrator comprising an emitter-grounded type integrator circuit comprising a transistor having the emitter thereof grounded and having a capacitor connected between the base and collector thereof, an amplifier circuit connected to the input side of said integrator circuit, and an offset eliminating circuit connected to said amplifier circuit, wherein said amplifier circuit comprises a first and a second differential amplifier circuit each of which comprises a differential transistor pair and includes a variable current source connected to common-connected emitters of the transistors of the differential transistor pair and a current-mirror circuit connected thereto as a load; one of the transistors constituting the differential transistor pair of said first differential amplifier circuit is diode-connected; an input signal super-imposed upon the bias voltage is imparted through a resistor to the base of one of the transistors constituting the differential transistor pair of said second amplifier circuit; said bias voltage is applied to the bases of the remaining transistors constituting said differential pairs of said first and second differential amplifier circuits; said offset eliminating circuit comprises a first and a second current-mirror circuit connected in cascade so as to serve as load for each other, and a third current-mirror circuit comprising a plurality of transistors which are connected in a base-common fashion to the transistors of said first current-mirror circuits and have emitters thereof connected to a current source providing a constant current and to the emitters of said transistors to which said bias voltage is applied at the bases thereof; and one of the output transistors of said third current-mirror circuit is connected to the base of said diode-connected transistor of said first differential amplifier circuit.

5,467,046

LOGARITHMIC INTERMEDIATE-FREQUENCY AMPLIFIER

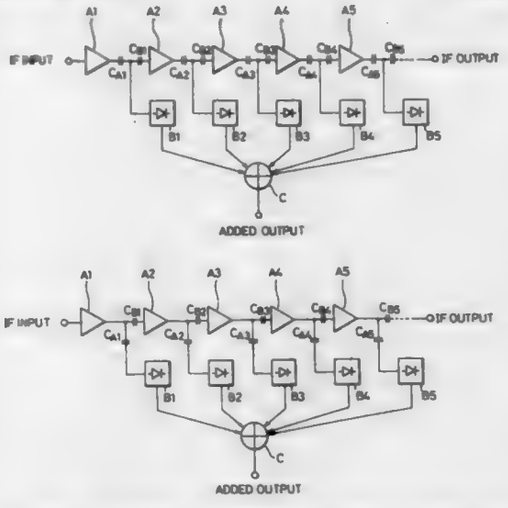
Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 22, 1992, Ser. No. 886,950

Claims priority, application Japan, May 30, 1991, 3-155648; May 23, 1991, 3-147769

Int. Cl.[6] G06F 7/556;7/24

U.S. Cl. 327—351 **6 Claims**



1. A C-MOS logarithmic intermediate-frequency amplifier comprising:

a plurality of intermediate-frequency amplifiers cascade-connected, each of said amplifiers being connected through a first coupling capacitor to each other, an intermediate-frequency input signal being applied to one of said amplifiers disposed at a first stage, each of said amplifiers being formed of MOS transistors;

a plurality of rectifiers, each of which being connected through a second coupling capacitor to corresponding one of said amplifiers to rectify an output signal from said corresponding one of said amplifiers, each of said rectifiers being formed of MOS transistors; and

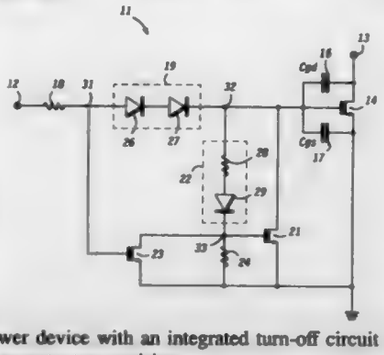
an adder connected to said rectifiers, said adder receiving output signals of said plurality of rectifiers and adding them to each other, said adder generating an output signal varying substantially logarithmically as a function of said intermediate-frequency input signal applied to said amplifier at said first stage;

wherein capacitance values of said first coupling capacitors are set so that each of said amplifiers has a frequency band whose low band side is cut off to reduce (1/f) noise thereof, and capacitance values of said second coupling capacitors are set so that each of said rectifiers has a frequency band whose low band side is expanded to improve linearity of a logarithmic characteristic of said logarithmic intermediate-frequency amplifier.

5,467,047
POWER TRANSISTOR RAPID TURN OFF CIRCUIT FOR SAVING POWER

Stephen P. Robb, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 15, 1994, Ser. No. 275,551
Int. Cl.[6] H03K *17/04;17/687*
U.S. Cl. 327—377 **12 Claims**



1. A power device with an integrated turn-off circuit having an input and an output comprising:

a power transistor having a first electrode, a control electrode, and a second electrode, said first electrode being coupled to the output and said second electrode being coupled for receiving a power supply voltage;

a first coupling circuit having a first terminal and a second terminal, said first terminal being coupled to the input and said second terminal being coupled to said control electrode of said power transistor wherein said first coupling circuit couples a first signal to said control electrode of said power transistor for enabling said power transistor during an enable cycle;

a first transistor having a first electrode, a control electrode, and a second electrode, said first electrode of said first transistor being coupled to said control electrode of said power transistor and said second electrode of said first transistor being coupled for receiving said power supply voltage;

a second transistor having a first electrode, a control electrode, and a second electrode, said first electrode of said second transistor being coupled to said control electrode of said first transistor, said control electrode of said second transistor being coupled to the input, and said second electrode of said second transistor being coupled for receiving said power supply voltage; and

a second coupling circuit having a first terminal and a second terminal, said first terminal of said second coupling circuit being coupled to said control electrode of said power transistor and said second terminal of said second coupling circuit being coupled to said control electrode of said first transistor wherein said second coupling circuit couples a second signal to said control electrode of said first transistor for enabling said first transistor during a disable cycle.

5,467,048
SEMICONDUCTOR DEVICE WITH TWO SERIES-CONNECTED COMPLEMENTARY MISFETS OF SAME CONDUCTION TYPE

Yoshiharu Watanabe, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

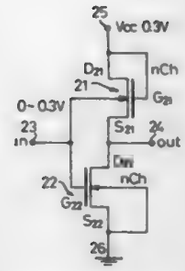
Filed Jul. 29, 1994, Ser. No. 282,548
Claims priority, application Japan, Nov. 15, 1993, 5-284638
Int. Cl.[6] H03K *17/687*
U.S. Cl. 327—436 **21 Claims**

1. A semiconductor device comprising:

a first MISFET; and

a second MISFET having a channel of the same conduction type as that of the first MISFET and connected in series with the first MISFET,

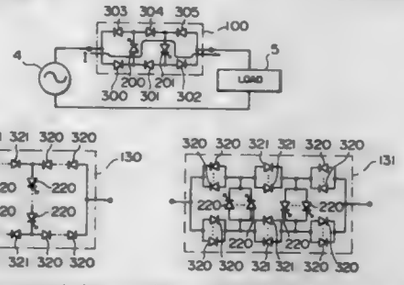
the first and second MISFETs operating complementarily.



5,467,049
SOLID-STATE SWITCH

Junzo Kida, Hitachi; Hiroshi Arita, Mito, and Yukio Kurosawa, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 15, 1993, Ser. No. 91,623
Claims priority, application Japan, Sep. 18, 1992, 4-249934
Int. Cl.[6] H03K *17/72;17/725*
U.S. Cl. 327—438 **33 Claims**



30. A solid-state switch comprising a plurality of gate turn-off thyristors and a plurality of diodes connected thereto to effect a circuit arrangement, wherein:

said plurality of gate turn-off thyristors are connected in series;

a forward current is made to flow through a connection consisting of a first forwardly-directioned diode, a first gate turn-off thyristor, a second forwardly-directioned diode, a second gate turn-off thyristor and a third forwardly-directioned diode, in turn;

a backward current is made to flow through a connection consisting of a first reversely-directioned diode, said second gate turn-off thyristor, a second reversely-directioned diode, said first gate turn-off thyristor and a third reversely-directioned diode, in turn;

an bidirectional current is rectified by said diodes in a manner such that both the forward and backward currents flow through said first and second gate turn-off thyristors; and

the number of said gate turn-off thyristors used is equal to or smaller than that determined by the breakdown voltage of said solid-state switch in the off-state and by the set voltage across each of said gate turn-off thyristors.

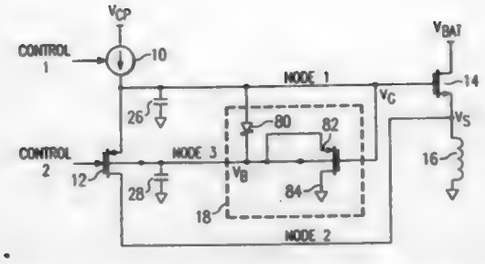
5,467,050
DYNAMIC BIASING CIRCUIT FOR SEMICONDUCTOR DEVICE

John S. Clapp, III, Reinholds, Pa., and Wayne T. Chen, Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 4, 1994, Ser. No. 177,811
Int. Cl.[6] G05F *1/10;* **H03K** *5/08;19/084*
U.S. Cl. 327—530 **20 Claims**

1. A dynamic biasing circuit, comprising:

a blocking current source coupled to a first node having a dynamic voltage level and to a second node, the blocking current source operable to allow current to flow from the first node to the second node and to block current from flowing from the second node to the first node;



a linear source follower coupled to the first node and the second node; and

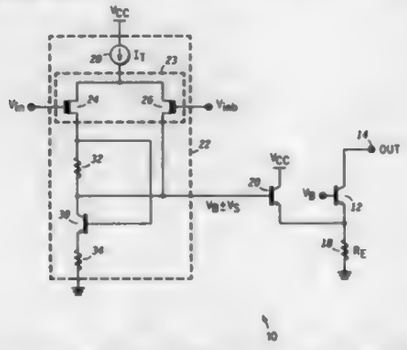
a voltage reference having a substantially constant voltage level coupled to the linear source follower, wherein the linear source follower is operable to couple the second node to the voltage reference when the dynamic voltage level of the first node is below the substantially constant voltage level of the voltage reference and alternatively to cause the voltage level of the second node to substantially track the dynamic voltage level of the first node when the dynamic voltage level of the first node is above the substantially constant voltage level of the voltage reference.

5,467,051

LOW VOLTAGE PRECISION SWITCH

Behrooz Abdi, Gilbert, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 1, 1993, Ser. No. 114,279
Int. Cl.[6] G05F *1/10*
U.S. Cl. 327—536 **6 Claims**



1. A current switch circuit having an output terminal, comprising:

a differential pair of transistors having first and second transistors each having a collector, a base, and an emitter, said emitter of said first transistor coupled to said emitter of said second transistor, said base of said first transistor coupled for receiving a bias voltage, said collector of said first transistor serving as the output terminal of the current switch circuit, said collector of said second transistor coupled to first supply voltage terminal;

a first resistor coupled between said emitter of said first transistor and a second supply voltage terminal; and

a bias circuit for alternately providing first and second voltages at said base of said second transistor, said bias circuit having an output node coupled to said base of said second transistor, said first transistor being operative and said second transistor being non-operative when said first voltage is greater than said bias voltage and said second transistor being operative and said first transistor being non-operative when said second voltage is less than said bias voltage, wherein said bias circuit includes:

a current source;

a first switch having first and second inputs responsive to a complementary pair of input signals for steering a current provided by said current source to either a first output or a second output of said first switch;

a third transistor having a collector, a base and an emitter, said base of said third transistor coupled to said first output of said first switch, said collector of said third transistor coupled to said second output of said first switch and to said output of said bias circuit;

a second resistor coupled between said first output of said first switch and said collector of said third transistor; and

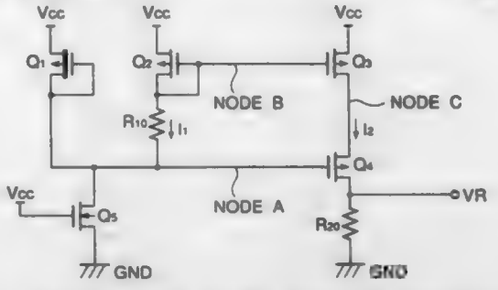
a third resistor coupled between said emitter of said third transistor and said second supply voltage terminal.

5,467,052

REFERENCE POTENTIAL GENERATING CIRCUIT UTILIZING A DIFFERENCE IN THRESHOLD BETWEEN A PAIR OF MOS TRANSISTORS

Shyuichi Tsukada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 2, 1994, Ser. No. 284,138
Claims priority, application Japan, Aug. 2, 1993, 5-191047
Int. Cl.[6] G05F *3/02;1/10*
U.S. Cl. 327—543 **6 Claims**



1. A reference potential generating circuit using MOS transistors having different thresholds and configured to generate a reference potential by amplifying a difference between the thresholds of the MOS transistors, the reference potential generating circuit comprising: a first PMOS transistor having its gate and its drain connected in common to a first node and its source connected to a high voltage supply voltage; a second PMOS transistor having its gate and its drain connected in common to a second node and its source connected to said high voltage supply voltage; a first resistor connected between said first node and said second node; a first current source connected between said first node and a low voltage supply voltage; a third PMOS transistor having its gate connected to said second node, its drain connected to a third node and its source connected to said high voltage supply voltage; a fourth PMOS transistor having its source connected to said third node, its gate connected to said first node and its drain connected to a fourth node; and a second resistor connected between said fourth node and said low voltage supply voltage, the reference potential being generated from said fourth node.

5,467,053

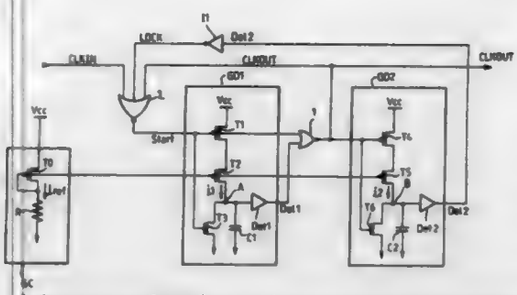
CIRCUIT FOR FILTERING A SIGNAL AND INTEGRATED CIRCUIT COMPRISING SUCH A CIRCUIT

Sylvie Wuidart, Pourrieres, and Tien-Dung Do, Aix-en-Provence, both of, France, assignors to SGS-Thomson Microelectronics, SA, Cedex, France

Filed Aug. 4, 1994, Ser. No. 286,485
Claims priority, application France, Aug. 5, 1993, 93 09680
Int. Cl.[6] H03K *3/017;5/14*
U.S. Cl. 327—551 **20 Claims**

1. A circuit for filtering an input pulse signal, comprising:

a stage for the generation of a first delay, comprising a first capacitor whose charging and discharging are controlled by a first control signal, one of the terminals of the first capacitor



being connected to a first non-inverter level detector to deliver a first delay signal, the other terminal being connected to the ground;

a stage to generate a second delay comprising a second capacitor whose charging and discharging are controlled by a second control signal, one of the terminals of the second capacitor being connected to a second non-inverter level detector to deliver a second delay signal, the other terminal being connected to the ground;

a first NOR type logic gate receiving the first control signal and the first delay signal at input and delivering, at output, the second control signal which is the output pulse signal;

a second NOR type logic gate receiving, at input, the input pulse signal, the output pulse signal and a locking signal controlled by the second delay signal and delivering, at output, the first control signal.

5,467,054

OUTPUT CIRCUIT FOR MULTIBIT-OUTPUTTING MEMORY CIRCUIT

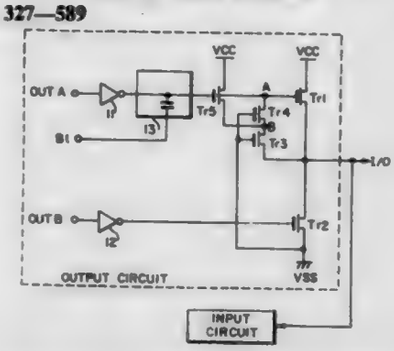
Minari Ikeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 5, 1994, Ser. No. 318,087

Claims priority, application Japan, Jan. 6, 1993, 5-250272

Int. Cl.[6] G05F *1/10;3/02*

U.S. Cl. 327—589 **4 Claims**



1. An output circuit comprising, an output transistor provided between a first power terminal and an output terminal, a voltage boosting circuit for supplying a boosted signal to the gate of said output circuit in response to an input signal, and control means connected to a second power terminal for electrically connecting said output terminal to the gate of said output transistor when the potential of said output terminal becomes lower by more than a predetermined voltage from the potential of said second power terminal while a low level signal is being supplied to the gate of said output transistor, and for electrically isolating said output terminal and said output transistor irrespective of the potential of said second power terminal when a high level signal is supplied to the gate of said output transistor.

5,467,055

POWER AMPLIFIER AND RADIO TRANSMITTER

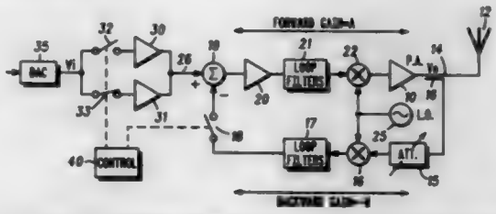
Anthony J. Wray, Hants; Babak Bastani, London, both of, United Kingdom, and Paul H. Gailus, Prospect Heights, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 6, 1995, Ser. No. 369,243

Claims priority, application United Kingdom, Jan. 29, 1994, 9401704

Int. Cl.[6] H03G *3/20*

U.S. Cl. 330—129 **5 Claims**



1. A power amplifier having an input and an output and comprising, between the input and output:

an amplifier circuit comprising

a forward loop gain element having an input for receiving a signal to be amplified and an output,

a feedback element coupled to the output of the forward gain element for providing a negative feedback signal,

a subtractor element for subtracting the negative feedback signal from the signal to be amplified, thereby providing an amplifier control loop and

loop closing means for selectively opening and closing the control loop in response to a loop closing signal; and

a gain adjustment element external to the control loop, responsive to the loop closing signal to select a first external gain when the loop is opened and a second external gain when the loop is closed, said first and second external gains being selected to maintain approximately constant gain between the input and the output of the amplifier during opening and closing of the loop.

5,467,056

VERY HIGH SPEED PRECISION AMPLIFIER

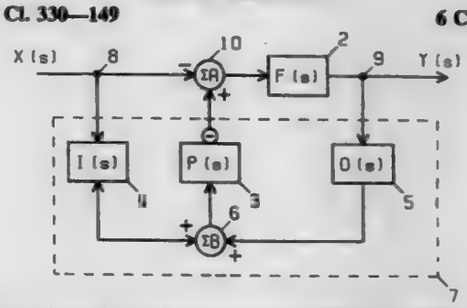
Jean-François Goumaz, Meyrin, Switzerland, assignor to LeCroy S.A., Meyrin, Switzerland

Filed Apr. 8, 1994, Ser. No. 224,883

Claims priority, application European Pat. Off., Apr. 8, 1993, 93105837

Int. Cl.[6] H03F *1/30*

U.S. Cl. 330—149 **6 Claims**



1. A high speed, precision composite amplifier comprising:

an input terminal to which an input signal is applied;

an output terminal to which an output signal is applied;

an open-loop high-speed precision amplifier connected to said output terminal;

a compensation network for compensating distortions of said open-loop high speed precision amplifier, said compensation network comprising:

(1) an input transfer network which receives said input signal from said input terminal, said input transfer network being a resistive network;

(2) an output transfer network which receives said output signal from said output terminal, said output transfer network being a resistive network;

(3) a first summing node which receives and sums outputs of said input transfer network and said output transfer network; and

(4) a high precision, high speed amplifier which receives an output of said first summing node; and

a second summing node which receives and sums an output of said high precision, high speed amplifier with said input signal and outputs the sum to said open-loop, high speed, precision amplifier, wherein transfer functions of said open-loop, high speed amplifier F(s), said high precision, high speed amplifier P(s), said input transfer network I(s), and said output transfer network O(s) satisfy the following conditions:

|I(s)-P(s)|>>1

|F(s)-O(s)-P(s)|>>1 at low frequencies, and

I(s)=F(s)-O(s) at high frequencies.

5,467,057

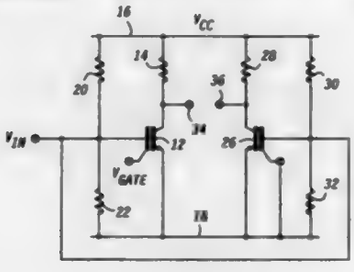
CIRCUIT AND METHOD OF VARYING AMPLIFIER GAIN

Kuntal Joardar, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 11, 1994, Ser. No. 320,427

Int. Cl.[6] H03F 3/45; H03G 3/30

U.S. Cl. 330—254 **20 Claims**



10

20. A method of varying gain in an amplifier circuit, comprising the steps of:

applying an input signal to bases of first and second transistors that are differentially coupled;

applying a first gate voltage to a gate of said first transistor;

applying a second gate voltage to a gate of said second transistor;

varying said first gate voltage to alter forward current gain of said first transistor; and

developing a differential output signal at collectors of said first and second transistors having a gain with respect to said input signal determined as a function of said first and second gate voltages.

5,467,058

AMPLIFIER CIRCUIT WITH A STABILIZED BIAS IN ITS OUTPUT STAGE

Shinichi Fujita, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Aug. 26, 1994, Ser. No. 296,712

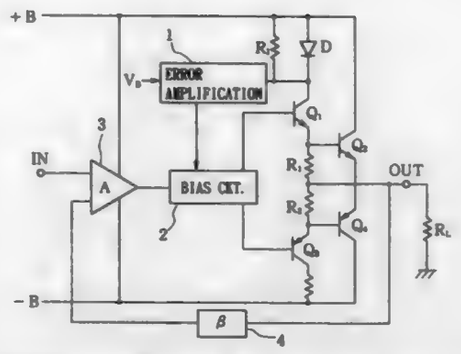
Claims priority, application Japan, Sep. 1, 1993, 5-240387

Int. Cl.[6] H03F 3/26

U.S. Cl. 330—267 **2 Claims**

1. An amplifier circuit comprising.

a push-pull type output circuit including a first transistor and a second transistor connected to each other in Darlington connection, a third transistor and a fourth transistor respectively



operating complementarily and connected to each other in Darlington connection, and said second transistor and said fourth transistor being connected in series as output stage transistors between terminals of a DC power supply source;

current detection means comprising current detection resistance inserted between either said first transistor or said third transistor and said DC power supply source and detecting idling current of either said first transistor or said third transistor on the basis of terminal voltage of said current detection resistance; and

biasing means responsive to output of said current detection means for controlling the idling current of either said first transistor or said third transistor in a negative feedback fashion.

5,467,059

TEMPERATURE-STABILIZED OSCILLATOR CIRCUIT HAVING HEATING ELEMENTS THAT CAN BE EXTERNALLY INFLUENCED

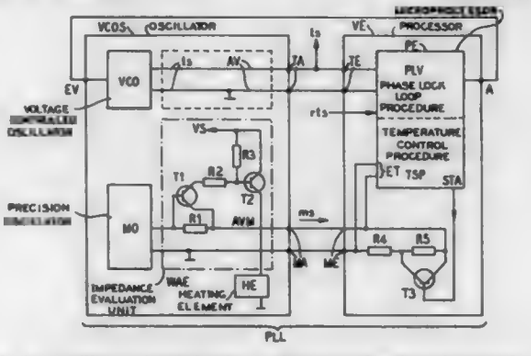
Eduard Zwack, Puchheim, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 7, 1994, Ser. No. 178,836

Claims priority, application Germany, Jan. 29, 1993, 43 02 529.3

Int. Cl.[6] H03B 1/00

U.S. Cl. 331—70 **14 Claims**



1. An oscillator circuit having at least one heating element for keeping the temperature of the oscillator circuit substantially constant, comprising:

oscillator means for forming oscillation signals;

oscillator connection means for connecting said oscillator means to an oscillator output of the oscillator circuit, said oscillator connection means conveying said oscillation signals from said oscillator means to said oscillator output; and

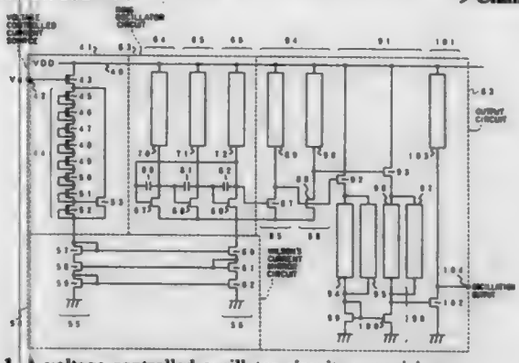
said oscillator connection means having an impedance evaluation means for detecting a change in the impedance of an impedance means connected to said oscillator output, said at least one heating element being activated and deactivated as a function of the change in said impedance of said impedance means.

5,467,060

VOLTAGE CONTROLLED OSCILLATOR HAVING A CURRENT MIRROR CIRCUIT AS CURRENT SOURCE

Tukumi Miyashita, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 26, 1994, Ser. No. 233,875
Claims priority, application Japan, Jun. 1, 1993, 5-130380
Int. Cl.[6] H03B *5/00;5/24;* **H03L** *7/099*
U.S. Cl. 331—74 **9 Claims**



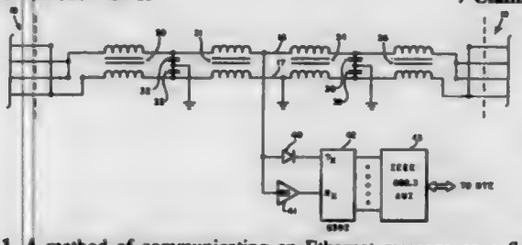
1. A voltage controlled oscillator circuit, comprising:
a voltage controlled current source supplying a first current which is controlled responsive to a control voltage;
a current mirror circuit including input side circuit means and output side circuit means, said input side circuit means receiving the first current from said voltage controlled current source;
an oscillator circuit using the output side circuit means of said current mirror circuit as current source means and having an oscillation frequency which is controlled responsive to a second current of the output side circuit means; and
an output circuit obtaining an oscillation output of said oscillator circuit, said oscillation output of said oscillator including complementary outputs,
wherein the output circuit includes two source follower circuits coupled to the complementary outputs, two pseudo resistor circuits, and another current mirror circuit, and
wherein the two source follower circuits are respectively coupled to input side means and output side means of the another current mirror circuit through the pseudo resistor circuits, and the output is obtained from between the output side means of the another current mirror circuit and the source follower circuit.

5,467,061

FLAT CABLE TO FLAT PARALLEL WIRE CABLE

Charles M. Aden; Martin H. Graham, both of Berkeley; Matthew Taylor, Pleasant Hill, and Mark Miller, Oakland, all of Calif., assignors to Tut Systems, Inc., Pleasanton, Calif.

Continuation of Ser. No. 92,721, Jul. 16, 1993, Pat. No. 5,379,005. This application Oct. 11, 1994, Ser. No. 320,606
The portion of the term of this patent subsequent to Jan. 3, 2012, has been disclaimed.
Int. Cl.[6] H03H *5/00*
U.S. Cl. 333—24 R **7 Claims**



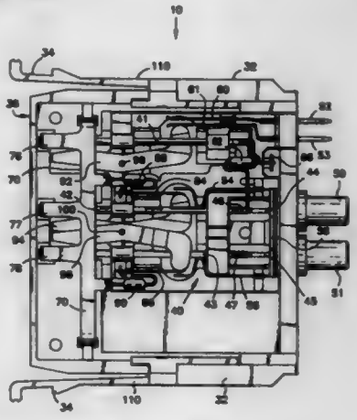
1. A method of communicating an Ethernet message on a flat cable, said flat cable having at least four insulated conductors, said method comprising the steps of:
connecting at both ends a first pair of said four insulated conductors to form a first half of a transmission line;
connecting at both ends a second pair of said four insulated conductors to form a second half of said transmission line;
connecting a first terminal of an Ethernet message transmitting circuit to said first half of said transmission line;
connecting a second terminal of said Ethernet message transmitting circuit to said second half of said transmission line;
transmitting said Ethernet message on said transmission line.

5,467,062

MINIATURE COAX JACK MODULE

Dennis M. Burroughs, Savage, Minn., assignor to ADC Telecommunications, Inc., Minneapolis, Minn.

Continuation of Ser. No. 859,272, Apr. 2, 1992, abandoned. This application Jun. 1, 1994, Ser. No. 252,067
Int. Cl.[6] H01P *1/10*
U.S. Cl. 333—124 **38 Claims**



1. A coax jack module comprising:
a first coax conductor;
a second coax conductor;
a first resilient conductive contact biased into electrical contact with said first conductor, said first conductor and said first contact having a combined first capacitance;
a second resilient conductive contact biased into electrical contact with said second conductor, said second conductor and said second contact having a combined second capacitance;
a cross-conductor electrically connecting said first and second contacts;
said cross-conductor having an inductance balancing said first and second capacitance;
an electrically conductive housing having a cast unitary body with walls defining an interior and a cover for enclosing said interior;
a dielectric support means for supporting said conductors, said contacts and said cross-conductor within said interior;
said body and cover having interior surfaces of a predetermined shape to provide a grounded shield for said conductors; and
said body and cover having generally parallel and narrowly spaced apart exterior surfaces.

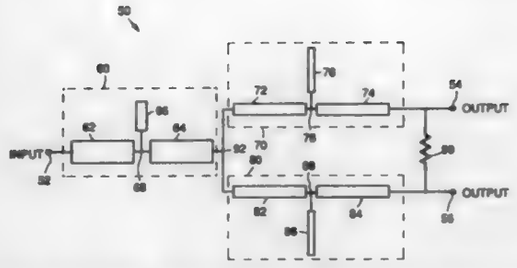
5,467,063

ADJUSTABLE MICROWAVE POWER DIVIDER

Richard W. Burns, Orange, and Darren E. Atkinson, La Habra, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 21, 1993, Ser. No. 125,055
Int. Cl.[6] H01P *5/12*
U.S. Cl. 333—125 **10 Claims**

6. A microwave power divider circuit, comprising:
a power divider circuit input port;



means for dividing an input signal received at said input port into first and second signals of equal power and phase;

first and second power division networks, said first network having a first input port at which said first signal is received and a first network output port, said second network having a second network input port and a second network output port, and wherein at least one of said first and second networks comprises an element whose length may be trimmed to affect an impedance of said power division network;

an isolation resistor connected across said first and second network output ports of said power division networks;

impedance matching circuit means connected at said circuit input port for matching a composite impedance presented by said power division networks to an impedance presented to said power divider circuit at said circuit input port, said impedance matching means comprising a transmission line network comprising two series-connected transmission line segments connected at a connection node, and an open stub transmission line segment connected to said connection node, said stub having a stub length, said network characterized by a characteristic impedance determined in part by said stub length, said stub length being selected to match said composite impedance to said impedance presented to said circuit; and

wherein said element length of one or more of said first and second power division networks is trimmed to provide characteristic impedances of said networks which provide a desired power division ratio of said input signal between said power division network output ports.

5,467,064

EMBEDDED GROUND PLANE FOR PROVIDING SHIELDED LAYERS IN LOW VOLUME MULTILAYER TRANSMISSION LINE DEVICES

Wang-Chang A. Gu, Albuquerque, N.M., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 28, 1994, Ser. No. 187,967

Int. Cl.[6] H01P *5/12*

U.S. Cl. 333—128 **10 Claims**

1. An electrical circuit that includes a plurality of vertically stacked dielectric substrates, comprising:

first input means for providing an input signal;

first output means for providing an output signal;

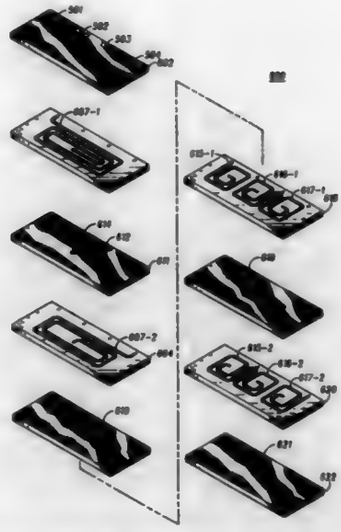
a first transmission line device electrically positioned between the first input means and the first output means, wherein the first transmission line device comprises:

a first ground plane disposed on a first of the plurality of vertically stacked dielectric substrates;

a first non-grounded conductive layer, having a first end connected to the first input means and a second end, that at least partially encloses a first area on a second of the plurality of vertically stacked dielectric substrates;

a second conductive layer, operably coupled at a first end to the second end of the first non-grounded conductive layer, that at least partially encloses a second area corresponding to the first area on a first major surface of a third of the plurality of vertically stacked dielectric substrates; and

an embedded ground plane disposed on a fourth of the plurality of vertically stacked dielectric substrates that is positioned substantially between the second dielectric substrate and the third dielectric substrate; and



a second transmission line device, comprising:

a third conductive layer, having a first end connected to the first input means and a second end, that at least partially encloses a third area on a fifth of the plurality of vertically stacked dielectric substrates;

a fourth conductive layer, operably coupled at a first end to the second end of the third non-grounded conductive layer, that at least partially encloses a fourth area corresponding to the third area on a first major surface of a sixth of the plurality of vertically stacked dielectric substrates; and

a second embedded around plane disposed on a seventh of the plurality of vertically stacked dielectric substrates, that is positioned substantially between the fifth dielectric substrate and the sixth dielectric substrate.

5,467,065

FILTER HAVING RESONATORS COUPLED BY A SAW FILTER AND A DUPLEX FILTER FORMED THEREFROM

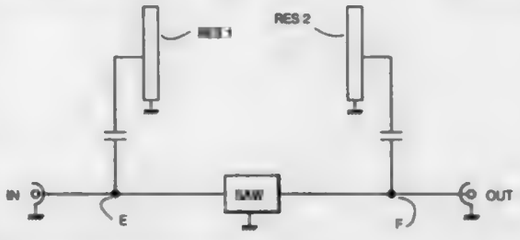
Aimo Turunen, and Heli Jantunen, both of Oulu, Finland, assignors to LK-Products Oy, Kempele, Finland

Filed Feb. 28, 1994, Ser. No. 202,901

Claims priority, application Finland, Mar. 3, 1993, 930944

Int. Cl.[6] H03H *7/46*; H01P *1/213*

U.S. Cl. 333—132 **6 Claims**



5. A radio transceiver comprising:

an antenna;

a receiver section;

a transmitter section; and

a duplex filter coupling the antenna to both the receiver and transmitter sections, the duplex filter comprising a receiver branch filter with an output coupled to the receiver section and with an input coupled to the antenna for filtering a received signal coupled from the antenna, and a transmitter branch filter with an input coupled to the transmitter section and with an output coupled the antenna for filtering a signal coupled from the transmitter section to the antenna, at least

one of the receiver branch filter and transmitter branch filter respectively comprising at least one filter, the at least one filter comprising:

a first filter comprising at least a pair of intercoupled resonators; and

a SAW filter coupled between the pair of intercoupled resonators to provide the intercoupling, whereby the input is coupled to the output through the SAW filter to provide the output signal.

5,467,066

RADIATING HIGH-FREQUENCY COAXIAL CABLE

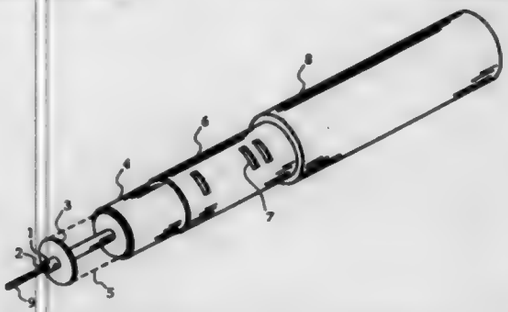
Karl Schulze-Buxloh, Monchengladbach, Germany, assignor to Kabel Rheydt Aktiengesellschaft, Monchengladbach, Germany

Filed Sep. 13, 1994, Ser. No. 305,149

Claims priority, application Germany, Sep. 14, 1993, 43 31 171.7

Int. Cl.[6] H01Q *13/20*

U.S. Cl. 333—237 **22 Claims**



18. A radiating high-frequency coaxial cable having an axis, comprising:

an outside conductor comprising a plurality of sections thereal-ong, each of said sections having a period length, said outside conductor having a plurality of openings therein, said openings being slots having a major axis arranged perpendicular to the axis of the coaxial cable; and

wherein adjacent sections have different period lengths and a different number of slots per period length.

5,467,067

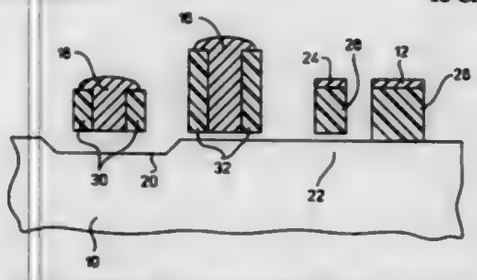
THERMALLY ACTUATED MICROMACHINED MICROWAVE SWITCH

Leslie A. Field, Portola Valley, and Richard C. Ruby, Menlo Park, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 14, 1994, Ser. No. 212,544

Int. Cl.[6] H01H *53/00*

U.S. Cl. 335—4 **18 Claims**



1. An integration of a micromachined device and a signal transmission scheme comprising:

a substrate;

first line means formed on said substrate for conducting an electrical signal;

second line means formed on said substrate for conducting an electrical signal, said second line means having an input/output site having a coupled position for signal communication with said first line means and having a decoupled position in which said first and second line means are isolated with respect to signal communication therebetween; and

thermally actuated means, formed on said substrate, for selectively switching said input/output site from one of said coupled and decoupled positions to the other of said coupled and decoupled positions, said thermally actuated means having electrically conductive first and second legs that are sufficiently different with respect to cross-sectional dimensions to effect said switching in response to a differential of thermal expansions of said first and second legs upon the conduction of electrical current therethrough.

5,467,068

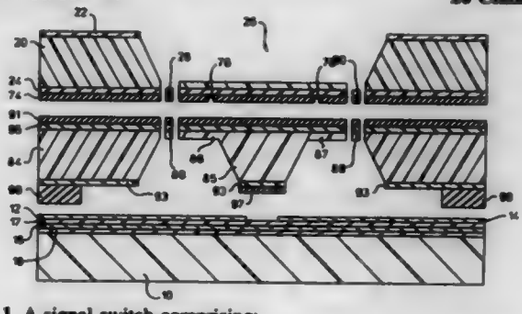
MICROMACHINED BI-MATERIAL SIGNAL SWITCH

Leslie A. Field, Portola Valley, and Richard C. Ruby, Menlo Park, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 7, 1994, Ser. No. 271,811

Int. Cl.[6] H01H *53/00*

U.S. Cl. 335—4 **20 Claims**



1. A signal switch comprising:

a first substrate having a first signal line extending along a surface of said first substrate; and

an actuator supported for reciprocating movement in a direction generally perpendicular to said surface, said actuator having a first position and a second position, said actuator being operatively associated with a conductive member aligned to electrically connect to said first signal line when said actuator is in said first position, said conductive member being electrically isolated from said first signal line when said actuator is in said second position, said actuator having first and second layers having different coefficients of thermal expansion, said first and second layers being arranged to induce displacement of said actuator in response to introduction of thermal energy into said first and second layers.

5,467,069

DEVICE FOR ADJUSTING THE TRIPPING THRESHOLD OF A MULTIPOLE CIRCUIT BREAKER

Jean-Luc Payet-Burin, Voreppe, and Eric Ogier, Grenoble, both of, France, assignors to Merlin Gerin, France

Filed Apr. 4, 1994, Ser. No. 222,225

Claims priority, application France, Apr. 16, 1993, 93 04856

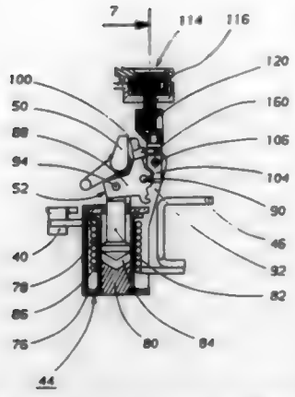
Int. Cl.[6] H01H *75/10*

U.S. Cl. 335—42 **9 Claims**

1. A device for adjusting a tripping threshold of a multipole circuit breaker including an insulating casing having a first orifice, said device comprising:

a magnetic circuit including a fixed core and an excitation coil;

a plunger spaced apart via an air-gap from said fixed core, the air-gap defining the tripping threshold of the circuit breaker;



an operating component secured to the plunger to position the plunger with respect to the fixed core, said operating component including a ramp;

return means for biasing the plunger to be separated from the fixed core;

adjustment means for finely adjusting the air-gap between the plunger and the fixed core, including a rotary knob which drives a positioning stud along the ramp of the operating component to set the air-gap, said rotary knob extending through the first orifice in the insulating case;

setting means for setting a maximum tripping threshold of the circuit breaker, including an annular ring having a central orifice in which said rotary knob is disposed, said annular ring including a protuberance which forms an end-of-travel stop to prevent rotational movement of the rotary knob;

a top cover plate covering the insulating casing, the top cover plate including an opening over said rotary knob to allow access thereto; and

preventative resetting means for preventing resetting of the maximum tripping threshold when said top cover plate is positioned on the insulating casing, wherein the opening of the top cover plate has a diameter less than a diameter of the annular ring.

5,467,070

VEHICLE SECURITY SYSTEM WITH SECURE VALET SWITCH

Ze'ev Drori, Los Angeles, and Robert M. Woskow, Encino, both of Calif., assignors to Clifford Electronics, Inc., Chatsworth, Calif.

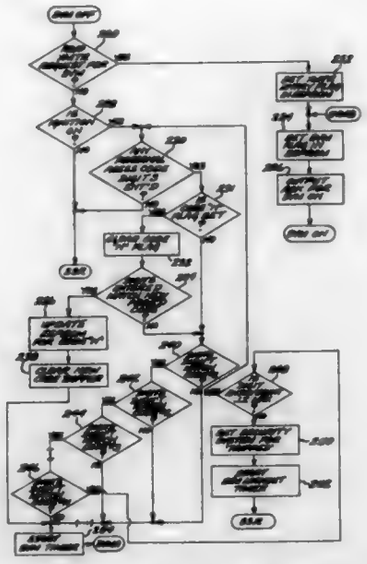
Filed Feb. 16, 1993, Ser. No. 17,801
Int. Cl.[6] B60R *25/00*
U.S. Cl. 340—426 **72 Claims**

1. A vehicle security system having a secure valet mode of operation, comprising:

a first user-operated communication device for generating a coded arm/disarm signal for putting said security system in an armed state or in a disarmed state, wherein when said system is in said armed state and is tripped, an alarm is generated, and when said system is in said disarmed state, said system is responsive to predetermined arming conditions to be put into said armed state;

a user-operated valet switch means disposed within said vehicle;

a system controller responsive to valet mode signals entered via said valet switch means to enter a secure valet mode wherein said system is turned off and thereby disabled from tripping and generating an alarm, and is further disabled from being put into said armed state so long as said system in said secure valet mode, said controller comprising means for comparing said valet mode signals to a predetermined valid valet access code, and means permitting said system to be put into said secure valet mode in response to signals entered via said valet switch means only if said signals comprise said valid valet access code, said system controller further comprising means



responsive to receipt of said coded arm/disarm signals for arming or disarming said security system if said system is not in said secure valet mode,

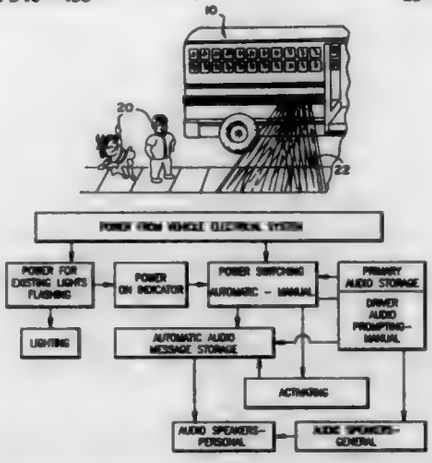
wherein said secure valet mode may be entered via signals received from said valet switch means only if said predetermined access code is first entered via said switch means.

5,467,071

AUDIOVISUAL SAFETY WARNING KIT

Don M. Koenig, Atlanta, Ga., assignor to Gerald J. Churchill, Atlanta, Ga.

Filed Dec. 15, 1993, Ser. No. 166,837
Int. Cl.[6] B60Q *1/26*
U.S. Cl. 340—433 **15 Claims**



1. A kit for producing an audiovisual safety warning for use in combination with a vehicle including a body having sidewalls and a rearwall, wheels, an exterior channel disposed above the wheels and having a length so as extend substantially along the sidewalls and rearwall, steps for boarding and exiting the vehicle, and an electrical wiring system, the kit comprising:

lighting means for producing a visual safety warning and for illuminating a surface adjacent to the vehicle, said lighting means being adapted to be mounted within the exterior channel and to extend substantially along the length thereof so as to be visible to individuals in close proximity to the vehicle, the lighting means including a constant burn light circuit;

means for electrically connecting said lighting means to the electrical wiring system of the vehicle; and

message means for producing verbal audio safety prompting messages audible to individuals inside of the vehicle, said message means being adapted to be mounted to the interior of the vehicle and electrically connected to the electrical wiring system, said message means including:

means for storing said verbal audio safety prompting messages;

means for a driver of the vehicle to create supplemental verbal audio safety prompting messages;

an audio speaker for emitting the stored verbal audio safety prompting messages and said supplemental verbal audio safety prompting messages;

first activation means adapted to be manually triggered by a driver of the vehicle to cause one of said supplemental verbal audio safety prompting messages to be transmitted to and emitted by said audio speaker; and

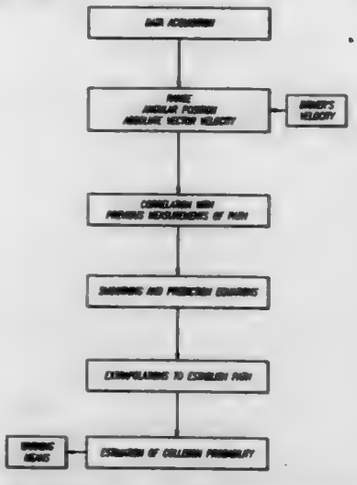
second activation means adapted to be triggered by individuals boarding or exiting on the steps of the vehicle to activate the storing means to cause one of said stored verbal audio safety prompting messages to be transmitted to and emitted by said audio speaker.

5,467,072

PHASED ARRAY BASED RADAR SYSTEM FOR VEHICULAR COLLISION AVOIDANCE

Joseph Michael, Beverly Hills, Calif., assignor to Piccard Enterprises, Inc., Beverly Hills, Calif.

Filed Mar. 11, 1994, Ser. No. 212,043
Int. Cl.[6] G08G *1/00*
U.S. Cl. 340—436 **32 Claims**



1. A vehicular collision avoidance system, comprising:

a first scanning phased array radar system mounted on a vehicle;

a microprocessor configured to control operation of the phased array radar and determine when a radar target creates an unsafe driving condition by repeatedly tracking a target and calculating a minimum probable position of the target relative to the vehicle based on an extrapolation of a recorded path for the target; and

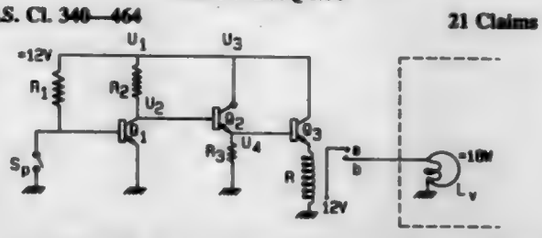
means for warning a driver of the vehicle when an unsafe driving condition occurs, wherein said vehicular collision avoidance system provides a warning to the vehicle driver when unsafe driving conditions result from an automobile approaching the vehicle.

5,467,073

SYSTEM FOR THE PROTECTION AND SAFETY OF CARS, PASSENGERS AND PEDESTRIANS

Jorge V. Elias, Avenida Insurgentes Sur 505 Suite 502, Colonia Napoles, Mexico

Filed Oct. 7, 1993, Ser. No. 133,535
Int. Cl.[6] B60Q *1/50*
U.S. Cl. 340—464 **21 Claims**



1. A system for the protection and safety of passengers and pedestrians, adaptable to vehicles having a gas pedal and a brake pedal, comprising:

(a) a green-light accelerator circuit connected to the gas pedal and consisting of a pedal sensor, a first, second and third transistor, wherein each transistor comprises a base electrode, a collector electrode and an emitter electrode, a first, second and third resistance, a first relay, and a first light bulb, mounted on vehicle structure visible from in front of the vehicle;

(b) a red-light brake circuit connected to the brake pedal and consisting of a brake relay, an auxiliary relay and a second light bulb, mounted on vehicle structure visible from in front of the vehicle;

(c) a high-beam sensor circuit consisting of a high-beam sensor, which is covered by a tube to guarantee that said sensor is only activated by stimulation by direct light, and is not activated by lateral light, fourth, fifth and sixth transistors, wherein each transistor comprises a base electrode, a collector electrode and an emitter electrode, fourth, fifth, sixth and seventh resistances, wherein the fourth resistance is a variable resistor connected to the high-beam sensor, and adjusted to a setting to guarantee that the high-beam light sensor will only respond to light from high-beams, a second relay and a third light bulb, mounted on vehicle structure visible from behind the vehicle; and

(d) a first, second and third housing to hold, respectively, the green-light accelerator circuit, the red-light brake circuit, and the high-beam sensor circuit.

5,467,074

PERSONAL SECURITY SYSTEM WITH TRANSMITTER TEST MODE

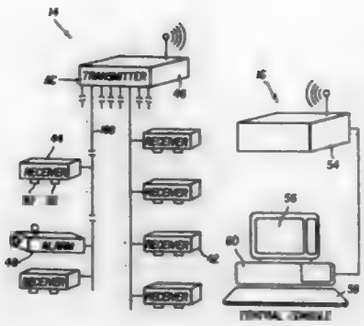
Daniel F. Pedtke, Palmyra, N.Y., assignor to Detection Systems, Inc., Fairport, N.Y.

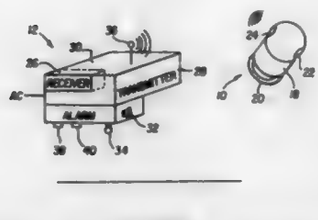
Continuation-in-part of Ser. No. 835,847, Dec. 18, 1992, abandoned. This application Sep. 20, 1993, Ser. No. 126,841
Int. Cl.[6] G08B *1/08*
U.S. Cl. 340—539 **15 Claims**

1. A hand portable transmitter for use with a personal security system; said transmitter comprising:

transmitting means (1) operated in an alarm state for transmitting an emergency signal to initiate a system alarm and (2) operated in a test state for transmitting a test signal differentiated from said emergency signal, to initiate a system test; and,

selectively-actuated switch elements (1) actuated in a first mode for operating said transmitting means in said alarm state and (2) actuated in a second mode for operating said transmitting means in said test state, said transmitting means being operated in said test state by actuation of at least the same switch elements of the transmitter as are required to operate the transmitting means in said alarm state.



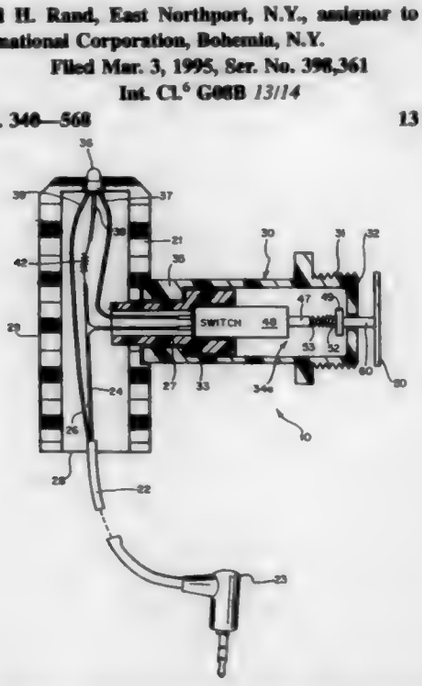


5,467,075

ANTI-THEFT ALARM FOR AIR POWERED HAND TOOLS

Richard H. Rand, East Northport, N.Y., assignor to Protex International Corporation, Bohemia, N.Y.

Filed Mar. 3, 1995, Ser. No. 398,361
Int. Cl.[6] G08B 13/14
U.S. Cl. 340—568 13 Claims



1. An alarm sensor for securing an object with a threaded female coupling, the alarm sensor having a secured and an unsecured state detectable by an alarm system, the alarm sensor comprising:

a sensor housing and an elongated cord containing a first and second conductor extending from said sensor housing for electrical communication with the alarm system;

a male coupling rotatably mounted to said sensor housing and cooperatively threaded to engage the threaded female coupling of the object; and

switch means carried by said male coupling and connected between said first and second conductors, said switch means being responsive to the relative position of said male coupling with respect to the threaded female coupling so that unscrewing said male coupling from the threaded female coupling activates said switch means to place the alarm sensor in the unsecured state.

5,467,076

REALTY SIGN LIGHTING/ANTI-THEFT ASSEMBLY

Rita Ruocco, 7123 Farralone Ave., #28, Canoga Park, Calif. 91303, and Roger Hance, 19328 Singing Hills Dr., Northridge, Calif. 91326

Filed Sep. 26, 1994, Ser. No. 311,981
Int. Cl.[6] G08B 13/14
U.S. Cl. 340—571 10 Claims

1. An improved realty sign lighting and display assembly, said assembly comprising, in combination:

a) a real estate standard having a vertical post and a horizontal cross-arm and a display panel depending from said cross-arm; and,

b) anti-theft/display means incorporated in said cross-arm, comprising:

i) a solar panel;

ii) a rechargeable battery connected to said solar panel;

iii) light means connected to said battery and directed toward said depending display panel;

iv) electric heating means connected to said battery and disposed adjacent said solar panel for heating said panel to remove snow therefrom;

v) alarm means connected to said battery and activatable by movement of said cross-arm; and,

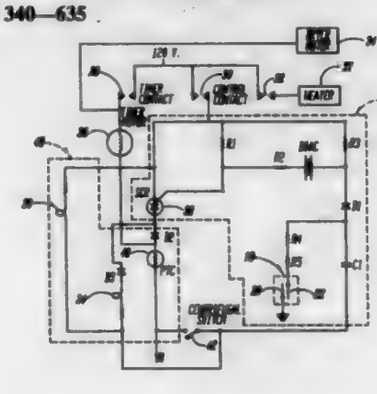
vi) an access door in said cross-arm for servicing said light means and said alarm means, said door being secured by a lock.

5,467,077

METHOD AND MEANS FOR INDICATING AN APPLIANCE CONDITION

Daniel F. Wunderlich; Nedra A. Herr, both of Newton; Donald N. Shannon, Ankeny, and L. Dean Kuhn, Newton, all of Iowa, assignors to Maytag Corporation, Newton, Iowa

Continuation-in-part of Ser. No. 22,958, Feb. 25, 1993. This application Dec. 16, 1993, Ser. No. 168,664
Int. Cl.[6] G08B 21/00
U.S. Cl. 340—635 6 Claims



1. Apparatus for displaying the progressive drying of initially moist fabrics from a wet condition to a dry condition within a rotating drum of a drying appliance, said apparatus comprising:

a moisture sensing circuit including a pair of spaced apart sensor bars in said drum, said moisture sensing circuit being capable of creating an intermittent sensor signal having a high frequency when said sensor bars are bridged by said moist fabrics and having a progressively lower frequency down to a frequency of zero corresponding to the progressive drying of said fabrics to said dry condition;

a power source;

an electrically actuatable indicator connected to said power source;

a gate connected between said power source and said indicator and also being connected to said sensor bars of said moisture sensing circuit, said gate being adapted to change from a normally open circuit condition preventing electrical connection between said power source and said indicator to a closed circuit condition causing electrical connection from said power source to said indicator in response to said sensor signal and at a frequency corresponding to said frequency of said sensor signal whereby said indicator will be actuated at a frequency corresponding to said frequency of said sensor signal.

5,467,078

SYSTEM AND METHOD FOR COMMUNICATING DATA BETWEEN PLURAL AIR CONDITIONING MACHINES FOR CONTROLLING THE MACHINES AND DISPLAYING THEIR STATUS

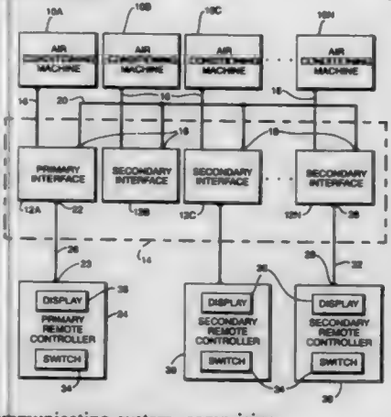
Tadaaki Koketsu, Gifu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 15, 1993, Ser. No. 45,869

Claims priority, application Japan, Apr. 15, 1992, 4-095213

Int. Cl.[6] G05B *23/02*

U.S. Cl. 340—825.06 **15 Claims**



1. A communicating system, comprising:

at least two air conditioning machines;

means for outputting an operating signal, the operating signal including an outputted indicating signal and an outputted actuating signal;

multiple display means, responsive to the outputted indicating signal, for displaying an operation of the air conditioning machines; and

means, responsive to the outputted operating signal and coupled to each air conditioning machine and to the outputting means, for controlling the operation of the air conditioning machines on the basis of the outputted actuating signal, the controlling means changing an operating state of the air conditioning machines in sequence at a predetermined interval as each display means displays the operation of all air conditioning machines substantially at the same time.

5,467,079

INCOMING MESSAGE PROCESSING METHOD IN PLURALITY OF TERMINAL EQUIPMENTS AND TERMINAL EQUIPMENT EXECUTING SAID METHOD

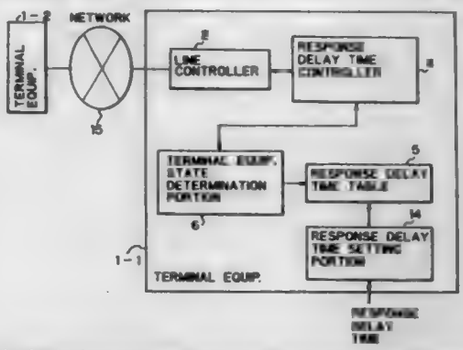
Kenichi Hasegawa, Inagi, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 96,856, Jul. 26, 1993, abandoned, which is a continuation of Ser. No. 667,659, Mar. 11, 1991, abandoned. This application Mar. 15, 1995, Ser. No. 405,402

Claims priority, application Japan, Mar. 16, 1990, 2-066207; Sep. 19, 1990, 2-249380

Int. Cl.[6] H04Q *1/00*

U.S. Cl. 340—825.16 **5 Claims**



1. An incoming message processing method for data reception in a plurality of terminal equipment wherein the plurality of terminal equipment are connected to one line of a network, comprising the steps of:

(a) presetting a delay time for response when states in which receiving data cannot be printed exist in one of the plurality of terminal equipment,

(b) receiving a request for response at the plurality of terminal equipment, from the network by receipt from the terminal equipment in a transmission side,

(c) returning a response to the network delayed by the delay time from the one of the plurality of terminal equipment if the one of the plurality of terminal equipment is in one of the states in which receiving data cannot be printed, returning a response to the network delayed by a shorter delay time compared with the delay time in one of the states in which receiving data cannot be printed, or by no delay time from the one of the plurality of terminal equipment, if the one of the plurality of terminal equipment is in the normal state, when said request is received by the one of the plurality of terminal equipment through the one line,

(d) acknowledging the response from the network only to another of the plurality of terminal equipment which returns the earliest response to the network, and

(e) communicating only between the another of the plurality of terminal equipment and said terminal equipment in the transmission side connected to another line through the network.

5,467,080

SECURITY ARRANGEMENT INTENDED FOR OPENING AND/OR CLOSING OF DOORS IN PARTICULAR FOR AN AUTOMOTIVE VEHICLE

Daniel Stoll, Neuchatel, and Daniel Clauss, Peseux, both of, Switzerland, assignors to SMH Management Services AG, Biel, Switzerland

Filed Aug. 10, 1993, Ser. No. 103,796

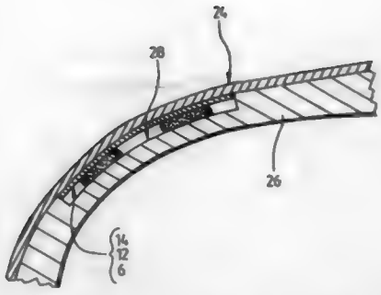
Claims priority, application France, Aug. 11, 1992, 92 09982

Int. Cl.[6] G06F *7/04*; H03K *17/94*

U.S. Cl. 340—825.31 **9 Claims**

1. A security arrangement intended for the opening and/or closing of at least one door of an automotive vehicle, and which includes:

at least one control keyboard integrated into a coachwork body of the vehicle to have sensing elements located under a



relatively small portion of a single structural sheet member forming a substantial portion of an outer layer of the coachwork body, said outer layer defining an unbroke exterior surface of said coachwork body, for responding to a touch at said exterior surface of said outer layer adjacent said keyboard for introduction of opening and closing codes, said control keyboard being provided with said sensing elements responsive to the touch at said exterior surface for furnishing codes corresponding to actuated keys,

a circuit coupled to said sensing elements for generating control signals in response to said codes furnished by the control keyboard; and

actuating means controlled by said control signal for assuring the latching and/or unlatching of said door.

5,467,081

DATACARRIERS WITH SEPARATE STORAGE OF READ AND WRITE-INHIBITED MEMORY LOCATIONS

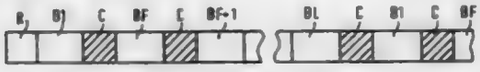
Steffen Drews, Hamburg; Wolfgang Tobergte, Halstenbek; Volker Timm, Pinneberg, and Klaus Axer, Lübeck, all of, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1993, Ser. No. 20,497

Claims priority, application Germany, Feb. 22, 1992, 42 05 567.9

Int. Cl.[6] G07C *1/00*; G11C *15/00*

U.S. Cl. 340—825.34 **13 Claims**



1. A datacarrier for detachable coupling to a terminal for data exchange between the terminal and the datacarrier, comprising:

(a) a read/write memory organized in a plurality of memory blocks, each memory block comprising a plurality of memory locations,

(b) inhibiting means for inhibiting or enabling reading and/or writing by the terminal in the read/write memory,

(c) first memory locations in one of the memory blocks for storing first information for identifying the memory locations of any of the memory blocks that are to be write-inhibited,

(d) second memory locations in one of the memory blocks for storing second information for identifying the memory locations of any of the memory blocks that are to be read-inhibited,

(e) third memory locations in one of the memory blocks for storing a password,

(f) a fourth memory location in one of the memory blocks for storing a mode bit for controlling an operating mode of the datacarrier,

(g) said inhibiting means comprising:

(i) first means for inhibiting writing in any memory locations of the write-inhibited blocks' memory locations identified by the first information stored in the first memory locations,

(ii) second means for inhibiting reading in any memory locations of the read-inhibited blocks' memory locations identified by the second information stored in the second memory locations,

(iii) third means for comparing a password transmitted from the terminal with the password stored in the third memory locations and outputting a signal indicating the result of such a comparison,

(iv) fourth means under the combined control of the comparison result of the third means and the mode bit stored in the fourth memory location for enabling or disabling writing in those blocks which are not write-inhibited by having first information identifying their memory locations stored in the first memory locations.

5,467,082

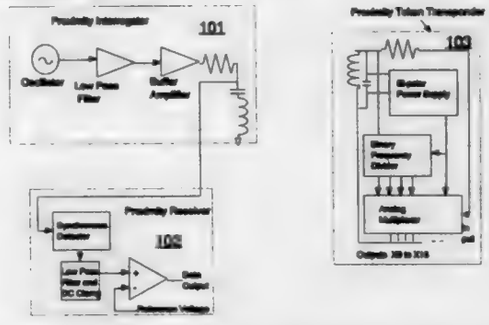
PROXIMITY ACTUATOR AND READER FOR AN ELECTRONIC ACCESS SYSTEM

Glenn A. Sanderson, 2211 Alameda Padra Serra, Santa Barbara, Calif. 93103

Continuation-in-part of Ser. No. 818,394, Jan. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 426,591, Oct. 25, 1989, abandoned. This application Aug. 5, 1993, Ser. No. 102,534

Int. Cl.[6] H04Q *9/00*

U.S. Cl. 340—825.54 **4 Claims**



1. An electronic access system comprising: (a) a key portion, said key portion consisting of an identification token comprising, in combination a parallel resonant circuit and a switching device with a resistor in series therewith, said switching device and resistor combination being connected in parallel with said parallel resonant circuit, said switching device and resistor combination either loading or unloading said parallel resonant circuit, and a coding means controlling said switching device wherein said coding means further comprises a digital circuit containing at least one preselected code, said token receiving, in operation, its supply voltage from said resonant circuit by rectifier means thereon and an input signal from said resonant circuit which input signal is processed by said coding means to provide an output signal, said output signal carrying said at least one preselected code, said output signal being fed to said switching device for effecting the loading or coupling of said resonant circuit; and (b) a lock portion, said lock portion comprising a reader data detection circuit, said reader data detection circuit comprising a resonant circuit and a synchronous detector, said resonant circuit receiving a driver signal from a sine wave carrier source and said resonant circuit providing a reader input signal to said synchronous detector, said synchronous detector including means for forming an instantaneous value signal representing the instantaneous absolute value of the amplitude of said reader input signal, and means for comparing said instantaneous value signal to a fixed reference voltage to recover said at least one preselected code.

5,467,083

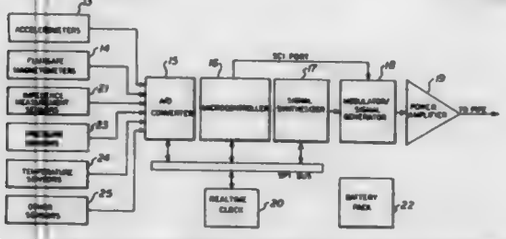
WIRELESS DOWNHOLE ELECTROMAGNETIC DATA TRANSMISSION SYSTEM AND METHOD

William J. McDonald; Gerard T. Pittard; Charles G. Steele, all of Houston; Karl F. Kiefer, The Woodlands; Terry P. Clifton, and Curtis E. Leitko, both of Houston, all of Tex., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Aug. 26, 1993, Ser. No. 111,915

Int. Cl.[6] G01V 1/40

U.S. Cl. 340—854.6 41 Claims



1. A wireless communications system for two way communication along a borehole extending into the earth from the surface, the drill pipe functioning as an electrical lossy, single conductor with the earth forming the electrical return path, the system comprising;

a probe unit supported adjacent to the lower end of said drill pipe including means for collecting data,

a microprocessor-controlled frequency synthesizer for producing frequencies in the range from 15 Hz to 100 kHz for transmission of data,

transmitter means for encoding data from said data collection means into an electromagnetic signal generated by said frequency synthesizer in the form of simultaneously encoded multiple frequencies impressed simultaneously on said drill pipe, and

a receiver-demodulator located at the earth surface receiving and decoding a signal from said encoded multiple frequencies from said transmitter means.

5,467,084

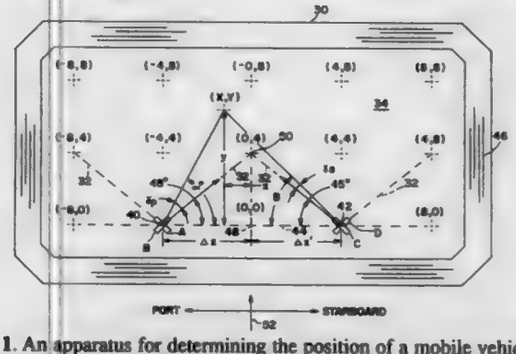
VEHICLE POSITION DETERMINING APPARATUS

Cornell W. Aloft, and Ronald R. Drenth, both of Petoskey, Mich., assignors to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Mar. 28, 1994, Ser. No. 218,716

Int. Cl.[6] G08G 1/01

U.S. Cl. 340—933 19 Claims



1. An apparatus for determining the position of a mobile vehicle relative to a fixed location marker device wherein:

said location marker device includes a coil having a central longitudinal axis, exciter means for causing said coil to emit a magnetic field of a certain frequency and composed of lines of magnetic flux extending radially and arcuately outwardly from the ends of said longitudinal axis;

said apparatus including a sensor unit mounted on said mobile vehicle, said sensor unit comprising four identical sensor coils each responsive to the frequency of said magnetic field, and each having a major axis;

said sensor unit including means for supporting said sensor coils in two pairs with their major axes disposed in two parallel planes positioned on said mobile vehicle so as to extend transversely to said longitudinal axis of said marker device, the major axis of one sensor coil of each pair lying in one of said two planes and the major axis of the other sensor coil of each pair lying in the other of said two planes, the major axes of the sensor coils of each pair being arranged in an X pattern in which the major axis of one coil of each pair extends perpendicularly to the major axis of the other coil of each pair, and in which said major axes of each pair cross medially of the length thereof to define a center for each pair of said sensor coils, said centers of said pairs of sensor coils being spaced apart by a fixed reference distance along a base line, said base line being crossed by the major axis of each of said sensor coils at an angle of 45 degrees;

circuit means for obtaining a position signal from each of said sensor coils in response to the passage thereof through said magnetic field;

and means for computing from said position signals and from the angular relations between said sensor coils which include Y and X coordinate values indicative of the position of said sensor unit relative to said location marker device.

5,467,085

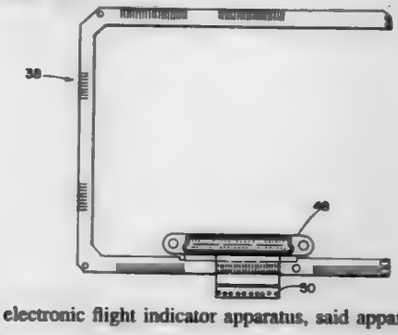
DISPLAY FOR ELECTRONIC INDICATOR

William R. Dunn, Alpharetta, Ga., assignor to Avionic Displays Corporation, Atlanta, Ga.

Filed Nov. 10, 1992, Ser. No. 973,990

Int. Cl.[6] G01C 21/00

U.S. Cl. 340—971 9 Claims



1. An electronic flight indicator apparatus, said apparatus comprising:

a chassis adapted to be installed in a standard ARINC cutout of an aircraft instrument panel;

a mounting flange secured to said chassis;

a bezel secured to said mounting flange; and

a display means having a signular viewing area on which information processed by said flight indicator is displayed, said singular viewing area being at least as large as the cross-sectional area of said chassis, said display means secured within said bezel.

5,467,086

APPARATUS AND METHOD OF CODING/DECODING VIDEO DATA

Jechang Jeong, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jun. 18, 1993, Ser. No. 78,343

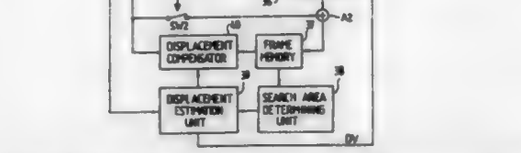
Claims priority, application Rep. of Korea, Jun. 18, 1992, 1992 10614

Int. Cl.[6] H03M 7/00; H04N 7/12

U.S. Cl. 341—50 21 Claims

1. A coder for compressing data, comprising:

block dividing means for dividing a frame of data into blocks of predetermined sizes, and outputting original data blocks;



coding means, coupled to said block dividing means, for coding each of said original data blocks according to a predetermined algorithm, and outputting coded data blocks;

reconstruction means, coupled to said coding means, for reconstructing each of said coded data blocks, and outputting reconstructed data blocks corresponding to said original data blocks;

a frame memory, coupled to said reconstruction means, for storing a frame of data based on said reconstructed data blocks;

search area determining means, coupled to said frame memory, for selecting a predetermined number of said reconstructed data blocks stored in said frame memory so as to define a search area;

displacement estimation means coupled to said search area determining means for receiving said selected number of reconstructed data blocks, and coupled to said block dividing means for receiving a present data block, said displacement estimation means determining by estimation which one of said reconstructed data blocks has a pattern similar to said present data block, and calculating a displacement vector based on said estimation;

displacement compensation means, coupled to said frame memory and to an output of said displacement estimation means, for receiving and outputting the data block from said frame memory having the pattern similar to said present data block based on said output of said displacement estimation means;

a first adder, coupled to said block dividing means and said displacement compensation means, for calculating differential data based on said present data block and the data block output by said displacement compensation means;

mode determining means, coupled to said first adder and said block dividing means, for determining a mode by comparing said present data block with said differential data, and outputting a corresponding mode value; and

means, responsive to said mode value output by said mode determining means, for selecting one of said present data block and said differential data according to the mode value; and inputting said selected one of said present data block and said differential data to said coding means for coding.

5,467,087

HIGH SPEED LOSSLESS DATA COMPRESSION SYSTEM

Ke-Chiang Chu, Saratoga, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 18, 1992, Ser. No. 992,972

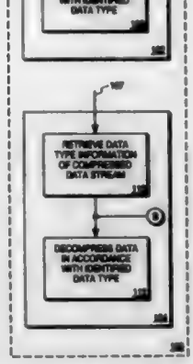
Int. Cl.[6] H03M 7/30

U.S. Cl. 341—51 **34 Claims**

1. An electronic data compression process for compressing at least one set of input data, the at least one set of input data being of a specific data type of a plurality of data types, the electronic data compression process comprises the steps of:

identifying the specific data type of the set of input data;

selecting at least one data compression method in response to the identified data type;



compressing the set of input data with the selected at least one data compression method; and

receiving a data compression rate control indicator for varying the data compression rate.

5,467,088

HUFFMAN CODE DECODING CIRCUIT

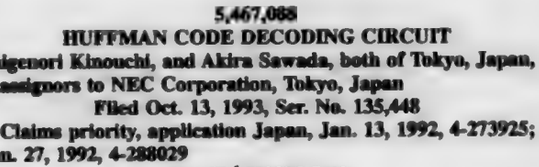
Shigenori Kinouchi, and Akira Sawada, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 13, 1993, Ser. No. 135,448

Claims priority, application Japan, Jan. 13, 1992, 4-273925; Jan. 27, 1992, 4-288029

Int. Cl.[6] H03M 7/40

U.S. Cl. 341—65 **10 Claims**



1. A huffman code decoding circuit comprising:

decoding table storing means for storing a decoded word and a code length or a pointer to be accessed in the next time determined on the basis of a state transition upon decoding of a bit variable length code per every one or n bits, where n is an integer greater than or equal to two, and a flag representative of the decoding condition of said code and outputting said decoded word and the code length or the pointer for next access and said flag corresponding to an access address of m bits, where m is greater than n;

latching means for latching said pointer of m−1 bit output from said decoding table storing means when said flag is indicative of continuation of decoding, which latching means is reset when said flag output from said decoding table storing means is indicative of completion of decoding; and

selecting means for selectively outputting n−1 bit from one of said latching means and said bit variable length code to said decoding table storing means, according to selection for decoding of said bit variable length code per every 1 bit or every n bit;

whereby the leading bit of the bit variable length code is input to said decoding table storing means as a least significant bit of said address, an upper m-n bits of the m−1 bit output from

said latching means is input as the upper bit of said address, and n−1 bit output from said selecting means is input as a intermediate bit of said address.

5,467,089

CAPACITOR ARRAY DIGITAL/ANALOG CONVERTER WITH COMPENSATION ARRAY FOR STRAY CAPACITANCE

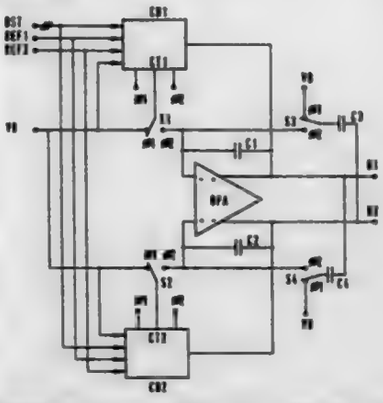
Dieter Draxelmayr, Villach, Austria, assignor to Siemens Aktiengesellschaft, Munich

Filed Jul. 13, 1993, Ser. No. 91,172

Claims priority, application Germany, Jul. 13, 1992, 42 23 080.4

Int. Cl.[6] H03M 1/78

U.S. Cl. 341—150 **1 Claim**



1. A digital/analog converter having a weighted capacitive network, comprising:

a differential operational amplifier having first and second inputs and first and second outputs;

first and second weighted capacitive networks;

a first capacitor connected between the first input and the first output, a second capacitor connected between the second input and the second output;

third and fourth capacitors;

means for connecting said first and second weighted capacitive networks and said third and fourth capacitors symmetrically to a ground potential during a first clock period;

means for connecting the first input through said first weighted capacitive network to the first output, and for connecting the second input through said second weighted capacitive network to the second output, symmetrically during a second clock period; and

means for connecting the first input through said third capacitor to the second output, and for connecting the second input through said fourth capacitor to the first output, symmetrically during the second clock period.

5,467,090

SERIAL PROCESSING CIRCUITS WITH SERIAL CHAINING

Richard A. Baumgartner, Palo Alto, Calif.; Charles E. Moore, Loveland, Colo., and Earl C. Herickson, Yamhill, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 876,546, Apr. 30, 1992, abandoned. This application Sep. 28, 1994, Ser. No. 314,162

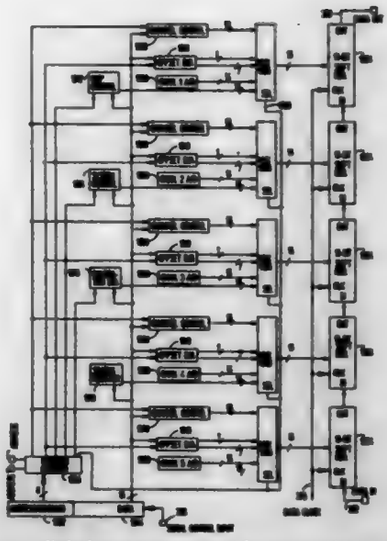
Int. Cl.[6] H03M 1/00

U.S. Cl. 341—155 **14 Claims**

1. A signal processing system comprising:

a plurality of integrated circuits serially connected together in a chain, having a first integrated circuit in said chain and a last integrated circuit in said chain;

each said integrated circuit in said plurality of integrated circuits further comprising;



analog to digital converter means for converting a plurality of analog input signals into digital output data;

shift register means for;

receiving and storing said digital output dam, and for serially shifting digital data in from a serial input port, and for serially shifting data out through a serial output port; and

each integrated circuit in said plurality of integrated circuits, except said first integrated circuit, having its serial input port connected to the serial output port of a serially preceding integrated circuit.

5,467,091

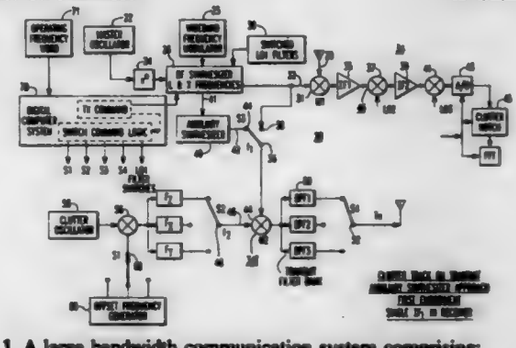
RADAR AND OTHER COMMUNICATION SYSTEMS HAVING LARGE BANDWIDTH AND LARGE DYNAMIC RANGE

Grant H. Watkins, Dunkirk, and Stephen P. Caldwell, Columbia, both of Md., assignors to Westinghouse Electric Corp., Baltimore, Md.

Filed Jul. 21, 1994, Ser. No. 278,214

Int. Cl.[6] G01S 13/524

U.S. Cl. 342—159 **43 Claims**



1. A large bandwidth communication system comprising:

a transmitter system for generating transmit signals over a selectable frequency operating range;

a receiver system having a first mixer for mixing an LO1 signal with received transmit signals;

the receiver system having a first IF system for processing signals received from the first mixer;

a frequency synthesizer system for generating frequency signals for application to at least a transmit mixer in the transmitter and to at least the first mixer in the receiver; and

a control system for selecting and applying a modified frequency value for at least one of plural frequencies including that of the LO1 signal applied to the first mixer, that of a frequency

signal applied to the transmit mixer, and an IF frequency of the first IF system, with the modified frequency value selected as a function of the system operating frequency and stored spurious amplitude data to sidestep spurious signals in portions of the total system frequency operating bandwidth where spurious amplitudes are excessive and otherwise would interfere with quality reception.

5,467,092

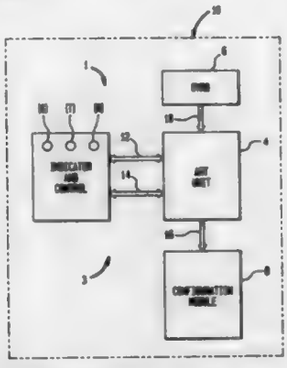
RADAR SYSTEM INCLUDING STABILIZATION CALIBRATION ARRANGEMENT

Mark G. Roos, Shawnee, and Terry K. Michie, Olathe, both of Kans., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed May 31, 1994, Ser. No. 251,435

Int. Cl.[6] G01S *7/40*

U.S. Cl. 342—174 **10 Claims**



1. A radar system including a stabilization calibration arrangement, comprising:

sensing means mounted to a mounting platform for sensing the attitude of the platform and for providing an analog reference signal and analog mounting platform attitude signals;

antenna means mounted to the mounting platform and including means connected to the sensing means and responsive to the analog reference and analog mounting platform attitude signals therefrom for providing digital stabilization calibration signals for commanding the antenna means to point a beam transmitted by said antenna means;

means mounted to the mounting platform and connected to the antenna means for receiving and storing the digital stabilization calibration signals and for applying stored digital stabilization calibration signals to said antenna means, whereby stabilization calibration is achieved so that the radar system and the sensing means are independent of each other;

indicator and control means; and

the antenna means connected to the indicator and control means and responsive to control data transmitted by the indicator and controls means for transmitting signals relating to the stabilization calibration of the antenna system to the indicator and control means for displaying said signals.

5,467,093

LOGARITHMIC DETECTOR

Ian G. Watson, Swindon, United Kingdom, assignor to Plessey Semiconductors Limited, United Kingdom

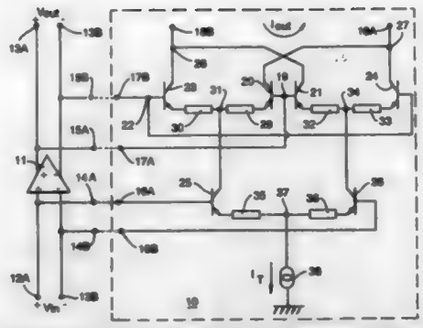
Filed Aug. 23, 1994, Ser. No. 294,550

Claims priority, application United Kingdom, Aug. 27, 1993, 9317848

Int. Cl.[6] G01S *7/285*

U.S. Cl. 342—175 **6 Claims**

1. A logarithmic detector comprising first to fourth input lines, first and second output lines, first to sixth transistors, first to sixth impedances and a current source arranged such that the first input line is linked to the base of the first transistor and the second input



line is linked to the base of the second transistor, the third input line is linked to a first circuit node which is in turn linked to the bases of both the third and fourth transistors and the fourth input line is linked to a second circuit node which is linked to the bases of both the fifth and sixth transistors; the first output line is linked to a third circuit node which is linked to the collectors of both the third and sixth transistors, the second output line is linked to a third circuit node which is linked to the collectors of the fourth and fifth transistors, the emitters of the third and fifth transistors are linked through the first and second impedances respectively to the fourth circuit node and the fourth circuit node is linked to the collector of the first transistor, the emitters of the fourth and sixth transistors are linked through the third and fourth impedances respectively to the fifth circuit node, the fifth circuit node is linked to the collector of the second transistor; the emitters of the first and second transistors are linked through the fifth and sixth impedances respectively to the sixth circuit node and the sixth circuit node is connected to earth by the current source.

5,467,094

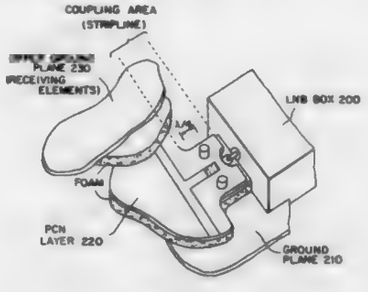
FLAT ANTENNA LOW-NOISE BLOCK DOWN CONVERTER CAPACITIVELY COUPLED TO FEED NETWORK

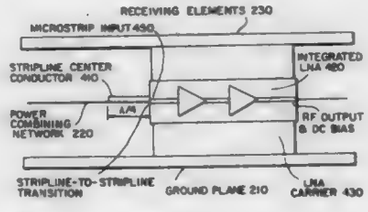
Richard C. Mott, Mt. Airy, and Bernard D. Geller, Gaithersburg, both of Md., assignors to Comsat Corporation, Bethesda, Md.

Filed Jun. 28, 1994, Ser. No. 266,713

Int. Cl.[6] H01Q *1/38*

U.S. Cl. 343—700 MS **3 Claims**





1. A flat antenna comprising:

a ground plane;

a first power combining network layer disposed over said ground plane, said power combining network layer comprising a first power combining network that is fed at a first point,

said first power combining network having a first plurality of feedlines extending from said first point;

a first low-noise block down-converter (LNB) extending through said first power combining network layer and capacitively coupled to said first power combining network; and

a first receiving element layer disposed over said first power combining network layer and comprising a first plurality of receiving elements, each of said first plurality of feedlines being capacitively coupled to a respective one of said first plurality of receiving elements, said LNB being mounted vertically in said antenna so as to extend between said ground plane and said first receiving element layer through said first power combining network layer.

5,467,095

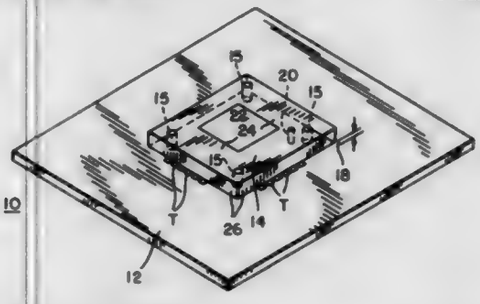
LOW PROFILE ANTENNA

Eric B. Rodal, 19140 Cozzette La., Cupertino, Calif. 95014, and Reed A. Parker, 12130 Mellowood Dr., Saratoga, Calif. 95027

Continuation of Ser. No. 901,084, Jun. 19, 1992, abandoned. This application Jun. 17, 1994, Ser. No. 261,742

Int. Cl.[6] H01Q *1/38*

U.S. Cl. 343—700 MS **5 Claims**



1. An antenna comprising:

means defining a ground plane;

means defining a radiating element having a plane portion substantially parallel to the ground plane and formed with a square nonradiating cutout, the means defining the radiating element also having an outer portion extending towards the ground plane;

means supporting the radiating element in spaced-apart relation to the ground plane so as to be electrically insulated therefrom and so as to define a radiating gap between the outer portion and the ground plane; and

feed means for feeding electrical energy to the radiating element for radiation therefrom;

the radiating element therefore having at least one effective electrical dimension that exceeds a corresponding dimension of a projection of the radiating element onto the ground plane along an axis perpendicular to the ground plane.

5,467,096

ANTENNA FOR A RADIO COMMUNICATION APPARATUS

Kenji Takamoro, Tokyo; Koji Umeda, Saitama, and Takao Ono, Tokyo, all of, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 24, 1994, Ser. No. 201,340

Claims priority, application Japan, Feb. 25, 1993, 5-035929

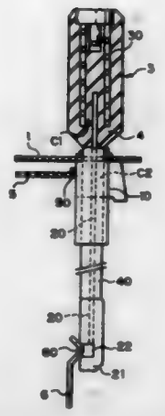
Int. Cl.[6] H01Q *1/24;1/36*

U.S. Cl. 343—702 **6 Claims**

1. An antenna for a radio communication apparatus, comprising:

a first whip antenna mounted on a casing of said apparatus and movable into and out of said casing;

a second whip antenna coaxially provided on a tip of said first whip antenna and accommodating a loading coil having a predetermined number of turns, said tip of said first whip antenna being received in said second whip antenna without being connected to said second whip antenna with respect to D.C. such that capacity coupling is set up between said first whip antenna and said second whip antenna;



covering means for covering said first whip antenna and said second whip antenna;

coupling means for setting up capacity coupling between said first whip antenna and a feed section included in said apparatus when said first whip antenna is retracted into said casing; and

grounding means for connecting a part of said first whip antenna to ground when said first whip antenna is retracted into said casing.

5,467,097

TELESCOPING ANTENNA WITH DUAL IMPEDANCE MATCHING CIRCUITS

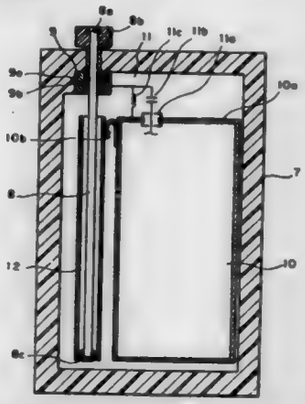
Yoshio Toko, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 851,668, Mar. 16, 1992, abandoned. This application Jan. 14, 1994, Ser. No. 181,380

Claims priority, application Japan, Apr. 12, 1991, 3-106499

Int. Cl.[6] H01Q *1/10;1/24*

U.S. Cl. 343—702 **9 Claims**



1. An antenna unit, comprising: a case for housing a wireless apparatus body section including a receiving-transmitting circuit; an antenna element extendibly mounted in said case for movement between an extended position and a stowed position and connected with said receiving-transmitting circuit in said wireless apparatus body section through a first impedance matching circuit and an antenna feeding section, said first impedance matching circuit providing an impedance match for matching the impedance of said antenna element in said extended position with said receiving-transmitting circuit; a conductive antenna stowage pipe for holding said antenna element with said antenna element being insulated from said stowage pipe when said antenna element is stowed in

said case; and a connecting means for connecting said antenna stowage pipe to a reference potential; wherein,

when said antenna element is stowed in said case, the part of said antenna element stowed in said stowage pipe and said antenna stowage pipe constitute a stub circuit forming a second impedance matching circuit for matching, together with said first impedance matching circuit, the impedance of said antenna element not stowed in said antenna stowage pipe with said receiving-transmitting circuit; and the other part of said antenna element not stowed in said antenna stowage pipe functions as a radiation element when fed with power through said antenna feeding section; and

the whole of said antenna element, when extended from said case, is impedance-matched with said receiving-transmitting circuit by said first impedance matching circuit and functions as a radiation element when fed with power through said antenna feeding section.

5,467,098

TRANSMISSION LINE NOTCH ANTENNA

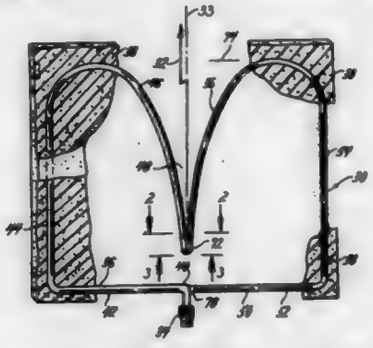
Mark E. Bonebright, La Mesa, Calif., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.

Continuation of Ser. No. 50,873, Apr. 20, 1993, abandoned. This application Dec. 2, 1994, Ser. No. 347,991

The portion of the term of this patent subsequent to Sep. 5, 2012, has been disclaimed.

Int. Cl.[6] H01Q *13/10*

U.S. Cl. 343—767 **32 Claims**



1. An antenna element (30) including: a transmission line (36) having:

a conductive layer (60);

a conductive member (58) adjacent said conductive layer; and

dielectric spacing means (62) between said conductive layer and said conductive member, said transmission line further having:

a first transmission line end (34) for connection to RF means;

a second transmission line end (72);

a transmission line connecting portion (42 & 44) extending from said first transmission line end; and

a transmission line notch portion (46) extending from said second transmission line end to said transmission line connecting portion; and

a conductor (50) having:

a first conductor end (78);

a second conductor end (72);

a conductor connecting portion extending from said first conductor end (52 & 54); and

a conductor notch portion (56) extending from said second conductor end to said conductor connecting portion, said transmission line notch portion is shaped in a first curve extending from said second transmission line end and said conductor notch portion is shaped in a second curve that is generally a mirror image of said first curve extending from said second conductor end, an RF energy field is set up across said transmission line notch portion and said conductor notch portion, said conductive member at said second transmission line end being electrically connected to said second conductor end so that said transmission line notch portion of said conductive layer and said conductor notch portion of said conductor form a RF active notch structure (from 72 to 74) for radiating said RF energy field in a direction away from said RF active notch structure and for transitioning the characteristic impedance of said transmission line to that of air.

5,467,099

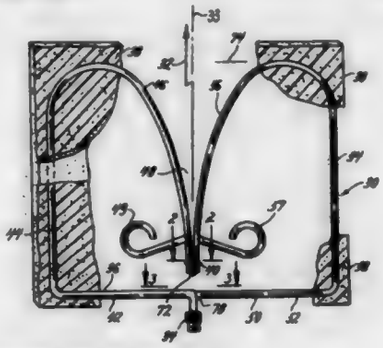
RESONATED NOTCH ANTENNA

Mark E. Bonebright, La Mesa, and John R. Glabe, Ramona, both of Calif., assignors to McDonnell Douglas Corporation, Huntington Beach, Calif.

Continuation-in-part of Ser. No. 50,873, Apr. 20, 1993, abandoned. This application Nov. 24, 1993, Ser. No. 158,057

Int. Cl.[6] H01Q *13/10*

U.S. Cl. 343—767 **37 Claims**



1. An antenna element including:

a transmission line (36) having:

an outer conductive layer (60);

a conductive member (58) adjacent said outer conductive layer; and

dielectric spacing means (62) between said outer conductive layer and said conductive member, said transmission line further having:

a first transmission line end (34) for connection to RF means;

a second transmission line end (72);

a transmission line connecting portion (42 & 44) extending from said first transmission line end; and

a transmission line notch portion (46) extending from said second transmission line end to said transmission line connecting portion; and

a conductor (50) having:

a first conductor end (78);

a second conductor end (72);

a conductor connecting portion (52 & 54) extending from said first conductor end; and

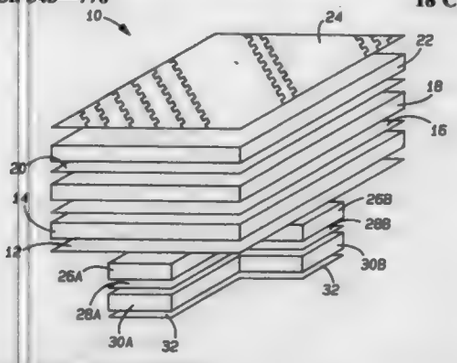
a conductor notch portion (56) extending from said second conductor end to said conductor connecting portion, said transmission line notch portion is shaped in a first curve extending from said second transmission line end and said conductor notch portion is shaped in a second curve that is generally a mirror image of said first curve extending from said second conductor end, an RF energy field is set up across said transmission line notch portion and said conductor notch portion, said conductive member at said second transmission line end being electrically connected to said second conductor end so that said transmission line notch portion of said outer conductive layer and said conductor notch portion of said conductor form an RF active notch structure (from 72 to 74) for radiating said RF energy field in a direction away from said RF active notch structure and for transitioning the characteristic impedance of said transmission line to that of air, and a portion of said conductor notch portion and a portion of said transmission line notch portion forming a parallel line transmission line therebetween.

5,467,100

SLOT-COUPLED FED DUAL CIRCULAR POLARIZATION TEM MODE SLOT ARRAY ANTENNA

Chien-An Chen, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 9, 1993, Ser. No. 104,460
Int. Cl.[6] H01Q *13/10*
U.S. Cl. 343—770 **18 Claims**



1. A slot antenna comprising:

first and second oppositely disposed metallic plates spaced separate from one another via a dielectric medium, said first and second plates being adapted to allow transverse-electromagnetic energy to propagate therebetween;

beam forming means for providing a predetermined field of view;

radio-wave connecting means coupled to said beam forming means;

an array of horizontal and vertical radiating elements formed in said first metallic plate; and

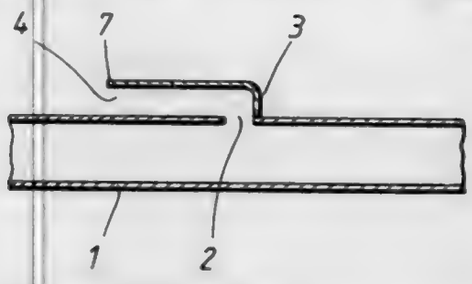
a first array of horizontal coupling slots and a second array of vertical coupling slots formed in said second metallic plate and operatively coupled to said beam forming means, wherein the coupling slots are electrically coupled to the radiating elements via transverse-electromagnetic energy.

5,467,101

WAVEGUIDE ANTENNA WITH TRANSVERSAL SLOTS

Lars G. Josefsson, Askim, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jul. 13, 1994, Ser. No. 274,448
Claims priority, application Sweden, Jul. 13, 1993, 9302412
Int. Cl.[6] H01Q *13/10*
U.S. Cl. 343—771 **10 Claims**



1. A waveguide antenna comprising:

a waveguide having a waveguide wall including a plurality of first transversal slots; and

a plurality of electrically conductive first waveguide elements, each first waveguide element having a surface parallel to the waveguide wall and being displaced outwardly from the waveguide wall such that a plurality of second transversal slots is formed between the waveguide elements and the waveguide wall,

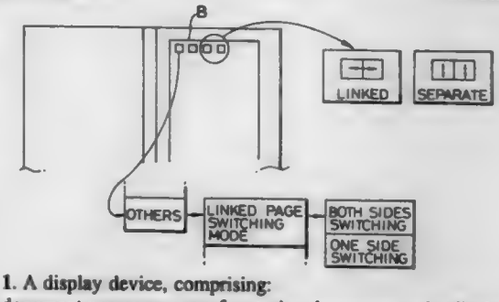
wherein each first waveguide element includes at least one side wall which extends from the waveguide element to the waveguide forming one second transversal slot; and each first waveguide element is attached at one end to a side of a respective first transversal slot, a portion of each first waveguide element protruding substantially perpendicularly to the waveguide wall for predetermined distance, and the remaining portion of each first waveguide element being disposed above the respective first transversal slot substantially parallel to the waveguide wall.

5,467,102

PORTABLE DISPLAY DEVICE WITH AT LEAST TWO DISPLAY SCREENS CONTROLLABLE COLLECTIVELY OR SEPARATELY

Yoshinori Kuno, Saitama; Noboru Tanabe, and Koichi Hasebe, both of Kanagawa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 113,637, Aug. 31, 1993, abandoned. This application Mar. 28, 1995, Ser. No. 411,924
Claims priority, application Japan, Aug. 31, 1992, 4-230732
Int. Cl.[6] G09G *3/02*
U.S. Cl. 345—1 **22 Claims**



1. A display device, comprising:

document memory means for storing documents to be displayed;

at least two display screens for displaying the documents stored in the document memory means; and

display control means for controlling displays of the documents on the display screens to be in a predetermined linked mode in which the displays on the display screens are linked together to display consecutive pages of a document and in a predetermined separate mode in which the displays on the display screens are independent from each other such that any page of the document can be displayed on any display screen,

wherein the linked mode further includes an all sides switching mode in which each page displayed on each one of the display screens is simultaneously switched to another page and a one side switching mode in which only one page displayed on one of the display screens is switched at a given time while other displayed pages are unchanged.

5,467,103

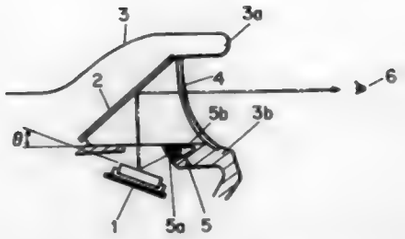
DISPLAY APPARATUS

Tadashi Iino; Yoshiyuki Furuya, and Kunimitsu Aoki, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 812,991, Dec. 24, 1991, abandoned. This application Sep. 29, 1993, Ser. No. 128,073
Claims priority, application Japan, Dec. 26, 1990, 2-404671
Int. Cl.[6] G09G *3/02*
U.S. Cl. 345—7 **17 Claims**

1. A display apparatus, comprising:

first means for emitting a first image in a first predetermined direction, said first means including a light emission portion sandwiched between a semi-reflective transparent surface and a base plate, said first means reflecting external light impinging on said semi-reflective transparent surface and being oriented at a predetermined angle θ formed with a horizontal line to prevent a doubled image due to the reflected light being observed by a driver;



second means for emitting a second image towards said semi-reflective transparent surface of said first means in a second predetermined direction at an incident angle θ_1 such that said second image is reflected by said semi-reflective transparent surface of said first means in said first predetermined direction, said first and second means being oriented such that said second image is reflected in substantially in the same direction as said first predetermined direction; and

reflection means for reflecting the first and second images from said first means in a third predetermined direction;

whereby said first and second images are observed along said third predetermined direction as a superimposed virtual image by the driver at the same position.

5,467,104

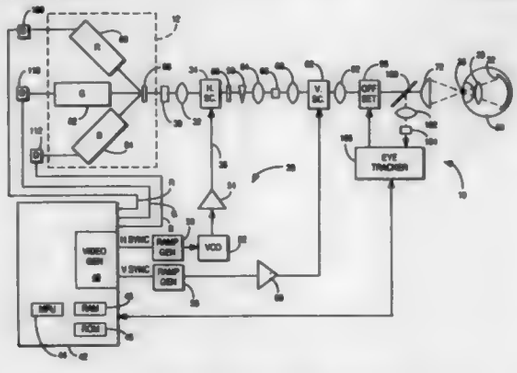
VIRTUAL RETINAL DISPLAY

Thomas A. Furness, III, and Joel S. Kollin, both of Seattle, Wash., assignors to Board of Regents of the University of Washington, Seattle, Wash.

Filed Oct. 22, 1992, Ser. No. 965,070

Int. Cl.[6] G09G 3/02

U.S. Cl. 345—8 **11 Claims**



1. A virtual image display system comprising:

a source of photons modulated with video information, said photons being scanned directly onto the retina of the user's eye to produce a virtual image perceived by the user without an aerial image outside of the user's eye perceivable by the user wherein said video information represents a plurality of picture elements of a video image and

means for varying the focus of said scanned photons to control the depth perceived for each picture element of said video image.

5,467,105

DISPLAY DEVICE

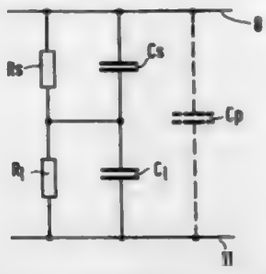
Antonius G. H. Verhulst, and Jacob Bruinink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1990, Ser. No. 581,839

Claims priority, application Netherlands, Sep. 29, 1989, 8902421

Int. Cl.[6] G09G 3/36

U.S. Cl. 345—87 **41 Claims**



1. A display device comprising: an electro-optical display medium between two supporting plates, a system of pixels arranged in rows and columns, with each pixel being constituted by picture electrodes, insulating layers provided on the facing surfaces of the supporting plates, and a system of row and column electrodes for presenting selection and data signals across the pixels via switching elements by means of which a range of voltages dependent on the electro-optical display medium can be presented for the purpose of picture display, and means for applying an auxiliary voltage across the pixels via said switching elements prior to selection wherein the auxiliary voltage is beyond or on the edge of the voltage range to be used for picture display, characterized in that, viewed across a pixel, the electrical resistance (R_s) of the combined insulating layers at the area of a pixel is large with respect to that of the layer of electro-optical material R_l, wherein the ratio C_s/C_l lies between 1 and 100 where C_s is the capacitance of the combined insulating layers at the area of the pixel and C_l is the capacitance of the layer of electro-optical material at the area of the pixel, and $\tau_{lc}=R_lC_l$ and lies in the range between 0.1 and 10 seconds.

5,467,106

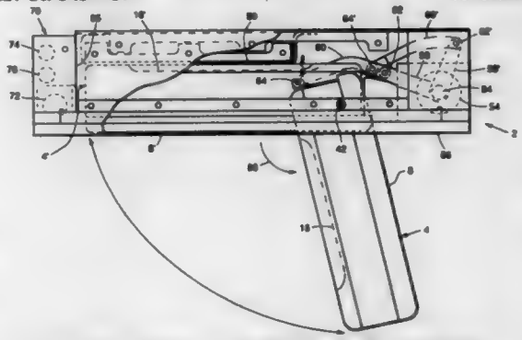
RETRACTABLE FACE-UP LCD MONITOR WITH OFF-MONITOR POWER SUPPLY AND BACK-EMF BRAKING

Andreas H. Salomon, Claremont, Calif., assignor to Hughes-Avicom International, Inc., Glendora, Calif.

Filed Feb. 10, 1994, Ser. No. 194,559

Int. Cl.[6] G09G 3/36

U.S. Cl. 345—87 **18 Claims**



1. A retractable liquid crystal display (LCD), comprising:

a housing having an exterior wall with an opening for an LCD monitor,

an LCD monitor pivotally mounted to said housing for pivoting through an arc exceeding 90° between an open position at which the monitor extends out from the housing, and a

retracted position at which the monitor is lodged in said opening, said monitor including an LCD viewing screen that is exposed for viewing in said open monitor position, faces the interior of said housing and is shielded by the remainder of said monitor in said retracted monitor position, said monitor being without an internal power supply but having an input to receive electrical power from an external supply,

a motor mounted to said housing so that it does not pivot with said monitor,

a power supply for said motor and for said monitor mounted to said housing outside the monitor's retracted position so that it does not pivot with said monitor, said power supply producing outputs at different respective voltage levels for said motor and said monitor,

a mechanical coupling between said motor and said monitor for pivoting said monitor to its open position when actuated by said motor,

a return actuator for returning said monitor to its retracted position, and

an electrical connector for supplying said monitor with power from said power supply in its open position.

5,467,107

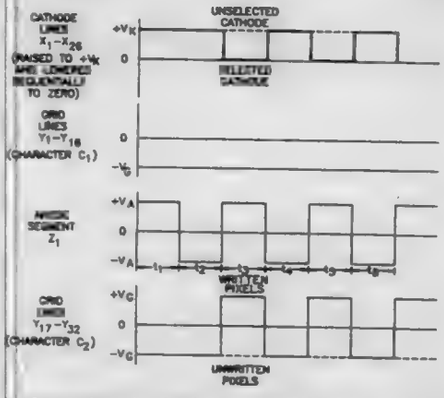
ELECTROPHORETIC DISPLAY PANEL WITH SELECTIVE CHARACTER ADDRESSABILITY

Frank J. DiSanto, North Hills; Denis A. Krusos, Lloyd Harbor, and Edward Lewit, Roslyn Heights, all of N.Y., assignors to Copytele, Inc., Huntington Station, N.Y.

Continuation of Ser. No. 130,269, Oct. 1, 1993, abandoned. This application Sep. 28, 1994, Ser. No. 313,987

Int. Cl.[6] G09G *3/34*

U.S. Cl. 345—107 **19 Claims**



1. An electrophoretic display apparatus having a selectively erasable display including a plurality of character lines, said display apparatus being capable of allowing a user to erase at least one character in one of said character lines which has been written to said display without having to completely re-write every character in said character line, comprising:

a fluid-tight envelope having a portion thereof which is at least partially transparent;

an electrophoretic fluid contained within said envelope, said fluid having pigmented particles suspended therein, and a plurality of row and column electrodes passing through said envelope and said fluid;

a plurality of anode segments passing through said envelope, wherein each character line of said display is defined by at least one of the anode segments and by a corresponding group of row and column electrode intersections;

line control means operable in a partial erasure mode to apply a first potential bias of a given polarity between an anode segment corresponding to a selected character line and a corresponding group of row and column intersections, said first potential bias being applied for a first given duration of time sufficient to cause said pigment particles to move relative to said intersections and partially erase said selected character line, said line control means being further operable in a rewriting mode to apply a second potential bias of an opposite polarity between said anode segment and said group of row and column intersections for a second given duration of time sufficient to partially rewrite every character of said selected character line except for at least one character selected for erasure, and said line control means being further operable to sequentially apply said first and second potential biases until said at least one of said characters selected for erasure is no longer displayed.

5,467,108

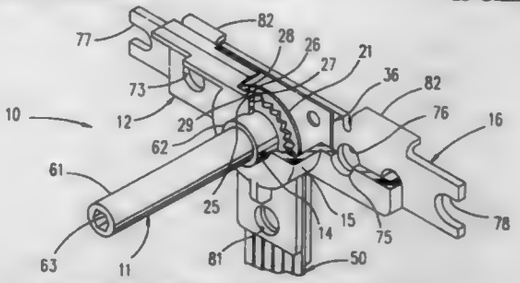
ADJUSTABLE POINTING STICK ASSEMBLY

Kenneth H. Mimlitch, Lexington, Ky., assignor to Lexmark International, Inc., Greenwich, Conn.

Filed Feb. 15, 1994, Ser. No. 196,629

Int. Cl.[6] G09G *3/02*

U.S. Cl. 345—161 **13 Claims**



1. An adjustable pointing stick assembly including:

a pointing stick having a substantially flat bottom surface and a longitudinal axis;

support means for supporting said pointing stick while enabling movement of said pointing stick in a plurality of degrees of freedom relative to said support means including axial movement of said pointing stick;

force sensing means including means fixed with respect to said support means and means movable by said pointing stick relative to said fixed means when said pointing stick is moved relative to said support means;

said force sensing means producing electrical signals responsive to movement of said movable means by said pointing stick to cause controlled movement of a cursor of a computer monitor in response to motion of said pointing stick;.

adjusting means for adjusting the axial position of said pointing stick along the longitudinal axis of said pointing stick relative to said support means;

said adjusting means including cooperating means on said pointing stick and said support means for changing the axial position of said pointing stick relative to said support means during assembly;

and said cooperating means producing adjustment of the axial position of said pointing stick through rotation of said pointing stick relative to said support means.

5,467,109

CIRCUIT FOR GENERATING DATA OF A LETTER TO BE DISPLAYED ON A SCREEN

Hideo Nagaoka, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

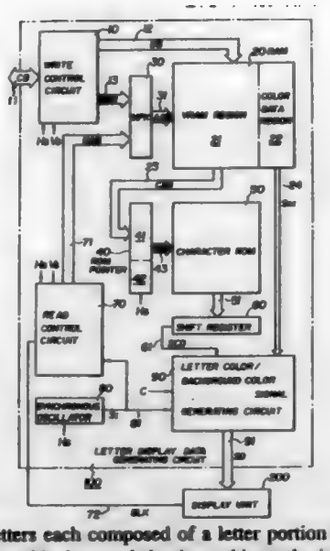
Continuation of Ser. No. 950,756, Sep. 24, 1992, abandoned, which is a continuation of Ser. No. 570,075, Aug. 20, 1990, abandoned. This application Apr. 18, 1994, Ser. No. 229,106

Claims priority, application Japan, Aug. 18, 1989, 1-212278

Int. Cl.[6] G09G *1/16*

U.S. Cl. 345—194 **3 Claims**

1. A circuit for generating color data of a letter to be displayed on a display device, comprising a first memory for storing a



plurality of letters each composed of a letter portion defined by a plurality of first bit data each having a binary logic level and a background portion defined by a plurality of second bit data each having binary logic level that is different from the binary logic level of the first bit data, a data output circuit coupled to said first memory and outputting each of said first and second bit data of at least one of said letters in series from said first memory, a second memory for temporarily storing color data for designating a color of one of said letter and background portions of said one of said letters, said color data being composed of a plurality of third bit data for designating said color of said one of said letter and background portions, and a color control circuit having a first input terminal coupled to said data output circuit to receive each of said first and second bit data outputted in series from said first memory, a plurality of second input terminals coupled to said second memory to receive said third bit data from said second memory, a plurality of output terminals of said color control circuit being coupled to said second memory, said color control circuit responding to said third bit data and producing at said output terminals first color data indicative of a first color each time said first input terminal receives said first bit data and second color data indicative of a second color different from said first color each time said first input terminal receives said second bit data, wherein said color control circuit includes a plurality of first gate circuits each having a first input node coupled to said first input terminal, a second input node coupled to an associated one of said second input terminals and an output node coupled to an associated one of said output terminals and transferring an associated one of said third bit data to said output node each time said first input node receives one of said first and second bit data and transferring an inverted data of said associated one of said third bit data to said output node each time said first input node receives the other of said first and second bit data, said first color being thereby complementary to said second color.

5,467,110

POPULATION ATTRIBUTE COMPRESSION

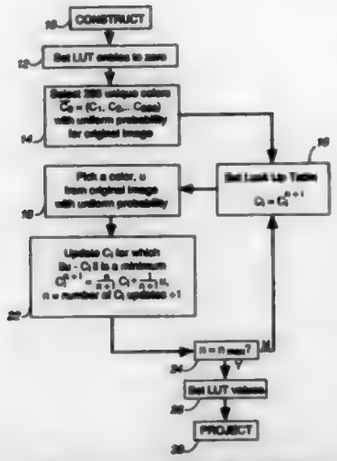
James M. White; Vance Faber, and Jeffrey S. Saltzman, all of Los Alamos, N.M., assignors to The Regents of the University of California, Office of Technology Transfer, Alameda, Calif.

Continuation-in-part of Ser. No. 350,675, May 12, 1989, Pat. No. 5,130,701. This application Sep. 28, 1990, Ser. No. 589,563

Int. Cl.[6] G09G *1/28*

U.S. Cl. 345—199 **6 Claims**

1. A method for associating selected attributes in a given population with a smaller number of attributes in a look-up table (LUT) to form a reconstructed population using said LUT attributes, comprising the steps of:



refining an attribute space containing said LUT attributes into a plurality of adaptive cube volumes in said attribute space wherein each said adaptive cube volume has a predetermined maximum number of associated ones of said LUT attributes that are closest to interior points of said cube volume;

forming a tree structure defining a plurality of nodes in said attribute space where each node of said tree is a corresponding cube volume in said attribute space and either points to smaller cube volumes formed from said corresponding cube volume or to said associated LUT attributes when said corresponding cube volume is a leaf of said tree consisting of one of said adaptive cube volumes;

traversing said tree with each of said selected population attributes to arrive at one said leaf containing said selected population attribute and said associated LUT attributes; and

determining the closest one of said associated LUT attributes in said leaf to said population attribute to replace said population attribute.

5,467,111

TRANSPORTING APPARATUS FOR SCANNING EXPOSURE

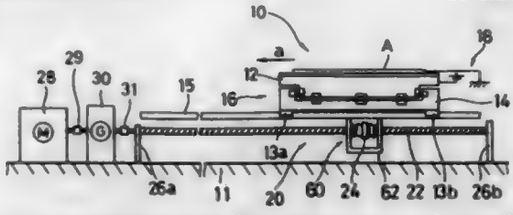
Koji Furukawa, and Chikashi Ohishi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 4, 1992, Ser. No. 894,335

Claims priority, application Japan, Jun. 6, 1991, 3-134742; Aug. 15, 1991, 3-205044

Int. Cl.[6] H04N *1/10*

U.S. Cl. 346—134 **20 Claims**



1. A transporting apparatus for scanning exposure of a recording material which comprises:

a screw transmission mechanism having a drive screw and a travelling nut that meshes with said drive screw;

an exposure mount comprising: a platen for carrying said recording material; a transport plate having an underside; and platen displacement means for coupling said transport plate to said platen such that said platen is displaced relative to said transport plate such that movements of said platen and said transport plate substantially coincide, and wherein said transport plate engages with the travelling nut of said screw transmission mechanism such that said screw transmission mechanism drives the transport plate; and

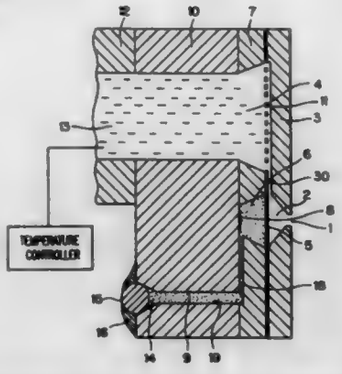
an engaging means provided on the underside of said transport plate for achieving engagement between said transport plate and said screw transmission mechanism.

5,467,112

LIQUID DROPLET EJECTING APPARATUS

Masao Mitani, Katsuta, Japan, assignor to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1993, Ser. No. 78,655
Claims priority, application Japan, Jun. 19, 1992, 4-160781
Int. Cl.[6] B41V 2/05
U.S. Cl. 347—1 20 Claims



1. A liquid droplet ejecting apparatus for ejecting a liquid from a nozzle, comprising:

a liquid ejection chamber for holding liquid to be ejected from the nozzle, said liquid ejection chamber having a temperature;

a liquid ejection chamber temperature controller for maintaining the temperature in said liquid ejection chamber in a range of 128° C.+/−3° C.;

a pressure chamber having an internal volume filled with a pressurizing liquid, the pressurizing liquid having a boiling point higher than the temperature in said liquid ejection chamber, the pressurizing liquid generating a bubble when heated to the boiling point, expansion of the generated bubble increasing pressure within the pressure chamber;

heat applying means for selectively heating the pressurizing liquid to the boiling point; and

pressure applying means for applying pressure to said liquid ejection chamber by deforming with increasing pressure in the pressure chamber to eject a liquid droplet.

5,467,113

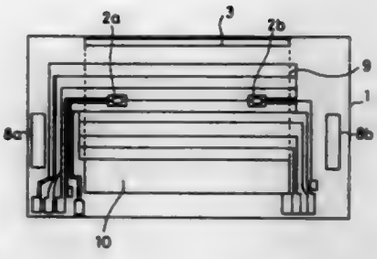
INK-JET RECORDING HEAD, BOARD FOR SAID HEAD AND INK-JET RECORDING APPARATUS

Hiroyuki Ishinaga, Tokyo; Tsuguhiro Fukuda, and Toshihiro Mori, both of Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 92,928, Jul. 15, 1993, abandoned, which is a continuation of Ser. No. 768,267, Dec. 12, 1991, abandoned. This application Jan. 30, 1995, Ser. No. 380,330
Claims priority, application Japan, Feb. 26, 1990, 2-42527
Int. Cl.[6] B41J 29/38
U.S. Cl. 347—17 23 Claims

1. An ink-jet recording head having a plurality of ink discharging orifices, and having, positioned on a same substrate, a plurality of heat generating elements for generating thermal energy used for discharging ink from said ink discharging orifices, a temperature sensor element for detecting a temperature of said substrate and a heating element for applying heat to said substrate,

characterized in that said temperature sensor element is disposed at a position where a time required for the influence due to a temperature change, when only a predetermined heat generating element is energized, to become exertive on said position



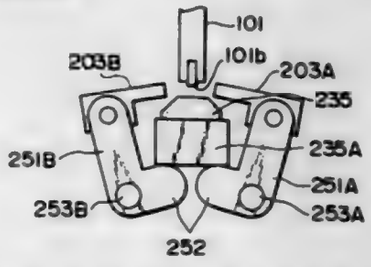
is substantially equal or equal to a time required for the influence due to a temperature change, when only said heating element is energized, to become exertive on said position, and wherein said predetermined heat generating element is selected from an intermediate temperature portion of said plurality of generating elements.

5,467,114

RECORDING APPARATUS AND INK CARTRIDGE

Ryuichi Ebinuma, Kawasaki; Nobutoshi Mizusawa, Yamato, and Yuji Chiba, Isehara, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 908,861, Jul. 1, 1992, abandoned, which is a continuation of Ser. No. 416,275, Oct. 2, 1989, abandoned, which is a division of Ser. No. 131,083, Dec. 9, 1987, Pat. No. 4,893,137. This application Mar. 17, 1995, Ser. No. 405,934
Claims priority, application Japan, Dec. 10, 1986, 61-292599; Dec. 10, 1986, 61-292600; Dec. 10, 1986, 61-292601; Dec. 25, 1986, 61-307937; Dec. 25, 1986, 61-307938; Dec. 25, 1986, 61-307939; Dec. 25, 1986, 61-307940
Int. Cl.[6] B41J 2/165
U.S. Cl. 347—32 34 Claims



1. An ink jet recording apparatus for use with an ink jet recording head having a discharge section for discharging ink and recording on a recording medium, said apparatus comprising:

a platen for guiding the recording medium and determining a head recording position of said recording head;

a moving means for moving said platen between a platen recording position for determining the head recording position and a position different from the platen recording position; and

an ink absorbing member positioned on a side of said platen opposite said recording head and not opposed to said discharge section of said recording head when said platen is at the platen recording position,

wherein said moving means moves said platen to the different platen position to provide a space for said ink absorbing member to oppose said discharge section of said recording head so that ink can be discharged into said ink absorbing member while not in contact with said recording head and wherein said ink absorbing member approaches the recording head by being mechanically controlled by a component connected to said platen in correspondence with movement of said platen.

5,467,115

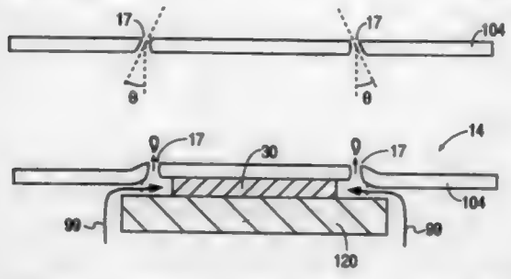
INKJET PRINTHEAD FORMED TO ELIMINATE INK TRAJECTORY ERRORS

Winthrop D. Childers, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 864,896, Apr. 1, 1992. This application Oct. 5, 1993, Ser. No. 131,816

Int. Cl.[6] B41J 2/14

U.S. Cl. 347—47 11 Claims



1. A method of forming an inkjet printhead comprising the steps of:

forming a nozzle member having a plurality of nozzles, a central axis of each of said nozzles having a first tilt angle with respect to a direction normal to a top surface of said nozzle member; and

affixing a substrate containing a plurality of ink ejection elements to a back surface of said nozzle member using pressure, said nozzle member extending over two or more outer edges of said substrate, said pressure causing bending of said nozzle member over said outer edges of said substrate, said bending causing said central axis of each of said nozzles to be tilted with respect to a direction normal to a top surface of said substrate by an angle approximately equal in magnitude and opposite in direction to said first tilt angle so as to offset said first tilt angle and result in a printhead having nozzles whose central axes are substantially normal to said top surface of said substrate.

5,467,116

INK JET PRINTER WITH DEVICE FOR ALIGNING AN INK CARTRIDGE

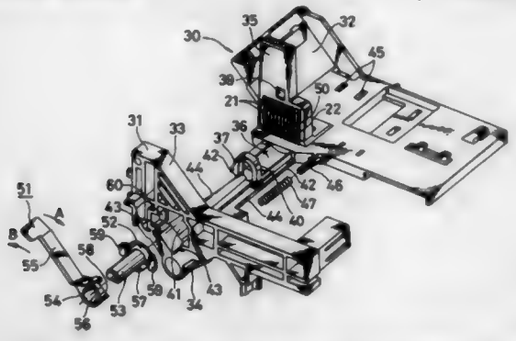
Shinya Nakamura; Tsutomu Yamaguchi, both of Shizuoka, Japan; Steven J. Dietl, and Donald M. Stevens, both of Webster, N.Y., assignors to Kabushiki Kaisha Tec, Shizuoka, Japan, and Xerox Corporation, Webster, N.Y.

Filed May 21, 1993, Ser. No. 64,423

Claims priority, application Japan, May 22, 1992, 4-130513; May 22, 1992, 4-130514; Jun. 12, 1992, 4-153329

Int. Cl.[6] B41J 2/14

U.S. Cl. 347—50 18 Claims



1. An ink jet printer in which an ink cartridge including an ink tank and a head base plate which has an ink jet head including a plurality of ink discharging means is used, comprising:

printing means for performing printing in a main printing direction on a recording medium with ink which is selectively discharged from said ink discharging means of said ink jet head, said printing means including a carriage shaft extending in the main printing direction and a carriage mounted for sliding movement on said carriage shaft for carrying said ink cartridge thereon, said carriage including a first carriage frame and a second carriage frame;

at least three projections provided on said first carriage frame for individually contacting with at least three portions of said head base plate to position said ink discharging means of said ink jet head at predetermined positions; and

pressurizing means provided on said carriage for pressing said head base plate against said projections by moving said first carriage frame and said second carriage frame along said carriage shaft.

5,467,117

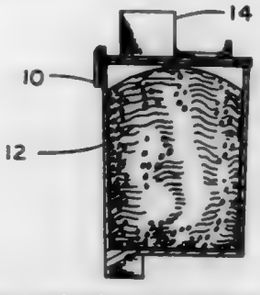
ADDITION OF ALCOHOL TO PREWET SOLUTIONS TO ENHANCE AND ACCELERATE WETTING TO HYDROPHOBIC FOAMS FOR APPLICATION TO INK-JET PENS

Roger F. Evans; Charles L. Thierheimer, Jr., and Norman E. Pawlowski, all of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 23, 1994, Ser. No. 200,794

Int. Cl.[6] G01D 15/18

U.S. Cl. 347—87 19 Claims



1. A method for accelerating and enhancing wetting of hydrophobic foams as ink reservoirs for application to ink-jet pens, comprising the steps of:

(a) compressing said hydrophobic foam to expel air from the foam, thereby forming compressed foam;

(b) placing said compressed foam in a prewet bath containing a solution comprising about 3 to 10 wt. % of a low molecular weight alcohol, 0 to about 0.5 wt. % biocide, and the balance water;

(c) allowing said compressed foam to expand in said prewet bath and to thereby absorb said solution;

(d) compressing said foam while said foam remains in said prewet bath;

(e) repeating steps (c) and (d) at least once;

(f) removing said foam from said prewet bath; and

(g) compressing said foam, thereby expelling excess solution while leaving a residual amount of said alcohol within the foam.

5,467,118

INK CARTRIDGE FOR A HARD COPY PRINTING OR PLOTTING APPARATUS

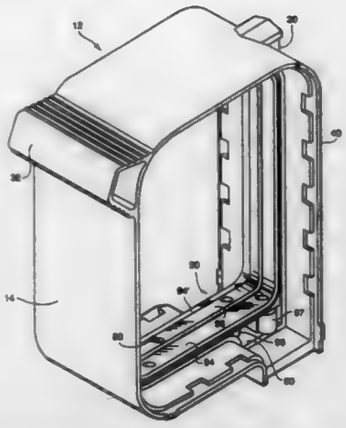
Brian D. Gragg, San Diego, Calif., and James E. Clark, Albany, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 21, 1993, Ser. No. 170,840

Int. Cl.[6] B41J 2/175

U.S. Cl. 347—87 7 Claims

1. In a pen for a hard copy printing device, having an ink cartridge with an exterior surface, an inner surface, and an interior cartridge chamber containing at least two ink reservoirs, each of



said reservoirs having a supply of ink therein, and a printhead device on said exterior surface, a fitment apparatus for supplying independent outflow of ink from each of said reservoirs to said printhead device, comprising:

at least two means, unitary with said cartridge and extending into said chamber, for piping ink from each of said reservoirs respectively to said printhead device;

a unitary means for forming inner walls of both of said reservoirs, having a means thereon for forming a substantially fluid-tight seal between said unitary means and each of said means for piping ink respectively, such that ink in each of said reservoirs can flow out through only one of said means for piping;

means for filtering said outflow of ink from said reservoirs; and

means, bonded to said cartridge in a substantially fluid-tight seal between said cartridge and said printhead device, for holding said means for filtering said outflow of ink,

wherein each of said means for piping ink is a tubular pipe device, extending inwardly from said inner surface of said cartridge into said chamber, having a bore extending from said exterior surface of said cartridge into said chamber, and

wherein said means for forming a substantially fluid-tight seal between said unitary means and each of said means for piping ink is a plurality of sleeving means, each adapted to fit over one each of each said tubular pipe devices, for coupling the supply of ink within one of each of said reservoirs to a respective tubular pipe bore and providing a substantially fluid-tight seal between each of said sleeving means and a respectively fitted tubular pipe device except through said bore.

5,467,119

INK-JET PRINTER WITH PRINT HEATER HAVING VARIABLE HEAT ENERGY FOR DIFFERENT MEDIA

Brent W. Richtsmeier, San Diego, Calif.; Todd L. Russell, Camas, Wash.; Todd R. Medin, Escondido, and William D. Meyer, Ramona, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 876,986, May 1, 1992, abandoned. This application Oct. 14, 1993, Ser. No. 137,388

Int. Cl.[6] B41J *2/01*

U.S. Cl. 347—102 **22 Claims**

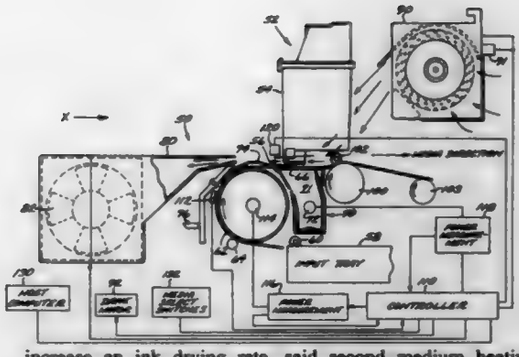
1. An ink-jet printer, comprising:

a printhead for printing onto a print medium, comprising a plurality of ink-jet nozzles for ejecting ink drops onto a surface of said print medium at a print zone in a controlled fashion;

medium advancing means for advancing said print medium along a medium path to said print zone;

first medium heating means for preheating said medium prior to advancement of said medium to said print zone;

second medium heating means for heating a portion of said medium disposed at said print zone during print operations to



increase an ink drying rate, said second medium heating means being spatially separated from said first medium heating means;

print medium type distinguishing means for providing a medium type signal indicative of a type of media being advanced to said print zone;

first heater control means for controlling said first medium heating means;

second heater control means responsive to said medium type signal for controlling said second medium heating means, said second control means for selectively setting an amount of heat energy generated by said second medium heating means in dependence on said type of print medium being advanced to said print zone, said heat energy amount being selected to heat said medium to a high level without causing deleterious heating effects on said medium, said second heater control means comprising means for causing said second heating means to generate heat at an initial, high level dependent on said medium type signal, and then to decrement the heat level by a given decrement rate as printing operations proceed on said medium to gradually reduce said heat level.

5,467,120

THERMAL TRANSFER RECORDING METHOD AND APPARATUS OF BOTH SUBLIMATION TYPE AND FUSION TYPE

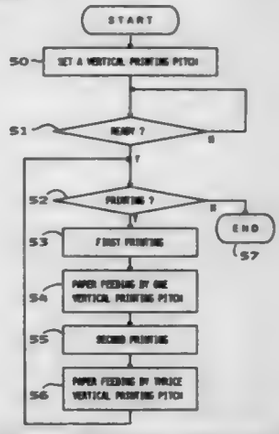
Akihiro Sadaki; Masayoshi Shiraishi; Naoki Kawawada, and Koji Kawaguchi, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Tokyo, Japan

Filed May 21, 1993, Ser. No. 64,558

Claims priority, application Japan, May 25, 1992, 4-132550; May 29, 1992, 4-138592

Int. Cl.[6] B41J *2/32;2/325*

U.S. Cl. 347—171 **8 Claims**



1. A thermal transfer recording method of a thermal transfer recording apparatus which uses a thermal head composed of heat generating resistive members aligned in a specified direction, obtains a desired halftone or color image by changing heat quantity generated in the heat generating resistive members, and is con-

structed to selectively switch over its recording mode to a selected recording mode selected from a sublimation type thermal transfer recording mode and a fusion type thermal transfer recording mode, said method comprising the steps of:

a) switching the apparatus over to the sublimation type thermal transfer recording mode:

b) determining a printing pitch for the sublimation type thermal transfer recording mode;

c) performing a first printing on a recording paper in accordance with selected printing data;

d) feeding the recording paper by a distance equal to an integral multiple, ≧1, of the determined printing pitch;

e) performing a second printing in accordance with the selected printing data as in said step of performing a first printing; and

f) feeding the recording paper by a distance equal to an integral multiple of the determined printing pitch.

5,467,121

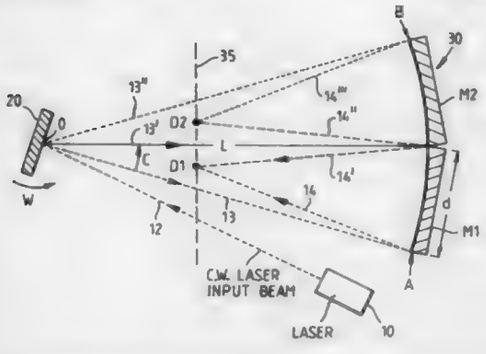
METHOD AND APPARATUS FOR DOT MATRIX WRITING USING A CONTINOUS WAVE LASER

Geoffrey Allcock, Kirkella, England, assignor to Coherent Hull, Ltd., United Kingdom

Continuation of Ser. No. 856,075, May 8, 1992. This application Aug. 12, 1994, Ser. No. 289,843

Int. Cl.[6] B41J *2/43*

U.S. Cl. 347—260 **74 Claims**



1. An apparatus for marking a target by exposing the target to continuous wave laser radiation, including:

a means for generating a continuous wave laser beam;

an array of concave mirrors;

a means for scanning the continuous wave laser beam across the array, wherein said means for scanning includes a rotating mirror, and said means for scanning includes a means for reflecting the laser beam from the rotating mirror;

a target positioned relative to the array so that each concave mirror in the array projects a stationary real image of the laser beam on the target when the laser beam is scanned across the array, wherein the stationary real image is projected on the target for a dwell time determined by a rotational velocity of the rotating mirror; and

control means, connected to the means for scanning, for controlling the rotational velocity to control the dwell time.

5,467,122

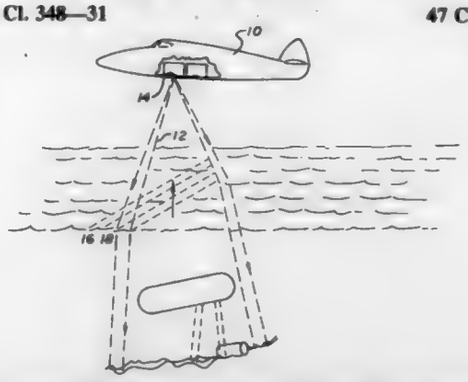
UNDERWATER IMAGING IN REAL TIME, USING SUBSTANTIALLY DIRECT DEPTH-TO-DISPLAY-HEIGHT LIDAR STREAK MAPPING

Kent Bowker, Essex, Mass., and Stephen C. Lubard, Woodland Hills, Calif., assignors to Areté Associates, Sherman Oaks, Calif.

Continuation-in-part of Ser. No. 781,038, Oct. 21, 1991, abandoned. This application Apr. 12, 1993, Ser. No. 46,335

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—31 **47 Claims**



5. A system for imaging a volume of a turbid medium, namely an ocean volume, with objects therein, said system being for use with means for bodily transporting at least part of the system with respect to said turbid ocean volume, and said system comprising:

means for projecting a pulsed thin-fan-shaped beam to selectively illuminate, along an illumination-propagation direction, a thin section of such turbid ocean volume;

a streak tube, having a cathode for receiving reflected light back, approximately along the illumination-propagation direction, from the thin section of turbid ocean volume; said streak tube also having an anode end, and comprising:

first electronic means for forming at the anode end of the streak tube successive thin-strip-shaped electronic-image segments of the light successively received on the cathode from the illuminated turbid-ocean-volume thin section, and

second electronic means for distributing the successive thin-strip-shaped electronic-image segments, along a direction generally perpendicular to a long dimension of the image segments, across the anode end of the streak tube,

said distributing of the electronic-image segments being in accordance with elapsed time after operation of the beam-projecting means so that each thin-strip-shaped electronic-image segment is displaced from an edge of the anode end of the tube substantially in proportion to total propagation distance and time into and out from the turbid-medium thin section, to form a composite electronic image of the turbid-ocean-volume thin section as a function of propagation depth;

means for imposing a substantially common spatial definition and directional restriction, in one dimension, upon (1) the pulsed thin-fan-shaped beam projected by the projecting means and (2) the reflected light received back from the thin section of turbid ocean volume;

means for sequentially operating the beam-projecting means, during operation of such bodily-transporting means, to project a sequence of beam pulses to illuminate successive thin sections, and generate a corresponding sequence of composite electronic images; and

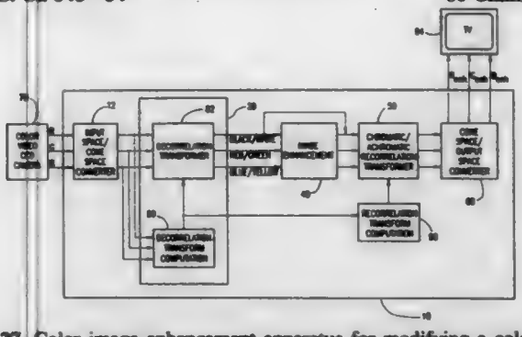
means for processing the composite electronic images, wherein said sequence of electronic images can be used to produce a corresponding sequence of composite optical images which can be displayed to show a motion picture that emulates visual perceptions of travel through the successive thin sections of turbid ocean volume.

5,467,123

APPARATUS & METHOD FOR ENHANCING COLOR IMAGES

Yehoshua Y. Zeevi, Haifa; Ran Ginosar, Nofit, both of, Israel, and Welf Stuart, Johannesbourg, South Africa, assignors to Technion Research and Development Foundation, Ltd., Haifa, Israel

Filed Jun. 1, 1993, Ser. No. 69,719
Claims priority, application Israel, Nov. 16, 1992, 103763
Int. Cl.[6] H04N 9/43
U.S. Cl. 348—34 60 Claims



27. Color image enhancement apparatus for modifying a color image for perception by a color-blind individual, the apparatus comprising:

apparatus for receiving signals representing the color image;

image processing apparatus comprising apparatus, employing the received signals, for modifying the color image such that at least one color in the color image which a color-blind individual cannot differentiate is transformed to at least one color which the color-blind individual can differentiate; and

apparatus for providing a color image using the output of said image processing apparatus,

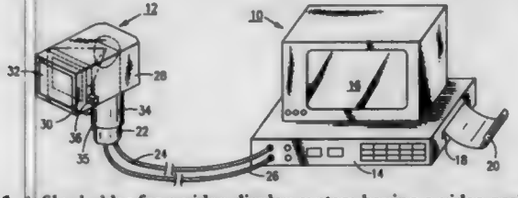
wherein said image processing apparatus which operates directly on the high spatial frequency chromatic components of the color image for enhancement thereof.

5,467,124

FILM HOLDER FOR VIDEO PROBE

Richard A. Tamburrino, Auburn, and Jack L. Connelly, Jr., Camillus, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Feb. 2, 1994, Ser. No. 190,317
Int. Cl.[6] H04N 7/18
U.S. Cl. 348—66 6 Claims



1. A film holder for a video display system having a video probe with a head portion, a processor, a monitor, and a printer, said film holder comprising:

a housing for positioning a film relative to the video probe, said housing including;

receiving means for positioning and securing the head portion of the video probe within the housing;

diffuser means for diffusing light entering said housing; and

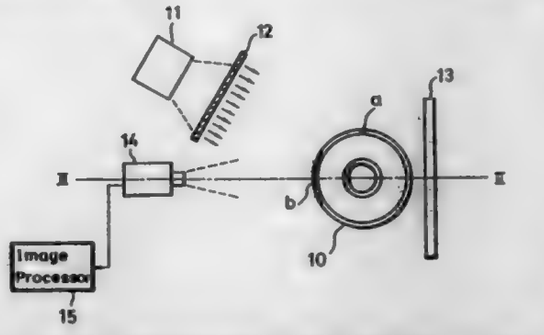
frame means positioned between said diffuser means and said receiving means, said frame means for securing the film a predetermined distance from the head of the video probe.

5,467,125

APPARATUS FOR THE INSPECTION OF TRANSPARENT CONTAINERS

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 95,822, Jul. 21, 1993, abandoned, which is a continuation of Ser. No. 728,511, Jul. 11, 1991, abandoned. This application Oct. 5, 1994, Ser. No. 317,681
Claims priority, application Japan, Jul. 13, 1990, 2-185667
Int. Cl.[6] H04N 7/18
U.S. Cl. 348—127 4 Claims



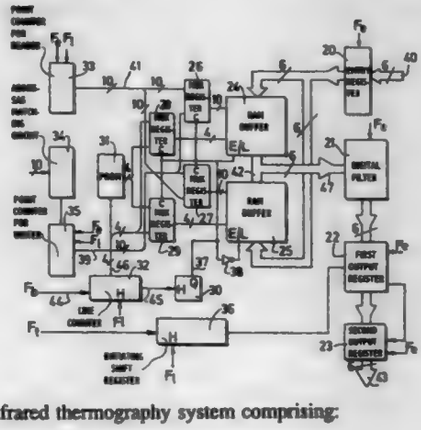
1. Apparatus for inspecting light transparent containers comprising a source of light, a light diffuser interposed between said light source and said container to irradiate said container uniformly, and a video camera, said source of light, said light diffuser and said video camera being arranged to have a field of irradiation and a field of view respectively from the same side of said container and through said container, a light absorbing wall placed behind said container in opposition to said video camera and in line to absorb the light passing through said container, said source of light, said light diffuser and said video camera being further arranged relative to each other so that light irradiated on the surface of said container is not reflected therefrom but passes through said container, and hence, said video camera receives only spurious reflection from said container, and a processor for processing the output signal of said video camera upon the sensing of a spurious reflection from said container.

5,467,126

THERMOGRAPHY SYSTEM WITH FULL-SCREEN DIGITAL ENLARGEMENT WITH CAMERA USING SERIES-PARALLEL SCANNING

Jean-Louis M. Duvent, Res "Les Vignes de Bures" Bât B1, 91940 Les Ulis, France

Filed Oct. 21, 1985, Ser. No. 805,013
Claims priority, application France, Jan. 19, 1984, 84 16072
Int. Cl.[6] H04N 5/33; G02B 26/10
U.S. Cl. 348—164 10 Claims



1. Infrared thermography system comprising:

(a) an infrared camera fitted with a raster scanner for one of (i) parallel and (ii) series-parallel scanning, and a line scanner to scan, point by point, by projection on a detection matrix comprised in the raster direction of at least a detection bar comprising a whole number of m photosensitive detectors in parallel for the simultaneous scanning of a strip of m adjacent lines of the field of view, the image of the aforesaid field of view being comprised of juxtaposed elementary fields,

(b) an electronic processor of the analog signal at the output of the camera, said electronic processor being fitted with at least a digitizer for the aforesaid analog signal, and with at least a digital-to-analog converter,

(c) means for visualization of the output signal from the aforesaid digital-to-analog converter on a television monitor, and

(d) enlargement means for operating in a digital enlargement mode, and being characterized by the fact that said enlargement means make it possible to obtain a full-screen digital enlargement, said enlargement means comprising control devices, sequencing devices, a buffer storage, and line reordering devices, and by which, (i) the movement of the raster scanning is slowed by said control devices relative to a predetermined usual scanning mode of said raster scanner, in the ratio of the enlargement factor g, selected, with preservation of raster scanning time, such that the images of any two scanning strips that follow each other in time and are projected on the aforesaid detectors overlap, the spatial displacement between these successive images in the form of a strip being greater than the dimension of a detector in the raster direction, and (ii) the output signals from said m photosensitive detectors are, after being put in digital series form, stored in the aforesaid buffer storage and read from this latter, the capacity of which is at least 2m lines, such that the chronological succession of the lines at the storage output for reproduction of the image of the field of view on the foresaid monitor is the same as the spatial succession of the field of view lines scanned.

5,467,127

AUTOMATIC OBJECTS TRACING DEVICE OF CAMCORDER

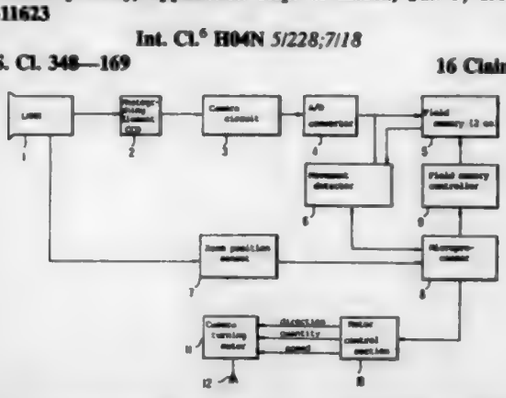
Lee Jong-Pil, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jul. 9, 1992, Ser. No. 910,811

Claims priority, application Rep. of Korea, Jul. 9, 1991, 91-11623

Int. Cl.[6] H04N *5/228;7/18*

U.S. Cl. 348—169 **16 Claims**



1. An automatic object tracing device, of a camcorder of the type which includes a zoom lens and a video processing section, which photographs an object by developing video luminance signals corresponding to an image being photographed, comprising:

A/D converting means for converting said video luminance signals output from said video processing section into digital luminance signals;

movement detecting means for comparing a present one of said digital luminance signals and a previously obtained one of said digital luminance signals to detect moving quantity and direction of said object as a motion vector to thereby generate moving information;

zoom position sensing means for detecting zoom position of said zoom lens;

a microprocessor which receives moving information of said object from said movement detecting means and position information from said zoom position sensing means and determines whether or not there is movement of said object, and a respective moving speed; and

motor control means receiving said movement and speed information of said object from said microprocessor for controlling a camcorder turning motor so that said camcorder photographs while automatically tracing said object.

5,467,128

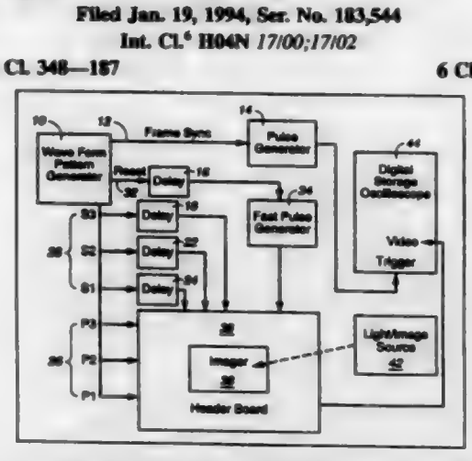
HIGH SPEED IMAGER TEST STATION

George J. Yates, Santa Fe; Kevin L. Albright, Los Alamos, both of N.M., and Bojan T. Turko, Moraga, Calif., assignors to The Regents of the University of California, Office of Technology Transfer, Alameda, Calif.

Filed Jan. 19, 1994, Ser. No. 183,544

Int. Cl.[6] H04N *17/00;17/02*

U.S. Cl. 348—187 **6 Claims**



1. A test station for determining the performance of a solid state imager, comprising:

a programmable waveform generator for outputting clock pulses at variable rates;

an imager header board for mounting a solid state imager to be tested, including clock level shifters for receiving said clock pulses and outputting readout pulses effective to clock charge from pixels forming said solid state imager and amplifiers effective to amplify output charge clocked from said solid state imager, wherein each one of said clock level shifters includes means for differentiating said output clock pulses so that said solid state imager is driven by leading and trailing edges of said clock pulses to reduce power dissipation in said clock level shifters;

analog circuit means receiving said output charge clocked from said solid state imager for canceling noise in output pulses formed by said output charge and peak sensing and holding means to sequentially hold a peak value of each of said output pulses;

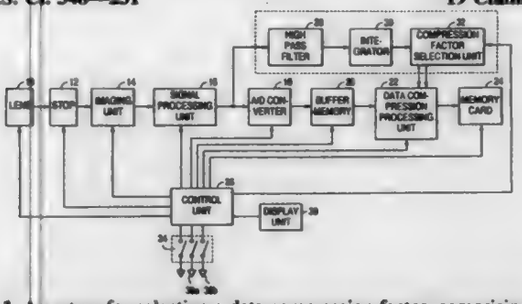
high speed digitizer means for receiving said peak value of each one of said output pulses and outputting a digital representation of each one of said output pulses; and

video means for displaying an image associated with said digital representation of said output pulses corresponding to said output charge clocked from each one of said pixels.

5,467,129
CAMERA WITH AUTOMATIC DATA COMPRESSION FACTOR SELECTION

Masahiro Suzuki, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Nov. 26, 1993, Ser. No. 157,416
Claims priority, application Japan, Nov. 25, 1992, 4-315356
Int. Cl.[6] H04N 5/76
U.S. Cl. 348—231 19 Claims



1. A system for selecting a data compression factor, comprising:

an image processing unit photoelectrically converting light from a photographic subject to analog image signals and performing image processing on the analog image signals;

a frequency component extraction unit, operatively coupled to the image processing unit, receiving the processed analog image signals from the image processing unit and extracting frequency components from the analog image signals;

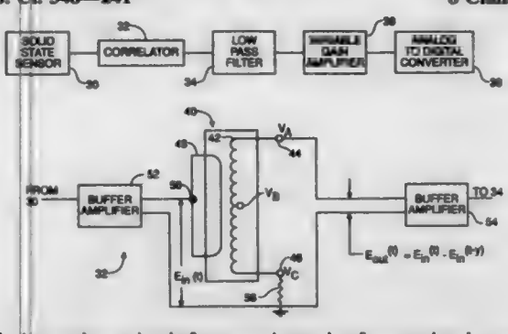
a compression factor selection unit, operatively coupled to the frequency component extraction unit, selecting a compression factor based upon the frequency components of the analog image signals extracted by the frequency component extraction unit; and

a data compression unit, operatively coupled to the image processing unit, receiving processed analog image signals from the image processing unit, converting the processed analog image signals to digital image signals and compressing the digital image signals based on the selected compression factor.

5,467,130
GROUND DRIVEN DELAY LINE CORRELATOR

Kim M. Darden, Vista, and Hokon O. Flogstad, La Mesa, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1994, Ser. No. 330,757
Int. Cl.[6] H04N 3/14
U.S. Cl. 348—241 8 Claims



1. A correlator circuit for removing noise from a signal, comprising:

a shielded delay line having a characteristic impedance Z_O and a delay period τ; said shielded delay line having an inductor with first and second terminals and a shield terminal which is connected to electrical ground;

an impedance connected between said second terminal and electrical ground, said impedance having an impedance value Z_O; and

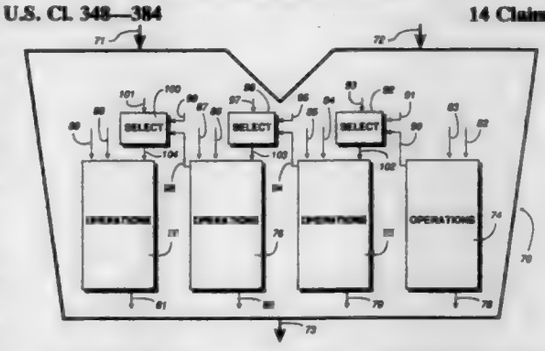
a signal source for providing to said shield terminal of said shielded delay line a signal having a sequence of a first interval with a first signal value and a second interval with a second signal value;

wherein the signal output from said first terminal of said delay line is free from noise and has a signal value which is a function of the difference between said first signal value and said second signal value.

5,467,131
METHOD AND APPARATUS FOR FAST DIGITAL SIGNAL DECODING

Vasudev Bhaskaran, Mountain View, and Ruby B. Lee, Los Altos Hills, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 30, 1993, Ser. No. 175,445
Int. Cl.[6] H04N 7/30;7/32
U.S. Cl. 348—384 14 Claims



1. A method for decompressing a compressed data bitstream, comprising the steps of:

Huffman decoding a variable length string in said data bitstream to produce an output therefrom in the form of a fixed length set of symbols contained in a data block;

classifying said data block for sparseness based upon data occupancy within said data block, wherein said classifying step further comprises:

classifying said data blocks in accordance with a classification scheme wherein each data block is defined as a sparse matrix H, and where each of said data blocks is placed into one of the following classes based upon data occupancy within said data block:

Type-0 — only H[0,0] is nonzero;

Type-1 — only one of the H[i,j] is nonzero and H[0,0] is zero;

Type-2 — only an upper 2×2 submatrix of H has nonzero values, where some or all of H[0,0], H[0,1], H[1,0] and H[1,1] are non-zero;

Type-3 — only an upper 4×4 submatrix of H has nonzero values, where some or all of H[i,j], i=0, 1, . . . , 3, j=0, 1, . . . , 3 are nonzero; and

Type-4 — H is not a member of any of the above-mentioned classes, where the occupancy pattern in H is random;

inverse quantizing to convert said symbols in said data block into a set of values adapted for an inverse discrete cosine transform calculation; and

performing an inverse discrete cosine transform ("IDCT") operation based upon data block classification;

wherein the overall number of calculations performed during said IDCT operation are a function of the data sparseness within said data block.

5,467,132

METHOD FOR DIGITAL TRANSMISSION OF HIERARCHICAL HDTV, EDTV AND SDTV TELEVISION SIGNALS

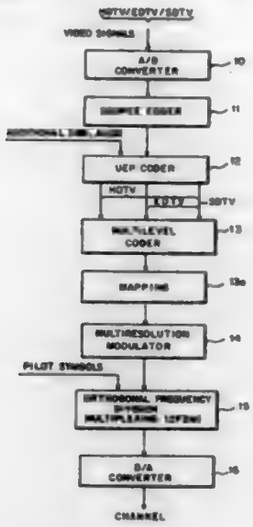
Khaled Fazel, WeBling, and Michael Ruf, München, both of, Germany, assignors to Deutsche Forschungsanstalt fur Luft- und Raumfahrt e.V., Köln, Germany

Filed Nov. 29, 1993, Ser. No. 158,436

Claims priority, application Germany, Nov. 30, 1992, 42 40 226.3

Int. Cl.[6] H04N 11/06;11/04

U.S. Cl. 348—390 3 Claims



1. A method for hierarchical transmission of television signals, the television signals being analog signals and selectively including at least two of HDTV signals, EDTV signals, and SDTV signals, the television signals moving from a transmission side to a receiving side, the method comprising, on the transmission side:

converting the television signals to digital signals, such that the digital signals include signal bits;

removing signal bit redundancy from the digital signals in a source coder;

protecting the signal bits in accordance with their significance in a UEP coder, whereby the digital signals are hierarchically built up;

multilevel encoding the digital signals to form symbols;

multiresolution modulating the digital signals;

OFD multiplexing the digital signals;

converting the digital signals to analog signals; and

transmitting the analog signals; the method further comprising, on the receiving side:

re-converting the analog signals to the digital signals;

inverse OFD multiplexing the digital signals;

demodulating the digital signals in a multiresolution demodulator according to a channel estimation, the multiresolution demodulator including various differently complex receivers selectively for the HDTV signals, the EDTV signals, and the SDTV signals;

decoding the digital signals in a multistage decoder;

processing the HDTV signals, the EDTV signals, and the SDTV signals by a digital-to-analog conversion in a UEP decoder specific to a respective one of the differently complex receivers and a following source decoder.

5,467,133

APPARATUS FOR COMPENSATING VIDEO MOTIONS IN DIGITAL TELEVISIONS

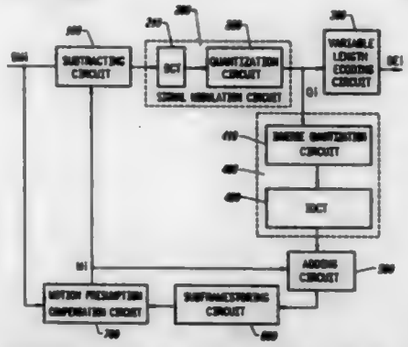
Dong H. Lee, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 63,133, May 17, 1993, abandoned. This application Dec. 1, 1994, Ser. No. 347,945

Claims priority, application Rep. of Korea, May 20, 1992, 8559/1992

Int. Cl.[6] H04N 7/12

U.S. Cl. 348—402 2 Claims



1. An apparatus for encoding of motion video for digital television, comprising:

subtracting means for generating a difference signal indicative of a difference between video information of a current subframe of a digital television signal input at a time t and reference video information of a corresponding previous subframe of the digital television signal input at a time t-1 and having been motion-compensated, the current subframe and the corresponding previous subframe each being one of a plurality of adjacent subframes comprising respectively a current frame and a previous frame of the digital television signal;

transforming means for transforming the difference signal generated by the subtraction means into a frequency domain signal;

quantizing means for quantizing the frequency domain signal from the transforming means to generate a quantized difference signal of a finite number;

variable length encoding means for encoding the quantized difference signal from the quantizing means into an encoded output signal having a variable number of bits according to a generation rate of the quantized difference signal;

de-quantizing means for de-quantizing the quantized difference signal from the quantizing means;

inverse transforming means for inversely transforming the de-quantized difference signal from the de-quantizing means into a signal in the spatial domain for generating a restored difference signal;

adding means for adding the restored difference signal from the inverse transforming means and the reference video information of the corresponding previous subframe;

subframe storing means for storing video information of the corresponding previous subframe output from the adding means; and

motion presumption/compensation means for: 1) detecting position data of moved pixels between the video information of the corresponding previous subframe stored in the subframe storing means and the video information of the current subframe, 2) calculating positional vector amounts of the moved pixels from the detected position data, and 3) motion-compensating the video information of the corresponding previous subframe in accordance with the calculated positional vector amounts to thereby form said reference video information;

wherein said detecting of position data of moved pixels is accomplished by:

detecting positions of unit blocks of pixels of the video information within a subframe,

detecting positions of moved pixels of the video information by search blocks of pixels surrounding the unit blocks for those of the unit blocks not positioned at a boundary of the subframe, and

detecting positions of moved pixels of the video information by limited search blocks of pixels surrounding the unit blocks for those of the unit blocks positioned at a boundary of the subframe, the limited search blocks being smaller in size than the search blocks such that the limited search blocks do not exceed the subframe boundary.

5,467,134

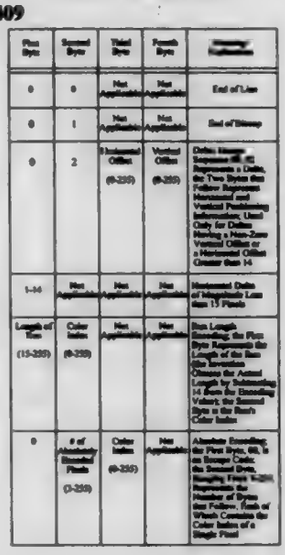
METHOD AND SYSTEM FOR COMPRESSING VIDEO DATA

Stuart T. Laney, Seattle; Eric Ledoux, Redmond; David M. Maymudes, Seattle, and Daniel J. Miller, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Dec. 22, 1992, Ser. No. 995,504

Int. Cl.[6] H04N 7/26

U.S. Cl. 348—409 **74 Claims**



1. A method for compressing video data, the video data being formed by a plurality of pixels, the method including the computer-implemented steps:

(a) forming a plurality of pixel groupings;

(b) determining a characteristic value for each pixel grouping;

(c) specifying a tolerance;

(d) determining a variance between the characteristic values of the pixel groupings;

(e) when the determined variance is within the tolerance, specifying a specified characteristic value to represent the pixel groupings, setting the characteristic value of each pixel grouping to the specified characteristic value; and

(f) counting a number of consecutive pixel groupings having the same specified characteristic value and storing the counted number and the specified characteristic value in a compressed version of the video data.

5,467,135

APPARATUS AND METHOD FOR MOVING PICTURE CODING

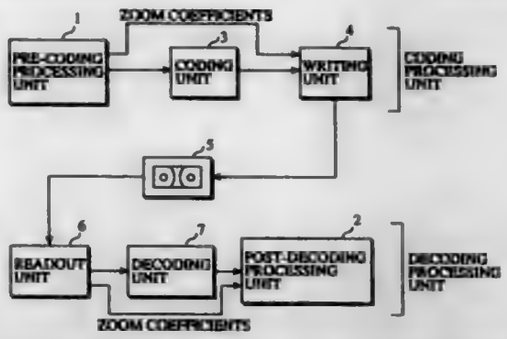
Yasuhiko Yamane, Moriguchi; Masakazu Nishino, Kashiwara; Yuji Fujiwara, Nishinomiya, and Toyohiko Matuda, Katano, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 22, 1994, Ser. No. 199,630

Claims priority, application Japan, Feb. 22, 1993, 5-031601; Feb. 25, 1993, 5-035971

Int. Cl.[6] H04N 7/32

U.S. Cl. 348—415 **54 Claims**



1. A method of coding image data with coefficients between fields by increasing the coefficients prior to coding, the method comprising the steps of:

(1) detecting a motion vector in a reference field to a sample field to check whether the reference field is zoomed in or out relative to the sample field, data of the reference field being coded based on the sample field;

(2) zooming out the reference field when the reference field is zoomed in relative to the sample field, and zooming in the reference field when the reference field is zoomed out relative to the sample field according to the motion vector; and

(3) coding the reference field after the reference field has been zoomed according to the motion vector in the second step.

5,467,136

VIDEO DECODER FOR DETERMINING A MOTION VECTOR FROM A SCALED VECTOR AND A DIFFERENCE VECTOR

Toshinori Odaka, Yokohama; Yoshiharu Uetani, Kawasaki; Tadaaki Masuda, Tokyo; Tomoo Yamakage, Kawasaki; Hideyuki Ueno, Tokyo; Noboru Yamaguchi, Yashio; Yoshihiro Kikuchi, Yokohama, and Tadahiro Oku, Urayasu, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 890,705, May 29, 1992, Pat. No. 5,317,397. This application Feb. 17, 1994, Ser. No. 197,862

Claims priority, application Japan, May 31, 1991, 3-130012; Jan. 17, 1991, 3-298316; Jan. 17, 1991, 3-298317; Jan. 31, 1991, 3-286855; Feb. 18, 1992, 4-30923

The portion of the term of this patent subsequent to Jun. 13, 2012, has been disclaimed.

Int. Cl.[6] H04N 7/36

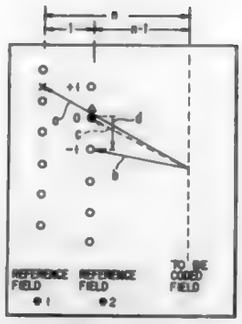
U.S. Cl. 348—416 **16 Claims**

9. A method of decoding a video signal comprising the steps of:

storing at least first and second reference pictures in a memory;

decoding a transmitted first motion vector and a transmitted motion vector difference, and for further decoding a second motion vector by adding a scaled motion vector and the motion vector difference, said scaled motion vector being derived by scaling the first motion vector to a motion vector for the second reference picture;

forming a prediction signal, using a first reference signal designated by the first motion vector for the first reference picture



and a second reference signal designated by the second motion vector for the second reference picture read out of said memory means; and

decoding a transmitted difference signal and obtaining an output signal by adding the difference signal and the prediction signal.

5,467,137

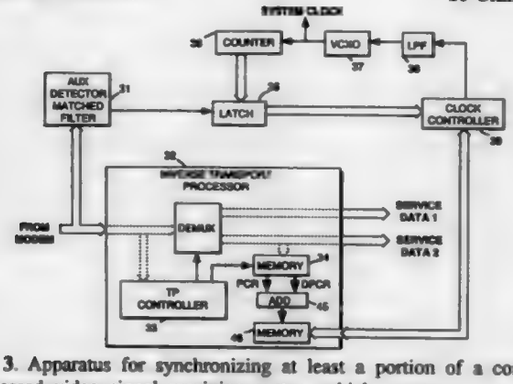
METHOD AND APPARATUS FOR SYNCHRONIZING A RECEIVER AS FOR A COMPRESSED VIDEO SIGNAL USING DIFFERENTIAL TIME CODE

Joel W. Zdepski, Mountainview, Calif., assignor to RCA Thomson Licensing Corporation, Princeton, N.J.

Division of Ser. No. 60,924, May 13, 1993. This application Mar. 29, 1994, Ser. No. 219,590

Int. Cl.[6] H04N *7/13*

U.S. Cl. 348—423 **10 Claims**



3. Apparatus for synchronizing at least a portion of a compressed video signal receiving system which processes a compressed signal occurring in transport packets of compressed video signal wherein identifiable ones of said transport packets include program clock references including count values periodically obtained from a counter arranged to count modulo K, (K a positive integer) pulses of an encoding system clock, and which includes differential count values which relate to one of program clock references of data of precompressed signal multiplexed with said compressed video signal and incremental delays incurred by transport packets, said apparatus comprising:

a source of said transport packets including transport packets having said count values and differential count values;

a controlled pulse generator, responsive to a control signal E, for providing a receiver system clock signal;

a receiver counter arranged to count pulses of said receiver system clock signal modulo K;

means, responsive to the occurrence of transport packets including said count values, for storing receiver count values output by said receiver counter;

means for retrieving count values and differential count values from said transport packets, and responsive thereto and stored said receiver count values for generating said control signal, E, for controlling said controlled pulse generator.

5,467,138

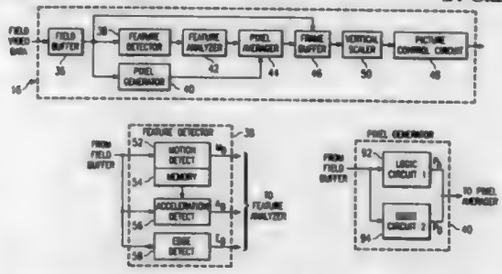
FIELD TO FRAME VIDEO PIXEL DATA GENERATION

Robert J. Gove, Los Gatos, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 183,534, Jan. 18, 1994, abandoned. This application Mar. 29, 1995, Ser. No. 412,839

Int. Cl.[6] H04N *7/01*

U.S. Cl. 348—452 **24 Claims**



1. A method of generating pixel data for creating frames of video pixel data from fields of input video pixel data, comprising the steps of:

storing a plurality of the fields of input video pixel data;

generating one or more feature magnitude signals from on or more of the field of input video pixel data, wherein one of said feature magnitude signals measures acceleration;

processing the input video pixel data with at least two different pixel processing methods to generate at least two different intermediate pixel data values;

selecting a feature weight corresponding to each intermediate pixel data value, wherein the selection is based upon the value of said one or more feature magnitude signals; and

generating output pixel data based upon a weighted average of the intermediate pixel data values wherein the weights consist of the feature weights corresponding to each intermediate pixel data value.

5,467,139

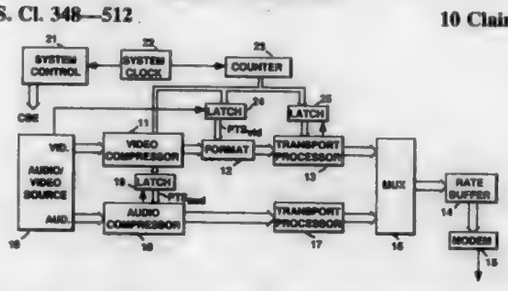
MUTING APPARATUS FOR A COMPRESSED AUDIO/VIDEO SIGNAL RECEIVER

Douglas E. Lankford, Carmel, Ind., assignor to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 129,974, Sep. 30, 1993. This application May 17, 1994, Ser. No. 245,113

Int. Cl.[6] H04N *9/1475*

U.S. Cl. 348—512 **10 Claims**



1. In a receiver for processing compressed audio/video signal, apparatus comprising:

a detector for providing said compressed audio/video signal;

an audio decompressor, responsive to said compressed audio/video signal, for providing decompressed audio signal;

a video decompressor, responsive to said compressed audio/video signal, for providing decompressed video signal;

detection means for generating an error signal which is a measure of non-synchronization between associated decompressed audio and decompressed video signals; and

muting means for muting said decompressed audio signal when said error signal exceeds a predetermined threshold.

5,467,140
VERTICAL SYNCHRONOUS SIGNAL SEPARATION APPARATUS

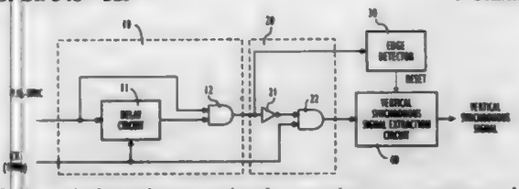
Ki S. Sohn, Kyungki-Do, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-Do, Rep. of Korea

Filed Aug. 8, 1994, Ser. No. 287,330

Claims priority, application Rep. of Korea, Aug. 13, 1993, 15715

Int. Cl.[6] H04N *5/08;5/10*

U.S. Cl. 348—529 **6 Claims**



1. A vertical synchronous signal separation apparatus comprising:

vertical synchronous pulse removal means for delaying original horizontal and vertical synchronous signals separated from a composite video signal by a predetermined time period in response to a reference clock signal and logically combining the original horizontal and vertical synchronous signals with the delayed horizontal and vertical synchronous signals to remove vertical synchronous pulses therefrom;

clock generation means for logically combining an output signal from said vertical synchronous pulse removal means with the reference clock signal to generate a clock signal;

edge detection means for detecting edges of the output signal from said vertical synchronous pulse removal means and outputting the detected edges as a reset signal; and

vertical synchronous signal extraction means for extracting a stable vertical synchronous signal from the original horizontal and vertical synchronous signals in response to the clock signal from said clock generation means and the reset signal from said edge detection means.

5,467,141
MODULATOR CIRCUIT FOR USE WITH A PLURALITY OF OPERATING STANDARDS

Peter J. Ligertwood, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

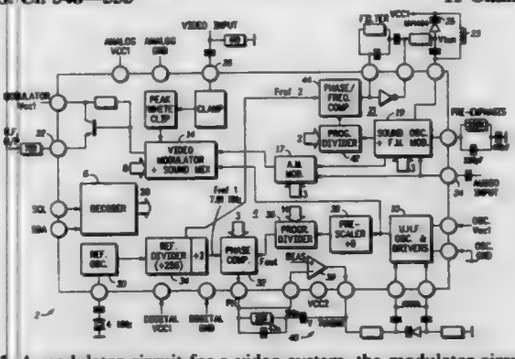
PCT No. PCT/EP93/00391, § 371 Date Oct. 12, 1993, § 102(e) Date Oct. 12, 1993, PCT Pub. No. WO93/17522, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 18, 1993, Ser. No. 129,037

Claims priority, application United Kingdom, Feb. 20, 1992, 9203587; Dec. 3, 1992, 9225292

Int. Cl.[6] H04N *5/40*

U.S. Cl. 348—555 **11 Claims**



1. A modulator circuit for a video system, the modulator circuit being selectably operable in any one of a plurality of modes of operation corresponding to different video standards, and comprising:

oscillator means for generating a carrier signal having a selectably variable frequency;

modulating means coupled to receive the carrier signal and having an audio input for receiving an audio signal and a video input for receiving a video signal, the modulating means using the video and audio signals to generate a modulated output signal on the carrier signal, the generation of the modulated output signal depending on selectably variable operating parameters of the modulating means;

control means coupled to the oscillator means and to the modulating means, for receiving a mode select signal and for selecting the frequency of the carrier signal and for selecting predetermined values for the variable operating parameters of the modulating means in dependence on the mode select signal, wherein the control means comprises:

data storage means for storing a different set of data for each of the plurality of modes of operation, each set comprising information representing the frequency of the carrier signal and the predetermined values for the variable operating parameters of the modulating means; and

a control bus which couples the data storage means to the oscillator means and the modulating means, wherein the control bus in response to the mode select signal communicates the selected set of signals representative of the carrier signal frequency and the predetermined values to the oscillator means and the modulating means respectively, whereby the modulated output signal is generated in accordance with one of the plurality of modes of operation.

5,467,142
TELEVISION RECEIVER FOR REPRODUCING VIDEO IMAGES HAVING DIFFERENT ASPECT RATIOS AND CHARACTERS TRANSMITTED WITH VIDEO IMAGES

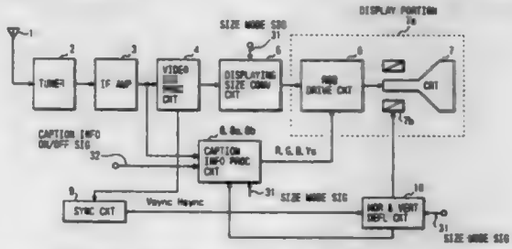
Hiroaki Ichinokawa, Ibaraki, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 23, 1993, Ser. No. 51,406

Claims priority, application Japan, Apr. 24, 1992, 4-131715

Int. Cl.[6] H04N *7/08;5/445*

U.S. Cl. 348—556 **20 Claims**



1. A television receiver for reproducing a video image from a video signal to be reproduced to have a first frame with a first aspect ratio, said television receiver having display means having a picture plane having a second aspect ratio different from said first aspect ratio, said video signal including a picture signal and a coded character signal to be reproduced within said first frame, said coded character signal including character information and positional information of said character information, comprising:

(a) first converting means for converting said picture signal into a second picture signal to be reproduced to have a second frame with said first aspect ratio on said picture plane in accordance with a size mode signal;

(b) character signal processing means including:

decoding means for extracting said coded character signal and for decoding said coded character signal to obtain said character information and said positional information;

synchronizing signal detection means for detecting vertical and horizontal synchronizing signals from said video signal;

clock signal generation means for generating a clock signal in response to the vertical or the horizontal synchronizing signal;

storing means for storing position data of a predetermined region having a plurality of sections for displaying said character information and for storing size data of said sections; and

modifying means for modifying said stored position data and size data in accordance with said size mode signal;

(c) displaying control means for determining a position of said predetermined region in accordance with said modified position data and for determining which section of said predetermined region said character information is displayed on in accordance with said positional information and for outputting said decoded character information at a timing determined in accordance with said determined section with reference to said horizontal synchronizing signal, said size data, and said clock signal, said display means displaying an image from said second picture signal and a character image from said outputted character information from said display control means with said character image superimposed on said displayed image, wherein said displaying control means outputs said decoded character information such that a size of said sections is controlled in accordance with said size mode signal due to said modifying said size data in accordance with said size mode signal by said modifying means.

5,467,143

Patent Not Issued For This Number

5,467,144

HORIZONTAL PANNING FOR PIP DISPLAY IN WIDE SCREEN TELEVISION

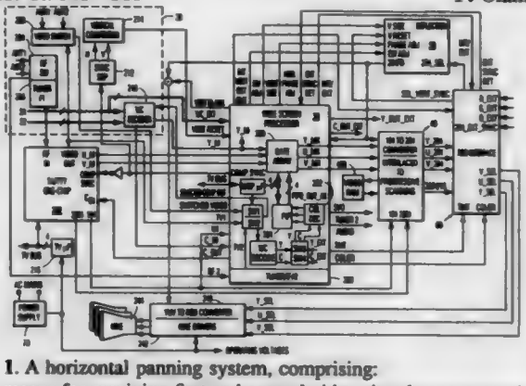
Timothy W. Saeger, Indianapolis, and Nathaniel H. Ersoz, Brownsburg, both of Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Dec. 3, 1992, Ser. No. 985,683

Claims priority, application United Kingdom, Jan. 8, 1992, 9200281

Int. Cl.[6] H04N *5/45*

U.S. Cl. 348—566 **14 Claims**



1. A horizontal panning system, comprising:

means for receiving first and second video signals representative of first and second pictures respectively;

video display means having a wide format display ratio and synchronized with said first video signal;

means for generating successive lines of video information representative of said first picture, substantially free of image aspect ratio distortion;

means for processing said second video signal to define an auxiliary picture smaller in size than said video display means and said first picture, and substantially free of image aspect ratio distortion;

means for storing successive lines of video information representative of said auxiliary picture;

means for combining said video information representative of said first and auxiliary pictures;

means for generating a variable time delay from a synchronizing component of said first video signal; and,

means for successively initiating a transfer of said lines of video information representative of said auxiliary picture from said storing means to said combining means after said variable time delay, said variable time delay determining one of a plurality of horizontal panning positions of said auxiliary picture across all of said video display means.

5,467,145

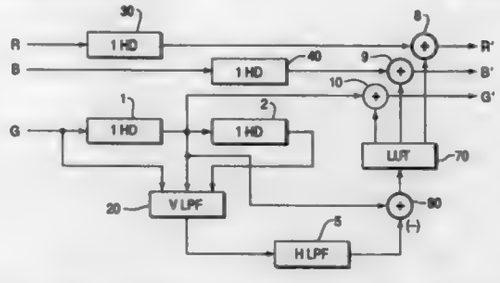
CIRCUITRY FOR ENHANCING DETAIL IN COLOR VIDEO SIGNALS

Allen L. Limberg, Vienna, Va., assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Oct. 26, 1994, Ser. No. 330,164

Int. Cl.[6] H04N *5/21;5/208*

U.S. Cl. 348—628 **25 Claims**



1. Circuitry for enhancing detail in a first video signal having horizontal scan lines, said circuitry comprising:

first and second delay lines, each having a respective input port and having a respective output port for supplying a response to signal received at its said input port after a delay substantially equal to the period (1H) of one of said horizontal scan lines, the input port of said first delay line connected for receiving said first video signal and for supplying from its output port a 1H-delayed response to said first video signal, the input port of said second delay line connected for receiving said 1H-delayed response to said first video signal and for supplying from its output port a 2H-delayed response to said first video signal;

a first weight-and sum circuit connected for receiving said first video signal, said 1H-delayed response to said first video signal, and said 2H-delayed response to said first video signal and supplying a vertical lowpass filtered response to said first video signal;

a first horizontal lowpass filter, having an input port connected to receive from first weight-and-sum circuit said vertical lowpass filtered response to said first video signal, and having an output port;

a first subtractor connected for receiving minuend and subtrahend signals from separate ones of the output ports of said first delay line and said first horizontal lowpass filter and for supplying a first difference signal descriptive of separated detail from said first video signal;

a first read-only memory addressed by said first difference signal and storing a first look-up table of detail values; and

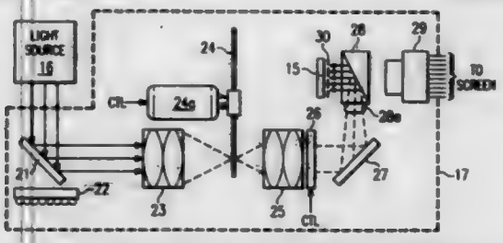
means for combining detail values read from said first read-only memory with 1H-delayed response to said first video signal to generate a first enhanced-detail video signal.

5,467,146

ILLUMINATION CONTROL UNIT FOR DISPLAY SYSTEM WITH SPATIAL LIGHT MODULATOR

Austin L. Huang, Dallas, and James M. Florence, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 31, 1994, Ser. No. 221,739
Int. Cl.[6] H04N 9/30
U.S. Cl. 348—743 11 Claims



1. An illumination control unit for an image display system, which uses a digital micro-mirror device (DMD) that has an array of mirror elements and that generate images according to a tilted or untilted state of each mirror elements, comprising:

a first set of lenses for receiving light from a source and directing said light through a color filter;

a color filter for filtering said light in one or more colors;

a second set of lenses for receiving said light from said color filter and for focusing said light to a prism;

a prism for receiving said light from said second set of lenses and for bending said light toward the reflective surfaces of said mirror elements;

a collimating at a face of said prism lens for providing a substantially collimated beam that is approximately the same area as said array;

a shutter interposed between said first set of lenses and said prism, for determining whether said light shall be transmitted to said prism; and

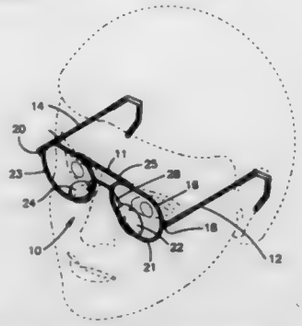
a projection lens for receiving light reflected from said mirror elements and for projecting images formed by said light to a display surface.

5,467,147

OPHTHALMIC TREATMENT AID HAVING A PRESSURE APPLICATOR

Carmen Faranda, 7295 Trenton Pl., Ravenna, Ohio 44266

Filed Jul. 26, 1994, Ser. No. 280,367
Int. Cl.[6] G02C 1/00
U.S. Cl. 351—41 15 Claims



1. An ophthalmic treatment aid comprising:

a) support structure configured to be worn on the face of a patient in a stationary position near an eye; and

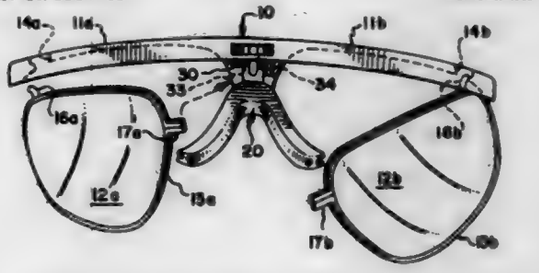
b) a pressure applicator mounted on said support structure for applying gentle external compressive pressure for inhibiting fluid flow through the lacrimal system of said eye when said support structure and said pressure applicator are worn in said stationary position.

5,467,148

EYEWEAR HAVING INTERCHANGEABLE LENSES

Simon M. Conway, Lima, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Nov. 8, 1993, Ser. No. 148,480
Int. Cl.[6] G02C 1/00;5/02
U.S. Cl. 351—85 15 Claims



1. Eyewear having interchangeable lenses comprising

(a) a pair of lenses, each lens having an inward extending projection and an outward extending projection extending substantially sidewardly from opposite sides thereof,

(b) a top frame having a pair of lens receiving sections, each of said sections having a downwardly opened elongated groove on its bottom edge for removably receiving the upper edge of one of said lenses and a recess area near the distal ends of said groove for accepting and holding said outward extending projection, and

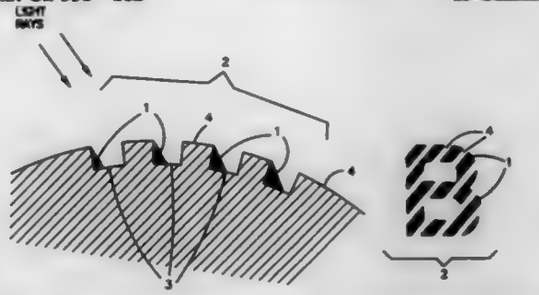
(c) a nose bridge centrally attached to said top frame and having means for releasably securing said inward extending projection, said nose bridge being movable with respect to said top frame to facilitate securing and releasing of said inward extending projection in said nose bridge.

5,467,149

HIGHLY VISIBLE MARKINGS FOR CONTACT LENSES

Donald Morrison, Fairport, and Daniel Abaied, Ontario, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation of Ser. No. 77,178, Jun. 15, 1993, abandoned.
This application Jun. 1, 1994, Ser. No. 252,374
Int. Cl.[6] G02C 7/04
U.S. Cl. 351—162 19 Claims



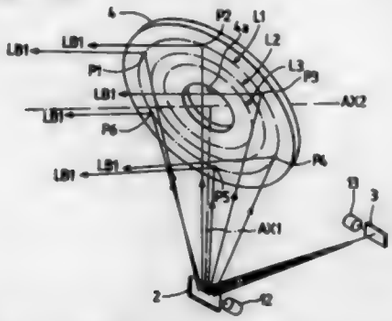
1. In a contact lens having at least one identifying indicium, defined by at least one indicium boundary, formed on a surface of the lens, the improvement of which comprises having a pattern of regions of varying depth within said at least one indicium boundary of said at least one identifying indicium.

5,467,150

APPARATUS FOR MEASURING A CORNEA SHAPE

Shuichi Isogawa, Fujisawa, and Nobuyuki Miyake, Yokohama, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed May 20, 1994, Ser. No. 246,765
Claims priority, application Japan, May 26, 1993, 5-123783
Int. Cl.[6] A61B 3/10
U.S. Cl. 351—212 8 Claims



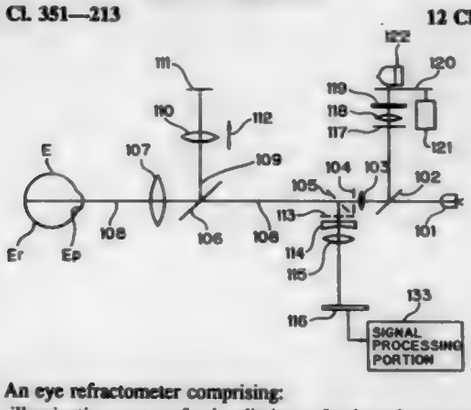
1. An apparatus for measuring a cornea shape comprising:
a light source for supplying a beam of light;
a scanner system for scanning the beam of light from said light source and forming a light spot describing a circular locus on the surface of said cornea, said scanner system including a reflecting mirror having a zonal reflecting surface disposed around said cornea, and a light deflector for directing the beam of light from said light source to said zonal reflecting surface; and
means for observing therethrough the shape of said cornea on the basis of the locus described by said beam of light reflected by said cornea.

5,467,151

EYE REFRACTOMETER HAVING VARIABLE WAVELENGTH ILLUMINATION MEANS

Yoshimi Kobayakawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1993, Ser. No. 37,429
Claims priority, application Japan, Mar. 27, 1992, 4-100269; Mar. 12, 1993, 5-078883
Int. Cl.[6] A61B 3/103
U.S. Cl. 351—213 12 Claims



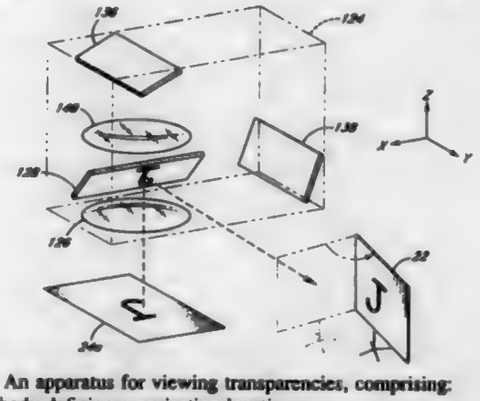
1. An eye refractometer comprising:
an illumination system for irradiating a fundus of an eye to be examined with measurement light, said illumination system comprising means for changing the wavelength of the measurement light;
a photodetecting system for receiving a light beam from the fundus of the eye to be examined irradiated with the measurement light by said illumination system; and
signal processing means for detecting eye refraction information of the eye to be examined on the basis of output signals from said photodetecting system receiving the light beam when said illumination system irradiates the fundus of the eye to be examined with the measurement light of different wavelengths.

5,467,152

OVERHEAD PROJECTOR

James S. Wilson, 3261 Eucalyptus Ave., Long Beach, Calif. 90806-1225, and Zeno L. Charles-Marcel, 30 Fawn Dr., Shillington, Pa. 19607-9734

Filed Apr. 28, 1994, Ser. No. 234,916
Int. Cl.[6] G03B 23/02;21/28
U.S. Cl. 353—99 21 Claims



1. An apparatus for viewing transparencies, comprising:
a body defining a projection location;
a light source within said body for illuminating transparencies at said projection location;
a head support;
a projection optics head supported by said head support, said head comprising:
a housing defining a first aperture and a second aperture, said first aperture positioned relative said body such that a light beam emitted from said source and passing through a transparency at said projection location will pass through said first aperture;
a first lens mounted within said housing positioned so as to focus a light beam passing through said first aperture;
a first mirror mounted within said housing;
a second mirror mounted within said housing;
a third mirror mounted within said housing;
a mechanism for moving said first mirror from a first position to a second position, wherein when said first mirror is in said first position a light beam passing through said first lens is first reflected by said first mirror through said second aperture and when said first mirror is in said second position a light beam passing through said first lens is first reflected by said second mirror toward said third mirror, which subsequently reflects said light beam toward said first mirror which thereafter reflects said light beam through said second aperture.

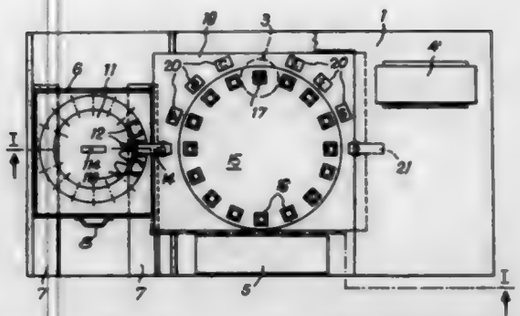
5,467,153

APPARATUS FOR AUTOMATICALLY DIGITIZING PHOTOGRAPHIC SLIDES

Michel Fargeot, Denice, France, assignor to Data Fit International, Anse, France

PCT No. PCT/FR92/00180, § 371 Date Aug. 30, 1993, § 102(e) Date Aug. 30, 1993, PCT Pub. No. WO92/15922, PCT Pub. Date Sep. 17, 1992
PCT Filed Feb. 27, 1992, Ser. No. 107,830
Claims priority, application France, Mar. 1, 1991, 91 02500
Int. Cl.[6] G03B 21/00
U.S. Cl. 353—103 28 Claims

1. An apparatus for automatically digitizing slides, the apparatus including a slide feed assembly (2), at least one digitizing and



input station (D), and a reception assembly (2') for receiving slides that have been digitized in this way, the apparatus being characterized in that each feed and reception assembly (2, 2') includes at least one drawer (6) containing a removable vertical magazine (11) and including at least one removable slide storage element (12), and in that it includes at least one transfer system (14, 21) serving firstly to feed slides from a storage element (12) of said removable magazine (11) to a central turntable (15) which places said slides successively before various workstations including said digitizing and input station (D), and secondly to transfer slides after digitizing from said station (D) to a storage element (12) of a removable magazine (11) placed in said reception assembly (2').

5,467,154

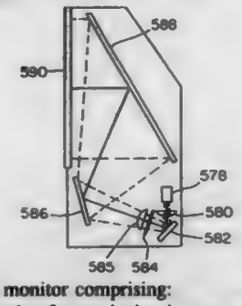
PROJECTION MONITOR

Ronald P. Gale, Sharon; Richard McCullough, Wrenthem; Jack P. Salerno, Waban; Stephen D. Fantone, Lynnfield; Robert P. Forsyth, Lexington; Peter T. Carellas, Winchester; Michael J. Thomas, Brookline, and Roy L. Youman, Newton, all of Mass., assignors to Kopin Corporation, Taunton, Mass.

Continuation-in-part of Ser. No. 839,241, Feb. 20, 1992, abandoned. This application Feb. 10, 1993, Ser. No. 15,813

Int. Cl.[6] G03B *21/28*

U.S. Cl. 353—119 **20 Claims**



1. A projection monitor comprising:

a light valve display for producing images, the display having a diagonal length equal to or less than 42 mm;

a light source for illuminating the light valve display;

a projection lens for enlarging and projecting the images received from the light valve display, the projection lens having a back focal length at least two times greater than the diagonal length of the display;

a mirror for reflecting images received from the projection lens;

a viewing screen for viewing images received from the mirror, the viewing screen having a diameter extending across the viewing screen; and

an enclosure for housing the light source, the light valve display, the projection lens, the mirror and viewing screen, the enclosure having a front surface and a back surface, the front surface defining a plane extending through the front surface and through which the viewing screen is viewed, a line orthogonal to the front surface plane and extending from the plane to a point on the back surface furthest from the plane, the distance between the plane and the furthest point on the back surface defining a depth of the enclosure such that the depth of the enclosure is in the range of between 33% and 41% of the diameter of the viewing screen.

5,467,155

CAMERA WITH A BAR CODE READING APPARATUS

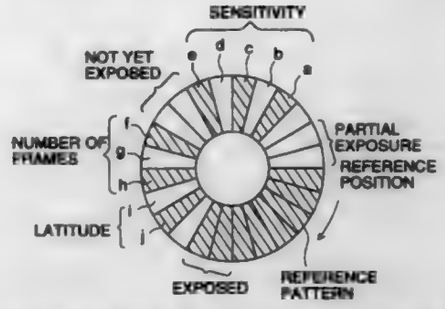
Takemi Miyazaki; Yoshio Kakuta, and Toshiki Fujisawa, all of Tokyo, Japan, assignors to Konica Corporation, Japan

Filed May 19, 1994, Ser. No. 246,365

Claims priority, application Japan, Jun. 15, 1993, 5-143781

Int. Cl.[6] G03B *7/00*

U.S. Cl. 354—21 **1 Claim**



1. A camera for reading film information expressed with a bar code, which is provided on a bar code plate being rotatable with a spool of a film cartridge, through a window of said film cartridge, comprising:

a drive for rotating said spool;

a reader for reading said bar code, and for generating a bar code information including said film information;

a detector for detecting a reference position of said bar code according to said bar code information; and

a storage for storing said bar code information being read by said reader;

wherein said drive starts rotating said spool in a film rewinding direction when said film cartridge is set in said camera and before a film in said film cartridge is loaded to a photographing position so that said reader reads said bar code information, said detector detects said reference position, and said storage stores said bar code information.

5,467,156

CAMERA HAVING DIFFERENT SUPPLY MODES SELECTABLE FOR A FILM

Akira Ezawa, Tokyo; Koichi Daitoku, Sagamihara; Hideya Inoue, Yokohama; Kazuyuki Kazami, and Kazuto Ohtsuka, both of Tokyo, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 154,400, Nov. 18, 1993, abandoned, which is a continuation of Ser. No. 942,366, Sep. 9, 1992, abandoned, which is a continuation of Ser. No. 884,225, May 11, 1992, abandoned, which is a continuation of Ser. No. 784,646, Oct. 28, 1991, abandoned, which is a continuation of Ser. No. 622,559, Dec. 5, 1990, abandoned. This application Oct. 13, 1994, Ser. No. 322,369

Claims priority, application Japan, Dec. 8, 1989, 1-317805; Jan. 18, 1990, 2-011067

Int. Cl.[6] G03B *7/00*

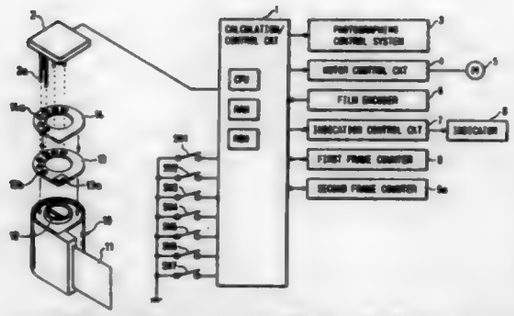
U.S. Cl. 354—21 **48 Claims**

1. A camera capable of loading a film unit having a film and a cartridge comprising:

an exposure mechanism;

a supply mechanism for supplying the film, said supply mechanism having a first mode for winding up the film from the cartridge of said film unit loaded into said camera in response to the operation of said exposure mechanism and a second mode for rewinding the film to the cartridge of said film unit loaded into said camera in response to the operation of said exposure mechanism;

a selector part for selecting one mode from either said first mode or said second mode, wherein said supply mechanism supplies the film based on a mode selected by said selector part; and



an inhibit mechanism for inhibiting switching said mode selected by said selector part into the other mode only after an operation by said exposure mechanism.

5,467,157

SMALL-SIZED TRIPOD HEAD WITH CONNECTING CABLE ATTACHED TO DRIVING SHAFT

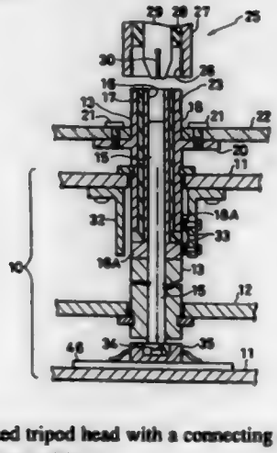
Kouji Kaneko, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Jul. 6, 1994, Ser. No. 268,130

Claims priority, application Japan, Jul. 8, 1993, 5-193054

Int. Cl.[6] G03B 29/00

U.S. Cl. 354—81 **7 Claims**



1. A small-sized tripod head with a connecting cable attached to a driving shaft, comprising:

at least two driving shafts;

a power supply mechanism disposed coaxially with one of said driving shafts so as to maintain the connection between said driving shaft and the power line of the main body of said tripod head during the rotation of said driving shaft;

a light guide disposed coaxially with said driving shaft so as to transmit a light signal; and

a photoelectric transducer disposed on said main body of said tripod head in such a manner as to be isolated from said light guide so as to convert a light signal into an electric signal;

whereby a power is supplied by said power supply mechanism and a signal is transmitted by said light guide and said photoelectric transducer.

5,467,158

FILM WINDING/REWINDING MECHANISM OF CAMERA

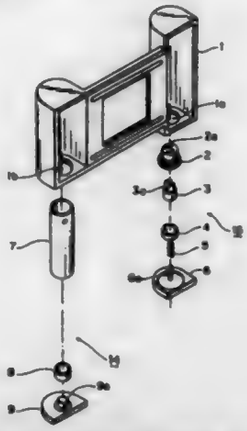
Nobuharu Murashima, Nara; Kenji Ishibashi; Dai Shintani, both of Sakai, and Nobuyuki Taniguchi, Nishinomiya, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 988,011, Dec. 9, 1992, abandoned, which is a continuation of Ser. No. 755,184, Sep. 5, 1991, abandoned. This application May 26, 1994, Ser. No. 249,681

Claims priority, application Japan, Sep. 7, 1990, 2-238416; Sep. 7, 1990, 2-238417; Sep. 12, 1990, 2-244886; Sep. 18, 1990, 2-249881; Sep. 18, 1990, 2-249882; Jan. 26, 1990, 2-289441; Jan. 26, 1990, 2-289443

Int. Cl.[6] G03B 1/18

U.S. Cl. 354—173.1 **6 Claims**



1. A camera with a changeable lens system which is driven by a driving force for auto focusing transmitted from a camera body comprising:

an ultrasonic wave motor with a driving shaft, which generates the driving force to drive the changeable lens system; and

a coupler member having an output portion which engages with a driven coupler provided in the lens system so as to transmit the driving force from the ultrasonic motor to the lens system,

wherein the driving shaft and the coupler member are coaxially provided and directly connected to each other so that a rotation of the shaft agrees with that of the coupler member.

5,467,159

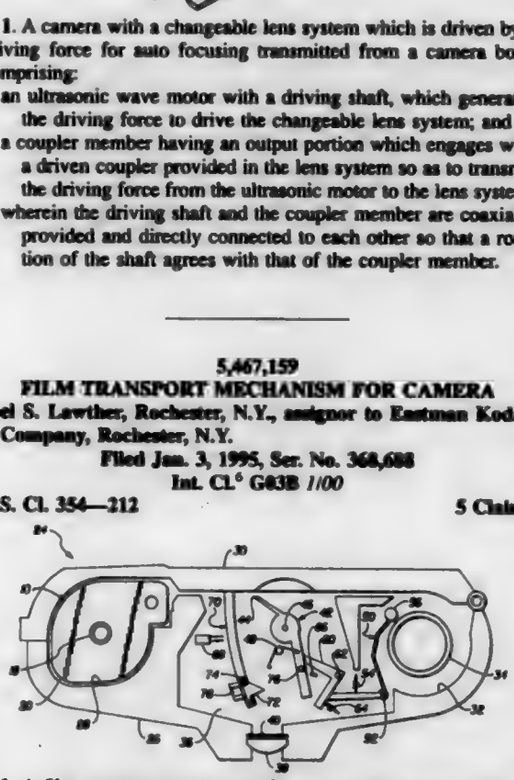
FILM TRANSPORT MECHANISM FOR CAMERA

Joel S. Lawther, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1995, Ser. No. 368,688

Int. Cl.[6] G03B 1/00

U.S. Cl. 354—212 **5 Claims**



1. A film transport mechanism for a camera comprising a film take-up spool rotated to advance a filmstrip from a film cartridge onto said take-up spool, and a perforation sensor for detecting a turn-around perforation in a trailing end portion of the filmstrip to initiate return of the filmstrip from said take-up spool to the film cartridge, is characterized in that:

said perforation sensor is movable to a sensing position against the filmstrip to be able to drop into the turn-around perfora-

tion when the turn-around perforation is advanced to the perforation sensor; and

film-on-spool sensor means is located against an outermost convolution of the filmstrip as the filmstrip accumulates on said take-up spool, and is moved in response to increased accumulation of the filmstrip on said take-up spool for effecting movement of said perforation sensor to its sensing position before the turn-around perforation can be advanced to the perforation sensor.

5,467,160

FOCAL-PLANE SHUTTER DEVICE

Takashi Matsubara, Yokohama; Masayuki Kanamuro, Kawasaki, and Masanori Hasuda, Yokohama, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 196,789, Feb. 15, 1994, which is a continuation of Ser. No. 972,642, Nov. 6, 1992, abandoned.

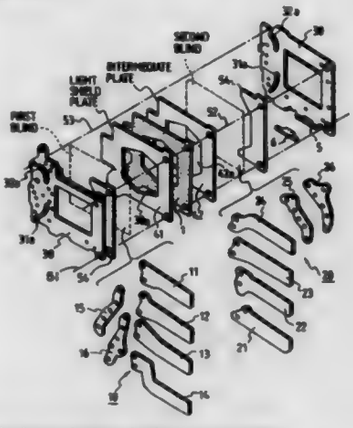
This application Jun. 10, 1994, Ser. No. 258,497

Claims priority, application Japan, Nov. 15, 1991, 3-300681; Aug. 10, 1992, 4-212816

The portion of the term of this patent subsequent to Dec. 6, 2011, has been disclaimed.

Int. Cl.[6] G03B 9/40

U.S. Cl. 354—246 **7 Claims**



1. A focal plane shutter device, comprising:

first and second blinds each constructed with a plurality of sectors; and

a light shielding plate having an opening which determines a field angle and an intermediate plate having an opening of greater dimension than said field angle determining opening, said light shielding plate and said intermediate plate being disposed between said first blind and said second blind, said first and second blinds being run in the facial direction of said light shielding plate so as to cover and expose said opening thereof,

characterized in that said light shielding plate and said intermediate plate are bonded to one another.

5,467,161

CAMERA HAVING A LINE-OF-SIGHT SENSOR OPERATING IN PARALLEL WITH ANOTHER PHOTOGRAPHIC PROCESSING OPERATION

Yukio Odaka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 62,339, May 17, 1993, abandoned.

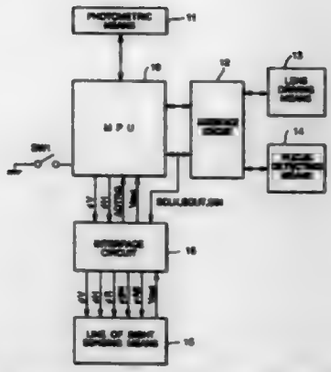
This application Feb. 9, 1994, Ser. No. 193,884

Claims priority, application Japan, May 22, 1992, 4-154161

Int. Cl.[6] G03B 7/08;13/36;17/00

U.S. Cl. 354—402 **23 Claims**

1. A camera, comprising:



a line-of-sight sensing circuit for sensing a position of a photographer's line-of-sight; and

a processing circuit for controlling each of (i) the line-of-sight sensing operation and (ii) at least one other photographic processing operation;

wherein said processing circuit controls said line-of-sight sensing circuit to sense the photographer's line-of-sight in parallel with the at least one other photographic processing operation.

5,467,162

CAMERA WITH AUTO PHOTOGRAPHING MODE CONVERSION FUNCTION AND METHOD FOR CONTROLLING THE SAME

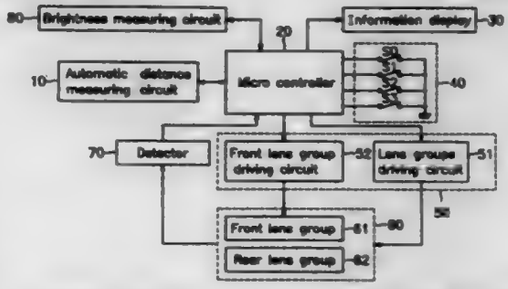
Bon-jeong Goo, Kyeongsangnam, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Kyeongsangnam, Rep. of Korea

Filed Dec. 29, 1993, Ser. No. 175,269

Claims priority, application Rep. of Korea, Dec. 30, 1992, 1992-26734

Int. Cl.[6] G03B 3/00;13/18

U.S. Cl. 354—402 **12 Claims**



1. A camera having an auto photographing mode conversion function, comprising:

a plurality of lens groups;

means for detecting a position of said lens groups and for producing a first signal corresponding to the detected position;

means for measuring a distance with respect to an object to be photographed and for producing a second signal corresponding to the measured distance;

means for measuring an ambient brightness surrounding the object and for producing a third signal corresponding to the measured brightness;

a microcontroller for comparing the measured distance and a predetermined photographing distance value in accordance with the detected position of the lens groups based on said first, second, and third signals to produce a lens driving signal; and

means for moving said lens groups to a suitable photographing position in response to said lens driving signal,

wherein said microcontroller includes:

means for determining whether the measured distance and the detected position of the lens groups correspond to a normal photographing position;

means for comparing the measured distance value with a predetermined minimum photographing distance value in accordance with the normal photographing position while the present position of the lens groups is in the normal photographing position; and

means for generating a signal to the lens groups corresponding to a macro photographing position of the lens groups when the measured distance is less than or equal to the predetermined minimum photographing distance value while the present position of the lens groups is in the normal photographing position.

5,467,163

FOCUS CONDITION DETECTING DEVICE

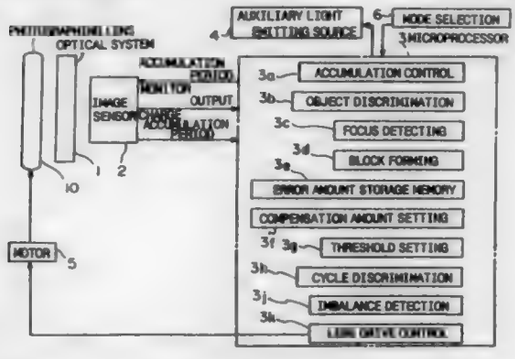
Shigeyuki Uchiyama, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 113,044, Aug. 31, 1993, abandoned. This application Apr. 25, 1994, Ser. No. 232,576

Claims priority, application Japan, Sep. 3, 1992, 4-235960

Int. Cl.[6] G03B *13/36*

U.S. Cl. 354—402 **18 Claims**



1. A focus condition detection device comprising:

an optical system that forms a pair of optical images by dividing light incoming from an object into two beams from two directions with parallax;

a pair of image sensor arrays including a plurality of photoelectric elements outputting a signal proportional to the intensity of the incoming light of the object and generating output signal trains corresponding to an object pattern by receiving said pair of optical images;

an operation means for shifting said output signal trains of said pair of image sensor arrays relative to each other for a predetermined number of shifts, calculating a correlation of said pair of optical images at each shift position, and determining a focus condition of a photographing lens on the basis of an ultimate shift position offering an ultimate correlation; and

a cycle detection means for judging whether the object pattern is cyclic on the basis of a first correlation determined at a first shift position distanced from the ultimate shift position, and a second correlation determined at a second shift position in the neighborhood of the first shift position.

5,467,164

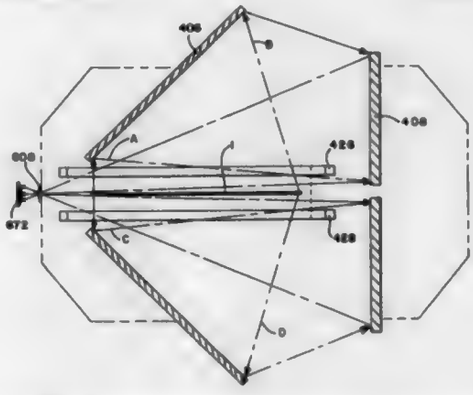
DOCUMENT PROCESSING SYSTEM HAVING A STRAIGHT LINE DOCUMENT PATH

Thomas R. Wells, Crystal Lake; Leo DaPrato, Mt. Prospect; Paul Friedrich; Kenneth Hendrickson, both of Glenview; Merv LaRue, Barrington, all of Ill.; John Overman, Fort Pierce, Fla.; Duane Patuszynski, Lincolnwood, Ill.; Dale Plum, Arlington Heights, Ill.; Al Rubin, Wood Dale, Ill.; Stuart Schwalb, Buffalo Grove, Ill.; Dan Solomon, Evanston, Ill.; Larry Turner, Lake Zurich, Ill.; David Briggs, Bartlett, Ill., and Herb Hausmann, Lincolnshire, Ill., assignors to Bell & Howell Document Management Products Company, Chicago, Ill.

Filed Jun. 21, 1993, Ser. No. 80,908

Int. Cl.[6] G03B *27/32;27/52*

U.S. Cl. 355—23 **23 Claims**



1. A document processing apparatus with an inlet and an outlet comprising:

a document transport system having opposed transport members for moving documents serially along a generally straight line document path from the inlet to the outlet;

an optical system located between the inlet and the outlet and having a first pair of mirrors to direct the image from one side of the document at a first location along the length of said document to an aperture, said optical system having a second pair of mirrors to direct the image from the other side of the document at said first location along the length of said document; and,

a removable camera module having a lens with an optical axis and film such that when the camera is attached to the apparatus, the lens is aligned with the aperture to receive the image from the optical system.

5,467,165

MASKING OF PHOTOGRAPHS FOR REPRODUCTION

Friedrich Jacob, and Wolfgang Zahn, both of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

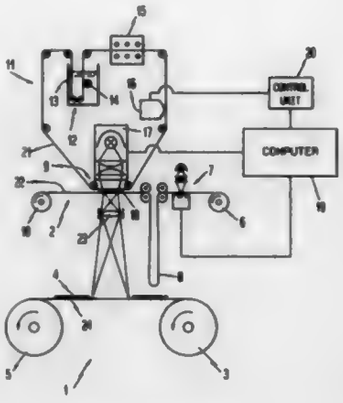
Filed Oct. 20, 1993, Ser. No. 139,430

Claims priority, application Germany, Jan. 29, 1992, 42 36 568

Int. Cl.[6] G03B *27/72*

U.S. Cl. 335—40 **18 Claims**

1. An apparatus for reproducing a master, comprising means for generating a contrast reducing mask for the master, said generating means including means for selectively applying a coating to a surface zone or selectively altering the structure of a surface zone; and means for copying the masked master.



5,467,166

PROJECTION EXPOSURE METHOD AND APPARATUS

Naomasa Shiraishi, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Aug. 10, 1994, Ser. No. 288,074

Claims priority, application Japan, Aug. 13, 1993, 5-201650

Int. Cl.[6] G03B *27/72;27/42*

U.S. Cl. 355—71 8 Claims

1. A projection exposure apparatus comprising:

an illuminating system for irradiating a mask with illuminating light;

a projection optical system for projecting the image of a pattern formed on said mask to a photosensitive substrate;

a first optical member for reducing the coherency between imaging light distributed in a first area comprising at least one of a circular area and an annular area centering around the optical axis of said projection optical system in or near an optical Fourier transform plane in said projection optical system for the pattern surface of said mask and imaging light distributed in a second area other than said first area in or near said Fourier transform plane; and

a second optical member for making the in-focus position of the light passing through said first area and the in-focus position of the light passing through said second area differ by a predetermined amount in the direction of the optical axis of said projection optical system.

5,467,167

IMAGING DEVICE

Masataka Nishiyama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 943,783, Sep. 11, 1992, abandoned. This application Aug. 5, 1994, Ser. No. 297,422

Claims priority, application Japan, Sep. 12, 1991, 3-261010; Sep. 12, 1991, 3-261011

Int. Cl.[6] G01D *15/16;* H04N *1/46*

U.S. Cl. 355—75 10 Claims

1. An imaging device using a recording paper having a base paper exhibiting a prescribed color and a photoconductively-color-changing layer formed of a photoconductively-color-changing agent having the characteristic that said agent usually exhibits a specific color different from that of said base paper and is changed to become colorless or transparent by being irradiated with a light having a specific wavelength, said photoconductively-color-changing layer being formed on a surface of said base paper; said imaging device comprising:

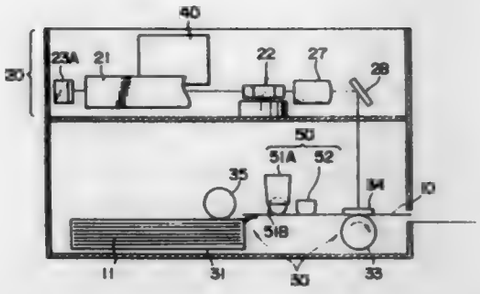
means for receiving said base paper;

means for applying said photoconductively-color-changing agent onto said base paper;

means for heating said agent whereby to fix said agent to said base paper to form said photoconductively-color-changing layer on said base paper so as to provide a recording paper upon which a desired image may be reproduced;

means for emitting light having said specific wavelength and for introducing said light having said specific wavelength to said photoconductively-color-changing layer to render selective portions of the photoconductively-color-changing layer transparent in accordance with image information of said desired image; and

recording paper holding means for holding said recording paper in position to receive said light to form said desired image on said recording paper.



5,467,168

PHOTOGRAPH PRINTING METHOD

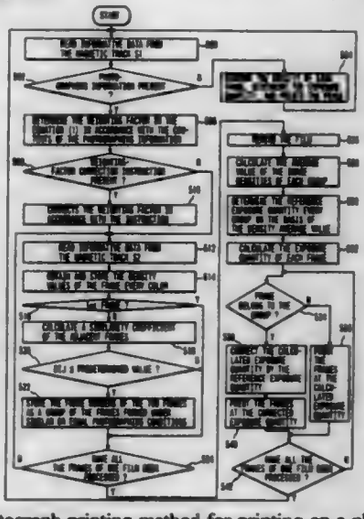
Naoto Kinjo, and Takaaki Terashita, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 18, 1993, Ser. No. 154,092

Claims priority, application Japan, Nov. 18, 1992, 4-308962; Jan. 11, 1993, 5-002454

Int. Cl.[6] G03B *17/24*

U.S. Cl. 355—77 12 Claims



1. A photograph printing method for printing on a photographic printing paper a plural number of images which are photographed on a film, said method comprising steps of:

detecting photographing information of said film;

determining frames of said film which have photographing conditions which are similar to one another by comparing said photographing information of said individual frames with one another;

determining similar print conditions corresponding to the similar photographing conditions of said frames thus determined; and

printing said images in said frames using said similar print conditions thus determined;

wherein in said detecting step, photographing information is read out from recording positions of said film; and

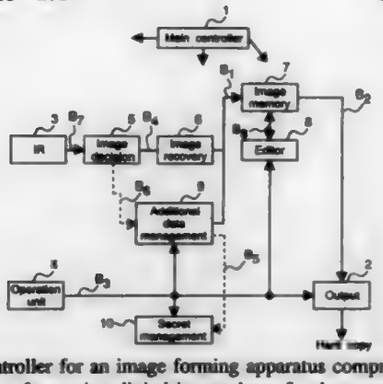
wherein in said frame determining step, a similarity coefficient of said photographic conditions of compared images is calculated by multiplying the square or the absolute value of the difference between the corresponding values of each item by a weighting factor predetermined for each item, summing the products of all of the items, and in a case that said similarity coefficient is equal to or smaller than a predetermined value, said compared images are determined to provide the similar photographing conditions as each other.

5,467,169

IMAGE FORMING APPARATUS WHICH CAN PREVENT COPYING DURING A PREDETERMINED PERIOD AND ALLOW COPYING AT OTHER TIMES

Takeshi Morikawa, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 28, 1994, Ser. No. 267,870
Claims priority, application Japan, Jul. 1, 1993, 5-163508
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—201 **11 Claims**



1. A controller for an image forming apparatus comprising:
a memory for storing digital image data of a document;
an image recognition device which recognizes time data included in the digital image data;
a clock which provides a current time; and
a comparator which compares the time derived from the time data recognized by the image recognition device with the current time provided by said clock and supplies a signal to control the image forming apparatus according to a result of the comparison.

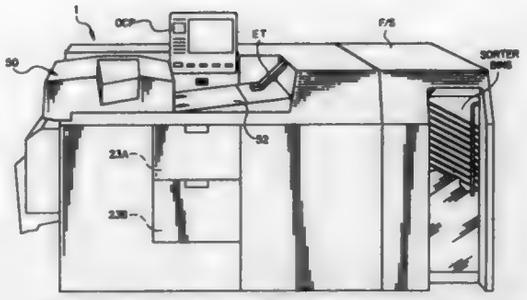
5,467,170

REPRODUCTION APPARATUS WITH MULTIPLE MEANS FOR CREATING INCREMENTING ALPHA-NUMERIC PAGE STAMPS

James Wilson, Coral Springs, Fla., and Frederick E. Altrieth, III, Scottsville, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1993, Ser. No. 173,299
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—209 **7 Claims**

1. A reproduction apparatus for producing copy, said apparatus comprising:
an operator control panel, said panel including a display screen for indicating on said screen certain standard selectable features for producing a copy, with plural displayed options for each feature, and first means for altering the display on the screen to indicate a displayed selected option and generating a first set of signals representing selected options of the standard features;
means for altering the display on said screen to display a set of alpha-numeric characters and/or symbols, and second means for altering the display on the screen to indicate one or more selected alpha-numeric characters and/or symbols and generating a second set of signals representing selected alpha-numeric characters and/or symbols; and
means responsive to said first and second sets of signals for producing a copy having said one or more selected alpha-numeric characters and/or symbols in a predetermined location on said copy.

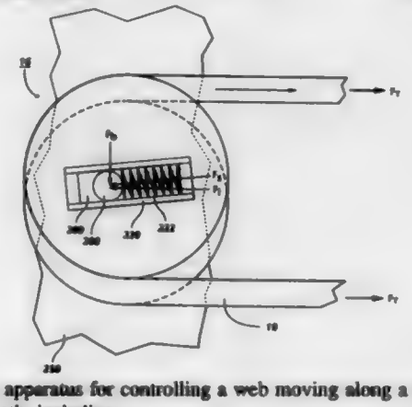


5,467,171

COMPACT ACTIVE STEERING ROLL FOR BELT LOOPS

Vittorio Castelli, Yorktown Heights, N.Y., and Stephen T. Chai, Rancho Palos Verde, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 17, 1993, Ser. No. 122,085
Int. Cl.[6] G03G *5/00*
U.S. Cl. 355—212 **10 Claims**



1. An apparatus for controlling a web moving along a predetermined path, including:
a web steering roll for supporting said web, said web steering roll being adapted for rotational movement about a first axis and tilting movement about a second axis transverse to the first axis;
means for sensing movement of the web in a direction substantially normal to the predetermined path and generating a signal indicative thereof; and
means, responsive to the signal generated by said sensing and generating means, for tilting said steering roll about the second axis, to return the web to the predetermined path, said tilting means being disposed internally within said steering roll.

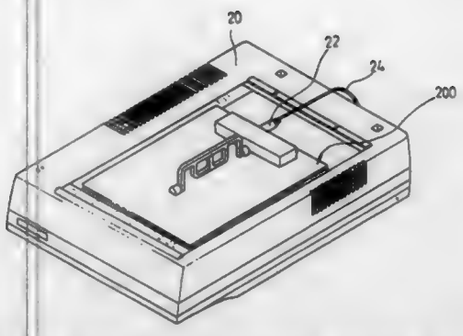
5,467,172

IMAGE SCANNER TRANSPARENCY ADAPTOR

Chun-Chi Liao, No. 9 Lane 126 Min-Sheng Road, Taichung City, Taiwan, Prov. of China

Filed Jun. 15, 1994, Ser. No. 259,983
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—231 **11 Claims**

1. A transparency adaptor for use in an image scanner wherein said image scanner comprises a transparent image window on which a light-transmittable image medium is placeable, said transparency adaptor comprising: a casing having a base plate with side



walls mounted thereto to define an interior space having an opening; a cover plate with a central opening mounted to the side walls of the casing to close the opening of the casing, the cover plate being opposite to the base plate of the casing; a transparent sheet provided to cover the central opening of the cover plate; a lighting module disposed inside the interior space, located between the transparent sheet and the base plate of the casing to provide a uniform planar light which covers a substantial area; a reflection sheet disposed between the lighting module and the base plate of the casing to direct the planar light to transmit through the transparent sheet; at least a plate-like light diffuser which is disposed between the transparent sheet and the lighting module to make the planar light more uniformly distributed through the substantial area; and power source means which provides electricity to power the lighting module, wherein said transparency adapter being adapted to be placed on the image window of the image scanner to have the light transmitting through the transparent sheet project to the image window through the light-transmittable image medium.

5,467,173

SPEED CONTROL CIRCUIT FOR AN OPTICAL SCANNING SYSTEM DRIVING MOTOR FOR AN IMAGE FORMING APPARATUS

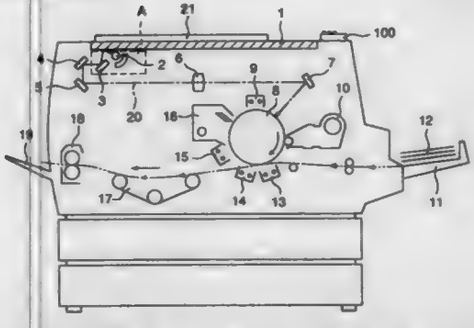
Satoshi Sakata; Tomoo Kudo; Hiroyuki Watanabe, and Tadashi Matsudaira, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 31, 1994, Ser. No. 189,503

Claims priority, application Japan, Feb. 5, 1993, 5-042149; Feb. 5, 1993, 5-042150; Feb. 5, 1993, 5-042151; Feb. 5, 1993, 5-042152

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—235 **20 Claims**



1. A speed controlling apparatus for controlling an optical scanning system driving motor in use with an image forming apparatus, comprising;

an encoder which generates pulse signals according to a rotation of said optical scanning system driving motor;

a generator for generating reference signals;

a first memory for storing a first set of a plurality of numbers for dividing a frequency of said pulse signals generated by said encoder;

a second memory for storing a second set of a plurality of numbers corresponding to a target rotation speed of said optical scanning system driving motor;

a first setting unit for reading one of said first set of numbers from said first memory and for setting said one of said first set of numbers at every predetermined interval time while said optical scanning system driving motor is accelerating or decelerating;

a second setting unit for reading one of said second set of numbers from said second memory and for setting said one of said second set of numbers at every predetermined interval time while said optical scanning system driving motor is accelerating or decelerating;

a divider for dividing said frequency of said pulse signals according to said one of said first set of numbers;

a detector for detecting a rotating speed of said optical scanning system driving motor according to said reference signals and pulse signals at every frequency period which is divided by said divider;

a comparing unit for comparing said rotating speed, detected by said detector, with said one of said second set of numbers, set by said second setting unit, at every frequency period which is divided by said divider, and for outputting a comparison result; and

a feedback path including the encoder and the comparing unit for feeding back signals from the encoder to a controller for controlling said rotating speed of said optical scanning system driving motor according to said comparison result of said comparing unit.

5,467,174

APPARATUS FOR FORMING AN IMAGE USING AN ELECTROPHOTOGRAPHIC PROCESS

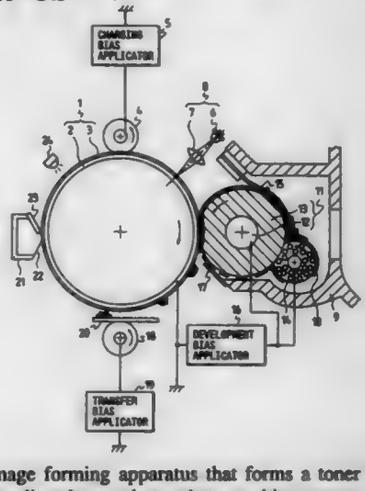
Yoshiro Koga, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Dec. 1, 1993, Ser. No. 159,630

Claims priority, application Japan, Dec. 3, 1992, 4-324439; Aug. 24, 1993, 5-209666

Int. Cl.[6] G03G *15/06*

U.S. Cl. 355—245 **45 Claims**



1. An image forming apparatus that forms a toner image on a recording medium by an electrophotographic process, comprising:

a contact charging member which contacts a latent image carrier wherein said contact charging member charges said latent image carrier to a predetermined potential;

exposure means for illuminating said latent image carrier with light to form a latent electrostatic image pattern on said latent image carrier;

a developing member that imparts a toner to said latent electrostatic image pattern to render said latent electrostatic image pattern visible, wherein said toner comprises matrix resin particles that have an external additive in an amount of 0.4 to 1.6 wt % and wherein said amount significantly reduces uneven charging of said latent image carrier by said charging member;

an impression transfer member that is pressed into contact with said latent image carrier and which transfers said toner to said recording medium after said toner has been imparted to said latent electrostatic image pattern on said latent image carrier; and

a cleaning member that is pressed into contact with said latent image carrier to remove said toner that remains on said latent image carrier after said toner has been transferred to said latent electrostatic image pattern.

5,467,175

DEVELOPING DEVICE FOR AN IMAGE FORMING APPARATUS

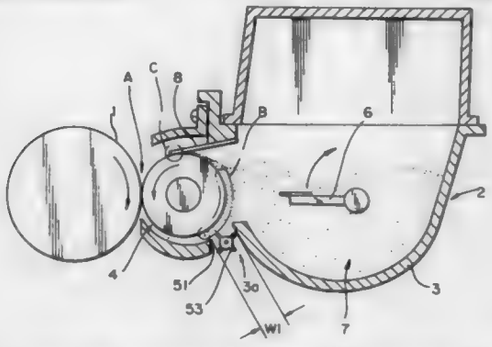
Hiromitsu Takagaki, Yokohama; Nobuo Iwata, Sagamihara, and Koji Suzuki, Yokohama, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 27, 1993, Ser. No. 172,818

Claims priority, application Japan, Dec. 30, 1992, 4-361016

Int. Cl.[6] G03G *15/08*

U.S. Cl. 355—259 **8 Claims**



1. A developing device for developing a latent image carrier with a developer supplied to said device, comprising:

a developer carrier for conveying the developer deposited thereon to said image carrier;

a flexible member facing a surface of said developer carrier and contacting the developer for moving said developer from a position adjoining said developer carrier where said developer is apt to aggregate toward said developer carrier to loosen said developer;

a movable member contacting said flexible member for causing said flexible member to move in an oscillating motion and causing the developer to loosen, said developer charged in frictional contact with the developer carrier and electrostatically deposited and conveyed by the developer carrier, wherein said movable member comprises a plurality of projections convex toward said flexible member and extending in a first direction substantially perpendicular to a second direction in which the surface of said developer carrier moves, said movable member being moved in said first direction;

movable member driving means for driving said movable member; and

developer charging means for depositing a predetermined amount of charge on the developer and located downstream of said flexible member with respect to a direction of rotation of said developer carrier and upstream of a developing position where said developer carrier faces said image carrier.

5,467,176

IMAGE FORMING METHOD AND APPARATUS WITH MAGNETIC BRUSH

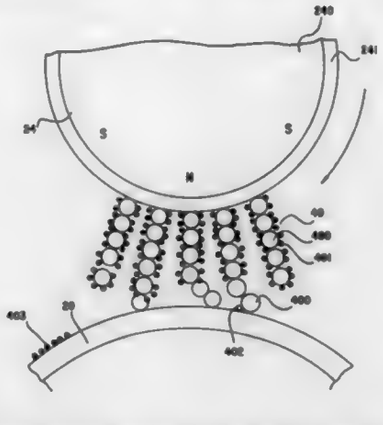
Tsuneo Watanuki; Yasushige Nakamura; Satoshi Takezawa; Norio Sawatari; Akira Nagahara; Sachio Sasaki; Mitsuru Sato; Shigenobu Utaka, all of Kawasaki; Takefumi Takahashi, Inagi; Masahiro Wanou, and Masao Konishi, both of Kawasaki, all of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 30, 1994, Ser. No. 220,601

Claims priority, application Japan, Jun. 24, 1993, 5-177236

Int. Cl.[6] G03G *15/06;21/00*

U.S. Cl. 355—270 **53 Claims**



1. An image forming method for forming an image on a sheet, comprising the steps of:

forming an electrostatic latent image on a rotary endless latent image carrier;

forming a magnetic brush with a developer, comprising magnetic toners and magnetic carriers, in a developing area, for developing the electrostatic latent image on said latent image carrier, and thereby for collecting residual toners on said latent image carrier, a toner density of the developer in the formed magnetic brush being set to near a limiting toner density; and

transferring said developed image on said latent image carrier to a sheet.

5,467,177

FIXING METHOD FOR PRINTING MACHINE AND ELECTROPHOTOGHRAPHIC PRINTING MACHINE

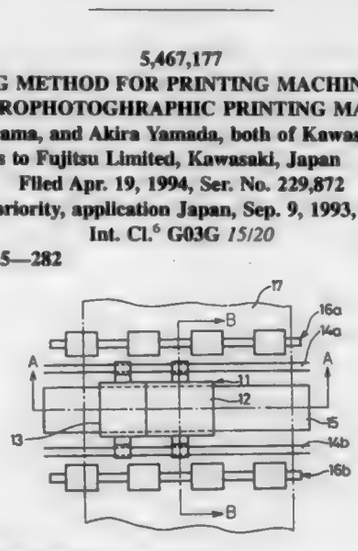
Ryoichi Iwama, and Akira Yamada, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 19, 1994, Ser. No. 229,872

Claims priority, application Japan, Sep. 9, 1993, 5-224792

Int. Cl.[6] G03G *15/20*

U.S. Cl. 355—282 **12 Claims**



6. A printing machine comprising:

transporting means for transporting a recording sheet in a sheet transporting direction;

a carriage process means for forming a latent image on a latent image carrier, and fixing means for performing a fixing operation on a visible image transferred onto the recording sheet at least two times;

transfer means for transferring the visible image to the recording sheet so that the visible image is transferred onto the recording sheet; and

moving means for moving said carriage in a main scanning direction perpendicular to the sheet transporting direction.

5,467,178

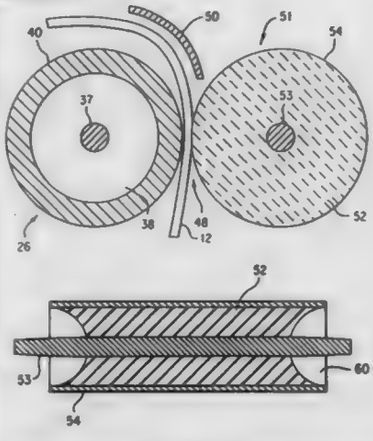
PRESSURE ROLLER FOR REDUCING MEDIA CURL AND WAVE IN ELECTROPHOTOGRAPHIC PRINTERS

Paul K. Mui, Boise, and John W. Huffman, Meridian, both of Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 24, 1994, Ser. No. 296,061

Int. Cl.[6] G03G *15/20*

U.S. Cl. 355—285 **7 Claims**



1. An apparatus operative within an electrophotographic printer for reducing deformation in electrophotographically printed media, said apparatus comprising of:

a fuser roller on a first side of media transport path, said fuser roller being rotated about an axis of rotation longitudinally along an axis of said fuser roller; and

a pressure roller on a second side of said media transport path and positioned adjacent to said fuser roller, said pressure roller comprised of

a shaft,

a cylindrical deformable material formed around said shaft, said cylindrical deformable material having a center section and a first end and a second end,

a cylindrical hard outer shell formed around said deformable material,

said cylindrical deformable material being removed from said first end and said second end so that said cylindrical deformable material is shorter than said cylindrical hard outer shell; and

said pressure roller being rotated about an axis of rotation longitudinally along an axis of said shaft, said printed media being compressed between said pressure roller and said fuser roller.

5,467,179

TURNOVER DEVICE FOR A WEB-SHAPED RECORDING MEDIUM

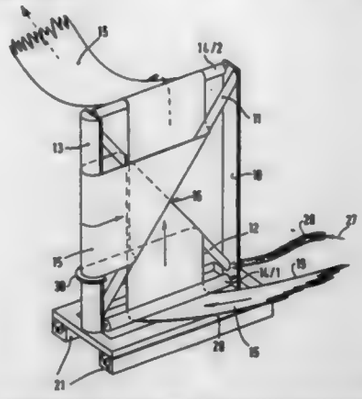
Vilmar Boeck, Poing, and Peter-Paul Kalhoff, Munich, both of, Germany, assignors to Siemens Nixdorf Informationssysteme AG, Paderborn, Germany

Filed Jan. 24, 1994, Ser. No. 185,241

Claims priority, application Germany, Jan. 18, 1993, 43 35 473.4

Int. Cl.[6] G03G *21/00*; B41F *13/02*; B65H *23/32*

U.S. Cl. 355—309 **14 Claims**



1. A turnover device for turning a web-shaped recording medium having a first and second lateral edge, said medium supplied to the turnover device in a prescribed delivery attitude, comprising:

two crossed turning elements and a deflector element arranged laterally with respect thereto; and

a crossing point of the turning elements is arranged offset in the direction of the deflector element, such that the recording medium departs the turnover device in a turned attitude wherein said second lateral edge aligns with said first lateral edge; and

wherein said turning elements have a circular cross section with a prescribed radius r, the crossing point of said turning elements being arranged offset from the center line of the recording medium corresponding to a distance of $\pi r/\sqrt{2}$.

5,467,180

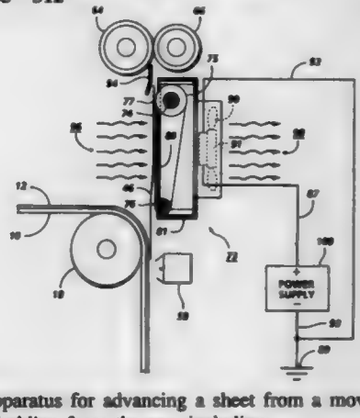
HIGH AIR FLOW LOW PRESSURE PREFUSER TRANSPORT

Michael Malachowski, Webster, N.Y.; Charles W. Spehrley, Jr., White River Junction, Vt.; Dean Thomas, Webster; Michelle Remus, Rochester, both of N.Y., and Robert R. Schaffer, Canaan, N.H., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 20, 1994, Ser. No. 327,721

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—312 **14 Claims**



1. An apparatus for advancing a sheet from a moving surface exerting a holding force thereon, including:

a transport, positioned to receive the sheet leading edge, exerting a drive force on the sheet, said transport moving at a greater velocity than the surface so that the sheet slips on said transport until the sheet is separated from the surface, said transport includes a plenum surface, a housing cover mounted over said plenum surface, an input drive member rotatably mounted to said housing cover, an output drive member, spaced from said input drive member, rotatably mounted to said housing cover, a plurality of moving belts entrained about said input drive member, said plenum surface and said output drive member, a plurality of vanes mounted interiorly of said housing to prevent variations in normal air flow through said housing, and means for holding the sheet against said belt with a low pressure; and

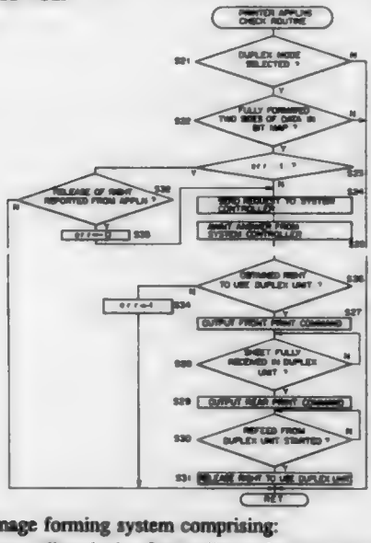
air moving means, in communication with said transport, to generate a high flow for sheet acquisition at a low pressure to maintain the drive force less than the holding force while maintaining the sheet in tension.

5,467,181

IMAGE FORMING SYSTEM

Jun Doi, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 7, 1994, Ser. No. 319,716
Claims priority, application Japan, Jan. 8, 1993, 5-252952
Int. Cl.[6] G03G *21/14*
U.S. Cl. 355—319 **8 Claims**



1. An image forming system comprising:

an image reading device for reading a document image;

an image forming device for outputting, in a bit map format, image data from said image reading device or image data from a host;

a duplex device for turning over a sheet carrying an image formed by said image forming device on one side thereof, and for refeeding said sheet to said image forming device in order to form an image on the other side thereof;

a system controller For controlling a plurality of applications which respectively execute particular functions, including at least a page printer function and a copier function, by suitably combining said image reading device, said image forming device, and said duplex device, and for controlling said image reading device, said image forming device and said duplex device in response to requests from said plurality of applications; and

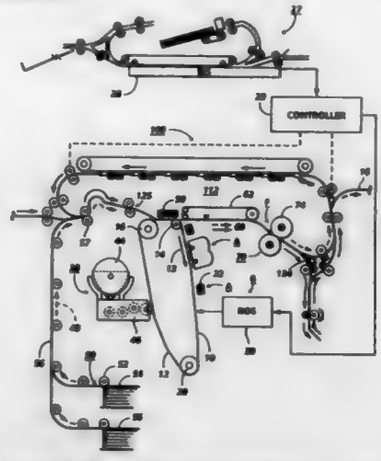
requesting means for requesting of said system controller a right to use said duplex device when the application in charge of the page printer function has fully formatted the image data to be output on both sides of the sheet in a bit map.

5,467,182

SHEET TRANSPORT FOR HIGH PRODUCTIVITY TRAYLESS DUPLEX

John D. Hower, Jr., Fairport; Kathleen M. Martin, Hamlin; John D. Gramlich, Webster, and LeRoy A. Baldwin, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 18, 1994, Ser. No. 342,289
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—319 **11 Claims**



1. A sheet feeding apparatus for feeding cut sheets in timed relationship comprising:

a first sheet drive;

a second sheet drive adjacent said first drive so that a sheet is fed from said first drive and then controlled by said second drive;

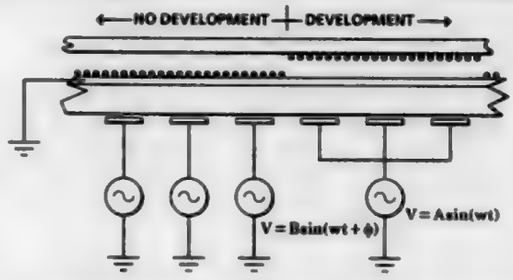
a timing mechanism adjacent said second drive to sequence the copy sheet into a process path, said second drive positively driving the sheet to said timing mechanism and then slipping relative to the sheet while simultaneously driving a second sheet toward said timing mechanism so that the speed of the first sheet is altered so that it is fed in the proper timed relation into the process path.

5,467,183

ELECTROSTATIC COLOR PRINTING SYSTEM WITH SONIC TONER RELEASE DEVELOPMENT

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 1, 1994, Ser. No. 283,366
Int. Cl.[6] G03G *15/01*
U.S. Cl. 355—326 R **16 Claims**



1. A printing machine adapted to print indicia on a document, including:

a member having a latent image recorded thereon; and

a development system comprising a first donor surface transporting first marking particles and a second donor surface transporting second marking particles, said first donor surface vibrating to develop a first portion of the latent image with the first marking particles with said second donor surface being substantially non-vibrating, said second donor surface vibrat-

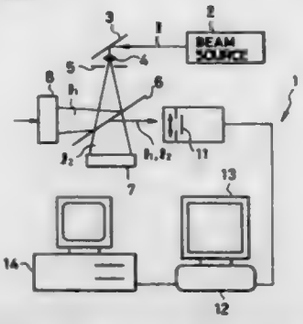
ing to develop a second portion of the latent image with the second marking particles with said first donor surface being substantially non-vibrating.

5,467,184

METHOD OF LARGE DEFORMATION MEASUREMENT USING SPECKLE INTERFEROMETRY

Koji Tenjimbayashi, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Sep. 9, 1993, Ser. No. 118,296
Claims priority, application Japan, Sep. 9, 1992, 4-266633
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—35.5 **1 Claim**



1. A method for measuring large deformation of an object using speckle interferometry, comprising the steps of:

(1) storing in an image memory a series of speckle images formed by superposing a laser beam reflected from the object and a laser beam reflected from a separate surface at specified intervals within a time from immediately before the start of deformation to the termination of deformation;

(2) reading a first speckle image stored immediately before the start of deformation and a second speckle image stored at a first specified interval to obtain a difference between the first and second speckle image, thereby inducing a speckle interference fringe representing deformation of the object during the first specified interval;

(3) reading the second speckle image and a third speckle image stored at a second specified interval to obtain a difference between the second and third speckle images, thereby inducing a speckle interference fringe representing deformation of the object during the second specified interval;

(4) continue reading subsequent pairs of said series of speckle images until induction of a speckle interference fringe representing deformation of the object during a final specified interval;

(5) obtaining amounts of deformation of said object at the respective specified intervals from the speckle interference fringes thus obtained; and

(6) summing said amounts of deformation.

5,467,185

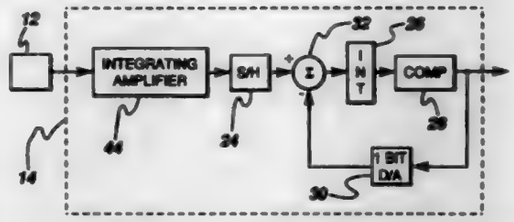
EMISSIONS CONTROL FOR INTERNAL COMBUSTION ENGINE

William E. Engeler, Scotia, and Dale M. Brown, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 15, 1994, Ser. No. 276,123
Int. Cl.[6] G01M *15/00*; F02D *41/14*; F02P *5/145*
U.S. Cl. 356—44 **26 Claims**

1. An apparatus for controlling emissions in an internal combustion engine having at least one cylinder, the apparatus comprising:

at least one high temperature optical sensor, the optical sensor being adapted to sense optical flame intensity from a flame in the at least one cylinder and convert the sensed optical flame intensity to an analog signal;



an integrator for converting the analog signal to an integrated analog signal; and

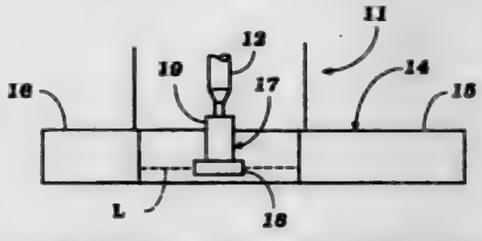
at least one signal converter for conditioning the integrated analog signal of the at least one optical sensor for use in an engine fuel-to-air ratio controller.

5,467,186

ATTRACTING NOZZLE CONTROL APPARATUS FOR A CHIP COMPONENT MOUNTING MACHINE

Kenichi Indo, and Hitoshi Onodera, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 5, 1993, Ser. No. 148,699
Claims priority, application Japan, Nov. 9, 1992, 4-298730
Int. Cl.[6] G01B *11/00*
U.S. Cl. 356—150 **9 Claims**



1. A component measuring system for measuring a component by rotation in an optical detecting station comprising a pick-up device supported for movement in a first direction and rotatable about an axis parallel to the first direction, an optical detection station having an optical range in the first direction that is limited in dimension and which is less than the degree of movement of said pick-up device in said first direction and defined by means for creating a plurality of parallel light rays, means for moving said pick-up device in selected amounts in said first direction into a position wherein a selected portion of the component held thereby is moved into said optical range, and means for controlling the movement in said first direction so that said selected portion of the component will be within the optical range.

5,467,187

AUTOMATIC CALIBRATION SYSTEM FOR TURBIDIMETERS USING A PULSING FLUID FLOW TO RECIPROCATE A STANDARD IN A CUVETTE

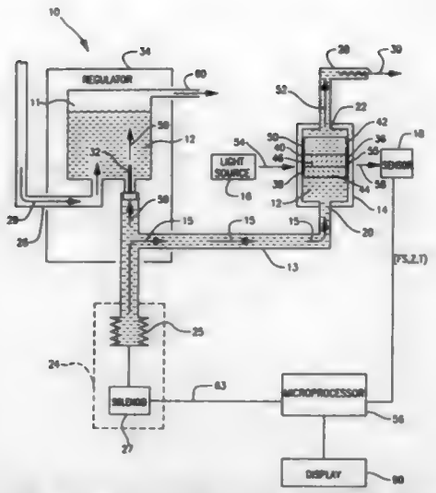
Howard L. Beers, North Fort Myers, Fla., assignor to HF Scientific, Inc., Fort Myers, Fla.

Filed Sep. 29, 1994, Ser. No. 315,112
Int. Cl.[6] G01J *1/02*
U.S. Cl. 356—243 **16 Claims**

1. An automatic calibration system for an apparatus that measures a presence of a selected component in a test fluid sample, said system comprising:

a transparent test fluid holder including an inlet and an outlet for conducting a test fluid into and out of said holder;

a transparent calibration element immersed in a test fluid in said holder and including a first sealed compartment that contains a zero calibration standard and a second sealed compartment that contains a full scale calibration standard;



means for directing a pulsed flow of said test fluid through said holder from said inlet to said outlet to reciprocate said calibration element within said holder;

a light source directed at said holder for establishing an incident beam of light that sequentially strikes said full scale standard, said zero standard and a test fluid sample as said calibration element reciprocates through said holder;

means directed at said holder for sensing light emitted from said full scale and zero calibration standards and said test liquid sample and generating respective signals representative of an intensity of said emitted light; and

means for processing said respective signals to determine a calibrated measure of the selected component in said test fluid sample.

5,467,188

PARTICLE DETECTION SYSTEM

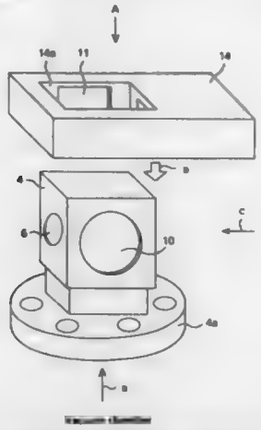
Haruo Miyashita, Tokyo, Japan, assignor to Anelva Corporation, Tokyo, Japan

Filed Aug. 19, 1994, Ser. No. 293,065

Claims priority, application Japan, Aug. 20, 1993, 5-228332

Int. Cl.[6] G01N *15/02*

U.S. Cl. 356—336 **9 Claims**



1. A particle detection system for detecting the number and size of microscopic particles generated in a process vacuum chamber in which a semiconductor manufacturing process is performed, the process vacuum chamber being formed by an enclosure, the particle detection system comprising:

a detection chamber defining an internal space and being mounted outside the enclosure forming the process vacuum chamber so as to communicate with the process vacuum chamber, and a laser beam transmitting window means and a scattered light extracting window; and

a particle detector means arranged in an external atmospheric environment outside the detection chamber and including a light-emission means for emitting a laser beam into the detection chamber through the laser beam transmitting window means and a light-detection means for detecting scattered light generated within the detection chamber through the scattered light extracting window.

5,467,189

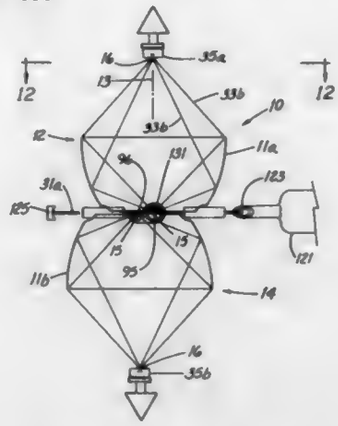
IMPROVED PARTICLE SENSOR AND METHOD FOR ASSAYING A PARTICLE

Gerhard Kreikebaum, San Bernardino, and David L. Chandler, Highland, both of Calif., assignors to Venturedyne, Ltd., Milwaukee, Wis.

Continuation of Ser. No. 126,570, Sep. 27, 1993, abandoned, which is a continuation of Ser. No. 7,958, Jan. 22, 1993, abandoned. This application Jan. 12, 1995, Ser. No. 384,601

Int. Cl.[6] G01N *15/02*

U.S. Cl. 356—336 **28 Claims**



1. In a particle sensor containing gas molecules and including (a) a first elliptical mirror with a cavity, a first major axis and primary and secondary focal points along such first major axis, (b) a particle-illuminating beam of light having a wavelength and extending along a beam axis intersecting the primary focal point, and (c) an inlet for introducing airborne particles into a sensor view volume, the improvement wherein:

a light detector is at the secondary focal point;

the region between the primary focal point and the light detector is substantially unobstructured;

the primary focal point of the first mirror is coincident with the view volume;

the sensor includes a second mirror having a second major axis offset along the beam axis and spaced from the first major axis, the second mirror reflecting light scattered substantially only by gas molecules; and

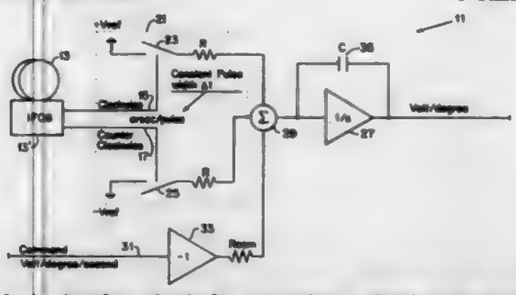
the beam axis and the first major axis define an angle greater than 0° therebetween;

whereby particles having a maximum dimension substantially less than the wavelength are detected.

5,467,190
DIGITAL TO ANALOG INTERFACE CONVERSION CIRCUIT

Richard R. Desmarais, and Andrew J. Karpinski, Jr., both of Clearwater, Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 16, 1993, Ser. No. 93,054
Int. Cl.[6] G01C *19/64;19/66*
U.S. Cl. 356—350 **8 Claims**



1. An interface circuit for connecting a digital pulse output rotation sensor and its associated electronics to a spinning mass rotation measurement system, the interface circuit comprising:

a first switch for receiving clockwise pulses from a digital pulse output rotation sensor and its associated electronics indicative of a change in angular position, the clockwise pulses actuating the first switch to permit a first voltage to pass through the first switch for an amount of time equal to the width of the clockwise pulses received from a digital pulse output rotation sensor and its associated electronics;

a second switch for receiving counterclockwise pulses from a digital pulse output rotation sensor and its associated electronics indicative of a change in angular position, the counterclockwise pulses actuating the second switch to permit a second voltage to pass through the second switch for an amount of time equal to the width of the counterclockwise pulses received from a digital pulse output rotation sensor and its associated electronics;

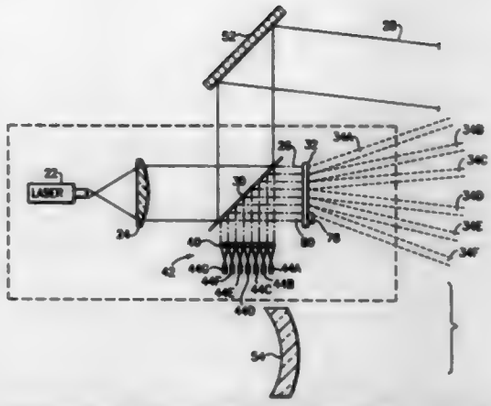
a convertor for receiving a command signal representative of change in angular rate commanded to a platform on which a digital pulse output rotation sensor and its associated electronics is mounted, the convertor converting the command signal to a third voltage proportional to the first and second voltages passing through the first and second switches, respectively; and

a summing integrator for receiving the first and second voltages from the first and second switches, respectively, and the third voltage from the convertor, the summing integrator summing the first, second and third voltages applied thereto for generating an error output in volts per degrees per second when the third voltage is not equal to a sum of the first and second voltages.

5,467,191
SAMPLE POINT INTERFEROMETER FOR MEASURING CHANGES IN FIGURE OF A PRIMARY MIRROR AND PRIMARY-SECONDARY MIRROR SPACING

Stanley J. Kishner, Pomona, N.Y., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 20, 1994, Ser. No. 246,522
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—360 **12 Claims**



1. Optical metrology apparatus for simultaneously measuring changes in figure of a primary mirror and spacing between the primary mirror and a secondary mirror comprising:

optical head means attached to structure supporting the secondary mirror and adjacent thereto including:

a source of radiation providing an output beam;

means for producing from the output beam first and second reference beams and a plurality of sample beams, said producing means providing the first reference beam to a first reference beam optical path and providing the second reference beam to a second reference beam optical path and providing the plurality of sample beams to a plurality of sample beam optical paths, reflecting means on the primary mirror being disposed in the optical path for the first reference beam and reflecting the first reference beam, reflecting means on the primary mirror being disposed in the paths of the plurality of the sample beams and reflecting the plurality of sample beams, reflecting means on said optical head means being disposed in the optical path of the second reference beam and reflecting the second reference beam before reaching the primary mirror, the optical path for the first reference beam being substantially similar in length to the optical paths for the plurality of the sample beams, the optical path for the second reference beam being substantially shorter than that of the first reference beam;

said producing means subsequently operable for combining the reflected first reference beam with each of the reflected sample beams into a plurality of combined beams;

detector means disposed for receiving the plurality of combined beams and having a plurality of outputs for providing a plurality of signals that indicate an intensity of each of the plurality of the combined beams;

comparing means for comparing the magnitude and/or phase of the plurality of signals and providing an output which is a function of the changes in figure of the primary mirror;

means for combining the reflected first reference beam with the reflected second reference beam into a combined beam;

detector means disposed for receiving the combined beam and having an output providing a signal that indicates a time varying intensity of the combined beam;

comparing means for comparing the magnitude and/or phase of the signal and providing an output which is a function of the changes in spacing between the primary mirror and the secondary mirror.

5,467,192
IMPROVEMENTS IN OR RELATING TO SURFACE CURVATURE MEASUREMENT

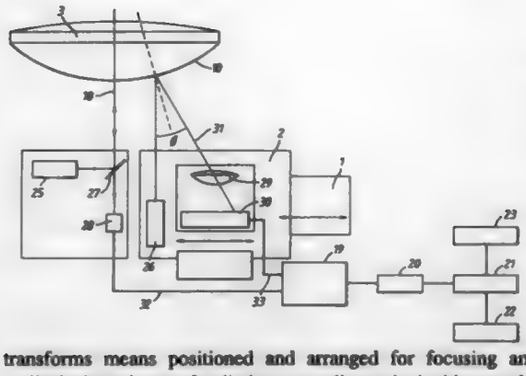
Kevin R. Manning, Rose Farm, England, assignor to Roke Manor Research Limited, Hampshire, England

Continuation of Ser. No. 30,921, Mar. 12, 1993, abandoned. This application Nov. 29, 1994, Ser. No. 348,834
Claims priority, application United Kingdom, Mar. 14, 1992, 9205655; Jun. 26, 1992, 9213626
Int. Cl.[6] G01B *15/04*
U.S. Cl. 356—371 **13 Claims**

1. An apparatus for measurement of a radius of curvature of a surface of an object having a plurality of at least partially reflective surfaces comprising:

at least one source of electromagnetic radiation,

electromagnetic radiation detector means for detecting electromagnetic radiation,



transforms means positioned and arranged for focusing and displacing a beam of radiation, according to its incident angle, reflected from at least one of said plurality of surfaces onto said detector means, said detector means being arranged to provide at least one output signal from each of said plurality of surfaces characteristic of at least one displaced position thereon at which the radiation is incident,

signal processor means, responsive to said at least one output signal, for providing a measurement of said radius of curvature at each of the plurality of surfaces, and

an additional light detector for detecting an additional beam from a further source and arranged to provide signals for the signal processor means when said additional beam is normal to at least one of the plurality of surfaces.

5,467,193

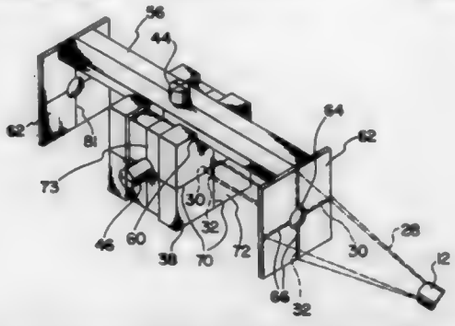
TARGET DEVICE AND USE THEREOF FOR ALIGNING LIGHT BEAMS UTILIZING CROSS-HAIR LIGHT BEAMS

Arne H. Laewen, 437 Tweedsmuir Avenue, Ottawa, Ontario, K1Z 5N8, and Stephen W. Busby, R.R. 1, Oxford Mills, Ontario, K1G 1S0, both of, Canada

Filed Aug. 8, 1994, Ser. No. 287,247

Int. Cl.[6] G01B *11/00*

U.S. Cl. 356—399 **13 Claims**



1. A target device for use in orienting a plurality of composite beams emitted by respective light sources, said beams extending in mutually different directions towards an isocenter and each beam having a cross-section comprising a pair of strips intersecting each other; wherein the device comprises

(a) a primary member having at least one surface inscribed with crosshairs, and

b) a secondary member mountable on the primary member and including at least one plate inscribed with crosshairs and having a hole centered on such crosshairs, the secondary member being so mountable on the primary member that the plate is positioned along a said beam at a location spaced towards the source of the beam away from the inscribed surface of the primary member whereby said surface receives a central portion of the beam that has passed through the hole, and a portion of the plate surrounding the hole receives an outer portion of the beam.

5,467,194

METHOD AND DEVICE FOR PHOTOELECTRIC IDENTIFICATION OF A MATERIAL WEB

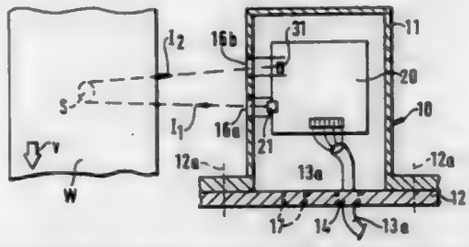
Kari Pellinen, Säynätsalo; Jukka Koiranen, Jyväskylä ; Kari Erkkilä, Palokka; Juhani Ahola, Jyväskylä , and Harri Vähätalo, Jyväskylä, all of, Finland, assignors to Valmet Paper Machinery, Inc., Helsinki, Finland

Continuation of Ser. No. 719,762, Jun. 24, 1991, abandoned. This application Oct. 12, 1993, Ser. No. 135,315

Claims priority, application Finland, Feb. 6, 1991, 910571

Int. Cl.[6] G01N *21/47*

U.S. Cl. 356—429 **16 Claims**



1. A method of identifying a state of presence of a web moving on and supported by a wire or felt in a paper making machine, comprising the steps of:

illuminating a portion of the web with a pulse-modulated transmitted beam of light from a light transmitter to produce a reflected beam of light, said modulated beam of light modulating in intensity from an on state to an off state, said reflected beam of light having a first pattern when said web supported by the wire or felt is present and a second pattern when said web is not present and the wire or felt is present, said first and second patterns being different from one another;

detecting said reflected beam of light with a light receiver to produce an electric signal corresponding to the intensity of said reflected beam of light received by said light receiver;

obtaining a background light level from said electric signal corresponding to when said modulated transmitted beam of light is in an off state and said web supported by the wire or felt is present;

obtaining an illuminated light level from said electric signal corresponding to when said modulated transmitted beam of light is in an on state and said web supported by the wire or felt is present and is illuminated by said modulated transmitted beam of light;

processing said electric signals corresponding to said background light level and said illuminated light level by subtracting said electric signal corresponding to said background light level from said electric signal corresponding to said illuminated light level to obtain a calibration signal;

adjusting the intensity of said transmitted beam of light when said web supported by the wire or felt is present so that said calibration signal is normalized; and

analyzing said electric signal produced by said light receiver and determining whether the web supported by the wire or felt is present or whether the web is not present and the wire or felt is present.

5,467,195

DENSITY ADJUSTMENT IN AN IMAGE PROCESSING APPARATUS

Yoshito Minoguchi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

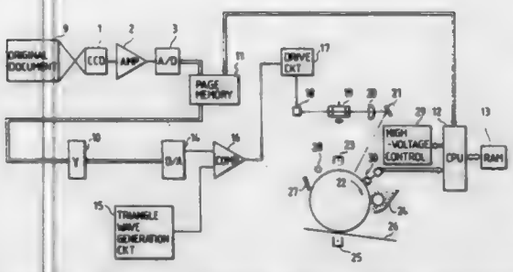
Continuation of Ser. No. 799,545, Nov. 27, 1991, abandoned. This application Dec. 20, 1994, Ser. No. 360,119

Claims priority, application Japan, Nov. 28, 1990, 2-322472

Int. Cl.[6] H04N *1/23;1/56;* G06K *9/46;* G03G *21/00*

U.S. Cl. 358—296 **12 Claims**

1. An image forming apparatus comprising:



producing means for producing original density information from an image of an original;

counting means for receiving the original density information from said producing means and for determining a signal level corresponding to a density occurring with a high frequency in a frequency distribution of the original density information;

image forming means for forming an image based on the signal level determined by said counting means;

detecting means for detecting a potential corresponding to an image density of the image formed by said image forming means based on the determined signal level, and for generating an output in accordance with the detected value; and

controlling means for controlling an image formation condition based on the output of said detecting means such that the image density is adjusted to a predetermined density which is used to form an image on a recording medium.

5,467,196

IMAGE FORMING APPARATUS WHICH FORMS HALFTONE IMAGES MIXED WITH CHARACTERS AND FINE LINES

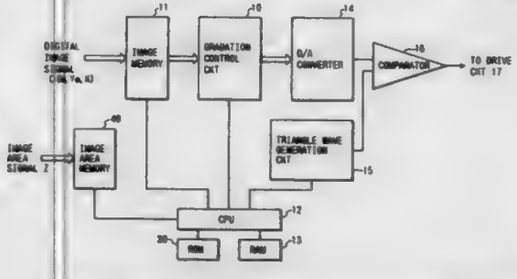
Satoru Fukushima, Tokyo; Sono Gu, Omiya, and Yoshito Mizoguchi, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 808,633, Dec. 17, 1991, abandoned. This application Mar. 17, 1995, Ser. No. 407,398

Claims priority, application Japan, Dec. 19, 1990, 2-403856

Int. Cl.[6] H04N *1/40*; G06K *9/46*

U.S. Cl. 358—298 **16 Claims**



1. An image processing apparatus for processing an image defined by plural pixels, comprising:

input means for inputting image data for each of said plural pixels of the image;

discriminating means for discriminating whether each of said plural pixels of the image data represents a pixel from a predetermined type of image;

forming means for forming a frequency distribution of density levels of image data for those pixels representing the predetermined type of image; and

processing means for processing said image data inputted by said input means in accordance with the frequency distribution formed by said forming means.

5,467,197

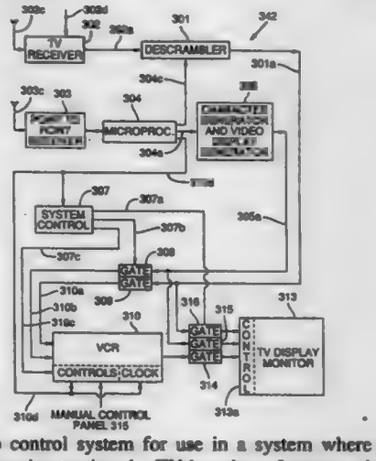
DUAL COMMUNICATION MODE VIDEO TAPE RECORDER

Don G. Hoff, Tiburon, Calif., assignor to Seiko Corporation, and Seiko Epson Corporation, both of, Japan

Continuation of Ser. No. 583,053, Sep. 14, 1990, abandoned, which is a continuation of Ser. No. 295,172, Jan. 9, 1989, Pat. No. 5,016,273. This application Dec. 16, 1993, Ser. No. 170,644

Int. Cl.[6] H04N *5/76*

U.S. Cl. 358—335 **4 Claims**



1. A video control system for use in a system where a video program is broadcast using the TV broadcast frequency band to a plurality of TV receivers including a first TV receiver and a second TV receiver, each of said TV receivers adapted to receive conventional TV programs, said video control system including the combination of:

a) a selective call radio receiver, said selective call receiver having a unique assigned address number, said selective call receiver adapted to receive messages addressed to said unique assigned address and to ignore messages which are addressed to addresses which differ from said unique address;

b) a radio transmitter which is operating on a first radio frequency outside said TV broadcast frequency band, said radio transmitter adapted to transmit messages to said selective call receiver,

c) means for transmitting command information including commands from a conventional telephone to said radio transmitter and for transmitting said commands to said selective call receiver via said radio transmitter,

d) means in said selective call receiver for receiving said commands;

e) a video tape recorder; and

f) control means operatively connected to said selective call receiver for receiving signals therefrom including said commands and for controlling said video tape recorder in response to said commands without intervention by an operator.

5,467,198

METHOD FOR CONTROLLING AN IMAGE PROCESSING SYSTEM

Ko Aosaki, and Yasuhiro Nishitani, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

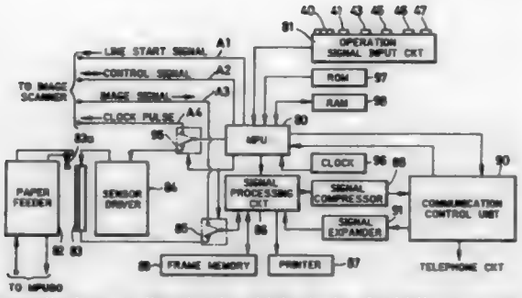
Continuation of Ser. No. 688,429, Apr. 22, 1991, abandoned. This application Sep. 1, 1993, Ser. No. 114,400

Claims priority, application Japan, Apr. 20, 1990, 2-105853; Apr. 20, 1990, 2-105854

Int. Cl.[6] H04N *1/00*

U.S. Cl. 358—400 **9 Claims**

1. A method for controlling an image processing system comprising an image scanner and a facsimile terminal connected to each other, said image scanner including an optical system and a line sensor for scanning an image of a remote subject formed by said optical system, said line sensor being moved in a direction



perpendicular to a direction in which pixels of said line sensor are aligned, said method comprising the steps of:

establishing access of said facsimile terminal to a telephone circuit;

actuating a switch means thereby to start scanning an image of a remote subject by said image scanner in synchronism with a clock pulse signal supplied from said facsimile terminal and, if an original document is positioned in said facsimile terminal, to start scanning said original by said facsimile terminal;

transmitting image signals of said remote subject scanned by said image scanner to said facsimile terminal through said telephone circuit prior to or following transmission of image signals of said original document;

maintaining the access of said facsimile terminal to said telephone circuit for a predetermined time interval after said image signals have been completely transmitted;

reserving said telephone circuit thereby to continue the access to said telephone circuit over said predetermined time interval for awaiting transmission of image signals of a second image picked up by said image scanner; and

releasing the access to said telephone circuit when said reserving step has not been executed within said predetermined time interval and said image signals of said remote subject and said image signals of said original document have been completely transmitted.

5,467,199

APPARATUS FOR RADIO COMMUNICATION OF FACSIMILE

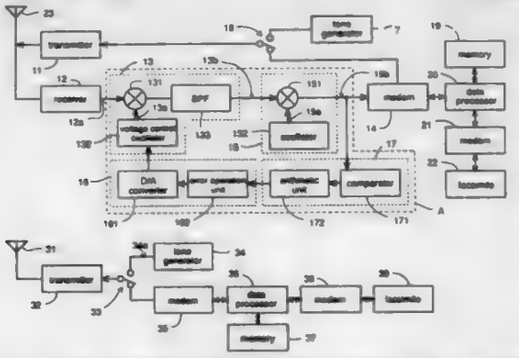
Shigeru Mikami, Asashi; Masayuki Mori, Kobe; Tetsuo Yamamoto, Yao; Matsuhiro Ohno, Takarazuka, and Mineo Matsumoto, Akashi, all of, Japan, assignors to Furuno Electric Company, Limited, Nishionmiya, Japan

Continuation of Ser. No. 862,551, Jun. 24, 1992, abandoned. This application Oct. 18, 1994, Ser. No. 324,488

Claims priority, application Japan, Nov. 28, 1990, 2-332254

Int. Cl.[6] H04N *1/00*

U.S. Cl. 358—425 **11 Claims**



1. A radio facsimile communication system employing SSB (single sideband) communication method for transmitting facsimile data from a transmission point to a reception point, comprising:

a transmission apparatus at the transmission point including a transmitting unit for producing SSB signals by modulating facsimile signals supplied from a facsimile apparatus, and transmission means for transmitting a signal having a reference frequency "f" to the reception point;

a reception apparatus at the reception point including a receiving unit for demodulating the SSB signals to reproduce the facsimile signals and supplying a facsimile apparatus with the resultant facsimile signals, and correction means for comparing the reference frequency "f" of the signal received by the reception apparatus with a reference frequency "f" set at the reception point and adjusting the frequency of output signal of the reception unit based on the comparison result.

7. A radio facsimile communication apparatus, which comprises:

a tone means for producing a tone signal having a reference frequency;

a facsimile;

a signal conversion means for converting signals fed from the facsimile;

a transmission means for transmitting the signals output from the tone means and the signal conversion means in time-division format by SSB system.

8. A radio facsimile communication apparatus, which comprises:

a signal means for producing a signal having a reference frequency;

a signal conversion means for converting signals fed from a facsimile;

a switch means for switching and feeding the signals output from the signal means and the signal conversion means in time-division format to an SSB transmitter.

9. A radio facsimile communication apparatus, which comprises:

a reception means for receiving tone signal and facsimile signals transmitted in radio SSB system;

a frequency detection means for detecting a reference frequency of the tone signal;

a differential frequency detection means for comparing the reference frequency with a frequency detected by the frequency detection means and finding a differential frequency between these frequencies;

a frequency correction means for correcting frequency included in the facsimile signals, based on the found differential frequency;

a facsimile for recording the facsimile signals.

5,467,200

DATA COMMUNICATION METHOD BETWEEN CIRCUITS

Yutaka Ohsawa, and Isamu Hashimoto, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

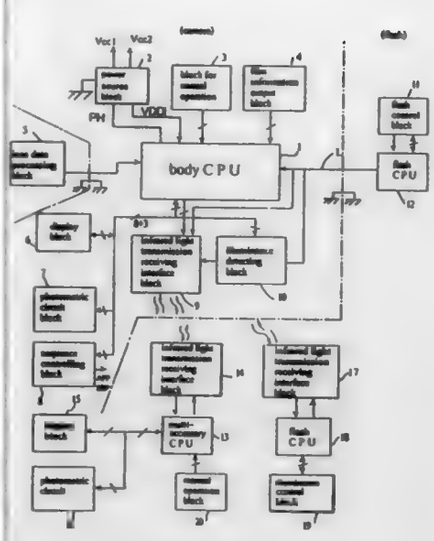
Division of Ser. No. 568,516, Aug. 16, 1990, Pat. No. 5,283,663. This application Nov. 4, 1993, Ser. No. 145,947

Claims priority, application Japan, Aug. 17, 1989, 1-212008; Sep. 18, 1989, 1-241459

Int. Cl.[6] H04N *1/41*

U.S. Cl. 358—426 **15 Claims**

1. A method for performing data communication between a pair of circuits, the data communication being established by serially transmitting information which is composed of pulse signals, wherein the pair of circuits are connected by a single bi-directional communication line, and wherein the data communication is performed in accordance with a duty modulation system using a format including a first predetermined time period, a second predetermined time period and a third predetermined time period, the first predetermined time period being defined as a time period from a time of detection of an instant of first level change of a signal level which is being output to the communication line to a time of detection of the instant of a second level change of the signal level following the instant of the first level change, the second predetermined time period being defined as a time period capable of giving data of "1" or "0" to the bi-directional communication line within the first predetermined time period, the third predetermined time period being defined as a time period for holding a level of the communication line following the second predetermined time period at "0" or "1."

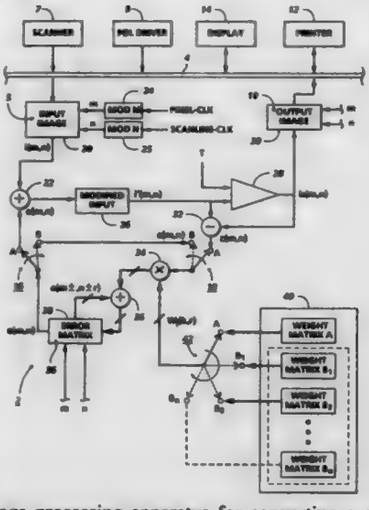


5,467,201

ITERATIVE ERROR DIFFUSION SYSTEM

Zhigang Fan, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 31, 1994, Ser. No. 251,450
Int. Cl.[6] H04N *1/40*
U.S. Cl. 358—447 **25 Claims**



1. An image processing apparatus for converting a gray image composed of gray image signals to a binary image composed of binary image signals, with each gray image signal of the gray image having a corresponding error signal, comprising:

means for segmenting the gray image into a plurality of image portions, said segmenting means forming a first image portion and a second image portion;

means for modifying each of the gray image signals in the first image portion with a corresponding error signal to form modified gray image signals;

means for quantizing each of the modified gray image signal in the first image portion with a threshold value, said quantizing means forming a binary image signal for each of the gray image signals in the first image portion;

means for determining a quantization error for each of the modified gray image signals in the first image portion;

means for distributing the quantization error for each of the modified gray image signals to a set of error signals including an error signal corresponding to a previously quantized gray image signal, wherein a first subset of the set of error signals has corresponding gray image signals in the first image portion and a second subset of the set of error signals has corresponding gray image signals in the second image portion; and

means for processing each error signal in the first subset of error signals with a first iterative pass in a first mode and a second iterative pass in a second mode,

the first iterative pass in the first mode dispersing the first subset of error signals to error signals in the set of error signals, and

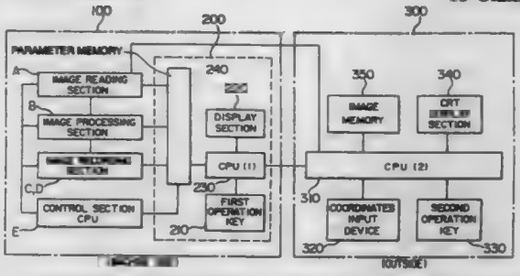
the second iterative in the second mode dispersing the first subset of error signals to error signals in the second subset of error signals.

5,467,202

DIGITAL COPYING APPARATUS WITH A DISPLAY

Koji Washio; Kazuyoshi Tnnaka, and Satoshi Haneda, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 13, 1992, Ser. No. 976,257
Claims priority, application Japan, Nov. 19, 1991, 3-303460; Dec. 4, 1991, 3-320567
Int. Cl.[6] H04N *1/40;1/46*
U.S. Cl. 358—448 **15 Claims**



1. An apparatus for processing an image on a document, comprising:

a copying unit including

means for photoelectrically reading an image on the document and for outputting digital image signals,

parameter memory means for storing a parameter,

processing means for processing the digital image signals on the basis of the parameter, and

means for printing the processed digital image signals as a copy image on a recording material with coloring members of cyan, magenta, yellow and black;

an operation unit including

image memory means for receiving the digital image signals from the reading means and for storing the digital image signals,

means for displaying the digital image signals stored in the image memory means as a display image on a screen, and

means for modifying the display image to make a desired image on the screen, for generating a new parameter to convert the display image into the desired image, and for outputting the new parameter to the parameter memory means; and

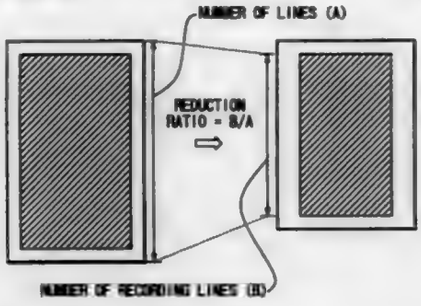
control means to control the copy unit and the operation unit so that the reading means reads the image on the document at least twice, the operation unit receives the digital image signals obtained in a first reading of the reading means and outputs the new parameter to the parameter memory means, and the copy unit processes in the processing means the digital image signals obtained in a second reading of the reading means on the basis of the new parameter so as to produce the desired image and print the produced desired image on a recording material by the printing means.

5,467,203

FACSIMILE MACHINE

Kenji Kawata, Uji, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 28, 1992, Ser. No. 936,948
Claims priority, application Japan, Aug. 29, 1991, 3-244880
Int. Cl.[6] H04N 1/46
U.S. Cl. 358—451 6 Claims



1. A facsimile machine, comprising:

means for receiving image data comprising a plurality of lines,

printing means for printing at least one of the plurality of lines on at least one recording sheet,

a buffer memory for storing the image data comprising a plurality of lines,

means for determining whether the plurality of unprinted lines of image data stored in the buffer memory is not less than a predetermined value,

means for activating the printing means to print all of the unprinted lines of image data stored in the buffer memory when the plurality of unprinted lines of image data stored in the buffer memory is not less than the predetermined value,

means for determining whether one page has been completed when the plurality of unprinted lines of image data stored in the buffer memory is less than the predetermined value,

means for determining whether at least one darkened pixel is present in the unprinted lines when the plurality of unprinted lines is less than the predetermined value and one page has been completed,

means for deactivating the printing means when no darkened pixel is present in the unprinted lines when the plurality of unprinted lines is less than the predetermined value and one page has been completed,

means for activating the printing means when at least one darkened pixel is present in the unprinted lines when the plurality of unprinted lines is less than the predetermined value and one page has been completed.

5,467,204

LIQUID CRYSTAL LIGHT VALVE WITH DUAL FUNCTION AS BOTH OPTICAL-TO-ELECTRICAL AND OPTICAL-TO-OPTICAL TRANSDUCER

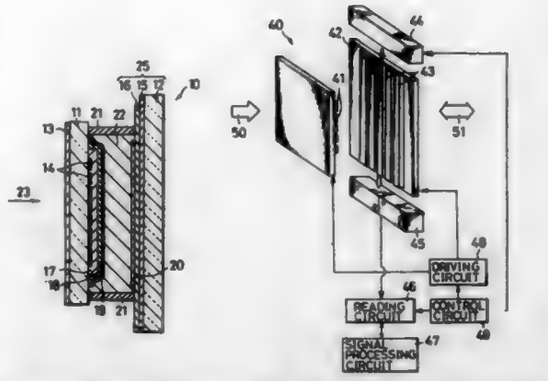
Akitsugu Hatano, Nara; Tsuyoshi Okazaki, Tenri; Yukihiro Sumida, Nara; Takashi Nojima, Gose, and Hidehiko Yamashita, Tenri, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 9, 1992, Ser. No. 988,040
Claims priority, application Japan, Dec. 9, 1991, 3-324142; Feb. 27, 1992, 4-041108; Mar. 6, 1992, 4-049603; Mar. 27, 1992, 4-071498; Mar. 27, 1992, 4-071499
Int. Cl.[6] H04N 1/028; G02F 1/1335;1/135
U.S. Cl. 358—482 15 Claims

1. A liquid crystal light valve comprising:

a liquid crystal layer disposed between two substrates having respective electrodes;

a photoconductive layer disposed between the liquid crystal layer and one of said two substrates and having an impedance changed by incident light including information; and



reading means for reading said information included in said incident light from said liquid crystal layer as electrical signals, including

optical waveguides disposed on a side of one of said two substrates

a light source for guiding light to each of the optical waveguides, and

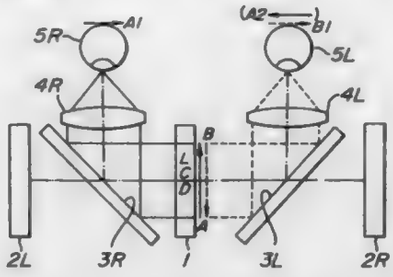
light receiving means for receiving light from said light source transmitted through respective ones of said optical waveguides and converting the transmitted light to an electrical signal.

5,467,205

IMAGE DISPLAY SYSTEM WITH RIGHT AND LEFT EYE ILLUMINATING MEANS

Keiichi Kuba, Hachioji, and Takayoshi Togino, Koganei, both of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1994, Ser. No. 231,669
Claims priority, application Japan, Apr. 28, 1993, 5-102815
Int. Cl.[6] G02F 1/1335
U.S. Cl. 359—40 8 Claims



1. An image display system comprising an image display element for displaying an image thereon, a right eye ocular optical system for forming a light path leading an image formed on the image display element onto the right eye of the viewer, a left eye ocular optical system for forming a light path leading an image formed on the image display element onto the left eye of the viewer, thereby viewing a spatially enlarged projection of the image by both the right and left eye ocular optical systems, the image display element being provided at a position at substantially equal distance from the right and left eye ocular optical systems, a right eye illuminating means provided at the side of the left eye ocular optical system, and a left eye illuminating means provided at the side of the right eye ocular optical system, in order to illuminate the image display element, whereby the image is time-divisionally led to the right and left eyes of the viewer by illuminating the image display element with pencil of rays from the right and left eye illuminating means alternately.

5,467,206

COLOR DISPLAY DEVICE WITH INTERVENING LENS AND SPATIAL FILTER OR WITH OVERLAPPING BEAMS OF CHROMATICALLY SEPARATED LIGHT BETWEEN THE CHROMATIC SEPARATOR AND LENS ARRAY

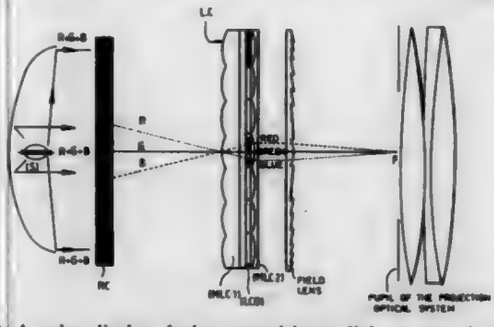
Brigitte Loiseaux, Villebon Sur Yvette; Cécile Joubert; Jean-Pierre Huignard, both of Paris; Pascal Joffre, Palaiseau, and Christophe Nicolas, Le Kremlin Bicetre, all of, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 6, 1994, Ser. No. 267,904

Claims priority, application France, Jul. 9, 1993, 93 08470

Int. Cl.[6] G02F *1/1335*; G03B *21/26*;*21/14*

U.S. Cl. 359—40 **15 Claims**



2. A color display device comprising a light source simultaneously emitting several ranges of chromatic components and a spatial light modulator comprising several dots, each dot comprising one sub-pixel per range of chromatic component to be displayed, wherein said device also comprises the following between the light source and the spatial light modulator; .

at least one chromatic separator comprising a component with index variations or relief features obtained by optical recording in a photosensitive material, this separator separating the light of the different chromatic ranges angularly along different directions providing chromatically angularly separated light;

an array of lenses, a first lens of said array of lenses focusing the light of a first chromatic range substantially on a first sub-pixel, focusing light of a second chromatic range on a second sub-pixel, and focusing light of a third chromatic range on a third sub-pixel;

wherein the light of the first, second, and third chromatic ranges overlap at said first lens.

5,467,207

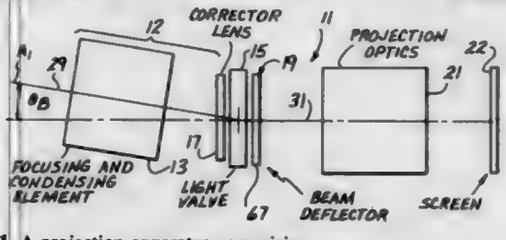
LCD PROJECTION SYSTEM WHICH ALIGNS THE LARGER BEAM SPREAD ANGLE OF THE LIGHT SOURCE WITH THE LARGER ACCEPTANCE ANGLE OF THE LIGHT VALVE AND A NONIMAGING REFLECTOR FOR AN ILLUMINATION SYSTEM

John F. Forkner, South Laguna, Calif.; Ronald F. Rykowski, Woodinville, Wash., and Stephen S. Wilson, Lake Elsinore, Calif., assignors to Prolux Corporation, San Juan Capistrano, Calif.

Filed Jul. 6, 1994, Ser. No. 271,368

Int. Cl.[6] G02F *1/1335*; G03B *21/00*;*21/14*

U.S. Cl. 359—40 **34 Claims**



1. A projection apparatus comprising:

a liquid crystal light valve having a first acceptance angle in a first direction and a second acceptance angle in a second direction transverse to the first direction, said first acceptance angle being larger than said second acceptance angle;

an illumination system for providing light to each of a plurality of pixels of a region of the liquid crystal light valve at a first beam spread angle in said first direction and a second beam spread angle in the second direction with the first beam spread angle being larger than the second beam spread angle at each of said plurality of pixels of said region, said illumination system including a light source which is elongated generally in the first direction;

said liquid crystal light valve being capable of modulating the light provided to it by the illumination system; and

projection optics for receiving light from the liquid crystal light valve and projecting such light toward a projection surface.

5,467,208

LIQUID CRYSTAL DISPLAY

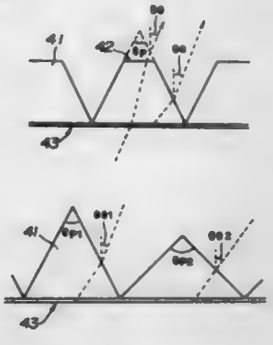
Shozo Kokawa; Michiharu Nishihara, and Yukikazu Sato, all of Yaita, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 1, 1993, Ser. No. 69,392

Claims priority, application Japan, Jun. 1, 1992, 4-165298; Sep. 2, 1992, 4-234556; Dec. 25, 1992, 4-345012; Jan. 21, 1993, 5-027457

Int. Cl.[6] G02F *1/13*

U.S. Cl. 359—49 **9 Claims**



1. A liquid crystal display comprising;

display means for displaying characters and graphics, said display means including a display portion comprising at least a liquid crystal panel including a plurality of picture elements and having a predetermined viewing angle in a front axial direction perpendicular to said panel;

illuminating means for illuminating the display portion of the liquid crystal panel; and

converging means for converging light rays from the illuminating means at the display portion of the liquid crystal panel,

said converging means including a prism lens comprising respective plurality of asymmetrical prisms having mutually different vertex angles for each of said picture elements for converging the light rays by refraction from the illuminating means at an angle within said viewing angle of the liquid crystal panel, thereby providing peak luminosity in the front axial direction.

5,467,209

FERROELECTRIC LIQUID CRYSTAL DEVICE WITH PARTICULAR LAYER THICKNESSES AT NON-PIXEL PORTIONS AND PIXEL PORTIONS

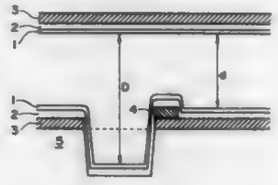
Yoshio Hotta; Yukio Hanyu, both of Atsugi; Tadashi Mihara, Isehara; Yasuto Kodera, Fujisawa, and Katsutoshi Nakamura, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

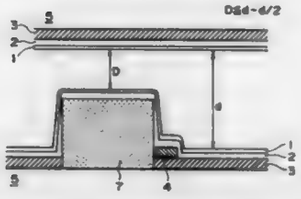
Filed Jan. 22, 1993, Ser. No. 8,607

Claims priority, application Japan, Jan. 24, 1992, 4-011025; Jan. 24, 1992, 4-032861

Int. Cl.[6] G02F *1/1333;1/141*

U.S. Cl. 359—74 **10 Claims**





1. A liquid crystal device, comprising: a pair of substrates each having thereon a group of display electrodes, and a chiral smectic liquid crystal disposed in a layer between the substrates, wherein the liquid crystal layer has a substantially uniform thickness d at a portion sandwiched by an opposite pair of display electrodes and a thickness D at a portion sandwiched by a display electrode on one substrate and a non-electrode portion between neighboring display electrodes on the other substrate, satisfying D–d≧d/2.

6. A liquid crystal device, comprising: a pair of substrates each having thereon a group of display electrodes, and a chiral smectic liquid crystal disposed in a layer between the substrates, wherein the liquid crystal layer has a thickness d at a portion sandwiched by an opposite pair of display electrodes, and only one of said pair of substrates is provided with a projection at a non-electrode portion between neighboring display electrodes so as to form a liquid crystal layer in a thickness D between the projection and a display electrode on the other substrate, satisfying d–D≧d/2.

5,467,210

ARRANGEMENT OF BONDING IC CHIP TO LIQUID CRYSTAL DISPLAY DEVICE

Masamitsu Kishigami, Kokubunji, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 7, 1994, Ser. No. 192,489

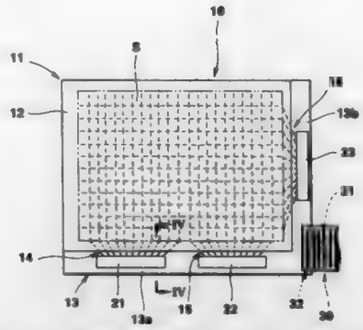
Claims priority, application Japan, Feb. 16, 1993, 5-051431; Jun. 1, 1993, 5-156052

Int. Cl.[6] G02F *1/1343*

U.S. Cl. 359—88 **20 Claims**

1. An arrangement of bonding IC chips to a liquid crystal display (LCD) device, comprising:

an LCD device including a first board-shaped transparent substrate and a second board-shaped transparent substrate opposite to each other, the first transparent substrate having a size larger than the second transparent substrate so that the first transparent substrate includes an extension beyond an edge of the second transparent substrate, a surface of said extension having first output wiring patterns formed thereon, each of the first output wiring patterns including a first output pad, said surface of said extension having first input wiring patterns formed thereon, each of the first input wiring patterns including a first input pad, said surface of said extension having



second output wiring patterns, each of the second output wiring patterns including a second output pad, said surface of said extension having second input wiring patterns formed thereon, each of the second input wiring patterns including a second input pad, the first and second input pads being positioned nearer to an edge of said surface of said extension than the first and second output pads, the IC chips being arranged along said surface of said extension, the first and second input wiring patterns extending along the direction of the arrangement of the IC chips and being electrically connected to the first and second input pads;

a first IC chip of the IC chips which includes output electrodes adjacent to and electrically connected to the first output pads and includes input electrodes adjacent to and electrically connected to the first input pads;

a second IC chip of the IC chips which includes output electrodes adjacent to and electrically connected to the second output pads and includes input electrodes adjacent to and electrically connected to the second input pads;

means for bonding the first output pads to the output electrodes of said first IC chip;

means for bonding the first input pads to the input electrodes of said first IC chip;

means for bonding the second output pads to the output electrodes of said second IC chip;

means for bonding the second input pads to the input electrodes of said second IC chip; and wherein

at least one of said first and second IC chips includes a pair of input electrodes connected to each other in the at least one IC chip and the input pads corresponding to the at least one IC chip comprise pads adjacent to and electrically connected to the pair of input electrodes of the at least one IC chip.

5,467,211

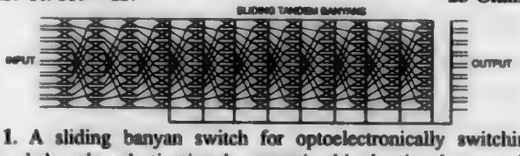
OPTOELECTRIC SLIDING BANYAN NETWORK

Michael W. Haney, Herndon, and Marc P. Christensen, Ashburn, both of Va., assignors to Capital Photonics, Inc., Washington, D.C.

Filed Jan. 25, 1995, Ser. No. 378,015

Int. Cl.[6] H04J *14/00*

U.S. Cl. 359—117 **23 Claims**



1. A sliding banyan switch for optoelectronically switching signals based on destination data contained in the signals, comprising:

N signal input lines for receiving N signals;

N signal output lines for transmitting the N signals;

N coplanar processing element arrays, each processing element array being on a single substrate and being connected to one of the N signal input lines and one of the N signal output lines, each processing element array having a plurality of light sources and light detectors and self-routing switching logic connected to said light detectors and input lines, the self-routing switching logic accepting a first signal from the N

signal input lines or the plurality of detectors and designating that the first signal be routed to one of the plurality of light sources based on decoding of the destination data in the first signal;

at least one mirror spaced from the coplanar processing element arrays so that light images from the light sources of the coplanar processing element arrays are passed along a light path back toward the coplanar processing arrays;

a plurality of shuffling lenses positioned in the light path for manipulating the images from the light sources of the coplanar processing arrays such that each of the plurality of light sources from the coplanar processing element arrays is imaged onto a separate individual one of the plurality of light detectors on the coplanar processing element arrays;

means for resolving conflicts between first signals designated to be routed to the same light source by designating one signal as successful and routing it to the designated light source, and designating the other signal as failed and routing the other signal to an alternate light source;

means for counting the number of consecutive successful routings for each signal;

means for deciding when the number of consecutive successful routings for a signal reaches a predetermined number; and

means for routing the successful signal to the signal output line connected to the processing element array where the successful signal was located when the determining means determines that the current number of successful routings reaches the predetermined number.

5,467,212

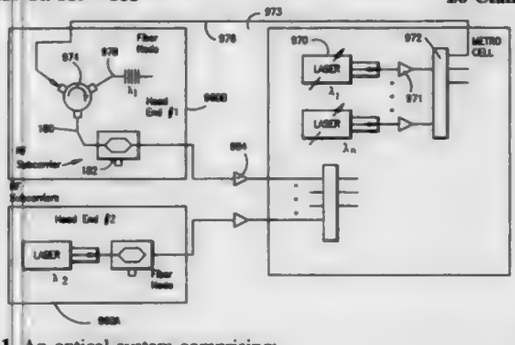
ADDRESSABLE GRATING MODULATION SYSTEM FOR OPTICAL CABLE TV SYSTEM

David R. Huber, 68 Country Club Dr., Warrington, Pa. 18976

Division of Ser. No. 71,263, Jun. 4, 1993. This application Dec. 30, 1994, Ser. No. 366,889

Int. Cl.[6] H04B *10/00*

U.S. Cl. 359—168 20 Claims



1. An optical system comprising:

a first tuneable laser at a first location for generating a first optical carrier;

a directional optical transfer device at a second location remote from the first location;

a first optical fiber operably connecting the first tuneable laser to the transfer device for carrying the first optical carrier thereon;

a second optical fiber operably connected to receive the first optical carrier by way of the transfer device;

an in-fiber grating in the second optical fiber for reflecting the first optical carrier when it is at a selected wavelength;

a third optical fiber operably connected to receive any reflected optical carrier from the transfer device; and

a first modulator connected to the third optical fiber for modulating any reflected optical carrier thereon with a first RF subcarrier.

5,467,213

OPTICAL TRUNK TRANSMISSION SYSTEM AND AN OPTICAL REPEATER CIRCUIT

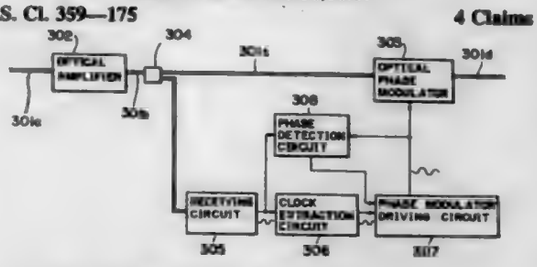
Kazuhisa Kaede, and Isamu Takano, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Division of Ser. No. 964,398, Oct. 21, 1992, Pat. No. 5,392,147. This application Oct. 13, 1994, Ser. No. 322,786

Claims priority, application Japan, Jan. 21, 1991, 3-271615; Jan. 21, 1991, 3-271617; Jan. 21, 1991, 3-271619

Int. Cl.[6] H04B *10/18;10/17*

U.S. Cl. 359—175 4 Claims



1. An optical repeater circuit comprising:

an optical amplifier means for optically amplifying an RZ intensity modulated signal light propagated through an optical fiber transmission path;

an optical branch circuit means for branching a part of an output light of said optical amplifier means;

an optical phase modulator means connected with a first output terminal of said optical branch circuit, for phase-modulating an output light of said optical branch circuit means and outputting a phase-modulated signal light to an outlet optical fiber transmission path;

a receiving circuit means connected with a second output terminal of said optical branch circuit, for converting an output light of said optical branch circuit means to an electric signal;

a timing extraction circuit means for extracting a timing signal from said electric signal of said receiving circuit means;

an optical phase modulator driving circuit means for setting said timing signal in a predetermined amplitude of voltage, as well as setting said timing signal in a predetermined phase based on a phase difference signal and driving said optical phase modulator; and

a phase detection circuit means for detecting a phase difference between an output signal phase of said optical phase modulator driving circuit means and an envelope signal phase of the input signal into said optical phase modulator means, and outputting said phase difference as said phase difference signal.

5,467,214

BIREFRINGENCE-COMPENSATED ALIGNMENT-INSENSITIVE FREQUENCY DOUBLER

Lee O. Heflinger, Torrance; William W. Simmons, Rancho Palos Verdes; Randall J. St. Pierre, Santa Monica, and Hagop Injeyan, Glendale, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 12, 1993, Ser. No. 152,647

Int. Cl.[6] H01S *3/10;* G01J *1/20*

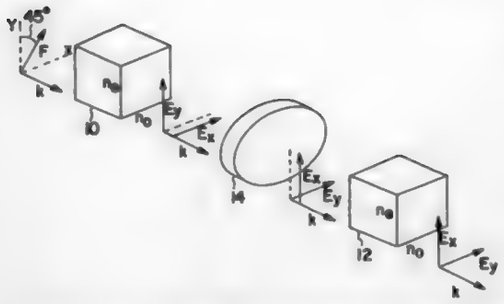
U.S. Cl. 359—238 9 Claims

1. A birefringence-compensated frequency multiplier assembly, comprising:

a first frequency multiplier crystal positioned to receive a light beam at a fundamental frequency and to produce an output beam containing a harmonic frequency component and a residual fundamental frequency component;

a polarization rotator positioned to receive the output beam and to rotate the polarization angle of the residual fundamental frequency component by an odd multiple of 90°; and

a second frequency multiplier crystal of the same length as the first, positioned to receive the output beam from the polarization rotator, wherein the first and second frequency multiplier



crystals have corresponding crystallographic axes oriented parallel to each other;

wherein random birefringence introduced in the first frequency multiplier crystal is substantially canceled in the second frequency multiplier crystal, and this birefringence compensation is relatively insensitive to changes in angular alignment of the assembly.

5,467,215

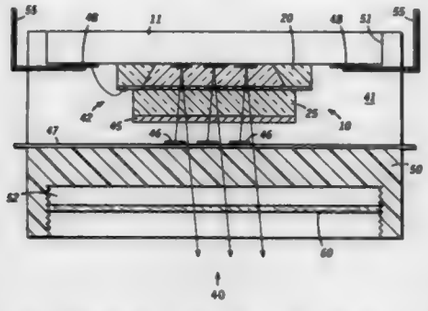
INTEGRATED ELECTRO-OPTIC PACKAGE FOR REFLECTIVE SPATIAL LIGHT MODULATORS

Michael S. Lebby, Apache Junction; George R. Kelly, Gilbert, and Karen E. Jachimowicz, Laveen, all of Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Dec. 21, 1994, Ser. No. 360,510

Int. Cl.[6] G02F *1/133*

U.S. Cl. 359—247 **25 Claims**



1. An integrated electro-optic package for reflective spatial light modulators comprising:

an array of reflective spatial light modulator pixels formed on a substrate with each pixel including a control circuit formed in the substrate, each control circuit including control terminals adjacent an outer edge of the substrate, a mirror positioned on the substrate in overlying relationship to the control circuit, and spatial light modulator material positioned in overlying relationship to the mirror so that light passing through the spatial light modulator material is reflected back through the spatial light modulator material;

a light polarizing layer positioned in overlying relationship to the array of reflective spatial light modulator pixels;

a light source mounted in an optically clear support positioned in overlying relationship to the array of reflective spatial light modulator pixels with the light source spaced from the array of reflective spatial light modulator pixels, so that light from the light source substantially evenly illuminates the array of reflective spatial light modulator pixels and allows passage of reflected light from the array of reflective spatial light modulator pixels through the optically clear support; and a diffuser mounted in overlying relationship to the optically clear support to form an image plane for reflected light from the array of reflective spatial light modulator pixels.

5,467,216

SPATIAL LIGHT MODULATION DEVICE

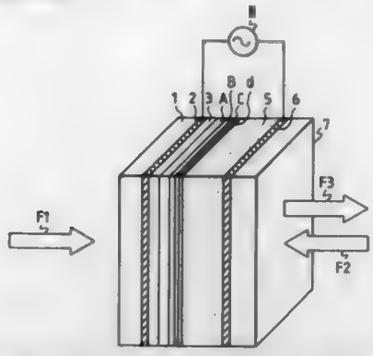
Masanobu Shigeta; Dai Imanishi, both of Yokosuka, and Shigeo Shimizu, Yokohama, all of, Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jan. 31, 1994, Ser. No. 188,982

Claims priority, application Japan, Jan. 29, 1993, 5-034945

Int. Cl.[6] G02F *1/03;1/1335;1/135*

U.S. Cl. 359—263 **6 Claims**



3. A spatial light modulation device having light writing means, a photoconductor, reflection means and a light modulator, the reflection means having a first dielectric mirror, information being written to the photoconductor by the light writing means, the reflection means reflecting read light which is incident on the light modulator, the spatial light modulation device further comprising:

a second dielectric mirror with a film having a layer thickness of a quarter of a wavelength close to a wavelength of a write light incident on the photoconductor, for reflecting lights having wavelengths near the write light; and

a third dielectric mirror adjoining to the light modulator for reflecting the read light.

5,467,217

LIGHT VALVE SUSPENSIONS AND FILMS CONTAINING UV ABSORBERS AND LIGHT VALVES CONTAINING THE SAME

Joseph A. Check, III, West Bayshore; Robert L. Saxe, New York; Robert L Thompson, Plainview; Matthew Forlini, Ozone Park, and Steven M. Slovak, Hicksville, all of N.Y., assignors to Research Frontiers Incorporated, Woodbury, N.Y.

Continuation-in-part of Ser. No. 972,826, Nov. 6, 1992, and Ser. No. 972,830, Nov. 6, 1992, which is a continuation-in-part of Ser. No. 786,511, Nov. 1, 1991, abandoned, said Ser. No. 972,826is a continuation-in-part of Ser. No. 786,511, Nov. 1, 0. This application May 11, 1993, Ser. No. 59,980

Int. Cl.[6] G02F *1/01*

U.S. Cl. 359—296 **24 Claims**

1. A liquid light valve suspension, which comprises particles suspended in a liquid suspending medium, the liquid suspending medium having dissolved therein a UV-absorbing effective amount of a benzotriazole derivative.

5,467,218

OPTICAL FIBER AMPLIFIER

Keiko Takeda; Shinya Inagaki; Kenji Tagawa, and Kazuya Sasaki, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

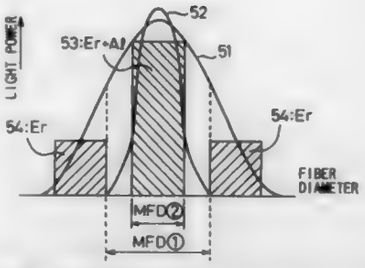
Filed Jul. 29, 1994, Ser. No. 281,998

Claims priority, application Japan, Dec. 17, 1993, 5-318358

Int. Cl.[6] H01S *3/06*

U.S. Cl. 359—341 **27 Claims**

1. An optical fiber amplifier for amplifying signal light using pump light, comprising an optical fiber and an optical coupler for guiding the optical signals and pump light to the optical fiber,



the optical fiber having an erbium-aluminum-doped core center where the field diameter of the signal light overlaps that of the pump light and an erbium-doped annular section outside the field diameter of the pump light,

the wavelength of the signal light being in the a 1.5- micrometer band, and that of the pump light corresponding to the absorption band of erbium.

5,467,219

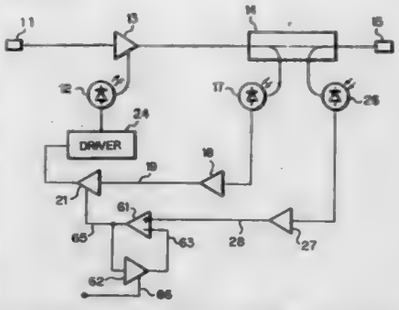
CONTROL DEVICE FOR AN OPTICAL AMPLIFIER

Mizuyuki Ushirozawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 28, 1995, Ser. No. 395,445

Int. Cl.[6] G02B *6/26;* **G02F** *1/39;* **H04B** *10/00;* **H01S** *3/10*

U.S. Cl. 359—341 **4 Claims**



1. A control device for an optical amplifier, comprising:

an optical fiber to which a rare-earth element is added as a medium for amplifying an optical signal;

an exciting light source for exciting said optical fiber;

driving means for driving said exciting light source;

output power detecting means for detecting output power of said optical fiber;

reflected light power detecting means for detecting reflected light power associated with an output of said optical fiber;

comparing means for comparing said reflected light power with a predetermined threshold;

output control means for receiving said output power and a result of comparison output from said comparing means, and for controlling said driving means such that when said reflected light power does not exceed said threshold, said output power remains at a predetermined value while, when said reflected light power exceeds said threshold, said output power decreases; and

threshold changing means for lowering, when said reflected light power exceeds said threshold, said threshold to a predetermined level or restoring, when said reflected light power increases to above the lowered threshold, said threshold to an original level.

5,467,220

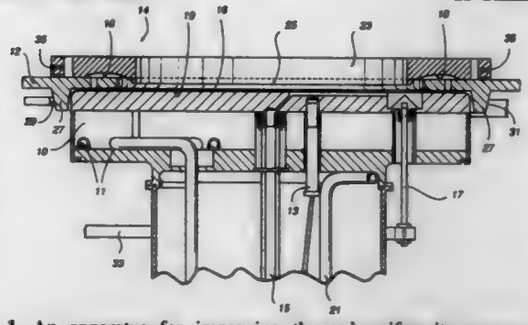
METHOD AND APPARATUS FOR IMPROVING SEMICONDUCTOR WAFER SURFACE TEMPERATURE UNIFORMITY

Zheng Xu, Foster City, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Feb. 18, 1994, Ser. No. 198,726

Int. Cl.[6] G02B *5/10;* **F27D** *11/00*

U.S. Cl. 359—350 **11 Claims**



1. An apparatus for improving thermal uniformity across a semiconductor wafer surface during wafer heating, comprising:

an annular yoke having a yoke surface positioned proximate to said wafer in spaced facing relation thereto; said yoke surface defining a concave circumferential reflector; said reflector positioned proximate to and coincident with said wafer surface, wherein said reflector is positioned relative to a wafer edge to reflect thermal energy radiated from said wafer edge back thereto, and wherein said yoke is placed atop a ring-like wafer clamping assembly, such that an innermost portion of the reflector surface overhangs, and extends below an upper surface of, said clamping assembly and thereby provides maximum reflection of heat to said wafer surface.

5,467,221

MULTI-SCREEN PROJECTOR

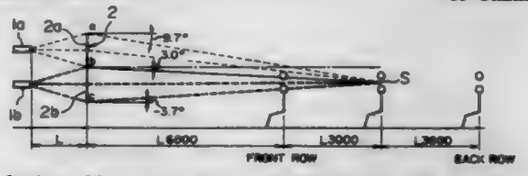
Yoshiaki Iwahara, Yokosuka; Shoji Kuroda, Odawara; Shuichi Sakamoto, and Masanori Ogino, both of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 15, 1994, Ser. No. 290,146

Claims priority, application Japan, Nov. 30, 1993, 5-300289

Int. Cl.[6] G03B *21/56*

U.S. Cl. 359—449 **13 Claims**



1. A multi-screen projector having unit module projectors stacked at two higher and lower stages in the vertical direction, each unit module projector having a screen with a Fresnel sheet means disposed on an input side thereof and with a lenticular sheet means disposed on the output side thereof, the multi-screen projector comprising:

a prism sheet means interposed between said Fresnel sheet means and said lenticular sheet means of each said screen, wherein

a higher stage Fresnel sheet means of said Fresnel sheet means of said screen for a higher stage unit module projector and a lower stage Fresnel sheet means of said Fresnel sheet means of said screen for a lower stage unit module projector, are formed to have substantially the same shape;

a higher stage prism sheet means of said prism sheet means of said screen for a higher stage unit module projector and a lower stage prism sheet means of said prism sheet means of said screen for a lower stage unit module projector, are formed to have substantially the same shape; and

the direction of the main output light from the lower end of said screen for a higher stage unit module projector and the direction of the main output light from the upper end of said screen for a lower stage unit module projector, are set to be substantially the same, and the main output light from the screen for a higher stage unit module projector and the main output light from the screen for a lower stage unit module projector, are converged to substantially the same point on an audience side, respectively by the functions of said Fresnel sheet means and said prism sheet means.

5,467,222

FOLDABLE OUTSIDE REARVIEW MIRROR

Katsuyoshi Oishi, Shizuoka, Japan, assignor to Eiji Murakami, Shizuoka, Japan

Division of Ser. No. 736,080, Jul. 26, 1991, Pat. No. 5,384,660.
This application Dec. 14, 1994, Ser. No. 331,342
Claims priority, application Japan, Jun. 17, 1991, 3-53564
Int. Cl.[6] G02B 7/182; B60R 1/06
U.S. Cl. 359—841 1 Claim

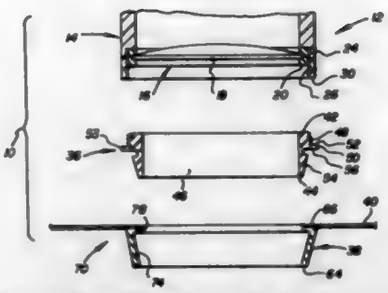
1. A foldable outside rearview mirror assembly, comprising a mirror body; a base having an extending portion; a shaft arranged on said extending portion of said base and having a root portion; a frame rotatably supported on said root portion of said shaft, said frame having an end plate which is rotatably and slidably contacting a surface of said extending portion of said base and receiving said root portion of said shaft; a positioning device attached to an upper surface of said end plate; a coil spring arranged around a periphery of said shaft to elastically contact said end plate with an upper surface of said extending portion of said base, said positioning device including a guide plate engaged with said shaft for locking a rotation of said guide plate, a plurality of small apertures provided on the peripheral surface of said guide plate, a plurality of steel balls loosely inserted through each of said apertures, concave portions provided on an upper surface of said end plate to receive said steel balls, a washer pressed to contact with an upper portion of said steel balls by an elasticity of said coil spring, said end plate of said frame retaining a surface contact with said extending portion of said base in case of said mirror body rotating to an erected or folded position.

5,467,223

DRAPE ADAPTER

John T. Cleveland, Jr., and Benjamin M. Rubin, both of Jacksonville, Fla., assignors to Xomed-Treace Inc., Jacksonville, Fla.

Filed Dec. 16, 1993, Ser. No. 168,801
Int. Cl.[6] G03B 11/04; B65D 85/38
U.S. Cl. 359—510 18 Claims



1. A system for positioning a microscope drape on a microscope having a lens housing with a lens unit comprising,

an adapter member attachable to a microscope lens housing with a lens unit and having first engaging means for detachable engagement with said lens housing without connection to the lens unit such that the adapter member can be secured to the lens housing in tandem with the lens unit, said adapter member having second engaging means for detachable securement with a microscope drape, and

a drape positioning member of a microscope drape having third engaging means detachably engagable with the second engaging means of said adapter member to secure the drape positioning member to the adapter member, whereby the microscope drape can be initially located on the adapter member when the adapter member is secured to the lens housing,

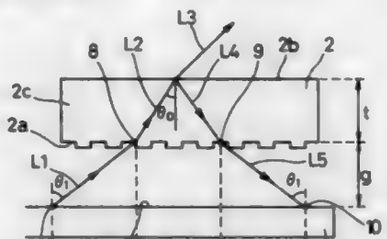
said adapter member and said drape positioning member being of annular shape, said second engaging means of said adapter member being configured with the shade of an outer surface of a conical frustum and the third engaging means of the drape positioning member being configured with the shape of an inner surface of a hollow conical frustum adapted to embrace and grip the outer frustum surface of said adapter member.

5,467,224

OPTICAL LOW PASS FILTER AND IMAGING DEVICE USING THE SAME

Ikuo Ohnishi, and Katsuya Fujisawa, both of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Nov. 3, 1993, Ser. No. 145,139
Claims priority, application Japan, Nov. 6, 1992, 4-297221
Int. Cl.[6] G02B 5/08;5/26
U.S. Cl. 359—614 4 Claims



1. An optical low pass filter which comprises:

a transparent substrate having first and second surfaces opposite to each other, said first surface of the transparent substrate being formed with a diffraction grating, said optical low pass filter being adapted to be disposed between a photo-taking lens and a solid-state imaging element with the first surface confronting the solid-state imaging element, said substrate having a thickness t (mm) which satisfies the following equation:

$$2 \cdot g \cdot \tan(\theta 1) + 2 \cdot t \cdot \tan(\theta c) < .45$$

wherein g represents the distance of spacing between the first surface of the transparent substrate and an image plane of the solid-state imaging element; θc represents the critical angle at the second surface of the transparent substrate; and θ1 represents the

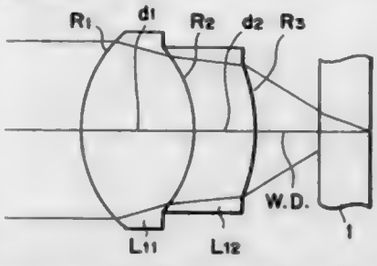
angle of emission of a first-order diffracted light which takes place when light passing through the transparent substrate is incident on the first surface at the critical angle θc.

5,467,225

OBJECTIVE LENS FOR AN OPTICAL DISK DRIVE

Yuji Manabe, Kamakura, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 957,382, Oct. 7, 1992, abandoned. This application Nov. 1, 1994, Ser. No. 331,879
Claims priority, application Japan, Jan. 11, 1991, 3-292470
Int. Cl.[6] G02B 21/02;3/02;9/04
U.S. Cl. 359—661 5 Claims



1. An objective lens for an optical disk drive consisting of a biconvex positive lens and a meniscus negative lens arranged in this order as viewed toward an optical disk and cemented together, wherein the cementing surface is spherical and other surfaces are aspherical, and the lenses meet the conditions of:

(1) $\nu_1>70$

(2) $n_1>1.55$

(3) $\nu_1-\nu_2>45$

(4) $1.1<(-r_2/(f\cdot NA)<1.5$

where ν_1 is an Abbe's number of the positive lens, ν_2 is an Abbe's number of the negative lens, n_1 is a refractive index on a d line of the positive lens, r_2 is a radius of curvature of the cementing surface, f is a combined focal distance of said objective lens and NA is a numerical aperture of said objective lens.

5,467,226

OPTICAL APPARATUS HAVING A LENS FOR ZOOMING MOVABLE TO A ZOOM AREA AND A MACRO AREA

Takashi Watanabe, Fuchu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

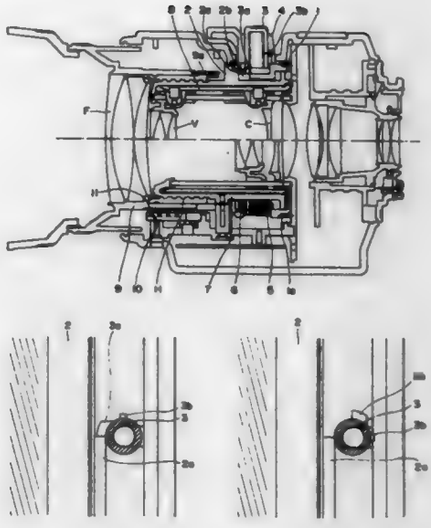
Continuation of Ser. No. 760,688, Sep. 16, 1991, abandoned. This application Sep. 14, 1993, Ser. No. 121,215
Claims priority, application Japan, Sep. 18, 1990, 2-249629
Int. Cl.[6] G02B 7/10
U.S. Cl. 359—693 18 Claims

1. An optical apparatus comprising:

(a) a lens for zooming movable to a zoom area and a macro area;

(b) a lens moving mechanism for moving said lens from said zoom area to said macro area; and

(c) stopper means to be changed over to a first state in which the movement of said lens from said zoom area to said macro area is prohibited and a second state in which the prohibition is released, means being provided so that said second state of said stopper means can be maintained.

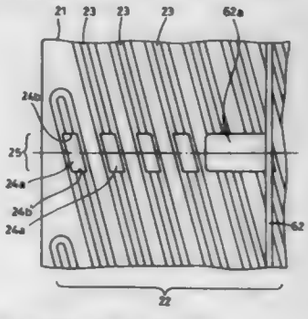


5,467,227

ZOOM LENS BARREL

Hiroshi Nomura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1994, Ser. No. 179,671
Claims priority, application Japan, Jan. 13, 1993, 5-004257
Int. Cl.[6] G03B 1/18; G02B 15/14
U.S. Cl. 359—694 18 Claims



16. A zoom lens barrel, comprising:

a pair of cylindrical members which are engaged with respective helicoid and are rotatable with respect to one another;

one of said helicoid being a discontinuous helicoid having a key way formed on said discontinuous helicoid which are aligned in a direction parallel with an optical axis of said lens barrel;

wherein a discontinuous linear guide groove is formed by a plurality of key grooves, wherein said guide groove is extended in a direction parallel to said optical axis of said zoom lens, and wherein the other of said helicoid mates with said one of said helicoid to block light from entering said discontinuous linear guide groove.

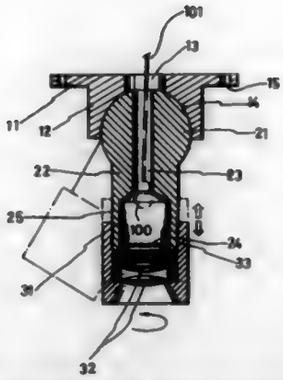
5,467,228

LIGHT CONTROL DEVICE

James Lin, Taipei Hsien, Taiwan, Prov. of China, assignor to Taiwan Line Tek Electronic Co., Ltd., Taipei Hsien, Taiwan, Prov. of China

Filed Jun. 15, 1994, Ser. No. 260,733
Int. Cl.[6] G02B 7/02
U.S. Cl. 359—822 3 Claims

1. A device for adjustably mounting a photosensitive element comprising:



a) a base frame including a flat base and a ball socket extending perpendicularly from the flat base and defining a half-round recess, and a center hole extending through the flat base and ball socket;

b) an elongate core member including a ball head pivotally mounted within the ball socket and an outer threaded portion, a longitudinal passage extending through the ball head and outer threaded portion, and a first lens mounted within the longitudinal passage;

c) the center hole and longitudinal passage being disposed in alignment for receiving a photosensitive element and wire assembly therethrough;

d) a socket shell including an inner thread engaged on the outer threaded portion of the core member, a longitudinal hole aligned with the longitudinal passage of the core member, and a second lens mounted within the longitudinal hole of the socket shell; and

e) whereby the focus of the first and second lenses may be adjusted by rotating the socket shell relative to the core member to increase or decrease the distance between the first and second lenses, and the detecting direction of the photosensitive element may be adjusted by pivoting the core member relative to the base frame.

5,467,229

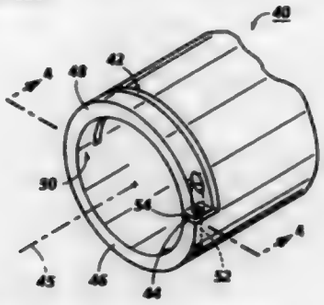
ADJUSTABLE LASER DIODE LENS ASSEMBLY

Karen M. Rumsey, Redondo Beach; Patrick Y. Maeda, Palo Alto, and Vincent W. AuYeung, Temple City, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 19, 1994, Ser. No. 358,507

Int. Cl.[6] G02B 7/02

U.S. Cl. 359—822 **15 Claims**



1. An adjustable lens assembly comprising:

a housing member;

a laser diode mounted within said housing member at a fixed position;

a lens barrel member for said laser diode;

a portion of one of said members being received within a portion of the other said member;

coacting means on said members for providing a relative movement between said members for adjustment of said lens barrel member relative to said laser diode;

said portion of said other member having a gripping means for gripping said one member to fix the position of said members relative to each other;

said portion of said other member comprising a hollow cylinder having a cylindrical wall and an axis;

said cylinder having two axially spaced ends;

said cylinder having a circumferential slit extending through said cylindrical wall;

said circumferential slit having circumferentially spaced apart ends;

an axial slit extending generally in a direction of the axis of said cylinder and through the wall of said cylinder from one of said cylinder ends to one of said ends of said circumferential slit;

said circumferential slit and said axial slit defining said gripping means which is detached from a main portion of said cylinder along said slits and integral with the main portion of said cylinder at the other of said ends of said circumferential slit whereby said gripping means is free to move relative to the main portion of said cylinder to grip said one member; and

means extending through said gripping means, across said axial slit and into said wall of the main portion of said cylinder for moving said gripping means toward the main portion of said cylinder for gripping said one member.

5,467,230

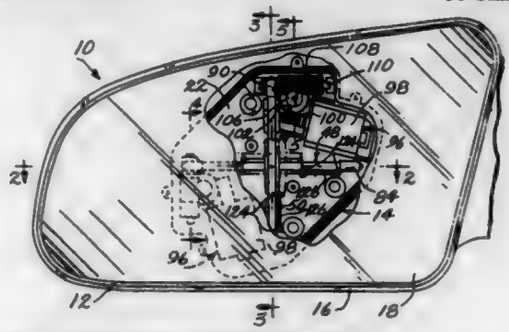
DUAL PIVOTED MEMBER MOUNT FOR MIRROR

Ian Boddy, Ada, and Donald S. Rawlings, Livonia, both of Mich., assignors to Lowell Engineering Corp., Alto, Mich.

Filed Aug. 16, 1993, Ser. No. 106,883

Int. Cl.[6] B60R 1/06

U.S. Cl. 359—874 **36 Claims**



14. A rearview mirror assembly comprising

a mirror unit having a mirror side and an opposite side,

a mirror unit support disposed on the opposite side of said mirror unit,

a first member mounted on said support for pivotal movement between limits with respect to said support about a first axis,

said first member including a first pair of spaced arms extending from said support toward said mirror unit and forming first spaced connections with the opposite side of said mirror unit at positions spaced in opposite directions from said first axis, said first member being constructed and arranged to enable limited pivotal movement of said mirror unit with respect to said first member about a second axis disposed in generally intersecting perpendicular relation with said first axis,

a second member mounted on said support for pivotal movement between limits with respect to said support about said second axis,

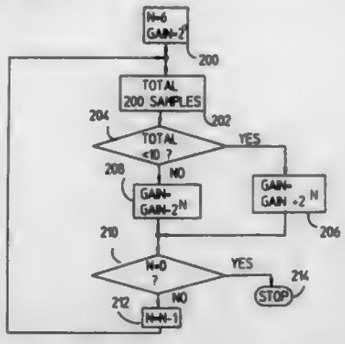
said second member including a second pair of spaced arms extending from said support toward said mirror unit and forming second spaced connections with the opposite side of said mirror unit at positions spaced in opposite directions from said second axis, said second member being constructed and arranged to enable limited pivotal movement of said mirror unit with respect to said second member about said first axis, and

a manually controlled mirror unit moving mechanism carried in part by said support for effecting a desired movement of said mirror unit together with a corresponding movement of either one or both of said first and second members with respect to said support in response to a remote manual movement by a user.

5,467,231
USING RECORDED DATA FOR AUTO CALIBRATION OF FIXED GAIN OF A READ AMPLIFIER IN A DATA STORAGE DEVICE

Mark E. Nash, Lyons, and Ronald R. Kennedy, Fort Collins, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 23,532, Feb. 26, 1993, abandoned. This application Oct. 13, 1994, Ser. No. 322,964
Int. Cl.[6] G11B *5/09;5/02*
U.S. Cl. 360—46 **7 Claims**



1. A calibration system in a data storage system, having an analog data signal amplified by an amplifier, the amplifier having a gain that is variable, the calibration system adjusting the gain to a fixed calibrated gain before extracting data from the analog data signal using the fixed calibrated gain, the calibration system comprising:

the analog data signal having a data pattern that is unknown;

a threshold that is predetermined;

a reference fraction that is predetermined;

the amplifier having a gain control input;

the amplifier receiving the analog data signal and generating an amplified signal,

the amplified signal having peak amplitudes; and

means for adjusting the gain, the means for adjusting receiving the amplified signal and the threshold and having a gain control output controlling the amplifier gain control input, the means for adjusting changing the gain until a fraction of the peak amplitudes exceeding the threshold exceeds the reference fraction.

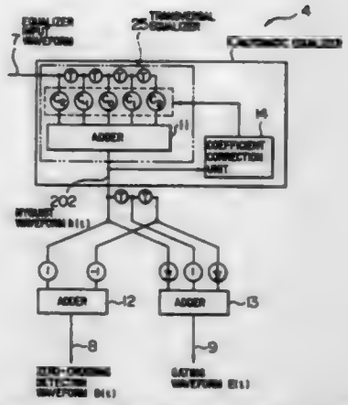
5,467,232
MAGNETIC RECORDING AND REPRODUCING METHOD USING PHASE DISCRIMINATION AND APPARATUS THEREFOR

Yasuhide Ouchi, Kodaira; Naoki Sato, Kokubunji; Hideki Sawaguchi, Kodaira, and Yosuke Hori, Hiratsuka, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1993, Ser. No. 36,280
Claims priority, application Japan, Mar. 24, 1992, 4-065789
Int. Cl.[6] G11B *5/035;5/09;27/10;* H03H *7/30*
U.S. Cl. 360—65 **22 Claims**

6. A magnetic recording and reproducing apparatus for reproducing a digitally recorded signal by using a phase discriminator, said apparatus comprising:

a phase discrimination transversal equalizer for transforming a reproduced output waveform of a magnetic head corresponding to an isolated magnetization reversal to a dy-bit waveform which is a waveform for a zero-crossing detection; and



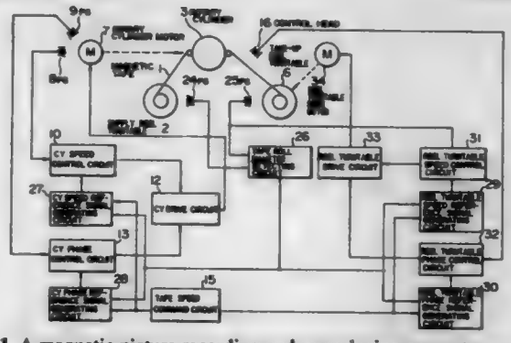
a signal processing circuit for discriminating a zero-crossing point of said dy-bit waveform as bit "1";

wherein said phase discrimination transversal equalizer includes a signal processing circuit for adding a plurality of Nyquist waveforms having positive and negative polarities and staggered in time.

5,467,233
MAGNETIC RECORDING AND REPRODUCING APPARATUS FOR REPRODUCING A MAGNETIC TAPE BEING FED AT HIGH SPEED

Tadashi Yoshino, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 609,730, Nov. 6, 1990, abandoned. This application Aug. 30, 1993, Ser. No. 113,352
Claims priority, application Japan, Nov. 10, 1989, 1-291228
Int. Cl.[6] G11B *15/52*
U.S. Cl. 360—70 **8 Claims**



1. A magnetic picture recording and reproducing apparatus comprising:

reel driving means for driving a pair of reel turntables, respectively engaging with reel hubs of a pair of reels having a magnetic tape wound thereon, each of said turntables rotating with one of said reels in a direction so as to take up said magnetic tape onto at least one of said reels;

rotary cylinder driving means for driving a rotary cylinder disposed between said pair of reel turntables;

rotation speed detecting means for detecting a rotation speed of said pair of reel turntables;

rotation phase detecting means for detecting a rotational phase of said pair of reel turntables;

tape roll diameter detecting means for detecting roll diameters of tape respectively wound on said pair of reels, based on the output of said rotation speed detecting means;

speed command means for outputting a desired magnetic tape speed;

reference generating means for generating a reference speed and a reference phase respectively for said rotary cylinder based

on the output of said tape roll diameter detecting means and the output of said speed command means;

reference setting means for setting a reference speed and a reference phase for said pair of reel turntables;

detecting means for detecting the rotation speed and the rotation phase respectively of said rotary cylinder;

means, operatively associated with said detecting means which detects the rotation speed and the rotation phase respectively of said rotary cylinder and said reference generating means, for comparing the detected rotation speed of said rotary cylinder with the reference speed for said rotary cylinder and for generating a rotary cylinder speed error signal;

means, operatively associated with said detecting means which detects the rotation speed and the rotation phase respectively of said rotary cylinder and said reference generating means, for comparing the detected rotation phase of said rotary cylinder with the reference phase for said rotary cylinder and for generating a rotary cylinder phase error signal;

means for controlling the rotary cylinder driving means to control the rotation speed and the rotation phase respectively of said rotary cylinder on the basis of said rotary cylinder speed error signal and said rotary cylinder phase error signal;

means, operatively associated with said rotation speed detecting means and said reference setting means, for comparing the detected rotation speed of said pair of reel turntables with the reference speed of said pair of reel turntables and generating a reel turntable speed error signal;

means, operatively associated with said rotation phase detecting means and said reference setting means, for comparing the detected rotation phase of said pair of reel turntables with the reference phase of said pair of reel turntables and for generating a reel turntable phase error signal; and

means for controlling the reel driving means to control the speed and the phase respectively of one of the reel turntables located on a tape take-up side based on said reel turntable speed error signal and said reel turntable phase error signal.

5,467,234

IDLER CONTROLLING APPARATUS OF A MAGNETIC RECORDING/REPRODUCING APPARATUS

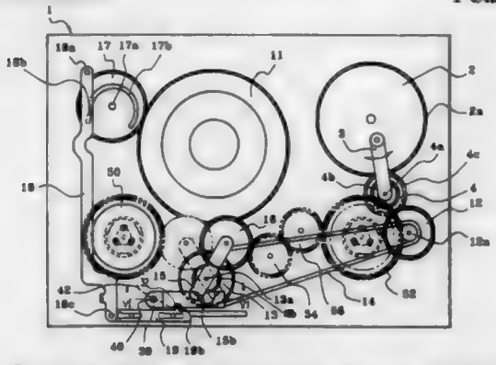
Gun C. Park; Do Y. Choi, and Young H. Cho, all of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Jul. 26, 1994, Ser. No. 280,611

Claims priority, application Rep. of Korea, Jul. 26, 1993, 93-14174

Int. Cl.[6] G11B *5/027;15/00*

U.S. Cl. 360—85 **1 Claim**



1. In a magnetic recording/reproducing apparatus of the type having an upper chassis which is seated on a lower chassis for loading a cassette tape onto a drum, a driving source, a driving gear which is selectively driven in the forward and reverse directions by said driving source to thereby pivot an idler into selective gearing engagement with a supply reel and a take-up reel, respectively, provided on said upper chassis, and a cam gear means operated by said driving source, the improvement comprising:

idler controlling means operated by said cam gear means for guiding said idler to a central position where said idler will not interfere with components on said upper chassis when said upper chassis is being seated on said lower chassis, and for guiding the pivoting of said idler during tape running operations of said apparatus, said idler controlling means further comprising:

a pin on said idler;

an idler cam having a cam surface, said idler cam biased in a first rotational direction to permit said pin to follow said cam surface as said idler is pivoted to the right and left, said cam surface being contoured so as to facilitate centering of said pin with respect to said cam surface; and

eject lever means for pushing said idler cam in an rotational direction opposite said bias direction to substantially lock said pin at a certain position along said cam surface, thereby moving said idler to said central position.

5,467,235

LID MECHANISM, FOR RECORDING-MEDIUM INSERTION OPENING, HAVING LID DEFORMATION CONTROL CONSTRUCTION

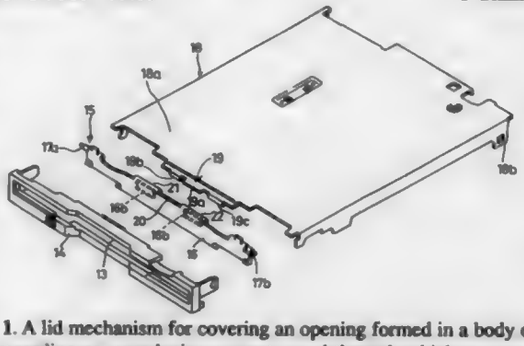
Takashi Watanabe, Ichikawa, Japan, assignor to TEAC Corporation, Japan

Filed Nov. 4, 1993, Ser. No. 147,684

Claims priority, application Japan, Dec. 25, 1992, 4-089018 U

Int. Cl.[6] G11B *17/04*

U.S. Cl. 360—99.06 **6 Claims**



1. A lid mechanism for covering an opening formed in a body of a recording or reproducing apparatus and through which a recording medium means is inserted into, and removed from, the body, said lid mechanism comprising:

a lid rotatably supported in said body solely at pivot points formed on opposite ends of said lid, said pivot points forming a rotational axis for said lid that lies along an edge of said lid and that is positioned proximate to a peripheral edge of the opening, said lid having a generally planar covering portion extending from said rotational axis across said opening to cover said opening, said lid being contacted by the recording medium means when the recording medium means is being inserted in the body and pivoted about said rotational axis inwardly into the body to uncover said opening and allow the recording medium means to be inserted in the body along an insertion axis, said lid being subject to deforming forces, as a result of being contacted by the recording medium means, which cause said rotational axis and covering portion to become bowed so as to move central portions of said lid inwardly of the body, said lid having an engaging portion located proximate to said rotational axis in the central portions of said lid; and

a lid deformation preventing member mounted on the inside of the body adjacent said engaging portion of said lid, said lid deformation preventing member being spaced behind said engaging portion by a predetermined distance in a direction parallel to the axis of insertion of the recording medium means into the body, said lid deformation preventing member extending from said inside of said body transversely of said parallel direction to engage said engaging portion of said lid

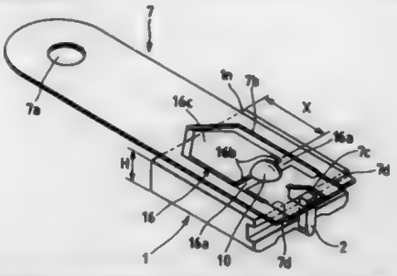
when said lid is subjected to deforming forces to limit the deformation of said lid.

5,467,236

GAPPED FLEXURE TONGUE FOR FLOATING TYPE MAGNETIC HEAD APPARATUS

Takashi Hatanai, Nagaoka, and Akira Takahashi, Mitsuke, both of, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1994, Ser. No. 274,670
Claims priority, application Japan, Jul. 15, 1993, 5-197997
Int. Cl.[6] G11B *5/48;21/20*
U.S. Cl. 360—104 **2 Claims**



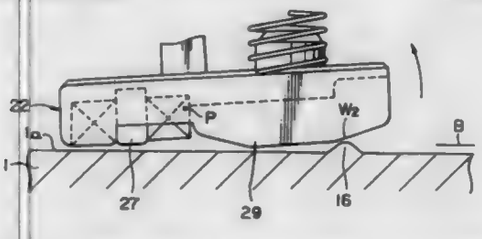
1. A floating type magnetic head apparatus comprising:
a load beam having a base portion and a free end;
a flexure connected to the load beam, the flexure having a cantilevered portion extending from the free end of the load beam, the flexure including a tongue piece including:
a first portion connected to the cantilevered portion and extending in a first direction toward the base portion of the load beam,
a protrusion connected to the first portion, the protrusion contacting the load beam adjacent the free end such that the tongue piece is bent away from the load beam, and
a second portion having a front edge connected to the protrusion; and
a magnetic head connected to the second portion of the tongue piece;
wherein gaps are formed between the front edge of the second portion and the first portion, the gaps being located on opposite sides of the protrusion; and
wherein the edge of the second portion is aligned in a second direction and intersects the protrusion, the second direction being perpendicular to the first direction.

5,467,237

SLIDING TYPE MAGNETIC HEAD FOR MAGNETO-OPTICAL RECORDING

Tomoyuki Takahashi, Miyagai, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 982,295, Nov. 25, 1992, abandoned. This application Dec. 5, 1994, Ser. No. 349,454
Claims priority, application Japan, Dec. 13, 1991, 3-330634; Feb. 10, 1992, 4-023964; Jun. 16, 1992, 4-157040
Int. Cl.[6] G11B *5/58*
U.S. Cl. 360—114 **5 Claims**



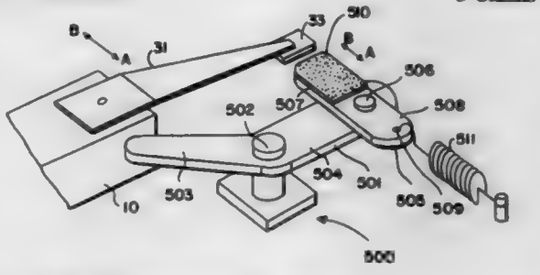
3. A sliding type magnetic head for magneto-optical recording, comprising:
a head body including a head element including a coil and a magnetic core, said head body further including a sliding element on one side of said head body for slidably contacting with a record medium, said head body further including said core and magnetic coil on another side of said head body;
means for pivotably mounting said head body for pivotable movement about an axis of rotation between said sliding element and said head element; and
a spring means for resiliently biasing said head body in a direction pressing said sliding element of said head body against a surface of a record medium and for spacing said head element away from the surface of the record medium, wherein said magnetic core moves toward the record medium as said sliding element moves away from the record medium due to striking a bump on the record medium.

5,467,238

CLEANING APPARATUS FOR HEADS OF DATA STORAGE DISKS

Neville K. Lee, Sherborn, and Hisashi Katao, Shrewsbury, both of Mass., assignors to Quantum Corporation, Milpitas, Calif.

Continuation of Ser. No. 88,293, Jul. 6, 1993. This application Aug. 19, 1994, Ser. No. 293,106
Int. Cl.[6] G11B *5/41*
U.S. Cl. 360—128 **5 Claims**



1. A head cleaning apparatus, comprising:
a base;
a read/write head;
a disk rotatably journalled to the base;
an actuator movably mounted relative to the base and carrying said head in operable relationship with the disk, movement& of said actuator for positioning said head relative to said disk and for placing said head into a cleaning contact relationship with a cleaning pad;
a substantially V-shaped lever having a first end and a second end, said substantially V-shaped lever being pivotably mounted to the base along an outer periphery of the disk such that the substantially V-shaped lever pivots about a pivot axis located intermediate the first end and the second end when the actuator contacts the first end of the substantially V-shaped lever upon unloading the read/write head from the disk:
a middle portion of a planar element pivotally mounted on the second end of the substantially V-shaped lever;
the cleaning pad mounted at one end of the planar element such that as the actuator unloads the read/write head from the disk and contacts and pivots the substantially V-shaped level the cleaning pad moves into cleaning contact relationship with the head; and
a spring connected to the planar element at an end opposite from the cleaning pad, said spring biasing the planar element and the cleaning pad away from the cleaning contact relationship as the actuator loads the head onto the disk and releases contact with the first end of the substantially V-shaped lever.

5,467,239

DISC CARTRIDGE WITHRIBBED SHUTTER

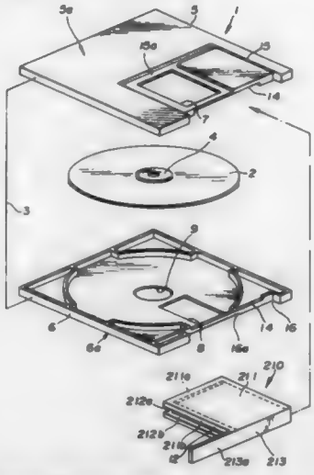
Hirotoshi Fujisawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 6, 1992, Ser. No. 817,049

Claims priority, application Japan, Jan. 11, 1991, 3-012683; Jan. 16, 1991, 3-014908

Int. Cl.[6] G11B 23/03

U.S. Cl. 360—133 6 Claims



1. A disc cartridge comprising:

a cartridge body, formed with at least one aperture and a groove, for accommodating a disc in which a portion of the disc is exposed to an exterior environment by the aperture, the groove being formed on a lateral side of the cartridge body;

an integrally formed shutter portion movably mounted on the cartridge body between a first position of opening the aperture and a second position of closing the aperture, the shutter portion including a slide portion and at least one rectangularly shaped plate portion and a pair of projections, the slide portion being formed with a tongue extended along the lateral side of the cartridge body so that the length of the slide portion along a slide direction of the shutter portion is longer than the length of the shutter portion along the slide direction, the tongue being formed with one of the projections, the other of the projections being formed on another side of the slide portion and a corner of the plate portion, each of the projections being engaged with the groove, and with at least one rib being formed on an inside surface of the plate portion of the shutter portion and extended in a direction perpendicular to the slide direction of the shutter portion.

5,467,240

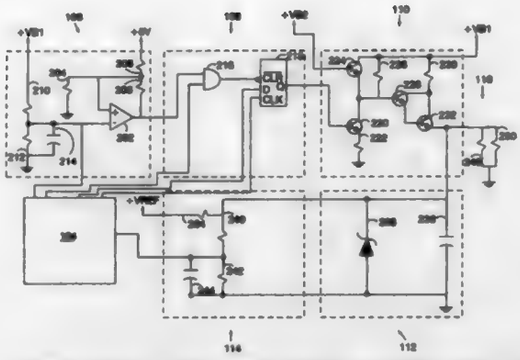
DRIVER CIRCUIT WITH DIAGNOSTICS AND OVER VOLTAGE PROTECTION

Gregory L. Williamson; Mark R. Hawkins, both of Chillicothe, and William J. Tate, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 30, 1993, Ser. No. 129,506

Int. Cl.[6] H02H 7/20

U.S. Cl. 361—18 12 Claims



1. A driver circuit connected to a load, comprising:

controlling means for producing a control signal, said control signal being indicative of a desired output current;

logic means for receiving said control signal and responsively producing a current signal;

driving means for receiving said current signal and responsively generating current having a magnitude responsive to the magnitude of said control signal;

over voltage detecting means for sensing system voltage and responsively producing a system voltage feedback signal, comparing said system voltage feedback signal with a predetermined voltage reference and responsively protecting said driver circuit if said system voltage is greater than said predetermined voltage reference, said over voltage detecting means including;

a comparator;

a first resistor connected between the positive input terminal of said comparator and electrical ground;

a second resistor connected between the output terminal and the positive input terminal of said comparator;

a third resistor connected between the positive input terminal of said comparator and +5 volts;

a fourth resistor connected between the negative input terminal of said comparator and system voltage (+VB1);

a fifth resistor connected between the negative input terminal of said comparator and electrical ground;

a first capacitor connected between the negative input terminal of said comparator and electrical ground;

means connected to said driving means and to the load for protecting the driver circuit from external electrical short circuits;

means for sensing the magnitude of the output voltage relative to electrical ground and responsively producing a output voltage feedback signal;

and wherein said controlling means is adapted to receive said system voltage feedback signal, said output voltage feedback signal and responsively perform output load condition diagnostics, said negative input terminal is connected to said controlling means, and said system voltage feedback signal is the voltage at the negative input terminal of said comparator.

5,467,241

POWER RECEIVING SYSTEM

Sinzi Sugitani; Toru Tanimizu; Koutarou Takematsu, all of Hitachi; Fumio Wakasa, Kitaibaraki, and Toshiaki Izumi, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 826,604, Jan. 28, 1992, abandoned. This application Nov. 14, 1994, Ser. No. 340,480

Claims priority, application Japan, Jan. 28, 1991, 3-008287; Mar. 20, 1991, 3-056356

Int. Cl.[6] H02H 7/26

U.S. Cl. 361—63 7 Claims

1. A power receiving system comprising:

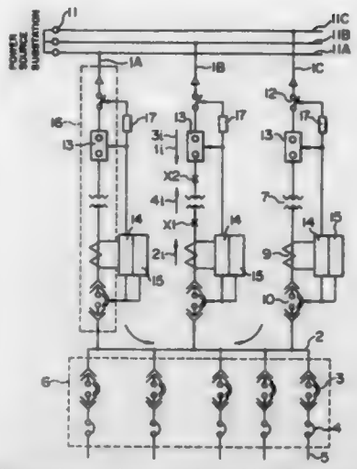
a plurality of network lines for delivering power and a network bus for receiving said power, with each network line having associated therewith:

a network transformer connected between said network line and said network bus;

a protector breaker and a current detector both of which are connected to a secondary side of said network transformer;

a breaker provided on a primary side of said network transformer and having a breaker interruption capacity which is smaller than that of said protector breaker; and

relay means responsive to a detection current which is detected by said current detector, for opening said breaker and said protector breaker when said current detector detects a first type of accident current flowing in a direction opposite to that of a normal current flow and indicating an



accident point on the secondary side of said network transformer, and for opening only said protector breaker when said current detector detects a second type of accident current flowing in a direction opposite to that of said normal current flow and indicating an accident point on a primary side of said network transformer.

5,467,242

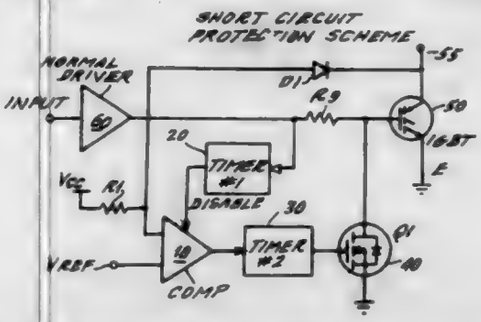
METHOD AND APPARATUS FOR SHORT CIRCUIT PROTECTION OF POWER TRANSISTOR DEVICE

Laszlo Kiraly, El Segundo, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.

Continuation of Ser. No. 900,834, Jun. 18, 1992, abandoned. This application Sep. 8, 1994, Ser. No. 303,137

Int. Cl.[6] H02H *9/02;3/00*

U.S. Cl. 361—94 **29 Claims**



1. A circuit for detecting and protecting against an overcurrent condition in a power transistor switching device, the power transistor switching device having main terminals and a control terminal, the main terminals having a range of normal saturation voltage therebetween during normal conduction of the power transistor device, the circuit comprising:

driver means providing control signals to the control terminal of the power transistor device for switching said power transistor device on and off;

sensing means coupled to the power transistor device for sensing the saturation voltage of the power transistor device, said sensing means including coupling means for providing as an output substantially said saturation voltage when the saturation voltage is in the range of normal saturation voltage and providing substantially a fixed further reference voltage level as the output when the saturation voltage is beyond said range of normal saturation voltage and further comprising means receiving said output for comparing substantially said saturation voltage to a reference voltage level when said saturation voltage is in the range of normal saturation voltage and for comparing substantially the fixed further reference voltage level to said reference voltage level when said saturation voltage is beyond said range of normal saturation voltage;

means responsive to the sensing means and coupled to the control terminal of the power transistor device for removing said control signals from said control terminal in the event said saturation voltage reaches a level beyond said range of normal saturation voltage indicating an overcurrent condition in said power transistor device; and further comprising

time delay means coupled between an output of said comparing means and said removing means for preventing removing of said control signals in the event of a transient overcurrent condition at said power transistor device for less than a time period that would damage said power transistor device.

5,467,243

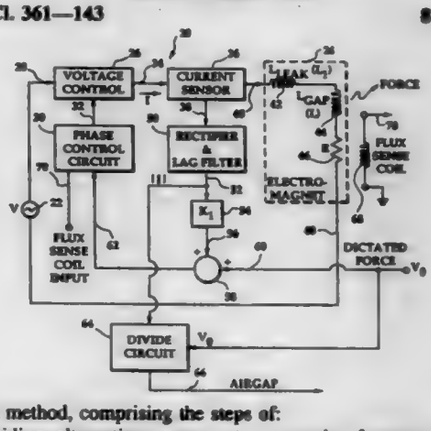
ELECTROMAGNET CONTROL SYSTEM

Clement A. Skalski, Avon, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Sep. 29, 1993, Ser. No. 128,924

Int. Cl.[6] H02N *15/00*

U.S. Cl. 361—143 **8 Claims**



8. A method, comprising the steps of:

providing alternating current at an angular frequency to an electromagnet force actuator having a leakage inductance; and

controlling the alternating current for providing a controlled current according to a voltage reference signal modified by a feedback signal indicative of the controlled current and amplified at a gain factor having a magnitude greater than or equal to the leakage inductance times the angular frequency, whereby the electromagnet has a flat or positive spring rate.

5,467,344

APPARATUS FOR THE ELECTROMAGNETIC CONTROL OF THE SUSPENSION OF AN OBJECT

Bhalchandra V. Jayawant, Kingston, and Raymond J. Wharlow, Brighton, both of, United Kingdom, assignors to British Nuclear Fuels plc, Cheshire, United Kingdom

Filed Dec. 8, 1992, Ser. No. 986,735

Claims priority, application United Kingdom, Jan. 3, 1992, 9200086; Sep. 22, 1992, 9219959

Int. Cl.[6] H02N *15/00*

U.S. Cl. 361—144 **21 Claims**

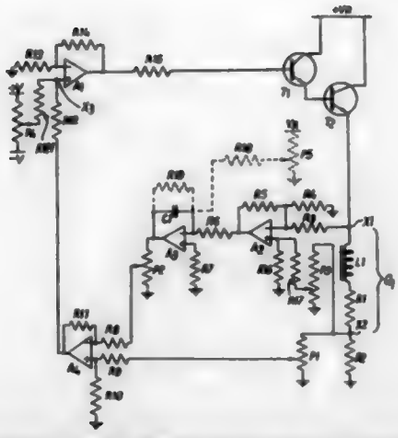
1. An apparatus for the electromagnetic control of the suspension of an object including:

an electromagnet including an inductive coil,

a source of electric power for the electromagnet which source includes a controllable electric supply device capable of delivering a controlled electric supply to the coil of the electromagnet,

a control signal producer for producing an error control signal in response to an incremental change in a parameter related to the position of the object relative to the electromagnet, and

a negative feedback control loop for feeding said error control signal generated by the control signal producer to said source



of electric power to adjust the electric supply to the coil so as to stabilize the suspension of the object relative to the electromagnet, wherein said control signal producer includes:

means for detecting a component V_L of voltage across the coil which is a function of pure inductance L of the coil,

means for detecting a current i flowing through the coil,

means for deriving, from the detected value of V_L and the detected value of i, opposing signals, and

means for balancing said opposing signals whereby said error control signal generated by the control signal producer represents a deviation from perfect balance of said opposing signals and comprises a correction signal applied to the electrical supply device for restoring said balance.

5,467,245

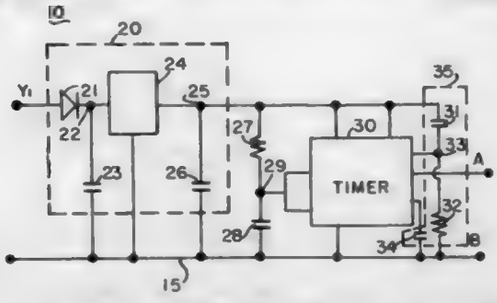
ANTI-ABUSE CIRCUIT

John M. Newbould, 1 Tigrone Blvd., Avon, N.C. 27915

Filed Jun. 22, 1993, Ser. No. 79,528

Int. Cl.[6] G05D *23/00*; H01H *47/00*

U.S. Cl. 361—170 **12 Claims**



1. An anti-abuse circuit for shutting down an energy load wherein said energy load is a compressor connected to controller means for demanding operation within a predetermined operating temperature range of said compressor through a relay in the predetermined operating temperature range, said anti-abuse circuit positioned between said controller means and said compressor for controlling said relay when said demanding means outputs a demand signal indicating operation of said compressor in said predetermined operating temperature range, said anti-abuse circuit comprising:

power means connected to said controller means for receiving said demand signal and for regulating said demand signal, said power means providing power to said compressor through said controller means during said predetermined operating temperature range;

timing means connected to said power means for receiving the regulated demand signal, said timing means operating for a predetermined time period as long as said regulated demand signal exists;

triggering means connected to said power means and said timing means for initially pulsing said timing means upon indication of said regulated demand signal; and

said anti-abuse circuit energizes said relay during said predetermined time period and said receipt of said regulated demand signal and de-energizes said relay when either said predetermined time period expires or said regulated demand signal stops.

5,467,246

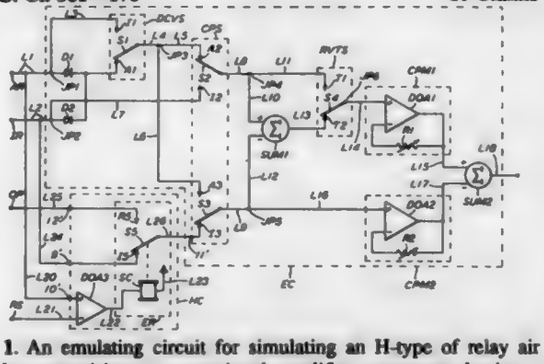
ARRANGEMENT FOR EMULATING AN H-TYPE RELAY AIR VALVE WHICH IS UTILIZED IN A RAILWAY BRAKING SYSTEM

Vincent Ferri, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sep. 23, 1993, Ser. No. 126,845

Int. Cl.[6] H01H *47/00*

U.S. Cl. 361—170 **10 Claims**



1. An emulating circuit for simulating an H-type of relay air valve comprising, an operational amplifier comparator having a pair of inputs and an output, one of the pair of inputs connected to a reference signal, the other of said pair of inputs connected to an automatic brake cylinder request signal, a solenoid relay having a core connected to said output of said operational amplifier comparator and having at least one movable contact and a pair of stationary contacts, one of said pair of stationary contacts connected to an independent brake cylinder request signal and the other of said pair of stationary contacts connected to a zero pressure signal both of which are connectable by said at least one movable contact to an output terminal.

5,467,247

ELECTRONIC STUNNING APPARATUS

Richard N. de Anda, 1312 Lynnmere Dr., Thousand Oaks, Calif. 91360, and Dale R. Hollis, 26000-A Alizia Canyon Dr., Calabasas, Calif. 91302

Filed Dec. 13, 1993, Ser. No. 165,468

Int. Cl.[6] H05C *1/04*

U.S. Cl. 361—232 **3 Claims**

1. An electrical stunning apparatus which is designed to be conveniently held in a hand of a human user, said electrical stunning apparatus being adapted to be used to stun a human aggressor, said electrical stunning apparatus to deliver an electrical shock to the human aggressor when contacting the skin of the aggressor with this shock being sufficient to temporarily immobilize the aggressor, said electrical stunning apparatus comprising:

a housing having an internal compartment, said housing adapted to be conveniently held in a hand of the user, said housing

having a forward-most end and an enlarged end, said forward-most end being tubular defining an internal chamber, said enlarged end surrounding said forward-most end, an annular chamber located between said forward-most end and said enlarged end;

an electrical power source mounted within said internal compartment, a manually operable switch mounted on said housing, said manually operable switch usable to cause activation of said power source;

a pair of spaced-apart contact probes mounted on a mounting plate, said mounting plate being fixed to said forward-most end, said mounting plate covering said internal chamber, said contact probes to apply the electrical shock to the human aggressor upon touching of said contact probes to the human aggressor;

said housing having a protective cap, said protective cap being movable within said annular chamber between an extended position and a retracted position, with said protective cap in said extended position said protective cap covering said contact probes not exposing said contact probes, with said protective cap in said retracted position said contact probes being exposed; and

said cap being connected to a biasing spring, said biasing spring exerting a constant bias tending to locate said protective cap in said extended position, said biasing spring being located in said annular chamber.

5,467,248

RELAY CONTROL CIRCUIT

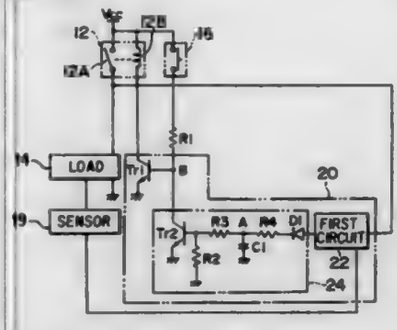
Yasushi Nishibe, Niwa, Japan, assignor to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Dec. 29, 1993, Ser. No. 175,223

Claims priority, application Japan, Jan. 19, 1993, 5-006615

Int. Cl.[6] H01H *47/22*

U.S. Cl. 361—170 **8 Claims**



1. A relay control circuit comprising:

switching means for operating a relay that supplies power to a load when an operating signal is supplied to said switching means;

a first circuit that receives power from said relay and outputs an input prohibiting signal in response to a condition of the load; and

a second circuit that receives the input prohibiting signal, said second circuit charging and prohibiting input of said operation signal to said switching means when said input prohibiting signal is input from said first circuit, said second circuit discharging when said input prohibiting signal is removed to further prohibit input of said operation signal to said switching means while said second circuit discharges.

5,467,249

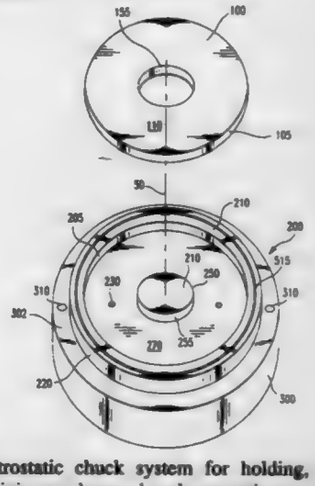
ELECTROSTATIC CHUCK WITH REFERENCE ELECTRODE

Michael S. Barnes, San Francisco, Calif.; John H. Keller, Newburgh, N.Y.; Joseph S. Logan, Jamestown, R.I.; Robert E. Tompkins, Pleasant Valley, and Robert P. Westerfield, Jr., Montgomery, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1993, Ser. No. 169,903

Int. Cl.[6] H02N *13/00*

U.S. Cl. 361—234 **12 Claims**



1. An electrostatic chuck system for holding, in a vacuum ambient containing a plasma, by electrostatic attraction of a DC potential a workpiece having a workpiece radius comprising at least two circularly symmetric, concentric aluminum electrodes having a hard-coat alumina coating and together providing a planar clamping surface, at least one of said aluminum electrodes having gas feed means therein, characterized in that:

an outer electrode of said at least two circularly symmetric, concentric aluminum electrodes has an electrode outer radius less than said workpiece radius by an offset distance;

said outer electrode is surrounded by a dielectric ring having a dielectric inner radius less than said workpiece radius by an overhang amount, having a dielectric ring top surface substantially coplanar with said planar clamping surface, further containing at least one probe member embedded within said dielectric ring and exposed to said plasma, whereby said probe member is maintained by said plasma at a characteristic reference potential;

said system further includes bias means connected to said probe member and to said two electrodes for biasing said two electrodes with respect to said characteristic potential, whereby said two electrodes are maintained at respective bias potentials with respect to said characteristic potential.

5,467,250

ELECTRICAL CABINET WITH DOOR-MOUNTED HEAT EXCHANGER

Paul A. Howard, Vienna, and James H. Durham, Reston, both of Va., assignors to Hubbell Incorporated, Orange, Conn.

Filed Mar. 21, 1994, Ser. No. 210,462

Int. Cl.[6] H05K *7/20*

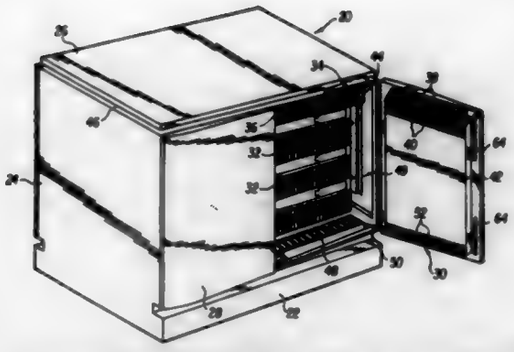
U.S. Cl. 361—696 **29 Claims**

1. An electrical equipment cabinet comprising:

an enclosure adapted to contain heat-generating electrical equipment, said enclosure having at least one access opening;

a door providing a closure for said opening, said door when open permitting access to said electrical equipment and when closed maintaining a substantially closed environment in the interior of said cabinet;

an air-to-air heat exchanger carried by said door for removing heat from the interior of said cabinet while maintaining said substantially closed environment within said cabinet, said heat



exchanger defining a first air flow path for air drawn from the exterior of said cabinet and a second air flow path for air drawn from the interior of said cabinet, said first and second air flow paths being substantially isolated from each other; and

a powered fan mounted in said enclosure for circulating air through at least one of said first and second air flow paths.

5,467,251

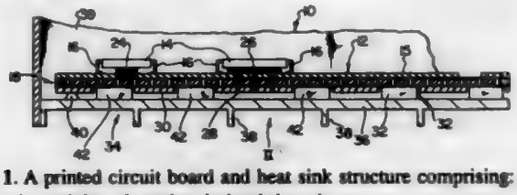
PRINTED CIRCUIT BOARDS AND HEAT SINK STRUCTURES

Roman Katchmar, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 8, 1993, Ser. No. 133,396

Int. Cl.[6] H05K 7/20

U.S. Cl. 361—719 **10 Claims**



1. A printed circuit board and heat sink structure comprising:

a heat sink and a printed circuit board;

the printed circuit board having a substantially planar circuitry layer, a plurality of electronic components disposed on one side of the plane of the circuitry layer, and a heat conductive layer means disposed on the other side of the plane of the circuitry layer, the heat conductive layer means extending across an area of the printed circuit board between positions in which the heat conductive layer means lies opposite to the plurality of electronic components and in heat conductive relationship with the electronic components for distributing heat received from any component throughout the heat conductive layer means and between said positions;

and the heat sink is spaced from the printed circuit board to define an air gap between the heat sink and the printed circuit board;

and wherein the heat conductive layer means comprises a first and second heat conductive layers which are spaced apart by heat insulating material of the printed circuit board and are connected to one another by heat conductive members extending through the insulating material, the first of the heat conductive layers on one side of the insulating material being in heat conductive relationship with the electronic components and the second conductive layer being in heat exchange relationship with the heat sink by thermally conductive bridge members which extend in localized and spaced positions across the gap to transmit heat from the second conductive layer into the heat sink, the bridge members limiting the rate of heat transfer into the heat sink such as to enable distribution of heat from the electronic components throughout the heat conductive layer means.

5,467,252

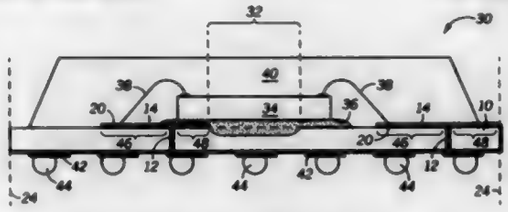
METHOD FOR PLATING USING NESTED PLATING BUSES AND SEMICONDUCTOR DEVICE HAVING THE SAME

Victor Nomi, Round Rock; John R. Pastore, Leander, and Twila J. Reeves, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 18, 1993, Ser. No. 136,845

Int. Cl.[6] H05K 7/02

U.S. Cl. 361—760 **21 Claims**



16. A semiconductor device comprising:

a printed wiring substrate having a periphery, a surface, a die receiving area on the surface, a plurality of conductive bonding fingers formed on the surface and surrounding the die receiving area, a first plurality of conductive vias extending through the substrate and positioned within the plurality of conductive bonding fingers, a second plurality of conductive vias extending through the substrate and positioned without the plurality of conductive bonding fingers, wherein each via of the first and the second pluralities of vias has two associated trace portions on the surface, a bonding trace portion and a plating trace portion, wherein the bonding trace portion of each via of the first and the second pluralities of vias is routed to a corresponding bonding finger, and wherein the plating trace portion of each via in the second plurality of vias is routed outward to the periphery of the substrate while the plating trace portion of each via in the first plurality of vias is routed inward toward a center of the substrate;

a semiconductor die positioned within the die receiving area;

means for electrically coupling the die to the plurality of bonding fingers on the substrate; and

a protective body encapsulating the semiconductor.

5,467,253

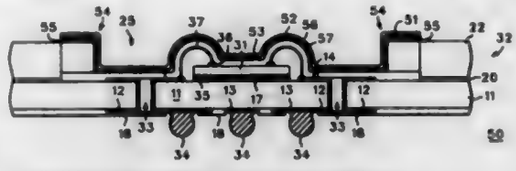
SEMICONDUCTOR CHIP PACKAGE AND METHOD OF FORMING

James K. Heckman, Tempe; Francis J. Carney, Gilbert, and Harry J. Geyer, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 30, 1994, Ser. No. 269,241

Int. Cl.[6] H05K 1/18

U.S. Cl. 361—761 **21 Claims**



1. A semiconductor chip package, comprising:

a substrate having first and second surfaces, the first surface having at least one conductive trace disposed thereon and having a semiconductor chip receiving area, the second surface having at least one bonding pad disposed thereon, the at least one bonding pad coupled to the at least one conductive trace by a via; and

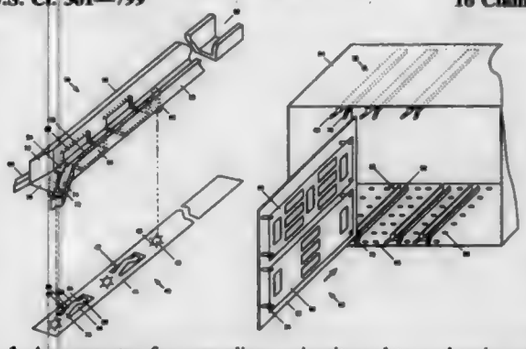
a substrate support coupled to the substrate, the substrate support providing structural strength for the substrate and having an aperture exposing the semiconductor chip receiving area, wherein the aperture cooperates with the substrate to form a cavity.

5,467,254

SUPPORTIVE GUIDE FOR CIRCUIT-CARD GROUNDING INCLUDING TRACKS HAVING STAGGERED PROTRUSIONS AT THE PROXIMAL END OF THE TRACKS

Peter V. Brusati, Hayward; J. Dewey Griffin, Milpitas, and Derek J. Sakazaki, Redwood City, all of Calif., assignors to SynOptics Communications, Inc., Santa Clara, Calif.

Filed Nov. 4, 1993, Ser. No. 147,870
Int. Cl.[6] H05K 7/14;9/00
U.S. Cl. 361—799 16 Claims



1. An apparatus for grounding a circuit card to a chassis, said apparatus comprising;

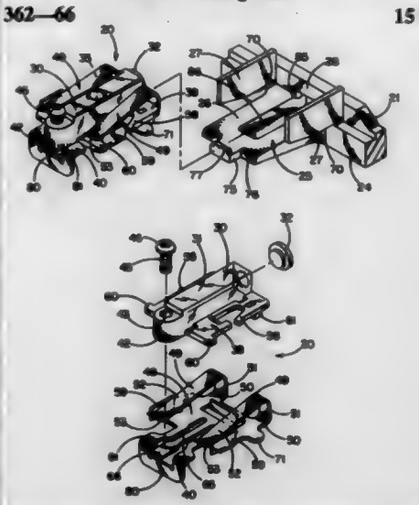
tracks for supporting said circuit card, said tracks attached to said chassis: and members having resilient contacts grounding said circuit card to said chassis, said members being sandwiched between said tracks and said chassis, each of said tracks including forked protrusions facilitating insertion of said circuit card into said tracks, said forked protrusions situated at a proximal end of each of said tracks, said forked protrusions obliquely disposed with respect to each other and staggered to enable overlap of the protrusions of adjacently-located tracks, thereby allowing said adjacently-located tracks to be placed directly side-by-side in said chassis and maximizing number of said circuit cards capable of being inserted into said chassis.

5,467,255

LEVEL INDICATING DEVICE FOR A VEHICLE HEADLAMP

Ronald S. Denley, Woodstock, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

Filed Apr. 11, 1994, Ser. No. 225,649
Int. Cl.[6] B60Q 1/00
U.S. Cl. 362—66 15 Claims



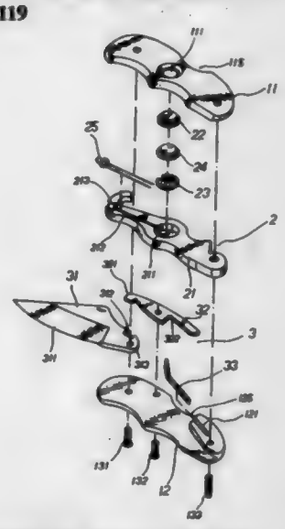
1. An indicating device for a vehicle headlamp, said device comprising a base molded of resilient plastic and having first and second ends, having first and second laterally spaced side edge portions and having upper and lower sides, a transparent vial having a body portion molded integrally with and projecting upwardly from the upper side of said base between the side edge portions thereof, said vial containing liquid having a gas bubble therein, means associated with said vial and coacting with said bubble to indicate when said vial is horizontal, a retaining bracket made of a single piece of spring metal, connecting means on said base and said bracket and interfitting with one another to hold said base and said bracket in assembled relation, said bracket having a plate underlying said base and having a pair of laterally spaced legs formed integrally with said plate, said legs having first generally horizontal sections projecting in one direction outwardly and away from said first end of said base, having second sections integral with and extending upwardly from said first sections in opposing relation with said first end of said base, and having cantilevered sections integral with said second sections and extending generally toward said second end of said base and generally opposite of said first sections, said cantilevered sections being located on opposite sides of said vial in straddling relation with said vial and having at least portions spaced above the upper side of said base in overlying relation therewith, said cantilevered sections having free ends bearing resiliently downwardly against the upper side of said base adjacent the second end of said base and said free ends of said cantilevered sections resisting upward movement of the second end of said base relative to said bracket.

5,467,256

KNIFE WITH LIGHTING FIXTURE

Shun-fu Chen, Taipei Hsien, Taiwan, Prov. of China, assignor to Chia Yi Enterprise Co., Ltd., Taiwan, Prov. of China

Filed Jan. 3, 1995, Ser. No. 367,847
Int. Cl.[6] B25B 23/18
U.S. Cl. 362—119 2 Claims



1. A knife with lighting fixture, comprising

a first and a second cases having a substantially symmetrical profile;

a knife control mechanism being disposed between said first and said second cases and including a knife which can be pivotally turned about said cases to be extended out of or received in said cases; and

a lighting fixture consisting of a supporting plate being pivotally connected between said first and said second cases and having a cell seat to receive a cell therein, an elongated groove extending from said cell seat toward a front end of said supporting plate, and a bulb seat formed in front of said elongated groove to receive a bulb therein; said bulb having two pole pieces separately connected to a corresponding pole of said cell received in said cell seat; and said lighting fixture

further consisting of a push button disposed above said cell with a top surface thereof slightly projecting from said first case; and

said bulb being shining when said push button is depressed to electrically connect said pole pieces of said bulb with said corresponding poles of said cell and directly lighting a cutting edge of said knife when said knife is pivotally turned relative to said cases to a completely extended position.

5,467,257

SOLAR PANEL UNIT AND SOLAR LAMP INCLUDING SAME

Ram Shalvi, Hong Kong, Hong Kong, assignor to Solar Wide Industrial Ltd., Hong Kong

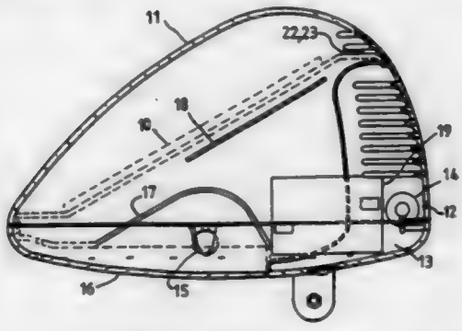
PCT No. PCT/GB92/02038, § 371 Date May 4, 1994, § 102(e) Date May 4, 1994, PCT Pub. No. WO93/09378, PCT Pub. Date May 13, 1993

PCT Filed Nov. 4, 1992, Ser. No. 232,225

Claims priority, application United Kingdom, Nov. 4, 1991, 9123342

Int. Cl.[6] F21L *13/00*; H01L *31/042*

U.S. Cl. 362—183 7 Claims



1. A solar panel unit comprising a movable solar panel arrangement support carriage and a drive motor for moving the carriage to orient the panel arrangement relative to the sunlight into optimum orientations for receiving solar energy, in which the panel arrangement comprises first and second main panels to convert solar energy into electrical power to charge a battery power pack, characterised in that the first and second main panels are angularly off-set slightly from one another and from a central mean optimum orientation of the panel arrangement, including means for sensing the intensity of solar energy being converted by the first and second main panels into respective first and second converted energies and controlling operation of the motor when there is an increasing energy difference between the first and second converted energies which exceeds a predetermined level of magnitude sufficient to move the panel arrangement towards optimum orientations as the sun moves relative to the unit.

7. A solar lamp having a housing characterised by a solar panel unit according to claim 1.

5,467,258

FLASHLIGHT APPARATUS

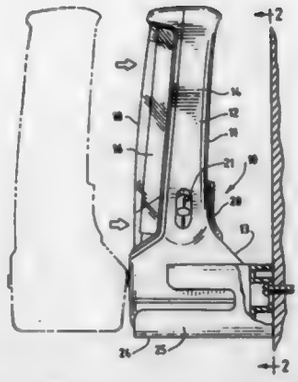
David Bamber, and Robert Deines, both of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Dec. 21, 1992, Ser. No. 988,832

Int. Cl.[6] F21L *9/00*

U.S. Cl. 362—184 10 Claims

1. A flashlight apparatus comprising: a housing for containing a power source, said housing including an elongate handle portion and a head portion; a first, power switch means connectable to the power source for activating the power source, said first switch means being disposed at the handle portion of the housing proximate the head portion; a first light source disposed in the head portion at one end of the housing; a second light source disposed at



the handle portion of the housing; a second, selecting switch means disposed proximate the first switch means so that a user may operate the first and second switch means while holding the apparatus, said second switch means connected to said first switch means and to the first and second light sources for selecting either the first or the second light sources for energizing by the power source.

5,467,259

DECORATIVE LAMP

Roger A. Hume, and Richard A. Felstead, both of Melton Mowbray, England, assignors to GE Lighting Limited, United Kingdom

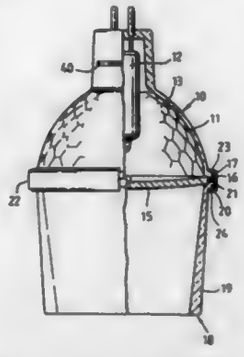
PCT No. PCT/GB91/00678, § 371 Date Dec. 2, 1992, § 102(e) Date Dec. 2, 1992, PCT Pub. No. WO91/17387, PCT Pub. Date Nov. 14, 1991

PCT Filed Apr. 29, 1991, Ser. No. 938,144

Claims priority, application United Kingdom, May 1, 1990, 9009754

Int. Cl.[6] F21V *3/02*

U.S. Cl. 362—307 3 Claims



1. A low voltage reflector lamp comprising:

a bowl-shaped reflector symmetrically disposed about an optical axis and having an annular rim;

a low voltage light source permanently located within the reflector at a predetermined position;

a light-transmitting appendage located at said annular trim, the appendage having a rim at an annular edge of complementary size to that of said annular rim of the reflector; and

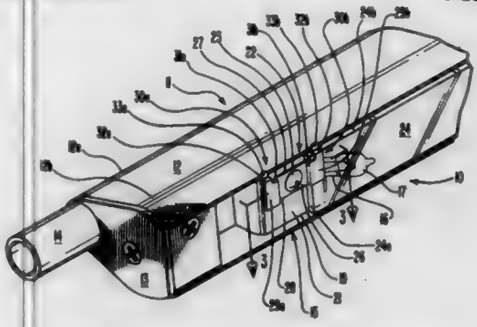
annular fixing means having two inwardly directed flanges, the flanges axially engaging said rims of the reflector and the appendage and being permanently deformed to hold the rims together to secure the appendage rigidly and permanently to the reflector, said rims having cooperating recesses adapted to seat a transparent cover.

5,467,260

LENS RETAINER SYSTEM FOR A SHOWCASE LIGHT

John E. Aspenwall, Lehi, Utah, assignor to Juhabow Industries, Inc., Owensville, Mo.

Filed Mar. 20, 1995, Ser. No. 407,116
Int. Cl.[6] F21V 21/00
U.S. Cl. 362—374 4 Claims



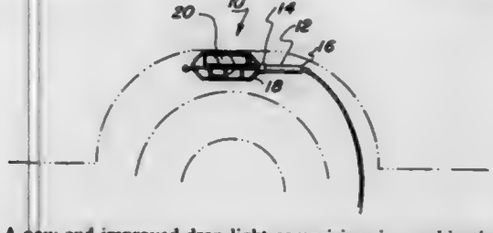
1. A showcase light lens retainer system for use with a conventional display light for mounting in a showcase that includes a housing that is open to expose at least one light bulb maintained therein and includes a flat transparent or translucent lens for positioning over the housing opening comprising, a pair of identical retainers, each formed from a thin metal plate to have a flat rectangular shaped center section wherethrough a hole is formed, identical flat rectangular wall segments are each joined along a lower edge of each opposite side of said center section to extend at right angles upwardly therefrom, and said wall segments each connect along an upper edge, at right angles, to an edge of a flat stepped portion that, in turn, includes a flat tab wall that is secured along an upper edge, at a right angle thereto, to extend downwardly from a top edge of said flat stepped portion, and a tab section is connected at a right angle to extend outwardly from a lower edge of said tab wall, which said flat rectangular wall segments each having a height that is at least the thickness of a display light lens, and said tab walls are each of a height that is less than the thickness of said display light lens; a pair or pier means secured to a display light house, arranged on opposite ends of and adjacent to an opening in said display light housing that is to receive said display light lens thereover, and each said pier means includes a hole formed therein; and a pair of pivot means each for fitting through said hole in each said retainer center section and through each said pier means, for providing a pivot coupling of each said retainer to each said pier means.

5,467,261

MAGNETIC SHIELD FOR DROP LIGHTS

Gary D. Whetstone, 229 Dalton La., Centreville, Miss. 39631

Filed Oct. 17, 1994, Ser. No. 323,626
Int. Cl.[6] F21V 21/08
U.S. Cl. 362—398 4 Claims



1. A new and improved drop light comprising, in combination:

a cylindrical handle having an exterior end and an interior end;

an electrical light socket for receiving a bulb secured to the exterior end of the handle;

a front guard formed of wires in a cage-like configuration positioned over the front half of the bulb for the passage of light therethrough;

a shield on the rear half of the light and coupled to the front guard, the shield having an enlarged rectangular central plate centrally located in the rear thereof, the shield also having a pair of laterally disposed rectangular side plates with their long edges secured to the long edges of the central plate with the side plates each forming an angle of about 135 degrees plus or minus ten percent;

the upper and lower ends of the central plate being formed with a trapezoidal type member secured at their interior ends to the upper and lower edges of the central plate and triangular plates coupling the side plates with the upper and lower ends;

magnets secured to the central plate, side plates and one trapezoidal type member for allowing the lamp to be positioned and secured at any of a plurality of locations;

a hook formed at the upper edge of the light for suspension purposes; and

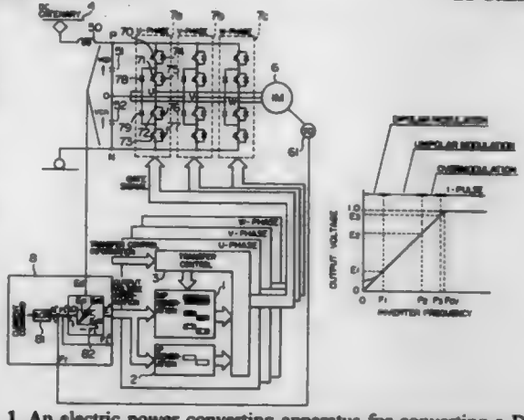
electrical lines extending through the handle to the light socket at one end and adapted to be coupled to a source of potential at the other end.

5,467,262

ELECTRIC POWER CONVERTING APPARATUS

Kiyoshi Nakata, Nishlibaraki; Tokunosuke Tanamachi; Kiyoshi Nakamura, both of Katsuta; Mutsuhiro Terunuma, Mito; Masato Suzuki, Naka; Yoshio Tsutsui, Katsuta; Eiichi Toyota, Katsuta, and Kouji Yasuda, Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

PCT No. PCT/JP93/00749, § 371 Date Feb. 3, 1994, § 102(e) Date Feb. 3, 1994, PCT Pub. No. WO93/24989, PCT Pub. Date Dec. 9, 1993
PCT Filed Jun. 3, 1993, Ser. No. 190,126
Claims priority, application Japan, Jun. 4, 1992, 4-143947
Int. Cl.[6] H02M 7/5387
U.S. Cl. 363—41 21 Claims



1. An electric power converting apparatus for converting a DC voltage into AC phase voltages having 3-leveled potentials, for driving an AC motor, said electric power converting apparatus comprising:

first means for receiving a DC voltage and producing therefrom an AC voltage in a dipolar modulation mode, to produce a series of output pulses such that each half period of a fundamental wave of an output AC voltage of said electric power converting apparatus is represented by a series of pulses having a zero potential between a positive pulse and a negative pulse;

second means for receiving the DC voltage and producing therefrom an AC voltage in a unipolar modulation mode, to produce a series of output pulses such that each half period of the fundamental wave of the output AC voltage of said electric power converting apparatus is represented by a series of single polarity pulses;

third means for receiving the DC voltage and producing therefrom an AC voltage in an overmodulation mode, to produce a series of output pulses such that each half period of the fundamental wave of the output AC voltage of said electric

power converting apparatus is represented by a series of single polarity pulses filled up in the center by a plurality of pulses of the single polarity;

fourth means for receiving the DC voltage and producing therefrom an AC voltage in a 1-pulse mode, to produce an output pulse such that a half period of the fundamental wave of the output AC voltage of said electric power converting apparatus is represented by a single pulse having the same polarity as said half period; and

output means for switching among said first, second, third, and fourth means to change the modulation mode among the dipolar modulation mode, the unipolar modulation mode, the overmodulation mode, and the 1-pulse mode.

5,467,263

PROCESS FOR DESIGNATING A DISTANT FUNCTIONAL OBJECT IN A CIRCUIT, AND FUNCTIONAL UNITS AND INSTALLATION PERTAINING THERETO

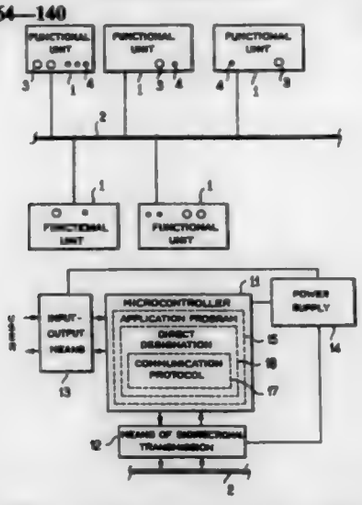
Jérôme Gilbert, Levallois Perret, France, assignor to EURO CP s.a.r.l., L'Hay les Roses, France

Filed Jun. 4, 1993, Ser. No. 70,605

Claims priority, application European Pat. Off., Jun. 10, 1992, 92401606

Int. Cl.[6] G06F *15/46*

U.S. Cl. 364—140 **16 Claims**



1. Process for selecting at least one electrical equipment among a plurality of electrical equipments interconnected through a bidirectional communication network, said process comprising the steps of:

transmitting a designation request via the communication network, from any one of said plurality of electrical equipments which requests said designation;

receiving said designation request message by other electrical equipments;

producing a sensory stimulus perceptible to an operator, by at least one of said electrical equipments;

successively performing a physical action on at least one electrical equipment chosen by an operator among those electrical equipments producing a sensory stimulus;

transmitting, in response to said physical action, via said communication network, by each electrical equipment submitted to said physical action, an answer message to said designation request, said answer message containing information relative to said transmitting electrical equipment; and

receiving and accepting said answer message, by said requesting equipment.

5,467,264

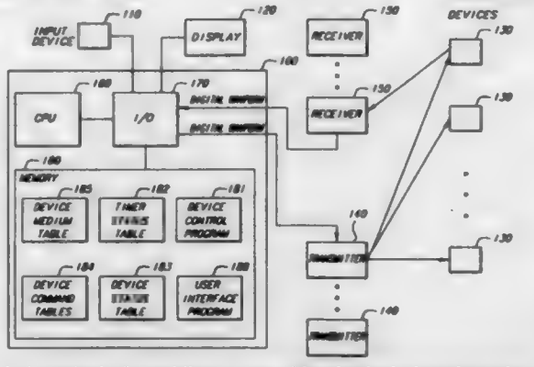
METHOD AND SYSTEM FOR SELECTIVELY INTERDEPENDENT CONTROL OF DEVICES

Adam Rauch, Seattle; Gregory W. Riker, Woodinville, and Nathan P. Myhrvold, Bellevue, all of Wash., assignors to Microsoft, Redmond, Wash.

Continuation of Ser. No. 85,447, Jun. 30, 1993. This application Sep. 30, 1993, Ser. No. 129,685

Int. Cl.[6] G06F *15/46*

U.S. Cl. 364—141 **28 Claims**



1. A method of providing a user with selectively interdependent control of devices, the method performed by a computer and comprising the steps of:

providing the user with a choice of devices that can be selected to depend on each other, each device having a status;

obtaining from the user an identification of a first device and a second device and an indication that the status of the second device depends on the status of the first device;

obtaining from the user a dependency relationship that defines how the status of the second device depends on the status of the first device;

using the computer, determining whether the status of the first device has changed;

using the computer, updating the status of the second device when the status of the first device has changed, the updated status of the second device based on the changed status of tile first device and the dependency relationship defined by the user; and

using the computer, controlling the second device based on the updated status of the second device.

5,467,265

PLANT OPERATION METHOD AND PLANT OPERATION CONTROL SYSTEM

Akihiro Yamada, Hitachi; Makoto Shimoda, Katsuta; Masaji Nakahara, and Masahiro Yoshioka, both of Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 10, 1994, Ser. No. 194,520

Claims priority, application Japan, Feb. 10, 1993, 5-022361

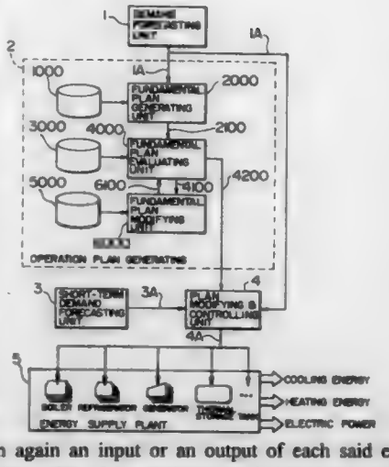
Int. Cl.[6] G05B *13/02*; G06F *19/00*

U.S. Cl. 364—154 **16 Claims**

16. An operation method for a plant having a plurality of equipment of different types, comprising the steps of:

generating a fundamental operation plan by reading a past record of input data and output data for each said equipment from a database to formulate a relationship therebetween, and providing a constraint condition expression for determining an upper bound and a lower bound for an input or an output in the relationship formulated, to obtain, at every operation time period, an input or an output of each of said equipments making a value of a predetermined objective function maximum or minimum, while satisfying a target output of said plant; and

making rules of knowledge regarding lifetime and knowledge regarding a response characteristic of each said equipment, to modify at least one of the upper bound and the lower bound of the constraint condition expression on the basis of the rules, to



obtain again an input or an output of each said equipment making a value of the predetermined objective function maximum or minimum.

5,467,266

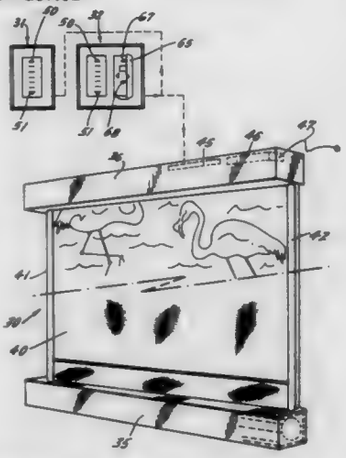
MOTOR-OPERATED WINDOW COVER

Russel J. Jacobs, Center Valley; Brett A. Pierce, Hellertown, and Joel S. Spira, Coopersburg, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Sep. 3, 1991, Ser. No. 753,811

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—167.01 **22 Claims**



1. A panel system comprising:

an elongated panel assembly including a plurality of panels following one another along the length of said panel assembly, said panels being configured to provide various aesthetic, light transmitting, or environment controlling characteristics;

first and second spaced rollers, said panel assembly having first and second ends respectively secured to said first and second rollers and means for selectively winding said panel assembly onto one or the other of said rollers so that any of said panels or portion thereof could be positioned between said rollers;

user actuatable means including plural input means, each of said panels having a corresponding one of said input means; and

control means for automatically positioning any one of said panels that has been selected randomly via said input means between said rollers.

5,467,267

PROM BUILT-IN MICRO COMPUTER

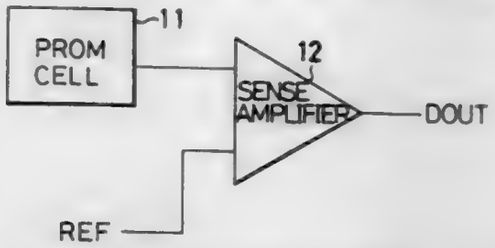
Yasushi Okino, Tsuge, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 14, 1994, Ser. No. 261,124

Claims priority, application Japan, Jun. 16, 1993, 5-144697

Int. Cl.[6] G05B *9/02*; G11C *11/34*

U.S. Cl. 364—184 **7 Claims**



1. A PROM built-in micro computer comprising:

a semiconducting nonvolatile memory which can be written electrically, and a micro computer, together on a single chip, said micro computer including,

detecting means for detecting a semiconducting nonvolatile memory cell, a readout current of which is less than or equal to a constant value at a time of a data comparison after a writing operation,

said PROM built-in micro computer being adapted to prevent a readout error resulting from a fluctuation of a temperature or a supply voltage of said micro computer building-in said semiconducting nonvolatile memory.

5,467,268

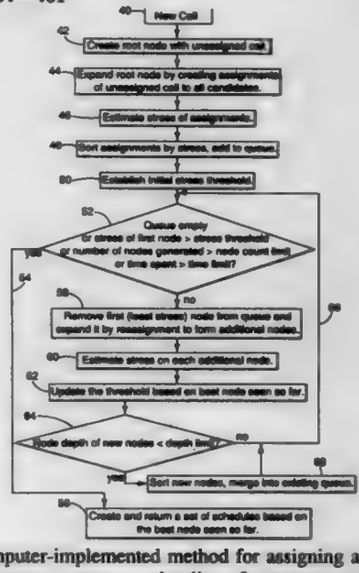
METHOD FOR RESOURCE ASSIGNMENT AND SCHEDULING

Elizabeth M. Sisley, Woodbury, Minn., and John E. Collins, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 25, 1994, Ser. No. 201,664

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—401 **52 Claims**



1. A computer-implemented method for assigning a plurality of resource requests among a plurality of resource providers, said plurality of resource requests including a plurality of pending resource requests assigned among said resource providers according to an existing assignment set, wherein said existing assignment set defines a root node of a search tree, said method comprising the steps of:

(a) expanding said root node by forming one or more next-level nodes, each of said next-level nodes corresponding to said root node but being further defined by a reassignment of one of said pending resource requests between one of said resource providers and another of said resource providers;

(b) estimating, for each of said next-level nodes, a stress value representing a degree of undesirability of the respective reassignment; and

(c) generating a new assignment set corresponding to one of said next-level nodes having a minimum stress value.

5,467,269

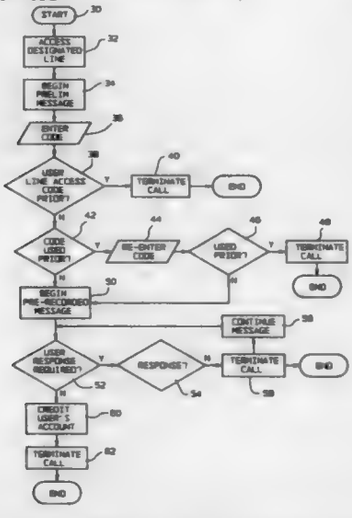
METHOD AND MEANS FOR TELEPHONICALLY CREDITING CUSTOMERS WITH REBATES AND REFUNDS

Lawrence M. Flaten, Carmel, Ind., assignor to J. B. Laughrey, Inc., Indianapolis, Ind.

Continuation of Ser. No. 811,581, Dec. 20, 1991, abandoned. This application May 31, 1994, Ser. No. 251,012

Int. Cl.[6] G06F *15/00*

U.S. Cl. 364—401 **18 Claims**



1. A system for crediting a rebate to a designated account of a user of the system, comprising:

a rebate certificate, said certificate having at least one predetermined unique code thereon;

input means for receiving from the user the predetermined unique code taken from the rebate certificate, said input means being capable of generating a signal comprising data corresponding to said predetermined code;

a processor linkable to said input means for receiving said signal, said processor being capable of reading said signal, said processor including means for identifying redeemable rebate certificates, and determining whether the rebate certificate having said predetermined unique code is redeemable;

means for linking the input device and the processor so that said signal may be transmitted therebetween; and

means operatively associated with said processor for crediting the rebate to the designated account.

5,467,270

SYSTEM AND METHOD FOR POS BASED FUZZY THEORY UTILIZING DATA EXTRACTION

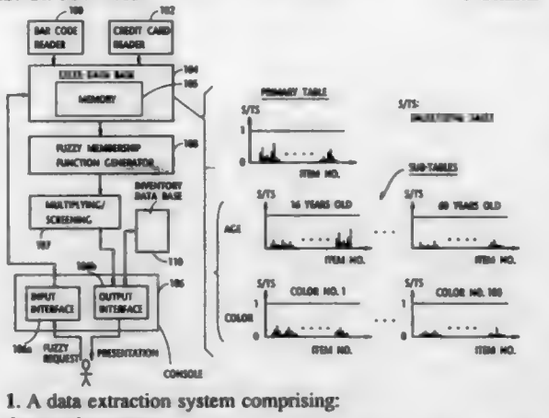
Hiroshi Matsumoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 29, 1992, Ser. No. 827,038

Claims priority, application Japan, Jan. 29, 1991, 3-026690

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—403 **6 Claims**



1. A data extraction system comprising:

data reader means;

data base means for sorting and storing data from said data reader means, said data base means storing an inventory data base correlating item numbers with characteristics of said item and responsive to an inquiry to generate a plurality of first data tables, said plurality of first data tables being divided into groups;

receiving means for receiving the plurality of said first data tables and for generating a plurality of fuzzy membership functions by multiplying together the first data tables in each said group;

multiplying means for multiplying the plurality of fuzzy membership functions to generate a second data table, said multiplying means screening data pertaining to said inquiry by comparing said second data table with a threshold level to determine identity information pertinent to said inquiry; and

identifying means for identifying specific items, using said pertinent identity information in said inventory data base of items.

5,467,271

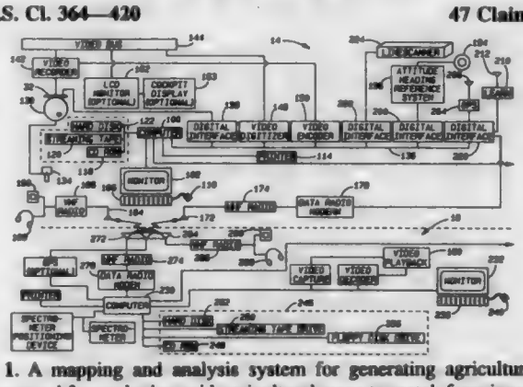
MAPPING AND ANALYSIS SYSTEM FOR PRECISION FARMING APPLICATIONS

Robert J. Abel, Newark; Michael C. MacDonald, San Jose, and Peter S.-S. Wang, Cupertino, all of Calif., assignors to TRW, Inc., Redondo Beach, Calif.

Filed Dec. 17, 1993, Ser. No. 169,853

Int. Cl.[6] G06F *17/40*

U.S. Cl. 364—420 **47 Claims**



1. A mapping and analysis system for generating agricultural maps and for analyzing said agricultural maps to match farm inputs

of a farming field to current soil and vegetation characteristics to optimize the productivity of the farming field comprising:

air-based means for generating spectral image data related to at least one of vegetation stress and soil characteristics for a portion of the farming field;

position means for generating position data related to the position of said air-based means with respect to said portion of the farming field; and

georeferencing means for synchronizing said position data with said spectral image data to generate georeferenced spectral image data.

5,467,272

INTEGRATED WIRING SYSTEM

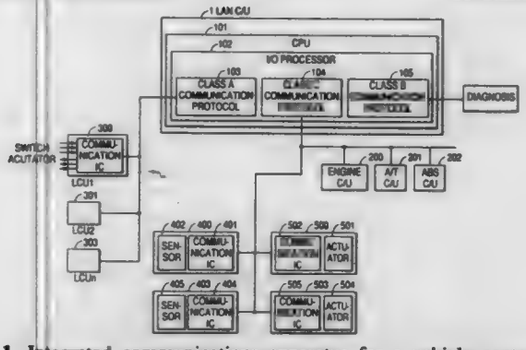
Tatsuya Yoshida, and Shigeru Oho, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 21, 1994, Ser. No. 184,443

Claims priority, application Japan, Jan. 21, 1993, 5-008079

Int. Cl.[6] G06F *15/80*

U.S. Cl. 364—424.01 **16 Claims**



1. Integrated communications apparatus for a vehicle control system having a computational processor for receiving and processing signals indicative of operational status of a plurality of vehicle systems and for controlling said vehicle systems, said apparatus comprising:

a plurality of terminal control units for operating said vehicle systems;

a central control unit having an input-output subprocessor for transferring electronic signals between said computational processor and said terminal control units;

said input-output subprocessor having a plurality of communications interface units for communicating with said terminal control units according to a plurality of communications protocols, each of said communications interface units having a different communications protocol for communicating with particular vehicle systems at a speed which is different from that of others of said communications interface units; and

means for alternating operation of said communications interface units according to a predetermined pattern.

5,467,273

LARGE AREA MOVEMENT ROBOT

Sorin Faibish; Giora Yahav, both of Haifa, and Shlomo Djerassi, Nahariya, all of, Israel, assignors to State of Israel, Ministry of Defence, Rafael Armament Development Authority, Haifa, Israel

Filed Jan. 11, 1993, Ser. No. 3,230

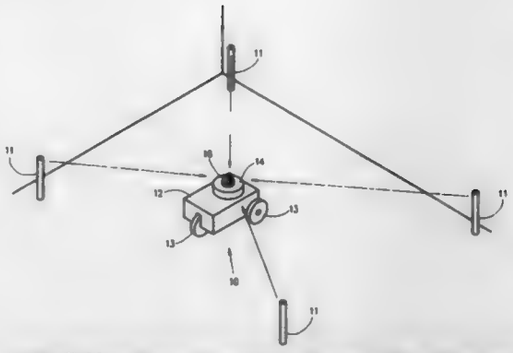
Claims priority, application Israel, Jan. 12, 1992, 100.633

Int. Cl.[6] G06F *165/00*

U.S. Cl. 364—424.02 **7 Claims**

1. A large area movement robot for displacement within a region delimited by a plurality of retroreflecting objects, the robot comprising:

a chassis;



a controllable apparatus operative to displace the chassis within the region delimited by the plurality of retroreflecting objects;

a learning navigator operative to control the operation of the controllable apparatus, said navigator comprising:

a scanning range finder mounted on the chassis and operative to measure initial azimuthal orientations and ranges of a plurality of retroreflecting objects;

an azimuth and range matching device associated with the scanning range finder operative to determine the current azimuthal orientation of the plurality of retroreflecting objects whose ranges are determined by the scanning range finder and matching the azimuthal orientations and ranges with initial azimuthal orientations and ranges of said plurality of retroreflecting objects; and

a self-position computation unit responsive to the output of the azimuth and range matching device and operative to provide operating instructions to the controllable apparatus.

5,467,274

METHOD OF DEBRIEFING MULTI AIRCRAFT OPERATIONS

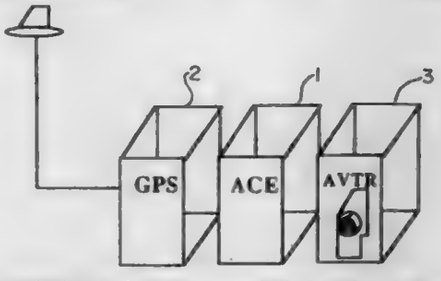
Hanan Vax, Yavne, Israel, assignor to Rada Electronic Industries, Ltd., Herzlia, Israel

Filed Mar. 16, 1992, Ser. No. 851,630

Claims priority, application Israel, Mar. 25, 1991, 97663

Int. Cl.[6] G06F *17/40*

U.S. Cl. 364—424.06 **8 Claims**



1. A method to gather, process and display aircraft operations data comprising:

conducting aircraft operation with multiple aircraft and collecting selected flight data in each of said aircraft in an airborne computer in each of said aircraft;

encoding said selected flight data collected in each said computer in each of said aircraft by an encoder and recording said encoded selected flight data onto a video tape in each said aircraft;

sensing inertial navigation data by an inertial navigation system on said aircraft, determining each aircraft location therefrom, and providing inertial navigation system location data to each said airborne computer;

transferring said inertial navigation system location data to a monitoring apparatus in each said aircraft;

sensing global positioning system satellite signals and determining each aircraft global positioning system location data by time differentiating said global positioning system satellite signals;

transferring said global positioning system location data to said monitoring apparatus in each said aircraft using an asynchronous protocol;

encoding said global positioning system location data and said inertial navigation system location data in each said aircraft monitoring apparatus with contemporaneously selected flight data and recording said global positioning system location data, said inertial navigation system location data and said flight data onto said video tape in each said aircraft;

reading said encoded selected flight data from said video tape in each said aircraft and decoding said encoded selected flight data from each said aircraft;

creating a display file by processing the decoded selected flight data;

generating from said display file at least one of tabular, computer generated graphical, and video representations of each said aircraft operations during which each said aircraft selected flight data was collected;

decoding each said aircraft encoded global positioning location data and said inertial navigation system location data and entering said global positioning location data and said inertial navigation system location data in said display file;

comparing said decoded inertial navigation location data to said decoded global positioning location data and computing a correction factor representative of the error of said inertial navigation location data; and

correcting each said aircraft inertial navigation location data by applying said correction factor to each said aircraft inertial navigation location data in said display file.

5,467,275

CONTROL APPARATUS FOR ELECTRIC VEHICLE

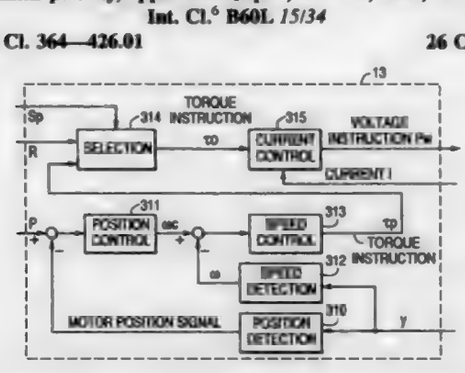
Yusuke Takamoto; Ryoso Masaki, both of Hitachi; Sanshiro Obara, Tokai, and Satoru Kaneko, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 19, 1993, Ser. No. 33,742

Claims priority, application Japan, Mar. 19, 1992, 4-063143

Int. Cl.[6] B60L *15/34*

U.S. Cl. 364—426.01 **26 Claims**



1. Method of controlling operation of a vehicle propelled by an electric motor, comprising the steps of:

generating a speed/torque control signal in response to input from a vehicle operator;

controlling movement of said vehicle by adjusting speed or torque of said electric motor in response to said speed/torque control signal;

sensing when said vehicle comes to a stop and generating a position control selection signal in response thereto;

generating a position control signal in response to a desired stop position entered by said vehicle operator; and

when said position control selection signal is operative, controlling said electric motor in response to said position control signal.

5,467,276

NAVIGATION APPARATUS AND METHOD

Toshio Tsuyuki, 865-3-352, Kajiya, Yugawaracho, Ashigarashimo-Gun, Kanagawa-Ken, Japan

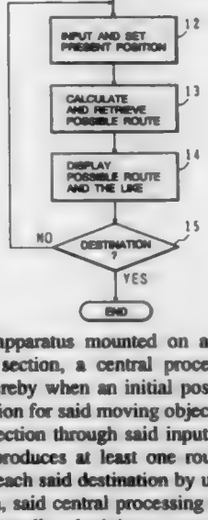
PCT No. PCT/JP92/00727, § 371 Date Nov. 18, 1993, § 102(e) Date Nov. 18, 1993, PCT Pub. No. WO92/21937, PCT Pub. Date Oct. 12, 1992

PCT Filed Jun. 5, 1992, Ser. No. 150,052

Claims priority, application Japan, Jun. 5, 1991, 3-230743

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—449 **10 Claims**



1. A navigation apparatus mounted on a moving object and including an input section, a central processing section and a display section, whereby when an initial position of said moving object and a destination for said moving object are provided to said central processing section through said input section, said central processing section produces at least one route along which said moving object can reach said destination by using map data stored in a memory section, said central processing section comprising:

means for repeatedly obtaining a current position of said moving object, said current position varying from said initial position during the movement of said moving object;

possible route operation means for repeatedly calculating two or more possible routes by using data of said current position, said destination and said map data stored in said memory section, any one of said two or more possible routes connecting said current position and said destination;

means for repeatedly indicating said current position, said destination and said two or more possible routes on said display section; and

possible area operation means for repeatedly calculating a possible area defined by maximum boundaries determined by two or more of said possible routes, said possible area being indicated on the display section, whereby a user may freely select any possible route contained in said possible area.

5,467,277

APPARATUS AND METHOD FOR AUTOMOBILE CONTROL USING A CONTROL CHARACTERISTIC WHICH CAN BE ADJUSTED BY THE DRIVER

Masaaki Fujisawa, Mito; Taiji Hasegawa, Nakaminato; Toshio Ishii, Mito; Shoji Sasaki, and Masahide Sakamoto, both of Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 597,339, Oct. 15, 1990, abandoned. This application Aug. 27, 1992, Ser. No. 936,224

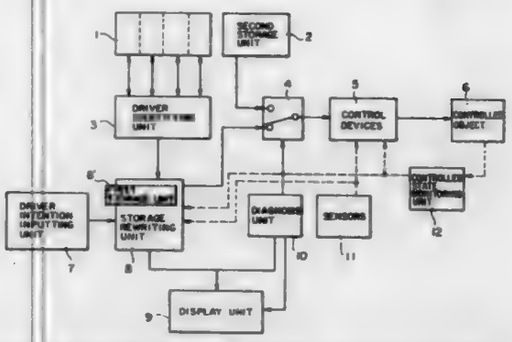
Claims priority, application Japan, Jan. 20, 1989, 1-271665

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—424.05 **2 Claims**

1. An automobile control system, comprising:

control devices provided in an automobile for controlling operations of the automobile in accordance with data representing control characteristics of said operation;



first rewritable storage means for storing operator-specific configuration data representing a plurality of different control characteristics for said control devices, said different control characteristics being related to use by different drivers of said control devices in the operation of the automobile;

means for reading from said first storage means data representing a control characteristic corresponding to a particular driver who has input data to the system and for delivering the data to said control devices in response to data inputted by the particular driver to operate said control devices;

means for modifying data representing a designated control characteristic for a particular driver as stored in said first storage means in response to a command and data input by the particular driver to adapt the modified control characteristic to requirements of said particular driver for operation of the automobile;

determining means for determining whether the particular driver who has inputted data to operate said control devices matches the driver corresponding to the data representing a characteristic stored in said first storage means to control said reading means to read from said first storage means only when a match is detected;

second storage means for storing data representing predetermined control characteristics;

means for checking whether or not the data stored in said first storage means and a determination made by said determining means are within a predetermined normal range; and

means for selecting one of the control characteristics of said first storage means and said second storage means for outputting selected control characteristic to said control devices by selecting data representing the control characteristic of said first storage means when said checking means determines that the data stored in said first storage means and the determination made by said determining means are within said predetermined normal range, and by selecting data representing the control characteristic of said second storage means when said checking means determines that the data stored in said first storage means and the determination made by said determining means are not within the predetermined normal range.

5,467,278

ELECTRIC CONTROL APPARATUS FOR FOUR-WHEEL STEERING SYSTEM

Mizuho Sugiyama, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 5, 1993, Ser. No. 13,979

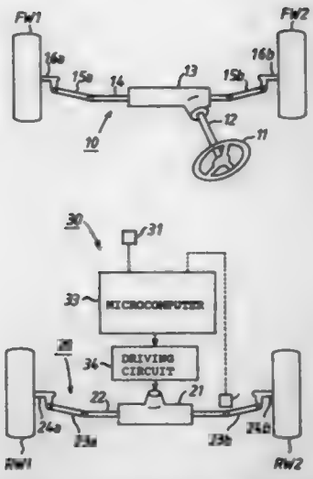
Claims priority, application Japan, Feb. 5, 1992, 4-020144

Int. Cl.[6] B62D *6/00;5/04*

U.S. Cl. 364—424.05 **3 Claims**

1. An electric control apparatus for a four-wheel steering system of an automotive vehicle having a front wheel steering mechanism for a set of dirigible front road wheels and a rear wheel steering mechanism for a set of dirigible rear road wheels, comprising:

yaw rate detection means for detecting an actual yaw rate of the vehicle and for producing a detection signal indicative of the actual yaw rate;



means responsive to the detection signal for obtaining a high-frequency component of the actual yaw rate and for defining an absolute value of the high-frequency component to be increased in a transition period for turning of the vehicle and to be maintained approximately at zero in steady-state cornering the vehicle;

control means for determining a target steering angle of the rear road wheels in proportion to the high-frequency component of the actual yaw rate and for producing a control signal indicative of the target steering angle; and

means for applying the control signal to an electrically operated actuator of said rear wheel steering mechanism so that the rear road wheels are steered at the target steering angle.

5,467,279

MOTOR-ASSISTED POWER STEERING CONTROL DEVICE

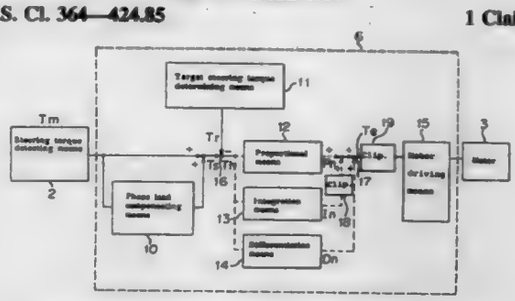
Shunichi Wada; Yasuo Naito; Kazuhisa Nishino, and Masanori Takagi, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1993, Ser. No. 51,545

Claims priority, application Japan, Apr. 27, 1992, 4-107452; Apr. 27, 1992, 4-107584

Int. Cl.[6] B62D *5/04*

U.S. Cl. 364—424.85 **1 Claim**



1. A motor-assisted power steering control device which comprises:

a detecting means for detecting a steering torque of a steering wheel,

means for obtaining an error between the detected steering torque and a target steering torque,

means for obtaining a proportional value, an integration value and a differentiation value of the error,

a motor for generating an auxiliary steering torque of the steering wheel,

a first clipping means for determining a lower limit clipping value of the integration value as the lower limit value of an instruction voltage value or an instruction current value of the motor,

a second clipping means for clipping a control value obtained by summing said proportional value, said integration value and said differentiation value according to upper and lower limit values of the instruction voltage value or the instruction current value of the motor, and

means for controlling the motor in response to the clipped control value.

5,467,280

VEHICULAR SUSPENSION SYSTEM UTILIZING VARIABLE DAMPING FORCE SHOCK ABSORBER

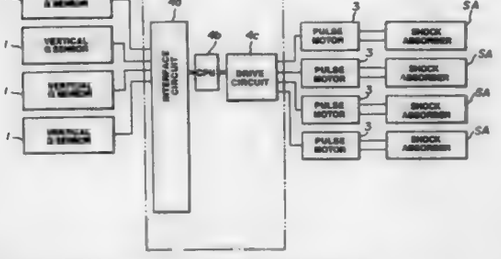
Makoto Kimura, Atsugi, Japan, assignor to Unisia Jecs Corporation, Kanagawa, Japan

Filed Jul. 30, 1993, Ser. No. 99,651

Claims priority, application Japan, Aug. 4, 1992, 4-207716

Int. Cl.[6] B60G *17/015*

U.S. Cl. 364—424.05 **16 Claims**



1. A vehicular suspension system comprising:

a variable damping force shock absorber disposed between a vehicle body and at least one of a plurality of road wheels and including a variable semi-active hydraulic damper which is operable between a plurality of different damping characteristics;

a sensor for detecting an absolute vertical velocity (Vn) of a sprung mass of the vehicle to generate an absolute vertical velocity indicative signal; and

a control unit responsive to said vertical velocity, for generating a control signal (V) based on said vertical velocity (Vn) to adjust the damping characteristic of said damper;

wherein said control unit includes a dead-band controlling means for adjusting the damping characteristic to a minimum damping characteristic only when the control signal value is maintained within a controlled dead-band threshold value (Ns);

wherein said dead-band controlling means initially sets the dead-band threshold value (Ns) by multiplying a ratio of a damping force generated at a minimum damping characteristic to a damping force generated at a maximum damping characteristic at a predetermined piston speed of said damper with an initially-set maximum damping characteristic threshold (Vp1, Vp2) above which the damping characteristic of said damper is adjusted to said maximum damping characteristic, and

wherein said dead-band controlling means renews said initially-set maximum damping characteristic threshold (Vp1, Vp2) with a current value of said control signal and varies said initially set dead-band threshold value (Ns) in proportion to changes in said renewed maximum damping characteristic threshold (Vp1, Vp2), until the control signal value (V) reaches a peak value (P1, P2), at which peak value a rate of change in said detected vertical velocity (Vn) is equal to zero, from the time when the control signal value (V) exceeds the initially set maximum damping characteristic threshold (Vp1, Vp2).

5,467,281

CONTROLLER FOR POWER STEERING APPARATUS

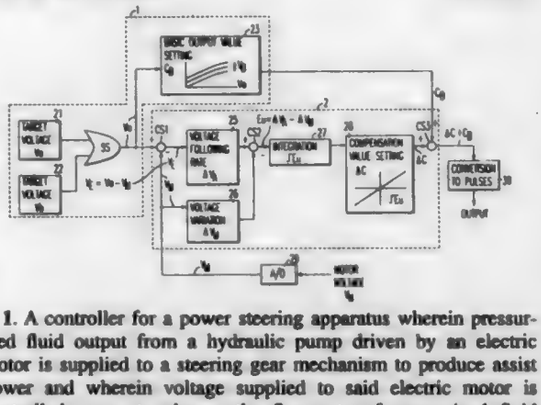
Shigeo Iwashita; Akihiro Ohno, both of Okazaki, and Takashi Shirai, Toyokawa, all of, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 11, 1994, Ser. No. 208,953

Claims priority, application Japan, Mar. 13, 1993, 5-078991; Mar. 13, 1993, 5-078992

Int. Cl.[6] B62D *5/04;5/06*

U.S. Cl. 364—424.05 **11 Claims**



1. A controller for a power steering apparatus wherein pressurized fluid output from a hydraulic pump driven by an electric motor is supplied to a steering gear mechanism to produce assist power and wherein voltage supplied to said electric motor is controlled so as to change the flow rate of pressurized fluid supplied to said steering gear mechanism, said controller comprising:

means for setting a target value representing a target voltage to be supplied to said electric motor;

means for detecting a detection value representative of a voltage being supplied to said electric motor;

means for generating a voltage compensation value based on said target value and said detection value;

means for generating a basic value based on said target value;

means for adding said voltage compensation value to said basic value to obtain a compensated target value; and

means for supplying said electric motor with a voltage corresponding to said compensated target value.

5,467,282

GPS AND SATELLITE NAVIGATION SYSTEM

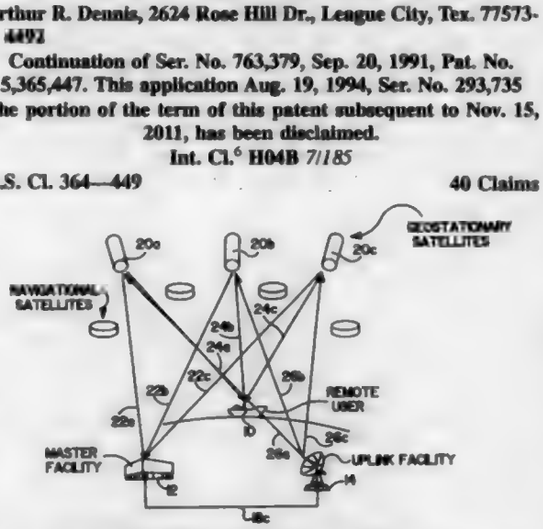
Arthur R. Dennis, 2624 Rose Hill Dr., League City, Tex. 77573-4492

Continuation of Ser. No. 763,379, Sep. 20, 1991, Pat. No. 5,365,447. This application Aug. 19, 1994, Ser. No. 293,735

The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.

Int. Cl.[6] H04B *7/185*

U.S. Cl. 364—449 **40 Claims**



1. An integrated positioning system, comprising:

a plurality of fixed relays receiving and transmitting a first plurality of signals;

a plurality of navigational satellites transmitting a second plurality of signals;

control means for receiving the first plurality of signals from the fixed relays and the second plurality of signals from the navigational satellites, for modulating the first plurality and the second plurality of signals, and for transmitting the modulated first plurality and the modulated second plurality of signals;

means for receiving the unmodulated first and second pluralities of signals and the modulated first and second pluralities of signals; and

means for calibrating and processing the positional data derived from one of the unmodulated first plurality and the unmodulated second plurality of signals received from the control means to minimize errors in data derived from the one unmodulated plurality of signals with data derived from the other of the unmodulated plurality of signals, data derived from the modulated first plurality of signals, and the modulated second plurality of signals to obtain accurate positional coordinates.

5,467,283

OBSTACLE SENSING APPARATUS FOR VEHICLES

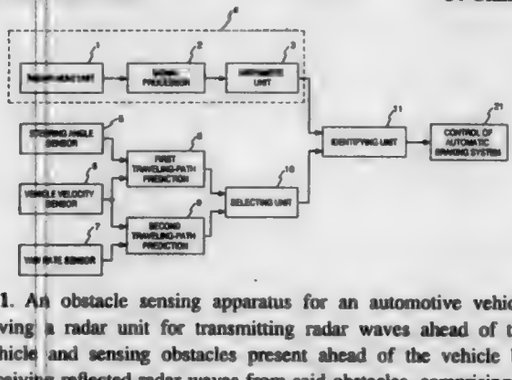
Tetsuro Butsuen, Hiroshima; Tohru Yoshioka, Hatsukaichi; Hiroki Uemura, Kure; Tadayuki Nübe, Hiroshima; Ayumu Doi, Hatsukaichi; Ken-ichi Okuda, Hatsukaichi; Tomohiko Adachi, Hatsukaichi, and Satoshi Morioka, Hiroshima, all of, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Oct. 19, 1993, Ser. No. 138,022

Claims priority, application Japan, Jan. 21, 1992, 4-282724

Int. Cl.[6] G06F *165/00*

U.S. Cl. 364—461 **14 Claims**



1. An obstacle sensing apparatus for an automotive vehicle having a radar unit for transmitting radar waves ahead of the vehicle and sensing obstacles present ahead of the vehicle by receiving reflected radar waves from said obstacles, comprising:

(a) steering angle sensing means for sensing steering angle of the vehicle;

(b) yaw rate sensing means for sensing yaw rate produced by the vehicle;

(c) first traveling-path predicting means for predicting a first traveling path of the vehicle based upon the steering angle sensed by said steering angle sensing means;

(d) second traveling-path predicting means for predicting a second traveling path of the vehicle based upon the yaw rate sensed by said yaw rate sensing means; and

(e) selecting means for selecting one of the first and second traveling paths, which have been predicted by said first and second traveling-path predicting means, in dependence upon the operating state of the vehicle and wherein the sensing of the obstacles is carried out within a limited region along the selected traveling path.

5,467,284

OBSTACLE DETECTION SYSTEM FOR MOTOR VEHICLE

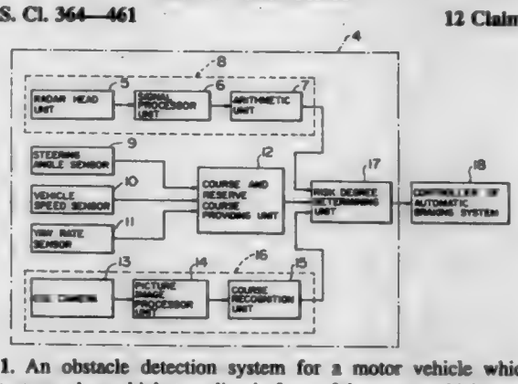
Tohru Yoshioka, Hatsukaichi; Hiroki Uemura, Kure; Tadayuki Nübe, Hiroshima; Ayumu Doi; Ken-ichi Okuda, both of Hatsukaichi; Yasunori Yamamoto, Higashi-Hiroshima; Tomohiko Adachi, Hatsukaichi, and Naotsugu Masuda, Hiroshima, all of, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed May 20, 1994, Ser. No. 247,206

Claims priority, application Japan, May 24, 1993, 5-121087

Int. Cl.[6] G06F *165/00*

U.S. Cl. 364—461 **12 Claims**



1. An obstacle detection system for a motor vehicle which detects another vehicle traveling in front of the motor vehicle as an obstacle comprising:

course providing means for providing a course on which the motor vehicle is supposed to travel;

reserve course providing means for providing a reserve course located outside of the course on which the motor vehicle is supposed to travel;

detection means for detecting the other vehicle traveling in one of the course on which the motor vehicle is supposed to travel and the reserve course as an obstacle; and

obstacle detection continuation means for continuously detecting the other vehicle until a predetermined condition has been satisfied when the other vehicle moves from the course on which the motor vehicle is supposed to travel to the reserve course.

5,467,285

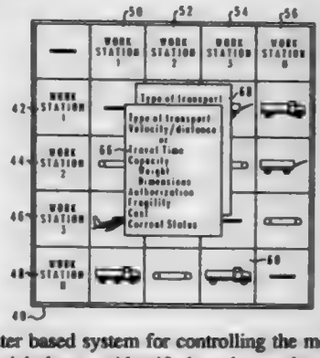
METHOD AND SYSTEM FOR OPTIMIZING MATERIAL MOVEMENT WITHIN A COMPUTER BASED MANUFACTURING SYSTEM

Donald R. Flinn, Roswell; John F. Laszcz, Marietta, both of Ga., and David H. Withers, Dayton, Ohio, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 802,997, Dec. 5, 1991, abandoned. This application Aug. 30, 1994, Ser. No. 299,171

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—478 **7 Claims**



1. A computer based system for controlling the movement of at least one material along an identified product path within a manu-

facturing process, said computer based system including a display device and a user input device, said computer based system comprising:

a plurality of workstations within said manufacturing process for operating upon said at least one material;

a plurality of means for transporting said at least one material between selected ones of said plurality of workstations wherein at least two diverse means exist for transporting said at least one material between a specified two of said plurality of workstations;

a transport matrix displayed within said display device, said transport matrix having a plurality of cells each located at an intersection of one of a plurality of rows and columns, each row and column having associated therewith an identification of one of said plurality of workstations, each cell including a graphic representation displayed therein of a means for transporting said at least one material;

a plurality of dynamically alterable parameters associated with each cell, said plurality of dynamically alterable parameters including an elapsed time required and a cost associated with each of said means for transporting said at least one material; and

processor means for analyzing said displayed transport matrix for identifying an optimum route for transporting at least one material between selected ones of said plurality of workstations in response to an identified product path and at least one desired path attribute specified by a user of said system utilizing said user input device.

5,467,286

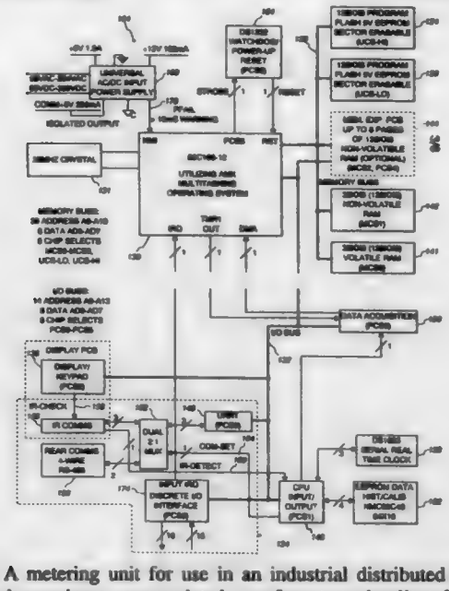
METERING UNIT WITH DOWNLOADABLE FIRMWARE

Michael W. Pyle, Hermitage, and Lee D. Wallis, Murfreesboro, both of Tenn., assignors to Square D Company, Palatine, Ill.

Filed Nov. 3, 1993, Ser. No. 159,398

Int. Cl.[6] G06F *12/02*; G01R *19/00*

U.S. Cl. 364—483 **15 Claims**



10. A metering unit for use in an industrial distributed power network carrying a power-related waveform to a plurality of power equipment loads, the metering unit sensing power-related parameters associated with the power-related waveform and generating and transmitting data representative thereof, the metering unit comprising:

a first non-volatile memory having a first section for storing main functionality firmware and a second section for storing boot code, said boot code including a reset portion for resetting the metering unit and a firmware update section for downloading external firmware to said first section, said firmware update section including a writing routine for writing the external firmware to said first section; and

a second memory, said writing routine being copied to said second memory and executed therefrom to write the external firmware over a broadcast-type communications link to said first section.

5,467,287

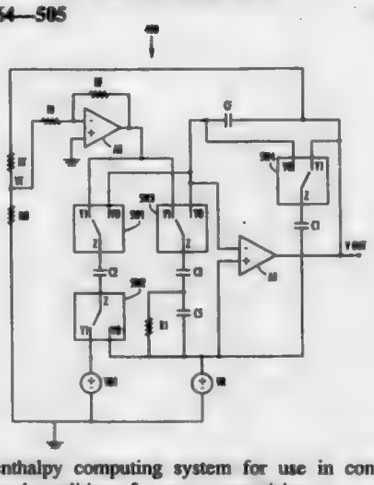
ENTHALPY CALCULATOR

Ronald J. Wenner, Brown Deer, and George Rudich, Jr., Cedarburg, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Feb. 9, 1994, Ser. No. 194,039

Int. Cl.[6] F24F *11/00*

U.S. Cl. 364—505 **38 Claims**



1. An enthalpy computing system for use in controlling an environmental condition of a room, comprising:

a temperature sensor having an output RT indicative of temperature;

a humidity sensor having an output CS indicative of humidity;

an electronic circuit having the output RT as a first input and the output CS as a second input, wherein the electronic circuit provides an output h of the form:

$$h=K1+K2*F1(RT)+K3*F2(CS)+K4*F1(RT)*F2(CS);$$

a source of energy controlled air;

a source of external air;

a damper, connected to the source external air and further connected to the source of energy controlled air, wherein a position of the damper determines how much of the external air and the energy controlled air is provided to the room, and wherein the position of the damper is based on the output h.

5,467,288

DIGITAL AUDIO WORKSTATIONS PROVIDING DIGITAL STORAGE AND DISPLAY OF VIDEO INFORMATION

Peter J. Fasciano, Natick, Mass.; Curt A. Rawley, Windham, N.H.; Thomas R. Hegg, New York, N.Y.; Mackenzie Leathurby, Newton; Jeffrey L. Bedell, Arlington, both of Mass., and James A. Ravan, Jr., Nashua, N.H., assignors to Avid Technology, Inc., Tewksbury, Mass.

Continuation-in-part of Ser. No. 867,052, Apr. 10, 1992, abandoned. This application Apr. 9, 1993, Ser. No. 45,658

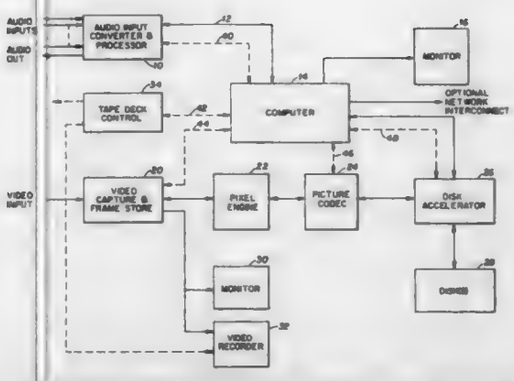
Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—514 R **34 Claims**

1. A digital audio workstation comprising:

a. means for storing digital audio information;

b. means for selecting a portion of digital audio information at audio sampling times spaced apart by less than one-thirtieth of a second;



c. a computer-readable randomly-accessible storage medium in which digital video information is stored and is associated in time with the digital audio information;

d. means for detecting selection by an operator of the portion of digital audio information; and

e. means for accessing the digital video information based on the selected portion of digital audio information selected by the operator.

5,467,289

METHOD OF AND AN APPARATUS FOR MEASURING SURFACE CONTOUR

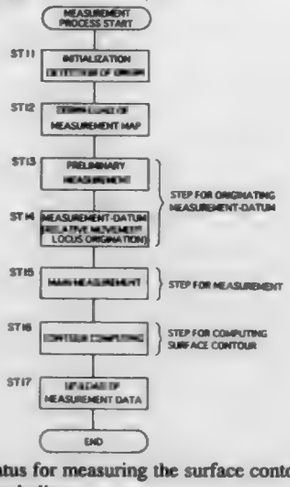
Makoto Abe; Shigekata Ohta; Hiroyuki Tokitoh, all of Kawasaki; Morimasa Ueda, Tsukuba; Takahumi Kano, Kure, and Hiroyuki Hidaka, Miyazaki, all of, Japan, assignors to Mitutoyo Corporation, Tokyo, Japan

Filed Oct. 12, 1993, Ser. No. 134,915

Claims priority, application Japan, Jan. 15, 1992, 4-277156; Jan. 15, 1992, 4-277157

Int. Cl.[6] G01B *5/008*

U.S. Cl. 364—560 **19 Claims**



15. An apparatus for measuring the surface contour of an object, said apparatus including:

a base;

a table disposed on said base adapted for receiving the object to be measured;

a displacement mechanism attached to said base and to said table for moving said table and the object along a first axis, said displacement mechanism including a drive unit responsive to drive signals for moving said table and a table position encoder for monitoring the position of said table on said base and configured to generate table position signals representative of the position of said table;

a distance measuring detector located above said table, said distance measuring detector being configured to measure the distance between said detector and the object to produce distance measurement signals representative of the distance, said distance measuring detector being configured to perform said measurements without contacting the object;

a detector positioning system connected to said base and said detector for positioning said detector above said table, said detector for moving said detector relative to said table and the object along a second axis separate from said first axis, said detector positioning system including a displacement assembly responsive to detector positioning drive signals for selectively positioning said detector and a position encoder for monitoring the position of said detector relative to said table and configured to generate detector position signals representative of said position of said detector;

a turntable for pivotally securing said detector to said detector positioning unit, said turntable being configured to pivot said detector around a point, said turntable having a turntable drive mechanism for selectively pivoting said detector in response to application of drive signals thereto and having a position detector configured to monitor the pivotal position of said detector that generates turntable position signals representative of the angular position of said detector; and

a control unit connected to said table displacement system for applying said displacement system drive signals thereto and receiving said table position signals therefrom, to said detector positioning system for applying said detector positioning drive signals thereto and receiving said detector position signals therefrom, to said turntable for applying said turntable drive signals thereto and receiving said turntable position signals therefrom and to said detector for receiving said measurement signals therefrom, said control unit being configured to:

generate said table displacement signals, said displacement mechanism drive signals and said turntable displacement signals so as to cause said detector to measure the contour of the object along a base datum, said base datum extending along said first and second axes;

receive a plurality of measurement signals from said detector representative of the distance between said detector and the object along said base datum;

generate a measurement datum based on said initial measurement signals, said measurement datum being at least partially closer to the object than said base datum and having at least one curved portion and to generate data representative of the distance between said base datum and said measurement datum;

generate said table displacement signals, said displacement mechanism drive signals and said turntable displacement signals so as to cause said detector to move along said measurement datum including said at least one curve portion thereof so that said detector makes main measurements representative of distances between said measurement datum and the object;

receive a plurality of main measurement signals from said detector representative of distance between said detector and the object along said measurement datum; and

generate data representative of object surface contour based on the main measurement signals and said data representative of the distance between said base datum and said measurement datum.

5,467,290

SURVEY SYSTEM AND METHOD

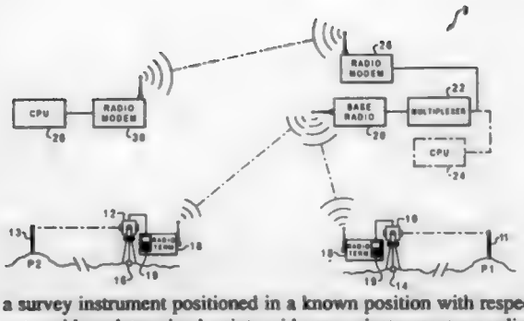
Fred S. Durland, Seal Beach, Calif., and Jerry A. Durgin, Wright, Wyo., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 18, 1993, Ser. No. 108,364

Int. Cl.[6] G01C *1/02;* **G06F** *17/40*

U.S. Cl. 364—561 **13 Claims**

1. A survey system for determining at least one of the Northing, Easting and elevation of a survey point from a predetermined point and for comparison with a calculated value of at least one of the Northing, Easting and elevation of said survey point comprising:



a survey instrument positioned in a known position with respect to said predetermined point, said survey instrument recording the Easting, Northing and elevation of a survey point surveyable by said survey instrument;

a radio terminal electrically connected to said survey instrument for receiving data related to said Northing, Easting and elevation of said survey point and for transmitting a radio frequency signal of said data;

a base radio disposed remote from said survey instrument and said survey point for transmitting and receiving signals of said data to and from said radio terminal;

a controller operably connected to said base radio for processing said data communicated to and from said base radio; and

a central processing unit capable of communicating with said controller for communicating said data related to at least one of a predetermined number of survey points, the distance between one of said predetermined number of survey points and at least one of a plurality of predetermined survey points and the result of a geometric calculation of a parameter of said one of said predetermined number of survey points.

5,467,291

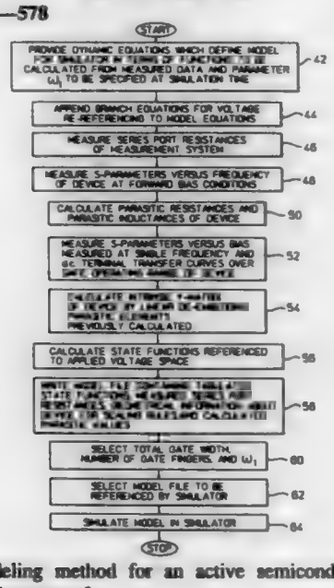
MEASUREMENT-BASED SYSTEM FOR MODELING AND SIMULATION OF ACTIVE SEMICONDUCTOR DEVICES OVER AN EXTENDED OPERATING FREQUENCY RANGE

Siqi Fan; David E. Root, and Jeffrey W. Meyer, all of Santa Rosa, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 756,393, Sep. 9, 1991, abandoned. This application Dec. 5, 1991, Ser. No. 802,993

Int. Cl.[6] G06G *7/62*

U.S. Cl. 364—578 **17 Claims**



1. A modeling method for an active semiconductor device, comprising the steps of:

providing dynamic equations which define a model of an active semiconductor device for a nonlinear circuit simulator, in terms of functions to be calculated from measured response data and a frequency parameter ω, to be specified during simulation;

providing branch equations for voltage re-referencing to the dynamic equations which define a large-signal model of the active semiconductor device for the nonlinear circuit simulator, defined in terms of functions to be measured;

providing a measurement system for generating stimuli and measuring responses to applied stimuli;

measuring series port resistances of the measurement system;

connecting terminals of the active semiconductor device to the measurement system;

measuring S-parameters versus frequency at the terminals of the active semiconductor device with the measurement system;

calculating parasitic device resistances and parasitic device inductances for the active semiconductor device;

measuring S-parameters versus applied, measured controlling bias voltages at at least one frequency and d.c. terminal transfer curves versus applied biases over a predetermined operating range of biases of the active semiconductor device with the measurement system;

calculating an intrinsic Y-matrix of the active semiconductor device by linear de-embedding of the parasitic device resistances and inductances previously calculated;

calculating state functions for the large-signal model, referenced to an applied, measured voltage space defined by the applied, measured controlling bias voltages; and

writing a model file, containing tabulated state function values, measurement series port resistances, and calculated parasitic values.

5,467,292

LOGICAL OPERATION METHOD EMPLOYING PARALLEL ARITHMETIC UNIT

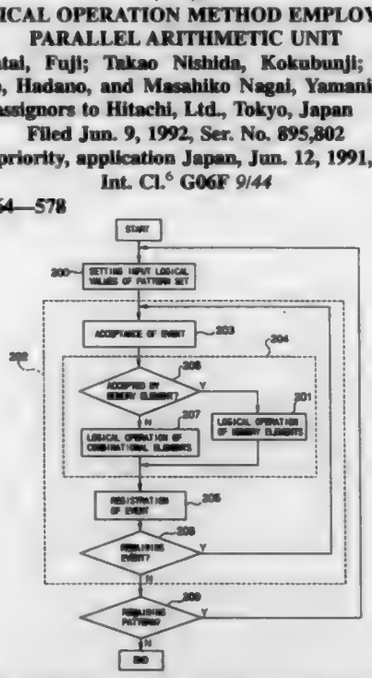
Hiroo Watal, Fuji; Takao Nishida, Kokubunji; Takaharu Nagumo, Hadano, and Masahiko Nagai, Yamanishi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 9, 1992, Ser. No. 895,802

Claims priority, application Japan, Jun. 12, 1991, 3-140296

Int. Cl.[6] G06F *9/44*

U.S. Cl. 364—578 **3 Claims**



1. A logical operation method for obtaining a train of output logical values of a memory element when a plurality of input patterns are successively applied to the memory element whose output .logical value depends upon a preceding output logical value in the presence of a specified input pattern (a "holding pattern"), the logical operation method comprising the steps of:

preparing a vector processor for calculating a vector data Q from a vector data A and a vector data B in accordance with an equation $Qi=Q_{i-1}A_i+B_i$, the Q_i representing an i-th element of the vector data Q, the Q_{i-1} representing an i-th minus one element of the vector data Q, the A_i representing an i-th

element of the vector data A and the B_i representing an i-th element of the vector data B;

evaluating each of the plurality of input patterns ordered in accordance with an order in which each of the input patterns is applied to the memory element, whether it is said holding pattern;

generating, based on a result of the step of evaluating, a first vector data A whose element A_i has a logical value indicating whether the i-th input patterns is said holding pattern;

generating a second vector data B whose element B_i has a predetermined logical value for said holding pattern in a case where the i-th input pattern is the holding pattern, and has a same logical value with the output logical value of said memory element for the i-th input pattern in a case where the i-th input pattern is a non-holding pattern; and

providing the generated vector data A and vector data B to said vector processor and calculating a vector data Q on said vector processor in accordance with said equation, thereby obtaining the calculated vector data Q whose element Q_i represents an i-th output logical value of the train of output logical values and based on the calculated vector value Q, determining an output value of a simulated memory element.

5,467,293

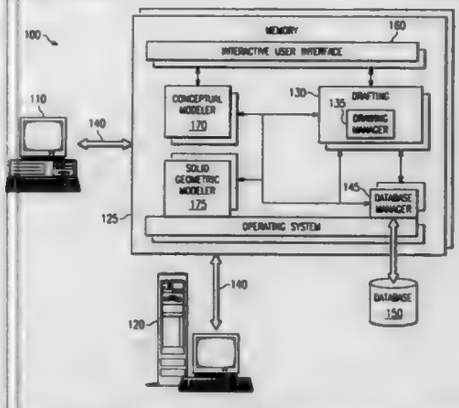
SYSTEM AND METHOD FOR ASSOCIATIVE SOLID SECTIONING DURING DRAFTING OF GEOMETRIC MODELS

Randi M. Summer, Long Beach; Dennis Garbanati, Mission Viejo; Patricia L. Winter, Long Beach, and Ronald D. Gates, Huntington Beach, all of Calif., assignors to Electronic Data Systems Corporation, Plano, Tex.

Filed Jul. 1, 1993, Ser. No. 86,680

Int. Cl.[6] G06F *17/00;15/60*

U.S. Cl. 364—578 **16 Claims**



1. A method for a computerized drafting system to update a section of a model when a feature of said model changes, comprising the computer-performed steps of:

determining that a feature through which a section line crosses has changed, wherein said section line is composed of a plurality of section segments;

adjusting automatically any of said section segments which cross such changed feature to track said changed feature;

regenerating said section line based on said adjusted section segments; and

updating said action based on said regenerated section line.

5,467,294

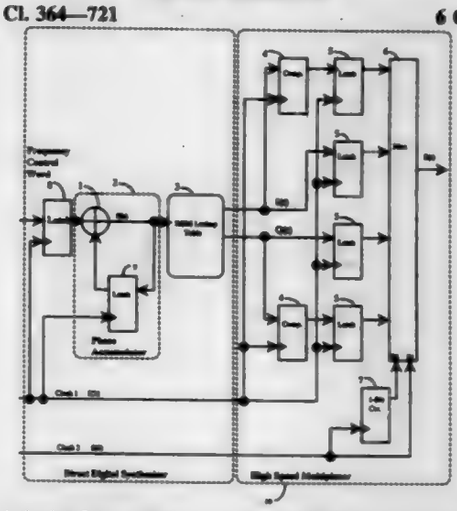
HIGH SPEED, LOW POWER DIRECT DIGITAL SYNTHESIZER

Vince Hu, 13031 Delano St., Van Nuys, Calif. 91401, and James Wang, 2625 Monterey Rd., San Marino, Calif. 91108

Filed Mar. 9, 1994, Ser. No. 207,705

Int. Cl.[6] G06F *1/02*

U.S. Cl. 364—721 **6 Claims**



1. A device for generating programmable digital sine and cosine waves comprising:

a direct digital synthesizer including:

an input latch having first and second inputs and outputs, said first input connected to an input frequency control word and said second input connected to a first clock frequency f_1;

a phase accumulator provided with an output, said phase accumulator connected to said output of said input latch producing an intermediate phase output frequency based upon said input frequency control word, said first clock frequency f_1 and a previous output of said phase accumulator;

a solid state lookup table connected to said output of said phase accumulator for generating sine and cosine output amplitude signal samples based upon said output of said phase accumulator, said lookup table provided with an output;

a high speed multiplexer connected to the output of said lookup table, said multiplexer including:

a first complementer connected to said output of said lookup table for negating said sine output amplitude signal sample and connected to said first clock frequency of f_1 for producing a negated sine output amplitude signal sample;

a second complementer connected to said output of said lookup table for negating said cosine output amplitude signal sample and connected to said first clock frequency of f_1 for producing a negated cosine output amplitude signal sample;

a plurality of second latch devices, each of said second latch devices connected to said lookup table output, and connected to said first clock frequency f_1, each of said second latch devices provided with respective outputs;

a plurality of third latch devices, each of said third latch devices connected to said first complementer or said second complementer and connected to said first clock frequency f_1, each of said third latch devices provided with respective outputs;

a multiplexer connected to the outputs of said second and third latch devices and to a second clock frequency f_2;

a switching device connected to said second clock frequency generator and producing an output frequency f_3 less than f_2, said output frequency f_3 connected to said multiplexer, wherein the combination of f_2 and f_3 produce a periodic four state sequence permitting the selection of one of said sine, cosine, negated sine or negated cosine amplitude signal samples, thereby yielding a sinusoidal output with a fundamental output frequency f_1 translated in frequency to f_2.

5,467,295

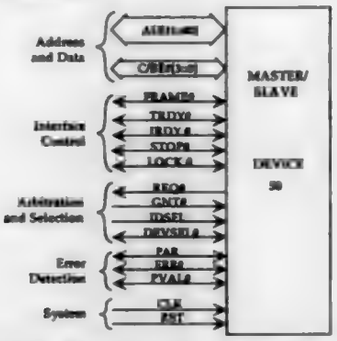
BUS ARBITRATION WITH MASTER UNIT CONTROLLING BUS AND LOCKING A SLAVE UNIT THAT CAN RELINQUISH BUS FOR OTHER MASTERS WHILE MAINTAINING LOCK ON SLAVE UNIT

Bruce Young, Tigard; Dave Carson; Norman Rasmussen, both of Hillsboro, all of Oreg.; Stephen Fischer, Rancho Cordova, and Jeffrey Rabe, Fair Oaks, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Apr. 30, 1992, Ser. No. 876,577

Int. Cl.[6] G06F *13/36*

U.S. Cl. 395—200.05 **23 Claims**



1. In a computer system comprising at least one master device, at least one slave device and a bus coupling the master and slave devices, a method for permitting a master to lock a target slave, comprising the steps of:

the master signalling control of the bus by asserting a frame signal line,

the master signalling to a first target slave that the first target slave is locked by asserting a lock signal line immediately following an address phase of a first transaction with the first target slave, the first target slave must signal retry during any subsequent transactions until the first target slave has been unlocked to any master attempting to access the first target slave with lock signal line asserted during an address phase of any of the subsequent transactions;

the master that locked the first target slave terminating the transaction upon completion by deasserting the frame signal line, wherein the master continues to assert the lock signal line;

the master that locked the first target slave re-accessing the first target slave by asserting frame signal line and deasserting the lock signal line during the address phase of a subsequent access to the first target slave;

the master maintaining control of access to the first target slave until the master releases all locked target slaves by deasserting lock signal line when frame signal line is inactive;

wherein a master locks a target slave and block access to the target slave by other masters.

5,467,296

HIGH-SPEED SMALL DIGITAL MULTIPLIER

Makoto Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 31, 1994, Ser. No. 251,050

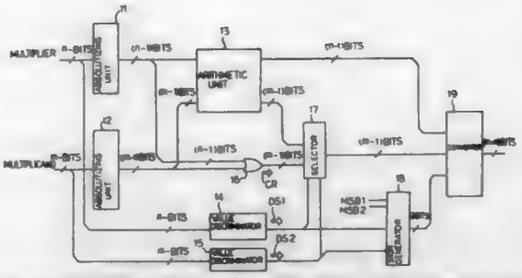
Claims priority, application Japan, Jun. 1, 1993, 5-129857

Int. Cl.[6] G06F *7/52;7/38;11/00*

U.S. Cl. 364—754 **4 Claims**

1. A digital multiplier supplied with a first multi-bit data code and a second multi-bit data code, said first multi-bit data code and said second multi-bit data code respectively representing a primary multiplicand and a primary multiplier in the twos complement representation, said digital multiplier comprising:

a first absolutizing unit for absolutizing said primary multiplicand for producing a secondary multiplicand represented by a third multi-bit data code smaller in the number of bits than said first multi-bit data code;



a second absolutizing unit for absolutizing said primary multiplier for producing a secondary multiplier represented by a fourth multi-bit data code smaller in the number of bits than said second multi-bit data code;

sign generating means for determining whether both of said primary multiplicand and said primary multiplier have the respective maximum negative values for making a first decision and whether at least one of said primary multiplicand and said primary multiplier is zero for making a second decision, and producing a decision signal representing said first decision and said second decision, said sign generating means being further for producing a sign signal indicative of a sign for a product on the basis of said decision signal;

arithmetic means connected to said first absolutizing unit and said second absolutizing unit for multiplying said secondary multiplicand by said secondary multiplier for producing a preliminary product represented by lower bits and higher bits without a sign bit,

said arithmetic means further producing corrective bits from said secondary multiplicand and said secondary multiplier, said corrective bits corresponding to said higher bits and being indicative of a correct value when one of said primary multiplicand and said primary multiplier has said maximum negative value,

said arithmetic means further being connected to said sign generating means so as to be responsive to said decision signal for outputting said lower and higher bits as a fifth multi-bit data code representative of said product when said primary multiplicand and said primary multiplier do not have said maximum negative values, respectively, said arithmetic means replacing said higher bits with said corrective bits for modifying said fifth multi-bit data code when at least one of said primary multiplicand and primary multiplier has the maximum negative value; and

a converting unit, connected to said arithmetic unit and said sign generating means, for producing a sixth multi-bit data code indicative of said product with said sign in the twos complement representation on the basis of said fifth multi-bit data code and said sign bits.

5,467,297

FINITE FIELD INVERSION

Christopher P. Zook, Longmont, Colo., assignor to Cirrus Logic, Inc., Fremont, Calif.

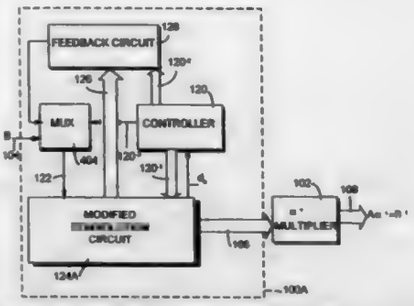
Continuation of Ser. No. 147,758, Nov. 4, 1993. This application Oct. 18, 1994, Ser. No. 325,831

Int. Cl.[6] G06F *7/00;15/00;7/52*

U.S. Cl. 364—746.1 **39 Claims**

1. An inversion circuit for determining an inverse of an m-bit symbol B, the symbol B being expressed in a dual basis representation, the circuit comprising:

an iterative convolution circuit to which the symbol B is applied, the convolution circuit generating and storing electrical signals corresponding to an m-bit value A, the value A being in a first basis representation, the electrical signals for the value A being generated by the convolution circuit such that an inner product of A and $\alpha^k B$ is equal to 0 for $k<m-1$;



a feedback circuit connected to the convolution circuit for enabling the convolution circuit to perform a convolution With a sequence starting with B and extended by taking α multiples of B; and

a multiplier circuit connected to the convolution circuit and which generates electrical output signals corresponding to the product of the value A and α^{-t}, wherein α is a field element and t is an integer, the electrical output signals from the multiplier representing the inverse of the m-bit symbol B in the first basis representation.

5,467,298

MULTIVALUED ADDER HAVING CAPABILITY OF SHARING PLURAL MULTIVALUED SIGNALS

Yukihiro Yoshida, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

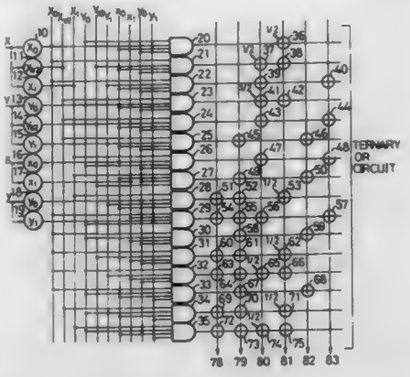
Filed Nov. 23, 1993, Ser. No. 155,828

Claims priority, application Japan, Nov. 26, 1992, 4-316680

The portion of the term of this patent subsequent to Oct. 31, 2012, has been disclaimed.

Int. Cl.[6] G06F *7/00*

U.S. Cl. 364—746.2 **12 Claims**



1. An apparatus for processing addition between a first data and a second data, each of said first and second data being in one of binary logic and multivalued logic, comprising:

first input means having parallel inputs of binary logic and multivalued logic for receiving said first data, and for outputting a first set of bit data representing said first data;

second input means having parallel inputs of binary logic and multivalued logic for receiving said second data, and for outputting a second set of bit data representing said second data;

adding means connected to said first input means and said second input means for adding said second set of bit data and said first set of bit data; and

output means, connected to said adding means, for converting output of said adding means into data in binary logic and multivalued logic, in parallel, and for outputting converted data in binary logic and multivalued logic, in parallel.

5,467,299

DIVIDER AND MICROCOMPUTER INCLUDING THE SAME

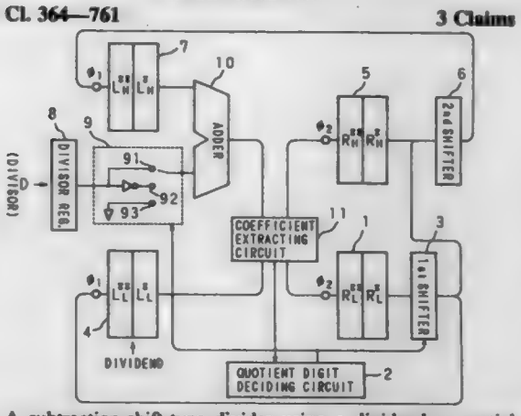
Fumiki Sato, and Kouichi Fujita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1994, Ser. No. 206,585

Claims priority, application Japan, Mar. 30, 1993, 5-071542

Int. Cl.[6] G06F *7/52*

U.S. Cl. 364—761 **3 Claims**



1. A subtraction-shift-type divider using a dividend or partial remainder represented by signed digits taking any of the values −1, 0, 1, and a divisor by twos complement representation, comprising:

converting means for converting the divisor into any of the same value, inverter value and "0";

adding means for adding (subtracting) the partial remainder and output of said converting means, and

next quotient digit deciding means for providing quotient digits, wherein

said next quotient digit deciding means decides the next quotient digit from the quotient digits at respective time points during the execution of division, and a portion of the partial remainder obtained from the addition (subtraction) of said adding means, and

conversion of the divisor by the converting means is in response to values of the quotient digit at respective time points during the execution of division.

5,467,300

GROUNDED MEMORY CORE FOR ROMS, EPROMS, AND EEPTROMS HAVING AN ADDRESS DECODER, AND SENSE AMPLIFIER

James A. Komarek, Newport Beach; Clarence W. Padgett, Westminster; Robert D. Amness, Harbor City, and Scott B. Tanner, Irvine, all of Calif., assignors to Creative Integrated Systems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 16,811, Feb. 11, 1993, and a continuation-in-part of Ser. No. 912,112, Jul. 9, 1992, Pat. No. 5,241,497, which is a continuation of Ser. No. 538,185, Jun. 14, 1990, abandoned. This application Jun. 28, 1993, Ser. No. 84,295

The portion of the term of this patent subsequent to Aug. 31, 2010, has been disclaimed.

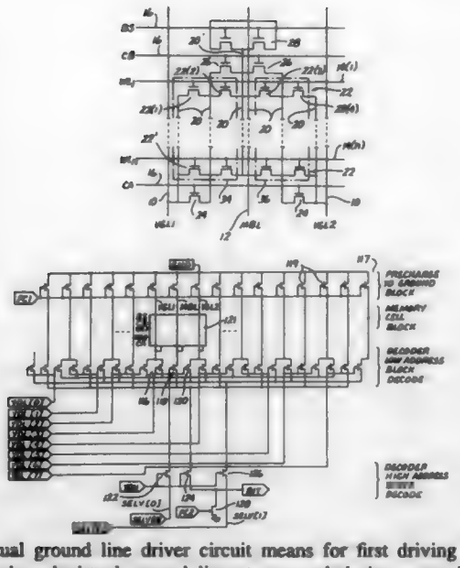
Int. Cl.[6] G11C *17/08;17/12*

U.S. Cl. 365—104 **17 Claims**

1. An improvement in a memory having a memory core with a plurality of memory cells and a predetermined memory core substrate voltage, said memory cells being accessed at least in part by selection of corresponding bit lines and virtual ground lines coupled thereto, said improvement comprising:

precharging circuit means for precharging said virtual ground lines and bit lines in said memory core to said memory core substrate voltage;

virtual ground line and bit line decoder and precharging circuit means for precharging previously selected virtual ground lines and bit lines in said memory core to ground; and



virtual ground line driver circuit means for first driving both selected virtual ground lines to ground during a precharge phase and then selectively driving one virtual ground line to ground and the second virtual ground line to a positive voltage level,

so that memory core junction leakage current from said virtual ground lines and bit lines in said memory core is reduced to zero when said memory core is precharged to said memory core substrate voltage, so that the need for an internal low voltage supply for a precharge level is eliminated, so that VDD standby current and operating voltage level required for said memory is significantly reduced, so that the time required to precharge the said memory core to the precharged voltage level at the beginning of a memory read cycle is significantly reduced, so that said precharging circuit means, virtual ground line and bit line decoder and precharging circuit means, virtual ground line driver circuit means and said memory core provide said memory bit line with bit-low level and bit-high level voltages which are negligibly affected by capacitively coupled negative noise voltages or by memory core junction leakage currents to the memory core substrate, so that said precharging circuit means, virtual ground line and bit line decoder and precharging circuit means, virtual ground line driver circuit means, and said memory core provide a positive current to said memory bit line for providing a positive voltage defined as a logic zero level or bit-high level and a precharged zero voltage level to said memory bit line for a logic one or bit-low level.

5,467,301

Patent Not Issued For This Number

5,467,302

SEMICONDUCTOR MEMORY DEVICE

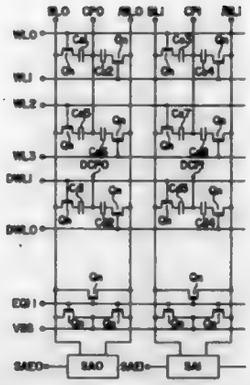
Hiroshige Hirano, Nara; Tatsumi Sumi, Osaka; Nobuyuki Moriwaki, and George Nakane, both of Kyoto, all of, Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Continuation of Ser. No. 161,328, Dec. 2, 1993, Pat. No. 5,392,234. This application Dec. 12, 1994, Ser. No. 354,476
Claims priority, application Japan, Dec. 2, 1992, 4-322983
Int. Cl.[6] G11C *11/22*
U.S. Cl. 361—145 **31 Claims**

4. A semiconductor memory device comprising:

an initializing control signal line;

an initializing potential signal line;



a first electrode having a first logic voltage;

a second electrode having a second logic voltage;

main memory means for storing data, said main memory means having a first ferroelectric capacitor coupled to a first MOS transistor and said first electrode;

dummy memory means for transferring data to and from said main memory means, said dummy memory means having a second capacitor coupled to a second MOS transistor and said second electrode; and

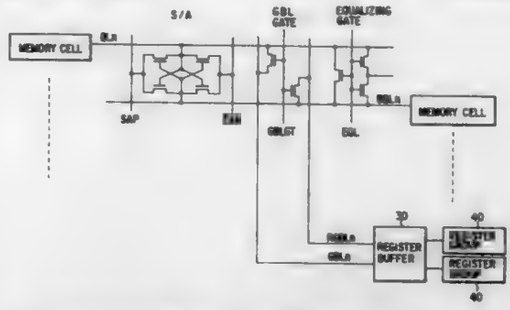
a third MOS transistor coupled to the initializing control signal line, the initializing potential signal line, and the second ferroelectric capacitor.

5,467,303

SEMICONDUCTOR MEMORY DEVICE HAVING REGISTER GROUPS FOR WRITING AND READING DATA

Takehiro Hasegawa, Tokyo; Shigeyoshi Watanabe, and Fujio Masuoka, both of Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 99,593, Jul. 30, 1993, abandoned. This application Jan. 30, 1995, Ser. No. 380,443
Claims priority, application Japan, Jul. 31, 1992, 4-205685
Int. Cl.[6] G11C *11/24;7/00*
U.S. Cl. 365—149 **18 Claims**



1. A semiconductor memory device comprising:

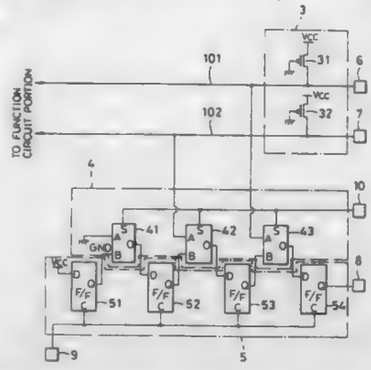
at least one memory cell array having a plurality of memory cell units each comprising a plurality of MOS transistors connected in series and a plurality of data storage capacitors each connected at one end to a source of a corresponding one of said MOS transistors; and

a plurality of register groups provided for each column of each of said memory cell units, each of said register groups having the same number of registers as the number of memory cells in one memory cell unit, one of said register groups of each column temporarily storing data stored in one of said memory cell unit of said column when data-reading/-writing of another register groups is executed for another memory cell unit.

5,467,304
SEMICONDUCTOR INTEGRATED CIRCUIT

Katsunori Uchida; Shotaro Kobayashi, and Tatsuhiro Fukushima, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 14, 1994, Ser. No. 340,293
Claims priority, application Japan, Nov. 17, 1993, 5-311307; Jun. 1, 1994, 6-119931
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—174 10 Claims



1. A semiconductor integrated circuit comprising:

a plurality of bonding pads, each bonding pad being supplied with a voltage for setting an identification code indicative of a kind of said semiconductor integrated circuit,

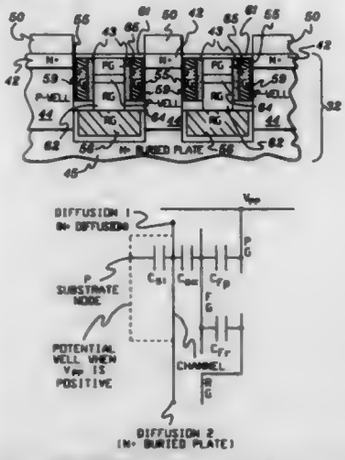
judgement means for making a judgement for a combination pattern of voltage levels of said bonding pads, and

holding means for holding a result of said judgement by said judgement means as said identification code.

5,467,305
THREE-DIMENSIONAL DIRECT-WRITE EEPROM ARRAYS AND FABRICATION METHODS

Claude L. Bertin, South Burlington, Vt.; Donelli J. DiMaria, Ossining, N.Y.; Makoto Miyakawa, and Yoshinori Sakaue, both of Tokyo, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 12, 1992, Ser. No. 850,734
Int. Cl.[6] G11C 14/00
U.S. Cl. 365—185.01 9 Claims



1. A direct-write EEPROM memory array formed in a semiconductor substrate, said memory array comprising:

a plurality of substantially parallel elongated trenches adjacently formed in the semiconductor substrate;

a plurality of vertical direct-write EEPROM cells disposed within said plurality of elongated trenches, multiple EEPROM cells being disposed within each of said plurality of elongated trenches, each of said multiple EEPROM cells disposed in each of said plurality of elongated trenches being paired with another of said EEPROM cells disposed in the same elongated trench such that EEPROM cell pairs are disposed in said plurality of elongated trenches, wherein said multiple EEPROM cells in each of said plurality of elongated trenches include a continuous polysilicon structure that functions as a recall gate for said multiple EEPROM cells in said trench, and each EEPROM cell includes an isolated polysilicon structure which functions as a floating gate for the cell;

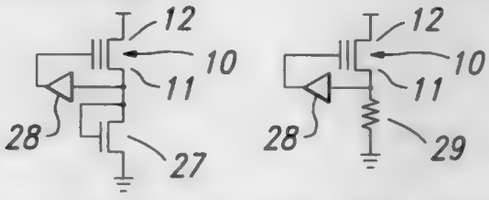
a plurality of discrete control gates disposed within said plurality of elongated trenches, each control gate being shared by one of said EEPROM cell-pairs; and

an electrically continuous diffusion structure associated with at least one elongated trench of said plurality of elongated trenches, said electrically continuous diffusion structure comprising either a source node or a drain node for each of at least two EEPROM cells of said multiple EEPROM cells disposed in said at least one elongated trench of said plurality of elongated trenches.

5,467,306
METHOD OF USING SOURCE BIAS TO INCREASE THRESHOLD VOLTAGES AND/OR TO CORRECT FOR OVER-ERASURE OF FLASH EPROMS

Cetin Kaya, Dallas; Wayland B. Holland, Garland, and Rabah Mezenner, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 4, 1993, Ser. No. 85,427
Int. Cl.[6] G11C 16/00
U.S. Cl. 365—185.2 19 Claims



1. A method for increasing the threshold voltage of at least one of a plurality of floating-gate memory cells in a nonvolatile integrated-circuit memory having a substrate connected to a reference voltage each said memory cells being of the single-transistor, non-split-gate type, said method comprising:

causing the voltage on the control gates of said plurality of memory cells to have a positive value with respect to said reference voltage;

causing the voltage on the sources of said plurality of memory cells to have a positive value with respect to said reference voltage; and

causing a current to flow into the drains of said plurality of memory cells;

said voltage on the control gates having a value less than the typical threshold voltage of said plurality of cells with said voltage on said sources of said plurality of cells.

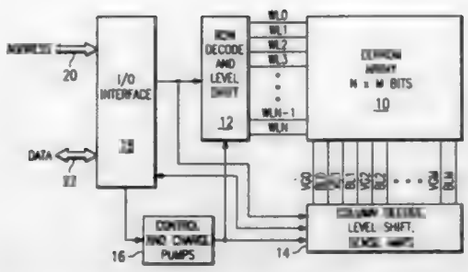
5,467,307
MEMORY ARRAY UTILIZING LOW VOLTAGE FOWLER-NORDHEIM FLASH EEPROM CELL

Iano D'Arrigo, Cannes; Georges Faleni, La Gaude, both of, France, and Michael C. Smayling, Missouri City, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 12, 1993, Ser. No. 135,694
Int. Cl.[6] G11C 11/34
U.S. Cl. 365—185.06 3 Claims

1. A memory array, comprising:

a plurality of electrically erasable, non-volatile memory cells, each comprising a floating gate, non-volatile device arranged



in rows and columns, each having a source, a drain and a control gate and programmable by Fowler-Nordheim electron tunneling by the application of at least a predetermined voltage ("the programming voltage") between the control gate and source thereof, and said floating gate devices being formed in the face of a semiconductor substrate of a first conductivity type and further comprising an isolation structure having a first isolation tank of the first conductivity type material for surrounding each of said floating gate transistor memory devices and a second isolation tank of a second conductivity type material opposite to the first conductivity type surrounding said first isolation tank, the memory cells arranged in a symmetric layout;

a plurality of word lines, each associated with one of the rows of said memory cells and connected to the control gate of each of the associated memory cells;

a plurality of bit lines, each associated with one of the columns of said memory cells and attached to one of the sources or drains of said associated memory cells;

a plurality of virtual ground lines, each associated with one of the columns of said memory cells and attached to the other of the sources or drains of said associated memory cells not connected to said bit lines; and

a programming device for selectively programming a select single memory cell and selectively applying a predetermined voltage to said row lines less than a full programming voltage and a negative voltage to either or both of said bit lines and virtual ground lines.

5,467,308

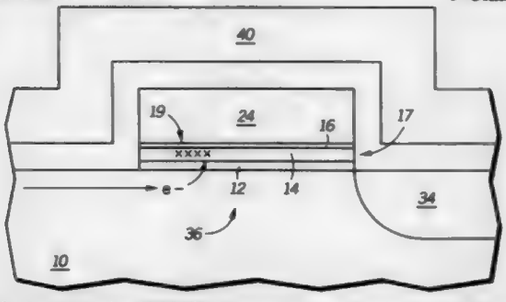
CROSS-POINT EEPROM MEMORY ARRAY

Kuo-Tung Chang, and Ko-Min Chang, both of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Apr. 5, 1994, Ser. No. 223,354

Int. Cl.[6] G11C *11/40*

U.S. Cl. 365—185.01 **9 Claims**



6. A cross-point EEPROM memory array having a plurality of memory cells comprising:

a semiconductor substrate partitioned into a plurality of active regions separated by isolation regions;

a plurality of control gate electrodes each overlying a first portion of each active region, and the plurality of control gate electrodes further electrically coupled by a plurality of control gate lines disposed on the semiconductor substrate,

wherein each control gate electrode is separated from each active region by an ONO layer, and

wherein each ONO layer contains charge trapping sites;

a plurality of select gate electrodes, each overlying a second portion of each active region and each control gate electrode and electrically coupled by a select gate line disposed on the semiconductor substrate perpendicular to each control gate line;

a plurality of diffused bit-lines disposed in the semiconductor substrate parallel to each control gate line,

wherein each bit-line is aligned to an edge of each control gate electrode, and

wherein each memory cell is programmed by transferring charge carriers into the trapping sites in each ONO layer.

5,467,309

SEMICONDUCTOR NONVOLATILE MEMORY DEVICE HAVING REDUCED SWITCHING OVERHEAD TIME ON THE PROGRAM MODE

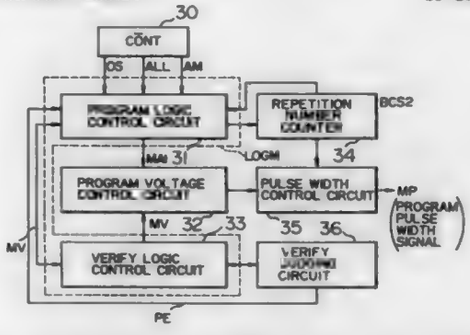
Toshihiro Tanaka, Akigawa; Masataka Kato; Hitoshi Kume, both of Musashino; Keisuke Ogura, Tokorozawa, and Tetsuo Adachi, Hachioji, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 1, 1994, Ser. No. 252,604

Claims priority, application Japan, Sep. 6, 1993, 5-221143

Int. Cl.[6] G11C *16/06*

U.S. Cl. 365—185.14 **13 Claims**



1. A semiconductor nonvolatile memory device including memory cells, each including a transistor, which is capable of electrically programming a threshold voltage, said memory device comprising:

programming means for performing programming for said memory cells by repeating a plurality of programming operations;

verify means for reading out a state of the memory cells to which at least one programming is performed during repetition of the programming operation by said programming means;

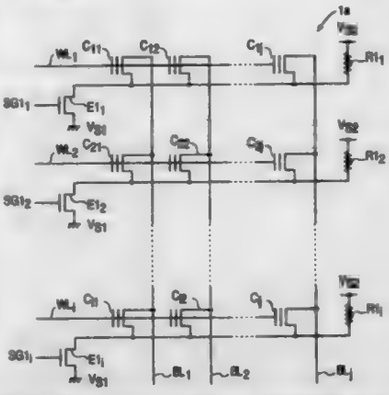
control means for controlling, on the basis of information on the state of memory cells read out by said verify means, said programming means to control succession and stopping of the repetition operation of the programming for said memory device, and

pulse control means for controlling a programming pulse in the repetitive programming operation, to change the programming pulse width according to the repetition number of the programming operations.

5,467,310
EEPROM AND EEPROM READING METHOD

Masanobu Yoshida, Kawasaki, and Kiyonori Ogura, Kasugai, both of, Japan, assignors to Fujitsu Limited, Kanagawa, and Fujitsu VLSI Limited, Aichi, both of, Japan

Continuation of Ser. No. 817,075, Jan. 6, 1992, abandoned.
This application Aug. 18, 1994, Ser. No. 292,748
Claims priority, application Japan, Jan. 16, 1991, 3-003272
Int. Cl.[6] G11C *11/34*
U.S. Cl. 365—185.07 13 Claims



1. An electrically programmable and electrically erasable non-volatile semiconductor memory device, comprising:

a cell array having a plurality of electrically erasable and programmable non-volatile cell transistors arranged in rows and columns, each of said cell transistors including a source, a drain and a control gate;

a plurality of word lines, each of said word lines being associated with a particular one of said cell transistor rows, each word line being connected to the control gates of each of its associated cell transistors;

a plurality of bit lines, each of said bit lines being associated with a particular one of said cell transistor columns such that any one of said cell transistors can be selected for writing or reading cell information by selecting the word line and the bit line associated with the selected cell transistor based on first and second selection signals;

a plurality of first select elements, each first select element being connected to the sources of the cell transistors in an associated row of said cell transistors in said cell transistor array, said first select elements being arranged to activate the selected cell transistor, wherein said first select elements are arranged to be activated in synchronism with the selection of their associated word lines to electrically connect the sources of their associated cell transistors to a first power supply based on a third selection signal when their associated word line is selected; and

a plurality of regulating elements, each of which is associated with a particular row of said cell transistors for electrically connecting the sources of their associated cell transistors to a second power supply having a potential different from a potential of the first power supply where their associated word line is not selected.

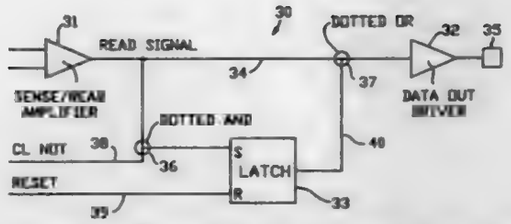
5,467,311
CIRCUIT FOR INCREASING DATA-VALID TIME WHICH INCORPORATES A PARALLEL LATCH

Siegfried K. Wiedmann, Stuttgart, and Dieter F. G. Wendel, Sindelfingen, both of, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 31, 1990, Ser. No. 560,696
Int. Cl.[6] G11C *7/02*
U.S. Cl. 365—189.05 15 Claims

1. A circuit for extending the data valid time for a data output driver which includes a source of system clock pulses comprising:

a data output driver circuit,



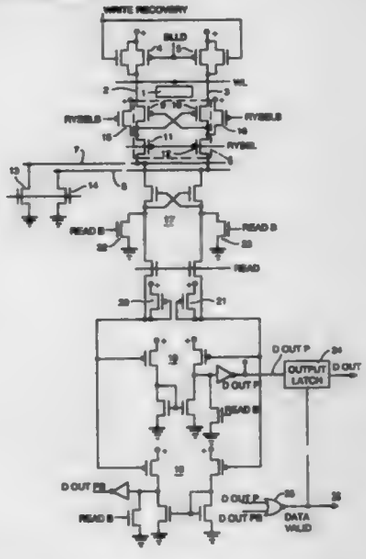
a sense/read amplifier connected to said data output driver via a signal path which provides one of high and low signal outputs during an interval when a pulse from said source of system clock pulses is present, and

means connected in parallel with said signal path for applying an input to said driver of said one of said high and low signal outputs during an interval when the complement of said pulse activates said means for applying.

5,467,312
RANDOM ACCESS MEMORY

Richard Albon, Tavistock, and David Williams, Plymouth, both of, United Kingdom, assignors to Plessey Semiconductors Limited, United Kingdom

Filed Mar. 31, 1994, Ser. No. 221,073
Claims priority, application United Kingdom, Apr. 21, 1993, 9308208
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—189.01 4 Claims



3. A semiconductor integrated circuit static random access memory comprising a plurality of memory cells arranged in rows and columns, the memory cells having differential access paths which are arranged selectively to be connected to read sensing means providing data signals to differential data output paths

during a read operation, and gating means to which said differential output paths are connected, said gating means being responsive to data signals on said output paths to provide a data-valid output signal for effectively terminating said read operation.

5,467,313

LEVEL SHIFTER AND DATA OUTPUT BUFFER HAVING SAME

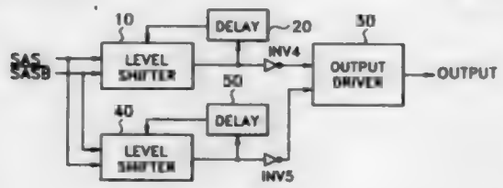
Chul-min Jung; Jeong-hee Lee, both of Seoul; Kee-sik Ahn, Kyungki, and Hee-chul Park, Suwon, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 12, 1994, Ser. No. 273,746

Claims priority, application Rep. of Korea, Jul. 28, 1993, 93-14563

Int. Cl.[6] G11C *7/00*; H03K *19/02*

U.S. Cl. 365—189.11 **19 Claims**



1. A level shifter comprising:

level shifting means for receiving an ECL-level data signal and an inverse of the ECL-level data signal, converting the received data signals to CMOS levels, and outputting a result signal, the level shifting means comprising:

a first bipolar transistor having a base receiving the ECL-level data signal, a collector, and emitter;

a second bipolar transistor having a base receiving the inverse of the ECL-level data signal, a collector, and an emitter, wherein the emitters of the first and second bipolar transistors are commonly connected emitters, and wherein the first and second transistors respond to an enable signal;

first clamping means, connected between a power source voltage and the collector of the first bipolar transistor, for clamping a first voltage to the first bipolar transistor;

second clamping means, connected between the power source voltage and the collector of said second bipolar transistor, for clamping a second voltage to the second bipolar transistor;

a first pull-up transistor having a source connected to the power source voltage and having a gate connected to the collector of Raid first bipolar transistor;

a second pull-up transistor having a source connected to the power source voltage and having a gate connected to the collector of said second bipolar transistor;

current mirror means, including third and fourth bipolar transistors, for causing a common current level to flow through the first and second pull-up transistors; and,

delay means for delaying the result signal of the level shifting means so as to control current consumption of the level shifting means.

5,467,314

METHOD OF TESTING AN ADDRESS MULTIPLEXED DYNAMIC RAM

Kazuyuki Miyazawa, Iruma; Katsuhiro Shimohigashi, Musashimurayama; Jun Etoh, Hachiohji, and Katsutaka Kimura, Sagamihara, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

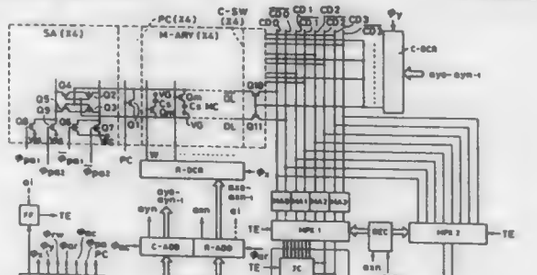
Continuation of Ser. No. 887,802, May 26, 1992, Pat. No. 5,331,596, which is a continuation of Ser. No. 648,885, Jan. 31, 1991, Pat. No. 5,117,393, which is a continuation of Ser. No. 319,693, Mar. 7, 1989, Pat. No. 4,992,985, which is a division of Ser. No. 41,070, Apr. 22, 1987, Pat. No. 4,811,299. This application Jul. 18, 1994, Ser. No. 277,430

Claims priority, application Japan, Apr. 23, 1986, 61-92056

The portion of the term of this patent subsequent to Jul. 19, 2011, has been disclaimed.

Int. Cl.[6] G11C *7/00;29/00*

U.S. Cl. 365—201 **2 Claims**



1. A method of testing an address multiplexed dynamic random access memory having a first external terminal for receiving a row address strobe (RAS) signal, a second external terminal for receiving a column address strobe (CAS) signal, a third external terminal for receiving a write enable signal (WE) signal, said method comprising the steps of:

entering into a test mode in response to a change in said RAS signal from a logic "high" level to a logic "low" level when said CAS signal is at a logic "low" level and said WE signal is at a logic "low" level;

selecting memory cells in accordance with row address signals and column address signals which are synchronized with said RAS signal and said CAS signal, respectively;

writing the same data into said memory cells; and

judging whether there is consistency or inconsistency of signals which are read out from said memory cells.

5,467,315

SEMICONDUCTOR MEMORY DEVICE FACILITATED WITH PLURAL SELF-REFRESH MODES

Takeshi Kajimoto, Hamura; Yutaka Shimbo, Hino; Katsuyuki Sato, Akishima; Masahiro Ogata, Fussa; Kanehide Kenmizaki, Kodaira; Shouji Kubono, Akishima; Nobuo Kato, Ohme; Kiichi Manita, Kawagoe, and Michitaro Kanamitsu, Akishima, all of, Japan, assignors to Hitachi, Ltd., and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

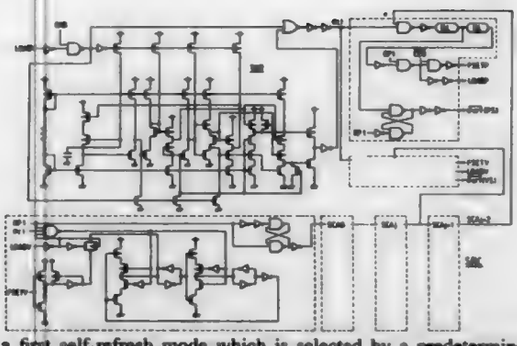
Division of Ser. No. 943,341, Jun. 18, 1992, Pat. No. 5,311,476, which is a division of Ser. No. 496,531, Mar. 20, 1990, Pat. No. 5,161,120. This application Apr. 28, 1994, Ser. No. 234,414

Claims priority, application Japan, Mar. 20, 1989, 1-065842

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—222 **30 Claims**

1. A semiconductor memory comprising a memory portion and control circuitry for providing a plurality of self-refresh modes of different refresh periods, respectively, said plurality of self-refresh modes including:



a first self-refresh mode which is selected by a predetermined start control signal when the semiconductor memory remains in a nonselected state for a comparatively long time, and a second self-refresh mode which provides for a refreshing operation substantially intermittently between periods of access to the memory portion of said semiconductor memory.

5,467,316

DEVICE AND METHOD OF REDUCING WORD LINE RESISTANCE OF A SEMICONDUCTOR MEMORY

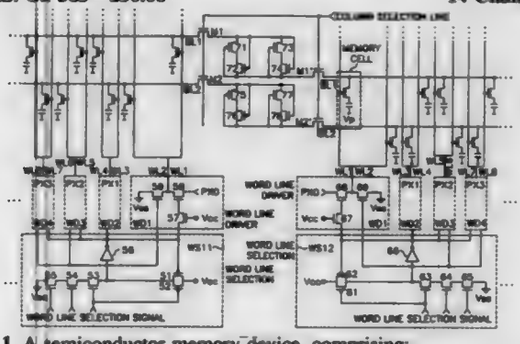
Hyeun-Su Kim, Suwon, and Dong-Jae Lee, Seoul, both of, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 3, 1992, Ser. No. 983,475

Claims priority, application Rep. of Korea, Dec. 4, 1991, 22107/1991

Int. Cl.[6] G11C *8/00;7/00*

U.S. Cl. 365—230.06 **14 Claims**



1. A semiconductor memory device, comprising:

a memory array formed as a matrix of memory cells and having a plurality of word lines, each one of said plurality of word lines accessing a different plurality of said memory cells; and

a plurality of word line driving means for driving said plurality of word lines, each of said plurality of word line driving means being connected to select and drive at least two of said plurality of word lines.

5,467,317

SEMICONDUCTOR MEMORY DEVICE FOR USE AN APPARATUS REQUIRING HIGH-SPEED ACCESS TO MEMORY CELLS

Yasushi Kameda, Yokosuka; Kenichi Nakamura, Sumida; Hiroshi Takamoto, Nerima; Takayuki Harima, Kawaguchi, and Makoto Segawa, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

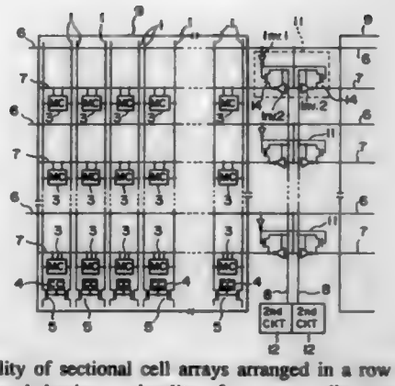
Continuation of Ser. No. 905,416, Jun. 29, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 328,049

Claims priority, application Japan, Jun. 27, 1991, 3-157112

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—230.06 **13 Claims**

1. A semiconductor memory device comprising:



a plurality of sectional cell arrays arranged in a row direction and each having a plurality of memory cells arranged in a matrix pattern;

main word lines each provided in common for a row of all of said sectional cell arrays and responsive to a row select signal;

section word lines provided for each row of each of said sectional cell arrays and each of said section word lines connected to the corresponding memory cells arranged in each corresponding row of each of said sectional cell arrays, for activating the memory cells connected thereto;

first and second section select lines provided between a pair of said sectional cell arrays, and responsive to section select signals,

a plurality of logical circuit groups each provided between a pair of said sectional cell arrays, and each having a plurality of logical circuits each connected to each row of said sectional cell arrays, for activating a section word line when a logical result of a row select signal and a section select signal satisfies a logical condition, each logical circuit including:

a common inverter provided in common for said pair of said sectional cell arrays; and

a first circuit for activating a section word line of one of said pair of said sectional cell arrays and a second circuit for activating a section word line of the other of said pair of said sectional cell arrays, said first and second circuits being symmetrical with each other with respect to a column line;

said first circuit having a first CMOS-type inverter composed of series-connected P-type and N-type transistors, and a first N-type transistor; and

said second circuit having a second CMOS-type inverter composed of series-connected P-type and N-type transistors, and a second N-type transistor;

said main word line being connected to said common inverter and to input terminals of the first and second CMOS-type inverters;

a first section select line being connected to a drain of the first N-type transistor and a source of the P-type transistor of the first inverter, and a second section select line being connected to a drain of the second N-type transistor and a source of the P-type transistor of the second inverter;

an output of said common inverter being connected to gates of the first and second N-type transistors; and

a source of the first N-type transistor and an output terminal of the first CMOS-type inverter being connected to a section word line of one of the sectional cell arrays, and a source of the second N-type transistor and an output terminal of the second CMOS-type inverter being connected to a section word line of the other of the sectional cell arrays; and

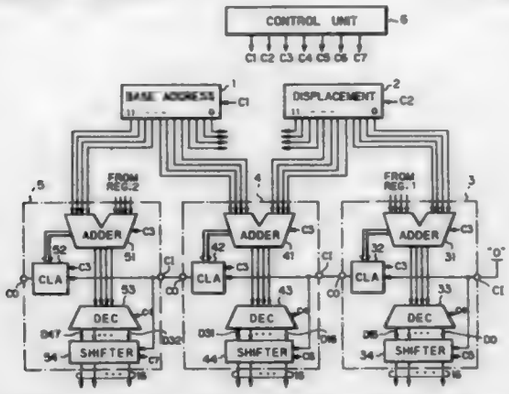
bit lines each connected to the memory cells, respectively, for receiving data from the selected memory cells and outputting the received data; and

a plurality of section select signal output circuits for outputting said section select signals to each said section select line, each section select signal output circuit comprising a power supply circuit with a high driving capacity, wherein said power supply circuit is a BiCMOS logical circuit.

5,467,318
ADDRESS GENERATING AND DECODING APPARATUS WITH HIGH OPERATION SPEED

Masato Motomura, Tokyo, Japan, assignor to NEC Corporation

Filed Dec. 20, 1994, Ser. No. 359,733
Claims priority, application Japan, Dec. 28, 1993, 5-333973
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—230.06 **6 Claims**



1. An apparatus for generating first and second addresses into a third address and decoding the third address, comprising:

a first register for storing the first address;

second register for storing the second address; and

a plurality of partial decoding signal generating units, connected to said first and second registers, for generating partial decoding signals,

each of said partial decoding signal generating units comprising:

a carry input terminal;

a carry output terminal;

an adder, connected to said first and second registers, for adding a part of the first address to a part of the second address, to generate a partial third address;

a carry look ahead circuit, connected to said adder and said carry input terminal, for generating a carry at said carry output terminal in accordance with data at inputs of said adder and data at said carry input terminal;

a decoder, connected to said adder, for decoding the partial third address to generate one of the partial decoding signals; and

a shifter, connected to said decoder and said carry input terminal, for shifting the one of the partial decoding signals in accordance with the data at said carry input signal,

said carry output terminal of one of said partial decoding signal generating units being connected to said carry input terminal of another of said partial decoding signal units.

5,467,319
CAM ARRAY AND METHOD OF LAYING OUT THE SAME

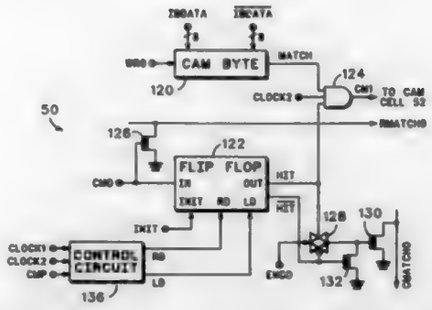
Eugene B. Nusinov, Sharon, and James A. Pasco-Anderson, Needham, both of Mass., assignors to Codex, Corp., Schaumburg, Ill.

Continuation of Ser. No. 123,551, Sep. 20, 1993, abandoned.
This application Apr. 7, 1995, Ser. No. 418,908
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—231 **14 Claims**

1. A CAM array, comprising:

a first plurality of CAM cells serially coupled for propagating match signals from less significant to more significant CAM cells, said first plurality of CAM cells being disposed in a first row of adjacent locations;

a second plurality of CAM cells serially coupled for propagating match signals from less significant to more significant CAM cells, said second plurality of CAM cells being disposed in a second row of adjacent locations such that a least significant one of said second plurality of CAM cells is disposed adjacent



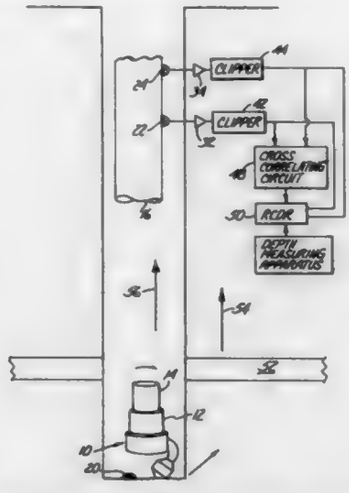
to and receives said match signal from a most significant one of said first plurality of CAM cells; and

circuit means for reversing prioritization of columns of said first and second pluralities of CAM cells where less significant CAM cells are given priority over more significant CAM cells in said first plurality of CAM cells and less significant CAM cells are given priority over more significant CAM cells in said second plurality of CAM cells.

5,467,320
ACOUSTIC MEASURING METHOD FOR BOREHOLE FORMATION TESTING

Voldi E. Maki, Jr., Austin, Tex., assignor to Halliburton Company, Dallas, Tex.

Filed Jan. 8, 1993, Ser. No. 2,373
Int. Cl.[6] G01V *1/40;1/143*
U.S. Cl. 367—40 **5 Claims**



1. A method of evaluating a subsurface formation while drilling a borehole penetrating said formation through use of a drill string including a drill bit, comprising the steps of:

providing first and second receivers in said drill string, said receivers in spaced relation to said drill bit and in spaced relation to one another, said receivers generally azimuthally aligned with one another;

rotating said drill bit to drill said borehole and to generate an acoustic signal propagating at least in part through said formation;

monitoring received acoustical signals at each of said receivers in said drill string, said received acoustical signals including a selected frequency range of interest;

converting said received acoustical signals at each of said first and second receivers into a respective generally digital received signal;

delaying the digital received signal from the receiver nearest to said drill bit; and

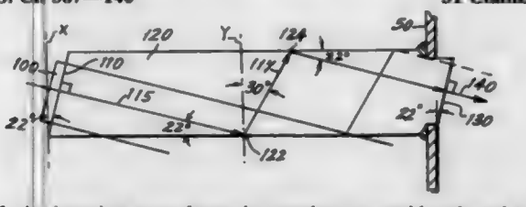
cross correlating said delayed digital received signal and the non-delayed received signal to identify signal components resulting from fixed members in the path of said acoustic propagation to identify signals representative of propagation through said formation to provide an output signal representative of properties of said formation.

5,467,321

INSERTION ULTRASONIC TRANSDUCER WITH MODE CONVERSION AND METHOD FOR REDUCING MULTIPLE SIGNAL RECEPTION

Joseph Baumoel, c/o Controlotron Corp. 155 Plant Ave., Hauppauge, N.Y. 11788

Filed Sep. 26, 1994, Ser. No. 312,299
Int. Cl.[6] H04R *23/00*; G01F *1/66*
U.S. Cl. 367—140 **31 Claims**



1. An insertion type ultrasonic transducer assembly adapted to be mounted to a pipe for determining ultrasonic energy transit time through a fluid in the pipe, comprising:

an ultrasonic transducer; and

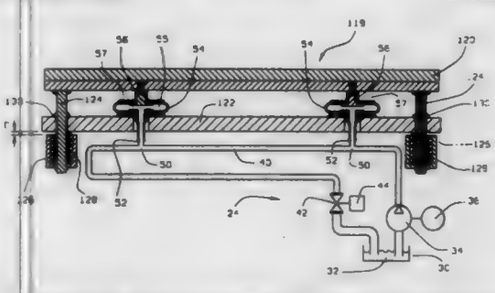
a coupling rod having the ultrasonic transducer mounted on a first end thereof and having a second end thereof adapted for disposition through an opening in a fluid containing pipe, the first end having a surface formed at a first angle which ensures that substantially only ultrasonic energy emitted by the transducer in a primary beam is converted at least once from a first mode to a second mode at a boundary surface of the coupling rod, thereby resulting in emission of a longitudinal mode wave at the second end of the coupling rod into the fluid in the pipe, the second end being formed at a second angle which ensures that the emitted longitudinal mode wave is emitted orthogonally with respect to a surface of the second end without refraction as the emitted wave enters the fluid in the pipe.

5,467,322

WATER HAMMER DRIVEN VIBRATOR

Bruno H. Walter, 902 Wentworth Ave., North Vancouver, British Columbia, Canada

Continuation-in-part of Ser. No. 936,032, Aug. 25, 1992. This application Oct. 26, 1994, Ser. No. 329,713
Int. Cl.[6] H04R *17/00*
U.S. Cl. 367—142 **1 Claim**



1. A vibrator for vibrating a structure, said vibrator comprising:

(a) a hydraulic driving system Comprising:

i) a conduit having an inlet and an outlet;

ii) a source of pressurized fluid connected to said inlet;

iii) a valve in said conduit;

iv) a valve actuator connected to said valve for repeatedly opening and closing said valve to create a continuous series of water hammers in said conduit;

(b) an actuator in fluid communication with said conduit upstream from said valve, said actuator comprising:

i) a wall enclosing a fluid-filled volume;

ii) means for transmitting changes in a pressure in said conduit into said fluid-filled volume; and

iii) a movable section in said wall, said movable section displaceable between a first position and a second position by increasing a fluid pressure in said fluid filled volume;

iv) means for holding said movable section of said wall in contact with a member to be vibrated; and,

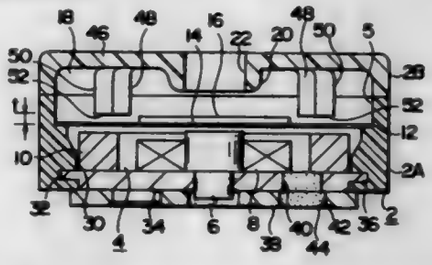
v) bias means biasing said movable wall toward said first position.

5,467,323

ELECTROACOUSTIC TRANSDUCER

Takahiro Sone, Shizuoka, Japan, assignor to Star Micronics Co., Ltd., Shizuoka, Japan

Filed Apr. 29, 1994, Ser. No. 235,794
Claims priority, application Japan, May 4, 1993, 5-128486
Int. Cl.[6] G08B *3/00*
U.S. Cl. 367—175 **4 Claims**



1. An electroacoustic transducer for converting an electric signal into an oscillating magnetic field which vibrates a diaphragm so as to convert said oscillating field to an acoustic vibration, said electroacoustic transducer comprising:

a cylindrical body made of synthetic resin and having a stepped supporting portion formed on an inner circumferential surface thereof;

a magnetic driving portion located in said casing body for converting said electric signal into said oscillating magnetic field;

said magnetic driving portion having

(a) a base made of magnetic material and fixed to said casing body so as to close an opening portion of said casing body, at the rear side thereof, when said casing body is formed;

(b) a magnetic core mounted on a center of said base;

(c) a coil wound around said magnetic core for receiving said electric signal from an external device; and

(d) a magnet having an annular body for surrounding said coil;

said diaphragm placed on said stepped supporting portion of said casing body and radially restricted thereby;

said diaphragm forming a gap between itself and an end surface of said magnetic core, and forming a closed magnetic path together with said core, base and magnet, and vibrating in response to said oscillating magnetic field produced in said magnetic driving portion;

a casing cap forming an outer casing together with said casing body for closing said opening of said casing body;

said casing cap made of synthetic resin and forming a resonance space at the front side of said diaphragm, and including a sound emitting hole for opening said resonance space to the atmosphere;

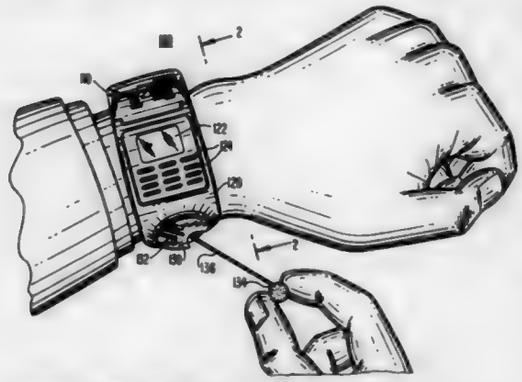
a plurality of projections formed in and integrated with said casing cap, each projection having an outer circumferential surface conforming to an inner circumferential surface of said casing body at said opening portion thereof, wherein said

casing body and casing cap are aligned with each other when said projections enter said opening portion of said casing body, and end surfaces of said projections forming a gap with a peripheral section of an upper surface of said diaphragm for limiting allowable axial movement range of said diaphragm.

5,467,324
WRISTWATCH RADIOTELEPHONE WITH DEPLOYABLE VOICE PORT

John T. Houlihan, Southbury, Conn., assignor to Timex Corporation, Middlebury, Conn.

Filed Nov. 23, 1994, Ser. No. 344,224
Int. Cl.[6] G04B *47/00*; H04M *1/03*
U.S. Cl. 368—10 **20 Claims**



1. Wristwatch radiotelephone apparatus comprising:

a strap structure adapted to at least partly encircle a wrist of a user of the apparatus, said strap structure lying in a plane which is transverse to the longitudinal axis of said wrist;

a combined watch and radiotelephone structure mounted on said strap structure for viewing and operation by said user and for use by said user to transmit the user's voice by radio transmission from said apparatus and to receive via radio transmission another person's voice which said apparatus renders audible by the user;

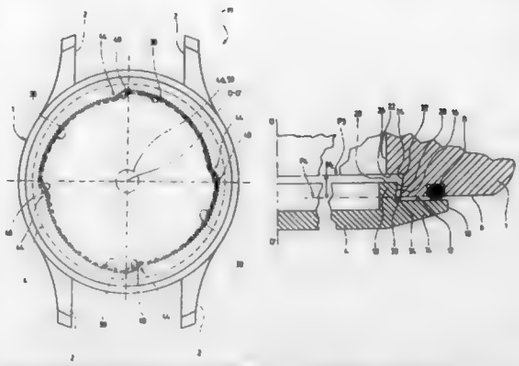
said combined watch and radiotelephone structure including a voice input port for receiving said user's voice and a voice output port for outputting said other person's voice as said apparatus has rendered it audible, at least one of said ports being deployable from said combined watch and radiotelephone structure but remaining secured to said combined watch and radiotelephone structure during such deployment, said deployment being from a first position in which said at least one of said ports is relatively close to the other of said ports to a second position in which said at least one of said ports is relatively far from said other port, said second position facilitating simultaneous placement of one of said ports adjacent the user's mouth and a second of said ports adjacent an ear of the user without removal of said apparatus from said wrist.

5,467,325
WATCH CASE

Jean-Charles Juillerat, Bienne, Switzerland, assignor to SMH Management Services AG, Biel, Switzerland

Filed Nov. 3, 1994, Ser. No. 335,338
Claims priority, application Switzerland, Dec. 23, 1993, 03859/93
Int. Cl.[6] G04B *37/00*
U.S. Cl. 368—276 **7 Claims**

1. A sealed watch case comprising two elements respectively forming a caseband and a back cover, and a packing interposed between these two elements, a first of the elements including an axially bounded and undercut lateral peripheral wall portion, the



second element likewise exhibiting an axially bounded and undercut lateral peripheral wall portion having a form complementary to the lateral wall portion of said first element, the lateral wall portions of said first and second elements being so conformed that in a first angular position relative to a rotation axis, referred to as the closure axis, the first element may be separated from the second element and that in a second angular position, in which the first element is turned through a predetermined angle around said closure axis starting from the first position, the first element is clamped in the second element whilst compressing the packing, and each of the lateral wall portions of said first and second elements defining a tapered surface inclined relative to said closure axis, the peripheral profile of the lateral wall portion of the first element comprising at least two sections in circular arc form each centered on a point shifted relative to the closure axis, such two sections being connected to one another by a reentrant section in order to form projections, the peripheral profile of the lateral wall portion of the second element comprising at least two sections in circular arc form each centered on a point shifted relative to the closure axis, such two sections being connected to one another by a broken profile portion defining an opening of such depth as to permit, in the first angular position, passage of the projections of the first element into the openings of the second element, each circular arc-formed section of the first element being associated with a circular arc-formed section of the second element, the sections associated with one another having substantially the same radius, and in the first angular position each circular arc-formed section of the first element being off-centered relative to the circular arc-formed section of the second element associated therewith, and in the second angular position each circular arc-formed section of the first element being concentric with the circular arc-formed section of the second element associated therewith so that the tapered surface of the lateral wall of each circular arc-formed section of the second element is in contact over substantially its entire extent with the tapered surface of the lateral wall of the circular arc-formed section of the first element associated therewith.

5,467,326
APPARATUS FOR SELECTIVELY PLAYING A RECORDING MEDIUM

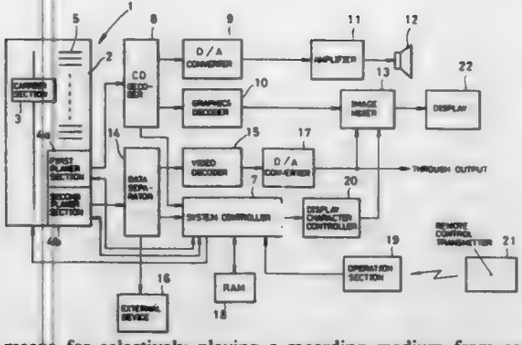
Masahiko Miyashita, Tokorozawa; Tatsuyuki Miyazawa; Hiroshi Fujii, both of Tokyo, and Yoshihiro Kitano, Tokorozawa, all of, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 29, 1994, Ser. No. 314,895
Claims priority, application Japan, Jan. 5, 1993, 5-249272
Int. Cl.[6] G11B *17/22*
U.S. Cl. 369—30 **2 Claims**

1. An apparatus for playing a recording medium comprising:

an accommodating section for accommodating a plurality of recording media;

memory means for storing relation information related to the recorded contents of each of said plurality of recording media, and position information indicating the position of each of said plurality of recording media; and



means for selectively playing a recording medium from said plurality of recording media in accordance with an instruction while referring to the stored contents of said memory means, wherein

at least one of said plurality of recording media is a correlative position information recording medium for recording said relation information of each of said plurality of recording media, and correlative position information indicating correlative positions of each of said plurality of recording media at the time of being accommodated, and

said memory means interrelatedly stores in memory said correlative position information and said relation information of said plurality of recording media reproduced by said playing means from said correlative position information recording medium.

5,467,327

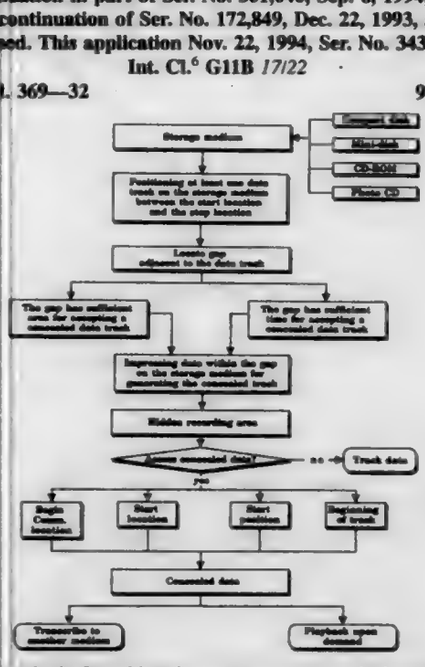
METHOD OF MASKING DATA ON A STORAGE MEDIUM

Randall Jamail, Houston, Tex.

Continuation-in-part of Ser. No. 301,040, Sep. 6, 1994, which is a continuation of Ser. No. 172,849, Dec. 22, 1993, abandoned. This application Nov. 22, 1994, Ser. No. 343,637

Int. Cl.[6] G11B *17/22*

U.S. Cl. 369—32 **9 Claims**



1. A method of masking data on a magneto-optical medium for selective playback upon demand or for transcription to another medium,

the magneto-optical medium adapted for communication with a player or transcriber such that the magneto-optical medium has a start location and a stop location with at least one data track therebetween,

each data track including a data recording area for executing at least one of recording and reproducing the data, and each track including a start position indicative of a beginning location for the data recording area for that track, the start location precedes the first start position for the first track for at least one of location or time, and the stop location follows the last data recording area for the last track for at least one of location or time,

the magneto-optical medium has a begin communication location at or in close proximity to the start position indicating the beginning of the data recording area for the respective track, the first start position is indicative of the beginning of the data recording area for a first track and the start position for each subsequent track, if any, is indicative of the beginning of the data recording area for the respective track,

such that the magneto-optical medium is engaged at the begin communication location for executing at least one of recording and reproducing data for each respective data track, the method comprising the steps of:

(a) after the first data track, determining the position of the start location on the magneto-optical medium,

(b) determining the position of the stop location on the magneto-optical medium,

(c) positioning at least one data track on the magneto-optical medium between the start location and the stop location such that the data track has, adjacent thereto, at least one of sufficient location or time for accepting a concealed data track, which sufficient location or time is defined as a gap,

(d) impressing data on the magneto-optical medium and within the gap for generating the concealed track having a hidden recording area such that the hidden recording area is located after the first data track and contains concealed data which can be accessed upon demand for transcription to another medium or for playback.

5,467,328

LENS DRIVE MECHANISM FOR OPTICAL DISC PLAYER WITH PARALLEL SUPPORT SPRINGS HAVING DIFFERENT SPRING CONSTANTS

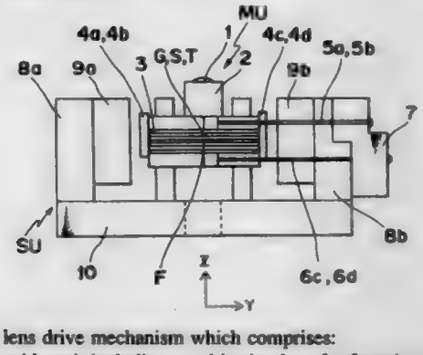
Yutaka Murakami; Toru Nakamura; Takao Hayashi, all of Katano; Akira Matsubara, Kameoka, and Hisashi Aizawa, Nara, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 4, 1994, Ser. No. 285,513

Claims priority, application Japan, Aug. 4, 1993, 5-193429

Int. Cl.[6] G11B *7/09*

U.S. Cl. 369—44.16 **20 Claims**



1. A lens drive mechanism which comprises:

a movable unit including an objective lens for focusing a coherent beam of light on at least an information carrier medium, a lens holder carrying the objective lens, focusing and tracking coil elements secured to or wound around a periphery of the lens holder;

a magnetic circuit including a permanent magnet element and a U-shaped yoke means and sandwiching the focusing and tracking coil elements; and

a plurality of support members sandwiching the focusing coil element and connected at one end to a periphery of the lens

holder and at the opposite end to a support fixture for supporting the movable unit for movement in focusing and tracking directions substantially perpendicular to each other, wherein a center of fitting of an upper set of the support members adjacent the objective lens and a lower set of the support members adjacent the yoke means with respect to a direction parallel to an optical axis of the objective tens is different from the center of gravity of the movable unit;

an upper set of the support members having a spring constant different from that of a lower set of the support members, and the product of the spring constant of the upper set of the support members multiplied by a distance from the center of gravity of the movable unit to a position of securement of the upper set of the support members being chosen to be equal to the product of the spring constant of the lower set of the support members multiplied by a distance from the center of gravity of the movable unit to a position of securement of the lower set of the support members.

5,467,329

OPTICAL DISC PLAYBACK APPARATUS AND METHOD WHICH UTILIZES SINGLE RAM FOR DATA DECODING AND TOC PROCESSING

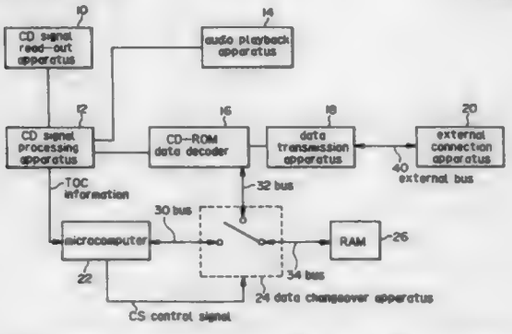
Minoru Hashimoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 9, 1993, Ser. No. 150,384

Claims priority, application Japan, Nov. 13, 1992, 4-328739

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—48 **9 Claims**



1. An optical disc playback apparatus for playing back information such as music recorded on a compact disc (CD) and/or information such as data recorded on compact disc read only memory (CD-ROM) comprising:

means for reading the information from the CD or the CD-ROM;

means for decoding the CD-ROM data from said reading means;

means for processing TOC information from said reading means;

storing means for storing CD TOC information when the CD is played back, and, alternatively, for storing data to be used for decoding the information recorded on the CD-ROM when the CD-ROM is played back; and

means for changing over between using said storing means for storing the TOC information or using said storing means as a data decoder for the CD-ROM.

5,467,330

RECORDING METHOD AND RECORDING AND REPRODUCING APPARATUS FOR OPTICAL DISK

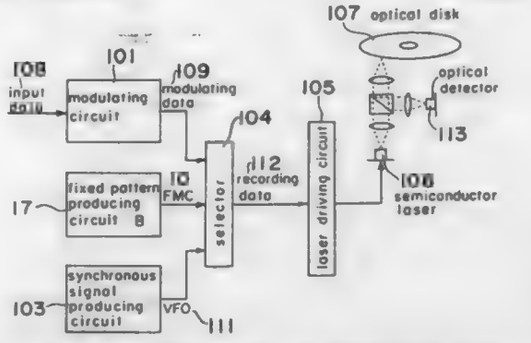
Takashi Ishida, Osaka; Shunji O'Hara, Higashiosaka; Kenzo Ishibashi, Moriguchi, and Tadashige Furutani, Kadoma, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 118,353, Sep. 9, 1993, Pat. No. 5,331,620, which is a continuation of Ser. No. 651,618, Feb. 6, 1991, abandoned. This application Apr. 29, 1994, Ser. No. 235,637

Claims priority, application Japan, Feb. 9, 1990, 2-30841

Int. Cl.[6] G11B *5/09;7/00*

U.S. Cl. 369—48 **4 Claims**



1. A method of generating optical disk recording data formed of successive one bits and zero bits having a run length limited code data format in which at least a predetermined minimum run length of recorded zero bits or at most a predetermined maximum run length of zero bits is located on each side of recorded one bits, said method comprising:

generating a fixed pattern data frame used as a synchronous signal, the fixed pattern data frame having plural successive adjacent run lengths of zero bits with respective one bits located between each successive adjacent run lengths of zero bits and having at least three different run lengths of zero bits including at least one of the minimum run length of zero bits and at least two of the maximum run lengths of zero bits; and,

combining the fixed pattern data frame with input data in accordance with the run length limited code data format to generate the optical disk recording data;

wherein, in the optical disk recording data, an initial run length of zero bits of said fixed pattern data frame is immediately preceded by a one bit and a last run length of zero bits of said fixed pattern data frame is immediately followed by a one bit, and

wherein said fixed pattern data frame comprises two minimum run lengths of zero bits and two maximum run lengths of zero bits, wherein one of the two minimum run lengths of zero bits is located between the two maximum run lengths of zero bits, and wherein one of the two maximum run lengths of zero bits is located between the two minimum run lengths of zero bits.

5,467,331

RECORDING AND REPRODUCING APPARATUS HAVING ARRANGEMENT FOR RECOVERY OF READ-OUT DATA ERROR

Eisaku Saiki, Yokohama; Takuya Mizokami, Odawara, and Naoto Matsunami, Fujisawa, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 912,504, Jul. 13, 1992, Pat. No. 5,388,087. This application Jul. 5, 1994, Ser. No. 266,857

Claims priority, application Japan, Jul. 11, 1991, 3-196084

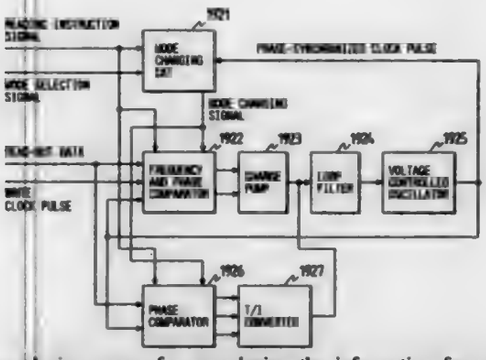
Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—53 **1 Claim**

1. A recording and reproducing apparatus comprising:

driving means for rotating a recording medium;

recording means for recording information on the recording medium rotated;



reproducing means for reproducing the information from the recording medium rotated, said reproducing means including a phase-synchronizing circuit, said reproducing means retrying reproduction of information from an area in the recording medium where an error has occurred to the data reproduced in cases where the error has occurred to the data reproduced in the reproduction of information from the recording medium; and

timing changing means for changing pull-in timing for said phase-synchronizing circuit in said reproducing means,

wherein, if an error has occurred to the reproduced data in the reproduction of information from the recording medium, the pull-in timing of said phase-synchronizing circuit in said reproducing means is changed by said timing changing means so that said reproducing means retries the reproduction of information from the area in the recording medium where the error has occurred to the reproduced data, at the changed pull-in timing.

5,467,332

DISC CLEANING DEVICE

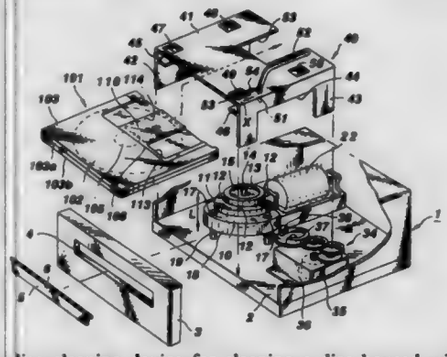
Katsuaki Tsurushima, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 3, 1992, Ser. No. 985,815

Claims priority, application Japan, Dec. 6, 1991, 3-348983

Int. Cl.[6] G11B *3/58;5/41*

U.S. Cl. 369—72 **2 Claims**



1. A disc cleaning device for cleaning a disc housed within a disc cartridge, the disc cleaning device comprising:

a chassis;

a cartridge holder connected to the chassis that holds the disc cartridge when the disc cartridge is loaded into the disc cleaning device, the cartridge holder having a top surface with a channel formed therein, the channel having a first end and a second end;

a single shutter opening pin positioned within the channel and supported by the cartridge holder for movement along the channel between the first end and the second end, the shutter opening pin opening an aperture in the disc cartridge when the disc cartridge is loaded into the cartridge holder, and closing the aperture when the disc cartridge is removed from the cartridge holder;

biasing means for biasing the shutter opening pin against the first end of the channel;

rotating and driving means connected to the chassis for rotating the disc housed within the disc cartridge;

a shaft support member connected to the chassis;

a cleaning material attached to the shaft support member; and

a cleaning roll having a rotary shaft and an exterior cleaning surface, the rotary shaft being supported by the shaft support member and connected to the rotating and driving means to rotate the cleaning roll, the exterior cleaning surface being adapted to rotatably contact both the cleaning material and an information recording surface of the disc via the aperture in the disc cartridge when disc cartridge is loaded into the cartridge holder.

5,467,333

TRAY AND DISC DRIVING MECHANISM FOR LASER DISC PLAYER

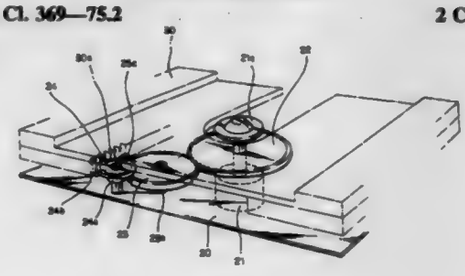
Jae H. Ji, Inchon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

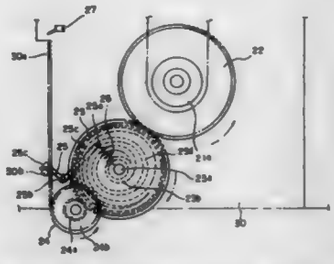
Continuation of Ser. No. 987,800, Dec. 9, 1992, abandoned. This application Jul. 25, 1994, Ser. No. 282,782

Claims priority, application Rep. of Korea, Feb. 27, 1992, 92-3045

Int. Cl.[6] G11B *33/02*

U.S. Cl. 369—75.2 **2 Claims**





1. A tray and disc driving mechanism for a laser disc player comprising:

a housing;

a tray slidably mounted in said housing so as to move between a first position, which corresponds to a playing position, and a second position, which corresponds to an ejected position;

a motor, having a shaft, mounted in said housing;

a turntable mounted on said shaft;

a first gear mounted on said shaft;

a second gear rotatably mounted in said housing so as to be engaged with said first gear, said second gear having a cam slot formed thereon, respective inner and outer portions of said cam slot being connected by a spiral portion thereof;

a pinion operatively engaged with said second gear;

a rack formed on said tray;

a lever, pivotally mounted in said housing, one end of said guide lever being engaged in said cam slot;

said rack being engaged with said pinion while said tray is between said first position and a critical position which is between said first and second position;

said one end of said lever moving from said inner portion to said outer portion, through said spiral portion, when said second gear is rotated in a predetermined direction which corresponds

to a direction of said spiral portion, said lever pushing said tray from said first position to said critical position as said lever moves from said inner portion to said outer portion.

5,467,334

DISK PLAYER MECHANISM

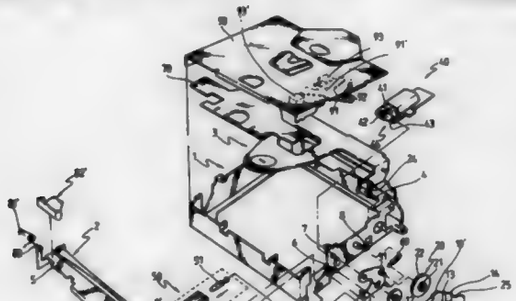
Ko-hyun Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Aug. 10, 1993, Ser. No. 103,713

Claims priority, application Rep. of Korea, Aug. 10, 1992, 92-14353; Aug. 12, 1992, 92-14471; Aug. 12, 1992, 92-15097

Int. Cl.[6] G11B *33/02;25/04*

U.S. Cl. 369—77.1 18 Claims



1. A disk player mechanism comprising:

a chassis;

a disk guide and a guide roller installed to oppose each other vertically in a disk-inserting slot in the front of said chassis;

a roller-supporting plate pivotally supporting said guide roller;

a clamp pivotally installed on said chassis for selectively clamping and releasing a disk seated on a turntable;

a slider slidably installed by slider driving means on one side of said chassis;

selective driving means for selectively connecting and separating said slider and said slider driving means;

attaching/detaching means for selectively connecting and detaching said guide roller from said slider driving means according to the movement of said slider so as to selectively make said guide roller rotate or stop;

engaging means engaged with said clamp according to the movement of said slider for selectively clamping and releasing the disk;

wherein when said slider is connected to said slider driving means to be driven by said selective driving means, said clamp is engaged with said slider to selectively clamp and release the disk, and when said guide roller is connected to said slider driving means to be driven by said attaching/detaching means, the disk is loaded or ejected;

wherein said slider driving means comprises:

a plurality of guide pins on one side of said chassis;

a main guide-slot formed on said slider having a rack and a plurality of auxiliary guide-slots, to which said guide pins are coupled; and

a gear assembly comprising a pinion engaged with said rack and a driven gear driven by a driving device between said chassis and slider, so that when said driven gear is rotated, said slider is then slid from side to side;

wherein a rotating device for rotating an operating plate comprises a solenoid operated by a switching device to one end of said operating plate, so that said operating plate rotates according to a state of the switching device;

wherein said switching device comprises:

a pair of switches electrically connected to said solenoid are provided on a cover installed above said chassis;

a switch lever, pivotally provided on said cover at a pivot point, connected to a power source and one end of which is slid across said pair of switches and the other end of which is elastically installed to said cover; and

a stop for blocking the other end of said switch lever formed on the upper edge of said slider,

wherein said switch lever is engaged with said stop according to the movement of said slider, so as to be alternately connected with one of said switches.

5,467,335

BEAM-SHAPING OPTICAL ELEMENT AND DEVICE FOR CONVERTING A BEAM HAVING A FIRST CROSS-SECTION INTO A BEAM HAVING A SECOND CROSS-SECTION

Josephus J. M. Braat, Eindhoven, Netherlands, assignor to U. S. Philips Corporation, New York, N.Y.

Filed Dec. 29, 1993, Ser. No. 175,075

Claims priority, application European Pat. Off., Jan. 4, 1993, 93200005

Int. Cl.[6] G11B *7/00;* G02B *27/09*

U.S. Cl. 369—100 18 Claims

1. A beam-shaping optical element comprising: an element material having an entrance surface, an exit surface located opposite thereto and an optical axis which coincides with the Z axis of a three-axis rectangular XYZ system of coordinates for converting a beam having a first longitudinal ratio between a first angular aperture in the YZ plane of the system of coordinates and a second, smaller angular aperture in the XZ plane into a beam having a second longitudinal ratio between said angular apertures, the second longitudinal ratio being smaller than the first longitudinal ratio, said element realising angular magnifications in said two planes wherein the angular magnifications differ from one another, wherein the entrance surface is centrally provided with a substantially cylindrical portion whose cylindrical axis is parallel to the Y axis and introduces an angular reduction of the order of n_1/n_2 in the YZ plane and an angular magnification of the order of n_2/n_1 in the XZ plane, in which n_2 and n_1 are the refractive indices of the element material and a medium surrounding the element, respectively, and wherein the exit surface is a toroidal surface whose radius of curvature in the XZ plane is larger than that in the YZ plane.

5,467,336

MAGNETO-OPTICAL RECORDING/REPRODUCING APPARATUS WITH OPTICAL PICKUP DEVICE HAVING A MULTI-LAYER DIELECTRIC FILM BEAM SPLITTER

Nobuhiko Ando, and Kazuhiko Fujiie, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 8, 1993, Ser. No. 163,927

Claims priority, application Japan, Dec. 8, 1992, 4-327964

Int. Cl.[6] G11B *11/10;7/00*

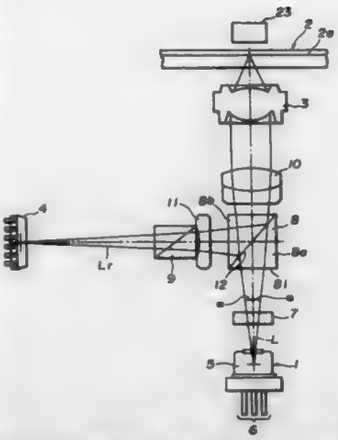
U.S. Cl. 369—112 7 Claims

1. An optical pickup device comprising:

a light source for radiating a divergent light beam,

an objective lens on which the light beam radiated by said light source is incident and which converges the incident light beam on an information signal recording medium,

a beam splitter arranged on a first light path between the light



source and the objective lens for guiding a reflected light beam containing a polarized light component modulated by the information signal recording medium to a second light path outside of said first light path, and

photodetector means for detecting the reflected light beam guided by said beam splitter to said second light path,

wherein the improvement resides in that

said beam splitter has a multi-layer dielectric film formed by a plurality of dielectric films stacked together and is arranged at a portion on said first light path in which the light beam is a divergent light beam, said multi-layer dielectric film having polarization film characteristics of reflecting 60 to 80% of modulated polarized components of a light beam incident on the multi-layer dielectric film and 20 to 40% of components of said incident light beam orthogonal to said modulated polarized components.

5,467,337

OPTICAL DISK REPRODUCING METHOD AND APPARATUS

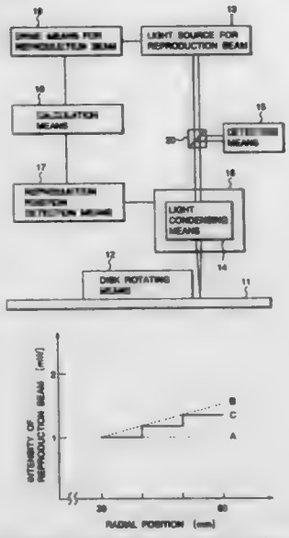
Hiroyuki Matsumoto, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Mar. 2, 1994, Ser. No. 204,609

Claims priority, application Japan, Mar. 4, 1993, 5-043476

Int. Cl.[6] G11B *7/125*

U.S. Cl. 369—116 **1 Claim**



1. An optical disk reproducing method using an optical disk reproducing apparatus comprising an optical disk, optical disk rotating means, a light source for irradiating a reproduction beam on the optical disk, light condensing means for condensing the reproduction beam on the optical disk, detection means for detecting a beam passing through or reflected by the optical disk, and position detection means for detecting a reproduction beam condensing position in a radial direction on the optical disk, wherein an intensity of the reproduction beam in reproduction of an outer region of the disk is set to be larger than that in reproduction of an inner region of the optical disk.

5,467,338

DISK CHUCKING APPARATUS OF A DISK PLAYER

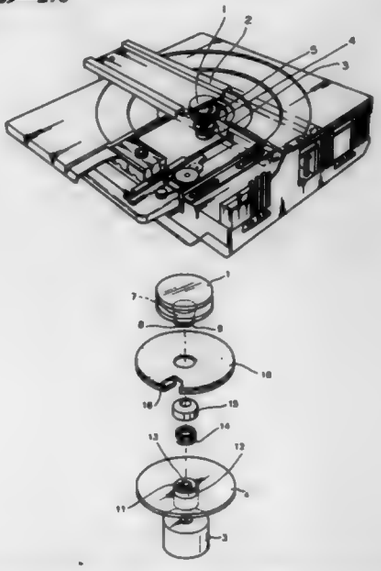
Kiseok Song, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 26, 1993, Ser. No. 157,481

Claims priority, application Rep. of Korea, Nov. 30, 1992, 92-23988

Int. Cl.[6] G11B *23/00*

U.S. Cl. 369—270 **3 Claims**



1. A disk chucking apparatus of a disk player, said disk chucking apparatus comprising:

a chucking plate including a cylindrical hollow portion at the bottom thereof, a tapered surface formed around the outer peripheral surface of said hollow portion and a protrusion formed at a lowest end of said tapered surface;

a clamping ring movably fitted around said tapered surface and supported by said protrusion, said clamping ring having a rubber ring attached thereunder to contact a disk when performing a chucking operation;

a turntable including a compartment at the center portion thereof to receive said tapered surface of said chucking plate and lifting means for lifting said clamping ring;

a head located in said compartment and connected to a spindle motor via a shaft;

a sliding ring slidably fitted with said head; and

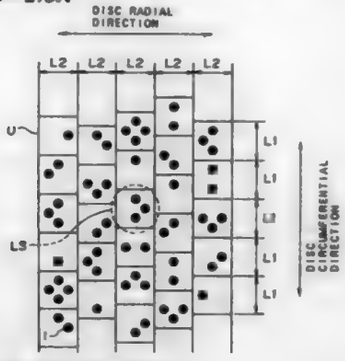
a spring located under said sliding ring so as to absorb an impact force on said turntable.

5,467,339

OPTICAL DISC HAVING INFORMATION UNITS COMPRISING A PLURALITY OF SEPARATED PIT PIECES, AND PLAYBACK APPARATUS AND RECORDING AND PLAYBACK METHOD THEREFOR

Hiroyuki Nakajima, and Makoto Satoh, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 30, 1994, Ser. No. 269,115
Claims priority, application Japan, Jul. 5, 1993, 5-165422
Int. Cl.[6] G11B *3/70*
U.S. Cl. 369—275.4 **10 Claims**



1. An optical disc comprising:

a disc substrate having a disc shape;

a recording surface formed on said disc substrate and having a spiral or coaxial track with a predetermined track pitch;

a plurality of information units formed on said track, each of which has a predetermined unit length in a circumferential direction and a radial direction of said optical disc respectively; and

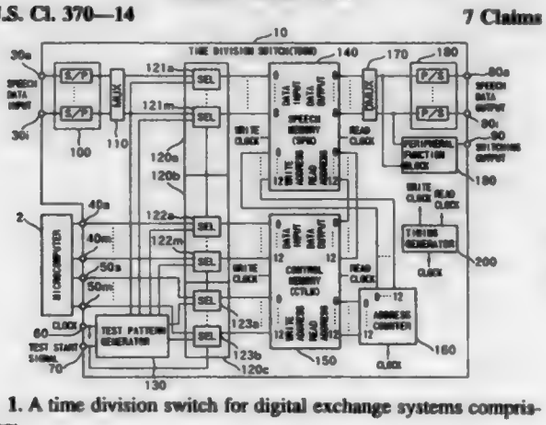
a pit formed in each of said information units, for recording information by converting the information in a shape of said pit, said pit having one of a plurality of shapes comprising a combination of presence and absence of 4 pit pieces, each of the pit pieces being separated from each other and disposed outside of an area, which is approximately shaped in a X letter in said information unit and includes a unit center of said information unit.

5,467,340

TIME DIVISION SWITCH

Akira Umezu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jan. 12, 1994, Ser. No. 180,913
Claims priority, application Japan, Jan. 13, 1993, 5-003711
Int. Cl.[6] H04L *12/26*
U.S. Cl. 370—14 **7 Claims**



1. A time division switch for digital exchange systems comprising:

speech data storage means for storing digitally coded speech data for transmission on a data highway,

control data storage means for storing control data for input/output control of speech data at said speech data storage means,

address generator means for generating sequential read and write addresses for reading and writing of data at said speech data storage means and said control data storage means;

write means for writing data to said speech data storage means according to the sequential addresses generated by said address generator means,

read means for reading data from said speech data storage means according to the control data stored in said control data storage means,

test pattern generator means for generating, upon input of a test start signal, test patterns for detecting failure at said speech data storage means and said control data storage means, and

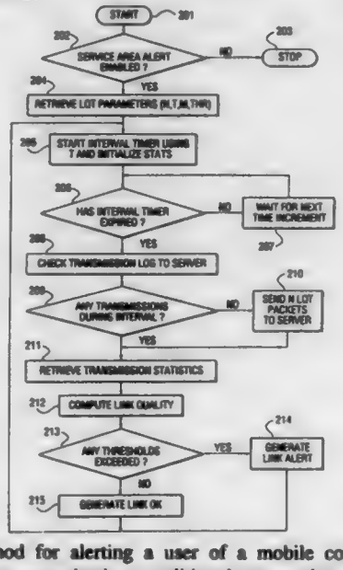
switch means which, when the speech data is sent to said speech data storage means, the control data and write address are sent to said control data storage means and said test patterns corresponding to said speech data and said control data, write address and said test start signal are input, supplies said speech data storage means and said control data storage means with the applicable test patterns output from said test pattern generator means in place of the speech data and said control data and write address.

5,467,341

APPARATUS AND METHOD FOR ALERTING COMPUTER USERS IN A WIRELESS LAN OF A SERVICE AREA TRANSITION

Edward H. Matsukane, Rancho Santa Margarita, and Ryan H. Tze, Irvine, both of Calif., assignors to Toshiba America Information Systems, Inc., Irvine, Calif.

Filed Apr. 14, 1994, Ser. No. 227,528
Int. Cl.[6] H04J *3/14*
U.S. Cl. 370—17 **30 Claims**



1. A method for alerting a user of a mobile computer to a deteriorated communication condition between the mobile computer and a computer server linked to the mobile computer over a wireless link, the method comprising the steps of:

(1) calculating a packet transmission error rate, said calculating step comprising the steps of

a. transmitting, from the mobile computer to the computer server, a plurality of Link Quality Test (LQT) packets;

b. receiving the transmitted LQT packets at the computer server;

c. determining whether an error-free reception of each received LQT packet occurred;

d. transmitting an acknowledgment packet from the computer server to the mobile computer in response to each error-free reception; and

e. calculating said packet transmission error rate in the mobile computer as a function of the number of acknowledgment packets received from the computer server;

(2) comparing the packet transmission error rate in the mobile computer with a threshold value to determine whether the deteriorated communication condition exists, and

(3) indicating to the user, responsive to the determination that the packet transmission error rate exceeds the threshold value in said step (2), the deteriorated communication condition.

5,467,342

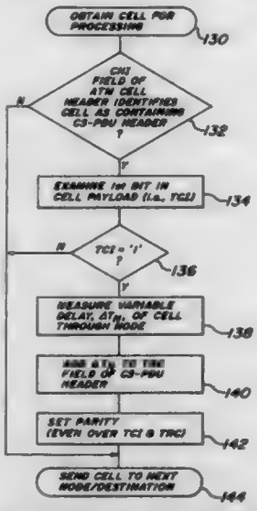
METHODS AND APPARATUS FOR TIME STAMP CORRECTION IN AN ASYNCHRONOUS TRANSFER MODE NETWORK

Gary L. Logston, Tucker; Anthony J. Wasilewski, Alpharetta; Maynard Hammond, Lawrenceville, and Francis Cheung, Tucker, all of Ga., assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 180,227, Jan. 12, 1994, abandoned, and a continuation-in-part of Ser. No. 219,652, Mar. 29, 1994. This application Oct. 5, 1994, Ser. No. 318,124

Int. Cl.[6] H04J *3/16;* **H04L** *12/56;* **H04Q** *11/04*

U.S. Cl. 370—17 **13 Claims**



10. A method of transmitting packets of data through an Asynchronous Transfer Mode (ATM) network wherein selected ones of the packets of data contain timestamp values, said method comprising the steps of:

(a) encapsulating each packet of data in a respective convergence sublayer protocol data unit (CS-PDU) having a header and a payload, the payload comprising the respective packet of data, the header comprising a time reference correction (TRC) field and a time correction indicator (TCI) that indicates whether the packet of data in the payload of the CS-PDU contains a timestamp value;

(b) segmenting each CS-PDU and inserting successive segments of each CS-PDU into a respective plurality of ATM cells, one of the respective plurality of ATM cells containing the header of the CS-PDU, each ATM cell having a header comprising an indicator that indicates whether the ATM cell carries the header of a CS-PDU;

(c) transmitting each ATM cell into the network and performing the following additional steps at each of a plurality of switching nodes in the network:

(i) receiving an ATM cell at the switching node and determining, based on the indicator in the header of the received ATM cell, whether the received ATM cell carries the header of a CS-PDU;

(ii) if the received ATM cell carries the header of a CS-PDU, then examining the TCI in the CS-PDU header and determining therefrom whether packet of data carried in the payload of that CS-PDU contains a timestamp value;

(iii) if the TCI indicates that the packet of data contains a timestamp value, then determining the amount of variable delay imposed by the switching node on the received ATM cell; and

(iv) adding a value indicative of the amount of variable delay to the TRC field of the CS-PDU header carried in the received ATM cell prior to transmitting that ATM cell to a next switching node.

5,467,343

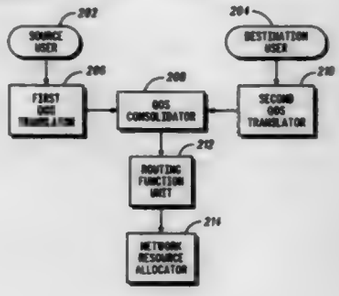
METHOD AND DEVICE FOR CONSOLIDATION OF PREFERENTIAL RESOURCE CONSTRAINTS

Whay C. Lee, Cambridge, and Michael G. Hluchyj, Wellesley, both of Mass., assignors to Motorola, Inc., Schuamburg, Ill.

Filed Jul. 27, 1994, Ser. No. 281,379

Int. Cl.[6] H04L *12/54*

U.S. Cl. 370—54 **10 Claims**



200

6. A method for providing consolidation of preferential resource quality of service constraints specified by a source user and a destination user in a communication network, comprising the steps of:

A) translating, by a first quality of service translator, first QOS translator, receiving preferential resource constraints input from the source user and a second quality of service translator, second QOS translator, receiving preferential resource constraints input from the destination user, the preferential resource constraints for each of the source user and the destination user into a requested resource constraint set and an acceptable resource constraint set,

B) consolidating, by a quality of service consolidator, the requested and acceptable resource constraint sets of the source user with the requested and acceptable resource constraint sets of the destination user in accordance with a predetermined resource constraint merge scheme to provide a consistent set of consolidated resource constraints for path selection and connection establishment,

C) using a routing function unit to determine an acceptable path subject to the set of consolidated resource constraints, and

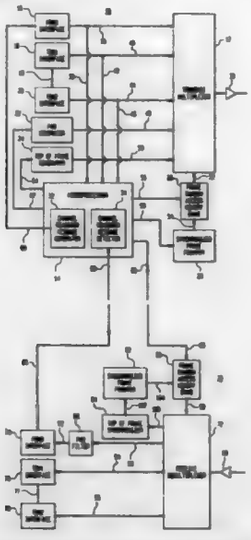
D) allocating, by a network resource allocator, resources along the selected acceptable path for connection establishment that supports information transfer between the source user and the destination user.

5,467,344

PACKET DATA TRANSMISSION WITH ASYNCHRONOUS BANDWIDTH SWITCHING

David Solomon, River Vale; Zigmunds A. Putnins, Ridgewood; David W. Gish, Riverdale, all of N.J., and Jeffrey B. Mendelson, Shrewsbury, Mass., assignors to Ascom Timeplex Trading AG, Bern, Switzerland

Filed Apr. 25, 1994, Ser. No. 232,952
Int. Cl.[6] H04J 3/16
U.S. Cl. 370—58.3 30 Claims



1. An asynchronously reconfigurable packet network node for transmitting digital message data to a remote packet network node over an outgoing digital transmission path and receiving digital message data from said remote node over an incoming digital transmission path, each of said digital transmission paths comprising a plurality of time division multiplexed digital channels and each of said digital channels having active and inactive states in response to respective channel connect and disconnect requests, said reconfigurable node comprising:

means for assigning to a packet data channel n of said digital channels in said outgoing transmission path, where n is an integer equal to or greater than zero;

means for detecting appearance of connect/disconnect requests for any of said digital channels in said outgoing transmission path;

means for transmitting predetermined unique pad characters in any of said digital channels in said outgoing transmission path in response to detection of the appearance of respective connect/disconnect requests for such channels, where said pad characters are ignored by said remote node whenever received and the flow of data in said packet data channel continues without interruption;

means for transmitting a channel reassignment initiation signal to said remote node over said outgoing transmission path;

means for receiving a channel reassignment acknowledgment signal from said remote node over said incoming transmission path, said acknowledgment signal signaling completion at said remote node of the channel reassignment requested by said initiation signal; and

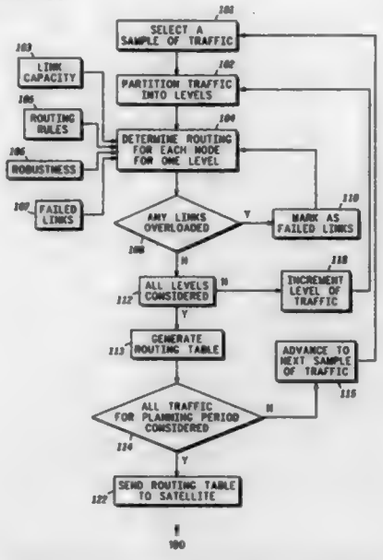
means responsive to receipt of said channel reassignment acknowledgment signal for changing the bandwidth of said packet data channel by changing the assignment with respect to said packet data channel of any of said digital channels in said outgoing transmission path containing said pad characters, where the flow of data in said packet data channel continues without interruption through said bandwidth change even though said acknowledgment signal is received subsequent in time to channel reassignment at said remote node.

5,467,345

PACKET ROUTING SYSTEM AND METHOD THEREFOR

Victor H. Cutler, Jr., Mesa; Peter Richetta, Tempe, both of Ariz.; Kenneth P. Young, Columbia, and Gerald J. Davieau, Eldersburg, both of Md., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 31, 1994, Ser. No. 251,459
Int. Cl.[6] H04J 3/24
U.S. Cl. 370—60 22 Claims



1. In a communication system comprised of nodes that communicate with each other over links, a method of routing data packets among said nodes comprising the steps of:

(a) partitioning an anticipated system traffic load into traffic levels, each traffic level being a subset of said anticipated system traffic load;

(b) providing an initial routing instruction set for each node;

(c) performing a routing simulation using said initial routing instruction set and traffic loading of said one traffic level;

(d) finding overloaded links by comparing a link capacity of each of said links with a utilized capacity of each of said links during said routing simulation;

(e) performing a second routing simulation using traffic loading of said one traffic level excluding links determined to be overloaded from step (d);

(f) generating a new routing instruction set based on said second routing simulation, said links determined to be overloaded being excluded from said new routing instruction set; and

(g) routing said data packets away from one of said nodes according to said new routing instruction set.

5,467,346

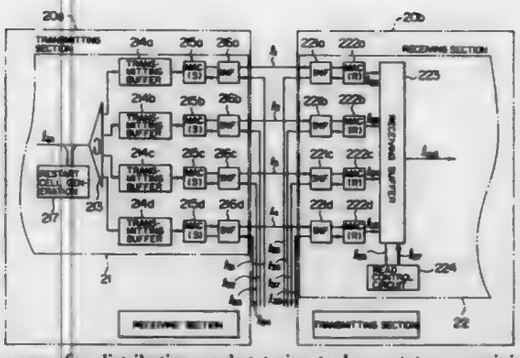
PACKET COMMUNICATION METHOD AND PACKET COMMUNICATION APPARATUS

Yutaka Ito, Yokohama; Makoto Mori, Hiratsuka, and Shinobu Gohara, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 789,001, Nov. 7, 1991, Pat. No. 5,386,415. This application Jun. 28, 1994, Ser. No. 266,636
Claims priority, application Japan, Nov. 9, 1990, 2-302371
Int. Cl.[6] H04Q 11/04
U.S. Cl. 370—60 5 Claims

1. A packet communication system for communicating packets each having a fixed length and including a header portion and an information portion between nodes through a plurality of transmission paths, said plurality of transmission paths for connecting said nodes comprise plural low speed and low capacity physical or logical lines, each node comprising:

a packet transmitting section which comprises:



means for distributing packet trains to be sent to a receiving section of another node into said plural low speed and low capacity physical or logical lines, wherein packets included in said packet trains are arranged in a predetermined order, and for transmitting said packets on said plural low speed and low capacity physical or logical lines; and

a packet receiving section which comprises:

buffer means for storing packets received from said plural low speed and low capacity physical or logical lines corresponding to said plural low speed and low capacity physical or logical lines respectively, and

read controlling means for monitoring whether said packets are received or not from said plural low speed and low capacity physical or logical lines, for storing management information concerning packets received, for reading out said packets stored in said buffer means in the same predetermined order as arranged at a packet transmitting section which transmitted said packets based on said management information when said packets have been received, and for waiting until said packets have been received in said buffer means and then reading out said packets based on said management information when said packets have not been received,

said packet trains are received and reproduced by said packet receiving section for receiving side communication nodes in the same predetermined order as said packet trains transmitted by said packet transmitting section of transmitting side communication nodes.

5,467,347

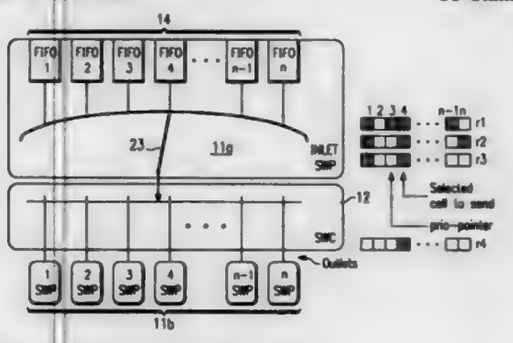
CONTROLLED ACCESS ATM SWITCH

Lars-Göran Petersen, Tumba, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 11,378, Jan. 29, 1993, abandoned. This application Aug. 1, 1994, Ser. No. 283,716

Int. Cl.[6] H04L *12/56*

U.S. Cl. 370—60.1 **38 Claims**



31. A data transfer switch comprising:

means for providing selectable routing paths for the routing of said information cells from input points to output points of a switchcore matrix having a plurality of rows, columns, and crosspoints thereof;

means for electronically connecting a plurality of input switchports to the input points of said switchcore matrix, each of said input switchports including at least one input buffer and being associated with one of said matrix rows;

means for electronically connecting a plurality of output switchports to the output points of said switchcore matrix, each of said output switchports being associated with one of said matrix columns;

means for connecting each of said switchports to an external information cell communications device;

means for asynchronously transmitting and receiving said stream of information cells from said switchcore matrix;

a plurality of single-cell buffers each of said single-cell buffers being mounted at a different one of said crosspoints of said switchcore matrix;

means for reporting to each of said input switchports whether each of said single-cell crosspoint buffers on said input switchport's associated row contains an information cell; and

means for controlling access by said information cells to said switchcore matrix by holding said information cells in said input buffer until one of said single-cell crosspoint buffers is empty.

5,467,348

BANDWIDTH ALLOCATION SYSTEM OF VIRTUAL PATH IN ASYNCHRONOUS TRANSFER MODE

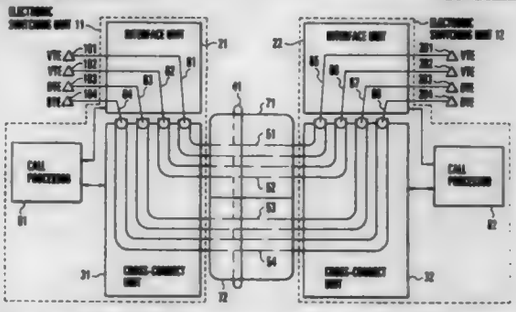
Shigeo Fujii, and Masayuki Kuga, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 6, 1994, Ser. No. 177,984

Claims priority, application Japan, Jan. 11, 1993, 5-002281

Int. Cl.[6] H04J *3/17*

U.S. Cl. 370—60.1 **10 Claims**



1. A bandwidth allocation system of a virtual path in an asynchronous transfer mode, comprising:

virtual path setting means for setting a plurality of virtual paths in a repeating line by which cross-connect units in an asynchronous transfer mode switching network are connected to each other, each of said virtual paths being a direct link in which a route and a bandwidth between said cross-connect units are logically determined;

bandwidth allocating means for allocating a bandwidth for each virtual path and bundling said plurality of said virtual paths into a plurality of virtual path groups;

attribute classifying means for defining attribute classifications respectively corresponding to a communication quality type;

attribute assigning means for assigning said attribute classifications to said plurality of virtual path groups;

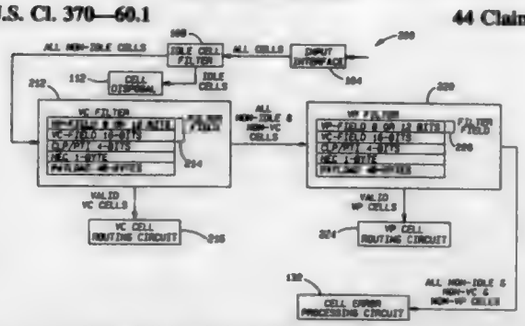
group bandwidth allocating means for proportionally distributing bandwidths to each of said virtual path groups in accordance with a sum total of all bandwidths allocated to said virtual paths constituting said each of said virtual path groups and setting a virtual path network; and

cell output means for outputting a cell of terminal information to said repeating line in accordance with the attribute classifications assigned to said virtual path groups.

5,467,349
ADDRESS HANDLER FOR AN ASYNCHRONOUS TRANSFER MODE SWITCH

Henry E. Huey, Redondo Beach, and Michael J. Nishimura, Torrance, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Dec. 21, 1993, Ser. No. 171,942
Int. Cl.[6] H04L *12/56*
U.S. Cl. 370—60.1 **44 Claims**



1. In an address handling circuit for an asynchronous transfer mode switch which processes a cell data stream including a plurality of cells having a header portion with a virtual channel identifier (VCI) and a virtual path identifier (VPI) and having a data payload portion, an improved address handling circuit comprising:

temporary storage means for temporarily storing at least one current cell for address processing;

virtual channel (VC) filter means, coupled to said temporary storage means and including VC address storage means for storing at least one selected VCI, corresponding VC matching data and a corresponding cell identifier, said VC filter means for comparing data from said header portion of said at least one current cell with said at least one selected VCI to identify cells matching said at least one selected VCI and including VC matching means, coupled to said VC filter means, for indicating a match;

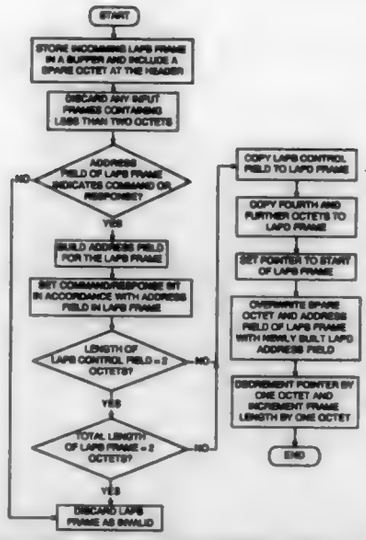
virtual path (VP) filter means, connected to said temporary storage means and including VP address storage means for storing at least one selected VPI, corresponding VP matching data and a corresponding cell identifier, said VP filter means for comparing said data from said header portion of said at least one current cell with said at least one selected VPI to identify cells matching said at least one selected VPI and including VP matching means, coupled to said VP filter means, for indicating a match, wherein said VP filter means has lower priority than said VC filter means; and

match priority means, coupled to said VC matching means of said VC filter means and said VP matching means of said VP filter means, for retrieving said matching data from a highest priority filter means having a match.

5,467,350
CONVERSION OF ISDN LAPB AND ISDN LAPD FRAMES

Steven Price, Overton; Raymond Jepson, Chandlers Ford; Barry J. Worley, Southampton; Steven P. Wood, Eastleigh, and Andrew J. Keogh, Southampton, all of, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 13, 1993, Ser. No. 90,584
Claims priority, application United Kingdom, Jul. 22, 1992, 9251841
Int. Cl.[6] H04J *3/16*
U.S. Cl. 370—82 **11 Claims**



1. A method of converting an ISDN LAPB frame to an ISDN LAPD frame comprising the steps of:

determining a frame length of the ISDN LAPB frame;

discarding any ISDN LAPB frames having a frame length less than two octets;

examining an address field of the ISDN LAPB frame to determine whether it is a, COMMAND or RESPONSE;

building an LAPD address field for the ISDN LAPD frame, and setting a COMMAND/RESPONSE bit in accordance with the address field of the ISDN LAPB frame;

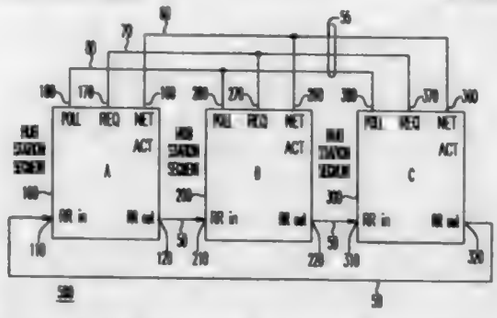
examining a control field of the ISDN LAPB frame to determine the length of the control field, and discarding the ISDN LAPB frame if the determined length of the control field is two octets and the total length of the ISDN LAPB frame is two octets, else copying the control field directly from the ISDN LAPB frame to the ISDN LAPD frame; and

copying a fourth and any further octets directly into an information field of the ISDN LAPD frame.

5,467,351
EXTENDIBLE ROUND ROBIN LOCAL AREA HUB NETWORK

Robert J. Baumert, Allentown, Pa., assignor to AT&T Corp., Murray Hill, N.J.

Filed Apr. 22, 1994, Ser. No. 231,419
Int. Cl.[6] H04J *3/02*
U.S. Cl. 370—85.15 **20 Claims**



1. An extendible, round robin, local area hub station network, said network comprising:

a round robin hub station including at least two round robin hub station segments coupled so as to form a ring-shaped hub station segment signal path;

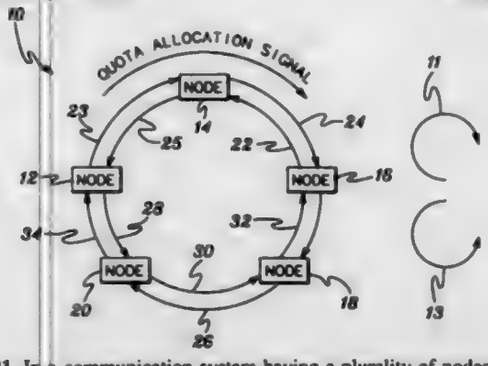
one of said at least two hub station segments comprising a master hub station segment adapted to provide control signals on said ring-shaped segment signal path to transfer control of round robin polling over said hub station network between any two of said at least two hub station segments in said ring-shaped segment signal path;

said at least two hub station segments being mutually coupled by a signal bus.

5,467,352
METHOD AND APPARATUS FOR IMPROVED THROUGHPUT IN A MULTI-NODE COMMUNICATION SYSTEM WITH A SHARED RESOURCE

Israel Cidon, Bronx; Leonidas Georgiadis, Chappaqua; Roch A. Guerin, Yorktown Heights, all of N.Y.; Yuval Y. Shavitt, Technion City, Israel, and Andrew E. Slater, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 7, 1994, Ser. No. 192,884
Int. Cl.[6] H04L *12/417*; H04J *3/14*
U.S. Cl. 370—85.5 **30 Claims**



21. In a communication system having a plurality of nodes and a shared communication path and employing a shared resource access quota scheme for node access to said shared communication path by said plurality of nodes, a method for a given node to indicate to the other of said plurality of nodes a status change thereof affecting possible non-quota access thereby to said shared communication path, said method comprising the steps of:

monitoring for a status change of said given node between a status of starved and a status of satisfied;

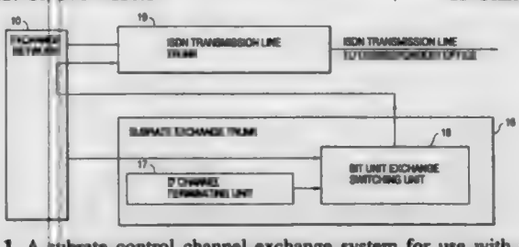
issuing a non-quota access update indicator from said given node in response to detecting said status change; and

propagating said issued non-quota access update indicator.

5,467,353
SUBRATE CONTROL CHANNEL EXCHANGE SYSTEM

Keiji Fukuda, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 22, 1993, Ser. No. 171,682
Claims priority, application Japan, Dec. 29, 1992, 4-361494
Int. Cl.[6] H04J *3/12*
U.S. Cl. 370—110.1 **15 Claims**



1. A subrate control channel exchange system for use with an exchange device in a communications network for establishing communications by multiplexing communications data applied from a source terminal unit to a destination terminal unit over an exchange network together with communication control data, said exchange device comprising:

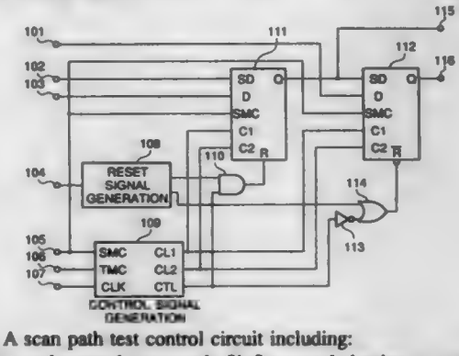
subrate switch trunk means for extracting only significant bits from low speed communications data applied from a plurality of low speed terminal units connected to said exchange network, multiplexing said significant bits in a time slot corresponding to a channel comprising a first predetermined number of bits in said communications network and outputting said multiplexed signal bits, and demultiplexing said significant bits in a reverse processing order; and

bit unit exchange switching means for multiplexing an output of said subrate switch trunk means with said communication control data, said communication control data being a number of bits such that the number of bits of said communication control data is less than said first predetermined number of bits.

5,467,354
TEST CONTROL CIRCUIT FOR CONTROLLING A SETTING AND RESETTING OF A FLIPFLOP

Hisashi Yamauchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 27, 1993, Ser. No. 126,653
Claims priority, application Japan, Sep. 25, 1992, 4-256670
Int. Cl.[6] H04Q *9/00*; G01R *31/28;31/00*
U.S. Cl. 371—22.3 **4 Claims**



1. A scan path test control circuit including:

first and second scan path flipflops each having a scan data terminal receiving a scan data signal for a scan path testing, a data input terminal receiving an input data signal for a normal circuit operation, a scan mode terminal receiving a scan mode signal indicative of whether the scan path circuit is in a scan shift mode or in a normal circuit test mode, a first clock terminal receiving a first clock for a data fetching, a second clock terminal receiving a second clock for a data outputting, a reset terminal and a data output terminal, said data output terminal of said first scan path flipflop being connected to said scan data terminal of said second scan path flipflop;

a first logic gate means having a first input connected to receive a reset signal, a second input, and an output connected to said reset terminal of said first scan path flipflop;

a second logic gate means having a first input connected to receive a reset signal, a second input, and an output connected to said reset terminal of said second scan path flipflop; and

a control signal generating circuit receiving said scan mode signal, a basic clock signal and a control signal indicative of inhibition and permission of the resetting of said first and second scan path flipflops, for generating said first clock signal and said second clock signal supplied to said first and second scan path flipflops, said second clock signal being activated at a timing later than that of said first clock signal, so that during said scan path testing, each of said first and second scan path flipflops fetches the scan data signal on said scan data terminal thereof in response to said first clock signal, and outputs the fetched scan data signal in response to said second clock signal,

said control signal generating circuit also generating a reset control signal supplied to said second input of each of said first and second logic gate means, said reset control signal being generated in such a manner that when said control signal is indicative of inhibition of the resetting of said first and second scan path flipflops, if said scan mode signal becomes indicative of the normal circuit test mode, said reset control signal first assumes an active level to open said first and second logic gate means so as to allow passage of said reset signal to said reset terminal of each of said first and second scan path flipflops, and then, assumes an inactive level at a timing between said first clock signal and said second

clock signal so that the passage of said reset signal to said reset terminal of each of said first and second scan path flipflops is inhibited, whereby the data held on each of said first and second scan flipflops as the result of the passage of said reset signal to said reset terminal of each of said first and second scan path flipflops is maintained.

5,467,355

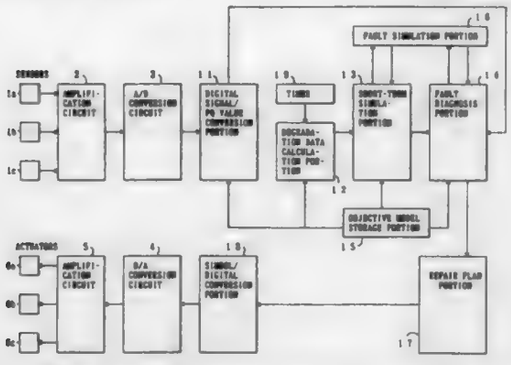
IMAGE FORMING APPARATUS PROVIDED WITH SELF-DIAGNOSIS SYSTEM

Yasushi Umeda, Chofu; Yasuo Motegi, Gunma; Tetsuo Tomiyama, Chiba; Hiroyuki Yoshikawa, Tokyo, and Yoshiki Shimomura, Yawata, all of, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 867,509, Apr. 13, 1992, abandoned. This application Sep. 1, 1994, Ser. No. 299,082

Int. Cl.[6] G06F *11/00*

U.S. Cl. 364—571.04 **9 Claims**



1. An image forming apparatus provided with a self-diagnosis system, comprising:

objective model storage means for storing data that represent the image forming apparatus as a combination of a plurality of elements, qualitative parameter data that represent, as parameters, attributes of respective elements of the plurality of elements and a combinational relationship between the elements, parameter membership functions corresponding to the parameters, and fault diagnosis knowledge;

degradation data storage means for storing degradation data representing an amount of degradation undergone by at least one component of the image forming apparatus after use of the image forming apparatus has started;

a plurality of sensor means for sensing a functional state of a predetermined portion of the image forming apparatus and outputting state data indicative thereof;

degradation amount calculation means for calculating the degradation of the at least one component from after the image forming apparatus starts to be used to the present time on the basis of degradation data stored in the degradation data storage means;

change calculation means for representing as a fuzzy qualitative value, the value of a changed parameter which has been changed by an amount of degradation calculated by the degradation amount calculation means from among qualitative parameter data stored in the objective model storage means by using the membership function corresponding to the changed parameter;

data conversion means for converting state data outputted by the sensor means into a fuzzy qualitative value by applying parameter membership functions stored in the objective model storage means;

fault judgement means of judging whether or not a fault exists by comparing a fuzzy qualitative value from the data conversion means with qualitative parameter data stored in the objective model storage means; and

fault diagnosis means for diagnosing the functional state of the image forming apparatus on the basis of qualitative parameter data and fault diagnosis knowledge stored in the objective model storage means by utilizing as initial conditions a fuzzy qualitative value from the change calculation means in response to a judgement that a fault exists by the fault judgement means, and for outputting a result of the diagnosis as an expression which has ambiguity and which indicates the state of the image forming apparatus.

5,467,356

BURN-IN CIRCUIT AND BURN-IN TEST METHOD

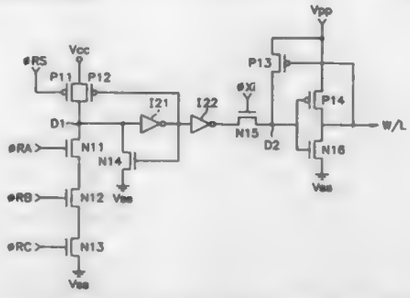
Yun-Ho Choi, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 2, 1993, Ser. No. 101,243

Claims priority, application Rep. of Korea, Jul. 31, 1992, 13818/92

Int. Cl.[6] G11C *29/00*

U.S. Cl. 371—21.1 **9 Claims**



4. A semiconductor memory device having a plurality of pins, a plurality of word line drivers for each receiving a row address signal synchronized with a row address strobe signal to enable a given word line, and a precharge reset signal to reset said given word line, said device comprising:

a memory cell array having a plurality of memory storage locations, each of said plurality of memory storage locations including a memory cell transistor coupled to one of said word lines;

a burn-in enable circuit connected to a first pin of said semiconductor memory device for generating a burn-in enable signal of a first voltage level when a voltage greater than an operating voltage of said device is applied to said first pin; and

a word line driver reset circuit for resetting said given word line when said precharge reset signal is input, said word line driver reset circuit further inputting a word line driver reset signal that is derived from said row address strobe signal and said burn-in enable signal such that said word line driver reset circuit does not reset said given word line when said word line driver reset signal is present so that a burn-in test of all of said memory cell transistors in said memory cell array can be performed simultaneously while said burn-in enable signal is generated.

5,467,357

EEPROM APPARATUS

Kazuo Asami, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1994, Ser. No. 230,456

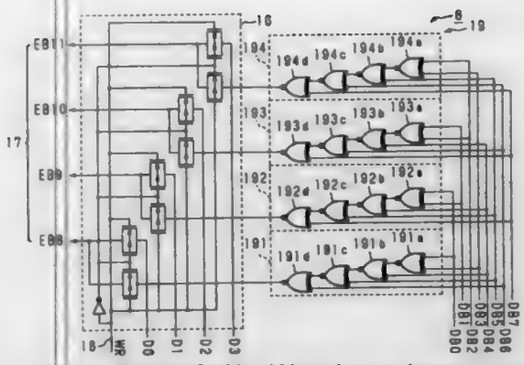
Claims priority, application Japan, Jun. 25, 1993, 5-154950

Int. Cl.[6] G06F *11/10*

U.S. Cl. 371—21.3 **9 Claims**

1. An EEPROM apparatus comprising: an EEPROM including memory cells arranged in a matrix of rows and columns with each row (or column) being of n-bit width (n is a natural number), and an error correction code generating unit for generating an error correction code of "n−m" bits when data of m bits (m is a natural number, m<n) to be stored is supplied, wherein

when said data of m bits to be stored is supplied, said EEPROM stores said data in m bits of the higher side (or lower side) of



a row (or column) of n-bit width, and stores the error correction code generated by said error correction code generating unit from said data in the remaining bits of the same row (or the same column) of n-bit width of said EEPROM, and

said error correction code generating unit generates, when said data of m bits to be stored in said EEPROM is composed of binary notations "1" and "0" alternately repeated, the error correction code whose value of the most significant bit (or the least significant bit) is different from a value of the least significant bit (or the most significant bit) of the adjacent data, and which is composed of "1" and "0" alternately repeated.

5,467,358

PROCESS FOR CHECKING THE MEMORIES OF A PROGRAMMED MICROCOMPUTER BY MEANS OF A MICRO-PROGRAM INCORPORATED IN THE MICROCOMPUTER ITSELF

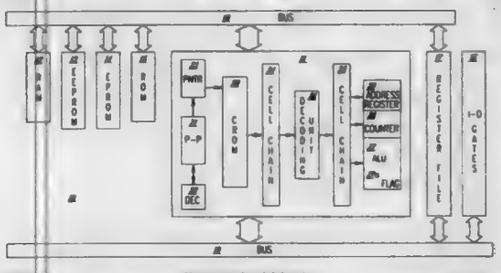
Flavio Scarra, Milan, Italy, assignor to SGS-Thomson Microelectronics, s.r.l., Milan, Italy

Filed Sep. 10, 1992, Ser. No. 943,186

Claims priority, application Italy, Sep. 10, 1991, 91A002385

Int. Cl.[6] H04B *17/00*

U.S. Cl. 371—22.3 **28 Claims**



1. A process for checking memories of a programmed microcomputer, the microcomputer including: read-only memories and read-and-write memories mapped into logic spaces suitable for containing information related to programs and data; a group of input and output ports; a register file; and a central microprocessing unit, the microprocessing unit including a control memory suitable for containing a micro-program constituted by micro-instructions; a pre-processor suitable for providing addresses of input points of the micro-program by means of decoded instructions; a decoder circuit for decoding said addresses or the input points of the micro-program; a pointer capable of addressing said micro-instructions of said micro-program; two scanning cell chains suitable for being triggered by means of pre-established operating signals and suitable for providing control signals of said logic spaces of said memories and of said micro-program; a decoding unit that transforms into operational signals said micro-instructions of the micro-program contained in said control memory; an arithmetic-logic unit containing an indicator register; a program counter and incrementer suitable for controlling addressing the information contained in said read-only and read-and-write memories; and an addressing circuit capable of providing an address of each register of said register file and of said input and output ports, the process comprising the steps of:

triggering said scanning cell chains by means of pre-established operating signals to generate control signals indicative of a pre-selected logic space of a pre-selected one of said memories to be checked, according to a pre-selected checking procedure that can be executed by means of said micro-instructions of said micro-program stored in said control memory;

selecting through said scanning cell chains, said pre-selected logic space where memory access will be performed;

initializing, through said scanning cell chains, said program counter, to define the staging point of said pre-selected memory to be checked;

selecting through said scanning cell chains one of said ports, as an output, on which to send all information taken from said pre-selected memory;

triggering, through said scanning cell chains, said control memory, said pre-processor, said decoding unit and said pointer, the addressing of said micro-instructions of the micro-program related to said pre-selected checking procedure, in order that it be executed by means of a pre-established number of clock strokes according to the size of the memory to be checked;

sending to said output information taken from said pre-selected memory:

repeating in a loop, according to an incremental sequence, the executing of said micro-instructions of the micro-program so as to send in succession to said output all the information contained in the same pre-selected memory, thereby checking the pre-selected memory; and

resetting said microprocessing unit through a special signal to return it to normal operating conditions.

5,467,359

APPARATUS FOR GENERATING AND CHECKING THE ERROR CORRECTION CODES OF MESSAGES IN A MESSAGE SWITCHING SYSTEM

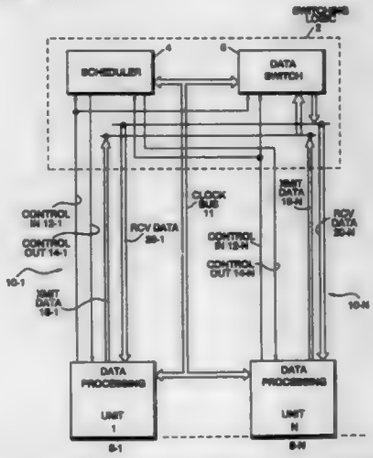
Pierre J. Huon, Saint Laurent du Var; Philippe Jachimczyk, Saint Jeannet; Gerard Barucchi, Villeneuve Loubet; Jean Calvignac, La Gaude, and Fabrice Verplanken, Cagnes sur Mer, all of, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 1, 1993, Ser. No. 24,061

Claims priority, application European Pat. Off., May 21, 1992, 92480073

Int. Cl.[6] G06F *11/10*

U.S. Cl. 371—37.1 **13 Claims**



1. An error correction apparatus (**36**) for generating the error correction code (CRC) of messages switched in interleaved data bursts between data processing units in a communication system, and exchanged through busses (**10**)comprising a plurality of wires, said error correction apparatus comprising, in each unit:

first error correction code generating means (54,110) responsive to the contents of the current data burst of the message sent by the unit towards a destination unit for generating a current error correction code associated to the current data burst as a function of an initial error code value of the burst if the first burst of the message or as a function of the previous error correction code associated to the previous burst of the message sent to the same destination unit,

first saving means (40-X,148) for saving the current error correction code and providing said current error correction code to the error correction generating means when the next burst of the message is ready to be sent, and

error correction code sending means (54;114,130) for sending the current error correction code on at least one first dedicated control wire of the bus connecting the unit to the destination unit, as a companion to the data burst contents which are sent by the unit through separate data wires.

5,467,360

STORAGE DEVICE FOR REVERSIBLY STORING DIGITAL DATA ON A MULTITRACK STORAGE MEDIUM, A DECODING DEVICE, AN INFORMATION REPRODUCING APPARATUS FOR USE WITH A STORAGE MEDIUM, AND A UNITARY STORAGE MEDIUM FOR USE WITH SUCH A STORAGE DEVICE DECODING DEVICE AND/O

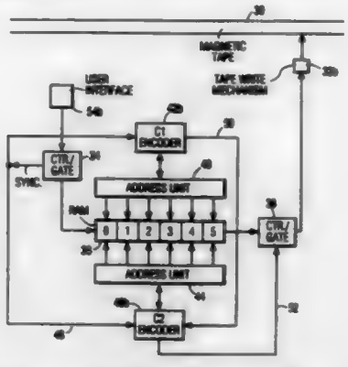
Gerardus C. P. Lokhoff, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 814,944, Dec. 30, 1991, abandoned, which is a continuation of Ser. No. 491,371, Mar. 9, 1990, abandoned. This application Feb. 15, 1994, Ser. No. 197,020

Claims priority, application European Pat. Off., Jan. 18, 1990, 90200128

Int. Cl.[6] G06F *11/10*; H03M *13/00*

U.S. Cl. 371—37.4 **25 Claims**



1. Apparatus for encoding data words included in a digital information signal as error protected codewords and recording said codewords on a record carrier having a number N, where N>2, of coextensive recording tracks, the signal having successive frames of data words, each data frame having a predetermined number of data segments, each data segment having a predetermined number of data blocks, each data block having a predetermined number of symbols of data words; said apparatus comprising:

first encoding means for receiving a data frame of said digital information signal and forming first codewords C1 from the symbols in the data blocks of each data segment of said data frame, each first codeword C1 including parity symbols in accordance with a first error protection code;

second encoding means for receiving said data frame and forming second codewords C2 from the symbols in the data blocks of each data segment of said data frame, each second codeword C2 including parity symbols in accordance with a second error protection error code;

the C1 and C2 codewords derived from the symbols of any particular data word constituting a product code such that a symbol in a codeword of either of said codes is also a symbol in a codeword of the other of said codes, whereby a symbol error can be corrected on the basis of either of the codewords in which said symbol error appears;

a data store connected to said first and second encoding means to receive C1 and C2 codewords therefrom and store the respective symbols of said codewords at respective store addresses, said store addresses being at locations in said data store corresponding to respective positions on said tracks; and

write means connected to said data store, said write means including a write head for simultaneously scanning all of said tracks and concurrently recording in respective coextensive segments of all tracks the symbols stored at store addresses included in corresponding segments of said memory;

the positions of the store addresses in said data store being such that when the symbols stored therein are recorded on said tracks the symbols of any particular C1 codeword are all on a single track in a single track segment and the symbols of any particular C2 codeword are distributed among a plurality of the tracks in a plurality of the track segments, the spacing between the adjoining recorded symbols of any particular C2 codeword being substantially uniform and proceeding both along and across said tracks.

5,467,361

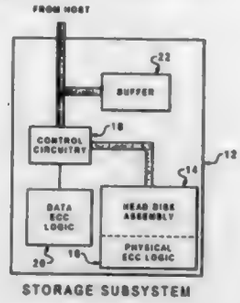
METHOD AND SYSTEM FOR SEPARATE DATA AND MEDIA MAINTENANCE WITHIN DIRECT ACCESS STORAGE DEVICES

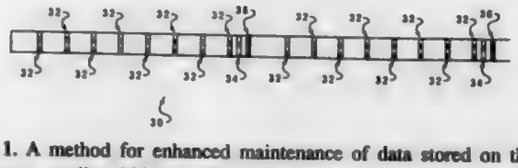
Lloyd R. Shipman, Jr., San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1994, Ser. No. 263,895

Int. Cl.[6] H03M *13/00*

U.S. Cl. 371—40.1 **14 Claims**





1. A method for enhanced maintenance of data stored on the storage media within a data processing system storage subsystem, said method comprising the steps of:

calculating and inserting a plurality of logical error correction codes based upon a content of said data at selected locations within said data prior to storage of said data;

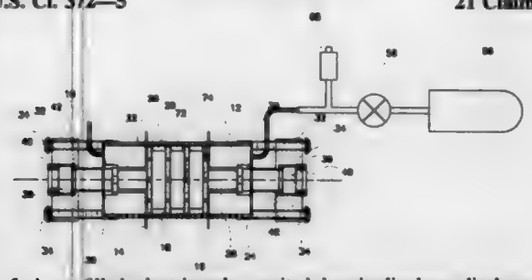
during storage of said data and said plurality of logical error correction codes, calculating and inserting at selected locations within said data and said plurality of logical error correction codes a plurality of physical error correction codes, each of said plurality of said physical error correction codes based upon a content of both said data and said plurality of logical error correction codes; and

maintaining said data within said data processing system storage subsystem utilizing both said plurality of logical error correction codes and said plurality of physical error correction codes.

5,467,362
PULSED GAS DISCHARGE XRAY LASER

Gordon A. Murray, 20306 Melville St., Orlando, Fla. 32833

Filed Aug. 3, 1994, Ser. No. 285,292
Int. Cl.[6] H01S *3/30*
U.S. Cl. 372—5 **21 Claims**



1. A gas filled, electric pulse excited, longitudinal gas discharge, laser tube comprising;

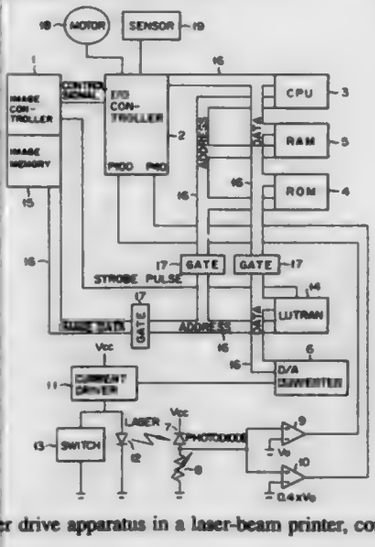
a gas tight elongated cylindrical electrically insulating vessel having an inner wall and an axis, said vessel containing a metal cathode electrode and metal anode electrode disposed within, said cathode electrode is disposed at one end of the vessel said anode electrode is disposed at the other end of the elongated electrically insulating vessel, said electrodes are joined to the said elongated electrically insulated vessel;

a plurality of electrically conducting discs disposed generally perpendicular to the axis, said discs are disposed between said anode and cathode electrodes and are surrounded by said elongated electrically insulating vessel, said discs each having an aperture co-axially aligned with said tube axis, said discs are separated from one another by spacers constructed from a refractory electrical insulator, said spacers having an internal dimension greater than said axial aperture dimension and an external dimension less than an internal dimension of the insulating vessel, means for exciting the gas in said laser tube with a fast high peak current electrical pulse having a peak current density greater than 50,000 amperes per square centimeter and sufficient to produce an optical output below 200 nanometers.

5,467,363
LASER DRIVE APPARATUS

Eiji Okabayashi, Toyokawa, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Dec. 1, 1994, Ser. No. 352,810
Claims priority, application Japan, Dec. 13, 1993, 5-312084
Int. Cl.[6] H01S *3/00*
U.S. Cl. 372—38 **9 Claims**



1. A laser drive apparatus in a laser-beam printer, comprising:

a drive circuit for feeding a drive current to a laser diode and causing the laser diode to emit a laser beam;

said drive circuit being adapted to vary the emission intensity of the laser beam by varying the drive current fed to the laser diode,

detection means for detecting the intensity of the emitted laser beam;

variation means for successively varying the drive current of said drive circuit;

first memory means for memorizing the magnitude of the drive current existing at the time that said detection means detects the fact that the magnitude of the laser beam reaches a first level;

second memory means for memorizing the magnitude of the drive current existing at the time that said detection means detects the fact that the magnitude of the laser beam reaches a second level different from the first level;

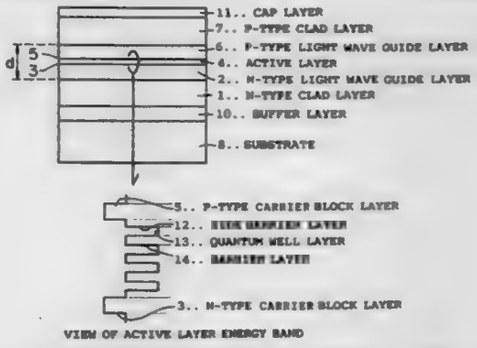
arithmetic means for computing the magnitude of the drive current corresponding to a relevant concentration level by dividing the difference between the magnitudes of drive current memorized in said first memory means and said second memory means by the number of intensity levels; and

conversion means for receiving an image data indicating the concentration level of each picture element, converting the image data into a signal corresponding to the drive current based on the result of the computation by said arithmetic means, and issuing the signal to said drive circuit.

5,467,364
SEMICONDUCTOR LASER ELEMENT AND LASER DEVICE USING THE SAME ELEMENT

Kiyofumi Muro; Tsuyoshi Fujimoto; Yuji Yoshida; Yoshikazu Yamada, and Shoji Ishizaka, all of Sodegaura, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 129,147, Oct. 5, 1993, abandoned. This application Aug. 9, 1994, Ser. No. 287,802
Claims priority, application Japan, Feb. 5, 1992, 4-20289
Int. Cl.[6] H01S *3/19*
U.S. Cl. 372—45 **11 Claims**



VIEW OF ACTIVE LAYER ENERGY BAND

1. A semiconductor laser element including an active layer having a light guiding function comprising:

a pair of carrier block layers sandwiching said active layer, for reducing the light guiding function of said active layer,

a pair of wave guide layers sandwiching said pair of carrier block layers, and

a pair of clad layers sandwiching said pair of wave guide layers,

wherein V_2 corresponding to the normalized frequency of the wave guide layer is in the range of $\pi/4$–π, and is defined by

$$V_2=(\pi d_2/\lambda)\cdot(N_0^2-N_3^2)^{0.5}$$

where π is the ratio of the circumference of a circle to its diameter,

d_2 is the effective thickness between said two clad layers, λ is the oscillation wave length, N_0 is the effective refractive index of said wave guide layer, and N_3 is the refractive index of said clad layer.

5,467,365

PROCESS FOR THE RECOVERY OF LEAD ARISING ESPECIALLY FROM THE ACTIVE MATERIAL OF SPENT BATTERIES, AND ELECTRIC FURNACE INTENDED ESPECIALLY FOR THE USE OF THE PROCESS

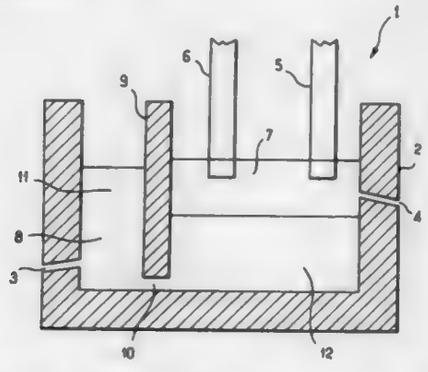
Benoît Bied-Charreton, Villefranche sur Saone; Pierre Chabry, Maurepas; Jacques Lecadet, Paris, and Patrice Pasquier, Chantilly, all of, France, assignors to Metaleurop S.A., France

Filed Sep. 9, 1993, Ser. No. 119,410

Claims priority, application France, Sep. 11, 1992, 92 10849

Int. Cl.[6] F27D *17/00*

U.S. Cl. 373—9 **8 Claims**



1. Process for the recovery of lead, arising from solid residues, said process comprising, in an electric furnace containing immersed electrodes, the steps of:

a) melting the residues which have the following composition in solid residues, in percentage by weight:

lead	10 to 95%
sulphur	1 to 12%
carbon	0 to 4%
materials which form slag	0 to 80%

the remaining percentage consisting of oxygen, and metals chosen among antimony, tin, arsenic and chlorine at a temperature between 600° C. and 1100° C. in the presence of a 2% to 4% carbon including the carbon arising from the organic materials contained in the residues, to separate the crude lead, on the one hand, and a lead-rich slag, on the other hand and, to remove the sulphur by evolution of a gaseous mixture consisting of carbon dioxide and 20% to 40% of sulphur dioxide and carbon dioxide and the amount of carbon added in the first stage is such that the slag has a lead content between 10% and 60% at the end of step a),

b) reduction of the lead-rich slag with an amount of carbon which is between 5% and 30% by weight with respect to the amount of PbO formed during step a) and which is present in a lead-rich slag phase, at a temperature between 900° C. and 1500° C., to separate, a reduced substantially lead-free slag and the crude lead,

c) recovery of the crude lead of obtained in step b).

5,467,366

ELECTRODE SYSTEM

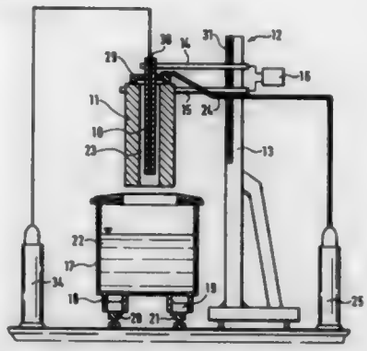
Herbert Wilhelmi, Aachen; Eberhard Steinmetz, Essen, and Klaus Peters, Aachen, all of, Germany, assignors to Messer Griesheim GmbH, Germany

Filed Oct. 18, 1994, Ser. No. 324,801

Claims priority, application Germany, Jan. 27, 1993, 43 36 628.7

Int. Cl.[6] F27D *23/04*

U.S. Cl. 373—85 **9 Claims**



1. An electrode system for melting and stirring and also for temperature control in metallurgical vessels, comprising a central electrode and an outer electrode which are each attached to a height adjustment and are connected to a common electric power source, and an annular space formed between central electrode and outer electrode which is connected to a gas source.

5,467,367

SPREAD SPECTRUM COMMUNICATION APPARATUS AND TELEPHONE EXCHANGE SYSTEM

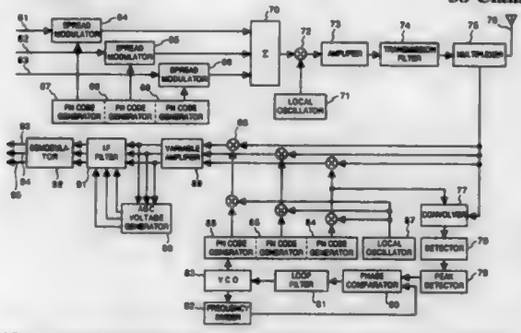
Michihiro Izumi, Kawasaki, and Kazunari Watanabe, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 892,273, Jun. 2, 1992, abandoned. This application Jun. 13, 1994, Ser. No. 259,122

Claims priority, application Japan, Jun. 7, 1991, 3-136520; Jun. 7, 1991, 3-136521; Jun. 7, 1991, 3-136527

Int. Cl.[6] H04B *1/707*

U.S. Cl. 375—206 **38 Claims**



18. A spread spectrum communication apparatus comprising:

first generation means for generating a first spread code;

a plurality of delay means for delaying the first spread code to generate a plurality of spread codes having different phases;

modulation means for modulating transmission information signals of a plurality of parallel channels using the plurality of spread codes generated by said plurality of delay;

accumulation means for accumulating the signals of the channels modulated by said modulation means;

second generation means for generating a second spread code;

multiplication means for multiplying a signal accumulated by said accumulation means with the second spread code generated by said second generation means; and

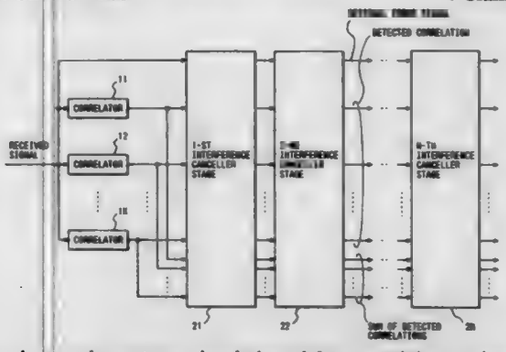
transmission means for transmitting the signal multiplied by said multiplication means.

5,467,368

SPREAD SPECTRUM SIGNAL DEMODULATOR

Yoshio Takeuchi, and Toshinori Suzuki, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Nov. 1, 1994, Ser. No. 333,074
Claims priority, application Japan, Nov. 5, 1993, 5-299085
Int. Cl.[6] H04B 1/707; H04J 13/04
U.S. Cl. 375—206 4 Claims



1. A spread spectrum signal demodulator receiving as input signal a sum of a plurality of spread spectrum signal, comprising:

means for obtaining the correlation of a spreading code assigned to each of the spread spectrum signals contained in the input signal and the input signal for each symbol of the spread spectrum signal and making the correlation to be a zero detected correlation signal;

a first interference canceller stage for receiving the input signal and the zero detected correlation signal and outputting a first residual error signal, a first detected correlation signal and a sum signal representative of a sum of the zero and first detected correlations signals; and

a plurality of interference canceller stages serially connected together and to the first interference canceller stage, each interference canceller stage of the plurality of interference canceller stages receiving from the previous interference canceller stage a residual error signal, a detected correlation signal, and a sum signal representative of a sum of all previously detected correlation signals and outputting further a residual error signal, a detected correlation signal, and a sum signal representative of a sum of all detected correlation signals through the respective each interference canceller stage.

5,467,369

AUI TO TWISTED PAIR LOOPBACK

Nader Vijeh, Cupertino; Ian S. Crayford, San Jose, and Jeffrey M. Blumenthal, Fremont, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

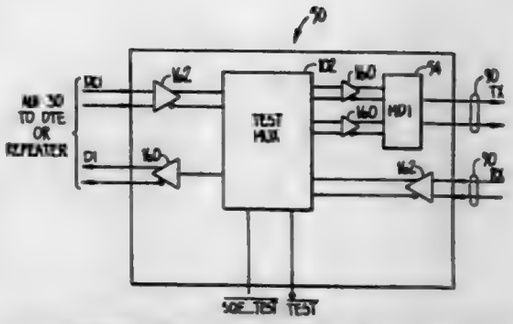
Division of Ser. No. 899,083, Jun. 15, 1992, Pat. No. 5,327,465, which is a division of Ser. No. 480,426, Feb. 15, 1990, Pat. No. 5,164,960. This application Apr. 8, 1994, Ser. No. 224,946
Int. Cl.[6] H04B 3/46;17/00
U.S. Cl. 375—224 2 Claims

1. A Medium Attachment Unit ("MAU") for implementing a first and second loopback mode in a computer network environment, comprising:

a first and second input port;

a first and second output port;

means, coupled to said first and second input ports and said first and second output ports, for detecting the simultaneous transmission of a first signal received from said first input port for



transmission to said second output port, and a second signal, received from said second input port for transmission to said first output port, and asserting a collision signal;

means, responsive to said collision signal, for disabling said simultaneous transmission of said first and second signals;

means, coupled to said simultaneous transmission detecting means and responsive to a third signal, for enabling the loopback modes;

means, coupled to said enabling means, for implementing the first loopback mode when a fourth signal is asserted, otherwise;

said implementing means implementing the second loopback mode when said fourth signal is negated;

wherein said third and fourth signal are provided to the MAU from a source other than one of said first and second input ports; and

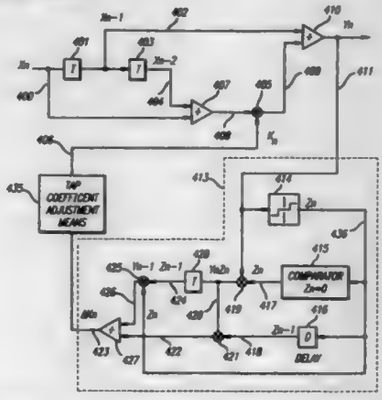
wherein said disabling means is responsive to an assertion of said third signal to prevent said disabling means from disabling said simultaneous transmission of said first and second signals and wherein said first loopback mode directs said first signal from said first input port to said first output port and said second signal from said second input port to said second output port, and said second loopback mode directs said first signal from said first input port to said second output port and said second signal from said second input port to said first output port.

5,467,370

METHOD AND APPARATUS FOR AN ADAPTIVE THREE TAP TRANSVERSAL EQUALIZER FOR PARTIAL-RESPONSE SIGNALING

Richard G. Yamasaki, Torrance, and Tzu-Wang Pan, Irvine, both of Calif., assignors to Silicon Systems, Inc., Tustin, Calif.

Filed Mar. 24, 1994, Ser. No. 217,493
Int. Cl.[6] H03H 7/30; G11B 5/035
U.S. Cl. 375—232 5 Claims



1. An apparatus for equalizing a channel comprising:

equalizing means coupled to said channel and providing an equalized output signal, said equalizing means receiving at least one coefficient signal;

coefficient adjustment means providing said at least one coefficient signal, said coefficient adjustment means receiving an update signal;

adaptive update means coupled to said equalized output signal, said adaptive update means providing said update signal, said adaptive update means comprising:

masking means coupled to said equalized output signal, said masking means suppressing said equalized output signal when said equalized output signal is larger than a specified range;

gradient determining means coupled to said masking means, said gradient determining means comprising:

quantizing means coupled to said equalized output signal, said quantizing means generating a quantized signal;

delay means coupled to said equalized output signal and said quantized signal, said delay means providing a delayed output signal and a delayed quantized signal;

first multiplying means coupled to said equalized output signal and said delayed quantized signal;

second multiplying means coupled to said delayed output signal and said quantized signal;

first summing means coupled to said first and second multiplying means.

5,467,371

ARRANGEMENT FOR GENERATING PULSE CODE MODULATION VALUES

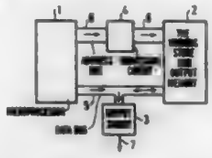
Gijsbertus A. Van Koelen; Paul G. Snaphaan, and Gertjan Rhebergen, all of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

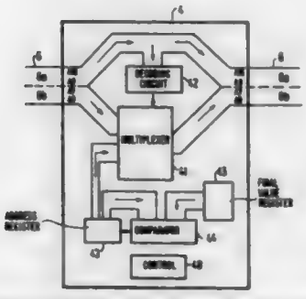
Filed Sep. 24, 1992, Ser. No. 951,493

Claims priority, application European Pat. Off., Sep. 27, 1991, 91202531

Int. Cl.[6] H04B *14/04*

U.S. Cl. 375—241 **16 Claims**





1. An arrangement for generating pulse code modulation values in a telephone set, comprising:

a microprocessor;

a working store for use by the microprocessor;

data bus means for coupling said microprocessor to said working store and for transmitting data from the microprocessor to the working store;

an output circuit, coupled to the microprocessor via the data bus means, for outputting the pulse code modulation values;

output memory means, coupled to the output circuit and the microprocessor via the data bus means, for storing the pulse code modulation values, said output memory means including addressable memory locations, said output circuit for reading the pulse code modulation values from the output memory means via the data bus and not from the microprocessor, the output memory means and the working store being comprised in a single memory circuit; and

address bus means for coupling the microprocessor to the working store and the output memory means and for transmitting addresses for addressing the working store and the output memory means.

5,467,372

MULTI CHANNEL ADPCM COMPRESSION AND EXPANSION DEVICE

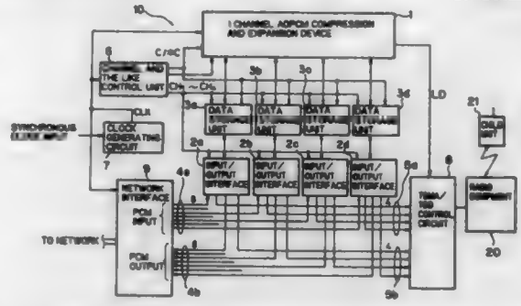
Shuji Nishitani, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jul. 20, 1994, Ser. No. 278,000

Claims priority, application Japan, Jul. 21, 1993, 5-201144

Int. Cl.[6] H04B *14/06*

U.S. Cl. 375—244 **11 Claims**



1. A multi channel ADPCM compression and expansion device comprising:

N sets (N is an integer greater than 1) of input and output interfaces which are connected in parallel with a transmitter and receiver side line and a digital telecommunication network side line which transmits and receives PCM data in a predetermined signal transmission slot, which receive data of K bits from the transmitter and receiver side line and send out data of M bits (wherein K and M are integers such that K<M) to the digital telecommunication network side line, and which receive data of M bits from the digital telecommunication network side line and send out data of K bits to the transmitter and receiver side line;

an ADPCM compression and expansion device which expansively converts data of K bits in a form of ADPCM signals into PCM signals of M bits in response to a first control signal and outputs the same and compressively converts data of M bits in a form of PCM signals into ADPCM data of K bits in response to a second control signal; and

a control unit which divides the signal transmission slot interval into N sections and successively selects said N sets of input and output interfaces in a predetermined order during respective divided intervals divided into N sections, and successively performs during the respective divided intervals a first control which generates the first control signal and then sends the data of K bits from the selected input and output interface to said ADPCM compression and expansion device and which receives the expansively converted M bit data from said ADPCM compression and expansion device and then returns the same to the selected input and output interface, and a second control which generates the second control signal and then sends the M bit data from the elected input and output interface to said ADPCM compression and expansion device and which receives the compressively converted K bit data from said ADPCM compression and expansion device and then returns the same to the selected input and output interface,

wherein the compressive conversion and the expansive conversion of said ADPCM compression and expansion device are completed in an interval shorter than ½ of the divided interval.

5,467,373

DIGITAL FREQUENCY AND PHASE MODULATOR FOR RADIO TRANSMISSION

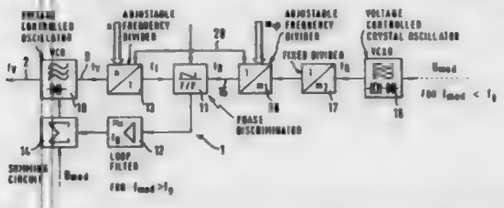
Hans-Peter Ketterling, Berlin, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 15, 1993, Ser. No. 5,890

Claims priority, application Germany, Jan. 15, 1992, 42 00 816.6

Int. Cl.[6] H03D *3/24*

U.S. Cl. 375—327 17 Claims



1. A method of modulating, in phase or frequency, an electric wave with a binary digital signal while minimizing the bandwidth of the resulting modulated wave, comprising the steps of:

generating (16) an electric oscillation of a stable fixed frequency and furnishing it to a first variable-ratio digital frequency divider (17, 18);

digitally dividing the frequency of said oscillation in a variable-ratio frequency divider and supplying a frequency-divided oscillation as a reference frequency oscillation to a phase discriminator (11);

generating, by means of a voltage-controllable oscillator (10) (VCO), said electric wave, said VCO (10) having a frequency control input;

supplying output oscillation derived from said voltage controllable oscillator (10) to said phase discriminator (11);

comparing in said phase discriminator (11) said oscillation derived from the voltage controllable oscillator (10) and said frequency divided oscillation, serving as reference frequency oscillation, and thereby deriving a comparison signal at an output of said phase discriminator,

supplying the comparison signal to said control input of said voltage-controlled oscillator (10) in a loop,

introducing modulation signals to one of:

the generated, stable fixed frequency oscillations, and

the loop between the voltage controlled oscillator (10) and the phase discriminator,

whereby said comparison signal will bring or keep the frequency of said oscillation excited by said wave to the frequency of said divided oscillation serving as a reference frequency oscillation, and

whereby at a selected available frequency division ratio of said first variable-ratio frequency divider, said oscillation serving as a reference frequency oscillation maintains undisturbed phase progress at a frequency determined by said selected frequency division ratio of said first variable-ratio frequency divider (17, 18); and

producing digitally, in response to said binary digital signal by reference to stored time division data for binary digital transitions, steps of phase shift in a bandwidth-reducing pattern, each said step being produced digitally by a change of the division ratio of said variable-ratio frequency divider (17, 18) at the timing of each said phase shift step, for a period of one cycle of said frequency divided oscillation serving as a reference frequency oscillation, with return to said selected frequency division ratio, after each of said phase shift steps, for maintaining said phase progress at said frequency determined by said selected frequency division ratio between successive phase shift steps and between said transitions of said binary digital signal as modified by said phase shift steps.

5,467,374

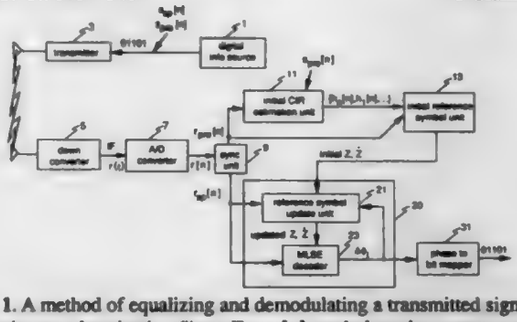
LOW COMPLEXITY ADAPTIVE EQUALIZER FOR U.S. DIGITAL CELLULAR RADIO RECEIVERS

Sandeep Chennakeshu; Paul W. Dent; Ravinder D. Koilpillai, and Raymond L. Toy, all of Cary, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 29, 1993, Ser. No. 143,028

Int. Cl.[6] H03D *1/00*

U.S. Cl. 375—340 6 Claims



1. A method of equalizing and demodulating a transmitted signal having synchronization ("sync") $s_{pre}[n]$ symbols and message symbols $s_{sp}[n]$ selected from even and odd π/4-shifted differential quadrature phase shift keyed (DQPSK) symbol constellation points {S}, {Ŝ}, into decoded symbols at a receive unit comprising the steps of:

a) receiving the transmitted signal;

b) synchronizing and sampling the transmitted signal into received samples r[n], where n is an integer, and separating the received data r[n] into sequences of sync samples $r_{pre}[n]$ and received message samples $r_{sp}[n]$;

c) selecting a portion of the received message samples $r_{sp}[n]$ for decoding;

d) determining initial channel impulse response (CIR) coefficients from the sync samples, $r_{pre}[n]$;

e) determining initial sets of estimated reference constellation points $\{Z^{ref}\}$ and $\{\hat{Z}^{ref}\}$ for even and odd constellations respectively, from the initial CIR coefficients and the predetermined set of sync symbols $s_{pre}[n]$;

f) rotating $\{Z^{ref}\}$ and $\{\hat{Z}^{ref}\}$ to result in a full set of estimated symbol constellation points {Z} and {Ẑ} which account for changes through the channel and intersymbol interference;

g) determining a most likely path of state transitions over a plurality of time period stages through a trellis, corresponding to the selected portions of the received message samples $r_{sp}[n]$ where each possible state transition has been preassigned to one of the π/4-shifted DQPSK symbol constellation point, {S} or {Ŝ}, for even and odd stages, respectively;

h) tracing back the state transitions, and the corresponding symbol constellation points of the most likely path being the decoded symbols;

i) repeating steps "c" through "h" for subsequent decoding.

5,467,375

GAS INJECTION SYSTEM OF NUCLEAR POWER PLANT AND GAS INJECTION METHOD THEREFOR

Noriyuki Sasaki, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 9, 1994, Ser. No. 303,813

Claims priority, application Japan, Sep. 9, 1993, 5-224666

Int. Cl.[6] G21C *19/317*

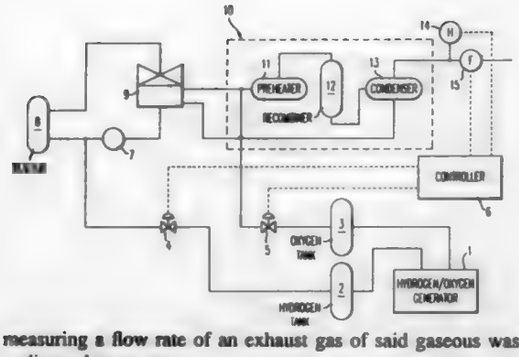
U.S. Cl. 376—300 11 Claims

8. A gas injection method for a nuclear power plant including a reactor and a gaseous waste disposal system, comprising the steps of:

injecting hydrogen into a reactor of a nuclear power plant;

injecting oxygen into a gaseous waste disposal system in which the oxygen is recombined with the hydrogen passed by way of the reactor;

measuring a balance of concentration between the hydrogen and the oxygen in said gaseous waste disposal system;



measuring a flow rate of an exhaust gas of said gaseous waste disposal system;

controlling injection quantities of the injected hydrogen and the oxygen in accordance with the results of the concentration balance measurement and the flow rate measurement;

storing a lag time between a time when the oxygen and the hydrogen are injected and the time when the oxygen and the hydrogen reach the gaseous waste disposal system, respectively; and

controlling an injection timing from the hydrogen injection and the oxygen injection in response to the lag time.

5,467,376

INCREMENTING AND DECREMENTING COUNTER CIRCUITS

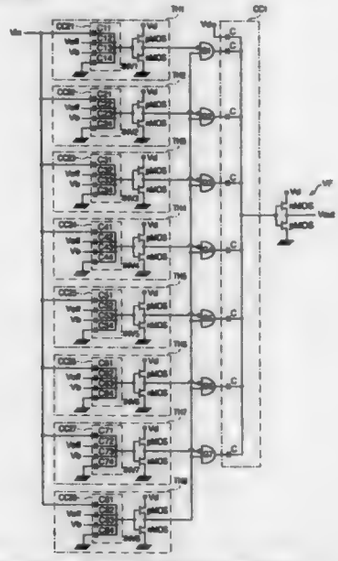
Guoliang Shou; Sunao Takatori, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan Inc., and Sharp Corporation, both of Tokyo, Japan

Filed Sep. 19, 1994, Ser. No. 308,460

Claims priority, application Japan, Sep. 20, 1993, 5-256377; Sep. 20, 1993, 5-256530

Int. Cl.[6] H03K *25/00*

U.S. Cl. 377—94 **12 Claims**



1. An incrementing counter circuit comprising:

a plurality of threshold circuits each having a first capacitive coupling for receiving an input voltage, an offset voltage and a bias voltage and generating a weighted summation of said input voltage, said offset voltage and said bias voltage when said input voltage exceeds a threshold voltage, and having an inverting amplifier which is connected to receive said weighted summation, said inverting amplifier generating an amplifier output;

a master threshold circuit having a master capacitive coupling for receiving said input voltage, said offset voltage, and said bias voltage and generating a master weighted summation of said input voltage said offset voltage and said bias voltage, when said input voltage exceeds a master threshold voltage, and having a master inverting amplifier for receiving said master weighted summation and generating a control signal;

a plurality of switching means corresponding to said plurality of threshold circuits, each of said switching means receiving said control signal at a first switch input and said amplifier output of a corresponding one of said threshold circuits at a second switch input, and providing an output; and

a second capacitive coupling connected to receive said output of each of said plurality of switching means, said second capacitive coupling providing a coupling output.

5,467,377

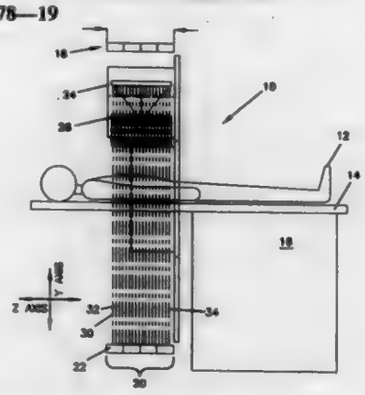
COMPUTED TOMOGRAPHIC SCANNER

Ralph L. Dawson, 32975 NE. Polk St., Cambridge, Minn.

Filed Apr. 15, 1994, Ser. No. 228,110

Int. Cl.[6] H05G *1/60*

U.S. Cl. 378—19 **1 Claim**



1. A tomographic scanner comprising:

an x-ray tube generating z-axis X-ray beams, each X-ray beam at a z-axis location forming a slice;

a stationary array of detectors, each detector having several segments, each segment having a photo detector;

control means for sequentially moving said X-ray beam to non-adjacent z axis locations and for collection data from detector segments corresponding to each z-axis location.

5,467,378

X-RAY APPARATUS COMPRISING A PHOTOCONDUCTOR AND A CORONA CHARGING DEVICE

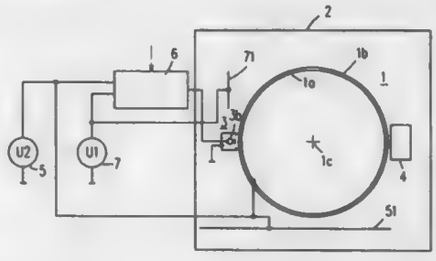
Waldemar Lumma, and Heinz Haarmann, both of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1994, Ser. No. 314,563

Claims priority, application Germany, Sep. 30, 1993, 43 33 325.7

Int. Cl.[6] G03G *13/26*

U.S. Cl. 378—32 **18 Claims**



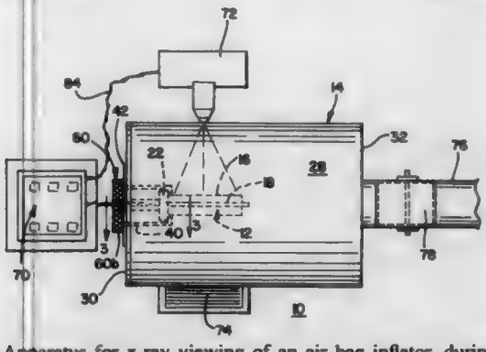
1. An X-ray apparatus, comprising a photoconductor (1) for convening X-rays into a charge pattern, and a corona charging device (3) for charging the surface of the photoconductor to a defined potential prior to an X-ray exposure, and a control unit (6) for operating the corona charging device (3) in a first mode and in a second mode, the corona charging device (3) receiving in the first mode a first voltage (U1) and in the second mode a second voltage (U2) of a polarity which opposes that of the first voltage at least temporarily.

5,467,379

APPARATUS FOR TAKING X-RAYS OF AN AIR BAG INFLATOR DURING A FIRING CYCLE

Steven D. Bybee, Roy, and A. Kim Cummings, Hooper, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Nov. 22, 1994, Ser. No. 343,623
Int. Cl.[6] G01N 23/04
U.S. Cl. 378—57 20 Claims



1. Apparatus for x-ray viewing of an air bag inflator, during a firing cycle comprising:

pressure tank means for holding said inflator during a firing cycle thereof having an access opening in a wall for receiving said inflator;

pressure plug housing means mounted in said access opening having stop means at an inner open end for engaging a base at an end of said inflator inserted into said open end for limiting the amount of insertion of said inflator into said tank means; and

pressure plug means removably securable in said housing means engageable with said base of said inflator for rigidly securing the same in fixed position in said tank means and sealing said housing means.

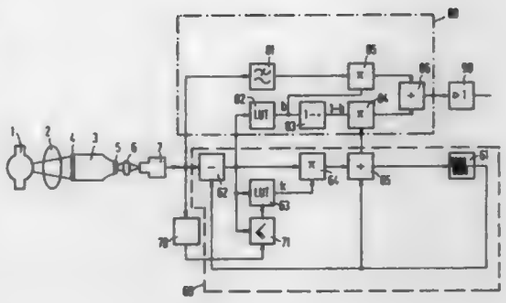
5,467,380

X-RAY EXAMINATION APPARATUS AND MEANS FOR NOISE REDUCTION FOR USE IN AN X-RAY EXAMINATION APPARATUS

Dirk J. A. De Jonge, and Herman Stegehuis, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 12, 1993, Ser. No. 89,958
Claims priority, application European Pat. Off., Jul. 10, 1992, 92202103
Int. Cl.[6] H05G 1/64
U.S. Cl. 378—98.2 20 Claims

18. A noise reduction apparatus for processing successive x-ray images, said apparatus comprising means for weighted temporal averaging an image at predetermined position in time in a temporal sequence of said x-ray images] with images from said sequence preceding said predetermined position and with images from said sequence succeeding said predetermined position using weight factors, and motion detection means which comprises means for generating the weight factors for said weighted temporal averaging in dependence on differences between images of said sequence.

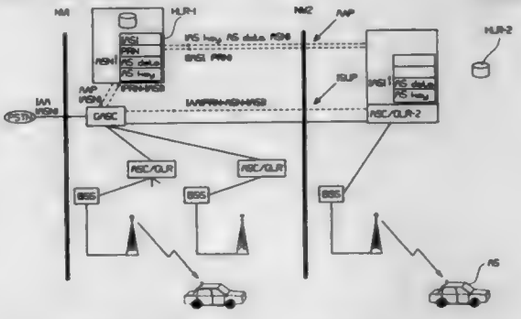


5,467,381

METHOD AND SYSTEM FOR RESTRUCTURING A CALL SIGNAL FRAME IN A CELLULAR MOBILE TELEPHONE SYSTEM HAVING DIRECTORY AND ROUTING NUMBER

Ari Peltonen, Aachen, Germany; Bo A. V. Åström, Tullinge, Sweden; Mars V. Gandils, Älvsjö, Sweden; Mats O. Stille, Stockholm, Sweden, and Sven J. Lantto, Tullinge, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Mar. 3, 1994, Ser. No. 205,154
Claims priority, application Sweden, Mar. 4, 1993, 9300721
Int. Cl.[6] H04Q 7/38
U.S. Cl. 379—58 7 Claims



1. A method for restructuring a standardized call signal frame arriving at a mobile telephone system, the frame including a first parameter field having a directory number for a subscriber roaming in the mobile telephone system, and a second parameter field into which optional information can be inserted, comprising the steps of:

replacing the directory number in the first parameter field with a unique routing number to a mobile telephone services switching center in whose service area the mobile subscriber roams; and

placing a subscriber unique identification number and directory number in the optional information space of the second parameter field.

5,467,382

METHOD AND APPARATUS FOR CLONE DETECTION IN A COMMUNICATION SYSTEM

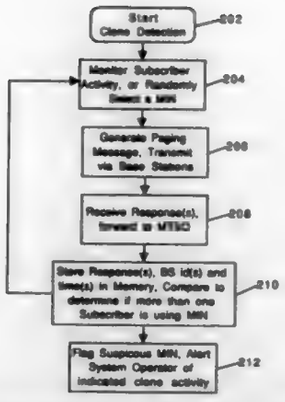
Eric R. Schorman, Bedford, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 31, 1994, Ser. No. 250,978
Int. Cl.[6] H04Q 7/20; H04K 1/00; G07D 7/00
U.S. Cl. 379—58 13 Claims

1. A method of detecting unauthorized subscribers in a communication system having plural subscribers each having an identifier and at least one base station, comprising the steps of:

transmitting a message including a first identifier of an authorized subscriber from the base station;

receiving a response to the message from each subscriber using the first identifier; and



storing each response and determining if an unauthorized subscriber is using the first identifier based on the number of stored responses to the message from different subscribers all using the first identifier.

5,467,383

CORDLESS TELEPHONE APPARATUS

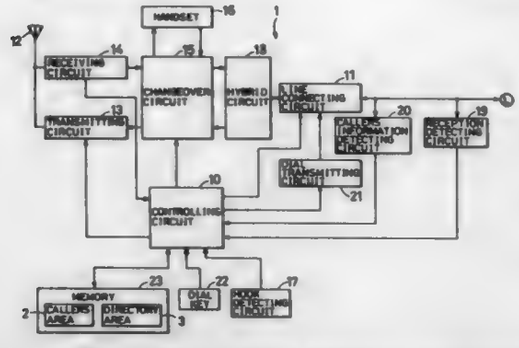
Shinichi Urasaka, and Takeharu Sakata, both of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, and Tottori Sanyo Electric Co., Ltd., Tottori, both of, Japan

Filed Nov. 29, 1994, Ser. No. 350,021

Claims priority, application Japan, Nov. 29, 1993, 5-298317; Jun. 16, 1994, 6-134404; Jul. 14, 1994, 6-162255

Int. Cl.[6] H04Q *7/30;7/32*

U.S. Cl. 379—61 **8 Claims**



1. A cordless telephone apparatus including a base unit connected to a telephone line and a sub unit connected to the base unit by wireless, said sub unit being connected to the telephone line through the base unit, calling with said sub unit being inhibited while the base unit is performing a calling operation through the telephone line,

wherein said base unit is provided with: detecting means for detecting callers information transmitted through the telephone line when a call is received, storing means for storing the callers information detected by the detecting means; and controlling means for controlling so that the callers information stored in the storing means is transmitted to the sub unit based on an access signal from the sub unit,

wherein said sub unit is provided with controlling means for transmitting a calling signal and the access signal, said controlling means of the sub unit processing the callers information transmitted from the base unit, and

wherein said controlling means of the base unit receives the access signal from the sub unit while the base unit is performing a calling operation through the telephone line, and transmits the callers information to the sub unit.

5,467,384

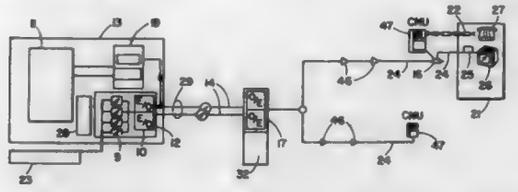
METHOD AND APPARATUS FOR PROVIDING POWER TO A COAXIAL CABLE NETWORK

Russell A. Skinner, Sr., Longmont, Colo., assignor to U S West Advanced Technologies, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 68,827, May 28, 1993, Pat. No. 5,355,401. This application Feb. 3, 1994, Ser. No. 191,303

Int. Cl.[6] H04M *9/00;11/04;* **H04H** *1/00*

U.S. Cl. 379—66 **6 Claims**



1. A video and telephony network, including customer premises equipment electromagnetically connected thereto, comprising:

a coaxial cable transmission system for carrying video and telephony signals over said network;

a video provisioning system electromagnetically connected to said coaxial cable transmission system;

a telephone switching system electromagnetically connected to said coaxial cable transmission system;

a cable network unit electromagnetically connected to said coaxial cable system, said cable network unit located at a network location external to a customer premise;

a power supply connected to said coaxial cable transmission system at a network location; and

a power converter connected to said cable network unit;

whereby the power from said power supply is transmitted through said coaxial cable transmission system and converted such that said cable network unit provides an electromagnetic form of signaling and supervision for a telephony service application to said customer premises equipment.

5,467,385

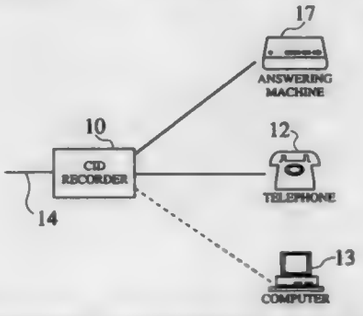
CALLING NUMBER DISPLAY AND RECORDING SYSTEM

Douglas S. Reuben, 16 Owen St., Hartford, Conn. 06105, and Ilan Reuben, 1843 San Ramon Ave., Berkeley, Calif. 94707

Filed Jan. 27, 1994, Ser. No. 188,616

Int. Cl.[6] H04M *1/64;3/50*

U.S. Cl. 379—88 **13 Claims**



1. An apparatus for processing telephone signals (**140**) carried on a telephone line (**14**), said telephone signals (**140**) including incoming messages (**152**), caller identification (CID) information (**148**), a calling party call termination ("Wink") signal (**146**), and an "Off Hook" condition voltage (**158**), said apparatus comprising:

an answering device (**17**) coupled to said telephone line (**14**);

a caller ID recorder means (**10**) for receiving said telephone signals (**140**), decoding said CID information (**148**) carried on said telephone signals (**140**) and detecting said "Wink" signal (**146**); said caller ID recorder means (**10**) having a control logic means (**38**) for generating an output (VS_OUT) (**80**)

derived from said CID information (148) received, said caller ID recorder means (10) coupled to said telephone line (14);

a visual display means (54) for visually displaying said CID information (148); said visual display means (54) coupled to said control logic means (38); and

an audio means (46) for announcing said output (VS_OUT) (80);

said audio means (46) coupled to said control logic means (38);

said control logic means (38) distinguishing said "Wink" signal and responding to said "Wink" signal (146) by disconnecting said answering device (17) from said telephone line (14) and preventing said "Wink" signal from reaching said answering device (17) to cause it to hang up,

said control logic means (38) sending said output (VS_OUT) (80) to said answering device (17) where said output (VS_OUT) (80) is recorded.

5,467,386

METHOD FOR SIGNALLING/COMMUNICATION WITHIN AN ENTRANCE TELEPHONE SYSTEM AND AN ENTRANCE TELEPHONE SYSTEM COMMUNICATING ACCORDING TO THE METHOD

Anders E. Trell, Hogalidsgatan 27, Stockholm, Sweden

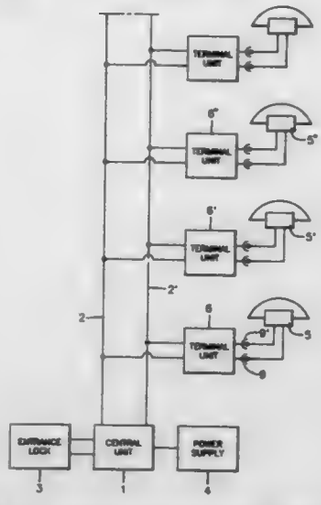
PCT No. PCT/SE91/00911, § 371 Date Jul. 23, 1993, § 102(e) Date Jul. 23, 1993, PCT Pub. No. WO92/13418, PCT Pub. Date Aug. 6, 1992

PCT Filed Dec. 27, 1991, Ser. No. 94,011

Claims priority, application Sweden, Jan. 29, 1991, 9100277

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—103 **12 Claims**



1. A method for signalling/communication within an entrance telephone system or the like, intended to facilitate selective communication from an entrance center or central unit to a desired and addressed substation via a loop including at least two conductors, and to also facilitate entrance lock opening or a similar function from such a substation, wherein the central unit, after an approved addressing operation is performed by a visitor, as a first step performs a feeding of work current to the loop joining the central unit and connected substations, and wherein the central unit in connection therewith transmits an address code unique to the addressed substation; wherein said addressed substation by means of a signal detecting means then establishes a galvanical connection between the loop and said addressed substation, and wherein the central unit performs generation of a ring signal, detection of "off-hook" or another like status or signalling changes, and wherein the central unit on detection of an incomplete reply, or terminated entrance telephone communication/function, interrupts the feeding of work current to the loop.

5,467,387

METHOD FOR INFLUENCING A SIGNALING PROCEDURE WITH THE ASSISTANCE OF COMMUNICATION TERMINAL EQUIPMENT OF A COMMUNICATION SYSTEM

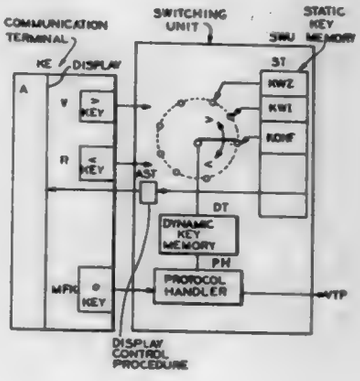
Helmut Kienberger, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 6, 1993, Ser. No. 161,409

Claims priority, application Germany, Dec. 18, 1992, 42 43 074.7

Int. Cl.[6] H04M *1/60*

U.S. Cl. 379—167 **2 Claims**



1. A method for influencing a signaling procedure using communication terminal equipment of a communication system, said communication terminal equipment having a numerical keyboard that controls call setup to other communication terminal equipment, and the communication system having a switching unit in which switching-oriented processes sequence, the method consisting of:

providing only a first navigation key, a second navigation key and an activation key for controlling key functions;

providing code functions of said key functions, said code functions being stored in a static key memory of the switching unit, said key functions corresponding to the subscriber performance features;

displaying the key functions on a display of a respective communication terminal equipment;

selecting and optical marking a respective key function in a forward direction on the display dependent on actuation of a first navigation key located at the respective communication terminal equipment and in a reverse direction on the display dependent on actuation of a second navigation key located at the respective communication terminal equipment;

for a present optically marked key function retrieving the corresponding code function from the static key memory and storing it in a dynamic key memory of the switching unit; and

actuating an activation key located at the respective communication terminal equipment to thereby transfer the corresponding code function stored in the dynamic key memory to a protocol handler, the protocol handler then supplying a logical key message indicative of the respective key function to the switching-oriented processes that are then activated.., said key functions being controlled by only said first navigation key, said second navigation key and said activation key.

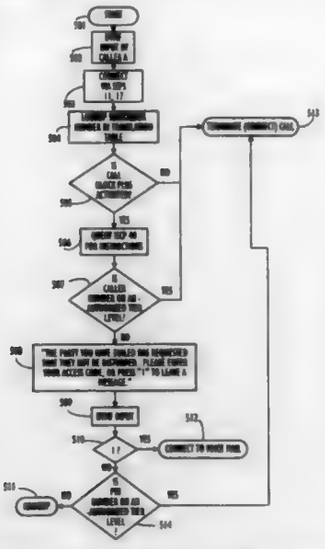
5,467,388
METHOD AND APPARATUS FOR SELECTIVELY BLOCKING INCOMING TELEPHONE CALLS

James C. Redd, Jr., Silver Spring, Md.; Von McConnell, Leawood, Kans., and Liam P. Brohan, Forks Township, Pa., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Continuation of Ser. No. 188,871, Jan. 31, 1994, abandoned. This application Feb. 6, 1995, Ser. No. 384,636

Int. Cl.[6] H04M *1/70*

U.S. Cl. 379—196 **15 Claims**



1. In a communications system comprising local communication lines, an integrated services control point comprising a data base for storing call processing data, a service management system connected to said data base and a data and reporting system for performing processing on said data base, a plurality of interconnected central office switching systems each connecting to a plurality of said local communication lines and responding to a service request on a connected local communication line to selectively provide a communication connection between a requesting line and another local communication line, and a signalling communication system interconnecting the central office switching systems and connecting the central office switching systems to the integrated services control point, a method of providing selective call blocking comprising the steps of:

outputting a Transaction Capabilities Applications Protocol (TCAP) query message from one of said central office switching systems in response to a request for services from a subscriber via one of said communication lines and in accordance with a translation table stored in said one central office switching system corresponding to said subscriber;

supplying at least a first part of said call processing data corresponding to said subscriber from said integrated services control point to said one central office switching system in response to said TCAP query message;

initiating an interface session with said subscriber in accordance with said first part of said call processing data;

supplying for said data base a list of caller numbers authorized to have access to said subscriber, and dividing said list of caller numbers into a plurality of groups during said interface session, each group being on a different authorization tier wherein each authorization tier has different requirements for bypassing a call blocking feature set for incoming calls to said subscriber;

supplying for said data base, during said interface session, time period data for activating a selective call blocking service;

storing said list of caller numbers and said time period data obtained during said interface session in said data base as a second part of said call processing data for said corresponding subscriber;

activating the selective call blocking service in accordance with said time period data stored in said data base, said activating step comprising the steps of:

outputting an activation signal from said integrated services control point to said one central office switching system for said time period stored in said data base, and

updating said translation table corresponding to said subscriber stored in said one central office switching system in response to said activation signal; and

selectively enabling access to said subscriber to callers having caller numbers stored in said data base in accordance with said updated translation table and said list of caller numbers.

5,467,389
PERSONAL COMMUNICATION SYSTEM ANSWERABLE BY PROXY

Takahiro Endo, Kokubunji, and Takashi Saeki, Hino, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

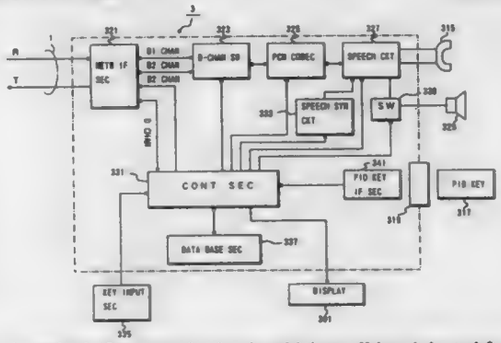
Filed Jul. 9, 1992, Ser. No. 911,297

Claims priority, application Japan, Jul. 10, 1991, 3-170231; Jul. 10, 1991, 3-170233

The portion of the term of this patent subsequent to May 3, 2011, has been disclaimed.

Int. Cl.[6] H04M *3/42;1/56;1/00*

U.S. Cl. 379—201 **8 Claims**



1. A method of communication in which a call is originated from a calling person using first terminal equipment with first identification information already allocated to a called person, the called person answering the call using second terminal equipment with the first identification information, the method comprising the steps of:

transmitting proxy answer information to the first terminal equipment indicating that a proxy person other than the called person intends to answer the call, when the proxy person enters second identification information already allocated to the proxy person to the second terminal equipment; and

notifying the calling person, in response to the proxy answer information, that the proxy person intends to answer the call.

5,467,390
DATA TRANSMISSION VIA A PUBLIC SWITCHED TELEPHONE NETWORK

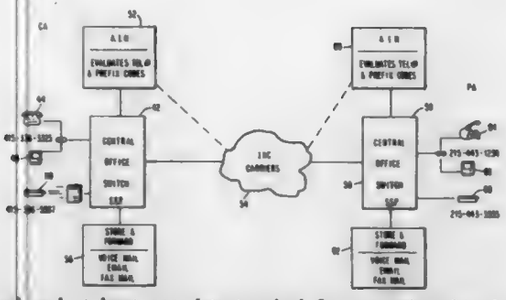
Russell J. Brankley, Willingboro, N.J., and James M. Dorsey, Havertown, Pa., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Continuation of Ser. No. 859,580, Mar. 27, 1992, abandoned. This application Apr. 22, 1994, Ser. No. 232,841

Int. Cl.[6] H04M *3/42*

U.S. Cl. 379—229 **8 Claims**

1. In a Public Switched Telephone Network (PSTN) linking an originating facility for transmitting data of an NPA-NXX-XXXX address with an added data set and a terminating facility through an originating PSTN switch and a terminating PSTN switch wherein said terminating facility includes a telephone station ter-



minal and at least one data terminal for outputting data in a non-audible format, said terminating facility having a distinct NPA-NXX-XXXX address, the improvement comprising:

(a) a customer premise (CPE) switch;

(b) a processor associated with said CPE switch;

(c) said telephone station terminal and at least a non-telephone data terminal being connected to said CPE switch;

(d) means at said terminating PSTN switch for transmitting to said CPE switch ring signals and signaling information;

(e) said terminating PSTN switch being arranged to transmit to said CPE switch the data of said NPA-NXX-XXXX address of said telephone station in addition to said added data set; and

(f) muting means associated with said processor for preventing a first ringing indication from being detected by a called party at said telephone station terminal, while allowing a second ringing indication to be detected at said non-telephone data terminal;

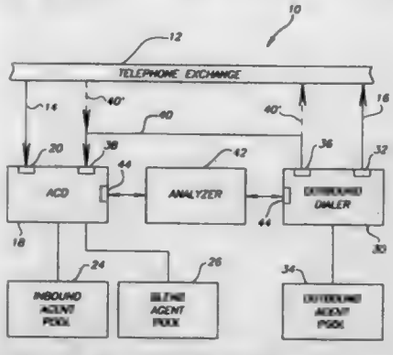
wherein said CPE switch and associated processor are responsive only to said added data set to establish connection to said terminal having an output format corresponding to the characteristic of said added data set.

5,467,391

INTEGRATED INTELLIGENT CALL BLENDING

Norman J. Donaghue, Jr., Renton; Clinton J. Hurd, Poulsbo, and David C. Mullen, Renton, all of Wash., assignors to Digital Systems International, Inc., Redmond, Wash.

Continuation of Ser. No. 964,600, Oct. 21, 1992, abandoned.
This application Jul. 14, 1994, Ser. No. 276,774
Int. Cl.[6] H04M *3/00;5/06*
U.S. Cl. 379—265 **36 Claims**



16. A method for dynamically sharing pools of agents using a stand-alone automatic call distributor with a stand-alone outbound dialer, the automatic call distributor and the outbound dialer both being coupled to a telephone exchange, each agent having a communication device, the method comprising the steps of:

creating a pool of inbound agents having their communication devices coupled to a plurality of trunk lines coupled to the telephone exchange and designated as inbound communication lines to receive inbound telephone calls, a pool of outbound agents having their communication devices coupled to a plurality of trunk lines coupled to the telephone exchange and designated as outbound communication lines to place outbound telephone calls, and a pool of blend agents designated as either inbound or outbound agents, the communication devices of said blend agents alternatively coupled to either said inbound communication lines or said outbound communication lines to selectively service either inbound or outbound telephone calls;

determining a response indicator indicative of a level of service quality;

placing an acquisition telephone call to the communication device of one of said blend agents who is currently servicing inbound telephone calls using the outbound dialer if said response indicator indicates that said level of service quality exceeds a predetermined service quality goal; and

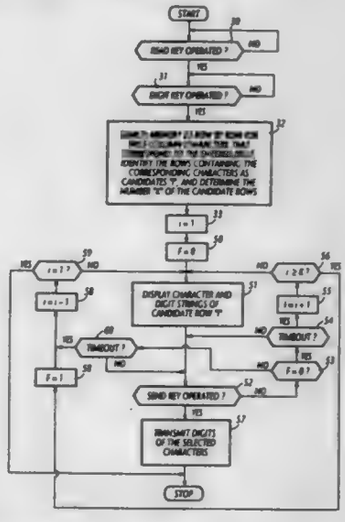
upon connection of said acquisition telephone call to the communication device of said one blend agent, acquiring control of the communication device of said one blend agent by coupling the communication device of said one blend agent to one of said outbound communication lines via the outbound dialer and the automatic call distributor to service said outbound telephone calls.

5,467,392

DIALING APPARATUS FOR DISPLAYING STORED CHARACTER WITH REDUCED KEY OPERATIONS

Noriko Norimatsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 23, 1993, Ser. No. 51,732
Claims priority, application Japan, Apr. 23, 1992, 4-104449
Int. Cl.[6] H04M *1/27*
U.S. Cl. 379—354 **4 Claims**



1. A dialing apparatus comprising:

a keypad having manually operated digit keys for entering a digit, each digit key being labelled uniquely with a set of characters, a first manually operated function key for entering a first command signal, and a second manually operated key for entering a second command signal;

a memory for storing a plurality of character strings and a plurality of corresponding digit strings, each of said digit strings containing a plurality of digits that constitute a subscriber number;

a display unit for displaying one of said character strings; and

control means responsive to the entered digit from said keypad for making a search through said memory for detecting the characters of the set of characters which are labelled on the digit key of the entered digit, detecting character strings containing the detected characters and causing said display unit to display one of the detected character strings, replacing the displayed character string with another of the detected character strings in response to said first command signal, and

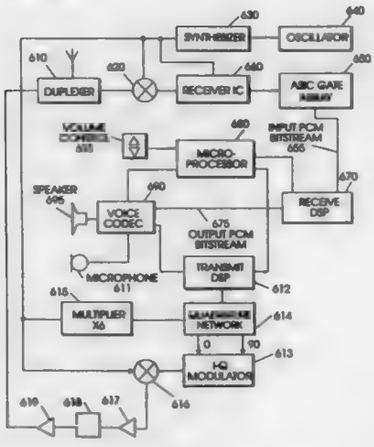
identifying digits stored in said memory corresponding to the character string being displayed on said display unit in response to said second command signal as dialing information to be sent to a switched network.

5,467,393

METHOD AND APPARATUS FOR VOLUME AND INTELLIGIBILITY CONTROL FOR A LOUDSPEAKER

Jim A. J. Rasmusson, Raleigh, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Nov. 24, 1993, Ser. No. 157,964
Int. Cl.[6] H04M 9/08
U.S. Cl. 379—388 30 Claims



1. A speakerphone comprising:

first conversion means for converting audible sounds into an output electrical audio signal;

transmission means operatively associated with said first conversion means for telephonically transmitting said output electrical audio signal;

receiving means for receiving a telephonically transmitted signal;

second conversion means operatively associated with said receiving means for converting said received telephonically transmitted signal into a received electrical audio signal;

a loudspeaker for converting said received electrical audio signals into audible sounds, said loudspeaker having a diaphragm;

volume control means operatively associated with said second conversion means and said loudspeaker for selecting the amplitude of said audible sounds based upon a selected one of a plurality of volume control settings; and

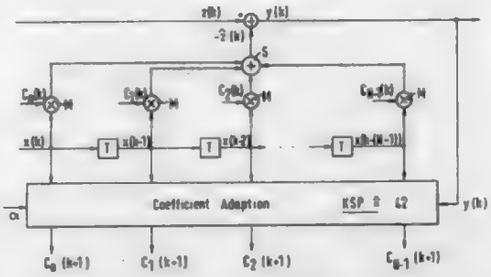
loudspeaker overload reducing means operatively associated with said volume control means, said loudspeaker and said second conversion means, for sensing the selected volume control setting and for selectively decreasing the amplitude of said received electrical audio signal based upon said selected volume control setting so as to prevent said diaphragm of said loudspeaker from being driven beyond an absolute magnitude of dislocation of said diaphragm based upon said selected volume control setting.

5,467,394

METHOD OF IMPROVING SIDETONE ATTENUATION IN ELECTROACOUSTIC SYSTEMS

Michael Walker, Baltmannsweiler, and Peter Heitkämper, Gross-Zimmern, both of, Germany, assignors to Alcatel N.V., Rijswijk, Netherlands

Filed Feb. 16, 1994, Ser. No. 197,054
Claims priority, application Germany, Feb. 20, 1993, 43 05 256.8
Int. Cl.[6] H04M 9/08
U.S. Cl. 379—392 18 Claims



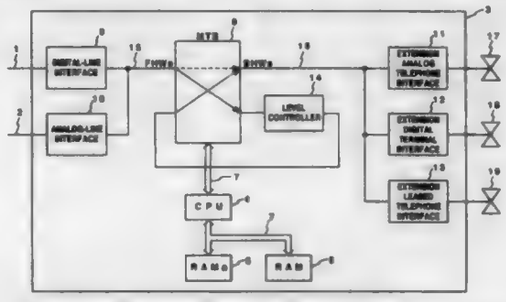
1. A method of improving the transmission properties, in particular the anti-sidetone (induction) of an electro-acoustic installation equipped with adaptive dynamic (range) control, which contains a transmitting branch with at least one microphone and a transmitting amplifier, and a receiving branch with a receiving amplifier and at least one loudspeaker, and a compander with an echo evaluation circuit for the adaptive dynamic control, whose compression and expansion starting points can be changed as a function of transmission, reception, echo and noise signals, whereby these signals are determined and control signals are produced in accordance with their level, and are used to control the compander by changing and displacing the compander curves, particularly to improve the intercom characteristics of a telecommunication terminal, characterized in that, to increase the anti-sidetone, the compander (4) is preceded by an echo compensator (40), with the input side located at the receiving branch (26) and the output side at the transmitting branch (2), controlled by the incoming signal (U12; x(k)) and by the transmitted signal (U1; y(k)), and a voice-controlled balance (51), which is connected between the receiving branch (26) and the transmitting branch (2), is located downstream of the compander and is further controlled by the echo evaluation circuit (52) of the compander (4).

5,467,395

TELEPHONE EXCHANGE APPARATUS

Michihiro Izumi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1992, Ser. No. 872,156
Claims priority, application Japan, Apr. 23, 1991, 3-092292
Int. Cl.[6] H04M 19/00
U.S. Cl. 379—399 21 Claims



1. A telephone exchange apparatus comprising:

receiving means for receiving voice code data from a digital external line;

converting means for digitally converting the voice code data received by said receiving means in accordance with a type of extension terminal to which the converted voice code data is transmitted; and

exchanging means for connecting the digital external line and the extension terminal via said converting means;

said converting means performing the digital conversion so that a signal level of the converted voice code data is attenuated.

5,467,396

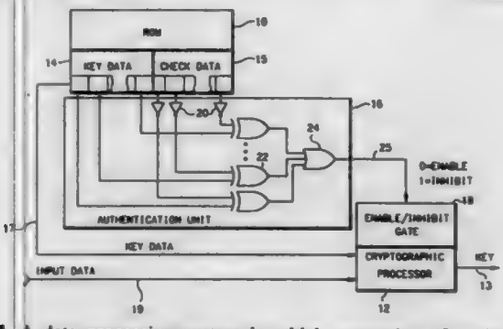
TAMPER-PROOF DATA STORAGE

Stephen R. Schossow, San Diego, and Thomas C. Reiner, Carlsbad, both of Calif., assignors to The Titan Corporation, San Diego, Calif.

Filed Oct. 27, 1993, Ser. No. 144,052

Int. Cl.[6] G06F *12/14*; H04L *9/22*

U.S. Cl. 380—4 **11 Claims**



1. A data processing system in which processing of retrieved altered data is inhibited, comprising

a memory for storing a plurality of data bits and in which the storage of one type of said bits is irreversible;

a data processor coupled to the memory for retrieving said bits from a first section of the memory and for processing the retrieved bits with other data bits;

authentication means coupled to the memory for processing the bits stored in the first section of the memory with bits stored in a second section of the memory to provide an indication as to whether or not the bits stored in the first section of the memory have a predetermined relationship to the bits stored in the second section of the memory; and

a gate coupled to the data processor and to the authentication processing means for inhibiting the data processor from processing the data bits retrieved from the first section of the memory unless the authentication means indicate that the bits stored in the first section of the memory have said predetermined relationship to the bits stored in the second section of the memory.

5,467,397

INTERDICTION METHOD AND APPARATUS WITH VARIABLE DWELL TIME

Lamar E. West, Maysville; David P. Durand, Atlanta; Melvin Paulick, Gainesville, and Guy A. Primiano, Cumming, all of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.

Continuation of Ser. No. 476,041, Feb. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 166,302, Mar. 10, 1988, Pat. No. 4,912,760. This application Dec. 16, 1992, Ser. No. 991,516

The portion of the term of this patent subsequent to Nov. 23, 2010, has been disclaimed.

Int. Cl.[6] H04N *7/167*

U.S. Cl. 380—7 **18 Claims**

1. An interdiction apparatus used in a cable television system having a headend for preventing unauthorized reception of programming transmitted to a subscriber comprising:

jamming means for jamming each of a plurality of unauthorized channels with a controlled jamming signal; and

control means for programmably controlling, during a jamming cycle wherein each of said plurality of unauthorized channels is jammed, said jamming means to selectively jam each of said plurality of unauthorized channels for a variable proportion of said jamming cycle, said variable proportion of said jamming cycle being determined by an addressed communication from said headend to said control means.

5,467,398

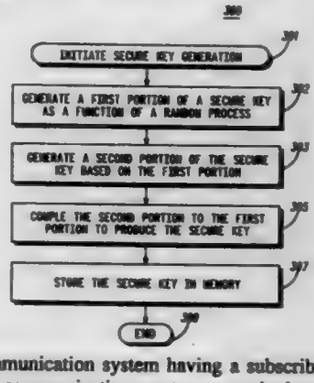
METHOD OF MESSAGING IN A COMMUNICATION SYSTEM

Jennifer A. Pierce, Algonquin; Louis D. Finkelstein, Wheeling; Daniel P. Brown, Elmhurst, and Jay R. Krebs, Crystal Lake, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1994, Ser. No. 270,564

Int. Cl.[6] H04L *9/22;9/32;9/16*

U.S. Cl. 380—44 **25 Claims**



1. In a communication system having a subscriber unit and an infrastructure communication center, a method of producing a secure key comprising the steps of:

a) generating, by the subscriber unit, a first portion of a secure key as a function of a random process;

b) generating a second portion of the secure key based on the first portion; and

c) coupling the second portion to the first portion to produce the secure key.

5,467,399

COHERENT SIGNAL GENERATION IN DIGITAL RADIO RECEIVER

John E. Whitecar, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

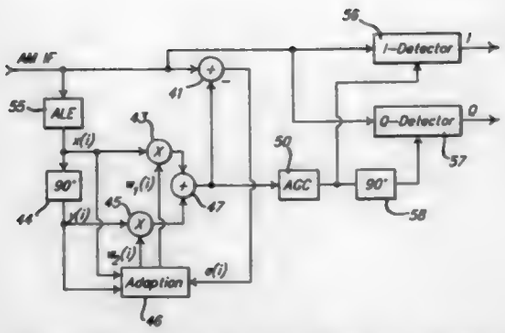
Division of Ser. No. 990,143, Dec. 14, 1992, Pat. No. 5,357,574. This application Aug. 31, 1994, Ser. No. 298,703

The portion of the term of this patent subsequent to Oct. 18, 2011, has been disclaimed.

Int. Cl.[6] H04H *5/00*

U.S. Cl. 381—4 **3 Claims**

1. A radio receiver generating a coherent signal in response to an input frequency in an input signal, comprising:



a summer having first and second inputs and an output for generating a notch-filtered signal according to the difference between signals applied to said first and second inputs, said first input being coupled to receive said input signal and said second input being coupled to receive said coherent signal;

a signal source providing a reference signal having a frequency about equal to said input frequency;

an adaptive filter receiving said reference signal and said notch-filtered signal for generating said coherent signal such that said notch-filtered signal is minimized;

a normalizer receiving said coherent signal and providing automatic gain control to generate a normalized coherent signal; and

mixer means coupled to said summing means and said normalizer for mixing said notch-filtered signal in response to said normalized coherent signal.

5,467,400

SOLID STATE AUDIO AMPLIFIER EMULATING A TUBE AUDIO AMPLIFIER

Bruce Keir, Milton Keynes, United Kingdom, assignor to Marshall Amplification Plc, Milton Keynes, United Kingdom

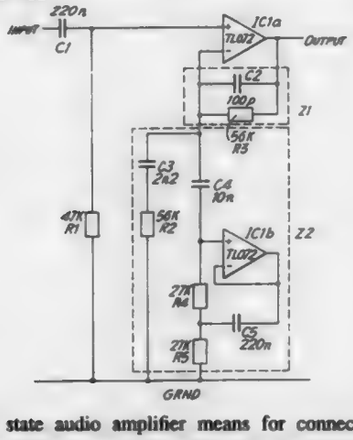
PCT No. PCT/GB92/00075, § 371 Date Jan. 18, 1994, § 102(e) Date Jan. 18, 1994, PCT Pub. No. WO92/13388, PCT Pub. Date Aug. 6, 1992

PCT Filed Jan. 14, 1992, Ser. No. 87,767

Claims priority, application United Kingdom, Jan. 17, 1991, 9101038

Int. Cl.[6] H03G *3/00*

U.S. Cl. 381—61 **6 Claims**



1. Solid state audio amplifier means for connection with a loudspeaker cabinet or emulation thereof to provide amplification characteristics emulating in frequency response those of a valve audio amplifier driving a loudspeaker cabinet, said loudspeaker cabinet comprising a loudspeaker drive and the enclosure thereof, so that when said solid state audio amplifier means is connected to said loudspeaker drive the frequency response of the audio amplifier means exhibits a low frequency resonant peak in gain representing the fundamental resonance of the loudspeaker cabinet comprising said loudspeaker drive and said enclosure and a monotonic increase in gain at higher frequency associated with the impedance provided by voice coil inductance of the loudspeaker cabinet comprising said loudspeaker drive and said enclosure.

5,467,401

SOUND ENVIRONMENT SIMULATOR USING A COMPUTER SIMULATION AND A METHOD OF ANALYZING A SOUND SPACE

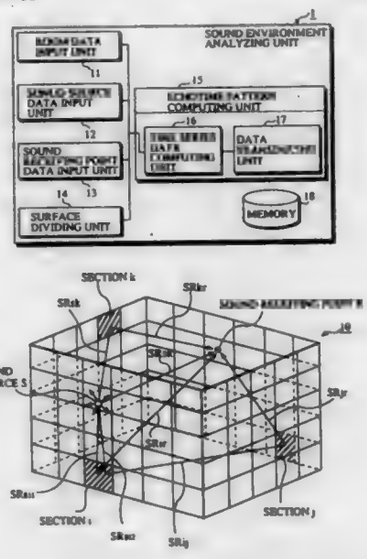
Sachio Nagamitsu, Kyoto; Mayumi Sakai, Hirakata; Hisashi Kodama, Ikoma, and Tsuneko Okada, Moriguchi, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 12, 1993, Ser. No. 135,008

Claims priority, application Japan, Jan. 13, 1992, 4-274248; Jan. 14, 1993, 5-004836; Sep. 6, 1993, 5-221101

Int. Cl.[6] H03G *3/00*

U.S. Cl. 381—63 **19 Claims**



1. A sound environment simulator comprising:

means for determining the position of the listener's head;

echotime pattern computing means for computing an echotime pattern of a space to be analyzed by a geometric method based on the theory of acoustics with input data as to the conditions of said space;

impulse response computing means for computing an impulse response by computing a response for a plurality of predetermined frequency bands from said echotime pattern and compositing all of said responses together;

sound field reproducing means for generating reproduced sound data by convolution of said impulse response on non-reverberant sound source data, taking into consideration the position of the listener's head; and

output means for outputting a sound by transducing said reproduced sound data.

5,467,402

DISTRIBUTED IMAGE RECOGNIZING SYSTEM AND TRAFFIC FLOW INSTRUMENTATION SYSTEM AND CRIME/DISASTER PREVENTING SYSTEM USING SUCH IMAGE RECOGNIZING SYSTEM

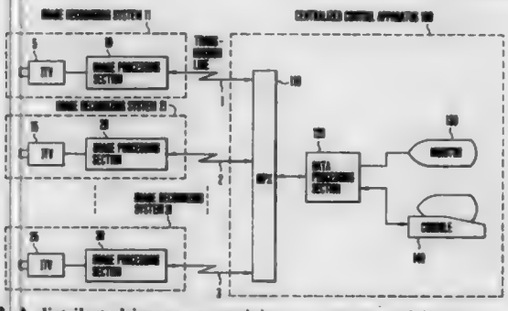
Yoshiyuki Okuyama; Tadaaki Kitamura; Yoshiki Kobayashi; Masakazu Yahiro, and Kazunori Fujiwara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 769,772, Oct. 2, 1991, abandoned, which is a continuation of Ser. No. 408,215, Sep. 18, 1989, abandoned. This application Mar. 14, 1994, Ser. No. 212,378

Claims priority, application Japan, Sep. 20, 1988, 63-233422

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—104 **5 Claims**



3. A distributed image recognizing system comprising:

a plurality of transmission lines;

a plurality of image recognizing units, each including,

image input means for inputting an image,

processing means for processing the input image based on received process data to produce a processed image, and

transmitting means for transmitting at least one of the input image and the processed image to a respective one of said plurality of transmission lines; and

a centralized control apparatus connected to said plurality of image recognizing units through said plurality of transmission lines, respectively, said centralized control apparatus comprising,

storing means for storing at least one of said input image and the processed image transmitted from one of said image recognizing units through the respective transmission line,

an image processor for processing said at least one of said input image and the processed image stored in said storing means according to a predetermined procedure to generate process data to be used by said processing means of said one image recognizing unit when processing the input image,

display means having a display screen for displaying said at least one of said input image and the processed image stored in said storing means on said display screen, and

supplying means for supplying said process data generated by said image processor to said processing means of said one image recognizing unit as said received process data.

5,467,403

PORTABLE FINGERPRINT SCANNING APPARATUS FOR IDENTIFICATION VERIFICATION

Glenn M. Fishbine, Eden Prairie; Robert J. Withoff, Minnetonka, and Theodore D. Klein, Mound, all of Minn., assignors to Digital Biometrics, Inc., Minnetonka, Minn.

Continuation-in-part of Ser. No. 794,476, Nov. 19, 1991, Pat. No. 5,222,152. This application Mar. 31, 1993, Ser. No. 40,878

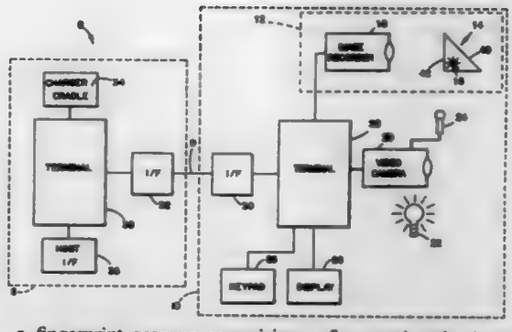
The portion of the term of this patent subsequent to Jun. 22, 2010, has been disclaimed.

Int. Cl.[6] G06K *9/22*

U.S. Cl. 382—116 **4 Claims**

1. A portable apparatus for identification verification, comprising:

a portable image collection unit including:



a fingerprint scanner comprising a finger prism having an opaque bottom surface, a finger receiving surface and two side surfaces; a light for illumination of the finger prism so that a fingerprint image can be propagated therefrom; a camera mounted within the portable apparatus so as to be capable of receiving fingerprint images propagated from the finger prism and a recording component for capturing the received fingerprint images;

image capturing means for obtaining an image of the person being fingerprinted;

display means for viewing an image from a group of images including the fingerprinted person's image and the captured fingerprint image; and

terminal means, connected to the fingerprint scanner, image capturing and display means, for selecting the image to be viewed;

a base unit connected to the terminal means, for receiving the selected image, and operative in digitizing the selected image wherein the portable image collection unit is selectively removable from the base unit.

5,467,404

METHOD AND APPARATUS FOR CONTRAST ENHANCEMENT

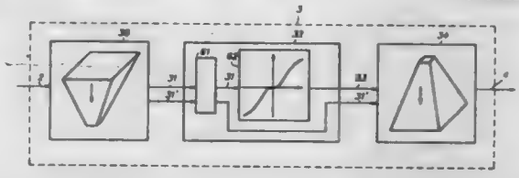
Pieter P. Vuylsteke, Mortsel, and Emile P. Schoeters, Lier, both of, Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed Aug. 3, 1992, Ser. No. 924,095

Claims priority, application European Pat. Off., Aug. 14, 1991, 91202079

Int. Cl.[6] G06K *9/40*

U.S. Cl. 382—274 **6 Claims**



1. An apparatus for generating an enhanced visual image from an electronic representation of an original image, said apparatus comprising:

decomposing means for decomposing said electronic representation into a sequence of detail images at multiple resolution levels and a residual image at a resolution level lower than the minimum of said multiple resolution levels, said decomposing means comprising:

means for computing approximation images at different resolution levels,

adding means and interpolation means for subtracting the approximation image at a current level from the approximation image at a next coarser level after both images are brought into register,

and means for iterating the above computations starting with the original image;

modifying means for modifying the pixel values of said detail images by means of at least one non-linear monotonically

increasing odd conversion function with a slope that gradually decreases with increasing absolute argument values,

computing means for computing a processed image representation by applying a reconstruction algorithm to the residual and the modified detail images, said reconstruction algorithm being such that if it were applied to the residual image and the detail images without modification then the original image or a close approximation thereof would be obtained, said computing means comprising:

adding means and interpolation means for adding the detail image at a resolution level to the approximation level at a coarser resolution level, said images being brought into register,

and means for iterating the above additions and interpolating starting with the residual image and the coarsest detail image; and,

means for forming the enhanced visual image using the processed image representation to control the generation of density values that constitute the enhanced visual image.

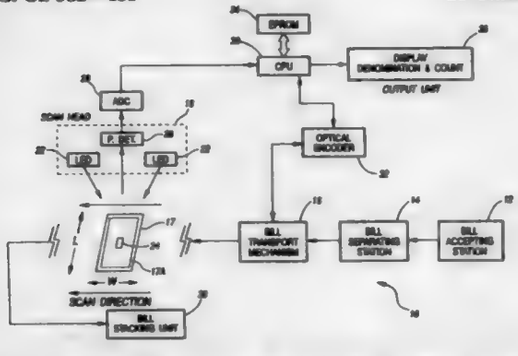
5,467,405
METHOD AND APPARATUS FOR CURRENCY DISCRIMINATION AND COUNTING

Donald E. Raterman, Deerfield; Bradford T. Graves; Lars R. Stromme, both of Arlington Heights, all of Ill., and Aaron M. Bauch, Boxborrow, Mass., assignors to Cummins-Allison Corporation, Mt. Prospect, Ill.

Continuation of Ser. No. 885,648, Jun. 19, 1992, Pat. No. 5,295,196, which is a continuation-in-part of Ser. No. 475,111, Feb. 5, 1990, abandoned. This application Sep. 27, 1993, Ser. No. 127,334

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—135 **28 Claims**



1. An improved method for discriminating between currency bills of different denominations, each currency bill having printed indicia enclosed within a borderline defined thereupon so that the bill surface outside the borderline is substantially blank, comprising the steps of:

illuminating a predetermined section of a test currency bill by focusing at least one strip of light thereupon;

detecting the light reflected off said illuminated section of said test bill to generate an analog reflectance signal;

generating relative lateral displacement between said strip of light and said test currency bill so as to illuminate or optically scan successive sections of said test bill along a predetermined dimension thereof and enclosed within said borderline;

obtaining a first series of analog reflectance signals corresponding to light reflected from successive bill sections using a first relatively narrow strip of light to detect said borderline as said test currency bill moves across said strip by detecting the difference in magnitude of the reflectance signal obtained from said test bill surface outside said borderline and the reflectance signal obtained about said borderline itself;

obtaining a second series of analog reflectance signals corresponding to light reflected from successive bill sections using a second relatively wide strip of light after said borderline has been detected, both of said first and second strips of light being elongated in the direction transverse to the direction of bill movement, and said first strip being narrower than said second strip in the direction of bill movement;

digitizing and processing said second series of analog reflectance signals to yield a set of digital data samples which, in combination, represent a data pattern characteristic of the currency denomination of said test bill;

generating and storing a set of master characteristic patterns corresponding to optical scanning of original bills of each of the different currency denominations to be discriminated; and

comparing the characteristic pattern for said test currency bill to each of said stored master patterns to determine the degree of correlation therebetween, and thereby to identify the denomination of said test currency bill.

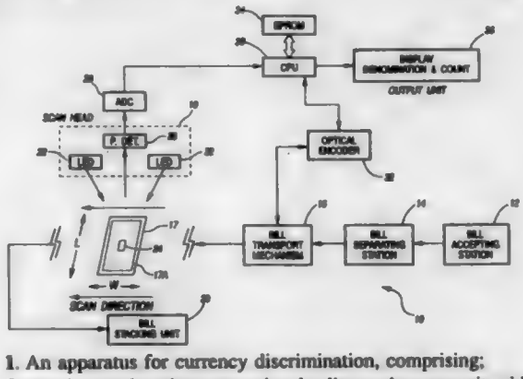
5,467,406
METHOD AND APPARATUS FOR CURRENCY DISCRIMINATION

Bradford T. Graves, Arlington Heights; Richard A. Mazur, Naperville, and Douglas U. Mennie, Barrington, all of Ill., assignors to Cummins-Allison Corp, Mt. Prospect, Ill.

Continuation-in-part of Ser. No. 127,334, Sep. 27, 1993, which is a continuation of Ser. No. 885,648, May 19, 1992, Pat. No. 5,295,196, which is a continuation-in-part of Ser. No. 475,111, Feb. 5, 1990, abandoned. This application Mar. 8, 1994, Ser. No. 207,592

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—135 **20 Claims**



1. An apparatus for currency discrimination, comprising;

first and second stationary scanheads, disposed on opposite sides of a bill transport path, for scanning respective first and second opposing surfaces of each bill of a plurality of bills traveling downstream along said bill transport path and for producing output signals associated with said respective first and second surfaces of each bill, said bills traveling between said scanheads in the direction of a predetermined dimension of said bills at a rate in excess of about 800 bills per minute, each scanned bill having a primary characteristic pattern on one of said first and second surfaces and a secondary characteristic pattern On the other of said first ad second surfaces;

a memory for storing master primary characteristic patterns of a plurality of denominations of genuine bills;

sampling means for sampling said output signals associated with said respective first and second opposing surfaces of each scanned bill; and

signal processing means for

(1) determining which surface of said first and second opposing surfaces of each scanned bill includes said primary characteristic pattern in response to said first and second scanheads scanning portions of said first and second opposing surfaces of each bill, and

(2) in response to determining which surface of said first and second opposing surfaces of each scanned bill includes said primary characteristic pattern to a predetermined degree of certainty, correlating only an output signal associated with said surface of each scanned bill which includes said pri-

mary characteristic pattern with said master primary characteristic patterns to identify the denomination of each scanned bill.

5,467,407

METHOD AND APPARATUS FOR RECOGNIZING CURSIVE WRITING FROM SEQUENTIAL INPUT INFORMATION

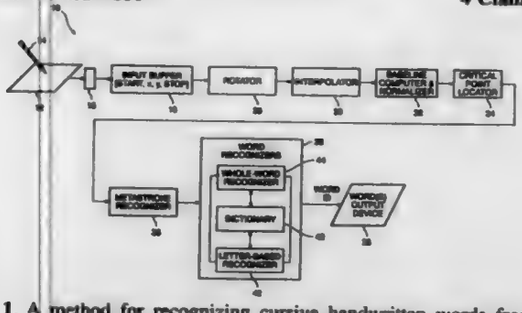
Shelja A. Guberman; Ilia Loosev, and Alexander V. Pashintsev, all of Moscow, Russian Federation, assignors to Paragraph International, Campbell, Calif.

Continuation of Ser. No. 954,351, Sep. 24, 1992, Pat. No. 5,313,527, which is a continuation of Ser. No. 712,180, Jun. 7, 1991, abandoned. This application Mar. 23, 1994, Ser. No. 216,752

The portion of the term of this patent subsequent to May 17, 2011, has been disclaimed.

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—186 **4 Claims**



1. A method for recognizing cursive handwritten words from stroke data, said method comprising the steps of:

accepting digital information representing a sequence of points including a beginning point and an end point;

selecting as a candidate word the sequence of points bounded by said beginning point and said ending point;

replacing said candidate word sequence with a first plurality of metastrokes, said first plurality of metastrokes representing said candidate word sequence;

compiling a list of possible matching word metastrokes using a dictionary of whole word metastrokes and said first plurality of metastrokes;

comparing a first possible matching word metastrokes from said list of possible matching word metastrokes with said first plurality of metastrokes;

computing a first word metric based on said comparison;

outputting a first possible matching word if said first word metric exceeds a predetermined threshold, said first possible matching word representing said first matching word metastrokes.

5,467,408

BALL POINT WRITING QUALITY ANALYSIS

William P. Dowst, Reading, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Apr. 22, 1994, Ser. No. 232,522

Int. Cl.[6] G06K *9/46*

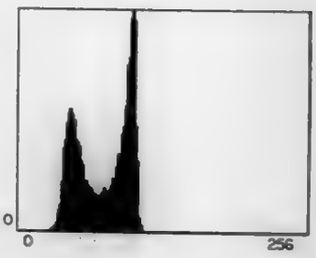
U.S. Cl. 382—112 **5 Claims**

1. A method of measuring ball point pen writing quality including the steps of:

preparing ink writing samples from a plurality of ball point pens having acceptable writing quality;

providing a computer imaging system;

transforming each ink writing sample and background into a histogram formed of a plurality of pixels by employing the computer imaging system to assign each pixel a gray value from zero which is pure black to 256 which is pure white and to sum the pixels of every gray value to produce a histogram



having the values of zero and 256 along the abscissa and the number of pixels of each gray value along the ordinate, each of said histograms comprising a pair of peaks, the ink peak disposed toward the 0 value indicating the maximum pixel value of the ink and the second peak spaced from the ink peak toward the 256 value indicating the maximum pixel value of the background on which the ink sample is formed;

establishing a plurality of ranges of values derived from the histogram obtained from the acceptable writing sample;

preparing an ink writing sample from a ball point pen of unknown writing quality;

employing said computer imaging system to transform said ink writing sample from said ball point pen of unknown writing quality into a histogram formed of a plurality of pixels, each pixel being assigned a gray value from zero which is pure black to 256 which is pure white and to sum the pixels of every gray value to produce a histogram having values of zero and 256 along the abscissa and the number of pixels of each gray value along the ordinate, each of said histograms comprising a pair of peaks, the ink peak disposed toward the 0 value indicating the maximum pixel value of the ink and the second peak spaced from the ink peak toward the 255 value indicating the maximum pixel value of the background on which the ink sample is formed;

determining the slope of the ink peak toward the zero value side of each histogram by forming a line running from a point about halfway up the ink peak to the point of intersection with the abscissa, and calculating that point along the abscissa where the slope line intersects the abscissa;

determining the number of pixels from that point to the zero point of each histogram and

dividing this number by the total number of pixels in each histogram to determine the fraction of image area covered with blobs of ink material in each histogram; and

comparing the values derived from the histogram of the ball point pen of unknown writing quality with the range of values established from the acceptable writing samples to determine the acceptability of the ball point pen of unknown writing quality.

5,467,409

METHOD FOR DETERMINING A SURFACE TO BE HIDDEN AND IMAGE TRANSFORMING APPARATUS

Takao Yamamoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 25, 1993, Ser. No. 22,161

Claims priority, application Japan, Mar. 4, 1992, 4-047243

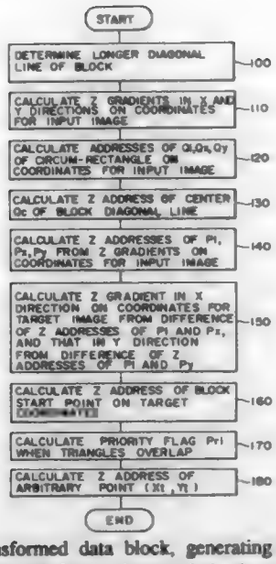
Int. Cl.[6] G06F *15/42;15/62*

U.S. Cl. 382—285 **2 Claims**

1. A method of transforming input image data representing an image to produce output image data representing a transformed image, comprising the steps of:

storing the input image data in a first memory as a plurality of input data blocks each representing a portion of the image;

generating read addresses for reading the input image data from the first memory to produce a plurality of transformed data blocks each representing a corresponding portion of the transformed image and including a plurality of pixels;



for each transformed data block, generating a representative depth value and first and second depth gradient data with respect to orthogonal directions of the transformed image;

generating a respective depth value for each pixel of each transformed data block based on the representative depth value and the first and second depth gradient data of the transformed data block;

comparing depth values of pixels of the transformed data blocks having corresponding positions in the transformed image to produce write enable data for storing the read addresses in a second memory;

storing the read addresses in the second memory based on the write enable data;

reading the read addresses from the second memory; and

reading the input image data from the first memory by means of the read addresses read from the second memory to produce the plurality of transformed data blocks.

5,467,410

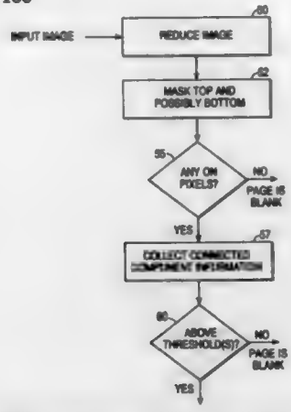
IDENTIFICATION OF A BLANK PAGE IN AN IMAGE PROCESSING SYSTEM

Dan S. Bloomberg, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 20, 1992, Ser. No. 855,375

Int. Cl.[6] G06K *9/40*

U.S. Cl. 382—100 **4 Claims**



1. A method for eliminating streaks from consideration in the analysis of whether an electronic representation of a page generated from a scanning system is blank, wherein the method executes on a computer system, wherein the computer system includes a processor coupled to a memory, wherein the memory includes the electronic representation of the page, the method comprising the steps of:

predetermining a streak width value and storing the streak width value in the computer system;

using the processor to determine the number and connectivity of pixels in the electronic representation and to designate pixels meeting a predetermined connectivity criterion as connected components;

using the processor to eliminate the number of connected components smaller in both dimensions than predetermined dimension values;

if any of the remaining connected components have a width dimension larger than the predetermined streak width value then using the processor to indicate that the page is not blank else if the number of remaining connected components is not larger than a predetermined allowed number then using the processor to indicate that the page is blank.

5,467,411

SYSTEM WITH APPROXIMATION MECHANISM FOR RECOGNIZING GRAPHICAL ELEMENTS IN A DRAWING

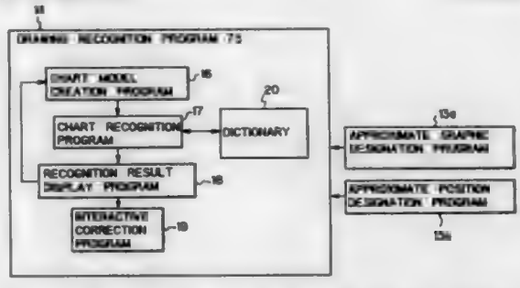
Satoshi Tanaka, and Hideaki Maehara, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1992, Ser. No. 951,745

Claims priority, application Japan, Sep. 26, 1991, 3-247700

Int. Cl.[6] G06K *9/62*

U.S. Cl. 382—113 **30 Claims**



1. A drawing recognition system for recognizing a graphic in a drawing from a digitized image of the drawing, the digitized image including a graphical image having light areas and dark areas that correspond to light areas and dark areas of the graphic in the drawing, the system comprising:

means for receiving a range of the digitized image including the graphical image;

means for calculating a distribution of the range of the digitized image by establishing a line through the range of the digitized image, and measuring a set of lengths of light area perpendicular to a set of points along the line, the distribution being the set of lengths of light area perpendicular to the set of points along the line; and

means for selecting a known distribution from a plurality of known distributions in a database, and calculating a difference between the calculated distribution and the selected known distribution, the graphic being recognized when the difference is below a predetermined threshold.

5,467,412

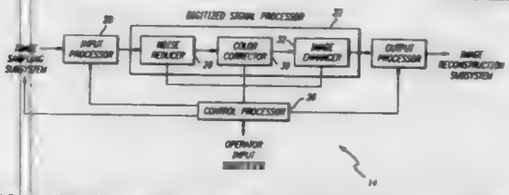
CORRECTING DIGITIZED SIGNALS TO ACHIEVE SPECIFIED OUTPUT RESULTS FOR AN IMAGE

Patrice J. Capitant, Los Altos, and David C. Collier, Gilroy, both of Calif., assignors to Sony Electronics, Inc., Park Ridge, N.J.

Continuation of Ser. No. 846,675, Mar. 5, 1992, abandoned. This application Aug. 2, 1994, Ser. No. 285,642

Int. Cl.[6] **G06T** *5/00*

U.S. Cl. 382—167 **18 Claims**



10. A digital image processing system for converting a source image from a first medium onto a second medium, comprising:

image sampling means for generating source image signals representative of the source image on the first medium;

operator input means for displaying a plurality of reference output images associated with the second medium, and for selecting a desired one of said reference output images;

processor means, being coupled to the operator input means and the image sampling means, for generating optimal values for a set of image processing parameters by performing a Levenberg-Marquardt non-linear optimization on a smoothly differentiable continuous function the value of the smoothly differentiable continuous function being approximately the desired reference output image, and the source image signals and the image processing parameters being variables of the smoothly differentiable continuous function;

image signal correction means, being coupled to the image sampling means and the processor means, for generating a corrected version of the source image signals so as to closely approximate the desired reference output image, using the optimal values for the image processing parameters;

image reconstruction means for using the corrected version of the source image signals to reconstruct the source image on a second medium.

5,467,413

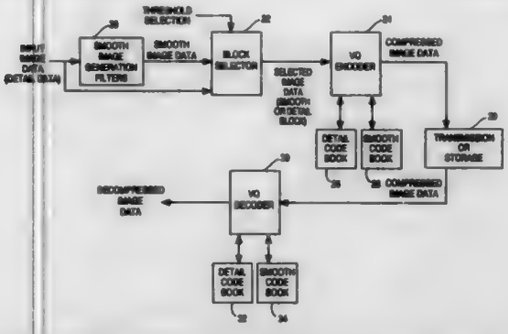
METHOD AND APPARATUS FOR VECTOR QUANTIZATION FOR REAL-TIME PLAYBACK ON LOW COST PERSONAL COMPUTERS

Peter T. Barrett, Palo Alto, Calif., assignor to Radius Inc., Sunnyvale, Calif.

Filed May 20, 1993, Ser. No. 64,843

Int. Cl.[6] **G06K** *9/36*

U.S. Cl. 382—236 **3 Claims**



1. A vector quantization method for compressing image data, wherein the image data comprises frames and each of the frames comprises blocks of pixels, said method including the steps of:

(a) classifying the blocks into at least two types according to level of detail, said types including at least a first type and a second type, wherein the frames of the image data include a keyframe followed by an interframe, each of the blocks of the first type consists of four image vectors, and each of the image vectors comprises a number of YUV values;

(b) performing vector quantization encoding on blocks of the first type using a first dedicated code book, to generate first code words;

(c) performing vector quantization encoding on blocks of the second type using a second dedicated code book, to generate second code words;

generating a smooth frame for the keyframe, wherein the smooth frame is a reduced resolution version of the keyframe, wherein the smooth frame consists of smooth blocks, and wherein each of the smooth blocks comprises an image vector comprising said number of YUV values;

performing step (b) on each of the blocks in which variation among the pixels exceeds a selected threshold, to generate four first code words; and

for each of the blocks in which variation among the pixels does not exceed the selected threshold, performing step (c) on a corresponding one of the smooth blocks to generate one of the second code words.

5,467,414

DEVICE FOR GENERATING FEEDBACK SIGNALS TO REGULATE OPTICAL MONITORING CIRCUITS (PLL)

Wolfram Birkmayer, Mazhuette-Haldorf, Germany; Michael J. Wale, and Colin Edge, both of Northhamptonshire, Great Britain, assignors to Deutsche Aerospace AG, Germany, and GEC-Marconi, Ltd., United Kingdom

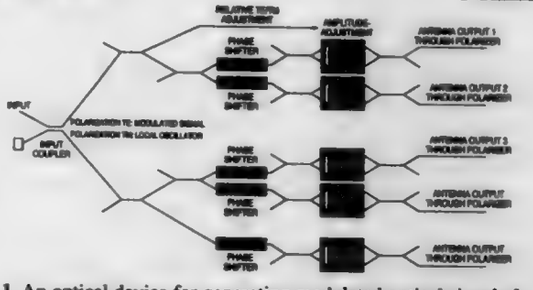
PCT No. PCT/EP93/02505, § 371 Date Aug. 31, 1994, § 102(e) Date Aug. 31, 1994, PCT Pub. No. WO94/07312, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 16, 1993, Ser. No. 244,057

Claims priority, application Germany, Sep. 16, 1992, 42 30 932.8

Int. Cl.[6] **G02B** *6/1; G02F 1/035*

U.S. Cl. 385—3 **8 Claims**



1. An optical device for generating modulated optical signals for coherent optical generation of a modulated, phase controlled RF carrier, said optical device comprising:

an optical waveguide;

a modulator optically coupled to said waveguide, said modulator performing at least one of phase modulation and frequency modulation of optical signals input thereto, along only a first polarization axis;

means for transmitting an optical carrier signal having a first frequency and an optical reference signal having a second frequency together in said optical waveguide, said optical carrier signal being polarized along said first polarization axis and said optical reference signal being polarized along a second polarization axis inclined at an angle relative to said first axis;

means for generating a reference signal with suppressed modulation by polarization analysis of the optical wave ω_1, which carries modulated and unmodulated components on orthogonal polarization axes, and superimposing the unmodulated components with the optical reference signal ω_{LO}; and

means for generating a fully modulated optical carrier signal having a frequency ω_1 by polarization analysis of the optical

wave ω_1 and superimposition of the modulated component with the optical reference signal ω_{LO}.

5,467,415

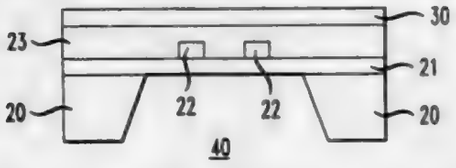
METHOD FOR MAKING POLARIZATION INDEPENDENT SILICA OPTICAL CIRCUITS

Herman M. Presby, Highland Park, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Apr. 22, 1994, Ser. No. 231,529

Int. Cl.[6] G02B *6/12*

U.S. Cl. 385—14 **13 Claims**



1. A method for making an integrated optical device comprising the steps of:

providing a substrate;

forming an optical waveguide structure on a region of the substrate;

forming a reinforcing layer over said waveguide structure; and

removing said region of the substrate underlying said waveguide structure.

5,467,416

LIGHT INPUT REFLECTOR FOR OPTICAL-FIBER SYSTEMS

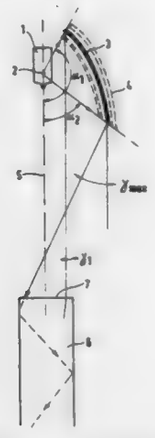
Harold Weingartner, Telfs, Austria, assignor to D. Swarovski & Co., Wattens, Austria

Filed Mar. 8, 1994, Ser. No. 207,194

Claims priority, application Germany, Mar. 10, 1993, 43 07 581.9

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—31 **7 Claims**



1. A light input reflector for optical-fiber systems, wherein at least 50% of the deviated luminous flux of the lamp hits the light entrance surface of the optical-fiber system, and wherein the geometry of the reflector is calculated according to the formula

beta(n+1)=½{alpha(n+1)+-arctan(((tan gamma(n))^2+/-dphi/(pi*h^2*Em))^½))}

wherein

beta(n+1) is the angle of the algorithmically following reflector tangent;

the first reflector tangent is calculated from the geometrical conditions resulting from the selection of gamma(n) and alpha (n)

alpha(n+1) is the angle of the lamp ray following after definition of the first lamp ray;

delta-alpha holds as the criterion for the fineness of resolution of the calculated coordinates;

start value alpha(n) characterizes the desired range as of which the light rays of the lamp are to hit the reflector

gamma (n) is the angle of the desired first reflector ray

dphi is the luminous flux of the lamp in the solid angle range to be calculated (see Catalog of Illuminants)

pi is the circle ratio 3.1415 . . .

h is the distance of the useful plane, and

Em is the desired mean luminous intensity or the result of total luminous flux of the lamp, max. angle of radiation and distance h of the useful plane.

5,467,417

PRISM PLATE FOR EFFICIENTLY EMITTING LIGHT FLUX WITHIN A PREDETERMINED RANGE, AND LIQUID CRYSTAL INDICATOR AND INDICATOR ILLUMINATION METHOD USING THE SAME

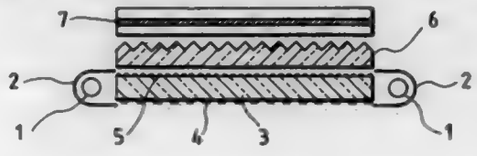
Shigeru Nakamura, Tachikawa; Akira Arimoto, Kodaira; Kenkichi Suzuki, and Katsuhiko Shibata, both of Mobara, all of, Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 8, 1993, Ser. No. 117,789

Claims priority, application Japan, Sep. 16, 1992, 4-246178

Int. Cl.[6] G02B *6/34;* **F21V** *9/04*

U.S. Cl. 385—36 **7 Claims**



1. An information indicator comprising:

a light source,

a light guide plate to transmit light irradiated from the light source,

a scattering plate for scattering the transmitted light being located at a surface of the light guide plate,

a prism plate having a plurality of prism-shaped protuberances formed at a surface thereof and located at a surface of the scattering plate, and

an indicator configured and arranged to be irradiated by the light from the prism plate.

5,467,418

FREQUENCY ROUTING DEVICE HAVING A SPATIALLY FILTERED OPTICAL GRATING FOR PROVIDING AN INCREASED PASSBAND WIDTH

Corrado Dragone, Little Silver, N.J., assignor to AT&T IPM Corp., Coral Gables, Fla.

Filed Sep. 2, 1994, Ser. No. 300,005

Int. Cl.[6] G02B *6/34*

U.S. Cl. 385—37 **10 Claims**

1. An optical apparatus comprising:

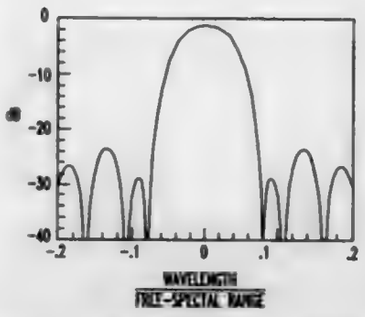
at least one input waveguide;

a first free space region connected to the at least one waveguide;

a first plurality of waveguides connected to the first free space region;

an optical grating connected to the first plurality of waveguides comprising a plurality of unequal length waveguides;

a second plurality of waveguides connected to the optical grating;



a second free space region connected to the second plurality of waveguides; and

at least one output waveguide connected to the second free space region; and

wherein said optical grating has a grating distribution representing a distribution of transmission coefficient contributions among the plurality of waveguides of the optical grating as determined at a wavelength of maximum transmission, said grating distribution having two intervals in which the transmission coefficient contributions have a predetermined phase that is opposite to the phase of the transmission coefficient contributions in a remaining portion of the optical grating distribution.

5,467,419

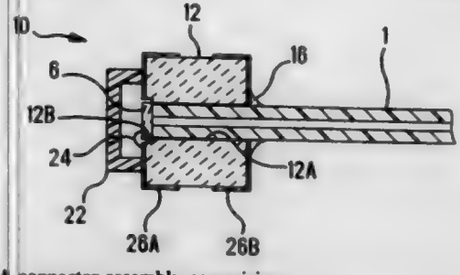
SUBMOUNT AND CONNECTOR ASSEMBLY FOR ACTIVE FIBER NEEDLE

Robert W. Roff, Westfield, and Randall B. Wilson, Maplewood, both of N.J., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 217,516, Mar. 24, 1994. This application Jun. 9, 1994, Ser. No. 257,607

Int. Cl.[6] G02B 6/42

U.S. Cl. 385—92 **39 Claims**



1. A connector assembly comprising:

a substantially cylindrical optical fiber having a first end and a second end, with an optic axis disposed along the center of said optical fiber between said ends;

a metallic surface of a prescribed thickness disposed circumferentially about said optical fiber;

a first face at said first end and a second face at said second end, said ends being substantially orthogonal to said optic axis;

an optoelectronic device directly bonded to said first face, whereby light impingent on or transmitted from said device is propagated through said optical fiber;

a cup-shaped housing having an open end and a closed end with sidewalls therebetween, said cup-shaped housing being disposed over the first end of said optical fiber for hermetically enclosing said optoelectronic device and the first end of the optical fiber, said housing being hermetically sealed to the metallic surface disposed circumferentially about said optical fiber; and

electrical lead means connected to said optoelectronic device and extending through said housing for facilitating connection to an external device.

5,467,420

COAXIAL HIGH FREQUENCY CABLE INCLUDING AN OPTICAL FIBER ELEMENT

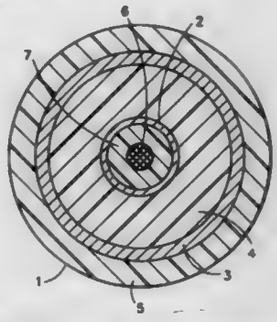
Peter Rohrmann; Alexander Weiss; George Hög, all of Mönchengladbach, and Peter Zamzow, Bochum, all of, Germany, assignors to Kabel Rheydt Aktiengesellschaft, Monchengladbach, Germany

Filed Apr. 8, 1994, Ser. No. 225,146

Claims priority, application Germany, Apr. 10, 1993, 43 11 915.8; Apr. 10, 1993, 43 11 913.1; Apr. 10, 1993, 43 11 912.3

Int. Cl.[6] G02B 6/44

U.S. Cl. 385—101 **13 Claims**



1. A coaxial high frequency cable; comprising:

a tubular metallic inner conductor;

a tubular metallic outer conductor, said tubular metallic inner conductor and said tubular metallic outer conductor being fixed in their spatial position by means of a dielectric, said tubular metallic inner conductor, said tubular metallic outer conductor and said dielectric therebetween constituting an electrical coaxial high frequency cable, said tubular metallic outer conductor including openings placed along a length of said cable for radiating electromagnetic energy; and

at least on optical fiber element disposed within said tubular metallic inner conductor.

5,467,421

NONLINEAR OPTICAL MATERIAL AND DEVICES UTILIZING SAID MATERIAL

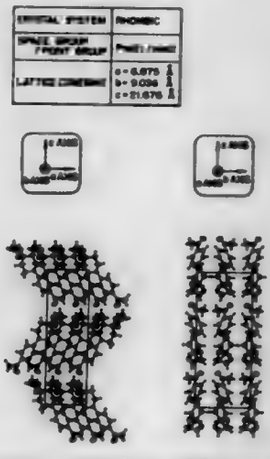
Makoto Kaji, Hitachi; Chie Odoi, Kanazawa; Masaichi Sagawa, Mito; Hiroyuki Kagawa, Hitachi; Atsushi Kakuta, Hitachiota; Kikujiro Ishii, Tokyo; Hideyuki Nakayama, Tokyo, and Keiichiro Ogawa, Tokyo, all of, Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Apr. 20, 1994, Ser. No. 230,374

Claims priority, application Japan, Apr. 21, 1993, 5-094109

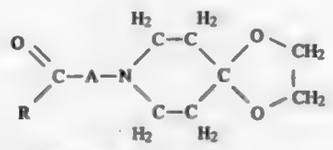
Int. Cl.[6] G02F 1/35

U.S. Cl. 385—122 **31 Claims**



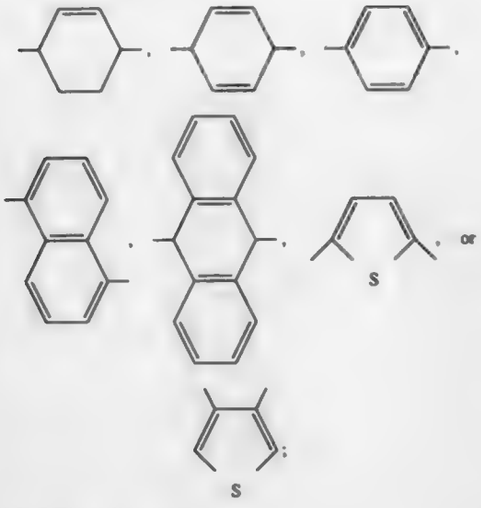
8. A light frequency conversion module comprising (a) a light frequency converter comprising a core and a clad surrounding said

core which is filled with an organic nonlinear optical single crystal belonging to a rhombic system or monoclinic system, having a light absorption wavelength end of 410 nm or less and at least one nonlinear optical coefficient of 30 pm/V or more, and being able to phase match to the light absorption wavelength end, the c axis of said nonlinear optical single crystal being grown in almost the same direction as a core axis, and (b) a ray device for guiding into said light frequency converter a linearly polarized fundamental wave in a direction of the a axis or b axis of said crystal crossing with said c axis at right angles; the organic nonlinear optical single crystal being obtained from a compound of the formula:



(I)

wherein A is —CH=CH—,



and R is CH_3, C_2H_5 or C_3H_7.

5,467,422

IMAGE FORMING APPARATUS WITH NEIGHBORING PIXEL PROCESSING

Yoshiyuki Itihara, Chohu; Satoshi Haneda, Hachioji; Noboru Koizumi, Hino; Takashi Hasebe, and Tetsuya Niitsuma, both of Hachioji, all of, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 28, 1992, Ser. No. 920,852

Claims priority, application Japan, Aug. 13, 1991, 3-202894; Mar. 12, 1992, 4-53714; May 25, 1992, 4-132590

Int. Cl.[6] H04N *1/40;1/405;* **G01D** *15/14*

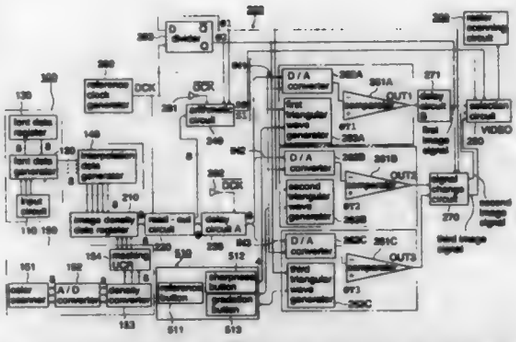
U.S. Cl. 358—298 **9 Claims**

1. An apparatus for forming an electrostatic latent image dot for each pixel on a photoreceptor, wherein each pixel has an imaging unit area and the dot is formed in the imaging unit area, comprising:

beam generation means for generating a light beam to expose the photoreceptor and form a dot;

wave generation means for generating a reference triangular wave signal;

processing means for comparing an image signal of each pixel with the reference triangular wave signal to generate a modulating image signal;



means for modulating the light beam based on the modulating image signal to form a dot-shaped latent image corresponding to the image signal on the photoreceptor;

the processing means for processing image signals of pixels neighboring in a matrix arrangement around a target pixel to obtain a neighboring density distribution around the target pixel, dividing the imaging unit area of the target pixel into plural sub-pixels in the matrix arrangement wherein each sub-pixel is smaller in size than the target pixel, and obtaining a sub-density distribution of the sub-pixels in the target pixel based on the neighboring density distribution;

the processing means controlling the wave generation means so that the position of an apex of the reference triangular wave signal is changed in accordance with the sub-density distribution.

5,467,423

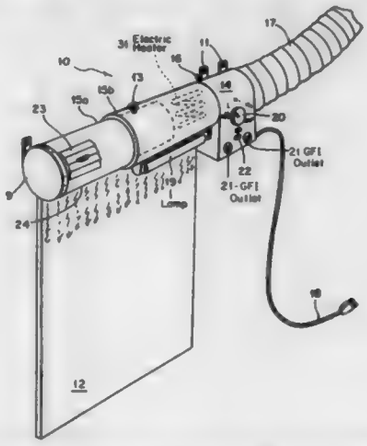
MIRROR DEFOGGER WITH TELESCOPING HOT AIR OUTLET MOUNTED ADJACENT A MIRROR SIDE DIRECTING HEATED AIRFLOW THEREOVER

Henryk P. Jakubowski, 65-10 108th St., Apt. 5H, Forest Hills, N.Y. 11375

Filed Apr. 19, 1994, Ser. No. 229,914

Int. Cl.[6] F24H *3/02;* **H05B** *3/00*

U.S. Cl. 392—379 **7 Claims**



1. An electrically powered bathroom fixture in combination with a mirror having a rectilinear side, the fixture comprising:

(a) an electrical housing mounted adjacent to the mirror;

(b) a telescopic housing having a first end, a spaced opposite second end, and a hot air outlet, said first end being pivotally mounted to said electrical housing, said hot air outlet extending parallel to the rectilinear side of the mirror and being adjustable to approximately the length of the rectilinear side of the mirror;

(c) an end cap mounted adjacent to the mirror for pivotally supporting said second end of said telescopic housing

(d) electrically conductive means connected to said electrical housing for providing power to said electrical housing from an electrical power source;

(e) a receptacle having ground fault protection connected to said electrically conductive means, said receptacle having a feed-through configuration for providing ground fault protection for electrical components wired downstream of said receptacle;

(f) an electrical hot air source disposed within said telescopic housing and being wired downstream of said receptacle; and

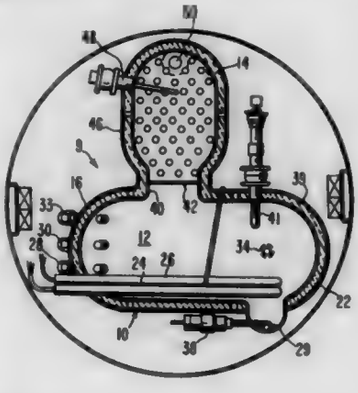
(g) wherein said electrical hot air source forces hot air through said length-adjustable hot air outlet against the mirror, said telescopic housing being rotated between said electrical housing and said end cap to adjust the angle of said hot air outlet and the forced hot air with respect to the rectilinear side to selectively defog the mirror.

5,467,424

APPARATUS AND METHOD FOR GENERATING STEAM

John T. Davies, El Sobrante; Stephen J. Egbert, Palo Alto, and John R. Wagar, Bethel Island, all of Calif., assignors to GaSonics, Inc., San Jose, Calif.

Filed Jul. 11, 1994, Ser. No. 273,570
Int. Cl.[6] F22B *1/28*
U.S. Cl. 392—401 **35 Claims**



1. A steam generator comprising:

means defining a first chamber for receiving water to be heated to steam;

means for directing water into the first chamber;

means in the first chamber for heating the water therein to a temperature sufficient to convert the water into steam;

means defining a second chamber in fluid communication with the first chamber, said second chamber adapted to receive the steam generated in the first chamber;

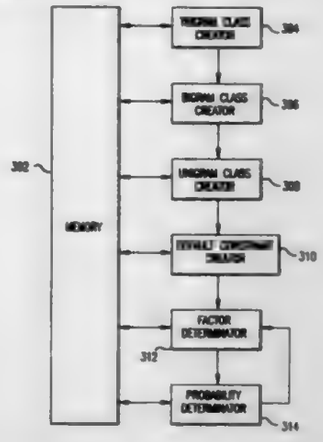
means in the second chamber for defining a plurality of pieces of quartz, there being a fluid outlet coupled with the second chamber for allowing steam to exit therefrom, the steam being in contact with the pieces of quartz in the second chamber as the steam moves from the first chamber to the outlet, said quartz pieces being quartz tubes or beads or quartz tubes and beads, in the second chamber.

5,467,425

BUILDING SCALABLE N-GRAM LANGUAGE MODELS USING MAXIMUM LIKELIHOOD MAXIMUM ENTROPY N-GRAM MODELS

Raymond Lau, Cambridge, Mass.; Ronald Rosenfeld, Pittsburgh, Pa., and Salim Roukos, Scarsdale, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1993, Ser. No. 23,543
Int. Cl.[6] G10L *9/00*
U.S. Cl. 395—2.52 **21 Claims**



1. A computer based language modelling system receiving data in the form of training text divided into a series of n-grams, each n-gram comprising a series of "n" words, each n-gram having an associated count, the history of an n-gram being represented by the initial n-1 words of the n-gram, comprising:

a language modelling means for determining a conditional probability of a predicted word given the previous (n-1) words, comprising:

a memory means for storing the data;

a separating means coupled to said memory means for examining each word within each n-gram and classifying each n-gram into one of one or more classes based upon one or more words in a given n-gram, each class having one or more similar n-grams associated with said class, said similar n-grams having the same predicted word and x previous words, where x varies from (n-1) to zero, to associate each n-gram with exactly one of said one or more classes, each class is identified with one of one or more sets based upon the value of x used when determining the class of the n-gram;

a factor means coupled to the output of said separating means and to said memory means for determining a factor for each of said one or more classes, said factor representing the relative strength of predicting said predicted word given the previous (n-1) words, the value of each factor being approximately equal to the ratio of the sum of the counts of each n-gram associated with a given class over the sum of the counts of all (n-1)-grams which when followed by said predicted word would belong to said given class; and

a conditional probability means coupled to the output of said factor means for determining said conditional probability of the occurrence of said predicted word given that a particular sequence of (n-1) previous words have occurred using said factors, said conditional probability approximately equal to the ratio of a first factor, said first factor associated with the class that a given n-gram is associated with, said given n-gram equal to said predicted word and the history of said predicted word, the history equal to a particular

sequence of (n-1) previous words, over the sum of one or more factors, said one or more factors associated with all of the classes of n-grams obtained by using said particular sequence of (n-1) words followed by any word of the vocabulary.

5,467,426

DIGITAL FUZZY INFERENCE APPARATUS HAVING TIME-DIVISIONAL CONTROL FUNCTION

Azuma Miyazawa, Mitaka; Koji Mizobuchi, and Takashi Suzuki, both of Hachioji, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

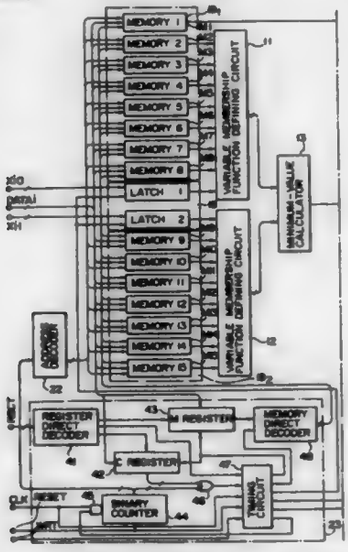
Continuation of Ser. No. 750,707, Aug. 28, 1991, Pat. No. 5,185,849, which is a continuation-in-part of Ser. No. 536,444, Jun. 12, 1990, abandoned. This application Jan. 11, 1993, Ser. No. 2,661

Claims priority, application Japan, Jun. 27, 1989, 1-164513; Mar. 19, 1990, 2-68639

The portion of the term of this patent subsequent to Feb. 9, 2010, has been disclaimed.

Int. Cl.[6] G06F *9/44*

U.S. Cl. 395—3 7 Claims



1. A digital fuzzy inference apparatus comprising:

latch means for latching a plurality of input signals simultaneously and holding said input signals over one inference period;

a set of fuzzy rule operation means for performing operations of fuzzy rules constituted by membership functions;

parameter storage means for storing parameters as a plurality of sets of parameters used for defining the membership functions of said fuzzy rule operation means;

operation control means for causing each of the plurality of parameters stored in said parameter storage means to be supplied sequentially to said fuzzy rule operation means during a period when the input signal is latched in said latch means, and causing said set of fuzzy rule operation means to time-divisionally perform a fuzzy rule operation on the basis of said parameters;

center-of-gravity calculating means for, when necessary fuzzy rule operations are completed on the basis of the plurality of sets of parameters, obtaining a center of gravity of an operation result which is output with respect to each rule of the fuzzy rule operation means; and

repeat control means for causing said latch means to latch a plurality of input signals after said one inference period, and for repeating said fuzzy inference operation.

5,467,427

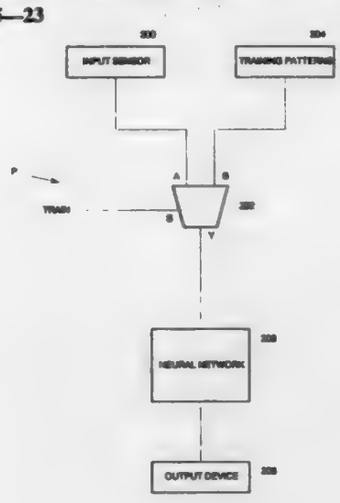
MEMORY CAPACITY NEURAL NETWORK

Suraj C. Kothari, and Heekuck Oh, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa

Continuation of Ser. No. 792,018, Nov. 13, 1991, abandoned. This application Jun. 6, 1994, Ser. No. 254,499

Int. Cl.[6] G06F *15/18*

U.S. Cl. 395—23 18 Claims



10. An artificial neural network comprising:

a computer configured as a bidirectional associative memory neural network having X and Y layers of neurons, said network receiving an input vector, utilizing a weight matrix and producing an output vector; and

means coupled to said computer for inputting a series of X and Y training pattern pairs to said computer, said training patterns organized as a series of X and Y element vectors,

wherein said computer includes:

means coupled to said training pattern pair means for developing a Y output vector of said network using each X element of each training pattern as an input vector to said Y neurons of said network;

means coupled to said training pattern pair means for developing an X output vector of said network using each Y element of each training pattern as an input vector to said X neurons of said network;

means coupled to said X output vector developing means for determining if said X output vector has changed from said input vector to said Y neurons;

means coupled to said X output vector changed means, said Y output vector developing means, said X output vector developing means and said training pattern pair means for determining a change in the weight matrix based on successive over-relaxation utilizing said Y output vector of said network and said X element of said input vector training pattern and determining a change in said weight matrix based on successive over-relaxation and utilizing said X output vector of said network and said Y element of said input vector training pattern if said X output vector has changed,

wherein said X and Y output vector developing means, said X output vector changed means and said weight matrix change determining means operate repeatedly until no changes are determined in said X output vector for all of said training patterns.

5,467,428

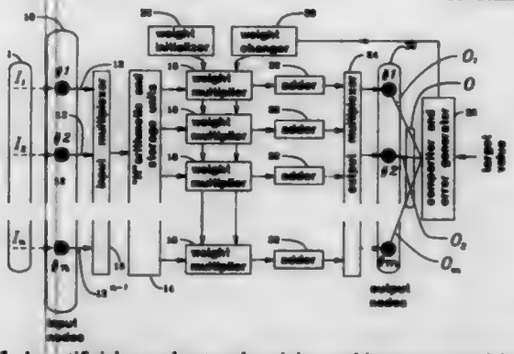
ARTIFICIAL NEURAL NETWORK METHOD AND ARCHITECTURE ADAPTIVE SIGNAL FILTERING

Mehmet E. Ulug, 1537 E. Hillsboro Blvd. #342, Deerfield Beach, Fla. 33441

Continuation of Ser. No. 793,850, Nov. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 710,461, Jun. 6, 1991, abandoned. This application Aug. 15, 1994, Ser. No. 290,672

Int. Cl.[6] G06F 15/18

U.S. Cl. 395—23 11 Claims



1. An artificial neural network training architecture comprising:

source means for supplying at least one input data signal representing an input vector;

a plurality of input terminals connected to said source means;

an input multiplexer connected to each of said input terminals;

N arithmetic and storage units, representing N sibling nodes, connected to said input multiplexer;

N weight multiplier units connected to said N arithmetic and storage units;

wherein each arithmetic and storage unit generates a Fourier series using an input data signal received from said input terminal through said input multiplexer as a variable of the Fourier series, said Fourier series having as arguments of the sine and cosine terms said input data signal and not a probability distribution function of said input data signal, and supplies an output data signal from said arithmetic and storage unit to said weight multiplier units;

an adder unit connected to every one of said arithmetic and storage units through a plurality of said weight multiplier units;

a weight initializer connected to each of said weight multiplier units;

a weight changer connected to each of said weight multiplier units;

wherein output signals, representing synaptic link weight values from said weight changer and said weight initializer are stored in said adder unit;

an output multiplexer connected to said adder unit;

at least one output node connected to each of said N weight multipliers through said adder unit and through said output multiplexer for generating at least one activation at said output node;

means for connecting each said output node to a mid input terminal when said artificial neural network training architecture is performing as a lowpass, highpass, and bandpass filter;

means for applying to said output node, as a target value, a noise corrupted signal associated with a noise signal at each said mid input terminal when said artificial neural network training architecture is performing as an in-band filter;

a comparitor and error generator unit connected to said output node, and to said weight changer for generating an error measure signal when said activation is different from said signal at said output node;

means for indicating the completion of training when said error measure becomes equal to a preset value; and

means for storing the synaptic link weight values of said weight multiplier units in a records file when training of said artificial neural network training architecture is completed.

5,467,429

NEURAL NETWORK CIRCUIT

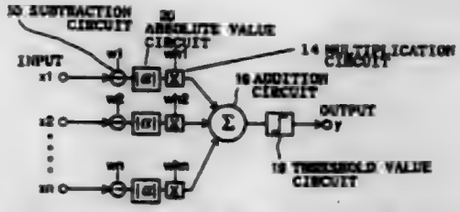
Kuniharu Uchimura; Osamu Saito, both of Kanagawa; Yoshihito Amemiya, and Atsushi Iwata, both of Tokyo, all of, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Division of Ser. No. 909,993, Jul. 7, 1992, Pat. No. 5,353,383, which is a division of Ser. No. 727,065, Jul. 8, 1991, Pat. No. 5,166,539. This application Jun. 28, 1994, Ser. No. 266,691

Claims priority, application Japan, Jul. 9, 1990, 2-179665; Jul. 9, 1990, 2-179666; Jul. 13, 1990, 2-186528; Sep. 3, 1990, 2-232914; Sep. 3, 1990, 2-232915; Sep. 7, 1990, 2-235700; Jan. 22, 1990, 2-281891; Mar. 25, 1991, 3-060384; Apr. 24, 1991, 3-094220

Int. Cl.[6] G06F 15/18

U.S. Cl. 395—24 10 Claims



6. A neural network circuit including a plurality of neuron circuits, comprising:

a plurality n of input terminals for receiving input signals, where n is an integer greater than 1;

two weight coefficients corresponding to each of said input terminals;

a subtraction circuit calculating a difference between one of the weight coefficients and an input signal;

an absolute value calculation circuit for executing absolute value calculation of a subtraction result of said subtraction circuit;

a multiplication circuit for multiplying an output signal of said absolute value calculation circuit by another of said weight coefficients;

an addition circuit accumulating all results of calculations performed on said plurality n of input signals and 2n weight coefficients obtained from said multiplication circuit;

a threshold value circuit having a predetermined threshold value for determining a magnitude of a result of said accumulation in accordance with said predetermined threshold value, and outputting said accumulation result wherein, said neuron circuits are unit circuits and use the output results of said threshold value circuit as output signals; and

means for connecting input and output terminals of said neuron circuits, said neuron circuits having independent said weight coefficients with respect to a plurality of said input signals inputted into said network circuit executing calculations, an output value of at least one of said neuron circuits being an output signal of said network circuit, and said two weight coefficients and a size of said threshold value of said threshold value circuit controlling said network circuit.

5,467,430

ROBOT CONTROLLING METHOD AND APPARATUS

Atsushi Itoh, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 783,972, Oct. 29, 1991, Pat. No. 5,327,523. This application Mar. 9, 1994, Ser. No. 207,599

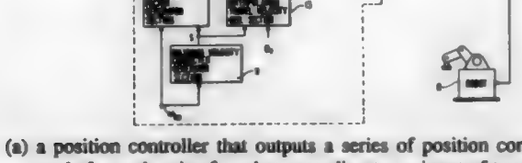
Claims priority, application Japan, Jan. 29, 1990, 2-291099; Sep. 30, 1991, 3-252119

The portion of the term of this patent subsequent to Jul. 5, 2011, has been disclaimed.

Int. Cl.[6] G05B 19/407

U.S. Cl. 395—95 8 Claims

1. A robot controlling apparatus comprising:



(a) a position controller that outputs a series of position commands for each axis of a robot according to an input of target position information for each said axis, said position controller comprising:

a source that outputs a maximum velocity character indicative of a baseline velocity value and a source that outputs a travel velocity character profile composed exclusively of scalar parameters;

a load factor generating section coupled to said maximum velocity character output source, said load factor generating section generating a respective load factor for each said axis on the basis of an axis angular velocity for each said axis and the maximum velocity character;

a velocity command generator coupled to said load factor generating section and said travel velocity character profile output source and responsive to at least the respective load factor and the travel velocity character profile, said velocity command generator generating, for each said axis, a velocity command; and

a position command generator coupled to said velocity command generator and responsive to the velocity command, said position command generator generating the series of position commands for each said axis; and

(b) a controller section coupled between said position controller and said robot, said controller section controlling each said axis of said robot in accordance with the series of position commands.

5,467,431

METHOD AND APPARATUS FOR CONTROLLING HIGH SPEED PRINTING

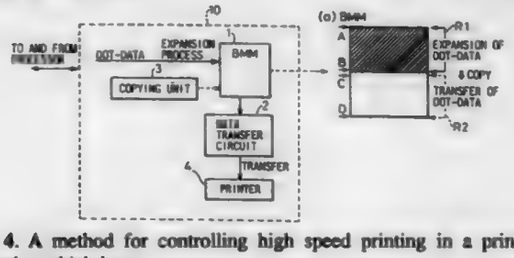
Hajime Ishiguro; Kazutoshi Morioka, both of Kawasaki; Tooru Sakai, and Yasushi Takemura, both of Kahoku, all of, Japan, assignors to Fujitsu Limited, Kanagawa, and PFU Limited, Ishikawa, both of, Japan

Filed Jul. 20, 1994, Ser. No. 277,566

Claims priority, application Japan, Jul. 20, 1993, 5-178657

Int. Cl.[6] G06F *3/12*

U.S. Cl. 395—102 **14 Claims**



4. A method for controlling high speed printing in a printer device which has:

a bit-map memory which generates dot-data which can be output as necessary video data, on the basis of printing data which is to be printed;

a data transfer circuit which allows video data to be transferred from at least two positions on said bit-map memory to a printer constituting a mechanical part of said printer device; and

a copying unit which allows said dot-data existing within a given rectangular region on said bit-map memory to be copied into any other rectangular region on said bit-map memory,

wherein, in accordance with the size of a printing paper which is used for printing said video data and the whole area which can be used for expanding the printing data of the current page in said bit-map memory as corresponding dot-data, at least one procedure is adapted to be selected among the following three types of procedures (A), (B) and (C):

(A) a first procedure comprising a step of copying said dot-data which is expanded in a first area on said bit-map memory into a second area that does not overlap with said first area, and a step of sending the thus copied dot-data to said printer as said video data, and simultaneously, expanding the printing data of the next page in said first area, a process for transferring said video data to said printer and a process for expanding the printing data of the next page in said first area being carried out substantially in parallel;

(B) a second procedure comprising a step of copying said dot-data which is expanded in a first area on said bit-map memory into a second area that overlaps with said first area in at least one part thereof, a step of sending the thus copied dot-data in the part of said second area which overlaps with said first area to said printer as said video data, and a step of sending the thus copied dot-data in the part of said second area which does not overlap with said first area to said printer as said video data, and expanding the printing data of the next page in said first area, a process for transferring said video data in the part of said second area which does not overlap with said first area to said printer and a process for expanding the printing data of the next page in said first area being carried out partially in parallel; and

(C) a third procedure comprising a step of executing an analysis for data expansion of the next page during the time period between the time when said process for transferring said video data to said printer is started and the time when said process for expanding the printing data of the next page in said first area is allowed to be executed, and a step of inhaling a paper of the next page in advance of said process for expanding the printing data of the next page, in the case where it is detected that a new page should be used within said time period as a result of said analysis, a process for inhaling a paper of the next page and said process for transferring said video data to said printer being carried out in parallel.

5,467,432

PRINTER CONTROLLER CAPABLE OF OPERATING WITH DIFFERENT OPERATION MODES BASED ON MODE-DETERMINATIVE CODES STORED IN POINT-TABLE MEMORY

Yuichi Ota, Anjo, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

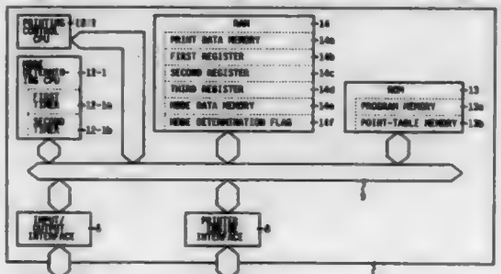
Filed Mar. 10, 1993, Ser. No. 29,381

Claims priority, application Japan, Mar. 13, 1992, 4-055411

Int. Cl.[6] G06K *15/02*; G06F *3/12*

U.S. Cl. 395—112 **16 Claims**

1. A printer controller having a function of emulating a plurality



of types of printers which operate in different operation modes, said printer controller being operable according to one of a plurality of batches of print data in a selected one of said operation modes of said plurality of printers, said printer controller comprising:

print data memory means for storing a received batch of print data, said received batch of print data including character codes and mode-determinative codes;

point-table memory means for storing point tables corresponding to said different operation modes, each of said point tables listing predetermined points given to said mode-determinative codes, respectively, said predetermined points being indicative of degrees of probability that each of said different operation modes which corresponds to said each point table is said selected operation modes;

mode determining means for scanning said point tables, summing the points of said mode-determinative codes included in said received batch of print data, to obtain a sum of said points for each of said different operation modes, and determining one of said operation modes as said selected operation mode on the basis of said sums obtained for said different operation modes; and

commanding means for activating said mode determining means when a predetermined time has lapsed after commencement of an operation to store said received batch of print data in said print data memory means.

5,467,433

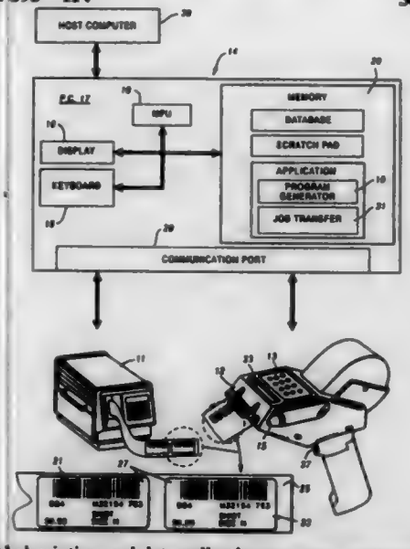
LABEL PRINTING AND DATA COLLECTION PROGRAM GENERATOR

Dale E. Lamprecht, Jr.; Donald A. Morrison; Richard E. Schwabe, all of Dayton; Raymond D. Tavener, Kettering, and Rex D. Watkins, Franklin, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Apr. 15, 1992, Ser. No. 869,253

Int. Cl.[6] G09F *3/08*

U.S. Cl. 395—114 **38 Claims**



1. A label printing and data collection program generator for use in a processing system having a display, an input device actuable by a user to enter information, a memory for storing information and a processor coupled to the input device, display and memory, the processor operating in accordance with the program generator to generate a software program for a labeler, said label printing and data collection program generator comprising:

means when executed by said processor for storing a user entered sequence of commands selected from a set of allowable commands that control label printing, data collection and data manipulation operations of said labeler and commands that provide directives to said processor;

means when executed by said processor for validating a sequence of commands entered by said user, said validating means controlling said processor to compare each label printing, data collection or data manipulation command in said sequence to data representing said set of allowable commands to determine if said command is valid; and

means when executed by said processor for translating said sequence of label printing and data collection commands to form an application program capable of being executed by said labeler to control at least one of a label printing operation, a data collection operation or a data manipulation operation.

5,467,434

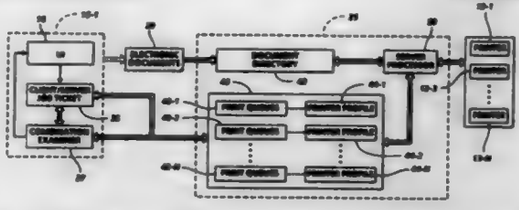
APPARATUS AND METHOD FOR DETERMINING PRINTER OPTION AVAILABILITY AND REPRESENTING CONFLICT RESOLUTION IN A COMBINATION OF PRINT JOB SELECTIONS

John D. Hower, Jr., Fairport, and Michael L. Campanella, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 28, 1992, Ser. No. 936,477

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—114 **18 Claims**



1. A printing system having a printer bank with a plurality of printers, the printers being respectively associated with printer profiles, each of the printer profiles having a set of printer properties available at the printer with which the printer profile is associated, comprising:

an input section, being remote from the printer bank, including:

means for programming a combination of print job selections, and

a memory section for storing a selected one of the printer profiles; and

means for comparing the programmed combination of print job selections from said programming means with a subset of the set of printer properties available in the selected one of the printer profiles from said memory section, wherein the set of printer properties available in the selected one of the printer profiles comprises a hierarchical list of the print job selections, the combination of print job selections being transmitted to one of the plurality of printers associated with the selected one of the printer profiles when the combination of print job selections corresponds with the subset of the set of printer properties available at the one of the plurality of printers associated with the selected one of the printer profiles.

5,467,435

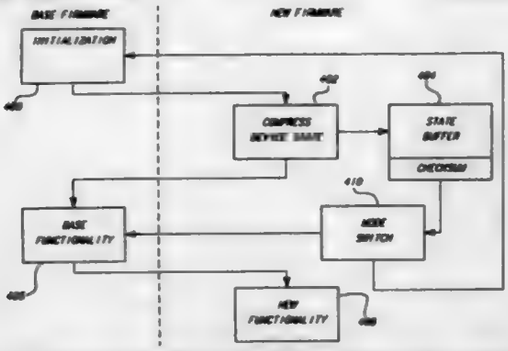
SYSTEM AND METHOD FOR MODE SWITCHING

George H. Douglas, Theodore, Ala.; William B. McCormick, Bellevue, and Stephen V. Dennis, Bothell, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation-in-part of Ser. No. 911,767, Jul. 10, 1992, and a continuation-in-part of Ser. No. 912,098, Jul. 10, 1992, Pat. No. 5,337,258. This application Nov. 16, 1992, Ser. No. 976,204

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—114 39 Claims



1. A system for switching a printer having internal data registers and a printer memory between a first data processing mode of operation and a second data processing mode of operation, the system comprising:

initializing means for initializing the printer to an initial state allowing the printer to operate in the first data processing mode, the printer data registers and memory having initial values when in said initial state;

saver means for saving said initial values after said initialization, said saver means compressing said initial values to create a set of compressed initial values;

a state buffer receiving said set of compressed initial values and storing said set of compressed initial values, said state buffer including a checksum; and

enabling means for selectively enabling either the first or second data processing mode, said enabling means setting the printer data registers and memory to operate in the second data processing mode if the printer is switching from the first data processing mode to the second data processing mode and using said stored set of compressed initial values to restore said initial state if the printer is switching from the second data processing mode to the first data processing mode and, when switching from the second data processing mode to the first data processing mode, said enabling means using said checksum to detect changes in the contents of said state buffer and, if said enabling means detects changes in the contents of said state buffer, said enabling means returning control to said initializing means to initialize the printer.

5,467,436

CONTROL SYSTEM FOR PRINTING PRESSES

Anton Rodi, Leimen, and Jürgen Reithofer, Nussloch, both of, Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

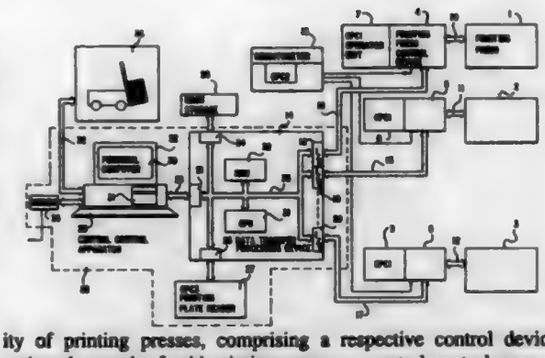
Continuation of Ser. No. 899,097, Jun. 15, 1992, abandoned, which is a continuation of Ser. No. 734,057, Jul. 22, 1991, abandoned, which is a continuation of Ser. No. 516,244, Apr. 30, 1990, abandoned. This application Mar. 17, 1993, Ser. No. 33,427

Claims priority, application Germany, Apr. 29, 1989, 39 14 238.8

The portion of the term of this patent subsequent to Feb. 26, 2008, has been disclaimed.

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—114 19 Claims



1. Apparatus for implementing a system of controlling a plurality of printing presses, comprising a respective control device assigned to each of said printing presses, a central control apparatus connected to said control device of each of said printing presses, said central control apparatus including a printing plate reader for reading ink distribution data from a printing plate, a computer in said central control apparatus, a data-transfer and processing device in said central control apparatus connected to said computer for transmitting data to said control device assigned to each of said printing presses, said data including ink distribution data from the printing plate reader for controlling a given one of said printing presses for printing a given printing job independently of said computer, a microprocessor in said data transfer and processing device for controlling flow of information between said computer and said control device and a data transmission network interconnecting said control device, said central control apparatus, said printing plate reader, said computer, and said data-transfer and processing device.

5,467,437

RECORDING APPARATUS

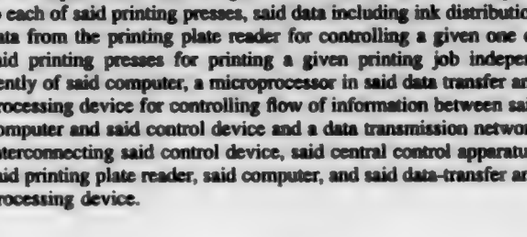
Takeshi Fuse, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1993, Ser. No. 128,133

Claims priority, application Japan, Jan. 6, 1992, 4-293702

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—115 9 Claims



1. A recording apparatus having a head mounted on a carriage moving relatively to a recording medium, said head printing one column substantially perpendicular to the direction in which said carriage moves so as to print a single line, said recording apparatus comprising:

a storage device for storing print data in units of bits and for allowing any of said print data to be accessed in units of bits by an X address and a Y address;

an X address counter for designating said X address in said storage device;

a Y address counter for designating said Y address in said storage device;

a mode setting register for storing write mode data;

a memory read/write timing controller for generating a plurality of timing signals for writing and reading to and from said storage device;

a bus timing controller for outputting print data in units of bits in accordance with the content of said mode setting register upon receipt of print data in units of words; and

a selector for supplying any one of said X address counter and said Y address counter with said timing signals in accordance

with the content of said mode setting register, said selector further sending a carry signal from the address counter having received said timing signals to the address counter not receiving said timing signals.

5,467,438

METHOD AND APPARATUS FOR COMPENSATING FOR COLOR IN COLOR IMAGES

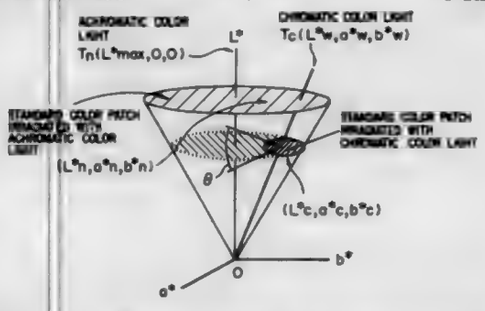
Kazutaka Nishio, Moriguchi; Kenji Nishimura, Sakai; Toshiya Naka, Osaka, and Yoshimori Nakase, Kawachinagano, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 597,360, Oct. 10, 1990, abandoned. This application May 24, 1993, Ser. No. 65,427

Claims priority, application Japan, Jan. 13, 1989, 1-266489; Jan. 30, 1990, 2-19503

Int. Cl.[6] G06T 15/50

U.S. Cl. 395—131 6 Claims



6. A color compensation device for three-dimensional color image generation, said device comprising a color space mapping unit, said color space mapping unit comprising:

(a) means for irradiating a standard white patch with an achromatic reference light;

(b) means for determining a first chromaticity coordinate value for said standard white patch indicative of a chromaticity of said standard white patch while being irradiated with said achromatic reference light;

(c) means for irradiating a standard color patch with said achromatic reference light;

(d) means for determining a first chromaticity coordinate value for said standard color patch indicative of a chromaticity of said standard color patch while being irradiated with said achromatic reference light;

(e) means for irradiating said standard white patch with a chromatic reference light;

(f) means for determining a second chromaticity coordinate value for said standard white patch indicative of a chromaticity of said standard white patch while being irradiated with said chromatic reference light;

(g) means for irradiating said standard color patch with said chromatic reference light;

(h) means for determining a second chromaticity coordinate value for said standard color patch indicative of a chromaticity of said standard color patch while being irradiated with said chromatic reference light;

(i) means for obtaining mapping data, in a uniform color space, representative of a transformation from (1) said first chromaticity coordinate values of said standard white patch and said standard color patch to (2) said second chromaticity coordinate values of said standard white patch and said standard color patch;

(j) means for irradiating said object surface with said achromatic reference light;

(k) means for determining a first chromaticity coordinate value for said object surface indicative of a chromaticity of said object surface while being irradiated with said achromatic reference light; and

(l) means for determining a second chromaticity coordinate value for said object surface indicative of a chromaticity of said object surface which would result when said object surface is irradiated with said chromatic reference light in accordance with (1) said mapping data and (2) said first chromaticity coordinate value for said object surface.

5,467,439

INTERPOLATION METHOD OF DIGITAL IMAGE DATA AND A CIRCUIT THEREFOR

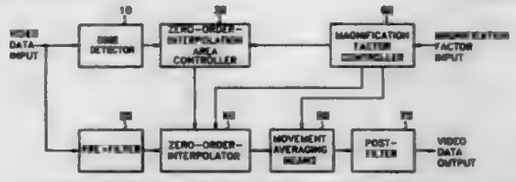
Seong-won Lee, and Joon-ki Paik, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jan. 14, 1994, Ser. No. 181,384

Claims priority, application Rep. of Korea, Jan. 14, 1993, 93-419

Int. Cl.[6] G06F 15/62

U.S. Cl. 395—133 8 Claims



1. A method of zero-order interpolating digital image data, said method comprising the steps of:

(a) calculating the respective absolute values of the difference between two neighboring pixels of image data representing an image, among four neighboring pixels of said image data, and then determining the maximum value and second-most maximum value of said absolute values; and

(b) interpolating the image data, responsive to the maximum and the second-most maximum values determined in said step (a), according to edge-forms defined by the four neighboring pixels of the image data.

5,467,440

ORGANIZATION CHART IMAGE PRINT METHOD

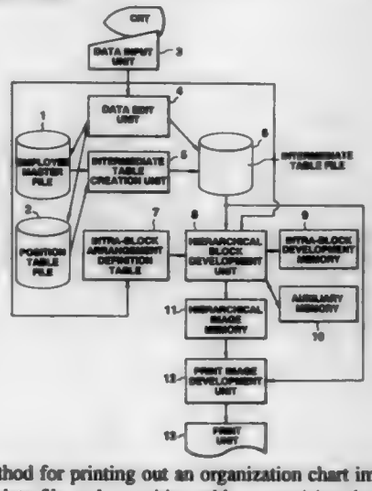
Tomoyuki Nihei, Iruma, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1994, Ser. No. 272,421

Claims priority, application Japan, Jul. 12, 1993, 5-171879

Int. Cl.[6] G06F 15/20

U.S. Cl. 395—133 3 Claims



1. A method for printing out an organization chart image on the basis of a data file and a position table, comprising the steps of:

storing a plurality of data in the data file, and storing a position code in correspondence with each of the stored data;

storing a plurality of position codes in the position table, and storing a higher-level connection code indicating a connection

to a higher-level connection code and a hierarchical level number indicating a higher hierarchical level in correspondence with each of the position codes;

classifying the data stored in the data file into blocks in units of corresponding position codes;

generating a position name indicating the position code of a block of interest and data included in the block as a block image for each of the classified blocks;

arranging the block image generated for each of the classified blocks in a hierarchical area corresponding to the hierarchical level number of the block when the block image is developed in an image memory which is divided into a plurality of hierarchical areas, and arranging blocks having the common higher-level connection code at neighboring positions upon arrangement of the block images;

correcting the arrangement position of the block image arranged in the higher-level hierarchical area of the blocks which have the common higher-level connection code and are arranged at the neighboring positions, so that the block image in the higher-level hierarchical area is arranged at a middle position between the block images of the blocks having the common higher-level connection code; and

connecting the hierarchical levels of block images arranged in the corresponding hierarchical areas in the image memory by connection line images, and printing out an image obtained by connecting the block images connected by the connection line images as an organization chart image.

5,467,441

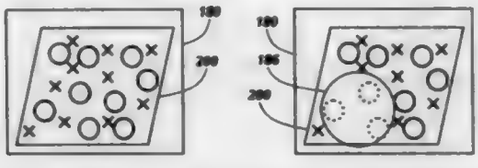
METHOD FOR OPERATING ON OBJECTS IN A FIRST IMAGE USING AN OBJECT-BASED MODEL DATA STRUCTURE TO PRODUCE A SECOND CONTEXTUAL IMAGE HAVING ADDED, REPLACED OR DELETED OBJECTS

Maureen C. Stone, Los Altos, Calif., and Anthony DeRose, Seattle, Wash., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 96,131, Jul. 21, 1993, abandoned. This application Oct. 6, 1994, Ser. No. 320,975

Int. Cl.[6] G06F *15/62*

U.S. Cl. 395—133 **49 Claims**



1. A method of operating a machine to provide a second view of an information space that shows a display object added to a first view of the information space; the machine including a display having a display area for presenting images; a processor connected for providing image definition data defining images for presentation in the display area of the display; and memory for storing data; the data stored in the memory including instruction data indicating instructions the processor executes and a model data structure indicating information included in the information space; the processor further being connected for accessing the data stored in the memory; the method comprising:

operating the processor to present a first image in a present image position in the display area of the display; the first image being produced from the model data structure and representing the first view of the information space; the first image including a first display object representing a first model data item included in the model data structure;

operating the processor to present a viewing operation region in a present viewing position in the display area coextensive with the present image position of a first image segment of the first image; the first image segment including the first display object;

operating the processor to perform a model-based viewing operation using the model data structure to produce a second image representing the second view of the information space; the model-based viewing operation using the present viewing position of the viewing operation region to obtain the first model data item included in the model data structure; the model-based viewing operation further, in producing the second image, mapping the first model data item to the first display object and to a second display object that is not included in the first image segment so that the second image includes the first and second display objects; and

operating the processor to present the second image in the viewing operation region so that the second image overlays and replaces the first image segment in the display area; the second image having size and shape dimensions substantially identical to size and shape dimensions of the viewing operation region, and being displayed substantially at the same time as the first image is being displayed in the display area; the second image including the second display object as an added display object representing information added to the information space.

5,467,442

IMAGE PROCESSING APPARATUS

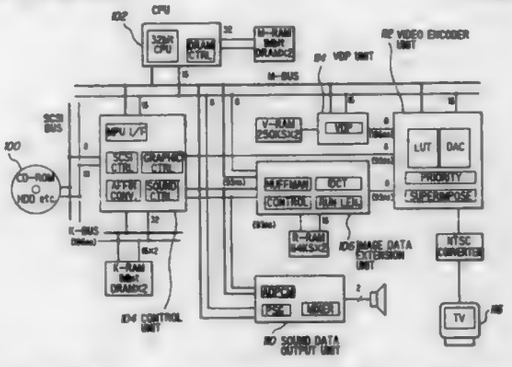
Kazuo Tsubota, and Syouichi Tahata, both of Hokkaido, Japan, assignors to Hudson Soft Co., Ltd., Hokkaido, Japan

Filed Sep. 29, 1993, Ser. No. 128,285

Claims priority, application Japan, Sep. 30, 1992, 4-285156; Sep. 30, 1992, 4-285157; Jan. 9, 1992, 4-298069; Jan. 14, 1992, 4-300671

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—135 **5 Claims**



1. An image processing apparatus, in which a plurality of different image pictures are displayed simultaneously, comprising:

a priority circuit which specifies the order of the plurality of different image pictures to be superimposed to each other;

cellophane means for selecting at least one picture to be displayed as transparent from the plurality of different image pictures;

coloring means for providing colors to the image pictures except for the selected picture(s);

means for superimposing the plurality of different image pictures in accordance with the order determined by the priority circuit; and

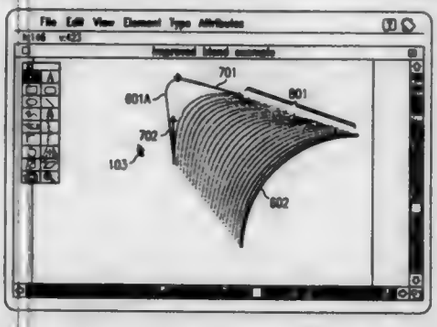
a display unit coupled to the superimposing means for displaying the superimposed image pictures with colors specified by the coloring means.

5,467,443

SYSTEM AND METHOD FOR AUTOMATICALLY GENERATING DERIVED GRAPHIC ELEMENTS

Steven R. Johnson; Kevin F. Crowder; Samantha Seals-Mason, and James R. Von Ehr, II, all of Plano, Tex., assignors to Macromedia, Inc., San Francisco, Calif.

Filed Sep. 25, 1991, Ser. No. 765,370
Int. Cl.[6] G06T *11/00*
U.S. Cl. 395—141 **47 Claims**



1. A graphics system for establishing as a plurality of pixels on a graphics display screen a plurality of derived elements derived from at least one defining element represented as a plurality of pixels on said display screen, said system comprising:

means for specifying a shape of said at least one defining element;

means for accepting and storing a set of parameters pertaining to a desired generation of said derived elements from said at least one defining element;

means controlled by said stored set of parameters for generating said derived elements from said at least one defining element;

means operational while said derived elements remain derived from said at least one defining element for regenerating new derived elements in accordance with updated parameters, said regenerating means being enabled by a change to said at least one defining element; and

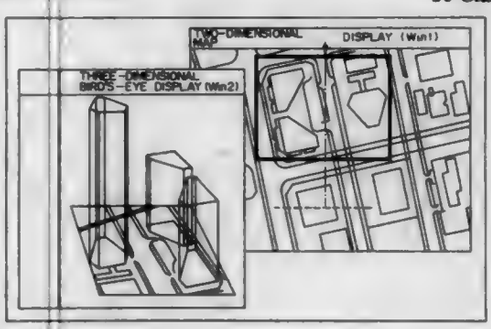
means for changing at least one of said at least one defining element.

5,467,444

METHOD OF THREE-DIMENSIONAL DISPLAY OF OBJECT-ORIENTED FIGURE INFORMATION AND SYSTEM THEREOF

Fumio Kawamura, Fujisawa; Shigeru Shimada, Kodaira, and Tsutomu Ikeda, Abiko, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Ltd. Hitachi Engineering & Services Co, Ibaraki, both of, Japan

Filed Nov. 7, 1991, Ser. No. 789,005
Claims priority, application Japan, Nov. 7, 1990, 2-299718
Int. Cl.[6] G06F *15/50*
U.S. Cl. 395—141 **30 Claims**



1. A method of displaying map information, said method comprising the steps of:

retrieving a relational object indicating relationships of map information from an object base in response to a display command;

retrieving entity objects from said object base in response to said retrieval of said relational object, wherein said entity object includes defined data and a procedure for processing said defined data;

processing said retrieved entity objects,

wherein, a map data entity object of said entity objects retrieves two-dimensional map data from a map data base and an attribute data entity object of said entity objects retrieves attribute data from an attribute data base; and

displaying on a display unit said two-dimensional map data, and said attribute data in accordance with a display format of said two-dimensional map data,

wherein said displaying step comprises the steps of:

converting a displaying format of said retrieved attribute data into that of said retrieved two-dimensional map data, and

displaying said two-dimensional map data and said attribute data on said display unit,

wherein said converting step comprises the steps of:

storing in advance in a table format, height data that has been determined in advance for each of the elements of said two-dimensional map data,

referring to said table in accordance with said attribute data to obtain height data of each element, and

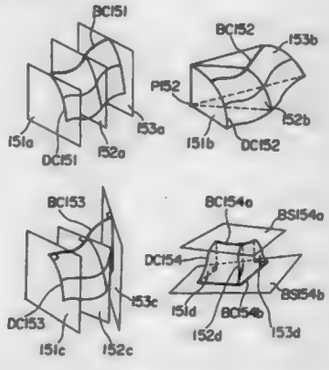
converting said two-dimensional map data into three-dimensional map data in accordance with said obtained height data.

5,467,445

CROSS SECTIONAL CONFIGURATION CREATING APPARATUS IN THE CREATION OF FREE CURVE

Masaki Seki, Suginami, and Osamu Hanaoka, Minamitsuru, both of, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP93/00449, § 371 Date Dec. 2, 1993, § 102(e) Date Dec. 2, 1993, PCT Pub. No. WO93/21569, PCT Pub. Date Oct. 28, 1993
PCT Filed Apr. 7, 1993, Ser. No. 157,041
Claims priority, application Japan, Apr. 7, 1993, 4-94233
Int. Cl.[6] G06F *15/60*
U.S. Cl. 395—142 **7 Claims**



1. A cross sectional configuration creating apparatus in the creation of a free curve for creating a cross sectional configuration to create the free curve by a CAD/CAM system, comprising:

cross sectional configuration creation means for creating said cross sectional configuration on a predetermined plane coordinate system;

coordinate transformation means for performing a coordinate transformation of said cross sectional configuration created on said predetermined plane coordinate system to position said cross sectional configuration on a plane in a spatial coordinate system; and

free curve creation means for creating said free curve from said cross sectional configuration positioned on the plane in said

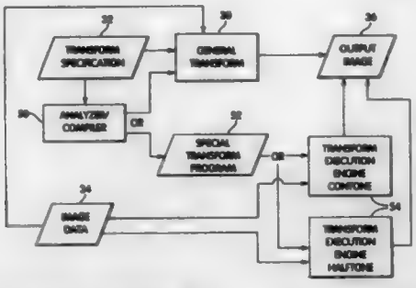
spatial coordinate system and a basic curve defined in said spatial coordinate system.

5,467,446

SYSTEM AND METHOD FOR RASTERIZING IMAGES SUBJECT TO ORTHOGONAL ROTATION

Carl M. Mikkelsen, Sudbury, and Edward S. Gavrin, Weston, both of Mass., assignors to ColorAge, Inc., Billerica, Mass.

Filed Jan. 29, 1993, Ser. No. 10,819
Int. Cl.[6] G06T *3/00*
U.S. Cl. 395—143 **20 Claims**



1. A rasterizer, comprising:

an analyzer and compiler which generates a transform program which represents a mapping, in accordance with a rotation and a scaling indicated by a transform specification, for only one scan line of an output raster image, between pixels in an input image to pixels in the output raster image scan line in response to the transform specification indicating the rotation to be orthogonal rotation; and

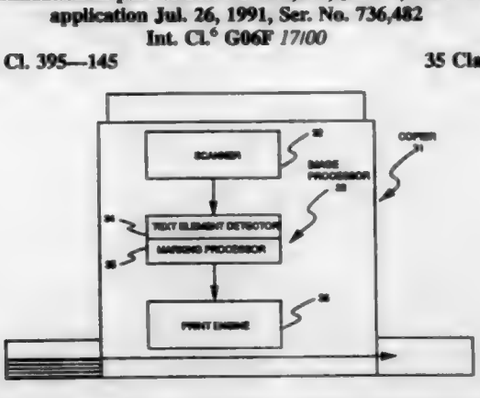
a transform execution engine which receives the transform program and the input image and which generates the output raster image by repetitively applying the transform program to the input image data for successive scan lines of the output raster image.

5,467,447

DOCUMENT MARKING SYSTEM EMPLOYING CONTEXT-SENSITIVE EMBEDDED MARKING CODES

Peter S. Vogel, 608 N. Sierra Dr., Beverly Hills, Calif. 90210

Continuation-in-part of Ser. No. 548,904, Jul. 24, 1990. This application Jul. 26, 1991, Ser. No. 736,482
Int. Cl.[6] G06F *17/00*
U.S. Cl. 395—145 **35 Claims**



1. A method of document marking comprising the steps of:

inputting a document comprising text elements separated by spaces;

receiving a marking code to be applied to said document, said marking code being selected from one of a plurality of possible marking codes;

performing a transformation to said marking code;

grouping text symbols of the input document into classes of text elements including at least one of characters, words, and lines;

selecting, according to the content of the document, at least one of said classes of text elements as the class to which space variations are to be applied; and

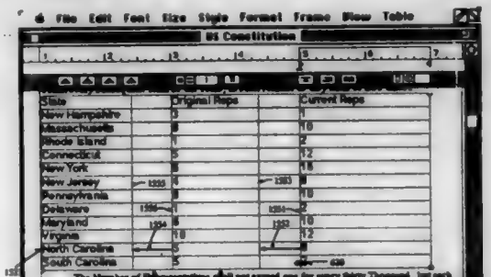
varying the spacing between text elements of the selected class according to the result of said transformation of said marking code so that consecutive individual spaces between said text elements of the selected class are of at least two different lengths and said marking code can be determined from the arrangement of said individual spaces.

5,467,448

TEXT FORMATTING BY THE DIRECT SELECTION OF BORDERS IN AN EDITING DISPLAY

Michael W. Hilton, Mountain View; Michael R. Plasterer, Cupertino, and Bruce H. Browne, Palo Alto, all of Calif., assignors to Claris Corporation, Santa Clara, Calif.

Continuation of Ser. No. 201,068, Feb. 24, 1994, abandoned, which is a continuation of Ser. No. 698,735, May 10, 1991, abandoned. This application Apr. 12, 1995, Ser. No. 420,622
Int. Cl.[6] G06F *17/21*
U.S. Cl. 395—148 **21 Claims**



1. In a computer system comprising a processor, a display, a selection device and a pointing device for controlling a cursor on said display, a computer-implemented method for manipulating appearance of text on said display to present said text on a page comprising the following steps:

a. displaying a plurality of borders on an editing window on said display, and displaying text from a document within said plurality of borders, each of said borders defining margins of said text on said display;

b. detecting a user moving said cursor on said computer system display within said editing window to a first position along at least one of said borders;

c. changing an appearance of said cursor to a second representation, wherein said cursor has a first representation during editing operations;

d. detecting said user selecting said at least one of said borders by activating said selection device;

e. detecting said user moving said cursor to a second position on said display, and responsive thereto, moving said at least one of said borders on said display to said second position;

f. detecting said user de-selecting said at least one of said borders by de-activating said selection device; and

g. reflowing said text on said display so that said margins of said text correspond with positions of each of said borders on said display including said one of said borders at said second position on said display.

5,467,449

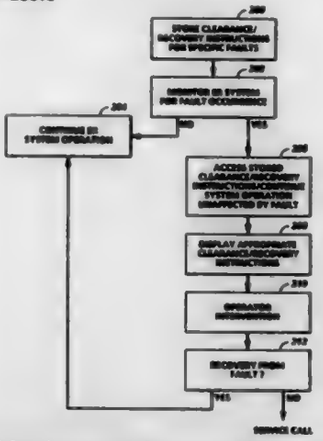
FAULT CLEARANCE AND RECOVERY IN AN ELECTRONIC REPROGRAPHIC SYSTEM

John F. Gauronski, and Kurt T. Knodt, both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 288,871, Mar. 9, 1994, abandoned, which is a continuation of Ser. No. 589,630, Sep. 28, 1990, abandoned. This application Jan. 31, 1995, Ser. No. 380,919

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—185.1 21 Claims



1. A method for clearance and recovery of faults in an electronic reprographic system, comprising the steps of:

storing in memory clearance and recovery instructions for specific system faults;

monitoring the system for fault occurrence during a normal system operating mode;

detecting at least two fault occurrences during the normal system operating mode;

grouping the at least two detected fault occurrences into at least one fault bucket, each fault bucket having a unique set of specific clearance and recovery instructions corresponding to the fault bucket and each fault bucket comprising a collection of faults which require the same unique set of specific clearance and recovery instructions corresponding to the fault bucket;

automatically accessing, based on at least one fault bucket, at least one unique set of specific clearance and recovery instructions corresponding to the at least one fault bucket;

automatically initiating clearance of and recovery from the at least two fault occurrences using the accessed at least one unique set of specific clearance and recovery instructions without requiring an operator to assist in restoring the system to the normal system operating mode; and

automatically displaying appropriate ones of the accessed clearance and recovery instructions corresponding to the at least one fault bucket when automatic recovery from the at least two fault occurrences fails to restore the system to the normal system operating mode, the appropriate ones of the accessed clearance and recovery instructions enabling an operator to manually initiate and perform clearance and recovery.

5,467,450

PROCESS AND APPARATUS FOR CHARACTERIZING AND ADJUSTING SPATIAL RELATIONSHIPS OF DISPLAYED OBJECTS

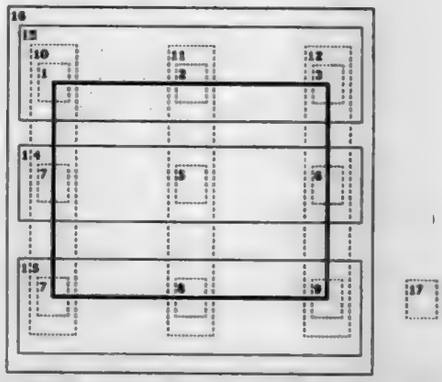
Rohan Coelho, Hillsboro, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 14, 1994, Ser. No. 182,743

Int. Cl.[6] G06F *15/20*

U.S. Cl. 395—155 21 Claims

1. A computer-implemented process for transforming signals corresponding to displayed objects, comprising the steps of:



(a) providing a first signal corresponding to a first displayed object, the first signal comprising a plurality of digital first object coordinates;

(b) providing a second signal corresponding to a second displayed object, the second signal comprising a plurality of digital second object coordinates;

(c) generating a plurality of differences between the first object coordinates and the second object coordinates;

(d) generating a table index from the most significant bits of the plurality of differences;

(e) characterizing the spatial relationship between the first and second displayed objects by accessing a lookup table in accordance with the table index; and

(f) transforming at least one of the first and second signals in accordance with the spatial relationship characterization.

5,467,451

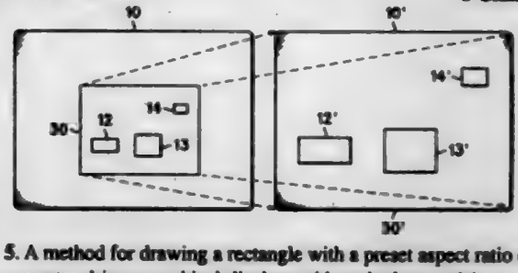
METHOD OF DISPLAYING A BOUNDING BOX USING A SET ASPECT RATIO AND THE COORDINATE RATIO OF A GRAPHICAL POINTER

Joseph J. Burkis, Chandler; Andrew H. Cowan, Gilbert; Martin F. Lutz, Mesa, and Steven L. Craia, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 925,135, Aug. 6, 1992, abandoned. This application Feb. 24, 1995, Ser. No. 394,853

Int. Cl.[6] G06F *15/62*

U.S. Cl. 395—161 6 Claims



5. A method for drawing a rectangle with a preset aspect ratio on a computer driven graphical display, said method comprising:

providing a plurality of graphical objects which appear on the computer driven graphical display;

providing a graphical pointer means;

storing in the computer a number to preset the aspect ratio of the rectangle to be drawn;

activating the graphical pointer means at an initial point;

moving the graphical pointer means from the initial point;

defining a rectangle with the graphical pointer means having a first edge coincident to a first axis of the initial point, a second edge coincident to a second axis of the initial point and meeting the first edge at the initial point, a third edge parallel to the second edge and meeting the first edge at the first axis, and a fourth edgeparallel to the first edge joining the second edge to the third edge;

determining by the computer according to the location of the graphical pointer means a governing dimension and a derived dimension of the rectangle to maintain the preset aspect ratio;

moving the graphical pointer means along an edge of the derived dimension of the rectangle towards and past an axis of the initial point;

tracking the graphical pointer means by moving the edges of the rectangle without altering the size and aspect ratio of the rectangle such that the rectangle completely surrounds a desired graphical object;

deactivating the graphical pointer means; and

identifying the desired graphical object based on containment of the graphical object within the rectangle.

5,467,452

ROUTING CONTROL INFORMATION VIA A BUS SELECTIVELY CONTROLS WHETHER DATA SHOULD BE ROUTED THROUGH A SWITCH OR A BUS ACCORDING TO NUMBER OF DESTINATION PROCESSORS

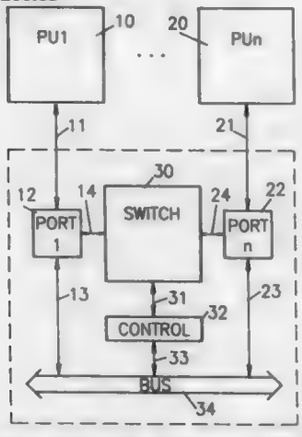
Arnold Blum, Gechingen; Gottfried Goldrian, Boeblingen, and Wolfgang Kumpf, Holzgerlingen, all of, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 14, 1993, Ser. No. 91,706

Claims priority, application European Pat. Off., Jul. 17, 1992, 4223600

Int. Cl.[6] G06F *13/12;13/14*

U.S. Cl. 395—200.12 **4 Claims**



1. A multiprocessor computer system comprising:

a bus;,

at least three processors coupled to said bus;

a switch coupled to all of said processors to selectively interconnect any two of said processors at a time;

control means, coupled between said switch and said bus and responsive to control information requesting communication between two processors, for controlling said switch to interconnect said two processors;

routing means for routing control information from any one of said processors to said control means and any and all of the other processors via said bus; thereafter, routing data destined for a single one of said other processors from said one processor to said switch bypassing said bus, and routing data destined for any two or more of said processors via said bus bypassing said switch;

wherein the routing means comprises a multiplicity of gate circuits, one for each processor unit, each gate circuit being connected to the respective processor unit and the switch and the bus; and

wherein each of said gate circuits includes means, responsive to control information which request communication to the respective processor, for determining if said respective processor is ready to communicate and responding to the gate circuit of the requesting processor via said bus with an indication whether said respective processor is ready to communicate.

5,467,453

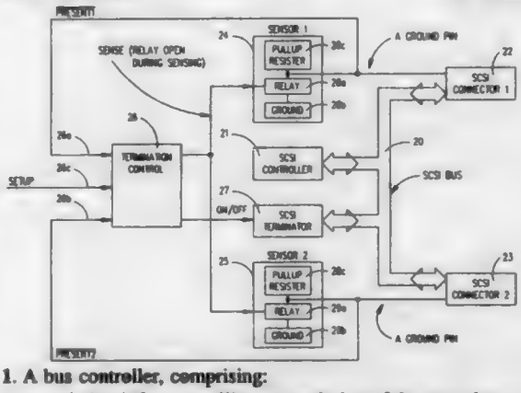
CIRCUIT FOR PROVIDING AUTOMATIC SCSI BUS TERMINATION

Thomas Kocis, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed Jul. 20, 1993, Ser. No. 94,642

Int. Cl.[6] H01R *9/07*

U.S. Cl. 395—281 **36 Claims**



1. A bus controller, comprising:

a control circuit for controlling transmission of data on a bus and for providing an interface between said bus and a computer system for communication of said data therebetween;

a first bus port and a second bus port, each of said first and second bus ports permitting a device to be coupled thereto for communication with said control circuit via said bus, said bus controller being at an end of said bus when a single one of said first and second bus ports is coupled to a device and being in a middle of said bus when both said first and second bus ports are coupled to devices; and

an automatic bus termination circuit coupled to said first and second bus ports and capable of coupling a terminating circuit to said bus as a function of a presence of devices coupled to said first and second bus ports, said bus requiring coupling of said terminating circuit when said bus controller is at said end of said bus.

5,467,454

BUS USE REQUEST ADJUSTING APPARATUS ALLOWING CHANGING PRIORITY LEVELS

Fumiki Sato, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1993, Ser. No. 125,903

Claims priority, application Japan, Sep. 29, 1992, 4-283983

Int. Cl.[6] G06F *13/36;9/46*

U.S. Cl. 395—296 **8 Claims**

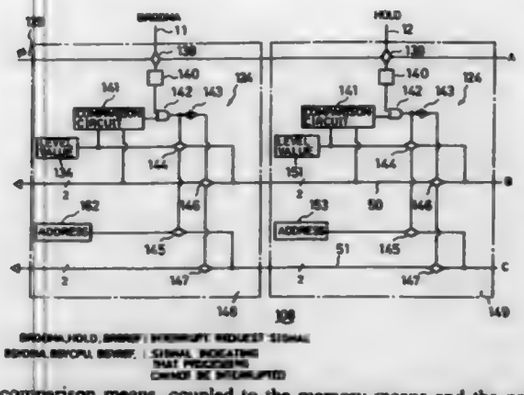
1. A bus use request adjusting apparatus which accepts bus use request signals from a plurality of processors coupled to a common bus, wherein the apparatus outputs a bus use permission signal to a processor according to a priority order of the plurality of processors, the apparatus comprising:

means for accepting the bus use request signals from the plurality of processors;

means for accepting a signal from each of the plurality of processors or a central processing unit (CPU) indicating that processing cannot be interrupted;

a priority line to which a priority level value of a processor or the CPU having a bus use right is applied;

memory means for holding for each of the processors a bus use request priority level value which is changeable;



comparison means, coupled to the memory means and the priority line, for comparing the current priority level value on the priority line with the held bus use request priority level of a processor outputting a bus use request signal to the means for accepting the bus use request signals and for outputting a result signal based on the comparison;

selection means for outputting a select signal for selecting whether or not the priority level value of the processor read from the memory means should be applied to the priority line, according to the bus use request signal and the result signal; and

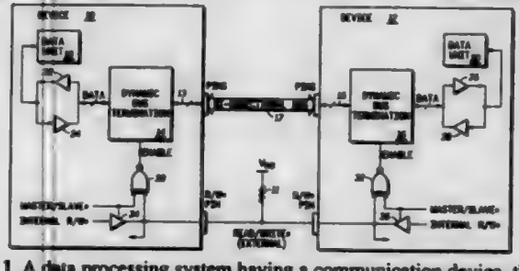
output control means for outputting the bus use permission signal to a processor or the CPU having the priority level value applied to the priority line according to the select signal when none of the processors and the CPU output a signal indicating that processing cannot be interrupted.

5,467,455

DATA PROCESSING SYSTEM AND METHOD FOR PERFORMING DYNAMIC BUS TERMINATION

James G. Gay, Pflugerville, and William B. Ledbetter, Jr., Austin, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1993, Ser. No. 145,117
Int. Cl.[6] G01R *27/00*; H03H *7/40*
U.S. Cl. 395—281 **29 Claims**



1. A data processing system having a communication device, the communication device being an integrated circuit having a plurality of external pins, the plurality of external pins being coupled to receive data from external to the communication device and transmit data external to the communication device, the communication device comprising:

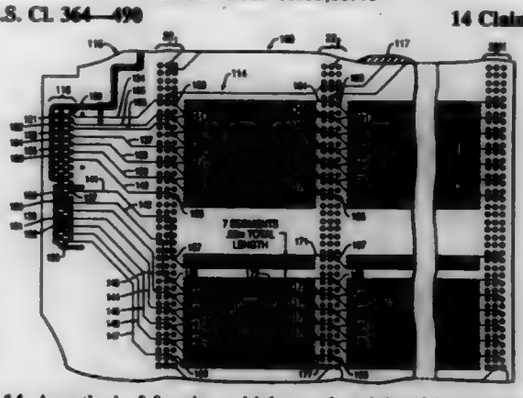
circuitry for signal termination having a plurality of first input/output terminals coupled to the plurality of external pins via a plurality of data lines, the circuitry for signal termination having a second input/output terminal for providing data to or receiving data from internal to the communication device, the circuitry for signal termination having an input for receiving an enable signal from either internal or external to the communication device and having a termination component, the enable signal allowing the circuitry for signal termination to couple the termination component to the plurality of external pins when the enable signal is asserted and decoupling the termination component from the plurality of external pins when the enable signal is deasserted.

5,467,456

HIGH SPEED BUS BRANCHES WITH COMPACT PHYSICAL SPACING

David C. Moxley, Irmo, and Frank W. Cabaniss, Columbia, both of S.C., assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 899,193, Jun. 16, 1992, abandoned. This application Sep. 23, 1994, Ser. No. 311,292
Int. Cl.[6] G06F *13/00;13/40*
U.S. Cl. 364—490 **14 Claims**



14. A method of forming a high speed peripheral bus meeting SCSI standards for peripheral device spacing in a compact cabinet, the method comprising the steps of:

forming a printed wiring board having a plurality of signal lines comprising electrical conductors attached to a surface of the board;

defining a plurality of peripheral device connection terminals generally uniformly spaced along a length of each of the conductors; and

folding each of the conductors between adjacent connection terminals into serpentine configurations such that the physical spacing between adjacent connections terminals is substantially less than the length of electrical conductor between the adjacent terminals and such that a signal path length sufficient to reduce any signal reflection to a level that does not generate a false logic level is created.

5,467,457

READ ONLY TYPE SEMICONDUCTOR MEMORY DEVICE INCLUDING ADDRESS COINCIDENCE DETECTING CIRCUITS ASSIGNED TO SPECIFIC ADDRESS REGIONS AND METHOD OF OPERATING THE SAME

Kenji Kohda, and Yasuhiro Kouro, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1992, Ser. No. 867,541
Claims priority, application Japan, May 2, 1991, 3-100749
Int. Cl.[6] G06F *12/00;11/16;* G11C *17/10;29/00*
U.S. Cl. 395—429 **21 Claims**

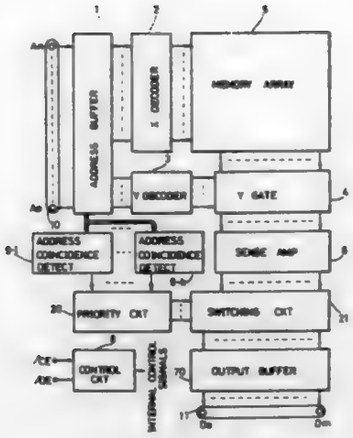
1. A read only semiconductor memory device including a memory cell array having a plurality of read only memory cells, each memory cell having an address corresponding thereto, said device comprising:

a data output terminal;

a plurality of address coincidence detecting means, each having a specific address region corresponding thereto, for detecting whether a received address signal designates an address in the specific address region corresponding thereto;

priority ordering means responsive to outputs of said plurality of address coincidence detecting means for determining a priority order among said outputs of said plurality of address coincidence detecting means; and

switching means responsive to said priority ordering means for selectively fixing said data output terminal at a predetermined logic level based on the priority order determined by said priority ordering means.



5,467,458

OPTICAL CHARACTER READER WITH INTERNAL MEMORY AND DATA PROCESSOR

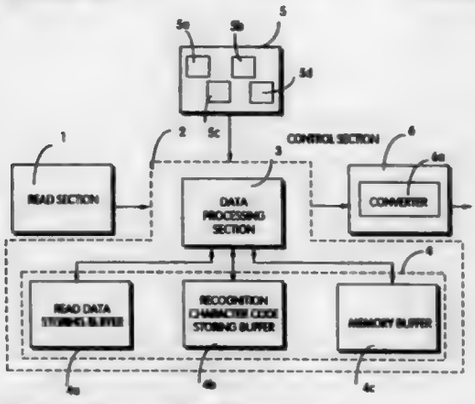
Katsunori Takeda, Nara; Shinsuke Otsuka, Kitakatsuragi; Yoshiharu Takahashi, Osaka; Hiroo Katsura, Nara; Kazuhiko Takata, Kitakatsuragi; Shoichi Maeda, and Takafumi Nagata, both of Yamatokoriyama, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 19, 1992, Ser. No. 885,435

Claims priority, application Japan, May 21, 1991, 3-116156

Int. Cl.[6] G06F *12/08*

U.S. Cl. 395—427 **16 Claims**



1. An optical character reader comprising:

input means for inputting one of a plurality of commands;

reading means for reading recorded data;

memory means having a first region for storing read data, a second region for storing character code corresponding to the read data, and a third region for storing the character code;

output means for supplying at least one of the character code stored in the second region of the memory means and the character code stored in the third region of the memory means to an information processing device; and

data processing means, when a read command is input from the input means, for storing the read data in the first region of the memory means, for converting the read data stored in the first region of the memory means into character code, and for storing the character code in the second region of the memory means, and, when a memory command is input from the input means, transferring the character code stored in the second region of the memory means to the third region of the memory means so as to store the character code stored in the second region of the memory means in the third region of the memory means until the next memory command is input from the input means,

wherein the data processing means outputs the character code stored in the second region of the memory means, when a data transmission command is input from the input means, and

wherein the data processing means outputs the character code stored in the third region of the memory means to the output means, when a memory data transmission command is input from the input means.

5,467,459

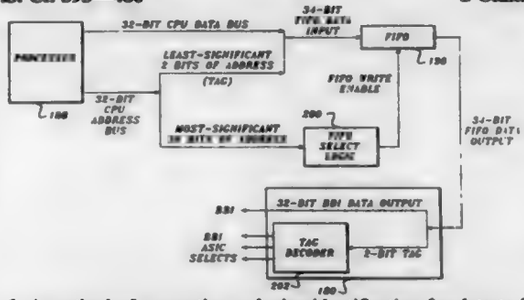
IMAGING AND GRAPHICS PROCESSING SYSTEM

Thomas Alexander; Yongmin Kim; Hyunwook Park; Kil-Su Eo, and Jing-Ming Jong, all of Seattle, Wash., assignors to Board of Regents of the University of Washington, Seattle, Wash., and Samsung Electronics, Rep. of Korea

Continuation of Ser. No. 744,587, Aug. 13, 1991, abandoned. This application Aug. 2, 1993, Ser. No. 101,366

Int. Cl.[6] G06F *12/04;13/00*

U.S. Cl. 395—480 **2 Claims**



1. A method of generating a device identification for data to be transmitted between a processor having an addressable memory space and one of a plurality of destination devices, the method comprising:

partitioning the addressable memory space into a plurality of sectors by assigning a uniquely identifiable tag portion of the addresses in the addressable memory space to each sector, wherein each tag portion identifies one of the destination devices;

receiving, at the processor, a data address at which the data to be transmitted are stored in the addressable memory space;

using the processor to extract a tag portion from said data address and concatenate the tag portion to the data to be transmitted to form tagged data;

transmitting the tagged data from the processor to a device identifier;

using the device identifier to extract the tag portion from the tagged data, identify a destination device from the tag portion, extract the data to be transmitted from the tagged data and forward the data to be transmitted to the identified destination device.

5,467,460

M&A FOR MINIMIZING DATA TRANSFER TO MAIN MEMORY FROM A WRITEBACK CACHE DURING A CACHE MISS

Piyush G. Patel, Fremont, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 28,724, Mar. 8, 1993, abandoned, which is a continuation of Ser. No. 479,628, Feb. 14, 1990, abandoned. This application Apr. 28, 1994, Ser. No. 234,587

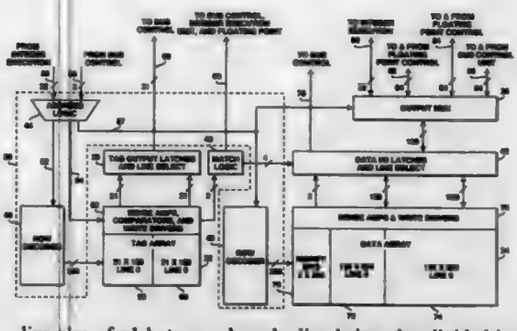
Int. Cl.[6] G06F *12/08;13/00*

U.S. Cl. 395—70 **4 Claims**

1. An apparatus comprising:

a main memory for storing data;

a writeback cache memory having s sets of cache lines for caching a subset of the data stored in main memory, s being greater than one, each set having w cache line(s), w being equal to or greater than one, each cache line having a cache



line size of n1 bytes, each cache line being also divided in to m cache line segments of n2 bytes, each cache line further having a single address tag for all m cache line segments, and m modify bits corresponding to the m cache line segments individually denoting whether the corresponding cache line segments have been modified, n1, n2 and m being non-zero integers with n1=m×n2, and n2 and m are both greater than one;

a plurality of write buffers coupled to the cache memory for buffering at least one cache line of data evicted out of the cache memory to make room in the cache memory for incoming replacement data responsive to cache misses;

a bus coupled to the write buffers and the main memory for transferring the buffered data to the main memory in quantities of n3 bytes at a time, n2 being an integer multiple of n3;

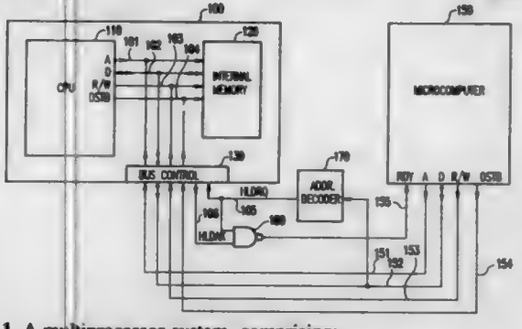
a bus controller coupled to the write buffers for controlling conditional partial write back of the buffered data for only those cache line segments whose corresponding modify bits denote the cache line segments having been modified.

5,467,461

MULTIPROCESSOR COMPUTER SYSTEM HAVING BUS CONTROL CIRCUITRY FOR TRANSFERRING DATA BETWEEN MICROCOMPUTERS

Masaki Nasu, and Hajime Sakuma, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jul. 8, 1992, Ser. No. 910,780
Claims priority, application Japan, Jul. 11, 1991, 3-170812
Int. Cl.[6] G06F *13/00;13/42*
U.S. Cl. 395—474 **16 Claims**



1. A multiprocessor system, comprising:

a first microcomputer including a central processing unit, an internal memory, a bus control unit, an internal bus interconnecting said central processing unit, said internal memory and said bus control unit, a set of first address terminals, a request signal input terminal, an acknowledge signal output terminal, and a strobe signal input terminal;

a second microcomputer including a set of second address terminals coupled via an address bus to said set of first address terminals of said first microcomputer, a strobe signal output terminal coupled via a strobe signal line to said strobe signal input terminal of said first microcomputer, and a ready signal input terminal,

said second microcomputer transferring to said address bus, through said set of second address terminals, address information designating an address within said internal memory of said first microcomputer and transferring a strobe signal to said strobe signal line through said strobe signal output terminal in response to a ready signal supplied to said ready signal input terminal;

address decoding means coupled to said address bus for supplying, when decoding said address information transferred by said second microcomputer, a request signal to said request signal input terminal of said first microcomputer,

said bus control unit of said first microcomputer responding to said request signal supplied to said request signal input terminal for detecting whether said internal bus is free from use by said central processing unit, and for outputting an acknowledge signal to said acknowledge signal output terminal when said internal bus is free; and

ready signaling means coupled to said acknowledge signal output terminal for supplying said ready signal to said ready signal input terminal of said second microcomputer in response to said acknowledge signal outputted at said acknowledge signal output terminal and said request signal,

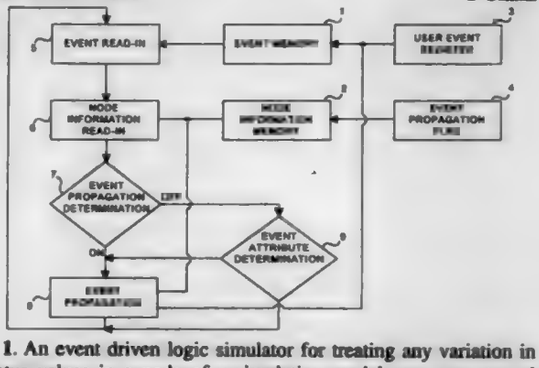
said bus control unit of said first microcomputer further responding to said strobe signal transferred from said second microcomputer to said strobe signal input terminal through said strobe signal line to access an address of said internal memory by using said address information transferred to said set of first address terminals through said address bus and to perform a data read/write operation on said address of said internal memory through said internal bus.

5,467,462

EVENT DRIVEN LOGIC SIMULATOR FOR PARTIAL SIMULATION

Toshiaki Fujii, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 14, 1992, Ser. No. 930,013
Claims priority, application Japan, Aug. 14, 1991, 3-228609
Int. Cl.[6] G06F *9/455*
U.S. Cl. 364—578 **1 Claim**



1. An event driven logic simulator for treating any variation in status values in a node of a simulation model as an event, and performing arithmetic operations only with that node corresponding to that event, comprising:

event storage means for storing relative to a first node a state value which is to vary, a time at which the state value in said first node is to vary, the state value after having varied in said first node, and an operator-set event attribute which indicates whether or not the event is what the operator preset before the execution of simulation;

node information storage means for storing node information, said node information including the state value of a node, a logic function of said node, a node of propagation origin of said node, a node of propagation destination of said node, a delay time which said node has, and an event propagation flag indicating whether or not said event having occurred during the execution of simulation will be transmitted to said propagation destination nodes;

user event registering means for registering said operator-set event attribute in said event storage means;

event propagation flag setting means for setting the event propagation flag of said node information of said node information storage means corresponding to a node designated by said operator;

event read-in means for reading in events registered in said event storage means in a predetermined sequence;

node information read-in means for reading in from said node information storage means said node information corresponding to the events read in by said event read-in means;

event propagation means for registering in said event storage means, on the basis of event information read in by said event read-in means, events to perform a first processing for altering the state value of the node stored in said node information storage means, a second processing for finding out the state value of said node of propagation destination by arithmetic operation, and a third processing for altering the state value of that node propagation destination;

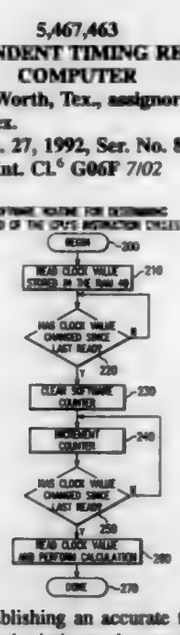
event attribute determination means for performing a fourth processing for starting to give a starting instruction to said event propagation means when said event attribute of the event read in by said event read-in means indicates that the event has been preset before the execution of simulation; and

event flag determination means for performing a fifth processing for initiating a starting instruction to said event propagation means when said event propagation flag indicates that an event that has occurred during the execution of simulation should be propagated, and for initiating a starting instruction to said event attribute determination means when said event propagation flag indicates that an event that has occurred during the execution of simulation should not be propagated.

5,467,463
SYSTEM INDEPENDENT TIMING REFERENCE FOR COMPUTER

Mark D. Siegel, Fort Worth, Tex., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Feb. 27, 1992, Ser. No. 842,441
Int. Cl.[6] G06F *7/02*
U.S. Cl. 395—550 **22 Claims**



1. A method for establishing an accurate timing reference in a computer system for use in timing and controlling the execution of particular functions, the method comprising:

reading a signal in said computer system that transitions from one value to another at a known rate;

determining a speed of instruction cycle execution in said computer system, said determining step comprising:

counting a first number of instruction cycles performed during a time period between transition of said signal from one value to another;

dividing said time period by said first number of instruction cycles;

establishing a second number of instruction cycles executed in a second time period required for an input/output device of said system to process a command from a central processing unit of said system based upon said determined speed; and

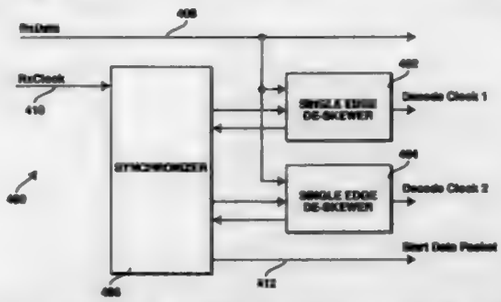
counting instruction cycles executed by said system upon issuance of a command to said I/0 device; and

issuing an indication signal to said central processing unit when said second number of instruction cycles has been executed, wherein responsive to said indication signal, execution of said central processing unit returns from performing other functions to issue another command to said I/0 device.

5,467,464
ADAPTIVE CLOCK SKEW AND DUTY CYCLE COMPENSATION FOR A SERIAL DATA BUS

Florin Oprescu, Sunnyvale, and Roger Van Brunt, San Francisco, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 9, 1993, Ser. No. 28,387
Int. Cl.[6] H03K *5/13*
U.S. Cl. 395—550 **16 Claims**



1. A double-edge de-skewer apparatus for reducing skew between a clock signal and a data signal having a leading edge and a trailing edge, received along first and second communication lines, said apparatus comprising:

a delay line coupled to receive said clock signal from said first communication line for delaying said clock signal to generate a plurality of delayed clock signals;

a first detector coupled to receive said plurality of delayed clock signals from said delay line and said data signal from said second communication line, for comparing the delayed clock signals with said leading edge of the data signal to identify a first delayed clock signal having a least amount of skew with respect to said data signal leading edge; and

a second detector coupled to said delay line and said second communication line for comparing the delayed clock signals with said trailing edge of the data signal to identify a second delayed clock signal having a least amount of skew with respect to said data signal trailing edge;

a first output coupled to said first detector for outputting said first delayed clock signal; and

a second output coupled to said second detector for outputting said second delayed clock signal.

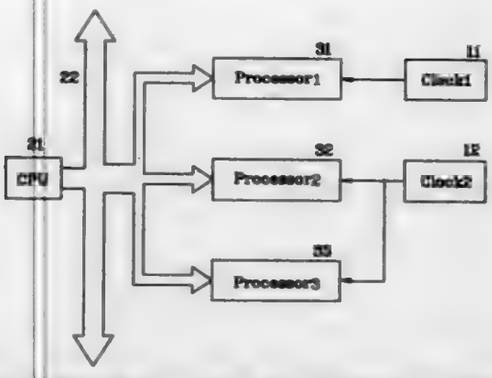
5,467,465
TWO CLOCK METHOD FOR SYNCHRONIZING A PLURALITY OF IDENTICAL PROCESSORS CONNECTED IN PARALLEL

Daniel Chen, Taipei, Taiwan, Prov. of China, assignor to UMAX Data System Inc., Hsinchu, Taiwan, Prov. of China

Filed Nov. 17, 1993, Ser. No. 153,751
Int. Cl.[6] G06F *13/42*
U.S. Cl. 395—550 **2 Claims**

1. A method for using a plurality of identical processors connected in parallel, said processors being able to send a ready signal after completing an instruction, and said method comprising the steps of:

(a) obtaining a computer system having a CPU and a plurality of identical processors connected in parallel, said processors also being connected to said CPU;



(b) obtaining first and second clocks of different oscillation frequencies, wherein said first clock being of slower oscillation frequency than said second clock;

(c) connecting said first clock to only one of said plurality of processors and said second clock to rest of said plurality of processors; and

(d) instructing said CPU to check only said processor connected to said first clock for said ready signal, and instructing said CPU to proceed to next step if a ready signal is received from said processor connected to said first clock.

5,467,466

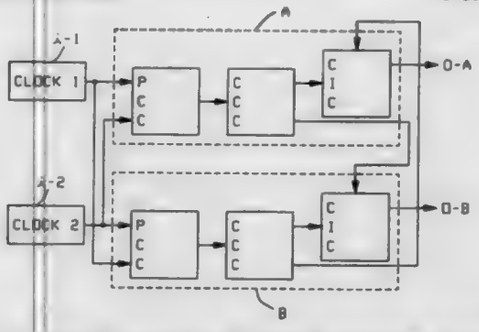
METHOD FOR SWITCHING BETWEEN A PLURALITY OF CLOCK SOURCES UPON DETECTION OF PHASE ALIGNMENT THEREOF AND DISABLING ALL OTHER CLOCK SOURCES

Robert H. Carlson, Laguna Niguel, Calif., assignor to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 737,303, Jul. 29, 1991, Pat. No. 5,381,542. This application Nov. 14, 1994, Ser. No. 339,426

Int. Cl.[6] G06F *1/04*

U.S. Cl. 395—550 **6 Claims**



1. A method for automatically bilaterally switching between a first clock-generating stage and N auxiliary clock-generating stages upon occurrance of a prescribed switchover event, this method comprising:

providing N+1 like Dynamic Switchover circuits, and coupling each to a respective clock-generating stage, each Switchover circuit comprising

an input Phase-compare stage, a clock control stage and a clock-internal-control stage;

coupling said compare stage to receive the outputs from all clock-generating stages, and adapting it to output an enable signal E upon detection of alignment of the phase of its clock signals with those of the then-Primary clock,

coupling said clock-control stage at the output of said phase compare stage and adapting it to output clock-output enable/switchover-initiating signals s-i;

arranging said clock-internal-control stage to include clock buffer means, and coupling it to receive the output of all such clock-control stages while adapting it to allow output of such switchover-initiating signals s-i responsive to receipt of a prescribed disable, signal indicating occurrance of said switchover event.

5,467,467

HIGH RELIABILITY CONSOLE CONNECTING DEVICE

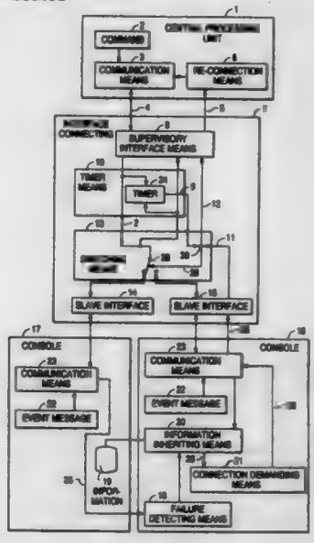
Masahiro Ozawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 21, 1993, Ser. No. 64,585

Claims priority, application Japan, May 21, 1992, 4-153047

Int. Cl.[6] G06F *11/30*

U.S. Cl. 395—185.08 **9 Claims**



9. A computer system comprising:

a central processing unit (CPU);

a first console;

a second console;

an interface unit connecting the first and second consoles to the CPU, the interface unit including,

a switch having a pole coupled to the CPU, a first throw coupled to the first console, and a second throw coupled to the second console, such that the CPU is coupled, via the switch, to one of the first console and the second console,

wherein the switch transitions from the first throw to the second throw upon failure of the first console and transitions from the second throw to the first throw upon failure of the second console, and

wherein the interface unit further includes a timer, the timer being set upon the transmission of a command from the CPU to one of the first and second consoles, the timer being reset upon the transmission of an event message from said one of the first and second consoles to the CPU, the timer issuing a time-out signal to the switch if the timer is not

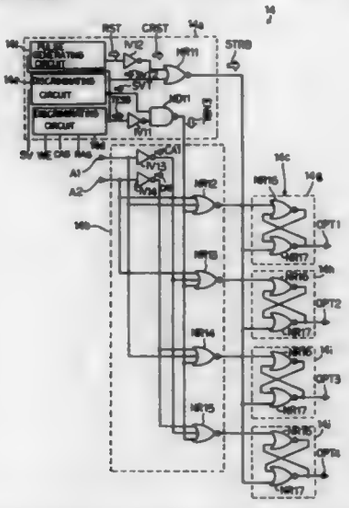
reset after a predetermined time from when the timer is set, the time-out signal indicating a failure in said one of the first and second consoles.

5,467,468

SEMICONDUCTOR MEMORY DEVICE HAVING BUILT-IN TEST CIRCUITS SELECTIVELY ACTIVATED BY DECODER CIRCUIT

Yasuji Koshikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 25, 1993, Ser. No. 22,622
Claims priority, application Japan, Feb. 27, 1992, 4-076104
Int. Cl.[6] G01R *31/28;* G06F *11/00*
U.S. Cl. 371—22.3 **14 Claims**



1. An instruction circuit incorporated in a semiconductor integrated circuit for selectively starting a plurality of internal inspection sequences, comprising:

a) a decoder circuit, coupled with first external signal pins of said semiconductor integrated circuit, which repeatedly decodes a plurality of multi-bit instruction signals at said first external signal pins while enabled by an enable signal for sequentially producing decoded signals at a plurality of output nodes of said decoder circuit;

b) a control circuit coupled with second external signal pins of said semiconductor integrated circuit, wherein said control circuit receives a multi-bit request signal via said second external pins, wherein said multi-bit request signal is indicative of an internal diagnosis, wherein said control circuit discriminates said multi-bit request signal for producing said enable signal, and wherein said control circuit produces a strobe signal when said internal diagnosis is requested; and

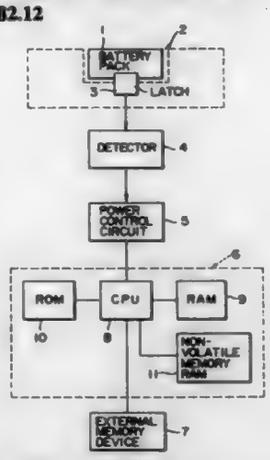
c) a plurality of resettable memory means, respectively coupled with said output nodes of said decoder circuit, for storing said decoded signals while enabled by said strobe signal, wherein said plurality of resettable memory means simultaneously supplies a plurality of test enable signals to a diagnostic unit incorporated in said semiconductor integrated circuit, wherein said plurality of test enable signals are based on said decoded signals, and wherein each of said test enable signals is indicative of a request of particular inspection sequences selected from said plurality of internal inspection sequences to be performed by said diagnostic unit.

5,467,469

COMPUTER UNIT WITH A RESUME FUNCTION

Toshimitsu Saito; Masahiko Kasashima, and Toshikazu Konno, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 572,246, Aug. 27, 1990, abandoned. This application Dec. 27, 1993, Ser. No. 173,877
Claims priority, application Japan, Aug. 28, 1989, 1-100572 U; Nov. 30, 1989, 1-309144; Mar. 20, 1990, 2-68079
Int. Cl.[6] G06F *11/30;12/16*
U.S. Cl. 395—182.12 **35 Claims**



1. A computer system comprising:

a power switch for instructing ON/OFF condition of a main power supply of said computer system;

a power supply circuit for controlling the main power supply in accordance with the ON/OFF Instruction by said power switch;

a removable battery mounted on said computer system; mode setting means for setting resume mode in said computer system;

a memory;

first data saving means, in response to the ON instruction by said power switch, if the resume mode is set for saving the system data necessary for resuming data processing executed by said computer system into said memory;

restoring means, in response to the ON instruction by said power switch, for restoring the system data saved in said memory;

a detector detecting movement of said battery when the main power supply is ON;

second data saving means, in response to the detection by said detector, for saving the system data and resume-factor data designating factor for causing system data saving, into said memory whether or not the resume mode is set; and

invalidating means for invalidating the ON instruction by said power switch of said if said removable battery being not mounted on said computer system.

5,467,470

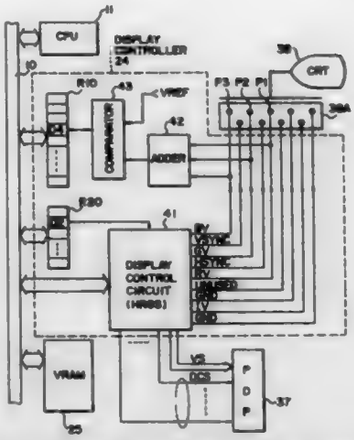
COMPUTER ABLE TO DETERMINE WHETHER OR NOT A DISPLAY IS CONNECTED TO IT, IN ACCORDANCE WITH THE STATUS DATA STORED IN A REGISTER, AND METHOD OF DETECTING WHETHER OR NOT A DISPLAY IS CONNECTED TO A COMPUTER

Ryozi Ninomiya, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 508,691, Apr. 13, 1990, abandoned. This application Apr. 19, 1994, Ser. No. 229,810
Claims priority, application Japan, Apr. 28, 1989, 1-110549
Int. Cl.[6] G06F *11/30*
U.S. Cl. 395—183.03 **7 Claims**

1. A computer capable of being connected to an external display, the computer comprising:

a main body;



connector means having pins for connecting the external display to said main body;

register means for storing data representing a first status or a second status depending on the value of a voltage of specified ones of the pins of said connector means, wherein the first status indicates a first condition in which the external display is connected to the computer during a video signal period and a second condition in which the external display is connected or not connected to the computer during a blanking period of the external display, and wherein the second status indicates that the external display is not connected to the computer during the video signal period;

display control means for controlling said external display, the display control means generating and supplying video signals to the external display through the specified pins of the connector means during the video signal period of the external display;

data-reading means for repeatedly reading the data stored in said register means during a first period longer than the blanking period, and for counting the number of times the data representing the first status is read from said register means; and

detecting means for determining that said external display is connected to the computer, when the number of times the data representing the first status is read from said register means is greater than the greatest number of times said data-reading means can read the data stored in the register means during the blanking period of said external display.

5,467,471

MAINTAINING DATABASES BY MEANS OF HIERARCHICAL GENEALOGICAL TABLE

David A. Bader, 161 Cherry Hill Rd., Nazareth, Pa. 18064

Filed Mar. 10, 1993, Ser. No. 29,268
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **15 Claims**

6. A method for searching records maintained in a computer database, comprising the steps of:

a. hierarchically arranging an ordered genealogy including records in the database meeting a criteria of a user selected search;

b. creating an array comprising all records satisfying the criteria and genealogical families of said records, the array indicating which records satisfy the criteria;

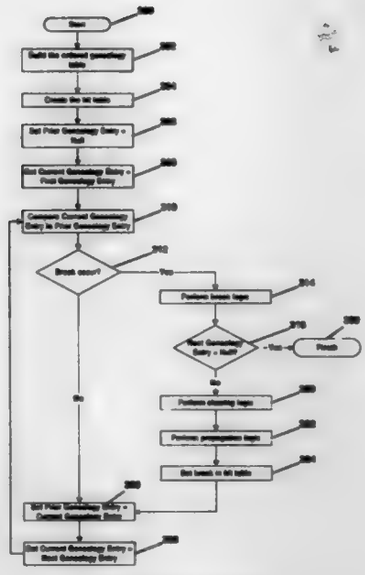
c. comparing a current genealogical family in the array with an immediate prior genealogical family in the array;

d. determining if an inequality exists between the current and prior families;

e. if an inequality is determined to exist, performing a correcting routine;

f. if either one of (i) no inequality exists and (ii) the correcting routine is completed, continuing the steps of comparing and determining until all records in the array are checked; and

g. identifying all records satisfying the search.

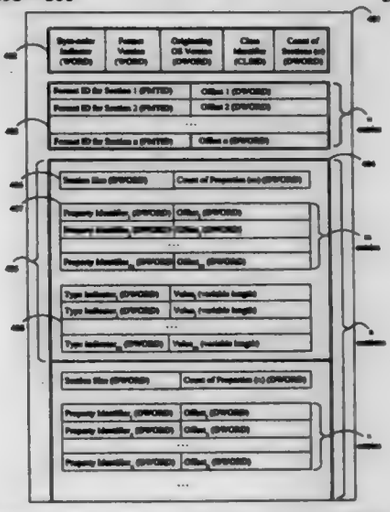


5,467,472

METHOD AND SYSTEM FOR GENERATING AND MAINTAINING PROPERTY SETS WITH UNIQUE FORMAT IDENTIFIERS

Antony Williams; Edward A. Martinez, both of Redmond, and Dean J. Hachamovitch, Seattle, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Apr. 15, 1994, Ser. No. 227,859
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **35 Claims**



1. A computer-implemented method for generating a property set in a storage device of a computer system, the method comprising the steps of:

allocating a property set stream within the storage device for storing the property set in the computer system;

storing header information in the property set stream, the header information having identifying information for identifying the property set;

storing a section locator in the property set stream, the section locator having a unique format identifier which uniquely identifies a corresponding section and having a location identifier for locating the corresponding section within the property set stream; and

storing the section within the property set stream, the section having a section header and having zero or more property definitions, each property definition including a property iden-

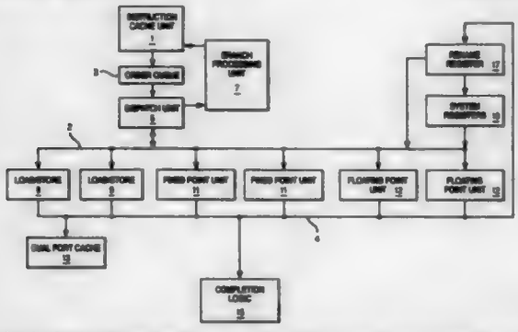
tifier which uniquely identifies the property definition within the section, each property definition including a property value containing data, and each property definition including a corresponding type indicator for indicating a format of the data stored in the property value.

5,467,473

OUT OF ORDER INSTRUCTION LOAD AND STORE COMPARISON

James A. Kahle, and Chin-Cheng Kau, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 8, 1993, Ser. No. 1,976
Int. Cl.[6] G06F *9/38*
U.S. Cl. 395—800 **19 Claims**



1. A data processing system that executes instructions which access a specific address in memory in a plurality of sequences, comprising:

means for reordering said instructions from a first sequence to a second sequence to enable simultaneous execution of said instructions in said second sequence;

means for storing said instructions in said first sequence, and for storing said instructions in said second sequence simultaneously;

a plurality of execution means for simultaneously executing said instructions in said second sequence; and

means for comparing, subsequent to execution of said instructions in said second sequence, whether the address of the non-executed instructions in said first sequence is the same as the address of the executed instructions in said second sequence, and for comparing an instruction number position in said means for storing of instructions in said first and second sequence which access the same address

wherein, if the address is the same and the instruction number for instructions in said first sequence is less than the instruction number for instructions in said second sequence, the data processing system continues executing instructions in said second sequence.

5,467,474

DISPLAY SYSTEM WITH SECTION ADDRESSABILITY

Marvin Ackerman, Sunnyvale, Calif.; Vincent Berluti, Southbury, Conn.; Terrell Poland, and Steven Waldron, both of Danbury, Conn., assignors to Electronic Retailing Systems International, Inc., Wilton, Conn.

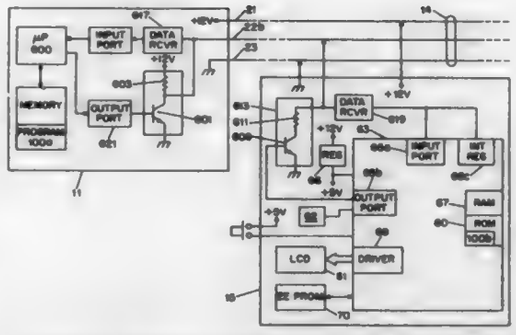
Division of Ser. No. 757,675, Sep. 10, 1991. This application Mar. 17, 1994, Ser. No. 210,163
Int. Cl.[6] G06F *3/147;17/60;* G08B *5/22;* G09F *21/04*
U.S. Cl. 395—800 **15 Claims**

1. A system for display of information regarding items which are arranged in an area, the system comprising:

a central computer;

a bus connected to the central computer;

a multiplicity of display devices connected to the central computer, each display device having a unique address on the bus



and being physically connectible to the bus in a multiplicity of locations, each display device capable of displaying data in response to a message from the central computer;

means within the central computer for maintaining records of the physical connection locations of the display devices, the records defining subareas within the area;

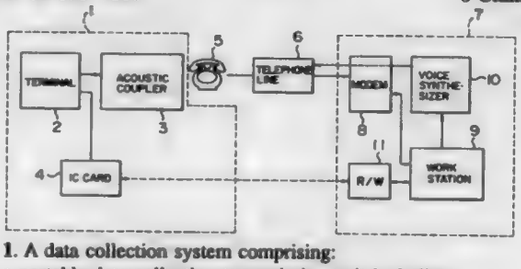
request detection means responsive to receipt of a display change request, for identifying the particular subarea corresponding to the request and transmitting on the bus at least one message relating to the display devices connected at locations in the particular subarea, whereby substantially all display devices in the particular subarea change from displaying any previously displayed data to displaying changed data in response to the request, and whereby substantially all display devices not in the particular subarea continue displaying previously displayed data.

5,467,475

DATA COLLECTION-TRANSMISSION APPARATUS AND DATA COLLECTION SYSTEM

Takehiro Takahashi; Kazuhiko Daito, both of Ibaraki, and Akihiro Kawaoka, Kanagawa, all of, Japan, assignors to Hitachi Maxell, Ltd., Osaka, and Hitachi, Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 689,908, Jun. 4, 1991, abandoned. This application Aug. 12, 1994, Ser. No. 290,308
Claims priority, application Japan, Jan. 13, 1989, 1-265225
Int. Cl.[6] G06F *17/40*
U.S. Cl. 395—800 **6 Claims**



1. A data collection system comprising:

a portable data collection-transmission unit including;

memory means for storing data,

operation means for entering operational instructions including data input/output instructions to said memory means,

a central processing unit for processing data input and output to/from said memory means in accordance with the operational instructions entered through said operation means,

a unidirectional acoustic coupler including signal processing circuit means for converting data read out of said memory means by said central processing unit in accordance with operational instructions from said operation means into a data input signal which can be transmitted over a telephone line, and

a speaker, responsive to said signal from said signal processing circuit means and converting the signal into an acoustic signal and supplying the acoustic signal to a telephone set, and

a data reception unit including;

demodulating means connected to said telephone line for converting the acoustic signal transmitted over said telephone line into a data output signal,

information terminal means for storing said data output signal from said demodulating means to judge the result of the received data, and

acoustic synthesizing means connected to said telephone line for generating a synthesized response message and coupling said response message to said data collection-transmission unit over the telephone line in response to the result of the received data judged by said information terminal means.

5,467,476

SUPERSCALAR PROCESSOR HAVING BYPASS CIRCUIT FOR DIRECTLY TRANSFERRING RESULT OF INSTRUCTION EXECUTION BETWEEN PIPELINES WITHOUT BEING WRITTEN TO REGISTER FILE

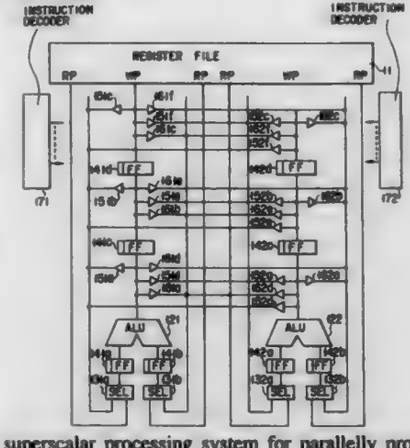
Takashi Kawasaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 874,135, Apr. 27, 1992, abandoned. This application Aug. 19, 1994, Ser. No. 293,164

Claims priority, application Japan, Apr. 30, 1991, 3-099132

Int. Cl.[6] G06F *9/34;9/22*

U.S. Cl. 395—800 **4 Claims**



1. A superscalar processing system for parallelly processing a plurality of instructions using a superscalar method, comprising:

first and second instruction execution operating units;

a register file having first and second read ports and first and second write ports; and

first and second instruction decoders, said first and second instruction decoders responding to said first and second instruction execution operating units, respectively;

said first instruction execution operating unit including:

a first pipeline having a first terminal connected to said first write port,

a first arithmetic and logic unit having an output port connected to a second terminal of said first pipeline,

two two-input selector circuits for selectively receiving data to be processed in accordance with instructions,

two flip-flop circuits, each positioned between respective ones of said two-input selector circuits and an input port of said first arithmetic and logic unit, and

a first group of flip-flop circuits arranged on said first pipeline for storing data;

said second instruction execution operating unit including:

a second pipeline having a first terminal connected to said second write port,

a second arithmetic and logic unit having an output port connected to a second terminal of said pipeline,

two two-input selector circuits for selectively receiving data to be processed in accordance with instructions,

two flip-flop circuits, each positioned between respective ones of said two-input selector circuits and an input port of said second arithmetic and logic unit, and

a second group of flip-flop circuits arranged on said second pipeline for storing data;

a first group of bypass circuits, each connecting said first pipeline to one of said two two-input selection circuits of said second instruction execution operating unit, for transferring data stored in said first group of flip-flop circuits to said one of said two two-input selection circuits of said second instruction execution operating unit; and

a second group of bypass circuits, each connecting said second pipeline to one of said two two-input selection circuits of said first instruction execution operating unit, for transferring data stored in said second group of flip-flop circuits to said one of said two two-input selection circuits of said first instruction execution operating unit.

5,467,477

ANTENNA AND TUNER COMBINATION

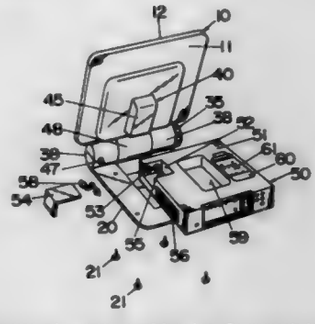
Takashi Furuta; Hajime Takeda, both of Osaka; Hiroyuki Nishimura, Yawata; Tsuyoshi Kadono; Hirofumi Ishizaki, both of Osaka, and Akira Uesaka, Ikoma, all of, Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Apr. 29, 1992, Ser. No. 875,678

Claims priority, application Japan, Nov. 21, 1991, 3-306077

Int. Cl.[6] H04B *1/08;* H01Q *1/24*

U.S. Cl. 455—348 **3 Claims**



1. An antenna and tuner combination for receiving microwaves from a broadcasting satellite, comprising:

a stand plate;

a flat planar antenna module connected by a hinge assembly to said stand plate in a supported relation thereto so as to be movable between a folded position upon said stand plate and an extended position extending from said stand plate, said antenna module having an output terminal;

adjustor means for adjusting the antenna module to a desired angular disposition with respect to a plane of said stand plate and holding it at said desired angular disposition; and

a tuner detachably mounted on said stand plate and having an input terminal detachably connected to said output terminal of said antenna module and a tuner output terminal for providing video and audio signals to a television set, said antenna module including a frequency converter which is disposed to project on the back of said antenna module, said frequency converter being received within a recess formed in the top surface of said tuner when said antenna module is folded over said tuner on said stand plate;

wherein said hinge assembly comprises a hinge shaft extending through and supported by a pair of brackets which extend from said stand plate and are spaced in an axial direction of said hinge shaft, a pair of tabs extending from said antenna module and positioned axially inwardly of said pair of brackets adjacent thereto in such a relation that said hinge shaft extends through said tabs to rotatably support said antenna module about said hinge shaft, a sleeve ring fitted around said hinge shaft between said tabs with its opposite ends abutted

against said tabs, respectively, and an operator handle secured to one axial end of said hinge shaft, said brackets being allowed to move in said axial direction to a limited extent, said hinge shaft formed with a pair of axially spaced right-hand and left-hand threads which are in threaded engagement with correspondingly threaded holes in said brackets, respectively, such that rotation of said hinge shaft by said handle in one direction causes said pair of brackets to move axially inwardly to tighten said tabs between said pair of brackets and the axial ends of said sleeve ring, respectively, and that rotation of said hinge shaft in the opposite direction causes said pair of brackets to move axially outwardly to release said tabs from between said pair of brackets and the axial ends of said sleeve ring, respectively.

DESIGNS

NOVEMBER 14, 1995

364,031

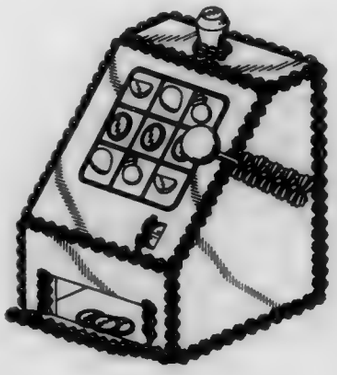
GINGERBREAD SLOT MACHINE

Kathleen A. Ryder, and Samuel J. Ryder, both of 1346 Juniper, both of Rock Springs, Wyo. 82901

Filed Dec. 8, 1994, Ser. No. 31,896

Term of patent 14 years

U.S. Cl. D1—106



364,032

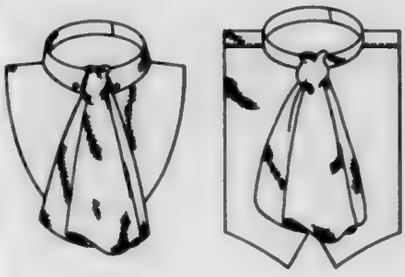
ADULT BIB

Kristal M. Caley, 200 N. Burr Oak, Lake Zurich, Ill. 60047

Filed Jun. 13, 1994, Ser. No. 24,346

Term of patent 14 years

U.S. Cl. D2—861



364,033

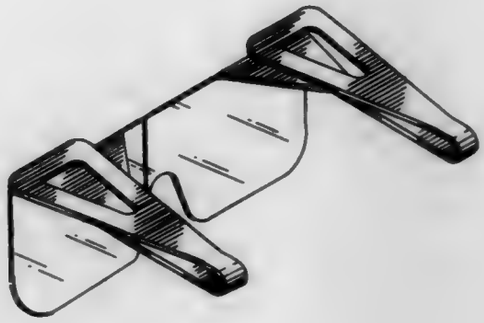
BASEBALL HAT VISOR

Joseph Romano, 957 Sycamore Ave., Bohemia, N.Y. 11716

Filed Jun. 27, 1994, Ser. No. 25,087

Term of patent 14 years

U.S. Cl. D2—894



364,034

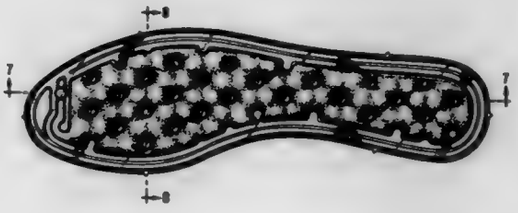
BLADDER FOR A SHOE SOLE

Lester Q. Lee, Gaston, and John C. Tawney, Portland, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.

Filed Oct. 20, 1994, Ser. No. 30,087

Term of patent 14 years

U.S. Cl. D2—961



364,035

BLADDER FOR A SHOE SOLE

Lester Q. Lee, Gaston, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Feb. 21, 1995, Ser. No. 35,145

Term of patent 14 years

U.S. Cl. D2—961

364,036

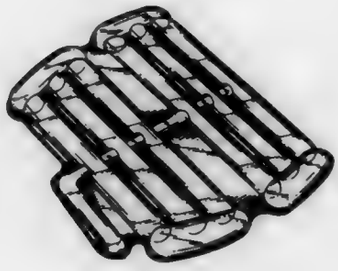
BLADDER FOR A SHOE SOLE

Joel L. Passke, Portland; James C. Sell, Jr., Beaverton; Michael T. Donaghu, and John C. Tawney, both of Portland, all of Oreg., assignors to Nike, Inc., Beaverton, Oreg.

Filed Mar. 15, 1995, Ser. No. 36,196

Term of patent 14 years

U.S. Cl. D2—961



364,037

SHOE UPPER

Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Aug. 30, 1994, Ser. No. 27,831

Term of patent 14 years

U.S. Cl. D2—969

364,038

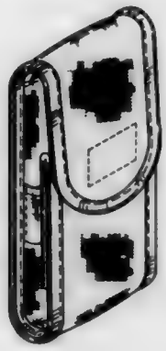
HANDCUFF POUCH

Emery J. Stanchin, 9617 Yarmouth Ct., Louisville, Ky. 440272

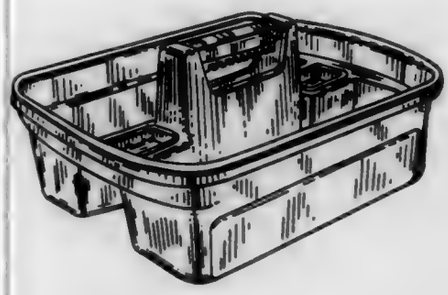
Filed Jul. 29, 1994, Ser. No. 26,494

Term of patent 14 years

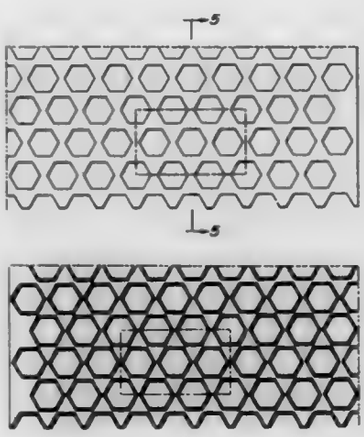
U.S. Cl. D3—230



364,039
CADDY WITH HANDLE
Cory J. Kruger, Gardner, Mass., assignor to Sterilite Corporation, Townsend, Mass.
Filed Aug. 8, 1994, Ser. No. 26,832
Term of patent 14 years
U.S. Cl. D3—315

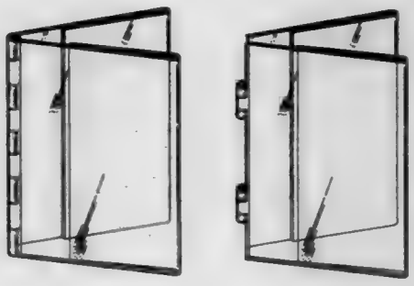


364,040
APERTURED COVERSTOCK FOR ABSORBENT ARTICLES
Stuart P. Suskind, Wayne, Pa., assignor to Confab, Inc., Wayne, Pa.
Filed Jul. 1, 1994, Ser. No. 25,453
Term of patent 14 years
U.S. Cl. D5—1

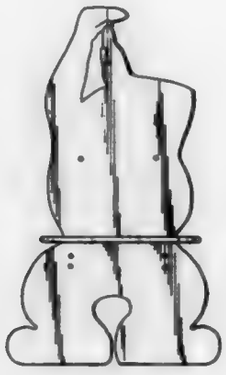


364,041
MIRROR
Sally S. Lewis, 8727 Melrose Ave., Los Angeles, Calif. 90069-5086
Filed Oct. 12, 1993, Ser. No. 14,045
Term of patent 14 years
U.S. Cl. D6—306

364,042
GREETING CARD SUPPORT DEVICE
Paula N. Chavaz, and Daniel L. Murphy, both of 1707 Pine Knoll Dr., Belmont, Calif. 94002
Filed Aug. 31, 1993, Ser. No. 12,483
Term of patent 14 years
U.S. Cl. D6—314

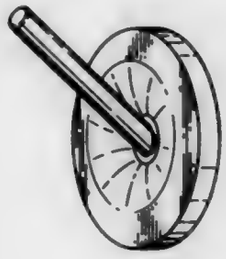


364,043
CHILD'S CHAIR
Amy L. Horn, 2680 Swansea Rd., Columbus, Ohio 43221
Filed Oct. 27, 1994, Ser. No. 30,073
Term of patent 14 years
U.S. Cl. D6—359



364,044
CHAIR
Giuseppe Proietto, Madison, Wis., and John Geiger, Atlanta, Ga., assignors to Geiger International, Inc., Atlanta, Ga.
Filed Jan. 7, 1994, Ser. No. 17,231
Term of patent 14 years
U.S. Cl. D6—366

364,045
HOOK
Philippe Starck, Montfort L'Amaury, France, assignor to Hans Grohe GmbH & Co. KG, Germany
Filed Aug. 4, 1994, Ser. No. 26,707
Claims priority, application Germany, Feb. 8, 1994, 94 01 167.2
Term of patent 14 years
U.S. Cl. D8—367



364,046
ARM CHAIR
H. Thomas Keller, High Point, N.C., assignor to Bernhardt Furniture Company, Lenoir, N.C.
Filed Sep. 13, 1994, Ser. No. 28,376
Term of patent 14 years
U.S. Cl. D6—379

364,047

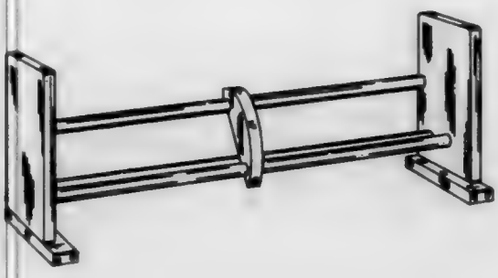
SHELF UNIT

Paul G. Bucher, P.O. Box 5889-1000, San Jose, Costa Rica

Filed Aug. 31, 1994, Ser. No. 27,888

Term of patent 14 years

U.S. Cl. D6—407



364,048

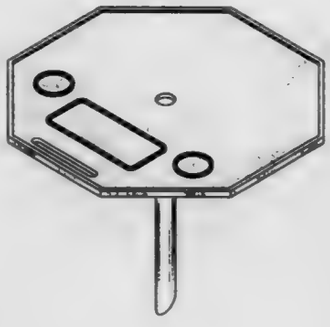
BEACH TABLE

Phillip S. Winslow, Sr., 201 Orville Ct., Kill Devil Hills, N.C. 27948

Filed Feb. 28, 1994, Ser. No. 19,270

Term of patent 14 years

U.S. Cl. D6—417



364,049

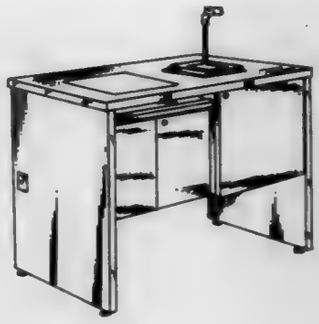
INSTRUCTOR PODIUM

John N. Lechman, Effingham, Ill., assignor to Nova Solutions, Inc., Effingham, Ill.

Filed Jun. 9, 1994, Ser. No. 24,148

Term of patent 14 years

U.S. Cl. D6—419



364,050

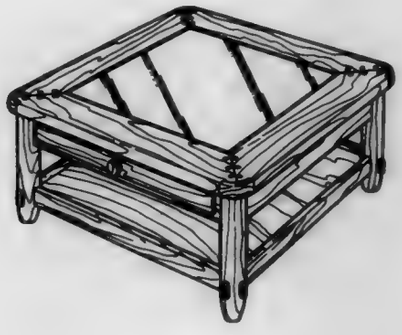
TABLE

Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.

Filed Mar. 24, 1994, Ser. No. 20,405

Term of patent 14 years

U.S. Cl. D6—436



364,051

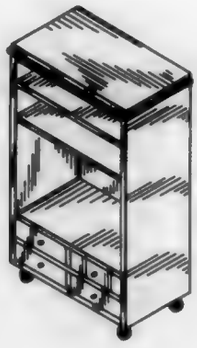
ENTERTAINMENT UNIT

Richard D. Berry, Jr., and David A. Clark, both of Hickory, N.C., assignors to Ethan Allen Inc., Danbury, Conn.

Filed Dec. 19, 1994, Ser. No. 32,402

Term of patent 14 years

U.S. Cl. D6—436



364,052

DISPLAY ASSEMBLY FOR GOLF EQUIPMENT

Ernst F. Sturm, 9612 Magnolia Dr., Hillsboro, Mo. 63050

Filed Jun. 17, 1994, Ser. No. 24,644

Term of patent 14 years

U.S. Cl. D6—466

364,053

MEDICAL CABINET

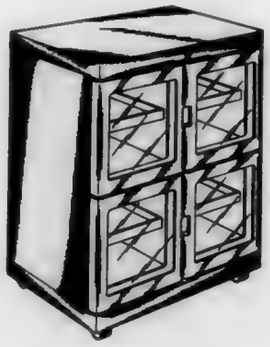
Yukou Hayashi, Ota; Kimie Takashima, and Masaki Hase, both of Oizumi, all of, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 14, 1994, Ser. No. 28,401

Claims priority, application Japan, Jun. 3, 1994, 6-16415

Term of patent 14 years

U.S. Cl. D6—470



364,054

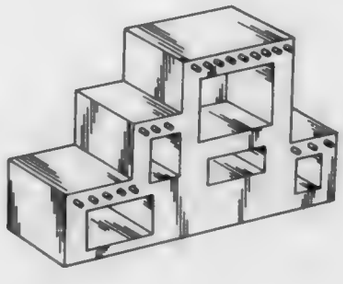
ENTERTAINMENT CENTER

Debbie A. Weber, P.O. Box 80731, Albuquerque, N.M. 87198

Filed Feb. 18, 1994, Ser. No. 18,982

Term of patent 14 years

U.S. Cl. D6—474



364,055

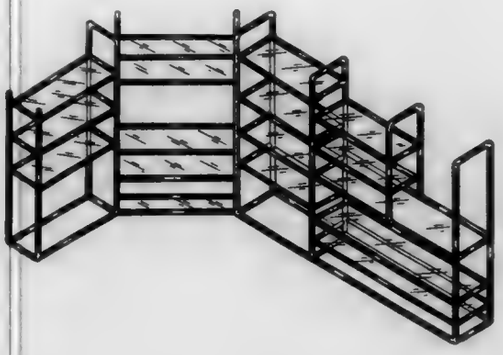
SHELF SYSTEM

Waclaw J. Pakla, 425 Broadmeadows Blvd. #316, Columbus, Ohio 43214

Filed Nov. 29, 1994, Ser. No. 31,597

Term of patent 14 years

U.S. Cl. D6—477



364,056

CONSOLE TABLE

Richard D. Berry, Jr., and David A. Clark, both of Hickory, N.C., assignors to Ethan Allen Inc., Danbury, Conn.

Filed Dec. 19, 1994, Ser. No. 32,406

Term of patent 14 years

U.S. Cl. D6—483

364,057

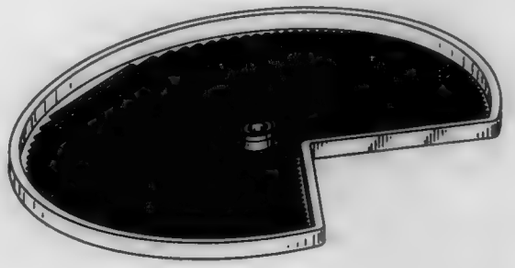
LAZY SUSAN SHELF

Thomas C. Bowman, Grand Rapids, Mich., assignor to Midwest Design, Inc., Grand Rapids, Mich.

Continuation of Ser. No. 952,283, Sep. 28, 1992, abandoned. This application Feb. 16, 1993, Ser. No. 4,876

Term of patent 14 years

U.S. Cl. D6—511



364,058

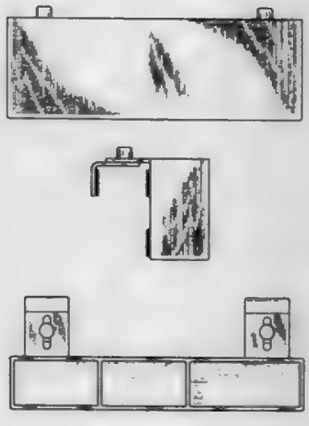
REMOTE CONTROL HOLDER

Philip A. Wilk, 17631 Goose Creek Rd., Olney, Md. 20832

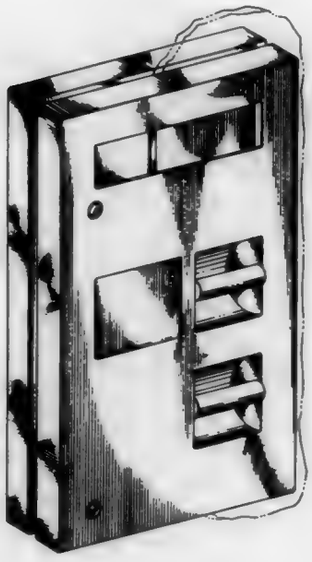
Filed Oct. 18, 1993, Ser. No. 14,269

Term of patent 14 years

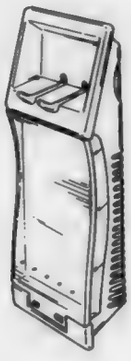
U.S. Cl. D6—513



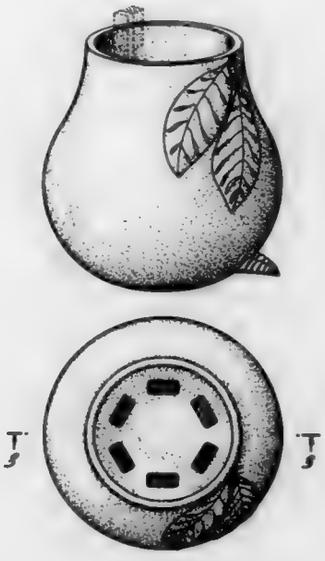
364,059
PARTITION-MOUNTED DUAL COMBINED SEAT COVER DISPENSER, TOILET PAPER DISPENSER, AND WASTE RECEPTACLE UNIT
Frank Merriweather, Jr., Carson, Calif., assignor to Bobrick Washroom Equipment, Inc., Los Angeles, Calif.
Filed May 27, 1994, Ser. No. 23,607
Term of patent 14 years
U.S. Cl. D6—519



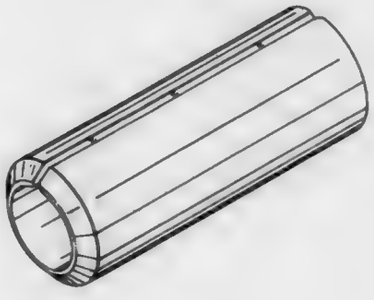
364,060
HOLDER FOR SHAVER AND CARTRIDE
Chung-Sung Lai, No. 518, HuShan Road, Ch'ao-Tun, Nan-Tao Hsien, Taiwan, Prov. of China
Filed Nov. 15, 1994, Ser. No. 31,231
Term of patent 14 years
U.S. Cl. D6—526



364,061
TOOTH BRUSH HOLDER
Leonor Burga, 454 Melody La., Placentia, Calif. 92670
Filed Apr. 27, 1993, Ser. No. 7,576
Term of patent 14 years
U.S. Cl. D6—534



364,062
TOOTHPASTE TUBE ROLLUP DEVICE
Joe C. Garcia, 249 Spring St., Clyde, Ohio 43410
Filed Apr. 29, 1994, Ser. No. 22,198
Term of patent 14 years
U.S. Cl. D6—541



364,063

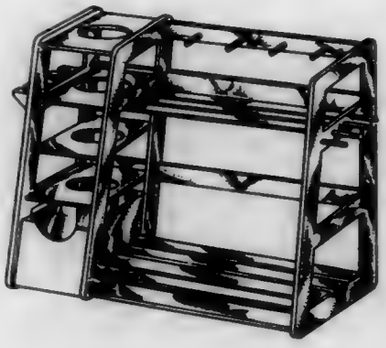
SPORTS EQUIPMENT RACK

Wei Wu Lo, No. 14, Lane 177, Guang-Fu N Rd., Taipei, Taiwan, Prov. of China

Filed Aug. 18, 1994, Ser. No. 27,330

Term of patent 14 years

U.S. Cl. D6—552



364,064

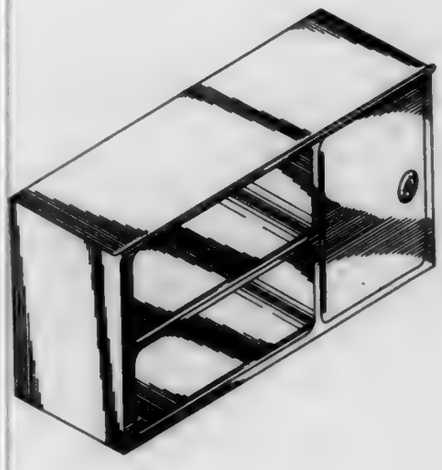
MODULAR CABINET UNIT

Kenneth C. Lorenz, 8 S. 484 Oxford La., Naperville, Ill. 60565

Filed Jan. 10, 1994, Ser. No. 17,241

Term of patent 14 years

U.S. Cl. D6—559



364,065

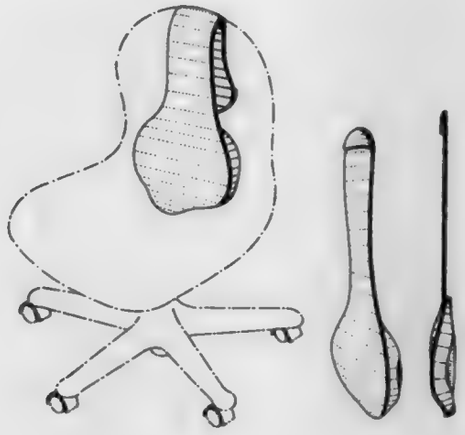
LUMBAR SUPPORT CUSHION

Stephen Peart, Los Gatos, Calif., and Ross Lovegrove, London, England, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1994, Ser. No. 20,315

Term of patent 14 years

U.S. Cl. D6—601



364,066

COMPACT DISC STAND

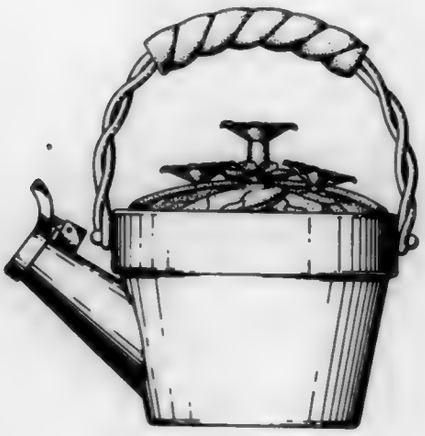
Wayne J. Haskett, 12050 Greenwood, Blue Island, Ill. 60406; John A. Andersen, 9514 S. Francisco, Evergreen Park, Ill. 60647, and Leonard Andersen, 5361 W. Otto, Oak Lawn, Ill. 60453

Filed Dec. 1, 1994, Ser. No. 31,614

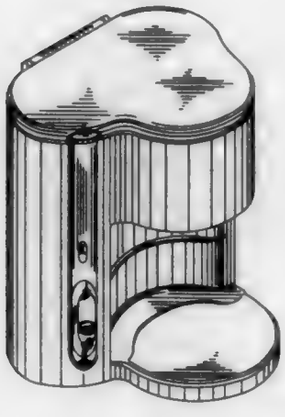
Term of patent 14 years

U.S. Cl. D6—629

364,067
KETTLE
Bruce Ancona; Jane Ancona; Mary J. DeGuzman, all of New York, N.Y., and Craig R. LaRosa, Red Bank, N.J., assignors to B. Via International Housewares, Inc., Englewood Cliffs, N.J.
Filed Aug. 5, 1994, Ser. No. 26,783
Term of patent 14 years
U.S. Cl. D7—302

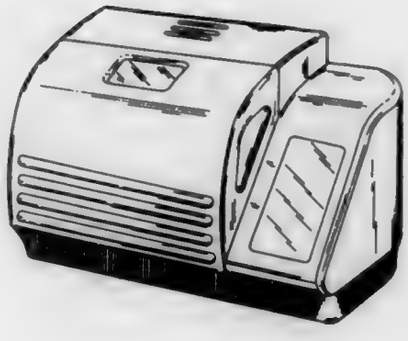


364,068
COFFEEMAKER
Don R. McCloskey, Troy, Ohio, and Anthony B. Rorke, Guilford, Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Dec. 14, 1994, Ser. No. 32,196
Term of patent 14 years
U.S. Cl. D7—309

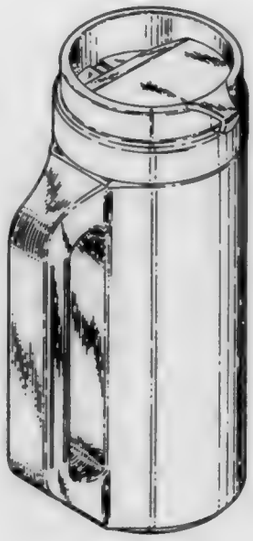


364,069
INSULATED JUG
Frank T. S. Huang, Ste. 804, 8 Fl., No. 128, Sec. 3, Ming-Sheng E. Rd., Taipei, Taiwan, Prov. of China
Filed Jul. 28, 1994, Ser. No. 26,450
Term of patent 14 years
U.S. Cl. D7—317

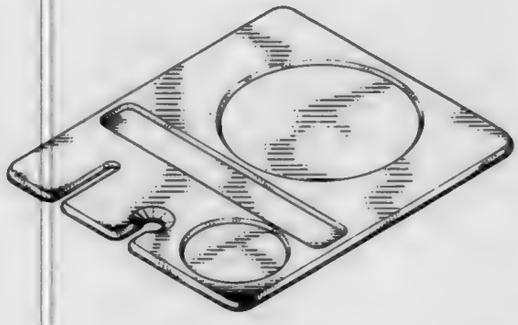
364,070
WIDE LOAF BREADMAKER
Annette T. Klein, Jackson; David C. Belongia, West Bend, both of Wis.; William C. Cesaroni, Glenview, Ill.; Shawn Barrett, Grayslake, Ill., and Steven Cozzolino, Chicago, Ill., assignors to The West Bend Company, West Bend, Wis.
Filed Aug. 1, 1994, Ser. No. 26,542
Term of patent 14 years
U.S. Cl. D7—350



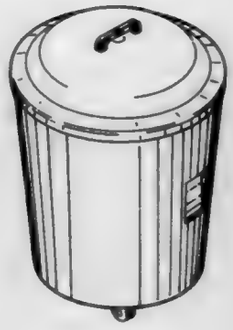
364,071
BOTTLE
Larry G. Lynd, c/o Lynd Properties, Ltd. 411 N. Reynoldsburg-New Albany Rd., Columbus, Ohio 43213
Filed Jun. 21, 1994, Ser. No. 24,765
Term of patent 14 years
U.S. Cl. D7—510



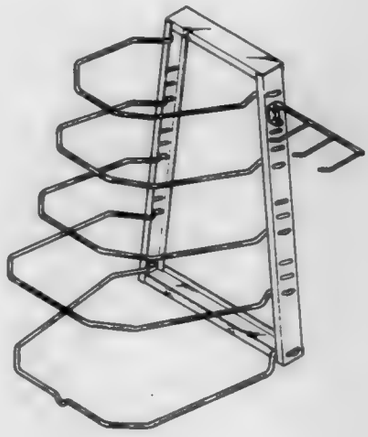
364,072
PARTY TRAY
Denis Keable, 3-284 Notre Dame Street, Winnipeg, Manitoba, Canada
Filed Jul. 15, 1994, Ser. No. 25,979
Claims priority, application Canada, Jan. 25, 1994, 19940113
Term of patent 14 years
U.S. Cl. D7—553



364,073
MOBILE COOLER
Peter V. Langley, 49 Telford Crescent Stirling, Perth, Australia
Filed Feb. 3, 1994, Ser. No. 18,339
Claims priority, application Australia, Aug. 6, 1993, 2422/93
Term of patent 14 years
U.S. Cl. D7—605



364,074
RACK FOR KITCHEN UTENSILS
Kuo S. Yeh, No. 15, Lane 33, Wei Kuo St., Tainan City, Taiwan, Prov. of China
Filed Sep. 14, 1994, Ser. No. 28,242
Term of patent 14 years
U.S. Cl. D7—637



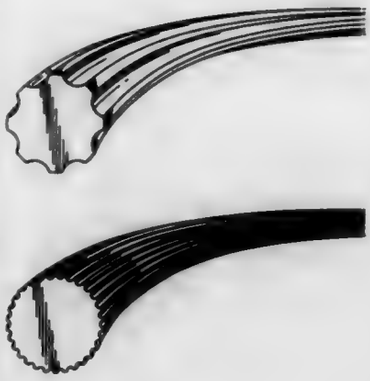
364,075
SPOON
Christer P. O. Brogren, Norrbackagatan 8, S-113 41, Stockholm, Sweden
Filed Sep. 22, 1993, Ser. No. 13,922
Claims priority, application Sweden, Mar. 22, 1993, 93-0704
Term of patent 14 years
U.S. Cl. D7—653

364,076
SPOON
Alphonse V. Lordo, 705 Olive St., St. Louis, Mo. 63101
Filed Nov. 22, 1993, Ser. No. 15,568
Term of patent 14 years
U.S. Cl. D7—653

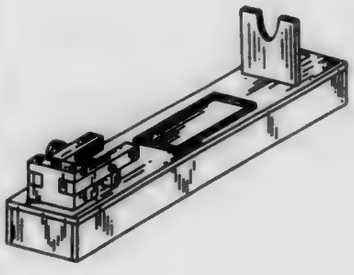
364,077
HANDLE FOR FORKS, SPOONS, AND TOOTHBRUSHES
Susan Harrison, Wichita Falls, Tex., assignor to Zooth, Inc., Wichita Falls, Tex.
Continuation-in-part of Ser. No. 3,463, Jan. 12, 1993, Pat. No. 5,269,420. This application Oct. 22, 1993, Ser. No. 14,528
Term of patent 14 years
U.S. Cl. D7—654

364,078
CONDIMENT DISPENSER
Frans M. Weterings, Tuscumbia, Ala., assignor to Robbins Industries, Inc., Florence, Ala.
Filed Jan. 7, 1994, Ser. No. 17,213
Term of patent 14 years
U.S. Cl. D7—679

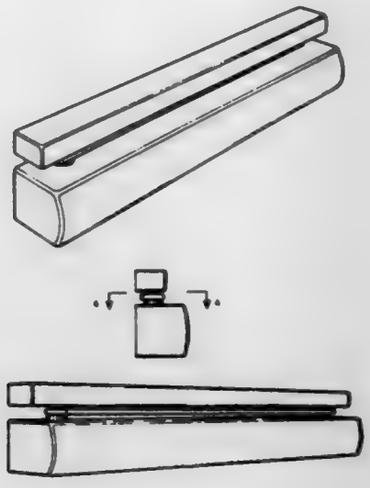
364,079
CUTTING LINE FOR A ROTATING LINE TRIMMER
David B. Skinner, Columbia, S.C., assignor to Shakespeare Company, Columbia, S.C.
Filed Feb. 12, 1992, Ser. No. 834,520
Term of patent 14 years
U.S. Cl. D8—8



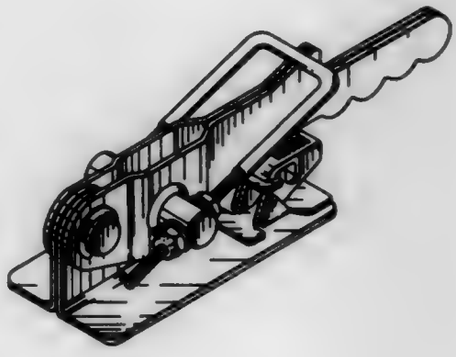
364,080
GUN VISE
George Weyrauch, P.O. Box 116, Bear Creek, Pa. 18602
Filed Jul. 29, 1994, Ser. No. 26,524
Term of patent 14 years
U.S. Cl. D8—74



364,081
DOOR CLOSER UNIT
David P. Yates, Sutton Coldfield, and Michael D. Knight, Birmingham, both of, England, assignors to NT Door Controls Ltd., Birmingham, England
Filed Aug. 4, 1994, Ser. No. 26,822
Claims priority, application United Kingdom, Feb. 28, 1994, 2037399
Term of patent 14 years
U.S. Cl. D8—330



364,082
HANDLE OPERATED DRAW LATCH ASSEMBLY WITH LOCKABLE SAFETY CATCH
Lee S. Weinerman, Medina, and Arthur J. Kuminski, Parma, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 65,283, May 21, 1993, abandoned, and a continuation-in-part of Ser. No. 8,629, May 21, 1993, abandoned. This application Jul. 20, 1994, Ser. No. 26,147
Term of patent 14 years
U.S. Cl. D8—331

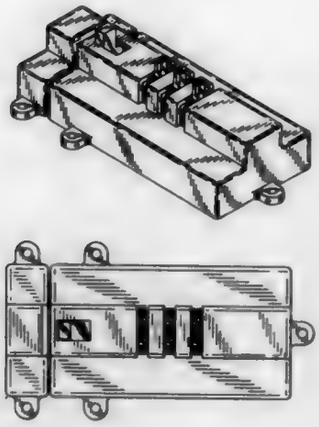


364,083

COMBINATION SURFACE BOLT

Theodore J. Werner, Dix Hills, N.Y., assignor to United States Marketing Corporation (Delaware), Huntington Station, N.Y.

Filed Oct. 14, 1994, Ser. No. 29,729
Term of patent 14 years
U.S. Cl. D8—331

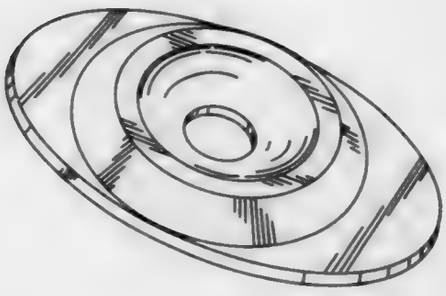


364,084

GROMMET

Floyd Yaich, 97 Center Ave., Jim Thorpe, Pa. 18229

Filed Sep. 12, 1994, Ser. No. 28,256
Term of patent 14 years
U.S. Cl. D8—356

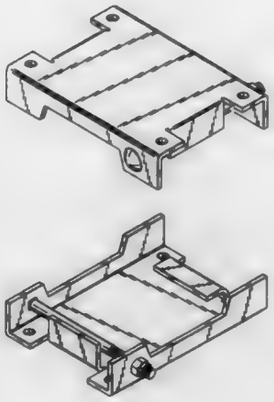


364,085

CASTER PAD

Kurt D. Beckman, Laguna Niguel, and James R. Dunbar, San Juan Capistrano, both of Calif., assignors to Lyn Seaquist, San Juan Capistrano, Calif.

Filed Dec. 14, 1994, Ser. No. 32,220
Term of patent 14 years
U.S. Cl. D8—375

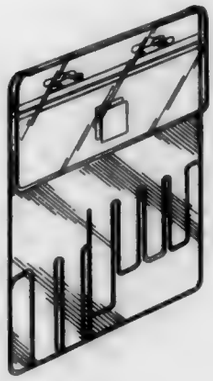


364,086

PLASTIC POUCH WITH SUBDIVIDED COMPARTMENTS

Arthur F. Jacobson, 1414 Jacobson Dr., Waukegan, Ill. 60085-7408

Filed Feb. 24, 1994, Ser. No. 19,144
Term of patent 14 years
U.S. Cl. D9—305



364,087

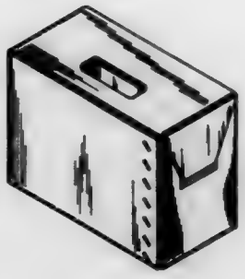
CORRUGATED CARTON

Timothy R. Farley, Henderson, Ky., assignor to The Servants, Inc., Jasper, Ind.

Filed Sep. 30, 1994, Ser. No. 29,229

Term of patent 14 years

U.S. Cl. D9—418



364,088

COLLAPSIBLE CONTAINER

Edward S. Robbins, III, 2802 E. Avalon Ave., Muscle Shoals, Ala. 35661

Division of Ser. No. 7,106, Apr. 16, 1993, Pat. No. Des. 358,764, and a continuation-in-part of Ser. No. 12,122, Feb. 1, 1993, abandoned. This application Oct. 31, 1994, Ser. No. 30,465

Term of patent 14 years

U.S. Cl. D9—428

364,089

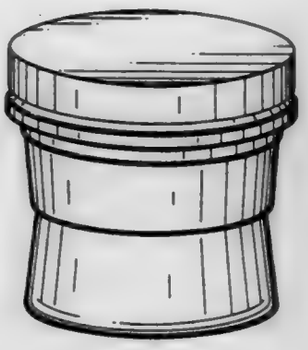
COLLAPSIBLE CONTAINER

Edward S. Robbins, III, 2802 E. Avalon Ave., Muscle Shoals, Ala. 35661

Division of Ser. No. 7,106, Apr. 16, 1993, Pat. No. Des. 358,764, which is a continuation-in-part of Ser. No. 12,122, Feb. 1, 1993, abandoned. This application Oct. 31, 1994, Ser. No. 30,466

Term of patent 14 years

U.S. Cl. D9—428



364,090

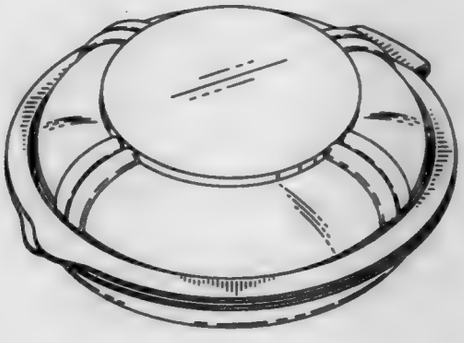
SHRIMP PACKAGE WITH HINGED LID

Calvin S. Krupa, 750 Navajo Rd., Medina, Minn. 55340

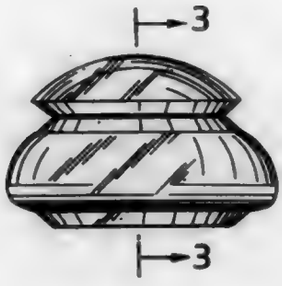
Filed Oct. 3, 1994, Ser. No. 29,304

Term of patent 14 years

U.S. Cl. D9—429



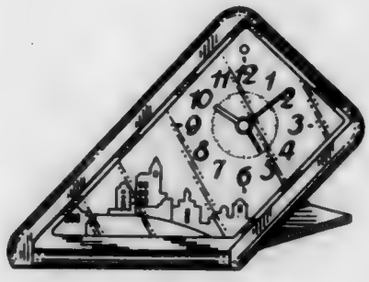
364,091
CONTAINER
Pierre Dinand, Levallois Perret, France, assignor to Pacific Corporation, Seoul, Rep. of Korea
Division of Ser. No. 8,621, May 20, 1993. This application Sep. 29, 1994, Ser. No. 29,126
Claims priority, application Rep. of Korea, Nov. 20, 1992, 1992-19597; Nov. 20, 1992, 1992-19598
Term of patent 14 years
U.S. Cl. D9—503



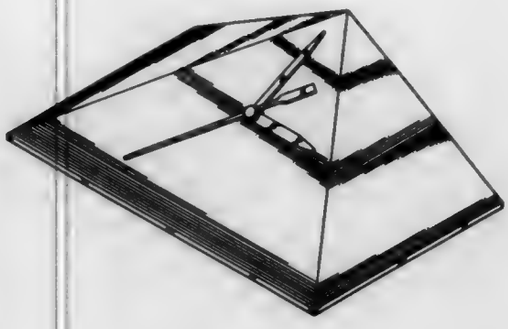
364,092
BOTTLE
Stuart H. Feen, Libertyville, Ill., assignor to Plastic Bottle Corporation, Libertyville, Ill.
Filed Dec. 1, 1994, Ser. No. 31,617
Term of patent 14 years
U.S. Cl. D9—542

364,093
COMBINED CONTAINER AND CAP FOR SALAD DRESSING
Edmund A. Weaver, Jr., Racine, Wis., assignor to Kraft Foods, Inc., Northfield, Ill.
Filed Sep. 30, 1992, Ser. No. 954,921
Term of patent 14 years
U.S. Cl. D9—563

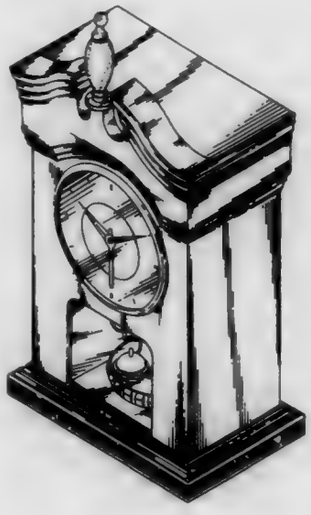
364,094
CLOCK
Mayumi Fujimori, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Feb. 28, 1995, Ser. No. 35,472
Term of patent 14 years
U.S. Cl. D10—20



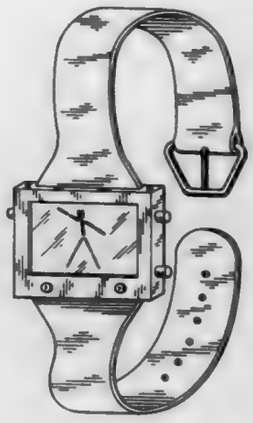
364,095
CLOCK
Ronnie C. W. Mak, Kowloon, Hong Kong, assignor to Sanny Electronics Limited, Kowloon, Hong Kong
Filed Mar. 8, 1995, Ser. No. 35,861
Term of patent 14 years
U.S. Cl. D10—21



364,096
CLOCK
Hsien-Chang Pan, P.O. Box:212, Hsin Chung, Taipei, Taiwan, Prov. of China
Filed Dec. 6, 1994, Ser. No. 32,105
Term of patent 14 years
U.S. Cl. D10—29



364,097
WRIST-BORNE EXERCISE DISPLAY DEVICE
Carl F. Mickey, Sr., P.O. Box 2044, High Point, N.C. 27261
Filed Jun. 8, 1992, Ser. No. 896,564
Term of patent 14 years
U.S. Cl. D10—125



364,098
WRISTWATCH
Barbara Giardiello, Naples, Italy, assignor to Artime SA, Neuchatel, Switzerland
Filed Sep. 14, 1994, Ser. No. 28,394
Claims priority, application Hague Agreement, Mar. 14, 1994, DMA/002451
Term of patent 14 years
U.S. Cl. D10—32

364,099

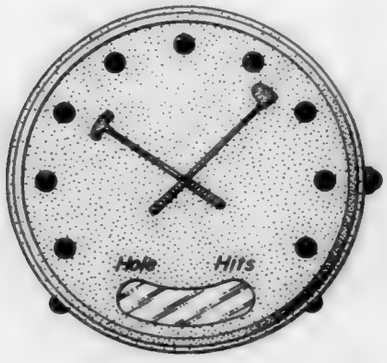
WATCH

Hubert Bergeron, PH 10–120 Donald Street, Winnipeg, Manitoba, Canada

Filed Aug. 22, 1994, Ser. No. 27,456

Term of patent 14 years

U.S. Cl. D10—33



364,100

WRISTWATCH

Barbara Giardiello, Napes, Italy, assignor to Artime SA, Neuchatel, Switzerland

Filed Sep. 7, 1994, Ser. No. 28,083

Claims priority, application WIPO, Mar. 8, 1994, DMA/002449

Term of patent 14 years

U.S. Cl. D10—39

364,101

PARKING METER TIMER

Lavan Bradley, 22543 Ventura Blvd. #224, Woodland Hills, Calif. 91364

Filed Oct. 31, 1994, Ser. No. 30,454

Term of patent 14 years

U.S. Cl. D10—40

364,102

CRIBBAGE BOARD

Edwin B. Coleman, Jr., 84 Branch Turnpike, Box 64, Concord, N.H. 03301

Filed Aug. 25, 1994, Ser. No. 27,627

Term of patent 14 years

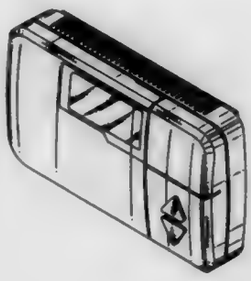
U.S. Cl. D10—46.1

364,103

THERMOSTAT

Gregory A. Stievenart, Ft. Wayne, Ind.; Philip A. Hider, Marcellus; Pasquale Fasulo, Liverpool, both of N.Y., and Mark D. Dzierak, Chicago, Ill., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 20, 1995, Ser. No. 33,833
Term of patent 14 years
U.S. Cl. D10—50

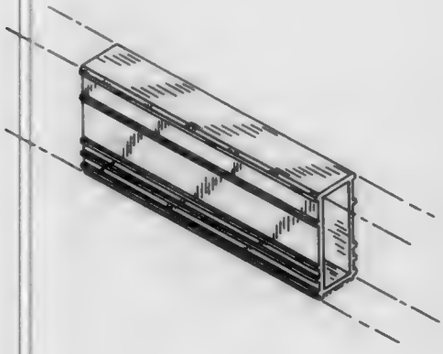


364,104

EXTRUSION FOR A BOX BEAM LEVEL

William G. Johnson, Mequon, Wis., assignor to Johnson Level & Tool Mfg. Co., Inc., Mequon, Wis.

Filed Apr. 26, 1994, Ser. No. 21,936
Term of patent 14 years
U.S. Cl. D10—74

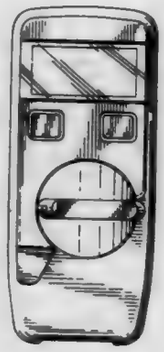


364,105

DIGITAL MULTI METER

Makoto Omuro, Suwa, and Manabu Kamiya, Tokyo, both of, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Apr. 7, 1994, Ser. No. 21,038
Claims priority, application Japan, Jan. 15, 1993, 5-31479
Term of patent 14 years
U.S. Cl. D10—78

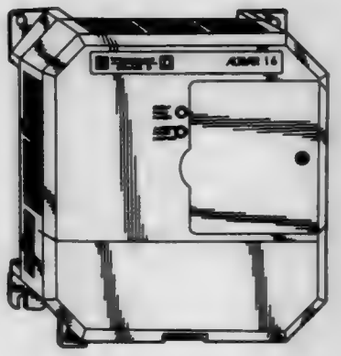


364,106

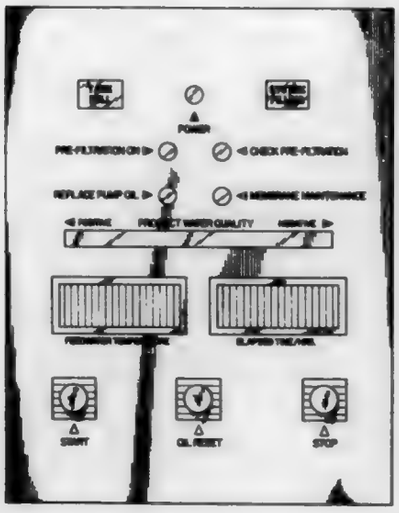
SPEED CONTROLLER AND ITS ADDITIVES

Christophe Dore, Fontenay le Fleury, France, assignor to Telemecanique, Rueil Malmaison, France

Filed Oct. 21, 1993, Ser. No. 14,419
Claims priority, application France, Apr. 21, 1993, 932146
Term of patent 14 years
U.S. Cl. D10—96

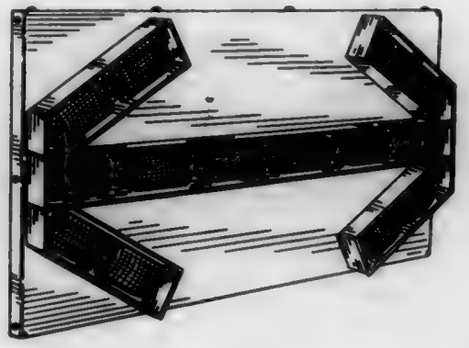


364,107
CONTROL PANEL FOR A WATER FILTRATION SYSTEM
Marwan F. Nesicolaci, Torrance, Calif., assignor to Universal Aqua Technologies, Inc., Santa Fe Springs, Calif.
Filed Jan. 19, 1993, Ser. No. 3,849
Term of patent 14 years
U.S. Cl. D10—103



364,108
SMOKE DETECTOR COVER
Kenneth I. DeWitt, Phoenix, Md., assignor to Universal Security Instruments, Inc., Owings Mills, Md.
Filed Jan. 30, 1995, Ser. No. 34,186
Term of patent 14 years
U.S. Cl. D10—106

364,109
SIGN FOR SIGNALLING DIRECTION OF TRAFFIC FLOW
Edward S. Stanuch, Oak Forest, and Donald E. Weger, Bradley, both of Ill., assignors to Federal Signal Corporation, Oak Brook, Ill.
Continuation of Ser. No. 20,551, Mar. 25, 1994, abandoned.
This application Sep. 14, 1994, Ser. No. 28,871
Term of patent 14 years
U.S. Cl. D10—114



364,110
FIBER OPTIC TREE STANDARD
Robert Johnson, Box 7506, Abu. Dhabi, United Arab Emirates
Filed Apr. 14, 1994, Ser. No. 21,293
Term of patent 14 years
U.S. Cl. D11—118

364,111

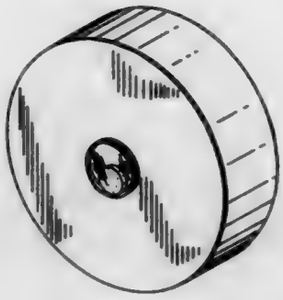
WALL PLAQUE

Raymond Smolik, Minneapolis, Minn., assignor to Daniel G. Dreyfuss, Belgrade, Mont.

Filed Jul. 25, 1994, Ser. No. 26,263

Term of patent 14 years

U.S. Cl. D11—132



364,112

FLOWER POT WITH AN INTEGRAL BASE

Thomas Dickinson, and Bradley D. Gale, both of St. Louis, Mo., assignors to Contico International, Inc., St. Louis, Mo.

Filed Dec. 5, 1994, Ser. No. 31,753

Term of patent 14 years

U.S. Cl. D11—152

364,113

FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Dec. 16, 1991, Ser. No. 807,679

The portion of the term of this patent subsequent to May 21, 2005, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164

364,114

FLOWER POT COVER

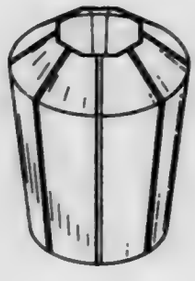
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, which is a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, which is a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Dec. 16, 1991, Ser. No. 808,556

The portion of the term of this patent subsequent to Apr. 2, 2005, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



364,115

FLOWER POT COVER

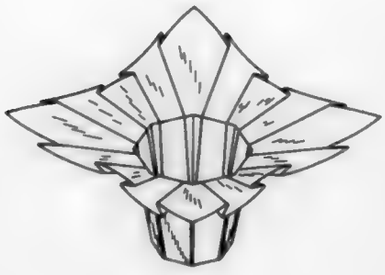
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989. This application Dec. 16, 1991, Ser. No. 809,077

The portion of the term of this patent subsequent to May 14, 2005, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164



364,116

FLOWER POT COVER

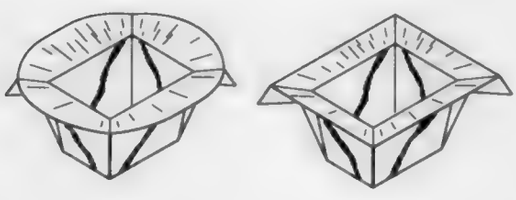
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, Pat. No. Des. 348,634, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989.

This application Oct. 20, 1992, Ser. No. 673

Term of patent 14 years

U.S. Cl. D11—164



364,117

FLOWER POT COVER

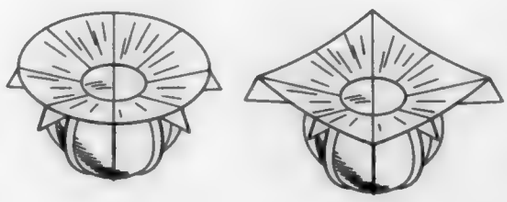
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, Pat. No. Des. 348,634, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989.

This application Oct. 20, 1992, Ser. No. 675

Term of patent 14 years

U.S. Cl. D11—164



364,118

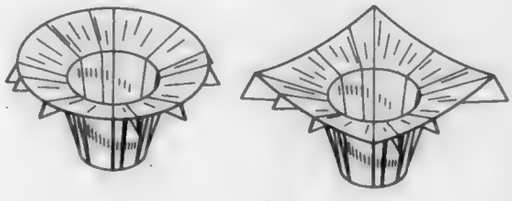
FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, Pat. No. Des. 348,634, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989. This application Nov. 9, 1992, Ser. No. 1,353

Term of patent 14 years

U.S. Cl. D11—164



364,119

FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 808,357, Dec. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, said Ser. No. 710,272is a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, said Ser. No. 710,272is a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, said Ser. No. 710,272is a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Jan. 12, 1993, Ser. No. 3,557

Term of patent 14 years

U.S. Cl. D11—164

364,120

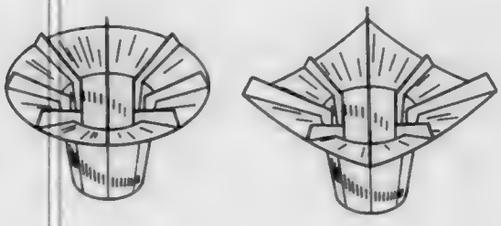
FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 782,237, Oct. 21, 1991, Pat. No. Des. 349,076, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989. This application Feb. 1, 1993, Ser. No. 1,353

Term of patent 14 years

U.S. Cl. D11—164



364,121

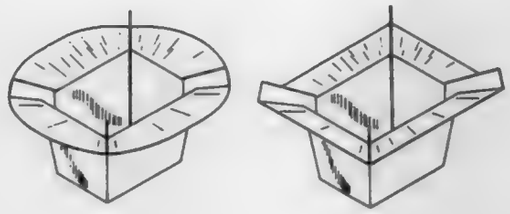
FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 782,237, Oct. 18, 1991, Pat. No. Des. 349,076, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989. This application Mar. 9, 1993, Ser. No. 1,353

Term of patent 14 years

U.S. Cl. D11—164



364,122

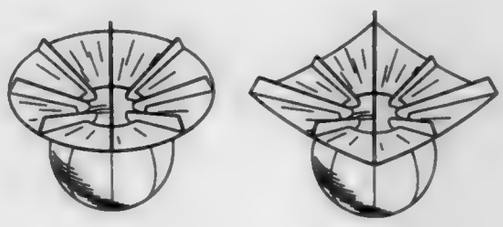
FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 782,237, Oct. 18, 1991, Pat. No. Des. 349,076, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, which is a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, which is a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Mar. 19, 1993, Ser. No. 6,100

Term of patent 14 years

U.S. Cl. D11—164



364,123

FLOWER POT COVER

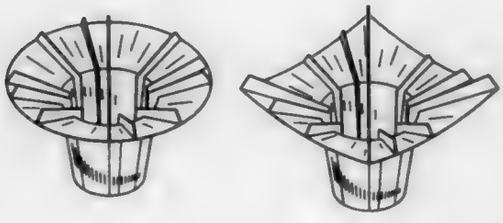
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 782,237, Oct. 18, 1991, Pat. No. Des. 349,076, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989.

This application Apr. 30, 1993, Ser. No. 7,869

Term of patent 14 years

U.S. Cl. D11—164



364,124

BUCKLE

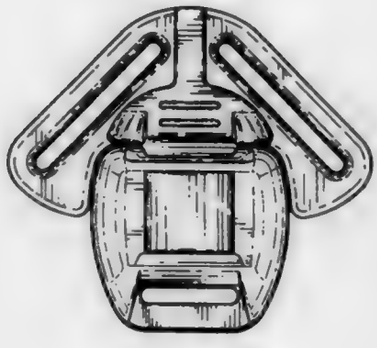
Allan R. Lortz, Noblesville; Michael A. Wiseman, and Jeffrey L. Beaver, both of Indianapolis, all of Ind., assignors to Indiana Mills & Manufacturing, Inc., Westfield, Ind.

Filed Nov. 26, 1993, Ser. No. 15,875

Claims priority, application France, May 28, 1993, 932815

Term of patent 14 years

U.S. Cl. D11—216



364,125

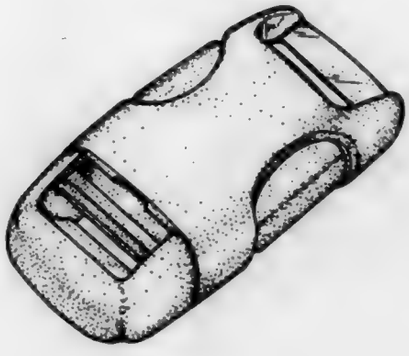
BUCKLE FASTENER

Joseph Anscher, Muttontown, N.Y., assignor to National Molding Corp., Farmingdale, N.Y.

Filed Oct. 13, 1994, Ser. No. 29,681

Term of patent 14 years

U.S. Cl. D11—216



364,126

HOOK ATTACHMENT RING

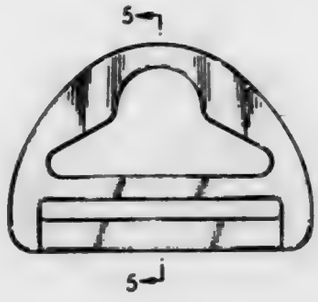
Koichi Ochiai, Hachioji, and Tomohisa Ishida, Kamifukuoka, both of, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Jun. 16, 1994, Ser. No. 24,553

Claims priority, application Japan, Dec. 20, 1993, 5-38498

Term of patent 14 years

U.S. Cl. D11—218



364,127

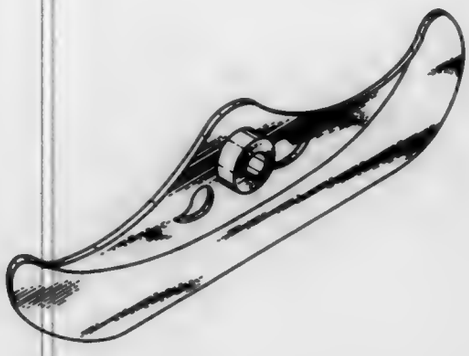
BLADE FOR CONVERTING A SKATEBOARD INTO AN ICE BOARD

Len D. Scherr, 410 S. 3rd St., and Kap L. Scherr, 2410-3rd Ave., SE., both of, Aberdeen, S. Dak. 57401

Filed Feb. 16, 1994, Ser. No. 18,811

Term of patent 14 years

U.S. Cl. D12—6



364,128

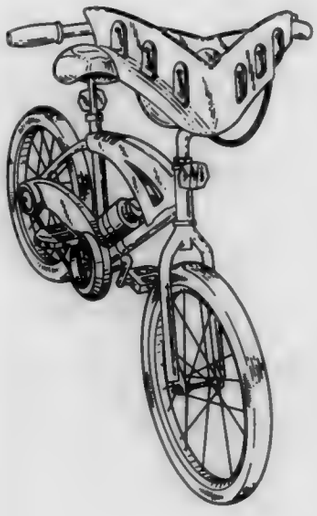
BICYCLE

Paul Haney, Dayton; Ronald J. Schneider, Cincinnati, and Kevin O. Strand, Delphos, all of Ohio, assignors to Huffy Corporation, Miamisburg, Ohio

Filed Feb. 28, 1994, Ser. No. 19,338

Term of patent 14 years

U.S. Cl. D12—111



364,129

MOTORCYCLE CLUTCH COVER

William G. Davidson, Delafield, and Louis Netz, Grafton, both of Wis., assignors to Harley-Davidson, Inc., Milwaukee, Wis.

Division of Ser. No. 16,164, Dec. 9, 1993, Pat. No. Des. 354,461. This application Jan. 13, 1995, Ser. No. 33,502

Term of patent 14 years

U.S. Cl. D12—126

364,130

MOTORCYCLE CLUTCH CHAIN GUARD COVER

William G. Davidson, Delafield, and Louis Netz, Grafton, both of Wis., assignors to Harley-Davidson, Inc., Milwaukee, Wis.

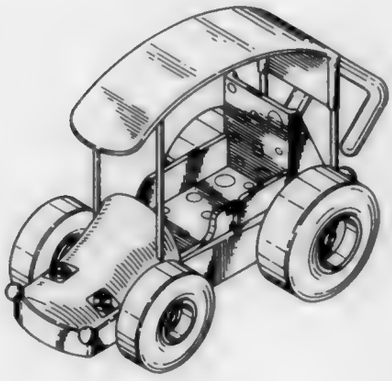
Division of Ser. No. 16,159, Dec. 9, 1993, Pat. No. Des. 354,464. This application Jan. 13, 1995, Ser. No. 33,514

Term of patent 14 years

U.S. Cl. D12—127

364,131
STROLLER
Anthony E. Eichhorn, East Amherst, and Kenneth P. Morton, East Aurora, both of N.Y., assignors to Fisher-Price, Inc., East Aurora, N.Y.
Filed Sep. 9, 1994, Ser. No. 29,022
Term of patent 14 years
U.S. Cl. D12—129

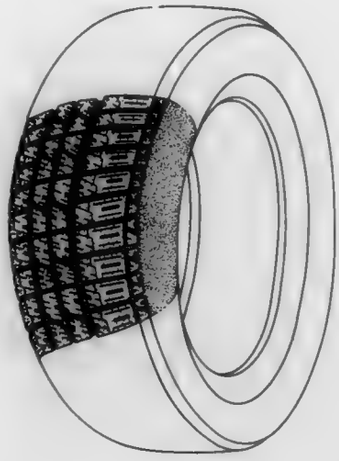
364,132
BEACH LOUNGE CHAIR
Aaron J. Badon, and Dana L. Ashley, both of 1835 Newton St., New Orleans, La. 70114
Filed Oct. 3, 1994, Ser. No. 29,810
Term of patent 14 years
U.S. Cl. D12—129



364,133
TIRE TREAD
Andre E. J. Baus, Bettembourg, Luxembourg; Rene Didier, Arlon, Belgium; Gerard Durand, Mamer, Luxembourg, and Soren Spejlborg, Tiercelet, France, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 10, 1994, Ser. No. 26,993
Term of patent 14 years
U.S. Cl. D12—143

364,134
AUTOMOBILE TIRE
Yasuo Himuro, and Kazunori Shinohara, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan
Filed May 27, 1994, Ser. No. 23,614
Claims priority, application Japan, Nov. 30, 1993, 5-35963
Term of patent 14 years
U.S. Cl. D12—146

364,135
TIRE
David J. Sulkowski, Guilford; John S. Carpino, Branford; Michael R. Greco, North Haven, and Louis E. Zurita, Hamden, all of Conn., assignors to Pirelli Armstrong Tire Corporation, New Haven, Conn.
Filed Dec. 22, 1992, Ser. No. 3,330
Term of patent 14 years
U.S. Cl. D12—147

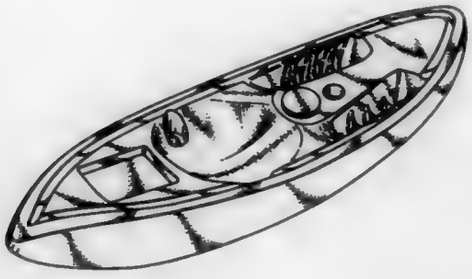


364,136
TIRE
Laurie W. Killian, Louisville, Ky., assignor to Michelin Recherche et Technique S.A., Granges-Paccot, Switzerland
Filed May 6, 1994, Ser. No. 22,513
Term of patent 14 years
U.S. Cl. D12—147

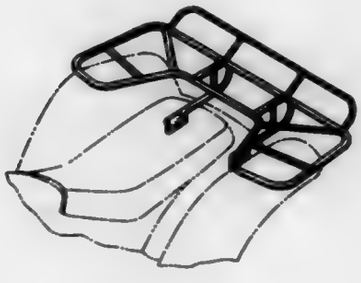
364,137
STEERING WHEEL COVER
Yhoshua Rigel, 21 Sharet, 62092 Tel Aviv, Israel
Filed Dec. 12, 1994, Ser. No. 32,461
Claims priority, application Israel, Jun. 14, 1994, 22740
Term of patent 14 years
U.S. Cl. D12—177

364,138
VEHICLE HOOD PROTECTOR
Rodney E. Horwill, PO Box 171, Salisbury Queensland 4107, Australia
Filed Mar. 8, 1994, Ser. No. 19,617
Claims priority, application Australia, Sep. 14, 1993, 2851/93
Term of patent 14 years
U.S. Cl. D12—181

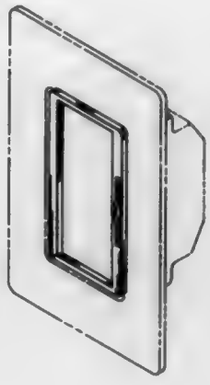
364,139
WATER CRAFT
Timothy A. Niemier, 1540 Wall St., Bellingham, Wash. 98226
Filed Jan. 18, 1995, Ser. No. 33,687
Term of patent 14 years
U.S. Cl. D12—302



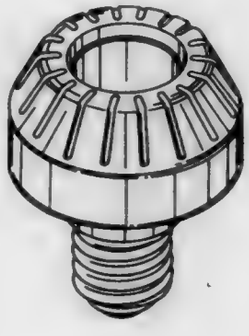
364,140
REAR ACCESSORY RACK FOR RECREATIONAL VEHICLE
Gilbert E. Gustavsen, 1025 W. Mingus Rd., Phoenix, Ariz. 85027
Filed May 16, 1994, Ser. No. 22,974
Term of patent 14 years
U.S. Cl. D12—407



364,141
COMBINED BEZEL AND ACTUATOR FOR DIMMER SWITCH
Robert S. Hanna, Macungie; Noel Mayo, Philadelphia; Joel S. Spira, Coopersburg, and James E. Swain, III, Bethlehem, all of Pa., assignors to Lutron Electronics Co., Inc., Coopersburg, Pa.
Filed Mar. 31, 1992, Ser. No. 861,494
Term of patent 14 years
U.S. Cl. D13—125



364,142
LIGHT SOCKET SWITCH WITH TIMER
Paul R. Metcalfe, Bentleyville Village; David J. Krusznewski, Parma, and Douglas A. Lootoski, Richfield, all of Ohio, assignors to The Lamson & Sessions Co., Cleveland, Ohio
Filed Sep. 12, 1994, Ser. No. 28,330
Term of patent 14 years
U.S. Cl. D13—134



364,143

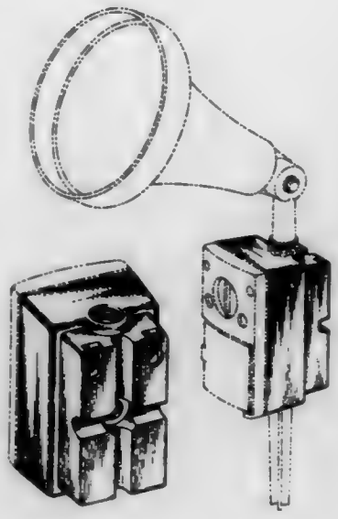
HOUSING FOR AN OUTDOOR UTILITY DEVICE

Peter A. Weingartner, Fairfield, Ohio, assignor to Woods Industries, Carmel, Ind.

Filed Aug. 4, 1994, Ser. No. 26,709

Term of patent 14 years

U.S. Cl. D13—152



364,144

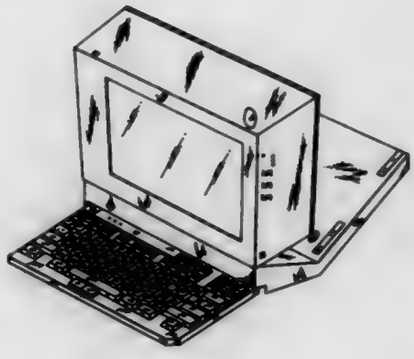
INTERLOCKING COMPUTER SYSTEM

Samuel A. M. Lucente, Stamford, Conn., and Richard F. Sapper, Milan, Italy, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1992, Ser. No. 1,402

Term of patent 14 years

U.S. Cl. D14—100



364,145

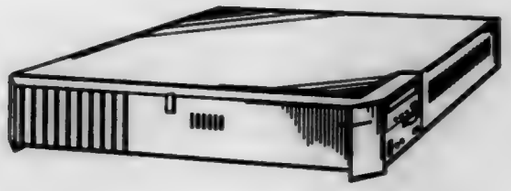
SLIM PROFILE COMPUTER HOUSING

Laura L. Beneville, Beaverton, and Bret W. Gutzka, Aloha, both of Oreg., assignors to Canon Computer Systems, Inc., Costa Mesa, Calif.

Filed Jun. 8, 1994, Ser. No. 24,089

Term of patent 14 years

U.S. Cl. D14—100



364,146

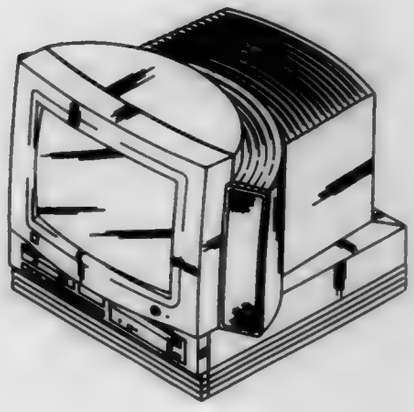
COMPUTER

Hartmut H. Esslinger, Los Gatos, Calif., assignor to Packard Bell Electronics, Inc., Westlake Village, Calif.

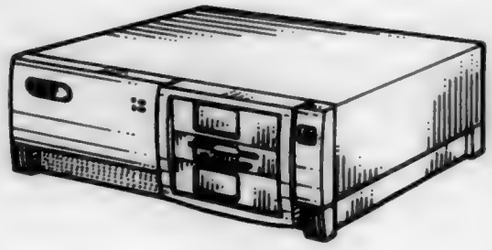
Continuation-in-part of Ser. No. 23,794, Jun. 1, 1994, abandoned. This application Jun. 13, 1994, Ser. No. 24,290

Term of patent 14 years

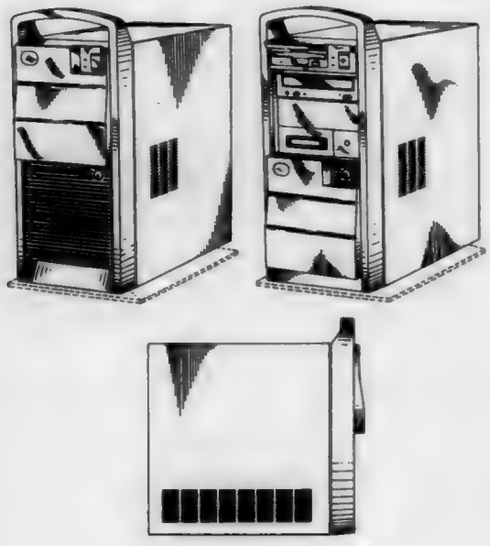
U.S. Cl. D14—100



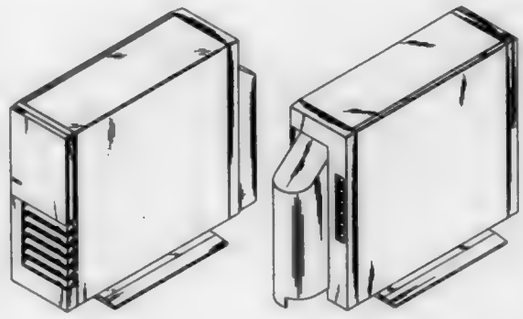
364,147
PERSONAL COMPUTER
Randall W. Martin, The Woodlands; Peter B. Barron, Houston, both of Tex.; Thor R. Haiseth, Simi Valley, and James L. Holtorf, Thousand Oaks, both of Calif., assignors to Compaq Computer Corporation, Houston, Tex.
Filed Jun. 23, 1994, Ser. No. 24,924
Term of patent 14 years
U.S. Cl. D14—100



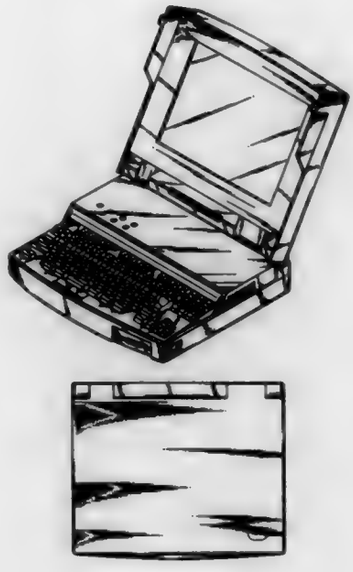
364,148
FLOOR STANDING PERSONAL COMPUTER
Joseph E. Jasinski; Susan S. Moffatt, both of Boca Raton, Fla.; Toshitaka Imai, Sagamihara, Japan, and John A. Wiseman, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 13, 1994, Ser. No. 29,684
Term of patent 14 years
U.S. Cl. D14—100



364,149
COMPUTER HOUSING
Pedro M. Alfonso, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 23, 1994, Ser. No. 28,879
Term of patent 14 years
U.S. Cl. D14—102



364,150
PERSONAL COMPUTER
Nariaki Mieki, Yokohama, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 12, 1994, Ser. No. 21,170
Claims priority, application Japan, Jan. 14, 1993, 5-31215
Term of patent 14 years
U.S. Cl. D14—106



364,151
DOCKING STATION FOR A PORTABLE PERSONAL COMPUTER

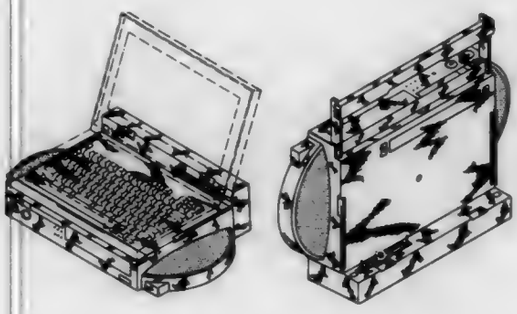
Kazuhiko Yamazaki, Hiratuka, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 11, 1994, Ser. No. 17,362

Claims priority, application Japan, Jul. 23, 1993, 5-22747

Term of patent 14 years

U.S. Cl. D14—107



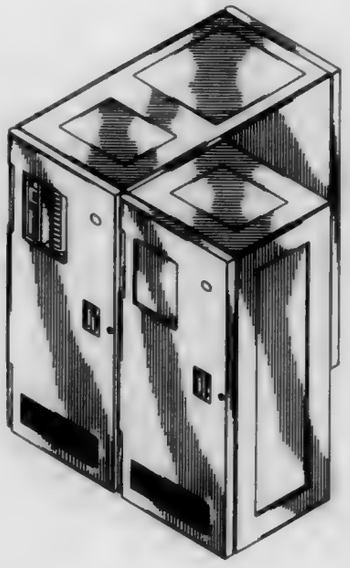
364,152
TAPE AUTOMATION SYSTEM

John V. Acciaoli; Hartmut E. Hausler; Chester D. Holden; Martin J. Marotti; Scott M. Rockwell; Terry R. Roscoe, and Roland Zapfe, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 6,969, Apr. 12, 1993, Pat. No. Des. 357,236. This application Sep. 12, 1994, Ser. No. 28,293

Term of patent 14 years

U.S. Cl. D14—108



364,153
DISPLAY FACE OF A LIQUID CRYSTAL DISPLAY MODULE

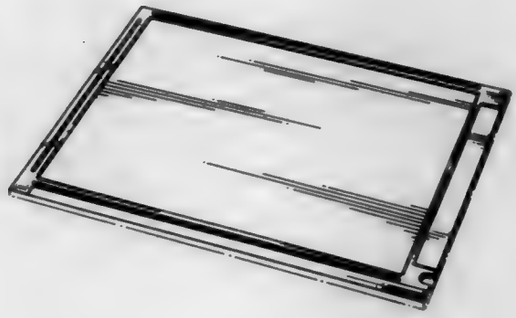
Toshiya Umaba, and Makoto Komatsu, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1994, Ser. No. 32,116

Claims priority, application Japan, Jun. 3, 1994, 6-16398

Term of patent 14 years

U.S. Cl. D14—113



364,154
KEYBOARD WRIST SUPPORT

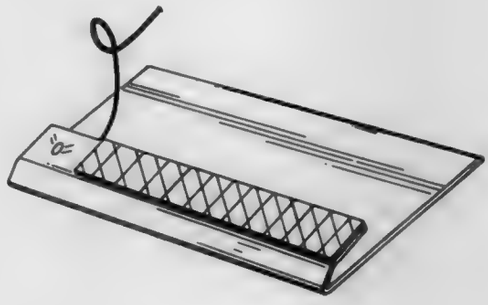
Warren D. Knighton, 4017 E. Shangri-La., Phoenix, Ariz. 85028, and William W. Knighton, P.O. Box 1762, Wausau, Wis. 54402

Filed May 23, 1989, Ser. No. 355,363

The portion of the term of this patent subsequent to Dec. 8, 2004, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—114



364,155

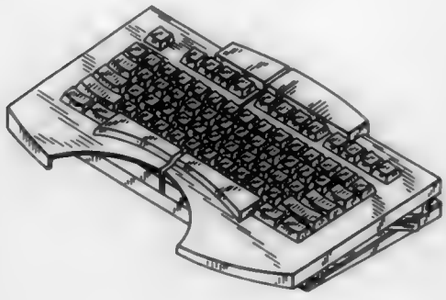
BILATERALLY LIFTABLE KEYBOARD

Stephen Chung, Taipei Hsien, Taiwan, Prov. of China, assignor to Silitek Corporation, Taipei, Taiwan, Prov. of China

Filed Dec. 17, 1993, Ser. No. 16,467

Term of patent 14 years

U.S. Cl. D14—115



364,156

AUDIO TAPE CASSETTE

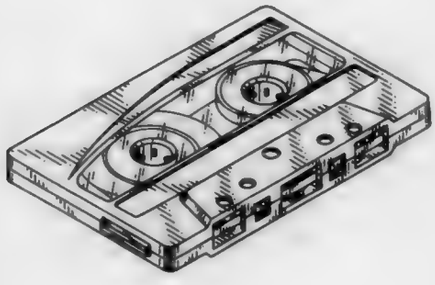
Kunihiko Tanaka, and Noriko Katayama, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 22, 1994, Ser. No. 27,480

Claims priority, application Japan, Feb. 25, 1994, 6-4828

Term of patent 14 years

U.S. Cl. D14—121



364,157

VIDEO DISPLAY CONSOLE

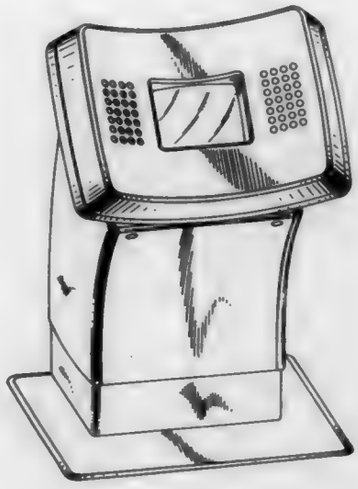
Michael H. Sharp, Johnstone, Great Britain, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1994, Ser. No. 20,750

Claims priority, application United Kingdom, Jan. 5, 1993, 2034314

Term of patent 14 years

U.S. Cl. D14—133



364,158

PORTABLE TWO-WAY RADIO STAND

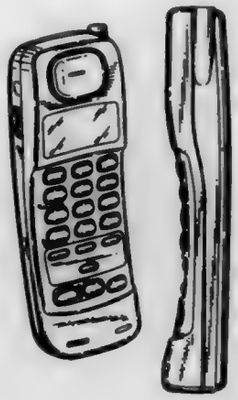
Gary A. Branch, 6090 Kathie Ct., Ellenwood, Ga. 30049

Filed Aug. 19, 1994, Ser. No. 27,377

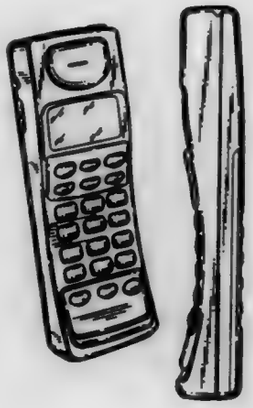
Term of patent 14 years

U.S. Cl. D14—137

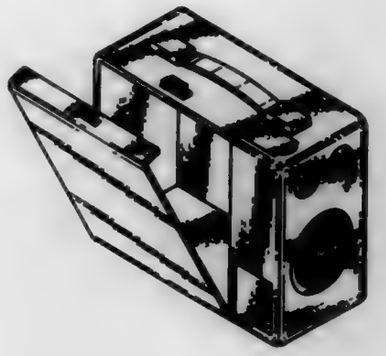
364,159
PORTABLE RADIO TELEPHONE
Naoko Seki, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Sep. 30, 1994, Ser. No. 29,817
Claims priority, application Japan, Jul. 11, 1994, 6-20341
Term of patent 14 years
U.S. Cl. D14—138



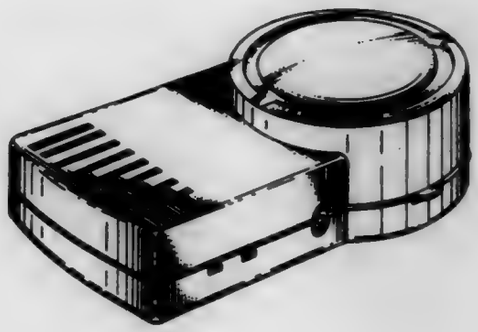
364,160
PORTABLE RADIO TELEPHONE
Naoko Seki, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Sep. 30, 1994, Ser. No. 29,818
Claims priority, application Japan, Jul. 11, 1994, 6-20340
Term of patent 14 years
U.S. Cl. D14—138



364,161
COMBINED LUNCH BOX AND RADIO
Floyd Campbell, 2677 Monterey, Detroit, Mich. 48206
Filed Sep. 6, 1994, Ser. No. 27,988
Term of patent 14 years
U.S. Cl. D14—168

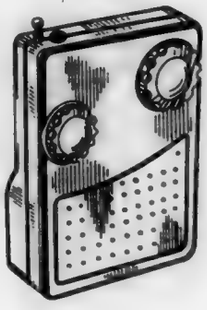


364,162
AMPLIFIER HOUSING
Gideon Dagan, Venice, Calif., assignor to Aura Systems, Inc., El Segundo, Calif.
Filed Jan. 27, 1994, Ser. No. 18,102
Term of patent 14 years
U.S. Cl. D14—188



364,163
SELECTIVE CALL RECEIVER
William J. Scheid, Coral Springs, and David P. Townsend, West Palm Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 4, 1993, Ser. No. 14,904
Term of patent 14 years
U.S. Cl. D14—191

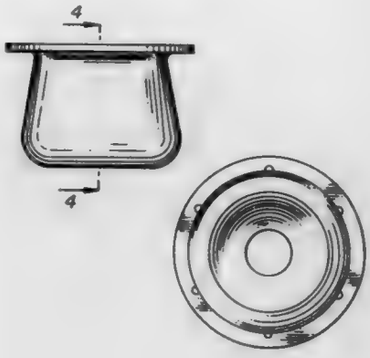
364,164
RADIO
James L. Hanig, Highland, Ill., assignor to Hanig & Co., Lincolnwood, Ill.
Filed Aug. 18, 1994, Ser. No. 27,300
Term of patent 14 years
U.S. Cl. D14—192



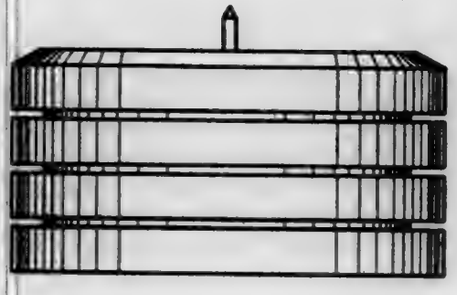
364,165
LOUDSPEAKER
Hartmut H. Esslinger, Los Gatos, Calif., assignor to Packard Bell Electronics, Inc., Westlake Village, Calif.
Filed Jun. 1, 1994, Ser. No. 23,784
Claims priority, application Germany, Jan. 5, 1994, M 94 00 004.2
Term of patent 14 years
U.S. Cl. D14—213

364,166
REMOTE CONTROL
Henry C. Yuen, Redondo Beach, Calif., assignor to Gemstar Development Corporation, Pasadena, Calif.
Filed Jan. 5, 1993, Ser. No. 3,574
Term of patent 14 years
U.S. Cl. D14—218

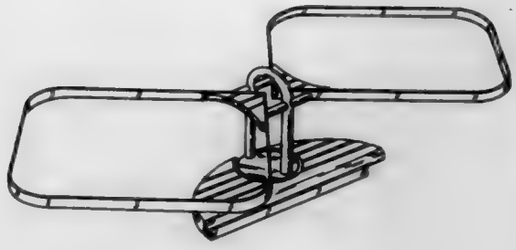
364,167
SPEAKER MOTOR CASE
Drew Daniels, North Hills, Calif., assignor to Aura Systems, Inc., El Segundo, Calif.
Filed Mar. 12, 1993, Ser. No. 5,828
Term of patent 14 years
U.S. Cl. D14—221



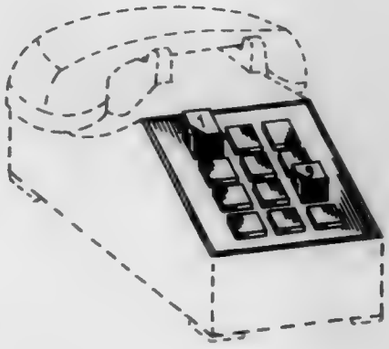
364,168
ACOUSTIC CONTROL UNIT FOR A STEREOPHONIC EQUIPMENT
William C. Ying, 1101 Ranleigh Way, Piedmont, Calif. 94610
Filed Apr. 21, 1993, Ser. No. 7,334
Term of patent 14 years
U.S. Cl. D14—221



364,169
TELEVISION ANTENNA
Francois Geneve, 2112 W. Grace St., Chicago, Ill. 60618; Luc Heiligstein, 3119 N. Honore St., Chicago, Ill. 60657, and Stephen Melamed, 2935 W. Belden Ave., Chicago, Ill. 60647
Filed Mar. 8, 1993, Ser. No. 5,634
Term of patent 14 years
U.S. Cl. D14—235



364,170
TELEPHONE KEYPAD
John J. Tobish, 1052 Earl St., St. Paul, Minn. 55106
Filed Feb. 7, 1994, Ser. No. 18,442
Term of patent 14 years
U.S. Cl. D14—747



364,171

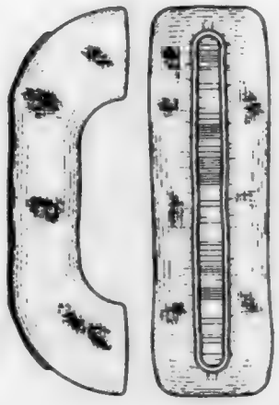
TELEPHONE RECEIVER SLEEVE

Andrea J. Maddack, and John Maddack, both of 769 N. 625 E., Westville, Ind. 46391

Filed Jul. 25, 1994, Ser. No. 26,399

Term of patent 14 years

U.S. Cl. D14—250



364,172

PUMP

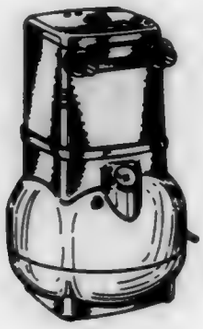
Niels D. Jensen, Bjerringbro, and Kurt F. Nielsen, Middelfart, both of, Denmark, assignors to Grundfos A/S, Bjerringbro, Denmark

Filed Feb. 28, 1994, Ser. No. 19,354

Claims priority, application Germany, Sep. 2, 1993, 93 06 891.3

Term of patent 14 years

U.S. Cl. D15—7



364,173

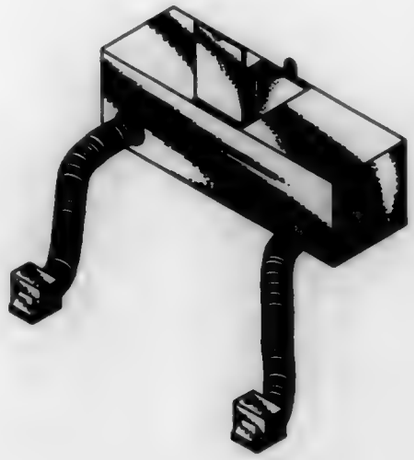
VEHICLE MOUNTED SAND DISPENSER

Wylie Woods, 1764 S. Dubbert Rd., Port Clinton, Ohio 43452

Filed Mar. 14, 1994, Ser. No. 19,841

Term of patent 14 years

U.S. Cl. D15—13



364,174

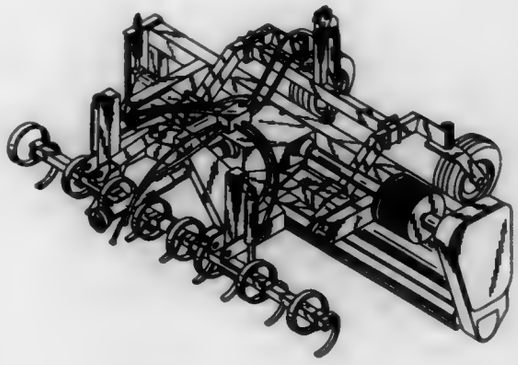
ROCK COLLECTING IMPLEMENT

Mac E. McPherson; Michael G. McPherson, both of Jamestown, N. Dak.; Kenneth L. Innocent, Sacramento, Calif.; Gary A. Parkos, and Roger D. Noska, both of Browerville, Minn., assignors to Glenmac Inc., Jamestown, N. Dak.

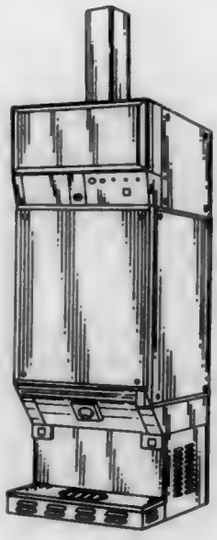
Filed Jul. 21, 1993, Ser. No. 10,967

Term of patent 14 years

U.S. Cl. D15—27



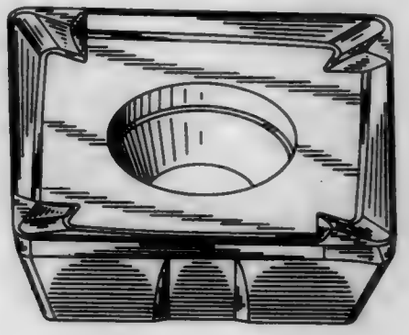
364,175
FROZEN DESSERT DISPENSER
Helmut A. Alpers, Gates Mills, Ohio; Lisa E. Duffy, North Andover, Mass.; Peter C. Erickson, Derry, N.H., and Jon P. Russett, Jr., Beloit, Wis., assignors to Flurry International, Inc., Cleveland, Ohio
Filed May 27, 1994, Ser. No. 23,637
Term of patent 14 years
U.S. Cl. D15—82



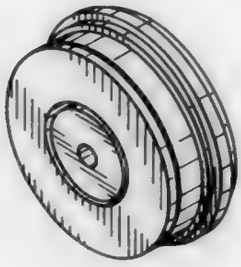
364,176
RELOADING DIE
Rodney P. Hartman, Lanark, Ill., assignor to Forster Products, Inc., Lanark, Ill.
Filed Apr. 22, 1993, Ser. No. 7,452
Term of patent 14 years
U.S. Cl. D15—136

364,177
CUTTING GUIDE WITH SAFETY GUARD
Judith R. Lewis, 98 Wyckoff Ave., Ramsey, N.J. 07446
Filed Nov. 14, 1994, Ser. No. 30,977
Term of patent 14 years
U.S. Cl. D15—138

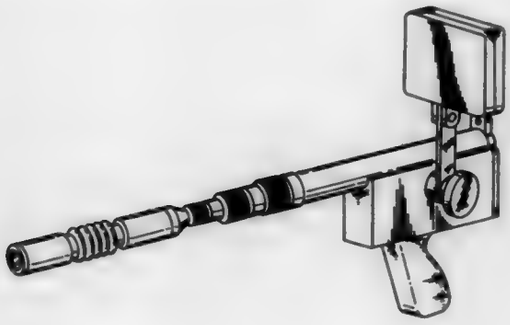
364,178
CUTTING INSERT FOR MILLING CUTTERS
Lars-Ola Hansson; Lars-Gunnar Wallström, both of Sandviken, and Göran Pantzar, Årsunda, all of, Sweden, assignors to Sandvik AB, Sandviken, Sweden
Filed Jul. 26, 1993, Ser. No. 11,048
Claims priority, application Sweden, Jan. 27, 1993, 93-0180
The portion of the term of this patent subsequent to Oct. 10, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D15—139



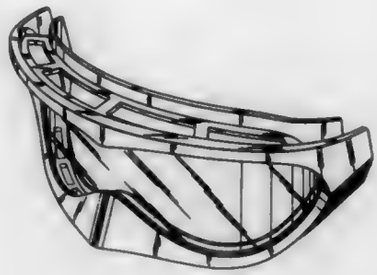
364,179
ANTI-WALK CAM
Richard R. Brush, 24 Chenango Bridge Rd., Binghamton, N.Y. 13901
Filed Oct. 21, 1994, Ser. No. 30,032
Term of patent 14 years
U.S. Cl. D15—148



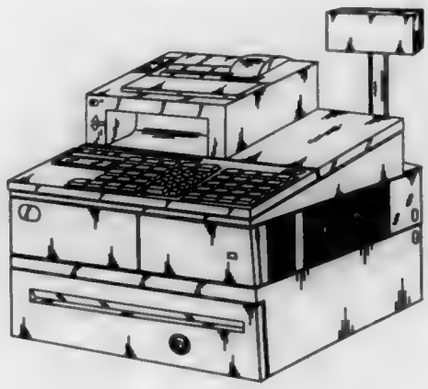
364,180
SEARCH CAMERA
Scott Park, 4117 Rio Del Norte, Bakersfield, Calif. 93308
Filed Sep. 14, 1994, Ser. No. 28,411
Term of patent 14 years
U.S. Cl. D16—202



364,181
SPORTS GOGGLE
Gregory F. Arnette, 33965 Cape Cove, South Laguna Beach, Calif. 92677
Filed Mar. 24, 1994, Ser. No. 20,445
Term of patent 14 years
U.S. Cl. D16—312



364,182
COMBINED POINT OF SALE TERMINAL, CONTROL UNIT AND CASH DRAWER
Ronald A. Smith, Apex, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 18, 1993, Ser. No. 8,501
Term of patent 14 years
U.S. Cl. D18—4



364,183

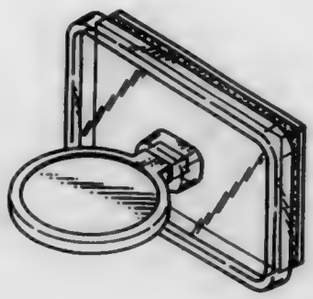
COMBINED HAND STAMP MOUNT AND RUBBER STAMP

Jeffrey M. Winston, 658 W. Shore Dr., Anacortes, Wash. 98221

Filed Jun. 3, 1994, Ser. No. 23,940

Term of patent 14 years

U.S. Cl. D18—15



364,184

TONER BOTTLE

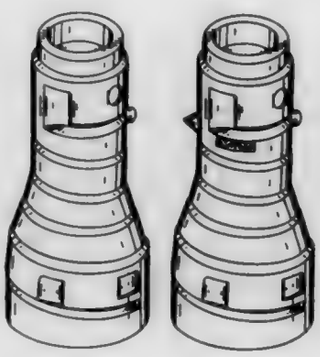
Syunsuke Satake, Kawanishi, and Akio Kimura, Toyokawa, both of, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Sep. 2, 1994, Ser. No. 27,976

Claims priority, application Japan, Mar. 2, 1994, 6-5414; Mar. 2, 1994, 6-5415

Term of patent 14 years

U.S. Cl. D18—43



364,185

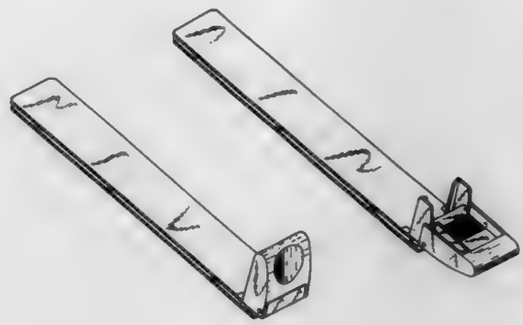
LENGTH ADJUSTER FOR PAPER OR OTHER MEDIA FOR A PRINTER

Thomas E. McCue, Vancouver, and Gerald J. Byers, Camas, both of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 6, 1994, Ser. No. 24,002

Term of patent 14 years

U.S. Cl. D18—56



364,186

PEN

Jiang S.-H. Kuo, Taipei Hsien, Taiwan, Prov. of China, assignor to Shine Sun Industrial, Co., Ltd., Taipei Hsien, Taiwan, Prov. of China

Filed Jul. 30, 1993, Ser. No. 11,233

Term of patent 14 years

U.S. Cl. D19—48

364,187

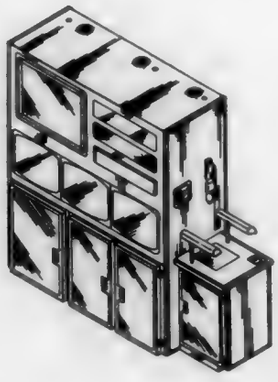
CABINET FOR A VIDEO DISTANCE LEARNING SYSTEM

John A. Powers, III, Belair; Miles A. Konopka, Forest Hill; Ray McNew, Baltimore, and Angelo T. Meola, Monkton, all of Md., assignors to Bell Atlantic--Maryland, Cockeysville, Md.

Filed Apr. 11, 1994, Ser. No. 21,123

Term of patent 14 years

U.S. Cl. D19—60



364,188

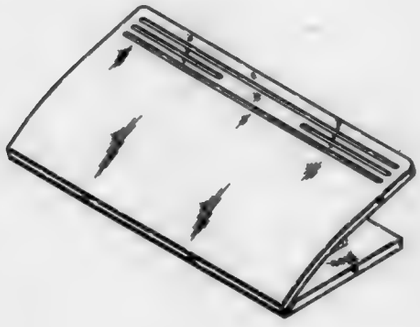
CLIP FOR HOLDING PAPER

Stephen H. Wolff, 35 W. 35th St., New York, N.Y. 10001

Filed Mar. 23, 1995, Ser. No. 36,643

Term of patent 14 years

U.S. Cl. D19—65



364,189

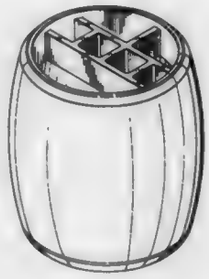
DESK CADDY

Edgar F. Trombly, Grosse Pointe Farms, Mich., assignor to Punch Products USA, Inc., Rahway, N.J.

Filed May 11, 1993, Ser. No. 6,874

Term of patent 14 years

U.S. Cl. D19—77



364,190

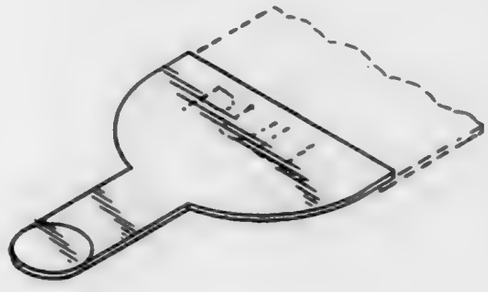
START TAB FOR TAPE

Rod W. Harris, 2106-C Gallows Rd., Vienna, Va. 22182

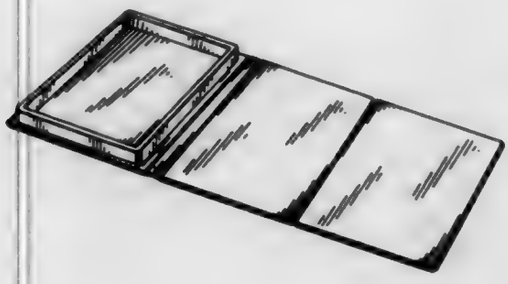
Filed Jul. 13, 1993, Ser. No. 10,585

Term of patent 14 years

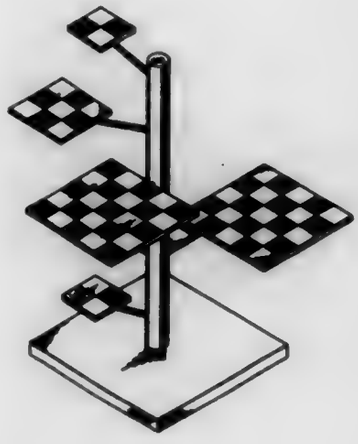
U.S. Cl. D19—99



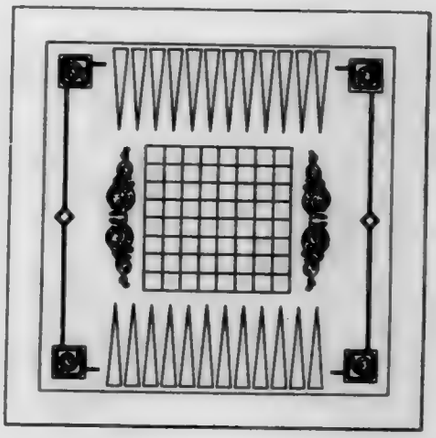
364,191
FOLDING GAME WITH TRAY
Norman A. Allen, Kings Lynn, England, assignor to Listawood Limited, Norfolk, England
Filed Apr. 15, 1993, Ser. No. 7,219
Claims priority, application United Kingdom, Jan. 15, 1992, 2026451
The portion of the term of this patent subsequent to Mar. 7, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—15



364,192
TRI-DIMENSIONAL GAME BOARD
James Dekker, 70 Hastings Drive, Belleville, Ontario, Canada
Filed Sep. 2, 1994, Ser. No. 28,033
Term of patent 14 years
U.S. Cl. D21—23



364,193
GAME TABLE
Gina M. Hartlieb, Waukesha, and Laura J. Samuels, Milwaukee, both of Wis., assignors to Premold Corporation, Oconomowoc, Wis.
Filed May 21, 1993, Ser. No. 8,646
Term of patent 14 years
U.S. Cl. D21—24



364,194
GAME BOARD
Nicholas O'Connell, and Meagan O'Connell, both of 64 Elliott St., Islip, N.Y. 11751
Filed Sep. 27, 1994, Ser. No. 28,979
Term of patent 14 years
U.S. Cl. D21—30

364,195

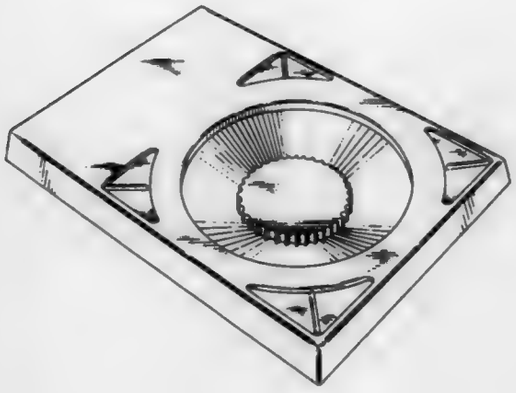
GAME BOARD

Tom E. Workman, 4000 Rock Creek Dr., Dallas, Tex. 75204-1626, and Sidney V. Bryan, 4920 Madella St., Fort Worth, Tex. 76117

Filed Apr. 5, 1994, Ser. No. 20,875

Term of patent 14 years

U.S. Cl. D21—37



364,196

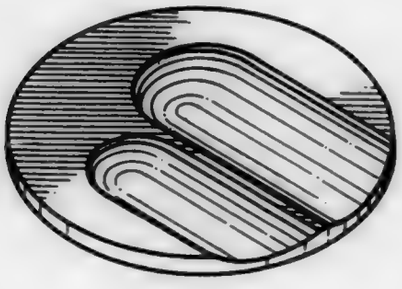
SLAMMING DISC

William J. Hodson, Orange, Calif., assignor to Trov U.S.A. Inc., Corona, Calif.

Filed Jan. 21, 1994, Ser. No. 17,774

Term of patent 14 years

U.S. Cl. D21—53



364,197

KANGAROO TOY

Owen W. Uebergang, 3 Oaklands Avenue, Royston Park, SA 5070, Australia

Filed Aug. 16, 1994, Ser. No. 27,246

Claims priority, application Australia, Apr. 20, 1994, 1206/94

Term of patent 14 years

U.S. Cl. D21—102

364,198

TOY BUILDING ELEMENT

Kristian A. Bluff, Lyngby, Denmark, assignor to Interlego AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,139

Term of patent 14 years

U.S. Cl. D21—108

364,199

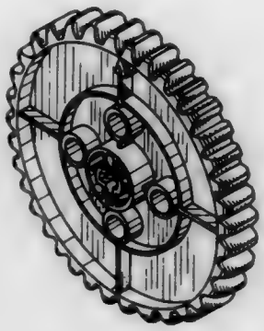
TOY GEAR WHEEL

Sten Schmidt, Grindsted, and Kurt Jensen, Vejle, both of, Denmark, assignors to Interlego AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,151

Term of patent 14 years

U.S. Cl. D21—108



364,200

TOY COLLAPSIBLE STRUCTURE

Charles L. Pridonoff, Los Angeles, and John Stregan, Woodland Hills, both of Calif., assignors to Marathon Partners, Los Angeles, Calif.

Filed May 18, 1994, Ser. No. 23,098

Term of patent 14 years

U.S. Cl. D21—114

364,201

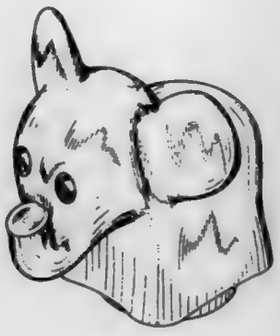
TOY ELEPHANT

Hanne D. Jensen, Valby, Denmark, assignor to Interlego AG, Baar, Switzerland

Filed Sep. 29, 1994, Ser. No. 29,184

Term of patent 14 years

U.S. Cl. D21—162



364,202

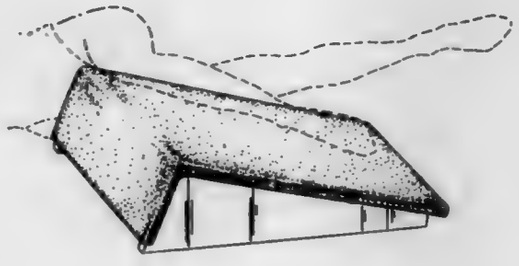
EXERCISE BENCH

Anna L. Benson, Columbia, S.C., assignor to The Firm, Inc., Columbia, S.C.

Filed Aug. 22, 1994, Ser. No. 27,481

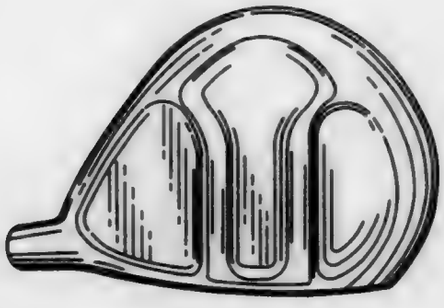
Term of patent 14 years

U.S. Cl. D21—191

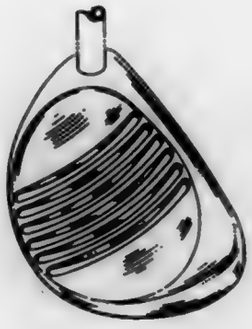


364,203
BASKETBALL NET
Robert K. Rothbard, P.O. Box 593, Galveston, Tex. 77553
Filed Jun. 23, 1994, Ser. No. 24,895
Term of patent 14 years
U.S. Cl. D21—201

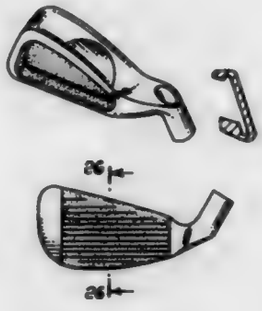
364,204
GOLF CLUB HEAD
Jimmy J. Lin, Valla Park, Calif., assignor to Besco USA International, Orange, Calif.
Filed Jun. 13, 1994, Ser. No. 24,284
Term of patent 14 years
U.S. Cl. D21—214



364,205
PUTTER GOLF CLUB HEAD
Clovis R. Duclos, 3661 Venture Dr., Huntington Beach, Calif. 92649
Filed Sep. 15, 1994, Ser. No. 28,468
Term of patent 14 years
U.S. Cl. D21—217



364,206
IRON GOLF CLUB HEAD
Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.
Continuation-in-part of Ser. No. 8,394, May 17, 1993. This application Nov. 5, 1993, Ser. No. 14,642
Term of patent 14 years
U.S. Cl. D21—220



364,207

TRIGGER MECHANISM

Steven T. Tuomey, 349 Carbon St., Fairview Heights, Ill. 62208

Filed May 4, 1994, Ser. No. 22,390

Term of patent 14 years

U.S. Cl. D22—108

364,208

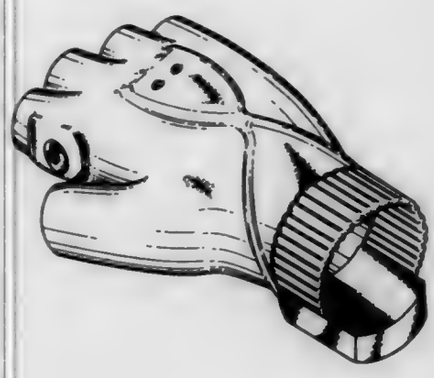
STUN GLOVE

Gary J. Larson, 162 Nelson Dr., LaVergne, Tenn. 37086

Filed Feb. 22, 1994, Ser. No. 19,054

Term of patent 14 years

U.S. Cl. D22—117



364,209

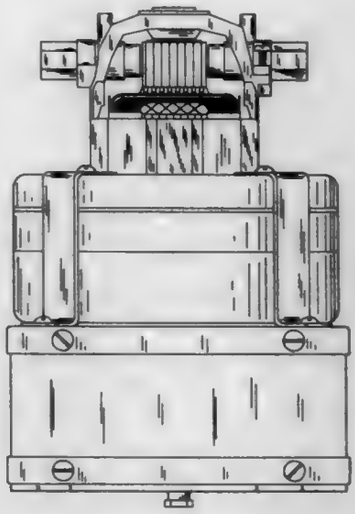
VACUUM CHECK VALVE

Henry H. Jenkins, 220 N. Smith Ave., Corona, Calif. 91720

Filed Jul. 5, 1994, Ser. No. 25,190

Term of patent 14 years

U.S. Cl. D23—233



364,210

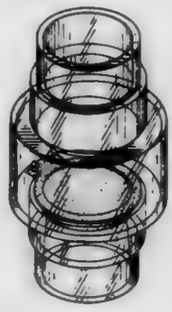
TRANSPARENT SUMP PUMP CHECK VALVE

Kenneth W. Loerop, Elmhurst, and Matthew Gieser, Mt. Prospect, both of Ill., assignors to Drummond Industries, Chicago, Ill.

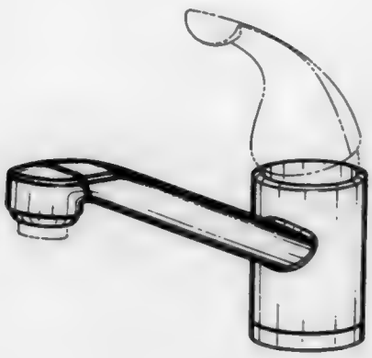
Filed Jul. 19, 1994, Ser. No. 26,085

Term of patent 14 years

U.S. Cl. D23—237

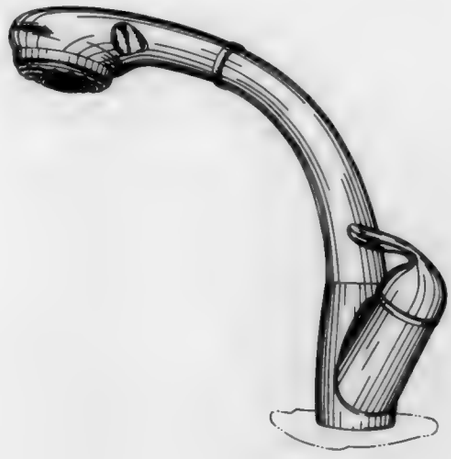


364,211
FAUCET BODY AND SPOUT
Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Nov. 2, 1993, Ser. No. 14,885
Term of patent 14 years
U.S. Cl. D23—238

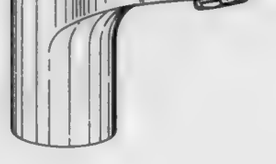


364,212
FAUCET BODY AND SPOUT
Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed Nov. 2, 1993, Ser. No. 15,039
The portion of the term of this patent subsequent to Oct. 24, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—238

364,213
FAUCET
Todd D. Dannenberg, and Robert C. Giese, both of Sheboygan, Wis., assignors to Kohler Co., Kohler, Wis.
Filed Dec. 21, 1994, Ser. No. 32,546
Term of patent 14 years
U.S. Cl. D23—238



364,214
FAUCET
Hans Lobermeier, Menden, Germany, assignor to Friedrich Grohe Aktiengesellschaft, Hemer, Germany
Filed Feb. 28, 1995, Ser. No. 35,488
Claims priority, application Germany, Sep. 7, 1994, M9406938.7
Term of patent 14 years
U.S. Cl. D23—238



364,215

FAUCET SET

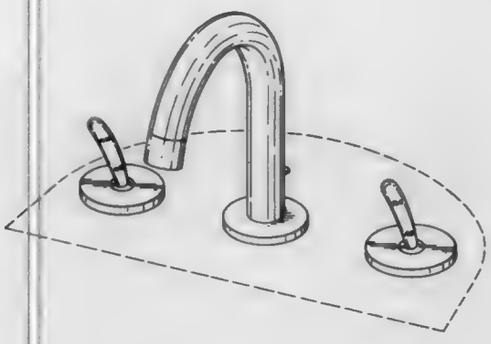
Philippe Starck, Montfort L'Amaury, France, assignor to Hans Grohe GmbH & Co. KG, Germany

Filed Aug. 4, 1994, Ser. No. 26,714

Claims priority, application Germany, Feb. 8, 1994, 94 01 185.0

Term of patent 14 years

U.S. Cl. D23—242



364,216

FAUCET HANDLE

Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Oct. 1, 1993, Ser. No. 13,768

Term of patent 14 years

U.S. Cl. D23—252

364,217

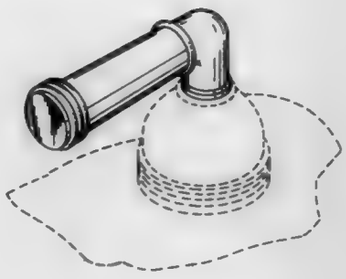
LAVATORY FAUCET HANDLE

Alfred R. Dubin, Los Angeles, Calif., assignor to Phylrich International, Los Angeles, Calif.

Filed Aug. 8, 1994, Ser. No. 26,869

Term of patent 14 years

U.S. Cl. D23—252



364,218

FAUCET SPOUT

Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Nov. 9, 1993, Ser. No. 15,154

Term of patent 14 years

U.S. Cl. D23—255

364,219

FAUCET SPOUT

Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Nov. 9, 1993, Ser. No. 15,156

The portion of the term of this patent subsequent to Oct. 24, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D23—255

364,220

FAUCET SPOUT

Loran R. Hill, Indianapolis, and Anthony G. Spangler, Sheridan, both of Ind., assignors to Masco Corporation of Indiana, Taylor, Mich.

Filed Nov. 9, 1993, Ser. No. 15,212

Term of patent 14 years

U.S. Cl. D23—255

364,221

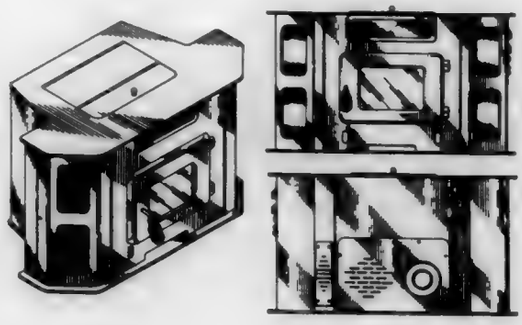
SOLID FUEL HEATING UNIT

Carrol E. Buckner, 5 Piney Dr., Fletcher, N.C. 28732

Filed Oct. 31, 1994, Ser. No. 30,442

Term of patent 14 years

U.S. Cl. D23—343



364,222

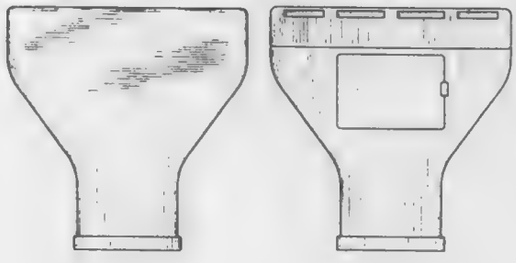
TOILET BOWL AIR FRESHENER

Matthew J. Sohr, 1901 Plantation Key Cir. #207, Brandon, Fla. 33511

Filed May 11, 1994, Ser. No. 22,755

Term of patent 14 years

U.S. Cl. D23—366



364,223

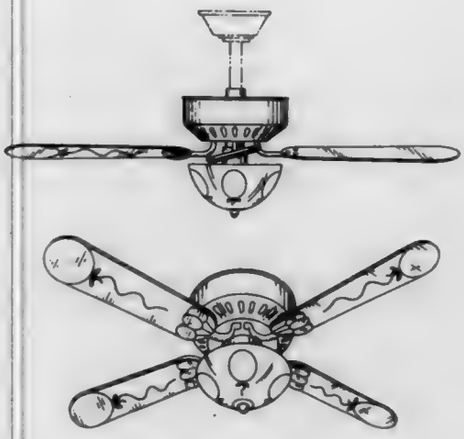
COMBINED CEILING FAN AND LIGHT WITH BALLOON DECORATION

Charles J. DiPasquale, Argyle, Tex., assignor to Smartel, Inc., Carrollton, Tex.

Filed Apr. 26, 1994, Ser. No. 21,937

Term of patent 14 years

U.S. Cl. D23—377



364,224

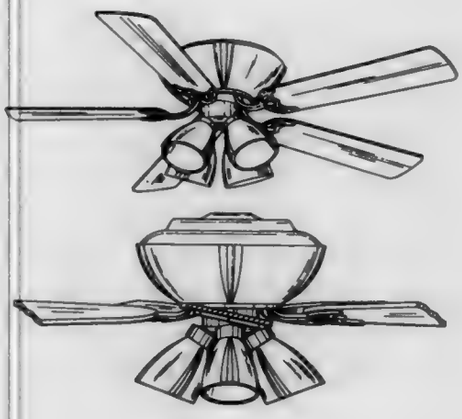
COMBINED ELECTRIC CEILING FAN AND LIGHT KIT

Pierce Wang, No. 46, Alley 26, Lane 667, Chung Shan Road, Shing Kong Hsiang, Taichung Hsien, Taiwan, Prov. of China

Filed Sep. 2, 1994, Ser. No. 27,972

Term of patent 14 years

U.S. Cl. D23—377



364,225

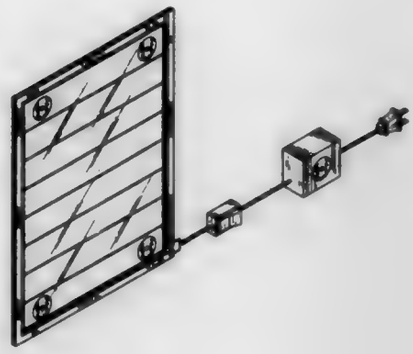
BATHROOM MIRROR DEFOGGER UNIT

Martin W. Canney, 3 Albert St., Somersworth, N.H. 03878

Filed Jun. 10, 1993, Ser. No. 9,231

Term of patent 14 years

U.S. Cl. D23—386



364,226

CALLUS REMOVER

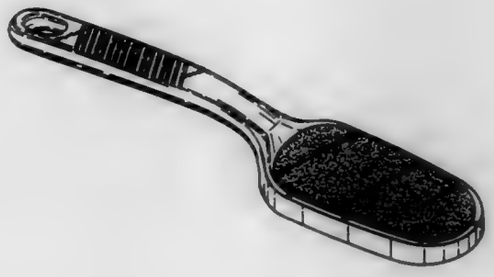
Gerd Hartmann, Solingen, Germany, assignor to Excellent Gesellschaft fur feine Schneidwaren mbH, Solingen, Germany

Filed Jun. 20, 1994, Ser. No. 24,712

Claims priority, application Germany, Dec. 23, 1993, M9309881.2

Term of patent 14 years

U.S. Cl. D24—147



364,227

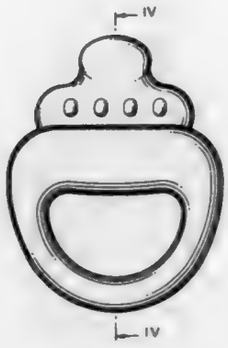
TEETHER

Moriya Kino, Yokohama, Japan, assignor to Royal Co., Ltd., Japan

Filed Dec. 30, 1994, Ser. No. 32,853

Term of patent 14 years

U.S. Cl. D24—194



364,228

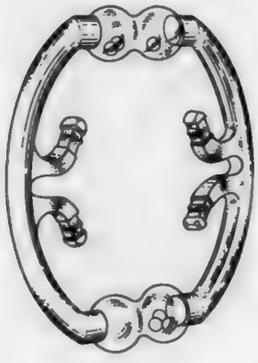
BABY BOTTLE HOLDER

Clifford Goler, 1262 Ridgeley, Los Angeles, Calif. 90019

Filed Sep. 7, 1994, Ser. No. 28,114

Term of patent 14 years

U.S. Cl. D24—199



364,229

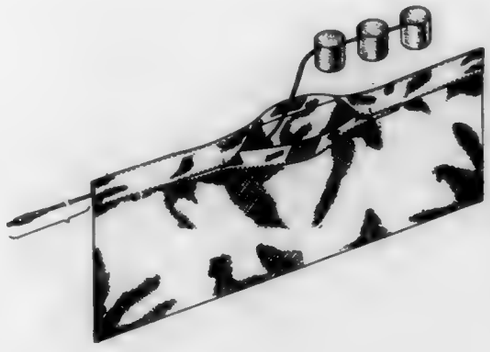
COMBINATION BODY SCARF AND MASSAGER

Clara Connor, 9459 Hollyhock Ave., Fountain Valley, Calif. 92708

Filed May 16, 1994, Ser. No. 22,896

Term of patent 14 years

U.S. Cl. D24—206



364,230

MASSAGE ROLLER

Günter Schweisfurth, Am Glaskopf 76, D-57567 Daaden, Germany

Filed Jun. 27, 1994, Ser. No. 25,015

Claims priority, application Germany, Jan. 5, 1994, 94 00 012.3

Term of patent 14 years

U.S. Cl. D24—211

364,231

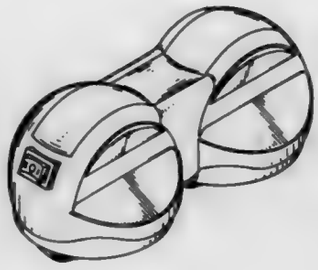
MASSAGER

Tony Kou, 2F, No. 14, Sublane 1, Lane 14, Ta Chih Street, and C. T. Chou, No. 6, Sublane 23, Lane 278, Chung Hsiao E. Rd., Sec. 6, both of Taipei, Taiwan, Prov. of China

Filed Jan. 31, 1994, Ser. No. 34,300

Term of patent 14 years

U.S. Cl. D24—215



364,232

GAZEBO

Robert J. Siebelink, 1851 SW. Farragut, Wyoming, Mich. 49509

Filed Mar. 30, 1994, Ser. No. 20,664

Term of patent 14 years

U.S. Cl. D25—19

364,233

TILE EDGING STRIP

Malcolm Caley, Burton Upon Trent, England, assignor to McKechnie UK Limited, Walsall, England

Filed Dec. 21, 1994, Ser. No. 32,561

Claims priority, application United Kingdom, Jun. 29, 1994, 2040021

Term of patent 14 years

U.S. Cl. D25—119

364,234

TILE EDGING STRIP

Malcolm Caley, Staffordshire, England, assignor to McKechnie UK Limited, Walsall, England

Filed Dec. 21, 1994, Ser. No. 32,562

Claims priority, application United Kingdom, Jun. 29, 1994, 2040022

Term of patent 14 years

U.S. Cl. D25—119

364,235

EXPANSION STRIP FOR TILED SURFACES

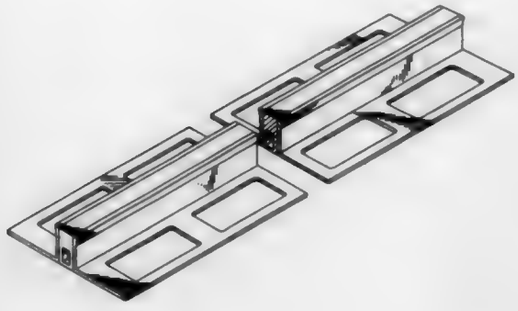
Malcolm Caley, Staffordshire, England, assignor to McKechnie UK Limited, Walsall, England

Filed Dec. 21, 1994, Ser. No. 32,567

Claims priority, application United Kingdom, Jun. 30, 1994, 2040049

Term of patent 14 years

U.S. Cl. D25—122



364,236

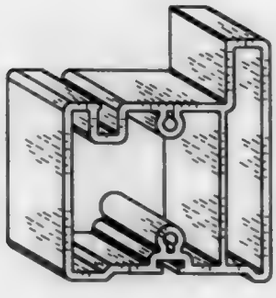
WINDOW COMPONENT EXTRUSION

Robert A. Schrader, Puyallup, Wash., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Sep. 13, 1994, Ser. No. 28,366

Term of patent 14 years

U.S. Cl. D25—124



364,237

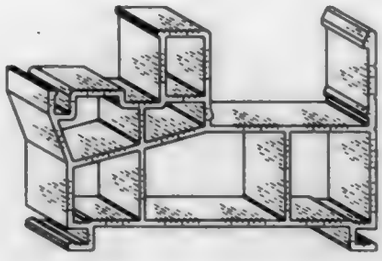
WINDOW COMPONENT EXTRUSION

Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Dec. 15, 1994, Ser. No. 32,245

Term of patent 14 years

U.S. Cl. D25—125



364,238

CANDLE STAND

Kuei-Hung Hung, No.206, Min Chu Road, Cheng Kung Li, Changhua, Taiwan, Prov. of China

Filed Dec. 19, 1994, Ser. No. 32,454

Term of patent 14 years

U.S. Cl. D26—9

364,239

REAR LIGHT OF AN AUTOMOBILE

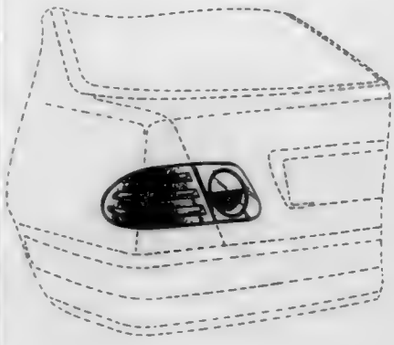
Bruno Sacco; Josef Gallitzendörfer, both of Sindelfingen, and Peter Pfeiffer, Böblingen, all of, Germany, assignors to Mercedes-Benz Aktiengesellschaft, Stuttgart, Germany

Filed Aug. 25, 1993, Ser. No. 12,162

Claims priority, application Germany, Feb. 25, 1993, M9301495.3

Term of patent 14 years

U.S. Cl. D26—28



364,240

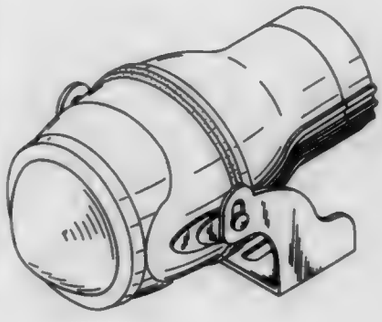
FOG LIGHT FOR VEHICLES

Kuo-Chin Huang, No. 103, Cheng I Second Street, Jen I Tsun, Jen Te Hsiang, Tainan Hsien, Taiwan, Prov. of China

Filed Jan. 18, 1995, Ser. No. 33,699

Term of patent 14 years

U.S. Cl. D26—28



364,241

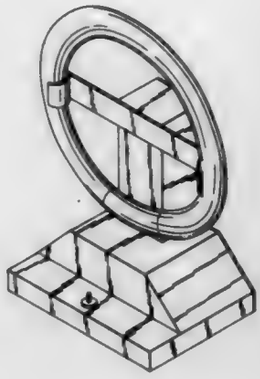
FLUORESCENT TABLE LAMP

Bruce Jaynes, 423 1st. Ave. #4, Salt Lake City, Utah 84103

Filed Nov. 5, 1993, Ser. No. 14,973

Term of patent 14 years

U.S. Cl. D26—79



364,242

LUMINAIRE

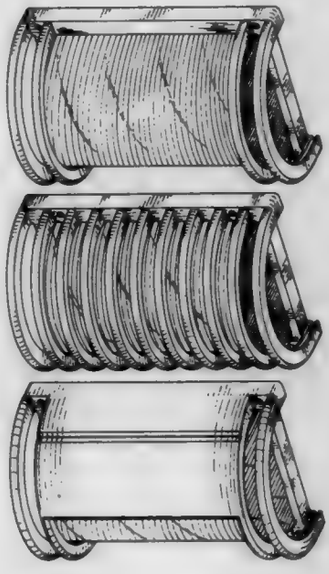
Roberto Florato, Verona, Italy, assignor to PRISMA S.p.A., Verona, Italy

Filed Sep. 23, 1994, Ser. No. 28,843

Claims priority, application WIPO, Mar. 24, 1994, DM/029 118

Term of patent 14 years

U.S. Cl. D26—85



364,243

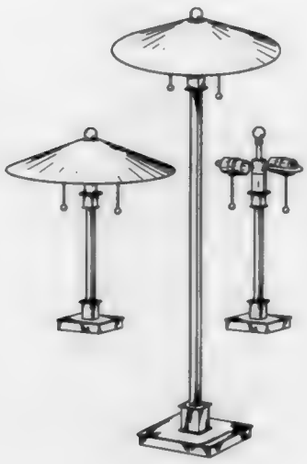
LAMP

Kevin Von Kluck, Hudson, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio

Filed Aug. 4, 1994, Ser. No. 26,748

Term of patent 14 years

U.S. Cl. D26—110



364,244

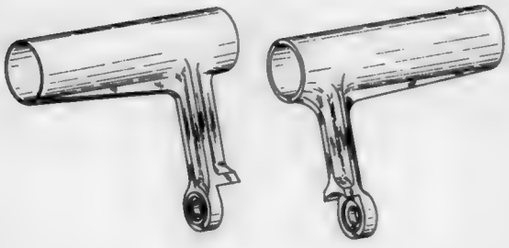
ILLUMINATOR BRACKET FOR A NIGHT VISION DEVICE

Gary L. Palmer, Vinton, Va., assignor to ITT Corporation, New York, N.Y.

Filed Mar. 22, 1994, Ser. No. 20,284

Term of patent 14 years

U.S. Cl. D26—138



364,245

ELECTRIC CIGARETT LIGHTER

Grant Anderson, 4550 Wadsworth Blvd., #183, Wheat Ridge, Colo. 80033

Filed Aug. 24, 1994, Ser. No. 27,569

Term of patent 14 years

U.S. Cl. D27—141

364,246

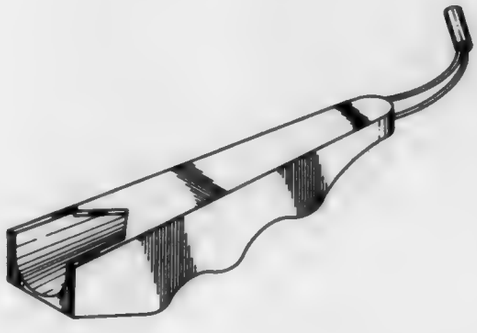
SHEATH FOR A NAIL CLIPPER

Billy W. Conerly, 12433 Coursey Blvd., Apt. 1122, Baton Rouge, La. 70816

Filed Jul. 27, 1994, Ser. No. 26,768

Term of patent 14 years

U.S. Cl. D28—60



364,247

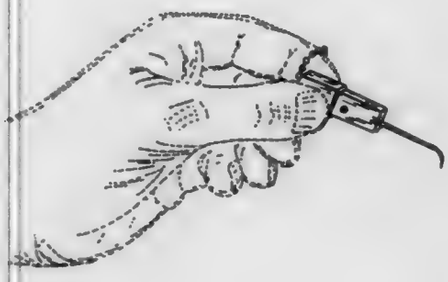
COMBINED DENTAL PICK AND SHEATH

Raymond P. Tipp, P.O. Box 3778, Missoula, Mont. 59806

Filed Mar. 21, 1994, Ser. No. 20,249

Term of patent 14 years

U.S. Cl. D28—64



364,248

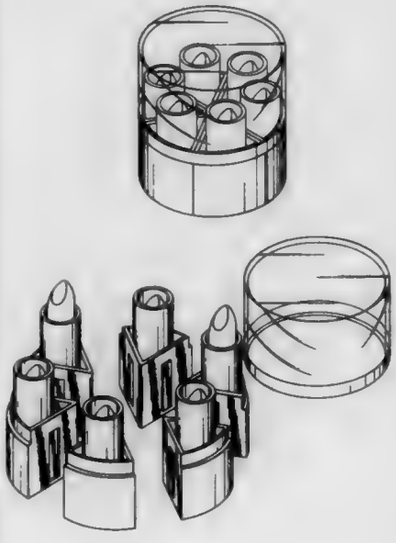
LIPSTICK KIT

Pao-Fon Su, Changhwa Hsien, Taiwan, Prov. of China, assignor to Lo Mei Cosmetics Ent. Co., Ltd., Changhwa Hsien, Taiwan, Prov. of China

Filed Mar. 23, 1994, Ser. No. 20,301

Term of patent 14 years

U.S. Cl. D28—86



364,249

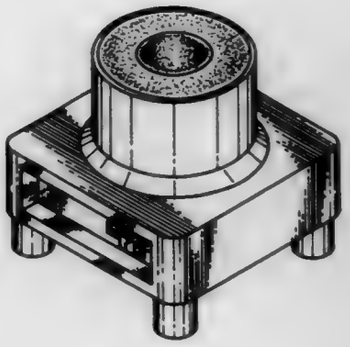
NAIL POLISH BLENDER/MIXER

Anita Cannata-Nowell, 20 Orchard St., Ramsey, N.J. 07446

Filed Jun. 13, 1994, Ser. No. 24,392

Term of patent 14 years

U.S. Cl. D28—99



364,250

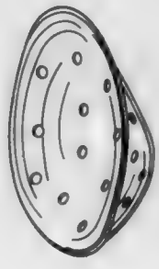
BREAST PROTECTOR

Jamie L. McCracken, and Kathy L. Goff, both of Stillwater, Okla., assignors to Turtle Shells Corporation, Stillwater, Okla.

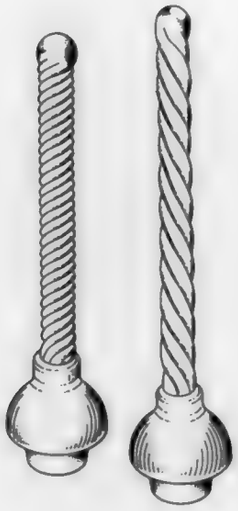
Continuation-in-part of Ser. No. 84,046, Jun. 28, 1993. This application Oct. 8, 1993, Ser. No. 13,974

Term of patent 14 years

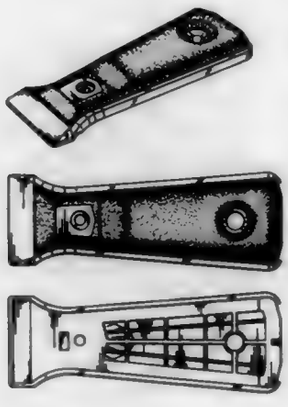
U.S. Cl. D29—100



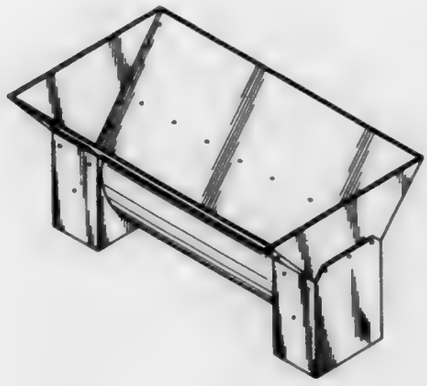
364,251
TOILET BOWL PLUNGER
Alan Novak, 5449 Encino Ave., Encino, Calif. 91436
Filed May 15, 1992, Ser. No. 883,717
Term of patent 14 years
U.S. Cl. D32—35



364,252
HAND TOOL
David R. Henke, Maple Grove, Minn., assignor to Warner Manufacturing Company, Minneapolis, Minn.
Filed Jun. 1, 1994, Ser. No. 23,817
Term of patent 14 years
U.S. Cl. D32—42



364,253
JOINT COMPOUND TROUGH
Anthony Pianella, 7536 Oriskany Rd., Rome, N.Y. 13440-0949
Filed Mar. 24, 1993, Ser. No. 6,349
Term of patent 14 years
U.S. Cl. D32—53.1



364,254
COMPOST BIN
Nigel Nattrass, 323 Pitt Town Road, Maraylya, NSW 2765, Australia
Filed May 31, 1994, Ser. No. 23,712
Claims priority, application Australia, Nov. 30, 1993, 3794/93
Term of patent 14 years
U.S. Cl. D34—1

364,255

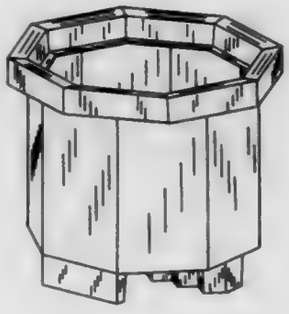
SINGLE DRUM COLLECTION CONTAINER

Mark D. Shaw, 9820 Preston Trail, Ponte Vedra Beach, Fla. 32082; J. Tad Heyman, 11858 Olde Oaks Ct. N., Jacksonville, Fla. 32223; Laurence M. Bierce, 105 Sandra Rd., Jacksonville, Fla. 32211, and Jesse Ehredt, 1711 Dufftон La., Painesville, Ohio 44077

Filed Jul. 7, 1994, Ser. No. 25,635

Term of patent 14 years

U.S. Cl. D34—1



364,256

COMBINED RIM AND HANDLE PORTION FOR A TRASH CONTAINER

John D. Breen, Wooster, and Charles W. Craft, Apple Creek, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Dec. 13, 1994, Ser. No. 32,168

Term of patent 14 years

U.S. Cl. D34—10

364,257

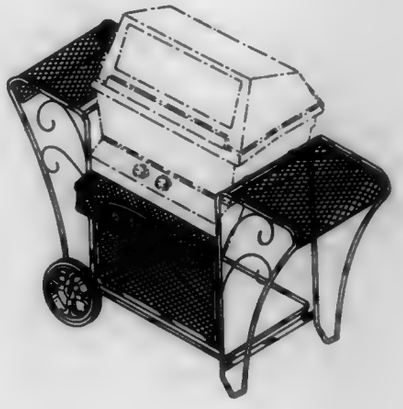
GRILL CART WITH A CONDIMENT BASKET AND A FRONT PANEL

William King, Neosho; Andy Hill, Joplin, both of Mo., and Glen Kemnitz, Gallatin, Tenn., assignors to Sunbeam Corporation, Fort Lauderdale, Fla.

Filed Nov. 19, 1993, Ser. No. 17,281

Term of patent 14 years

U.S. Cl. D34—21



364,258

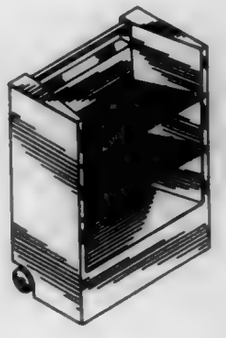
PORTABLE PRODUCT MERCHANDISING CART

Paul Whittington, Thornhill, Canada, assignor to Gorrie Advertising Management Limited, Mississauga, Canada

Filed Jun. 7, 1994, Ser. No. 24,080

Term of patent 14 years

U.S. Cl. D34—21



364,259

STABILIZER JACK

Bernard F. Garceau, Granger, Ind., assignor to Norco Industries, Inc., Compton, Calif.

Filed Sep. 19, 1994, Ser. No. 28,642

Term of patent 14 years

U.S. Cl. D34—31

364,260

TOMBSTONE

Frank Landrey, 322 Bayberry Cove, Forest, Va. 24551

Filed Jun. 20, 1991, Ser. No. 718,853

Term of patent 14 years

U.S. Cl. D99—17

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14th DAY OF NOVEMBER, 1995

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Viel Lamare, Charles; Hiltunen, Matti; and Lee, Yam, 5,465,690, Cl. 122-4.00D.

A.G. (Patents) Limited (British company): *See*—
Gaylor, Ian M. D., 5,466,474, Cl. 426-394.000.

A.P.I.S. Medical B.V.: *See*—
van den Haak, Abraham, 5,466,226, Cl. 604-192.000.

Aaslyng, Dorrit A.: *See*—
Quttrup, Helle; Dambmann, Claus; Christiansen, Margrethe; and Aaslyng, Dorrit A., 5,466,594, Cl. 435-221.000.

Abaied, Daniel: *See*—
Morrison, Donald; and Abaied, Daniel, 5,467,149, Cl. 351-162.000.

ABB Management AG: *See*—
Althaus, Rolf; Chyou, Yau-Pin; Frutschi, Hans U.; Genet, Christian; Kamber, Peter; Lindvall, Anders; Sattelmayer, Thomas; Senior, Peter; and Rufli, Peter, 5,465,569, Cl. 60-39.030.
Biangetti, Francisco; Kost, Andreas; and Volks, Gunter, 5,465,784, Cl. 165-114.000.
Ebeling, Wilhelm; Faber, Guy; Kuhnen, Gottfried; and Scholz, Arthur, 5,466,910, Cl. 219-130.010.
Elvekjaer, Peter; and Gribi, Urs, 5,465,482, Cl. 29-889.100.

ABB Management Ltd.: *See*—
Heinrich, Klaus, 5,466,118, Cl. 415-58.600.

ABB Power T&D Company Inc.: *See*—
Blom, Leo E.; and Byron, Eldridge R., 5,466,902, Cl. 200-50.0AA.
Freeman, Willie B.; Johnson, David S.; and Froehlich, Klaus B., 5,466,891, Cl. 174-142.000.

ABB Vetco Gray Inc.: *See*—
McConaughy, Brett R.; Brammer, Norman; and Gariepy, James A., 5,465,794, Cl. 166-375.000.

Abbott, Joshua B. Fence slat locking system and method. 5,465,941, Cl. 256-34.000.

Abbott Laboratories: *See*—
Kessenich, Peter, 5,466,227, Cl. 604-246.000.

Abdelnaalek, Fawzy T. Cyclonic centrifugal gas separator - absorber apparatus for boiler flue gas cleaning. 5,466,270, Cl. 55-238.000.

Abdi, Behrooz, to Motorola, Inc. Low voltage precision switch. 5,467,051, Cl. 327-536.000.

Abe, Hisamasa: *See*—
Shirakura, Yuji; Abe, Hisamasa; Yamashita, Teruo; Shimizu, Tatsuo; Kawahara, Sei; Miyoshi, Takahito; and Nishikawa, Yasuo, 5,466,519, Cl. 428-323.000.

Abe, Kiyomi, to Fuji Jukogyo Kabushiki Kaisha. Control method for purging fuel vapor of automotive engine. 5,465,703, Cl. 123-674.000.

Abe, Makoto; Ohta, Shigekata; Tokitoh, Hiroyuki; Ueda, Morimasa; Kano, Takahumi; and Hidaka, Hiroyuki, to Mitutoyo Corporation. Method of and an apparatus for measuring surface contour. 5,467,289, Cl. 364-560.000.

Abel, Robert J.; MacDonald, Michael C.; and Wang, Peter S.-S., to TRW, Inc. Mapping and analysis system for precision farming applications. 5,467,271, Cl. 364-420.000.

Abele, John E., to Boston Scientific Corporation. Fluoroscopically viewable multifilar calibrated guidewire and method of measuring occlusions with calibrated guidewires. 5,465,732, Cl. 128-772.000.

Abels, Robert L.; and Reilly, Karen, to Amgen Inc. Method for treating psoriasis. 5,466,447, Cl. 424-85.200.

Able Corporation: *See*—
Able, Lyvonne, 5,465,527, Cl. 47-33.000.

Able, Lyvonne, to Able Corporation. Landscaping border. 5,465,527, Cl. 47-33.000.

Abraham, Michael: *See*—
Ruf, Alexander; Abraham, Michael; Lacher, Manfred; Zetterer, Thomas; and Dietrich, Thomas R., 5,465,611, Cl. 73-104.000.

Abramson, Richard D.; and Gelfand, David H., to Hoffmann-La Roche Inc. 5' to 3' exonuclease mutations of thermostable DNA polymerases. 5,466,591, Cl. 435-194.000.

Abresch, Martin J.: *See*—
Spraggins, Gary L.; Abresch, Martin J.; Newton, William B.; and Yee, Renwin J., 5,466,484, Cl. 437-228.000.

Abuto, Frank P.: *See*—
Wanek, M. Chris; Van Den Bogart, Thomas W.; Georger, William A.; Ribble, Brendon F.; Matthews, Billie J.; Sawyer, Lawrence H.; Abuto, Frank P.; and Werner, Edward E., 5,466,513, Cl. 428-218.000.

Accu Bite Dental Supply Company: *See*—
Walter, Jose, 5,466,152, Cl. 433-60.000.

Accu-Sort Systems, Inc.: *See*—
Lapinski, Charles; Eckert, Charles; Skokowski, Richard; Cox, James; Scott, William; Chaleff, Edward; Sharpe, Jeffrey G.; and Wurz, David A., 5,466,921, Cl. 235-462.000.

Acer Peripherlas, Inc.: *See*—
Chun-Jung, Cho, 5,465,927, Cl. 248-271.000.

Ackerman, James H.: *See*—
Hlasta, Dennis J.; Ackerman, James H.; Mura, Albert J.; and Desai, Ranjit C., 5,466,701, Cl. 514-373.000.

Ackerman, Marvin; Berluti, Vincent; Poland, Terrell; and Waldron, Steven, to Electronic Retailing Systems International, Inc. Display system with section addressability. 5,467,474, Cl. 395-800.000.

Ackley, Donald E.; Lebby, Michael S.; and Witting, Gary F., to Motorola. Optical reading head and method for making same. 5,466,633, Cl. 437-129.000.

ACO Severin Ahlmann GmbH & Co., KG: *See*—
Sauerwein, Heinrich; and Arm, Wolfgang, 5,466,091, Cl. 405-36.000.

Activeaid, Inc.: *See*—
Nearing, Charles H., 5,466,204, Cl. 482-102.000.

Acuson Corporation: *See*—
Sliwa, John W., Jr.; Cooper, Thomas G.; and Ayter, Sevig, 5,465,724, Cl. 128.662.030.

Adachi, Tetsuo: *See*—
Tanaka, Toshihiro; Kato, Masataka; Kume, Hitoshi; Ogura, Keisuke; and Adachi, Tetsuo, 5,467,309, Cl. 365-185.140.

Adachi, Tomohiko: *See*—
Butsuen, Tetsuro; Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Adachi, Tomohiko; and Morioka, Satoshi, 5,467,283, Cl. 364-461.000.
Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, 5,467,284, Cl. 364-461.000.

Adachi, Tsugio: *See*—
Mifune, Hiroshi; Saitoh, Satoshi; Kaneda, Teruo; Tomokiyo, Shigetaka; Adachi, Tsugio; Tanaka, Tsutomu; and Furudate, Toshiharu, 5,465,525, Cl. 43-132.100.

Adamian, Vahe A.; Falcinelli, Michael T.; and Phillips, Peter V., to ATN Microwave, Inc. Calibration method and apparatus. 5,467,021, Cl. 324-601.000.

Adams, Amanda J.; Jackson, Philip S.; Moulden, Howard N.; Roberts, David W.; and Watkin, Keith, to Lever Brothers Company, Division of Conopco, Inc. Detergent production. 5,466,851, Cl. 558-21.000.

Adams, Billy J., to Amphion International, Limited. Biological decontamination system. 5,466,425, Cl. 422-186.300.

Adams, Brent L.; Dingley, David J.; and Field, David P. Method and apparatus for identification of crystallographic defects. 5,466,934, Cl. 250-307.000.

Adams, Byron H.; and Lee, Chia W., to Adams Golf, Inc. Metal wood golf club head. 5,465,970, Cl. 273-169.000.

Adams Golf, Inc.: *See*—
Adams, Byron H.; and Lee, Chia W., 5,465,970, Cl. 273-169.000.

Adams, Jonathan P.; Rastrelli, Edmund C.; and Heaton, John C., to Johnson & Johnson Vision Products, Inc. Apparatus for treating an ophthalmic lens mold. 5,466,144, Cl. 425-174.400.

Adams, J. Wesley: *See*—
Yount, Thomas L.; Windes, Larry C.; and Adams, J. Wesley, 5,466,419, Cl. 422-131.000.

ADC Telecommunications, Inc.: *See*—
Burroughs, Dennis M., 5,467,062, Cl. 333-124.000.

Adderley, Colin I.; Fowler, John O.; and Wignall, Michael F., to Rolls-Royce plc. Heat exchanger. 5,465,785, Cl. 165-166.000.

Adderley, Colin I.: *See*—
Banks, Simon A.; Adderley, Colin I.; Fowler, John O.; and Boardman, James E., 5,465,484, Cl. 29-890.042.

Aden, Charles M.; Graham, Martin H.; Taylor, Matthew; and Miller, Mark, to Tut Systems, Inc. Flat cable to flat parallel wire cable. 5,467,061, Cl. 333-24.00R.

Adhikari, Prasad K.: *See*—
Catena, Robert J.; and Adhikari, Prasad K., 5,466,734, Cl. 524-230.000.

Adise, Herbert H. Method of dealing playing cards. 5,465,974, Cl. 273-292.000.

Adriance, Kyle: *See*—
Shaffer, Robert W.; Adriance, Kyle; and Kimbro, Charles D., 5,466,134, Cl. 418-15.000.

Advanced Composite Designs Co., Ltd.: *See*—
Cheng, Cheng-Hsien, 5,465,959, Cl. 273-80.00B.

Advanced Delivery & Chemical Systems, Inc.: *See*—

Siegele, Stephen H.; Nosh, Craig M.; and Gregg, John N., 5,465,766, Cl. 141-198.000.

Advanced Engineering Systems, Operations & Products, Inc.: *See*—
Slocum, Alexander, 5,466,071, Cl. 384-118.000.

Advanced Medical Products Inc.: *See*—
Dickie, Robert G.; and Phillips, Michael J., 5,465,709, Cl. 600-223.000.

Advanced Micro Devices, Inc.: *See*—
Vijeh, Nader; Crayford, Ian S.; and Blumenthal, Jeffrey M., 5,467,369, Cl. 375-224.000.

Advanced Supplies, Inc.: *See*—
Rossi, Giorgio; Ritrovato, Michael L.; and Johnson, Gregory E., 5,466,073, Cl. 400-197.000.

Aeba, Nobuaki, to NEC Corporation. Semiconductor integrated circuit device with electrode for measuring interlayer insulator capacitance. 5,466,956, Cl. 257-203.000.

Aero-Design Technology: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.

Aertbelien, Jozef R.: *See*—
Van Havenbergh, Jan E.; Aertbelien, Jozef R.; and Dooms, Philip, 5,466,541, Cl. 428-690.000.

Afflitto, John: *See*—
Gaffar, Abdul; Nabi, Nuran; Afflitto, John; and Stringer, Orum, 5,466,437, Cl. 424-52.000.

Agari, Norimasa, to Nippon Thompson Co., Ltd. Linear motion guide unit with end recessed retainer. 5,466,069, Cl. 384-49.000.

Agarrat, Stanley A. V-block engine lubrication device. 5,465,694, Cl. 123-196.00R.

Agency of Industrial Science & Technology: *See*—
Tenjimbayashi, Koji, 5,467,184, Cl. 356-35.500.

Agfa-Gevaert: *See*—
Vuylsteke, Pieter P.; and Schoeters, Emile P., 5,467,404, Cl. 382-274.000.

Agfa-Gevaert AG: *See*—
Weber, Beate; Hagemann, Jörg; and Geiger, Markus, 5,466,569, Cl. 430-551.000.

Agfa-Gevaert Aktiengesellchaft: *See*—
Jacob, Friedrich; and Zahn, Wolfgang, 5,467,165, Cl. 335-40.000.

AGFA-Gevaert. N.V.: *See*—
Van Havenbergh, Jan E.; Aertbelien, Jozef R.; and Dooms, Philip, 5,466,541, Cl. 428-690.000.

Agip Petroli S.p.A.: *See*—
Pianta, Orazio; and Koch, Paolo, 5,466,387, Cl. 252-51.50A.

Ahlen, Arne; Mokvist, Anders; and Johansen, Thor, to Sunds Defibrator Industries Aktiebolag. Apparatus for dividing a flow of fibrous material into at least two equally metered flows. 5,465,915, Cl. 241-247.000.

Ahlquist, Paul G.; and French, Roy C., to Mycogen Plant Science, Inc. Subgenomic promoter. 5,466,788, Cl. 536-24.100.

Ahluwalia, Diljit S., to Alfa Manufacturing Industries, Inc. Multi-stepped power drill bit having handle chuck adaptor. 5,466,100, Cl. 408-224.000.

Ahmad, Mohammad N.: *See*—
Igarashi, Yasuyuki; Ahmad, Mohammad N.; Okoshi, Hirofumi; and Hakomori, Sen-itroh, 5,466,716, Cl. 514-642.000.

Ahmed, Nighat: *See*—
Spowage, Mark J.; Grayson, Julia P.; Outhwaite, Alan C.; and Ahmed, Nighat, 5,466,736, Cl. 524-315.000.

Ahn, Kee-sik: *See*—
Jung, Chul-min; Lee, Jeong-hee; Ahn, Kee-sik; and Park, Hee-chul, 5,467,313, Cl. 365-189.110.

Ahola, Juhani: *See*—
Pellinen, Kari; Koiranen, Jukka; Erkkilä, Kari; Ahola, Juhani; and Vähä, Harritalo, 5,467,194, Cl. 356-429.000.

Aida, Satoshi: *See*—
Fujimoto, Katsuhiko; Aida, Satoshi; Oyanagi, Masamichi; and Kudo, Nobuki, 5,465,625, Cl. 73-700.000.

Aihara, Takao; Fukuda, Taro; and Takada, Hideaki, to Honda Giken Kogyo Kabushiki Kaisha. Variable propeller for boat. 5,466,177, Cl. 440-50.000.

Air Squared, Inc.: *See*—
Shaffer, Robert W.; Adriance, Kyle; and Kimbro, Charles D., 5,466,134, Cl. 418-15.000.

Aircast, Inc.: *See*—
Johnson, Glenn W., Jr.; and McVicker, Henry J., 5,466,250, Cl. 607-104.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Aoki, Kouji; and Yokochi, Masaru, 5,467,022, Cl. 324-661.000.
Fujie, Naofumi; Fukura, Kenichi; Ito, Koichi; Hirata, Tetsuya; and Nishio, Naoto, 5,466,038, Cl. 296-213.000.
Ishihara, Hiroshi; and Ogura, Yoshinobu, 5,466,021, Cl. 292-201.000.

Aizawa, Hisashi: *See*—
Murakami, Yutaka; Nakamura, Toru; Hayashi, Takao; Matsubara, Akira; and Aizawa, Hisashi, 5,467,328, Cl. 369-44.160.

Aizawa, Yuichi; and Oku, Yutaka, to Daiwa Golf Co., Ltd. Golf clubhead having beryllium face plate. 5,465,968, Cl. 273-167.00H.

Aizpuru, Jose J.; and Matzen, Walter T., to Honeywell Inc. Shunt phototransistor with reverse bias protection. 5,466,954, Cl. 257-187.000.

Ajinomoto Co., Inc.: *See*—
Honda, Yutaka; Shiragami, Hiroshi; Iwagami, Hisso; and Arai, Masayuki, 5,466,793, Cl. 536-55.300.

Takemoto, Tadashi; Hijiya, Toyoto; Yonekawa, Teruo; and Mochizuki, Chiaki, 5,466,864, Cl. 562-445.000.

Akabane, Atsushi: *See*—
Iguchi, Atsushi; Akabane, Atsushi; Yamashita, Takehiro; and Matsuoka, Koichi, 5,466,916, Cl. 219-633.000.

Akagi, Takao: *See*—
Fukuda, Keiji; Tokunaga, Isao; and Akagi, Takao, 5,466,505, Cl. 428-91.000.

Akers, Paul J.; and Brunskill, William, to Courtaulds Fibres (Holdings) Limited. Fibre and film of a water-absorbent water-insoluble material having a matrix of a copolymer. 5,466,731, Cl. 524-52.000.

Akima, Hiroaki, to Tachi-S Co., Ltd. Lumbar support device. 5,466,045, Cl. 297-284.800.

Akimoto, Katsuyuki; Machida, Takahiro; and Ishii, Yoshinori, to Mitsubishi Denki Kabushiki Kaisha. Fly-back transformer. 5,466,994, Cl. 315-411.000.

Akinwande, Akintunde I., to Honeywell Inc. Comb toothed field emitter structure having resistive and capacitive coupled input. 5,466,982, Cl. 313-309.000.

Akioka, Takao, to Laurel Bank Machine Co., Ltd. Sheet discriminating apparatus. 5,465,821, Cl. 194-207.000.

Akiyama, Setsuo: *See*—
Kusano, Yukihiro; Inagaki, Tomoko; Yoshikawa, Masato; Akiyama, Setsuo; and Naitoh, Kazuo, 5,466,424, Cl. 422-186.050.

Akkerman, Neil H., to Dresser Industries, Inc. Subsurface tubing safety valve. 5,465,786, Cl. 166-66.400.

Akutsu, Eiichi; Soga, Hiroh; Ando, Shigehito; Hirakata, Susumu; and Maruyama, Kazuo, to Fuji Xerox Co., Ltd. Erasable display medium. 5,466,654, Cl. 503-206.000.

Akutsu, Norikatsu: *See*—
Ikoma, Munehisa; Muramatsu, Kimie; Matsuda, Hiromu; Akutsu, Norikatsu; and Matsumoto, Isao, 5,466,543, Cl. 429-59.000.

Akzo Nobel N.V.: *See*—
Davey, Cheryl; Malek, Lawrence T.; Lens, Peter F.; and Wielaard, Frits, 5,466,586, Cl. 435-91.210.
Maria, Christiaan J.; De Weijer, Anton P.; Middeljans, Hendrik; and Heuvel, Herman M., 5,466,525, Cl. 428-357.000.

Aladdin Industries, Inc.: *See*—
Bridges, John A., 5,465,891, Cl. 224-566.000.

Albemarle Corporation: *See*—
Lin, Ronny W.; Atkinson, Eldon E., Jr.; and Layman, William J., Jr., 5,466,867, Cl. 562-554.000.
Sangokoya, Samuel A., 5,466,647, Cl. 502-113.000.

Albersdörfer, Gernot; and Swoboda, Reiner, to Riedhammer GmbH und Co. KG. Sagger wall for a ring pit furnace. 5,466,150, Cl. 432-192.000.

Albinus, Eberhard: *See*—
Krallmann, Anton; Reiners, Ulrich; Albinus, Eberhard; Böhner, Jürgen; and Neelen, Neele, 5,466,520, Cl. 428-323.000.

Albon, Richard; and Williams, David, to Plessey Semiconductors Limited. Random access memory. 5,467,312, Cl. 365-189.010.

Albright, Kevin L.: *See*—
Yates, George J.; Albright, Kevin L.; and Turko, Bojan T., 5,467,128, Cl. 348-187.000.

Alcatel N.V.: *See*—
Walker, Michael; and Heidkämper, Peter, 5,467,394, Cl. 379-392.000.

Alexander, Jose, to Merck & Co., Inc. Dioxolenylmethyl carbamates pro moieties for amine drugs. 5,466,811, Cl. 546-283.000.

Alexander, J. Steven: *See*—
Shepro, David; and Alexander, J. Steven, 5,466,667, Cl. 514-11.000.

Alexander, Thomas; Kim, Yongmin; Park, Hyunwook; Eo, Kil-Su; and Jong, Jing-Ming, to University of Washington, Board of Regents of the ; and Samsung Electronics. Imaging and graphics processing system. 5,467,459, Cl. 395-480.000.

Alfa Manufacturing Industries, Inc.: *See*—
Ahluwalia, Diljit S., 5,466,100, Cl. 408-224.000.

Allcock, Geoffrey, to Coherent Hull, Ltd. Method and apparatus for dot matrix writing using a continous wave laser. 5,467,121, Cl. 347-260.000.

Allen, Harold. Overload controlled wet and dry vacuum apparatus. 5,465,455, Cl. 15-319.000.

Allen, Loyd V., Jr.: *See*—
Poulos, Charles W.; Brenner, George M.; Allen, Loyd V., Jr.; Prabhu, Vilas A.; and Huerta, Pedro L., Jr., 5,466,695, Cl. 514-275.000.

Allen, Scott R., to Mascotech Accessories, Inc. Automotive vehicle rack mast holder. 5,465,890, Cl. 224-324.000.

Allen, William J.; Stein, Jeffrey A.; DiCesare, Paul; Mulhauser, Paul; and Spranger, Doug, to United States Surgical Corporation. Linear surgical stapling instrument. 5,465,896, Cl. 227-176.000.

Allergan, Inc.: *See*—
Chandraratna, Roshantha A. S., 5,466,690, Cl. 514-247.000.
Yang, Shih-Liang S., 5,466,768, Cl. 528-15.000.

AlliedSignal Inc.: *See*—
Muntner, Michael S.; and Perron, James S., 5,465,780, Cl. 164-516.000.
Peters, Norman K., 5,465,757, Cl. 137-625.650.
Roos, Mark G.; and Michie, Terry K., 5,467,092, Cl. 342-174.000.
Royalty, Charles M.; Traxler, William; and Hough, Joseph W., 5,465,756, Cl. 137-625.310.

Allman, Derryl D. J.: *See*—
Yakura, James P.; Cole, Richard K.; Von Thun, Matthew S.; Hass, Crystal J.; and Allman, Derryl D. J., 5,466,614, Cl. 437-8.000.

Allman, Thomas; and Lee, Cathy A. Mobile nursing station. 5,465,438, Cl. 4-626.000.

Alofs, Cornell W.; and Drenth, Ronald R., to Jervis B. Webb Company. Vehicle position determining apparatus. 5,467,084, Cl. 340-933.000.

Alps Electric Co., Ltd.: *See*—
Hatanai, Takashi; and Takahashi, Akira, 5,467,236, Cl. 360-104.000.
Kobayashi, Hiroshi; Hibino, Ikuo; Maruyama, Takahito; Hori, Fumihisa; Nakamura, Tadashi; Matsuura, Takanobu; and Ohsakama, Chikashi, 5,466,076, Cl. 400-248.000.

Alt, Helmut G.: *See*—
Patsidis, Konstantinos; Peifer, Bernd; Palackal, Syriac J.; Alt, Helmut G.; Welch, M. Bruce; Geerts, Rolf L.; Fahey, Darryl R.; and Deck, Harold R., 5,466,766, Cl. 526-129.000.

Alter, Sheldon. Float post apparatus. 5,465,677, Cl. 114-230.000.

Althaus, Tim J.; and Johnson, Paul A., to Micropump Corporation. Multiple-chamber gear pump with hydraulically connected chambers. 5,466,131, Cl. 417-420.000.

Althaus, Rolf; Chyou, Yau-Pin; Frutschi, Hans U.; Genet, Christian; Kamber, Peter; Lindvall, Anders; Sattelmayer, Thomas; Senior, Peter; and Rufli, Peter, to ABB Management AG. Method of establishing part-load operation in a gas turbine group. 5,465,569, Cl. 60-39.030.

Altrieth, Frederick E., III: *See*—
Wilson, James; and Altrieth, Frederick E., III, 5,467,170, Cl. 355-209.000.

Alty, Adam C.; and Sellers, Simon F., to PCR, Inc. Process for the preparation of fluorosilanes. 5,466,850, Cl. 556-477.000.

Aluminum Company of America: *See*—
Botterman, Ralph C.; and Doran, Michael J., 5,466,050, Cl. 301-65.000.
Lause, Herb; Moore, Sylvia; Seltzer, Clif; Taylor, Cliff; and King, Dan, 5,466,317, Cl. 156-79.000.

Alvarez, Ramiro M.; and Lea, Susan J., to Snorex, Inc. Adjustable tongue positioning device and method. 5,465,734, Cl. 128-848.000.

Alza Corporation: *See*—
Myers, Robert M.; Haak, Ronald P.; and Phue, Richard W., 5,466,217, Cl. 604-20.000.

Amagai, Masazumi: *See*—
Beng, Lim T.; Chong, Chai T.; Amagai, Masazumi; Anjoh, Ichiro; Arita, Junichi; Tsubosaki, Kunihiro; Ichitani, Masahiro; and Edwards, Darvin, 5,466,888, Cl. 174-52.200.

Amalgamated Sugar Company, The: *See*—
Kearney, Michael M.; Kochergin, Vadim; Peterson, Kenneth R.; and Velasquez, Larry, 5,466,294, Cl. 127-42.000.

Amano, Masahiko: *See*—
Jackson, John E.; Nitta, Hideo; Shoichi, Katoh; Amano, Masahiko; Kurisu, Yasushi; and Ohno, Keiichiro, 5,466,208, Cl. 492-53.000.

Amemiya, Yoshihito: *See*—
Uchimura, Kuniharu; Saito, Osamu; Amemiya, Yoshihito; and Iwata, Atsushi, 5,467,429, Cl. 395-24.000.

American Cyanamid Company: *See*—
Sum, Phaik-Eng; Lee, Ving J.; and Testa, Raymond T., 5,466,684, Cl. 514-152.000.

American Flywheel Systems, Inc.: *See*—
Bitterly, Jack G.; and Bitterly, Steven E., 5,466,977, Cl. 310-74.000.

American Harvest, Inc.: *See*—
Dornbush, David A.; Erickson, Chad S.; Iverson, Troy M.; Sandahl, Jeffrey E.; Moore, Kevin B.; Barnes, Neal P.; Easley, James B.; Jackson, Richard C.; and Von Duyke, Andrew L., 5,466,912, Cl. 219-400.000.
Erickson, Chad; Dornbush, David; and Finn, John, 5,465,651, Cl. 99-330.000.

American Home Products Corporation: *See*—
Butera, John A.; Antane, Schuyler A.; and Hirth, Bradford H., 5,466,712, Cl. 514-524.000.
Commons, Thomas J.; LaClair, Christa M.; and Christman, Susan, 5,466,688, Cl. 514-212.000.
Ellingboe, John W., 5,466,692, Cl. 514-258.000.
Sabatucci, Joseph P., 5,466,830, Cl. 549-315.000.

American Recreation Products, Inc.: *See*—
Scherer, Michael J., 5,465,886, Cl. 224-215.000.

"Amerika-Bogen" Handelsgesellschaft mbH: *See*—
Klaus, Emmerich, 5,465,981, Cl. 273-423.000.

AMF Bowling Inc.: *See*—
Hixson, Kenneth L., 5,466,193, Cl. 473-115.000.

Amgen Inc.: *See*—
Abels, Robert I.; and Reilly, Karen, 5,466,447, Cl. 424-85.200.

Amiral, Jean, to Serbio. Thrombocytopenia determination. 5,466,582, Cl. 435-7.900.

Amneus, Robert D.: *See*—
Komarek, James A.; Padgett, Clarence W.; Amneus, Robert D.; and Tanner, Scott B., 5,467,300, Cl. 365-104.000.

Amoco Corporation: *See*—
Weisburg, William G., 5,466,577, Cl. 435-6.000.

Amphion International, Limited: *See*—
Adams, Billy J., 5,466,425, Cl. 422-186.300.

Analog Devices, Inc.: *See*—
Ashe, James; and Bowers, Derek F., 5,467,044, Cl. 327-333.000.
McGlinchey, Gerard F., 5,467,009, Cl. 323-269.000.
Sherman, Steven J., 5,465,604, Cl. 73-1.0DV.

Anderson, Carl R.; and Seaman, Gary G., to AT&T IPM Corp. Apparatus for manipulating wound cables. 5,465,478, Cl. 29-748.000.

Anderson, Charles C.; Wang, Yongcai; Bello, James L.; Shalhoub, Ibrahim M.; and Corbin, Douglas D., to Eastman Kodak Company. Imaging element comprising an electrically-conductive layer containing conductive fine particles, a film-forming hydrophilic colloid and pre-crosslinked gelatin particles. 5,466,567, Cl. 430-530.000.

Anderson, Daniel W.: *See*—
Leonard, Timothy J.; and Anderson, Daniel W., 5,466,000, Cl. 280-728.300.

Anderson, John M.: *See*—
McAdams, Eric T.; Anderson, John M.; and McLaughlin, James A., 5,466,256, Cl. 607-142.000.

Anderson, Ronald G. Aligning device for hitching a towed vehicle. 5,465,992, Cl. 280-477.000.

Anderson, Scott C. War game apparatus. 5,465,973, Cl. 273-262.000.

Anderson, Sydia B.: *See*—
Goliaszewski, Alan E.; Cady, Michael A.; Burgmayer, Paul R.; Anderson, Sydia B.; Carey, William S.; and Moulton, Roger D., 5,466,381, Cl. 210-750.000.

Andersson-Schager, Per; Johansson, Ingemar; Larsson, Willy; and Lindmark, Erik, to Excorim AB. System and method for treatment of a biological liquid. 5,466,607, Cl. 436-50.000.

Ando, Nobuhiko; and Fujiie, Kazuhiko, to Sony Corporation. Magneto-optical recording/reproducing apparatus with optical pickup device having a multi-layer dielectric film beam splitter. 5,467,336, Cl. 369-112.000.

Ando, Shigehito: *See*—
Akutsu, Eiichi; Soga, Hiroh; Ando, Shigehito; Hirakata, Susumu; and Maruyama, Kazuo, 5,466,654, Cl. 503-206.000.

Andoh, Fumihiko; Miyakawa, Kazunori; Yamamoto, Hidekazu; and Yamawaki, Masao, to Nippon Hoso Kyokai; and Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing a camera device. 5,466,613, Cl. 437-3.000.

Andrä, Hans P.; and Andrä, Wolfhart. Articulated bearing for heavy loads. 5,466,068, Cl. 384-36.000.

Andrä, Wolfhart: *See*—
Andrä, Hans P.; and Andrä, Wolfhart, 5,466,068, Cl. 384-36.000.

Andreas Stihl: *See*—
Benholz, Martin, 5,465,698, Cl. 123-38.000.

Andrus, Paul G. L. Intermodal rail drag reduer with flexible enclosure between CWS. 5,465,669, Cl. 105-1.100.

Anelva Corporation: *See*—
Miyashita, Haruzo, 5,467,188, Cl. 356-336.000.

Angelmayer, Karl-Hans; Walz, Gerd; and Zoeller, Joachim, to Hoechst Aktiengesellschaft. Unsaturated polyurethanes and their use as dispersants for alkyd resins. 5,466,772, Cl. 528-73.000.

Angelsen, Bjorn; and Nickel, Michael, to Vingmed Sound A/S. Method and apparatus for ultrasound imaging. 5,465,723, Cl. 128-661.020.

Angrave, Janice E.: *See*—
Hollander, Milton B.; Jacobs, David R.; and Angrave, Janice E., 5,465,838, Cl. 206-305.000.

ANGUS Chemical Company: *See*—
Chou, Chih-Yuch, 5,466,769, Cl. 528-60.000.

Anisuzzaman, Abul K.: *See*—
Soloway, Albert H.; Barth, Rolf F.; Anisuzzaman, Abul K.; Tjarks, Werner; Rong, Feng-Guang; and Wyzlic, Iwona M., 5,466,679, Cl. 514-50.000.

Anjoh, Ichiro: *See*—
Beng, Lim T.; Chong, Chai T.; Amagai, Masazumi; Anjoh, Ichiro; Arita, Junichi; Tsubosaki, Kunihiro; Ichitani, Masahiro; and Edwards, Darvin, 5,466,888, Cl. 174-52.200.

Antane, Schuyler A.: *See*—
Butera, John A.; Antane, Schuyler A.; and Hirth, Bradford H., 5,466,712, Cl. 514-524.000.

Anthony, Sam: *See*—
Corrigan, Frank; Anthony, Sam; and Sweeting, Barbara, 5,466,269, Cl. 51-307.000.

Anthony, Thomas R.; Williams, Bradley E.; and McNamara, Karen M., to General Electric Company. Optically improved diamond wire die. 5,465,603, Cl. 72-467.000.

Aoki, Kouji; and Yokochi, Masaru, to Aisin Seiki Kabushiki Kaisha. Dielectric detecting system. 5,467,022, Cl. 324-661.000.

Aoki, Kunimitsu: *See*—
Iino, Tadashi; Furuya, Yoshiyuki; and Aoki, Kunimitsu, 5,467,103, Cl. 345-7.000.

Aoki, Takeshi: *See*—
Okumura, Keiji; Aoki, Takeshi; Sugishima, Yoshio; Hayama, Satoru; Taguchi, Keiichi; Iwase, Yuichiro; and Okamoto, Noriaki, 5,465,947, Cl. 270-58.000.

Aoki, Yasushi: *See*—
Baba, Mitsuo; and Aoki, Yasushi, 5,467,041, Cl. 327-276.000.

Aosaki, Ko; and Nishitani, Yasuhiro, to Fuji Photo Film Co., Ltd. Method for controlling an image processing system. 5,467,198, Cl. 358-400.000.

Aoyama, Moriyuki: *See*—
Takemoto, Takatoshi; Kawashima, Kazunari; Kadomatsu, Hideyuki; Aoyama, Moriyuki; and Nakamura, Takaharu, 5,465,950, Cl. 271-125.000.

Apple Computer, Inc.: *See*—
Chu, Ke-Chiang, 5,467,087, Cl. 341-51.000.
Law, David; Boyle, Dennis; and Herron, Matt, 5,466,166, Cl. 439-159.000.
Opreacu, Florin; and Van Brunt, Roger, 5,467,464, Cl. 395-550.000.

Appleton, William J.; Hahn, Dennis; Moucha, William E.; Ruscio, Dominic V.; Shannon, John H.; Silbermann, Steven D.; and Weaver, Edwin W., Jr., to Bausch & Lomb Incorporated. Apparatus for molding lenses. 5,466,147, Cl. 425-412.000.

Applied Materials, Inc.: *See*—
Ebbing, Peter F., 5,465,746, Cl. 137-14.000.
Xu, Zheng, 5,467,220, Cl. 359-350.000.

Applied Power Inc.: *See*—
Miller, Douglas P., 5,465,576, Cl. 60-478.000.

Arai, Masayuki: *See*—
Honda, Yutaka; Shiragami, Hiroshi; Iwagami, Hisao; and Arai, Masayuki, 5,466,793, Cl. 536-55.300.

Araki, Masaaki: *See*—
Shinozaki, Kengo; Wakabayashi, Kimihiro; Murakami, Hiroki; and Araki, Masaaki, 5,465,892, Cl. 225-2.000.

ARCO Chemical Technology, L.P.: *See*—
Cooper, Charles F., 5,466,843, Cl. 554-149.000.
Jubin, John C., Jr., 5,466,836, Cl. 549-531.000.

Arens, Cornelus G. Die change apparatus for reciprocating press. 5,466,207, Cl. 483-28.000.

Areté Associates: *See*—
Bowker, Kent; and Lubard, Stephen C., 5,467,122, Cl. 348-31.000.

Arimoto, Akira: *See*—
Nakamura, Shigeru; Arimoto, Akira; Suzuki, Kenkichi; and Shibata, Katsuhiko, 5,467,417, Cl. 385-36.000.

Arita, Hiroshi: *See*—
Kida, Junzo; Arita, Hiroshi; and Kurosawa, Yukio, 5,467,049, Cl. 327-438.000.

Arita, Junichi: *See*—
Beng, Lim T.; Chong, Chai T.; Amagai, Masazumi; Anjoh, Ichiro; Arita, Junichi; Tsubosaki, Kunihiro; Ichitani, Masahiro; and Edwards, Darvin, 5,466,888, Cl. 174-52.200.

Arizona Board of Regents: *See*—
Glaunsinger, William; Sorensen, Ian; Bao, Qingcheng; and McKelvy, Michael J., 5,466,605, Cl. 436-6.000.

Arjunan, Palanisamy, to Exxon Chemical Patents Inc. Process for converting polyketones to polyesters. 5,466,780, Cl. 528-494.000.

Arm, Wolfgang: *See*—
Sauerwein, Heinrich; and Arm, Wolfgang, 5,466,091, Cl. 405-36.000.

Armacost, Michael; Baker, A. Richard, Jr.; Berry, Wayne S.; Carl, Daniel A.; Kenney, Donald M.; and Licata, Thomas J., to International Business Machines Corporation. Micro mask comprising agglomerated material. 5,466,626, Cl. 437-60.000.

Armiger, William: *See*—
Yang, Xin; Lee, Jaw E.; Armiger, William; Maneshin, Sergey K.; and Kolb, Marcus E., 5,466,604, Cl. 435-286.100.

Armijo, Orlando M.; and Spector, George. Portable household water dispenser. 5,465,878, Cl. 222-181.200.

Arnold, Barry J., to Hewlett-Packard Company. Pseudo-NMOS logic circuits with negligible static current during quiescent current testing. 5,467,026, Cl. 326-16.000.

Arnswald, Kurt W., to WILO GmbH. Device for switching a submersible motor-driven pump on and off. 5,466,127, Cl. 417-38.000.

Arrow Art Finishers, Inc.: *See*—
Smith, Michael J., 5,465,851, Cl. 211-59.100.

Arthrex, Inc.: *See*—
Schmieding, Reinhold; and Krupp, Stefan, 5,466,243, Cl. 606-232.000.

Arvidsson, Lars-Erik; Berg, Hans; Engström, Björn; and Hagström, Gunnar, to Pharmacia LKB Biotechnology AB. Anion exchanger. 5,466,368, Cl. 210-198.200.

Asahi Glass Company Ltd.: *See*—
Ishino, Toshihiro; Kida, Otojiro; and Beppu, Yoshihisa, 5,466,643, Cl. 501-105.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Matsuda, Akio; and Matsuyama, Kenji, 5,466,598, Cl. 435-254.110.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Nishiyama, Masataka, 5,467,167, Cl. 355-75.000.
Nomura, Hiroshi, 5,467,227, Cl. 359-694.000.
Ohsawa, Yutaka; and Hashimoto, Isamu, 5,467,200, Cl. 358-426.000.

Asahi Yukizai Kogyo Co. Ltd.: *See*—
Iguchi, Atsushi; Akabane, Atsushi; Yamashita, Takehiro; and Matsuoka, Koichi, 5,466,916, Cl. 219-633.000.

Asai, Tetsuo: *See*—
Hashimoto, Kenichi; Machara, Toshio; Imaizumi, Yasuo; and Asai, Tetsuo, 5,465,602, Cl. 72-347.000.

Asai, Tomohito: *See*—
Miyake, Kazutoshi; Ueno, Masato; Watanabe, Satomi; Funahashi, Nobuaki; Asai, Tomohito; and Isono, Thoru, 5,465,485, Cl. 29-892.110.

Asakura, Osamu; Uchikata, Yoshio; Kawazoe, Kenji; and Kanome, Yuji, to Canon Kabushiki Kaisha. Recording apparatus with mechanism for shifting ink ribbon cassettes. 5,466,074, Cl. 400-206.000.

Asami, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. EEPROM apparatus. 5,467,357, Cl. 371-21.300.

Aschenbeck, David P.: *See*—
Gavin, Patrick M.; Schelhorn, Jean E.; Aschenbeck, David P.; and Strauss, Carl R., 5,466,504, Cl. 428-74.000.

Ascom Timeplex Trading AG: *See*—
Solomon, David; Putnins, Zigmunds A.; Gish, David W.; and Mendelson, Jeffrey B., 5,467,344, Cl. 370-58.300.

Asea Brown Boveri Ltd.: *See*—
Schulte-Werning, Burkhard, 5,465,577, Cl. 60-722.000.

Ashe, James; and Bowers, Derek F., to Analog Devices, Inc. CMOS input circuit with improved supply voltage rejection. 5,467,044, Cl. 327-333.000.

Aspenwall, John E., to Jahabow Industries, Inc. Lens retainer system for a showcase light. 5,467,260, Cl. 362-374.000.

Aspinall, Graeme H.: *See*—
Kass, John J.; Hoopes, Philip K.; Sously, Wayne E.; and Aspinall, Graeme H., 5,465,991, Cl. 280-457.000.

Assier, Michel R. M., to Moulinex (Societe Anonyme). Process for the manufacture of a basket for domestic centrifuge. 5,466,408, Cl. 264-156.000.

Astec Industries, Inc.: *See*—
Swanson, Malcolm L.; Feltman, Wendell R.; and Schreter, Robert E., 5,466,418, Cl. 422-111.000.

Åström, Bo A. V.: *See*—
Peltonen, Ari; Åström, Bo A. V.; Gandils, Mars V.; Stille, Mats O.; and Lantto, Sven J., 5,467,381, Cl. 379-58.000.

Asymptotic Technologies, Inc.: *See*—
La, Duong; Bouras, Carlos E.; Meier, Mark S.; and Roetker, Thomas J., 5,465,879, Cl. 222-189.060.

AT&T Corp.: *See*—
Baumert, Robert J., 5,467,351, Cl. 370-85.150.
Frank, Aaron L.; Ibidunni, Ajibola O.; Johnson, Douglas B.; Krause, Dennis L.; and Nguyen, Trac, 5,466,972, Cl. 257-764.000.
Presby, Herman M., 5,467,415, Cl. 385-14.000.

AT&T Global Information Solutions Company: *See*—
Yakura, James P.; Cole, Richard K.; Von Thun, Matthew S.; Hass, Crystal J.; and Allman, Derryl D. J., 5,466,614, Cl. 437-8.000.

AT&T IPM Corp.: *See*—
Anderson, Carl R.; and Seaman, Gary G., 5,465,478, Cl. 29-748.000.
Dragone, Corrado, 5,467,418, Cl. 385-37.000.

ATC Leasing Company: *See*—
Lichter, Nicholas J., 5,465,813, Cl. 188-3.00H.

Atkinson, Darren E.: *See*—
Burns, Richard W.; and Atkinson, Darren E., 5,467,063, Cl. 333-125.000.

Atkinson, Eldon E., Jr.: *See*—
Lin, Ronny W.; Atkinson, Eldon E., Jr.; and Layman, William J., Jr., 5,466,867, Cl. 562-554.000.

Atlantic Packaging Products Ltd.: *See*—
Blyth, David; Granovsky, David; Ledger, Greg; and Smith, Bruce, 5,465,846, Cl. 206-554.000.

Atlantic Richfield Company: *See*—
Darland, Fred S.; and Durgin, Jerry A., 5,467,290, Cl. 364-561.000.
Henderson, Gerald J.; Johnson, Peter C.; and Sullivan, Lawrence B., 5,466,157, Cl. 434-299.000.

Atlas Elektronik GmbH: *See*—
Freking, Benno, 5,465,622, Cl. 73-597.000.

ATN Microwave, Inc.: *See*—
Adamian, Vahe A.; Falcinelli, Michael T.; and Phillips, Peter V., 5,467,021, Cl. 324-601.000.

Atoma International Inc.: *See*—
Cetnar, Roman, 5,466,024, Cl. 292-336.300.
Kiefer, Gerry D., 5,466,404, Cl. 264-408.000.
Lambert, Jeffrey T.; and Walblay, Edward J., 5,466,043, Cl. 297-238.000.

Atsugi Unisia Corporation: *See*—
Kono, Satoshi; Hidaka, Shizuaki; and Takahashi, Tetsu, 5,465,635, Cl. 74-595.000.

Atwal, Karnail, to E.R. Squibb & Sons, Inc. Benzopyran derivatives and heterocyclic analogs thereof as antiischemic agents. 5,466,817, Cl. 548-305.100.

Audeh, Costandi A.; and Rankel, Lillian A., to Mobil Oil Corporation. Integrated process for hydrotreating heavy oil, then manufacturing an alloy or steel using a carbon-based catalyst. 5,466,363, Cl. 208-251.00H.

Audenaert, Frans A.; Dams, Rudolf J.; and Kamrath, Robert F., to Minnesota Mining and Manufacturing Company. Fluorine-efficient oil- and water-repellent compositions. 5,466,770, Cl. 528-60.000.

Audi AG: *See*—
Klages, Ulrich; Feldschmid, Alois; Kreis, Gundolf; and Timm, Heinrich, 5,466,035, Cl. 296-205.000.

Aul, Marta: *See*—
Schneider, Günther; Klier, Manfred; Aul, Marta; and Teichmann, Stephan, 5,466,457, Cl. 424-401.000.

Australian National University, The: *See*—
Ninham, Barry W.; Calka, Andrzej; and Williams, James S., 5,466,310, Cl. 148-513.000.

AuYeung, Vincent W.: *See*—
Rumsey, Karen M.; Maeda, Patrick Y.; and AuYeung, Vincent W., 5,467,229, Cl. 359-822.000.

Avery Dennison Corporation: *See*—
Merser, F. Gerard, 5,465,442, Cl. 12-142.0LC.

Avid Marketing, Inc.: *See*—
Wooldridge, Sammy E.; Yoakum, Jay F.; and Stoddard, Hannis L., III, 5,465,556, Cl. 53-468.000.

Avid Technology, Inc.: *See*—
Fasciano, Peter J.; Rawley, Curt A.; Hegg, Thomas R.; Leathurby, Mackenzie; Bedell, Jeffrey L.; and Ravan, James A., Jr., 5,467,288, Cl. 364-514.00R.

Avionic Displays Corporation: *See*—

Dunn, William R., 5,467,085, Cl. 340-971.000.
Avitall, Boaz. Catheter control handle. 5,465,716, Cl. 128-642.000.
Axer, Klaus: *See*—
Drews, Steffen; Tobergte, Wolfgang; Timm, Volker; and Axer, Klaus, 5,467,081, Cl. 340-825.340.
Axon, Allan, to System E. Controls Limited. Measuring apparatus and method. 5,465,496, Cl. 33-522.000.
Ayter, Sevig: *See*—
Sliwa, John W., Jr.; Cooper, Thomas G.; and Ayter, Sevig, 5,465,724, Cl. 128-662.030.
Azuma, Chihiro: *See*—
Tanizawa, Osamu; Okayama, Hiroto; Saji, Fumitaka; Azuma, Chihiro; and Kimura, Tadashi, 5,466,584, Cl. 435-69.100.
B. F. Goodrich Company, The: *See*—
Hagen, Floyd W.; Hohenstein, Gregg A.; Severson, John A.; and Trongard, Pennelle J., 5,466,067, Cl. 374-138.000.
B-Line Systems, Inc.: *See*—
Dooley, David M., 5,465,929, Cl. 248-681.000.
Baba, Mitsuo; and Aoki, Yasushi, to NEC Corporation. Variable delay buffer circuit. 5,467,041, Cl. 327-276.000.
Baba, Sohkichi: *See*—
Taguchi, Takayuki; Hasegawa, Kenichi; Baba, Sohkichi; and Takai, Yoshitsugu, 5,466,555, Cl. 430-110.000.
Babcock, Laura M.; Bard, John K.; and Leibfried, Raymond T., Sr., to Hercules Incorporated. Flame retardant organosilicon polymer composition, process for making same, and article produced therefrom. 5,466,512, Cl. 428-209.000.
Babcock, Laura M.; Bard, John K.; and Leibfried, Raymond T., Sr., to Hercules Incorporated. Flame retardant organosilicon polymer composition, process for making same, and article produced therefrom. 5,466,728, Cl. 523-179.000.
Bachhofer, Bruno; and Locher, Anton. Process for treating organically polluted water. 5,466,374, Cl. 210-610.000.
Bacon, Edward R.; Daum, Sol J.; and Spara, Paul P., to Eastman Kodak Company. Polyiodinated aroyloxy esters. 5,466,433, Cl. 424-9.451.
Bacon, Edward R: *See*—
Baker, Edward J.; Bacon, Edward R; Illig, Carl R.; Caulfield, Thomas J.; Douty, Brent D.; Josef, Kurt A.; Toner, John L.; and Lee, Robert W., 5,466,435, Cl. 424-9.450.
Bader, David A. Maintaining databases by means of hierarchical genealogical table. 5,467,471, Cl. 395-600.000.
Badier, Frédéric: *See*—
Poyet, Georges; Badier, Frédéric; and Guillot, Dominique, 5,466,063, Cl. 366-6.000.
Bae, Myung-Ho, to Samsung Electronics Co., Ltd. Chip initialization signal generating circuit. 5,467,039, Cl. 327-198.000.
Baeseman, Clifford E. Pre-cooking assembly for use with an archery bow. 5,465,705, Cl. 124-88.000.
Bahram, Resul: *See*—
Ivanics, József; Szabó, Tibor; Hermecz, István; Dalmadi, Gyula; Ivanics, Józsefné; Kovács, Gáborné; and Bahram, Resul, 5,466,833, Cl. 549-475.000.
Bahrmann, Helmut: *See*—
Konkol, Werner; Bahrmann, Helmut; Herrmann, Wolfgang A.; and Kohlpaintner, Christian, 5,466,644, Cl. 502-28.000.
Baillargeon, David J.; Cardis, Angeline B.; Heck, Dale B.; and Johnson, Susan W., to Mobil Oil Corporation. Oligomeric/polymeric multifunctional additives to improve the low-temperature properties of distillate fuels. 5,466,267, Cl. 44-386.000.
Bajo Trading Anstalt: *See*—
Wilbs, Alfred, 5,465,935, Cl. 248-316.300.
Bajraszewski, Alexander; Dodds, David H.; Muessig, Charles E.; and Nagpal, Vijay, to Ford Motor Company. Extrusion forming of internal helical splines. 5,465,597, Cl. 72-19.000.
Baker, A. Richard, Jr.: *See*—
Arnacost, Michael; Baker, A. Richard, Jr.; Berry, Wayne S.; Carl, Daniel A.; Kenney, Donald M.; and Licata, Thomas J., 5,466,626, Cl. 437-40.000.
Baker, Charles K.; Ram, Mohan R. A.; and Willinghoff, Stephen T. Selective electrochemical detector for nitric oxide and method. 5,466,350, Cl. 204-153.140.
Baker, Edward J.; Bacon, Edward R; Illig, Carl R.; Caulfield, Thomas J.; Douty, Brent D.; Josef, Kurt A.; Toner, John L.; and Lee, Robert W., to Sterling Winthrop Inc. Compositions of iodophenoxy alkylene ethers and cellulose derivatives for visualization of the gastrointestinal tract. 5,466,435, Cl. 424-9.450.
Baker, Jeffrey L.; and Legare, Jeffrey R. Scented cartridges and container. 5,465,521, Cl. 43-1.000.
Baker, John M.: *See*—
Worley, Eugene R., 5,466,948, Cl. 257-3.000.
Baldwin, LeRoy A.: *See*—
Hower, John D., Jr.; Martin, Kathleen M.; Gramlich, John D.; and Baldwin, LeRoy A., 5,467,182, Cl. 355-319.000.
Bales, Stephen E.; Brennan, David J.; Guiotty, Robert J., Jr.; Inbasekaran, Muthiah N.; Mang, Michael N.; and Newsham, Mark D., to Dow Chemical Company, The. Nonlinear optically active pyrazolines and polymeric compositions containing moieties derived therefrom. 5,466,397, Cl. 252-582.000.
Bambei, David; and Deines, Robert, to Coleman Company, Inc., The. Flashlight apparatus. 5,467,258, Cl. 362-184.000.
Ban, Kazutoshi: *See*—
Masaki, Katsuhiro; and Ban, Kazutoshi, 5,466,464, Cl. 424-434.000.
Bang, Young U., to Goldstar Co., Ltd. Method for fabricating a liquid crystal display device. 5,466,620, Cl. 437-51.000.
Banks, Simon A.; Adderley, Colin I.; Fowler, John O.; and Boardman, James E., to Rolls-Royce plc; and Rolls-Royce and Associates. Heat exchanger. 5,465,484, Cl. 29-890.042.
Bao, Qingcheng: *See*—
Glaunsinger, William; Sorensen, Ian; Bao, Qingcheng; and McKelvy, Michael J., 5,466,605, Cl. 436-6.000.
Baratto, Eugene L.; David, John R.; Larson, Curtis L.; Nelson, Thomas L.; and Wrobel, Norbert E., to Minnesota Mining and Manufacturing Company. Pretaped container blanks. 5,465,900, Cl. 229-125.390.
Barben, Ted; Carlson, Randy; Christner, Kurt; and Doring, Heinz, to Universal Analyzers, Inc. Thermoelectric gas sample cooler. 5,465,578, Cl. 62-3.200.
Bard, John K.: *See*—
Babcock, Laura M.; Bard, John K.; and Leibfried, Raymond T., Sr., 5,466,512, Cl. 428-209.000.
Babcock, Laura M.; Bard, John K.; and Leibfried, Raymond T., Sr., 5,466,728, Cl. 523-179.000.
Barley, Geoffrey W.; and Morton, Norman, to Britax-Excelsior Limited. Child safety seat. 5,466,044, Cl. 297-252.000.
Barlow, Wayne K.; and Quirante, Carmelo G., to Wescor, Inc. Cytocentrifugation device. 5,466,371, Cl. 210-361.000.
Barnes, Michael S.; Keller, John H.; Logan, Joseph S.; Tompkins, Robert E.; and Westerfield, Robert P., Jr., to International Business Machines Corporation. Electrostatic chuck with reference electrode. 5,467,249, Cl. 361-234.000.
Barnes, Neal P.: *See*—
Dornbush, David A.; Erickson, Chad S.; Iverson, Troy M.; Sandahl, Jeffrey E.; Moore, Kevin B.; Barnes, Neal P.; Easley, James B.; Jackson, Richard C.; and Von Duyke, Andrew L., 5,466,912, Cl. 219-400.000.
Barrett, Peter T., to Radius Inc. Method and apparatus for vector quantization for real-time playback on low cost personal computers. 5,467,413, Cl. 382-236.000.
Barron, Daniel R.; Jasulaitis, Vytas; and Morrill, Brion F., to McDonnell Douglas Corporation. Umbilical mechanism. 5,466,163, Cl. 439-138.000.
Barsotti, Robert J.; Berge, Charles T.; and Scopazzi, Christopher, to Du Pont de Nemours, E. I., and Company. Noncyclic anhydride, epoxy polymer and catalytic macromonomer-grafted acrylic copolymer. 5,466,752, Cl. 525-65.000.
Barth, Rolf F.: *See*—
Soloway, Albert H.; Barth, Rolf F.; Anisuzzaman, Abul K.; Tjarks, Werner; Rong, Feng-Guang; and Wyzlic, Iwona M., 5,466,679, Cl. 514-50.000.
Barucchi, Gerard: *See*—
Huon, Pierre J.; Jachimcsyk, Philippe; Barucchi, Gerard; Calvignac, Jean; and Verplanken, Fabrice, 5,467,359, Cl. 371-37.100.
BASF Aktiengesellschaft: *See*—
Beckmann, Stefan; and Schefczik, Ernst, 5,466,812, Cl. 546-288.000.
Butterfass, Dieter; Schuhmacher, Hans-Joachim; and Mueller, Michael W., 5,466,411, Cl. 264-176.100.
Gruettner-Merten, Sabine; Reichelt, Helmut; Lange, Arno; and Degen, Helmut, 5,466,790, Cl. 534-753.000.
Kroner, Matthias; Schornick, Gunnar; Baur, Richard; Schwendemann, Volker; and Hartmann, Heinrich, 5,466,762, Cl. 525-472.000.
Marczinke, Bernd L.; and Müller, Hans-Joachim, 5,466,753, Cl. 525-193.000.
Schnurr, Werner; Fischer, Rolf; Goetz, Norbert; and Kuekenhoehner, Thomas, 5,466,831, Cl. 549-323.000.
BASF Corporation: *See*—
Hills, William H., 5,466,410, Cl. 264-172.110.
Roach, Matthew N.; Stapensea, Neil P.; and Webster, Jon, 5,465,874, Cl. 222-51.000.
Walsh, William C.; and James, Lawrence E., 5,466,300, Cl. 134-38.000.
BASF Magnetics GmbH: *See*—
Kraetschmer, Reinhard; Pertzsch, Albert; and Schelble, Josef, 5,466,542, Cl. 428-694.0BS.
Bastani, Babak: *See*—
Wray, Anthony J.; Bastani, Babak; and Gailus, Paul H., 5,467,055, Cl. 330-129.000.
Batenhorst, Randal L.; and Fox, Anthony W., to Glaxo Wellcome Inc. Anesthetic use of N-phenyl-N-(4-piperidinyl)amides. 5,466,700, Cl. 514-329.000.
Battenfeld GmbH: *See*—
Eckardt, Helmut; Ehritt, Jürgen; and Renger, Michael, 5,466,141, Cl. 425-130.000.
Bauch, Aaron M.: *See*—
Raterman, Donald E.; Graves, Bradford T.; Stromme, Lars R.; and Bauch, Aaron M., 5,467,405, Cl. 382-135.000.
Bauer, Franz; and Schierling, Hubert, to Siemens Aktiengesellschaft. Method and apparatus for current regulating in a voltage-injecting converter. 5,467,000, Cl. 318-432.000.
Bauer, Heinz; Becker, Burckhard; and Frohnhaus, Ernst-Reiner, to Firma C. Rob. Hammerstein GmbH. Back-rest hinge for a vehicle seat with a seat support and a back-rest hinged to it. 5,466,047, Cl. 297-367.000.
Baumert, Robert J., to AT&T Corp. Extendible round robin local area hub network. 5,467,351, Cl. 370-85.150.
Baumgartner, Christine: *See*—

Geck, Michael; Deubzer, Bernward; Baumgartner, Christine; Lautenschlager, Hans-Jürgen; and Sejpka, Johann, 5,466,746, Cl. 524-837.000.

Baumgartner, Richard A.; Moore, Charles E.; and Herleikson, Earl C., to Hewlett-Packard Company. Serial processing circuits with serial chaining. 5,467,090, Cl. 341-155.000.

Baumgartner, Werner A., to Psychemedics Corporation. Hair analysis method. 5,466,579, Cl. 435-7.100.

Baumoel, Joseph. Insertion ultrasonic transducer with mode conversion and method for reducing multiple signal reception. 5,467,321, Cl. 367-140.000.

Baur, Richard: *See*—
Kroner, Matthias; Schornick, Gunnar; Baur, Richard; Schwendemann, Volker; and Hartmann, Heinrich, 5,466,762, Cl. 525-472.000.

Baur, Stefan T.: *See*—
Green, Paul D.; and Baur, Stefan T., 5,466,943, Cl. 250-493.100.

Bausch & Lomb Incorporated: *See*—
Appleton, William J.; Hahn, Dennis; Moucha, William E.; Ruscio, Dominic V.; Shannon, John H.; Silbermann, Steven D.; and Weaver, Edwin W., Jr., 5,466,147, Cl. 425-412.000.
Bigler, Michael; Hommann, Edgar; and Myerly, Scott, 5,465,444, Cl. 15-22.100.
Conway, Simon M., 5,467,148, Cl. 351-85.000.
Morrison, Donald; and Abaied, Daniel, 5,467,149, Cl. 351-162.000.

Bausch, Richard G.: *See*—
Girardot, Richard M.; Grosgogeat, Eric J.; Yeazell, Charles G.; and Bausch, Richard G., 5,465,452, Cl. 15-210.100.

Baxter, Anthony D.; Baylis, Eric K.; Collingwood, Stephen P.; Taylor, Roger J.; De Mesmaeker, Alain; and Schmit, Chantal, to Ciba-Geigy Corporation. Dinucleoside phosphinates and their pharmaceutical compositions. 5,466,677, Cl. 514-44.000.

Baxter International, Inc.: *See*—
Kersten, Jean; and Delmotte, Yves, 5,466,725, Cl. 523-122.000.
Munsch, John M., 5,466,322, Cl. 156-273.300.

Bayer Aktiengesellschaft: *See*—
Kraus, Helmut, 5,466,800, Cl. 544-82.000.
Pies, Michael; Fiege, Helmut; Puppe, Lothar; and Klabauer, Josef, 5,466,881, Cl. 570-202.000.
Riegels, Martin; and Grütze, Joachim, 5,466,265, Cl. 8-594.000.
Roschger, Peter, 5,466,805, Cl. 544-245.000.
Sieber, Helmut; Schilling, Ferdinand; Hagen, Günter; Kleissendorf, Roland; and Michaelis, Johannes, 5,465,834, Cl. 206-193.000.

Bayer Corporation: *See*—
Hicks, Sharon D.; Wicks, Douglas A.; and Hunter, John H., 5,466,771, Cl. 528-64.000.
Johnson, Mark W., 5,466,482, Cl. 427-212.000.
Krupica, Libor; and McElwain, William L., 5,465,955, Cl. 271-265.020.
Prasad, Vidyanatha A.; and Newallis, Peter E., 5,466,852, Cl. 558-122.000.

Bäyer, Harald; and Kemmerer, Klemens, to MAN Roland Druckmaschinen AG. Sheet-guiding drum for printing machines. 5,465,663, Cl. 101-409.000.

Bayless, Ronnie E.: *See*—
Dotolo, John; and Bayless, Ronnie E., 5,465,685, Cl. 119-159.000.

Baylis, Eric K.: *See*—
Baxter, Anthony D.; Baylis, Eric K.; Collingwood, Stephen P.; Taylor, Roger J.; De Mesmaeker, Alain; and Schmit, Chantal, 5,466,677, Cl. 514-44.000.

Beard, David: *See*—
Lester, Robert A.; Beard, David; and Cram, Milton E., 5,467,019, Cl. 324-339.000.

Bears S.r.l.: *See*—
Bonomi, Giovanni B., 5,465,868, Cl. 221-165.000.

Beasom, James D., to Harris Corporation. Trench resistor architecture. 5,466,963, Cl. 257-516.000.

Beaton, Edward R. Photo cap. 5,465,426, Cl. 2-195.100.

Bebop Incorporated: *See*—
Steinberg, John D.; and Saltzman, Eric T., 5,466,194, Cl. 474-80.000.

Becker, Burckhard: *See*—
Bauer, Heinz; Becker, Burckhard; and Prohnhaus, Ernst-Reiner, 5,466,047, Cl. 297-367.000.

Beckman Instruments, Inc.: *See*—
Rampal, Sushma; Rampal, Jang B.; and Osborne, James C., 5,466,351, Cl. 204-180.100.

Beckmann, Stefan; and Schefczik, Ernst, to BASF Aktiengesellschaft. Preparation of N-aminopyridones. 5,466,812, Cl. 546-288.000.

Becton, Dickinson and Company: *See*—
Bressler, Peter; Sweeney, Niall; Hicswa, Daniel; and Burns, James A., 5,466,223, Cl. 604-110.000.

Bedell, Jeffrey L.: *See*—
Fasciano, Peter J.; Rawley, Curt A.; Hegg, Thomas R.; Leathurby, Mackenzie; Bedell, Jeffrey L.; and Ravan, James A., Jr., 5,467,288, Cl. 364-514.00R.

Beeley, Micheal G.: *See*—
James, M. Elmer; and Beeley, Micheal G., 5,466,056, Cl. 305-54.000.

Beers, Howard L., to HF Scientific, Inc. Automatic calibration system for turbidimeters using a pulsing fluid flow to reciprocate a standard in a cuvette. 5,467,187, Cl. 356-243.000.

Beeson, David. Guitar string support. 5,465,643, Cl. 84-297.00R.

Begemann, Ulrich; Heinzmann, Helmut; and Ruf, Wolfgang, to J. M. Voith GmbH. Paper machine headbox and method of controlling pulp material parameters. 5,466,340, Cl. 162-216.000.

Behring Diagnostics Inc.: *See*—
Waylett, John E., Jr., 5,465,629, Cl. 73-864.240.

Behringwerke Aktiengesellschaft: *See*—
Toth, Tibor, 5,466,611, Cl. 436-534.000.

Beier, Ross C.: *See*—
Stanker, Larry H.; Elissalde, Marcel H., Jr.; Beier, Ross C.; Rowe, Loyd D., Jr.; and DeLoach, John R., 5,466,784, Cl. 530-388.900.

Beiersdorf Aktiengesellschaft: *See*—
Schneider, Günther; Klier, Manfred; Aul, Marta; and Teichmann, Stephan, 5,466,457, Cl. 424-401.000.

Beilstein, Kenneth E., Jr.; Bertin, Claude L.; Cronin, John E.; Howell, Wayne J.; Leas, James M.; and Phillips, Robert B., to International Business Machines Corporation. Electronic modules with interconnected surface metallization layers and fabrication methods therefore. 5,466,634, Cl. 437-180.000.

Belcastro, Domenic. Automatically sealing cup. 5,465,866, Cl. 220-709.000.

Belcher, James F., to Texas Instruments Incorporated. Elevated thin film for ceramic materials. 5,466,331, Cl. 216-17.000.

Belcher, James F.: *See*—
Owen, Robert A.; and Belcher, James F., 5,466,332, Cl. 156-630.000.

Bell & Howell Document Management Products Company: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.

Bell Atlantic Network Services, Inc.: *See*—
Brankley, Russell J.; and Dorsey, James M., 5,467,390, Cl. 379-229.000.
Redd, James C., Jr.; McConnell, Von; and Brohan, Liam P., 5,467,388, Cl. 379-196.000.

Bell, James P.; Iroh, Jude O.; Scola, Daniel A.; and Liang, Jengli, to University of Connecticut, The. Electropolymerization method and product. 5,466,357, Cl. 205-50.000.

Bell, Mace; Nagori, Vinod; and Zinner, Darren E., to United States Surgical Corporation. Specimen retrieval pouch and method for use. 5,465,731, Cl. 128-749.000.

Bell, Ronald F.; and Wysocki, J. Christopher, to GOJO Industries, Inc. Adjustable stroke pump dispenser. 5,465,877, Cl. 222-181.200.

Bellamy, Wayne R.: *See*—
Konig, Wolfgang; Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Takase, Mitsunori; and Bellamy, Wayne R., 5,466,669, Cl. 514-12.000.

Belleau, Bernard, deceased (by Pierrette Belleau, executrix); Mansour, Tarek; The, Allan; Evans, Colleen A.; Jin, Haolun; Zacharie, Boulos; and Nguyen-Ba, Nghe, to Biochem Pharma Inc. Processes for preparing substituted 1,3-oxathiolanes with antiviral properties. 5,466,806, Cl. 544-310.000.

Belleau, Pierrette, executrix: *See*—
Belleau, Bernard, deceased; Mansour, Tarek; The, Allan; Evans, Colleen A.; Jin, Haolun; Zacharie, Boulos; and Nguyen-Ba, Nghe, 5,466,806, Cl. 544-310.000.

Bello, James L.: *See*—
Anderson, Charles C.; Wang, Yongcai; Bello, James L.; Shalhoub, Ibrahim M.; and Corbin, Douglas D., 5,466,567, Cl. 430-530.000.

Beltemacchi, Peter P.: *See*—
Sauter, Bruce M.; Short, Kevin G.; and Beltemacchi, Peter P., 5,465,749, Cl. 137-359.000.

Benchmark Research and Technology, Inc.: *See*—
Sharif, Sharif, 5,466,846, Cl. 556-55.000.

Bender, Burnell L.; and Marshall, Brian P., to Navistar International Transportation Corp. Idle automated A/C system. 5,465,589, Cl. 62-133.000.

Benedict, Lawrence R.: *See*—
Sotack, John D.; Dezen, William L.; Benedict, Lawrence R.; Zayed, Gaith O.; and Werner, Alan J., Jr., 5,465,619, Cl. 73-304.00C.

Beng, Lim T.; Chong, Chai T.; Amagai, Masazumi; Anjoh, Ichiro; Arita, Junichi; Tsubosaki, Kunihiro; Ichitani, Masahiro; and Edwards, Darvin, to Hitachi, Ltd.; and Texas Instruments, Inc. Packaged semiconductor device having stress absorbing film. 5,466,888, Cl. 174-52.200.

Benholz, Martin, to Andreas Stihl. Membrane carburetor. 5,465,698, Cl. 123-38.000.

Benjamin, Michael H.: *See*—
Ulrich, W. Thatcher; Kosella, Harvey A.; Bobick, Aaron F.; and Benjamin, Michael H., 5,466,200, Cl. 482-4.000.

Bennett, Linda K.; and Feldman, Joseph, to Mattel, Inc. Doll having conductive outer skin areas and internal battery supply. 5,466,181, Cl. 446-297.000.

Benson, Anthony B.: *See*—
Brunson, Kevin K.; and Benson, Anthony B., 5,466,251, Cl. 607-112.000.

Beppu, Yoshihisa: *See*—
Ishino, Toshihiro; Kida, Otojiro; and Beppu, Yoshihisa, 5,466,643, Cl. 501-105.000.

Berenter, Allen. Apparatus and method for mounting items at an inaccessible wall surfaces. 5,466,015, Cl. 285-158.000.

Berg, Hans: *See*—
Arvidsson, Lars-Erik; Berg, Hans; Engström, Björn; and Hagström, Gunnar, 5,466,368, Cl. 210-198.200.

Berg, Lloyd, to Berg, Lloyd. Separation of o-xylene from p-xylene and m-xylene by azeotropic distillation. 5,466,345, Cl. 203-57.000.

Berge, Charles T.: *See*—
Barsotti, Robert J.; Berge, Charles T.; and Scopazzi, Christopher, 5,466,752, Cl. 525-65.000.

Berger, Terry A.: *See*—

Haertl, Hans-Georg; and Berger, Terry A., 5,465,581, Cl. 62-50.100.
Bergeron, Raymond J., to University of Florida Research Foundation, Inc. Anti-neoplastic, anti-viral and ribonucleotide reductase activity affecting pharmaceutical compositions and methods of treatment. 5,466,702, Cl. 514-374.000.
Bergwerksverband GmbH: *See*—
Ruter, Horst; and Strack, Kurt-Martin, 5,467,018, Cl. 324-336.000.
Berluti, Vincent: *See*—
Ackerman, Marvin; Berluti, Vincent; Poland, Terrell; and Waldron, Steven, 5,467,474, Cl. 395-800.000.
Bernard, Rex: *See*—
Lutz, Gary P.; Zima, George C.; and Bernard, Rex, 5,466,840, Cl. 554-70.000.
Berndorf Luzern A.G.: *See*—
Meier, Herman; and Witzig, Martin, 5,466,915, Cl. 219-622.000.
Berner, Hans-Ulrich; Ebisch, Rolf; Saverin, Eckehard; and Tyrakowski, Udo, to Felix Schoeller jr Papierfabriken GmbH & Co. KG. Reverse side coating for photographic support. 5,466,536, Cl. 428-522.000.
Bernloehr, Darrel A., to Johnson Fishing, Inc. Foot actuated trolling motor control. 5,465,633, Cl. 74-512.000.
Berry, Lee A., to Sematech, Inc. Optimized ECR plasma apparatus with varied microwave window thickness. 5,466,991, Cl. 315-111.410.
Berry, Wayne S.: *See*—
Armacost, Michael; Baker, A. Richard, Jr.; Berry, Wayne S.; Carl, Daniel A.; Kenney, Donald M.; and Licata, Thomas J., 5,466,626, Cl. 437-60.000.
Berta, Norbert L, to McNeil-PPC, Inc. Drying systems for apparatus for gelatin coating tablets. 5,466,290, Cl. 118-20.000.
Bertenshaw, Stephen R.: *See*—
Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., 5,466,823, Cl. 548-377.100.
Bertin, Claude L.; DiMaria, Donelli J.; Miyakawa, Makoto; and Sakaue, Yoshinori, to International Business Machines Corporation. Three-dimensional direct-write EEPROM arrays and fabrication methods. 5,467,305, Cl. 365-185.010.
Bertin, Claude L.: *See*—
Beilstein, Kenneth E., Jr.; Bertin, Claude L.; Cronin, John E.; Howell, Wayne J.; Leas, James M.; and Phillips, Robert B., 5,466,634, Cl. 437-180.000.
Bertram, Heinz-Jürgen; Emberger, Roland; Güntert, Matthias; and Werkhoff, Peter, to Haarmann & Reimer GmbH. Use of thioalkanediones as aroma substances. 5,466,827, Cl. 549-66.000.
Bertrand, Dominique: *See*—
Gatto, Jean-Marie; and Bertrand, Dominique, 5,466,922, Cl. 250-208.100.
Betz Laboratories, Inc.: *See*—
Goliaszewski, Alan E.; Cady, Michael A.; Burgmayer, Paul R.; Anderson, Sydia B.; Carey, William S.; and Moulton, Roger D., 5,466,381, Cl. 210-750.000.
Beuscher, Norbert; and Willigmann, Ingo, to Schaper & Bruemmer GmbH & Co., KG. Pharmaceutically active composition extracted from tanacetum parthenium, process for its extraction, and pharmaceutical composition containing same. 5,466,451, Cl. 424-195.100.
Bhaskaran, Vasudev; and Lee, Ruby B., to Hewlett-Packard Company. Method and apparatus for fast digital signal decoding. 5,467,131, Cl. 348-384.000.
Biba, Scott I.; and Genova, John R., to Springs Window Fashions Division, Inc. Venetian blind with wand operator. 5,465,775, Cl. 160-168.100.
Bibeau, John M.: *See*—
Kowligi, Rajagopal R.; Bibeau, John M.; and Taylor, Howard H., 5,466,509, Cl. 428-141.000.
Bickerton, David J.; and Wakefield, David, to Hiatt and Company Limited. Baton with extensible handle and foldable crosshandle. 5,465,960, Cl. 273-84.00R.
Bied-Charreton, Benoit; Chabry, Pierre; Lecadet, Jacques; and Pasquier, Patrice, to Metaleurop S.A. Process for the recovery of lead arising especially from the active material of spent batteries, and electric furnace intended especially for the use of the process. 5,467,365, Cl. 373-9.000.
Bierlein, John C.; Wenker, Wayne B.; and Yoho, Jerry L., to Eaton Corporation. Roller gerotor device and pressure balancing arrangement therefor. 5,466,137, Cl. 418-75.000.
Biernacki, Christian P., to Fypon Inc. Facade structure for windows. 5,465,540, Cl. 52-211.000.
Biffin, John R.: *See*—
Regtop, Hubertus L.; and Biffin, John R., 5,466,824, Cl. 548-402.000.
Bigler, Michael; Hommann, Edgar; and Myerly, Scott, to Bausch & Lomb Incorporated. Electric toothbrush. 5,465,444, Cl. 15-22.100.
Bilisik, A. Kadir: *See*—
Mohamed, Mansour H.; and Bilisik, A. Kadir, 5,465,760, Cl. 139-11.000.
Bindon, John N.: *See*—
Lampi, Rauno A.; Bindon, John N.; Bowles, Anthony J. G.; and Parks, Thomas R., 5,465,654, Cl. 99-422.000.
Binga, Tonya D.: *See*—
Fitzgerald, John J.; Ferrar, Wayne T.; Binga, Tonya D.; and Fichtner, Michael W., 5,466,533, Cl. 428-447.000.
Bio-Rad Laboratories, Inc.: *See*—
Fleig, Gordon E.; and Gueffroy, Donald E., 5,466,947, Cl. 250-582.000.
Biochem Pharma Inc.: *See*—
Belleau, Bernard, deceased; Mansour, Tarek; Tse, Allan; Evans, Colleen A.; Jin, Haolun; Zacharie, Boulos; and Nguyen-Ba, Nghe, 5,466,806, Cl. 544-310.000.
BioChem Technology, Inc.: *See*—
Yang, Xin; Lee, Jaw E.; Arniger, William; Maneshin, Sergey K.; and Kolb, Marcus E., 5,466,604, Cl. 435-286.100.
Biochemical Veterinary Research Pty. Ltd.: *See*—
Regtop, Hubertus L.; and Biffin, John R., 5,466,824, Cl. 548-402.000.
Bioject, Inc.: *See*—
Brenneman, Rodney, 5,466,220, Cl. 604-87.000.
Biomembrane Institute, The: *See*—
Igarashi, Yasuyuki; Ahmad, Mohammad N.; Okoshi, Hirofumi; and Hakomori, Sen-itroh, 5,466,716, Cl. 514-642.000.
Biosource Technologies, Inc.: *See*—
della-Cioppa, Guy R.; Garger, Stephen J., Jr.; Holtz, Richard B.; McCulloch, Michael J.; and Sverlow, Genadie G., 5,466,592, Cl. 435-212.000.
Biotechnology Research & Development Corporation: *See*—
Olinger, Jill M.; Sligar, Stephen G.; McLean, Mark A.; Bohn, Paul W.; and Stayton, Patrick, 5,466,589, Cl. 435-174.000.
Bird, Neal R.: *See*—
Warrington, Roger P.; Ramsay, Guy; and Bird, Neal R., 5,466,693, Cl. 514-269.000.
Birkmayer, Wolfram; Wale, Michael J.; and Edge, Colin, to Deutache Aerospace AG; and GEC-Marconi, Ltd. Device for generating feedback signals to regulate optical monitoring circuits (PLL). 5,467,414, Cl. 385-3.000.
Bitterly, Jack G.; and Bitterly, Steven E., to American Flywheel Systems, Inc. Methods for producing bearing surfaces. 5,466,977, Cl. 310-74.000.
Bitterly, Steven E.: *See*—
Bitterly, Jack G.; and Bitterly, Steven E., 5,466,977, Cl. 310-74.000.
Bittman, Barry B.; and Cram, Jeffrey R., to Mindscope Incorporated. Method and apparatus for biofeedback. 5,465,729, Cl. 128-732.000.
Bixler, Graig; and Nelson, Richard A., to Molex Incorporated. Polarizing system for a blind mating electrical connector assembly. 5,466,171, Cl. 439-378.000.
BJ Services Company: *See*—
Dawson, Jeffrey C.; and Van Le, Hoang, 5,465,792, Cl. 166-295.000.
Björk, Bengt, to Duni AB. Method for manufacturing a fabric-like laminate and a product manufactured according to said method. 5,466,318, Cl. 156-183.000.
Black & Decker Inc.: *See*—
Bone, Daniel; and Stones, Kevin, 5,466,106, Cl. 411-433.000.
Black Clawson Company, The: *See*—
Parks, Clinton R., 5,466,335, Cl. 162-60.000.
Blaeser, David J.: *See*—
Ressemann, Thomas V.; and Blaeser, David J., 5,466,222, Cl. 604-96.000.
Blagaila, John H.: *See*—
Utenick, Michael R.; and Blagaila, John H., 5,466,997, Cl. 318-254.000.
Blanck, Edward, to Blue Sky Productions, Inc. Locking assembly and method for a firearm. 5,465,519, Cl. 42-70.110.
Blangetti, Francisco; Kost, Andreas; and Volks, Gunter, to ABB Management AG. Steam condenser. 5,465,784, Cl. 165-114.000.
Blankenburg, Karl. Modular storage apparatus. 5,466,057, Cl. 312-108.000.
Blaser, Horst. Shooting arms with a safety device. 5,465,518, Cl. 42-70.080.
Blauer, Charles: *See*—
Blauer, Stephen; and Blauer, Charles, 5,466,515, Cl. 428-252.000.
Blauer Manufacturing Company, Inc.: *See*—
Blauer, Stephen; and Blauer, Charles, 5,466,515, Cl. 428-252.000.
Blauer, Stephen; and Blauer, Charles, to Blauer Manufacturing Company, Inc. Weather protective fabric combination, outerwear constructed therefrom. 5,466,515, Cl. 428-252.000.
Blazey, Richard N.; and Thou, Andy H., to Eastman Kodak Company. Control of non-contact interference fringes in photographic films. 5,466,564, Cl. 430-403.000.
Bleicher, Joel N. Disposable hydrotherapy tank liner. 5,465,436, Cl. 4-580.000.
Blenke, Timothy J.: *See*—
Partridge, Mary E.; Blenke, Timothy J.; Everson, Stephen R.; Schroth, Carl G.; and Venturino, Michael B., 5,466,409, Cl. 264-165.000.
Bliss, Anthony P. S.; and Gabzdyl, Jacek T., to BOC Group plc, The. Cryogenic liquid dispensers. 5,465,582, Cl. 62-51.100.
Blitstein-Willinger, Eveline; and Sliwa-Hähnle, Karin, to Schering Aktiengesellschaft. Iloprost with action against cerebral malaria. 5,466,713, Cl. 514-573.000.
Blom, Leo E.; and Byron, Eldridge R., to ABB Power T&D Company Inc. Switch operator and interlock mechanism. 5,466,902, Cl. 200-50.0AA.
Blomberg, A. Lennart I.: *See*—
Krivan, Howard C.; and Blomberg, A. Lennart I., 5,466,681, Cl. 514-54.000.
Bloomberg, Dan S., to Xerox Corporation. Identification of a blank page in an image processing system. 5,467,410, Cl. 382-100.000.
Blott, Barry H.: *See*—
Zadehkoochak, Mohsen; Blott, Barry H.; and Daniell, Geoffrey J., 5,465,730, Cl. 128-734.000.
Blue Sky Productions, Inc.: *See*—
Blanck, Edward, 5,465,519, Cl. 42-70.110.

Blum, Arnold; Goldrian, Gottfried; and Kumpf, Wolfgang, to International Business Machines Corporation. Routing control information via a bus selectively controls whether data should be routed through a switch or a bus according to number of destination processors. 5,467,452, Cl. 395-200.120.

Blumenthal, Jeffrey M.: *See*—
Vijeh, Nader; Crayford, Ian S.; and Blumenthal, Jeffrey M., 5,467,369, Cl. 375-224.000.

Blyth, David; Granovsky, David; Ledger, Greg; and Smith, Bruce, to Atlantic Packaging Products Ltd. Bag dispensing system. 5,465,846, Cl. 206-554.000.

Board of Regents Acting for the Univ. of Michigan: *See*—
Getty, Ward D., 5,466,295, Cl. 118-723.0MA.

Board of Regents, The University of: *See*—
Bryant, Michael D.; and Lin, Jau-Wen, 5,466,979, Cl. 310-248.000.

Board of Regents, The University of Texas at Austin: *See*—
Booth, Frank W.; Thomason, Donald B.; Morrison, Paul R.; and Stancel, George M., 5,466,676, Cl. 514-44.000.

Boardman, James E.: *See*—
Banks, Simon A.; Adderley, Colin I.; Fowler, John O.; and Boardman, James E., 5,465,484, Cl. 29-890.042.

Bobick, Aaron F.: *See*—
Ulrich, W. Thatcher; Koselka, Harvey A.; Bobick, Aaron F.; and Benjamin, Michael H., 5,466,200, Cl. 482-4.000.

BOC Group, Inc., The: *See*—
Ramachandran, Ramakrishnan; and Dao, Loc H., 5,466,837, Cl. 549-533.000.

BOC Group plc, The: *See*—
Bliss, Anthony P. S.; and Gabzdyl, Jacek T., 5,465,582, Cl. 62-51.100.

Boddy, Ian; and Rawlings, Donald S., to Lowell Engineering Corp. Dual pivoted member mount for mirror. 5,467,230, Cl. 359-874.000.

Boeck, Vilmar; and Kalhoff, Peter-Paul, to Siemens Nixdorf Informationssysteme AG. Turnover device for a web-shaped recording medium. 5,467,179, Cl. 355-309.000.

Boeckenhaupt, Herbert. Universal grip with adjustable backweighting capability. 5,465,967, Cl. 273-162.00R.

Boesel, George F. W.; and Geis, Mark W., to Woods Industries, Inc. Portable outlet adapter. 5,466,165, Cl. 439-142.000.

Bogden, W. Scott: *See*—
Resler, Edwin W.; Tong, Vincent L.; Swanson, Russell C.; and Bogden, W. Scott, 5,466,117, Cl. 414-799.000.

Bohl, Eric E.; Hale, Brent; and Parker, Tim. Crutch pack. 5,465,884, Cl. 224-407.000.

Bohn, Paul W.: *See*—
Olinger, Jill M.; Sligar, Stephen G.; McLean, Mark A.; Bohn, Paul W.; and Stayton, Patrick, 5,466,589, Cl. 435-174.000.

Böhner, Jürgen: *See*—
Krallmann, Anton; Reiners, Ulrich; Albinus, Eberhard; Böhner, Jürgen; and Neelen, Neele, 5,466,520, Cl. 428-323.000.

Boivin, Jean-Claude; Chollet, Jean-Emile; Falcoz, Pierre; and Mathieu, Luc, to Societe Anonyme Dite: Alcatel Cit. Spacer of adjustable thickness. 5,466,119, Cl. 415-90.000.

Bond, Robert F., to Five Star Enterprises Limited. Alignment device for a hand tool. 5,465,492, Cl. 33-275.00R.

Bone, Daniel; and Stones, Kevin, to Black & Decker Inc. Clamp nut. 5,466,106, Cl. 411-433.000.

Bonebright, Mark E., to McDonnell Douglas Corporation. Transmission line notch antenna. 5,467,098, Cl. 343-767.000.

Bonebright, Mark E.; and Glabe, John R., to McDonnell Douglas Corporation. Resonated notch antenna. 5,467,099, Cl. 343-767.000.

Bonin, Yves; and LeBlanc, Jack, to Rhone-Poulenc Chimie. Flame-retardant, noncorrosive polyamide compositions. 5,466,741, Cl. 524-405.000.

Bonomi, Giovanni B., to Bears S.r.l. Automatic system for selecting and feeding preoriented rivets to riveting machines. 5,465,868, Cl. 221-165.000.

Boone, Paul J.: *See*—
Fink, David J.; Everett, James W.; Costlow, Annette M.; Roberts, James J.; and Boone, Paul J., 5,465,483, Cl. 29-890.031.

Boos, Margareta: *See*—
Bühler, Ulrich; Kühn, Reinhard; and Boos, Margareta, 5,466,791, Cl. 534-854.000.

Boot, Jeffrey T.: *See*—
Burt, Donald E.; Boot, Jeffrey T.; Bouche, Matthew D.; and Moeller, Carl, 5,465,951, Cl. 271-167.000.

Booth, Frank W.; Thomason, Donald B.; Morrison, Paul R.; and Stancel, George M., to Board of Regents, The University of Texas at Austin. Satellite cell proliferation in adult skeletal muscle. 5,466,676, Cl. 514-44.000.

Borg-Warner Automotive, Inc.: *See*—
Weilant, David R.; and Fowler, Craig, 5,465,819, Cl. 192-35.000.

Borst, Erich: *See*—
Kirn, Manfred; Borst, Erich; Schaal, Guenter; Staebler, Manfred-Wilhelm; and Eicher, Bernard, 5,466,183, Cl. 451-359.000.

Bory, William H., to Chesapeake Corporation. Cutter instrument for precision cutting of rectangular shapes from a corrugated cardboard sheet. 5,465,640, Cl. 83-36.000.

Borzatta, Valerio; and Vignali, Graziano, to Ciba-Geigy Corporation. Piperidine-triazine compounds suitable for use as stabilizers for organic materials. 5,466,803, Cl. 544-198.000.

Boston Scientific Corporation: *See*—
Abele, John E., 5,465,732, Cl. 128-772.000.

Botterman, Ralph C.; and Doran, Michael J., to Aluminum Company of America. Vehicle wheel and associated methods of making a vehicle wheel. 5,466,050, Cl. 301-65.000.

Bouche, Matthew D.: *See*—
Burt, Donald E.; Boot, Jeffrey T.; Bouche, Matthew D.; and Moeller, Carl, 5,465,951, Cl. 271-167.000.

Bouras, Carlos E.: *See*—
La, Duong; Bouras, Carlos E.; Meier, Mark S.; and Roetker, Thomas J., 5,465,879, Cl. 222-189.060.

Bourdeau, Joël, to Salomon S.A. Insole for sport shoe. 5,465,508, Cl. 36-44.000.

Bourns, Inc.: *See*—
Yumibe, George; Gratzinger, Paul; Nguyen, Thanh; and Wimer, Duane, 5,466,161, Cl. 439-66.000.

Bowen, David C.; Harwath, Frank A.; and Triner, Irvin R., to Molex Incorporated. Locating fixture system for electrical connectors. 5,465,479, Cl. 29-749.000.

Bowers, Derek F.: *See*—
Ashe, James; and Bowers, Derek F., 5,467,044, Cl. 327-333.000.

Bowers, William F., to Millipore Corporation. Sanitizable slider diaphragm valve. 5,465,748, Cl. 137-240.000.

Bowker, Kent; and Lubard, Stephen C., to Areté Associates. Underwater imaging in real time, using substantially direct depth-to-display-height lidar streak mapping. 5,467,122, Cl. 348-31.000.

Bowles, Anthony J. G.: *See*—
Lampi, Rauno A.; Bindon, John N.; Bowles, Anthony J. G.; and Parks, Thomas R., 5,465,654, Cl. 99-422.000.

Bowman, Wayne A.: *See*—
Harrison, Daniel J.; Simpson, William H.; Bowman, Wayne A.; Lawrence, Kristine B.; and Weber, Helmut, 5,466,658, Cl. 503-227.000.

Boyce, Joseph S.: *See*—
Freitas, Glen; Boyce, Joseph S.; and Magee, Constance, 5,466,506, Cl. 428-105.000.

Boyette, James E., Jr.; and Mahlbacher, James C., to International Business Machines Corporation. Testing fixture and method for circuit traces on a flexible substrate. 5,467,020, Cl. 324-537.000.

Boyle, Dennis: *See*—
Law, David; Boyle, Dennis; and Herron, Matt, 5,466,166, Cl. 439-159.000.

Boyle, Joseph P.; Camano, Gordon C.; Lachine, Randall S.; Lingley, Howard R.; and Saunders, Raymond W., to Exxon Research & Engineering Co. On-line analysis for continuous measurement of presence of carryunder in liquid-liquid extraction. 5,466,376, Cl. 210-634.000.

Boyse, George C.; and Morgan, Steven R., to Down River International, Inc. Wrapped deck pallet. 5,465,672, Cl. 108-51.300.

BP Chemicals Limited: *See*—
McClarron, Andrew R.; Smith, Stephen J.; Watson, Derrick J.; Williams, Bruce L.; and Ross, Euan S., 5,466,876, Cl. 562-608.000.

Braat, Josephus J. M., to U.S. Philips Corporation. Beam-shaping optical element and device for converting a beam having a first cross-section into a beam having a second cross-section. 5,467,335, Cl. 369-100.000.

Bradt, Jean E.: *See*—
Evans, Thomas L.; Brunelle, Daniel J.; Bradt, Jean E.; Pearce, Eric J.; and Wilson, Paul R., 5,466,744, Cl. 524-714.000.

Brainard, David S.: *See*—
Van Steenburgh, Leon R., Jr.; and Brainard, David S., 5,465,590, Cl. 62-195.000.

Bramlett, William L., Jr.: *See*—
Clark, Jay V.; Bramlett, William L., Jr.; and Moyer, Judith, 5,466,159, Cl. 434-322.000.

Brammer, Norman: *See*—
McConaughy, Brett R.; Brammer, Norman; and Gariepy, James A., 5,465,794, Cl. 166-375.000.

Brankley, Russell J.; and Dorsey, James M., to Bell Atlantic Network Services, Inc. Data transmission via a public switched telephone network. 5,467,390, Cl. 379-229.000.

Branly, Keith L.: *See*—
McMahon, William A.; Lew, Chel W.; and Branly, Keith L., 5,466,460, Cl. 424-408.000.

Brasile, Francis J.: *See*—
Tseytlin, Alexander S.; and Brasile, Francis J., 5,465,624, Cl. 73-653.000.

Bratten, Jack R. Sump system and method for collecting liquid to be filtered. 5,466,380, Cl. 210-741.000.

Brede, Uwe; Hagel, Rainer; and Redecker, Klaus, to Dynamit Nobel Aktiengesellschaft. Gas-producing material. 5,466,313, Cl. 149-1.000.

Breitbach, Karen E.: *See*—
Cudney, Douglas J.; and Breitbach, Karen E., 5,465,424, Cl. 2-2.000.

Breitman, Martin L.; Dumont, Daniel; and Gradwohl, Gerard G., to Mount Sinai Hospital Corporation. Tissue specific transcriptional regulatory element. 5,466,596, Cl. 435-240.200.

Brennan, David J.: *See*—
Bales, Stephen E.; Brennan, David J.; Gulotty, Robert J., Jr.; Inbasekaran, Muthiah N.; Mang, Michael N.; and Newsham, Mark D., 5,466,397, Cl. 252-582.000.

Brenneman, Rodney, to Bioject, Inc. Drug vial mixing and transfer device. 5,466,220, Cl. 604-87.000.

Brenner, George M.: *See*—
Poulos, Charles W.; Brenner, George M.; Allen, Loyd V., Jr.; Prabhu, Vilas A.; and Huerta, Pedro L., Jr., 5,466,695, Cl. 514-275.000.

Brent River Packaging Corporation: *See*—
Sheffler, Robert J., 5,465,856, Cl. 215-370.000.
Bressler, Peter; Sweeney, Niall; Hicswa, Daniel; and Burns, James A., to Becton, Dickinson and Company. Needle assembly having single-handedly activatable needle barrier. 5,466,223, Cl. 604-110.000.
Brickell, Christopher G.; and Langland, Kenneth A., to Eaton Corporation. Apparatus for detecting proper positioning of objects in a holder. 5,466,945, Cl. 250-559.120.
Bridges, John A., to Aladdin Industries, Inc. Beverage container holder. 5,465,891, Cl. 224-566.000.
Bridgestone Corporation: *See*—
Kadota, Kuninobu; Koseki, Hiroyuki; and Toyoda, Kenji, 5,465,773, Cl. 152-454.000.
Kusano, Yukihiro; Inagaki, Tomoko; Yoshikawa, Masato; Akiyama, Setsuo; and Naitoh, Kazuo, 5,466,424, Cl. 422-186.050.
Senbokuya, Takashi, 5,465,639, Cl. 83-34.000.
Bridgestone Cycle Co., Ltd.: *See*—
Komatsubara, Yoshitada, 5,466,139, Cl. 425-35.000.
Bridgestone Sports Co., Ltd.: *See*—
Kusano, Yukihiro; Inagaki, Tomoko; Yoshikawa, Masato; Akiyama, Setsuo; and Naitoh, Kazuo, 5,466,424, Cl. 422-186.050.
Briggs, David: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.
Bright, Stuart W.; Gold, Gerald; Sage, Scott W.; and Sportsman, John R., to Eli Lilly and Company. Immunoassays for insulin sensitivity enhancers, insulin sensitivity enhancer antibodies, and non-thiazolidinedione insulin sensitivity enhancer compositions. 5,466,610, Cl. 436-518.000.
Bril, Thijs W.: *See*—
Pronk, Franciscus A.; Bril, Thijs W.; Knapen, Peter S. A.; Van Heeren, Arie H.; and Rhijnsburger, Laurens J., 5,466,495, Cl. 427-576.000.
Brinton, David L.; and Kodokian, George K., to Du Pont de Nemours, E. I., and Company. Apparatus for corona discharge treatment of an article. 5,466,423, Cl. 422-186.050.
Briody, Paul P.; Cable, Randy C., deceased (by Lori A. Cable, legal representative), to General Motors Corporation. Solderless filler neck joint. 5,466,016, Cl. 285-204.000.
Briselli, Robert C.; and Matthews, James F., to Du Pont de Nemours, E. I., and Company. Stable automotive aqueous metallic-flake tint dispersion. 5,466,286, Cl. 106-404.000.
Bristol-Myers Squibb Company: *See*—
Chen, Bang-Chi; and Quinlan, Sandra L., 5,466,787, Cl. 536-55.300.
Tsunakawa, Mitsuaki; Yamasaki, Tetsuro; Tomita, Koji; and Tenmyo, Osamu, 5,466,450, Cl. 424-118.000.
Britax-Excelsior Limited: *See*—
Barley, Geoffrey W.; and Morton, Norman, 5,466,044, Cl. 297-252.000.
British Aerospace PLC: *See*—
Milner, Paul, 5,465,923, Cl. 244-2.000.
British Nuclear Fuels plc: *See*—
Jayawant, Bhalchandra V.; and Whorlow, Raymond J., 5,467,244, Cl. 361-144.000.
British Technology Group Ltd.: *See*—
Zadehkoochak, Mohsen; Blott, Barry H.; and Daniell, Geoffrey J., 5,465,730, Cl. 128-734.000.
Brkic, Zinka: *See*—
Kovacevic, Mice; Herak, Jure J.; Mandic, Zora; Lukic, Irena; Tomic, Mirjana; and Brkic, Zinka, 5,466,686, Cl. 514-210.000.
Brochetie, Hervé, to Schlumberger Industries, S.A. Bearing for the impeller of a fluid meter. 5,466,126, Cl. 416-244.00R.
Brocke, Rolf; and Glagow, Klaus, to Metzeler Automotive Profiles, GmbH. Seal for a rigid panel for a vehicle roof opening. 5,466,508, Cl. 428-122.000.
Brockhus, Jeroen J.; Moree, Jeanette D.; Lammers, Jannes G.; and Rodenburg, Tileman, to Unilever Patent Holdings B.V. Glazing agent. 5,466,478, Cl. 426-602.000.
Brohan, Liam P.: *See*—
Redd, James C., Jr.; McConnell, Von; and Brohan, Liam P., 5,467,388, Cl. 379-196.000.
Brooks, David M., to Reliance Medical Products, Inc. Adjustable chair having programmable control switches. 5,467,002, Cl. 318-553.000.
Brookstein, David S.: *See*—
Schmitt, Peter J.; Brookstein, David S.; and Skelton, John, 5,466,257, Cl. 623-1.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Inaishi, Kouji, 5,466,556, Cl. 430-138.000.
Mochizuki, Isao, 5,466,901, Cl. 200-5.00A.
Ota, Yuichi, 5,467,432, Cl. 395-112.000.
Suzuki, Masahiko, 5,466,985, Cl. 310-333.000.
Brown & Williamson Tobacco Corporation: *See*—
Lewis, Robert T.; and Lowe, Byron L., 5,465,554, Cl. 53-438.000.
Brown, Clem H.; and Vowles, David L., to Motorola, Inc. Pressure sensor with stress isolation platform hermetically sealed to protect sensor die. 5,465,626, Cl. 73-715.000.
Brown, Dale M.: *See*—
Engeler, William E.; and Brown, Dale M., 5,467,185, Cl. 356-44.000.
Brown, Daniel P.: *See*—
Pierce, Jennifer A.; Finkelstein, Louis D.; Brown, Daniel P.; and Krebs, Jay R., 5,467,398, Cl. 380-44.000.
Brown, Douglas G.: *See*—
Lair, Christopher L.; Brown, Ivan E.; and Brown, Douglas G., 5,466,215, Cl. 602-21.000.
Brown, Ivan E.: *See*—
Lair, Christopher L.; Brown, Ivan E.; and Brown, Douglas G., 5,466,215, Cl. 602-21.000.
Brown, Jack W.; Strauss, Brian; and White, George W., to Gish Biomedical, Inc. Antegrade/retrograde cardioplegia method and system. 5,466,216, Cl. 604-33.000.
Brown, James L. Flip-flop float chart. 5,466,009, Cl. 283-34.000.
Brown, James P., to Union Switch & Signal Inc. Coded track circuit repeater having standby mode. 5,465,926, Cl. 246-34.00B.
Brown Medical Industries: *See*—
Lair, Christopher L.; Brown, Ivan E.; and Brown, Douglas G., 5,466,215, Cl. 602-21.000.
Brown, Steve B.; and Milanovich, Fred P., to University of California, Regents of the. High aspect ratio, remote controlled pumping assembly. 5,466,128, Cl. 417-254.000.
Browne, Bruce H.: *See*—
Hilton, Michael W.; Plasterer, Michael R.; and Browne, Bruce H., 5,467,448, Cl. 395-148.000.
Browning, U. Grant, to My Independence, Inc. Mobility assist device. 5,465,744, Cl. 135-67.000.
Brown-Skrobot, Susan; Novick, Richard P.; and Projan, Steven J., to Johnson & Johnson. Inhibition of expression of beta-lactamase using esters of fatty acid alcohols. 5,466,685, Cl. 514-199.000.
Broze, George J., Jr.: *See*—
Wun, Tze-Chein; Kretzmer, Kuniko K.; and Broze, George J., Jr., 5,466,783, Cl. 530-380.000.
Bruce Industries, Inc.: *See*—
Nemirow, Arthur T.; and Harper, James C., 5,466,992, Cl. 315-276.000.
Brücken, Volker; Pötzschke, Manfred; Langner, Bernd; and Stelter, Michael, to Metallgesellschaft Aktiengesellschaft. Method and apparatus for processing waste sulfuric acid. 5,466,352, Cl. 204-182.400.
Brueggen, Shane J.; and Martin, Alan, to Dana Corporation. Dust boot retainer ring. 5,466,084, Cl. 403-134.000.
Bruinink, Jacob: *See*—
Verhulst, Antonius G. H.; and Bruinink, Jacob, 5,467,105, Cl. 345-87.000.
Bruker-Franzen Analytik GmbH: *See*—
Karl, Manfred; and Burgartz, Ralf, 5,465,480, Cl. 29-825.000.
Brun, Paul E. Off-ice hockey shooting practice device. 5,465,958, Cl. 273-57.200.
Brundage, Kevin R.; and Rajnik, Lawrence S., to Corning Incorporated. Extrusion of metal honeycombs. 5,466,415, Cl. 419-67.000.
Brunelle, Daniel J.: *See*—
Evans, Thomas L.; Brunelle, Daniel J.; Bradt, Jean E.; Pearce, Eric J.; and Wilson, Paul R., 5,466,744, Cl. 524-714.000.
Brunner, Donald G., to Budd Company, The. Contact pouring. 5,465,777, Cl. 164-136.000.
Brunner, Heinrich; and Gerstenmaier, York C., to Siemens Aktiengesellschaft. Controllable power semiconductor element with buffer zone and method for the manufacture thereof. 5,466,951, Cl. 257-139.000.
Brunskill, William: *See*—
Akers, Paul J.; and Brunskill, William, 5,466,731, Cl. 524-52.000.
Brunson, Kevin K.; and Benson, Anthony B., to Tecnol Medical Products, Inc. Therapeutic sleeve. 5,466,251, Cl. 607-112.000.
Brunswick Biomedical Corporation: *See*—
Reinhold, Herbert E., Jr., 5,465,727, Cl. 128-710.000.
Brussati, Peter V.; Griffin, J. Dewey; and Sakazaki, Derek J., to SynOptics Communications, Inc. Supportive guide for circuit-card grounding including tracks having staggered protrusions at the proximal end of the tracks. 5,467,254, Cl. 361-799.000.
Bryant, Michael D.; and Lin, Jau-Wen, to Board of Regents, The University of. Methods and apparatus to reduce wear on sliding surfaces. 5,466,979, Cl. 310-248.000.
Bryson, Charles E., III; and Kelly, Michael A., to Surface Interface, Inc. Dual electron analyzer. 5,466,933, Cl. 250-305.000.
Buchanan, John S.; Krambeck, Frederick J.; and Schatz, Klaus W., to Mobil Oil Corporation. Containment of heavy vapor clouds and aerosols. 5,465,536, Cl. 52-198.000.
Bucher, David H.: *See*—
Buescher, Melvin H.; and Bucher, David H., 5,465,796, Cl. 172-762.000.
Buckie, Anne-Marie: *See*—
Sasaki, Dennis T.; Van den Engh, Gerrit J.; and Buckie, Anne-Marie, 5,466,572, Cl. 435-2.000.
Buckman Laboratories Int'l, Inc.: *See*—
Rayudu, S. Rao; Fenyes, Joseph G.; and McNeel, Thomas E., 5,466,717, Cl. 514-689.000.
Budd Company, The: *See*—
Brunner, Donald G., 5,465,777, Cl. 164-136.000.
Budzinski, Ralph-Michael: *See*—
Maier, Roland; Müller, Peter; Woitün, Eberhard; Hurnaus, Rudolf; Mark, Michael; Eisele, Bernhard; Budzinski, Ralph-Michael; and Hallermayer, Gerhard, 5,466,687, Cl. 514-212.000.
Buehler AG: *See*—
Naef, Peter, 5,466,894, Cl. 177-59.000.
Buescher, Melvin H.; and Bucher, David H., to Deere & Company. Shank assembly with knock-on sweep. 5,465,796, Cl. 172-762.000.
Buhler, Clayton K. Arrows with reduced diameter nocks. 5,465,979, Cl. 273-416.000.

Bühler, Ulrich; Kühn, Reinhard; and Boos, Margareta, to Cassella Aktiengesellschaft. Monoazo dyes, their preparation and use. 5,466,791, Cl. 534-854.000.

Buhr, Chris A.; and Matteucci, Mark, to Gilead Sciences. 2'modified nucleoside and nucleotide compounds. 5,466,786, Cl. 536-26.260.

Bum-O-Matic Corporation: *See*—
Friedrich, Brent R.; and Knepler, John T., 5,465,650, Cl. 99-286.000.

Burchfield, David E.: *See*—
Lotzshin, Anatole; Burchfield, David E.; and Tracy, David H., 5,465,608, Cl. 73-24.010.

Burgartz, Ralf: *See*—
Karl, Manfred; and Burgartz, Ralf, 5,465,480, Cl. 29-825.000.

Burgess, Arnold C.: *See*—
Hilbish, Brian K.; Burgess, Arnold C.; and Wilson, Michael A., 5,466,096, Cl. 406-84.000.

Burgmayer, Paul R.: *See*—
Goliaszewski, Alan E.; Cady, Michael A.; Burgmayer, Paul R.; Anderson, Sydia B.; Carey, William S.; and Moulton, Roger D., 5,466,381, Cl. 210-750.000.

Burkis, Joseph J.; Cowan, Andrew H.; Lutz, Martin F.; and Crain, Steven L., to Motorola, Inc. Method of displaying a bounding box using a set aspect ratio and the coordinate ratio of a graphical pointer. 5,467,451, Cl. 395-161.000.

Burlington Industries: *See*—
Jenkins, William G., 5,466,527, Cl. 428-375.000.

Burnell, Timothy B.: *See*—
Wengrovius, Jeffrey H.; Burnell, Timothy B.; and Van Valkenburgh, Virginia M., 5,466,532, Cl. 428-447.000.

Burno, Jon D.: *See*—
McKibbin, Albert H.; and Burno, Jon D., 5,466,198, Cl. 475-346.000.

Burns, James A.: *See*—
Bressler, Peter; Sweeney, Niall; Hicswa, Daniel; and Burns, James A., 5,466,223, Cl. 604-110.000.

Burns, Michael: *See*—
Zhou, Dawei; Mareci, Thomas; Burns, Michael; and Ruby, Ward, 5,466,480, Cl. 427-63.000.

Burns, Richard W.; and Atkinson, Darren E., to Hughes Aircraft Company. Adjustable microwave power divider. 5,467,063, Cl. 333-125.000.

Burroughs, Dennis M., to ADC Telecommunications, Inc. Miniature coax jack module. 5,467,062, Cl. 333-124.000.

Burroughs Wellcome Co.: *See*—
Latter, Victoria S.; Gutteridge, Winston E.; and Hudson, Alan T., 5,466,711, Cl. 514-510.000.
Robertson, Alan D.; Hill, Alan P.; Glen, Robert C.; and Martin, Graeme R., 5,466,699, Cl. 514-323.000.

Burshteyn, Alexander: *See*—
Siiman, Olavi; Burshteyn, Alexander; and Gupta, Ravinder K., 5,466,609, Cl. 436-518.000.

Burt, Donald E.; Boot, Jeffrey T.; Bouche, Matthew D.; and Moeller, Carl, to Design Technology Corporation. Fabric piece handling system. 5,465,951, Cl. 271-167.000.

Burt, John R.; Szabo, Kenneth A.; and Stewart, Ronald L., to Oscoda Plastics, Inc. Making a cushiony decorative tile or cover product from extruded recycled membrane with discrete fibers randomly dispersed therein. 5,466,320, Cl. 156-244.190.

Burt, Richard A.; Liebermann, George; Hamer, Gordon K.; Gardner, Sandra J.; Jennings, Carol A.; Daimon, Katsumi; and Nukada, Katsumi, to Xerox Corporation. Alkoxy-bridged metallophthalocyanine dimers. 5,466,796, Cl. 540-139.000.

Burtch, Ronald P., to Ronald P. Burtch & Associates Limited. Punch-out game. 5,465,961, Cl. 273-85.00R.

Burton, Edward A.; and West, Jeffrey A., to North American Philips Corporation. Programmable cell with a programmable component outside the signal path. 5,467,027, Cl. 326-38.000.

Burwell, Malcolm C.: *See*—
Clark, George A.; Burwell, Malcolm C.; Gola, John A.; Robinson, Christopher; and Snyder, Fred E., 5,465,894, Cl. 227-175.000.

Busby, David C.: *See*—
Glancy, Chasrles W.; and Busby, David C., 5,466,490, Cl. 427-422.000.

Busby, Stephen W.: *See*—
Laewen, Arne H.; and Busby, Stephen W., 5,467,193, Cl. 356-399.000.

Buse, Dale C. Portable dance floor. 5,465,546, Cl. 52-480.000.

Bushnell, John J.: *See*—
Page, Ronald C.; Bushnell, John J.; and Stephens, Raymond B., 5,465,944, Cl. 267-217.000.

Butcher, Ronald S., to National Steel Car Limited. Railroad freight car having an improved structural support. 5,465,670, Cl. 105-355.000.

Butera, John A.; Antane, Schuyler A.; and Hirth, Bradford H., to American Home Products Corporation. Substituted n-aryl-1,2-diaminocyclobutene-3,4-diones. 5,466,712, Cl. 514-524.000.

Butsuen, Tetsuro; Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Adachi, Tomohiko; and Morioka, Satoshi, to Mazda Motor Corporation. Obstacle sensing apparatus for vehicles. 5,467,283, Cl. 364-461.000.

Butterfass, Dieter; Schuhmacher, Hans-Joachim; and Mueller, Michael W., to BASF Aktiengesellschaft. Production of fibers containing mainly polypropylene. 5,466,411, Cl. 264-176.100.

Bybee, Steven D.; and Cummings, A. Kim, to Morton International, Inc. Apparatus for taking x-rays of an air bag inflator during a firing cycle. 5,467,379, Cl. 378-57.000.

Byeong-Deog, Park: *See*—
Yoon-Sik, Lee; Byeong-Deog, Park; and Hyoung-Ik, Lee, 5,466,758, Cl. 525-384.000.

Byrd, J. Abbott, III; Puno, Rolando M.; and Mellinger, Philip, to Cross Medical Products, Inc. Variable locking stabilizer anchor seat and screw. 5,466,237, Cl. 606-61.000.

Byron, Eldridge R.: *See*—
Blom, Leo E.; and Byron, Eldridge R., 5,466,902, Cl. 200-50.0AA.

Cabaniss, Frank W.: *See*—
Moxley, David C.; and Cabaniss, Frank W., 5,467,456, Cl. 364-490.000.

Cable, Lori A., legal representative: *See*—
Briody, Paul P.; Cable, Randy C., deceased, 5,466,016, Cl. 285-204.000.

Cable, Randy C., deceased (by Lori A. Cable, legal representative): *See*—
Briody, Paul P.; Cable, Randy C., deceased, 5,466,016, Cl. 285-204.000.

Cabot Corporation: *See*—
Rumpf, Frederick H.; and Scher, Jonathan B., 5,466,427, Cl. 423-210.000.

Cadieux, Serge; and Levesque, Yvon, to Johnson & Johnson Inc. Unitized sanitary napkin. 5,466,232, Cl. 604-378.000.

Cadorniga, Lauro C., to Dunlop Slazenger Corporation. Foamed core golf club. 5,465,969, Cl. 273-167.00R.

Cady, Michael A.: *See*—
Goliaszewski, Alan E.; Cady, Michael A.; Burgmayer, Paul R.; Anderson, Sydia B.; Carey, William S.; and Moulton, Roger D., 5,466,381, Cl. 210-750.000.

Calderon-Garcidueñas, Jose. Dynamic harness for human spine. 5,466,214, Cl. 602-19.000.

Caldwell, Stephen P.: *See*—
Watkins, Grant H.; and Caldwell, Stephen P., 5,467,091, Cl. 342-159.000.

Calgon Carbon Corporation: *See*—
Dussert, Bertrand W.; Farmer, Richard W.; and Hayden, Richard A., 5,466,378, Cl. 210-660.000.
Hayden, Richard A., 5,466,645, Cl. 502-56.000.

California State University, Fresno Foundation: *See*—
Evans, John M., 5,466,228, Cl. 604-248.000.

Calka, Andrzej: *See*—
Ninham, Barry W.; Calka, Andrzej; and Williams, James S., 5,466,310, Cl. 148-513.000.

Calvignac, Jean: *See*—
Huon, Pierre J.; Jachimcsyk, Philippe; Barucchi, Gerard; Calvignac, Jean; and Verplanken, Fabrice, 5,467,359, Cl. 371-37.100.

Camano, Gordon C.: *See*—
Boyle, Joseph P.; Camano, Gordon C.; Lachine, Randall S.; Lingley, Howard R.; and Saunders, Raymond W., 5,466,376, Cl. 210-634.000.

Cambra, John J.: *See*—
Harris, Martin W.; and Cambra, John J., 5,466,030, Cl. 296-98.000.

Camco International Inc.: *See*—
Pearce, David E.; and Wick, Thomas A., 5,465,800, Cl. 175-368.000.
Pringle, Ronald E., 5,465,793, Cl. 166-319.000.
Roth, Brian A., 5,465,787, Cl. 166-66.400.

Cameron, James F.: *See*—
Dawson, Marcia L.; Cameron, James F.; Hobbs, Peter D.; Jong, Ling; Pfahl, Magnus; Zhang, Xiao-kun; and Lehmann, Jürgen M., 5,466,861, Cl. 560-100.000.

Campain, Jean-Pierre: *See*—
Janssen, Sylvain; and Campain, Jean-Pierre, 5,465,606, Cl. 73-23.200.

Campanella, Michael L.: *See*—
Hower, John D., Jr.; and Campanella, Michael L., 5,467,434, Cl. 395-114.000.

Canadian Space Agency/Agence Spatiale Canadienne: *See*—
Mee, Frances H. A., 5,466,025, Cl. 294-1.100.

Canon Kabushiki Kaisha: *See*—
Asakura, Osamu; Uchikata, Yoshio; Kawazoe, Kenji; and Kanome, Yuji, 5,466,074, Cl. 400-206.000.
Ebinuma, Ryuichi; Mizusawa, Nobutoshi; and Chiba, Yuji, 5,467,114, Cl. 347-32.000.
Eida, Tsuyoshi; Nishiwaki, Osamu; Yamamoto, Takao; and Mafune, Kumiko, 5,466,282, Cl. 106-22.00K.
Fukushima, Satoru; Gu, Sono; and Mizoguchi, Yoshito, 5,467,196, Cl. 358.298.000.
Hotta, Yoshio; Hanyu, Yukio; Mihara, Tadashi; Kodera, Yasuto; and Nakamura, Katsutoshi, 5,467,209, Cl. 359-74.000.
Ichikawa, Takeshi; Yonehara, Takao; Sakamoto, Masaru; Naruse, Yasuhiro; Nakayama, Jun; Yamagata, Kenji; and Sakaguchi, Kiyofumi, 5,466,631, Cl. 437-62.000.
Ishinaga, Hiroyuki; Fukuda, Tsuguhiro; and Mori, Toshihiro, 5,467,113, Cl. 347-17.000.
Izumi, Michihiro; and Watanabe, Kazunari, 5,467,367, Cl. 375-206.000.
Izumi, Michihiro, 5,467,395, Cl. 379-399.000.
Kanemaru, Tetsuro; Takai, Hideyuki; Yamazaki, Itaru; and Iochi, Kazushi, 5,466,550, Cl. 430-58.000.
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,466,961, Cl. 257-379.000.
Kohayakawa, Yoshimi, 5,467,151, Cl. 351-213.000.
Mizoguchi, Yoshito, 5,467,195, Cl. 358-296.000.
Nakasugi, Mikio, 5,466,070, Cl. 384-112.000.
Odaka, Yukio, 5,467,161, Cl. 354-402.000.
Watanabe, Takashi, 5,467,226, Cl. 359-693.000.
Yamada, Takeshi; and Hirai, Katsuaki, 5,465,949, Cl. 271-110.000.

Cantone, Giovanni. Doorstop. 5,465,460, Cl. 16-82.000.

Capaldo, Richard G. Valve guide. 5,465,691, Cl. 123-188.900.
Capital Photonics, Inc.: *See*—
Haney, Michael W.; and Christensen, Marc P., 5,467,211, Cl. 359-117.000.
Capitant, Patrice J.; and Collier, David C., to Sony Electronics, Inc. Correcting digitized signals to achieve specified output results for an image. 5,467,412, Cl. 382-167.000.
Capitol Trencher Corporation: *See*—
Umberson, Gerald E., 5,465,511, Cl. 37-355.000.
Cappelletti, Paolo G., to SGS-Thomson Microelectronics, S.r.l. Process for fabricating integrated devices including nonvolatile memories and transistors with tunnel oxide protection. 5,466,622, Cl. 437-52.000.
Cappelli, Giorgio: *See*—
Rinnhofer, Johann; Schmidberger, Robert; Pawliska, Volker; and Cappelli, Giorgio, 5,465,943, Cl. 266-220.000.
Capraro, Hans G.: *See*—
Schneider, Peter; van Hoogevest, Peter; Capraro, Hans G.; and Isele, Ute, 5,466,468, Cl. 424-450.000.
Carclo Engineering Group PLC.: *See*—
Schmolke, Karl-Heinz; and Lydall, Kenneth, 5,465,567, Cl. 57-408.000.
Cardiac Pacemakers, Inc.: *See*—
Spinelli, Julio C.; and Heemels, Jan P., 5,466,245, Cl. 607-17.000.
Cardiac Pathways Corporation: *See*—
Imran, Mir A.; Pomeranz, Mark L.; and Zadno-Azizi, Gholam-Reza, 5,465,717, Cl. 128-642.000.
Cardis, Angeline B.: *See*—
Baillargeon, David J.; Cardis, Angeline B.; Heck, Dale B.; and Johnson, Susan W., 5,466,267, Cl. 44-386.000.
Carellas, Peter T.: *See*—
Gale, Ronald P.; McCullough, Richard; Salerno, Jack P.; Fantone, Stephen D.; Forsyth, Robert P.; Carellas, Peter T.; Thomas, Michael J.; and Youman, Roy L., 5,467,154, Cl. 353-119.000.
Carespodi, Dennis L.: *See*—
Perfetti, Thomas A.; Carespodi, Dennis L.; Saintsing, Barry L.; and Koschak, Matthew S., 5,465,739, Cl. 131-335.000.
Carey, Paul G.; Thompson, Jesse B.; Colella, Nicolas J.; and Williams, Kenneth A., to University of California, Regents of the. Solar cell array interconnects. 5,466,302, Cl. 136-251.000.
Carey, William S.: *See*—
Goliaszewski, Alan E.; Cady, Michael A.; Burgmayer, Paul R.; Anderson, Sydia B.; Carey, William S.; and Moulton, Roger D., 5,466,381, Cl. 210-750.000.
Carl, Daniel A.: *See*—
Armacost, Michael; Baker, A. Richard, Jr.; Berry, Wayne S.; Carl, Daniel A.; Kenney, Donald M.; and Licata, Thomas J., 5,466,626, Cl. 437-60.000.
Carl Edelmann GmbH: *See*—
Sieber, Helmut; Schilling, Ferdinand; Hagen, Günter; Kleissendorf, Roland; and Michaelis, Johannes, 5,465,834, Cl. 206-193.000.
Carlson, Douglas W.; and Simmons, Stephen P., to Hydril Company. Variable diameter pipe protector. 5,465,759, Cl. 138-110.000.
Carlson, Gene D.; and Dela Cruz, Alfredo R., to Frye Copysystems, Inc. Universal black ink. 5,466,284, Cl. 106-31.00R.
Carlson, Randy: *See*—
Barben, Ted; Carlson, Randy; Christner, Kurt; and Doring, Heinz, 5,465,578, Cl. 62-3.200.
Carlson, Robert H., to Unisys Corporation. Method for switching between a plurality of clock sources upon detection of phase alignment thereof and disabling all other clock sources. 5,467,466, Cl. 395-550.000.
Carnaudmetalbox plc: *See*—
Jowitt, Frederick W.; and Simms, Paul, 5,465,601, Cl. 72-347.000.
Carney, Francis J.: *See*—
Heckman, James K.; Carney, Francis J.; and Geyer, Harry J., 5,467,253, Cl. 361-761.000.
Carr, Graham; Harrison, Paul R.; and James, Alun P., to Solvay Interox Limited. Aryl imido substituted peroxycarboxylic acids. 5,466,825, Cl. 548-479.000.
Carroll, Stephen F.: *See*—
White, Mark L.; Carroll, Stephen F.; and Ma, Jeremy K., 5,466,580, Cl. 435-7.100.
White, Mark L.; Carroll, Stephen F.; and Ma, Jeremy K.-k., 5,466,581, Cl. 435-7.320.
Carson, Dave: *See*—
Young, Bruce; Carson, Dave; Rasmussen, Norman; Fischer, Stephen; and Rabe, Jeffrey, 5,467,295, Cl. 395-200.050.
Carstens, Robert J.; Gatti, John E.; Shoda, Thomas M.; and Toor, John W., to Motorola, Inc. Inter-module semi-rigid cable connector and configuration of modules employing same. 5,466,172, Cl. 439-509.000.
Carter, Jeffery S.: *See*—
Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., 5,466,823, Cl. 548-377.100.
Caruso, Andrew J.; and Lee, Julia L., to General Electric Company. Xanthene polymers, and copolymers, and method for making. 5,466,777, Cl. 528-298.000.
Case Corporation: *See*—
Panoushek, Dale W.; and Milender, Jeffery S., 5,465,560, Cl. 56-10.20E.
Case Western Reserve University: *See*—
Scheiner, Avram; and Marsolais, Ernest B., 5,466,247, Cl. 607-48.000.
Casio Computer Co., Ltd.: *See*—
Kishigami, Masamitsu, 5,467,210, Cl. 359-88.000.
Nihei, Tomoyuki, 5,467,440, Cl. 395-133.000.
Cassella Aktiengesellschaft: *See*—
Bühler, Ulrich; Kühn, Reinhard; and Boos, Margareta, 5,466,791, Cl. 534-554.000.
Casteels, Peter: *See*—
Tempst, Paul; and Casteels, Peter, 5,466,671, Cl. 514-13.000.
Castelli, Vittorio; and Chai, Stephen T., to Xerox Corporation. Compact active steering roll for belt loops. 5,467,171, Cl. 355-212.000.
Castillo, Thomas S.: *See*—
Castolo, Rodrigo L.; and Castillo, Thomas S., 5,466,192, Cl. 473-67.000.
Castleman, Albert W., Jr.; and Guo, Baochuan, to Penn State Research Foundation, The. Metallo-carbohedrenes M_8C_{12}. 5,466,430. Cl. 423-440.000.
Castolo, Rodrigo L.; and Castillo, Thomas S. Adjustable hinged bowling wrist support. 5,466,192, Cl. 473-62.000.
Catena, Robert J.; and Adhikari, Prasad K., to Sun Chemical Corporation. Aqueous cold seal release lacquer. 5,466,734, Cl. 524-230.000.
Caterpillar Inc.: *See*—
Livesay, Richard E.; Rozenboom, Nathan G.; and Shane, Frederick J., 5,465,512, Cl. 37-457.000.
Tietje, Mark E., 5,466,052, Cl. 303-1.000.
Williamson, Gregory L.; Hawkins, Mark R.; and Tate, William J., 5,467,240, Cl. 361-18.000.
Catrombon, George T. Conical motion mixing machine. 5,466,065, Cl. 366-209.000.
Catteau, Gilles: *See*—
Leroy, Joël; and Catteau, Gilles, 5,466,241, Cl. 606-139.000.
Caudle, Donald M.: *See*—
Imboden, Walter H.; Myers, Jonathan M.; and Caudle, Donald M., 5,465,594, Cl. 66-177.000.
Caulfield, Thomas J.: *See*—
Baker, Edward J.; Bacon, Edward R; Illig, Carl R.; Caulfield, Thomas J.; Douty, Brent D.; Josef, Kurt A.; Toner, John L.; and Lee, Robert W., 5,466,435, Cl. 424-9.450.
Cayley, George R.: *See*—
Martin, Robert; Cayley, George R.; Thacker, Jonathan R. M.; Hall, Franklin R.; North, Denise K.; Groome, John M.; and Jeffries, David A., 5,466,458, Cl. 424-405.000.
CE.TE.V Centro Technologie Del Vuoto: *See*—
Misiano, Carlo; Simonetti, Enrico; and Taglioni, Giovanni, 5,466,296, Cl. 118-723.0MP.
Center for Innovative Technology, The: *See*—
Jablonski, Peter E.; and Ferry, James G., 5,466,600, Cl. 435-262.500.
Central Tools, Inc.: *See*—
Rogler, Albert, 5,465,501, Cl. 33-810.000.
Cercone, Ronald J.; Quaratella, Scott J.; and Gertzman, Arthur A., to Merocel Corporation. Laminated sponge device. 5,466,231, Cl. 604-369.000.
Ceridian Corporation: *See*—
Pai, Deepak K.; Lund, Lowell D.; and Maday, Gene A., 5,466,540, Cl. 428-614.000.
Cetnar, Roman, to Atoma International Inc. V-link release mechanism for automobile door latches. 5,466,024, Cl. 292-336.300.
Chabry, Pierre: *See*—
Bied-Charreton, Benoît; Chabry, Pierre; Lecadet, Jacques; and Pasquier, Patrice, 5,467,365, Cl. 373-9.000.
Chai, Stephen T.: *See*—
Castelli, Vittorio; and Chai, Stephen T., 5,467,171, Cl. 355-212.000.
Chakravarthy, Debashish: *See*—
Volke, Robert W.; and Chakravarthy, Debashish, 5,466,724, Cl. 523-111.000.
Chaleff, Edward: *See*—
Lapinski, Charles; Eckert, Charles; Skokowski, Richard; Cox, James; Scott, William; Chaleff, Edward; Sharpe, Jeffrey G.; and Wurz, David A., 5,466,921, Cl. 235-462.000.
Chamberlain, Craig P.; Lamb, Dennis; Lauby, William J.; and Voorheis, Howard T., to Fluke Corporation. Compact, shock resistant battery pack. 5,466,545, Cl. 429-99.000.
Chan, Shiu C., to One Two One Systems, Inc. Stackable interlocking modular storage system. 5,466,058, Cl. 312-111.000.
Chandler, David L.: *See*—
Kreikebaum, Gerhard; and Chandler, David L., 5,467,189, Cl. 356-136.000.
Chandraratna, Roshantha A. S., to Allergan, Inc. Acetylenes disubstituted with a heteroaromatic group and a tetralin group and having retinoid like activity. 5,466,690, Cl. 514-247.000.
Chang, Byeong S.: *See*—
Dorin, Glenn; Gray, David R.; Chang, Byeong S.; Cowgill, Cynthia A.; and Milley, Robert J., 5,466,781, Cl. 530-351.000.
Chang, Fountain. Impulse driven rocking apparatus installed with elliptically-shaped springs. 5,466,191, Cl. 472-95.000.
Chang, Kai-Kuo. High-rise building cleaning machine. 5,465,446, Cl. 15-50.300.
Chang, Ko-Min: *See*—
Chang, Kuo-Tung; and Chang, Ko-Min, 5,467,308, Cl. 365-185.010.
Chang, Kuo-Tung; and Chang, Ko-Min, to Motorola Inc. Cross-point eeprom memory array. 5,467,308, Cl. 365-185.010.
Chang, Ronald: *See*—
Ross, James B.; Christiansen, Gary L.; and Chang, Ronald, 5,466,897, Cl. 181-131.000.
Chang, Tao C.: *See*—

Lee, Chester C.; Cheng, Tao C.; and Huang, Yung-Hui, 5,466,763, Cl. 525-523.000.

Chang, Tsan-Yun. Dual windshield wiper having swinging and pivoting ribs. 5,465,454, Cl. 15-250.410.

Chang, William. Method and apparatus for producing herbal concentrate. 5,466,454, Cl. 424-195.100.

Chapple-Sokol, Jonathan D.; Hsu, Louis L.-C.; Tsang, Paul J.-M.; and Yuan, Chi-Min, to International Business Machines Corporation. Dual phase and hybrid phase shifting mask fabrication using a surface etch monitoring technique. 5,465,859, Cl. 216-12.000.

Charbonnel, Jean-Louis; Guerout, Philippe; Happey, Jacques L.; Mainfroy, Frédéric G. J.; Naudet, Jacky; and Porcher, Jean-Claude, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA". Turbine engine stator with pivoting blades and control ring. 5,466,122, Cl. 415-160.000.

Charles-Marcel, Zeno L.: *See*—
Wilson, James S.; and Charles-Marcel, Zeno L., 5,467,152, Cl. 353-99.000.

Charnnaroog, Jain: *See*—
Hogan, Neville; Krebs, Hermano I.; Sharon, Andre; and Charnnaroog, Jain, 5,466,213, Cl. 601-33.000.

Chavallo, Eusevio, Jr. Modular exercise, play, and living structure for domestic cats. 5,465,682, Cl. 119-19.000.

Cheburkov, Yuri, to Minnesota Mining and Manufacturing Company. Production of hexafluoroacetone and its oxime. 5,466,879, Cl. 564-253.000.

Check, Joseph A., III; Saxe, Robert L.; Thompson, Robert I.; Forlini, Matthew; and Slovak, Steven M., to Research Frontiers Incorporated. Light valve suspensions and films containing UV absorbers and light valves containing the same. 5,467,217, Cl. 359-296.000.

Chemie Linz GmbH: *See*—
Lercher, Johannes; and Zhaoqui, Zhan, 5,466,429, Cl. 423-365.000.

Chen, Bang-Chi; and Quinlan, Sandra L., to Bristol-Myers Squibb Company. Process for preparing AZT. 5,466,787, Cl. 536-55.300.

Chen, Chien-An, to TRW Inc. Slot-coupled fed dual circular polarization TEM mode slot array antenna. 5,467,100, Cl. 343-770.000.

Chen, Chin-pei. Handlebar assembly for cycles. 5,465,634, Cl. 74-551.300.

Chen, Cindy C.: *See*—
Yuh, Huoy-Jen; Spiewak, John W.; Tarnawskyj, Christine J.; Grammatica, Steven J.; Chen, Cindy C.; and Teuscher, Leon A., 5,466,551, Cl. 430-63.000.

Chen, Daniel, to UMAX Data System Inc. Two clock method for synchronizing a plurality of identical processors connected in parallel. 5,467,465, Cl. 395-550.000.

Chen, George. Magnetically controlled load adjusting structure of gymnastic apparatus. 5,466,203, Cl. 482-63.000.

Chen, Lung-Hua; Pote, Jonathan; and Fuller, Mary, to Mississippi State University. Decorticating machine with variable speed feed and beater rollers. 5,465,464, Cl. 19-24.000.

Chen, Shun-fu, to Chia Yi Enterprise Co., Ltd. Knife with lighting fixture. 5,467,256, Cl. 362-119.000.

Chen, Wayne T.: *See*—
Clapp, John S., III; and Chen, Wayne T., 5,467,050, Cl. 327-530.000.

Cheng, Cheng-Hsien, to Advanced Composite Designs Co., Ltd. Golf club body made of composite material and having a bent front section. 5,465,959, Cl. 273-80.00B.

Chennakeshu, Sandeep; Dent, Paul W.; Koilpillai, Ravinder D.; and Toy, Raymond L., to General Electric Company. Low complexity adaptive equalizer for U.S. digital cellular radio receivers. 5,467,374, Cl. 375-140.000.

Cheon, In K., to Goldstar Co., Ltd. Brake device for video cassette tape recorder. 5,465,921, Cl. 242-355.100.

Cherney, Dale M., to Hayssen Manufacturing Company. Continuous motion heat seal control. 5,466,326, Cl. 156-359.000.

Cherpeck, Richard E., to Chevron Chemical Company. Polyalkyl and polyalkenyl aromatic amides and fuel compositions containing the same. 5,466,268, Cl. 44-419.000.

Cherpeck, Richard E., to Chevron Chemical Company. Poly (oxyalkylene) aromatic ethers. 5,466,872, Cl. 564-443.000.

Chesapeake Corporation: *See*—
Bory, William H., 5,465,640, Cl. 83-36.000.

Cheung, Francis: *See*—
Logston, Gary L.; Wasilewski, Anthony J.; Hammond, Maynard; and Cheung, Francis, 5,467,342, Cl. 370-17.000.

Chevron Chemical Company: *See*—
Cherpeck, Richard E., 5,466,268, Cl. 44-419.000.
Cherpeck, Richard E., 5,466,872, Cl. 564-443.000.

Chia Yi Enterprise Co., Ltd.: *See*—
Chen, Shun-fu, 5,467,256, Cl. 362-119.000.

Chia-ching, Huang, to New Gulf Measurement Instrument Ltd. Company. Water temperature and conductivity detector for reverse-osmosis water purifier systems. 5,466,366, Cl. 210-85.000.

Chian, Tao: *See*—
Sun, Jyi-Yu; Chian, Tao; Shih, Di-Kon; and Wang, Chih-Yao, 5,465,782, Cl. 165-104.260.

Chiba, Masaru: *See*—
Yamasaki, Masahiro; Chiba, Masaru; Yokogoshi, Takashi; Kodama, Kenji; Yamaya, Tatsuo; and Yokoyama, Masakazu, 5,466,475, Cl. 426-439.000.

Chiba, Yuji: *See*—
Ebinuma, Ryuichi; Mizusawa, Nobutoshi; and Chiba, Yuji, 5,467,114, Cl. 347-32.000.

Chida, Tosikazu: *See*—
Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sedimoto, Kozo; and Suzuki, Masanori, 5,465,956, Cl. 271-274.000.

Chien, Jui-Lung, to Jina Manufacturer Thai Co., Ltd. Device for retaining a playpen in an extended position. 5,465,439, Cl. 5-99.100.

Chikama, Tosnio: *See*—
Miyagi, Kunihiko; and Chikama, Toshio, 5,465,710, Cl. 600-139.000.

Chikaraishi, Tsuneo: *See*—
Tanaka, Yoshihiko; Chikaraishi, Tsuneo; and Osada, Nobuya, 5,465,999, Cl. 280-733.000.
Tanaka, Yoshihiko; Chikaraishi, Tsuneo; and Tomie, Muneharu, 5,466,002, Cl. 280-733.000.
Tanaka, Yoshihiko; Ohishi, Yoshinori; and Chikaraishi, Tsuneo, 5,466,003, Cl. 280-733.000.

Childers, Winthrop D., to Hewlett-Packard Company. Inkjet printhead formed to eliminate ink trajectory errors. 5,467,115, Cl. 347-47.000.

Childress, Thomas E., to OSi Specialties, Inc. Process for the preparation of silane polysulfides. 5,466,848, Cl. 556-427.000.

Chin, Albert K.: *See*—
Moll, Frederic H.; Gresl, Charles, Jr.; Chin, Albert K.; and Hopper, Philip K., 5,465,711, Cl. 600-207.000.

Chin, Hsiaw-Sheng: *See*—
Lur, Water; Lin, Jenn-Tarng; and Chin, Hsiaw-Sheng, 5,466,627, Cl. 437-52.000.

Chin, Teresa: *See*—
Szillat, John C.; Laudadio, Nicola; and Chin, Teresa, 5,465,570, Cl. 60.39.060.

Chinoin Ltd.: *See*—
Ivanics, József; Szabó, Tibor; Hermecz, István; Dalmadi, Gyula; Ivanics, Józsefné; Kovács, Gáborné; and Bahram, Resul, 5,466,833, Cl. 549-475.000.

Chiou, Wen-Chih: *See*—
Hu, Chen-Ti; and Chiou, Wen-Chih, 5,466,311, Cl. 148-513.000.

Chiron Therapeutics: *See*—
Dorin, Glenn; Gray, David R.; Chang, Byeong S.; Cowgill, Cynthia A.; and Milley, Robert J., 5,466,781, Cl. 530-351.000.

Cho, Jin H.: *See*—
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,466,854, Cl. 558-233.000.

Cho, Young H.: *See*—
Park, Gun C.; Choi, Do Y.; and Cho, Young H., 5,467,234, Cl. 360-85.000.

Choi, Do Y.: *See*—
Park, Gun C.; Choi, Do Y.; and Cho, Young H., 5,467,234, Cl. 360-85.000.

Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., to Lucky Ltd. Processes for preparation of dithiocarbazates. 5,466,854, Cl. 558-233.000.

Choi, Jong M., to Goldstar Electron Co., Ltd. Method for fabricating a thin film transistor. 5,466,619, Cl. 437-41.000.

Choi, Yang K., to Hyundai Electronics Industries Co., Ltd. Method for forming a metal wire of a semiconductor device. 5,466,640, Cl. 437-195.000.

Choi, Yun-Ho, to Samsung Electronics Co., Ltd. Burn-in circuit and burn-in test method. 5,467,356, Cl. 371-21.100.

Chollet, Jean-Emile: *See*—
Boivin, Jean-Claude; Chollet, Jean-Emile; Falcoz, Pierre; and Mathieu, Luc, 5,466,119, Cl. 415-90.000.

Chong, Chai T.: *See*—
Beng, Lim T.; Chong, Chai T.; Amagai, Masazumi; Anjoh, Ichiro; Arita, Junichi; Tsubosaki, Kunihiro; Ichitani, Masahiro; and Edwards, Darvin, 5,466,888, Cl. 174-52.200.

Chou, Chih-Yuch, to ANGUS Chemical Company. Reactive diluent aldimine oxazolidines. 5,466,769, Cl. 528-60.000.

Chou, The-Chuan, to National Science Council. Quinone synthesized from an aromatic compound in an undivided electrochemical cell. 5,466,346, Cl. 204-72.000.

Choudhuri, Kumar S.: *See*—
Nair, Parameswaran B.; Choudhuri, Kumar S.; Stills, James T.; and Evans, John C., 5,466,920, Cl. 235-449.000.

Christensen, Marc P.: *See*—
Haney, Michael W.; and Christensen, Marc P., 5,467,211, Cl. 359-117.000.

Christiansen, Gary L.: *See*—
Ross, James B.; Christiansen, Gary L.; and Chang, Ronald, 5,466,897, Cl. 181-131.000.

Christiansen, Margrethe: *See*—
Outtrup, Helle; Dambmann, Claus; Christiansen, Margrethe; and Aaslyng, Dorrit A., 5,466,594, Cl. 435-221.000.

Christman, Susan: *See*—
Commons, Thomas J.; LaClair, Christa M.; and Christman, Susan, 5,466,688, Cl. 514-212.000.

Christner, Kurt: *See*—
Barben, Ted; Carlson, Randy; Christner, Kurt; and Doring, Heinz, 5,465,578, Cl. 62-3.200.

Chrylser Corporation: *See*—
Stroeters, Kurt H.; Clark, Dean B.; and DeGrendel, Glen A., 5,466,036, Cl. 296-208.000.

Chrysler Corporation: *See*—

Nogle, Thomas D.; Haven, Willem S.; and Kietlinski, Tomasz K., 5,466,195, Cl. 475-55.000.

Chu, Ke-Chiang, to Apple Computer, Inc. High speed lossless data compression system. 5,467,087, Cl. 341-51.000.

Chugai Phote Chemical Co., Ltd.: *See*—
Shigemori, Nobuki; and Kamo, Hisao, 5,466,565, Cl. 430-444.000.

Chun, Bongsoo. Slideable seating member. 5,465,441, Cl. 5-653.000.

Chun-Jung, Cho, to Acer Peripherlas, Inc. Metal bracket for a printed circuit board. 5,465,927, Cl. 248-271.000.

Church & Dwight Co., Inc.: *See*—
Lajoie, M. Stephen, 5,466,470, Cl. 424-641.000.

Churchill, Gerald J.: *See*—
Koenig, Don M., 5,467,071, Cl. 340-433.000.

Chyou, Yau-Pin: *See*—
Althaus, Rolf; Chyou, Yau-Pin; Frutschi, Hans U.; Genet, Christian; Kamber, Peter; Lindvall, Anders; Sattelmayer, Thomas; Senior, Peter; and Rufli, Peter, 5,465,569, Cl. 60-39.030.

Ciba-Geigy Corporation: *See*—
Baxter, Anthony D.; Baylis, Eric K.; Collingwood, Stephen P.; Taylor, Roger J.; De Mesmaeker, Alain; and Schmit, Chantal, 5,466,677, Cl. 514-44.000.
Borzatta, Valerio; and Vignali, Graziano, 5,466,803, Cl. 544-198.000.
Horisberger, Michel A.; Hochkeppel, Heinz-Kurt; and Content, Jean, 5,466,585, Cl. 435-69.100.
Schneider, Peter; van Hoogevest, Peter; Capraro, Hans G.; and Isele, Ute, 5,466,468, Cl. 424-450.000.
Spindler, Felix; Wirth-Tijani, Amina; and Landert, Heidi, 5,466,844, Cl. 556-11.000.
de Prymond, Annick J., 5,466,785, Cl. 536-24.100.

Cibus Pharmaceutical, Inc.: *See*—
Kuharts, Eric H., 5,466,469, Cl. 424-451.000.

Cidon, Ismel; Georgiadis, Leonidas; Guerin, Roch A.; Shavitt, Yuval Y.; and Slater, Andrew E., to International Business Machines Corporation. Method and apparatus for improved throughput in a multi-node communication system with a shared resource. 5,467,352, Cl. 370-85.500.

Cimino, Roberto: *See*—
Savastano, Cesar; and Cimino, Roberto, 5,466,365, Cl. 208-309.000.

Cinberg, James Z.; and Wilk, Peter J. Myringotomy ventilation tube and associated method. 5,466,239, Cl. 606-109.000.

Cirrus Logic, Inc.: *See*—
Smith, Stephen A.; Richter, Bryan; and Singhal, Dave M., 5,467,042, Cl. 327-293.000.
Zook, Christopher P., 5,467,297, Cl. 364-746.100.

Citra Science Ltd.: *See*—
Dotolo, John; and Bayless, Ronnie E., 5,465,685, Cl. 119-159.000.

Claas OHG: *See*—
Schaal, Walter; and Weigelt, Horst, 5,466,188, Cl. 460-24.000.

Claesen, Christianus A. A.: *See*—
Hoeks, Theodorus L.; Claesen, Christianus A. A.; Lohmeijer, Johannes H. G. M.; and Pickett, James E., 5,466,733, Cl. 524-141.000.

Clapp, John S., III; and Chen, Wayne T., to Texas Instruments Incorporated. Dynamic biasing circuit for semiconductor device. 5,467,050, Cl. 327-530.000.

Claris Corporation: *See*—
Hilton, Michael W.; Plasterer, Michael R.; and Browne, Bruce H., 5,467,448, Cl. 395-148.000.

Clark, Dean B.: *See*—
Stroeters, Kurt H.; Clark, Dean B.; and DeGrendel, Glen A., 5,466,036, Cl. 296-208.000.

Clark, Dennis E.: *See*—
Clark, Richard J.; Clark, Richard K.; and Clark, Dennis E., 5,465,778, Cl. 164-137.000.

Clark, George A.; Burwell, Malcolm C.; Gola, John A.; Robinson, Christopher; and Snyder, Fred E., to Ethicon, Inc. Surgical stapling instrument with articulated stapling head assembly on rotatable and flexible support shaft. 5,465,894, Cl. 227-175.000.

Clark Industries, Inc.: *See*—
Clark, Richard J.; Clark, Richard K.; and Clark, Dennis E., 5,465,778, Cl. 164-137.000.

Clark, James E.: *See*—
Gragg, Brian D.; and Clark, James E., 5,467,118, Cl. 347-87.000.

Clark, Jay V.; Bramlett, William L., Jr.; and Moyer, Judith, to National Computer Systems, Inc. Collaborative and quality control scoring system. 5,466,159, Cl. 434-322.000.

Clark, Jim A., to United Technologies Corporation. Fuel nozzle attachment in gas turbine combustors. 5,465,571, Cl. 60-39.320.

Clark, Richard J.; Clark, Richard K.; and Clark, Dennis E., to Clark Industries, Inc. Method of casting one piece cylinder liner incorporating a draftless water jacket. 5,465,778, Cl. 164-137.000.

Clark, Richard K.: *See*—
Clark, Richard J.; Clark, Richard K.; and Clark, Dennis E., 5,465,778, Cl. 164-137.000.

Clausen, Edvin L.; and Happian-Smith, Julian, to Norsk Hydro a.s. Intrusion beam for reinforcing body panels of a vehicle and a vehicle door provided with such beam. 5,466,032, Cl. 296-188.000.

Clauss, Daniel: *See*—
Stoll, Daniel; and Clauss, Daniel, 5,467,080, Cl. 340-825.310.

Clayton Industries: *See*—
La Belle, John T., 5,465,612, Cl. 73-117.000.

Clecim: *See*—
Davene, Jean; Rachenne, Sylvie; and Douvry, Jean-Jacques, 5,466,309, Cl. 148-508.000.

Cleveland, John T., Jr.; and Rubin, Benjamin M., to Xomed-Treace Inc. Drape adapter. 5,467,223, Cl. 359-510.000.

Clifford Electronics, Inc.: *See*—
Drori, Ze'ev; and Woskow, Robert M., 5,467,070, Cl. 340-426.000.

Clifton, Norman E., Jr.: *See*—
Rogers, William H.; and Clifton, Norman E., Jr., 5,465,429, Cl. 2-300.000.

Clifton, Terry P.: *See*—
McDonald, William J.; Pittard, Gerard T.; Steele, Charles G.; Kiefer, Karl F.; Clifton, Terry P.; and Leitko, Curtis E., 5,467,083, Cl. 340-854.600.

Coate, Robert B.; and Towles, John T., to Environmental Restoration Services, Inc. Industrial waste water treatment. 5,466,367, Cl. 210-96.100.

Coca-Cola Company, The: *See*—
Richter, Simon J.; Hohmann, Frank G.; and Vesely, Ernst, 5,466,413, Cl. 264-521.000.

Cockrum, Charles A.: *See*—
Rosbeck, Joseph P.; and Cockrum, Charles A., 5,466,953, Cl. 257-185.000.

Codex, Corp.: *See*—
Nusinov, Eugene B.; and Pasco-Anderson, James A., 5,467,319, Cl. 365-231.000.

Coe, John A. Water conservation system for home installation. 5,465,434, Cl. 4-546.000.

Coelho, Rohan, to Intel Corporation. Process and apparatus for characterizing and adjusting spatial relationships of displayed objects. 5,467,450, Cl. 395-155.000.

Cognis, Inc.: *See*—
Fristad, William E.; Narum, Jeffrey L.; Mattison, Phillip L.; Virnig, Michael J.; and Fast, John, 5,466,426, Cl. 423-98.000.

Cohen, Bernard: *See*—
Isaac, Robert L.; and Cohen, Bernard, 5,466,518, Cl. 428-288.000.

Cohen, Bernhard; and Jameson, Lee K., to Kimberly-Clark Corporation. Process for hydrosonically area thinning thin sheet materials. 5,466,401, Cl. 264-443.000.

Cohen, Joel H.: *See*—
Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; and Grubbs, Gray W., 5,466,905, Cl. 219-121.460.

Coherent Hull, Ltd.: *See*—
Allcock, Geoffrey, 5,467,121, Cl. 347-260.000.

Cohn, David L. Cable identification system. 5,466,011, Cl. 283-67.000.

Col-Ven S.A.: *See*—
Sartor, Rolando D., 5,465,772, Cl. 152-416.000.

Cole, James E.: *See*—
Lynn, Lawrence A.; and Cole, James E., 5,466,219, Cl. 604-86.000.

Cole, Richard K.: *See*—
Yakura, James P.; Cole, Richard K.; Von Thun, Matthew S.; Hass, Crystal J.; and Allman, Derryl D. J., 5,466,614, Cl. 437-8.000.

Colella, Nicolas J.: *See*—
Carey, Paul G.; Thompson, Jesse B.; Colella, Nicolas J.; and Williams, Kenneth A., 5,466,302, Cl. 136-251.000.

Coleman Company, Inc., The: *See*—
Bamber, David; and Deines, Robert, 5,467,258, Cl. 362-184.000.

Coleman, Patrick L.: *See*—
Rolando, Richard J.; Coleman, Patrick L.; Kangas, Steven L.; and Kotnour, Thomas A., 5,466,747, Cl. 525-54.100.
Rolando, Richard J.; Coleman, Patrick L.; Kangas, Steven L.; and Kotnour, Thomas A., 5,466,749, Cl. 525-54.100.

Colgate Palmolive Company: *See*—
Gaffar, Abdul; Nabi, Nuran; Affilitto, John; and Stringer, Orum, 5,466,437, Cl. 424-52.000.

Collier, David C.: *See*—
Capitant, Patrice J.; and Collier, David C., 5,467,412, Cl. 382-167.000.

Collier, Kevin E.: *See*—
Rogers, Ernest E.; and Collier, Kevin E., 5,466,385, Cl. 210-787.000.

Collingwood, Stephen P.: *See*—
Baxter, Anthony D.; Baylis, Eric K.; Collingwood, Stephen P.; Taylor, Roger J.; De Mesmaeker, Alain; and Schmit, Chantal, 5,466,677, Cl. 514-44.000.

Collins, John E.: *See*—
Sisley, Elizabeth M.; and Collins, John E., 5,467,268, Cl. 364-401.000.

Collins, Paul W.: *See*—
Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., 5,466,823, Cl. 548-377.100.

ColorAge, Inc.: *See*—
Mikkelsen, Carl M.; and Gavrin, Edward S., 5,467,446, Cl. 395-143.000.

Comar, Inc.: *See*—
Gargione, Frank V., 5,465,858, Cl. 215-252.000.

Cominolli, Joseph E. Recoil buffer for semi-automatic pistol. 5,465,645, Cl. 89-198.000.

Commier, Philippe; and Le Masson, Jacques, to Salomon S.A. Device for damping ski vibrations. 5,465,994, Cl. 280-602.000.

Commons, Thomas J.; LaClair, Christa M.; and Christman, Susan, to American Home Products Corporation. Pyrido[3,4-B]indole derivatives as serotonergic agents. 5,466,688, Cl. 514-212.000.

Communication Cable, Inc.: *See*—
Vander Groef, Lawrence, 5,465,922, Cl. 242-573.000.

Compagne Plastic Omnium: *See*—
Lee, Norman C., 5,465,844, Cl. 206-515.000.
Comsat Corporation: *See*—
Mott, Richard C.; and Geller, Bernard D., 5,467,094, Cl. 343-700.0MS.
Connell, Larry V. Method of treating organic material. 5,466,273, Cl. 71-11.000.
Connelly, Jack L., Jr.: *See*—
Tamburrino, Richard A.; and Connelly, Jack L., Jr., 5,467,124, Cl. 348-66.000.
Connolly, Christopher J.; Lawrence, Thomas H.; Mankaukas, Joseph J.; Pawlowski, John J.; and Smith, Matthew T., to United Technologies Corporation. Automatic release of a load from a helicopter external cargo suspension system. 5,465,925, Cl. 244-137.100.
Content, Jean: *See*—
Horisberger, Michel A.; Hochkeppel, Heinz-Kurt; and Content, Jean, 5,466,585, Cl. 435-69.100.
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., to Aero-Design Technology. Aircraft trash collection and compacting apparatus. 5,465,660, Cl. 100-68.000.
Conway, Simon M., to Bausch & Lomb Incorporated. Eyewear having interchangeable lenses. 5,467,148, Cl. 351-85.000.
Cook, Scott: *See*—
Martin, Eugene; and Cook, Scott, 5,466,185, Cl. 452-165.000.
Coombes, Ian R. Stackable bulk transport container. 5,465,865, Cl. 220-410.000.
Cooper, Charles F., to ARCO Chemical Technology, L.P. Process for preparing a C_{12}–C_{24} saturated fatty acid esterified alkoxylated polyol. 5,466,843, Cl. 554-149.000.
Cooper, Eugene R.: *See*—
Ruddy, Stephen B.; Eickhoff, W. Mark; Liversidge, Gary; and Cooper, Eugene R., 5,466,440, Cl. 424-9.411.
Cooper Industries, Inc.: *See*—
Stagnitti, Brian M., 5,466,890, Cl. 174-84.00R.
Cooper, Thomas G.: *See*—
Sliwa, John W., Jr.; Cooper, Thomas G.; and Ayter, Sevig, 5,465,724, Cl. 128-662.030.
Copack International Inc.: *See*—
Morgan, Gaylard M.; Malczanek, Anthony; and Gould, Peter J., 5,465,555, Cl. 53-451.000.
Copytele, Inc.: *See*—
DiSanto, Frank J.; Krusos, Denis A.; and Lewit, Edward, 5,467,107, Cl. 345-107.000.
Corbiere, Steven L.: *See*—
Haley, Neil F.; and Corbiere, Steven L., 5,466,557, Cl. 430-278.000.
Corbin, Douglas D.: *See*—
Anderson, Charles C.; Wang, Yongcai; Bello, James L.; Shalhoub, Ibrahim M.; and Corbin, Douglas D., 5,466,567, Cl. 430-530.000.
Cordis Corporation: *See*—
Davila, Luis A., 5,466,230, Cl. 604-256.000.
Corma Inc.: *See*—
Lupke, Manfred A. A., 5,466,402, Cl. 264-39.000.
Cornell, Paul A.; and Warner, Roy K., to Pan Electric Corporation. Cable clamp with moisture resistant shield and method for using same. 5,466,176, Cl. 439-789.000.
Cornett, Jerry W. Golf putting aid. 5,465,972, Cl. 273-186.300.
Corning Incorporated: *See*—
Brundage, Kevin R.; and Rajnik, Lawrence S., 5,466,415, Cl. 419-67.000.
Correia, Yves, to Societe Elf Atochem S.A. Catalyst for the dehalogenation of alphahalogenated carboxylic acids and its use for purifying monochloroacetic acid. 5,466,650, Cl. 502-185.000.
Corrigan, Colin; and Haley, Lawrence, to Research Corporation Technologies, Inc. Explosive detection screening system. 5,465,607, Cl. 73-23.360.
Corrigan, Frank; Anthony, Sam; and Sweeting, Barbara, to General Electric Company. Polycrystalline cubic boron nitride abrasive particles and abrasive tools made therefrom. 5,466,269, Cl. 51-307.000.
Costantini, Michel; Manaut, Daniel; and Michelet, Daniel, to Rhone-Poulenc Chimie. Preparation of p-fuchsones and synthesis of p-dihydroxylated aromatic compounds therefrom. 5,466,839, Cl. 552-304.000.
Costlow, Annette M.: *See*—
Fink, David J.; Everett, James W.; Costlow, Annette M.; Roberts, James J.; and Boone, Paul J., 5,465,483, Cl. 29-890.031.
Coulter Corporation: *See*—
Siiman, Olavi; Burshteyn, Alexander; and Gupta, Ravinder K., 5,466,609, Cl. 436-518.000.
Counts, Clement L., III: *See*—
Handwerker, Thomas S.; and Counts, Clement L., III, 5,466,373, Cl. 210-602.000.
Courtaulds Fibres (Holdings) Limited: *See*—
Akers, Paul J.; and Brunskill, William, 5,466,731, Cl. 524-52.000.
Cowan, Andrew H.: *See*—
Burkis, Joseph J.; Cowan, Andrew H.; Lutz, Martin F.; and Crain, Steven L., 5,467,451, Cl. 395-161.000.
Cowgill, Cynthia A.: *See*—
Dorin, Glenn; Gray, David R.; Chang, Byeong S.; Cowgill, Cynthia A.; and Milley, Robert J., 5,466,781, Cl. 530-351.000.
Cox, James: *See*—
Lapinski, Charles; Eckert, Charles; Skokowski, Richard; Cox, James; Scott, William; Chaleff, Edward; Sharpe, Jeffrey G.; and Wurz, David A., 5,466,921, Cl. 235-462.000.
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., to i-Stat Corporation. Process for the manufacture of wholly microfabricated biosensors. 5,466,575, Cl. 435-6.000.
CPG Holdings Inc.: *See*—
Kinsley, Homan B., Jr., 5,466,336, Cl. 162-146.000.
Crain, Allen L.: *See*—
Heidt, Philip C.; Foster, Charles H.; Witzeman, J. Stewart; and Crain, Allen L., 5,466,863, Cl. 560-176.000.
Crain, Steven L.: *See*—
Burkis, Joseph J.; Cowan, Andrew H.; Lutz, Martin F.; and Crain, Steven L., 5,467,451, Cl. 395-161.000.
Cram, Jeffrey R.: *See*—
Bittman, Barry B.; and Cram, Jeffrey R., 5,465,729, Cl. 128-732.000.
Cram, Milton E.: *See*—
Lester, Robert A.; Beard, David; and Cram, Milton E., 5,467,019, Cl. 324-339.000.
Crane Plastics Company Limited Partnership: *See*—
Newby, Charles D., 5,466,534, Cl. 428-457.000.
Crane, Robert F.: *See*—
Wentworth, Steven W.; Haas, Jon A.; Crane, Robert F.; and Reynolds, Payce D., 5,465,797, Cl. 173-91.000.
Cray Research, Inc.: *See*—
Nelson, Stephen E.; Duxstad, David L.; and Flunker, Galen C., 5,467,040, Cl. 327-276.000.
Crayford, Ian S.: *See*—
Vijeh, Nader; Crayford, Ian S.; and Blumenthal, Jeffrey M., 5,467,369, Cl. 375-224.000.
Creative Integrated Systems, Inc.: *See*—
Komarek, James A.; Padgett, Clarence W.; Amneus, Robert D.; and Tanner, Scott B., 5,467,300, Cl. 365-104.000.
Creative Minds Foundation: *See*—
Shields, Rodney M., 5,465,427, Cl. 2-206.000.
Crisci, Robert E., to Portola Packaging, Inc. Container and closure resealable bottle cap with push pull closure. 5,465,876, Cl. 222-153.100.
Crispin, Harold D. Fishing garment with removable pockets with fastening means on both pocketsides. 5,465,425, Cl. 2-102.000.
Critz, Kurt M.: *See*—
Leonida, Andrei; Moulthrop, Lawrence C.; and Critz, Kurt M., 5,466,354, Cl. 204-252.000.
Croft, W. Jack. Nut harvester. 5,465,562, Cl. 56-16.40R.
Cronin, John E.; Kaanta, Carter W.; Kenney, Donald M.; Kerbaugh, Michael L.; Landis, Howard S.; Machesney, Brian J.; Parries, Paul; Previti-Kelly, Rosemary A.; and Rembetski, John F., to International Business Machines Corporation. Method of forming borderless contacts using a removable mandrel. 5,466,636, Cl. 437-187.000.
Cronin, John E.: *See*—
Beilstein, Kenneth E., Jr.; Bertin, Claude L.; Cronin, John E.; Howell, Wayne J.; Leas, James M.; and Phillips, Robert B., 5,466,634, Cl. 437-180.000.
Cross Medical Products, Inc.: *See*—
Byrd, J. Abbott, III; Puno, Rolando M.; and Mellinger, Philip, 5,466,237, Cl. 606-61.000.
Crowder, Kevin F.: *See*—
Johnson, Steven R.; Crowder, Kevin F.; Seals-Mason, Samantha; and Von Ehr, James R., II, 5,467,443, Cl. 395-141.000.
Crowe, Lawrence E.: *See*—
Sutrina, Thomas; Crowe, Lawrence E.; Smith, Edward W.; Peterson, Ronald P.; and Hoppe, Richard J., 5,466,974, Cl. 307-38.000.
Cudney, Douglas J.; and Breitbach, Karen E., to Tipperary Sport Products, Inc. Body protector. 5,465,424, Cl. 2-2.000.
Cully, Jan: *See*—
Heidlas, Jürgen; Cully, Jan; Michlbauer, Franz; and Vollbrecht, Heinz-Rüdiger, 5,466,842, Cl. 554-83.000.
Cummings, A. Kim: *See*—
Bybee, Steven D.; and Cummings, A. Kim, 5,467,379, Cl. 378-57.000.
Cummings, Dave. Clamp for line fitting. 5,466,014, Cl. 285-92.000.
Cummins-Allison Corp: *See*—
Graves, Bradford T.; Mazur, Richard A.; and Mennie, Douglas U., 5,467,406, Cl. 382-135.000.
Cummins-Allison Corporation: *See*—
Raterman, Donald E.; Graves, Bradford T.; Stromme, Lars R.; and Bauch, Aaron M., 5,467,405, Cl. 382-135.000.
Cupp, Carl J., to Pachmayr Ltd. Gun grip. 5,465,520, Cl. 42-71.020.
Cur, Nihat O.; Kuehl, Steven J.; Khanpara, Jatin C.; LeClear, Douglas D.; and Peterson, James R., to Whirlpool Corporation. Dual evaporator refrigerator with non-simultaneous evaporator. 5,465,591, Cl. 62-439.000.
Custer, Daniel A., to DogWatch, Inc. Animal control apparatus. 5,465,687, Cl. 119-719.000.
Cuthbert, Murray W., to Imperial Chemical Industries, PLC. Process for preparing a physical form of pharmaceutical agent. 5,466,826, Cl. 548-511.000.
Cutler, Victor H., Jr.; Richetta, Peter; Young, Kenneth P.; and Davieau, Gerald J., to Motorola, Inc. Packet routing system and method therefor. 5,467,345, Cl. 370-60.000.
Cy, Chiou C. Cylinder having a piston assembly capable of stopping once when having moved up and down every time. 5,465,648, Cl. 92-140.000.
Cyberdan A/S: *See*—

Westermann, Soeren E.; and Schultz, Erik, 5,466,353, Cl. 204-196.000.
CyberGear, Inc.: *See*—
Ulrich, W. Thatcher; Koselka, Harvey A.; Bobick, Aaron F.; and Benjamin, Michael H., 5,466,200, Cl. 482-4.000.
Cypress Semiconductor Corp.: *See*—
Taffe, Norman P.; Douglass, Stephen M.; and Nazarian, Hagop, 5,467,029, Cl. 326-41.000.
Cytec Technology Corporation: *See*—
Fiori, Denise E.; and Quinn, Richard J., 5,466,745, Cl. 524-801.000.
Cytologics, Inc.: *See*—
Rudy, Michael A., 5,466,680, Cl. 514-57.000.
Czech, Anna M., to OSi Specialties, Inc. Polysiloxanes having anionic carboxy, phosphonic or carboxy and sulfonate groups useful as an antistain finish for nylon. 5,466,529, Cl. 428-395.000.
D. Swarovski & Co.: *See*—
Weingartner, Harold, 5,467,416, Cl. 385-31.000.
Dabico, Inc.: *See*—
Devlin, Mike, 5,465,862, Cl. 220-335.000.
Daewoo Electronics Co., Ltd.: *See*—
Song, Kiseok, 5,467,338, Cl. 369-270.000.
Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Egashira, Noritaka; and Nakamura, Yoshinori, 5,466,657, Cl. 503-227.000.
Daicel Chemical Industries, Ltd.: *See*—
Horiguchi, Akira; and Oda, Shingo, 5,466,856, Cl. 558-277.000.
Kanno, Tatsuya; Hukuda, Yutaka; and Oshino, Yasuhiro, 5,466,774, Cl. 528-199.000.
Kanno, Tatsuya; and Fukuda, Yutaka, 5,466,775, Cl. 528-207.000.
Kosaki, Michio; and Kawai, Kimitoshi, 5,466,588, Cl. 435-139.000.
Morimoto, Takao; and Nakano, Shinji, 5,466,754, Cl. 525-206.000.
Daicell Chemical Industry Co., Ltd.: *See*—
Takegawa, Masaharu; Kotani, Motoharu; and Yokota, Hiromu, 5,466,209, Cl. 493-4.000.
Daido Metal Company Ltd.: *See*—
Tanaka, Tadashi; Sakamoto, Masaaki; and Kato, Tohru, 5,466,538, Cl. 428-610.000.
Daifuku Co., Ltd.: *See*—
Iizuka, Yukio, 5,466,109, Cl. 414-283.000.
Nakagawa, Susumu; Hayashi, Nobuhiro; and Nakagawa, Hiroshi, 5,465,827, Cl. 198-465.300.
Dailey, Gary G.: *See*—
Ilardi, Joseph M.; Schwartzkopf, George; and Dailey, Gary G., 5,466,389, Cl. 252-156.000.
Daimon, Katsumi: *See*—
Burt, Richard A.; Liebermann, George; Hamer, Gordon K.; Gardner, Sandra J.; Jennings, Carol A.; Daimon, Katsumi; and Nukada, Katsumi, 5,466,796, Cl. 540-139.000.
Daito, Kazuhiko: *See*—
Takahashi, Takehiro; Daito, Kazuhiko; and Kawaoka, Akihiro, 5,467,475, Cl. 395-800.000.
Daito Valve Seisakusho Co., Ltd.: *See*—
Sudo, Kiyoshi; and Ookubo, Masakazu, 5,465,754, Cl. 137-614.200.
Daitoku, Koichi: *See*—
Ezawa, Akira; Daitoku, Koichi; Inoue, Hideya; Kazami, Kazuyuki; and Ohtsuka, Kazuto, 5,467,156, Cl. 354-21.000.
Daiwa Golf Co., Ltd.: *See*—
Aizawa, Yuichi; and Oku, Yutaka, 5,465,968, Cl. 273-167.00H.
Daley, Joseph W.: *See*—
Petersen, Niel R.; Petersen, Paul S.; and Daley, Joseph W., 5,465,615, Cl. 73-118.100.
Dall'Omo, Davide, to Wrapmatic S.p.A. Quick-release conveying arm in machines for assembling and wrapping packs of rolls. 5,465,550, Cl. 53-233.000.
Dalmadi, Gyula: *See*—
Ivanics, József; Szabó, Tibor; Hermecz, István; Dalmadi, Gyula; Ivanics, Józsefné; Kovács, Gáborné; and Bahram, Resul, 5,466,833, Cl. 549-475.000.
Dambmann, Claus: *See*—
Outtrup, Helle; Dambmann, Claus; Christiansen, Margrethe; and Aaslyng, Dorrit A., 5,466,594, Cl. 435-221.000.
Damon, Dwight H., to Damon Family Limited Partnership. Spring-locked orthodontic bracket. 5,466,151, Cl. 433-10.000.
Damon Family Limited Partnership: *See*—
Damon, Dwight H., 5,466,151, Cl. 433-10.000.
Dams, Rudolf J.: *See*—
Audenaert, Frans A.; Dams, Rudolf J.; and Kamrath, Robert F., 5,466,770, Cl. 528-60.000.
Dana Corporation: *See*—
Brueggen, Shane J.; and Martin, Alan, 5,466,084, Cl. 403-134.000.
Dick, Wesley M., 5,465,820, Cl. 192-35.000.
Daniell, Geoffrey J.: *See*—
Zadehkoochak, Mohsen; Blott, Barry H.; and Daniell, Geoffrey J., 5,465,730, Cl. 128-734.000.
Danly Corporation: *See*—
Katz, Wolfgang, 5,465,811, Cl. 184-24.000.
Dao, Loc H.: *See*—
Ramachandran, Ramakrishnan; and Dao, Loc H., 5,466,837, Cl. 549-513.000.
DaPrato, Leo: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.
Darden, Kim M.; and Flogstad, Hokon O., to Eastman Kodak Company. Ground driven delay line correlator. 5,467,130, Cl. 348-241.000.
Darfler, Stephen C., to Hexcel Corporation. High thermal conductivity non-metallic honeycomb with laminated cell walls. 5,466,507, Cl. 428-116.000.
Darland, Fred S.; and Durgin, Jerry A., to Atlantic Richfield Company. Survey system and method. 5,467,290, Cl. 364-561.000.
Darlington, William B.; and Lanier, William G., to Mead Corporation, The. Repulpable wet strength paper. 5,466,337, Cl. 162-164.300.
D'Arrigo, Iano; Falessi, Georges; and Smayling, Michael C., to Texas Instruments Incorporated. Memory array utilizing low voltage Fowler-Nordheim Flash EEPROM cell. 5,467,307, Cl. 365-185.060.
Das, Siddhartha: *See*—
Fujimoto, Harry H.; and Das, Siddhartha, 5,465,860, Cl. 216-24.000.
Data Fit International: *See*—
Fargeot, Michel, 5,467,153, Cl. 353-103.000.
Data Packaging Corporation: *See*—
Lyman, George; Mathus, Gregory; and Root, David, 5,466,602, Cl. 435-297.100.
Daum, Sol J.: *See*—
Bacon, Edward R.; Daum, Sol J.; and Spara, Paul P., 5,466,433, Cl. 424-9.451.
Davene, Jean; Rachenne, Sylvie; and Douvry, Jean-Jacques, to Clecim. Metal strip treatment installation. 5,466,309, Cl. 148-508.000.
Davenport, Kenneth G.; Sheldon, Roger A.; Le Bars, Joel; and Mueller, Werner H., to Hoechst Celanese Corporation. Process for perparing 4-hydroxyacetophenone oxime. 5,466,869, Cl. 564-265.000.
Davey, Cheryl; Malek, Lawrence T.; Lens, Peter F.; and Wielaard, Frits, to Akzo Nobel N.V. Method for the synthesis of ribonucleic acid (RNA). 5,466,586, Cl. 435-91.210.
David, Claire; and Seon, Francoise, to Rhone-Poulenc Chimie. Morphologically improved ceric oxide particulates. 5,466,428, Cl. 423-263.000.
David, John R.: *See*—
Baratto, Eugene L.; David, John R.; Larson, Curtis L.; Nelson, Thomas L.; and Wrobel, Norbert E., 5,465,900, Cl. 229-125.390.
Davidson Textron Inc.: *See*—
Parker, Thomas; and Iannazzi, Peter, 5,466,412, Cl. 264-255.000.
Daviau, Gerald J.: *See*—
Cutler, Victor H., Jr.; Richetta, Peter; Young, Kenneth P.; and Daviau, Gerald J., 5,467,345, Cl. 370-60.000.
Davies, John T.; Egbert, Stephen J.; and Wagar, John R., to GaSonics, Inc. Apparatus and method for generating steam. 5,467,424, Cl. 392-401.000.
Davila, Luis A., to Cordis Corporation. Catheter sheath introducer with strain relief. 5,466,230, Cl. 604-256.000.
Davis, Carl L.; and Spector, George. Cap glide puller. 5,465,430, Cl. 29-267.000.
Davis, David J., to Winget, Larry J. Air bag cover having a tear seam membrane switch. 5,465,998, Cl. 280-731.000.
Davis, Graham: *See*—
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., 5,466,575, Cl. 435-6.000.
Davis, R. Andrew; and Heineman, Rolf, to Riedel Omni Rubber Products, Inc. Mounting plate for fixing elastomeric grade crossing panels to ties. 5,465,903, Cl. 238-8.000.
Davis, Richard C., to Trek Medical Corporation. Crutch. 5,465,745, Cl. 135-82.000.
Davis, Richard E.; and Greenhoe, William J., to Medtronic, Inc. Surgical needle assembly. 5,466,225, Cl. 604-165.000.
Davis, Ronald A.: *See*—
Dudek, Kenneth P.; Matthews, Gregory P.; Folkerts, Charles H.; and Davis, Ronald A., 5,465,617, Cl. 73-118.200.
Davstar, Inc.: *See*—
Elson, Edward E.; and Kuntz, David H., 5,466,229, Cl. 604-317.000.
Dawson, Andrew W.: *See*—
Rice, Chris A.; Gazzola, Alain J.; Smith, Desroy D.; Evans, John T.; and Dawson, Andrew W., 5,465,443, Cl. 15-246.000.
Dawson, Jeffrey C.; and Van Le, Hoang, to BJ Services Company. Method of controlling production of excess water in oil and gas wells. 5,465,792, Cl. 166-295.000.
Dawson, Marcia L.; Cameron, James F.; Hobbs, Peter D.; Jong, Ling; Pfahl, Magnus; Zhang, Xiao-kun; and Lehmann, Jürgen M., to SRI International; and La Jolla Cancer Research Foundation. Bridged bicyclic aromatic compounds and their use in modulating gene expression of retinoid receptors. 5,466,861, Cl. 560-100.000.
Dawson, Ralph L. Computed tomographic scanner. 5,467,377, Cl. 378-19.000.
Day, James; Kailasam, Ganesh; and Varadarajan, Godavarthi S., to General Electric Company. Apparatus for isolating solids from fluids. 5,466,370, Cl. 210-298.000.
d by the Secretary of Agriculture, Fmr: *See*—
Slighton, Jerry L.; Tepfer, David A., 5,466,792, Cl. 536-23.700.
De Nora Permelec S.p.A.: *See*—
Shimamune, Takayuki; and Nakajima, Yasuo, 5,466,347, Cl. 204-98.000.
Deal, Michel, to Sedepro. Pump having a rotary distributor. 5,466,132, Cl. 417-519.000.

de Almeida, Alcino R., to Petroleo Brasileiro S.A.-Petrobras. Pressure valve assembly for use in gas-lift producing oil-wells. 5,465,747, Cl. 137-155.000.

Dean, Charles W. Method of making a rigid frame construction. 5,465,487, Cl. 29-897.350.

de Anda, Richard N.; and Hollis, Dale R. Electronic stunning apparatus. 5,467,247, Cl. 361-232.000.

De Araujo, Carlos P.: *See*—
Mihara, Takashi; Yoshimori, Hiroyuki; Watanabe, Hitoshi; McMillan, Larry D.; and De Araujo, Carlos P., 5,466,629, Cl. 437-60.000.

Debenedetto, Paul: *See*—
Kowdley, Balasubramanian S.; Lewis, Thomas A.; Tsukida, Robert S.; Saxon, Edward W.; Ortega, Frank; and Debenedetto, Paul, 5,465,497, Cl. 33-626.000.

deBrught, Gerhardus J. A.: *See*—
Scheetz, Howard A.; and deBrught, Gerhardus J. A., 5,466,761, Cl. 525-432.000.

de Buzzaccarini, Francesco; Farwick, Timothy J.; and Zhen, Yueqian, to Procter & Gamble Co., The. Stable, aqueous laundry detergent composition having improved softening properties. 5,466,394, Cl. 252-547.000.

Deck, Harold R.: *See*—
Patsidis, Konstantinos; Peifer, Bernd; Palackal, Syriac J.; Alt, Helmut G.; Welch, M. Bruce; Geerts, Rolf L.; Fahey, Darryl R.; and Deck, Harold R., 5,466,766, Cl. 526-129.000.

Decker, Gary T.; Gornowicz, Gerald A.; and Tobukuro, Kuniaki, to Toray Industries. Preparing epoxy resin/hardener/aminopolysiloxane composite. 5,466,323, Cl. 156-307.400.

Deere & Company: *See*—
Buescher, Melvin H.; and Bucher, David H., 5,465,796, Cl. 172-762.000.
Deutsch, Timothy A.; and Neumeyer, Lowell H., 5,466,189, Cl. 460-100.000.
Norberg, Lars G., 5,466,113, Cl. 414-723.000.
Skinner, David A.; and Pearson, Mark L., 5,466,190, Cl. 460-101.000.

de Framond, Annick J., to Ciba-Geigy Corporation. Tissue-preferential promoters. 5,466,785, Cl. 536-24.100.

Degen, Helmut: *See*—
Gruettner-Merten, Sabine; Reichelt, Helmut; Lange, Arno; and Degen, Helmut, 5,466,790, Cl. 534-753.000.

Degouy, Didier: *See*—
Romieu, Jacques; Degouy, Didier; Parigot, Philippe; and Hourcard, Michel, 5,465,609, Cl. 73-38.000.

DeGregoria, Anthony J., to ElasTek, Inc. Elastomer bed. 5,465,781, Cl. 165-8.000.

DeGrendel, Glen A.: *See*—
Stroeters, Kurt H.; Clark, Dean B.; and DeGrendel, Glen A., 5,466,036, Cl. 296-218.000.

Degussa Aktiengesellschaft: *See*—
Deller, Klaus; Moesinger, Hans; Mueller, Herbert; Riedl, Josef; Kuehn, Wenzel; and Spielmannleitner, Rudolf, 5,466,421, Cl. 422-171.000.
Wieland, Stefan; Panster, Peter; and Grethe, Horst, 5,466,767, Cl. 525-9.000.

Deil, Peter: *See*—
Obermeier, Rainer; Sabel, Walter; Deil, Peter; and Geisen, Karl, 5,466,666, Cl. 514-3.000.

Deines, Robert: *See*—
Bamber, David; and Deines, Robert, 5,467,258, Cl. 362-184.000.

De Jonge, Dirk J. A.; and Stegehuis, Herman, to U.S. Philips Corporation. X-ray examination apparatus and means for noise reduction for use in an x-ray examination apparatus. 5,467,380, Cl. 378-98.200.

Dela Cruz, Alfredo R.: *See*—
Carlson, Gene D.; and Dela Cruz, Alfredo R., 5,466,284, Cl. 106-31.000R.

Delaware Capital Formation, Inc.: *See*—
May, Dennis J., 5,466,184, Cl. 452-38.000.

Delco Electronics Corporation: *See*—
Manlove, Gregory J.; and Hitko, Donald A., 5,467,034, Cl. 327-63.000.

De Lena, Oscar, to Societa Italiana Vetro - SIV S.p.A. Movable transparent panel structure to close the roof of an automobile. 5,466,037, Cl. 296-211.000.

Dell USA, L.P.: *See*—
Kocis, Thomas, 5,467,453, Cl. 395-281.000.

della-Cioppa, Guy R.; Garger, Stephen J., Jr.; Holtz, Richard B.; McCulloch, Michael J.; and Sverlow, Genadie G., to Biosource Technologies, Inc. Method for making stable, extracellular tyrosinase and synthesis of polyphenolic polymers therefrom. 5,466,592, Cl. 435-212.000.

della Valle, Francesco; and Romeo, Aurelio, to Fidia, S.p.A. Polysaccharide esters. 5,466,461, Cl. 424-423.000.

DellaVecchia, Joseph A. Folding handtruck attachment. 5,465,987, Cl. 280-47.280.

Deller, Klaus; Moesinger, Hans; Mueller, Herbert; Riedl, Josef; Kuehn, Wenzel; and Spielmannleitner, Rudolf, to Degussa Aktiengesellschaft. Apparatus for the catalytic conversion of waste gases containing hydrocarbon, halogenated hydrocarbon and carbon monoxide. 5,466,421, Cl. 422-171.000.

Delmotte, Yves: *See*—
Kersten, Jean; and Delmotte, Yves, 5,466,725, Cl. 523-122.000.

DeLoach, John R.: *See*—
Stanker, Larry H.; Elissalde, Marcel H., Jr.; Beier, Ross C.; Rowe, Loyd D., Jr.; and DeLoach, John R., 5,466,784, Cl. 530-388.900.

De Mesmaeker, Alain: *See*—
Baxter, Anthony D.; Baylis, Eric K.; Collingwood, Stephen P.; Taylor, Roger J.; De Mesmaeker, Alain; and Schmit, Chantal, 5,466,677, Cl. 514-44.000.

Demizu, Kei: *See*—
Sato, Yukihiro; Sone, Takumi; Nagata, Sachio; Sakata, Tetsuhiro; Demizu, Kei; and Tanaka, Shinichi, 5,466,305, Cl. 148-222.000.

Denley, Ronald S., to Elco Industries, Inc. Level indicating device for a vehicle headlamp. 5,467,255, Cl. 362-66.000.

Dennis, Arthur R. GPS and satellite navigation system. 5,467,282, Cl. 364-449.000.

Dennis, Macy S. Utility cart. 5,465,988, Cl. 280-47.350.

Dennis, Stephen V.: *See*—
Douglas, George H.; McCormick, William B.; and Dennis, Stephen V., 5,467,435, Cl. 395-114.000.

Dent, Paul W.: *See*—
Chennakeshu, Sandeep; Dent, Paul W.; Koilpillai, Ravinder D.; and Toy, Raymond L., 5,467,374, Cl. 375-340.000.

De Peretti, Danielle: *See*—
George, Pascal; De Peretti, Danielle; Roy, Jocelyne; Schmitt, Jean-Paul; and Sevrin, Mireille, 5,466,706, Cl. 514-394.000.

de Putter, Cornelis. Operating lamp device. 5,466,249, Cl. 607-90.000.

Deringer, Helmut: *See*—
Schmitt, Edgar; Siegel, Heinz; Mergenthaler, Robert; and Deringer, Helmut, 5,466,055, Cl. 303-119.200.

Derman, Jay S. Safety cable lock for knob-operated door. 5,466,022, Cl. 292-246.000.

DeRoos, Bradley G.; Downing, John P., Jr.; and Neal, Michael P. Fluid transport container. 5,465,768, Cl. 141-329.000.

DeRose, Anthony: *See*—
Stone, Maureen C.; and DeRose, Anthony, 5,467,441, Cl. 395-133.000.

Derr, John D., to Wessco, Inc. Material for use as soil stabilizer and as soil substitute. 5,466,288, Cl. 106-486.000.

Derungs, Romano; Märki, Hans P.; Stalder, Henri; and Szente, André, to Hoffmann-La Roche Inc. Oxetanones. 5,466,708, Cl. 514-449.000.

Desai, Ranjit C.: *See*—
Hlasta, Dennis J.; Ackerman, James H.; Mura, Albert J.; and Desai, Ranjit C., 5,466,701, Cl. 514-373.000.

Design Technology Corporation: *See*—
Burt, Donald E.; Boot, Jeffrey T.; Bouche, Matthew D.; and Moeller, Carl, 5,465,951, Cl. 271-167.000.

Desmarais, Richard R.; and Karpinski, Andrew J., Jr., to Honeywell Inc. Digital to analog interface conversion circuit. 5,467,190, Cl. 356-350.000.

Desmond, John S.: *See*—
Rummo, Richard J., Jr.; Petro, Stephen M.; and Desmond, John S., 5,465,533, Cl. 52-60.000.

Detection Systems, Inc.: *See*—
Pedtke, Daniel F., 5,467,074, Cl. 340-539.000.

Dettwiler, Hermann. Device for generating an inversion-kinematic movement. 5,466,124, Cl. 416-82.000.

Deubzer, Bernward: *See*—
Geck, Michael; Deubzer, Bernward; Baumgartner, Christine; Lautenschlager, Hans-Jürgen; and Sejpka, Johann, 5,466,746, Cl. 524-837.000.

Deutsche Aerospace AG: *See*—
Birkmayer, Wolfram; Wale, Michael J.; and Edge, Colin, 5,467,414, Cl. 385-3.000.

Deutsch, Timothy A.; and Neumeyer, Lowell H., to Deere & Company. Cleaner for a rotating screen on a harvester. 5,466,189, Cl. 460-100.000.

Deutsche Aerospace AG: *See*—
Schneider, Heinrich, 5,465,924, Cl. 244-118.100.

Deutsche Forschungsanstalt fur Luft-und Raumfahrt e.V.: *See*—
Fazel, Khaled; and Ruf, Michael, 5,467,132, Cl. 348-390.000.

Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V.: *See*—
Goebel, Olaf; and Hennecke, Klaus, 5,465,708, Cl. 126-635.000.

Devan, Colleen M.; and Devan, William M. Wheeled portable cooler. 5,465,985, Cl. 280-30.000.

Devan, William M.: *See*—
Devan, Colleen M.; and Devan, William M., 5,465,985, Cl. 280-30.000.

Devlin, Mike, to Dabico, Inc. Aircraft servicing pit lid with lift control. 5,465,862, Cl. 220-335.000.

Devon Industries, Inc.: *See*—
Sandel, Dan, 5,465,461, Cl. 16-111.00R.

Devos, Francis, to Roquette Freres. Process for the manufacture of mannitol. 5,466,795, Cl. 536-125.000.

De Weijer, Anton P.: *See*—
Maria, Christiaan J.; De Weijer, Anton P.; Middeljans, Hendrik; and Heuvel, Herman M., 5,466,525, Cl. 428-357.000.

DeWoolfson, Bruce H.; Powell, Ken R.; and Schumacher, Warner, to Environmental Products Corporation. Commodity densification assembly having a multiple path distribution device. 5,465,822, Cl. 194-209.000.

Dezen, William L.: *See*—
Sotack, John D.; Dezen, William L.; Benedict, Lawrence R.; Zayed, Gaith O.; and Werner, Alan J., Jr., 5,465,619, Cl. 73-304.00C.

Diafoil Hoechst Company, Ltd.: *See*—
Sato, Yoshinori; Komiyama, Megumi; Endo, Kazuo; and Tate, Masashi, 5,466,521, Cl. 428-330.000.

DiCarlo, Leonard J., to McNeil (Ohio) Corporation. Hydraulic motor. 5,465,646, Cl. 91-308.000.

DiCesare, Paul: *See*—
Allen, William J.; Stein, Jeffrey A.; DiCesare, Paul; Mulhauser, Paul; and Spranger, Doug, 5,465,896, Cl. 227-176.000.

Dick, Wesley M., to Dana Corporation. Clutch actuating device for use in a vehicle drivetrain subassembly. 5,465,820, Cl. 192-35.000.
Dickie, Robert G.; and Phillips, Michael J., to Advanced Medical Products Inc. Illuminated vaginal speculum. 5,465,709, Cl. 600-223.000.
Dickinson, Robert J.; and Kitney, Richard I., to Intravascular Research Limited. Ultrasound imaging and catheters for use therein. 5,465,726, Cl. 128-663.010.
Di Cosimo, Robert: *See*—
Nakamura, Charles E.; Di Cosimo, Robert; and Moran, John R., 5,466,801, Cl. 544-173.000.
Diede, Amos J.; and McCune, William H., to United States of America, Navy. Intermetallic thermal sensor. 5,466,537, Cl. 428-548.000.
Diehl, Donald R.; Helber, Margaret J.; and Williamson, Hugh, to Eastman Kodak Company. Imine dye and photographic elements containing same. 5,466,813, Cl. 548-179.000.
Diehl, Steven F., to Olin Corporation. Primer. 5,465,665, Cl. 102-470.000.
Dietl, Steven J.: *See*—
Nakamura, Shinya; Yamaguchi, Tsutomu; Dietl, Steven J.; and Stevens, Donald M., 5,467,116, Cl. 347-50.000.
Dietrich, Thomas R.: *See*—
Ruf, Alexander; Abraham, Michael; Lacher, Manfred; Zettierer, Thomas; and Dietrich, Thomas R., 5,465,611, Cl. 73-104.000.
Dietz, Erwin; and Urban, Manfred, to Hoechst Aktiengesellschaft. Perylene compounds containing sulfonic acid groups process for preparing them and their use. 5,466,807, Cl. 546-6.000.
Diez, Ricardo; Pidnebesny, John; and Ng, Susanna, to Stepan Company. Foaming agent. 5,466,393, Cl. 252-307.000.
Digital Biometrics, Inc.: *See*—
Fishbine, Glenn M.; Withoff, Robert J.; and Klein, Theodore D., 5,467,403, Cl. 382-116.000.
Digital Systems International, Inc.: *See*—
Donaghue, Norman J., Jr.; Hurd, Clinton J.; and Mullen, David C., 5,467,391, Cl. 379-265.000.
DiMaria, Donelli J.: *See*—
Bertin, Claude L.; DiMaria, Donelli J.; Miyakawa, Makoto; and Sakaue, Yoshinori, 5,467,305, Cl. 365-185.010.
Dime, David, to Toronto Research Chemicals, Inc. Process for the preparation of immunostimulating swainsonine analogs. 5,466,809, Cl. 546-183.000.
Dingley, David J.: *See*—
Adams, Brent L.; Dingley, David J.; and Field, David P., 5,466,934, Cl. 250-307.000.
DiRico, Mark A., to MMT Manufacturing Corp. Stand alone coating apparatus for printed material and method of operation thereof. 5,466,291, Cl. 118-244.000.
DiSanto, Frank J.; Krusos, Denis A.; and Lewit, Edward, to Copytele, Inc. Electrophoretic display panel with selective character addressability. 5,467,107, Cl. 345-107.000.
Dischler, Louis, to Milliken Research Corporation. Energy absorption of a high tenacity fabric during a ballistic event. 5,466,503, Cl. 428-43.000.
Dixon, Raymond D.; Roe, Lawrence H.; and Migliori, Albert, to University of California, Office of Technology Transfer, The Regents of the. Bonded ultrasonic transducer and method for making. 5,465,897, Cl. 228-121.000.
Djerassi, Shlomo: *See*—
Faibish, Sorin; Yahav, Giora; and Djerassi, Shlomo, 5,467,273, Cl. 364-424.020.
Do, Tien-Dung: *See*—
Wuidart, Sylvie; and Do, Tien-Dung, 5,467,053, Cl. 327-551.000.
Doan, Phong D., to Pacesetter, Inc. Crush resistant multi-conductor lead body. 5,466,253, Cl. 607-122.000.
Dodds, David H.: *See*—
Bajatzewski, Alexander; Dodds, David H.; Muessig, Charles E.; and Nagpal, Vijay, 5,465,597, Cl. 72-19.000.
DogWatch, Inc.: *See*—
Custer, Daniel A., 5,465,687, Cl. 119-719.000.
Doi, Ayumu: *See*—
Butsuen, Tetsuro; Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Adachi, Tomohiko; and Morioka, Satoshi, 5,467,283, Cl. 364-461.000.
Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, 5,467,284, Cl. 364-461.000.
Doi, Jun, to Ricoh Company, Ltd. Image forming system. 5,467,181, Cl. 355-319.000.
Doi, Takayuki: *See*—
Yamamoto, Mitsuo; Doi, Takayuki; and Kato, Kaneyoshi, 5,466,689, Cl. 514-229.500.
Donaghue, Norman J., Jr.; Hurd, Clinton J.; and Mullen, David C., to Digital Systems International, Inc. Integrated intelligent call blending. 5,467,391, Cl. 379-265.000.
Dong, Geng X.: *See*—
Maofu, Tong; Jiancheng, Xiong; and Dong, Geng X., 5,466,307, Cl. 148-307.000.
Donlar Corporation: *See*—
Ross, Robert J., 5,466,779, Cl. 528-363.000.
Doole, Kevin G. Timber connectors. 5,466,087, Cl. 403-406.100.
Dooley, David M., to B-Line Systems, Inc.; and Tray-Safe Inc. Ladder-type cable tray system. 5,465,929, Cl. 248-681.000.
Dooms, Philip: *See*—
Van Havenbergh, Jan E.; Aertbelien, Jozef R.; and Dooms, Philip, 5,466,541, Cl. 428-690.000.
Doran, Michael J.: *See*—
Botterman, Ralph C.; and Doran, Michael J., 5,466,050, Cl. 301-65.000.
Dörflinger, Hans-Dieter: *See*—
Veh, Gerhard; Schweib, Peter; and Dörflinger, Hans-Dieter, 5,465,848, Cl. 209-170.000.
Dorfman, Veniamin; and Pypkin, Boris, to Dorfman, Veniamin. Diamond-like metallic nanocomposites. 5,466,431, Cl. 423-446.000.
Dorin, Glenn; Gray, David R.; Chang, Byeong S.; Cowgill, Cynthia A.; and Milley, Robert J., to Chiron Therapeutics. Process for purifying bacterially produced M-CSF. 5,466,781, Cl. 530-351.000.
Doring, Heinz: *See*—
Barben, Ted; Carlson, Randy; Christner, Kurt; and Doring, Heinz, 5,465,578, Cl. 62-3.200.
Dornbush, David: *See*—
Erickson, Chad; Dornbush, David; and Finn, John, 5,465,651, Cl. 99-330.000.
Dornbush, David A.; Erickson, Chad S.; Iverson, Troy M.; Sandahl, Jeffrey E.; Moore, Kevin B.; Barnes, Neal P.; Easley, James B.; Jackson, Richard C.; and Von Duyke, Andrew L., to American Harvest, Inc. Convection oven. 5,466,912, Cl. 219-400.000.
Dorsey, James M.: *See*—
Brankley, Russell J.; and Dorsey, James M., 5,467,390, Cl. 379-229.000.
Doryokuro Kakunenryo Kaihatsu Jigyodan: *See*—
Wada, Yukio; Yamamoto, Kazunori; Tsukamoto, Osami; Ohara, Takeshi; Miyake, Chie; and Mori, Sadao, 5,465,849, Cl. 209-214.000.
Dotolo, John; and Bayless, Ronnie E., to Citra Science Ltd. Animal coat deodorizer and insect repellent. 5,465,685, Cl. 119-159.000.
Dotson, Billy R., to Eastman Kodak Company. Radiation curable adhesive for laminating a lineform image to a lenticular array sheet. 5,466,723, Cl. 522-96.000.
Douglas, George H.; McCormick, William B.; and Dennis, Stephen V., to Microsoft Corporation. System and method for mode switching. 5,467,435, Cl. 395-114.000.
Douglass, Stephen M.: *See*—
Taffe, Norman P.; Douglass, Stephen M.; and Nazarian, Hagop, 5,467,029, Cl. 326-41.000.
Douty, Brent D.: *See*—
Baker, Edward J.; Bacon, Edward R; Illig, Carl R.; Caulfield, Thomas J.; Douty, Brent D.; Josef, Kurt A.; Toner, John L.; and Lee, Robert W., 5,466,435, Cl. 424-9.450.
Douvry, Jean-Jacques: *See*—
Davene, Jean; Rachenne, Sylvie; and Douvry, Jean-Jacques, 5,466,309, Cl. 148-508.000.
Dow Chemical Company, The: *See*—
Bales, Stephen E.; Brennan, David J.; Gulotty, Robert J., Jr.; Inbasekaran, Muthiah N.; Mang, Michael N.; and Newsham, Mark D., 5,466,397, Cl. 252-582.000.
Wu, Weishi W.; Shankar, Ravi B.; Romer, Duane R.; and Pews, R. Garth, 5,466,707, Cl. 514-411.000.
Dow Corning Corporation: *See*—
Frye, Cecil L., 5,466,479, Cl. 426-611.000.
Loboda, Mark J., 5,465,680, Cl. 117-84.000.
DowElanco: *See*—
Keeney, F. Nelson; and Troth, John L., 5,466,659, Cl. 504-130.000.
Dowell Schlumberger Incorporated: *See*—
Poyet, Georges; Badier, Frédéric; and Guillot, Dominique, 5,466,063, Cl. 366-6.000.
Down River International, Inc.: *See*—
Boyse, George C.; and Morgan, Steven R., 5,465,672, Cl. 108-51.300.
Down, William J. Longitudinally compressible coaxial cable connector. 5,466,173, Cl. 439-584.000.
Downey, Angela B.; Frazier, Valerie S.; and Willingham, Gary L., to Rohm and Haas Company. Synergistic microbicidal combinations containing 4,5-dichloro-2-n-octyl-3-isothiazolone and certain commercial biocides. 5,466,382, Cl. 210-764.000.
Downing, John P., Jr.: *See*—
DeRoos, Bradley G.; Downing, John P., Jr.; and Neal, Michael P., 5,465,768, Cl. 141-329.000.
Downs, James J.; and Roberts, William A., to Rolite, Inc. Incineration residue treatment process. 5,466,407, Cl. 264-115.000.
Dowst, William P., to Gillette Company, The. Ball point writing quality analysis. 5,467,408, Cl. 382-112.000.
Dr. Ing. h.c.F. Porsche AG: *See*—
Kircher, Günter; and Küsters, Heinz-Peter, 5,465,803, Cl. 180-69.210.
Kohlmeier, Hans-Heinrich; and Gerber, Pritz, 5,466,005, Cl. 280-781.000.
Dr. Karl Thomae GmbH: *See*—
Maier, Roland; Müller, Peter; Woitun, Eberhard; Humaus, Rudolf; Mark, Michael; Eisele, Bernhard; Budzinski, Ralph-Michael; and Hallermayer, Gerhard, 5,466,687, Cl. 514-212.000.
Dragone, Corrado, to AT&T IPM Corp. Frequency routing device having a spatially filtered optical grating for providing an increased passband width. 5,467,418, Cl. 385-37.000.
Draskovits, Günter; and Merz, Johann, to ZF Friedrichshafen AG. Rotary vane-cell pump. 5,466,135, Cl. 418-268.000.
Draxelmayr, Dieter, to Siemens Aktiengesellschaft. Capacitor array digital/analog converter with compensation array for stray capacitance. 5,467,089, Cl. 341-150.000.
Dreger, Douglas D., to Hayssen Manufacturing Company. Web creaser. 5,465,558, Cl. 53-551.000.
Drenth, Ronald R.: *See*—

Alofs, Cornell W.; and Drenth, Ronald R., 5,467,084, Cl. 340-933.000.

Dresser Industries, Inc.: *See*—
Akkerman, Neil H., 5,465,786, Cl. 166-66.400.

Drews, Steffen; Tobergte, Wolfgang; Timm, Volker; and Axer, Klaus, to U.S. Philips Corporation. Datacarriers with separate storage of read and write-inhibited memory locations. 5,467,081, Cl. 340-825.340.

Drori, Ze'ev; and Woskow, Robert M., to Clifford Electronics, Inc. Vehicle security system with secure valet switch. 5,467,070, Cl. 340-426.000.

DSM N.V.: *See*—
Scheetz, Howard A.; and deBrught, Gerhardus J. A., 5,466,761, Cl. 525-432.000.

Du Pont de Nemours, E. I., and Company: *See*—
Barsotti, Robert J.; Berge, Charles T.; and Scopazzi, Christopher, 5,466,752, Cl. 525-65.000.
Brinton, David L.; and Kodokian, George K., 5,466,423, Cl. 422-186.050.
Briselli, Robert C.; and Matthews, James F., 5,466,286, Cl. 106-404.000.
Edwards, Donald W.; Jackson, Craig A.; Shibata, Steven K.; and Yngve, Paul W., 5,465,566, Cl. 57-204.000.
Fitzpatrick-McElligott, Sandra G.; Lavin, John G.; Rivard, Germain F.; and Subramoney, Shekhar, 5,466,587, Cl. 435-172.100.
Hsu, Che-Hsiung, 5,466,485, Cl. 427-306.000.
Ma, Sheau-Hwa; and West, Michael W. J., 5,466,653, Cl. 503-200.000.
Nakamura, Charles E.; Di Cosimo, Robert; and Moran, John R., 5,466,801, Cl. 544-173.000.
Samuels, Michael R.; and Waggoner, Marion G., 5,466,773, Cl. 528-194.000.
Sariaslani, Fateme S.; Trower, Michael K.; and Omer, Charles A., 5,466,590, Cl. 435-189.000.

Du Pont (UK) Limited: *See*—
Wade, John R.; Pratt, Michael J.; and Ren, Jianrong, 5,466,789, Cl. 534-560.000.

Du Pont Merck Pharmaceutical Company, The: *See*—
Rossano, Lucius T.; and Lo, Young S., 5,466,797, Cl. 540-503.000.

Duckworth, Maxine L.: *See*—
McLane, Michael J.; and Duckworth, Maxine L., 5,466,205, Cl. 482-140.000.

Dudek, Kenneth P.; Matthews, Gregory P.; Folkerts, Charles H.; and Davis, Ronald A., to General Motors Corporation. Internal combustion engine control. 5,465,617, Cl. 73-118.200.

Dudley, Diane J. Braid aid hair clip. 5,465,742, Cl. 132-279.000.

Duerr, Wilhelm; Mikoshiba, Norihiko; and Watanabe, Yutaka, to Siemens Aktiengesellschaft. Antenna arrangement for a nuclear magnetic resonance apparatus. 5,467,017, Cl. 324-318.000.

Dumont, Daniel: *See*—
Breitman, Martin L.; Dumont, Daniel; and Gradwohl, Gerard G., 5,466,596, Cl. 435-240.200.

Dunger, David B.; Savage, Martin O.; and Sönksen, Peter H., to Pharmacia AB. Use of IGF-1. 5,466,670, Cl. 514-12.000.

Duni AB: *See*—
Björk, Bengt, 5,466,318, Cl. 156-183.000.

Dunlop Limited: *See*—
Smith, Wilfred W., 5,466,007, Cl. 280-840.000.

Dunlop Slazenger Corporation: *See*—
Cadorniga, Lauro C., 5,465,969, Cl. 273-167.00R.

Dunn, William R., to Avionic Displays Corporation. Display for electronic indicator. 5,467,085, Cl. 340-971.000.

Duraframe Window Shutter Systems, Inc.: *See*—
Fullwood, James, 5,465,537, Cl. 52-202.000.

Durand, David P.: *See*—
West, Lamar E.; Durand, David P.; Paulick, Melvin; and Primiano, Guy A., 5,467,397, Cl. 380-7.000.

Durette, Jean-Francois. Orbital implant and method. 5,466,259, Cl. 623-4.000.

Durgin, Jerry A.: *See*—
Darland, Fred S.; and Durgin, Jerry A., 5,467,290, Cl. 364-561.000.

Durham, Bernard G.: *See*—
Miller, Larry E.; Hawkins, Gene P.; and Durham, Bernard G., 5,466,870, Cl. 564-298.000.

Durham, James H.: *See*—
Howard, Paul A.; and Durham, James H., 5,467,250, Cl. 361-696.000.

Dussert, Bertrand W.; Parmer, Richard W.; and Hayden, Richard A., to Calgon Carbon Corporation. Oxidized activated carbon for the control of pH and alkalinity in water treatment applications. 5,466,378, Cl. 210-660.000.

Duvent, Jean-Louis M. Thermography system with full-screen digital enlargement with camera using series-parallel scanning. 5,467,126, Cl. 348-164.000.

Duxstad, David L.: *See*—
Nelson, Stephen E.; Duxstad, David L.; and Flunker, Galen C., 5,467,040, Cl. 327-276.000.

Dvorak, Sherry L. Hair wrap device. 5,465,741, Cl. 132-275.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Brede, Uwe; Hagel, Rainer; and Redecker, Klaus, 5,466,313, Cl. 149-1.000.

Dyson, Karen. Hay feeder for livestock. 5,465,684, Cl. 119-60.000.

E.I. Partners: *See*—
Massie, Joseph E., 5,465,928, Cl. 248-27.100.

E.R. Squibb & Sons, Inc.: *See*—
Atwal, Kamail, 5,466,817, Cl. 548-305.100.
Poss, Michael A., 5,466,704, Cl. 514-381.000.

Earl, Michael S. Exercise device of adjustable resistance for flexing of muscles of the legs and torso. 5,465,428, Cl. 2-238.000.

Earth Tool Corporation: *See*—
Wentworth, Steven W.; Haas, Jon A.; Crane, Robert F.; and Reynolds, Payce D., 5,465,797, Cl. 173-91.000.

Easley, James B.: *See*—
Dornbush, David A.; Erickson, Chad S.; Iverson, Troy M.; Sandahl, Jeffrey E.; Moore, Kevin B.; Barnes, Neal P.; Easley, James B.; Jackson, Richard C.; and Von Duyke, Andrew L., 5,466,912, Cl. 219-400.000.

Eastman Chemical Company: *See*—
Haseltine, Douglas M.; Yount, Thomas L.; and Ryans, Jimmy L., 5,466,765, Cl. 526-65.000.
Heidt, Philip C.; Foster, Charles H.; Witzeman, J. Stewart; and Crain, Allen L., 5,466,863, Cl. 560-176.000.
Lutz, Gary P.; Zima, George C.; and Bernard, Rex, 5,466,840, Cl. 554-70.000.
Matayabas, James C., Jr.; and Falling, Stephen N., 5,466,759, Cl. 525-403.000.
Tustin, Gerald C., 5,466,832, Cl. 549-330.000.

Eastman Kodak Company: *See*—
Anderson, Charles C.; Wang, Yongcai; Bello, James L.; Shalhoub, Ibrahim M.; and Corbin, Douglas D., 5,466,567, Cl. 430-530.000.
Bacon, Edward R.; Daum, Sol J.; and Spara, Paul P., 5,466,433, Cl. 424-9.451.
Blazey, Richard N.; and Tsou, Andy H., 5,466,564, Cl. 430-403.000.
Darden, Kim M.; and Flogstad, Hokon O., 5,467,130, Cl. 348-241.000.
Diehl, Donald R.; Helber, Margaret J.; and Williamson, Hugh, 5,466,813, Cl. 548-179.000.
Dotson, Billy R., 5,466,723, Cl. 522-96.000.
Fitzgerald, John J.; Ferrar, Wayne T.; Binga, Tonya D.; and Fichtner, Michael W., 5,466,533, Cl. 428-447.000.
Freeman, Dennis R.; and Soper, Richard C., 5,466,522, Cl. 428-332.000.
Haley, Neil F.; and Corbiere, Steven L., 5,466,557, Cl. 430-278.000.
Harrison, Daniel J.; Simpson, William H.; Bowman, Wayne A.; Lawrence, Kristine B.; and Weber, Helmut, 5,466,658, Cl. 503-227.000.
Jagannathan, Seshadri; Mahar, David F.; and Mehta, Rajendrakumar V., 5,466,570, Cl. 430-569.000.
Kapp, Daniel L.; Ross, Robert J.; Younathan, Janet N.; and Singer, Stephen P., 5,466,568, Cl. 430-551.000.
Lawther, Joel S., 5,467,159, Cl. 354-212.000.
Marsden, Peter D., 5,466,562, Cl. 430-373.000.
Merle, Thomas C.; Ryan, Dale W.; and Rowden, David L., 5,465,920, Cl. 242-348.100.
Miller, Gary R.; Walls, John E.; and Felker, Melanie A., 5,466,559, Cl. 430-331.000.
Pasztor, Julius, 5,465,681, Cl. 118-680.000.
Ray, Lawrence A.; Ellson, Richard N.; and Gandhi, Bhavan R., 5,466,918, Cl. 235-380.000.
Ruddy, Stephen B.; Eickhoff, W. Mark; Liversidge, Gary; and Cooper, Eugene R., 5,466,440, Cl. 424-9.411.
Sowinski, Allan F.; Szajewski, Richard P.; and Merrill, James P., 5,466,560, Cl. 430-347.000.
Wilson, James; and Altrieth, Frederick E., III, 5,467,170, Cl. 355-209.000.

Eaton Corporation: *See*—
Bierlein, John C.; Wenker, Wayne B.; and Yoho, Jerry L., 5,466,137, Cl. 418-75.000.
Brickell, Christopher G.; and Langland, Kenneth A., 5,466,945, Cl. 250-559.120.

Ebbing, Peter F., to Applied Materials, Inc. Pneumatic circuit to provide different opening and closing speeds for a pneumatic operator. 5,465,746, Cl. 137-14.000.

Ebeling, Wilhelm; Faber, Guy; Kuhnen, Gottfried; and Scholz, Arthur, to ABB Management AG. Method of testing weld seams using an eddy-current technique. 5,466,910, Cl. 219-130.010.

Eberle, Jurg; and Weber, Bruno, to Ferag AG. Gripper for a conveying device for conveying single-sheet or multiple-sheet printed products. 5,465,952, Cl. 271-204.000.

Ebinuma, Ryuichi; Mizusawa, Nobutoshi; and Chiba, Yuji, to Canon Kabushiki Kaisha. Recording apparatus and ink cartridge. 5,467,114, Cl. 347-32.000.

Ebisch, Rolf: *See*—
Berner, Hans-Ulrich; Ebisch, Rolf; Saverin, Eckehard; and Tyrakowski, Udo, 5,466,536, Cl. 428-522.000.

Echigo, Yoshiaki: *See*—
Tomioka, Isao; Nakano, Takeshi; Furukawa, Mikio; and Echigo, Yoshiaki, 5,466,732, Cl. 524-113.000.

Eckardt, Helmut; Ehritt, Jürgen; and Renger, Michael, to Battenfeld GmbH. Device for injection molding articles of plastics material which contain hollow spaces. 5,466,141, Cl. 425-130.000.

Eckert, Charles: *See*—
Lapinski, Charles; Eckert, Charles; Skokowski, Richard; Cox, James; Scott, William; Chaleff, Edward; Sharpe, Jeffrey G.; and Wurz, David A., 5,466,921, Cl. 235-462.000.

Ecomed, Inc.: *See*—
Wilson, Joseph H.; Mennel, David B.; and Rapp, Jeffrey C., 5,465,841, Cl. 206-366.000.

Edauw, Peter: *See*—

Pellegrini, Alfred, Jr.; Tormena, Andrea; Pozzobon, Alessandro; Zorzi, Claudio; and Edauw, Peter, 5,465,984, Cl. 280-11.200.

Eddowes, David W.: *See*—
Quarmby, Neil A.; and Eddowes, David W., 5,467,010, Cl. 323-284.000.

Edge, Colin: *See*—
Birkmayer, Wolfram; Wale, Michael J.; and Edge, Colin, 5,467,414, Cl. 385-3.000.

Edlund, Hans E.; and Haines, Marvin L., to Reedrill, Inc. Drill automation control system. 5,465,798, Cl. 175-24.000.

Edwards, Darvin: *See*—
Beng, Lim T.; Chong, Chai T.; Amagai, Masazumi; Anjoh, Ichiro; Arita, Junichi; Tsubosaki, Kunihiro; Ichitani, Masahiro; and Edwards, Darvin, 5,466,888, Cl. 174-52.200.

Edwards, Donald W.; Jackson, Craig A.; Shibata, Steven K.; and Yngve, Paul W., to Du Pont de Nemours, E. I., and Company. Alternate twist-plied yarn. 5,465,566, Cl. 57-204.000.

Egashira, Noritaka; and Nakamura, Yoshinori, to Dai Nippon Insatsu Kabushiki Kaisha. Heat transfer image-receiving sheets. 5,466,657, Cl. 503-227.000.

Egbert, Stephen J.: *See*—
Davies, John T.; Egbert, Stephen J.; and Wagar, John R., 5,467,424, Cl. 392-401.000.

Egloff, Anton, to Sulzer Rueti AG. Thread holder for a gripper loom. 5,465,763, Cl. 139-196.200.

Eguchi, Koji, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing a metal interconnect with high resistance to electromigration. 5,466,638, Cl. 437-193.000.

Ehritt, Jürgen: *See*—
Eckardt, Helmut; Ehritt, Jürgen; and Renger, Michael, 5,466,141, Cl. 425-130.000.

Ehrsam, Robert F.; and Reath, Robert Z., to Reath, Robert Z. Method for preparing aluminum for subsequent electroplating. 5,466,360, Cl. 205-170.000.

Eicher, Bernard: *See*—
Kirn, Manfred; Borst, Erich; Schaal, Guenter; Staebler, Manfred-Wilhelm; and Eicher, Bernard, 5,466,183, Cl. 451-359.000.

Eickhoff, W. Mark: *See*—
Ruddy, Stephen B.; Eickhoff, W. Mark; Liversidge, Gary; and Cooper, Eugene R., 5,466,440, Cl. 424-9.411.

Eida, Tsuyoshi; Nishiwaki, Osamu; Yamamoto, Takao; and Mafune, Kumiko, to Canon Kabushiki Kaisha. Azo dye compound, ink containing the same, and recording method and instrument using the ink. 5,466,282, Cl. 106-22.00R.

Eidemanis, Gunars: *See*—
Hosking, Jack K.; and Eidemanis, Gunars, 5,465,667, Cl. 104-17.200.

Eisele, Bernhard: *See*—
Maier, Roland; Müller, Peter; Woitun, Eberhard; Hurnaus, Rudolf; Mark, Michael; Eisele, Bernhard; Budzinski, Ralph-Michael; and Hallermayer, Gerhard, 5,466,687, Cl. 514-212.000.

Ekman, Christer V. Piece of hull for boats and vessels. 5,465,678, Cl. 114-284.000.

ELA Medical: *See*—
Franchi, Pierre, 5,466,255, Cl. 607-128.000.

ElasTek, Inc.: *See*—
DeGregoria, Anthony J., 5,465,781, Cl. 165-8.000.

Elco Industries, Inc.: *See*—
Denley, Ronald S., 5,467,255, Cl. 362-66.000.

Elder, Jack E., to Mister Dripper Company, LLC. Irrigation system with multi-functional irrigation control valves. 5,465,905, Cl. 239-75.000.

Electric Power Research Institute: *See*—
McDonald, William J.; Pittard, Gerard T.; Steele, Charles G.; Kiefer, Karl F.; Clifton, Terry P.; and Leitko, Curtis E., 5,467,083, Cl. 340-854.600.

Electronic Data Systems Corporation: *See*—
Summer, Randi M.; Garbanati, Dennis; Winter, Patricia L.; and Gates, Ronald D., 5,467,293, Cl. 364-578.000.

Electronic Retailing Systems International, Inc.: *See*—
Ackerman, Marvin; Berluti, Vincent; Poland, Terrell; and Waldron, Steven, 5,467,474, Cl. 395-800.000.

Elf Atochem North America, Inc.: *See*—
Stein, Daryl L., 5,466,855, Cl. 558-263.000.

Eli Lilly and Company: *See*—
Bright, Stuart W.; Gold, Gerald; Sage, Scott W.; and Sportsman, John R., 5,466,610, Cl. 436-518.000.
Godfrey, Alexander G., 5,466,810, Cl. 546-202.000.
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,466,709, Cl. 514-432.000.

Elias, Jorge V. System for the protection and safety of cars, passengers and pedestrians. 5,467,073, Cl. 340-464.000.

Elissalde, Marcel H., Jr.: *See*—
Stanker, Larry H.; Elissalde, Marcel H., Jr.; Beier, Ross C.; Rowe, Loyd D., Jr.; and DeLoach, John R., 5,466,784, Cl. 530-388.900.

Ellingboe, John W., to American Home Products Corporation. Substituted pyridopyrimidines and antihypertensives. 5,466,692, Cl. 514-258.000.

Ellis, Steve: *See*—
Thomas, Donald; Ellis, Steve; Kriz, Paul; and Scott, Gordon, 5,465,828, Cl. 198-495.000.

Ellson, Richard N.: *See*—
Ray, Lawrence A.; Ellson, Richard N.; and Gandhi, Bhavan R., 5,466,918, Cl. 235-380.000.

Elson, Edward E.; and Kuntz, David H., to Davstar, Inc. Fluid collection system. 5,466,229, Cl. 604-317.000.

Elvekjaer, Peter; and Gribi, Urs, to ABB Management AG. Method for matching the flow capacity of a radial turbine of a turbocharger to a capacity of an internal combustion engine. 5,465,482, Cl. 29-889.100.

Emberger, Roland: *See*—
Bertram, Heinz-Jürgen; Emberger, Roland; Güntert, Matthias; and Werkhoff, Peter, 5,466,827, Cl. 549-66.000.

Emirze, Ararad: *See*—
Eschwey, Helmut; Giesen-Wiese, Monika; Grill, Maria; Emirze, Ararad; Seidler, Hans-Peter; Klein, Bernhard; and Kauschke, Michael, 5,466,517, Cl. 428-288.000.

Emory University: *See*—
Hunter, Robert L., 5,466,445, Cl. 424-78.310.

Endo, Kazuo: *See*—
Sato, Yoshinori; Komiyama, Megumi; Endo, Kazuo; and Tate, Masashi, 5,466,521, Cl. 428-330.000.

Endo, Takahiro; and Saeki, Takashi, to Kabushiki Kaisha Toshiba. Personal communication system answerable by proxy. 5,467,389, Cl. 379-201.000.

Endo, Takeshi: *See*—
Kawabata, Hironori; Moriguchi, Koei; and Endo, Takeshi, 5,466,678, Cl. 514-46.000.

Engeler, William E.; and Brown, Dale M., to General Electric Company. Emissions control for internal combustion engine. 5,467,185, Cl. 356-44.000.

Engelhard Corporation: *See*—
White, James F., 5,466,866, Cl. 562-485.000.

Engelhardt, Jürgen: *See*—
Kalbe, Jochen; Müller, Hanns P.; Koch, Rainhard; Engelhardt, Jürgen; Koch, Wolfgang; Szablikowski, Klaus; and Weber, Gunter, 5,466,794, Cl. 536-66.000.

Engen Meccanica Di Minen Ettore: *See*—
Minen, Ettore, 5,465,659, Cl. 100-30.000.

England, Garry L.; and Higgins, Joel C. Biocompatible components fabricated from a substantially consolidated stock of material. 5,466,530, Cl. 428-411.100.

Engström, Björn: *See*—
Arvidsson, Lars-Erik; Berg, Hans; Engström, Björn; and Hagström, Gunnar, 5,466,368, Cl. 210-198.200.

Enhsen, Alfons; Glombik, Heiner; Kramer, Werner; and Weas, Günther, to Hoechst Aktiengesellschaft. Tetrazole derivatives of bile acids, and their use as lipid level lowering medicaments. 5,466,815, Cl. 548-252.000.

Eniricerche S.p.A.: *See*—
Savastano, Cesar; and Cimino, Roberto, 5,466,365, Cl. 208-309.000.

Enlight Corporation: *See*—
Liu, Morgan C., 5,466,059, Cl. 312-223.200.

Enomoto, Masayuki: *See*—
Hiratsuka, Mitsunori; Takano, Minoru; Enomoto, Masayuki; Kizawa, Satoru; and Saitoh, Kazuo, 5,466,663, Cl. 504-286.000.

Enomoto, Tadashi: *See*—
Sasano, Nobusuke; and Enomoto, Tadashi, 5,466,926, Cl. 250-216.000.

ENRJ Ltd.: *See*—
Hudson, Dannie B., 5,466,064, Cl. 366-132.000.

Environmental Products Corporation: *See*—
DeWoolfson, Bruce H.; Powell, Ken R.; and Schumacher, Warner, 5,465,822, Cl. 194-209.000.

Environmental Restoration Services, Inc.: *See*—
Coate, Robert B.; and Towles, John T., 5,466,367, Cl. 210-96.100.

Envirotest Systems Corp.: *See*—
Fournier, Thomas J., 5,465,614, Cl. 73-118.100.

Eo, Kil-Su: *See*—
Alexander, Thomas; Kim, Yongmin; Park, Hyunwook; Eo, Kil-Su; and Jong, Jing-Ming, 5,467,459, Cl. 395-480.000.

Equipto: *See*—
Mittag, Douglas, 5,465,534, Cl. 52-126.600.

Erdmann, Gerd, to Fried. Krupp AG Hoesch-Krupp. Telescoping crane arm. 5,465,855, Cl. 212-349.000.

Erickson, Chad; Dornbush, David; and Finn, John, to American Harvest, Inc. Rapid cooking device. 5,465,651, Cl. 99-330.000.

Erickson, Chad S.: *See*—
Dornbush, David A.; Erickson, Chad S.; Iverson, Troy M.; Sandahl, Jeffrey E.; Moore, Kevin B.; Barnes, Neal P.; Easley, James B.; Jackson, Richard C.; and Von Duyke, Andrew L., 5,466,912, Cl. 219-400.000.

Erickson, Jack A.; Kramer, Robert L.; and Hallis, John M., to Federal-Hoffman, Inc. Non-toxic primer for center-fire cartridges. 5,466,315, Cl. 149-96.000.

Erickson, Lee J.: *See*—
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., 5,465,586, Cl. 62-84.000.
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., 5,465,587, Cl. 62-84.000.

Erickson, Robert A., to Kennametal Inc. System for coupling machine tools. 5,466,102, Cl. 409-232.000.

Ericsson Inc.: *See*—
Rasmusson, Jim A. J., 5,467,393, Cl. 379-388.000.

Erkkilä, Kari: *See*—
Pellinen, Kari; Koiranen, Jukka; Erkkilä, Kari; Ahola, Juhani; and Vihä, Harritalo, 5,467,194, Cl. 356-429.000.

Ernst Winter & Sohn GmbH & Co.: *See*—
Sawluk, Wlodzimier, 5,465,706, Cl. 125-15.000.

Ersoz, Nathaniel H.: *See*—
Saeger, Timothy W.; and Ersoz, Nathaniel H., 5,467,144, Cl. 348-366.000.
Esau, Merlin L.: *See*—
Koehn, Leroy F.; and Esau, Merlin L., 5,465,564, Cl. 56-320.200.
Escalon Ophthalmics, Inc.: *See*—
Weiner, Alan L.; Sinnett, Kevin; and Johnson, Sterling, 5,466,233, Cl. 604-890.100.
Eschmann, Sylvester; Hüser, Martin; and Halterbeck, Walter, to Thomas Josef Heimbach GmbH & Co. Papermaking dryer fabric with groups of abutting machine direction threads. 5,465,764, Cl. 139-383.00A.
Eschwey, Helmut; Giesen-Wiese, Monika; Grill, Maria; Emirze, Ararad; Seidler, Hans-Peter; Klein, Bernhard; and Kauschke, Michael, to Freudenberg, Carl. Spundbonded fabrics comprising biodegradable polycaprolactone filaments and process for its manufacture. 5,466,517, Cl. 428-288.000.
Essex Specialty Products, Inc.: *See*—
Hsieh, Harry W., 5,466,727, Cl. 523-421.000.
Ethicon Endo-Surgery, Inc.: *See*—
Knodel, Bryan D.; Nuchols, Richard P.; and Williamson, Warren P., IV, 5,465,895, Cl. 227-176.000.
Ethicon, Inc.: *See*—
Clark, George A.; Burwell, Malcolm C.; Gola, John A.; Robinson, Christopher; and Snyder, Fred E., 5,465,894, Cl. 227-175.000.
Etoh, Jun: *See*—
Miyazawa, Kazuyuki; Shimohigashi, Katsuhiro; Etoh, Jun; and Kimura, Katsutaka, 5,467,314, Cl. 365-201.000.
EURO CP s.a.r.l.: *See*—
Gilbert, Jérôme, 5,467,263, Cl. 364-140.000.
Evans, Colleen A.: *See*—
Belleau, Bernard, deceased; Mansour, Tarek; Tse, Allan; Evans, Colleen A.; Jin, Haohun; Zacharie, Boulos; and Nguyen-Ba, Nghe, 5,466,806, Cl. 544-310.000.
Evans, James O. Apparatus and method of magnetic well stimulation. 5,465,789, Cl. 166-248.000.
Evans, John C.: *See*—
Nair, Parameswaran B.; Choudhuri, Kumar S.; Stills, James T.; and Evans, John C., 5,466,920, Cl. 235-449.000.
Evans, John M., to California State University, Fresno Foundation. Fluid control apparatus. 5,466,228, Cl. 604-248.000.
Evans, John T.: *See*—
Rice, Chris A.; Gazzola, Alain J.; Smith, Desroy D.; Evans, John T.; and Dawson, Andrew W., 5,465,443, Cl. 15-246.000.
Evans, Roger F.; Thierheimer, Charles L., Jr.; and Pawlowski, Norman E., to Hewlett-Packard Company. Addition of alcohol to prewet solutions to enhance and accelerate wetting to hydrophobic foams for application to ink-jet pens. 5,467,117, Cl. 347-87.000.
Evans, Thomas L.; Brunelle, Daniel J.; Bradt, Jean E.; Pearce, Eric J.; and Wilson, Paul R., to General Electric Company. Polymerization of macrocyclic poly(alkylene dicarboxylate) oligomers. 5,466,744, Cl. 524-714.000.
Eveready Battery Company, Inc.: *See*—
Pensabene, Saverio F.; and Puglisi, Vincent J., 5,466,546, Cl. 429-223.000.
Everett, James W.: *See*—
Fink, David J.; Everett, James W.; Costlow, Annette M.; Roberts, James J.; and Boone, Paul J., 5,465,483, Cl. 29-890.031.
Everson, Stephen R.: *See*—
Partridge, Mary E.; Blenke, Timothy J.; Everson, Stephen R.; Schroth, Carl G.; and Venturino, Michael B., 5,466,409, Cl. 264-165.000.
Excorim AB: *See*—
Andersson-Schager, Per; Johansson, Ingemar; Larsson, Willy; and Lindmark, Erik, 5,466,607, Cl. 436-50.000.
Exxon Chemical Patents Inc.: *See*—
Arjunan, Palanisamy, 5,466,780, Cl. 528-494.000.
Jejelowo, Moses O., 5,466,649, Cl. 502-120.000.
Jenkins, Terry L.; McAbee, Michael L.; and Richardson, Joe W., Jr., 5,466,601, Cl. 435-263.000.
Exxon Research & Engineering Co.: *See*—
Boyle, Joseph P.; Camano, Gordon C.; Lachine, Randall S.; Lingley, Howard R.; and Saunders, Raymond W., 5,466,376, Cl. 210-634.000.
Kaul, Bal K.; Sabottke, Craig Y.; Fiato, Rocco A.; and Niessen, Edward, 5,466,364, Cl. 208-307.000.
Ezawa, Akira; Daitoku, Koichi; Inoue, Hideya; Kazami, Kazuyuki; and Ohtsuka, Kazuto, to Nikon Corporation. Camera having different supply modes selectable for a film. 5,467,156, Cl. 354-21.000.
Faber, Guy: *See*—
Ebeling, Wilhelm; Faber, Guy; Kuhnen, Gottfried; and Scholz, Arthur, 5,466,910, Cl. 219-130.010.
Faber, Timothy R.; and Wong, Tak M., to Square D Company. Current limiting circuit breaker. 5,466,903, Cl. 200-400.000.
Faber, Vance: *See*—
White, James M.; Faber, Vance; and Saltzman, Jeffrey S., 5,467,110, Cl. 345-199.000.
Faccia, Tiziano. Transmission for combined shredding and mixing trucks for fibrous zootechnical products. 5,465,914, Cl. 241-101.710.
Factor, Arnold; and Lewis, Larry N., to General Electric Company. Radiation curable silicon containing polyarcylate hardcoat compositions, method for making, and use. 5,466,491, Cl. 427-515.000.
Fahey, Darryl R.: *See*—
Patsidis, Konstantinos; Peifer, Bernd; Palackal, Syriac J.; Alt, Helmut G.; Welch, M. Bruce; Geerts, Rolf L.; Fahey, Darryl R.; and Deck, Harold R., 5,466,766, Cl. 526-129.000.
Paibish, Sorin; Yahav, Giora; and Djerassi, Shlomo, to State of Israel, Ministry of Defence, Rafael Armament Development Authority. Large area movement robot. 5,467,273, Cl. 364-424.020.
Fainsztein, Henry. High rise evacuation chair. 5,466,040, Cl. 297-183.600.
Fairmount Chemical Company, Inc.: *See*—
Leistner, William E.; and Moshchitsky, Semyon, 5,466,819, Cl. 548-259.000.
Falcaro, Steven M. Barnacle shield. 5,465,676, Cl. 114-222.000.
Falcinelli, Michael T.: *See*—
Adamian, Vahe A.; Falcinelli, Michael T.; and Phillips, Peter V., 5,467,021, Cl. 324-601.000.
Falcoz, Pierre: *See*—
Boivin, Jean-Claude; Chollet, Jean-Emile; Falcoz, Pierre; and Mathieu, Luc, 5,466,119, Cl. 415-90.000.
Falessi, Georges: *See*—
D'Arrigo, Iano; Falessi, Georges; and Smayling, Michael C., 5,467,307, Cl. 365-185.060.
Falling, Stephen N.: *See*—
Matayabas, James C., Jr.; and Falling, Stephen N., 5,466,759, Cl. 525-403.000.
Fan, Sheng-Chi. Method of making chemical fiber knitted towelling. 5,465,467, Cl. 28-167.000.
Fan, Siqi; Root, David E.; and Meyer, Jeffrey W., to Hewlett-Packard Company. Measurement-based system for modeling and simulation of active semiconductor devices over an extended operating frequency range. 5,467,291, Cl. 364-578 000.
Fan, Zhigang, to Xerox Corporation. Iterative error diffusion system. 5,467,201, Cl. 358-447.000.
Fantone, Stephen D.: *See*—
Gale, Ronald P.; McCullough, Richard; Salerno, Jack P.; Fantone, Stephen D.; Forsyth, Robert P.; Carellas, Peter T.; Thomas, Michael J.; and Youman, Roy L., 5,467,154, Cl. 353-119.000.
Fanuc Ltd.: *See*—
Iwashita, Yasusuke, 5,467,001, Cl. 318-434.000.
Kosaka, Tetsuya; and Kobayashi, Eiichi, 5,467,003, Cl. 318-568.130.
Seki, Masaki; and Hanaoka, Osamu, 5,467,445, Cl. 395-142.000.
Fanuc Ltd: *See*—
Nihei, Ryo; Terada, Akihiro; and Sasaki, Yasuo, 5,466,909, Cl. 219-121.720.
Faranda, Carmen. Ophthalmic treatment aid having a pressure applicator. 5,467,147, Cl. 351-41.000.
Fargeot, Michel, to Data Fit International. Apparatus for automatically digitizing photographic slides. 5,467,153, Cl. 353-103.000.
Farley, Gary L., to United States of America, National Aeronautics and Space Administration. Adjustable reed for weaving net-shaped tailored fabrics. 5,465,762, Cl. 139-192.000.
Farmer, Richard W.: *See*—
Dussert, Bertrand W.; Farmer, Richard W.; and Hayden, Richard A., 5,466,378, Cl. 210-660.000.
Farwick, Timothy J.: *See*—
de Buzzaccarini, Francesco; Farwick, Timothy J.; and Zhen, Yueqian, 5,466,394, Cl. 252-547.000.
Fasciano, Peter J.; Rawley, Curt A.; Hegg, Thomas R.; Leathurby, Mackenzie; Bedell, Jeffrey L.; and Ravan, James A., Jr., to Avid Technology, Inc. Digital audio workstations providing digital storage and display of video information. 5,467,288, Cl. 364-514.00R.
Fast, John: *See*—
Fristad, William E.; Narum, Jeffrey L.; Mattison, Phillip L.; Virnig, Michael J.; and Fast, John, 5,466,426, Cl. 423-98.000.
Faulkner, Nathan H.; and Nordenbrock, Ronald D., to Siemens Energy & Automation, Inc. Electrical power busway and insulator assembly. 5,466,889, Cl. 174-68.200.
Fay, Frank J.: *See*—
Fay, Susan K.; Fay, Frank J.; and Weston, C. Don, 5,466,155, Cl. 434-115.000.
Fay, Susan K.; Fay, Frank J.; and Weston, C. Don. Laptop braille slate. 5,466,155, Cl. 434-115.000.
Fazel, Khaled; and Ruf, Michael, to Deutsche Forschungsansalt fur Luft-und Raumfahrt e.V. Method for digital transmission of hierarchical HDTV, EDTV and SDTV television signals. 5,467,132, Cl. 348-390.000.
FEDCO Automotive Components Company, Inc.: *See*—
O'Connor, Timothy J., 5,465,783, Cl. 165-134.100.
Federal-Hoffman, Inc.: *See*—
Erickson, Jack A.; Kramer, Robert L.; and Hallis, John M., 5,466,315, Cl. 149-96.000.
Schinzel, Craig E.; and Lau, Robert G., 5,465,528, Cl. 49-368.000.
Fedij, Victor; Suto, Mark J.; Wemple, James N.; and Zeller, James R., to Warner-Lambert Company. Chiral 3-cyano-1-substituted-pyrrolidines. 5,466,828, Cl. 548-566.000.
Feeley, Brian P.: *See*—
Liberti, Paul A.; Wang, Yuzhou; Tang, Weixin; Feeley, Brian P.; and Gohel, Dhanesh I., 5,466,574, Cl. 435-5.000.
Feemster, William R.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.

Feldman, Joseph: *See*—
Bennett, Linda K.; and Feldman, Joseph, 5,466,181, Cl. 446-297.000.
Feldschmid, Alois: *See*—
Klages, Ulrich; Feldschmid, Alois; Kreis, Gundolf; and Timm, Heinrich, 5,466,035, Cl. 296-205.000.
Felix Schoeller jr Papierfabriken GmbH & Co. KG: *See*—
Berner, Hans-Ulrich; Ebisch, Rolf; Saverin, Eckehard; and Tyrakowski, Udo, 5,466,536, Cl. 428-522.000.
Felker, Melanie A.: *See*—
Miller, Gary R.; Walls, John E.; and Felker, Melanie A., 5,466,559, Cl. 430-331.000.
Feller, Richard L. Combined dump truck and spreader apparatus. 5,466,112, Cl. 414-528.000.
Fellhauer, Jeffery R.; and Savidge, Michael W., to National Super Service Company. Floor cleaning apparatus. 5,465,456, Cl. 15-320.000.
Felstead, Richard A.: *See*—
Hume, Roger A.; and Felstead, Richard A., 5,467,259, Cl. 362-307.000.
Feltman, Wendell R.: *See*—
Swanson, Malcolm L.; Feltman, Wendell R.; and Schreter, Robert E., 5,466,418, Cl. 422-111.000.
Felts, Jeffrey L.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.
Fenyes, Joseph G.: *See*—
Rayadu, S. Rao; Fenyes, Joseph G.; and McNeel, Thomas E., 5,466,717, Cl. 514-689.000.
Ferag AG: *See*—
Eberle, Jurg; and Weber, Bruno, 5,465,952, Cl. 271-204.000.
Ferrar, Wayne T.: *See*—
Fitzgerald, John J.; Ferrar, Wayne T.; Binga, Tonya D.; and Fichtner, Michael W., 5,466,533, Cl. 428-447.000.
Ferrenberg, Allan J. Regenerated engine with improved heating and cooling strokes. 5,465,702, Cl. 123-543.000.
Ferri, Vincent, to Westinghouse Air Brake Company. Arrangement for emulating an H-type relay air valve which is utilized in a railway braking system. 5,467,246, Cl. 361-170.000.
Ferry, James G.: *See*—
Jablonski, Peter E.; and Ferry, James G., 5,466,600, Cl. 435-262.500.
Fetterman, Harold R.: *See*—
Meng, Charles C.; and Fetterman, Harold R., 5,466,965, Cl. 257-604.000.
Fey, Warren O. Fuel and explosive composition with ferric or cupric ion and reducing sugars. 5,465,664, Cl. 102-290.000.
Fiato, Rocco A.: *See*—
Kaul, Bal K.; Sabottke, Craig Y.; Fiato, Rocco A.; and Niessen, Edward, 5,466,364, Cl. 208-307.000.
Fichtner, Michael W.: *See*—
Fitzgerald, John J.; Ferrar, Wayne T.; Binga, Tonya D.; and Fichtner, Michael W., 5,466,533, Cl. 428-447.000.
Fidia, S.p.A.: *See*—
della Valle, Francesco; and Romeo, Aurelio, 5,466,461, Cl. 424-423.000.
Fiege, Helmut: *See*—
Pies, Michael; Fiege, Helmut; Puppe, Lothar; and Käsbauer, Josef, 5,466,881, Cl. 570-202.000.
Field, David P.: *See*—
Adams, Brent L.; Dingley, David J.; and Field, David P., 5,466,934, Cl. 250-307.000.
Field, Leslie A.; and Ruby, Richard C., to Hewlett-Packard Company. Thermally actuated micromachined microwave switch. 5,467,067, Cl. 335-4.000.
Field, Leslie A.; and Ruby, Richard C., to Hewlett-Packard Company. Micromachined bi-material signal switch. 5,467,068, Cl. 335-4.000.
Fields, Antony J.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.
Fields, Larry R.; Will, Jerald D.; and Rense, Mark S., to Philips Electronics North America Corporation. Integral reflector lamp. 5,466,981, Cl. 313-113.000.
Figaro Engineering Inc.: *See*—
Niwa, Miki; Kodakari, Nobuaki; Funabiki, Hisato; and Katada, Naonobu, 5,466,483, Cl. 427-226.000.
Fink, David J.; Everett, James W.; Costlow, Annette M.; Roberts, James J.; and Boone, Paul J., to Westinghouse Electric Corporation. Method for removing a metallic plug from a tube. 5,465,483, Cl. 29-890.031.
Finkel, Gilbert; and Moore, Katherine L., to Procter & Gamble Company, The. Pastry crust and pastry crust dough. 5,466,476, Cl. 426-556.000.
Finkelstein, Louis D.: *See*—
Pierce, Jennifer A.; Finkelstein, Louis D.; Brown, Daniel P.; and Krebs, Jay R., 5,467,398, Cl. 380-44.000.
Finmeccanica S.p.A.: *See*—
Levato, Mauro; and Sofia, Giuseppe, 5,465,825, Cl. 198-444.000.
Finn, John: *See*—
Erickson, Chad; Dornbush, David; and Finn, John, 5,465,651, Cl. 99-330.000.
Fiori, Denise E.; and Quinn, Richard J., to Cytec Technology Corporation. Emulsifiable compositions, curable emulsions thereof and uses of such curable emulsions. 5,466,745, Cl. 524-801.000.
Firma C. Rob. Hammerstein GmbH: *See*—
Bauer, Heinz; Becker, Burckhard; and Frohnhaus, Ernst-Reiner, 5,466,047, Cl. 297-367.000.
Fischer, Rolf: *See*—
Schnurr, Werner; Fischer, Rolf; Goetz, Norbert; and Kuekenhoehner, Thomas, 5,466,831, Cl. 549-323.000.
Fischer, Stephen: *See*—
Young, Bruce; Carson, Dave; Rasmussen, Norman; Fischer, Stephen; and Rabe, Jeffrey, 5,467,295, Cl. 395-200.050.
Fish, Elson B., to Polygon Company. Fluid cylinder end cap assembly. 5,465,647, Cl. 92-128.000.
Fishbine, Glenn M.; Withoff, Robert J.; and Klein, Theodore D., to Digital Biometrics, Inc. Portable fingerprint scanning apparatus for identification verification. 5,467,403, Cl. 382-116.000.
Fisher, Frances E.; and Fisher, Joseph S. Nail polish drying method. 5,466,441, Cl. 424-61.000.
Fisher, Gary B.: *See*—
Singaram, Bakthan; Fisher, Gary B.; Fuller, Joseph C.; Harrison, John; and Goralski, Christian T., 5,466,798, Cl. 540-541.000.
Fisher, Joseph S.: *See*—
Fisher, Frances E.; and Fisher, Joseph S., 5,466,441, Cl. 424-61.000.
Fitzgerald, John J.; Ferrar, Wayne T.; Binga, Tonya D.; and Fichtner, Michael W., to Eastman Kodak Company. Zinc oxide filled diphenylsiloxane-dimethylsiloxane fuser member for fixing toner to a substrate. 5,466,533, Cl. 428-447.000.
Fitzpatrick-McElligott, Sandra G.; Lavin, John G.; Rivard, Germain F.; and Subramoney, Shekhar, to Du Pont de Nemours, E. I., and Company. Method for introducing a biological substance into a target. 5,466,587, Cl. 435-172.100.
Five Star Enterprises Limited: *See*—
Bond, Robert F., 5,465,492, Cl. 33-275.00R.
Flaten, Lawrence M., to J. B. Laughrey, Inc. Method and means for telephonically crediting customers with rebates and refunds. 5,467,269, Cl. 364-401.000.
Fleig, Gordon E.; and Gueffroy, Donald E., to Bio-Rad Laboratories, Inc. Protective overlayer for phosphor imaging screen. 5,466,947, Cl. 250-582.000.
Fleming, John P. Exercise aids. 5,466,206, Cl. 482-141.000.
Flieger, Richard: *See*—
Liebich, Ernst; Van Houdenhove, Rony; Smoravek, Miroslav; and Flieger, Richard, 5,466,168, Cl. 439-188.000.
Flinn, Donald R.; Laszcz, John F.; and Withers, David H., to International Business Machines Corporation. Method and system for optimizing material movement within a computer based manufacturing system. 5,467,285, Cl. 364-478.000.
Flogstad, Hokon O.: *See*—
Darden, Kim M.; and Flogstad, Hokon O., 5,467,130, Cl. 348-241.000.
Florence, James M.: *See*—
Huang, Austin L.; and Florence, James M., 5,467,146, Cl. 348-743.000.
Florida State University: *See*—
Holton, Robert A., 5,466,834, Cl. 549-510.000.
Schlenoff, Joseph B., 5,466,930, Cl. 250-252.100.
Flosbach, Carmen; Philipp, Dieter; and Schubert, Walter, to Herberts Gesellschaft mit beschrankter Haftung. Process for the preparation of blocked isocyanates. 5,466,860, Cl. 560-43.000.
Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; and Grubbs, Gray W., to General Electric Company. Low electric D.C., low time rate polarity reversing arc welding method. 5,466,905, Cl. 219-121.460.
Fluke Corporation: *See*—
Chamberlain, Craig P.; Lamb, Dennis; Lauby, William J.; and Voorheis, Howard T., 5,466,545, Cl. 429-99.000.
Flunker, Galen C.: *See*—
Nelson, Stephen E.; Duxstad, David L.; and Flunker, Galen C., 5,467,040, Cl. 327-276.000.
Focke & Co. (GmbH & Co.): *See*—
Focke, Heinz, 5,465,836, Cl. 206-264.000.
Focke, Heinz, 5,465,837, Cl. 206-268.000.
Focke, Heinz, to Focke & Co. (GmbH & Co.). Pack for cigarettes. 5,465,836, Cl. 206-264.000.
Focke, Heinz, to Focke & Co. (GmbH & Co.). Packs for cigarettes. 5,465,837, Cl. 206-268.000.
Folkerts, Charles H.: *See*—
Dudek, Kenneth P.; Matthews, Gregory P.; Folkerts, Charles H.; and Davis, Ronald A., 5,465,617, Cl. 73-118.200.
Food and Agrosystems, Inc.: *See*—
Lampi, Rauno A.; Bindon, John N.; Bowles, Anthony J. G.; and Parks, Thomas R., 5,465,654, Cl. 99-422.000.
Foodcraft Equipment Company: *See*—
Martin, Eugene; and Cook, Scott, 5,466,185, Cl. 452-165.000.
Forage, Alan J.; and Purdham, Robert, to Guiness Brewing Worldwide Limited. Beverage package with baffle plate to reduce froth production. 5,466,473, Cl. 426-115.000.
Ford, Larry C., to Lafor Laboratories Limited. Viracidal, bactericidal and spermicidal vaginal suppository. 5,466,463, Cl. 424-433.000.
Ford Motor Company: *See*—
Bajraszewski, Alexander; Dodds, David H.; Muessig, Charles E.; and Nagpal, Vijay, 5,465,597, Cl. 72-19.000.

Goff, Kenneth H., Jr.; and Schultz, William E., 5,465,600, Cl. 72-309.000.
Hamburg, Douglas R.; Logothetis, Eleftherios M.; and Meyer, Daniel L., 5,465,697, Cl. 123-424.000.
Ma, Thomas T., 5,465,574, Cl. 60-300.000.
McCune, Robert C., Jr.; Kim, Michael R.; and Smith, Ronald W., 5,466,906, Cl. 219-121.470.
Nicopolis, Michael D., 5,466,028, Cl. 296-37.700.
Sims, Ronald I., 5,467,006, Cl. 320-22.000.
Spagnoli, Robert A.; and Janson, Philip D., 5,466,911, Cl. 219-203.000.
Theytlin, Alexander S.; and Brasile, Francis J., 5,465,624, Cl. 73-653.000.
Whitecar, John E., 5,467,399, Cl. 381-4.000.

Foret, Timothy J.: *See*—
Gilbert, Edwin E.; and Foret, Timothy J., 5,466,898, Cl. 181-131.000.

Forkner, John F.; Rykowski, Ronald F.; and Wilson, Stephen S., to Prolux Corporation. LCD projection system which aligns the larger beam spread angle of the light source with the larger acceptance angle of the light valve and a nonimaging reflector for an illumination system. 5,467,207, Cl. 359-40.000.

Forlini, Matthew: *See*—
Check, Joseph A., III; Saxe, Robert L.; Thompson, Robert I.; Forlini, Matthew; and Slovak, Steven M., 5,467,217, Cl. 359-296.000.

Forloni, Roberto; and Paleari, Mario, to W. R. Grace & Co.-Conn. Pasteurizable, cook-in multilayer shrink film. 5,466,498, Cl. 428-36.700.

Formosa Plastics Corporation: *See*—
Lee, Chester C.; Chang, Tao C.; and Huang, Yung-Hui, 5,466,763, Cl. 525-523.000.

Forslund, Kjell: *See*—
Fredriksson, Börje; and Forslund, Kjell, 5,466,334, Cl. 162-56.000.

Forsyth, Robert P.: *See*—
Gale, Ronald P.; McCullough, Richard; Salerno, Jack P.; Fantone, Stephen D.; Forsyth, Robert P.; Carellas, Peter T.; Thomas, Michael J.; and Youman, Roy L., 5,467,154, Cl. 353-119.000.

Fort, J. Robert; Neidell, Norman S.; Morgan, Douglas J.; and Landmeier, Phillip C. Synthetic aperture ultrasound imaging system. 5,465,722, Cl. 128-661.010.

Forward Enterprises: *See*—
Kirby, Norman R.; and Schmidt, Richard S., 5,466,094, Cl. 405-232.000.

Foster, Charles H.: *See*—
Heidt, Philip C.; Foster, Charles H.; Witzeman, J. Stewart; and Crain, Allen L., 5,466,863, Cl. 560-176.000.

Foster-Miller, Inc.: *See*—
Freitas, Glen; Boyce, Joseph S.; and Magee, Constance, 5,466,506, Cl. 428-105.000.

Fournier, Thomas J., to Envirotest Systems Corp. Apparatus and method for non-intrusive testing of a motor vehicle canister purge system. 5,465,614, Cl. 73-118.100.

Fowler, Craig: *See*—
Weilant, David R.; and Fowler, Craig, 5,465,819, Cl. 192-35.000.

Fowler, John O.: *See*—
Adderley, Colin I.; Fowler, John O.; and Wignall, Michael F., 5,465,785, Cl. 165-166.000.
Banks, Simon A.; Adderley, Colin I.; Fowler, John O.; and Boardman, James E., 5,465,484, Cl. 29-890.042.

Fowler, Thomas J.; and Rus, Liviu, to Lear Seating Corporation. Backrest release mechanism. 5,466,048, Cl. 297-378.120.

Fox, Anthony W.: *See*—
Batenhorst, Randal L.; and Fox, Anthony W., 5,466,700, Cl. 514-329.000.

Franchi, Pierre, to ELA Medical. Probe for cardiac pacemaker. 5,466,255, Cl. 607-128.000.

Frank, Aaron L.; Ibidunni, Ajibola O.; Johnson, Douglas B.; Krause, Dennis L.; and Nguyen, Trac, to AT&T Corp. Metallization for polymer-dielectric multichip modules including a Ti/Pd alloy layer. 5,466,972, Cl. 257-764.000.

Frank, William C.: *See*—
Whitcomb, David R.; and Frank, William C., 5,466,804, Cl. 544-225.000.

Frazier, Valerie S.: *See*—
Downey, Angela B.; Frazier, Valerie S.; and Willingham, Gary L., 5,466,382, Cl. 210-764.000.

Fred Hutchinson Cancer Research Center: *See*—
Schulz, Vincent P.; and Zakian, Virginia A., 5,466,576, Cl. 435-6.000.

Fredriksson, Börje; and Forslund, Kjell, to Sunds Defibrator Industries Aktiebolag. Method and apparatus for mixing a treatment agent with a pulp suspension. 5,466,334, Cl. 162-56.000.

Freeman, Dennis R.; and Soper, Richard C., to Eastman Kodak Company. Cobalt platinum magnetic film and method of fabrication thereof. 5,466,522, Cl. 428-332.000.

Freeman, Willie B.; Johnson, David S.; and Froehlich, Klaus B., to ABB Power T&D Company Inc. Conical composite SF_6 high voltage bushing with floating shield. 5,466,891, Cl. 174-142.000.

Freidhoff, Carl B.: *See*—
Young, Robert M.; Freidhoff, Carl B.; Polla, Dennis L.; and Schiller, Peter J., 5,466,932, Cl. 250-289.000.

Freitas, Glen; Boyce, Joseph S.; and Magee, Constance, to Foster-Miller, Inc. Translaminar reinforcement system for Z-direction reinforcement of a fiber matrix structure. 5,466,506, Cl. 428-105.000.

Freking, Benno, to Atlas Elektronik GmbH. Method for determining depth values of a body of water. 5,465,622, Cl. 73-597.000.

French, Roy C.: *See*—
Ahlquist, Paul G.; and French, Roy C., 5,466,788, Cl. 536-24.100.

Freudenberg, Carl: *See*—
Eschwey, Helmut; Giesen-Wiese, Monika; Grill, Maria; Emirze, Ararad; Seidler, Hans-Peter; Klein, Bernhard; and Kauschke, Michael, 5,466,517, Cl. 428-288.000.

Freund, Peter W.: *See*—
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., 5,465,586, Cl. 62-84.000.
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., 5,465,587, Cl. 62-84.000.

Fried. Krupp AG Hoesch-Krupp: *See*—
Erdmann, Gerd, 5,465,855, Cl. 212-349.000.

Friedrich, Brent R.; and Knepler, John T., to Bunn-O-Matic Corporation. Combo grinder and brewer. 5,465,650, Cl. 99-286.000.

Friedrich, Paul: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.

Fristad, William E.; Narum, Jeffrey L.; Mattison, Phillip L.; Virnig, Michael J.; and Fast, John, to Cognis, Inc. Method and apparatus for removing metal contamination from soil. 5,466,426, Cl. 423-98.000.

Fritz, Alton L.: *See*—
Fritz, Michael L.; and Fritz, Alton L., 5,466,146, Cl. 425-389.000.

Fritz, Michael L.; and Fritz, Alton L. Hydroforming platen and seal. 5,466,146, Cl. 425-389.000.

Froehlich, Klaus B.: *See*—
Freeman, Willie B.; Johnson, David S.; and Froehlich, Klaus B., 5,466,891, Cl. 174-142.000.

Frohnhaus, Ernst-Reiner: *See*—
Bauer, Heinz; Becker, Burckhard; and Frohnhaus, Ernst-Reiner, 5,466,047, Cl. 297-367.000.

Frutschi, Hans U.: *See*—
Althaus, Rolf; Chyou, Yau-Pin; Frutschi, Hans U.; Genet, Christian; Kamber, Peter; Lindvall, Anders; Sattelmayer, Thomas; Senior, Peter; and Rufli, Peter, 5,465,569, Cl. 60-39.030.

Frye, Cecil L., to Dow Corning Corporation. Fat and oil replacements as human food ingredients. 5,466,479, Cl. 426-611.000.

Frye Copysystems, Inc.: *See*—
Carlson, Gene D.; and Dela Cruz, Alfredo R., 5,466,284, Cl. 106-31.00R.

Fuerst, Rory W.; and Granville, James E., to Kaepa, Inc. Athletic shoe with lateral stabilizer system. 5,465,509, Cl. 36-88.000.

Fuji Electric Co., Ltd.: *See*—
Kinoshita, Shigenori; Yanase, Takao; and Fujita, Koetsu, 5,466,998, Cl. 318-375.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Abe, Kiyomi, 5,465,703, Cl. 123-674.000.
Hashimoto, Kenichi; Machara, Toshio; Imaizumi, Yasuo; and Asai, Tetsuo, 5,465,602, Cl. 72-347.000.

Fuji Kagaku Kogyo Kabushiki Kaisha: *See*—
Kawabata, Hironori; Moriguchi, Koei; and Endo, Takeshi, 5,466,678, Cl. 514-46.000.

Fuji Photo Film Co., Ltd.: *See*—
Aosaki, Ko; and Nishitani, Yasuhiro, 5,467,198, Cl. 358-400.000.
Fujiwara, Toshiki, 5,466,822, Cl. 548-305.700.
Furukawa, Koji; and Ohishi, Chikashi, 5,467,111, Cl. 346-134.000.
Ishikawa, Takatoshi; and Snelling, Bryan A. L, 5,466,563, Cl. 430-398.000.
Kinjo, Naoto; and Terashita, Takaaki, 5,467,168, Cl. 355-77.000.
Shirakura, Yuji; Abe, Hisamasa; Yamashita, Teruo; Shimizu, Tatsuo; Kawahara, Sei; Miyoshi, Takahito; and Nishikawa, Yasuo, 5,466,519, Cl. 428-323.000.
Tashiro, Mamoru; and Ichijima, Seiji, 5,466,566, Cl. 430-505.000.

Fuji Photo Optical Co., Ltd.: *See*—
Kaneko, Kouji, 5,467,157, Cl. 354-81.000.

Fuji Xerox Co., Ltd.: *See*—
Akutsu, Eiichi; Soga, Hiroh; Ando, Shigehito; Hirakata, Susumu; and Maruyama, Kazuo, 5,466,654, Cl. 503-206.000.
Fuse, Takeshi, 5,467,437, Cl. 395-115.000.
Nagashima, Atsushi, 5,466,328, Cl. 156-443.000.
Shinozaki, Kengo; Wakabayashi, Kimihiro; Murakami, Hiroki; and Araki, Masaaki, 5,465,892, Cl. 225-2.000.

Fujie, Naofumi; Fukura, Kenichi; Ito, Koichi; Hirata, Tetsuya; and Nishio, Naoto, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Sliding roof device. 5,466,038, Cl. 296-213.000.

Fujii, Hiroshi: *See*—
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; Hosaka, Sumio; Ono, Kouichi; and Moriyama, Yoshiaki, 5,466,883, Cl. 84-610.000.
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; and Kitano, Yoshihiro, 5,467,326, Cl. 369-30.000.

Fujii, Nobuyuki: *See*—
Nishikawa, Masao; and Fujii, Nobuyuki, 5,466,481, Cl. 427-130.000.

Fujii, Shigeo; and Kuga, Masayuki, to NEC Corporation. Bandwidth allocation system of virtual path in asynchronous transfer mode. 5,467,348, Cl. 370-60.100.

Fujii, Takashi; Fujino, Masaru; Sekijima, Takenori; and Takagi, Hiroshi, to Murata Mfg. Co., Ltd. Material for magnetostatic-wave devices. 5,466,388, Cl. 252-62.590.

Fujii, Toshiaki, to NEC Corporation. Event driven logic simulator for partial simulation. 5,467,462, Cl. 364-578.000.
Fujii, Yasufumi: *See*—
Sakagami, Teruo; Ogihara, Takeo; Fujii, Yasufumi; and Katono, Hiroki, 5,466,755, Cl. 525-326.600.
Fujiie, Kazuhiko: *See*—
Ando, Nobuhiko; and Fujiie, Kazuhiko, 5,467,336, Cl. 369-112.000.
Fujimoto, Harry H.; and Das, Siddhartha, to Intel Corporation. Method of forming an integrated circuit waveguide. 5,465,860, Cl. 216-24.000.
Fujimoto, Hiroaki: *See*—
Kudoh, Kichizo; Kikuchi, Yasuo; Ishida, Tatsuya; Ikeda, Tatsufumi; and Fujimoto, Hiroaki, 5,466,703, Cl. 514-374.000.
Fujimoto, Kaoru; Shikada, Tsutomu; Yamaoka, Yojiro; and Sumigama, Takashi, to Fujimoto, Kaoru; and NKK Corporation. Method of producing dimethyl ether. 5,466,720, Cl. 518-700.000.
Fujimoto, Katsuhiko; Aida, Satoshi; Oyanagi, Masamichi; and Kudo, Nobuki, to Kabushiki Kaisha Toshiba. Heat measurement apparatus for inspecting therapeutic energy waves. 5,465,625, Cl. 73-700.000.
Fujimoto, Katsunori: *See*—
Mishima, Akio; Harada, Tosiharu; Tanihara, Mamoru; Ota, Yasutaka; Okinaka, Kenji; Mori, Kohji; Kawasaki, Hirofumi; Nagai, Norimichi; Fujimoto, Katsunori; and Okuda, Yoshiro, 5,466,306, Cl. 148-106.000.
Fujimoto, Tsuyoshi: *See*—
Maro, Kiyofumi; Fujimoto, Tsuyoshi; Yoshida, Yuji; Yamada, Yoshikazu; and Ishizaka, Shoji, 5,467,364, Cl. 372-45.000.
Fujimura, Setsuo; Matsuura, Yutaka; and Sagawa, Masato, to Sumitomo Special Metals Co. Ltd. Magnetic precursor materials for making permanent magnets. 5,466,308, Cl. 148-302.000.
Fujino, Masaru: *See*—
Fujii, Takashi; Fujino, Masaru; Sekijima, Takenori; and Takagi, Hiroshi, 5,466,388, Cl. 252-62.590.
Fujino, Seiji: *See*—
Yamaguchi, Hitoshi; Fujino, Seiji; and Hattori, Tadashi, 5,466,303, Cl. 148-33.000.
Fujisawa, Hirotoshi, to Sony Corporation. Disc cartridge withribbed shutter. 5,467,239, Cl. 360-133.000.
Fujisawa, Katsuya: *See*—
Ohnishi, Ikuo; and Fujisawa, Katsuya, 5,467,224, Cl. 359-614.000.
Fujisawa, Kazuhiro: *See*—
Matsushita, Hiroomi; Sasaki, Teruo; and Fujisawa, Kazuhiro, 5,465,945, Cl. 267-294.000.
Fujisawa, Masaaki; Hasegawa, Taiji; Ishii, Toshio; Sasaki, Shoji; and Sakamoto, Masahide, to Hitachi, Ltd. Apparatus and method for automobile control using a control characteristic which can be adjusted by the driver. 5,467,277, Cl. 364-424.050.
Fujisawa, Shuichi: *See*—
Takaba, Katsumi; and Fujisawa, Shuichi, 5,465,613, Cl. 73-117.300.
Fujisawa, Toshiki: *See*—
Miyazaki, Takemi; Kakuta, Yoshio; and Fujisawa, Toshiki, 5,467,155, Cl. 354-21.000.
Fujistu Limited: *See*—
Gotoh, Kohtaroh, 5,467,015, Cl. 324-248.000.
Fujita, Hirotsugu: *See*—
Takagi, Jun; and Fujita, Hirotsugu, 5,466,499, Cl. 428-36.900.
Fujita, Koetsu: *See*—
Kinoshita, Shigenori; Yanase, Takao; and Fujita, Koetsu, 5,466,998, Cl. 318-375.000.
Fujita, Kouichi: *See*—
Sato, Fumiki; and Fujita, Kouichi, 5,467,299, Cl. 364-761.000.
Fujita, Shinichi, to Yamaha Corporation. Amplifier circuit with a stabilized bias in its output stage. 5,467,058, Cl. 330-267.000.
Fujitani, Mitsuhiro: *See*—
Miyazaki, Sho; Konoya, Hisashi; Tanaka, Yoshihiro; Fujitani, Mitsuhiro; and Konda, Kazumoto, 5,466,164, Cl. 439-140.000.
Fujitsu Limited: *See*—
Fukuda, Keiji, 5,467,353, Cl. 370-110.100.
Hasegawa, Kenichi, 5,467,079, Cl. 340-825.160.
Hosoya, Kimio; Teruya, Yoshihiro; and Kobayashi, Yasushi, 5,466,908, Cl. 217-121.680.
Ishiguro, Hajime; Morioka, Kazutoshi; Sakai, Tooru; and Takemura, Yasushi, 5,467,431, Cl. 395-102.000.
Iwama, Ryoichi; and Yamada, Akira, 5,467,177, Cl. 355-282.000.
Miyashita, Takumi, 5,467,060, Cl. 331-74.000.
Takeda, Keiko; Inagaki, Shinya; Tagawa, Kenji; and Sasaki, Kazuya, 5,467,218, Cl. 359-341.000.
Watanabe, Shuko, 5,465,918, Cl. 242-334.200.
Watanabe, Yoshiharu, 5,467,048, Cl. 327-436.000.
Watanuki, Tsuneo; Nakamura, Yasushige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utaka, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, 5,467,176, Cl. 355-270.000.
Yamada, Akio, 5,466,549, Cl. 430-30.000.
Yoshida, Masanobu; and Ogura, Kiyonori, 5,467,310, Cl. 365-185.070.
Fujitsu VLSI Limited: *See*—
Yoshida, Masanobu; and Ogura, Kiyonori, 5,467,310, Cl. 365-185.070.
Fujiwara, Kazunori: *See*—
Okuyama, Yoshiyuki; Kitamura, Tadaaki; Kobayashi, Yoshiki; Yahiro, Masakazu; and Fujiwara, Kazunori, 5,467,402, Cl. 382-104.000.
Fujiwara, Toshiki, to Fuji Photo Film Co., Ltd. Benzimidazolocarbocyanine dye and silver halide photographic material containing said dye. 5,466,822, Cl. 548-305.700.
Fujiwara, Yuji: *See*—
Yamane, Yasuhiko; Nishino, Masakazu; Fujiwara, Yuji; and Matuda, Toyohiko, 5,467,135, Cl. 348-415.000.
Fukai, Isamu, to Sanden Corporation. Valved diacharge mechanism of a refrigerant compressor. 5,466,129, Cl. 417-269.000.
Fukuda, Keiji; Tokunaga, Isao; and Akagi, Takao, to Kuraray Company Limited. Napped fabric and process for its production. 5,466,505, Cl. 428-91.000.
Fukuda, Keiji, to Fujitsu Limited. Subrate control channel exchange system. 5,467,353, Cl. 370-110.100.
Fukuda, Taro: *See*—
Aihara, Takao; Fukuda, Taro; and Takada, Hideaki, 5,466,177, Cl. 440-30.000.
Fukuda, Tsuguhiro: *See*—
Ishinaga, Hiroyuki; Fukuda, Tsuguhiro; and Mori, Toshihiro, 5,467,113, Cl. 347-17.000.
Fukuda, Yutaka: *See*—
Kanno, Tatsuya; and Fukuda, Yutaka, 5,466,775, Cl. 528-207.000.
Fukuhara, Hiroyuki: *See*—
Yamada, Sadayuki; Muramatsu, Shigeru; Hashimoto, Takeshi; and Fukuhara, Hiroyuki, 5,466,136, Cl. 418-55.600.
Fukura, Kenichi: *See*—
Fujie, Naofumi; Fukura, Kenichi; Ito, Koichi; Hirata, Tetsuya; and Nishio, Naoto, 5,466,038, Cl. 296-213.000.
Fukushi, Kawakami: *See*—
Sakai, Takeshi; and Fukushi, Kawakami, 5,465,469, Cl. 29-404.000.
Fukushima, Kiyoshi: *See*—
Terada, Fusao; Nakazato, Takashi; Tadano, Rikio; Tanigawa, Naohide; Hirose, Tatuya; Ikegami, Kazuo; and Fukushima, Kiyoshi, 5,465,579, Cl. 62-6.000.
Fukushima, Satoru; Gu, Sono; and Mizoguchi, Yoshito, to Canon Kabushiki Kaisha. Image forming apparatus which forms halftone images mixed with characters and fine lines. 5,467,196, Cl. 358-298.000.
Fukushima, Tatsuhiro: *See*—
Uchida, Katsunori; Kobayashi, Shotaro; and Fukushima, Tatsuhiro, 5,467,304, Cl. 365-174.000.
Fukuyo, Hideaki: *See*—
Ohhashi, Tateo; Nakashima, Koichi; Fukuyo, Hideaki; and Seki, Takakazu, 5,466,355, Cl. 204-298.130.
Fulcher, Fred; and Huang, Andrew B. Self heating individual meal package. 5,465,707, Cl. 126-263.080.
Fuller, Joseph C.: *See*—
Singaram, Bakthan; Fisher, Gary B.; Fuller, Joseph C.; Harrison, John; and Goralski, Christian T., 5,466,798, Cl. 540-541.000.
Fuller, Marty: *See*—
Chen, Lung-Hua; Pote, Jonathan; and Fuller, Marty, 5,465,464, Cl. 19-24.000.
Fullwood, James, to Duraframe Window Shutter Systems, Inc. Storm shutter window frame system. 5,465,537, Cl. 52-202.000.
Fulmer, Brian H.: *See*—
Parker, Todd S.; Snyder, Brian T.; and Fulmer, Brian H., 5,466,420, Cl. 422-164.000.
Fumio, Abe; Ito, Tadato; and Ogawa, Masato, to NGK Insulators, Ltd. Multi-stage honeycomb heater. 5,465,573, Cl. 60-274.000.
Funabiki, Hisato: *See*—
Niwa, Miki; Kodakari, Nobuaki; Funabiki, Hisato; and Katada, Naonobu, 5,466,483, Cl. 427-226.000.
Funahashi, Nobuaki: *See*—
Miyake, Kazutoshi; Ueno, Masato; Watanabe, Satomi; Funahashi, Nobuaki; Asai, Tomohito; and Isono, Thoru, 5,465,485, Cl. 29-892.110.
Funahashi, Takahiko: *See*—
Murakami, Azuma; Yamanami, Tauguya; and Funahashi, Takahiko, 5,466,896, Cl. 178-19.000.
Funai Electric Co., Ltd.: *See*—
Tanimoto, Toshinobu; Okamoto, Yoshikatsu; Yoshida, Shinji; and Hironaka, Yasumasa, 5,466,913, Cl. 219-492.000.
Furness, Thomas A., III; and Kollin, Joel S., to University of Washington, Board of Regents of the. Virtual retinal display. 5,467,104, Cl. 345-8.000.
Furudate, Toshiharu: *See*—
Mifune, Hiroshi; Saitoh, Satoshi; Kaneda, Teruo; Tomokiyo, Shigetaka; Adachi, Tsugio; Tanaka, Tsutomu; and Furudate, Toshiharu, 5,465,525, Cl. 43-132.100.
Furukawa Denchi Kabushiki Kaisha: *See*—
Furukawa, Jun, 5,466,544, Cl. 429-59.000.
Furukawa Denki Kogyo Kabushiki Kaisha: *See*—
Irisawa, Daiichi, 5,466,885, Cl. 174-35.0MS.
Furukawa, Jun, to Furukawa Denchi Kabushiki Kaisha. Method for manufacturing a hydrogen-occlusion-alloy electrode. 5,466,544, Cl. 429-59.000.
Furukawa, Koji; and Ohishi, Chikashi, to Fuji Photo Film Co., Ltd. Transporting apparatus for scanning exposure. 5,467,111, Cl. 346-134.000.
Furukawa, Mikio: *See*—
Tomioka, Isao; Nakano, Takeshi; Furukawa, Mikio; and Echigo, Yoshiaki, 5,466,732, Cl. 524-113.000.
Furuno Electric Company, Limited: *See*—
Mikami, Shigeru; Mori, Masayuki; Yamamoto, Tetsuo; Ohno, Matsuhiro; and Matsumoto, Mineo, 5,467,199, Cl. 358-425.000.

Furuta, Takashi; Takeda, Hajime; Nishimura, Hiroyuki; Kadono, Tsuyoshi; Ishizaki, Hirofumi; and Uesaka, Akira, to Matsushita Electric Works, Ltd. Antenna and tuner combination. 5,467,477, Cl. 455-348.000.

Furutani, Tadashige: *See*—
Ishida, Takashi; O'Hara, Shunji; Ishibashi, Kenzo; and Furutani, Tadashige, 5,467,330, Cl. 369-48.000.

Furuya, Yoshiyuki: *See*—
Iino, Tadashi; Furuya, Yoshiyuki; and Aoki, Kunimitsu, 5,467,103, Cl. 345-7.000.

Fuse, Genshu; and Ishikawa, Katuya, to Matsushita Electronics Corp. Method of manufacturing a solid-state image pickup device. 5,466,612, Cl. 437-3.000.

Fuse, Takeshi, to Fuji Xerox Co., Ltd. Recording apparatus. 5,467,437, Cl. 395-115.000.

Fypon Inc.: *See*—
Biernazki, Christian P., 5,465,540, Cl. 52-211.000.

G.A.L. Gage Co.: *See*—
Lycan, Goodwin A., 5,465,498, Cl. 33-645.000.

G.D. Searle & Co.: *See*—
Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., 5,466,823, Cl. 548-377.100.

Gabzdyl, Jacek T.: *See*—
Bliss, Anthony P. S.; and Gabzdyl, Jacek T., 5,465,582, Cl. 62-51.100.

Gaffar, Abdul; Nabi, Nuran; Affitto, John; and Stringer, Orum, to Colgate Palmolive Company. Antibacterial antiplaqued oral composition mouthwash or liquid dentifrice. 5,466,437, Cl. 424-52.000.

Gai, Giorgio; and Trivella, Walter, to Ultraflex S.r.L. Electromechanical remote-control device. 5,466,996, Cl. 318-16.000.

Gailus, Paul H.: *See*—
Wray, Anthony J.; Bastani, Babak; and Gailus, Paul H., 5,467,055, Cl. 330-129.000.

Galbraith, Lyle D.; Holland, Gary F.; Poole, Donald R.; and Mitchell, Robert M., to Olin Corporation. Fire suppressing apparatus for generating steam from a water-ice mixture. 5,465,795, Cl. 169-11.000.

Gale, Ronald P.; McCullough, Richard; Salerno, Jack P.; Pantone, Stephen D.; Forsyth, Robert P.; Carellas, Peter T.; Thomas, Michael J.; and Youman, Roy L., to Kopin Corporation. Projection monitor. 5,467,154, Cl. 353-119.000.

Galey, Jean B.: *See*—
Terranova, Eric; Galey, Jean B.; Hocquaux, Michel; Maignan, Jean; and Tuloup, Rémy, 5,466,694, Cl. 514-272.000.

Galik, George M. Liquid-liquid extraction. 5,466,375, Cl. 210-634.000.

Gandhi, Bhavan R.: *See*—
Ray, Lawrence A.; Ellson, Richard N.; and Gandhi, Bhavan R., 5,466,918, Cl. 235-380.000.

Gandils, Mars V.: *See*—
Peltonen, Ari; Åström, Bo A. V.; Gandils, Mars V.; Stille, Mats O.; and Lantto, Sven J., 5,467,381, Cl. 379-58.000.

Garbanati, Dennis: *See*—
Summer, Randi M.; Garbanati, Dennis; Winter, Patricia L.; and Gates, Ronald D., 5,467,293, Cl. 364-578.000.

Gardner, Sandra J.: *See*—
Burt, Richard A.; Liebermann, George; Hamer, Gordon K.; Gardner, Sandra J.; Jennings, Carol A.; Daimon, Katsumi; and Nukada, Katsumi, 5,466,796, Cl. 540-139.000.

Garger, Stephen J., Jr.: *See*—
della-Cioppa, Guy R.; Garger, Stephen J., Jr.; Holtz, Richard B.; McCulloch, Michael J.; and Sverlow, Genadie G., 5,466,592, Cl. 435-212.000.

Gargione, Frank V., to Comar, Inc. Tamper-evident closure. 5,465,858, Cl. 215-252.000.

Gariepy, James A.: *See*—
McConaughy, Brett R.; Brammer, Norman; and Gariepy, James A., 5,465,794, Cl. 166-375.000.

Garman, Michael S.: *See*—
Matis, Clark A.; and Garman, Michael S., 5,465,506, Cl. 36-11.500.

Garnett, Richard H., to Wisdom Agricultural Investment Limited. Closed transfer devices for agricultural chemicals and the like. 5,465,875, Cl. 222-148.000.

Garofalo, Giovanni, to HTM Sport S.p.A. Safety catch for underwater guns. 5,465,517, Cl. 42-70.060.

Garrison, Ronald R., to Wallace Computer Services, Inc. Card intermediate and method. 5,466,013, Cl. 283-107.000.

Garshelis, Ivan J., to Magnetoelastic Devices, Inc. Circularly magnetized non-contact torque sensor and method for measuring torque using same. 5,465,627, Cl. 73-862.335.

Garst, Gregory C. Undulating single tail fishing lure. 5,465,523, Cl. 43-42.240.

GaSonics, Inc.: *See*—
Davies, John T.; Egbert, Stephen J.; and Wagar, John R., 5,467,424, Cl. 392-401.000.

Gates, Ronald D.: *See*—
Summer, Randi M.; Garbanati, Dennis; Winter, Patricia L.; and Gates, Ronald D., 5,467,293, Cl. 364-578.000.

Gatti, John E.: *See*—
Carstens, Robert J.; Gatti, John E.; Shoda, Thomas M.; and Toor, John W., 5,466,172, Cl. 439-509.000.

Gatto, Jean-Marie; and Bertrand, Dominique, to Internationale Des Jeux. Device for analyzing information carriers provided with means of compensation of its output signals. 5,466,922, Cl. 250-208.100.

Gatwood, Millard E. Cargo cushioning apparatus. 5,466,104, Cl. 410-156.000.

Gauronski, John F.; and Knodt, Kurt T., to Xerox Corporation. Fault clearance and recovery in an electronic reprographic system. 5,467,449, Cl. 395-185.100.

Gauthier, Remy C. H.: *See*—
Guillet, Antoine J. E.; and Gauthier, Remy C. H., 5,466,729, Cl. 523-421.000.

Gavin, Patrick M.; Schelhorn, Jean E.; Aschenbeck, David P.; and Strauss, Carl R., to Owens-Corning Fiberglas Technology, Inc. Fibrous glass insulation assembly. 5,466,504, Cl. 428-74.000.

Gavrin, Edward S.: *See*—
Mikkelsen, Carl M.; and Gavrin, Edward S., 5,467,446, Cl. 395-143.000.

Gay, James G.; and Ledbetter, William B., Jr., to Motorola, Inc. Data processing system and method for performing dynamic bus termination. 5,467,455, Cl. 395-281.000.

Gaylor, Ian M. D., to A.G. (Patents) Limited (British company). Method and apparatus for manufacturing infusion packages. 5,466,474, Cl. 426-394.000.

Gazzola, Alain J.: *See*—
Rice, Chris A.; Gazzola, Alain J.; Smith, Desroy D.; Evans, John T.; and Dawson, Andrew W., 5,465,443, Cl. 15-246.000.

GE Lighting Limited: *See*—
Hume, Roger A.; and Felstead, Richard A., 5,467,259, Cl. 362-307.000.

GEC-Marconi, Ltd.: *See*—
Birkmayer, Wolfram; Wale, Michael J.; and Edge, Colin, 5,467,414, Cl. 385-3.000.

Geck, Michael; Deubzer, Bernward; Baumgartner, Christine; Lautenschlager, Hans-Jürgen; and Sejpka, Johann, to Wacker-Chemie GmbH. Emulsions of organopolysiloxanes containing polar groups with alkyl polyglycosides as emulsifiers. 5,466,746, Cl. 524-837.000.

Gee, Calvin J.; and Matkin, John M., to GMT, Inc. Portable tongue for trailers. 5,465,993, Cl. 280-491.500.

Geerts, Rolf L.: *See*—
Patsidis, Konstantinos; Peifer, Bernd; Palackal, Syriac J.; Alt, Helmut G.; Welch, M. Bruce; Geerts, Rolf L.; Fahey, Darryl R.; and Deck, Harold R., 5,466,766, Cl. 526-129.000.

Geiger, Markus: *See*—
Weber, Beate; Hagemann, Jörg; and Geiger, Markus, 5,466,569, Cl. 430-551.000.

Geis, Mark W.: *See*—
Boesel, George F. W.; and Geis, Mark W., 5,466,165, Cl. 439-142.000.

Geisen, Karl: *See*—
Obermeier, Rainer; Sabel, Walter; Deil, Peter; and Geisen, Karl, 5,466,666, Cl. 514-3.000.

Geisenberger, Stefan, to Nokia Technology. Arrangement for active sound damping. 5,466,899, Cl. 181-206.000.

Gelfand, David H.: *See*—
Abramson, Richard D.; and Gelfand, David H., 5,466,591, Cl. 435-194.000.

Geller, Bernard D.: *See*—
Mott, Richard C.; and Geller, Bernard D., 5,467,094, Cl. 343-700.0MS.

General Electric Company: *See*—
Anthony, Thomas R.; Williams, Bradley E.; and McNamara, Karen M., 5,465,603, Cl. 72-467.000.
Caruso, Andrew J.; and Lee, Julia L., 5,466,777, Cl. 528-298.000.
Chennakeshu, Sandeep; Dent, Paul W.; Koilpillai, Ravinder D.; and Toy, Raymond L., 5,467,374, Cl. 375-340.000.
Corrigan, Frank; Anthony, Sam; and Sweeting, Barbara, 5,466,269, Cl. 51-307.000.
Day, James; Kailasam, Ganesh; and Varadarajan, Godavarthi S., 5,466,370, Cl. 210-298.000.
Engeler, William E.; and Brown, Dale M., 5,467,185, Cl. 356-44.000.
Evans, Thomas L.; Brunelle, Daniel J.; Bradt, Jean E.; Pearce, Eric J.; and Wilson, Paul R., 5,466,744, Cl. 524-714.000.
Factor, Arnold; and Lewis, Larry N., 5,466,491, Cl. 427-515.000.
Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; and Grubbs, Gray W., 5,466,905, Cl. 219-121.460.
Hoeks, Theodorus L.; Claesen, Christianus A. A.; Lohmeijer, Johannes H. G. M.; and Pickett, James E., 5,466,733, Cl. 524-141.000.
Kliman, Gerald B.; Preston, Mark A.; and Jones, Donald W., 5,466,978, Cl. 310-156.000.
Kowdley, Balasubramanian S.; Lewis, Thomas A.; Tsukida, Robert S.; Saxon, Edward W.; Ortega, Frank; and Debenedetto, Paul, 5,465,497, Cl. 33-626.000.
Kurzynski, David W.; and Pourjavid, Sussan, 5,465,720, Cl. 128-660.010.
Nicoli, Robert A.; and Vdoviak, John W., 5,465,572, Cl. 60-266.000.

General Motors Corporation: *See*—
Briody, Paul P.; Cable, Randy C., deceased, 5,466,016, Cl. 285-204.000.
Dudek, Kenneth P.; Matthews, Gregory P.; Folkerts, Charles H.; and Davis, Ronald A., 5,465,617, Cl. 73-118.200.

Genest, Nelson J. Adjustable height tray stand with tray toy opening for easier loading/unloading of service trays. 5,465,671, Cl. 108-43.000.

Genet, Christian: *See*—
Althaus, Rolf; Chyou, Yau-Pin; Frutschi, Hans U.; Genet, Christian; Kamber, Peter; Lindvall, Anders; Sattelmayer, Thomas; Senior, Peter; and Rufli, Peter, 5,465,569, Cl. 60-39.030.

Genetics Institute, Inc.: *See*—
Jones, Simon; and Tang, Jin, 5,466,595, Cl. 435-240.200.
Genga, Richard A., to Taco, Inc. Zoning circulator controller. 5,466,995, Cl. 318-3.000.
Gennaro, Mark A. Expansible and contractible chamber assembly and method. 5,466,138, Cl. 418-188.000.
Genova, John R.: *See*—
Biba, Scott I.; and Genova, John R., 5,465,775, Cl. 160-168.100.
Genox Co. Ltd.: *See*—
Shinji, Ueno, 5,466,391, Cl. 252-186.270.
George, Pascal; De Peretti, Danielle; Roy, Jocelyne; Schmitt, Jean-Paul; and Sevrin, Mireille, to Synthelabo. 9H-imidazo[1,2-A]benzimidazole-3-acetamide derivatives, their preparation and their therapeutic application. 5,466,706, Cl. 514-394.000.
Georger, William A.: *See*—
Wanek, M. Chris; Van Den Bogart, Thomas W.; Georger, William A.; Ribble, Brendon F.; Matthews, Billie J.; Sawyer, Lawrence H.; Abuto, Frank P.; and Werner, Edward E., 5,466,513, Cl. 428-218.000.
Georgiadis, Leonidas: *See*—
Cidon, Israel; Georgiadis, Leonidas; Guerin, Roch A.; Shavitt, Yuval Y.; and Slater, Andrew E., 5,467,352, Cl. 370-85.500.
Gerb. Happich GmbH: *See*—
Viertel, Lothar; Welter, Patrick; Lercorvaisier, René; Mosser, Serge; and Pompino, Karl-Heinz, 5,466,405, Cl. 264-45.400.
Gerber, Fritz: *See*—
Kohlmeier, Hans-Heinrich; and Gerber, Fritz, 5,466,005, Cl. 280-781.000.
Gerber Scientific Products, Inc.: *See*—
Logan, David J.; and Rich, Leonard G., 5,466,501, Cl. 428-40.000.
Gerstenmaier, York C.: *See*—
Brunner, Heinrich; and Gerstenmaier, York C., 5,466,951, Cl. 257-139.000.
Gertzman, Arthur A.: *See*—
Cercone, Ronald J.; Quaratella, Scott J.; and Gertzman, Arthur A., 5,466,231, Cl. 604-369.000.
Getty, Ward D., to Board of Regents Acting for the Univ. of Michigan. ECR plasma generation apparatus and methods. 5,466,295, Cl. 118-723.0MA.
Geyer, Harry J.: *See*—
Heckman, James K.; Carney, Francis J.; and Geyer, Harry J., 5,467,253, Cl. 361-761.000.
Geyer, Robert P.; and Tuliani, Vinod V., to Ibah, Inc. Neomorphic ibuprofen and methods of using same. 5,466,865, Cl. 562-496.000.
Ghaed, Ali; Leland, Jonathan K.; Zoski, Glenn D.; Goodman, Jack E.; and Groover, John T. Apparatus and methods for carrying out electrochemiluminescence test measurements. 5,466,416, Cl. 422-52.000.
Ghahary, Akbar, to Safas Corporation. Decorative facings for bricks, cinder-blocks and the like. 5,465,544, Cl. 52-311.100.
Gheysen, Nico, to N.V. Michel Van de Wiele. Single rapier woven face-to-face carpet fabric in one-shot-weave. 5,465,761, Cl. 139-21.000.
Giba, Jeffrey J.: *See*—
Loeb, Marvin P.; Shaolian, Samuel M.; Saadatmanesh, Vahid; Giba, Jeffrey J.; and Pham, To V., 5,466,234, Cl. 606-15.000.
Gibby, Wendell A.; and Puttagunta, N. Rao, to Magnetic Research, Inc. Polymeric contrast enhancing agents for magnetic resonance images. 5,466,439, Cl. 424-9.365.
Giddings & Lewis, Inc.: *See*—
Sheldon, Paul C.; and Kirkham, Edward E., 5,466,085, Cl. 403-157.000.
Giesen-Wiese, Monika: *See*—
Eschwey, Helmut; Giesen-Wiese, Monika; Grill, Maria; Emirze, Ararad; Seidler, Hans-Peter; Klein, Bernhard; and Kauschke, Michael, 5,466,517, Cl. 428-288.000.
Gilbert, Edwin E.; and Foret, Timothy J. Stethoscope isolation system. 5,466,898, Cl. 181-131.000.
Gilbert, Jérôme, to EURO CP s.a.r.l. Process for designating a distant functional object in a circuit, and functional units and installation pertaining thereto. 5,467,263, Cl. 364-140.000.
Gilead Sciences: *See*—
Buhr, Chris A.; and Matteucci, Mark, 5,466,786, Cl. 536-26.260.
Gillette Company, The: *See*—
Dowst, William P., 5,467,408, Cl. 382-112.000.
Gilmore, Larry J. Refuse material recovery system. 5,465,847, Cl. 209-12.100.
Gindelberger, Bruce: *See*—
Hanke, David E.; Gindelberger, Bruce; and Heiman, Saul, 5,466,281, Cl. 106-20.00R.
Ginosar, Ran: *See*—
Zeevi, Yehoshua Y.; Ginosar, Ran; and Stuart, Wolf, 5,467,123, Cl. 348-34.000.
Girardot, Richard M.; Grosgogeat, Eric J.; Yeazell, Charles G.; and Bausch, Richard G., to Procter & Gamble Company, The. Implement for personal cleansing made from extruded plastic scrim. 5,465,452, Cl. 15-210.100.
Girgis, Mikhail M., to PPG Industries, Inc. Chemically treated glass type substrates with vinyl polymer compatibility. 5,466,528, Cl. 428-391.000.
Gish Biomedical, Inc.: *See*—
Brown, Jack W.; Strauss, Brian; and White, George W., 5,466,216, Cl. 604-33.000.
Gish, David W.: *See*—
Solomon, David; Putnins, Zigmunds A.; Gish, David W.; and Mendelson, Jeffrey B., 5,467,344, Cl. 370-58.300.
Glabe, John R.: *See*—
Bonebright, Mark E.; and Glabe, John R., 5,467,099, Cl. 343-767.000.
Glagow, Klaus: *See*—
Brocke, Rolf; and Glagow, Klaus, 5,466,508, Cl. 428-122.000.
Glancy, Charles W.; and Busby, David C., to Union Carbide Chemicals & Plastics Technology Corporation. Precursor coating compositions containing water and an organic coupling solvent suitable for spraying with supercritical fluids as diluents. 5,466,490, Cl. 427-422.000.
Glase, Shelly; Jaen, Juan C.; Smith, Sarah J.; and Wise, Lawrence D., to Warner-Lambert Company. Substituted tetrahydrophyridines and hydroxypiperidines as central nervous system agents. 5,466,698, Cl. 514-318.000.
Glaser, Charles B.; Morser, Michael J.; and Light, David R., to Schering Aktiengesellschaft. Superior thrombomodulin analogs for pharmaceutical use. 5,466,668, Cl. 514-12.000.
Glaunsinger, William; Sorensen, Ian; Bao, Qingcheng; and McKelvy, Michael J., to Arizona Board of Regents. Method for detection of chemical components. 5,466,605, Cl. 436-6.000.
Glaxo Group Limited: *See*—
Stables, Roger, 5,466,436, Cl. 514-161.000.
Glaxo Wellcome Inc.: *See*—
Batenhorst, Randal L.; and Fox, Anthony W., 5,466,700, Cl. 514-329.000.
Glen, Robert C.: *See*—
Robertson, Alan D.; Hill, Alan P.; Glen, Robert C.; and Martin, Graeme R., 5,466,699, Cl. 514-323.000.
Glombik, Heiner: *See*—
Enhsen, Alfons; Glombik, Heiner; Kramer, Werner; and Wess, Günther, 5,466,815, Cl. 548-252.000.
Glover, Morris S. Facial cleanser. 5,466,456, Cl. 424-401.000.
Glynn, Kenneth P., to Ideal Ideas, Inc. Double action spray dispenser. 5,465,880, Cl. 222-321.800.
Gmelin, Karl, to Robert Bosch GmbH. Throttle appliance for an internal combustion engine and method of manufacturing metering walls in the throttle appliance. 5,465,696, Cl. 123-337.000.
GMT, Inc.: *See*—
Gee, Calvin J.; and Matkin, John M., 5,465,993, Cl. 280-491.500.
Godfrey, Alexander G., to Eli Lilly and Company. 2-amino-3-aroylbenzo[β]thiophenes and methods for preparing and using same to produce 6-hydroxy-2-(4-hydroxyphenyl)-3-[4-(2-aminoethoxy)-benzoyl]benzo[β]thiophenes. 5,466,810, Cl. 546-202.000.
Goebel, Olaf; and Hennecke, Klaus, to Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V. Trough-shaped collector. 5,465,708, Cl. 126-635.000.
Goerlach, Alfred; Michel, Hartmut; and Mindl, Anton, to Robert Bosch GmbH. Semiconductor device for influencing the breakdown voltage of transistors. 5,466,959, Cl. 257-361.000.
Goertz, Harvey M.: *See*—
Hudson, Alice P.; Woodward, Fred E., deceased; Woodward, by Sam, executor; Timmons, Richard J.; and Goertz, Harvey M., 5,466,274, Cl. 71-28.000.
Goetz, Norbert: *See*—
Schnurr, Werner; Fischer, Rolf; Goetz, Norbert; and Kuekenhoehner, Thomas, 5,466,831, Cl. 549-323.000.
Goff, Kenneth H., Jr.; and Schultz, William E., to Ford Motor Company. Die assembly. 5,465,600, Cl. 72-309.000.
Gohara, Shinobu: *See*—
Ito, Yutaka; Mori, Makoto; and Gohara, Shinobu, 5,467,346, Cl. 370-60.000.
Gohel, Dhanesh I.: *See*—
Liberti, Paul A.; Wang, Yuzhou; Tang, Weixin; Feeley, Brian P.; and Gohel, Dhanesh I., 5,466,574, Cl. 435-5.000.
GOJO Industries, Inc.: *See*—
Bell, Ronald F.; and Wysocki, J. Christopher, 5,465,877, Cl. 222-181.200.
Gola, John A.: *See*—
Clark, George A.; Burwell, Malcolm C.; Gola, John A.; Robinson, Christopher; and Snyder, Fred E., 5,465,894, Cl. 227-175.000.
Gold, Gerald: *See*—
Bright, Stuart W.; Gold, Gerald; Sage, Scott W.; and Sportsman, John R., 5,466,610, Cl. 436-518.000.
Goldenstein, Alexander: *See*—
Litman, Alon; Goldenstein, Alexander; and Rogers, Steven R., 5,466,940, Cl. 250-397.000.
Goldrian, Gottfried: *See*—
Blum, Arnold; Goldrian, Gottfried; and Kumpf, Wolfgang, 5,467,452, Cl. 395-200.120.
Goldstar Co., Ltd.: *See*—
Bang, Young U., 5,466,620, Cl. 437-51.000.
Cheon, In K., 5,465,921, Cl. 242-355.100.
Kim, Jin H., 5,466,618, Cl. 437-40.000.
Lee, Dong H., 5,467,133, Cl. 348-402.000.
Goldstar Electron Co., Ltd.: *See*—
Choi, Jong M., 5,466,619, Cl. 437-41.000.
Sohn, Ki S., 5,467,140, Cl. 348-529.000.
Goliaszewski, Alan E.; Cady, Michael A.; Burgmayer, Paul R.; Anderson, Sydia B.; Carey, William S.; and Moulton, Roger D., to Betz Laboratories, Inc. Method of scavenging oxygen from an aqueous medium. 5,466,381, Cl. 210-750.000.
Gonzalez, Adolpho, to Silicon Graphics, Inc. Bracket for a CPU daughter card. 5,465,934, Cl. 248-223.410.
Gonzalez, Mark A., to MGwhiz, Inc. Gamepiece with protector. 5,465,976, Cl. 273-317.000.

Goo, Bon-jeong, to Samsung Aerospace Industries, Ltd. Camera with auto photographing mode conversion function and method for controlling the same. 5,467,162, Cl. 354-402.000.

Goode, John E., to Hydra Rig, Inc. Liquid methane fueling facility. 5,465,583, Cl. 62-50.200.

Goodman, Jack E.: *See*—
Ghaed, Ali; Leland, Jonathan K.; Zoski, Glenn D.; Goodman, Jack E.; and Grosser, John T., 5,466,416, Cl. 422-52.000.

Goodman, Walter H.; Rao, Narasimha M.; and Johnson, Donald A., to Nalco Chemical Company. Process for removal of primarily iron oxide deposits. 5,466,297, Cl. 134-3.000.

Goodnough, Scott E.; and Moren, Thomas F. Roof rake. 5,465,510, Cl. 37-285.000.

Goralski, Christian T.: *See*—
Singaram, Bakthan; Fisher, Gary B.; Fuller, Joseph C.; Harrison, John; and Goralski, Christian T., 5,466,798, Cl. 540-541.000.

Gornowicz, Gerald A.: *See*—
Decker, Gary T.; Gornowicz, Gerald A.; and Tobukuro, Kuniaki, 5,466,323, Cl. 156-307.400.

Gosche, Matt J., to Union Special Corporation. Overedge stitch sewing device. 5,465,674, Cl. 112-162.000.

Goto, Masaki, to Gotoh Gut Yugen Kaisha. Neck straightener for stringed instrument. 5,465,642, Cl. 84-293.000.

Goto, Toshio; Hayakawa, Hidenori; Watanabe, Yukiyoshi; Narabu, Shin-ichi; and Yanagi, Akihiko, to Nihon Bayer Agrochem K.K. Tetrazolinones as herbicides for use in paddy. 5,466,660, Cl. 504-134.000.

Goto, Yasuo, to Home Co., Ltd. Connector, method for connecting structural members with connector and connection structure between structural members. 5,466,086, Cl. 403-268.000.

Gotoh Gut Yugen Kaisha: *See*—
Goto, Masaki, 5,465,642, Cl. 84-293.000.

Gotoh, Hiroyuki, to Sony Corporation. Implosion-resistant band with stack retainer. 5,466,984, Cl. 313-477.00R.

Gotoh, Kohtaroh, to Fujistu Limited. Superconducting magnetometer having increased bias current tolerance and producing digital output. 5,467,015, Cl. 324-248.000.

Gotomyo, Yasuo; Kore, Haruhisa; Muramoto, Hisao; Nomura, Yoshinbu; Kohno, Shigefumi; and Hirashima, Isao, to Mazda Motor Corporation. Air bag system for an automotive vehicle. 5,466,001, Cl. 280-730.100.

Gould, Peter J.: *See*—
Morgan, Gaylard M.; Malczanek, Anthony; and Gould, Peter J., 5,465,555, Cl. 53-451.000.

Goumaz, Jean-François, to LeCroy S.A. Very high speed precision amplifier. 5,467,056, Cl. 330-149.000.

Gove, Robert J., to Texas Instruments Incorporated. Field to frame video pixel data generation. 5,467,138, Cl. 348-452.000.

Gradwohl, Gerard G.: *See*—
Breitman, Martin L.; Dumont, Daniel; and Gradwohl, Gerard G., 5,466,596, Cl. 435-240.200.

Graf, Eckhard; Graf, Jürgen; and Mauz, Hubert, to Uhrig Kanaltechnik GmbH. Apparatus for sealing leakage points in pipes from the inside of the pipe, and a method of sealing the leakage points. 5,465,758, Cl. 138-98.000.

Graf, Jürgen: *See*—
Graf, Eckhard; Graf, Jürgen; and Mauz, Hubert, 5,465,758, Cl. 138-98.000.

Gragg, Brian D.; and Clark, James E., to Hewlett-Packard Company. Ink cartridge for a hard copy printing or plotting apparatus. 5,467,118, Cl. 347-87.000.

Graham, Martin H.: *See*—
Aden, Charles M.; Graham, Martin H.; Taylor, Matthew; and Miller, Mark, 5,467,061, Cl. 333-24.00R.

Gramlich, John D.: *See*—
Hower, John D., Jr.; Martin, Kathleen M.; Gramlich, John D.; and Baldwin, LeRoy A., 5,467,182, Cl. 355-319.000.

Grammatica, Steven J.: *See*—
Yuh, Huoy-Jen; Spiewak, John W.; Tarnawskyj, Christine J.; Grammatica, Steven J.; Chen, Cindy C.; and Teuscher, Leon A., 5,466,551, Cl. 430-63.000.

Grand Haven Stamped Products Div of JSJ Corporation: *See*—
Osborn, Charles; and Medema, Robert M., 5,465,818, Cl. 192-4.00A.

Grandics, Peter; and Szathmary, Susan. Chromatography media and their uses. 5,466,377, Cl. 210-635.000.

Graneto, Matthew J.: *See*—
Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., 5,466,823, Cl. 548-377.100.

Granovsky, David: *See*—
Blyth, David; Granovsky, David; Ledger, Greg; and Smith, Bruce, 5,465,846, Cl. 206-554.000.

Granville, James E.: *See*—
Fuerst, Rory W.; and Granville, James E., 5,465,509, Cl. 36-88.000.

Gratzinger, Paul: *See*—
Yumibe, George; Gratzinger, Paul; Nguyen, Thanh; and Wisner, Duane, 5,466,161, Cl. 439-66.000.

Graves, Bradford T.; Mazur, Richard A.; and Mennie, Douglas U., to Cummins-Allison Corp. Method and apparatus for currency discrimination. 5,467,406, Cl. 382-135.000.

Graves, Bradford T.: *See*—
Raterman, Donald E.; Graves, Bradford T.; Stromme, Lars R.; and Bauch, Aaron M., 5,467,405, Cl. 382-135.000.

Gray, David R.: *See*—
Dorin, Glenn; Gray, David R.; Chang, Byeong S.; Cowgill, Cynthia A.; and Milley, Robert J., 5,466,781, Cl. 530-351.000.

Graybill, James B.; Hixon, Larry M.; and Huang, Ching-Chung, to Hosokawa Micron International Inc. Pulverizing and grinding hammer. 5,465,912, Cl. 241-27.000.

Grayson, Julia P.: *See*—
Spowage, Mark J.; Grayson, Julia P.; Outhwaite, Alan C.; and Ahmed, Nighat, 5,466,736, Cl. 524-315.000.

Green, Paul D.; and Baur, Stefan T., to Hughes Aircraft Company. Evacuated testing device having calibrated infrared source. 5,466,943, Cl. 250-493.100.

Greenhoe, William J.: *See*—
Davis, Richard E.; and Greenhoe, William J., 5,466,225, Cl. 604-105.000.

Greger, Ferdinand: *See*—
Mattern-Klosson, Monika; Mundinger, Hans-Juergen; and Greger, Ferdinand, 5,465,584, Cl. 62-55.500.

Gregg, John N.: *See*—
Siegele, Stephen H.; Noah, Craig M.; and Gregg, John N., 5,465,766, Cl. 141-198.000.

Greif Bros. Corporation: *See*—
Seick, Thomas; and Wagers, Rex E., 5,465,863, Cl. 220-403.000.

Gresl, Charles, Jr.: *See*—
Moll, Frederic H.; Gresl, Charles, Jr.; Chin, Albert K.; and Hopper, Philip K., 5,465,711, Cl. 600-207.000.

Grethe, Horst: *See*—
Wieland, Stefan; Panster, Peter; and Grethe, Horst, 5,466,767, Cl. 528-9.000.

Gretz, Jon J., to Wilson Sporting Goods Co. Golf bag formed from interlocking tubes. 5,465,839, Cl. 206-315.300.

Gribi, Urs: *See*—
Elvekjaer, Peter; and Gribi, Urs, 5,465,482, Cl. 29-889.100.

Griffin, J. Dewey: *See*—
Brusati, Peter V.; Griffin, J. Dewey; and Sakazaki, Derek J., 5,467,254, Cl. 361-799.000.

Griffioen, Jan H., to N.V. Geb Zuid-Holland West. Delivery point voltage regulation in electric energy distribution networks. 5,466,973, Cl. 307-17.000.

Griffiths, Kenneth F. Closed system multistage superpurification recrystallization. 5,466,266, Cl. 23-295.00R.

Grill, Maria: *See*—
Eschwey, Helmut; Giesen-Wiese, Monika; Grill, Maria; Emirze, Ararad; Seidler, Hans-Peter; Klein, Bernhard; and Kauschke, Michael, 5,466,517, Cl. 428-288.000.

Groome, John M.: *See*—
Martin, Robert; Cayley, George R.; Thacker, Jonathan R. M.; Hall, Franklin R.; North, Denise K.; Groome, John M.; and Jeffries, David A., 5,466,458, Cl. 424-405.000.

Grosgogeat, Eric J.: *See*—
Girardot, Richard M.; Grosgogeat, Eric J.; Yeazell, Charles G.; and Bausch, Richard G., 5,465,452, Cl. 15-210.100.

Grossberg, Sidney E.: *See*—
Kushnaryov, Vladimir M.; Redlich, Philip N.; Grossberg, Sidney E.; and Sedmak, J. James, 5,466,672, Cl. 514-14.000.

Grosser, John T.: *See*—
Ghaed, Ali; Leland, Jonathan K.; Zoski, Glenn D.; Goodman, Jack E.; and Grosser, John T., 5,466,416, Cl. 422-52.000.

Grove, William D. Hand-powered and controlled two-wheeled cycle for the disabled. 5,465,989, Cl. 280-250.000.

Grubbs, Gray W.: *See*—
Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; and Grubbs, Gray W., 5,466,905, Cl. 219-121.460.

Gruettner-Merten, Sabine; Reichelt, Helmut; Lange, Arno; and Degen, Helmut, to BASF Aktiengesellschaft. Azo dyes with an acetalized diazo component of the thiophene or thiazole series. 5,466,790, Cl. 534-753.000.

Grütze, Joachim: *See*—
Riegels, Martin; and Grütze, Joachim, 5,466,265, Cl. 8-594.000.

Gu, Sono: *See*—
Fukushima, Satoru; Gu, Sono; and Mizoguchi, Yoshito, 5,467,196, Cl. 358-298.000.

Gu, Wang-Chang A., to Motorola, Inc. Embedded ground plane for providing shielded layers in low volume multilayer transmission line devices. 5,467,064, Cl. 333-128.000.

Guberman, Shelja A.; Lossev, Ilia; and Pashintsev, Alexander V., to Paragraph International. Method and apparatus for recognizing cursive writing from sequential input information. 5,467,407, Cl. 382-186.000.

Gueffroy, Donald E.: *See*—
Fleig, Gordon E.; and Gueffroy, Donald E., 5,466,947, Cl. 250-582.000.

Gueret, Jean-Louis H., to L'Oreal. Product dispensing unit with movable dispensing device and cap. 5,465,872, Cl. 222-95.000.

Guerin, Roch A.: *See*—
Cidon, Israel; Georgiadis, Leonidas; Guerin, Roch A.; Shavitt, Yuval Y.; and Slater, Andrew E., 5,467,352, Cl. 370-85.500.

Guerout, Philippe: *See*—
Charbonnel, Jean-Louis; Guerout, Philippe; Happey, Jacques L.; Mainfroy, Frédéric G. J.; Naudet, Jacky; and Porcher, Jean-Claude, 5,466,122, Cl. 415-160.000.

Guillet, Antoine J. E.; and Gauthier, Remy C. H., to OSi Specialties, Inc. Aqueous silylated epoxy resin dispersion from secondary silanes. 5,466,729, Cl. 523-421.000.
Guillot, Dominique: *See*—
Poyet, Georges; Badier, Frédéric; and Guillot, Dominique, 5,466,063, Cl. 366-6.000.
Guiness Brewing Worldwide Limited: *See*—
Forage, Alan J.; and Purdham, Robert, 5,466,473, Cl. 426-115.000.
Gulbransen, Inc.: *See*—
Lee, J. Robert, 5,466,882, Cl. 84-603.000.
Gulotty, Robert J., Jr.: *See*—
Bales, Stephen E.; Brennan, David J.; Gulotty, Robert J., Jr.; Inbasekaran, Muthiah N.; Mang, Michael N.; and Newsham, Mark D., 5,466,397, Cl. 252-582.000.
Güntert, Matthias: *See*—
Bertram, Heinz-Jürgen; Emberger, Roland; Güntert, Matthias; and Werkhoff, Peter, 5,466,827, Cl. 549-66.000.
Guo, Baochuan: *See*—
Castleman, Albert W., Jr.; and Guo, Baochuan, 5,466,430, Cl. 423-440.000.
Gupta, Ravinder K.: *See*—
Siiman, Olavi; Burshteyn, Alexander; and Gupta, Ravinder K., 5,466,609, Cl. 436-518.000.
Gutierrez, Eddie N.; and Wu, Shang-Ren, to Lever Brothers Company, Division of Conopco, Inc. Process for the purification of alkaline earth metal salts of 2,2'-oxydisuccinate by acidification. 5,466,875, Cl. 562-580.000.
Gutierrez, Eddie N.: *See*—
Wu, Shang-Ren; Wu, Donna; and Gutierrez, Eddie N., 5,466,868, Cl. 562-580.000.
Guttag, Alvin. Process for recycling printed and plastic coated paper. 5,466,333, Cl. 162-6.000.
Gutteridge, Winston E.: *See*—
Latter, Victoria S.; Gutteridge, Winston E.; and Hudson, Alan T., 5,466,711, Cl. 514-510.000.
Gutweiler, Matthias; and Kroggel, Matthis, to Hoechst Aktiengesellschaft. Plasticized polymer moldings made from modified polyvinyl butyrals. 5,466,751, Cl. 525-58.000.
Guzman, Paulino A.; and Spector, George. Easy jack. 5,465,940, Cl. 254-423.000.
Haak, Ronald P.: *See*—
Myers, Robert M.; Haak, Ronald P.; and Plue, Richard W., 5,466,217, Cl. 604-20.000.
Haarmann & Reimer GmbH: *See*—
Bertram, Heinz-Jürgen; Emberger, Roland; Güntert, Matthias; and Werkhoff, Peter, 5,466,827, Cl. 549-66.000.
Haarmann, Heinz: *See*—
Lurama, Waldemar; and Haarmann, Heinz, 5,467,378, Cl. 378-32.000.
Haas, Jon A.: *See*—
Wentworth, Steven W.; Haas, Jon A.; Crane, Robert F.; and Reynolds, Payce D., 5,465,797, Cl. 173-91.000.
Hachamovitch, Dean J.: *See*—
Williams, Antony; Martinez, Edward A.; and Hachamovitch, Dean J., 5,467,472, Cl. 395-600.000.
Hae Sung Engineering Co., Ltd.: *See*—
Ra, Jong O.; Lim, Joon Y.; and Yoo, Wan M., 5,466,196, Cl. 475-59.000.
Haertl, Hans-Georg; and Berger, Terry A., to Hewlett-Packard. Analytical system having energy efficient pump. 5,465,581, Cl. 62-50.100.
Hagel, Rainer: *See*—
Brede, Uwe; Hagel, Rainer; and Redecker, Klaus, 5,466,313, Cl. 149-1.000.
Hagemann, Jörg: *See*—
Weber, Beate; Hagemann, Jörg; and Geiger, Markus, 5,466,569, Cl. 430-551.000.
Hagen, Floyd W.; Hohenstein, Gregg A.; Severson, John A.; and Trongard, Pennelle J., to B. F. Goodrich Company, The. Multifunctional air data sensing probes. 5,466,067, Cl. 374-138.000.
Hagen, Günter: *See*—
Sieber, Helmut; Schilling, Ferdinand; Hagen, Günter; Kleissendorf, Roland; and Michaelis, Johannes, 5,465,834, Cl. 206-193.000.
Haglund, Michael M.: *See*—
Hochman, Daryl; and Haglund, Michael M., 5,465,718, Cl. 128-653.100.
Hagström, Gunnar: *See*—
Arvidsson, Lars-Erik; Berg, Hans; Engström, Björn; and Hagström, Gunnar, 5,466,368, Cl. 210-198.200.
Hahn, Dennis: *See*—
Appleton, William J.; Hahn, Dennis; Moucha, William E.; Ruscio, Dominic V.; Shannon, John H.; Silbermann, Steven D.; and Weaver, Edwin W., Jr., 5,466,147, Cl. 425-412.000.
Haines, Hiemi K.: *See*—
McClure, Donald C.; and Haines, Hiemi K., 5,465,790, Cl. 166-273.000.
Haines, Marvin L.: *See*—
Edlund, Hans E.; and Haines, Marvin L., 5,465,798, Cl. 175-24.000.
Hait, John N., to Rocky Mountain Research Center. Amplitude to phase conversion logic. 5,466,925, Cl. 250-216.000.
Hajime Industries Ltd.: *See*—
Yoshida, Hajime, 5,467,125, Cl. 348-127.000.
Hakomori, Sen-itroh: *See*—
Igarashi, Yasuyuki; Ahmad, Mohammad N.; Okoshi, Hirofumi; and Hakomori, Sen-itroh, 5,466,716, Cl. 514-642.000.
Hale, Brent: *See*—
Bohl, Eric E.; Hale, Brent; and Parker, Tim, 5,465,884, Cl. 224-407.000.
Haley, Lawrence: *See*—
Corrigan, Colin; and Haley, Lawrence, 5,465,607, Cl. 73-23.360.
Haley, Neil F.; and Corbiere, Steven L., to Eastman Kodak Company. Radiation-sensitive composition containing a resole resin, a novolac resin, a latent bronsted acid, an infrared absorber and terephthalaldehyde and use thereof in lithographic printing plates. 5,466,557, Cl. 430-278.000.
Hall, Bryan C.; Wieczorek, David P.; Wyant, Gordon H.; Wildeson, Ramond T.; and Nally, Debora E., to Siemens Automotive Corporation. Overmolded cover for fuel injector power group and method. 5,465,910, Cl. 239-585.400.
Hall, Bryan C., to Siemens Automotive L.P. Angled terminal/coil design for small diameter fuel injector. 5,465,911, Cl. 239-585.400.
Hall, Franklin R.: *See*—
Martin, Robert; Cayley, George R.; Thacker, Jonathan R. M.; Hall, Franklin R.; North, Denise K.; Groome, John M.; and Jeffries, David A., 5,466,458, Cl. 424-405.000.
Hallermayer, Gerhard: *See*—
Maier, Roland; Müller, Peter; Woitun, Eberhard; Humaus, Rudolf; Mark, Michael; Eisele, Bernhard; Budzinski, Ralph-Michael; and Hallermayer, Gerhard, 5,466,687, Cl. 514-212.000.
Halliburton Company: *See*—
Maki, Voldi E., Jr., 5,467,320, Cl. 367-40.000.
Hallis, John M.: *See*—
Erickson, Jack A.; Kramer, Robert L.; and Hallis, John M., 5,466,315, Cl. 149-96.000.
Halterbeck, Walter: *See*—
Eschmann, Sylvester; Hüser, Martin; and Halterbeck, Walter, 5,465,764, Cl. 139-383.00A.
Hamburg, Douglas R.; Logothetis, Eleftherios M.; and Meyer, Daniel L., to Ford Motor Company. Cold start engine air/fuel control system. 5,465,697, Cl. 123-424.000.
Hamer, Gordon K.: *See*—
Burt, Richard A.; Liebermann, George; Hamer, Gordon K.; Gardner, Sandra J.; Jennings, Carol A.; Daimon, Katsumi; and Nukada, Katsumi, 5,466,796, Cl. 540-139.000.
Hammerbacher, Milfred D.; and Schmit, Russell R., to Texas Instruments Incorporated. Solar cell having an output-increasing, protective cover. 5,466,301, Cl. 136-246.000.
Hammond, Maynard: *See*—
Logston, Gary L.; Wasilewski, Anthony J.; Hammond, Maynard; and Cheung, Francis, 5,467,342, Cl. 370-17.000.
Hanaoka, Osamu: *See*—
Seki, Masaki; and Hanaoka, Osamu, 5,467,445, Cl. 395-142.000.
Hanasaka, Satoru: *See*—
Kishimoto, Shinji; Harashima, Masa; Kanda, Hiroshi; Sasaki, Akira; Tanabe, Kozi; Nosaka, Kenji; Hanasaka, Satoru; and Ishihara, Ken, 5,465,721, Cl. 128-660.070.
Hance, Roger: *See*—
Ruocco, Rita; and Hance, Roger, 5,467,076, Cl. 340-571.000.
Handwerker, Thomas S.; and Counts, Clement L., III, to University of Maryland Eastern Shore. Maintenance-free enhancement of aquatic biological filters using amphipods. 5,466,373, Cl. 210-602.000.
Haneda, Satoshi: *See*—
Itihara, Yoshiyuki; Haneda, Satoshi; Koizumi, Noboru; Hasebe, Takashi; and Niitsuma, Tetsuya, 5,467,422, Cl. 358-298.000.
Washio, Koji; Tanaka, Kazuyoshi; and Haneda, Satoshi, 5,467,202, Cl. 358-448.000.
Haney, Michael W.; and Christensen, Marc P., to Capital Photonics, Inc. Optoelectric sliding banyan network. 5,467,211, Cl. 359-117.000.
Hanke, David E.; Gindelberger, Bruce; and Heiman, Saul, to National Ink Incorporated. Water-based ink composition for ball-point pen. 5,466,281, Cl. 106-20.00R.
Hans Stahlecker: *See*—
Stahlecker, Fritz, 5,465,465, Cl. 19-292.000.
Hans, Waldemar, to Robert Bosch GmbH. Electromagnetically actuatable injection valve having swirl conduits. 5,465,906, Cl. 239-489.000.
Hanson, Terry E. Multi-functional mailbox. 5,465,902, Cl. 232-33.000.
Hanyu, Yukio: *See*—
Hotta, Yoshio; Hanyu, Yukio; Mihara, Tadashi; Kodera, Yasuto; and Nakamura, Katsutoshi, 5,467,209, Cl. 359-74.000.
Happey, Jacques L.: *See*—
Charbonnel, Jean-Louis; Guerout, Philippe; Happey, Jacques L.; Mainfroy, Frédéric G. J.; Naudet, Jacky; and Porcher, Jean-Claude, 5,466,122, Cl. 415-160.000.
Happian-Smith, Julian: *See*—
Clausen, Edvin L.; and Happian-Smith, Julian, 5,466,032, Cl. 296-181.000.
Harada, Tosiharu: *See*—
Mishima, Akio; Harada, Tosiharu; Tanihara, Mamoru; Ota, Yasutaka; Okinaka, Kenji; Mori, Kohji; Kawasaki, Hirofumi; Nagai, Norimichi; Fujimoto, Katsunori; and Okuda, Yoshiro, 5,466,306, Cl. 148-105.000.
Harashima, Masa: *See*—
Kishimoto, Shinji; Harashima, Masa; Kanda, Hiroshi; Sasaki, Akira; Tanabe, Kozi; Nosaka, Kenji; Hanasaka, Satoru; and Ishihara, Ken, 5,465,721, Cl. 128-660.070.
Hardigg Industries, Inc.: *See*—

Hardigg, James S.; and Turner, Edward W., 5,466,316, Cl. 156-69.000.
Hardigg, James S.; and Turner, Edward W., to Hardigg Industries, Inc. Welding method. 5,466,316, Cl. 156-69.000.
Harima, Takayuki: *See*—
Kameda, Yasushi; Nakamura, Kenichi; Takamoto, Hiroshi; Harima, Takayuki; and Segawa, Makoto, 5,467,317, Cl. 365-230.060.
Harms, Frank H.; and Neas, Edwin D., to LifeSource Advanced Bloodbank Systems, Inc. Premeasured fluids packaging, storing and dispensing apparatus and method. 5,465,767, Cl. 141-237.000.
Harmsen, Arlyn. Balancing ring. 5,466,049, Cl. 301-5.220.
Harp, Robert S.: *See*—
Ray, David J.; and Harp, Robert S., 5,466,935, Cl. 250-307.000.
Harper, James C.: *See*—
Nemirow, Arthur T.; and Harper, James C., 5,466,992, Cl. 315-276.000.
Harris Corporation: *See*—
Beasom, James D., 5,466,963, Cl. 257-516.000.
Harris, Martin W.; and Cambra, John J., to Tuff Boy Holding, Inc. Side loading vehicle: apparatus and method. 5,466,030, Cl. 296-98.000.
Harrison, Daniel J.; Simpson, William H.; Bowman, Wayne A.; Lawrence, Kristine B.; and Weber, Helmut, to Eastman Kodak Company. Thermal dye transfer receiving element for mordanting ionic dyes. 5,466,658, Cl. 503-227.000.
Harrison, John: *See*—
Singaram, Bakthan; Fisher, Gary B.; Fuller, Joseph C.; Harrison, John; and Goralski, Christian T., 5,466,798, Cl. 540-541.000.
Harrison, Paul R.: *See*—
Carr, Graham; Harrison, Paul R.; and James, Alun P., 5,466,825, Cl. 548-479.000.
Harrogate Holdings, Limited: *See*—
Royds, Robert B.; Lim, John; and Rosen, Joel D., 5,466,465, Cl. 424-449.000.
Hart, James E.: *See*—
McKay, Albert A.; and Hart, James E., 5,466,105, Cl. 411-84.000.
Harte, James R., to Koch Supplies, Inc. Hinge assembly for vacuum packaging machine. 5,465,557, Cl. 53-510.000.
Hartmann, Heinrich: *See*—
Kroner, Matthias; Schornick, Gunnar; Baur, Richard; Schwendemann, Volker; and Hartmann, Heinrich, 5,466,762, Cl. 525-472.000.
Harvest Fuel, Inc.: *See*—
Thornberg, Robert, 5,466,115, Cl. 414-786.000.
Harwath, Frank A.: *See*—
Bowen, David C.; Harwath, Frank A.; and Triner, Irvin R., 5,465,479, Cl. 29-749.000.
Hasebe, Koichi: *See*—
Kuno, Yoshinori; Tanabe, Noboru; and Hasebe, Koichi, 5,467,102, Cl. 345-1.000.
Hasebe, Takashi: *See*—
Itihara, Yoshiyuki; Haneda, Satoshi; Koizumi, Noboru; Hasebe, Takashi; and Niitsuma, Tetsuya, 5,467,422, Cl. 358-298.000.
Hasegawa, Kenichi, to Fujitsu Limited. Incoming message processing method in plurality of terminal equipments and terminal equipment executing said method. 5,467,079, Cl. 340-825.160.
Hasegawa, Kenichi: *See*—
Taguchi, Takayuki; Hasegawa, Kenichi; Baba, Sohkichi; and Takai, Yoshitsugu, 5,466,555, Cl. 430-110.000.
Hasegawa, Miki, to Rohm Co. Ltd. Resin-packaged electronic component. 5,466,887, Cl. 174-52.200.
Hasegawa, Taiji: *See*—
Fujisawa, Masaaki; Hasegawa, Taiji; Ishii, Toshio; Sasaki, Shoji; and Sakamoto, Masahide, 5,467,277, Cl. 364-424.050.
Hasegawa, Takehiro; Watanabe, Shigeyoshi; and Masuoka, Fujio, to Kabushiki Kaisha Toshiba. Semiconductor memory device having register groups for writing and reading data. 5,467,303, Cl. 365-149.000.
Haseltine, Douglas M.; Yount, Thomas L.; and Ryans, Jimmy L., to Eastman Chemical Company. Vaccum system for controlling pressure in a polyester process. 5,466,765, Cl. 526-65.000.
Hashimoto, Isamu: *See*—
Ohsawa, Yutaka; and Hashimoto, Isamu, 5,467,200, Cl. 358-426.000.
Hashimoto, Kenichi; Machara, Toshio; Imaizumi, Yasuo; and Asai, Tetsuo, to Fuji Jukogyo Kabushiki Kaisha. Press die assembly. 5,465,602, Cl. 72-347.000.
Hashimoto, Minoru, to Sony Corporation. Optical disc playback apparatus and method which utilizes single RAM for data decoding and TOC processing. 5,467,329, Cl. 369-48.000.
Hashimoto, Takeshi: *See*—
Yamada, Sadayuki; Muramatsu, Shigeru; Hashimoto, Takeshi; and Fukuhara, Hiroyuki, 5,466,136, Cl. 418-55.600.
Hass, Crystal J.: *See*—
Yakura, James P.; Cole, Richard K.; Von Thun, Matthew S.; Hass, Crystal J.; and Allman, Derryl D. J., 5,466,614, Cl. 437-8.000.
Hassler, Joachim; Lenk, Rudi; and Neusch, Michael, to Nokia Technology GmbH. Process and device for magnetizing a magnet ring in the neck of a color picture tube. 5,466,180, Cl. 445-3.000.
Hasuda, Masanori: *See*—
Matsubara, Takashi; Kanamuro, Masayuki; and Hasuda, Masanori, 5,467,160, Cl. 354-246.000.
Hatanai, Takashi; and Takahashi, Akira, to Alps Electric Co., Ltd. Gapped flexure tongue for floating type magnetic head apparatus. 5,467,236, Cl. 360-104.000.
Hatano, Akitsugu; Okazaki, Tsuyoshi; Sumida, Yukihiro; Nojima, Takashi; and Yamashita, Hidehiko, to Sharp Kabushiki Kaisha. Liquid crystal light valve with dual function as both optical-to-electrical and optical-to-optical transducer. 5,467,204, Cl. 358-482.000.
Hatcher, Donald. Pig holder. 5,465,688, Cl. 119-728.000.
Hattori, Tadashi: *See*—
Yamaguchi, Hitoshi; Fujino, Seiji; and Hattori, Tadashi, 5,466,303, Cl. 148-33.000.
Hattori, Takao; Iwanaga, Takaki; and Yamaguchi, Toru, to Kabushiki Kaisha Toshiba. Electric dust collector system. 5,466,279, Cl. 96-69.000.
Hausmann, Herb: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.
Haven, Willem S.: *See*—
Nogle, Thomas D.; Haven, Willem S.; and Kietlinski, Tomasz K., 5,466,195, Cl. 475-55.000.
Hawkins Chemical, Inc.: *See*—
Sevenich, John R., 5,466,477, Cl. 426-582.000.
Hawkins, Gene P.: *See*—
Miller, Larry E.; Hawkins, Gene P.; and Durham, Bernard G., 5,466,870, Cl. 564-298.000.
Hawkins, Mark R.: *See*—
Williamson, Gregory L.; Hawkins, Mark R.; and Tate, William J., 5,467,240, Cl. 361-18.000.
Hayakawa, Hidenori: *See*—
Goto, Toshio; Hayakawa, Hidenori; Watanabe, Yukiyoshi; Narabu, Shin-ichi; and Yanagi, Akihiko, 5,466,660, Cl. 504-134.000.
Hayakawa, Yutaka: *See*—
Tosaka, Masaki; Saijo, Hiroyuki; Kawano, Haruki; Hayakawa, Yutaka; and Ohi, Toshiaki, 5,466,395, Cl. 252-551.000.
Hayama, Satoru: *See*—
Okumura, Keiji; Aoki, Takeshi; Sugishima, Yoshio; Hayama, Satoru; Taguchi, Keiichi; Iwase, Yuichiro; and Okamoto, Noriaki, 5,465,947, Cl. 270-58.000.
Hayasaka, Nobuo: *See*—
Sakai, Itsuko; Hayasaka, Nobuo; and Okano, Haruo, 5,466,942, Cl. 250-492.200.
Hayashi, Nobuhiro: *See*—
Nakagawa, Susumu; Hayashi, Nobuhiro; and Nakagawa, Hiroshi, 5,465,827, Cl. 198-465.300.
Hayashi, Takao: *See*—
Murakami, Yutaka; Nakamura, Toru; Hayashi, Takao; Matsubara, Akira; and Aizawa, Hisashi, 5,467,328, Cl. 369-44.160.
Hayden, Richard A., to Calgon Carbon Corporation. Method for reactivating nitrogen-treated carbon catalysts. 5,466,645, Cl. 502-56.000.
Hayden, Richard A.: *See*—
Dussert, Bertrand W.; Farmer, Richard W.; and Hayden, Richard A., 5,466,378, Cl. 210-660.000.
Haynes, Carla A.: *See*—
Rosenthal, Arthur L.; Light, Nicholas D.; and Haynes, Carla A., 5,466,462, Cl. 424-426.000.
Hayssen Manufacturing Company: *See*—
Cherney, Dale M., 5,466,326, Cl. 156-359.000.
Dreger, Douglas D., 5,465,558, Cl. 53-551.000.
Health Care Keyboard Company: *See*—
Szmanda, Jeffrey P.; and Szmanda, William J., 5,466,078, Cl. 400-489.000.
Heartstream, Inc.: *See*—
Morgan, Carlton B., 5,466,244, Cl. 607-5.000.
Heaton, John C.: *See*—
Adams, Jonathan P.; Rastrelli, Edmund C.; and Heaton, John C., 5,466,144, Cl. 425-174.400.
Heck, Dale B.: *See*—
Baillargeon, David J.; Cardis, Angeline B.; Heck, Dale B.; and Johnson, Susan W., 5,466,267, Cl. 44-386.000.
Heck, Roland H.; Heinemann, Heinz; Reischman, P. T.; Venuto, Paul B.; and Whitehurst, D. Duayne, to Mobil Oil Corporation. Process for the disposal of aqueous sulfur and caustic-containing wastes. 5,466,361, Cl. 208-131.000.
Heckman, James K.; Carney, Francis J.; and Geyer, Harry J., to Motorola, Inc. Semiconductor chip package and method of forming. 5,467,253, Cl. 361-761.000.
Heemels, Jan P.: *See*—
Spinelli, Julio C.; and Heemels, Jan P., 5,466,245, Cl. 607-17.000.
Heflinger, Lee O.; Simmons, William W.; St. Pierre, Randall J.; and Injeyan, Hagop, to TRW Inc. Birefringence-compensated alignment-insensitive frequency doubler. 5,467,214, Cl. 359-238.000.
Hegg, Thomas R.: *See*—
Fasciano, Peter J.; Rawley, Curt A.; Hegg, Thomas R.; Leathurby, Mackenzie; Bedell, Jeffrey L.; and Ravan, James A., Jr., 5,467,288, Cl. 364-514.00R.
Heidelberger Druckmaschinen AG: *See*—
Rodi, Anton; and Reithofer, Jürgen, 5,467,436, Cl. 395-114.000.
Springer, Johannes, 5,466,212, Cl. 493-434.000.
Heidlas, Jürgen; Cully, Jan; Michlbauer, Franz; and Volfbrecht, Heinz-Rüdiger, to SKW Trostberg Aktiengesellschaft. Process for the isolation of lipid fractions from EGG products in powder form. 5,466,842, Cl. 554-[illegible]11.000.

Heidt, Philip C.; Foster, Charles H.; Witzeman, J. Stewart; and Crain, Allen L., to Eastman Chemical Company. Thermosetting coating compositions. 5,466,863, Cl. 560-176.000.
Heiman, Saul: *See*—
Hanke, David E.; Gindelberger, Bruce; and Heiman, Saul, 5,466,281, Cl. 106-20.000R.
Heine, Uwe: *See*—
Meehan, Brian W.; Heine, Uwe; and Mason, James M., 5,466,603, Cl. 435-285.100.
Heineman, Rolf: *See*—
Davis, R. Andrew; and Heineman, Rolf, 5,465,903, Cl. 238-8.000.
Heinemann, Heinz: *See*—
Heck, Roland H.; Heinemann, Heinz; Reischman, P. T.; Venuto, Paul B.; and Whitehurst, D. Duayne, 5,466,361, Cl. 208-131.000.
Heiner, Hal R.; and Jenkins, Kendall. Hay roll bagging system. 5,465,559, Cl. 53-567.000.
Heinrich, Klaus, to ABB Management Ltd. Centrifugal compressor with a flow-stabilizing casing. 5,466,118, Cl. 415-58.600.
Heinz, William. Lawn mower with rotatable wheels. 5,465,563, Cl. 56-17.200.
Heinzmann, Helmut: *See*—
Begemann, Ulrich; Heinzmann, Helmut; and Ruf, Wolfgang, 5,466,340, Cl. 162-216.000.
Heitkämper, Peter: *See*—
Walker, Michael; and Heitkämper, Peter, 5,467,394, Cl. 379-392.000.
Heitzmann, David E., to MOR/ryde International, Inc. Rubber spring tag axle supension. 5,465,997, Cl. 280-716.000.
Helber, Margaret J.: *See*—
Diehl, Donald R.; Helber, Margaret J.; and Williamson, Hugh, 5,466,813, Cl. 548-179.000.
Helland, John R., to Pacesetter, Inc. Coronary sinus lead with atrial sensing capability. 5,466,254, Cl. 607-123.000.
Henderson, Gerald J.; Johnson, Peter C.; and Sullivan, Lawrence B., to Atlantic Richfield Company. Method of simulating a seismic survey. 5,466,157, Cl. 434-299.000.
Henderson, Robert W.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 110-48.000.
Hendrickson, Kenneth: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.
Henkel Corporation: *See*—
Share, Paul E., 5,466,721, Cl. 522-34.000.
Henlopen Manufacturing Co., Inc.: *See*—
Schrepf, Volker, 5,466,081, Cl. 401-129.000.
Hennecke, Klaus: *See*—
Goebel, Olaf; and Hennecke, Klaus, 5,465,708, Cl. 126-635.000.
Henriksson, Mats E.: *See*—
Karlsson, Rolf L.; Tinoco, Hernan; and Henriksson, Mats E., 5,466,272, Cl. 55-457.000.
Heptner, Patricia. Partially fitted top sheet for bed and method of using and making same. 5,465,440, Cl. 5-497.000.
Herak, Jure J.: *See*—
Kovacevic, Mice; Herak, Jure J.; Mandic, Zora; Lukic, Irena; Tomic, Mirjana; and Brkic, Zinka, 5,466,686, Cl. 514-210.000.
Herbert Gesellschaft mit beschrankter Haftung: *See*—
Flosbach, Carmen; Philipp, Dieter; and Schubert, Walter, 5,466,860, Cl. 560-43.000.
Herbert GmbH: *See*—
Kießling, Gerhard; Pillath, Raimund; Reuther, Stefan; and Richter, Anja, 5,466,492, Cl. 427-522.000.
Hercules Incorporated: *See*—
Babcock, Laura M.; Bard, John K.; and Leibfried, Raymond T., Sr., 5,466,512, Cl. 428-209.000.
Babcock, Laura M.; Bard, John K.; and Leibfried, Raymond T., Sr., 5,466,728, Cl. 523-179.000.
Herd, Josef, to Maschinenfabrik Goebel GmbH. Cylinder for processing. 5,465,641, Cl. 83-698.610.
Herdt, Hubert; and Hurt, Josef, to Hoechst Aktiengesellschaft. Process for dyeing fur skins with oxidation dyes. 5,466,263, Cl. 8-404.000.
Herleikson, Earl C.: *See*—
Baumgartner, Richard A.; Moore, Charles E.; and Herleikson, Earl C., 5,467,090, Cl. 341-155.000.
Herman Miller, Inc.: *See*—
McPherson, James I.; Kinney, Daniel R.; Jeannot, William E., Jr.; and Karel, Thomas R., 5,466,062, Cl. 312-348.600.
Herman, William David. Bathing appliance for handicapped persons. 5,465,437, Cl. 4-611.000.
Herman, William P., to Hsin Lung Accessories Co. Ltd. Bicycle seat post with an adjusting mechanism. 5,466,042, Cl. 297-215.150.
Hermecz, István: *See*—
Ivanics, József; Szabó, Tibor; Hermecz, István; Dalmadi, Gyula; Ivanics, Józsefné; Kovács, Gáborné; and Bahram, Resul, 5,466,833, Cl. 549-475.000.
Herr, Nedra A.: *See*—
Wunderlich, Daniel F.; Herr, Nedra A.; Shannon, Donald N.; and Kuhn, L. Dean, 5,467,077, Cl. 340-635.000.
Herrmann, Wolfgang A.: *See*—
Konkol, Werner; Bahrmann, Helmut; Herrmann, Wolfgang A.; and Kohlpaintner, Christian, 5,466,644, Cl. 502-28.000.
Herrmeyer, Dennis C., to Rigid Form, Inc. Vehicle door upper assembly. 5,465,531, Cl. 49-463.000.
Herrmeyer, Dennis C., to Rigid Form, Inc. Article unloading system and method. 5,466,103, Cl. 410-33.000.
Herron, Matt: *See*—
Law, David; Boyle, Dennis; and Herron, Matt, 5,466,166, Cl. 439-159.000.
Herzig, Christian, to Wacker-Chemie GmbH. Sulfonium salts and process for their preparation. 5,466,845, Cl. 556-12.000.
Herzig, Yaacov: *See*—
Sterling, Jeff; and Herzig, Yaacov, 5,466,683, Cl. 514-80.000.
Hess, Irwin H.; and Weber, Leo D. Liquid circulating device. 5,466,369, Cl. 210-220.000.
Heuvel, Herman M.: *See*—
Maria, Christiaan J.; De Weijer, Anton P.; Middeljans, Hendrik; and Heuvel, Herman M., 5,466,525, Cl. 428-357.000.
Hewlett-Packard: *See*—
Haertl, Hans-Georg; and Berger, Terry A., 5,465,581, Cl. 62-50.100.
Hewlett-Packard Company: *See*—
Arnold, Barry J., 5,467,026, Cl. 326-16.000.
Baumgartner, Richard A.; Moore, Charles E.; and Herleikson, Earl C., 5,467,090, Cl. 341-155.000.
Bhaskaran, Vasudev; and Lee, Ruby B., 5,467,131, Cl. 348-384.000.
Childers, Winthrop D., 5,467,115, Cl. 347-47.000.
Evans, Roger F.; Thierheimer, Charles L., Jr.; and Pawlowski, Norman E., 5,467,117, Cl. 347-87.000.
Fan, Siqi; Root, David E.; and Meyer, Jeffrey W., 5,467,291, Cl. 364-578.000.
Field, Leslie A.; and Ruby, Richard C., 5,467,067, Cl. 335-4.000.
Field, Leslie A.; and Ruby, Richard C., 5,467,068, Cl. 335-4.000.
Gragg, Brian D.; and Clark, James E., 5,467,118, Cl. 347-87.000.
Motley, Gordon W.; Meier, Peter J.; and Miller, Brian C., 5,467,038, Cl. 327-185.000.
Movaghar, Abdolreza; Rhoads, W. Wistar; and Nguyen, Michael A., 5,466,077, Cl. 400-354.000.
Mui, Paul K.; and Huffman, John W., 5,467,178, Cl. 355-285.000.
Nash, Mark E.; and Kennedy, Ronald R., 5,467,231, Cl. 360-46.000.
Quintana, Jason, 5,466,079, Cl. 400-579.000.
Richtsmeier, Brent W.; Russell, Todd L.; Medin, Todd R.; and Meyer, William D., 5,467,119, Cl. 347-102.000.
Seyed-Bolorforosh, Mir S., 5,465,725, Cl. 128-662.030.
Hexacomb Corporation: *See*—
Komarek, Dale W.; and Moser, Paul, 5,466,211, Cl. 493-355.000.
Hexcel Corporation: *See*—
Darfler, Stephen C., 5,466,507, Cl. 428-116.000.
HF Scientific, Inc.: *See*—
Beers, Howard L., 5,467,187, Cl. 356-243.000.
Hi-Shear Technology Corporation: *See*—
Smith, Walter C.; and Mooney, Thomas R., 5,465,490, Cl. 30-180.000.
Hiatt and Company Limited: *See*—
Bickerton, David J.; and Wakefield, David, 5,465,960, Cl. 273-84.00R.
Hibino, Ikuo: *See*—
Kobayashi, Hiroshi; Hibino, Ikuo; Maruyama, Takahito; Hori, Fumihisa; Nakamura, Tadashi; Matsuura, Takanobu; and Ohsakama, Chikashi, 5,466,076, Cl. 400-248.000.
Hicks, Sharon D.; Wicks, Douglas A.; and Hunter, John H., to Bayer Corporation. Coating compositions based on aldimines and polyisocyanates containing allophanate groups. 5,466,771, Cl. 528-64.000.
Hicswa, Daniel: *See*—
Bressler, Peter; Sweeney, Niall; Hicswa, Daniel; and Burns, James A., 5,466,223, Cl. 604-110.000.
Hidaka, Akihiko, to Seiko Instruments Inc. Thermogravimetric apparatus with a balance arm vibrating function. 5,466,066, Cl. 374-14.000.
Hidaka, Hiroyuki: *See*—
Abe, Makoto; Ohta, Shigekata; Tokitoh, Hiroyuki; Ueda, Morimasa; Kano, Takahumi; and Hidaka, Hiroyuki, 5,467,289, Cl. 364-560.000.
Hidaka, Shizuaki: *See*—
Kono, Satoshi; Hidaka, Shizuaki; and Takahashi, Tetsu, 5,465,635, Cl. 74-595.000.
Hidec Co., Ltd.: *See*—
Iguchi, Atsushi; Akabane, Atsushi; Yamashita, Takehiro; and Matsuoka, Koichi, 5,466,916, Cl. 219-633.000.
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Nasu, Hidetoshi; and Sato, Kazunobu, to Kabushiki Kaisha Shikoku Sogo Kenkyujo; and Sato, Kazunobo. Electric vehicle. 5,465,806, Cl. 180-165.000.
Higgins, David E.; and Wright, Martin, to Imperial Chemical Industries PLC. Polymeric film. 5,466,535, Cl. 428-483.000.
Higgins, Gary. Multi-function valve for a riser in a sprinkler system. 5,465,752, Cl. 137-512.500.
Higgins, Joel C.: *See*—
England, Garry L.; and Higgins, Joel C., 5,466,530, Cl. 428-411.100.
Highland Supply Corporation: *See*—
Weder, Donald E., 5,465,551, Cl. 53-397.000.
Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., 5,465,552, Cl. 53-399.000.

Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., 5,465,553, Cl. 53-399.000.
Higuchi, Toshihiko, to Seiko Epson Corporation. Semiconductor device having a multilayer interconnection layer. 5,466,971, Cl. 257-751.000.
Hijiya, Toyoto: *See*—
Takemoto, Tadashi; Hijiya, Toyoto; Yonekawa, Teruo; and Mochizuki, Chiaki, 5,466,864, Cl. 562-445.000.
Hilbish, Brian K.; Burgess, Arnold C.; and Wilson, Michael A., to Simplimatic Engineering Company. Pressurized air conveyor. 5,466,096, Cl. 406-14.000.
Hill, Alan P.: *See*—
Robertson, Alan D.; Hill, Alan P.; Glen, Robert C.; and Martin, Graeme R., 5,466,699, Cl. 514-323.000.
Hills, William H., to BASF Corporation. Process of making multiple monocomponent fiber. 5,466,410, Cl. 264-172.110.
Hilton, Michael W.; Plasterer, Michael R.; and Browne, Bruce H., to Claris Corporation. Text formatting by the direct selection of borders in an editing display. 5,467,448, Cl. 395-148.000.
Hiltunen, Matti: *See*—
Viel Lamare, Charles; Hiltunen, Matti; and Lee, Yam, 5,465,690, Cl. 122-4.00D.
Hino, Yuji: *See*—
Yoshida, Hironari; and Hino, Yuji, 5,467,028, Cl. 326-38.000.
Hinohara, Tomoaki; and Vetter, James W. Guide wire for catheters and method for its use. 5,465,733, Cl. 128-772.000.
Hiraharu, Teruo: *See*—
Maeda, Tukasa; Sasagawa, Yasuhiko; Ikeda, Yorinobu; and Hiraharu, Teruo, 5,466,739, Cl. 524-525.000.
Hirai, Katsuaki: *See*—
Yamada, Takeshi; and Hirai, Katsuaki, 5,465,949, Cl. 271-110.000.
Hirai, Yukio; Kanayama, Kouzou; Yoshii, Kenji; Iwasaki, Kiyotoshi; Kanai, Isao; and Suzuki, Shin, to Topy Kogyo Kabushiki Kaisha; and Ishihara, Shunso. Method for forming an annular member. 5,465,598, Cl. 72-84.000.
Hiraiwa, Atsushi: *See*—
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,466,621, Cl. 437-52.000.
Hirakata, Susumu: *See*—
Akutsu, Eiichi; Soga, Hiroh; Ando, Shigehito; Hirakata, Susumu; and Maruyama, Kazuo, 5,466,654, Cl. 503-206.000.
Hirano, Hiroshige; Sumi, Tatsumi; Moriwaki, Nobuyuki; and Nakane, George, to Matsushita Electric Industrial Company, Ltd. Semiconductor memory device. 5,467,302, Cl. 361-145.000.
Hirano, Tadayoshi: *See*—
Ozaki, Masami; Ikeda, Atsuhiko; Yumita, Takashi; Honami, Reijiro; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,466,705, Cl. 514-383.000.
Hiraoka, Soichiro, to Three Bond Co., Ltd. Adhesive composition comprising a cyanoacrylate and an epoxy adduct. 5,466,764, Cl. 525-530.000.
Hirashima, Isao: *See*—
Gotomyo, Yasuo; Kore, Haruhisa; Muramoto, Hisao; Nomura, Yoshinbu; Kohno, Shigefumi; and Hirashima, Isao, 5,466,001, Cl. 280-730.100.
Hirata, Tetsuya: *See*—
Fujie, Naofumi; Fukura, Kenichi; Ito, Koichi; Hirata, Tetsuya; and Nishio, Naoto, 5,466,038, Cl. 296-213.000.
Hiratsuka, Mitsunori; Takano, Minoru; Enomoto, Masayuki; Kizawa, Satoru; and Saitoh, Kazuo, to Sumitomo Chemical Company, Limited. Tetrahydrophthalimide derivatives and their use as herbicides. 5,466,663, Cl. 504-286.000.
Hironaka, Yasumasa: *See*—
Tanimoto, Toshinobu; Okamoto, Yoshikatsu; Yoshida, Shinji; and Hironaka, Yasumasa, 5,466,913, Cl. 219-492.000.
Hironaka, Yoshio; Nakamura, Hiroaki; and Kusumoto, Tadashi, to Idemitsu Kosan Co., Ltd. Organic electroluminescence device and compound having an aluminum complex structure. 5,466,392, Cl. 252-301.160.
Hirose, Tatuya: *See*—
Terada, Fusao; Nakazato, Takashi; Tadano, Rikio; Tanigawa, Naohide; Hirose, Tatuya; Ikegami, Kazuo; and Fukushima, Kiyoshi, 5,465,579, Cl. 62-6.000.
Hirose, Youichi: *See*—
Miura, Shin; Hiroae, Youichi; and Sato, Mitsuaki, 5,466,277, Cl. 75-255.000.
Hiroshi, Tanaka: *See*—
Nakao, Tohru; Yuji, Ono; Hiroshi, Tanaka; Minoru, Obata; and Yasuto, Morimoto, 5,466,691, Cl. 514-254.000.
Hirsch, Martin: *See*—
Queneau, Paul E.; and Hirsch, Martin, 5,466,278, Cl. 75-501.000.
Hirth, Bradford H.: *See*—
Butera, John A.; Antane, Schuyler A.; and Hirth, Bradford H., 5,466,712, Cl. 514-524.000.
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, to Hitachi, Ltd. Method of manufacturing a semiconductor device having silicon islands. 5,466,621, Cl. 437-52.000.
Hiserman, Franklin R. Ball rolling game. 5,465,962, Cl. 273-118.00R.
Hitachi America, Ltd.: *See*—
Hunt, Frank, 5,465,701, Cl. 123-531.000.
Hitachi Chemical Company, Ltd.: *See*—
Kaji, Makoto; Odoi, Chie; Sagawa, Masaichi; Kagawa, Hiroyuki; Kakuta, Atsushi; Ishii, Kikujiro; Nakayama, Hideyuki; and Ogawa, Keiichiro, 5,467,421, Cl. 385-122.000.
Hitachi Engineering & Services Co, Ltd.: *See*—
Kawamura, Fumio; Shimada, Shigeru; and Ikeda, Tsutomu, 5,467,444, Cl. 395-141.000.
Hitachi Koki Co., Ltd.: *See*—
Mitani, Masao, 5,467,112, Cl. 347-1.000.
Hitachi, Ltd.: *See*—
Beng, Lim T.; Chong, Chai T.; Amagai, Masazumi; Anjoh, Ichiro; Arita, Junichi; Tsubosaki, Kunihiro; Ichitani, Masahiro; and Edwards, Darvin, 5,466,888, Cl. 174-52.200.
Fujisawa, Masaaki; Hasegawa, Taiji; Ishii, Toshio; Sasaki, Shoji; and Sakamoto, Masahide, 5,467,277, Cl. 364-424.050.
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,466,621, Cl. 437-52.000.
Itagaki, Hiroyuki; Taniguchi, Yo; Shiono, Hidemi; Takiguchi, Kenji; and Yamamoto, Etsuji, 5,465,719, Cl. 128-653.500.
Ito, Yutaka; Mori, Makoto; and Gohara, Shinobu, 5,467,346, Cl. 370-60.000.
Iwahara, Yoshiaki; Kuroda, Shoji; Sakamoto, Shuichi; and Ogino, Masanori, 5,467,221, Cl. 359-449.000.
Kajimoto, Takeshi; Shimbo, Yutaka; Sato, Katsuyuki; Ogata, Masahiro; Kenmizaki, Kanehide; Kubono, Shouji; Kato, Nobuo; Manita, Kiichi; and Kanamitsu, Michitaro, 5,467,315, Cl. 365-222.000.
Kawamura, Fumio; Shimada, Shigeru; and Ikeda, Tsutomu, 5,467,444, Cl. 395-141.000.
Kida, Junzo; Arita, Hiroshi; and Kurosawa, Yukio, 5,467,049, Cl. 327-438.000.
Miyazawa, Kazuyuki; Shimohigashi, Katsuhiro; Etoh, Jun; and Kimura, Katsutaka, 5,467,314, Cl. 365-201.000.
Mizuno, Fumio; Moriuchi, Noboru; Shirai, Seiichiro; Moroishi, Yutaka; Sunakawa, Makoto; and Kawanishi, Michirou, 5,466,325, Cl. 156-344.000.
Nakamura, Shigeru; Arimoto, Akira; Suzuki, Kenkichi; and Shibata, Katsuhiko, 5,467,417, Cl. 385-36.000.
Nakata, Kiyoshi; Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Terunuma, Mutsuhiro; Suzuki, Masato; Tsutsui, Yoshio; Toyota, Eiichi; and Yasuda, Kouji, 5,467,262, Cl. 363-41.000.
Okuyama, Yoshiyuki; Kitamura, Tadaaki; Kobayashi, Yoshiki; Yahiro, Masakazu; and Fujiwara, Kazunori, 5,467,402, Cl. 382-104.000.
Ouchi, Yasuhide; Sato, Naoki; Sawaguchi, Hideki; and Hori, Yosuke, 5,467,232, Cl. 360-65.000.
Saiki, Eisaku; Mizokami, Takuya; and Matsunami, Naoto, 5,467,331, Cl. 369-53.000.
Sakai, Katsuhiko; Nasu, Osamu; and Ose, Yoichi, 5,466,929, Cl. 250-251.000.
Shirai, Shoji; Watanabe, Kenichi; and Wakita, Shoichi, 5,466,983, Cl. 313-414.000.
Sugitani, Sinzi; Tanimizu, Toru; Takematsu, Koutarou; Wakasa, Fumio; and Izumi, Toshiaki, 5,467,241, Cl. 361-63.000.
Takahashi, Takehiro; Daito, Kazuhiko; and Kawaoka, Akihiro, 5,467,475, Cl. 395-800.000.
Takamoto, Yuusuke; Masaki, Ryoso; Obara, Sanshiro; and Kaneko, Satoru, 5,467,275, Cl. 364-426.010.
Tanaka, Toshihiro; Kato, Masataka; Kume, Hitoshi; Ogura, Keisuke; and Adachi, Tetsuo, 5,467,309, Cl. 365-185.140.
Watai, Hiroo; Nishida, Takao; Nagumo, Takaharu; and Nagai, Masahiko, 5,467,292, Cl. 364-578.000.
Yamada, Akihiro; Shimoda, Makoto; Nakahara, Masaji; and Yoshioka, Masahiro, 5,467,265, Cl. 364-154.000.
Yoshida, Tatsuya; and Oho, Shigeru, 5,467,272, Cl. 364-424.010.
Hitachi Maxell, Ltd.: *See*—
Takahashi, Takehiro; Daito, Kazuhiko; and Kawaoka, Akihiro, 5,467,475, Cl. 395-800.000.
Hitachi Medical Corporation: *See*—
Kishimoto, Shinji; Harashima, Masa; Kanda, Hiroshi; Sasaki, Akira; Tanabe, Kozi; Nosaka, Kenji; Hanasaka, Satoru; and Ishihara, Ken, 5,465,721, Cl. 128-660.070.
Hitachi VLSI Engineering Corp.: *See*—
Kajimoto, Takeshi; Shimbo, Yutaka; Sato, Katsuyuki; Ogata, Masahiro; Kenmizaki, Kanehide; Kubono, Shouji; Kato, Nobuo; Manita, Kiichi; and Kanamitsu, Michitaro, 5,467,315, Cl. 365-222.000.
Hitko, Donald A.: *See*—
Manlove, Gregory J.; and Hitko, Donald A., 5,467,034, Cl. 327-63.000.
Hixon, Larry M.: *See*—
Graybill, James B.; Hixon, Larry M.; and Huang, Ching-Cbung, 5,465,912, Cl. 241-27.000.
Hixson, Kenneth L., to AMF Bowling Inc. T-shaped foul line construction joining lane sections. 5,466,193, Cl. 473-115.000.
Hjorth, Jens, to Royal Seafoods, Inc. Device for processing flat fish. 5,466,186, Cl. 452-170.000.
Hlasta, Dennis J.; Ackerman, James H.; Mura, Albert J.; and Desai, Ranjit C., to Sterling Winthrop Inc. Saccharin derivative proteolytic enzyme inhibitors. 5,466,701, Cl. 514-373.000.
Hluchyj, Michael G.: *See*—
Lee, Whay C.; and Hluchyj, Michael G., 5,467,343, Cl. 370-54.000.
Ho, Hwa-Shan. System and method for precision downhole tool-face setting and survey measurement correction. 5,465,799, Cl. 175-61.000.

Ho, Shu K.; and Yao, Yi F., to Ho, Shu K. Herbal-based oral composition and process for producing the same. 5,466,443, Cl. 424-70.600.

Hobbs, Peter D.: *See*—
Dawson, Marcia L.; Cameron, James F.; Hobbs, Peter D.; Jong, Ling; Pfahl, Magnus; Zhang, Xiao-kun; and Lehmann, Jürgen M., 5,466,861, Cl. 560-100.000.

Hochkeppel, Heinz-Kurt: *See*—
Horisberger, Michel A.; Hochkeppel, Heinz-Kurt; and Content, Jean, 5,466,585, Cl. 435-69.100.

Hochman, Daryl; and Haglund, Michael M. Solid tumor, cortical function, and nerve tissue imaging methods and device. 5,465,718, Cl. 128-653.100.

Hockey, Edward J. Ball retrieving and storage device. 5,466,027, Cl. 294-19.200.

Hocquaux, Michel: *See*—
Terranova, Eric; Galey, Jean B.; Hocquaux, Michel; Maignan, Jean; and Tuloup, Rémy, 5,466,694, Cl. 514-272.000.

Hoechst Aktiengesellschaft: *See*—
Angelmayer, Karl-Hans; Walz, Gerd; and Zoeller, Joachim, 5,466,772, Cl. 528-73.000.
Dietz, Erwin; and Urban, Manfred, 5,466,807, Cl. 546-6.000.
Enhsen, Alfons; Glombik, Heiner; Kramer, Werner; and Wess, Günther, 5,466,815, Cl. 548-252.000.
Gutweiler, Matthias; and Kroggel, Matthis, 5,466,751, Cl. 525-58.000.
Herdt, Hubert; and Hurt, Josef, 5,466,263, Cl. 8-404.000.
Konkol, Werner; Bahrmann, Helmut; Herrmann, Wolfgang A.; and Kohlpaintner, Christian, 5,466,644, Cl. 502-28.000.
Obermeier, Rainer; Sabel, Walter; Deil, Peter; and Geisen, Karl, 5,466,666, Cl. 514-3.000.
Römer, Michael; Schleicher, Andreas; and Stamprech, Peter, 5,466,738, Cl. 524-508.000.
Schach, Thomas; Papenfuhs, Theodor; and Pfirmann, Ralf, 5,466,859, Cl. 558-425.000.

Hoechst Celanese Corporation: *See*—
Davenport, Kenneth G.; Sheldon, Roger A.; Le Bars, Joel; and Mueller, Werner H., 5,466,869, Cl. 564-265.000.
Saukaitis, John C., 5,466,808, Cl. 546-153.000.
Scates, Mark O.; Warner, R. Jay; and Torrence, G. Paull, 5,466,874, Cl. 562-519.000.
Tafesh, Ahmed M.; Kvakovszky, George; and Lindley, Charlet R., 5,466,873, Cl. 568-312.000.

Hoechstetter, Craig S.: *See*—
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,466,709, Cl. 514-432.000.

Hoeks, Theodorus L.; Claesen, Christianus A. A.; Lohmeijer, Johannes H. G. M.; and Pickett, James E., to General Electric Company. Thermoplastic composition with boron compounds. 5,466,733, Cl. 524-141.000.

Hoff, Don G., to Seiko Corporation; and Seiko Epson Corporation. Dual communication mode video tape recorder. 5,467,197, Cl. 358-335.000.

Hoffman, D. Stephen; and Lowe, Charles F., to Ultra-Mek, Inc. Ottoman including storage receptacle. 5,466,041, Cl. 297-188.100.

Hoffman, Keith A., to Knape & Vogt Manufacturing Company. Drawer slide with access holes. 5,466,060, Cl. 312-334.800.

Hoffmann-La Roche Inc.: *See*—
Abramson, Richard D.; and Gelfand, David H., 5,466,591, Cl. 435-194.000.
Derungs, Romano; Märki, Hans P.; Stalder, Henri; and Szente, André, 5,466,708, Cl. 514-449.000.

Hofmann, Karl, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 5,465,907, Cl. 239-533.900.

Hög, George: *See*—
Rohrmann, Peter; Weiss, Alexander; Hög, George; and Zamzow, Peter, 5,467,420, Cl. 385-101.000.

Hogan, Neville; Krebs, Hermano I.; Sharon, Andre; and Charnnarong, Jain, to Massachusetts Institute of Technology. Interactive robotic therapist. 5,466,213, Cl. 601-33.000.

Hogg, John M. Electrically operated motorized turnbuckle. 5,466,083, Cl. 403-46.000.

Hohensein, Gregg A.: *See*—
Hagen, Floyd W.; Hohenstein, Gregg A.; Severson, John A.; and Trongard, Pennelle J., 5,466,067, Cl. 374-138.000.

Hohmann, Frank G.: *See*—
Richter, Simon J.; Hohmann, Frank G.; and Vesely, Ernst, 5,466,413, Cl. 264-521.000.

Holik, Herbert; Leitenberger, Werner; and Pinter, Reinhard, to Sulzer-Escher Wyss GmbH. Suction roll in particular for a paper web dryer. 5,465,502, Cl. 34-115.000.

Holland, Gary F.: *See*—
Galbraith, Lyle D.; Holland, Gary F.; Poole, Donald R.; and Mitchell, Robert M., 5,465,795, Cl. 169-11.000.

Holland, Wayland B.: *See*—
Kaya, Cetin; Holland, Wayland B.; and Mezenner, Rabah, 5,467,306, Cl. 365-185.200.

Hollander, Milton B.; Jacobs, David R.; and Angrave, Janice E., to Omega Engineering, Inc. Protective identifying shield and protected instrument case. 5,465,838, Cl. 206-305.000.

Hollis, Dale R.: *See*—
de Anda, Richard N.; and Hollis, Dale R., 5,467,247, Cl. 361-232.000.

Holm-Kennedy, James W. Methods and devices for enhanced biochemical sensing. 5,466,348, Cl. 204-153.100.

Holton, Robert A., to Florida State University. Preparation of substituted isoserine esters using metal alkoxides and β-lactams. 5,466,834, Cl. 549-510.000.

Holtz, Richard B.: *See*—
della-Cioppa, Guy R.; Garger, Stephen J., Jr.; Holtz, Richard B.; McCulloch, Michael J.; and Sverlow, Genadie G., 5,466,592, Cl. 435-212.000.

Home Co., Ltd.: *See*—
Goto, Yasuo, 5,466,086, Cl. 403-268.000.

Hommann, Edgar: *See*—
Bigler, Michael; Hommann, Edgar; and Myerly, Scott, 5,465,444, Cl. 15-22.100.

Homoelle, John B.: *See*—
Mefford, John J.; and Homoelle, John B., 5,466,493, Cl. 427-384.000.

Honami, Reijiro: *See*—
Ozaki, Masami; Ikeda, Atsuhiko; Yumita, Takashi; Honami, Reijiro; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,466,705, Cl. 514-383.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Aihara, Takao; Fukuda, Taro; and Takada, Hideaki, 5,466,177, Cl. 440-50.000.
Sato, Katsuaki; Tominaga, Katsuhiko; Saka, Tsutomu; Kawamura, Osamu; Takahashi, Teruo; and Kakiuchi, Arata, 5,466,276, Cl. 75-231.000.
Shibayama, Takao; and Maekawa, Keiichiro, 5,465,616, Cl. 73-118.100.

Honda, Yutaka; Shiragami, Hiroshi; Iwagami, Hisao; and Arai, Masayuki, to Ajinomoto Co., Inc. Process for preparing 2', 3'- dideoxyinosine. 5,466,793, Cl. 536-55.300.

Honeywell Inc.: *See*—
Aizpuru, Jose J.; and Matzen, Walter T., 5,466,954, Cl. 257-187.000.
Akinwande, Akintunde I., 5,466,982, Cl. 313-309.000.
Desmarais, Richard R.; and Karpinski, Andrew J., Jr., 5,467,190, Cl. 356-350.000.

Honjo, Toshio: *See*—
Sato, Yuji; Honjo, Toshio; Kayamoto, Kanao; Ogata, Masahiro; and Shimizu, Kouichi, 5,466,552, Cl. 430-106.600.

Hoopes, Philip K.: *See*—
Kass, John J.; Hoopes, Philip K.; Sously, Wayne E.; and Aspinall, Graeme H., 5,465,991, Cl. 280-457.000.

Hoover, Terry A. Motorized wheelbarrow. 5,465,801, Cl. 180-19.100.

Hopkins, David M. Stairway carpet fastening device. 5,465,459, Cl. 16-11.000.

Hoppe, Richard J.: *See*—
Sutrina, Thomas; Crowe, Lawrence E.; Smith, Edward W.; Peterson, Ronald F.; and Hoppe, Richard J., 5,466,974, Cl. 307-38.000.

Hopper, Philip K.: *See*—
Moll, Frederic H.; Gresl, Charles, Jr.; Chin, Albert K.; and Hopper, Philip K., 5,465,711, Cl. 600-207.000.

Hori, Fumihisa: *See*—
Kobayashi, Hiroshi; Hibino, Ikuo; Maruyama, Takahito; Hori, Fumihisa; Nakamura, Tadashi; Matsuura, Takanobu; and Ohsakama, Chikashi, 5,466,076, Cl. 400-248.000.

Hori, Yosuke: *See*—
Ouchi, Yasuhide; Sato, Naoki; Sawaguchi, Hideki; and Hori, Yosuke, 5,467,232, Cl. 360-65.000.

Horiguchi, Akira; and Oda, Shingo, to Daicel Chemical Industries, Ltd. Method of producing carbonic diesters. 5,466,856, Cl. 558-277.000.

Horisberger, Michel A.; Hochkeppel, Heinz-Kurt; and Content, Jean, to Ciba-Geigy Corporation. Interferon-induced human protein in pure form, monoclonal antibodies thereto, and test kits containing these antibodies. 5,466,585, Cl. 435-69.100.

Horiuchi, Makoto; Koyama, Kazutaka; Kamitani, Takayuki; and Ozawa, Masataka, to Matsushita Electric Industrial Co., Ltd. High pressure discharge lamp having improved convection regulating means. 5,466,988, Cl. 313-35.000.

Horrobin, David F.; McMordie, Austin; and Manku, Mehar S., to Scotia Holdings PLC. Formulations containing unsaturated fatty acids. 5,466,841, Cl. 554-79.000.

Horvat, Ivan J. Pre-filter with rotating nozzle. 5,466,271, Cl. 55-294.000.

Hosaka, Sumio: *See*—
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; Hosaka, Sumio; Ono, Kouichi; and Moriyama, Yoshiaki, 5,466,883, Cl. 84-610.000.

Hoshi, Youichi; Speliotis, Dennis E.; and Judy, Jack H., to Kabushiki Kaisha Kobe Seiko Sho. Barium hexaferrite-silicon nitride-carbon magnetic recording medium. 5,466,524, Cl. 428-336.000.

Hosking, Jack K.; and Eidemanis, Gunars, to Oak Industries, Inc. Modular railway maintenance system. 5,465,667, Cl. 104-17.200.

Hosoi, Hideki: *See*—
Mishima, Ikuhiro; Ikeda, Munehiro; and Hosoi, Hideki, 5,466,750, Cl. 525-84.000.

Hosokawa Micron International Inc.: *See*—
Graybill, James B.; Hixon, Larry M.; and Huang, Ching-Chung, 5,465,912, Cl. 241-27.000.

Hosoya, Kimio; Teruya, Yoshihiro; and Kobayashi, Yasushi, to Fujitsu Limited. Method and apparatus for cutting patterns of printed wiring boards and method and apparatus for cleaning printed wiring boards. 5,466,908, Cl. 217-121.680.

Hotta, Yoshio; Hanyu, Yukio; Mihara, Tadashi; Kodera, Yasuto; and Nakamura, Katsutoshi, to Canon Kabushiki Kaisha. Ferroelectric liquid crystal device with particular layer thicknesses at non-pixel portions and pixel portions. 5,467,209, Cl. 359-74.000.

Hough, Joseph W.: *See*—
Royalty, Charles M.; Traxler, William; and Hough, Joseph W., 5,465,756, Cl. 137-625.310.

Houghton, Mark P.; and Verburg, Charles C., to Lever Brothers Company. Liquid cleaning products. 5,466,390, Cl. 252-174.170.

Houlihan, John T., to Timex Corporation. Wristwatch radiotelephone with deployable voice port. 5,467,324, Cl. 368-10.000.

Hourcard, Michel: *See*—
Romieu, Jacques; Degouy, Didier; Parigot, Philippe; and Hourcard, Michel, 5,465,609, Cl. 73-38.000.

Houston Fearless 76, Inc.: *See*—
Lindke, Paul A., 5,466,344, Cl. 202-205.000.

Hovakimian, Henry. Credit/charge card system enabling purchasers to contribute to selected charities. 5,466,919, Cl. 235-380.000.

Howard, James R.; and Lucas, Gregory L., to Zycon Corporation. Circuit boards including capacitive coupling for signal transmission and methods of use and manufacture. 5,466,892, Cl. 174-261.000.

Howard, Paul A.; and Durham, James H., to Hubbell Incorporated. Electrical cabinet with door-mounted heat exchanger. 5,467,250, Cl. 361-696.000.

Howard, Paul L.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.

Howell, Wayne J.: *See*—
Beilstein, Kenneth E., Jr.; Bertin, Claude L.; Cronin, John E.; Howell, Wayne J.; Leas, James M.; and Phillips, Robert B., 5,466,634, Cl. 437-180.000.

Hower, John D., Jr.; Martin, Kathleen M.; Gramlich, John D.; and Baldwin, LeRoy A., to Xerox Corporation. Sheet transport for high productivity trayless duplex. 5,467,182, Cl. 355-319.000.

Hower, John D., Jr.; and Campanella, Michael L., to Xerox Corporation. Apparatus and method for determining printer option availability and representing conflict resolution in a combination of print job selections. 5,467,434, Cl. 395-114.000.

Hsieh, Chang-Ming; Hsu, Louis L. C.; and Ogura, Seiki, to International Business Machines Corporation. Method of making a high-density DRAM structure on SOI. 5,466,625, Cl. 437-52.000.

Hsieh, Harry W., to Essex Specialty Products, Inc. Primer composition for improving the bonding of a urethane adhesive to non-porous substrates. 5,466,727, Cl. 523-421.000.

Hsin Lung Accessories Co. Ltd.: *See*—
Herman, William P., 5,466,042, Cl. 297-215.150.

Hsu, Che-Hsiung, to Du Pont de Nemours, E. I., and Company. Process for batch-plating aramid fibers. 5,466,485, Cl. 427-306.000.

Hsu, Louis L.-C.: *See*—
Chapple-Sokol, Jonathan D.; Hsu, Louis L.-C.; Tkang, Paul J.-M.; and Yuan, Chi-Min, 5,465,859, Cl. 216-12.000.
Hsieh, Chang-Ming; Hsu, Louis L. C.; and Ogura, Seiki, 5,466,625, Cl. 437-52.000.

HTM Sport S.p.A.: *See*—
Garofalo, Giovanni, 5,465,517, Cl. 42-70.060.

Hu, Chen-Ti; and Chiou, Wen-Chih, to National Science Council. Method of manufacturing a NI-Al intermetallic compound matrix composite. 5,466,311, Cl. 148-513.000.

Hu, Vince; and Wang, James. High speed, low power direct digital synthesizer. 5,467,294, Cl. 364-721.000.

Huang, Andrew B.: *See*—
Fulcher, Fred; and Huang, Andrew B., 5,465,707, Cl. 126-263.080.

Huang, Austin L.; and Florence, James M., to Texas Instruments Incorporated. Illumination control unit for display system with spatial light modulator. 5,467,146, Cl. 348-743.000.

Huang, Ching-Chung: *See*—
Graybill, James B.; Hixon, Larry M.; and Huang, Ching-Chung, 5,465,912, Cl. 241-27.000.

Huang, Jiansheng: *See*—
Nakatsu, Tetsuo; Kang, Kok Lean R.; McAlister, Kelly L.; and Huang, Jiansheng, 5,466,718, Cl. 514-724.000.

Huang, Yung-Hui: *See*—
Lee, Chester C.; Chang, Tao C.; and Huang, Yung-Hui, 5,466,763, Cl. 525-523.000.

Hubbell Incorporated: *See*—
Howard, Paul A.; and Durham, James H., 5,467,250, Cl. 361-696.000.
Lengyel, Szabolcs G.; and Murphy, Thomas C., Jr., 5,466,886, Cl. 174-48.000.

Huber, David R. Addressable grating modulation system for optical cable TV system. 5,467,212, Cl. 359-168.000.

Hudson, Alan T.: *See*—
Latter, Victoria S.; Gutteridge, Winston E.; and Hudson, Alan T., 5,466,711, Cl. 514-510.000.

Hudson, Alice P.; Woodward, Fred E., deceased; Woodward, by Sam, executor; Timmons, Richard J.; and Goertz, Harvey M., to OMS Investments, Inc. Abrasion resistant coatings for fertilizers. 5,466,274, Cl. 71-28.000.

Hudson, Dannie B., to ENRJ Ltd. Fuel homogenization system with dual compensating homogenization valves. 5,466,064, Cl. 366-132.000.

Hudson, Keith. Archery bow backpack carrier. 5,465,887, Cl. 224-209.000.

Hudson Soft Co., Ltd.: *See*—
Tsubota, Kazuo; and Tahata, Syouichi, 5,467,442, Cl. 395-135.000.

Huerta, Pedro L., Jr.: *See*—
Poulos, Charles W.; Brenner, George M.; Allen, Loyd V., Jr.; Prabhu, Vilas A.; and Huerta, Pedro L., Jr., 5,466,695, Cl. 514-275.000.

Huey, Henry E.; and Nishimura, Michael J., to TRW Inc. Address handler for an asynchronous transfer mode switch. 5,467,349, Cl. 370-60.100.

Huff, Robert O.: *See*—
Owens, Valerie; Shadeck, Louis M.; and Huff, Robert O., 5,465,983, Cl. 279-157.000.

Huffman, John W.: *See*—
Mui, Paul K.; and Huffman, John W., 5,467,178, Cl. 355-285.000.

Huffstutler, Miles C., Jr.; and Steuart, Gary M. Polyphase fluid-extraction process, resulting products and methods of use. 5,466,455, Cl. 424-401.000.

Hughes Aircraft Company: *See*—
Burns, Richard W.; and Atkinson, Darren E., 5,467,063, Cl. 333-125.000.
Green, Paul D.; and Baur, Stefan T., 5,466,943, Cl. 250-493.100.
Kishner, Stanley J., 5,467,191, Cl. 356-360.000.

Hughes-Avicom International, Inc.: *See*—
Salomon, Andreas H., 5,467,106, Cl. 345-87.000.

Hughes, Larry J.: *See*—
Panandiker, Rajan K.; Wertz, William C.; and Hughes, Larry J., 5,466,802, Cl. 544-193.200.

Huignard, Jean-Pierre: *See*—
Loiseaux, Brigitte; Joubert, Cécile; Huignard, Jean-Pierre; Joffre, Pascal; and Nicolas, Christophe, 5,467,206, Cl. 359-40.000.

Hukuda, Yutaka: *See*—
Kanno, Tatsuya; Hukuda, Yutaka; and Oshino, Yasuhiro, 5,466,774, Cl. 528-199.000.

Hume, Roger A.; and Felstead, Richard A., to GE Lighting Limited. Decorative lamp. 5,467,259, Cl. 362-307.000.

Humphries, Victor A. Toothbrush. 5,465,450, Cl. 15-167.100.

Hunt, Frank, to Hitachi America, Ltd. Internal combustion fuel control system. 5,465,701, Cl. 123-531.000.

Hunt, Paul C., to National Rural Electric Cooperative Assn. System for detection of the phase of an electrical signal on an alternating circuit power line. 5,467,011, Cl. 324-67.000.

Hunter, John H.: *See*—
Hicks, Sharon D.; Wicks, Douglas A.; and Hunter, John H., 5,466,771, Cl. 528-64.000.

Hunter, Robert L., to Emory University. Methods for reducing salmonella in chickens. 5,466,445, Cl. 424-78.310.

Huntsman Corporation: *See*—
Lambert, Timothy L.; and Knifton, John F., 5,466,778, Cl. 528-361.000.

Huon, Pierre J.; Jachimcsyk, Philippe; Barucchi, Gerard; Calvignac, Jean; and Verplanken, Fabrice, to International Business Machines Corporation. Apparatus for generating and checking the error correction codes of messages in a message switching system. 5,467,359, Cl. 371-37.100.

Hurd, Clinton J.: *See*—
Donaghue, Norman J., Jr.; Hurd, Clinton J.; and Mullen, David C., 5,467,391, Cl. 379-265.000.

Hurnaus, Rudolf: *See*—
Maier, Roland; Müller, Peter; Woitun, Eberhard; Hurnaus, Rudolf; Mark, Michael; Eisele, Bernhard; Budzinski, Ralph-Michael; and Hallermayer, Gerhard, 5,466,687, Cl. 514-212.000.

Hurt, Josef: *See*—
Herdt, Hubert; and Hurt, Josef, 5,466,263, Cl. 8-404.000.

Huser, Diane: *See*—
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,466,709, Cl. 514-432.000.

Hüser, Martin: *See*—
Eschmann, Sylvester; Hüser, Martin; and Halterbeck, Walter, 5,465,764, Cl. 139-383.00A.

Hutsell, Larry, to Maxtor Corporation. Spindle motor start control process and apparatus. 5,466,999, Cl. 318-431.000.

Hyakutake, Kiyoshi, to Matsushita Electric Industrial Co., Ltd. Charging apparatus. 5,467,007, Cl. 320-22.000.

Hydra Rig, Inc.: *See*—
Goode, John E., 5,465,583, Cl. 62-50.200.

Hydra-Tight Limited: *See*—
Percival-Smith, Harry D., 5,466,107, Cl. 411-546.000.

Hydraulic Tool Engineering, Inc.: *See*—
Lapp, Ellsworth W., 5,465,755, Cl. 137-625.210.

Hydril Company: *See*—
Carlson, Douglas W.; and Simmons, Stephen P., 5,465,759, Cl. 138-110.000.

Hydro Delta Corporation: *See*—
McCahill, David I.; and Valli, Gary E., 5,465,588, Cl. 62-127.000.

Hymes, Richard H. Cooking apparatus and method. 5,465,652, Cl. 99-400.000.

Hyoung-Ik, Lee: *See*—
Yoon-Sik, Lee; Byeong-Deog, Park; and Hyoung-Ik, Lee, 5,466,758, Cl. 525-384.000.

Hyundai Electronics America: *See*—
Yakura, James P.; Cole, Richard K.; Von Thun, Matthew S.; Hass, Crystal J.; and Allman, Derryl D. J., 5,466,614, Cl. 437-8.000.

Hyundai Electronics Industries Co., Ltd.: *See*—
Choi, Yang K., 5,466,640, Cl. 437-195.000.

Kim, Jae K., 5,466,637, Cl. 437-187.000.
i-Stat Corporation: *See*—
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., 5,466,575, Cl. 435-6.000.
Iannazzi, Peter: *See*—
Parker, Thomas; and Iannazzi, Peter, 5,466,412, Cl. 264-255.000.
Ibah, Inc.: *See*—
Geyer, Robert P.; and Tuliani, Vinod V., 5,466,865, Cl. 562-496.000.
Ibidunni, Ajibola O.: *See*—
Frank, Aaron L.; Ibidunni, Ajibola O.; Johnson, Douglas B.; Krause, Dennis L.; and Nguyen, Trac, 5,466,972, Cl. 257-764.000.
Ichihara, Masaki, to NEC Corporation. Time constant detecting circuit and time constant adjusting circuit. 5,466,976, Cl. 307-112.000.
Ichijima, Seiji: *See*—
Tashiro, Mamoru; and Ichijima, Seiji, 5,466,566, Cl. 430-505.000.
Ichikawa, Takeshi; Yonehara, Takao; Sakamoto, Masaru; Naruse, Yasuhiro; Nakayama, Jun; Yamagata, Kenji; and Sakaguchi, Kiyofumi, to Canon Kabushiki Kaisha. Method for producing semiconductor articles. 5,466,631, Cl. 437-62.000.
Ichikawa, Takeshi: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,466,961, Cl. 257-379.000.
Ichinokawa, Hiroaki, to Victor Company of Japan, Ltd. Television receiver for reproducing video images having different aspect ratios and characters transmitted with video images. 5,467,142, Cl. 348-556.000.
Ichitani, Masahiro: *See*—
Beng, Lim T.; Chong, Chai T.; Amagai, Masazumi; Anjoh, Ichiro; Arita, Junichi; Tsubosaki, Kunihiro; Ichitani, Masahiro; and Edwards, Darvin, 5,466,888, Cl. 174-52.200.
Ide, Kinya: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Morita, Koichi; Masuko, Michio; Ide, Kinya; and Ueyama, Yoshito, 5,466,661, Cl. 504-253.000.
Ideal Ideas, Inc.: *See*—
Glynn, Kenneth P., 5,465,880, Cl. 222-321.800.
Ideal Industries, Inc.: *See*—
Konen, Bruce P.; and Van Naarden, Robert W., 5,465,637, Cl. 81-9.510.
Idemitsu Kosan Co., Ltd.: *See*—
Hironaka, Yoshio; Nakamura, Hiroaki; and Kusumoto, Tadashi, 5,466,392, Cl. 252-301.160.
Igarashi, Yasuyuki; Ahmad, Mohammad N.; Okoshi, Hirofumi; and Hakomori, Sen-itroh, to Biomembrane Institute, The. Liposomal trimethylsphingosine. 5,466,716, Cl. 514-642.000.
Iguchi, Atsushi; Akabane, Atsushi; Yamashita, Takehiro; and Matsuoka, Koichi, to Hidec Co., Ltd.; and Asahi Yukizai Kogyo Co. Ltd. Method and apparatus for joint resin pipes using high-frequency electric induction heating. 5,466,916, Cl. 219-633.000.
Iguchi, Yoshikazu: *See*—
Suzuki, Minoru; and Iguchi, Yoshikazu, 5,466,143, Cl. 425-140.000.
Ihara Chemical Industry Co., Ltd.: *See*—
Ozaki, Masami; Ikeda, Atsuhiko; Yumita, Takashi; Honami, Reijiro; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,466,705, Cl. 514-383.000.
Iino, Tadashi; Furuya, Yoshiyuki; and Aoki, Kunimitsu, to Yazaki Corporation. Display apparatus. 5,467,103, Cl. 345-7.000.
Iiyama, Michitomo: *See*—
Inada, Hiroshi; Nakamura, Takao; and Iiyama, Michitomo, 5,466,664, Cl. 505-330.000.
Iizuka, Yukio, to Daifuku Co., Ltd. Load storing equipment. 5,466,109, Cl. 414-283.000.
Ikeda, Atsuhiko: *See*—
Ozaki, Masami; Ikeda, Atsuhiko; Yumita, Takashi; Honami, Reijiro; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,466,705, Cl. 514-383.000.
Ikeda, Kaoru; Sato, Toshiaki; and Ishiura, Kazuhige, to Kuraray Co., Ltd. Resin composition. 5,466,748, Cl. 525-57.000.
Ikeda, Minari, to NEC Corporation. Output circuit for multibit-outputting memory circuit. 5,467,054, Cl. 327-589.000.
Ikeda, Munehiro: *See*—
Mishima, Ikuhiro; Ikeda, Munehiro; and Hosoi, Hideki, 5,466,750, Cl. 525-84.000.
Ikeda, Osamu: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,466,961, Cl. 257-379.000.
Ikeda, Tatsufumi: *See*—
Kudoh, Kichizo; Kikuchi, Yasuo; Ishida, Tatsuya; Ikeda, Tatsufumi; and Fujimoto, Hiroaki, 5,466,703, Cl. 514-374.000.
Ikeda, Tsutomu: *See*—
Kawamura, Fumio; Shimada, Shigeru; and Ikeda, Tsutomu, 5,467,444, Cl. 395-141.000.
Ikeda, Yorinobu: *See*—
Maeda, Tukasa; Sasagawa, Yasuhiko; Ikeda, Yorinobu; and Hiraharu, Teruo, 5,466,739, Cl. 524-525.000.
Ikegami, Iwao. Magnetic brake. 5,465,815, Cl. 188-164.000.
Ikegami, Kazuo: *See*—
Terada, Fusao; Nakazato, Takashi; Tadano, Rikio; Tanigawa, Naohide; Hirose, Tatuya; Ikegami, Kazuo; and Fukushima, Kiyoshi, 5,465,579, Cl. 62-6.000.
Ikoma, Akira: *See*—
Kimura, Tomohisa; and Ikoma, Akira, 5,465,474, Cl. 29-601.000.
Ikoma, Munehisa; Muramatsu, Kimie; Matsuda, Hiromu; Akutsu, Norikatsu; and Matsumoto, Isao, to Matsushita Electric Industrial Co., Ltd. Nickel positive electrode for use in alkaline storage battery and nickel-hydrogen storage battery using the same. 5,466,543, Cl. 429-59.000.
Ilardi, Joseph M.; Schwartzkopf, George; and Dailey, Gary G., to J. T. Baker Inc. PH adjusted nonionic surfactant-containing alkaline cleaner composition for cleaning microelectronics substrates. 5,466,389, Cl. 252-156.000.
Ilderem, Vida; and Leibiger, Steven M., to National Semiconductor Corporation. BiCMOS device having self-aligned well tap and method of fabrication. 5,466,960, Cl. 257-369.000.
Illig, Carl R.: *See*—
Baker, Edward J.; Bacon, Edward R; Illig, Carl R.; Caulfield, Thomas J.; Douty, Brent D.; Josef, Kurt A.; Toner, John L.; and Lee, Robert W., 5,466,435, Cl. 424-9.450.
Washburn, William N.; Lussier, Barbara B.; Illig, Carl R.; and Latimer, Lee H., 5,466,715, Cl. 514-618.000.
Imaizumi, Yasuo: *See*—
Hashimoto, Kenichi; Maehara, Toshio; Imaizumi, Yasuo; and Asai, Tetsuo, 5,465,602, Cl. 72-347.000.
Imanishi, Dai: *See*—
Shigeta, Masanobu; Imanishi, Dai; and Shimizu, Shigeo, 5,467,216, Cl. 359-263.000.
ImaR, Pharmaceutical Corp.: *See*—
Unger, Evan C.; and Shen, DeKang, 5,466,438, Cl. 424-936.500.
Imboden, Walter H.; Myers, Jonathan M.; and Caudle, Donald M., to Sara Lee Corporation. Panty garment and method for forming same. 5,465,594, Cl. 66-177.000.
Imler, Donald C.; and Keller, Dirk A., to National Feedscrew & Machining Industries, Inc. Tire press with improved segmented mold operator. 5,466,140, Cl. 425-38.000.
IMM Institut Fur Mikrotechnik GmbH: *See*—
Ruf, Alexander; Abraham, Michael; Lacher, Manfred; Zetterer, Thomas; and Dietrich, Thomas R., 5,465,611, Cl. 73-104.000.
Immunivest Corporation: *See*—
Liberti, Paul A.; Wang, Yuzhou; Tang, Weixin; Feeley, Brian P.; and Gohel, Dhanesh I., 5,466,574, Cl. 435-5.000.
Imperial Chemical Industries, PLC: *See*—
Cuthbert, Murray W., 5,466,826, Cl. 548-511.000.
Higgins, David E.; and Wright, Martin, 5,466,535, Cl. 428-483.000.
Warrington, Roger P.; Ramsay, Guy; and Bird, Neal R., 5,466,693, Cl. 514-269.000.
IMPRA, Inc.: *See*—
Kowligi, Rajagopal R.; Bibeau, John M.; and Taylor, Howard H., 5,466,509, Cl. 428-141.000.
Imran, Mir A.; Pomeranz, Mark L.; and Zadno-Azizi, Gholam-Reza, to Cardiac Pathways Corporation. Apparatus and Method for ventricular mapping and ablation. 5,465,717, Cl. 128-642.000.
Inada, Hiroshi; Nakamura, Takao; and Iiyama, Michitomo, to Sumitomo Electric Industries, Ltd. Method for manufacturing a superconducting device having a thin superconducting channel formed of oxide superconductor material. 5,466,664, Cl. 505-330.000.
Inada, Hiroshi: *See*—
Kamiya, Tadao; Inoue, Motoyuki; and Inada, Hiroshi, 5,466,285, Cl. 106-35.000.
Inagaki, Shinya: *See*—
Takeda, Keiko; Inagaki, Shinya; Tagawa, Kenji; and Sasaki, Kazuya, 5,467,218, Cl. 359-341.000.
Inagaki, Tomoko: *See*—
Kusano, Yukihiro; Inagaki, Tomoko; Yoshikawa, Masato; Akiyama, Setsuo; and Naitoh, Kazuo, 5,466,424, Cl. 422-186.050.
Inaishi, Kouji, to Brother Kogyo Kabushiki Kaisha. Photosensitive microencapsulated toner. 5,466,556, Cl. 430-138.000.
Inaji, Toshio: *See*—
Matsuo, Keisuke; and Inaji, Toshio, 5,467,004, Cl. 318-807.000.
Inbasekaran, Muthiah N.: *See*—
Bales, Stephen E.; Brennan, David J.; Gulotty, Robert J., Jr.; Inbasekaran, Muthiah N.; Mang, Michael N.; and Newsham, Mark D., 5,466,397, Cl. 252-582.000.
Indo, Kenichi; and Onodera, Hitoshi, to Yamaha Hatsudoki Kabushiki Kaisha. Attracting nozzle control apparatus for a chip component mounting machine. 5,467,186, Cl. 356-150.000.
Indravudh, Virote: *See*—
Srisathapat, Chad; and Indravudh, Virote, 5,466,218, Cl. 604-49.000.
Industrial Technology Research Institute: *See*—
Sun, Jyi-Yu; Chian, Tao; Shih, Di-Kon; and Wang, Chih-Yao, 5,465,782, Cl. 165-104.260.
Ingersoll-Rand Company: *See*—
Sell, Leslie J., 5,465,939, Cl. 254-276.000.
Injeyan, Hagop: *See*—
Heflinger, Lee O.; Simmons, William W.; St. Pierre, Randall J.; and Injeyan, Hagop, 5,467,214, Cl. 359-238.000.
Inman, Frederick R., Jr.: *See*—
Inman, Frederick R., Sr.; and Inman, Frederick R., Jr., 5,466,178, Cl. 440-61.000.
Inman, Frederick R., Sr.; and Inman, Frederick R., Jr., to Inman Marine Corporation. Load-relieving external steering system for marine outdrive units. 5,466,178, Cl. 440-61.000.
Inman Marine Corporation: *See*—

Inman, Frederick R., Sr.; and Inman, Frederick R., Jr., 5,466,178, Cl. 440-61.000.

Inoue, Hideya: *See*—
Ezawa, Akira; Daitoku, Koichi; Inoue, Hideya; Kazami, Kazuyuki; and Ohtsuka, Kazuto, 5,467,156, Cl. 354-21.000.

Inoue, Motoyuki: *See*—
Kamiya, Tadao; Inoue, Motoyuki; and Inada, Hiroshi, 5,466,285, Cl. 106-35.000.

Inoue, Shunsuke: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,466,961, Cl. 257-379.000.

Inoue, Yoshio; Susumu, Sekiguchi; and Kurihara, Yasuo, to Shin-Etsu Chemical Co., Ltd. Antibacterial, antifungal silicone rubber composition. 5,466,726, Cl. 523-122.000.

Institut Francais du Petrole: *See*—
Prevost, Isabelle; and Rojey, Alexandre, 5,466,384, Cl. 210-787.000.

Institut National de La Recherche Agronomique: *See*—
Loisel, William G., 5,465,610, Cl. 73-60.110.

Integral Peripherals, Inc.: *See*—
Utenick, Michael R.; and Blagaila, John H., 5,466,997, Cl. 318-254.000.

Intel Corporation: *See*—
Coelho, Rohan, 5,467,450, Cl. 395-155.000.
Fujimoto, Harry H.; and Das, Siddhartha, 5,465,860, Cl. 216-24.000.
Ong, Tong-Chern; and Tang, Daniel N., 5,466,624, Cl. 437-52.000.
Patel, Piyush G., 5,467,460, Cl. 395-70.000.
Young, Bruce; Carson, Dave; Rasmussen, Norman; Fischer, Stephen; and Rabe, Jeffrey, 5,467,295, Cl. 395-200.050.

International Business Machines Corporation: *See*—
Armacost, Michael; Baker, A. Richard, Jr.; Berry, Wayne S.; Carl, Daniel A.; Kenney, Donald M.; and Licata, Thomas J., 5,466,626, Cl. 437-60.000.
Barnes, Michael S.; Keller, John H.; Logan, Joseph S.; Tompkins, Robert E.; and Westerfield, Robert P., Jr., 5,467,249, Cl. 361-234.000.
Beilstein, Kenneth E., Jr.; Bertin, Claude L.; Cronin, John E.; Howell, Wayne J.; Leas, James M.; and Phillips, Robert B., 5,466,634, Cl. 437-180.000.
Bertin, Claude L.; DiMaria, Donelli J.; Miyakawa, Makoto; and Sakaue, Yoshinori, 5,467,305, Cl. 365-185.010.
Blum, Arnold; Goldrian, Gottfried; and Kumpf, Wolfgang, 5,467,452, Cl. 395-200.120.
Boyette, James E., Jr.; and Mahlbacher, James C., 5,467,020, Cl. 324-537.000.
Chapple-Sokol, Jonathan D.; Hsu, Louis L.-C.; Tsang, Paul J.-M.; and Yuan, Chi-Min, 5,465,859, Cl. 216-12.000.
Cidon, Israel; Georgiadis, Leonidas; Guerin, Roch A.; Shavitt, Yuval Y.; and Slater, Andrew E., 5,467,352, Cl. 370-85.500.
Cronin, John E.; Kaanta, Carter W.; Kenney, Donald M.; Kerbaugh, Michael L.; Landis, Howard S.; Machesney, Brian J.; Parries, Paul; Previti-Kelly, Rosemary A.; and Rembetski, John F., 5,466,636, Cl. 437-187.000.
Flinn, Donald R.; Laszcz, John F.; and Withers, David H., 5,467,285, Cl. 364-478.000.
Hsieh, Chang-Ming; Hsu, Louis L. C.; and Ogura, Seiki, 5,466,625, Cl. 437-52.000.
Huon, Pierre J.; Jachimczyk, Philippe; Barucchi, Gerard; Calvignac, Jean; and Verplanken, Fabrice, 5,467,359, Cl. 371-37.100.
Kahle, James A.; and Kau, Chin-Cheng, 5,467,473, Cl. 395-800.000.
Kumar, Manoj; Lattimore, George M.; and Poplawski, Joseph M., Jr., 5,467,037, Cl. 327-142.000.
Lau, Raymond; Rosenfeld, Ronald; and Roukos, Salim, 5,467,425, Cl. 395-2.520.
Leaver, David, 5,466,993, Cl. 315-411.000.
Pfeiffer, Hans C.; and Stickel, Werner, 5,466,904, Cl. 219-121.250.
Potter, Michael D., 5,466,980, Cl. 310-309.000.
Price, Steven; Jepson, Raymond; Worley, Barry J.; Wood, Steven P.; and Keogh, Andrew J., 5,467,350, Cl. 370-82.000.
Shipman, Lloyd R., Jr., 5,467,361, Cl. 371-40.100.
Takayama, Shinji, 5,466,539, Cl. 428-611.000.
Wiedmann, Siegfried K.; and Wendel, Dieter F. G., 5,467,311, Cl. 365-189.050.

International Rectifier Corporation: *See*—
Kiraly, Laszlo, 5,467,242, Cl. 361-94.000.

International Superconductivity Technology Center: *See*—
Yoshida, Yukihisa; Ito, Wataru; and Morishita, Tadataka, 5,466,665, Cl. 505-476.000.

Internationale Des Jeux: *See*—
Gatto, Jean-Marie; and Bertrand, Dominique, 5,466,922, Cl. 250-208.100.

Intravascular Research Limited: *See*—
Dickinson, Robert J.; and Kitney, Richard I., 5,465,726, Cl. 128-663.010.

Iowa State University Research Foundation: *See*—
Kothair, Suraj C.; and Oh, Heekuck, 5,467,427, Cl. 395-23.000.

Iowa State University Research Foundation, Inc.: *See*—
Kraus, George A., 5,466,799, Cl. 540-573.000.

Ireland, Philip J., to Micron Semiconductor, Inc. Double mask process for forming trenches and contacts during the formation of a semiconductor memory device. 5,466,639, Cl. 437-195.000.

Irisawa, Daiichi, to Furukawa Denki Kogyo Kabushiki Kaisha. Magnetically shielding structure. 5,466,885, Cl. 174-35.0MS.

Iritani, Satoshi: *See*—
Uchida, Yukio; Iritani, Satoshi; and Miyake, Toshio, 5,466,453, Cl. 424-195.100.

Iroh, Jude O.: *See*—
Bell, James P.; Iroh, Jude O.; Scola, Daniel A.; and Liang, Jengli, 5,466,357, Cl. 205-50.000.

Isaac, Robert L.; and Cohen, Bernard, to Kimberly-Clark Corporation. Binder compositions and web materials formed thereby. 5,466,518, Cl. 428-188.000.

Isaacs, Charles E.; Kim, Kwang S.; and Wisniewski, Henryk M., to Research Foundation For Mental Health Hygiene, Inc. Spermicidal and cytocidal fatty acid compositions. 5,466,714, Cl. 514-558.000.

Isele, Ute: *See*—
Schneider, Peter; van Hoogevest, Peter; Capraro, Hans G.; and Isele, Ute, 5,466,468, Cl. 424-450.000.

Ishibashi, Kenji: *See*—
Murashima, Nobuharu; Ishibashi, Kenji; Shintani, Dai; and Taniguchi, Nobuyuki, 5,467,158, Cl. 354-173.100.

Ishibashi, Kenzo: *See*—
Ishida, Takashi; O'Hara, Shunji; Ishibashi, Kenzo; and Furutani, Tadashige, 5,467,330, Cl. 369-48.000.

Ishida, Katsuhiko: *See*—
Okimoto, Tomoyuki; Maki, Kazumi; and Ishida, Katsuhiko, 5,466,656, Cl. 503-217.000.

Ishida, Takashi; O'Hara, Shunji; Ishibashi, Kenzo; and Furutani, Tadashige, to Matsushita Electric Industrial Co., Ltd. Recording method and recording and reproducing apparatus for optical disk. 5,467,330, Cl. 369-48.000.

Ishida, Tatsuya: *See*—
Kudoh, Kichizo; Kikuchi, Yasuo; Ishida, Tatsuya; Ikeda, Tatsufumi; and Fujimoto, Hiroaki, 5,466,703, Cl. 514-374.000.

Ishiguro, Hajime; Morioka, Kazutoshi; Sakai, Tooru; and Takemura, Yasushi, to Fujitsu Limited; and PFU Limited. Method and apparatus for controlling high speed printing. 5,467,431, Cl. 395-102.000.

Ishihara, Hiroshi; and Ogura, Yoshinobu, to Aisin Seiki Kabushiki Kaisha. Door closing device. 5,466,021, Cl. 292-201.000.

Ishihara, Kazuhiko: *See*—
Koinuma, Yasumi; Matsumoto, Takeo; Nakada, Nobuharu; Nakabayashi, Nobuo; and Ishihara, Kazuhiko, 5,466,853, Cl. 558-169.000.

Ishihara, Ken: *See*—
Kishimoto, Shinji; Harashima, Masa; Kanda, Hiroshi; Sasaki, Akira; Tanabe, Kozi; Nosaka, Kenji; Hanasaka, Satoru; and Ishihara, Ken, 5,465,721, Cl. 128-660.070.

Ishihara, Shunso: *See*—
Hirai, Yukio; Kanayama, Kouzou; Yoshii, Kenji; Iwasaki, Kiyotoshi; Kanai, Isao; and Suzuki, Shin, 5,465,598, Cl. 72-84.000.

Ishii, Kikujiro: *See*—
Kaji, Makoto; Odoi, Chie; Sagawa, Masaichi; Kagawa, Hiroyuki; Kakuta, Atsushi; Ishii, Kikujiro; Nakayama, Hideyuki; and Ogawa, Keiichiro, 5,467,421, Cl. 385-122.000.

Ishii, Toshio: *See*—
Fujisawa, Masaaki; Hasegawa, Taiji; Ishii, Toshio; Sasaki, Shoji; and Sakamoto, Masahide, 5,467,277, Cl. 364-424.050.

Ishii, Yoshinori: *See*—
Akimoto, Katsuyuki; Machida, Takahiro; and Ishii, Yoshinori, 5,466,994, Cl. 315-411.000.

Ishikawa, Fumihiko: *See*—
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Nasu, Hidetoshi; and Sato, Kazunobu, 5,465,806, Cl. 180-165.000.

Ishikawa, Katuya: *See*—
Fuse, Genshu; and Ishikawa, Katuya, 5,466,612, Cl. 437-3.000.

Ishikawa, Takatoshi; and Snelling, Bryan A. L., to Fuji Photo Film Co., Ltd. Method of processing silver halide photographic material. 5,466,563, Cl. 430-398.000.

Ishinaga, Hiroyuki; Fukuda, Tsuguhiro; and Mori, Toshihiro, to Canon Kabushiki Kaisha. Ink-jet recording head, board for said head and ink-jet recording apparatus. 5,467,113, Cl. 347-17.000.

Ishino, Toshihiro; Kida, Otojiro; and Beppu, Yoshihisa, to Asahi Glass Company Ltd. High zirconia fused cast refractories. 5,466,643, Cl. 501-105.000.

Ishino, Tsutomu: *See*—
Mitsuya, Hiroyuki; Yamada, Hideki; Maruyama, Ryoichi; and Ishino, Tsutomu, 5,466,197, Cl. 475-72.000.

Ishiura, Kazuhige: *See*—
Ikeda, Kaoru; Sato, Toshiaki; and Ishiura, Kazuhige, 5,466,748, Cl. 525-57.000.

Ishizaka, Shoji: *See*—
Muro, Kiyofumi; Fujimoto, Tsuyoshi; Yoshida, Yuji; Yamada, Yoshikazu; and Ishizaka, Shoji, 5,467,364, Cl. 372-45.000.

Ishizaki, Hirofumi: *See*—
Furuta, Takashi; Takeda, Hajime; Nishimura, Hiroyuki; Kadono, Tsuyoshi; Ishizaki, Hirofumi; and Uesaka, Akira, 5,467,477, Cl. 455-348.000.

Isogawa, Shuichi; and Miyake, Nobuyuki, to Nikon Corporation. Apparatus for measuring a cornea shape. 5,467,150, Cl. 351-212.000.

Isono, Thoru: *See*—
Miyake, Kazutoshi; Ueno, Masato; Watanabe, Satomi; Funahashi, Nobuaki; Asai, Tomohito; and Isono, Thoru, 5,465,485, Cl. 29-892.110.

Isosport Verbundbauteile Gesellschaft m.b.H.: *See*—
Schamesberger, Robert, 5,466,743, Cl. 524-462.000.

Istituto Gentili S.p.A.: *See*—

Rosmi, Sergio; and Mian, Maurizio, 5,466,682, Cl. 514-76.000.

Itagaki, Hiroyuki; Taniguchi, Yo; Shiono, Hidemi; Takiguchi, Kenji; and Yamamoto, Etsuji, to Hitachi, Ltd. Nuclear magentic resonance imaging apparatus. 5,465,719, Cl. 128-653.500.

Itagaki, Takasi: *See*—
Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sedimoto, Kozo; and Suzuki, Masanori, 5,465,956, Cl. 271-274.000.

Itaya, Kazuhiko: *See*—
Sugawara, Hideto; and Itaya, Kazuhiko, 5,466,950, Cl. 257-94.000.

Itihara, Yoshiyuki; Haneda, Satoshi; Koizumi, Noboru; Hasebe, Takashi; and Niitsuma, Tetsuya, to Konica Corporation. Image forming apparatus with neighboring pixel processing. 5,467,422, Cl. 358-298.000.

Ito, Eiji: *See*—
Takemoto, Takatoshi; Kano, Noriaki; Ito, Eiji; and Sekimoto, Kozo, 5,465,953, Cl. 271-234.000.

Ito, Eizi: *See*—
Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sedimoto, Kozo; and Suzuki, Masanori, 5,465,956, Cl. 271-274.000.

Ito, Koichi: *See*—
Fujie, Naofumi; Fukura, Kenichi; Ito, Koichi; Hirata, Tetsuya; and Nishio, Naoto, 5,466,038, Cl. 296-213.000.

Ito, Seigo, to Kabushiki Kaisha Toshiba. Method of manufacturing lead frame, and lead frame. 5,466,966, Cl. 257-666.000.

Ito, Tadato: *See*—
Fumio, Abe; Ito, Tadato; and Ogawa, Masato, 5,465,573, Cl. 60-274.000.

Ito, Wataru: *See*—
Yoshida, Yukihisa; Ito, Wataru; and Morishita, Tadataka, 5,466,665, Cl. 505-476.000.

Ito, Yoshio: *See*—
Takemoto, Takatoshi; and Ito, Yoshio, 5,465,954, Cl. 271-251.000.

Ito, Yutaka; Mori, Makoto; and Gohara, Shinobu, to Hitachi, Ltd. Packet communication method and packet communication apparatus. 5,467,346, Cl. 370-60.000.

Itoh, Atsushi, to Mitsubishi Denki Kabushiki Kaisha. Robot controlling method and apparatus. 5,467,430, Cl. 395-95.000.

Itoh, Katsumi; Okonogi, Kenji; and Tamura, Norikazu, to Takeda Chemical Industries, Ltd. Production of Di or tri-azolyl substituted 5-keto azole compounds. 5,466,820, Cl. 548-263.200.

Itoh, Takashi; Saitoh, Hiroyuki; Kinami, Haruyuki; Konaka, Toshinori; and Murai, Tsuyoshi, to M. Setek Co., Ltd. Apparatus for scrubbing substrate. 5,465,447, Cl. 15-88.300.

ITT Automotive Electrical Systems Inc.: *See*—
Jones, Christopher H.; Kuck, Lloyd L. R.; and Lombardo, Frank R., 5,465,636, Cl. 74-602.000.

ITT Automotive Europe GmbH: *See*—
Klinar, Robert, 5,465,631, Cl. 74-458.000.

ITT Corporation: *See*—
Szabo, George; and Zelinski, Gary, 5,466,017, Cl. 285-319.000.

Iuchi, Kazushi: *See*—
Kasemaru, Tetsuro; Takai, Hideyuki; Yamazaki, Itaru; and Iuchi, Kazushi, 5,466,550, Cl. 430-58.000.

Ivanics, József; Szabó, Tibor; Hermecz, István; Dalmadi, Gyula; Ivanics, Józsefné; Kovács, Gáborné; and Bahram, Resul, to Kabi Pharmacia AB; and Chinoin Ltd. A process for the preparation of 13,14-dihydro-15(R)-17-phenyl-18,19,20-trinor-$PGF_{2\alpha}$ isopropyl ester. 5,466,833, Cl. 549-475.000.

Ivanics, Józsefné: *See*—
Ivanics, József; Szabó, Tibor; Hermecz, István; Dalmadi, Gyula; Ivanics, Józsefné; Kovács, Gáborné; and Bahram, Resul, 5,466,833, Cl. 549-475.000.

Iverson, Troy M.: *See*—
Dornbush, David A.; Erickson, Chad S.; Iverson, Troy M.; Sandahl, Jeffrey E.; Moore, Kevin B.; Barnes, Neal P.; Easley, James B.; Jackson, Richard C.; and Von Duyke, Andrew L., 5,466,912, Cl. 219-400.000.

Iwabuchi, Motoaki: *See*—
Shinohara, Toshio; Yokoo, Akio; Kudo, Muneo; Iwabuchi, Motoaki; and Matsumura, Kazuyuki, 5,466,847, Cl. 556-409.000.

Iwagami, Hisao: *See*—
Honda, Yutaka; Shiragami, Hiroshi; Iwagami, Hisao; and Arai, Masayuki, 5,466,793, Cl. 536-55.300.

Iwahara, Yoshiaki; Kuroda, Shoji; Sakamoto, Shuichi; and Ogino, Masanori, to Hitachi, Ltd. Multi-screen projector. 5,467,221, Cl. 359-449.000.

Iwama, Ryoichi; and Yamada, Akira, to Fujitsu Limited. Fixing method for printing machine and electrophotoghraphic printing machine. 5,467,177, Cl. 355-282.000.

Iwamoto, Masatoshi, to Kubota Corporation. Drive transmitting apparatus for a working vehicle. 5,465,630, Cl. 74-331.000.

Iwanaga, Takaki: *See*—
Hattori, Takao; Iwanaga, Takaki; and Yamaguchi, Toru, 5,466,279, Cl. 96-69.000.

Iwasaki, Kiyotoshi: *See*—
Hirai, Yukio; Kanayama, Kouzou; Yoshii, Kenji; Iwasaki, Kiyotoshi; Kanai, Isao; and Suzuki, Shin, 5,465,598, Cl. 72-84.000.

Iwase, Yuichiro: *See*—
Okumura, Keiji; Aoki, Takeshi; Sugishima, Yoshio; Hayama, Satoru; Taguchi, Keiichi; Iwase, Yuichiro; and Okamoto, Noriaki, 5,465,947, Cl. 270-58.000.

Iwashita, Shigeo; Ohno, Akihiro; and Shirai, Takashi, to Toyoda Koki Kabushiki Kaisha. Controller for power steering apparatus. 5,467,281, Cl. 364-424.050.

Iwashita, Yasusuke, to Fanuc Ltd. Control method for an alternating current motor. 5,467,001, Cl. 318-434.000.

Iwata, Atsushi: *See*—
Uchimura, Kuniharu; Saito, Osamu; Amemiya, Yoshihito; and Iwata, Atsushi, 5,467,429, Cl. 395-24.000.

Iwata, Nobuo: *See*—
Takagaki, Hiromitsu; Iwata, Nobuo; and Suzuki, Koji, 5,467,175, Cl. 355-259.000.

Izawa, Norihiko: *See*—
Ozaki, Masami; Ikeda, Atsuhiko; Yumita, Takashi; Honami, Reijiro; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,466,705, Cl. 514-383.000.

Izumi, Michihiro; and Watanabe, Kazumari, to Canon Kabushiki Kaisha. Spread spectrum communication apparatus and telephone exchange system. 5,467,367, Cl. 375-206.000.

Izumi, Michihiro, to Canon Kabushiki Kaisha. Telephone exchange apparatus. 5,467,395, Cl. 379-399.000.

Izumi, Toshiaki: *See*—
Sugitani, Sinzi; Tanimizu, Toru; Takematsu, Koutarou; Wakasa, Fumio; and Izumi, Toshiaki, 5,467,241, Cl. 361-63.000.

J. B. Laughrey, Inc.: *See*—
Flaten, Lawrence M., 5,467,269, Cl. 364-401.000.

J. M. Voith GmbH: *See*—
Begemann, Ulrich; Heinzmann, Helmut; and Ruf, Wolfgang, 5,466,340, Cl. 162-216.000.
Jerabek, Michael; Ruf, Wolfgang; and Martin, Thomas, 5,466,372, Cl. 210-512.100.
Kustermann, Martin, 5,466,292, Cl. 118-257.000.
Veh, Gerhard; Schweib, Peter; and Dörflinger, Hans-Dieter, 5,465,848, Cl. 209-170.000.

J. T. Baker Inc.: *See*—
Ilardi, Joseph M.; Schwartzkopf, George; and Dailey, Gary G., 5,466,389, Cl. 252-156.000.

Jablonski, Peter E.; and Ferry, James G., to Center for Innovative Technology, The. Use of carbon monoxide dehydrogenase for bioremediation of toxic compounds. 5,466,600, Cl. 435-262.500.

Jachimcsyk, Philippe: *See*—
Huon, Pierre J.; Jachimcsyk, Philippe; Barucchi, Gerard; Calvignac, Jean; and Verplanken, Fabrice, 5,467,359, Cl. 371-37.100.

Jachimowicz, Karen E.: *See*—
Lebby, Michael S.; Kelly, George R.; and Jachimowicz, Karen E., 5,467,215, Cl. 359-247.000.

Jack Kennedy Metal Products and Buildings, Inc.: *See*—
Kennedy, John M.; and Kennedy, William R., 5,466,187, Cl. 454-169.000.

Jackson, Andrew: *See*—
Peterson, Brian K.; and Jackson, Andrew, 5,465,810, Cl. 184-6.210.

Jackson, Craig A.: *See*—
Edwards, Donald W.; Jackson, Craig A.; Shibata, Steven K.; and Yagve, Paul W., 5,465,566, Cl. 57-204.000.

Jackson, John E.; Nitta, Hideo; Shoichi, Katoh; Amano, Masahiko; Kurisu, Yasushi; and Ohno, Keiichiro, to Praxair S.T. Technology, Inc. Hearth roll. 5,466,208, Cl. 492-53.000.

Jackson, Philip S.: *See*—
Adams, Amanda J.; Jackson, Philip S.; Moulden, Howard N.; Roberts, David W.; and Watkin, Keith, 5,466,851, Cl. 558-21.000.

Jackson, Richard C.: *See*—
Dornbush, David A.; Erickson, Chad S.; Iverson, Troy M.; Sandahl, Jeffrey E.; Moore, Kevin B.; Barnes, Neal P.; Easley, James B.; Jackson, Richard C.; and Von Duyke, Andrew L., 5,466,912, Cl. 219-400.000.

Jacob, Friedrich; and Zahn, Wolfgang, to Agfa-Gevaert Aktiengesellchaft. Masking of photographs for reproduction. 5,467,165, Cl. 335-40.000.

Jacobs Chuck Technology Corporation: *See*—
Owens, Valerie; Shadeck, Louis M.; and Huff, Robert O., 5,465,983, Cl. 279-157.000.

Jacobs, David R.: *See*—
Hollander, Milton B.; Jacobs, David R.; and Angrave, Janice E., 5,465,838, Cl. 206-305.000.

Jacobs, Russel J.; Pierce, Brett A.; and Spira, Joel S., to Lutron Electronics Co., Inc. Motor-operated window cover. 5,467,266, Cl. 364-167.010.

Jacobson, Gunnard K.; Jolly, Setsuko O.; Sedmak, Joseph J.; Skatrud, Thomas J.; and Wasileski, John M., to Universal Foods Corporation. Astaxanthin over-producing strains of phaffia rhodozyma. 5,466,599, Cl. 435-255.100.

Jaen, Juan C.: *See*—
Glase, Shelly; Jaen, Juan C.; Smith, Sarah J.; and Wise, Lawrence D., 5,466,698, Cl. 514-318.000.

Jagannathan, Seshadri; Mahar, David F.; and Mehta, Rajendrakumar V., to Eastman Kodak Company. Sonic micro reaction zones in silver halide emulsion precipitation process. 5,466,570, Cl. 430-569.000.

Jahabow Industries, Inc.: *See*—
Aspenwall, John E., 5,467,260, Cl. 362-374.000.

Jakel, Karl W. Lightweight cementitious roofing. 5,465,547, Cl. 52-518.000.

Jakobson, Gerald; Siemanowski, Werner; and Uhlig, Karl-Heinz, to Solvay Fluor und Derivate GmbH. Polyglycerol fatty acid ester mixture. 5,466,719, Cl. 514-785.000.

Jakubowski, Henryk P. Mirror defogger with telescoping hot air outlet mounted adjacent a mirror side directing heated airflow thereover. 5,467,423, Cl. 392-379.000.

Jamail, Randall. Method of masking data on a storage medium. 5,467,327, Cl. 369-32.000.

Jambazian, Petra V.: *See*—
Tench, D. Morgan; and Jambazian, Petra V., 5,466,349, Cl. 204-153.100.

James, Alun P.: *See*—
Carr, Graham; Harrison, Paul R.; and James, Alun P., 5,466,825, Cl. 548-479.000.

James, Lawrence E.: *See*—
Walsh, William C.; and James, Lawrence E., 5,466,300, Cl. 134-38.000.

James, M. Elmer; and Beeley, Micheal G., to LMC Operating Corp. Cleat retaining assembly for vehicle endless track. 5,466,056, Cl. 305-54.000.

James River Paper Company, Inc.: *See*—
Joiner, John R., 5,465,504, Cl. 34-446.000.
Pollock, Rodney E., 5,466,298, Cl. 134-15.000.

Jameson, Lee K.: *See*—
Cohen, Bernhard; and Jameson, Lee K., 5,466,401, Cl. 264-443.000.

Jan, Raymond J., to Mobil Oil Corporation. Method for removing a contaminant from a contaminated surface soil. 5,466,299, Cl. 134-21.000.

Janson, Philip D.: *See*—
Spagnoli, Robert A.; and Janson, Philip D., 5,466,911, Cl. 219-203.000.

Janssen, Sylvain; and Campain, Jean-Pierre, to Schlumberger Industries. System for measuring the efficiency of hydrocarbon vapor recovery installations used in gas stations. 5,465,606, Cl. 73-23.200.

Jantunen, Heli: *See*—
Turunen, Aimo; and Jantunen, Heli, 5,467,065, Cl. 333-132.000.

Japan Energy Corporation: *See*—
Ohhashi, Taico; Nakashima, Koichi; Fukuyo, Hideaki; and Seki, Takakazu, 5,466,355, Cl. 204-298.130.

Japan Synthetic Rubber Co., Ltd.: *See*—
Maeda, Tukasa; Sasagawa, Yasuhiko; Ikeda, Yorinobu; and Hiraharu, Teruo, 5,466,739, Cl. 524-525.000.

Jasulaitis, Vytas: *See*—
Barron, Daniel R.; Jasulaitis, Vytas; and Morrill, Brion F., 5,466,163, Cl. 439-138.000.

Jayawant, Bhaichandra V.; and Whorlow, Raymond J., to British Nuclear Fuels plc. Apparatus for the electromagnetic control of the suspension of an object. 5,467,244, Cl. 361-144.000.

Jeannot, William E., Jr.: *See*—
McPherson, James I.; Kinney, Daniel R.; Jeannot, William E., . and Karel, Thomas R., 5,466,062, Cl. 312-348.600.

Jeffrey, Lawrence W., Sr. Self inflatable flotation device. 5,466,179, Cl. 441-108.000.

Jeffries, David A.: *See*—
Martin, Robert; Cayley, George R.; Thacker, Jonathan R. M.; Hall, Franklin R.; North, Denise K.; Groome, John M.; and Jeffries, David A., 5,466,458, Cl. 424-405.000.

Jejelowo, Moses O., to Exxon Chemical Patents Inc. Polymerization catalyst systems, their production and use. 5,466,649, Cl. 502-120.000.

Jenkins, Kendall: *See*—
Heiner, Hal R.; and Jenkins, Kendall, 5,465,559, Cl. 53-567.000.

Jenkins, Terry L.; McAbee, Michael L.; and Richardson, Joe W., Jr., to Exxon Chemical Patents Inc. Selectively removing embedded lint precursors with cellulase. 5,466,601, Cl. 435-263.000.

Jenkins, William G., to Burlington Industries. Stain resistance of nylon carpet. 5,466,527, Cl. 428-375.000.

Jennings, Carol A.: *See*—
Burt, Richard A.; Liebermann, George; Hamer, Gordon K.; Gardner, Sandra J.; Jennings, Carol A.; Daimon, Katsumi; and Nukada, Katsumi, 5,466,796, Cl. 540-139.000.

Jeong, Jechang, to Samsung Electronics Co., Ltd. Apparatus and method of coding/decoding video data. 5,467,086, Cl. 341-50.000.

Jepson, Raymond: *See*—
Price, Steven; Jepson, Raymond; Worley, Barry J.; Wood, Steven P.; and Keogh, Andrew J., 5,467,350, Cl. 370-82.000.

Jerabek, Michael; Ruf, Wolfgang; and Martin, Thomas, to J. M. Voith GmbH. Cyclone including an inlet diffuser tube. 5,466,372, Cl. 210-512.100.

Jerome, Wallace H. Method for unloading content of multilayer containers. 5,466,116, Cl. 414-786.000.

Jervis B. Webb Company: *See*—
Alofs, Cornell W.; and Drenth, Ronald R., 5,467,084, Cl. 340-933.000.

Jhung, In B.: *See*—
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,466,854, Cl. 558-233.000.

Ji, Jae H., to Samsung Electronics Co., Ltd. Tray and disc driving mechanism for laser disc player. 5,467,333, Cl. 369-75.200.

Jiancheng, Xiong: *See*—
Maofu, Tong; Jiancheng, Xiong; and Dong, Geng X., 5,466,307, Cl. 148-302.000.

Jin, Haolun: *See*—
Belleau, Bernard, deceased; Mansour, Tarek; Tse, Allan; Evans, Colleen A.; Jin, Haolun; Zacharie, Boulos; and Nguyen-Ba, Nghe, 5,466,806, Cl. 544-310.000.

Jin, Yong W., to Samsung Electron Devices Co., Ltd. Liquid crystal-dispersed polymeric film. 5,466,496, Cl. 428-1.000.

Jina Manufacturer Thai Co., Ltd.: *See*—
Chien, Jui-Lung, 5,465,439, Cl. 5-99.100.

Jo, Sung J.: *See*—
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,466,854, Cl. 558-233.000.

Joardar, Kuntal, to Motorola, Inc. Circuit and method of varying amplifier gain. 5,467,057, Cl. 330-254.000.

Joffre, Pascal: *See*—
Loiseaux, Brigitte; Joubert, Cécile; Huignard, Jean-Pierre; Joffre, Pascal; and Nicolas, Christophe, 5,467,206, Cl. 359-40.000.

Joh, William K. Golf bag, and methods of constructing and utilizing same. 5,465,840, Cl. 206-315.600.

Johansen, Thor: *See*—
Ahlen, Arne; Molkvist, Anders; and Johansen, Thor, 5,465,915, Cl. 241-247.000.

Johansson, Ingemar: *See*—
Andersson-Schager, Per; Johansson, Ingemar; Larsson, Willy; and Lindmark, Erik, 5,466,607, Cl. 436-50.000.

Johnson & Johnson: *See*—
Brown-Skrobot, Susan; Novick, Richard P.; and Projan, Steven J., 5,466,685, Cl. 514-199.000.

Johnson & Johnson Inc.: *See*—
Cadieux, Serge; and Levesque, Yvon, 5,466,232, Cl. 604-378.000.

Johnson & Johnson Medical, Inc.: *See*—
Rosenthal, Arthur L.; Light, Nicholas D.; and Haynes, Carla A., 5,466,462, Cl. 424-426.000.

Johnson & Johnson Vision Products, Inc.: *See*—
Adams, Jonathan P.; Rastrelli, Edmund C.; and Heaton, John C., 5,466,144, Cl. 425-174.400.

Johnson, David S.: *See*—
Freeman, Willie B.; Johnson, David S.; and Proehlich, Klaus B., 5,466,891, Cl. 174-142.000.

Johnson, Donald A.: *See*—
Goodman, Walter H.; Rao, Narasimha M.; and Johnson, Donald A., 5,466,297, Cl. 134-3.000.

Johnson, Douglas B.: *See*—
Frank, Aaron L.; Ibidunni, Ajibola O.; Johnson, Douglas B.; Krause, Dennis L.; and Nguyen, Trac, 5,466,972, Cl. 257-764.000.

Johnson Fishing, Inc.: *See*—
Bernloehr, Darrel A., 5,465,633, Cl. 74-512.000.

Johnson, Glenn W., Jr.; and McVicker, Henry J., to Aircast, Inc. Automatic fluid compress and circulating system. 5,466,250, Cl. 607-104.000.

Johnson, Gregory E.: *See*—
Rossi, Giorgio; Ritrovato, Michael L.; and Johnson, Gregory E., 5,466,073, Cl. 400-197.000.

Johnson, Mark W., to Bayer Corporation. Phosphoric acid monoesters useful for surface treatment of pigments for waterborne coatings. 5,466,482, Cl. 427-212.000.

Johnson, Paul A.: *See*—
Altham, Tim J.; and Johnson, Paul A., 5,466,131, Cl. 417-420.000.

Johnson, Peter C.: *See*—
Henderson, Gerald J.; Johnson, Peter C.; and Sullivan, Lawrence B., 5,466,157, Cl. 434-299.000.

Johnson Service Company: *See*—
Wenner, Ronald J.; and Rudich, George, Jr., 5,467,287, Cl. 364-505.000.

Johnson, Sterling: *See*—
Weiner, Alan L.; Sinnett, Kevin; and Johnson, Sterling, 5,466,233, Cl. 604-890.100.

Johnson, Steven R.; Crowder, Kevin F.; Seals-Mason, Samantha; and Von Ehr, James R., II, to Macromedia, Inc. System and method for automatically generating derived graphic elements. 5,467,443, Cl. 395-141.000.

Johnson, Susan W.: *See*—
Baillargeon, David J.; Cardis, Angeline B.; Heck, Dale B.; and Johnson, Susan W., 5,466,267, Cl. 44-386.000.

Johnston, Anthony. Tool for marking chalk lines and plumb lines. 5,465,494, Cl. 33-414.000.

Joiner, John R., to James River Paper Company, Inc. System for modifying the moisture profile of a paper web. 5,465,504, Cl. 34-446.000.

Jolly, Setsuko O.: *See*—
Jacobson, Gunnard K.; Jolly, Setsuko O.; Sedmak, Joseph J.; Skatrud, Thomas J.; and Wasileski, John M., 5,466,599, Cl. 435-255.100.

Jones, Christopher H.; Kuck, Lloyd L. R.; and Lombardo, Frank R., to ITT Automotive Electrical Systems Inc. Depressed park windshield wiper mechanism. 5,465,636, Cl. 74-602.000.

Jones, Donald W.: *See*—
Kliman, Gerald B.; Preston, Mark A.; and Jones, Donald W., 5,466,978, Cl. 310-156.000.

Jones, Richard R.: *See*—
Nemeth, Laszlo T.; Malloy, Thomas P.; and Jones, Richard R., 5,466,835, Cl. 549-531.000.

Jones, Simon; and Tang, Jin, to Genetics Institute, Inc. Calcium independent cytosolic phospholipase A2/B enzymes. 5,466,595, Cl. 435-240.200.

Jong, Jing-Ming: *See*—
Alexander, Thomas; Kim, Yongmin; Park, Hyunwook; Eo, Kil-Su; and Jong, Jing-Ming, 5,467,459, Cl. 395-480.000.

Jong, Ling: *See*—
Dawson, Marcia L.; Cameron, James F.; Hobbs, Peter D.; Jong, Ling; Pfahl, Magnus; Zhang, Xiao-kun; and Lehmann, Jürgen M., 5,466,861, Cl. 560-100.000.

Jong-Pil, Lee, to Samsung Electronics Co., Ltd. Automatic objects tracing device of camcorder. 5,467,127, Cl. 348-169.000.

Josef, Kurt A.: *See*—

Baker, Edward J.; Bacon, Edward R; Illig, Carl R.; Caulfield, Thomas J.; Douty, Brent D.; Josef, Kurt A.; Toner, John L.; and Lee, Robert W., 5,466,435, Cl. 424-9.450.

Josefsson, Lars G., to Telefonaktiebolaget LM Ericsson. Waveguide antenna with transversal slots. 5,467,101, Cl. 343-771.000.

Josephs, Harold, to Josephs, Harold. Safety guard for hand trucks c: lift gates. 5,465,807, Cl. 180-274.000.

Joubert, Cécile: *See*—
Loiseaux, Brigitte; Joubert, Cécile; Huignard, Jean-Pierre; Joffre, Pascal; and Nicolas, Christophe, 5,467,206, Cl. 359-40.000.

Jowitt, Frederick W.; and Simms, Paul, to Carnaudmetalbox plc. Ram for long stroke press. 5,465,601, Cl. 72-347.000.

Juang, Bor-Chang. Drill bit guiding device. 5,466,098, Cl. 408-115.00R.

Jubin, John C., Jr., to ARCO Chemical Technology, L.P. Catalytic converter and method for highly exothermic reactions. 5,466,836, Cl. 549-531.000.

Judy, Jack H.: *See*—
Hoshi, Youichi; Speliotis, Dennis E.; and Judy, Jack H., 5,466,524, Cl. 428-336.000.

Juillerat, Jean-Charles, to SMH Management Services AG. Watch case. 5,467,325, Cl. 368-276.000.

Jung, Chul-min; Lee, Jeong-hee; Ahn, Kee-sik; and Park, Hee-chul, to Samsung Electronics Co., Ltd. Level shifter and data output buffer having same. 5,467,313, Cl. 365-189.110.

Junino, Alex; and Malle, Gérard, to L'Oreal. Reducing composition for the permanent deformation of hair containing as a reducing agent, an amino mercaptoalkylamide or a salt thereof. 5,466,878, Cl. 564-197.000.

Jurgens, Christian. Resorbable, biocompatible copolymers and their use. 5,466,444, Cl. 424-78.080.

Jurik, Dean. Ground and floor covering block. 5,466,089, Cl. 404-34.000.

Kaanta, Carter W.: *See*—
Cronin, John E.; Kaanta, Carter W.; Kenney, Donald M.; Kerbaugh, Michael L.; Landis, Howard S.; Machesney, Brian J.; Parries, Paul; Previti-Kelly, Rosemary A.; and Rembetski, John P., 5,466,636, Cl. 437-187.000.

Kabei, Toshihiro, to NEC Corporation. Method of manufacturing microwave tube collector. 5,466,359, Cl. 205-109.000.

Kabel Rheydt Aktiengesellschaft: *See*—
Rohrmann, Peter; Weiss, Alexander; Hög, George; and Zamzow, Peter, 5,467,420, Cl. 385-101.000.
Schulze-Buxloh, Karl, 5,467,066, Cl. 333-237.000.

Kabi Pharmacia AB: *See*—
Ivánics, József; Szabó, Tibor; Hermecz, István; Dalmadi, Gyula; Ivanics, Józsefné; Kovács, Gáborné; and Bahram, Resul, 5,466,833, Cl. 549-475.000.

Kabushiki Kaisha Ace Denken: *See*—
Takemoto, Takatoshi; Kawashima, Kazunari; Kadomatsu, Hideyuki; Aoyama, Moriyuki; and Nakamura, Takaharu, 5,465,950, Cl. 271-125.000.
Takemoto, Takatoshi; Kano, Noriaki; Ito, Eiji; and Sekimoto, Kozo, 5,465,953, Cl. 271-234.000.
Takemoto, Takatoshi; and Ito, Yoshio, 5,465,954, Cl. 271-251.000.
Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sedimoto, Kozo; and Suzuki, Masanori, 5,465,956, Cl. 271-274.000.

Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Uchida, Yukio; Iritani, Satoshi; and Miyake, Toshio, 5,466,453, Cl. 424-195.100.

Kabushiki Kaisha Kaisui Kagaku Kenkyojo: *See*—
Miyata, Shigeo, 5,466,740, Cl. 524-399.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Shimoda, Yoshiaki; and Kimura, Masaji, 5,465,644, Cl. 84-423.00R.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Hoshi, Youichi; Speliotis, Dennis E.; and Judy, Jack H., 5,466,524, Cl. 428-336.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kimura, Tomohisa; and Ikoma, Akira, 5,465,474, Cl. 29-601.000.
Matsuno, Akira; and Nire, Takashi, 5,466,494, Cl. 427-561.000.
Mitsuya, Hiroyuki; Yamada, Hideki; Maruyama, Ryoichi; and Ishino, Tsutomu, 5,466,197, Cl. 475-72.000.

Kabushiki Kaisha Kouransha: *See*—
Matsuki, Masaharu; Yoshihara, Toshiaki; and Kurita, Sumihiko, 5,466,917, Cl. 219-730.000.

Kabushiki Kaisha Sato: *See*—
Kikuchi, Koji, 5,465,919, Cl. 242-532.600.

Kabushiki Kaisha Shikoku Sogo Kenkyujo: *See*—
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Nasu, Hidetoshi; and Sato, Kazunobu, 5,465,806, Cl. 180-165.000.

Kabushiki Kaisha Takubo Seiki Seisakusho: *See*—
Takubo, Sadao, 5,465,495, Cl. 33-507.000.

Kabushiki Kaisha Tec: *See*—
Nakamura, Shinya; Yamaguchi, Tsutomu; Dietl, Steven J.; and Stevens, Donald M., 5,467,116, Cl. 347-50.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Nishibe, Yasushi, 5,467,248, Cl. 361-170.000.

Kabushiki Kaisha Toshiba: *See*—
Endo, Takahiro; and Saeki, Takashi, 5,467,389, Cl. 379-201.000.
Fujimoto, Katsuhiko; Aida, Satoshi; Oyanagi, Masamichi; and Kudo, Nobuki, 5,465,625, Cl. 73-700.000.
Hasegawa, Takehiro; Watanabe, Shigeyoshi; and Masuoka, Fujio, 5,467,303, Cl. 365-149.000.
Hattori, Takao; Iwanaga, Takaki; and Yamaguchi, Toru, 5,466,279, Cl. 96-69.000.
Ito, Seigo, 5,466,966, Cl. 257-666.000.
Kakumu, Masakazu, 5,466,958, Cl. 257-345.000.
Kameda, Yasushi; Nakamura, Kenichi; Takamoto, Hiroshi; Harima, Takayuki; and Segawa, Makoto, 5,467,317, Cl. 365-230.060.
Kawasaki, Takashi, 5,467,476, Cl. 395-800.000.
Koketsu, Tadaaki, 5,467,078, Cl. 340-825.060.
Kuno, Yoshinori; Tanabe, Noboru; and Hasebe, Koichi, 5,467,102, Cl. 345-1.000.
Ninomiya, Ryozi, 5,467,470, Cl. 395-183.030.
Odaka, Toshinori; Uetani, Yoshiharu; Manuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,467,136, Cl. 348-416.000.
Saito, Toshimitsu; Kasashima, Masahiko; and Konno, Toshikazu, 5,467,469, Cl. 395-182.120.
Sakai, Itsuko; Hayasaka, Nobuo; and Okano, Haruo, 5,466,942, Cl. 250-492.200.
Sasaki, Noriyuki, 5,467,375, Cl. 376-300.000.
Sasano, Nobusuke; and Enomoto, Tadashi, 5,466,926, Cl. 250-216.000.
Sugawara, Hideto; and Itaya, Kazuhiko, 5,466,950, Cl. 257-94.000.
Tsunoda, Tetsujiro, 5,466,969, Cl. 257-706.000.

Kabushiki Kaisha Yakult Honsha: *See*—
Kuma, Yoshiharu; Setoyama, Tamotsu; Maruyama, Hideaki; and Kawai, Makiko, 5,466,472, Cl. 426-43.000.

Kadomatsu, Hideyuki: *See*—
Takemoto, Takatoshi; Kawashima, Kazunari; Kadomatsu, Hideyuki; Aoyama, Moriyuki; and Nakamura, Takaharu, 5,465,950, Cl. 271-125.000.

Kadono, Tsuyoshi: *See*—
Furuta, Takashi; Takeda, Hajime; Nishimura, Hiroyuki; Kadono, Tsuyoshi; Ishizaki, Hirofumi; and Uesaka, Akira, 5,467,477, Cl. 455-348.000.

Kadota, Kuninobu; Koseki, Hiroyuki; and Toyoda, Kenji, to Bridgestone Corporation. Pneumatic radial tires with zigzag belt and rubberized card ply belt reinforcing layer. 5,465,773, Cl. 152-454.000.

Kaede, Kazuhisa; and Takano, Isamu, to NEC Corporation. Optical trunk transmission system and an optical repeater circuit. 5,467,213, Cl. 359-175.000.

Kaepa, Inc.: *See*—
Fuerst, Rory W.; and Granville, James E., 5,465,509, Cl. 36-88.000.

Kaga, Toru: *See*—
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masshiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,466,621, Cl. 437-52.000.

Kagawa, Hiroyuki: *See*—
Kaji, Makoto; Odoi, Chie; Sagawa, Masaichi; Kagawa, Hiroyuki; Kakuta, Atsushi; Ishii, Kikujiro; Nakayama, Hideyuki; and Ogawa, Keiichiro, 5,467,421, Cl. 385-122.000.

Kagawa, Nobuaki: *See*—
Mitsuhashi, Tsuyoshi; and Kagawa, Nobuaki, 5,466,571, Cl. 430-278.000.

Kahle, James A.; and Kau, Chin-Cheng, to International Business Machines Corporation. Out of order instruction load and store comparison. 5,467,473, Cl. 395-800.000.

Kai, Hiroyuki: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Morita, Koichi; Masuko, Michio; Ide, Kinya; and Ueyama, Yoshito, 5,466,661, Cl. 504-253.000.

Kailasam, Ganesh: *See*—
Day, James; Kailasam, Ganesh; and Varadarajan, Godavarthi S., 5,466,370, Cl. 210-298.000.

Kaji, Makoto; Odoi, Chie; Sagawa, Masaichi; Kagawa, Hiroyuki; Kakuta, Atsushi; Ishii, Kikujiro; Nakayama, Hideyuki; and Ogawa, Keiichiro, to Hitachi Chemical Company, Ltd. Nonlinear optical material and devices utilizing said material. 5,467,421, Cl. 385-122.000.

Kajimoto, Takeshi; Shimbo, Yutaka; Sato, Katsuyuki; Ogata, Masahiro; Kenmizaki, Kanehide; Kubono, Shouji; Kato, Nobuo; Manita, Kiichi; and Kanamitsu, Michitaro, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Semiconductor memory device facilitated with plural self-refresh modes. 5,467,315, Cl. 365-222.000.

Kakiuchi, Arata: *See*—
Sato, Katsuaki; Tominaga, Katsuhiko; Saka, Tsutomu; Kawamura, Osamu; Takahashi, Teruo; and Kakiuchi, Arata, 5,466,276, Cl. 75-231.000.

Kakumu, Masakazu, to Kabushiki Kaisha Toshiba. MOS-type semiconductor device having electrode structure capable of coping with short-channel effect and manufacturing method thereof. 5,466,958, Cl. 257-345.000.

Kakuta, Atsushi: *See*—
Kaji, Makoto; Odoi, Chie; Sagawa, Masaichi; Kagawa, Hiroyuki; Kakuta, Atsushi; Ishii, Kikujiro; Nakayama, Hideyuki; and Ogawa, Keiichiro, 5,467,421, Cl. 385-122.000.

Kakuta, Yoshio: *See*—
Miyazaki, Takemi; Kakuta, Yoshio; and Fujisawa, Toshiki, 5,467,155, Cl. 354-21.000.

Kalbe, Jochen; Müller, Hanns P.; Koch, Rainhard; Engelhardt, Jürgen; Koch, Wolfgang; Szablikowski, Klaus; and Weber, Gunter, to Wolff Walsrode Aktiengesellschaft. Thermoplastic cellulose ether ester graft copolymers and process for .neir production. 5,466,794, Cl. 536-66.000.

Kalhoff, Peter-Paul: *See*—
Boeck, Vilmar; and Kalhoff, Peter-Paul, 5,467,179, Cl. 355-309.000.

Kamada, Akihiko: *See*—
Sakai, Norio; Saitoh, Tsuyoshi; Nakayama, Yoshikatsu; and Kamada, Akihiko, 5,466,330, Cl. 156-584.000.

Kamber, Peter: *See*—
Althaus, Rolf; Chyou, Yau-Pin; Frutschi, Hans U.; Genet, Christian; Kamber, Peter; Lindvall, Anders; Sattelmayer, Thomas; Senior, Peter; and Rufli, Peter, 5,465,569, Cl. 60-39.030.

Kameda, Yasushi; Nakamura, Kenichi; Takamoto, Hiroshi; Harima, Takayuki; and Segawa, Makoto, to Kabushiki Kaisha Toshiba. Semiconductor memory device for use an apparatus requiring high-speed access to memory cells. 5,467,317, Cl. 365-230.060.

Kamitani, Takayuki: *See*—
Horiuchi, Makoto; Koyama, Kazutaka; Kamitani, Takayuki; and Ozawa, Masataka, 5,466,988, Cl. 313-35.000.

Kamiya, Tadao; Inoue, Motoyuki; and Inada, Hiroshi, to Noritake Co., Limited. Dental porcelain material preventing yellow coloration and method for producing same. 5,466,285, Cl. 106-35.000.

Kamo, Hisao: *See*—
Shigemori, Nobuki; and Kamo, Hisao, 5,466,565, Cl. 430-444.000.

Kamrath, Robert F.: *See*—
Audenaert, Frans A.; Dams, Rudolf J.; and Kamrath, Robert F., 5,466,770, Cl. 528-60.000.

Kanai, Isao: *See*—
Hirai, Yukio; Kanayama, Kouzou; Yoshii, Kenji; Iwasaki, Kiyotoshi; Kanai, Isao; and Suzuki, Shin, 5,465,598, Cl. 72-84.000.

Kanamitsu, Michitaro: *See*—
Kajimoto, Takeshi; Shimbo, Yutaka; Sato, Katsuyuki; Ogata, Masahiro; Kenmizaki, Kanehide; Kubono, Shouji; Kato, Nobuo; Manita, Kiichi; and Kanamitsu, Michitaro, 5,467,315, Cl. 365-222.000.

Kanamuro, Masayuki: *See*—
Matsubara, Takashi; Kanamuro, Masayuki; and Hasuda, Masanori, 5,467,160, Cl. 354-246.000.

Kanayama, Kouzou: *See*—
Hirai, Yukio; Kanayama, Kouzou; Yoshii, Kenji; Iwasaki, Kiyotoshi; Kanai, Isao; and Suzuki, Shin, 5,465,598, Cl. 72-84.000.

Kanda, Hiroshi: *See*—
Kishimoto, Shinji; Harashima, Masa; Kanda, Hiroshi; Sasaki, Akira; Tanabe, Kozi; Nosaka, Kenji; Hanasaka, Satoru; and Ishihara, Ken, 5,465,721, Cl. 128-660.070.

Kaneda, Teruo: *See*—
Mifune, Hiroshi; Saitoh, Satoshi; Kaneda, Teruo; Tomokiyo, Shigetaka; Adachi, Tsugio; Tanaka, Tsutomu; and Purudate, Toshiharu, 5,465,525, Cl. 43-132.100.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Mishima, Ikuhiro; Ikeda, Munehiro; and Hosoi, Hideki, 5,466,750, Cl. 525-84.000.

Kaneishi, Akimasa; and Toyota, Akinori, to Mitsubishi Gas Chemical Company, Inc. Gas-feeding nozzle. 5,465,908, Cl. 239-571.000.

Kaneko, Kouji, to Fuji Photo Optical Co., Ltd. Small-sized tripod head with connecting cable attached to driving shaft. 5,467,157, Cl. 354-81.000.

Kaneko, Satoru: *See*—
Takamoto, Yuusuke; Masaki, Ryoso; Obara, Sanshiro; and Kaneko, Satoru, 5,467,275, Cl. 364-426.010.

Kaneko, Yoshio: *See*—
Shimizu, Tetushi; Koda, Munetaka; Shida, Yoshikatsu; Kawaguchi, Jun-ichi; and Kaneko, Yoshio, 5,466,641, Cl. 437-233.000.

Kanemaru, Tetsuro; Takai, Hideyuki; Yamazaki, Itaru; and Iuchi, Kazushi, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member and electrophotographic apparatus, device unit and facsimile machine using the same. 5,466,550, Cl. 430-58.000.

Kang, Kok Lean R.: *See*—
Nakatsu, Tetsuo; Kang, Kok Lean R.; McAlister, Kelly L.; and Huang, Jiansheng, 5,466,718, Cl. 514-724.000.

Kangas, Steven L.: *See*—
Rolando, Richard J.; Coleman, Patrick L.; Kangas, Steven L.; and Kotnour, Thomas A., 5,466,747, Cl. 525-54.100.
Rolando, Richard J.; Coleman, Patrick L.; Kangas, Steven L.; and Kotnour, Thomas A., 5,466,749, Cl. 525-54.100.

Kankaanpää, Matti, to Valmet Paper Machinery, Inc. Method for draining water from a paper web. 5,466,341, Cl. 162-217.000.

Kankaanpää, Matti, to Valmet Paper Machinery, Inc. Suction roll in a twin-wire zone of a web former and a twin-wire web former. 5,466,342, Cl. 162-301.000.

Kankaanpää, Matti, to Valmet Paper Machinery, Inc. Suction element for a paper machine. 5,466,343, Cl. 162-357.000.

Kanno, Tatsuya; Hukuda, Yutaka; and Oshino, Yasuhiro, to Daicel Chemical Industries, Ltd. (Co) Polycarbonate and process for producing the same. 5,466,774, Cl. 528-199.000.

Kanno, Tatsuya; and Fukuda, Yutaka, to Daicel Chemical Industries, Ltd. Process for the preparation of polycarbonate. 5,466,775, Cl. 528-207.000.

Kano, Noriaki: *See*—
Takemoto, Takatoshi; Kano, Noriaki; Ito, Eiji; and Sekimoto, Kozo, 5,465,953, Cl. 271-234.000.
Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sedimoto, Kozo; and Suzuki, Masanori, 5,465,956, Cl. 271-274.000.

Kano, Takahumi: *See*—
Abe, Makoto; Ohta, Shigekata; Tokitoh, Hiroyuki; Ueda, Morimasa; Kano, Takahumi; and Hidaka, Hiroyuki, 5,467,289, Cl. 364-560.000.

Kanome, Yuji: *See*—
Asakura, Osamu; Uchikata, Yoshio; Kawazoe, Kenji; and Kanome, Yuji, 5,466,074, Cl. 400-206.000.

Kao Corporation: *See*—
Ohashi, Yukihiro; and Kawamata, Akira, 5,466,442, Cl. 424-70.120.
Shioya, Yasushi; Suzuki, Yuji; Takeuchi, Ken; Yoshino, Koji; and Kawamata, Akira, 5,466,849, Cl. 556-445.000.
Tosaka, Masaki; Saijo, Hiroyuki; Kawano, Haruki; Hayakawa, Yutaka; and Ohi, Toshiaki, 5,466,395, Cl. 252-551.000.

Kapp, Daniel L.; Ross, Robert J.; Younathan, Janet N.; and Singer, Stephen P., to Eastman Kodak Company. Photographic element containing an azopyrazolone masking coupler exhibiting reduced fog. 5,466,568, Cl. 430-551.000.

Karel, Thomas R.: *See*—
McPherson, James I.; Kinney, Daniel R.; Jeannot, William E., Jr.; and Karel, Thomas R., 5,466,062, Cl. 312-348.600.

Karhu USA Inc.: *See*—
Matis, Clark A.; and Garman, Michael S., 5,465,506, Cl. 36-11.500.

Karl, Manfred; and Burgartz, Ralf, to Bruker-Pranzen Analytik GmbH. Method of manufacturing a gating grid. 5,465,480, Cl. 29-825.000.

Karlsson, Rolf L.; Tinoco, Hernan; and Henriksson, Mats E., to Vattenfall Utveckling AB. Separator. 5,466,272, Cl. 55-457.000.

Karpinski, Andrew J., Jr.: *See*—
Desmarais, Richard R.; and Karpinski, Andrew J., Jr., 5,467,190, Cl. 356-350.000.

Kasashima, Masahiko: *See*—
Saito, Toshimitsu; Kasashima, Masahiko; and Konno, Toshikazu, 5,467,469, Cl. 395-182.120.

Käsbauer, Josef: *See*—
Pies, Michael; Fiege, Helmut; Puppe, Lothar; and Käsbauer, Josef, 5,466,881, Cl. 570-202.000.

Kase, Seiichi, to NEC Corporation. Integrated circuit test system. 5,465,850, Cl. 209-573.000.

Kashiwabara, Masuo: *See*—
Kobayashi, Hirohisa; and Kashiwabara, Masuo, 5,466,199, Cl. 477-107.000.

Kashiwagi, Kouichi: *See*—
Sugise, Ryoji; Kashiwagi, Kouichi; Shirai, Masashi; and Shimakawa, Toshihiro, 5,466,858, Cl. 558-364.000.

Kass, John J.; Hoopes, Philip K.; Sously, Wayne E.; and Aspinall, Graeme H., to Reese Products, Inc. Weight distributing hitch. 5,465,991, Cl. 280-457.000.

Katada, Naonobu: *See*—
Niwa, Miki; Kodakari, Nobuaki; Funabiki, Hisato; and Katada, Naonobu, 5,466,483, Cl. 427-226.000.

Katao, Hisashi: *See*—
Lee, Neville K.; and Katao, Hisashi, 5,467,238, Cl. 360-128.000.

Kataoka, Takayuki; Uemura, Ryuji; Kawasaki, Shunzo; and Shibata, Fumio, to Teijin Limited. High-density textile fabric. 5,466,514, Cl. 428-229.000.

Katchmar, Roman, to Northern Telecom Limited. Printed circuit boards and heat sink structures. 5,467,251, Cl. 361-719.000.

Kato, Kaneyoshi: *See*—
Yamamoto, Mitsuo; Doi, Takayuki; and Kato, Kaneyoshi, 5,466,689, Cl. 514-229.500.

Kato, Masataka: *See*—
Tanaka, Toshihiro; Kato, Masataka; Kume, Hitoshi; Ogura, Keisuke; and Adachi, Tetsuo, 5,467,309, Cl. 365-185.140.

Kato, Nobuo: *See*—
Kajimoto, Takeshi; Shimbo, Yutaka; Sato, Katsuyuki; Ogata, Masahiro; Kenmizaki, Kanehide; Kubono, Shouji; Kato, Nobuo; Manita, Kiichi; and Kanamitsu, Michitaro, 5,467,315, Cl. 365-222.000.

Kato, Tohru: *See*—
Tanaka, Tadashi; Sakamoto, Masaaki; and Kato, Tohru, 5,466,538, Cl. 428-610.000.

Katono, Hiroki: *See*—
Sakagami, Teruo; Ogihara, Takeo; Fujii, Yasufumi; and Katono, Hiroki, 5,466,755, Cl. 525-326.600.

Katsura, Hiroo: *See*—
Takeda, Katsunori; Otsuka, Shinsuke; Takahashi, Yoshiharu; Katsura, Hiroo; Takata, Kazuhiko; Maeda, Shoichi; and Nagato, Takafumi, 5,467,458, Cl. 395-427.000.

Katz, Wolfgang, to Danly Corporation. Self-contained gas cylinder. 5,465,811, Cl. 184-24.000.

Kau, Chin-Cheng: *See*—
Kahle, James A.; and Kau, Chin-Cheng, 5,467,473, Cl. 395-800.000.

Kaub, Kevin F.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.

Kaul, Bal K.; Sabottke, Craig Y.; Fiato, Rocco A.; and Niessen, Edward, to Exxon Research & Engineering Co. Performance of contaminated wax isomerate oil and hydrocarbon synthesis liquid products by silica adsorption. 5,466,364, Cl. 208-307.000.

Kauschke, Michael: *See*—
Eschwey, Helmut; Giesen-Wiese, Monika; Grill, Maria; Emirze, Ararad; Seidler, Hans-Peter; Klein, Bernhard; and Kauschke, Michael, 5,466,517, Cl. 428-288.000.

Kawabata, Hironori; Moriguchi, Koei; and Endo, Takeshi, to Fuji Kagaku Kogyo Kabushiki Kaisha. Co-administration of S-adenosyl-L-methionine to reduce the nephrotoxicity of cisplatin therapy. 5,466,678, Cl. 514-46.000.

Kawaguchi, Jun-ichi: *See*—
Shimizu, Tetushi; Koda, Munetaka; Shida, Yoshikatsu; Kawaguchi, Jun-ichi; and Kaneko, Yoshio, 5,466,641, Cl. 437-233.000.

Kawaguchi, Koji: *See*—
Sadaki, Akihiro; Shiraishi, Masayoshi; Kawawada, Naoki; and Kawaguchi, Koji, 5,467,120, Cl. 347-171.000.

Kawahara, Sei: *See*—
Shirakura, Yuji; Abe, Hisamasa; Yamashita, Teruo; Shimizu, Tatsuo; Kawahara, Sei; Miyoshi, Takahito; and Nishikawa, Yasuo, 5,466,519, Cl. 428-323.000.

Kawai, Kimitoshi: *See*—
Kosaki, Michio; and Kawai, Kimitoshi, 5,466,588, Cl. 435-139.000.

Kawai, Makiko: *See*—
Kuma, Yoshiharu; Setoyama, Tamotsu; Maruyama, Hideaki; and Kawai, Makiko, 5,466,472, Cl. 426-43.000.

Kawamata, Akira: *See*—
Ohashi, Yukihiro; and Kawamata, Akira, 5,466,442, Cl. 424-70.120.
Shioya, Yasushi; Suzuki, Yuji; Takeuchi, Ken; Yoshino, Koji; and Kawamata, Akira, 5,466,849, Cl. 556-445.000.

Kawamura, Fumio; Shimada, Shigeru; and Ikeda, Tsutomu, to Hitachi, Ltd.; and Hitachi Engineering & Services Co, Ltd. Method of three-dimensional display of object-oriented figure information and system thereof. 5,467,444, Cl. 395-141.000.

Kawamura, Osamu: *See*—
Sato, Katsuaki; Tominaga, Katsuhiko; Saka, Tsutomu; Kawamura, Osamu; Takahashi, Teruo; and Kakiuchi, Arata, 5,466,276, Cl. 75-231.000.

Kawanishi, Michirou: *See*—
Mizuno, Fumio; Moriuchi, Noboru; Shirai, Seiichiro; Moroishi, Yutaka; Sunakawa, Makoto; and Kawanishi, Michirou, 5,466,325, Cl. 156-344.000.

Kawano, Haruki: *See*—
Tosaka, Masaki; Saijo, Hiroyuki; Kawano, Haruki; Hayakawa, Yutaka; and Ohi, Toshiaki, 5,466,395, Cl. 252-551.000.

Kawaoka, Akihiro: *See*—
Takahashi, Takehiro; Daito, Kazuhiko; and Kawaoka, Akihiro, 5,467,475, Cl. 395-800.000.

Kawasaki, Hirofumi: *See*—
Mishima, Akio; Harada, Tosiharu; Tanihara, Mamoru; Ota, Yasutaka; Okinaka, Kenji; Mori, Kohji; Kawasaki, Hirofumi; Nagai, Norimichi; Fujimoto, Katsunori; and Okuda, Yoshiro, 5,466,306, Cl. 148-306.000.

Kawasaki, Shunzo: *See*—
Kataoka, Takayuki; Uemura, Ryuji; Kawasaki, Shunzo; and Shibata, Fumio, 5,466,514, Cl. 428-229.000.

Kawasaki Steel Corporation: *See*—
Kogiku, Fumio; Yukumoto, Masao; and Okabe, Seiji, 5,466,304, Cl. 148-100.000.
Shimizu, Tetushi; Koda, Munetaka; Shida, Yoshikatsu; Kawaguchi, Jun-ichi; and Kaneko, Yoshio, 5,466,641, Cl. 437-233.000.

Kawasaki, Takashi, to Kabushiki Kaisha Toshiba. Superscalar processor having bypass circuit for directly transferring result of instruction execution between pipelines without being written to register file. 5,467,476, Cl. 395-800.000.

Kawase, Kozo: *See*—
Konig, Wolfgang; Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Takase, Mitsunori; and Bellamy, Wayne R., 5,466,669, Cl. 514-12.000.

Kawashima, Kazunari: *See*—
Takemoto, Takatoshi; Kawashima, Kazunari; Kadomatsu, Hideyuki; Aoyama, Moriyuki; and Nakamura, Takaharu, 5,465,950, Cl. 271-125.000.

Kawata, Kenji, to Murata Kikai Kabushiki Kaisha. Facsimile machine. 5,467,203, Cl. 358-451.000.

Kawawada, Naoki: *See*—
Sadaki, Akihiro; Shiraishi, Masayoshi; Kawawada, Naoki; and Kawaguchi, Koji, 5,467,120, Cl. 347-171.000.

Kawazoe, Kenji: *See*—
Asakura, Osamu; Uchikata, Yoshio; Kawazoe, Kenji; and Kanome, Yuji, 5,466,074, Cl. 400-206.000.

Kaya, Cetin; Holland, Wayland B.; and Mezenner, Rabah, to Texas Instruments Incorporated. Method of using source bias to increase threshold voltages and/or to correct for over-erasure of flash eproms. 5,467,306, Cl. 365-185.200.

Kayamoto, Kanao: *See*—
Sato, Yuji; Honjo, Toshio; Kayamoto, Kanao; Ogata, Masahiro; and Shimizu, Kouichi, 5,466,552, Cl. 430-106.600.

Kazami, Kazuyuki: *See*—
Ezawa, Akira; Daitoku, Koichi; Inoue, Hideya; Kazami, Kazuyuki; and Ohtsuka, Kazuto, 5,467,156, Cl. 354-21.000.

Kearney, Michael M.; Kochergin, Vadim; Peterson, Kenneth R.; and Velasquez, Larry, to Amalgamated Sugar Company, The. Sugar beet juice purification process. 5,466,294, Cl. 127-42.000.

Keating, Paul J.: *See*—
Roach, Donald E.; and Keating, Paul J., 5,466,756, Cl. 525-330.600.

Keeney, F. Nelson; and Troth, John L., to DowElanco. Triclopyr butoxyethyl ester compositions comprising vegetable oil esters as carriers. 5,466,659, Cl. 504-130.000.

Keir, Bruce, to Marshall Amplification Plc. Solid state audio amplifier emulating a tube audio amplifier. 5,467,400, Cl. 381-61.000.

Keller, Carl E. Method and apparatus for removing contaminants from a duct or pipe. 5,466,093, Cl. 405-152.000.

Keller, Dirk A.: *See*—
Imler, Donald C.; and Keller, Dirk A., 5,466,140, Cl. 425-38.000.

Keller, John H.: *See*—
Barnes, Michael S.; Keller, John H.; Logan, Joseph S.; Tompkins, Robert E.; and Westerfield, Robert P., Jr., 5,467,249, Cl. 361-234.000.

Kelley, Paul E., to Teledyne ET a div. of Teledyne Industries. Mass spectrometry method using notch filter. 5,466,931, Cl. 250-282.000.

Kelly, Earl L., Jr.: *See*—
Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; and Grubbs, Gray W., 5,466,905, Cl. 219-121.460.

Kelly, George R.: *See*—
Lebby, Michael S.; Kelly, George R.; and Jachimowicz, Karen E., 5,467,215, Cl. 359-247.000.

Kelly, Michael A.: *See*—
Bryson, Charles E., III; and Kelly, Michael A., 5,466,933, Cl. 250-305.000.

Kemmerer, Klemens: *See*—
Bayer, Harald; and Kemmerer, Klemens, 5,465,663, Cl. 101-409.000.

Kendall Company, The: *See*—
Patel, Harish A., 5,465,735, Cl. 128-888.000.

Kenmizaki, Kanehide: *See*—
Kajimoto, Takeshi; Shimbo, Yutaka; Sato, Katsuyuki; Ogata, Masahiro; Kenmizaki, Kanehide; Kubono, Shouji; Kato, Nobuo; Manita, Kiichi; and Kanamitsu, Michitaro, 5,467,315, Cl. 365-222.000.

Kennametal Inc.: *See*—
Erickson, Robert A., 5,466,102, Cl. 409-232.000.

Kennedy, James K.; and Wilson, James A., to Minnesota Mining and Manufacturing Company. Card reader case. 5,465,832, Cl. 206-45.230.

Kennedy, John M.; and Kennedy, William R., to Jack Kennedy Metal Products and Buildings, Inc. Mine ventilation structure. 5,466,187, Cl. 454-169.000.

Kennedy, Ronald R.: *See*—
Nash, Mark E.; and Kennedy, Ronald R., 5,467,231, Cl. 360-46.000.

Kennedy, William R.: *See*—
Kennedy, John M.; and Kennedy, William R., 5,466,187, Cl. 454-169.000.

Kenney, Donald M.: *See*—
Armacost, Michael; Baker, A. Richard, Jr.; Berry, Wayne S.; Carl, Daniel A.; Kenney, Donald M.; and Licata, Thomas J., 5,466,626, Cl. 437-60.000.
Cronin, John E.; Kaanta, Carter W.; Kenney, Donald M.; Kerbaugh, Michael L.; Landis, Howard S.; Machesney, Brian J.; Parries, Paul; Previti-Kelly, Rosemary A.; and Rembetski, John F., 5,466,636, Cl. 437-187.000.

Keogh, Andrew J.: *See*—
Price, Steven; Jepson, Raymond; Worley, Barry J.; Wood, Steven P.; and Keogh, Andrew J., 5,467,350, Cl. 370-82.000.

KeraVision, Inc.: *See*—
Silvestrini, Thomas; Mathis, Mark; and Loomas, Bryan, 5,466,260, Cl. 623-5.000.

Kerbaugh, Michael L.: *See*—
Cronin, John E.; Kaanta, Carter W.; Kenney, Donald M.; Kerbaugh, Michael L.; Landis, Howard S.; Machesney, Brian J.; Parries, Paul; Previti-Kelly, Rosemary A.; and Rembetski, John F., 5,466,636, Cl. 437-187.000.

Kersten, Jean; and Delmotte, Yves, to Baxter International, Inc. Anti-viral materials. 5,466,725, Cl. 523-122.000.

Kerttula, Reima, to Valmet Paper Machinery, Inc. Inverted dryer group in a multi-cylinder dryer in a paper machine. 5,465,505, Cl. 34-452.000.

Keesenich, Peter, to Abbott Laboratories. Patient controlled analgesic injector assembly and method of assembling same to an infuser unit. 5,466,227, Cl. 604-246.000.

Ketterling, Hans-Peter, to Robert Bosch GmbH. Digital frequency and phase modulator for radio transmission. 5,467,373, Cl. 375-327.000.

Keung, Wing-Kwong; and Kulpa, Walter J., to Pitney Bowes Inc. Envelope positioning assembly. 5,465,662, Cl. 101-235.000.

Keus, Arie, to Waterworks International, Inc. Freeze crystallization for the removal of water from a solution of dissolved solids. 5,465,592, Cl. 62-544.000.

Khanna, Ish K.: *See*—
Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., 5,466,823, Cl. 548-377.100.

Khanpara, Jatin C.: *See*—
Cur, Nihat O.; Kuehl, Steven J.; Khanpara, Jatin C.; LeClear, Douglas D.; and Peterson, James R., 5,465,591, Cl. 62-439.000.

Khoe, Teng H. Enteric coated papain-containing food supplement for controlling auto immune diseases. 5,466,547, Cl. 424-439.000.

Kiczka, Witold, to Nika Health Products, Ltd. Antibacterial composition and method of use. 5,466,449, Cl. 424-94.610.

Kida, Junzo; Arita, Hiroshi; and Kurosawa, Yukio, to Hitachi, Ltd. Solid-state switch. 5,467,049, Cl. 327-438.000.

Kida, Otojiro: *See*—

Ishino, Toshihiro; Kida, Otojiro; and Beppu, Yoshihisa, 5,466,643, Cl. 501-105.000.

Kidwell, David A., to United States of America, Navy. Surfactant-enhanced light emission- or absorbance-based binding assays for polynucleic acids. 5,466,578, Cl. 435-6.000.

Kießling, Gerhard; Pillath, Raimund; Reuther, Stefan; and Richter, Anja, to Herberts GmbH. Process for fixing wound items with radically polymerisable compounds. 5,466,492, Cl. 427-522.000.

Kiefer, Gerry D., to Atoma International Inc. Controlled venting during molding of polyurethane foam. 5,466,404, Cl. 264-408.000.

Kiefer, Karl F.: *See*—
McDonald, William J.; Pittard, Gerard T.; Steele, Charles G.; Kiefer, Karl F.; Clifton, Terry P.; and Leitko, Curtis E., 5,467,083, Cl. 340-854.600.

Kienberger, Helmut, to Siemens Aktiengesellschaft. Method for influencing a signaling procedure with the assistance of communication terminal equipment of a communication system. 5,467,387, Cl. 379-167.000.

Kietlinski, Tomasz K.: *See*—
Nogle, Thomas D.; Haven, Willem S.; and Kietlinski, Tomasz K., 5,466,195, Cl. 475-55.000.

Kikuchi, Koji, to Kabushiki Kaisha Sato. Strip winding mechanism. 5,465,919, Cl. 242-532.600.

Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, to Canon Kabushiki Kaisha. Semiconductor device and method of manufacturing the same. 5,466,961, Cl. 257-379.000.

Kikuchi, Yasuo: *See*—
Kudoh, Kichizo; Kikuchi, Yasuo; Ishida, Tatsuya; Ikeda, Tatsufumi; and Fujimoto, Hiroaki, 5,466,703, Cl. 514-374.000.

Kikuchi, Yoshihiro: *See*—
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,467,136, Cl. 348-416.000.

Kim, Hyeun-Su; and Lee, Dong-Jae, to SamSung Electronics Co., Ltd. Device and method of reducing word line resistance of a semiconductor memory. 5,467,316, Cl. 365-230.060.

Kim, Jae K., to Hyundai Electronics Industries Co., Ltd. Method of making a self-aligned contact in semiconductor device. 5,466,637, Cl. 437-187.000.

Kim, Jin H., to Goldstar Co., Ltd. Method for fabricating a thin film transistor for a liquid crystal display. 5,466,618, Cl. 437-40.000.

Kim, Ko-hyun, to Samsung Electronics Co., Ltd. Disk player mechanism. 5,467,334, Cl. 369-77.100.

Kim, Kwang S.: *See*—
Isaacs, Charles E.; Kim, Kwang S.; and Wisniewski, Henryk M., 5,466,714, Cl. 514-558.000.

Kim, Michael R.: *See*—
McCune, Robert C., Jr.; Kim, Michael R.; and Smith, Ronald W., 5,466,906, Cl. 219-121.470.

Kim, Seong I. Negative ion sputtering beam source. 5,466,941, Cl. 250-423.00R.

Kim, Tae S. Battery operated nail file apparatus. 5,465,740, Cl. 132-73.600.

Kim, Yongmin: *See*—
Alexander, Thomas; Kim, Yongmin; Park, Hyunwook; Eo, Kil-Su; and Jong, Jing-Ming, 5,467,459, Cl. 395-480.000.

Kimberly-Clark Corporation: *See*—
Cohen, Bernhard; and Jameson, Lee K., 5,466,401, Cl. 264-443.000.
Isaac, Robert L.; and Cohen, Bernard, 5,466,518, Cl. 428-288.000.
Partridge, Mary E.; Blenke, Timothy J.; Everson, Stephen R.; Schroth, Carl G.; and Venturino, Michael B., 5,466,409, Cl. 264-165.000.
Wanek, M. Chris; Van Den Bogart, Thomas W.; Georger, William A.; Ribble, Brendon F.; Matthews, Billie J.; Sawyer, Lawrence H.; Abuto, Frank P.; and Werner, Edward E., 5,466,513, Cl. 428-218.000.

Kimbro, Charles D.: *See*—
Shaffer, Robert W.; Adriance, Kyle; and Kimbro, Charles D., 5,466,134, Cl. 418-15.000.

Kimura, Katsuji, to NEC Corporation. Logarithmic intermediate-frequency amplifier. 5,467,046, Cl. 327-351.000.

Kimura, Katsutaka: *See*—
Miyazawa, Kazuyuki; Shimohigashi, Katsuhiro; Etoh, Jun; and Kimura, Katsutaka, 5,467,314, Cl. 365-201.000.

Kimura, Makoto, to Unisia Jecs Corporation. Vehicular suspension system utilizing variable damping force shock absorber. 5,467,280, Cl. 364-424.050.

Kimura, Masaji: *See*—
Shimoda, Yoshiaki; and Kimura, Masaji, 5,465,644, Cl. 84-423.00R.

Kimura, Shinichiro: *See*—
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,466,621, Cl. 437-52.000.

Kimura, Tadashi: *See*—
Tanizawa, Osamu; Okayama, Hiroto; Saji, Fumitaka; Azuma, Chihiro; and Kimura, Tadashi, 5,466,584, Cl. 435-69.100.

Kimura, Tomohisa; and Ikoma, Akira, to Kabushiki Kaisha Komatsu Seisakusho. Cylindrically machining apparatus. 5,465,474, Cl. 29-601.000.

Kinami, Haruyuki: *See*—
Itoh, Takashi; Saitoh, Hiroyuki; Kinami, Haruyuki; Konaka, Toshinori; and Murai, Tsuyoshi, 5,465,447, Cl. 15-88.300.

King, Dan: *See*—
Lause, Herb; Moore, Sylvia; Seltzer, Clif; Taylor, Cliff; and King, Dan, 5,466,317, Cl. 156-79.000.

King, Daniel W. Siding panel and support strip assembly and method of production. 5,465,486, Cl. 29-897.320.

Kinjo, Naoto; and Terashita, Takaaki, to Fuji Photo Film Co., Ltd. Photograph printing method. 5,467,168, Cl. 355-77.000.

Kinney, Daniel R.: *See*—
McPherson, James I.; Kinney, Daniel R.; Jeannot, William E., Jr.; and Karel, Thomas R., 5,466,062, Cl. 312-348.600.

Kinoshita, Mikio; and Ohta, Wasaburo, to Ricoh Co., Ltd. Method of forming a thin film magnetic head. 5,465,475, Cl. 29-603.000.

Kinoshita, Mitsuo: *See*—
Yonezawa, Toshio; Mitsui, Kenrou; Nakazima, Makoto; Kinoshita, Mitsuo; Shimono, Toshihide; and Yamamoto, Tuneo, 5,466,289, Cl. 106-409.000.

Kinoshita, Shigenori; Yanase, Takao; and Fujita, Koetsu, to Fuji Electric Co., Ltd. Electric system for an electric vehicle. 5,466,998, Cl. 318-375.000.

Kinouchi, Shigenori; and Sawada, Akira, to NEC Corporation. Huffman code decoding circuit. 5,467,088, Cl. 341-65.000.

Kinsley, Homan B., Jr., to CPG Holdings Inc. Process for making a paper based product employing a polymeric latex binder. 5,466,336, Cl. 162-146.000.

Kiraly, Laszlo, to International Rectifier Corporation. Method and apparatus for short circuit protection of power transistor device. 5,467,242, Cl. 361-94.000.

Kirby, Norman R.; and Schmidt, Richard S., to Forward Enterprises. Method of setting, resetting and protecting poles in the ground with foam polyurethane resins. 5,466,094, Cl. 405-232.000.

Kircher, Günter; and Küsters, Heinz-Peter, to Dr. Ing. h.c.F. Porsche AG. Hood for a mobile excavator. 5,465,803, Cl. 180-69.210.

Kirkham, Edward E.: *See*—
Sheldon, Paul C.; and Kirkham, Edward E., 5,466,085, Cl. 403-157.000.

Kirn, Manfred; Borst, Erich; Schaal, Guenter; Staebler, Manfred-Wilhelm; and Eicher, Bernard, to Robert Bosch GmbH. Hand held power tool with locking rotatable appendage. 5,466,183, Cl. 451-359.000.

Kishigami, Masamitsu, to Casio Computer Co., Ltd. Arrangement of bonding IC chip to liquid crystal display device. 5,467,210, Cl. 359-88.000.

Kishimoto, Shinji; Harashima, Masa; Kanda, Hiroshi; Sasaki, Akira; Tanabe, Kozi; Nosaka, Kenji; Hanasaka, Satoru; and Ishihara, Ken, to Hitachi Medical Corporation. Ultrasonic diagnostic apparatus and ultrasonic diagnosis method. 5,465,721, Cl. 128-660.070.

Kishimoto, Yuji: *See*—
Yasui, Katsuaki; and Kishimoto, Yuji, 5,465,618, Cl. 73-204.270.

Kishner, Stanley J., to Hughes Aircraft Company. Sample point interferometer for measuring changes in figure of a primary mirror and primary-secondary mirror spacing. 5,467,191, Cl. 356-360.000.

Kitahara, Toshihiro, to Olympus Optical Co., Ltd. Recording-reproducing apparatus with a mechanism for preventing successive insertion of two cards. 5,466,914, Cl. 235-483.000.

Kitamura, Naomi: *See*—
Shimomura, Takeshi; Yamada, Kazunori; Morimoto, Yuuki; Kitamura, Naomi; and Miyazawa, Keiji, 5,466,593, Cl. 435-219.000.

Kitamura, Syozo: *See*—
Kouzai, Fumio; Tokumaru, Susumu; and Kitamura, Syozo, 5,466,075, Cl. 400-240.300.

Kitamura, Tadaaki: *See*—
Okuyama, Yoshiyuki; Kitamura, Tadaaki; Kobayashi, Yoshiki; Yahiro, Masakazu; and Fujiwara, Kazunori, 5,467,402, Cl. 382-104.000.

Kitano, Yoshihiro: *See*—
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; and Kitano, Yoshihiro, 5,467,326, Cl. 369-30.000.

Kitney, Richard I.: *See*—
Dickinson, Robert J.; and Kitney, Richard I., 5,465,726, Cl. 128-663.010.

Kiyomiya, Tadashi; Ohoshi, Toshio; and Okita, Masami, to Sony Corporation. Method of forming a fluoresecent screen by electrodeposition on a screen panel of a field emission display. 5,466,358, Cl. 205-96.000.

Kizawa, Satoru: *See*—
Hiratsuka, Mitsunori; Takano, Minoru; Enomoto, Masayuki; Kizawa, Satoru; and Saitoh, Kazuo, 5,466,663, Cl. 504-286.000.

Klages, Ulrich; Feldschmid, Alois; Kreis, Gundolf; and Timm, Heinrich, to Audi AG. Improved vehicle front-end support structure for a passenger car. 5,466,035, Cl. 296-205.000.

Klaus, Emmerich, to "Amerika-Bogen" Handelsgesellschaft mbH. Fledging vane. 5,465,981, Cl. 273-423.000.

Klein, Bernhard: *See*—
Eschwey, Helmut; Giesen-Wiese, Monika; Grill, Maria; Emirze, Ararad; Seidler, Hans-Peter; Klein, Bernhard; and Kauschke, Michael, 5,466,517, Cl. 428-288.000.

Klein, Theodore D.: *See*—
Fishbine, Glenn M.; Withoff, Robert J.; and Klein, Theodore D., 5,467,403, Cl. 382-116.000.

Kleinschmitt, David; Touma, Maroun; and Zabetakis, George E., to Miles, Inc. Method and apparatus for discriminating between liquids and gases. 5,466,946, Cl. 250-577.000.

Kleissendorf, Roland: *See*—
Sieber, Helmut; Schilling, Ferdinand; Hagen, Günter; Kleissendorf, Roland; and Michaelis, Johannes, 5,465,834, Cl. 206-193.000.

Klemer, Daniel R.: *See*—
Sobottke, Mark D.; and Klemer, Daniel R., 5,465,493, Cl. 33-286.000.

Klier, Manfred: *See*—
Schneider, Günther; Klier, Manfred; Aul, Marta; and Teichmann, Stephan, 5,466,457, Cl. 424-401.000.

Kliman, Gerald B.; Preston, Mark A.; and Jones, Donald W., to General Electric Company. Permanent magnet line start motor having magnets outside the starting cage. 5,466,978, Cl. 310-156.000.

Klinar, Robert, to ITT Automotive Europe GmbH. Shaft with a worm formed onto it, and milling machine for manufacturing a worm. 5,465,631, Cl. 74-458.000.

Klöckner Hänsel Tevopharm B.V.: *See*—
Van Maanen, Johannes D., 5,465,824, Cl. 198-418.400.

Knape & Vogt Manufacturing Company: *See*—
Hoffman, Keith A., 5,466,060, Cl. 312-334.800.

Knapen, Peter S. A.: *See*—
Pronk, Franciscus A.; Bril, Thija W.; Knapen, Peter S. A.; Van Heeren, Arie H.; and Rhijnsburger, Laurens J., 5,466,495, Cl. 427-576.000.

Knapp, William. Tail pipe adapter. 5,466,900, Cl. 181-227.000.

Knepler, John T.: *See*—
Friedrich, Brent R.; and Knepler, John T., 5,465,650, Cl. 99-286.000.

Knifton, John F.: *See*—
Lambert, Timothy L.; and Knifton, John F., 5,466,778, Cl. 528-361.000.

Knodel, Bryan D.; Nuchols, Richard P.; and Williamson, Warren P., IV, to Ethicon Endo-Surgery, Inc. Surgical stapler instrument. 5,465,895, Cl. 227-176.000.

Knodt, Kurt T.: *See*—
Gauronski, John F.; and Knodt, Kurt T., 5,467,449, Cl. 395-185.100.

Knott, David S., to Rolls-Royce plc. Rotors for gas turbine engines. 5,466,125, Cl. 416-193.00A.

Kobayashi, Eiichi: *See*—
Kosaka, Tetsuya; and Kobayashi, Eiichi, 5,467,003, Cl. 318-568.130.

Kobayashi, Hirohisa; and Kashiwabara, Masuo, to Unisia Jecs Corporation. Method and apparatus for controlling, during N-D or P-D shift, the engine output by a second throttle valve of a vehicle fitted with an automatic transmission. 5,466,199, Cl. 477-107.000.

Kobayashi, Hiroshi; Hibino, Ikuo; Maruyama, Takahito; Hori, Fumihisa; Nakamura, Tadashi; Matsuura, Takanobu; and Ohsakama, Chikashi, to Alps Electric Co., Ltd. Ink ribbon cassette for use in transfer printer. 5,466,076, Cl. 400-248.000.

Kobayashi, Shotaro: *See*—
Uchida, Katsunori; Kobayashi, Shotaro; and Fukushima, Tatsuhiro, 5,467,304, Cl. 365-174.000.

Kobayashi, Yasushi: *See*—
Hosoya, Kimio; Teruya, Yoshihiro; and Kobayashi, Yasushi, 5,466,908, Cl. 217-121.680.

Kobayashi, Yoshiki: *See*—
Okuyama, Yoshiyuki; Kitamura, Tadaaki; Kobayashi, Yoshiki; Yahiro, Masakazu; and Fujiwara, Kazunori, 5,467,402, Cl. 382-104.000.

Kobelt, Jacob. Helm pump. 5,466,130, Cl. 417-269.000.

Koch, Paolo: *See*—
Pianta, Orazio; and Koch, Paolo, 5,466,387, Cl. 252-51.50A.

Koch, Rainhard: *See*—
Kalbe, Jochen; Müller, Hanns P.; Koch, Rainhard; Engelhardt, Jürgen; Koch, Wolfgang; Szablikowski, Klaus; and Weber, Gunter, 5,466,794, Cl. 536-66.000.

Koch Supplies, Inc.: *See*—
Harte, James R., 5,465,557, Cl. 53-510.000.

Koch, Wolfgang: *See*—
Kalbe, Jochen; Müller, Hanns P.; Koch, Rainhard; Engelhardt, Jürgen; Koch, Wolfgang; Szablikowski, Klaus; and Weber, Gunter, 5,466,794, Cl. 536-66.000.

Kochergin, Vadim: *See*—
Kearney, Michael M.; Kochergin, Vadim; Peterson, Kenneth R.; and Velasquez, Larry, 5,466,294, Cl. 127-42.000.

Kocis, Thomas, to Dell USA, L.P. Circuit for providing automatic SCSI bus termination. 5,467,453, Cl. 395-281.000.

Koda, Munetaka: *See*—
Shimizu, Tetushi; Koda, Munetaka; Shida, Yoshikatsu; Kawaguchi, Jun-ichi; and Kaneko, Yoshio, 5,466,641, Cl. 437-233.000.

Kodakari, Nobuaki: *See*—
Niwa, Miki; Kodakari, Nobuaki; Funabiki, Hisato; and Katada, Naonobu, 5,466,483, Cl. 427-226.000.

Kodama, Hisashi: *See*—
Nagamitsu, Sachio; Sakai, Mayumi; Kodama, Hisashi; and Okada, Tsuneko, 5,467,401, Cl. 381-63.000.

Kodama, Kenji: *See*—
Yamasaki, Masahiro; Chiba, Masaru; Yokogoshi, Takashi; Kodama, Kenji; Yamaya, Tatsuo; and Yokoyama, Masakazu, 5,466,475, Cl. 426-439.000.

Kodera, Yasuto: *See*—
Hotta, Yoshio; Hanyu, Yukio; Mihara, Tadashi; Kodera, Yasuto; and Nakamura, Katsutoshi, 5,467,209, Cl. 359-74.000.

Kodokian, George K.: *See*—
Brinton, David L.; and Kodokian, George K., 5,466,423, Cl. 422-186.050.

Koefelda, Gerald R., to Rehrig Pacific Company. Nestable display crate for bottles or the like. 5,465,843, Cl. 206-507.000.

Koehn, Leroy F.; and Esau, Merlin L., to Moridge Manufacturing, Inc. Convertible mower deck. 5,465,564, Cl. 56-320.200.

Koelzer, Robert L., to Midland Brake, Inc. Full-function valve for tandem trailer brake system. 5,466,053, Cl. 303-7.000.

Koenig, Don M., to Churchill, Gerald J. Audiovisual safety warning kit. 5,467,071, Cl. 340-433.000.

Koga, Yoshiro, to Seiko Epson Corporation. Apparatus for forming an image using an electrophotographic process. 5,467,174, Cl. 355-245.000.

Kogiku, Fumio; Yukumoto, Masao; and Okabe, Seiji, to Kawasaki Steel Corporation. Amorphous iron based alloy and method of manufacture. 5,466,304, Cl. 148-100.000.

Kohama, Yoshiaki; and Ohmori, Kaoru, to Nikon Corporation. Charged particle microscope. 5,466,936, Cl. 250-310.000.

Kohayakawa, Yoshimi, to Canon Kabushiki Kaisha. Eye refractometer having variable wavelength illumination means. 5,467,151, Cl. 351-213.000.

Kohchi, Tetsunobu: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,466,961, Cl. 257-379.000.

Kohda, Kenji; and Kouro, Yasuhiro, to Mitsubishi Denki Kabushiki Kaisha. Read only type semiconductor memory device including address coincidence detecting circuits assigned to specific address regions and method of operating the same. 5,467,457, Cl. 395-429.000.

Kohl, William K., to Testy Putts Corporation. Disc launcher. 5,465,704, Cl. 124-5.000.

Kohler, Timothy A.; and Ringlien, James A., to Owens-Brockway Glass Container Inc. Inspection of translucent containers. 5,466,927, Cl. 250-223.00B.

Kohlmeier, Hans-Heinrich; and Gerber, Fritz, to Dr. Ing. h.c.F. Porsche AG. Motor vehicle. 5,466,005, Cl. 280-781.000.

Kohlpaintner, Christian: *See*—
Konkol, Werner; Bahrmann, Helmut; Herrmann, Wolfgang A.; and Kohlpaintner, Christian, 5,466,644, Cl. 502-28.000.

Kohno, Shigefumi: *See*—
Gotomyo, Yasuo; Kore, Haruhisa; Muramoto, Hisao; Nomura, Yoshinbu; Kohno, Shigefumi; and Hirashima, Isao, 5,466,001, Cl. 280-730.100.

Kohno, Teruhisa: *See*—
Nokubo, Seiji; and Kohno, Teruhisa, 5,465,937, Cl. 251-129.150.

Koike, Naomasa; Nakano, Akira; Kosaka, Takao; and Sakata, Naoya, to Mitsubishi Paper Mills Limited. Heat-sensitive recording material. 5,466,655, Cl. 503-209.000.

Koilpillai, Ravinder D.: *See*—
Chennakeshu, Sandeep; Dent, Paul W.; Koilpillai, Ravinder D.; and Toy, Raymond L., 5,467,374, Cl. 375-340.000.

Koinuma, Yasumi; Matsumoto, Takeo; Nakada, Nobuharu; Nakabayashi, Nobuo; and Ishihara, Kazuhiko, to NOF Corporation. Diester monomer, its polymer, water-containing soft contact lens, and processing solution for contact lens. 5,466,853, Cl. 558-169.000.

Koiranen, Jukka: *See*—
Pellinen, Kari; Koiranen, Jukka; Erkkilä, Kari; Ahola, Juhani; and Vähä, Harritalo, 5,467,194, Cl. 356-429.000.

Koizumi, Noboru: *See*—
Itihara, Yoshiyuki; Haneda, Satoshi; Koizumi, Noboru; Haaebe, Takashi; and Niitsuma, Tetsuya, 5,467,422, Cl. 358-298.000.

Kokawa, Shozo; Nishihara, Michiharu; and Sato, Yukikazu, to Sharp Kabushiki Kaisha. Liquid crystal display. 5,467,208, Cl. 359-49.000.

Koketsu, Tadaaki, to Kabushiki Kaisha Toshiba. System and method for communicating data between plural air conditioning machines for controlling the machines and displaying their status. 5,467,078, Cl. 340-825.060.

Koks, Maarten; and Titulaer, Franz, to Titulaer, Franz; and Loitegaard, Birgit. Display frame for small articles. 5,465,852, Cl. 211-87.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Takeuchi, Yoshio; and Suzuki, Toshinori, 5,467,368, Cl. 375-206.000.

Kolb, Marcus E.: *See*—
Yang, Xin; Lee, Jaw E.; Armiger, William; Maneahin, Sergey K.; and Kolb, Marcus E., 5,466,604, Cl. 435-286.100.

Kollin, Joel S.: *See*—
Furness, Thomas A., III; and Kollin, Joel S., 5,467,104, Cl. 345-8.000.

Komarek, Dale W.; and Moser, Paul, to Hexacomb Corporation. Method and apparatus for manufacturing articles employing folded honeycomb panels. 5,466,211, Cl. 493-355.000.

Komarek, James A.; Padgett, Clarence W.; Amneus, Robert D.; and Tanner, Scott B., to Creative Integrated Systems, Inc. Grounded memory core for Roms, Eproms, and EEpproms having an address decoder, and sense amplifier. 5,467,300, Cl. 365-104.000.

Komatsubara, Yoshitada, to Bridgestone Cycle Co., Ltd. Vulcanizer. 5,466,139, Cl. 425-35.000.

Komiyama, Megumi: *See*—
Sato, Yoshinori; Komiyama, Megumi; Endo, Kazuo; and Tate, Masashi, 5,466,521, Cl. 428-330.000.

Komolrochanaporn, Naris. Pipe coupling. 5,466,019, Cl. 285-343.000.

Komorowski, Karl J.; Saul, Jonathan R.; LaPointe, Larry P.; and Marshall, Richard E., to La-Z-Boy Chair Co. Linear actuation drive mechanism for power-assisted chairs. 5,466,046, Cl. 297-325.000.

Konaka, Toshinori: *See*—
Itoh, Takashi; Saitoh, Hiroyuki; Kinami, Haruyuki; Konaka, Toshinori; and Murai, Tsuyoshi, 5,465,447, Cl. 15-88.300.

Konda, Kazumoto: *See*—
Miyazaki, Sho; Konoya, Hisashi; Tanaka, Yoshihiro; Fujitani, Mitsuhiro; and Konda, Kazumoto, 5,466,164, Cl. 439-140.000.

Kondo, Masahiko: *See*—
Uraki, Yoichi; Kubozuka, Takao; Kondo, Masahiko; Miyakubo, Hiroshi; and Usuki, Hisafumi, 5,465,692, Cl. 123-195.00C.

Kondo, Masahiro; and Matsubara, Nobuo, to Pilot Ink Co., Ltd. Aqueous ink composition for writing instrument. 5,466,283, Cl. 106-25.00R.

Konen, Bruce P.; and Van Naarden, Robert W., to Ideal Industries, Inc. Wire stripping method and machine. 5,465,637, Cl. 81-9.510.

Konica Corporation: *See*—

Itihara, Yoshiyuki; Haneda, Satoshi; Koizumi, Noboru; Hasebe, Takashi; and Niitsuma, Tetsuya, 5,467,422, Cl. 358-298.000.
Mitsuhashi, Tsuyoshi; and Kagawa, Nobuaki, 5,466,571, Cl. 430-578.000.
Miyazaki, Takemi; Kakuta, Yoshio; and Fujisawa, Toshiki, 5,467,155, Cl. 354-21.000.
Sakata, Satoshi; Kudo, Tomoo; Watanabe, Hiroyuki; and Matsudaira, Tadashi, 5,467,173, Cl. 355-235.000.
Tanaka, Takeshi; Minamino, Daiki; Yoshizaki, Akira; and Nakano, Nakaya, 5,466,293, Cl. 118-264.000.
Washio, Koji; Tanaka, Kazuyoshi; and Haneda, Satoshi, 5,467,202, Cl. 358-448.000.

König, Günter, to Zinser Textilmaschinen GmbH. Winding up at least one synthetic-resin yarn. 5,465,916, Cl. 242-18.0PW.

Konig, Wolfgang; Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Takase, Mitsunori; and Bellamy, Wayne R., to Morinaga Milk Industry Co., ltd. Immunostimulatory agent. 5,466,669, Cl. 514-12.000.

Konishi, Masao: *See*—
Watanuki, Tsuneo; Nakamura, Yasushige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utska, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, 5,467,176, Cl. 355-270.000.

Konkol, Werner; Bahrmann, Helmut; Herrmann, Wolfgang A.; and Kohlpaintner, Christian, to Hoechst Aktiengesellschaft. Reactivation of water-soluble hydroformylation catalysts. 5,466,644, Cl. 502-28.000.

Konno, Toshikazu: *See*—
Saito, Toshimitsu; Kasashima, Masahiko; and Konno, Toshikazu, 5,467,469, Cl. 395-182.120.

Kono, Satoshi; Hidaka, Shizuaki; and Takahashi, Tetsu, to Atsugi Unisia Corporation. Crankshaft assembly for internal combustion engine. 5,465,635, Cl. 74-595.000.

Konoya, Hisashi: *See*—
Miyazaki, Sho; Konoya, Hisashi; Tanaka, Yoshihiro; Fujitani, Mitsuhiro; and Konda, Kazumoto, 5,466,164, Cl. 439-140.000.

Kopin Corporation: *See*—
Gale, Ronald P.; McCullough, Richard; Salerno, Jack P.; Pantone, Stephen D.; Forsyth, Robert P.; Carellas, Peter T.; Thomas, Michael J.; and Youman, Roy L., 5,467,154, Cl. 353-119.000.

Kore, Haruhisa: *See*—
Gotomyo, Yasuo; Kore, Haruhisa; Muramoto, Hisao; Nomura, Yoshinbu; Kohno, Shigefumi; and Hirashima, Isao, 5,466,001, Cl. 280-730.100.

Kortec AG: *See*—
Wells, William; Raidl, Georg; and Schmelzer, Walter, 5,465,942, Cl. 266-46.000.

Kosaka, Takao: *See*—
Koike, Naomasa; Nakano, Akira; Kosaka, Takao; and Sakata, Naoya, 5,466,655, Cl. 503-209.000.

Kosaka, Tetsuya; and Kobayashi, Eiichi, to Fanuc Ltd. Control method and control apparatus for a robot with sensor. 5,467,003, Cl. 318-568.130.

Kosaki, Michio; and Kawai, Kimitoshi, to Daicel Chemical Industries, Ltd. Production of high optical purity D-lactic acid. 5,466,588, Cl. 435-139.000.

Kosch, Delmar D. Welding wire dispenser with adjustable brake. 5,465,917, Cl. 242-128.000.

Koschak, Matthew S.: *See*—
Perfetti, Thomas A.; Carespodi, Dennis L.; Saintsing, Barry L.; and Koschak, Matthew S., 5,465,739, Cl. 131-335.000.

Koseki, Hiroyuki: *See*—
Kadota, Kunimobu; Koseki, Hiroyuki; and Toyoda, Kenji, 5,465,773, Cl. 152-454.000.

Koselka, Harvey A.: *See*—
Ulrich, W. Thatcher; Koselka, Harvey A.; Bobick, Aaron F.; and Benjamin, Michael H., 5,466,200, Cl. 482-4.000.

Koshikawa, Yasuji, to NEC Corporation. Semiconductor memory device having built-in test circuits selectively activated by decoder circuit. 5,467,468, Cl. 371-22.300.

Kost, Andreas: *See*—
Blangetti, Francisco; Kost, Andreas; and Volks, Gunter, 5,465,784, Cl. 165-114.000.

Kotani, Motoharu: *See*—
Takegawa, Masaharu; Kotani, Motoharu; and Yokota, Hiromu, 5,466,209, Cl. 493-4.000.

Kothair, Suraj C.; and Oh, Heekuck, to Iowa State University Research Foundation. Memory capacity neural network. 5,467,427, Cl. 395-23.000.

Kotnour, Thomas A.: *See*—
Rolando, Richard J.; Coleman, Patrick L.; Kangas, Steven L.; and Kotnour, Thomas A., 5,466,747, Cl. 525-54.100.
Rolando, Richard J.; Coleman, Patrick L.; Kangas, Steven L.; and Kotnour, Thomas A., 5,466,749, Cl. 525-54.100.

Kotsifas, Peter N.: *See*—
Werge, Robert W.; and Kotsifas, Peter N., 5,465,938, Cl. 251-149.100.

Kouro, Yasuhiro: *See*—
Kohda, Kenji; and Kouro, Yasuhiro, 5,467,457, Cl. 395-429.000.

Kouzai, Fumio; Tokumaru, Susumu; and Kitamura, Syozo, to Mitsubishi Denki Kabushiki Kaisha. Color thermal printer. 5,466,075, Cl. 400-240.300.

Kovacevic, Mice; Herak, Jure J.; Mandic, Zora; Lukic, Irena; Tomic, Mirjana; and Brkic, Zinka, to PLIVA and PLIVA Handels GmbH. Amides of 4-oxo-azetidine-2-sulfonic acids and salts thereof, processes for their preparation and their use. 5,466,686, Cl. 514-210.000.

Kovács, Gáborné: *See*—
Ivanics, József; Szabó, Tibor; Hermecz, István; Dalmadi, Gyula; Ivanics, Józsefné; Kovács, Gáborné; and Bahram, Resul, 5,466,833, Cl. 549-475.000.

Kowdley, Balasubramanian S.; Lewis, Thomas A.; Tsukida, Robert S.; Saxon, Edward W.; Ortega, Frank; and Debenedetto, Paul, to General Electric Company. Control rod drive uncoupling tool gage. 5,465,497, Cl. 33-626.000.

Kowligi, Rajagopal R.; Bibeau, John M.; and Taylor, Howard H., to IMPRA, Inc. Textured, porous, expanded PTFE. 5,466,509, Cl. 428-141.000.

Koyama, Kazutaka: *See*—
Horiuchi, Makoto; Koyama, Kazutaka; Kamitani, Takayuki; and Ozawa, Masataka, 5,466,988, Cl. 313-35.000.

Kraetschmer, Reinhard; Pertzsch, Albert; and Schelble, Josef, to BASF Magnetics GmbH. A magnetic recording medium. 5,466,542, Cl. 428-694.0B5.

Krajec, Russell S.; and Preston, Vincent L., to Maxtor Corporation. HDA headload carriage tooling. 5,465,476, Cl. 29-759.000.

Krallmann, Anton; Reiners, Ulrich; Albinus, Eberhard; Böhner, Jürgen; and Neelen, Neele, to Wolff Walsrode Aktiengesellschaft. Paper-like white-opaque heat-sealable polypropylene film. 5,466,520, Cl. 428-323.000.

Krambeck, Frederick J.: *See*—
Buchanan, John S.; Krambeck, Frederick J.; and Schatz, Klaus W., 5,465,536, Cl. 52-198.000.

Kramer, Robert L.: *See*—
Erickson, Jack A.; Kramer, Robert L.; and Hallis, John M., 5,466,315, Cl. 149-96.000.

Kramer, Werner: *See*—
Enhsen, Alfons; Glombik, Heiner; Kramer, Werner; and Weiss, Günther, 5,466,815, Cl. 548-252.000.

Kraus, George A., to Iowa State University Research Foundation, Inc. Synthesis of benzodiazepines. 5,466,799, Cl. 540-573.000.

Kraus, Helmut, to Bayer Aktiengesellschaft. Process for the preparation of 2,5-disubstituted pyridines. 5,466,800, Cl. 544-82.000.

Krause, Dennis L.: *See*—
Frank, Aaron L.; Ibidunni, Ajibola O.; Johnson, Douglas B.; Krause, Dennis L.; and Nguyen, Trac, 5,466,972, Cl. 257-764.000.

Krause, Robert, to Siemens Components, Inc. Optically-coupled differential line receiver. 5,466,944, Cl. 250-551.000.

Krautstrunk, Juergen; and Mackensen, Klaus, to Zimmer Aktiengesellschaft. Process for the multistage generation of vacuum for polyester production. 5,466,776, Cl. 526-68.000.

Krebs, Hermano I.: *See*—
Hogan, Neville; Krebs, Hermano I.; Sharon, Andre; and Charnnarong, Jain, 5,466,213, Cl. 601-33.000.

Krebs, Jay R.: *See*—
Pierce, Jennifer A.; Finkelstein, Louis D.; Brown, Daniel P.; and Krebs, Jay R., 5,467,398, Cl. 380-44.000.

Kreikebaum, Gerhard; and Chandler, David L., to Venturedyne, Ltd. Improved particle sensor and method for assaying a particle. 5,467,189, Cl. 356-336.000.

Kreis, Gundolf: *See*—
Klages, Ulrich; Feldschmid, Alois; Kreis, Gundolf; and Timm, Heinrich, 5,466,035, Cl. 296-205.000.

Kretzmer, Kumiko K.: *See*—
Wun, Tze-Chein; Kretzmer, Kumiko K.; and Broze, George J., Jr., 5,466,783, Cl. 530-380.000.

Krivan, Howard C.; and Blomberg, A. Lennart I., to MicroCarb, Inc. Receptor conjugates for targeting penicillin antibiotics to bacteria. 5,466,681, Cl. 514-54.000.

Kriz, Paul: *See*—
Thomas, Donald; Ellis, Steve; Kriz, Paul; and Scott, Gordon, 5,465,828, Cl. 198-495.000.

Kroggel, Matthis: *See*—
Gutweiler, Matthias; and Kroggel, Matthis, 5,466,751, Cl. 525-58.000.

Kroner, Matthias; Schornick, Gunnar; Baur, Richard; Schwendemann, Volker; and Hartmann, Heinrich, to BASF Aktiengesellschaft. Block copolyacetals, preparation thereof and use thereof in detergents and cleaners. 5,466,762, Cl. 525-472.000.

Kruit, Pieter, to U.S. Philips Corporation. Additive composition of defocusing images in an electron microscope. 5,466,937, Cl. 250-311.000.

Krupica, Libor; and McElwain, William L., to Bayer Corporation. Method and apparatus for an external media buffer. 5,465,955, Cl. 271-265.020.

Krupp, Stefan: *See*—
Schmieding, Reinhold; and Krupp, Stefan, 5,466,243, Cl. 606-232.000.

Kruse, Larry D., to Sudenga Industries, Inc. Pallet with hopper and auguer and method for distributing particular material. 5,465,829, Cl. 198-538.000.

Krusos, Denis A.: *See*—
DiSanto, Frank J.; Krusos, Denis A.; and Lewit, Edward, 5,467,107, Cl. 345-107.000.

KSB Aktiengesellschaft: *See*—
Schäfer, Horst; and Schaaf, Günter, 5,466,121, Cl. 415-129.000.

Kuba, Keiichi; and Togino, Takayoshi, to Olympus Optical Co., Ltd. Image display system with right and left eye illuminating means. 5,467,205, Cl. 359-40.000.

Kubo, Masaru: *See*—
Yamamoto, Motohiko; and Kubo, Masaru, 5,466,962, Cl. 257-437.000.

Kubono, Shouji: *See*—
Kajimoto, Takeshi; Shimbo, Yutaka; Sato, Katsuyuki; Ogata, Masahiro; Kenmizaki, Kanehide; Kubono, Shouji; Kato, Nobuo; Manita, Kiichi; and Kanamitsu, Michitaro, 5,467,315, Cl. 365-222.000.

Kubota Corporation: *See*—
Iwamoto, Masatoshi, 5,465,630, Cl. 74-331.000.
Samejima, Kazuo; Matsuyama, Mitsuhiro; Morita, Shigeru; and Kure, Masaji, 5,465,561, Cl. 56-11.800.
Kubozuka, Takao: *See*—
Usaki, Yoichi; Kubozuka, Takao; Kondo, Masahiko; Miyakubo, Hiroshi; and Usuki, Hisafumi, 5,465,692, Cl. 123-195.00C.
Kuck, Lloyd L. R.: *See*—
Jones, Christopher H.; Kuck, Lloyd L. R.; and Lombardo, Frank R., 5,465,636, Cl. 74-602.000.
Kudo, Muneo: *See*—
Shinohara, Toshio; Yokoo, Akio; Kudo, Muneo; Iwabuchi, Motoaki; and Matsumura, Kazuyuki, 5,466,847, Cl. 556-409.000.
Kudo, Nobuki: *See*—
Fujimoto, Katsuhiko; Aida, Satoshi; Oyanagi, Masamichi; and Kudo, Nobuki, 5,465,625, Cl. 73-700.000.
Kudo, Tomoo: *See*—
Sakata, Satoshi; Kudo, Tomoo; Watanabe, Hiroyuki; and Matsudaira, Tadashi, 5,467,173, Cl. 355-235.000.
Kudoh, Kichizo; Kikuchi, Yasuo; Ishida, Tatsuya; Ikeda, Tatsufumi; and Fujimoto, Hiroaki, to Sumitomo Chemical Company, Limited. Insecticidal and miticidal composition. 5,466,703, Cl. 514-374.000.
Kuehl, Steven J.: *See*—
Cur, Nihat O.; Kuehl, Steven J.; Khanpara, Jatin C.; LeClear, Douglas D.; and Peterson, James R., 5,465,591, Cl. 62-439.000.
Kuehn, Wenzel: *See*—
Deller, Klaus; Moesinger, Hans; Mueller, Herbert; Riedl, Josef; Kuehn, Wenzel; and Spielmannleitner, Rudolf, 5,466,421, Cl. 422-171.000.
Kuekenhoehner, Thomas: *See*—
Schnurr, Werner; Fischer, Rolf; Goetz, Norbert; and Kuekenhoehner, Thomas, 5,466,831, Cl. 549-323.000.
Kuga, Masayuki: *See*—
Fujii, Shigeo; and Kuga, Masayuki, 5,467,348, Cl. 370-60.100.
Kuhn, L. Dean: *See*—
Wunderlich, Daniel F.; Herr, Nedra A.; Shannon, Donald N.; and Kuhn, L. Dean, 5,467,077, Cl. 340-635.000.
Kühn, Reinhard: *See*—
Bühler, Ulrich; Kühn, Reinhard; and Boos, Margareta, 5,466,791, Cl. 534-854.000.
Kuhnen, Gottfried: *See*—
Ebeling, Wilhelm; Faber, Guy; Kuhnen, Gottfried; and Scholz, Arthur, 5,466,910, Cl. 219-130.010.
Kuhrts, Eric H., to Cibus Pharmaceutical, Inc. Granular drug delivery system. 5,466,469, Cl. 424-451.000.
Kulpa, Walter J.: *See*—
Keung, Wing-Kwong; and Kulpa, Walter J., 5,465,662, Cl. 101-235.000.
Kuma, Yoshiharu; Setoyama, Tamotsu; Maruyama, Hideaki; and Kawai, Makiko, to Kabushiki Kaisha Yakult Honsha. Process for the production of a cultured milk beverage. 5,466,472, Cl. 426-43.000.
Kumar, Anil: *See*—
Van Gemert, Barry; and Kumar, Anil, 5,466,398, Cl. 252-586.000.
Kumar, Manoj; Lattimore, George M.; and Poplawski, Joseph M., Jr., to International Business Machines Corporation. Reset generation circuit to reset self resetting CMOS circuits. 5,467,037, Cl. 327-142.000.
Kumazawa, Satoru: *See*—
Yoshida, Eyji; Kusano, Nobuyuki; and Kumazawa, Satoru, 5,466,816, Cl. 548-267.800.
Kumazawa, Yoshihiko; and Tanaka, Kazumi, to Shimadzu Corporation. Nuclear medicine imaging apparatus. 5,466,939, Cl. 250-363.040.
Kume, Hitoshi: *See*—
Tanaka, Toshihiro; Kato, Masataka; Kume, Hitoshi; Ogura, Keisuke; and Adachi, Tetsuo, 5,467,309, Cl. 365-185.140.
Kumiai Chemical Industry Co., Ltd.: *See*—
Ozaki, Masami; Ikeda, Atsuhiko; Yumita, Takashi; Honami, Reijiro; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,466,705, Cl. 514-383.000.
Kumpf, Wolfgang: *See*—
Blum, Arnold; Goldrian, Gottfried; and Kumpf, Wolfgang, 5,467,452, Cl. 395-200.120.
Kuno, Yoshinori; Tanabe, Noboru; and Hasebe, Koichi, to Kabushiki Kaisha Toshiba. Portable display device with at least two display screens controllable collectively or separately. 5,467,102, Cl. 345-1.000.
Kuntz, David H.: *See*—
Elson, Edward E.; and Kuntz, David H., 5,466,229, Cl. 604-317.000.
Kunz, Josef G.; and Temmesfeld, Angelika B. M., to Temtec Fahrzeugtechnik Entwicklungsgesellschaft mbH. Closure for closing the orifice of a socket-piece. 5,465,861, Cl. 220-260.000.
Kuraray Company Limited: *See*—
Fukuda, Keiji; Tokunaga, Isao; and Akagi, Takao, 5,466,505, Cl. 428-91.000.
Kuraray Co., Ltd.: *See*—
Ikeda, Kaoru; Sato, Toshiaki; and Ishiura, Kazuhige, 5,466,748, Cl. 525-57.000.
Ohnishi, Ikuo; and Fujisawa, Katsuya, 5,467,224, Cl. 359-614.000.
Kure, Masaji: *See*—
Samejima, Kazuo; Matsuyama, Mitsuhiro; Morita, Shigeru; and Kure, Masaji, 5,465,561, Cl. 56-11.800.
Kurebayashi, Hideki: *See*—
Okutani, Haruo; Tagami, Toshio; Kurebayashi, Hideki; and Nakadera, Kazue, 5,466,553, Cl. 430-109.000.
Kureha Chemical Industry Co., Ltd.: *See*—
Yoshida, Eyji; Kusano, Nobuyuki; and Kumazawa, Satoru, 5,466,816, Cl. 548-267.800.
Kureha, Kagaku Kogyo Kabushiki Kaisha: *See*—
Sakagami, Teruo; Ogihara, Takeo; Fujii, Yasufumi; and Katono, Hiroki, 5,466,755, Cl. 525-326.600.
Kurihara, Yasuo: *See*—
Inoue, Yoshio; Susumu, Sekiguchi; and Kurihara, Yasuo, 5,466,726, Cl. 523-122.000.
Kurisu, Yasushi: *See*—
Jackson, John E.; Nitta, Hideo; Shoichi, Katoh; Amano, Masahiko; Kurisu, Yasushi; and Ohno, Keiichiro, 5,466,208, Cl. 492-53.000.
Kurita, Sumihiko: *See*—
Matsuki, Masaharu; Yoshihara, Toshiaki; and Kurita, Sumihiko, 5,466,917, Cl. 219-730.000.
Kuroda, Shoji: *See*—
Iwahara, Yoshiaki; Kuroda, Shoji; Sakamoto, Shuichi; and Ogino, Masanori, 5,467,221, Cl. 359-449.000.
Kurosawa, Yukio: *See*—
Kida, Junzo; Arita, Hiroshi; and Kurosawa, Yukio, 5,467,049, Cl. 327-438.000.
Kurzynski, David W.; and Pourjavid, Sussan, to General Electric Company. Automated qualitative image quality for ultrasound images. 5,465,720, Cl. 128-660.010.
Kusano, Nobuyuki: *See*—
Yoshida, Eyji; Kusano, Nobuyuki; and Kumazawa, Satoru, 5,466,816, Cl. 548-267.800.
Kusano, Yukihiro; Inagaki, Tomoko; Yoshikawa, Masato; Akiyama, Setsuo; and Naitoh, Kazuo, to Bridgestone Corporation; and Bridgestone Sports Co., Ltd. Corona discharge surface treating method. 5,466,424, Cl. 422-185.050.
Kushnaryov, Vladimir M.; Redlich, Philip N.; Grossberg, Sidney E.; and Sedmak, J. James, to Ophidian Pharmaceuticals, Inc. Therapeutic use of clostridium difficile toxin A. 5,466,672, Cl. 514-14.000.
Kustermann, Martin, to J.M Voith GmbH. Apparatus for coating traveling webs of paper or cardboard. 5,466,292, Cl. 118-257.000.
Küsters, Heinz-Peter: *See*—
Kircher, Günter; and Küsters, Heinz-Peter, 5,465,803, Cl. 180-69.210.
Kusumoto, Tadashi: *See*—
Hironaka, Yoshio; Nakamura, Hiroaki; and Kusumoto, Tadashi, 5,466,392, Cl. 252-301.160.
Kuzuhara, Masaaki: *See*—
Maruhashi, Kenichi; Onda, Kazuhiko; and Kuzuhara, Masaaki, 5,466,955, Cl. 257-192.000.
Kvakovszky, George: *See*—
Tafesh, Ahmed M.; Kvakovszky, George; and Lindley, Charlet R., 5,466,873, Cl. 568-312.000.
Kwan, Kinying: *See*—
Yip, Linda Y.; and Kwan, Kinying, 5,467,033, Cl. 326-93.000.
Kwan, Wie J.: *See*—
Park, Hwa K.; Lee, Suk K.; Park, Pyeong U.; and Kwan, Wie J., 5,466,829, Cl. 549-297.000.
Kwon, Sung L.: *See*—
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., 5,465,586, Cl. 62-84.000.
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., 5,465,587, Cl. 62-84.000.
Kwon, Yong-Rak, to Samsung Electronics Co., Ltd. Cooling and heating water circulation apparatus of Vuilleumier heat pump. 5,465,580, Cl. 62-6.000.
Kyle, David J., to Martek Corporation. Method of diagnosing fatty acid metabolism or absorption disorders using labeled triglyceride oils produced by cultivation of microorganisms. 5,466,434, Cl. 424-9.000.
La, Duong; Bouras, Carlos E.; Meier, Mark S.; and Roetker, Thomas J., to Asymptotic Technologies, Inc. Disposable nozzle assembly for high speed viscous material droplet dispenser. 5,465,879, Cl. 222-189.060.
La Jolla Cancer Research Foundation: *See*—
Dawson, Marcia L.; Cameron, James F.; Hobbs, Peter D.; Jong, Ling; Pfahl, Magnus; Zhang, Xiao-kun; and Lehmann, Jürgen M., 5,466,861, Cl. 560-100.000.
La-Z-Boy Chair Co.: *See*—
Komorowski, Karl J.; Saul, Jonathan R.; LaPointe, Larry P.; and Marshall, Richard E., 5,466,046, Cl. 297-325.000.
La Belle, John T., to Clayton Industries. Method and apparatus for testing motor vehicles under simulated road conditions. 5,465,612, Cl. 73-117.000.
Laboratoires Inocosm: *See*—
Rousset, Gerard, 5,466,782, Cl. 530-374.000.
Lacher, Manfred: *See*—
Ruf, Alexander; Abraham, Michael; Lacher, Manfred; Zetterer, Thomas; and Dietrich, Thomas R., 5,465,611, Cl. 73-104.000.
Lachine, Randall S.: *See*—
Boyle, Joseph P.; Camano, Gordon C.; Lachine, Randall S.; Lingley, Howard R.; and Saunders, Raymond W., 5,466,376, Cl. 210-634.000.
LaClair, Christa M.: *See*—
Commons, Thomas J.; LaClair, Christa M.; and Christmas, Susan, 5,466,688, Cl. 514-212.000.
Laewen, Arne H.; and Busby, Stephen W. Target device and use thereof for aligning light beams utilizing cross-hair light beams. 5,467,193, Cl. 356-399.000.
Lafor Laboratories Limited: *See*—
Ford, Larry C., 5,466,463, Cl. 424-433.000.

Lagsdin, Andry. Stabilizer pad for earth moving apparatus. 5,466,004, Cl. 280-763.100.

Lai, Kuang-Chih. Zero insertion force socket. 5,466,169, Cl. 439-264.000.

Lair, Christopher L.; Brown, Ivan E.; and Brown, Douglas G., to Brown Medical Industries. Method of using a carpal tunnel protection device. 5,466,215, Cl. 602-21.000.

Lajoie, M. Stephen, to Church & Dwight Co., Inc. Co-micronized bicarbonate salt compositions. 5,466,470, Cl. 424-641.000.

Lamb, Dennis: *See*—
Chamberlain, Craig P.; Lamb, Dennis; Lauby, William J.; and Voorheis, Howard T., 5,466,545, Cl. 429-99.000.

Lambert, Bart: *See*—
Peferoen, Marnix; Lambert, Bart; and Van Audenhove, Katrien, 5,466,597, Cl. 435-252.300.

Lambert, Jeffrey T.; and Walblay, Edward J., to Atoma International Inc. Translating headrest. 5,466,043, Cl. 297-238.000.

Lambert, Timothy L.; and Knifton, John F., to Huntsman Corporation. Process for polymerization of tetrahydrofuran using acidic zeolite catalysts. 5,466,778, Cl. 528-361.000.

Lammers, Jannes G.: *See*—
Brockhus, Jeroen J.; Moree, Jeanette D.; Lammers, Jannes G.; and Rodenburg, Tileman, 5,466,478, Cl. 426-602.000.

Lampi, Rauno A.; Bindon, John N.; Bowles, Anthony J. G.; and Parks, Thomas R., to Food and Agrosystems, Inc. Pan for baking, frying, and braising, and pan stacking system. 5,465,654, Cl. 99-422.000.

Lamprecht, Dale E., Jr.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., to Monarch Marking Systems, Inc. Label printing and data collection program generator. 5,467,433, Cl. 395-114.000.

Landert, Heidi: *See*—
Spindler, Felix; Wirth-Tijani, Amina; and Landert, Heidi, 5,466,844, Cl. 556-11.000.

Landis, Howard S.: *See*—
Cronin, John E.; Kaanta, Carter W.; Kenney, Donald M.; Kerbaugh, Michael L.; Landis, Howard S.; Machesney, Brian J.; Parries, Paul; Previti-Kelly, Rosemary A.; and Rembetski, John F., 5,466,636, Cl. 437-187.000.

Landmeier, Phillip C.: *See*—
Fort, J. Robert; Neidell, Norman S.; Morgan, Douglas J.; and Landmeier, Phillip C., 5,465,722, Cl. 128-661.010.

Landmeier, Robert F. Paint brush protective cover. 5,465,453, Cl. 15-247.000.

Laney, Stuart T.; Ledoux, Eric; Maymudes, David M.; and Miller, Daniel J., to Microsoft Corporation. Method and system for compressing video data. 5,467,134, Cl. 348-409.000.

Lange, Arno: *See*—
Gruettner-Merten, Sabine; Reichelt, Helmut; Lange, Arno; and Degen, Helmut, 5,466,790, Cl. 534-753.000.

Langland, Kenneth A.: *See*—
Brickell, Christopher G.; and Langland, Kenneth A., 5,466,945, Cl. 250-559.120.

Langley, Bobby J. High-strength landscape ring. 5,465,526, Cl. 47-33.000.

Langner, Bernd: *See*—
Brücken, Volker; Pötzschke, Manfred; Langner, Bernd; and Stelter, Michael, 5,466,352, Cl. 204-182.400.

Lanier, William G.: *See*—
Darlington, William B.; and Lanier, William G., 5,466,337, Cl. 162-164.300.

Lankford, Douglas E., to Thomson Consumer Electronics, Inc. Muting apparatus for a compressed audio/video signal receiver. 5,467.139, Cl. 348-512.000.

Lansberry, John B., to Stone & Wood, Inc. Tree harvesting apparatus with impact hammer. 5,465,770, Cl. 144-336.000.

Lansberry, John B., to Stone & Wood, Inc. Wood processing apparatus with impact hammer. 5,465,771, Cl. 144-343.000.

Lantto, Sven J.: *See*—
Peltonen, Ari; Åström, Bo A. V.; Gandils, Mars V.; Stille, Mats O.; and Lantto, Sven J., 5,467,381, Cl. 379-58.000.

Lapinski, Charles; Eckert, Charles; Skokowski, Richard; Cox, James; Scott, William; Chaleff, Edward; Sharpe, Jeffrey G.; and Wurz, David A., to Accu-Sort Systems, Inc. Scanner to combine partial fragments of a complete code. 5,466,921, Cl. 235-462.000.

LaPlante, Daniel J. Tool for installing siding. 5,465,499, Cl. 33-647.000.

Lapluye, Gerard; and Poisson, Roger, to Rhône-Poulenc Rorer S.A. Process and apparatus for heterogeneous phase synthesis of macromolecules such as peptides, polynucleotides or oligosaccharides. 5,466,608, Cl. 436-86.000.

LaPointe, Larry P.: *See*—
Komorowski, Karl J.; Saul, Jonathan R.; LaPointe, Larry P.; and Marshall, Richard E., 5,466,046, Cl. 297-325.000.

Lapp, Ellsworth W., to Hydraulic Tool Engineering, Inc. Three-position, four-way rotary valve with pistol grip actuator. 5,465,755, Cl. 137-625.210.

Larkin, John P.: *See*—
Weston, John B.; Larkin, John P.; and Smith, Ian H., 5,466,710, Cl. 514-452.000.

Larson, Curtis L.: *See*—
Baratto, Eugene L.; David, John R.; Larson, Curtis L.; Nelson, Thomas L.; and Wrobel, Norbert E., 5,465,900, Cl. 229-125.390.

Larsson, Willy: *See*—
Andersson-Schager, Per; Johansson, Ingemar; Larsson, Willy; and Lindmark, Erik, 5,466,607, Cl. 436-50.000.

LaRue, Merv: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.

La Savio, Michael. Street or court hockey puck. 5,465,966, Cl. 273-128.00R.

Laszcz, John F.: *See*—
Flinn, Donald R.; Laszcz, John F.; and Withers, David H., 5,467,285, Cl. 364-478.000.

Latimer, Lee H.: *See*—
Washburn, William N.; Lussier, Barbara B.; Illig, Carl R.; and Latimer, Lee H., 5,466,715, Cl. 514-618.000.

Latter, Victoria S.; Gutteridge, Winston E.; and Hudson, Alan T., to Burroughs Wellcome Co. Medicaments. 5,466,711, Cl. 514-510.000.

Lattimore, George M.: *See*—
Kumar, Manoj; Lattimore, George M.; and Poplawski, Joseph M., Jr., 5,467,037, Cl. 327-142.000.

Lau, Raymond; Rosenfeld, Ronald; and Roukos, Salim, to International Business Machines Corporation. Building scalable N-gram language models using maximum likelihood maximum entropy N-gram models. 5,467,425, Cl. 395-2.520.

Lau, Robert G.: *See*—
Schinzel, Craig E.; and Lau, Robert G., 5,465,528, Cl. 49-368.000.

Lauby, William J.: *See*—
Chamberlain, Craig P.; Lamb, Dennis; Lauby, William J.; and Voorheis, Howard T., 5,466,545, Cl. 429-99.000.

Laudadio, Nicola: *See*—
Szillat, John C.; Laudadio, Nicola; and Chin, Teresa, 5,465,570, Cl. 60-39.060.

Lauks, Imants R.: *See*—
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., 5,466,575, Cl. 435-6.000.

Laurel Bank Machine Co., Ltd.: *See*—
Akioka, Takao, 5,465,821, Cl. 194-207.000.

Lause, Herb; Moore, Sylvia; Seltzer, Clif; Taylor, Cliff; and King, Dan, to Aluminum Company of America. Laminated building panel and method for its production. 5,466,317, Cl. 156-79.000.

Lautenschlager, Hans-Jürgen: *See*—
Geck, Michael; Deubzer, Bernward; Baumgartner, Christine; Lautenschlager, Hans-Jürgen; and Sejpka, Johann, 5,466,746, Cl. 524-837.000.

Lautenschläger, Horst, to MEPLA-Werke Lautenschläger GmbH & Co. KG. Corner connecting hardware for drawers. 5,466,061, Cl. 312-348.200.

Lautenschläger, Reinhard, to Mepla-Werke Lautenschläger GmbH & Co. KG. Corner cabinet hinge. 5,465,463, Cl. 16-236.000.

Lavin, John G.: *See*—
Fitzpatrick-McElligott, Sandra G.; Lavin, John G.; Rivard, Germain F.; and Subramoney, Shekhar, 5,466,587, Cl. 435-172.100.

Law, David; Boyle, Dennis; and Herron, Matt, to Apple Computer, Inc. Ejection mechanism. 5,466,166, Cl. 439-159.000.

Lawrence, Kristine B.: *See*—
Harrison, Daniel J.; Simpson, William H.; Bowman, Wayne A.; Lawrence, Kristine B.; and Weber, Helmut, 5,466,658, Cl. 503-227.000.

Lawrence, Thomas H.: *See*—
Connolly, Christopher J.; Lawrence, Thomas H.; Mankaukas, Joseph J.; Pawlowski, John J.; and Smith, Matthew T., 5,465,925, Cl. 244-137.100.

Lawther, Joel S., to Eastman Kodak Company. Film transport mechanism for camera. 5,467,159, Cl. 354-212.000.

Layman, William J., Jr.: *See*—
Lin, Ronny W.; Atkinson, Eldon E., Jr.; and Layman, William J., Jr., 5,466,867, Cl. 562-514.000.

Lea, Susan J.: *See*—
Alvarez, Ramiro M.; and Lea, Susan J., 5,465,734, Cl. 128-848.000.

Lear Seating Corporation: *See*—
Fowler, Thomas J.; and Rus, Liviu, 5,466,048, Cl. 297-378.120.

Leas, James M.: *See*—
Beilstein, Kenneth E., Jr.; Bertin, Claude L.; Cronin, John E.; Howell, Wayne J.; Leas, James M.; and Phillips, Robert B., 5,466,634, Cl. 437-180.000.

Leathurby, Mackenzie: *See*—
Fasciano, Peter J.; Rawley, Curt A.; Hegg, Thomas R.; Leathurby, Mackenzie; Bedell, Jeffrey L.; and Ravan, James A., Jr., 5,467,288, Cl. 364-514.00R.

Leaver, David, to International Business Machines Corporation. Deflection apparatus for raster scanned CRT displays. 5,466,993, Cl. 315-411.000.

Le Bars, Joel: *See*—
Davenport, Kenneth G.; Sheldon, Roger A.; Le Bars, Joel; and Mueller, Werner H., 5,466,869, Cl. 564-265.000.

Lebby, Michael S.; Kelly, George R.; and Jachimowicz, Karen E., to Motorola. Integrated electro-optic package for reflective spatial light modulators. 5,467,215, Cl. 359-247.000.

Lebby, Michael S.: *See*—
Ackley, Donald E.; Lebby, Michael S.; and Witting, Gary F., 5,466,633, Cl. 437-129.000.

LeBlanc, Jack: *See*—
Bonin, Yves; and LeBlanc, Jack, 5,466,741, Cl. 524-405.000.

Lecadet, Jacques: *See*—
Bied-Charreton, Benoit; Chabry, Pierre; Lecadet, Jacques; and Pasquier, Patrice, 5,467,365, Cl. 373-9.000.

LeClear, Douglas D.: *See*—
Can, Nihat O.; Kuehl, Steven J.; Khanpara, Jatin C.; LeClear, Douglas D.; and Peterson, James R., 5,465,591, Cl. 62-439.000.

LeCroy S.A.: *See*—
Goumaz, Jean-François, 5,467,056, Cl. 330-149.000.

Ledbetter, William B., Jr.: *See*—
Gay, James G.; and Ledbetter, William B., Jr., 5,467,455, Cl. 395-281.000.

Lederman, Joel A.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.

Ledger, Greg: *See*—
Blyth, David; Granovsky, David; Ledger, Greg; and Smith, Bruce, 5,465,846, Cl. 206-554.000.

Ledoux, Eric: *See*—
Laney, Stuart T.; Ledoux, Eric; Maymudes, David M.; and Miller, Daniel J., 5,467,134, Cl. 348-409.000.

Lee, Cathy A.: *See*—
Allman, Thomas; and Lee, Cathy A., 5,465,438, Cl. 4-626.000.

Lee, Chester C.; Chang, Tao C.; and Huang, Yung-Hui, to Formosa Plastics Corporation. High performance epoxy resin modified by a polysulfide polymer derived from the heavy ends waste of chlorinated hydrocarbon production. 5,466,763, Cl. 525-523.000.

Lee, Chia W.: *See*—
Adams, Byron H.; and Lee, Chia W., 5,465,970, Cl. 273-169.000.

Lee, Chwen-Chern; and Lee, Show-Wei. Inorganic coating composition having high-heat-resisting, anti-rusting and anti-corrosive properties. 5,466,280, Cl. 106-14.120.

Lee, Dong H., to Goldstar Co., Ltd. Apparatus for compensating video motions in digital televisions. 5,467,133, Cl. 348-402.000.

Lee, Dong-Jae: *See*—
Kim, Hyeun-Su; and Lee, Dong-Jae, 5,467,316, Cl. 365-230.060.

Lee, Harry W., Jr., to Reynolds Metals Company. Can flanger having base pad with stop spacer arrangement determining a working spring gap. 5,465,599, Cl. 72-94.000.

Lee, Jae C.: *See*—
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,466,854, Cl. 558-233.000.

Lee, Jae-Hyeong, to Samsung Electronics Co., Ltd. Word line driver circuit for a semiconductor memory device. 5,467,032, Cl. 326-88.000.

Lee, Jaw E.: *See*—
Yang, Xin; Lee, Jaw E.; Armiger, William; Maneshin, Sergey K.; and Kolb, Marcus E., 5,466,604, Cl. 435-286.100.

Lee, Jeong-hee: *See*—
Jung, Chul-min; Lee, Jeong-hee; Ahn, Kee-sik; and Park, Hee-chul, 5,467,313, Cl. 365-189.110.

Lee, Joo-young; and Lee, Kyu-pil, to Samsung Electronics Co, Ltd. Method of manufacturing trench capacitor with a recessed field oxide layer. 5,466,628, Cl. 437-60.000.

Lee, J. Robert, to Gulbransen, Inc. Method and apparatus for producing an electronic representation of a musical sound using extended coerced harmonics. 5,466,882, Cl. 84-603.000.

Lee, Julia L.: *See*—
Caruso, Andrew J.; and Lee, Julia L., 5,466,777, Cl. 528-298.000.

Lee, Kunmo, to Samsung Engineering & Construction Co., Ltd. Process for treating sludges. 5,466,383, Cl. 210-774.000.

Lee, Kyu-pil: *See*—
Lee, Joo-young; and Lee, Kyu-pil, 5,466,628, Cl. 437-60.000.

Lee, Neville K.; and Katao, Hisashi, to Quantum Corporation. Cleaning apparatus for heads of data storage disks. 5,467,238, Cl. 360-128.000.

Lee, Norman C., to Compagne Plastic Omnium. Wheeled nestable refuse container. 5,465,844, Cl. 206-515.000.

Lee, Robert W.: *See*—
Baker, Edward J.; Bacon, Edward R; Illig, Carl R.; Caulfield, Thomas J.; Douty, Brent D.; Josef, Kurt A.; Toner, John L.; and Lee, Robert W., 5,466,435, Cl. 424-9.450.

Lee, Ruby B.: *See*—
Bhaskaran, Vasudev; and Lee, Ruby B., 5,467,131, Cl. 348-384.000.

Lee, Sean S., to Mattel, Inc. Finger painting apparatus. 5,466,080, Cl. 401-7.000.

Lee, Seong-won; and Paik, Joon-ki, to Samsung Electronics Co., Ltd. Interpolation method of digital image data and a circuit therefor. 5,467,439, Cl. 395-133.000.

Lee, Show-Wei: *See*—
Lee, Chwen-Chern; and Lee, Show-Wei, 5,466,280, Cl. 106-14.120.

Lee, Suk K.: *See*—
Park, Hwa K.; Lee, Suk K.; Park, Pyeong U.; and Kwan, Wie J., 5,466,829, Cl. 549-297.000.

Lee, Thomas M.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.

Lee, Ving J.: *See*—
Sum, Phaik-Eng; Lee, Ving J.; and Testa, Raymond T., 5,466,684, Cl. 514-152.000.

Lee, Whay C.; and Hluchyj, Michael G., to Motorola, Inc. Method and device for consolidation of preferential resource constraints. 5,467,343, Cl. 370-54.000.

Lee, Yam: *See*—
Viel Lamare, Charles; Hiltunen, Matti; and Lee, Yam, 5,465,690, Cl. 122-4.00D.

Legare, Jeffrey R.: *See*—
Baker, Jeffrey L.; and Legare, Jeffrey R., 5,465,521, Cl. 43-1.000.

Legge, Robert W., to Tamfelt, Inc. Method of making and using a paper maker felt. 5,466,339, Cl. 162-200.000.

Lehmann, Jürgen M.: *See*—
Dawson, Marcia L.; Cameron, James F.; Hobbs, Peter D.; Jong, Ling; Pfahl, Magnus; Zhang, Xiao-kun; and Lehmann, Jürgen M., 5,466,861, Cl. 560-100.000.

Leibfried, Raymond T., Sr.: *See*—
Babcock, Laura M.; Bard, John K.; and Leibfried, Raymond T., Sr., 5,466,512, Cl. 428-209.000.
Babcock, Laura M.; Bard, John K.; and Leibfried, Raymond T., Sr., 5,466,728, Cl. 523-179.000.

Leibiger, Steven M.: *See*—
Ilderem, Vida; and Leibiger, Steven M., 5,466,960, Cl. 257-369.000.

Leistner, William E.; and Moshchitsky, Semyon, to Fairmount Chemical Company, Inc. Coupled benzotriazole and benzophenone UV absorbers. 5,466,819, Cl. 548-259.000.

Leitenberger, Werner: *See*—
Holik, Herbert; Leitenberger, Werner; and Pinter, Reinhard, 5,465,502, Cl. 34-115.000.

Leitko, Curtis E.: *See*—
McDonald, William J.; Pittard, Gerard T.; Steele, Charles G.; Kiefer, Karl F.; Clifton, Terry P.; and Leitko, Curtis E., 5,467,083, Cl. 340-854.600.

Leland, Jonathan K.: *See*—
Ghaed, Ali; Leland, Jonathan K.; Zoski, Glenn D.; Goodman, Jack E.; and Grosser, John T., 5,466,416, Cl. 422-52.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Van Duyne, Scott A.; and Smith, Julius O., III, 5,466,884, Cl. 84-661.000.

Lemanski, Michael F.: *See*—
Paparizos, Christos; Suresh, Dev D.; and Lemanski, Michael F., 5,466,652, Cl. 502-330.000.

Le Masson, Jacques: *See*—
Commier, Philippe; and Le Masson, Jacques, 5,465,994, Cl. 280-602.000.

Lengyel, Szabolcs G.; and Murphy, Thomas C., Jr., to Hubbell Incorporated. Electrical outlet box assembly for power and communication wires. 5,466,886, Cl. 174-48.000.

Lenk, Rudi: *See*—
Hassler, Joachim; Lenk, Rudi; and Neuach, Michael, 5,466,180, Cl. 445-3.000.

Lens, Peter F.: *See*—
Davey, Cheryl; Malek, Lawrence T.; Lens, Peter F.; and Wielaard, Frits, 5,466,586, Cl. 435-91.210.

Leonard, Timothy J.; and Anderson, Daniel W., to Morton International, Inc. Flat-lying cutter/ripper foldable into upstanding position during deployment of a vehicle airbag for detaching a deployment door from a panel. 5,466,000, Cl. 280-728.300.

Leonida, Andrei; Moulthrop, Lawrence C.; and Critz, Kurt M., to United Technologies Corporation. Metal compression pad for an electrolysis cell. 5,466,354, Cl. 204-252.000.

Lercher, Johannes; and Zhaoqui, Zhan, to Chemie Linz GmbH. Process for preparing isocyanic acid from cyanuric acid. 5,466,429, Cl. 423-365.000.

Lercorvaisier, René: *See*—
Viertel, Lothar; Welter, Patrick; Lercorvaisier, René; Mosser, Serge; and Pompino, Karl-Heinz, 5,466,405, Cl. 264-45.400.

Lerio Corporation, The: *See*—
Oates, Ira O. L., 5,465,503, Cl. 34-179.000.

Leroy, Joël; and Catteau, Gilles. Ligature and/or suture system for endoscopic surgery. 5,466,241, Cl. 606-139.000.

Lester, Robert A.; Beard, David; and Cram, Milton E., to Western Atlas International Inc. Method and apparatus for balancing the electrical output of the receiver coils of an induction logging tool by use of a slidable magnetic rod for eliminating direct coupling. 5,467,019, Cl. 324-339.000.

Levaro, Mauro; and Sofia, Giuseppe, to Finmeccanica S.p.A. Mail flow compensating device. 5,465,825, Cl. 198-444.000.

Lever Brothers Company: *See*—
Houghton, Mark P.; and Verburg, Charles C., 5,466,390, Cl. 252-174.170.
Madison, Stephen A.; Massaro, Michael; Rattinger, Gail B.; and Wenzel, Christine, 5,466,396, Cl. 252-557.000.

Lever Brothers Company, Division of Conopco, Inc.: *See*—
Adams, Amanda J.; Jackson, Philip S.; Moulden, Howard N.; Roberts, David W.; and Watkin, Keith, 5,466,851, Cl. 558-21.000.
Gutierrez, Eddie N.; and Wu, Shang-Ren, 5,466,875, Cl. 562-580.000.
Wu, Shang-Ren; Wu, Donna; and Gutierrez, Eddie N., 5,466,868, Cl. 562-580.000.

Leveaque, Yvon: *See*—
Cadieux, Serge; and Leveaque, Yvon, 5,466,232, Cl. 604-378.000.

Levy, Sander A.: *See*—
Ward, Bennie R., Jr.; Levy, Sander A.; and Sloan, George A., 5,466,312, Cl. 148-551.000.

Lew, Chel W.: *See*—

McMahon, William A.; Lew, Chel W.; and Branly, Keith L., 5,466,460, Cl. 424-408.000.

Lewis, Larry N.: *See*—
Factor, Arnold; and Lewis, Larry N., 5,466,491, Cl. 427-515.000.

Lewis, Robert T.; and Lowe, Byron L., to Brown & Williamson Tobacco Corporation. Package, and method for packaging loose leaf material. 5,465,554, Cl. 53-438.000.

Lewis, Thomas A.: *See*—
Kowdley, Balasubramanian S.; Lewis, Thomas A.; Tsukida, Robert S.; Saxon, Edward W.; Ortega, Frank; and Debenedetto, Paul, 5,465,497, Cl. 33-626.000.

Lewit, Edward: *See*—
DiSanto, Frank J.; Krusos, Denis A.; and Lewit, Edward, 5,467,107, Cl. 345-107.000.

Lewkowicz, Martin, to Ranir/DCP Corporation. Denture brush. 5,465,449, Cl. 15-106.000.

Lex, Joseph: *See*—
O'Dell, Robin D.; and Lex, Joseph, 5,466,511, Cl. 428-207.000.

Lexmark International, Inc.: *See*—
Mimlitch, Kenneth H., 5,467,108, Cl. 345-161.000.

Leybold Aktiengesellschaft: *See*—
Mattern-Klosson, Monika; Mundinger, Hans-Juergen; and Greger, Ferdinand, 5,465,584, Cl. 62-55.500.

Liang, Jengli: *See*—
Bell, James P.; Iroh, Jude O.; Scola, Daniel A.; and Liang, Jengli, 5,466,357, Cl. 205-50.000.

Liao, Chun-Chi. Image scanner transparency adaptor. 5,467,172, Cl. 355-231.000.

Liao, Gordon, to Unique Product & Design Co., Ltd. Releasable wheel assembly for golf cart. 5,466,051, Cl. 301-111.000.

Liberti, Paul A.; Wang, Yuzhou; Tang, Weixin; Feeley, Brian P.; and Gohel, Dhanesh I., to Immunivest Corporation. Apparatus and methods for magnetic separation featuring external magnetic means. 5,466,574, Cl. 435-5.000.

Licata, Thomas J.: *See*—
Armacost, Michael; Baker, A. Richard, Jr.; Berry, Wayne S.; Carl, Daniel A.; Kenney, Donald M.; and Licata, Thomas J., 5,466,626, Cl. 437-60.000.

Lichter, Nicholas J., to ATC Leasing Company. Brake unit. 5,465,813, Cl. 188-3.00H.

Liebermann, George: *See*—
Burt, Richard A.; Liebermann, George; Hamer, Gordon K.; Gardner, Sandra J.; Jennings, Carol A.; Daimon, Katsumi; and Nukada, Katsumi, 5,466,796, Cl. 540-139.000.

Liebich, Ernst; Van Houdenhove, Rony; Smoravek, Miroslav; and Flieger, Richard, to Siemens Aktiengesellschaft. Plug connector with short-circuit bridge. 5,466,168, Cl. 439-188.000.

LifeSource Advanced Bloodbank Systems, Inc.: *See*—
Harms, Frank H.; and Neas, Edwin D., 5,465,767, Cl. 141-237.000.

Ligertwood, Peter J., to Motorola, Inc. Modulator circuit for use with a plurality of operating standards. 5,467,141, Cl. 348-555.000.

Light, David R.: *See*—
Glaser, Charles B.; Morser, Michael J.; and Light, David R., 5,466,668, Cl. 514-12.000.

Light, Nicholas D.: *See*—
Rosenthal, Arthur L.; Light, Nicholas D.; and Haynes, Carla A., 5,466,462, Cl. 424-426.000.

Lim, John: *See*—
Royds, Robert B.; Lim, John; and Rosen, Joel D., 5,466,465, Cl. 424-449.000.

Lim, Joon Y.: *See*—
Ra, Jong O.; Lim, Joon Y.; and Yoo, Wan M., 5,466,196, Cl. 475-59.000.

Limberg, Allen L., to Samsung Electronics Co., Ltd. Circuitry for enhancing detail in color video signals. 5,467,145, Cl. 348-628.000.

Lin, Chih-I. Vertebral locking and retrieving system having a fixation crossbar. 5,466,238, Cl. 606-61.000.

Lin, James, to Taiwan Line Tek Electronic Co., Ltd. Light control device. 5,467,228, Cl. 359-822.000.

Lin, Jau-Wen: *See*—
Bryant, Michael D.; and Lin, Jau-Wen, 5,466,979, Cl. 310-248.000.

Lin, Jenn-Tarng: *See*—
Lur, Water; Lin, Jenn-Tarng; and Chin, Hsiaw-Sheng, 5,466,627, Cl. 437-52.000.

Lin, Ronny W.; Atkinson, Eldon E., Jr.; and Layman, William J., Jr., to Albemarle Corporation. Method for producing [S,S]-ethylenediamine-N,N'-disuccinic acid from its calcium salt. 5,466,867, Cl. 562-554.000.

Lin, Yi-Chung; and Wu, Wen-Tien. Building construction of longitudinal and cross hollow components. 5,465,541, Cl. 52-220.200.

Lindke, Paul A., to Houston Fearless 76, Inc. Method and apparatus for controlling water-based liquid waste. 5,466,344, Cl. 202-205.000.

Lindley, Charlet R.: *See*—
Tafesh, Ahmed M.; Kvakovszky, George; and Lindley, Charlet R., 5,466,873, Cl. 568-312.000.

Lindmark, Erik: *See*—
Andersson-Schager, Per; Johansson, Ingemar; Larsson, Willy; and Lindmark, Erik, 5,466,607, Cl. 436-50.000.

Lindvall, Anders: *See*—
Althaus, Rolf; Chyou, Yau-Pin; Frutschi, Hans U.; Genet, Christian; Kamber, Peter; Lindvall, Anders; Sattelmayer, Thomas; Senior, Peter; and Rufli, Peter, 5,465,569, Cl. 60-39.030.

Lingley, Howard R.: *See*—
Boyle, Joseph P.; Camano, Gordon C.; Lachine, Randall S.; Lingley, Howard R.; and Saunders, Raymond W., 5,466,376, Cl. 210-634.000.

Litman, Alon; Goldenstein, Alexander; and Rogers, Steven R., to Opal Technologies Ltd. Electron detector with high backscattered electron acceptance for particle beam apparatus. 5,466,940, Cl. 250-397.000.

Liu, Cheng-Kung, to United States Surgical Corporation. Process of treating filaments. 5,466,406, Cl. 264-103.000.

Liu, Mon-Teng: *See*—
Sheu, Miin-Tsang; and Liu, Mon-Teng, 5,465,743, Cl. 135-34.200.

Liu, Morgan C., to Enlight Corporation. Interface seat for a personal computer. 5,466,059, Cl. 312-223.200.

Liversidge, Gary: *See*—
Ruddy, Stephen B.; Eickhoff, W. Mark; Liversidge, Gary; and Cooper, Eugene R., 5,466,440, Cl. 424-9.411.

Livesay, Richard E.; Rozenboom, Nathan G.; and Shane, Frederick J., to Caterpillar Inc. Implement assembly with a mechanically attached adapter. 5,465,512, Cl. 37-457.000.

LK-Products Oy: *See*—
Turunen, Aimo; and Jantunen, Heli, 5,467,065, Cl. 333-132.000.

LMC Operating Corp.: *See*—
James, M. Elmer; and Beeley, Micheal G., 5,466,056, Cl. 305-54.000.

Lo, Young S.: *See*—
Rossano, Lucius T.; and Lo, Young S., 5,466,797, Cl. 540-503.000.

Load Controls Incorporated: *See*—
Nystrom, Robert W., 5,467,012, Cl. 324-74.000.

Loboda, Mark J., to Dow Corning Corporation. Method of forming crystalline silicon carbide coatings. 5,465,680, Cl. 117-84.000.

Locher, Anton: *See*—
Bachhofer, Bruno; and Locher, Anton, 5,466,374, Cl. 210-610.000.

Loe, Bradley E.: *See*—
Wilhelm, Robert S.; and Loe, Bradley E., 5,466,697, Cl. 514-300.000.

Loeb, Marvin P.; Shaolian, Samuel M.; Sasdatmanesh, Vahid; Giba, Jeffrey J.; and Pham, To V., to Trimedyne, Inc. Expandable laser catheter. 5,466,234, Cl. 606-15.000.

Logan, David J.; and Rich, Leonard G., to Gerber Scientific Products, Inc. Sign making web with tack killing overcoat removable by washing and related method. 5,466,501, Cl. 428-40.000.

Logan, James D., to MicroTouch Systems, Inc. Wear resistant improved tablet for a digitizer. 5,466,895, Cl. 178-18.000.

Logan, Joseph S.: *See*—
Barnes, Michael S.; Keller, John H.; Logan, Joseph S.; Tompkins, Robert E.; and Westerfield, Robert P., Jr., 5,467,249, Cl. 361-234.000.

Logothetis, Eleftherios M.: *See*—
Hamburg, Douglas R.; Logothetis, Eleftherios M.; and Meyer, Daniel L., 5,465,697, Cl. 123-424.000.

Logston, Gary L.; Wasilewski, Anthony J.; Hammond, Maynard; and Cheung, Francis, to Scientific-Atlanta, Inc. Methods and apparatus for time stamp correction in an asynchronous transfer mode network. 5,467,342, Cl. 370-17.000.

Lohmeijer, Johannes H. G. M.: *See*—
Hoeks, Theodorus L.; Claesen, Christianus A. A.; Lohmeijer, Johannes H. G. M.; and Pickett, James E., 5,466,733, Cl. 524-141.000.

Loiseaux, Brigitte; Joubert, Cécile; Huignard, Jean-Pierre; Joffre, Pascal; and Nicolas, Christophe, to Thomson-CSF. Color display device with intervening lens and spatial filter or with overlapping beams of chromatically separated light between the chromatic separator and lens array. 5,467,206, Cl. 359-40.000.

Loisel, William G., to Institut National de La Recherche Agronomique. Device for the characterization of the foaming properties of a product which is at least partially soluable. 5,465,610, Cl. 73-60.110.

Loitegaard, Birgit: *See*—
Koks, Maarten; and Titulaer, Franz, 5,465,852, Cl. 211-87.000.

Loitherstein, Joel S. Resilient spider for well installation. 5,465,791, Cl. 166-278.000.

Lokhoff, Gerardus C. P., to U.S. Philips Corporation. Storage device for reversibly storing digital data on a multitrack storage medium, a decoding device, an information reproducing apparatus for use with a storage medium, and a unitary storage medium for use with such a storage device decoding device and/o. 5,467,360, Cl. 371-37.400.

Lokshin, Anatole; Burchfield, David E.; and Tracy, David H., to Orbital Sciences Corporation. Saw vapor sensor apparatus and multicomponent signal processing. 5,465,608, Cl. 73-24.010.

Lombardo, Frank R.: *See*—
Jones, Christopher H.; Kuck, Lloyd L. R.; and Lombardo, Frank R., 5,465,636, Cl. 74-602.000.

Lonardo, Robert, to Restorative Care of America Incorporated. Method and means for preventing skin abrasions for patients having legs substantially locked in juxtaposition. 5,465,736, Cl. 128-892.000.

Loomas, Bryan: *See*—
Silvestrini, Thomas; Mathis, Mark; and Loomas, Bryan, 5,466,260, Cl. 623-5.000.

Loral Vought Systems Corporation: *See*—
Musgrove, Robert G., 5,465,808, Cl. 182-2.000.

L'Oreal: *See*—
Gueret, Jean-Louis H., 5,465,872, Cl. 222-95.000.
Junino, Alex; and Malle, Gérard, 5,466,878, Cl. 564-197.000.
Terranova, Eric; Galey, Jean B.; Hocquaux, Michel; Maignan, Jean; and Tuloup, Rémy, 5,466,694, Cl. 514-272.000.

Lossev, Ilia: *See*—
Guberman, Shelja A.; Lossev, Ilia; and Pashintsev, Alexander V., 5,467,407, Cl. 382-186.000.

Lowe, Byron L.: *See*—
Lewis, Robert T.; and Lowe, Byron L., 5,465,554, Cl. 53-438.000.
Lowe, Charles F.: *See*—
Hoffman, D. Stephen; and Lowe, Charles F., 5,466,041, Cl. 297-188.100.
Lowell Engineering Corp.: *See*—
Boddy, Ian; and Rawlings, Donald S., 5,467,230, Cl. 359-874.000.
LSI Logic Corporation: *See*—
Lynch, Brian; and O'Brien, Patrick, 5,466,635, Cl. 437-183.000.
Nguyen, Trung; and Luong, Hung, 5,467,031, Cl. 326-81.000.
Vongfuangfoo, Sutee; and Trabucco, Robert, 5,465,470, Cl. 29-559.000.
LSI Logic Products GmbH: *See*—
Westerkamp, Hugo, 5,466,967, Cl. 257-666.000.
LTS Lohmann Therapie-Systeme GmbH & Co. KG: *See*—
Müller, Walter, 5,466,466, Cl. 424-449.000.
Lubard, Stephen C.: *See*—
Bowker, Kent; and Lubard, Stephen C., 5,467,122, Cl. 348-31.000.
Lucas, Gregory L.: *See*—
Howard, James R.; and Lucas, Gregory L., 5,466,892, Cl. 174-261.000.
Lucky Ltd.: *See*—
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,466,854, Cl. 558-233.000.
Ludlow Corporation: *See*—
Lyons, Joseph N., 5,465,715, Cl. 128-640.000.
Lukic, Irena: *See*—
Kovacevic, Mice; Herak, Jure J.; Mandic, Zora; Lukic, Irena; Tomic, Mirjana; and Brkic, Zinka, 5,466,686, Cl. 514-210.000.
Lumma, Waldemar; and Haarmann, Heinz, to U.S. Philips Corporation. X-ray apparatus comprising a photoconductor and a corona charging device. 5,467,378, Cl. 378-32.000.
Lummus, Charles L., to Lummus Investment Corporation. Apparatus for applying twist ties. 5,465,549, Cl. 53-138.800.
Lummus Investment Corporation: *See*—
Lummus, Charles L., 5,465,549, Cl. 53-138.800.
Lund, Lowell D.: *See*—
Pai, Deepak K.; Lund, Lowell D.; and Maday, Gene A., 5,466,540, Cl. 428-614.000.
Luong, Hung: *See*—
Nguyen, Trung; and Luong, Hung, 5,467,031, Cl. 326-81.000.
Lupke, Manfred A. A., to Corma Inc. Gap adjustment of a plastic flow channel in a plastic part forming device. 5,466,402, Cl. 264-39.000.
Lur, Water; Lin, Jenn-Tarng; and Chin, Hsiaw-Sheng, to United Microelectronics Corporation. Stacked capacitor process using BPSG precipitates. 5,466,627, Cl. 437-52.000.
Lur, Water, to United Microelectronics Corp. Silicon-on-insulator technique with buried gap. 5,466,630, Cl. 437-62.000.
Lur, Water; and Wu, Jiun Y., to United Microelectronics Corp. Field oxide with curvilinear boundaries and method of producing the same. 5,466,632, Cl. 437-69.000.
Lussier, Barbara B.: *See*—
Washburn, William N.; Lussier, Barbara B.; Illig, Carl R.; and Latimer, Lee H., 5,466,715, Cl. 514-618.000.
Lutron Electronics Co., Inc.: *See*—
Jacobs, Russel J.; Pierce, Brett A.; and Spira, Joel S., 5,467,266, Cl. 364-167.010.
Lutz, Gary P.; Zima, George C.; and Bernard, Rex, to Eastman Chemical Company. Process for preparing purified alkali metal salts of 4-sulfophenyl-[(1-oxyalkanoyl)amino]alkanoate without isolation of intermediates. 5,466,840, Cl. 554-70.000.
Lutz, Martin F.: *See*—
Burkis, Joseph J.; Cowan, Andrew H.; Lutz, Martin F.; and Crain, Steven E., 5,467,451, Cl. 395-161.000.
Lutzow, Thomas H.; and Ryan, Daniel E., to Matarah Industries, Inc. Thermoplastic fiber laminate. 5,466,516, Cl. 428-282.000.
Lycan, Goodwin A., to G.A.L. Gage Co. Gauge for measuring the degree of alignment at the inner surfaces of two tubular members positioned end to end. 5,465,498, Cl. 33-645.000.
Lydall, Kenneth: *See*—
Schmolke, Karl-Heinz; and Lydall, Kenneth, 5,465,567, Cl. 57-408.000.
Lyman, George; Mathus, Gregory; and Root, David, to Data Packaging Corporation. Apparatus for growing tissue cultures in vitro. 5,466,602, Cl. 435-297.100.
Lynch, Brian; and O'Brien, Patrick, to LSI Logic Corporation. Process for making an interconnect bump for flip-chip integrated circuit including integral standoff and hourglass shaped solder coating. 5,466,635, Cl. 437-183.000.
Lynn, Lawrence A.; and Cole, James E., to Lynn, Lawrence A. Blood aspiration assembly components and blunt needle aspirators. 5,466,219, Cl. 604-80.000.
Lyon, Peter J., to Willett International Limited. Ink composition. 5,466,287, Cl. 106-20.00R.
Lyons, Joseph N., to Ludlow Corporation. Positive locking biomedical electrode and connector system. 5,465,715, Cl. 128-640.000.
M. Setek Co., Ltd.: *See*—
Itoh, Takashi; Saitoh, Hiroyuki; Kinami, Haruyuki; Konaka, Toshinori; and Murai, Tsuyoshi, 5,465,447, Cl. 15-88.300.
Ma, Jeremy K.: *See*—
White, Mark L.; Carroll, Stephen F.; and Ma, Jeremy K., 5,466,580, Cl. 435-7.100.
Ma, Jeremy K.-k.: *See*—
White, Mark L.; Carroll, Stephen F.; and Ma, Jeremy K.-k., 5,466,581, Cl. 435-7.320.
Ma, Mark. Collapsible stool or table apparatus with handle portion. 5,465,673, Cl. 108-118.000.
Ma, Sheau-Hwa; and West, Michael W. J., to Du Pont de Nemours, E. I., and Company. Method for preparing negative-working wash-off relief images and non-photosensitive elements for use therein. 5,466,653, Cl. 503-200.000.
Ma, Thomas T., to Ford Motor Company. Catalytic converter. 5,465,574, Cl. 60-300.000.
Maby, Edward W.: *See*—
Sanderson, Arthur C.; and Maby, Edward W., 5,465,620, Cl. 73-504.000.
MacDonald, Michael C.: *See*—
Abel, Robert J.; MacDonald, Michael C.; and Wang, Peter S.-S., 5,467,271, Cl. 364-420.000.
MacDonald, Ray C. Mechanism for relieving stress on the hands of a person operating a computer keyboard. 5,465,931, Cl. 248-118.300.
MacElwee, Donald B.: *See*—
Stewart, Harry E.; and MacElwee, Donald B., 5,466,386, Cl. 252-2.000.
Machesney, Brian J.: *See*—
Cronin, John E.; Kaanta, Carter W.; Kenney, Donald M.; Kerbaugh, Michael L.; Landis, Howard S.; Machesney, Brian J.; Parries, Paul; Previti-Kelly, Rosemary A.; and Rembetski, John F., 5,466,636, Cl. 437-187.000.
Machida Endoscope Co., Ltd.: *See*—
Miyagi, Kunihiko; and Chikama, Toshio, 5,465,710, Cl. 600-139.000.
Machida, Takahiro: *See*—
Akimoto, Katsuyuki; Machida, Takahiro; and Ishii, Yoshinori, 5,466,994, Cl. 315-411.000.
Mackensen, Klaus: *See*—
Krautstrunk, Juergen; and Mackensen, Klaus, 5,466,776, Cl. 526-68.000.
MacRae, Elwyn F. Wheel restraining device for a shopping cart or a portable vehicle. 5,465,986, Cl. 280-33.994.
Macromedia, Inc.: *See*—
Johnson, Steven R.; Crowder, Kevin F.; Seals-Mason, Samantha; and Von Ehr, James R., II, 5,467,443, Cl. 395-141.000.
Maday, Gene A.: *See*—
Pai, Deepak K.; Lund, Lowell D.; and Maday, Gene A., 5,466,540, Cl. 428-614.000.
Madison, Stephen A.; Massaro, Michael; Rattinger, Gail B.; and Wenzel, Christine, to Lever Brothers Company. Isethionate esters of alkyl alkoxy carboxylic acid. 5,466,396, Cl. 252-557.000.
Maeda, Katsuhiko: *See*—
Oikawa, Isamu; and Maeda, Katsuhiko, 5,466,510, Cl. 428-172.000.
Maeda, Patrick Y.: *See*—
Rumsey, Karen M.; Maeda, Patrick Y.; and AuYeung, Vincent W., 5,467,229, Cl. 359-822.000.
Maeda, Shoichi: *See*—
Takeda, Katsunori; Otsuka, Shinsuke; Takahashi, Yoshiharu; Katsura, Hiroo; Takata, Kazuhiko; Maeda, Shoichi; and Nagato, Takafumi, 5,467,458, Cl. 395-427.000.
Maeda, Tukasa; Sasagawa, Yasuhiko; Ikeda, Yorinobu; and Hiraharu, Teruo, to Japan Synthetic Rubber Co., Ltd. Water-based maskant composition and chemical milling method using the same. 5,466,739, Cl. 524-525.000.
Machara, Hideaki: *See*—
Tanaka, Satoshi; and Machara, Hideaki, 5,467,411, Cl. 382-113.000.
Maehara, Toshio: *See*—
Hashimoto, Kenichi; Maehara, Toshio; Imaizumi, Yasuo; and Asai, Tetsuo, 5,465,602, Cl. 72-347.000.
Maekawa, Keiichiro: *See*—
Shibayama, Takao; and Maekawa, Keiichiro, 5,465,616, Cl. 73-118.100.
Mafune, Kumiko: *See*—
Eida, Tsuyoshi; Nishiwaki, Osamu; Yamamoto, Takao; and Mafune, Kumiko, 5,466,282, Cl. 106-22.00K.
Magata, Katsumi. Far infrared radiant composite fiber containing metal. 5,466,526, Cl. 428-372.000.
Magee, Constance: *See*—
Freitas, Glen; Boyce, Joseph S.; and Magee, Constance, 5,466,506, Cl. 428-105.000.
Magnetic Research, Inc.: *See*—
Gibby, Wendell A.; and Puttagunta, N. Rao, 5,466,439, Cl. 424-9.365.
Magnetoelastic Devices, Inc.: *See*—
Garshelis, Ivan J., 5,465,627, Cl. 73-862.335.
Magnone, Jean-Pierre; and Uttinacci, Roberto. Training apparatus for launching soccer balls. 5,465,978, Cl. 273-411.000.
Mahar, David F.: *See*—
Jagannathan, Seshadri; Mahar, David F.; and Mehta, Rajendrakumar V., 5,466,570, Cl. 430-569.000.
Mahl, Wolfgang H.: *See*—
Von Kempski, Diotima; and Mahl, Wolfgang H., 5,466,399, Cl. 261-27.000.
Mahlbacher, James C.: *See*—
Boyette, James E., Jr.; and Mahlbacher, James C., 5,467,020, Cl. 324-537.000.
Maier, Peter H.: *See*—
Schulz-Harder, Jurgen; and Maier, Peter H., 5,465,898, Cl. 228-122.100.
Maier, Roland; Müller, Peter; Woitun, Eberhard; Hurnaus, Rudolf; Mark, Michael; Eisele, Bernhard; Budzinski, Ralph-Michael; and Hallermayer, Gerhard, to Dr. Karl Thomae GmbH. Arylidene-1-azacycloalkanes and arylalkyl-1-azacyclo-alkanes, their salts, medicaments containing these compounds and their use, and processes for their preparation. 5,466,687, Cl. 514-212.000.

Maignan, Jean: *See*—
Terranova, Eric; Galey, Jean B.; Hocquaux, Michel; Maignan, Jean; and Tuloup, Rémy, 5,466,694, Cl. 514-272.000.
Mailloux, Dennis R., to Polaroid Corporation. Apparatus and process for separation of laminae. 5,466,324, Cl. 156-344.000.
Mainfroy, Frédéric G. J.: *See*—
Charbonnel, Jean-Louis; Guerout, Philippe; Happey, Jacques L.; Mainfroy, Frédéric G. J.; Naudet, Jacky; and Porcher, Jean-Claude, 5,466,122, Cl. 415-160.000.
Maki, Kazumi: *See*—
Okimoto, Tomoyuki; Maki, Kazumi; and Ishida, Katsuhiko, 5,466,656, Cl. 503-217.000.
Maki, Voldi E., Jr., to Halliburton Company. Acoustic measuring method for borehole formation testing. 5,467,320, Cl. 367-40.000.
Makita Corporation: *See*—
Matsumoto, Toshio; and Watanabe, Hideki, 5,467,005, Cl. 320-20.000.
Malachowski, Michael; Spehrley, Charles W., Jr.; Thomas, Dean; Remus, Michelle; and Schaffer, Robert R., to Xerox Corporation. High air flow low pressure prefuser transport. 5,467,180, Cl. 355-312.000.
Malczanek, Anthony: *See*—
Morgan, Gaylard M.; Malczanek, Anthony; and Gould, Peter J., 5,465,555, Cl. 53-451.000.
Malecha, James W.: *See*—
Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., 5,466,823, Cl. 548-377.100.
Malek, Lawrence T.: *See*—
Davey, Cheryl; Malek, Lawrence T.; Lens, Peter F.; and Wielaard, Frits, 5,466,586, Cl. 435-91.210.
Malik, John S., to T. B. Wood's Sons Company. Combination of a power steering pump and air conditioning compressor in an automotive vehicle. 5,465,804, Cl. 180-133.000.
Malis, Jerry; Rosen, Jonathan J.; Mortimer, Martin T.; and Vasconcellos, Alfred V., to Valley Forge Scientific Corporation. Resuscitation mask having ribs in the air flow conduit and mask body. 5,465,712, Cl. 128-205.250.
Malle, Gérard: *See*—
Junino, Alex; and Malle, Gérard, 5,466,878, Cl. 564-197.000.
Malloy, Thomas P.: *See*—
Nemeth, Laszlo T.; Malloy, Thomas P.; and Jones, Richard R., 5,466,835, Cl. 549-531.000.
Malvaez, Laura A.; and Monfredini, David J. Shower step for shaving legs. 5,465,435, Cl. 4-574.100.
MAN Roland Druckmaschinen AG: *See*—
Bayer, Harald; and Kemmerer, Klemens, 5,465,663, Cl. 101-409.000.
Manabe, Yuji, to Nikon Corporation. Objective lens for an optical disk drive. 5,467,225, Cl. 359-661.000.
Manaut, Daniel: *See*—
Costantini, Michel; Manaut, Daniel; and Michelet, Daniel, 5,466,839, Cl. 552-304.000.
Mandic, Zora: *See*—
Kovacevic, Mice; Herak, Jure J.; Mandic, Zora; Lukic, Irena; Tomic, Mirjana; and Brkic, Zinka, 5,466,686, Cl. 514-210.000.
Maneshin, Sergey K.: *See*—
Yang, Xin; Lee, Jaw E.; Armiger, William; Maneshin, Sergey K.; and Kolb, Marcus E., 5,466,604, Cl. 435-286.100.
Mang, Michael N.: *See*—
Bales, Stephen E.; Brennan, David J.; Gulotty, Robert J., Jr.; Inbasekaran, Muthiah N.; Mang, Michael N.; and Newsham, Mark D., 5,466,397, Cl. 252-582.000.
Manita, Kiichi: *See*—
Kajimoto, Takeshi; Shimbo, Yutaka; Sato, Katsuyuki; Ogata, Masahiro; Kenmizaki, Kanehide; Kubono, Shouji; Kato, Nobuo; Manita, Kiichi; and Kanamitsu, Michitaro, 5,467,315, Cl. 365-222.000.
Mankaukas, Joseph J.: *See*—
Connolly, Christopher J.; Lawrence, Thomas H.; Mankaukas, Joseph J.; Pawlowski, John J.; and Smith, Matthew T., 5,465,925, Cl. 244-137.100.
Manku, Mehar S.: *See*—
Horrobin, David F.; McMordie, Austin; and Manku, Mehar S., 5,466,841, Cl. 554-79.000.
Manlove, Gregory J.; and Hitko, Donald A., to Delco Electronics Corporation. Oxygen sensor interface circuit with optimized gain characteristics. 5,467,034, Cl. 327-63.000.
Mann, Daniel. Archery target stop. 5,465,977, Cl. 273-408.000.
Manna, Ronald R., to Misonix, Inc. Method of making an electromechanical transducer device. 5,465,468, Cl. 29-25.350.
Manning, Kevin R., to Roke Manor Research Limited. Improvements in or relating to surface curvature measurement. 5,467,192, Cl. 356-371.000.
Mansour, Tarek: *See*—
Belleau, Bernard, deceased; Mansour, Tarek; Tse, Allan; Evans, Colleen A.; Jin, Haolun; Zacharie, Boulos; and Nguyen-Ba, Nghe, 5,466,806, Cl. 544-310.000.
Maofu, Tong; Jiancheng, Xiong; and Dong, Geng X., to Shanghai Yue Long Non-Ferrous Metals Limited. Rare earth magnetic alloy powder and its preparation. 5,466,307, Cl. 148-302.000.
Marangoni, Giorgio, to Margangoni Meccanica S.p.A. Machine for scraping tires with controllable relative positioning of tire and work tool. 5,466,182, Cl. 451-254.000.
Marathon Oil Company: *See*—
McClure, Donald C.; and Haines, Hiemi K., 5,465,790, Cl. 166-273.000.
Marczinke, Bernd L.; and Müller, Hans-Joachim, to BASF Aktiengesellschaft. Propylene copolymers grafted with monomaleimides. 5,466,753, Cl. 525-193.000.
Mardikian 1991 Irrevocable Trust: *See*—
Mardikian, Albert, 5,465,679, Cl. 114-363.000.
Mardikian, Albert, to Mardikian 1991 Irrevocable Trust. Personal watercraft and boat with shock absorbing floorboards. 5,465,679, Cl. 114-363.000.
Mareci, Thomas: *See*—
Zhou, Dawei; Mareci, Thomas; Burns, Michael; and Ruby, Ward, 5,466,480, Cl. 427-63.000.
Margangoni Meccanica S.p.A.: *See*—
Marangoni, Giorgio, 5,466,182, Cl. 451-254.000.
Maria, Christiaan J.; De Weijer, Anton P.; Middeljans, Hendrik; and Heuvel, Herman M., to Akzo Nobel N.V. Multifilament yarn of polyethylene naphthalate and method for producing said yarn. 5,466,525, Cl. 428-357.000.
Mark, Michael: *See*—
Maier, Roland; Müller, Peter; Woitun, Eberhard; Hurnaus, Rudolf; Mark, Michael; Eisele, Bernhard; Budzinski, Ralph-Michael; and Hallermayer, Gerhard, 5,466,687, Cl. 514-212.000.
Marker Deutschland GmbH: *See*—
Sedlmair, Gerhard, 5,465,995, Cl. 280-605.000.
Märki, Hans P.: *See*—
Derungs, Romano; Märki, Hans P.; Stalder, Henri; and Szente, André, 5,466,708, Cl. 514-449.000.
Marquip, Inc.: *See*—
Marschke, Carl R., 5,466,329, Cl. 156-470.000.
Marrinan, Thomas E.: *See*—
Sturm, Albert J.; and Marrinan, Thomas E., 5,465,854, Cl. 212-319.000.
Marschke, Carl R., to Marquip, Inc. Adjustable ballast system for the holddown belt in a double facer. 5,466,329, Cl. 156-470.000.
Marsden, Peter D., to Eastman Kodak Company. Method of photographic processing. 5,466,562, Cl. 430-373.000.
Marshall Amplification Plc: *See*—
Keir, Bruce, 5,467,400, Cl. 381-61.000.
Marshall, Brian P.: *See*—
Bender, Burnell L.; and Marshall, Brian P., 5,465,589, Cl. 62-133.000.
Marshall, Richard E.: *See*—
Komorowski, Karl J.; Saul, Jonathan R.; LaPointe, Larry P.; and Marshall, Richard E., 5,466,046, Cl. 297-325.000.
Marsolais, Ernest B.: *See*—
Scheiner, Avram; and Marsolais, Ernest B., 5,466,247, Cl. 607-48.000.
Martek Corporation: *See*—
Kyle, David J., 5,466,434, Cl. 424-9.000.
Martin, Alan: *See*—
Brueggen, Shane J.; and Martin, Alan, 5,466,084, Cl. 403-134.000.
Martin, Eugene; and Cook, Scott, to Foodcraft Equipment Company. Removing breast meat from poultry. 5,466,185, Cl. 452-165.000.
Martin, Graeme R.: *See*—
Robertson, Alan D.; Hill, Alan P.; Glen, Robert C.; and Martin, Graeme R., 5,466,699, Cl. 514-323.000.
Martin, Kathleen M.: *See*—
Hower, John D., Jr.; Martin, Kathleen M.; Gramlich, John D.; and Baldwin, LeRoy A., 5,467,182, Cl. 355-319.000.
Martin, Robert; Cayley, George R.; Thacker, Jonathan R. M.; Hall, Franklin R.; North, Denise K.; Groome, John M.; and Jeffries, David A., to Roussel Uclaf. Emulsified spray formulations. 5,466,458, Cl. 424-405.000.
Martin, Thomas: *See*—
Jerabek, Michael; Ruf, Wolfgang; and Martin, Thomas, 5,466,372, Cl. 210-512.100.
Martindale, Jack E. Vacuum apparatus for developing fingerprints. 5,465,765, Cl. 141-65.000.
Martinez, Edward A.: *See*—
Williams, Antony; Martinez, Edward A.; and Hachamovitch, Dean J., 5,467,472, Cl. 395-600.000.
Martinez, Gilbert: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey T.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.
Martino, Gary T.; and Tessler, Martin M., to National Starch and Chemical Investment Holding Corporation. Low molecular weight polyacetals and polyaldehydes. 5,466,862, Cl. 560-152.000.
Maruhashi, Kenichi; Onda, Kazuhiko; and Kuzuhara, Masaaki, to NEC Corporation. Field effect transistor having an improved transistor characteristic. 5,466,955, Cl. 257-192.000.
Maruyama, Hideaki: *See*—
Kuma, Yoshiharu; Setoyama, Tamotsu; Maruyama, Hideaki; and Kawai, Makiko, 5,466,472, Cl. 426-43.000.
Maruyama, Kazuo: *See*—
Akutsu, Eiichi; Soga, Hiroh; Ando, Shigehito; Hirakata, Susumu; and Maruyama, Kazuo, 5,466,654, Cl. 503-206.000.
Maruyama, Ryoichi: *See*—
Mitsuya, Hiroyuki; Yamada, Hideki; Maruyama, Ryoichi; and Ishino, Tsutomu, 5,466,197, Cl. 475-72.000.
Maruyama, Takahito: *See*—
Kobayashi, Hiroshi; Hibino, Ikuo; Maruyama, Takahito; Hori, Fumihisa; Nakamura, Tadashi; Matsuura, Takanobu; and Ohsakama, Chikashi, 5,466,076, Cl. 400-248.000.

Masaki, Katsuhiro; and Ban, Kazutoshi, to Yamanouchi Pharmaceutical Co., Ltd. Intrabuccally disintegrating preparation and production thereof. 5,466,464, Cl. 424-434.000.
Masaki, Ryoso: *See*—
Takamoto, Yusuke; Masaki, Ryoso; Obara, Sanshiro; and Kaneko, Satoru, 5,467,275, Cl. 364-426.010.
Maschinenfabrik Goebel GmbH: *See*—
Herd, Josef, 5,465,641, Cl. 83-698.610.
Mascotech Accessories, Inc.: *See*—
Allen, Scott R., 5,465,890, Cl. 224-324.000.
Mason, James M.: *See*—
Meehan, Brian W.; Heine, Uwe; and Mason, James M., 5,466,603, Cl. 435-285.100.
Massachusetts Institute of Technology: *See*—
Hogan, Neville; Krebs, Hermano I.; Sharon, Andre; and Charnnarong, Jain, 5,466,213, Cl. 601-33.000.
Massaro, Michael: *See*—
Madison, Stephen A.; Massaro, Michael; Rattinger, Gail B.; and Wenzel, Christine, 5,466,396, Cl. 252-557.000.
Massie, Joseph E., to E.I. Partners. Mounting clip. 5,465,928, Cl. 248-27.100.
Masuda, Naotsugu: *See*—
Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, 5,467,284, Cl. 364-461.000.
Masuda, Tadaaki: *See*—
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,467,136, Cl. 348-416.000.
Masukawa, Tsuyoshi: *See*—
Watanabe, Naotoshi; Masukawa, Tsuyoshi; Ozaki, Kenji; and Moriwaki, Noboru, 5,466,757, Cl. 525-352.000.
Masuko, Michio: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Morita, Koichi; Masuko, Michio; Ide, Kinya; and Ueyama, Yoshito, 5,466,661, Cl. 504-253.000.
Masuoka, Fujio: *See*—
Hasegawa, Takehiro; Watanabe, Shigeyoshi; and Masuoka, Fujio, 5,467,303, Cl. 365-149.000.
Matarah Industries, Inc.: *See*—
Lutzow, Thomas H.; and Ryan, Daniel E., 5,466,516, Cl. 428-282.000.
Matayabas, James C., Jr.; and Falling, Stephen N., to Eastman Chemical Company. Polyether glycols and alcohols derived from 3,4-epoxy-1-butene. 5,466,759, Cl. 525-403.000.
Mathews, Mark H.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.
Mathieu, Luc: *See*—
Boivin, Jean-Claude; Chollet, Jean-Emile; Falcoz, Pierre; and Mathieu, Luc, 5,466,119, Cl. 415-90.000.
Mathis, Mark: *See*—
Silvestrini, Thomas; Mathis, Mark; and Loomas, Bryan, 5,466,260, Cl. 623-5.000.
Mathus, Gregory: *See*—
Lyman, George; Mathus, Gregory; and Root, David, 5,466,602, Cl. 435-297.100.
Matis, Clark A.; and Garman, Michael S., to Karhu USA Inc. Sandal fastening system. 5,465,506, Cl. 36-11.500.
Matkin, John M.: *See*—
Gee, Calvin J.; and Matkin, John M., 5,465,993, Cl. 280-491.500.
Matoba, Hiroshi, to YKK Corporation. Buckle. 5,465,472, Cl. 24-625.000.
Matsubara, Akira: *See*—
Murakami, Yutaka; Nakamura, Toru; Hayashi, Takao; Matsubara, Akira; and Aizawa, Hisashi, 5,467,328, Cl. 369-44.160.
Matsubara, Nobuo: *See*—
Kondo, Masahiro; and Matsubara, Nobuo, 5,466,283, Cl. 106-25.00R.
Matsubara, Takashi; Kanamuro, Masayuki; and Hasuda, Masanori, to Nikon Corporation. Focal-plane shutter device. 5,467,160, Cl. 354-246.000.
Matsuda, Akio; and Matsuyama, Kenji, to Asahi Kasei Kogyo Kabushiki Kaisha. Deacetylcephalosporin C acetyltransferase from *Acremonium chrysogenum*. 5,466,598, Cl. 435-254.110.
Matsuda, Hiromu: *See*—
Ikoma, Munehisa; Muramatsu, Kimie; Matsuda, Hiromu; Akutsu, Norikatsu; and Matsumoto, Isao, 5,466,543, Cl. 429-59.000.
Matsudaira, Tadashi: *See*—
Sakata, Satoshi; Kudo, Tomoo; Watanabe, Hiroyuki; and Matsudaira, Tadashi, 5,467,173, Cl. 355-235.000.
Matsui, Shinji, to NEC Corporation. Method for producing nanometer order dot pattern by electron holography and drawing apparatus for the same. 5,466,548, Cl. 430-1.000.
Matsukane, Edward H.; and Tze, Ryan H., to Toshiba America Information Systems, Inc. Apparatus and method for alerting computer users in a wireless LAN of a service area transition. 5,467,341, Cl. 370-17.000.
Matsuki, Masaharu; Yoshihara, Toshiaki; and Kurita, Sumihiko, to Kabushiki Kaisha Kouransha. Microwave-absorptive heat-generating body and method for forming a heat-generating layer in a microwave-absorptive heat-generating body. 5,466,917, Cl. 219-730.000.
Matsumoto, Hiroshi, to NEC Corporation. System and method for POS based fuzzy theory utilizing data extraction. 5,467,270, Cl. 364-403.000.
Matsumoto, Hiroyuki, to Nikon Corporation. Optical disk reproducing method and apparatus. 5,467,337, Cl. 369-116.000.
Matsumoto, Isao: *See*—
Ikoma, Munehisa; Muramatsu, Kimie; Matsuda, Hiromu; Akutsu, Norikatsu; and Matsumoto, Isao, 5,466,543, Cl. 429-59.000.
Matsumoto, Mineo: *See*—
Mikami, Shigeru; Mori, Masayuki; Yamamoto, Tetsuo; Ohno, Matsuhiro; and Matsumoto, Mineo, 5,467,199, Cl. 358-425.000.
Matsumoto, Takeo: *See*—
Koinuma, Yasumi; Matsumoto, Takeo; Nakada, Nobuharu; Nakabayashi, Nobuo; and Ishihara, Kazuhiko, 5,466,853, Cl. 558-169.000.
Matsumoto, Toshio; and Watanabe, Hideki, to Makita Corporation. Battery charger which accounts for initial surge in battery voltage and which is immune to noise during completion of charging. 5,467,005, Cl. 320-20.000.
Matsumura, Kazuyuki: *See*—
Shinohara, Toshio; Yokoo, Akio; Kudo, Muneo; Iwabuchi, Motoaki; and Matsumura, Kazuyuki, 5,466,847, Cl. 556-409.000.
Matsumura, Shigenori: *See*—
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Nasu, Hidetoshi; and Sato, Kazunobu, 5,465,806, Cl. 180-165.000.
Matsunami, Naoto: *See*—
Saiki, Eisaku; Mizokami, Takuya; and Matsunami, Naoto, 5,467,331, Cl. 369-53.000.
Matsuno, Akira; and Nire, Takashi, to Kabushiki Kaisha Komatsu Seisakusho. Method for producing thin film. 5,466,494, Cl. 427-561.000.
Matsuo, Keisuke; and Inaji, Toshio, to Matsushita Electric Industrial Co., Ltd. Motor speed control apparatus for keeping the speed of the motor fixed in the presence of a disturbance torque. 5,467,004, Cl. 318-807.000.
Matsuoka, Koichi: *See*—
Iguchi, Atsushi; Akabane, Atsushi; Yamashita, Takehiro; and Matsuoka, Koichi, 5,466,916, Cl. 219-633.000.
Matsushita Electric Industrial Company, Ltd.: *See*—
Hirano, Hiroshige; Sumi, Tatsumi; Moriwaki, Nobuyuki; and Nakase, George, 5,467,302, Cl. 361-145.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Horiuchi, Makoto; Koyama, Kazutaka; Kamitani, Takayuki; and Ozawa, Masataka, 5,466,988, Cl. 313-35.000.
Hyakutake, Kiyoshi, 5,467,007, Cl. 320-22.000.
Ikoma, Munehisa; Muramatsu, Kimie; Matsuda, Hiromu; Akutsu, Norikatsu; and Matsumoto, Isao, 5,466,543, Cl. 429-59.000.
Ishida, Takashi; O'Hara, Shunji; Ishibashi, Kenzo; and Furutani, Tadashige, 5,467,330, Cl. 369-48.000.
Matsuo, Keisuke; and Inaji, Toshio, 5,467,004, Cl. 318-807.000.
Murakami, Yutaka; Nakamura, Toru; Hayashi, Takao; Matsubara, Akira; and Aizawa, Hisashi, 5,467,328, Cl. 369-44.160.
Nagamitsu, Sachio; Sakai, Mayumi; Kodama, Hisashi; and Okada, Tsuneko, 5,467,401, Cl. 381-63.000.
Nishio, Kazutaka; Nishimura, Kenji; Naka, Toshiya; and Nakase, Yoshimori, 5,467,438, Cl. 395-131.000.
Ogawa, Kazufumi; Mino, Norihisa; and Soga, Mamoru, 5,466,486, Cl. 427-352.000.
Ogawa, Kazufumi; Mino, Norihisa; and Soga, Mamoru, 5,466,523, Cl. 428-333.000.
Ohtake, Tadashi; Mino, Norihisa; and Ogawa, Kazufumi, 5,466,487, Cl. 427-352.000.
Yamada, Sadayuki; Muramatsu, Shigeru; Hashimoto, Takashi; and Fukuhara, Hiroyuki, 5,466,136, Cl. 418-55.600.
Yamane, Yasuhiko; Nishino, Masakazu; Fujiwara, Yuji; and Matuda, Toyohiko, 5,467,135, Cl. 348-415.000.
Yoshino, Tadashi, 5,467,233, Cl. 360-70.000.
Matsushita Electric Works, Ltd.: *See*—
Furuta, Takashi; Takeda, Hajime; Nishimura, Hiroyuki; Kadono, Tsuyoshi; Ishizaki, Hirofumi; and Uesaka, Akira, 5,467,477, Cl. 455-346.000.
Matsushita Electronics Corp.: *See*—
Fuse, Genshu; and Ishikawa, Katuya, 5,466,612, Cl. 437-3.000.
Matsushita, Hiroomi; Sasaki, Teruo; and Fujisawa, Kazuhiro, to Sumitomo Rubber Industries, Inc. Laminated rubber support and method of designing the same. 5,465,945, Cl. 267-294.000.
Matsushita, Kouji: *See*—
Nakayama, Yasunori; Yonekawa, Noboru; Matsushita, Kouji; Nakagami, Yasuhiro; and Yuge, Shizuo, 5,466,938, Cl. 250-326.000.
Matsuura, Takanobu: *See*—
Kobayashi, Hiroshi; Hibino, Ikuo; Maruyama, Takahito; Hori, Fumihisa; Nakamura, Tadashi; Matsuura, Takanobu; and Ohsakama, Chikashi, 5,466,076, Cl. 400-248.000.
Matsuura, Yutaka: *See*—
Fujimura, Setsuo; Matsuura, Yutaka; and Sagawa, Masato, 5,466,308, Cl. 148-302.000.
Matsuyama, Kenji: *See*—
Matsuda, Akio; and Matsuyama, Kenji, 5,466,598, Cl. 435-254.110.
Matsuyama, Mitsuhiro: *See*—
Samejima, Kazuo; Matsuyama, Mitsuhiro; Morita, Shigeru; and Kure, Masaji, 5,465,561, Cl. 56-11.800.
Mattel, Inc.: *See*—
Bennett, Linda K.; and Feldman, Joseph, 5,466,181, Cl. 446-297.000.
Lee, Sean S., 5,466,080, Cl. 401-7.000.
Mattern-Klosson, Monika; Mundinger, Hans-Juergen; and Greger, Ferdinand, to Leybold Aktiengesellschaft. Cryopump. 5,465,584, Cl. 62-55.500.
Matteucci, Mark: *See*—

Buhr, Chris A.; and Matteucci, Mark, 5,466,786, Cl. 536-26.260.

Matthews, Billie J.: *See*—
Wanek, M. Chris; Van Den Bogart, Thomas W.; Georger, William A.; Ribble, Brendon F.; Matthews, Billie J.; Sawyer, Lawrence H.; Abuto, Frank P.; and Werner, Edward E., 5,466,513, Cl. 428-218.000.

Matthews, Gregory P.: *See*—
Dudek, Kenneth P.; Matthews, Gregory P.; Folkerts, Charles H.; and Davis, Ronald A., 5,465,617, Cl. 73-118.200.

Matthews, James F.: *See*—
Briselli, Robert C.; and Matthews, James F., 5,466,286, Cl. 106-404.000.

Mattison, Phillip L.: *See*—
Fristad, William E.; Narum, Jeffrey L.; Mattison, Phillip L.; Virnig, Michael J.; and Fast, John, 5,466,426, Cl. 423-98.000.

Matuda, Toyohiko: *See*—
Yamane, Yasuhiko; Nishino, Masakazu; Fujiwara, Yuji; and Matuda, Toyohiko, 5,467,135, Cl. 348-415.000.

Matzen, Walter T.: *See*—
Aizpuru, Jose J.; and Matzen, Walter T., 5,466,954, Cl. 257-187.000.

Maurin, Edward E. Arrow with deployable snare. 5,465,980, Cl. 273-416.000.

Mauz, Hubert: *See*—
Graf, Eckhard; Graf, Jürgen; and Mauz, Hubert, 5,465,758, Cl. 138-[illegible]000.

Maxtor Corporation: *See*—
Hutsell, Larry, 5,466,999, Cl. 318-431.000.
Krajec, Russell S.; and Preston, Vincent L., 5,465,476, Cl. 29-759.000.

May, Dennis J., to Delaware Capital Formation, Inc. Device for removing surface air in casings. 5,466,184, Cl. 452-38.000.

Maymudes, David M.: *See*—
Laney, Stuart T.; Ledoux, Eric; Maymudes, David M.; and Miller, Daniel J., 5,467,134, Cl. 348-409.000.

Maytag Corporation: *See*—
Wunderlich, Daniel F.; Herr, Nedra A.; Shannon, Donald N.; and Kuhn, L. Dean, 5,467,077, Cl. 340-635.000.

Mazda Motor Corporation: *See*—
Butsuen, Tetsuro; Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Adachi, Tomohiko; and Morioka, Satoshi, 5,467,283, Cl. 364-461.000.
Gotomyo, Yasuo; Kore, Haruhisa; Muramoto, Hisao; Nomura, Yoshinbu; Kohno, Shigefumi; and Hirashima, Isao, 5,466,001, Cl. 280-730.100.
Murakami, Tetsuya; Osumi, Masahiro; Nakanishi, Toshisuke; and Watanabe, Shigeaki, 5,466,033, Cl. 296-189.000.
Okazaki, Haruki, 5,466,054, Cl. 303-150.000.
Yamamoto, Hiroyuki; Ota, Noriyuki; and Terashita, Toshiyuki, 5,465,695, Cl. 123-256.000.
Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, 5,467,284, Cl. 364-461.000.

Mazur, Richard A.: *See*—
Graves, Bradford T.; Mazur, Richard A.; and Mennie, Douglas U., 5,467,406, Cl. 382-135.000.

McAbee, Michael L.: *See*—
Jenkins, Terry L.; McAbee, Michael L.; and Richardson, Joe W., Jr., 5,466,601, Cl. 435-263.000.

McAdams, Eric T.; Anderson, John M.; and McLaughlin, James A. Multi-function multi-electrode device. 5,466,256, Cl. 607-142.000.

McAlister, Kelly L.: *See*—
Nakatsu, Tetsuo; Kang, Kok Lean R.; McAlister, Kelly L.; and Huang, Jiansheng, 5,466,718, Cl. 514-724.000.

McCahill, David L.; and Valli, Gary E., to Hydro Delta Corporation. Multi-function self-contained heat pump system with microprocessor control. 5,465,588, Cl. 62-127.000.

McClarron, Andrew R.; Smith, Stephen J.; Watson, Derrick J.; Williams, Bruce L.; and Ross, Euan S., to BP Chemicals Limited. Process for the removal of corrosion metal contaminants from liquid compositions. 5,466,876, Cl. 562-608.000.

McClean, Craig E., to Owens-Illinois Plastic Products Inc. Venting thermoplastic container for a package with a bladder system. 5,465,864, Cl. 220-403.000.

McClure, Donald C.; and Haines, Hiemi K., to Marathon Oil Company. Enhanced oil recovery from heterogeneous reservoirs. 5,465,790, Cl. 166-273.000.

McClure, John R.: *See*—
Wagstaff, Robert A.; and McClure, John R., 5,465,658, Cl. 100-5.000.

McConaughy, Brett R.; Brammer, Norman; and Gariepy, James A., to ABB Vetco Gray Inc. Hydraulic seal between tubing hanger and wellhead. 5,465,794, Cl. 166-375.000.

McConnell, Von: *See*—
Redd, James C., Jr.; McConnell, Von; and Brohan, Liam P., 5,467,388, Cl. 379-196.000.

McCormick, William B.: *See*—
Douglas, George H.; McCormick, William B.; and Dennis, Stephen V., 5,467,435, Cl. 395-114.000.

McCready, Keith A., to Stenograph Corporation. Method and apparatus for recording and translating shorthand notes. 5,466,072, Cl. 400-91.000.

McCulloch, Michael J.: *See*—
della-Cioppa, Guy R.; Garger, Stephen J., Jr.; Holtz, Richard B.; McCulloch, Michael J.; and Sverlow, Genadie G., 5,466,592, Cl. 435-212.000.

McCullough, Richard: *See*—
Gale, Ronald P.; McCullough, Richard; Salerno, Jack P.; Fantone, Stephen D.; Forsyth, Robert P.; Carellas, Peter T.; Thomas, Michael J.; and Youman, Roy L., 5,467,154, Cl. 353-119.000.

McCune, Robert C., Jr.; Kim, Michael R.; and Smith, Ronald W., to Ford Motor Company. Process for coating automotive engine cylinders. 5,466,906, Cl. 219-121.470.

McCune, William H.: *See*—
Diede, Amos J.; and McCune, William H., 5,466,537, Cl. 428-548.000.

McDonald, William J.; Pittard, Gerard T.; Steele, Charles G.; Kiefer, Karl F.; Clifton, Terry P.; and Leitko, Curtis E., to Electric Power Research Institute. Wireless downhole electromagnetic data transmission system and method. 5,467,083, Cl. 340-854.600.

McDonel, Timothy R.: *See*—
Reiling, Vincent G.; Rinker, Jeffrey E.; McDonel, Timothy R.; and Sarna, Joseph C., 5,466,857, Cl. 558-319.000.

McDonnell Douglas Corporation: *See*—
Barron, Daniel R.; Jasulaitis, Vytas; and Morrill, Brion F., 5,466,163, Cl. 439-138.000.
Bonebright, Mark E., 5,467,098, Cl. 343-767.000.
Bonebright, Mark E.; and Glabe, John R., 5,467,099, Cl. 343-767.000.

McDougall, Maria N. V.: *See*—
Sacripante, Guerino G.; Veregin, Richard P. N.; and McDougall, Maria N. V., 5,466,554, Cl. 430-110.000.

McElwain, William L.: *See*—
Krupica, Libor; and McElwain, William L., 5,465,955, Cl. 271-265.020.

McGlinchey, Gerard F., to Analog Devices, Inc. Voltage regulator with multiple fixed plus user-selected outputs. 5,467,009, Cl. 323-269.000.

McKay, Albert A.; and Hart, James E., to Westinghouse Air Brake Company. Fastener assembly for installing valve devices and the like. 5,466,105, Cl. 411-84.000.

McKelvy, Michael J.: *See*—
Glaunsinger, William; Sorensen, Ian; Bao, Qingcheng; and McKelvy, Michael J., 5,466,605, Cl. 436-6.000.

McKibbin, Albert H.; and Burno, Jon D., to United Technologies Corporation. Geared drive system for a bladed propulsor. 5,466,198, Cl. 475-346.000.

McLane, Michael J.; and Duckworth, Maxine L. Traction device with a self clamping retainer. 5,466,205, Cl. 482-140.000.

McLaughlin, James A.: *See*—
McAdams, Eric T.; Anderson, John M.; and McLaughlin, James A., 5,466,256, Cl. 607-142.000.

McLean, Mark A.: *See*—
Olinger, Jill M.; Sligar, Stephen G.; McLean, Mark A.; Bohn, Paul W.; and Stayton, Patrick, 5,466,589, Cl. 435-174.000.

McMahon, William A.; Lew, Chel W.; and Branly, Keith L., to Micro Flo Company. Controlled release microcapsules. 5,466,460, Cl. 424-408.000.

McMillan, Larry D.: *See*—
Mihara, Takashi; Yoshimori, Hiroyuki; Watanabe, Hitoshi; McMillan, Larry D.; and De Araujo, Carlos P., 5,466,629, Cl. 437-60.000.

McMordie, Austin: *See*—
Horrobin, David F.; McMordie, Austin; and Manku, Mehar S., 5,466,841, Cl. 554-79.000.

McNamara, Karen M.: *See*—
Anthony, Thomas R.; Williams, Bradley E.; and McNamara, Karen M., 5,465,603, Cl. 72-467.000.

McNeel, Thomas E.: *See*—
Rayudu, S. Rao; Fenyes, Joseph G.; and McNeel, Thomas E., 5,466,717, Cl. 514-689.000.

McNeil (Ohio) Corporation: *See*—
DiCarlo, Leonard J., 5,465,646, Cl. 91-308.000.

McNeil-PPC, Inc.: *See*—
Berta, Norbert I., 5,466,290, Cl. 118-20.000.

McPherson, James I.; Kinney, Daniel R.; Jeannot, William E., Jr.; and Karel, Thomas R., to Herman Miller, Inc. Drawer front. 5,466,062, Cl. 312-348.600.

McVicker, Henry J.: *See*—
Johnson, Glenn W., Jr.; and McVicker, Henry J., 5,466,250, Cl. 607-104.000.

Mead Corporation, The: *See*—
Darlington, William B.; and Lanier, William G., 5,466,337, Cl. 162-164.300.

Meadox Medicals, Inc.: *See*—
Schmitt, Peter J.; Brookstein, David S.; and Skelton, John, 5,466,257, Cl. 623-1.000.

Medema, Robert M.: *See*—
Osborn, Charles; and Medema, Robert M., 5,465,818, Cl. 192-4.00A.

Medin, Todd R.: *See*—
Richtsmeier, Brent W.; Russell, Todd L.; Medin, Todd R.; and Meyer, William D., 5,467,119, Cl. 347-102.000.

Medtronic, Inc.: *See*—
Davis, Richard E.; and Greenhoe, William J., 5,466,225, Cl. 604-165.000.

Mee, Frances H. A., to Canadian Space Agency/Agence Spatiale Canadienne. End effector clamping jaw interface for attachment to an orbital replacement unit. 5,466,025, Cl. 294-1.100.

Meehan, Brian W.; Heine, Uwe; and Mason, James M. Temperature regulated hybridization chamber. 5,466,603, Cl. 435-285.100.

Meek, Phynes L. Tool for removing highway lane marking tabs. 5,465,489, Cl. 30-171.000.

Mefford, John J.; and Homoelle, John B., to Michelman, Inc. Non-skid surface composition for paper products. 5,466,493, Cl. 427-384.000.

Mehta, Rajendrakumar V.: *See*—

Jagannathan, Seshadri; Mahar, David P.; and Mehta, Rajendrakumar V., 5,466,570, Cl. 430-569.000.
Meier, Herman; and Witzig, Martin, to Berndorf Luzern A.G. Tray transport cart having electromagnetic induction heaters for heating meals to be placed on the trays. 5,466,915, Cl. 219-622.000.
Meier, Mark S.: *See*—
La, Duong; Bouras, Carlos E.; Meier, Mark S.; and Roetker, Thomas J., 5,465,879, Cl. 222-189.060.
Meier, Peter J.: *See*—
Motley, Gordon W.; Meier, Peter J.; and Miller, Brian C., 5,467,038, Cl. 327-185.000.
Mejean, Pascal; and Peyrot, Christian, to Reboul-SMT. Pot for the metered dispensing a fluid substance. 5,465,873, Cl. 222-47.000.
Mellinger, Philip: *See*—
Byrd, J. Abbott, III; Puno, Rolando M.; and Mellinger, Philip, 5,466,237, Cl. 606-61.000.
Mendelson, Jeffrey B.: *See*—
Solomon, David; Putnins, Zigmunds A.; Gish, David W.; and Mendelson, Jeffrey B., 5,467,344, Cl. 370-58.300.
Meng, Charles C.; and Fetterman, Harold R., to University of California, The Regents of the. High efficiency, high power multiquantum well IMPATT device with optical injection locking. 5,466,965, Cl. 257-604.000.
Mennel, David B.: *See*—
Wilson, Joseph H.; Mennel, David B.; and Rapp, Jeffrey C., 5,465,841, Cl. 206-366.000.
Mennie, Douglas U.: *See*—
Graves, Bradford T.; Mazur, Richard A.; and Mennie, Douglas U., 5,467,406, Cl. 382-135.000.
MEPLA-Werke Lautenschläger GmbH & Co. KG: *See*—
Lautenschläger, Horst, 5,466,061, Cl. 312-348.200.
Lautenschläger, Reinhard, 5,465,463, Cl. 16-236.000.
Merck & Co., Inc.: *See*—
Alexander, Jose, 5,466,811, Cl. 546-283.000.
Mergenthaler, Robert: *See*—
Schmitt, Edgar; Siegel, Heinz; Mergenthaler, Robert; and Deringer, Helmut, 5,466,055, Cl. 303-119.200.
Merle, Thomas C.; Ryan, Dale W.; and Rowden, David L., to Eastman Kodak Company. Tool and method for detaching a trailing end portion of a filmstrip from at least one hook atop a ramp on a film spool inside a film cartridge. 5,465,920, Cl. 242-348.100.
Merletti, Didier, to Rexroth Sigma. Method and circuit for compensating the drift of the output signal of a photoelectric sensor in an electrical remote control apparatus, and remote control apparatus realizing this method and this arrangement. 5,466,923, Cl. 250-214.0PR.
Merlin Gerin: *See*—
Payet-Burin, Jean-Luc; and Ogier, Eric, 5,467,069, Cl. 335-42.000.
Merocel Corporation: *See*—
Cercone, Ronald J.; Quaratella, Scott J.; and Gertzman, Arthur A., 5,466,231, Cl. 604-369.000.
Merrill, James P.: *See*—
Sowinski, Allan F.; Szajewski, Richard P.; and Merrill, James P., 5,466,560, Cl. 430-347.000.
Merser, R. Gerard, to Avery Dennison Corporation. Fastener system for use in shoe-lasting applications. 5,465,442, Cl. 12-142.0LC.
Merz, Johann: *See*—
Draskovits, Günter; and Merz, Johann, 5,466,135, Cl. 418-268.000.
Mesmer, Larry P., to Metal Cutting Corp. Push-type collet and seat assembly. 5,465,638, Cl. 82-127.000.
Messer Griesheim GmbH: *See*—
Wilhelmi, Herbert; Steinmetz, Eberhard; and Peters, Klaus, 5,467,366, Cl. 373-85.000.
Metal Cutting Corp.: *See*—
Mesmer, Larry P., 5,465,638, Cl. 82-127.000.
Metaleurop S.A.: *See*—
Bied-Charreton, Benoit; Chabry, Pierre; Lecadet, Jacques; and Paaquier, Patrice, 5,467,365, Cl. 373-9.000.
Metallgesellschaft Aktiengesellschaft: *See*—
Brücken, Volker; Pötzschke, Manfred; Langner, Bernd; and Stelter, Michael, 5,466,352, Cl. 204-182.400.
Queneau, Paul E.; and Hirsch, Martin, 5,466,278, Cl. 75-501.000.
Metzeler Automotive Profiles, GmbH: *See*—
Brocke, Rolf; and Glagow, Klaus, 5,466,508, Cl. 428-122.000.
Meyen, Hans-Peter, to Robert Bosch GmbH. Device on hand power tools for driving tools. 5,466,101, Cl. 408-226.000.
Meyer, Daniel L.: *See*—
Hamburg, Douglas R.; Logothetis, Eleftherios M.; and Meyer, Daniel L., 5,465,697, Cl. 123-424.000.
Meyer, Jeffrey W.: *See*—
Fan, Siqi; Root, David E.; and Meyer, Jeffrey W., 5,467,291, Cl. 364-578.000.
Meyer, Rudolf X. Wheelchair and lifting apparatus for handicapped persons driving automobiles. 5,466,111, Cl. 414-462.000.
Meyer, William D.: *See*—
Richtsmeier, Brent W.; Russell, Todd L.; Medin, Todd R.; and Meyer, William D., 5,467,119, Cl. 347-102.000.
Mezenner, Rabah: *See*—
Kaya, Cetin; Holland, Wayland B.; and Mezenner, Rabah, 5,467,306, Cl. 365-185.200.
MGwhiz, Inc.: *See*—
Gonzalez, Mark A., 5,465,976, Cl. 273-317.000.
Mian, Maurizio: *See*—
Rosini, Sergio; and Mian, Maurizio, 5,466,682, Cl. 514-76.000.
Miani, Mario. Two-component extrusion head, having a spinneret with high perforation density. 5,466,142, Cl. 425-131.500.
Michael, Joseph, to Piccard Enterprises, Inc. Phased array based radar system for vehicular collision avoidance. 5,467,072, Cl. 340-436.000.
Michaelis, Johannes: *See*—
Sieber, Helmut; Schilling, Ferdinand; Hagen, Günter; Kleissendorf, Roland; and Michaelis, Johannes, 5,465,834, Cl. 206-193.000.
Michel, Hartmut: *See*—
Goerlach, Alfred; Michel, Hartmut; and Mindl, Anton, 5,466,959, Cl. 257-361.000.
Michelet, Daniel: *See*—
Costantini, Michel; Manaut, Daniel; and Michelet, Daniel, 5,466,839, Cl. 552-304.000.
Michelman, Inc.: *See*—
Mefford, John J.; and Homoelle, John B., 5,466,493, Cl. 427-384.000.
Michie, Terry K.: *See*—
Roos, Mark G.; and Michie, Terry K., 5,467,092, Cl. 342-174.000.
Michlbauer, Franz: *See*—
Heidlas, Jürgen; Cully, Jan; Michlbauer, Franz; and Vollbrecht, Heinz-Rüdiger, 5,466,842, Cl. 554-83.000.
Micro Flo Company: *See*—
McMahon, William A.; Lew, Chel W.; and Branly, Keith L., 5,466,460, Cl. 424-408.000.
MicroBilt Corporation: *See*—
Nair, Parameswaran B.; Choudhuri, Kumar S.; Stills, James T.; and Evans, John C., 5,466,920, Cl. 235-449.000.
MicroCarb, Inc.: *See*—
Krivan, Howard C.; and Blomberg, A. Lennart L., 5,466,681, Cl. 514-54.000.
Micron Semiconductor, Inc.: *See*—
Ireland, Philip J., 5,466,639, Cl. 437-195.000.
Micropump Corporation: *See*—
Altham, Tim J.; and Johnson, Paul A., 5,466,131, Cl. 417-420.000.
Microsoft: *See*—
Rauch, Adam; Riker, Gregory W.; and Myhrvold, Nathan P., 5,467,264, Cl. 364-141.000.
Microsoft Corporation: *See*—
Douglas, George H.; McCormick, William B.; and Dennis, Stephen V., 5,467,435, Cl. 395-114.000.
Laney, Stuart T.; Ledoux, Eric; Maymudes, David M.; and Miller, Daniel J., 5,467,134, Cl. 348-409.000.
Williams, Antony; Martinez, Edward A.; and Hachamovitch, Dean J., 5,467,472, Cl. 395-600.000.
MicroTouch Systems, Inc.: *See*—
Logan, James D., 5,466,895, Cl. 178-18.000.
Middeljans, Hendrik: *See*—
Maria, Christiaan J.; De Weijer, Anton P.; Middeljans, Hendrik; and Heuvel, Herman M., 5,466,525, Cl. 428-357.000.
Midland Brake, Inc.: *See*—
Koelzer, Robert L., 5,466,053, Cl. 303-7.000.
Mier, Randall M.: *See*—
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., 5,466,575, Cl. 435-6.000.
Mifune, Hiroshi; Saitoh, Satoshi; Kaneda, Teruo; Tomokiyo, Shigetaka; Adachi, Tsugio; Tanaka, Tsutomu; and Purudate, Toshiharu, to Tomokiyo White Ant Co. Ltd. Intellectual working robot of self controlling and running. 5,465,525, Cl. 43-132.100.
Migliori, Albert: *See*—
Dixon, Raymond D.; Roe, Lawrence H.; and Migliori, Albert, 5,465,897, Cl. 228-121.000.
Mihara, Tadashi: *See*—
Hotta, Yoshio; Hanyu, Yukio; Mihara, Tadashi; Kodera, Yasuo; and Nakamura, Katsutoshi, 5,467,209, Cl. 359-74.000.
Mihara, Takashi; Yoshimori, Hiroyuki; Watanabe, Hitoshi; McMillan, Larry D.; and De Araujo, Carlos P., to Symetrix Corporation; and Olympus Optical Co., Ltd. Process for fabricating ferroelectric integrated circuit. 5,466,629, Cl. 437-60.000.
Mikami, Shigeru; Mori, Masayuki; Yamamoto, Tetsuo; Ohno, Matsuhiro; and Matsumoto, Mineo, to Furuno Electric Company, Limited. Apparatus for radio communication of facsimile. 5,467,199, Cl. 358-425.000.
Mikkelsen, Carl M.; and Gavrin, Edward S., to ColorAge, Inc. System and method for rasterizing images subject to orthogonal rotation. 5,467,446, Cl. 395-143.000.
Mikoshiba, Norihiko: *See*—
Duerr, Wilhelm; Mikoshiba, Norihiko; and Watanabe, Yutaka, 5,467,017, Cl. 324-318.000.
Milanovich, Fred P.: *See*—
Brown, Steve B.; and Milanovich, Fred P., 5,466,128, Cl. 417-254.000.
Milender, Jeffery S.: *See*—
Panoushek, Dale W.; and Milender, Jeffery S., 5,465,560, Cl. 56-10.20E.
Miles, Inc.: *See*—
Kleinschmitt, David; Touma, Maroun; and Zabetakis, George E., 5,466,946, Cl. 250-577.000.
Miller, Brian C.: *See*—
Motley, Gordon W.; Meier, Peter J.; and Miller, Brian C., 5,467,038, Cl. 327-185.000.
Miller, Daniel J.: *See*—
Laney, Stuart T.; Ledoux, Eric; Maymudes, David M.; and Miller, Daniel J., 5,467,134, Cl. 348-409.000.

Miller, Douglas P., to Applied Power Inc. Vented hydraulic fluid reservoir. 5,465,576, Cl. 60-478.000.

Miller, Gary R.; Walls, John E.; and Felker, Melanie A., to Eastman Kodak Company. Aqueous developer for lithographic printing plates which exhibits reduced sludge formation. 5,466,559, Cl. 430-331.000.

Miller, John B. Device to secure toilet flush lever arm to effect a partial flush. 5,465,432, Cl. 4-325.000.

Miller, Larry E.; Hawkins, Gene P.; and Durham, Bernard G., to Procter & Gamble Company, The. Process for reducing the levels of nitrite contaminants in amine oxide surfactants. 5,466,870, Cl. 564-298.000.

Miller, Mark: *See*—
Aden, Charles M.; Graham, Martin H.; Taylor, Matthew; and Miller, Mark, 5,467,061, Cl. 333-24.00R.

Miller, Thomas C.: *See*—
Puckett, Richard D.; Obringer, Thomas J.; and Miller, Thomas C., 5,466,012, Cl. 283-67.000.

Miller/Zell, Inc.: *See*—
Stabile, David J., 5,465,516, Cl. 40-649.000.

Milley, Robert J.: *See*—
Dorin, Glenn; Gray, David R.; Chang, Byeong S.; Cowgill, Cynthia A.; and Milley, Robert J., 5,466,781, Cl. 530-351.000.

Milliken Research Corporation: *See*—
Dischler, Louis, 5,466,503, Cl. 428-43.000.

Millipore Corporation: *See*—
Bowers, William F., 5,465,748, Cl. 137-240.000.

Mills, Donald L.: *See*—
Schumacher, James H.; and Mills, Donald L., 5,465,507, Cl. 36-30.00R.

Milner, Paul, to British Aerospace PLC. Vertical take-off/landing of aircraft. 5,465,923, Cl. 244-2.000.

Mimlitch, Kenneth H., to Lexmark International, Inc. Adjustable pointing stick assembly. 5,467,108, Cl. 345-161.000.

Minamino, Daiki: *See*—
Tanaka, Takeshi; Minamino, Daiki; Yoshizaki, Akira; and Nakano, Nakaya, 5,466,293, Cl. 118-264.000.

Mindl, Anton: *See*—
Goerlach, Alfred; Michel, Hartmut; and Mindl, Anton, 5,466,959, Cl. 257-361.000.

Mindscope Incorporated: *See*—
Bittman, Barry B.; and Cram, Jeffrey R., 5,465,729, Cl. 128-732.000.

Mine Safety Appliances Company: *See*—
Schneider, Alan A.; and Scheffler, Towner B., 5,466,356, Cl. 204-406.000.

Minen, Ettore, to Engen Meccanica Di Minen Ettore. Automatic machine for binding bundles of pipes or the like. 5,465,659, Cl. 100-30.000.

MiniMed, Inc.: *See*—
Srisathapat, Chad; and Indravudh, Virote, 5,466,218, Cl. 604-49.000.

Ministry of International Trade & Industry: *See*—
Tenjimbayashi, Koji, 5,467,184, Cl. 356-35.500.

Minnesota Mining and Manufacturing: *See*—
Whitcomb, David R.; and Frank, William C., 5,466,804, Cl. 544-225.000.

Minnesota Mining and Manufacturing Company: *See*—
Audenaert, Frans A.; Dams, Rudolf J.; and Kamrath, Robert F., 5,466,770, Cl. 528-60.000.
Barato, Eugene L.; David, John R.; Larson, Curtis L.; Nelson, Thomas L.; and Wrobel, Norbert E., 5,465,900, Cl. 229-125.390.
Cheburkov, Yuri, 5,466,879, Cl. 564-253.000.
Kennedy, James K.; and Wilson, James A., 5,465,832, Cl. 206-45.230.
Moore, George G. I., 5,466,877, Cl. 562-852.000.
Pluim, Arthur W., 5,466,500, Cl. 428-40.000.
Rolando, Richard J.; Coleman, Patrick L.; Kangas, Steven L.; and Kotnour, Thomas A., 5,466,747, Cl. 525-54.100.
Rolando, Richard J.; Coleman, Patrick L.; Kangas, Steven L.; and Kotnour, Thomas A., 5,466,749, Cl. 525-54.100.
Sisley, Elizabeth M.; and Collins, John E., 5,467,268, Cl. 364-401.000.

Mino, Norihisa: *See*—
Ogawa, Kazufumi; Mino, Norihisa; and Soga, Mamoru, 5,466,486, Cl. 427-352.000.
Ogawa, Kazufumi; Mino, Norihisa; and Soga, Mamoru, 5,466,523, Cl. 428-333.000.
Ohtake, Tadashi; Mino, Norihisa; and Ogawa, Kazufumi, 5,466,487, Cl. 427-352.000.

Minoguchi, Naokazu: *See*—
Ozaki, Masami; Ikeda, Atsuhiko; Yumita, Takashi; Honami, Reijiro; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,466,705, Cl. 514-383.000.

Minolta Camera Kabushiki Kaisha: *See*—
Morikawa, Takeshi, 5,467,169, Cl. 355-201.000.
Murashima, Nobuharu; Ishibashi, Kenji; Shintani, Dai; and Taniguchi, Nobuyuki, 5,467,158, Cl. 354-173.100.

Minolta Co., Ltd.: *See*—
Nakayama, Yasunori; Yonekawa, Noboru; Matsushita, Kouji; Nakagami, Yasuhiro; and Yuge, Shizuo, 5,466,938, Cl. 250-326.000.
Okabayashi, Eiji, 5,467,363, Cl. 372-38.000.

Minoru, Obata: *See*—
Nakao, Tohru; Yuji, Ono; Hiroshi, Tanaka; Minoru, Obata; and Yasuto, Morimoto, 5,466,691, Cl. 514-254.000.

Mirza, Fernand. Window shade. 5,465,776, Cl. 160-368.100.

Mishima, Akio; Harada, Tosiharu; Tanihara, Mamoru; Ota, Yasutaka; Okinaka, Kenji; Mori, Kohji; Kawasaki, Hirofumi; Nagai, Norimichi; Fujimoto, Katsunori; and Okuda, Yoshiro, to Toda Kogyo Corp. Spindle-shaped magnetic iron based alloy particles. 5,466,306, Cl. 148-306.000.

Mishima, Ikuhiro; Ikeda, Munehiro; and Hosoi, Hideki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Nonflammable injection-molding resin composition. 5,466,750, Cl. 525-84.000.

Misiano, Carlo; Simonetti, Enrico; and Taglioni, Giovanni, to CE.TE.V Centro Technologie Del Vuoto. Thin film deposition apparatus, mainly dedicated to PECVD and sputtering techniques and respective processes. 5,466,296, Cl. 118-723.0MP.

Misonix, Inc.: *See*—
Manna, Ronald R., 5,465,468, Cl. 29-25.350.

Mississippi State University: *See*—
Chen, Lung-Hua; Pote, Jonathan; and Fuller, Marty, 5,465,464, Cl. 19-24.000.

Mister Dripper Company, LLC: *See*—
Elder, Jack E., 5,465,905, Cl. 239-75.000.

Mita Industrial Co., Ltd.: *See*—
Okumura, Keiji; Aoki, Takeahi; Sugishima, Yoshio; Hayama, Satoru; Taguchi, Keiichi; Iwase, Yuichiro; and Okamoto, Noriaki, 5,465,947, Cl. 270-58.000.
Umeda, Yasushi; Motegi, Yasuo; Tomiyama, Tetsuo; Yoshikawa, Hiroyuki; and Shimomura, Yoshiki, 5,467,355, Cl. 364-571.040.

Mitani, Masao, to Hitachi Koki Co., Ltd. Liquid droplet ejecting apparatus. 5,467,112, Cl. 347-1.000.

Mitani, Tetsuya: *See*—
Sato, Takashi; Suzuki, Takahisa; Tsuchiya, Hiromitsu; and Mitani, Tetsuya, 5,466,989, Cl. 313-635.000.

Mitchell, Robert M.: *See*—
Galbraith, Lyle D.; Holland, Gary F.; Poole, Donald R.; and Mitchell, Robert M., 5,465,795, Cl. 169-11.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Akimoto, Katsuyuki; Machida, Takahiro; and Ishii, Yoshinori, 5,466,994, Cl. 315-411.000.
Andoh, Fumihiko; Miyakawa, Kazunori; Yamamoto, Hidekazu; and Yamawaki, Masao, 5,466,613, Cl. 437-3.000.
Asami, Kazuo, 5,467,357, Cl. 371-21.300.
Eguchi, Koji, 5,466,638, Cl. 437-193.000.
Itoh, Atsushi, 5,467,430, Cl. 395-95.000.
Kohda, Kenji; and Kouro, Yasuhiro, 5,467,457, Cl. 395-429.000.
Kouzai, Fumio; Tokumaru, Susumu; and Kitamura, Syozo, 5,466,075, Cl. 400-240.300.
Nishimoto, Koji, 5,465,700, Cl. 123-492.000.
Sato, Fumiki; and Fujita, Kouichi, 5,467,299, Cl. 364-761.000.
Sato, Fumiki, 5,467,454, Cl. 395-296.000.
Shimizu, Masahiro; and Tsukamoto, Katsuhiro, 5,466,623, Cl. 437-52.000.
Tanaka, Satoshi; and Machara, Hideaki, 5,467,411, Cl. 382-113.000.
Toko, Yoshio, 5,467,097, Cl. 343-702.000.
Uchinami, Masanobu, 5,467,008, Cl. 322-27.000.
Wada, Shunichi; Naito, Yasuo; Nishino, Kazuhisa; and Takagi, Masanori, 5,467,279, Cl. 364-424.850.
Yasui, Katsuaki; and Kishimoto, Yuji, 5,465,618, Cl. 73-204.270.
Yoshida, Hironari; and Hino, Yuji, 5,467,028, Cl. 326-38.000.
Yoshida, Yukihisa; Ito, Wataru; and Morishita, Tadataka, 5,466,665, Cl. 505-476.000.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Kaneishi, Akimasa; and Toyota, Akinori, 5,465,908, Cl. 239-571.000.

Mitsubishi Kasei Corporation: *See*—
Shimomura, Takeshi; Yamada, Kazunori; Morimoto, Yuuki; Kitamura, Naomi; and Miyazawa, Keiji, 5,466,593, Cl. 435-219.000.

Mitsubishi Materials Corporation: *See*—
Tajima, Itsurou; and Ueda, Fumihiro, 5,466,642, Cl. 501-96.000.
Toyoda, Seiji; Sugamura, Kunio; and Yoshida, Hideaki, 5,466,488, Cl. 427-376.200.

Mitsubishi Paper Mills Limited: *See*—
Koike, Naomasa; Nakano, Akira; Kosaka, Takao; and Sakata, Naoya, 5,466,655, Cl. 503-209.000.

Mitsubishi Plastics Industries Limited: *See*—
Takagi, Jun; and Fujita, Hirotsugu, 5,466,499, Cl. 428-36.900.

Mitsuhashi, Tsuyoshi; and Kagawa, Nobuaki, to Konica Corporation. Silver halide photographic light-sensitive material. 5,466,571, Cl. 430-578.000.

Mitsui, Kenrou: *See*—
Yonezawa, Toshio; Mitsui, Kenrou; Nakazima, Makoto; Kinoshita, Mitsuo; Shimono, Toshihide; and Yamamoto, Tsuneo, 5,466,289, Cl. 106-309.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Muro, Kiyofumi; Fujimoto, Tsuyoshi; Yoshida, Yuji; Yamada, Yoshikazu; and Ishizaka, Shoji, 5,467,364, Cl. 372-45.000.

Mitsuya, Hiroyuki; Yamada, Hideki; Maruyama, Ryoichi; and Ishino, Tsutomu, to Kabushiki Kaisha Komatsu Seisakusho. Mechanical-hydraulic transmission. 5,466,197, Cl. 475-72.000.

Mittag, Douglas, to Equipto. Flooring substructure. 5,465,534, Cl. 52-126.600.

Mitutoyo Corporation: *See*—
Abe, Makoto; Ohta, Shigekata; Tokitoh, Hiroyuki; Ueda, Morimasa; Kano, Takahumi; and Hidaka, Hiroyuki, 5,467,289, Cl. 364-560.000.

Miura, Shin; Hirose, Youichi; and Sato, Mitsuaki, to Showa Denko K.K. Starting powder for producing sintered-aluminum alloy, method for producing sintered parts, and sintered aluminum alloy. 5,466,277, Cl. 75-255.000.
Miyagi, Kunihiko; and Chikama, Toshio, to Machida Endoscope Co., Ltd. Endoscope. 5,465,710, Cl. 600-139.000.
Miyaji, Hiroshi, to Sanki Machinery Co., Ltd. Method of and apparatus for superposing strip members. 5,466,321, Cl. 156-260.000.
Miyakawa, Kazunori: *See*—
Andoh, Fumihiko; Miyakawa, Kazunori; Yamamoto, Hidekazu; and Yamawaki, Masao, 5,466,613, Cl. 437-3.000.
Miyakawa, Makoto: *See*—
Bertin, Claude L.; DiMaria, Donelli J.; Miyakawa, Makoto; and Sakaue, Yoshinori, 5,467,305, Cl. 365-185.010.
Miyake, Chie: *See*—
Wada, Yukio; Yamamoto, Kazunori; Tsukamoto, Osami; Ohara, Takeshi; Miyake, Chie; and Mori, Sadao, 5,465,849, Cl. 209-214.000.
Miyake, Kazutoshi; Ueno, Masato; Watanabe, Satomi; Funahashi, Nobuaki; Asai, Tomohito; and Isono, Thoru, to Toyoda Gosei Co., Ltd. Method for producing damper pulley. 5,465,485, Cl. 29-892.110.
Miyake, Nobuyuki: *See*—
Isogawa, Shuichi; and Miyake, Nobuyuki, 5,467,150, Cl. 351-212.000.
Miyake, Toshio: *See*—
Uchida, Yukio; Iritani, Satoshi; and Miyake, Toshio, 5,466,453, Cl. 424-195.100.
Miyakubo, Hiroshi: *See*—
Uraki, Yoichi; Kubozuka, Takao; Kondo, Masahiko; Miyakubo, Hiroshi; and Usuki, Hisafumi, 5,465,692, Cl. 123-195.00C.
Miyashito, Julie M.: *See*—
Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., 5,466,823, Cl. 548-377.100.
Miyashita, Haruzo, to Anelva Corporation. Particle detection system. 5,467,188, Cl. 356-336.000.
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; Hosaka, Sumio; Ono, Kouichi; and Moriyama, Yoshiaki, to Pioneer Electronic Corporation. Karaoke reproducing apparatus. 5,466,883, Cl. 84-610.000.
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; and Kitano, Yoshihiro, to Pioneer Electronic Corporation. Apparatus for selectively playing a recording medium. 5,467,326, Cl. 369-30.000.
Miyashita, Takumi, to Fujitsu Limited. Voltage controlled oscillator having a current mirror circuit as current source. 5,467,060, Cl. 331-74.000.
Miyata, Shigeo, to Kabushiki Kaisha Kaisui Kagaku Kenkyojo. Stabilized, halogen-containing resin composition, and composite metal oxide and process for the production thereof. 5,466,740, Cl. 524-399.000.
Miyawaki, Mamoru: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,466,961, Cl. 257-379.000.
Miyazaki, Sho; Konoya, Hisashi; Tanaka, Yoshihiro; Fujitani, Mitsuhiro; and Konda, Kazumoto, to Sumitomo Wiring Systems, Ltd. Connector having a protective hood. 5,466,164, Cl. 439-140.000.
Miyazaki, Takemi; Kakuta, Yoshio; and Fujisawa, Toshiki, to Konica Corporation. Camera with a bar code reading apparatus. 5,467,155, Cl. 354-21.000.
Miyazawa, Azuma; Mizobuchi, Koji; and Suzuki, Takashi, to Olympus Optical Co., Ltd. Digital fuzzy inference apparatus having time-divisional control function. 5,467,426, Cl. 395-3.000.
Miyazawa, Kazuyuki; Shimohigashi, Katsuhiro; Etoh, Jun; and Kimura, Katsutaka, to Hitachi, Ltd. Method of testing an address multiplexed dynamic RAM. 5,467,314, Cl. 365-201.000.
Miyazawa, Keiji: *See*—
Shimomura, Takeshi; Yamada, Kazunori; Morimoto, Yuuki; Kitamura, Naomi; and Miyazawa, Keiji, 5,466,593, Cl. 435-219.000.
Miyazawa, Tatsuyuki: *See*—
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; Hosaka, Sumio; Ono, Kouichi; and Moriyama, Yoshiaki, 5,466,883, Cl. 84-610.000.
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; and Kitano, Yoshihiro, 5,467,326, Cl. 369-30.000.
Miyoshi, Takahito: *See*—
Shirakura, Yuji; Abe, Hisamasa; Yamashita, Teruo; Shimizu, Tatsuo; Kawahara, Sei; Miyoshi, Takahito; and Nishikawa, Yasuo, 5,466,519, Cl. 428-323.000.
Mizobuchi, Koji: *See*—
Miyazawa, Azuma; Mizobuchi, Koji; and Suzuki, Takashi, 5,467,426, Cl. 395-3.000.
Mizoguchi, Yoshito, to Canon Kabushiki Kaisha. Density adjustment in an image processing apparatus. 5,467,195, Cl. 358-296.000.
Mizoguchi, Yoshito: *See*—
Fukushima, Satoru; Gu, Sono; and Mizoguchi, Yoshito, 5,467,196, Cl. 358-298.000.
Mizokami, Takuya: *See*—
Saiki, Eisaku; Mizokami, Takuya; and Matsunami, Naoto, 5,467,331, Cl. 369-53.000.
Mizuno, Fumio; Moriuchi, Noboru; Shirai, Seiichiro; Moroishi, Yutaka; Sunakawa, Makoto; and Kawanishi, Michirou, to Nitto Denko Corporation; and Hitachi Ltd. Resist removing method, and curable pressure-sensitive adhesive, adhesive sheets and apparatus used for the method. 5,466,325, Cl. 156-344.000.
Mizusawa, Nobutoshi: *See*—
Ebinuma, Ryuichi; Mizusawa, Nobutoshi; and Chiba, Yaji, 5,467,114, Cl. 347-32.000.
MMT Manufacturing Corp.: *See*—
DiRico, Mark A., 5,466,291, Cl. 118-244.000.
Mobil Oil Corporation: *See*—
Audeh, Costandi A.; and Rankel, Lillian A., 5,466,363, Cl. 208-251.00H.
Baillargeon, David J.; Cardis, Angeline B.; Heck, Dale B.; and Johnson, Susan W., 5,466,267, Cl. 44-386.000.
Buchanan, John S.; Krambeck, Frederick J.; and Schatz, Klaus W., 5,465,536, Cl. 52-198.000.
Heck, Roland H.; Heinemann, Heinz; Reischman, P. T.; Venuto, Paul B.; and Whitehurst, D. Duayne, 5,466,361, Cl. 208-131.000.
Jan, Raymond J., 5,466,299, Cl. 134-21.000.
Norby, Allen J.; and Prader, Randolph D., 5,465,845, Cl. 206-554.000.
Peterson, Brian K.; and Jackson, Andrew, 5,465,810, Cl. 184-6.210.
Mochizuki, Chiaki: *See*—
Takemoto, Tadashi; Hijiya, Toyoto; Yonekawa, Teruo; and Mochizuki, Chiaki, 5,466,864, Cl. 562-445.000.
Mochizuki, Isao, to Brother Kogyo Kabushiki Kaisha. Keyswitch assembly having mechanism for controlling touch of keys. 5,466,901, Cl. 200-5.00A.
Modern Medical Devices: *See*—
Ross, James B.; Christiansen, Gary L.; and Chang, Ronald, 5,466,897, Cl. 181-131.000.
Moeller, Carl: *See*—
Burt, Donald E.; Boot, Jeffrey T.; Bouche, Matthew D.; and Moeller, Carl, 5,465,951, Cl. 271-167.000.
Moesinger, Hans: *See*—
Deller, Klaus; Moesinger, Hans; Mueller, Herbert; Riedl, Josef; Kuehn, Wenzel; and Spielmannleitner, Rudolf, 5,466,421, Cl. 422-171.000.
Moffatt, Frank S.; and Winstanley, David, to Zeneca Limited. Isothiazolinone solutions. 5,466,814, Cl. 548-209.000.
Mohamed, Mansour H.; and Bilisik, A. Kadir, to North Carolina State University. Multi-layer three-dimensional fabric and method for producing. 5,465,760, Cl. 139-11.000.
Molkvist, Anders: *See*—
Ahlen, Arne; Molkvist, Anders; and Johansen, Thor, 5,465,915, Cl. 241-247.000.
Molex Incorporated: *See*—
Bixler, Craig; and Nelson, Richard A., 5,466,171, Cl. 439-378.000.
Bowen, David C.; Harwath, Frank A.; and Triner, Irvin R., 5,465,479, Cl. 29-749.000.
Moll, Frederic H.; Gresl, Charles, Jr.; Chin, Albert K.; and Hopper, Philip K., to Origin Medsystems, Inc. Surgical procedures using endoscopic inflatable retraction devices. 5,465,711, Cl. 600-207.000.
Monarch Marking Systems, Inc.: *See*—
Lamprecht, Dale E., Jr.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., 5,467,433, Cl. 395-114.000.
Monetti, Catherine J.: *See*—
Monetti, Steven A.; and Monetti, Catherine J., 5,465,686, Cl. 119-168.000.
Monetti, Steven A.; and Monetti, Catherine J. Collapsible house for pets. 5,465,686, Cl. 119-168.000.
Monfredini, David J.: *See*—
Malvaez, Laura A.; and Monfredini, David J., 5,465,435, Cl. 4-574.100.
Moniwa, Masahiro: *See*—
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,466,621, Cl. 437-52.000.
Monma, Genzo: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,466,961, Cl. 257-379.000.
Monsanto Company: *See*—
Wun, Tze-Chein; Kretzmer, Kuniko K.; and Broze, George J., Jr., 5,466,783, Cl. 530-380.000.
Moody, Paul T., to U.S. Philips Corporation. Semiconductor device having an IGET and a control or protection component. 5,466,952, Cl. 257-139.000.
Mooney, Thomas R.: *See*—
Smith, Walter C.; and Mooney, Thomas R., 5,465,490, Cl. 30-180.000.
Moore Business Forms, Inc.: *See*—
Wilkinson, Stephen C.; and Thorman, Randy A., 5,466,502, Cl. 428-40.000.
Moore, Charles E.: *See*—
Baumgartner, Richard A.; Moore, Charles E.; and Herleikson, Earl C., 5,467,090, Cl. 341-155.000.
Moore, George G. I., to Minnesota Mining and Manufacturing Company. Process for converting perfluorinated esters to perfluorinated acyl fluorides and/or ketones. 5,466,877, Cl. 562-852.000.
Moore, Katherine L.: *See*—
Finkel, Gilbert; and Moore, Katherine L., 5,466,476, Cl. 426-556.000.
Moore, Kevin B.: *See*—
Dornbush, David A.; Erickson, Chad S.; Iverson, Troy M.; Sandahl, Jeffrey E.; Moore, Kevin B.; Barnes, Neal P.; Easley, James B.; Jackson, Richard C.; and Von Duyke, Andrew L., 5,466,912, Cl. 219-400.000.
Moore, Roland S.; and Tran, Howard T., to Westinghouse Air Brake Company. Slack adjusting brake cylinder for a brake unit on a railway transit vehicle. 5,465,816, Cl. 188-196.00P.
Moore, Sylvia: *See*—

Lause, Herb; Moore, Sylvia; Seltzer, Clif; Taylor, Cliff; and King, Dan, 5,466,317, Cl. 156-79.000.

MOR/ryde International, Inc.: *See*—
Heitzmann, David E., 5,465,997, Cl. 280-716.000.

Moran, John R.: *See*—
Nakamura, Charles E.; Di Cosimo, Robert; and Moran, John R., 5,466,801, Cl. 544-173.000.

More, Anton. Method and apparatus for desulphurizing iron with minimal slag formation. 5,466,275, Cl. 75-10.460.

Moree, Jeanette D.: *See*—
Brockhus, Jeroen J.; Moree, Jeanette D.; Lammers, Jannes G.; and Rodenburg, Tileman, 5,466,478, Cl. 426-602.000.

Moren, Thomas F.: *See*—
Goodnough, Scott E.; and Moren, Thomas F., 5,465,510, Cl. 37-285.000.

Morgan, Carlton B., to Heartstream, Inc. Defibrillator electrode system. 5,466,244, Cl. 607-5.000.

Morgan Crucible Company PLC, The: *See*—
Spowage, Mark J.; Grayson, Julia P.; Outhwaite, Alan C.; and Ahmed, Nighat, 5,466,736, Cl. 524-315.000.

Morgan, Douglas J.: *See*—
Fort, J. Robert; Neidell, Norman S.; Morgan, Douglas J.; and Landmeier, Phillip C., 5,465,722, Cl. 128-661.010.

Morgan, Gaylard M.; Malczanek, Anthony; and Gould, Peter J., to Copack International Inc. Apparatus for packaging granular material. 5,465,555, Cl. 53-451.000.

Morgan, Steven R.: *See*—
Boyse, George C.; and Morgan, Steven R., 5,465,672, Cl. 108-51.300.

Mori, Katsushi. Stent for biliary, urinary or vascular system. 5,466,242, Cl. 606-198.000.

Mori, Kohji: *See*—
Mishima, Akio; Harada, Tosiharu; Tanihara, Mamoru; Ota, Yasutaka; Okinaka, Kenji; Mori, Kohji; Kawasaki, Hirofumi; Nagai, Norimichi; Fujimoto, Katsunori; and Okuda, Yoshiro, 5,466,306, Cl. 148-306.000.

Mori, Makoto: *See*—
Ito, Yutaka; Mori, Makoto; and Gohara, Shinobu, 5,467,346, Cl. 370-60.000.

Mori, Masayuki: *See*—
Mikami, Shigeru; Mori, Masayuki; Yamamoto, Tetsuo; Ohno, Matsuhiro; and Matsumoto, Mineo, 5,467,199, Cl. 358-425.000.

Mori, Sadao: *See*—
Wada, Yukio; Yamamoto, Kazunori; Tsukamoto, Osami; Ohara, Takeshi; Miyake, Chie; and Mori, Sadao, 5,465,849, Cl. 209-214.000.

Mori, Toshihiro: *See*—
Ishinaga, Hiroyuki; Fukuda, Tsuguhiro; and Mori, Toshihiro, 5,467,113, Cl. 347-17.000.

Moridge Manufacturing, Inc.: *See*—
Koehn, Leroy F.; and Esau, Merlin L., 5,465,564, Cl. 56-320.200.

Moriguchi, Koei: *See*—
Kawabata, Hironori; Moriguchi, Koei; and Endo, Takeshi, 5,466,678, Cl. 514-46.000.

Morikawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus which can prevent copying during a predetermined period and allow copying at other times. 5,467,169, Cl. 355-201.000.

Morimoto, Shohei: *See*—
Nakatani, Fumio; Wakita, Shinichi; Murakami, Hisatoshi; Terada, Tsunehiko; and Morimoto, Shohei, 5,466,893, Cl. 174-261.000.

Morimoto, Takao; and Nakano, Shinji, to Nippon Paint Co., Ltd.; and Daicel Chemical Industries, Ltd. Curable resin composition. 5,466,754, Cl. 525-200.000.

Morimoto, Yuuki: *See*—
Shimomura, Takeshi; Yamada, Kazunori; Morimoto, Yuuki; Kitamura, Naomi; and Miyazawa, Keiji, 5,466,593, Cl. 435-219.000.

Morinaga Milk Industry Co., Ltd.: *See*—
Konig, Wolfgang; Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Takase, Mitsunori; and Bellamy, Wayne R., 5,466,669, Cl. 514-12.000.

Morioka, Kazutoshi: *See*—
Ishiguro, Hajime; Morioka, Kazutoshi; Sakai, Tooru; and Takemura, Yasushi, 5,467,431, Cl. 395-102.000.

Morioka, Satoshi: *See*—
Butsuen, Tetsuro; Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Adachi, Tomohiko; and Morioka, Satoshi, 5,467,283, Cl. 364-461.000.

Morishita, Tadataka: *See*—
Yoshida, Yukihisa; Ito, Wataru; and Morishita, Tadataka, 5,466,665, Cl. 505-476.000.

Morita, Koichi: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Morita, Koichi; Masuko, Michio; Ide, Kinya; and Ueyama, Yoshito, 5,466,661, Cl. 504-253.000.

Morita, Shigeru: *See*—
Samejima, Kazuo; Matsuyama, Mitsuhiro; Morita, Shigeru; and Kure, Masaji, 5,465,561, Cl. 56-11.800.

Moriuchi, Noboru: *See*—
Mizuno, Fumio; Moriuchi, Noboru; Shirai, Seiichiro; Moroishi, Yutaka; Sunakawa, Makoto; and Kawanishi, Michirou, 5,466,325, Cl. 156-344.000.

Moriwaki, Noboru: *See*—
Watanabe, Naotoshi; Masukawa, Tsuyoshi; Ozaki, Kenji; and Moriwaki, Noboru, 5,466,757, Cl. 525-352.000.

Moriwaki, Nobuyuki: *See*—
Hirano, Hiroshige; Sumi, Tatsumi; Moriwaki, Nobuyuki; and Nakane, George, 5,467,302, Cl. 361-145.000.

Moriya, Masami: *See*—
Takahara, Hiroaki; and Moriya, Masami, 5,466,928, Cl. 250-239.000.

Moriyama, Yoshiaki: *See*—
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; Hosaka, Sumio; Ono, Kouichi; and Moriyama, Yoshiaki, 5,466,883, Cl. 84-610.000.

Mornhed, Goran; Young, John; and Thompson, Harvey W., to Trigen Energy Corporation. Method of low-temperature stratified chilled water storage. 5,465,585, Cl. 62-59.000.

Moroishi, Yutaka: *See*—
Mizuno, Fumio; Moriuchi, Noboru; Shirai, Seiichiro; Moroishi, Yutaka; Sunakawa, Makoto; and Kawanishi, Michirou, 5,466,325, Cl. 156-344.000.

Morrill, Brion F.: *See*—
Barron, Daniel R.; Jasulaitis, Vytas; and Morrill, Brion F., 5,466,163, Cl. 439-138.000.

Morrison, Donald; and Abaied, Daniel, to Bausch & Lomb Incorporated. Highly visible markings for contact lenses. 5,467,149, Cl. 351-162.000.

Morrison, Donald A.: *See*—
Lamprecht, Dale E., Jr.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., 5,467,433, Cl. 395-114.000.

Morrison, Paul R.: *See*—
Booth, Frank W.; Thomason, Donald B.; Morrison, Paul R.; and Stancel, George M., 5,466,676, Cl. 514-44.000.

Morser, Michael J.: *See*—
Glaser, Charles B.; Morser, Michael J.; and Light, David R., 5,466,668, Cl. 514-12.000.

Mortimer, Martin T.: *See*—
Malis, Jerry; Rosen, Jonathan J.; Mortimer, Martin T.; and Vasconcellos, Alfred V., 5,465,712, Cl. 128-205.250.

Morton International, Inc.: *See*—
Bybee, Steven D.; and Cummings, A. Kim, 5,467,379, Cl. 378-57.000.
Leonard, Timothy J.; and Anderson, Daniel W., 5,466,000, Cl. 280-728.300.
Parker, Todd S.; Snyder, Brian T.; and Pulmer, Brian H., 5,466,420, Cl. 422-164.000.

Morton, Norman: *See*—
Barley, Geoffrey W.; and Morton, Norman, 5,466,044, Cl. 297-252.000.

Moser, Paul: *See*—
Komarek, Dale W.; and Moser, Paul, 5,466,211, Cl. 493-355.000.

Moser, William R., to Worcester Polytechnic Institute. Process for the preparation of solid state materials and said materials. 5,466,646, Cl. 502-60.000.

Moshchitsky, Semyon: *See*—
Leistner, William E.; and Moshchitsky, Semyon, 5,466,819, Cl. 548-259.000.

Mosler, Michel, to R. B. Management Inc. Fur fabric and method of production. 5,466,497, Cl. 428-15.000.

Mosser, Serge: *See*—
Viertel, Lothar; Welter, Patrick; Lercorvaisier, René; Mosser, Serge; and Pompino, Karl-Heinz, 5,466,405, Cl. 264-45.400.

Motegi, Yasuo: *See*—
Umeda, Yasushi; Motegi, Yasuo; Tomiyama, Tetsuo; Yoshikawa, Hiroyuki; and Shimomura, Yoshiki, 5,467,355, Cl. 364-571.040.

Motley, Gordon W.; Meier, Peter J.; and Miller, Brian C., to Hewlett-Packard Company. Quick resolving latch. 5,467,038, Cl. 327-185.000.

Motomura, Masato, to NEC Corporation. Address generating and decoding apparatus with high operation speed. 5,467,318, Cl. 365-230.060.

Motorola: *See*—
Ackley, Donald E.; Lebby, Michael S.; and Witting, Gary F., 5,466,633, Cl. 437-129.000.
Lebby, Michael S.; Kelly, George R.; and Jachimowicz, Karen E., 5,467,215, Cl. 359-247.000.

Motorola, Inc.: *See*—
Abdi, Behrooz, 5,467,051, Cl. 327-536.000.
Brown, Clem H.; and Vowles, David L., 5,465,626, Cl. 73-715.000.
Burkis, Joseph J.; Cowan, Andrew H.; Lutz, Martin F.; and Crain, Steven L., 5,467,451, Cl. 395-161.000.
Carstens, Robert J.; Gatti, John E.; Shoda, Thomas M.; and Toor, John W., 5,466,172, Cl. 439-509.000.
Chang, Kuo-Tung; and Chang, Ko-Min, 5,467,308, Cl. 365-185.010.
Cutler, Victor H., Jr.; Richetta, Peter; Young, Kenneth P.; and Davieau, Gerald J., 5,467,345, Cl. 370-60.000.
Gay, James G.; and Ledbetter, William B., Jr., 5,467,455, Cl. 395-281.000.
Gu, Wang-Chang A., 5,467,064, Cl. 333-128.000.
Heckman, James K.; Carney, Francis J.; and Geyer, Harry J., 5,467,253, Cl. 361-761.000.
Joardar, Kuntal, 5,467,057, Cl. 330-254.000.
Lee, Whay C.; and Hluchyj, Michael G., 5,467,343, Cl. 370-54.000.
Ligertwood, Peter J., 5,467,141, Cl. 348-555.000.
Nomi, Victor; Pastore, John R.; and Reeves, Twila J., 5,467,252, Cl. 361-760.000.
Pierce, Jennifer A.; Finkelstein, Louis D.; Brown, Daniel P.; and Krebs, Jay R., 5,467,398, Cl. 380-44.000.
Robb, Stephen P., 5,467,047, Cl. 327-377.000.
Romero, Guillermo L., 5,465,481, Cl. 29-840.000.

Schorman, Eric R., 5,467,382, Cl. 379-58.000.
Spraggins, Gary L.; Abresch, Martin J.; Newton, William B.; and Yee, Renwin J., 5,466,484, Cl. 437-228.000.
Swapp, Mavin C., 5,467,024, Cl. 324-771.000.
Wray, Anthony J.; Bastani, Babak; and Gailus, Paul H., 5,467,055, Cl. 330-129.000.
Mott, Richard C.; and Geller, Bernard D., to Comsat Corporation. Flat antenna low-noise block down converter capacitively coupled to feed network. 5,467,094, Cl. 343-700.0MS.
Moucha, William E.: *See*—
Appleton, William J.; Hahn, Dennis; Moucha, William E.; Ruscio, Dominic V.; Shannon, John H.; Silbermann, Steven D.; and Weaver, Edwin W., Jr., 5,466,147, Cl. 425-412.000.
Moulden, Howard N.: *See*—
Adams, Amanda J.; Jackson, Philip S.; Moulden, Howard N.; Roberts, David W.; and Watkin, Keith, 5,466,851, Cl. 558-21.000.
Moulinex (Societe Anonyme): *See*—
Assier, Michel R. M., 5,466,408, Cl. 264-156.000.
Moulthrop, Lawrence C.: *See*—
Leonida, Andrei; Moulthrop, Lawrence C.; and Critz, Kurt M., 5,466,354, Cl. 204-252.000.
Moulton, Roger D.: *See*—
Goliaszewski, Alan E.; Cady, Michael A.; Burgmayer, Paul R.; Anderson, Sydia B.; Carey, William S.; and Moulton, Roger D., 5,466,381, Cl. 210-750.000.
Mount Sinai Hospital Corporation: *See*—
Breitman, Martin L.; Dumont, Daniel; and Gradwohl, Gerard G., 5,466,596, Cl. 435-240.200.
Movaghar, Abdolreza; Rhoads, W. Wistar; and Nguyen, Michael A., to Hewlett-Packard Company. Split bushing mounting of a printer carriage with pre-load. 5,466,077, Cl. 400-354.000.
Moxley, David C.; and Cabaniss, Frank W., to NCR Corporation. High speed bus branches with compact physical spacing. 5,467,456, Cl. 364-490.000.
Moyer, Judith: *See*—
Clark, Jay V.; Bramlett, William L., Jr.; and Moyer, Judith, 5,466,159, Cl. 434-322.000.
MTS Systems Corporation: *See*—
Petersen, Niel R.; Petersen, Paul S.; and Daley, Joseph W., 5,465,615, Cl. 73-118.100.
Mueller, Herbert: *See*—
Deller, Klaus; Moesinger, Hans; Mueller, Herbert; Riedl, Josef; Kuehn, Wenzel; and Spielmannleitner, Rudolf, 5,466,421, Cl. 422-171.000.
Mueller, Michael W.: *See*—
Butterfass, Dieter; Schuhmacher, Hans-Joachim; and Mueller, Michael W., 5,466,411, Cl. 264-176.100.
Mueller, Werner H.: *See*—
Davenport, Kenneth G.; Sheldon, Roger A.; Le Bars, Joel; and Mueller, Werner H., 5,466,869, Cl. 564-265.000.
Muessig, Charles E.: *See*—
Bajaszewski, Alexander; Dodds, David H.; Muessig, Charles E.; and Nagpal, Vijay, 5,465,597, Cl. 72-19.000.
Mui, Paul K.; and Huffman, John W., to Hewlett-Packard Company. Pressure roller for reducing media curl and wave in electrophotographic printers. 5,467,178, Cl. 355-285.000.
Muis, Jan A., to Sara Lee/De N.V. Apparatus for preparing beverages such as coffee, soup, tea or the like. 5,465,649, Cl. 99-280.000.
Mulhauser, Paul: *See*—
Allen, William J.; Stein, Jeffrey A.; DiCesare, Paul; Mulhauser, Paul; and Spranger, Doug, 5,465,896, Cl. 227-176.000.
Mullen, David C.: *See*—
Donaghue, Norman J., Jr.; Hurd, Clinton J.; and Mullen, David C., 5,467,391, Cl. 379-265.000.
Müller, Hanns P.: *See*—
Kalbe, Jochen; Müller, Hanns P.; Koch, Rainhard; Engelhardt, Jürgen; Koch, Wolfgang; Szablikowski, Klaus; and Weber, Gunter, 5,466,794, Cl. 536-66.000.
Müller, Hans-Joachim: *See*—
Marczinke, Bernd L.; and Müller, Hans-Joachim, 5,466,753, Cl. 525-193.000.
Müller, Peter: *See*—
Maier, Roland; Müller, Peter; Woitun, Eberhard; Humaus, Rudolf; Mark, Michael; Eisele, Bernhard; Budzinski, Ralph-Michael; and Hallermayer, Gerhard, 5,466,687, Cl. 514-212.000.
Müller, Walter, to LTS Lohmann Therapie-Systeme GmbH & Co. KG. Therapeutic system for the retarded and controlled transdermal or transmucous administration of active substrates II. 5,466,466, Cl. 424-449.000.
Mundinger, Hans-Juergen: *See*—
Mattern-Klosson, Monika; Mundinger, Hans-Juergen; and Gregor, Ferdinand, 5,465,584, Cl. 62-55.500.
Munk, Joachim, to Thyssen Nordseewerke GmbH. Apparatus for machining bars. 5,465,471, Cl. 29-563.000.
Munsch, John M., to Baxter International Inc. Method for making an elongated plastic member assembly. 5,466,322, Cl. 156-273.300.
Muntner, Michael S.; and Perron, James S., to AlliedSignal Inc. Laser machining of ceramic cores. 5,465,780, Cl. 164-516.000.
Mura, Albert J.: *See*—
Hlasta, Dennis J.; Ackerman, James H.; Mura, Albert J.; and Desai, Ranjit C., 5,466,701, Cl. 514-373.000.
Murahashi, Shun-Ichi; and Oda, Yoshiaki, to Sumitomo Chemical Company, Limited. Process for producing epoxide. 5,466,838, Cl. 549-533.000.
Murai, Tsuyoshi: *See*—
Itoh, Takashi; Saitoh, Hiroyuki; Kinami, Haruyuki; Konaka, Toshinori; and Murai, Tsuyoshi, 5,465,447, Cl. 15-88.300.
Murakami, Azuma; Yamanami, Tsuguya; and Funahashi, Takahiko. Position detector. 5,466,896, Cl. 178-19.000.
Murakami, Eiji: *See*—
Oishi, Katsuyoshi, 5,467,222, Cl. 359-841.000.
Uchida, Katsuyoshi; and Murakami, Eiji, 5,466,031, Cl. 296-146.600.
Murakami, Hiroki: *See*—
Shinozaki, Kengo; Wakabayashi, Kimihiro; Murakami, Hiroki; and Araki, Masaaki, 5,465,892, Cl. 225-2.000.
Murakami, Hisatoshi: *See*—
Nakatani, Fumio; Wakita, Shinichi; Murakami, Hisatoshi; Terada, Tsunehiko; and Morimoto, Shohei, 5,466,893, Cl. 174-261.000.
Murakami, Koji: *See*—
Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sedimoto, Kozo; and Suzuki, Masanori, 5,465,956, Cl. 271-274.000.
Murakami, Tetsuya; Osumi, Masahiro; Nakanishi, Toshisuke; and Watanabe, Shigeaki, to Mazda Motor Corporation. Front body structure of a vehicle and a method for assembling a front body of a vehicle. 5,466,033, Cl. 296-189.000.
Murakami, Yutaka; Nakamura, Toru; Hayashi, Takao; Matsubara, Akira; and Aizawa, Hisashi, to Matsushita Electric Industrial Co., Ltd. Lens drive mechanism for optical disc player with parallel support springs having different spring constants. 5,467,328, Cl. 369-44.160.
Muramatsu, Kimie: *See*—
Ikoma, Munehisa; Muramatsu, Kimie; Matsuda, Hiromu; Akutsu, Norikatsu; and Matsumoto, Isao, 5,466,543, Cl. 429-59.000.
Muramatsu, Shigeru: *See*—
Yamada, Sadayuki; Muramatsu, Shigeru; Hashimoto, Takeshi; and Fukuhara, Hiroyuki, 5,466,136, Cl. 418-55.600.
Muramoto, Hisao: *See*—
Gotomyo, Yasuo; Kore, Haruhisa; Muramoto, Hisao; Nomura, Yoshinbu; Kohno, Shigefumi; and Hirashima, Isao, 5,466,001, Cl. 280-730.100.
Murashima, Nobuharu; Ishibashi, Kenji; Shintani, Dai; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Film winding/rewinding mechanism of camera. 5,467,158, Cl. 354-173.100.
Murata Kikai Kabushiki Kaisha: *See*—
Kawata, Kenji, 5,467,203, Cl. 358-451.000.
Murata Manufacturing Co., Ltd.: *See*—
Sakai, Norio; Saitoh, Tsuyoshi; Nakayama, Yoshikatsu; and Kamada, Akihiko, 5,466,330, Cl. 156-584.000.
Murata Mfg. Co., Ltd.: *See*—
Fujii, Takashi; Fujino, Masaru; Sekijima, Takenori; and Takagi, Hiroshi, 5,466,388, Cl. 252-62.590.
Ogura, Hiromi, 5,466,160, Cl. 439-63.000.
Muro, Kiyofumi; Fujimoto, Tsuyoshi; Yoshida, Yuji; Yamada, Yoshikazu; and Ishizaka, Shoji, to Mitsui Petrochemical Industries, Ltd. Semiconductor laser element and laser device using the same element. 5,467,364, Cl. 372-45.000.
Murphy, Scott; and Shimizu, Tetsuo, to Thomas Jefferson University. Platelet storage method in a medium containing acetate and phosphate. 5,466,573, Cl. 435-2.000.
Murphy, Thomas C., Jr.: *See*—
Lengyel, Szabolcs G.; and Murphy, Thomas C., Jr., 5,466,886, Cl. 174-48.000.
Murray, Gordon A. Pulsed gas discharge Xray laser. 5,467,362, Cl. 372-5.000.
Muscatell, Ralph P. Hydraulic brake pump with eccentric cam and reciprocating piston. 5,465,817, Cl. 188-295.000.
Musgrove, Robert G., to Loral Vought Systems Corporation. Elevating system. 5,465,808, Cl. 182-2.000.
Music City Marketing, Inc.: *See*—
Rowland, Richard K., 5,465,738, Cl. 131-329.000.
My Independence, Inc.: *See*—
Browning, U. Grant, 5,465,744, Cl. 135-67.000.
Mycoen Plant Science, Inc.: *See*—
Slightom, Jerry L.; Tepfer, David A., 5,466,792, Cl. 536-23.700.
Mycogen Plant Science, Inc.: *See*—
Ahlquist, Paul G.; and French, Roy C., 5,466,788, Cl. 536-24.100.
Myerly, Scott: *See*—
Bigler, Michael; Hommann, Edgar; and Myerly, Scott, 5,465,444, Cl. 15-22.100.
Myers, Jonathan M.: *See*—
Imboden, Walter H.; Myers, Jonathan M.; and Caudle, Donald M., 5,465,594, Cl. 66-177.000.
Myers, Robert M.; Haak, Ronald P.; and Phae, Richard W., to Alza Corporation. Iontophoretic drug delivery apparatus. 5,466,217, Cl. 604-20.000.
Myhrvold, Nathan P.: *See*—
Rauch, Adam; Riker, Gregory W.; and Myhrvold, Nathan P., 5,467,264, Cl. 364-141.000.
N.V. Geb Zuid-Holland West: *See*—
Griffioen, Jan H., 5,466,973, Cl. 307-17.000.
N.V. Michel Van de Wiele: *See*—
Gheysen, Nico, 5,465,761, Cl. 139-21.000.
Nabi, Nuran: *See*—
Gaffar, Abdul; Nabi, Nuran; Affilito, John; and Stringer, Orum, 5,466,437, Cl. 424-52.000.
Naef, Peter, to Buehler AG. Method for supplying pre-defined filling quantities of bulk material by exact weight as well as filling apparatus. 5,466,894, Cl. 177-59.000.

Nagahara, Akira: *See*—
Watanuki, Tsuneo; Nakamura, Yasushige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utaka, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, 5,467,176, Cl. 355-270.000.

Nagai, Masahiko: *See*—
Watai, Hiroo; Nishida, Takao; Nagumo, Takaharu; and Nagai, Masahiko, 5,467,292, Cl. 364-578.000.

Nagai, Norimichi: *See*—
Mishima, Akio; Harada, Tosiharu; Tanihara, Mamoru; Ota, Yasutaka; Okinaka, Kenji; Mori, Kohji; Kawasaki, Hirofumi; Nagai, Norimichi; Fujimoto, Katsunori; and Okuda, Yoshiro, 5,466,306, Cl. 148-306.000.

Nagamitsu, Sachio; Sakai, Mayumi; Kodama, Hisashi; and Okada, Tsuneko, to Matsushita Electric Industrial Co., Ltd. Sound environment simulator using a computer simulation and a method of analyzing a sound space. 5,467,401, Cl. 381-63.000.

Nagaoka, Hideo, to NEC Corporation. Circuit for generating data of a letter to be displayed on a screen. 5,467,109, Cl. 345-194.000.

Nagashima, Atsushi, to Fuji Xerox Co., Ltd. Recorded sheet processing unit for image forming apparatus. 5,466,328, Cl. 156-443.000.

Nagata, Sachio: *See*—
Sato, Yukihiro; Sone, Takumi; Nagata, Sachio; Sakata, Tetsuhiro; Demizu, Kei; and Tanaka, Shinichi, 5,466,305, Cl. 148-222.000.

Nagato, Takafumi: *See*—
Takeda, Katsunori; Otsuka, Shinsuke; Takahashi, Yoshiharu; Katsura, Hiroo; Takata, Kazuhiko; Maeda, Shoichi; and Nagato, Takafumi, 5,467,458, Cl. 395-427.000.

Nagori, Vinod: *See*—
Bell, Mace; Nagori, Vinod; and Zinner, Darren E., 5,465,731, Cl. 128-749.000.

Nagpal, Vijay: *See*—
Bajraszewski, Alexander; Dodds, David H.; Muessig, Charles E.; and Nagpal, Vijay, 5,465,597, Cl. 72-19.000.

Nagumo, Takaharu: *See*—
Watai, Hiroo; Nishida, Takao; Nagumo, Takaharu; and Nagai, Masahiko, 5,467,292, Cl. 364-578.000.

Nair, Parameswaran B.; Choudhuri, Kumar S.; Stills, James T.; and Evans, John C., to MicroBilt Corporation. Real time decoding for card transaction terminal. 5,466,920, Cl. 235-449.000.

Naito, Tomihisa, to Nanomizer, Inc. Atomizer. 5,465,913, Cl. 241-39.000.

Naito, Yasuo: *See*—
Wada, Shunichi; Naito, Yasuo; Nishino, Kazuhisa; and Takagi, Masanori, 5,467,279, Cl. 364-424.850.

Naitoh, Kazuo: *See*—
Kusano, Yukihiro; Inagaki, Tomoko; Yoshikawa, Masato; Akiyama, Setsuo; and Naitoh, Kazuo, 5,466,424, Cl. 422-186.050.

Naka, Toshiya: *See*—
Nishio, Kazutaka; Nishimura, Kenji; Naka, Toshiya; and Nakase, Yoshimori, 5,467,438, Cl. 395-131.000.

Nakabayashi, Nobuo: *See*—
Koinuma, Yasumi; Matsumoto, Takeo; Nakada, Nobuharu; Nakabayashi, Nobuo; and Ishihara, Kazuhiko, 5,466,853, Cl. 558-169.000.

Nakada, Nobuharu: *See*—
Koinuma, Yasumi; Matsumoto, Takeo; Nakada, Nobuharu; Nakabayashi, Nobuo; and Ishihara, Kazuhiko, 5,466,853, Cl. 558-169.000.

Nakadera, Kazue: *See*—
Okutani, Haruo; Tagami, Toshio; Kurebayashi, Hideki; and Nakadera, Kazue, 5,466,553, Cl. 430-109.000.

Nakagami, Yasuhiro: *See*—
Nakayama, Yasunori; Yonekawa, Noboru; Matsushita, Kouji; Nakagami, Yasuhiro; and Yuge, Shizuo, 5,466,938, Cl. 250-326.000.

Nakagawa, Hiroshi: *See*—
Nakagawa, Susumu; Hayashi, Nobuhiro; and Nakagawa, Hiroshi, 5,465,827, Cl. 198-465.300.

Nakagawa, Susumu; Hayashi, Nobuhiro; and Nakagawa, Hiroshi, to Daifuku Co., Ltd. Transport arrangement for movable members. 5,465,827, Cl. 198-465.300.

Nakahara, Masaji: *See*—
Yamada, Akihiro; Shimoda, Makoto; Nakahara, Masaji; and Yoshioka, Masahiro, 5,467,265, Cl. 364-154.000.

Nakajima, Hiroyuki; and Satoh, Makoto, to Pioneer Electronic Corporation. Optical disc having information units comprising a plurality of separated pit pieces, and playback apparatus and recording and playback method therefor. 5,467,339, Cl. 369-275.400.

Nakajima, Yasuo: *See*—
Shimamune, Takayuki; and Nakajima, Yasuo, 5,466,347, Cl. 204-98.000.

Nakamura, Charles E.; Di Cosimo, Robert; and Moran, John R., to Du Pont de Nemours, E. I., and Company. Process for the preparation of 3-, 6-substituted 2,5-morpholinediones. 5,466,801, Cl. 544-173.000.

Nakamura, Hiroaki: *See*—
Hironaka, Yoshio; Nakamura, Hiroaki; and Kusumoto, Tadashi, 5,466,392, Cl. 252-301.160.

Nakamura, Katsutoshi: *See*—
Hotta, Yoshio; Hanyu, Yukio; Mihara, Tadashi; Kodera, Yasuto; and Nakamura, Katsutoshi, 5,467,209, Cl. 359-74.000.

Nakamura, Kenichi: *See*—
Kameda, Yasushi; Nakamura, Kenichi; Takamoto, Hiroshi; Harima, Takayuki; and Segawa, Makoto, 5,467,317, Cl. 365-230.060.

Nakamura, Kiyoshi: *See*—
Nakata, Kiyoshi; Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Terunuma, Mutsuhiro; Suzuki, Masato; Tsutsui, Yoshio; Toyota, Eiichi; and Yasuda, Kouji, 5,467,262, Cl. 363-41.000.

Nakamura, Shigeru; Arimoto, Akira; Suzuki, Kenkichi; and Shibata, Katsuhiko, to Hitachi, Ltd. Prism plate for efficiently emitting light flux within a predetermined range, and liquid crystal indicator and indicator illumination method using the same. 5,467,417, Cl. 385-36.000.

Nakamura, Shinya; Yamaguchi, Tsutomu; Dietl, Steven J.; and Stevens, Donald M., to Kabushiki Kaisha Tec; and Xerox Corporation. Ink jet printer with device for aligning an ink cartridge. 5,467,116, Cl. 347-50.000.

Nakamura, Tadashi: *See*—
Kobayashi, Hiroshi; Hibino, Ikuo; Maruyama, Takahito; Hori, Fumihisa; Nakamura, Tadashi; Matsuura, Takanobu; and Ohsakama, Chikashi, 5,466,076, Cl. 400-248.000.

Nakamura, Takaharu: *See*—
Takemoto, Takatoshi; Kawashima, Kazunari; Kadomatsu, Hideyuki; Aoyama, Moriyuki; and Nakamura, Takaharu, 5,465,950, Cl. 271-125.000.

Nakamura, Takao: *See*—
Inada, Hiroshi; Nakamura, Takao; and Iiyama, Michitomo, 5,466,664, Cl. 505-330.000.

Nakamura, Toru: *See*—
Murakami, Yutaka; Nakamura, Toru; Hayashi, Takao; Matsubara, Akira; and Aizawa, Hisashi, 5,467,328, Cl. 369-44.160.

Nakamura, Yasushige: *See*—
Watanuki, Tsuneo; Nakamura, Yasushige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utaka, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, 5,467,176, Cl. 355-270.000.

Nakamura, Yoshinori: *See*—
Egashira, Noritaka; and Nakamura, Yoshinori, 5,466,657, Cl. 503-227.000.

Nakamura, Yoshio: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,466,961, Cl. 257-379.000.

Nakane, George: *See*—
Hirano, Hiroshige; Sumi, Tatsumi; Moriwaki, Nobuyuki; and Nakane, George, 5,467,302, Cl. 361-145.000.

Nakanishi, Toshisuke: *See*—
Murakami, Tetsuya; Osumi, Masahiro; Nakanishi, Toshisuke; and Watanabe, Shigeaki, 5,466,033, Cl. 296-189.000.

Nakano, Akira: *See*—
Koike, Naomasa; Nakano, Akira; Kosaka, Takao; and Sakata, Naoya, 5,466,655, Cl. 503-209.000.

Nakano, Nakaya: *See*—
Tanaka, Takeshi; Minamino, Daiki; Yoshizaki, Akira; and Nakano, Nakaya, 5,466,293, Cl. 118-264.000.

Nakano, Shinji: *See*—
Morimoto, Takao; and Nakano, Shinji, 5,466,754, Cl. 525-206.000.

Nakano, Takeshi: *See*—
Tomioka, Isao; Nakano, Takeshi; Furukawa, Mikio; and Echigo, Yoshiaki, 5,466,732, Cl. 524-113.000.

Nakao, Tohru; Yuji, Ono; Hiroshi, Tanaka; Minoru, Obata; and Yasuto, Morimoto, to Yoshitomi Pharmaceutical Industries, Ltd. Thiophene compound. 5,466,691, Cl. 514-254.000.

Nakase, Yoshimori: *See*—
Nishio, Kazutaka; Nishimura, Kenji; Naka, Toshiya; and Nakase, Yoshimori, 5,467,438, Cl. 395-131.000.

Nakashima, Koichi: *See*—
Ohhashi, Tateo; Nakashima, Koichi; Fukuyo, Hideaki; and Seki, Takakazu, 5,466,355, Cl. 204-298.130.

Nakasugi, Mikio, to Canon Kabushiki Kaisha. Dynamic fluid bearing rotating apparatus. 5,466,070, Cl. 384-112.000.

Nakata, Kiyoshi; Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Terunuma, Mutsuhiro; Suzuki, Masato; Tsutsui, Yoshio; Toyota, Eiichi; and Yasuda, Kouji, to Hitachi, Ltd. Electric power converting apparatus. 5,467,262, Cl. 363-41.000.

Nakatani, Fumio; Wakita, Shinichi; Murakami, Hisatoshi; Terada, Tsunehiko; and Morimoto, Shohei, to Tatsuta Electric Wire & Cable Co., Ltd. Printed circuit board having enhanced EMI suppression. 5,466,893, Cl. 174-261.000.

Nakatsu, Tetsuo; Kang, Kok Lean R.; McAlister, Kelly L.; and Huang, Jiansheng, to Takasago Institute for Interdisciplinary. Tyrosinase inhibitors. 5,466,718, Cl. 514-724.000.

Nakayama, Hideyuki: *See*—
Kaji, Makoto; Odoi, Chie; Sagawa, Masaichi; Kagawa, Hiroyuki; Kakuta, Atsushi; Ishii, Kikujiro; Nakayama, Hideyuki; and Ogawa, Keiichiro, 5,467,421, Cl. 385-122.000.

Nakayama, Jun: *See*—
Ichikawa, Takeshi; Yonehara, Takao; Sakamoto, Masaru; Naruse, Yasuhiro; Nakayama, Jun; Yamagata, Kenji; and Sakaguchi, Kiyofumi, 5,466,631, Cl. 437-62.000.

Nakayama, Yasunori; Yonekawa, Noboru; Matsushita, Kouji; Nakagami, Yasuhiro; and Yuge, Shizuo, to Minolta Co., Ltd. Corona discharge device. 5,466,938, Cl. 250-326.000.

Nakayama, Yoshikatsu: *See*—
Sakai, Norio; Saitoh, Tsuyoshi; Nakayama, Yoshikatsu; and Kamada, Akihiko, 5,466,330, Cl. 156-584.000.

Nakazato, Takashi: *See*—

Terada, Fusao; Nakazato, Takashi; Tadano, Rikio; Tanigawa, Naohide; Hirose, Tatuya; Ikegami, Kazuo; and Fukushima, Kiyoshi, 5,465,579, Cl. 62-6.000.

Nakazima, Makoto: *See*—
Yonezawa, Toshio; Mitsui, Kenrou; Nakazima, Makoto; Kinoshita, Mitsuo; Shimono, Toshihide; and Yamamoto, Tsuneo, 5,466,289, Cl. 106-809.000.

Nalco Chemical Company: *See*—
Goodman, Walter H.; Rao, Narasimba M.; and Johnson, Donald A., 5,466,297, Cl. 134-3.000.
Pearson, Jon E., 5,466,338, Cl. 162-168.200.

Nally, Debora E.: *See*—
Hall, Bryan C.; Wieczorek, David P.; Wyant, Gordon H.; Wildeson, Ramond T.; and Nally, Debora E., 5,465,910, Cl. 239-585.400.

Nammoto, Yuji. Magnetic point identifier. 5,465,500, Cl. 33-666.000.

Nanomizer, Inc.: *See*—
Naito, Tomihisa, 5,465,913, Cl. 241-39.000.

Napier, Kandie K. Fashion frame chain holders. 5,465,466, Cl. 24-3.300.

Narabe, Shin-ichi: *See*—
Goto, Toshio; Hayakawa, Hidenori; Watanabe, Yukiyoshi; Narabu, Shin-ichi; and Yanagi, Akihiko, 5,466,660, Cl. 504-134.000.

Narum, Jeffrey L.: *See*—
Pristad, William E.; Narum, Jeffrey L.; Mattison, Phillip L.; Virnig, Michael J.; and Fast, John, 5,466,426, Cl. 423-98.000.

Naruse, Yasuhiro: *See*—
Ichikawa, Takeshi; Yonehara, Takao; Sakamoto, Masaru; Naruse, Yasuhiro; Nakayama, Jun; Yamagata, Kenji; and Sakaguchi, Kiyofumi, 5,466,631, Cl. 437-62.000.

Nasatka, Ralph G. Vehicle barrier having a pivotal vehicle barricade and a cooperating pivotal signal barrier. 5,466,088, Cl. 404-6.000.

Nash, Mark E.; and Kennedy, Ronald R., to Hewlett-Packard Company. Using recorded data for auto calibration of fixed gain of a read amplifier in a data storage device. 5,467,231, Cl. 360-46.000.

Nasu, Hidetoshi: *See*—
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Nasu, Hidetoshi; and Sato, Kazunobu, 5,465,806, Cl. 180-165.000.

Nasu, Masaki; and Sakuma, Hajime, to NEC Corporation. Multiprocessor computer system having bus control circuitry for transferring data between microcomputers. 5,467,461, Cl. 395-474.000.

Nasu, Osamu: *See*—
Sakai, Katsuhiko; Nasu, Osamu; and Ose, Yoichi, 5,466,929, Cl. 250-251.000.

National Computer Systems, Inc.: *See*—
Clark, Jay V.; Bramlett, William L., Jr.; and Moyer, Judith, 5,466,159, Cl. 434-322.000.

National Feedscrew & Machining Industries, Inc.: *See*—
Imler, Donald C.; and Keller, Dirk A., 5,466,140, Cl. 425-38.000.

National Ink Incorporated: *See*—
Hanke, David E.; Gindelberger, Bruce; and Heiman, Saul, 5,466,281, Cl. 106-20.00R.

National Rural Electric Cooperative Assn.: *See*—
Hunt, Paul C., 5,467,011, Cl. 324-67.000.

National Science Council: *See*—
Chou, Tse-Chuan, 5,466,346, Cl. 204-72.000.
Hu, Chen-Ti; and Chiou, Wen-Chih, 5,466,311, Cl. 148-513.000.

National Semiconductor Corporation: *See*—
Ilderem, Vida; and Leibiger, Steven M., 5,466,960, Cl. 257-369.000.

National Starch and Chemical Investment Holding Corporation: *See*—
Martino, Gary T.; and Tessler, Martin M., 5,466,862, Cl. 560-152.000.

National Steel Car Limited: *See*—
Butcher, Ronald S., 5,465,670, Cl. 105-355.000.

National Super Service Company: *See*—
Fellhauer, Jeffery R.; and Savidge, Michael W., 5,465,456, Cl. 15-320.000.

Naudet, Jacky: *See*—
Charbonnel, Jean-Louis; Guerout, Philippe; Happey, Jacques L.; Mainfroy, Frédéric G. J.; Naudet, Jacky; and Porcher, Jean-Claude, 5,466,122, Cl. 415-160.000.

Navistar International Transportation Corp.: *See*—
Bender, Burnell L.; and Marshall, Brian P., 5,465,589, Cl. 62-133.000.

Nazarian, Hagop: *See*—
Taffe, Norman P.; Douglass, Stephen M.; and Nazarian, Hagop, 5,467,029, Cl. 326-41.000.,

NCR Corporation: *See*—
Moxley, David C.; and Cabaniss, Frank W., 5,467,456, Cl. 364-490.000.
Puckett, Richard D.; Obringer, Thomas J.; and Miller, Thomas C., 5,466,012, Cl. 283-67.000.

Neal, Michael P.: *See*—
DeRoos, Bradley G.; Downing, John P., Jr.; and Neal, Michael P., 5,465,768, Cl. 141-329.000.

Nearing, Charles H., to Activeaid, Inc. Upper body exercise apparatus. 5,466,204, Cl. 482-102.000.

Neas, Edwin D.: *See*—
Harms, Frank H.; and Neas, Edwin D., 5,465,767, Cl. 141-237.000.

NEC Corporation: *See*—
Aeba, Nobuaki, 5,466,956, Cl. 257-203.000.
Baba, Mitsuo; and Aoki, Yasushi, 5,467,041, Cl. 327-276.000.
Fujii, Shigeo; and Kuga, Masayuki, 5,467,348, Cl. 370-60.100.
Fujii, Toshiaki, 5,467,462, Cl. 364-578.000.
Ichihara, Masaki, 5,466,976, Cl. 307-112.000.
Ikeda, Minari, 5,467,054, Cl. 327-589.000.
Kabei, Toshihiro, 5,466,359, Cl. 205-109.000.
Kaede, Kazuhisa; and Takano, Isamu, 5,467,213, Cl. 359-175.000.
Kase, Seiichi, 5,465,850, Cl. 209-573.000.
Kimura, Katsuji, 5,467,046, Cl. 327-351.000.
Kinouchi, Shigenori; and Sawada, Akira, 5,467,088, Cl. 341-65.000.
Koshikawa, Yasuji, 5,467,468, Cl. 371-22.300.
Maruhashi, Kenichi; Onda, Kazuhiko; and Kuzuhara, Masaaki, 5,466,955, Cl. 257-192.000.
Matsui, Shinji, 5,466,548, Cl. 430-1.000.
Matsumoto, Hiroshi, 5,467,270, Cl. 364-403.000.
Motomura, Masato, 5,467,318, Cl. 365-230.060.
Nagaoka, Hideo, 5,467,109, Cl. 345-194.000.
Nasu, Masaki; and Sakuma, Hajime, 5,467,461, Cl. 395-474.000.
Nishikawa, Masao; and Fujii, Nobuyuki, 5,466,481, Cl. 427-130.000.
Norimatsu, Noriko, 5,467,392, Cl. 379-354.000.
Ohi, Susumu; and Shiba, Hiroshi, 5,467,035, Cl. 327-94.000.
Ohi, Susumu, 5,467,043, Cl. 327-333.000.
Ozawa, Masahiro, 5,467,467, Cl. 395-185.080.
Sakao, Masato; and Ohya, Shuichi, 5,466,964, Cl. 257-532.000.
Suzuki, Makoto, 5,467,296, Cl. 364-754.000.
Takamoro, Kenji; Umeda, Koji; and Ono, Takao, 5,467,096, Cl. 343-702.000.
Tsukada, Shyuichi, 5,467,052, Cl. 327-543.000.
Uchida, Katsunori; Kobayashi, Shotaro; and Fukushima, Tatsuhiro, 5,467,304, Cl. 365-174.000.
Umezu, Akira, 5,467,340, Cl. 370-14.000.
Ushirozawa, Mizuyuki, 5,467,219, Cl. 359-341.000.
Yamauchi, Hisashi, 5,467,354, Cl. 371-22.300.

Neelen, Neele: *See*—
Krallmann, Anton; Reiners, Ulrich; Albinus, Eberhard; Böhner, Jürgen; and Neelen, Neele, 5,466,520, Cl. 428-323.000.

Negoro, Atsuhito: *See*—
Okumura, Hiroshi; and Negoro, Atsuhito, 5,466,968, Cl. 257-693.000.

Neidell, Norman S.: *See*—
Fort, J. Robert; Neidell, Norman S.; Morgan, Douglas J.; and Landmeier, Phillip C., 5,465,722, Cl. 128-661.010.

Nelson Metal Products Corporation: *See*—
Shimmell, Dennis S., 5,465,575, Cl. 60-345.000.

Nelson, Richard A.: *See*—
Bixler, Graig; and Nelson, Richard A., 5,466,171, Cl. 439-378.000.

Nelson, Stephen E.; Duxstad, David L.; and Flunker, Galen C., to Cray Research, Inc. Method for adjusting clock skew. 5,467,040, Cl. 327-276.000.

Nelson, Thomas L.: *See*—
Baratto, Eugene L.; David, John R.; Larson, Curtis L.; Nelson, Thomas L.; and Wrobel, Norbert E., 5,465,900, Cl. 229-125.390.

Nemeth, Laszlo T.; Malloy, Thomas P.; and Jones, Richard R., to UOP. Titanosilicate as an epoxidation catalyst for olefins. 5,466,835, Cl. 549-531.000.

Nemirow, Arthur T.; and Harper, James C., to Bruce Industries, Inc. Inverter ballast circuit featuring current regulation over wide lamp load range. 5,466,992, Cl. 315-276.000.

Neumann, Joachim, to Volkswagen AG. Motor vehicle having an engine with a collision energy conversion arrangement. 5,466,006, Cl. 280-784.000.

Neumeyer, Lowell H.: *See*—
Deutsch, Timothy A.; and Neumeyer, Lowell H., 5,466,189, Cl. 460-100.000.

Neusch, Michael: *See*—
Hassler, Joachim; Lenk, Rudi; and Neusch, Michael, 5,466,180, Cl. 445-3.000.

Nevamar Corporation: *See*—
O'Dell, Robin D.; and Lex, Joseph, 5,466,511, Cl. 428-207.000.

New Gulf Measurement Instrument Ltd. Company: *See*—
Chia-ching, Huang, 5,466,366, Cl. 210-85.000.

New Holland North America, Inc.: *See*—
Wagstaff, Robert A.; and McClure, John R., 5,465,658, Cl. 100-5.000.

New Oji Paper Company, Ltd.: *See*—
Okimoto, Tomoyuki; Maki, Kazumi; and Ishida, Katsuhiko, 5,466,656, Cl. 503-217.000.

Newallis, Peter E.: *See*—
Prasad, Vidyanatha A.; and Newallis, Peter E., 5,466,852, Cl. 558-122.000.

Newbould, John M. Anti-abuse circuit. 5,467,245, Cl. 361-170.000.

Newby, Charles D., to Crane Plastics Company Limited Partnership. Metal-polymer composite insulative spacer for glass members and insulative window containing same. 5,466,534, Cl. 428-457.000.

Newsham, Mark D.: *See*—
Bales, Stephen E.; Brennan, David J.; Gulotty, Robert J., Jr.; Inbasekaran, Muthiah N.; Mang, Michael N.; and Newsham, Mark D., 5,466,397, Cl. 252-582.000.

Newton, Edward K., to R.W. Lyall & Company, Inc. Excess flow valve. 5,465,751, Cl. 137-498.000.

Newton, William B.: *See*—
Spraggins, Gary L.; Abreach, Martin J.; Newton, William B.; and Yee, Renwin J., 5,466,484, Cl. 437-228.000.

Ng, Susanna: *See*—
Diez, Ricardo; Pidnebesny, John; and Ng, Susanna, 5,466,393, Cl. 252-307.000.

NGK Insulators, Ltd.: *See*—
Fumio, Abe; Ito, Tadato; and Ogawa, Masato, 5,465,573, Cl. 60-274.000.

Nguyen, Khuong B.: *See*—
Smart, Grover C., Jr.; and Nguyen, Khuong B., 5,466,448, Cl. 424-93.100.
Nguyen, Michael A.: *See*—
Movaghar, Abdolreza; Rhoads, W. Wistar; and Nguyen, Michael A., 5,466,077, Cl. 400-354.000.
Nguyen, Thanh: *See*—
Yumibe, George; Gratzinger, Paul; Nguyen, Thanh; and Wisner, Duane, 5,466,161, Cl. 439-66.000.
Nguyen, Trac: *See*—
Frank, Aaron L.; Ibidunni, Ajibola O.; Johnson, Douglas B.; Krause, Dennis L.; and Nguyen, Trac, 5,466,972, Cl. 257-764.000.
Nguyen, Trung; and Luong, Hung, to LSI Logic Corporation. 3.3 volt CMOS tri-state driver circuit capable of driving common 5 volt line. 5,467,031, Cl. 326-81.000.
Nguyen-Ba, Nghe: *See*—
Belleau, Bernard, deceased; Mansour, Tarek; Tse, Allan; Evans, Colleen A.; Jin, Haohan; Zacharie, Boulos; and Nguyen-Ba, Nghe, 5,466,806, Cl. 544-310.000.
Nickel, Michael: *See*—
Angelsen, Bjorn; and Nickel, Michael, 5,465,723, Cl. 128-661.020.
Nicolas, Christophe: *See*—
Loiseaux, Brigitte; Joubert, Cécile; Huignard, Jean-Pierre; Joffre, Pascal; and Nicolas, Christophe, 5,467,206, Cl. 359-40.000.
Nicoll, Robert A.; and Vdoviak, John W., to General Electric Company. Multi-hole film cooled afterburner cumbustor liner. 5,465,572, Cl. 60-266.000.
Nicopolis, Michael D., to Ford Motor Company. Storage compartment for an automotive vehicle. 5,466,028, Cl. 296-37.700.
Niese, Michael W., to Robbins, Inc. Prefabricated sleeper for anchored and resilient hardwood floor system. 5,465,548, Cl. 52-741.100.
Niessen, Edward: *See*—
Kaul, Bal K.; Sabottke, Craig Y.; Fiato, Rocco A.; and Niessen, Edward, 5,466,364, Cl. 208-307.000.
Nihei, Ryo; Terada, Akihiro; and Sasaki, Yasuo, to Fanuc Ltd. Laser robot with approach time from origin to a starting position minimized. 5,466,909, Cl. 219-121.720.
Nihei, Tomoyuki, to Casio Computer Co., Ltd. Organization chart image print method. 5,467,440, Cl. 395-133.000.
Nihon Bayer Agrochem K.K.: *See*—
Goto, Toshio; Hayakawa, Hidenori; Watanabe, Yukiyoshi; Narabu, Shinichi; and Yanagi, Akihiko, 5,466,660, Cl. 504-134.000.
Niibe, Tadayuki: *See*—
Butsuen, Tetsuro; Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Adachi, Tomohiko; and Morioka, Satoshi, 5,467,283, Cl. 364-461.000.
Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, 5,467,284, Cl. 364-461.000.
Niiranen, Jaakko. Method for changing railway sleepers and equipment for applying the method. 5,465,666, Cl. 104-7.300.
Niitsuma, Tetsuya: *See*—
Itihara, Yoshiyuki; Haneda, Satoshi; Koizumi, Noboru; Hasebe, Takashi; and Niitsuma, Tetsuya, 5,467,422, Cl. 358-298.000.
Nika Health Products, Ltd.: *See*—
Kiczka, Witold, 5,466,449, Cl. 424-94.610.
Nikon Corporation: *See*—
Ezawa, Akira; Daitoku, Koichi; Inoue, Hideya; Kazami, Kazuyuki; and Ohtsuka, Kazuto, 5,467,156, Cl. 354-21.000.
Isogawa, Shuichi; and Miyake, Nobuyuki, 5,467,150, Cl. 351-212.000.
Kohama, Yoshiaki; and Ohmori, Kaoru, 5,466,936, Cl. 250-310.000.
Manabe, Yuji, 5,467,225, Cl. 359-661.000.
Matsubara, Takashi; Kanamuro, Masayuki; and Hasuda, Masanori, 5,467,160, Cl. 354-246.000.
Matsumoto, Hiroyuki, 5,467,337, Cl. 369-116.000.
Shiraishi, Naomasa, 5,467,166, Cl. 355-71.000.
Suzuki, Masahiro, 5,467,129, Cl. 348-231.000.
Takahara, Hiroaki; and Moriya, Masami, 5,466,928, Cl. 250-239.000.
Uchiyama, Shigeyuki, 5,467,163, Cl. 354-402.000.
Ninham, Barry W.; Calka, Andrzej; and Williams, James S., to Australian National University, The. Production of metal and metalloid nitrides. 5,466,310, Cl. 148-513.000.
Ninomiya, Ryozi, to Kabushiki Kaisha Toshiba. Computer able to determine whether or not a display is connected to it, in accordance with the status data stored in a register, and method of detecting whether or not a display is connected to a computer. 5,467,470, Cl. 395-183.030.
Nippon Hoso Kyokai: *See*—
Andoh, Fumihiko; Miyakawa, Kazunori; Yamamoto, Hidekazu; and Yamawaki, Masao, 5,466,613, Cl. 437-3.000.
Nippon Paint Co., Ltd.: *See*—
Morimoto, Takao; and Nakano, Shinji, 5,466,754, Cl. 525-206.000.
Nippon Piston Ring Co., Ltd.: *See*—
Sato, Katsuaki; Tominaga, Katsuhiko; Saka, Tsutomu; Kawamura, Osamu; Takahashi, Teruo; and Kakiuchi, Arata, 5,466,276, Cl. 75-231.000.
Nippon Steel Corporation: *See*—
Yoshida, Yukihisa; Ito, Wataru; and Morishita, Tadataka, 5,466,665, Cl. 505-476.000.
Nippon Telegraph and Telephone Corporation: *See*—
Uchimura, Kuniharu; Saito, Osamu; Amemiya, Yoshihito; and Iwata, Atsushi, 5,467,429, Cl. 395-24.000.
Nippon Thompson Co., Ltd.: *See*—
Agari, Norimasa, 5,466,069, Cl. 384-49.000.
Nippondenso Co., Ltd.: *See*—
Takaba, Katsumi; and Fujisawa, Shuichi, 5,465,613, Cl. 73-117.300.
Takeuchi, Kazuhiro; and Yamanaka, Akira, 5,466,120, Cl. 415-119.000.
Yamaguchi, Hitoshi; Fujino, Seiji; and Hattori, Tadashi, 5,466,303, Cl. 148-33.000.
Nire, Takashi: *See*—
Matsuno, Akira; and Nire, Takashi, 5,466,494, Cl. 427-561.000.
Nishibe, Yasushi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Relay control circuit. 5,467,248, Cl. 361-170.000.
Nishida, Kuniyoshi: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Morita, Koichi; Masuko, Michio; Ide, Kinya; and Ueyama, Yoshito, 5,466,661, Cl. 504-253.000.
Nishida, Takao: *See*—
Watai, Hiroo; Nishida, Takao; Nagumo, Takaharu; and Nagai, Masahiko, 5,467,292, Cl. 364-578.000.
Nishihara, Michiharu: *See*—
Kokawa, Shozo; Nishihara, Michiharu; and Sato, Yukikazu, 5,467,208, Cl. 359-49.000.
Nishikawa, Masao; and Fujii, Nobuyuki, to NEC Corporation. Substrate for magnetic disk. 5,466,481, Cl. 427-130.000.
Nishikawa, Yasuo: *See*—
Shirakura, Yuji; Abe, Hisamasa; Yamashita, Teruo; Shimizu, Tatsuo; Kawahara, Sei; Miyoshi, Takahito; and Nishikawa, Yasuo, 5,466,519, Cl. 428-323.000.
Nishimoto, Koji, to Mitsubishi Denki Kabushiki Kaisha. Fuel injection device for an engine with optimized control of a fuel injection amount after acceleration. 5,465,700, Cl. 123-492.000.
Nishimura, Hiroyuki: *See*—
Furuta, Takashi; Takeda, Hajime; Nishimura, Hiroyuki; Kadono, Tsuyoshi; Ishizaki, Hirofumi; and Uesaka, Akira, 5,467,477, Cl. 455-348.000.
Nishimura, Kenji: *See*—
Nishio, Kazutaka; Nishimura, Kenji; Naka, Toshiya; and Nakase, Yoshimori, 5,467,438, Cl. 395-131.000.
Nishimura, Michael J.: *See*—
Huey, Henry E.; and Nishimura, Michael J., 5,467,349, Cl. 370-60.100.
Nishino, Kazuhisa: *See*—
Wada, Shunichi; Naito, Yasuo; Nishino, Kazuhisa; and Takagi, Masanori, 5,467,279, Cl. 364-424.850.
Nishino, Masakazu: *See*—
Yamane, Yasuhiko; Nishino, Masakazu; Fujiwara, Yuji; and Matuda, Toyohiko, 5,467,135, Cl. 348-415.000.
Nishio, Kazutaka; Nishimura, Kenji; Naka, Toshiya; and Nakase, Yoshimori, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for compensating for color in color images. 5,467,438, Cl. 395-131.000.
Nishio, Naoto: *See*—
Fujie, Naofumi; Fukura, Kenichi; Ito, Koichi; Hirata, Tetsuya; and Nishio, Naoto, 5,466,038, Cl. 296-213.000.
Nishitani, Shuji, to Rohm Co., Ltd. Multi channel ADPCM compression and expansion device. 5,467,372, Cl. 375-244.000.
Nishitani, Yasuhiro: *See*—
Aosaki, Ko; and Nishitani, Yasuhiro, 5,467,198, Cl. 358-400.000.
Nishiwaki, Osamu: *See*—
Eida, Tsuyoshi; Nishiwaki, Osamu; Yamamoto, Takao; and Mafune, Kumiko, 5,466,282, Cl. 106-22.00K.
Nishiyama, Masataka, to Asahi Kogaku Kogyo Kabushiki Kaisha. Imaging device. 5,467,167, Cl. 355-75.000.
Nissan Motor Co., Ltd.: *See*—
Uchida, Katsuyoshi; and Murakami, Eiji, 5,466,031, Cl. 296-146.600.
Uraki, Yoichi; Kubozuka, Takao; Kondo, Masahiko; Miyakubo, Hiroshi; and Usuki, Hisafumi, 5,465,692, Cl. 123-195.00C.
Nissel, Frank R., to Welex Incorporated. Apparatus and method for extruding and cooling a polymeric sheet. 5,466,403, Cl. 264-39.000.
Nissin ShokuhinKabushiki Kaisha: *See*—
Yamasaki, Masahiro; Chiba, Masaru; Yokogoshi, Takashi; Kodama, Kenji; Yamaya, Tatsuo; and Yokoyama, Masakazu, 5,466,475, Cl. 426-439.000.
Nitta, Hideo: *See*—
Jackson, John E.; Nitta, Hideo; Shoichi, Katoh; Amano, Masahiko; Kurisu, Yasushi; and Ohno, Keiichiro, 5,466,208, Cl. 492-53.000.
Nitto Denko Corporation: *See*—
Mizuno, Fumio; Moriuchi, Noboru; Shirai, Seiichiro; Moroishi, Yutaka; Sunakawa, Makoto; and Kawanishi, Michirou, 5,466,325, Cl. 156-344.000.
Niwa, Miki; Kodakari, Nobuaki; Funabiki, Hisato; and Katada, Naonobu, to Niwa, Miki; and Figaro Engineering Inc. Method for producing a silica mask on metal oxide surface. 5,466,483, Cl. 427-226.000.
Nix, Norbert. Device for measuring the thickness of a layer or coating on a ferrous and/or non-ferrous substrate. 5,467,014, Cl. 324-230.000.
NKK Corporation: *See*—
Fujimoto, Kaoru; Shikada, Tsutomu; Yamaoka, Yojiro; and Sumigama, Takashi, 5,466,720, Cl. 518-700.000.
Noah, Craig M.: *See*—
Siegele, Stephen H.; Noah, Craig M.; and Gregg, John N., 5,465,766, Cl. 141-198.000.
Noestheden, Andrew, to Valiant Machine & Tool, Inc. Conveyor system. 5,465,826, Cl. 198-465.300.
NOF Corporation: *See*—

Koinuma, Yasumi; Matsumoto, Takeo; Nakada, Nobuharu; Nakabayashi, Nobuo; and Ishihara, Kazuhiko, 5,466,853, Cl. 558-169.000.

Nogle, Thomas D.; Haven, Willem S.; and Kietlinski, Tomasz K., to Chrysler Corporation. Input compounding torque converter. 5,466,195, Cl. 475-55.000.

Nojima, Takashi: *See*—
Hatano, Akitsugu; Okazaki, Tsuyoshi; Sumida, Yukihiro; Nojima, Takashi; and Yamashita, Hidehiko, 5,467,204, Cl. 358-482.000.

Nokia Technology: *See*—
Geisenberger, Stefan, 5,466,899, Cl. 181-206.000.

Nokia Technology GmbH: *See*—
Hassler, Joachim; Lenk, Rudi; and Neusch, Michael, 5,466,180, Cl. 445-3.000.

Nokubo, Seiji; and Kohno, Teruhisa, to Sumitomo Electric Industries, Ltd. Fluid pressure control device. 5,465,937, Cl. 251-129.150.

Nolan, J. David. Seat lift. 5,465,433, Cl. 4-496.000.

Nomi, Victor; Pastore, John R.; and Reeves, Twila J., to Motorola, Inc. Method for plating using nested plating buses and semiconductor device having the same. 5,467,252, Cl. 361-760.000.

Nomura, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens barrel. 5,467,227, Cl. 359-694.000.

Nomura, Yoshinbu: *See*—
Gotomyo, Yasuo; Kore, Haruhisa; Muramoto, Hisao; Nomura, Yoshinbu; Kohno, Shigefumi; and Hirashima, Isao, 5,466,001, Cl. 280-730.100.

Norand Corporation: *See*—
Pavek, John G., 5,466,170, Cl. 439-374.000.

Norberg, Lars G., to Deere & Company. Arrangement for the retention of an implement to a lifting gear. 5,466,113, Cl. 414-723.000.

Norby, Allen J.; and Prader, Randolph D., to Mobil Oil Corporation. Grocery bag dispensing and loading system. 5,465,845, Cl. 206-554.000.

Nordenbrock, Ronald D.: *See*—
Faulkner, Nathan H.; and Nordenbrock, Ronald D., 5,466,889, Cl. 174-68.200.

Nordica S.p.A.: *See*—
Pellegrini, Alfred, Jr.; Tormena, Andrea; Pozzobon, Alessandro; Zorzi, Claudio; and Edauw, Peter, 5,465,984, Cl. 280-11.200.

Norimatsu, Noriko, to NEC Corporation. Dialing apparatus for displaying stored character with reduced key operations. 5,467,392, Cl. 379-354.000.

Noritake Co., Limited: *See*—
Kamiya, Tadao; Inoue, Motoyuki; and Inada, Hiroshi, 5,466,285, Cl. 106-35.000.

Norsk Hydro a.s.: *See*—
Clausen, Edvin L.; and Happian-Smith, Julian, 5,466,032, Cl. 296-188.000.

North American Philips Corporation: *See*—
Burton, Edward A.; and West, Jeffrey A., 5,467,027, Cl. 326-38.000.

North Carolina State University: *See*—
Mohamed, Mansour H.; and Bilisik, A. Kadir, 5,465,760, Cl. 139-11.000.

North, Denise K.: *See*—
Martin, Robert; Cayley, George R.; Thacker, Jonathan R. M.; Hall, Franklin R.; North, Denise K.; Groome, John M.; and Jeffries, David A., 5,466,458, Cl. 424-405.000.

Northern Telecom Limited: *See*—
Katchmar, Roman, 5,467,251, Cl. 361-719.000.

Norton Company: *See*—
Pujari, Vimal K.; and Rossi, Gulio, 5,466,400, Cl. 264-13.000.

Nosaka, Kenji: *See*—
Kishimoto, Shinji; Harashima, Masa; Kanda, Hiroshi; Sasaki, Akira; Tanabe, Kozi; Nosaka, Kenji; Hanasaka, Satoru; and Ishihara, Ken, 5,465,721, Cl. 128-660.070.

Nove Nordisk A/S: *See*—
Outtrup, Helle; Dambmann, Claus; Christiansen, Margrethe; and Aaslyng, Dorrit A., 5,466,594, Cl. 435-221.000.

Novick, Richard P.: *See*—
Brown-Skrobot, Susan; Novick, Richard P.; and Projan, Steven J., 5,466,685, Cl. 514-199.000.

NTN Corporation: *See*—
Oki, Yoshio; and Shimokusuzono, Takumi, 5,466,737, Cl. 524-495.000.

Nuchols, Richard P.: *See*—
Knodel, Bryan D.; Nuchols, Richard P.; and Williamson, Warren P., IV, 5,465,895, Cl. 227-176.000.

Nukada, Katsumi: *See*—
Burt, Richard A.; Liebermann, George; Hamer, Gordon K.; Gardner, Sandra J.; Jennings, Carol A.; Daimon, Katsumi; and Nukada, Katsumi, 5,466,796, Cl. 540-139.000.

Nusinov, Eugene B.; and Pasco-Anderson, James A., to Codex, Corp. CAM array and method of laying out the same. 5,467,319, Cl. 365-231.000.

Nystrom, Robert W., to Load Controls Incorporated. Power monitoring. 5,467,012, Cl. 324-74.000.

O&K Orenstein & Koppel AG: *See*—
Schoeneweiss, Klaus, 5,465,823, Cl. 198-338.000.

Oak Industries, Inc.: *See*—
Hosking, Jack K.; and Eidemanis, Gunars, 5,465,667, Cl. 104-17.200.

Oates, Ira O. L., to Lerio Corporation, The. Dryer densifier. 5,465,503, Cl. 34-179.000.

Obara, Sanshiro: *See*—
Takamoto, Yuusuke; Masaki, Ryoso; Obara, Sanshiro; and Kaneko, Satoru, 5,467,275, Cl. 364-426.010.

Obermeier, Rainer; Sabel, Walter; Deil, Peter; and Geisen, Karl, to Hoechst Aktiengesellschaft. Amorphous monospheric forms of insulin derivatives. 5,466,666, Cl. 514-3.000.

O'Brien, Patrick: *See*—
Lynch, Brian; and O'Brien, Patrick, 5,466,635, Cl. 437-183.000.

Obringer, Thomas J.: *See*—
Puckett, Richard D.; Obringer, Thomas J.; and Miller, Thomas C., 5,466,012, Cl. 283-67.000.

O'Connor, Timothy J., to FEDCO Automotive Components Company, Inc. Sacrificial erosion bridge for a heat exchanger. 5,465,783, Cl. 165-134.100.

Oda, Shingo: *See*—
Horiguchi, Akira; and Oda, Shingo, 5,466,856, Cl. 558-277.000.

Oda, Yoshiaki: *See*—
Murahashi, Shun-Ichi; and Oda, Yoshiaki, 5,466,838, Cl. 549-533.000.

Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, to Kabushiki Kaisha Toshiba. Video decoder for determining a motion vector from a scaled vector and a difference vector. 5,467,136, Cl. 348-416.000.

Odaka, Yukio, to Canon Kabushiki Kaisha. Camera having a line-of-sight sensor operating in parallel with another photographic processing operation. 5,467,161, Cl. 354-402.000.

O'Dell, Robin D.; and Lex, Joseph, to Nevamar Corporation. Coated transfer sheet and laminate produced therefrom. 5,466,511, Cl. 428-207.000.

Odoi, Chie: *See*—
Kaji, Makoto; Odoi, Chie; Sagawa, Masaichi; Kagawa, Hiroyuki; Kakuta, Atsushi; Ishii, Kikujiro; Nakayama, Hideyuki; and Ogawa, Keiichiro, 5,467,421, Cl. 385-122.000.

Ogata, Kazumi: *See*—
Ohmori, Shinji; Ogata, Kazumi; Tsuruoka, Hideki; and Sakaue, Takahiro, 5,466,673, Cl. 514-18.000.

Ogata, Masahiro: *See*—
Kajimoto, Takeshi; Shimbo, Yutaka; Sato, Katsuyuki; Ogata, Masahiro; Kenmizaki, Kanehide; Kubono, Shouji; Kato, Nobuo; Manita, Kiichi; and Kanamitsu, Michitaro, 5,467,315, Cl. 365-222.000.
Sato, Yuji; Honjo, Toshio; Kayamoto, Kanao; Ogata, Masahiro; and Shimizu, Kouichi, 5,466,552, Cl. 430-106.600.

Ogawa, Kazufumi; Mino, Norihisa; and Soga, Mamoru, to Matsushita Electric Industrial Co., Ltd. Chemically adsorbed monomolecular lamination film. 5,466,486, Cl. 427-352.000.

Ogawa, Kazufumi; Mino, Norihisa; and Soga, Mamoru, to Matsushita Electric Industrial Co., Ltd. Hydrophilic chemically adsorbed film. 5,466,523, Cl. 428-333.000.

Ogawa, Kazufumi: *See*—
Ohtake, Tadashi; Mino, Norihisa; and Ogawa, Kazufumi, 5,466,487, Cl. 427-352.000.

Ogawa, Keiichiro: *See*—
Kaji, Makoto; Odoi, Chie; Sagawa, Masaichi; Kagawa, Hiroyuki; Kakuta, Atsushi; Ishii, Kikujiro; Nakayama, Hideyuki; and Ogawa, Keiichiro, 5,467,421, Cl. 385-122.000.

Ogawa, Masato: *See*—
Fumio, Abe; Ito, Tadato; and Ogawa, Masato, 5,465,573, Cl. 60-274.000.

Ogden, Ralph. Method and apparatus for making instant coffee. 5,465,656, Cl. 99-485.000.

Ogier, Eric: *See*—
Payet-Burin, Jean-Luc; and Ogier, Eric, 5,467,069, Cl. 335-42.000.

Ogihara, Takeo: *See*—
Sakagami, Teruo; Ogihara, Takeo; Fujii, Yasufumi; and Katono, Hiroki, 5,466,755, Cl. 525-326.600.

Ogino, Masanori: *See*—
Iwahara, Yoshiaki; Kuroda, Shoji; Sakamoto, Shuichi; and Ogino, Masanori, 5,467,221, Cl. 359-449.000.

Ogura, Hiromi, to Murata Mfg. Co., Ltd. Surface mount type receptacle of coaxial connector and mounting arrangement for mounting receptacle of coaxial connector on substrate. 5,466,160, Cl. 439-63.000.

Ogura, Keisuke: *See*—
Tanaka, Toshihiro; Kato, Masataka; Kume, Hitoshi; Ogura, Keisuke; and Adachi, Tetsuo, 5,467,309, Cl. 365-185.140.

Ogura, Kiyonori: *See*—
Yoshida, Masanobu; and Ogura, Kiyonori, 5,467,310, Cl. 365-185.070.

Ogura, Seiki: *See*—
Hsieh, Chang-Ming; Hsu, Louis L. C.; and Ogura, Seiki, 5,466,625, Cl. 437-52.000.

Ogura, Yoshinobu: *See*—
Ishihara, Hiroshi; and Ogura, Yoshinobu, 5,466,021, Cl. 292-201.000.

Oh, Heekuck: *See*—
Kothair, Suraj C.; and Oh, Heekuck, 5,467,427, Cl. 395-23.000.

O'Hara, Shunji: *See*—
Ishida, Takashi; O'Hara, Shunji; Ishibashi, Kenzo; and Furutani, Tadashige, 5,467,330, Cl. 369-48.000.

Ohara, Takeshi: *See*—
Wada, Yukio; Yamamoto, Kazunori; Tsukamoto, Osami; Ohara, Takeshi; Miyake, Chie; and Mori, Sadao, 5,465,849, Cl. 209-214.000.

Ohashi, Yukihiro; and Kawamata, Akira, to Kao Corporation. Cholesteryl silicone derivative and cosmetic composition comprising the same. 5,466,442, Cl. 424-70.120.

Ohhashi, Tateo; Nakashima, Koichi; Fukuyo, Hideaki; and Seki, Takakazu, to Japan Energy Corporation. Mosaic target. 5,466,355, Cl. 204-298.130.

Ohi, Susumu; and Shiba, Hiroshi, to NEC Corporation. Sample-and-hold circuit. 5,467,035, Cl. 327-94.000.

Ohi, Susumu, to NEC Corporation. Signal level converting circuit for liquid crystal display device receiving analog color signal. 5,467,043, Cl. 327-333.000.

Ohi, Toshiaki: *See*—
Tosaka, Masaki; Saijo, Hiroyuki; Kawano, Haruki; Hayakawa, Yutaka; and Ohi, Toshiaki, 5,466,395, Cl. 252-551.000.

Ohio State University Research Foundation, The: *See*—
Soloway, Albert H.; Barth, Rolf F.; Anisuzzaman, Abul K.; Tjarks, Werner; Rong, Feng-Guang; and Wyzlic, Iwona M., 5,466,679, Cl. 514-50.000.

Ohishi, Chikashi: *See*—
Furukawa, Koji; and Ohishi, Chikashi, 5,467,111, Cl. 346-134.000.

Ohishi, Yoshinori: *See*—
Tanaka, Yoshihiko; Ohishi, Yoshinori; and Chikaraishi, Tsuneo, 5,466,003, Cl. 280-733.000.

Ohmori, Kaoru: *See*—
Kohama, Yoshiaki; and Ohmori, Kaoru, 5,466,936, Cl. 250-310.000.

Ohmori, Shinji; Ogata, Kazumi; Tsuruoka, Hideki; and Sakaue, Takahiro, to Senju Pharmaceutical Co., Ltd. Method of inhibiting calcium precipitation in an intraocular irrigating solution. 5,466,673, Cl. 514-18.000.

Ohnishi, Ikuo; and Fujisawa, Katsuya, to Kuraray Co., Ltd. Optical low pass filter and imaging device using the same. 5,467,224, Cl. 359-614.000.

Ohno, Akihiro: *See*—
Iwashita, Shigeo; Ohno, Akihiro; and Shirai, Takashi, 5,467,281, Cl. 364-424.050.

Ohno, Keiichiro: *See*—
Jackson, John E.; Nitta, Hideo; Shoichi, Katoh; Amano, Masahiko; Kurisu, Yasushi; and Ohno, Keiichiro, 5,466,208, Cl. 492-53.000.

Ohno, Matsuhiro: *See*—
Mikami, Shigeru; Mori, Masayuki; Yamamoto, Tetsuo; Ohno, Matsuhiro; and Matsumoto, Mineo, 5,467,199, Cl. 358-425.000.

Oho, Shigeru: *See*—
Yoshida, Tatsuya; and Oho, Shigeru, 5,467,272, Cl. 364-424.010.

Ohoshi, Toshio: *See*—
Kiyomiya, Tadashi; Ohoshi, Toshio; and Okita, Masami, 5,466,358, Cl. 205-96.000.

Ohsakama, Chikashi: *See*—
Kobayashi, Hiroshi; Hibino, Ikuo; Maruyama, Takahito; Hori, Fumihisa; Nakamura, Tadashi; Matsuura, Takanobu; and Ohsakama, Chikashi, 5,466,076, Cl. 400-248.000.

Ohsawa, Yutaka; and Hashimoto, Isamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Data communication method between circuits. 5,467,200, Cl. 358-426.000.

Ohta, Shigekata: *See*—
Abe, Makoto; Ohta, Shigekata; Tokitoh, Hiroyuki; Ueda, Morimasa; Kano, Takahumi; and Hidaka, Hiroyuki, 5,467,289, Cl. 364-560.000.

Ohta, Wasaburo: *See*—
Kinoshita, Mikio; and Ohta, Wasaburo, 5,465,475, Cl. 29-603.000.

Ohtake, Tadashi; Mino, Norihisa; and Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Chemically adsorbed film and method of manufacturing the same. 5,466,487, Cl. 427-352.000.

Ohtsuka, Kazuto: *See*—
Ezawa, Akira; Daitoku, Koichi; Inoue, Hideya; Kazami, Kazuyuki; and Ohtsuka, Kazuto, 5,467,156, Cl. 354-21.000.

Ohya, Shuichi: *See*—
Sakao, Masato; and Ohya, Shuichi, 5,466,964, Cl. 257-532.000.

Ohzu, Hayao: *See*—
Kikuchi, Shin; Miyawaki, Mamoru; Monma, Genzo; Ohzu, Hayao; Inoue, Shunsuke; Nakamura, Yoshio; Ichikawa, Takeshi; Ikeda, Osamu; and Kohchi, Tetsunobu, 5,466,961, Cl. 257-379.000.

Oikawa, Isamu; and Maeda, Katsuhiko, to Tokyo Silicone Co., Ltd. Structure, method of preventing adhesion of adhesive substance, and method of preventing adhesion of non-vulcanized rubber. 5,466,510, Cl. 428-172.000.

Oishi, Katsuyoshi, to Murakami, Eiji. Foldable outside rearview mirror. 5,467,222, Cl. 359-841.000.

Okabayashi, Eiji, to Minolta Co., Ltd. Laser drive apparatus. 5,467,363, Cl. 372-38.000.

Okabe, Seiji: *See*—
Kogiku, Fumio; Yukumoto, Masao; and Okabe, Seiji, 5,466,304, Cl. 148-100.000.

Okada, Tsuneko: *See*—
Nagamitsu, Sachio; Sakai, Mayumi; Kodama, Hisashi; and Okada, Tsuneko, 5,467,401, Cl. 381-63.000.

Okamoto, Noriaki: *See*—
Okumura, Keiji; Aoki, Takeshi; Sugishima, Yoshio; Hayama, Satoru; Taguchi, Keiichi; Iwase, Yuichiro; and Okamoto, Noriaki, 5,465,947, Cl. 270-58.000.

Okamoto, Yoshikatsu: *See*—
Tanimoto, Toshinobu; Okamoto, Yoshikatsu; Yoshida, Shinji; and Hironaka, Yasumasa, 5,466,913, Cl. 219-492.000.

Okano, Haruo: *See*—
Sakai, Itsuko; Hayasaka, Nobuo; and Okano, Haruo, 5,466,942, Cl. 250-492.200.

Okayama, Hiroto: *See*—
Tanizawa, Osamu; Okayama, Hiroto; Saji, Fumitaka; Azuma, Chihiro; and Kimura, Tadashi, 5,466,584, Cl. 435-69.100.

Okazaki, Haruki, to Mazda Motor Corporation. Anti-skid brake system with coefficient of friction correction. 5,466,054, Cl. 303-150.000.

Okazaki, Tsuyoshi: *See*—
Hatano, Akitsugu; Okazaki, Tsuyoshi; Sumida, Yukihiro; Nojima, Takashi; and Yamashita, Hidehiko, 5,467,204, Cl. 358-482.000.

Oki, Martin D.: *See*—
Oki, T. Jack; and Oki, Martin D., 5,465,632, Cl. 74-493.000.

Oki, T. Jack; and Oki, Martin D. Steering wheel having a stationary display. 5,465,632, Cl. 74-493.000.

Oki, Yoshio; and Shimokusuzono, Takumi, to NTN Corporation. Polyimide resin composition for sliding members. 5,466,737, Cl. 524-495.000.

Okimoto, Tomoyuki; Maki, Kazumi; and Ishida, Katsuhiko, to New Oji Paper Company, Ltd. Heat sensitive recording material. 5,466,656, Cl. 503-217.000.

Okinaka, Kenji: *See*—
Mishima, Akio; Harada, Tosiharu; Tanihara, Mamoru; Ota, Yasutaka; Okinaka, Kenji; Mori, Kohji; Kawasaki, Hirofumi; Nagai, Norimichi; Fujimoto, Katsunori; and Okuda, Yoshiro, 5,466,306, Cl. 148-306.000.

Okino, Yasushi, to Sharp Kabushiki Kaisha. PROM built-in micro computer. 5,467,267, Cl. 364-184.000.

Okita, Masami: *See*—
Kiyomiya, Tadashi; Ohoshi, Toshio; and Okita, Masami, 5,466,358, Cl. 205-96.000.

Okonogi, Kenji: *See*—
Itoh, Katsumi; Okonogi, Kenji; and Tamura, Norikazu, 5,466,820, Cl. 548-263.200.

Okoshi, Hirofumi: *See*—
Igarashi, Yasuyuki; Ahmad, Mohammad N.; Okoshi, Hirofumi; and Hakomori, Sen-itroh, 5,466,716, Cl. 514-642.000.

Oku, Tadahiro: *See*—
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Nobuo; Mikuchi, Yoshihiro; and Oku, Tadahiro, 5,467,136, Cl. 348-416.000.

Oku, Yutaka: *See*—
Aizawa, Yuichi; and Oku, Yutaka, 5,465,968, Cl. 273-167.00H.

Okuda, Ken-ichi: *See*—
Butsuen, Tetsuro; Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Adachi, Tomohiko; and Morioka, Satoshi, 5,467,283, Cl. 364-461.000.
Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, 5,467,284, Cl. 364-461.000.

Okuda, Yoshiro: *See*—
Mishima, Akio; Harada, Tosiharu; Tanihara, Mamoru; Ota, Yasutaka; Okinaka, Kenji; Mori, Kohji; Kawasaki, Hirofumi; Nagai, Norimichi; Fujimoto, Katsunori; and Okuda, Yoshiro, 5,466,306, Cl. 148-306.000.

Okumura, Hiroshi; and Negoro, Atsuhito, to Rohm Co. Ltd. Leadframe for making semiconductor devices. 5,466,968, Cl. 257-693.000.

Okumura, Keiji; Aoki, Takeshi; Sugishima, Yoshio; Hayama, Satoru; Taguchi, Keiichi; Iwase, Yuichiro; and Okamoto, Noriaki, to Mita Industrial Co., Ltd. Apparatus for discharging sheets from a sorter. 5,465,947, Cl. 270-58.000.

Okuno, Yasutoshi, to Texas Instruments Incorporated. Silicon oxide germanium resonant tunneling. 5,466,949, Cl. 257-25.000.

Okutani, Haruo; Tagami, Toshio; Kurebayashi, Hideki; and Nakadera, Kazue, to Tomoegawa Paper Co., Ltd. Toner for developing electrostatic image. 5,466,553, Cl. 430-109.000.

Okuyama, Yoshiyuki; Kitamura, Tadaaki; Kobayashi, Yoshiki; Yahiro, Masakazu; and Fujiwara, Kazunori, to Hitachi, Ltd. Distributed image recognizing system and traffic flow instrumentation system and crime/disaster preventing system using such image recognizing system. 5,467,402, Cl. 382-104.000.

Oleo International Holdings Limited: *See*—
Page, Ronald C.; Bushnell, John J.; and Stephens, Raymond B., 5,465,944, Cl. 267-217.000.

Olin Corporation: *See*—
Diehl, Steven F., 5,465,665, Cl. 102-470.000.
Galbraith, Lyle D.; Holland, Gary F.; Poole, Donald R.; and Mitchell, Robert M., 5,465,795, Cl. 169-11.000.

Olinger, Jill M.; Sligar, Stephen G.; McLean, Mark A.; Bohn, Paul W.; and Stayton, Patrick, to Biotechnology Research & Development Corporation. Coated substrates employing oriented layers of mutant heme proteins and methods of making and using same. 5,466,589, Cl. 435-174.000.

Olympus Optical Co., Ltd.: *See*—
Kitahara, Toshihiro, 5,466,914, Cl. 235-483.000.
Kuba, Keiichi; and Togino, Takayoshi, 5,467,205, Cl. 359-40.000.
Mihara, Takashi; Yoshimori, Hiroyuki; Watanabe, Hitoshi; McMillan, Larry D.; and De Araujo, Carlos P., 5,466,629, Cl. 437-60.000.
Miyazawa, Azuma; Mizobuchi, Koji; and Suzuki, Takashi, 5,467,426, Cl. 395-3.000.

Omega Engineering, Inc.: *See*—
Hollander, Milton B.; Jacobs, David R.; and Angrave, Janice E., 5,465,838, Cl. 206-305.000.

Omer, Charles A.: *See*—
Sariaslani, Fateme S.; Trower, Michael K.; and Omer, Charles A., 5,466,590, Cl. 435-189.000.

OMS Investments, Inc.: *See*—
Hudson, Alice P.; Woodward, Fred E., deceased; Woodward, by Sam, executor; Timmons, Richard J.; and Goertz, Harvey M., 5,466,274, Cl. 71-28.000.

Onda, Kazuhiko: *See*—
Maruhashi, Kenichi; Onda, Kazuhiko; and Kuzuhara, Masaaki, 5,466,955, Cl. 257-192.000.

One Two One Systems, Inc.: *See*—

Chan, Shiu C., 5,466,058, Cl. 312-111.000.
Ong, Tong-Chern; and Tang, Daniel N., to Intel Corporation. Isolation between diffusion lines in a memory array. 5,466,624, Cl. 437-52.000.
Ono, Kouichi: *See*—
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; Hosaka, Sumio; Ono, Kouichi; and Moriyama, Yoshiaki, 5,466,883, Cl. 84-610.000.
Ono, Takao: *See*—
Takamoro, Kenji; Umeda, Koji; and Ono, Takao, 5,467,096, Cl. 343-702.000.
Onoda, Katsuhiko, to Yazaki Corporation. Shield connector connecting shield cables. 5,466,175, Cl. 439-610.000.
Onodera, Hitoshi: *See*—
Indo, Kenichi; and Onodera, Hitoshi, 5,467,186, Cl. 356-150.000.
Ookubo, Masakazu: *See*—
Sudo, Kiyoshi; and Ookubo, Masakazu, 5,465,754, Cl. 137-614.200.
Opal Technologies Ltd.: *See*—
Litman, Alon; Goldenstein, Alexander; and Rogers, Steven R., 5,466,940, Cl. 250-397.000.
Ophidian Pharmaceuticals, Inc.: *See*—
Kushnaryov, Vladimir M.; Redlich, Philip N.; Grossberg, Sidney E.; and Sedmak, J. James, 5,466,672, Cl. 514-14.000.
Opresca, Florin; and Van Brunt, Roger, to Apple Computer, Inc. Adaptive clock skew and duty cycle compensation for a serial data bus. 5,467,464, Cl. 395-550.000.
Orbital Sciences Corporation: *See*—
Lokshin, Anatole; Burchfield, David E.; and Tracy, David H., 5,465,608, Cl. 73-24.010.
Orcutt, John W.: *See*—
Quick, Roderick L.; and Orcutt, John W., 5,465,899, Cl. 228-180.500.
Origin Medsystems, Inc.: *See*—
Moll, Frederic H.; Gresl, Charles, Jr.; Chin, Albert K.; and Hopper, Philip K., 5,465,711, Cl. 600-207.000.
Orion-Yhtyma Oy: *See*—
Rantanen, Matti, 5,466,561, Cl. 430-347.000.
Ormrod, John C.: *See*—
Singhbansal, Harjinder; and Ormrod, John C., 5,466,662, Cl. 504-202.000.
Ortega, Frank: *See*—
Kowdley, Balasubramanian S.; Lewis, Thomas A.; Tsukida, Robert S.; Saxon, Edward W.; Ortega, Frank; and Debenedetto, Paul, 5,465,497, Cl. 33-626.000.
Orthotic Rehabilitation Products, Inc.: *See*—
Stern, Martin L., 5,466,202, Cl. 482-47.000.
Osada, Nobuya: *See*—
Tanaka, Yoshihiko; Chikaraishi, Tsuneo; and Osada, Nobuya, 5,465,999, Cl. 280-733.000.
OSAGE Footwear, Inc.: *See*—
Schumacher, James H.; and Mills, Donald L., 5,465,507, Cl. 36-30.00R.
Osaka Prefecture: *See*—
Sato, Yukihiro; Sone, Takumi; Nagata, Sachio; Sakata, Tetsuhiro; Demizu, Kei; and Tanaka, Shinichi, 5,466,305, Cl. 148-222.000.
Osborn, Charles; and Medema, Robert M., to Grand Haven Stamped Products Div of JSJ Corporation. Park lock mechanism with means to prevent lockout member from accidentially becoming inoperative. 5,465,818, Cl. 192-4.00A.
Osborne, James C.: *See*—
Rampal, Sushma; Rampal, Jang B.; and Osborne, James C., 5,466,351, Cl. 204-180.100.
Oscoda Plastics, Inc.: *See*—
Burt, John R.; Szabo, Kenneth A.; and Stewart, Ronald L., 5,466,320, Cl. 156-244.190.
Ose, Yoichi: *See*—
Sakai, Katsuhiko; Nasu, Osamu; and Ose, Yoichi, 5,466,929, Cl. 250-251.000.
Oshikiri Machinery Ltd.: *See*—
Suzuki, Minoru; and Iguchi, Yoshikazu, 5,466,143, Cl. 425-140.000.
Oshino, Yasuhiro: *See*—
Kanno, Tatsuya; Hukuda, Yutaka; and Oshino, Yasuhiro, 5,466,774, Cl. 528-199.000.
OSi Specialties, Inc.: *See*—
Childress, Thomas E., 5,466,848, Cl. 556-427.000.
Czech, Anna M., 5,466,529, Cl. 428-395.000.
Guillet, Antoine J. E.; and Gauthier, Remy C. H., 5,466,729, Cl. 523-421.000.
Osram Sylvania Inc.: *See*—
Williamson, Glen P., 5,466,987, Cl. 313-25.000.
Osumi, Masahiro: *See*—
Murakami, Tetsuya; Osumi, Masahiro; Nakanishi, Toshisuke; and Watanabe, Shigeaki, 5,466,033, Cl. 296-189.000.
Ota, Noriyuki: *See*—
Yamamoto, Hiroyuki; Ota, Noriyuki; and Terashita, Toshiyuki, 5,465,695, Cl. 123-256.000.
Ota, Yasutaka: *See*—
Mishima, Akio; Harada, Tosiharu; Tanihara, Mamoru; Ota, Yasutaka; Okinaka, Kenji; Mori, Kohji; Kawasaki, Hirofumi; Nagai, Norimichi; Fujimoto, Katsunori; and Okuda, Yoshiro, 5,466,306, Cl. 148-306.000.
Ota, Yuichi, to Brother Kogyo Kabushiki Kaisha. Printer controller capable of operating with different operation modes based on mode-determinative codes stored in point-table memory. 5,467,432, Cl. 395-112.000.
Otis Elevator Company: *See*—
Skalski, Clement A., 5,467,243, Cl. 361-143.000.
Otsuka, Shinsuke: *See*—
Takeda, Katsunori; Otsuka, Shinsuke; Takahashi, Yoshiharu; Katsura, Hiroo; Takata, Kazuhiko; Maeda, Shoichi; and Nagato, Takafumi, 5,467,458, Cl. 395-427.000.
Ouchi, Yasuhide; Sato, Naoki; Sawaguchi, Hideki; and Hori, Yosuke, to Hitachi, Ltd. Magnetic recording and reproducing method using phase discrimination and apparatus therefor. 5,467,232, Cl. 360-65.000.
Outhwaite, Alan C.: *See*—
Spowage, Mark J.; Grayson, Julia P.; Outhwaite, Alan C.; and Ahmed, Nighat, 5,466,736, Cl. 524-315.000.
Outtrup, Helle; Dambmann, Claus; Christiansen, Margrethe; and Aaslyng, Dorrit A., to Nove Nordisk A/S. Alkaline protease Bacillus sp. JP 395, method of making and detergent compositions. 5,466,594, Cl. 435-221.000.
Overman, John: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.
Owen, Robert A.; and Belcher, James F., to Texas Instruments Incorporated. Dual etching of ceramic materials. 5,466,332, Cl. 156-630.000.
Owens-Brockway Glass Container Inc.: *See*—
Kohler, Timothy A.; and Ringlien, James A., 5,466,927, Cl. 250-223.00B.
Owens-Corning Fiberglas Technology, Inc.: *See*—
Gavin, Patrick M.; Schelhorn, Jean E.; Aschenbeck, David P.; and Strauss, Carl R., 5,466,504, Cl. 428-74.000.
Owens-Illinois Plastic Products Inc.: *See*—
McClean, Craig E., 5,465,864, Cl. 220-403.000.
Owens, Kathleen P. Child care accessory cycling belt. 5,465,888, Cl. 224-224.000.
Owens, Valerie; Shadeck, Louis M.; and Huff, Robert O., to Jacobs Chuck Technology Corporation. Removable nosepieces for chucks and similar tool holders. 5,465,983, Cl. 279-157.000.
Oyanagi, Masamichi: *See*—
Fujimoto, Katsuhiko; Aida, Satoshi; Oyanagi, Masamichi; and Kudo, Nobuki, 5,465,625, Cl. 73-700.000.
Ozaki, Kenji: *See*—
Watanabe, Naotoshi; Masukawa, Tsuyoshi; Ozaki, Kenji; and Moriwaki, Noboru, 5,466,757, Cl. 525-352.000.
Ozaki, Masami; Ikeda, Atsuhiko; Yumita, Takashi; Honami, Reijiro; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihito; and Hirano, Tadayoshi, to Kumiai Chemical Industry Co., Ltd.; and Ihara Chemical Industry Co., Ltd. Triazole derivatives pest controlling agent and pest control method. 5,466,705, Cl. 514-383.000.
Ozawa, Masahiro, to NEC Corporation. High reliability console connecting device. 5,467,467, Cl. 395-185.080.
Ozawa, Masataka: *See*—
Horiuchi, Makoto; Koyama, Kazutaka; Kamitani, Takayuki; and Ozawa, Masataka, 5,466,988, Cl. 313-35.000.
Ozeki, Jiro, to Slidex Corporation. File sheet storing device. 5,466,008, Cl. 281-31.000.
Pacesetter, Inc.: *See*—
Doan, Phong D., 5,466,253, Cl. 607-122.000.
Helland, John R., 5,466,254, Cl. 607-123.000.
Silvian, Sergiu, 5,466,246, Cl. 607-32.000.
Pachmayr Ltd.: *See*—
Cupp, Carl J., 5,465,520, Cl. 42-71.020.
Padgett, Clarence W.: *See*—
Komarek, James A.; Padgett, Clarence W.; Amneus, Robert D.; and Tanner, Scott B., 5,467,300, Cl. 365-104.000.
Page, Jon P.; and Stoddard, Robert B., to Valleylab Inc. Bayonet connector for surgical handpiece. 5,466,020, Cl. 285-361.000.
Page, Ronald C.; Bushnell, John J.; and Stephens, Raymond B., to Oleo International Holdings Limited. Buffer. 5,465,944, Cl. 267-217.000.
Paget, Charles J.: *See*—
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,466,709, Cl. 514-432.000.
Pai, Deepak K.; Lund, Lowell D.; and Maday, Gene A., to Ceridian Corporation. Mark of an electronic component lid. 5,466,540, Cl. 428-614.000.
Paik, Joon-ki: *See*—
Lee, Seong-won; and Paik, Joon-ki, 5,467,439, Cl. 395-133.000.
Paine, Derrick, Jr. Basket for produce. 5,465,901, Cl. 229-407.000.
Palackal, Syriac J.: *See*—
Patsidis, Konstantinos; Peifer, Bernd; Palackal, Syriac J.; Alt, Helmut G.; Welch, M. Bruce; Geerts, Rolf L.; Fahey, Darryl R.; and Deck, Harold R., 5,466,766, Cl. 526-129.000.
Paleari, Mario: *See*—
Forloni, Roberto; and Paleari, Mario, 5,466,498, Cl. 428-36.700.
Pan Electric Corporation: *See*—
Cornell, Paul A.; and Warner, Roy K., 5,466,176, Cl. 439-789.000.
Pan, Tzu-Wang: *See*—
Yamasaki, Richard G.; and Pan, Tzu-Wang, 5,467,370, Cl. 375-232.000.
Panandiker, Rajan K.; Wertz, William C.; and Hughes, Larry J., to Procter & Gamble Company, The. Detergent compositions which provide dye transfer inhibition benefits. 5,466,802, Cl. 544-193.200.
Panicci, Richard L. Safety platform attachment apparatus. 5,465,809, Cl. 182-121.000.

Panoushek, Dale W.; and Milender, Jeffery S., to Case Corporation. Electronic combine harvesting head status display system. 5,465,560, Cl. 56-10.20E.

Panster, Peter: *See*—
Wieland, Stefan; Panster, Peter; and Grethe, Horst, 5,466,767, Cl. 528-9.000.

Paparizos, Christos; Suresh, Dev D.; and Lemanski, Michael F., to Standard Oil Co., The. Process for the preparation of vinyl acetate catalyst. 5,466,652, Cl. 502-330.000.

Papenfuhs, Theodor: *See*—
Schach, Thomas; Papenfuhs, Theodor; and Pfirmann, Ralf, 5,466,859, Cl. 558-425.000.

Papetti, Stephen T., to Papetti's Hygrade Egg Products, Inc. Apparatus of producing extended refrigerated shelf life bakeable liquid egg. 5,465,655, Cl. 99-455.000.

Papetti's Hygrade Egg Products, Inc.: *See*—
Papetti, Stephen T., 5,465,655, Cl. 99-455.000.

Par Systems, Inc.: *See*—
Sturm, Albert J.; and Marrinan, Thomas E., 5,465,854, Cl. 212-319.000.

Paragraph International: *See*—
Guberman, Shelja A.; Lossev, Ilia; and Pashintsev, Alexander V., 5,467,407, Cl. 382-186.000.

Parigot, Philippe: *See*—
Romieu, Jacques; Degouy, Didier; Parigot, Philippe; and Hourcard, Michel, 5,465,609, Cl. 73-38.000.

Park, Chaan-Kyung. Support stand for decorative tree. 5,465,529, Cl. 47-40.500.

Park, Gun C.; Choi, Do Y.; and Cho, Young H., to Samsung Electronics Co., Ltd. Idler controlling apparatus of a magnetic recording/reproducing apparatus. 5,467,234, Cl. 360-85.000.

Park, Hee-chul: *See*—
Jung, Chul-min; Lee, Jeong-hee; Ahn, Kee-sik; and Park, Hee-chul, 5,467,313, Cl. 365-189.110.

Park, Hwa K.; Lee, Suk K.; Park, Pyeong U.; and Kwan, Wie J., to Sunkyong Industries Co., Ltd. Ginkgolide derivatives and a process for preparing them. 5,466,829, Cl. 549-297.000.

Park, Hyunwook: *See*—
Alexander, Thomas; Kim. Yongmin; Park, Hyunwook; Eo, Kil-Su; and Jong, Jing-Ming, 5,467,459, Cl. 395-480.000.

Park, James I. Key ring. 5,465,596, Cl. 70-458.000.

Park, Pyeong U.: *See*—
Park, Hwa K.; Lee, Suk K.; Park, Pyeong U.; and Kwan, Wie J., 5,466,829, Cl. 549-297.000.

Parker, Reed A.: *See*—
Rodal, Eric B.; and Parker, Reed A., 5,467,095, Cl. 343-700.0MS.

Parker, Thomas; and Iannazzi, Peter, to Davidson Textron Inc. Method for forming an outer skin for a cover assembly. 5,466,412, Cl. 264-255.000.

Parker, Tim: *See*—
Bohl, Eric E.; Hale, Brent; and Parker, Tim, 5,465,884, Cl. 224-407.000.

Parker, Todd S.; Snyder, Brian T.; and Fulmer, Brian H., to Morton International, Inc. Air bag inflator. 5,466,420, Cl. 422-164.000.

Parks, Clinton R., to Black Clawson Company, The. Paper pulp washing. 5,466,335, Cl. 162-60.000.

Parks, Thomas R.: *See*—
Lampi, Rauno A.; Bindon, John N.; Bowles, Anthony J. G.; and Parks, Thomas R., 5,465,654, Cl. 99-422.000.

Parries, Paul: *See*—
Cronin, John E.; Kaanta, Carter W.; Kenney, Donald M.; Kerbaugh, Michael L.; Landis, Howard S.; Machesney, Brian J.; Parries, Paul; Previti-Kelly, Rosemary A.; and Rembetski, John F., 5,466,636, Cl. 437-187.000.

Partridge, Mary E.; Blenke, Timothy J.; Everson, Stephen R.; Schroth, Carl G.; and Venturino, Michael B., to Kimberly-Clark Corporation. Forming belt for three-dimensional forming applications. 5,466,409, Cl. 264-165.000.

Pasco-Anderson, James A.: *See*—
Nusinov, Eugene B.; and Pasco-Anderson, James A., 5,467,319, Cl. 365-231.000.

Pashintsev, Alexander V.: *See*—
Guberman, Shelja A.; Lossev, Ilia; and Pashintsev, Alexander V., 5,467,407, Cl. 382-186.000.

Pasquier, Patrice: *See*—
Bied-Charreton, Benoit; Chabry, Pierre; Lecadet, Jacques; and Pasquier, Patrice, 5,467,365, Cl. 373-9.000.

Pastore, John R.: *See*—
Nomi, Victor; Pastore, John R.; and Reeves, Twila J., 5,467,252, Cl. 361-760.000.

Pasztor, Julius, to Eastman Kodak Company. Coating roll drive. 5,465,681, Cl. 118-680.000.

Patel, Harish A., to Kendall Company, The. Wound dressing. 5,465,735, Cl. 128-888.000.

Patel, Piyush G., to Intel Corporation. M&A for minimizing data transfer to main memory from a writeback cache during a cache miss. 5,467,460, Cl. 395-70.000.

Patel, Ravi V.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.

Patla, James A., Sr., to Williams Electronics Games, Inc. Height adjustable pinball game cabinet. 5,465,963, Cl. 273-118.00R.

Patsidis, Konstantinos; Peifer, Bernd; Palackal, Syriac J.; Alt, Helmut G.; Welch, M. Bruce; Geerts, Rolf L.; Fahey, Darryl R.; and Deck, Harold R., to Phillips Petroleum Company. Metallocenes and processes therefor and therewith. 5,466,766, Cl. 526-129.000.

Patuszynski, Duane: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.

Paulick, Melvin: *See*—
West, Lamar E.; Durand, David P.; Paulick, Melvin; and Primiano, Guy A., 5,467,397, Cl. 380-7.000.

Pavek, John G., to Norand Corporation. End-insertion data terminal dock with positive data terminal lock and bounce-preventing contact engagement bias. 5,466,170, Cl. 439-374.000.

Pawliska, Volker: *See*—
Rinnhofer, Johann; Schmidberger, Robert; Pawliska, Volker; and Cappelli, Giorgio, 5,465,943, Cl. 266-220.000.

Pawlowski, John J.: *See*—
Connolly, Christopher J.; Lawrence, Thomas H.; Mankaukas, Joseph J.; Pawlowski, John J.; and Smith, Matthew T., 5,465,925, Cl. 244-137.100.

Pawlowski, Norman E.: *See*—
Evans, Roger F.; Thierheimer, Charles L., Jr.; and Pawlowski, Norman E., 5,467,117, Cl. 347-87.000.

Payet-Burin, Jean-Luc; and Ogier, Eric, to Merlin Gerin. Device for adjusting the tripping threshold of a multipole circuit breaker. 5,467,069, Cl. 335-42.000.

PCR, Inc.: *See*—
Alty, Adam C.; and Sellers, Simon F., 5,466,850, Cl. 556-477.000.

Pearce, David E.; and Wick, Thomas A., to Camco International Inc. Rolling cutter drill bits. 5,465,800, Cl. 175-368.000.

Pearce, Eric J.: *See*—
Evans, Thomas L.; Brunelle, Daniel J.; Bradt, Jean E.; Pearce, Eric J.; and Wilson, Paul R., 5,466,744, Cl. 524-714.000.

Pearson, Jon E., to Nalco Chemical Company. Use of dispersion polymers for coated broke treatment. 5,466,338, Cl. 162-168.200.

Pearson, Mark L.: *See*—
Skinner, David A.; and Pearson, Mark L., 5,466,190, Cl. 460-101.000.

Pedtke, Daniel F., to Detection Systems, Inc. Personal security system with transmitter test mode. 5,467,074, Cl. 340-539.000.

Peferoen, Marnix; Lambert, Bart; and Van Audenhove, Katrien, to Plant Genetic Systems, N.V. *Bacillus thuringiensis* strains and their genes encoding insecticidal toxins. 5,466,597, Cl. 435-252.300.

Peifer, Bernd: *See*—
Patsidis, Konstantinos; Peifer, Bernd; Palackal, Syriac J.; Alt, Helmut G.; Welch, M. Bruce; Geerts, Rolf L.; Fahey, Darryl R.; and Deck, Harold R., 5,466,766, Cl. 526-129.000.

Pellegrini, Alfred, Jr.; Tormena, Andrea; Pozzobon, Alessandro; Zorzi, Claudio; and Edauw, Peter, to Nordica S.p.A. Braking device particularly for skates. 5,465,984, Cl. 280-11.200.

Pellinen, Kari; Koiranen, Jukka; Erkkilä, Kari; Ahola, Juhani; and Vähä, Harritalo, to Valmet Paper Machinery, Inc. Method and device for photoelectric identification of a material web. 5,467,194, Cl. 356-429.000.

Peltonen, Ari; Åström, Bo A. V.; Gandils, Mars V.; Stille, Mats O.; and Lantto, Sven J., to Telefonaktiebolaget LM Ericsson. Method and system for restructuring a call signal frame in a cellular mobile telephone system having directory and routing number. 5,467,381, Cl. 379-58.000.

Penn State Research Foundation, The: *See*—
Castleman, Albert W., Jr.; and Guo, Baochuan, 5,466,430, Cl. 423-440.000.

Penning, Thomas D.: *See*—
Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., 5,466,823, Cl. 548-377.100.

Pensabene, Saverio F.; and Puglisi, Vincent J., to Eveready Battery Company, Inc. Positive nickel electrode for nickel metal hydride cells. 5,466,546, Cl. 429-223.000.

Pentwater Wire Products, Inc.: *See*—
Petter, Jay C., 5,465,812, Cl. 187-237.000.

Percival-Smith, Harry D., to Hydra-Tight Limited. Spacer washer for bolted joint. 5,466,107, Cl. 411-546.000.

Perfetti, Thomas A.; Carespodi, Dennis L.; Saintsing, Barry L.; and Koschak, Matthew S., to R. J. Reynolds Tobacco Company. Cigarette and cigarette filter element therefor. 5,465,739, Cl. 131-335.000.

Perkins Manufacturing Company: *See*—
Redding, John W., 5,466,110, Cl. 414-421.000.

Permelec Electrode, Ltd.: *See*—
Shimamune, Takayuki; and Nakajima, Yasuo, 5,466,347, Cl. 204-98.000.

Perron, James S.: *See*—
Muntner, Michael S.; and Perron, James S., 5,465,780, Cl. 164-516.000.

Pertzsch, Albert: *See*—
Kraetschmer, Reinhard; Pertzsch, Albert; and Schelble, Josef, 5,466,542, Cl. 428-694.0BS.

Peters, Klaus: *See*—
Wilhelmi, Herbert; Steinmetz, Eberhard; and Peters, Klaus, 5,467,366, Cl. 373-85.000.

Peters, Norman K., to AlliedSignal Inc. Electro-hydraulic fluid metering and control device. 5,465,757, Cl. 137-625.650.
Petersen, Lars-Göran, to Telefonaktiebolaget LM Ericsson. Controlled access ATM switch. 5,467,347, Cl. 370-60.100.
Petersen, Niel R.; Petersen, Paul S.; and Daley, Joseph W., to MTS Systems Corporation. Loading assembly for a vehicle spindle test fixture. 5,465,615, Cl. 73-118.100.
Petersen, Paul S.: *See*—
Petersen, Niel R.; Petersen, Paul S.; and Daley, Joseph W., 5,465,615, Cl. 73-118.100.
Peterson, Brian K.; and Jackson, Andrew, to Mobil Oil Corporation. Multi-phase lubricant and apparatus for the dispensing thereof. 5,465,810, Cl. 184-6.210.
Peterson, James R.: *See*—
Cur, Nihat O.; Kuehl, Steven J.; Khanpara, Jatin C.; LeClear, Douglas D.; and Peterson, James R., 5,465,591, Cl. 62-439.000.
Peterson, Kenneth R.: *See*—
Kearney, Michael M.; Kochergin, Vadim; Peterson, Kenneth R.; and Velasquez, Larry, 5,466,294, Cl. 127-42.000.
Peterson, Ronald F.: *See*—
Sutrina, Thomas; Crowe, Lawrence E.; Smith, Edward W.; Peterson, Ronald F.; and Hoppe, Richard J., 5,466,974, Cl. 307-38.000.
Petigara, Ramesh B., to Rohm and Haas Company. 3-isothiazolone biocide process. 5,466,818, Cl. 548-213.000.
Petro, Stephen M.: *See*—
Runamo, Richard J., Jr.; Petro, Stephen M.; and Desmond, John S., 5,465,533, Cl. 52-60.000.
Petroleo Brasileiro S.A.-Petrobras: *See*—
de Almeida, Alcino R., 5,465,747, Cl. 137-155.000.
Petter, Jay C., to Pentwater Wire Products, Inc. Pallet guard. 5,465,812, Cl. 187-237.000.
Pettersson, Bjorn O. A., to TecSyn, Inc. Process for fabrication of sintered metal components. 5,466,414, Cl. 419-11.000.
Pews, R. Garth: *See*—
Wu, Weishi W.; Shankar, Ravi B.; Romer, Duane R.; and Pews, R. Garth, 5,466,707, Cl. 514-411.000.
Peyrot, Christian: *See*—
Mejean, Pascal; and Peyrot, Christian, 5,465,873, Cl. 222-47.000.
Pfahl, Magnus: *See*—
Dawson, Marcia L.; Cameron, James F.; Hobbs, Peter D.; Jong, Ling; Pfahl, Magnus; Zhang, Xiao-kun; and Lehmann, Jürgen M., 5,466,861, Cl. 560-100.000.
Pfefferle, William C. Catalytic method. 5,466,651, Cl. 502-304.000.
Pfeiffer, Hans C.; and Stickel, Werner, to International Business Machines Corporation. Electron beam lithography system. 5,466,904, Cl. 219-121.250.
Pfirmann, Ralf: *See*—
Schach, Thomas; Papenfuhs, Theodor; and Pfirmann, Ralf, 5,466,859, Cl. 558-425.000.
Pfizer Inc.: *See*—
Quallich, George J., 5,466,880, Cl. 568-319.000.
PFU Limited: *See*—
Ishiguro, Hajime; Morioka, Kazutoshi; Sakai, Tooru; and Takemura, Yasushi, 5,467,431, Cl. 395-102.000.
Pham, To V.: *See*—
Loeb, Marvin P.; Shaolian, Samuel M.; Saadatmanesh, Vahid; Giba, Jeffrey J.; and Pham, To V., 5,466,234, Cl. 606-15.000.
Pharmacia AB: *See*—
Dunger, David B.; Savage, Martin O.; and Sönksen, Peter H., 5,466,670, Cl. 514-12.000.
Pharmacia LKB Biotechnology AB: *See*—
Arvidsson, Lars-Erik; Berg, Hans; Engström, Björn; and Hagström, Gunnar, 5,466,368, Cl. 210-198.200.
Philipp, Dieter: *See*—
Flosbach, Carmen; Philipp, Dieter; and Schubert, Walter, 5,466,860, Cl. 560-43.000.
Philips Electronics North America Corporation: *See*—
Fields, Larry R.; Will, Jerald D.; and Rense, Mark S., 5,466,981, Cl. 313-113.000.
Phillips, Michael. Breath collection. 5,465,728, Cl. 128-730.000.
Phillips, Michael J.: *See*—
Dickie, Robert G.; and Phillips, Michael J., 5,465,709, Cl. 600-223.000.
Phillips, Peter V.: *See*—
Adamian, Vahe A.; Falcinelli, Michael T.; and Phillips, Peter V., 5,467,021, Cl. 324-601.000.
Phillips Petroleum Company: *See*—
Patsidis, Konstantinos; Peifer, Bernd; Palackal, Syriac J.; Alt, Helmut G.; Welch, M. Bruce; Geerts, Rolf L.; Fahey, Darryl R.; and Deck, Harold R., 5,466,766, Cl. 526-129.000.
Phillips, Robert B.: *See*—
Beilstein, Kenneth E., Jr.; Bertin, Claude L.; Cronin, John E.; Howell, Wayne J.; Leas, James M.; and Phillips, Robert B., 5,466,634, Cl. 437-180.000.
Phytopharm Ltd.: *See*—
Whittle, Brian A., 5,466,452, Cl. 424-195.100.
Pianta, Orazio; and Koch, Paolo, to Agip Petroli S.p.A. Oil-soluble adducts of disuccinimides and anhydrides of unsaturated bicarboxylic aliphatic acids. 5,466,387, Cl. 252-51.50A.
Piccard Enterprises, Inc.: *See*—
Michael, Joseph, 5,467,072, Cl. 340-436.000.
Pickett, James E.: *See*—
Hoeks, Theodorus L.; Claesen, Christianus A. A.; Lohmeijer, Johannes H. G. M.; and Pickett, James E., 5,466,733, Cl. 524-141.000.
Pidnebesny, John: *See*—
Diez, Ricardo; Pidnebesny, John; and Ng, Susanna, 5,466,393, Cl. 252-307.000.
Pierce, Brett A.: *See*—
Jacobs, Russel J.; Pierce, Brett A.; and Spira, Joel S., 5,467,266, Cl. 364-167.010.
Pierce, Jennifer A.; Finkelstein, Louis D.; Brown, Daniel P.; and Krebs, Jay R., to Motorola, Inc. Method of messaging in a communication system. 5,467,398, Cl. 380-44.000.
Pies, Michael; Fiege, Helmut; Puppe, Lothar; and Käsbauer, Josef, to Bayer Aktiengesellschaft. Process for preparing m-chloroaromatics. 5,466,881, Cl. 570-202.000.
Piljac, Goran; and Piljac, Vinja. Immunological activity of rhamnolipids. 5,466,675, Cl. 514-25.000.
Piljac, Vinja: *See*—
Piljac, Goran; and Piljac, Vinja, 5,466,675, Cl. 514-25.000.
Pillath, Raimund: *See*—
Kießling, Gerhard; Pillath, Raimund; Reuther, Stefan; and Richter, Anja, 5,466,492, Cl. 427-522.000.
Pilot Ink Co., Ltd.: *See*—
Kondo, Masahiro; and Matsubara, Nobuo, 5,466,283, Cl. 106-25.00R.
Pinter, Reinhard: *See*—
Holik, Herbert; Leitenberger, Werner; and Pinter, Reinhard, 5,465,502, Cl. 34-115.000.
Pioneer Electronic Corporation: *See*—
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; Hosaka, Sumio; Ono, Kouichi; and Moriyama, Yoshiaki, 5,466,883, Cl. 84-610.000.
Miyashita, Masahiko; Miyazawa, Tatsuyuki; Fujii, Hiroshi; and Kitano, Yoshihiro, 5,467,326, Cl. 369-30.000.
Nakajima, Hiroyuki; and Satoh, Makoto, 5,467,339, Cl. 369-275.400.
Piroska, Jozsff, to Vattenfall Energisystem AB. Process and apparatus for feeding fragmented material into a container under pressure. 5,466,108, Cl. 414-218.000.
Pitney Bowes Inc.: *See*—
Keung, Wing-Kwong; and Kulpa, Walter J., 5,465,662, Cl. 101-235.000.
Pittard, Gerard T.: *See*—
McDonald, William J.; Pittard, Gerard T.; Steele, Charles G.; Kiefer, Karl F.; Clifton, Terry P.; and Leitko, Curtis E., 5,467,083, Cl. 340-854.600.
Piznik, Sylvia: *See*—
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., 5,466,575, Cl. 435-6.000.
Plant Genetic Systems, N.V.: *See*—
Peferoen, Marnix; Lambert, Bart; and Van Audenhove, Katrien, 5,466,597, Cl. 435-252.300.
Plasterer, Michael R.: *See*—
Hilton, Michael W.; Plasterer, Michael R.; and Browne, Bruce H., 5,467,448, Cl. 395-148.000.
Plessey Semiconductors Limited: *See*—
Albon, Richard; and Williams, David, 5,467,312, Cl. 365-189.010.
Watson, Ian G., 5,467,093, Cl. 342-175.000.
PLIVA and PLIVA Handels GmbH: *See*—
Kovacevic, Mice; Herak, Jure J.; Mandic, Zora; Lukic, Irena; Tomic, Mirjana; and Brkic, Zinka, 5,466,686, Cl. 514-210.000.
Plue, Richard W.: *See*—
Myers, Robert M.; Haak, Ronald P.; and Plue, Richard W., 5,466,217, Cl. 604-20.000.
Pluim, Arthur W., to Minnesota Mining and Manufacturing Company. Double-coated pressure-sensitive adhesive tape incorporating a strong, flexible thread. 5,466,500, Cl. 428-40.000.
Plum, Dale: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.
PMC Specialties Group Inc.: *See*—
Preiser, Marvin F.; and Vogt, Peter F., 5,466,674, Cl. 514-23.000.
Poindexter, Forrest R. Prop for use in dentistry and oral surgery. 5,466,153, Cl. 433-140.000.
Poisson, Roger: *See*—
Lapluye, Gerard; and Poisson, Roger, 5,466,608, Cl. 436-86.000.
Poland, Terrell: *See*—
Ackerman, Marvin; Berluti, Vincent; Poland, Terrell; and Waldron, Steven, 5,467,474, Cl. 395-800.000.
Polaroid Corporation: *See*—
Mailloux, Dennis R., 5,466,324, Cl. 156-344.000.
Polla, Dennis L.: *See*—
Young, Robert M.; Freidhoff, Carl B.; Polla, Dennis L.; and Schiller, Peter J., 5,466,932, Cl. 250-289.000.
Pollock, Rodney E., to James River Paper Company, Inc. Web cleaning method. 5,466,298, Cl. 134-15.000.
Polygon Company: *See*—
Fish, Elson B., 5,465,647, Cl. 92-128.000.
Pomagalski S.A.: *See*—
Tarassoff, Serge; and Toyre, Georges, 5,465,668, Cl. 104-95.000.
Pomeranz, Mark L.: *See*—

Imran, Mir A.; Pomeranz, Mark L.; and Zadno-Azizi, Gholam-Reza, 5,465,717, Cl. 128-642.000.

Pompino, Karl-Heinz: *See*—
Viertel, Lothar; Welter, Patrick; Lercorvaisier, René; Mosser, Serge; and Pompino, Karl-Heinz, 5,466,405, Cl. 264-45.400.

Poole, Donald R.: *See*—
Galbraith, Lyle D.; Holland, Gary F.; Poole, Donald R.; and Mitchell, Robert M., 5,465,795, Cl. 169-11.000.

Poole, Laurance L. Motorcycle engine improvement. 5,465,693, Cl. 123-196.0CP.

Poplawski, Joseph M., Jr.: *See*—
Kumar, Manoj; Lattimore, George M.; and Poplawski, Joseph M., Jr., 5,467,037, Cl. 327-142.000.

Popp, Karl F.: *See*—
Stiefel, Werner K.; and Popp, Karl F., 5,466,446, Cl. 424-78.370.

Porcher, Jean-Claude: *See*—
Charbonnel, Jean-Louis; Guerout, Philippe; Happey, Jacques L.; Mainfroy, Frédéric G. J.; Naudet, Jacky; and Porcher, Jean-Claude, 5,466,122, Cl. 415-160.000.

Porex Surgical, Inc.: *See*—
Rubin, Peter A. D., 5,466,258, Cl. 623-4.000.

Porter Athletic Equipment Company: *See*—
Schroeder, Edward A., 5,465,957, Cl. 273-1.50R.

Portola Packaging, Inc.: *See*—
Crisci, Robert E., 5,465,876, Cl. 222-153.100.

Poss, Michael A., to E. R. Squibb & Sons, Inc. N-substituted imidazole and benzimidazole derivatives useful as angiotenson II antagonists. 5,466,704, Cl. 514-381.000.

Pote, Jonathan: *See*—
Chen, Lung-Hua; Pote, Jonathan; and Fuller, Marty, 5,465,464, Cl. 19-24.000.

Potter, Michael D., to International Business Machines Corporation. Charged rotor pole micromachine motor. 5,466,980, Cl. 310-309.000.

Pötzschke, Manfred: *See*—
Brücken, Volker; Pötzschke, Manfred; Langner, Bernd; and Stelter, Michael, 5,466,352, Cl. 204-182.400.

Poulos, Charles W.; Brenner, George M.; Allen, Loyd V., Jr.; Prabhu, Vilas A.; and Huerta, Pedro L., Jr., to Tulsa Forte Pharmacy Enterprises, Inc. Method for stimulating hair growth with cationic derivative of minoxidil using therapeutic iontophoresis. 5,466,695, Cl. 514-275.000.

Pourjavid, Sussan: *See*—
Kurzynski, David W.; and Pourjavid, Sussan, 5,465,720, Cl. 128-660.010.

Powdertech Co., Ltd.: *See*—
Sato, Yuji; Honjo, Toshio; Kayamoto, Kanao; Ogata, Masahiro; and Shimizu, Kouichi, 5,466,552, Cl. 430-106.600.

Powell, Ken R.: *See*—
DeWoolfson, Bruce H.; Powell, Ken R.; and Schumacher, Warner, 5,465,822, Cl. 194-209.000.

Powers, John, Jr. Prefabricated lintel. 5,465,538, Cl. 52-204.200.

POWSUS, Inc.: *See*—
Stewart, Harry E.; and MacElwee, Donald B., 5,466,386, Cl. 252-2.000.

Poyet, Georges; Badier, Frédéric; and Guillot, Dominique, to Dowell Schlumberger Incorporated. Device for continuously mixing liquid additives into a fluid. 5,466,063, Cl. 366-6.000.

Pozzi, Giuseppe; and Sanvito, Roberto, to Rimoldi Necchi, S.R.L. Overedge sewing machine including an upper looper with a hooked member. 5,465,675, Cl. 112-162.000.

Pozzobon, Alessandro: *See*—
Pellegrini, Alfred, Jr.; Tormena, Andrea; Pozzobon, Alessandro; Zorzi, Claudio; and Edauw, Peter, 5,465,984, Cl. 280-11.200.

PPG Industries, Inc.: *See*—
Girgis, Mikhail M., 5,466,528, Cl. 428-391.000.

Prabhu, Vilas A.: *See*—
Poulos, Charles W.; Brenner, George M.; Allen, Loyd V., Jr.; Prabhu, Vilas A.; and Huerta, Pedro L., Jr., 5,466,695, Cl. 514-275.000.

Prader, Randolph D.: *See*—
Norby, Allen J.; and Prader, Randolph D., 5,465,845, Cl. 206-554.000.

Prasad, Vidyanatha A.; and Newallis, Peter E., to Bayer Corporation. Process for the production of S,S,S-tributylphosphorotrithioate. 5,466,852, Cl. 558-122.000.

Pratt, Michael J.: *See*—
Wade, John R.; Pratt, Michael J.; and Ren, Jianrong, 5,466,789, Cl. 534-560.000.

Praxair S.T. Technology, Inc.: *See*—
Jackson, John E.; Nitta, Hideo; Shoichi, Katoh; Amano, Masahiko; Kurisu, Yasushi; and Ohno, Keiichiro, 5,466,208, Cl. 492-53.000.
Vuitton, Jacques M., 5,466,907, Cl. 219-121.590.

Preiser, Marvin F.; and Vogt, Peter F., to PMC Specialties Group Inc. Bird aversion compounds. 5,466,674, Cl. 514-23.000.

Presby, Herman M., to AT&T Corp. Method for making polarization independent silica optical circuits. 5,467,415, Cl. 385-14.000.

Preston, Mark A.: *See*—
Kliman, Gerald B.; Preston, Mark A.; and Jones, Donald W., 5,466,978, Cl. 310-156.000.

Preston, Vincent L.: *See*—
Krajec, Russell S.; and Preston, Vincent L., 5,465,476, Cl. 29-759.000.

Previti-Kelly, Rosemary A.: *See*—
Cronin, John E.; Kaanta, Carter W.; Kenney, Donald M.; Kerbaugh, Michael L.; Landis, Howard S.; Machesney, Brian J.; Parries, Paul; Previti-Kelly, Rosemary A.; and Rembetzki, John F., 5,466,636, Cl. 437-187.000.

Prevost, Isabelle; and Rojey, Alexandre, to Institut Francais du Petrole. Device and process for carrying out phase separation by filtration and centrifugation. 5,466,384, Cl. 210-787.000.

Price, Steven; Jepson, Raymond; Worley, Barry J.; Wood, Steven P.; and Keogh, Andrew J., to International Business Machines Corporation. Conversion of ISDN LAPB and ISDN LAPD frames. 5,467,350, Cl. 370-467.000.

Primiano, Guy A.: *See*—
West, Lamar E.; Durand, David P.; Paulick, Melvin; and Primiano, Guy A., 5,467,397, Cl. 380-7.000.

Pringle, Ronald E., to Camco International Inc. Spoolable flexible hydraulic controlled annular control valve. 5,465,793, Cl. 166-319.000.

Procter & Gamble Co., The: *See*—
de Buzzaccarini, Francesco; Farwick, Timothy J.; and Zhen, Yueqian, 5,466,394, Cl. 252-547.000.

Procter & Gamble Company, The: *See*—
Finkel, Gilbert; and Moore, Katherine L., 5,466,476, Cl. 426-556.000.
Girardot, Richard M.; Grosgogeat, Eric J.; Yeazell, Charles G.; and Bausch, Richard G., 5,465,452, Cl. 15-210.100.
Miller, Larry E.; Hawkins, Gene P.; and Durham, Bernard G., 5,466,870, Cl. 564-298.000.
Panandiker, Rajan K.; Wertz, William C.; and Hughes, Larry J., 5,466,802, Cl. 544-193.200.

Projan, Steven J.: *See*—
Brown-Skrobot, Susan; Novick, Richard P.; and Projan, Steven J., 5,466,685, Cl. 514-199.000.

Prolux Corporation: *See*—
Forkner, John F.; Rykowski, Ronald F.; and Wilson, Stephen S., 5,467,207, Cl. 359-40.000.

Pronk, Franciscus A.; Bril, Thijs W.; Knapen, Peter S. A.; Van Heeren, Arie H.; and Rhijnsburger, Laurens J., to U.S. Philips Corporation. Method of manufacturing a magnetic head. 5,466,495, Cl. 427-576.000.

Protex International Corporation: *See*—
Rand, Richard H., 5,467,075, Cl. 340-568.000.

Psychemedics Corporation: *See*—
Baumgartner, Werner A., 5,466,579, Cl. 435-7.100.

Puckett, Richard D.; Obringer, Thomas J.; and Miller, Thomas C., to NCR Corporation. Facsimile security system. 5,466,012, Cl. 283-67.000.

Puglisi, Vincent J.: *See*—
Pensabene, Saverio F.; and Puglisi, Vincent J., 5,466,546, Cl. 429-223.000.

Pujari, Vimal K.; and Rossi, Gulio, to Norton Company. Process for drip casting silicon nitride slurries. 5,466,400, Cl. 264-13.000.

Pulido, Arnulfo S. Flying insect vacuum device. 5,465,457, Cl. 15-402.000.

Puno, Rolando M.: *See*—
Byrd, J. Abbott, III; Puno, Rolando M.; and Mellinger, Philip, 5,466,237, Cl. 606-61.000.

Puppe, Lothar: *See*—
Pies, Michael; Fiege, Helmut; Puppe, Lothar; and Käsbauer, Josef, 5,466,881, Cl. 570-202.000.

Purdham, Robert: *See*—
Forage, Alan J.; and Purdham, Robert, 5,466,473, Cl. 426-115.000.

Puritan Bennett Corporation: *See*—
Shaffer, Robert W.; Adriance, Kyle; and Kimbro. Charles D., 5,466,134, Cl. 418-15.000.

Putnins, Zigmunds A.: *See*—
Solomon, David; Putnins, Zigmunds A.; Gish, David W.; and Mendelson, Jeffrey B., 5,467,344, Cl. 370-58.300.

Puttagunta, N. Rao: *See*—
Gibby, Wendell A.; and Puttagunta, N. Rao, 5,466,439, Cl. 424-9.365.

Pyle, Michael W.; and Wallis, Lee D., to Square D Company. Metering unit with downloadable firmware. 5,467,286, Cl. 364-483.000.

Pypkin, Boris: *See*—
Dorfman, Veniamin; and Pypkin, Boris, 5,466,431, Cl. 423-446.000.

Quallich, George J., to Pfizer Inc. Process for preparing ketone enantiomer. 5,466,880, Cl. 568-319.000.

Quantum Chemical Corporation: *See*—
Winslow, Linda N., 5,466,648, Cl. 502-117.000.

Quantum Corporation: *See*—
Lee, Neville K.; and Katao, Hisashi, 5,467,238, Cl. 360-128.000.

Quaratella, Scott J.: *See*—
Cercone, Ronald J.; Quaratella, Scott J.; and Gertzman, Arthur A., 5,466,231, Cl. 604-369.000.

Quarmby, Neil A.; and Eddowes, David W., to Texas Instruments Incorporated. Voltage regulator control circuit. 5,467,010, Cl. 323-284.000.

Queneau, Paul E.; and Hirsch, Martin, to Metallgesellschaft Aktiengesellschaft. Process for the manufacture of steel. 5,466,278, Cl. 75-501.000.

Quesant Instrument Corporation: *See*—
Ray, David J.; and Harp, Robert S., 5,466,935, Cl. 250-307.000.

Quick, Roderick L.; and Orcutt, John W., to Texas Instruments Incorporated. Method and apparatus for fine pitch wire bonding using a shaved capillary. 5,465,899, Cl. 228-180.500.

Quinlan, Sandra L.: *See*—
Chen, Bang-Chi; and Quinlan, Sandra L., 5,466,787, Cl. 536-55.300.

Quinn, Richard J.: *See*—
Fiori, Denise E.; and Quinn, Richard J., 5,466,745, Cl. 524-801.000.

Quintana, Jason, to Hewlett-Packard Company. Apparatus for detecting media leading edge and method for substantially eliminating pick skew in a media handling subsystem. 5,466,079, Cl. 400-579.000.

Quirante, Carmelo G.: *See*—
Barlow, Wayne K.; and Quirante, Carmelo G., 5,466,371, Cl. 210-361.000.

R. B. Management Inc.: *See*—
Mosler, Michel, 5,466,497, Cl. 428-15.000.

R. J. Reynolds Tobacco Company: *See*—
Perfetti, Thomas A.; Carespodi, Dennis L.; Saintsing, Barry L.; and Koschak, Matthew S., 5,465,739, Cl. 131-335.000.

R. R. Donnelley & Sons Company: *See*—
White, Jason K., 5,465,661, Cl. 101-219.000.

R.W. Lyall & Company, Inc.: *See*—
Newton, Edward K., 5,465,751, Cl. 137-498.000.

Ra, Jong O.; Lim, Joon Y.; and Yoo, Wan M., to Hae Sung Engineering Co., Ltd. Stepless automatic variable transmission. 5,466,196, Cl. 475-59.000.

Rabe, Jeffrey: *See*—
Young, Bruce; Carson, Dave; Rasmussen, Norman; Fischer, Stephen; and Rabe, Jeffrey, 5,467,295, Cl. 395-200.050.

Rabin, Al: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.

Rachenne, Sylvie: *See*—
Davene, Jean; Rachenne, Sylvie; and Douvry, Jean-Jacques, 5,466,309, Cl. 148-508.000.

Rada Electronic Industries, Ltd.: *See*—
Vax, Hanan, 5,467,274, Cl. 364-424.060.

Radius Inc.: *See*—
Barrett, Peter T., 5,467,413, Cl. 382-236.000.

Raidl, Georg: *See*—
Wells, William; Raidl, Georg; and Schmelzer, Walter, 5,465,942, Cl. 266-46.000.

Rajnik, Lawrence S.: *See*—
Brundage, Kevin R.; and Rajnik, Lawrence S., 5,466,415, Cl. 419-67.000.

Ram, Mohan R. A.: *See*—
Baker, Charles K.; Ram, Mohan R. A.; and Willinghoff, Stephen T., 5,466,350, Cl. 204-153.140.

Ramachandran, Ramakrishnan; and Dao, Loc H., to BOC Group, Inc., The. Process for the production of hydrocarbon partial oxidation products. 5,466,837, Cl. 549-533.000.

Ramirez, Angel L. P. Device for teaching volleyball hitting techniques. 5,466,156, Cl. 434-247.000.

Rampal, Jang B.: *See*—
Rampal, Sushma; Rampal, Jang B.; and Osborne, James C., 5,466,351, Cl. 204-180.100.

Rampal, Sushma; Rampal, Jang B.; and Osborne, James C., to Beckman Instruments, Inc. Capillary electrophoretic system for separation of samples containing both positively and negatively charged components. 5,466,351, Cl. 204-180.100.

Ramsay, Guy: *See*—
Warrington, Roger P.; Ramsay, Guy; and Bird, Neal R., 5,466,693, Cl. 514-269.000.

Rand, Richard H., to Protex International Corporation. Anti-theft alarm for air powered hand tools. 5,467,075, Cl. 340-568.000.

Ranir/DCP Corporation: *See*—
Lewkowicz, Martin, 5,465,449, Cl. 15-106.000.

Rankel, Lillian A.: *See*—
Audeh, Costandi A.; and Rankel, Lillian A., 5,466,363, Cl. 208-251.00H.

Rapak Corp.: *See*—
Santoiemmo, Carl V., 5,465,530, Cl. 47-84.000.

Rantanen, Matti, to Orion-Yhtyma Oy. Image plate for dental X-ray photography and a method of taking it out of its shield. 5,466,561, Cl. 430-347.000.

Rao, Narasimba M.: *See*—
Goodman, Walter H.; Rao, Narasimba M.; and Johnson, Donald A., 5,466,297, Cl. 134-3.000.

Rapp, Jeffrey C.: *See*—
Wilson, Joseph H.; Mennel, David B.; and Rapp, Jeffrey C., 5,465,841, Cl. 206-366.000.

Rasmussen, Norman: *See*—
Young, Bruce; Carson, Dave; Rasmussen, Norman; Fischer, Stephen; and Rabe, Jeffrey, 5,467,295, Cl. 395-200.050.

Rasmusson, Jim A. J., to Ericsson Inc. Method and apparatus for volume and intelligibility control for a loudspeaker. 5,467,393, Cl. 379-388.000.

Rastrelli, Edmund C.: *See*—
Adams, Jonathan P.; Rastrelli, Edmund C.; and Heaton, John C., 5,466,144, Cl. 425-174.400.

Raterman, Donald E.; Graves, Bradford T.; Stromme, Lars R.; and Bauch, Aaron M., to Cummins-Allison Corporation. Method and apparatus for currency discrimination and counting. 5,467,405, Cl. 382-135.000.

Rattinger, Gail B.: *See*—
Madison, Stephen A.; Massaro, Michael; Rattinger, Gail B.; and Wenzel, Christine, 5,466,396, Cl. 252-557.000.

Rauber, Walter; and Tobler, Markus, to Schweizerische Eidgenossenschaft Vertreten Durch Die Eidg. Munitionsfabrik Thun der Grupper fur Rustungsdienste. Smoke charge and method for its preparation. 5,466,314, Cl. 149-46.000.

Rauch, Adam; Riker, Gregory W.; and Myhrvold, Nathan P., to Microsoft. Method and system for selectively interdependent control of devices. 5,467,264, Cl. 364-141.000.

Ravan, James A., Jr.: *See*—
Fasciano, Peter J.; Rawley, Curt A.; Hegg, Thomas R.; Leathurby, Mackenzie; Bedell, Jeffrey L.; and Ravan, James A., Jr., 5,467,288, Cl. 364-514.00R.

Rawley, Curt A.: *See*—
Fasciano, Peter J.; Rawley, Curt A.; Hegg, Thomas R.; Leathurby, Mackenzie; Bedell, Jeffrey L.; and Ravan, James A., Jr., 5,467,288, Cl. 364-514.00R.

Rawlings, Donald S.: *See*—
Boddy, Ian; and Rawlings, Donald S., 5,467,230, Cl. 359-874.000.

Ray, David J.; and Harp, Robert S., to Quesant Instrument Corporation. Programmable, scanned-probe microscope system and method. 5,466,935, Cl. 250-307.000.

Ray, Lawrence A.; Ellson, Richard N.; and Gandhi, Bhavan R., to Eastman Kodak Company. Method and apparatus for image compression, storage, and retrieval on magnetic transaction cards. 5,466,918, Cl. 235-380.000.

Ray, William F., to Switched Reluctance Drives Limited. Sensorless rotor position measurement in electric machines. 5,467,025, Cl. 324-772.000.

Rayudu, S. Rao; Fenyes, Joseph G.; and McNeel, Thomas E., to Buckman Laboratories Int'l, Inc. Halogenated 4'-methoxyacetophenones as microbicides and preservatives. 5,466,717, Cl. 514-689.000.

RCA Thomson Licensing Corporation: *See*—
Zdepski, Joel W., 5,467,137, Cl. 348-423.000.

Read-Rite Corporation: *See*—
Tucker, Larry E., 5,465,477, Cl. 29-603.000.

Reath, Robert Z.: *See*—
Ehrsam, Robert F.; and Reath, Robert Z., 5,466,360, Cl. 205-170.000.

Rebane, George '., to Resrev Partners. Method and apparatus for disclosing a target pattern for identification. 5,465,982, Cl. 273-433.000.

Reboul-SMT: *See*—
Mejean, Pascal; and Peyrot, Christian, 5,465,873, Cl. 222-47.000.

Redd, James C., Jr.; McConnell, Von; and Brohan, Liam P., to Bell Atlantic Network Services, Inc. Method and apparatus for selectively blocking incoming telephone calls. 5,467,388, Cl. 379-196.000.

Redding, John W., to Perkins Manufacturing Company. Lifting device. 5,466,110, Cl. 414-421.000.

Redecker, Klaus: *See*—
Brede, Uwe; Hagel, Rainer; and Redecker, Klaus, 5,466,313, Cl. 149-1.000.

Redlich, Philip N.: *See*—
Kushnaryov, Vladimir M.; Redlich, Philip N.; Grossberg, Sidney E.; and Sedmak, J. James, 5,466,672, Cl. 514-14.000.

Reedrill, Inc.: *See*—
Edlund, Hans E.; and Haines, Marvin L., 5,465,798, Cl. 175-24.000.

Reese Products, Inc.: *See*—
Kass, John J.; Hoopes, Philip K.; Sously, Wayne E.; and Aspinall, Graeme H., 5,465,991, Cl. 280-457.000.

Reeves, Twila J.: *See*—
Nomi, Victor; Pastore, John R.; and Reeves, Twila J., 5,467,252, Cl. 361-760.000.

Regtop, Hubertus L.; and Biffin, John R., to Biochemical Veterinary Research Pty. Ltd. Divalent metal complexes of indomethacin, compositions and medical methods of use thereof. 5,466,824, Cl. 548-402.000.

Rehrig Pacific Company: *See*—
Koefelda, Gerald R., 5,465,843, Cl. 206-507.000.

Reichelt, Helmut: *See*—
Gruettner-Merten, Sabine; Reichelt, Helmut; Lange, Arno; and Degen, Helmut, 5,466,790, Cl. 534-753.000.

Reiling, Vincent G.; Rinker, Jeffrey E.; McDonel, Timothy R.; and Sarna, Joseph C., to Standard Oil Company, The. Process for reduction of waste material during manufacture of acrylonitrile. 5,466,857, Cl. 558-319.000.

Reilly, Karen: *See*—
Abels, Robert I.; and Reilly, Karen, 5,466,447, Cl. 424-85.200.

Reiner, Thomas C.: *See*—
Schossow, Stephen R.; and Reiner, Thomas C., 5,467,396, Cl. 380-4.000.

Reiners, Ulrich: *See*—
Krallmann, Anton; Reiners, Ulrich; Albinus, Eberhard; Böhner, Jürgen; and Neelen, Neele, 5,466,520, Cl. 428-323.000.

Reinhold, Herbert E., Jr., to Brunswick Biomedical Corporation. Twelve-lead portable heart monitor. 5,465,727, Cl. 128-710.000.

Reischman, P. T.: *See*—
Heck, Roland H.; Heinemann, Heinz; Reischman, P. T.; Venuto, Paul B.; and Whitehurst, D. Duayne, 5,466,361, Cl. 208-131.000.

Reisdorf, Alfred. Bird feeder and method of making. 5,465,683, Cl. 119-52.200.

Reithofer, Jürgen: *See*—
Rodi, Anton; and Reithofer, Jürgen, 5,467,436, Cl. 395-114.000.

Reliance Medical Products, Inc.: *See*—
Brooks, David M., 5,467,002, Cl. 318-553.000.

Rembetski, John F.: *See*—
Cronin, John E.; Kaanta, Carter W.; Kenney, Donald M.; Kerbaugh, Michael L.; Landis, Howard S.; Machesney, Brian J.; Parries, Paul; Previti-Kelly, Rosemary A.; and Rembetski, John F., 5,466,636, Cl. 437-187.000.

Remus, Michelle: *See*—

Malachowski, Michael; Spehrley, Charles W., Jr.; Thomas, Dean; Remus, Michelle; and Schaffer, Robert R., 5,467,180, Cl. 355-312.000.

Ren, Jianrong: *See*—
Wade, John R.; Pratt, Michael J.; and Ren, Jianrong, 5,466,789, Cl. 534-560.000.

Renger, Michael: *See*—
Eckardt, Helmut; Ehritt, Jürgen; and Renger, Michael, 5,466,141, Cl. 425-130.000.

Rense, Mark S.: *See*—
Fields, Larry R.; Will, Jerald D.; and Rense, Mark S., 5,466,981, Cl. 313-113.000.

Rensselaer Polytechnic Institute: *See*—
Sanderson, Arthur C.; and Maby, Edward W., 5,465,620, Cl. 73-504.000.

Research Corporation Technologies, Inc.: *See*—
Corrigan, Colin; and Haley, Lawrence, 5,465,607, Cl. 73-23.360.

Research Foundation For Mental Health Hygiene, Inc.: *See*—
Isaacs, Charles E.; Kim, Kwang S.; and Wisniewski, Henryk M., 5,466,714, Cl. 514-558.000.

Research Frontiers Incorporated: *See*—
Check, Joseph A., III; Saxe, Robert L.; Thompson, Robert I.; Forlini, Matthew; and Slovak, Steven M., 5,467,217, Cl. 359-296.000.

Resler, Edwin W.; Tong, Vincent L.; Swanson, Russell C.; and Bogden, W. Scott, to Xilinx, Inc. Device and method for programming multiple arrays of semiconductor devices. 5,466,117, Cl. 414-799.000.

Resrev Partners: *See*—
Rebane, George J., 5,465,982, Cl. 273-433.000.

Ressemann, Thomas V.; and Blaeser, David J., to Scimed Life Systems, Inc. Longitudinally collapsible and exchangeable catheter. 5,466,222, Cl. 604-96.000.

Restorative Care of America Incorporated: *See*—
Lonardo, Robert, 5,465,736, Cl. 128-892.000.

Reuben, Douglas S.; and Reuben, Ilan. Calling number display and recording system. 5,467,385, Cl. 379-88.000.

Reuben, Ilan: *See*—
Reuben, Douglas S.; and Reuben, Ilan, 5,467,385, Cl. 379-88.000.

Reuther, Stefan: *See*—
Kießling, Gerhard; Pillath, Raimund; Reuther, Stefan; and Richter, Anja, 5,466,492, Cl. 427-522.000.

Rexroth Sigma: *See*—
Merletti, Didier, 5,466,923, Cl. 250-214.0PR.

Reynolds Metals Company: *See*—
Lee, Harry W., Jr., 5,465,599, Cl. 72-94.000.
Ward, Bennie R., Jr.; Levy, Sander A.; and Sloan, George A., 5,466,312, Cl. 148-551.000.
Wilcox, Karl M., 5,466,210, Cl. 493-309.000.

Reynolds, Payce D.: *See*—
Wentworth, Steven W.; Haas, Jon A.; Crane, Robert F.; and Reynolds, Payce D., 5,465,797, Cl. 173-91.000.

Rhebergen, Gertjan: *See*—
Van Koelen, Gijsbertus A.; Snaphaan, Paul G.; and Rhebergen, Gertjan, 5,467,371, Cl. 375-241.000.

Rhein Chemie Rheinau GmbH: *See*—
Wagner, Herbert; and Schuhmacher, Karl-Heinrich, 5,466,742, Cl. 524-448.000.

Rhijnsburger, Laurens J.: *See*—
Pronk, Franciscus A.; Bril, Thijs W.; Knapen, Peter S. A.; Van Heeren, Arie H.; and Rhijnsburger, Laurens J., 5,466,495, Cl. 427-576.000.

Rhoads, W. Wistar: *See*—
Movaghar, Abdolreza; Rhoads, W. Wistar; and Nguyen, Michael A., 5,466,077, Cl. 400-354.000.

Rhône-Poulenc Rorer S.A.: *See*—
Lapluye, Gerard; and Poisson, Roger, 5,466,608, Cl. 436-86.000.

Rhone-Poulenc Chimie: *See*—
Bonin, Yves; and LeBlanc, Jack, 5,466,741, Cl. 524-405.000.
Costantini, Michel; Manaut, Daniel; and Michelet, Daniel, 5,466,839, Cl. 552-304.000.
David, Claire; and Seon, Francoise, 5,466,428, Cl. 423-263.000.

Ribbans, Robert C.: *See*—
Tippett, Stephen W.; and Ribbans, Robert C., 5,466,531, Cl. 428-422.000.

Ribble, Brendon F.: *See*—
Wanek, M. Chris; Van Den Bogart, Thomas W.; Georger, William A.; Ribble, Brendon F.; Matthews, Billie J.; Sawyer, Lawrence H.; Abuto, Frank P.; and Werner, Edward E., 5,466,513, Cl. 428-218.000.

Riccio, Renato. Spit used in cooking apparatus. 5,465,653, Cl. 99-421.00H.

Rice, Chris A.; Gazzola, Alain J.; Smith, Desroy D.; Evans, John T.; and Dawson, Andrew W., to Zarina Holdings C.V. Swimming pool cleaner discs and assemblies. 5,465,443, Cl. 15-246.000.

Rich, Leonard G.: *See*—
Logan, David J.; and Rich, Leonard G., 5,466,501, Cl. 428-40.000.

Richardson, Joe W., Jr.: *See*—
Jenkins, Terry L.; McAbee, Michael L.; and Richardson, Joe W., Jr., 5,466,601, Cl. 435-263.000.

Richelsoph, Marc E., to Wright Medical Technology, Inc. Non-invasive expandable prosthesis for growing children. 5,466,261, Cl. 623-16.000.

Richetta, Peter: *See*—
Cutler, Victor H., Jr.; Richetta, Peter; Young, Kenneth P.; and Davieau, Gerald J., 5,467,345, Cl. 370-60.000.

Richter, Anja: *See*—
Kießling, Gerhard; Pillath, Raimund; Reuther, Stefan; and Richter, Anja, 5,466,492, Cl. 427-522.000.

Richter, Bryan: *See*—
Smith, Stephen A.; Richter, Bryan; and Singhal, Dave M., 5,467,042, Cl. 327-293.000.

Richter, Gary L. Flexible telephone mount. 5,465,932, Cl. 248-160.000.

Richter, Simon J.; Hohmann, Frank G.; and Vesely, Ernst, to Coca-Cola Company, The. Method and apparatus for blow molding a plastic drinking vessel. 5,466,413, Cl. 264-521.000.

Richtsmeier, Brent W.; Russell, Todd L.; Medin, Todd R.; and Meyer, William D., to Hewlett-Packard Company. Ink-jet printer with print heater having variable heat energy for different media. 5,467,119, Cl. 347-102.000.

Ricoh Company, Ltd.: *See*—
Doi, Jun, 5,467,181, Cl. 355-319.000.
Takagaki, Hiromitsu; Iwata, Nobuo; and Suzuki, Koji, 5,467,175, Cl. 355-259.000.

Ricoh Co., Ltd.: *See*—
Kinoshita, Mikio; and Ohta, Wasaburo, 5,465,475, Cl. 29-603.000.

Riedel-De Haen Aktiengesellschaft: *See*—
Scholz, Eugen, 5,466,606, Cl. 436-42.000.

Riedel Omni Rubber Products, Inc.: *See*—
Davis, R. Andrew; and Heineman, Rolf, 5,465,903, Cl. 238-8.000.

Riedhammer GmbH und Co. KG: *See*—
Albersdörfer, Gernot; and Swoboda, Reiner, 5,466,150, Cl. 432-192.000.

Riedl, Josef: *See*—
Deller, Klaus; Moesinger, Hans; Mueller, Herbert; Riedl, Josef; Kuehn, Wenzel; and Spielmannleitner, Rudolf, 5,466,421, Cl. 422-171.000.

Riegels, Martin; and Grütze, Joachim, to Bayer Aktiengesellschaft. Lithium-containing assistants for dyeing and printing of cellulosic and/or regenerated cellulosic materials. 5,466,265, Cl. 8-594.000.

Rigid Form, Inc.: *See*—
Herrmeyer, Dennis C., 5,465,531, Cl. 49-463.000.
Herrmeyer, Dennis C., 5,466,103, Cl. 410-33.000.

Riker, Gregory W.: *See*—
Rauch, Adam; Riker, Gregory W.; and Myhrvold, Nathan P., 5,467,264, Cl. 364-141.000.

Rimoldi Necchi, S.R.L.: *See*—
Pozzi, Giuseppe; and Sanvito, Roberto, 5,465,675, Cl. 112-162.000.

Ringlien, James A.: *See*—
Kohler, Timothy A.; and Ringlien, James A., 5,466,927, Cl. 250-221.000.

Rinker, Jeffrey E.: *See*—
Reiling, Vincent G.; Rinker, Jeffrey E.; McDonel, Timothy R.; and Sarna, Joseph C., 5,466,857, Cl. 558-319.000.

Rinnhofer, Johann; Schmidberger, Robert; Pawliska, Volker; and Cappelli, Giorgio, to Veitsch-Radex Aktiengesellschaft fur feuerfeste Erzeugnisse. Bottom or wall structure for a metallurgical vessel. 5,465,943, Cl. 266-220.000.

Ritrovato, Michael L.: *See*—
Rossi, Giorgio; Ritrovato, Michael L.; and Johnson, Gregory E., 5,466,073, Cl. 400-197.000.

Rivard, Germain F.: *See*—
Fitzpatrick-McElligott, Sandra G.; Lavin, John G.; Rivard, Germain F.; and Subramoney, Shekhar, 5,466,587, Cl. 435-172.100.

Roach, Donald E.; and Keating, Paul J., to Rohm and Haas Company. Methyl methacrylate compositions. 5,466,756, Cl. 525-330.600.

Roach, Matthew N.; Stapensea, Neil P.; and Webster, Jon, to BASF Corporation. Portable multi-compartment chemical storage and mixing tank. 5,465,874, Cl. 222-51.000.

Robb, Stephen P., to Motorola, Inc. Power transistor rapid turn off circuit for saving power. 5,467,047, Cl. 327-377.000.

Robbins, Edward S., III. Spice jar and associated dispenser cap. 5,465,871, Cl. 222-023.000.

Robbins, Inc.: *See*—
Niese, Michael W., 5,465,548, Cl. 52-741.100.

Robert Bosch GmbH: *See*—
Gmelin, Karl, 5,465,696, Cl. 123-337.000.
Goerlach, Alfred; Michel, Hartmut; and Mindl, Anton, 5,466,959, Cl. 257-361.000.
Hans, Waldemar, 5,465,906, Cl. 239-489.000.
Hofmann, Karl, 5,465,907, Cl. 239-533.900.
Ketterling, Hans-Peter, 5,467,373, Cl. 375-327.000.
Kirn, Manfred; Borst, Erich; Schaal, Guenter; Staebler, Manfred-Wilhelm; and Eicher, Bernard, 5,466,183, Cl. 451-359.000.
Meyen, Hans-Peter, 5,466,101, Cl. 408-226.000.
Schmitt, Edgar; Siegel, Heinz; Mergenthaler, Robert; and Deringer, Helmut, 5,466,055, Cl. 303-119.200.

Robert Finke GmbH & Co. KG: *See*—
Schumacher, Clemens; and Ziegler, Arthur, 5,465,835, Cl. 206-221.000.

Roberts, David W.: *See*—
Adams, Amanda J.; Jackson, Philip S.; Moulden, Howard N.; Roberts, David W.; and Watkin, Keith, 5,466,851, Cl. 558-21.000.

Roberts, James J.: *See*—
Fink, David J.; Everett, James W.; Costlow, Annette M.; Roberts, James J.; and Boone, Paul J., 5,465,483, Cl. 29-890.031.

Roberts, William A.: *See*—
Downs, James J.; and Roberts, William A., 5,466,407, Cl. 264-115.000.

Robertson, Alan D.; Hill, Alan P.; Glen, Robert C.; and Martin, Graeme R., to Burroughs Wellcome Co. Indolyl compounds for treating migraine. 5,466,699, Cl. 514-323.000.

Robinson, Christopher: *See*—

Clark, George A.; Burwell, Malcolm C.; Gola, John A.; Robinson, Christopher; and Snyder, Fred E., 5,465,894, Cl. 227-175.000.

Rockwell International Corporation: *See*—
Tench, D. Morgan; and Jambazian, Petra V., 5,466,349, Cl. 204-153.100.

Rocky Mountain Research Center: *See*—
Hait, John N., 5,466,925, Cl. 250-216.000.

Rodal, Eric B.; and Parker, Reed A. Low profile antenna. 5,467,095, Cl. 343-700.0MS.

Rodenburg, Tileman: *See*—
Brockhus, Jeroen J.; Moree, Jeanette D.; Lammers, Jannes G.; and Rodenburg, Tileman, 5,466,478, Cl. 426-602.000.

Rodi, Anton; and Reithofer, Jürgen, to Heidelberger Druckmaschinen AG. Control system for printing presses. 5,467,436, Cl. 395-114.000.

Roe, Lawrence H.: *See*—
Dixon, Raymond D.; Roe, Lawrence H.; and Migliori, Albert, 5,465,897, Cl. 228-121.000.

Roether, Thomas J.: *See*—
La, Duong; Bouras, Carlos E.; Meier, Mark S.; and Roether, Thomas J., 5,465,879, Cl. 222-189.060.

Roff, Robert W.; and Wilson, Randall B., to Whitaker Corporation, The. Submount and connector assembly for active fiber needle. 5,467,419, Cl. 385-92.000.

Rogers, Ernest E.; and Collier, Kevin E., to Taggart, Charles W. Gas spurged centrifugation method. 5,466,385, Cl. 210-787.000.

Rogers, Roland S.: *See*—
Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., 5,466,823, Cl. 548-377.100.

Rogers, Steven R.: *See*—
Litman, Alon; Goldenstein, Alexander; and Rogers, Steven R., 5,466,940, Cl. 250-397.000.

Rogers, William H.; and Clifton, Norman E., Jr., to Safariland Ltd., Inc. Outside holster and an inside article of clothing. 5,465,429, Cl. 2-300.000.

Rogier, Donald J., Jr.: *See*—
Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., 5,466,823, Cl. 548-377.100.

Rogler, Albert, to Central Tools, Inc. Gage with adjustable depth stops for measuring distance between two spaced surfaces. 5,465,501, Cl. 33-810.000.

Rohm and Haas Company: *See*—
Downey, Angela B.; Frazier, Valerie S.; and Willingham, Gary L., 5,466,382, Cl. 210-764.000.
Petigara, Ramesh B., 5,466,818, Cl. 548-213.000.
Roach, Donald E.; and Keating, Paul J., 5,466,756, Cl. 525-330.600.

Rohm Co. Ltd.: *See*—
Hasegawa, Miki, 5,466,887, Cl. 174-52.200.
Nishitani, Shuji, 5,467,372, Cl. 375-244.000.
Okumura, Hiroshi; and Negoro, Atsuhito, 5,466,968, Cl. 257-693.000.
Sawada, Hideki, 5,467,036, Cl. 327-108.000.

Rohrmann, Peter; Weiss, Alexander; Hög, George; and Zamzow, Peter, to Kabel Rheydt Aktiengesellschaft. Coaxial high frequency cable including an optical fiber element. 5,467,420, Cl. 385-101.000.

Rohto Pharmaceutical Co., Ltd.: *See*—
Tanizawa, Osamu; Okayama, Hiroto; Saji, Fumitaka; Azuma, Chihiro; and Kimura, Tadashi, 5,466,584, Cl. 435-69.100.

Rojey, Alexandre: *See*—
Prevost, Isabelle; and Rojey, Alexandre, 5,466,384, Cl. 210-787.000.

Roke Manor Research Limited: *See*—
Manning, Kevin R., 5,467,192, Cl. 356-371.000.

Rolando, Richard J.; Coleman, Patrick L.; Kangas, Steven L.; and Kotnour, Thomas A., to Minnesota Mining and Manufacturing Company. Graft copolymers and graft copolymer/protein compositions. 5,466,747, Cl. 525-54.100.

Rolando, Richard J.; Coleman, Patrick L.; Kangas, Steven L.; and Kotnour, Thomas A., to Minnesota Mining and Manufacturing Company. Graft copolymers and graft copolymer/protein compositions. 5,466,749, Cl. 525-54.100.

Rolite, Inc.: *See*—
Downs, James J.; and Roberts, William A., 5,466,407, Cl. 264-115.000.

Rolls-Royce and Associates: *See*—
Banks, Simon A.; Adderley, Colin I.; Fowler, John O.; and Boardman, James E., 5,465,484, Cl. 29-890.042.

Rolls-Royce plc: *See*—
Adderley, Colin I.; Fowler, John O.; and Wignall, Michael F., 5,465,785, Cl. 165-166.000.
Banks, Simon A.; Adderley, Colin I.; Fowler, John O.; and Boardman, James E., 5,465,484, Cl. 29-890.042.
Knott, David S., 5,466,125, Cl. 416-193.00A.
Rose, Martin G., 5,466,123, Cl. 415-182.100.

Romeo, Aurelio: *See*—
della Valle, Francesco; and Romeo, Aurelio, 5,466,461, Cl. 424-423.000.

Romer, Duane R.: *See*—
Wu, Weishi W.; Shankar, Ravi B.; Romer, Duane R.; and Pews, R. Garth, 5,466,707, Cl. 514-411.000.

Römer, Michael; Schleicher, Andreas; and Stamprech, Peter, to Hoechst Aktiengesellschaft. Mixtures of liquid crystalline copolymers and fluorothermoplastics, and use thereof. 5,466,738, Cl. 524-508.000.

Romero, Guillermo L., to Motorola, Inc. Method for fabricating a semiconductor package. 5,465,481, Cl. 29-840.000.

Romieu, Jacques; Degouy, Didier; Parigot, Philippe; and Hourcard, Michel, to Total. Apparatus for study of gas migration in cement slag. 5,465,609, Cl. 73-38.000.

Ronald P. Burtch & Associates Limited: *See*—
Burtch, Ronald P., 5,465,961, Cl. 273-85.00R.

Rong, Feng-Guang: *See*—
Soloway, Albert H.; Barth, Rolf F.; Anisuzzaman, Abul K.; Tjarks, Werner; Rong, Feng-Guang; and Wyzlic, Iwona M., 5,466,679, Cl. 514-50.000.

Roos, Mark G.; and Michie, Terry K., to AlliedSignal Inc. Radar system including stabilization calibration arrangement. 5,467,092, Cl. 342-174.000.

Root, David: *See*—
Lyman, George; Mathus, Gregory; and Root, David, 5,466,602, Cl. 435-297.100.

Root, David E.: *See*—
Fan, Siqi; Root, David E.; and Meyer, Jeffrey W., 5,467,291, Cl. 364-578.000.

Roquette Freres: *See*—
Devos, Francis, 5,466,795, Cl. 536-125.000.

Rosbeck, Joseph P.; and Cockrum, Charles A., to Santa Barbara Research Center. Denuded zone field effect photoconductive detector. 5,466,953, Cl. 257-185.000.

Roschger, Peter, to Bayer Aktiengesellschaft. Perinone dyestuffs for bulk dyeing of plastics. 5,466,805, Cl. 544-245.000.

Rose, Gary T. Window assembly with plant-on. 5,465,539, Cl. 52-204.530.

Rose, Martin G., to Rolls-Royce plc. Gas turbine engine turbine. 5,466,123, Cl. 415-182.100.

Rosen, Joel D.: *See*—
Royds, Robert B.; Lim, John; and Rosen, Joel D., 5,466,465, Cl. 424-449.000.

Rosen, Jonathan J.: *See*—
Malis, Jerry; Rosen, Jonathan J.; Mortimer, Martin T.; and Vasconcellos, Alfred V., 5,465,712, Cl. 128-205.250.

Rosenfeld, Ronald: *See*—
Lau, Raymond; Rosenfeld, Ronald; and Roukos, Salim, 5,467,425, Cl. 395-2.520.

Rosenthal, Arthur L.; Light, Nicholas D.; and Haynes, Carla A., to Johnson & Johnson Medical, Inc. Heteromorphic sponges containing active agents. 5,466,462, Cl. 424-426.000.

Rosini, Sergio; and Mian, Maurizio, to Istituto Gentili S.p.A. Acylaminoalkyliden-hydroxy-bisphosphonic acids esters and salts thereof, wherein the acyl group is derived from an acid having antiinflammatory activity. 5,466,682, Cl. 514-76.000.

Ross, Euan S.: *See*—
McClarron, Andrew R.; Smith, Stephen J.; Watson, Derrick J.; Williams, Bruce L.; and Ross, Euan S., 5,466,876, Cl. 562-608.000.

Ross, James B.; Christiansen, Gary L.; and Chang, Ronald, to Modern Medical Devices. Stethoscope diaphragm dispenser and method. 5,466,897, Cl. 181-131.000.

Ross, Robert J., to Donlar Corporation. Production of polysuccinimide. 5,466,779, Cl. 528-363.000.

Ross, Robert J.: *See*—
Kapp, Daniel L.; Ross, Robert J.; Younathan, Janet N.; and Singer, Stephen P., 5,466,568, Cl. 430-551.000.

Rossano, Lucius T.; and Lo, Young S., to Du Pont Merck Pharmaceutical Company, The. Intermediates for the preparation of cyclic urea. 5,466,797, Cl. 540-503.000.

Rossi, Giorgio; Ritrovato, Michael L.; and Johnson, Gregory E., to Advanced Supplies, Inc. Printer ribbon cartridge with re-inking reservoir and pump. 5,466,073, Cl. 400-197.000.

Rossi, Gulio: *See*—
Pujari, Vimal K.; and Rossi, Gulio, 5,466,400, Cl. 264-13.000.

Roth, Brian A., to Camco International Inc. Fluid circulation apparatus. 5,465,787, Cl. 166-66.400.

Roth, Rudolf. Talking contribution box. 5,465,909, Cl. 232-10.000.

Roukos, Salim: *See*—
Lau, Raymond; Rosenfeld, Ronald; and Roukos, Salim, 5,467,425, Cl. 395-2.520.

Roussel Uclaf: *See*—
Martin, Robert; Cayley, George R.; Thacker, Jonathan R. M.; Hall, Franklin R.; North, Denise K.; Groome, John M.; and Jeffries, David A., 5,466,458, Cl. 424-405.000.
Weston, John B.; Larkin, John P.; and Smith, Ian H., 5,466,710, Cl. 514-452.000.

Rousset, Gerard, to Laboratoires Inocosm. Method for separating a compound containing glycolipids, lysophospholipids, sphingolipids and ceramides of plant origin. 5,466,782, Cl. 530-374.000.

Rowden, David L.: *See*—
Merle, Thomas C.; Ryan, Dale W.; and Rowden, David L., 5,465,920, Cl. 242-348.100.

Rowe, Loyd D., Jr.: *See*—
Stanker, Larry H.; Elissalde, Marcel H., Jr.; Beier, Ross C.; Rowe, Loyd D., Jr.; and DeLoach, John R., 5,466,784, Cl. 530-388.900.

Rowland, Richard K., to Music City Marketing, Inc. Smoking system. 5,465,738, Cl. 131-329.000.

Roy, Jocelyne: *See*—
George, Pascal; De Peretti, Danielle; Roy, Jocelyne; Schmitt, Jean-Paul; and Sevrin, Mireille, 5,466,706, Cl. 514-394.000.

Royal Seafoods, Inc.: *See*—
Hjorth, Jens, 5,466,186, Cl. 452-170.000.

Royalty, Charles M.; Traxler, William; and Hough, Joseph W., to AlliedSignal Inc. Butterfly valve plate for a pneumatic surge valve. 5,465,756, Cl. 137-625.310.

Royds, Robert B.; Lim, John; and Rosen, Joel D., to Harrogate Holdings, Limited. Transdermal drug delivery system. 5,466,465, Cl. 424-449.000.

Rozenboom, Nathan G.: *See*—
Livesay, Richard E.; Rozenboom, Nathan G.; and Shane, Frederick J., 5,465,512, Cl. 37-457.000.

Rozon, David. Integrated cord loop drive means and housing for window covering. 5,465,779, Cl. 160;168.100.

Rubin, Benjamin M.: *See*—
Cleveland, John T., Jr.; and Rubin, Benjamin M., 5,467,223, Cl. 359-510.000.

Rubin, Peter A. D., to Porex Surgical, Inc. Orbital implant. 5,466,258, Cl. 623-4.000.

Ruby, Richard C.: *See*—
Field, Leslie A.; and Ruby, Richard C., 5,467,067, Cl. 335-4.000.
Field, Leslie A.; and Ruby, Richard C., 5,467,068, Cl. 335-4.000.

Ruby, Ward: *See*—
Zhou, Dawei; Mareci, Thomas; Burns, Michael; and Ruby, Ward, 5,466,480, Cl. 427-63.000.

Ruddy, Stephen B.; Eickhoff, W. Mark; Liversidge, Gary; and Cooper, Eugene R., to Eastman Kodak Company. Formulations of oral gastrointestinal diagnostic X-ray contrast agents in combination with pharmaceutically acceptable clays. 5,466,440, Cl. 424-9.411.

Rudich, George, Jr.: *See*—
Wenner, Ronald J.; and Rudich, George, Jr., 5,467,287, Cl. 364-505.000.

Rudy, Michael A., to Cytologics, Inc. Method and compositions for enhancing white blood cell functioning on a mucosal or cutaneous surface. 5,466,680, Cl. 514-57.000.

Ruf, Alexander; Abraham, Michael; Lacher, Manfred; Zetterer, Thomas; and Dietrich, Thomas R., to IMM Institut Fur Mikrotechnik GmbH. Sensor head for use in atomic force microscopy and method for its production. 5,465,611, Cl. 73-104.000.

Ruf, Michael: *See*—
Fazel, Khaled; and Ruf, Michael, 5,467,132, Cl. 348-390.000.

Ruf, Wolfgang: *See*—
Begemann, Ulrich; Heinzmann, Helmut; and Ruf, Wolfgang, 5,466,340, Cl. 162-216.000.
Jerabek, Michael; Ruf, Wolfgang; and Martin, Thomas, 5,466,372, Cl. 210-512.100.

Rufli, Peter: *See*—
Althaus, Rolf; Chyou, Yau-Pin; Frutschi, Hans U.; Genet, Christian; Kamber, Peter; Lindvall, Anders; Sattelmayer, Thomas; Senior, Peter; and Rufli, Peter, 5,465,569, Cl. 60-39.030.

Rummo, Richard J., Jr.; Petro, Stephen M.; and Desmond, John S. Modular roof curb assembly construction and interlocking joint means therefor. 5,465,533, Cl. 52-60.000.

Rumpf, Frederick H.; and Scher, Jonathan B., to Cabot Corporation. Catalysis and treatment of gases with the catalysts. 5,466,427, Cl. 423-210.000.

Rumsey, Karen M.; Maeda, Patrick Y.; and AuYeung, Vincent W., to Xerox Corporation. Adjustable laser diode lens assembly. 5,467,229, Cl. 359-822.000.

Ruocco, Rita; and Hance, Roger. Realty sign lighting/anti-theft assembly. 5,467,076, Cl. 340-571.000.

Rus, Liviu: *See*—
Fowler, Thomas J.; and Rus, Liviu, 5,466,048, Cl. 297-378.120.

Ruscio, Dominic V.: *See*—
Appleton, William J.; Hahn, Dennis; Moucha, William E.; Ruscio, Dominic V.; Shannon, John H.; Silbermann, Steven D.; and Weaver, Edwin W., Jr., 5,466,147, Cl. 425-412.000.

Russell, Todd L.: *See*—
Richtsmeier, Brent W.; Russell, Todd L.; Medin, Todd R.; and Meyer, William D., 5,467,119, Cl. 347-102.000.

Ruter, Horst; and Strack, Kurt-Martin, to Bergwerksverband GmbH. Method of processing transient electromagnetic measurements in geophysical analysis. 5,467,018, Cl. 324-336.000.

Ryan, Dale W.: *See*—
Merle, Thomas C.; Ryan, Dale W.; and Rowden, David L., 5,465,920, Cl. 242-348.100.

Ryan, Daniel E.: *See*—
Lutzow, Thomas H.; and Ryan, Daniel E., 5,466,516, Cl. 428-282.000.

Ryans, Jimmy L.: *See*—
Haseltine, Douglas M.; Yount, Thomas L.; and Ryans, Jimmy L., 5,466,765, Cl. 526-65.000.

Rykowski, Ronald F.: *See*—
Forkner, John F.; Rykowski, Ronald F.; and Wilson, Stephen S., 5,467,207, Cl. 359-40.000.

Sa, Jong S.: *See*—
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,466,854, Cl. 558-233.000.

Saadatmanesh, Vahid: *See*—
Loeb, Marvin P.; Shaolian, Samuel M.; Saadatmanesh, Vahid; Giba, Jeffrey J.; and Pham, To V., 5,466,234, Cl. 606-15.000.

Sabatucci, Joseph P., to American Home Products Corporation. Inhibition of bone loss by 4-aryloxy-5-hydroxy-2(5H)-furanones. 5,466,830, Cl. 549-315.000.

Sabel, Walter: *See*—
Obermeier, Rainer; Sabel, Walter; Deil, Peter; and Geisen, Karl, 5,466,666, Cl. 514-3.000.

Sabottke, Craig Y.: *See*—
Kaul, Bal K.; Sabottke, Craig Y.; Fiato, Rocco A.; and Niessen, Edward, 5,466,364, Cl. 208-307.000.

Sacripante, Guerino G.; Veregin, Richard P. N.; and McDougall, Maria N. V., to Xerox Corporation. Toner compositions with modified polyester resins. 5,466,554, Cl. 430-110.000.

Sadaki, Akihiro; Shiraishi, Masayoshi; Kawawada, Naoki; and Kawaguchi, Koji, to Seiko Instruments Inc. Thermal transfer recording method and apparatus of both sublimation type and fusion type. 5,467,120, Cl. 347-171.000.

Saeger, Timothy W.; and Ersoz, Nathaniel H., to Thomson Consumer Electronics, Inc. Horizontal panning for PIP display in wide screen television. 5,467,144, Cl. 348-566.000.

Saeki, Takashi: *See*—
Endo, Takahiro; and Saeki, Takashi, 5,467,389, Cl. 379-201.000.

Safariland Ltd., Inc.: *See*—
Rogers, William H.; and Clifton, Norman E., Jr., 5,465,429, Cl. 2-300.000.

Safas Corporation: *See*—
Ghahary, Akbar, 5,465,544, Cl. 52-311.100.

Saffran, Bruce N. Malleable fracture stabilization device with micropores for directed drug delivery. 5,466,262, Cl. 623-16.000.

Sagawa, Masaichi: *See*—
Kaji, Makoto; Odoi, Chie; Sagawa, Masaichi; Kagawa, Hiroyuki; Kakuta, Atsushi; Ishii, Kikujiro; Nakayama, Hideyuki; and Ogawa, Keiichiro, 5,467,421, Cl. 385-122.000.

Sagawa, Masato: *See*—
Fujimura, Setsuo; Matsuura, Yutaka; and Sagawa, Masato, 5,466,308, Cl. 148-302.000.

Sage, Scott W.: *See*—
Bright, Stuart W.; Gold, Gerald; Sage, Scott W.; and Sportsman, John R., 5,466,610, Cl. 436-518.000.

Saijo, Hiroyuki: *See*—
Tosaka, Masaki; Saijo, Hiroyuki; Kawano, Haruki; Hayakawa, Yutaka; and Ohi, Toshiaki, 5,466,395, Cl. 252-551.000.

Saiki, Eisaku; Mizokami, Takuya; and Matsunami, Naoto, to Hitachi, Ltd. Recording and reproducing apparatus having arrangement for recovery of read-out data error. 5,467,331, Cl. 369-53.000.

Saintsing, Barry L.: *See*—
Perfetti, Thomas A.; Carespodi, Dennis L.; Saintsing, Barry L.; and Koschak, Matthew S., 5,465,739, Cl. 131-335.000.

Saito, Osamu: *See*—
Uchimura, Kuniharu; Saito, Osamu; Amemiya, Yoshihito; and Iwata, Atsushi, 5,467,429, Cl. 395-24.000.

Saito, Toshimitsu; Kasashima, Masahiko; and Konno, Toshikazu, to Kabushiki Kaisha Toshiba. Computer unit with a resume function. 5,467,469, Cl. 395-182.120.

Saitoh, Hiroyuki: *See*—
Itoh, Takashi; Saitoh, Hiroyuki; Kinami, Haruyuki; Konaka, Toshinori; and Murai, Tsuyoshi, 5,465,447, Cl. 15-88.300.

Saitoh, Kazuo: *See*—
Hiratsuka, Mitsunori; Takano, Minoru; Enomoto, Masayuki; Kizawa, Satoru; and Saitoh, Kazuo, 5,466,663, Cl. 504-286.000.

Saitoh, Satoshi: *See*—
Mifune, Hiroshi; Saitoh, Satoshi; Kaneda, Teruo; Tomokiyo, Shigetaka; Adachi, Tsugio; Tanaka, Tsutomu; and Furudate, Toshiharu, 5,465,525, Cl. 43-132.100.

Saitoh, Tsuyoshi: *See*—
Sakai, Norio; Saitoh, Tsuyoshi; Nakayama, Yoshikatsu; and Kamada, Akihiko, 5,466,330, Cl. 156-584.000.

Saji, Fumitaka: *See*—
Tanizawa, Osamu; Okayama, Hiroto; Saji, Fumitaka; Azuma, Chihiro; and Kimura, Tadashi, 5,466,584, Cl. 435-69.100.

Saka, Tsutomu: *See*—
Sato, Katsuaki; Tominaga, Katsuhiko; Saka, Tsutomu; Kawamura, Osamu; Takahashi, Teruo; and Kakiuchi, Arata, 5,466,276, Cl. 75-231.000.

Sakagami, Teruo; Ogihara, Takeo; Fujii, Yasufumi; and Katono, Hiroki, to Kureha, Kagaku Kogyo Kabushiki Kaisha. Optical filter. 5,466,755, Cl. 525-326.600.

Sakaguchi, Kiyofumi: *See*—
Ichikawa, Takeshi; Yonehara, Takao; Sakamoto, Masaru; Naruse, Yasuhiro; Nakayama, Jun; Yamagata, Kenji; and Sakaguchi, Kiyofumi, 5,466,631, Cl. 437-62.000.

Sakai, Itsuko; Hayasaka, Nobuo; and Okano, Haruo, to Kabushiki Kaisha Toshiba. Charged beam irradiating apparatus having a cleaning means and a method of cleaning a charged beam irradiating apparatus. 5,466,942, Cl. 250-492.200.

Sakai, Katsuhiko; Nasu, Osamu; and Ose, Yoichi, to Hitachi, Ltd. Apparatus and method for suppressing electrification of sample in charged beam irradiation apparatus. 5,466,929, Cl. 250-251.000.

Sakai, Mayumi: *See*—
Nagamitsu, Sachio; Sakai, Mayumi; Kodama, Hisashi; and Okada, Tsuneko, 5,467,401, Cl. 381-63.000.

Sakai, Norio; Saitoh, Tsuyoshi; Nakayama, Yoshikatsu; and Kamada, Akihiko, to Murata Manufacturing Co., Ltd. Handling apparatus for ceramic green sheet. 5,466,330, Cl. 156-584.000.

Sakai, Takeshi; and Fukushi, Kawakami, to Yamaha Corporation. Method for measuring sound absorption power of a theater chair with a dummy representing a human being seated thereon. 5,465,469, Cl. 29-404.000.

Sakai, Tooru: *See*—
Ishiguro, Hajime; Morioka, Kazutoshi; Sakai, Tooru; and Takemura, Yasushi, 5,467,431, Cl. 395-102.000.

Sakamoto, Masaaki: *See*—
Tanaka, Tadashi; Sakamoto, Masaaki; and Kato, Tohru, 5,466,538, Cl. 428-610.000.

Sakamoto, Masahide: *See*—
Fujisawa, Masaaki; Hasegawa, Taiji; Ishii, Toshio; Sasaki, Shoji; and Sakamoto, Masahide, 5,467,277, Cl. 364-424.050.

Sakamoto, Masaru: *See*—
Ichikawa, Takeshi; Yonehara, Takao; Sakamoto, Masaru; Naruse, Yasuhiro; Nakayama, Jun; Yamagata, Kenji; and Sakaguchi, Kiyofumi, 5,466,631, Cl. 437-62.000.

Sakamoto, Shuichi: *See*—
Iwahara, Yoshiaki; Kuroda, Shoji; Sakamoto, Shuichi; and Ogino, Masanori, 5,467,221, Cl. 359-449.000.

Sakao, Masato; and Ohya, Shuichi, to NEC Corporation. Semiconductor device capable of increasing reliability. 5,466,964, Cl. 257-532.000.

Sakata, Naoya: *See*—
Koike, Naomasa; Nakano, Akira; Kosaka, Takao; and Sakata, Naoya, 5,466,655, Cl. 503-209.000.

Sakata, Satoshi; Kudo, Tomoo; Watanabe, Hiroyuki; and Matsudaira, Tadashi, to Konica Corporation. Speed control circuit for an optical scanning system driving motor for an image forming apparatus. 5,467,173, Cl. 355-235.000.

Sakata, Takeharu: *See*—
Urasaka, Shinichi; and Sakata, Takeharu, 5,467,383, Cl. 379-61.000.

Sakata, Tetsuhiro: *See*—
Sato, Yukihiro; Sone, Takumi; Nagata, Sachio; Sakata, Tetsuhiro; Demizu, Kei; and Tanaka, Shinichi, 5,466,305, Cl. 148-222.000.

Sakaue, Takahiro: *See*—
Okmori, Shinji; Ogata, Kazumi; Tsuruoka, Hideki; and Sakaue, Takahiro, 5,466,673, Cl. 514-18.000.

Sakaue, Yoshinori: *See*—
Bertin, Claude L.; DiMaria, Donelli J.; Miyakawa, Makoto; and Sakaue, Yoshinori, 5,467,305, Cl. 365-185.010.

Sakazaki, Derek J.: *See*—
Brusati, Peter V.; Griffin, J. Dewey; and Sakazaki, Derek J., 5,467,254, Cl. 361-799.000.

Sakuma, Hajime: *See*—
Nasu, Masaki; and Sakuma, Hajime, 5,467,461, Cl. 395-474.000.

Salerno, Jack P.: *See*—
Gale, Ronald P.; McCullough, Richard; Salerno, Jack P.; Fantone, Stephen D.; Forsyth, Robert P.; Carellas, Peter T.; Thomas, Michael J.; and Youman, Roy L., 5,467,154, Cl. 353-119.000.

Salomon, Andreas H., to Hughes-Avicom International, Inc. Retractable face-up LCD monitor with off-monitor power supply and back-EMF braking. 5,467,106, Cl. 345-87.000.

Salomon S.A.: *See*—
Bourdeau, Joël, 5,465,508, Cl. 36-44.000.
Commier, Philippe; and Le Masson, Jacques, 5,465,994, Cl. 280-702.000.

Saltzman, Eric T.: *See*—
Steinberg, John D.; and Saltzman, Eric T., 5,466,194, Cl. 474-80.000.

Saltzman, Jeffrey S.: *See*—
White, James M.; Faber, Vance; and Saltzman, Jeffrey S., 5,467,110, Cl. 345-199.000.

Samejima, Kazuo; Matsuyama, Mitsuhiro; Morita, Shigeru; and Kure, Masaji, to Kubota Corporation. Mower unit having a bevel gear mechanism, 5,465,561, Cl. 56-11.800.

Samsung Aerospace Industries, Ltd.: *See*—
Goo, Bon-jeong, 5,467,162, Cl. 354-402.000.

Samsung Electron Devices Co., Ltd.: *See*—
Jin, Yong W., 5,466,496, Cl. 428-1.000.

Samsung Electronics: *See*—
Alexander, Thomas; Kim, Yongmin; Park, Hyunwook; Eo, Kil-Su; and Jong, Jing-Ming, 5,467,459, Cl. 395-480.000.

Samsung Electronics Co, Ltd.: *See*—
Lee, Joo-young; and Lee, Kyu-pil, 5,466,628, Cl. 437-60.000.

Samsung Electronics Co., Ltd.: *See*—
Bae, Myung-Ho, 5,467,039, Cl. 327-198.000.
Choi, Yun-Ho, 5,467,356, Cl. 371-21.100.
Jeong, Jechang, 5,467,086, Cl. 341-50.000.
Ji, Jae H., 5,467,333, Cl. 369-75.200.
Jong-Pil, Lee, 5,467,127, Cl. 348-169.000.
Jung, Chul-min; Lee, Jeong-hee; Ahn, Kee-sik; and Park, Hee-chul, 5,467,313, Cl. 365-189.110.
Kim, Hyeun-Su; and Lee, Dong-Jae, 5,467,316, Cl. 365-230.060.
Kim, Ko-hyun, 5,467,334, Cl. 369-77.100.
Kwon, Yong-Rak, 5,465,580, Cl. 62-6.000.
Lee, Jae-Hyeong, 5,467,032, Cl. 326-88.000.
Lee, Seong-won; and Paik, Joon-ki, 5,467,439, Cl. 395-133.000.
Limberg, Allen L., 5,467,145, Cl. 348-628.000.
Park, Gun C.; Choi, Do Y.; and Cho, Young H., 5,467,234, Cl. 360-85.000.

Samsung Engineering & Construction Co., Ltd.: *See*—
Lee, Kunmo, 5,466,383, Cl. 210-774.000.

Samuels, Michael R.; and Waggoner, Marion G., to Du Pont de Nemours, E. I., and Company. Liquid crystalline polyester resin. 5,466,773, Cl. 528-194.000.

Sandahl, Jeffrey E.: *See*—
Dornbush, David A.; Erickson, Chad S.; Iverson, Troy M.; Sandahl, Jeffrey E.; Moore, Kevin B.; Barnes, Neal P.; Easley, James B.; Jackson, Richard C.; and Von Duyke, Andrew L., 5,466,912, Cl. 219-400.000.

Sandel, Dan, to Devon Industries, Inc. Handle for use with a disposable cover. 5,465,461, Cl. 16-111.00R.

Sanden Corporation: *See*—
Fukai, Isamu, 5,466,129, Cl. 417-269.000.

Sanderson, Arthur C.; and Maby, Edward W., to Rensselaer Polytechnic Institute. Micromechanical vibratory gyroscope sensor array. 5,465,620, Cl. 73-504.000.

Sanderson, Glenn A. Proximity actuator and reader for an electronic access system. 5,467,082, Cl. 340-825.540.

Sandvik AB: *See*—
Wallström, Lars-Gunnar, 5,466,097, Cl. 407-113.000.

Sangokoya, Samuel A., to Albemarle Corporation. Tertiary aminoaluminoxane halides. 5,466,647, Cl. 502-113.000.

Sangret, Henry C., to TRW Inc. Power steering system. 5,465,805, Cl. 180-143.000.

Sanki Machinery Co., Ltd.: *See*—
Miyaji, Hiroshi, 5,466,321, Cl. 156-260.000.

Santa Barbara Research Center: *See*—
Rosbeck, Joseph P.; and Cockrum, Charles A., 5,466,953, Cl. 257-185.000.

Santoiemmo, Carl V., to Ranpak Corp. Method of using a paper packing product to store/ship plants with exposed roots. 5,465,530, Cl. 47-84.000.

Sanvito, Roberto: *See*—
Pozzi, Giuseppe; and Sanvito, Roberto, 5,465,675, Cl. 112-162.000.

Sanyo Chemical Industries, Ltd.: *See*—
Taguchi, Takayuki; Hasegawa, Kenichi; Baba, Sohkichi; and Takai, Yoshitsugu, 5,466,555, Cl. 430-110.000.

Sanyo Electric Co., Ltd.: *See*—
Terada, Fusao; Nakazato, Takashi; Tadano, Rikio; Tanigawa, Naohide; Hirose, Tatuya; Ikegami, Kazuo; and Fukushima, Kiyoshi, 5,465,579, Cl. 62-6.000.
Urasaka, Shinichi; and Sakata, Takeharu, 5,467,383, Cl. 379-61.000.

Sara Lee Corporation: *See*—
Imboden, Walter H.; Myers, Jonathan M.; and Caudle, Donald M., 5,465,594, Cl. 66-177.000.

Sara Lee/De N.V.: *See*—
Muis, Jan A., 5,465,649, Cl. 99-280.000.

Sariaslani, Fateme S.; Trower, Michael K.; and Omer, Charles A., to Du Pont de Nemours, E. I., and Company. Constitutive expression of P450soy and ferredoxin-soy in Streptomyces. 5,466,590, Cl. 435-189.000.

Sarna, Joseph C.: *See*—
Reiling, Vincent G.; Rinker, Jeffrey E.; McDonel, Timothy R.; and Sarna, Joseph C., 5,466,857, Cl. 558-319.000.

Sartor, Rolando D., to Col-Ven S.A. Controlling and maintaining air-pressure in vehicle tires. 5,465,772, Cl. 152-416.000.

Sasagawa, Yasuhiko: *See*—
Maeda, Tukasa; Sasagawa, Yasuhiko; Ikeda, Yorinobu; and Hiraharu, Teruo, 5,466,739, Cl. 524-525.000.

Sasaki, Akira: *See*—
Kishimoto, Shinji; Harashima, Masa; Kanda, Hiroshi; Sasaki, Akira; Tanabe, Kozi; Nosaka, Kenji; Hanasaka, Satoru; and Ishihara, Ken, 5,465,721, Cl. 128-660.070.

Sasaki, Dennis T.; Van den Engh, Gerrit J.; and Buckie, Anne-Marie, to Systemix, Inc. High speed flow cytometric separation of viable cells. 5,466,572, Cl. 435-2.000.

Sasaki, Goro, to Sumitomo Electric Industries, Ltd. Method of manufacturing a light receiving module with optical fiber coupling. 5,466,558, Cl. 430-321.000.

Sasaki, Kazuya: *See*—
Takeda, Keiko; Inagaki, Shinya; Tagawa, Kenji; and Sasaki, Kazuya, 5,467,218, Cl. 359-341.000.

Sasaki, Noriyuki, to Kabushiki Kaisha Toshiba. Gas injection system of nuclear power plant and gas injection method therefor. 5,467,375, Cl. 376-300.000.

Sasaki, Sachio: *See*—
Watanuki, Tsuneo; Nakamura, Yasushige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utaka, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, 5,467,176, Cl. 355-270.000.

Sasaki, Shoji: *See*—
Fujisawa, Masaaki; Hasegawa, Taiji; Ishii, Toshio; Sasaki, Shoji; and Sakamoto, Masahide, 5,467,277, Cl. 364-424.050.

Sasaki, Teruo: *See*—
Matsushita, Hiroomi; Sasaki, Teruo; and Fujisawa, Kazuhiro, 5,465,945, Cl. 267-294.000.

Sasaki, Yasuo: *See*—
Nihei, Ryo; Terada, Akihiro; and Sasaki, Yasuo, 5,466,909, Cl. 219-121.720.

Sasano, Nobusuke; and Enomoto, Tadashi, to Kabushiki Kaisha Toshiba. Colored microlens array and method of manufacturing same. 5,466,926, Cl. 250-216.000.

Sato, Fumiki; and Fujita, Kouichi, to Mitsubishi Denki Kabushiki Kaisha. Divider and microcomputer including the same. 5,467,299, Cl. 364-761.000.

Sato, Fumiki, to Mitsubishi Denki Kabushiki Kaisha. Bus use request adjusting apparatus allowing changing priority levels. 5,467,454, Cl. 395-296.000.

Sato, Katsuaki; Tominaga, Katsuhiko; Saka, Tsutomu; Kawamura, Osamu; Takahashi, Teruo; and Kakiuchi, Arata, to Honda Giken Kogyo Kabushiki Kaisha; and Nippon Piston Ring Co., Ltd. Valve seat made of secondary hardening-type high temperature wear-resistant sintered alloy. 5,466,276, Cl. 75-231.000.

Sato, Katsuyuki: *See*—
Kajimoto, Takeshi; Shimbo, Yutaka; Sato, Katsuyuki; Ogata, Masahiro; Kenmizaki, Kanehide; Kubono, Shouji; Kato, Nobuo; Manita, Kiichi; and Kanamitsu, Michitaro, 5,467,315, Cl. 365-222.000.

Sato, Kazunobo: *See*—
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Nasu, Hidetoshi; and Sato, Kazunobu, 5,465,806, Cl. 180-165.000.

Sato, Kazunobu: *See*—
Higasa, Hiromasa; Ishikawa, Fumihiko; Matsumura, Shigenori; Nasu, Hidetoshi; and Sato, Kazunobu, 5,465,806, Cl. 180-165.000.

Sato, Mitsuaki: *See*—
Miura, Shin; Hirose, Youichi; and Sato, Mitsuaki, 5,466,277, Cl. 75-255.000.

Sato, Mitsuru: *See*—
Watanuki, Tsuneo; Nakamura, Yasushige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utaka, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, 5,467,176, Cl. 355-270.000.

Sato, Naoki: *See*—
Ouchi, Yasuhide; Sato, Naoki; Sawaguchi, Hideki; and Hori, Yosuke, 5,467,232, Cl. 360-65.000.

Sato, Takashi; Suzuki, Takahisa; Tsuchiya, Hiromitsu; and Mitani, Tetsuya, to Yazaki Corporation. Discharge tube. 5,466,989, Cl. 313-635.000.

Sato, Toshiaki: *See*—
Ikeda, Kaoru; Sato, Toshiaki; and Ishiura, Kazuhige, 5,466,748, Cl. 525-57.000.

Sato, Yoshinori; Komiyama, Megumi; Endo, Kazuo; and Tate, Masashi, to Diafoil Hoechst Company, Ltd. Film for high heat-sensitive stencil paper. 5,466,521, Cl. 428-330.000.

Sato, Yuji; Honjo, Toshio; Kayamoto, Kanao; Ogata, Masahiro; and Shimizu, Kouichi, to Powdertech Co., Ltd. Ferrite carrier for electrophotographic developer and developer containing the carrier. 5,466,552, Cl. 430-106.600.

Sato, Yukihiro; Sone, Takumi; Nagata, Sachio; Sakata, Tetsuhiro; Demizu, Kei; and Tanaka, Shinichi, to Tanaka Limited; and Osaka Prefecture. Method of treating the surface of titanium. 5,466,305, Cl. 148-222.000.

Sato, Yukikazu: *See*—
Kokawa, Shozo; Nishihara, Michiharu; and Sato, Yukikazu, 5,467,208, Cl. 359-49.000.

Satoh, Makoto: *See*—
Nakajima, Hiroyuki; and Satoh, Makoto, 5,467,339, Cl. 369-275.400.

Sattelmayer, Thomas: *See*—
Althaus, Rolf; Chyou, Yau-Pin; Frutschi, Hans U.; Genet, Christian; Kamber, Peter; Lindvall, Anders; Sattelmayer, Thomas; Senior, Peter; and Rufli, Peter, 5,465,569, Cl. 60-39.030.

Sauerwein, Heinrich; and Arm, Wolfgang, to ACO Severin Ahlmann GmbH & Co., KG. Surface drainage apparatus. 5,466,091, Cl. 405-36.000.

Saukaitis, John C., to Hoechst Celanese Corporation. 8-sulfo-3-quinoline carboxylic acids and process therefore. 5,466,808, Cl. 546-153.000.

Saul, Jonathan R.: *See*—
Komorowski, Karl J.; Saul, Jonathan R.; LaPointe, Larry P.; and Marshall, Richard E., 5,466,046, Cl. 297-325.000.

Saunders, Raymond W.: *See*—
Boyle, Joseph P.; Camano, Gordon C.; Lachine, Randall S.; Lingley, Howard R.; and Saunders, Raymond W., 5,466,376, Cl. 210-634.000.

Sauter, Bruce M.; Short, Kevin G.; and Beltemacchi, Peter P., to Sterling Plumbing Group, Inc. Top mounting faucet assembly. 5,465,749, Cl. 137-359.000.

Savage, John M., Jr. Apparatus to connect LEDs at display panel to circuit board. 5,466,174, Cl. 439-596.000.

Savage, Martin O.: *See*—
Dunger, David B.; Savage, Martin O.; and Sönksen, Peter H., 5,466,670, Cl. 514-12.000.

Savage, William A. Assembly for vehicle body panels. 5,466,034, Cl. 296-191.000.

Savastano, Cesar; and Cimino, Roberto, to Enitricerche S.p.A. Process for deasphalting and demetallizing petroleum residues. 5,466,365, Cl. 208-309.000.

Saverin, Eckehard: *See*—
Berner, Hans-Ulrich; Ebisch, Rolf; Saverin, Eckehard; and Tyrakowski, Udo, 5,466,536, Cl. 428-522.000.

Savidge, Michael W.: *See*—
Fellhauer, Jeffery R.; and Savidge, Michael W., 5,465,456, Cl. 15-320.000.

Sawada, Akira: *See*—
Kinouchi, Shigenori; and Sawada, Akira, 5,467,088, Cl. 341-65.000.

Sawada, Hideki, to Rohm Co., Ltd. Integrated circuit device for driving elements and light emitting device. 5,467,036, Cl. 327-108.000.

Sawaguchi, Hideki: *See*—
Ouchi, Yasuhide; Sato, Naoki; Sawaguchi, Hideki; and Hori, Yosuke, 5,467,232, Cl. 360-65.000.

Sawatari, Norio: *See*—
Watanuki, Tsuneo; Nakamura, Yasushige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utaka, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, 5,467,176, Cl. 355-270.000.

Sawluk, Wlodzimier, to Ernst Winter & Sohn GmbH & Co. Saw. 5,465,706, Cl. 125-15.000.

Sawyer, Lawrence H.: *See*—
Wanek, M. Chris; Van Den Bogart, Thomas W.; Georger, William A.; Ribble, Brendon F.; Matthews, Billie J.; Sawyer, Lawrence H.; Abuto, Frank P.; and Werner, Edward E., 5,466,513, Cl. 428-218.000.

Saxe, Robert L.: *See*—
Check, Joseph A., III; Saxe, Robert L.; Thompson, Robert I.; Forlini, Matthew; and Slovak, Steven M., 5,467,217, Cl. 359-296.000.

Saxon, Edward W.: *See*—
Kowdley, Balasubramanian S.; Lewis, Thomas A.; Tsukida, Robert S.; Saxon, Edward W.; Ortega, Frank; and Debenedetto, Paul, 5,465,497, Cl. 33-626.000.

Scarra, Flavio, to SGS-Thomson Microelectronics, s.r.l. Process for checking the memories of a programmed microcomputer by means of a microprogram incorporated in the microcomputer itself. 5,467,358, Cl. 371-22.300.

Scates, Mark O.; Warner, R. Jay; and Torrence, G. Paull, to Hoechst Celanese Corporation. Polymeric carbonylation catalyst system. 5,466,874, Cl. 562-519.000.

Schaaf, Günter: *See*—
Schäfer, Horst; and Schaaf, Günter, 5,466,121, Cl. 415-129.000.

Schaal, Guenter: *See*—
Kim, Manfred; Borst, Erich; Schaal, Guenter; Staebler, Manfred-Wilhelm; and Eicher, Bernard, 5,466,183, Cl. 451-359.000.

Schaal, Walter; and Weigelt, Horst, to Claas OHG. Method of decorticating flax and a flax dressing machine for carrying out this method. 5,466,188, Cl. 460-24.000.

Schach, Thomas; Papenfuhs, Theodor; and Pfirmann, Ralf, to Hoechst Aktiengesellschaft. Process for preparing fluorobenzonitriles. 5,466,859, Cl. 558-425.000.

Schachar, Ronald A. Treatment of presbyopia and other eye disorders. 5,465,737, Cl. 128-898.000.

Schäfer, Horst; and Schaaf, Günter, to KSB Aktiengesellschaft. Hydraulic adjustment device. 5,466,121, Cl. 415-129.000.

Schaffer, Robert R.: *See*—
Malachowski, Michael; Spehrley, Charles W., Jr.; Thomas, Dean; Remus, Michelle; and Schaffer, Robert R., 5,467,180, Cl. 355-312.000.

Schamesberger, Robert, to Isosport Verbundbauteile Gesellschaft m.b.H. Polyethylene-based ski coating. 5,466,743, Cl. 524-462.000.

Schaper & Bruemmer GmbH & Co., KG: *See*—
Beuscher, Norbert; and Willigmann, Ingo, 5,466,451, Cl. 424-195.100.

Schatz, Klaus W.: *See*—
Buchanan, John S.; Krambeck, Frederick J.; and Schatz, Klaus W., 5,465,536, Cl. 52-198.000.

Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., to Eli Lilly and Company. Ring-substituted 2-amino-1,2,3,4-tetrahydronaphthalenes, 3-aminochromanes, and 3-aminothiochromanes. 5,466,709, Cl. 514-432.000.

Scheetz, Howard A.; and deBrught, Gerhardus J. A., to DSM N.V. Nylon alloys. 5,466,761, Cl. 525-432.000.

Schefczik, Ernst: *See*—
Beckmann, Stefan; and Schefczik, Ernst, 5,466,812, Cl. 546-288.000.

Scheffler, Towner B.: *See*—
Schneider, Alan A.; and Scheffler, Towner B., 5,466,356, Cl. 204-406.000.

Scheiner, Avram; and Marsolais, Ernest B., to Case Western Reserve University. Subcutaneous electrode for stimulating skeletal musculature. 5,466,247, Cl. 607-48.000.

Schelble, Josef: *See*—
Kraetschmer, Reinhard; Pertzach, Albert; and Schelble, Josef, 5,466,542, Cl. 428-694.0BS.

Schelhorn, Jean E.: *See*—
Gavin, Patrick M.; Schelhorn, Jean E.; Aschenbeck, David P.; and Strauss, Carl R., 5,466,504, Cl. 428-74.000.

Scher, Jonathan B.: *See*—
Rumpf, Frederick H.; and Scher, Jonathan B., 5,466,427, Cl. 423-210.000.

Scherer, John. Self-terminating phone plug and method of manufacture. 5,466,167, Cl. 439-188.000.

Scherer, Michael J., to American Recreation Products, Inc. Pack. 5,465,886, Cl. 224-215.000.

Schering Aktiengesellschaft: *See*—
Blitstein-Willinger, Eveline; and Sliwa-Hähnle, Karin, 5,466,713, Cl. 514-573.000.
Glaser, Charles B.; Morser, Michael J.; and Light, David R., 5,466,668, Cl. 514-12.000.

Scheuing, Richard S., to Somanetics Corporation. Electro-optical sensor for spectrophotometric medical devices. 5,465,714, Cl. 128-633.000.

Schierling, Hubert: *See*—
Bauer, Franz; and Schierling, Hubert, 5,467,000, Cl. 318-432.000.

Schiller, Peter J.: *See*—

Young, Robert M.; Freidhoff, Carl B.; Polla, Dennis L.; and Schiller, Peter J., 5,466,932, Cl. 250-289.000.

Schilling, Ferdinand: *See*—
Sieber, Helmut; Schilling, Ferdinand; Hagen, Günter; Kleissendorf, Roland; and Michaelis, Johannes, 5,465,834, Cl. 206-193.000.

Schinzel, Craig E.; and Lau, Robert G., to Federal-Hoffman, Inc. Cabinet with overlapping doors. 5,465,528, Cl. 49-368.000.

Schiwek, Helmut. Method of removing oil and oil like environmental contaminants from water of ground surfaces. 5,466,379, Cl. 210-680.000.

Schlager, Gary S. Retainer for towels, garments, and the like. 5,465,458, Cl. 16-1.00R.

Schleicher, Andreas: *See*—
Römer, Michael; Schleicher, Andreas; and Stamprech, Peter, 5,466,738, Cl. 524-508.000.

Schleicher, Israel D.; and Schleicher, Yaacov. Garden seeder. 5,465,869, Cl. 221-185.000.

Schleicher, Yaacov: *See*—
Schleicher, Israel D.; and Schleicher, Yaacov, 5,465,869, Cl. 221-185.000.

Schlenoff, Joseph B., to Florida State University. Solid scintillators for detecting radioactive ions in solution. 5,466,930, Cl. 250-252.100.

Schlumberger Industries: *See*—
Janssen, Sylvain; and Campain, Jean-Pierre, 5,465,606, Cl. 73-23.200.

Schlumberger Industries, S.A.: *See*—
Brochette, Hervé, 5,466,126, Cl. 416-244.00R.

Schmelzer, Walter: *See*—
Wells, William; Raidl, Georg; and Schmelzer, Walter, 5,465,942, Cl. 266-46.000.

Schmidberger, Robert: *See*—
Rinnhofer, Johann; Schmidberger, Robert; Pawliska, Volker; and Cappelli, Giorgio, 5,465,943, Cl. 266-220.000.

Schmidt, Richard S.: *See*—
Kirby, Norman R.; and Schmidt, Richard S., 5,466,094, Cl. 405-232.000.

Schmieding, Reinhold; and Krupp, Stefan, to Arthrex, Inc. Method and apparatus for installing a suture anchor through a hollow cannulated grasper. 5,466,243, Cl. 606-232.000.

Schmit, Chantal: *See*—
Baxter, Anthony D.; Baylis, Eric K.; Collingwood, Stephen P.; Taylor, Roger J.; De Mesmaeker, Alain; and Schmit, Chantal, 5,466,677, Cl. 514-44.000.

Schmit, Russell R.: *See*—
Hammerbacher, Milfred D.; and Schmit, Russell R., 5,466,301, Cl. 156-246.000.

Schmitt, Edgar; Siegel, Heinz; Mergenthaler, Robert; and Deringer, Helmut, to Robert Bosch GmbH. Electrohydraulic unit for regulating the pressure in vehicle braking systems. 5,466,055, Cl. 303-119.200.

Schmitt, Jean-Paul: *See*—
George, Pascal; De Poretti, Danielle; Roy, Jocelyne; Schmitt, Jean-Paul; and Sevrin, Mireille, 5,466,706, Cl. 514-394.000.

Schmitt, Peter J.; Brookstein, David S.; and Skelton, John, to Meadox Medicals, Inc. Vascular prosthesis. 5,466,257, Cl. 623-1.000.

Schmolke, Karl-Heinz; and Lydall, Kenneth, to Carclo Engineering Group PLC. Fiber opening device for separating individual fibers from a fiber sliver. 5,465,567, Cl. 57-408.000.

Schneider, Alan A.; and Scheffler, Towner B., to Mine Safety Appliances Company. Potentiostat circuit for electrochemical cells. 5,466,356, Cl. 204-404.000.

Schneider, Günther; Klier, Manfred; Aul, Marta; and Teichmann, Stephan, to Beiersdorf Aktiengesellschaft. Cosmetic sticks. 5,466,457, Cl. 424-401.000.

Schneider, Heinrich, to Deutsche Aerospace AG. Inertial stabilizing system. 5,465,924, Cl. 244-118.100.

Schneider, Peter; van Hoogevest, Peter; Capraro, Hans G.; and Isele, Ute, to Ciba-Geigy Corporation. Parenterally administrable liposome formulation comprising synthetic lipids. 5,466,468, Cl. 424-450.000.

Schnurr, Werner; Fischer, Rolf; Goetz, Norbert; and Kuekenhoehner, Thomas, to BASF Aktiengesellschaft. Preparation of 3-(2-acyloxyethyl)-dihydro-2(3H)furanones. 5,466,831, Cl. 549-323.000.

Schoendorfer, Donald W., to Sudor Partners. Energy-assisted transdermal collection patch for accelerated analyte collection and method of use. 5,465,713, Cl. 128-632.000.

Schoeneweiss, Klaus, to O&K Orenstein & Koppel AG. Handrail inlet element of an escalator, a moving walkway or the like. 5,465,823, Cl. 198-338.000.

Schoeters, Emile P.: *See*—
Vuylsteke, Pieter P.; and Schoeters, Emile P., 5,467,404, Cl. 382-274.000.

Scholz, Arthur: *See*—
Ebeling, Wilhelm; Faber, Guy; Kuhnen, Gottfried; and Scholz, Arthur, 5,466,910, Cl. 219-130.010.

Scholz, Eugen, to Riedel-De Haen Aktiengesellschaft. Use of N-methylformamide as solvent for the Karl Fischer titration. 5,466,606, Cl. 436-42.000.

Schormak, Eric R., to Motorola, Inc. Method and apparatus for clone detection in a communication system. 5,467,382, Cl. 379-58.000.

Schornick, Gunnar: *See*—
Kroner, Matthias; Schornick, Gunnar; Baur, Richard; Schwendemann, Volker; and Hartmann, Heinrich, 5,466,762, Cl. 525-472.000.

Schossow, Stephen R.; and Reiner, Thomas C., to Titan Corporation, The. Tamper-proof data storage. 5,467,396, Cl. 380-4.000.

Schrepf, Volker, to Henlopen Manufacturing Co., Inc. Material application with ejectable head. 5,466,081, Cl. 401-129.000.

Schreter, Robert E.: *See*—
Swanson, Malcolm L.; Feltman, Wendell R.; and Schreter, Robert E., 5,466,418, Cl. 422-111.000.

Schroeder, Edward A., to Porter Athletic Equipment Company. Retainer for adjustable basketball backboards. 5,465,957, Cl. 273-1.50R.

Schroepfer, Richard C.; and Smith, Tracy L., to Whitaker Corporation, The. Removable high density connector. 5,466,162, Cl. 439-79.000.

Schroth, Carl G.: *See*—
Partridge, Mary E.; Blenke, Timothy J.; Everson, Stephen R.; Schroth, Carl G.; and Venturino, Michael B., 5,466,409, Cl. 264-165.000.

Schubert, Walter: *See*—
Flosbach, Carmen; Philipp, Dieter; and Schubert, Walter, 5,466,860, Cl. 560-43.000.

Schuhmacher, Hans-Joachim: *See*—
Butterfass, Dieter; Schuhmacher, Hans-Joachim; and Mueller, Michael W., 5,466,411, Cl. 264-176.100.

Schuhmacher, Karl-Heinrich: *See*—
Wagner, Herbert; and Schuhmacher, Karl-Heinrich, 5,466,742, Cl. 524-440.000.

Schulte-Werning, Burkhard, to Asea Brown Boveri Ltd. Gas turbine combustion chamber. 5,465,577, Cl. 60-722.000.

Schultz, Erik: *See*—
Westermann, Soeren E.; and Schultz, Erik, 5,466,353, Cl. 204-196.000.

Schultz, William E.: *See*—
Goff, Kenneth H., Jr.; and Schultz, William E., 5,465,600, Cl. 72-309.000.

Schulz, Vincent P.; and Zakian, Virginia A., to Fred Hutchinson Cancer Research Center. Modulation of PIF-1-type helicases. 5,466,576, Cl. 435-6.000.

Schulze-Buxloh, Karl, to Kabel Rheydt Aktiengesellschaft. Radiating high-frequency coaxial cable. 5,467,066, Cl. 333-237.000.

Schulz-Harder, Jurgen; and Maier, Peter H. Process for producing a metal-ceramic substrate. 5,465,898, Cl. 228-122.100.

Schumacher, Clemens; and Ziegler, Arthur, to Robert Finke GmbH & Co. KG. Bottle closure cap for two-component packings. 5,465,835, Cl. 206-221.000.

Schumacher, James H.; and Mills, Donald L., to OSAGE Footwear, Inc. Integral sole with footprint embossing. 5,465,507, Cl. 36-30.00R.

Schumacher, Warner: *See*—
DeWoolfson, Bruce H.; Powell, Kea R.; and Schumacher, Warner, 5,465,822, Cl. 194-209.000.

Schwabe, Richard E.: *See*—
Lamprecht, Dale E., Jr.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., 5,467,433, Cl. 395-114.000.

Schwalb, Stuart: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.

Schwartz, John E. Safety vessel and valve assembly. 5,465,753, Cl. 137-587.000.

Schwartzkopf, George: *See*—
Ilardi, Joseph M.; Schwartzkopf, George; and Dailey, Gary G., 5,466,389, Cl. 252-156.000.

Schweib, Peter: *See*—
Veh, Gerhard; Schweib, Peter; and Dörflinger, Hans-Dieter, 5,465,848, Cl. 209-170.000.

Schweizerische Eidgenossenschaft Vertreten Durch Die Eidg. Munitionsfabrik Thun der Grupper fur Rustungadienste: *See*—
Rauber, Walter; and Tobler, Markus, 5,466,314, Cl. 149-46.000.

Schwendemann, Volker: *See*—
Kroner, Matthias; Schornick, Gunnar; Baur, Richard; Schwendemann, Volker; and Hartmann, Heinrich, 5,466,762, Cl. 525-472.000.

Scientific-Atlanta, Inc.: *See*—
Logston, Gary L.; Wasilewski, Anthony J.; Hammond, Maynard; and Cheung, Francis, 5,467,342, Cl. 370-17.000.
West, Lamar E.; Durand, David P.; Paulick, Melvin; and Primiano, Guy A., 5,467,397, Cl. 380-7.000.

Scimed Life Systems, Inc.: *See*—
Ressemann, Thomas V.; and Blaeser, David J., 5,466,222, Cl. 604-96.000.

Scola, Daniel A.: *See*—
Bell, James P.; Iroh, Jude O.; Scola, Daniel A.; and Liang, Jengli, 5,466,357, Cl. 205-50.000.

Scopazzi, Christopher: *See*—
Barsotti, Robert J.; Berge, Charles T.; and Scopazzi, Christopher, 5,466,752, Cl. 525-65.000.

Scotia Holdings PLC: *See*—
Horrobin, David F.; McMordie, Austin; and Manku, Mehar S., 5,466,841, Cl. 554-79.000.

Scott Fetzer Company, The: *See*—
Stegens, Alfred H., 5,465,451, Cl. 15-179.000.

Scott, Gordon: *See*—
Thomas, Donald; Ellis, Steve; Kriz, Paul; and Scott, Gordon, 5,465,828, Cl. 198-495.000.

Scott Investment Partners: *See*—
Scott, James J., 5,466,095, Cl. 405-302.200.

Scott, James J., to Scott Investment Partners. Underground support system and method of support. 5,466,095, Cl. 405-302.200.

Scott, William: *See*—
Lapinski, Charles; Eckert, Charles; Skokowski, Richard; Cox, James; Scott, William; Chaleff, Edward; Sharpe, Jeffrey G.; and Wurz, David A., 5,466,921, Cl. 235-462.000.

Seals-Mason, Samantha: *See*—
Johnson, Steven R.; Crowder, Kevin F.; Seals-Mason, Samantha; and Von Ehr, James R., II, 5,467,443, Cl. 395-141.000.

Seaman, Gary G.: *See*—
Anderson, Carl R.; and Seaman, Gary G., 5,465,478, Cl. 29-748.000.

Sedepro: *See*—
Deal, Michel, 5,466,132, Cl. 417-519.000.

Sedimoto, Kozo: *See*—
Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sedimoto, Kozo; and Suzuki, Masanori, 5,465,956, Cl. 271-274.000.

Sedlmair, Gerhard, to Marker Deutschland GmbH. Pedal for ski brakes. 5,465,995, Cl. 280-605.000.

Sedmak, J. James: *See*—
Kushnaryov, Vladimir M.; Redlich, Philip N.; Grossberg, Sidney E.; and Sedmak, J. James, 5,466,672, Cl. 514-14.000.

Sedmak, Joseph J.: *See*—
Jacobson, Gunnard K.; Jolly, Setsuko O.; Sedmak, Joseph J.; Skatrud, Thomas J.; and Wasileski, John M., 5,466,599, Cl. 435-255.100.

Sega Pinball, Inc.: *See*—
Wurz, Norman R., 5,465,965, Cl. 273-121.00A.

Segawa, Makoto: *See*—
Kameda, Yasushi; Nakamura, Kenichi; Takamoto, Hiroshi; Harima, Takayuki; and Segawa, Makoto, 5,467,317, Cl. 365-230.060.

Seick, Thomas; and Wagers, Rex E., to Greif Bros. Corporation. Recyclable steel drum for hot flow products. 5,465,863, Cl. 220-403.000.

Seidler, Hans-Peter: *See*—
Eschwey, Helmut; Giesen-Wiese, Monika; Grill, Maria; Emirze, Ararad; Seidler, Hans-Peter; Klein, Bernhard; and Kauschke, Michael, 5,466,517, Cl. 428-288.000.

Seifert, Bernhard U., to Tanner Bond Pty. Ltd. Imitation weatherboard. 5,465,543, Cl. 52-309.800.

Seiko Corporation: *See*—
Hoff, Don G., 5,467,197, Cl. 358-335.000.

Seiko Epson Corporation: *See*—
Higuchi, Toshihiko, 5,466,971, Cl. 257-751.000.
Hoff, Don G., 5,467,197, Cl. 358-335.000.
Koga, Yoshiro, 5,467,174, Cl. 355-245.000.

Seiko Instruments Inc.: *See*—
Hidaka, Akihiko, 5,466,066, Cl. 374-14.000.
Sadaki, Akihiro; Shiraishi, Masayoshi; Kawawada, Naoki; and Kawaguchi, Koji, 5,467,120, Cl. 347-171.000.

Seikoh Giken Co., Ltd.: *See*—
Takahashi, Mitsuo, 5,466,145, Cl. 425-190.000.

Sejpka, Johann: *See*—
Geck, Michael; Deubzer, Bernward; Baumgartner, Christine; Lautenschlager, Hans-Jürgen; and Sejpka, Johann, 5,466,746, Cl. 524-837.000.

Seki, Masahiro, to Tomi Seiko Co., Ltd. Sterilizer using high temperature steam. 5,466,417, Cl. 422-109.000.

Seki, Masaki; and Hanaoka, Osamu, to Fanuc Ltd. Cross sectional configuration creating apparatus in the creation of free curve. 5,467,445, Cl. 395-142.000.

Seki, Takakazu: *See*—
Ohhashi, Tateo; Nakashima, Koichi; Fukuyo, Hideaki; and Seki, Takakazu, 5,466,355, Cl. 204-298.130.

Sekijima, Takenori: *See*—
Fujii, Takashi; Fujino, Masaru; Sekijima, Takenori; and Takagi, Hiroshi, 5,466,388, Cl. 252-62.590.

Sekimoto, Kozo: *See*—
Takemoto, Takatoshi; Kano, Noriaki; Ito, Eiji; and Sekimoto, Kozo, 5,465,953, Cl. 271-234.000.

Seko, Shinzo, to Sumitomo Chemical Company, Limited. Process for preparing nitroaniline derivatives. 5,466,871, Cl. 564-395.000.

Sell, Leslie J., to Ingersoll-Rand Company. Directional control assembly for an air winch. 5,465,939, Cl. 254-276.000.

Sellers, Simon F.: *See*—
Alty, Adam C.; and Sellers, Simon F., 5,466,850, Cl. 556-477.000.

Seltzer, Clif: *See*—
Lause, Herb; Moore, Sylvia; Seltzer, Clif; Taylor, Cliff; and King, Dan, 5,466,317, Cl. 156-79.000.

Sematech, Inc.: *See*—
Berry, Lee A., 5,466,991, Cl. 315-111.410.
Williams, Norman; and Spain, James, 5,467,013, Cl. 324-127.000.

Semenza, Christopher G.; and Tremblay, Richard. Form-drain filter. 5,466,092, Cl. 405-45.000.

Senbokuya, Takashi, to Bridgestone Corporation. Method and apparatus for cutting a belt-shaped member. 5,465,639, Cl. 83-34.000.

Senior, Peter: *See*—
Althaus, Rolf; Chyou, Yau-Pin; Frutschi, Hans U.; Genet, Christian; Kamber, Peter; Lindvall, Anders; Sattelmayer, Thomas; Senior, Peter; and Ruffi, Peter, 5,465,569, Cl. 60-39.030.

Senju Pharmaceutical Co., Ltd.: *See*—
Ohmori, Shinji; Ogata, Kazumi; Tsuruoka, Hideki; and Sakaue, Takahiro, 5,466,673, Cl. 514-18.000.

Seon, Francoise: *See*—
David, Claire; and Seon, Francoise, 5,466,428, Cl. 423-263.000.

Serbio: *See*—
Amiral, Jean, 5,466,582, Cl. 435-7.900.

Setoyama, Tamotsu: *See*—
Kuma, [illegible]; Setoyama, Tamotsu; Maruyama, Hideaki; and Kawai, Makiko, 5,466,472, Cl. 426-43.000.

Sevenich, John R., to Hawkins Chemical, Inc. Preparation of process cheese using liquid sodium phosphate. 5,466,477, Cl. 426-582.000.

Severson, John A.: *See*—
Hagen, Floyd W.; Hohenstein, Gregg A.; Severson, John A.; and Trongard, Pennelle J., 5,466,067, Cl. 374-138.000.

Sevrin, Mireille: *See*—
George, Pascal; De Peretti, Danielle; Roy, Jocelyne; Schmitt, Jean-Paul; and Sevrin, Mireille, 5,466,706, Cl. 514-394.000.

Seyed-Bolorforosh, Mir S., to Hewlett Packard Company. Ultrasonic probe. 5,465,725, Cl. 128-662.030.

SGS-Thomson Microelectronics, S.r.l.: *See*—
Cappelletti, Paolo G., 5,466,622, Cl. 437-52.000.
Scarra, Flavio, 5,467,358, Cl. 371-22.300.

SGS-Thomson Microelectronics, SA: *See*—
Wuidart, Sylvie; and Do, Tien-Dung, 5,467,053, Cl. 327-551.000.

Shadeck, Louis M.: *See*—
Owens, Valerie; Shadeck, Louis M.; and Huff, Robert O., 5,465,983, Cl. 279-157.000.

Shaffer, Robert W.; Adriance, Kyle; and Kimbro, Charles D., to Puritan Bennett Corporation; and Air Squared, Inc. Scroll compressor having idler cranks and strengthening and heat dissipating ribs. 5,466,134, Cl. 418-15.000.

Shalhoub, Ibrahim M.: *See*—
Anderson, Charles C.; Wang, Yongcai; Bello, James L.; Shalhoub, Ibrahim M.; and Corbin, Douglas D., 5,466,567, Cl. 430-530.000.

Shalvi, Ram, to Solar Wide Industrial Ltd. Solar panel unit and solar lamp including same. 5,467,257, Cl. 362-183.000.

Shane, Frederick J.: *See*—
Livesay, Richard E.; Rozenboom, Nathan G.; and Shane, Frederick J., 5,465,512, Cl. 37-457.000.

Shanghai Yue Long Non-Ferrous Metals Limited: *See*—
Maofu, Tong; Jiancheng, Xiong; and Dong, Geng X., 5,466,307, Cl. 148-302.000.

Shankar, Ravi B.: *See*—
Wu, Weishi W.; Shankar, Ravi B.; Romer, Duane R.; and Pews, R. Garth, 5,466,707, Cl. 514-411.000.

Shannon, Donald N.: *See*—
Wunderlich, Daniel F.; Herr, Nedra A.; Shannon, Donald N.; and Kuhn, L. Dean, 5,467,077, Cl. 340-635.000.

Shannon, John H.: *See*—
Appleton, William J.; Hahn, Dennis; Moucha, William E.; Ruscio, Dominic V.; Shannon, John H.; Silbermann, Steven D.; and Weaver, Edwin W., Jr., 5,466,147, Cl. 425-412.000.

Shannon, John M., to U.S. Philips Corporation. Manufacturing electronic devices comprising TFTs and MIMs. 5,466,617, Cl. 437-40.000.

Shaolian, Samuel M.: *See*—
Loeb, Marvin P.; Shaolian, Samuel M.; Sasdatmanesh, Vahid; Giba, Jeffrey J.; and Pham, To V., 5,466,234, Cl. 606-15.000.

Shap, Inc.: *See*—
Staniszewski, Tadeusz, 5,466,327, Cl. 156-441.500.

Share, Paul E., to Henkel Corporation. Citral acetal ethers of alpha-hydroxy phenyl ketones and radiation curable compositions thereof. 5,466,721, Cl. 522-34.000.

Sharif, Sharif, to Benchmark Research and Technology, Inc. Process for preparation of stable aqueous solutions of zirconium chelates. 5,466,846, Cl. 556-55.000.

Sharon, Andre: *See*—
Hogan, Neville; Krebs, Hermano I.; Sharon, Andre; and Charnnarong, Jain, 5,466,213, Cl. 601-33.000.

Sharp Corporation: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,467,030, Cl. 327-58.000.
Shou, Guoliang; Takatori, Sunao; and Yamamoto, Makoto, 5,467,376, Cl. 377-94.000.

Sharp Kabushiki Kaisha: *See*—
Hatano, Akitsugu; Okazaki, Tsuyoshi; Sumida, Yukihiro; Nojima, Takashi; and Yamashita, Hidehiko, 5,467,204, Cl. 358-482.000.
Kokawa, Shozo; Nishihara, Michiharu; and Sato, Yukikazu, 5,467,208, Cl. 359-49.000.
Okino, Yasushi, 5,467,267, Cl. 364-184.000.
Takeda, Katsunori; Otsuka, Shinsuke; Takahashi, Yoshiharu; Katsura, Hiroo; Takata, Kazuhiko; Maeda, Shoichi; and Nagato, Takafumi, 5,467,458, Cl. 395-427.000.
Yamamoto, Motohiko; and Kubo, Masaru, 5,466,962, Cl. 257-437.000.
Yoshida, Yukihiro, 5,467,298, Cl. 364-746.200.
Yuki, Masaru; and Tanaka, Kenichi, 5,466,957, Cl. 257-344.000.

Sharpe, Jeffrey G.: *See*—
Lapinski, Charles; Eckert, Charles; Skokowski, Richard; Cox, James; Scott, William; Chaleff, Edward; Sharpe, Jeffrey G.; and Wurz, David A., 5,466,921, Cl. 235-462.000.

Shavitt, Yuval Y.: *See*—
Cidon, Israel; Georgiadis, Leonidas; Guerin, Roch A.; Shavitt, Yuval Y.; and Slater, Andrew E., 5,467,352, Cl. 370-85.500.

Sheffler, Robert J., to Brent River Packaging Corporation. Plastic container having injection-molded container components. 5,465,856, Cl. 215-370.000.
Sheldon, Paul C.; and Kirkham, Edward E., to Giddings & Lewis, Inc. Gimbal assembly for six axis machine tool. 5,466,085, Cl. 403-157.000.
Sheldon, Roger A.: *See*—
Davenport, Kenneth G.; Sheldon, Roger A.; Le Bars, Joel; and Mueller, Werner H., 5,466,869, Cl. 564-265.000.
Shen, DeKang: *See*—
Unger, Evan C.; and Shen, DeKang, 5,466,438, Cl. 424-936.500.
Shepperd, Harold A. Dead bolt pass key lock. 5,465,595, Cl. 70-416.000.
Shepro, David; and Alexander, J. Steven, to Trustees of Boston University. Prophylactic and therapeutic methods for treating edema with antamanides. 5,466,667, Cl. 514-11.000.
Sherar, James R., to United States of America, Agriculture. In-line safety shackle. 5,466,082, Cl. 403-2.000.
Sherman, Steven J., to Analog Devices, Inc. Method for adjusting sensitivity of a sensor. 5,465,604, Cl. 73-1.0DV.
Sheu, Miin-Tsang; and Liu, Mon-Teng. Sheathing device for umbrella. 5,465,743, Cl. 135-34.200.
Shiba, Hiroshi: *See*—
Ohi, Susumu; and Shiba, Hiroshi, 5,467,035, Cl. 327-94.000.
Shibata, Fumio: *See*—
Kataoka, Takayuki; Uemura, Ryuji; Kawasaki, Shunzo; and Shibata, Fumio, 5,466,514, Cl. 428-229.000.
Shibata, Katsuhiko: *See*—
Nakamura, Shigeru; Arimoto, Akira; Suzuki, Kenkichi; and Shibata, Katsuhiko, 5,467,417, Cl. 385-36.000.
Shibata, Steven K.: *See*—
Edwards, Donald W.; Jackson, Craig A.; Shibata, Steven K.; and Yngve, Paul W., 5,465,566, Cl. 57-204.000.
Shibayama, Takao; and Maekawa, Keiichiro, to Honda Giken Kogyo Kabushiki Kaisha. Method of inspecting various control functions of a motorcar. 5,465,616, Cl. 73-118.100.
Shida, Yoshikatsu: *See*—
Shimizu, Tetushi; Koda, Munetaka; Shida, Yoshikatsu; Kawaguchi, Jun-ichi; and Kaneko, Yoshio, 5,466,641, Cl. 437-233.000.
Shields, Rodney M., to Creative Minds Foundation. Facial mask and method. 5,465,427, Cl. 2-206.000.
Shigemori, Nobuki; and Kamo, Hisao, to Chugai Photo Chemical Co., Ltd. Color development composition and process. 5,466,565, Cl. 430-444.000.
Shigeta, Masanobu; Imanishi, Dai; and Shimizu, Shigeo, to Victor Company of Japan, Ltd. Spatial light modulation device. 5,467,216, Cl. 359-263.000.
Shih, Di-Kon: *See*—
Sun, Jyi-Yu; Chian, Tao; Shih, Di-Kon; and Wang, Chih-Yao, 5,465,782, Cl. 165-104.260.
Shikada, Tsutomu: *See*—
Fujimoto, Kaoru; Shikada, Tsutomu; Yamaoka, Yojiro; and Sumigama, Takashi, 5,466,720, Cl. 518-700.000.
Shimada, Shigeru: *See*—
Kawamura, Fumio; Shimada, Shigeru; and Ikeda, Tsutomu, 5,467,444, Cl. 395-141.000.
Shimadzu Corporation: *See*—
Kumazawa, Yoshihiko; and Tanaka, Kazumi, 5,466,939, Cl. 250-363.040.
Shimakawa, Toshihiro: *See*—
Sugise, Ryoji; Kashiwagi, Kouichi; Shirai, Masashi; and Shimakawa, Toshihiro, 5,466,858, Cl. 558-364.000.
Shimamune, Takayuki; and Nakajima, Yasuo, to Permelec Electrode, Ltd.; and De Nora Permelec S.p.A. Method for electrolyzing aqueous solution of alkali chloride. 5,466,347, Cl. 204-98.000.
Shimamura, Seiichi: *See*—
Konig, Wolfgang; Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Takase, Mitsunori; and Bellamy, Wayne R., 5,466,669, Cl. 514-12.000.
Shimbo, Yutaka: *See*—
Kajimoto, Takeshi; Shimbo, Yutaka; Sato, Katsuyuki; Ogata, Masahiro; Kenmizaki, Kanehide; Kubono, Shouji; Kato, Nobuo; Manita, Kiichi; and Kanamitsu, Michitaro, 5,467,315, Cl. 365-222.000.
Shimizu, Kouichi: *See*—
Sato, Yuji; Honjo, Toshio; Kayamoto, Kanao; Ogata, Masahiro; and Shimizu, Kouichi, 5,466,552, Cl. 430-106.600.
Shimizu, Masahiro; and Tsukamoto, Katsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Method of making semiconductor integrated circuit having isolation oxide regions with different thickness. 5,466,623, Cl. 437-52.000.
Shimizu, Shigeo: *See*—
Shigeta, Masanobu; Imanishi, Dai; and Shimizu, Shigeo, 5,467,216, Cl. 359-263.000.
Shimizu, Tatsuo: *See*—
Shirakura, Yuji; Abe, Hisamasa; Yamashita, Teruo; Shimizu, Tatsuo; Kawahara, Sei; Miyoshi, Takahito; and Nishikawa, Yasuo, 5,466,519, Cl. 428-323.000.
Shimizu, Tetsuo: *See*—
Murphy, Scott; and Shimizu, Tetsuo, 5,466,573, Cl. 435-2.000.
Shimizu, Tetushi; Koda, Munetaka; Shida, Yoshikatsu; Kawaguchi, Jun-ichi; and Kaneko, Yoshio, to Kawasaki Steel Corporation. Process for forming polycrystalline silicon film. 5,466,641, Cl. 437-233.000.
Shimmell, Dennis S., to Nelson Metal Products Corporation. Torque converter and method for producing the same. 5,465,575, Cl. 60-345.000.
Shimoda, Makoto: *See*—
Yamada, Akihiro; Shimoda, Makoto; Nakahara, Masaji; and Yoshioka, Masahiro, 5,467,265, Cl. 364-154.000.
Shimoda, Yoshiaki; and Kimura, Masaji, to Kabushiki Kaisha Kawai Gakki Seisakusho. Stand structure for a keyed instrument. 5,465,644, Cl. 84-423.00R.
Shimohigashi, Katsuhiro: *See*—
Miyazawa, Kazuyuki; Shimohigashi, Katsuhiro; Etoh, Jun; and Kimura, Katsutaka, 5,467,314, Cl. 365-201.000.
Shimokusuzono, Takumi: *See*—
Oki, Yoshio; and Shimokusuzono, Takumi, 5,466,737, Cl. 524-495.000.
Shimomura, Takeshi; Yamada, Kazunori; Morimoto, Yuuki; Kitamura, Naomi; and Miyazawa, Keiji, to Mitsubishi Kasei Corporation. Hepatocyte growth factor activating protease and gene encoding the protease. 5,466,593, Cl. 435-219.000.
Shimomura, Yoshiki: *See*—
Umeda, Yasushi; Motegi, Yasuo; Tomiyama, Tetsuo; Yoshikawa, Hiroyuki; and Shimomura, Yoshiki, 5,467,355, Cl. 364-571.040.
Shimono, Toshihide: *See*—
Yonezawa, Toshio; Mitsui, Kenrou; Nakazima, Makoto; Kinoshita, Mitsuo; Shimono, Toshihide; and Yamamoto, Tsuneo, 5,466,289, Cl. 106-309.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Inoue, Yoshio; Susumu, Sekiguchi; and Kurihara, Yasuo, 5,466,726, Cl. 523-122.000.
Shinohara, Toshio; Yokoo, Akio; Kudo, Muneo; Iwabuchi, Motoaki; and Matsumura, Kazuyuki, 5,466,847, Cl. 556-409.000.
Shinji, Ueno, to Genox Co. Ltd. Granulated agent and catalyst used for oxygen generation. 5,466,391, Cl. 252-186.270.
Shinohara, Kazunori, to Suzuki Kabushiki Kaisha. Carrier for scooter-type vehicle. 5,465,882, Cl. 224-39.000.
Shinohara, Toshio; Yokoo, Akio; Kudo, Muneo; Iwabuchi, Motoaki; and Matsumura, Kazuyuki, to Shin-Etsu Chemical Co., Ltd. Process for preparing hexamethylcyclotrisilazane. 5,466,847, Cl. 556-409.000.
Shinozaki, Kengo; Wakabayashi, Kimihiro; Murakami, Hiroki; and Araki, Masaaki, to Fuji Xerox Co., Ltd. Method and apparatus for cutting plate-shaped brittle material. 5,465,892, Cl. 225-2.000.
Shintani, Dai: *See*—
Murashima, Nobuharu; Ishibashi, Kenji; Shintani, Dai; and Taniguchi, Nobuyuki, 5,467,158, Cl. 354-173.100.
Shiono, Hidemi: *See*—
Itagaki, Hiroyuki; Taniguchi, Yo; Shiono, Hidemi; Takiguchi, Kenji; and Yamamoto, Etsuji, 5,465,719, Cl. 128-653.500.
Shionogi & Co., Ltd.: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Morita, Koichi; Masuko, Michio; Ide, Kinya; and Ueyama, Yoshito, 5,466,661, Cl. 504-253.000.
Shioya, Yasushi; Suzuki, Yuji; Takeuchi, Ken; Yoshino, Koji; and Kawamata, Akira, to Kao Corporation. Siloxane derivatives, producing method thereof and agents including siloxane derivative. 5,466,849, Cl. 556-445.000.
Shipman, Lloyd R., Jr., to International Business Machines Corporation. Method and system for separate data and media maintenance within direct access storage devices. 5,467,361, Cl. 371-40.100.
Shiragami, Hiroshi: *See*—
Honda, Yutaka; Shiragami, Hiroshi; Iwagami, Hisao; and Arai, Masayuki, 5,466,793, Cl. 536-55.300.
Shirai, Masashi: *See*—
Sugise, Ryoji; Kashiwagi, Kouichi; Shirai, Masashi; and Shimakawa, Toshihiro, 5,466,858, Cl. 558-364.000.
Shirai, Seiichiro: *See*—
Mizuno, Fumio; Moriuchi, Noboru; Shirai, Seiichiro; Moroishi, Yutaka; Sunakawa, Makoto; and Kawanishi, Michirou, 5,466,325, Cl. 156-344.000.
Shirai, Shoji; Watanabe, Kenichi; and Wakita, Shoichi, to Hitachi, Ltd. Cathode ray tube with improved resolution. 5,466,983, Cl. 313-414.000.
Shirai, Takashi: *See*—
Iwashita, Shigeo; Ohno, Akihiro; and Shirai, Takashi, 5,467,281, Cl. 364-424.050.
Shiraishi, Masayoshi: *See*—
Sadaki, Akihiro; Shiraishi, Masayoshi; Kawawada, Naoki; and Kawaguchi, Koji, 5,467,120, Cl. 347-171.000.
Shiraishi, Naomasa, to Nikon Corporation. Projection exposure method and apparatus. 5,467,166, Cl. 355-71.000.
Shirakura, Yuji; Abe, Hisamasa; Yamashita, Teruo; Shimizu, Tatsuo; Kawahara, Sei; Miyoshi, Takahito; and Nishikawa, Yasuo, to Fuji Photo Film Co., Ltd. Support for a photographic printing paper and a manufacturing process therefor. 5,466,519, Cl. 428-323.000.
Shoda, Thomas M.: *See*—
Carstens, Robert J.; Gatti, John E.; Shoda, Thomas M.; and Toor, John W., 5,466,172, Cl. 439-509.000.
Shoichi, Katoh: *See*—
Jackson, John E.; Nitta, Hideo; Shoichi, Katoh; Amano, Masahiko; Kurisu, Yasushi; and Ohno, Keiichiro, 5,466,208, Cl. 492-53.000.
Short, Kevin G.: *See*—
Sauter, Bruce M.; Short, Kevin G.; and Beltemacchi, Peter P., 5,465,749, Cl. 137-359.000.
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, to Yozan Inc.; and Sharp Corporation. Circuit for calculating a maximum value. 5,467,030, Cl. 327-58.000.
Shou, Guoliang; Takatori, Sunao; and Yamamoto, Makoto, to Yozan Inc.; and Sharp Corporation. Incrementing and decrementing counter circuits. 5,467,376, Cl. 377-94.000.

Shoun, Mary L.: *See*—
Shull, Naomi S.; and Shoun, Mary L., 5,465,975, Cl. 273-295.000.
Showa Denko K.K.: *See*—
Miura, Shin; Hirose, Youichi; and Sato, Mitsuaki, 5,466,277, Cl. 75-255.000.
Showa Denko Kabushiki Kaisha: *See*—
Watanabe, Naotoshi; Masukawa, Tsuyoshi; Ozaki, Kenji; and Moriwaki, Noboru, 5,466,757, Cl. 525-352.000.
Showa Tansan Co., Ltd.: *See*—
Sudo, Kiyoshi; and Ookubo, Masakazu, 5,465,754, Cl. 137-614.200.
Shubin, Steven A., Sr. Female functional mannequin. 5,466,235, Cl. 600-38.000.
Shull, Naomi S.; and Shoun, Mary L. Dead hand card game and method of use. 5,465,975, Cl. 273-295.000.
Shvartsman, Felix P.: *See*—
Zager, Stephen A.; and Shvartsman, Felix P., 5,466,319, Cl. 156-220.000.
Sieber, Helmut; Schilling, Ferdinand; Hagen, Günter; Kleissendorf, Roland; and Michaelis, Johannes, to Carl Edelmann GmbH; and Bayer Aktiengesellschaft. Folding box with a subdivided interior. 5,465,834, Cl. 206-193.000.
Siegel, Heinz: *See*—
Schmitt, Edgar; Siegel, Heinz; Mergenthaler, Robert; and Deringer, Helmut, 5,466,055, Cl. 303-119.200.
Siegel, Mark D., to Tandy Corporation. System independent timing reference for computer. 5,467,463, Cl. 395-550.000.
Siegele, Stephen H.; Noah, Craig M.; and Gregg, John N., to Advanced Delivery & Chemical Systems, Inc. Chemical refill system for high purity chemicals. 5,465,766, Cl. 141-198.000.
Siemanowski, Werner: *See*—
Jakobson, Gerald; Siemanowski, Werner; and Uhlig, Karl-Heinz, 5,466,719, Cl. 514-785.000.
Siemens Aktiengesellschaft: *See*—
Bauer, Franz; and Schierling, Hubert, 5,467,000, Cl. 318-432.000.
Brunner, Heinrich; and Gerstenmaier, York C., 5,466,951, Cl. 257-137.000.
Draxelmayr, Dieter, 5,467,089, Cl. 341-150.000.
Duerr, Wilhelm; Mikoshiba, Norihiko; and Watanabe, Yutaka, 5,467,017, Cl. 324-318.000.
Kienberger, Helmut, 5,467,387, Cl. 379-167.000.
Liebich, Ernst; Van Houdenhove, Rony; Smoravek, Miroslav; and Flieger, Richard, 5,466,168, Cl. 439-188.000.
Zwack, Eduard, 5,467,059, Cl. 331-70.000.
Siemens Automotive Corporation: *See*—
Hall, Bryan C.; Wieczorek, David P.; Wyant, Gordon H.; Wildeson, Ramond T.; and Nally, Debora E., 5,465,910, Cl. 239-585.400.
Siemens Automotive L.P.: *See*—
Hall, Bryan C., 5,465,911, Cl. 239-585.400.
Siemens Components, Inc.: *See*—
Krause, Robert, 5,466,944, Cl. 250-551.000.
Siemens Energy & Automation, Inc.: *See*—
Faulkner, Nathan H.; and Nordenbrock, Ronald D., 5,466,889, Cl. 174-68.200.
Siemens Medical Systems, Inc.: *See*—
Thomasson, David M., 5,467,016, Cl. 324-309.000.
Siemens Nixdorf Informationssysteme AG: *See*—
Boeck, Vilmar; and Kalhoff, Peter-Paul, 5,467,179, Cl. 355-309.000.
Siiman, Olavi; Burshteyn, Alexander; and Gupta, Ravinder K., to Coulter Corporation. Biodegradable gelatin-aminodextran particle coatings of and processes for making same. 5,466,609, Cl. 436-518.000.
Silbermann, Steven D.: *See*—
Appleton, William J.; Hahn, Dennis; Moucha, William E.; Ruscio, Dominic V.; Shannon, John H.; Silbermann, Steven D.; and Weaver, Edwin W., Jr., 5,466,147, Cl. 425-412.000.
Silicon Graphics, Inc.: *See*—
Gonzalez, Adolpho, 5,465,934, Cl. 248-223.410.
Silicon Systems, Inc.: *See*—
Yamasaki, Richard G.; and Pan, Tzu-Wang, 5,467,370, Cl. 375-232.000.
Silvestrini, Thomas; Mathis, Mark; and Loomas, Bryan, to KeraVision, Inc. Adjustable devices for corneal curvature adjustment. 5,466,260, Cl. 623-5.000.
Silvian, Sergiu, to Pacesetter, Inc. Telemetry receiver for implantable device, incorporating digital signal processing. 5,466,246, Cl. 607-32.000.
Simmons, Stephen P.: *See*—
Carlson, Douglas W.; and Simmons, Stephen P., 5,465,759, Cl. 138-110.000.
Simmons, William W.: *See*—
Heflinger, Lee O.; Simmons, William W.; St. Pierre, Randall J.; and Injeyan, Hagop, 5,467,214, Cl. 359-238.000.
Simms, Paul: *See*—
Jowitt, Frederick W.; and Simms, Paul, 5,465,601, Cl. 72-347.000.
Simonetti, Enrico: *See*—
Misiano, Carlo; Simonetti, Enrico; and Taglioni, Giovanni, 5,466,296, Cl. 118-723.0MP.
Simplimatic Engineering Company: *See*—
Hilbish, Brian K.; Burgess, Arnold C.; and Wilson, Michael A., 5,466,096, Cl. 406-84.000.
Simpson, William H.: *See*—
Harrison, Daniel J.; Simpson, William H.; Bowman, Wayne A.; Lawrence, Kristine B.; and Weber, Helmut, 5,466,658, Cl. 503-227.000.
Sims, Ronald L., to Ford Motor Company. Energy transfer device and method. 5,467,006, Cl. 320-22.000.
Singaram, Bakthan; Fisher, Gary B.; Fuller, Joseph C.; Harrison, John; and Goralski, Christian T., to University of California, The Regents of the. Synthesis of lithium aminoborohydrides and reactions thereof. 5,466,798, Cl. 540-541.000.
Singer, Stephen P.: *See*—
Kapp, Daniel L.; Ross, Robert J.; Younathan, Janet N.; and Singer, Stephen P., 5,466,568, Cl. 430-551.000.
Singh, Alok, to United States of America, Navy. Liposomes containing polymerized lipids for non-covalent immobilization of proteins and enzymes. 5,466,467, Cl. 424-450.000.
Singhal, Dave M.: *See*—
Smith, Stephen A.; Richter, Bryan; and Singhal, Dave M., 5,467,042, Cl. 327-293.000.
Singhbansal, Harjinder; and Ormrod, John C., to Zeneca Limited. Use of 4-chloro-3-(4-chloro-2-fluorophenyl)-5-difluoromethoxy-1-methyl-1H-pyrazole as an herbicidal treatment. 5,466,662, Cl. 504-202.000.
Sinnett, Kevin: *See*—
Weiner, Alan L.; Sinnett, Kevin; and Johnson, Sterling, 5,466,233, Cl. 604-890.100.
Sisley, Elizabeth M.; and Collins, John E., to Minnesota Mining and Manufacturing Company. Method for resource assignment and scheduling. 5,467,268, Cl. 364-401.000.
Sitton, Oliver C.: *See*—
Stoffer, James O.; and Sitton, Oliver C., 5,466,722, Cl. 522-51.000.
Sizemore, Sean S. Cup-type vending system. 5,465,870, Cl. 222-2.000.
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., to ThermoKing Corporation. Methods and apparatus for operating a refrigeration system characterized by controlling engine coolant. 5,465,586, Cl. 62-84.000.
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., to Thermo King Corporation. Methods and apparatus for operating a refrigeration system characterized by controlling engine coolant. 5,465,587, Cl. 62-84.000.
Skalski, Clement A., to Otis Elevator Company. Electromagnet control system. 5,467,243, Cl. 361-143.000.
Skatrud, Thomas J.: *See*—
Jacobson, Gunnard K.; Jolly, Setsuko O.; Sedmak, Joseph J.; Skatrud, Thomas J.; and Wasileski, John M., 5,466,599, Cl. 435-255.100.
Skelton, John: *See*—
Schmitt, Peter J.; Brookstein, David S.; and Skelton, John, 5,466,257, Cl. 623-1.000.
Skinner, David A.; and Pearson, Mark L., to Deere & Company. Precleaner for a cleaning shoe. 5,466,190, Cl. 460-101.000.
Skinner, Russell A., Sr., to U S West Advanced Technologies, Inc. Method and apparatus for providing power to a coaxial cable network. 5,467,384, Cl. 379-56.000.
Skogberg, Bo T., to Soilex AB. Method of installing a soil anchor and a soil anchor. 5,465,535, Cl. 52-156.000.
Skokowski, Richard: *See*—
Lapinski, Charles; Eckert, Charles; Skokowski, Richard; Cox, James; Scott, William; Chaleff, Edward; Sharpe, Jeffrey G.; and Wurz, David A., 5,466,921, Cl. 235-462.000.
SKW Trostberg Aktiengesellschaft: *See*—
Heidlas, Jürgen; Cully, Jan; Michlbauer, Franz; and Vollbrecht, Heinz-Rüdiger, 5,466,842, Cl. 554-83.000.
Slater, Andrew E.: *See*—
Cidon, Israel; Georgiadis, Leonidas; Guerin, Roch A.; Shavitt, Yuval Y.; and Slater, Andrew E., 5,467,352, Cl. 370-85.500.
Slidex Corporation: *See*—
Ozeki, Jiro, 5,466,008, Cl. 281-31.000.
Sligar, Stephen G.: *See*—
Olinger, Jill M.; Sligar, Stephen G.; McLean, Mark A.; Bohn, Paul W.; and Stayton, Patrick, 5,466,589, Cl. 435-174.000.
Slightom, Jerry L.; Tepfer, David A. (Frx), to Mycoen Plant Science, Inc. RI T-DNA Promoters. 5,466,792, Cl. 536-23.700.
Sliwa, John W., Jr.; Cooper, Thomas G.; and Ayter, Sevig, to Acuson Corporation. Compact rotationally steerable ultrasound transducer. 5,465,724, Cl. 128-662.030.
Sliwa-Hähnle, Karin: *See*—
Blitstein-Willinger, Eveline; and Sliwa-Hähnle, Karin, 5,466,713, Cl. 514-573.000.
Sloan, George A.: *See*—
Ward, Bennie R., Jr.; Levy, Sander A.; and Sloan, George A., 5,466,312, Cl. 148-551.000.
Sloan-Kettering Institute for Cancer Research: *See*—
Tempst, Paul; and Casteels, Peter, 5,466,671, Cl. 514-13.000.
Slocum, Alexander, to Advanced Engineering Systems, Operations & Products, Inc. High speed hydrostatic spindle design. 5,466,071, Cl. 384-110.000.
Slovak, Steven M.: *See*—
Check, Joseph A., III; Saxe, Robert L.; Thompson, Robert I.; Forlini, Matthew; and Slovak, Steven M., 5,467,217, Cl. 359-296.000.
Smart, Grover C., Jr.; and Nguyen, Khuong B., to University of Florida Research Foundation, Inc. Biological control of orthoptera pest insects. 5,466,448, Cl. 424-93.100.
Smayling, Michael C.: *See*—
D'Arrigo, Iano; Falessi, Georges; and Smayling, Michael C., 5,467,307, Cl. 365-185.060.
SMH Management Services AG: *See*—

Juillerat, Jean-Charles, 5,467,325, Cl. 368-276.000.
Stoll, Daniel; and Clauss, Daniel, 5,467,080, Cl. 340-825.310.

Smit, Nicolaas: *See—*
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., 5,466,575, Cl. 435-6.000.

Smith, Abram W. Purse assembly. 5,465,889, Cl. 224-224.000.

Smith, Bruce: *See—*
Blyth, David; Granovsky, David; Ledger, Greg; and Smith, Bruce, 5,465,846, Cl. 206-554.000.

Smith, Desroy D.: *See—*
Rice, Chris A.; Gazzola, Alain J.; Smith, Desroy D.; Evans, John T.; and Dawson, Andrew W., 5,465,443, Cl. 15-246.000.

Smith, Dresden G. Positioning fixture for welding operations having a lockable ball joint. 5,465,946, Cl. 269-75.000.

Smith, Edward W.: *See—*
Sutrina, Thomas; Crowe, Lawrence E.; Smith, Edward W.; Peterson, Ronald F.; and Hoppe, Richard J., 5,466,974, Cl. 307-38.000.

Smith, Garrick D. S.: *See—*
Smith, Gary W. H.; and Smith, Garrick D. S., 5,465,605, Cl. 73-7.000.

Smith, Gary W. H.; and Smith, Garrick D. S. Floor covering foot impact simulator. 5,465,605, Cl. 73-7.000.

Smith, Ian H.: *See—*
Weston, John B.; Larkin, John P.; and Smith, Ian H., 5,466,710, Cl. 514-452.000.

Smith, Jay, III. Interactive book device. 5,466,158, Cl. 434-317.000.

Smith, Jeffrey A., to Squire Corrugated Container Corp. Transport/display package. 5,465,831, Cl. 206-44.00R.

Smith, Julius O., III: *See—*
Van Duyne, Scott A.; and Smith, Julius O., III, 5,466,884, Cl. 84-661.000.

Smith, Mary A. Sliding glass door privacy screens. 5,465,774, Cl. 160-90.000.

Smith, Matthew T.: *See—*
Connolly, Christopher J.; Lawrence, Thomas H.; Mankaukas, Joseph J.; Pawlowski, John J.; and Smith, Matthew T., 5,465,925, Cl. 244-137.100.

Smith, Michael J., to Arrow Art Finishers, Inc. Suspension-type display stand. 5,465,851, Cl. 211-59.100.

Smith, Ronald W.: *See—*
McCune, Robert C., Jr.; Kim, Michael R.; and Smith, Ronald W., 5,466,906, Cl. 219-121.470.

Smith, Sarah J.: *See—*
Glase, Shelly; Jaen, Juan C.; Smith, Sarah J.; and Wise, Lawrence D., 5,466,698, Cl. 514-318.000.

Smith, Stephen A.; Richter, Bryan; and Singhal, Dave M., to Cirrus Logic, Inc. Low power clocking apparatus and method. 5,467,042, Cl. 327-293.000.

Smith, Stephen J.: *See—*
McClarron, Andrew R.; Smith, Stephen J.; Watson, Derrick J.; Williams, Bruce L.; and Ross, Euan S., 5,466,876, Cl. 562-608.000.

Smith, Tracy L.: *See—*
Schroepfer, Richard C.; and Smith, Tracy L., 5,466,162, Cl. 439-79.000.

Smith, Walter C.; and Mooney, Thomas R., to Hi-Shear Technology Corporation. Rescue chopping tool. 5,465,490, Cl. 30-180.000.

Smith, Wilfred W., to Dunlop Limited. Vehicle suspension system. 5,466,007, Cl. 280-840.000.

Smithers, Matthew C., to Thermalloy, Inc. Hooked spring clip. 5,466,970, Cl. 257-712.000.

Smoravek, Miroslav: *See—*
Liebich, Ernst; Van Houdenhove, Rony; Smoravek, Miroslav; and Flieger, Richard, 5,466,168, Cl. 439-188.000.

Snaphaan, Paul G.: *See—*
Van Koelen, Gijsbertus A.; Snaphaan, Paul G.; and Rhebergen, Gertjan, 5,467,371, Cl. 375-241.000.

Snelling, Bryan A. L.: *See—*
Ishikawa, Takatoshi; and Snelling, Bryan A. L., 5,466,563, Cl. 430-309.000.

Snelling, Christopher, to Xerox Corporation. Electrostatic color printing system with sonic toner release development. 5,467,183, Cl. 355-326.00R.

Snorex, Inc.: *See—*
Alvarez, Ramiro M.; and Lea, Susan J., 5,465,734, Cl. 128-848.000.

Snyder, Brian T.: *See—*
Parker, Todd S.; Snyder, Brian T.; and Fulmer, Brian H., 5,466,420, Cl. 422-164.000.

Snyder, Fred E.: *See—*
Clark, George A.; Burwell, Malcolm C.; Gola, John A.; Robinson, Christopher; and Snyder, Fred E., 5,465,894, Cl. 227-175.000.

Sobottke, Mark D.; and Klemer, Daniel R., to Spectra-Physics Laserplane, Inc. Pipe alignment apparatus and method using green light. 5,465,493, Cl. 33-286.000.

Societa Italiana Vetro - SIV S.p.A.: *See—*
De Lena, Oscar, 5,466,037, Cl. 296-211.000.

Societe Anonyme Dite: Alcatel Cit: *See—*
Boivin, Jean-Claude; Chollet, Jean-Emile; Falcoz, Pierre; and Mathieu, Luc, 5,466,119, Cl. 415-90.000.

Societe Elf Atochem S.A.: *See—*
Correia, Yves, 5,466,650, Cl. 502-185.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA": *See—*
Charbonnel, Jean-Louis; Guerout, Philippe; Happey, Jacques L.; Mainfroy, Frédéric G. J.; Naudet, Jacky; and Porcher, Jean-Claude, 5,466,122, Cl. 415-160.000.

Sofia, Giuseppe: *See—*
Levaro, Mauro; and Sofia, Giuseppe, 5,465,825, Cl. 198-444.000.

Soga, Hiroh: *See—*
Akutsu, Eiichi; Soga, Hiroh; Ando, Shigehito; Hirakata, Susumu; and Maruyama, Kazuo, 5,466,654, Cl. 503-206.000.

Soga, Mamoru: *See—*
Ogawa, Kazufumi; Mino, Norihisa; and Soga, Mamoru, 5,466,486, Cl. 427-352.000.
Ogawa, Kazufumi; Mino, Norihisa; and Soga, Mamoru, 5,466,523, Cl. 428-333.000.

Sohn, Ki S., to Goldstar Electron Co., Ltd. Vertical synchronous signal separation apparatus. 5,467,140, Cl. 348-529.000.

Soilex AB: *See—*
Skogberg, Bo T., 5,465,535, Cl. 52-156.000.

Solar Wide Industrial Ltd.: *See—*
Shalvi, Ram, 5,467,257, Cl. 362-183.000.

Solomon, Dan: *See—*
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.

Solomon, David; Putnins, Zigmunds A.; Gish, David W.; and Mendelson, Jeffrey B., to Ascom Timeplex Trading AG. Packet data transmission with asynchronous bandwidth switching. 5,467,344, Cl. 370-58.300.

Soloway, Albert H.; Barth, Rolf F.; Anisuzzaman, Abul K.; Tjarks, Werner; Rong, Feng-Guang; and Wyzlic, Iwona M., to Ohio State University Research Foundation, The. Carboranyl uridines and their use in boron neutron capture therapy. 5,466,679, Cl. 514-50.000.

Solvay Fluor und Derivate GmbH: *See—*
Jakobson, Gerald; Siemanowski, Werner; and Uhlig, Karl-Heinz, 5,466,719, Cl. 514-785.000.

Solvay Interox Limited: *See—*
Carr, Graham; Harrison, Paul R.; and James, Alun P., 5,466,825, Cl. 548-479.000.

Somanetics Corporation: *See—*
Scheuing, Richard S., 5,465,714, Cl. 128-633.000.

Sone, Takahiro, to Star Micronics Co., Ltd. Electroacoustic transducer. 5,467,323, Cl. 367-175.000.

Sone, Takumi: *See—*
Sato, Yukihiro; Sone, Takumi; Nagata, Sachio; Sakata, Tetsuhiro; Demizu, Kei; and Tanaka, Shinichi, 5,466,305, Cl. 148-222.000.

Sonerud, John T. Device for quick connection of hydraulic tubings. 5,465,513, Cl. 37-468.000.

Song, Kiseok, to Daewoo Electronics Co., Ltd. Disk chucking apparatus of a disk player. 5,467,338, Cl. 369-270.000.

Sönksen, Peter H.: *See—*
Dunger, David B.; Savage, Martin O.; and Sönksen, Peter H., 5,466,670, Cl. 514-12.000.

Sony Corporation: *See—*
Ando, Nobuhiko; and Fujiie, Kazuhiko, 5,467,336, Cl. 369-112.000.
Fujisawa, Hirotoshi, 5,467,239, Cl. 360-133.000.
Gotoh, Hiroyuki, 5,466,984, Cl. 313-477.00R.
Hashimoto, Minoru, 5,467,329, Cl. 369-48.000.
Kiyomiya, Tadashi; Ohoshi, Toshio; and Okita, Masami, 5,466,358, Cl. 205-96.000.
Takahashi, Tomoyuki, 5,467,237, Cl. 360-114.000.
Tsurushima, Katsuaki, 5,467,332, Cl. 369-72.000.
Yamamoto, Takao, 5,467,409, Cl. 382-285.000.

Sony Electronics, Inc.: *See—*
Capitant, Patrice J.; and Collier, David C., 5,467,412, Cl. 382-167.000.

Soper, Richard C.: *See—*
Freeman, Dennis R.; and Soper, Richard C., 5,466,522, Cl. 428-332.000.

Sorensen, Ian: *See—*
Glaunsinger, William; Sorensen, Ian; Bao, Qingcheng; and McKelvy, Michael J., 5,466,605, Cl. 436-6.000.

Sotack, John D.; Dezen, William L.; Benedict, Lawrence R.; Zayed, Gaith O.; and Werner, Alan J., Jr., to Xerox Corporation. Capacitive sensor. 5,465,619, Cl. 73-304.00C.

Soukup, Thomas M.; and Staley, Richard A., to W. L. Gore & Associates, Inc. Implantable lead. 5,466,252, Cl. 607-116.000.

Sously, Wayne E.: *See—*
Kass, John J.; Hoopes, Philip K.; Sously, Wayne E.; and Aspinall, Graeme H., 5,465,991, Cl. 280-457.000.

Sowinski, Allan F.; Szajewski, Richard P.; and Merrill, James P., to Eastman Kodak Company. Limited use cameras and films. 5,466,560, Cl. 430-347.000.

Spagnoli, Robert A.; and Janson, Philip D., to Ford Motor Company. Window assembly and method for electrically heating vehicle side lite. 5,466,911, Cl. 219-203.000.

Spain, James: *See—*
Williams, Norman; and Spain, James, 5,467,013, Cl. 324-127.000.

Spara, Paul P.: *See—*
Bacon, Edward R.; Daum, Sol J.; and Spara, Paul P., 5,466,433, Cl. 424-9.451.

Spector, George: *See—*
Armijo, Orlando M.; and Spector, George, 5,465,878, Cl. 222-181.200.
Davis, Carl L.; and Spector, George, 5,465,430, Cl. 29-267.000.

Guzman, Paulino A.; and Spector, George, 5,465,940, Cl. 254-423.000.

Spectra-Physics Laserplane, Inc.: *See*—
Sobottke, Mark D.; and Klemer, Daniel R., 5,465,493, Cl. 33-286.000.

Spehrley, Charles W., Jr.: *See*—
Malachowski, Michael; Spehrley, Charles W., Jr.; Thomas, Dean; Remus, Michelle; and Schaffer, Robert R., 5,467,180, Cl. 355-312.000.

Speliotis, Dennis E.: *See*—
Hoshi, Youichi; Speliotis, Dennis E.; and Judy, Jack H., 5,466,524, Cl. 428-336.000.

Spichtinger, Rudolf: *See*—
Wallau, Martin; Spichtinger, Rudolf; Unger, Klaus K.; Tissler, Arno; and Thome, Roland, 5,466,432, Cl. 423-700.000.

Spielmannleitner, Rudolf: *See*—
Deller, Klaus; Moesinger, Hans; Mueller, Herbert; Riedl, Josef; Kuehn, Wenzel; and Spielmannleitner, Rudolf, 5,466,421, Cl. 422-171.000.

Spiewak, John W.: *See*—
Yuh, Huoy-Jen; Spiewak, John W.; Tarnawskyj, Christine J.; Grammatica, Steven J.; Chen, Cindy C.; and Teuscher, Leon A., 5,466,551, Cl. 430-63.000.

Spindler, Felix; Wirth-Tijani, Amina; and Landert, Heidi, to Ciba-Geigy Corporation. Ferrocene diphosphines as ligands for homogeneous catalysts. 5,466,844, Cl. 556-11.000.

Spinelli, Julio C.; and Heemels, Jan P., to Cardiac Pacemakers, Inc. Method and apparatus to continuously optimize the A-V delay in a dual chamber pacemaker. 5,466,245, Cl. 607-17.000.

Spira, Joel S.: *See*—
Jacobs, Russel J.; Pierce, Brett A.; and Spira, Joel S., 5,467,266, Cl. 364-167.010.

Spooner, James J. Cards used as both coupons and playing cards and their method of manufacture and use. 5,466,010, Cl. 283-67.000.

Sportsman, John R.: *See*—
Bright, Stuart W.; Gold, Gerald; Sage, Scott W.; and Sportsman, John R., 5,466,610, Cl. 436-518.000.

Spowage, Mark J.; Grayson, Julia P.; Outhwaite, Alan C.; and Ahmed, Nighat, to Morgan Crucible Company PLC, The. Electrostatic spray paint. 5,466,736, Cl. 524-315.000.

Spraggins, Gary L.; Abresch, Martin J.; Newton, William B.; and Yee, Renwin J., to Motorola, Inc. Resistor structure and method of setting a resistance value. 5,466,484, Cl. 437-228.000.

Spranger, Doug: *See*—
Allen, William J.; Stein, Jeffrey A.; DiCesare, Paul; Mulhauser, Paul; and Spranger, Doug, 5,465,896, Cl. 227-176.000.

Springer, Johannes, to Heidelberger Druckmaschinen AG. Device for trouble-free conveyance of products in a folding apparatus. 5,466,212, Cl. 493-434.000.

Springs Window Fashions Division, Inc.: *See*—
Biba, Scott L.; and Genova, John R., 5,465,775, Cl. 160-168.100.

Square D Company: *See*—
Faber, Timothy R.; and Wong, Tak M., 5,466,903, Cl. 200-400.000.
Pyle, Michael W.; and Wallis, Lee D., 5,467,286, Cl. 364-483.000.

Squire Corrugated Container Corp.: *See*—
Smith, Jeffrey A., 5,465,831, Cl. 206-44.00R.

Srchem, Inc.: *See*—
Wood, Louis L., 5,466,760, Cl. 525-435.000.

SRI International: *See*—
Dawson, Marcia L.; Cameron, James F.; Hobbs, Peter D.; Jong, Ling; Pfahl, Magnus; Zhang, Xiao-kun; and Lehmann, Jürgen M., 5,466,861, Cl. 560-100.000.

Srisathapat, Chad; and Indravudh, Virote, to MiniMed, Inc. Method of cleaning an implanted medication infusion pump with discharge side port. 5,466,218, Cl. 604-49.000.

Stabile, David J., to Miller/Zell, Inc. Valance assembly. 5,465,516, Cl. 40-649.000.

Stables, Roger, to Glaxo Group Limited. Medicaments for treating inflammatory conditions or for analgesia. 5,466,436, Cl. 514-161.000.

Staebler, Manfred-Wilhelm: *See*—
Kirn, Manfred; Borst, Erich; Schaal, Guenter; Staebler, Manfred-Wilhelm; and Eicher, Bernard, 5,466,183, Cl. 451-359.000.

Stagnitti, Brian M., to Cooper Industries, Inc. Expansion joint for an electrical conduit which is electrically grounded through the expansion joint. 5,466,890, Cl. 174-84.00R.

Stahl, Joel S. Environmental non-toxic encasement systems for covering in-place asbestos and lead paint. 5,466,489, Cl. 427-421.000.

Stahlecker, Fritz, to Hans Stahlecker. Two-apron drafting unit comprising at least one sliver guide. 5,465,465, Cl. 19-292.000.

Stalder, Henri: *See*—
Derungs, Romano; Märki, Hans P.; Stalder, Henri; and Szeate, André, 5,466,708, Cl. 514-449.000.

Staley, Richard A.: *See*—
Soukup, Thomas M.; and Staley, Richard A., 5,466,252, Cl. 607-116.000.

Stamprech, Peter: *See*—
Römer, Michael; Schleicher, Andreas; and Stamprech, Peter, 5,466,738, Cl. 524-508.000.

Stancel, George M.: *See*—
Booth, Frank W.; Thomason, Donald B.; Morrison, Paul R.; and Stancel, George M., 5,466,676, Cl. 514-44.000.

Standard Keil Industries, Inc.: *See*—
Wang, Yushan, 5,465,750, Cl. 137-484.800.

Standard Oil Co., The: *See*—
Paparizos, Christos; Suresh, Dev D.; and Lemanski, Michael F., 5,466,652, Cl. 502-330.000.
Reiling, Vincent G.; Rinker, Jeffrey E.; McDonel, Timothy R.; and Sarna, Joseph C., 5,466,857, Cl. 558-319.000.

Staniszewski, Tadeusz, to Shap, Inc. Envelope-flap sealing device. 5,466,327, Cl. 156-44 500.

Stanker, Larry H.; Elissalde, Marcel H., Jr.; Beier, Ross C.; Rowe, Loyd D., Jr.; and DeLoach, John R., to United States of America, Agriculture. Monoclonal antibodies to salinomycin and method for detecting the same. 5,466,784, Cl. 530-388.900.

Stapensea, Neil P.: *See*—
Roach, Matthew N.; Stapensea, Neil P.; and Webster, Jon, 5,465,874, Cl. 222-51.000.

Star Micronics Co., Ltd.: *See*—
Sone, Takahiro, 5,467,323, Cl. 367-175.000.

State of Israel, Ministry of Defence, Rafael Armament Development Authority: *See*—
Faibish, Sorin; Yahav, Giora; and Djerassi, Shlomo, 5,467,273, Cl. 364-424.020.

Stayton, Patrick: *See*—
Olinger, Jill M.; Sligar, Stephen G.; McLean, Mark A.; Bohn, Paul W.; and Stayton, Patrick, 5,466,589, Cl. 435-174.000.

Steele, Charles G.: *See*—
McDonald, William J.; Pittard, Gerard T.; Steele, Charles G.; Kiefer, Karl F.; Clifton, Terry P.; and Leitko, Curtis E., 5,467,083, Cl. 340-854.600.

Stegehuis, Herman: *See*—
De Jonge, Dirk J. A.; and Stegehuis, Herman, 5,467,380, Cl. 378-98.200.

Stegens, Alfred H., to Scott Fetzer Company, The. Brushroll. 5,465,451, Cl. 15-179.000.

Stein, Daryl L., to Elf Atochem North America, Inc. Functionalized peroxides for polymerization reactions. 5,466,855, Cl. 558-263.000.

Stein, Jeffrey A.: *See*—
Allen, William J.; Stein, Jeffrey A.; DiCesare, Paul; Mulhauser, Paul; and Spranger, Doug, 5,465,896, Cl. 227-176.000.

Steinberg, John D.; and Saltzman, Eric T., to Bebop Incorporated. Jockey wheel assembly. 5,466,194, Cl. 474-80.000.

Steinberg, Robert M.; and Strickland, John C., to Texaco Inc. Process and system for catalyst addition to an ebullated bed reactor. 5,466,362, Cl. 208-157.000.

Steiner, Timothy L. Tire lifter apparatus. 5,466,026, Cl. 294-17.000.

Steinmetz, Eberhard: *See*—
Wilhelmi, Herbert; Steinmetz, Eberhard; and Peters, Klaus, 5,467,366, Cl. 373-85.000.

Stelter, Michael: *See*—
Brücken, Volker; Pötzschke, Manfred; Langner, Bernd; and Stelter, Michael, 5,466,352, Cl. 204-182.400.

Stenograph Corporation: *See*—
McCready, Keith A., 5,466,072, Cl. 400-91.000.

Stepan Company: *See*—
Diez, Ricardo; Pidnebesny, John; and Ng, Susanna, 5,466,393, Cl. 252-307.000.

Stephens, Raymond B.: *See*—
Page, Ronald C.; Bushnell, John J.; and Stephens, Raymond B., 5,465,944, Cl. 267-217.000.

Sterling, Jeff; and Herzig, Yaacov, to Teva Pharmaceutical Industries Ltd. Water-soluble analogs of carbamazepine. 5,466,683, Cl. 514-80.000.

Sterling Plumbing Group, Inc.: *See*—
Sauter, Bruce M.; Short, Kevin G.; and Beltemacchi, Peter P., 5,465,749, Cl. 137-359.000.

Sterling Winthrop Inc.: *See*—
Baker, Edward J.; Bacon, Edward R; Illig, Carl R.; Caulfield, Thomas J.; Douty, Brent D.; Josef, Kurt A.; Toner, John L.; and Lee, Robert W., 5,466,435, Cl. 424-9.450.
Hlasta, Dennis J.; Ackerman, James H.; Mura, Albert J.; and Desai, Ranjit C., 5,466,701, Cl. 514-373.000.
Washburn, William N.; Lussier, Barbara B.; Illig, Carl R.; and Latimer, Lee H., 5,466,715, Cl. 514-618.000.

Stern, Martin L., to Orthotic Rehabilitation Products, Inc. Inflatable hand orthosis. 5,466,202, Cl. 482-47.000.

Steuart, Gary M.: *See*—
Huffstutler, Miles C., Jr.; and Steuart, Gary M., 5,466,455, Cl. 424-401.000.

Stevens, Donald M.: *See*—
Nakamura, Shinya; Yamaguchi, Tsutomu; Dietl, Steven J.; and Stevens, Donald M., 5,467,116, Cl. 347-50.000.

Stewart, Harry E.; and MacElwee, Donald B., to POWSUS, Inc. Fire extinguishing compositions. 5,466,386, Cl. 252-2.000.

Stewart, Ronald L.: *See*—
Burt, John R.; Szabo, Kenneth A.; and Stewart, Ronald L., 5,466,320, Cl. 156-244.190.

Stickel, Werner: *See*—
Pfeiffer, Hans C.; and Stickel, Werner, 5,466,904, Cl. 219-121.250.

Stiefel Laboratories, Inc.: *See*—
Stiefel, Werner K.; and Popp, Karl F., 5,466,446, Cl. 424-78.370.

Stiefel, Werner K.; and Popp, Karl F., to Stiefel Laboratories, Inc. Topical compositions containing bensoyl peroxide and clindamycin and method of use thereof. 5,466,446, Cl. 424-78.370.

Stille, Mats O.: *See*—
Peltonen, Ari; Åström, Bo A. V.; Gandils, Mars V.; Stille, Mats O.; and Lantto, Sven J., 5,467,381, Cl. 379-58.000.

Stills, James T.: *See*—
Nair, Parameswaran B.; Choudhuri, Kumar S.; Stills, James T.; and Evans, John C., 5,466,920, Cl. 235-449.000.
Stobbart, John, to Techlok Limited. Seal ring and joint. 5,466,018, Cl. 285-334.200.
Stoddard, Hannis L., III: *See*—
Weoldridge, Sammy E.; Yoakum, Jay F.; and Stoddard, Hannis L., III, 5,465,556, Cl. 53-468.000.
Stoddard, Robert B.: *See*—
Page, Jon P.; and Stoddard, Robert B., 5,466,020, Cl. 285-361.000.
Stoffer, James O.; and Sitton, Oliver C. Ultrasonic polymerization process. 5,466,722, Cl. 522-51.000.
Stoll, Daniel; and Clauss, Daniel, to SMH Management Services AG. Security arrangement intended for opening and/or closing of doors in particular for an automotive vehicle. 5,467,080, Cl. 340-825.310.
Stone & Wood, Inc.: *See*—
Lansberry, John B., 5,465,770, Cl. 144-336.000.
Lansberry, John B., 5,465,771, Cl. 144-343.000.
Stone, Maureen C.; and DeRose, Anthony, to Xerox Corporation. Method for operating on objects in a first image using an object-based model data structure to produce a second contextual image having added, replaced or deleted objects. 5,467,441, Cl. 395-133.000.
Stones, Kevin: *See*—
Bone, Daniel; and Stones, Kevin, 5,466,106, Cl. 411-433.000.
St. Pierre, Randall J.: *See*—
Heflinger, Lee O.; Simmons, William W.; St. Pierre, Randall J.; and Injeyan, Hagop, 5,467,214, Cl. 359-238.000.
Strack, Kurt-Martin: *See*—
Ruter, Horst; and Strack, Kurt-Martin, 5,467,018, Cl. 324-336.000.
Straeter, Joseph G.: *See*—
Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., 5,465,552, Cl. 53-399.000.
Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., 5,465,553, Cl. 53-399.000.
Straeter, William F.: *See*—
Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., 5,465,552, Cl. 53-399.000.
Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., 5,465,553, Cl. 53-399.000.
Strauss, Brian: *See*—
Brown, Jack W.; Strauss, Brian; and White, George W., 5,466,216, Cl. 604-33.000.
Strauss, Carl R.: *See*—
Gavin, Patrick M.; Schelhorn, Jean E.; Aschenbeck, David P.; and Strauss, Carl R., 5,466,504, Cl. 428-74.000.
Strickland, John C.: *See*—
Steinberg, Robert M.; and Strickland, John C., 5,466,362, Cl. 208-157.000.
Stringer, Orum: *See*—
Gaffar, Abdul; Nabi, Nuran; Afflitto, John; and Stringer, Orum, 5,466,437, Cl. 424-52.000.
Stroeters, Kurt H.; Clark, Dean B.; and DeGrendel, Glen A., to Chrylser Corporation. Vehicle wire routing apparatus. 5,466,036, Cl. 296-208.000.
Stromme, Lars R.: *See*—
Raterman, Donald E.; Graves, Bradford T.; Stromme, Lars R.; and Bauch, Aaron M., 5,467,405, Cl. 382-135.000.
Stuart, Wolf: *See*—
Zeevi, Yehoshua Y.; Ginosar, Ran; and Stuart, Wolf, 5,467,123, Cl. 348-34.000.
Sturm, Albert J.; and Marrinan, Thomas E., to Par Systems, Inc. Telescoping tube assembly. 5,465,854, Cl. 212-319.000.
Subramoney, Shekhar: *See*—
Fitzpatrick-McElligott, Sandra G.; Lavin, John G.; Rivard, Germain F.; and Subramoney, Shekhar, 5,466,587, Cl. 435-172.100.
Sudenga Industries, Inc.: *See*—
Kruse, Larry D., 5,465,829, Cl. 198-538.000.
Sudo, Kiyoshi; and Ookubo, Masakazu, to Showa Tansan Co., Ltd.; and Daito Valve Seisakusho Co., Ltd. Valve arrangement. 5,465,754, Cl. 137-614.200.
Sudor Partners: *See*—
Schoendorfer, Donald W., 5,465,713, Cl. 128-632.000.
Sugamura, Kunio: *See*—
Toyoda, Seiji; Sugamura, Kunio; and Yoshida, Hideaki, 5,466,488, Cl. 427-376.200.
Sugawara, Hideto; and Itaya, Kazuhiko, to Kabushiki Kaisha Toshiba. Semiconductor light emitting device with short wavelength light selecting means. 5,466,950, Cl. 257-94.000.
Sugise, Ryoji; Kashiwagi, Kouichi; Shirai, Masashi; and Shimakawa, Toshihiro, to Ube Industries, Ltd. Method of producing straight-chain acrylonitrile dimers. 5,466,858, Cl. 558-364.000.
Sugishima, Yoshio: *See*—
Okumura, Keiji; Aoki, Takeshi; Sugishima, Yoshio; Hayama, Satoru; Taguchi, Keiichi; Iwase, Yuichiro; and Okamoto, Noriaki, 5,465,947, Cl. 270-58.000.
Sugitani, Sinzi; Tanimizu, Toru; Takematsu, Koutarou; Wakasa, Fumio; and Izumi, Toshiaki, to Hitachi, Ltd. Power receiving system. 5,467,241, Cl. 361-63.000.
Sugiyama, Mizuho, to Toyota Jidosha Kabushiki Kaisha. Electric control apparatus for four-wheel steering system. 5,467,278, Cl. 364-424.050.
Sullivan, James B.; and Wilson, Michael L., to TDW Delaware, Inc. Cutter shell for forming holes of improved cylindricality. 5,466,099, Cl. 408-200.000.
Sullivan, Lawrence B.: *See*—
Henderson, Gerald J.; Johnson, Peter C.; and Sullivan, Lawrence B., 5,466,157, Cl. 434-299.000.
Sulzer-Escher Wyss GmbH: *See*—
Holik, Herbert; Leitenberger, Werner; and Pinter, Reinhard, 5,465,502, Cl. 34-115.000.
Sulzer Rueti AG: *See*—
Egloff, Anton, 5,465,763, Cl. 139-196.200.
Sum, Phaik-Eng; Lee, Ving J.; and Testa, Raymond T., to American Cyanamid Company. 7-(substituted)-9-[(substituted glycyl)amido]-6-demethyl-6-deoxytetracyclines. 5,466,684, Cl. 514-152.000.
Sumi, Tatsumi: *See*—
Hirano, Hiroshige; Sumi, Tatsumi; Moriwaki, Nobuyuki; and Nakane, George, 5,467,302, Cl. 361-145.000.
Sumida, Yukihiro: *See*—
Hatano, Akitsugu; Okazaki, Tsuyoshi; Sumida, Yukihiro; Nojima, Takashi; and Yamashita, Hidehiko, 5,467,204, Cl. 358-482.000.
Sumigama, Takashi: *See*—
Fujimoto, Kaoru; Shikada, Tsutomu; Yamaoka, Yojiro; and Sumigama, Takashi, 5,466,720, Cl. 518-700.000.
Sumitomo Chemical Company, Limited: *See*—
Hiratsuka, Mitsunori; Takano, Minoru; Enomoto, Masayuki; Kizawa, Satoru; and Saitoh, Kazuo, 5,466,663, Cl. 504-286.000.
Kudoh, Kichizo; Kikuchi, Yasuo; Ishida, Tatsuya; Ikeda, Tatsufumi; and Fujimoto, Hiroaki, 5,466,703, Cl. 514-374.000.
Murahashi, Shun-Ichi; and Oda, Yoshiaki, 5,466,838, Cl. 549-533.000.
Seko, Shinzo, 5,466,871, Cl. 564-395.000.
Sumitomo Chemical Co., Ltd.: *See*—
Takahira, Akitoshi; and Yoshii, Yuuzi, 5,466,735, Cl. 524-273.000.
Sumitomo Electric Industries, Ltd.: *See*—
Inada, Hiroshi; Nakamura, Takao; and Iiyama, Michitomo, 5,466,664, Cl. 505-330.000.
Nokubo, Seiji; and Kohno, Teruhisa, 5,465,937, Cl. 251-129.150.
Sasaki, Goro, 5,466,558, Cl. 430-321.000.
Sumitomo Rubber Industries, Inc.: *See*—
Matsushita, Hiroomi; Sasaki, Teruo; and Fujisawa, Kazuhiro, 5,465,945, Cl. 267-294.000.
Sumitomo Special Metals Co. Ltd.: *See*—
Fujimura, Setsuo; Matsuura, Yutaka; and Sagawa, Masato, 5,466,308, Cl. 148-302.000.
Sumitomo Wiring Systems, Ltd.: *See*—
Miyazaki, Sho; Konoya, Hisashi; Tanaka, Yoshihiro; Fujitani, Mitsuhiro; and Konda, Kazumoto, 5,466,164, Cl. 439-140.000.
Takeyama, Jun, 5,467,023, Cl. 324-754.000.
Summer, Randi M.; Garbanati, Dennis; Winter, Patricia L.; and Gates, Ronald D., to Electronic Data Systems Corporation. System and method for associative solid sectioning during drafting of geometric models. 5,467,293, Cl. 364-578.000.
Sun Chemical Corporation: *See*—
Catena, Robert J.; and Adhikari, Prasad K., 5,466,734, Cl. 524-230.000.
Sun, Jyi-Yu; Chian, Tao; Shih, Di-Kon; and Wang, Chih-Yao, to Industrial Technology Research Institute. High-efficiency isothermal heat pipe. 5,465,782, Cl. 165-104.260.
Sunakawa, Makoto: *See*—
Mizuno, Fumio; Moriuchi, Noboru; Shirai, Seiichiro; Moroishi, Yutaka; Sunakawa, Makoto; and Kawanishi, Michirou, 5,466,325, Cl. 156-344.000.
Sunds Defibrator Industries Aktiebolag: *See*—
Ahlen, Arne; Mokvist, Anders; and Johansen, Thor, 5,465,915, Cl. 241-247.000.
Fredriksson, Börje; and Forslund, Kjell, 5,466,334, Cl. 162-56.000.
Sundstrand Corporation: *See*—
Sutrina, Thomas; Crowe, Lawrence E.; Smith, Edward W.; Peterson, Ronald F.; and Hoppe, Richard J., 5,466,974, Cl. 307-38.000.
Sunkyong Industries Co., Ltd.: *See*—
Park, Hwa K.; Lee, Suk K.; Park, Pyeong U.; and Kwan, Wie J., 5,466,829, Cl. 549-297.000.
Suresh, Dev D.: *See*—
Paparizos, Christos; Suresh, Dev D.; and Lemanski, Michael F., 5,466,652, Cl. 502-330.000.
Surface Interface, Inc.: *See*—
Bryson, Charles E., III; and Kelly, Michael A., 5,466,933, Cl. 250-305.000.
Susumu, Sekiguchi: *See*—
Inoue, Yoshio; Susumu, Sekiguchi; and Kurihara, Yasuo, 5,466,726, Cl. 523-122.000.
Suto, Mark J.: *See*—
Fedij, Victor; Suto, Mark J.; Wemple, James N.; and Zeller, James R., 5,466,828, Cl. 548-566.000.
Sutrina, Thomas; Crowe, Lawrence E.; Smith, Edward W.; Peterson, Ronald F.; and Hoppe, Richard J., to Sundstrand Corporation. Electric power distribution module for an electric power generation and distribution system. 5,466,974, Cl. 307-38.000.
Sutter Apparatebau AG: *See*—
von Leeuwen, Jurmin, 5,466,422, Cl. 422-186.050.
Suzuki Kabushiki Kaisha: *See*—
Shinohara, Kazunori, 5,465,882, Cl. 224-39.000.
Suzuki, Kenkichi: *See*—

Nakamura, Shigeru; Arimozo, Akira; Suzuki, Kenkichi; and Shibata, Katsuhiko, 5,467,417, Cl. 385-36.000.

Suzuki, Koji: *See*—
Takagaki, Hiromitsu; Iwata, Nobuo; and Suzuki, Koji, 5,467,175, Cl. 355-259.000.

Suzuki, Makoto, to NEC Corporation. High-speed small digital multiplier. 5,467,296, Cl. 364-754.000.

Suzuki, Masahiko, to Brother Kogyo Kabushiki Kaisha. Method for non-destructively driving a thickness shear mode piezoelectric actuator. 5,466,985, Cl. 310-333.000.

Suzuki, Masahiro, to Nikon Corporation. Camera with automatic data compression factor selection. 5,467,129, Cl. 348-231.000.

Suzuki, Masanori: *See*—
Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sedimoto, Kozo; and Suzuki, Masanori, 5,465,956, Cl. 271-274.000.

Suzuki, Masato: *See*—
Nakata, Kiyoshi; Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Terunuma, Mutsuhiro; Suzuki, Masato; Tsutsui, Yoshio; Toyota, Eiichi; and Yasuda, Kouji, 5,467,262, Cl. 363-41.000.

Suzuki, Minoru; and Iguchi, Yoshikazu, to Oshikiri Machinery Ltd. Dough sheet former with closed loop control. 5,466,143, Cl. 425-140.000.

Suzuki, Shin: *See*—
Hirai, Yukio; Kanayama, Kouzou; Yoshii, Kenji; Iwasaki, Kiyotoshi; Kanai, Isao; and Suzuki, Shin, 5,465,598, Cl. 72-84.000.

Suzuki, Takahisa: *See*—
Sato, Takashi; Suzuki, Takahisa; Tsuchiya, Hiromitsu; and Mitani, Tetsuya, 5,466,989, Cl. 313-635.000.

Suzuki, Takashi: *See*—
Miyazawa, Azuma; Mizobuchi, Koji; and Suzuki, Takashi, 5,467,426, Cl. 395-3.000.

Suzuki, Toshinori: *See*—
Takeuchi, Yoshio; and Suzuki, Toshinori, 5,467,368, Cl. 375-206.000.

Suzuki, Yuji: *See*—
Shioya, Yasushi; Suzuki, Yuji; Takeuchi, Ken; Yoshino, Koji; and Kawamata, Akira, 5,466,849, Cl. 556-445.000.

Sverlow, Genadie G.: *See*—
della-Cioppa, Guy R.; Garger, Stephen J., Jr.; Holtz, Richard B.; McCulloch, Michael J.; and Sverlow, Genadie G., 5,466,592, Cl. 435-212.000.

Swain, Eugene A., to Xerox Corporation. System for supporting hollow cylinders. 5,466,114, Cl. 414-746.500.

Swanson, Malcolm L.; Feltman, Wendell R.; and Schreter, Robert E., to Astec Industries, Inc. System for the remediation of highly contaminated soils. 5,466,418, Cl. 422-111.000.

Swanson, Russell C.: *See*—
Resler, Edwin W.; Tong, Vincent L.; Swanson, Russell C.; and Bogden, W. Scott, 5,466,117, Cl. 414-799.000.

Swapp, Mavin C., to Motorola, Inc. Integrated circuit test with programmable source for both AC and DC modes of operation. 5,467,024, Cl. 324-771.000.

Sweeney, Niall: *See*—
Bressler, Peter; Sweeney, Niall; Hicswa, Daniel; and Burns, James A., 5,466,223, Cl. 604-110.000.

Sweeting, Barbara: *See*—
Corrigan, Frank; Anthony, Sam; and Sweeting, Barbara, 5,466,269, Cl. 51-307.000.

Switched Reluctance Drives Limited: *See*—
Ray, William F., 5,467,025, Cl. 324-772.000.

Swoboda, Reiner: *See*—
Albersdörfer, Gernot; and Swoboda, Reiner, 5,466,150, Cl. 432-192.000.

Symetrix Corporation: *See*—
Mihara, Takashi; Yoshimori, Hiroyuki; Watanabe, Hitoshi; McMillan, Larry D.; and De Araujo, Carlos P., 5,466,629, Cl. 437-60.000.

SynOptics Communications, Inc.: *See*—
Brusati, Peter V.; Griffin, J. Dewey; and Sakazaki, Derek J., 5,467,254, Cl. 361-799.000.

Syntex (U.S.A.) Inc.: *See*—
Wilhelm, Robert S.; and Loe, Bradley E., 5,466,697, Cl. 514-300.000.

Synthelabo: *See*—
George, Pascal; De Peretti, Danielle; Roy, Jocelyne; Schmitt, Jean-Paul; and Sevrin, Mireille, 5,466,706, Cl. 514-394.000.

System E. Controls Limited: *See*—
Axon, Allan, 5,465,496, Cl. 33-522.000.

Systemix, Inc.: *See*—
Sasaki, Dennis T.; Van den Engh, Gerrit J.; and Buckie, Anne-Marie, 5,466,572, Cl. 435-2.000.

Szablikowski, Klaus: *See*—
Kalbe, Jochen; Müller, Hanns P.; Koch, Rainhard; Engelhardt, Jürgen; Koch, Wolfgang; Szablikowski, Klaus; and Weber, Gunter, 5,466,794, Cl. 536-66.000.

Szabo, George; and Zelinski, Gary, to ITT Corporation. Squeeze-to-release quick connector. 5,466,017, Cl. 285-319.000.

Szabo, Kenneth A.: *See*—
Burt, John R.; Szabo, Kenneth A.; and Stewart, Ronald L., 5,466,320, Cl. 156-244.190.

Szabó, Tibor: *See*—
Ivanics, József; Szabó, Tibor; Hermecz, István; Dalmadi, Gyula; Ivanics, Józsefné; Kovács, Gáborné; and Bahram, Resul, 5,466,833, Cl. 549-475.000.

Szajewski, Richard P.: *See*—
Sowinski, Allan F.; Szajewski, Richard P.; and Merrill, James P., 5,466,560, Cl. 430-347.000.

Szathmary, Susan: *See*—
Grandics, Peter; and Szathmary, Susan, 5,466,377, Cl. 210-635.000.

Szente, André: *See*—
Derungs, Romano; Märki, Hans P.; Stalder, Henri; and Szente, André, 5,466,708, Cl. 514-449.000.

Szillat, John C.; Laudadio, Nicola; and Chin, Teresa, to United Technologies Corporation. Fuel control system for a staged combustor. 5,465,570, Cl. 60-39.060.

Szmanda, Jeffrey P.; and Szmanda, William J., to Health Care Keyboard Company. Input keyboard apparatus for information processing and other keyboard devices. 5,466,078, Cl. 400-489.000.

Szmanda, William J.: *See*—
Szmanda, Jeffrey P.; and Szmanda, William J., 5,466,078, Cl. 400-489.000.

T. B. Wood's Sons Company: *See*—
Malik, John S., 5,465,804, Cl. 180-133.000.

Tachi-S Co., Ltd.: *See*—
Akima, Hiroaki, 5,466,045, Cl. 297-284.800.

Taco, Inc.: *See*—
Genga, Richard A., 5,466,995, Cl. 318-3.000.

Tadano, Rikio: *See*—
Terada, Fusao; Nakazato, Takashi; Tadano, Rikio; Tanigawa, Naohide; Hirose, Tatuya; Ikegami, Kazuo; and Fukushima, Kiyoshi, 5,465,579, Cl. 62-6.000.

Tafesh, Ahmed M.; Kvakovszky, George; and Lindley, Charlet R., to Hoechst Celanese Corporation. Process for preparing arylketoamines. 5,466,873, Cl. 568-312.000.

Taffe, Norman P.; Douglass, Stephen M.; and Nazarian, Hagop, to Cypress Semiconductor Corp. OR array architecture for a programmable logic device. 5,467,029, Cl. 326-41.000.

Tagami, Toshio: *See*—
Okutani, Haruo; Tagami, Toshio; Kurebayashi, Hideki; and Nakadera, Kazue, 5,466,553, Cl. 430-109.000.

Tagawa, Kenji: *See*—
Takeda, Keiko; Inagaki, Shinya; Tagawa, Kenji; and Sasaki, Kazuya, 5,467,218, Cl. 359-341.000.

Taggart, Charles W.: *See*—
Rogers, Ernest E.; and Collier, Kevin E., 5,466,385, Cl. 210-787.000.

Taglioni, Giovanni: *See*—
Misiano, Carlo; Simonetti, Enrico; and Taglioni, Giovanni, 5,466,296, Cl. 118-723.0MP.

Taguchi, Keiichi: *See*—
Okumura, Keiji; Aoki, Takeshi; Sugishima, Yoshio; Hayama, Satoru; Taguchi, Keiichi; Iwase, Yuichiro; and Okamoto, Noriaki, 5,465,947, Cl. 270-58.000.

Taguchi, Takayuki; Hasegawa, Kenichi; Baba, Sohkichi; and Takai, Yoshitsugu, to Sanyo Chemical Industries, Ltd. Releasing composition and binder resin composition for electrophotographic toner, and toner containing the same. 5,466,555, Cl. 430-110.000.

Tahata, Syouichi: *See*—
Tsubota, Kazuo; and Tahata, Syouichi, 5,467,442, Cl. 395-135.000.

Taiwan Line Tek Electronic Co., Ltd.: *See*—
Lin, James, 5,467,228, Cl. 359-822.000.

Taiwan Semiconductor Manufacturing Company Ltd.: *See*—
Tsai, Nun-Sian, 5,466,615, Cl. 437-31.000.

Tajima Denken Co., Ltd.: *See*—
Tajima, Itsuho; and Tajima, Yoshitaka, 5,465,448, Cl. 15-104.310.

Tajima, Itsuho; and Tajima, Yoshitaka, to Tajima Denken Co., Ltd. Pipe interior cleaning apparatus. 5,465,448, Cl. 15-104.310.

Tajima, Itsurou; and Ueda, Fumihiro, to Mitsubishi Materials Corporation. Wear resistant cubic-boron-nitride-based cutting tool. 5,466,642, Cl. 501-96.000.

Tajima, Yoshitaka: *See*—
Tajima, Itsuho; and Tajima, Yoshitaka, 5,465,448, Cl. 15-104.310.

Takaba, Katsumi; and Fujisawa, Shuichi, to Nippondenso Co., Ltd. Self-diagnosing apparatus for motor vehicles. 5,465,613, Cl. 73-117.300.

Takada, Hideaki: *See*—
Aihara, Takao; Fukuda, Taro; and Takada, Hideaki, 5,466,177, Cl. 440-50.000.

Takagaki, Hiromitsu; Iwata, Nobuo; and Suzuki, Koji, to Ricoh Company, Ltd. Developing device for an image forming apparatus. 5,467,175, Cl. 355-259.000.

Takagi, Hiroshi: *See*—
Fujii, Takashi; Fujino, Masaru; Sekijima, Takenori; and Takagi, Hiroshi, 5,466,388, Cl. 252-62.590.

Takagi, Jun; and Fujita, Hirotsugu, to Mitsubishi Plastics Industries Limited. Heat-shrinkable polystyrene tube. 5,466,499, Cl. 428-36.900.

Takagi, Masanori: *See*—
Wada, Shunichi; Naito, Yasuo; Nishino, Kazuhisa; and Takagi, Masanori, 5,467,279, Cl. 364-424.850.

Takahara, Hiroaki; and Moriya, Masami, to Nikon Corporation. Light detection device bonded to an optics housing which includes tapered cavities for delivering adhesive to the bonding surface. 5,466,928, Cl. 250-239.000.

Takahashi, Akira: *See*—
Hatanai, Takashi; and Takahashi, Akira, 5,467,236, Cl. 360-104.000.

Takahashi, Mitsuo, to Seikoh Giken Co., Ltd. Disc base board molding die including stamper plate attaching/detaching device. 5,466,145, Cl. 425-190.000.

Takahashi, Takefumi: *See*—

Watanuki, Tsuneo; Nakamura, Yasushige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utaka, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, 5,467,176, Cl. 355-270.000.

Takahashi, Takehiro; Daito, Kazuhiko; and Kawaoka, Akihiro, to Hitachi Maxell, Ltd.; and Hitachi, Ltd. Data collection-transmission apparatus and data collection system. 5,467,475, Cl. 395-800.000.

Takahashi, Teruo: *See*—
Sato, Katsuaki; Tominaga, Katsuhiko; Saka, Tsutomu; Kawamura, Osamu; Takahashi, Teruo; and Kakiuchi, Arata, 5,466,276, Cl. 75-231.000.

Takahashi, Tetsu: *See*—
Kono, Satoshi; Hidaka, Shizuaki; and Takahashi, Tetsu, 5,465,635, Cl. 74-595.000.

Takahashi, Tomoyuki, to Sony Corporation. Sliding type magnetic head for magneto-optical recording. 5,467,237, Cl. 360-114.000.

Takahashi, Yoshiharu: *See*—
Takeda, Katsunori; Otsuka, Shinsuke; Takahashi, Yoshiharu; Katsura, Hiroo; Takata, Kazuhiko; Maeda, Shoichi; and Nagato, Takafumi, 5,467,458, Cl. 395-427.000.

Takahira, Akitoshi; and Yoshii, Yuuzi, to Sumitomo Chemical Co., Ltd. Aqueous emulsion and easily macerating moisture-proof paper. 5,466,735, Cl. 524-273.000.

Takai, Hideyuki: *See*—
Kanemaru, Tetsuro; Takai, Hideyuki; Yamazaki, Itaru; and Iuchi, Kazushi, 5,466,550, Cl. 430-58.000.

Takai, Yoshitsugu: *See*—
Taguchi, Takayuki; Hasegawa, Kenichi; Baba, Sohkichi; and Takai, Yoshitsugu, 5,466,555, Cl. 430-110.000.

Takamoro, Kenji; Umeda, Koji; and Ono, Takao, to NEC Corporation. Antenna for a radio communication apparatus. 5,467,096, Cl. 343-702.000.

Takamoto, Hiroshi: *See*—
Kameda, Yasushi; Nakamura, Kenichi; Takamoto, Hiroshi; Harima, Takayuki; and Segawa, Makoto, 5,467,317, Cl. 365-230.060.

Takamoto, Yuusuke; Masaki, Ryoso; Obara, Sanshiro; and Kaneko, Satoru, to Hitachi, Ltd. Control apparatus for electric vehicle. 5,467,275, Cl. 364-426.010.

Takano, Isamu: *See*—
Kaede, Kazuhisa; and Takano, Isamu, 5,467,213, Cl. 359-175.000.

Takano, Minoru: *See*—
Hiratsuka, Mitsunori; Takano, Minoru; Enomoto, Masayuki; Kizawa, Satoru; and Saitoh, Kazuo, 5,466,663, Cl. 504-286.000.

Takasago Institute for Interdisciplinary: *See*—
Nakatsu, Tetsuo; Kang, Kok Lean R.; McAlister, Kelly L.; and Huang, Jiansheng, 5,466,718, Cl. 514-724.000.

Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Morita, Koichi; Masuko, Michio; Ide, Kinya; and Ueyama, Yoshito, to Shionogi & Co., Ltd. Benzaldehyde oxime derivatives, production and use thereof. 5,466,661, Cl. 504-253.000.

Takase, Mitsunori: *See*—
Konig, Wolfgang; Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Takase, Mitsunori; and Bellamy, Wayne R., 5,466,669, Cl. 514-12.000.

Takasu, Katsuya. Acupuncture point puncturing needle and pierced earring. 5,465,593, Cl. 63-12.000.

Takata Corporation: *See*—
Tanaka, Yoshihiko; Chikaraishi, Tsuneo; and Osada, Nobuya, 5,465,999, Cl. 280-733.000.
Tanaka, Yoshihiko; Chikaraishi, Tsuneo; and Tomie, Muneharu, 5,466,002, Cl. 280-733.000.
Tanaka, Yoshihiko; Ohishi, Yoshinori; and Chikaraishi, Tsuneo, 5,466,003, Cl. 280-733.000.

Takata, Kazuhiko: *See*—
Takeda, Katsunori; Otsuka, Shinsuke; Takahashi, Yoshiharu; Katsura, Hiroo; Takata, Kazuhiko; Maeda, Shoichi; and Nagato, Takafumi, 5,467,458, Cl. 395-427.000.

Takatori, Sunao: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,467,030, Cl. 327-58.000.
Shou, Guoliang; Takatori, Sunao; and Yamamoto, Makoto, 5,467,376, Cl. 377-94.000.

Takayama, Shinji, to International Business Machines Corporation. High permeability iron-based alloy. 5,466,539, Cl. 428-611.000.

Takeda Chemical Industries, Ltd.: *See*—
Itoh, Katsumi; Okonogi, Kenji; and Tamura, Norikazu, 5,466,820, Cl. 548-263.200.
Yamamoto, Mitsuo; Doi, Takayuki; and Kato, Kaneyoshi, 5,466,689, Cl. 514-229.500.

Takeda, Eiji: *See*—
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,466,621, Cl. 437-52.000.

Takeda, Hajime: *See*—
Furuta, Takashi; Takeda, Hajime; Nishimura, Hiroyuki; Kadono, Tsuyoshi; Ishizaki, Hirofumi; and Uesaka, Akira, 5,467,477, Cl. 455-348.000.

Takeda, Katsunori; Otsuka, Shinsuke; Takahashi, Yoshiharu; Katsura, Hiroo; Takata, Kazuhiko; Maeda, Shoichi; and Nagato, Takafumi, to Sharp Kabushiki Kaisha. Optical character reader with internal memory and data processor. 5,467,458, Cl. 395-427.000.

Takeda, Keiko; Inagaki, Shinya; Tagawa, Kenji; and Sasaki, Kazuya, to Fujitsu Limited. Optical fiber amplifier. 5,467,218, Cl. 359-341.000.

Takegawa, Masaharu; Kotani, Motoharu; and Yokota, Hiromu, to Daicell Chemical Industry Co., Ltd. Cigarette filter-rod manufacturing device. 5,466,209, Cl. 493-4.000.

Takematsu, Koutarou: *See*—
Sugitani, Sinzi; Tanimizu, Toru; Takematsu, Koutarou; Wakasa, Fumio; and Izumi, Toshiaki, 5,467,241, Cl. 361-63.000.

Takemoto, Tadashi; Hijiya, Toyoto; Yonekawa, Teruo; and Mochizuki, Chiaki, to Ajinomoto Co., Inc. Method for recovering L-phenylalanine. 5,466,864, Cl. 562-445.000.

Takemoto, Takatoshi; Kawashima, Kazunari; Kadomatsu, Hideyuki; Aoyama, Moriyuki; and Nakamura, Takaharu, to Kabushiki Kaisha Ace Denken. Paper sheet conveying and arranging apparatus. 5,465,950, Cl. 271-125.000.

Takemoto, Takatoshi; Kano, Noriaki; Ito, Eiji; and Sekimoto, Kozo, to Kabushiki Kaisha Ace Denken. Bank note conveying equipment. 5,465,953, Cl. 271-234.000.

Takemoto, Takatoshi; and Ito, Yoshio, to Kabushiki Kaisha Ace Denken. Paper money conveying equipment. 5,465,954, Cl. 271-251.000.

Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sedimoto, Kozo; and Suzuki, Masanori, to Kabushiki Kaisha Ace Denken. Endless belt bank note conveying device with ball supports for the bank notes. 5,465,956, Cl. 271-274.000.

Takemoto Yushi Kabushiki Kaisha: *See*—
Yonezawa, Toshio; Mitsui, Kenrou; Nakazima, Makoto; Kinoshita, Mitsuo; Shimono, Toshihide; and Yamamoto, Tsuneo, 5,466,289, Cl. 106-809.000.

Takemura, Yasushi: *See*—
Ishiguro, Hajime; Morioka, Kazutoshi; Sakai, Tooru; and Takemura, Yasushi, 5,467,431, Cl. 395-102.000.

Takenaka Corporation: *See*—
Yonezawa, Toshio; Mitsui, Kenrou; Nakazima, Makoto; Kinoshita, Mitsuo; Shimono, Toshihide; and Yamamoto, Tsuneo, 5,466,289, Cl. 106-809.000.

Takeuchi, Kazuhiro; and Yamanaka, Akira, to Nippondenso Co., Ltd. Blower with bent stays. 5,466,120, Cl. 415-119.000.

Takeuchi, Ken: *See*—
Shioya, Yasushi; Suzuki, Yuji; Takeuchi, Ken; Yoshino, Koji; and Kawamata, Akira, 5,466,849, Cl. 556-445.000.

Takeuchi, Yoshio; and Suzuki, Toshinori, to Kokusai Denshin Denwa Kabushiki Kaisha. Spread spectrum signal demodulator. 5,467,368, Cl. 375-206.000.

Takeyama, Jun, to Sumitomo Wiring Systems, Ltd. Connector inspecting apparatus having size regulating member for retainer test fitting probes external to the connetor for retainer integrity detection. 5,467,023, Cl. 324-754.000.

Takezawa, Satoshi: *See*—
Watanuki, Tsuneo; Nakamura, Yasushige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utaka, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, 5,467,176, Cl. 355-270.000.

Takigen Manufacturing Co. Ltd.: *See*—
Yamada, Kenichi, 5,465,462, Cl. 16-112.000.

Takiguchi, Kenji: *See*—
Itagaki, Hiroyuki; Taniguchi, Yo; Shiono, Hidemi; Takiguchi, Kenji; and Yamamoto, Etsuji, 5,465,719, Cl. 128-653.500.

Takubo, Sadao, to Kabushiki Kaisha Takubo Seiki Seisakusho. Lens shape measuring instrument. 5,465,495, Cl. 33-507.000.

Talley, John J.; Penning, Thomas D.; Collins, Paul W.; Rogier, Donald J., Jr.; Malecha, James W.; Miyashiro, Julie M.; Bertenshaw, Stephen R.; Khanna, Ish K.; Graneto, Matthew J.; Rogers, Roland S.; and Carter, Jeffery S., to G.D. Searle & Co. Substituted pyrazolyl benzenesulfonamides. 5,466,823, Cl. 548-377.100.

Tamburrino, Richard A.; and Connelly, Jack L., Jr., to Welch Allyn, Inc. Film holder for video probe. 5,467,124, Cl. 348-66.000.

Tamfelt, Inc.: *See*—
Legge, Robert W., 5,466,339, Cl. 162-200.000.

Tamura, Norikazu: *See*—
Itoh, Katsumi; Okonogi, Kenji; and Tamura, Norikazu, 5,466,820, Cl. 548-263.200.

Tanabe, Kozi: *See*—
Kishimoto, Shinji; Harashima, Masa; Kanda, Hiroshi; Sasaki, Akira; Tanabe, Kozi; Nosaka, Kenji; Hanasaka, Satoru; and Ishihara, Ken, 5,465,721, Cl. 128-660.070.

Tanabe, Noboru: *See*—
Kuno, Yoshinori; Tanabe, Noboru; and Hasebe, Koichi, 5,467,102, Cl. 345-1.000.

Tanaka, Haruhiko: *See*—
Hisamoto, Dai; Kaga, Toru; Kimura, Shinichiro; Moniwa, Masahiro; Tanaka, Haruhiko; Hiraiwa, Atsushi; and Takeda, Eiji, 5,466,621, Cl. 437-52.000.

Tanaka, Kazumi: *See*—
Kumazawa, Yoshihiko; and Tanaka, Kazumi, 5,466,939, Cl. 250-363.040.

Tanaka, Kazuyoshi: *See*—
Washio, Koji; Tanaka, Kazuyoshi; and Haneda, Satoshi, 5,467,202, Cl. 358-448.000.

Tanaka, Kenichi: *See*—
Yuki, Masaru; and Tanaka, Kenichi, 5,466,957, Cl. 257-344.000.

Tanaka Limited: *See*—

Sato, Yukihiro; Sone, Takumi; Nagata, Sachio; Sakata, Tetsuhiro; Demizu, Kei; and Tanaka, Shinichi, 5,466,305, Cl. 148-222.000.

Tanaka, Satoshi; and Maehara, Hideaki, to Mitsubishi Denki Kabushiki Kaisha. System with approximation mechanism for recognizing graphical elements in a drawing. 5,467,411, Cl. 382-113.000.

Tanaka, Shinichi: *See*—
Sato, Yukihiro; Sone, Takumi; Nagata, Sachio; Sakata, Tetsuhiro; Demizu, Kei; and Tanaka, Shinichi, 5,466,305, Cl. 148-222.000.

Tanaka, Tadashi; Sakamoto, Masaaki; and Kato, Tohru, to Daido Metal Company Ltd. Multi-layer sliding member. 5,466,538, Cl. 428-610.000.

Tanaka, Takeshi; Minamino, Daiki; Yoshizaki, Akira; and Nakano, Nakaya, to Konica Corporation. Coating apparatus for providing a superficial protective layer on a card. 5,466,293, Cl. 118-264.000.

Tanaka, Toshihiro; Kato, Masataka; Kume, Hitoshi; Ogura, Keisuke; and Adachi, Tetsuo, to Hitachi, Ltd. Semiconductor nonvolatile memory device having reduced switching overhead time on the program mode. 5,467,309, Cl. 365-185.140.

Tanaka, Tsutomu: *See*—
Mifune, Hiroshi; Saitoh, Satoshi; Kaneda, Teruo; Tomokiyo, Shigetaka; Adachi, Tsugio; Tanaka, Tsutomu; and Furudate, Toshiharu, 5,465,525, Cl. 43-132.100.

Tanaka, Yoshihiko; Chikaraishi, Tsuneo; and Osada, Nobuya, to Takata Corporation. Inflatable seat belt having defined shape. 5,465,999, Cl. 280-733.000.

Tanaka, Yoshihiko; Chikaraishi, Tsuneo; and Tomie, Muneharu, to Takata Corporation. Inflatable seat belt with leak detection device. 5,466,002, Cl. 280-733.000.

Tanaka, Yoshihiko; Ohishi, Yoshinori; and Chikaraishi, Tsuneo, to Takata Corporation. Inflatable seat belt having bag filter. 5,466,003, Cl. 280-733.000.

Tanaka, Yoshihiro: *See*—
Miyazaki, Sho; Konoya, Hisashi; Tanaka, Yoshihiro; Fujitani, Mitsuhiro; and Konda, Kazumoto, 5,466,164, Cl. 439-140.000.

Tanamachi, Tokunosuke: *See*—
Nakata, Kiyoshi; Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Terunuma, Mutsuhiro; Suzuki, Masato; Tsutsui, Yoshio; Toyota, Eiichi; and Yasuda, Kouji, 5,467,262, Cl. 363-41.000.

Tandem Computers Incorporated: *See*—
Yip, Linda Y.; and Kwan, Kinying, 5,467,033, Cl. 326-93.000.

Tandy Corporation: *See*—
Siegel, Mark D., 5,467,463, Cl. 395-550.000.

Tang, Daniel N.: *See*—
Ong, Tong-Chern; and Tang, Daniel N., 5,466,624, Cl. 437-52.000.

Tang, Jin: *See*—
Jones, Simon; and Tang, Jin, 5,466,595, Cl. 435-240.200.

Tang, Weixin: *See*—
Liberti, Paul A.; Wang, Yuzhou; Tang, Weixin; Feeley, Brian P.; and Gohel, Dhanesh I., 5,466,574, Cl. 435-5.000.

Tanigawa, Hiroshi, to Toko, Inc. Integrator including an offset eliminating circuit and capable of operating with low voltage. 5,467,045, Cl. 327-336.000.

Tanigawa, Naohide: *See*—
Terada, Fusao; Nakazato, Takashi; Tadano, Rikio; Tanigawa, Naohide; Hirose, Tatuya; Ikegami, Kazuo; and Fukushima, Kiyoshi, 5,465,579, Cl. 62-6.000.

Taniguchi, Nobuyuki: *See*—
Murashima, Nobuharu; Ishibashi, Kenji; Shintani, Dai; and Taniguchi, Nobuyuki, 5,467,158, Cl. 354-173.100.

Taniguchi, Yo: *See*—
Itagaki, Hiroyuki; Taniguchi, Yo; Shiono, Hidemi; Takiguchi, Kenji; and Yamamoto, Etsuji, 5,465,719, Cl. 128-653.500.

Tanihara, Mamoru: *See*—
Mishima, Akio; Harada, Tosiharu; Tanihara, Mamoru; Ota, Yasutaka; Okinaka, Kenji; Mori, Kohji; Kawasaki, Hirofumi; Nagai, Norimichi; Fujimoto, Katsunori; and Okuda, Yoshiro, 5,466,306, Cl. 148-306.000.

Tanimizu, Toru: *See*—
Sugitani, Sinzi; Tanimizu, Toru; Takematsu, Koutarou; Wakasa, Fumio; and Izumi, Toshiaki, 5,467,241, Cl. 361-63.000.

Tanimoto, Toshinobu; Okamoto, Yoshikatsu; Yoshida, Shinji; and Hironaka, Yasumasa, to Funai Electric Co., Ltd. Bread making apparatus and its temperature control method. 5,466,913, Cl. 219-492.000.

Tanizawa, Osamu; Okayama, Hiroto; Saji, Fumitaka; Azuma, Chihiro; and Kimura, Tadashi, to Rohto Pharmaceutical Co., Ltd. Oxytocin receptor and DNA coding therefor. 5,466,584, Cl. 435-69.100.

Tanner Bond Pty. Ltd.: *See*—
Seifert, Bernhard U., 5,465,543, Cl. 52-309.800.

Tanner, Scott B.: *See*—
Komarek, James A.; Padgett, Clarence W.; Amneus, Robert D.; and Tanner, Scott B., 5,467,300, Cl. 365-104.000.

Tarassoff, Serge; and Toyre, Georges, to Pomagalski S.A. Overhead cable transport installation having two cables. 5,465,668, Cl. 104-95.000.

Tarnawskyj, Christine J.: *See*—
Yuh, Huoy-Jen; Spiewak, John W.; Tarnawskyj, Christine J.; Grammatica, Steven J.; Chen, Cindy C.; and Teuscher, Leon A., 5,466,551, Cl. 430-63.000.

Tarter, Norman D. Dental impression material package. 5,465,833, Cl. 206-63.500.

Tashiro, Mamoru; and Ichijima, Seiji, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,466,566, Cl. 430-505.000.

Tate, Masashi: *See*—
Sato, Yoshinori; Komiyama, Megumi; Endo, Kazuo; and Tate, Masashi, 5,466,521, Cl. 428-330.000.

Tate, William J.: *See*—
Williamson, Gregory L.; Hawkins, Mark R.; and Tate, William J., 5,467,240, Cl. 361-18.000.

Tatsuta Electric Wire & Cable Co., Ltd.: *See*—
Nakatani, Fumio; Wakita, Shinichi; Murakami, Hisatoshi; Terada, Tsunehiko; and Morimoto, Shohei, 5,466,893, Cl. 174-261.000.

Tavener, Raymond D.: *See*—
Lamprecht, Dale E., Jr.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., 5,467,433, Cl. 395-114.000.

Taylor, Cliff: *See*—
Lause, Herb; Moore, Sylvia; Seltzer, Clif; Taylor, Cliff; and King, Dan, 5,466,317, Cl. 156-79.000.

Taylor, David H.: *See*—
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., 5,465,586, Cl. 62-84.000.
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., 5,465,587, Cl. 62-84.000.

Taylor, Howard H.: *See*—
Kowligi, Rajagopal R.; Bibeau, John M.; and Taylor, Howard H., 5,466,509, Cl. 428-141.000.

Taylor, Matthew: *See*—
Aden, Charles M.; Graham, Martin H.; Taylor, Matthew; and Miller, Mark, 5,467,061, Cl. 333-24.00R.

Taylor, Roger J.: *See*—
Baxter, Anthony D.; Baylis, Eric K.; Collingwood, Stephen P.; Taylor, Roger J.; De Mesmaeker, Alain; and Schmit, Chantal, 5,466,677, Cl. 514-44.000.

Taylor-Varney, Martha. Body protective vest. 5,465,423, Cl. 2-2.000.

TDW Delaware, Inc.: *See*—
Sullivan, James B.; and Wilson, Michael L., 5,466,099, Cl. 408-206.000.

TEAC Corporation: *See*—
Watanabe, Takashi, 5,467,235, Cl. 360-99.060.

Techlok Limited: *See*—
Stobbart, John, 5,466,018, Cl. 285-334.200.

Technion Research and Development Foundation, Ltd.: *See*—
Zeevi, Yehoshua Y.; Ginosar, Ran; and Stuart, Wolf, 5,467,123, Cl. 348-34.000.

Tecnol Medical Products, Inc.: *See*—
Brunson, Kevin K.; and Benson, Anthony B., 5,466,251, Cl. 607-112.000.

TecSyn, Inc.: *See*—
Pettersson, Bjorn O. A., 5,466,414, Cl. 419-11.000.

Teeslink, John W. Method of providing a toolholder body guide for punch presses. 5,465,473, Cl. 29-402.090.

Teichmann, Stephan: *See*—
Schneider, Günther; Klier, Manfred; Aul, Marta; and Teichmann, Stephan, 5,466,457, Cl. 424-401.000.

Teijin Limited: *See*—
Kataoka, Takayuki; Uemura, Ryuji; Kawasaki, Shunzo; and Shibata, Fumio, 5,466,514, Cl. 428-229.000.

Teledyne ET a div. of Teledyne Industries: *See*—
Kelley, Paul E., 5,466,931, Cl. 250-282.000.

Telefonaktiebolaget LM Ericsson: *See*—
Josefsson, Lars G., 5,467,101, Cl. 343-771.000.
Peltonen, Ari; Åström, Bo A. V.; Gandils, Mars V.; Stille, Mats O.; and Lantto, Sven J., 5,467,381, Cl. 379-58.000.
Petersen, Lars-Göran, 5,467,347, Cl. 370-60.100.

Temmesfeld, Angelika B. M.: *See*—
Kunz, Josef G.; and Temmesfeld, Angelika B. M., 5,465,861, Cl. 220-260.000.

Tempst, Paul; and Casteels, Peter, to Sloan-Kettering Institute for Cancer Research. Apidaecin-type peptide antibiotics with improved activities and/or different antibacterial spectrum. 5,466,671, Cl. 514-13.000.

Temtec Fahrzeugtechnik Entwicklungsgesellschaft mbH: *See*—
Kunz, Josef G.; and Temmesfeld, Angelika B. M., 5,465,861, Cl. 220-260.000.

Tench, D. Morgan; and Jambazian, Petra V., to Rockwell International Corporation. Potentiometric evaluation of substrate oxidation and coating porosity. 5,466,349, Cl. 204-153.100.

Tenjimbayashi, Koji, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method of large deformation measurement using speckle interferometry. 5,467,184, Cl. 356-35.500.

Tenmyo, Osamu: *See*—
Tsunakawa, Mitsuaki; Yamasaki, Tetsuro; Tomita, Koji; and Tenmyo, Osamu, 5,466,450, Cl. 424-118.000.

Tepfer, David A. (Frx): *See*—
Slightom, Jerry L.; Tepfer, David A., 5,466,792, Cl. 536-23.700.

Terada, Akihiro: *See*—
Nihei, Ryo; Terada, Akihiro; and Sasaki, Yasuo, 5,466,909, Cl. 219-121.720.

Terada, Fusao; Nakazato, Takashi; Tadano, Rikio; Tanigawa, Naohide; Hirose, Tatuya; Ikegami, Kazuo; and Fukushima, Kiyoshi, to Sanyo Electric Co., Ltd. Gas compression/expansion apparatus. 5,465,579, Cl. 62-6.000.

Terada, Tsunehiko: *See*—
Nakatani, Fumio; Wakita, Shinichi; Murakami, Hisatoshi; Terada, Tsunehiko; and Morimoto, Shohei, 5,466,893, Cl. 174-261.000.

Terashita, Takaaki: *See*—

Kinjo, Naoto; and Terashita, Takaaki, 5,467,168, Cl. 355-77.000.

Terashita, Toshiyuki: *See*—
Yamamoto, Hiroyuki; Ota, Noriyuki; and Terashita, Toshiyuki, 5,465,695, Cl. 123-256.000.

Terranova, Eric; Galey, Jean B.; Hocquaux, Michel; Maignan, Jean; and Tuloup, Rémy, to L'Oreal. Compositions for slowing down hair loss and for inducing and stimulating its growth, based on 2,4-diamino-pyrimidine 3-oxide derivatives, and new 2,4-diaminopyrimidine 3-oxide derivatives. 5,466,694, Cl. 514-272.000.

Terry, Verl O. Interblocking concrete form modules. 5,465,542, Cl. 52-309.700.

Terunuma, Mutsuhiro: *See*—
Nakata, Kiyoshi; Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Terunuma, Mutsuhiro; Suzuki, Masato; Tsutsui, Yoshio; Toyota, Eiichi; and Yasuda, Kouji, 5,467,262, Cl. 363-41.000.

Teruya, Yoshihiro: *See*—
Hosoya, Kimio; Teruya, Yoshihiro; and Kobayashi, Yasushi, 5,466,908, Cl. 217-121.680.

Tessler, Martin M.: *See*—
Martino, Gary T.; and Tessler, Martin M., 5,466,862, Cl. 560-152.000.

Testa, Raymond T.: *See*—
Sun, Phaik-Eng; Lee, Ving J.; and Testa, Raymond T., 5,466,684, Cl. 514-152.000.

Testy Putts Corporation: *See*—
Kohl, William K., 5,465,704, Cl. 124-5.000.

Teuscher, Leon A.: *See*—
Yuh, Huoy-Jen; Spiewak, John W.; Tarnawskyj, Christine J.; Grammatica, Steven J.; Chen, Cindy C.; and Teuscher, Leon A., 5,466,551, Cl. 430-63.000.

Teva Pharmaceutical Industries Ltd.: *See*—
Sterling, Jeff; and Herzig, Yaacov, 5,466,683, Cl. 514-80.000.

Texaco Inc.: *See*—
Steinberg, Robert M.; and Strickland, John C., 5,466,362, Cl. 208-157.000.

Texas Instruments Incorporated: *See*—
Belcher, James F., 5,466,331, Cl. 216-17.000.
Beng, Lim T.; Chong, Chai T.; Amagai, Masazumi; Anjoh, Ichiro; Arita, Junichi; Tsubosaki, Kunihiro; Ichitani, Masahiro; and Edwards, Darvin, 5,466,888, Cl. 174-52.200.
Clapp, John S., III; and Chen, Wayne T., 5,467,050, Cl. 327-530.000.
D'Arrigo, Iano; Falessi, Georges; and Smayling, Michael C., 5,467,307, Cl. 365-185.060.
Gove, Robert J., 5,467,138, Cl. 348-452.000.
Hammerbacher, Milfred D.; and Schmit, Russell R., 5,466,301, Cl. 136-246.000.
Huang, Austin L.; and Florence, James M., 5,467,146, Cl. 348-743.000.
Kaya, Cetin; Holland, Wayland B.; and Mezenner, Rabah, 5,467,306, Cl. 365-185.200.
Okuno, Yasutoshi, 5,466,949, Cl. 257-25.000.
Owen, Robert A.; and Belcher, James F., 5,466,332, Cl. 156-630.000.
Quarmby, Neil A.; and Eddowes, David W., 5,467,010, Cl. 323-284.000.
Quick, Roderick L.; and Orcutt, John W., 5,465,899, Cl. 228-180.500.

Textiles Coated International: *See*—
Tippett, Stephen W.; and Ribbans, Robert C., 5,466,531, Cl. 428-422.000.

Thacker, Jonathan R. M.: *See*—
Martin, Robert; Cayley, George R.; Thacker, Jonathan R. M.; Hall, Franklin R.; North, Denise K.; Groome, John M.; and Jeffries, David A., 5,466,458, Cl. 424-405.000.

Thell, Dale G. Adjustable yardage plate. 5,465,491, Cl. 33-265.000.

Thermalloy, Inc.: *See*—
Smithers, Matthew C., 5,466,970, Cl. 257-712.000.

Thermo King Corporation: *See*—
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., 5,465,587, Cl. 62-84.000.

ThermoKing Corporation: *See*—
Sjoholm, Lars I.; Kwon, Sung L.; Taylor, David H.; Erickson, Lee J.; and Freund, Peter W., 5,465,586, Cl. 62-84.000.

Thierheimer, Charles L., Jr.: *See*—
Evans, Roger F.; Thierheimer, Charles L., Jr.; and Pawlowski, Norman E., 5,467,117, Cl. 347-87.000.

Thomas Air Systems, Inc.: *See*—
Thomas, Donald; Ellis, Steve; Kriz, Paul; and Scott, Gordon, 5,465,828, Cl. 198-495.000.

Thomas, Dean: *See*—
Malachowski, Michael; Spehrley, Charles W., Jr.; Thomas, Dean; Remus, Michelle; and Schaffer, Robert R., 5,467,180, Cl. 355-312.000.

Thomas, Donald; Ellis, Steve; Kriz, Paul; and Scott, Gordon, to Thomas Air Systems, Inc. Automated mail processing cleaning system. 5,465,828, Cl. 198-495.000.

Thomas Jefferson University: *See*—
Murphy, Scott; and Shimizu, Tetsuo, 5,466,573, Cl. 435-2.000.

Thomas Josef Heimbach GmbH & Co.: *See*—
Eschmann, Sylvester; Hüser, Martin; and Halterbeck, Walter, 5,465,764, Cl. 139-383.00A.

Thomas, Michael J.: *See*—
Gale, Ronald P.; McCullough, Richard; Salerno, Jack P.; Fantone, Stephen D.; Forsyth, Robert P.; Carellas, Peter T.; Thomas, Michael J.; and Youman, Roy L., 5,467,154, Cl. 353-119.000.

Thomason, Donald B.: *See*—
Booth, Frank W.; Thomason, Donald B.; Morrison, Paul R.; and Stancel, George M., 5,466,676, Cl. 514-44.000.

Thomasson, David M., to Siemens Medical Systems, Inc. Saturation selective spectroscopic imaging. 5,467,016, Cl. 324-309.000.

Thome, Roland: *See*—
Wallau, Martin; Spichtinger, Rudolf; Unger, Klaus K.; Tissler, Arno; and Thome, Roland, 5,466,432, Cl. 423-700.000.

Thompson, Albert N., to Thompson Broom Manufacturers Ltd. Curling hack. 5,465,964, Cl. 273-126.00R.

Thompson Broom Manufacturers Ltd.: *See*—
Thompson, Albert N., 5,465,964, Cl. 273-126.00R.

Thompson, Harvey W.: *See*—
Mornhed, Goran; Young, John; and Thompson, Harvey W., 5,465,585, Cl. 62-59.000.

Thompson, James M. Braille board with movable dot pins. 5,466,154, Cl. 434-114.000.

Thompson, Jesse B.: *See*—
Carey, Paul G.; Thompson, Jesse B.; Colella, Nicolas J.; and Williams, Kenneth A., 5,466,302, Cl. 136-251.000.

Thompson, Robert L: *See*—
Check, Joseph A., III; Saxe, Robert L.; Thompson, Robert L; Fortini, Matthew; and Slovak, Steven M., 5,467,217, Cl. 359-296.000.

Thompson, William J. Impact actuated tool for driving fasteners with safety mechanism. 5,465,893, Cl. 227-8.000.

Thomson Consumer Electronics, Inc.: *See*—
Lankford, Douglas E., 5,467,139, Cl. 348-512.000.
Saeger, Timothy W.; and Ersoz, Nathaniel H., 5,467,144, Cl. 348-566.000.

Thomson-CSF: *See*—
Loiseaux, Brigitte; Joubert, Cécile; Huignard, Jean-Pierre; Joffre, Pascal; and Nicolas, Christophe, 5,467,206, Cl. 359-40.000.

Thomson, Kenneth S.; and Thomson, Susan A. Method and apparatus for performing 3-dimensional antibiotic susceptibility tests. 5,466,583, Cl. 435-30.000.

Thomson, Susan A.: *See*—
Thomson, Kenneth S.; and Thomson, Susan A., 5,466,583, Cl. 435-30.000.

Thorman, Randy A.: *See*—
Wilkinson, Stephen C.; and Thorman, Randy A., 5,466,502, Cl. 428-40.000.

Thornberg, Robert, to Harvest Fuel, Inc. Feed barrel. 5,466,115, Cl. 414-786.000.

Three Bond Co., Ltd.: *See*—
Hiraoka, Soichiro, 5,466,764, Cl. 525-530.000.

Thyssen Nordseewerke GmbH: *See*—
Munk, Joachim, 5,465,471, Cl. 29-563.000.

Tietje, Mark E., to Caterpillar Inc. A fluid connecting device. 5,466,052, Cl. 303-1.000.

Timex Corporation: *See*—
Houlihan, John T., 5,467,324, Cl. 368-10.000.

Timm, Heinrich: *See*—
Klages, Ulrich; Feldschmid, Alois; Kreis, Gundolf; and Timm, Heinrich, 5,466,035, Cl. 296-205.000.

Timm, Volker: *See*—
Drews, Steffen; Tobergte, Wolfgang; Timm, Volker; and Axer, Klaus, 5,467,081, Cl. 340-825.340.

Timmons, Richard J.: *See*—
Hudson, Alice P.; Woodward, Fred E., deceased; Woodward, by Sam, executor; Timmons, Richard J.; and Goertz, Harvey M., 5,466,274, Cl. 71-28.000.

Timmons, Robert D. Multiple sampling lysimeter. 5,465,628, Cl. 73-864.340.

Tingskog, Lennart. Conveyor for loading and unloading material within a very wide area, which conveyor includes a single endless belt. 5,465,830, Cl. 198-819.000.

Tinoco, Hernan: *See*—
Karlsson, Rolf L.; Tinoco, Hernan; and Henriksson, Mats E., 5,466,272, Cl. 55-457.000.

Tipperary Sport Products, Inc.: *See*—
Cudney, Douglas J.; and Breitbach, Karen E., 5,465,424, Cl. 2-2.000.

Tippett, Stephen W.; and Ribbans, Robert C., to Textiles Coated International. Polytetrafluoroethylene laminate and method of producing same. 5,466,531, Cl. 428-422.000.

Tischler, Edward A. Putting training device. 5,465,971, Cl. 273-186.200.

Tissler, Arno: *See*—
Wallau, Martin; Spichtinger, Rudolf; Unger, Klaus K.; Tissler, Arno; and Thome, Roland, 5,466,432, Cl. 423-700.000.

Titan Corporation, The: *See*—
Schossow, Stephen R.; and Reiner, Thomas C., 5,467,396, Cl. 380-4.000.

Titulaer, Franz: *See*—
Koks, Maarten; and Titulaer, Franz, 5,465,852, Cl. 211-87.000.

Titus, Robert D.: *See*—
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,466,709, Cl. 514-432.000.

Tjarks, Werner: *See*—
Soloway, Albert H.; Barth, Rolf F.; Anisuzzaman, Abul K.; Tjarks, Werner; Rong, Feng-Guang; and Wyzlic, Iwona M., 5,466,679, Cl. 514-50.000.

TNS Mills: *See*—
Tsuzuki, Kiyohiro, 5,465,565, Cl. 57-90.000.

Tobergte, Wolfgang: *See*—

Drews, Steffen; Toberge, Wolfgang; Timm, Volker; and Axer, Klaus, 5,467,081, Cl. 340-825.340.

Tobler, Markus: *See*—
Rauber, Walter; and Tobler, Markus, 5,466,314, Cl. 149-46.000.

Tobukuro, Kuniaki: *See*—
Decker, Gary T.; Gornowicz, Gerald A.; and Tobukuro, Kuniaki, 5,466,323, Cl. 156-307.400.

Toda Kogyo Corp.: *See*—
Mishima, Akio; Harada, Tosiharu; Tanihara, Mamoru; Ota, Yasutaka; Okinaka, Kenji; Mori, Kohji; Kawasaki, Hirofumi; Nagai, Norimichi; Fujimoto, Katsunori; and Okuda, Yoshiro, 5,466,306, Cl. 148-106.000.

Todd, Glen L. Tree stand bow holder releasably coupled to a tree stand. 5,465,933, Cl. 248-201.000.

Togino, Takayoshi: *See*—
Kuba, Keiichi; and Togino, Takayoshi, 5,467,205, Cl. 359-40.000.

Tokitoh, Hiroyuki: *See*—
Abe, Makoto; Ohta, Shigekata; Tokitoh, Hiroyuki; Ueda, Morimasa; Kano, Takahumi; and Hidaka, Hiroyuki, 5,467,289, Cl. 364-560.000.

Toko, Inc.: *See*—
Tanigawa, Hiroshi, 5,467,045, Cl. 327-336.000.

Toko, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Telescoping antenna with dual impedance matching circuits. 5,467,097, Cl. 343-702.000.

Tokumaru, Susumu: *See*—
Kouzai, Fumio; Tokumaru, Susumu; and Kitamura, Syozo, 5,466,075, Cl. 400-240.300.

Tokunaga, Isao: *See*—
Fukuda, Keiji; Tokunaga, Isao; and Akagi, Takao, 5,466,505, Cl. 428-91.000.

Tokyo Silicone Co., Ltd.: *See*—
Oikawa, Isamu; and Maeda, Katsuhiko, 5,466,510, Cl. 428-172.000.

Tomi Seiko Co., Ltd.: *See*—
Seki, Masahiro, 5,466,417, Cl. 422-109.000.

Tomic, Mirjana: *See*—
Kovacevic, Mice; Herak, Jure J.; Mandic, Zora; Lukic, Irena; Tomic, Mirjana; and Brkic, Zinka, 5,466,686, Cl. 514-210.000.

Tomie, Muneharu: *See*—
Tanaka, Yoshihiko; Chikaraishi, Tsuneo; and Tomie, Muneharu, 5,466,002, Cl. 280-733.000.

Tominaga, Katsuhiko: *See*—
Sato, Katsuaki; Tominaga, Katsuhiko; Saka, Tsutomu; Kawamura, Osamu; Takahashi, Teruo; and Kakiuchi, Arata, 5,466,276, Cl. 75-231.000.

Tomioka, Isao; Nakano, Takeshi; Furukawa, Mikio; and Echigo, Yoshiaki, to Unitika Ltd. Polyimide precursor solution, process for producing the solution and moldings and coatings obtained therefrom. 5,466,732, Cl. 524-113.000.

Tomita, Koji: *See*—
Tsunakawa, Mitsuaki; Yamasaki, Tetsuro; Tomita, Koji; and Tennyo, Osamu, 5,466,450, Cl. 424-118.000.

Tomita, Mamoru: *See*—
Konig, Wolfgang; Tomita, Mamoru; Shimamura, Seiichi; Kawase, Kozo; Takase, Mitsunori; and Bellamy, Wayne R., 5,466,669, Cl. 514-12.000.

Tomiyama, Tetsuo: *See*—
Umeda, Yasushi; Motegi, Yasuo; Tomiyama, Tetsuo; Yoshikawa, Hiroyuki; and Shimomura, Yoshiki, 5,467,355, Cl. 364-571.040.

Tomoegawa Paper Co., Ltd.: *See*—
Okutani, Haruo; Tagami, Toshio; Kurebayashi, Hideki; and Nakadera, Kazue, 5,466,553, Cl. 430-109.000.

Tomokiyo, Shigetaka: *See*—
Mifune, Hiroshi; Saitoh, Satoshi; Kaneda, Teruo; Tomokiyo, Shigetaka; Adachi, Tsugio; Tanaka, Tsutomu; and Furudate, Toshiharu, 5,465,525, Cl. 43-132.100.

Tomokiyo White Ant Co. Ltd.: *See*—
Mifune, Hiroshi; Saitoh, Satoshi; Kaneda, Teruo; Tomokiyo, Shigetaka; Adachi, Tsugio; Tanaka, Tsutomu; and Furudate, Toshiharu, 5,465,525, Cl. 43-132.100.

Tompkins, Robert E.: *See*—
Barnes, Michael S.; Keller, John H.; Logan, Joseph S.; Tompkins, Robert E.; and Westerfield, Robert P., Jr., 5,467,249, Cl. 361-234.000.

Toner, John L.: *See*—
Baker, Edward J.; Bacon, Edward R; Illig, Carl R.; Caulfield, Thomas J.; Douty, Brent D.; Josef, Kurt A.; Toner, John L.; and Lee, Robert W., 5,466,435, Cl. 424-9.450.

Tong, Vincent L.: *See*—
Resler, Edwin W.; Tong, Vincent L.; Swanson, Russell C.; and Bogden, W. Scott, 5,466,117, Cl. 414-799.000.

Toor, John W.: *See*—
Carstens, Robert J.; Gatti, John E.; Shoda, Thomas M.; and Toor, John W., 5,466,172, Cl. 439-509.000.

Topy Kogyo Kabushiki Kaisha: *See*—
Hirai, Yukio; Kanayama, Kouzou; Yoshii, Kenji; Iwasaki, Kiyotoshi; Kanai, Isao; and Suzuki, Shin, 5,465,598, Cl. 72-84.000.

Toray Industries: *See*—
Decker, Gary T.; Gornowicz, Gerald A.; and Tobukuro, Kuniaki, 5,466,323, Cl. 156-307.400.

Tormena, Andrea: *See*—
Pellegrini, Alfred, Jr.; Tormena, Andrea; Pozzobon, Alessandro; Zorzi, Claudio; and Edauw, Peter, 5,465,984, Cl. 280-11.200.

Toronto Research Chemicals, Inc.: *See*—
Dime, David, 5,466,809, Cl. 546-183.000.

Torrence, G. Paull: *See*—
Scates, Mark O.; Warner, R. Jay; and Torrence, G. Paull, 5,466,874, Cl. 562-519.000.

Tosaka, Masaki; Saijo, Hiroyuki; Kawano, Haruki; Hayakawa, Yutaka; and Ohi, Toshiaki, to Kao Corporation. Liquid detergent composition. 5,466,395, Cl. 252-551.000.

Toshiba America Information Systems, Inc.: *See*—
Matsukane, Edward H.; and Tze, Ryan H., 5,467,341, Cl. 370-17.000.

Total: *See*—
Romieu, Jacques; Degouy, Didier; Parigot, Philippe; and Hourcard, Michel, 5,465,609, Cl. 73-38.000.

Toth, Tibor, to Behringwerke Aktiengesellschaft. Method for the determination of antigens or antibodies in the presence of an immune complex. 5,466,611, Cl. 436-534.000.

Tottori Sanyo Electric Co., Ltd.: *See*—
Urasaka, Shinichi; and Sakata, Takeharu, 5,467,383, Cl. 379-61.000.

Touma, Maroun: *See*—
Kleinschmitt, David; Touma, Maroun; and Zabetakis, George E., 5,466,946, Cl. 250-577.000.

Towles, John T.: *See*—
Coate, Robert B.; and Towles, John T., 5,466,367, Cl. 210-96.100.

Toy, Raymond L.: *See*—
Chennakeshu, Sandeep; Dent, Paul W.; Koilpillai, Ravinder D.; and Toy, Raymond L., 5,467,374, Cl. 375-340.000.

Toyoda Gosei Co., Ltd.: *See*—
Miyake, Kazutoshi; Ueno, Masato; Watanabe, Satomi; Funahashi, Nobuaki; Asai, Tomohito; and Isono, Thoru, 5,465,485, Cl. 29-892.110.

Toyoda, Kenji: *See*—
Kadota, Kuninobu; Koseki, Hiroyuki; and Toyoda, Kenji, 5,465,773, Cl. 152-454.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Iwashita, Shigeo; Ohno, Akihiro; and Shirai, Takashi, 5,467,281, Cl. 364-424.050.

Toyoda, Seiji; Sugamura, Kunio; and Yoshida, Hideaki, to Mitsubishi Materials Corporation. Method of making glazed AlN substrate with an Al_2O_3-SiO_2 interfacial layer. 5,466,488, Cl. 427-376.200.

Toyota, Akinori: *See*—
Kaneishi, Akimasa; and Toyota, Akinori, 5,465,908, Cl. 239-571.000.

Toyota, Eiichi: *See*—
Nakata, Kiyoshi; Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Terunuma, Mutsuhiro; Suzuki, Masato; Tsutsui, Yoshio; Toyota, Eiichi; and Yasuda, Kouji, 5,467,262, Cl. 363-41.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Fujie, Naofumi; Fukura, Kenichi; Ito, Koichi; Hirata, Tetsuya; and Nishio, Naoto, 5,466,038, Cl. 296-213.000.
Sugiyama, Mizuho, 5,467,278, Cl. 364-424.050.

Toyre, Georges: *See*—
Tarassoff, Serge; and Toyre, Georges, 5,465,668, Cl. 104-95.000.

Trabucco, Robert: *See*—
Vongfuangfoo, Sutee; and Trabucco, Robert, 5,465,470, Cl. 29-559.000.

Tracy, David H.: *See*—
Lokshin, Anatole; Burchfield, David E.; and Tracy, David H., 5,465,608, Cl. 73-24.010.

Tran, Howard T.: *See*—
Moore, Roland S.; and Tran, Howard T., 5,465,816, Cl. 188-196.00P.

Transitions Optical, Inc.: *See*—
Van Gemert, Barry; and Kumar, Anil, 5,466,398, Cl. 252-586.000.

Traxler, William: *See*—
Royalty, Charles M.; Traxler, William; and Hough, Joseph W., 5,465,756, Cl. 137-625.310.

Tray-Safe Inc.: *See*—
Dooley, David M., 5,465,929, Cl. 248-681.000.

Trek Medical Corporation: *See*—
Davis, Richard C., 5,465,745, Cl. 135-82.000.

Trell, Anders E. Method for signalling/communication within an entrance telephone system and an entrance telephone system communicating according to the method. 5,467,386, Cl. 379-103.000.

Tremblay, Richard: *See*—
Semenza, Christopher G.; and Tremblay, Richard, 5,466,092, Cl. 405-85.000.

Trigen Energy Corporation: *See*—
Mornhed, Goran; Young, John; and Thompson, Harvey W., 5,465,585, Cl. 62-59.000.

Trimedyne, Inc.: *See*—
Loeb, Marvin P.; Shaolian, Samuel M.; Saadatmanesh, Vahid; Giba, Jeffrey J.; and Pham, To V., 5,466,234, Cl. 606-15.000.

Triner, Irvin R.: *See*—
Bowen, David C.; Harwath, Frank A.; and Triner, Irvin R., 5,465,479, Cl. 29-749.000.

Trivella, Walter: *See*—
Gai, Giorgio; and Trivella, Walter, 5,466,996, Cl. 318-16.000.

Trongard, Pennelle J.: *See*—
Hagen, Floyd W.; Hohenstein, Gregg A.; Severson, John A.; and Trongard, Pennelle J., 5,466,067, Cl. 374-138.000.

Troth, John L.: *See*—
Keeney, F. Nelson; and Troth, John L., 5,466,659, Cl. 504-130.000.

Trousilek, Jan P. V. Wall structure fabricating system and prefabricated form for use therein. 5,465,545, Cl. 52-425.000.

Trower, Michael K.: *See*—

Sarraf, Fateme S.; Trower, Michael K.; and Omer, Charles A., 5,466,590, Cl. 435-189.000.

Trustees of Boston University: *See*—
Shapiro, David; and Alexander, J. Steven, 5,466,667, Cl. 514-11.000.

TRW, Inc.: *See*—
Abel, Robert J.; MacDonald, Michael C.; and Wang, Peter S.-S., 5,467,271, Cl. 364-420.000.
Chen, Chien-An, 5,467,100, Cl. 343-770.000.
Heflinger, Lee O.; Simmons, William W.; St. Pierre, Randall J.; and Injeyan, Hagop, 5,467,214, Cl. 359-238.000.
Huey, Henry E.; and Nishimura, Michael J., 5,467,349, Cl. 370-60.100.
Saagret, Henry C., 5,465,805, Cl. 180-143.000.

Tsai, Chin-Lin. Heating torch. 5,466,149, Cl. 431-344.000.

Tsai, Nun-Sian, to Taiwan Semiconductor Manufacturing Company Ltd. Silicon damage free process for double poly emitter and reverse MOS in BiCMOS application. 5,466,615, Cl. 437-31.000.

Tsang, Paul J.-M.: *See*—
Chapple-Sokol, Jonathan D.; Hsu, Louis L.-C.; Tsang, Paul J.-M.; and Yuan, Chi-Min, 5,465,859, Cl. 216-12.000.

Tse, Allan: *See*—
Belleau, Bernard, deceased; Mansour, Tarek; Tse, Allan; Evans, Colleen A.; Jin, Haolun; Zacharie, Boulos; and Nguyen-Ba, Nghe, 5,466,806, Cl. 544-310.000.

Tseytlin, Alexander S.; and Brasile, Francis J., to Ford Motor Company. Apparatus for measuring kinematic errors in power transmission mechanisms. 5,465,624, Cl. 73-653.000.

Tsou, Andy H.: *See*—
Blazey, Richard N.; and Tsou, Andy H., 5,466,564, Cl. 430-403.000.

Tsubosaki, Kunihiro: *See*—
Beng, Lim T.; Chong, Chai T.; Amagai, Masazumi; Anjoh, Ichiro; Arita, Junichi; Tsubosaki, Kunihiro; Ichitani, Masahiro; and Edwards, Darvin, 5,466,888, Cl. 174-52.200.

Tsubota, Kazuo; and Tahata, Syouichi, to Hudson Soft Co., Ltd. Image processing apparatus. 5,467,442, Cl. 395-135.000.

Tsuchiya, Hiromitsu: *See*—
Sato, Takashi; Suzuki, Takahisa; Tsuchiya, Hiromitsu; and Mitani, Tetsuya, 5,466,989, Cl. 313-635.000.

Tsukada, Shyuichi, to NEC Corporation. Reference potential generating circuit utilizing a difference in threshold between a pair of MOS transistors. 5,467,052, Cl. 327-543.000.

Tsukamoto, Katsuhiro: *See*—
Shimizu, Masahiro; and Tsukamoto, Katsuhiro, 5,466,623, Cl. 437-57.000.

Tsukamoto, Osami: *See*—
Wada, Yukio; Yamamoto, Kazunori; Tsukamoto, Osami; Ohara, Takeshi; Miyake, Chie; and Mori, Sadao, 5,465,849, Cl. 209-214.000.

Tsukida, Robert S.: *See*—
Kowdley, Balasubramanian S.; Lewis, Thomas A.; Tsukida, Robert S.; Saxon, Edward W.; Ortega, Frank; and Debenedetto, Paul, 5,465,497, Cl. 33-626.000.

Tsunakawa, Mitsuaki; Yamasaki, Tetsuro; Tomita, Koji; and Tenmyo, Osamu, to Bristol-Myers Squibb Co. Antiviral antibiotic BU-4224V. 5,466,450, Cl. 424-118.000.

Tsunoda, Tetsujiro, to Kabushiki Kaisha Toshiba. Intelligent power device module. 5,466,969, Cl. 257-706.000.

Tsuruoka, Hideki: *See*—
Ohmori, Shinji; Ogata, Kazumi; Tsuruoka, Hideki; and Sakaue, Takahiro, 5,466,673, Cl. 514-18.000.

Tsurushima, Katsuaki, to Sony Corporation. Disc cleaning device. 5,467,332, Cl. 369-72.000.

Tsutsui, Yoshio: *See*—
Nakata, Kiyoshi; Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Terunuma, Mutsuhiro; Suzuki, Masato; Tsutsui, Yoshio; Toyota, Eiichi; and Yasuda, Kouji, 5,467,262, Cl. 363-41.000.

Tsuyuki, Toshio. Navigation apparatus and method. 5,467,276, Cl. 364-449.000.

Tsuzuki, Kiyohiro, to TNS Mills. Apparatus and method for delivery of sliver to ringless spinning machine. 5,465,565, Cl. 57-90.000.

Tuck, Alan D., Jr. Peristaltic pump and diaphragm therefor. 5,466,133, Cl. 418-2.000.

Tucker, Larry E., to Read-Rite Corporation. Method of assembling a head arm stack for a magnetic disk drive. 5,465,477, Cl. 29-603.000.

Tuff Boy Holding, Inc.: *See*—
Harris, Martin W.; and Cambra, John J., 5,466,030, Cl. 296-98.000.

Tuliani, Vinod V.: *See*—
Geyer, Robert P.; and Tuliani, Vinod V., 5,466,865, Cl. 562-496.000.

Tuloup, Rémy: *See*—
Terranova, Eric; Galey, Jean B.; Hocquaux, Michel; Maignan, Jean; and Tuloup, Rémy, 5,466,694, Cl. 514-272.000.

Tulsa Forte Pharmacy Enterprises, Inc.: *See*—
Poulos, Charles W.; Brenner, George M.; Allen, Loyd V., Jr.; Prabhu, Vilas A.; and Huerta, Pedro L., Jr., 5,466,695, Cl. 514-275.000.

Turko, Bojan T.: *See*—
Yates, George J.; Albright, Kevin L.; and Turko, Bojan T., 5,467,128, Cl. 348-187.000.

Turner, Edward W.: *See*—
Hardigg, James S.; and Turner, Edward W., 5,466,316, Cl. 156-69.000.

Turner, Larry: *See*—
Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, 5,467,164, Cl. 355-23.000.

Turunen, Aimo; and Jantunen, Heli, to LK-Products Oy. Filter having resonators coupled by a saw filter and a duplex filter formed therefrom. 5,467,065, Cl. 333-132.000.

Tustin, Gerald C., to Eastman Chemical Company. Process for the manufacture of 2,5-dihydrofurans from γ, δ-epoxybutenes. 5,466,832, Cl. 549-330.000.

Tut Systems, Inc.: *See*—
Aden, Charles M.; Graham, Martin H.; Taylor, Matthew; and Miller, Mark, 5,467,061, Cl. 333-24.00R.

Tyrakowski, Udo: *See*—
Berner, Hans-Ulrich; Ebiach, Rolf; Saverin, Eckehard; and Tyrakowski, Udo, 5,466,536, Cl. 428-522.000.

Tze, Ryan H.: *See*—
Matsukane, Edward H.; and Tze, Ryan H., 5,467,341, Cl. 370-17.000.

U S West Advanced Technologies, Inc.: *See*—
Skinner, Russell A., Sr., 5,467,384, Cl. 379-66.000.

Ube Industries, Ltd.: *See*—
Sugise, Ryoji; Kashiwagi, Kouichi; Shirai, Masashi; and Shimakawa, Toshihiro, 5,466,858, Cl. 558-364.000.

Uchida, Katsunori; Kobayashi, Shotaro; and Fukushima, Tatsuhiro, to NEC Corporation. Semiconductor integrated circuit. 5,467,304, Cl. 365-174.000.

Uchida, Katsuyoshi; and Murakami, Eiji, to Nissan Motor Co., Ltd. Door structure for vehicle. 5,466,031, Cl. 296-146.600.

Uchida, Yukio; Iritani, Satoshi; and Miyake, Toshio, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Method for improving the taste of pine extract, and orally administrable product obtained thereby. 5,466,453, Cl. 424-195.100.

Uchikata, Yoshio: *See*—
Asakura, Osamu; Uchikata, Yoshio; Kawazoe, Kenji; and Kanome, Yuji, 5,466,074, Cl. 400-206.000.

Uchimura, Kuniharu; Saito, Osamu; Amemiya, Yoshihito; and Iwata, Atsushi, to Nippon Telegraph and Telephone Corporation. Neural network circuit. 5,467,429, Cl. 395-24.000.

Uchinami, Masanobu, to Mitsubishi Denki Kabushiki Kaisha. Electronic control device for controlling the alternator and the idling RPM of automotive engine. 5,467,008, Cl. 322-27.000.

Uchiyama, Shigeyuki, to Nikon Corporation. Focus condition detecting device. 5,467,163, Cl. 354-402.000.

Ueda, Fumihiro: *See*—
Tajima, Itsurou; and Ueda, Fumihiro, 5,466,642, Cl. 501-96.000.

Ueda, Morimasa: *See*—
Abe, Makoto; Ohta, Shigekata; Tokitoh, Hiroyuki; Ueda, Morimasa; Kano, Takahumi; and Hidaka, Hiroyuki, 5,467,289, Cl. 364-560.000.

Uemura, Hiroki: *See*—
Butsuen, Tetsuro; Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Adachi, Tomohiko; and Morioka, Satoshi, 5,467,283, Cl. 364-461.000.
Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, 5,467,284, Cl. 364-461.000.

Uemura, Ryuji: *See*—
Kataoka, Takayuki; Uemura, Ryuji; Kawasaki, Shunzo; and Shibata, Fumio, 5,466,514, Cl. 428-229.000.

Ueno, Hideyuki: *See*—
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,467,136, Cl. 348-416.000.

Ueno, Masato: *See*—
Miyake, Kazutoshi; Ueno, Masato; Watanabe, Satomi; Funahashi, Nobuaki; Asai, Tomohito; and Isono, Thoru, 5,465,485, Cl. 29-892.110.

Uesaka, Akira: *See*—
Furuta, Takashi; Takeda, Hajime; Nishimura, Hiroyuki; Kadono, Tsuyoshi; Ishizaki, Hirofumi; and Uesaka, Akira, 5,467,477, Cl. 455-348.000.

Uetani, Yoshiharu: *See*—
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,467,136, Cl. 348-416.000.

Ueyama, Yoshito: *See*—
Takase, Akira; Kai, Hiroyuki; Nishida, Kuniyoshi; Morita, Koichi; Masuko, Michio; Ide, Kinya; and Ueyama, Yoshito, 5,466,661, Cl. 504-253.000.

Uhlig, Karl-Heinz: *See*—
Jakobson, Gerald; Siemanowski, Werner; and Uhlig, Karl-Heinz, 5,466,719, Cl. 514-785.000.

Uhrig Kanaltechnik GmbH: *See*—
Graf, Eckhard; Graf, Jürgen; and Mauz, Hubert, 5,465,758, Cl. 138-98.000.

Ulrich, W. Thatcher; Koselka, Harvey A.; Bobick, Aaron F.; and Benjamin, Michael H., to CyberGear, Inc. Interactive exercise apparatus. 5,466,200, Cl. 482-4.000.

Ultra-Mek, Inc.: *See*—
Hoffman, D. Stephen; and Lowe, Charles F., 5,466,041, Cl. 297-188.100.

Ultraflex S.r.L.: *See*—
Gai, Giorgio; and Trivella, Walter, 5,466,996, Cl. 318-16.000.

Ulug, Mehmet E. Artificial neural network method and architecture adaptive signal filtering. 5,467,428, Cl. 395-23.000.
Ulysse, Clark H. Variable decorative picture frame. 5,465,514, Cl. 40-152.000.
UMAX Data System Inc.: *See—*
Chen, Daniel, 5,467,465, Cl. 395-550.000.
Umberson, Gerald E., to Capitol Trencher Corporation. Trenching machine. 5,465,511, Cl. 37-355.000.
Umbrianna, Gloria J. Foldable lounge with combination headrest and backrest. 5,466,039, Cl. 297-116.000.
Umeda, Koji: *See—*
Takamoro, Kenji; Umeda, Koji; and Ono, Takao, 5,467,096, Cl. 343-702.000.
Umeda, Yasushi; Motegi, Yasuo; Tomiyama, Tetsuo; Yoshikawa, Hiroyuki; and Shimomura, Yoshiki, to Mita Industrial Co., Ltd. Image forming apparatus provided with self-diagnosis system. 5,467,355, Cl. 364-571.040.
Umezu, Akira, to NEC Corporation. Time division switch. 5,467,340, Cl. 370-14.000.
Unger, Evan C.; and Shen, DeKang, to ImaR, Pharmaceutical Corp. Liposoluble compounds useful as magnetic resonance imaging agents. 5,466,438, Cl. 424-936.500.
Unger, Klaus K.: *See—*
Wallau, Martin; Spichtinger, Rudolf; Unger, Klaus K.; Tissler, Arno; and Thome, Roland, 5,466,432, Cl. 423-700.000.
Unilever Patent Holdings B.V.: *See—*
Brockhus, Jeroen J.; Moree, Jeanette D.; Lammers, Jannes G.; and Rodenburg, Tileman, 5,466,478, Cl. 426-602.000.
Union Carbide Chemicals & Plastics Technology Corporation: *See—*
Glancy, Chasrles W.; and Busby, David C., 5,466,490, Cl. 427-422.000.
Union Special Corporation: *See—*
Gosche, Matt J., 5,465,674, Cl. 112-162.000.
Union Switch & Signal Inc.: *See—*
Brown, James P., 5,465,926, Cl. 246-34.00B.
Unique Product & Design Co., Ltd.: *See—*
Liao, Gordon, 5,466,051, Cl. 301-111.000.
Unisia Jecs Corporation: *See—*
Kimura, Makoto, 5,467,280, Cl. 364-424.050.
Kobayashi, Hirohisa; and Kashiwabara, Masuo, 5,466,199, Cl. 477-107.000.
Unisys Corporation: *See—*
Carlson, Robert H., 5,467,466, Cl. 395-550.000.
United Microelectronics Corporation: *See—*
Lur, Water; Lin, Jenn-Tarng; and Chin, Hsiaw-Sheng, 5,466,627, Cl. 437-52.000.
Lur, Water, 5,466,630, Cl. 437-62.000.
Lur, Water; and Wu, Jiun Y., 5,466,632, Cl. 437-69.000.
Yang, Sheng-Hsing, 5,466,616, Cl. 437-40.000.
United States of America
Agriculture: *See—*
Sherar, James R., 5,466,082, Cl. 403-2.000.
Stanker, Larry H.; Elissalde, Marcel H., Jr.; Beier, Ross C.; Rowe, Loyd D., Jr.; and DeLoach, John R., 5,466,784, Cl. 530-388.900.
National Aeronautics and Space Administration: *See—*
Farley, Gary L., 5,465,762, Cl. 139-192.000.
Navy: *See—*
Diede, Amos J.; and McCune, William H., 5,466,537, Cl. 428-548.000.
Kidwell, David A., 5,466,578, Cl. 435-6.000.
Singh, Alok, 5,466,467, Cl. 424-450.000.
U.S. Philips Corporation: *See—*
Braat, Josephus J. M., 5,467,335, Cl. 369-100.000.
De Jonge, Dirk J. A.; and Stegehuis, Herman, 5,467,380, Cl. 378-98.200.
Drews, Steffen; Tobergte, Wolfgang; Timm, Volker; and Axer, Klaus, 5,467,081, Cl. 340-825.340.
Kruit, Pieter, 5,466,937, Cl. 250-311.000.
Lokhoff, Gerardus C. P., 5,467,360, Cl. 371-37.400.
Lumma, Waldemar; and Haarmann, Heinz, 5,467,378, Cl. 378-32.000.
Moody, Paul T., 5,466,952, Cl. 257-139.000.
Pronk, Franciscus A.; Bril, Thijs W.; Knapen, Peter S. A.; Van Heeren, Arie H.; and Rhijnsburger, Laurens J., 5,466,495, Cl. 427-576.000.
Shannon, John M., 5,466,617, Cl. 437-40.000.
Van Aller, Gerardus, 5,466,924, Cl. 250-214.0VT.
Van Koelen, Gijsbertus A.; Snaphaan, Paul G.; and Rhebergen, Gertjan, 5,467,371, Cl. 375-241.000.
Verhulst, Antonius G. H.; and Bruinink, Jacob, 5,467,105, Cl. 345-87.000.
Zager, Stephen A.; and Shvartsman, Felix P., 5,466,319, Cl. 156-220.000.
United States Surgical Corporation: *See—*
Allen, William J.; Stein, Jeffrey A.; DiCesare, Paul; Mulhauser, Paul; and Spranger, Doug, 5,465,896, Cl. 227-176.000.
Bell, Mace; Nagori, Vinod; and Zinner, Darren E., 5,465,731, Cl. 128-749.000.
Liu, Cheng-Kung, 5,466,406, Cl. 264-103.000.
United Technologies Corporation: *See—*
Clark, Jim A., 5,465,571, Cl. 60-39.320.
Connolly, Christopher J.; Lawrence, Thomas H.; Mankaukas, Joseph J.; Pawlowski, John J.; and Smith, Matthew T., 5,465,925, Cl. 244-137.100.
Leonida, Andrei; Moulthrop, Lawrence C.; and Critz, Kurt M., 5,466,354, Cl. 204-252.000.
McKibbin, Albert H.; and Burno, Jon D., 5,466,198, Cl. 475-346.000.
Szillat, John C.; Laudadio, Nicola; and Chin, Teresa, 5,465,570, Cl. 60-39.060.
Unitika Ltd.: *See—*
Tomioka, Isao; Nakano, Takeshi; Furukawa, Mikio; and Echigo, Yoshiaki, 5,466,732, Cl. 524-113.000.
Universal Analyzers, Inc.: *See—*
Barben, Ted; Carlson, Randy; Christner, Kurt; and Doring, Heinz, 5,465,578, Cl. 62-3.200.
Universal Foods Corporation: *See—*
Jacobson, Gunnard K.; Jolly, Setsuko O.; Sedmak, Joseph J.; Skatrud, Thomas J.; and Wasileski, John M., 5,466,599, Cl. 435-255.100.
University of California, Office of Technology Transfer, The Regents of the: *See—*
Dixon, Raymond D.; Roe, Lawrence H.; and Migliori, Albert, 5,465,897, Cl. 228-121.000.
White, James M.; Faber, Vance; and Saltzman, Jeffrey S., 5,467,110, Cl. 345-199.000.
Yates, George J.; Albright, Kevin L.; and Turko, Bojan T., 5,467,128, Cl. 348-187.000.
University of California, Regents of the: *See—*
Brown, Steve B.; and Milanovich, Fred P., 5,466,128, Cl. 417-254.000.
Carey, Paul G.; Thompson, Jesse B.; Colella, Nicolas J.; and Williams, Kenneth A., 5,466,302, Cl. 136-251.000.
University of California, The Regents of the: *See—*
Meng, Charles C.; and Fetterman, Harold R., 5,466,965, Cl. 257-604.000.
Singaram, Bakthan; Fisher, Gary B.; Fuller, Joseph C.; Harrison, John; and Goralski, Christian T., 5,466,798, Cl. 540-541.000.
University of Connecticut, The: *See—*
Bell, James P.; Iroh, Jude O.; Scola, Daniel A.; and Liang, Jengli, 5,466,357, Cl. 205-50.000.
University of Florida: *See—*
Zhou, Dawei; Mareci, Thomas; Burns, Michael; and Ruby, Ward, 5,466,480, Cl. 427-63.000.
University of Florida Research Foundation, Inc.: *See—*
Bergeron, Raymond J., 5,466,702, Cl. 514-374.000.
Smart, Grover C., Jr.; and Nguyen, Khuong B., 5,466,448, Cl. 424-93.100.
University of Maryland Eastern Shore: *See—*
Handwerker, Thomas S.; and Counts, Clement L., III, 5,466,373, Cl. 210-602.000.
University of Washington, Board of Regents of the: *See—*
Alexander, Thomas; Kim, Yongmin; Park, Hyunwook; Eo, Kil-Su; and Jong, Jing-Ming, 5,467,459, Cl. 395-480.000.
Furness, Thomas A., III; and Kollin, Joel S., 5,467,104, Cl. 345-8.000.
UOP: *See—*
Nemeth, Laszlo T.; Malloy, Thomas P.; and Jones, Richard R., 5,466,835, Cl. 549-531.000.
Uraki, Yoichi; Kubozuka, Takao; Kondo, Masahiko; Miyakubo, Hiroshi; and Usuki, Hisafumi, to Nissan Motor Co., Ltd. Construction of oil pan for internal combusion engine. 5,465,692, Cl. 123-195.00C.
Urasaka, Shinichi; and Sakata, Takeharu, to Sanyo Electric Co., Ltd.; and Tottori Sanyo Electric Co., Ltd. Cordless telephone apparatus. 5,467,383, Cl. 379-61.000.
Urban, Manfred: *See—*
Dietz, Erwin; and Urban, Manfred, 5,466,807, Cl. 546-6.000.
Ushirozawa, Mizuyuki, to NEC Corporation. Control device for an optical amplifier. 5,467,219, Cl. 359-341.000.
Usuki, Hisafumi: *See—*
Uraki, Yoichi; Kubozuka, Takao; Kondo, Masahiko; Miyakubo, Hiroshi; and Usuki, Hisafumi, 5,465,692, Cl. 123-195.00C.
Utaka, Shigenobu: *See—*
Watanuki, Tsuneo; Nakamura, Yasushige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utaka, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, 5,467,176, Cl. 355-270.000.
Utenick, Michael R.; and Blagaila, John H., to Integral Peripherals, Inc. Spin motor control system for a hard disk assembly. 5,466,997, Cl. 318-254.000.
Utley, Wayne S., to Vitex Packaging, Inc. Composite endless form for making flexible, windowed, form, fill and seal bags. 5,465,842, Cl. 206-390.000.
Uttinacci, Roberto: *See—*
Magnone, Jean-Pierre; and Uttinacci, Roberto, 5,465,978, Cl. 273-411.000.
Vaello, Donald B. Domestic watering and agricultural irrigation control system. 5,465,904, Cl. 239-69.000.
Vähä, Harritalo: *See—*
Pellinen, Kari; Koiranen, Jukka; Erkkilä, Kari; Ahola, Juhani; and Vähä, Harritalo, 5,467,194, Cl. 356-429.000.
Valiant Machine & Tool, Inc.: *See—*
Noestheden, Andrew, 5,465,826, Cl. 198-465.300.
Valley Forge Scientific Corporation: *See—*
Malis, Jerry; Rosen, Jonathan J.; Mortimer, Martin T.; and Vasconcellos, Alfred V., 5,465,712, Cl. 128-205.250.
Valleylab Inc.: *See—*
Page, Jon P.; and Stoddard, Robert B., 5,466,020, Cl. 285-361.000.
Valli, Gary E.: *See—*
McCahill, David I.; and Valli, Gary E., 5,465,588, Cl. 62-127.000.
Vallone, Salvatore N.: *See—*

Vallone, Thomas R.; and Vallone, Salvatore N., 5,465,524, Cl. 43-42.320.

Vallone, Thomas R.; and Vallone, Salvatore N. Fishing lures having light sensitive color change and method of producing. 5,465,524, Cl. 43-42.320.

Valmet Paper Machinery, Inc.: *See*—
Kankaanpää, Matti, 5,466,341, Cl. 162-217.000.
Kankaanpää, Matti, 5,466,342, Cl. 162-301.000.
Kankaanpää, Matti, 5,466,343, Cl. 162-357.000.
Kerttula, Reima, 5,465,505, Cl. 34-452.000.
Pellinen, Kari; Koiranen, Jukka; Erkkilä, Kari; Ahola, Juhani; and Vähä, Harritalo, 5,467,194, Cl. 356-429.000.

Van Aller, Gerardus, to U.S. Philips Corporation. Image intensifier tube with entrance screen photocathode which is insensitive to light emitted by the exit screen phosphor layer. 5,466,924, Cl. 250-214.0VT.

Van Audenhove, Katrien: *See*—
Peferoen, Marnix; Lambert, Bart; and Van Audenhove, Katrien, 5,466,597, Cl. 435-252.300.

Van Brunt, Roger: *See*—
Oprescu, Florin; and Van Brunt, Roger, 5,467,464, Cl. 395-550.000.

Van Den Bogart, Thomas W.: *See*—
Winek, M. Chris; Van Den Bogart, Thomas W.; Georger, William A.; Ribble, Brendon F.; Matthews, Billie J.; Sawyer, Lawrence H.; Abuto, Frank P.; and Werner, Edward E., 5,466,513, Cl. 428-218.000.

Van den Engh, Gerrit J.: *See*—
Sasaki, Dennis T.; Van den Engh, Gerrit J.; and Buckie, Anne-Marie, 5,466,572, Cl. 435-2.000.

van den Haak, Abraham, to A.P.I.S. Medical B.V. Injection assembly with a suction needle and a retractable injection needle. 5,466,226, Cl. 604-192.000.

Vander Groef, Lawrence, to Communication Cable, Inc. Mandrel with self-aligning flange. 5,465,922, Cl. 242-573.000.

Van Der Werf, Paul: *See*—
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., 5,466,575, Cl. 435-6.000.

Van Duyne, Scott A.; and Smith, Julius O., III, to Leland Stanford Junior University, The Board of Trustees of the. Music synthesizer system and method for simulating response of resonant digital waveguide struck by felt covered hammer. 5,466,884, Cl. 84-661.000.

Van Gemert, Barry; and Kumar, Anil, to Transitions Optical, Inc. Photochromic substituted naphthopyran compounds. 5,466,398, Cl. 252-586.000.

Van Havenbergh, Jan E.; Aertbelien, Jozef R.; and Dooms, Philip, to AGFA-Gevaert. N.V. Luminescent radiographic system comprising a support, a phosphor-binder layer and a primer layer therebetween. 5,466,541, Cl. 428-690.000.

Van Heeren, Arie H.: *See*—
Pronk, Franciscus A.; Bril, Thijs W.; Knapen, Peter S. A.; Van Heeren, Arie H.; and Rhijnsburger, Laurens J., 5,466,495, Cl. 427-576.000.

van Hoogevest, Peter: *See*—
Schneider, Peter; van Hoogevest, Peter; Capraro, Hans G.; and Isele, Ute, 5,466,468, Cl. 424-450.000.

Van Houdenhove, Rony: *See*—
Liebich, Ernst; Van Houdenhove, Rony; Smoravek, Miroslav; and Flieger, Richard, 5,466,168, Cl. 439-188.000.

Van Koelen, Gijsbertus A.; Snaphaan, Paul G.; and Rhebergen, Gertjan, to U.S. Philips Corporation. Arrangement for generating pulse code modulation values. 5,467,371, Cl. 375-241.000.

Van Le, Hoang: *See*—
Dawson, Jeffrey C.; and Van Le, Hoang, 5,465,792, Cl. 166-295.000.

Van Maanen, Johannes D., to Klöckner Hänsel Tevopharm B.V. Stacking device. 5,465,824, Cl. 198-418.400.

Van Naarden, Robert W.: *See*—
Konen, Bruce P.; and Van Naarden, Robert W., 5,465,637, Cl. 81-9.510.

Van Steenburgh, Leon R., Jr.; and Brainard, David S., to Van Steenburgh, Jr., Leon R. Refrigerant reclaim with air purge. 5,465,590, Cl. 62-195.000.

Van Valkenburgh, Virginia M.: *See*—
Wengrovius, Jeffrey H.; Burnell, Timothy B.; and Van Valkenburgh, Virginia M., 5,466,532, Cl. 428-447.000.

Varadarajan, Godavarthi S.: *See*—
Day, James; Kailasam, Ganesh; and Varadarajan, Godavarthi S., 5,466,370, Cl. 210-298.000.

Varda, Alan J. Minnow scoop. 5,465,522, Cl. 43-4.000.

Varin, Robert. Lower edge door seal. 5,465,532, Cl. 49-493.100.

Variseal Corporation: *See*—
Volke, Robert W.; and Chakravarthy, Debashish, 5,466,724, Cl. 523-111.000.

Vasconcellos, Alfred V.: *See*—
Malis, Jerry; Rosen, Jonathan J.; Mortimer, Martin T.; and Vasconcellos, Alfred V., 5,465,712, Cl. 128-205.250.

Vattenfall Energisystem AB: *See*—
Piroska, Jozsff, 5,466,108, Cl. 414-218.000.

Vattenfall Utveckling AB: *See*—
Karlsson, Rolf L.; Tinoco, Hernan; and Henriksson, Mats E., 5,466,272, Cl. 55-457.000.

VAW Aluminium AG: *See*—
Wallau, Martin; Spichtinger, Rudolf; Unger, Klaus K.; Tissler, Arno; and Thome, Roland, 5,466,432, Cl. 423-700.000.

Vax, Hanan, to Rada Electronic Industries, Ltd. Method of debriefing multi aircraft operations. 5,467,274, Cl. 364-424.060.

Vdoviak, John W.: *See*—
Nicoll, Robert A.; and Vdoviak, John W., 5,465,572, Cl. 60-266.000.

Veba Oel AG: *See*—
Wallau, Martin; Spichtinger, Rudolf; Unger, Klaus K.; Tissler, Arno; and Thome, Roland, 5,466,432, Cl. 423-700.000.

Veh, Gerhard; Schweib, Peter; and Dörflinger, Hans-Dieter, to J. M. Voith GmbH. Flotation cell and injector. 5,465,848, Cl. 209-170.000.

Veitsch-Radex Aktiengesellschaft fur feuerfeste Erzeugnisse: *See*—
Rinnhofer, Johann; Schmidberger, Robert; Pawliska, Volker; and Cappelli, Giorgio, 5,465,943, Cl. 266-220.000.

Velasquez, Larry: *See*—
Kearney, Michael M.; Kochergin, Vadim; Peterson, Kenneth R.; and Velasquez, Larry, 5,466,294, Cl. 127-42.000.

Venturedyne, Ltd.: *See*—
Kreikebaum, Gerhard; and Chandler, David L., 5,467,189, Cl. 356-336.000.

Venturino, Michael B.: *See*—
Partridge, Mary E.; Blenke, Timothy J.; Everson, Stephen R.; Schroth, Carl G.; and Venturino, Michael B., 5,466,409, Cl. 264-165.000.

Venuto, Paul B.: *See*—
Heck, Roland H.; Heinemann, Heinz; Reischman, P. T.; Venuto, Paul B.; and Whitehurst, D. Duayne, 5,466,361, Cl. 208-131.000.

Verburg, Charles C.: *See*—
Houghton, Mark P.; and Verburg, Charles C., 5,466,390, Cl. 252-174.170.

Veregin, Richard P. N.: *See*—
Sacripante, Guerino G.; Veregin, Richard P. N.; and McDougall, Maria N. V., 5,466,554, Cl. 430-110.000.

Verhulst, Antonius G. H.; and Bruinink, Jacob, to U.S. Philips Corporation. Display device. 5,467,105, Cl. 345-87.000.

Verplanken, Fabrice: *See*—
Huon, Pierre J.; Jachimcsyk, Philippe; Barucchi, Gerard; Calvignac, Jean; and Verplanken, Fabrice, 5,467,359, Cl. 371-37.100.

Vesely, Ernst: *See*—
Richter, Simon J.; Hohmann, Frank G.; and Vesely, Ernst, 5,466,413, Cl. 264-521.000.

Vetter, James W.: *See*—
Hinohara, Tomoaki; and Vetter, James W., 5,465,733, Cl. 128-772.000.

Victor Company of Japan, Ltd.: *See*—
Ichinokawa, Hiroaki, 5,467,142, Cl. 348-556.000.
Shigeta, Masanobu; Imanishi, Dai; and Shimizu, Shigeo, 5,467,216, Cl. 359-263.000.

Viel Lamare, Charles; Hiltunen, Matti; and Lee, Yam, to A. Ahlstrom Corporation. Method of purifying gases containing nitrogen oxides and an apparatus for purifying gases in a steam generation boiler. 5,465,690, Cl. 122-4.00D.

Viertel, Lothar; Welter, Patrick; Lercorvaisier, René; Mosser, Serge; and Pompino, Karl-Heinz, to Gerb. Happich GmbH. Method for the manufacture of a sun visor. 5,466,405, Cl. 264-45.400.

Vignali, Graziano: *See*—
Borzatta, Valerio; and Vignali, Graziano, 5,466,803, Cl. 544-198.000.

Vijeh, Nader; Crayford, Ian S.; and Blumenthal, Jeffrey M., to Advanced Micro Devices, Inc. AUI to twisted pair loopback. 5,467,369, Cl. 375-214.000.

Vingmed Sound A/S: *See*—
Angelsen, Bjorn; and Nickel, Michael, 5,465,723, Cl. 128-661.020.

Virnig, Michael J.: *See*—
Pristad, William E.; Narum, Jeffrey L.; Mattison, Phillip L.; Virnig, Michael J.; and Fast, John, 5,466,426, Cl. 423-98.000.

Vitex Packaging, Inc.: *See*—
Utley, Wayne S., 5,465,842, Cl. 206-390.000.

Vogel, Peter S. Document marking system employing context-sensitive embedded marking codes. 5,467,447, Cl. 395-145.000.

Vogt, Peter F.: *See*—
Preiser, Marvin F.; and Vogt, Peter F., 5,466,674, Cl. 514-23.000.

Voigt, Dieter, to Volkswagen AG. Intake pipe arrangement for an internal combustion engine having individual arc-shaped cylinder intake pipes. 5,465,699, Cl. 123-470.000.

Volke, Robert W.; and Chakravarthy, Debashish, to Variseal Corporation. Adhesive composition for a wound dressing. 5,466,724, Cl. 523-111.000.

Volks, Gunter: *See*—
Blangetti, Francisco; Kost, Andreas; and Volks, Gunter, 5,465,784, Cl. 165-114.000.

Volkswagen AG: *See*—
Neumann, Joachim, 5,466,006, Cl. 280-784.000.
Voigt, Dieter, 5,465,699, Cl. 123-470.000.

Vollbrecht, Heinz-Rüdiger: *See*—
Heidlas, Jürgen; Cully, Jan; Michlbauer, Franz; and Vollbrecht, Heinz-Rüdiger, 5,466,842, Cl. 554-83.000.

Von Duyke, Andrew L.: *See*—
Dornbush, David A.; Erickson, Chad S.; Iverson, Troy M.; Sandahl, Jeffrey E.; Moore, Kevin B.; Barnes, Neal P.; Easley, James B.; Jackson, Richard C.; and Von Duyke, Andrew L., 5,466,912, Cl. 219-400.000.

Von Ehr, James R., II: *See*—
Johnson, Steven R.; Crowder, Kevin F.; Seals-Mason, Samantha; and Von Ehr, James R., II, 5,467,443, Cl. 395-141.000.

Vongfuangfoo, Sutee; and Trabucco, Robert, to LSI Logic Corporation. Fixture for attaching multiple lids to multi-chip module (MCM) integrated circuit. 5,465,470, Cl. 29-559.000.

Von Kempski, Diotima; and Mahl, Wolfgang H. Process, installation and device for enriching ventilation or air-conditioning air with aromatic substances. 5,466,399, Cl. 261-27.000.

von Leeuwen, Jurmin, to Sutter Apparatebau AG. Dielectric-forming sheath for electrodes for corona pre-treatment installations. 5,466,422, Cl. 422-186.050.

Von Thun, Matthew S.: *See*—
Yakura, James P.; Cole, Richard K.; Von Thun, Matthew S.; Hass, Crystal J.; and Altman, Derryl D. J., 5,466,614, Cl. 437-8.000.

Voorheis, Howard T.: *See*—
Chamberlain, Craig P.; Lamb, Dennis; Lauby, William J.; and Voorheis, Howard T., 5,466,545, Cl. 429-99.000.

Vowles, David L.: *See*—
Brown, Clem H.; and Vowles, David L., 5,465,626, Cl. 73-715.000.

Vuitton, Jacques M., to Praxair S.T. Technology, Inc. Process for coating the internal surfaces of hollow bodies. 5,466,907, Cl. 219-121.590.

Vuylsteke, Pieter P.; and Schoeters, Emile P., to Agfa-Gevaert. Method and apparatus for contrast enhancement. 5,467,404, Cl. 382-274.000.

W. L. Gore & Associates, Inc.: *See*—
Soukup, Thomas M.; and Staley, Richard A., 5,466,252, Cl. 607-116.000.

W. R. Grace & Co.-Conn.: *See*—
Forloni, Roberto; and Paleari, Mario, 5,466,498, Cl. 428-36.700.

Wacker-Chemie GmbH: *See*—
Geck, Michael; Deubzer, Bernward; Baumgartner, Christine; Lautenschlager, Hans-Jürgen; and Sejpka, Johann, 5,466,746, Cl. 524-837.000.
Herzig, Christian, 5,466,845, Cl. 556-12.000.

Wada, Shunichi; Naito, Yasuo; Nishino, Kazuhisa; and Takagi, Masanori, to Mitsubishi Denki Kabushiki Kaisha. Motor-assisted power steering control device. 5,467,279, Cl. 364-424.850.

Wada, Yukio; Yamamoto, Kazunori; Tsukamoto, Osami; Ohara, Takeshi; Miyake, Chie; and Mori, Sadao, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Column and method for separating particles in accordance with their magnetic susceptibility. 5,465,849, Cl. 209-214.000.

Wade, John R.; Pratt, Michael J.; and Ren, Jianrong, to Du Pont (UK) Limited. Polyunsaturated diazonium compounds. 5,466,789, Cl. 534-560.000.

Wagar, John R.: *See*—
Davies, John T.; Egbert, Stephen J.; and Wagar, John R., 5,467,424, Cl. 392-401.000.

Wagers, Rex E.: *See*—
Seick, Thomas; and Wagers, Rex E., 5,465,863, Cl. 220-403.000.

Waggoner, Marion G.: *See*—
Samuels, Michael R.; and Waggoner, Marion G., 5,466,773, Cl. 528-194.000.

Wagner, Herbert; and Schuhmacher, Karl-Heinrich, to Rhein Chemie Rheinau GmbH. Aqueous outside release agent comprising diatomaceous earth and pyrogenic hydrophobic silica for molding and vulcanizing tires and other rubber articles. 5,466,742, Cl. 524-448.000.

Wagstaff, Robert A.; and McClure, John R., to New Holland North America, Inc. Twine cutting apparatus for round baler. 5,465,658, Cl. 100-5.000.

Wakabayashi, Kimihiro: *See*—
Shinozaki, Kengo; Wakabayashi, Kimihiro; Murakami, Hiroki; and Araki, Masaaki, 5,465,892, Cl. 225-2.000.

Wakasa, Fumio: *See*—
Sugitani, Sinzi; Tanimizu, Toru; Takematsu, Koutarou; Wakasa, Fumio; and Izumi, Toshiaki, 5,467,241, Cl. 361-63.000.

Wakefield, David: *See*—
Bickerton, David J.; and Wakefield, David, 5,465,960, Cl. 273-84.00R.

Wakita, Shinichi: *See*—
Nakatani, Fumio; Wakita, Shinichi; Murakami, Hisatoshi; Terada, Tsunehiko; and Morimoto, Shohei, 5,466,893, Cl. 174-261.000.

Wakita, Shoichi: *See*—
Shirai, Shoji; Watanabe, Kenichi; and Wakita, Shoichi, 5,466,983, Cl. 313-414.000.

Walblay, Edward J.: *See*—
Lambert, Jeffrey T.; and Walblay, Edward J., 5,466,043, Cl. 297-256.000.

Waldrep, Michael W.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.

Waldron, Steven: *See*—
Ackerman, Marvin; Berluti, Vincent; Poland, Terrell; and Waldron, Steven, 5,467,474, Cl. 395-800.000.

Wale, Michael J.: *See*—
Birkmayer, Wolfram; Wale, Michael J.; and Edge, Colin, 5,467,414, Cl. 385-3.000.

Walieddine, Fadi S. Modular advertising display apparatus. 5,465,515, Cl. 40-471.000.

Walker, Michael; and Heitkämper, Peter, to Alcatel N.V. Method of improving sidetone attenuation in electroacoustic systems. 5,467,394, Cl. 379-392.000.

Wallace Computer Services, Inc.: *See*—
Garrison, Ronald R., 5,466,013, Cl. 283-107.000.

Wallau, Martin; Spichtinger, Rudolf; Unger, Klaus K.; Tissler, Arno; and Thome, Roland, to VAW Aluminium AG; and Veba Oel AG. Crystalline zeolite-like gallosilicate, and method for its synthesis. 5,466,432, Cl. 423-700.000.

Wallis, Lee D.: *See*—
Pyle, Michael W.; and Wallis, Lee D., 5,467,286, Cl. 364-483.000.

Walls, John E.: *See*—
Miller, Gary R.; Walls, John E.; and Felker, Melanie A., 5,466,559, Cl. 430-331.000.

Wallström, Lars-Gunnar, to Sandvik AB. Cutting insert with twisted chip surface. 5,466,097, Cl. 407-113.000.

Walsh, William C.; and James, Lawrence E., to BASF Corporation. Method for removing and reclaiming excess uncured paint from paint spray booth. 5,466,300, Cl. 134-38.000.

Walter, Bruno H. Water hammer driven vibrator. 5,467,322, Cl. 367-142.000.

Walter, Jose, to Accu Bite Dental Supply Company. Method for creating a dental model. 5,466,152, Cl. 433-60.000.

Walz, Gerd: *See*—
Angelmayer, Karl-Hans; Walz, Gerd; and Zoeller, Joachim, 5,466,772, Cl. 528-73.000.

Wanek, M. Chris; Van Den Bogart, Thomas W.; Georger, William A.; Ribble, Brendon F.; Matthews, Billie J.; Sawyer, Lawrence H.; Abuto, Frank P.; and Werner, Edward E., to Kimberly-Clark Corporation. Multi-layer absorbent composite. 5,466,513, Cl. 428-218.000.

Wang, Chih-Yao: *See*—
Sun, Jyi-Yu; Chian, Tao; Shih, Di-Kon; and Wang, Chih-Yao, 5,465,782, Cl. 165-104.260.

Wang, James: *See*—
Hu, Vince; and Wang, James, 5,467,294, Cl. 364-721.000.

Wang, Peter S.-S.: *See*—
Abel, Robert J.; MacDonald, Michael C.; and Wang, Peter S.-S., 5,467,271, Cl. 364-420.000.

Wang, Tsong L. Rotatable bracket of a monitor. 5,465,936, Cl. 248-371.000.

Wang, Wen-Bin, to Yaban Chain Industrial Co., Ltd. Chain structure for bicycles. 5,465,568, Cl. 59-4.000.

Wang, Yongcai: *See*—
Anderson, Charles C.; Wang, Yongcai; Bello, James L.; Shalhoub, Ibrahim M.; and Corbin, Douglas D., 5,466,567, Cl. 430-530.000.

Wang, Yushan, to Standard Keil Industries, Inc. Two-stage regulator. 5,465,750, Cl. 137-484.800.

Wang, Yuzhou: *See*—
Liberti, Paul A.; Wang, Yuzhou; Tang, Weixin; Feeley, Brian P.; and Gohel, Dhanesh I., 5,466,574, Cl. 435-5.000.

Wanou, Masahiro: *See*—
Watanuki, Tsuneo; Nakamura, Yasushige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utaka, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, 5,467,176, Cl. 355-270.000.

Ward, Bennie R., Jr.; Levy, Sander A.; and Sloan, George A., to Reynolds Metals Company. Method for making aluminum foil and cast strip stock for aluminum foilmaking and products therefrom. 5,466,312, Cl. 148-551.000.

Warner-Lambert Company: *See*—
Fedij, Victor; Suto, Mark J.; Wemple, James N.; and Zeller, James R., 5,466,828, Cl. 548-566.000.
Glase, Shelly; Jaen, Juan C.; Smith, Sarah J.; and Wise, Lawrence D., 5,466,698, Cl. 514-318.000.
Woolf, Thomas F., 5,466,696, Cl. 514-297.000.

Warner, R. Jay: *See*—
Scates, Mark O.; Warner, R. Jay; and Torrence, G. Paull, 5,466,874, Cl. 562-519.000.

Warner, Roy K.: *See*—
Cornell, Paul A.; and Warner, Roy K., 5,466,176, Cl. 439-789.000.

Warrington, Roger P.; Ramsay, Guy; and Bird, Neal R., to Imperial Chemical Industries PLC. Granular fungicidal composition for application to an aquatic environment. 5,466,693, Cl. 514-269.000.

Washburn, William N.; Lussier, Barbara B.; Illig, Carl R.; and Latimer, Lee H., to Sterling Winthrop Inc. 3,4-disubstituted phenols-immunomodulating agents. 5,466,715, Cl. 514-618.000.

Washington University: *See*—
Wun, Tze-Chein; Kretzmer, Kuniko K.; and Broze, George J., Jr., 5,466,783, Cl. 530-380.000.

Washio, Koji; Tanaka, Kazuyoshi; and Haneda, Satoshi, to Konica Corporation. Digital copying apparatus with a display. 5,467,202, Cl. 358-448.000.

Wasileski, John M.: *See*—
Jacobson, Gunnard K.; Jolly, Setsuko O.; Sedmak, Joseph J.; Skatrud, Thomas J.; and Wasileski, John M., 5,466,599, Cl. 435-255.100.

Wasilewski, Anthony J.: *See*—
Logston, Gary L.; Wasilewski, Anthony J.; Hammond, Maynard; and Cheung, Francis, 5,467,342, Cl. 370-17.000.

Watai, Hiroo; Nishida, Takao; Nagumo, Takaharu; and Nagai, Masahiko, to Hitachi, Ltd. Logical operation method employing parallel arithmetic unit. 5,467,292, Cl. 364-578.000.

Watanabe, Hideki: *See*—
Matsumoto, Toshio; and Watanabe, Hideki, 5,467,005, Cl. 320-20.000.

Watanabe, Hiroyuki: *See*—
Sakata, Satoshi; Kudo, Tomoo; Watanabe, Hiroyuki; and Matsudaira, Tadashi, 5,467,173, Cl. 355-235.000.

Watanabe, Hitoshi: *See*—
Mihara, Takashi; Yoshimori, Hiroyuki; Watanabe, Hitoshi; McMillan, Larry D.; and De Araujo, Carlos P., 5,466,629, Cl. 437-60.000.

Watanabe, Kazunari: *See*—
Izumi, Michihiro; and Watanabe, Kazunari, 5,467,367, Cl. 375-206.000.

Watanabe, Kenichi: *See*—
Shirai, Shoji; Watanabe, Kenichi; and Wakita, Shoichi, 5,466,983, Cl. 313-414.000.

Watanabe, Naotoshi; Masukawa, Tsuyoshi; Ozaki, Kenji; and Moriwaki, Noboru, to Showa Denko Kabushiki Kaisha. Process for production of chlorinated ethylene-propylene copolymers. 5,466,757, Cl. 525-352.000.

Watanabe, Satomi: *See*—
Miyake, Kazutoshi; Ueno, Masato; Watanabe, Satomi; Funahashi, Nobuaki; Asai, Tomohito; and Isono, Thoru, 5,465,485, Cl. 29-892.110.

Watanabe, Shigeaki: *See*—
Murakami, Tetsuya; Osumi, Masahiro; Nakanishi, Toshisuke; and Watanabe, Shigeaki, 5,466,033, Cl. 296-189.000.

Watanabe, Shigeyoshi: *See*—
Hasegawa, Takehiro; Watanabe, Shigeyoshi; and Masuoka, Fujio, 5,467,303, Cl. 365-149.000.

Watanabe, Shuko, to Fujitsu Limited. Current supply circuit and control method for supply current in a magnetic tape apparatus. 5,465,918, Cl. 242-334.200.

Watanabe, Takashi, to Canon Kabushiki Kaisha. Optical apparatus having a lens for zooming movable to a zoom area and a macro area. 5,467,226, Cl. 359-693.000.

Watanabe, Takashi, to TEAC Corporation. Lid mechanism, for recording-medium insertion opening, having lid deformation control construction. 5,467,235, Cl. 360-99.060.

Watanabe, Yoshiharu, to Fujitsu Limited. Semiconductor device with two series-connected complementary misfets of same conduction type. 5,467,048, Cl. 327-436.000.

Watanabe, Yukiyoshi: *See*—
Goto, Toshio; Hayakawa, Hidenori; Watanabe, Yukiyoshi; Narabu, Shin-ichi; and Yanagi, Akihiko, 5,466,660, Cl. 504-134.000.

Watanabe, Yutaka: *See*—
Duerr, Wilhelm; Mikoshiba, Norihiko; and Watanabe, Yutaka, 5,467,017, Cl. 324-318.000.

Watanuki, Tsuneo; Nakamura, Yasuhige; Takezawa, Satoshi; Sawatari, Norio; Nagahara, Akira; Sasaki, Sachio; Sato, Mitsuru; Utaka, Shigenobu; Takahashi, Takefumi; Wanou, Masahiro; and Konishi, Masao, to Fujitsu Limited. Image forming method and apparatus with magnetic brush. 5,467,176, Cl. 355-270.000.

Waterworks International, Inc.: *See*—
Keus, Arie, 5,465,592, Cl. 62-544.000.

Watkin, Keith: *See*—
Adams, Amanda J.; Jackson, Philip S.; Moulden, Howard N.; Roberts, David W.; and Watkin, Keith, 5,466,851, Cl. 558-21.000.

Watkins, Grant H.; and Caldwell, Stephen P., to Westinghouse Electric Corp. Radar and other communication systems having large bandwidth and large dynamic range. 5,467,091, Cl. 342-159.000.

Watkins, Rex D.: *See*—
Lamprecht, Dale E., Jr.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., 5,467,433, Cl. 395-114.000.

Watson, Derrick J.: *See*—
McClarron, Andrew R.; Smith, Stephen J.; Watson, Derrick J.; Williams, Bruce L.; and Ross, Euan S., 5,466,876, Cl. 562-608.000.

Watson, Ian G., to Plessey Semiconductors Limited. Logarithmic detector. 5,467,093, Cl. 342-175.000.

Waylett, John E., Jr., to Behring Diagnostics Inc. Liquid dispensing system with acoustic sensing means. 5,465,629, Cl. 73-864.240.

Weaver, Edwin W., Jr.: *See*—
Appleton, William J.; Hahn, Dennis; Moucha, William E.; Ruscio, Dominic V.; Shannon, John H.; Silbermann, Steven D.; and Weaver, Edwin W., Jr., 5,466,147, Cl. 425-412.000.

Weber, Beate; Hagemann, Jörg; and Geiger, Markus, to Agfa-Gevaert AG. Color photographic recording material. 5,466,569, Cl. 430-551.000.

Weber, Bruno: *See*—
Eberle, Jurg; and Weber, Bruno, 5,465,952, Cl. 271-204.000.

Weber, Gunter: *See*—
Kalbe, Jochen; Müller, Hanns P.; Koch, Rainhard; Engelhardt, Jürgen; Koch, Wolfgang; Szablikowski, Klaus; and Weber, Gunter, 5,466,794, Cl. 536-66.000.

Weber, Helmut: *See*—
Harrison, Daniel J.; Simpson, William H.; Bowman, Wayne A.; Lawrence, Kristine B.; and Weber, Helmut, 5,466,658, Cl. 503-227.000.

Weber, Leo D.: *See*—
Hess, Irwin H.; and Weber, Leo D., 5,466,369, Cl. 210-220.000.

Webster, Jon: *See*—
Roach, Matthew N.; Stapensea, Neil P.; and Webster, Jon, 5,465,874, Cl. 222-51.000.

Weder, Donald E., to Highland Supply Corporation. Method for wrapping an item with a sheet of material from a pad of sheets of material. 5,465,551, Cl. 53-397.000.

Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., to Highland Supply Corporation. Method for applying a band about a sheet of material and a pot. 5,465,552, Cl. 53-399.000.

Weder, Donald E.; Straeter, William F.; and Straeter, Joseph G., to Highland Supply Corporation. Method for applying a band about a sheet of material and a pot. 5,465,553, Cl. 53-399.000.

Wei, Hsu S.: *See*—
Yaw, Ke G.; and Wei, Hsu S., 5,465,488, Cl. 30-41.000.

Weigelt, Horst: *See*—
Schaal, Walter; and Weigelt, Horst, 5,466,188, Cl. 460-24.000.

Weilant, David R.; and Fowler, Craig, to Borg-Warner Automotive, Inc. Power transmitting assembly. 5,465,819, Cl. 192-35.000.

Weiner, Alan L.; Sinnett, Kevin; and Johnston, Sterling, to Escalon Ophthalmics, Inc. Tack for intraocular drug delivery and method for inserting and removing same. 5,466,233, Cl. 604-890.100.

Weingartner, Harold, to D. Swarovski & Co. Light input reflector for optical-fiber systems. 5,467,416, Cl. 385-31.000.

Weisburg, William G., to Amoco Corporation. Nucleic acid probes for the detection of Lyme disease spirochetes. 5,466,577, Cl. 435-6.000.

Weiss, Alexander: *See*—
Rohrmann, Peter; Weiss, Alexander; Hög, George; and Zamzow, Peter, 5,467,420, Cl. 385-101.000.

Welch Allyn, Inc.: *See*—
Tamburrino, Richard A.; and Connelly, Jack L., Jr., 5,467,124, Cl. 348-65.000.

Welch, M. Bruce: *See*—
Patsidis, Konstantinos; Peifer, Bernd; Palackal, Syriac J.; Alt, Helmut G.; Welch, M. Bruce; Geerts, Rolf L.; Fahey, Darryl R.; and Deck, Harold R., 5,466,766, Cl. 526-129.000.

Welex Incorporated: *See*—
Nissel, Frank R., 5,466,403, Cl. 264-39.000.

Weller, Richard G., to Xerox Corporation. Sheet feeding and separating apparatus. 5,465,948, Cl. 271-34.000.

Wells, Thomas R.; DaPrato, Leo; Friedrich, Paul; Hendrickson, Kenneth; LaRue, Merv; Overman, John; Patuszynski, Duane; Plum, Dale; Rabin, Al; Schwalb, Stuart; Solomon, Dan; Turner, Larry; Briggs, David; and Hausmann, Herb, to Bell & Howell Document Management Products Company. Document processing system having a straight line document path. 5,467,164, Cl. 355-23.000.

Wells, William; Raidl, Georg; and Schmelzer, Walter, to Kortec AG. Tuyere arrangement for the introduction of agents into a molten bath and method of operating such a tuyere arrangement. 5,465,942, Cl. 266-46.000.

Welter, Patrick: *See*—
Viertel, Lothar; Welter, Patrick; Lercorvaisier, René; Mosser, Serge; and Pompino, Karl-Heinz, 5,466,405, Cl. 264-45.400.

Wemple, James N.: *See*—
Fedij, Victor; Suto, Mark J.; Wemple, James N.; and Zeller, James R., 5,466,828, Cl. 548-566.000.

Wendel, Dieter F. G.: *See*—
Wiedmann, Siegfried K.; and Wendel, Dieter F. G., 5,467,311, Cl. 365-189.050.

Wengrovius, Jeffrey H.; Burnell, Timothy B.; and Van Valkenburgh, Virginia M. Solventless or high solids-containing silicone pressure sensitive adhesive compositions. 5,466,532, Cl. 428-447.000.

Wenker, Wayne B.: *See*—
Bierlein, John C.; Wenker, Wayne B.; and Yoho, Jerry L., 5,466,137, Cl. 418-75.000.

Wenner, Ronald J.; and Rudich, George, Jr., to Johnson Service Company. Enthalpy calculator. 5,467,287, Cl. 364-505.000.

Wentworth, Steven W.; Haas, Jon A.; Crane, Robert F.; and Reynolds, Payce D., to Earth Tool Corporation. Pneumatic ground piercing tool with detachable head. 5,465,797, Cl. 173-91.000.

Wenzel, Christine: *See*—
Madison, Stephen A.; Massaro, Michael; Rattinger, Gail B.; and Wenzel, Christine, 5,466,396, Cl. 252-557.000.

Werge, Robert W.; and Kotsifas, Peter N. Universal fluid flow control. 5,465,938, Cl. 251-149.100.

Werkhoff, Peter: *See*—
Bertram, Heinz-Jürgen; Emberger, Roland; Güntert, Matthias; and Werkhoff, Peter, 5,466,827, Cl. 549-66.000.

Werner, Alan J., Jr.: *See*—
Sotack, John D.; Dezen, William L.; Benedict, Lawrence R.; Zayed, Gaith O.; and Werner, Alan J., Jr., 5,465,619, Cl. 73-304.00C.

Werner, Edward E.: *See*—
Wanek, M. Chris; Van Den Bogart, Thomas W.; Georger, William A.; Ribble, Brendon F.; Matthews, Billie J.; Sawyer, Lawrence H.; Abuso, Frank P.; and Werner, Edward E., 5,466,513, Cl. 428-218.000.

Wertz, Carl F. Boy's urinal trainer for a toilet. 5,465,431, Cl. 4-300.300.

Wertz, William C.: *See*—
Panandiker, Rajan K.; Wertz, William C.; and Hughes, Larry J., 5,466,802, Cl. 544-193.200.

Wescor, Inc.: *See*—
Barlow, Wayne K.; and Quirante, Carmelo G., 5,466,371, Cl. 210-361.000.

Wess, Günther: *See*—
Enhsen, Alfons; Glombik, Heiner; Kramer, Werner; and Wess, Günther, 5,466,815, Cl. 548-252.000.

Wessco, Inc.: *See*—
Derr, John D., 5,466,288, Cl. 106-486.000.

Wessels, Larry L. Locking system for a semitrailer sliding undercarriage. 5,465,990, Cl. 280-407.100.

West, Jeffrey A.: *See*—
Burton, Edward A.; and West, Jeffrey A., 5,467,027, Cl. 326-38.000.

West, Lamar E.; Durand, David P.; Paulick, Melvin; and Primiano, Guy A., to Scientific-Atlanta, Inc. Interdiction method and apparatus with variable dwell time. 5,467,397, Cl. 380-7.000.

West, Michael W. J.: *See*—
Ma, Sheau-Hwa; and West, Michael W. J., 5,466,653, Cl. 503-200.000.

Westerfield, Robert P., Jr.: *See*—
Barnes, Michael S.; Keller, John H.; Logan, Joseph S.; Tompkins, Robert E.; and Westerfield, Robert P., Jr., 5,467,249, Cl. 361-234.000.

Westerkamp, Hugo, to LSI Logic Products GmbH. Lead frame for a multiplicity of terminals. 5,466,967, Cl. 257-666.000.

Westermann, Soeren E.; and Schultz, Erik, to Cyberdan A/S. Electric power distribution system for active cathodic protection of reinforced concrete constructions. 5,466,353, Cl. 204-196.000.

Western Atlas International Inc.: *See*—
Lester, Robert A.; Beard, David; and Cram, Milton E., 5,467,019, Cl. 324-339.000.

Westinghouse Air Brake Company: *See*—
Ferri, Vincent, 5,467,246, Cl. 361-170.000.
McKay, Albert A.; and Hart, James E., 5,466,105, Cl. 411-84.000.
Moore, Roland S.; and Tran, Howard T., 5,465,816, Cl. 188-196.00P.

Westinghouse Electric Corporation: *See*—
Fink, David J.; Everett, James W.; Costlow, Annette M.; Roberts, James J.; and Boone, Paul J., 5,465,483, Cl. 29-890.031.
Watkins, Grant H.; and Caldwell, Stephen P., 5,467,091, Cl. 342-159.000.
Young, Robert M.; Freidhoff, Carl B.; Polla, Dennis L.; and Schiller, Peter J., 5,466,932, Cl. 250-289.000.

Weston, C. Don: *See*—
Fay, Susan K.; Fay, Frank J.; and Weston, C. Don, 5,466,155, Cl. 434-115.000.

Weston, John B.; Larkin, John P.; and Smith, Ian H., to Roussel Uclaf. Heterobicycloalkanes as pesticidal compounds. 5,466,710, Cl. 514-452.000.

Wetzel, John E.: *See*—
Conti, Walter; Feemster, William R.; Felts, Jeffrey L.; Fields, Antony J.; Henderson, Robert W.; Howard, Paul L.; Kaub, Kevin F.; Lederman, Joel A.; Lee, Thomas M.; Martinez, Gilbert; Mathews, Mark H.; Patel, Ravi V.; Waldrep, Michael W.; and Wetzel, John E., 5,465,660, Cl. 100-48.000.

Whetstone, Gary D. Magnetic shield for drop lights. 5,467,261, Cl. 362-398.000.

Whirlpool Corporation: *See*—
Cur, Nihat O.; Kuehl, Steven J.; Khanpara, Jatin C.; LeClear, Douglas D.; and Peterson, James R., 5,465,591, Cl. 62-439.000.

Whitaker Corporation, The: *See*—
Roff, Robert W.; and Wilson, Randall B., 5,467,419, Cl. 385-92.000.
Schroepfer, Richard C.; and Smith, Tracy L., 5,466,162, Cl. 439-79.000.
Wratten, Kenneth B., 5,466,975, Cl. 307-100.000.

Whitcomb, David R.; and Frank, William C., to Minnesota Mining and Manufacturing. Silver-carboxylate/1,2-diazine compounds as silver sources in photothermographic and thermographic elements. 5,466,804, Cl. 544-225.000.

White, George W.: *See*—
Brown, Jack W.; Strauss, Brian; and White, George W., 5,466,216, Cl. 604-33.000.

White, James F., to Engelhard Corporation. Process for the purification of aromatic polycarboxylic acids. 5,466,866, Cl. 562-485.000.

White, James M.; Faber, Vance; and Saltzman, Jeffrey S., to University of California, Office of Technology Transfer, The Regents of the. Population attribute compression. 5,467,110, Cl. 345-199.000.

White, Jason K., to R. R. Donnelley & Sons Company. Printing press temperature adjustment system. 5,465,661, Cl. 101-219.000.

White, Mark L.; Carroll, Stephen F.; and Ma, Jeremy K., to XOMA Corporation. Method for quantifying BPI in body fluids. 5,466,580, Cl. 435-7.100.

White, Mark L.; Carroll, Stephen F.; and Ma, Jeremy K.-k., to XOMA Corporation. Method for quantifying BPI in body fluids. 5,466,581, Cl. 435-7.320.

Whitecar, John E., to Ford Motor Company. Coherent signal generation in digital radio receiver. 5,467,399, Cl. 381-4.000.

Whitehurst, D. Duayne: *See*—
Heck, Roland H.; Heinemann, Heinz; Reischman, P. T.; Venuto, Paul B.; and Whitehurst, D. Duayne, 5,466,361, Cl. 208-131.000.

Whitson-Newman, Jayne C. Foot ghost ender. 5,466,248, Cl. 607-88.000.

Whittle, Brian A., to Phytopharm Ltd. Pharmaceutical compositions for the treatment of skin disorders. 5,466,452, Cl. 424-195.100.

Whorlow, Raymond J.: *See*—
Jayawant, Bhalchandra V.; and Whorlow, Raymond J., 5,467,244, Cl. 361-144.000.

Wick, Thomas A.: *See*—
Pearce, David E.; and Wick, Thomas A., 5,465,800, Cl. 175-368.000.

Wicks, Douglas A.: *See*—
Hicks, Sharon D.; Wicks, Douglas A.; and Hunter, John H., 5,466,771, Cl. 528-64.000.

Wieck, Henry J.: *See*—
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., 5,466,575, Cl. 435-6.000.

Wieczorek, David P.: *See*—
Hall, Bryan C.; Wieczorek, David P.; Wyant, Gordon H.; Wildeson, Ramond T.; and Nally, Debora E., 5,465,910, Cl. 239-585.400.

Wiedmann, Siegfried K.; and Wendel, Dieter F. G., to International Business Machines Corporation. Circuit for increasing data-valid time which incorporates a parallel latch. 5,467,311, Cl. 365-189.050.

Wielaard, Frits: *See*—
Davey, Cheryl; Malek, Lawrence T.; Lens, Peter F.; and Wielaard, Frits, 5,466,586, Cl. 435-91.210.

Wieland, Stefan; Panster, Peter; and Grethe, Horst, to Degussa Aktiengesellschaft. Shaped organosiloxane polycondensates, process for their preparation and use. 5,466,767, Cl. 528-9.000.

Wignall, Michael F.: *See*—
Adderley, Colin I.; Fowler, John O.; and Wignall, Michael F., 5,465,785, Cl. 165-166.000.

Wilbs, Alfred, to Bajo Trading Anstalt. Holding means for implement shafts. 5,465,935, Cl. 248-316.300.

Wilcox, Karl M., to Reynolds Metals Company. Apparatus for opening tube material. 5,466,210, Cl. 493-309.000.

Wilder Agricultural Products Co., Inc.: *See*—
Wilson, Walter R., 5,466,459, Cl. 424-407.000.

Wildeson, Ramond T.: *See*—
Hall, Bryan C.; Wieczorek, David P.; Wyant, Gordon H.; Wildeson, Ramond T.; and Nally, Debora E., 5,465,910, Cl. 239-585.400.

Wilhelm, Robert S.; and Loe, Bradley E., to Syntex (U.S.A.) Inc. 8-phenyl-1,6-naphthyridin-5-ones. 5,466,697, Cl. 514-300.000.

Wilhelmi, Herbert; Steinmetz, Eberhard; and Peters, Klaus, to Messer Griesheim GmbH. Electrode system. 5,467,366, Cl. 373-85.000.

Wilk, Peter J.: *See*—
Cimberg, James Z.; and Wilk, Peter J., 5,466,239, Cl. 606-109.000.

Wilkinson, Stephen C.; and Thorman, Randy A., to Moore Business Forms, Inc. Dual-ply repositional window pricing label having separable record sheet. 5,466,502, Cl. 428-40.000.

Will, Jerald D.: *See*—
Fields, Larry R.; Will, Jerald D.; and Rense, Mark S., 5,466,981, Cl. 313-113.000.

Willett International Limited: *See*—
Lyon, Peter J., 5,466,287, Cl. 106-20.00R.

Williams, Antony; Martinez, Edward A.; and Hachamovitch, Dean J., to Microsoft Corporation. Method and system for generating and maintaining property sets with unique format identifiers. 5,467,472, Cl. 395-600.000.

Williams, Bradley E.: *See*—
Anthony, Thomas R.; Williams, Bradley E.; and McNamara, Karen M., 5,465,603, Cl. 72-467.000.

Williams, Bruce L.: *See*—
McClarron, Andrew R.; Smith, Stephen J.; Watson, Derrick J.; Williams, Bruce L.; and Ross, Euan S., 5,466,876, Cl. 562-608.000.

Williams, David: *See*—
Albon, Richard; and Williams, David, 5,467,312, Cl. 365-189.010.

Williams Electronics Games, Inc.: *See*—
Patla, James A., Sr., 5,465,963, Cl. 273-118.00R.

Williams, James S.: *See*—
Ninham, Barry W.; Calka, Andrzej; and Williams, James S., 5,466,310, Cl. 148-513.000.

Williams, Kenneth A.: *See*—
Carey, Paul G.; Thompson, Jesse B.; Colella, Nicolas J.; and Williams, Kenneth A., 5,466,302, Cl. 136-251.000.

Williams, Levi: *See*—
Flowers, Gilbert E.; Cohen, Joel H.; Kelly, Earl L., Jr.; Williams, Levi; and Grubbs, Gray W., 5,466,905, Cl. 219-121.460.

Williams, Norman; and Spain, James, to Sematech, Inc. Radio frequency monitor for semiconductor process control. 5,467,013, Cl. 324-127.000.

Williamson, Christopher H. Security door bar system and method of use. 5,466,023, Cl. 292-259.00R.

Williamson, Glen P., to Osram Sylvania Inc. Rigid mounting for arc discharge lamp arc tube. 5,466,987, Cl. 313-25.000.

Williamson, Gregory L.; Hawkins, Mark R.; and Tate, William J., to Caterpillar Inc. Driver circuit with diagnostics and over voltage protection. 5,467,240, Cl. 361-18.000.

Williamson, Hugh: *See*—
Diehl, Donald R.; Helber, Margaret J.; and Williamson, Hugh, 5,466,813, Cl. 548-179.000.

Williamson, Warren P., IV: *See*—
Knodel, Bryan D.; Nuchols, Richard P.; and Williamson, Warren P., IV, 5,465,895, Cl. 227-176.000.

Willigmann, Ingo: *See*—
Beuscher, Norbert; and Willigmann, Ingo, 5,466,451, Cl. 424-195.100.

Willingham, Gary L.: *See*—
Downey, Angela B.; Frazier, Valerie S.; and Willingham, Gary L., 5,466,382, Cl. 210-764.000.

Willinghoff, Stephen T.: *See*—
Baker, Charles K.; Ram, Mohan R. A.; and Willinghoff, Stephen T., 5,466,350, Cl. 204-153.140.

WILO GmbH: *See*—
Arnswald, Kurt W., 5,466,127, Cl. 417-38.000.

Wilson, James; and Altrieth, Frederick E., III, to Eastman Kodak Company. Reproduction apparatus with multiple means for creating incrementing alpha-numeric page stamps. 5,467,170, Cl. 355-209.000.

Wilson, James A.: *See*—
Kennedy, James K.; and Wilson, James A., 5,465,832, Cl. 206-45.230.

Wilson, James S.; and Charles-Marcel, Zeno L. Overhead projector. 5,467,152, Cl. 353-99.000.

Wilson, Joseph H.; Mennel, David B.; and Rapp, Jeffrey C., to Ecomed, Inc. Medical waste collection and treatment station. 5,465,841, Cl. 206-366.000.

Wilson, Michael A.: *See*—
Hilbish, Brian K.; Burgess, Arnold C.; and Wilson, Michael A., 5,466,096, Cl. 406-84.000.

Wilson, Michael L.: *See*—
Sullivan, James B.; and Wilson, Michael L., 5,466,099, Cl. 408-206.000.

Wilson, Paul R.: *See*—
Evans, Thomas L.; Brunelle, Daniel J.; Bradt, Jean E.; Pearce, Eric J.; and Wilson, Paul R., 5,466,744, Cl. 524-714.000.

Wilson, Randall B.: *See*—

Roff, Robert W.; and Wilson, Randall B., 5,467,419, Cl. 385-92.000.
Wilson Sporting Goods Co.: *See*—
Gretz, Jon J., 5,465,839, Cl. 206-315.300.
Wilson, Stephen S.: *See*—
Forkner, John F.; Rykowski, Ronald F.; and Wilson, Stephen S., 5,467,207, Cl. 359-40.000.
Wilson, Walter R., to Wilder Agricultural Products Co., Inc. Wax and capsaicin based pesticide. 5,466,459, Cl. 424-407.000.
Winder, Forrest. Flea and tick repellent bandanna for pets. 5,465,689, Cl. 119-861.000.
Windes, Larry C.: *See*—
Yount, Thomas L.; Windes, Larry C.; and Adams, J. Wesley, 5,466,419, Cl. 422-131.000.
Winget, Larry J.: *See*—
Davis, David J., 5,465,998, Cl. 280-731.000.
Winslow, Linda N., to Quantum Chemical Corporation. Supported alpha-olefin dimerization catalyst. 5,466,648, Cl. 502-117.000.
Winsor Corporation: *See*—
Winsor, Mark D., 5,466,990, Cl. 315-56.000.
Winsor, Mark D., to Winsor Corporation. Planar Fluoreacent and electroluminescent lamp having one or more chambers. 5,466,990, Cl. 315-56.000.
Winstanley, David: *See*—
Moffatt, Frank S.; and Winstanley, David, 5,466,814, Cl. 548-209.000.
Winter, Patricia L.: *See*—
Summer, Randi M.; Garbanati, Dennis; Winter, Patricia L.; and Gates, Ronald D., 5,467,293, Cl. 364-578.000.
Wirth-Tijani, Amina: *See*—
Spindler, Felix; Wirth-Tijani, Amina; and Landert, Heidi, 5,466,844, Cl. 556-11.000.
Wisdom Agricultural Investment Limited: *See*—
Garnett, Richard H., 5,465,875, Cl. 222-148.000.
Wise, Lawrence D.: *See*—
Glase, Shelly; Jaen, Juan C.; Smith, Sarah J.; and Wise, Lawrence D., 5,466,698, Cl. 514-318.000.
Wisner, Duane: *See*—
Yumibe, George; Gratzinger, Paul; Nguyen, Thanh; and Wisner, Duane, 5,466,161, Cl. 439-66.000.
Wisniewski, Henryk M.: *See*—
Isaacs, Charles E.; Kim, Kwang S.; and Wisniewski, Henryk M., 5,466,714, Cl. 514-558.000.
Wist, William. Cooler carrier apparatus. 5,465,996, Cl. 280-651.000.
Withers, David H.: *See*—
Flinn, Donald R.; Laszcz, John F.; and Withers, David H., 5,467,285, Cl. 364-478.000.
Withoff, Robert J.: *See*—
Fishbine, Glenn M.; Withoff, Robert J.; and Klein, Theodore D., 5,467,403, Cl. 382-116.000.
Witteveen, Gustaaf J. Low NOX combustor. 5,466,148, Cl. 431-116.000.
Witting, Gary F.: *See*—
Ackley, Donald E.; Lebby, Michael S.; and Witting, Gary F., 5,466,633, Cl. 437-129.000.
Witzeman, J. Stewart: *See*—
Heidt, Philip C.; Foster, Charles H.; Witzeman, J. Stewart; and Crain, Allen L., 5,466,863, Cl. 560-176.000.
Witzig, Martin: *See*—
Meier, Herman; and Witzig, Martin, 5,466,915, Cl. 219-622.000.
Wm. Wrigley Jr. Company: *See*—
Yatka, Robert J., 5,466,471, Cl. 426-3.000.
Woitun, Eberhard: *See*—
Maier, Roland; Müller, Peter; Woitun, Eberhard; Hurnaus, Rudolf; Mark, Michael; Eisele, Bernhard; Budzinski, Ralph-Michael; and Hallermayer, Gerhard, 5,466,687, Cl. 514-212.000.
Wolff Walsrode Aktiengesellschaft: *See*—
Kalbe, Jochen; Müller, Hanns P.; Koch, Rainhard; Engelhardt, Jürgen; Koch, Wolfgang; Szablikowski, Klaus; and Weber, Gunter, 5,466,794, Cl. 536-66.000.
Krallmann, Anton; Reiners, Ulrich; Albinus, Eberhard; Böhner, Jürgen; and Neelen, Neele, 5,466,520, Cl. 428-323.000.
Wong, Tak M.: *See*—
Faber, Timothy R.; and Wong, Tak M., 5,466,903, Cl. 200-400.000.
Wongwarawipat, Wiwat: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,467,030, Cl. 327-58.000.
Wood, Louis L., to Srchem, Inc. Copolymers of polyaspartic acid. 5,466,760, Cl. 525-435.000.
Wood, Steven P.: *See*—
Price, Steven; Jepson, Raymond; Worley, Barry J.; Wood, Steven P.; and Keogh, Andrew J., 5,467,350, Cl. 370-82.000.
Woods Industries, Inc.: *See*—
Boesel, George F. W.; and Geis, Mark W., 5,466,165, Cl. 439-142.000.
Woodward, by Sam, executor: *See*—
Hudson, Alice P.; Woodward, Fred E., deceased; Woodward, by Sam, executor; Timmons, Richard J.; and Goertz, Harvey M., 5,466,274, Cl. 71-28.000.
Woodward, Fred E., deceased: *See*—
Hudson, Alice P.; Woodward, Fred E., deceased; Woodward, by Sam, executor; Timmons, Richard J.; and Goertz, Harvey M., 5,466,274, Cl. 71-28.000.
Woodward, Jerry A. Windshield carrier rack for the rear end of a pickup truck. 5,465,883, Cl. 224-495.000.
Wooldridge, Sammy E.; Yoakum, Jay F.; and Stoddard, Hannis L., III, to Avid Marketing, Inc. Container providing selective access to stored objects. 5,465,556, Cl. 53-468.000.
Woolf, Thomas F., to Warner Lambert Company. Tacrine and cytochrome P450 oxidase inhibitors and methods of use. 5,466,696, Cl. 514-297.000.
Worcester Polytechnic Institute: *See*—
Moser, William R., 5,466,646, Cl. 502-60.000.
Worley, Barry J.: *See*—
Price, Steven; Jepson, Raymond; Worley, Barry J.; Wood, Steven P.; and Keogh, Andrew J., 5,467,350, Cl. 370-82.000.
Worley, Eugene R., to Baker, John M. Monolithic silicon opto-coupler using enhanced silicon based LEDS. 5,466,948, Cl. 257-3.000.
Worthington, Paul A., to Zeneca Limited. Heterocyclic compounds. 5,466,821, Cl. 548-268.800.
Woskow, Robert M.: *See*—
Drori, Ze'ev; and Woskow, Robert M., 5,467,070, Cl. 340-426.000.
Wrapmatic S.p.A.: *See*—
Dall'Omo, Davide, 5,465,550, Cl. 53-233.000.
Wratten, Kenneth B., to Whitaker Corporation, The. Swiched termination for bus tap-off line. 5,466,975, Cl. 307-100.000.
Wray, Anthony J.; Bastani, Babak; and Gailus, Paul H., to Motorola, Inc. Power amplifier and radio transmitter. 5,467,055, Cl. 330-129.000.
Wright, Andrew, to 569,396 Alberta Ltd. Tubing string hanging apparatus. 5,465,788, Cl. 166-78.100.
Wright, Martin: *See*—
Higgins, David E.; and Wright, Martin, 5,466,535, Cl. 428-483.000.
Wright Medical Technology, Inc.: *See*—
Richelsoph, Marc E., 5,466,261, Cl. 623-16.000.
Wrobel, Norbert E.: *See*—
Baratto, Eugene L.; David, John R.; Larson, Curtis L.; Nelson, Thomas L.; and Wrobel, Norbert E., 5,465,900, Cl. 229-125.390.
Wu, Ching-Chang. Golf bag cradle assembly. 5,465,930, Cl. 248-96.000.
Wu, Donna: *See*—
Wu, Shang-Ren; Wu, Donna; and Gutierrez, Eddie N., 5,466,868, Cl. 562-580.000.
Wu, Hsiu-Liang. Device for removing outer membrane of scallion head or garlic head. 5,465,657, Cl. 99-584.000.
Wu, Jiun Y.: *See*—
Lur, Water; and Wu, Jiun Y., 5,466,632, Cl. 437-69.000.
Wu, Shang-Ren; Wu, Donna; and Gutierrez, Eddie N., to Lever Brothers Company, Division of Conopco, Inc. Process for the preparation of an enriched 2,2'-oxydisuccinate reaction mixture by removal of calcium malate. 5,466,868, Cl. 562-580.000.
Wu, Shang-Ren: *See*—
Gutierrez, Eddie N.; and Wu, Shang-Ren, 5,466,875, Cl. 562-580.000.
Wu, Weishi W.; Shankar, Ravi B.; Romer, Duane R.; and Pews, R. Garth, to Dow Chemical Company, The. Dimercapto-1,3-dithiolo-2-one or thione maleimides, compositions containing them and their use as antimicrobial and marine antifouling agents. 5,466,707, Cl. 514-411.000.
Wu, Wen-Tien: *See*—
Lin, Yi-Chung; and Wu, Wen-Tien, 5,465,541, Cl. 52-220.200.
Wuidart, Sylvie; and Do, Tien-Dung, to SGS-Thomson Microelectronics, SA. Circuit for filtering a signal and integrated circuit comprising such a circuit. 5,467,053, Cl. 327-551.000.
Wun, Tze-Chein; Kretzmer, Kuniko K.; and Broze, George J., Jr., to Monsanto Company; and Washington University. Human tissue factor inhibitor. 5,466,783, Cl. 530-380.000.
Wunderlich, Daniel F.; Herr, Nedra A.; Shannon, Donald N.; and Kuhn, L. Dean, to Maytag Corporation. Method and means for indicating an appliance condition. 5,467,077, Cl. 340-635.000.
Wurz, David A.: *See*—
Lapinski, Charles; Eckert, Charles; Skokowski, Richard; Cox, James; Scott, William; Chaleff, Edward; Sharpe, Jeffrey G.; and Wurz, David A., 5,466,921, Cl. 235-462.000.
Wurz, Norman R., to Sega Pinball, Inc. Rotating pinball bridge and drop. 5,465,965, Cl. 273-121.00A.
Wyant, Gordon H.: *See*—
Hall, Bryan C.; Wieczorek, David P.; Wyant, Gordon H.; Wildeson, Ramond T.; and Nally, Debora E., 5,465,910, Cl. 239-585.400.
Wyatt, William R. Insulated backpack with drinking liquid container. 5,465,885, Cl. 224-148.000.
Wysocki, J. Christopher: *See*—
Bell, Ronald F.; and Wysocki, J. Christopher, 5,465,877, Cl. 222-181.200.
Wyzlic, Iwona M.: *See*—
Soloway, Albert H.; Barth, Rolf F.; Anisuzzaman, Abul K.; Tjarks, Werner; Rong, Feng-Guang; and Wyzlic, Iwona M., 5,466,679, Cl. 514-50.000.
Xerox Corporation: *See*—
Bloomberg, Dan S., 5,467,410, Cl. 382-100.000.
Burt, Richard A.; Liebermann, George; Hamer, Gordon K.; Gardner, Sandra J.; Jennings, Carol A.; Daimon, Katsumi; and Nukada, Katsumi, 5,466,796, Cl. 540-139.000.
Castelli, Vittorio; and Chai, Stephen T., 5,467,171, Cl. 355-212.000.
Fan, Zhigang, 5,467,201, Cl. 358-447.000.
Gauronski, John F.; and Knodt, Kurt T., 5,467,449, Cl. 395-185.100.
Hower, John D., Jr.; Martin, Kathleen M.; Gramlich, John D.; and Baldwin, LeRoy A., 5,467,182, Cl. 355-319.000.
Hower, John D., Jr.; and Campanella, Michael L., 5,467,434, Cl. 395-114.000.

Malachowski, Michael; Spehrley, Charles W., Jr.; Thomas, Dean; Remus, Michelle; and Schaffer, Robert R., 5,467,180, Cl. 355-312.000.
Nakamura, Shinya; Yamaguchi, Tsutomu; Dietl, Steven J.; and Stevens, Donald M., 5,467,116, Cl. 347-50.000.
Rumsey, Karen M.; Maeda, Patrick Y.; and AuYeung, Vincent W., 5,467,229, Cl. 359-822.000.
Sacripante, Guerino G.; Veregin, Richard P. N.; and McDougall, Maria N. V., 5,466,554, Cl. 430-110.000.
Snelling, Christopher, 5,467,183, Cl. 355-326.00R.
Sotack, John D.; Dezen, William L.; Benedict, Lawrence R.; Zayed, Gaith O.; and Werner, Alan J., Jr., 5,465,619, Cl. 73-304.00C.
Stone, Maureen C.; and DeRose, Anthony, 5,467,441, Cl. 395-133.000.
Swain, Eugene A., 5,466,114, Cl. 414-746.500.
Weller, Richard G., 5,465,948, Cl. 271-34.000.
Yuh, Huoy-Jen; Spiewak, John W.; Tarnawskyj, Christine J.; Grammatica, Steven J.; Chen, Cindy C.; and Teuscher, Leon A., 5,466,551, Cl. 430-63.000.

Xilinx, Inc.: *See*—
Resler, Edwin W.; Tong, Vincent L.; Swanson, Russell C.; and Bogden, W. Scott, 5,466,117, Cl. 414-799.000.

XOMA Corporation: *See*—
White, Mark L.; Carroll, Stephen F.; and Ma, Jeremy K., 5,466,580, Cl. 435-7.100.
White, Mark L.; Carroll, Stephen F.; and Ma, Jeremy K.-k., 5,466,581, Cl. 435-7.320.

Xomed-Treace Inc.: *See*—
Cleveland, John T., Jr.; and Rubin, Benjamin M., 5,467,223, Cl. 359-510.000.

Xu, Zheng, to Applied Materials, Inc. Method and apparatus for improving semiconductor wafer surface temperature uniformity. 5,467,220, Cl. 359-350.000.

Yaban Chain Industrial Co., Ltd.: *See*—
Wang, Wen-Bin, 5,465,568, Cl. 59-4.000.

Yahav, Giora: *See*—
Faibish, Sorin; Yahav, Giora; and Djerassi, Shlomo, 5,467,273, Cl. 364-424.020.

Yahiro, Masakazu: *See*—
Okuyama, Yoshiyuki; Kitamura, Tadaaki; Kobayashi, Yoshiki; Yahiro, Masakazu; and Fujiwara, Kazunori, 5,467,402, Cl. 382-104.000.

Yakura, James P.; Cole, Richard K.; Von Thun, Matthew S.; Hass, Crystal J.; and Allman, Derryl D. J., to AT&T Global Information Solutions Company; and Hyundai Electronics America. Structure and method for remotely measuring process data. 5,466,614, Cl. 437-8.000.

Yamada, Akihiro; Shimoda, Makoto; Nakahara, Masaji; and Yoshioka, Masahiro, to Hitachi, Ltd. Plant operation method and plant operation control system. 5,467,265, Cl. 364-154.000.

Yamada, Akio, to Fujitsu Limited. Method of detecting and adjusting exposure conditions of charged particle exposure system. 5,466,549, Cl. 430-30.000.

Yamada, Akira: *See*—
Iwama, Ryoichi; and Yamada, Akira, 5,467,177, Cl. 355-282.000.

Yamada, Hideki: *See*—
Mitsuya, Hiroyuki; Yamada, Hideki; Maruyama, Ryoichi; and Ishino, Tsutomu, 5,466,197, Cl. 475-72.000.

Yamada, Kazunori: *See*—
Shimomura, Takeshi; Yamada, Kazunori; Morimoto, Yuuki; Kitamura, Naomi; and Miyazawa, Keiji, 5,466,593, Cl. 435-219.000.

Yamada, Kenichi, to Takigen Manufacturing Co. Ltd. Swingable handle assembly. 5,465,462, Cl. 16-112.000.

Yamada, Sadayuki; Muramatsu, Shigeru; Hashimoto, Takeshi; and Fukuhara, Hiroyuki, to Matsushita Electric Industrial Co., Ltd. Scroll compressor having a gas liquid separator. 5,466,136, Cl. 418-55.600.

Yamada, Takeshi; and Hirai, Katsuaki, to Canon Kabushiki Kaisha. Automatic sheet feeding device with selectively applied pressure member. 5,465,949, Cl. 271-110.000.

Yamada, Yoshikazu: *See*—
Muro, Kiyofumi; Fujimoto, Tsuyoshi; Yoshida, Yuji; Yamada, Yoshikazu; and Ishizaka, Shoji, 5,467,364, Cl. 372-45.000.

Yamagata, Kenji: *See*—
Ichikawa, Takeshi; Yonehara, Takao; Sakamoto, Masaru; Naruse, Yasuhiro; Nakayama, Jun; Yamagata, Kenji; and Sakaguchi, Kiyofumi, 5,466,631, Cl. 437-62.000.

Yamaguchi, Hitoshi; Fujino, Seiji; and Hattori, Tadashi, to Nippondenso Co., Ltd. Semiconductor device and manufacturing method therefor. 5,466,303, Cl. 148-33.000.

Yamaguchi, Noboru: *See*—
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,467,136, Cl. 348-416.000.

Yamaguchi, Toru: *See*—
Hattori, Takao; Iwanaga, Takaki; and Yamaguchi, Toru, 5,466,279, Cl. 96-69.000.

Yamaguchi, Tsutomu: *See*—
Nakamura, Shinya; Yamaguchi, Tsutomu; Dietl, Steven J.; and Stevens, Donald M., 5,467,116, Cl. 347-50.000.

Yamaha Corporation: *See*—
Fujita, Shinichi, 5,467,058, Cl. 330-267.000.
Sakai, Takeshi; and Fukushi, Kawakami, 5,465,469, Cl. 29-404.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Indo, Kenichi; and Onodera, Hitoshi, 5,467,186, Cl. 356-150.000.

Yamakage, Tomoo: *See*—
Odaka, Toshinori; Uetani, Yoshiharu; Masuda, Tadaaki; Yamakage, Tomoo; Ueno, Hideyuki; Yamaguchi, Noboru; Kikuchi, Yoshihiro; and Oku, Tadahiro, 5,467,136, Cl. 348-416.000.

Yamamoto, Etsuji: *See*—
Itagaki, Hiroyuki; Taniguchi, Yo; Shiono, Hidemi; Takiguchi, Kenji; and Yamamoto, Etsuji, 5,465,719, Cl. 128-653.500.

Yamamoto, Hidekazu: *See*—
Andoh, Fumihiko; Miyakawa, Kazunori; Yamamoto, Hidekazu; and Yamawaki, Masao, 5,466,613, Cl. 437-3.000.

Yamamoto, Hiroyuki; Ota, Noriyuki; and Terashita, Toshiyuki, to Mazda Motor Corporation. Ignition system for internal combustion engine. 5,465,695, Cl. 123-256.000.

Yamamoto, Kazunori: *See*—
Wada, Yukio; Yamamoto, Kazunori; Tsukamoto, Osami; Ohara, Takeshi; Miyake, Chie; and Mori, Sadao, 5,465,849, Cl. 209-214.000.

Yamamoto, Makoto: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,467,030, Cl. 327-58.000.
Shou, Guoliang; Takatori, Sunao; and Yamamoto, Makoto, 5,467,376, Cl. 377-94.000.

Yamamoto, Mitsuo; Doi, Takayuki; and Kato, Kaneyoshi, to Takeda Chemical Industries, Ltd. Morpholine derivatives and their use. 5,466,689, Cl. 514-229.500.

Yamamoto, Motohiko; and Kubo, Masaru, to Sharp Kabushiki Kaisha. Light-receiving semiconductor device with plural buried layers. 5,466,962, Cl. 257-437.000.

Yamamoto, Takao, to Sony Corporation. Method for determining a surface to be hidden and image transforming apparatus. 5,467,409, Cl. 382-285.000.

Yamamoto, Takao: *See*—
Eida, Tsuyoshi; Nishiwaki, Osamu; Yamamoto, Takao; and Mafune, Kumiko, 5,466,282, Cl. 106-22.00K.

Yamamoto, Tetsuo: *See*—
Mikami, Shigeru; Mori, Masayuki; Yamamoto, Tetsuo; Ohno, Matsuhiro; and Matsumoto, Mineo, 5,467,199, Cl. 358-425.000.

Yamamoto, Tsuneo: *See*—
Yonezawa, Toshio; Mitsui, Kenrou; Nakazima, Makoto; Kinoshita, Mitsuo; Shimono, Toshihide; and Yamamoto, Tsuneo, 5,466,289, Cl. 106-809.000.

Yamamoto, Yasunori: *See*—
Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, 5,467,284, Cl. 364-461.000.

Yamanaka, Akira: *See*—
Takeuchi, Kazuhiro; and Yamanaka, Akira, 5,466,120, Cl. 415-119.000.

Yamanami, Tsuguya: *See*—
Murakami, Azuma; Yamanami, Tsuguya; and Funahashi, Takahiko, 5,466,896, Cl. 178-19.000.

Yamane, Yasuhiko; Nishino, Masakazu; Fujiwara, Yuji; and Matuda, Toyohiko, to Matsushita Electric Industrial Co., Ltd. Apparatus and method for moving picture coding. 5,467,135, Cl. 348-415.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Masaki, Katsuhiro; and Ban, Kazutoshi, 5,466,464, Cl. 424-434.000.

Yamaoka, Yojiro: *See*—
Fujimoto, Kaoru; Shikada, Tsutomu; Yamaoka, Yojiro; and Sumigama, Takashi, 5,466,720, Cl. 518-700.000.

Yamasaki, Masahiro; Chiba, Masaru; Yokogoshi, Takashi; Kodama, Kenji; Yamaya, Tatsuo; and Yokoyama, Masakazu, to Nissin ShokuhinKabushiki Kaisha. Method of frying noodles. 5,466,475, Cl. 426-439.000.

Yamasaki, Richard G.; and Pan, Tzu-Wang, to Silicon Systems, Inc. Method and apparatus for an adaptive three tap transversal equalizer for partial-response signaling. 5,467,370, Cl. 375-232.000.

Yamasaki, Tetsuro: *See*—
Tsunakawa, Mitsuaki; Yamasaki, Tetsuro; Tomita, Koji; and Tenmyo, Osamu, 5,466,450, Cl. 424-118.000.

Yamashita, Hidehiko: *See*—
Hatano, Akitsugu; Okazaki, Tsuyoshi; Sumida, Yukihiro; Nojima, Takashi; and Yamashita, Hidehiko, 5,467,204, Cl. 358-482.000.

Yamashita, Takehiro: *See*—
Iguchi, Atsushi; Akabane, Atsushi; Yamashita, Takehiro; and Matsuoka, Koichi, 5,466,916, Cl. 219-633.000.

Yamashita, Teruo: *See*—
Shirakura, Yuji; Abe, Hisamasa; Yamashita, Teruo; Shimizu, Tatsuo; Kawahara, Sei; Miyoshi, Takahito; and Nishikawa, Yasuo, 5,466,519, Cl. 428-323.000.

Yamauchi, Hisashi, to NEC Corporation. Test control circuit for controlling a setting and resetting of a flipflop. 5,467,354, Cl. 371-22.300.

Yamawaki, Masao: *See*—
Andoh, Fumihiko; Miyakawa, Kazunori; Yamamoto, Hidekazu; and Yamawaki, Masao, 5,466,613, Cl. 437-3.000.

Yamaya, Tatsuo: *See*—
Yamasaki, Masahiro; Chiba, Masaru; Yokogoshi, Takashi; Kodama, Kenji; Yamaya, Tatsuo; and Yokoyama, Masakazu, 5,466,475, Cl. 426-439.000.

Yamazaki, Itaru: *See*—
Kanemaru, Tetsuro; Takai, Hideyuki; Yamazaki, Itaru; and Iuchi, Kazushi, 5,466,550, Cl. 430-58.000.

Yanagi, Akihiko: *See*—
Goto, Toshio; Hayakawa, Hidenori; Watanabe, Yukiyoshi; Narabu, Shinichi; and Yanagi, Akihiko, 5,466,660, Cl. 504-134.000.

Yanase, Takao: *See*—

Kinoshita, Shigenori; Yanase, Takao; and Fujita, Koetsu, 5,466,998, Cl. 318-375.000.
Yang, Chen-Chi. Electromotive wheel with a disengageable stator. 5,465,802, Cl. 180-65.500.
Yang, Heng-Te. Vacuum cap for liquor bottles. 5,465,857, Cl. 215-228.000.
Yang, Sheng-Hsing, to United Microelectronics Corp. Method of producing an LDMOS transistor having reduced dimensions, reduced leakage, and a reduced propensity to latch-up. 5,466,616, Cl. 437-40.000.
Yang, Shih-Liang S., to Allergan, Inc. Ultraviolet light absorbing compounds, silicone compositions and methods for making same. 5,466,768, Cl. 528-15.000.
Yang, Weikang: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,467,030, Cl. 327-58.000.
Yang, Xin; Lee, Jaw E.; Armiger, William; Maneshin, Sergey K.; and Kolb, Marcus E., to BioChem Technology, Inc. Apparatus for monitoring biological activity in wastewater and controlling the treatment thereof. 5,466,604, Cl. 435-286.100.
Yano, Hiroyuki: *See*—
Ozaki, Masami; Ikeda, Atsuhiko; Yumita, Takashi; Honami, Reijiro; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,466,705, Cl. 514-383.000.
Yao, Yi F.: *See*—
Ho, Shu K.; and Yao, Yi F., 5,466,443, Cl. 424-70.600.
Yasuda, Kouji: *See*—
Nakata, Kiyoshi; Tanamachi, Tokunosuke; Nakamura, Kiyoshi; Terunuma, Mutsuhiro; Suzuki, Masato; Tsutsui, Yoshio; Toyota, Eiichi; and Yasuda, Kouji, 5,467,262, Cl. 363-41.000.
Yasui, Katsuaki; and Kishimoto, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Thermal flow sensor and heat-sensitive resistor therefor. 5,465,618, Cl. 73-204.270.
Yasuto, Morimoto: *See*—
Nakao, Tohru; Yuji, Ono; Hiroshi, Tanaka; Minoru, Obata; and Yasuto, Morimoto, 5,466,691, Cl. 514-254.000.
Yates, George J.; Albright, Kevin L.; and Turko, Bojan T., to University of California, Office of Technology Transfer, The Regents of the. High speed imager test station. 5,467,128, Cl. 348-187.000.
Yatka, Robert J., to Wm. Wrigley Jr. Company. Chewing gum containing aspartame and maltodextrin or purified maltodextrin. 5,466,471, Cl. 426-3.000.
Yaw, Ke G.; and Wei, Hsu S. Folding razor. 5,465,488, Cl. 30-41.000.
Yazaki Corporation: *See*—
Iino, Tadashi; Furuya, Yoshiyuki; and Aoki, Kunimitsu, 5,467,103, Cl. 345-7.000.
Onoda, Katsuhiko, 5,466,175, Cl. 439-610.000.
Sato, Takashi; Suzuki, Takahisa; Tsuchiya, Hiromitsu; and Mitani, Tetsuya, 5,466,989, Cl. 313-635.000.
Yeazell, Charles G.: *See*—
Girardot, Richard M.; Grosgogeat, Eric J.; Yeazell, Charles G.; and Bausch, Richard G., 5,465,452, Cl. 15-210.100.
Yee, Renwin J.: *See*—
Spraggins, Gary L.; Abreach, Martin J.; Newton, William B.; and Yee, Renwin J., 5,466,484, Cl. 437-228.000.
Yeh, Richard T. Hydraulically operated toothbrush. 5,465,445, Cl. 15-29.000.
Yip, Linda Y.; and Kwan, Kinying, to Tandem Computers Incorporated. Chip clock skew control method and apparatus. 5,467,033, Cl. 326-93.000.
YKK Corporation: *See*—
Matoba, Hiroshi, 5,465,472, Cl. 24-625.000.
Yngve, Paul W.: *See*—
Edwards, Donald W.; Jackson, Craig A.; Shibata, Steven K.; and Yngve, Paul W., 5,465,566, Cl. 57-204.000.
Yoakum, Jay F.: *See*—
Wooldridge, Sammy E.; Yoakum, Jay F.; and Stoddard, Hannis L., III, 5,465,556, Cl. 53-468.000.
Yoho, Jerry L.: *See*—
Bierlein, John C.; Wenker, Wayne B.; and Yoho, Jerry L., 5,466,137, Cl. 418-75.000.
Yokochi, Masaru: *See*—
Aoki, Kouji; and Yokochi, Masaru, 5,467,022, Cl. 324-661.000.
Yokogoshi, Takashi: *See*—
Yamasaki, Masahiro; Chiba, Masaru; Yokogoshi, Takashi; Kodama, Kenji; Yamaya, Tatsuo; and Yokoyama, Masakazu, 5,466,475, Cl. 426-439.000.
Yokoo, Akio: *See*—
Shinohara, Toshio; Yokoo, Akio; Kudo, Muneo; Iwabuchi, Motoaki; and Matsumura, Kazuyuki, 5,466,847, Cl. 556-409.000.
Yokota, Hiromu: *See*—
Takegawa, Masaharu; Kotani, Motoharu; and Yokota, Hiromu, 5,466,209, Cl. 493-4.000.
Yokoyama, Masakazu: *See*—
Yamasaki, Masahiro; Chiba, Masaru; Yokogoshi, Takashi; Kodama, Kenji; Yamaya, Tatsuo; and Yokoyama, Masakazu, 5,466,475, Cl. 426-439.000.
Yonehara, Takao: *See*—
Ichikawa, Takeshi; Yonehara, Takao; Sakamoto, Masaru; Naruse, Yasuhiro; Nakayama, Jun; Yamagata, Kenji; and Sakaguchi, Kiyofumi, 5,466,631, Cl. 437-62.000.
Yonekawa, Noboru: *See*—
Nakayama, Yasunori; Yonekawa, Noboru; Matsushita, Kouji; Nakagami, Yasuhiro; and Yuge, Shizuo, 5,466,938, Cl. 250-326.000.
Yonekawa, Teruo: *See*—
Takemoto, Tadashi; Hijiya, Toyoto; Yonekawa, Teruo; and Mochizuki, Chisato, 5,466,864, Cl. 562-445.000.
Yonezawa, Toshio; Mitsui, Kenrou; Nakazima, Makoto; Kinoshita, Mitsuo; Shimono, Toshihide; and Yamamoto, Tsuneo, to Takenaka Corporation; and Takemoto Yushi Kabushiki Kaisha. Ultra high-strength hydraulic cement compositions. 5,466,289, Cl. 106-809.000.
Yoo, Wan M.: *See*—
Ra, Jong O.; Lim, Joon Y.; and Yoo, Wan M., 5,466,196, Cl. 475-59.000.
Yoon, InBae. Safety penetrating instrument having a triggered portal sleeve for establishing an endoscopic portal in an anatomical cavity wall. 5,466,224, Cl. 604-165.000.
Yoon-Sik, Lee; Byeong-Deog, Park; and Hyoung-Ik, Lee. Process for preparing polystyrenes having β hydroxy group and polyglycol-grafted polystyrenes thereof. 5,466,758, Cl. 525-384.000.
Yoshida, Eyji; Kusano, Nobuyuki; and Kumazawa, Satoru, to Kureha Chemical Industry Co., Ltd. Process for preparation of azolylmethylcycloalkanol derivatives. 5,466,816, Cl. 548-267.800.
Yoshida, Hajime, to Hajime Industries Ltd. Apparatus for the inspection of transparent containers. 5,467,125, Cl. 348-127.000.
Yoshida, Hideaki: *See*—
Toyoda, Seiji; Sugamura, Kunio; and Yoshida, Hideaki, 5,466,488, Cl. 427-376.200.
Yoshida, Hironari; and Hino, Yuji, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit with plural use of a terminal. 5,467,028, Cl. 326-38.000.
Yoshida, Masanobu; and Ogura, Kiyonori, to Fujitsu Limited; and Fujitsu VLSI Limited. EEPROM and EEPROM reading method. 5,467,310, Cl. 365-185.070.
Yoshida, Shinji: *See*—
Tanimoto, Toshinobu; Okamoto, Yoshikatsu; Yoshida, Shinji; and Hironaka, Yasumasa, 5,466,913, Cl. 219-492.000.
Yoshida, Tatsuya; and Oho, Shigeru, to Hitachi, Ltd. Integrated wiring system. 5,467,272, Cl. 364-424.010.
Yoshida, Yuji: *See*—
Muro, Kiyofumi; Fujimoto, Tsuyoshi; Yoshida, Yuji; Yamada, Yoshikazu; and Ishizaka, Shoji, 5,467,364, Cl. 372-45.000.
Yoshida, Yukihiro, to Sharp Kabushiki Kaisha. Multivalued adder having capability of sharing plural multivalued signals. 5,467,298, Cl. 364-746.200.
Yoshida, Yukihisa; Ito, Wataru; and Morishita, Tadataka, to Mitsubishi Denki Kabushiki Kaisha; Nippon Steel Corporation; and International Superconductivity Technology Center. Method of manufacturing Y-Ba-Cu-O superconducting thin film. 5,466,665, Cl. 505-476.000.
Yoshihara, Toshiaki: *See*—
Matsuki, Masaharu; Yoshihara, Toshiaki; and Kurita, Sumihiko, 5,466,917, Cl. 219-730.000.
Yoshii, Kenji: *See*—
Hirai, Yukio; Kanayama, Kouzou; Yoshii, Kenji; Iwasaki, Kiyotoshi; Kanai, Isao; and Suzuki, Shin, 5,465,598, Cl. 72-84.000.
Yoshii, Yuuzi: *See*—
Takahira, Akitoshi; and Yoshii, Yuuzi, 5,466,735, Cl. 524-273.000.
Yoshikawa, Hiroyuki: *See*—
Umeda, Yasushi; Motegi, Yasuo; Tomiyama, Tetsuo; Yoshikawa, Hiroyuki; and Shimomura, Yoshiki, 5,467,355, Cl. 364-571.040.
Yoshikawa, Masato: *See*—
Kusano, Yukihiro; Inagaki, Tomoko; Yoshikawa, Masato; Akiyama, Setsuo; and Naitoh, Kazuo, 5,466,424, Cl. 422-186.050.
Yoshimori, Hiroyuki: *See*—
Mihara, Takashi; Yoshimori, Hiroyuki; Watanabe, Hitoshi; McMillan, Larry D.; and De Araujo, Carlos P., 5,466,629, Cl. 437-60.000.
Yoshino, Koji: *See*—
Shioya, Yasushi; Suzuki, Yuji; Takeuchi, Ken; Yoshino, Koji; and Kawamata, Akira, 5,466,849, Cl. 556-445.000.
Yoshino, Tadashi, to Matsushita Electric Industrial Co., Ltd. Magnetic recording and reproducing apparatus for reproducing a magnetic tape being fed at high speed. 5,467,233, Cl. 360-70.000.
Yoshioka, Masahiro: *See*—
Yamada, Akihiro; Shimoda, Makoto; Nakahara, Masaji; and Yoshioka, Masahiro, 5,467,265, Cl. 364-154.000.
Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Yamamoto, Yasunori; Adachi, Tomohiko; and Masuda, Naotsugu, to Mazda Motor Corporation. Obstacle detection system for motor vehicle. 5,467,284, Cl. 364-461.000.
Yoshioka, Tohru: *See*—
Butsuen, Tetsuro; Yoshioka, Tohru; Uemura, Hiroki; Niibe, Tadayuki; Doi, Ayumu; Okuda, Ken-ichi; Adachi, Tomohiko; and Morioka, Satoshi, 5,467,283, Cl. 364-461.000.
Yoshitomi Pharmaceutical Industries, Ltd.: *See*—
Nakao, Tohru; Yuji, Ono; Hiroshi, Tanaka; Minoru, Obata; and Yasuto, Morimoto, 5,466,691, Cl. 514-254.000.
Yoshizaki, Akira: *See*—
Tanaka, Takeshi; Minamino, Daiki; Yoshizaki, Akira; and Nakano, Nakaya, 5,466,293, Cl. 118-264.000.
Youman, Roy L.: *See*—
Gale, Ronald P.; McCullough, Richard; Salerno, Jack P.; Fantone, Stephen D.; Forsyth, Robert P.; Carellas, Peter T.; Thomas, Michael J.; and Youman, Roy L., 5,467,154, Cl. 353-119.000.
Younathan, Janet N.: *See*—
Kapp, Daniel L.; Ross, Robert J.; Younathan, Janet N.; and Singer, Stephen P., 5,466,568, Cl. 430-551.000.

Young, Bruce; Carson, Dave; Rasmussen, Norman; Fischer, Stephen; and Rabe, Jeffrey, to Intel Corporation. Bus arbitration with master unit controlling bus and locking a slave unit that can relinquish bus for other masters while maintaining lock on slave unit. 5,467,295, Cl. 395-200.050.

Young, John: *See*—
Mornhed, Goran; Young, John; and Thompson, Harvey W., 5,465,585, Cl. 62-59.000.

Young, Kenneth P.: *See*—
Cutler, Victor H., Jr.; Richetta, Peter; Young, Kenneth P.; and Davieau, Gerald J., 5,467,345, Cl. 370-60.000.

Young, Robert M.; Freidhoff, Carl B.; Polla, Dennis L.; and Schiller, Peter J., to Westinghouse Electric Corp. Micro-miniature piezoelectric diaphragm pump for the low pressure pumping of gases. 5,466,932, Cl. 250-289.000.

Yount, Thomas L.; Windes, Larry C.; and Adams, J. Wesley. Split flow reactor trays for vertical staged polycondensation reactors. 5,466,419, Cl. 422-131.000.

Yount, Thomas L.: *See*—
Haseltine, Douglas M.; Yount, Thomas L.; and Ryans, Jimmy L., 5,466,765, Cl. 526-65.000.

Yown, Robert. Litter bin. 5,465,867, Cl. 220-735.000.

Yozan Inc.: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,467,030, Cl. 327-58.000.
Shou, Guoliang; Takatori, Sunao; and Yamamoto, Makoto, 5,467,376, Cl. 377-94.000.

Yuan, Chi-Min: *See*—
Chapple-Sokol, Jonathan D.; Hsu, Louis L.-C.; Tsang, Paul J.-M.; and Yuan, Chi-Min, 5,465,859, Cl. 216-12.000.

Yuge, Shizuo: *See*—
Nakayama, Yasunori; Yonekawa, Noboru; Matsushita, Kouji; Nakagami, Yasuhiro; and Yuge, Shizuo, 5,466,938, Cl. 250-326.000.

Yuh, Huoy-Jen; Spiewak, John W.; Tarnawskyj, Christine J.; Grammatica, Steven J.; Chen, Cindy C.; and Teuscher, Leon A., to Xerox Corporation. Image member including a grounding layer. 5,466,551, Cl. 430-63.000.

Yuji, Ono: *See*—
Nakao, Tohru; Yuji, Ono; Hiroshi, Tanaka; Minoru, Obata; and Yasuto, Morimoto, 5,466,691, Cl. 514-254.000.

Yuki, Masaru; and Tanaka, Kenichi, to Sharp Kabushiki Kaisha. Transistor having source-to-drain nonuniformly-doped channel and method for fabricating the same. 5,466,957, Cl. 257-344.000.

Yukumoto, Masao: *See*—
Kogiku, Fumio; Yukumoto, Masao; and Okabe, Seiji, 5,466,304, Cl. 148-100.000.

Yumibe, George; Gratzinger, Paul; Nguyen, Thanh; and Wisner, Duane, to Bourns, Inc. Compliant stacking connector for printed circuit boards. 5,466,161, Cl. 439-66.000.

Yumita, Takashi: *See*—
Ozaki, Masami; Ikeda, Atsuhiko; Yumita, Takashi; Honami, Reijiro; Minoguchi, Naokazu; Yano, Hiroyuki; Izawa, Norihiko; and Hirano, Tadayoshi, 5,466,705, Cl. 514-383.000.

Zabetakis, George E.: *See*—
Kleinschmitt, David; Touma, Maroun; and Zabetakis, George E., 5,466,946, Cl. 250-577.000.

Zacharie, Boulos: *See*—
Belleau, Bernard, deceased; Mansour, Tarek; Tse, Allan; Evans, Colleen A.; Jin, Haolun; Zacharie, Boulos; and Nguyen-Ba, Nghe, 5,466,806, Cl. 544-310.000.

Zadehkoochak, Mohsen; Blott, Barry H.; and Daniell, Geoffrey J., to British Technology Group Ltd. Electrical impedance tomography. 5,465,730, Cl. 128-734.000.

Zadini, Filiberto P.; and Zadini, Giorgio C. Percutaneous cardiac pump for cardiopulmonary resuscitation. 5,466,221, Cl. 604-96.000.

Zadini, Giorgio C.: *See*—
Zadini, Filiberto P.; and Zadini, Giorgio C., 5,466,221, Cl. 604-96.000.

Zadno-Azizi, Gholam-Reza: *See*—
Imran, Mir A.; Pomeranz, Mark L.; and Zadno-Azizi, Gholam-Reza, 5,465,717, Cl. 128-642.000.

Zager, Stephen A.; and Shvartsman, Felix P., to U.S. Philips Corporation. Method for making optically readable media containing embossed information. 5,466,319, Cl. 156-220.000.

Zahn, Wolfgang: *See*—
Jacob, Friedrich; and Zahn, Wolfgang, 5,467,165, Cl. 335-40.000.

Zakian, Virginia A.: *See*—
Schulz, Vincent P.; and Zakian, Virginia A., 5,466,576, Cl. 435-6.000.

Zamzow, Peter: *See*—
Rohrmann, Peter; Weiss, Alexander; Hög, George; and Zamzow, Peter, 5,467,420, Cl. 385-101.000.

Zarina Holdings C.V.: *See*—
Rice, Chris A.; Gazzola, Alain J.; Smith, Desroy D.; Evans, John T.; and Dawson, Andrew W., 5,465,443, Cl. 15-246.000.

Zayed, Gaith O.: *See*—
Sotack, John D.; Dezen, William L.; Benedict, Lawrence R.; Zayed, Gaith O.; and Werner, Alan J., Jr., 5,465,619, Cl. 73-304.00C.

Zdepski, Joel W., to RCA Thomson Licensing Corporation. Method and apparatus for synchronizing a receiver as for a compressed video signal using differential time code. 5,467,137, Cl. 348-423.000.

Zeevi, Yehoshua Y.; Ginosar, Ran; and Stuart, Wolf, to Technion Research and Development Foundation, Ltd. Apparatus & method for enhancing color images. 5,467,123, Cl. 348-34.000.

Zelinski, Gary: *See*—
Szabo, George; and Zelinski, Gary, 5,466,017, Cl. 285-319.000.

Zeller, James R.: *See*—
Fedij, Victor; Suto, Mark J.; Wemple, James N.; and Zeller, James R., 5,466,828, Cl. 548-566.000.

Zeneca Limited: *See*—
Moffatt, Frank S.; and Winstanley, David, 5,466,814, Cl. 548-209.000.
Singhbansal, Harjinder; and Ormrod, John C., 5,466,662, Cl. 504-207.000.
Worthington, Paul A., 5,466,821, Cl. 548-268.800.

Zetterer, Thomas: *See*—
Ruf, Alexander; Abraham, Michael; Lacher, Manfred; Zetterer, Thomas; and Dietrich, Thomas R., 5,465,611, Cl. 73-104.000.

Zetterlund, Karl E. Sunvisor. 5,466,029, Cl. 296-97.800.

ZF Friedrichshafen AG: *See*—
Draskovits, Günter; and Merz, Johann, 5,466,135, Cl. 418-268.000.

Zhang, Xiao-kun: *See*—
Dawson, Marcia L.; Cameron, James F.; Hobbs, Peter D.; Jong, Ling; Pfahl, Magnus; Zhang, Xiao-kun; and Lehmann, Jürgen M., 5,466,861, Cl. 560-100.000.

Zhaoqui, Zhan: *See*—
Lercher, Johannes; and Zhaoqui, Zhan, 5,466,429, Cl. 423-365.000.

Zhen, Yueqian: *See*—
de Buzzaccarini, Francesco; Farwick, Timothy J.; and Zhen, Yueqian, 5,466,394, Cl. 252-547.000.

Zhou, Dawei; Mareci, Thomas; Burns, Michael; and Ruby, Ward, to University of Florida. Method for making an NMR coil. 5,466,480, Cl. 427-63.000.

Ziaylek, Jr., Theodore: *See*—
Ziaylek, Michael P., 5,465,814, Cl. 188-32.000.

Ziaylek, Michael P., to Ziaylek, Jr., Theodore; and Ziaylek, Michael P. Collapsible wheel chock apparatus. 5,465,814, Cl. 188-32.000.

Ziegler, Arthur: *See*—
Schumacher, Clemens; and Ziegler, Arthur, 5,465,835, Cl. 206-221.000.

Zima, George C.: *See*—
Lutz, Gary P.; Zima, George C.; and Bernard, Rex, 5,466,840, Cl. 554-70.000.

Zimmer Aktiengesellschaft: *See*—
Krautstrunk, Juergen; and Mackensen, Klaus, 5,466,776, Cl. 526-68.100.

Zinner, Darren E.: *See*—
Bell, Mace; Nagori, Vinod; and Zinner, Darren E., 5,465,731, Cl. 128-749.000.

Zinser Textilmaschinen GmbH: *See*—
König, Günter, 5,465,916, Cl. 242-18.0PW.

Zoeller, Joachim: *See*—
Angelmayer, Karl-Hans; Walz, Gerd; and Zoeller, Joachim, 5,466,772, Cl. 528-73.000.

Zook, Christopher P., to Cirrus Logic, Inc. Finite field inversion. 5,467,297, Cl. 364-746.100.

Zorzi, Claudio: *See*—
Pellegrini, Alfred, Jr.; Tormena, Andrea; Pozzobon, Alessandro; Zorzi, Claudio; and Edauw, Peter, 5,465,984, Cl. 280-11.200.

Zoski, Glenn D.: *See*—
Ghaed, Ali; Leland, Jonathan K.; Zoski, Glenn D.; Goodman, Jack E.; and Grosser, John T., 5,466,416, Cl. 422-52.000.

Zwack, Eduard, to Siemens Aktiengesellschaft. Temperature-stabilized oscillator circuit having heating elements that can be externally influenced. 5,467,059, Cl. 331-70.000.

Zwicky, Ron A. System for underwater repair of cracks in concrete. 5,465,881, Cl. 222-389.000.

Zycon Corporation: *See*—
Howard, James R.; and Lucas, Gregory L., 5,466,892, Cl. 174-261.000.

569,396 Alberta Ltd.: *See*—
Wright, Andrew, 5,465,788, Cl. 166-78.100.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 14th DAY OF NOVEMBER, 1995

NOTE— Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

Canon Kabushiki Kaisha: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, Re. 35,087, Cl. 270-53.000.

Dix, David W.: *See*—
Paulson, Richard F.; Ross, Kent L.; Prochnow, Timothy C.; Dix, David W.; and Stout, Luke A., Re. 35,086, Cl. 83-13.000.

Gilbert, Jerry F., to Trencor Jetco, Inc. Trenching machine with laterally adjustable chain-type digging implement. Re. 35,088, Cl. 37-360.000.

Hiroi, Masakazu: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, Re. 35,087, Cl. 270-53.000.

Kobayashi, Kenji: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, Re. 35,087, Cl. 270-53.000.

Lorenz, Marcel, to PAV Praezisions-Apparatebau Aktiengesellschaft. Method for measuring a length and electronic slide caliper. Re. 35,084, Cl. 33-706.000.

Marquip, Inc.: *See*—
Paulson, Richard F.; Ross, Kent L.; Prochnow, Timothy C.; Dix, David W.; and Stout, Luke A., Re. 35,086, Cl. 83-13.000.

Murakami, Koichi: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, Re. 35,087, Cl. 270-53.000.

Naito, Masataka: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, Re. 35,087, Cl. 270-53.000.

Paulson, Richard F.; Ross, Kent L.; Prochnow, Timothy C.; Dix, David W.; and Stout, Luke A., to Marquip, Inc. Slitting apparatus for corrugated paperboard and the like. Re. 35,086, Cl. 83-13.000.

PAV Praezisions-Apparatebau Aktiengesellschaft: *See*—
Lorenz, Marcel, Re. 35,084, Cl. 33-706.000.

Prochnow, Timothy C.: *See*—
Paulson, Richard F.; Ross, Kent L.; Prochnow, Timothy C.; Dix, David W.; and Stout, Luke A., Re. 35,086, Cl. 83-13.000.

Ross, Kent L.: *See*—
Paulson, Richard F.; Ross, Kent L.; Prochnow, Timothy C.; Dix, David W.; and Stout, Luke A., Re. 35,086, Cl. 83-13.000.

Saito, Jun: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, Re. 35,087, Cl. 270-53.000.

Sanderson, Robert. Space frame system. Re. 35,085, Cl. 52-655.100.

Shido, Hironori: *See*—
Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, Re. 35,087, Cl. 270-53.000.

Stout, Luke A.: *See*—
Paulson, Richard F.; Ross, Kent L.; Prochnow, Timothy C.; Dix, David W.; and Stout, Luke A., Re. 35,086, Cl. 83-13.000.

Trencor Jetco, Inc.: *See*—
Gilbert, Jerry F., Re. 35,088, Cl. 37-360.000.

Uto, Nobutaka; Shido, Hironori; Saito, Jun; Hiroi, Masakazu; Kobayashi, Kenji; Murakami, Koichi; and Naito, Masataka, to Canon Kabushiki Kaisha. Sheet sorter with stapler. Re. 35,087, Cl. 270-53.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bassi, Dario, to Staubli-Verdol S.A. Mechanism for controlling griffe frame movement. B1 5,103,873, Cl. 139-59.000.

Brujo Incorporated: *See*—
Goldman, Lawrence, B1 5,141,928, Cl. 514-54.000.

Byer, Robert L.; Fejer, Martin M.; and Lim, Eric J., to Leland Stanford Junior University. Nonlinear optical radiation generator and method of controlling regions of ferroelectric polarization domains in solid state bodies. B1 5,036,220, Cl. 359-328.000.

Dipsol Chemicals Co., Ltd.: *See*—
Oshima, Katsuhide; Murai, Toshiaki; Sakurai, Hitoshi; Igarashi, Shuji; Hanagata, Haruo; and Igarashi, Hidesato, B1 4,889,602, Cl. 205-176.000.

Endress+Hauser GmbH & Co.: *See*—
Snyder, Ellery P., B1 4,000,650, Cl. 73-290.00V.

Fejer, Martin M.: *See*—
Byer, Robert L.; Fejer, Martin M.; and Lim, Eric J., B1 5,036,220, Cl. 359-328.000.

Galda, Michael P.; and Witt, Stephen H., to Stanpac Inc. Sealing member for a container. B1 4,961,986, Cl. 428-201.000.

Goldman, Lawrence, to Brujo Incorporated. Ophthalmic medication. B1 5,141,928, Cl. 514-54.000.

Hanagata, Haruo: *See*—
Oshima, Katsuhide; Murai, Toshiaki; Sakurai, Hitoshi; Igarashi, Shuji; Hanagata, Haruo; and Igarashi, Hidesato, B1 4,889,602, Cl. 205-176.000.

Igarashi, Hidesato: *See*—
Oshima, Katsuhide; Murai, Toshiaki; Sakurai, Hitoshi; Igarashi, Shuji; Hanagata, Haruo; and Igarashi, Hidesato, B1 4,889,602, Cl. 205-176.000.

Igarashi, Shuji: *See*—
Oshima, Katsuhide; Murai, Toshiaki; Sakurai, Hitoshi; Igarashi, Shuji; Hanagata, Haruo; and Igarashi, Hidesato, B1 4,889,602, Cl. 205-176.000.

Jarvi, Esa T.; McCarthy, James R.; and Prakash, Nellikunja J., to Merrell Dow Pharmaceuticals Inc. 5'-deoxy-4',5'-unsaturated-5'-substituted adenosines. B1 4,997,924, Cl. 536-27.200.

Leland Stanford Junior University: *See*—
Byer, Robert L.; Fejer, Martin M.; and Lim, Eric J., B1 5,036,220, Cl. 359-328.000.

Lim, Eric J.: *See*—
Byer, Robert L.; Fejer, Martin M.; and Lim, Eric J., B1 5,036,220, Cl. 359-328.000.

McCarthy, James R.: *See*—
Jarvi, Esa T.; McCarthy, James R.; and Prakash, Nellikunja J., B1 4,997,924, Cl. 536-27.200.

Merrell Dow Pharmaceuticals Inc.: *See*—
Jarvi, Esa T.; McCarthy, James R.; and Prakash, Nellikunja J., B1 4,997,924, Cl. 536-27.200.

Murai, Toshiaki: *See*—
Oshima, Katsuhide; Murai, Toshiaki; Sakurai, Hitoshi; Igarashi, Shuji; Hanagata, Haruo; and Igarashi, Hidesato, B1 4,889,602, Cl. 205-176.000.

Olympus Optical Co., Ltd.: *See*—
Tsunefuji, Katsuhiko, B1 5,111,232, Cl. 354-402.000.

Oshima, Katsuhide; Murai, Toshiaki; Sakurai, Hitoshi; Igarashi, Shuji; Hanagata, Haruo; and Igarashi, Hidesato, to Dipsol Chemicals Co., Ltd. Electroplating bath and method for forming zinc-nickel alloy coating. B1 4,889,602, Cl. 205-176.000.

Prakash, Nellikunja J.: *See*—
Jarvi, Esa T.; McCarthy, James R.; and Prakash, Nellikunja J., B1 4,997,924, Cl. 536-27.200.

Sakurai, Hitoshi: *See*—
Oshima, Katsuhide; Murai, Toshiaki; Sakurai, Hitoshi; Igarashi, Shuji; Hanagata, Haruo; and Igarashi, Hidesato, B1 4,889,602, Cl. 205-176.000.

Snyder, Ellery P., to Endress+Hauser GmbH & Co. Method and apparatus for ultrasonic material level measurement. B1 4,000,650, Cl. 73-290.00V.

Stanpac Inc.: *See*—
Galda, Michael P.; and Witt, Stephen H., B1 4,961,986, Cl. 428-201.000.

Staubli-Verdol S.A.: *See*—
Bassi, Dario, B1 5,103,873, Cl. 139-59.000.

Tsunefuji, Katsuhiko, to Olympus Optical Co., Ltd. Camera having fuzzy inference function. B1 5,111,232, Cl. 354-402.000.

Witt, Stephen H.: *See*—
Galda, Michael P.; and Witt, Stephen H., B1 4,961,986, Cl. 428-201.000.

LIST OF DESIGN PATENTEES

Acciaoli, John V.; Hausler, Hartmut E.; Holden, Chester D.; Marotti, Martin J.; Rockwell, Scott M.; Roscoe, Terry R.; and Zapfe, Roland, to International Business Machines Corporation. Tape automation system. 364,152, Cl. D14-108.000.

Alfonso, Pedro M., to International Business Machines Corporation. Computer housing. 364,149, Cl. D14-102.000.

Allen, Norman A., to Listawood Limited. Folding game with tray. 364,191, Cl. D21-15.000.

Alpers, Helmut A.; Duffy, Lisa E.; Erickson, Peter C.; and Russett, Jon P., Jr., to Flurry International, Inc. Frozen dessert dispenser. 364,175, Cl. D15-112.000.

Ancona, Bruce; Ancona, Jane; DeGuzman, Mary J.; and LaRosa, Craig R., to B. Via International Housewares, Inc. Kettle. 364,067, Cl. D7-302.000.

Ancona, Jane: *See*—
Ancona, Bruce; Ancona, Jane; DeGuzman, Mary J.; and LaRosa, Craig R., 364,067, Cl. D7-302.000.

Andersen, John A.: *See*—
Haskett, Wayne J.; Andersen, John A.; and Andersen, Leonard, 364,066, Cl. D6-629.000.

Andersen, Leonard: *See*—
Haskett, Wayne J.; Andersen, John A.; and Andersen, Leonard, 364,066, Cl. D6-629.000.

Anderson, Grant. Electric cigarette lighter. 364,245, Cl. D27-141.000.

Anscher, Joseph, to National Molding Corp. Buckle fastener. 364,125, Cl. D11-216.000.

Arnette, Gregory F. Sports goggle. 364,181, Cl. D16-312.000.

Artime SA: *See*—
Giardiello, Barbara, 364,098, Cl. D10-32.000.
Giardiello, Barbara, 364,100, Cl. D10-39.000.

Ashley, Dana L.: *See*—
Badon, Aaron J.; and Ashley, Dana L., 364,132, Cl. D12-129.000.

Aura Systems, Inc.: *See*—
Dagan, Gideon, 364,162, Cl. D14-188.000.
Daniels, Drew, 364,167, Cl. D14-221.000.

B. Via International Housewares, Inc.: *See*—
Ancona, Bruce; Ancona, Jane; DeGuzman, Mary J.; and LaRosa, Craig R., 364,067, Cl. D7-302.000.

Badon, Aaron J.; and Ashley, Dana L. Beach lounge chair. 364,132, Cl. D12-129.000.

Barrett, Shawn: *See*—
Klein, Annette T.; Belongia, David C.; Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, 364,070, Cl. D7-350.000.

Barron, Peter B.: *See*—
Martin, Randall W.; Barron, Peter B.; Halseth, Thor R.; and Holtorf, James L., 364,147, Cl. D14-100.000.

Baus, Andre E. J.; Didier, Rene; Durand, Gerard; and Spejlborg, Soren, to Goodyear Tire & Rubber Company, The. Tire tread. 364,133, Cl. D12-143.000.

Beaver, Jeffrey L.: *See*—
Lortz, Allan R.; Wiseman, Michael A.; and Beaver, Jeffrey L., 364,124, Cl. D11-216.000.

Beckman, Kurt D.; and Dunbar, James R., to Seaquist, Lyn. Caster pad. 364,085, Cl. D8-375.000.

Bell Atlantic–Maryland: *See*—
Powers, John A., III; Konopka, Miles A.; McNew, Ray; and Meola, Angelo T., 364,187, Cl. D19-60.000.

Belongia, David C.: *See*—
Klein, Annette T.; Belongia, David C.; Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, 364,070, Cl. D7-350.000.

Beneville, Laura L.; and Gutzka, Bret W., to Canon Computer Systems, Inc. Slim profile computer housing. 364,145, Cl. D14-100.000.

Benson, Anna L., to Firm, Inc., The. Exercise bench. 364,202, Cl. D21-191.000.

Bergeron, Hubert. Watch. 364,099, Cl. D10-33.000.

Bernhardt Furniture Company: *See*—
Keller, H. Thomas, 364,046, Cl. D6-379.000.

Berry, Richard D., Jr.; and Clark, David A., to Ethan Allen Inc. Entertainment unit. 364,051, Cl. D6-436.000.

Berry, Richard D., Jr.; and Clark, David A., to Ethan Allen Inc. Console table. 364,056, Cl. D6-483.000.

Besco USA International: *See*—
Lin, Jimmy J., 364,204, Cl. D21-214.000.

Bierce, Laurence M.: *See*—
Shaw, Mark D.; Heyman, J. Tad; Bierce, Laurence M.; and Ehredt, Jesse, 364,255, Cl. D34-1.000.

Black & Decker Inc.: *See*—
McCloskey, Don R.; and Rorke, Anthony B., 364,068, Cl. D7-309.000.

Bluff, Kristian A., to Interlego AG. Toy building element. 364,198, Cl. D21-108.000.

Bobrick Washroom Equipment, Inc.: *See*—
Merriweather, Frank, Jr., 364,059, Cl. D6-519.000.

Bowman, Thomas C., to Midwest Design, Inc. Lazy susan shelf. 364,057, Cl. D6-511.000.

Bradley, Lavan. Parking meter timer. 364,101, Cl. D10-40.000.

Branch, Gary A. Portable two-way radio stand. 364,158, Cl. D14-137.000.

Breen, John D.; and Craft, Charles W., to Rubbermaid Incorporated. Combined rim and handle portion for a trash container. 364,256, Cl. D34-10.000.

Bridgestone Corporation: *See*—
Himuro, Yasuo; and Shinohara, Kazunori, 364,134, Cl. D12-146.000.

Brogren, Christer P. O. Spoon. 364,075, Cl. D7-653.000.

Brush, Richard R. Anti-walk cam. 364,179, Cl. D15-148.000.

Bryan, Sidney V.: *See*—
Workman, Tom E.; and Bryan, Sidney V., 364,195, Cl. D21-37.000.

Bucher, Paul G. Shelf unit. 364,047, Cl. D6-407.000.

Buckner, Carrol E. Solid fuel heating unit. 364,221, Cl. D23-343.000.

Burga, Leonor. Tooth brush holder. 364,061, Cl. D6-534.000.

Byers, Gerald J.: *See*—
McCue, Thomas E.; and Byers, Gerald J., 364,185, Cl. D18-56.000.

Caley, Kristal M. Adult bib. 364,032, Cl. D2-861.000.

Caley, Malcolm, to McKechnie UK Limited. Tile edging strip. 364,233, Cl. D25-119.000.

Caley, Malcolm, to McKechnie UK Limited. Tile edging strip. 364,234, Cl. D25-119.000.

Caley, Malcolm, to McKechnie UK Limited. Expansion strip for tiled surfaces. 364,235, Cl. D25-122.000.

Callaway Golf Company: *See*—
Schmidt, Glenn H.; and Helmstetter, Richard C., 364,206, Cl. D21-220.000.

Campbell, Floyd. Combined lunch box and radio. 364,161, Cl. D14-168.000.

Cannata-Nowell, Anita. Nail polish blender/mixer. 364,249, Cl. D28-99.000.

Canney, Martin W. Bathroom mirror defogger unit. 364,225, Cl. D23-186.000.

Canon Computer Systems, Inc.: *See*—
Beneville, Laura L.; and Gutzka, Bret W., 364,145, Cl. D14-100.000.

Carpino, John S.: *See*—
Sulkowski, David J.; Carpino, John S.; Greco, Michael R.; and Zurita, Louis E., 364,135, Cl. D12-147.000.

Carrier Corporation: *See*—
Stievenart, Gregory A.; Hider, Philip A.; Fasulo, Pasquale; and Dziersk, Mark D., 364,103, Cl. D10-50.000.

Cesaroni, William C.: *See*—
Klein, Annette T.; Belongia, David C.; Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, 364,070, Cl. D7-350.000.

Chavaz, Paula N.; and Murphy, Daniel L. Greeting card support device. 364,042, Cl. D6-314.000.

Chou, C. T.: *See*—
Kou, Tony; and Chou, C. T., 364,231, Cl. D24-215.000.

Chung, Stephen, to Silitek Corporation. Bilaterally liftable keyboard. 364,155, Cl. D14-115.000.

Clark, David A.: *See*—
Berry, Richard D., Jr.; and Clark, David A., 364,051, Cl. D6-436.000.
Berry, Richard D., Jr.; and Clark, David A., 364,056, Cl. D6-483.000.

Coleman, Edwin B., Jr. Cribbage board. 364,102, Cl. D10-46.100.

Compaq Computer Corporation: *See*—
Martin, Randall W.; Barron, Peter B.; Halseth, Thor R.; and Holtorf, James L., 364,147, Cl. D14-100.000.

Conerly, Billy W. Sheath for a nail clipper. 364,246, Cl. D28-60.000.

Confab, Inc.: *See*—
Suskind, Stuart P., 364,040, Cl. D5-1.000.

Connor, Clara. Combination body scarf and massager. 364,229, Cl. D24-206.000.

Contico International, Inc.: *See*—
Dickinson, Thomas; and Gale, Bradley D., 364,112, Cl. D11-152.000.

Cozzolino, Steven: *See*—
Klein, Annette T.; Belongia, David C.; Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, 364,070, Cl. D7-350.000.

Craft, Charles W.: *See*—
Breen, John D.; and Craft, Charles W., 364,256, Cl. D34-10.000.

Dagan, Gideon, to Aura Systems, Inc. Amplifier housing. 364,162, Cl. D14-188.000.

Daniels, Drew, to Aura Systems, Inc. Speaker motor case. 364,167, Cl. D14-221.000.

Dannenberg, Todd D.; and Giese, Robert C., to Kohler Co. Faucet. 364,213, Cl. D23-238.000.

Davidson, William G.; and Netz, Louis, to Harley-Davidson, Inc. Motorcycle clutch cover. 364,129, Cl. D12-126.000.

Davidson, William G.; and Netz, Louis, to Harley-Davidson, Inc. Motorcycle clutch chain guard cover. 364,130, Cl. D12-127.000.

DeGuzman, Mary J.: *See*—
Ancona, Bruce; Ancona, Jane; DeGuzman, Mary J.; and LaRosa, Craig R., 364,067, Cl. D7-302.000.

Dekker, James. Tri-dimensional game board. 364,192, Cl. D21-23.000.

DeWitt, Kenneth L., to Universal Security Instruments, Inc. Smoke detector cover. 364,108, Cl. D10-106.000.

Dickinson, Thomas; and Gale, Bradley D., to Contico International, Inc. Flower pot with an integral base. 364,112, Cl. D11-152.000.

Didier, Rene: *See*—
Baus, Andre E. J.; Didier, Rene; Durand, Gerard; and Spejlborg, Soren, 364,133, Cl. D12-143.000.

Dinand, Pierre, to Pacific Corporation. Container. 364,091, Cl. D9-503.000.
DiPasquale, Charles J., to Smartel, Inc. Combined ceiling fan and light with balloon decoration. 364,223, Cl. D23-377.000.
Donaghu, Michael T.: *See*—
Passke, Joel L.; Sell, James C., Jr.; Donaghu, Michael T.; and Tawney, John C., 364,036, Cl. D2-961.000.
Dore, Christophe, to Telemecanique. Speed controller and its additives. 364,106, Cl. D10-96.000.
Dreyfuss, Daniel G.: *See*—
Smolik, Raymond, 364,111, Cl. D11-132.000.
Drummond Industries: *See*—
Loerop, Kenneth W.; and Gieser, Matthew, 364,210, Cl. D23-237.000.
Dubin, Alfred R., to Phylrich International. Lavatory faucet handle. 364,217, Cl. D23-252.000.
Duclos, Clovis R. Putter golf club head. 364,205, Cl. D21-217.000.
Duffy, Lisa E.: *See*—
Alpers, Helmut A.; Duffy, Lisa E.; Erickson, Peter C.; and Russett, Jon P., Jr., 364,175, Cl. D15-82.000.
Dunbar, James R.: *See*—
Beckman, Kurt D.; and Dunbar, James R., 364,085, Cl. D8-375.000.
Durand, Gerard: *See*—
Baus, Andre E. J.; Didier, Rene; Durand, Gerard; and Spejlborg, Soren, 364,133, Cl. D12-143.000.
Dziersk, Mark D.: *See*—
Stievenart, Gregory A.; Hider, Philip A.; Fasulo, Pasquale; and Dziersk, Mark D., 364,103, Cl. D10-50.000.
Eastern Company, The: *See*—
Weinerman, Lee S.; and Kuminski, Arthur J., 364,082, Cl. D8-331.000.
Ehredt, Jesse: *See*—
Shaw, Mark D.; Heyman, J. Tad; Bierce, Laurence M.; and Ehredt, Jesse, 364,255, Cl. D34-1.000.
Eichhorn, Anthony E.; and Morton, Kenneth P., to Fisher-Price, Inc. Stroller. 364,131, Cl. D12-129.000.
Erickson, Peter C.: *See*—
Alpers, Helmut A.; Duffy, Lisa E.; Erickson, Peter C.; and Russett, Jon P., Jr., 364,175, Cl. D15-82.000.
Esslinger, Hartmut H., to Packard Bell Electronics, Inc. Computer. 364,146, Cl. D14-100.000.
Esslinger, Hartmut H., to Packard Bell Electronics, Inc. Loudspeaker. 364,165, Cl. D14-213.000.
Ethan Allen Inc.: *See*—
Berry, Richard D., Jr.; and Clark, David A., 364,051, Cl. D6-436.000.
Berry, Richard D., Jr.; and Clark, David A., 364,056, Cl. D6-483.000.
Excellent Gesellschaft fur feine Schneidwaren mbH: *See*—
Hartmann, Gerd, 364,226, Cl. D24-147.000.
Farley, Timothy R., to Servants, Inc., The. Corrugated carton. 364,087, Cl. D9-418.000.
Fasulo, Pasquale: *See*—
Stievenart, Gregory A.; Hider, Philip A.; Fasulo, Pasquale; and Dziersk, Mark D., 364,103, Cl. D10-50.000.
Federal Signal Corporation: *See*—
Stanuch, Edward S.; and Weger, Donald E., 364,109, Cl. D10-114.000.
Feen, Stuart H., to Plastic Bottle Corporation. Bottle. 364,092, Cl. D9-542.000.
Fiorano, Roberto, to PRISMA S.p.A. Luminaire. 364,242, Cl. D26-85.000.
Firm, Inc., The: *See*—
Benson, Anna L., 364,202, Cl. D21-191.000.
Fisher-Price, Inc.: *See*—
Eichhorn, Anthony E.; and Morton, Kenneth P., 364,131, Cl. D12-129.000.
Flurry International, Inc.: *See*—
Alpers, Helmut A.; Duffy, Lisa E.; Erickson, Peter C.; and Russett, Jon P., Jr., 364,175, Cl. D15-82.000.
Forster Products, Inc.: *See*—
Hartman, Rodney P., 364,176, Cl. D15-136.000.
Friedrich Grohe Aktiengesellschaft: *See*—
Lobermeier, Hans, 364,214, Cl. D23-238.000.
Fuji Photo Film Co., Ltd.: *See*—
Tanaka, Kunihiko; and Katayama, Noriko, 364,156, Cl. D14-121.000.
Fujimori, Mayumi, to Seikosha Co., Ltd. Clock. 364,094, Cl. D10-20.000.
Gale, Bradley D.: *See*—
Dickinson, Thomas; and Gale, Bradley D., 364,112, Cl. D11-152.000.
Gallitzendörfer, Josef: *See*—
Sacco, Bruno; Gallitzendörfer, Josef; and Pfeiffer, Peter, 364,239, Cl. D26-28.000.
Garceau, Bernard F., to Norco Industries, Inc. Stabilizer jack. 364,259, Cl. D34-31.000.
Garcia, Joe C. Toothpaste tube rollup device. 364,062, Cl. D6-541.000.
Geiger International, Inc.: *See*—
Proietto, Giuseppe; and Geiger, John, 364,044, Cl. D6-366.000.
Geiger, John: *See*—
Proietto, Giuseppe; and Geiger, John, 364,044, Cl. D6-366.000.
Gemstar Development Corporation: *See*—
Yuen, Henry C., 364,166, Cl. D14-218.000.
Geneve, Francois; Heiligstein, Luc; and Melamed, Stephen. Television antenna. 364,169, Cl. D14-235.000.
Giardiello, Barbara, to Artime SA. Wristwatch. 364,098, Cl. D10-32.000.
Giardiello, Barbara, to Artime SA. Wristwatch. 364,100, Cl. D10-39.000.
Giese, Robert C.: *See*—
Dannenberg, Todd D.; and Giese, Robert C., 364,213, Cl. D23-238.000.
Gieser, Matthew: *See*—
Loerop, Kenneth W.; and Gieser, Matthew, 364,210, Cl. D23-237.000.
Glenmac Inc.: *See*—
McPherson, Mac E.; McPherson, Michael G.; Innocent, Kenneth L.; Parkos, Gary A.; and Noska, Roger D., 364,174, Cl. D15-27.000.
Goff, Kathy L.: *See*—
McCracken, Jamie L.; and Goff, Kathy L., 364,250, Cl. D29-100.000.
Goler, Clifford. Baby bottle holder. 364,228, Cl. D24-199.000.
Goodyear Tire & Rubber Company, The: *See*—
Baus, Andre E. J.; Didier, Rene; Durand, Gerard; and Spejlborg, Soren, 364,133, Cl. D12-143.000.
Gorrie Advertising Management Limited: *See*—
Whittington, Paul, 364,258, Cl. D34-21.000.
Goss, Lorane C., Jr., to Mikron Industries, Inc. Window component extrusion. 364,237, Cl. D25-125.000.
Greco, Michael R.: *See*—
Sulkowski, David J.; Carpino, John S.; Greco, Michael R.; and Zurita, Louis E., 364,135, Cl. D12-147.000.
Grundfos A/S: *See*—
Jensen, Niels D.; and Nielsen, Kurt F., 364,172, Cl. D15-7.000.
Gustavsen, Gilbert E. Rear accessory rack for recreational vehicle. 364,140, Cl. D12-407.000.
Gutzka, Bret W.: *See*—
Beneville, Laura L.; and Gutzka, Bret W., 364,145, Cl. D14-100.000.
Halseth, Thor R.: *See*—
Martin, Randall W.; Barron, Peter B.; Halseth, Thor R.; and Holtorf, James L., 364,147, Cl. D14-100.000.
Haney, Paul; Schneider, Ronald J.; and Strand, Kevin O., to Huffy Corporation. Bicycle. 364,128, Cl. D12-111.000.
Hanig & Co.: *See*—
Hanig, James L., 364,164, Cl. D14-192.000.
Hanig, James L., to Hanig & Co. Radio. 364,164, Cl. D14-192.000.
Hanna, Robert S.; Mayo, Noel; Spira, Joel S.; and Swain, James E., III, to Lutron Electronics Co., Inc. Combined bezel and actuator for dimmer switch. 364,141, Cl. D13-125.000.
Hans Grohe GmbH & Co. KG: *See*—
Starck, Philippe, 364,045, Cl. D8-367.000.
Starck, Philippe, 364,215, Cl. D23-242.000.
Hansson, Lars-Ola; Wallström, Lars-Gunnar; and Pantzar, Göran, to Sandvik AB. Cutting insert for milling cutters. 364,178, Cl. D15-139.000.
Harley-Davidson, Inc.: *See*—
Davidson, William G.; and Netz, Louis, 364,129, Cl. D12-126.000.
Davidson, William G.; and Netz, Louis, 364,130, Cl. D12-127.000.
Harris, Rod W. Start tab for tape. 364,190, Cl. D19-99.000.
Harrison, Susan, to Zooth, Inc. Handle for forks, spoons, and toothbrushes. 364,077, Cl. D7-654.000.
Hartliep, Gina M.; and Samuels, Laura J., to Premold Corporation. Game table. 364,193, Cl. D21-24.000.
Hartman, Rodney P., to Forster Products, Inc. Reloading die. 364,176, Cl. D15-136.000.
Hartmann, Gerd, to Excellent Gesellschaft fur feine Schneidwaren mbH. Callus remover. 364,226, Cl. D24-147.000.
Hase, Masaki: *See*—
Hayashi, Yukou; Takashima, Kimie; and Hase, Masaki, 364,053, Cl. D6-470.000.
Haskett, Wayne J.; Andersen, John A.; and Andersen, Leonard. Compact disc stand. 364,066, Cl. D6-629.000.
Hausler, Hartmut E.: *See*—
Acciaoli, John V.; Hausler, Hartmut E.; Holden, Chester D.; Marotti, Martin J.; Rockwell, Scott M.; Roscoe, Terry R.; and Zapfe, Roland, 364,152, Cl. D14-108.000.
Hayashi, Yukou; Takashima, Kimie; and Hase, Masaki, to Sanyo Electric Co., Ltd. Medical cabinet. 364,053, Cl. D6-470.000.
Heiligstein, Luc: *See*—
Geneve, Francois; Heiligstein, Luc; and Melamed, Stephen, 364,169, Cl. D14-235.000.
Helmstetter, Richard C.: *See*—
Schmidt, Glenn H.; and Helmstetter, Richard C., 364,206, Cl. D21-220.000.
Henke, David R., to Warner Manufacturing Company. Hand tool. 364,252, Cl. D32-42.000.
Hewlett-Packard Company: *See*—
McCue, Thomas E.; and Byers, Gerald J., 364,185, Cl. D18-56.000.
Heyman, J. Tad: *See*—
Shaw, Mark D.; Heyman, J. Tad; Bierce, Laurence M.; and Ehredt, Jesse, 364,255, Cl. D34-1.000.
Hider, Philip A.: *See*—
Stievenart, Gregory A.; Hider, Philip A.; Fasulo, Pasquale; and Dziersk, Mark D., 364,103, Cl. D10-50.000.
Highland Supply Corporation: *See*—
Weder, Donald E.; and Straeter, Joseph G., 364,113, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,114, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,115, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,116, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,117, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,118, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,119, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,120, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,121, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,122, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,123, Cl. D11-164.000.
Hill, Andy: *See*—

King, William; Hill, Andy; and Kemnitz, Glen, 364,257, Cl. D34-21.000.
Hill, Loran R.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet body and spout. 364,211, Cl. D23-238.000.
Hill, Loran R.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet body and spout. 364,212, Cl. D23-238.000.
Hill, Loran R.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet handle. 364,216, Cl. D23-252.000.
Hill, Loran R.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet spout. 364,218, Cl. D23-255.000.
Hill, Loran R.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet spout. 364,219, Cl. D23-255.000.
Hill, Loran R.; and Spangler, Anthony G., to Masco Corporation of Indiana. Faucet spout. 364,220, Cl. D23-255.000.
Himuro, Yasuo; and Shinohara, Kazunori, to Bridgestone Corporation. Automobile tire. 364,134, Cl. D12-146.000.
Hodson, William J., to Trov U.S.A. Inc. Slamming disc. 364,196, Cl. D21-53.000.
Holden, Chester D.: *See*—
Acciaoli, John V.; Hausler, Hartmut E.; Holden, Chester D.; Marotti, Martin J.; Rockwell, Scott M.; Roscoe, Terry R.; and Zapfe, Roland, 364,152, Cl. D14-108.000.
Holtorf, James L.: *See*—
Martin, Randall W.; Barron, Peter B.; Halseth, Thor R.; and Holtorf, James L., 364,147, Cl. D14-100.000.
Horn, Amy L. Child's chair. 364,043, Cl. D6-359.000.
Horwill, Rodney E. Vehicle hood protector. 364,138, Cl. D12-181.000.
Huang, Frank T. S. Insulated jug. 364,069, Cl. D7-317.000.
Huang, Kuo-Chin. Fog light for vehicles. 364,240, Cl. D26-28.000.
Huffy Corporation: *See*—
Haney, Paul; Schneider, Ronald J.; and Strand, Kevin O., 364,128, Cl. D12-111.000.
Hung, Kuei-Hung. Candle stand. 364,238, Cl. D26-9.000.
Imai, Toshitaka: *See*—
Jasinski, Joseph E.; Moffatt, Susan S.; Imai, Toshitaka; and Wiseman, John A., 364,148, Cl. D14-100.000.
Indiana Mills & Manufacturing, Inc.: *See*—
Lortz, Allan R.; Wiseman, Michael A.; and Beaver, Jeffrey L., 364,124, Cl. D11-216.000.
Innocent, Kenneth L.: *See*—
McPherson, Mac E.; McPherson, Michael G.; Innocent, Kenneth L.; Parkos, Gary A.; and Noska, Roger D., 364,174, Cl. D15-27.000.
Interlego AG: *See*—
Bluff, Kristian A., 364,198, Cl. D21-108.000.
Jensen, Hanne D., 364,201, Cl. D21-162.000.
Schmidt, Sten; and Jensen, Kurt, 364,199, Cl. D21-108.000.
International Business Machines Corporation: *See*—
Acciaoli, John V.; Hausler, Hartmut E.; Holden, Chester D.; Marotti, Martin J.; Rockwell, Scott M.; Roscoe, Terry R.; and Zapfe, Roland, 364,152, Cl. D14-108.000.
Alfonso, Pedro M., 364,149, Cl. D14-102.000.
Jasinski, Joseph E.; Moffatt, Susan S.; Imai, Toshitaka; and Wiseman, John A., 364,148, Cl. D14-100.000.
Lucente, Samuel A. M.; and Sapper, Richard F., 364,144, Cl. D14-100.000.
Mieki, Nariaki, 364,150, Cl. D14-106.000.
Sharp, Michael H., 364,157, Cl. D14-133.000.
Smith, Ronald A., 364,182, Cl. D18-4.000.
Yamazaki, Kazuhiko, 364,151, Cl. D14-107.000.
Ishida, Tomohisa: *See*—
Ochiai, Koichi; and Ishida, Tomohisa, 364,126, Cl. D11-218.000.
ITT Corporation: *See*—
Palmer, Gary L., 364,244, Cl. D26-138.000.
Jacobson, Arthur F. Plastic pouch with subdivided compartments. 364,086, Cl. D9-305.000.
Jasinski, Joseph E.; Moffatt, Susan S.; Imai, Toshitaka; and Wiseman, John A., to International Business Machines Corporation. Floor standing personal computer. 364,148, Cl. D14-100.000.
Jaynes, Bruce. Fluorescent table lamp. 364,241, Cl. D26-79.000.
Jenkins, Henry H. Vacuum check valve. 364,209, Cl. D23-233.000.
Jensen, Hanne D., to Interlego AG. Toy elephant. 364,201, Cl. D21-162.000.
Jensen, Kurt: *See*—
Schmidt, Sten; and Jensen, Kurt, 364,199, Cl. D21-108.000.
Jensen, Niels D.; and Nielsen, Kurt F., to Grundfos A/S. Pump. 364,172, Cl. D15-7.000.
Johnson Level & Tool Mfg. Co., Inc.: *See*—
Johnson, William G., 364,104, Cl. D10-74.000.
Johnson, Robert. Fiber optic tree standard. 364,110, Cl. D11-118.000.
Johnson, William G., to Johnson Level & Tool Mfg. Co., Inc. Extrusion for a box beam level. 364,104, Cl. D10-74.000.
Kamiya, Manabu: *See*—
Omuro, Makoto; and Kamiya, Manabu, 364,105, Cl. D10-78.000.
Katayama, Noriko: *See*—
Tanaka, Kunihiko; and Katayama, Noriko, 364,156, Cl. D14-121.000.
Keable, Denis. Party tray. 364,072, Cl. D7-553.000.
Keller, H. Thomas, to Bernhardt Furniture Company. Arm chair. 364,046, Cl. D6-379.000.
Kemnitz, Glen: *See*—
King, William; Hill, Andy; and Kemnitz, Glen, 364,257, Cl. D34-21.000.
Killian, Laurie W., to Michelin Recherche et Technique S.A. Tire. 364,136, Cl. D12-147.000.
Kimura, Akio: *See*—
Satake, Syunsuke; and Kimura, Akio, 364,184, Cl. D18-43.000.
King, William; Hill, Andy; and Kemnitz, Glen, to Sunbeam Corporation. Grill cart with a condiment basket and a front panel. 364,257, Cl. D34-21.000.
Kino, Moriya, to Royal Co., Ltd. Teether. 364,227, Cl. D24-194.000.
Klein, Annette T.; Belongia, David C.; Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, to West Bend Company, The. Wide loaf breadmaker. 364,070, Cl. D7-350.000.
Knight, Michael D.: *See*—
Yates, David P.; and Knight, Michael D., 364,081, Cl. D8-330.000.
Knighton, Warren D.; and Knighton, William W. Keyboard wrist support. 364,154, Cl. D14-114.000.
Knighton, William W.: *See*—
Knighton, Warren D.; and Knighton, William W., 364,154, Cl. D14-114.000.
Kohler Co.: *See*—
Dannenberg, Todd D.; and Giese, Robert C., 364,213, Cl. D23-238.000.
Komatsu, Makoto: *See*—
Umaba, Toshiya; and Komatsu, Makoto, 364,153, Cl. D14-113.000.
Konopka, Miles A.: *See*—
Powers, John A., III; Konopka, Miles A.; McNew, Ray; and Meola, Angelo T., 364,187, Cl. D19-60.000.
Kou, Tony; and Chou, C. T. Massager. 364,231, Cl. D24-215.000.
Kraft Foods, Inc.: *See*—
Weaver, Edmund A., Jr., 364,093, Cl. D9-563.000.
Kruger, Cory J., to Sterilite Corporation. Caddy with handle. 364,039, Cl. D3-315.000.
Krupa, Calvin S. Shrimp package with hinged lid. 364,090, Cl. D9-429.000.
Kruszewski, David J.: *See*—
Metcalfe, Paul R.; Kruszewski, David J.; and Lostoski, Douglas A., 364,142, Cl. D13-134.000.
Kuminski, Arthur J.: *See*—
Weinerman, Lee S.; and Kuminski, Arthur J., 364,082, Cl. D8-331.000.
Kuo, Jiang S.-H., to Shine Sun Industrial, Co., Ltd. Pen. 364,186, Cl. D19-48.000.
L.D. Kichler Co., The: *See*—
Von Kluck, Kevin, 364,243, Cl. D26-110.000.
Lai, Chung-Sung. Holder for shaver and cartride. 364,060, Cl. D6-526.000.
Lamson & Sessions Co., The: *See*—
Metcalfe, Paul R.; Kruszewski, David J.; and Lostoski, Douglas A., 364,142, Cl. D13-134.000.
Landrey, Frank. Tombstone. 364,260, Cl. D99-17.000.
Langley, Peter V. Mobile cooler. 364,073, Cl. D7-605.000.
LaRosa, Craig R.: *See*—
Ancona, Bruce; Ancona, Jane; DeGuzman, Mary J.; and LaRosa, Craig R., 364,067, Cl. D7-302.000.
Larson, Gary J. Stun glove. 364,208, Cl. D22-117.000.
Lechman, John N., to Nova Solutions, Inc. Instructor podium. 364,049, Cl. D6-419.000.
Lee, Lester Q.; and Tawney, John C., to Nike, Inc. Bladder for a shoe sole. 364,034, Cl. D2-961.000.
Lee, Lester Q., to Nike, Inc. Bladder for a shoe sole. 364,035, Cl. D2-961.000.
Lewis, Judith R. Cutting guide with safety guard. 364,177, Cl. D15-138.000.
Lewis, Sally S. Mirror. 364,041, Cl. D6-306.000.
Lin, Jimmy J., to Besco USA International. Golf club head. 364,204, Cl. D21-214.000.
Listawood Limited: *See*—
Allen, Norman A., 364,191, Cl. D21-15.000.
Lo Mei Cosmetics Ent. Co., Ltd.: *See*—
Su, Pao-Fon, 364,248, Cl. D28-86.000.
Lo, Wei Wu. Sports equipment rack. 364,063, Cl. D6-552.000.
Lobermeier, Hans, to Friedrich Grohe Aktiengesellschaft. Faucet. 364,214, Cl. D23-238.000.
Loerop, Kenneth W.; and Gieser, Matthew, to Drummond Industries. Transparent sump pump check valve. 364,210, Cl. D23-237.000.
Lordo, Alphonse V. Spoon. 364,076, Cl. D7-653.000.
Lorenz, Kenneth C. Modular cabinet unit. 364,064, Cl. D6-559.000.
Lortz, Allan R.; Wiseman, Michael A.; and Beaver, Jeffrey L., to Indiana Mills & Manufacturing, Inc. Buckle. 364,124, Cl. D11-216.000.
Lostoski, Douglas A.: *See*—
Metcalfe, Paul R.; Kruszewski, David J.; and Lostoski, Douglas A., 364,142, Cl. D13-134.000.
Lovegrove, Ross: *See*—
Peart, Stephen; and Lovegrove, Ross, 364,065, Cl. D6-601.000.
Lozano, Sergio G., to Nike, Inc. Shoe upper. 364,037, Cl. D2-969.000.
Lucente, Samuel A. M.; and Sapper, Richard F., to International Business Machines Corporation. Interlocking computer system. 364,144, Cl. D14-100.000.
Lutron Electronics Co., Inc.: *See*—
Hanna, Robert S.; Mayo, Noel; Spira, Joel S.; and Swain, James E., III, 364,141, Cl. D13-125.000.
Lynd, Larry G. Bottle. 364,071, Cl. D7-510.000.
Maddack, Andrea J.; and Maddack, John. Telephone receiver sleeve. 364,171, Cl. D14-250.000.
Maddack, John: *See*—
Maddack, Andrea J.; and Maddack, John, 364,171, Cl. D14-250.000.
Mak, Ronnie C. W., to Sanny Electronics Limited. Clock. 364,095, Cl. D10-21.000.
Marathon Partners: *See*—

Pridonoff, Charles L.; and Stregan, John, 364,200, Cl. D21-114.000.
Marotti, Martin J.: *See*—
Acciaoli, John V.; Hausler, Hartmut E.; Holden, Chester D.; Marotti, Martin J.; Rockwell, Scott M.; Roscoe, Terry R.; and Zapfe, Roland, 364,152, Cl. D14-108.000.
Martin, Randall W.; Barron, Peter B.; Halseth, Thor R.; and Holtorf, James L., to Compaq Computer Corporation. Personal computer. 364,147, Cl. D14-100.000.
Masco Corporation of Indiana: *See*—
Hill, Loran R.; and Spangler, Anthony G., 364,211, Cl. D23-238.000.
Hill, Loran R.; and Spangler, Anthony G., 364,212, Cl. D23-238.000.
Hill, Loran R.; and Spangler, Anthony G., 364,216, Cl. D23-252.000.
Hill, Loran R.; and Spangler, Anthony G., 364,218, Cl. D23-255.000.
Hill, Loran R.; and Spangler, Anthony G., 364,219, Cl. D23-255.000.
Hill, Loran R.; and Spangler, Anthony G., 364,220, Cl. D23-255.000.
Mayo, Noel: *See*—
Hanna, Robert S.; Mayo, Noel; Spira, Joel S.; and Swain, James E., III, 364,141, Cl. D13-125.000.
McCloskey, Don R.; and Rorke, Anthony B., to Black & Decker Inc. Coffeemaker. 364,068, Cl. D7-309.000.
McCracken, Jamie L.; and Goff, Kathy L., to Turtle Shells Corporation. Breast protector. 364,250, Cl. D29-100.000.
McCue, Thomas E.; and Byers, Gerald J., to Hewlett-Packard Company. Length adjuster for paper or other media for a printer. 364,185, Cl. D18-56.000.
McKechnie UK Limited: *See*—
Caley, Malcolm, 364,233, Cl. D25-119.000.
Caley, Malcolm, 364,234, Cl. D25-119.000.
Caley, Malcolm, 364,235, Cl. D25-122.000.
McNew, Ray: *See*—
Powers, John A., III; Konopka, Miles A.; McNew, Ray; and Meola, Angelo T., 364,187, Cl. D19-60.000.
McPherson, Mac E.; McPherson, Michael G.; Innocent, Kenneth L.; Parkos, Gary A.; and Noska, Roger D., to Glenmac Inc. Rock collecting implement. 364,174, Cl. D15-27.000.
McPherson, Michael G.: *See*—
McPherson, Mac E.; McPherson, Michael G.; Innocent, Kenneth L.; Parkos, Gary A.; and Noska, Roger D., 364,174, Cl. D15-27.000.
Melamed, Stephen: *See*—
Geneve, Francois; Heiligstein, Luc; and Melamed, Stephen, 364,169, Cl. D14-235.000.
Meola, Angelo T.: *See*—
Powers, John A., III; Konopka, Miles A.; McNew, Ray; and Meola, Angelo T., 364,187, Cl. D19-60.000.
Mercedes-Benz Aktiengesellschaft: *See*—
Sacco, Bruno; Gallitzendörfer, Josef; and Pfeiffer, Peter, 364,239, Cl. D26-28.000.
Merriweather, Frank, Jr., to Bobrick Washroom Equipment, Inc. Partition-mounted dual combined seat cover dispenser, toilet paper dispenser, and waste receptacle unit. 364,059, Cl. D6-519.000.
Metcalfe, Paul R.; Kruszewski, David J.; and Lostoski, Douglas A., to Lamson & Sessions Co., The. Light socket switch with timer. 364,142, Cl. D13-134.000.
Michelin Recherche et Technique S.A.: *See*—
Killian, Laurie W., 364,136, Cl. D12-147.000.
Mickey, Carl F., Sr. Wrist-borne exercise display device. 364,097, Cl. D10-125.000.
Midwest Design, Inc.: *See*—
Bowman, Thomas C., 364,057, Cl. D6-511.000.
Mieki, Nariaki, to International Business Machines Corporation. Personal computer. 364,150, Cl. D14-106.000.
Mikron Industries, Inc.: *See*—
Goss, Lorane C., Jr., 364,237, Cl. D25-125.000.
Schrader, Robert A., 364,236, Cl. D25-124.000.
Minolta Co., Ltd.: *See*—
Satake, Syunsuke; and Kimura, Akio, 364,184, Cl. D18-43.000.
Moffatt, Susan S.: *See*—
Jasinski, Joseph E.; Moffatt, Susan S.; Imai, Toshitaka; and Wiseman, John A., 364,148, Cl. D14-100.000.
Morton, Kenneth P.: *See*—
Eichhorn, Anthony E.; and Morton, Kenneth P., 364,131, Cl. D12-129.000.
Motorola, Inc.: *See*—
Scheid, William J.; and Townsend, David P., 364,163, Cl. D14-191.000.
Murphy, Daniel L.: *See*—
Chavaz, Paula N.; and Murphy, Daniel L., 364,042, Cl. D6-314.000.
National Molding Corp.: *See*—
Anscher, Joseph, 364,125, Cl. D11-216.000.
Nattrass, Nigel. Compost bin. 364,254, Cl. D34-1.000.
Nesicolaci, Marwan F., to Universal Aqua Technologies, Inc. Control panel for a water filtration system. 364,107, Cl. D10-103.000.
Netz, Louis: *See*—
Davidson, William G.; and Netz, Louis, 364,129, Cl. D12-126.000.
Davidson, William G.; and Netz, Louis, 364,130, Cl. D12-127.000.
Nielsen, Kurt F.: *See*—
Jensen, Niels D.; and Nielsen, Kurt F., 364,172, Cl. D15-7.000.
Niemier, Timothy A. Water craft. 364,139, Cl. D12-302.000.
Nike, Inc.: *See*—
Lee, Lester Q.; and Tawney, John C., 364,034, Cl. D2-961.000.
Lee, Lester Q., 364,035, Cl. D2-961.000.
Lozano, Sergio G., 364,037, Cl. D2-969.000.
Passke, Joel L.; Sell, James C., Jr.; Donaghu, Michael T.; and Tawney, John C., 364,036, Cl. D2-961.000.
Norco Industries, Inc.: *See*—
Garceau, Bernard F., 364,259, Cl. D34-31.000.
Noska, Roger D.: *See*—
McPherson, Mac E.; McPherson, Michael G.; Innocent, Kenneth L.; Parkos, Gary A.; and Noska, Roger D., 364,174, Cl. D15-27.000.
Nova Solutions, Inc.: *See*—
Lechman, John N., 364,049, Cl. D6-419.000.
Novak, Alan. Toilet bowl plunger. 364,251, Cl. D32-35.000.
NT Door Controls Ltd.: *See*—
Yates, David P.; and Knight, Michael D., 364,081, Cl. D8-330.000.
Ochiai, Koichi; and Ishida, Tomohisa, to Yoshida Kogyo K.K. Hook attachment ring. 364,126, Cl. D11-218.000.
O'Connell, Meagan: *See*—
O'Connell, Nicholas; and O'Connell, Meagan, 364,194, Cl. D21-30.000.
O'Connell, Nicholas; and O'Connell, Meagan. Game board. 364,194, Cl. D21-30.000.
Oki Electric Industry Co., Ltd.: *See*—
Seki, Naoko, 364,159, Cl. D14-138.000.
Seki, Naoko, 364,160, Cl. D14-138.000.
Omuro, Makoto; and Kamiya, Manabu, to Seiko Epson Corporation. Digital multi meter. 364,105, Cl. D10-78.000.
Pacific Corporation: *See*—
Dinand, Pierre, 364,091, Cl. D9-503.000.
Packard Bell Electronics, Inc.: *See*—
Esslinger, Hartmut H., 364,146, Cl. D14-100.000.
Esslinger, Hartmut H., 364,165, Cl. D14-213.000.
Pakla, Waclaw J. Shelf system. 364,055, Cl. D6-477.000.
Palmer, Gary L., to ITT Corporation. Illuminator bracket for a night vision device. 364,244, Cl. D26-138.000.
Pan, Hsien-Chang. Clock. 364,096, Cl. D10-29.000.
Pantzar, Göran: *See*—
Hansson, Lars-Ola; Wallström, Lars-Gunnar; and Pantzar, Göran, 364,178, Cl. D15-139.000.
Park, Scott. Search camera. 364,180, Cl. D16-202.000.
Parkos, Gary A.: *See*—
McPherson, Mac E.; McPherson, Michael G.; Innocent, Kenneth L.; Parkos, Gary A.; and Noska, Roger D., 364,174, Cl. D15-27.000.
Passke, Joel L.; Sell, James C., Jr.; Donaghu, Michael T.; and Tawney, John C., to Nike, Inc. Bladder for a shoe sole. 364,036, Cl. D2-961.000.
Paus, Michael J., to Universal Furniture Industries, Inc. Table. 364,050, Cl. D6-436.000.
Peart, Stephen; and Lovegrove, Ross, to Westinghouse Electric Corporation. Lumbar support cushion. 364,065, Cl. D6-601.000.
Pfeiffer, Peter: *See*—
Sacco, Bruno; Gallitzendörfer, Josef; and Pfeiffer, Peter, 364,239, Cl. D26-28.000.
Phylrich International: *See*—
Dubin, Alfred R., 364,217, Cl. D23-252.000.
Pianella, Anthony. Joint compound trough. 364,253, Cl. D32-53.100.
Pirelli Armstrong Tire Corporation: *See*—
Sulkowski, David J.; Carpino, John S.; Greco, Michael R.; and Zarita, Louis E., 364,135, Cl. D12-147.000.
Plastic Bottle Corporation: *See*—
Feen, Stuart H., 364,092, Cl. D9-542.000.
Powers, John A., III; Konopka, Miles A.; McNew, Ray; and Meola, Angelo T., to Bell Atlantic–Maryland. Cabinet for a video distance learning system. 364,187, Cl. D19-60.000.
Premold Corporation: *See*—
Hartliep, Gina M.; and Samuels, Laura J., 364,193, Cl. D21-24.000.
Pridonoff, Charles L.; and Stregan, John, to Marathon Partners. Toy collapsible structure. 364,200, Cl. D21-114.000.
PRISMA S.p.A.: *See*—
Fiorato, Roberto, 364,242, Cl. D26-85.000.
Proietto, Giuseppe; and Geiger, John, to Geiger International, Inc. Chair. 364,044, Cl. D6-366.000.
Punch Products USA, Inc.: *See*—
Trombly, Edgar F., 364,189, Cl. D19-77.000.
Rigel, Yhoshua. Steering wheel cover. 364,137, Cl. D12-177.000.
Robbins, Edward S., III. Collapsible container. 364,088, Cl. D9-428.000.
Robbins, Edward S., III. Collapsible container. 364,089, Cl. D9-428.000.
Robbins Industries, Inc.: *See*—
Weterrings, Frans M., 364,078, Cl. D7-679.000.
Rockwell, Scott M.: *See*—
Acciaoli, John V.; Hausler, Hartmut E.; Holden, Chester D.; Marotti, Martin J.; Rockwell, Scott M.; Roscoe, Terry R.; and Zapfe, Roland, 364,152, Cl. D14-108.000.
Romano, Joseph. Baseball hat visor. 364,033, Cl. D2-894.000.
Rorke, Anthony B.: *See*—
McCloskey, Don R.; and Rorke, Anthony B., 364,068, Cl. D7-309.000.
Roscoe, Terry R.: *See*—
Acciaoli, John V.; Hausler, Hartmut E.; Holden, Chester D.; Marotti, Martin J.; Rockwell, Scott M.; Roscoe, Terry R.; and Zapfe, Roland, 364,152, Cl. D14-108.000.
Rothbard, Robert K. Basketball net. 364,203, Cl. D21-201.000.
Royal Co., Ltd.: *See*—
Kino, Moriya, 364,227, Cl. D24-194.000.
Rubbermaid Incorporated: *See*—
Breen, John D.; and Craft, Charles W., 364,256, Cl. D34-10.000.
Russett, Jon P., Jr.: *See*—

Alpers, Helmut A.; Duffy, Lisa E.; Erickson, Peter C.; and Russett, Jon P., Jr., 364,175, Cl. D15-82.000.

Ryder, Kathleen A.; and Ryder, Samuel J. Gingerbread slot machine. 364,031, Cl. D1-106.000.

Ryder, Samuel J.: *See*—
Ryder, Kathleen A.; and Ryder, Samuel J., 364,031, Cl. D1-106.000.

Sacco, Bruno; Gallitzendörfer, Josef; and Pfeiffer, Peter, to Mercedes-Benz Aktiengesellschaft. Rear light of an automobile. 364,239, Cl. D26-28.000.

Samuels, Laura J.: *See*—
Hartliep, Gina M.; and Samuels, Laura J., 364,193, Cl. D21-24.000.

Sandvik AB: *See*—
Hansson, Lars-Ola; Wallström, Lars-Gunnar; and Pantzar, Göran, 364,178, Cl. D15-139.000.

Sanny Electronics Limited: *See*—
Mak, Ronnie C. W., 364,095, Cl. D10-21.000.

Sanyo Electric Co., Ltd.: *See*—
Hayashi, Yukou; Takashima, Kimie; and Hase, Masaki, 364,053, Cl. D6-470.000.

Sapper, Richard F.: *See*—
Lucente, Samuel A. M.; and Sapper, Richard F., 364,144, Cl. D14-100.000.

Satake, Syunsuke; and Kimura, Akio, to Minolta Co., Ltd. Toner bottle. 364,184, Cl. D18-43.000.

Scheid, William J.; and Townsend, David P., to Motorola, Inc. Selective call receiver. 364,163, Cl. D14-191.000.

Scherr, Kap L.: *See*—
Scherr, Len D.; and Scherr, Kap L., 364,127, Cl. D12-6.000.

Scherr, Len D.; and Scherr, Kap L. Blade for converting a skateboard into an ice board. 364,127, Cl. D12-6.000.

Schmidt, Glenn H.; and Helmstetter, Richard C., to Callaway Golf Company. Iron golf club head. 364,206, Cl. D21-220.000.

Schmidt, Sten; and Jensen, Kurt, to Interlego AG. Toy gear wheel. 364,199, Cl. D21-108.000.

Schneider, Ronald J.: *See*—
Haney, Paul; Schneider, Ronald J.; and Strand, Kevin O., 364,128, Cl. D12-111.000.

Schrader, Robert A., to Mikron Industries, Inc. Window component extrusion. 364,236, Cl. D25-124.000.

Schweisfurth, Günter. Massage roller. 364,230, Cl. D24-211.000.

Seaquist, Lyn: *See*—
Beckman, Kurt D.; and Dunbar, James R., 364,085, Cl. D8-375.000.

Seiko Epson Corporation: *See*—
Omuro, Makoto; and Kamiya, Manabu, 364,105, Cl. D10-78.000.

Seikosha Co., Ltd.: *See*—
Fujimori, Mayumi, 364,094, Cl. D10-20.000.

Seki, Naoko, to Oki Electric Industry Co., Ltd. Portable radio telephone. 364,159, Cl. D14-138.000.

Seki, Naoko, to Oki Electric Industry Co., Ltd. Portable radio telephone. 364,160, Cl. D14-138.000.

Sell, James C., Jr.: *See*—
Passke, Joel L.; Sell, James C., Jr.; Donaghu, Michael T.; and Tawney, John C., 364,036, Cl. D2-961.000.

Servants, Inc., The: *See*—
Farley, Timothy R., 364,087, Cl. D9-418.000.

Shakespeare Company: *See*—
Skinner, David B., 364,079, Cl. D8-8.000.

Sharp Kabushiki Kaisha: *See*—
Umaba, Toshiya; and Komatsu, Makoto, 364,153, Cl. D14-113.000.

Sharp, Michael H., to International Business Machines Corporation. Video display console. 364,157, Cl. D14-133.000.

Shaw, Mark D.; Heyman, J. Tad; Bierce, Laurence M.; and Ehredt, Jesse. Single drum collection container. 364,255, Cl. D34-1.000.

Shine Sun Industrial, Co., Ltd.: *See*—
Kuo, Jiang S.-H., 364,186, Cl. D19-48.000.

Shinohara, Kazunori: *See*—
Himuro, Yasuo; and Shinohara, Kazunori, 364,134, Cl. D12-146.000.

Siebelink, Robert J. Gazebo. 364,232, Cl. D25-19.000.

Silitek Corporation: *See*—
Chung, Stephen, 364,155, Cl. D14-115.000.

Skinner, David B., to Shakespeare Company. Cutting line for a rotating line trimmer. 364,079, Cl. D8-8.000.

Smartel, Inc.: *See*—
DiPasquale, Charles J., 364,223, Cl. D23-377.000.

Smith, Ronald A., to International Business Machines Corporation. Combined point of sale terminal, control unit and cash drawer. 364,182, Cl. D18-4.000.

Smolik, Raymond, to Dreyfuss, Daniel G. Wall plaque. 364,111, Cl. D11-132.000.

Sohr, Matthew J. Toilet bowl air freshener. 364,222, Cl. D23-366.000.

Spangler, Anthony G.: *See*—
Hill, Loran R.; and Spangler, Anthony G., 364,211, Cl. D23-238.000.
Hill, Loran R.; and Spangler, Anthony G., 364,212, Cl. D23-238.000.
Hill, Loran R.; and Spangler, Anthony G., 364,216, Cl. D23-252.000.
Hill, Loran R.; and Spangler, Anthony G., 364,218, Cl. D23-255.000.
Hill, Loran R.; and Spangler, Anthony G., 364,219, Cl. D23-255.000.
Hill, Loran R.; and Spangler, Anthony G., 364,220, Cl. D23-255.000.

Spejlborg, Soren: *See*—
Baus, Andre E. J.; Didier, Rene; Durand, Gerard; and Spejlborg, Soren, 364,133, Cl. D12-143.000.

Spira, Joel S.: *See*—
Hanna, Robert S.; Mayo, Noel; Spira, Joel S.; and Swain, James E., III, 364,141, Cl. D13-125.000.

Stanchin, Emery J. Handcuff pouch. 364,038, Cl. D3-230.000.

Stanuch, Edward S.; and Weger, Donald E., to Federal Signal Corporation. Sign for signalling direction of traffic flow. 364,109, Cl. D10-114.000.

Starck, Philippe, to Hans Grohe GmbH & Co. KG. Hook. 364,045, Cl. D6-357.000.

Starck, Philippe, to Hans Grohe GmbH & Co. KG. Faucet set. 364,215, Cl. D23-242.000.

Sterilite Corporation: *See*—
Kruger, Cory J., 364,039, Cl. D3-315.000.

Stievenart, Gregory A.; Hider, Philip A.; Fasulo, Pasquale; and Dziersk, Mark D., to Carrier Corporation. Thermostat. 364,103, Cl. D10-50.000.

Straeter, Joseph G.: *See*—
Weder, Donald E.; and Straeter, Joseph G., 364,113, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,114, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,115, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,116, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,117, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,118, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,119, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,120, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,121, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,122, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,123, Cl. D11-164.000.

Strand, Kevin O.: *See*—
Haney, Paul; Schneider, Ronald J.; and Strand, Kevin O., 364,128, Cl. D12-111.000.

Stregan, John: *See*—
Pridonoff, Charles L.; and Stregan, John, 364,200, Cl. D21-114.000.

Sturm, Ernst F. Display assembly for golf equipment. 364,052, Cl. D6-466.000.

Su, Pao-Fon, to Lo Mei Cosmetics Ent. Co., Ltd. Lipstick kit. 364,248, Cl. D28-66.000.

Sulkowski, David J.; Carpino, John S.; Greco, Michael R.; and Zurita, Louis E., to Pirelli Armstrong Tire Corporation. Tire. 364,135, Cl. D12-147.000.

Sunbeam Corporation: *See*—
King, William; Hill, Andy; and Kemnitz, Glen, 364,257, Cl. D34-21.000.

Suskind, Stuart P., to Confab, Inc. Apertured coverstock for absorbent articles. 364,040, Cl. D5-1.000.

Swain, James E., III: *See*—
Hanna, Robert S.; Mayo, Noel; Spira, Joel S.; and Swain, James E., III, 364,141, Cl. D13-125.000.

Takashima, Kimie: *See*—
Hayashi, Yukou; Takashima, Kimie; and Hase, Masaki, 364,053, Cl. D6-470.000.

Tanaka, Kunihiko; and Katayama, Noriko, to Fuji Photo Film Co., Ltd. Audio tape cassette. 364,156, Cl. D14-121.000.

Tawney, John C.: *See*—
Lee, Lester Q.; and Tawney, John C., 364,034, Cl. D2-961.000.
Passke, Joel L.; Sell, James C., Jr.; Donaghu, Michael T.; and Tawney, John C., 364,036, Cl. D2-961.000.

Telemecanique: *See*—
Dore, Christophe, 364,106, Cl. D10-96.000.

Tipp, Raymond P. Combined dental pick and sheath. 364,247, Cl. D28-64.000.

Tobish, John J. Telephone keypad. 364,170, Cl. D14-747.000.

Townsend, David P.: *See*—
Scheid, William J.; and Townsend, David P., 364,163, Cl. D14-191.000.

Trombly, Edgar F., to Punch Products USA, Inc. Desk caddy. 364,189, Cl. D19-77.000.

Trov U.S.A. Inc.: *See*—
Hodson, William J., 364,196, Cl. D21-53.000.

Tuomey, Steven T. Trigger mechanism. 364,207, Cl. D22-108.000.

Turtle Shells Corporation: *See*—
McCracken, Jamie L.; and Goff, Kathy L., 364,250, Cl. D29-100.000.

Uebergang, Owen W. Kangaroo toy. 364,197, Cl. D21-102.000.

Umaba, Toshiya; and Komatsu, Makoto, to Sharp Kabushiki Kaisha. Display face of a liquid crystal display module. 364,153, Cl. D14-113.000.

United States Marketing Corporation (Delaware): *See*—
Werner, Theodore J., 364,083, Cl. D8-331.000.

Universal Aqua Technologies, Inc.: *See*—
Nesicolaci, Marwan F., 364,107, Cl. D10-103.000.

Universal Furniture Industries, Inc.: *See*—
Paus, Michael J., 364,050, Cl. D6-436.000.

Universal Security Instruments, Inc.: *See*—
DeWitt, Kenneth I., 364,108, Cl. D10-106.000.

Von Kluck, Kevin, to L.D. Kichler Co., The. Lamp. 364,243, Cl. D26-110.000.

Wallström, Lars-Gunnar: *See*—
Hansson, Lars-Ola; Wallström, Lars-Gunnar; and Pantzar, Göran, 364,178, Cl. D15-139.000.

Wang, Pierce. Combined electric ceiling fan and light kit. 364,224, Cl. D23-377.000.

Warner Manufacturing Company: *See*—
Henke, David R., 364,252, Cl. D32-42.000.

Weaver, Edmund A., Jr., to Kraft Foods, Inc. Combined container and cap for salad dressing. 364,093, Cl. D9-563.000.

Weber, Debbie A. Entertainment center. 364,054, Cl. D6-474.000.

Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,113, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,114, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,115, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,116, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,117, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,118, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,119, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,120, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,121, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,122, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,123, Cl. D11-164.000.
Weger, Donald E.: *See*—
Stanuch, Edward S.; and Weger, Donald E., 364,109, Cl. D10-114.000.
Weinerman, Lee S.; and Kuminski, Arthur J., to Eastern Company, The. Handle operated draw latch assembly with lockable safety catch. 364,082, Cl. D8-331.000.
Weingartner, Peter A., to Woods Industries. Housing for an outdoor utility device. 364,143, Cl. D13-152.000.
Wernet, Theodore J., to United States Marketing Corporation (Delaware). Combination surface bolt. 364,083, Cl. D8-331.000.
West Bend Company, The: *See*—
Klein, Annette T.; Belongia, David C.; Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, 364,070, Cl. D7-350.000.
Westinghouse Electric Corporation: *See*—
Peart, Stephen; and Lovegrove, Ross, 364,065, Cl. D6-601.000.
Weterrings, Frans M., to Robbins Industries, Inc. Condiment dispenser. 364,078, Cl. D7-679.000.
Weyrauch, George. Gun vise. 364,080, Cl. D8-74.000.
Whittington, Paul, to Gorrie Advertising Management Limited. Portable product merchandising cart. 364,258, Cl. D34-21.000.
Wilk, Philip A. Remote control holder. 364,058, Cl. D6-513.000.
Winslow, Phillip S., Sr. Beach table. 364,048, Cl. D6-417.000.
Winston, Jeffrey M. Combined hand stamp mount and rubber stamp. 364,183, Cl. D18-15.000.
Wiseman, John A.: *See*—
Jasinski, Joseph E.; Moffatt, Susan S.; Imai, Toshitaka; and Wiseman, John A., 364,148, Cl. D14-100.000.
Wiseman, Michael A.: *See*—
Lortz, Allan R.; Wiseman, Michael A.; and Beaver, Jeffrey L., 364,124, Cl. D11-216.000.
Wolff, Stephen H. Clip for holding paper. 364,188, Cl. D19-65.000.
Woods Industries: *See*—
Weingartner, Peter A., 364,143, Cl. D13-152.000.
Woods, Wylie. Vehicle mounted sand dispenser. 364,173, Cl. D15-13.000.
Workman, Tom E.; and Bryan, Sidney V. Game board. 364,195, Cl. D21-37.000.
Yaich, Floyd. Grommet. 364,084, Cl. D8-356.000.
Yamazaki, Kazuhiko, to International Business Machines Corporation. Docking station for a portable personal computer. 364,151, Cl. D14-107.000.
Yates, David P.; and Knight, Michael D., to NT Door Controls Ltd. Door closer unit. 364,081, Cl. D8-330.000.
Yeh, Kuo S. Rack for kitchen utensils. 364,074, Cl. D7-637.000.
Ying, William C. Acoustic control unit for a stereophonic equipment. 364,168, Cl. D14-221.000.
Yoshida Kogyo K.K.: *See*—
Ochiai, Koichi; and Ishida, Tomohisa, 364,126, Cl. D11-218.000.
Yuen, Henry C., to Gemstar Development Corporation. Remote control. 364,166, Cl. D14-218.000.
Zapfe, Roland: *See*—
Acciaoli, John V.; Hausler, Hartmut E.; Holden, Chester D.; Marotti, Martin J.; Rockwell, Scott M.; Roscoe, Terry R.; and Zapfe, Roland, 364,152, Cl. D14-108.000.
Zooth, Inc.: *See*—
Harrison, Susan, 364,077, Cl. D7-654.000.
Zurita, Louis E.: *See*—
Sulkowski, David J.; Carpino, John S.; Greco, Michael R.; and Zurita, Louis E., 364,135, Cl. D12-147.000.

LIST OF PLANT PATENTEES

Florfis, AG: *See*—
Schumann, Ingeborg, 9,373, Cl. Plt.-87.120.
Zerr, Katharina, 9,371, Cl. Plt.-86.400.

Iverson, Ronald C. Daylily plant named 'Yellow Silk Ruffles'. 9,372, Cl. Plt.-87.400.

Nies, Marvin L. Cherry tree 'Early Red'. 9,368, Cl. Plt.-37.000.

Schumann, Ingeborg, to Florfis, AG. Geranium plant named Fisbliz. 9,373, Cl. Plt.-87.120.

VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named 'Sandusky'. 9,369, Cl. Plt.-82.200.

VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named 'Ami'. 9,370, Cl. Plt.-82.200.

Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 9,369, Cl. Plt.-82.200.
VandenBerg, Cornelis P., 9,370, Cl. Plt.-82.200.

Zerr, Katharina, to Florfis AG. Poinsettia plant named Fispic. 9,371, Cl. Plt.-86.400.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 14, 1995

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2

2 5,465,423
[illegible] 5,465,425
195.1 5,465,426
206 5,465,427
238 5,465,428
300 5,465,429

CLASS 4

300.3 5,465,431
325 5,465,432
406 5,465,433
546 5,465,434
574.1 5,465,435
580 5,465,436
611 5,465,437
626 5,465,438

CLASS 5

99.1 5,465,439
497 5,465,440
653 5,465,441

CLASS 8

404 5,466,263
[illegible] 5,466,265

CLASS 12

[illegible] LC 5,465,442

CLASS 15

22.1 5,465,444
29 5,465,445
50.3 5,465,446
88.3 5,465,447
104.31 5,465,448
116 5,465,449
167.1 5,465,450
179 5,465,451
210.1 5,465,452
246 5,465,443
247 5,465,453
250.41 5,465,454
319 5,465,455
320 5,465,456
402 5,465,457

CLASS 16

1 R 5,465,458
11 5,465,459
82 5,465,460
111 R 5,465,461
112 5,465,462
236 5,465,463

CLASS 19

24 5,465,464
292 5,465,465

CLASS 23

295 R 5,466,266

CLASS 24

3.3 5,465,466
625 5,465,472

CLASS 28

167 5,465,467

CLASS 29

25.35 5,465,468
267 5,465,430
402.09 5,465,473
404 5,465,469
559 5,465,470
563 5,465,471
601 5,465,474
603 5,465,475
748 5,465,478
749 5,465,479
759 5,465,476
825 5,465,480
840 5,465,481
889.1 5,465,482
890.031 5,465,483
890.042 5,465,484
892.11 5,465,485
897.32 5,465,486
897.35 5,465,487

CLASS 30

41 5,465,488
171 5,465,489
180 5,465,490

CLASS 33

265 5,465,491
275 R 5,465,492
286 5,465,493
414 5,465,494
[illegible] 5,465,495
522 5,465,496
626 5,465,497
645 5,465,498
647 5,465,499
666 5,465,500
706 Re.35,084
810 5,465,501

CLASS 34

115 5,465,502
179 5,465,503
446 5,465,504
452 5,465,505

CLASS 36

11.5 5,465,506
30 R 5,465,507
44 5,465,508
88 5,465,509

CLASS 37

285 5,465,510
355 5,465,511
360 Re.35,088
457 5,465,512
468 5,465,513

CLASS 40

152 5,465,514
471 5,465,515
649 5,465,516

CLASS 42

70.06 5,465,517
70.08 5,465,518
70.11 5,465,519
71.02 5,465,520

CLASS 43

1 5,465,521
4 5,465,522
42.24 5,465,523
42.32 5,465,524
132.1 5,465,525

CLASS 44

386 5,466,267
419 5,466,268

CLASS 47

33 5,465,526
40.5 5,465,529
84 5,465,530

CLASS 49

368 5,465,528
463 5,465,531
493.1 5,465,532

CLASS 51

307 5,466,269

CLASS 52

60 5,465,533
126.6 5,465,534
156 5,465,535
198 5,465,536
202 5,465,537
204.2 5,465,538
204.53 5,465,539
211 5,465,540
220.2 5,465,541
309.7 5,465,542
309.8 5,465,543
311.1 5,465,544
425 5,465,545
480 5,465,546
518 5,465,547
655.1 Re.35,085
741.1 5,465,548

CLASS 53

138.8 5,465,549
233 5,465,550
397 5,465,551
399 5,465,552
438 5,465,554
451 5,465,555
468 5,465,556
510 5,465,557
531 5,465,558
567 5,465,559

CLASS 55

238 5,466,270
294 5,466,271
457 5,466,272

CLASS 56

10.2 E 5,465,560
11.8 5,465,561
16.4 R 5,465,562
17.2 5,465,563
320.2 5,465,564

CLASS 57

90 5,465,565
204 5,465,566
408 5,465,567

CLASS 59

4 5,465,568

CLASS 60

39.03 5,465,569
39.06 5,465,570
39.32 5,465,571
266 5,465,572
274 5,465,573
300 5,465,574
345 5,465,575
478 5,465,576
722 5,465,577

CLASS 62

3.2 5,465,578
6 5,465,579
50.1 5,465,581
50.2 5,465,583
51.1 5,465,582
55.5 5,465,584
59 5,465,585
84 5,465,586
127 5,465,588
133 5,465,589
195 5,465,590
439 5,465,591
544 5,465,592

CLASS 63

12 5,465,593

CLASS 66

177 5,465,594

CLASS 70

416 5,465,595
458 5,465,596

CLASS 71

11 5,466,273
28 5,466,274

CLASS 72

19 5,465,597
84 5,465,598
94 5,465,599
309 5,465,600
347 5,465,601
467 5,465,603

CLASS 73

1 DV 5,465,604
7 5,465,605
23.2 5,465,606
23.36 5,465,607
24.01 5,465,608
38 5,465,609
60.11 5,465,610
104 5,465,611
117 5,465,612
117.3 5,465,613
118.1 5,465,614
118.2 5,465,617
204.27 5,465,618
290 V 4,000,650
304 C 5,465,619
504 5,465,620
597 5,465,622
653 5,465,624
700 5,465,625
715 5,465,626
RE2.335 5,465,627
R64.24 5,465,629
R64.34 5,465,628

CLASS 74

331 5,465,630
458 5,465,631
493 5,465,632
512 5,465,633
551.3 5,465,634
595 5,465,635
602 5,465,636

CLASS 75

10.46 5,466,275
231 5,466,276
255 5,466,277
501 5,466,278

CLASS 81

9.51 5,465,637

CLASS 82

127 5,465,638

CLASS 83

13 Re.35,086
34 5,465,639
36 5,465,640
698.61 5,465,641

CLASS 84

293 5,465,642
297 R 5,465,643
423 R 5,465,644
603 5,466,882
610 5,466,883
661 5,466,884

CLASS 89

198 5,465,645

CLASS 91

308 5,465,646

CLASS 92

128 5,465,647
140 5,465,648

CLASS 96

69 5,466,279

CLASS 99

280 5,465,649
286 5,465,650
330 5,465,651
400 5,465,652
421 H 5,465,653
422 5,465,654
455 5,465,655
485 5,465,656
584 5,465,657

CLASS 100

5 5,465,658
30 5,465,659
48 5,465,660

CLASS 101

219 5,465,661
235 5,465,662
409 5,465,663

CLASS 102

290 5,465,664
470 5,465,665

CLASS 104

7.3 5,465,666
17.2 5,465,667
95 5,465,668

CLASS 105

1.1 5,465,669
355 5,465,670

CLASS 106

14.12 5,466,280
20 R 5,466,281
22 K 5,466,282
25 R 5,466,283
31 R 5,466,284
35 5,466,285
404 5,466,286
486 5,466,288
809 5,466,289

CLASS 108

43 5,465,671
51.3 5,465,672
118 5,465,673

CLASS 112

162 5,465,674

CLASS 114

222 5,465,676
230 5,465,677
284 5,465,678
363 5,465,679

CLASS 117

84 5,465,680

CLASS 118

20 5,466,290
244 5,466,291
257 5,466,292
264 5,466,293
680 5,465,681
723 MA 5,466,295
723 MP 5,466,296

CLASS 119

19 5,465,682
52.2 5,465,683
60 5,465,684
159 5,465,685
168 5,465,686
719 5,465,687
728 5,465,688
861 5,465,689

CLASS 122

4 D 5,465,690

CLASS 123

38 5,465,698
188.9 5,465,691
195 C 5,465,692
196 CP 5,465,693
196 R 5,465,694
256 5,465,695
337 5,465,696
424 5,465,697
470 5,465,699
492 5,465,700
531 5,465,701
543 5,465,702
674 5,465,703

CLASS 124

5 5,465,704
88 5,465,705

CLASS 125

15 5,465,706

CLASS 126

263.08 5,465,707
635 5,465,708

CLASS 127

42 5,466,294

CLASS 128

205.25 5,465,712
632 5,465,713
633 5,465,714
640 5,465,715
642 5,465,716
653.1 5,465,718
653.5 5,465,719
660.01 5,465,720
660.07 5,465,721
661.01 5,465,722
681.02 5,465,723
662.03 5,465,724
663.01 5,465,726
710 5,465,727
730 5,465,728
732 5,465,729
734 5,465,730
748 5,465,731
772 5,465,732
848 5,465,734
[illegible] 5,465,735
[illegible] 5,465,736
[illegible] 5,465,737

CLASS 131

329 5,465,738
335 5,465,739

CLASS 132

73.6 5,465,740
275 5,465,741
279 5,465,742

CLASS 134

3 5,466,297
15 5,466,298
21 5,466,299
38 5,466,300

CLASS 135

34.2 5,465,743
67 5,465,744
82 5,465,745

CLASS 136

246 5,466,301
251 5,466,302

CLASS 137

14 5,465,746
155 5,465,747
240 5,465,748
359 5,465,749
484.8 5,465,750
498 5,465,751
512.5 5,465,752
587 5,465,753
614.2 5,465,754
625.21 5,465,755
625.31 5,465,756
625.65 5,465,757

CLASS 138

98 5,465,758
110 5,465,759

CLASS 139

11 5,465,760
21 5,465,761
59 5,103,873
192 5,465,762
196.2 5,465,763
383 A 5,465,764

CLASS 141

65 5,465,765
198 5,465,766
237 5,465,767
329 5,465,768

CLASS 144

336 5,465,770
343 5,465,771

CLASS 148

33 5,466,303
100 5,466,304
222 5,466,305
302 5,466,307
306 5,466,306
508 5,466,309
513 5,466,310
551 5,466,312

CLASS 149

1 5,466,313
46 5,466,314
96 5,466,315

CLASS 152

416 5,465,772
454 5,465,773

CLASS 156

69 5,466,316
79 5,466,317
183 5,466,318
220 5,466,319
244.19 5,466,320

260 5,466,321
273.3 5,466,322
307.A 5,466,323
344 5,466,324
359 5,466,326
441.5 5,466,327
443 5,466,328
470 5,466,329
584 5,466,330
630 5,466,332

CLASS 160

90 5,465,774
168.1 5,465,775
368.1 5,465,776

CLASS 162

6 5,466,333
56 5,466,334
60 5,466,335
146 5,466,336
164.3 5,466,337
168.2 5,466,338
200 5,466,339
216 5,466,340
217 5,466,341
301 5,466,342
357 5,466,343

CLASS 164

136 5,465,777
137 5,465,778
516 5,465,780

CLASS 165

8 5,465,781
104.26 5,465,782
114 5,465,784
134.1 5,465,783
166 5,465,785

CLASS 166

66.4 5,465,786
78.1 5,465,788
248 5,465,789
273 5,465,790
278 5,465,791
295 5,465,792
319 5,465,793
375 5,465,794

CLASS 169

11 5,465,795

CLASS 172

762 5,465,796

CLASS 173

91 5,465,797

CLASS 174

35 MS 5,466,885
48 5,466,886
52.2 5,466,887
68.2 5,466,889
84 R 5,466,890
142 5,466,891
261 5,466,892

CLASS 175

24 5,465,798
61 5,465,799
368 5,465,800

CLASS 177

119 5,466,894

CLASS 178

18 5,466,895
19 5,466,896

CLASS 180

19.1 5,465,801
85.5 5,465,802
89.31 5,465,803
133 5,465,804
143 5,465,805
165 5,465,806
274 5,465,807

CLASS 181

131 5,466,897
205 5,466,899
227 5,466,900

CLASS 182

2 5,465,808
121 5,465,809

CLASS 184

6.21 5,465,810
24 5,465,811

CLASS 187

237 5,465,812

CLASS 188

3 H 5,465,813
32 5,465,814
164 5,465,815
196 P 5,465,816
295 5,465,817

CLASS 191

4 A 5,465,818
35 5,465,819

CLASS 194

207 5,465,821
209 5,465,822

CLASS 198

338 5,465,823
418.4 5,465,824
444 5,465,825
465.3 5,465,826
495 5,465,828
538 5,465,829
819 5,465,830

CLASS 200

5 A 5,466,901
50 AA 5,466,902
400 5,466,903

CLASS 202

205 5,466,344

CLASS 203

57 5,466,345

CLASS 204

72 5,466,346
98 5,466,347
153.1 5,466,348
153.14 5,466,350
180.1 5,466,351
182.4 5,466,352
196 5,466,353
252 5,466,354
298.13 5,466,355
406 5,466,356

CLASS 205

50 5,466,357
96 5,466,358
109 5,466,359
170 5,466,360
176 4,889,602

CLASS 206

44 R 5,465,831
45.23 5,465,832
63.5 5,465,833
193 5,465,834
221 5,465,835
264 5,465,836
268 5,465,837
305 5,465,838
315.3 5,465,839
315.6 5,465,840
366 5,465,841
390 5,465,842
507 5,465,843
515 5,465,844
554 5,465,845

CLASS 208

131 5,466,361
157 5,466,362
251 H 5,466,363
307 5,466,364
309 5,466,365

CLASS 209

12.1 5,465,847
170 5,465,848
214 5,465,849
573 5,465,850

CLASS 210

85 5,466,366
96.1 5,466,367
198.2 5,466,368
220 5,466,369
298 5,466,370
361 5,466,371
512.1 5,466,372
602 5,466,373
610 5,466,374
634 5,466,375
635 5,466,377
660 5,466,378
680 5,466,379
741 5,466,380
750 5,466,381
764 5,466,382
774 5,466,383
787 5,466,384

CLASS 211

59.1 5,465,851
87 5,465,852

CLASS 212

319 5,465,854
349 5,465,855

CLASS 215

228 5,465,857
252 5,465,858
370 5,465,856

CLASS 216

12 5,465,859
17 5,466,331
24 5,465,860

CLASS 217

121.68 5,466,908

CLASS 219

121.25 5,466,904
121.46 5,466,905
121.47 5,466,906
121.59 5,466,907
121.72 5,466,909
130.01 5,466,910
203 5,466,911
400 5,466,912
492 5,466,913
622 5,466,915
633 5,466,916
730 5,466,917

CLASS 220

260 5,465,861
335 5,465,862
403 5,465,863
410 5,465,865
709 5,465,866
735 5,465,867

CLASS 221

165 5,465,868
185 5,465,869

CLASS 222

2 5,465,870
023 5,465,871
47 5,465,873
51 5,465,874
95 5,465,872
148 5,465,875
153.1 5,465,876
181.2 5,465,877
189.06 5,465,879
321.8 5,465,880
389 5,465,881

CLASS 224

39 5,465,882
148 5,465,885
209 5,465,887
215 5,465,886
224 5,465,889
224.0 5,465,888
324 5,465,890
407 5,465,884
495 5,465,883
566 5,465,891

CLASS 225

2 5,465,892

CLASS 227

8 5,465,893
175 5,465,894
176 5,465,895

CLASS 228

121 5,465,897
122.1 5,465,898
180.5 5,465,899

CLASS 229

125.39 5,465,900
407 5,465,901

CLASS 232

10 5,465,909
33 5,465,902

CLASS 235

380 5,466,918
449 5,466,920
462 5,466,921
483 5,466,914

CLASS 238

8 5,465,903

CLASS 239

69 5,465,904
75 5,465,905
489 5,465,906
533.9 5,465,907
571 5,465,908
585.4 5,465,910

CLASS 241

27 5,465,912
39 5,465,913
101.71 5,465,914
247 5,465,915

CLASS 242

18 PW 5,465,916
128 5,465,917
334.2 5,465,918
348.1 5,465,920
355.1 5,465,921
532.6 5,465,919
573 5,465,922

CLASS 244

2 5,465,923
118.1 5,465,924
137.1 5,465,925

CLASS 246

34 B 5,465,926

CLASS 248

27.1 5,465,928
96 5,465,930
118.3 5,465,931
160 5,465,932
201 5,465,933
223.41 5,465,934
271 5,465,927
316.3 5,465,935
371 5,465,936
681 5,465,929

CLASS 250

208.1 5,466,922
214 FW 5,466,923
214 VT 5,466,924
216 5,466,925
221 B 5,466,927
239 5,466,928
251 5,466,929
252.1 5,466,930
282 5,466,931
289 5,466,932
305 5,466,933
307 5,466,934
308 5,466,936
311 5,466,937
326 5,466,938
363.04 5,466,939
397 5,466,940
423 R 5,466,941
492.2 5,466,942
493.1 5,466,943
551 5,466,944
559.12 5,466,945
577 5,466,946
582 5,466,947

CLASS 251

129.15 5,465,937
149.1 5,465,938

CLASS 252

2 5,466,386
51.5 A 5,466,387
62.59 5,466,388
156 5,466,389
174.17 5,466,390
186.27 5,466,391
301.16 5,466,392
307 5,466,393
547 5,466,394
551 5,466,395
557 5,466,396
582 5,466,397
586 5,466,398

CLASS 254

276 5,465,939
423 5,465,940

CLASS 256

34 5,465,941

CLASS 257

3 5,466,948
25 5,466,949
94 5,466,950
139 5,466,951
185 5,466,953
187 5,466,954
192 5,466,955
203 5,466,956
344 5,466,957
345 5,466,958
361 5,466,959
369 5,466,960
379 5,466,961
437 5,466,962
516 5,466,963
532 5,466,964
604 5,466,965
666 5,466,966
693 5,466,968
706 5,466,969
712 5,466,970
751 5,466,971
764 5,466,972

CLASS 261

27 5,466,399

CLASS 264

13 5,466,400
39 5,466,402
45.4 5,466,405
103 5,466,406
115 5,466,407
156 5,466,408
165 5,466,409
172.11 5,466,410
176.1 5,466,411
255 5,466,412
408 5,466,404
443 5,466,401
521 5,466,413

CLASS 266

46 5,465,942
220 5,465,943

CLASS 267

217 5,465,944
294 5,465,945

CLASS 269

75 5,465,946

CLASS 270

53 Re.35,087
58 5,465,947

CLASS 271

34 5,465,948
110 5,465,949
125 5,465,950
167 5,465,951
204 5,465,952
234 5,465,953
251 5,465,954
265.02 5,465,955
274 5,465,956

CLASS 273

1.5 R 5,465,957
57.2 5,465,958
80 B 5,465,959
84 R 5,465,960
85 R 5,465,961
118 B 5,465,962
121 A 5,465,965
126 R 5,465,964
128 R 5,465,966
162 R 5,465,967
167 H 5,465,968
187 R 5,465,969
189 5,465,970
186.2 5,465,971
186.3 5,465,972
262 5,465,973
292 5,465,974
295 5,465,975
317 5,465,976
408 5,465,977
411 5,465,978
416 5,465,979
423 5,465,981
431 5,465,982

CLASS 279

157 5,465,983

CLASS 280

11.2 5,465,984
30 5,465,985
33.994 5,465,986
47.28 5,465,987
47.35 5,465,988
250 5,465,989
407.1 5,465,990
457 5,465,991
477 5,465,992
491.3 5,465,993
602 5,465,994
605 5,465,995
651 5,465,996
716 5,465,997
728.3 5,466,000
730.1 5,466,001
731 5,465,998
733 5,465,999
763.1 5,466,004
781 5,466,005
784 5,466,006
840 5,466,007

CLASS 281

31 5,466,008

CLASS 283

34 5,466,009
67 5,466,010
107 5,466,013

CLASS 285

92 5,466,014
158 5,466,015
204 5,466,016
319 5,466,017
334.2 5,466,018
343 5,466,019
361 5,466,020

CLASS 292

201 5,466,021
246 5,466,022
259 R 5,466,023
336.3 5,466,024

CLASS 294

1.1 5,466,025
17 5,466,026
19.2 5,466,027

CLASS 296

37.7 5,466,028
97.8 5,466,029
98 5,466,030
146.6 5,466,031
188 5,466,032
189 5,466,033
191 5,466,034
205 5,466,035
208 5,466,036
211 5,466,037
213 5,466,038

CLASS 297

116 5,466,039
183.6 5,466,040
188.1 5,466,041
215.15 5,466,042
238 5,466,043
252 5,466,044
284.8 5,466,045
325 5,466,046
367 5,466,047
378.12 5,466,048

CLASS 301

5.22 5,466,049
65 5,466,050
111 5,466,051

CLASS 303

1 5,466,052
7 5,466,053
119.2 5,466,055
150 5,466,054

CLASS 305

54 5,466,056

CLASS 307

17 5,466,973
38 5,466,974
100 5,466,975
112 5,466,976

CLASS 310

74 5,466,977
156 5,466,978
248 5,466,979
309 5,466,980
333 5,466,985

CLASS 312

108 5,466,057
111 5,466,058
223.2 5,466,059
334.8 5,466,060
348.2 5,466,061
348.6 5,466,062

CLASS 313

25	5,466,987
35	5,466,988
113	5,466,981
309	5,466,982
414	5,466,983
477 R	5,466,984
635	5,466,989

CLASS 315

56	5,466,990
111.41	5,466,991
276	5,466,992
411	5,466,993

CLASS 318

3	5,466,995
16	5,466,996
254	5,466,997
375	5,466,998
431	5,466,999
432	5,467,000
434	5,467,001
553	5,467,002
568.13	5,467,003
807	5,467,004

CLASS 320

20	5,467,005
22	5,467,006

CLASS 322

27	5,467,008

CLASS 323

269	5,467,009
284	5,467,010

CLASS 324

67	5,467,011
74	5,467,012
127	5,467,013
230	5,467,014
248	5,467,015
309	5,467,016
318	5,467,017
336	5,467,018
339	5,467,019
537	5,467,020
601	5,467,021
661	5,467,022
754	5,467,023
771	5,467,024
772	5,467,025

CLASS 326

16	5,467,026
38	5,467,027
41	5,467,029
81	5,467,031
88	5,467,032
93	5,467,033

CLASS 327

58	5,467,030
63	5,467,034
94	5,467,035
108	5,467,036
142	5,467,037
185	5,467,038
198	5,467,039
276	5,467,040
293	5,467,042
333	5,467,043
336	5,467,045
351	5,467,046
377	5,467,047
436	5,467,048
438	5,467,049
530	5,467,050
536	5,467,051
543	5,467,052
551	5,467,053
589	5,467,054

CLASS 330

129	5,467,055
149	5,467,056
254	5,467,057
267	5,467,058

CLASS 331

70	5,467,059
74	5,467,060

CLASS 333

24 R	5,467,061
124	5,467,062
125	5,467,063
128	5,467,064
132	5,467,065
237	5,467,066

CLASS 335

4	5,467,067
40	5,467,165
42	5,467,069

CLASS 340

426	5,467,070
433	5,467,071
436	5,467,072
464	5,467,073
539	5,467,074
568	5,467,075
571	5,467,076
635	5,467,077
825.06	5,467,078
825.16	5,467,079
825.31	5,467,080
825.34	5,467,081
825.54	5,467,082
854.6	5,467,083
933	5,467,084
971	5,467,085

CLASS 341

50	5,467,086
51	5,467,087
65	5,467,088
150	5,467,089
155	5,467,090

CLASS 342

159	5,467,091
174	5,467,092
175	5,467,093

CLASS 343

700 MS	5,467,094
702	5,467,096
767	5,467,098
770	5,467,100
771	5,467,101

CLASS 345

1	5,467,102
7	5,467,103
8	5,467,104
87	5,467,105
107	5,467,107
161	5,467,108
194	5,467,109
199	5,467,110

CLASS 346

134	5,467,111

CLASS 347

1	5,467,112
17	5,467,113
32	5,467,114
47	5,467,115
80	5,467,116
87	5,467,117
102	5,467,119
171	5,467,120
200	5,467,121

CLASS 348

11	5,467,122
34	5,467,123
66	5,467,124
127	5,467,125
164	5,467,126
169	5,467,127
187	5,467,128
231	5,467,129
241	5,467,130
384	5,467,131
390	5,467,132
402	5,467,133
409	5,467,134
415	5,467,135
416	5,467,136
423	5,467,137
452	5,467,138
512	5,467,139
529	5,467,140
553	5,467,141
556	5,467,142
566	5,467,144
628	5,467,145
743	5,467,146

CLASS 351

41	5,467,147
85	5,467,148
162	5,467,149
212	5,467,150
213	5,467,151

CLASS 353

99	5,467,152
103	5,467,153
119	5,467,154

CLASS 354

21	5,467,155
81	5,467,157
173.1	5,467,158
212	5,467,159
246	5,467,160
402	5,467,161
	5,111,232

CLASS 355

23	5,467,164
71	5,467,166
75	5,467,167
77	5,467,168
201	5,467,169
209	5,467,170
212	5,467,171
231	5,467,172
235	5,467,173
245	5,467,174
259	5,467,175
270	5,467,176
282	5,467,177
285	5,467,178
309	5,467,179
312	5,467,180
319	5,467,181
326 R	5,467,183

CLASS 356

35.5	5,467,184
44	5,467,185
150	5,467,186
243	5,467,187
336	5,467,188
350	5,467,190
360	5,467,191
371	5,467,192
399	5,467,193
429	5,467,194

CLASS 358

296	5,467,195
298	5,467,196
335	5,467,197
400	5,467,198
425	5,467,199
426	5,467,200
447	5,467,201
448	5,467,202
451	5,467,203
482	5,467,204

CLASS 359

40	5,467,205
49	5,467,208
74	5,467,209
88	5,467,210
117	5,467,211
168	5,467,212
175	5,467,213
238	5,467,214
247	5,467,215
263	5,467,216
296	5,467,217
328	5,036,220
341	5,467,218
350	5,467,220
449	5,467,221
510	5,467,223
614	5,467,224
661	5,467,225
693	5,467,226
694	5,467,227
822	5,467,228
841	5,467,222
874	5,467,230

CLASS 360

46	5,467,231
65	5,467,232
70	5,467,233
85	5,467,234
99.06	5,467,235
104	5,467,236
114	5,467,237
128	5,467,238
133	5,467,239

CLASS 361

18	5,467,240
63	5,467,241
94	5,467,242
143	5,467,243
144	5,467,244
145	5,467,302
170	5,467,245
232	5,467,247
234	5,467,249
696	5,467,250
719	5,467,251
760	5,467,252
761	5,467,253
799	5,467,254

CLASS 362

66	5,467,255
119	5,467,256
183	5,467,257
184	5,467,258
307	5,467,259
374	5,467,260
398	5,467,261

CLASS 363

41	5,467,262

CLASS 364

140	5,467,263
141	5,467,264
154	5,467,265
167.01	5,467,266
184	5,467,267
401	5,467,268
465	5,467,270
420	5,467,271
424.01	5,467,272
424.02	5,467,273
424.05	5,467,277
424.06	5,467,274
424.85	5,467,279
426.01	5,467,275
449	5,467,276
461	5,467,283
478	5,467,285
483	5,467,286
490	5,467,456
505	5,467,287
514 R	5,467,288
560	5,467,289
561	5,467,290
571.04	5,467,355
578	5,467,291
721	5,467,294
746.1	5,467,297
746.2	5,467,298
754	5,467,296
761	5,467,299

CLASS 365

104	5,467,300
148	5,467,303
174	5,467,304
185.01	5,467,305
185.06	5,467,307
185.07	5,467,310
185.14	5,467,309
185.2	5,467,306
189.01	5,467,312
189.05	5,467,311
189.11	5,467,313
201	5,467,314
222	5,467,315
230.06	5,467,316
231	5,467,319

CLASS 366

8	5,466,063
132	5,466,064
189	5,466,065

CLASS 367

40	5,467,320
140	5,467,321
142	5,467,322
175	5,467,323

CLASS 368

10	5,467,324
276	5,467,325

CLASS 369

30	5,467,326
32	5,467,327
44.16	5,467,328
48	5,467,329
53	5,467,331
72	5,467,332
75.2	5,467,333
77.1	5,467,334
100	5,467,335
112	5,467,336
116	5,467,337
270	5,467,338
275.4	5,467,339

CLASS 370

14	5,467,340
17	5,467,341
54	5,467,343
58.3	5,467,344
60	5,467,345
60.1	5,467,347
82	5,467,350
85.15	5,467,351
85.5	5,467,352
110.1	5,467,353

CLASS 371

21.1	5,467,356
21.3	5,467,357
22.3	5,467,354
37.1	5,467,359
37.4	5,467,360
40.1	5,467,361

CLASS 372

5	5,467,362
38	5,467,363
45	5,467,364

CLASS 373

9	5,467,365
85	5,467,366

CLASS 374

14	5,466,066
138	5,466,067

CLASS 375

206	5,467,367
224	5,467,369
232	5,467,370
241	5,467,371
244	5,467,372
327	5,467,373
340	5,467,374

CLASS 376

300	5,467,375

CLASS 377

94	5,467,376

CLASS 378

19	5,467,377
32	5,467,378
57	5,467,379
98.2	5,467,380

CLASS 379

58	5,467,381
61	5,467,383
66	5,467,384
88	5,467,385
103	5,467,386
157	5,467,387
196	5,467,388
201	5,467,389
229	5,467,390
245	5,467,391
354	5,467,392
388	5,467,393
392	5,467,394
399	5,467,395

CLASS 380

4	5,467,396
7	5,467,397
44	5,467,398

CLASS 381

4	5,467,399
61	5,467,400
63	5,467,401

CLASS 382

100	5,467,410
104	5,467,402
112	5,467,408
113	5,467,411
116	5,467,403
135	5,467,405
167	5,467,412
186	5,467,407
236	5,467,413
274	5,467,404
285	5,467,409

CLASS 384

36	5,466,068
49	5,466,069
112	5,466,070
118	5,466,071

CLASS 385

3	5,467,414
14	5,467,415
31	5,467,416
36	5,467,417
37	5,467,418
92	5,467,419
101	5,467,420
122	5,467,421

CLASS 392

379	5,467,423
401	5,467,424

CLASS 395

2.52	5,467,425
3	5,467,426
23	5,467,427
24	5,467,429
70	5,467,460
95	5,467,430
102	5,467,431
112	5,467,432
114	5,467,433
115	5,467,437
117	5,467,438
133	5,467,439
135	5,467,442
141	5,467,443
142	5,467,445
143	5,467,446
145	5,467,447
148	5,467,448
155	5,467,450
161	5,467,451
182.12	5,467,469
183.03	5,467,470
185.08	5,467,467
185.1	5,467,449
200.05	5,467,295
200.12	5,467,452
201	5,467,453
296	5,467,454
427	5,467,458
429	5,467,457
474	5,467,461
480	5,467,459
550	5,467,463
600	5,467,471
800	5,467,473

CLASS 400

91	5,466,072
197	5,466,073
206	5,466,074
240.3	5,466,075
248	5,466,076
354	5,466,077
489	5,466,078
579	5,466,079

CLASS 401

7	5,466,080
129	5,466,081

CLASS 403

2	5,466,082
46	5,466,083
134	5,466,084
157	5,466,085
268	5,466,086
406.1	5,466,087

CLASS 404

6	5,466,088
34	5,466,089

CLASS 405

36	5,466,091
45	5,466,092
152	5,466,093
232	5,466,094
302.2	5,466,095

CLASS 406

84	5,466,096

CLASS 407

113	5,466,097

CLASS 408

115 R	5,466,098
206	5,466,099
224	5,466,100
226	5,466,101

CLASS 409

233	5,466,102

CLASS 410

33	5,466,103
156	5,466,104

CLASS 411

84	5,466,105
433	5,466,106
546	5,466,107

CLASS 414

218	5,466,108
283	5,466,109
421	5,466,110
462	5,466,111
808	5,466,112
723	5,466,113
746.5	5,466,114
780	5,466,115

709	5,466,117

CLASS 415

58.6	5,466,118
90	5,466,119
119	5,466,120
129	5,466,121
160	5,466,122
182.1	5,466,123

CLASS 416

82	5,466,124
193 A	5,466,125
244 R	5,466,126

CLASS 417

38	5,466,127
254	5,466,128
269	5,466,129
420	5,466,131
519	5,466,132

CLASS 418

2	5,466,133
15	5,466,134
55.6	5,466,136
75	5,466,137
188	5,466,138
268	5,466,135

CLASS 419

11	5,466,414
67	5,466,415

CLASS 422

52	5,466,416
109	5,466,417
111	5,466,418
131	5,466,419
164	5,466,420
171	5,466,421
186.05	5,466,422
186.3	5,466,425

CLASS 423

98	5,466,426
210	5,466,427
263	5,466,428
365	5,466,429
440	5,466,430
446	5,466,431
700	5,466,432

CLASS 424

9	5,466,434
9.363	5,466,439
9.411	5,466,440
9.45	5,466,435
9.451	5,466,433
52	5,466,437
61	5,466,441
70.12	5,466,442
70.6	5,466,443
78.08	5,466,444
78.31	5,466,445
78.37	5,466,446
85.2	5,466,447
93.1	5,466,448
94.61	5,466,449
118	5,466,450
195.1	5,466,451
401	5,466,455
405	5,466,458
407	5,466,459
408	5,466,460
423	5,466,461
426	5,466,462
433	5,466,463
434	5,466,464
439	5,466,547
449	5,466,465
450	5,466,467
451	5,466,469
541	5,466,470
936.5	5,466,438

CLASS 425

35	5,466,139
38	5,466,140
130	5,466,141
131.5	5,466,142
140	5,466,143
174.4	5,466,144
190	5,466,145
389	5,466,146
412	5,466,147

CLASS 426

3	5,466,471
43	5,466,472
115	5,466,473
394	5,466,474
439	5,466,475
556	5,466,476
582	5,466,477
602	5,466,478
611	5,466,479

CLASS 427

63	5,466,480
130	5,466,481
212	5,466,482
226	5,466,483
306	5,466,485
352	5,466,486
376.2	5,466,488
384	5,466,493
421	5,466,489
422	5,466,490
515	5,466,491
522	5,466,492
561	5,466,494
576	5,466,495

CLASS 428

1	5,466,496
15	5,466,497
36.7	5,466,498
36.9	5,466,499
40	5,466,500
43	5,466,503
74	5,466,504
91	5,466,505
105	5,466,506
116	5,466,507
122	5,466,508
141	5,466,509
172	5,466,510
201	4,981,986
207	5,466,511
209	5,466,512
218	5,466,513
229	5,466,514
252	5,466,515
282	5,466,516
288	5,466,517
323	5,466,519
330	5,466,521
332	5,466,522
333	5,466,523
336	5,466,524
357	5,466,525
372	5,466,526
373	5,466,527
391	5,466,528
395	5,466,529
411.1	5,466,530
422	5,466,531
447	5,466,532
457	5,466,534
483	5,466,535
522	5,466,536
548	5,466,537
610	5,466,538
611	5,466,539
614	5,466,540
690	5,466,541
694 BS	5,466,542

CLASS 429

59	5,466,543
99	5,466,545
223	5,466,546

CLASS 430

1	5,466,548
30	5,466,549
58	5,466,550
63	5,466,551
106.6	5,466,552
109	5,466,553
110	5,466,554
138	5,466,556
278	5,466,557
321	5,466,558
331	5,466,559
347	5,466,560
373	5,466,562
398	5,466,563
403	5,466,564
444	5,466,565
505	5,466,566
530	5,466,567
551	5,466,568
569	5,466,570
578	5,466,571

CLASS 431

116	5,466,148
344	5,466,149

CLASS 432

192	5,466,150

CLASS 433

10	5,466,151
80	5,466,152
140	5,466,153

CLASS 434

114	5,466,154
115	5,466,155
247	5,466,156
299	5,466,157
317	5,466,158
322	5,466,159

CLASS 435

3	5,466,572
5	5,466,574
6	5,466,575
7.1	5,466,579
7.32	5,466,581
7.9	5,466,582
30	5,466,583
69.1	5,466,584
91.21	5,466,586
139	5,466,588
172.1	5,466,587
174	5,466,589
189	5,466,590
194	5,466,591
212	5,466,592
219	5,466,593
221	5,466,594
240.2	5,466,595
252.3	5,466,597
254.11	5,466,598
255.1	5,466,599
262.5	5,466,600
263	5,466,601
285.1	5,466,603
286.1	5,466,604
297.1	5,466,602

CLASS 436

6	5,466,605
42	5,466,606
50	5,466,607
86	5,466,608
518	5,466,609
534	5,466,611

CLASS 437

3	5,466,612
8	5,466,614
31	5,466,615
40	5,466,616
41	5,466,619
51	5,466,620
52	5,466,621
60	5,466,626
62	5,466,630
69	5,466,632
129	5,466,633
180	5,466,634
183	5,466,635
187	5,466,636
193	5,466,638
195	5,466,639
228	5,466,484
233	5,466,641

CLASS 439

63	5,466,160
66	5,466,161
79	5,466,162
138	5,466,163
140	5,466,164
142	5,466,165
159	5,466,166
188	5,466,167
264	5,466,169
374	5,466,170
378	5,466,171
509	5,466,172
584	5,466,173
596	5,466,174
610	5,466,175
789	5,466,176

CLASS 440

50	5,466,177
61	5,466,178

CLASS 441

108	5,466,179

CLASS 445

3	5,466,180

CLASS 446

297	5,466,181

CLASS 451

254	5,466,182
359	5,466,183

CLASS 452

38	5,466,184
185	5,466,185
170	5,466,186

CLASS 454

169	5,466,187

CLASS 455

348	5,467,477

CLASS 460

24	5,466,188
100	5,466,189
101	5,466,190

CLASS 472

95	5,466,191

CLASS 473

62	5,466,192
115	5,466,193

CLASS 474

80	5,466,194

CLASS 475

55	5,466,195
59	5,466,196
72	5,466,197
348	5,466,198

CLASS 477

107	5,466,199

CLASS 482

4	5,466,200
47	5,466,202
63	5,466,203
102	5,466,204
140	5,466,205
141	5,466,206

CLASS 483

28	5,466,207

CLASS 492

53	5,466,208

CLASS 493

4	5,466,209
309	5,466,210
355	5,466,211
434	5,466,212

CLASS 501

96	5,466,642
105	5,466,643

CLASS 502

28	5,466,644
56	5,466,645
60	5,466,646
113	5,466,647
117	5,466,648
120	5,466,649
185	5,466,650
304	5,466,651
330	5,466,652

CLASS 503

200	5,466,653
206	5,466,654
209	5,466,655
217	5,466,656
227	5,466,657

CLASS 504

130	5,466,659
134	5,466,660
202	5,466,662
253	5,466,661
286	5,466,663

CLASS 505

330	5,466,664
476	5,466,665

CLASS 514

3	5,466,666
11	5,466,667
12	5,466,668
13	5,466,671
14	5,466,672
18	5,466,673
23	5,466,674
25	5,466,675
44	5,466,676
46	5,466,678
50	5,466,679
54	5,466,681
	5,141,928
57	5,466,680
76	5,466,682
80	5,466,683
152	5,466,684
161	5,466,436
199	5,466,685
210	5,466,686
212	5,466,687
229.5	5,466,689
247	5,466,690
254	5,466,691
258	5,466,692
269	5,466,693
272	5,466,694
275	5,466,695
297	5,466,696
300	5,466,697
318	5,466,698
323	5,466,699
329	5,466,700
373	5,466,701
374	5,466,702
381	5,466,704
383	5,466,705
394	5,466,706
411	5,466,707
432	5,466,709
449	5,466,708
452	5,466,710
510	5,466,711
524	5,466,712
538	5,466,714
573	5,466,713
618	5,466,715
642	5,466,716
689	5,466,717
724	5,466,718
783	5,466,719

CLASS 518

700	5,466,720

CLASS 522

34	5,466,721
51	5,466,722
96	5,466,723

CLASS 523

111	5,466,724
122	5,466,725
179	5,466,728
421	5,466,727

CLASS 524

52	5,466,731
113	5,466,732
141	5,466,733
230	5,466,734
273	5,466,735
315	5,466,736
399	5,466,740
405	5,466,741
448	5,466,742
462	5,466,743
495	5,466,737
508	5,466,738
525	5,466,739
714	5,466,744
801	5,466,745
837	5,466,746

CLASS 525

54.1	5,466,747
57	5,466,748
58	5,466,751
65	5,466,752
84	5,466,750
193	5,466,753
206	5,466,754
326.6	5,466,755
330.6	5,466,756
352	5,466,757
384	5,466,758
403	5,466,759
432	5,466,761
435	5,466,760
472	5,466,762
523	5,466,763
530	5,466,764

CLASS 526

65	5,466,765
68	5,466,776
129	5,466,766

CLASS 528

9	5,466,767
15	5,466,768
60	5,466,769
64	5,466,771
73	5,466,772
194	5,466,773
199	5,466,774
207	5,466,775
298	5,466,777
361	5,466,778
363	5,466,779
494	5,466,780

CLASS 530

351	5,466,781
374	5,466,782
380	5,466,783
388.9	5,466,784

CLASS 534

560	5,466,789
753	5,466,790
854	5,466,791

CLASS 536

23.7	5,466,792
24.1	5,466,785
26.26	5,466,786
27.2	4,997,924
55.3	5,466,787
66	5,466,794
125	5,466,795

CLASS 540

139	5,466,796
503	5,466,797
541	5,466,798
573	5,466,799

CLASS 544

82	5,466,800
173	5,466,801
193.2	5,466,802
198	5,466,803
225	5,466,804
245	5,466,805
310	5,466,806

CLASS 546

6	5,466,807
153	5,466,808
183	5,466,809
202	5,466,810
283	5,466,811
288	5,466,812

CLASS 548

179	5,466,813
209	5,466,814
213	5,466,818
252	5,466,815
259	5,466,819
263.2	5,466,820
267.8	5,466,816
268.8	5,466,821
305.1	5,466,817
305.7	5,466,822
377.1	5,466,823
402	5,466,824
479	5,466,825
511	5,466,826
566	5,466,828

CLASS 549

66	5,466,827
297	5,466,829
315	5,466,830
323	5,466,831
330	5,466,832
475	5,466,833
510	5,466,834
531	5,466,835
533	5,466,837

CLASS 552

304	5,466,839

CLASS 554

70	5,466,840
79	5,466,841
83	5,466,842
149	5,466,843

CLASS 556

11	5,466,844
12	5,466,845
55	5,466,846
409	5,466,847
427	5,466,848
445	5,466,849
477	5,466,850

CLASS 558

21	5,466,851
122	5,466,852
169	5,466,853
233	5,466,854
263	5,466,855
277	5,466,856
319	5,466,857
364	5,466,858

425 5,466,859

CLASS 560

43 5,466,860
100 5,466,861
152 5,466,862
176 5,466,863

CLASS 562

445 5,466,864
485 5,466,866
496 5,466,865
519 5,466,874
554 5,466,867
580 5,466,868
608 5,466,876

852 5,466,877

CLASS 564

197 5,466,878
253 5,466,879
265 5,466,869
298 5,466,870
395 5,466,871
443 5,466,872

CLASS 568

312 5,466,873
319 5,466,880

CLASS 570

202 5,466,881

CLASS 600

38 5,466,235
139 5,465,710
207 5,465,711
223 5,465,709

CLASS 601

33 5,466,213

CLASS 602

19 5,466,214
21 5,466,215

CLASS 604

10 5,466,217
33 5,466,216

49 5,466,218
86 5,466,219
87 5,466,220
96 5,466,221
110 5,466,223
163 5,466,224
192 5,466,226
246 5,466,227
248 5,466,228
256 5,466,230
317 5,466,229
369 5,466,231
378 5,466,232
890.1 5,466,233

CLASS 606

15 5,466,234
61 5,466,237
109 5,466,239
139 5,466,241
198 5,466,242
232 5,466,243

CLASS 607

5 5,466,244
17 5,466,245
32 5,466,246
48 5,466,247
88 5,466,248
90 5,466,249
104 5,466,250

112 5,466,251
116 5,466,252
122 5,466,253
123 5,466,254
128 5,466,255
142 5,466,256

CLASS 623

1 5,466,257
4 5,466,258
5 5,466,260
16 5,466,261

CLASSIFICATION OF DESIGNS

D1	105	364,031		309	364,068		74	364,104		113	364,153		55	364,188		206	364,229
102	861	364,032		317	364,069		78	364,105		114	364,154		77	364,189		211	364,230
	894	364,033		350	364,070		96	364,106		115	364,155		99	364,190		215	364,231
	961	364,034		510	364,071		103	364,107		121	364,156	D21	15	364,191	D25	19	364,232
	969	364,037		553	364,072		106	364,108		133	364,157		23	364,192		119	364,233
D3	230	364,038		605	364,073		114	364,109		137	364,158		24	364,193		122	364,235
	315	364,039		637	364,074		125	364,097		138	364,159		30	364,194		124	364,236
D5	1	364,040		653	364,075	D11	118	364,110		168	364,161		37	364,195		125	364,237
D6	306	364,041		654	364,077		132	364,111		188	364,162		53	364,196	D26	9	364,238
	314	364,042		679	364,078		152	364,112		191	364,163		102	364,197		28	364,239
	359	364,043	D8	8	364,079		164	364,113		192	364,164		108	364,198		79	364,241
	362	364,044		74	364,080		216	364,124		213	364,165		114	364,200		85	364,242
	378	364,046		330	364,081		218	364,126		218	364,166		162	364,201		110	364,243
	407	364,047		331	364,082	D12	6	364,127		221	364,167		191	364,202		138	364,244
	417	364,048		356	364,084		111	364,128		235	364,169		201	364,203	D27	141	364,245
	419	364,049		367	364,045		126	364,129		250	364,171		214	364,204	D28	60	364,246
	436	364,050		375	364,085		127	364,130		747	364,170		217	364,205		68	364,247
	466	364,052	D9	301	364,086		129	364,131	D15	7	364,172		220	364,206		86	364,248
	470	364,053		418	364,087		143	364,133		13	364,173	D22	108	364,207		99	364,249
	474	364,054		428	364,088		146	364,134		27	364,174		117	364,208	D29	100	364,250
	477	364,055		429	364,090		147	364,135		82	364,175	D23	233	364,209	D32	35	364,251
	483	364,056		503	364,091		177	364,137		136	364,176		237	364,210		42	364,252
	511	364,057		542	364,092		181	364,138		138	364,177		238	364,211		53.1	364,253
	513	364,058		563	364,093		302	364,139		139	364,178		242	364,215	D34	1	364,254
	519	364,059	D10	20	364,094		407	364,140		148	364,179		252	364,216		10	364,256
	526	364,060		21	364,095	D13	125	364,141	D16	202	364,180		255	364,218		21	364,257
	534	364,061		29	364,096		134	364,142		312	364,181		343	364,221		31	364,259
	541	364,062		32	364,098		152	364,143	D18	4	364,182		366	364,222	D99	17	364,260
	552	364,063		33	364,099	D14	100	364,144		15	364,183		377	364,223			
	559	364,064		39	364,100		102	364,149		43	364,184		386	364,225			
	601	364,065		40	364,101		106	364,150		56	364,185	D24	147	364,226			
	629	364,066		46.1	364,102		107	364,151	D19	48	364,186		194	364,227			
D7	301	364,067		50	364,103		108	364,152		60	364,187		199	364,228			

CLASSIFICATION OF PLANTS

Plt.	37	9,368		82.2	9,369		86.4	9,371		87.12	9,373		87.4	9,372			

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01	:	5,465,871	5,465,520	5,466,117	5,466,635		5,467,115		5,466,020
		5,465,993	5,465,532	5,466,128	5,466,668		5,467,118		5,466,023
		5,466,156	5,465,546	5,466,138	5,466,675		5,467,119		5,466,557
		5,466,202	5,465,547	5,466,158	5,466,690		5,467,130		5,466,559
		5,466,414	5,465,556	5,466,161	5,466,693		5,467,131		5,466,614
		5,467,435	5,465,608	5,466,163	5,466,697		5,467,137		5,466,629
02	:	5,465,507	5,465,612	5,466,166	5,466,718		5,467,138		5,466,997
		5,465,887	5,465,660	5,466,167	5,466,768		5,467,152		5,466,999
04	:	5,465,432	5,465,661	5,466,174	5,466,781		5,467,189		5,467,026
		5,465,481	5,465,672	5,466,178	5,466,786		5,467,197		5,467,038
		5,465,538	5,465,679	5,466,179	5,466,798		5,467,207		5,467,231
		5,465,614	5,465,690	5,466,181	5,466,861		5,467,214		5,467,297
		5,465,626	5,465,702	5,466,192	5,466,872		5,467,220		5,467,384
		5,465,756	5,465,707	5,466,194	5,466,882		5,467,229	09 :	5,465,499
		5,465,885	5,465,711	5,466,205	[illegible]		5,467,242		5,465,569
		5,466,010	5,465,713	5,466,216	5,466,892		5,467,247		5,465,570
		5,466,146	5,465,717	5,466,217	5,466,897		5,467,249		5,465,662
		5,466,172	5,465,722	5,466,218	5,466,919		5,467,254		5,465,731
		5,466,173	5,465,724	5,466,221	5,466,931		5,467,271		5,465,780
		5,466,252	5,465,725	5,466,228	5,466,933		[illegible]		[illegible]
		5,466,438	5,465,733	5,466,229	5,466,935		5,467,291		5,465,946
		5,466,484	5,465,734	5,466,234	5,466,943		5,467,293		5,465,925
		5,466,509	5,465,746	5,466,235	5,466,944		5,467,294		5,465,938
		5,466,605	5,465,751	5,466,238	5,466,947		5,467,300		5,466,198
		5,467,024	5,465,752	5,466,246	5,466,948		5,467,341		5,466,231
		5,467,047	5,465,766	5,466,253	5,466,953		5,467,349		5,466,354
		5,467,051	5,465,776	5,466,260	5,466,965		5,467,361		5,466,357
		5,467,057	[illegible]	5,466,262	5,466,975		5,467,369		[illegible]
		5,467,215	5,465,860	5,466,268	5,466,977		5,467,370		5,466,406
		5,467,253	5,465,862	5,466,281	5,467,029		[illegible]		5,466,501
		5,467,345	5,465,869	5,466,302	5,467,031		5,467,410		5,466,745
		5,467,451	5,465,879	5,466,344	5,467,033		5,467,412		5,466,880
06	:	5,465,426	5,465,881	5,466,349	5,467,042		5,467,413		[illegible]
		5,465,427	[illegible]	5,466,351	5,467,044		5,467,424		5,466,904
		5,465,434	5,465,890	5,466,375	5,467,061		5,467,441		5,466,946
		5,465,435	5,465,893	5,466,377	5,467,063		5,467,447		5,467,243
		5,465,445	5,465,901	5,466,426	5,467,067		5,467,448		5,467,324
		5,465,455	5,465,934	5,466,454	5,467,068		5,467,460		5,467,385
		5,465,457	5,465,946	5,466,463	5,467,070		5,467,464		[illegible]
		5,465,459	5,465,966	5,466,469	5,467,072		5,467,466	10 :	5,465,566
		5,465,461	5,465,982	5,466,507	5,467,076		5,467,474		5,465,581
		5,465,464	5,466,022	5,466,537	5,467,082		[illegible]		5,466,319
		5,465,470	5,466,027	5,466,572	5,467,087	08 :	5,465,476		5,466,423
		5,465,477	5,466,030	5,466,579	5,467,090		5,465,478		[illegible]
		5,465,490	5,466,040	[illegible]	5,467,095		5,465,590		5,466,512
		5,465,497	5,466,058	5,466,581	5,467,098		5,465,664		5,466,590
		5,465,509	5,466,077	5,466,591	5,467,099		[illegible]		5,466,728
		5,465,515	[illegible]	5,466,592	5,467,100		5,465,886		5,466,773
		5,465,519	5,466,111	5,466,624	5,467,106		5,465,990		5,466,797

5,466,301
11 : 5,465,458
12 : 5,465,428
5,465,429
5,465,443
5,465,453
5,465,487
5,465,500
5,465,537
5,465,571
5,465,665
5,465,676
5,465,677
5,465,685
5,465,694
5,465,736
5,465,745
5,465,755
5,465,777
5,465,817
5,465,909
5,466,015
5,466,064
5,466,104
5,466,144
5,466,154
5,466,230
5,466,243
5,466,274
5,466,410
5,466,441
5,466,446
5,466,448
5,466,480
5,466,489
5,466,546
5,466,609
5,466,702
5,466,834
5,466,850
5,466,902
5,466,930
5,466,963
5,467,020
5,467,170
5,467,187
5,467,190
5,467,223
5,467,362
5,467,428
5,141,928
13 : 5,465,444
5,465,516
5,465,554
5,465,767
5,465,843
5,465,915
5,466,401
5,466,413
5,466,418
5,466,445
5,466,513
5,466,601
5,466,920
5,467,071
5,467,085
5,467,285
5,467,342
5,467,397
15 : 5,465,704
5,465,971
5,466,348
16 : 5,465,542
5,466,294
5,466,600
5,466,639
5,467,178
17 : 5,465,479
5,465,512
5,465,534
5,465,551
5,465,552
5,465,553
5,465,560
5,465,637
5,465,650
5,465,674
5,465,749
5,465,778
5,465,863
5,465,957
5,465,963
5,465,965
5,465,986
5,466,013
5,466,052
5,466,072
5,466,100
5,466,155
5,466,171
5,466,187
5,466,190
5,466,211

5,466,227
5,466,297
5,466,322
5,466,378
5,466,471
5,466,769
5,466,779
5,466,835
5,466,855
5,466,974
5,467,055
5,467,164
5,467,240
5,467,255
5,467,398
5,467,405
5,467,406
18 : 5,465,589
5,465,647
5,465,656
5,465,684
5,465,757
5,465,819
5,465,820
5,465,841
5,465,991
5,466,011
5,466,208
5,466,530
5,466,589
5,466,610
5,466,659
5,466,709
5,466,810
5,467,034
5,467,139
5,467,144
5,467,269
19 : 5,465,436
5,465,796
5,465,829
5,466,159
5,466,170
5,466,189
5,466,284
5,466,799
5,466,903
5,467,077
5,467,427
20 : 5,465,531
5,465,557
5,465,564
5,466,103
5,466,215
5,466,811
5,466,852
5,467,092
5,467,258
21 : 5,465,433
5,466,493
5,466,981
5,467,108
22 : 5,465,523
5,465,673
5,465,929
5,465,988
5,466,647
5,466,867
5,466,898
23 : 5,465,442
5,465,671
5,465,931
5,466,602
24 : 5,465,540
5,465,640
5,465,727
5,465,967
5,466,088
5,466,224
5,466,333
5,466,373
5,466,416
5,466,434
5,466,511
5,466,518
5,466,681
5,466,760
5,467,091
5,467,094
5,467,388
25 : Re.35,085
5,465,494
5,465,521
5,465,533
5,465,572
5,465,592
5,465,604
5,465,620
5,465,627
5,465,629
5,465,654
5,465,687
5,465,715

5,465,732
5,465,735
5,465,748
5,465,791
5,465,809
5,465,951
5,465,955
5,466,004
5,466,039
5,466,042
5,466,165
5,466,208
5,466,206
5,466,213
5,466,258
5,466,291
5,466,316
5,466,324
5,466,339
5,466,400
5,466,427
5,466,506
5,466,515
5,466,524
5,466,577
5,466,595
5,466,646
5,466,667
5,466,865
5,466,972
5,467,012
5,467,021
5,467,122
5,467,154
5,467,238
5,467,288
5,467,319
5,467,343
5,467,408
5,467,425
5,467,446
26 : 5,465,498
5,465,522
5,465,539
5,465,575
5,465,591
5,465,597
5,465,600
5,465,617
5,465,624
5,465,680
5,465,697
5,465,701
5,465,714
5,465,807
5,465,812
5,465,818
5,465,840
5,465,866
5,465,905
5,465,928
5,465,997
5,465,998
5,466,016
5,466,017
5,466,028
5,466,036
5,466,043
5,466,046
5,466,048
5,466,057
5,466,060
5,466,062
5,466,089
5,466,137
5,466,195
5,466,207
5,466,225
5,466,295
5,466,320
5,466,323
5,466,380
5,466,397
5,466,479
5,466,603
5,466,696
5,466,698
5,466,707
5,466,727
5,466,792
5,466,828
5,466,906
5,466,911
5,467,006
5,467,084
5,467,230
5,467,399
27 : 5,465,491
5,465,510
5,465,514
5,465,528
5,465,586

5,465,587
5,465,615
5,465,633
5,465,651
5,465,652
5,465,854
5,465,902
5,466,067
5,466,204
5,466,222
5,466,245
5,466,315
5,466,455
5,466,477
5,466,500
5,466,540
5,466,747
5,466,749
5,466,770
5,466,804
5,466,877
5,466,879
5,466,912
5,466,982
5,467,011
5,467,062
5,467,268
5,467,377
5,467,403
28 : 5,465,975
5,467,261
29 : 5,465,646
5,466,053
5,466,095
5,466,270
5,466,404
5,466,502
5,466,722
5,466,783
5,466,823
5,466,892
30 : 5,465,753
5,466,345
5,466,925
31 : 5,465,917
5,466,583
32 : 5,465,578
5,465,932
5,466,992
33 : 5,465,423
5,465,985
5,466,071
5,466,278
5,466,412
5,466,531
5,466,805
5,466,895
5,466,987
34 : 5,465,449
5,465,536
5,465,544
5,465,638
5,465,655
5,465,686
5,465,728
5,465,750
5,465,774
5,465,831
5,465,856
5,465,858
5,465,880
5,465,894
5,465,912
5,465,922
5,466,065
5,466,233
5,466,239
5,466,250
5,466,267
5,466,327
5,466,361
5,466,363
5,466,364
5,466,389
5,466,437
5,466,447
5,466,449
5,466,465
5,466,470
5,466,476
5,466,575
5,466,633
5,466,651
5,466,685
5,466,692
5,466,704
5,466,712
5,466,714
5,466,715
5,466,734
5,466,752
5,466,756
5,466,763
5,466,830
5,466,837

5,466,862
5,466,868
5,466,875
5,466,941
5,467,016
5,467,344
5,467,390
5,467,415
5,467,418
5,467,419
35 : 5,465,425
5,465,878
5,465,897
5,466,093
5,467,064
5,467,110
5,467,128
36 : 5,465,430
5,465,437
5,465,460
5,465,466
5,465,468
5,465,585
5,465,603
5,465,619
5,465,645
5,465,681
5,465,740
5,465,783
5,465,845
5,465,851
5,465,859
5,465,920
5,465,948
5,465,974
5,465,996
5,466,009
5,466,034
5,466,081
5,466,092
5,466,114
5,466,147
5,466,257
5,466,370
5,466,396
5,466,415
5,466,431
5,466,491
5,466,522
5,466,529
5,466,532
5,466,533
5,466,551
5,466,560
5,466,564
5,466,567
5,466,568
5,466,570
5,466,625
5,466,626
5,466,658
5,466,671
5,466,674
5,466,680
5,466,684
5,466,723
5,466,733
5,466,744
5,466,777
5,466,787
5,466,813
5,466,819
5,466,918
5,466,978
5,467,074
5,467,075
5,467,107
5,467,116
5,467,124
5,467,148
5,467,149
5,467,159
5,467,171
5,467,180
5,467,182
5,467,183
5,467,185
5,467,191
5,467,201
5,467,217
5,467,321
5,467,352
5,467,423
5,467,434
5,467,449
5,465,594
5,465,739
5,465,760
5,465,833
5,465,844
5,465,870
5,465,874

5,465,933
5,466,041
5,466,082
5,466,102
5,466,184
5,466,271
5,466,700
5,466,785
5,467,245
5,467,374
5,467,393
38 : 5,466,026
5,466,115
39 : 5,465,451
5,465,452
5,465,456
5,465,486
5,465,493
5,465,530
5,465,548
5,465,636
5,465,864
5,465,877
5,465,895
5,466,012
5,466,050
5,466,134
5,466,219
5,466,247
5,466,269
5,466,288
5,466,300
5,466,317
5,466,335
5,466,337
5,466,369
5,466,394
5,466,456
5,466,458
5,466,504
5,466,534
5,466,648
5,466,652
5,466,679
5,466,724
5,466,802
5,466,848
5,466,857
5,466,866
5,466,870
5,466,905
5,466,927
5,467,002
5,467,147
5,467,433
4,997,924
40 : 5,465,595
5,466,084
5,466,099
5,466,695
5,466,766
41 : 5,465,489
5,465,847
5,465,903
5,465,941
5,465,992
5,466,014
5,466,220
5,466,900
5,467,117
5,467,295
5,467,450
42 : 5,465,440
5,465,483
5,465,555
5,465,588
5,465,658
5,465,712
5,465,729
5,465,770
5,465,771
5,465,810
5,465,814
5,465,876
5,465,926
5,465,980
5,465,987
5,465,989
5,466,073
5,466,105
5,466,140
5,466,162
5,466,185
5,466,223
5,466,248
5,466,286
5,466,290
5,466,356
5,466,378
5,466,382
5,466,386
5,466,388
5,466,403

5,466,407	5,465,969	5,465,798	5,467,037	5,465,962		5,467,264
5,466,430	5,465,983	5,465,799	5,467,083	5,466,096		5,467,391
5,466,433	5,466,482	5,465,800	5,467,146	5,466,152		5,467,459
5,466,435	5,466,503	5,465,804	5,467,252	5,466,153		5,467,472
5,466,440	5,466,889	5,465,808	5,467,282	5,466,193	54 :	5,466,490
5,466,459	5,467,456	5,465,832	5,467,306	5,466,210	55 :	Re.35,086
5,466,528	47 : 5,465,693	5,465,884	5,467,307	5,466,237		5,465,524
5,466,573	5,465,738	5,465,899	5,467,308	5,466,312		5,465,558
5,466,574	5,465,741	5,465,904	5,467,320	5,466,336		5,465,576
5,466,587	5,465,744	5,465,940	5,467,327	5,466,467		5,465,605
5,466,604	5,465,839	5,465,970	5,467,382	5,466,527		5,467,829
5,466,645	5,465,891	5,465,972	5,467,443	5,466,578		5,465,667
5,466,653	5,466,261	5,465,976	5,467,453	5,467,145		5,465,705
5,466,688	5,466,419	5,466,029	5,467,455	5,467,211		5,465,716
5,466,701	5,466,717	5,466,083	5,467,463	5,467,250		5,465,720
5,466,721	5,466,759	5,466,094	5,467,473	53 : 5,465,438		5,465,775
5,466,761	5,466,765	5,466,251	49 : 5,465,473	5,465,504		5,465,781
5,466,771	5,466,832	5,466,299	5,465,883	5,465,682		5,465,797
5,466,817	5,466,840	5,466,301	5,466,000	5,465,718		5,465,813
5,466,818	5,466,863	5,466,331	5,466,056	5,465,768		5,465,900
5,466,836	5,466,991	5,466,332	5,466,371	5,465,795		5,465,973
5,466,843	5,467,286	5,466,350	5,466,385	5,465,939		5,466,049
5,466,891	48 : Re.35,088	5,466,362	5,466,420	5,465,977		5,466,078
5,466,921	5,465,503	5,466,367	5,466,439	5,466,079		5,466,085
5,466,932	5,465,511	5,466,381	5,466,890	5,466,131		5,466,112
5,466,934	5,465,526	5,466,460	5,467,027	5,466,133		5,466,116
5,467,050	5,465,549	5,466,462	5,467,260	5,466,151		5,466,266
5,467,212	5,465,562	5,466,649	5,467,379	5,466,186		5,466,326
5,467,246	5,465,583	5,466,676	50 : 5,465,506	5,466,244		5,466,329
5,467,266	5,465,596	5,466,778	5,466,634	5,466,254		5,466,409
5,467,351	5,465,653	5,466,780	5,466,636	5,466,273		5,466,516
5,467,471	5,465,689	5,466,784	5,466,980	5,466,298		5,466,599
44 : 5,465,501	5,465,737	5,466,869	5,467,305	5,466,425		5,466,672
5,465,545	5,465,759	5,466,873	51 : 5,465,599	5,466,545		5,466,784
5,466,808	5,465,765	5,466,874	5,465,742	5,466,576		5,467,040
5,466,995	5,465,786	5,466,888	5,465,762	5,466,716		5,467,287
45 : 5,465,431	5,465,787	5,466,954	5,465,822	5,466,945	56 :	5,465,599
5,465,527	5,465,789	5,466,970	5,465,842	5,466,960		
5,465,565	5,465,792	5,466,979	5,465,888	5,466,990		
5,465,801	5,465,793	5,467,013	5,465,910	5,467,104		
5,465,816	5,465,794	5,467,019	5,465,911	5,467,134		

DESIGN PATENTS

01 :	364,078		364,228		364,164		364,111		364,221	47 :	364,208
	364,088		364,229		364,169		364,170	38 :	364,174	48 :	364,077
	364,089		364,251		364,176		364,252	39 :	364,043		364,147
06 :	364,140	08 :	364,245		364,207	29 :	364,052		364,053		364,149
	364,152	09 :	364,135		364,210		364,076		364,062		364,195
	364,154		364,144	18 :	364,103		364,112		364,068		364,203
10 :	364,041	12 :	364,148		364,124		364,257		364,071		364,223
	364,042		364,163		364,171	30 :	364,247		364,082	49 :	364,241
	364,059		364,222		364,211	33 :	364,102		364,128	51 :	364,190
	364,061		364,255		364,212		364,225		364,142		364,244
	364,065	13 :	364,158		364,216	34 :	364,177		364,143		364,260
	364,083	17 :	364,032		364,218		364,249		364,173	53 :	364,139
	364,101		364,049		364,219	35 :	364,054		364,175		364,183
	364,107		364,064		364,220	36 :	364,033		364,243		364,185
	364,146		364,066		364,259		364,067		364,256		364,236
	364,162		364,086	21 :	364,038		364,083	40 :	364,250	55 :	364,044
	364,165		364,092		364,087		364,125	41 :	364,034		364,070
	364,166		364,109		364,136		364,131		364,035		364,093
	364,167		364,113	22 :	364,132		364,179		364,036		364,104
	364,168		364,114		364,246		364,188		364,037		364,129
	364,180		364,115	24 :	364,058		364,194		364,145		364,130
	364,181		364,116		364,108		364,253	42 :	364,040		364,193
	364,196		364,117		364,187	37 :	364,046		364,080		364,213
	364,200		364,118	25 :	364,039		364,048		364,084	56 :	364,031
	364,204		364,119	26 :	364,057		364,050		364,141		
	364,205		364,120		364,161		364,051		364,237		
	364,206		364,121		364,189		364,056	45 :	364,079		
	364,209		364,122		364,232		364,097		364,202		
	364,217		364,123	27 :	364,090		364,182	46 :	364,127		

PLANT PATENTS

06 :	9,368		9,369		9,370		51 :	9,372			

U.S. GOVERNMENT PRINTING OFFICE : 1995 O - 165-919 : QL 3

CHANGE OF ADDRESS FORM

NAME– FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

(or) COUNTRY

PLEASE PRINT OR TYPE

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

Superintendent of Documents **Subscription** Order Form

Order Processing Code:
*** 5606**

❑ **YES,** enter _____ subscription(s) to **Official Gazette of the U.S. Patent and Trademark Office: Patents** (OG) for $549 per year ($686.25 foreign).

The total cost of my order is $_____. Price includes regular shipping and handling and is subject to change. International customers please add 25%.

Company or personal name (Please type or print)

Additional address/attention line

Street address

City, State, Zip code

Daytime phone including area code

Purchase order number (optional)

Charge your order. It's easy!

For privacy protection, check the box below:
❑ Do not make my name available to other mailers

Fax your orders (202) 512–2250

Check method of payment:
❑ Check payable to Superintendent of Documents
❑ GPO Deposit Account ☐☐☐☐☐☐☐ – ☐
❑ VISA ❑ MasterCard

Phone your orders (202) 512–1800

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

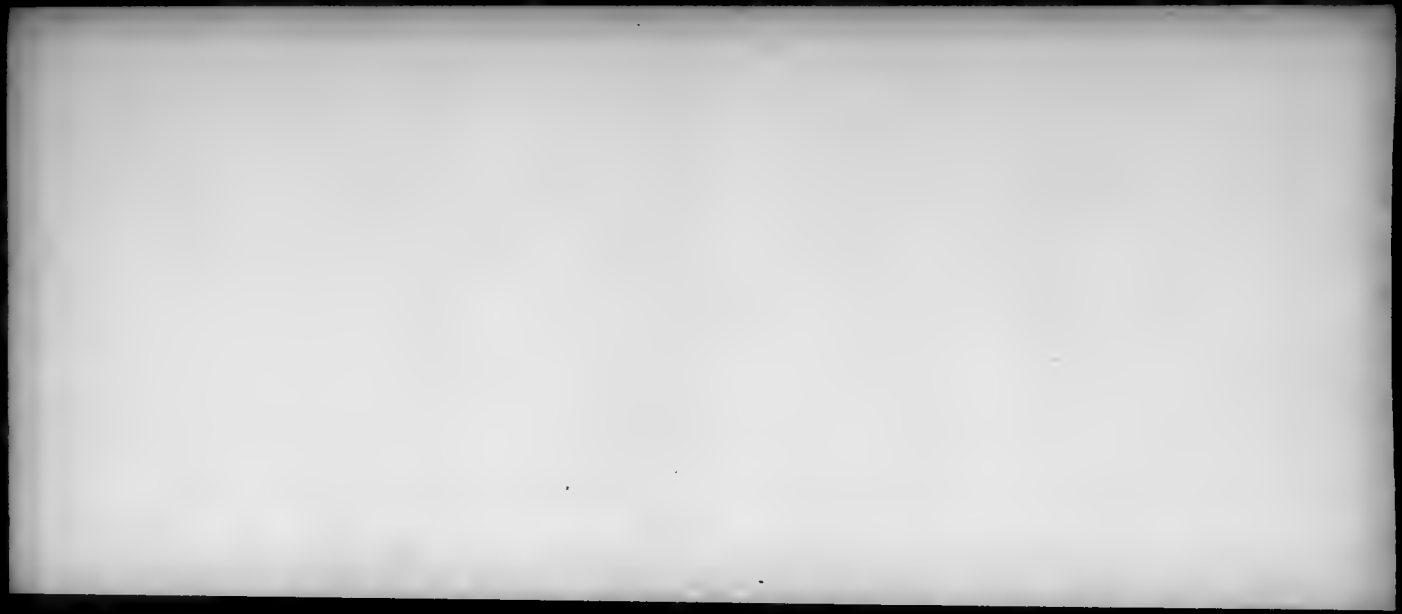
☐☐☐☐ (expiration date)

Thank you for your order!

Authorizing signature 4/95

Mail To: Superintendent of Documents
P.O. Box 371954, Pittsburgh, PA 15250–7954

Important: Please be sure to include this completed order form with your remittance.



Vol. 1180 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

te to:

PATENTS

November 21 [illegible]

PUBLISHED WEEKLY BY AUTHORITY OF [illegible]

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

November 21, 1995 Volume 1180 Number 3

CONTENTS

			Page
Patent and Trademark Office Notices			
Patent Cooperation Treaty (PCT) Information	1180	OG	65
Notice of Maintenance Fees Payable	1180	OG	65
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee	1180	OG	66
Reissue Applications Filed	1180	OG	73
Requests for Reexaminations Filed	1180	OG	74
Notice of Expiration of Trademark Registrations Due To Failure to Renew	1180	OG	75
Errata	1180	OG	76
Service by Publication	1180	OG	77
Registration To Practice	1180	OG	77
Patent Certificates of Correction	1180	OG	88
Summary of Final Decisions			
Issued by the Trademark Trial and Appeal Board July 31-August 4, 1995	1180	OG	90
Issued by the Trademark Trial and Appeal Board August 7-11, 1995	1180	OG	93
Notice of Hearings and Request for Comments on Issues Relating to Patent Protection for Nucleic Acid Sequences	1180	OG	95
Special Boxes for Mail	1180	OG	100
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1180	OG	102
Patent Examining Corps	1180	OG	104
Condition of Trademark Applications	1180	OG	105
Reexaminations			1369
Reissue Patents Granted (35,090)			1371
Plant Patents Granted (9,374)			1375
Patents Granted			
General and Mechanical (5,467,478)			1377
Chemical (5,468,255)			1653
Electrical (5,468,906)			1843
Design Patents Granted (364,261)			2077
Index of Patentees		PI	I
Indices of Reissue, Reexaminations, Design and Plant Patents		PI	95
Classification of			
Patents (Including Reissues and Reexaminations)		PI	105
Designs and Plants Applications		PI	109
Geographical Index of Residence of Inventors			
Patents (Including Reissues and Reexaminations)		PI	111
Designs and Plant Applications		PI	113
Change of Address Form		PI	115
Subscription Order Form		PI	117

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, to whom all subscriptions should be made payable and all communications addressed. VISA or MasterCard may be used for telephone orders, (202)-512-1800.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly. Stock No. 703-033-00000-8
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly. Stock No. 703-034-00000-4
PATENT AND TRADEMARK OFFICE NOTICES, issued weekly. Stock No. 703-035-00000-1
GENERAL INFORMATION concerning PATENTS. Stock No. 003-004-00661-7

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $3.00 each; PLANT PATENTS in color, $12.00 each; copies of TRADEMARKS at $3.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S.P.T.O.

For sale by the U.S. Government Printing Office
Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402–9328

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1178 O.G. 29, on September 12, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1174 O.G. 57, on May 9, 1995.

International fees were changed, effective on January 1, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1168 O.G. 99, on November 29, 1994.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1995, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	660.00
—Corresponding prior U.S. national application filed	430.00
—Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1722.00
International fees	
Basic fee	604.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region	
—For the first 10 national or regional offices designated	147.00
—For each designation in excess of 10 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
—Designation fee	147.00
—Confirmation fee	73.50
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	185.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—USPTO was ISA in PCT Chapter I	470.00
—Additional examination fee, per additional invention (payable only upon invitation)	140.00
—USPTO was not ISA in PCT Chapter I	710.00
—Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
—All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
—All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
—Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
—Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
—For each independent claim in excess of 3	39.00	78.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	125.00	250.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l)	130.00	130.00

Sept. 11, 1995

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

---

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 17, 1992 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,163,182 through 5,165,109
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 15, 1988 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,783,853 through 4,782,475
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 13, 1984 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,481,679 through 4,483,018
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED September 13, 1995 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,909	06/621,859	04/18/89
(4,404,146)	(06/304,305)	(09/13/83)
Re. 33,127	07/200,976	12/12/89
(4,691,814)	(06/855,719)	(09/08/87)
4,403,359	06/282,151	09/13/83
4,403,360	06/250,480	09/13/83
4,403,367	06/293,723	09/13/83
4,403,369	06/314,906	09/13/83
4,403,371	06/258,513	09/13/83
4,403,373	06/231,555	09/13/83
4,403,374	06/274,521	09/13/83
4,403,381	06/254,593	09/13/83
4,403,382	06/239,643	09/13/83
4,403,386	06/298,294	09/13/83
4,403,387	06/262,422	09/13/83
4,403,396	06/334,393	09/13/83
4,403,400	06/347,586	09/13/83
4,403,403	06/284,102	09/13/83
4,403,404	06/308,314	09/13/83
4,403,405	06/285,260	09/13/83
4,403,408	06/274,902	09/13/83
4,403,411	06/231,329	09/13/83
4,403,418	06/330,338	09/13/83
4,403,420	06/286,828	09/13/83
4,403,424	06/248,706	09/13/83
4,403,429	06/314,968	09/13/83
4,403,432	06/467,400	09/13/83
4,403,439	06/253,334	09/13/83
4,403,448	06/331,974	09/13/83
4,403,450	06/412,992	09/13/83
4,403,470	06/335,643	09/13/83
4,403,471	06/295,837	09/13/83
4,403,474	06/253,185	09/13/83
4,403,476	06/317,697	09/13/83
4,403,479	06/349,989	09/13/83
4,403,482	06/373,274	09/13/83
4,403,485	06/304,856	09/13/83
4,403,489	06/254,676	09/13/83
4,403,490	06/276,937	09/13/83
4,403,494	06/239,564	09/13/83
4,403,495	06/263,817	09/13/83
4,403,502	06/240,581	09/13/83
4,403,515	06/371,980	09/13/83
4,403,520	06/221,304	09/13/83
4,403,522	06/235,542	09/13/83
4,403,549	06/352,751	09/13/83
4,403,555	06/272,749	09/13/83
4,403,559	06/239,164	09/13/83
4,403,568	06/331,774	09/13/83

Patent Number	Serial Number	Issue Date
4,403,589	06/280,224	09/13/83
4,403,592	06/374,255	09/13/83
4,403,593	06/344,609	09/13/83
4,403,601	06/243,396	09/13/83
4,403,609	06/237,563	09/13/83
4,403,618	06/256,019	09/13/83
4,403,621	06/369,436	09/13/83
4,403,623	06/321,877	09/13/83
4,403,625	06/314,431	09/13/83
4,403,630	06/287,632	09/13/83
4,403,631	06/261,206	09/13/83
4,403,636	06/280,981	09/13/83
4,403,639	06/301,258	09/13/83
4,403,650	06/319,322	09/13/83
4,403,654	06/246,767	09/13/83
4,403,656	06/288,258	09/13/83
4,403,657	06/222,773	09/13/83
4,403,668	06/328,118	09/13/83
4,403,673	06/222,939	09/13/83
4,403,686	06/268,690	09/13/83
4,403,692	06/297,082	09/13/83
4,403,695	06/337,497	09/13/83
4,403,700	06/263,775	09/13/83
4,403,704	06/364,470	09/13/83
4,403,706	06/386,378	09/13/83
4,403,710	06/376,949	09/13/83
4,403,715	06/278,685	09/13/83
4,403,720	06/345,971	09/13/83
4,403,736	06/389,695	09/13/83
4,403,741	06/229,839	09/13/83
4,403,744	06/297,603	09/13/83
4,403,750	06/373,186	09/13/83
4,403,752	06/299,518	09/13/83
4,403,756	06/218,469	09/13/83
4,403,757	06/245,734	09/13/83
4,403,768	06/325,844	09/13/83
4,403,769	06/371,417	09/13/83
4,403,778	06/382,492	09/13/83
4,403,783	06/286,040	09/13/83
4,403,785	06/270,387	09/13/83
4,403,786	06/229,186	09/13/83
4,403,788	06/286,195	09/13/83
4,403,791	06/290,657	09/13/83
4,403,792	06/362,367	09/13/83
4,403,796	06/411,616	09/13/83
4,403,805	06/337,474	09/13/83
4,403,812	06/383,621	09/13/83
4,403,813	06/311,379	09/13/83
4,403,818	06/269,879	09/13/83
4,403,828	06/269,197	09/13/83
4,403,833	06/293,779	09/13/83
4,403,839	06/236,240	09/13/83
4,403,842	06/318,242	09/13/83
4,403,846	06/299,771	09/13/83
4,403,852	06/326,510	09/13/83
4,403,858	06/236,229	09/13/83
4,403,861	06/220,971	09/13/83
4,403,865	06/233,609	09/13/83
4,403,868	06/283,126	09/13/83
4,403,871	06/421,053	09/13/83
4,403,875	06/323,694	09/13/83
4,403,877	06/372,883	09/13/83
4,403,882	06/284,325	09/13/83
4,403,885	06/252,312	09/13/83
4,403,890	06/355,107	09/13/83
4,403,902	06/342,862	09/13/83
4,403,905	06/300,183	09/13/83
4,403,913	06/317,843	09/13/83
4,403,928	06/248,950	09/13/83
4,403,936	06/261,084	09/13/83
4,403,937	06/382,551	09/13/83
4,403,943	06/233,761	09/13/83
4,403,947	06/292,229	09/13/83
4,403,951	06/334,429	09/13/83
4,403,963	06/326,911	09/13/83
4,403,970	06/288,469	09/13/83
4,403,983	06/318,715	09/13/83
4,403,984	06/218,710	09/13/83
4,403,985	06/262,806	09/13/83
4,403,988	06/249,600	09/13/83
4,403,990	06/326,736	09/13/83
4,404,002	06/405,871	09/13/83
4,404,005	06/294,004	09/13/83
4,404,009	06/452,274	09/13/83
4,404,016	06/306,055	09/13/83
4,404,020	06/323,604	09/13/83
4,404,023	06/363,572	09/13/83
4,404,032	06/360,906	09/13/83
4,404,037	06/407,682	09/13/83
4,404,041	06/437,537	09/13/83
4,404,043	06/218,612	09/13/83
4,404,044	06/299,961	09/13/83
4,404,048	06/321,500	09/13/83
4,404,051	06/298,892	09/13/83
4,404,054	06/282,117	09/13/83
4,404,067	06/358,750	09/13/83
4,404,068	06/258,656	09/13/83
4,404,070	06/401,437	09/13/83
4,404,075	06/445,472	09/13/83
4,404,081	06/292,852	09/13/83
4,404,083	06/293,694	09/13/83
4,404,084	06/357,230	09/13/83
4,404,085	06/285,564	09/13/83
4,404,086	06/333,039	09/13/83
4,404,089	06/427,330	09/13/83
4,404,093	06/386,346	09/13/83
4,404,095	06/400,843	09/13/83
4,404,097	06/303,335	09/13/83
4,404,098	06/446,894	09/13/83
4,404,102	06/344,506	09/13/83
4,404,103	06/318,558	09/13/83
4,404,110	06/219,272	09/13/83
4,404,112	06/281,452	09/13/83
4,404,120	06/336,138	09/13/83
4,404,131	06/287,912	09/13/83
4,404,136	06/330,509	09/13/83
4,404,139	06/353,870	09/13/83
4,404,140	06/314,869	09/13/83
4,404,144	06/327,821	09/13/83
4,404,145	06/407,672	09/13/83
4,404,147	06/326,615	09/13/83
4,404,150	06/231,914	09/13/83
4,404,153	06/291,539	09/13/83
4,404,160	06/248,224	09/13/83
4,404,164	06/302,338	09/13/83
4,404,167	06/246,270	09/13/83
4,404,170	06/371,142	09/13/83
4,404,171	06/312,150	09/13/83
4,404,179	06/284,949	09/13/83
4,404,180	06/292,360	09/13/83
4,404,185	06/375,549	09/13/83
4,404,188	06/287,943	09/13/83
4,404,189	06/226,615	09/13/83
4,404,192	06/253,931	09/13/83
4,404,194	06/285,567	09/13/83
4,404,195	06/369,049	09/13/83
4,404,199	06/374,243	09/13/83
4,404,204	06/275,393	09/13/83
4,404,207	06/318,929	09/13/83
4,404,210	06/393,807	09/13/83
4,404,211	06/393,809	09/13/83
4,404,212	06/280,263	09/13/83
4,404,213	06/367,210	09/13/83
4,404,214	06/323,289	09/13/83
4,404,221	06/313,097	09/13/83
4,404,222	06/219,054	09/13/83
4,404,226	06/395,724	09/13/83
4,404,236	06/314,305	09/13/83
4,404,237	06/220,342	09/13/83
4,404,248	06/334,892	09/13/83
4,404,253	06/352,208	09/13/83
4,404,259	06/313,611	09/13/83
4,404,260	06/401,405	09/13/83
4,404,262	06/289,586	09/13/83
4,404,268	06/320,883	09/13/83
4,404,273	06/326,786	09/13/83

Patent Number	Serial Number	Issue Date
4,404,277	06/295,015	09/13/83
4,404,280	06/283,092	09/13/83
4,404,285	06/276,982	09/13/83
4,404,289	06/298,719	09/13/83
4,404,291	06/345,499	09/13/83
4,404,299	06/368,686	09/13/83
4,404,300	06/348,771	09/13/83
4,404,304	06/344,191	09/13/83
4,404,308	06/381,175	09/13/83
4,404,309	06/288,225	09/13/83
4,404,321	06/333,984	09/13/83
4,404,323	06/276,637	09/13/83
4,404,324	06/329,413	09/13/83
4,404,338	06/279,581	09/13/83
4,404,340	06/334,300	09/13/83
4,404,342	06/297,959	09/13/83
4,404,343	06/329,967	09/13/83
4,404,345	06/302,781	09/13/83
4,404,351	06/420,438	09/13/83
4,404,352	06/405,959	09/13/83
4,404,355	06/305,829	09/13/83
4,404,356	06/412,740	09/13/83
4,404,366	06/284,137	09/13/83
4,404,374	06/367,502	09/13/83
4,404,375	06/367,501	09/13/83
4,404,376	06/367,503	09/13/83
4,404,383	06/277,627	09/13/83
4,404,388	06/292,847	09/13/83
4,404,390	06/319,567	09/13/83
4,404,393	06/268,179	09/13/83
4,404,400	06/414,224	09/13/83
4,404,410	06/272,229	09/13/83
4,404,411	06/344,302	09/13/83
4,404,412	06/345,874	09/13/83
4,404,414	06/425,845	09/13/83
4,404,415	06/370,322	09/13/83
4,404,416	06/286,639	09/13/83
4,404,417	06/286,643	09/13/83
4,404,418	06/385,249	09/13/83
4,404,421	06/352,680	09/13/83
4,404,428	06/232,270	09/13/83
4,404,430	06/323,374	09/13/83
4,404,434	06/291,248	09/13/83
4,404,436	06/323,034	09/13/83
4,404,437	06/301,150	09/13/83
4,404,440	06/216,764	09/13/83
4,404,442	06/220,374	09/13/83
4,404,443	06/308,170	09/13/83
4,404,449	06/350,238	09/13/83
4,404,452	06/375,741	09/13/83
4,404,454	06/350,275	09/13/83
4,404,455	06/283,742	09/13/83
4,404,456	06/247,770	09/13/83
4,404,459	06/312,589	09/13/83
4,404,462	06/248,187	09/13/83
4,404,468	06/287,140	09/13/83
4,404,469	06/267,178	09/13/83
4,404,470	06/263,649	09/13/83
4,404,473	06/331,863	09/13/83
4,404,479	06/247,973	09/13/83
4,404,482	06/352,464	09/13/83
4,404,483	06/238,459	09/13/83
4,404,484	06/241,362	09/13/83
4,404,485	06/273,328	09/13/83
4,404,486	06/220,203	09/13/83
4,404,495	06/230,273	09/13/83
4,404,501	06/361,355	09/13/83
4,404,503	06/317,153	09/13/83
4,404,505	06/240,146	09/13/83
4,404,506	06/330,667	09/13/83
4,404,528	06/301,439	09/13/83
4,404,529	06/221,299	09/13/83
4,404,532	06/362,326	09/13/83
4,404,538	06/295,375	09/13/83
4,404,549	06/282,307	09/13/83
4,404,554	06/440,598	09/13/83
4,404,559	06/267,206	09/13/83
4,404,560	06/261,401	09/13/83
4,404,567	06/305,428	09/13/83
4,404,573	06/334,840	09/13/83
4,404,591	06/337,031	09/13/83
4,404,594	06/317,363	09/13/83
4,404,597	06/326,724	09/13/83
4,404,602	06/322,278	09/13/83
4,404,608	06/231,321	09/13/83
4,404,611	06/282,664	09/13/83
4,404,612	06/330,087	09/13/83
4,404,614	06/264,008	09/13/83
4,404,616	06/250,643	09/13/83
4,404,617	06/282,222	09/13/83
4,404,625	06/247,284	09/13/83
4,404,631	06/233,616	09/13/83
4,404,632	06/235,173	09/13/83
4,404,638	06/217,391	09/13/83
4,404,641	06/234,769	09/13/83
4,404,646	06/220,287	09/13/83
4,404,653	06/307,664	09/13/83
4,404,670	06/363,392	09/13/83
4,404,675	06/258,192	09/13/83
4,404,678	06/365,606	09/13/83
4,404,682	06/217,083	09/13/83
4,404,685	06/314,717	09/13/83
4,691,387	06/658,610	09/08/87
4,691,390	06/812,269	09/08/87
4,691,394	06/943,038	09/08/87
4,691,398	06/652,654	09/08/87
4,691,412	06/752,845	09/08/87
4,691,413	06/862,241	09/08/87
4,691,417	06/553,360	09/08/87
4,691,421	06/915,724	09/08/87
4,691,422	06/884,083	09/08/87
4,691,426	06/836,411	09/08/87
4,691,428	06/851,454	09/08/87
4,691,434	06/463,817	09/08/87
4,691,438	06/700,410	09/08/87
4,691,439	06/929,072	09/08/87
4,691,440	06/878,509	09/08/87
4,691,444	06/846,637	09/08/87
4,691,447	06/760,836	09/08/87
4,691,449	06/775,054	09/08/87
4,691,451	06/930,058	09/08/87
4,691,452	06/887,888	09/08/87
4,691,456	06/537,861	09/08/87
4,691,464	06/889,216	09/08/87
4,691,467	06/840,408	09/08/87
4,691,469	06/855,470	09/08/87
4,691,476	06/677,297	09/08/87
4,691,483	06/688,017	09/08/87
4,691,485	06/868,802	09/08/87
4,691,487	06/891,346	09/08/87
4,691,489	06/828,333	09/08/87
4,691,490	06/825,080	09/08/87
4,691,492	06/709,208	09/08/87
4,691,493	06/794,191	09/08/87
4,691,494	06/749,731	09/08/87
4,691,496	06/462,640	09/08/87
4,691,500	06/888,111	09/08/87
4,691,501	06/742,996	09/08/87
4,691,502	06/896,721	09/08/87
4,691,503	06/883,793	09/08/87
4,691,509	06/898,848	09/08/87
4,691,511	06/790,417	09/08/87
4,691,520	06/515,600	09/08/87
4,691,522	06/765,823	09/08/87
4,691,523	06/620,364	09/08/87
4,691,525	06/848,992	09/08/87
4,691,531	06/882,293	09/08/87
4,691,534	06/843,102	09/08/87
4,691,539	06/830,729	09/08/87
4,691,542	06/721,478	09/08/87
4,691,544	06/890,862	09/08/87
4,691,546	06/549,744	09/08/87
4,691,548	06/769,870	09/08/87
4,691,550	06/857,761	09/08/87
4,691,555	06/854,186	09/08/87
4,691,557	06/731,894	09/08/87

Patent Number	Serial Number	Issue Date
4,691,558	06/876,969	09/08/87
4,691,561	06/873,818	09/08/87
4,691,571	06/902,140	09/08/87
4,691,574	06/832,736	09/08/87
4,691,581	06/804,768	09/08/87
4,691,583	06/845,208	09/08/87
4,691,592	06/672,897	09/08/87
4,691,593	06/835,381	09/08/87
4,691,598	06/844,007	09/08/87
4,691,601	06/840,438	09/08/87
4,691,602	06/301,951	09/08/87
4,691,603	06/824,119	09/08/87
4,691,604	06/855,739	09/08/87
4,691,605	06/757,618	09/08/87
4,691,607	06/849,168	09/08/87
4,691,609	06/941,226	09/08/87
4,691,617	06/829,216	09/08/87
4,691,618	06/859,992	09/08/87
4,691,620	06/725,225	09/08/87
4,691,621	06/869,591	09/08/87
4,691,628	06/922,958	09/08/87
4,691,635	06/775,400	09/08/87
4,691,638	06/729,026	09/08/87
4,691,643	06/903,238	09/08/87
4,691,652	06/869,915	09/08/87
4,691,655	06/818,817	09/08/87
4,691,656	06/808,898	09/08/87
4,691,657	06/885,844	09/08/87
4,691,659	06/879,041	09/08/87
4,691,661	06/654,900	09/08/87
4,691,665	06/785,796	09/08/87
4,691,666	06/878,294	09/08/87
4,691,669	06/840,404	09/08/87
4,691,670	06/874,871	09/08/87
4,691,676	06/837,845	09/08/87
4,691,677	06/820,613	09/08/87
4,691,678	06/813,107	09/08/87
4,691,679	06/753,548	09/08/87
4,691,686	06/785,151	09/08/87
4,691,691	06/758,605	09/08/87
4,691,693	06/902,462	09/08/87
4,691,694	06/907,392	09/08/87
4,691,695	06/784,534	09/08/87
4,691,701	06/889,763	09/08/87
4,691,710	06/830,080	09/08/87
4,691,714	06/850,077	09/08/87
4,691,715	06/867,034	09/08/87
4,691,716	06/867,039	09/08/87
4,691,723	06/732,258	09/08/87
4,691,728	06/868,129	09/08/87
4,691,735	06/914,563	09/08/87
4,691,745	06/804,480	09/08/87
4,691,746	06/782,122	09/08/87
4,691,748	06/819,278	09/08/87
4,691,753	06/945,205	09/08/87
4,691,754	06/814,970	09/08/87
4,691,757	06/901,995	09/08/87
4,691,759	06/888,010	09/08/87
4,691,760	06/764,436	09/08/87
4,691,762	06/839,737	09/08/87
4,691,765	06/846,664	09/08/87
4,691,766	06/829,160	09/08/87
4,691,772	06/725,398	09/08/87
4,691,774	06/798,527	09/08/87
4,691,780	06/740,523	09/08/87
4,691,781	06/867,499	09/08/87
4,691,783	06/836,682	09/08/87
4,691,785	06/712,881	09/08/87
4,691,787	06/830,842	09/08/87
4,691,789	06/871,903	09/08/87
4,691,790	06/708,245	09/08/87
4,691,793	06/809,111	09/08/87
4,691,797	06/883,931	09/08/87
4,691,812	06/852,240	09/08/87
4,691,815	06/896,459	09/08/87
4,691,822	06/849,261	09/08/87
4,691,823	06/944,576	09/08/87
4,691,829	06/678,613	09/08/87
4,691,831	06/747,560	09/08/87
4,691,841	06/819,933	09/08/87
4,691,846	06/743,529	09/08/87
4,691,849	06/805,272	09/08/87
4,691,852	06/544,262	09/08/87
4,691,856	06/749,764	09/08/87
4,691,857	06/796,322	09/08/87
4,691,858	06/517,324	09/08/87
4,691,869	06/888,626	09/08/87
4,691,876	06/870,501	09/08/87
4,691,878	06/795,303	09/08/87
4,691,879	06/875,024	09/08/87
4,691,882	06/843,846	09/08/87
4,691,883	06/890,868	09/08/87
4,691,884	06/803,484	09/08/87
4,691,885	06/859,393	09/08/87
4,691,889	06/887,749	09/08/87
4,691,891	06/780,096	09/08/87
4,691,901	06/942,627	09/08/87
4,691,903	06/850,705	09/08/87
4,691,907	06/708,883	09/08/87
4,691,908	06/816,441	09/08/87
4,691,921	06/923,282	09/08/87
4,691,926	06/644,016	09/08/87
4,691,932	06/869,891	09/08/87
4,691,933	06/586,850	09/08/87
4,691,934	06/860,748	09/08/87
4,691,935	06/892,296	09/08/87
4,691,936	06/828,953	09/08/87
4,691,937	06/864,334	09/08/87
4,691,939	06/790,157	09/08/87
4,691,942	06/896,599	09/08/87
4,691,943	06/897,608	09/08/87
4,691,946	06/763,129	09/08/87
4,691,947	06/821,260	09/08/87
4,691,948	06/802,533	09/08/87
4,691,949	06/835,281	09/08/87
4,691,950	06/867,912	09/08/87
4,691,951	06/864,441	09/08/87
4,691,955	06/875,629	09/08/87
4,691,956	06/753,641	09/08/87
4,691,960	06/854,769	09/08/87
4,691,969	06/896,137	09/08/87
4,691,974	06/815,528	09/08/87
4,691,980	06/896,728	09/08/87
4,691,985	06/779,018	09/08/87
4,691,994	06/309,044	09/08/87
4,691,998	06/841,020	09/08/87
4,692,001	06/660,739	09/08/87
4,692,005	06/904,574	09/08/87
4,692,010	06/883,641	09/08/87
4,692,012	06/843,180	09/08/87
4,692,017	06/812,027	09/08/87
4,692,018	06/772,251	09/08/87
4,692,020	06/799,265	09/08/87
4,692,021	06/788,209	09/08/87
4,692,024	06/732,689	09/08/87
4,692,028	06/897,870	09/08/87
4,692,029	06/718,560	09/08/87
4,692,038	06/863,636	09/08/87
4,692,042	06/922,648	09/08/87
4,692,047	06/754,835	09/08/87
4,692,050	06/776,702	09/08/87
4,692,052	06/878,336	09/08/87
4,692,055	06/598,033	09/08/87
4,692,056	06/890,381	09/08/87
4,692,057	06/859,085	09/08/87
4,692,058	06/752,686	09/08/87
4,692,061	06/717,399	09/08/87
4,692,066	06/840,737	09/08/87
4,692,074	06/850,652	09/08/87
4,692,078	06/870,302	09/08/87
4,692,080	06/808,514	09/08/87
4,692,082	06/809,780	09/08/87
4,692,086	06/801,338	09/08/87
4,692,089	06/801,200	09/08/87
4,692,096	06/884,594	09/08/87
4,692,099	06/875,195	09/08/87

Patent Number	Serial Number	Issue Date
4,692,102	06/398,513	09/08/87
4,692,111	06/749,734	09/08/87
4,692,114	06/844,396	09/08/87
4,692,117	06/689,718	09/08/87
4,692,124	06/788,418	09/08/87
4,692,125	06/898,861	09/08/87
4,692,133	06/847,078	09/08/87
4,692,135	06/849,054	09/08/87
4,692,142	06/832,906	09/08/87
4,692,152	06/712,265	09/08/87
4,692,153	06/847,704	09/08/87
4,692,157	06/812,773	09/08/87
4,692,162	06/853,174	09/08/87
4,692,168	06/872,590	09/08/87
4,692,169	06/795,521	09/08/87
4,692,171	06/791,798	09/08/87
4,692,172	06/827,858	09/08/87
4,692,176	06/816,783	09/08/87
4,692,182	06/864,686	09/08/87
4,692,183	06/814,855	09/08/87
4,692,185	06/818,149	09/08/87
4,692,186	06/432,220	09/08/87
4,692,187	06/825,627	09/08/87
4,692,201	06/733,440	09/08/87
4,692,205	06/824,893	09/08/87
4,692,207	06/917,860	09/08/87
4,692,213	06/689,650	09/08/87
4,692,217	06/760,314	09/08/87
4,692,220	06/822,488	09/08/87
4,692,222	06/832,057	09/08/87
4,692,223	06/859,636	09/08/87
4,692,224	06/895,062	09/08/87
4,692,225	06/883,253	09/08/87
4,692,226	06/901,792	09/08/87
4,692,230	06/852,314	09/08/87
4,692,232	06/762,210	09/08/87
4,692,233	06/597,123	09/08/87
4,692,238	06/895,724	09/08/87
4,692,239	06/880,362	09/08/87
4,692,243	06/808,234	09/08/87
4,692,247	06/828,557	09/08/87
4,692,248	06/833,000	09/08/87
4,692,254	06/839,837	09/08/87
4,692,259	06/901,916	09/08/87
4,692,261	06/811,602	09/08/87
4,692,263	06/898,987	09/08/87
4,692,268	06/814,403	09/08/87
4,692,270	06/783,225	09/08/87
4,692,272	06/774,431	09/08/87
4,692,274	06/871,233	09/08/87
4,692,275	06/856,069	09/08/87
4,692,277	06/811,268	09/08/87
4,692,280	06/936,305	09/08/87
4,692,281	06/859,077	09/08/87
4,692,282	06/859,123	09/08/87
4,692,284	06/857,854	09/08/87
4,692,287	06/526,387	09/08/87
4,692,293	06/869,789	09/08/87
4,692,294	06/835,361	09/08/87
4,692,296	06/946,111	09/08/87
4,692,297	06/692,156	09/08/87
4,692,298	06/788,982	09/08/87
4,692,299	06/788,983	09/08/87
4,692,301	06/735,922	09/08/87
4,692,302	06/567,450	09/08/87
4,692,304	06/812,041	09/08/87
4,692,309	06/904,888	09/08/87
4,692,310	06/852,590	09/08/87
4,692,322	06/917,997	09/08/87
4,692,330	06/778,558	09/08/87
4,692,331	06/583,268	09/08/87
4,692,334	06/645,484	09/08/87
4,692,339	06/670,006	09/08/87
4,692,340	06/785,023	09/08/87
4,692,342	06/797,914	09/08/87
4,692,349	06/835,355	09/08/87
4,692,352	06/857,692	09/08/87
4,692,355	06/866,539	09/08/87
4,692,358	06/803,408	09/08/87
4,692,360	06/820,234	09/08/87
4,692,364	06/797,610	09/08/87
4,692,370	06/766,853	09/08/87
4,692,373	06/782,929	09/08/87
4,692,374	06/886,073	09/08/87
4,692,377	06/878,447	09/08/87
4,692,385	06/851,086	09/08/87
4,692,386	06/861,772	09/08/87
4,692,387	06/874,817	09/08/87
4,692,390	06/897,243	09/08/87
4,692,393	06/791,793	09/08/87
4,692,397	06/802,655	09/08/87
4,692,402	06/859,116	09/08/87
4,692,403	06/675,601	09/08/87
4,692,408	06/556,020	09/08/87
4,692,411	06/529,347	09/08/87
4,692,415	06/896,950	09/08/87
4,692,418	07/016,459	09/08/87
4,692,424	06/875,191	09/08/87
4,692,426	06/901,861	09/08/87
4,692,430	06/880,266	09/08/87
4,692,433	06/761,751	09/08/87
4,692,444	06/836,402	09/08/87
4,692,445	06/929,592	09/08/87
4,692,446	06/923,993	09/08/87
4,692,447	06/757,429	09/08/87
4,692,455	06/694,871	09/08/87
4,692,457	06/852,181	09/08/87
4,692,462	06/713,068	09/08/87
4,692,466	06/831,546	09/08/87
4,692,468	06/416,426	09/08/87
4,692,471	06/947,339	09/08/87
4,692,477	06/863,648	09/08/87
4,692,479	06/756,632	09/08/87
4,692,484	06/779,947	09/08/87
4,692,487	06/902,541	09/08/87
4,692,490	06/841,441	09/08/87
4,692,496	06/821,086	09/08/87
4,692,498	06/762,311	09/08/87
4,692,499	06/863,643	09/08/87
4,692,503	06/493,045	09/08/87
4,692,504	06/858,311	09/08/87
4,692,506	06/888,476	09/08/87
4,692,508	06/811,214	09/08/87
4,692,510	06/855,649	09/08/87
4,692,511	06/627,702	09/08/87
4,692,517	06/842,123	09/08/87
4,692,518	06/795,568	09/08/87
4,692,520	06/808,559	09/08/87
4,692,521	06/808,558	09/08/87
4,692,522	06/871,340	09/08/87
4,692,525	06/807,714	09/08/87
4,692,527	06/776,460	09/08/87
4,692,531	06/911,613	09/08/87
4,692,533	06/774,220	09/08/87
4,692,547	06/810,519	09/08/87
4,692,551	06/887,298	09/08/87
4,692,555	06/598,225	09/08/87
4,692,561	06/780,451	09/08/87
4,692,568	06/865,075	09/08/87
4,692,569	06/481,667	09/08/87
4,692,574	06/854,261	09/08/87
4,692,576	06/866,745	09/08/87
4,692,578	07/009,027	09/08/87
4,692,580	06/851,945	09/08/87
4,692,583	06/895,735	09/08/87
4,692,585	06/930,550	09/08/87
4,692,587	06/831,720	09/08/87
4,692,589	06/826,228	09/08/87
4,692,590	06/918,141	09/08/87
4,692,592	06/774,049	09/08/87
4,692,607	06/791,215	09/08/87
4,692,609	06/872,008	09/08/87
4,692,611	06/823,600	09/08/87
4,692,612	06/874,028	09/08/87
4,692,628	06/798,158	09/08/87
4,692,631	06/892,552	09/08/87

Patent Number	Serial Number	Issue Date
4,692,639	06/812,176	09/08/87
4,692,644	06/923,358	09/08/87
4,692,656	06/835,023	09/08/87
4,692,657	06/808,333	09/08/87
4,692,658	06/856,279	09/08/87
4,692,660	06/831,697	09/08/87
4,692,673	06/760,255	09/08/87
4,692,677	06/809,934	09/08/87
4,692,685	06/711,795	09/08/87
4,692,686	06/767,624	09/08/87
4,692,702	06/773,258	09/08/87
4,692,704	06/826,747	09/08/87
4,692,708	06/706,356	09/08/87
4,692,709	06/720,264	09/08/87
4,692,710	06/772,471	09/08/87
4,692,715	06/835,295	09/08/87
4,692,717	06/940,212	09/08/87
4,692,730	06/827,502	09/08/87
4,692,736	06/724,455	09/08/87
4,692,743	06/787,404	09/08/87
4,692,745	06/812,520	09/08/87
4,692,746	06/833,824	09/08/87
4,692,748	06/887,863	09/08/87
4,692,749	06/770,597	09/08/87
4,692,756	06/628,012	09/08/87
4,692,760	06/752,456	09/09/87
4,692,763	06/812,601	09/08/87
4,692,768	06/545,008	09/08/87
4,692,769	06/856,569	09/08/87
4,692,776	06/906,978	09/08/87
4,692,789	06/516,543	09/08/87
4,692,792	06/939,059	09/08/87
4,692,800	06/772,759	09/08/87
4,692,803	06/848,731	09/08/87
4,692,808	06/902,811	09/08/87
4,692,813	06/777,438	09/08/87
4,692,816	06/626,700	09/08/87
4,692,824	06/910,276	09/08/87
4,692,827	06/696,204	09/08/87
4,692,832	06/882,646	09/08/87
4,692,836	06/664,408	09/08/87
4,692,840	06/836,988	09/08/87
4,692,841	06/846,002	09/08/87
4,692,845	06/850,823	09/08/87
4,692,846	06/902,612	09/08/87
4,692,848	06/885,674	09/08/87
4,692,849	06/766,572	09/08/87
4,692,862	06/807,697	09/08/87
4,692,870	06/684,411	09/08/87
4,692,880	06/798,313	09/08/87
4,692,881	06/917,244	09/08/87
4,692,885	06/813,738	09/08/87
4,692,892	06/795,839	09/08/87
4,692,893	06/685,514	09/08/87
4,692,896	06/752,853	09/08/87
4,692,903	06/755,509	09/08/87
4,692,905	06/863,380	09/08/87
4,692,913	06/551,638	09/08/87
4,692,916	06/808,664	09/08/87
4,692,920	06/859,847	09/08/87
4,692,922	06/807,682	09/08/87
4,692,929	06/871,432	09/08/87
4,692,932	06/826,705	09/08/87
4,692,933	06/843,369	09/08/87
4,692,934	06/669,442	09/08/87
4,692,935	06/803,214	09/08/87
4,692,936	06/617,126	09/08/87
4,692,942	06/790,451	09/08/87
4,692,943	06/686,663	09/08/87
5,046,191	07/568,467	09/10/91
5,046,192	07/412,458	09/10/91
5,046,195	07/666,566	09/10/91
5,046,197	07/464,947	09/10/91
5,046,198	07/526,581	09/10/91
5,046,200	07/575,374	09/10/91
5,046,202	07/508,770	09/10/91
5,046,207	07/631,979	09/10/91
5,046,209	07/511,466	09/10/91
5,046,214	07/470,204	09/10/91
5,046,216	07/294,633	09/10/91
5,046,219	07/570,666	09/10/91
5,046,234	07/570,959	09/10/91
5,046,237	07/570,471	09/10/91
5,046,247	07/393,933	09/10/91
5,046,250	07/610,845	09/10/91
5,046,255	07/441,292	09/10/91
5,046,259	07/522,638	09/10/91
5,046,261	07/472,169	09/10/91
5,046,263	07/558,343	09/10/91
5,046,264	07/517,079	09/10/91
5,046,268	07/446,749	09/10/91
5,046,269	07/161,635	09/10/91
5,046,273	07/364,801	09/10/91
5,046,275	07/478,956	09/10/91
5,046,276	07/526,053	09/10/91
5,046,277	07/459,544	09/10/91
5,046,279	07/587,216	09/10/91
5,046,281	07/375,577	09/10/91
5,046,282	07/534,694	09/10/91
5,046,284	07/580,074	09/10/91
5,046,286	07/511,305	09/10/91
5,046,291	07/534,396	09/10/91
5,046,293	07/366,747	09/10/91
5,046,296	07/404,181	09/10/91
5,046,301	07/462,043	09/10/91
5,046,306	07/556,689	09/10/91
5,046,310	07/502,995	09/10/91
5,046,326	07/603,033	09/10/91
5,046,329	07/358,553	09/10/91
5,046,331	07/384,839	09/10/91
5,046,337	07/483,452	09/10/91
5,046,339	07/035,873	09/10/91
5,046,343	07/410,105	09/10/91
5,046,346	07/440,512	09/10/91
5,046,354	07/414,856	09/10/91
5,046,355	07/401,252	09/10/91
5,046,356	07/413,323	09/10/91
5,046,368	07/606,148	09/10/91
5,046,371	07/461,962	09/10/91
5,046,373	07/390,974	09/10/91
5,046,386	07/414,151	09/10/91
5,046,387	07/103,759	09/10/91
5,046,392	07/334,302	09/10/91
5,046,393	07/508,163	09/10/91
5,046,403	07/573,848	09/10/91
5,046,408	07/552,017	09/10/91
5,046,427	06/445,329	09/10/91
5,046,430	07/477,846	09/10/91
5,046,439	07/384,565	09/10/91
5,046,446	07/570,511	09/10/91
5,046,450	07/538,897	09/10/91
5,046,459	07/639,362	09/10/91
5,046,465	07/394,535	09/10/91
5,046,468	07/558,736	09/10/91
5,046,472	07/482,602	09/10/91
5,046,474	07/519,095	09/10/91
5,046,485	07/491,241	09/10/91
5,046,493	07/156,473	09/10/91
5,046,506	07/478,246	09/10/91
5,046,508	07/452,727	09/10/91
5,046,514	07/171,833	09/10/91
5,046,515	07/054,143	09/10/91
5,046,518	07/488,619	09/10/91
5,046,519	07/605,175	09/10/91
5,046,521	07/487,428	09/10/91
5,046,524	07/556,773	09/10/91
5,046,526	07/618,875	09/10/91
5,046,527	07/665,390	09/10/91
5,046,533	07/436,240	09/10/91
5,046,539	07/357,897	09/10/91
5,046,542	07/481,653	09/10/91
5,046,545	07/131,217	09/10/91
5,046,547	07/477,717	09/10/91
5,046,548	07/473,970	09/10/91
5,046,549	07/214,043	09/10/91
5,046,553	07/575,197	09/10/91

Patent Number	Serial Number	Issue Date
5,046,561	07/492,006	09/10/91
5,046,572	07/513,845	09/10/91
5,046,573	07/539,947	09/10/91
5,046,574	07/538,440	09/10/91
5,046,579	07/566,662	09/10/91
5,046,580	07/569,392	09/10/91
5,046,582	07/592,278	09/10/91
5,046,589	07/506,943	09/10/91
5,046,601	07/596,548	09/10/91
5,046,602	07/470,844	09/10/91
5,046,603	07/462,419	09/10/91
5,046,605	07/485,107	09/10/91
5,046,612	07/530,599	09/10/91
5,046,614	07/559,398	09/10/91
5,046,616	07/548,003	09/10/91
5,046,619	07/506,962	09/10/91
5,046,620	07/583,568	09/10/91
5,046,623	07/550,315	09/10/91
5,046,624	07/566,141	09/10/91
5,046,625	07/575,170	09/10/91
5,046,626	06/563,684	09/10/91
5,046,629	07/555,451	09/10/91
5,046,632	07/483,353	09/10/91
5,046,634	07/465,383	09/10/91
5,046,639	07/487,103	09/10/91
5,046,640	07/592,265	09/10/91
5,046,645	07/566,348	09/10/91
5,046,648	07/460,038	09/10/91
5,046,656	07/243,535	09/10/91
5,046,661	07/446,862	09/10/91
5,046,665	07/511,339	09/10/91
5,046,667	07/406,406	09/10/91
5,046,669	07/485,594	09/10/91
5,046,670	07/448,159	09/10/91
5,046,676	07/488,290	09/10/91
5,046,684	07/308,656	09/10/91
5,046,687	07/223,166	09/10/91
5,046,688	07/263,686	09/10/91
5,046,689	07/340,275	09/10/91
5,046,692	07/443,329	09/10/91
5,046,693	07/589,198	09/10/91
5,046,694	07/548,259	09/10/91
5,046,695	07/473,991	09/10/91
5,046,701	07/431,507	09/10/91
5,046,704	07/295,553	09/10/91
5,046,713	07/594,358	09/10/91
5,046,720	07/524,583	09/10/91
5,046,722	07/422,104	09/10/91
5,046,734	07/277,719	09/10/91
5,046,738	07/600,619	09/10/91
5,046,739	07/606,630	09/10/91
5,046,740	07/371,456	09/10/91
5,046,741	07/509,701	09/10/91
5,046,743	07/570,409	09/10/91
5,046,747	07/451,829	09/10/91
5,046,748	07/505,839	09/10/91
5,046,750	07/585,035	09/10/91
5,046,753	07/456,470	09/10/91
5,046,759	07/335,001	09/10/91
5,046,760	07/451,613	09/10/91
5,046,762	07/357,334	09/10/91
5,046,763	07/473,571	09/10/91
5,046,766	07/532,925	09/10/91
5,046,767	07/450,234	09/10/91
5,046,773	07/459,928	09/10/91
5,046,777	07/521,722	09/10/91
5,046,782	07/529,463	09/10/91
5,046,788	07/555,281	09/10/91
5,046,789	07/505,232	09/10/91
5,046,809	07/584,171	09/10/91
5,046,844	07/204,870	09/10/91
5,046,845	07/378,026	09/10/91
5,046,849	07/548,422	09/10/91
5,046,850	07/400,304	09/10/91
5,046,852	07/397,677	09/10/91
5,046,853	07/365,131	09/10/91
5,046,854	07/647,179	09/10/91
5,046,856	07/406,212	09/10/91
5,046,860	07/561,808	09/10/91
5,046,861	07/446,259	09/10/91
5,046,870	07/562,494	09/10/91
5,046,874	07/492,820	09/10/91
5,046,875	07/515,723	09/10/91
5,046,876	07/574,368	09/10/91
5,046,886	07/542,954	09/10/91
5,046,891	07/485,903	09/10/91
5,046,895	07/460,262	09/10/91
5,046,896	07/531,180	09/10/91
5,046,898	07/540,757	09/10/91
5,046,901	07/509,883	09/10/91
5,046,902	07/499,269	09/10/91
5,046,907	07/512,918	09/10/91
5,046,910	07/497,604	09/10/91
5,046,912	07/289,140	09/10/91
5,046,917	07/530,609	09/10/91
5,046,926	07/559,298	09/10/91
5,046,929	07/336,059	09/10/91
5,046,931	07/549,838	09/10/91
5,046,932	07/437,889	09/10/91
5,046,933	07/450,081	09/10/91
5,046,934	07/481,853	09/10/91
5,046,939	07/446,464	09/10/91
5,046,941	07/420,942	09/10/91
5,046,944	07/329,551	09/10/91
5,046,945	07/529,533	09/10/91
5,046,949	07/588,755	09/10/91
5,046,958	07/623,559	09/10/91
5,046,964	07/419,406	09/10/91
5,046,967	07/488,943	09/10/91
5,046,968	07/413,988	09/10/91
5,046,969	07/556,393	09/10/91
5,046,971	07/561,222	09/10/91
5,046,973	07/353,654	09/10/91
5,046,981	07/495,843	09/10/91
5,046,983	07/598,524	09/10/91
5,046,985	07/830,237	09/10/91
5,046,987	07/403,274	09/10/91
5,046,995	07/536,188	09/10/91
5,047,000	07/441,363	09/10/91
5,047,001	07/574,515	09/10/91
5,047,004	07/476,981	09/10/91
5,047,013	07/404,589	09/10/91
5,047,014	07/496,342	09/10/91
5,047,024	07/455,789	09/10/91
5,047,034	07/529,529	09/10/91
5,047,037	07/464,092	09/10/91
5,047,042	07/477,548	09/10/91
5,047,046	07/217,830	09/10/91
5,047,049	07/614,691	09/10/91
5,047,052	07/117,268	09/10/91
5,047,056	07/481,017	09/10/91
5,047,074	07/445,789	09/10/91
5,047,075	07/360,460	09/10/91
5,047,085	07/587,729	09/10/91
5,047,089	07/344,127	09/10/91
5,047,093	07/364,759	09/10/91
5,047,095	07/297,445	09/10/91
5,047,100	07/382,155	09/10/91
5,047,105	07/286,987	09/10/91
5,047,120	07/352,324	09/10/91
5,047,124	07/385,107	09/10/91
5,047,126	07/530,933	09/10/91
5,047,128	07/459,535	09/10/91
5,047,129	07/459,689	09/10/91
5,047,136	07/423,453	09/10/91
5,047,144	07/412,596	09/10/91
5,047,146	07/484,559	09/10/91
5,047,153	07/430,768	09/10/91
5,047,160	07/291,745	09/10/91
5,047,161	07/183,425	09/10/91
5,047,162	07/372,141	09/10/91
5,047,165	07/302,168	09/10/91
5,047,168	07/146,514	09/10/91
5,047,176	07/288,897	09/10/91
5,047,184	07/210,696	09/10/91
5,047,187	07/345,480	09/10/91

Patent Number	Serial Number	Issue Date
5,047,192	07/377,314	09/10/91
5,047,193	07/160,000	09/10/91
5,047,205	07/338,447	09/10/91
5,047,209	07/156,515	09/10/91
5,047,227	07/650,363	09/10/91
5,047,229	06/943,639	09/10/91
5,047,250	06/875,143	09/10/91
5,047,257	07/461,990	09/10/91
5,047,264	07/357,577	09/10/91
5,047,265	07/342,341	09/10/91
5,047,266	07/500,255	09/10/91
5,047,273	07/439,142	09/10/91
5,047,281	06/946,649	09/10/91
5,047,296	07/241,584	09/10/91
5,047,299	07/559,111	09/10/91
5,047,311	07/018,722	09/10/91
5,047,336	06/792,880	09/10/91
5,047,371	07/239,891	09/10/91
5,047,374	07/186,998	09/10/91
5,047,376	07/386,526	09/10/91
5,047,384	07/376,590	09/10/91
5,047,385	07/221,726	09/10/91
5,047,386	07/291,681	09/10/91
5,047,388	07/290,520	09/10/91
5,047,389	07/265,827	09/10/91
5,047,392	07/334,582	09/10/91
5,047,403	07/396,194	09/10/91
5,047,410	07/378,958	09/10/91
5,047,412	07/304,718	09/10/91
5,047,415	07/378,730	09/10/91
5,047,416	07/386,645	09/10/91
5,047,419	07/261,288	09/10/91
5,047,420	07/396,489	09/10/91
5,047,427	07/264,589	09/10/91
5,047,429	07/339,763	09/10/91
5,047,434	07/375,507	09/10/91
5,047,436	07/478,824	09/10/91
5,047,440	07/380,979	09/10/91
5,047,442	07/227,606	09/10/91
5,047,448	07/331,350	09/10/91
5,047,453	06/730,384	09/10/91
5,047,467	07/388,739	09/10/91
5,047,479	07/396,786	09/10/91
5,047,480	07/131,091	09/10/91
5,047,486	07/332,881	09/10/91
5,047,493	07/546,934	09/10/91
5,047,494	07/394,908	09/10/91
5,047,498	07/365,958	09/10/91
5,047,499	07/310,642	09/10/91
5,047,502	07/389,093	09/10/91
5,047,503	07/072,051	09/10/91
5,047,505	07/132,185	09/10/91
5,047,506	07/321,133	09/10/91
5,047,509	07/311,650	09/10/91
5,047,516	07/190,672	09/10/91
5,047,518	07/507,305	09/10/91
5,047,522	07/217,381	09/10/91
5,047,527	07/495,045	09/10/91
5,047,529	07/492,837	09/10/91
5,047,535	07/081,769	09/10/91
5,047,539	07/511,302	09/10/91
5,047,541	07/366,070	09/10/91
5,047,545	07/300,179	09/10/91
5,047,546	07/612,737	09/10/91
5,047,551	07/429,783	09/10/91
5,047,564	07/151,931	09/10/91
5,047,566	07/073,890	09/10/91
5,047,569	07/548,483	09/10/91
5,047,573	07/123,157	09/10/91
5,047,576	07/172,178	09/10/91
5,047,584	06/806,915	09/10/91
5,047,592	07/396,346	09/10/91
5,047,599	07/498,267	09/10/91
5,047,600	07/488,142	09/10/91
5,047,602	07/521,669	09/10/91
5,047,603	07/371,932	09/10/91
5,047,630	07/571,281	09/10/91
5,047,640	07/467,177	09/10/91
5,047,642	07/595,955	09/10/91
5,047,645	07/376,741	09/10/91
5,047,654	07/475,370	09/10/91
5,047,662	07/399,147	09/10/91
5,047,666	07/513,910	09/10/91
5,047,688	07/536,308	09/10/91
5,047,693	07/527,502	09/10/91
5,047,703	07/426,560	09/10/91
5,047,712	07/571,961	09/10/91
5,047,717	07/446,469	09/10/91
5,047,720	07/432,762	09/10/91
5,047,721	07/562,743	09/10/91
5,047,736	07/580,146	09/10/91
5,047,748	07/341,531	09/10/91
5,047,750	07/491,105	09/10/91
5,047,753	07/529,561	09/10/91
5,047,765	07/539,911	09/10/91
5,047,769	07/518,596	09/10/91
5,047,770	07/518,595	09/10/91
5,047,771	07/518,600	09/10/91
5,047,772	07/533,263	09/10/91
5,047,786	07/473,070	09/10/91
5,047,799	07/602,790	09/10/91
5,047,839	07/429,142	09/10/91
5,047,849	07/510,575	09/10/91
5,047,855	07/604,732	09/10/91
5,047,866	07/323,841	09/10/91
5,047,872	07/311,939	09/10/91
5,047,880	07/345,169	09/10/91
5,047,882	07/528,761	09/10/91
5,047,885	07/269,608	09/10/91
5,047,893	07/586,927	09/10/91
5,047,896	07/433,575	09/10/91
5,047,907	07/536,195	09/10/91
5,047,908	07/619,030	09/10/91
5,047,911	07/223,035	09/10/91
5,047,915	07/543,984	09/10/91
5,047,928	07/292,927	09/10/91
5,047,931	07/358,300	09/10/91
5,047,937	07/531,676	09/10/91
5,047,942	07/192,562	09/10/91
5,047,948	07/342,753	09/10/91
5,047,950	07/343,073	09/10/91
5,047,962	07/202,498	09/10/91
5,047,969	07/283,447	09/10/91
5,047,992	07/546,605	09/10/91
5,048,006	07/374,998	09/10/91
5,048,007	07/451,628	09/10/91
5,048,011	07/338,958	09/10/91
5,048,020	07/557,080	09/10/91
5,048,027	07/490,657	09/10/91
5,048,032	07/554,785	09/10/91
5,048,033	07/577,875	09/10/91
5,048,043	07/564,739	09/10/91
5,048,046	07/564,736	09/10/91
5,048,055	07/485,206	09/10/91
5,048,058	07/318,051	09/10/91
5,048,062	07/429,268	09/10/91
5,048,068	07/437,396	09/10/91
5,048,076	07/464,869	09/10/91
5,048,083	07/470,723	09/10/91
5,048,085	07/418,068	09/10/91
5,048,089	07/441,327	09/10/91
5,048,103	07/494,395	09/10/91
5,048,115	07/313,975	09/10/91
5,048,120	07/560,039	09/10/91

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

5,059,895, Re. S.N. 08/507,167, July 26, 1995, Cl. 324/104, BATTERY VOLTMETER, Richard T. Cataldi, et. al., Owner

of Record: *Eastman Kodak Co., Rochester, N.Y.,* Attorney or Agent: Charles L. Gholz, Ex. Gp.: 2213

5,243,467, Re. S.N. 08/529,266, Sept. 6, 1995, Cl. 359/694, ZOOM LENS BARRELL FOR WATERPROOF AND/OR WATER, Hitoshi Tanaka, Owner of Record: *Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Bruce H. Bernstein, Ex. Gp.: 2507

5,256,047, Re. S.N. 08/531,430, Sept. 21, 1995, Cl. 425/130, GAS ASSISTED INJECTION MOLDING APPARATUS UTILIZING SLEEVE AND PIN ARRANGEMENT, Jay F. Moldovanyi, Owner of Record: *Tom W. Johnson, Hunting Valley, Ohio,* Attorney or Agent: None, Ex. Gp.: 1305

5,271,110, Re. S.N. 08/492,254, June 22, 1995, Cl. 5/81, PATIENT TRANSFER DEVICE, William C. Newman, Owner of Record: *Inventor,* Attorney or Agent: Harry M. Cross, Jr., Ex. Gp.: 3508

5,282,103, Re. S.N. 08/521,786, Aug. 31, 1995, Cl. 360/104, MAGNETIC HEAD SUSPENSION ASSEMBLY FABRICATED WITH INTEGRAL LOAD BEAM AND FLEXURE, Michael R. Hatch, Owner of Record: *Read-Rite Corp., Milpitas, Calif.,* Attorney or Agent: Bradley J. Bereznak, Ex. Gp.: 2512

5,371,792, Re. S.N. 08/519,580, Aug. 25, 1995, Cl. 380/003, CD-ROM DISK AND SECURITY CHECK METHOD FOR THE SAME, Tushinori Asai, et. al., Owner of Record: *Kabushiku Kaisha Sega Enterprises, Tokyo, Japan,* Attorney or Agent: Thomas J. D'Amico, Ex. Gp.: 2202

5,419,747, Re. S.N. 08/529,514, Sept. 18, 1995, Cl. 482/051, STRIDING-TYPE EXERCISE APPARATUS, Gary D. Pigget, et. al., Owner of Record: *Inventor,* Attorney or Agent: Stephen J. Holmes, Ex. Gp.: 3302

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 32,939, Reexam. No. 90/003,988, Oct. 4, 1995, Cl. 601/152, MEDICAL APPLIANCE, Arthur M.N. Gardner, et. al., Owner of Record: *Novamedix, Ltd., Andover, U.K.,* Attorney or Agent: Hopgood Calimafde Kalil Blaustein & Judlowe, New York, N.Y., Ex. Gp.: 3302, Requester: Charles W. Hanor, Akin Gump Strauss Hauer & Feld, San Antonio, Tex.

Re. 32,940, Reexam. No. 90/003,987, Oct. 4, 1995, Cl. 601/152, MEDICAL APPLIANCE, Arthur M.N. Gardner, et. al., Owner of Record: *Novamedix, Ltd., Andover, U.K.,* Attorney or Agent: Hopgood Calimafde Kalil Blaustein & Judlowe, New York, N.Y., Ex. Gp.: 3302, Requester: Charles W. Hanor, Akin Gump Strauss Hauer & Feld, San Antonio, Tex.

4,420,909, Reexam. No. 90/003,983, Oct. 16, 1995, Cl. 451/041, WAFERING SYSTEM, Robert E. Steere, Jr., Owner of Record: *Silicon Tchnology Corp., Oakland, N.J.,* Attorney or Agent: Kenyon & Kenyon, New York, N.Y., Ex. Gp.: 3203, Requester: Owner

4,596,980, Reexam. No. 90/003,985, Oct. 3, 1995, Cl. 379/105, PHONE-LINE-LINKED, TONE-OPERATED CONTROL DEVICE, Philip S. Jackson, Owner of Record: *Inventor,* Attorney or Agent: Raiford A. Blackstone, Jr., Trexler Bushnell Giangiorgi & Blackstone, New York, N.Y., Ex. Gp.: 2601, Requester: Matsushita Electric Industrial Co., Ltd., Osaka, Japan, c/o Amster Rothstein & Ebenstein, Chicago, Ill.

4,455,025, Reexam. No. 90/003,991, Oct. 5, 1995, Cl. 273/237, ELECTRONIC CARD AND BOARD GAME, Yuri Itkis, Owner of Record: *Fortunet, Inc., Las Vegas, N.V.,* Attorney or Agent: Browdy & Neimark, Washington, D.C., Ex. Gp.: 3304, Requester: Stuart Entertainment, Inc., c/o D.C. Toedt, III, Arnold White & Durkee, Houston, Tex.

4,624,462, Reexam. No. 90/003,992, Oct. 5, 1995, Cl. 273/337, ELECTRONIC CARD AND BOARD GAME, Yuri Itkis, Owner of Record: *Fortunet, Inc., Las Vegas, Nev.,* Attorney or Agent: Browdy & Neimark, Washington, D.C., Ex. Gp.: 3304, Requester: Stuart Entertainment, Inc., c/o D.C. Toedt, III, Arnold White & Durkee, Houston, Tex.

4,696,289, Reexam. No. 90/003,989, Oct. 4, 1995, Cl. 601/152, METHOD OF PROMOTING VENOUS PUMP ACTION, Arthur M.N. Gardner, et. al., Owner of Record: *Novamedix, Ltd., Andover, Great Britain,* Attorney or Agent: Hopgood Calimafde Kalil Blaustein & Judlowe, New York, N.Y., Ex. Gp.: 3302, Requester: Charles W. Hanor, Akin Gump Strauss Hauer & Feld, San Antonio, Tex.

4,721,101, Reexam. No. 90/003,990, Oct. 4, 1995, Cl. 601/152, MEDICAL APPLIANCE, Arthur M.N. Gardner, et. al., Owner of Record: *Novamedix, Ltd., Andover, Great Britain,* Attorney or Agent: Hopgood Calimafde Kalil Blaustein & Judlowe, New York, N.Y., Ex. Gp.: 3302, Requester: Charles W. Hanor, Akin Gump Strauss Hauer & Feld, San Antonio, Tex.

4,840,284, Reexam. No. 90/003,981, Sept. 29, 1995, Cl. 220/601, SLOPED BOTTOM TANK, Andrew W. Snyder, Owner of Record: *Hoover Group Inc., Roswell, Ga.,* Attorney or Agent: Harness Dickey & Pierce, Bloomfield Hills, Mich., Ex. Gp.: 3207, Requester: Custom Metalcraft, Inc., Springfield, Mo.

4,856,294, Reexam. No. 90/003,993, Oct. 6, 1995, Cl. 062/259.3, MICRO-CLIMATE CONTROL VEST, Robert P. Scaringe, et. al., Owner of Record: *Mainstream Engineering Corp., Melbourne, Fla.,* Attorney or Agent: Charles E. Wands, Evenson Wands Edwards Lenahan & McKeown, Palm Bay, Fla., Ex. Gp.: 3404, Requester: Brian Doherty, c/o Wigman Cohen Leitner & Myers, Arlington, Va.

4,940,462, Reexam. No. 90/003,996, Oct. 12, 1995, Cl. 604/387, SANITARY NAPKIN WITH EXPANDABLE FLAPS, Catherine E. Salerno, Owner of Record: *McNeil-PPC, Inc., Milltown, N.J.,* Attorney or Agent: Robert L. Minier, Johnson & Johnson, New Brunswick, N.J., Ex. Gp.: 3308, Requester: Arnold Turk, Sandler, Greenblum & Bernstein, Arlington, Va.

5,096,607, Reexam. No. 90/003,986, Oct. 3, 1995, Cl. 252/106, METHOD AND COMPOSITION FOR CLEANING AND DISINFECTING CONTACT LENSES, Mary F. Mowrey-McKee, et. al., Owner of Record: *Bausch & Lomb, Rochester, N.Y.,* Attorney or Agent: Denis A. Polyn & James B. Bieber, Rochester, N.Y., Ex. Gp.: 1105, Requester: Edward W. Goldstein, Tobor & Goldstein, Houston, Tex.

5,145,016, Reexam. No. 90/003,982, Sept. 29, 1995, Cl. 175/331, ROCK BIT WITH REAMING ROWS, Roy D. Estes, Owner of Record: *Rock Bit International, Inc., Ft. Worth, Tex.,* Attorney or Agent: Donald Gunn, Gunn & Associates, Houston, Tex., Ex. Gp.: 3506, Requester: Owner

5,349,329, Reexam. No. 90/003,980, Sept. 14, 1995, Cl. 340/539, VEHICLE SECURITY APPARATUS AND METHOD, Jerry R. Smith, Owner of Record: *Ideaz International, Inc., Englewood, Colo.,* Attorney or Agent: Timothy J. Martin, Lakewood, Colo., Ex. Gp.: 2617, Requester: Winner International Royalty Corp., Sharon, Pa.

5,419,763, Reexam. No. 90/003,994, Oct. 6, 1995, Cl. 604/054, PROSTATIC DRUG-DELIVERY CATHETER, Keith R. Hildebrand, Owner of Record: *Cor Trak Medical, Inc., Roseville, Minn.,* Attorney or Agent: Merchant Gould Smith Edell Welter & Schmidt, Minneapolis, Minn., Ex. Gp.: 3306, Requester: Owner

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED AUGUST 28, 1995 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
11,709	70/011,709	11/25/1884
11,710	70/011,710	11/25/1884
11,711	70/011,711	11/25/1884
43,745	70/043,745	11/22/1904
43,746	70/043,746	11/22/1904
101,291	71/080,648	11/24/1914
101,313	71/077,289	11/24/1914
319,165	71/354,115	11/20/1934
319,181	71/354,009	11/20/1934
319,189	71/354,030	11/20/1934
319,192	71/353,585	11/20/1934
319,194	71/353,596	11/20/1934
319,197	71/353,599	11/20/1934
319,198	71/353,598	11/20/1934
319,199	71/353,597	11/20/1934
319,202	71/353,600	11/20/1934
319,203	71/353,702	11/20/1934
319,206	71/353,706	11/20/1934
319,207	71/353,704	11/20/1934
319,208	71/353,703	11/20/1934
319,212	71/353,787	11/20/1934
319,269	71/353,383	11/20/1934
319,296	71/344,631	11/20/1934
319,297	71/345,840	11/20/1934
319,311	71/350,260	11/20/1934
319,358	71/353,949	11/20/1934
319,384	71/353,271	11/20/1934
319,402	71/342,414	11/20/1934
598,336	71/638,591	11/23/1954
598,344	71/660,376	11/23/1954
598,347	71/661,224	11/23/1954
598,348	71/627,341	11/23/1954
598,359	71/631,773	11/23/1954
598,360	71/634,943	11/23/1954
598,362	71/643,062	11/23/1954
598,366	71/649,470	11/23/1954
598,369	71/654,855	11/23/1954
598,371	71/657,048	11/23/1954
598,372	71/657,051	11/23/1954
598,376	71/648,676	11/23/1954
598,378	71/659,692	11/23/1954
598,384	71/536,154	11/23/1954
598,388	71/654,155	11/23/1954
598,390	71/655,353	11/23/1954
598,402	71/664,205	11/23/1954
598,405	71/664,687	11/23/1954
598,407	71/639,003	11/23/1954
598,408	71/642,759	11/23/1954
598,420	71/641,522	11/23/1954
598,421	71/650,563	11/23/1954
598,422	71/651,175	11/23/1954
598,423	71/653,913	11/23/1954
598,428	71/658,840	11/23/1954
598,430	71/660,084	11/23/1954
598,432	71/661,157	11/23/1954
598,433	71/661,464	11/23/1954
598,441	71/646,359	11/23/1954
598,452	71/634,913	11/23/1954
598,454	71/641,057	11/23/1954
598,457	71/642,695	11/23/1954
598,460	71/643,732	11/23/1954
598,461	71/645,445	11/23/1954
598,471	71/652,907	11/23/1954
598,484	71/660,105	11/23/1954
598,493	71/659,982	11/23/1954
598,497	71/656,781	11/23/1954
598,499	71/616,649	11/23/1954
598,502	71/655,574	11/23/1954
598,509	71/661,703	11/23/1954
598,510	71/602,310	11/23/1954
598,517	71/655,133	11/23/1954
598,518	71/655,136	11/23/1954
598,522	71/657,485	11/23/1954
598,528	71/662,527	11/23/1954
598,535	71/662,687	11/23/1954
598,556	71/663,290	11/23/1954
598,564	71/635,087	11/23/1954
598,565	71/643,677	11/23/1954
598,566	71/645,793	11/23/1954
598,567	71/646,249	11/23/1954
598,577	71/659,349	11/23/1954
598,578	71/659,618	11/23/1954
598,580	71/660,760	11/23/1954
598,582	71/654,286	11/23/1954
598,584	71/654,766	11/23/1954
598,587	71/659,200	11/23/1954
598,589	71/660,156	11/23/1954
598,594	71/662,563	11/23/1954
598,595	71/662,564	11/23/1954
598,598	71/645,110	11/23/1954
598,602	71/649,924	11/23/1954
598,605	71/659,205	11/23/1954
983,878	72/432,062	05/14/1974
990,710	72/440,572	08/13/1974
998,373	73/000,988	11/19/1974
998,377	73/008,844	11/19/1974
998,380	73/000,542	11/19/1974
998,382	73/007,319	11/19/1974
998,383	73/004,423	11/19/1974
998,384	73/010,637	11/19/1974
998,385	73/010,740	11/19/1974
998,386	73/010,741	11/19/1974
998,389	73/012,717	11/19/1974
998,390	73/013,476	11/19/1974
998,395	73/001,009	11/19/1974
998,396	73/001,851	11/19/1974
998,399	73/006,393	11/19/1974
998,401	73/001,096	11/19/1974
998,403	73/000,511	11/19/1974
998,404	73/002,047	11/19/1974
998,409	73/001,441	11/19/1974
998,411	73/006,192	11/19/1974
998,412	73/010,719	11/19/1974
998,413	73/011,234	11/19/1974
998,414	73/011,257	11/19/1974
998,415	73/011,335	11/19/1974
998,416	73/011,343	11/19/1974
998,417	73/013,046	11/19/1974
998,419	73/015,213	11/19/1974
998,420	73/001,093	11/19/1974
998,421	73/004,536	11/19/1974
998,422	73/004,537	11/19/1974
998,423	73/009,246	11/19/1974
998,424	73/002,552	11/19/1974
998,425	73/004,325	11/19/1974
998,430	73/012,638	11/19/1974
998,431	73/018,385	11/19/1974
998,433	73/014,101	11/19/1974
998,441	73/004,943	11/19/1974
998,442	73/005,108	11/19/1974
998,453	73/011,436	11/19/1974
998,458	73/019,443	11/19/1974
998,462	73/007,783	11/19/1974
998,464	73/010,789	11/19/1974
998,465	73/001,932	11/19/1974
998,474	73/002,167	11/19/1974
998,476	73/015,941	11/19/1974

Reg. Number	Serial Number	Reg. Date
998,477	73/017,745	11/19/1974
998,478	73/018,025	11/19/1974
998,483	73/011,714	11/19/1974
998,485	73/012,723	11/19/1974
998,491	73/005,072	11/19/1974
998,494	73/005,684	11/19/1974
998,495	73/006,598	11/19/1974
998,497	73/007,899	11/19/1974
998,506	73/012,227	11/19/1974
998,512	73/014,283	11/19/1974
998,516	73/015,110	11/19/1974
998,518	73/010,475	11/19/1974
998,523	73/011,844	11/19/1974
998,524	73/012,031	11/19/1974
998,525	73/012,032	11/19/1974
998,529	73/013,234	11/19/1974
998,530	73/013,324	11/19/1974
998,531	73/017,395	11/19/1974
998,532	73/017,569	11/19/1974
998,539	73/005,469	11/19/1974
998,540	73/005,627	11/19/1974
998,544	73/007,685	11/19/1974
998,545	73/008,885	11/19/1974
998,546	73/010,638	11/19/1974
998,547	73/010,681	11/19/1974
998,550	73/011,047	11/19/1974
998,552	73/005,105	11/19/1974
998,555	73/005,362	11/19/1974
998,557	73/005,584	11/19/1974
998,560	73/006,286	11/19/1974
998,563	73/009,711	11/19/1974
998,566	73/014,977	11/19/1974
998,572	73/006,736	11/19/1974
998,573	73/006,814	11/19/1974
998,574	73/006,927	11/19/1974
998,577	73/016,085	11/19/1974
998,578	73/003,703	11/19/1974
998,580	73/001,859	11/19/1974
998,586	72/451 642	11/19/1974
998,587	72/458,746	11/19/1974
998,596	72/416,332	11/19/1974
998,597	72/431,824	11/19/1974
998,598	72/442,381	11/19/1974
998,599	72/443,268	11/19/1974
998,600	72/443,269	11/19/1974
998,601	72/443,270	11/19/1974
998,605	72/463,541	11/19/1974
998,609	72/448,008	11/19/1974
998,610	72/453,464	11/19/1974
998,614	72/431,357	11/19/1974
998,615	72/431,642	11/19/1974
998,616	72/431,689	11/19/1974
998,619	72/450,811	11/19/1974
998,621	72/458,046	11/19/1974
998,625	72/430,264	11/19/1974
998,626	72/438,726	11/19/1974
998,633	72/356,582	11/19/1974
998,635	72/451,525	11/19/1974
998,636	72/464,969	11/19/1974
998,639	72/452,744	11/19/1974
998,642	72/384,882	11/19/1974
998,645	72/418,774	11/19/1974
998,656	72/465,732	11/19/1974
998,657	72/466,000	11/19/1974
998,659	72/466,120	11/19/1974
998,663	72/432,797	11/19/1974
998,666	72/441,078	11/19/1974
998,668	72/447,893	11/19/1974
998,669	72/453,014	11/19/1974
998,683	72/393,640	11/19/1974
998,685	72/404,727	11/19/1974
998,686	72/406,594	11/19/1974
998,690	72/432,919	11/19/1974
998,691	72/434,396	11/19/1974
998,693	72/446,333	11/19/1974
998,697	72/459,621	11/19/1974
998,701	72/432,905	11/19/1974
998,702	72/442,076	11/19/1974
998,705	72/450,286	11/19/1974
998,707	72/462,882	11/19/1974
998,708	72/465,853	11/19/1974
998,715	72/438,167	11/19/1974
998,716	72/439,922	11/19/1974
998,717	72/442,837	11/19/1974
998,718	72/454,088	11/19/1974
998,719	72/458,382	11/19/1974
998,722	72/426,859	11/19/1974
998,726	72/462,328	11/19/1974
998,733	72/452,444	11/19/1974
998,735	72/456,654	11/19/1974
998,736	72/459,274	11/19/1974
998,738	72/462,071	11/19/1974
998,740	72/462,833	11/19/1974
998,745	72/443,018	11/19/1974
998,747	72/448,781	11/19/1974
998,748	72/451,584	11/19/1974
998,751	72/456,165	11/19/1974
998,755	72/462,031	11/19/1974
998,757	72/462,632	11/19/1974
998,764	72/464,766	11/19/1974
998,765	72/349,738	11/19/1974
998,766	72/387,097	11/19/1974
998,768	72/399,633	11/19/1974
998,769	72/407,245	11/19/1974
998,776	72/456,979	11/19/1974
998,779	72/460,706	11/19/1974
998,781	72/462,003	11/19/1974
998,783	72/433,032	11/19/1974
998,785	72/456,031	11/19/1974
998,790	72/381,944	11/19/1974
998,796	72/453,528	11/19/1974
998,798	72/456,361	11/19/1974
998,800	72/457,789	11/19/1974
998,805	72/459,819	11/19/1974
998,808	72/462,257	11/19/1974
998,812	72/463,648	11/19/1974
998,814	72/466,025	11/19/1974
998,817	72/458,958	11/19/1974
998,819	72/461,376	11/19/1974
998,820	72/463,421	11/19/1974
998,821	72/465,625	11/19/1974
998,823	72/461,900	11/19/1974
998,827	72/456,929	11/19/1974
998,829	72/412,135	11/19/1974
998,830	72/435,201	11/19/1974
998,832	72/453,542	11/19/1974
998,835	72/461,775	11/19/1974
998,837	72/466,894	11/19/1974
998,841	72/461,776	11/19/1974
998,847	72/453,789	11/19/1974
998,852	72/461,878	11/19/1974
998,853	72/438,205	11/19/1974
998,854	72/451,198	11/19/1974
998,855	72/451,199	11/19/1974
998,858	72/464,373	11/19/1974
998,861	72/457,057	11/19/1974
998,867	72/459,120	11/19/1974
998,868	72/459,121	11/19/1974
998,870	72/464,937	11/19/1974
998,871	72/419,461	11/19/1974
998,872	73/001,979	11/19/1974
998,873	73/001,980	11/19/1974
998,875	72/461,408	11/19/1974
998,880	72/442,825	11/19/1974
998,882	72/459,834	11/19/1974
998,883	72/430,305	11/19/1974
998,885	72/444,558	11/19/1974
998,887	73/003,442	11/19/1974
998,890	72/455,983	11/19/1974
998,892	72/467,140	11/19/1974

Errata

"All reference to Patent No. 5,455,394 to David Durand, et. al., of Rhode Island for FLEXIBLE PRINTED POLYMER

LEAD FRAME appearing in the *Official Gazette* of October 3, 1995 should be deleted since no patent was granted."

"All reference to Patent No. 5,455,812 to Akira Shinada of Japan for POWER SAVING METHOD AND APPARATUS FOR INTERMITTENTLY READING REPRODUCTION APPARATUS appearing in the *Official Gazette* of October 3, 1995 should be deleted since no patent was granted."

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Alicia Villarreal, Costa Mesa, Calif., Reg. No. 1,214,156, for the mark "MISCELLANEOUS DESIGN". Canc. No. 22,872.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Registration To Practice

The results of the examination for registration to practice before the United States Patent and Trademark Office held on May 3, 1995, were mailed to 2,086 candidates. There were 700 persons who successfully passed the examination. The following list contains the names of those persons who passed the examination and have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR 10.7 (a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical, or other grounds should be furnished to the Director of Enrollment and Discipline on or before January 5, 1996.

Abbott, Eric Laurence, 50 North 21st St., # 23, Las Vegas, Nev. 89101

Abeyta, Andrew Augustine, 817 Sagebrush Trail SE, Albuquerque, N.M. 87123

Abraham, Daniel L., 15 Chicory Way, Irvine, Calif. 92715

Ackerman, Paul D., 6 Rutland Rd., N. Massapequa, N.Y. 11756

Adamo, Frank, 5564 Suncrest Ct., Parma, Ohio 44134

Adams, Sharon J., 912 Quiet Place Court, Walnut Creek, Calif. 94598

Adeli, Mani, 3625 Fillmore St., # 8, San Francisco, Calif. 94123

Adusei-Poku, Kwadjo, 1597 York Ave., # 2, New York, N.Y. 10028

Ahn, Harry Kyuhoon, 1310 Minor Ave., # 509, Seattle, Wash. 98101

Ainsworth, Kevin Neil, 16 Moore Ave., Woodbridge, N.J. 07095

Alapati, Nanda Krishna, 20005 Mattingly Terrace, Gaithersburg, Md. 20879

Alboszta, Marek, 426 Lowell Ave., Palo Alto, Calif. 94301

Albue, Bryan A., 7625 North 22nd Place, Phoenix, Ariz. 85020

Alcorn, Linda E., 529 N. Columbus St., Alexandria, Va. 22314-2215

Allen, James Randall, 2727 Stetson Ln., Houston, Tex. 77043

Anderson, Paul Matthew, 200 Whispering Valley, Dripping Springs, Tex. 78620

Anderson, Stephen J., 1285 Sagunka Dr., Yorktown Hgts., N.Y. 10598

Arrambide, Joseph Carl, 722 Tartan Trail, Highland Village, Tex. 75067

Aust, Reynold, 956 Hope St., Stamford, CT 06907

Babbitt, William Thomas, P.O. Box 7000-776, Redondo Beach, Calif. 90277

Babcock, Brenton Ray, 500 1/2 Begonia Ave., Corona Del Mar, Calif. 92625

Baker, Larry David, 945 Ward Drive, # 73, Santa Barbara, Calif. 93111

Banner, David L., 6 Kinney St., Binghamton, N.Y. 13901

Bardell, Scott A., 4905 Claremont, # 2, Midland, Mich. 48642

Barger, G. Andrew, 43 Brewer Rd., Leonard, Mich. 48367

Barlow, Stacey A., 1808 Connecticut Ave., N.W., # 603, Washington, D.C. 20009

Barnd, Donna Leslie, 10007 Markham St., Silver Spring, Md. 20901

Barnes, Richard William, Jr., 1817 Stonebrook Dr., Knoxville, Tenn. 37923

Barrett, Brian Paul, 4729 Bayberry Ln., Zionsville, Ind. 46077

Barron, David, 28-E Knights Bridge, Guilderland, N.Y. 12084

Barron, Timothy Joseph, 620 Rock Spring Rd., Naperville, Ill. 60565

Bartfeld, Neil S., 12240 Briardale Way, San Diego, Calif. 92128

Bates, David J., 4811 South 15th Place, Milwaukee, Wis. 53221

Beam, Dayn Thomas, 1707 Sun Valley Rd., Huntsville, Ala. 35801

Beard, R. William, Jr., 12022-B Mighty Oak, Houston, Tex. 77066

Becker, Jennifer M., 335 E. South 6th St., Red Bud, Ill. 62278

Becker, Jordan Michael, 510 Mansion Court, # 307, Santa Clara, Calif. 95054

Bedi, Harmohinder Singh, 169 Corral Circle, San Ramon, Calif. 94583

Behiel, Arthur Joseph, 7552 Hillsdale Dr., Pleasanton, Calif. 94588

Bell, Michael J., 6705 Tusculum Rd., Bethesda, Md. 20817

Benado, Lisa N., 1083 Morris Ct., San Jose, Calif. 95126

Bendel, Michael Joseph, 1797 Grove Ave., Schaumburg, Ill. 60193

Bergstrom, Robert W., 9651 NE Winters Rd., Bainbridge Island, Wash. 98110

Berka, Thomas R., 14A Grove St., # 12, Arlington, Mass. 02174

Berkowitz, Michael Jay, 1502 Seneca Run, Ambler, Pa. 19002

Berube, Robert Boyd, 651 W. Mineral Ave., # 1526, Littleton, Colo. 80120

Beverly, Brian, 785 Kern St., Richmond, Calif. 94805

Beyer, Jay R., 1210 Lehigh St., Boulder, Colo. 80303

Bianchi, Timothy Ernest, 1225 Polk Place, Columbia Hgts., Minn. 55421

Biffoni, Ulysses John, 1206 Gyros Court, Bel Air, Md. 21014

Bilsker, David Leon, 2 Bayside Village Pl., # 110, San Francisco, Calif. 94107

Blankinship, Thomas Christopher, 3670 Glendon Ave., # 318, Los Angeles, Calif. 90034

Bloor, Stephen Michael, 7929 Barnhill Cir., Severn, Md. 21144-1805

Blosfelds, Ingar Theodore, 153 Fenwick Court, Delran, N.J. 08075

Bockhop, Bryan William, 948 Ashwood Green Ct., Snellville, Ga. 30278

Bogosian, Elizabeth Ann, 530 Summit Ave., Westfield, N.J. 07090

Bohdan, William J., 9 Edgerton St., Darien, Conn. 06820

Boisbrun, Glenn Warren, 12516 Audelia Rd., # 1002, Dallas, Tex. 75243

Bolcsak, James W., 11 Tower Place, Lawrenceville, N.J. 08648

Bondi, Michael A., 835 Como Ave., # 10, St. Paul, Minn. 55103

Booth, Paul Martin, 16217 Orchard View Court, Gaithersburg, Md. 20878

Borromeo, Alvin Anthony, 7000 Ernest Way, Dublin, Ohio 43017

Bowen, Mark David, 1183 Lake Pointe Lane, Plantation, Fla. 33322

Bowls, David B., 37 Smokestone, Irvine, Calif. 92714

Bradley, Wayne Harl, 136 Greenway, Bloomingdale, Ill. 60108

Brennan, Sean M., 3607 14th Avenue, Oakland, Calif. 94602

Brewer, Scott R., 802 Windcrest Court, Sleepy Hollow, Ill. 60118

Bristol, Craig J., 200 Avery Ln., # 5, Los Gatos, Calif. 95030

Brizuela, Corazon Cris, 7084 Sherwood Rd., Woodbury, Minn. 55125

Brodsky, Aaron S., 3350 34th St., # A, Boulder, Colo. 80301

Brooks, Michael Blaine, 3931 Stell Dr., Simi Valley, Calif. 93063

Brunelli, Robert R., 1020 S. Dudley St., Lakewood, Colo. 80226

Burnham, Daniel John, 609 W. Arlington Place, Chicago, Ill. 60614-2640

Burns, Phillip Wesley, 11710 Davisburg Rd., Davisburg, Mich. 48350

Burraston, Neil Kenneth, 123 Diamond St., Unit A, Arcadia, Calif. 91006

Burtis, John Arthur, 8722 Summer Wind Bay, Woodbury, Minn. 55125

Caldwell, Andrew T., 1020 N. Quincy St., # 202, Arlington, Va. 22201

Caldwell, Gregory D., 781 Monica Ln., Campbell, Calif. 95008

Campbell, Anthony Edward J., 5855 Gladys, Beaumont, Tex. 77706

Canady, Karen S., Rembrandtstrasse 30, Munich Germany 81245

Capehart, Brent A., 1201 E. Central, P.O. Box 447, Rogers, Ariz. 72756

Carlozzi, Mark Joseph, 115 East Bay Ave., Newport Beach, Calif. 92661

Carlson, Brett A., 7714 E. Pinchot Ave., Scottsdale, Ariz. 85251

Carlson, Stephen Conrad, 11534 Ivy Bush Ct., Reston, Va. 22091

Carnegie, Don Joseph, 7 La Quinta, Irvine, Calif. 92715

Carpenter, Alan Purdom, Jr., P.O. Box 373, Carlisle, Mass. 01741

Carrano, Cono Anthony, 4601 Connecticut Ave., # 616, Washington, D.C. 20008

Carroll, Rodney Brian, 19 York Rd., Wilmington, Del. 19803

Cataxinos, Edgar Richard, 520 E. Wilmington Ave., Salt Lake City, Utah 84106

Ceriello, Christopher G., 10 Melody Dr., Farmingdale, N.Y. 11735

Cerpa, Robert Keith, 1375 Seventh Ave., San Francisco, Calif. 94122

Chaikovsky, Yar Roman, 2304 Manhattan Ave., Manhattan Beach, Calif. 90266

Chan, Melvin David, 2054 Anthony Dr., Campbell, Calif. 95008

Chapin, Barry W., 22 Bryon Rd., # 3, Chestnut Hill, Mass. 02167

Chapman, Gena M., 516 Third Avenue, N.W., New Brighton, Minn. 55112

Cheek, John Joseph, 105 Kenwood Dr., Middletown, Ohio 45042

Chell, Timothy W., 67 Thornwood Ln., Sewell, N.J. 08080

Chen, George Chun, 1191 N. Tercera Ct., Chandler, Ariz. 85226

Chen, Kent Mark, 11 Hickory, Irvine, Calif. 92714

Chen, Peter P., 440 Santa Rita Ave., Menlo Park, Calif. 94025

Chen, Raymond T., 117 10th St., Huntington Beach, Calif. 92648

Chen, Sylvia Y., 1931 N. Cleveland St., # 511, Arlington, Va. 22201

Cherdak, Erik Benjamin, 711 Chestertown St., North Potomac, Md. 20878

Chiapetta, James Robert, 856 Great Oaks Trail, Eagan, Minn. 55123

Childs, Lisa Carol, 1255 N. State Pkwy., # 4E, Chicago, Ill. 60610

Chin, Stephen Mark, 45-38 149th St., Flushing, N.Y. 11355

Chisholm, Robert Francis, 2 S. State St., # 4, Concord, N.H. 03301

Chizek, Martin S., 152 McKeen St., # D-19, Brunswick, Me. 04011

Chmielewski, Stefan V., 1811 Willowtree Ln., # 3-A7, Ann Arbor, Mich. 48105

Cho, Lawrence M., 575 Arastradero Rd., Palo Alto, Calif. 94306

Christen, Daniel R., 29 Prescott St., # 18, Concord, N.H. 03301

Chuang, William W., 256 Casitas Ave., San Francisco, Calif. 94127

Churchill, Margaret A., 262 Lupine Pl., Monterey Park, Calif. 91754

Cimino, Frank Charles, 819 W. Lombard St., Baltimore, Md. 21201

Claiborne, Anthony B., 778 Cottage Ln., Boulder, Colo. 80304

Clement, Candice J., 16 Ashley Dr., Latham, N.Y. 12110-5132

Coester, Thomas M., 3746 Via Dolce, Marina Del Rey, Calif. 90292

Cohen, Morris E., 620 Ave I, Brooklyn, N.Y. 11230

Colaianni, Joseph Vincent, Jr., 5573 Seminary Rd., # 303, Falls Church, Va. 22041

Coleman, Granetta Maruth, 117 Canner St., New Haven, Conn. 06511

Conforti, Vitaliana, 6478 N. Oxford, Chicago, Ill. 60631

Cook, Elizabeth Whitham, 2025 Sarazen Place, Reston, Va. 22091

Cooper, Victor G., 23102 Carlow Rd., Torrance, Calif. 90505

Coursey, Robert Stevan, 1897 Mt. Brian Rd., N.E., Atlanta, Ga. 30329

Cox, Craig J., 1130 N. Cottonwood, Richardson, Tex. 75080

Creehan, R. Dennis, 66 Sutherland Rd., Arlington, Mass. 02174

Crisman, Douglas James, 989 Marquette Ln., Foster City, Calif. 94404

Crowe, Daniel Alan, 912 Oak Terrace Ct., St. Louis, Mo. 63026

Cullman, Louis Calvin, 3520 Marina Ave., Long Beach, Calif. 90808

Cummings, Kelly Lynn, 2217 Amhurst Court, Arlington Hgts., Ill. 60004

Cunningham, Robert Brown, 3114 Trolley Square Crossing, Atlanta, Ga. 30306

Currie, Robert Andrew, 1093 Westbrook Way, Atlanta, Ga. 30319

Czaja, Timothy Andrew, 4709 Stratford Ln., Eagan, Minn. 55123

D'Ascenzo, David Samuel, 1510 W. North Loop, # 431, Austin, Tex. 78756

Dardi, Peter Sabatino, 2324 Brewster St., St. Paul, Minn. 55108

Dauer, John Lloyd, Jr., 25-17 34th St., # 2R, Astoria, N.Y. 11103-4949

Davis, Elbert Alan, 8111 Greenslope, Austin, Tex. 78759

Davis, Steven Brett, P.O. Box 1524, Daphne, AL 36526

Davis, Steven G., 4 Glen Ora Dr., Bedford, Mass. 01730

deGuzman, Arnold Moises, 3211 113th Ave. S.E., Bellevue, Wash. 98004

DeCarlo, Kean J., 225 Spearfield Trace, Roswell, Ga. 30075-1881

DeFranco, Edward J., 14040 Skyline Blvd., Woodside, Calif. 94062

DeMoor, Laura J., 3727 N. Fremont # 2, Chicago, Ill. 60613

DeSanctis, Michael Anthony, 1128 Pomeroy Ave., Santa Clara, Calif. 95051

Desmarais, John Michael, 18 Pondview Close, Chappaqua, N.Y. 10514

Devore, Ronald D., 2345 Avenida de Guadalup, Santa Clara, Calif. 95054

DiSalvo, Joseph, 4432 Seeley Ave., Downers Grove, Ill. 60515

Dials, John J., Jr., 6027 N. 22nd Rd., Arlington, Va. 22205

Diamond, Konstantine Jordan, 1428 Yorkshire Rd., Grosse Pointe Park, Mich. 48230

Diepenbrock, Anthony Bernard, III, 4909 Wellington Park Dr., San Jose, Calif. 95136

Dietzen, Carolyn I., 110 Stonewood Circle, Lafayette, La. 70508

Dinella, Donald Peter, 5 Barbieri Ct., Raritan Borough, N.J. 08869

DiNovo, Andrew Gerald, 3817 Northwestern, Houston, Tex. 77005

Divney, Jeffrey Alan, 163 Willowleaf Dr., Littleton, Colo. 80127

Donovan, Paul F., 1123 Kenwood Avenue, Beloit, Wis. 53511

Doskocil, Douglas C., 30 Lindor Rd., N. Reading, Mass. 01864

Douglas, Kenneth Root, III, 1260 Gainsborough Dr., Sunnyvale, Calif. 94087

Dowell, Anthony E., 1185 Hampton Ln., Mundelein, Ill. 60060

Dryja, Michael A., 433 South 7th St., #1916, Minneapolis, Minn. 55415

Duffy, Vincent Edward, 250 Cherry Rd., Yorktown, N.Y. 10598

Dunham, Thomas Mark, 1530 N. Key Blvd., # 1222, Arlington, Va. 22209

Ehrlich, Henry Louis, 4445 Alvin Dark, # 286, Baton Rouge, La. 70820

Ehrlich, Marc A., 87 Town View Dr., Wapangers Falls, N.Y. 12590

Eipert, William F., 350 Broadway, # 1, Newport, R.I. 02840

Ellison, Eldora L., 64 Willard St., # 103, Quincy, Mass. 02169

Elnitski, John Joseph, Jr., 1016 Cottonwood Ct., Cranberry TWP, Pa. 16066

Embretson, Janet E., 19250 Rosedale Court, Deephaven, Minn. 55331

Emile, Volel, 3201 Duval Rd., Unit 815, Austin, Tex. 78759

Eng, Um Ping Peter, 3751 Jasmine Ave., # 203, Los Angeles, Calif. 90034

Engling, Timothy James, 1111 Lake St., Evanston, Ill. 60201

Epp Ryan, Sandra J., 1375 Iowa Ave. West, Falcon Hgts., Minn. 55108

Ett, Allen H., 9820 Inglemere Dr., Bethesda, Md. 20817

Evans, Curtis A., 12 White St., Concord, N.H. 03301

Faatz, Cynthia Thomas, 1139 Huntingdon Dr., San Jose, Calif. 95129

Ferris, Kassim M. A., 703 Cottage St. N.E., Salem, Oreg. 97301

Fieschko, Craig A., 2906 Forest Down, Madison, Wis. 53711

Finn, Reginald J., 280 East St., # 417, Mountain View, Calif. 94043

Fish, Raymond F., 75 Kings Grant Rd., Saunderstown, R.I. 02874

Fitzgerald, Jennifer Lynn, 1570 N. Western, Lake Forest, Ill. 60045

Flock, John, 141 E. 3rd St., # 6E, New York, N.Y. 10009-7304

Florenzo, Philip Anthony, 4610 College Ave., College Park, Md. 20740

Flournoy, Marc T., P.O. Box 40843, Memphis, Tenn. 38174-0843

Floyd, Patrick D., 5856 Winslow Rd., Whitehouse, Ohio 43571

Foley, James Robert, 2712 Arnold Rd., Des Moines, Iowa 50310

Fonda, David B., 3345 W. Wake Circle, West Jordan, Utah 84084

Force, Alan Peter, 360 Putnam Rd., Union, N.J. 07083

Foreman, Glenn B., 309 E. Jefferson Davis St., Rayne, La. 70578

Forest, Jane Choi, 151 N. Michigan Ave., # 1715, Chicago, Ill. 60601

Foster, Jason H., 1806 Orlando Rd., Columbus, Ohio 43232

Fowler, Charles C., 3400 Ave. of the Arts, # J-412, Costa Mesa, Calif. 92626

Friedrich, Valerie Kay, 1422 Chestnest Springs, Houston, Tex. 77062

Frische, Eric August, 833 Grand Teton Dr., Plano, Tex. 75023

Fuerst, John J., III, 2550 Woodstock Place, Boulder, Colo. 80303

Fuierer, Mariann, 1 Ogden Rd., Holley, N.Y. 14470

Fulghum, Roger Joseph, 6115 Rutherglenn, Houston, Tex. 77096

Furst, Marian J., 988 Sycamore Ave., Boulder, Colo. 80303

Gache, Russell Carter, 716 Savannah Pl., Birmingham, Ala. 35226

Gallagher, Gerard T., 1402 E. Monroe St., South Bend, Ind. 46615

Galvan, Hilda Contreras, 945 Creek Crossing, Coppell, Tex 75019

Garascia, Christian J., 517 River Ridge Dr., Waterford, Mich. 48327

Garretson, John Davis, 45 W. 60th St., # 32(C), New York, N.Y. 10023

Garrett, Patrick E., 606 Brookwood Rd., Baltimore, Md. 21229

Garrett, Scott M., 840 Station View Run, Lawrenceville, Ga. 30243

Gattari, Patrick G., 840 Todd Court, Deerfield, Ill. 60015

Gaylor, Diane Catherine, 2250 Clarendon Blvd., # 916, Arlington, Va. 22201

Gazdzinski, Robert Francis, 704A Cypress Point Circle, Mt. Laurel, N.J. 08054

Gellenthien, Thomas C., 717 S. 25th Street, Arlington, Va. 22202

Gentin, Jonathan, 4000 Mass. Ave., N.W., # 1327, Washington, D.C. 20016

Gerahik, Gary J., 1480 Ocean Ave., Brooklyn, N.Y. 11230

Giaccio, Anthony, 80 Bay St. Landing - Apt. 9C, Staten Island, N.Y. 10301

Gibbons, Robert J., 231 Buckthorn Rd., New Castle, Colo. 81647

Giezentanner, John Phillip, 1175-D Baker St., # 12-175, Costa Mesa, Calif. 92626

Giffels, Robert E., 11719 S. Brightway, Mokena, Ill. 60448

Gilden, Brian D., 96 Pheasant Rd., Billerica, Mass. 01821

Giles, Alan Louis, 3200 Brush Dr., Falls Church, Va. 22042

Gilpin, Brian G., 1220 N. LaSalle, # 3J, Chicago, Ill. 60610

Gleason, Mark L., 11615 Rodeo Dr., Burnsville, Minn. 55337

Glitzenstein, Kurt L., 44 Blue Jay Ln., Concord, Mass. 01742

Gold, Philip Howard, 3804 Folly Quarter Rd., Ellicott City, Md. 21042

Goldberg, Daniel Mark, 3429 NW 44th St., # 104, Ft. Lauderdale, Fla. 33309

Goldberg, Daniel S., 13 Stonicker Dr., Lawrenceville, N.J. 08648

Golden, Dean Robert, 899 South CR 250 East, Winona Lake, Ind. 46590

Goldsmith, Barry Stuart, 11918 Tildenwood Dr., N. Bethesda, Md. 20852

Goldstein, Sandra M., 1416 Hopkins St., NW, # 3, Washington, D.C. 20036

Goltry, Michael W., 125 E. Echo Ln., Phoenix, Ariz. 85020

Graeser, D'Vorah, 47 Victoria Rd., United Kingdom NW4 2RP, London

Graham, Lawrence Dean, 1265 165th Avenue SE, Bellevue, Wash. 98008

Gratz, Michael Joseph, 3809 South 20th St., Milwaukee, Wis. 53221

Greenberg, Sheryl Mindy, 21 Circle Dr., Weston, Mass. 02193

Greenlee, Michael Roy, 2424 Meadow Isle Ln., Lawrenceville, Ga. 30243

Greenspoon, Robert Philip, 851 N. Wood St., # 1, Chicago, Ill. 60622

Griecci, John A., 2101 21st St., # 318, Signal Hill, Calif. 90806

Griem, John M., Jr., 1248 Bloomfield St., # 1, Hoboken, N.J. 07030

Groff, Bradley K., 1399 Holly Ln., N.E., Atlanta, Ga. 30329

Gross, Mason A., 2322 Burch Circle, Atlanta, Ga. 30319

Gross, Russell L, 34-10 Fox Run Dr., Plainsboro, N.J. 08536

Groth, Henry Joseph, 3332 Duke Court, Santa Clara, Calif. 95051-6103

Grove, Andrew Michael, 1256 Cedar, Birmingham, Mich. 48009

Guenther, John P., 18755 Blue Skies, Livonia, Mich. 48152

Guernsey, Larry B., 248 S. 21st St., San Jose, Calif. 95116

Guice, John Roland, Jr., 12205 St. Peter Court, # M, Germantown, Md. 20874

Gupta, Balaram, 6947 Everhrt Rd., # 3204, Corpus Christi, Tex. 78413

Ha, Michael Bruce, 2474 Centinela Ave., # 4, Los Angeles, Calif. 90064

Habermas, Karl L., 245 E. 37th St., # 5B, New York, N.Y. 10016

Hackbarth, Marybeth B., 5427 N. Berkeley Blvd., Whitefish Bay, Wis. 53217

Hails, Robert Louis, Jr., 5425 Crystalford Ln., Centreville, Va. 22020

Hakamaki, Michaele Ann, 1641 Garden Ln., White Bear Lake, Minn. 55110

Halajian, Dicran, 44 Old East Neck Rd., Melville, Nebr. 11747

Hale, Jeffrey D., 1224 Alton Woods Dr., Concord, N.H. 03301

Handley, Laura A., 19 Doris Ct., Redwood City, Calif. 94061

Harris, James Edward, 6804 Amethyst, Plano, Tex. 75023

Hartung, Wendy Kay, 5946 EP True Pkwy., W. Des Moines, Iowa 50266

Harvey, James F. III, 321 84th Ave. NE, Norman, Okla. 73071

Haynes, Michael Neal, 96 Bradhill Ln., Concord, N.H. 03301

Hendler, Pablo D., 1376 Midland Ave., # 309, Bronxville, N.Y. 10708

Herlihy, Eileen M., One School St., # 304, Arlington, Mass. 02174

Hickey, Denise Maureen, 236 W. Robinson Ave., San Diego, Calif. 92103-4020

Higgins, Patrick Henry, 317 Kolmar, La Jolla, Calif. 92037

Hirshman, Jesse Adam, 344 Frazier Dr., Pittsburgh, Pa. 15235

Ho, Cynthia M., 322 W. 57th St., # 39D, New York, N.Y. 10019

Ho, Eric, 814 6th St., # 5, Santa Monica, Calif. 90403

Hoag, Robert Patrick, 237 Lincoln Ave., Hasbrouck Hgts., N.J. 07640

Hodgson, Serge John, 33002 Lake Huron, Fremont, Calif. 94555

Hoff, Michael A., 521 Arbor Dr., # 304, San Diego, Calif. 92103

Hoffman, Brian Michael, 3100 Cole Ave., # 113, Dallas, Tex. 75204

Hoffman, Michael F., 52 Woodside Dr., Albany, N.Y. 12208

Holland, Robert Wayne, 3402 Rosefinch Trail, Austin, Tex. 78746

Holman, Christopher Michael, 1240 Dale Ave., # 1, Mountain View, Calif. 94040

Holman, Molly A., 147 Coolidge St., # 1, Brookline, Mass. 02146

Homa, Joseph Michael, 168 W. Main St., # 1, Port Jervis, N.Y. 12771

Hopenfeld, Bruce Robert, 333 S. Doheny Dr., # 106, Los Angeles, Calif. 90048

Howard, James E., 5630 Wind Drift Dr., Powell, Ohio 43065

Hsi, Jeffrey D., 12 Bacorn Rd., Flemington, N.J. 08822

Hsu, Lee, 1254 W. 220th St., Torrance, Calif. 90502

Hu, Dan C., 4615 Spruce, Bellaire, Tex. 77401

Hwang, Sharon Ann, 1 N. 617 Turnberry Ln., Winfield, Ill. 60190

Imperato, John Louis, 680 47th Ave., San Francisco, Calif. 94121

Ingolia, Diane E., 3113 Stockton Pl., Palo Alto, Calif. 94303

Isztwan, Andrew George, 145 Hicks St., # A40, Brooklyn, N.Y. 11201

Jacobs, Jeffrey David, 6261 Shadybrook Ln., #289, Dallas, Tex. 75206

Jacobson, Jill Ann, 2133 Rock Street, Mountain View, Calif. 94043

Jalali, Laleh, 1545 18th St., N.W., #406, Washington, D.C. 20036

Jamison, Bruce Kyle, 3717 Chevy Chase, Houston, Tex. 77019

Johnson, Brian Lee, 10703 Barnhill Dr., Austin, Tex. 78758

Johnson, David A., 3 Wainwright Dr., Poquoson, Va. 23662

Johnson, Joseph L., 619 E. Stanford, Springfield, Mo. 65807

Johnson, Linda S., 8216 S. 87th St., # 4, La Vista, Nebr. 68128

Johnson, Mark K., 4023 Harvey Ave., Western Springs, Ill. 60558

Johnston, Danielle Marie, 2850 N. Sheridan Rd., # 1021, Chicago, Ill. 60657

Johnston, Lisa H., 26H Country Squire Ct., W. Lafayette, Ind. 47906

Johnston, Scott W., 1521 E. 50th St., Minneapolis, Minn. 55417

Jones, Eric T., 34418 Shorewood Dr., New Baltimore, Mich. 48047

Jones, Lorri Walker, 8 Arch St., # 1, Norwalk, Conn. 06850

Jovanovic, Jovan N., 1419 E. 58th St., # 1, Chicago, Ill. 60637

Kacvinsky, John Francis, 5225 Pooks Hill Rd., # 622N, Bethesda, Md. 20814

Kadle, Ranjana, 63 Sable Run, E. Amherst, N.Y. 14051

Kalminov, Sivon, 7534 Sausalito Ave., West Hills, Calif. 91307

Kane, Michael J. Saratoga Ln., Eden Prairie, Minn. 55347

Kang, Suil, 106 MacDougal St., # 3, New York, N.Y. 10012

Kaplan, Cindy S., 10 Midpark Lane, Ladve, Mo. 63124

Kapouytian, Ararat, 7045 Vanscoy Ave., N. Hollywood, Calif. 91605

Karra, Satheesh K., 5970 Clerkenwell Ct., Burke, Va. 22015

Kawula, Walter J. Jr., 6147 N. Olcott, Chicago, Ill. 60631

Keeble, Tania J., 3806 Porter St., N.W., # 102, Washington, D.C. 20016

Kellogg, Leigh Robinson, 5500 - 68D Fortunes Ridge Dr., Durham, N.C. 27713

Kellogg, Rosemary P., 295 Bellevue Dr., Boulder, Colo. 80302

Kempf, Paul Philip, 5616 Concord Ave., South, Edina, Minn. 55424

Kenady, Donald Brent, 4676 Talmadge Rd., # 2D, Toledo, Ohio 43623

Kim, Richard, 7950 Via Capri, La Jolla, Calif. 92037

Kim, Rosa S., 2145 Larkin St., # 11, San Francisco, Calif. 94109

Kim, Stanley H., 6254 Caminito Juanico, San Diego, Calif. 92111

Kinsella, Peter Joseph, 5702 Birch Trail, Shoreview, Minn. 55126

Kirkland, Mark D., 308 Palmetto Ave., # 123, Pacifica, Calif. 94044

Kispert, Jennifer Ann, 27 Lincoln Ave., Marblehead, Mass. 01945-2532

Kleinsmith, David F., 600 Third Ave., # 416, San Diego, Calif. 92101

Klembczyk, Jeffrey R., 44 Springfield Dr., Voorheesville, N.Y. 12186

Klembus, Nancy M., 1539 Chanticlair Circle, Wixom, Mich. 48393

Klima Silberg, Catherine I., 6022 Mulford Hills Dr., Loves Park, Ill. 61111

Kolodka, Joseph John, 769 E. Main St., Bridgewater, N.J. 08807

Koneru, Phanesh, 24791 San Pedro Ave., Laguna Hills, Calif. 92653

Kong, John P., 1101 New Hampshire Ave., # 408, Washington, D.C. 20037

Kordziel, Linda Liu, 1200 N. Veitch St., # 717, Arlington, Va. 22201

Kott, Stephen J., P.O. Box 37, Stewarts Point, Calif. 95480

Kozuch, James Jeffrey, 942 Bridle Path Rd., Allentown, Pa. 18103

Krall, Noreen Anne, 901 South Pierson Way, Lakewood, Colo. 80226

Krasinski, Monica, 26 Shady Glen Ln., Somers, Conn. 06071

Krawshuk, Martin Anthony, 2215 Albany Ave., West Hartford, Conn. 06117

Kriegsman, Daniel S., 67 Arlington St., # 1, Newton, Mass. 02158

Krueger, Cynthia Ann, 211 Yacht Club Way, # 352, Redondo Beach, Calif. 90277

Kuvelker, Subhash, 6346 Rainprint Row, Columbia, Md. 21045

Labbee, Michael F., 4055 E. Weldon Ave., Phoenix, Ariz. 85018

Lam, Chung W., 262 Bonita Ln., Foster City, Calif. 94404

Lampert, Scott L., 499 Cambridge Ln., Ft. Lauderdale, Fla. 33326

Langton, Grant Todd, 25129 Feijoa Ave., Lomita, Calif. 90717

Lanza, John D., 61 Oakland St., Wellesley Hills, Mass. 02181

Lao, Kenneth Quochuy, 650 Glen Ave., Westfield, N.J. 07090

LaSalle, Carol Mary, 25 Elsie St., San Francisco, Calif. 94110

Lau, Billy Y., 486 N. Vista Del Notre, Walnut, Calif. 91789

Law, Ellen D., 826 Lincoln St., Evanston, Ill. 60201

Lee, Dolly M., 541 Del Medio, # 41-108, Mountain View, Calif. 94040

Lee, Jun Young, 10306 Winstead Ct., Woodstock, Md. 21163

Lee, William David, 6824 St. Lawrence, Plano, Tex. 75024

Leflar, John, 832 Bremerton Dr., Sunnyvale, Calif. 94087

Leitich, Greg H., 2600 Lake Austin Blvd, # 3303, Austin, Tex. 78703

LeMoine, Dana B., 13213 N. 69th St., Scottsdale, Ariz. 85254

Lempia, Bryan J., 1414 Laurel Ave., # L-328, Minneapolis, Minn. 55403

Lenkin, Alan Mitchell, 531 N. Alta Vista Blvd., Los Angeles, Calif. 90036

Levitt, Kenneth E., 16550 Elm Rd., Maple Grove, Minn. 55311

Lewine, Donald A., 40 Maclean Dr., Sudbury, Mass. 01776

Lewis, Douglas L, 1133 Sandhurst Dr., Buffalo Grove, Ill. 60089

Liao, Frank Y., 226 Ashwood Ct., Howell, N.J. 07731

Liepa, Mara E., 816 Ashland Ave., St. Paul, Minn. 55104

Likourezos, George, 9313 Ridge Blvd., Brooklyn, N.Y. 11209

Limbach, Alan A., 1205 Daniel Court, Milpitas, Calif. 95035

Lindenfeldar, Russell George, 1730 Pine St., # 3R, Philadelphin, Pa. 19103

Linzbach, Matthew Ronald, II, 1901 14th Ave. NW, East Grand Forks, Minn. 56721

Liotta, MaryAnne, 1927 Kennedy Dr., # 102, McLean, Va. 22102

Lipsey, Rebecca Gwen, 1968 Shuey Ave., Walnut Creek, Calif. 94596

Litovsky, Allan Zinovy, 7280 Hillside Ave., # 307, Los Angeles, Calif. 90046

Livesay, Paul Owen, 1235 Holly St., # 3, San Carlos, Calif. 94070

Lo, Jack, 1415 Eddington Ln., Daly City, Calif. 94014

Long, Suzanne Elaine, 100 Canterbury Dr., Parkersburg, W. Va. 26104

Longo, Robin R., 291 Commonwealth Ave., # 7, Boston, Mass. 02115

Lorenz, Todd A., 1420 Taylor St., # 3, San Francisco, Calif. 94133

Losk, Jonathan Thomas, 2467 Purdue Ave., Los Angeles, Calif. 90064

Lutton, Richard Joseph, Jr., 5454 Newcastle, # 1806, Houston, Tex. 77081

Lyon, H. Mark, 12 Chester Circle, Los Altos, Calif. 94022

Lytle, Bradley D., 1425 Valley Mill Ct., Herndon, Va. 22070

MacDonald, Malcolm John, 8576 Harvest View Ct., Ellicott City, Md. 21043

Maddry, Tyler, 3544 S. Utah St., Arlington, Va. 22206

Maeda, Mayumi, 4510 Briar Hollow Place, # 312, Houston, Tex. 77027

Maeyaert, Paul L., 1633 Lakewood Dr., Maplewood, Minn. 55119

Magee, Theodore Martin, 2736 Ulysses St., N.E, Minneapolis, Minn. 55418

Maher, David William, 870 E. El Camino Real, # 25, Mt. View, Calif. 94040

Malone, Thomas Edward, 920 North Kings Rd., # 209, West Hollywood, Calif. 90069

Malpass, Gerald Dixon, Jr., 11815 Orchard Mountain Dr., Houston, Tex. 77059

Manghera, Peter John, 2909 Oakridge Ave., Madison, Wis. 53704

Maniere, Francois Y., 2 Auburn Pl., Princeton Jct., N.J. 08550

Marantidis, Constantinos, 1501 Hyland Ave., Arcadia, Calif. 91006-1809

Margolies, Stacy Beth, 3003 Van Ness St., N.W., S304, Washington, D.C. 20008

Marmo, Carol A., 102 Wye Oake Dr., Cheswick, Pa. 15024

Martin, Christine F., 3030 N. Sheridan Rd., #307, Chicago, Ill. 60657

Massina, Glenn M., 813 Fairfax Rd., Drexel Hill, Pa. 19026

Matos, Jose R., 231 Romeo Dr., New Castle, Del. 19720

Mavrakakis, Thomas Christos, 235 Embarcadero Rd., Palo Alto, Calif. 94301

McCauley, Stephen Lynn, 1700 E. 13th St., # 12IE, Cleveland, Ohio 44114-3218

McGrath, Michael B., 4265 Ruthelma Ave., Palo Alto, Calif. 94306

McKay, Gail Anne, 1133 64th St., LaGrange, Ill. 60525

McKinney, Osborne K., 56 White Oak Ct., Lake Jackson, Tex. 77566

McNutt, Matthew Brown, 1467 Benson Blvd. East, Stillwater, Minn. 55082

McPhail, William Rex, 143 W. 10th, Bristow, Okla. 74010

Mealy, Melanie Louise, 4440 Raleigh Ave., # 401, Alexandria, Va. 22304

Mehrman, Michael J., 5011 Lake Hollow, Douglasville, Ga. 30135

Mei, Peter Chen-Cheng, 3138 Rodney Common, Fremont, Calif. 94538

Meier, Linda Blair, 313 W. Chapel Ln., Midland, Mich. 48640

Melito, Carl Frank, 13217 Emily Rd., Suite 3205, Dallas, Tex. 75240

Merchant, Mary Anthony, 2902 Delcourt Dr., Decatur, Ga. 30033

Merkel, Edwin V., 3608 S. First Rd., Arlington, Va. 22204

Micallef, Joseph A., 55 Arell Ct., Alexandria, Va. 22304

Michaud, Richard Raymond, 380 Hitchcock Rd., # 140, Waterbury, Conn. 06705

Mickelson, Nils Peter, RR # 3 Box 86F, Gorham, Me. 04038

Milbrada, Edward John, 5613 Winding Creek Way, West Chester, Ohio 45069

Miller, Jeffrey J., 76 Forest St., # 1 F, Stamford, Conn. 06901

Miller, Thomas A., 2471 N. Clybourn Ave., Chicago, Ill. 60614

Miller, Todd Richard, 3829 Davis Place, N.W., # 1, Washington, D.C. 20007

Minihane, Derek E., 326 W. 83rd St., # 4B, New York, N.Y. 10024

Mirman, Rita, 427 Oregon St., # 6, Cincinnati, Ohio 45202

Mitchell, James Christian, 524 Irving Ave., San Jose, Calif. 95128

Mitchell, Janyce Rae, 2417 Parker Place, Honolulu, Hi. 96822

Mlynar, Theodore J., 5 Chelsea Court, Edison, N.J. 08820

Mockler, John Thomas, 7308 Parkridge Blvd., # No. 30, Irving, Tex. 75063

Moeller, Randall H., 912 1/2 North 35th St., Seattle, Wash. 98103

Molano, Michael A., 1330 Alma, # El01, Walnut Creek, Calif. 94598

Monroe, Wesley Warren, 367 Allendale Rd., Pasadena, Calif. 91106

Monteleone, Geraldine D'Amico, 15 Parkwood Court, Edison, N.J. 08837

Moore, Charles Foster, 3900 Crosby Dr., # 1812, Lexington, Ky. 40515

Morris, Susan K., 5377 South 1410 East, Salt Lake City, Utah 84117

Moses, Thomas Lawrence, 404 High Valley Blvd., Greenville, S.C. 29605

Moss, Richard Lloyd, 46-24 Belmont Rd., Great Neck, N.Y. 11020

Mottes, Andrew J., 406 Barclay Rd., Rosemont, Pa. 19010

Muenzen, Colette Christine, 704 N. Wayne St., # 203, Arlington, Va. 22201-1856

Muraff, James Perry, 1250 N. Dearborn, Chicago, Ill. 60610

Murphy, Christopher P., 11 Harvard Ct., Rockville, Md. 20850

Murphy, Matthew B., 1649 12th Ave., # 1, San Francisco, Calif. 94122

Myaliwiec, Richard Allen, 15 Nottingham Dr., Natick, Mass. 01760

Nadan, Michele Milnes, 2673 Thornhill Dr., San Carlos, Calif. 94070

Narasimhan, Meera P., P.O. Box 695, Vienna, Va. 22183

Nasiedlak, Tyler L., 3237 Casco Circle, Wayzata, Minn. 55391

Nelson, James P., 4936 Hanson Rd., Shoreview, Minn. 55126

Neumann, Clarke William, Jr., 929 Marine St., # B, Santa Monica, Calif. 90405

Neuner, Kathleen Elizabeth, 1986 Middlesex St., # 22, Lowell, Mass. 01851

Nguyen, Frank-Thanh Duc, 3950 Paul Terrace, Fremont, Calif. 94538

Niederluecke, Kurt J., 6521 Quail Crossing, Chanhassen, Minn. 55317

Nigohosian, Leon, Jr., 8 Algonquin Ct., Wayne, Pa. 19087

Noble, Lisa Dean, 555 Alger Dr., Palo Alto, Calif. 94306

Noe, Jeremy E., 646 Lexington Square West, Gurnee, Ill. 60031

Nordstrom, Erik R., 1410 Carling Dr., # 210, St. Paul, Minn. 55108

Norton, Karin J., 36 Third Place, Brooklyn, N.Y. 11232

Nuss, Eric John, 7980 Drumbeat Pl., Jessup, Md. 20794

O'Brien, David W., 3839 Dry Creek Dr., #206, Austin, Tex. 78731

O'Bryant, David W., 8766 S. 620 E., Sandy, Utah 84070

O'Connor, Mark Edward, 810 Martha Lake Ct., Shoreview, Minn. 55126

O'Regan, Briana Kirsten, 6 Oak St., Gorham, Me. 04038

O'Rourke, Gerard M., 2308 Mousley Place, Wilmington, Del. 19810

Okamoto, James Kozo, 1910 Magdalena Circle, # 91, Santa Clara, Calif. 95051

Olson, Maria Sudendorf, 8526 N. Karlov Ave., Skokie, Ill. 60076

Orzech, Jennifer Mary, 1024 N. Utah St., # 519, Arlington, Va. 22201

Orzolek, Robert J., 2156 Hollyberry Ct., Pottstown, Pa. 19464

Osborne, Thomas Joseph, Jr., 1428 Golden Gate Blvd., # H-12, Mayfield Hgts., Ohio 44124

Ostrom, Kenneth A., 5857 W. 78th St., Los Angeles, Calif. 90045

Pang, Andrew Y., 73 N. Spring St., Concord, N.H. 03301

Papavasiliou, Elaine, 2405 Hartfell Rd., Timonium, Md. 21093

Pappas, Joanne N., 21 Harborview St., Squantom, Mass. 02171

Pappenhagen, Thomas Louis, 122 Oldbury Dr., Wilmington, Del. 19808

Parker, James S., 5403 NW 26 Pl., Gainesville, Fla. 32606

Parks, Jonathan C., 733 Fallowfield Ave., Charleroi, Pa. 15022

Patnode, Patrick K., 1206 Cambridge Manor Dr., Scotia, N.Y. 12302

Pauls, Brian Curt, 616 Three Rivers East, Ft. Wayne, Ind. 46802

Pauly, Daniel Michael, 2747 Emerson Ave. S., Minneapolis, Minn. 55408

Paynter, L. Scott, 6170 N. Oxford St., Indianapolis, Ind. 46220

Peacock, James Clayton, III, 14866 Farwell Ave., Saratoga, Calif. 95070

Pentlicki, Stephen John, 7 Redding Ridge Dr., Gaithersburg, Md. 20878

Perreault, Donald J., 11 Kossuth St., Exeter, N.H. 03833

Peterman, Thomas Cregg, 266 E. 236th St., Bronx, N.Y. 10470

Phipps, Charles E., 2938 W. Royal Lane, # 3149, Irving, Tex. 75063

Pillai, Xavier, 5450 Astor Ln., # 404, Rolling Meadows, Ill. 60008

Piper, Michael Wayne, 7121 Highland Heather Ln., Dallas, Tex. 75248

Pleszczynska, Joanna, 4216 Sherando Ln., Annandale, Va. 22003

Podgorski, Annette K., 5917 Tomlinson Dr., McHenry, Ill. 60050

Polglaze, Daniel J., 2480 S. Highway 100, # 105, St. Louis Park, Minn. 55416

Polizzi, Catherine Mary, 10 Stonepine Rd., Hillsborough, Calif. 94010

Pollack, Alan Henry, 50 Lexington Ave., # 19H, New York, N.Y. 10010

Porter, Gregory Lawrence, 3469 Kawkawlin River Dr., Bay City, Mich. 48706

Powell, William Eugene, III, 4725 Edwards St., Alexandria, Va. 22312

Powers, Margaret A., 209 Mariposa Ave., Mountain View, Calif. 94041

Puknys, Erik R., 124 N. Furman St., Alexandria, Va. 22304

Purks, David K., 1132 Ridgeview Circle, Broomfield, Colo. 80020

Quimby, Kathleen Hall, 820 King St., # 3, Alexandria, Va. 22314

Quittner, Andrew Lewton, 414 Clifford St., Corpus Christi, Tex. 78414-1926

Rabinowitz, Stephen Solomon, 720 Greenwich St., # 4R, New York, N.Y. 10014

Ramanujam, Rama P., 1310 Fairlane Ave., Brookfield, Wis. 53005

Ramsey, Robert Wilbur, III, 2313 S. Joyce St., Arlington, Va. 22202

Raskin, Joshua L., 244 Madison Ave., # 16L, New York, N.Y. 10016

Rattner, Charles Arthur, 33 Settlers Trail, Stamford, Conn. 06903

Rauschenbach, Kurt, 425 Woburn St., # 44, Lexington, Mass. 02173

Ray, Jeanine Susanne, 8625 Purnell Ridge Rd., Wake Forest, N.C. 27587

Raynes, Alan Steven, 4240 Via Marina # 25, Marina Del Rey, Calif. 90292

Rayve, Brian Richard, 3622 Crickwood Circle, Indianapolis, Ind. 46268

Read, David Charles, 25723 Hunt Trail, South Bend, Ind. 46628

Redman, Lesley Ann, 239 Elm St., Glenview, Ill. 60025

Reed, Derrick William, 2215 Pier Ave., Santa Monica, Calif. 90405

Reginelli, Arthur M., 6076 Padua Dr., N. Royalton, Ohio 44133

Rein, Frederick Howard, 200 E. 90th St., # 6A, New York, N.Y. 10128

Rein, Michael David, 5718 Stage Line Court, Arlington, Tex. 76017

Reinecke, Susan D., 13621 Cedar Rd., # 1, University Hgts., Ohio 44118

Remus, Mark Herbert, 6N419 Ferson Woods Dr., St. Charles, Ill. 60175

Rice, Dan Merrill, 150 West 55th St., New York, N.Y. 10019

Richardson, Julie Hauschild, 103 Bathgate Ln., Cary, N.C. 27513

Richardson, Robert R., 4166 Hosman Circle NW, Silverdale, Wash. 98383

Rickey, June Elizabeth, 10801 Deer Run, Grafton, Ohio 44044

Rider, Emily Kay, 2746 Sedgeway Ln., Carrollton, Tex. 75006

Rietz, Roy Kenneth, 1659 Maple Knoll Dr., Falcon Hgts., Minn. 55113

Rigsbee, John T., Jr., 395 Euclid Ave., # 201, San Francisco, Calif. 94118

Riley, Louis A., 2306 Brun, Houston, Tex. 77019

Riley, Pamela Michigan, 2765 Pine Castle Dr., Hanford, Calif. 93230

Ritz, Peter B., 1225 Gilbert Rd., Meadowbrook, Pa. 19046

Ritz, Terry Grant, 3200 S. Gessner Rd., #342, Houston, Tex. 77063

Rizzo, Matthew, 962 NW 93 Ave., Plantation, Fla. 33324

Roberts, Paul Andrew, 6300 Hollins Dr., Bethesda, Md. 20817

Robinson, Ann Gallagher, 5502 East Galbraith Rd., Cincinnati, Ohio 45236

Roe, William Kevin, 4975 Moorpark Ave., San Jose, Calif. 95129

Rose, Kenneth Jon, 4604 49th St., N.W., Washington, D.C. 20016-4321

Rosen, Mark J., 60 Garlor Dr., Havertown, Pa. 19083

Rosenberg, Matthew A., 8079 Hafner Ct., University City, Mo. 63130

Rouille, David W., 8 Elm St., Hudson, Mass. 01749

Ruschke, David P., 1930 Mount Royal Terrace, Baltimore, Md. 21217

Russell, Douglas Donald, 3449 Highlands Bridge Rd., Sarasota, Fla. 34235

Rutt, Steven, 5601 8th St. N., Arlington, Va. 22205

Sadler, Lloyd W., 2110 Country Club Dr., Salt Lake City, Utah 84109

Saffold, David J., 2435 Twin Creek Ct., Duluth, Ga. 30136

Samuel, Mathias W., 3610 Gramercy, Houston, Tex. 77025

Santema, Steven R., 1122 N. Clark, # 909, Chicago, Ill. 60610

Santisi, Steven M., 727 S. Dearborn St., # 513, Chicago, Ill. 60605

Santos, Daniel Joseph, 970 Sidney Marcus Blvd., # 1414, Atlanta, Ga. 30324

Santos, Leslie Sharon, One Tanglewood Rd., # Z, Berkeley, Calif. 94705

Sardesai, Rajendra G., 420 W. Coolidge Dr., San Gabriel, Calif. 91775

Saterno, Eric Karl, 2085 1/2 Tustin Ave., Costa Mesa, Calif. 92627

Scadina, Mark Russell, 5172 Derek Dr., San Jose, Calif. 95136

Scaduto, Patricia M., 1205 Wakefield Dr., Midland, Mich. 48640

Schiff, J. Michael, 808 Coleman Ave., #19, Menlo Park, Calif. 94025-2456

Schmaltz, David Gerard, 11060 100th Ave. North, Plymouth, Minn. 55369

Schulte, Daniel Christopher, 1170 Lealand Rd., Maplewood, Minn. 55109

Schwartz, Michael Alan, 950 25th St., N.W., # 1021N., Washington, D.C. 20037

Scott, Kimberly, 4094 Woodrush Lane, Comstock Park, Mich. 49321

Scotti, Robert Francis, 3146 NE 63rd Ave., Portland, Oreg. 97213-4512

Seferian, Peter George, 838 West 42nd Street, Houston, Tex. 77018

Segal, Marc Steven, 145 Pine Court, Norristown, Pa. 19401

Selbo, Todd W., 40 Monte Vista, Laguna Hills, Calif. 92653

Sellers, Michael E., 4717 Clairson Dr., Knoxville, Tenn. 37931

Seo, Ik Hyun, 77 West Huron, #1703, Chicago, Ill. 60610

Shah, Naineah P., 6841 Day Dr., # 708A, Parma, Ohio 44129

Shamrock, Douglas W., 43 Warrington Ln., Concord, Ohio 44060

Shannon, Paul J., 503 Balderston Dr., Exton, Pa. 19341

Shapiro, Stuart Bryan, 12290 Green Meadow Dr., # 504, Columbia, Md. 21044

Shariati, Behrooz, 706 University Dr., Menlo Park, Calif. 94025-4914

Sharrott, Douglas, 31 Browning Dr., Greenlawn, N.Y. 11740

Shattil, Steven James, 1302 Grandview, Boulder, Colo. 80302

Shaurette, James Dale, 5577 Fera Dr., Bethel Park, Pa. 15102

Shemwell, Charles Ethan, 3039A Kaiser Dr., Santa Clara, Calif. 95051

Shen, Evelyn D., 11 Hancock St., # 2, Boston, Mass. 02114

Shofi, David M., 1900 Summer St., Unit 16, Stamford, Conn. 06905

Shoger, Elaine Turley, 2836 Scarborough Rd., Cleveland Hgts., Ohio 44118

Sieburth, Kathryn Lutomski, 6 Latimer Ave., Coram, N.Y. 11727

Siekevitz, Miriam, 90 Woodridge Rd., Hillsborough, Calif. 94010

Silberman, Gregory P., 1400 2nd Ave. N., # 289, Seattle, Wash. 98109

Simmensen, Finn Thomas, 2249 Portola Ave., Stockton, Calif. 95209

Singer, Lawson F., 30 Andover Rd., Roslyn Hgts., N.Y. 11577

Singer, Phillip Arlen, 3616 Jennifer St., San Diego, Calif. 92117

Sinn, Eric, 2905 Seay St., # 201, Alexandria, Va. 22314

Sipes, Christopher Neil, 3133 Connecticut Ave., # 1126, Washington D.C. 20008

Skoog, Mark T., 5144 Upton Ave. South, Minneapolis, Minn. 55410

Slifer, Russell Dale, 5324 Drew Ave. S., Minneapolis, Minn. 55410

Smith, Christopher John, 956 Wood Duck Ave., Santa Clara, Calif. 95051

Smith, Diane Evensen, 2415 10th Ave., Watervliet, N.Y. 12189

Smith, J. David, 4430 Taney Ave., # 301, Alexandria, Va. 22304

Smith, Michael D., 5935 DaCosta St., Dearborn Hgts., Mich. 48127

Smith T, John Winston, 1608 Cahaba Road, Birmingham, Al. 35223

Songer, Michael Joseph, 17924 Winslow Rd., Floor 2, Shaker Heights, Ohio 44122

Spangler, Jonathan David, 1926 Aldrich Ave. South, # 12, Minneapolis, Minn. 55403

Spencer, Karen Y., 438-24th Ave., # 3, San Francisco, Calif. 94121

Springer, Kenneth D., 2477 W. Lincoln Ave., # 66, Anaheim, Calif. 92801

Stafford, Philip Roy, 2413 Prairie Green, # C, Urbana, Ill. 61801

Steck, Jeffrey A., 141 W. 10th St., # 1, New York, N.Y. 10014

Steele, Patrick Keith, 8614 Parmer Court, Houston, Tex. 77064

Steger, Steven G., 1416 W. Wolfram, # 1, Chicago, Ill. 60657

Steinhauer, Esther Helen, 9 Gedney Terr., White Plains, N.Y. 10605

Steins, Karl Michael, 3847 Zoe St., San Diego, Calif. 92117

Sternerick, David M., 5598 Carlsbad Ct., Fairfield, Ohio 45014

Stewart, John C., 8817 S.E. 61st St., Mercer Island, Wash. 98040

Stiefeld, Robyn Erica, 2704 Marie Park NE, Albuquerque, N.M. 87112

Stokley, Linda A., 22323 Morning Lake Dr., Katy, Tex. 77450

Stolte, Michael Allen, 6419 Pineshade Ln., Houston, Tex. 77008

Straussman, Richard, 63 Perkins Dr., West Orange, N.J. 07052

Stutius, Wolfgang E., 80 Country Dr., Weston, Mass. 02193

Suffredini, Brian Richard, 794 Lexington Ave., # 3, New York, N.Y. 10021

Sugimura, Audrey M., 1545 18th St., N.W., # 303, Washington, D.C. 20036

Sullivan, Sean M., 10132 S. Bell, Chicago, Ill. 60643

Sun, Hsiang-ning, 4212 Villanova St., Houston, Tex. 77005

Superko, Colleen, 6202 Avalon Dr., Bethesda, Md. 20816

Suskind, Stuart P., 7 Cabot Dr., Wayne, Pa. 19087

Svendsen, Chris E., 4706 W. Chestnut, Yakima, Wash. 98903

Swanson, Erik Carl, 7A Academy St., Concord, N.H. 03301-4220

Swanson, Kara W., 32 Chandler St., # 1, Somerville, Mass. 02144

Swope, Elket V., 5622 Bostwick Ct., Norcross, Ga. 30092

Talcott, Kelly D., 45 Field Ave., Hicksville, N.Y. 11801

Tanezaki, Eric Lee, 3327 Helms Ave., Culver City, Calif. 90232

Tanner, Mary Anne P., 316 W. 79th St., # 7E, New York, N.Y. 10024

Taylor, Craig Fitch, 1271 Vildmark Dr., Eagan, Minn. 55123

Taylor, Errol B., 23 Glacier Dr., Lawrenceville, N.J. 08648

Terrano, Mark C., 8214 Timber Lake Lane, Sarasota, Fla. 34243-1401

Terzola, Mark C., 2430 Applewood Dr., Stow, Ohio 44224

Tesluk, Timothy M., 12202 Mayfield Rd., # 1, Cleveland, Ohio 44106

Thiessen, Rose Marie, 91 Meadow Brook Rd., Edison, N.J. 08837

Thill, George Russell, 999 W. Wolfram, # 404, Chicago, Ill. 60657

Thomann, William J., 330 E. 39th St., # 30-D, New York, N.Y. 10016

Thomas, Gregory Scott, 6505 Sunburst Way, Alexandria, Va. 22310

Thomas, Laura K., 8015 Wikle Rd. East, Brentwood, Tenn. 37027

Thomas, Michael J., 12588 Starspur Ln., St. Louis, Mo. 64146

Thurmon, Mark A., 2601 Westover Rd., Austin, Tex. 78703

Thyfault, Paul M., 22892 Cedarspring, Lake Forest, Calif. 92630

Tiller, Steven Edward, 206 E. Cross St., Baltimore, Md. 21230

Tipsord, Jennifer Anne, 404 E. 66th St., # 12b, New York, N.Y. 10021

Titus, Robert Daniel, 3707 Wild Ivy Dr., Indianapolis, Ind. 46227

Tobin, Christopher M., 2727 Duke St., # 1314, Alexandria, Va. 22314

Tolar, Kenneth Lee, 4705 St. Martin St., Metairie, La. 70006

Torkelson, John S., 9609 Linden, Overland Park, Kans. 66207

Tremain, Allen R., 1925 Laver Ct., Los Altos, Calif. 94024

Trimbo, Susan L., 737 Ridge Ave., # 3F, Evanston, Ill. 60015

Trosino, James, 643 14th St., San Francisco, Calif. 94114

Tsang, Thomas Christopher, 235 W. 48th St., # 17-D, New York, N.Y. 10036

Tsang, Vivien Y., 820 Dewey, Ann Arbor, Mich. 48104

Tuma, Garry J., 118 Gina Court, Hurley, N.Y. 12443

Turner, Frank Calvin, 5342 Pagewood, Houston, Tex. 77056

Turner Brim, Phyllis, 2817 Greenwood Rd., Hazel Crest, Ill. 60429

Umbach, Corwin Paul, 1011 Alton Woods Dr., Concord, N.H. 03301

Van Amsterdam, John R., 72 Pleasant St., Natick, Mass. 01760

Van Cleave, George William, 7194 Rustic Trail, Boulder, Colo. 80301

Van Ness, Mark C., 2160 S. Eldridge St., Lakewood, Colo. 80228

Vesto, Elizabeth Ann, 415 W. Vine, Arlington Hgts., Ill. 60004

Victor, David William, 11810 Mayfield Ave., # 206, Los Angeles, Calif. 90049

Vradenburgh, Anna Marie, 5257 Radford Ave., # 212, N. Hollywood, Calif. 91607

Vrioni, Beth A., 3040A N. Atlantic Ave., Cocoa Beach, Fla. 32931

Wagner, Susan Faye, 306 Green Valley Dr., Johnson City, Tenn. 37601

Walshe, Edward Alan, 17610 Cameron St., # G, Huntington Beach, Calif. 92647

Walthall, Marion, 1006 Ferndale Ave., Johnstown, Pa. 15905

Wang, William Li-Tien, 1901 Jardin Dr., Mountain View, Calif. 94040

Ward, John Patrick, 118 Smith Creek Dr., Los Gatos, Calif. 95030

Ward, Robert R., Jr., 10383 SW 70th St., Miami, Fla. 33173

Wasson, Robert Daniel, 99 Clinton St., # 503, Concord, N.H. 03301

Webster, Thomas D., 3945 Brickenwood Trace, Indianapolis, Ind. 46227

Wegemer, Leo Brian, 4 Cardinal Way, Shelburne, Vt. 05482

Weisenbach, Lori Ann, 6370 N.W. 38th Drive, Coral Springs, Fla. 33067

Weissman, Peter Steven, 2126 R St., N.W., Washington, D.C. 20008

Wenocur, Deborah Weissman, 941 San Marcos Circle, Mountain View, Calif. 94043

Werling, Jill Lynn, 600 N. Alabama, # 1404, Indianapolis, Ind. 46204

West, David B., 4 Canal Park, # 411, Cambridge, Mass. 02141

Weyand, Karla M., 267 Fayette Ave., Buffalo, N.Y. 14223

Whipple, Marc J., 1417 West Sherwin, Chicago, Ill. 60626

Wieland, Robert N., 1100 Lovering Ave., # 908, Wilmington, Del. 19806

Wildman, David Evan, 10 Village Park Court, Scotch Plains, N.J. 07076

Williams, Bradley Paul, 5305 N. MacArthur Blvd., # 2008, Irving, Tex. 75038

Williams, Michael Franklin, 104 First St. East, P.O. Box 46, Newhall, Iowa 52315

Williams, Scott A., 10636 W. 99th St., Overland Park, Kans. 66214

Willis, Carl Myron, 529 N. Miller, Mesa, Ariz. 85203

Wilson, Eve J., 12306 Quintette Ln., Bowie, Md. 20720

Wilson, Keith Milton, 10987 Bluffside Dr., # 4106, Studio City, Calif. 91604

Wisdom, Gregg Wendel, 12483 Able Dr., Star, Id. 83669

Witcher, John Richard, III, 147 E. 37th St., New York, N.Y. 10016

Witkowski, Timothy Xenophon, 83 Washington Pl., # 2W, New York, N.Y. 10011

Wixon, Clarke A., 136 Hermosa Ave., Hermosa Beach, Calif. 90254

Wodeslavsky, Shirly Nechama, 5 Peter Lynas Ct., Tenally, N.J. 07670

Woldin, Richard A., 233 S. Sixth St., # 2501, Philadelphia, Pa. 19106-3757

Wong, Albert Kang, 2620 S. Fern St., Arlington, Va. 22202

Woo, Philip Wayne, 3901 Travis St., # 229, Dallas, Tex. 75204

Woolston, Thomas Graham, 5126 S. 12th St., Arlington, Va. 22204

Wright, Ann Marie, 322 W. 57th St., # 26D, New York, N.Y. 10019

Wright, Michael Lamarr, 2672 Wendee Dr., # 2536, Cincinnati, Ohio 45238

Wydeven, Richard, 2801 Park Center Dr., # A-1503, Alexandria, Va. 22302

Yamamoto, Diane M., 1628 Dolcetto Ln., Gurnee, Ill. 60031-5128

Yee, Alvis Ian, 27 Fairway Pl., Cold Spring Harbor, N.Y. 11724

Yerkeson, Douglas Alan, 7340 Capri Way, # 5, Maineville, Ohio 45039

Yeung, Tin-Chuen, 3550 River Falls Dr., Northbrook, Ill. 60062

Yi, Susan C., 325M Sharon Park Dr., # 717, Menlo Park, Calif. 94025

Young, Jessica Wynne, 6238 Groliad Ave., Dallas, Tex. 75214

Zaccaria, John, 96-34 72 Road, Forest Hills, N.Y. 11375

Zarneke, David A., 5270 Duke St., # 224, Alexandria, Va. 22304

Zarrabian, Michael, 11646 Chenault Ave., # 21, Los Angeles, Calif. 90049

Zele, John D., 2834 S. Abingdon St., # A-1, Arlington, Va. 22206

Zhu, Jianxiong, 3801 McFarlane Dr., Tallahasse, Fla. 32303

Ziarno, Witold, 495 Forest Ave., New Rochelle, N.Y. 10804

October 20, 1995

KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Certificate of Correction
For Week of November 21, 1995

B1 4,925,457	5,355,005	5,412,458	5,429,328
D. 360,557	5,355,163	5,412,486	5,429,409
4,134,817	5,362,163	5,412,807	5,430,050
4,790,128	5,364,773	5,413,099	5,430,265
4,847,220	5,365,227	5,413,735	5,430,276
4,937,324	5,365,881	5,414,343	5,430,469
4,982,984	5,366,240	5,414,345	5,430,727
5,010,357	5,371,614	5,414,488	5,430,796
5,057,301	5,374,568	5,414,529	5,432,126
5,063,593	5,376,502	5,415,538	5,432,263
5,075,031	5,376,568	5,416,368	5,432,379
5,078,474	5,376,560	5,416,507	5,432,419
5,094,848	5,377,102	5,416,904	5,432,499
5,098,831	5,379,962	5,417,874	5,432,554
5,102,651	5,381,252	5,418,395	5,432,794
5,111,645	5,382,949	5,418,560	5,432,977
5,126,621	5,383,328	5,419,668	5,433,192
5,152,759	5,385,765	5,420,518	5,433,232
5,156,813	5,386,007	5,420,535	5,433,797
5,160,982	5,387,667	5,420,620	5,433,988
5,161,016	5,387,953	5,420,647	5,434,637
5,173,977	5,389,291	5,420,703	5,434,663
5,179,300	5,389,802	5,420,834	5,434,679
5,185,553	5,391,696	5,420,905	5,434,952
5,208,864	5,391,728	5,422,016	5,435,230
5,222,046	5,392,299	5,422,063	5,435,505
5,244,671	5,393,829	5,422,082	5,435,956
5,257,147	5,394,553	5,422,367	5,436,187
5,257,619	5,395,547	5,422,748	5,436,310
5,266,274	5,396,537	5,422,754	5,436,438
5,267,071	5,396,755	5,422,783	5,436,522
5,269,038	5,398,646	5,423,086	5,436,620
5,272,978	5,398,673	5,423,425	5,436,692
5,277,638	5,399,637	5,423,752	5,436,709
5,283,645	5,399,696	5,423,925	5,436,731
5,291,342	5,399,708	5,424,023	5,436,743
5,292,824	5,401,348	5,424,371	5,436,875
5,293,603	5,402,160	5,424,982	5,437,780
5,293,790	5,404,316	5,425,056	5,438,073
5,300,379	5,404,935	5,425,744	5,438,180
5,303,714	5,405,274	5,426,024	5,438,319
5,304,825	5,405,331	5,426,042	5,438,364
5,305,463	5,406,451	5,426,107	5,438,433
5,307,240	5,406,847	5,426,207	5,438,435
5,320,816	5,407,343	5,426,219	5,438,539
5,325,293	5,408,273	5,426,298	5,438,558
5,327,191	5,408,336	5,426,356	5,438,586
5,330,591	5,408,349	5,426,421	5,439,035
5,332,699	5,408,435	5,426,422	5,439,653
5,334,953	5,408,879	5,426,533	5,439,777
5,339,415	5,409,023	5,426,536	5,439,785
5,340,419	5,409,713	5,426,633	5,439,884
5,340,503	5,410,366	5,426,710	5,439,909
5,344,271	5,410,571	5,427,129	5,439,923
5,345,920	5,410,944	5,427,222	5,440,139
5,347,572	5,410,983	5,427,404	5,440,212
5,348,826	5,411,567	5,427,615	5,440,380
5,350,484	5,411,635	5,427,825	5,440,437
5,353,222	5,411,830	5,428,104	5,440,780
5,353,957	5,412,058	5,428,808	5,440,814

5,441,242	5,441,655	5,442,103	5,444,472	5,444,773	5,449,085	5,449,885	5,451,002
5,441,347	5,441,673	5,442,817	5,444,519	5,445,575	5,449,587	5,449,888	5,452,448
5,441,570	5,441,693	5,443,463	5,444,556	5,447,207	5,449,617	5,449,969	5,453,788
5,441,636	5,441,984	5,443,473	5,444,613	5,448,541			

Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

July 31 - August 4, 1995

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
8-1	EX EX	73/777,543 73/777,551	In-N-Out Burgers	2(d) [consent agreement]	Refusal Reversed [in both cases]		"4 X 4" and "FOUR BY FOUR" [both marks for made-to-order cheeseburgers having four cooked beef hamburger patties and four cheese slices]	"FOUR BY FOUR" [sandwiches for consumption on or off the premises]	No
8-1	EX	74/278,828	Novell, Inc.	2(e)(1)	Refusal Affirmed		"PALMDOS" [operating system software for use with computer; computer manuals for use with operating system software or instructional manuals for use with computer operating software]		No
8-1	EX	74/353,881	Arcto, Inc.	2(d)	Refusal Affirmed		"TIGERSHARK" [clothing, namely, caps, gloves, jackets, swim trunks, sweat pants, golf shirts, swimsuits, and shoes]	"TIGER SHARK" [men's clothing, namely, pants, slacks, coats, and suits]	No
8-1	OPP	86,081	Traveling Software, Inc. v. James Cass Hendee	2(d)	Opposition Sustained	"TRAVELING SOFTWARE" [computer programs and prerecorded audio tapes]	"TRAVELSOFT" [computer software for use by travel agencies]		No
8-2	EX	74/009,506	Bob's Inc.	2(d)	Refusal Reversed		"SPRUZZO" [in stylized lettering] [clothing and footwear, namely, socks, pants, shirts, sweaters, shoes and boots]	"SPLASH" [women's sweaters, blouses, pants, shirts, warm-up suits, shorts, tops and jeans]	No
8-3	OPP	76,388	Huffy Corp. and Derby Cycle Corp. v. Geoffrey, Inc.	2(d) [priority]	Opposition Dismissed	"RALLY" [bicycles]	"RALLYE" [bicycles]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
8-3	EX	74/356,789	Great American Insurance Co.	2(d)	Refusal Reversed		"PRISMS" [newsletters for distribution to jewelers regarding the security, protection and insurance of jewelry]	"PRISMS" (and prism design) [pre-recorded audio cassettes for use in the insurance field; printed training manuals; providing training with respect to the sale of insurance]; "PRISMS FOR AGENTS" [conducting training seminars in the field of insurance selling or marketing; printed and audio visual materials of educational training programs relating to the sale of insurance]	No
8-3	EX	74/161,189	Coulston Int'l. Corp.	whether the matter asserted for registration functions as a mark or is, rather, mere non-distinctive ornamentation	Refusal Affirmed		a green border design used on a label for applicant's goods [insecticides, insect and arthropod repellents for application to fabric]		No
8-3	EX	74/379,701	Dragon Systems, Inc.	2(e)(1)	Refusal Affirmed		"VOICETOOL" [computer software for use in speech recognition applications]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=RBQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
8-3	EX	74/102,337	Lighting Management, Inc.	whether the matter presented for registration is capable of registration on the Supplemental Register [geniricness]	Refusal Affirmed		"LIGHTING MANAGEMENT, INC." [consulting and design services in the field of lighting systems, namely, analyzing lighting systems for existing or proposed business establishments]		No
8-4	EX	74/369,461	Jeffrey H. Gitomer	2(d)	Refusal Reversed		"SALESMASTERS" [educational services, namely, conducting periodic meetings between salespersons for the purposes of improving selling skills and techniques and otherwise exchanging professional information and ideas]	"SALESMASTERS" [educational services, namely, a training program for the building industry]	No
8-4	OPP	84,704	SF Hotel Co., L. P. v. Embassy Suites, Inc.	2(d);2(e)(1)	Opposition Dismissed	"THINK TWICE" [hotel services]	"THINK TWICE" [hotel services]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

August 7-11, 1995

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
8-7	OPP OPP	89,707 89,708	Hasbro, Inc. v. Cinco Inc.	2(d)	Oppositions Sustained	"GI JOE" [dolls, etc.]	"GI JANE" and "GI JANE DEFENDER OF FREEDOM" [dolls]		No
8-7	OPP	90,447	Kimberton Enterprises, Inc. v. Henry Co.	2(d)	Opposition Dismissed	"ELASTO-SEAL" [adhesives, namely, multi-purpose repair tape]	"ELASTOTAPE" [fabric reinforcement tape, namely, fiberglass for patching and sealing roofs]		No
8-7	OPP	87,984	C-Tec, Inc. v. Tate Access Floors, Inc.	2(d)	Opposition Dismissed	"TEC-CRETE" et. al., [access floor panels, including access floor panels that have concrete and particulate cores]	"TATECRETE" [access floor panels made of reinforced concrete]		No
8-8	CANC	19,982	Rocol Ltd. v. Fox Valley Systems, Inc.	2(d)	Petition to Cancel Granted	"EASYLINE" [paint contained in aerosol spray cans; hand operated line marking apparatus using aerosol spray paint cans]	"EASYLITE" [paint, namely, aerosol spray coating containing reflective beads for general purposes]		No
8-10	EX	74/361,993	Americh Corp.	2(e)(4)	Refusal Reversed		"BARRINGTON" [whirlpool baths and plumbing systems for such baths]		No
8-10	EX	74/342,028	Defender Steel Door Co., Inc.	2(d)	Refusal Affirmed		"DEFENDER" [steel doors and steel security storm doors]	"DEFENDER" [storm windows of plastic materials for interior use]	No
8-10	EX	74/319,691	Unverferth Mfg. Co., Inc.	2(d)	Refusal Affirmed		"RAWSON" [tillage implements for soil cultivation, namely, cares, coulters, subsoilers, row cleaners and sealers]	"RAWSON" [metal backhoe and loader buckets for earth moving construction equipment]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
8-10	EX	74/158,872	L. Perrigo Co.	2(e)(1); whether the matter asserted for registration has been used in commerce as a trademark	Refusal Affirmed [on 2(e)(1) ground only]		"THE BETTER NAME BRAND" [personal antiperspirants and deodorants, hair shampoo and conditioner, hair spray, skin care lotion, sunscreen and tanning lotion, baby oil, dentifrice, mouthwashes, denture creams, suppositories, analgesics, antacids, cough medications, dietary drinks for weight control, food supplements, etc.]		No
8-10	OPP	85,931	Restin Foods Corp. v. Premium Coffee Distributors, Inc.	2(d)	Opposition Sustained	"DONA MARIA" [Mexican-style foods, namely, nopalitos, mole and refried beans]	"CAFE DONA MARIA" [coffee]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

DEPARTMENT OF COMMERCE

Patent and Trademark Office

Notice of Hearings and Request for Comments on Issues Relating to Patent Protection for Nucleic Acid Sequences

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Notice of Hearings and Request for Comments.

SUMMARY: The Patent and Trademark Office (PTO) will hold public hearings, and it requests comments, on issues relating to patent protection for nucleic acid sequences. Interested members of the public are invited to testify at public hearings and to present written comments on any of the topics outlined in the supplementary information section of this notice.

DATES: Public hearings will be held on Wednesday, November 29, 1995, from 9:00 a.m. until 1:00 p.m., and Thursday, December 7, 1995, from 9:00 a.m. until 1:00 p.m.

Those wishing to present oral testimony at any of the hearings must request an opportunity to do so no later than Monday, November 27, 1995, for the November 29 hearing, or Tuesday, December 5, 1995, for the December 7 hearing.

Speakers may provide a written copy of their testimony for inclusion in the record of the proceedings no later than Monday, December 18, 1995.

Written comments will be accepted by the PTO until December 18, 1995.

Written comments and transcripts of the hearings will be available for public inspection on or about Monday, January 22, 1996.

ADDRESSES: The November 29 hearing will be held from 9:00 a.m. until 1:00 p.m. at the University of California, San Diego, The Mandeville Auditorium/Recital Hall, Muir Campus, La Jolla, California.

The December 7 public hearing will be held from 9:00 a.m. until 1:00 p.m. in Suite 912, Commissioner's Conference Room, Crystal Park Building No. 2, 2121 Crystal Drive, Arlington, Virginia.

Requests to testify should be sent to Esther Kepplinger by telephone at (703) 306-2714, by facsimile transmission at (703) 308-6879, or by mail marked to her attention addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231. No request for oral testimony will be accepted through electronic mail.

Written comments should be addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231, marked to the attention of Esther

Kepplinger. Comments may also be submitted by facsimile transmission at (703) 308-6879, with a confirmation copy mailed to the above address, or by electronic mail over the Internet to "sequences@uspto.gov."

Written comments and transcripts of the hearings will be maintained for public inspection in Suite 520 of Crystal Park One, 2011 Crystal Drive, Arlington, Virginia. Transcripts and comments provided in machine readable format will also be available through anonymous file transfer protocol (ftp) via the internet (address: sequences@uspto.gov).

FOR FURTHER INFORMATION CONTACT: Esther Kepplinger by telephone at (703) 306-2714, by facsimile transmission to (703) 308-6879, by electronic mail at ekepplin@uspto.gov, or by mail marked to her attention addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION

I. *Background*

With the growth of the biotechnology industry have come significant changes in the process of research, development and commercialization of biotechnology inventions. For at least a decade, patent applications claiming nucleic acid sequences, such as genes composed of deoxyribonucleic acid ("DNA"), have been examined and granted patent rights by the PTO. These sequences typically encode known proteins or proteins for which applicant discovered a function. Scientific and technological advances have permitted researchers to identify large numbers of gene fragments rapidly. Armed with databases containing the sequences of known genes, they can identify a novel sequence. The ease of sequencing large numbers of random nucleic acid fragments has resulted in the filing of a growing number of patent applications each claiming thousands of nucleic acid sequences. This is a serious problem for the PTO. While the PTO has recently acquired sophisticated and costly hardware and software necessary to search applications containing such sequences, their examination will significantly burden the existing system and may necessitate the acquisition of many additional, expensive, massively parallel processor computers to complete examination in a reasonable time.

PTO estimates that the computer search time for one hundred sequences is about fifteen hours and the examiner time for evaluating the sequence search results is about sixty-five hours. The estimated cost for computer search time for one hundred sequences is $1500. Although the number of cases involving large numbers of sequences presently before the PTO is small, it is estimated that the cost to search and examine these cases will be $8 million. These estimates represent searches by a massively parallel processor computer of commercially available databases. Applications that claim excessively long sequences present similar challenges, since the claimed sequence must be broken up into numerous smaller sequences in order to be searched.

An additional issue has been raised relating to what is known as the Human Genome Initiative (HGI).

The HGI is a project to obtain the entire DNA sequence in the human genome. Many of the benefits expected from the HGI are due to the characterization of expressed nucleic acid sequences in the human genome and their protein products.

Some individuals believe that expressed nucleic acid sequences in the human genome should not be patentable because of the possibility that a patent to a gene fragment could preclude future use of the gene or its protein product. This, it is argued, could inhibit future research efforts to isolate the entire gene or to develop medically beneficial protein compounds. Others believe that the benefits of the patent system should not be withheld from this area of technology, because research and development would be drastically curtailed due to the inability to protect capital investments or to reap financial rewards from those investments. Appropriate policies must be established to address these challenges.

II. Issues for Public Comment

Interested members of the public are invited to testify or to present written comments related to the above topics, including the following issues:

1. Is there a more cost-effective way to examine applications containing large numbers of sequences or excessively long sequences, in view of the PTO's limited human and computer resources?

2. How should the significantly higher cost associated with searching applications claiming large numbers of sequences or excessively long sequences be underwritten? For example:

a) By fees from all applications?
b) By fees from the biotechnology industry applications only?
c) By fees from those specific applications involving large numbers of sequences or extraordinarily long sequences?

3. Will the patenting of a complete genome of an organism inhibit rather than promote advancement of the biotechnology arts? If so, why?

4. Will the patenting of human genome fragments inhibit rather than promote advancement of the biotechnology arts? If so, why?

III. *Guidelines for Oral Testimony*

Individuals wishing to testify at the hearings must adhere to the following guidelines:

1. Requests to testify must include the speaker's name, affiliation, title, phone number, fax number, mailing address, and Internet mail address (if available).

2. Speakers will be provided between seven and fifteen minutes to present their remarks. The exact amount of time allocated per speaker will be determined after the final number of parties testifying has been determined. All efforts will be made to accommodate requests for additional time for testimony presented before the day of the hearing.

3. Requests to testify may be accepted on the date of the hearing if sufficient time is available on the schedule. No one will be permitted to testify without prior approval.

A schedule providing approximate times for testimony will be provided to all speakers the morning of the day of the hearing.

Speakers are advised that the schedule for testimony may be subject to change during the course of the hearings.

IV. Guidelines for Written Comments

Written comments should include the following information:

1. Name and affiliation of the individual responding.

2. If applicable, an indication of whether comments offered represent views of the respondent's organization or are the respondent's personal views.

3. If applicable, information on the respondent's organization, including the type of organization (e.g., business, trade group, university, non-profit organization) and general areas of interest.

Information that is provided pursuant to this notice will be made part of the public record. In view of this, parties should not provide information they do not wish publicly disclosed. Parties who would like to rely on confidential information to illustrate a point being made are requested to summarize or otherwise provide the information in a way that will permit its public disclosure.

Parties offering testimony or written comments should provide their comments in machine readable format, if possible. Such submissions should be provided by electronic mail messages over the Internet, or on a 3.5" floppy disk formatted for use in either a Macintosh or MS-DOS based computer. Machine readable submissions should be provided as unformatted text (e.g., ACSII or plain text), or as formatted text in one of the following file formats: Microsoft Word (Macintosh, DOS or Windows versions) or WordPerfect (Macintosh, DOS or Windows versions).

V. *Guidelines for Comments via Internet*

Comments received via the Internet should include the same information requested in the guidelines set out for written comments.

VI. *Other Information*

Questions regarding the facilities and lodging in the La Jolla, California, area should be directed to the University of California, San Diego, Special Events, by phone at (619) 534-6386, or by fax to (619) 534-0905. Parking permits are required for on-campus parking and may be purchased in advance through the Parking Office or on November 29 at Information booths at the university. Questions regarding parking should be directed to the Special Events Parking Office at (619) 534-9682, or by fax to (619) 534-9685.

NOV - 8 1995

Date

Bruce A. Lehman

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box _____
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or material related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box M Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filings of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

Please address mail as follows:

Box _____
FEE (or "NO FEE")
Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOU's), and extension requests.
Box TTAB FEE	Oppositions, Cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections, and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.
Please address mail as follows:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation*; papers relating to pending litigation shall be mailed only to the Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

State	*Name of Library*	*Telephone Contact*
	New York Public Library (The Research Libraries)	(212) 930-0917
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron: Summit County Public Library	Not Yet Operational
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	Not Yet Operational
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	Not Yet Operational
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy
J.O. THOMAS, JR., Deputy Assistant Commissioner for Patent Process Services

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	05/19/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	06/23/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	08/23/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	08/25/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	03/01/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	12/06/93
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	04/19/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	06/02/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	03/26/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	04/12/94
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	03/08/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	04/18/94
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	05/09/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	05/31/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	08/16/94
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	07/14/94
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	05/30/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of October 1, 1995

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/23/95	05/25/95
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	07/03/95
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/26/95	08/21/95
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/06/95	08/14/95
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	05/01/95
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/14/95	07/03/95
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/02/95	07/24/95
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions– Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/15/95	06/17/95
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/30/95	05/30/95
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—John Walker, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	02/14/95	—0—
Renewals (All Classes)	07/25/95	—0—
Section 12(c) Publications (All Classes)	04/11/95	—0—

1. ** Assigned to all Law Office

2. Applicants with inquires concerning the status of their applications and a touch tone phone should call (703) 305–8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday thru Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquires concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

NOVEMBER 21, 1995

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,448,061 (2734th)

VISCOMETER WITH A CONTINUOUSLY VARIABLE ELECTRONIC READOUT

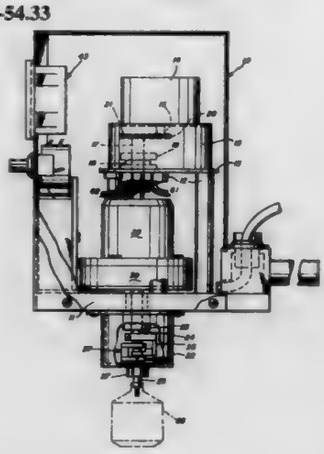
David A. Brookfield, 168 Massapoag Ave., Sharon, Mass. 02067

Reexamination Request No. 90/001,975, Mar. 26, 1990.

Reexamination Certificate for Patent 4,448,061, issued May 15, 1984, Ser. No. 385,576, Jun. 7, 1982.

Int. Cl.[6] G01N *11/14*

U.S. Cl. 73—54.33



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–4** are cancelled.

New claims **5** and **6** are added and determined to be patentable.

5. A viscometer for use in continuously monitoring the viscosity of a liquid, said viscometer including

a rotatable drive unit,

means to rotate said unit,

a rotatable driven unit coaxial with said first mentioned drive unit and provided with an element to be immersed in the liquid the viscosity of which is to be monitored, and to be subjected to drag which increases as the viscosity of the liquid increases,

resiliently yieldable means connecting said units enabling the drive unit to rotate the driven unit but with the connecting means yielding as the drag increases; and

an electric circuit including

an electronic readout having a plurality of leads and

a transducer having a stator included in said drive unit and a rotor included in said driven unit,

said stator having a plurality of leads each including a slip ring, one for each of said readout leads and said readout leads including brushes, one for each slip ring and in contact therewith,

said transducer providing a variable signal continuously to said readout to which said readout responds and which varies in strength immediately with any variations in the viscosity of the liquid, the rotatable drive unit comprising a drive shaft with a bushing in a bottom end thereof, the rotatable driven unit comprising a driven shaft with an upper end thereof of reduced diameter than the remainder of the driven shaft, the upper end of the driven shaft entering and rotatably held centered by the bushing at the bottom end of the drive shaft.

B1 4,536,897 (2735th)

INTRAOCULAR LENS

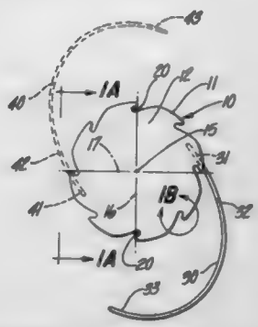
Robert M. Powell, 686 Crestwood Dr., Gaylord, Mich. 49735

Reexamination Request No. 90/003,393, Apr. 12, 1994.

Reexamination Certificate for Patent 4,536,897, issued Aug. 27, 1985, Ser. No. 511,849, Jul. 8, 1983.

Int. Cl.[6] A61F *2/16*

U.S. Cl. 623—6



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **4**, **7**, **9**, **10–14** is confirmed.

Claims **1–3**, **5**, **6** and **8** are cancelled.

New claims **15**, **16** and **17** are added and determined to be patentable.

10. An intraocular lens useful for implantation or positioning in the chamber of an eye after capsular extraction, comprising:

a lens optic having an anterior face and a posterior face, the circumference of each face having a continuous curving common edge configured with at least one axial socket recess open to said edge and faces, and haptic support means adapted for rotating the lens and centering the lens optic on the optical axis, the socket recess having bearing surfaces adapted to receive the distal end of a surgical tool and to be moved by the tool for positioning of the lens in a surgical procedure and being undercut from the edge and configured to receive the end of a surgical tool in close fitting relation to accommodate implantation or repositioning in a surgical procedure.

B1 4,922,264 (2736th)

SATELLITE ANTENNA MOUNTING APPARATUS WITH BALLAST MEANS

Robert M. Fitzgerald, 3545 Saxon Way, Marietta, Ga. 30062, and Eugene O. Gresens, 5266 Westhill Dr., Norcross, Ga. 30071

Reexamination Request No. 90/002,952, Dec. 17, 1992.

Reexamination Certificate for Patent 4,922,264, issued May 1, 1990, Ser. No. 341,846, Apr. 24, 1989.

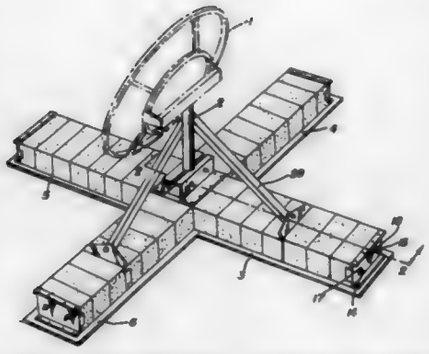
Int. Cl.[6] H01Q *1/12*; E04H *12/18*

U.S. Cl. 343—878

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–9** are cancelled.

[1. Antenna mounting apparatus comprising a base assembly, said base assembly comprising an inner end plate, ballast means disposed generally adjacent said base assembly and in abutting relationship with said inner end plate, an outer end plate disposed in abutting relationship with said ballast means remote from said base assembly, a tie rod interconnected to said inner and outer end plates and extending generally adjacent said ballast means, and



means to secure said end plates on said tie rod so as to place a compression force on said ballast means.]

B1 5,115,493 (2737th)

CONTINUOUS LASER PRINTER FOR PRINTING OVER PAGE BOUNDARIES

Ivan M. Jeanblanc, Chesterfield; Stephen E. Hutchison, Manchester; Mark K. Virkus, Manchester, and Ronald J. Johnsen, Manchester, all of Mo., assignors to DH Technology, Inc., San Diego, Calif.

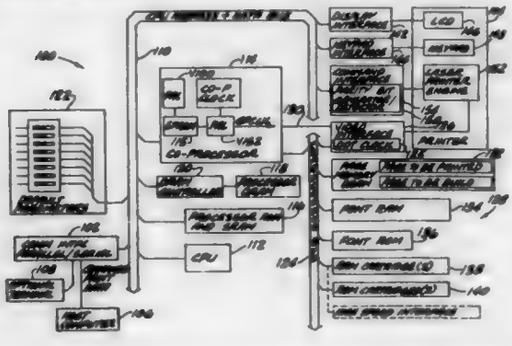
Reexamination Request No. 90/003,538, Aug. 24, 1994.

Reexamination Certificate for Patent 5,115,493, issued May 19, 1992, Ser. No. 567,839, Aug. 15, 1990.

Continuation-in-part of Ser. No. 541,820, Jun. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 558,036, Jul. 25, 1990, abandoned.

Int. Cl.[6] **G06K** *15/00;* **G06F** *3/12*

U.S. Cl. 395—117



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–31** are confirmed.

1. An apparatus for controlling a laser printer engine in response to commands and print data signals provided by a computer representing patterns to be printed by the laser printer engine, said apparatus comprising:

a pattern memory in which signals representing reference patterns are stored;

a page memory in which signals representing patterns on a first page to be printed are stored and in which signals representing patterns on second and subsequent pages to be built are stored;

central processing means, responsive to the commands and print data signals, for selectively storing the reference pattern signals from the pattern memory into the page memory, wherein said central processing means provides the first page pattern signals stored in the page memory to the laser printer engine for use in printing the first page while simultaneously providing the second page pattern signals from the pattern memory to the page memory to build the second page in the page memory and, after the first page pattern signals have been provided to the laser printer engine, said central processing means provides the second page pattern signals stored in the page memory to the laser printer engine for printing while simultaneously providing the subsequent page pattern signals from the pattern memory to the first page memory to build the subsequent page in the page memory wherein the laser printer engine defines virtual page boundaries and said central processing means includes means for splitting a reference pattern to be printed on one of the virtual page boundaries between the first and second pages; and

means for interconnecting the computer and the central processing means, for interconnecting the pattern memory and the page memory, and for interconnecting the page memory and the laser printer engine.

B1 5,142,184 (2738th)

COLD CATHODE FIELD EMISSION DEVICE WITH INTEGRAL EMITTER BALLASTING

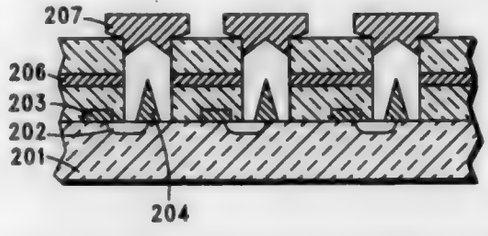
Robert C. Kane, Woodstock, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Reexamination Request No. 90/003,705, Jan. 31, 1995.

Reexamination Certificate for Patent 5,142,184, issued Aug. 25, 1992, Ser. No. 477,695, Feb. 9, 1990.

Int. Cl.[6] **H01J** *1/16*

U.S. Cl. 313—309



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2**, **4**, **5**, **7** and **9** is confirmed.

Claims **1**, **3**, **6** and **8** are determined to be patentable as amended.

Claims **2**, **4**, **5**, and **7**, dependent on an amended claim, are determined to be patentable.

1. A cold-cathode field emission device having an anode, an emitter, and a ballast resistor formed integrally therewith and coupled to the emitter, *the ballast resistor being defined by a resistance extending laterally from electrical contact with the emitter to electrical contact with an emitter conductor and forming a lateral electrical path between the emitter and the emitter conductor.*

REISSUES

NOVEMBER 21, 1995

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,090
CERAMIC CUTTING TOOL REINFORCED BY WHISKERS

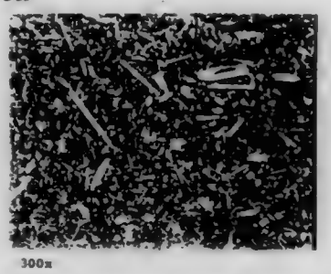
Nils G. L. Brandt, Solna, and Zeljka D. Senesan, Stockholm, both of, Sweden, assignors to Sandvik AB, Sandviken, Sweden

Original No. 4,867,761, dated Sep. 19, 1989, Ser. No. 170,343, Mar. 18, 1988. Application for reissue Apr. 8, 1994, Ser. No. 224,792

Claims priority, application Sweden, Mar. 20, 1987, 8701172

Int. Cl.[6] C04B *35/117;35/56;35/58*

U.S. Cl. 51—309 **8 Claims**



300x

1. Oxide-based ceramic cutting insert for chip forming machining of steel characterized in that said insert consists essentially of a matrix of aluminum oxide and <20% by volume of ZrO_2 and 5–50% by volume of homogeneously dispersed whiskers of [carbides,] nitrides and/or borides of titanium and/or zirconium [and], *and/or carbides of zirconium, and/or* solid solutions [thereof] *of carbides, nitrides, and/or borides of titanium and/or zirconium.*

Re. 35,091
PRESSURE DEVICE AND SEAL FOR FILTER BELT MACHINES

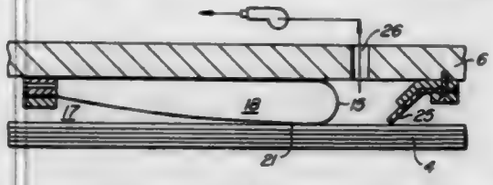
Dag Bergloff, Graz; Peter Scheucher, Kumberg; Rudolf Schieg, and Giselher Stummer, both of Graz, all of, Austria, assignors to Maschenfabrik Andritz Actiengesellschaft, Graz, Austria

Original No. 4,834,884, dated May 30, 1989, Ser. No. 84,007, Aug. 10, 1987. Continuation of Ser. No. 706,840, May 29, 1991, abandoned. Application for reissue Aug. 24, 1993, Ser. No. 110,840

Claims priority, application Austria, Aug. 18, 1986, A2214/86

Int. Cl.[6] B01D *33/04;* **B30B** *5/04;5/06*

U.S. Cl. 210—401 **42 Claims**



18. Apparatus for pressing and dewatering or filtering suspensions, sludges, fibrous material or pulp suspensions, comprising:

a first stationary support having first and second sides;

a first driven, endless, fluid impervious, pressure belt;

a first driven, endless filter belt, said apparatus being structured to press material on two sides by exerting pressure on said first pressure belt and on said first filter belt;

a pressure medium source on said first side of said first stationary support for applying a pressure medium directly on said first pressure belt;

a first deformable, essentially hollow impervious pressure bladder of flexibly elastic material having an interior space for receiving pressure medium from said pressure medium source, said bladder being coupled to said second side of said first stationary support and having a form of a closed, annular frame viewed in top view onto the first pressure belt;

a pressure space bounded by said first pressure belt, said first bladder and said first support for receiving said pressure medium therein;

a gap formed between said first bladder and said first pressure belt;

means for adjusting the size of said gap by subjecting said pressure space to a first pressure and the interior space of the first pressure bladder to a second pressure produced by said pressure medium source;

first and second substantially rectangular frames for fixing the first hollow pressure bladder to said first stationary support, said first bladder having first and second edges, said first edge being clamped by said first frame and said second edge being clamped be said second frame; and

seal means coupled to said second side of said first stationary support and being disposed outside of and encircling said first pressure bladder and contacting said first pressure belt outside said pressure space.

Re. 35,092
IGNITION COIL ASSEMBLY FOR INTERNAL COMBUSTION ENGINES

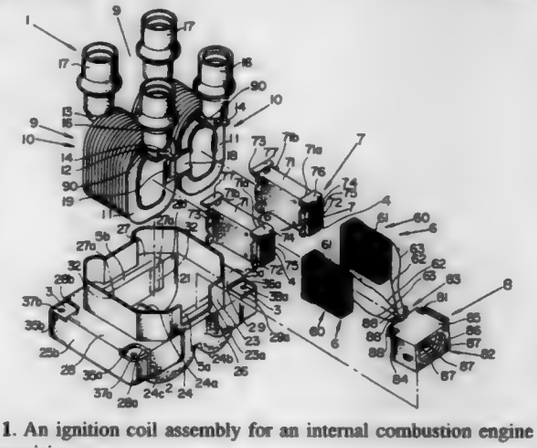
Masami Kojima, Chiryu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Original No. 4,763,094, dated Aug. 9, 1988, Ser. No. 128,218, Dec. 3, 1987. Application for reissue Aug. 8, 1990, Ser. No. 564,282

Claims priority, application Japan, Dec. 4, 1986, 61-289491

Int. Cl.[6] H01F *27/02*

U.S. Cl. 336—92 **12 Claims**



1. An ignition coil assembly for an internal combustion engine comprising:

a housing made of an electrically insulating material;

at least one first laminated core embedded in said housing and having a plurality of surface portions exposed to the outside of said housing and a plurality of magnetic path connection end faces exposed to the inside of said housing;

at least one second laminated core having a plurality of magnetic path connection end faces each opposing through a small gap one of said magnetic path connection end faces of said first laminated core and contained in said housing to form, along with said first laminated core, a closed magnetic path;

a primary coil and a secondary coil which are wound on said second laminated core;

a molding resin filling in said housing to insulate and fix in place said second laminated core, said primary coil and said secondary coil; and

a plurality of soft waterproof layers formed on inner walls of said housing to cover said magnetic path connection end faces of said first laminated core.

Re. 35,093

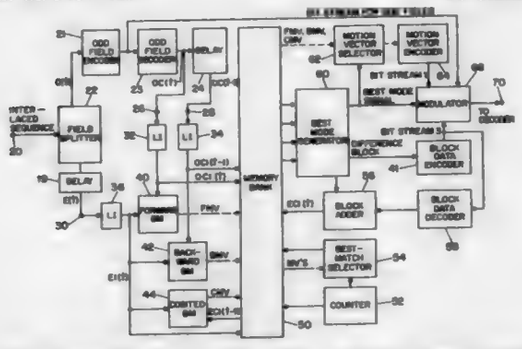
SYSTEMS AND METHODS FOR CODING EVEN FIELDS OF INTERLACED VIDEO SEQUENCES

Feng M. Wang, Milpitas, Calif., and Dimitris Anastassiou, Tenafly, N.J., assignors to The Trustees of Columbia University In the City of New York, New York, N.Y.

Original No. 5,193,004, dated Mar. 9, 1993, Ser. No. 621,343, Dec. 3, 1990. Continuation of Ser. No. 218,970, Mar. 25, 1994, abandoned. Application for reissue Dec. 9, 1994, Ser. No. 353,968

Int. Cl.[6] **H04N** *7/36*

U.S. Cl. 348—413 **56 Claims**



46. A method, for decoding coded fields of video data, wherein frames of video data consist of first and second fields of video data, comprising the steps of:

(a) receiving location signals providing location data for best matched blocks of data, pixel error signals representative of pixel value errors in a best mode block relative to a first field of a current frame of data, and second field data signals;

(b) selecting, with use of said location signals, one or more blocks of pixel data from a second field of said current frame and a first field of a past frame of data;

(c) providing an averaging function, responsive to blocks of pixel data selected in step (b), to provide a single best mode data block regardless of the number of blocks of pixel data selected;

(d) combining said single best mode data block with said pixel error signals to derive a block of first field of a current frame pixel data; and

(e) assembling first fields of data for combination with said second fields of data to provide video signals including frames of first and second fields.

Re. 35,094

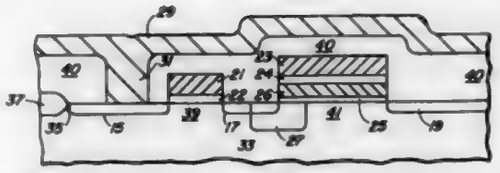
FABRICATION PROCESS FOR PROGRAMMABLE AND ERASABLE MOS MEMORY DEVICE

Tsung-Ching Wu, San Jose, and Geeng-Chuan Chern, Cupertino, both of Calif., assignors to Atmel Corporation, San Jose, Calif.

Original No. 5,081,054, dated Jan. 14, 1992, Ser. No. 652,293, Feb. 5, 1991. Continuation of Ser. No. 332,879, Apr. 3, 1989, abandoned. Application for reissue Nov. 10, 1992, Ser. No. 974,262

Int. Cl.[6] **H01L** *21/8247*

U.S. Cl. 437—43 **5 Claims**



5. A process of fabricating a programmable and erasable EEPROM memory device comprising,

defining an active memory area for an EEPROM device on a semiconductor wafer and forming a layer of field oxide in nonactive areas of said wafer, then

forming a thin oxide layer over the active memory area, said then oxide layer having a thickness in a range from 70 Å to 150 Å, then

depositing a first polysilicon layer on said wafer and selectively removing said first polysilicon layer so as to define a floating gate in said active memory area of the EEPROM device, then

selectively implanting an N-type impurity after the definition of said floating gate into said active memory area of said wafer adjacent to one edge of said floating gate, to form a drain portion in the active area, the drain portion being a tunneling region of the EEPROM device using the edge of the floating gate to locate the drain portion adjacent to the floating gate,

forming a second oxide layer on said wafer including over said polysilicon floating gate,

depositing a second polysilicon layer over said second oxide layer,

selectively removing said second polysilicon layer and said second oxide layer to define control gates, said control gates including a sense gate located over said floating gate,

forming source and drain active areas in said active memory area, the drain joined to the previously formed drain portion,

forming a covering of insulative material over said wafer, said covering having via holes therein to selected sources, drains and gates, and

forming a layer of conductive lines over said covering connected to said selected sources, drains and gates through said via holes, and

subsequent to implanting said N-type impurity, heating said wafer, driving a portion of said N-type impurity comprising the drain portion under a portion of said floating gate, without driving the subsequently formed source and drain active areas under the floating gate, for programming and erasing the MOS memory device by tunneling.

Re. 35,095

BENZOTHIAZEPINE ANTI-SEIZURE METHOD

Ray H. Zobrist, and William R. Morrone, both of Olathe, Kans., assignors to Marion Laboratories, Inc., Kansas City, Mo.

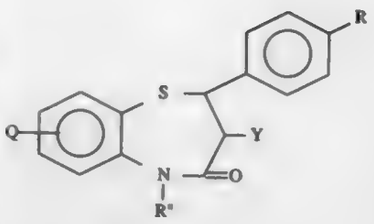
Original No. 4,963,545, dated Oct. 16, 1990, Ser. No. 440,376, Nov. 22, 1989. Continuation of Ser. No. 198,054, May 24, 1988, Pat. No. 4,879,289. Application for reissue Sep. 9, 1992, Ser. No. 942,494

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[6] **A61K** *31/55*

U.S. Cl. 514—211 **15 Claims**

1. A method for ameliorating a generalized tonic clonic type epileptic seizure in a mammal comprising systemically administering to a mammal in need of treatment therefor a Benzothiazepine-compound in an amount effective to ameliorate said seizure, wherein the Benzothiazepine-compound is a benzothiazepine-type compound, or a pharmaceutically acceptable salt thereof, having calcium antagonist activity and which is represented by the following general formula:



(I)

wherein

Q is hydro (H) or halo:

R is H, Lower alkoxy, lower haloalkyl, cyano, lower alkyl or halo;

Y is

OR', wherein R' is H of alkylacyl, provided that then there is full saturation between carbons 2 & 3 of the benzothiazepine nucleus and 2,3-dihydro-functionality thereat as well, or

Cl, provided that then there is ethylenic unsaturation between positions 2 & 3 of the ebenzothiazepine nucleus, and

R" is 2-[di(lower alkyl)amino]ethyl, 3-[di(lower alkyl)amino]propyl, 2-(pyrrolidino)ethyl, 3-(pyrrolidino)propyl, 2-(piperidino)ethyl, 3-(piperidino)propyl, 2-(morpholino)ethyl, 3-(morpholino)propyl or (N-pyridinium)alkyl with a suitable counterion being present,

provided that, in the cis-configuration, when Q is H or 8-Cl, R is methoxy, R' is acetyl, and R" is 2-(dimethylamino)-ethyl, then the compound is the levorotary isomer.

Re. 35,096

PYRROLECARBOXYLIC ACID DERIVATIVES

Masao Taniguchi, Machida; Kohei Umezu, Yokohama; Tadashi Shirasaka, Machida; Shinya Inoue; Tetsuro Shinpuku, both of Yokohama; Masayuki Mitsuka, Machida, and Mayumi Hirata, Yokohama, all of, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

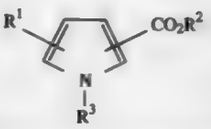
Original No. 5,082,856, dated Jan. 21, 1992, Ser. No. 369,816, Jun. 22, 1989. Application for reissue Jan. 21, 1994, Ser. No. 183,744

Claims priority, application Japan, Jun. 23, 1988, 63-155689; Dec. 22, 1988, 63-324469; Apr. 7, 1989, 1-88512; May 31, 1989, 1-137644

Int. Cl.[6] **A61K** *31/40;* **C07D** *207/333*

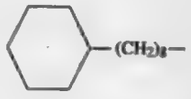
U.S. Cl. 514—423 **16 Claims**

1. A pyrrolecarboxylic acid derivative represented by the following formula (I):



(I)

wherein R^1 is a hydrogen atom, an alkyl group of 10 to 16 carbon atoms,



or an alkenyl group of 8 to 16 carbon atoms, R^2 is a hydrogen atom, a phenyl group, or an alkyl group of 1 to 10 carbon atoms unsubstituted or substituted with a halogen atom, hydroxyl group, amino group, alkylamino group of 1 to 5 carbon atoms, carbamoyl group, C_1–C_5-alkylcarbonylamino group, alkylthio group of 1 to 5 carbon atoms, mercapto group, a C_1–C_5-alkylcarbonyloxy group of aminocarbonyloxy group, and R^3 is an alkyl group of 10 to 16 carbon atoms or an alkenyl group of 10 to 16 carbon atoms, provided that, when R^1 is a group other than a hydrogen atom, R^1 is not adjacent to CO_2R^2, or a pharmaceutically acceptable salt thereof.

13. 4-tridecylpyrrole-2-carboxylic acid.

16. A method of reducing the level of triglyceride or cholesterol in serum, which comprises administering a therapeutically effective amount of 4-tridecylpyrrole-2-carboxylic acid or a pharmaceutically acceptable salt thereof to a patient suffering from high level of triglyceride or cholesterol in serum.

Re. 35,097

GENE FOR DIAGNOSING CANCER METASTATIC POTENTIAL

Patricia S. Steeg, Ellicott City; Lance A. Liotta, Potomac, and Mark E. Sobel, Bethesda, all of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Original No. 5,049,662, dated Sep. 17, 1991, Ser. No. 107,098, Oct. 13, 1987. Application for reissue Apr. 6, 1993, Ser. No. 48,136

Int. Cl.[6] **C07H** *15/12;17/00;* **C12Q** *1/68*

U.S. Cl. 536—23.5 **4 Claims**

3. [The gene of claim 2] *A clone* having the identifying characteristics of ATCC 67539.

PLANT PATENTS

GRANTED NOVEMBER 21, 1995

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,374

SHRUB ROSE PLANT NAMED 'JACWADE'

Keith W. Zary, Thousand Oaks, Calif., assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Nov. 8, 1994, Ser. No. 335,635
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—1 1 Claim

1. A new and distinct variety of rose plant of the shrub class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its dwarf, low growing habit of growth; small, white recurrent blooms; dark green, glossy, disease-resistant foliage; ease of propagation from softwood cuttings; and presence of many glands on the peduncles.

9,375

MINIATURE ROSE PLANT NAMED 'X-RATED'

Cecilia L. D. Bennett, deceased, late of Chula Vista, and by Susan M. O'Brien, special administrator, 489 Minot Ave., Chula Vista, both of Calif. 91910

Filed Dec. 22, 1994, Ser. No. 364,680
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—7.1 1 Claim

1. A new and distinct variety of miniature rose plant substantially as herein described and illustrated named 'X-Rated'; the plant being characterized by its hardy, dwarf, vigorous growth; by its well branched and attractive appearance; by its hybrid tea form blooms which range from creamy white to near Naples Yellow with a pink blush on the outermost petals of near Shell Pink to near Neyron Rose; and by its relative abundance of blooms, which are usually borne one to a stem but occasionally in sprays of 3 to 5 or more with the blooms held very erect and well above the foliage.

9,376

HYBRID TEA ROSE PLANT NAMED 'JACBOY'

Jack E. Christensen, Ontario, Calif., assignor to Bear Creek Gardens, Inc., Medford, Oreg.

Filed Oct. 17, 1994, Ser. No. 324,410
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—12 1 Claim

1. A new and distinct variety of rose plant of the Hybrid Tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its bicolor flower, few thorns, resistance to powdery mildew, good production as a cut flower greenhouse rose and vigorous, upright habit of growth.

9,377

MAGNOLIA GRANDIFLORA NAMED 'GREEN GIANT'

Bruce Hammons, Trussville, Ala., assignor to Plantation Tree Company, Selma, Ala.

Filed Jun. 23, 1994, Ser. No. 264,502
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—53.5 1 Claim

1. The new and distinct cultivar of *Magnolia grandiflora*, substantially as herein shown and described, characterized by a coarse textured, broad, blunt, flame shape and by a pyramidal growth habit with a fairly coarse branch structure, and its dense foliage of coarse textured, green backed leaves exhibiting little pubescence and by exhibiting little to no flowering.

9,378

HEBE 'ROSIE'

Hubert J. Tooby, Worchester, Great Britain, assignor to John Tooby & Co. Ltd., Worcester, United Kingdom

Filed Nov. 8, 1994, Ser. No. 337,527
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—67.2 1 Claim

1. The new and distinct variety of Hebe as described and illustrated.

9,379

CHRYSANTHEMUM PLANT NAMED 'YVETTE'

Cornelis P. VandenBerg, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Nov. 1, 1994, Ser. No. 331,865
Int. Cl.[6] A07H *5/00*
U.S. Cl. Plt.—82.1 1 Claim

1. A new and distinct Chrysanthemum plant named Yvette, as described and illustrated.

9,380

DAYLILY PLANT NAMED 'PINK SILK RUFFLES'

Ronald C. Iverson, Rte. 1, Box 326B, Orange, Va. 22960

Filed Dec. 12, 1994, Ser. No. 355,319
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.4 1 Claim

1. A new and distinct cultivar of daylily plant named Pink Silk Ruffles, as illustrated and described.

9,381

GERANIUM PLANT NAMED FISFLORI

Ingeborg Schumann, Albstadt, Germany, assignor to Florfis, AG, Binningen, Switzerland

Filed Dec. 21, 1994, Ser. No. 360,341
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of geranium plant named Fisflori, as illustrated and described.

9,382

GERANIUM PLANT NAMED FISMOLI

Ingeborg Schumann, Albstadt, and Angelika Utecht, Montabaur, both of, Germany, assignors to Florfis AG, Binningen, Switzerland

Filed Dec. 21, 1994, Ser. No. 360,647
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of geranium plant named Fismoli, as illustrated and described.

9,383

GERANIUM NAMED 'AMERICANA DEEP ROSE'

Mitchell E. Hanes, Morgan Hill, Calif., assignor to Goldsmith Seeds, Inc., Gilroy, Calif.

Filed Dec. 27, 1994, Ser. No. 364,873

Int. Cl.[6] A01H 5/00

U.S. Cl. Plt.—87.12 1 Claim

1. A new and distinct cultivar of geranium substantially as herein shown and described, named Americana Deep Rose, that is characterized by: green foliage, deep rose flower with a center spot color, and semi-double flowers on large umbels, fast rooting and a bigorous growth habit.

PATENTS

GRANTED NOV. 21, 1995

ERRATA

For CLASS	See PATENT NO.
034–117	5,467,534
034–168	5,467,535
036–028	5,467,536
036–050	5,467,537
091–441	5,467,688
600–114	5,467,762
600–201	5,467,763
405–052	5,468,088
405–052	5,468,089
405–094	5,468,090
405–094	5,468,090
405–154	5,468,091
415–055	5,468,119
216–024	5,468,337
216–090	5,468,338
216–067	5,468,339
216–067	5,468,340
216–069	5,468,341
216–051	5,468,345
216–034	5,468,346
523–435	5,468,461
514–150	5,468,469
524–408	5,468,498
530–351	5,468,609
505–238	5,468,806
310–024	5,469,004
330–129	5,469,105
330–254	5,469,106
330–277	5,469,107
330–286	5,469,108
332–105	5,469,126
332–149	5,469,127
333–022	5,469,128
333–124	5,469,129

ERRATA—CONTINUED

For CLASS	See PATENT NO.
333–246	5,469,130
318–432	5,469,215
378–019	5,469,429
395–182	5,469,463
379–088	5,469,491

PATENTS

GRANTED NOVEMBER 21, 1995

GENERAL AND MECHANICAL

5,467,478

HANDKERCHIEF WITH FINGER SECURING LOOP

John L. Slaughter, and Ella M. Slaughter, both of 2607 W. Burnell, Muncie, Ind. 47304

Filed Dec. 27, 1994, Ser. No. 364,807
Int. Cl.[6] A41B *15/00*
U.S. Cl. 2—1 **19 Claims**

1. A handkerchief which comprises:
a sheet of fabric;
a flexible, elastic closed loop;
a flexible sheath disposed surrounding said loop;
means for attaching said loop to said sheet so that said loop is proximate to the center of said sheet; and
means for attaching said sheath to said sheet so that said sheath is proximate to the center of said sheet.

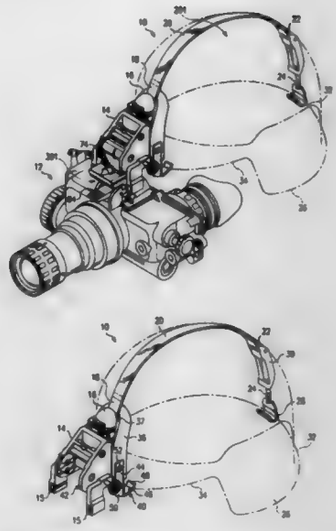
5,467,479

NIGHT VISION GOGGLE MOUNT

Paul B. Mattes, Garland, Tex., assignor to Varo Inc., Garland, Tex.

Filed May 7, 1993, Ser. No. 58,945
Int. Cl.[6] A42B *1/24;3/00;* A61F *9/02*
U.S. Cl. 2—6.3 **27 Claims**

19. A helmet mount for attaching night vision goggles to a helmet so that a wearer may select between a stowed position for the goggles in which the power to the goggles is not supplied and a line-of-sight position in which the power to the goggles is supplied, comprising:
a rear helmet clamp for gripping the back end of the helmet;
a mounting block;
a goggle mount attached to the mounting block for receiving and securing the goggles and for allowing the goggles to rotate between the line-of-sight position and the stowed position;
a first and second magnet attached to the goggle mount for activating a reed switch incorporated into the goggles so that the power is supplied in the line-of-sight position and not supplied in the stowed position;
a first and second front swing clamp secured to the mounting block for gripping the front end of the helmet;
a tension latch attached to the rear helmet clamp;
a strap of pliable material having a first and a second end, the first end of the strap is secured to the tension latch and the second end is secured to the mounting block; and



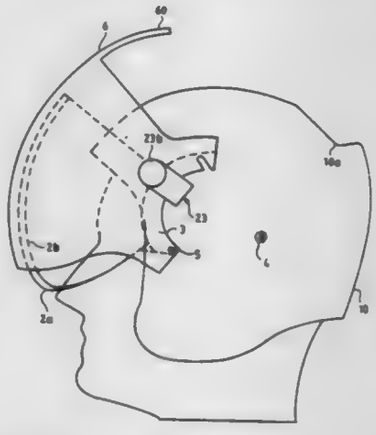
the tension latch for maintaining the desired tension in the strap of pliable material.

5,467,480

SUPPORT SYSTEM FOR AT LEAST ONE VISOR ON A HELMET

Joël Baudou, St Medard en Jalles, and Vincent Vitte, Bordeaux, both of, France, assignors to Sextant Avionique, Meudon la Foret, France

Continuation of Ser. No. 158,271, Nov. 29, 1993, abandoned. This application Mar. 1, 1995, Ser. No. 396,905
Claims priority, application France, Dec. 8, 1992, 92 14768
Int. Cl.[6] A42B *3/00*
U.S. Cl. 2—6.5 **9 Claims**



1. A helmet comprising:
a shell;
at least one visor having a visor sliding block and being movable between a withdrawn position and at least one operational position;
on each side of said shell, a part comprising a slide having an open end and being adapted to receive said visor sliding block, for supporting and guiding said visor between said withdrawn position and said operational position;

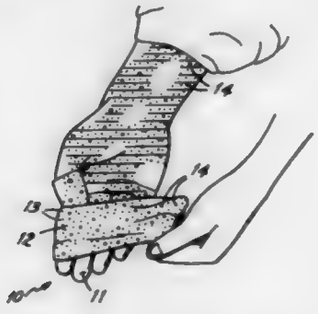
first attaching means and second attaching means for attaching said part respectively on a first and on a second location of said shell when the visor is in any position between said withdrawn and said operational positions, said first attaching means including an attachment device for releasing of said part from said first location, said second attaching means including a retaining device for pivoting of said part around said second location, whereby said visor is guided in a third position wherein it can be removed from said part without contacting said shell, by sliding said visor sliding block through said open end.

5,467,481

GLOVE WITH HAND-COLORING MATERIAL

Laxmi S. Srivastava, 1868 Loisview La., Cincinnati, Ohio 45230

Filed Jul. 15, 1994, Ser. No. 275,603
Int. Cl.[6] A41D *19/00*
U.S. Cl. 2—161.7 **14 Claims**



8. A glove having an interior surface which in use contacts a wearer's hand, said interior surface being coated with a nontoxic mixture comprising a slip-increasing powder and a hand-coloring material that will transfer from said interior surface onto the wearer's hand during use, said hand-coloring material then remaining on the hand, when the glove is removed, in an amount sufficient that said hand-coloring material is easily visible on the hand, said hand-coloring material being one which is removable from the hand by washing.

5,467,482

SELF SUPPORTING SIDELESS AND WAISTLESS TANNING BRIEF

William E. Crawford, II, 6112 Edgemoor, Houston, Tex. 77081

Filed Sep. 12, 1994, Ser. No. 304,783
Int. Cl.[6] A41D *7/00*; A41B *9/00*
U.S. Cl. 2—67 **8 Claims**

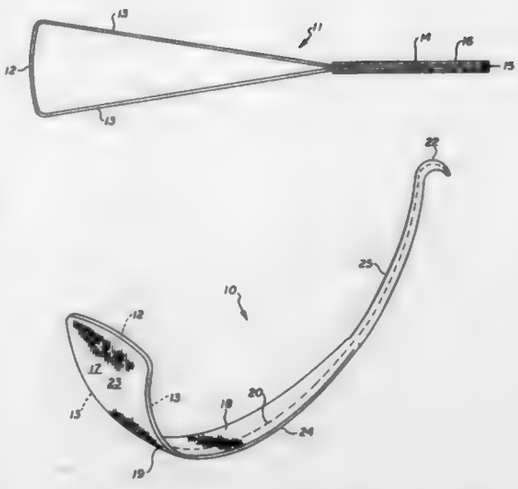
1. A sideless and waistless thong-type tanning brief comprising in combination;

an elongate generally triangular shaped frame of small diameter resilient malleable wire bent to form a relatively short front portion, opposed elongate side portions which extend rearwardly and angularly inward from said front portion and converge toward each other and then extend rearwardly parallel together to form a longitudinal rear portion,

a length of soft elastomeric tubing encircling said parallel rearwardly extending portions of said wire to hold said parallel rearwardly extending portions together and form a cushioned longitudinal rear portion, and

a fabric covering completely enclosing said frame and said soft elastomeric tubing,

said enclosed frame being formed into a generally C-shaped configuration curved along its length and resiliently maintained in said C-shaped configuration, such that



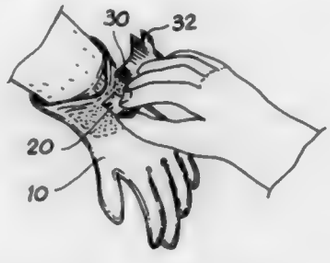
when worn, said brief will cover the genital area, extend rearwardly along the crotch area, and curve upwardly between the buttocks of the wearer with said cushioned longitudinal rear portion disposed along the crotch area and between the buttocks, and will be maintained on the body of the wearer by the spring tension of said frame in said C-shaped configuration.

5,467,483

SURGICAL GLOVE WITH REMOVAL MEANS PROTECTED FROM CONTAMINATION

Hamid Saadatmanesh, 5121 E. Paseo Del Bak, Tucson, Ariz. 85718, and Mohammad R. Ehsani, 5630 E. Via Arbolada, Tucson, Ariz. 85715

Filed Jan. 7, 1994, Ser. No. 178,898
Int. Cl.[6] A41D *19/00*
U.S. Cl. 2—161.7 **20 Claims**



1. A glove with removal means protected from contamination to avoid exposure by a wearer while the glove is taken off, comprising:

(a) a glove made with impermeable material and comprising a wrist portion adapted to prevent penetration of contaminants between the glove and a wrist of the wearer;

(b) gripping means attached to an outer surface of said wrist portion and adapted for gripping and for pulling to remove the glove; and

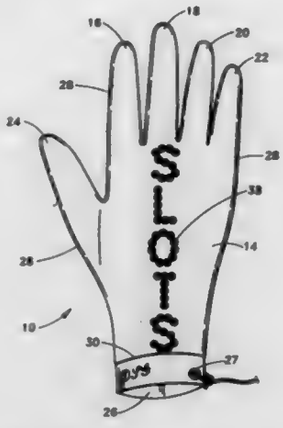
(c) protective-cover means for completely covering said gripping means and hermetically sealing it from contamination, said protective-cover means being attached to said outer surface of the wrist portion over an area surrounding said gripping means and being detachable such that said gripping means may be exposed for removing the glove.

5,467,484

NON-SLIP GLOVE

Bonnie J. Drescher, and Scott M. Drescher, both of 3595 Hwy. NN, West Bend, Wis. 53095

Filed Dec. 13, 1993, Ser. No. 165,175
Int. Cl.[6] A41D 19/00
U.S. Cl. 2—161.8 8 Claims



8. A non-slip glove, comprising:

(a) a front panel conforming generally to the shape of the human hand and having a first peripheral edge extending about the thumb and finger retaining portions thereof, said front panel being cut from a multilayered, laminated, flexible, sheet material wherein a polymer compound, exhibiting a relatively high coefficient of friction, is supported upon an inner fabric layer;

(b) a rear panel of breathable, elastic fabric having a hand-like shape substantially similar to that of said front panel and having a second peripheral edge extending about the thumb and finger retaining portions thereof, said first peripheral edge being joined to said second peripheral edge so as to form a covering for the human hand;

(c) a cuff secured to the bottom of said front panel and said rear panel;

(d) an eyelet lining in said cuff for fastening said glove to a retaining surface so as to prevent the loss thereof; and

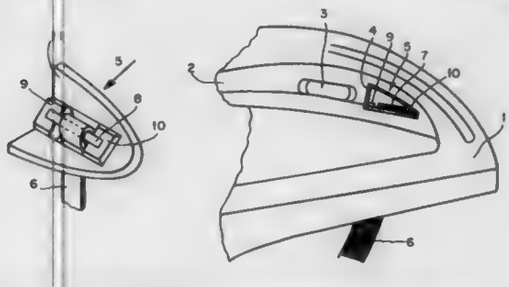
(e) a light reflective material joined to said rear panel for increasing the visibility of said glove in conditions of low light.

5,467,485

CRASH-HELMET FOR CYCLISTS AND SPORTSPEOPLE IN GENERAL

Gabriele Casartelli, Clamart, France, assignor to E.D.C. Sarl, Issy Les Moulineaux, France

Filed Apr. 12, 1994, Ser. No. 226,777
Claims priority, application European Pat. Off., Apr. 13, 1993, 93105998
Int. Cl.[6] A42B 7/00
U.S. Cl. 2—421 7 Claims



1. Crash helmet for cyclists and sportspeople comprising a protection cap of rigid expanded material opportunely shaped and provided with means defining openings suitable to ensure an adequate ventilation within said cap, and means defining slots suitable to permit the passage of chin-straps;

at least two elements for fastening chin-straps on two external sides of said cap, constituted by a small frame provided with two holding and engagement means placed in opposite position with respect to one another along the edges of said frame and by a strap-holding bar suitable to fit in and be stably held between said holding and engagement means;

at least two chin-straps provided on one end with an eyelet loop suitable to be engaged on said strap-holding bar;

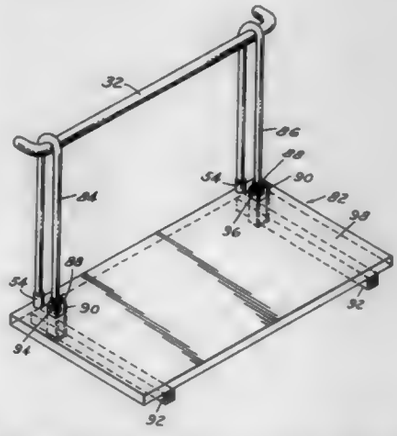
said frame has basically the profile of an isosceles triangle, dihedron-bent at 90° along its height to form an edge, said holding and engagement means being placed in correspondence of the vertex and the centre of the basis of said isosceles triangle respectively, so that said strap-holding bar, fitted in said holding means is placed in correspondence of the edge of the dihedron.

5,467,486

FOLDABLE SHOWER/TUB SEAT

Torbett B. Guenther, 8992 Tamarack Ct., Plymouth, Mich. 48170, assignor to Torbett B. Guenther, and Dolores Guenther, both of Plymouth, Mich.

Filed Oct. 31, 1994, Ser. No. 332,336
Int. Cl.[6] A47K 3/12
U.S. Cl. 4—578.1 15 Claims



1. A shower/tub seat for mounting to a horizontal bar affixed to a shower/tub wall, the shower/tub seat comprising:

U-shaped hanger means adapted to be removably received over the horizontal bar so as to have an inner leg adjacent to the wall and an outer leg remote from the wall, and

a platform including means mounting said platform to a lower end of said outer leg so as to pivot between a vertical position adjacent to said outer leg and a horizontal position,

said platform having an end edge portion adapted to engage the wall and simultaneously engage a lower end of said inner leg in said horizontal position of said platform to support weight placed on said platform.

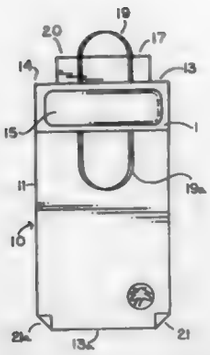
5,467,487

PORTABLE MULTIPURPOSE BEACH TOWEL APPARATUS

Pamela J. Sicard, 4 River Bend, Colchester, Vt. 05446

Filed Dec. 19, 1994, Ser. No. 358,416
Int. Cl.[6] A47G 9/02
U.S. Cl. 5—419 2 Claims

1. A portable multipurpose beach towel apparatus, for use by individuals as an all purpose carry all to and from the beach and by



companies as promotional items by having messages or logos screenprinted on the apparatus, comprising:

a towel having at least one layer of absorbent material;

said layers of absorbent materials comprising layers of terrycloth type material;

said towel having side portions;

said towel further having end portions with a length shorter than said side portions comprising a rectangular design;

said towel further having an open area at one of said end portions of said towel which operates as a duffel bag for the storage of extra items for use at the beach;

said open area at one of said end portions having enclosing means for encasing items kept within said open area;

said enclosing means comprising zippers;

the other of said end portions having pockets located at each corner of said end portion for receiving sand for maintaining said end portion from being blown by the wind and for enabling said apparatus to be maintained in a desired position;

said towel further having inflatable head rest means comprising a pillow located at said open area of said towel;

said pillow having means for withdrawal of said pillow from said open area for allowing the cleaning of said apparatus;

said towel further having fold out storage means located within said open area of said towel;

said fold out storage means comprising a water proof pouch;

said fold out storage means having closing means;

said fold out storage closing means comprising zipper; and

carrying means.

5,467,488

BORDER STABILIZING MEMBER AND METHOD FOR MAKING MATTRESSES, CUSHIONS AND THE LIKE USING THE SAME

Robert F. Wagner, Medina, Ohio, assignor to The Ohio Mattress Co. Licensing & Components Group, Cleveland, Ohio

Continuation-in-part of Ser. No. 84,735, Jun. 29, 1993, abandoned, and a continuation of Ser. No. 833,683, Feb. 11, 1992, Pat. No. 5,239,715. This application Mar. 3, 1994, Ser. No. 205,933

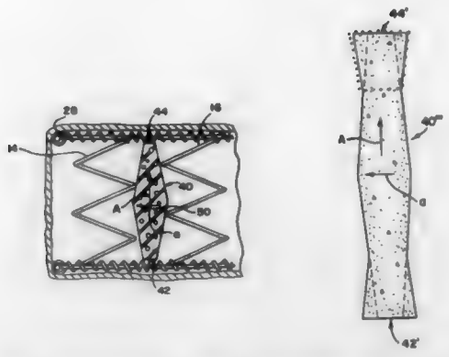
Int. Cl.[6] A47C *27/64*

U.S. Cl. 5—474 **8 Claims**

1. An elongated stabilizing and reinforcing beam of resilient material which can be compressed under load and will thereafter return to its original shape upon removal of said load, for use in an innerspring assembly formed of springs, a plurality of such springs each having a longitudinal axis and being organized into rows and columns and forming a support surface with a top and bottom, with at least a first row of springs and a second row of springs spaced inboard from said first row and generally parallel to said first row, a gap thereby being formed between said first and second rows, and means for retaining said springs in said assembly,

said stabilizing member having a longitudinal axis extending along its elongated length, and a symmetric cross-section orthogonal to said longitudinal axis having a major axis and a minor axis, said major axis being of greater length than said minor axis, said cross-section having a perimeter shape where sides of said perimeter are at least partially defined by modified rhombus-shape having truncated top and bottom ends with said major axis as measured along the diagonal between where two diametrically opposed corners would be with the side surfaces of the rhombus-shape being fully extended, and said minor axis as measured along another diagonal between the other two diametrically opposed corners, said perimeter shape being further defined by a trapezoid-shape superposed upon each end of said modified rhombus-shape on said major axis with the greater of the parallel sides of said trapezoid-shape being coextensive with each of said ends of said modified rhombus-shape,

said stabilizing member being located between said first and second rows of springs in said gap with said major axis thereof being aligned substantially parallel to said longitudinal axes of said springs.



5,467,489

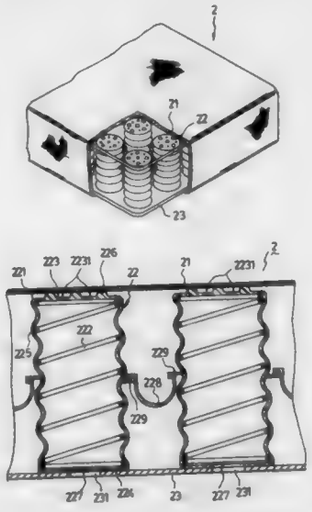
AIR PERMEABLE CUSHION

Cchung-Pao Cchen, No. 184, Yung-Feng Rd., Chien-Chen Dist., Kaohsiung City, Taiwan, Prov. of China

Filed Jan. 21, 1994, Ser. No. 184,842

Int. Cl.[6] A47C *27/04*

U.S. Cl. 5—475 **5 Claims**



1. An air permeable cushion including a horizontal base plate, a plurality of spring units erected on said base plate, and an upper covering disposed on said spring units and enveloping said spring units therein, wherein the improvement comprises:

said base plate having several holes formed therethrough;

said covering being made of an air permeable cloth;

each of said spring units including:

a bellows tube being made of a flexible material and having a horizontal bottom wall which abuts against said base plate

and which has a check valve communicated with a corresponding one of said holes of said base plate in order to prevent air in said bellows tube from flowing out of said bellows tube through said bottom wall while permitting air to flow from said corresponding one of said holes of said base plate into said bellows tube through said bottom wall, a horizontal top wall which abuts against said covering and which has several holes formed therethrough, and an accordion-like peripheral wall which interconnects said top and bottom walls so that, when pressure is applied on said covering, said bellows tube contracts, thereby causing air to flow through said covering via said holes of said top wall;

a coiled compression spring mounted within said bellows tube so that when said pressure applied on said covering is released, said bellows tube expands by action of said spring, thereby sucking in air via said check valve and said holes of said top wall; and

a plurality of flexible U-shaped connection rods, each of said connection rods having two end portions respectively attached to an adjacent pair of said bellows tubes so as to position said spring units on said base plate.

5,467,490

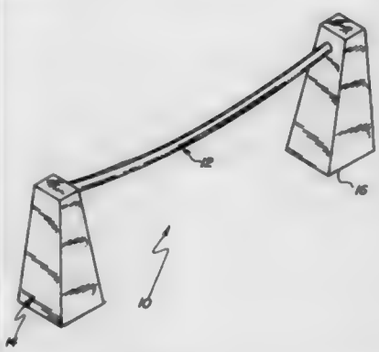
NECK CRADLE

Susan F. Rice, P.O. Box 54, Valentines, Va. 23887

Filed May 31, 1994, Ser. No. 251,240

Int. Cl.[6] A47G *9/00*

U.S. Cl. 5—636 **10 Claims**



1. A new and improved neck cradle for providing neck support to an upward facing prone human comprising:

a resilient elongated rod-like member; and

a support member pair wherein each support member is affixed to an end of said rod-like member thereby producing a substantially horizontal operational disposition of said rod-like member, said support member pair further having two substantially solid truncated pyramids having an attachment means for said resilient elongated rod-like member disposed thereon, each said solid truncated pyramid having a first non-horizontally disposed side forming a first acute angle with the horizontal and a second opposed non-horizontal disposed side having an attachment means disposed thereon for forming a second acute angle with the horizontal, and further said first acute angle being greater than said second acute angle.

5,467,491

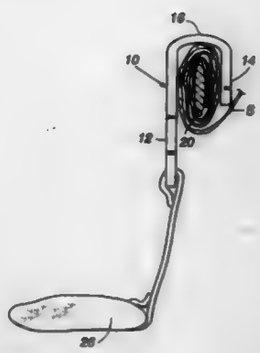
BEDDING ANCHOR

John D. Griffith, 625 N. Kalsman Ave., Compton, Calif. 90220

Filed Jun. 17, 1994, Ser. No. 261,930

Int. Cl.[6] A47C *21/02*

U.S. Cl. 5—658 **4 Claims**



1. A bedding anchor for holding a bed sheet in a taught condition over a mattress, said bedding anchor comprising:

a) a retaining member disposed between a mattress and a support upon which the mattress is disposed;

b) an elastic strap connected to said retaining member and extending outwardly from the position between an undersurface of the mattress and the support;

c) a generally U-shaped clip having a pair of resilient relatively straight spaced apart arms connected by a bight section connected to an outer end of said elastic strap and which arms can be resiliently spread apart to allow access to a recess formed between the arms and thereafter elastically return to their original position, one arm of said clip is longer than the other arm and the elastic strap is connected to the longer of the arms at an end opposite the bight section; and

d) a retainer strip for wrapping about an edge portion of the sheet for a plurality of turns therearound and which is sized to be removably disposed and retentively held within said clip, said clip and the turns of the sheet wrapped therearound being sufficiently thick to cause the clip means to retentively hold the edge portion of the sheet therein, such that a plurality of said bedding anchors, when connected to said sheet, and having their respective retaining members disposed between the undersurface of the mattress and the support, will hold a sheet in a taught position.

5,467,492

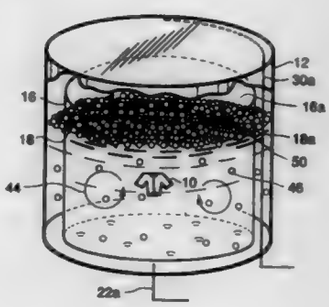
DRY-CLEANING OF GARMENTS USING LIQUID CARBON DIOXIDE UNDER AGITATION AS CLEANING MEDIUM

Sidney C. Chao, Manhattan Beach; Thomas B. Stanford, San Pedro; Edna M. Purer, Los Angeles, and Angela Y. Wilkerson, Inglewood, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 29, 1994, Ser. No. 236,776

Int. Cl.[6] D06B *15/09*

U.S. Cl. 8—159 **19 Claims**



11. A process for cleaning soiled garments and fabric materials by removing soiling substances therefrom, comprising the steps of:

(a) placing said soiled materials in a stationary perforated drum within a walled vessel, said walled vessel provided with

agitation means selected from the group consisting of gas, sonic, and liquid agitation;

(b) introducing into said walled vessel a cleaning fluid, comprising liquid carbon dioxide and, optionally, up to about 5 wt % of at least one cleaning enhancer, and contacting said soiled materials with said cleaning fluid;

(c) simultaneously contacting said soiled materials in said walled vessel with said cleaning fluid and directly agitating said cleaning fluid to thereby agitate said soiled materials for a period of time sufficient to clean said materials.

5,467,493

SUPPORT PLATES FOR BRIDGES AND RAMPS

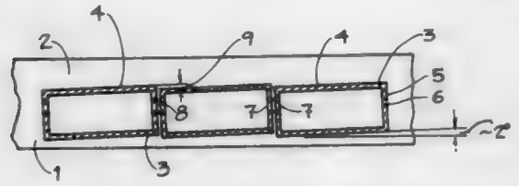
Kurt Alten, Ringstr. 14, D-30974 Wennigesn, Germany

Filed Aug. 19, 1993, Ser. No. 110,288

Claims priority, application Germany, Aug. 19, 1992, 42 27 381.1

Int. Cl.[6] B65G *69/28*

U.S. Cl. 14—69.5 **13 Claims**



1. A support plate for bridges and ramps having a roadway and/or a walkway, said support plate comprising:

two longitudinal supports defining lateral sides of said support plate in a longitudinal direction of said support plate;

a plurality of transverse members having acting surfaces constituting the roadway and/or walkway and having a first and a second free ends, said transverse members connected with said first and said second free ends to said longitudinal supports so as to be perpendicular to said longitudinal direction and parallel to one another, wherein said transverse members are hollow profiles;

each of said acting surfaces being slanted relative to said longitudinal direction and displaced by an increment of displacement with respect to neighboring ones of said acting surfaces such that said acting surfaces are stepped in said longitudinal direction; and

connecting elements for connecting said transverse members to one another, said connecting elements each comprising a plate with two sides and two projections, each said projection connected to one said side of said plate so as to be positioned in a common plane.

5,467,494

TOOTHBRUSH

Ingo Müller, Klagenfurt, and Norbert Schneider, Ebental, both of, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

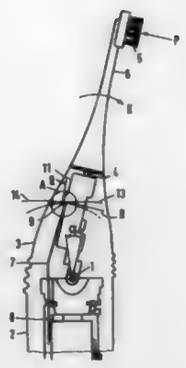
Filed Jul. 27, 1994, Ser. No. 280,914

Claims priority, application Belgium, Jul. 30, 1993, 09300812

Int. Cl.[6] A61C *17/34;* **A46B** *13/02*

U.S. Cl. 15—22.1 **5 Claims**

1. A toothbrush comprising two parts (2,3) which are pivotable relative to one another, of which a first part (2) serves as a handle and of which a second part (3) carries a brush-head (5), a spring (7) being arranged between the parts, said spring having one end portion (9) in contact with a portion of one of the parts (3) and having one end portion (8) fixedly connected to one of the parts (2), the second part (3) being pivotable relative to the first part (2) against a pressure exerted by the spring (7) during use of the toothbrush, which spring snaps from a point of contact with the part (3) when a given pressure threshold (P_d) is exceeded and



resumes said point of contact with the part (3) when the pressure has decreased, wherein the part (3) has a wall portion (11), which wall portion (11), in a situation after snapping of the spring (7), follows a path (13) which differs from the path (14) of the spring end portion (9) which engages against said wall portion (11) before snapping of the spring (7), the spring being subjected only to a bending load in the absence of a pressure (Q) directed in the longitudinal direction of said spring and exerted by the wall portion (11).

5,467,495

BRUSH FOR AN ELECTRICALLY POWERED TOOTHBRUSH

Bernhard Boland, Frankfurt/M., and Peter Hilfinger, Bad Homburg, both of, Germany, assignors to Braun Aktiengesellschaft, Germany

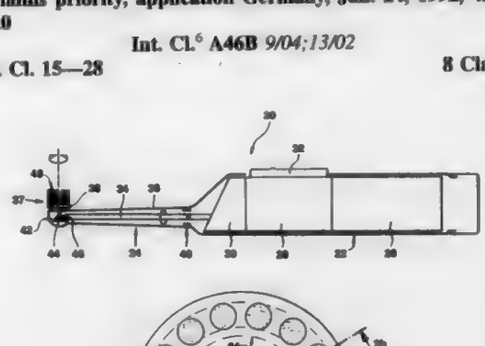
Continuation of Ser. No. 8,619, Jan. 22, 1993, abandoned.

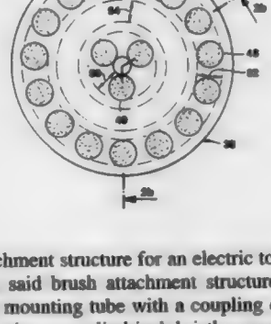
This application Oct. 11, 1994, Ser. No. 320,558

Claims priority, application Germany, Jan. 24, 1992, 42 01 873.0

Int. Cl.[6] A46B *9/04;13/02*

U.S. Cl. 15—28 **8 Claims**





1. A brush attachment structure for an electric toothbrush having a handle section, said brush attachment structure comprising an elongated hollow mounting tube with a coupling end for coupling to the handle section, a cylindrical bristle supporting structure mounted at an end of said mounting tube opposite said coupling end and having an axis of rotation that is oriented in a transverse direction relative to a longitudinal axis of said mounting tube, a shaft and gear mechanism within said mounting tube for transmitting a drive motion from the handle section to the bristle supporting structure, said drive motion causing said supporting structure to perform oscillating movements about its axis of rotation,

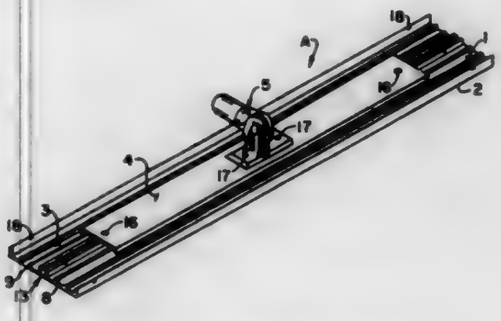
said bristle supporting structure having bristles arranged thereon so as to be fully contained within approximately concentric bristle containing annular cylindrical regions, each region having a wall thickness and wherein at least two adjacent concentric bristle containing regions are separated by an annular cylindrical region devoid of bristles and having a wall thickness that is larger than the wall thickness of at least one of the concentric bristle containing regions on either side thereof.

5,467,496

FLOAT MEANS

Jack D. Jarvis, 3204 Periwinkle, Memphis, Tenn. 38127

Filed Jul. 19, 1993, Ser. No. 95,581
Int. Cl.[6] E01C *19/22*; B05C *17/10*
U.S. Cl. 15—235.8 **15 Claims**



1. A float means for finishing concrete, comprising:

an elongated plate portion for applying to a surface of concrete for finishing, said plate portion having an upper surface and upwardly extending locating means comprising a series of ridges extending upwardly from the upper surface of said plate portion, and said plate portion also having ends;

a handle connected with the upper surface of the plate portion and disposed for grasping by the user during application of the float means;

a separate reinforcing brace mounted upon the plate portion and positioned by the ridges to the upper surface of the plate portion, said reinforcing brace extending a substantial distance along the entire length of the plate portion and also extending from the center of the plate to at least the midpoint of each half of the plate portion in a widthwise direction and fastened thereto, said reinforcing brace provided for reducing pressure bending and heat distortion of the float means during repeated usage.

5,467,497

ADJUSTABLE DRYWALL CORNER TOOL

Gary L. Greene, 5126 Snover Rd., Carsonville, Mich. 48419, and George Spector, 233 Broadway Rm. 702, New York, N.Y. 10279

Filed Sep. 9, 1994, Ser. No. 303,729
Int. Cl.[6] B05C *17/10*
U.S. Cl. 15—235.8 **2 Claims**

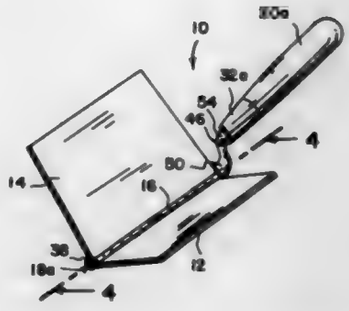
1. An adjustable drywall corner tool comprising:

a) a pair of work engaging blades normally disposed substantially at a ninety degree angle to one another;

b) a hinge extending between mating edges of said blades;

c) means for changing the angle between said two blades, so that said blades will fit in an inside corner of more and less than the ninety degree angle;

d) a handle extending from said angle changing means, so that a person can grip said handle to apply taping to the corner; wherein said angle changing means includes:



e) a locking pin bolt having an externally threaded first end that extends through said hinge and an enlarged knurled head with a slot on a second end of said locking pin bolt to make contact with a first side of said hinge and

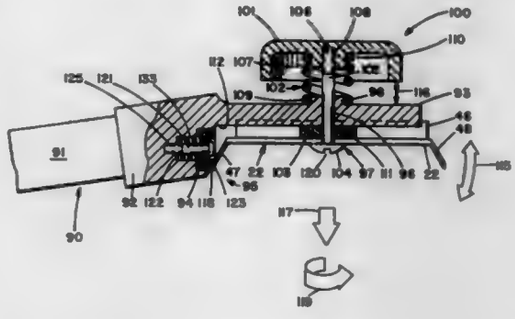
f) an enlarged S-shaped shaft having an internally threaded aperture in a first end for engagement with the externally threaded first end of said locking pin bolt, to make contact with a second side of said hinge, so that said blades can be put at a different angle and retained in that position by the tightening of said knurled head of said locking pin bolt.

5,467,498

SELF-SHARPENING SCRAPING TOOL

Joseph P. Keegan, 530 Fish Rock Rd., Southbury, Conn. 06488, and Thomas E. Devlin, 97 Brookline St. #3, Cambridge, Mass. 02139

Filed Oct. 13, 1993, Ser. No. 135,341
Int. Cl.[6] A47L *13/08*
U.S. Cl. 15—236.05 **5 Claims**



1. A sharpening device in combination with a surface scraping type tool having a scraping plate which contains at least one scraping blade, comprising:

mounting means (**100**) having a mounting post (**97**) mounted to the scraping tool for mounting a handle (**101**) to the scraping tool, and a spring (**102**) mounted between the scraping tool and said handle (**101**) and a spacer member mounted between a portion of the scraping tool and the at least one scraping blade(**103**), for pivotally mounting the scraper plate unto the scraping tool;

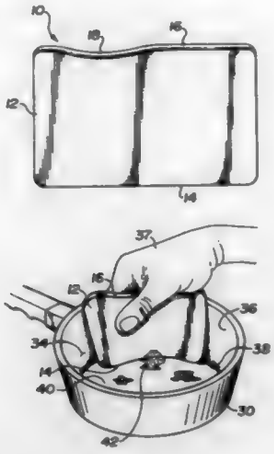
sharpening means (**95**) mounted to the scraping tool for sharpening the at least one scraping blade with a pivotal motion of the pivotally mounted scraper plate.

5,467,499

METHOD OF CLEANING AN INTERIOR CAVITY OF A CONTAINER AND A SCRAPPER

Bernadette D. Blouin, R.R. #1, Range Road 263, St. Albert, Alberta, Canada

Filed Mar. 16, 1994, Ser. No. 213,580
Int. Cl.[6] A47L 17/06
U.S. Cl. 15—236.05 1 Claim



1. A scraper, comprising:

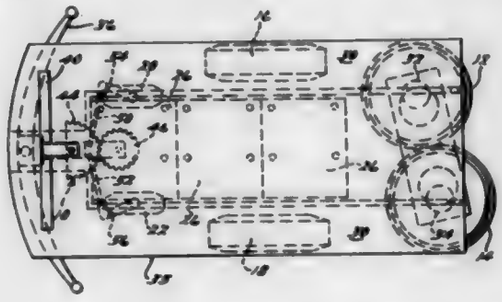
a hard pliant rectangular card with three scraping edges and a beaded gripping edge having axial contouring on a plane coincident with the card thereby forming an arcuate indent, the card being of polymer plastic material sufficiently pliant to conform to a one inch radiused curve and to a substantially 90 degree corner with rapid elastic recovery to within 96% of its original shape.

5,467,500

STEERING MECHANISM FOR A CLEANING VEHICLE

Robert J. O'Hara, Denver, Colo., and Christopher M. Knowlton, West End, N.C., assignors to AAR Corp., Elk Grove Village, Ill.

Filed Jan. 27, 1993, Ser. No. 9,816
Int. Cl.[6] A47L 11/283
U.S. Cl. 15—320 20 Claims



1. A powered cleaning vehicle for moving in a longitudinal direction and cleaning a surface, comprising:

a steering wheel being mounted to said vehicle such that said steering wheel is selectively turned about a generally vertical axis for steering said vehicle;

a steering mechanism for turning said steering wheel having a steering input member being connected to an input gear, said input gear being in meshing engagement with an output gear, said output gear being connected to a first end of a rocker arm, a second end of the rocker arm being operatively connected to said steering wheel, whereby turning said steering input member a specific angular magnitude in one direction causes said steering wheel to turn a greater angular magnitude in an opposite direction;

cleaning means connected to said vehicle and for engaging said surface for cleaning said surface;

a plurality of wheels mounted to said vehicle and engaging said surface; and

driving means mounted to said vehicle and engaging at least one of said wheels for propelling said vehicle in said longitudinal direction;

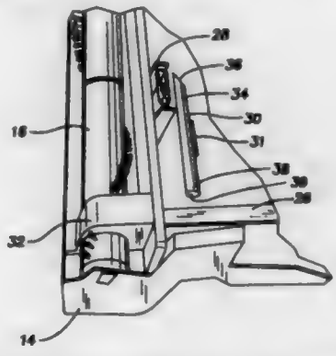
at least one of said wheels being a steering wheel.

5,467,501

VACUUM CLEANER WITH ILLUMINATED BELT VIEW

Arnold L. Sepke, Hudson, Ill., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation of Ser. No. 8,739, Jan. 25, 1993, abandoned.
This application Jun. 10, 1994, Ser. No. 259,144
Int. Cl.[6] A47L 9/30
U.S. Cl. 15—324 20 Claims



1. A vacuum cleaner comprising a floor engaging unit and light communication means, said floor engaging unit including a hood and a base, a light source having a length dimension and being mounted within said floor engaging unit and being adapted to illuminate an area in front of the vacuum cleaner, said light communication means comprising a light pipe located within said floor engaging unit adjacent said light source and adapted to transmit a portion of light produced by the light source to a secondary area which is remote from the light source, said light pipe collecting said portion of light from a substantial portion of the length of said light source, said light pipe having a longitudinal axis whereby the portion of light from said light source enters said light pipe in a direction generally perpendicular to said axis and is thereafter transmitted along said axis toward said secondary area, said secondary area being within the floor engaging unit and being visible to a user from an exterior thereof.

5,467,502

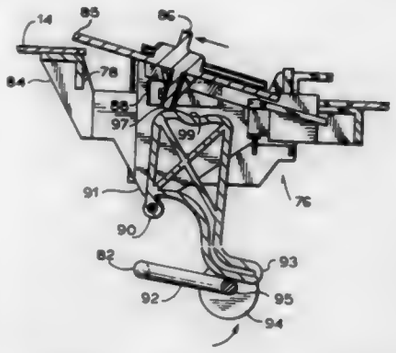
HEIGHT ADJUSTING SYSTEM FOR UPRIGHT VACUUM CLEANER

Milton J. Johnson, Stanford, and Jeffrey T. Roney, Perryville, both of Ky., assignors to Matsushita Applicane Corporation, Danville, Ky.

Division of Ser. No. 893,267, Jun. 4, 1992, Pat. No. 5,331,715.
This application Mar. 2, 1994, Ser. No. 205,893
Int. Cl.[6] A47L 5/34
U.S. Cl. 15—339 12 Claims

1. An adjustment apparatus of a vacuum cleaner nozzle assembly which includes an agitator brush driven by an agitator motor for controlling the distance of the agitator brush from the floor surface being cleaned and for deenergizing the agitator motor, comprising:

a wheel assembly movably mounted to the nozzle assembly for supporting the agitator brush above the floor surface;



means for moving the wheel assembly from a first position wherein the agitator brush is closest to the floor to a second position wherein the agitator brush is furthest from the floor; and

a switching means responsive to the means for moving the wheel assembly which deenergizes the agitator motor when the wheel assembly is in the first position.

5,467,503

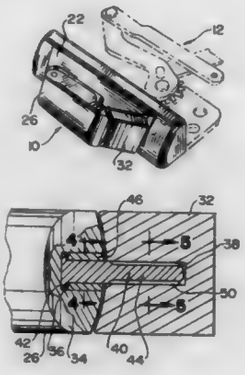
HANDLE AND COVER ASSEMBLY FOR A WINDOW OPERATOR

Douglas A. Nolte; Gregory J. Vetter; Kenneth E. Best, all of Owatonna, and Dennis J. Krampotich, Burnsville, all of Minn., assignors to Truth Hardware Corporation, Owatonna, Minn.

Continuation of Ser. No. 278,971, Jul. 20, 1994, abandoned, which is a continuation of Ser. No. 1,270, Jan. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 882,625, May 13, 1992, Pat. No. D. 347,569. This application Jan. 9, 1995, Ser. No. 370,346

Int. Cl.[6] E05B *5/02*

U.S. Cl. 16—115 **9 Claims**



1. A pivotable knob and handle assembly for a window operator, comprising:

a handle having an opening in one end;

a knob having an opening in one end; said knob opening being axially aligned with said handle opening;

an axial pin having a head on one end and a friction surface about the other end;

a sleeve disposed over said axial pin and having a friction surface about its outer periphery, said sleeve having an inner diameter greater than the outer diameter of the pin other end;

wherein said pin other end is frictionally press fit in either the handle end opening or the knob opening and said sleeve is frictionally press fit in the other of the openings whereby said sleeve secures said pin against axial movement while permitting rotational movement of the pin relative to the sleeve.

5,467,504

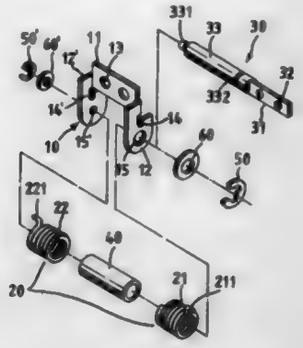
HINGE FOR A PORTABLE COMPUTER

A-Tho Yang, Taipei Hsien, Taiwan, Prov. of China, assignor to Chiahuan Spring Co., Ltd., Taipei Hsien, Taiwan, Prov. of China

Filed Feb. 4, 1994, Ser. No. 191,958

Int. Cl.[6] E05D *11/08*

U.S. Cl. 16—342 **1 Claim**



1. A hinge to be attached to a portable computer, said portable computer including a lower housing and an upper housing which is pivoted to said lower housing by said hinge, said hinge comprising:

a first hinge leaf unit including a first elongated positioning plate portion adapted to be mounted securely on said upper housing, and a pair of pivot plate portions secured respectively to two ends of said first elongated positioning plate portion at upper portions thereof, each of said pivot plate portions having a pivot hole formed in a lower portion thereof;

a second hinge leaf unit including a second elongated positioning plate portion which is adapted to be mounted securely on said lower housing, and a pivot pin which is connected securely to an end surface of said second elongated positioning plate portion and which extends through said pivot holes of said pivot plate portions of said first hinge leaf unit so as to allow said first hinge leaf unit to be mounted rotatably on said second hinge leaf unit;

a sleeve being sleeved tightly on said pivot pin of said second hinge leaf unit between said pivot plate portions of said first hinge leaf unit so as to provide friction between an inner surface of said sleeve and an outer surface of said pivot pin, thus locating said upper housing at a selected position relative to said lower housing; and

a resisting unit including a first torsion spring which is sleeved tightly on a portion of an outer surface of said sleeve and which has an end portion that is retained on one of said pivot plate portions so as to fasten said sleeve to said first hinge leaf unit in such a manner that said sleeve can rotate with said first hinge leaf unit, and a second torsion spring which is sleeved tightly on another portion of said outer surface of said sleeve and which has an end portion that is retained on the other one of said pivot plate portions, said second torsion spring having a retaining force capable of arresting upward movement of said upper housing relative to said lower housing, said second torsion spring being tightened on said sleeve when said first hinge leaf unit is turned upward so as to allow said sleeve to rotate synchronously with said first hinge leaf unit, synchronous rotation of said sleeve and said first hinge leaf unit loosening said first torsion spring, said first torsion spring having a returning force capable of arresting downward movement of said upper housing relative to said lower housing, said first torsion spring being tightened on said sleeve when said first hinge leaf unit is turned downward so as to allow said sleeve to rotate synchronously with said first hinge leaf unit, synchronous rotation of said sleeve and said first hinge leaf unit loosening said second torsion spring, said first and second torsion springs cooperatively facilitating retaining of said Upper housing in said selected position relative to said lower housing.

5,467,505

CARD CLOTHING FOR A CARDING MACHINE

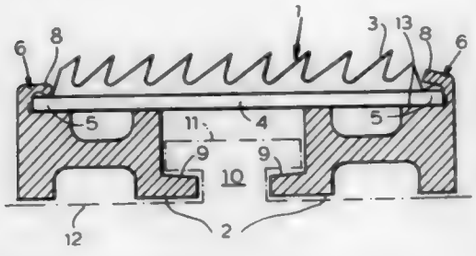
Ralph Graf, Freienbach, Switzerland, assignor to Graf + Cie AG Kratzen- Und Maschinenfabrik, Rapperswil, Switzerland

Filed Aug. 4, 1994, Ser. No. 286,474

Claims priority, application Germany, Aug. 4, 1993, 43 26 203.1

Int. Cl.[6] D01G *15/24;15/28;15/92*

U.S. Cl. 19—114 **6 Claims**



1. A card clothing comprising:

a cover lining having an inwardly directed and longitudinally extending foot part, a multiplicity of hooks extending outward from the foot part, and a pair of ends; and

a pair of longitudinally spaced support elements wholly out of direct contact with each other, one end of the cover lining being fixed in one of the support elements and the other end of the cover lining being fixed in the other support element so that the card clothing is self supporting, the support elements together forming an inwardly open T-section recess adapted to fit with a complementary T-section support structure of the carding machine.

5,467,506

NIPPER APPARATUS FOR USE IN COMBER

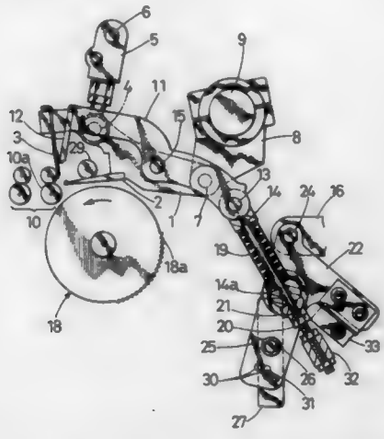
Shinjirou Nishikawa, Gifu Prefecture, Japan, assignor to Kabushiki Kaisha Hara Shokki Seisakusho, Gifu Prefecture, Japan

Filed Nov. 10, 1994, Ser. No. 338,806

Claims priority, application Japan, Nov. 12, 1993, 5-065496 U

Int. Cl.[6] D01G *19/16*

U.S. Cl. 19—223 **3 Claims**



1. A nipper apparatus for use in a comber comprising a nipper frame having a cushion plate fixed to a lower portion of the frame, said nipper frame being suspended as a whole by a nipper pivot and a nipper shaft and being arranged to swing toward and away from a detaching roller by a reciprocating turn of said nipper shaft, said nipper apparatus being arranged to repeat gripping and releasing of a fleece on said cushion plate by means of a nipper knife through motion of a nipper arm having said nipper knife at a front end thereof and a spring rod at a rear end thereof which turn according to a swing of said nipper frame,

in which a spring end portion of said spring rod which serves as a point for providing pressure support for said nipper arm is pivotally movable supported with respect to a machine frame, said spring end portion being movable along an arc to a predetermined position according to a change in a nipper gauge and fixable in that position.

5,467,507

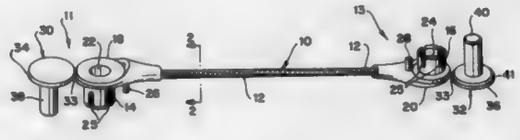
POLYMER CABLE CHECK STRAP

David J. Marsh, Royal Oak, and Gary L. Schubring, New Baltimore, both of Mich., assignors to Emhart Inc., Newark, Del.

Filed Sep. 17, 1993, Ser. No. 123,310

Int. Cl.[6] A44B *21/00;* **E05F** *5/00*

U.S. Cl. 24—298 **7 Claims**



1. A strap assembly for limiting the motion of a first, relatively moveable closure member with respect to a second member, while allowing free travel of said first member even after said first member has remained at one extremity of its motion for an extended period of time, said strap assembly comprising:

a cable extending between said first and said second members;

said cable comprising a plurality of single strands of plastic material and a sheath of braided plastic enclosing said plurality of strands;

said plurality of strands and said braid together allowing said cable to readily convert from curled to straight and from straight to curled orientations upon corresponding relative movement of said first and said second members to enable said first member to readily move between fully open and closed positions without being affected by the time for which it has remained in either position; and

an end fastener molded on each end of said cable, each of said fasteners comprising:

a cylindrical portion molded over an end of said cable;

a flange portion extending from said cylindrical portion and a boss extending from said flange engagable with one of said first and said second members.

5,467,508

TIGHTENING-UP BELT

Le-Jang Feng, 1 Fl., No. 22-10, Lane 50, Tien Mu E. Rd., Taipei, Taiwan, Prov. of China

Filed Oct. 18, 1994, Ser. No. 324,941

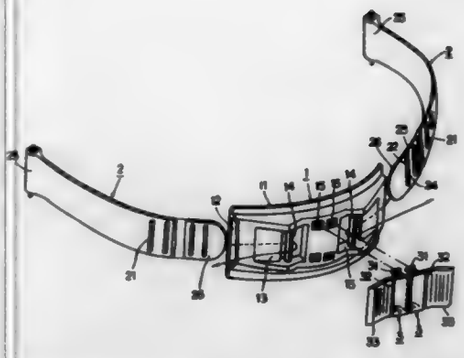
Int. Cl.[6] A44B *11/00*

U.S. Cl. 24—68 SK **4 Claims**

1. A tightening-up belt comprising:

an embowed assembly plate as an embowed plate of which the two sides on the outer surface are symmetrically provided with a slot respectively, each opening on the inner side of each slot is provided with a shaft, and the embowed assembly plate is provided with an assembly structure for installing a holding-down plate;

two belts which are made of elastic material and have a retractable elasticity and a plurality of check strips embossing on the outer surface, and when these belts are pressed, these belts still can be pulled outward forward but are prevented from shrinking back reversely; one end (fixed end) of each belt is



pivotally fixed on each of two sides of a frame of an article to be used, and another end (free end) thereof passes through each of sots on two sides of embowed assembly plate and then is reversely folded toward two outer sides and around the shaft so that a portion of free end forms a reversely-folded belt to be caught at and around the shaft through the check strips; and

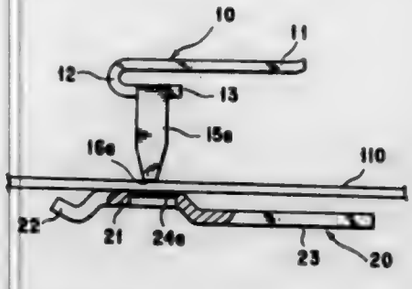
two holding-down plates which are assembled with the embowed assembly plate through some assembly structure of the former and have some elastic structure to be closeing inward and opening outward, so the outer end portion (operating portion) of these holding-down plates has an elastic effect of closing inward, opening outward and being pullable, and a check strip with the same structure as that on the two belts is provided on the inner surface of the operating portion and able to tighten or loosen the reversely-folded belt.

5,467,509

HOOK-AND-EYE FASTENER

Jukichi Fukushima, Nanseikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Feb. 2, 1994, Ser. No. 190,530
Claims priority, application Japan, Feb. 8, 1993, 5-043232
Int. Cl.[6] A44B *13/00*
U.S. Cl. 24—689 **11 Claims**



1. A hook-and-eye fastener, comprising:

fastener members comprising a hook and an eye, each member having a pair of engaging prongs projecting substantially perpendicularly therefrom; and

retainers adapted severally to immobilize said fastener members and intended to be disposed on the side of a fabric opposite to the side thereof on which said fastener members are set in place;

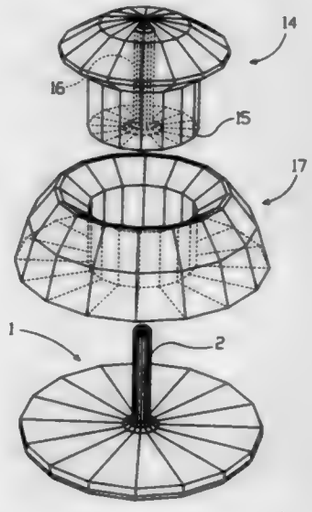
each of said retainers having a pair of thin-wall parts adapted to be pierced by said pair of engaging prongs of the relevant fastener member, each thin-wall part of said retainers having a means for contacting the fabric comprising an upper surface lying flush with an upper surface of the retainer and a lower concave surface, and leading ends of said engaging prongs of each fastener member being formed in the shape of a flat part lying in a plane substantially perpendicular to a direction of penetration of said engaging prongs into said thin-wall parts of the relevant retainer through first the upper surface and then the lower concave surface of the thin-wall parts of said retainers.

5,467,510

SOCK TAGGING DEVICE AND METHOD

Jonathan Hartzell, 8760-A Research Blvd. #210, Austin, Tex. 78758

Filed Sep. 26, 1994, Ser. No. 311,953
Int. Cl.[6] A44B *17/00*
U.S. Cl. 24—706.9 **4 Claims**

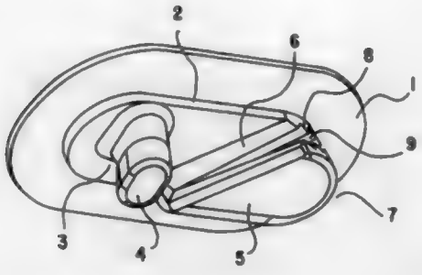


1. A sock tagging device to be used in multiplicity comprising firstly a penetrating component made of solid material which, because its form resembles that of a common thumbtack, will hereinafter be referred to as the tack, having a solid, cylindrical piercing post protruding perpendicularly from the center of a disc base which will henceforth be referred to as the tack disc, secondly a cap core made of solid material, having a cylindrical receiving void extending perpendicularly from the center of its circular base facet to a point just short of emerging from the cap core material, and thirdly a cap ring made of solid material through which said cap core can be partially inserted such that both core and ring, when mated in such manner, form a composite cap in the shape of a dome, having hemispherical appearance, and hereinafter referred to as the cap, said cylindrical receiving void of said cap core being of a diameter corresponding in such a way with the diameter of the aforementioned piercing post that when said piercing post is forced deeply into said receiving void sufficient friction is generated between the exterior cylindrical surface of the inserted post and the interior cylindrical surface of the cap core material to cause said tack and said cap core, bearing its accompanying cap ring, to remain coupled and resistant to ambient and prevailing forces that would otherwise tend to separate them, such that when the piercing post of the tack is pushed through the fabric of a sock and then forced deeply into the receiving void of the cap core, thereby sandwiching the sock fabric between the tack disc and the base facet of the cap core, the tack and cap remain securely affixed to the sock, and whereby the tack, cap core and cad ring each independently bear any one of a multiplicity of distinctive colors.

5,467,511
SHOELACE FASTENING DEVICE

Yoshihiro Kubo, Osaka, Japan, assignor to Morito Kabushiki Gaisha, Osaka, Japan

Filed Apr. 19, 1994, Ser. No. 229,941
Claims priority, application Japan, Dec. 6, 1993, 5-065031 U
Int. Cl.[6] F16G *11/00*
U.S. Cl. 24—712.9 4 Claims

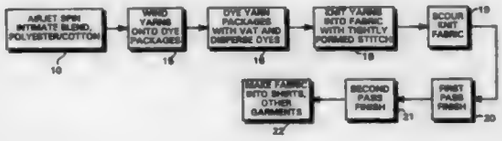


1. A shoelace fastening device comprising: a mounting base; a lace holder guide mounted on said mounting base, said lace holder guide having a lace holder at a middle column portion; and a lace fastener body mounted on said mounting base in juxtaposition to said lace holder guide and formed with a lace clamping groove which has a V-shaped section extending from the side of said lace holder guide to the opposite side and which is formed in the facing inner surfaces thereof with a multiplicity of ridges inclined upward from the side of said lace holder guide to the opposite side to form a V-shaped opening.

5,467,512
KNITTED FABRIC CONSTRUCTION FOR AN INDUSTRIALLY LAUNDERABLE KNITTED GARMENT

Jon Weingarten, Weston; Rod Kosann, Stamford, both of Conn.; Jerry E. Wallace, Statesville; Olin E. Wilson, Wake Forest, both of N.C., and Maura T. Buckley, Glen Ridge, N.J., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 14, 1994, Ser. No. 195,141
Int. Cl.[6] A41B *1/00;* D04B *1/14*
U.S. Cl. 28—100 24 Claims



1. A method of producing a rental shirt, comprising the steps of substantially sequentially:

(a) air jet spinning an air jet spun intimate polyester/cotton blend yarn to form a yarn bundle, having wrapper fibers holding the yarn bundle together;

(b) vat dyeing the cotton component of the air jet spun yarn with vat dye, and dyeing the polyester component;

(c) knitting the dyed yarn into a fabric; and

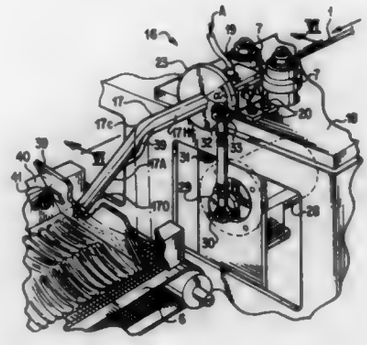
(d) making the fabric into shirts; and

wherein step (c) is practiced to knit the fabric with tightly formed stitches, and wherein steps (a)–(d) are practiced to produce a shirt which shrinks a maximum of about 8% both in length and width unrestored after 5 wash and tumble dry sequences per AATCC Test Method 135, has a colorfastness rating of 4.0 or higher when subjected to AATCC Test Method 61-IIA, has a rating of 4.0 or higher when tested for pilling using ASTMD3512 Resistance to Pilling, Random Tumble test method, and a life expectancy of at least 50 industrial laundering wash-dry-wear cycles.

5,467,513
METHOD AND APPARATUS FOR HEAT-SETTING CARPET YARN USING VARIABLE YARN LAYING MECHANISM

Erwin Steiner, Clover, and Rolf Mischker, Fort Mill, both of S.C., assignors to American Suessen Corporation, Charlotte, N.C.

Filed Jul. 8, 1994, Ser. No. 271,911
Int. Cl.[6] D02G *3/00*
U.S. Cl. 28—281 57 Claims



1. A replacement kit for replacing a yarn stuffer box assembly on a carpet yarn heat-setting machine of the type having a conveyor belt traveling through a heat setting chamber carrying yarn supplied from driven yarn feed rolls and through a stuffer box assembly disposed between the yarn feed rolls and the conveyor belt, said replacement kit comprising:

a yarn laying device including a yarn outlet end guide and an end guide moving mechanism for reciprocally moving the yarn outlet end guide in directions transverse to the conveyor belt travel direction to thereby control a pattern of yarn on the conveyor belt between a first pattern for processing straight-set yarn to further patterns for processing textured yarn

wherein the yarn laying device is a yarn supply tube which is mountable so that a yarn supply tube inlet end is immediately downstream of the yarn feed rolls, an outlet end of the yarn supply tube forming the yarn outlet end guide

wherein said yarn supply tube includes a first section which extends along a travel path of yarn fed by the yarn feed rolls and a second section angularly inclined with respect to the first section, and

a bearing assembly which is detachably mountable to a machine frame downstream of the yarn feed rolls, said bearing assembly pivotably bearingly supporting the first section of the yarn supply tube.

5,467,514
LINING STRIP CUTTING MACHINE

Fei-Lung Ku, No. 10, Alley 6, Lane 148, Kai Yuan Road, Tainan, Taiwan, Prov. of China

Filed Jul. 13, 1994, Ser. No. 274,329
Int. Cl.[6] B26D *3/16*
U.S. Cl. 29—2.19 5 Claims

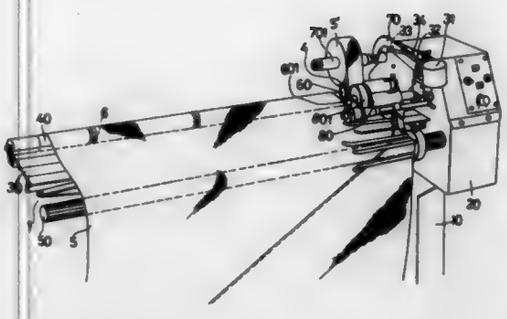
1. A lining strip cutting machine comprising:

a machine frame supporting a transmission assembly on a top portion thereof;

said transmission assembly rotating a transferring rod, an upper cutting wheel and a lower cutting wheel and a winding roller, disposed on top of said machine frame;

a flat long board having one end connected with and supported by said machine frame, said flat long board receiving a closed loop of cloth thereon from which a lining strip is to be cut;

said transferring rod being located along one side of said flat long board, said transferring rod having one end connected to and rotated by said transmission assembly to move a closed loop cloth across said flat long board;



an elongate guide rod located along an other side of said flat long board, said guide rod having one end supported by a side wall of said transmission assembly said guide rod being connected with a pair of micro adjusters for angularly positioning said guide rod relative to said flat board, said angularly positioned guide rod forcing said closed loop of cloth to move angularly toward said upper cutting wheel and said lower cutting wheel;

each of said pair of micro adjusters including a first arm and a second arm pivotally connected each to the other with a screw, a washer and a curved washer, said first arm having an outer end connected with said flat board by means of connecter, a screw, a washer and a curved washer, said second arm having an outer end connected with said guide rod by means of a connecter, a screw, and two washers, said pair of micro adjusters enabling each end of said guide rod to be a predetermined distance from said flat board by displacing a respective second arm relative to a respective first arm, and thereby positioning said guide rod at an angle needed to make said closed loop of cloth move angularly nearer to said cutting wheels in accordance with the width of a lining strip to be cut by said cutting wheels;

a winding roller located in abutting relationship with said upper cutting wheel, said winding roller being connected with said transmission assembly to be rotated thereby so as to pick up a lining strip cut from said closed loop of cloth by said cutting wheels, said winding roller passing said lining strip onto a strip shaft to wind said strip thereon;

said strip shaft being located to always be in contact with said winding roller, said strip shaft being movably supported on an inner end by a curvingly bent end of a swingable arm pivotally coupled to an outer wall of said transmission assembly;

said upper cutting wheel and said lower cutting wheel connected to and rotated by said transmission assembly for cutting a lining strip from the closed loop of cloth moving across said flat board, said upper cutting wheel being located over said flat board, said lower cutting wheel being located under said flat board, both said cutting wheels having a plurality of radial grooves forming ridges between each two grooves for balancing speed differences therebetween;

a cloth stretching unit fixed at a lower portion of said machine frame, including:

a locating body having an upper clamp movably clamping around an intermediate portion of said machine frame by means of a screw bolt, said locating body having two inclined sides located under said clamp, and a channel-shaped portion for receiving a connecting tube therein is disposed below said two inclined sides;

said connecting tube fitting in channel-shaped portion of said locating body and being pivotally connected therewith, said connecting tube having a small diameter shaft extending from an outer end thereof, two bearings and two lock washers being disposed on said small diameter shaft for supporting one end portion of a stretching tube slid over said bearings, an urging button disposed within a hole in one parallel wall of said channel-shaped portion of said locating body to press against said connecting tube, an elastic plate with one end fixed on said parallel wall and another end pushing elastically against said urging button for applying a bias force thereto;

said elongate stretching tube being rotatable on said two bearings on said small shaft of said connecting tube, said elongate stretching tube stretching a lower drooping portion of said closed loop of cloth; and,

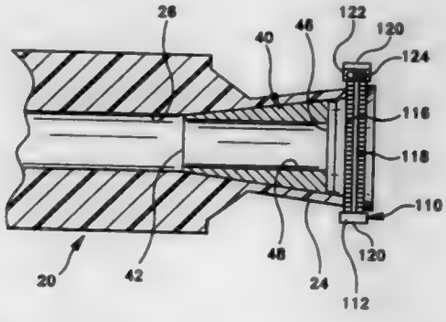
a weight unit provided to be hung at an inner end of said swingable arm to decrease a frictional contact force between said strip shaft and said winding roller for cutting twill or denim cloth.

5,467,515

ALTERNATIVE COLD SHRINK DEVICE

Glenn J. Luzzi, Mt. Bethel, Pa., assignor to Amerace Corporation, Hackettstown, N.J.

Filed Sep. 28, 1994, Ser. No. 313,778
Int. Cl.[6] B23P *19/02*
U.S. Cl. 29—235 **12 Claims**



1. A device for expanding the bore of a recoverable member comprising:

a) mandrel means having a first end of a first diameter and a second end of a second diameter larger than said first diameter with a tapered exterior surface between said first end and said second end;

b) said mandrel means having an interior bore from said first end to said second end to increase the diameter of said bore of said recoverable member when said mandrel means is placed in said bore of said recoverable member;

c) and locking means for fixing said mandrel means to said recoverable means to maintain said recoverable means bore in its increased diameter state;

d) said locking means when released permitting said recoverable member bore to return to its original dimensions ejecting said mandrel means from said recoverable member.

5,467,516

PALLET SLAT SALVAGING APPARATUS

Rick E. DeGeorge, 2423 Harrisburg Pike, Lancaster, Pa. 17601

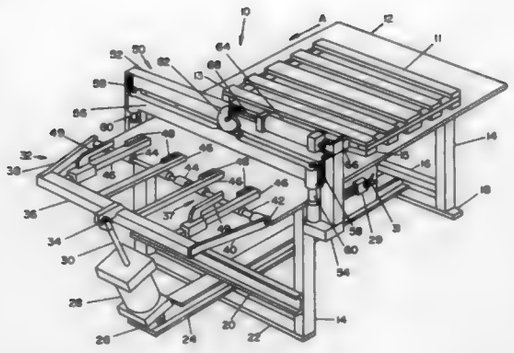
Filed Apr. 21, 1994, Ser. No. 230,829
Int. Cl.[6] B23P *19/00*
U.S. Cl. 29—239 **6 Claims**

1. An apparatus for removing a slat from a pallet comprising:

a table surface located upon a support structure with the table surface determining a plane;

an arm assembly pivotably attached to the table surface at a pivot axis and extending away from the pivot axis to an end structure, the arm assembly including a plurality of arms which have free ends, with the arms attached to the end structure and oriented so that the arms extend from the End structure and across the pivot axis, with the free ends of the arms located adjacent to a portion of the table surface, so that the free ends of the arms move in a direction opposite from the movement of the end structure;

a motive means connected to the arm assembly to move the arms over a path so that the free ends of the arms move away from and then back toward the table surface; and



clamp means to hold a pallet on the table surface and prevent any movement of the pallet as the arms engage a slat on the pallet and move away from the table surface;

wherein the clamp means comprises:

a support means located so that it is spaced away from the table surface;

a clamp structure movably attached to the support means and spaced away from the table surface in a first position;

a motive means operating upon the clamp structure to move the clamp structure from the first position and into a second position which is closer to the table surface than the first position, and in which the clamp structure engages a pallet located on the table surface; and

a return means acting on the clamp structure to return it to the first position when the force of the motive means is released from the clamp structure;

wherein the motive means is a cam rotated by a pneumatic cylinder, and the return means is at least one spring attached to the clamp structure and anchored on the support means.

5,467,517

METHOD AND SYSTEM FOR FITTING WORK-PIECES

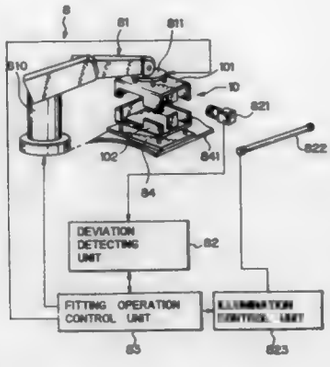
Katsuhiko Sugito, and Yasuo Hibi, both of Nagoya, Japan, assignors to Nippondenso Co., Ltd., Japan

Filed May 28, 1993, Ser. No. 68,671

Claims priority, application Japan, May 29, 1992, 4-164216; Apr. 20, 1993, 5-117727

Int. Cl.[6] B23P *21/00*

U.S. Cl. 29—407 **15 Claims**



1. A method for fitting two work-pieces separated with each other and having at least two pairs of fitting lands, comprising the steps of:

(a) providing holding means for stationary holding one of the work-pieces;

(b) providing fitting means for movably holding the other work-piece, said fitting means being capable of moving the other work-piece toward said one work-piece;

(c) determining a consecutive order of fitting operations between the at least two pairs of fitting lands;

(d) determining if an initially selected pair of fitting lands to be subjected to a first stage fitting operation has a fitting portion which is within a first range of assembling allowance;

(e) upon a determination that the initially selected pair of the fitting lands is out of the first range of assembling allowance at the step (d), correcting a relative deviation in the initially selected pair of fitting lands by moving the other work-piece with said fitting means so that the initially selected pair of fitting lands is within said first range of assembling allowance;

(f) with regard to the initially selected pair of fitting lands within the first range of assembling allowance, executing a fitting operation by moving the other work-piece with said fitting means so that the initially selected pair of fitting lands are in a provisionally fitted condition;

(g) with regard to fitting lands to be fitted in a secondary stage fitting operation, determining if a secondary selected pair of fitting lands subjected to the secondary stage fitting operation has a fitting portion which is within a second range of assembling allowance;

(h) upon a determination that the secondary selected pair of fitting lands in the secondary stage fitting operation is out of the second range of assembling allowance at the step (g), correcting a relative deviation in the secondary selected lands by moving the other work-piece with said fitting means so that the secondary selected pair of fitting lands is within the second range of assembling allowance, while maintaining the provisional fitting condition of the initially selected fitting lands; and

(i) with regard to the secondary selected fitting lands within the second range of assembling allowance, executing a fitting operation by moving the other work-piece with said fitting means so that the secondary selected pair of fitting lands are in a provisionally fitted condition with each other.

5,467,518

METHOD OF AND APPARATUS FOR CONTINUOUSLY CASTING AND ROLLING DOWN THIN SLABS

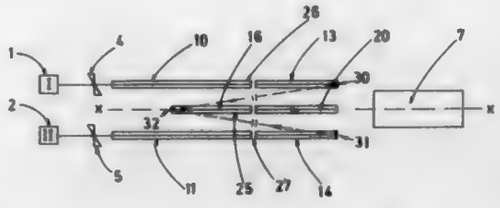
Werner Mertens, Viersen, Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Germany

Filed Oct. 13, 1993, Ser. No. 135,838

Claims priority, application Germany, Jan. 13, 1992, 42 34 455.7

Int. Cl.[6] B21B *1/46;13/22*

U.S. Cl. 29—527.7 **11 Claims**



1. A method of continuously casting and rolling down a hot-rolled wide strip in successive operational steps in a pitch line including a regenerative furnace and a rolling train, said method comprising the steps of:

providing at least two casting lines for casting a cast strand and arranged on opposite sides of the pitch line;

continuously casting a cast strand in each of the at least two casting lines;

cutting off a thin slab from the cast strand cast in one of the casting lines;

homogenizing the thin slab and bringing it up to a predetermined temperature in an equalizing furnace arranged coaxially with a respective casting line;

transporting the thin slab from the equalizing furnace into a movable furnace part formed are one of an equalizer portion, a buffer portion and a regenerative furnace portion and arranged coaxially with the equalizing furnace;

transporting the thin slab from the respective casting line to the pitch line and into the regenerative furnace in a direction opposite to the casting direction, after a first reversal of the direction of movement of the thin slab, by one of pivoting and sidewise displacing the movable furnace part;

after a second reversal of the direction of movement of the thin slab, transporting the thin slab from the regenerative furnace to a holding furnace located downstream of the regenerative furnace; and

transporting the thin slab from the holding furnace to the rolling train for obtaining therein an end product.

5. An arrangement for continuously casting and rolling down a hot-rolled wide strip said arrangement comprising:

a pitch line including a regenerative furnace, a holding furnace located downstream of the regenerative furnace, and a rolling train located downstream of the holding furnace;

at least two casting lines for continuously casting a cast strand and arranged on opposite sides of the pitch line;

means for cutting off a thin slab from the cast strand and located downstream of each of said two casting lines;

an equalizing furnace located downstream of each cutting means coaxially therewith for homogenizing the thin slab and bringing it to a predetermined temperature;

a movable furnace part located downstream of each equalizing furnace coaxially therewith and formed as one of a regenerative furnace part, a buffer portion and an equalizer portion;

wherein at least one of the movable furnace parts and said regenerative furnace, which cooperates with said at least one of the movable furnace parts have means for connecting said regenerative furnace and said at least one of the movable furnace parts with each other for transporting the thin slab from a respective casting line to said pitch line, and direction reversing means for enabling transportation of the thin slab.

5,467,519

INTERMEDIATE THICKNESS TWIN SLAB CASTER AND INLINE HOT STRIP AND PLATE LINE

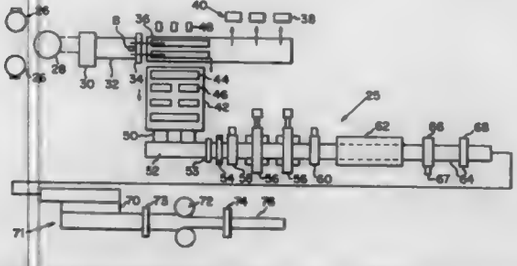
George W. Tippins, and John E. Thomas, both of Pittsburgh, Pa., assignors to Tippins Incorporated, Pittsburgh, Pa.

Filed Jan. 10, 1994, Ser. No. 179,109

The portion of the term of this patent subsequent to Jan. 11, 2011, has been disclaimed.

Int. Cl.[6] B21B *1/00;13/22*

U.S. Cl. 29—527.7 **18 Claims**



15. An intermediate thickness slab caster and inline hot strip and plate line comprising:

a) a continuous twin strip caster for forming either a single strand having a width up to about 125 inches or two parallel strands having a total width of said pair of strands up to about 120 inches;

b) an inline shear means for cutting each said strand to a slab of desired length;

c) a reheat furnace inline with said shear means;

d) a pair of tandem hot reversing mills inline with said reheat furnace for reducing each said slab exiting said reheat furnace to an intermediate thickness product sufficient for coiling;

e) a pair of coiler furnaces, one located upstream of said tandem hot reversing mills and the other downstream, said coiler furnaces capable of receiving and paying out said intermediate thickness product as it is passed between the coiler furnaces and through said tandem hot reversing mills as the product is being reduced to an end product thickness; and

f) a finishing line downstream of and inline with said pair of coiler furnaces and said tandem hot reversing mills.

18. An inline method of casting steel slabs and converting them into finished strip or plate product comprising the steps of:

a) simultaneously casting two strands from a single caster;

b) cutting each of said strands into a plurality of slabs of predetermined length;

c) feeding such slabs into an inline heating furnace;

d) extracting said slabs onto a continuous processing line including at least two reducing mills and a pair of coiler furnaces, one said coiler furnace positioned upstream of said two reducing mills and the other coiler furnace positioned downstream of said two reducing mills; and

e) reducing said slabs into a product of desired thickness on said at least two reducing mills.

5,467,520

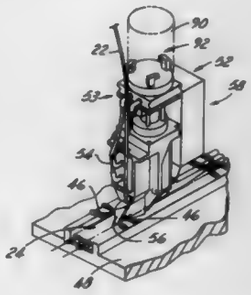
APPARATUS FOR AUTOMATICALLY FEEDING AND ASSEMBLING WIRES INTO A TROUGH OF A PANEL

Eduardo Nuñez, and Michael J. Johnson, both of El Paso, Tex., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 993,543, Dec. 21, 1992, abandoned. This application Jan. 21, 1994, Ser. No. 184,743

Int. Cl.[6] H05K *13/06*

U.S. Cl. 29—564.6 **15 Claims**



1. A wire feeding device for placing wire into a trough extending in at least one axial direction and having an opening for placement of said wire therein, the trough including a restraining mechanism positioned over the opening to restrain said wire therein, the wire feeding device comprising:

a housing for said wire feeding device;

a wire feeding assembly mounted to the housing, said wire feeding assembly including a feed tube for said wire to pass therethrough, said feed tube directing said wire for placement into the trough; and

a wedge mounted to the housing for insertion into the trough to traverse a path tracing said trough and for encountering said restraining mechanism to move said restraining mechanism from a first position over said opening to the trough to a second position away from said first position so that said wire is placed within the trough, said wedge having a forward end and a rear end, said feed tube being disposed between said forward end and said rear end so that said restraining mechanism will be held in said second position while said wire is being placed in said trough,

wherein said wedge extends along a longitudinal axis, said forward end being defined by the relative direction of movement of said wedge along the trough, said rear end opposing said forward end, said wedge having a lateral width generally perpendicular longitudinal axis, said forward end having a width that is narrower than the width of said rear end.

5,467,521
METHOD OF PRODUCING SQUIRREL-CAGE ROTOR FOR INDUCTION MOTOR

Kosei Nakamura, Yamanashi; Yoshiyuki Hayashi, Shizuoka; Masami Kimijima, and Yohei Arimatsu, both of Yamanashi, all of, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

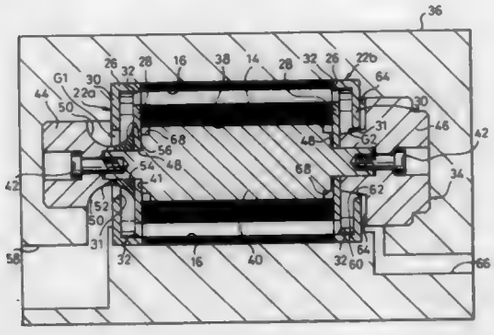
PCT No. PCT/JP94/00253, § 371 Date Oct. 17, 1994, § 102(e) Date Oct. 17, 1994, PCT Pub. No. WO94/19857, PCT Pub. Date Jan. 9, 1994

PCT Filed Feb. 18, 1994, Ser. No. 318,681

Claims priority, application Japan, Feb. 18, 1993, 5-029129

Int. Cl.[6] H02K *15/14*

U.S. Cl. 29—598 **4 Claims**



1. A method of producing a squirrel-cage rotor for an induction motor, which includes a laminated core coaxially fixed to a shaft and having axially extending through holes near an outer circumferential surface, a plurality of secondary conductors arranged respectively in the through holes of the laminated core, and a pair of end rings connecting the secondary conductors with one another at both axial ends of the laminated core, comprising the steps of:

a) providing a pair of reinforcing members, each of which includes an axially extending cylindrical wall having an outer diameter being generally the same as an outer diameter of said laminated core, an annular multi-aperture wall provided with apertures which can communicate respectively with said through holes of said laminated core and extending in a radial inward direction from one edge of said cylindrical wall, and an annular end wall spaced generally parallel to said multi-aperture wall and extending in a radial inward direction from another edge of said cylindrical wall;

b) arranging each reinforcing member in a manner in which said multi-aperture wall is brought into contact with one of axial end faces of said laminated core while said apertures communicate with said through holes, and, in this state, fixedly supporting said laminated core and said pair of reinforcing members by a jig;

c) placing said laminated core and said pair of reinforcing members supported by said jig in a mold;

d) pouring molten metal into a continuous cavity from a center opening of said end wall of one reinforcing member while discharging gas in said cavity from a center opening of said end wall of other reinforcing member, said cavity being defined in said mold by annular spaces each being surrounded by said cylindrical wall, said multi-aperture wall and said end wall of each reinforcing member, said apertures of said multi-aperture wall of each reinforcing member, and said through holes of said laminated core;

e) setting the molten metal in said cavity, whereby integrally forming said secondary conductors and said pair of end rings in a manner in which said multi-aperture wall of each reinforcing member is held between an axial end face of said laminated core and each end ring, and in which said cylindrical wall and said end wall of each reinforcing member cover a surface of each end ring; and

f) removing said laminated core and said reinforcing members, which have said secondary conductors and said pair of end rings as being formed, from said mold together with said jig, and removing said jig from said laminated core and said reinforcing members.

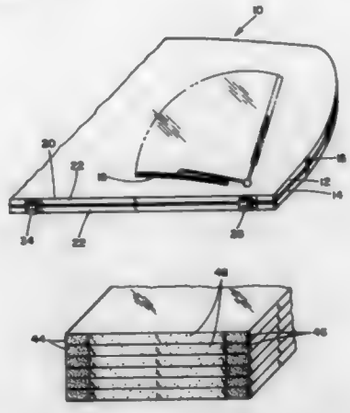
5,467,522
WINDSHIELD WIPER DEICING WINDSHIELD AND METHOD OF CONSTRUCTING SAME

Peter Gold, 389 Peninsula Blvd., Hempstead, N.Y. 11550

Filed Aug. 25, 1994, Ser. No. 295,410

Int. Cl.[6] H05B *3/00*

U.S. Cl. 29—611 **1 Claim**



1. A method of assembly of an auto front windshield with a windshield wiper mounted near a bottom edge thereof with a conductive coating thereon, said auto front windshield of a type comprised of cooperating exterior and interior glass laminates having adhered therebetween an electrically insulative plastic ply and said windshield wiper of a type pivotally mounted to be traversable over said surface of said exterior glass laminate starting from a position adjacent a bottom edge of said windshield, said method comprising the steps of stacking plural windshields each consisting of glass laminates with an inbetween plastic ply in superposed relation, applying simultaneously to said stacked windshields an electrically conductive coating along bottom edges of said glass laminates thereof, integrating said coated edges into an electrical circuit to be electrically connected to a battery of said auto, and installing on each removed windshield from said stack thereof a windshield wiper pivotally transversable over the exterior driver's side surface thereof starting from a position of movement adjacent said bottom edge, whereby at said starting position of transversing movement said windshield wiper is at rest above a marginal edge of said windshield heated by said battery-operated electric circuit so as to cause a deicing of said windshield wiper.

5,467,523
METHOD FOR ASSEMBLING AND CALIBRATING A CONDITION-RESPONSIVE ELECTRIC SWITCH MECHANISM

Burton J. Seaman, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Sep. 1, 1994, Ser. No. 299,833

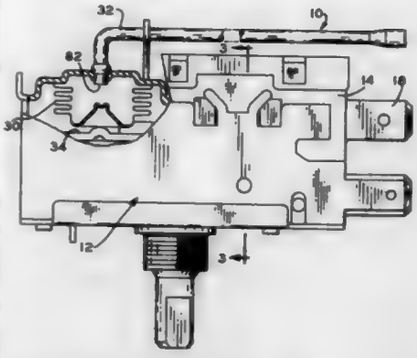
Int. Cl.[6] H01H *11/00;65/00;35/30*

U.S. Cl. 29—622 **4 Claims**

1. A method for assembling a condition-responsive switch mechanism comprising the steps of:

assembling in a housing a bellows, said bellows changing in at least one dimension in response to fluid pressure conditions inside the bellows, actuator link means connecting the movement of the bellows to a switch actuator, means for adjusting the movement of the switch actuator in response to fluid pressure in the bellows, and a bistable spring switch element extending generally between first and second blade terminals and operable upon actuation by the switch actuator to snap between an open position in which the blade terminals are disconnected and a closed position in which the blade terminals are connected;

calibrating the switch mechanism by filling and evacuating the bellows with air, monitoring the pressure at which the spring



switch element snaps between said open and closed positions, and manipulating said switch actuator adjustment means until the actuator operates the spring switch element to snap between the open and closed positions when the bellows is filled to a predetermined pressure;

following said calibrating step, sealingly connecting a capillary tube to the bellows;

filling the capillary tube and bellows with an operating fluid; and

sealing the capillary tube thereby to capture the operating fluid within the capillary tube and bellows.

5,467,524

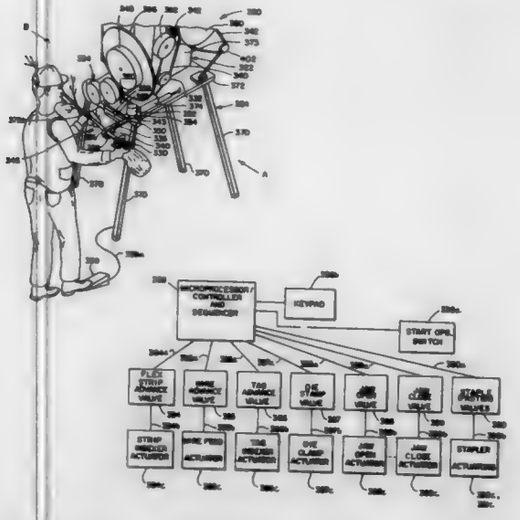
APPARATUS FOR TAGGING PLANTS

Gordon J. Diemer, Grand Ledge, Mich., assignor to The John Henry Company, Lansing, Mich.

Continuation-in-part of Ser. No. 46,031, Apr. 12, 1993, Pat. No. 5,339,517. This application Apr. 25, 1994, Ser. No. 232,768

Int. Cl.[6] B23P *21/00*; B27F *7/17*

U.S. Cl. 29—701 **13 Claims**



1. An apparatus for tagging plants, comprising:

jaws for receiving a branch including surfaces for advancing a section of flexible strip in a loop around the branch when the branch is positioned in the jaws;

a strip-advancing mechanism for advancing the section of flexible strip onto said surfaces on said jaws;

a tag-advancing mechanism for advancing a tag into a position proximate said jaws;

a fastening mechanism for fastening the tag to the section of strip and for fastening the strip in a permanent loop around the branch; and

a sequencer for actuating said jaws, said strip-advancing mechanism, said tag-advancing mechanism and said fastening mechanism in a predetermined sequence.

5,467,525

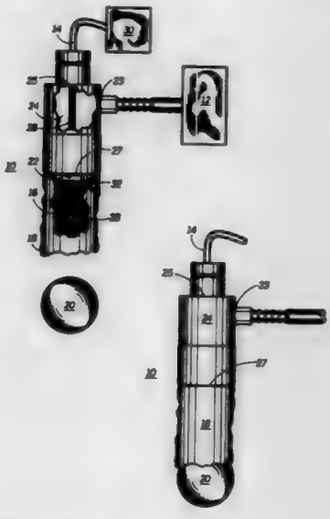
APPARATUS FOR PICKING AND PLACING COMPONENTS USING A MORPHING VACUUM TIP

Jerrold Pine; Sunil Lakhani, and Stanley Renteria, all of Boca Raton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 14, 1994, Ser. No. 209,288

Int. Cl.[6] B23P *19/04*

U.S. Cl. 29—743 **17 Claims**



1. A morphing vacuum tip, comprising:

a chamber having a sealed first port, a filter on a second port, and a vacuum on a third port;

a needle pierced through the sealed first port and through the filter on the second port;

a non-porous bag having a plurality of particles within the bag and an external portion of the bag surrounding a periphery of a portion of the needle pierced through the filter on the second port, the non-porous bag having an open portion being exposed to an external side of the filter on the second port of the chamber, wherein the vacuum on the third port sucks air out of the non-porous bag and the filter prevents the plurality of fine particles from entering the chamber; and

a vacuum on the portion of the needle piercing through the sealed first port.

5,467,526

TOOL FOR WAFER ALIGNMENT AND INSERTION

Scott H. Kunkel, Centreville, and Wiley M. Peck, Fairfax, both of Va., assignors to E-Systems, Inc., Dallas, Tex.

Filed Nov. 22, 1993, Ser. No. 155,524

Int. Cl.[6] H01R *43/22*; B23P *19/04*

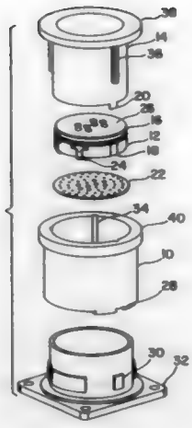
U.S. Cl. 29—747 **15 Claims**

1. An apparatus for inserting a wafer onto plural connector pins of a connector having a wall portion with engagement features extending therefrom comprising:

an alignment tube having a connector facing end, an opposing end and a side wall, said side wall having alignment tube features mateable with said connector wall engagement features;

a keyway in said alignment tube side wall;

a wafer plunger having a connector facing end, an opposing end and an external wall, said wafer plunger external wall carrying a keying block, said keying block being mateable with said keyway;



a planar surface for receiving force at the opposing end of said wafer plunger;

at least one prong extending from the connector facing end of said wafer plunger;

a wafer retainer having a plunger facing end and a connector facing end, and having a substantially transparent internal core member;

a notch in a wall portion of said wafer retainer, said notch being mateable with said prong for connecting said wafer retainer to said wafer plunger;

a plurality of bores in said internal core member extending from the connector facing end of said wafer retainer towards said plunger facing end;

two clips extending from the connector facing end of said wafer retainer, wherein a wafer is connectable to said wafer retainer by said clips; and

wherein said wafer retainer and said wafer plunger are insertable into said alignment tube.

5,467,527

CAPPING UNIT FOR AUTOMATICALLY ASSEMBLING PUMP-OPERATED SPRAY CAP

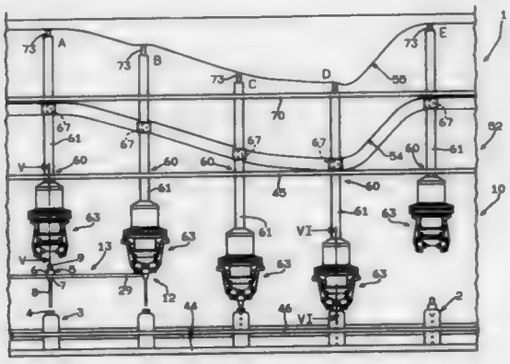
Gianpietro Zanini, Montanara; Renzo Vesentini, and Carlo Corniani, both of Marmirolo, all of, Italy, assignors to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A., Bologna, Italy

Filed Jul. 26, 1994, Ser. No. 280,783

Claims priority, application Italy, Jul. 28, 1993, BO93A0333

Int. Cl.[6] B23P *21/00*

U.S. Cl. 29—773 **17 Claims**



1. A capping unit for assembling pump-operated spray cap bottles that each include a container with an externally threaded neck and a pump-operated cap having a nozzle and an internally threaded ring nut fitted to the nozzle so as to rotate about a first axis; the capping unit comprising:

(a) first engaging means moveable into an engagement position with the ring nut of a pump-operated spray cap, for engaging the ring nut and rotating the ring nut about the first axis;

(b) second engaging means moveable into an engagement position with the nozzle of a pump-operated spray cap for engaging the nozzle; and

(c) first drive means for rotating the first engaging means about the first axis to rotate the ring nut with respect to the nozzle.

5,467,528

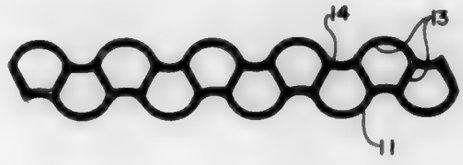
METHOD OF MAKING A TUBULAR THERMAL STRUCTURE

Daniel A. Bales, Palm City, and Mark L. Hartman, Tequesta, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1991, Ser. No. 812,318

Int. Cl.[6] B23P *15/00*

U.S. Cl. 29—890.01 **24 Claims**



1. A method of making a thermal structure having coolant flowpaths therein, said structure comprising:

providing first and second fixtures;

positioning a first member onto the first fixture;

positioning a plurality of tubes onto the first member, each tube having an inner surface and an outer surface;

positioning a second member onto the plurality of tubes, thereby sandwiching the tubes between the first and second members and defining interstices bounded by adjacent tubes and the first and second members;

positioning the second fixture onto the first member, thereby fixing the relative positions of the first and second fixtures and the first and second members;

heating the tubes and members to a temperature at which the tubes can be plastically or superplastically deformed;

subjecting each tube to a pressure differential sufficient to cause each tube to expand into intimate contact with adjacent tubes and the first and second members, thereby substantially eliminating the interstices; and,

maintaining the pressure and temperature until each of the tubes bonds to the adjacent tubes and the first and second members said tubes defining said coolant flowpaths.

5,467,529

PNEUMATIC CHECK VALVE AND METHOD FOR MAKING A PNEUMATIC CHECK VALVE

Raymond T. Gilchrist, and Kevin McCoy, both of Tucson, Ariz., assignors to AlliedSignal Inc., Morris Township, N.J.

Division of Ser. No. 199,865, Feb. 22, 1994, Pat. No. 5,386,848. This application Oct. 12, 1994, Ser. No. 321,508

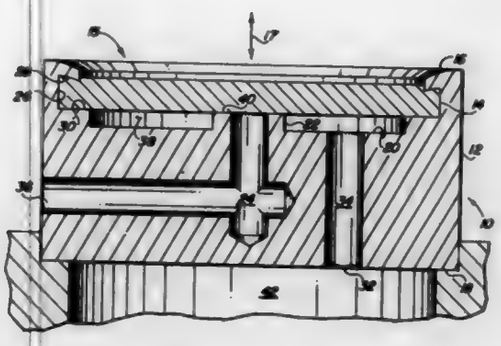
Int. Cl.[6] B23P *15/00*

U.S. Cl. 29—890.128 **2 Claims**

1. A method of manufacturing a check valve, comprising the steps of:

machining a metallic, cylindrical member in an axial direction to form a first annular recess surrounding a cylindrical boss that is coaxial with the member and that projects toward a first axial extreme thereof;

machining the member in a radial direction to form a second annular recess defining two opposing annular lands near the first axial extreme, the lands being coaxial with the boss;



drilling a hole extending into the member from the cylindrical boss to provide a low-pressure channel;

drilling a second hole extending into the member from the first annular recess to provide a high-pressure channel;

inserting a circular diaphragm into the second annular recess so that an annular peripheral portion of the diaphragm is disposed between the opposing annular lands; and

crimping the member onto the annular peripheral portion so that the diaphragm is captively retained by the member and cooperates therewith to form an annular chamber circumscribing the boss.

5,467,530

WET RAZOR

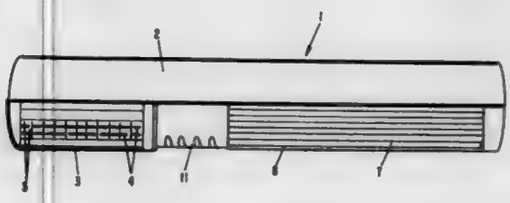
Wolfgang Althaus, Wuppertal, Germany, assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 7, 1994, Ser. No. 179,141

Claims priority, application Germany, Jan. 8, 1993, 9300148 U

Int. Cl.[6] B26B *21/52*

U.S. Cl. 30—85 **8 Claims**



1. A wet razor, comprising:

an elongated handle extending in a longitudinal direction and having a first end that is provided with a recessed portion which extends in said longitudinal direction of said handle, said recessed portion forming a cutout in said handle such that said recessed portion defines a planar surface, said cutout being open at said first end of said handle such that said planar surface extends all the way to said first end;

guide and holding bar means that projects from said planar surface of said recessed portion and extends in said longitudinal direction of said handle;

a razor blade unit that is provided with razor blades and with means for holdingly engaging said guide and holding bar means such that when said razor blade unit is mounted on said handle via cooperation of said guide and holding bar means and said means of said razor blade unit for engaging said guide and holding bar means, cutting edges of said razor blades of said razor blade unit extend essentially parallel to said longitudinal direction of said handle.

5,467,531

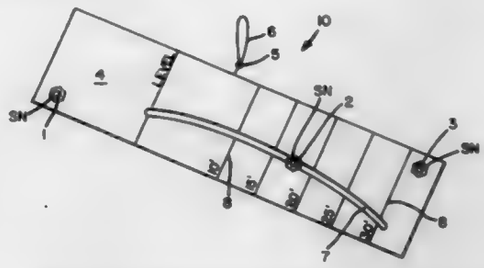
TREE STAND RANGEFINDER AND METHOD OF USING THE SAME

John M. David, 2059 Huntington Ave., #311, Alexandria, Va. 22303

Filed Jul. 20, 1994, Ser. No. 277,577

Int. Cl.[6] G01C *3/12;3/10*

U.S. Cl. 33—284 **18 Claims**



1. A distance measuring device including a base member, means connected to said base member for suspending the same in a vertical position, a pair of spaced opposed pins disposed on said base member, with one of said pins indicating a ground distance to be determined and the other being a sight pin, support means disposed on said base member between said pins, indicia markings spaced along said support means indicating differing heights above ground level, and an adjustable pin means mounted for movement with respect to said support means and to said markings to designate an above-ground height whereby said sight pin sequentially cooperates with said one pin and said adjustable pin when said base member is held in suspension to determine a maximum distance and a second distance therewithin.

5,467,532

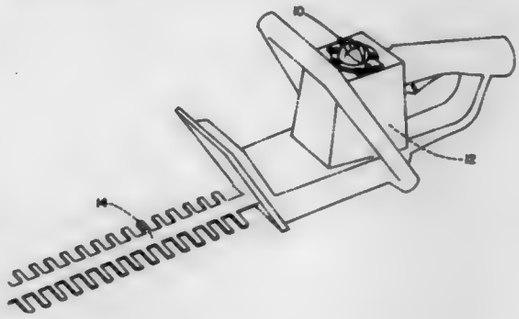
HEDGE TRIMMER AID

Sherry A. Ames, 105 Six Rod Rd., Fairfield, Me. 04937

Filed Jun. 20, 1994, Ser. No. 262,646

Int. Cl.[6] B25B *29/00*

U.S. Cl. 33—334 **6 Claims**



1. A new and improved hedge trimmer aid for visually indicating the angular cutting disposition of a hedge trimmer comprising:

a true horizontal reference means having a visual indication of the disposition of a plane to the true or earth horizontal,

an adjustable indicator means which provides an indication of a selected angular disposition of said plane, and

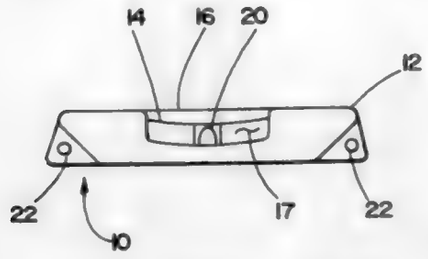
a frame for mounting said true horizontal reference means and said adjustable indicator means to a hedge trimmer wherein the plane is maintained substantially within the plane of the hedge trimmer cutting blade and furthermore the adjustable indicator means and the true horizontal reference means are coupled thereby enabling a visual indication of a condition wherein the selected angular disposition of said plane is substantially the angular disposition of said plane referenced to true horizontal.

5,467,533

NIGHT VISION INCLINOMETER

William R. Dunn, Alpharetta, Ga., assignor to Avionic Displays Corporation, Duluth, Ga.

Filed Jan. 28, 1994, Ser. No. 187,832
Int. Cl.[6] G01C 9/32
U.S. Cl. 33—348 6 Claims



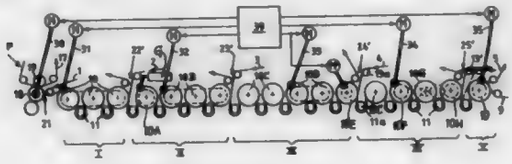
1. An inclinometer, comprising: a body portion; a capsule secured within said body portion, said capsule having at least a portion thereof made of clear material; a damping fluid contained within the capsule; a light source in association with the capsule; a white zirconia ball movable within the damping fluid within the capsule.

5,467,534

PROCEDURE FOR DRYING A PAPER WEB AND A DRYING PART FOR A PAPER MACHINE

Robert L. Salter, Rte. 3, Box 587, Mena, Ark. 71953, and Hans-Peter Sollinger, Germanenstr. 161, D-89522 Heidenheim, Germany

Filed Nov. 10, 1993, Ser. No. 150,449
Int. Cl.[6] F26B 11/02
U.S. Cl. 34—117 16 Claims



1. A process for drying a paper web comprising

passing the paper web over the dryers of a drying group which comprises a plurality of drying cylinders each with a heated peripheral drying surface, and rotating all of the cylinders in the direction of movement of the web along the web path through the drying section;

driving fewer than all of the cylinders to rotate so that their peripheral surfaces engaged by the paper web travel at substantially the same circumferential velocity as the web moving therepast;

driving at least one of the drying cylinders in the drying group so that the circumferential velocity of the peripheral surface of the at least one drying cylinder differs from the velocity of the paper web passing by the peripheral surface of that at least one drying cylinder.

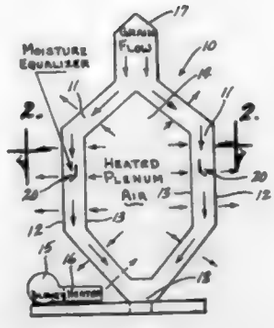
5,467,535

MOISTURE EQUALIZER FOR A CONTINUOUS FLOW GRAIN DRYER

Thomas D. Lentz, Zionsville, Ind., assignor to Beard Industries, Inc., Frankfort, Ind.

Filed May 25, 1994, Ser. No. 248,600
Int. Cl.[6] F26B 17/12
U.S. Cl. 34—168 17 Claims

15. Grain drying apparatus comprising:



a pair of spaced apart air pervious walls for confining a column of grain to be dried;

a plenum chamber formed on one side of the outside of one of said air pervious walls;

means for causing heated air from said plenum chamber to pass through said spaced air pervious walls and therefore through said column of grain to be dried;

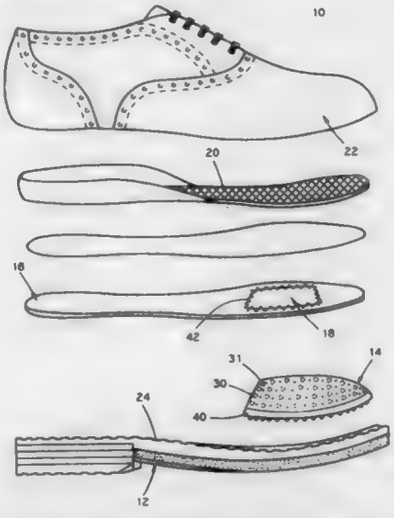
flow control means for causing the grain to flow faster in said column in the area between said one wall and said first portion of said plate than the grain in said grain column which is disposed between said second portion of said plate and said other air pervious wall so that the hottest and driest grain in said column which is closest to said one wall will flow faster than the cooler, wetter grain in said column of grain which is farther away from said one wall.

5,467,536

SHOE CONSTRUCTION

John Ramer, 69 Borrows Rd., Foxboro, Mass. 02035, and Richard S. Herman, 30 Magnolia Rd., Sharon, Mass. 02067

Continuation of Ser. No. 845,514, Feb. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 675,282, May 24, 1991, abandoned. This application Jul. 29, 1993, Ser. No. 98,239
Int. Cl.[6] A43B 13/18;7/06
U.S. Cl. 36—28 2 Claims



1. A shoe construction comprising a dual density sole, a nippled insert, a mid-sole and an upper, the nippled insert having apertures formed therethrough, and having an upper surface and a lower surface, the nippled insert having a peripheral edge and having a hollow formed therein, the peripheral edge being biased from the upper surface of the nippled insert to the lower surface thereof, the hollow having a base surface, the base surface having nipples extending therefrom, the dual density sole having a cavity formed

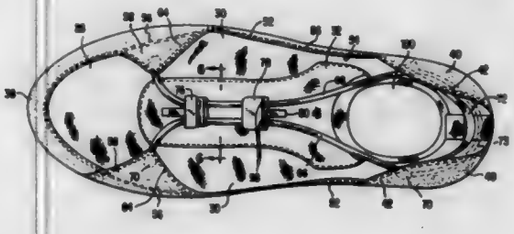
therein and having an upper edge around and proximate the periphery of the cavity, the peripheral edge of the cavity overlapping the peripheral edge of the nippled insert, the nippled insert being press fitted into the cavity with the nipples facing the dual density sole, the apertures being spaced from the nipples, the mid-sole being mounted on the dual density sole and the upper being mounted on the dual density sole, the upper defining an open area and the cavity being isolated from the open area, the mid-sole having a forward portion, a through aperture formed at the forward portion thereof, a flexible cushion mounted in the through aperture, and the cushion being in superimposed abutting relation to the nippled insert.

5,467,537

SHOE WITH ADJUSTABLE CLOSURE SYSTEM

Michael A. Aveni, Lake Oswego, and Daniel R. Potter, Forest Grove, both of Oreg., assignors to Nike, Inc., Beaverton, Oreg.

Filed Mar. 18, 1994, Ser. No. 214,742
Int. Cl.[6] A43B *11/00;3/12;* **A44B** *9/00*
U.S. Cl. 36—50.1 **43 Claims**



1. A shoe having a closure system, comprising:

an upper;

a sole attached to said upper;

a first strap member attached to the medial side of the shoe at two longitudinal locations;

a second strap member attached to the lateral side of the shoe at two longitudinal locations;

a first adjusting member slidably coupled to both said first and second strap members, said first adjusting member slidable along said first and second strap members towards the front of the foot to adjustably tighten the upper about the forefoot of the foot; and

a second adjusting member slidably coupled to both said first and second strap members, said second adjusting member slidable along said first and second strap members towards the rear of the foot to adjustably tighten the upper about the ankle and heel of the foot;

wherein said first strap member is attached at a first location in the forefoot portion of the shoe and at a second location in the heel portion of the shoe and wherein said second strap member is attached at a first location in the forefoot portion of the shoe and at a second location in the heel portion of the shoe; and

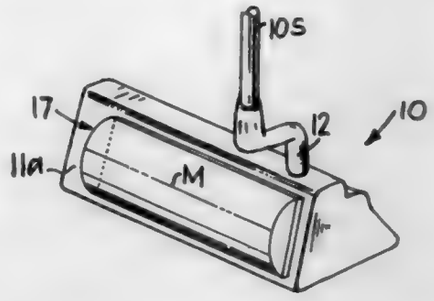
wherein said first and second strap members are attached to one of the sole and the upper of the shoe and said second locations of said first and second strap members are located intermediate the top of said upper in the heel portion of the shoe and the top of said sole.

5,467,538

METHOD AND APPARATUS OF DETERMINING GOLFER'S EFFECTIVE PUTTER LOFT

Arthur C. P. Chou, Oceanside, Calif., and Steven Aoyama, Marion, Mass., assignors to Acushnet Company, Fairhaven, Mass.

Filed Sep. 30, 1994, Ser. No. 316,600
Int. Cl.[6] A63B *69/36;57/00*
U.S. Cl. 33—508 **3 Claims**



1. An apparatus for measuring the effective loft of a golf putter when swung by a golfer comprising:

a) a putter having

i) a shaft;

ii) a curved test striking face in place of the ball striking face; and

iii) a means of locating the impact point on the curved test striking face; and

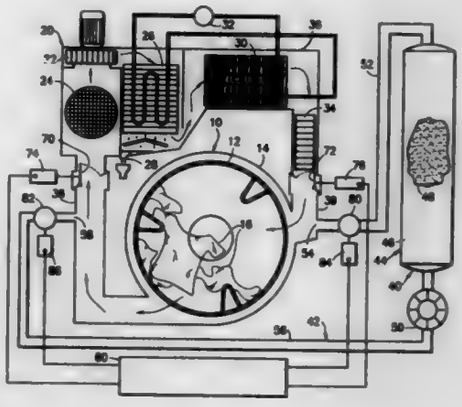
b) a cylindrical or conical hitting puck having a curved face, which puck is positioned on a horizontal surface with its axis in a vertical position.

5,467,539

REDUCING THE CONCENTRATION OF SOLVENT VAPORS IN DRYCLEANING MACHINES

Horst Hahn, Hackensack, N.J., assignor to Multimatic Corporation, Northvale, N.J.

Filed Apr. 19, 1994, Ser. No. 229,530
Int. Cl.[6] F26B *21/06*
U.S. Cl. 34—77 **10 Claims**



7. The method for reducing the concentration of solvent vapor in the drum of a drycleaning machine upon completion of a cleaning and drying operation, the drycleaning machine being of the type having a drum, and a solvent recovery system communicating with the drum, the solvent recovery system including a fan for circulating solvent-laden air through the solvent recovery system and the drum during a drying and solvent recovery cycle to recover solvent from the solvent-laden air, the method comprising:

circulating solvent-laden air from the drum through the solvent recovery system, including the fan of the solvent recovery system, during the drying and recovery cycle;

then closing communication between the drum and the solvent recovery system, including the fan of the solvent recovery system, during a post-recovery cycle, to isolate the drum from the solvent recovery system, including the fan of the solvent recovery system, subsequent to the drying and recovery cycle; and

then circulating solvent-laden air from the drum through separate filtering means during the post-recovery cycle, while the solvent recovery system, including the fan of the solvent recovery system, is maintained isolated from the drum and the separate filtering means.

5,467,540

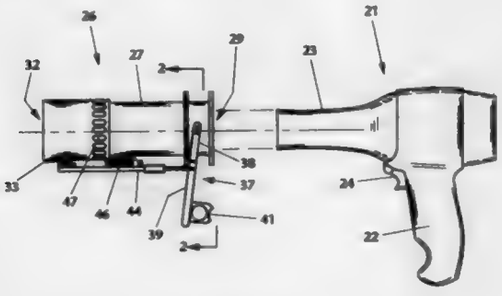
DIFFUSER FOR HAIR DRYER

Ernest J. Bastien, 362 DeAnza Dr., Vallejo, Calif. 94589

Filed Jul. 11, 1994, Ser. No. 272,798

Int. Cl.[6] A45D *20/00*

U.S. Cl. 34—97 **17 Claims**



1. A diffuser device for a hair dryer, including;

a tubular body member having a bore therethrough, said bore having an input end for receiving air flow from a blower and an output end for directing the air flow from the hair dryer;

a diffuser plate, and means for securing said diffuser plate in said bore in rotatable fashion;

means for pivoting said diffuser plate through a continuously variable angle from an open position in which said bore is substantially unobstructed to a closed position in which said bore is completely obstructed;

means for venting the air flow from the dryer when said diffuser plate is disposed in said closed position, including a plurality of vent holes extending through said tubular body member to said bore, said vent holes disposed in an annular array positioned adjacent to said diffuser plate in said closed position and between said diffuser plate and said input end; and,

means for emitting an attenuated flow of air from said output end when said diffuser plate is disposed in said closed position, including a plurality of small holes extending through said diffuser plate and arrayed in spaced apart fashion.

5,467,541

ELECTRONIC IMPLEMENT CONTROL

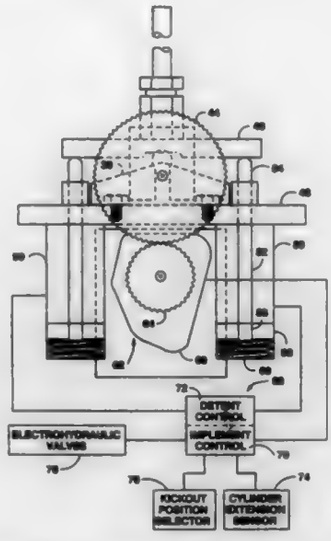
Robert D. Greer, Peoria; Daniel E. Henderson, Washington; Javad Hosseini; Noel J. Rytter, both of Peoria, and Gerald P. Simmons, Morton, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

PCT No. PCT/US91/07004, § 371 Date Sep. 26, 1991, § 102(e) Date Sep. 26, 1991, PCT Pub. No. WO93/06313, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 26, 1991, Ser. No. 30,286

Int. Cl.[6] G05D *1/02*

U.S. Cl. 37—348 **15 Claims**



1. An apparatus for controlling an implement connected to a work vehicle and movable to and between a plurality of positions, comprising:

means for sensing the position of the implement and responsively producing an implement position signal;

a mounting bracket connected to the vehicle;

a control lever being pivotably connected to said mounting bracket and movable between first and second positions;

a rocker bar connected to said control lever;

means for producing a control signal in response to movement of the control lever;

a solenoid having an actuator rod being in contact with said rocker bar and movable to a detent position in response to said solenoid being energized; and

detent control means for controllably energizing said solenoid in response to said control signal having a value indicative of the control lever being moved beyond a detent position and said implement position signal being indicative of the implement having a predetermined relationship with a set position and deenergizing said solenoid in response to the implement position signal being indicative of the implement having a second predetermined relation with said set position.

5,467,542

COUPLING ASSEMBLY AND ACTUATING MECHANISM THEREFOR

Fritiof Hulden, Laskeruds Gardi, S-660 60 Molkom, Sweden

Filed Aug. 23, 1994, Ser. No. 294,310

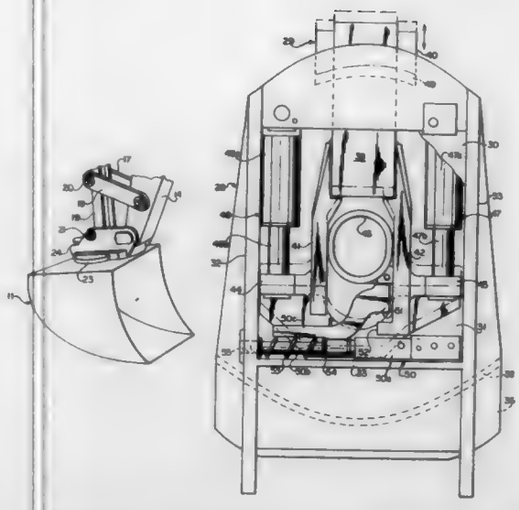
Int. Cl.[6] E02F *3/28*

U.S. Cl. 37—468 **26 Claims**

1. An assembly for coupling a maneuvering member to a working implement comprising:

a first coupling component mountable on said working implement;

a second coupling component mountable on said maneuvering member and cooperative with said first coupling component



for selectively coupling said first coupling component to said second coupling component;

said first coupling component having an annular undercut portion and a gripping surface;

said second coupling component having first and second gripping members, each provided with a protruding portion receivable within said annular undercut portion and a gripping surface engageable with the gripping surface of said first coupling component in gripping relation therewith when said gripping members are displaced relative to each other along a line of travel;

means for selectively displacing said gripping members relative to each other along said line of travel into a fully coupled condition of said coupling components wherein the protruding portions of said gripper members are received within said annular undercut portion of said first coupling component and the gripping surfaces of said gripping members firmly engage the gripping surface of said first coupling component, and into a fully uncoupled condition of said coupling components wherein the protruding portions of said gripper members are disposed without said annular undercut portion of said first coupling component;

means for restricting the displacement of said gripping members into a partially uncoupled condition between said fully coupled and fully uncoupled conditions and sufficient to disengage said gripping surfaces to allow rotational displacement of one coupling component relative to the other coupling component about the axis of said annular undercut portion, for reorientating said working tool relative to said maneuvering member; and

means for selectively disabling said restricting means.

5,467,543

MULTI-POSITIONAL INFLATABLE AUTO DECOY WITH AUTOMATIC INFLATION MEANS

Steven R. Fink, and Floyd J. Herman, both of Lansdale, Pa., assignors to Sterman Enterprises, Inc., Lansdale, Pa.

Continuation-in-part of Ser. No. 57,681, May 4, 1993, Pat. No. 5,340,350. This application Aug. 22, 1994, Ser. No. 294,119

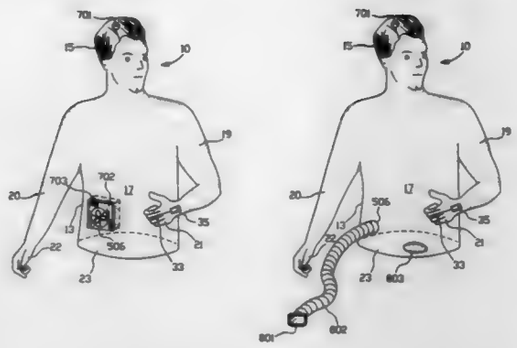
The portion of the term of this patent subsequent to Aug. 23, 2011, has been disclaimed.

Int. Cl.[6] **G09F** *19/00;* **A63H** *3/06*

U.S. Cl. 40—538 **20 Claims**

1. An inflatable multi-positional auto decoy representative of at least the upper portion of a human form adapted to be buckled into place by a car seat belt comprising:

a. a plastic inflatable exoskeleton with an inner side and an outer side molded to represent at least a torso with an upper portion and a lower portion, a neck, a head and two arms;



b. upper inserting means and lower inserting means located on said plastic exoskeleton in the region of at least one of said arms for receiving an upper end and a lower end of elongated inserts recited below;

c. elongated inserts each having an upper end and a lower end, said upper end inserted into said upper inserting means and said lower end inserted into said lower inserting means of at least one of said arms; and

d. inflation means for inflating said inflatable exoskeleton.

5,467,544

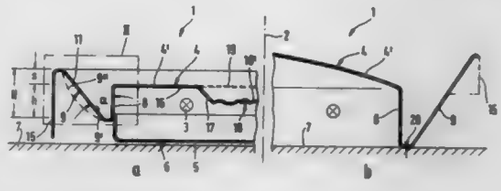
ELECTRIC SIGN ADVERTISING ELEMENT

Heinz D. Treuberg, P.O. Box 271482, Tampa, Fla. 33688

Continuation of Ser. No. 264,252, Jun. 22, 1994, abandoned, which is a continuation of Ser. No. 33,780, Mar. 17, 1993, abandoned, which is a continuation of Ser. No. 946,066, Sep. 18, 1992, abandoned. This application Feb. 27, 1995, Ser. No. 395,209

Int. Cl.° **G09F** *13/04*

U.S. Cl. 40—564 **31 Claims**



1. Electric sign advertising element, comprising:

at least one light source,

an at least partially light transmissive cover hood covering said light source,

said cover hood having a front portion adapted to carry an advertising medium and further having an at least partially light transmissive outer segment,

said outer segment being bent off toward the rear and extending to a rear end,

a reflector segment extending from said rear end in an outward and forward direction to a front edge,

said reflector segment having an inside facing said outer segment,

said inside of said reflector segment reflecting light at least partially,

said inside of said reflector segment reflecting light coming through said outer segment,

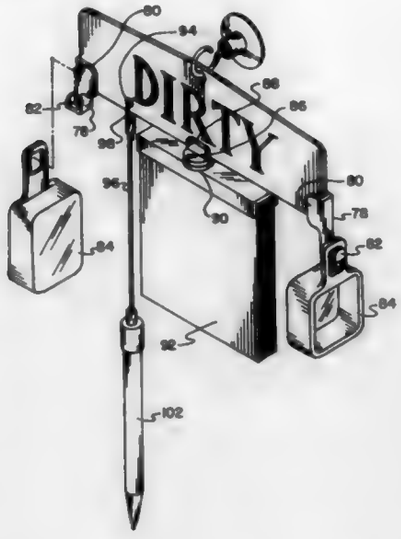
wherein said reflector segment protrudes forward beyond said outer segment by at least about 1 inch.

5,467,545

ASSEMBLIES TO DETERMINE THE STATE OF CLEANLINESS OF DISHES IN A DISHWASHER

Jospeh W. Zillner, 721-B Edgewater Dr. Chula Vista, Calif. 91913

Filed May 2, 1994, Ser. No. 236,187
Int. Cl.[6] G09F 7/00
U.S. Cl. 40—597 2 Claims



1. A new and improved assembly to determine the state of cleanliness of dishes in a dishwasher comprising, in combination:

a planar sign formed of a rigid material in a pentagon configuration and having a lower edge, and opposed second and third side edges extending 90 degrees from opposite ends of the lower edge, with the length of the lower edge being essentially four times greater than the second and third side edges, and fourth and fifth side edges extending upwardly from the end of the second and third opposite side edges of the lower first edge and intersecting at an upper center point the sign having a hole near the upper center point, the sign having the word DIRTY printed on one side thereof and having the word CLEAN printed on the other side thereof;

a suction cup formed of an elastomeric material having an inboard segment and an outboard segment, the inboard segment being generally hemispheric in configuration with a periphery adapted to contact an exterior surface of a dishwasher and when pressed thereagainst to be held by suction thereto, the outboard segment having a cylindrical exterior cross-section with a central cylindrical recess, the recess having an interior component of a predetermined length and a predetermined diameter and an exterior component having a length shorter than the length of the interior component and large diameter larger than the diameter of the interior component to thereby form an exterior bearing surface between the interior and exterior components;

a wire eyelet having an interior portion and an exterior portion, the interior portion being generally linear in extent with a cone-shaped prong at one end positioned within the interior component of the suction cup and with an enlarged flange having an interior bearing surface positioned in the exterior component of the suction cup with its interior bearing surface in contact with the exterior bearing surface of the suction cup, the exterior portion of the eyelet being formed in a circular loop with a small opening at the other end adjacent to a central extent of the eyelet, and with the hole on the sign being of sufficient size to allow the loop of the eyelet to be moved therethrough whereby when the prong of the eyelet is positioned in the suction cup with the loop of the eyelet extended within the hole on the sign and positioned in a vertical plane, the sign may depend therefrom in another vertical plane to display one side of the sign and whereby the eyelet may be turned 180 degrees within the suction cup to display the other side of the sign; and

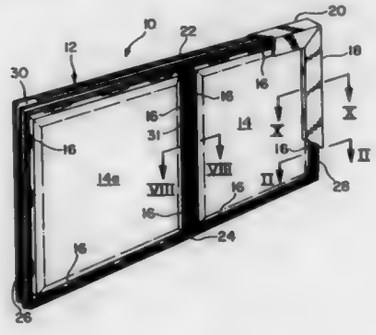
supplemental devices for attaching kitchen related implements to the sign when in use, such devices including a first bracket having an upper end adapted to grasp one of the second or third side edges of the sign and a lower end adapted to support a measuring cup, a supplemental bracket having an upper end to grasp the lower edge of the sign and a lower end to support a notepad and an additional aperture in the sign with a string having a loop at an upper end supported by the additional aperture and having a lower end for supporting a pen for writing on the notepad.

5,467,546

TENSIONED FABRIC SIGN

Judson L. Kovalak, Jr., Rockford, Mich., assignor to Sign-Comp, Inc., Comstock Park, Mich.

Continuation of Ser. No. 690,055, Apr. 23, 1991, abandoned.
This application May 18, 1993, Ser. No. 63,245
Int. Cl.[6] G09F 17/00
U.S. Cl. 40—603 26 Claims



21. A tensioned fabric sign comprising:

a frame defining a frame channel having first and second walls spaced apart a distance from one another, said first wall having a plurality of spaced, longitudinal grooves formed thereon;

a sheet of flexible sign fabric disposed in tension on said frame and having a margin portion located within said frame channel; and

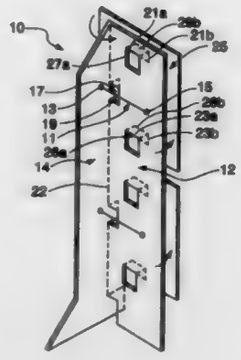
a plurality of tension clips each comprising a relatively stiff clip body having a width less than said distance between said first and second channel walls whereby said clip can rotate within said channel, said clip having first and second sides generally facing said first and second channel walls, respectively, said clip having securing means for securing said fabric margin portion to said clip, said fabric extending between said second clip side and said second channel wall, said first clip side having engagement means for engaging said grooves upon rotation of said clip within said channel, whereby the tension of said sign fabric on said clips rotates said clips within said frame channel and urges said engagement means into engagement with said grooves.

5,467,547

SELF-ERECTING DISPLAY STAND THAT AUTOMATICALLY DIMENSIONALIZES FRONT PANELS

Larry L. Fortner, Huntington Beach, Calif., assignor to Graphic Communications, Inc., Golden, Colo.

Filed Nov. 10, 1993, Ser. No. 150,391
Int. Cl.[6] G09F 15/00
U.S. Cl. 40—610 33 Claims



28. A method for erecting a display stand having a first side support panel, a front display panel and a back panel, said first side support panel including a first tongue, said method comprising the steps of:

(a) biasing said first side support panel from a first position substantially planar with said back panel to a second position capable of supporting a free-standing display stand; and

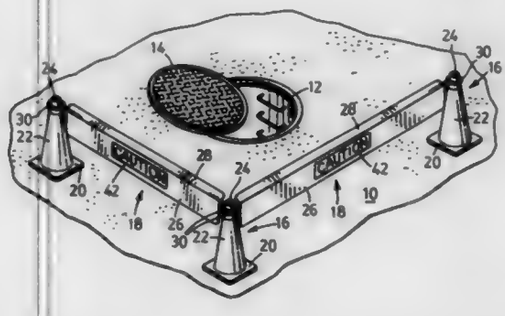
(b) simultaneously projecting said front display panel outwardly relative to said back panel as said first tongue pushes against said front display panel when said first side support panel moves from said first position to said second position.

5,467,548

PROTECTIVE BARRIER MEMBERS FOR WORK AREAS

Charles N. Ross, 48 Meander Close, Carlisle, Ontario, Canada

Filed Jul. 27, 1994, Ser. No. 281,091
Int. Cl.[6] E01F 9/012;13/02
U.S. Cl. 40—612 17 Claims



9. A barrier member adapted for mounting on a pair of spaced road mounted vertically extending conical pylon members each having an upper and a lower end;

the barrier member comprising an elongated barrier body providing a barrier surface that when the member is mounted on the pylons extends vertically for presentation to an observer as a visible barrier;

wherein the barrier body is of thin sheet material, has a major portion of greater width which, when the member is mounted on its pylon, extends vertically and constitutes the said barrier surface, and has another minor portion of narrower width extending from the upper edge of the major portion at an angle thereto to increase the transverse rigidity of the member; and

the barrier member also comprising a pylon-engaging member at each end of the barrier body attached to the barrier member at the junction of the major and minor portions;

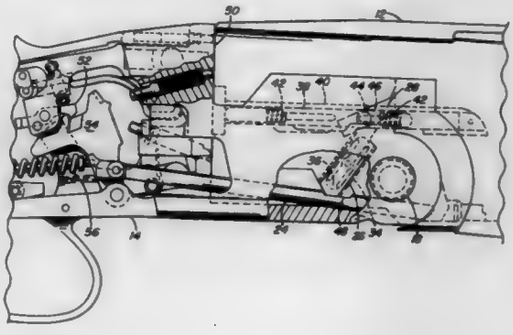
each pylon-engaging member having an aperture therein of diameter equal to an external diameter of the respective pylon adjacent to the upper end thereof, whereby with the pylon-engaging member mounted on the pylon upper end with the pylon uppermost end portion protruding through the aperture the pylon-engaging member and the barrier member are thereby retained against transverse movement relative to the pylon, and the pylon-engaging member is also retained against downward movement on the pylon so that the barrier surface is maintained at a corresponding predetermined distance above the road surface.

5,467,549

FIREARM AUTOMATIC SAFETY SYSTEM

Kenneth C. Rowlands, 612 Pauline Ave., Utica, N.Y. 13502, and Thomas G. Bauman, R.D. 1, Box 190A, McGowan Rd., Ilion, N.Y. 13357

Filed Dec. 30, 1993, Ser. No. 175,831
Int. Cl.[6] F41A 3/06;15/06;19/25
U.S. Cl. 42—42.03 9 Claims



1. In a break open firearm having a frame attached to a stock, a barrel housing carrying at least one barrel and rotatable about a pivot on the frame, at least one hammer pivotally mounted on the

frame for movement from a cocked position to a position against the frame acted on by a hammer strut, a hammer spring urging the hammer strut forwardly, a firing pin aligned with said hammer, trigger means operatively connected to actuate the hammer, a cocking rod mounted for reciprocation on the frame for acting on the hammer strut, and cam means for moving the cocking rod rearward when the barrel housing is rotated about the frame, a fore-end housing and means for ejecting cartridges from the firearm, a safety mechanism for disengaging the trigger means from the hammer, the safety mechanism comprising an auto safety actuating rod having a front end operatively connected to a locking bolt mechanism to move rearward when the locking bolt mechanism is opened, the auto safety actuating rod being detachably connected to an auto safety actuator by attaching means which is slideably disposed in the frame in a path parallel to the horizontal axis of the firearm and which, in the rearmost portion of the sliding path, abuts a safety switch to put the safety mechanism in the "on" position, the attaching means between the auto safety actuating rod and the auto safety actuator being below the principal axis of the sliding path of the auto safety actuator, the rear end of the auto safety actuating rod being aligned to impinge, when unattached to the auto safety actuator, upon a front nose portion of a selector block in the trigger means, disengaging the trigger means from the hammer, and, when the auto safety actuating rod is attached to the auto safety actuator, the auto safety actuator, in its rearmost position, moves the safety switch to the "on" position.

5,467,550

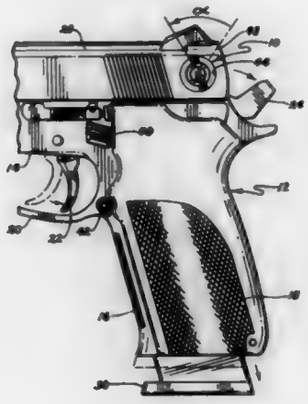
PASSIVE SAFETY MECHANISM FOR FIREARMS

Dean W. Mumbleau, 14841 Pine View Dr., Becker, Minn. 55308-9212

Filed Nov. 29, 1993, Ser. No. 159,001

Int. Cl.[6] F41A *17/02*

U.S. Cl. 42—70.11 **14 Claims**



1. In a firearm to be used by a person having a thumb and a forefinger, said firearm having a frame, a firing pin, and a hammer, said hammer being mounted on said frame for movement between a cocked position and a firing position in contact with said firing pin, the improvement comprising:

a passive safety mechanism, said passive safety mechanism having a body mounted on the frame, said body being movable between an engaged position and a disengaged position, at least a portion of said body being disposed operatively between the hammer and the firing pin when the passive safety mechanism is in the engaged position such that the hammer is prevented from contacting the firing pin, said passive safety mechanism having at least one surface exposed to the person and including a keyway; and

a key for actuating said passive safety mechanism, said key having an engaging portion configured so as to operatively mate with said keyway, said body being substantially free of and not operatively connected to a surface which may be gripped or engaged by the thumb or the forefinger or both of the person such that the person may not manually move said passive safety mechanism between said engaged position and said disengaged position except by use of said key,

whereby the person may engage the keyway of the passive safety mechanism with the key and move the passive safety mechanism between said engaged position and said disengaged position.

5,467,551

NIPPLE FOR MUZZLE-LOADING FIREARM

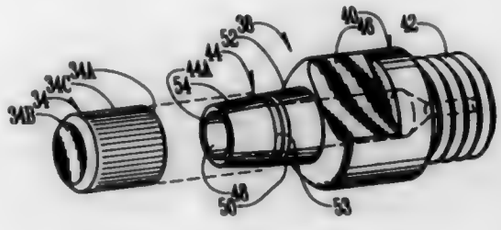
Albert L. Kruse, Revillo, S. Dak., assignor to Modern Muzzleloading, Inc., Centerville, Iowa

Filed Nov. 22, 1994, Ser. No. 343,219

Int. Cl.[6] F41C *9/08*

U.S. Cl. 42—83 **11 Claims**

1. A nipple for a muzzle loader firearm, comprising:



a generally cylindrical main body;

a forward end projecting coaxially forwardly from the main body and having an exterior diameter less than the exterior diameter of the main body;

a rearward end projecting coaxially rearwardly from the main body and having an exterior diameter less than the exterior diameter of the main body; and

an ignition bore extending from a rearward rim of the rearward end through the rearward end, main body and forward end, coaxial with said main body;

said rearward end having a sloped exterior surface tapering from a forward end adjacent the main body to a smaller diameter at the rearward rim;

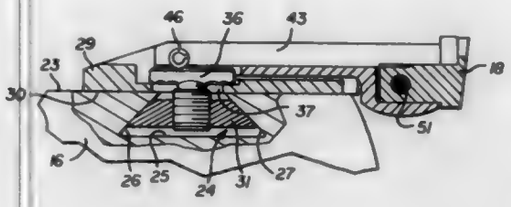
said rearward end exterior surface having a forward tapered surface and a rearward tapered surface adjoining at a circumferential junction, the rearward surface being tapered at a slope greater than the slope of the forward surface.

5,467,552

GUN SIGHT MOUNTING STRUCTURE

Carl J. Cupp, Hawaiian Gardens, and Ronald L. Plue, Encino, both of Calif., assignors to Pachmayr Ltd., Monrovia, Calif.

Filed Oct. 12, 1994, Ser. No. 321,761
Int. Cl.[6] F41G 1/16; 1/387
U.S. Cl. 42—100 15 Claims



1. An aiming device for a gun, which gun has a surface containing a dovetail groove with converging side walls, said aiming device comprising:

a rigid body part to be held against said surface of the gun;

a sight carried by said body part to be viewed by a user in aiming the gun;

an anchoring part received within said dovetail groove between said converging side walls thereof, and in engagement with both of said converging side walls;

a threaded fastener extending along an axis through an opening in said body part and threadedly connected to said anchoring part and operable by rotation relative to both of said parts to pull the anchoring part toward the body part in a manner tightening the anchoring part against both of said side walls of the groove and clamping said body part rigidly between said fastener and said surface of the gun to locate the sight relative to the gun; and

means on said body part and said anchoring part interfitting in a relation preventing the body part from turning about the axis of said fastener relative to the anchoring part.

5,467,553

Patent Not Issued For This Number

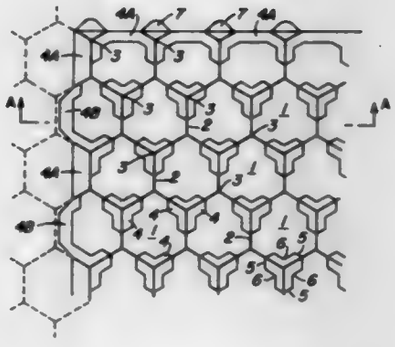
5,467,554

GRID PLATE FOR SEEDING DOWN SURFACES

Eugen Prestele, Albert-Greiner-Strasse 73, D-86161 Augsburg, Germany

Filed Jan. 3, 1994, Ser. No. 176,656
Claims priority, application Germany, Jan. 7, 1993, 9300099
Int. Cl.[6] A01G 1/00
U.S. Cl. 47—1.01 16 Claims

1. A grid plate for seeding surfaces, having cells comprised of cell walls open at the top, each of the cells having openings at the bottom which enable root growth into earth below the grid plate,



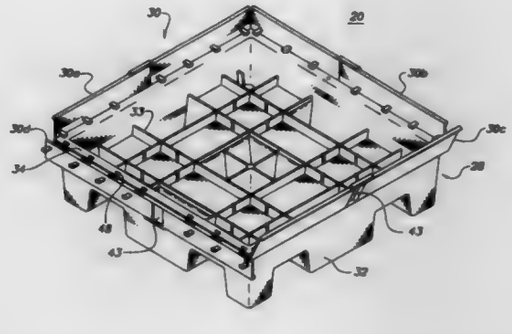
cell walls between adjacent cells forming nodal points, said grid plate further having webs extending at right angles to the cell walls at the bottom of at least some nodal points, said webs having lengths which are a fraction of the lengths of associated cell walls leaving at least a portion of said cell walls having no webs extending therefrom.

5,467,555

TURFING SYSTEMS FOR STADIA

Thomas L. Ripley, Sr., and Stephen A. Cataldo, both of Chalfont, Pa., assignors to GreenTech, L.L.C., Richmond, Va.

Filed Oct. 24, 1994, Ser. No. 327,654
Int. Cl.[6] A01G 9/02
U.S. Cl. 47—66 7 Claims



1. A growing pan for a transportable, natural turf activity surface, said growing pan being adapted for containing plant growing medium together with growing, substantially entire, turf plants, said growing pan comprising:

a bottom surface;

a plurality of sidewalls connected to said bottom surface and having a top edge;

a fence section hingeably connected to the top edge of each one of said sidewalls, said fence section being adapted for containing plant growing medium together with growing, substantially entire, turf plants when said fence section is in a

closed position above the top edge, said fence section being rotatable about the hingeable connection to an open position below the top edge; and

said fence section comprising first and second fence segments, said first and second fence segments being slidable on said top edge of each one of said sidewalls.

5,467,556

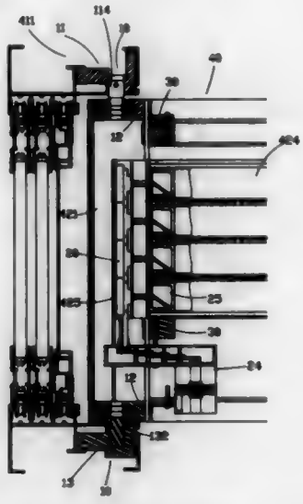
SHUTTER WINDOW ASSEMBLY

Tien-Wang Lin, No. 6, Lane 185, Chi Li Tan Rd., Jeou-Hsi Hsiang, Yi-Lan Hsien, Taiwan, Prov. of China

Filed Nov. 22, 1994, Ser. No. 343,660

Int. Cl.[6] E06B 7/096

U.S. Cl. 49—82.1 1 Claim



1. A shutter window assembly comprising:

an aluminum window frame unit including an outer window frame and a shutter, said outer window frame being a rectangular open frame comprising an inside chamber and a plurality of longitudinal grooves vertically disposed at two opposite sides, said shutter being fastened to said longitudinal grooves of said outer window frame, comprising two stiles, a top rail, a bottom rail, a plurality of louvers, and two packing strips respectively fastened to said stiles on the inside, each stile comprising an inside chamber, two inside flanges longitudinally raised from the inside chamber at two opposite sides, and two longitudinal ribs raised from the inside chamber, said packing strips being respectively fastened to the inside chambers of said stiles and retained between the longitudinal ribs and inside flanges of said stiles, each packing strip having a longitudinal rib retained between the inside flanges of the respective stile, and inside chamber, and a plurality of vertically spaced pin holes, said top rail comprising a longitudinal chamber, a longitudinal groove, and a plurality of screw holes on the longitudinal groove of said top rail at two opposite ends, said bottom rail comprising a longitudinal chamber, a longitudinal groove, and a plurality of screw holes on the longitudinal groove of said bottom rail at two opposite ends, said louvers each comprising a longitudinal through hole, and two reversed hooks disposed at two opposite sides at different elevations;

two pairs of coupling blocks to connect said top and bottom rails to said stiles, each coupling block comprising a first coupling portion at one end fastened to the inside chamber of one stile, a second coupling portion at an opposite end fastened to the longitudinal chamber of said top or bottom rail, two openings bilaterally disposed between said first and second coupling portions, which receive the inside flanges of one stile, and a plurality of screw holes through said second coupling portion respectively connected to the screw holes at one end of said top or bottom rail;

two hinge devices connected between said shutter and said outer window frame permitting said shutter to be retained within said outer window frame, each hinge device comprised of an upper locating block, two pivot holders, and a lower locating block, said upper locating block comprising a flat base, an upright connecting block raised from said flat base at one side and having a pair of mounting holes fastened to said outer window frame, an elongated chamber disposed on said flat base along said upright connecting block, a vertical center through hole through the center of said elongated chamber, a bolt inserted into said vertical center through hole and having a side hole, a rod having one end fitted into the side hole on the bolt of said upper locating block and an opposite end made with a screw hole, an adjusting screw threaded into the screw hole on the rod of said upper locating block and turned to adjust the elevation of the bolt of said upper locating block, a horizontal T-block horizontally extended from said flat base opposite to said upright connecting block and having a center screw hole and two mounting holes, the mounting holes of said horizontal T-block being fastened to said outer window frame, and a balance adjustment screw threaded into the center screw hole on said horizontal T-block, said balance adjustment screw of said upper locating block being turned to adjust the horizontal balance of said aluminum window frame unit when said aluminum window frame unit is mounted within a hole on a wall, said lower locating block comprising a vertical locating hole, a bolt inserted into said vertical locating hole and having an outward horizontal flange stopped above said vertical locating hole, a vertical screw hole disposed in parallel with said vertical locating hole, a balance adjustment screw threaded into said vertical screw hole and adjusted to regulate the balance of said outer window frame of said aluminum window frame unit when said outer window frame is installed, and a plurality of mounting holes spaced along two opposite sides respectively fastened to the inside chamber of said window frame of said aluminum window frame unit, each pivot holder comprising a bearing block having a bearing hole and a projecting block, said projecting block having a screw hole, an axle bearing received in the bearing hole to hold the bolt of said upper or lower locating block, and a locating block connected between said bearing block and said shutter, said locating block comprising an U-channel, a stop block in said U-channel, a screw hole on said stop block connected to the screw hole on said projecting block of said bearing block by a screw, an angle frame connected to the inside flanges of the inside chamber of one stile of said shutter; and

a shutter transmission mechanism comprised of a motor drive installed in the longitudinal chamber of said bottom rail and having an output shaft, and a plurality of transmission devices disposed inside one stile and connected between said output shaft and said louvers, each transmission device comprising a gear box mounted around said output shaft, a spiral gear mounted inside said gear box and turned by said output shaft, a spur gear mounted inside said gear box and turned by said spiral gear, and a transmission rod coupled between said spur gear and one louver, said gear box comprising a first shell and a second shell, said first shell comprising two parallel supports, which support said second shell, a chamber defined between said supports, a plurality of pins, a round hole, two vertically aligned half-round holes, and a plurality of pins, said second shell comprising a chamber matched with the chamber of said first shell, a plurality of pin holes, which receive the pins of said first shell, a round hole aligned with the round hole on said first shell to hold said spur gear, and two vertically aligned half-round holes matched with the half-round holes of said first shell to hold said spiral gear, said spur gear having two coupling portions at two opposite ends

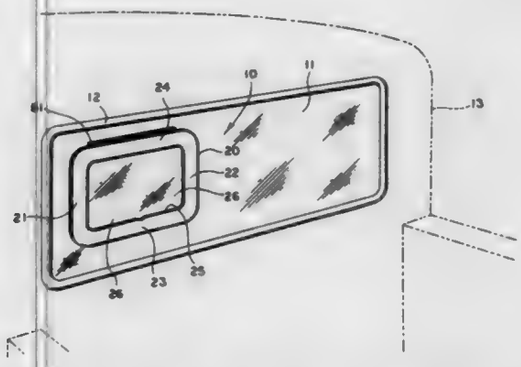
respectively inserted into the round holes on said first and second shells, and a longitudinal center through hole, which receives said transmission rod, said spiral gear being fixedly mounted around said output shaft and meshed with said spur gear and having two coupling portions at two opposite ends respectively inserted into the half-round holes on said first and second shells, said transmission rod having a rod section at one end fitted into the longitudinal center through hole on said spur gear, and connecting block at an opposite end fastened to one louver.

5,467,557

WINDOW CONSTRUCTION AND METHOD OF MAKING THE SAME

Edgar W. Jones, 2757 Progress Park Dr., Stow, Ohio 44224

Filed Dec. 15, 1993, Ser. No. 167,670
Int. Cl.[6] E06B *7/28*
U.S. Cl. 49—171 **16 Claims**



1. In combination with a window having an aperture therein:
a moveable, secondary window assembly mounted on one side of the window aperture, such that said secondary window assembly is moveable from a position closing the window aperture to a position wherein the window aperture is at least partially open;
said secondary window assembly comprising a frame member, a secondary window mounted within said frame member, and mounting means for mounting said frame member upon the window;
said mounting means including at least one flexible hinge pin affixed to said frame member and positioned through a hinge pin aperture through the window.

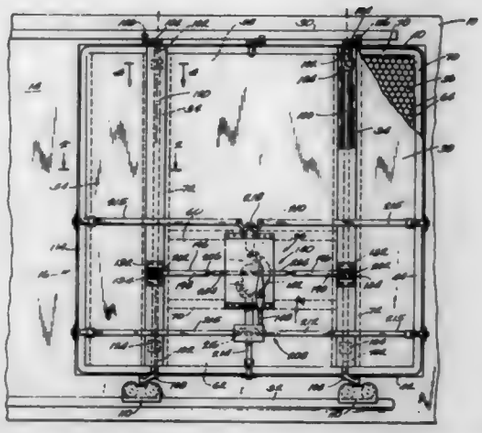
5,467,558

RAIL CAR PLUG DOOR

Jeffrey F. Kober, Wauwatosa, Wis., and Victor A. Nelson, Springfield, Va., assignors to Prime Composites, Inc.

Filed Jan. 11, 1994, Ser. No. 179,742
Int. Cl.[6] E05D *15/10*
U.S. Cl. 49—220 **12 Claims**

1. A plug door comprising
a door panel including a first section of core having a first section planar face and a first section edge, a second section of core having a second section planar face and a second section edge spaced from the first section edge, said door panel also including a first skin bonded to said first and second section planar faces and extending between said first and second section edges, said skin, said first section edge, and said second section edge defining therebetween an elongated door panel recess opening away from said first and second section planar surfaces, said door panel also including an elongated support member received by said door panel recess, said support member having a U-shaped cross-section



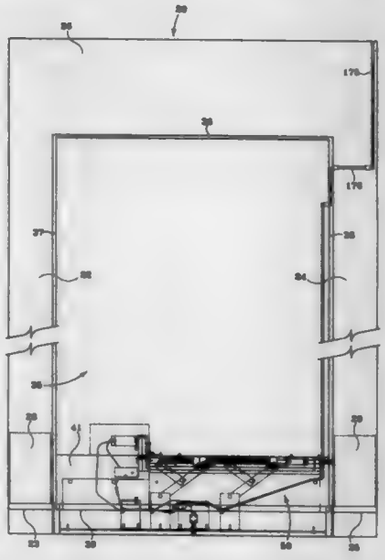
when viewed in a plane perpendicular to said length of said support member and opening away from said first and second planar surfaces,
an elongated crank rod received in and supported by said door panel for pivotable movement relative thereto about a pivot axis,
door locking means mounted on said door panel for pivoting said crank rod about said pivot axis, and
a cover secured to said door panel and extending between said first and second section edges to close said door panel recess.

5,467,559

ELECTRICALLY OPERATED DROP SEAL FOR PASS DOORS IN OPERABLE WALLS

N. Douglas Owens, Lynn, Ind., assignor to Modernfold, Incorporated, New Castle, Ind.

Filed Jul. 19, 1994, Ser. No. 276,947
Int. Cl.[6] E06B *7/28*
U.S. Cl. 49—321 **20 Claims**



1. A pass door drop seal assembly for use with a pass door in an operable partition, wherein the pass door is suspended above a floor, and wherein the pass door is movable relative to the operable partition between an opened position and a closed position, the pass door drop seal assembly comprising:
a motor;
an actuator operatively connected to said motor and selectively movable by said motor between a first position and a second position;

a retractable drop seal for providing a seal between the pass door and the floor, said drop seal being movable between a retracted position above the floor and a sealed position in sealing engagement with the floor;

a coupling operatively connecting said actuator and said retractable drop seal arranged to convert movement of said actuator from the first position to the second position into movement of said retractable drop seal from the retracted position to the sealed position; and

a pass door opening activated retractor for raising said retractable drop seal from the sealed position when the pass door is moved from the closed position to the opened position.

5,467,560

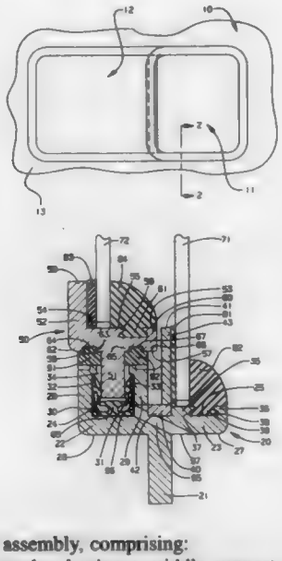
WINDOW ASSEMBLY

Calvin C. Camp, Bartonville; Jack R. Kaveney, East Peoria; Ronald H. Garman, Pekin; Raymond M. Vanderburg, and Malcolm H. Kingsinger, both of Washington, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 23, 1994, Ser. No. 294,694

Int. Cl.[6] E05D *15/10*

U.S. Cl. 49—413 **20 Claims**



1. A window assembly, comprising:

a first base member having a middle support, first and second arms, and being of general T-shaped, each of said arms extending generally transverse the middle support on opposed sides thereof, said first and second arms each having first and second surfaces;

first and second spaced apart uprights connected to and extending generally transverse said first surface of the first base member first arm, each of said uprights having an inner surface and a longitudinal slot on said inner surface, and said first and second uprights defining a first longitudinal channel therebetween;

third and fourth spaced apart uprights connected to and extending generally transverse said first surface of the first base member second arm, each of said uprights having an inner surface and an outer surface, and said uprights defining a first longitudinal slot therebetween, and said second and third spaced apart uprights defining a second longitudinal slot therebetween;

a fifth upright having a base and an upright member, and being of general L-shaped, and connected to and extending generally transverse said first surface of the first base member second arm, and insertable in said second longitudinal slot;

a second base member having a middle support, first and second arms, and being of general T-shaped, each of said arms extending generally transverse the middle support on opposed sides thereof, said first and second arms each having first and second surfaces, and said second base member being insertable in said first longitudinal channel;

a first upright connected to and extending generally transverse said first surface of the second base member first arm;

second and third spaced apart uprights connected to and extending generally transverse said first surface of the second base member second arm, and said uprights defining a first longitudinal slot therebetween;

fourth and fifth spaced apart uprights respectfully connected to and extending generally transverse said second surface of the second base member first arm and second arm;

fourth and fifth longitudinal slots respectfully formed on one of said first and second spaced apart uprights of the first base member first arm, and said fourth and fifth spaced apart uprights of the second base member first arm;

a first window pane being supported by said third upright of the first base member second arm at a location spaced from said L-shaped upright of the first base member;

a second window pane being supported by said second upright of the second base member second arm at a location spaced from the first upright of the second base member;

a first seal positioned between the first base member fifth upright and the first window pane, and being in sealing engagement therewith;

a second seal positioned between the first base member first slot and the first window pane and being in sealing engagement therewith;

a third seal positioned between the second base member first upright and the second window pane, and being in sealing engagement therewith;

a fourth seal positioned between the second base member first slot and the second window pane and being in sealing engagement therewith;

a fifth seal positioned between the second base member middle support and the first base member longitudinal channel and being in sealing engagement therewith;

first and second plastic blocks respectfully positioned in the fourth and fifth longitudinal slots, and respectfully being in sliding engagement with one of said first base member first and second uprights, and said second surface of the second base member first and second arms.

5,467,561

AUTOMATED HIGH-RAISED PARKING SYSTEM

Shigekazu Takaoka, Kasugai, Japan, assignor to Daifuku Co., Ltd., Osaka, Japan

Filed Oct. 13, 1992, Ser. No. 960,116

Claims priority, application Japan, Jan. 14, 1991, 3-264228; Jan. 15, 1991, 3-265727

Int. Cl.[6] E04H *6/06*

U.S. Cl. 52—30 **12 Claims**

1. An automated high-raised parking system comprising:

a parking construction including

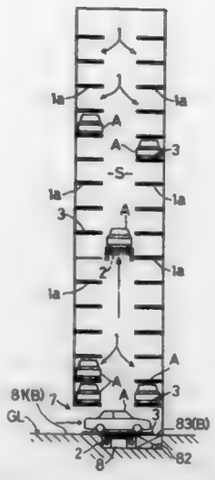
a parking rack structure having a plurality of stories of parking racks for parking an automobile which is mounted on a pallet,

a lift passage having a lift-translator device, said lift passage being formed beside said parking racks, said lift-translator device including a lift table and a translator device, and

an automobile entrance/exit section for allowing entrance and exit of the automobile to and out of said parking construction, a holding unit being provided at a same height as a ground-level floor of said entrance/exit section, said holding unit being adapted for holding ends of said pallet so as to maintain a horizontal posture of said pallet mounting the automobile and also to prevent said pallet from being moved lower than said ground-level floor,

wherein within said parking construction the automobile is mounted on said lift table and vertically moved to a predetermined one of said racks and then translated by said translator device onto said predetermined rack; and

a turntable device provided at said entrance/exit section, said turntable device including a turntable which swivellably



holds, at a center thereof, said pallet mounting the automobile thereon so that an orientation of the automobile on said pallet is changed by swiveling said turntable, said turntable device further including an elevator mechanism for elevating said turntable so as to allow an upward movement of said pallet relative to the height of said entrance/exit section, wherein said elevator mechanism includes a base structure, a cam follower coupled to said turntable, an eccentric cam coupled to said base structure for vertically moving said cam follower and a drive unit attached to said base structure for driving said eccentric cam.

5,467,562

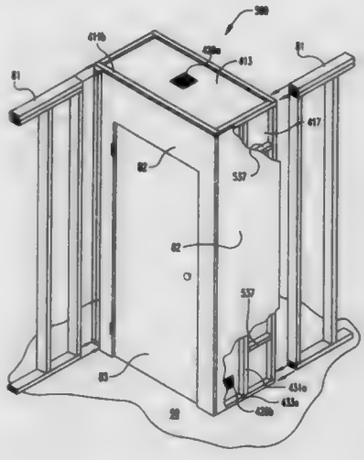
PREFABRICATED MODULAR CLOSET UNIT

Phillip R. Holland, 453 Westcrest Dr., Nashville, Tenn. 37211

Continuation-in-part of Ser. No. 532,584, Jun. 4, 1990, Pat. No. 5,319,903. This application May 18, 1993, Ser. No. 63,410

Int. Cl.[6] A47G *29/00*

U.S. Cl. 52—79.1 **7 Claims**



1. A prefabricated closet assembly for installation on a structure floor, comprising:

a) an enclosure defining a closet volume having a finished interior surface and being accessible by a front opening, comprising:

(1) a pair of oppositely disposed vertical side walls connected to each other by a transverse vertically disposed rear wall, each said side walls having a front end and a rear end;

(2) a horizontal ceiling member connected to said side walls and said rear wall;

(3) a horizontal floor member connected to said side walls and said rear wall, wherein said floor member is adapted to overlie and cover the floor of the structure;

said floor member having a front edge and means for securing said floor member to the structure floor along said front edge of said floor member, and wherein said front edge comprises a forwardly projecting flange member located in a plane lower than said floor member and arranged to lie flush along a top surface of the structure floor;

(4) a closable door attached to said enclosure and an upper vent and a lower vent to provide ventilation of said closet volume when said door is closed; and

(5) wherein said side walls, said rear wall, said ceiling member and said floor member are all molded together to form a unitary member;

b) a transverse storage member connected to and running transversely between said pair of side walls;

c) a support frame exteriorly connected to and supporting said enclosure, wherein said enclosure and said support frame are modular separate from the structure, said support frame comprising:

(1) four vertical corner posts, said vertical corner posts include a pair of front vertical corner posts positioned along said front end of each of said side walls, and a pair of rear vertical corner posts positioned along said rear end of each of said side walls;

(2) a plurality of horizontal members interconnecting upper ends of at least two said vertical corner posts;

(3) a plurality of horizontal members interconnecting lower ends of at least two said vertical corner posts;

(4) a pair of load bearing structural truss frames respectively positioned along an outside of each of said side walls, said truss frames disposed between a front corner post and a corresponding rear corner post and including at least one said vertical corner post, said truss frames comprising at least a pair of generally vertical posts and a plurality of struts therebetween;

(5) at least one front vertical post disposed between the front corner post of each said sidewalls, a vertically elongated front wall member interior of and supported by said front vertical post, said front wall member running from said floor member to said ceiling member, wherein said front wall member comprises a portion of said enclosure and adjoins one of said side walls; and,

d) a lighting fixture pre-installed in said closet assembly.

5,467,563

DEFORMABLE SEALING DEVICE FOR A GAP BETWEEN THE EDGE OF A WALL OPENING AND THE BACK WALL OF A VEHICLE DOCKING AT THE WALL OPENING

Horst Borchardt, Wennigsen, Germany, assignor to Alten Gerätebau GmbH, Wennigsen, Germany

Filed Dec. 14, 1993, Ser. No. 167,636

Claims priority, application Germany, Dec. 14, 1992, 42 42 088.1

Int. Cl.[6] E04H *14/00*

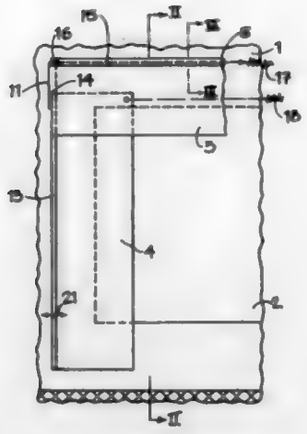
U.S. Cl. 52—173.2 **12 Claims**

1. A deformable sealing device for a gap between a wall opening of a building wall and a back wall of a vehicle docking at the wall opening, said sealing device comprising:

a flap-shaped deformable skirt for receiving loads by the back wall of the vehicle docking at the wall opening, said skirt comprising an upper transverse portion and two vertical strips that are arranged parallel to vertical sides of the wall opening;

a cover connected between said upper transverse portion and the building wall;

said vertical strips having vertically extending outer edges with stiffened edge profiles;



first guide members connected between said stiffened edge profiles and the building wall, said first guide members extending at a slant relative to the vertical; and

wherein each said first guide member is a first tension spring with windings that are substantially directly adjacent to one another, such that said first tension spring is pressure resistant and rigid in a longitudinal direction of said first spring, stretchable by pulling forces acting in the longitudinal direction, and bendable when acted on by lateral forces.

5,467,564

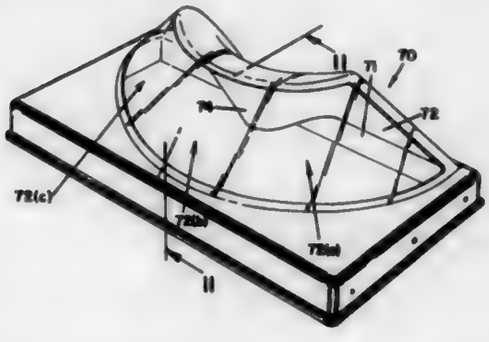
DAYLIGHT COLLECTION AND DISTRIBUTION SYSTEM

Dawn DeKeyser, Minneapolis; Loren Abraham, White Bear Lake, and David A. Eljadi, St. Paul, all of Minn., assignors to Andersen Corporation, Bayport, Minn.

Continuation-in-part of Ser. No. 69,989, May 28, 1993, Pat. No. 5,408,795. This application Mar. 28, 1994, Ser. No. 218,803

Int. Cl.[6] E04D *13/03*; E04B *7/18*; G02B *17/00*

U.S. Cl. 52—173.3 **20 Claims**



19. An apparatus for directing daylight towards a target area in a building, said apparatus comprising:

a) a housing;

b) an aperture in said housing, said aperture having first and second portions respectively arranged to face in first and second directions towards the horizon; and

c) passive directing structure for: 1) directing daylight entering said aperture toward said target area, and 2) increasing the angle of acceptance through which daylight entering said aperture is directed towards said target area, wherein said passive directing structure is located proximate said aperture.

5,467,565

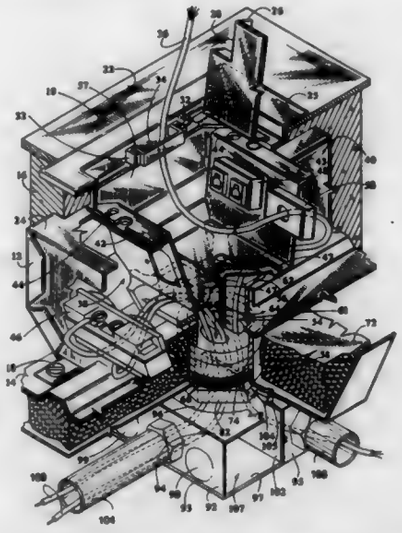
METHOD AND APPARATUS FOR IMPROVED ACTIVATION OF SERVICES IN AN OFFICE BUILDING FLOOR

Timothy Bowman, Parkersburg, W. Va.; Charles N. Domigan, Coolville, Ohio; Robert W. Hadfield, Parkersburg, W. Va.; J. David Harmon, Vienna, W. Va., and James E. Sheridan, Williamstown, W. Va., assignors to Walker Systems, Inc., Parkersburg, W. Va.

Continuation-in-part of Ser. No. 659,528, Feb. 22, 1991, abandoned, which is a continuation of Ser. No. 455,083, Dec. 22, 1989, abandoned. This application Mar. 13, 1992, Ser. No. 850,530

Int. Cl.[6] E04B *5/48*

U.S. Cl. 52—220.1 **5 Claims**



1. An activation assembly for use with service distribution systems, including conduit carrying conductors in a space below an office building floor having a corrugated metal deck sheet and an overlying layer of concrete defining an upper floor surface, the activation assembly comprising:

a void-forming box adapted to be positioned on the corrugated metal deck sheet and having spaced apart ends and spaced apart sides joining the ends, each end having a lower edge adapted to be positioned adjacent to and adapted to conform to the corrugated metal deck sheet and each end extending toward the floor surface to a respective upper edge below the floor surface, each side having a lower edge adapted to be positioned adjacent to and adapted to conform to the corrugated metal deck sheet and extending between the lower edges of the ends, the lower edges of the ends together with the lower edges of the sides adapted to circumscribe a void-bounding region of the deck sheet, each side extending toward the floor surface to respective upper edge below and spaced apart from the floor surface and extending between the upper edges of the ends;

a top overlying the upper edges of the ends and sides and defining an activation opening sized to allow mounting hardware and connectors to be positioned in and secured to the void-forming box;

the sides, ends, and top defining an interior volume;

the interior volume sized to receive connectors and mounting hardware for connectors for one or more service and shields for separating the services;

a box adapter adapted to be positioned on the metal deck sheet in the void-forming box and adapted to extend through an activation opening in the metal deck sheet into the space below the floor, the box adapter having a conductor passage communicating with the interior volume of the void-forming box and extending through the box adapter to an opening at an end of the box adapter, the opening being adapted to be positioned in the space below the metal deck sheet; and

an extension box secured to the box adapter in the space below the floor, the extension box having a top defining an opening communicating with the opening at the end of the box adapter in the space below the floor and sides adapted to be connected to conduit, sides circumscribing the boundary of the top and extending from the top away from the deck sheet to lower edges, and a cover secured to the extension box abutting the lower edges of the extension box;

the top, sides, and cover of the extension box defining a box interior that communicates with the interior of the void-forming box through the conductor passage in the box adapter, whereby conduit of the distribution systems is connected to the sides of the extension box and conductors are routed into the void-forming box through the conduit, extension box, and conductor passage of the box adapter.

5,467,566

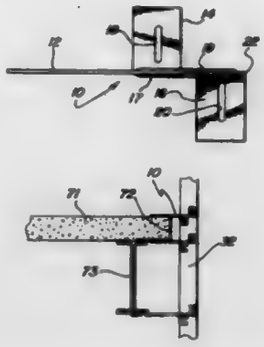
CURTAIN WALL CLIP

Allan J. Swartz, Orange, and Gregory A. Kulpa, Tustin, both of Calif., assignors to Swartz & Kulpa, Structural Design and Engineering, Tustin, Calif.

Continuation of Ser. No. 783,854, Oct. 28, 1991, abandoned. This application Aug. 31, 1994, Ser. No. 299,320

Int. Cl.[6] E04B *5/00*

U.S. Cl. 52—235 **20 Claims**



1. A curtain wall connecting arrangement for coupling a curtain wall stud and building floor structure, comprising:

an elongated clip having two ends with an attachment portion at one end which is plate-like in shape and two oppositely, offset depending ears at the other end, each ear having an elongated slot therein disposed substantially perpendicular to the attachment portion; and

spacer means and threaded members, said threaded members securing the spacer means and said two offset depending ears in slideable engagement with the curtain wall stud.

5,467,567

SPRING BIASED APPARATUS FOR MAINTAINING PRECAST PANELS IN A STABLE REMOVABLE POSITION IN A VERTICAL SLOT

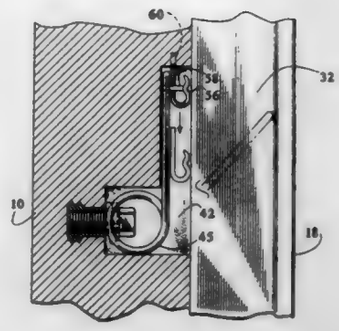
Stephen M. Christensen, Leesburg, Va., assignor to The Reinforced Earth Company, Vienna, Va.

Continuation of Ser. No. 311,209, Sep. 23, 1994, abandoned, which is a continuation of Ser. No. 997,871, Dec. 29, 1992, abandoned. This application Mar. 8, 1995, Ser. No. 400,492

Int. Cl.[6] E04C *3/00*

U.S. Cl. 52—459 **21 Claims**

1. A road barrier panel and post construction, said panel of the type having spaced, opposite faces connected by spaced opposite sides, said post having spaced flanges defining a slot, said slot slidably receiving one side of the panel with the panel faces opposed to the flanges;



and wedging apparatus interposed between a flange and panel face, said wedging apparatus comprising, in combination:

a biasing member attached to the panel at a face thereof; and

an arm engaged by the biasing member and extendable from the panel toward one flange with a sufficient force and at an angle to thereby wedge the panel in the slot.

5,467,568

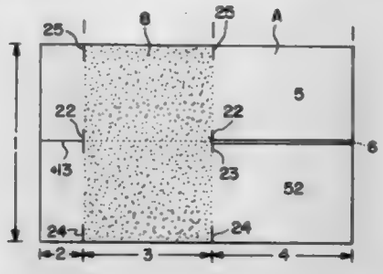
DIMENSIONAL HIP AND RIDGE ROOFING PANEL

Frederick W. Sieling, Bound Brook, N.J., assignor to Building Materials Corporation of America, Wilmington, Del.

Filed Jan. 11, 1994, Ser. No. 179,852

Int. Cl.[6] E09D *1/00*

U.S. Cl. 52—518 **17 Claims**



1. A hip and ridge roofing panel comprising an asphaltic membrane having an upper granulated surface and a non-granulated under surface and having a width of between about 9 and about 18 inches and a length of between about 10 and about 28 inches, said membrane being divided successively into a foldable, longitudinally divided rear section, a mid section having an exposable surface area and a foldable forward section which is longitudinally divided into two substantially equal subsections by a slot or notch extending approximately the length of said forward section and located at a point midway of its width; said forward section having a length equal to the length of said mid section minus between about ⅖th and about ⅘th the length of said rear section.

5,467,569

ANCHOR DEVICE

Daniel J. Chiodo, 12399 SW. 53rd St., Suite 104, Cooper City, Fla. 33330

Filed Jul. 1, 1994, Ser. No. 269,747

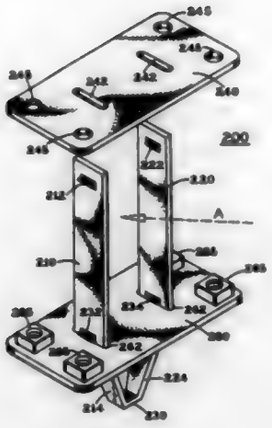
Int. Cl.[6] E04B *1/38*

U.S. Cl. 52—713 **11 Claims**

1. An anchoring apparatus for securing a beam to a structural member, comprising:

a first vertical support having a top end and a bottom end;

a second vertical support generally parallel to the first vertical support having a top end and a bottom end, wherein the bottom end of the first vertical support is affixed to the bottom end of the second vertical support for insertion in concrete;



a structural member for engaging the first and the second vertical supports;

a first plate having parallel slits sized to allow each vertical support to pass therethrough, the first plate positioned generally perpendicular to the first and the second vertical supports at a location adjacent to the top ends of the first and the second vertical supports, wherein the first plate is positioned to one side of a beam; and

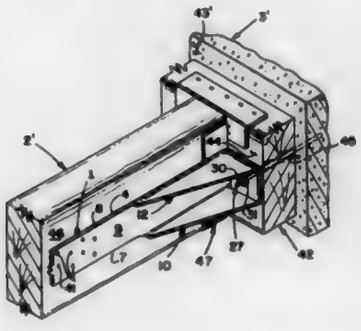
a second plate positioned parallel to the first plate, wherein the second plate is positioned to a second side of the beam.

5,467,570

TENSION TIE

William F. Leek, Anaheim, Calif., assignor to Simpson Strong-Tie Co., Inc., Pleasanton, Calif.

Filed Oct. 12, 1994, Ser. No. 321,909
Int. Cl.[6] E04C *5/00*
U.S. Cl. 52—712 **7 Claims**



1. A single piece tension tie connection for tying a wood, or steel structural frame member to a wood, steel or concrete structural base member comprising:

a. an elongated strap member having a distal end and a proximal end, first and second spaced side edges and a generally planar face;

b. a first side member having a generally triangular shape integrally connected to a portion of said first side edge of said elongated strap member along a first side-generally 90° bend line;

c. a second side member having a generally triangular shape integrally connected to a portion of said second side edge of said elongated strap member along a second side generally 90° bend line and positioned in generally parallel spaced relation to said first side member;

d. a first seat member integrally connected to a portion of said first side member along a first seat bend lie and formed with a first seat opening therethrough;

e. a second seatsmember integrally connected to a portion of said second side member along a second seat bend line for overlapping registration with said first seat member and formed with a second seal opening therethrough located for general registration with said first seat opening;

f. a third seat member integrally connected to said proximal end of said elongated strap member at a generally 90° back bend line for underlapping said first and second seat members and formed with a third seat opening therethrough located for general registration with said first and second seat openings;

g. a fourth seat member integrally connected to said third seat member at a fourth seat bend line for overlapping said first, second and third seat members and formed with a fourth seat opening therethrough located for general registration with said first, second, and third seat openings;

h. shear fastener means for insertion through said elongated strap member for connection to said structural frame member; and

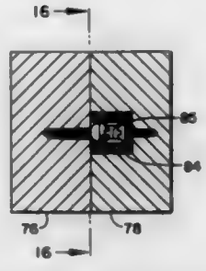
i. tension fastener means for insertion through said first, second, third and fourth seat openings for attachment of said single piece tension tie to said structural base member.

5,467,571

SNAP FASTENER AND METHOD OF INSTALLING REMOVABLE TRIM

Janis M. Khatibi, 2805 194th Ave. SE., Issaquah, Wash. 98027

Filed Jan. 19, 1994, Ser. No. 183,497
Int. Cl.[6] A44B *21/00*
U.S. Cl. 52—718.04 **11 Claims**



1. A method of installing a wood product against a mounting surface comprising the steps of:

screwing a plurality of metallic ball head screws into a backside of said wood product, each head of said plurality of ball head screws having a curved top portion and a curved bottom portion, said curved top portion being joined to said curved bottom portion at a major outside diameter, each head of said plurality of ball head screws having a socket to facilitate screwing into said wood product, each said socket being spaced apart from said major outside diameter to provide said major outside diameter with a substantially smooth uninterrupted surface;

positioning said wood product with said ball head screws against a mounting surface with said curved top portion of said ball head screws being pressed against said mounting surface;

striking a front side of said wood product with enough force to drive said ball head screws partially into said mounting surface to leave a plurality of indentations in said mounting surface corresponding to the location of each of said plurality of ball head screws;

drilling a plurality of holes into said mounting surface at the locations marked by said plurality of indentations;

inserting a plurality of polymeric receptacles in said plurality of holes, said receptacles having a substantially cylindrical side wall with one end substantially open and having a substantially circular base at an opposite end, said side wall defining a bore having an inside diameter that is smaller than said major outside diameter of said plurality of ball head screws, said substantially circular base having an anchor hole therethrough;

anchoring said polymeric receptacles in said mounting surface by putting a mounting screw through said anchor hole and fastening said mounting screw to said mounting surface;

positioning said wood product to align said plurality of ball head screws to said plurality of polymeric receptacles in said plurality of holes; and

striking said front side of said wood product to force, said plurality of ball head screws into said polymeric receptacles in said plurality of holes to removably hold said wood product in place.

5,467,572

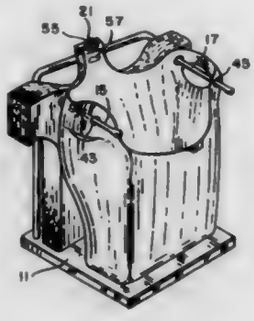
BAGGING SYSTEM

Richard M. Wile, Medfield, Mass., and Lawrence Cole, Warwick, R.I., assignors to EPI Packaging Technologies, Inc., North Dighton, Mass.

Filed Apr. 1, 1992, Ser. No. 861,535

Int. Cl.[6] B65B *43/26;* **B65D** *85/62*

U.S. Cl. 53—384.1 **4 Claims**



1. A merchandise bagging system comprising:

a rack providing a pair of spaced, generally parallel cantilevered arms and, between said arms at one end thereof, a mounting hook; and

mounted on said rack, a pack of T-shirt type bags having front and back panels which are cut out to provide an openable mouth edge with handles at each side of the mouth edge and a protruding tab extending upwards from each panel above the mouth edge between the handles, each handle having a mounting aperture for receiving one of said arms, each tab having an opening for receiving said hook and, below said opening, a transverse slit leaving only easily severed portions of the tab on each side of said slit, and, between the adjacent protruding tabs on successive bags in said pack, below said slit and above said mouth edge of the respective bag, a releasable adhesive bond linking the successive bags,

whereby removal of one bag from a rack having arms passing through said handle apertures and a hook engaging said mounting aperture, will cause the front wall of the next bag to be torn from the respective central tab and said next bag to be opened across said arms.

5,467,573

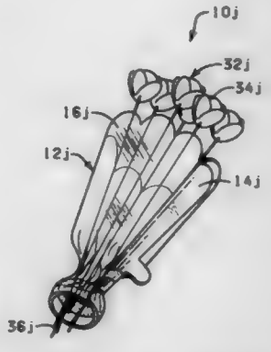
METHOD OF USING A WRAPPING MATERIAL HAVING A PULL TAB AND PULL INDICIA FOR WRAPPING A FLORAL ARRANGEMENT

Donald E. Weder; Joseph G. Straeter, both of Highland, and William F. Straeter, Breese, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 963,882, Oct. 20, 1992, which is a continuation-in-part of Ser. No. 865,563, Apr. 9, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 963,882is a continuation-in-part of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned, said Ser. No. 502,358is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application Jul. 19, 1993, Ser. No. 93,838

Int. Cl.[6] B65B *11/02;11/48;51/04;25/02*

U.S. Cl. 53—397 **21 Claims**



1. A method for wrapping a floral arrangement, comprising:

providing a floral arrangement having a flower portion and a stem portion;

providing a sheet of material having:

an upper surface,

a lower surface,

a first connecting means disposed on a portion of the sheet of material for connecting portions of the sheet of material to itself during the wrapping step, the connecting means positioned such that portions of the sheet of material adjacent the stem portion of the floral arrangement can be crimped together about the stem portion of the floral arrangement;

a second connecting means for further crimpingly connecting portions of the sheet of material about the floral arrangement, the second connecting means comprising a pull tab attached to the sheet of material, the pull tab having a bonding material disposed on a portion thereof, the pull tab acting both to crimpingly connect portions of the sheet of material about the floral arrangement and to retain the sheet of material in a crimped condition about the floral arrangement;

placing the floral arrangement on the sheet of material;

wrapping the sheet of material about the floral arrangement causing a portion of the sheet of material near the first connecting means to overlap another portion of the sheet of material resulting in overlapping portions;

bonding the overlapping portions of the sheet of material by contacting the first connecting means on the adjacent overlapping portions of the sheet of material whereby the overlapping portions of the sheet of material are bonded together, the sheet of material substantially encompassing and surrounding a substantial portion of the stem portion of the floral arrangement forming a wrapper about the floral arrangement, the wrapper having an opening extending through the lower end thereof and an opening extending through the upper end thereof with a portion of the stem portion of the floral

arrangement extending through the opening in the lower end and a portion of the flower portion of the floral arrangement being exposed near the opening in the upper end thereof; and

binding the wrapper to the floral arrangement by crimping portions of the wrapper together causing the first connecting means to engage portions of the wrapper adjacent the stem portion and crimpingly connecting said portions of the wrapper about the stem portion of the floral arrangement and wrapping the second connecting means comprising the pull tab about the wrapper and about the stem portion of the floral arrangement and connecting the pull tab to the wrapper via the bonding material on the pull tab, the pull tab both crimpingly connecting said portions of the wrapper about the floral arrangement and retaining the wrapper in a crimped condition, both first connecting means and second connecting means thereby firmly binding the wrapper to the floral arrangement.

5,467,574

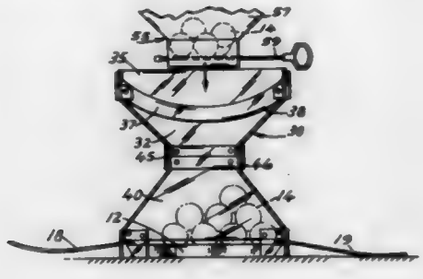
STACKING AND CARRYING DEVICE

John E. Thomsen, 1621 116th St., Kenosha, Wis. 53140

Continuation of Ser. No. 295,963, Aug. 25, 1994, abandoned, which is a division of Ser. No. 175,056, Dec. 28, 1993, Pat. No. 5,381,895. This application Feb. 13, 1995, Ser. No. 388,123

Int. Cl.[6] B65B *35/50;39/00*

U.S. Cl. 53—397 **12 Claims**



1. A method of stacking spherical objects on a support in the form of a pyramid comprising:

placing a support on a supporting surface, the support having an essentially square configuration with a plurality of continuous apertures aligned in rows and in a square orientation, each aperture constructed in the form of a partial sphere to receive a portion of the spherical object;

positioning a filling device over the support, the filling device having a pyramidal section and an open top and bottom, the pyramidal section being placed over the support; and

flowing the spherical objects into the filling device from the top thereof.

5,467,575

METHOD FOR WRAPPING A FLORAL GROUPING WITH A SHEET OF MATERIAL HAVING A REINFORCING MEMBER

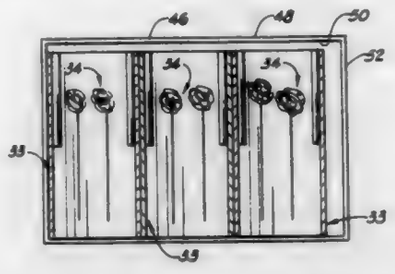
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 928,242, Aug. 10, 1992, Pat. No. 5,363,630, which is a continuation-in-part of Ser. No. 687,701, Apr. 18, 1991, abandoned, and a continuation-in-part of Ser. No. 803,318, Dec. 4, 1991, Pat. No. 5,344,016, which is a continuation-in-part of Ser. No. 707,417, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 391,463, Aug. 9, 1989, abandoned, which is a continuation-in-part of Ser. No. 249,761, Sep. 26, 1988, abandoned. This application Jul. 1, 1994, Ser. No. 270,071

The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.

Int. Cl.[6] B65B *25/02;11/58;5/06*

U.S. Cl. 53—399 **20 Claims**



1. A method for wrapping a floral grouping comprising:

providing a sheet of material with a closure bonding material disposed thereon and with reinforcing member means being connected thereto;

providing the floral grouping;

placing the floral grouping on the sheet of material; and

wrapping the floral grouping with the sheet of material, the closure bonding material engaging portions of the sheet of material to cooperate in securing the sheet of material wrapped about the floral grouping to provide a wrapper with at least a portion of the floral grouping being disposed in the wrapper, the reinforcing member means cooperating to provide reinforcing member rigidity to at least a portion of the wrapper so that when the wrapped floral grouping is disposed within a carton and the reinforcing member or the sheet of material engages a sidewall of the carton the reinforcing member prevents engagement of the floral grouping with the side wall of the carton.

5,467,576

MACHINE FOR MAKING A PACKAGE OF FOOD CASING STRANDS

Ivo G. Hendriks, Overpelt, Belgium, assignor to Teepak, Inc., Westchester, Ill.

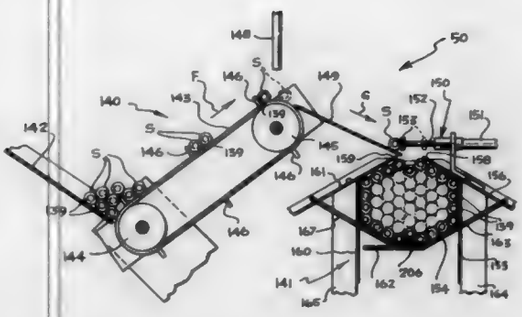
Continuation-in-part of Ser. No. 966,961, Oct. 27, 1992, Pat. No. 5,328,031, which is a continuation-in-part of Ser. No. 907,007, Jul. 1, 1992, Pat. No. 5,228,572, which is a continuation-in-part of Ser. No. 696,436, May 6, 1991, Pat. No. 5,137,153. This application Nov. 4, 1993, Ser. No. 146,866

Int. Cl.[6] B65B *1/22;43/26;53/00*

U.S. Cl. 53—437 **9 Claims**

1. A machine for making a package of food casing strands, wherein said package has a hexagonal-like cross section, comprising:

a product holder for initially holding a plurality of said strands in a configuration having a hexagonal-like cross section, wherein said holder has an opening therein for admitting said strands into said holder;



means for transporting said strands to said holder and for depositing said strands into said opening;

shaker means for shaking said holder at predetermined times to ensure that said plurality of strands settle into said holder in said configuration having a hexagonal-like cross section;

means for measuring and cutting a predetermined amount of stretch film, where said stretch film is a closed loop used to encase said package of food casing strands;

means for stretching and holding said stretch film into a shape of a polygon having a perimeter which is larger than the perimeter of said holder;

means for moving said stretched film into a position proximate said holder;

means for pushing all of said strands out of said holder and into said stretched closed loop of film; and,

means for releasing said stretched film, wherein said film then relaxes about said plurality of strands to form said package of food casing strands.

5,467,577

APPARATUS AND METHOD OF ENCLOSING AND SEALING ENCLOSURE

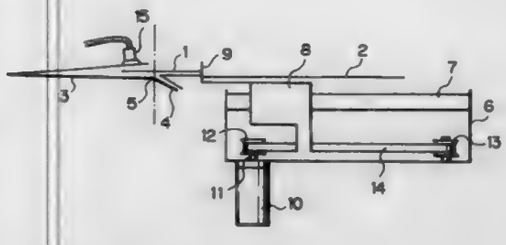
Koki Sato, Tokyo, Japan, assignor to Juki Corporation, Chofu, Japan

Filed Oct. 29, 1993, Ser. No. 145,344

Claims priority, application Japan, Nov. 6, 1992, 4-296783

Int. Cl.[6] B43M *3/00;* **B65B** *5/00;57/14*

U.S. Cl. 53—468 **9 Claims**



1. A method of enclosing and sealing comprising the steps of;

arranging an insert carriage in a manner to be reciprocatable in the direction of an envelope, said insert carriage having a manipulating member for abutting an enclosure against an enclosure attached to a base having the upper surface onto which a specified enclosure is supplied, the envelope being disposed with a foldable flap connected to the mouth portion of the envelope via a fold line being located to the side of said enclosure at one side of the base;

reciprocally moving said manipulating member between a basic position and an insert position corresponding to said fold line of the envelope by moving said insert carriage;

providing a carriage motor for driving said insert carriage;

inputting variable amounts for indicating the desired insert positions of said manipulating member in conformity with the thickness or quality of paper of the enclosure;

storing an insert pulse number based on said variable amounts;

detecting the starting timing respectively of an insert operation and a return operation in accordance with the rotary angle of the carriage motor; and

rotationally controlling said carriage motor toward said envelope by the amount corresponding to said insert pulse number when said detecting step has detected that the insert operation can be started and away from said envelope by the amount corresponding to a return pulse number when said detecting step has detected that the return operation can be started.

5,467,578

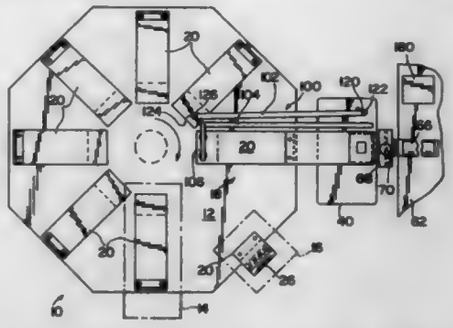
METHOD FOR ENCAPSULATING ARTICLES IN WICKETED BAGS

Harold A. Jensen, Brockton, Mass., assignor to MHB Industries Corp., Somerville, Mass.

Continuation of Ser. No. 132,501, Oct. 5, 1993, abandoned, which is a division of Ser. No. 892,203, Jun. 2, 1992, Pat. No. 5,249,409. This application Nov. 21, 1994, Ser. No. 342,659

Int. Cl.[6] B65B *43/26*

U.S. Cl. 53—469 **2 Claims**



1. A method of encapsulating an article within a pocket formed as an integral part of a bag, said bag being connected at a common header to a plurality of other bags to form a wicket, said pocket being bordered by a free edge defining an aperture communicating with the interior of said pocket, said method comprising the steps of:

locating said wicket at a first station with said common header positioned between said first station and an adjacent second station;

opening said aperture to gain access to the interior of the pocket;

inserting the article into the pocket through the thus opened aperture; and

sealing the free edge to close said aperture and to encapsulate the article in the pocket;

said method additionally comprising a step of transferring said bag and its integral pocket across said common header from said first station to said second station at which the free edge is sealed, the aforesaid steps of opening, inserting, sealing and transferring being performed while the bag remains connected at said common header to said other bags.

5,467,579

METHOD AND DEVICE FOR LATERALLY JOINING PRODUCT WRAPPINGS

Silvano Boriani, and Antonio Gamberini, both of Bologna, Italy, assignors to G.D Societa' Per Azioni, Bologna, Italy

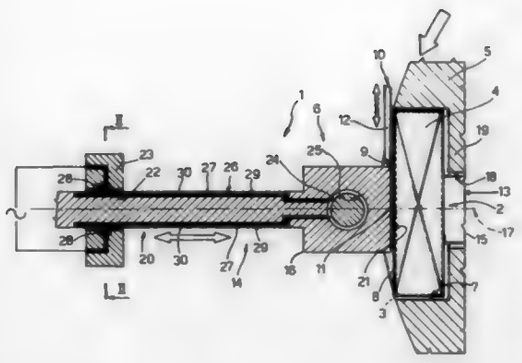
Continuation of Ser. No. 900,951, Jun. 18, 1992. This application Jun. 20, 1994, Ser. No. 262,395

Claims priority, application Italy, Jun. 21, 1991, BO91A0222

Int. Cl.[6] B65B *51/10*

U.S. Cl. 53—477 **7 Claims**

1. A method of laterally joining product wrappings, wherein each said product wrapping is a tubular product wrapping (2)



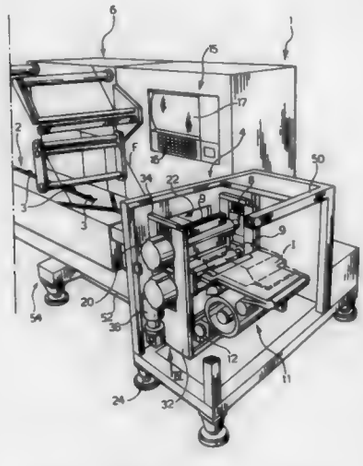
defined by a sheet (4) of wrapping material wrapped about a respective product (3) as said product is fed forward within a retaining element (7) of a wrapping conveyor (5), and wherein each said tubular product wrapping (2) comprises an overlapping lateral portion (11) defined by two opposite longitudinal portions (8, 9) of said sheet (4) of wrapping material being arranged one on top of the other, said method comprising the step of effecting a stable connection between said two portions (8, 9) of said sheet (4) of wrapping material along said overlapping lateral portion (11) as said tubular product wrapping (2) and said respective product (3) are unloaded from within said retaining element (7) of said wrapping conveyor (5) by a pusher (13) and an opposing counterpusher (14), said counterpusher (14) being heated to effect said stable connection.

5,467,580

AUTOMATIC PACKAGING MACHINE

Renzo Francioni, Prato Sesia, Italy, assignor to Cayanna S.p.A., Italy

Filed Apr. 8, 1994, Ser. No. 224,880
Claims priority, application Italy, Apr. 20, 1993, T093A0267
Int. Cl.[6] B65B *9/06;65/00*
U.S. Cl. 53—550 **19 Claims**



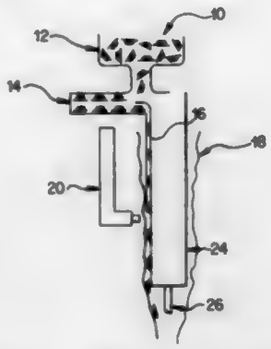
1. In an automatic packaging machine including at least two operative units which are configured and arranged to act in succession on articles to be packaged and advance in a direction in which said at least two units are aligned, the improvement comprising generally flat, load-bearing frame which extends transverse to said direction of alignment of said at least two units, said at least two operative units being mounted so as to be supported by said frame on respective opposite sides of said frame itself such that said frame constitutes a fulcrum for said at least two units.

5,467,581

APPARATUS AND PROCESS FOR POSITIONING A FITMENT

David B. Everette, Greenville, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Apr. 25, 1994, Ser. No. 232,561
Int. Cl.[6] B65B *61/18*
U.S. Cl. 53—133.2 **11 Claims**



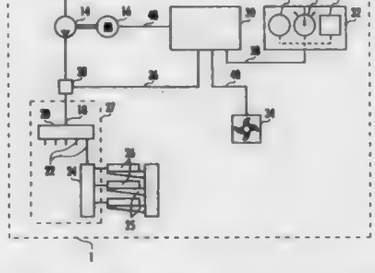
1. An apparatus for positioning and attaching a plurality of fitments to a film, comprising:
a) a means for guiding a plurality of fitments;
b) a means for attaching the fitments to the film;
c) means for advancing the attached fitments and film; and
d) a means for indexing the fitments driven by the film, the means for indexing the fitments comprising a counterweight having two projecting fingers thereon, the projecting fingers being spaced apart from each other at respective outer ends of each finger, said counterweight constructed such that when a first fitment has been attached to the film and advances past the means for indexing, the means for indexing rotates, and a second fitment is advanced into attaching position and said indexing means rotates back to its original position.

5,467,582

COTTON PICKER SPINDLE MOISTENING SYSTEM

Dale W. Panoushek, Orion, Ill., and Calvin J. Kraning, Valley City, N. Dak., assignors to Case Corporation, Racine, Wis.

Filed Jun. 10, 1994, Ser. No. 258,461
Int. Cl.[6] A01D *46/16*
U.S. Cl. 56—10.2 R **39 Claims**



1. A moistening system for an agricultural harvesting vehicle including a plurality of rotating harvesting implements, the moistening system comprising:
a fluid pump coupled to an electric motor and adapted to draw fluid from a reservoir and to deliver a flow of pressurized fluid to a fluid distribution circuit;
a plurality of moisture dispensers adapted to receive fluid from the fluid distribution circuit and to apply moisture to the implements;

a monitoring device coupled to the fluid distribution circuit and configured to generate a sensed pressure signal representative of the pressure of the fluid delivered to the fluid distribution circuit;

a command signal generator configured to generate a desired pressure signal representative of a desired pressure of the fluid delivered to the fluid distribution circuit; and

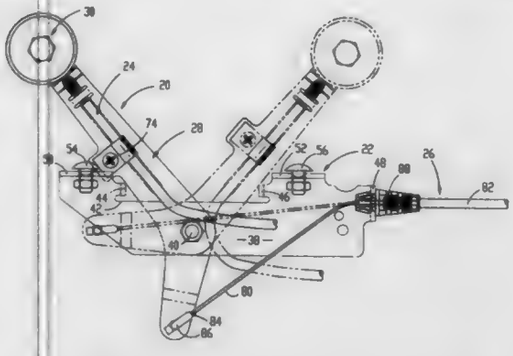
a control circuit coupled to the monitoring device, the command signal generator and the electric motor, and configured to generate a control signal derived from the desired pressure signal and the sensed pressure signal, and to apply the control signal to the electric motor to control the pressure of the fluid delivered by the pump.

5,467,583

DUAL ACTUATOR CONTROL ASSEMBLY AND METHOD OF DUAL ACTION CONTROL ASSEMBLY UTILIZATION

Anthony F. Beugelsdyk, and Michael A. Barnard, both of Wichita, Kans., assignors to Wescon Products Company, Wichita, Kans.

Filed Apr. 22, 1994, Ser. No. 231,166
Int. Cl.[6] A01D *69/00;75/20*
U.S. Cl. 56—10.8 **16 Claims**



14. A method of selectively and independently actuating first and second of cable-controllable mechanisms of an apparatus, said method comprising the steps of:

providing a lever and a spool rotatably mounted to said lever,

shifting a spool rotatably mounted to said lever to cause responsive shifting of a first cable operatively interconnecting said spool and said first cable controllable mechanism;

shifting said lever to cause responsive shifting of a second cable operatively interconnecting said lever and said second cable-controllable mechanism.

5,467,584

LINE TRIMMER STABILIZER

George K. Boyles, P.O. Box 311, Mill Springs, N.C. 28756

Filed Jul. 27, 1993, Ser. No. 97,537
Int. Cl.[6] A01G *3/06*
U.S. Cl. 56—12.7 **19 Claims**

16. A stabilized monofilament line trimmer, comprising:

a line trimmer having a cutting head attached upon a handle shaft;

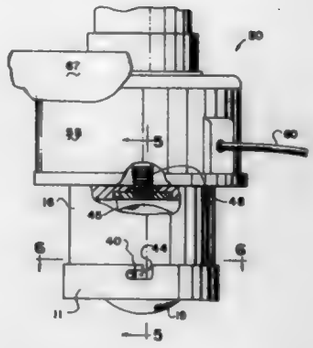
a stabilizer assembly mounted directly upon said cutting head for rotation therewith during operation; and

said stabilizer assembly further comprising:

a ball housing;

a substantially spherical ball retained within said ball housing for rotation therewithin; and,

a portion of said ball protruding from a bottom end of said housing for contact with the ground's surface.

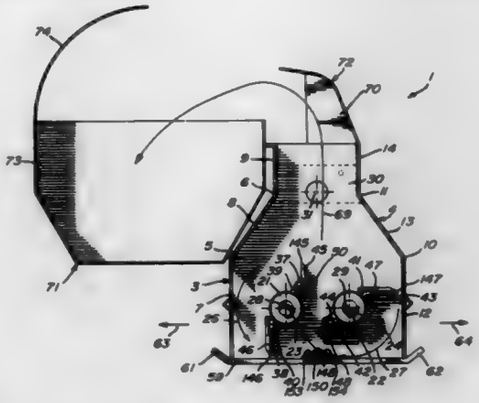


5,467,585

BRUSHWOOD CLEARING MACHINE CAPABLE OF CUTTING AND RECUPERATING THE CUT BRUSHWOOD MATERIAL

Maurice Gagnon, 159 Rang St-Joseph, St-Fulgence, Québec, Canada

Filed Jul. 7, 1994, Ser. No. 271,653
Int. Cl.[6] A01D *49/00;* **A01G** *23/08*
U.S. Cl. 56—14.3 **18 Claims**



1. A brushwood clearing machine comprising:

a pair of first and second elongate, mutually adjacent rotary brushwood cutting units;

means for rotating said first and second cutting units about respective first and second axes both lying in a generally horizontal plane, said rotating means comprising means for rotating said first and second cutting units in respective opposite directions adequate to force the brushwood between said cutting units where said brushwood is cut and to throw the cut brushwood material generally upwardly; and

channel means having proximate opening means to receive the thrown brushwood material directly from said cutting units and distal opening means to discharge said cut brushwood material.

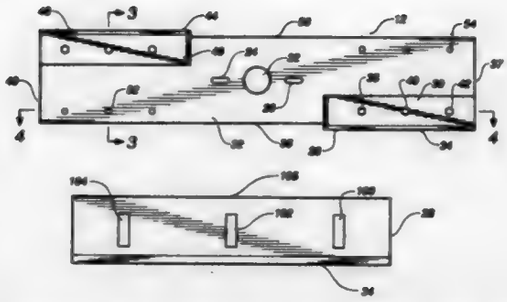
5,467,586

REPLACEABLE CUTTING BLADE FOR A LAWN MOWER BLADE

Chun S. Lin; Thomas Lin; Jefferson Lin, and Philip Lin, all of 11610 Inwood, Houston, Tex. 77077

Filed Sep. 6, 1994, Ser. No. 301,077
Int. Cl.[6] A01D *34/73*
U.S. Cl. 56—17.5 **18 Claims**

1. An improved lawn mower blade, the improvement comprising:



a cutting blade detachably affixed to a surface of the lawn mower blade and extending outwardly beyond a forward edge of the lawn mower blade, said cutting blade having a longitudinal dimension in parallel relationship to a longitudinal axis of the lawn mower blade, said cutting blade having a slot extending transverse to said longitudinal dimension; and

a cover plate affixed to said cutting blade on a surface of said cutting blade opposite the lawn mower blade, said cover plate in compressive contact with said surface of said cutting blade.

5,467,587

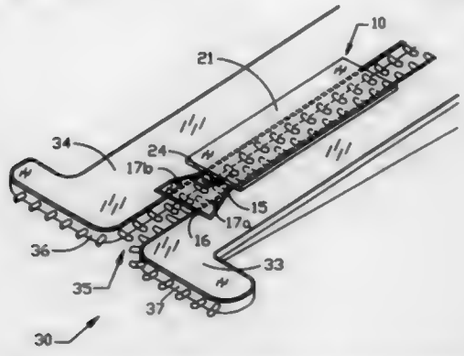
SUNFLOWER HARVESTING ATTACHMENT FOR CORN PICKER HEADS

Daniel L. Thompson, Rural Rte. 1, Box 35, and W. Dale Thompson, Rural Rte. 1, Box 30, both of Clifford, N. Dak.

Filed Oct. 21, 1994, Ser. No. 327,500

Int. Cl.[6] A01D *45/00*

U.S. Cl. 56—98 **11 Claims**



1. A sunflower harvesting attachment for corn picker heads comprising:

a blade; and

a blade mount having an elongated upper plate member, an elongated lower plate member, a spacer member fixedly attached to and separating said plate members, an eyelet member fixedly attached to an end of said blade mount and to which said blade is pivotally attached, said blade mount further having two longitudinal grooves defined by said plate members and said spacer member and extending in opposite sides of said blade mount, for detachably mounting said blade to two adjacent deck plates on a corn picker head.

5,467,588

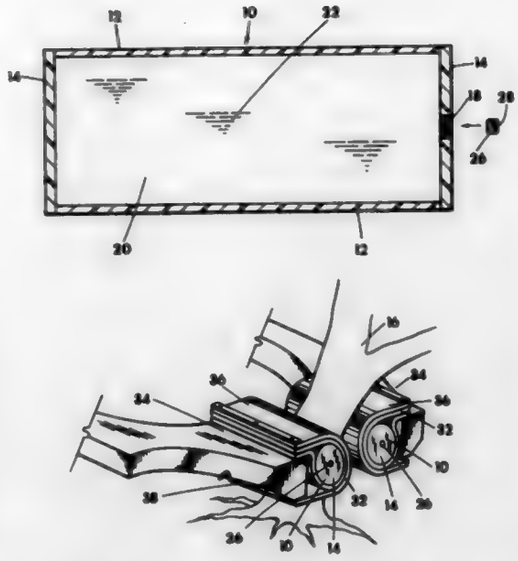
FLUID FILLED SHAKER PAD FOR A TREE SHAKING HARVESTER

Ira Compton, 2434 Dayton Rd., Chico, Calif. 95928

Filed Jan. 23, 1995, Ser. No. 377,098

Int. Cl.[6] A01D *46/26*

U.S. Cl. 56—340.1 **6 Claims**



5. A low heat generating shaker head assembly on an end of a shaker arm of a vibratory tree trunk shaking harvester for protecting tree bark layers and for transmitting vibration during tree shaking, said assembly comprising;

an elongated main pad lengthwise generally horizontally disposed on the shaker arm, said pad being of a length sufficient to span at least a small tree trunk diameter, said pad generally comprising an elongated annular main body wall having two oppositely disposed sealingly closed ends;

said annular main body wall defined of durable materials providing the body wall with flexibly resilient characteristics;

a sealed interior chamber within said pad;

a liquid within said chamber and filling at least 65 percent of the chamber;

liquid displacement allowing means cooperatively operable with said flexibly resilient characteristics of said annular main body wall and the end walls allowing for limited deformation of the liquid filled main pad when pressed against a tree during tree shaking;

attachment means retaining said main pad on the shaker arm;

slippage providing means for substantially preventing movement in said shaker arm from translating into tree injurious movement against a tree during tree shaking.

5,467,589

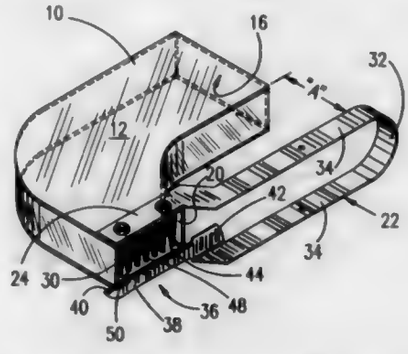
VEGETABLE HARVESTING SYSTEM

Victor S. Lambert, 702 St. John St., Boqalusa, La. 70427

Filed Aug. 23, 1993, Ser. No. 110,578

Int. Cl.[6] A01D *46/22*

U.S. Cl. 56—327.1 **23 Claims**



2. A vegetable harvesting device for harvesting a harvest portion from a plant having a harvest portion supported at the end of a stem, such as okra and the like, said device comprising:

a conduit member including a passageway having receiving and discharge ports therein; said passageway being adapted to allow passage therethrough of a desired harvest portion and to receive a portion of the stem adjacent the harvest portion; the perimeter of said receiving port being defined by a peripheral lip located at a surface of said conduit member having at least a functional portion lying within a plane;

severing means, in operational connection with said functional portion of said peripheral lip and selectively responsive to an operator, for harvesting the harvest portion by severing the stem while a section of the stem is received within said passageway of said conduit member; and

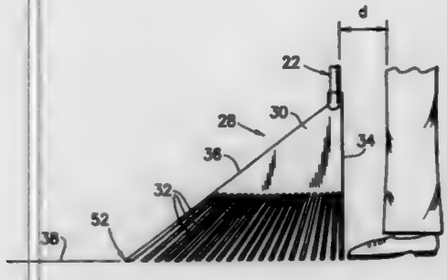
flexible barrier means, disposed within said receiving port an operational distance from said peripheral lip, for allowing entrance of the harvest portion into said passageway when said harvest portion is supported by the stem and for preventing the harvest portion from exiting said passageway under the force of gravity through said receiving port after the harvest portion has been harvested from the plant by severing the stem, said barrier means being operationally deflectable by a harvest portion supported on a stem, and wherein said barrier member is not operationally deflectable by the weight of a harvest portion.

5,467,590

RAKING TOOL

Albert E. Mencarelli, 1050 E. Lake Rd., Oakdale, Conn. 06370, and Richard A. Mencarelli, 11 High St., Groton, Conn. 06340

Filed Sep. 16, 1994, Ser. No. 307,302
Int. Cl.[6] A01D *7/06*
U.S. Cl. 56—400.17 **5 Claims**



1. A raking tool comprising:

an elongated handle having a longitudinal axis and extending between a proximal end and a distal end;

a rake head mounted to said distal end of said handle, said rake head including:

a support plate; and

a plurality of integral tines extending from said support plate to extremities in mutually diverging directions between first and second edges laterally disposed relative to said longitudinal axis, said rake head being asymmetrically disposed relative to said handle, said first edge being substantially aligned with said longitudinal axis, said second edge being angularly disposed with respect to said longitudinal axis, an imaginary line joining said extremities being substantially perpendicular to said first edge;

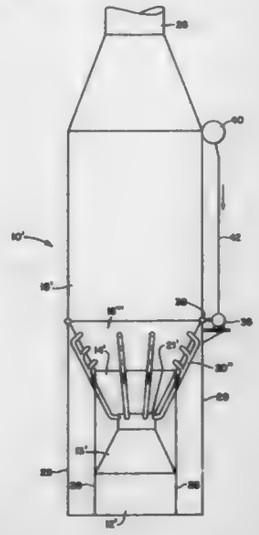
thereby enabling a user holding said raking tool such that said first edge is nearest the person of the user to draw said raking tool proximate his/her body and generally parallel thereto.

5,467,591

GAS TURBINE COMBINED CYCLE SYSTEM

Carl R. Bozzuto, Enfield, Conn.; Joseph D. Bianca, Feeding Hills, Mass., and Walter F. Siddall, Suffield, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 30, 1993, Ser. No. 175,972
Int. Cl.[6] F02C *6/18;7/00*
U.S. Cl. 60—39.02 **16 Claims**



1. A gas turbine combined cycle system, comprising:

a gas turbine which emits an exhaust gas,

a steam generator for receiving the exhaust gas,

a diffuser duct between the gas turbine and steam generator for reducing the flow velocity of the exhaust gas prior to entry into the steam generator, the diffuser duct having a diverging portion including a wall with an inner wall surface,

boundary layer suction means for removing gas from along the inner wall surface of the diffuser duct in order to minimize the overall pressure drop in the diffuser duct, and

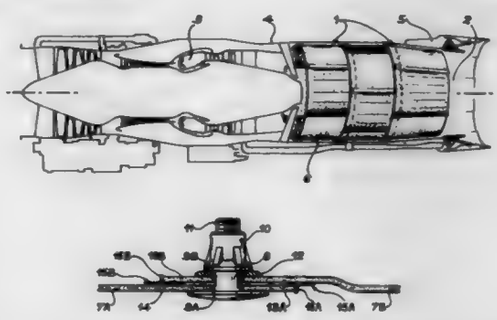
means for reinserting into the system at least a portion of the removed gas.

5,467,592

SECTORIZED TUBULAR STRUCTURE SUBJECT TO IMPLOSION

Ollivier Carletti, Vaux le Penil, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "Snecma", Paris, France

Filed Jun. 29, 1994, Ser. No. 267,541
Claims priority, application France, Jun. 30, 1993, 93 07954
Int. Cl.[6] F02K *3/10*
U.S. Cl. 60—261 **7 Claims**



1. A sectorized tubular structure subject to implosion which comprises:

a plurality of annular composite sectors overlapped with respect to one another and forming at least one tubular portion,

a plurality of linking elements fixing the annular sectors together, wherein the linking elements comprise metallic plates including at least one central portion and at least two ends perpendicular to the central portion and parallel to each other with one annular sector resting on each of said ends wherein the ends of said linking elements comprise projections forming the central portion and include a convex surfaced stop which engages one of the annular sectors wherein each of said annular sectors substantially overlap the linking element on one face of the linking element.

5,467,593

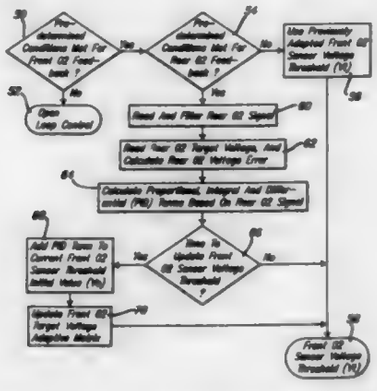
METHOD OF ELECTRONIC FUEL INJECTION FEEDBACK CONTROL

Michael T. Vincent, Novi; Terry R. Gutermuth, St. Clair Shores; Robert E. Lawrie, Whitmore Lake; Richard K. Moote, Ann Arbor; Mark A. Simonich, Highland, and James R. Tamm, Ann Arbor, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 4, 1994, Ser. No. 238,095

Int. Cl.[6] F01N *3/20*

U.S. Cl. 60—274 **19 Claims**



1. A method of feedback control for an electronic fuel injection system in an internal combustion engine, said method comprising the steps of:

calculating a front O_2 sensor switching voltage threshold based on a signal from a front O_2 sensor upstream of a catalyst in an exhaust system for the engine and from a rear O_2 sensor downstream of the catalyst;

comparing a voltage output of the front O_2 sensor to the calculated front O_2 sensor switching voltage threshold to determine if a fuel/air ratio of the engine is rich or lean; and

decreasing or increasing an amount of fuel to the engine by fuel injectors of the electronic fuel injection system if the fuel/air ratio is determined rich or lean, respectively.

5,467,594

EXHAUST GAS-PURIFYING SYSTEM FOR INTERNAL COMBUSTION ENGINES

Takuya Aoki; Yuichi Shimasaki; Seiji Matsumoto; Seiji Hatcho; Toshikazu Oketani; Yukio Miyashita; Akihisa Saito; Takashi Komatsuda, and Hiroaki Kato, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

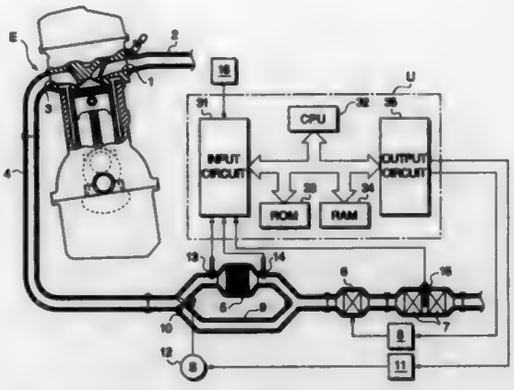
Filed Jul. 26, 1994, Ser. No. 280,559

Claims priority, application Japan, Jul. 27, 1993, 5-185256

Int. Cl.[6] F01N *3/28*

U.S. Cl. 60—276 **10 Claims**

1. An exhaust gas-purifying system for an internal combustion engine having an exhaust passage, comprising:



unburnt gas component-adsorbing means arranged in said exhaust passage of said engine, for adsorbing unburnt gas components present in exhaust gases emitted from said engine;

at least one exhaust gas-purifying catalyzer arranged in said exhaust passage at a location downstream of said unburnt gas component-absorbing means, for purifying exhaust gases;

a bypass passage bypassing said unburnt gas component-absorbing means, said bypass passage having an upstream end thereof connected to said exhaust passage to form a branchpoint together therewith;

a changeover valve arranged in said exhaust passage at said branchpoint, for selecting a first flow path in which exhaust gases are guided to said unburnt gas component-adsorbing means, or a second flow path in which exhaust gases are guided through said bypass passage;

first exhaust gas concentration sensor means arranged in said exhaust passage at a location upstream of said unburnt gas component-adsorbing means;

second exhaust gas concentration sensor means arranged in said exhaust passage at a location downstream of said unburnt gas component-adsorbing means; and

control means for controlling said changeover valve to select said first flow path or said second flow path, based on outputs from said first and second exhaust gas concentration sensor means.

5,467,595

VALVE MEANS

Wilfred W. Smith, Coventry, Great Britain, assignor to Dunlop Limited, United Kingdom

PCT No. PCT/GB92/01688, § 371 Date Mar. 11, 1994, § 102(e) Date Mar. 11, 1994, PCT Pub. No. WO93/05972, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 14, 1992, Ser. No. 196,210

Claims priority, application United Kingdom, Sep. 13, 1991, 9119544

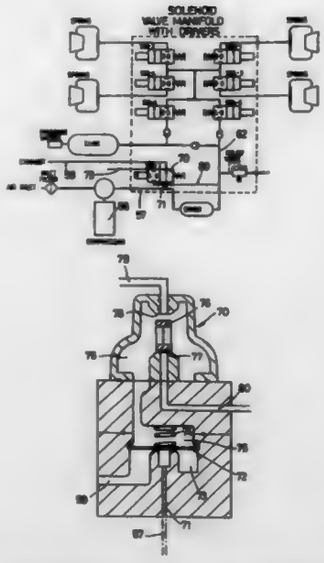
Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—410 **12 Claims**

1. Valve means for a vehicle gas suspension system, said valve means comprising a central chamber to which pressurized gas may be admitted and from which pressurized gas may be exhausted,

gas communication paths for extending from said central chamber each to communicate with a respective gas suspension unit, and interposed in each gas communication path a valve unit operable to lie either in a closed condition in which an associated gas spring is isolated from the central chamber or to lie in an open position in which the gas spring communicates with said central chamber, the central chamber and the valve units being formed integrally as part of a valve manifold assembly,

a first common flow passage from an exhaust valve to a drier which serves in part also as a supply passage for flow of gas from the drier to a reservoir,



a second common flow passage which extends from the drier to a compressor means for supplying pressurized gas,

an exhaust passage extending from said second common flow passage and incorporating a second exhaust valve arranged to allow exhausting of air which has passed through the drier from the central chamber,

said second exhaust valve being a solenoid operated pilot type valve arranged to close a pilot exhaust line upon increase of pressure in the first common flow passage and to close a said exhaust passage which extends from the second common flow passage.

5,467,596

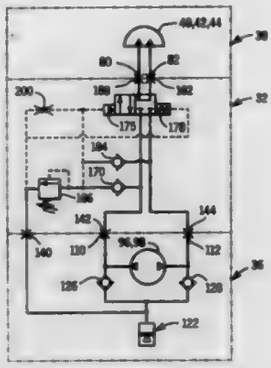
UNITARY ELECTRO-HYDRAULIC ROTARY ACTUATOR FOR AUTOMOTIVE CONVERTIBLE TOP

Xudong Yu, Brookfield, Wis., assignor to Applied Power Inc., Butler, Wis.

Filed Nov. 9, 1994, Ser. No. 336,435

Int. Cl.[6] F16D *31/02;* **F15B** *11/08;13/04;* **B60J** *7/00*

U.S. Cl. 60—415 **13 Claims**



1. In a hydro-electric rotary actuator of the type having a rotary vane actuator having a pair of ports, one of said ports communicating with one side of a vane of said actuator and the other port communicating with an opposite side of said vane, a pump for supplying hydraulic fluid under pressure, an electric motor for operating said pump and a hydraulic circuit for directing fluid between said pump and said ports, said hydraulic circuit including a control valve having a normal position in which said ports are placed in communication with one another and an actuated position in which one of said ports is placed in communication with a pressure supply line and the other port is placed in communication with a fluid return line, the improvement wherein:

said control valve has a hydraulic pilot pressure port for shifting said valve from said normal position to said actuated position when pressure is applied to said port; and

an orifice communicates said pilot pressure port to a pressure relief line such that after said electric motor is stopped, a pressure in said pilot pressure port persists for a period of time so that said control valve delays shifting from said actuated position to said normal position.

5,467,597

HYDROMECHANICAL TRANSMISSION

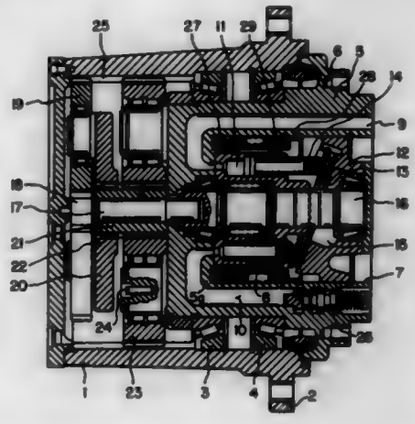
Franz Forster, Karlstadt-Muhlbach, Germany, assignor to Linde Aktiengesellschaft, Germany

Filed Feb. 26, 1993, Ser. No. 23,929

Claims priority, application Germany, Feb. 27, 1992, 42 06 102.4

Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—442 **14 Claims**



1. A hydromechanical transmission including a hydrostatic axial piston motor having a swash plate, a cylindrical drum, work cylinders located in said cylindrical drum and a driven shaft, at least a single-stage planetary gear axially adjacent to and coaxial with said piston motor, said planetary gear having a rotary hub radially surrounding said planetary gear and said axial piston motor, said rotary hub having an annular inner surface and a ring gear located at said annular inner surface of said rotary hub, a stationary hub support member, said stationary hub support member having an axial cavity formed therein to receive said axial piston motor and said axial piston motor mounted within said cavity coaxial with said rotary hub, said cavity having an end wall forming a control surface for said axial piston motor, a plurality of pressure medium channels formed in said stationary hub support, each of said pressure medium channels having an inlet end and an outlet end, said outlet ends opening on said control surface for connection with said work cylinders in said cylindrical drum.

5,467,598

DISPLACEMENT OVERRIDE/BRAKE CONTROL CIRCUIT

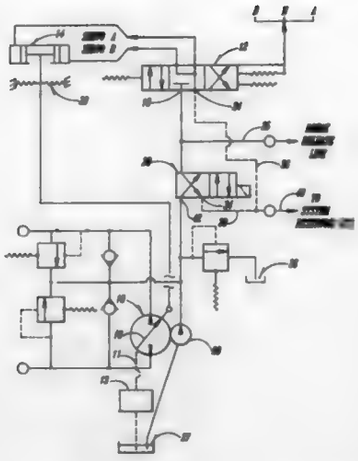
William L. Welscher, Ankeny, Iowa, assignor to Sauer Inc., Ames, Iowa

Filed Nov. 16, 1992, Ser. No. 976,952

Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—436 **9 Claims**

1. In a wheeled vehicle propelled by a hydrostatic transmission, having a variable displacement pump fluidly connected to a motor



in a closed circuit for propulsion and a hydraulically-released brake for stopping the vehicle, a return to neutral and brake release circuit comprising:

a system reservoir for holding fluid;

a charge pump for drawing fluid from said reservoir and providing pressurized flow of same;

a hydraulically-released brake operatively attached to the wheels of said vehicle and said charge pump;

a displacement varying means operatively connected to said variable displacement pump;

a control means for providing differential pressure command signals to said displacement varying means, said control means having a porting means, two outlet servo ports, an inlet supply port and a drain port;

a valve means for interrupting the flow of fluid to said brake and control means to stop said vehicle, said valve means having an outlet port fluidly connected to said brake and said control means at said inlet supply port, a supply port fluidly connected with said charge pump, and a drain port;

said displacement varying means connected to said variable displacement pump and said control means and responsive to differential pressure commands from said outlet servo ports;

a first drain passage fluidly connecting the drain port of said control means directly to said system reservoir;

a second drain passage hydraulically parallel to said first drain passage and fluidly connecting said valve means drain port with said system reservoir; and

whereby when the valve means interrupts the flow of fluid from said charge pump to said brake, control means, and displacement varying means, residual fluid from said control means and displacement varying means in one branch and from said brakes in the other branch is drained by said hydraulically parallel passages to said system reservoir, immediately engaging said brake and returning said variable displacement pump to neutral, thereby stopping said vehicle quickly.

5,467,599

METHOD FOR REDUCING SEAL STICTION IN A FLUID CYLINDER

Richard N. Fargo, Plainville, and William A. Wurts, Wethersfield, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Dec. 23, 1992, Ser. No. 996,346

Int. Cl.[6] F16D *31/02*

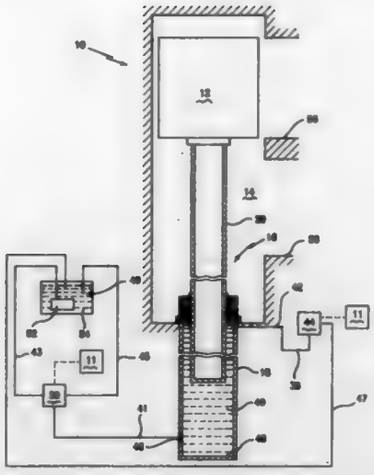
U.S. Cl. 60—478 **10 Claims**

1. A method for reducing seal stiction in a fluid cylinder, comprising the steps of:

providing a fluid cylinder, having

a piston, displaceably mounted in a housing;

a first and second seal, in register with said piston;



a first pressure chamber between said seals, having a pressure P1;

a second pressure chamber, separated from said first pressure chamber by said second seal, having a pressure P2, wherein said second seal is normally applied against said piston to maintain P2 in said second pressure chamber, and

said first seal is normally relaxed;

applying said first seal against said piston and relaxing said second seal prior to displacement of said piston; and

axially displacing said piston before said first seal is applied against said piston sufficiently to create significant stiction between said first seal and said piston.

5,467,600

NATURALLY CIRCULATED THERMAL CYCLING SYSTEM WITH ENVIRONMENTALLY POWERED ENGINE

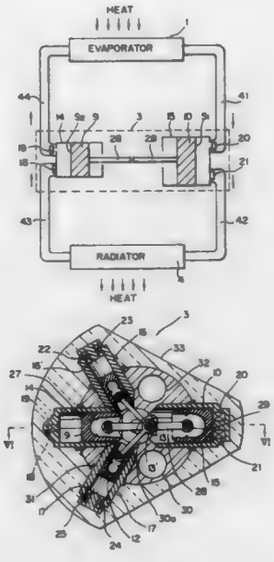
Kazuo Kuroiwa, 8-18-16, Shirane, Asahi-ku, Yokohama-shi, Kanagawa, Japan

Filed Dec. 16, 1992, Ser. No. 991,099

Claims priority, application Japan, Dec. 26, 1991, 3-361304

Int. Cl.[6] F02G *1/04*

U.S. Cl. 62—6 **25 Claims**



1. A system for thermally cycling a compressible fluid medium contained in the system, comprising:

an evaporator for evaporating and heating the fluid medium in the system to a first temperature and a first pressure;

a radiator coupled to the evaporator for radiating the heat of the fluid medium in the system to a second temperature lower than the, first temperature and a second pressure lower than the first pressure;

at least three actuating cylinders coupled to the evaporator and the radiator each having an inlet valve and an outlet valve in an end thereof;

an actuating piston disposed in each of the actuating cylinders having a pressure receiving surface S_1;

at least one pressurizing cylinder coupled to the evaporator and the radiator having an inlet valve and an outlet valve in an end thereof;

a pressurizing piston disposed in said pressurizing cylinder having a pressure receiving surface S_2, wherein S_2 has a smaller cross sectional area than S_1 such that the total volume of the at least three actuating cylinders is greater than the total volume of the at least one pressurizing cylinder,

rotatable body means operatively coupled to the at least three actuating pistons and the at least one pressurizing piston;

a first inlet pipe having one end connected to the evaporator and another end connected to each of the at least three actuating cylinders;

a first outlet pipe having one end connected to each of the at least three actuating cylinders and another end connected to the radiator;

a second inlet pipe having one end connected to the radiator and another end connected to the at least one pressurizing cylinder;

a second outlet pipe having one end connected to the at least one pressurizing cylinder and another end connected to the radiator; and

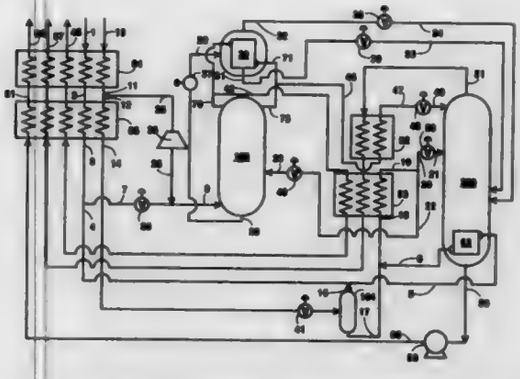
a flow control valve arranged on the first inlet pipe, wherein at least one of the actuating cylinder inlet valves is open when the flow control valve is open.

5,467,601

AIR BOILING CRYOGENIC RECTIFICATION SYSTEM WITH LOWER POWER REQUIREMENTS

Gerald A. Paolino, Lancaster; Raymond F. Drnevich, Clarence Center, and Neil M. Prosser, East Amherst, all of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed May 10, 1994, Ser. No. 240,423
Int. Cl.[6] F25J 3/02
U.S. Cl. 62—38 **9 Claims**



1. In a cryogenic air separation process employing a higher pressure column and a lower pressure column wherein feed air is employed to boil the bottom liquid of the lower pressure column and is thereafter passed into the higher pressure column and wherein liquid oxygen is produced in the lower pressure column, the improvement comprising:

(A) turboexpanding a second portion of feed air to generate refrigeration and passing turboexpanded second feed air into the higher pressure column;

(B) withdrawing liquid oxygen from the lower pressure column and increasing the pressure of the withdrawn liquid oxygen;

(C) vaporizing the pressurized liquid oxygen by indirect heat exchange with a third feed air portion which is at a pressure higher than that of the feed air employed to boil the bottom liquid of the lower pressure column, and also with feed air which is subsequently employed to boil the bottom liquid of the lower pressure column, resulting in the production of oxygen gas;

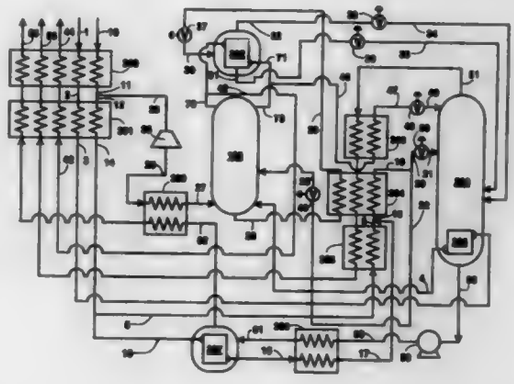
(D) recovering resulting oxygen gas as elevated pressure oxygen gas product.

5,467,602

AIR BOILING CRYOGENIC RECTIFICATION SYSTEM FOR PRODUCING ELEVATED PRESSURE OXYGEN

Gerald A. Paolino, Lancaster, and Raymond F. Drnevich, Clarence Center, both of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed May 10, 1994, Ser. No. 240,424
Int. Cl.[6] F25J 3/04
U.S. Cl. 62—38 **7 Claims**



1. In a cryogenic air separation process employing a higher pressure column and a lower pressure column wherein feed air is employed to boil the bottom liquid of the lower pressure column and is thereafter passed into the higher pressure column and wherein liquid oxygen is produced in the lower pressure column, the improvement comprising:

(A) turboexpanding a second portion of feed air to generate refrigeration and passing turboexpanded second feed air into the higher pressure column;

(B) withdrawing liquid oxygen from the lower pressure column and increasing the pressure of the withdrawn liquid oxygen;

(C) vaporizing the pressurized liquid oxygen by indirect heat exchange with a third feed air portion which is at a pressure higher than that of the feed air employed to boil the bottom liquid of the lower pressure column, resulting in the production of oxygen gas and liquid feed air;

(D) passing resulting liquid feed air into both the higher pressure column and the lower pressure column; and

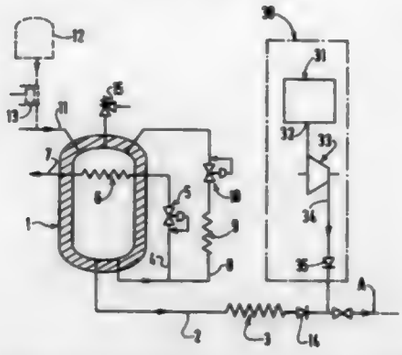
(E) recovering resulting oxygen gas as elevated pressure oxygen gas product having an oxygen concentration within the range of from 70 to 85 mole percent.

5,467,603

HIGH-PRESSURE GAS SUPPLY INSTALLATION

Jean-Yves Lehman, Maisons Alfort, and Charles Mirigay, Saint Maur des Fossés, both of, France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude, Paris, France

Filed Jul. 6, 1994, Ser. No. 272,384
Claims priority, application France, Jul. 8, 1993, 93 08394
Int. Cl.[6] F17C 7/04
U.S. Cl. 62—50.2 6 Claims



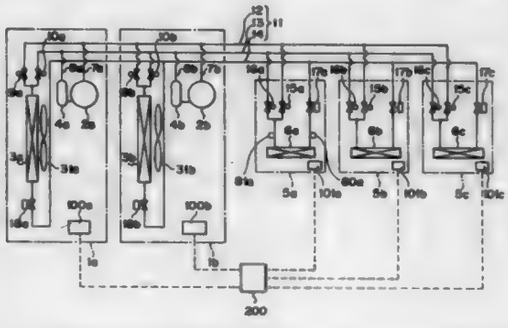
1. An installation for supplying a gas under high pressure to at least one user station, comprising an insulated tank for storing the gas in at least partially liquid form at a pressure greater than 10×10^5 Pa, having an upper part and a lower part, at least one supply line comprising an evaporator and extending between the lower part of the tank and the user station, a first fluid circuit extending between the lower part of the tank and an outer circuit portion comprising, serially arranged, an ON/OFF valve, and a first heat exchanger in heat exchange relationship with the fluid within the tank to thereby keep the tank cold.

5,467,604

MULTIROOM AIR CONDITIONER AND DRIVING METHOD THEREFOR

Kunie Sekigami, Oota; Kouji Nagae, and Makoto Shimotani, both of Ootzumimachi, all of, Japan, assignors to Sanyo Electric Co., Ltd., Oosaka, Japan

Filed Feb. 14, 1995, Ser. No. 388,565
Claims priority, application Japan, Feb. 18, 1994, 6-045171
Int. Cl.[6] F25B 7/00
U.S. Cl. 62—117 8 Claims



1. A multiroom air conditioner in which each individual indoor side unit independently and selectively performs a room cooling operation or a room heating operation for an individual room, comprising

plural outdoor side units each containing a compressor, an outdoor fan, an outdoor heat exchanger and a refrigerant path change-over valve;

plural indoor side units each containing an indoor heat exchanger;

an inter-unit pipe comprising a high-pressure gas pipe, a low-pressure gas pipe and a liquid pipe through which said plural outdoor side units are connected to said indoor side units to thereby form a refrigerant cycle; and

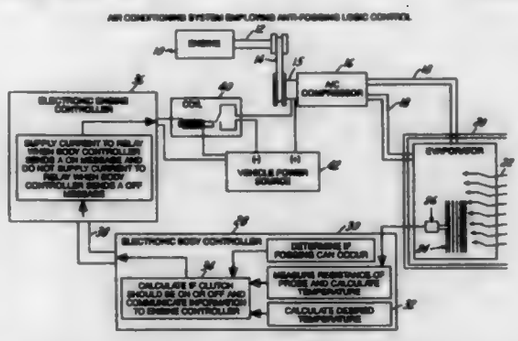
a controller for individually controlling each of said compressor, said outdoor fan, said outdoor heat exchanger and said refrigerant path change-over valve.

5,467,605

SYSTEM FOR PREVENTING FOGGING IN CLIMATE CONTROL SYSTEM

Robert P. Hennessee, Rochester Hills; Gary B. Flaishans, Clarkston; Robert G. Rudzewicz, Sterling Heights, and David A. Barwin, Troy, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 159,139, Nov. 22, 1993, abandoned.
This application Apr. 26, 1995, Ser. No. 432,456
Int. Cl.[6] F25D 21/04
U.S. Cl. 62—133 8 Claims



1. A method of controlling fogging in an air conditioning system of the type employing an evaporator and a pump driven by a prime mover, said pump circulating refrigerant through the evaporator, including the steps of:

A) determining if conditions for fogging exist,

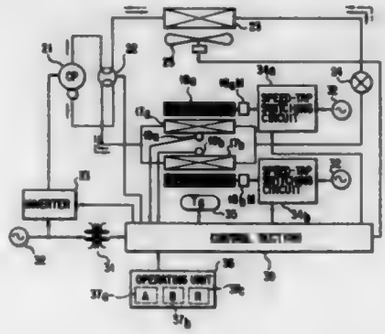
B) in response to an affirmative determination in step A. lowering the temperature of the evaporator at a controlled rate.

5,467,606

AIR CONDITIONING APPARATUS CAPABLE OF OPERATING IN COOLING MODE AND HEATING MODE

Masahiko Sasaki; Yasutoshi Tuchiya, and Hidetoshi Fukunaga, all of Fuji, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 28, 1993, Ser. No. 142,143
Claims priority, application Japan, Jan. 28, 1992, 4-290043; Jan. 28, 1992, 4-290287
Int. Cl.[6] F25B 13/00; F24B 1/06
U.S. Cl. 62—160 13 Claims



1. An air conditioning apparatus capable of operating in cooling mode and heating mode, comprising:

a first indoor heat exchanger for cooling and heating indoor air;

a second indoor heat exchanger for cooling and heating the indoor air;

a first indoor fan for drawing the indoor air and and supplying the indoor air via said first heat exchanger back into the room in a first direction;

a second indoor fan for drawing the indoor air and supplying the indoor air via said second heat exchanger back into the room in a second direction;

a first temperature sensor for detecting the temperature of said first heat exchanger;

a second temperature sensor for detecting the temperature of said second heat exchanger;

selection means for selecting the higher or lower of the temperatures detected by said first and second temperature sensors, in accordance with the mode in which the apparatus is operating; and

control means for controlling said first and second indoor fans in accordance with the temperature selected by said selection means.

5,467,607

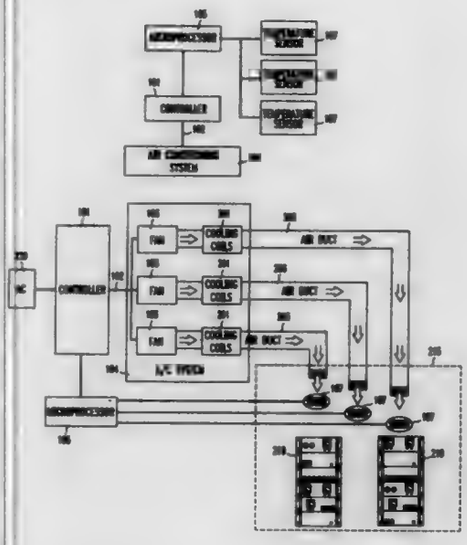
AIR CONDITIONING CONTROL SYSTEM

William J. Harvey, Hoboken, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Feb. 22, 1994, Ser. No. 199,045

Int. Cl.[6] F28F *7/00*

U.S. Cl. 62—186 **8 Claims**



1. A control system for reducing the effects of thermal shock on electrical components located in an area cooled by an air conditioning system, said control system comprising

a sensor for monitoring rate of temperature change R in said area in which said electrical components are located;

means for controlling the output of said air conditioning system;

means for coupling an output from said sensor to said controlling means to control said rate of temperature change R experienced by said electrical components, so that R does not exceed a predetermined maximum value consistent with eliminating thermal shock to said electrical components, and

means for activating said controlling means only after restoration of power to said air conditioning system following a power outage.

5,467,608

APPARATUS FOR COLLECTING A VOLATILE CONDENSATE AND FOR SEPARATING NON-CONDENSIBLE GAS THEREFROM

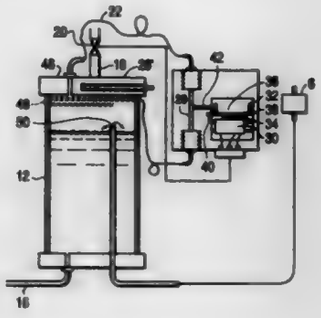
Louis B. Cording, Sønderborg; Hans B. Knudsen, Kolding, and Asger Gramkow, Augustenborg, all of, Denmark, assignors to A'Gramkow A/S, Sonderborg, Denmark

Continuation of Ser. No. 970,920, Nov. 2, 1992, abandoned, which is a continuation of Ser. No. 762,009, Sep. 20, 1991, abandoned. This application Oct. 11, 1994, Ser. No. 321,468

Claims priority, application Denmark, Mar. 16, 1990, 684/90

Int. Cl.[6] F25B *43/04*

U.S. Cl. 62—195 **12 Claims**



1. An apparatus for purging volatile liquids and collecting the purged liquid in a collector tank, the apparatus comprising:

an inlet for receiving volatile liquid;

a condenser unit in a delivery connection with the collector tank;

a purging system arranged in an in-line connection between said inlet and said condenser unit and operable to deliver purged liquid in a gaseous phase to said condenser;

a gas blow-off valve mounted in a blow-off conduit connected with a top of the collector tank, said gas blow-off valve being controllable in dependence upon condensate vapor pressure in the collector tank to effect an intermittent blow-off of non-condensible gas separated from the condensate,

wherein the condenser unit is separately mounted from the collector tank,

the gas blow-off valve is controllable by means for at least one of measuring or indicating a differential pressure between the actual condensate vapor pressure of the condensed liquid and a total gas pressure in the collector tank,

said valve is adapted to be opened when a total pressure exceeds the condensate vapor pressure by a predetermined value,

said means for measuring the condensate vapor pressure comprises a temperature responsive measuring container for holding a confined partial volume of at least one of the condensate or a liquid having substantially the same temperature/gas pressure characteristics as said condensate, and

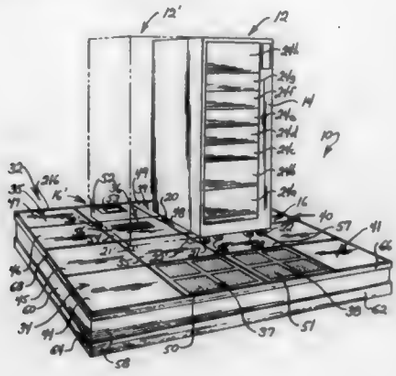
wherein said measuring container is mounted in a heat conducting connection with the top portion of the collector tank in such manner that said measuring container is operatively responsive to temperature changes in said top portion of the collector tank and therethrough only indirectly responsive to temperature changes of the infeed liquid to the collector tank.

5,467,609

MODULAR FLOOR SUB-STRUCTURE FOR THE OPERATIONAL SUPPORT OF COMPUTER SYSTEMS

Edward K. Feeney, Worthington, Ohio, assignor to Liebert Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 51,534, Apr. 23, 1993, Pat. No. 5,345,779. This application Mar. 3, 1994, Ser. No. 201,587
The portion of the term of this patent subsequent to Sep. 13, 2011, has been disclaimed.
Int. Cl.[6] F25D 17/06
U.S. Cl. 62—259.2 26 Claims



1. A floor supported substructure assemblage for a computer component having a given base peripheral configuration with a base region through which heat removing air may pass, said component having given operational heat generation and power consumption characteristics, comprising:

a plurality of floor modules, each having a lower portion supported upon said floor and having side portions with access openings, extending upwardly from said lower portion to support an elevated floor surface at a given floor height and defining a module chamber intermediate said lower portion and said elevated floor surface, said floor modules being arranged in a said assemblage of predetermined peripheral geometric shape including a linear side portion;

a said floor module having a said side portion forming said assemblage linear side portion, having a cooling coil mounted within said chamber thereof and having cooling fluid coupling components manually accessible through said access opening at said linear side portion, connectable with cooling fluid conduits, and said cooling coil being located within an input air path extending to an air intake;

the said elevated floor surface of a said floor module supporting said computer component and having an air outlet formed therein for providing air transfer communication with said base region;

a said floor module chamber retaining an air circulation blower having an input for receiving air from said input air path and an air flow output providing air cooled at said cooling coil to said air outlet;

a step assembly connected in adjacency with said assemblage at said linear side portion, having a step defining structure with a step surface located at a select height less than said floor module given floor height, said step defining structure being pivotally movable between a seated position supported by said floor and defining a step cavity and an open position providing manual access to said access opening at said linear side portion; and

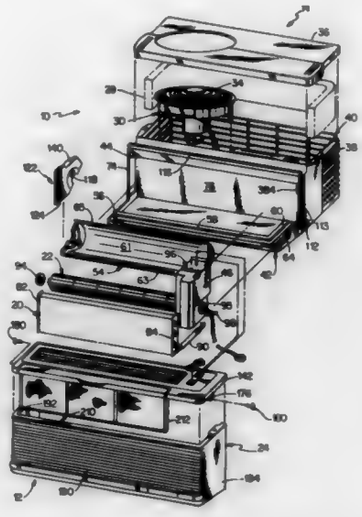
said cooling fluid conduits being located within said step cavity and coupled with said cooling coil at said cooling fluid coupling components.

5,467,610

LOW PROFILE ROOM AIR CONDITIONER INDOOR SECTION CONSTRUCTION

Theodore S. Bolton, Liverpool, and Stephen Stopyra, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 9, 1994, Ser. No. 208,176
Int. Cl.[6] F25D 23/08
U.S. Cl. 62—262 5 Claims



1. A window air conditioner unit of the type having a basepan which supports indoor and outdoor sections, with a generally vertically extending partition dividing the unit into said indoor and outdoor sections, said partition and the portion of said basepan supporting said indoor section being molded as a single component, with said basepan extending generally horizontally and said partition extending generally perpendicular thereto said partition having a horizontally extending rib formed at the upper end thereof;

said indoor section comprising an evaporator coil disposed in said basepan generally forward of said partition and extending across a major portion of said basepan;

a condensate pan mounted in said basepan under said evaporator coil along its entire length thereof and having an extension thereof extending substantially perpendicularly thereto across said basepan to said partition wall;

an evaporator fan scroll mounted in said basepan rearwardly of said condensate pan and evaporator coil and having a longitudinally extending front edge thereof engaging said condensate pan, said scroll having a distal longitudinal edge thereof engaging said partition, said scroll having one end thereof in engagement with said condensate pan extension;

a control box mounted in said indoor section including a lower end thereof overlying said condensate pan extension and an upper surface thereof having a portion thereof engaging said horizontally extending rib of said partition;

an indoor fan motor mounted within said control box having an axis of rotation extending parallel to said basepan and said partition and spaced from the interior surface of said scroll;

an indoor fan operatively engaged with said indoor fan motor and extending substantially the width of said scroll, said, scroll further comprising fan support structure at the end thereof spaced from said fan motor to thereby support said fan for rotation about said fan axis;

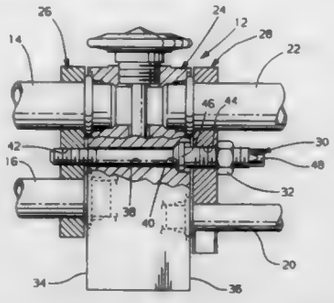
a fan support bracket adapted to matingly engage said fan support structure on said scroll to support said fan bearing, said bracket including an upper surface thereof having a portion adapted to engage said horizontally extending rib of said partition.

5,467,611

TWO PLATE TXV BLOCK CONNECTOR FOR AUTOMOTIVE A/C SYSTEM WITH COMMON BOLTS AND INDEPENDENTLY ATTACHABLE SIDES

Larry D. Cummings, Clarence, and Kurt R. Mittlefehldt, Amherst, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1994, Ser. No. 334,980
Int. Cl.[6] F25D *19/00*
U.S. Cl. 62—299 **3 Claims**



3. In an automotive air conditioning system, a connector for fluidly connecting a pair of evaporator lines to a pair of compressor lines, comprising,

a block having opposed, first and second side surfaces adapted to receive and fluidly connect said pairs of lines, said block also having at least one bolt passage therethrough generally perpendicular to said block surfaces with a stepped cylindrical shape including a conical shoulder proximate said second block side surfaces,

a first plate abutable with said block first side surface, said plate being fixed to said evaporator lines so as to hold them at the proper orientation to be received within said block, said first plate also having a threaded opening alignable with said bolt passage,

a second plate abutable with said block second side surface, said plate being fixed to said compressor lines so as to hold them at the proper orientation to be received within said block, said second plate also having a smooth opening alignable with said bolt passage,

a bolt receivable through said block with an intermediate conical flange abutable with said bolt passage shoulder and two threaded ends, a first threaded end matched to said first plate threaded opening and a second threaded end receivable freely through said second plate smooth opening, said bolt having sufficient end to end length to protrude from said block side surfaces when said bolt flange is abutted with said bolt passage, and,

a fastener threadable over said bolt second threaded end,

whereby said evaporator lines may be joined to said block by first threading said bolt first end into said first plate, thereby abutting said first plate with said block first side surface and drawing said conical bolt flange into said conical bolt passage shoulder to center said bolt, after which said compressor lines may be independently joined to said block, and thereby fluidly connected to said evaporator lines, by inserting said second plate opening over said bolt second threaded and threading said threaded fastener thereto, thereby abutting said second plate with said block second side surface.

5,467,612

FREEZING SYSTEM FOR FRANGIBLE FOOD PRODUCTS

Jim M. Venetucci, Forest Park, Ill., assignor to Liquid Carbonic Corporation, Oak Brook, Ill.

Filed Apr. 29, 1994, Ser. No. 235,386
Int. Cl.[6] F25D *17/02*
U.S. Cl. 62—374 **7 Claims**

1. Apparatus for freezing frangible foodstuffs comprising:

(a) a first freezing section which includes a solid conveyor belt which is guided by roller means to provide an upper product receiving section and a lower immersed section with the lower immersed section passing through a bath of cryogen to chill the surface of said belt and the upper section extending above the cryogen bath, said first freezing section including means to admit product onto said upper belt section and means to move said product to an exit end of said upper belt section prior to said product reaching said lower immersed section; and

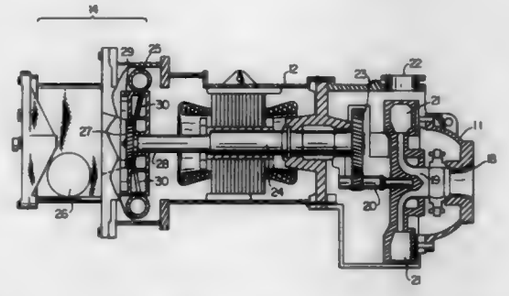
(b) a second freezing section which is a spiral mechanical or cryogenic freezer having an entry end and an exit end, said entry end of said freezing section being mated to said exit end of said first freezing section so as to receive product form said first freezing section which has a bottom frozen crust to cause product to traverse the spiral freezer substantially undamaged at the bottom surface thereof from the entry end to the exit end of the spiral freezer.

5,467,613

TWO PHASE FLOW TURBINE

Joost J. Brasz, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 5, 1994, Ser. No. 222,966
Int. Cl.[6] F25B *1/00;* **F01K** *25/00*
U.S. Cl. 62—402 **12 Claims**



1. Single fluid compression/expansion refrigeration apparatus which comprises a fill of a fluid refrigerant that exists in the apparatus as liquid and as vapor; a rotary compressor having an input shaft that is driven at a predetermined rotary speed, for compressing the vapor thereby adding compression energy to the refrigerant fluid; having an inlet to receive said fluid at a predetermined reduced pressure and an outlet from which the fluid is delivered at an elevated pressure; a drive motor having a drive shaft coupled to said input shaft to rotate the same; condenser means that exhausts heat from the condensed refrigerant to convert the compressed vapor to liquid; a turbine expander having an inlet supplied by said condenser means with said fluid at said elevated pressure as a combination of liquid and vapor for expanding the refrigerant fluid to said reduced pressure, including an output shaft coupled to said rotary compressor input shaft by a speed changing transmission, for recovering at least a part of the compression energy of the refrigerant fluid as it is being expanded and an outlet providing said refrigerant fluid at said reduced pressure; and evaporator means situated in circuit between the outlet of said

turbine expander and the inlet of said compressor and fed with said refrigerant fluid at said reduced pressure for evaporating the refrigerant liquid to vapor and absorbing heat, and returning the resulting vapor to said compressor inlet, said turbine expander being sized such that, at the relative speeds of the compressor and turbine expander, the capacity of the turbine expander is matched with the mass flow of liquid and vapor being delivered to said turbine expander inlet.

5,467,614

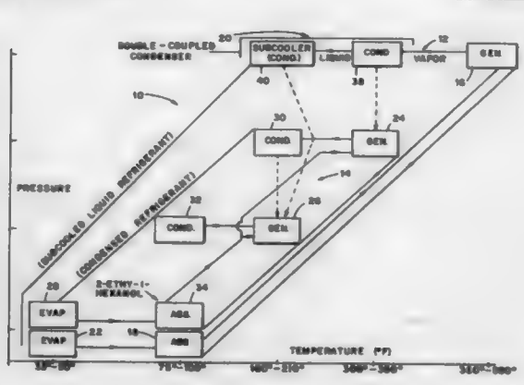
DUAL-CIRCUIT, MULTIPLE-EFFECT REFRIGERATION SYSTEM AND METHOD

Robert C. DeVault, Knoxville, Tenn., assignor to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Feb. 14, 1994, Ser. No. 194,901

Int. Cl.[6] F25B *7/00*

U.S. Cl. 62—476 **18 Claims**



1. A dual loop multiple-effect absorption refrigeration system having a double-condenser coupling comprising:

a first refrigeration loop defined by a double-effect absorption refriqeration loop comprising first and second generator means, first and second condensing means, first evaporating means, and first absorber means operatively coupled together for the circulation of a first refrigerant-containing solution therethrough and with the first and second condensing means adapted to respectively receive vaporous refrigerant from the first and second generator means for condensing the vaporous refrigerant;

a second refrigeration loop in combination with said first refriqeration loop and defined by a single-effect refriqeration loop comprising third generator means, third condensing means, second evaporating means and second absorber means operatively coupled together for the circulation of a second refrigerant-containing solution therethrough;

means for heating the second refrigerant-containing absorption solution in the third generator means to a first refrigerant-vaporizing temperature;

first heat exchange means coupled to the third condensing means and to the second generator means for heating the first refrigerant-containing solution in the second generator means to a second refrigerant-vaporizing temperature which is lower than said first temperature;

second heat exchange means coupled to the second condensing means and the first generator means for providing heat to the first refrigerant-containing solution in the first generator means; and

third heat exchange means coupled between the third condensing means and the first generator means and in heat exchange relationship with the first refrigerant-containing solution in said first generator means for combining heat from vaporous refrigerant from the second refrigerant-containing solution condensed in the third condensing means with said heat provided to the first refrigerant-containing solution in the first generator means by said second heat exchange means for heating the first refrigerant-containing solution in the first generator means to a third refrigerant-vaporizing temperature which is lower than said second temperature.

5,467,615

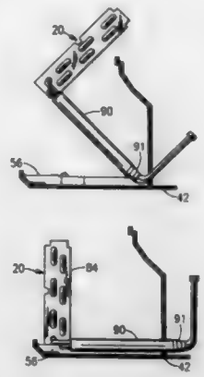
SEAL FOR REFRIGERANT TUBING THROUGH AIR CONDITIONER PARTITION

Theodore S. Bolton, Liverpool, and John H. Michaels, Baldwinsville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 9, 1994, Ser. No. 208,174

Int. Cl.[6] F25D *23/08;* **F16L** *5/00;* **F25B** *47/00*

U.S. Cl. 62—498 **3 Claims**



1. An air conditioning unit including a basepan which comprises:

an indoor section in communication with the space to be conditioned including an indoor heat exchanger and means for circulating air to be conditioned in heat exchange relation with the indoor heat exchanger;

an outdoor section in communication with ambient air and including an outdoor heat exchanger and a compressor;

a partition mounted to said basepan for dividing the air conditioning unit to separate said indoor section from said outdoor section, said partition further defining a partition opening;

at least two refrigerant carrying lines extending between said indoor section and said outdoor section through said partition opening; and

an elongated length of sealing material, said material circumferentially enclosing the portion of said at least two refrigerant carrying lines adapted to extend through said partition opening, the circumference of said elongated length of sealing material being greater than the circumference of said partition opening; and

tape means surrounding one end of said elongated length of sealing material for attaching said material to said refrigerant carrying lines on the side of said partition opening adjacent to the outside section and for creating a tapered transition having a circumference smaller than that of said elongated length of sealing material.

5,467,616

PROCESS FOR FORMING A YARN SECURING KNOT IN A FLAT KNITTING MACHINE

Rüdiger Loquet, Waasmunster, Belgium, and Ulrich Kimmich, Pliezhausen, Germany, assignors to H. Stroll GmbH & Co., Reutlingen, Germany

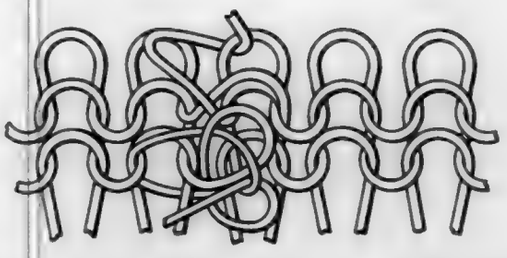
Filed Mar. 16, 1994, Ser. No. 214,366

Claims priority, application Germany, Mar. 16, 1993, 43 08 275.0; Sep. 4, 1993, 43 29 920.2

Int. Cl.[6] D04B *7/00;7/24*

U.S. Cl. 66—60 R **17 Claims**

1. Process for forming a yarn securing knot with a flat knitting machine comprising a first and second needle bed, each of said



needle beds being provided with a plurality of needles movable toward each other, and a carriage with cam parts for knitting, tucking and transferring devices, said process comprising the steps of:

a) looping one end portion of a new yarn strand (13,120) to be secured in a knit good at a knit good region edge of a knit good region with said needles of said first and second needle bed to form at least one loop (19,131) or stitch having legs in said first needle bed;

b) during successive carriage displacements, crossing over both of said legs of said at least one loop (19,131) or stitch formed in said first needle bed to form a crossed-over yarn portion associated with said at least one loop (19,131) or stitch; and

c) transferring said at least one loop or stitch (19,131) having said legs crossed over by said crossed-over yarn portion (18,135) to one of said needles of said second needle bed.

5,467,617

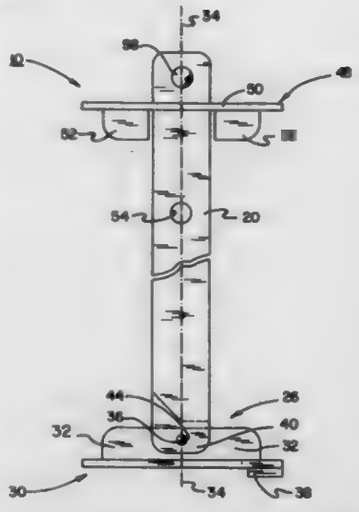
BOAT LOCKING APPARATUS

Jerold R. Huebner, 565 Roast Meat Hill Rd., Killingworth, Conn. 06419

Filed Aug. 11, 1994, Ser. No. 288,689

Int. Cl.[6] E05B *73/00*

U.S. Cl. 70—18 **4 Claims**



1. A boat locking apparatus for a boat having a centerboard slot which has a predetermined width and a predetermined height, comprising:

a lock-retaining assembly which includes a first end portion adapted for connecting with a flexible connector, which includes a mid-portion extending distally from said first end portion, and which includes a second end portion connected to said mid-portion, wherein a predetermined distance including said first end portion, said mid-portion, and said second end portion of said lock-retaining assembly is greater than the predetermined height of the centerboard slot, and wherein said lock-retaining assembly has a width which is less than the width of the centerboard slot, and

a transverse lock assembly connected to said second end portion of said lock-retaining assembly, said transverse lock assembly capable of being oriented in two selectable orientations, a non-locking orientation in which said transverse lock assembly is oriented such that said transverse lock assembly can be contained within the predetermined width of the centerboard slot and a locking orientation in which said transverse lock assembly cannot be contained with the predetermined width of the centerboard slot,

further including:

a lock plate mounted on said first end portion of said lock-retaining assembly, wherein said lock plate is capable of sliding up and down said first end portion and is capable of engaging a top portion of the centerboard slot,

wherein said lock plate includes:

a transverse portion which straddles said first end portion of said lock-retaining assembly, and

a descending portion which projects from said transverse portion and which is adapted to enter a top portion of the centerboard slot, and

wherein said first end portion of said lock-retaining assembly includes a receiving aperture.

5,467,618

MOTORCYCLE DISK BRAKE LOCK

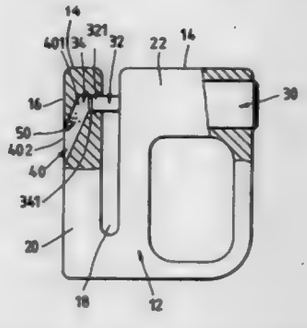
Jin-Ren Shieh, No. 178, Shih Chia Rd., Taichung, Taiwan, Prov. of China

Filed Dec. 10, 1993, Ser. No. 165,115

The portion of the term of this patent subsequent to Jan. 10, 2012, has been disclaimed.

Int. Cl.[6] B60R *25/00*

U.S. Cl. 70—33 **2 Claims**



1. An improved motorcycle disk brake lock comprising:

a lock body having a first side, a second side adjacent to said first side, and an open slot of a predetermined length and extending into said lock body such that said open slot is perpendicular to said first side, said lock body being divided by said open slot into a first portion and a second portion; and

a locking means disposed in said second portion and having a locking bolt extending outwards from a center thereof, with said locking bolt being located at a first position at such time when said locking means is in an unlocking state, said locking bolt capable of being caused to move from said first position to a second position so as to seal off an open end of said open slot and to pass through one of a plurality of heat radiating holes of a motorcycle disk brake received in said open slot;

wherein said first portion of said lock body is provided with a locking hole having an open end adjacent to said open slot and coaxial with said locking bolt and said locking hole; and wherein said first portion of said lock body is provided with at least one through hole having one end joining obliquely with said locking hole and having another end that is located in a side other than a side of said open slot,

wherein dust is pushed out of the locking hole by way of the through hole when said locking bolt is moved into said second position.

5,467,619

POST LATCHING SYSTEMS

Woodrow C. Stillwagon, Atlanta, Ga., and Donald Embry, Cloverport, Ky., assignors to Star Lock Systems, Inc., Hilliard, Ohio

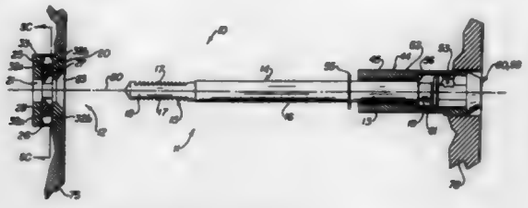
Continuation-in-part of Ser. No. 834,248, Feb. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 403,665, Sep. 6, 1989, Pat. No. 5,022,243, and a continuation-in-part of Ser. No. 11,196, Jan. 29, 1993, abandoned, which is a continuation of Ser. No. 698,917, May 13, 1991, Pat. No. 5,197,314, which is a continuation of Ser. No. 557,305, Jul. 23, 1990, Pat. No. 5,050,413, which is a continuation of Ser. No. 358,888, May 30, 1989, Pat. No. 5,027,630, which is a continuation-in-part of Ser. No. 327,250, Mar. 22, 1989, Pat. No. 4,900,182.

This application Aug. 13, 1993, Ser. No. 106,436

The portion of the term of this patent subsequent to Dec. 13, 2007, has been disclaimed.

Int. Cl.[6] E05B *67/36*

U.S. Cl. 70—34 **86 Claims**



1. A latching apparatus comprising:

a post member defining,

an elongated axis,

an elongated, axially extending latching surface defined by at least one outer radius from said elongated axis, and

an elongated, axially extending releasing surface defined by at least one inner radius from said elongated axis, wherein said outer radius is greater than said inner radius;

a latching assembly defining a passage for receiving said post member and including a grip means extending at least partially into said passage for,

effecting a grip between said post member and said latching assembly when said grip means cooperates with said latching surface, and

releasing said grip between said post member and said latching assembly when said grip means cooperates with said releasing surface; and

a moving means for,

moving said latching surface into cooperation with said grip means, whereby said grip is effected between said post member and said latching assembly, and

moving said releasing surface into cooperation with said grip means, whereby said grip is released between said post member and said latching assembly.

5,467,620

U-LOCK WITH STRENGTH ENHANCING HEADER EXTENSIONS

Richard H. Byrd, Jr., 949 Steiner St., San Francisco, Calif. 94117

Continuation of Ser. No. 942,578, Sep. 9, 1992, Pat. No. 5,333,476. This application Apr. 7, 1994, Ser. No. 224,162

The portion of the term of this patent subsequent to Aug. 2, 2011, has been disclaimed.

Int. Cl.[6] E05B *67/24*

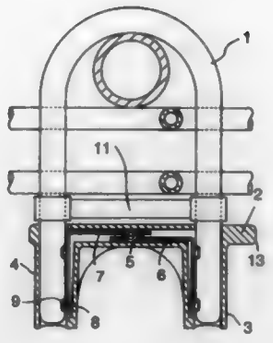
U.S. Cl. 70—38 A **15 Claims**

1. A locking apparatus for locking a first object to a second object, the apparatus comprising:

a. a U-shaped bar having two spaced apart, substantially straight and parallel arms with a space therebetween, the arms coupled together by a curved bow; and

b. a detachable header having a base and two extension arms, the base having a first dimension parallel to the substantially straight and parallel arms and the extension arms having a second dimension parallel to the first dimension, wherein the second dimension is at least twice the first dimension, each extension arm having an enclosed, hollow, circular cylinder for receiving one of the substantially straight and parallel arms, either in a first regular position with the base of the header at the end of the parallel arms and the extension arms positioned between the base of the header and the curved bow or in a second inverted position with the base of the header secured between the ends of the parallel arms and the curved bow and the extension arms positioned between the base of the header and the ends of the parallel arms

the header comprising a locking mechanism having a key receiving hole and two L-shaped bars for securing the header by locking to each of the substantially straight and parallel arms of the U-shaped bar.



5,467,621

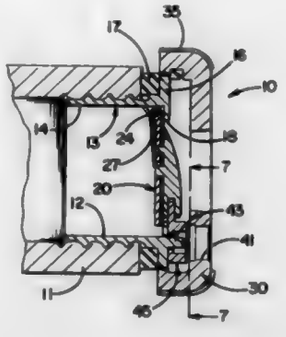
LOCKABLE CLOSURE FOR A FUEL TANK FILLER PIPE

Marc C. Gravino, Rockford, Ill., assignor to Trilby, Ltd., Rockford, Ill.

Filed Feb. 10, 1994, Ser. No. 194,499

Int. Cl.[6] B65D *41/04;55/14*

U.S. Cl. 70—171 **14 Claims**



1. A closure for the outer end portion of the filler pipe of a fuel tank adapted to be filled by a nozzle inserted into the filler pipe, said closure comprising a base having inner and outer end portions, the inner end portion of said base being adapted to be screwed onto and unscrewed from the filler pipe when the base is rotated in first and second directions, respectively, relative to the filler pipe, said base having a fill opening extending therethrough, a valve member mounted on said base and movable between open and closed positions relative to said fill opening, said valve member normally being in said closed position and being moved to said open position as an incident to insertion of said nozzle into said filler pipe via said fill opening, a cover rotatably supported on the outer end portion of said base and having a fill opening aligned with the fill opening in said base, said cover shielding said base against being manually gripped and rotated and normally being freely

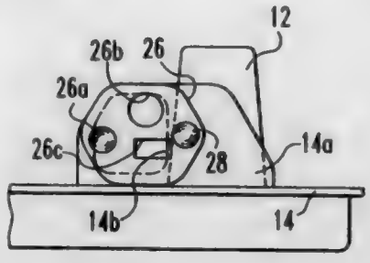
rotatable relative to said base in said second direction, and key means selectively operable to couple said cover and said base for rotation in unison in said second direction thereby to enable turning of said cover in said second direction to effect unscrewing of said base from said filler pipe.

5,467,622

HANDLE LOCK FOR RECIPROCALLY MOVABLE OPERATOR HANDLE

James A. Becker, Snellville, Ga.; Ronald J. Fritsch, Menomonee Falls, Wis.; Richard J. Holland, Glendale, Wis., and Robert F. Klobuchar, West Allis, Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 29, 1994, Ser. No. 236,430
Int. Cl.[6] G05G *5/02*
U.S. Cl. 70—203 **15 Claims**



1. A handle lock for a reciprocally movable operator handle, said handle lock comprising:

a flange fixedly disposed proximate said operator handle extending substantially parallel to reciprocal movement of said handle;

an opening in said flange adapted to simultaneously receive a plurality of padlock shackles, a shackle of a single one of said padlocks attached to said flange through said opening being effective for blocking movement of said handle to an operated position;

a plate permanently pivotally mounted to said flange, said plate being movable from a first position alongside said opening to a second position overlying said opening; and

at least one hole in said plate aligned with said opening in said second position of said plate, said hole being substantially smaller than said opening and adapted to receive a shackle of a single locking device, said locking device shackle attached to said flange through said opening and said hole, said hole positioning said locking device shackle relative to said opening and said handle for blocking movement of said handle to an operated position.

5,467,623

DOOR LOCKING HANDLE ASSEMBLY OF PULL-OUT AND SIDE-SWINGING LEVER-ACTION TYPE

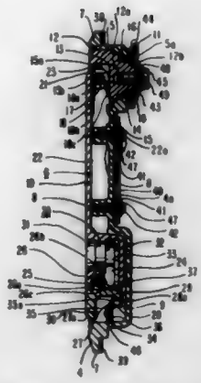
Kenichi Yamada, and Takanobu Esaki, both of Tokyo, Japan, assignors to Takigen Manufacturing Co. Ltd., Tokyo, Japan

Filed Feb. 3, 1994, Ser. No. 191,807
Claims priority, application Japan, Feb. 22, 1993, 5-056453
Int. Cl.[6] E05B *13/10*
U.S. Cl. 70—208 **5 Claims**

1. A door locking handle assembly of a pull-out and side-swinging lever-action type, comprising:

a casing (4) for fixedly mounting on a door;

a locking shaft (12) rotatably mounted in a cylindrical portion (5) of a base-end portion of said casing (4) in an insertion manner, said locking shaft (12) being non-axially slidable in said cylindrical portion (5) and having its rear-end portion fixed to a catch plate (11);



a retractable handle (19) which folds into a front concave portion (6) of said casing (4), and has its base-end portion pivoted to a front-end portion of said locking shaft (12) through a first cross pivot (17);

a biasing spring (18) for swingably biasing said handle (19) in its projecting direction on said first cross pivot (17), said biasing spring (18) being mounted between said locking shaft (12) and said handle (19);

a push button (27) which is connected with a front-end portion of said handle (19) through a second cross pivot (25) and is provided with a leg portion (28) projecting from its rear surface, said leg portion (28) having its front-end portion formed into an engaging-hook portion (29);

a position-keeping spring (26) disposed between said handle (19) and said push button (27) to align said push button (27) with said handle (19) along an extension line of said handle (19);

a lock unit (31) which is fixedly embedded in a lock-receiving portion (20) of a front-end portion of said handle (19), and comprises a rotor (32) with is rotated by a key (38) to move a lock plate (33) forward and backward so that said lock plate (33) engages with said leg portion (28) of said push button (27) to prevent said push button (27) from being depressed to swing on said second cross pivot (25);

a socket-member spring (34) which is fixedly mounted in a front-end portion of said front concave portion (6) of said casing (4) and has a front-end bent portion (35) engaged with the engaging-hook portion (29) of said leg portion (28), so that said handle (19) is held in a thus depressed position; and

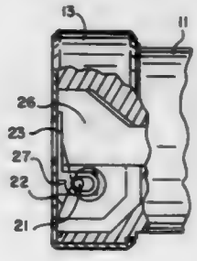
said handle (19) being held in said front concave portion (6) of said casing (4) in a condition in which said lock plate (33) fixed to said rotor (32) of said lock unit (31) is moved to its projecting position to restrict said push button (27) in rotating motion on the second cross pivot (25).

5,467,624

DUST SHUTTER ASSEMBLY FOR LOCKS

Gary L. Myers, Monee, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Sep. 12, 1994, Ser. No. 304,366
Int. Cl.[6] E05B *17/18*
U.S. Cl. 70—455 **5 Claims**



1. A lock assembly with an improved dust shutter mechanism comprising, in combination:

a generally cylindrical lock plug having a first end, a second end, tumblers disposed between said first and second ends which are engageable by a flat key, and a dust shutter cavity disposed between said first end and said tumblers, said cavity having two axial slots;

a lock plug cover having a face and a cylindrical sleeve, said face having a keyway slot and an inner surface, said sleeve being slidably receivable over said first end of said lock plug;

a dust shutter door rotatably disposed within said cavity, said shutter door having a face portion with inner and outer surfaces and a pair of hinge joints, each hinge joint having an inner contour, said outer surface of said shutter door engages said inner surface of said lock plug cover when said key is not inserted into said cavity;

a torsion spring having a center portion with an inner diameter, one or more wire protuberances which extend tangentially outwardly from said center portion and which load against said inner surface of said dust shutter door, and one or more additional wire protuberances which extend tangentially outwardly from said center portion and which load against said inner surface of said lock plug cover; and

a pin having two ends, said pin fitting within said inner diameter of said torsion spring and also fitting within said inner contours of each hinge joint of said dust shutter door, said ends of said pin fitting within said axial slots of said dust shutter cavity, said axial slots having sufficient axial length to permit axial translation of said pin within said slots such that when said key is pressed against said shutter door, said door moves axially rearward, in the direction of key insertion, and rotates about said pin.

5,467,625

ARRANGEMENT FOR ADJUSTING OF THREE ROLLERS OR GUIDING ROLLS WHICH TOGETHER FORM A CALIBER OPENING

Helmut Holthoff, Duesseldorf, Germany, assignor to Kocks Technik GmbH & Co., Hilden, Germany

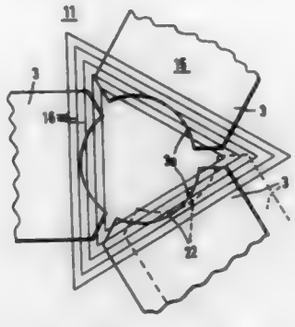
Continuation of Ser. No. 970,085, Nov. 3, 1992, Pat. No. 5,355,704. This application Apr. 29, 1994, Ser. No. 236,367

Claims priority, application Germany, Nov. 14, 1991, 41 37 451.7

The portion of the term of this patent subsequent to Oct. 18, 2011, has been disclaimed.

Int. Cl.[6] B21B *31/16*; B23Q *17/22*

U.S. Cl. 72—35 **1 Claim**



1. An arrangement for adjusting of three caliber opening-forming rolling elements, comprising a light source located on one axial side of the rolling element; a device located at another axial side of the rolling element that receives a shadow image of a caliber contour and having a turnable, displaceable and arrestable bar template, said bar template being marked with at least one polygon which corresponds to the number of rolling elements of a caliber and has sides which are offset from one another in an angular position corresponding to an angular position of rotary axes of rolling elements and center points of inscribed circles of several such polygons are located on one another.

5,467,626

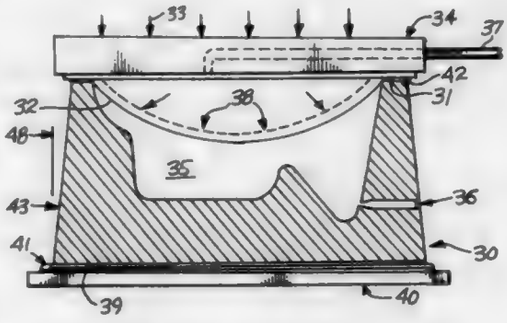
INTEGRAL FORMING DIE SYSTEM FOR SUPERPLASTIC METAL FORMING

Daniel G. Sanders, Sumner, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Oct. 1, 1993, Ser. No. 130,545

Int. Cl.[6] B21D *26/02*

U.S. Cl. 72—60 **22 Claims**



1. A superplastic forming die comprising:

a free standing, self-supporting, generally block-shaped ceramic monolithic die base having a bottom surface on which said die rests, and a top surface, opposite to said bottom surface, in which a forming cavity is formed and which is surrounded by a contact surface, said forming cavity having a shape like the desired shape of sheet metal parts to be formed by superplastic forming in said die;

a die lid having a horizontal cross sectional shape and size at least large enough to cover said die base, and having a contact surface corresponding in size and contour to said die base contact surface, whereby said lid is placed on said base with said contact surfaces aligning and in contact;

said die base being formed of a ceramic material that provides sufficient compressive strength to resist a compressive load exerted by a press to hold said lid on said die against oppositely directed force generated by gas at superplastic forming pressures within said die, and provides sufficient tensile strength, when under pressure of compressive loads exerted by said press, to resist internal bursting forces exerted by gas at superplastic forming pressures within said die, whereby said forming die may be safely used in said press to make superplastic formed parts free of an enclosing containment vessel around said forming die.

5,467,627

END FINISHER MACHINE

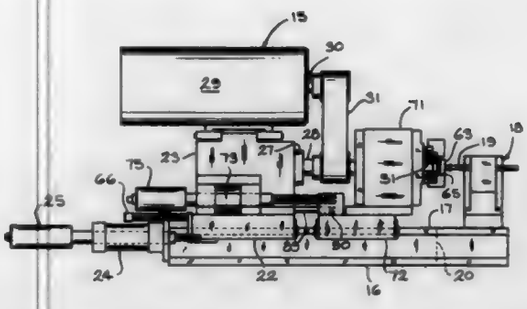
Kevin E. Smith, and Kurtis J. Hoffman, both of Wauseon, Ohio, assignors to Wauseon Machine and Manufacturing, Inc., Wauseon, Ohio

Filed Jan. 5, 1994, Ser. No. 177,729

Int. Cl.[6] B21H *1/06*

U.S. Cl. 72—121 **12 Claims**

1. An end finisher machine comprising a longitudinally extending base, a workpiece holder mounted on said base, a stabilizing block assembly mounted on said base, a rotatable shaft extending from said block assembly toward said workpiece holder, a head assembly surrounding said shaft for movement along said shaft, said head assembly defining an opening at one end, a tooling assembly mounted on said shaft within said head assembly opening, said head assembly and said tooling assembly defining mating surfaces wherein longitudinal movement of said head assembly opens and closes said tooling assembly, a stop assembly mounted



adjacent said workpiece holder, said stop assembly including a pivotal arm movable between a stop position for engaging a workpiece adjacent said tooling assembly and an outer position, motor means for rotating said shaft, first cylinder means for moving said stabilizing block assembly and said tooling assembly toward and away from said workpiece holder and second cylinder means for moving said head assembly and its mating surface toward and away from said mating surfaces of said tooling assembly, said tooling assembly including a tooling shaft member fixed to said shaft within said head assembly opening, a plurality of tool holders mounted for radial movement on said tooling shaft member, springs mounted between said tooling shaft member and said tool holders for urging said tool holders radially outwardly, and holding means on said tool holders for holding the tools.

5,467,628

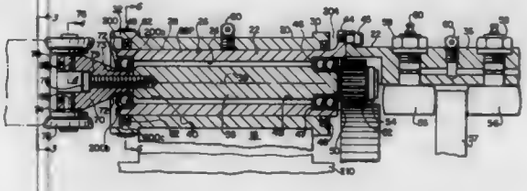
CAN BOTTOM REPROFILER

Geoffrey R. Bowlin; Joseph G. Schill, both of Lynchburg, and Alexander A. Henzel, Forest, all of Va., assignors to Belvac Production Machinery, Inc., Lynchburg, Va.

Filed Jan. 31, 1994, Ser. No. 189,243

Int. Cl.[6] B21D *51/26*

U.S. Cl. 72—126 **15 Claims**



1. An apparatus for reshaping ends of cylindrical containers having a longitudinal axis, a side wall and a bottom end, said apparatus comprising:

a) a tool drive ram assembly having a first end, a second end, a central axis, and a central axial bore;

b) a substantially cylindrical, ram slide bushing having a first end, a second end, and an axial bore through which said tool drive ram assembly is concentrically and slidably received for axial reciprocation;

c) a tooling drive shaft concentrically mounted for rotation within the tool drive ram assembly central axial bore and having a first end, a second end and a central axis coinciding with the tool drive ram assembly central axis;

d) a plurality of reprofiler rollers, each having an axis of rotation;

e) means for supporting a can in axial alignment with said central axis;

f) mounting means connected to the first end of said tooling drive shaft for supporting said reprofiler rollers for rotation with their axes of rotation having a component substantially perpendicular to the central axis of the tooling drive shaft and with said rollers being positioned so that movement of the tool drive ram assembly toward the can effects contact of the reprofiler rollers with the can to reconfigure the end of the can;

g) said mounting means comprising a reprofiler roller mounting block having a first end, a second end, a central axial bore, and an outer periphery;

h) said second end of said mounting block including two circumferentially spaced tangs extending in an axial direction from an annular shoulder that is orthogonal to and surrounding said mounting block central axial bore;

i) a pivot base shim seated against said mounting block annular shoulder for axially spacing said mounting block from said tooling drive shaft first end so as to accurately position said mounting block relative to said drive shaft; and

j) roller spacers provided between said mounting block and said reprofiler rollers for accurately establishing the radius of a circular path traveled by said rollers resultant from rotation of said tooling drive shaft.

5,467,629

STRAIGHTENING APPARATUS FOR TUBULAR MATERIAL, WIRE AND CABLE

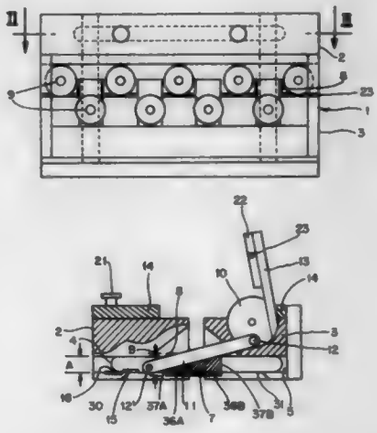
Eckehard Albert, Berlin, Germany, assignor to Witels Apparate-Maschinen Albert GmbH & Co. KG, Berlin, Germany

Filed Apr. 5, 1994, Ser. No. 222,845

Claims priority, application Germany, Apr. 6, 1993, 43 11 299.4

Int. Cl.[6] B21D *3/02*

U.S. Cl. 72—164 **9 Claims**



1. A straightening apparatus for wire, cable and tubular material, comprising:

a plurality of rotatable straightening rollers arranged in two adjacent and parallel planes, wherein each of said rollers has an axle and defines a straightening space between adjacent rollers;

two body parts forming a basic chassis, said body parts supporting the axles of said straightening rollers, said body parts being disposed on guides and being relatively movable against each other;

springs supported on the body parts such that said parts are maintained in a defined open position;

a closing mechanism including an eccentric wheel rotably supported in one of said body parts, an operating lever fastened to said eccentric wheel, and a pull rod having one end connected to said eccentric wheel and the other end connected to the other of said body parts, said closing mechanism bringing said body parts and adjacent rollers into a closed position to form a predetermined defined zero position, said zero position defining the straightening space between adjacent rollers; and

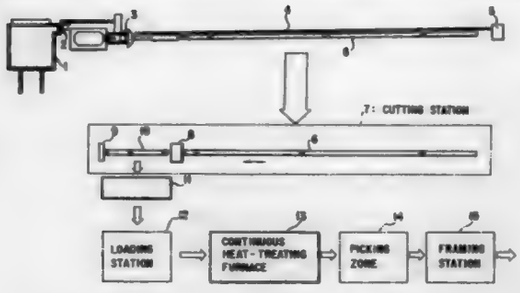
a releasable locking connection for securing the body parts in a closed position to maintain the defined zero position.

5,467,630

METHOD FOR WORKING TERMINAL PART OF MATERIAL FOR VERTICAL SUSPENSION TYPE SURFACE TREATMENT

Kiyomitsu Matsushima, Kurobe, and Katsuyuki Nagata, Uozu, both of, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Dec. 30, 1992, Ser. No. 998,926
Claims priority, application Japan, Dec. 30, 1991, 3-360380
Int. Cl.[6] B21C *35/04*
U.S. Cl. 72—254 **10 Claims**



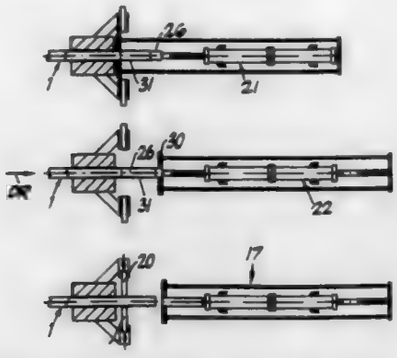
1. In a method for working a terminal part of a fixed length of material subjected to vertical suspension type surface treatment by extruding an elongated member, cutting the elongated member into a fixed length of material with a terminal part and forming in said terminal part a hook engaging part to be engaged with a nipping device of a carrier bar serving to convey said fixed length of material successively to a series of surface-treating baths, the improvement comprising carrying out the step of forming said hook engaging part in said terminal part of the material at the same time as performing the step of cutting the elongated member into a fixed length of material.

5,467,631

METHOD FOR MANUFACTURING A PLUG-TYPE CHAMBER USED IN THE CASCADE DRAWING OF TUBES, AND DEVICE FOR IMPLEMENTING THE METHOD

Friedrich Eberts, Menden, and Helmut Pohl, Eltorf, both of, Germany, assignors to KM-Kabelmetal AG, Osnabruck, Germany

Filed Feb. 28, 1994, Ser. No. 203,146
Claims priority, application Germany, Feb. 27, 1993, 43 06 181.8
Int. Cl.[6] B21C *1/24*
U.S. Cl. 72—283 **10 Claims**



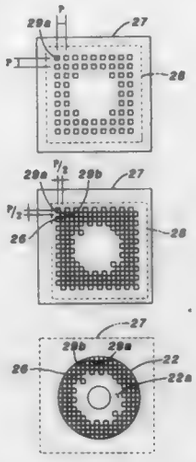
1. A method for manufacturing a plug-type chamber to accommodate at least two floating plugs for use in the cascade drawing of tubes made of non-ferrous metal alloys, comprising the steps of:
expanding the inner diameter, and the outer diameter of the tube at a front, feed directional end of the tube;
reducing the outer diameter of the tube until it reaches its original diameter along at least a portion of the section of tube whose outside diameter has been expanded in the previous step whilst the tube is lengthened;
forming an indentation in the tube upstream from the front of the tube;
inserting floating plugs into the tube section; and
forming a drawing point onto the free end of the tube.

5,467,632

METHOD FOR FABRICATING A CONTACT ASSEMBLY OF A MAGNETIC SWITCH

Mitsuhiro Kogure, Gumma; Shinichi Nagashima, Tochigi; Kazuhisa Wakabayashi, Gumma; Shigeyuki Enkaku, Gumma; Hitoshi Shimayama, Gumma; Minoru Kimura, Gumma; Shuji Shimoyama, Gumma, and Tsuguo Yokoo, Gumma, all of, Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Gumma, Japan

PCT No. PCT/JP93/00588, § 371 Date Dec. 16, 1993, § 102(e) Date Dec. 16, 1993, PCT Pub. No. WO93/22783, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 30, 1993, Ser. No. 167,954
Claims priority, application Japan, May 6, 1992, 4-142099
Int. Cl.[6] H01R *43/16*
U.S. Cl. 72—379.2 **6 Claims**



1. A method for fabricating a contact assembly for a magnetic switch comprising a pair of fixed contact members and a plate-shaped moveable contact member adapted to be selectively connected across the fixed contact members, said method comprising:
punching a contact surface of at least one of the fixed contact members and the moveable contact member to form a first plurality of recesses which are separated from each other, said punching being by operation of a punch having a plurality of projections at a certain pitch applied to the contact surface;
shifting the relative position of the punch and the contact surface a prescribed distance; and punching with the punch the contact surface at the relative shifted position to form a second plurality of recesses on the contact surface at the shifted position of the punch and contact surface.

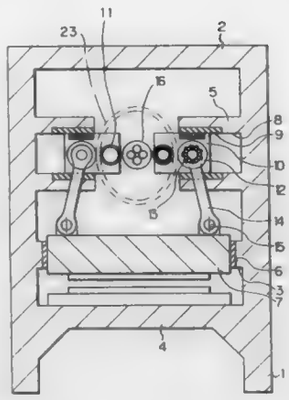
5,467,633

MECHANICAL PRESSING MACHINE

Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Seisakusho Co., Tokyo, Japan

Filed Aug. 22, 1994, Ser. No. 294,066
Claims priority, application Japan, Aug. 25, 1993, 5-210666
Int. Cl.[6] B21J *9/18*
U.S. Cl. 72—452 **4 Claims**

1. A mechanical pressing machine comprising:



a slider supported on a frame for vertical sliding movement, said slider having an upper press die mounted on its lower surface;

a pair of sliding blocks mounted respectively on right and left side portions of said frame for horizontal sliding movement;

a cam follower and a roller follower rotatably mounted on each of said pair of sliding blocks;

a pair of right and left connecting rods rotatably connected at their one ends to said pair of sliding blocks, respectively, the other ends of said pair of connecting rods being rotatably connected to said slider;

an input shaft rotatably mounted on said frame, said input shaft being connected at its one end to rotation transmission means; and

a rib cam mounted on the other end portion of said input shaft for rotation therewith, said rib cam having a peripheral portion held between said cam follower and said roller follower on each of said pair of sliding blocks so as to reciprocally move said pair of sliding blocks right and left in a symmetrical manner.

5,467,634

METHOD AND APPARATUS FOR CALIBRATING THREE-DIMENSIONAL SPACE FOR MACHINE VISION APPLICATIONS

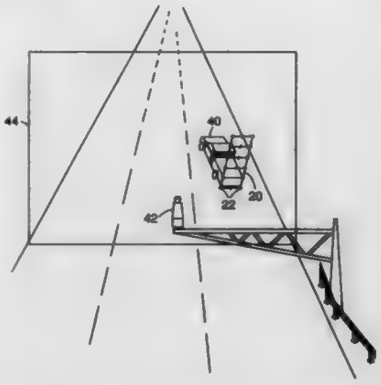
Mark I. Brady, Cottage Grove, and Darin G. Cerny, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 95,908, Jul. 22, 1993, abandoned. This application Apr. 14, 1995, Ser. No. 422,263

Claims priority, application European Pat. Off., Jun. 7, 1994, 94918223; WIPO, Jun. 7, 1994, PCT/US94/06383

Int. Cl.[6] G01C *25/00*

U.S. Cl. 73—1 D **4 Claims**



1. A method for calibrating a three-dimensional space, said method for use with a machine vision system, said machine vision system including tracking means for tracking objects within said three-dimensional space, said method comprising the steps of:

a) moving at least one pair of indicators spaced apart by a known distance through said three-dimensional space at a known speed;

b) tracking said at least one pair of indicators with said tracking means through said three-dimensional space; and

c) mapping pixel space to said three-dimensional space based on the location of said at least one pair of indicators within said pixel space and said known, constant speed of said at least one pair of indicators.

5,467,635

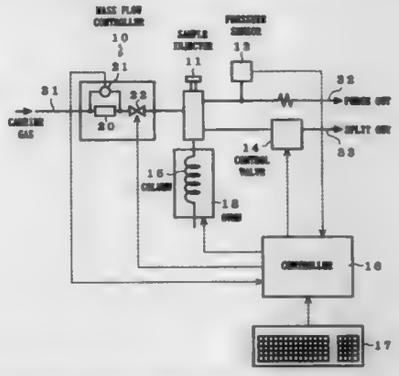
GAS CHROMATOGRAPH

Kazuya Nakagawa, Kyoto, and Toyoaki Fukushima, Uji, both of, Japan, assignors to Shimadzu Corporation, Japan

Filed Dec. 12, 1994, Ser. No. 354,789

Int. Cl.[6] B01D *15/08;* **G01N** *30/88*

U.S. Cl. 73—23.350 **12 Claims**



1. A gas chromatograph comprising:

a pressure regulator under variable control via electrical input signals for regulating a pressure of a gas at an entrance of a column of the gas chromatograph;

a pressure sensor for detecting a pressure of the gas at the entrance of the column;

calculating means for calculating a target pressure of the gas at the entrance of the column from a length of the column, an inner diameter of the column and a temperature of the column, the target pressure being such a pressure that a linear velocity of the gas flowing, through the column is at a preset pre-determined value; and

a controller with electrical output signals for controlling the pressure regulator so that the pressure detected by the pressure sensor is maintained at the target pressure.

5,467,636

FLAT PLATE SENSOR WITH A ROBUST PACKAGE DESIGN

David A. Thompson, Burton; Venkatesh Rajagopalan, Flint; Kurt W. Wright, Fenton; John J. Sterba, Clio; William J. Paulus; Nancy J. Paulus, both of Grand Blanc; Kathryn M. McCauley, Durand, and David K. Chen, Rochester Hills, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 27, 1994, Ser. No. 313,689

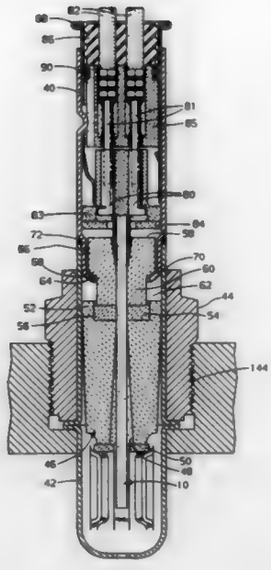
Int. Cl.[6] G01N *27/12;* **B05D** *5/12;* **H01C** *7/00*

U.S. Cl. 73—23.31 **4 Claims**

1. An automotive exhaust sensor comprising:

an upper and lower tubular metal shell joined together with an airtight seal;

a first ceramic insulator carried in the lower tubular shell having a slot-shaped hole formed therein for receiving a length-wise



portion of a flat plate sensing element, said first ceramic insulator including an upper end having an upwardly extending annular ring immediately adjacent the walls of the lower tubular shell, said upwardly extending annular ring defining a recess on the top central portion of the first ceramic insulator;

a flat plate element received in the first ceramic insulator and extending above the annular ring;

a glass seal formed in the recess as an internal seal and extending radially outward from the flat plate sensing element to the annular ring of said first ceramic insulator.

5,467,637

METHOD OF MEASURING GAS PURITY INFORMATION, CHAMBER UNIT AND EXPOSURE UNIT USING THE METHOD AND A DEVICE PRODUCTION METHOD

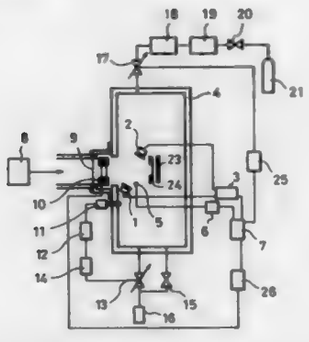
Takayuki Hasegawa, Yokohama, and Hidehiko Fujioka, Yamato, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1993, Ser. No. 168,150

Claims priority, application Japan, Dec. 24, 1992, 4-344576; Jun. 24, 1993, 5-153623

Int. Cl.[6] G01N *29/02;7/00*

U.S. Cl. 73—24.01 **26 Claims**



1. A method of measuring purity information relating to gas contained in a closed space, said method comprising:

generating ultrasonic waves in the gas contained in the closed space;

measuring values of the sonic velocity in the gas at a plurality of positions in the closed space; and

determining purity information relating to the gas in the closed space on the basis of the measured values.

5,467,638

METHOD AND DEVICE FOR RECOGNIZING THE KNOCKING OF AN INTERNAL-COMBUSTION ENGINE

Matthias Philipp, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

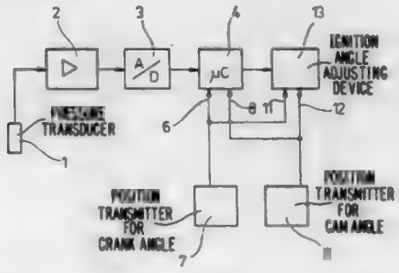
PCT No. PCT/DE93/00254, § 371 Date Aug. 4, 1994, § 102(e) Date Aug. 4, 1994, PCT Pub. No. WO93/20424, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 20, 1993, Ser. No. 284,528

Claims priority, application Germany, Apr. 7, 1992, 42 11 645.7

Int. Cl.[6] G01L *23/22*

U.S. Cl. 73—35.06 **10 Claims**



7. Device for detecting knocking in an internal combustion engine, said device comprising

a knock sensor for generating a sensor signal characteristic of said knocking in said internal combustion engine;

an analog/digital converter connected to said knock sensor to receive said sensor signal and to generate a digitized signal;

processor means for high pass filtration and analysis of said sensor signal to detect a presence of a knocking condition in said internal combustion engine,

wherein said processor means includes high-pass filter means for high-pass filtration of said digitized signal to form a high frequency signal comprising a plurality of oscillations having amplitudes, means for counting said amplitudes of said oscillations of said high frequency signal greater than a first threshold value (P1) to form an amplitude count; means for integrating an absolute value of said high-frequency signal to obtain an integrated signal; means for comparing said integrated signal to a second threshold value (P2); and means for generating an output signal indicating said knocking is occurring when said amplitude count is at least one and said integrated signal is greater than said second threshold value.

5,467,639

UNIVERSAL PENETRATION TEST APPARATUS AND METHOD

Phillip W. Johnson, Rochester, Minn., assignor to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Continuation of Ser. No. 4,839, Jan. 19, 1993, abandoned. This application Aug. 17, 1994, Ser. No. 291,745

Int. Cl.[6] G01N *15/08*

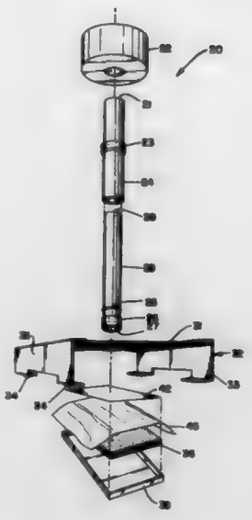
U.S. Cl. 73—38 **3 Claims**

1. A universal penetration test apparatus for measuring resistance of material to a challenge fluid, comprising:

an absorbent pad capable of absorbing the challenge fluid;

an elongated weight support assembly having a top end and a bottom end, the material being positionable between the pad and the elongated weight support assembly;

frame means for supporting the elongated weight support assembly in a vertical orientation;



a plurality of weight members being slidably receivable on the elongated weight support assembly, the elongated weight support assembly including flange means for supporting the weight members on the elongated weight support assembly;

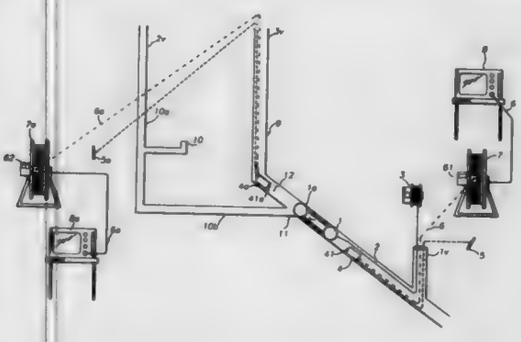
the elongated weight assembly comprising a hollow sleeve and a rod, the sleeve being telescopically received on the rod, the rod including flange means for limiting movement of the sleeve along the rod, the sleeve including flange means for limiting movement of the weight members along the sleeve, the bottom end of the rod having concentric circles of varying widths cut at different depths with an inner most concentricity having the greatest depth.

5,467,640

PIPELINE TESTING AND LEAK LOCATING APPARATUS AND METHOD

Joe E. Salinas, P.O. Box 270654, Corpus Christi, Tex. 78427-0654

Filed May 2, 1994, Ser. No. 235,916
Int. Cl.[6] G01N *03/28;25/72;* **F16L** *55/00*
U.S. Cl. 73—40.5 R **10 Claims**



2. A PIPELINE leak locating and TESTING APPARATUS comprising:

(a) at least one pipeline inflatable test ball made of any of the following or similar materials; rubber or canvas or rubber impregnated canvas further comprising an interior and an exterior surface and being at least one fourth inch in diameter and one inch long when not inflated and having an anterior and a posterior end which posterior end is connected to a pneumatic hose which has first and second ends and is connected on said first end to a supply of pneumatic air, and wherein the second end of the pneumatic hose is connected to the posterior end of the test ball, wherein when said test ball is inserted to a point in a pipeline which consists of an interior wall and an exterior surface, said test ball may be inflated to produce a temporary passageway seal or blockage in a pipeline by virtue of said test ball's exterior surface coming in contact with said pipelines interior wall and by virtue of its ball shape;

(b) at least one remote camera lens, each housed in a housing which has an anterior end and a posterior end, said housing contains lights facing anteriorly and is tubularly shaped and has a lens also facing anteriorly and has means for connecting posteriorly thereto a semi-rigid camera service cable, hereafter, cable, having first and second ends, said cable attached on said first end to the camera housing's posterior end which supplies power for the lights and signal path for the visual signal to be conducted to a viewing terminal, (T.V. monitor screen) which is attached to said cables second end, said cable's semi-rigidness further comprises means for inserting said camera lights and housing into a pipeline and means for controlling the attitude of the remote camera lens, said remote camera also has on its anterior and posterior surfaces means such as an eyelet or recessed peg, eccentrically located, for attaching a lanyard thereto;

(c) at least one mechanism for measuring the amount of cable or lanyard that has passed into or out of a pipeline wherein said mechanism has a numerical display which can be directly read;

(d) at least one lanyard having a reel end and a service end and means for attaching said lanyard service end to either said camera housing or said test ball anterior or posterior ends such as a spring clip, or pneumatic hose coupling or loop formed on said lanyard end, said lanyard further being made of any one or combination of the following, monofilament plastic, braided nylon string, cotton string plastic string, braided string braided cotton or plastic rope, metal or plastic ball chain, metal link chain, plastic coated cords, plastic coated string, fibre flat strap, flattened plastic cord, plastic chain or flexible hose;

(e) at least one lanyard-retrieving hose comprising a first pipeline penetrating forward end and a second water or air supply static end and a rearward facing jet nozzle mounted on said forward end and a lanyard mounting means such as an eyelet or spring clip, whereby when said hose is supplied with pressurized air or water said hose will be propelled through a pipeline in which it may be inserted by virtue of the forward propulsion provided by the escaping water or air through said rearward facing nozzle, whereby said hose may be thusly propelled completely through a pipeline thus providing means for threading a lanyard through a pipeline or pipeline segment by attaching said lanyard to said hose lanyard attaching means and pulling said lanyard-retrieving hose back out of said pipeline;

(f) a protective sleeve on said lanyard, said pneumatic hose and said semi rigid camera service cable for adding durability thereto consisting of any one or a combination of the following elements, plastic, rubber, steel braid, fiber-glass, fiber-glass braid, metal alloy braid;

(g) wherein said test balls further comprise a device with means for signalling by an audible beacon or an inaudible radio beacon and said apparatus further comprises a receiving radio or a remotely activated audible beacon or inaudible radio beacon.

5,467,641

METHOD OF AND APPARATUS FOR DETECTING FUEL SYSTEM LEAK

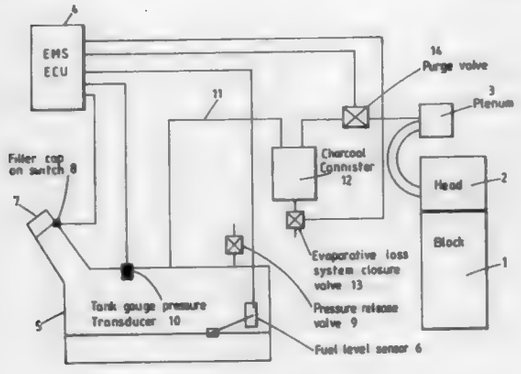
David Williams, Warwickshire; Stuart M. Briscoe, Wolverhampton, both of, England, and Keith Melbourne, Perth, Australia, assignors to Lucas Industries Public Limited Company, England

Filed Feb. 14, 1994, Ser. No. 194,950

Claims priority, application United Kingdom, Feb. 13, 1993, 9302958

Int. Cl.[6] G01M 3/32

U.S. Cl. 73—49.7 10 Claims



1. A method of detecting an unacceptable vapour leak in a fuel system of a vehicle internal combustion engine, including a fuel tank containing liquid fuel comprising performing a fuel system pressure test while the engine is switched off, said pressure test comprising closing said fuel system and measuring a first rate of vapour pressure rise in said fuel system resulting from evaporation of fuel in the fuel tank, introducing a predetermined vapour leak into said fuel system and measuring a second rate of vapour pressure rise in said fuel system including a fuel tank containing liquid fuel, and comparing said first and second rates of pressure rise to detect the presence of an unacceptable vapour leak.

5,467,642

SCANNING PROBE MICROSCOPE AND METHOD OF CONTROL ERROR CORRECTION

Sumio Hosaka, Tokyo; Atsushi Kikugawa, Kokubunji; Yukio Honda, Fuchu; Hajime Koyanagi, Koshigaya, and Kiyosi Nagasawa, Ibaraki, all of, Japan, assignors to Hitachi, Ltd., and Hitachi Construction Machinery, Ltd., both of Tokyo, Japan

Filed Nov. 4, 1993, Ser. No. 145,600

Claims priority, application Japan, Nov. 6, 1992, 4-296728

Int. Cl.[6] G01B 5/28

U.S. Cl. 73—105 26 Claims

1. A scanning probe microscope comprising:

a probe including a cantilever with a stylus at an end thereof and a probe base at another end thereof;

a scanning means driving at least one of said probe base and a sample arranged in proximity to said stylus to move relative positions of said stylus and a surface of said sample;

a driving means driving at least one of said probe base and said sample in order to adjust a distance between said stylus and the surface of said sample;

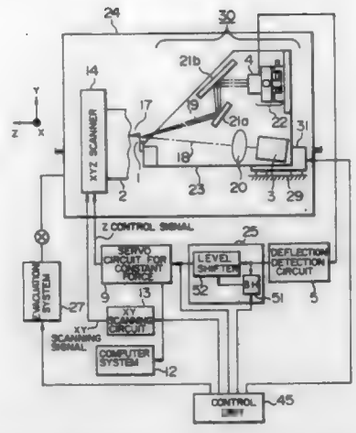
a control means controlling said driving means in accordance with a predetermined schedule;

an optical detector detecting a deflection of said cantilever;

a correction means, which comprises a sample and hold means correcting an output of said optical detector in accordance with an output of said sample and hold means; and

a servo control means supplied with a corrected detection output of said optical detector from said correction means and controlling relative distances between said stylus and the surface of said sample thereby to control a force exerted between the surface of said sample and said stylus,

wherein said control means schedules in such a manner so as initially to contact said stylus and the surface of said sample, then for a predetermined period, to leave at least a distance between said stylus and the surface of said sample by which said stylus is substantially not affected by any force from the surface of said sample, and said sample and hold means samples and holds an output of said optical detector when said stylus is substantially not affected by any force from the surface of said sample, and then to contact said stylus and the surface of said sample again.



5,467,643

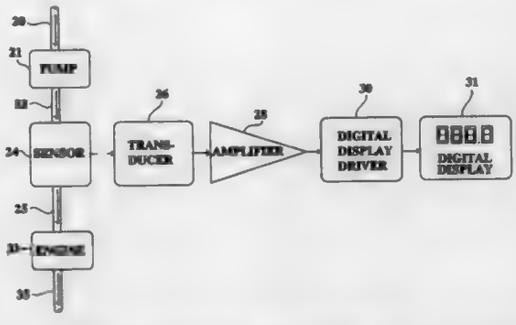
METHOD AND APPARATUS FOR MONITORING WATER FLOW IN A MARINE ENGINE COOLING WATER SYSTEM AND A BILGE WATER PUMPING SYSTEM

Michael L. Barnett, Rte. #1, Box 3700, Coquille, Oreg. 97423, and Larry G. Brader, 538 SW. 283rd St., Federal Way, Wash. 98023

Filed Aug. 15, 1994, Ser. No. 290,390

Int. Cl.[6] G01L 15/00

U.S. Cl. 73—116 16 Claims



1. A method for remotely and instantaneously monitoring a cooling water flow rate in a marine engine cooling system comprising the steps of:

a) sensing an instantaneously variable rate of flow of cooling water using a sensor located in a cooling water intake pipe of a marine engine;

b) providing a primary signal to establish an instantaneously sensed cooling water flow rate;

c) transducing the primary signal to provide a secondary flow rate signal proportionally variable with respect to the primary signal; and

d) translating the secondary signal to provide a tertiary, operator-detectable flow rate signal, proportionally variable in relation to the primary signal to provide an instantaneous indication of

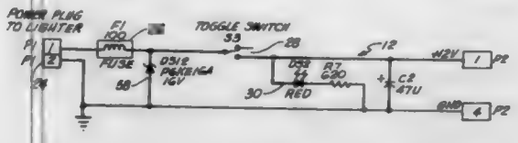
the instantaneously variable rate of flow, whereby an operator of the marine engine can monitor the tertiary signal and thereby remotely, instantaneously monitor the cooling water flow rate in the marine engine cooling system.

5,467,644

UNIVERSAL TRANSMISSION TESTER

Larry Schaffer, 7204 Centerhill Dr., Lakeland, Fla. 33809

Filed Apr. 26, 1993, Ser. No. 51,977
Int. Cl.[6] G01M *19/00*
U.S. Cl. 73—118.1 **8 Claims**



1. A device for selectively testing a computer-controlled transmission that has an interface connector module and a plurality of solenoids that control a torque converter clutch therein, comprising:

(a) circuitry for providing electrical power to said device;

(b) an interface connector module having multiple pin connectors for connecting said device to said interface connector module of the computer-controlled transmission to be tested;

(c) a plurality of two-pole, six-position rotary switches for selectively shifting the transmission to be tested to one of the transmission gears;

(d) indicator means electrically connected to and activated by said rotary switches for indicating the selected transmission gear;

(e) circuitry enabled by said rotary switches to provide ground connection input to said transmission to energize at least one of the plurality of solenoids that control said torque converter clutch;

(f) means connected through said interface connector modules for selectively controlling the pressure in said transmission being tested; and,

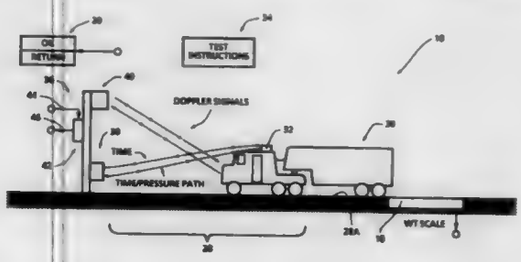
(g) means for limiting the current to said solenoids.

5,467,645

REMOTE BRAKE PERFORMANCE TESTING SYSTEM/ METHOD

Jeffrey H. Skorupski, Brighton, and Thomas A. Gee, Allen Park, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Aug. 16, 1993, Ser. No. 107,432
Int. Cl.[6] G01L *5/28*
U.S. Cl. 73—121 **17 Claims**



1. A method for testing vehicle brake system performance of a vehicle brake system on a vehicle (**30**) driving on a test roadway (**28A**) past a brake performance test module (**36**), said method comprising:

providing a first sensor (**18**) in said roadway for sensing vehicle weight and for providing a first input signal indicative thereof,

providing a second sensor (**32**) on-board said vehicle for sensing brake application force and for providing a second input signal indicative thereof,

providing a third sensor (**40**) at said module for sensing one of vehicle ground speed and the rate of change of vehicle ground speed of said vehicle on said roadway and for providing a third input signal indicative thereof; [and]

providing a brake performance monitor (**42**) for receiving said first, second and third input signals and for processing same according to predetermined logic rules to determine if the performance of said vehicle brake system is within predetermined acceptable standards or is not within said predetermined acceptable standards; and

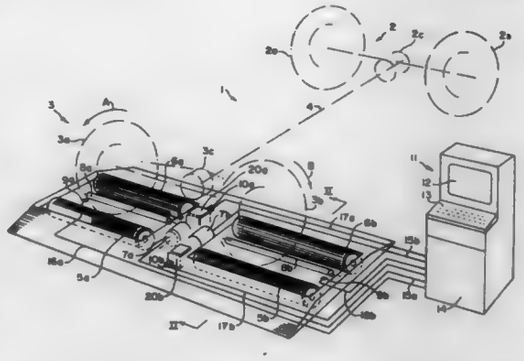
causing said vehicle to travel at a predetermined range of ground speed on said roadway and then causing said brake system to be applied to retard said vehicle on said roadway.

5,467,646

PROCESS AND DEVICE FOR CONTROLLING THE BRAKING OF FOUR-WHEEL DRIVE VEHICLES

Denis Douine, Lagny Sur Marne, and Gilles Durand, Voinsles, both of, France, assignors to Muller BEM, Chartres, France

Filed May 4, 1994, Ser. No. 237,993
Claims priority, application France, May 7, 1993, 93 05492
Int. Cl.[6] G01L *5/28*
U.S. Cl. 73—126 **11 Claims**



1. Process of controlling the braking on a brake bench of a wheeled vehicle having plural interconnected drive shafts, each shaft having a differential, said brake bench comprising for each wheel of the axle a pair of drive rollers; said drive rollers being driven in asynchronous fashion by drive means; said process comprising:

—driving one wheel on a shaft in the forward direction and one other wheel on the same shaft in the rearward direction, and

—adjusting the speed (V_A) of the drive means (**7***a*) of the one wheel (**3***a*) and the speed (V_B) of the drive means (**7***b*) of the other wheel (**3***b*), said two speeds (V_A, V_B) being different from each other such that the difference of the two speeds (V_A, V_B) is maintained less than a value such as will move another shaft of the vehicle which is external to said brake bench.

5,467,647

CLAMP ASSEMBLY FOR TESTING AND/OR MEASURING UNIT ACTIVATED UPON INFLATION OF A PNEUMATIC TIRE

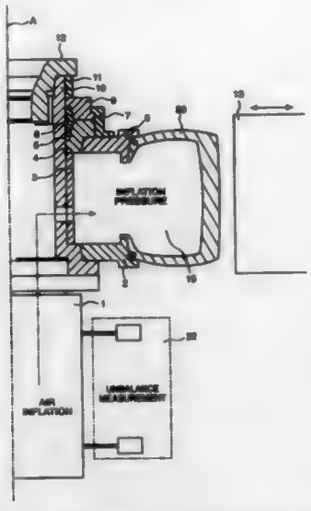
Michael Schepp, Darmstadt, Germany, assignor to Hofmann Maschinenbau GmbH, Germany

Filed May 25, 1994, Ser. No. 249,032

Claims priority, application Germany, May 28, 1993, 43 17 970.3

Int. Cl.[6] G01M 17/02

U.S. Cl. 73—146 16 Claims



16. Apparatus for mounting a pneumatic tire on a device having a rotatable spindle with a rotational axis comprising first and second rim mounting portions, at least said first rim mounting portion being movable along said rotatable spindle in a direction substantially parallel with the rotational axis, at least one deformable clamp assembly positioned between said first rim mounting portion and said rotatable spindle so that when a tire is mounted between said first and second rim mounting portions and inflated, the inflation pressure activates said at least one deformed clamp assembly to non-rotatably clamp said first rim mounting portion and said rotatable spindle together.

5,467,648

AIR FLOW RATE MEASURING DEVICE

Shinya Igarashi; Hiroshi Hirayama; Chihiro Kobayashi, all of Katsuta; Mitsukuni Tsutsui, Ibaraki, and Yukio Kato, Hitachi, all of, Japan, assignors to Hitachi, Ltd., and Hitachi Automotive Engineering Co., Ltd., both of, Japan

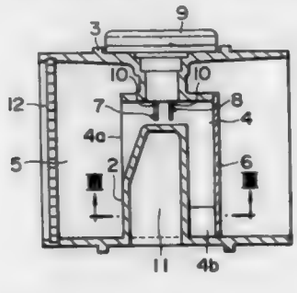
Filed Sep. 14, 1993, Ser. No. 120,542

Claims priority, application Japan, Sep. 17, 1992, 4-247626; Sep. 18, 1992, 4-249504; Jan. 30, 1992, 4-292478; Mar. 18, 1993, 5-058371

Int. Cl.[6] G01F 1/68;5/00

U.S. Cl. 73—202.5 11 Claims

1. An air flow rate measuring device, comprising:



a main air passage for intake air;

a sub-air passage which permits part of the air flowing in said main air passage to pass therethrough, said sub-air passage having an inlet and an outlet, and being provided with a flow rate measuring portion disposed therein; and

pressure reducing means disposed in said main air passage at a region upstream of the outlet of said sub-air passage, for reducing pressure in a region of said main air passage around said outlet of said sub-air passage,

wherein the inlet of said sub-air passage has an opening which contains a central longitudinal axis of said main air passage while the outlet of said sub-air passage is disposed in the vicinity of the wall defining said main air passage.

5,467,649

MASS FLOW SENSOR HAVING A MEASURING ELEMENT ARRANGED ON A MEMBRANE RETAINED ON A MONOCRYSTALLINE SILICON WAFER

Eckart Reihlen; Jiri Marek, both of Reutlingen; Frank Bantien, Ditzingen; Guenther Findler, Stuttgart; Michael Offenberg, Tuebingen; Josef Kleinhans, Vaihingen; Uwe Konzelmann, Asperg, and Botho Ziegenbein, Reutlingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

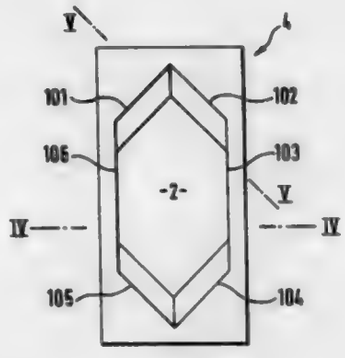
Continuation of Ser. No. 202,408, Feb. 25, 1994, abandoned.

This application Jul. 21, 1994, Ser. No. 278,342

Claims priority, application Germany, Feb. 25, 1993, 43 05 797.7; Nov. 13, 1993, 43 38 890.6

Int. Cl.[6] G01F 1/68

U.S. Cl. 73—204.26 3 Claims



3. A mass flow sensor for measurinq the flow of a medium having a first temperature, the sensor comprising:

a membrane;

a measuring element arranged on the membrane, the measuring element being at a second temperature higher than the first temperature, the measuring element measuring the flow of the medium based upon a transfer of heat from the measuring element to the medium; and

a frame for retaining the membrane, the frame including a monocrystalline silicon wafer having a recess with side walls that are perpendicular to a bottom surface of the silicon wafer, wherein:

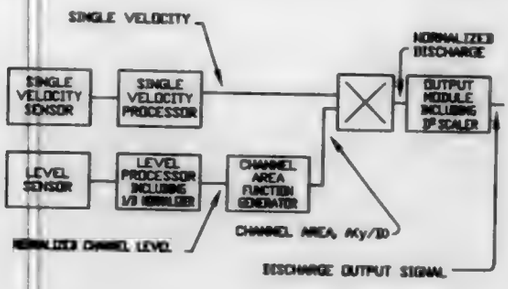
the bottom surface of the silicon wafer has a 110 orientation; and

the recess has first, second, third and fourth edges which form a parallelogram-shaded opening on the bottom surface of the silicon wafer and which lie on planes with a 111 orientation perpendicular to the bottom surface of the silicon wafer, with the first and second edges forming an angle of approximately 109.5° , the second and third edges forming an angle of approximately 70.5°, and the third and fourth edges forming an angle of approximately 109.5°.

5,467,650
OPEN CHANNEL FLOWMETER

Vincent J. Cushing, 153 Williams Dr., Annapolis, Md. 21401

Continuation-in-part of Ser. No. 747,431, Aug. 13, 1991, which is a continuation of Ser. No. 478,872, Feb. 12, 1990, abandoned. This application Feb. 25, 1992, Ser. No. 841,885
Int. Cl.[6] G01F 7/00
U.S. Cl. 73—215 22 Claims



1. An apparatus for measuring the discharge of a fluid in an open channel, comprising:

a velocity measuring device which measures velocity of the fluid in the neighborhood of at least one fixed point and produces a corresponding fluid velocity signal value;

a level measuring device which measures the height of said fluid at a predetermined location in said channel and produces a corresponding fluid level signal value;

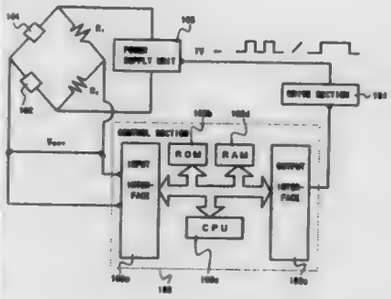
a level-discharge function generator which receives said fluid level signal value and in response generates a level-discharge function of the form $f(y)=Q/v_p$, where y is said height of said fluid, Q is said volumetric discharge and v_p is said measured velocity; and

a multiplication circuit which multiplies the fluid velocity signal by said level-discharge function to obtain a discharge signal representing volumetric discharge.

5,467,651
DRIVE CONTROL APPARATUS FOR MICROSENSOR

Junji Manaka, Tokyo, Japan, assignor to Ricoh Seiki Company, Ltd., Tokyo, Japan

Filed Oct. 22, 1993, Ser. No. 139,695
Claims priority, application Japan, Jan. 23, 1992, 4-309405
Int. Cl.[6] G01N 37/00
U.S. Cl. 73—23.21 7 Claims

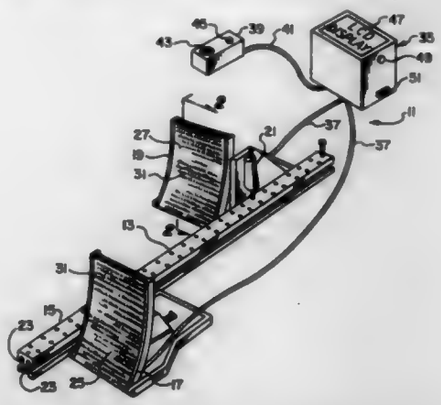


1. A drive control apparatus for a microsensor in which a plurality of cavity sections are provided on an airtight substrate at positions facing each other when said substrates are stacked via a junction area, and thin film heat generating bodies for temperature detection and temperature compensation are installed in a bridge form in each of the plurality of spaces each formed by said cavity sections, wherein a predetermined voltage is constantly supplied to the microsensor above a predetermined humidity.

5,467,652
APPARATUS AND METHOD FOR DETERMINING RESPONSE PARAMETERS OF A RUNNER TO A START SIGNAL

Katy S. Richards, 7611 Concord Dr., Boulder, Colo. 80301

Filed Jan. 3, 1994, Ser. No. 176,662
Int. Cl.[6] G01L 3/24
U.S. Cl. 73—379.01 20 Claims



1. An apparatus for use with a starting block for determining response parameters of a runner to a start signal comprising:

pressure sensing means at the starting block for sensing a plurality of pressure levels applied to the starting block by the runner and providing an output signal indicative of sensed pressure levels;

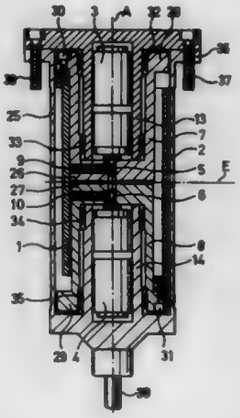
processing means connected with said pressure sensing means to receive said output signal for processing said signal to measure a time interval from at or after the start signal to the occurrence of at least one of said plurality of pressure levels; and

indicating means connected with said processing means for indicating at least said time interval measurement.

5,467,653
APPARATUS FOR UNBALANCE COMPENSATION OF A GRINDING WHEEL

Eugen Lulay, Bensheim, Germany, assignor to Hofmann Maschinenbau GmbH, Germany

Filed May 24, 1993, Ser. No. 64,983
Claims priority, application Germany, Jul. 9, 1992, 42 22 535.3
Int. Cl.[6] G01M 1/16
U.S. Cl. 73—469 12 Claims



1. An apparatus for compensating for unbalance in a grinding wheel rotatable about an axis of rotation, comprising:

first and second compensating weights rotatably disposed with symmetrical mass distribution relative to a central plane of said grinding wheel which is perpendicular to said axis of rotation;

first and second electric motors having motor shafts to produce different angular positions of said first and second compensating weights, respectively, said motor shafts being concentrically arranged with said axis of rotation; and

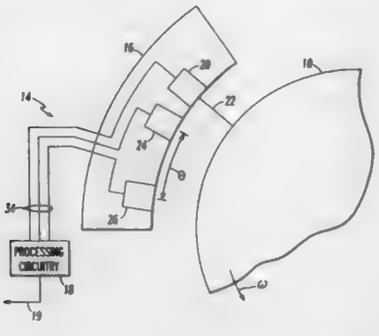
first and second rotating mounting sleeves rotatably mounted to guide said first and second compensating weights respectively through 360° about said axis of rotation, said first and second rotating mounting sleeves being drivingly connected to said motor shafts of said first and second electric motors respectively, said compensating weights being disposed at different radii from said axis of rotation so that the product of a mass of each of said first and second compensating weights and an associated radius of said radii is of at least substantially a same magnitude for each of said first and second compensating weights.

5,467,654

METHOD AND APPARATUS FOR DETERMINING THE OPERATING SPEED OF A RAIL VEHICLE

James P. Chew, Jeannette, and Robert E. Hamilton, Girard, both of Pa., assignors to Union Switch & Signal Inc., Pittsburgh, Pa.

Filed Dec. 20, 1993, Ser. No. 170,525
Int. Cl.[6] G01P *3/22*
U.S. Cl. 73—514.39 **19 Claims**



1. Apparatus for producing a speed reference for a rail vehicle having a rotatable wheel and axle assembly, said apparatus comprising:

laser source means for directing a laser beam on a selected portion of said rotatable wheel and axle assembly said laser beam defining said selected portion;

magnetic encoding means for impressing a magnetic signal on said selected portion of said rotatable wheel and axle assembly;

magnetic receiving means displaced from said magnetic encoding means by a selected angular displacement for detecting the presence of selected portion; and

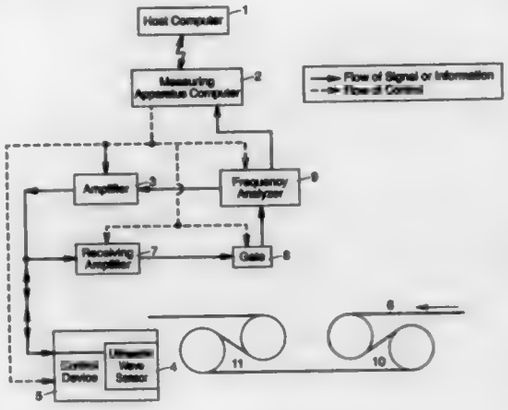
processing means in electrical communication with said magnetic encoding means and said magnetic receiving means for deriving said speed reference based on an angular velocity of said selected portion of said rotatable wheel and axle assembly.

5,467,655

METHOD FOR MEASURING PROPERTIES OF COLD ROLLED THIN STEEL SHEET AND APPARATUS THEREFOR

Takao Hyoguchi, and Katsuhiro Kawashima, both of Sagamihara, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 858,103, Mar. 26, 1992, abandoned.
This application Apr. 10, 1995, Ser. No. 419,968
Claims priority, application Japan, Mar. 27, 1991, 3-063142
Int. Cl.[6] G01N *29/12*; G01H *11/04*; *13/00*
U.S. Cl. 73—579 **5 Claims**



1. A method for measuring properties of a cold rolled thin steel sheet wherein said cold rolled thin steel sheet has a rolling direction and a thickness, with the thickness having a direction perpendicular to the rolling direction, said method comprising:

determining, as a first thickness resonant frequency, a resonant frequency of a first transverse ultrasonic wave propagating within the cold rolled thin steel sheet in the thickness direction, said first transverse ultrasonic wave being polarized in a direction parallel to the rolling direction;

determining, as a second thickness resonant frequency, a resonant frequency of a first longitudinal ultrasonic wave propagating within the cold rolled thin steel sheet in the thickness direction;

determining, as a first ratio, a ratio of said first thickness resonant frequency to said second thickness resonant frequency;

determining, as a third thickness resonant frequency, a resonant frequency of a second transverse ultrasonic wave propagating within the cold rolled thin steel sheet in the thickness direction, said second transverse ultrasonic wave being polarized in a direction normal to the rolling direction;

determining, as a second ratio, a ratio of said third thickness resonant frequency to said second thickness resonant frequency;

regarding as a constant value a third ratio, said third ratio being a ratio of a SHO plate wave velocity propagating within the cold rolled thin steel sheet in a direction at 45° to the rolling direction to a SHO plate wave velocity propagating within the cold rolled thin steel sheet in a direction parallel to or normal to the rolling direction;

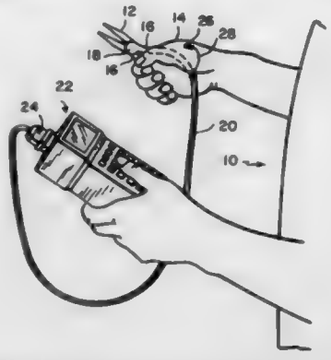
computing in-plane average value of Young's moduli and in plane average value of Lankford values of the cold rolled thin steel sheet from said three ratios and a known modulus of elasticity of a single crystal of iron.

5,467,656

MEASUREMENT SYSTEM FOR HAND TOOLS

Peter R. Teare, Westborough; Patrice L. Murphy, Mendon, and George E. Brogmus, Hopkinton, all of Mass., assignors to Liberty Mutual Insurance Co., Boston, Mass.

Filed Oct. 20, 1993, Ser. No. 139,546
Int. Cl.[6] G01L *1/00*
U.S. Cl. 73—862.541 54 Claims



38. A method for measuring forces exerted by a hand tool when the hand tool is used, the tool having a sensor which provides an input signal relating to the exerted force during a selected time period, the tool being used for a plurality of repetitions, the method comprising the steps of:

receiving the force signal when a force is exerted by the tool;

determining when a repetition occurs during a time period based on a slope or magnitude of the received force signal; and

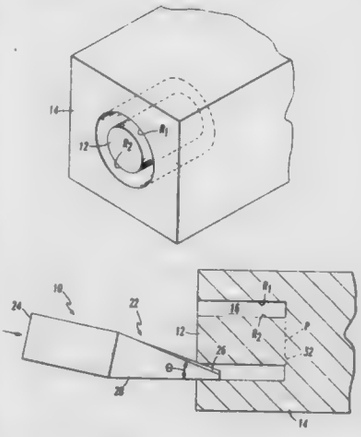
providing an output signal indicating a number of repetitions.

5,467,657

METHOD AND DEVICE FOR CORE SAMPLING STEEL

Tim Kakascik, Wintersville, Ohio, assignor to Wheeling Pittsburgh Steel Corporation, Wheeling, W. Va.

Filed Dec. 29, 1993, Ser. No. 174,981
Int. Cl.[6] G01N *1/04*
U.S. Cl. 73—864.44 4 Claims



1. A method of sampling a section of a metal object, comprising the steps of:

forming an annular kerf of outer radius R_1 upon said section of metal, such that an annular cavity surrounds a cylindrical sample of metal;

said sample having an outer radius R_2;

inserting into said kerf a tool having a rigid elongated shaft with a longitudinal axis and said shaft having a first end; said first end having a cylindrical, concave inner surface with a radius R_3, said first end having a cylindrical convex outer surface with a radius R_4, said inner and outer surfaces lying at an angle relative to one another such that said first end of said shaft is tapered and said first end of said shaft terminates in an arcuate edge;

urging said arcuate edge of said tool into said annular cavity such that said inner cylindrical surface is forcibly engaging said radius R_2 of said sample and said outer cylindrical surface is forcibly engaging said radius R_1 of said kerf;

administering a longitudinally-directed force upon a second end of said shaft until said cylindrical sample is separated from said section of metal; and

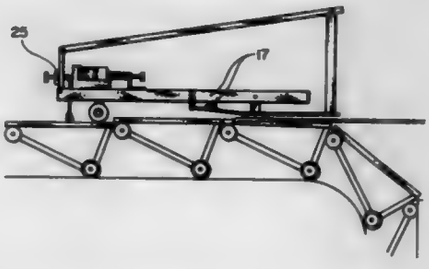
removing said sample from said cavity.

5,467,658

ESCALATOR DEFECTIVE ROLLER DETECTOR

Robert D. Buckalew, 4296 Drake Ct., Waldorf, Md. 20603, and Michael E. Neitzke, 3735 Tanyard Dr., Mechanicsville, Md. 20659

Filed Dec. 19, 1994, Ser. No. 358,931
Int. Cl.[6] G01B *5/28*
U.S. Cl. 73—865.9 16 Claims



1. A portable escalator testing device comprising:

a framework support means;

a step level detection means for detecting a change in vertical level of an escalator step;

a marking means operatively connected to said framework support means;

an indicator means operatively connected to said framework support means;

said framework support means supporting both said step level detection means and said marking means, and

wherein a detected change in said vertical level of said escalator step within a predetermined range actuates said indicator and/or marking means.

5,467,659

POWDER TESTER

David J. Young, Chorleywood, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 956,540, Oct. 5, 1992, abandoned.
This application Sep. 26, 1994, Ser. No. 313,523
Claims priority, application United Kingdom, Jan. 7, 1992, 9200215
Int. Cl.[6] G01N *33/00*
U.S. Cl. 73—866 11 Claims

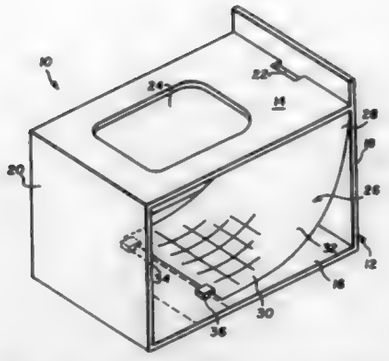
1. An apparatus for testing the handling properties of a sample of powder, comprising:

a frame;

a stationary test member mounted to the frame, the test member having a substantially curved test surface with an upper portion;

a grid marked on the test surface for deriving quantitative information about a sample of powder; and

means for introducing the sample of powder onto the upper portion of the test surface, such that the sample of powder moves downward along the test surface and comes to rest on



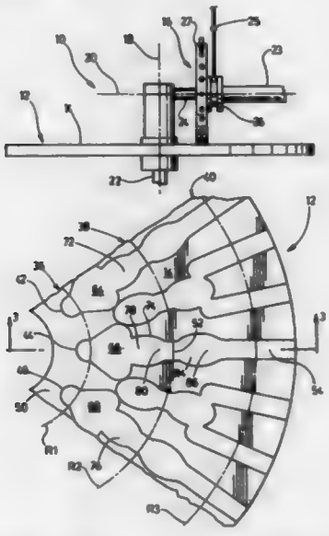
the grid, thereby allowing a quantitative derivation of information on the sample of powder.

5,467,660

VARIABLE-SPEED GEAR MECHANISM

Ivor Barens, 401 Markham Street, Toronto, Ontario, Canada

Filed Jun. 1, 1994, Ser. No. 252,223
Int. Cl.[6] F16H *3/24*
U.S. Cl. 74—351 **13 Claims**



1. In a variable-speed gear mechanism including a pinion which comprises a rotational axis, a multiplicity of radial coplanar pins equally spaced circumferentially by a predetermined arc distance, and means yieldably urging each of the pins radially from the pinion to a predetermined fully-extended state; a face gear which comprises a rotational axis substantially perpendicular to and intersecting the rotational axis of the pinion and an operative face structured to mesh with the pins of the pinion gear at a plurality of predetermined meshing radii, the operative face of the gear comprising an innermost meshing structure at a radially innermost one of the plurality of meshing radii and another meshing structure at a next larger one of the meshing radii; and means which support the pinion and the gear for rotation about their respective rotational axes and permit selective displacement of the pinion between the meshing radii, the improvement in which:

the innermost meshing structure comprises a multiplicity of sockets equidistant from the rotational axis of the gear and equally spaced circumferentially by an arc distance corresponding to the predetermined arc distance between the pins of the pinion;

each of the sockets comprises a pair of circumferentially opposing wall portions that are substantially axially oriented, an axial opening facing axially outwardly from the operative face of the gear, and a lateral opening extending circumferentially between the wall portions, the lateral opening facing radially outwardly relative to the rotational axis of the gear and being dimensioned to permit passage of any one of the pins in its fully-extended state laterally between the wall portions when the pinion is meshed with the meshing structure, the pair of opposing wall portions being spaced to prevent relative circumferential displacement of the received pin; and,

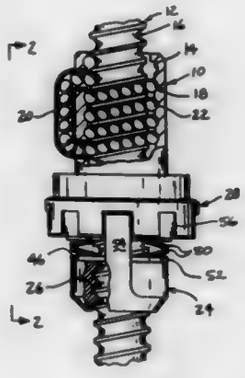
each of the sockets is associated with a recessed surface portion in the operative face of the gear, each of the recessed surface portions extending radially outwardly from an axial bottom of the lateral opening of the associated socket and extending in both circumferential directions relative to the lateral opening of the associated socket, each of the recessed surface portions spanning a sector of the gear which is greater than the sector spanned by the opposing wall portions of the associated socket and permitting unobstructed displacement of any of the pins to and from the lateral opening of the associated socket as the pinion rotates in meshed relationship with the innermost meshing structure.

5,467,661

BALL NUT AND SCREW ASSEMBLY WITH BACKDRIVE CONTROL

David A. Lange, Bay City, Mich., assignor to Thomson Saginaw Ball Screw Company, Inc., Saginaw, Mich.

Filed Apr. 25, 1994, Ser. No. 232,390
Int. Cl.[6] F16H *55/18*
U.S. Cl. 74—441 **9 Claims**



1. A ball nut and screw assembly with backdrive control comprising a screw, a nut received on said screw, said nut and screw having complementary helical ball receiving grooves compositely forming a raceway, balls operable in said raceway to effect relative translation of said nut and screw on relative rotation thereof wherein the translation is in a backdrive direction when the torque developed on said nut and screw by a static axial load is less than a resisting torque acting on said nut and screw, said raceway being provided with ball return portions for recirculating said balls, a backdrive control member received on said screw, said backdrive control member having an internal helical thread complementary to and engaging within the helical ball receiving groove on said screw, a spring device for urging said backdrive control member and nut axially apart to enforce frictional drag between said internal thread on said backdrive control member and said helical groove on said screw in opposition to said backdrive translation, and releasable indexable coupling means for releasably coupling said backdrive control member in a plurality of relative angular and thereby spaced apart positions on said screw whereby said backdrive control member is indexable on said screw relative to said nut to adjust the compression of said spring device to prevent said backdrive translation, said releasable indexable coupling means comprising a collar mounted externally on said nut for conjoint rotation with said nut and a limited axial translation

thereon, said backdrive control member and said collar having axially engageable and disengageable tangs and notches for releasably coupling said backdrive control member to said collar and preventing relative rotation thereof, and a resilient member reactable between said collar and nut for normally holding said collar in a position in which said tangs and notches are in axially interengaged locking engagement while permitting axial withdrawal of said collar from said interengaged locking engagement to free said backdrive control member for rotation and axial displacement on said screw.

5,467,662

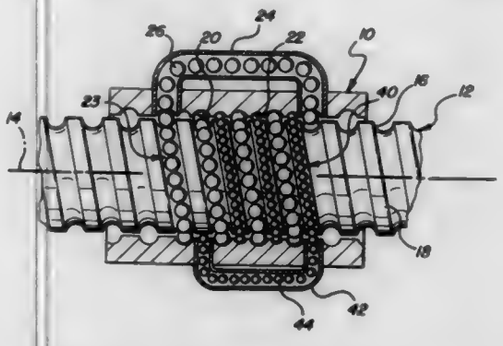
BALL NUT AND SCREW ASSEMBY WITH ENHANCED RADIAL LOAD CAPACITY

David A. Lange; Robert L. Benton, both of Bay City; William E. Welling, Saginaw, all of Mich., and Peter R. Mugglestone, Northport, N.Y., assignors to Thomson Saginaw Ball Screw Company, Inc., Saginaw, Mich.

Filed Apr. 20, 1994, Ser. No. 230,330

Int. Cl.[6] F16H *25/22*

U.S. Cl. 74—459 **20 Claims**



1. A ball nut and screw assembly comprising a screw, a nut received on said screw, a first recirculating raceway having a helical portion defined between said screw and nut and a plurality of first balls for cooperatively effecting relative translation of said nut and screw on relative rotation thereof wherein essentially all axial loading of said nut and screw is taken through said first balls, said first raceway extending axially helically over a predetermined axial extent of said nut, and a second recirculating raceway having a helical portion defined between said screw and nut and a plurality of second balls for co-operatively establishing a radial lashless condition between said nut and screw and isolating essentially all radial loading of said nut, said second raceway being helically interwoven with said first raceway in said predetermined extent of said nut.

5,467,663

CONTROL CABLE FOR A VEHICLE SYSTEM

Jon D. Trowbridge, East Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jul. 19, 1993, Ser. No. 93,024

Int. Cl.[6] G05G *1/24;11/00;* **B62L** *5/18*

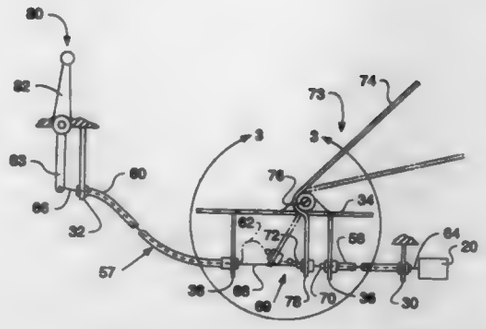
U.S. Cl. 74—481 **5 Claims**

1. An arrangement for controlling a vehicle from two separate inputs, comprising:

a flexible cable assembly includes a first outer sleeve, a second outer sleeve, and a central wire extending through the first and second outer sleeves, the central wire has a first end portion connected to the vehicle system, a second end portion and an intermediate portion having an exposed portion, said exposed portion having first and second stops fixedly attached thereto;

first means for moving the central wire to control the vehicle system, the first means being attached to the intermediate portion of the central wire and said second stop being adapted to contact said first means; and

second means for moving the central wire to control the vehicle system, the second means being attached to the second end portion of the central wire.



5,467,664

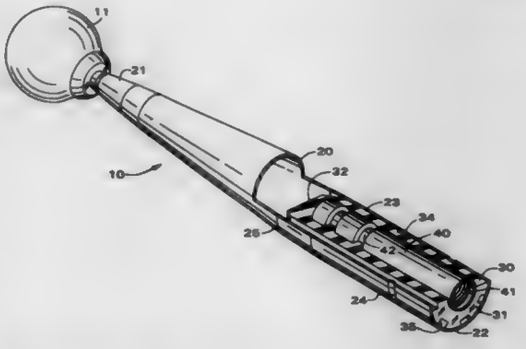
NOISE ABATING VEHICLE TRANSMISSION SHIFT LEVER

Timothy D. Wehner, Port Huron, Mich., assignor to Black River Manufacturing, Inc., Port Huron, Mich.

Filed Jul. 26, 1993, Ser. No. 97,134

Int. Cl.[6] G05G *1/04;25/02*

U.S. Cl. 74—523 **13 Claims**



10. An insert member for installation in an automotive transmission shift lever wherein,

said insert member comprises outer resilient member means and inner attachment means,

said resilient member means shaped generally cylindrically having a closed end and an open end providing a preselected volume and formed from material of a predetermined hardness,

said resilient member means having a truncated cone section at said closed end, an intermediate tapered section and a section of substantially constant diameter terminating at said open end,

said resilient member means having a continuous outer circumferential surface adaptable for installation in said transmission shift lever,

said resilient member means having a plurality of longitudinal grooves formed therein,

said inner attachment means disposed within and substantially encapsulated by said resilient member means and having an exposed free end, and

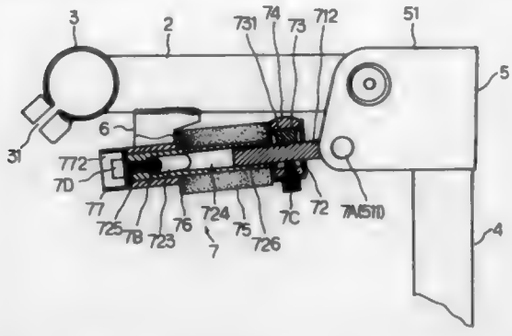
connection means disposed at said free end of said attachment means for releasable securement of said shift lever to an automotive transmission so as to provide a predetermined rigidity in said shift lever and thereby achieve a desired shift feel capability.

5,467,665

ADJUSTABLE, SHOCK-ABSORBING BICYCLE HANDLEBAR MOUNTING HARDWARE

Yuan-Hsin Huang, No. 18, Lun Tzu Chiao Road, Hsihu Town, Changhua County, Taiwan, Prov. of China

Filed Aug. 31, 1994, Ser. No. 298,949
Int. Cl.[6] **B62K** *21/14;21/16*
U.S. Cl. 74—551.2 **1 Claim**



1. A bicycle handlebar mounting hardware comprising:

a coupling fixed to a stem on a head tube of a bicycle frame, having substantially U-shaped coupling portion, said U-shaped coupling portion having a first pair of pivot holes and a second pair of pivot holes at a lower elevation than that of said first pair of pivot holes;

an extension bar having a rear end pivotally connected between said first pair of pivot holes by a pivot and a front end terminating in a handlebar holder to hold a handlebar, said extension bar comprising a downward lug adjacent to said handlebar holder, said downward lug having two parallel supporting walls and a rivet connected between said parallel supporting walls;

a headed connecting bar turned about the rivet between said two parallel supporting walls, said headed connecting bar comprising a head, a cylindrical rod section extended from said head, a longitudinal center through hole through said head and said cylindrical rod section, a screw hole at one end of the longitudinal center through hole of said headed connecting bar remote from said head, an oblong hole on said cylindrical rod section, which receives the rivet between said two parallel supporting walls, a plane on said head, and an opening through said head;

a coupling block mounted around said cylindrical rod section of said headed connecting bar and turned about the rivet between said parallel supporting walls of said downward lug of said extension bar, said coupling block having a longitudinal through hole, which receives said cylindrical rod section of said headed connecting bar, and a countersunk hole longitudinally communicated with the longitudinal through hole of said coupling block;

a first headed screw bolt inserted into the countersunk hole on said coupling block and threaded into the screw hole at said one end of said headed connecting bar;

a brake holder received in the opening on the head of said headed connecting bar, having a screw hole on one end thereof and a through hole intersecting with the longitudinal center through hole of said headed connecting bar;

a second headed screw bolt having a head stopped outside the plane on the head of said headed connecting bar and a screw bolt body threaded into the screw hole on said brake holder;

a brake block in the shape of a half-round rod having teeth on a flat bottom wall thereof said brake block disposed within said through hole of said brake holder;

a T-bar having a head pivotally connected between said second pair of pivot holes on said U-shaped coupling portion of said coupling by a rivet, and a rack perpendicularly extended from the head of said T-bar and inserted into the longitudinal center through hole on said headed connecting bar and into the through hole of said brake holder and meshed with the teeth of said brake block;

a cylindrical cushion mounted around the cylindrical rod section of said headed connecting bar and stopped between the head of said T-bar and the head of said headed connecting bar; and

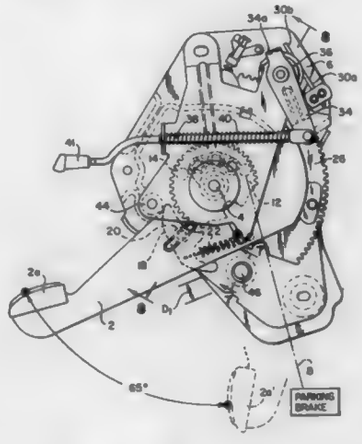
a washer mounted around said cylindrical rod section of said headed connecting bar and stopped between said cylindrical cushion and the coupling block.

5,467,666

NON-JAMMING SLEF-ADJUST PAWL AND RATCHET MECHANISM

Wayne L. Soucie, Columbia; Larry B. Champ, Cairo; Jeffrey E. Tayon, Moberly; Harold L. Carlson, Moberly; Steven W. Marek, Moberly, and Peter C. Koenig, Moberly, all of Mo., assignors to Dura Automotive Systems, Inc., Troy, Mich.

Filed Jul. 7, 1994, Ser. No. 271,723
Int. Cl.[6] **C22B** *9/00;* **C21C** *7/10*
U.S. Cl. 74—575 **10 Claims**



1. A parking brake system of the self-adjust type for automatically removing slack from a parking brake cable, comprising:

(a) a housing (**6**, **106**, **206**);

(b) an operating lever (**2**, **102**, **202**) pivotally connected with said housing for movement between brake-released and brake-engaged positions;

(c) means (**28**,**30**; **180**,**188**; **280**,**288**) for releasably maintaining said lever in said brake-engaged position relative to said housing; and

(d) self-adjust means for releasably connecting said cable with said lever so that cable tension is progressively increased as said lever is pivoted in the brake-applying direction, including:

(1) a cable track member (**12**, **112**, **212**) rotatably connected with said housing, said cable track member being adapted for connection with one end of the parking brake cable;

(2) an adjuster ratchet (**14**, **114**, **214**) connected with said cable track member said adjuster ratchet having a plurality of ratchet teeth;

(3) an adjuster pawl (**18**, **118**, **218**) pivotally connected with said lever, said adjuster pawl having a pawl tooth adapted for engagement with corresponding teeth on said ratchet in one of full engagement, partial tip-to-tip engagement, and non-load bearing top-on-top conditions, respectively;

(4) adjuster spring means (**16**, **116**, **216**) normally rotatably biasing said cable track member in the cable-slack-removing direction relative to said housing;

(5) cam-out means (**44**, **144**, **47**) mounted on said housing for pivoting said adjuster pawl to disengage the tooth thereof from said adjuster ratchet teeth when said operating lever is in the brake-disengaged position; and

(6) cam-in means (**46**, **146**; **47**, **218***c*) for pivoting said adjuster pawl toward a fully-engaged position relative to said adjuster ratchet, said cam-in means being spaced from said cam-out means a distance greater than the distance

between said cam-out means and the point of travel T_4 of said lever at which the force vector (V_c) produced by the progressively increasing cable tension exceeds the sum of the opposing adjuster spring force (V_{ar}) and the pedal force (V_p), thereby to effect slight displacement of said adjuster pawl relative to said adjuster ratchet, whereby the occurrence of a tip-on-tip condition at the time of cam-in operation is prevented.

5,467,667

EPICYCLIC CHANGE-SPEED GEARBOX CASING WITH A SPIRAL PARTITION WALL

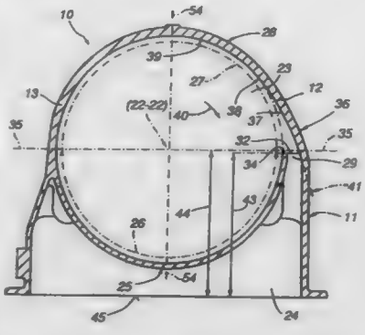
Wolfgang Zaiser, Steinheim, and Hans Merkle, Stuttgart, both of, Germany, assignors to Mercedes-Benz AG, Germany

Filed Nov. 18, 1993, Ser. No. 154,360

Claims priority, application Germany, Nov. 18, 1992, 42 38 855.4

Int. Cl.[6] F16H 57/04

U.S. Cl. 74—606 R **17 Claims**



1. A gearbox casing for an epicyclic change-speed gearbox, comprising two casing wall parts branching off upwards from a base part open towards a bottom thereof in an installed position and arranged on both sides of a casing longitudinal axis coinciding with a central main axis of rotation of rotating gearbox parts and extending in a direction of the casing longitudinal axis so as to enclose therebetween a casing interior accommodating the rotating gearbox parts of the epicyclic change-speed gearbox, in which the rotating gearbox parts define an outer rotating boundary, and forming a unitary cylindrical casing outer part, and a casing inner part arranged in the casing interior in a rotationally fixed manner relative to the base part and extending along a lower portion of the outer rotating boundary of the rotating gearbox parts, and one region of the casing interior enclosed by the base part said casing inner part being configured as an intermediate solid wall extending from one of the two casing wall parts toward the other of the two casing wall parts to partition off another region of the casing interior which accommodates the rotating gearbox parts from the one region of the casing interior enclosed by the base part and is open towards the bottom, the casing inner part being cylindrical and lying centrally with respect to the casing longitudinal axis, and the casing outer part and the casing inner part constituting a one-piece casing cylinder, and at least one outlet opening for lubricating oil arranged to connect the another region of the casing interior which accommodates the rotating gearbox parts to the one region of the casing interior and one wall surface of the casing cylinder contains an inner mouth of the at least one outlet opening, said inner mouth lying in the another region of the casing interior which accommodates the rotating gearbox parts at an upper free end of the casing inner part, wherein the wall surface containing the inner mouth is opposite a casing bulge defined by an inner wall surface which starts from a point on an inner wall of the cylindrical casing outer part lying ahead of the inner mouth in relation to a forward rotation direction of the rotating gearbox parts, and follows a spiral curve away from the casing longitudinal axis in a circumferential direction of the central main axis of rotation corresponding to the forward rotation direction.

5,467,668

POWERTRAIN FOR AN AUTOMOTIVE VEHICLE

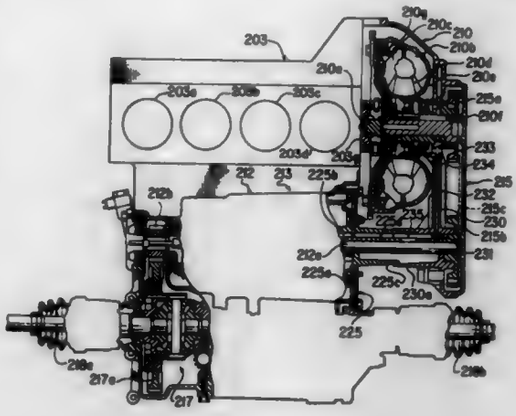
Osamu Kameda; Hitoshi Akutagawa, both of Hiroshima; Junichi Okita, Iwakuni, and Ichiro Hirose, Hiroshima, all of, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Division of Ser. No. 857,579, Mar. 25, 1992, Pat. No. 5,309,789. This application Jan. 14, 1994, Ser. No. 181,502

Claims priority, application Japan, Mar. 25, 1991, 3-060516; Mar. 25, 1991, 3-060532; Mar. 25, 1991, 3-060533; Jul. 31, 1991, 3-192255; Feb. 13, 1992, 4-026400

Int. Cl.[6] F16H 57/02

U.S. Cl. 74—606 R **11 Claims**



1. A structure of a powertrain disposed in an engine compartment of an automotive vehicle comprising:

an engine placed within the engine compartment and having a crankshaft directed in a transverse direction of a vehicle body;

a transmission placed within the engine compartment, said transmission having an input shaft and an output shaft which are arranged coaxially with each other and directed parallel to said crankshaft;

a torque converter disposed adjacent to said engine, said torque converter being directly connected to said crankshaft;

power transfer means, disposed opposite to said engine with respect to said torque converter, for operationally transferring power from said torque converter to said input shaft of said transmission so as to transmit an output from said engine to said transmission; and

casing means, having first, second and third chambers, for accommodating said transmission, said torque converter and said power transfer means separately in said first, second and third chambers, respectively, said first and second chambers being connected by an oil passage through which said input shaft extends from said transmission to said power transfer means.

5,467,669

CUTTING TOOL INSERT

Donald S. Stroud, Montgomery, Tex., assignor to American National Carbide Company, Tomball, Tex.

Continuation-in-part of Ser. No. 56,833, May 3, 1993, abandoned. This application Apr. 5, 1995, Ser. No. 417,435

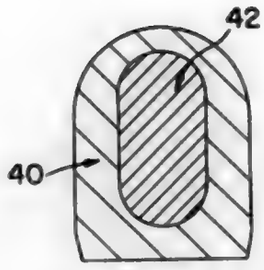
Int. Cl.[6] B21K 5/02

U.S. Cl. 76—108.2 **7 Claims**

1. A method for forming a hard metal insert for being accommodated within a socket opening of a drill bit and having a cutting tip projecting therefrom, comprising

creating a first mixture of a carbide material and a binder material suitable for making an inner body of the insert,

creating a second mixture of a carbide material and a binder material suitable for making an outer body of the insert wherein said inner body mixture is comprised of material



having a particle grain size and/or chemical composition with respect to said outer body mixture to establish the inner body as tougher than the outer body and to establish the outer as harder than the inner body,

compressing the first mixture to form a homogeneous inner body,

encapsulating the inner body within the second mixture so that the outer body is homogeneous and of at least approximately equal thickness around the inner body at the cutting tip of the insert, and

sintering the insert so that the homogenous materials of the inner and outer bodies blend together without a distinct separation or interface layer therebetween.

5,467,670

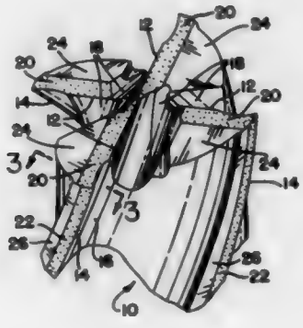
METHOD OF MANUFACTURE FOR ROTARY CUTTING TOOL

John Alverio, Macomb Township, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 15, 1994, Ser. No. 288,710

Int. Cl.[6] B21K *5/02*

U.S. Cl. 76—108.6 **1 Claim**



1. A method for manufacturing a rotary cutting tool of the type having a plurality of sharp cutting edges, each of which is formed by the intersection of a relief surface trailing said cutting edge and a rake surface leading said cutting edge, and in which the base material of said tool is a carbide material in which sharp edges are subject to embrittlement if treated at temperatures above a predetermined threshold, comprising the steps of,

grinding all surfaces of said tool to a final shape but for said relief surface, which is rough ground initially,

coating said tool surfaces by chemical vapor deposition with a layer of wear resistant material at a temperature above said predetermined threshold,

finish grinding said relief surface to sharpen said cutting edge and remove embrittled material from said edge, and,

coating said finish ground relief surface with a different wear resistant material at a temperature below said threshold temperature.

5,467,671

FLUID-OPERATED TORQUE TOOL

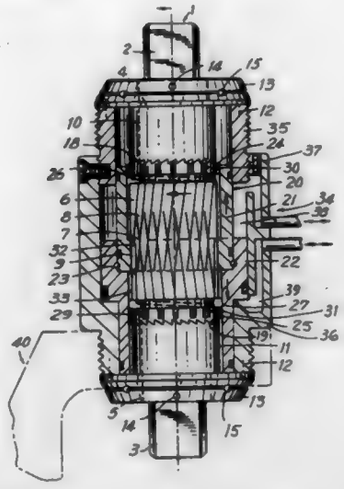
John K. Junkers, 7 Arrowhead Ln., Saddle River, N.J. 07540

Continuation of Ser. No. 112,770, Aug. 26, 1993, Pat. No. 5,429,017, which is a continuation-in-part of Ser. No. 812,629, Dec. 23, 1991, abandoned. This application Nov. 14, 1994, Ser. No. 338,330

The portion of the term of this patent subsequent to Jul. 4, 2012, has been disclaimed.

Int. Cl.[6] B25B *13/00*

U.S. Cl. 81—57.44 **4 Claims**



1. A fluid-operated torque tool for tightening and loosening threaded connectors, comprising an engaging element having an axis and turnable about said axis, and also having two axial ends with at least one of said ends formed to engage a threaded connector to be tightened or loosened; and a single driving element which is displaceable under the action of a working fluid axially relative to said engaging element in a consecutive order in one axial direction of said engaging element and then in another opposite axial direction of said engaging element and engages with said engaging element so that during a consecutive axial displacement of said single driving element first in said one axial direction of said engaging element and thereafter in said another opposite axial direction of said engaging element, said engaging element turns about said axis only in one circumferential direction and therefore tightens or loosens a threaded connector engaged by said engaging element.

5,467,672

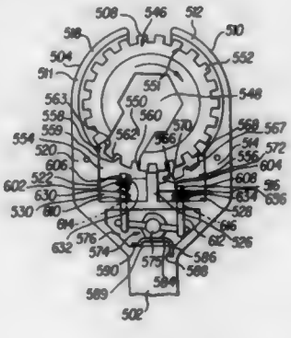
OPEN END RATCHET WRENCH

Earl T. Ashby, 3421 Saint Ann St., Owensboro, Ky. 42303

Continuation-in-part of Ser. No. 871,119, Apr. 20, 1992, abandoned. This application Aug. 31, 1993, Ser. No. 113,710

Int. Cl.[6] B25B *13/46*

U.S. Cl. 81—58.2 **5 Claims**



1. An open end reversible wrench, comprising:
a head having an aperture;
an operating jaw journaled for rotation in said aperture, said jaw having a nut-engaging opening, a slot extending from said nut- engaging opening to the peripheral surface of said jaw, and a ratchet having ratchet teeth formed in said peripheral surface from one side of said slot to the other side thereof;
a pair of reciprocating ratchet pawls, one for allowing rotation of said jaw in a clockwise direction and for blocking rotation in a counterclockwise direction and the other for allowing rotation of said jaw in a counterclockwise direction and for blocking rotation in the clockwise direction, said ratchet pawls each having a plurality of projecting pawl teeth;
a pair of guide means, one for guiding said one ratchet pawl along a first rectilinear path parallel to and on one side of the longitudinal axis of said wrench and the other for guiding said other ratchet pawl along a second rectilinear path parallel to and on the other side of said longitudinal axis of said wrench; and
single control means for selectively engaging said one of said pawls with said ratchet for rotation of said jaw in said clockwise direction or said other of said pawls with said ratchet for rotation of said jaw in said counterclockwise direction, no more than a single pawl being engaged with said ratchet at any one time, said single control means comprising a control shaft, a handle for rotating said control shaft, and linkage means coupling said control shaft to said pawls, said control shaft having a first position causing said linkage means to position said one pawl in engagement with said ratchet and said other pawl out of engagement with said ratchet, a second position causing said linkage means to position said one pawl out of engagement with said ratchet and said other pawl in engagement with said ratchet, and a third position causing said linkage means to position both pawls out of engagement with said ratchet.

5,467,673

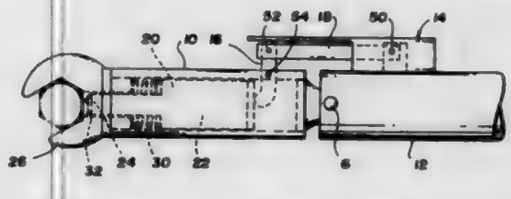
Patent Not Issued For This Number

5,467,674

COMBINED TORQUE LIMITING AND MARKING WRENCH

Brent Thorn, 280 S. Center, Northville, Mich. 48167

Filed Aug. 9, 1994, Ser. No. 287,968
Int. Cl.[6] B25B *23/145*
U.S. Cl. 81—468 **2 Claims**



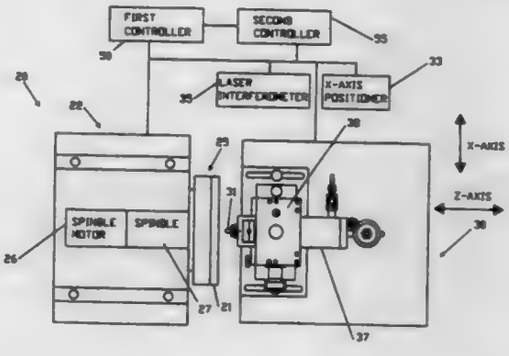
1. An improved torque limiting and part marking wrench of the type having:
a torque-applying handle;
a housing pivotally mounted at a first end to the torque-applying handle, said housing adapted to receive a releasably mounted, replaceable, part-engaging head assembly at a second end thereof;
a part-marking mechanism mounted within said housing; and
said part-marking mechanism including a marking tip that passes through a bore in said head assembly for reciprocal movement within said bore, and being extendible outwardly from said housing for marking a part in said part engaging head assembly;
the improvement comprising;
a mechanical linkage arm pivotally connected to the torque-applying handle; and
a pivotable cam having first and second ends, said cam being pivotally connected at said first end to said linkage arm, and in operative engagement at said second end with said part-marking mechanism for moving said marking tip through said bore toward said part to be marked, and said cam being pivotally connected at a point between said first and second ends to said housing, such that, when torque on a part has reached a predetermined value the torque-applying handle releases and pivots about a pivot joint, the torque applying handle moves the linkage arm, which pivots the pivotable cam, thus forcing the second end of the pivotable cam against the part marking mechanism, which causes the marking tip to extend outwardly from said housing to mark the part.

5,467,675

APPARATUS AND METHOD FOR FORMING A WORKPIECE SURFACE INTO A NON-ROTATIONALLY SYMMETRIC SHAPE

Thomas A. Dow; Kenneth P. Garrard; George M. Moorefield, II, all of Raleigh, and Lauren W. Taylor, Cary, all of N.C., assignors to North Carolina State University, Raleigh, N.C.

Continuation of Ser. No. 138,163, Nov. 15, 1993, abandoned.
This application Feb. 24, 1995, Ser. No. 393,890
Int. Cl.[6] B23B *5/24;5/40;1/00*
U.S. Cl. 82—1.11 **36 Claims**



1. An apparatus for shaping a workpiece surface to a predetermined non-rotationally symmetric shape, said apparatus comprising:
spindle means for rotating the workpiece about an axis;
spindle sensing means for sensing an angular position of the rotating workpiece;
shaping means cooperating with said spindle means for removing portions of the rotating workpiece to shape the workpiece surface into the predetermined non-rotationally symmetric shape, said shaping means comprising a cutting blade, radial positioning means for relatively positioning said cutting blade and said rotating workpiece along a radial direction relative to the axis of the rotating workpiece, and transverse positioning means for relatively positioning said cutting blade and said rotating workpiece along a transverse direction to the radial direction;
radial and transverse position sensing means for sensing respective relative radial and transverse positions of said cutting blade and the workpiece, and
control means cooperating with said spindle means and said shaping means for positioning said cutting blade in predetermined varying transverse positions during a revolution of the workpiece responsive to the radial and transverse position sensing means and the spindle sensing means to form the workpiece surface into the predetermined non-rotationally symmetric shape, said control means comprising

shape component generating means for generating both aspherical and non-rotationally symmetric shape components together defining the predetermined non-rotationally symmetric shape,

a first controller comprising means for controlling said spindle means and said shaping means for forming an aspherical surface based upon corresponding aspherical shape components, and

a second controller comprising means for controlling said spindle means and said shaping means for forming the predetermined non-rotationally symmetric shape from corresponding non-rotationally symmetric shape components.

5,467,676

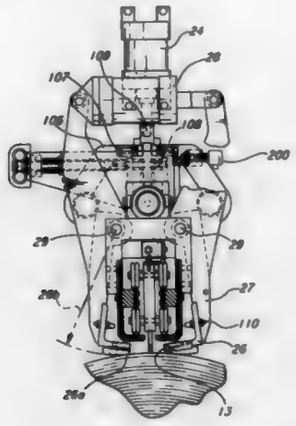
AUTOMATIC ROLL WRAPPER REMOVING APPARATUS AND METHOD

Steven C. Hooper, Hoquiam, and Norman E. Dornblaser, Shelton, both of Wash., assignors to Lamb-Grays Harbor Co., Hoquiam, Wash.

Continuation-in-part of Ser. No. 744,292, Aug. 13, 1991, abandoned. This application Jul. 14, 1993, Ser. No. 91,611

Int. Cl.[6] B26D 7/14

U.S. Cl. 83—24 29 Claims



1. A method of cutting and removing a wrapper from a cylindrical roll having a protective wrapper around substantially the entire surface of the circumference of the roll, comprising:

positioning a cylindrical roll with a wrapper having an outer surface at a wrapper removing station;

rotating the roll about its longitudinal axis at the removing station until the outer end of the wrapper is located with respect to a predetermined cutting path to position two spaced portions of the outer surface of the wrapper on opposite sides of the cutting path;

pushing said two spaced portions against the roll and toward each other along a pushing plane intersecting the roll to pinch the wrapper and push it outwardly of the roll into a raised bubble having an exposed crown extending radially outwardly of said pushing plane;

moving a blade through the bubble radially outwardly of the pushing plane that intersects the roll to cut the wrapper by cutting through the crown; and

removing the cut wrapper.

5,467,677

CUTTING APPARATUS

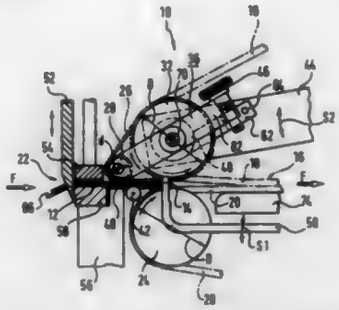
Robert D. Kinson, Jr., Sidney, Ohio, assignor to Baumfolder Corporation, Sidney, Ohio

Filed Jul. 16, 1993, Ser. No. 92,641

Claims priority, application Germany, Jul. 17, 1992, 9209633 U

Int. Cl.[6] B26D 5/20

U.S. Cl. 83—155 32 Claims



1. Apparatus for transporting a product bound in a booklet-like manner so that a bound-spine end may be inserted into a cutting mechanism and be transported therethrough, said apparatus comprising:

a transport means for transporting said product between a first position serving for front trimming and a second position serving for foot-and-head trimming, the transport means including at least one pair of main transport bands guided about a main deflection roll located adjacent said cutting mechanism; and,

at least one synchronously drivable auxiliary-transport band guided about an auxiliary drive that is connected to said main deflection roll about an auxiliary deflection roll that is located closer to said cutting mechanism than said main deflection roll, the diameter of said auxiliary deflection roll being less than the diameter of said main deflection roll.

5,467,678

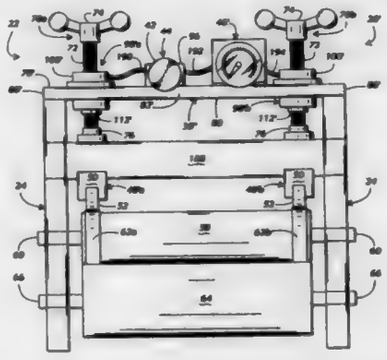
APPARATUS FOR AUTOMATICALLY APPLYING EQUALIZED PRESSURE TO A ROTARY CUTTING DIE

Josef A. Stollenwerk, 344 Spring Branch Dr., Canton, Ga. 30115

Continuation-in-part of Ser. No. 129,871, Sep. 30, 1993, abandoned, and a continuation-in-part of Ser. No. 111,475, Aug. 25, 1993, abandoned. This application Feb. 7, 1994, Ser. No. 192,713

Int. Cl.[6] B26D 1/62

U.S. Cl. 83—344 2 Claims



1. In a press assembly comprising a frame; a rotary anvil connected to the frame and including a first end and a second end; a rotary cutting die disposed above the rotary anvil, connected to the frame, and including a first end adjacent to the first end of the

rotary anvil and a second end adjacent to the second end of the rotary anvil; a pressure bar disposed above the rotary cutting die and including a first end proximate to and for interacting with the first end of the rotary cutting die, and a second end proximate to and for interacting with the second end of the rotary cutting die; a bridge bar disposed above the pressure bar and connected to the frame; and a pair of jackscrews movably connected to the bridge bar, wherein the press assembly is so constructed and arranged that upon proper operation, respectively, of a first jackscrew and a second jackscrew of the pair of jackscrews, the first jackscrew functions to apply a force to the pressure bar proximate to the first end of the pressure bar and the second jackscrew functions to apply a force to the pressure bar proximate to the second end of the pressure bar; and wherein the pressure bar translates the forces applied thereto to the rotary cutting die in the form of a first force applied proximate to the first end of the rotary cutting die and a second force applied proximate to the second end of the rotary cutting die so that pressure is applied between the rotary cutting die and the rotary anvil, wherein an improvement thereto comprises:

a first hydraulic actuator constructed and arranged to interact with the first jackscrew to develop a first hydraulic pressure that corresponds to the first force,

wherein said first hydraulic actuator includes a first cylinder connected to the bridge bar and a first piston movably connected to said first cylinder,

wherein said first hydraulic actuator is so constructed and arranged to, in response to increases in the force applied by the first jackscrew, cause said first piston to move relative to said first cylinder such that said first hydraulic pressure increases,

wherein said first hydraulic actuator is so constructed and arranged to, in response to decreases in the force applied by the first jackscrew, allow said first piston to move relative to said first cylinder so that said first hydraulic pressure decreases, and

wherein said first piston defines a first bore therethrough and the first jackscrew extends through said first bore and threadedly engages said first piston in a manner that facilitates movement of the first jackscrew relative to said first piston,

a second hydraulic actuator constructed and arranged to interact with the second jackscrew to develop a second hydraulic pressure that corresponds to the second force,

wherein said second hydraulic actuator includes a second cylinder connected to the bridge bar and a second piston movably connected to said second cylinder,

wherein said second hydraulic actuator is so constructed and arranged to, in response to increases in the force applied by the second jackscrew, cause said second piston to move relative to said second cylinder such that said second hydraulic pressure increases,

wherein said second hydraulic actuator is so constructed and arranged to, in response to decreases in the force applied by the second jackscrew, allow said second piston to move relative to said second cylinder such that said second hydraulic pressure decreases, and

wherein said second piston defines a second bore therethrough and the second jackscrew extends through said second bore and threadedly engages said second piston in a manner that facilitates movement of the second jackscrew relative to said second piston,

wherein said first hydraulic actuator and said second hydraulic actuator are in fluid communication so that said first hydraulic pressure and said second hydraulic pressure are equalized, whereby said first hydraulic pressure equals said second hydraulic pressure to define a system hydraulic pressure, and

wherein said first hydraulic actuator and said second hydraulic actuator are so constructed and arranged that when said first hydraulic pressure equals said second hydraulic pressure, the first force equals the second force,

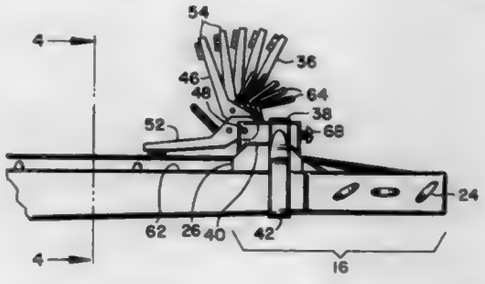
whereby the first force and the second force are automatically equalized, whereby the pressure between the rotary cutting die and the rotary anvil proximate to the first ends thereof is substantially similar to the pressure between the rotary cutting die and the rotary anvil proximate to the second ends thereof, whereby the pressure distribution between the rotary cutting die and the rotary anvil is substantially uniform.

5,467,679

DISCRETE STRING DAMPER FOR A GUITAR

Bradley R. Schmidt, 977 River Rd., Windom, Minn. 56101

Filed Apr. 27, 1995, Ser. No. 429,789
Int. Cl.[6] G10D *3/14*
U.S. Cl. 84—312 R **19 Claims**



1. A damper device for use on a guitar having a body coupled to a headstock by way of a neck, said guitar having six strings extending from said body, along said neck and attached to said headstock, said damper device comprising:

a base adapted for attachment to said headstock; and

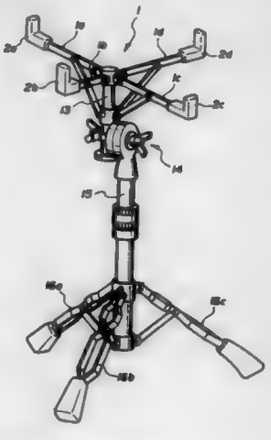
six dampers corresponding to said six strings, said six dampers being pivotally connected to said base, each of said six dampers having two positions of equilibrium including a closed position and an open position, each of said six dampers being independently repositionable to said closed position and said open position, wherein said closed position and said open position respectively correspond to engagement and disengagement of one of said six dampers with one of said six strings.

5,467,680

SNARE DRUM STAND

Makoto Kurosaki, Shizuoka, Japan, assignor to Yamaha Corporation, Japan

Filed Apr. 12, 1993, Ser. No. 191,558
Claims priority, application Japan, Apr. 10, 1992, 4-091236
Int. Cl.[6] G10D *13/02*
U.S. Cl. 84—421 **3 Claims**



1. A snare drum stand comprising:

an upright center post;

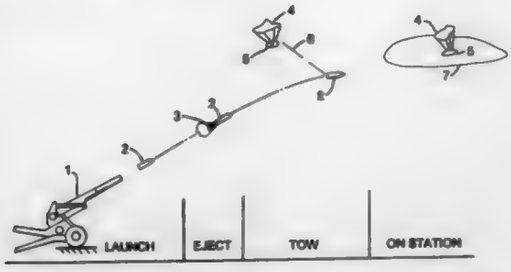
a support connected to a lower end of said center post;
four radial arms extending radially outwards from a common point and in a common plane for supporting a snare drum with 90 degree intervals between adjacent arms; and
arm holder means connected to said center post for mounting said arms over said center post.

5,467,681

CANNON LAUNCHED RECONNAISSANCE VEHICLE

Harold J. Liberman, Randolph, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 21, 1994, Ser. No. 281,797
Int. Cl.[6] F42B *10/00*
U.S. Cl. 89—1.11 **4 Claims**



1. An unmanned reconnaissance device which can be launched from conventional cannon artillery, and which device has an extended altitude feature, making available an extended time for reconnaissance of an area which is under surveillance, said device comprising:
a projectile having a surveillance cargo which comprises a reconnaissance payload suspended from a parafoil in which said parafoil includes a drogue chute, said chute being connected to said projectile by a line means, said projectile having means to eject said surveillance cargo from said projectile, said means to eject being initiated during flight by a preset fuze which initiates said ejection when said projectile is essentially at the highest point of its trajectory by releasing said drogue chute, and said drogue chute thereafter acting to pull out said parafoil which has attached thereto said reconnaissance payload, said parafoil also being attached to said line means to maintain its connection to said projectile, whereby said extended altitude feature is achieved inasmuch as said reconnaissance payload after ejection can reach an altitude higher than that of said projectile altitude, while still attached to said line means, through a kite-like action of the parafoil rising higher than said projectile, and said reconnaissance payload being suspended from said parafoil thereby also rising higher than said projectile.

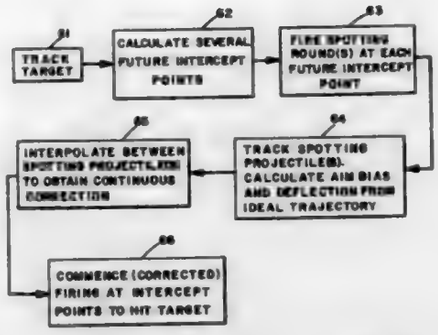
5,467,682

ACTION CALIBRATION FOR FIRING UPON A FAST TARGET

Herbert B. Brooks, Claremont, Calif., assignor to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Aug. 27, 1984, Ser. No. 644,748
Int. Cl.[6] F41G *3/02;3/06*
U.S. Cl. 89—41.22 **7 Claims**

1. A method for firing a computerized radar weapon system upon a fast target, which comprises;
computing an intercept point ahead of the target at which to stage an interception;
computing an extrapolated target track for the target along which to stage the interception;
computing an intercept point on the extrapolated track that is ahead of the target by a distance corresponding to the sum of



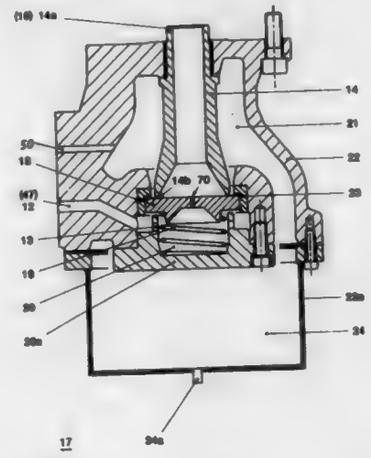
the time required to aim and fire a spotting round at the intercept point, the time required for a projectile from the spotting round to reach the intercept point after being fired, the time required to measure and analyze the aim of the spotting round, the time required to fire a correctly-aimed intercept round, and the time required for a projectile from the intercept round to reach the intercept point;
zeroing in on the intercept point with a spotting round before the interception; and then
firing a correctly-aimed round at the point in time to make the interception;
thereby reducing errors in aim caused by aim-biasing factors that vary in time and space.

5,467,683

ACTUATING DRIVE FOR A CONTROL VALVE

Heinz Frey, Menziken; Kamil Prochazka, Windisch, and Franz Suter, Gebenstorf, all of, Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Jun. 2, 1994, Ser. No. 253,250
Claims priority, application Germany, Jun. 24, 1993, 43 20 937.8
The portion of the term of this patent subsequent to Jul. 25, 2012, has been disclaimed.
Int. Cl.[6] F15B *13/04*
U.S. Cl. 91—442 **4 Claims**



1. An actuating drive for a control valve, the control valve having a control circuit for setting the actuating drive to correspond with a specified required value from an overriding installation control system, the actuating drive comprising:
a main cylinder;
a main piston slidably disposed in the main cylinder, the main piston and the main cylinder defining a drive volume on a first side of the main piston, and a buffer volume on a second side of the main piston, the buffer volume being connected with a drain appliance;

a plate valve fitted upstream of the drive volume, the plate valve being arranged in a spatially separate manner from the drive volume and being connected to the drive volume by a connecting conduit, the plate valve having a reservoir volume, the reservoir volume including a first volume and an intermediate volume connected directly to the drain appliance,

wherein pressurized fluid causes the main piston to slide in the main cylinder.

5,467,684

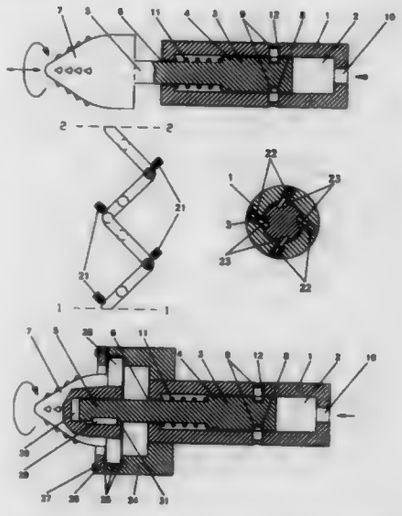
ROTARY PISTON DRIVING MECHANISM

Arieh Sher, 35 Spinoza St., Rehovot 76452, Israel

Continuation-in-part of Ser. No. 83,760, Jun. 30, 1993, Pat. No. 5,350,390, which is a continuation of Ser. No. 857,556, Mar. 25, 1992, abandoned. This application Aug. 3, 1993, Ser. No. 100,949

Int. Cl.[6] F01B *3/00*

U.S. Cl. 92—31 **19 Claims**



1. Apparatus for converting linear reciprocating motion of a piston in a housing to rotation of the piston in only one direction about its longitudinal axis, said apparatus comprising:

an endless wave-shaped guide groove defined in one of said piston and said housing and comprising a series of groove sections of generally alternating directions;

motion conversion means responsive to linear motion of said piston in said housing for causing said piston to rotate relative to said housing about said axis, said motion conversion means comprising at least one guide member secured in the other of said piston and said housing and projecting substantially radially and into said guide groove; and

directing means responsive to linear reciprocation of said piston for directing said guide member in a forward direction into circumferentially successive groove sections while preventing reverse directional movement of the guide member into a groove section that has been immediately previously traversed;

wherein each successive pair of said groove sections intersects at a respective apex, and wherein successive apices point in generally opposite longitudinal directions;

wherein said groove has first and second opposite side walls, wherein said guide member alternately bears forcefully against said first and second side walls in successive sections of said groove to define load bearing and non-load bearing side walls in each groove section, and wherein said directing means comprises:

at each apex on the load bearing side wall, a smooth arcuate section positioned symmetrically with respect to the longitudinal axis of the piston for effecting smooth redirected movement of the guide member therealong into the next successive groove section in said forward direction; and

at each apex on the non-load bearing side wall, a discrete directional transition positioned asymmetrically with respect to the longitudinal axis of the piston so as to be passed by said guide member in said groove before said guide member is redirected into the next successive groove section by said symmetrical arcuate section.

19. Apparatus for converting linear reciprocating motion of a piston in a housing to rotation of the piston in only one direction about its longitudinal axis, said apparatus comprising:

an endless wave-shaped guide groove defined in one of said piston and said housing and comprising a series of groove sections of generally alternating directions;

motion conversion means responsive to linear motion of said piston in said housing for causing said piston to rotate relative to said housing about said axis, said motion conversion means comprising at least one guide member secured in the other of said piston and said housing and projecting substantially radially and into said guide groove; and

directing means responsive to linear reciprocation of said piston for directing said guide member in a forward direction into circumferentially successive groove sections while preventing reverse directional movement of the guide member into a groove section that has been immediately previously traversed;

wherein each successive pair of said groove sections intersect at a respective apex, and wherein successive apices point in generally opposite longitudinal directions;

wherein said groove has first and second opposite side walls, wherein said guide member alternately bears forcefully against said first and second side walls in successive sections of said groove to define load bearing and non-load bearing surfaces in each groove section, and wherein said directing means comprises:

a plurality of recesses each defined in the load bearing surface adjacent the apex demarking the end of a respective groove section; and

a plurality of gate members disposed in respective recesses, each gate member being resiliently biased to project out from said recess and into said groove, and configured to be forced into said recess in opposition to said resilient bias by said guide member traversing said groove in a forward direction and passing said recess, said gate member blocking movement of said guide member through said groove in said reverse directional movement.

5,467,685

RODLESS PNEUMATIC CYLINDER HAVING A PAIR OF DRIVEN ELEMENTS

Werner Hubl, Xanten, Germany, assignor to Norgren Martonair GmbH, Alpen/Niederrhein, Germany

Filed Oct. 11, 1994, Ser. No. 320,656

Claims priority, application Germany, Jan. 12, 1993, 43 34 681.2

Int. Cl.[6] F01B *29/00*

U.S. Cl. 92—88 **15 Claims**

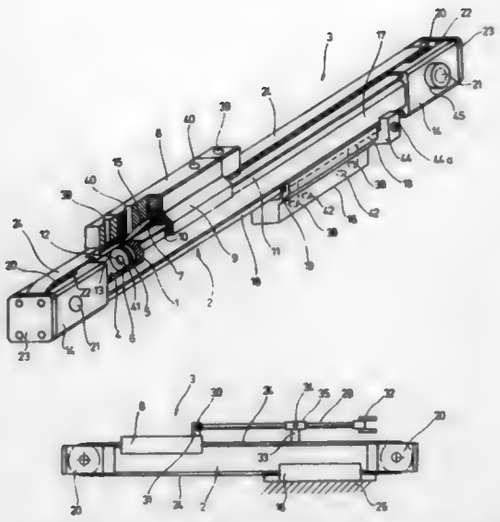
1. A fluid-powered linear actuator comprising:

a) a fluid-powered rodless cylinder including an elongate body and a piston reciprocably movable within a bore in said body upon the application of fluid pressure alternately to opposite ends of the piston;

b) a first element mounted externally of the body on or adjacent to one side thereof and reciprocably drivable by, and in the same direction as, the piston longitudinally of the body;

c) a second element mounted externally of the body on or adjacent to a side thereof opposite to said first side and reciprocably movable longitudinally of the body; and

d) flexible drive means connected to the first element or the piston and to the second element, the flexible drive means extending longitudinally of the body and around bearing means located at opposite ends of the body, whereby move-



ment of the piston in response to the application of fluid pressure thereto causes the second element simultaneously to move longitudinally of the body in a direction opposite to the direction of movement of the piston and the first element.

5,467,686

LINEAR DRIVE WITHOUT A PISTON ROD

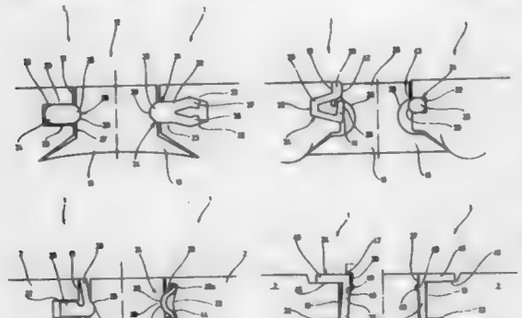
Reinhard Lipinski, Plochingen, Germany, assignor to Invest Tech AG, Rotkreuz, Switzerland

Filed Jan. 11, 1995, Ser. No. 371,556

Claims priority, application Germany, Jan. 11, 1994, 44 00 454.0

Int. Cl.[6] F01B *29/00*

U.S. Cl. 92—88 **21 Claims**



1. A linear drive, comprising:

a guide tube having a longitudinal slot defined therein by at least one flank, and at least one closing device for closing an end face of the guide tube;

a piston mounted in the guide tube and displaceable in a longitudinal direction;

a web connected to the piston and passing through the longitudinal slot;

a sealing band for sealing the longitudinal slot at least in pressurized regions and which is held fixedly at end faces relative to the guide tube, at least one portion of the sealing band being seated in the longitudinal slot; and

at least one separate profile element disposed in the longitudinal slot and extending essentially along a longitudinal extension of the flank of the longitudinal slot;

wherein the profile element is connected to the sealing band such that a catching connection is formed between the sealing band and the guide tube.

5,467,687

PISTON COMPRESSOR

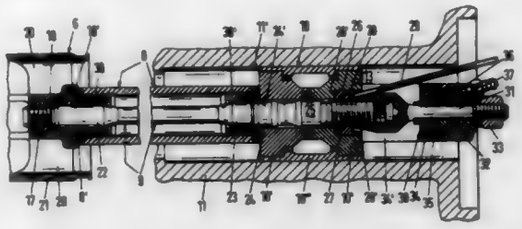
Oskar Habegger, Therwil, Switzerland, assignor to Maschinenfabrik Sulzer Burckhardt AG, Basel, Switzerland

Filed Jul. 28, 1994, Ser. No. 282,396

Claims priority, application European Pat. Off., Aug. 25, 1993, 93810606

Int. Cl.[6] F16J *15/18*

U.S. Cl. 92—165 R **12 Claims**



1. A piston compressor comprising a cylinder having a longitudinal axis, a piston reciprocably movably disposed in the cylinder, and means guiding the piston so that the piston reciprocates in the cylinder substantially without contact between the piston and the cylinder, the guiding means including a crosshead adapted to be connected to a connecting rod driven by a rotating crankshaft, the crosshead being guided for linear movement coaxial to the piston axis, a tubular compression member and a prestressed tensioning rod coaxially connecting the piston and the crosshead, and means rigidly coupling the piston, the compression member, the tensioning rod and the crosshead in a manner preventing relative lateral displacements between the crosshead and the piston so that the crosshead guides the piston when it reciprocates in the cylinder to thereby substantially prevent contact between them.

5,467,688

OPERATING VALVE DEVICE

Jun Maruyama, and Koji Yamashita, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

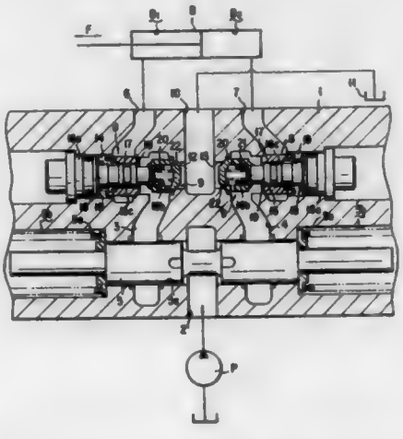
Filed Mar. 19, 1993, Ser. No. 509,580

Claims priority, application Japan, Aug. 16, 1988, 63-202747; WIPO, Aug. 16, 1989, PCT/JP89/00834

The portion of the term of this patent subsequent to Jun. 15, 2008, has been disclaimed.

Int. Cl.[6] F15B *11/08; 13/04*

U.S. Cl. 91—441 **2 Claims**



1. An operating valve device having an inlet port formed in the valve body thereof so as to communicate with a pressurized fluid supply source, a first outlet port and a second outlet port formed in

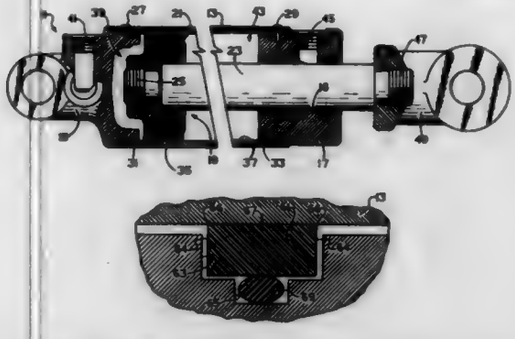
the valve body so as to communicate with pressure chambers, respectively, defined on both sides of an actuator, a first hole and a second hole formed in the valve body at positions on both sides of said inlet port so as to allow said inlet port to communicate with said first and second outlet ports, respectively, and a tank port formed in the valve body between the first and second holes and communicating with a fluid tank, characterized in that it comprises a first communication hole and a second communication hole formed coaxially and in opposed relationship with each other so as to allow said first and second holes, respectively, to communicate with said tank port; a first valve hole and a second valve hole formed coaxially in the valve body outside and in succession with these communication holes, respectively; a pair of support shafts inserted in these valve holes, respectively, in opposed relationship with each other; vacuum prevention valve means each mounted on a leading end portion of each of the support shafts so as to open and shut each of said communication holes; and check valve means each mounted an the axially intermediate portion of each of said support shafts so as to prevent fluid under pressure from flowing through said first and second holes, respectively, into said inlet port.

5,467,689

HYDRAULIC CYLINDER AND BIASED WEAR RING ASSEMBLY FOR USE THEREIN

Jerry F. Carlin, Mound; James E. Koon, Chanhassen, both of Minn.; Paul D. Parker, and Warren L. Thompson, both of Ankeny, Iowa, assignors to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 751,382, Aug. 28, 1991, abandoned. This application Oct. 26, 1994, Ser. No. 329,054
Int. Cl.[6] F16J *1/00;9/06;* F02F *5/00*
U.S. Cl. 92—172 **7 Claims**



1. A linear hydraulic cylinder of the type including a cylinder barrel, first closure means cooperating with said cylinder barrel to define a head end and a fluid inlet port, second closure means cooperating with said cylinder barrel to define a rod end and a fluid outlet port; a piston assembly reciprocally disposed within said cylinder barrel for movement over substantially the entire axial length of the cylinder barrel, said piston assembly including a piston cooperating with an interior, cylindrical surface of said cylinder barrel and said first and second closure means to define a head end fluid chamber and a rod end fluid chamber, said piston assembly further including a rod member fixed to said piston and extending through a rod opening in said second closure means; said piston including an outer, generally cylindrical surface closely spaced apart from said interior surface of said cylinder barrel, said outer cylindrical surface defining first and second annular grooves being disposed adjacent said head end and said rod end fluid chambers, respectively, a wear ring being disposed in said first annular groove, and a seal assembly being disposed in said second annular groove; characterized by:

(a) said wear ring comprising a generally annular, split ring member defining a substantially cylindrical outer surface bounded by a pair of substantially square corners; and

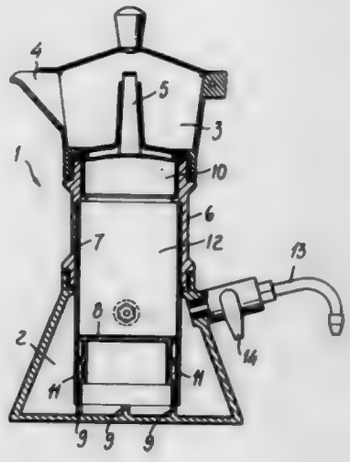
(b) a loader member disposed in said first annular groove and operable to bias said wear ring into sufficiently tight engagement with said interior, cylindrical surface of said cylinder barrel substantially to prevent passage of contaminant particles between said interior surface and said wear ring.

5,467,690

MACHINE FOR PREPARING A COFFEE INFUSION IN PARTICULAR FOR HOME USE

Paolo Zappala, and Biagio Tomasello, both of Via Rapisardi, 314, 95123 - Catania, Italy

Filed Dec. 16, 1993, Ser. No. 168,650
Claims priority, application Italy, Dec. 18, 1992, MI92U1075
Int. Cl.[6] A47J *31/36*
U.S. Cl. 99—302 P **7 Claims**



1. An improved coffee making machine for preparing by infusion a coffee based beverage, said machine comprising a construction formed by a plurality of elements including a water boiling chamber, a prepared coffee beverage collecting chamber mounted above said water boiling chamber, said collecting chamber having a bottom portion being adapted to receive a filter adapted to hold therein a coffee powder, wherein said water boiling chamber has a top portion to which is secured the bottom portion of a cylindrical fitting element having a top portion thereof secured to said bottom portion of said collecting chamger, inside said cylindrical fitting element there being coaxially arranged a vertical hollow cylinder having vertical inside walls encompassing a movable piston which, as is upwardly displaced, is adapted to displace a given water amount toward said filter.

5,467,691

COOKING GRID

Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antioch, Ill.

Filed Nov. 1, 1994, Ser. No. 332,965
Int. Cl.[5] A47J *37/07*
U.S. Cl. 99—340 **8 Claims**

1. A dual purpose cooking grid for use with a barbecue cooking grill having a heat source and support means for supporting the grid above the heat source, the grid comprising:

a base member having first and second opposed sides and composed of a heat conducting material;

a multiplicity of essentially parallel spaced apart elongated ribs extending from the first side of the base member; the base

member defining an essentially flat and smooth surface on the second side opposite the side with the ribs;

a multiplicity of openings extending through the base member and between the spaced apart ribs; and

a multiplicity of grooves in the second side extending in an essentially parallel manner with the ribs, with a first set of grooves interconnecting with the openings and a second set of grooves bypassing the openings to direct juices or fats produced during cooking of a food item heat source.

5,467,692

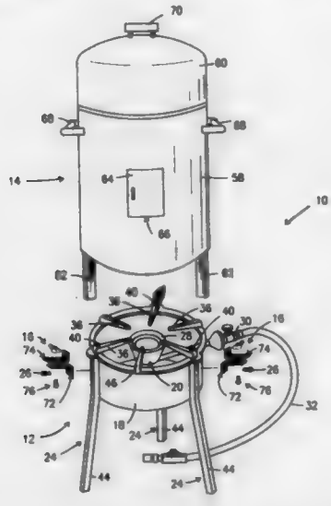
COMBINATION OUTDOOR COOKER AND SMOKER

Manuel Perez, III, 11204 Hidden Valley Dr., Tampa, Fla. 33624

Filed Feb. 17, 1995, Ser. No. 390,229

Int. Cl.[6] A47J *37/04;37/07*

U.S. Cl. 99—340 **2 Claims**



1. A combination outdoor cooker and smoker having a cooker configuration for use as an outdoor cooker and a smoker configuration for use as a smoker comprising a cooker assembly including a hollow housing having a heat source therein and a support grate supported thereon disposed in heat exchange relationship relative to the heat source and a plurality of support legs attached to the hollow housing, a smoker enclosure detachably mountable on said cooker assembly when said combination outdoor cooker and smoker is in said smoker configuration and a retention assembly comprising a plurality of retention brackets attached to said cooker assembly each having a cooker retention configuration to retain a cooking utensil in operative relationship relative to said support grate when said combination cooker and smoker is in said cooker configuration and a smoker retention configuration to retain said smoke enclosure in operative relationship relative to said support grate when said combination cooker and smoker is in said smoker configuration.

5,467,693

PRODUCTION OF GRANULAR CRACKERS

René Van den Berghe, Baneike 24, B9660 Brakel, Belgium

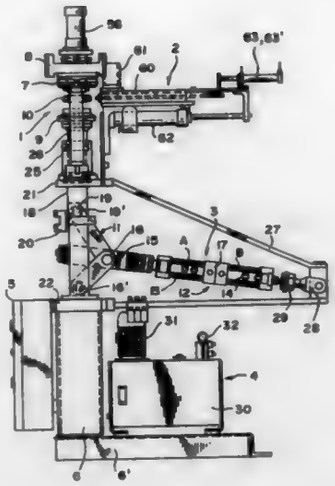
Continuation-in-part of Ser. No. 949,889, Nov. 24, 1992, abandoned. This application Jan. 22, 1993, Ser. No. 7,212

Claims priority, application WIPO, Jan. 24, 1991, PCT/BE91/00005; European Pat. Off., Jan. 24, 1992, 92200184

The portion of the term of this patent subsequent to Apr. 7, 2009, has been disclaimed.

Int. Cl.[6] A23L *1/18;* **A21B** *5/02*

U.S. Cl. 99—353 **15 Claims**



1. A high capacity apparatus for simultaneously producing granular crackers from cereal raw materials by pressure-baking and expanding a given quantity of cereal material within a heated mould, the apparatus comprising:

a) moulding means including at least two separate three-part moulds situated in tandem, each of said three-part moulds including a heatable, fixed upper mould plate, a movable peripheral mould element and a heatable punch element to be received within said peripheral mould element in a fluidtight manner;

b) said mould plate, said peripheral mould element and said punch element cooperate vertically with each other to form a hermetically closed separate mould cavity for compressing and heating therein a granular material into a pressed product of predetermined shape that is readily removable from said mould cavity;

c) frame means for supporting said mould plates on said apparatus, said frame means configured to slidably receive therethrough a cooperating pair of guide bars extending perpendicular to each of said mould plates, each of said pair of guide bars supporting a separate one of said peripheral mould elements for selective engagement with a respective one of said mould plates;

d) means for interconnecting each of said punch elements for simultaneous operation;

e) means for selectively driving said interconnected punch elements into and out of the corresponding one of said mould cavities causing the respective one of said three-part moulds to simultaneously assume one of said open, closed or expanded positions;

f) means for feeding granular material cooperating with said moulding means;

g) said driving means comprising an integral drive unit having cooperating first and second jack means;

h) said first jack means for selectively driving each of said interconnected punch elements into and out of the respective one of said mould cavities thereby allowing each of said three-part moulds to assume either said open position or said closed position;

i) said second jack means for partially driving each of said interconnected punch elements out of the respective one of said mould cavities to allow each of said three-part moulds to assume said expanded position;

j) first timing means operatively associated with said first jack means for variably adjusting the extent of forward movement of each of said interconnected punch means into the respective one of said mould cavities to optimize cavity baking pressure; and

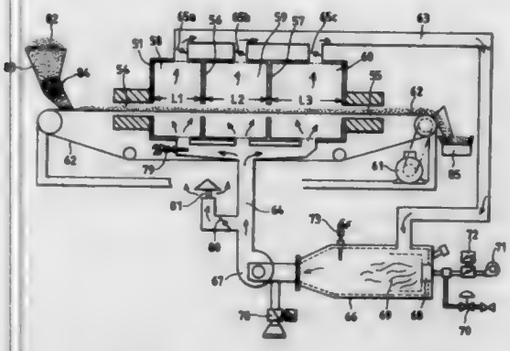
k) second timing means operatively associated with said second jack means for variably adjusting the extent of post pressure-baking rearward movement of each of said interconnected punch elements out of the respective one of said mould cavities to limit cereal expansion within said mould cavities and hence product thickness.

5,467,694

APPARATUS FOR CONTROLLING WATER CONTENT OF FRIED FOOD USING MICROWAVE HEATING

Keiso Mochizuki, and Tomio Minobe, both of Saitama, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, and Micro Denshi Co., Ltd., Saitama, both of, Japan

Filed Apr. 11, 1995, Ser. No. 419,692
Claims priority, application Japan, Apr. 11, 1994, 6-095486
Int. Cl.[6] A23L 1/00;1/025; H05B 6/64;6/78
U.S. Cl. 99—355 4 Claims



1. An apparatus for drying a fried food and appropriately lowering water content of said food, comprising:

a dry chamber being provided with a plurality of separated chambers through which said food passes in order, at least one of said separated chamber having a length in a food forward direction longer than that of the other separated chambers; and

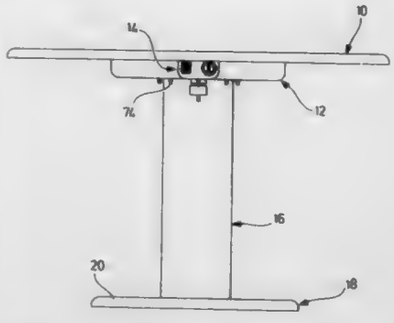
heating means for supplying microwave energy and heated air to said respective separated chambers, said microwave energy to be supplied to respective separated chambers corresponding to the water content of said food passing through said respective separated chambers.

5,467,695

DEVICE FOR PREPARING FOODS

Dieter Keller, Oberderdingen, and Manfred Mück, Kürnbach, both of, Germany, assignors to Bineo GmbH & Co. KG, Oberderdingen, Germany

Filed Jun. 8, 1994, Ser. No. 255,675
Claims priority, application Germany, Sep. 29, 1993, 43 33 158.9
Int. Cl.[6] A47J 37/10
U.S. Cl. 99—422 35 Claims



1. An apparatus for preparing foods, said apparatus having the shape of a table and comprising:

an upper unit having:

a one-piece tabletop of stainless steel sheet metal having a shallow concavity at least in a central region,

a heating device beneath said tabletop, said heating device for heating the central region of said tabletop,

a single, one-piece, metal, heat transfer plate at least approximately equal in lateral extent to said central region of said tabletop, said heat transfer plate arranged between said tabletop and said heating device, and having a thermal conductivity greater than that of stainless steel for reducing temperature gradients throughout the extent of the plate, and

connectors holding said heat transfer plate in contact with an underside of said tabletop substantially over said central region and allowing sliding movement between said tabletop and said heat transfer plate so as to compensate for differing thermal expansions of said tabletop and said heat transfer plate; and

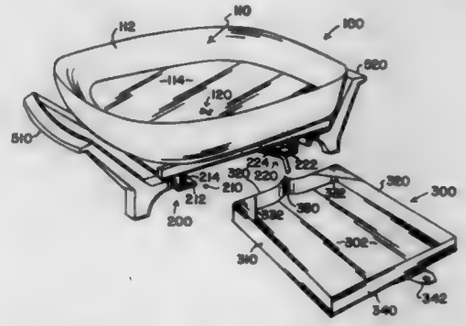
a support having a central column with a foot device at a lower end thereof, said support carrying said upper unit.

5,467,696

GREASE FREE SKILLET

Rick J. Everhart, 9913 Belmont, Kansas City, Mo. 64134

Filed Jan. 18, 1995, Ser. No. 374,042
Int. Cl.[6] A47J 37/06;37/10
U.S. Cl. 99—425 16 Claims



1. In a skillet having a cooking surface, the improvement comprising:

a plurality of apertures centrally located in the cooking surface, said apertures defining one end of a bore extending to an underside of the cooking surface, said bore presenting a second plurality of apertures on the underside surface;

track means mounted on the underside surface for defining a course therealong;

a tray slidable along said track to a position underneath said second apertures;

a cover;

means for mounting said cover to the underside of the cooking surface in movement between a first position covering said second plurality of apertures and a second position displaced from a selected number of said plurality of apertures, whereby grease formed on the cooking surface is directed through the first plurality of apertures and out the second plurality of apertures not covered by said cover into said tray therebelow.

5,467,697

DISPOSABLE CHAFING DISH

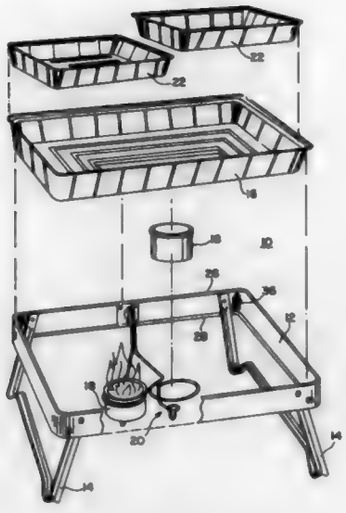
Hugo Humziker, 2135 President Pl., Costa Mesa, Calif. 92627

Filed Oct. 14, 1994, Ser. No. 324,022
Int. Cl.[6] A47J 27/00
U.S. Cl. 99—449 4 Claims

1. A chafing dish assembly, comprising:

a frame that has a bent top edge, and a bent bottom edge which has a plurality of slots;

a pair of legs that are pivotally connected to said frame and rotated between a retracted position and an unfolded position, said legs being located within said frame slots and captured by said bent bottom edge when in the unfolded position;



a tray that is supported by said bent top edge of said frame; and,

a ring that extends from said frame.

5,467,698

AUTOMATIC DEVICE FOR PRODUCING A COOLED SEMI-LIQUID FOOD PRODUCT AND CLEANING DEVICE USED THEREBY

Guido Ooms, Beringenbaan 110, 3295 Diest, Belgium

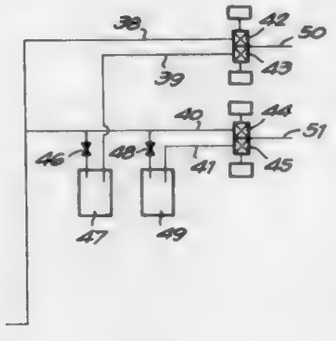
PCT No. PCT/BE93/00015, § 371 Date Sep. 27, 1994, § 102(e) Date Sep. 27, 1994, PCT Pub. No. WO93/19616, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 23, 1993, Ser. No. 307,756

Claims priority, application Belgium, Mar. 27, 1992, 09200296

Int. Cl.[6] A23G *9/30;* **A23C** *7/02*

U.S. Cl. 99—455 **12 Claims**



1. An automatic device for producing a cooled semi-liquid food product, such as soft-ice, milk-shake or yoghurt, from a starting composition comprising:

a first pump having an inlet and an outlet;

a reservoir housing the starting composition for the cooled semi-liquid food product;

a suction conduit having first and second ends, the first end of said suction conduit being connected to the inlet of said first pump, the second end of said suction conduit incorporating a first connection piece for selectively interconnecting said suction conduit with said reservoir;

a pressure conduit having a first end connected to the outlet of said pump and a second end defining a draught end for the cooled semi-liquid food product;

a cooling element arranged in said pressure conduit between the first and second ends thereof, said cooling element incorporating a cooling part that constitutes an evaporator of a cooling circuit;

a shunt conduit having a first end connected to said suction conduit between said first pump and said reservoir and a second end connected to said pressure conduit between said first pump and said cooling element; and

a cleaning device including a cleaning conduit having first and second ends, the first end of said cleaning conduit being provided with a second connection piece and the second end of said cleaning conduit being provided with a third connection piece, said second connection piece being adapted to selectively interconnect the cleaning conduit to the second end of said pressure conduit and the third connection piece being adapted to selectively interconnect the cleaning conduit to said suction conduit, said cleaning device further including a drain conduit provided between the first and second ends of said cleaning conduit, a second pump, having a higher output capacity than said first pump, mounted along said cleaning conduit, means for selectively closing said drain conduit, liquid supply means incorporating a supply conduit adapted to receive a supply of cleaning liquid, means for fluidly interconnecting said supply conduit and said cleaning conduit, and means for blocking the supply of cleaning liquid to said cleaning conduit through said supply conduit, wherein said cleaning device is isolated from the remainder of said automatic device when the suction conduit is fluidly interconnected with the reservoir through the first connection piece such that said automatic device can be used to produce a cooled semi-liquid food product and, when said automatic device is to be cleaned, the cleaning conduit is fluidly interconnected with the suction conduit through the first and third connection pieces and the second end of said pressure conduit is fluidly interconnected with the cleaning conduit through the second connection piece so that cleaning liquid can be passed through the supply conduit, the cleaning conduit, the suction conduit, the shunt conduit, the pressure conduit and the drain conduit.

5,467,699

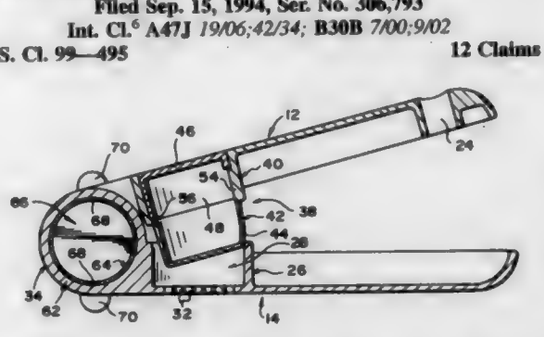
GARLIC PRESS

Douglas M. Laib, Kissimmee, Fla., assignor to Dart Industries Inc., Deerfield, Ill.

Filed Sep. 15, 1994, Ser. No. 306,793

Int. Cl.[6] A47J *19/06;42/34;* **B30B** *7/00;9/02*

U.S. Cl. 99—495 **12 Claims**



1. A hand press for foodstuffs comprising first and second elongate arms, each arm including a hand grip portion and a press component, said press component on said first arm comprising a compartment on said first arm remote from said hand grip portion thereof, said compartment including an inner wall with multiple draining apertures therethrough for discharge of effluent from a pressed foodstuff, said press component on said second arm comprising a pressure member on said second arm remote from said hand grip portion thereof for compression of a foodstuff within said compartment, said pressure member being configured for close slidable reception within said compartment, pivot means pivotally joining said arms remote from said hand grip portions and said press components wherein selective pivotal movement of

said hand grip portions toward and away from each other will produce a corresponding movement of said press components toward and away from each other, said pivot means comprising hinge means on said first and second arms aligning with each other and defining a passage therethrough transversely of said arms, and a hinge pintle removably received within said passage and retaining said arms for pivotal movement of said arms relative to each other, and a cleaning portion on said pintle manipulable, upon removal of said pintle from said passage, to engage and clean said draining apertures.

5,467,700

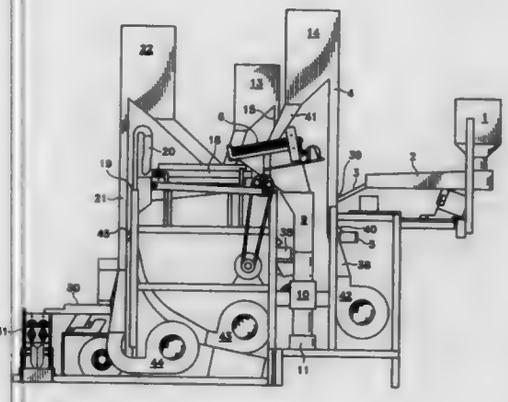
DENSITY SEPARATION SHELLER FOR PEANUT GRADE SAMPLES

Floyd E. Bowell; Harry T. Sheppard; Lawrence A. Dettore, all of Albany, and Clyde T. Bennett, Dawson, all of Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 10, 1993, Ser. No. 15,978

Int. Cl.[6] A23N *5/01*; B07B *9/02*

U.S. Cl. 99—570 **15 Claims**



1. An apparatus for cleaning, shelling and sizing farmers stock nuts which includes pods, whole loose kernels, loose shelled kernels, loose shelled split kernels and foreign material that includes dirt, rocks, trash, sticks, vines, and leaves, comprising

a means for cleaning the farmers stock nuts; said means for cleaning includes

(a) a first density separating means for removing the rocks from said farmers stock;

(b) a first roller means operatively connected to said first density separating means for separating the pods and whole loose shelled kernels from the sticks, trash, and loose shelled split kernels exiting from said first density separating means;

(c) a second density separating means operatively connected to said first roller means for separating the pods from said loose shelled kernels exiting from said first roller means;

(d) a first feeding means for moving the pods from said roller means to a downstream portion of the apparatus;

a sheller means operatively connected to said first feeding means for shelling the pods to obtain kernels;

a second feeding means for transporting the kernels exiting from said sheller means to a further downstream portion of the appartus; and

a sizing means operatively connected to said second feeding means for grading the kernels exiting from said sheller means.

5,467,701

ARTICLE STRAPPING ARRANGEMENT WITH A SYNCHRONOUS MOTORS CONNECTED TO A FREQUENCY CONVERTER

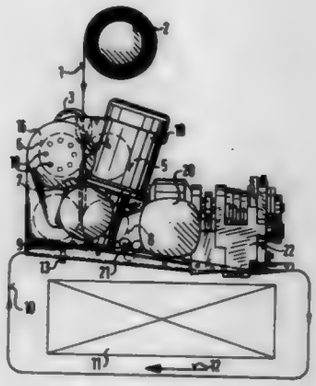
Gerd Bartzick, Gevelsberg; Reinhard Naydowski, Ennepetal, and Jürgen Werk, Wuppertal, all of, Germany, assignors to Fried. Krupp AG Hoesch-Krupp, Essen, Germany

Filed Apr. 22, 1994, Ser. No. 231,284

Claims priority, application Germany, Apr. 23, 1993, 43 13 420.3

Int. Cl.[6] B65B *13/22*

U.S. Cl. 100—4 **16 Claims**



1. An article strapping arrangement comprising: a strap track looped around an article to be strapped; three motor-driven units mounted on said strap track and comprising a strap feed, a strap stretcher, and a strap-end fastener; said strap feed having at least two spring-loaded wheels; each of said wheels being forced against one side of a strap; a reversible strap-feed motor connected to said strap feed for driving said strap feed; a strap-stretcher wheel between said strap feed and said strap track for intercepting a leading portion of a strap and introducing said leading portion into said track; a strap guide partly loosely surrounding said strap-stretcher wheel; said guide having one end opening into said track; a strap-stretcher motor connected to said strap-stretcher wheel, said strap-stretcher motor and said strap-feed motor being asynchronous three-phase motors; a frequency converter connected to said motors for supplying said motors with electricity of varying frequency and potential; control means in said frequency converter for controlling said converter; a manually adjustable terminal strap-tension selector connected to said control means for selecting a specific terminal strap tension; said strap-stretcher motor being operated at an electrical frequency varying in accordance with said specific terminal strap tension, said strap-feed motor being operated with electricity varying in accordance with frequency and potential form said frequency converter.

5,467,702

BALER STUFFER MECHANISM AND METHOD

Adrianus Naaktgeboren, Varsenare, and Christiaan A. C. Lippens, Sint-Laureins, both of, Belgium, assignors to New Holland North America, Inc., New Holland, Pa.

Filed Jun. 14, 1994, Ser. No. 260,296

Claims priority, application European Pat. Off., Jul. 24, 1993, 93202182

Int. Cl.[6] B30B *13/00*; *7/00*

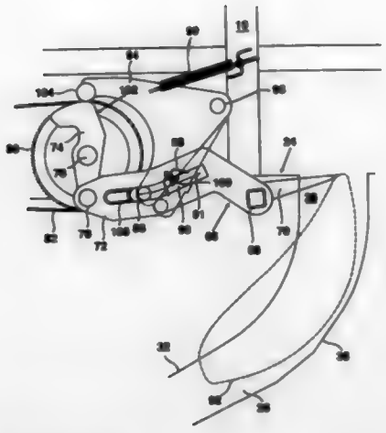
U.S. Cl. 100—35 **18 Claims**

1. In an agricultural baler having

a bale case comprising a wall portion with an entrance opening for the introduction of crop material,

compression means disposed for movement in the bale case to thereby compact said crop material into bales,

a duct for the transportation of said crop material to said entrance opening, and



loading means, operably associated with said duct and comprising a rotatable drive shaft, at least one crank arm fixed to said drive shaft and a fork assembly, said fork assembly comprising tines moving with a predetermined speed course along a predetermined path relative to said duct for cyclic engagement of said crop material in said duct and conveyance of charges thereof to said entrance opening, and at least one fork lever which is rotatably coupled with said crank arm on the one hand, and operably supported by guide means allowing relative movement of said lever to a fulcrum along a predetermined path relative to said lever, on the other hand, the improvement comprising

means for mounting said fulcrum for movement relative to said drive shaft between a first and a second position.

5,467,703

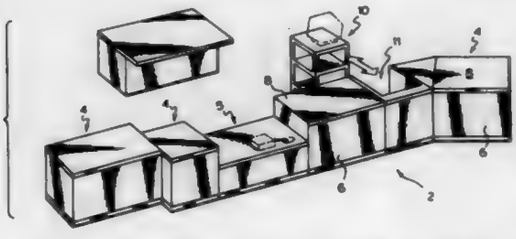
COUNTERLINE SYSTEMS

Jonathan Crinion, Toronto, Canada, assignor to Teknion Furniture Systems, Downsview, Canada

Continuation of Ser. No. 796,788, Nov. 25, 1991, abandoned. This application Jun. 15, 1994, Ser. No. 261,089

Int. Cl.[6] A47B *35/00*

U.S. Cl. 108—50 **17 Claims**



1. A counterline comprising a series of individual modules with each module having opposed side frames which abut and overlap with side frames of adjacent modules, said modules being horizontally shiftable relative to adjacent modules from an aligned position to a forwardly offset overlap position to a rearwardly offset overlap position, and in said offset overlap positions define a continuous outwardly opening wire receiving channel at a front face of said counterline and a passageway at an exposed side of a forwardly offset module and wherein at least some of said modules are in an offset overlap position; each module including a channel passageway at a front a which channel passageway joins with said opposed side frames of the module, said side frames having exterior outwardly opening side channel passageways extending generally horizontally and communicating with said channel passageway across the front portion of the module and being positioned to communicate along a length of said side channel passageway with a channel portion of an adjacent module which is in a rearwardly offset position, said side channel passageways extending at least partially along said side frames such that said side channel passageway of one of said side frames of a forwardly offset module defines part of said outwardly opening wire receiving channel joining the channel passageways across the front portion of said adjacent modules and thereby permits wiring to be placed in said channel passageways and passed from module to module while accommodating any offset overlap position of said modules; and removable covers which cover the portion of the side frames of forwardly offset modules exposed due to said offset while said side channel passageway continues to connect the channel passageways across said front of said modules.

5,467,704

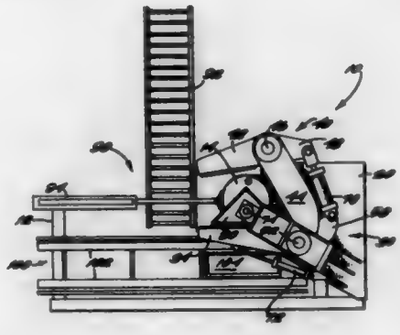
WASTE CONTAINER REFORMER AND METHOD FOR REFORMING WASTE CONTAINERS

Ron Mencarelli, Cayce, and Jeffry P. Sasko, Lexington, both of S.C., assignors to Alaron Corporation, Columbia, S.C.

Filed Sep. 2, 1994, Ser. No. 300,327

Int. Cl.[6] B30B *9/02*

U.S. Cl. 100—131 **17 Claims**



12. Apparatus for reforming waste container for storage and disposal, said apparatus comprising:

a frame;

a reforming arm carried by said frame;

a stationary arm carried by said frame;

a mounting arm carried by said frame and in operative connection with said reforming arm and said stationary arm so that said reforming arm and said stationary arm can rotate about the end of said mounting arm;

a top pressure surface carried by said frame;

a bottom pressure surface carried by said frame;

a first pressure surface carried by said stationary arm;

a second pressure surface carried by said reforming arm;

a third pressure surface carried by said reforming arm,

said second and said third pressure surfaces opposing said first pressure surface;

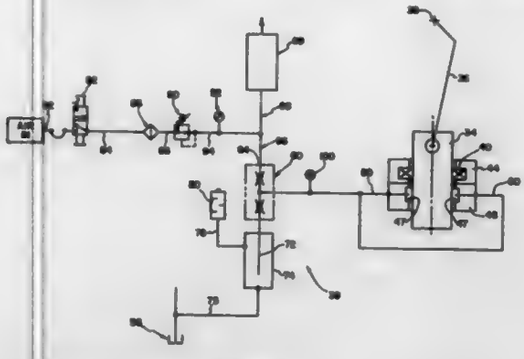
power means to move said reforming arm so that said second and third pressure surfaces are brought into engagement with a waste container, said container being held between said top pressure surface and said bottom pressure surface and reformed waste container is of a shape that has only flat surfaces and has substantially the same volume as said waste container before being reformed, said power means carried by said frame.

5,467,705

OIL CONTROL SYSTEM FOR A PRESS

Edward A. Daniel; Norman J. Couchot, both of Fort Loramie; Daniel L. Keller, and William C. Brewer, both of Minster, all of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Continuation of Ser. No. 108,067, Aug. 17, 1993, abandoned. This application Mar. 25, 1995, Ser. No. 409,910
Int. Cl.[6] B30B *15/00*
U.S. Cl. 100—214 12 Claims



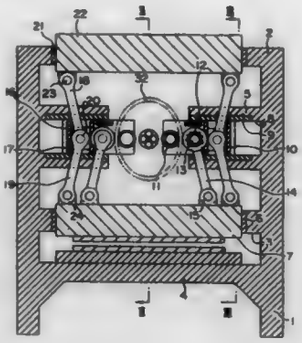
1. A mechanical press comprising:
a frame structure with a crown and a bed;
a slide guided by the frame structure for reciprocating movement in opposed relation to said bed, said slide including a drive piston having a periphery;
a drive mechanism attached to said frame structure for reciprocating said slide;
a seal about said drive piston periphery to prevent oil migration from said drive piston to said slide; and
an oil control mechanism including a housing having a bore through which said drive piston extends, said housing including at least one drain port opening into said bore at said drive piston periphery, a vacuum in communication with said at least one drain port, and an air duct for communicating air external of said housing to said drain port, wherein said air duct is structured and arranged to inlet a flow of air suitable to provide a vacuum induced air flow through said drain port during vacuum operation sufficient to vacuum away from said drive piston oil reaching said drain port after leaking past said seal toward said slide.

5,467,706

MECHANICAL PRESSING MACHINE WITH DYNAMIC BALANCING DEVICE

Heizaburo Kato, Shizuoka, Japan, assignor to Sankyo Seisakusho Co., Tokyo, Japan

Filed Aug. 22, 1994, Ser. No. 293,815
Claims priority, application Japan, Aug. 25, 1993, 5-210667
Int. Cl.[6] B30B *1/26*
U.S. Cl. 100—282 6 Claims



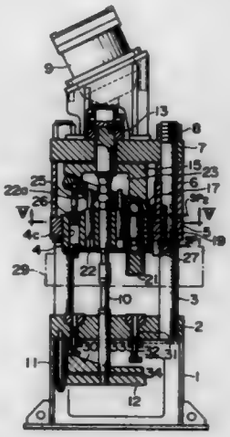
1. A mechanical pressing machine comprising:
a slider supported on a frame for vertical sliding movement, said slider having an upper press die mounted on its lower surface;
a pair of sliding blocks mounted respectively on right and left side portions of said frame for horizontal sliding movement;
a cam follower and a roller follower rotatably mounted on each of said pair of sliding blocks;
a pair of right and left connecting rods rotatably connected at their one ends to said pair of sliding blocks, respectively, the other ends of said pair of connecting rods being rotatably connected to said slider;
a balance weight mounted on an upper portion of said frame for vertical sliding movement;
a first link having one end rotatably connected to each of said pair of sliding blocks for vertical sliding movement through a slide piece, the other end of said first link being rotatably connected to said balance weight;
a second link having one end rotatably connected to each of said pair of sliding blocks for vertical sliding movement through said slide piece together with said first link, the other end of said second link being rotatably connected to said slider, and said second link having the same length as that of said first link;
an input shaft rotatably mounted on said frame, said input shaft being connected at its one end to rotation transmission means; and
a rib cam fixedly mounted on the other end portion of said input shaft for rotation therewith, said rib cam having a peripheral portion held between said cam follower and said roller follower on each of said pair of sliding blocks so as to reciprocally move said pair of sliding blocks right and left in a symmetrical manner.

5,467,707

REVOLVING CAM-TYPE PRESS

Hisanobu Kanamaru, Hitachinaka, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 30, 1995, Ser. No. 413,762
Claims priority, application Japan, Mar. 30, 1994, 6-060563
Int. Cl.[6] B30B *1/26*
U.S. Cl. 100—292 9 Claims



1. A revolving cam-type press comprising:
a drive shaft supported by a crown and a middle plate, said drive shaft being adapted to be rotated by a drive device;
a revolving cam fixedly mounted on said drive shaft;
a fluctuating disk provided on an inclined surface of said revolving cam for converting a rotational output of said revolving cam into a reciprocal motion;
slider means movably provided at an outer peripheral portion of said fluctuating disk for producing a pressing pressure;
a plurality of fluctuation disk rotation-prevention pins extending through said fluctuating disk to be in parallel relationship to

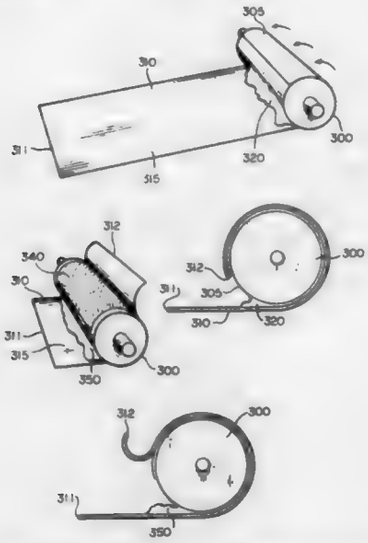
and in a concentric relationship to said drive shaft, said pins being fixedly secured at their one ends to a slider guide; and spherical bearings slidably mounted respectively on the other ends of said rotation prevention pins, and engaged respectively in through holes formed through said fluctuating disk; wherein a line passing through centers of said spherical bearings is disposed in a plane bisecting an intersection angle formed between an axis of said drive shaft and an axis of said fluctuating disk.

5,467,708

DIRECT APPLIED EMBOSSING CASTING METHOD

Joseph S. Kildune, Salem, N.H., assignor to GenCorp Inc., Fairlawn, Ohio

Filed Mar. 15, 1995, Ser. No. 404,857
Int. Cl.[6] B31F *1/07*
U.S. Cl. 101—32 **8 Claims**



1. A method of creating a seamless printing master for use with an embossing roll, said method comprising the steps of:

a. applying a first amount of hardenable material (**320**) to a positive printing master (**310**), said positive printing master (**310**) comprising a substrate having a textured surface (**315**), a leading edge (**311**), and a trailing edge (**312**);

b. positioning said embossing roll (**300**) upon said positive printing master (**310**);

c. advancing said embossing roll (**300**) by rotating it in a forward direction along the length of said positive printing master (**310**) such that said first amount of hardenable material (**320**) is compressed between said textured surface (**315**) of said positive printing master (**310**) and the outer surface (**305**) of said embossing roll (**300**) until said positive printing master (**310**) and said first amount of hardenable material (**320**) cover approximately three-fourths of the circumference of said embossing roll (**300**), whereby imprinting a pattern upon said first amount of hardenable material (**320**) as said first amount of hardenable material (**320**) is compressed between said positive printing master (**300**) and said outer surface (**305**) of said embossing roll (**300**);

d. hardening said first amount of hardenable material (**320**);

e. partially peeling back said positive printing master (**300**) away from said outer surface (**305**) of said embossing roll (**300**) such that a portion of said imprinted hardened material is exposed;

f. rotating said embossing roll (**300**) in a rearward direction;

g. applying a second amount of hardenable material (**350**) to the portion of said positive printing master (**300**) corresponding to the remaining uncovered portion of said outer surface (**305**) of said embossing roll (**300**);

h. advancing said embossing roll (**300**) by rotating it in said forward direction such that said positive printing master (**300**) and said second amount of hardenable material (**350**) cover the remaining one-fourth of the circumference of said embossing roll (**300**), said hardenable material being compressed between said positive printing master (**310**) and said remaining portion of said outer surface (**305**) of said embossing roll (**300**), whereby imprinting a pattern upon said second amount of hardenable material (**350**);

i. hardening said second amount of hardenable material (**350**); and,

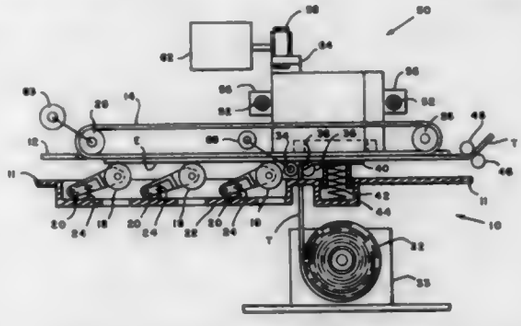
j. removing said positive printing master (**310**) completely from said first and said second amounts of hardened material, whereby exposing a final seamless negative master of hardened material firmly adhered to said outer surface (**305**) of said embossing roll (**300**).

5,467,709

MAILING MACHINE UTILIZING INK JET PRINTER

James A. Salomon, Cheshire, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 22, 1994, Ser. No. 362,330
Int. Cl.[6] B41J *11/00;1/00*
U.S. Cl. 101—93 **8 Claims**



1. A mailing machine for printing postage indicia on mail pieces which are fed through the mailing machine or on a predetermined length of tape which is stored in the mailing machine, said mailing machine comprising:

A. means defining a first elongate feed path which extends through the mailing machine and along which mail pieces are adapted to be fed,

B. means defining a first printing position in said first feed path at which a postage indicia is printed on the mail pieces,

C. first feeding means for feeding the mail pieces seriatim along said first feed path and past said first printing position,

D. means defining a second elongate feed path which extends through a portion of the mailing machine and along which a strip of tape stored in the mailing machine is adapted to be fed,

E. means defining a second printing position in said second feed path at which a postage indicia is printed on a predetermined length of the tape,

F. second feeding means for feeding the tape along said second feed path and past said second printing position,

G. a printing device for printing said postage indicia on the mail pieces and on said tape,

H. means mounting said printing device for movement in a direction lateral to the direction of said first and second feed paths so that said printing device can be disposed at either of said first and second printing positions,

I. means for moving said printing device in said lateral direction, and

J. control means for controlling the operation of said moving means for moving said printing device between said first and second printing positions depending on whether the postage indicia is to be printed on mail pieces fed along said first feed path or on tape fed along said second feed path,

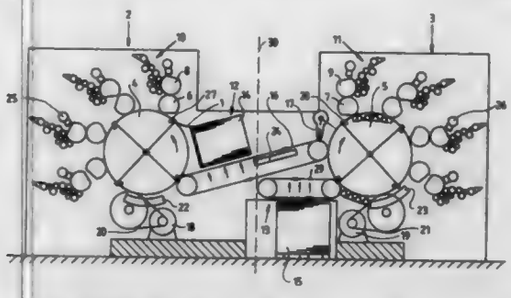
whereby postage indicia can be printed on mail pieces or on tape selectively while the mail pieces or the tape move in their respective feed paths.

5,467,710

ROTARY PRINTING PRESS FOR TWO-SIDED PRINTING OF SHEETS

Arno Wirz, Bammental, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Feb. 10, 1994, Ser. No. 195,156
Claims priority, application Germany, Feb. 10, 1993, 43 03 796.8
Int. Cl.[6] B41F 5/02;5/22
U.S. Cl. 101—177 19 Claims



1. Rotary printing press for two-sided printing of sheets having a first and a second printing unit, each comprising a respective impression cylinder, the press having a sheet feeder, having means for separating sheets singly from a feeder pile, and means for feeding the singly separated sheets to the first printing unit for printing one of the sides of the respective sheets; means for conveying the sheets to the second printing unit for printing the other of the sides of the respective sheets and through the entire printing press; a delivery having means for conveying and depositing the sheets on a delivery pile, and a control device for controlling operating sequences performed in the rotary printing press; the first and second printing unit being disposed in tandem horizontally and, respectively having a plurality of inking units arranged around each of the respective impression cylinder; said sheet feeder and said delivery being disposed between the first and second printing unit.

5,467,711

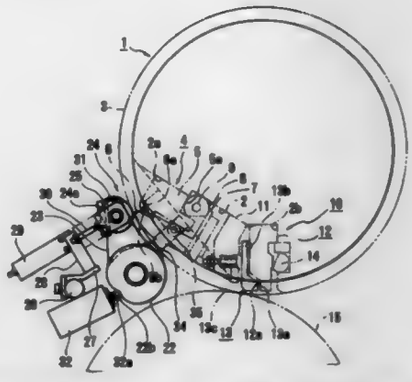
PLATE EXCHANGE APPARATUS FOR PRINTING PRESS

Kazuhiro Maejima, Ibaraki, Japan, assignor to Komori Corporation, Tokyo, Japan

Continuation of Ser. No. 1,338, Jan. 7, 1993, abandoned. This application Jun. 28, 1994, Ser. No. 267,841
Claims priority, application Japan, Jan. 8, 1992, 4-003591 U
Int. Cl.[6] B41F 27/06;27/12
U.S. Cl. 101—216 4 Claims

1. A plate exchange apparatus for a printing press comprising: a plate press member for pressing a plate against a circumferential surface of a plate cylinder when said plate is wound around said plate cylinder, for guiding a leading end of said plate into plate gripper surfaces of a leading-side plate lockup device when said leading end of said plate opposes said plate gripper surfaces of said leading-side plate lockup device, and for inserting a trailing end of said plate into plate gripper surfaces of a trailing-side plate lockup device under pressure when said trailing end of said plate wound around said circumferential surface of said plate cylinder opposes said plate gripper surfaces of said trailing-side plate lockup device;

operating members coupled to said plate press member for pressing said plate press member against said circumferential surface of said plate cylinder until said trailing end of said plate is inserted under pressure after said leading end of said plate is gripped;



regulating members for regulating movement of said plate press member in a radial direction of said plate cylinder during plate gripping: and

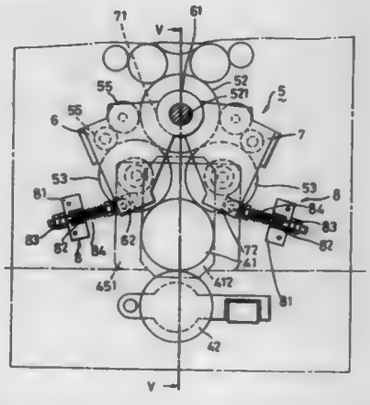
said regulating members including a first element arranged on said plate press member and a second element arranged on said plate cylinder, said first element and said second element opposing each other at the time of plate gripping.

5,467,712

PRINTING MACHINE WITH A PRINTING UNIT ADAPTED TO RECEIVE VARIOUS PLATE CYLINDERS

Ching-Ho Chou, No. 168, Pao-Chung-Erh St., Hou-Hu Li, Chia-Yi City, Taiwan, Prov. of China

Filed Oct. 14, 1994, Ser. No. 324,028
Int. Cl.[6] B41F 5/04
U.S. Cl. 101—219 2 Claims



1. A printing machine with at least one printing unit mounted on a base body for printing a continuous roll of paper which is pulled through said printing unit by a paper pulling mechanism for forward pulling or intermittently forward and backward pulling, said printing unit comprising;

a pair of spaced and opposed walls provided on two sides of and parallel to a paper-supplying route passing through said printing unit, said opposed walls having a pair of aligned mounting holes;

an impression cylinder journalled between said walls below said pair of mounting holes;

a pair of mounting seats which are mounted respectively and detachably in said pair of mounting holes and which are formed with a pair of aligned bushing-receiving holes therethrough corresponding with a certain size of a plate cylinder to be journalled therein so as to perform a printing action in cooperation with said impression cylinder; and

an inking apparatus comprising:

a first transmission roller journalled between said opposed walls and located above said plate cylinder in a parallel manner,

a second transmission roller mounted between said plate cylinder and said first transmission roller and associated operably with said first transmission roller, and

an adjusting mechanism to adjust said inking mechanism to complement a position of said plate cylinder so as to enable said inking apparatus to associate with said plate cylinder in order to supply printing ink to said plate cylinder, said adjusting mechanism including at least one regulator mounted on an inner surface of said opposed walls, and a pair of pivot blocks provided between said opposed walls, each of said pivot blocks having a first end portion sleeved respectively and pivotally on two sides of an axle of said first transmission roller, and a second end portion which is located adjacent to said plate cylinder, said second transmission roller being journalled between said second end portions of said pivot blocks with said regulator being connected pivotally to said second end portion of a corresponding one of said pivot blocks, actuation of said regulator pivoting said pivot blocks relative to said axle of said first transmission roller and enabling said second transmission roller to be operable with said plate cylinder.

5,467,713

IGNITION AND SAFTY DEVICE FOR A GRENADE PROJECTILE PROVIDED WITH A SHAPED CHARGE INSERT

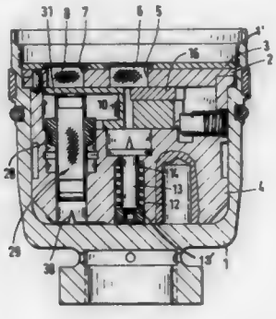
Karl-Heinz Roosmann, and Ulf Hahn, both of Ratingen, Germany, assignors to Rheinmetall GmbH, Ratigen, Germany

Filed Oct. 14, 1994, Ser. No. 321,895

Claims priority, application Germany, Jan. 14, 1993, 43 35 022.4

Int. Cl.[6] **F42C** *15/26;15/22;9/16*

U.S. Cl. 102—233 **5 Claims**



1. An ignition and safety arrangement for a base-side impact fuse for a grenade projectile provided with a shaped charge insert, said fuse having: a housing for attaching to the projectile; a spin-dependent safety element and an acceleration-dependent safety element mounted in said housing for preventing arming of the fuse until the fuse has been subjected to a launch acceleration and a given centrifugal force; and a self-destruct device disposed in said housing for igniting the shaped charge, with said self-destruct device including a firing pin, a pyrotechnical delay segment, means for mounting said pyrotechnical delay segment in said housing for axial displacement into engagement with said firing pin in response to launch acceleration, and a booster charge for igniting the shaped charge, with said booster charge being mounted in said housing extremely off-center and being ignited by said delay segment after its delay time.

5,467,714

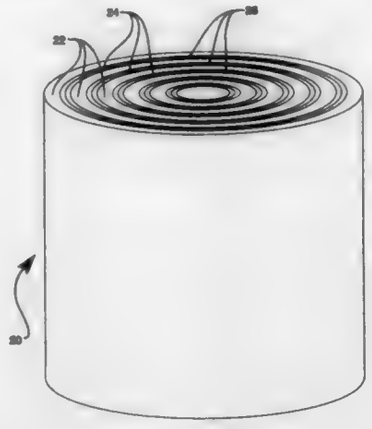
ENHANCED PERFORMANCE, HIGH REACTION TEMPERATURE EXPLOSIVE

Gary K. Lund, Ogden, and Paul C. Braithwaite, Brigham City, both of Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed Dec. 16, 1993, Ser. No. 168,714

Int. Cl.[6] **C06B** *45/12*

U.S. Cl. 102—284 **30 Claims**



1. An explosive composition comprising:

an acceptor phase containing a halogenated polymer phase and a reactive metal phase; and

an explosive phase which is substantially free of metal, wherein at least a portion of said explosive phase encapsulates the acceptor phase and wherein said explosive phase is capable of producing a detonation pressure in excess of 200 kilobars at the Chapman-Jouget (C-J) condition;

wherein the explosive composition has a detonation velocity in excess of 5000 meters per second.

5,467,715

GAS GENERANT COMPOSITIONS

Robert D. Taylor, Hyrum; Thomas M. Deppert, and Michael W. Barnes, both of Brigham City, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 165,133, Dec. 10, 1993, abandoned. This application Mar. 8, 1994, Ser. No. 207,922

Int. Cl.[6] **C06B** *45/00*

U.S. Cl. 102—289 **20 Claims**

1. A gas generant composition comprising between about 20 and about 40 wt % of fuel, said fuel comprising a tetrazole and/or triazole compound at between about 50 and about 85 wt % of said fuel and a water-soluble fuel at between about 15 and about 50 wt % of said fuel; between about 20 and about 80 wt % of oxidizer, at least about 20 wt % and up to 100% of said oxidizer being a transition metal oxide or mixture of transition metal oxides, the balance of said oxidizer being an alkali and/or alkaline earth metal nitrate, chlorate, perchlorate or mixture thereof; and, any balance comprising additional gas generant-compatible components.

5,467,716

TELESCOPED-TYPE MUNITION

Roland Boual, Saint German du Puy, France, assignor to Giat Industries, Versailles, France

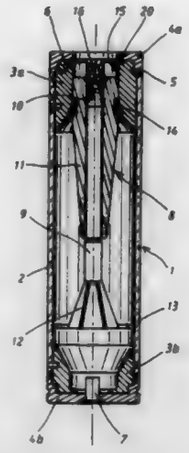
PCT No. PCT/FR94/00252, § 371 Date Oct. 13, 1994, § 102(e) Date Oct. 13, 1994, PCT Pub. No. WO94/20813, PCT Pub. Date Sep. 15, 1994

PCT Filed Mar. 8, 1994, Ser. No. 318,725

Claims priority, application France, Mar. 12, 1993, 93 02896

Int. Cl.[6] F42B *5/045*

U.S. Cl. 102—434 14 Claims



1. A telescoped munition comprising a casing having a cylindrical envelope blocked at front and rear ends with respective front and rear plugs, a projectile in contact with the front plug, said projectile being located within said envelope and between said front and rear plugs, and means to ensure an axial hold of the projectile with respect to the envelope, said axial holding means comprising a cap having a cylindrical central part supporting a front part of the projectile and fitted with a ring-shaped collar connected to the front plug.

5,467,717

WORK TRAIN FOR EXCHANGING OLD TIES FOR NEW TIES

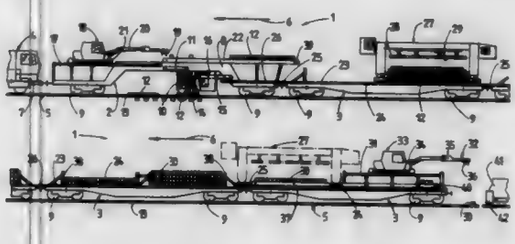
Josef Theurer, Vienna, and Herbert Wörgötter, Gallneukirchen, both of, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b. H., Vienna, Austria

Continuation-in-part of Ser. No. 272,133, Jul. 8, 1994, abandoned. This application Dec. 28, 1994, Ser. No. 359,444

Claims priority, application Austria, Dec. 7, 1993, A2478/93

Int. Cl.[6] E01B *29/06*

U.S. Cl. 104—6 11 Claims



1. A work train for exchanging old ties for new ties and comprising sequentially arranged cars including freight cars for storing old ties and new ties, the train extending in a longitudinal direction and the cars being movable in an operating direction along an existing railroad track comprised of rails fastened to the old ties resting on a ballast bed, a rearmost car in the operating direction at a rear end of the train being supported on the track by a rear undercarriage in the operating direction, the train comprising

(a) a tie exchange device for laterally pulling respective ones of the old ties out of the track,

(b) a crane for transporting the old ties pulled out of the track and movable in the longitudinal direction, the crane comprising

(1) a tie gripping device, and

(c) a tie transport device on the rearmost car at the rear undercarriage for placing the new ties on the railroad track at the rear train end.

5,467,718

MAGNETIC LEVITATION TRANSPORT SYSTEM WITH NON-CONTACT INDUCTIVE POWER SUPPLY AND BATTERY CHARGING

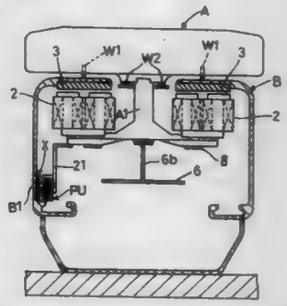
Satoru Shibata, and Shigeto Murayama, both of Komaki, Japan, assignors to Daifuku Co., Ltd., Osaka, Japan

Filed Jul. 19, 1993, Ser. No. 93,791

Claims priority, application Japan, Jul. 20, 1992, 4-191897; Jul. 20, 1992, 4-191898; Jul. 21, 1992, 4-192585; Jul. 21, 1992, 4-192586; Jul. 24, 1992, 4-197342

Int. Cl.[6] B61B *13/08*

U.S. Cl. 104—284 16 Claims



1. A magnetic levitation transport system comprising:

a magnetic levitation vehicle;

lines extending through predetermined blocks of a running track of said vehicle to transmit a high frequency sine-wave current therethrough;

wherein said vehicle is driven by a linear motor, and includes levitating magnetic force generating means to attract levitating magnetic members extending along said running track, a pickup coil resonant with a frequency of said lines to generate an electromotive force, a power receiving unit connecting said pickup coil to said levitating magnetic force generating means, and a battery connected to said power receiving unit,

with said power receiving unit receiving power from only said pickup coil and both charging said battery and supplying power to said levitating magnetic force generating means when said pickup .coil is generating an electromotive force,

with said power receiving unit receiving power from only said battery and supplying power to said levitating magnetic force generating means when said pickup coil is generating no electromotive force.

5,467,719

METHOD AND APPARATUS FOR SECURING A TANK TO A TANK CAR SILL

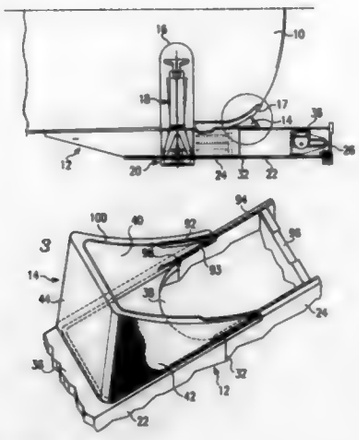
Thomas H. Dalrymple, Duncanville, and Christopher C. Harkey, Dallas, both of Tex., assignors to Trinity Industries, Inc., Dallas, Tex.

Filed Jul. 29, 1994, Ser. No. 282,345

Int. Cl.[6] B61D *49/00*

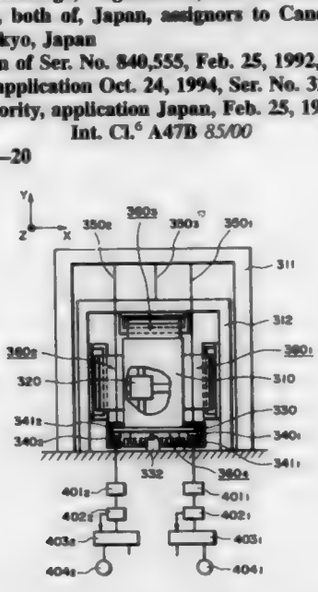
U.S. Cl. 105—362 17 Claims

5. An apparatus for securing a tank to a railway tank car, the apparatus comprising:



a head brace comprising:
a main wall,
a first tail connected to the main wall at a first angle, and
a second tail connected to the main wall at an angle; and
a draft sill having a top surface and wherein the top surface is formed to have an access opening for accessing an interior portion of the head brace between the main wall and the first and second tails.

5,467,720
SUPPORT DEVICE
Nobushige Korenaga, Sagamihara, and Kazunori Iwamoto, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 840,555, Feb. 25, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 328,390
Claims priority, application Japan, Feb. 25, 1991, 2-050102
Int. Cl.[6] A47B *85/00*
U.S. Cl. 108—20 **14 Claims**



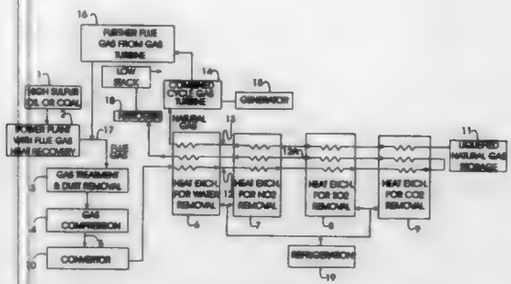
1. A supporting system for supporting a structure having a movable portion, a gravity center position of the structure being changeable with movement of the movable portion, said system comprising:
a main frame for supporting the structure through a plurality of supporting members;
a plurality of first supporting members coupled to a top of said main frame, each of said first supporting members having a predetermined rigidity and comprising an actuator being expansible and contractable along a vertical direction; and
a second supporting member for connecting the structure and the first supporting members, said second supporting member having (i) a predetermined elasticity along the vertical direction, and (ii) a rigidity less than that of said first supporting members,
wherein the structure is suspended from the top of said main frame through said first and second supporting members.

5,467,721
VERTICALLY MOVABLE TABLE
Richard H. Gosch, Westchester, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed May 14, 1993, Ser. No. 61,371
Int. Cl.[6] A47B *9/00*
U.S. Cl. 108—146 **4 Claims**

1. An adjustable table surface comprising:
A) a table surface;
B) an L-shaped member having:
one leg coupled to the table surface; and
a second leg having;
a vertical guide attached thereto;
ratchet teeth attached thereto;
a cam surface; and
a release trigger;
C) a support surface having:
a vertical track having the vertical guide disposed therein; and
pawl guide surfaces, wherein at least one pawl guide surface includes a first catch;
D) a pawl supported and guided by the pawl guide surfaces and being arranged and configured to interact with the ratchet teeth to form a ratchet such that the table surface is moveable in a first direction to a plurality of fixed vertical positions, wherein the bawl includes a second catch and a release pad; and such that the first and second catch will interact when the cam surface urges the pawl to a first position, thereby holding the pawl in a locked position that prevents interaction of the pawl with the ratchet teeth, and when the release trigger contacts the release pad, the first and second catch are disengaged from one another, thereby releasing the pawl from the locked position.

5,467,722
METHOD AND APPARATUS FOR REMOVING POLLUTANTS FROM FLUE GAS
Zoher M. Meratia, 2275 Westhill Drive, West Vancouver, British Columbia, Canada
Filed Aug. 22, 1994, Ser. No. 293,297
Int. Cl.[6] F23J *11/00*
U.S. Cl. 110—345 **42 Claims**

1. A method for removing gaseous pollutants from a polluted flue gas stream of an oil or coal-fired combustion furnace, comprising:
(A) providing a source of liquified combustible gas;
(B) providing a combustible gas-fired furnace;
(C) passing the polluted flue gas stream through a dust removal means and removing flue dust from the flue gas stream so as to provide a de-dusted flue gas stream;
(D) recovering heat from the flue gas to generate power therefrom;



(E) compressing the de-dusted flue gas to a pressure of at least 10 psi gauge using the generated power to at least in part compress the de-dusted flue gas;

(F) passing the compressed flue gas and the combustible gas through at least one multi-sided heat exchanger, wherein the compressed flue gas is first passed through one side thereof and the liquified combustible gas in an at least partially vaporized state is passed through another side thereof, and wherein the compressed flue gas is cooled sufficiently by the combustible gas that water and at least one gaseous pollutant selected from the group consisting of NO_2, SO_2 and CO_2 are condensed and separated from the compressed flue gas to provide reduced pollutant flue gas; and

(G) passing fully vaporized combustible gas to the combustible gas-fired furnace and combusting the gas to a further flue gas and passing the further flue gas into the polluted flue gas stream.

5,467,723

COMBINED CULTIVATOR AND FLUID INJECTOR SYSTEM

Alan McIvor-Dean, Downham Market, and Murree Groom, King's Lynn, both of, Great Britain, assignors to Christopher Robin Knights, Norfolk, United Kingdom

PCT No. PCT/GB91/01435, § 371 Date Apr. 15, 1993, § 102(e) Date Apr. 15, 1993, PCT Pub. No. WO92/03045, PCT Pub. Date Mar. 5, 1992

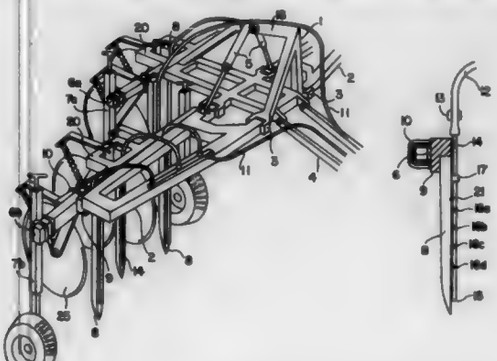
PCT Filed Aug. 27, 1991, Ser. No. 39,311

Claims priority, application United Kingdom, Aug. 25, 1990, 9018728

Int. Cl.[6] A01C *23/00*

U.S. Cl. 111—123 **16 Claims**

1. A cultivator-injector machine for sub-surface application of a



fluid pesticide to a field of root crop grown in rows forming soil ridges carrying said root crop separated by furrows, which machine comprises: means for delivering said pesticide to said soil ridges from said furrows comprising a chassis carrying a plurality of times, each said tine having at least one fluid delivery pipe mounted therein extending longitudinally down a rearward, in use, face thereof, each said delivery pipe having a closed lower end and at least one lateral aperture therein facing rearwardly, in use, at an angle to the axis of ploughing motion so as to direct said pesticide toward said rows of root crop, said chassis further carrying at least one free-turning cutting disc, each mounted closely in front of and substantially aligned with a respective tine along the axis of ploughing motion of the machine, said machine being thereby adapted for repeated passage through the field of root crop grown in rows as the crop grows, the tines being substantially straight and spaced apart to pass between said rows of root crop and the machine being mounted to the front of a powered vehicle, in use, said machine further having a delivery pump means to pressurize said fluid pesticide to thereby laterally pump said fluid pesticide out of said lateral aperture of said delivery pump means to the roots of the root crop.

13. A method of sub-surface application of a pesticide to a field of root crop growing in rows, which method comprises the steps of:

(a) providing a cultivator-injector machine for sub-surface application of a fluid pesticide to a field, which machine comprises a chassis carrying a plurality of tines, each said tine having at least one fluid delivery pipe mounted thereon extending longitudinally down a rearward, in use, face thereof, each said delivery pipe having a closed lower end at least one lateral aperture therein facing rearwardly, in use, at an angle to the axis of ploughing motion, said chassis further carrying at least one free-turning cutting disc, each mounted closely in front of and substantially aligned with a respective tine along the axis of ploughing motion of the machine, said machine being adapted for repeated passage through the field of root crop grown in rows as the crop grows, the tines being substantially straight and spaced apart to pass between said rows of root crop and said lateral aperture therein facing rearwardly and the machine being mounted to the front of a powered vehicle, in use, said machine further having a delivery pump means to pressurize said fluid pesticide to thereby laterally pump said fluid pesticide out of said lateral aperture of said delivery pump means to the roots of the root crop;

(b) establishing communication between said delivery pipe and a pressurised supply of fluid pesticide; and

(c) moving the chassis along the field of the growing crop ahead of the powered vehicle with the cutting disc parting obstructive vegetation ahead of the tine with the tine ploughing the soil between the rows of the crop and with the delivery pipe, via the lateral aperture therein, injecting fluid pesticide into the soil ridges.

5,467,724

YARN JERKER AND THREADER GUIDE FOR TUFTING MACHINES

Harold B. Bardsley, Nr. Chorley, and Arthur Bagnall, Whitefield, both of, England, assignors to Spencer Wright Industries, Inc., Dalton, Ga.

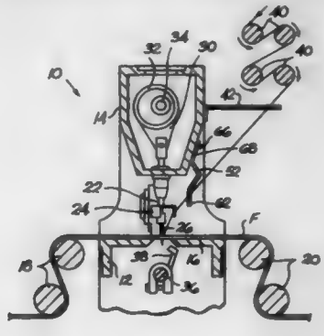
Filed Jan. 13, 1994, Ser. No. 180,630

Claims priority, application United Kingdom, Feb. 11, 1993, 9302718

Int. Cl.[6] D05C *15/16*

U.S. Cl. 112—80.7 **8 Claims**

1. In a tufting machine having a needle bar, a needle having an



axis of elongation carried by said needle bar, said needle including an eye through which a strand of yarn may be threaded, means for reciprocating said needle bar toward and away from a backing material for penetrating said needles into and out of said backing, yarn feed means for feeding a strand of yarn to said needle, and yarn handling apparatus intermediate said feed means and said needle for tensioning and guiding yarn to said needle, said yarn handling apparatus comprising a stationary guide member having a face substantially parallel to said axis of elongation, an aperture extending through said face for receiving a strand of yarn from said feed means, a movable guide member carried by said needle bar, said movable guide member having an arm spaced from said needle bar and parallel to said axis of elongation, and an eyelet extending through said arm disposed at an elevation not above said needle bar spaced from and offset from said aperture for receiving a strand of yarn fed from said aperture toward said needle eye and for jerking and tensioning said strand of yarn as said needle bar reciprocates away from said backing.

5,467,725

THREAD SPREADING APPARATUS FOR USE IN OVERLOCK SEWING MACHINE

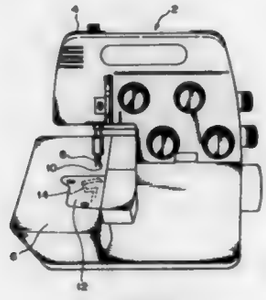
Shuji Fujita; Yasushi Baba; Hitoshi Itoh, and Shiro Satoma, all of Tokyo, Japan, assignors to Juki Corporation, Tokyo, Japan

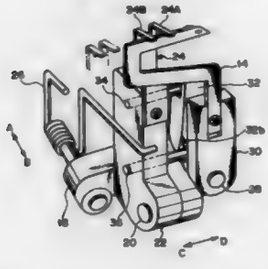
Filed Jun. 6, 1994, Ser. No. 254,887

Claims priority, application Japan, Jun. 8, 1993, 5-137453; Jun. 10, 1993, 5-139616; Jun. 28, 1993, 5-157687; Jun. 28, 1993, 5-157688; Jan. 21, 1994, 6-004932

Int. Cl.[6] D05B *61/00;1/20*

U.S. Cl. 112—162 **28 Claims**





1. An apparatus for use in an overlock sewing machine to sew material with a looper thread and a needle thread as the material is moved along a feed path, said apparatus comprising:

a lower looper;

first drive means for oscillating said lower looper along the material feed path and for oscillating said lower looper transversely to the material feed path during operation of the sewing machine;

thread positioning means having a thread engaging surface for positioning the needle thread relative to the looper thread and said lower looper to at least partially define an area into which a needle is movable; and

second drive means for oscillating said thread positioning means along the material feed path and for oscillating said thread positioning means transversely to the material feed path.

5,467,726

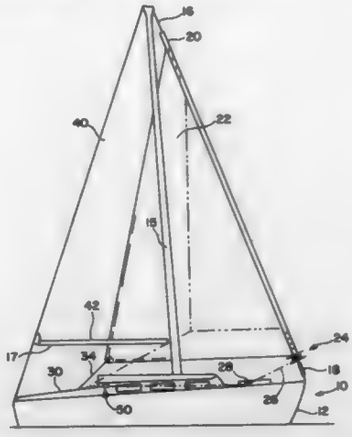
FURLING LINE TENSION CONTROL FOR ROLLER-REEFING DRUM

William L. Hutchins, 654 Harbor Island, Clearwater, Fla. 33515

Filed Dec. 16, 1994, Ser. No. 357,913

Int. Cl.[6] B63B *21/04*

U.S. Cl. 114—218 **18 Claims**



1. A furling line tensioning device for controlling the coiling action of a roller-reefing drum, comprising a base adapted to be fastened to a sailboat mounting structure, first and second members on said base and having opposed cam walls defining a furling line receiving passageway therebetween, said cam walls being constructed and arranged to accommodate non-locking linear furling line movement in opposite directions, and at least one of said members being pivotally mounted on said base and spring-biased to move its cam surface toward a passage restricting position to pressurize said furling line between the opposed cam walls and resist furling line movement in only one direction.

5,467,727

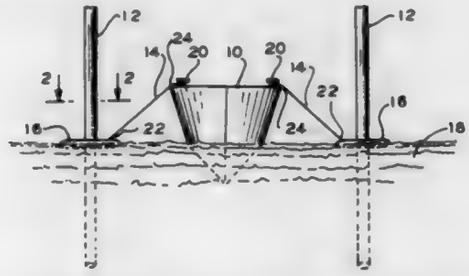
PILE MOORING DEVICE FOR BOATS

Gerard B. Godvin, 111 Lazier Rd., Budd Lake, N.J. 07828, and Charles F. Kolb, Jr., 247D Birch St., Old Bridge, N.J. 08857

Filed Mar. 7, 1994, Ser. No. 206,888

Int. Cl.[6] B63B *21/00*

U.S. Cl. 114—230 **20 Claims**



1. A mooring device for use with a plurality of conventional wooden cylindrical mooring piles exhibiting a plurality of corresponding different outer diameters and surface roughness to which a boat is to be moored, said device comprising:

an annular member of any geometric annular outer peripheral shape arranged to float on water, said member having a central opening sufficiently large for receiving any of said piles therethrough in spaced relation thereto, said opening being dimensioned to permit the member to slide along the received pile in response to changes in water level about the received pile, said member including means arranged to withstand mooring loads induced therein by said boat; and

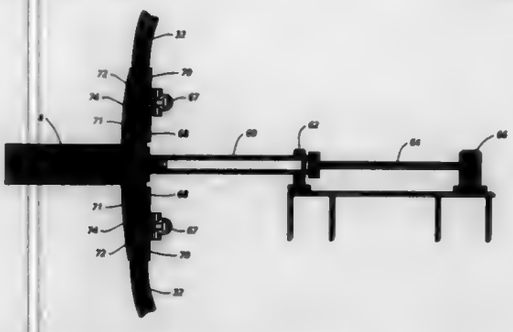
means for securing a mooring line to said member.

5,467,728

RETRACTABLE BOW DIVING PLANE FOR A SUBMARINE

William D. Lucy, Virginia Beach, and William F. Firman, Poquoson, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 22, 1994, Ser. No. 264,120
Int. Cl.[6] B63E *8/18*
U.S. Cl. 114—332 13 Claims



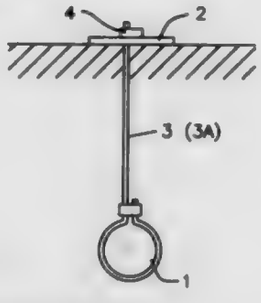
1. A submarine control device comprising:
a diving plane,
a rotor bearing having a slot, said diving plane being engaged in said slot, whereby said rotor bearing supports said diving plane as said diving plane is extended and retracted through said slot in said rotor bearing,
an extension and retraction hydraulic cylinder, said extension and retraction hydraulic cylinder being rigidly connected to said diving plane, whereby said extension and retraction hydraulic cylinder supports the moment of force from said diving plane,
a journal bearing which supports said extension and retraction hydraulic cylinder,
a piston rod which supports the axial force from said diving plane,
a support bearing supporting said piston rod, and
a rotational hydraulic cylinder which rotates said rotor bearing and said diving plane.

5,467,729

BURIED MARKER

Yoshio Yamada, Yokohama, and Katumi Yamakawa, Ichinomiya, both of, Japan, assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Sep. 28, 1993, Ser. No. 127,535
Claims priority, application Japan, Jan. 2, 1992, 4-68944
Int. Cl.[6] G01D *21/00*
U.S. Cl. 116—209 9 Claims



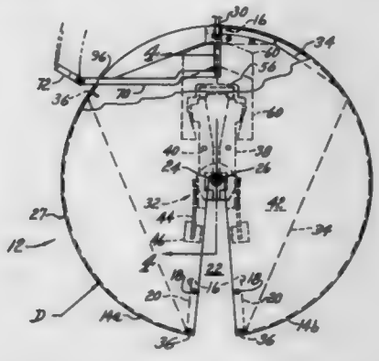
1. A buried marker comprising:
an identifying plate comprising indicia thereon for identifying a type, the number, a burying depth of an object buried in the ground;
an interconnect member for interconnecting said identifying plate and the object buried in the ground, and
a first lock affixing said interconnect member to said identifying plate and a second lock affixing said interconnect member to said buried object, said first lock and said second lock both being of the type comprising a plastic locking head having an insertion hole therein to receive an end of said interconnect member and a metal pawl supported therein to engage a respective end of said interconnect member.

5,467,730

FIXTURE APPARATUS FOR ELEVATED LINES

Mark P. Kovaletz, 1935 Brandon Clr., Anaheim Hills, Calif. 92807

Continuation-in-part of Ser. No. 68,427, May 27, 1993, abandoned. This application Feb. 22, 1994, Ser. No. 199,668
Int. Cl.[6] G01D *21/00*
U.S. Cl. 116—209 23 Claims



1. A fixture apparatus for an elevated utility line, comprising:
(a) a body having a slot formed therein for receiving a conductor of the line;
(b) a trap supported relative to the body for holding the conductor within the slot, the trap being activated by movement of the conductor into the slot; and
(c) a trap releaser for releasing the trap during removal of the body from the conductor, comprising:
(i) a hook receiver movably connected to the body for support thereof during removal of the body from the conductor; and
(ii) connector means for connecting the hook receiver to the trap for release thereof when the body is supported by the hook receiver, without preventing subsequent reactivation of the trap.

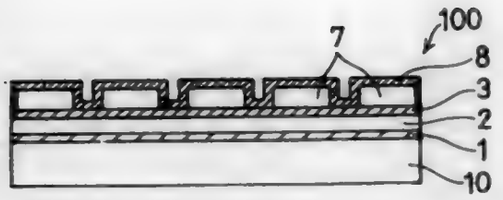
5,467,731

METHOD OF PRODUCING A SEMICONDUCTOR STRUCTURE INCLUDING A RECRYSTALLIZED FILM

Satoshi Arimoto; Norio Hayafuji; Mikio Deguchi, and Satoshi Hamamoto, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 151,823, Nov. 15, 1993, abandoned. This application Oct. 13, 1994, Ser. No. 322,375
Claims priority, application Japan, Feb. 26, 1993, 5-037205
Int. Cl.[6] C30B *13/20*
U.S. Cl. 117—43 10 Claims

1. A method of producing a semiconductor structure including a semiconductor film disposed on an insulating film that is disposed on a semiconductor substrate body comprising:
preparing a semiconductor substrate having a front surface and a rear surface opposite to said front surface;



forming a first insulating film, a first semiconductor film, and a second insulating film on said front surface of said semiconductor substrate successively;

forming spaced apart stripe-shaped second semiconductor films of constant width on said second insulating film and arranged periodically with a constant period;

covering said second semiconductor films with a third insulating film;

zone melting and recrystallizing said first semiconductor film in a direction parallel to said stripe-shaped second semiconductor films, moving from one end of said substrate to an opposite end;

removing said third insulating film and portions of said second insulating film leaving portions of said second insulating film sandwiched between said first semiconductor film and said second semiconductor film;

oxidizing said second semiconductor film and said first semiconductor film exposed in the removing step; and

removing the remaining portions of said second insulating film.

5,467,732

DEVICE PROCESSING INVOLVING AN OPTICAL INTERFEROMETRIC THERMOMETRY

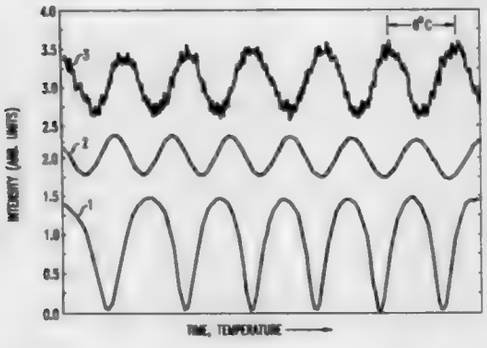
Vincent M. Donnelly, Jr., Berkeley Heights, and James A. McCaulley, Clinton, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation-in-part of Ser. No. 808,949, Dec. 13, 1991, Pat. No. 5,229,303. This application May 21, 1993, Ser. No. 65,501

The portion of the term of this patent subsequent to Jul. 20, 2010, has been disclaimed.

Int. Cl.[6] H01L *21/20*

U.S. Cl. 117—86 **16 Claims**



1. Method of manufacturing a semiconductor device, the method comprising

a) providing a semiconductor body having a first and a second major surface one of which is polished and one of which is unpolished,

b) carrying out one or more processing steps on the body, at least one of the steps depending on the temperature of the body;

CHARACTERIZED IN THAT the method further comprises

c) exposing said unpolished major surface of the body to electromagnetic radiation at an incidence angle between 90 to 15 to said polished surface and detecting radiation reflected from the body wherein said radiation undergoes interference;

d) monitoring the intensity of the detected radiation through at least one extremum as the temperature of the body changes during one of said processing steps, the processing step to be carried out at a nominal processing temperature T_p; and

e) controlling at least one of said processing steps in accordance with the result of step d).

5,467,733

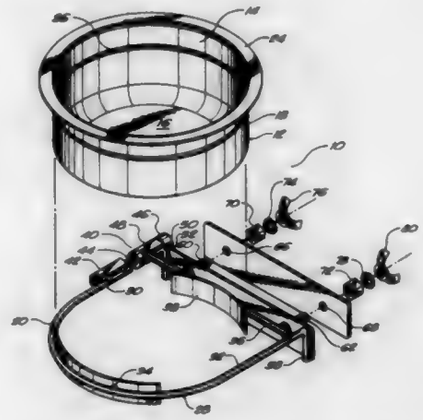
FEEDER BOWL FOR A BIRD IN A CAGE

Anthony Messina, 10502 Tolman St., Houston, Tex. 77034

Filed Aug. 15, 1994, Ser. No. 291,517

Int. Cl.[6] A01K *5/01;39/014*

U.S. Cl. 119—18 **15 Claims**



1. A feeder bowl for a bird or animal in a cage comprising:

a bowl having an open top and a closed bottom, said bowl having a notch extending outwardly therefrom between said open top and said closed bottom;

a clamp ring extending around at least a portion of an exterior circumference of said bowl, said clamp ring positioned between said open top and said notch, said clamp ring having a curved portion having a radius generally corresponding to a radius of said bowl, said clamp ring having linear arms extending from ends of said curved portion, one of said linear arms having an expansion means connected thereto, said expansion means rotatable so as to vary a compressive force of said clamp ring upon an exterior surface of said bowl; and

attachment means connected to said clamp ring, said attachment means for affixing said clamp ring to the cage.

5,467,734

MOVABLE ANIMAL HOUSE

Ying-Kuon Ho, No. 22, Alley 18, Lane 75, An Ping Road, Tainan, Taiwan, Prov. of China

Filed Jun. 8, 1994, Ser. No. 255,606

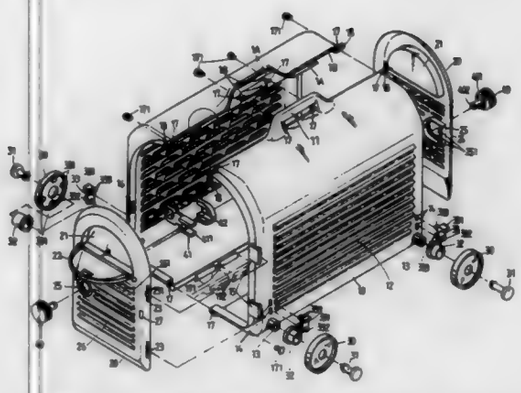
Int. Cl.[6] A01K *31/08*

U.S. Cl. 119—19 **4 Claims**

1. A movable animal house comprising:

a pair of compartments including a lower portion pivotally coupled together and including an upper portion having a grip means provided thereon, said pair of compartments including a bottom portion having at least two wheel axles extended therefrom, and including at least one open side portion having a door pivotally coupled thereto for enclosing said open side portion, means for locking said door to said compartments, and at least two wheels rotatably engaged on said wheel axles for moving said animal house,

said pair of compartments include at least two stop means slidably disposed therein, each said stop means includes a bulge extended therefrom, said wheels each include at least



two stubs extended therefrom, said each bulge is located between said at least two stubs for limiting rotational movement of said wheels, and said wheels are freely rotatable when said bulge is disengaged from said stubs; and

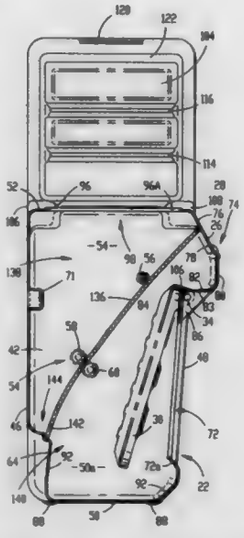
said pair of compartments further include at least two pairs of 8-shaped apertures, and said stop means each includes two extensions engaged in said apertures such that said extensions are movable up and down in said apertures.

5,467,735

AUTOMATIC PET FEEDER

Larry L. Chrisco, Fairland, Okla., assignor to Blitz U.S.A., Inc., Miami, Okla.

Filed Jun. 8, 1994, Ser. No. 257,013
Int. Cl.[6] A01K *5/02*
U.S. Cl. 119—51.5 **11 Claims**



1. An automatic pet feeder having a minimal number of different parts for presenting a quantity of food to a pet for consumption over a period of time, said feeder comprising:

a body having marginal wall structure defining a chamber therein communicating a feed inlet opening and a feed outlet opening, said body having an inlet lid coupling means proximal to said inlet opening and an outlet lid coupling means proximal to said outlet opening;

a divider wall separating said chamber into a feed inlet side and a feed outlet side, and providing a chute communicating said feed inlet and outlet sides;

an inlet lid pivotally coupled with said inlet lid coupling means to cover said inlet opening at a primary position to deny access thereto, and not covering said inlet opening at a plurality of secondary positions pivoted away from said first position to allow access into said inlet side; and

an outlet lid pivotally coupled with said outlet lid coupling means at a closed position covering said outlet side to deny access thereto and an open position pivoted away from said closed position to permit access to said outlet side,

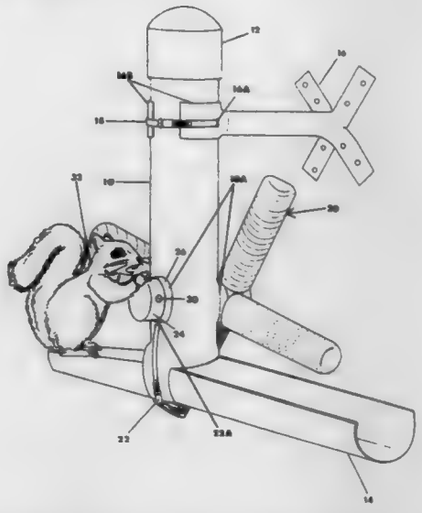
said inlet lid and said outlet lid having substantial similarity sufficient to allow operably interchanging said lids by substituting said inlet lid for said outlet lid on the outlet lid coupling means and substituting said outlet lid for said inlet lid on the inlet lid coupling means.

5,467,736

WILD SQUIRREL FEEDER

Robert R. Reynolds, 811 Heard Ave., Maybrook, N.Y. 12543

Filed Jun. 29, 1994, Ser. No. 269,354
Int. Cl.[6] A01K *39/01*
U.S. Cl. 119—52.2 **3 Claims**



1. A wild animal feed dispensing machine comprising:

a. vertical feed storage container having a base, and a lid is fitted atop said feed storage container,

b. a horizontal semi-circular trough and perch feed catch basin centered and attached to said base,

c. a horizontal cylindrical symmetrical rotating valve slip fitted through a sleeve in said feed storage container just above said trough and perch catch basin,

d. a spoked wheel of different colored spokes rotatably attached perpendicularly to said horizontal cylindrical symmetrical rotating valve at one end,

e. a cap attached to said rotating valve at an opposite end from said spoked wheel, and

g. a holding bracket of suitable material supporting the weight of said wild animal feeder and attached to said feed storage container.

5,467,737

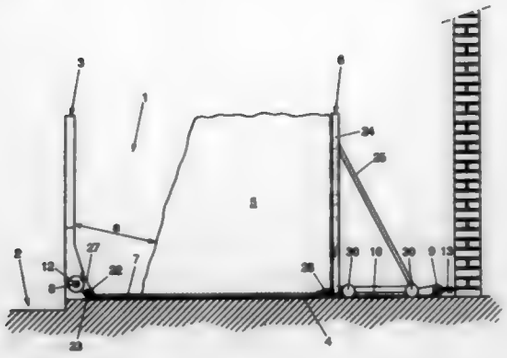
STABLE WITH FEEDING SYSTEM

J. M. W. Weelink, Tynaarlosestraat 58, 9481 AD Vries, Netherlands

Filed Mar. 22, 1994, Ser. No. 216,486
Claims priority, application Netherlands, Mar. 22, 1993, 9300501
Int. Cl.[6] A01K *1/10*
U.S. Cl. 119—60 **22 Claims**

1. A cubicle stable for keeping cows comprising:

a dwelling area;



a feeding area comprising a floor for storing and presenting feed;

a partition between the dwelling area and the feeding area, the partition comprising openings to allow heads of animals in the dwelling area access to the feeding area;

a feed slide movable from a starting position through the feeding area toward the partition and operable to push feed stored in the feeding area to the partition; and

a plurality of flexible hauling elements extending between the feed slide and the partition for hauling the feed slide toward the partition;

a feed slide driver connected to the hauling members, the hauling members having a tensioned condition wherein a force is applied to the hauling members by the feed slide driver;

the hauling elements in the tensioned condition extending above and immediately adjacent the floor of the feeding area such that feed deposited in the feeding area between the feed slide and the partition is at least partially supported on the hauling members.

5,467,738

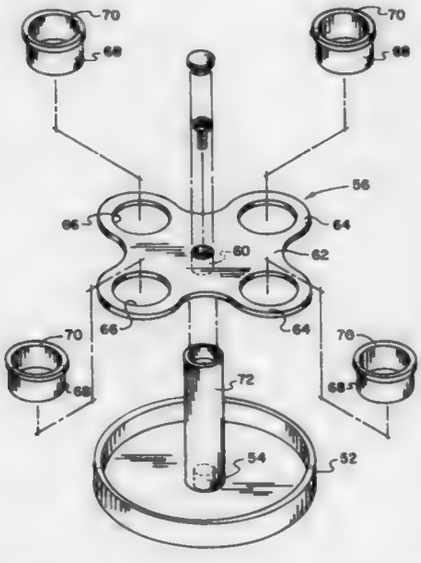
ANT-FREE PET DISHES

Jeanie E. Cass, 7279 7th St., Canutillo, Tex. 79835

Filed Dec. 20, 1993, Ser. No. 169,411

Int. Cl.[6] A01K *5/01; 7/00*

U.S. Cl. 119—61 **3 Claims**



1. An ant-free dish for use by pets comprising:

a lower dish positionable in a horizontal plane and defining a lower liquid reservoir therein, the lower dish having an upwardly extending projection about the center of the dish with an axial bore therethrough;

an upper food containing section comprising a horizontally disposed upper base member having an undulant periphery with a plurality of protrusions disposed thereon and extending outwardly in a spaced, equidistant, generally circumferential and symmetrical relationship relative to the center of the base member and between each undulation, a downwardly extending projection with an axial bore therein being disposed about the center of the upper base member, each protrusion containing a circular aperture of a diameter adapted to encompass a circular food dish therein, the food dish having a circular plate, an upwardly extending peripheral wall, and an outwardly extending annular flange at the upper terminus of the wall adapted to hold the food dish in proximate relationship to the base member upon the placement of the food dish with an aperture thereof;

a support member comprising a cylindrical tube having an unthreaded upper extent of a diameter to receive the projection of the upper base member, an unthreaded lower end of a diameter to receive the projection of the lower dish, and a threaded central extent therebetween; and

a lower bolt extending through the axial bore of the lower dish and into the threaded central extent of the tube and an upper bolt extending through the axial bore of the upper base member and into the threaded central extent of the tube such that the upper base member and lower dish are maintained in fixed vertical alignment thereto.

5,467,739

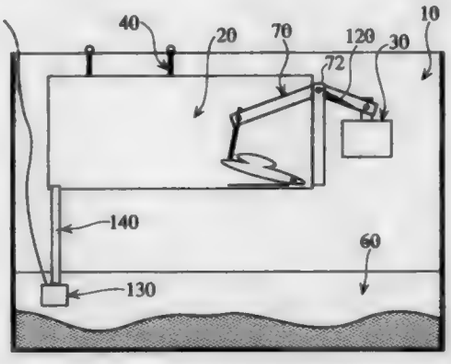
APPARATUS FOR SIMULATING A TIDE POOL IN AN AQUARIUM

Jeff D. Boschert, 16310 Shannon Rd., Los Gatos, Calif. 95032

Filed Aug. 25, 1994, Ser. No. 296,322

Int. Cl.[6] A01K *63/00*

U.S. Cl. 119—247 **11 Claims**



1. A tide pool device adapted for use with an aquarium, comprising:

a top container having side walls and a bottom wall, said top container being adapted to accumulate water;

a drain formed in the bottom wall of said top container;

a pump means for transferring water from said aquarium to said top container thereby lowering the water level in said aquarium tank;

an overflow container having side walls and a bottom wall, said overflow container being pivotally attached to said top container and adapted to receive any water that overflows from said top container;

a drainage hole formed in the bottom wall of said overflow container;

means for directing water that is overflowing from said top container into said overflow container;

a flapper covering said drain; and

a coupling between said overflow container and said flapper that is adapted to lift said flapper from said drain when said

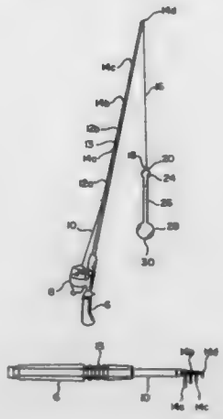
overflow container is filled by a selected amount of water that flows into said overflow container from said top container.

5,467,740

DOG AND CAT TRAINER-EXERCISER

Steve Redwine, P.O. Box 777, Granger, Wash. 98932

Filed Sep. 15, 1994, Ser. No. 307,319
Int. Cl.[6] A01K *15/02*
U.S. Cl. 119—707 **13 Claims**



1. A hand held trainer exerciser for use by a human trainer to train and exercise dogs and cats of all sizes comprising:

a flexible, telescopic pole having a plurality of telescoping sections for expanding or collapsing the pole, the pole having a handle attached to a base segment of the pole, and a plurality of eyelets attached to the pole between the handle and a tip of the pole;

a reel attached to the pole near the handle, the reel having an adjustable drag mechanism to selectably increase or decrease a drag setting of the reel so that a dog or cat training subject can pull against the reel drag and pull line off of the reel to simulate an activity of fighting and overwhelming a hunting or retrieval subject;

an anchor line releasably and retrievably windable on a spool of the reel, a portion of the line stringable through the eyelets of the pole, the line releasable and retrievable from the reel to provide a variable line length between the reel and a target end of the line to accommodate a variety of training and exercise activities and subjects; and

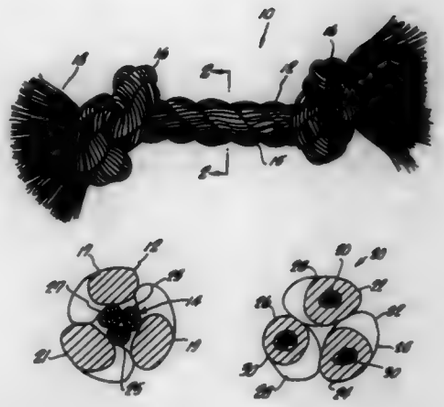
a pet training target object attractive to a dog or cat and otherwise suitable as a target object for the training subject, the target object connectable to the target end of the line and castable a variable distance from the trainer, the object designed to be visually tracked and pursued while the lure is cast through the air or dragged along the ground.

5,467,741

DOG CHEW TOY FOR CANINE DENTAL CARE AND METHODS FOR MAKING CHEW TOY

Anthony O'Rourke, Malibu, Calif., assignor to Booda Products, Inc., Gardena, Calif.

Continuation-in-part of Ser. No. 938,282, Aug. 31, 1992, Pat. No. 5,329,881, and a continuation-in-part of Ser. No. 69,702, Jun. 1, 1993, which is a continuation-in-part of Ser. No. 932,770, Aug. 20, 1992, Pat. No. 5,215,038. This application Dec. 2, 1993, Ser. No. 162,346
Int. Cl.[6] A01K *29/00*
U.S. Cl. 119—710 **45 Claims**



5. A chew toy for dogs comprising a plurality of soft pliable threads twisted about a plurality of twisted fibers so as to substantially encase and retain said fibers within said pliable threads, and a breath freshening agent carried by said fibers, said agent being retained within said toy by said fibers and said strands of soft pliable threads and, upon said toy being chewed by a dog, said soft pliable threads provide a cleaning of the dog's teeth and a massaging of its gums and a portion of said dental agent is released onto the teeth and gums of the dog.

5,467,742

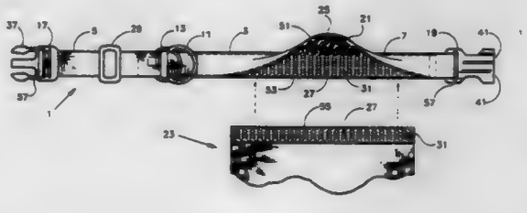
Patent Not Issued For This Number

5,467,743

PET COLLAR

Karen A. Doose, 3052 Skyline Dr., Oceanside, Calif. 92056

Filed Dec. 12, 1994, Ser. No. 353,632
Int. Cl.[6] A01K *27/00*
U.S. Cl. 119—864 **19 Claims**



1. A pet collar comprising:

a) first and second flexible belt segments of terminal length adapted to pass around the neck of the pet and form an encircling loop thereabout;

b) an interlocking clasp attached respectively to one end of each said segment to connect said segments together in end-to-end fashion;

c) a pocket formed in one said segment; and,

d) a bib removeably connected to said pocket for depending from said collar.

5,467,744

OSCILLATING PISTON ENGINE FOR HELICOPTERS

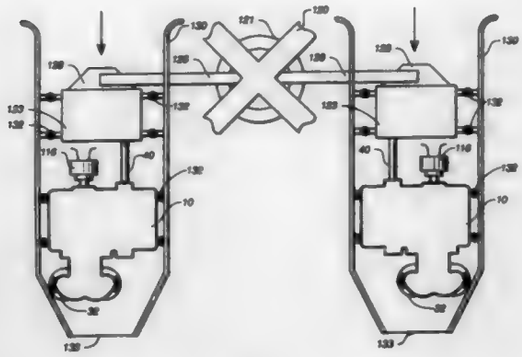
Monti Farrell, 1942 Carpenter Canyon Rd., San Luis Obispo, Calif. 93401

Continuation-in-part of Ser. No. 918,374, Jul. 23, 1992, Pat. No. 5,222,463. This application Jun. 4, 1993, Ser. No. 72,240

The portion of the term of this patent subsequent to Jun. 29, 2010, has been disclaimed.

Int. Cl.[6] F02B *53/00;* **B64C** *27/04*

U.S. Cl. 123—18 A **20 Claims**



1. An internal combustion engine system to provide the motive power source of a rotor system comprising:

(a) a rotating annular cylinder,

(b) a plurality of pairs of oscillating pistons in said cylinder,

(c) means to oscillate said pistons so as to alternately move adjacent pistons apart from one another and toward one another for the respective strokes an the internal combustion engine of said system,

(d) intake ports, exhaust ports and ignition means on said rotating annular cylinder for registry with the respective spaces between the adjacent pistons according to the firing order and cycle of said engine,

(e) a power take-off shaft in said engine,

(f) means to convert the oscillating of said pistons into rotation of said power take-off shaft,

(g) transmitting means between said power take-off shaft and said cylinder to rotate said annular cylinder in a predetermined ratio to the oscillation of said piston for registering said intake ports, exhaust ports and ignition means with the respective spaces between said oscillating pistons in a predetermined sequence,

(h) the ratio between the rotation of said shaft and the resulting angular oscillation of said pistons with respect to the rotating annular cylinder is one oscillation of each piston for each quarter of one revolution of said cylinder,

(i) the inner periphery of the cylinder being of circular cross-section and said pistons being also of circular cross-section, and piston rings on said pistons being in contact with the inner circular periphery of said cylinder,

(j) said means to convert said piston oscillation into rotation including concentric tubes journalled concentrically with said rotating cylinder,

(k) connecting means between the tubes and the power take-off shaft for converting oscillation of the tubes into rotation of the shaft,

(l) a crankcase,

(m) journal means on said crankcase to support said rotating cylinder in a generally horizontal plane,

(n) said oscillation converting means including connecting devices between the respective concentric tubes and said power take-off shaft for oscillating said tubes oppositely to one another during the rotation of said shaft,

(o) said inner tube being connected to a fuel vapor intake,

(p) an intake manifold on said rotating cylinder connected to the said intake ports, said inner tube discharging into said intake manifold,

(q) piston supporting torque disks being flanges extending from the respective concentric tube to the inner periphery of said rotating cylinder and to the adjacent pistons so that said pistons are directly connected alternately to each of the respective torque disks,

(r) transmission means for reducing the torque speed of said power take-off shaft, and for providing the motive force for rotating a rotor system, operably connected to said power take-off shaft,

(s) said torque disks being slidable relatively to one another according to relative turning movement of said concentric tubes and extending from the respective tubes to support said pistons in a balanced position in said cylinder,

(t) each of said pistons having a substantially cylindrical section which is operably seated against the walls of said cylinder and which is attached to each of the respective torque disks, and

(u) each of said connecting means between each of the concentric tubes and the power take-off shaft comprises an elongated arm having a circular aperture near one end thereof and through which one of the respective tubes passes and is fixedly attached thereto and having an elliptical aperture near the other end thereof operably connected to said power take-off shaft to transmit the axial oscillation of each of said torque discs and the back-and-forth oscillation into rotation of the power take-off shaft.

5,467,745

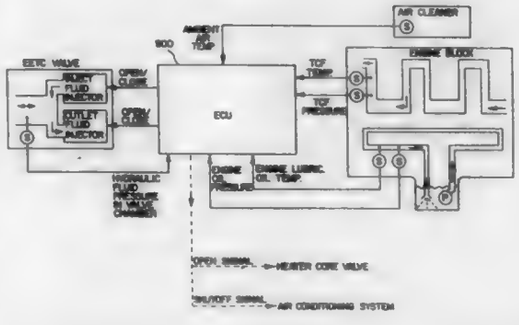
SYSTEM FOR DETERMINING THE APPROPRIATE STATE OF A FLOW CONTROL VALVE AND CONTROLLING ITS STATE

Thomas J. Hollis, 5 Roxbury Dr., Medford, N.J. 08055

Filed Sep. 14, 1994, Ser. No. 306,272

Int. Cl.[6] F01P *7/14*

U.S. Cl. 123—41.1 **25 Claims**



1. A temperature control system in a liquid cooled internal combustion engine equipped with a radiator, the system comprising:

(a) a first flow control valve for controlling flow of a temperature control fluid through a first passageway, the first flow control valve having a first state for preventing said flow and a second state for allowing said flow;

(b) a first sensor for detecting the temperature of at least one engine operation parameter;

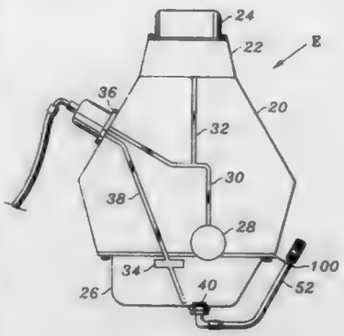
(c) a second sensor for detecting the temperature of at least one ambient condition; and

(d) an engine computer for receiving the engine operation parameter and the ambient condition signals, the engine computer determining a desired state of the valve by comparing at least the engine operation signal and the ambient condition signal to a set of predetermined values which define a valve state curve, at least a portion of the valve state curve having a non-zero slope, and sending said control signals to the first flow control valve to control the state of the valve.

5,467,746
ADAPTERS FOR FLUSHING AN INTERNAL COMBUSTION ENGINE

Erik F. M. Waelput, 6530 Sattes Dr., Rancho Palos Verdes, Calif. 90274; Peter C. Hollub, 16615 S. Pacific, Sunset Beach, Calif. 90742, and Joseph D. Lentini, 311 Easter Cir., Huntington Beach, Calif. 92649

Filed Dec. 27, 1993, Ser. No. 173,088
Int. Cl.[6] F01M *11/04*
U.S. Cl. 123—196 A **16 Claims**



1. An adapter system for use with an internal combustion engine flushing apparatus which permits connection to the crank case and oil filter port of an internal combustion engine for introducing fluid through the oil filter port and draining of said fluid through the crank case, said adapter system comprising:

a) an oil pan adapter sized to fit within the drain plug port of an oil pan of the engine to create a liquid tight seal with the port, and a connecting conduit connected with the adapter, the conduit being directed from the drain plug port in an overall upward direction and intended to be located relatively permanently adjacent the engine, the adapter and conduit having communicating bores for selectively passing fluid from the engine when the bore is open; and

b) an oil filter adapter, such oil filter adapter fitting with the oil filter port of the internal combustion engine and creating a liquid tight seal with the port, and selectively permitting communication of fluid through the adapter and the flushing apparatus, wherein the oil filter adapter includes a threaded elongated non-hollow post for engagement with the engine block at the oil filter port, the post being threaded at both ends, the one end engaging with the engine block and the opposite end engaging a cap associated with the oil filter adapter, and a cylindrical elongated ring surrounding the post.

5,467,747
NOISE SUPPRESSION ENCLOSURE FOR AN ENGINE

Everett G. Brandt, Chillicothe; M. Kathryn Christensen, Metamora, and W. Charles Sahm, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 721,422, Aug. 19, 1991, Pat. No. 5,297,517. This application Jan. 10, 1994, Ser. No. 179,634
The portion of the term of this patent subsequent to Mar. 24, 2011, has been disclaimed.
Int. Cl.[6] F02B *77/00*
U.S. Cl. 123—198 E **20 Claims**

1. A noise reduction enclosure (**10**) adapted for use with an engine (**14**), comprising:

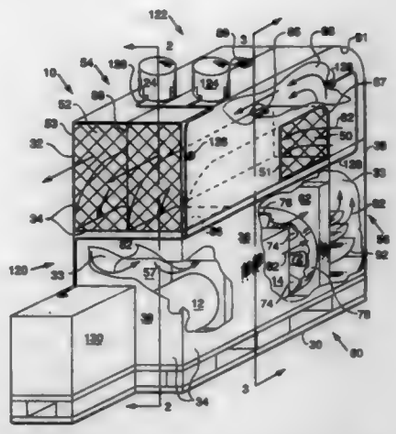
a housing (**32**) having a generally rectangular shape and being divided into a duct portion (**54**) and an engine portion (**56**);

said duct portion (**54**) being disposed above said engine portion (**56**) and having an inlet opening (**50**) and an outlet opening (**52**) in fluid communication therewith;

said duct portion (**54**) further including an inlet duct (**84**) through which a cooling medium (**82**) flows from said inlet opening (**50**) to said engine portion (**56**) and an outlet duct (**88**) through which said cooling medium (**82**) exits from said engine portion (**56**) to said outlet opening (**52**);

said inlet duct (**84**) and said outlet duct (**88**) each having at least one curved portion (**87,91**) and being disposed adjacent one another within said duct portion (**54**); and

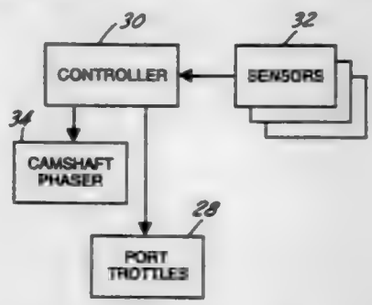
an absorptive material (**102**) attached to at least a portion of the interior surfaces of said inlet duct (**84**) and said outlet duct (**88**).



5,467,748
INTERNAL COMBUSTION ENGINE WITH INTAKE PORT THROTTLING AND EXHAUST CAMSHAFT PHASE SHIFTING FOR CYLINDER DEACTIVATION

William F. Stockhausen, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 16, 1995, Ser. No. 407,523
Int. Cl.[6] F02B *77/00*
U.S. Cl. 123—198 F **13 Claims**



1. A four-stroke cycle, multicylinder reciprocating internal combustion engine having a crankshaft and a plurality of pistons reciprocably contained within a plurality of cylinders, with said engine further comprising:

at least one intake popper valve and at least one exhaust popper valve for each engine cylinder;

a camshaft for operating at least the exhaust valves;

a camshaft phaser for powering said camshaft and for adjusting the timing of the camshaft with respect to the rotational position of the crankshaft;

a plurality of intake port throttles, with one of said throttles mounted in proximity to, and upstream of each of said intake valves; and

a controller, connected with said port throttles and said camshaft phaser, for deactivating at least some of the cylinders by operating said camshaft phaser and said port throttles such that for each cylinder which is to be deactivated, the port throttle is closed, and the camshaft timing is adjusted such that the exhaust valve opens and closes at points which are

approximately symmetrical about a rotational position of the crankshaft at which the direction of motion of the cylinder's piston changes.

5,467,749

APPARATUS FOR GOVERNING THE IDLING RPM OF AN INTERNAL COMBUSTION ENGINE

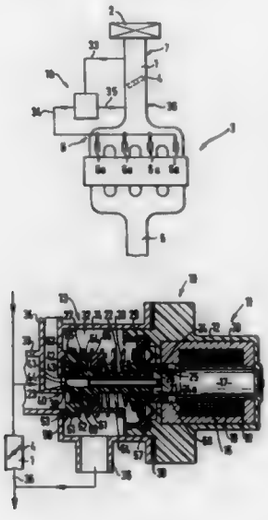
Johannes Meiwes, Markgroningen; Albert Gerhard, Tamm, and Uwe Hammer, Schwieberdingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 29, 1994, Ser. No. 235,054

Claims priority, application Germany, May 8, 1993, 43 15 436.0

Int. Cl.[6] F02D 9/02;33/00

U.S. Cl. 123—339.27 **8 Claims**



1. An apparatus for governing an idling rpm of an internal combustion engine by controlling a quantity of operating fluid that is delivered to at least two flow lines of the engine, a first flow cross section of a first flow line is controllable by means of a first valve closing member, and a second flow cross section of a second flow line is controllable by means of a second valve closing member, and the first flow line communicates with a fuel metering device of the engine, and the second flow line communicates with an intake conduit of the engine downstream of a throttle device disposed in the intake conduit, the apparatus having an electromechanical actuator, disposed in a drive housing, and an adjusting member coupled to the actuator, by means of said adjusting member the first and second valve closing members are adjustable from a closing position to an opening position, the first valve closing member (**42**) and the second valve closing member (**52**) are axially displaceable relative to one another, and the first and second valve closing members (**42**, **52**) are coupled via a slaving device (**60**) in such a way that in the closing position of the first valve closing member (**42**), the second valve closing member (**52**) is likewise closed, and the second valve closing member (**52**) is adjustable only after the attainment of a predetermined opening position of the first valve closing member (**42**) in the valve opening direction.

5,467,750

METHOD OF CONTROLLING ENGINE OUTPUT TORQUE

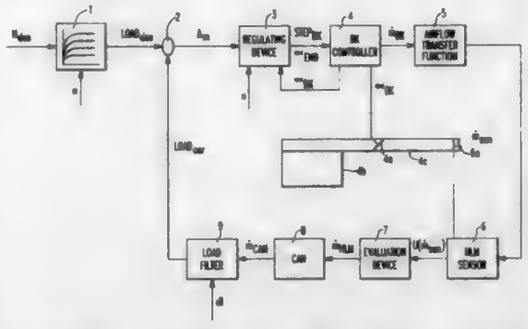
Hans Braun; Ulf Weinecke, both of Stuttgart; Kurt Maute, Sindelfingen, and Wolfgang Strauss, Denkendorf, all of, Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed May 11, 1994, Ser. No. 240,825

Claims priority, application Germany, May 12, 1993, 43 15 885.4

Int. Cl.[6] F02D 41/00

U.S. Cl. 123—350 **6 Claims**



1. A method of controlling the output torque of an internal combustion engine having a combustion chamber to which combustion air is supplied through an air inlet pipe including a throttle valve for controlling the combustion air flow to said combustion chamber, said method comprising the steps of:

providing a desired load value corresponding to a given desired output torque of said engine,

determining an average air mass flow value required to achieve said desired load value,

measuring the combustion air mass flow through said air inlet pipe to said combustion chamber,

correcting said average air mass flow value by compensating for deviations occurring, in dynamic engine operating states, in said measured combustion air mass flow from an actual air mass flow through said inlet pipe to said combustion chamber,

comparing, at predetermined time intervals, said corrected average air mass flow value with said measured combustion air mass flow value, and

operating said throttle valve in a mass flow control state so as to reduce to zero any deviation of said measured combustion air mass flow value from said corrected average combustion air mass flow value.

5,467,751

THROTTLE VALVE CONTROL SYSTEM

Masato Kumagai, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Apr. 11, 1994, Ser. No. 226,083

Claims priority, application Japan, Apr. 13, 1993, 5-086465

Int. Cl.[6] F02D 7/00

U.S. Cl. 123—399 **5 Claims**

1. A throttle valve control system for a motor vehicle, comprising:

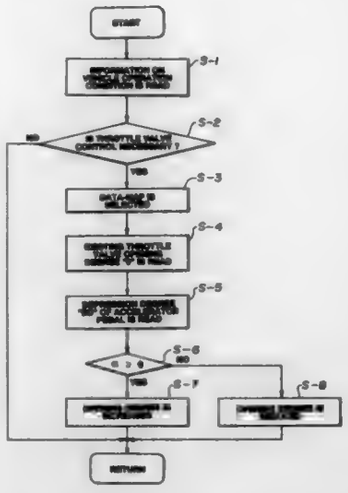
means for receiving an inclination angle signal representing an inclination angle of a throttle valve;

means for receiving a depression degree signal representing a depression degree of an accelerator pedal;

a memory for storing a data map representing a relationship between inclination angles and accelerator pedal depression degrees for a vehicle operation condition; and

microprocessor control means coupled to the memory and receiving the inclination angle signal and the depression degree signal, the microprocessor control means being programmed to

(i) determine when the vehicle is operating under the vehicle operation condition,



(ii) determine, when the vehicle is operating under the vehicle operation condition, a target inclination angle of the throttle valve based on the data map,

(iii) compare the target throttle inclination angle to the inclination angle represented by the incliration angle signal, and

(iv) output a control signal to control the throttle valve based on the comparison of step (iii),

wherein the position of the throttle valve is thus varied according to the control signal and independent of movement of the accelerator pedal when the vehicle is operating under the vehicle operation condition.

5,467,752

METHOD AND APPARATUS FOR CONTROLLING THE FUEL INJECTION/IGNITION TIMING OF INTERNAL COMBUSTION ENGINES, AND A CRANK ANGLE SENSOR USING SAME

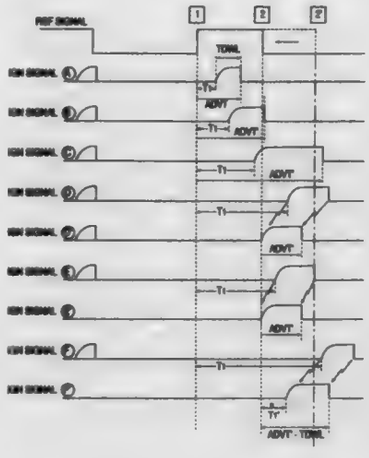
Yoshinori Murao; Masami Nagano, and Shigenori Hosowari, all of Katsuta, Japan, assignors to Hitachi, Ltd., and Hitachi Automotive Eng. Co., both of, Japan

Filed Sep. 3, 1993, Ser. No. 115,717

Claims priority, application Japan, Sep. 4, 1992, 4-236810

Int. Cl.[6] F02P *5/00*

U.S. Cl. 123—414 **20 Claims**



4. Method of controlling ignition timing of an internal combustion engine comprising, for each cylinder of said engine, the steps of:

generating a reference signal having a plurality of designated reference points which occur at predetermined angular points in an operating cycle of said cylinder;

determining an ignition spark advance angle for said cylinder based on operating parameters of said engine;

comparing said ignition spark advance angle with said plurality of designated reference points;

selecting one of said reference points which most closely precedes said ignition spark advance angle;

calculating an ignition timing value relative to said selected reference point based on said ignition spark advance angle;

measuring said calculated ignition timing value from said selected reference point; and

generating an ignition spark at end of said measured ignition timing value.

5,467,753

IGNITION TIMING CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE OF VEHICLE

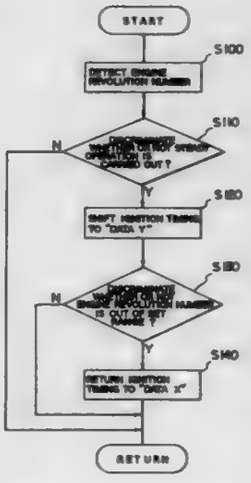
Atsushi Takaoka, Shizuoka, and Kazuhiko Mizutani, Hamamatsu, both of, Japan, assignors to Suzuki Kabushiki Kaisha, Shizuoka, Japan

Filed Feb. 1, 1995, Ser. No. 382,400

Claims priority, application Japan, Feb. 23, 1994, 6-025355

Int. Cl.[6] F02P *5/15*

U.S. Cl. 123—418 **2 Claims**



1. An ignition timing control apparatus for an internal combustion engine of a vehicle, comprising:

a detection means connected to an internal combustion engine for detecting a revolution number of the internal combustion engine; and

a control means operatively connected to said detection means for controlling an ignition timing period in accordance with the detected revolution number of the internal combustion engine, said control means being connected to an ignition unit connected to the internal combustion engine,

said control means including an element for discriminating that the internal combustion engine is now in a steady operation state in a case where the detected engine revolution number is maintained by a predetermined time interval within a predetermined engine revolution number variation range and an element for setting, to the internal combustion engine, the ignition timing period for preventing irregular combustion and knocking when it is discriminated that the internal combustion engine is in the steady operation period and for setting, to the internal combustion engine, the ignition timing period satisfying an output requirement when it is discriminated that the internal combustion engine is out of the steady operation period.

5,467,754
ACCUMULATOR FUEL INJECTION SYSTEM

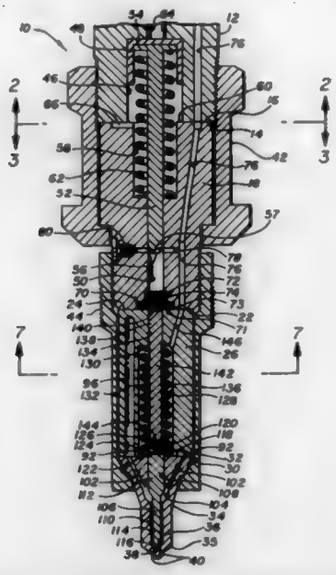
Niels J. Beck, Bonita; James A. Pena, Leucadia; Alan R. Roach, Del Mar, and Bevan H. Johnston, La Mesa, all of Calif., assignors to Servojet Electronic Systems, Ltd., San Diego, Calif.

Continuation-in-part of Ser. No. 830,981, Jan. 28, 1992, Pat. No. 5,241,935, which is a continuation of Ser. No. 152,013, Feb. 3, 1988, abandoned. This application Sep. 7, 1993, Ser. No. 118,168

The portion of the term of this patent subsequent to Aug. 30, 2011, has been disclaimed.

Int. Cl.[6] F02B *3/00*

U.S. Cl. 123—467 **31 Claims**



1. A method of reducing undesired premixed burning in an internal combustion engine, comprising:

A. lifting an injector needle of a fuel injector a constant low-lift increment from a valve seat of a valve covers orifice (VCO) nozzle having an injection hole opening into said valve seat;

B. preventing lifting of said injector needle beyond said low-lift increment for a sufficient interval of time to inject a relatively small initial fuel charge into the engine from said VCO nozzle, said injection producing a highly atomized, wide-angle spray plume with relatively low penetration, said interval terminating when lifting forces imposed on said injector needle overcome holding forces imposed on said injector needle by a stop plate, said stop plate having opposed first and second surfaces exposed to an ambient fluid pressure and to a fluid vapor pressure, respectively;

C. lifting said injector needle to a higher lift position to inject a main fuel charge into the engine, said main fuel charge being ejected from said VC0 nozzle as a relatively narrow jet having high penetration.

5,467,755
METHOD AND SYSTEM FOR CONTROLLING FLEXIBLE FUEL VEHICLE FUELING

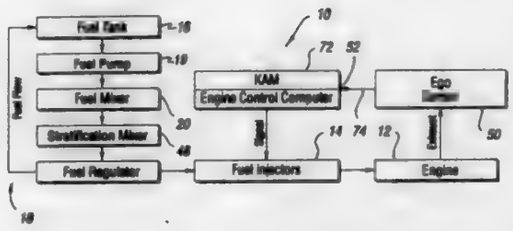
Julie A. Konrad, Saline; Mark Freeland, Farmington Hills, and Brian S. Czuhal, Canton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 25, 1994, Ser. No. 295,450

Int. Cl.[6] F02D *41/14*; **F02M** *37/00*

U.S. Cl. 123—674 **14 Claims**

1. For use in a motor vehicle powered by a fuel-injected engine, said motor vehicle having a fuel tank, a fuel pump and a fuel rail and operative to run on a plurality of fuels and fuel blends, an adaptive fuel control system comprising:



a fuel mixer provided in fluid communication with said fuel tank and said fuel pump, said fuel mixer operative as a fluid damper to slow the rate at which new fuel is blended with existing fuel;

a stratification mixer provided in fluid communication with said fuel rail, said stratification mixer operative to re-mix components of blended fuels that may have separated at cold temperatures;

an Exhaust Gas Oxygen Sensor (EGO) operative to monitor engine exhaust gases and generate corresponding electrical signals when the air/fuel mixture of said fuel switches between rich and lean, said EGO switch points indicative of the air/fuel mixture passing through stoichiometry; and

an Electronic Control Assembly (ECA) provided in electrical communication with said EGO and said fuel injectors, said ECA having a Keep Alive Memory (KAM) and adapted to monitor said EGO during closed loop fuel control and receive said electrical signals, said ECA further adapted to generate and store in said KAM an updatable adaptive fuel control table of air/fuel ratio multipliers for selected engine load/engine speed cells and correspondingly adjust said fuel injectors to provide the correct fuel request for the current fuel, engine speed, and engine load.

5,467,756
DEVICE FOR CONTROLLING AN AMOUNT OF EXHAUST GAS RETURNED TO AN ASPIRATING LINE

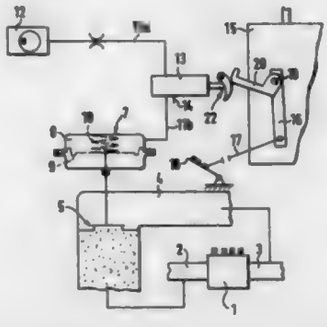
Jorg-Peter Fischer, Kirchheim, and Steffen Mossner, Heilbronn, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 19, 1994, Ser. No. 293,266

Claims priority, application Germany, Sep. 30, 1993, 43 33 295.1

Int. Cl.[6] F02M *25/07*

U.S. Cl. 123—569 **3 Claims**



1. A device for controlling the amounts of returned exhaust gas of a self-igniting internal combustion engine (1), supplied by a fuel injection pump (15), having an exhaust gas return valve (5) disposed in an exhaust gas return line (4) of the internal combustion engine, said gas return valve is operated by means of a pneumatic servo motor (7) having a work chamber (8) which is controlled by means of a control valve (13) which, in turn, is controlled as a function of a position of a floating lever (16) of the fuel injection pump (15) that controls the injection amount and which, depending on the switching position of the control valve, can be connected with either a control pressure source (12) or a reference pressure

source, wherein the floating lever (16) is coupled with a control cam (20) which cooperates with an actuation member (22) of the control valve (13), the control cam describes a continuously increasing or decreasing cam course in relation to the actuation member (22), and the control valve is embodied in such a way that, with increasing actuation of the actuation member (22), the control valve attains three switching positions in sequence when the floating lever (16) moves from an idle position to a full load position, namely a first switching position in accordance with a first switching state, a second switching position in accordance with a second switching state and a third switching position in accordance with a third switching state, wherein the first switching state adjusts the control pressure in the work chamber (8) in such a way that the exhaust gas return valve (5) is closed, and wherein the second switching state sets the control pressure such that the exhaust gas return valve (5) is opened.

5,467,757

COMPRESSION-IGNITION TYPE ENGINE AND COMBUSTION METHOD OF SAME

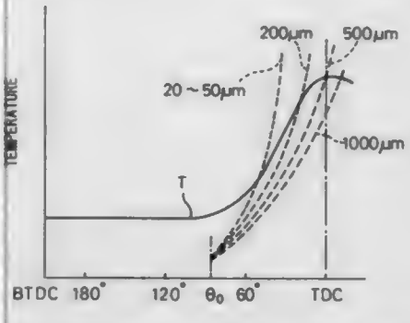
Hiromichi Yanagihara, Gotemba; Yasuo Sato, and Akio Kawaguchi, both of Susono, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 15, 1994, Ser. No. 290,254

Claims priority, application Japan, Aug. 20, 1993, 5-206432; May 23, 1994, 6-108560

Int. Cl.[6] F02B *5/00*

U.S. Cl. 123—305 **22 Claims**



1. A compression-ignition type engine having a combustion chamber, comprising:

injection means for injecting fuel in the combustion chamber and forming fuel droplets diffused in the combustion chamber, the mean value of the particle size of said fuel droplets being larger than a predetermined particle size at which the temperature of the fuel droplets having said predetermined particle size reaches a boiling point of a main ingredient of said fuel, which boiling point is determined by pressure in the combustion chamber, at about the top dead center of the compression stroke; and

control means for controlling said injection means to carry out an injecting operation by said injection means at a predetermined timing during a period from the start of an intake stroke to approximately 60 degrees before top dead center of the compression stroke.

5,467,758

ELECTRONIC DISTRIBUTING TYPE IGNITION DEVICE

Norio Moriyama, Toukai, and Noboru Sugiura, Mito, both of, Japan, assignors to Hitachi, Ltd., Japan

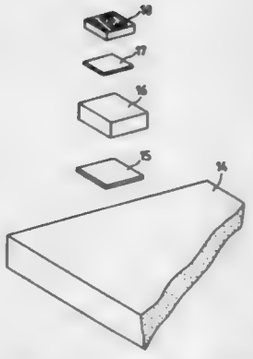
Filed Aug. 15, 1994, Ser. No. 290,084

Claims priority, application Japan, Aug. 13, 1993, 5-201383

Int. Cl.[6] F02P *7/02*

U.S. Cl. 123—617 **3 Claims**

1. An electronic distributing type ignition device formed in a unit of an ignition coil for each of spark plugs and an ignition



controller having a power transistor for controlling said spark plug, wherein said power transistor in said ignition controller is mounted on and fixed to a molybdenum plate in a multilayered member formed by fixing the molybdenum plate on the fixing surface of a copper base and by flatting each of the surfaces.

5,467,759

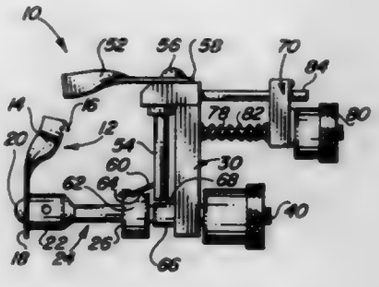
ARCHERY REST ASSEMBLY

Vincent F. Troncoso, Montrose, Colo., assignor to Golden Key Futura, Inc., Montrose, Colo.

Filed Jan. 9, 1995, Ser. No. 370,100

Int. Cl.[6] F41B *5/22*

U.S. Cl. 124—44.5 **5 Claims**



1. An improved archery arrow rest and side pressure point assembly, said assembly comprising, in combination:

a) an archery arrow shaft support having a front end adapted to support an arrow shaft and an opposite rear end;

b) a transverse cross-bar having a free end, an intermediate portion and an opposite end, said free end being releasably connected to the rear end of said support, for projecting said support forwardly into the window of an archery bow, said cross-bar being generally circular in transverse cross-section;

c) a bracket having an upper portion and a lower portion, said bracket receiving said intermediate portion of said cross-bar for rotation of said cross-bar therein;

d) a forwardly and rearwardly extending elongated mounting block having a front portion and a rear portion, said block front portion being adapted to be secured to the sidewall of the riser section of an archery bow, said sidewall defining said window on the side thereof facing said bracket and said arrow shaft support, said block rear portion being adapted to extend rearwardly of said riser section;

e) a tubular arm connected to the side of said bracket facing said block and extending transversely through said block rear portion;

f) guide means connected to said bracket and spaced from said tubular arm, said guide means passing transversely through said block rear portion to prevent rotational movement of said bracket;

g) a turn knob rotatably connected to said tubular arm on the side of said block facing away from said arrow shaft support

for incremental transverse movement of said bracket and support towards and away from said block for adjustable lateral positioning of said support in said window;

h) an arrow shaft side pressure arm having a front end and a rear end, said arm rear end being releasably connected to said bracket above said arrow shaft support; and,

i) connector means in said bracket interconnecting said intermediate portion of said cross-bar and said rear end of said side pressure point arm, whereby depressing of said support during shooting of an arrow shaft therefrom simultaneously effects movement of said front end of said arm towards said sidewall, providing automatic arrow clearance during said shooting.

5,467,760

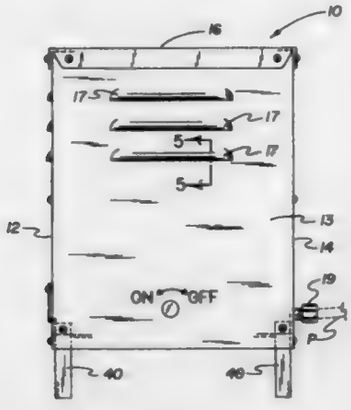
PORTABLE SPORTSMAN FURNACE

John H. Cox, 2005 Alanson St., Westland, Mich. 48185

Filed Nov. 16, 1994, Ser. No. 340,607

Int. Cl.[6] A61F 7/08

U.S. Cl. 126—268 **5 Claims**



1. A portable sportsman furnace, comprising,

a unitary housing having a floor spaced from a top wall, with a continuous side wall member, including a first wall spaced from a third wall, with a second wall spaced from a fourth wall, with the second wall and the fourth wall oriented between the first wall and the third wall,

and

at least the first wall having a vent opening,

and

burner means positioned within the housing adjacent to the floor, with the burner means oriented between the vent openings and the floor for directing heat throughout the housing and directing the heat through the vent opening,

the burner means includes a burner assembly, with the burner assembly having an array of burner ports, and a first conduit extending through the third wall, and the first conduit having a coupler oriented exteriorly of the third wall for securement to a fuel line selectively, with the first conduit having a first valve, and a second conduit extending from the first valve to a second valve, and a control rod extending through the second wall to the second valve to control fuel flow therethrough, and a third conduit extending from the second valve to the burner ports.

5,467,761

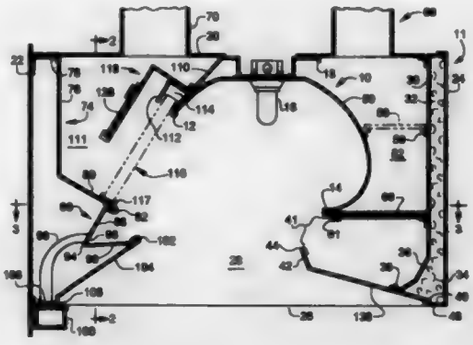
APPARATUS AND METHOD FOR REMOVING FUMES FROM THE SPACE ABOVE A COOKING APPLIANCE

Irv Kuechler, San Bernardino, Calif., assignor to D.E.R. Investments Ltd., Chicago, Ill.

Filed Aug. 11, 1993, Ser. No. 105,295

Int. Cl.[6] F24C 15/20; F23J 11/02

U.S. Cl. 126—299 D **25 Claims**



1. A method of removing cooking fumes and odors from an area above a cooking appliance located in a kitchen area, wherein supplied air passes through a supply air plenum into an interior of a hood, partly defined by a vortex liner, and exits through filter means in an exhaust plenum and is then exhausted exteriorly of the kitchen area, comprising the steps of:

modulating the flow of the supply air through the supply air plenum,

directing air flow from the supply air plenum toward a chamber in the hood,

deflecting and increasing the velocity of the supply air to create a vortex flow to capture rising fumes and smoke entering a hood chamber,

directing the supply air, contaminated with the fumes and smoke, through said filter means into the exhaust plenum,

channeling exhaust air upwardly after passing through the filter means, and

directing the flow of the exhaust air along a horizontal path toward a transition exhaust duct,

wherein the step of modulating the flow of supply air is achieved by inserting perforated plates in the supply air plenum to impart particular flow characteristics to the supply air,

including the step of positionally adjusting the perforated plates with respect to each other to control the amount of supply air entering the chamber in the hood.

5,467,762

OPTICAL TROCAR

Jude S. Sauer, Pittsford; Michael G. Oravecz, Rochester; Roger J. Greenwald, Holley, and Alexander I. Kobiansky, Pittsford, all of N.Y., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 120,489, Sep. 13, 1993. This application Oct. 6, 1993, Ser. No. 132,403

The portion of the term of this patent subsequent to Aug. 15, 2012, has been disclaimed.

Int. Cl.[6] A61B 1/00

U.S. Cl. 600—114 **20 Claims**

1. A trocar which comprises:

a cannula;

an obturator configured for insertion into said cannula, said obturator having a proximal end, a distal end and a longitudinal bore;

a member positioned at said distal end of said obturator for allowing optical images to pass into said longitudinal bore;

a cutting blade for penetrating body tissue positioned at said distal end of said obturator, said cutting blade being movable between non-deployed and deployed positions; and

an actuator operatively connected to said cutting blade, said actuator selectively movable to move the cutting blade between the non-deployed and deployed positions.

5,467,763

SURGICAL INSTRUMENTS

Michael J. McMahon, 5 Foxhill Crescent, Leeds, West Yorkshire, England, and Peter Moran, 31 Spring Valley Drive, Leeds, West Yorkshire, England

Continuation of Ser. No. 942,674, Sep. 9, 1992, abandoned. This application Jul. 20, 1994, Ser. No. 277,699

Claims priority, application United Kingdom, Jan. 21, 1992, 9201214; Jul. 30, 1992, 9216233

Int. Cl.[6] A61M *25/00*

U.S. Cl. 600—201 **19 Claims**

1. An endoscopic surgical instrument including an elongate portion comprising a plurality of segments, said elongate portion being arranged, in use, to be inserted through a restricted opening in a body when in a first position, said segments being pivotally movable relative to each other with adjacent segments being movable about a pivot located towards a first side of the instrument from said first position to a second, substantially rigid predetermined position upon pulling of a control means extending within the elongate portion, said control means being located towards a second side of the instrument opposite to said first side whereby, when movement of the segments occurs from said first position to said second position the relative direction in which a part of the elongate portion extends, when compared to another part of the elongate portion, is altered and in which, when said segments are held in said second predetermined position, further movement of said segments away from said first position is arranged to be inhibited by one segment being pulled against an abutment associated with an adjacent segment by the control means.

5,467,764

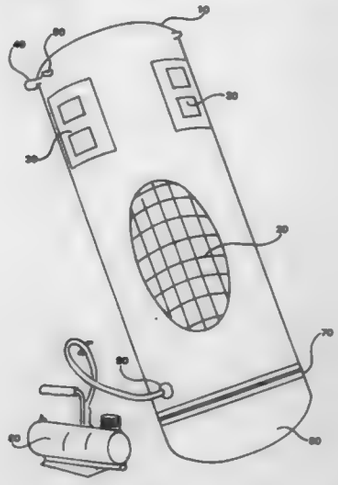
HYPOBARIC SLEEPING CHAMBER

Rustem I. Gamow, Boulder, Colo., assignor to Hyperbaric Mountain Technologies, Inc., Boulder, Colo.

Continuation of Ser. No. 837,760, Feb. 19, 1992, abandoned. This application May 13, 1993, Ser. No. 61,275

Int. Cl.[6] A62B *18/08;7/00;* **A61M** *15/00*

U.S. Cl. 128—202.12 **6 Claims**



1. A cylindrically-shaped hypobaric sleeping chamber with a length longer than its diameter having a size sufficient to accommodate no more than two reclining humans, having means for maintaining a selected internal pressure between 0.1 and 10 psi below the local ambient air pressure, and having means for providing fresh air to occupants of said chamber over a period of up to eight hours, said chamber further comprising:

(a) an air-impermeable outer layer formed of essentially non-elastomeric material, and an inner frame of rigid or semi-rigid material, said outer layer and inner frame when formed into said cylindrically-shaped hypobaric chamber having sufficient strength to withstand an external collapsing pressure of approximately 30 psig;

(b) a substantially airtight ingress and egress means through said air-impermeable material of a size sufficient to allow a human to pass therethrough;

(c) said means for providing fresh air comprising a vacuum pressure release valve located in said air-impermeable material responsive to a predetermined decrease in said internal pressure within said hypobaric chamber below ambient pressure for pulling fresh ambient air into said chamber;

(d) said means for maintaining said selected internal pressure comprising a vacuum maintenance orifice located within said air-impermeable material through which air is removed from said chamber; and

(e) said cylindrically-shaped hypobaric sleeping chamber weighing approximately 200 pounds or less.

5,467,765

DISPOSABLE FACE MASK WITH MULTIPLE LIQUID RESISTANT LAYERS

Thawatchai Maturaporn, 127 Ratchadapisek Road, Chongnonsee, Bangkok 10120 THX

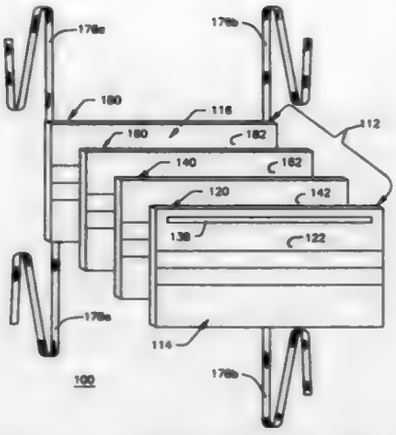
Filed Oct. 6, 1994, Ser. No. 319,006

Int. Cl.[6] A62B *7/10;18/02;23/02;18/08*

U.S. Cl. 128—206.19 **39 Claims**

1. A pleated, disposable, air permeable, liquid-resistant face mask having three plies of material, comprising:

a) a first face-contacting ply of liquid-resistant material formed of a non-woven paper pulp material, a carded cotton wadding material, and a creped tissue wadding material for filtering out organic and inorganic particulate matter;



b) a second ply of liquid-resistant material formed of a non-woven, polypropylene material to form a first filter barrier for filtering out organic and inorganic particulate matter;

c) a third ply of liquid-resistant material formed of a non-woven, polypropylene material to form a second filter barrier for filtering out organic and inorganic particulate matter;

d) said first, second, and third plies being folded relative to each other to form pleated and overlapping sections which expand relative to each other during use;

e) a flexible stiffening member disposed within said mask and being bendable to conform to the shape of the wearer's face;

f) the edges of said first, second, and third plies being attached to form a composite laminate structure; and

g) fastening means for fastening said face mask to the wearer's face.

5,467,766

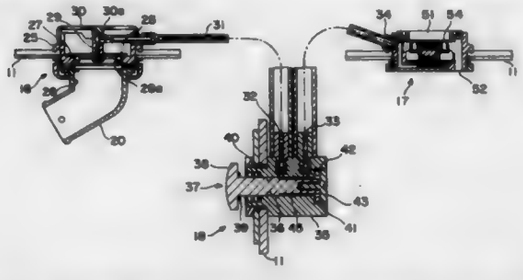
VALVE FOR A PRESSURE BREATHING SYSTEM WHICH ACCOMPLISHES THE VALSALVA MANEUVER

William K. Ansite, Glendale, and David N. Pennell, Apple Valley, both of Calif., assignors to Gentex Corporation, Rancho Cucamonga, Calif.

Filed Oct. 13, 1993, Ser. No. 135,740

Int. Cl.[6] A62B *9/02;18/02*

U.S. Cl. 128—205.24 **8 Claims**



1. In a pressurized breathing system comprising a face mask defining a breathing cavity adapted to surround a user's nose and mouth, in which an inhalation valve receives breathing gases under supply pressure and supplies them on demand to the cavity, and in which an exhalation valve receives gases from the cavity and discharges them to atmosphere, said inhalation valve and said exhalation valve being unidirectional check valves, said exhalation valve being biased to require muscular effort by the user to raise the cavity to a sufficient pressure to open said exhalation valve, the improvement comprising means to selectively maintain the exhalation valve closed even at pressures above said sufficient pressure, whereby upon exertion of exhalation pressure, the Valsalva maneuver will be accomplished, said means comprising:

said exhalation valve including a seat and an exhalation poppet having a seal, said exhalation poppet being spring-biased toward said seat, and a compensation chamber selectively communicable with said breathing cavity and with said source of gases under supply pressure, said compensation chamber facing said exhalation poppet, pressure in said compensation chamber tending to force the seal toward the seat; and

a Valsalva valve comprising a body having a poppet passage, a poppet seat, a poppet, and a poppet seal, connected between said compensation chamber and said cavity, said Valsalva valve selectively preventing and permitting entry of cavity pressure to said compensation chamber such that when said compensation chamber communicates with said source of gasses under supply pressure, the exhalation valve operates normally, but when said compensation chamber communicates with cavity pressure, the exhalation poppet is held closed.

5,467,767

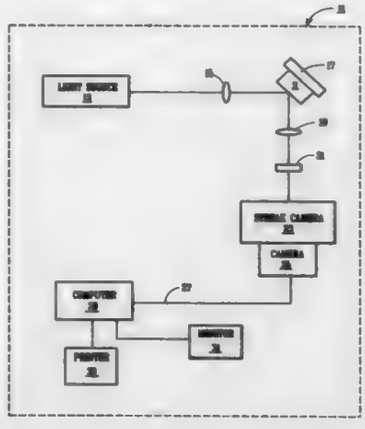
METHOD FOR DETERMINING IF TISSUE IS MALIGNANT AS OPPOSED TO NON-MALIGNANT USING TIME-RESOLVED FLUORESCENCE SPECTROSCOPY

Robert R. Alfano, 3777 Independence Ave., Bronx, N.Y. 10463; Asima Pradhan, 71, Gajapatinagar, Bhubaneswar, Orissa 751005, Ind.; Guichen C. Tang, 2670 Valentine Ave., Apt. 9, Bronx, N.Y. 10458; Leming Wang, 142-19 Cherry Ave., Flushing, N.Y. 11355; Yury Budansky, 736 Ramapo Valley Rd., Oakland, N.J. 07436, and Bidyut B. Das, 477 W. 140 St., Apt. 62, New York, N.Y. 10031

Continuation-in-part of Ser. No. 797,723, Nov. 25, 1991, Pat. No. 5,348,018. This application Aug. 27, 1993, Ser. No. 112,291

Int. Cl.[6] A61B *6/00*

U.S. Cl. 128—665 **5 Claims**



1. A method for determining if a human breast tissue sample is malignant as opposed to non-malignant comprising:

a) irradiating the human breast tissue sample with light at a wavelength of about 310 nm whereby native time-resolved fluorescence is emitted therefrom;

b) measuring the native time-resolved fluorescence emitted therefrom at a wavelength of about 340 nm; and

c) comparing the native time-resolved fluorescence emitted from the human breast tissue sample to that emitted from known malignant and non-malignant human breast tissues;

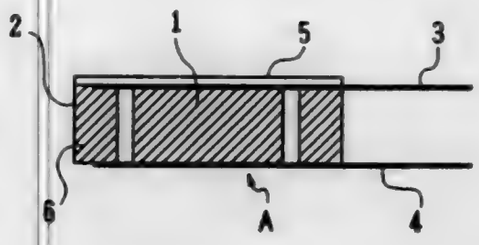
d) the irradiating and measuring steps being performed using a fiber optic bundle in combination with a hypodermic needle to convey the light to and from the human breast tissue.

5,467,768

MULTI-PURPOSE SENSOR

Shin Suda, and Hidehiro Hosaka, both of Tokyo, Japan, assignors to Nihon Koden Corporation, Tokyo, Japan

Filed Mar. 17, 1994, Ser. No. 214,127
Claims priority, application Japan, Mar. 17, 1993, 5-011773 U
Int. Cl.[6] A61B 5/0205
U.S. Cl. 128—640 7 Claims



1. A multi-purpose sensor for detecting more than one kind of vital sign from a subject, when the sensor is attached to the skin surface of the subject, the multi-purpose sensor comprising:

an element formed of conductive fibers in a shape of a plate having a top face and a bottom face, said bottom face being closer than said top face to the skin surface of the subject;

a flat holder having a top face and a bottom face and a center hole, said flat holder disposed around an outer perimeter of said element, an adhesive layer being provided on said bottom face of said holder, said holder being no more than generally the same in thickness as said element; and

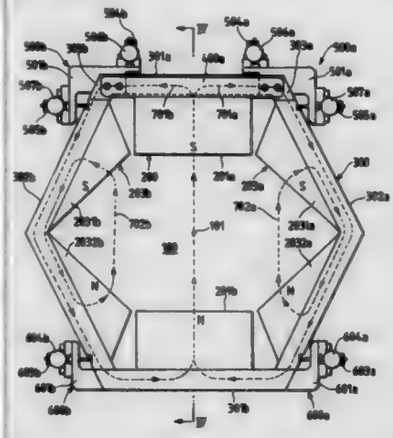
a pair of terminals respectively connected electrically to both said top and said bottom faces of said element and held on both said top and said bottom faces of said holder, a first of said terminals being connected to said top faces and a second of said terminals being connected to said bottom faces.

5,467,769

MAGNETIC FIELD GENERATING APPARATUS

Hitoshi Yoshino, Kashiwa, and Shigeo Hashimoto, Nishinomiya, both of, Japan, assignors to Hitachi Medical Corporation, Tokyo, and Sumitomo Special Metals Co., Ltd., Osaka, both of, Japan

Filed Feb. 16, 1994, Ser. No. 197,277
Claims priority, application Japan, Feb. 19, 1993, 5-030645
Int. Cl.[6] A61B 5/055
U.S. Cl. 128—653.2 15 Claims



1. A magnetic field generating apparatus having a magnetic field generating space, comprising a permanent magnet arrangement for generating a magnetic field in the magnetic field generating space and a yoke arrangement forming magnetic circuits for generation of the magnetic field together with the permanent magnet arrangement, the yoke arrangement including:

(1) a first pair of yokes arranged so as to face each other;

(2) a second pair of yokes arranged so as to face each other and through which said first pair of yokes are magnetically coupled to each other;

(3) a third pair of yokes arranged between one end of one yoke of said first pair of yokes and one end of one yoke of said second pair of yokes and between the other end of said one yoke of said first pair of yokes and one end of the other yoke of said second pair of yokes, respectively; and

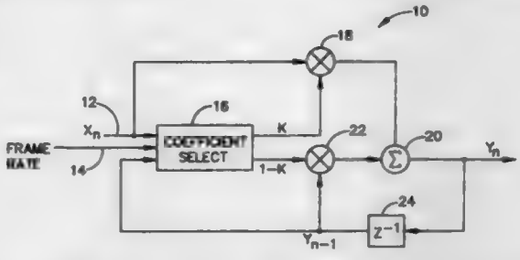
(4) yoke moving means for independently moving said one yoke of said first pair of yokes and each yoke of said second pair of yokes with respect to said third pair of yokes, respectively.

5,467,770

COLOR ADAPTIVE FRAME AVERAGING

James A. Smith, Pewaukee; Matthew Ellis, Waukesha; Rowland F. Saunders, Hartland, and Anne L. Hall, New Berlin, all of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Nov. 25, 1994, Ser. No. 344,923
Int. Cl.[6] A61B 8/00
U.S. Cl. 128—661.08 8 Claims



1. A color adaptive frame averaging method for an ultrasound imaging system comprising the steps of:

computing filter weighting coefficients;

using the filter weighting coefficients to compensate for aliased color data;

achieving frame rate compensation by adjusting the filter weighting coefficients.

5,467,771

PULSE WAVE SENSOR

Kiyoyuki Narimatsu, Kasugai, and Norio Kawamura, Nagoya, both of, Japan, assignors to Colin Corporation, Japan

Filed Sep. 19, 1994, Ser. No. 307,445
Claims priority, application Japan, Jan. 26, 1993, 5-267173
Int. Cl.[6] A61B 5/00
U.S. Cl. 128—672 7 Claims

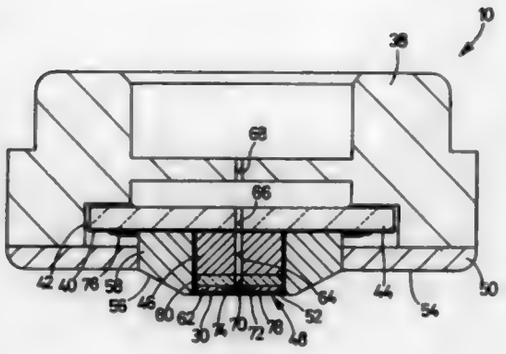
1. A pressure pulse wave sensor for detecting a pressure pulse wave produced from an arterial vessel of a living subject in synchronism with a heartbeat of the subject comprising:

a press surface adapted to be pressed on a body surface of the subject;

a protruding portion protruding from said press surface and having a top surface, said top surface of said protruding portion being covered with a resilient protective layer, which is formed of a first material;

at least one pressure sensing element provided in said top surface of said protruding portion for detecting said pressure pulse wave produced from said arterial vessel; and

a hard member which surrounds said protruding portion such that a top end of said hard member is substantially flush with said resilient protective layer covering said top surface of said protruding portion, said hard member being formed of a



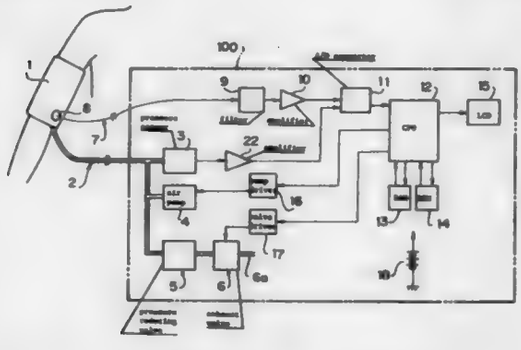
second material which is different from said first material and having a hardness higher than that of said resilient protective layer.

5,467,772

AUTOMATIC SPHYGMOMANOMETER

Takahiro Souma, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1993, Ser. No. 76,631
Claims priority, application Japan, Jun. 16, 1992, 4-156506
Int. Cl.[6] A61B 5/00
U.S. Cl. 128—680 18 Claims



1. An automatic sphygmomanometer which inflates a cuff to a cuff pressure higher than an individual's maximum blood pressure and measures a blood pressure in a deflating process, comprising:

a pressure cuff for being placed on a portion of an individual's body;

air pressurization means connected to said pressure cuff to pressurize the cuff by pumping air into the cuff;

a pressure reducing valve connected to the cuff, said pressure reducing valve having an inlet side connected to the pressure cuff and an exhaustion side;

an openable and closable exhaust valve connected to the exhaustion side of said pressure reducing valve to intermittently exhaust air delivered from the pressure reducing valve, the pressure reducing valve automatically adjusting a cuff pressure reducing exhaust rate to a substantially constant rate regardless of the cuff pressure when the exhaust valve is opened;

control means for controlling opening and closing of the exhaust valve; and

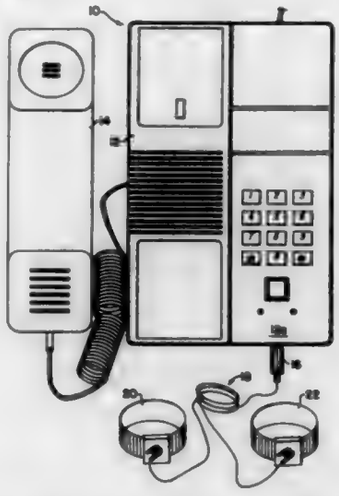
measuring means connected to the pressure cuff for measuring the individual's blood pressure.

5,467,773

CARDIAC PATIENT REMOTE MONITORING USING MULTIPLE TONE FREQUENCIES FROM CENTRAL STATION TO CONTROL FUNCTIONS OF LOCAL INSTRUMENT AT PATIENT'S HOME

Michael N. Bergelson, Riverdale, N.Y., and Nartzis Naydenov, Hackensack, N.J., assignors to Paceart Associates, L.P., Wayne, N.J.

Filed May 21, 1993, Ser. No. 65,669
Int. Cl.[6] A61B 5/02
U.S. Cl. 128—709 14 Claims



1. A cardiac patient follow up system comprising a local instrument having ECG lead inputs for connection to ECG electrodes coupled with a patient and further having telephone line inputs for connection with a central instrument through a telephone network utilizing dual tone multifrequency signals for dialing, said local instrument comprising:

a local telephone set for establishing a two-way telephone connection with said central instrument through a telephone line and telephone network, said local telephone set having a telephone circuit including a speaker for converting a voice signal received over said telephone line to a sound signal and a microphone converting a sound signal received at the microphone into a signal for transmission over said telephone line and network; and a local dual tone multifrequency decoder responsive to dual tone multifrequency signals received over said telephone line to generate respective local command signals;

a patient monitoring portion coupled to said telephone set, said patient monitoring portion including:

an amplifier coupled with said inputs for ECG leads to amplify signals received thereat;

an ECG filter and a pulse filter each coupled with the amplifier to receive signals amplified thereby, said ECG filter comprising circuitry tending to pass ECG signals while suppressing pulse signals corresponding to cardiac pacemaker pulses, and said pulse filter comprising circuitry tending to pass pulse signals corresponding to cardiac pacemaker pulses while suppressing ECG signals;

a pulse detector coupled with said pulse filter to detect leading and trailing edges of pulses passed thereby and to generate in response relatively short pulses signifying said leading and trailing edges;

a pulse width encoder coupled with said pulse detector and, when enabled by a respective local command, responding to each pair of said short pulses corresponding to a pacemaker pulse to generate a respective pulse width encoded signal;

a fixed pulse encoder coupled with said pulse detector and, when enabled by a respective local command, responding to each pair of said short pulses corresponding to a pacemaker pulse to generate a respective fixed width pulse;

an FM encoder coupled with said pulse width encoder and said fixed pulse encoder and, when enabled by a respective local

command, receiving said pulse width encoded signal and said fixed width pulse therefrom and encoding said pulse width encoded signal and said fixed width pulse into an FM signal having a specified center frequency and deviations therefrom corresponding to parameters of said pulse width encoded signal and said fixed width pulse for transmission over said telephone line and network to said central instrument;

a patient alert indicator displaying at least one message for a patient using said local instrument;

a logic control circuit coupled with said local dual tone multi-frequency decoder and responsive to said local command signals therefrom to generate respective local commands for selectively enabling said FM encoder, pulse encoder, pulse width encoder, and patient alert indicator; and

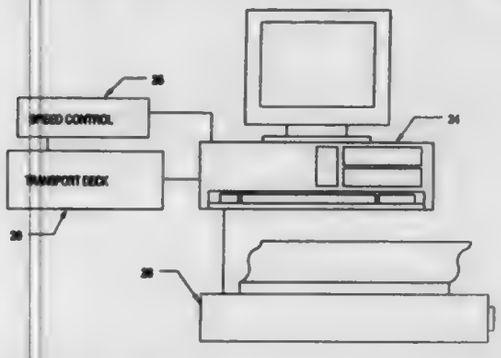
an isolation stage connecting said FM encoder and said logic control circuit with said telephone circuit to pass information therebetween while suppressing electrical interaction therebetween.

5,467,774

METHOD AND SYSTEM FOR PRECISE TIME BASED PRESENTATION OF RECORDED MEDICAL DATA

Dennis E. Ochs; David L. Burton; John F. Groh, all of McMinnville, and David E. Smith, Wilsonville, all of Oreg., assignors to Hewlett-Packard Corporation, Palo Alto, Calif.

Filed Jun. 15, 1994, Ser. No. 260,135
Int. Cl.[6] A61B *5/0432*
U.S. Cl. 128—711 **11 Claims**



1. A system for precise time based presentation of recorded data, said system comprising;

a presentation device for presenting recorded data at an actual presentation speed which varies in response to variations of a variable speed control signal wherein actual presentation speed varies linearly in response to variations of said variable speed control signal which do not exceed a selected maximum during a given period of time and nonlinearly in response to variations of said variable speed control signal which exceed said selected maximum during a given period of time;

a speed control detection circuit coupled to said presentation device for periodically determining a difference between a desired presentation speed and said actual presentation speed; and

a speed control signal generation circuit coupled to said speed control detection circuit and said presentation device for generating and varying said variable speed control signal in response to said difference between said desired presentation speed and said actual presentation speed, said speed control signal generation circuit comprising:

a linear control system for periodically varying said variable speed control signal at not greater than a first rate in response to a difference between said desired presentation speed and said actual presentation speed which results in a variation of said variable speed control signal which does not exceed said selected maximum during a given period of time and for coupling said variable speed control signal to said presentation device; and

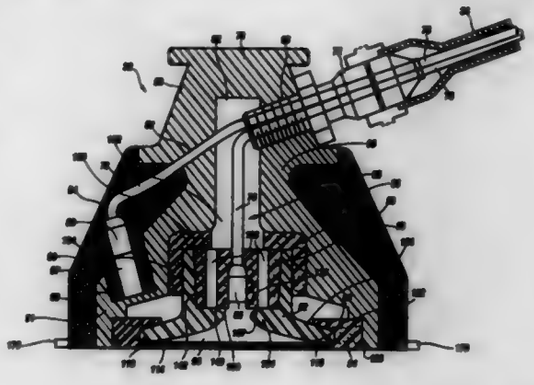
a nonlinear control system for periodically varying said variable speed control signal at a constant rate in response to a difference between said desired presentation speed and said actual presentation speed which results in a variation of said variable speed control signal wherein said variation does exceed said selected maximum during a given period of time and for coupling said variable speed control signal to said presentation device wherein said presentation device continues to operate in a stable manner despite the occurrence of large variations in presentation speed.

5,467,775

MODULAR AUSCULTATION SENSOR AND TELEMETRY SYSTEM

Thomas F. Callahan, Maynard, and Matthew G. Callahan, Ipswich, both of Mass., assignors to University Research Engineers & Associates, Maynard, Mass.

Filed Mar. 17, 1995, Ser. No. 405,879
Int. Cl.[6] A61B *7/04*
U.S. Cl. 128—715 **45 Claims**



36. A modular auscultation sensor and telemetry system for use in sensing body sounds emanating from a living body, comprising:

a transducer head having a first chamber and a second chamber substantially isolated from said first chamber, wherein said first chamber has an opening, said transducer head comprising

a first sensor positioned adjacent to or in said first chamber,

a second sensor positioned adjacent to or in said second chamber, and

a diaphragm that extends across said opening of said first chamber;

a telemetry conduit coupled to said transducer head and comprising a first signal conductor operably coupled to said first sensor and a second signal conductor operably coupled to said second sensor; and

digital signal processing means, operably coupled to said first and second conductors for receiving signals from said first and second sensors, processing said signals and producing an output signal that is indicative of body sounds when said diaphragm of said transducer head is brought into contact with a living body.

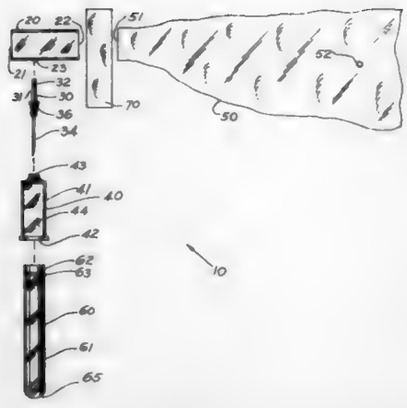
5,467,776

AIR SAMPLING DEVICE AND METHOD FOR SAMPLING EXHALED AIR

Steven D. Hamilton, Greenfield, Wis., assignor to The Brewer Company, Menomonee Falls, Wis.

Filed Jul. 28, 1993, Ser. No. 89,537
Int. Cl.[6] A61B *5/097*
U.S. Cl. 128—730 **9 Claims**

1. An air sampling device for obtaining a sample of alveolar air from a person's lungs, the air sampling device comprising:



a blowing means for allowing the person to blow air therethrough;

an air sample capture assembly connected to the blowing means by a conduit means for directing a portion of the air from the blowing means into the air sample capture assembly, the conduit means being directly connected to the blowing means;

the air sample capture assembly including a vacuum chamber containing a vacuum and having a permeable rubber membrane capable of being punctured and resealed at a predetermined time separating the vacuum from the conduit means connected to said blowing means.

5,467,777

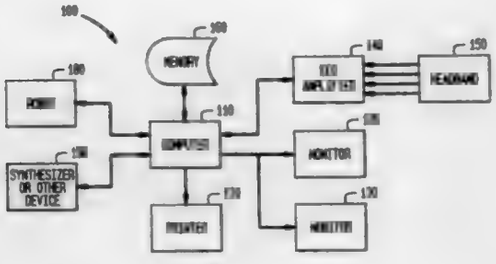
METHOD FOR ELECTROENCEPHALOGRAPHIC INFORMATION DETECTION

Lawrence A. Farwell, Fairfield, Iowa, assignor to Francis Luca Conte, Swampscott, Mass.

Division of Ser. No. 57,607, May 5, 1993, Pat. No. 5,363,858, which is a continuation-in-part of Ser. No. 16,215, Feb. 11, 1993, Pat. No. 5,406,956. This application Sep. 15, 1994, Ser. No. 306,717

Int. Cl.[6] A61B *5/0476*

U.S. Cl. 128—731 **11 Claims**



1. A method of detecting electrical brain response in a subject comprising:

presenting stimuli to said subject with a predetermined inter-stimulus interval;

informing said subject of a predetermined time range within said inter-stimulus interval during which said subject may blink;

detecting an electrical brain response from said subject in response to each of said stimuli; and

analyzing said electrical brain responses for uncovering an event related brain potential.

5,467,778

MONITORING METHOD

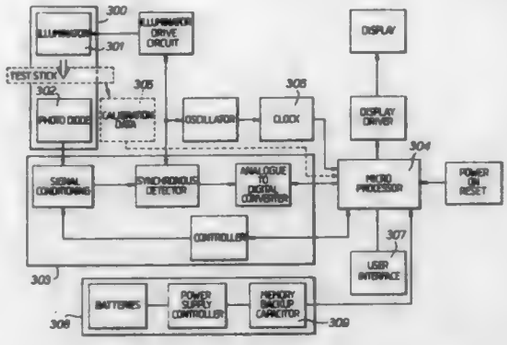
Michael Catt, Wallingborough; John Coley, Stanwick, and Paul J. Davis, Felmersham, all of, United Kingdom, assignors to Unilever Patent Holdings B.V., Netherlands

Filed Aug. 20, 1993, Ser. No. 109,503

Claims priority, application United Kingdom, Aug. 21, 1992, 9217864

Int. Cl.[6] A61B *10/00*

U.S. Cl. 128—738 **27 Claims**



1. A method of monitoring the status of a current ovulation cycle of an individual mammalian female subject, involving repeated testing of the body fluid concentration of at least one analyte of significance in relation to the status of the ovulation cycle during at least the pre-ovulation phase of the current ovulation cycle of the individual subject, wherein

a) testing for said analyte concentration during the current ovulation cycle is commenced a plurality of days following the onset of menses but at least 2 numerical days in advance of the earliest numerical day on which actual ovulation has occurred in one or more previous ovulation cycles in the same individual subject; and

b) an analyte concentration change indicative of imminent ovulation is identified from the results of such testing by reference to an analyte concentration reference value that has been adapted to the individual subject on the basis of analyte concentration test data obtained from the individual subject during one or more previous ovulation cycles,

said testing commencing on a numerical day in advance of the earliest numerical day on which actual ovulation has occurred in one or more previous ovulation cycles in the same individual subject, said testing commencement day being calculated according to the following relationship:

Earliest previous ovulation day	Testing commencement day
8–10	–4
11–14	–5
15–18	–6
19–23	–7
24–28	–8
29+	–9

5,467,779

MULTIPLANAR PROBE FOR ULTRASONIC IMAGING

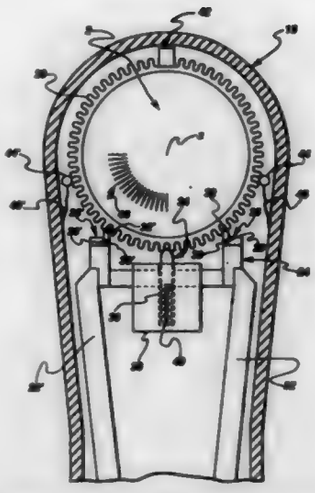
Lowell S. Smith, Schenectady, and Robert S. Lewandowski, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 18, 1994, Ser. No. 276,380

Int. Cl.[6] A61B *8/12*

U.S. Cl. 128—660.1 **11 Claims**

1. A multiplanar probe comprising, an array of ultrasonic transducers, each of said transducers including an output electrode, said



probe further comprising means for rotating the transducer array about an axis of rotation, the rotating means comprising a ring gear affixed to said transducer array, said ring gear having a plurality of teeth distributed at equal angular intervals on its periphery, and indexing means for driving said ring gear to rotate in angular steps, said indexing means comprising a ratchet mechanism having first and second pawls, and means for displacing said ratchet mechanism between first and second positions, said first pawl being engaged with said teeth of said ring gear and said second pawl being disengaged from said teeth of said ring gear when said ratchet mechanism is in said first position, and said first pawl being disengaged from said teeth of said ring gear and said second pawl being engaged with said teeth of said ring gear when said ratchet mechanism is in said second position, a flexible printed circuit board having terminals thereon, and means coupling said terminals to the output electrodes of the transducer array.

5,467,780

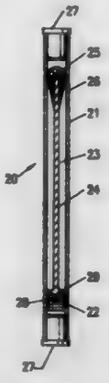
BIOPSY WOUND CLOSURE DEVICE AND METHOD

Hossein Nabai, 14555 Levan Rd. Suite 410, Livonia, Mich. 48154, and Homayoon Rahbari, 1314 N. Macomb St., P.O. Box 360, Monroe, Mich. 48161

Division of Ser. No. 56,399, May 4, 1993, Pat. No. 5,388,588. This application Dec. 19, 1994, Ser. No. 358,815

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—754 **13 Claims**



1. A closure device for the repair of skin tissue, controlling bleeding, and reducing the likelihood of inducing excess scar tissue during a routine skin biopsy procedure, comprising: a sterile tubular container for storing a close fitting pre-formed cylindrical sponge and an applicator for implanting said sponge in a bleeding site caused by the excising of a specimen of skin for a biopsy; a closely fitting pre-formed cylindrical sponge stored in the interior of said container, said sponge made from a foam material which swells and is absorbed in said bleeding site with little tissue reaction, said sponge being pre-formed to a diameter which is approximately equal to the diameter of a sharp circular blade of a surgical punch used for taking a specimen of skin for a biopsy from said biopsy site; a shard surgical punch for taking a specimen of skin from said biopsy site; and an applicator for extracting said sponge from said container and implanting said sterile sponge into said biopsy site after the excising of said specimen by said punch, said sponge being detachably held on to an end of said applicator; and a means at an opposite end of said applicator for applying pressure to said sponge for a short interval of time after said sponge has been implanted into said biopsy site.

5,467,781

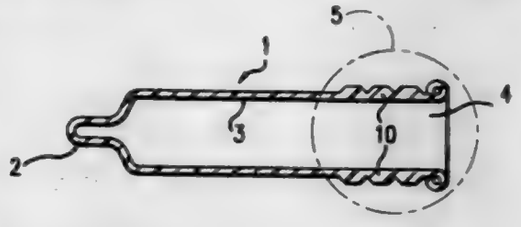
CONDOM

Kazuyuki Kato, 5-5, Shintenchi, Naka-ku, Hiroshima-shi, Japan

Filed Oct. 12, 1994, Ser. No. 321,996

Int. Cl.[6] A61F *6/04*

U.S. Cl. 128—844 **3 Claims**



1. A condom comprising:

a cylindrical main portion,

a sperm reservoir formed at one end of the cylindrical main portion, and

an open end portion formed at the other end of the cylindrical main portion, said open end portion including an elastic annular end and an elongated annular portion located between the annular end and the cylindrical main portion, said elongated annular portion having a thickness substantially greater than a thickness of the main portion and a plurality of annular V-shape notches arranged parallel to each other, each notch extending radially inwardly from an outer surface of the annular portion toward an inner surface thereof to have an open portion near the outer surface thereof so that when the condom is worn, the open end portion provides wide elasticity stronger than that at the cylindrical main portion without concentrating at one portion.

5,467,782

PATIENT SUPPORT DEVICE

Jay Wiseman, Royal Oak, Mich., assignor to R-Made, Inc., Bloomfield, Mich.

Continuation of Ser. No. 944,361, Sep. 14, 1992, abandoned. This application Nov. 22, 1993, Ser. No. 156,680

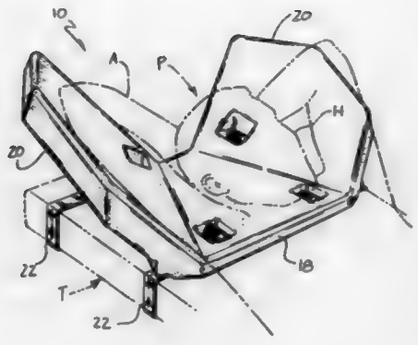
Int. Cl.[6] A61G *15/00*

U.S. Cl. 128—845 **14 Claims**

1. A device for supporting, positioning and elevating the forearms of a patient lying in a supine position such that at least one of the patient's hands may be positioned behind the patient's head during a medical procedure, said device comprising:

a flat, head-receiving base dimensioned to receive a patient's head thereupon and configured to rest upon a flat surface, said base defining a plane and having opposed side edges which taper toward each other to define a shorter top edge and a longer bottom edge;

a pair of opposed, planar, side panels integrally formed along each of said side edges and angularly projecting upward and



outward from the plane defined by said base, said planar side panels being dimensioned and configured to receive said patient's forearms when said forearms are positioned proximate said patient's head such that said forearms project out of the plane of the base.

5,467,783

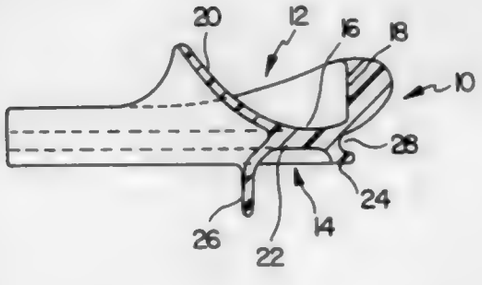
APPARATUS AND METHOD FOR THE REDUCTION OF SNORING

Thomas E. Meade, 215 16th St., SW., Albuquerque, N.M. 87104

Continuation of Ser. No. 977,266, Nov. 16, 1992, abandoned. This application Dec. 6, 1994, Ser. No. 354,139

Int. Cl.[6] A61F *5/56*

U.S. Cl. 128—848 **10 Claims**



1. An apparatus for intra-oral use comprising:

a framework having an upper platform and a lower platform, each of the platforms being defined by two walls extending from and separated by a floor, a rear one of the two walls defining the lower platform extending substantially perpendicular to the floor defining the lower platform, said upper and lower platforms being curved in an arch to conform to a user's mouth, a rear wall of said lower platform being disposed at an inner portion of the arch and extending substantially perpendicular to a plane that contains the arch;

a material bonded to the upper and lower platform adapted to be molded in a shape suitable for relatively snugly receiving maxillary teeth of a user and for relatively loosely receiving mandibular teeth of the user when the user's mouth is closed in a normal closing arch; and

a cavity formed between the upper and lower platforms adapted to receive the tongue of the user.

5,467,784

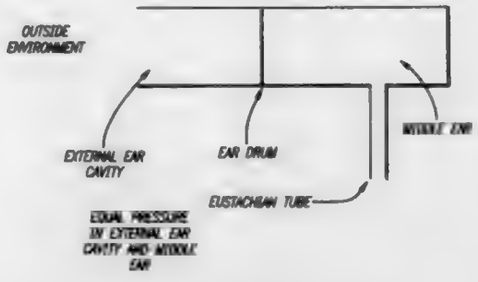
PRESSURE-REGULATING EAR PLUG

J. Phil Mobley, 17404 Ascona Dr., Canyon Country, Calif. 91351-3572; Chaoying Zhang, 2817 W. Grand Ave., No. C, Alhambra, Calif. 91801; Sigfried D. Soll, 2020 N. Santa Anita Ave., Sierra Madre, Calif. 91024; Chris Johnson, 121 Stonecliff Aisle, Irvine, Calif. 92715, and Drew O'Connell, 46 Goose Hill Rd., Cold Spring Harbor, N.Y. 11724

Filed Aug. 16, 1994, Ser. No. 291,165

Int. Cl.[6] A61F *11/06*

U.S. Cl. 128—867 **9 Claims**



1. An air pressure regulating earplug comprising:

an earplug body, with a bore therethrough, and said earplug body capable of forming an air tight seal when inserted into an ear canal;

an air pressure regulator substantially sealing said bore with a leak rate in the range of 6.1×10^{-5} to 1.4×10^{-4} cm^3/sec.

5,467,785

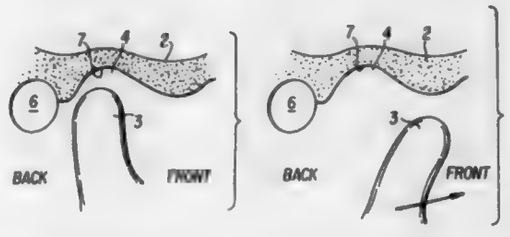
THERAPEUTIC METHOD FOR EFFECTING TRANSLATORY CONTINUOUS PASSIVE MOTION OF THE TEMPOROMANDIBULAR JOINT

William L. McCarty, Jr., 2021 Normandie Dr., Montgomery, Ala. 36198

Division of Ser. No. 919,961, Jul. 27, 1992, Pat. No. 5,374,237, which is a continuation-in-part of Ser. No. 628,177, Dec. 17, 1990, abandoned. This application Dec. 30, 1993, Ser. No. 174,312

Int. Cl.[6] A61F *5/00*

U.S. Cl. 128—898 **36 Claims**



1. A method for rehabilitation of the temporomandibular joint through use of apparatus capable of continuously and passively imparting motion to the joint comprising the step of effecting translatory motion of the joint for a therapeutically useful period of time, the motion being effected in a side to side manner.

5,467,786

METHOD FOR REPARING TEARS AND INCISIONS IN SOFT TISSUE

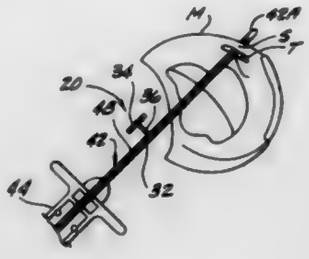
William C. Allen, Division of Orthopaedic Surgery, University of Missouri-Columbia, Health Sciences Center, Columbia, Mo. 65212, and Michael G. Maurizi, Columbia, Mo., assignors to William C. Allen, Columbia, Mo.

Continuation-in-part of Ser. No. 988,454, Dec. 10, 1992, Pat. No. 5,320,633. This application May 16, 1994, Ser. No. 242,788

The portion of the term of this patent subsequent to Jun. 14, 2011, has been disclaimed.

Int. Cl.[6] A61B *17/00*

U.S. Cl. 128—898 7 Claims



1. A method for closing an opening in soft tissue inside the body, the method comprising the steps of:

making an incision in the body for permitting access to the interior of the body generally adjacent to the location of the opening in the soft tissue inside the body;

inserting an instrument through the incision to the vicinity of the opening in the soft tissue inside the body;

passing the instrument through the soft tissue and across the opening in the soft tissue generally from a first side of the opening to a second side of the opening opposite the first side, a portion of the instrument lying in a passage having an entrance on the first side of the opening and an exit on the second side of the opening;

delivering said suture means in the instrument to said passage, said suture means comprising a first leg, a second leg spaced from the first leg and a cross member extending generally transversely with respect to the lengthwise extension of the first and second legs and connecting the first and second legs;

pushing the first leg and cross member generally lengthwise into said passage through the entrance thereof with the first leg and the cross member being resiliently deflected from their relaxed positions relative to one another, the first leg moving back to its relaxed position relative to the cross member upon passing out of said passage through the exit thereof and leaving the instrument, the first leg thereafter extending transversely with respect to the lengthwise extension of said passage across the exit thereof so that the first leg cannot move back into said passage through the exit, the second leg extending generally transversely with respect to the lengthwise extension of said passage across the entrance thereof so that the second leg cannot move into said passage through the entrance, and the cross member being disposed in said passage;

the cross member having a length less than the length of said passage such that said suture means compresses the soft tissue to at least partially close the opening.

5,467,787

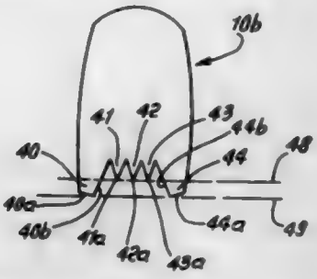
SERRATED EDGE NAIL

Rolf Mast, Riverside, and Dulce M. Powers, Ontario, both of Calif., assignors to International Beauty Design, Inc., Gardena, Calif.

Filed Aug. 25, 1994, Ser. No. 295,418

Int. Cl.[6] A45D *29/00*

U.S. Cl. 132—73 14 Claims



1. An artificial fingernail comprising:

a) said fingernail having the form of a thin sheet extending longitudinally forwardly between proximal and distal edges,

b) said sheet having laterally spaced edges, and having arching curvature between said lateral edges,

c) said proximal edge characterized by a row of serrations, certain of serrations having tapering edges of different lengths, said serrations adapted to be adhesively attached to the upper surface of a natural fingernail and to be concealed thereon,

d) two of said serrations respectively closest to said laterally spaced edges of the sheet having rearwardly presented terminals that are sufficiently blunt so as not to dangerously penetrate natural nail cuticle.

5,467,788

HAIR CURLER AND METHOD OF MANUFACTURING THE SAME

Yoshio Kimura, Osaka, Japan, assignor to Lucky Corporation Co., Ltd., Osaka, Japan

Filed Jun. 6, 1994, Ser. No. 254,916

Claims priority, application Japan, Aug. 25, 1993, 5-210545

Int. Cl.[6] A45D *2/00;6/14*

U.S. Cl. 132—255 12 Claims

1. A hair curler comprising a roller and a rectangular frame-like setting frame having a pair of clasps respectively disposed on first and second sides of said setting frame for radially holding said roller from both of said first and second sides, said setting frame being releasably engaged in an axial direction with either end of said roller and provided with a flexible cover covering at least part of an entire length of about a half of an outer periphery of said roller between said clasps, said cover including first and second ends which are each fixedly embedded by insert molding in a respective one of said pair of clasps of said setting frame, wherein:

each of said clasps include an outer cut surface portion at a location at which said first and second ends of said cover are respectively embedded thereby providing respective exposed

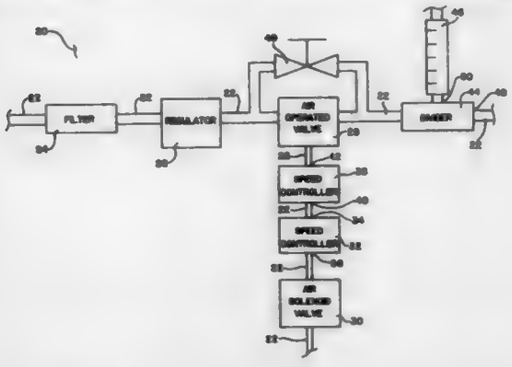
first and second outer edges of said first and second ends of said cover at said outer cut surface portions, with said first and second outer edges each fixedly embedded in a respective one of said pair of clasps.

5,467,789

SYSTEM FOR REMOVAL OF PHOSPHOR FROM CRT FANELS

Haruki Takahashi, and Bill Lin, both of San Diego, Calif., assignors to Sony Electronics Inc.

Filed Jan. 24, 1994, Ser. No. 185,544
Int. Cl.[6] B08B *3/02*
U.S. Cl. 134—56 R **6 Claims**



1. A system for removing material from a surface by using a stream of water which is discharged onto said material comprising:

a water supply connected to a first valve by a first conduit;

a nozzle connected to said first valve by a second conduit, wherein said first valve may be incrementally opened at a rate which corresponds to an incoming air flow rate received by said first valve, such that water from said water supply flows through said first conduit, said first valve, said second conduit and said nozzle and is discharged from said nozzle on said material at a water flow rate which incrementally increases from a zero water flow rate to a maximum water flow rate, and wherein said first valve may be incrementally closed at a rate which corresponds to an outgoing air flow rate vented by said first valve, such that said water flow rate from said nozzle incrementally decreases from said maximum water flow rate to said zero water flow rate and wherein said water discharged from said nozzle does not include air bubbles to provide a continuous stream of water;

air flow means for adjusting said incoming air flow rate and said outgoing air flow rate, wherein said air flow means is connected to said first valve by a third conduit and wherein said air flow means includes first and second speed controllers arranged such that said incoming air flow rate is not restricted by said first speed controller and is subsequently adjusted by said second speed controller and said outgoing air flow rate is not restricted by said second speed controller and is subsequently adjusted by said first speed controller; and

an air supply for supplying said incoming air to said air flow means, wherein said air supply is connected to said air flow means by a fourth conduit.

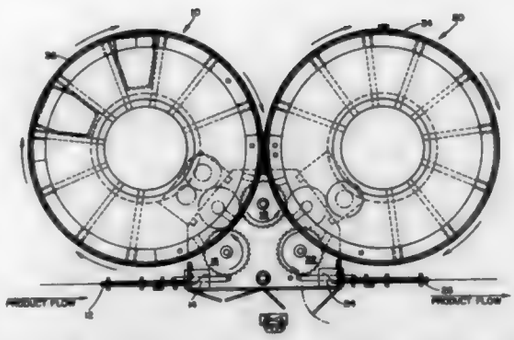
5,467,790

MANIFOLD AND VALVE BLOCK ASSEMBLY

Chris Heckler, Rockford, Ill., assignor to PepsiCo, Inc., Purchase, N.Y.

Filed Jul. 13, 1993, Ser. No. 90,501
Int. Cl.[6] B08B *9/08*
U.S. Cl. 134—66 **29 Claims**

1. A manifold and valve block assembly for a bottle cleaning machine comprising:



a. a bottle cleaning machine for cleaning bottles, including a carousel, having a circumference, which has a plurality of bottle mounts around its circumference for mounting a plurality of bottles being cleaned in inverted positions, and each bottle mount on the carousel having a separate manifold and valve block assembly associated therewith and mounted on the carousel; and

b. each manifold and valve block assembly comprising,

i. a valve block housing,

ii. a drive cylinder mounted in said valve block housing,

iii. a lance longitudinally movably positioned within said drive cylinder, said lance having a central fluid flow passageway, and also having a spray nozzle on a first upper end thereof, said lance having a retracted position in which the lance is positioned retracted within said drive cylinder and a fully extended position in which the fully extended lance positions said spray nozzle internally within a bottle for spraying a fluid through said nozzle against the internal surfaces of the bottle, and

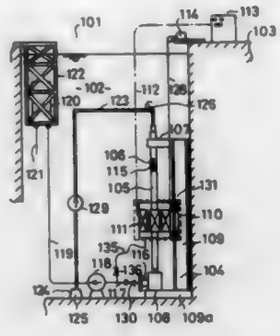
iv. a plurality of valves mounted in said valve block housing for supplying a plurality of spray fluids to a common manifold which provides a fluid passage to said central fluid flow passageway of the lance for fluids to be sequentially sprayed through the nozzle.

5,467,791

ULTRASONIC CLEANING METHOD AND DEVICE THEREFOR

Hiroaki Kato, Koshigaya; Hideaki Heki, Yokohama; Shirou Komura, Fujisawa, and Emiko Okamura, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 22, 1994, Ser. No. 199,658
Claims priority, application Japan, Feb. 22, 1993, 5-031017
Int. Cl.[6] B08B *3/10*
U.S. Cl. 134—166. C **23 Claims**



13. Ultrasonic cleaning device for cleaning an inside portion of a polygonal tube having an axis, the device comprising:

a plurality of ultrasonic transducers irradiating ultrasonic waves towards the tube from an exterior portion of the tube and from at least two directions;

a support member supporting the tube;

an ultrasonic transducer transferring mechanism moving said ultrasonic transducers along the axis of the tube;

a cleaning liquid supply mechanism arranged outside the tube, said supply mechanism supplying cleaning fluid into the tube;

a cleaning liquid discharge mechanism discharging the cleaning liquid from the tube; and

an ultrasonic wave leakage prevention structure preventing leakage of ultrasonic waves from the ultrasonic transducers to areas external of the device wherein said ultrasonic wave leakage prevention structure comprises a stainless steel wire mesh enclosure.

5,467,792

COLLAPSIBLE UMBRELLA

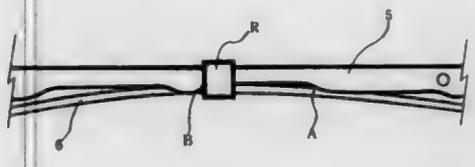
Toshio Okuda, 4-3, 1-Chome Sugi, Hirpakata City, Osaka, Japan

Filed Oct. 12, 1994, Ser. No. 321,928

Claims priority, application China, Jun. 24, 1994, 9421361?.8

Int. Cl.[6] A45B *19/00*

U.S. Cl. 135—25.3 **4 Claims**



1. A collapsible umbrella of the type defined by a plurality of rib assemblies, with each fib assembly including a strut, a stay having one end pivotally connected to the strut between the opposite ends of the strut, a rod having a reverse U-shaped cross-section partially formed by a pair of lower edges and having a first end pivotally connected to an end of the strut, a link having a first end pivotally connected to the stay and a second end pivotally connected to the first end of the rod, a first joint member pivotally connected at a second end of the rod, a tension wire connecting the strut and the first joint member, a second joint member, a spoke connecting the first and the second joint members, a tension link connecting the second end of the rod and the second joint member, and a rib extending outwardly of the second joint member, the improvement comprising:

a pair of spaced stops integrally formed along the lower edges of the rod, a guide ring slidably mounted around the rod between the stops, the tension wire extending between the lower edges of the rod and through the guide ring, whereby the guide ring is caused to freely slide along the rod under the action of the tension wire during the opening and dosing of the umbrella.

5,467,793

ORTHOTIC WALKER

David Hart, Keighley, England, assignor to Ontario Crippled Children's Centre, Toronto, Canada

Filed Oct. 27, 1994, Ser. No. 330,832

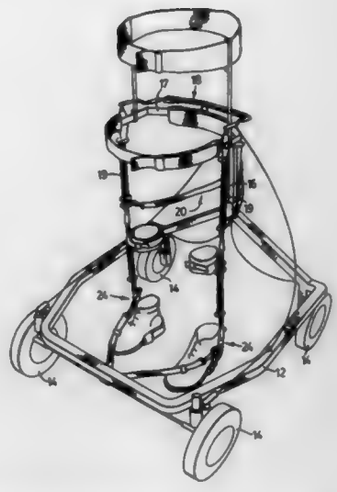
Int. Cl.[6] A61H *3/00*

U.S. Cl. 135—67 **10 Claims**

1. A walking support orthosis comprising:

a wheeled frame and a support member for a body brace, the support member being located to extend at least partially behind the body of a user;

a body brace including leg braces having support engagement means to engage said support member, the engagement means being located on a rear part of the body brace, and the leg braces having generally hip level pivotal connections to said support member to allow articulation of the hip joint of the user;



a reciprocating mechanism biasing opposite action of said leg braces.

5,467,794

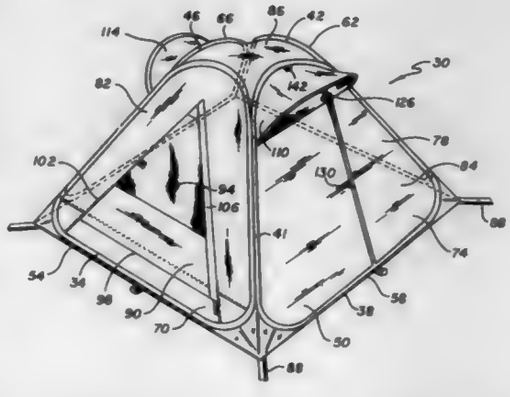
COLLAPSIBLE SHADE STRUCTURE

Yu Zheng, Covina, Calif., assignor to Posit Plus, Monrovia, Calif.

Continuation-in-part of Ser. No. 764,784, Sep. 24, 1991. This application Mar. 1, 1993, Ser. No. 24,690

Int. Cl.[6] E04H *15/40*

U.S. Cl. 135—125 **16 Claims**



1. A collapsible shade structure supported on a surface for defining an interior space, the collapsible shade structure comprising:

at least three foldable frame members each having a folded and an unfolded orientation, each frame member comprising at least three sides forming a continuous loop in the unfolded orientation;

a fabric material substantially covering the frame members to form a side panel for each frame member, each side panel assuming the unfolded orientation of its associated frame member;

each frame member and its associated side panel having a first side connected to an adjacent frame member and its associated side panel by a first interconnecting sleeve and a second side connected to another adjacent frame member and its associated side panel by a second interconnecting sleeve; and

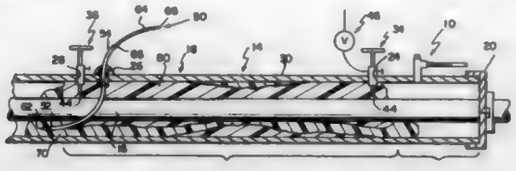
wherein each of the first and the second interconnecting sleeves comprises a hollow lumen for retaining a portion of the adjacent sides of the adjacent frame members.

5,467,795

METHODS OF SEALING ANNULAR SPACE BETWEEN INNER AND OUTER GAS MAINS FOR TIE-OVERS

Luther W. Martin, Champaign, and Richard L. Smith, Edwardsville, both of Ill., assignors to Insertec Systems, Inc., Champaign, Ill.

Filed Feb. 8, 1994, Ser. No. 193,570
Int. Cl.[6] F16L *55/162;55/165*
U.S. Cl. 137—15 **5 Claims**



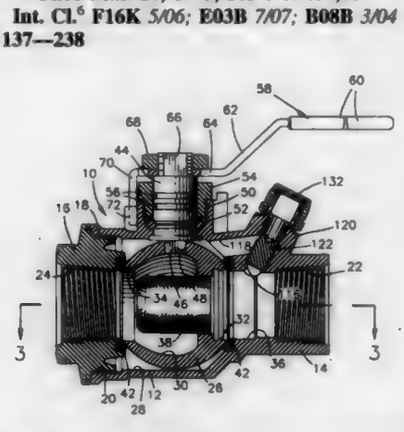
1. In a method of tying over an individual customer service connection from a live outer gas main to an inner gas main inserted within the live outer gas main comprising the steps of defining a generally annular region within the space between the inner and outer mains, said region being upstream from the customer service connection between the customer service connection and the source of gas for the outer main, opening a sidewall of the outer main intermediate the ends of said region, introducing into said opening an amount of a high-density liquid foaming composition sufficient to fill said region, permitting the foaming composition to foam and harden to a plug in said region, removing a section of outer main downstream from said region, and placing the new customer service connection through the sidewall of the inner main exposed by cutting away the outer main, the improvement comprising, before permitting the foaming composition to foam and harden, inserting into said opening a first end of a first conduit having said first end and a second end, and pushing said first conduit into the space so that said first end lies upstream of the region so that said first end of said first conduit will not be obstructed by said hardening of said foaming composition.

5,467,796

BALL VALVE WITH A STRAINER AND INTEGRATED MEANS FOR FLUSHING THE STRAINER

Giuseppe Pettinaroli, Novara, Italy, and John C. Sherman, Highland, Mich., assignors to Hydronic Components, Inc., Madison Heights, Mich.

Filed Mar. 24, 1995, Ser. No. 410,489
Int. Cl.[6] F16K *5/06;* **E03B** *7/07;* **B08B** *3/04*
U.S. Cl. 137—238 **4 Claims**



1. A ball valve (**10**) comprising a valve body (**12**) having a valve chamber (**28**), inlet (**22**) and outlet (**24**) ports communicating with said valve chamber (**28**), a rotatable ball valve element (**26**) disposed within the valve chamber (**28**) and movable between a valve open position and a valve closed position, said ball valve element (**26**) including means (**30,32,34**) defining a passage therethrough, said passage (**30**) defining inlet and outlet portions (**32,34**) therein that are in fluid alignment with said inlet and outlet ports (**22,24**) when said valve is in said open position, a basket strainer (**38**) removably mounted in the ball valve element (**26**) between said inlet and said outlet portions (**32,34**) of said passage (**30**) said ball valve element (**26**) having a rotatable shaft (**44**) for rotating the ball valve element (**26**) between said valve open position and said valve closed position, a control lever (**58**) connected to the ball valve element (**26**) rotatable shaft (**44**), said control lever (**58**) having a downwardly depending lip (**70**) at the end thereof for engaging stop protrusions (**72,74**) integrally formed on the valve body (**12**) when the ball valve element (**26**) in said open and closed positions, respectively, characterized by:

(a) an internal pilot fluid flush passage means (**116,118**) is located in a portion of the valve body (**12**) at said inlet port (**22**) and connects the inlet port (**22**) with the ball valve element chamber (**28**);

(b) a fluid flow control plug valve (**122**) is movably mounted in the pilot fluid flush passage means (**116,118**) between said inlet port (**22**) and said valve chamber (**28**), and is movable between selective open and closed positions to allow and prevent fluid flow through the pilot fluid flush passage means (**116,118**);

(c) a pilot fluid flush discharge port (**88**) is formed in said ball valve body (**12**) and communicates with the ball valve element chamber (**28**); and,

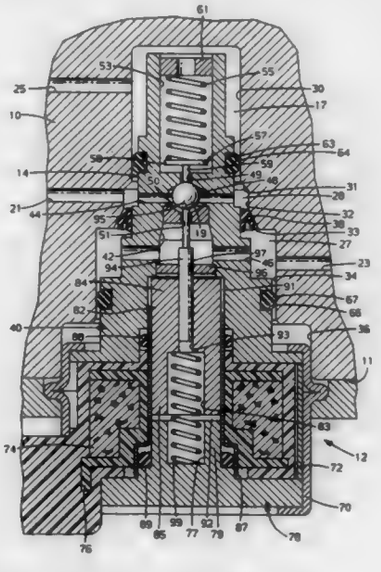
(d) a pilot fluid flush discharge valve (**90**) is connected to said pilot fluid discharge port (**88**), whereby when the ball valve element (**26**) is rotated to a closed position, and the fluid flow control plug valve (**122**) and the pilot fluid flush discharge valve (**90**) are moved to open positions, the upstream fluid entering the inlet port (**22**) will flow through the internal pilot fluid flush passage means (**116,118**) into the ball valve element chamber (**28**) through said outlet portion (**34**) of said passage (**30**) and flow through the basket strainer (**38**) and out the pilot fluid flush discharge valve (**90**), to reverse flush out debris captured by the basket strainer.

5,467,797

TWO-POSITION THREE-WAY SOLENOID VALVE

Viswanath Seetharaman, Anderson, Ind., and David F. Reuter, Beavercreek, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 23, 1994, Ser. No. 362,227
Int. Cl.[6] F16K *15/14;31/06*
U.S. Cl. 137—599 **14 Claims**



1. A directional control valve comprising:
a housing;
a solenoid actuator engaging the housing;

a valve member contained within the housing and actuated by the solenoid actuator providing directional flow control;

an integral check including a lip seal engaging the housing and permitting a flow in one direction between the lip seal and the housing bypassing the valve member; and

an integral pressure relief including the valve member captured between a first valve seat and a second valve seat with a first spring forcing the valve member toward the first valve seat and a second spring forcing the valve member toward the second valve seat.

5,467,798

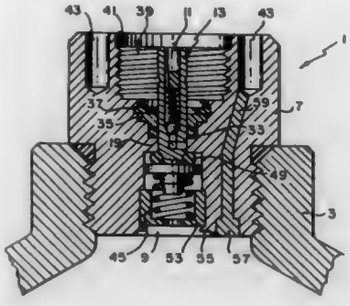
REFILL-PREVENTING VALVE FOR NON-REFILLABLE CONTAINERS

George D. Baker, and V. Russell Henry, both of Cambridge, Md., assignors to Liquid Air Corporation, Walnut Creek, Calif.

Continuation of Ser. No. 977,801, Nov. 17, 1992, abandoned. This application Dec. 2, 1993, Ser. No. 160,172

Int. Cl.[6] F16K *15/00*

U.S. Cl. 137—614.2 **10 Claims**



1. A non-refill valve for a non-refillable container, comprising a valve body having an inlet and an outlet and a passage through the valve body interconnecting the inlet and the outlet, a valve stem slidable in said passage, the valve stem having an axial passageway that extends partway therethrough and that terminates laterally in a passageway that extends through a side wall of the stem intermediate the ends of the stem, a ball in the stem that rests on a seat on the stem and that closes said valve stem passageway against the flow of gas from said outlet towards said inlet, first resilient means urging the ball against said seat to permit flow of gas only in a direction from said inlet to said outlet by displacing the ball from the seat against the action of said first resilient means in an open position of said valve, second resilient means urging the stem in the direction of the flow of gas from said inlet to said outlet, and sealing means between the stem and the valve body, said second resilient means yieldably urging said sealing means into sealing relation with said valve body in a closed position of said valve, whereby when a coupling is attached to said valve body, said coupling urges said stem in a direction opposite the first-mentioned direction and against the action of said second resilient means to move said sealing means out of sealing relation with said valve body, thereby to establish communication between said inlet and said outlet when the pressure of a gas in said inlet is sufficient to move said ball off said seat against the action of said first resilient means.

5,467,799

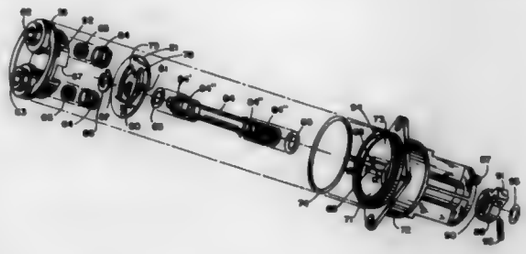
MIXING VALVE

Dana F. Buccicone, Crystal Lake, Ill., and Jeffrey F. Tempas, Oostburg, Wis., assignors to Kohler Co., Kohler, Wis.

Division of Ser. No. 306,352, Sep. 15, 1994. This application Mar. 7, 1995, Ser. No. 399,681

Int. Cl.[6] F16K *11/06*

U.S. Cl. 137—625.41 **4 Claims**



1. A valve comprising:

a valve body having an axial bore and an open lower end extending from the bore, the valve body having an engagement means extending radially inward into the bore;

a rotatable valve element positioned in the axial bore to control flow of a fluid through the valve, the valve element having a radially outward projecting member; and

a nonrotatable ported member in the axial bore having at least two axially extending holes therethrough;

whereby the engagement means assists in aligning the ported member in the open lower end of the valve body, and also provides a stop surface for contact with the projection member of the rotatable valve element.

5,467,800

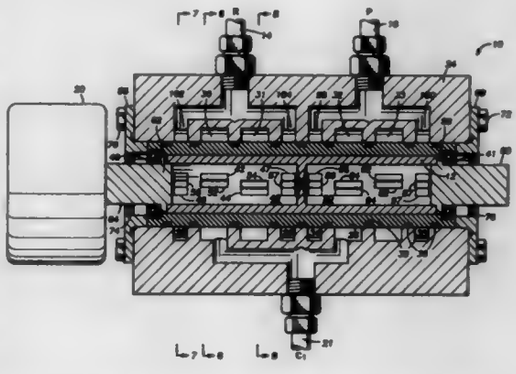
LOW INERTIA SERVO VALVE

John J. Sallas, Plano, Tex., assignor to Atlas Fluid Controls Inc., Houston, Tex.

Continuation of Ser. No. 170,635, Dec. 21, 1993, abandoned, which is a continuation of Ser. No. 49,950, Apr. 20, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 337,137

Int. Cl.[6] F15B *13/044*

U.S. Cl. 137—625.65 **7 Claims**



1. In a low inertia servo valve including a valve body having an internal cylindrical bore, said bore including a plurality of annular chambers therearound, said annular chambers being distributed axially at selected locations along said bore, said annular chambers comprising means for fluid communication with, respectively, a pressurized fluid source, a fluid return and the fluid input and fluid output ports of a fluid-driven actuator device, the improvement comprising:

a sleeve mounted within said bore, said sleeve including at least two groups of at least three sets of ports per group, said sets of ports being distributed axially along said sleeve, the ports that comprise each said set having preselected areal dimensions, are radially distributed around the perimeter of said sleeve, opening into corresponding annular chambers, the angular orientation of those ports that comprise a first set of ports within each group being rotated by a preselected angular displacement with respect to the angular orientation of a second set of ports within each group;

a fluid-flow control member rotatably mounted within said sleeve, said control member including at least a first and a second internal elongated chamber each for containing respectively first and second groups of at least three sets of apertures, the axial distribution of the respective groups of sets of apertures along said control member corresponding to the axial distribution of the groups of sets of ports along said sleeve, the apertures of each said set, having preselected areal dimensions, are radially disposed around the perimeter of said control member, the angular orientations of a first and a second set of apertures in each group being in angular alignment;

a control member drive means for rotatably reciprocating said control member between a first and a second angular position relative to a null position; and

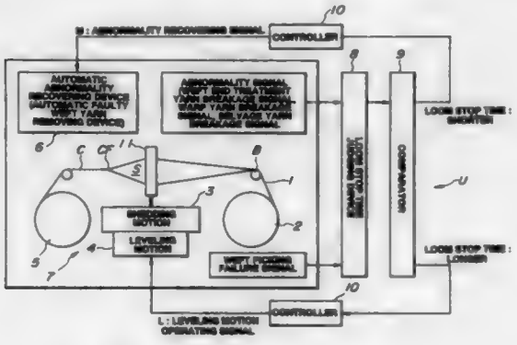
in each group in said sleeve, a third set of ports that are dimensioned radially such that the angular opening of each port of said third set of ports of each group subtends an arc having a width sufficient to ensure unrestricted fluid flow through a third set of control-member apertures as the control member rotates between the first and second angular positions.

5,467,801

WARP YARN LEVELING MOTION INCORPORATED WITH A LOOM STOP TIMING JUDGING DEVICE

Kazuo Kaneda, Sagamihara, and Masayuki Ushiro, Tanashi, both of, Japan, assignors to Nissan Texsys Co., Ltd., Tokyo, Japan

Filed Apr. 15, 1994, Ser. No. 228,424
Claims priority, application Japan, Apr. 17, 1993, 5-113765
Int. Cl.[6] D03D *51/00*; D03C *13/00*
U.S. Cl. 139—1 E **10 Claims**



1. A loom comprising:

a shedding motion;

a leveling motion incorporated with the shedding motion, for leveling warp yarns, when said leveling motion is operated;

means for generating a plurality of types of loom stop signals to stop a weaving operation of the loom based on different types of predetermined reasons for stopping the loom;

means for operating said leveling motion in response to one of said loom stop signals;

means for judging that a loom stop time is longer or shorter than a predetermined time in accordance with the type of said loom stop signals, said loom stop time being equal to a time duration between a first time at which the loom weaving operation is stopped and a second time at which the loom weaving operation is restarted; and

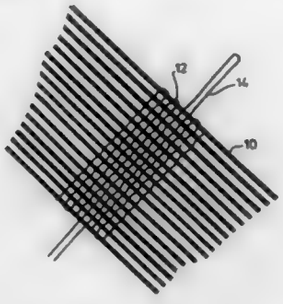
means for operating said leveling motion in response to a judgment of said judging means that said loom stop time is longer than said predetermined time.

5,467,802

WOVEN SLEEVE WITH INTEGRAL LACING CORD

Leonard Lusen, Lansdale, and Tammy S. Ebersole, Warminster, both of Pa., assignors to The Bentley-Harris Manufacturing Company, Exton, Pa.

Filed Jan. 21, 1994, Ser. No. 184,877
Int. Cl.[6] D03D *3/00*
U.S. Cl. 139—384 R **12 Claims**



1. A wrap-around flexible fabric sleeve having a substantially rectangular shape when flattened and being adapted for bundling elongated substrates such as wires and cables, said fabric sleeve being wrapped around the substrates with the fabric selvages in adjacent relationship;

said sleeve comprising interwoven warp and weft yarns forming a flat body being flexible about its long axis, having a first surface to be disposed in adjacent relationship to the substrates and an outer surface, said flat body being bounded by said selvages and halving a plurality of pairs of tie cords extended parallel to the weft yarns, each tie cord being separated by a plurality of weft yarns, the tie cords projecting beyond each said selvage by predetermined amounts sufficient to permit the cords of a pair to be tied together;

said tie cords being interwoven with the warp yarns.

5,467,803

OUTER LEAD BENDING APPARATUS FOR A SEMICONDUCTOR PACKAGE DEVICE HAVING A PACKAGE AND OUTER LEADS EXTENDING FROM THE PACKAGE

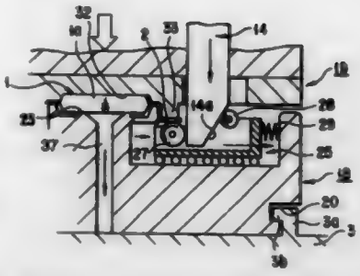
Atsushi Yoshimura; Hiroshi Shibata, both of Yokohama; Fumio Takahashi, Kitakami, and Kuniaki Tsurushima, Atsugi, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 9, 1994, Ser. No. 194,506
Claims priority, application Japan, Feb. 10, 1993, 5-022275
Int. Cl.[6] B21F *1/00*
U.S. Cl. 140—105 **10 Claims**

1. An outer lead bending apparatus for a semiconductor package device having a package and outer leads extending from the package, comprising:

first and second holding units, wherein one of the holding units is driven in a driving direction toward and away from the other unit;

a first die unit detachably secured to the first holding unit and having a first holding section for holding a semiconductor package device, the first die unit defining a space around the first holding section where outer leads of the semiconductor package device are inserted, and a moving body slidably movable in the space in a direction perpendicular to the



driving direction to an extent corresponding to a bending length of the outer leads to bend the outer lead portions in a direction substantially perpendicular to the driving direction; and

a second die unit detachably secured to the second holding unit and having a second holding section holding the semiconductor package device relative to the first holding section and a restricting section projecting from a surrounding area of the second holding section for holding the outer leads relative to the moving body and restricting the bending direction of the outer leads.

5,467,804

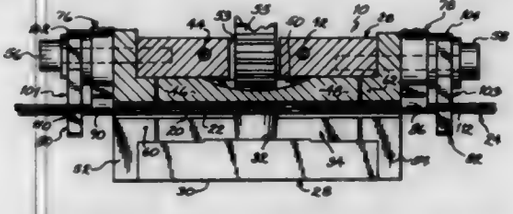
WIRE TWISTER-CUTTER ASSEMBLY

Albert Kupferschmidt, Highland Park, and John Wiedel, Chicago, both of Ill., assignors to L&P Property Management Company, Chicago, Ill.

Filed Jan. 26, 1994, Ser. No. 188,462

Int. Cl.[6] B21F *15/04*

U.S. Cl. 140—115 **12 Claims**



1. An assembly for use in a wire-tieing machine comprising:

a base member having a bearing bore therethrough and a wire receiving side slot intersecting said bore, a wire-twister pinion rotatably disposed in said bore and having a wire receiving side slot therein for receiving first and second wire portions in side-by-side relationship for twisting about each other upon rotation of said pinion, members respectively mounted on opposite ends of said base member by mounting screws extending into said base member for resisting twisting of the wires around each other at said opposite ends of said base member, and first and second cutter members shiftably mounted on said opposite ends of said base member outwardly of said members for respectively cutting said first and second wire portions, said assembly being mountable as a unit in, and removable as a unit from, said wire-tieing machine.

5,467,805

LEAD GRID SPREADING MACHINE FOR MAKING GRID PLATES FOR ELECTRIC ACCUMULATORS

Pietro Farina, Villafrance, Italy, assignor to Sovema S.r.l., Villafranca, Italy

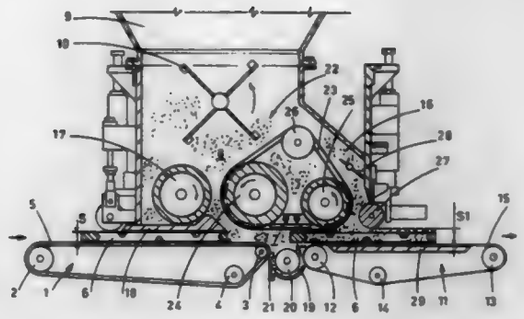
Filed Jul. 29, 1994, Ser. No. 282,008

Claims priority, application Italy, May 27, 1994, VR94A000

Int. Cl.[6] H01M *4/72*

U.S. Cl. 141—32 **5 Claims**

1. A machine for spreading a paste on lead grids to manufacture plates for electrical accumulators, comprising:



a first conveyor belt, having a rest surface with a high friction coefficient for carrying a grid to be covered with the paste;

a spreading chamber of the paste, downstream of the first conveyor belt and towards which the first conveyor belt advances, at which paste is spread on an upper and a lower face of the grid; means for spreading the paste on the grid being provided at the spreading chamber;

a loading hopper of the paste which is in communication with and which feeds the spreading chamber;

a second conveyor belt moving in a direction away from the spreading chamber, having an uncompressible rest surface, for distancing the grid from the spreading chamber;

a calibrator, positioned at the second conveyor belt, for regulating a breadth of paste spread on at least one face of the grid;

a recycling chamber of the paste, communicating with the spreading chamber and the loading hopper, whereat excess quantities of the paste are removed from the spreading chamber and returned to the loading hopper; and a regulator, positioned in the recycling chamber, for setting a pressure of the paste inside the spreading chamber;

wherein the means for spreading comprise:

a rotating conveyor roller placed inside the loading hopper and positioned above a wall partially overlying the first conveyor belt and distanced from the first conveyor belt by a superior distance to a thickness of the grid; said conveyor roller spreading the paste on the upper face of the grid transiting in the spreading chamber;

a rotating counter-roller positioned in a housing cavity fashioned in the spreading chamber below the lower face of the grid transiting through the spreading chamber, which counter-roller compresses the paste on said lower face of the grid;

a scraping blade which breasts a conveyor plane of the first conveyor belt and constitutes a lateral side of the housing cavity; and

a spreading and transport group, comprising a belt ring-wound about two rollers and a tension roller, and positioned above a grid transiting in the spreading chamber, which spreading and transport group compresses the paste on the upper face of the grid and contemporaneously nudges the grid from the first conveyor belt to the second conveyor belt.

5,467,806

TWO-PART COUPLING STRUCTURE HAVING COOPERATING PARTS EFFECTING FLUID FLOW UPON CONNECTION AN MUTUAL RESEALING UPON DISCONNECTION

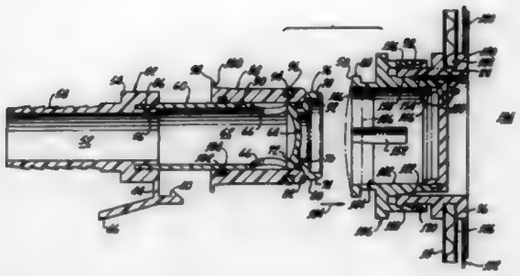
Douglas K. Stricklin, Brea, and Chester Savage, Irvine, both of Calif., assignors to Scholle Corporation, Irvine, Calif.

Filed May 10, 1994, Ser. No. 240,978

Int. Cl.[6] F16L *37/28*

U.S. Cl. 141—346 **35 Claims**

1. A two-part coupling structure having a female coupling part for fluid flow communication with a vessel, and a male coupling part for fluid flow communication with a conduit, said coupling parts being mutually engageable to effect fluid flow communication between said vessel and said conduit, and being disengageable to both discontinue said fluid flow communication and also to



mutually close fluid flow communication between ambient and each of said vessel and conduit; said two-part coupling structure comprising:

said female coupling part having:

a yieldably shape-retaining female cap member defining a through bore communicating between ambient and said vessel, and a radially inwardly opening circumferential groove on said through bore spaced outwardly of said vessel along said through bore;

a yieldably shape-retaining disk-like plug member having a wall portion for spanning and closing said through bore of said cap member, said plug member including a circumferential ring portion which is sealingly receivable forcefully into said through bore of said cap member in an axial direction outwardly of said vessel, and said ring portion radially outwardly defining a circumferential ridge receivable into said circumferential groove of said cap member to lock said plug member into sealing relation therewith, said ring portion further defining an inner radially inwardly opening circumferential groove;

said cap member and said plug member cooperating to define a first axial force for engagement of said plug member ring portion into said through bore of said cap member, and an oppositely directed second axial force for disengagement of said plug member from said cap member removing said plug member inwardly of said vessel from said through bore of said cap member;

said male coupling part having:

an elongate yieldably shape-retaining probe member defining a blind axial passage for fluid flow communication with said conduit and a wall portion closing said axial passage adjacent a forward end of said probe member, said probe member defining a stepped outer diameter with an enlarged-diameter forward flange portion of a size to be received into said plug member ring portion, said forward flange portion defining a radially outer circumferential rib receivable into said inner groove of said ring portion, and also cooperating with a smaller-diameter portion of said probe member to define a rearwardly-disposed shoulder, said probe member defining a lateral aperture opening from said blind passage outwardly on said smaller-diameter portion rearwardly of and adjacent to said shoulder;

a yieldably shape-retaining sleeve member carried slidably on said smaller-diameter portion of said probe member between a first position across and closing said lateral aperture and a second position at least partially rearwardly of and opening said lateral aperture, said sleeve member having a stepped outer diameter with an elongate smaller-diameter portion of a size to be received closely into said through bore of said cap member, said sleeve member having a circumferential axially-disposed forward end edge surface engageable in said first position of said sleeve member with said shoulder of said probe member flange portion, and further having a larger-diameter radially outwardly extending flange portion at a rear end thereof opposite to said forward end edge, said flange portion of said sleeve member being engageable with said cap member to slide said sleeve member from said first position to said second position thereof, said sleeve member also outwardly carrying resilient sealing means for sealingly engaging retainingly into said circumferential groove of said cap member substantially simultaneously with said flange portion of said sleeve member engaging said cap member;

said probe member and said plug member cooperatively defining a third axial force for engagement of said probe member flange portion into said plug member ring portion, which third axial engagement force is less than said second axial force for disengagement of said plug member from said cap member; upon insertion of said male coupling part into said female coupling part said probe member first sequentially engaging with said plug member and then disengaging said plug member from said cap member for movement of said plug member inwardly of said vessel with said inserting probe member, said sleeve member engaging said cap member and moving to said second position thereof relative to said inserting probe member to uncover said lateral aperture and to open fluid flow communication between said vessel and said conduit;

said probe member and said plug member cooperatively defining a fourth axial force for disengagement of said probe member from within said ring portion of said plug member which is greater than said first axial force necessary to engage said plug member ring portion into said bore of said cap member, so that upon withdrawal of said male coupling part from said female coupling part said plug member first sequentially re-engages with said cap member followed by said probe member disengaging from said plug member, said resilient sealing means retaining and relatively moving said sleeve member forwardly along said withdrawing probe member to said first position thereof to re-close said lateral aperture, and said shoulder of said enlarged-diameter flange portion of said withdrawing probe member engaging said sleeve member to overcome said resilient retention and remove said sleeve member axially outwardly from within said cap member.

5,467,807

PNEUMATIC VEHICLE TIRE WITH OPTIMIZED RECYCLABILITY

Thomas Neddenriep, Schwarmstedt, and Theodor Frucht, Hanover, both of, Germany, assignors to Continental Aktiengesellschaft, Hanover, Germany

Filed Jun. 7, 1994, Ser. No. 255,642

Claims priority, application Germany, Jun. 7, 1993, 43 18 825.7

Int. Cl.[6] **B60C** *1/00;9/18;15/04;15/06*

U.S. Cl. 152—458 **7 Claims**

1. A pneumatic vehicle tire comprising:

two beads each having a bead core;

a carcass of at least one layer anchored at said bead cores within said beads;

said beads further comprising bead profiling members;

a reinforcement structure located radially outwardly of said carcass;

a tread positioned radially outwardly of said reinforcement structure;

said carcass consisting essentially of aramid cord fabric;

said bead cores consisting essentially of aramid cords;

said reinforcement structure consisting essentially of rubber reinforced with synthetic fibers; and

said bead profiling members consisting essentially of rubber reinforced with synthetic fibers.

5,467,808

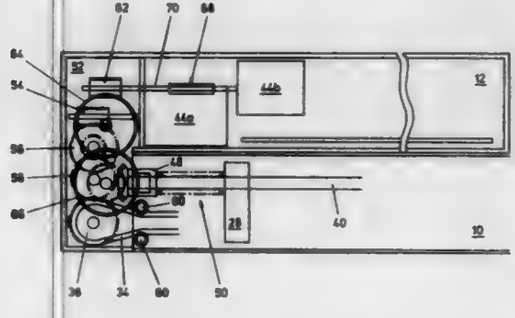
BLIND OR CURTAIN SUSPENSION SYSTEM

David Bell, Bradford, United Kingdom, assignor to Eclipse Blinds Limited, Renfrew, Scotland

Filed Jan. 11, 1994, Ser. No. 180,087

Int. Cl.[6] E06B *9/30*

U.S. Cl. 160—168.1 **18 Claims**



1. A blind/curtain suspension system, comprising:

a support;

at least one suspension device carried by said support and being arranged for movement relative to said support for opening and closing the blind/curtain;

an electric motor coupled to said suspension device and operable for causing movement of the suspension device relative to said support;

a stop and a resilient component onto which the suspension device impinges at one end of its range of motion, said resilient component being located between said suspension device and said stop so that said resilient component is resiliently stressed as said suspension device approaches said one end of its range of motion; and,

a controller including means for detecting an increase in current to said electric motor associated with said electric motor resiliently stressing said resilient component and means for interrupting current to said electric motor when the increase in electric motor current is detected.

5,467,809

LIQUID-COOLED INGOT MOLD FOR THE CONTINUOUS CASTING OF STEEL BILLETS IN THE FORM OF SLABS

Giovanni Arvedi, Cremona; Giovanni Gosio, Rovato, both of, Italy; Ulrich Siegers, Berlin, Germany; Luciano Manini, Azzanello, Italy; Fritz-Peter Pleschiutschnigg, Duisburg, Germany; Lothar Parschat, Ratingen, Germany; Hans-Günther Thurm, Duisburg, Del., and Harald Lüdorff, Langenfeld, Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

PCT No. PCT/DE91/00761, § 371 Date Jun. 1, 1993, § 102(e) Date Jun. 1, 1993, PCT Pub. No. WO92/05898, PCT Pub. Date Apr. 16, 1992

PCT Filed Sep. 23, 1991, Ser. No. 39,063

Claims priority, application Germany, Jan. 2, 1990, 40 31 691.2; Sep. 20, 1991, 41 31 829.3

Int. Cl.[6] B22D *7/00;11/04*

U.S. Cl. 164—418 **10 Claims**

1. A liquid-cooled plate mould with adjustable width for the continuous casting of billets from steel in the form of slabs having a thickness of less than 100 mm, the mould having a pour-in side (4), and slab outlet end (5) and a direction of casting; the mould comprising:

oppositely disposed broad side plates (1) forming in the direction of casting a pair of curved mould walls;

narrow side plates (2) slidably disposed between the broad side plates for increasing the width of the slab along a region of adjustment (3') extending from a smallest slab width to a relatively larger slab width, the narrow side plates being arranged substantially parallel to one another along the height of the mould;

the broad side plates (1) including a cavity extending along at least the smallest slab width, the cavity having a curve length, a chord length and a depth (13), the depth of the cavity of the curved mould being at most 12 mm per 1,000 mm slab width at the pour-in side (4) of the mould;

the shape of the broad side plates (1) at the slab outlet end (5) of the mould corresponding to the slab being produced, the broad side plates (1) being constructed so as to be concave at the slab outlet end (5) of the mould in such a way that the depth (13) of the mould walls forming the curve is still at least 0.5 to 2 mm as seen in cross-section;

the broad side plates having a plane inner surface in the region of adjustment (3') of the narrow side plates (2); and

a plurality of ducts (8) within the broad side plates (1) for cooling the mould.

5,467,810

CONTINUOUS METAL CASTING MOLD

John A. Grove, Franklin, Pa., assignor to Acutus Industries, Waterford, Mich.

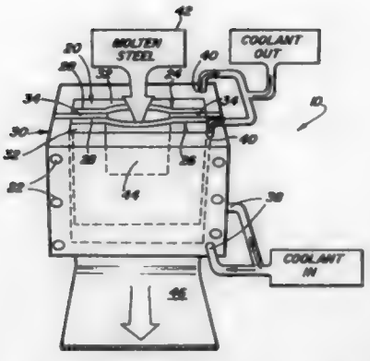
Filed Apr. 1, 1994, Ser. No. 221,954

Int. Cl.[6] B22D *11/04*

U.S. Cl. 164—418 **12 Claims**

1. A continuous metal casting mold Comprising an insert and a mold frame from which said insert ,may be removed for service, said insert comprising:

a pair of primary plate-like mold members juxtaposed in a spaced substantially parallel relationship with each other, each primary plate-like mold member having a copper facing plate, a steel backing plate and fastening means between said coppers facing plate and said steel backing plate, said copper facing plate having a central upper portion expanding out-



wardly providing a downwardly converging funnel-shaped area to receive molten metal, said steel backing plate having a contour in the surface facing the copper facing plate that mates with the funnel-shaped area of the copper facing plate, and cooling means between said copper facing plate and said steel backing plate,

a pair of end mold members opposing each other and situated between said primary plate-like mold members laterally outwardly of said funnel-shaped area, said end mold members are each equipped with a copper surface, and

a generally box-like open-ended sleeve formed by said pair of primary plate-like mold members and said pair of end mold members having a top inlet for accepting molten metal and a bottom outlet for discharging partially solidified metal slab.

5,467,811

THIN CAST STRIP OF AUSTENITIC STAINLESS STEEL AND COLD-ROLLED SHEET IN THIN STRIP FORM AND PROCESSES FOR PRODUCING SAID STRIP AND SHEET

Toshiyuki Suehiro, Hikari; Shinichi Teraoka, Futtsu; Eiichiro Ishimaru, Hikari; Yoshimori Fukuda, Futtsu, and Shuichi Inoue, Hikari, all of, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

PCT No. PCT/JP93/00496, § 371 Date Dec. 16, 1993, § 102(e) Date Dec. 16, 1993, PCT Pub. No. WO93/20966, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 16, 1993, Ser. No. 167,803

Claims priority, application Japan, Apr. 17, 1992, 4-098147; Dec. 14, 1992, 4-352809

Int. Cl.[6] B22D *11/16;11/00*

U.S. Cl. 164—476 **4 Claims**

1. A process for producing a thin austenitic stainless steel cast sheet comprising:

synchronous continuously casting a thin austenitic stainless steel sheet using a pair of cooling drums having a kissing point therebetween, each cooling drum having a width direction, wherein said cast stainless steel sheet has a center section and a Ni segregated portion in said center section vicinity;

regulating Ni segregation ratio in said center section vicinity to 0.90 or more by applying a drum pressing force perpendicular to said kissing point, said pressing force having a range of from 3 to 25 kgf/mm in the width direction of the cooling drums; and

said Ni segregation ratio is defined by a formula: {average Ni content of the segregated portion (%) }/{average Ni content of the cast sheet (%)}; wherein Ni content is expressed in % by mass.

5,467,812

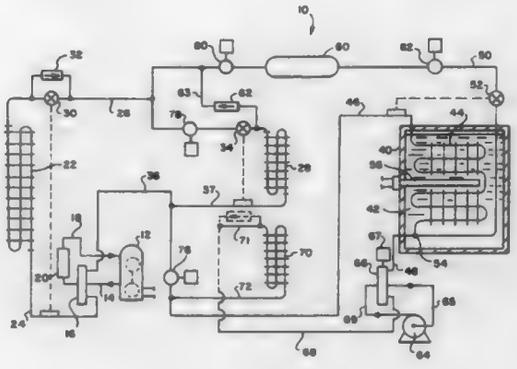
AIR CONDITIONING SYSTEM WITH THERMAL ENERGY STORAGE AND LOAD LEVELING CAPACITY

William J. Dean, Grapevine, and Theodore C. Gilles, Dallas, both of Tex., assignors to Lennox Industries Inc., Dallas, Tex.

Filed Aug. 19, 1994, Ser. No. 293,875

Int. Cl.[6] F25B *25/00*

U.S. Cl. 165—2 **20 Claims**



1. An air conditioning system comprising:

a compressor for compressing a refrigerant;

a first heat exchanger operably connected to said compressor;

a second heat exchanger operably connected to said first heat exchanger and said compressor, said compressor being operable to circulate refrigerant between said first heat exchanger and said second heat exchanger, whereby fluid in heat exchange relationship with said second heat exchanger is cooled;

a thermal energy storage unit comprising a tank having a thermal energy storage medium disposed therein and a third heat exchanger disposed in said medium, said third heat exchanger being operably connected to said compressor and said first heat exchanger, said compressor being operable to circulate refrigerant between said third heat exchanger and said first heat exchanger to cool said medium;

a fourth heat exchanger operably connected to said third heat exchanger;

refrigerant circulation means for circulating refrigerant between said third heat exchanger and said fourth heat exchanger, whereby fluid in heat exchange relationship with said fourth heat exchanger is cooled; and

flow control means interposed in said system for selective operation to effect refrigerant flow through a first circuit comprising said compressor, said first heat exchanger and said second heat exchanger, a second circuit comprising said compressor, said first heat exchanger and said third heat exchanger and a third circuit comprising said third heat exchanger, said refrigerant circulation means and said fourth heat exchanger, whereby said system is selectively operable in a first operating mode wherein refrigerant flows through said first circuit to cool fluid in heat exchange relationship with said second heat exchanger, in a second operating mode wherein refrigerant flows through said second circuit to cool said thermal energy storage medium, in a third operating mode wherein refrigerant flows through said third circuit to cool fluid in heat exchange relationship with said fourth heat exchanger, and in a fourth operating mode wherein refrigerant flows simultaneously through said first and third circuits to cool fluid in heat exchange relationship with said second heat exchanger and fluid in heat exchange relationship with said fourth heat exchanger.

5,467,813

ROBOT WITH SUCTION CUP ATTACHMENT TO STEAM GENERATOR PARTITION

Huibrecht P. Vermaat, Rockanje, Netherlands, assignor to Vermaat Technics B.V., Rockanje, Netherlands

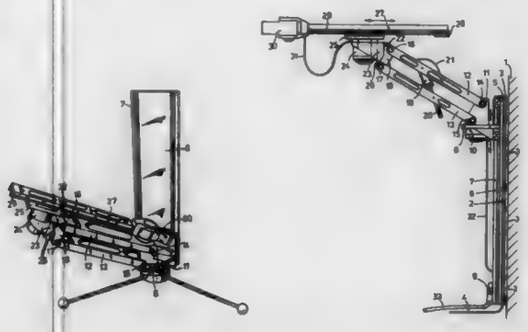
PCT No. PCT/NL92/00060, § 371 Date Dec. 29, 1993, § 102(e) Date Dec. 29, 1993, PCT Pub. No. WO92/17734, PCT Pub. Date Oct. 15, 1992

PCT Filed Mar. 27, 1992, Ser. No. 122,452

Claims priority, application Netherlands, Mar. 27, 1991, 9100543

Int. Cl.[6] B25J 5/00; F22B 37/00

U.S. Cl. 165—11.2 8 Claims



1. A robot particularly suitable for being hoisted into one of the chambers of a heat exchanger steam generator, said chambers being separated from one another by a partition, so as to carry out inspection and repair operations, comprising a supporting means including guide means along which a first table is reciprocal, a shoulder joint arranged on the table to rotate a mounting head for a robot arm assembly about a vertical axis, as well as driving means for said first table, said mounting head, and said robot arm assembly, said supporting means comprises a table plate (6) on which said guide means (7) for said first table (8) are provided and a base plate (2) onto which suction cups (3) are applied to secure the robot to the partition (1) of the heat exchanger.

5,467,814

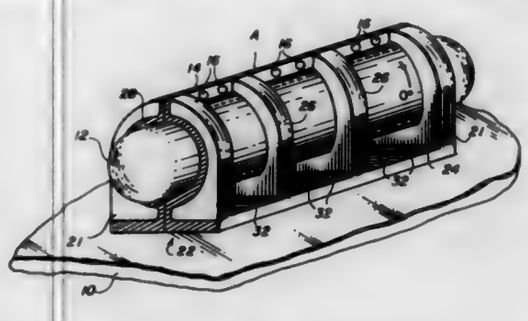
GRAPHITE/EPOXY HEAT SINK/MOUNTING FOR COMMON PRESSURE VESSEL

Nelson L. Hyman, Randallstown; William R. Braun, Seabrook; James C. Garner, Bowie, all of Md.; Lawrence R. Larson, Kitty Hawk, N.C., and Sheleen M. Tuner, North Beach, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 24, 1995, Ser. No. 393,799

Int. Cl.[6] F28F 7/00

U.S. Cl. 165—41 14 Claims



1. A heat transmitter and mounting structure

a pressure vessel generating a thermal dissipation;

a shear panel acting as a radiator for the thermal dissipation of the pressure vessel that is a part of a larger external surface of a spacecraft; and

a heat transmitter assembly comprised of a mounting structure constructed of layers of graphite fibers divided into halves having a means of joining the halves together so as to restrain the pressure vessel and a mounting plate made of layers of graphite fibers having a means for mounting the heat transmitter assembly onto the shear panel, and layers of graphite fiber between the pressure vessel and the mounting structure, the mounting structure, mounting plate and layers of graphite fibers cooperating to conduct thermal energy from the pressure vessel to the shear panel.

9. A heat transmitter and mounting structure comprising:

a pressure vessel generating thermal energy;

a layer of electrical insulating material wrapped around the pressure vessel;

a heat conducting structure made of layers of graphite fibers attached to the insulated pressure vessel;

a mounting plate capable of conducting heat attached to the heat conducting structure; and

a radiator, to which the mounting plate is attached, for radiating thermal energy that is conducted from the pressure vessel, through the heat conducting structure and mounting plate to the radiator.

10. A device for controlling the temperature of a common pressure vessel within a spacecraft comprising:

a pressure vessel that generates the thermal energy;

a layer of electrical insulating material wrapped around the pressure vessel;

a radiator to radiate the thermal energy;

means for heating the pressure vessel during periods of cold environment; and

a heat transmitter assembly further comprised of a mounting structure and a thermal conductive layer wrapped around the insulated pressure vessel.

5,467,815

APPARATUS FOR IMPINGEMENT COOLING

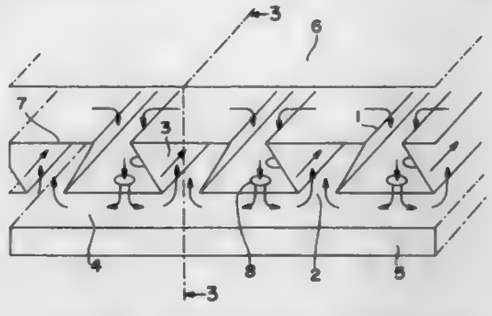
Jurgen Haumann, Rekingen; Alfred Knopfli, Othmarsingen; Thomas Sattelmayer, Mandach, and Rudolf Tresch, Seon, all of, Switzerland, assignors to ABB Research Ltd., Switzerland

Filed Dec. 28, 1993, Ser. No. 174,351

Claims priority, application Germany, Dec. 28, 1992, 42 44 302.4; Dec. 28, 1992, 42 44 303.2

Int. Cl.[6] F28F 13/12

U.S. Cl. 165—109.1 4 Claims



1. An apparatus for impingement cooling a cooling surface, in which a cooling surface and a cover surface are disposed parallel to one another, comprising trapezoidal profiles that are open respectively on a narrow side and connected to one another at a constant distance from the cooling surface and are disposed crosswise to a flow direction of cooling air, wherein a side of the trapezoidal profiles facing the cooling surface is provided with at least one row of perforations, and defines, with the cooling surface, a gap having a constant height, and open sides of the trapezoidal profiles located opposite the cover surface define overflow openings, a space between the trapezoidal profiles provided with perforations defines a trapezoidal return flow conduit, a feed opening is

larger than a cross-section of the perforations, a cross-section of the return flow conduit is larger than the overflow openings, and the overflow openings are larger than a cross-section of the gap between the cooling surface and the sides of the trapezoidal profiles provided with the perforations.

5,467,816

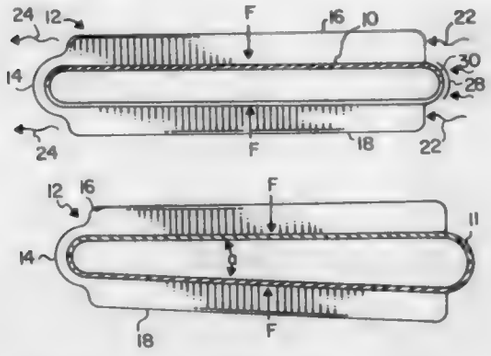
FINNED TUBES FOR AIR-COOLED STEAM CONDENSERS

Michael W. Larinoff, 370 Holly Hill Rd., Oldsmar, Fla. 34677

Filed Feb. 8, 1993, Ser. No. 14,620

Int. Cl.[6] F28F *1/20*

U.S. Cl. 165—151 **6 Claims**



1. Apparatus for use in condensing steam, the apparatus including an elongated, air-cooled tube having a generally rectangular shape with flat side-walls and end-walls therebetween, the apparatus also including a plurality of thin, closely spaced, generally U-shaped, extended surface, heat transfer fins coupled to the tube in a completely stacked relationship, each fin being of a three-link design and with two outer fin-links and a middle fin-link therebetween as an abutting extension of the outer fin-links, the middle fin-link having an inner portion shaped to generally conform to the adjacent shape of the tube and having an outer portion curved to provide an optimized clamping force, with the fins held in place on the tube by the two outer fin-links clamped against the flat side walls of the tube by stress-induced forces generated in the middle fin-links as a result of the forced movement between one end-wall of the tube and the fins when assembled on the tube and means to permanently bond the fins to the tube in a separate metallurgical procedure.

5,467,817

PACKING ELEMENT FOR METHODS OF EXCHANGE OR CONVERSION OF MATERIALS DESIGNED AS A HEAT-TRANSFER ELEMENT

Günther Schwald, München, Germany, assignor to Sulzer Chemtech AG, Winterthur, Switzerland

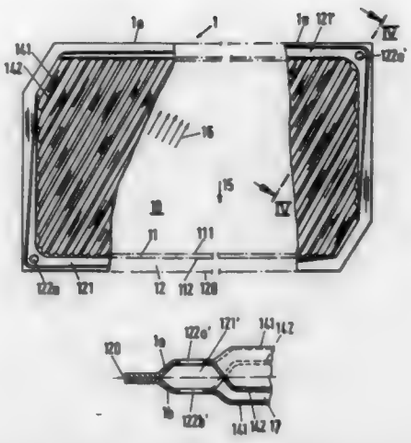
Filed Mar. 14, 1994, Ser. No. 213,201

Claims priority, application European Pat. Off., Mar. 25, 1993, 93810218

Int. Cl.[6] F28F *3/12*

U.S. Cl. 165—167 **10 Claims**

1. A packing element for methods of exchange or conversion of materials designed as a heat-transfer element, the packing element comprising a plurality of parallel layers which extend in a main direction (15) of a material stream and are formed by bodies (1) with hollow heat transfer channels (17) for a heat-transfer medium, each of the heat-transfer bodies (1) having a pair of shells (1*a*, 1*b*) made of a foil material and having side surfaces with a wave-shaped profile forming wave crests (141) the shells further having a relief-type profiling which forms a distribution and a collection channel system (121, 121') for the heat-transfer medium, a plurality of connection points located along the flow channels on the



inner side of the shell pair capable of withstanding excess pressure of the heat-transfer medium, each of the shells having a wave-shaped inner region (**10**), a border zone (**12**) and a transition zone (**11**) between the inner region and the border zone, the heat-transfer channels (**17**) being situated in the inner region, and the distribution and collection channel system (**121**, **121'**) being situated in the border zone, the border zones (**12**) of the shell pair being made as mirror images of each other, and the inner regions (**10**) being made as inverse mirror images such that connection is established between the two shells.

5,467,818

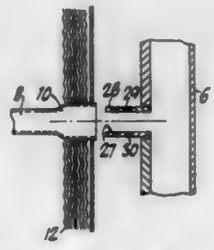
HEAT EXCHANGER

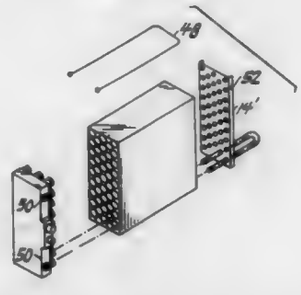
James H. Buckley, Jr., Fort Worth, Tex., assignor to Valeo Climate Control Corporation, Fort Worth, Tex.

Filed Mar. 24, 1993, Ser. No. 36,324

Int. Cl.[6] F28F *9/06*

U.S. Cl. 165—178 **12 Claims**





1. A heat exchanger comprising:

an end tank defining therein a fluid inlet through which, in use, fluid enters the heat exchanger, and a fluid outlet through which, in use, fluid leaves the heat exchanger;

a plurality of heat exchange tubes having end portions at which the heat exchange tubes are connected to said end tank;

a plurality of heat exchange fins connected to the heat exchange tubes;

a plurality of stubs provided on said end tank defining passageways into said end tank, said stubs receiving or being received

by end portions of respective heat exchange tubes, to form the connection between said end tank and said heat exchange tubes;

wherein sealing "O"-rings are provided between said heat exchange tube end portions and said stubs to provide a seal therebetween, and wherein annular grooves are formed in said heat exchange tube end portions or stubs, within which said grooves said sealing "O"-rings are seated; and

wherein said end tank is a plastic end tank having aluminum stubs insert-moulded therein.

5,467,819

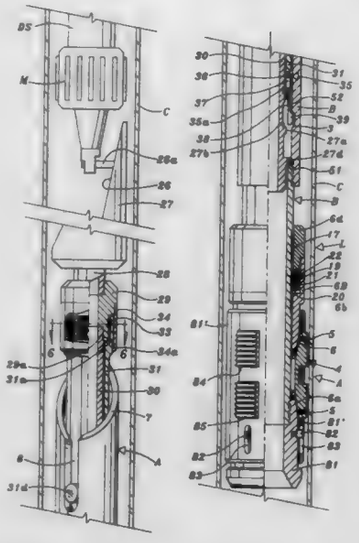
RETRIEVABLE WHIPSTOCK AND METHOD OF USE ORIENTABLE

Britt O. Braddick, Houston, Tex., assignor to TIW Corporation, Houston, Tex.

Filed Dec. 23, 1992, Ser. No. 996,958

Int. Cl.[6] E21B *7/08*

U.S. Cl. 166—117.6 **62 Claims**



54. An arrangement for positioning a whipstock face on a well string in an anchor secured in a cased well bore tubular member for drilling a lateral well bore including:

a shaft extending from the whipstock;

said shaft including an orientation sleeve;

said shaft including a latch mandrel;

a lug on said sleeve;

the anchor including a tubular body extending upwardly there from to terminate in an upper end with an inclined annular edge surface thereon and a whipstock latching surface extending longitudinally on said tubular body from said inclined annular edge surface for receiving said lug on said sleeve; and

a latch supported on said latch mandrel for releasably engaging with the anchor for securing the whipstock with the anchor and for releasing the whipstock from the anchor for retrieval from the well bore by manipulation of a well string.

5,467,820

SLOTTED FACE WELLBORE DEVIATION ASSEMBLY

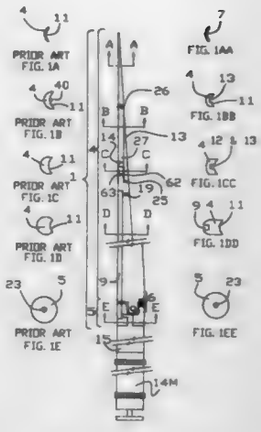
Bobby G. Sieber, Rte. 1, Arp, Tex. 75750

Division of Ser. No. 201,800, Feb. 25, 1994, Pat. No. 5,425,419. This application Apr. 11, 1995, Ser. No. 420,082

Int. Cl.[6] E21B *23/00*

U.S. Cl. 166—117.6 **56 Claims**

1. A wellbore deviation assembly for lowering into a wellbore on a drill string for orientating and anchoring the wellbore deviation assembly in the wellbore in a single trip by manipulating the drill string, comprising:



a whipstock, adapted for securing to an anchor packer, having a back side, a tool face, a top, a bottom, and a longitudinal central axis; and,

an elongate setting slot formed in said whipstock having a rear wall, a front side, an apex and a base, extending into said whipstock from said tool face thereof and extending from near said top of said whipstock toward said bottom thereof such that said front side of said elongate setting slot is an opening within said tool face of said whipstock.

5,467,821

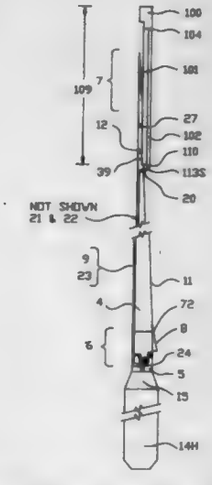
RECTILINEAR TOOL FOR USE WITH A SLOTTED FACE WELLBORE DEVIATION ASSEMBLY

Bobby G. Sieber, Rte. 1, Arp, Tex. 75750

Division of Ser. No. 201,800, Feb. 25, 1994, Pat. No. 5,425,419. This application Apr. 11, 1995, Ser. No. 419,915

Int. Cl.[6] E21B *23/00*

U.S. Cl. 166—123 **19 Claims**



1. A rectilinear setting tool for use with a slotted face wellbore deviation assembly which includes

a whipstock, adapted for securing to an anchor packer, having a back side, a tool face, a top, a bottom, and a longitudinal central axis; and having

an elongate setting slot having a rear wall, a front side, an apex and a base, extending into the whipstock from said tool face thereof and extending from near said top of the whipstock toward said bottom thereof such that the front side of the elongate setting slot is an opening within the tool face of the whipstock;

comprising:

a bar having a top end, a bottom end, a back side, a front side and side walls, with said bar configured and dimensioned to be slidingly received and releasably secured within the elongate setting slot.

5,467,822

PACK-OFF TOOL

Klaas J. Zwart, Drumgarth, Inchgarth Road, Cults, Aberdeen, AB1 9NX, United Kingdom

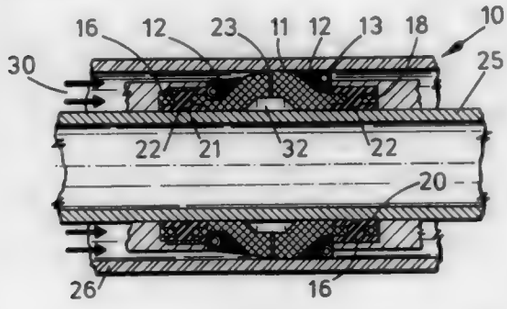
PCT No. PCT/GB92/01568, § 371 Date Feb. 28, 1994, § 102(e) Date Feb. 28, 1994, PCT Pub. No. WO93/05267, PCT Pub. Date Mar. 18, 1993

PCT Filed Aug. 27, 1992, Ser. No. 199,236

Claims priority, application United Kingdom, Aug. 31, 1991, 9118693; Apr. 3, 1992, 9207321

Int. Cl.[6] E21B *33/126*

U.S. Cl. 166—179 **11 Claims**



1. A pack-off tool comprising a main tubular body mounted on a mandrel, the body including an expandable sealing element having an integral non-expandable ring member at one end thereof for reinforcing the end of the element against distortion and including seal means for providing a sliding seal with the mandrel, a circular spring member being bonded into the sealing element at said one end, and a communicating bore toward the other end of the body and extending through the body, the tubular body being axially compressible to expand the sealing element into a radially extended configuration for sealing engagement with a bore wall and the communicating bore allowing higher pressure fluid from said other end of the tool to enter between the sealing element and the mandrel to exert radial pressure forces on a portion of the sealing element between the bore and the ring member to press the sealing element into tighter sealing engagement with the bore wall.

5,467,823

METHODS AND APPARATUS FOR LONG TERM MONITORING OF RESERVOIRS

Kamal Babour, Bures sur Yvette, France; Ashok K. Belani, Dubai, United Arab Emirates, and Jacques Pilla, Saint Remy Les Chevreuse, France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Nov. 17, 1994, Ser. No. 340,973

Claims priority, application France, Nov. 17, 1993, 93 13719

Int. Cl.[6] E21B *43/00*

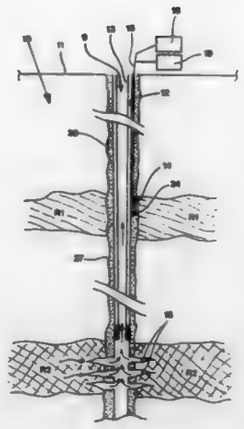
U.S. Cl. 166—250.01 **28 Claims**

1. A method of monitoring subsurface formations containing at least one fluid reservoir and traversed by at least one well, comprising the steps of:

providing one sensor responsive to a parameter related to fluids;

lowering the sensor into the well to a depth level corresponding to the reservoir;

fixedly positioning said sensor at said depth while isolating the section of the well where the sensor is located from the rest of the well;



providing fluid communication between the sensor and the reservoir; and

establishing communication between the sensor and the surface.

5,467,824

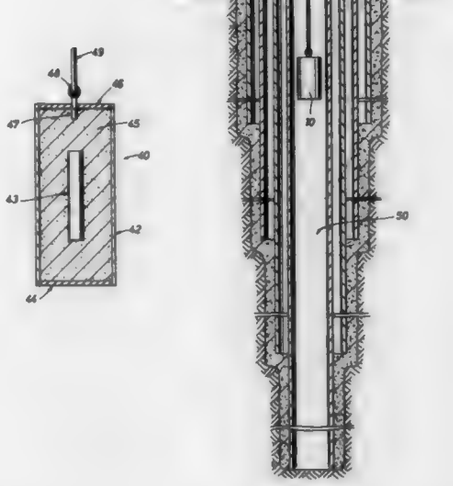
APPARATUS FOR AND A METHOD OF SEVERING MULTIPLE CASING STRINGS USING EXPLOSIVES

Peter L. DeMarsh, Picayune, Miss., and William W. Crawford, Slidell, La., assignors to Senior Engineering Company, Commerce, Calif.

Filed Dec. 9, 1994, Ser. No. 352,910

Int. Cl.[6] E21B *29/02*

U.S. Cl. 166—297 **5 Claims**

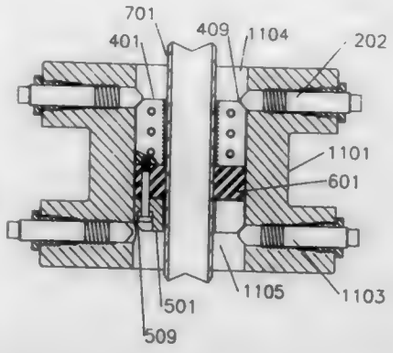


1. Apparatus for severing multiple concentric casing strings in an abandoned, oil or gas well located in a body of water to allow the upper portion of the casing strings to be removed so as not to be a hazard to navigation, comprising a container for positioning in the casing at the location of the desired cut, said container having a quantity of high velocity explosive surrounding a sealed cylinder in the center of the container, a detonator located at an end of the container for detonating the high velocity explosive to cause a shock wave and gas bubbles to move toward the sealed cylinder and collapsing the cylinder causing it to fail, whereby the pressurized air from the cylinder causes the shock wave to move laterally through the casing strings.

5,467,825
APPARATUS AND METHOD FOR HANGING COILED TUBING IN WELLS

Aldon J. Vallet, 129 Arbour Cliff Close, N.W., Calgary, Alberta, Canada

Filed Oct. 31, 1994, Ser. No. 332,109
Claims priority, application Canada, May 10, 1994, 2133724
Int. Cl.[6] E21B *19/00*
U.S. Cl. 166—379 8 Claims



1. A split dognut assembly for use with coil tubing on a wellhead having a spool, the split dognut assembly comprising:
a split dognut having means to grip coil tubing;
a split seal dimensioned to fit snugly between the spool and the coil tubing on one side of the split dognut, the seal being limited in movement by the split dognut; and
means to provide axial compression on the seal towards the split dognut and force the seal into sealing engagement with the spool and coil tubing.

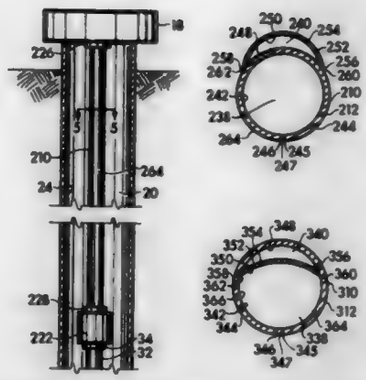
6. A method of installing coiled tubing having a weight in a well using a split dognut mounted in a spool, the split dognut having means to grip the coiled tubing, the method comprising the steps of:
clamping the split dognut onto the coiled tubing;
securing an expandable seal onto the coiled tubing with the expandable seal limited in movement in one direction by the split dognut; and
compressing the expandable seal by force applied towards the split dognut into sealing engagement with the coiled tubing and the spool.

5,467,826
OILFIELD TUBING STRING INTEGRALLY ENCLOSING A FLUID PRODUCTION OR INJECTION TUBE AND A SERVICE LINE

Troy A. Miller, Anchorage, Ak., assignor to Marathon Oil Company, Findlay, Ohio

Filed Sep. 30, 1994, Ser. No. 316,535
Int. Cl.[6] E21B *17/18;34/10*
U.S. Cl. 166—380 22 Claims

1. A well assembly positionable in a wellbore in fluid communication with a subterranean hydrocarbon-bearing formation across a production interval comprising:
(a) a valve having a pressure-controlled valve actuator; and
(b) an integrated tubing string engaging said valve, said tubing string including:
i) a tube having an inside surface and an outside surface, wherein said inside surface of said tube at least partially encloses a first interior passageway having a substantially concave inside surface and said valve is positioned to selectively provide fluid access to said first interior passageway and said outside surface is substantially convex; and
ii) an arcuate member having a concave inside surface and a convex outside surface, wherein said member is longitudinally affixed to said tube such that a continuous longitudinal space is maintained between said tube and said member, thereby defining a second interior passageway having a substantially crescentic cross section in pressure communication with said valve actuator and in fluid isolation from said first interior passageway.

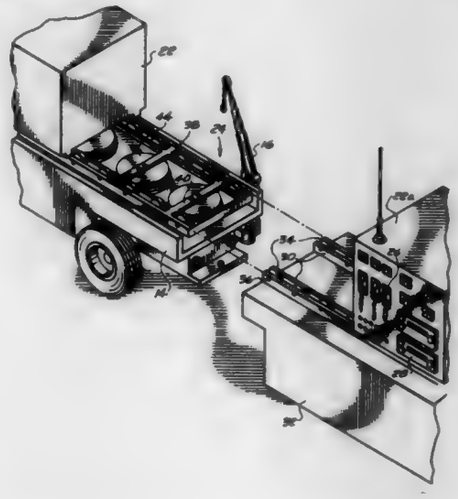


17. A method for constructing an oilfield tubing string comprising:
providing a first band having a length, a width, a first longitudinal edge, a second longitudinal edge, a first planar surface, and a second planar surface;
providing a second band having a length, a width, a first longitudinal edge, a second longitudinal edge, a first planar surface, and a second planar surface;
longitudinally positioning said first band beneath said second band;
joining said first and second bands along a first substantially longitudinal seam;
joining said first and second bands along a second substantially longitudinal seam maintained a distance apart from said first seam;
joining said first and second longitudinal edges of said first band along a third substantially longitudinal seam, thereby defining a first interior passageway bounded by said first band; and
maintaining a longitudinally continuous space between said first band and said second band, thereby defining a second interior passageway bounded by said first band and said second band.

5,467,827
MODULAR FIRE TRUCK

John E. McLoughlin, 26 Southern Blvd., Nesconset, N.Y. 11767

Filed Sep. 20, 1993, Ser. No. 123,796
Int. Cl.[6] A62C *27/00*
U.S. Cl. 169—24 9 Claims



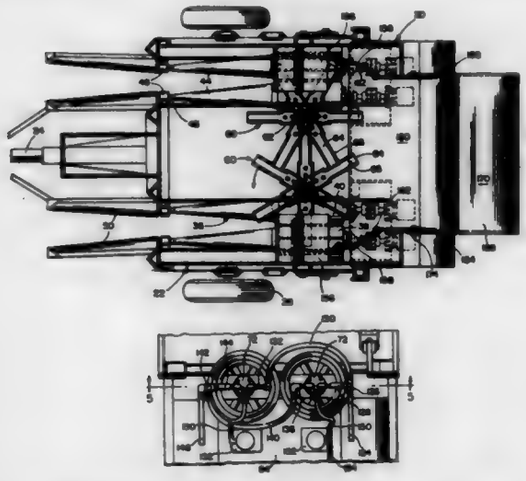
1. A fire truck comprising:
a) a cab having a front and a rear;
b) a flat bed to the rear of said cab, said bed having a predetermined length and including a pair of elongated sides and a floor;
c) a plurality of removable , interchangeable modules containing individual firefighting systems, including at least one tank module containing a liquid for extinguishing a fire;
d) conveyance means for facilitating movement of said modules on and off said bed;
e) a pump intake line extending through the length of said bed;
f) a pump discharge line extending through the length of said bed;
g) flexible fluid coupling means for connecting said tank module to said intake and discharge lines; and
h) valve means coupled to said tank module for regulating flow between said tank module and said intake and discharge lines;
wherein said intake and discharge lines are chassis rails for truck.

5,467,828

HYDRAULICALLY POWERED STALK AND ROOT SHREDDER

Aldo Ruozi, 509 E. Brundage La., Bakersfield, Calif. 93387

Filed Mar. 24, 1994, Ser. No. 216,972
Int. Cl.[6] A01D *25/04*
U.S. Cl. 171—58 **16 Claims**



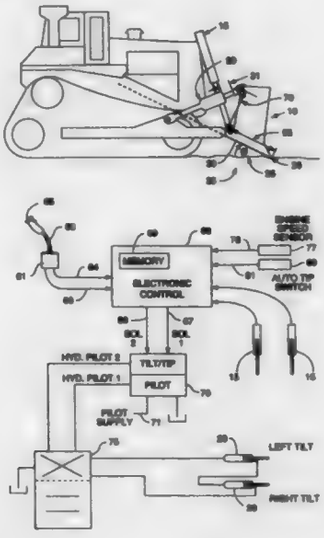
1. A stalk and root shredder comprising a frame moveable along a path of travel, a pair of longitudinally extending, parallel, driven lifting roller rotatably mounted on the frame and extending longitudinally thereof, guide means forwardly of the rollers for guiding stalks, roots and similar material between the rollers, a blade assembly mounted on the frame above the rollers and operatively associated with the rollers for cutting material lifted by the rollers, each of the rollers comprising a cylindrical portion and a forward tapering end portion, said cylindrical portions being generally parallel and closely spaced to grip and lift stalks, roots and similar material received between the rollers, means supporting one of the rollers for spring biased movement toward and away from the other of the rollers to enable the distance between the rollers to vary for lifting different size roots, stalks and similar material, said rollers being hydraulically powered from the end thereof remote from the tapered end, said means supporting one of the rollers for spring biased movement including a supporting plate, a bearing structure on said supporting plate, said roller that is spring biased including a shaft received in the bearing structure, said plate including guide means enabling the bearing structure to move laterally, spring means resisting such lateral movement to spring bias the movable roller towards the stationarily supported roller, each roller being hydraulically driven by a hydraulic motor capable of being reversed to unclog the rollers, said blade assembly including a plurality of horizontally disposed, vertically spaced blades mounted on a vertical shaft, bearing means supporting the vertical shaft and hydraulic shaft motor connected to and driving the vertical shaft, said hydraulic motor being positioned within a large housing open at the top and bottom, hydraulic tubing connected to said shaft motor and being spirally disposed at the open top of the housing, a fan mounted on said shaft between the blades and shaft motor to circulate air upwardly through the housing and over the tubing to cool the motor driving said shaft and cool the hydraulic fluid for maintaining optimum operating conditions.

5,467,829

AUTOMATIC LIFT AND TIP COORDINATION CONTROL SYSTEM AND METHOD OF USING SAME

James C. Barton, Peoria; Kevin J. Lueschow, Edwards, and Ken L. Stratton, Dunlap, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Nov. 30, 1993, Ser. No. 159,275
Int. Cl.[6] E02F *3/76;* **G06F** *15/50*
U.S. Cl. 172—4.5 **18 Claims**



1. A control device used on an off-highway vehicle, comprising:
an implement;
a lift actuator associated with the implement;
a tilt actuator associated with the implement;
a command means for issuing a tip command signal corresponding to a desired implement tip angle position;
an engine speed sensor having an engine speed signal; and
control means for receiving the engine speed sensor signal and the tip command signal, calculating a change in implement height in response to the tip command signal, calculating lift actuator command signal to compensate for the blade height change, and issuing the lift acuator command signal to the lift actuator.

5,467,830

WEEDING DEVICE

Gene Watson, Carefree, Ariz., assignor to Henry R. Hoffman, Dallas, Tex.

Filed Oct. 6, 1993, Ser. No. 132,198
Int. Cl.[6] A63B *57/00*
U.S. Cl. 172—378 **11 Claims**

1. A device for removing weeds from the ground comprising:
an elongated shaft having first and second ends,

a relatively sharp ground-penetrating tool mounted in the first end of the shaft, and

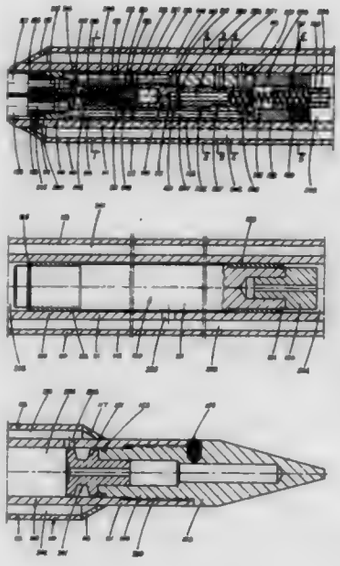
a compressible and resilient pad shaped like a football mounted on the shaft adjacent said ground-penetrating tool, said pad including a pair of ends and a passage extending through the pad between the two ends, said shaft extending through said passage.

5,467,831

MONOTUBE DIFFERENTIAL PNEUMOPERCUSSIVE REVERSIBLE SELF-PROPELLED SOIL PENETRATING MACHINE WITH STABILIZERS

Michael B. Spektor, 1030 Tamera Dr., Klamath Falls, Oreg. 97603

Filed Aug. 22, 1994, Ser. No. 294,070
Int. Cl.[6] E21B 4/14;7/26
U.S. Cl. 175—19 5 Claims



1. A monotube differential pneumopercussive self-propelled reversible soil penetrating machine with stabilizers, comprising:

a monotube elongated housing assembly, including a tube having internal threads in its front part for accommodating a chisel assembly, structurally shaped longitudinal directional stabilizers rigidly attached to the outside surface of said tube and creating between the inner surfaces of said stabilizers and outside surface of said tube longitudinal channels hermetically closed by appropriate plugs at both ends of each stabilizer and used for delivery and exhaust of compressed air;

a chisel assembly rigidly secured to the front part of said tube for accepting impact loading, including a chisel, a front anvil rigidly secured to said chisel, and a resilient sealing O-ring mounted in an appropriate groove of said chisel in order to prevent leakage of compressed air through the threaded connection of said chisel and said tube;

a rear anvil assembly rigidly secured inside of the rear part of said tube for accepting impact loading, including a rear anvil, a spring loaded follower slidably disposed in a longitudinal hole of said rear anvil, and means for securing said rear anvil inside of said tube;

a striker assembly slidably disposed inside of said tube between said rear anvil and said front anvil creating a forward stroke chamber between the rear end of said striker assembly and said rear anvil and a backward stroke chamber between the front end of said striker assembly and said front anvil, including a striker, a front bit rigidly secured to said striker, two bushings slidably mounted on both ends of said striker and having a slide fit with said tube,.and retaining rings mounted in appropriate grooves in said striker for keeping in place said bushings; and

a differential air-distributing mechanism installed inside of the rear part of said tube immediately behind said rear anvil providing pneumatically control of the reciprocating motion of said striker which during forward mode operation of said machine is accelerated without restriction in order to impart an impact to said front anvil and is restricted to impart a slight impact to said rear anvil and during reverse mode operation of said machine is braked to avoid an impact to said front anvil or restricted to impart a slight impact to said front anvil and is accelerated without restriction in order to impart an impact to said rear anvil, including an adjustable by a pressure regulator nominal (high) air pressure line, an adjustable by a pressure regulator reduced (low) air pressure line, a rear valve chest carrying two barbs for hoses for said air lines, a spring loaded relief valve slidably disposed inside said rear chest for connecting by an additional air passage said forward stroke chamber with the atmosphere at the backward stroke of said striker during reverse mode operation of said machine, a coil spring disposed inside said rear valve chest to push said relief valve to its extreme right position, a front valve chest assembled with said tube by a press fit, a hollow stepped bushing accommodated by said rear and front valve chests and centering said rear and front valve chests, a stepped stroke control valve slidably disposed inside said front valve chest, a coil spring disposed in longitudinal central holes of said stepped stroke control valve and said follower and simultaneously loading said stepped stroke control valve and said follower in opposite directions, and a set of bolts securing said rear valve chest to said front valve chest.

5. A method of retracting from a hole a failed monotube differential pneumopercussive reversible self-propelled soil penetrating machine with stabilizers by another identical or similar machine representing the retracting machine comprising following steps:

mounting on the front part of said retracting machine a pulling accessory including a puller body having holes therethrough;

passing hoses and electrical wire of said failed machine through said holes in said puller body;

connecting the wires of said failed machine and said retracting machine to an electrically operated indicator of engagement between said pulling accessory and said rear part of said failed machine;

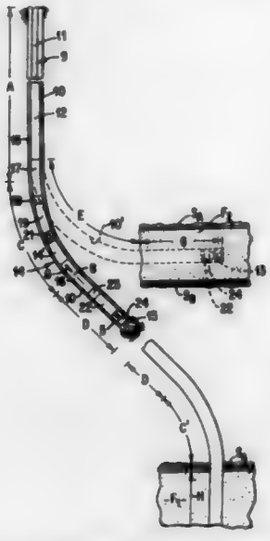
driving said retracting machine into the hole made by said failed machine until said pulling accessory on said retracting machine engages with said failed machine; and

reversing said retracting machine which in a tandem arrangement will retract said failed machine.

5,467,832
METHOD FOR DIRECTIONALLY DRILLING A BOREHOLE

Jacques Orban, Sugar Land, and Neil W. Richardson, Houston, both of Tex., assignors to Schlumberger Technology Corporation, Sugar Land, Tex.

Division of Ser. No. 823,789, Jan. 21, 1992, abandoned. This application Nov. 10, 1993, Ser. No. 150,932
Int. Cl.[6] E21B *7/04;47/09*
U.S. Cl. 175—45 **2 Claims**

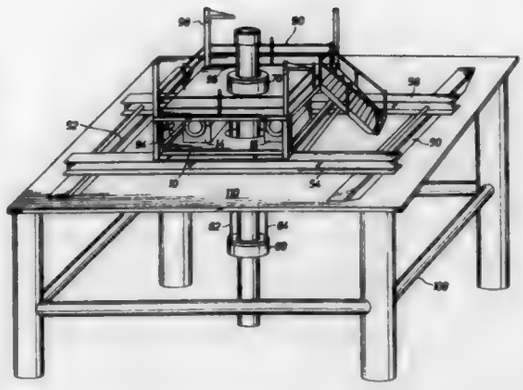


1. A method for directionally drilling a borehole into a horizontal or substantially horizontal earth formation with a tool string that includes a drilling motor that drives a bit on the lower end of a drill string, comprising the steps of: curving said borehole until its lower end extends along a path that is between the top and the bottom of said formation; drilling ahead while measuring at least two characteristic properties of said formation, wherein one of said characteristic properties is electrical resistivity determined by operating a first electromagnetic means that induces axial flow of current in the walls of said tool string which passes out into said formation and then returns to the walls of said tool string above said first electromagnetic means, and using a second electromagnetic means spaced below said first electromagnetic means to sense the magnitude of the current flow that returns to said walls, said first and second electromagnetic means being insulated with respect to said walls of said tool string such that a portion of said current is prevented from leaving said walls except at locations below said second electromagnetic means, and wherein the measurement of one of said characteristic properties trends upward if the borehole is approaching either the top or the bottom of said formation, and the measurements of another of said characteristic properties trends downward if the borehole is approaching the bottom of said formation; and in response to a comparison of said trends, deviating the borehole when necessary so that its path remains between the top and the bottom of said formation.

5,467,833
SYSTEM FOR LIFTING TUBULARS AND EQUIPMENT BELOW THE MAIN DECK OF PLATFORMS

Jack A. Crain, 107 Fabiola Ave., Lafayette, La. 70508

Filed Jun. 8, 1994, Ser. No. 255,652
Int. Cl.[6] E21B *19/00*
U.S. Cl. 175—52 **11 Claims**



7. A method for moving a string of tubulars through an aperture in the main deck of a platform over a well comprising:

placing a winch unit on the main deck of the platform, the winch unit comprising at least two winches, the winches having cable thereon and being supported by a pivoted beam, the beam being supported at a spaced apart distance above a base frame by a load cell so as to indicate the lift force exerted by each winch;

placing movable beams between the skid beams of the platform;

placing a movable deck above the winch unit, the movable deck being supported by the movable beams and adapted to support slips for supporting the tubulars to be moved;

attaching to the cable of the winch an elevator, the elevator being below the main deck of the platform;

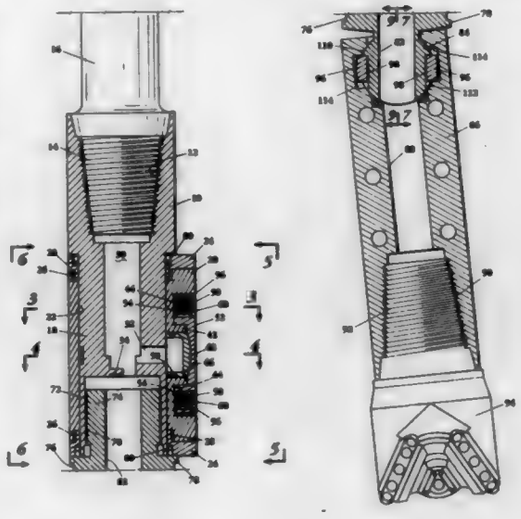
alternatively supporting the tubular string in the slips and the elevator and moving the elevator by cable on the winch; and

connecting or disconnecting joints of the string of tubulars so as to move the string of tubulars through the aperture.

5,467,834
METHOD AND APPARATUS FOR SHORT RADIUS DRILLING OF CURVED BOREHOLES

W. James Hughes; James W. McCabe, both of Tulsa, and Owen L. Marks, Jr., Wagoner, all of Okla., assignors to Maverick Tool Company, Tulsa, Okla.

Filed Aug. 8, 1994, Ser. No. 287,501
Int. Cl.[6] E21B *7/08*
U.S. Cl. 175—61 **16 Claims**



15. A method for drilling a curved lateral borehole from an existing main borehole by means of drilling assembly having a drill string transmitting rotational torque sequentially to a lower borehole drilling tool which in turn is connected by a flexible joint to a terminal drill bit and wherein fluid under pressure is pumped through a central opening in the drilling assembly during the drilling comprising:

providing a borehole drilling tool which includes an eccentric collar rotatably mounted circumferentially about a drill pipe sub and having a horizontal opening extending outwardly from the central opening, the horizontal opening being in sealed alignment with a piston activated radial extending and retractable compression pad on a cammed side of the eccentric collar,

drilling the curved borehole while pumping fluid under pressure through the central opening in the drilling assembly such that the fluid passes through the horizontal opening and engages the piston, thus forcing the compression pad outwardly against the borehole wall causing the drilling tool to be displaced to a side of the borehole, while simultaneously pressing a side of the eccentric collar opposite from the cammed side against a side of the borehole wall, thus preventing the eccentric collar from rotating during the rotational drilling,

thereafter reducing the fluid pressure, after a period of drilling, so as to disengage the compression pad from the borehole wall and retract the piston and compression pad into their deactivated positions, and then moving the drilling tool as required.

5,467,835

DRILLING OR CHISELING TOOL WITH SUCTION APPARATUS

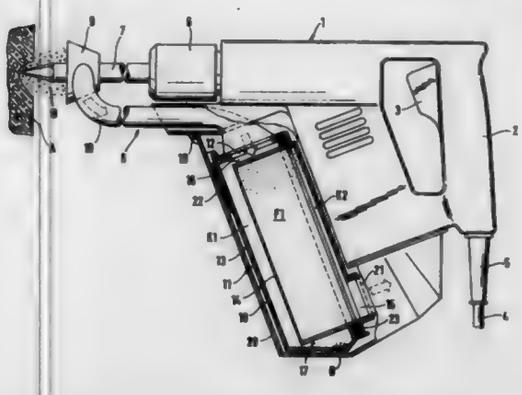
Josef Obermeier, Peiting; Ulrich Müller-Boysen, Deizisau; Siegfried Keusch, Deizisau, and Peter Gaffal, Deizisau, all of, Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Oct. 18, 1994, Ser. No. 324,869

Claims priority, application Germany, Jan. 18, 1993, 43 35 417.3

Int. Cl.[6] B25D *17/14;* **E21C** *7/02*

U.S. Cl. 175—209 **9 Claims**



1. Manually operated drilling and chiseling tool comprises a suction apparatus (8) including a separating device (11) releasably mounted on the tool, wherein the improvement comprises that the separating device (11) comprises a filter element (14) and a housing (13) which is releasably connected with the suction apparatus (8), that the housing (13) is mounted in the suction apparatus (8), the filter element (14) is located within and divides the housing (13) into a first inlet chamber (K1) and a second outlet chamber (K2), said housing (13) includes a first aperture (12) having a first cross-section opening into said first chamber (K1) and a second aperture (15) having a second cross-section and opening from said second chamber (K2), and said filter element (14) having filtering face surfaces elongated in a first direction and said first direction extending substantially at right angles to the first cross-section of said first aperture (12).

5,467,836

FIXED CUTTER BIT WITH SHEAR CUTTING GAGE

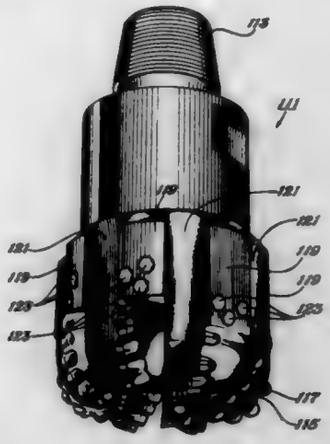
Robert E. Grimes, Cypress; Danny E. Scott, The Woodlands, and Rudolf C. O. Pessier, Houston, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Continuation-in-part of Ser. No. 169,880, Dec. 17, 1993, Pat. No. 5,346,026, which is a continuation-in-part of Ser. No. 830,130, Jan. 31, 1992, Pat. No. 5,287,936. This application Sep. 2, 1994, Ser. No. 300,502

The portion of the term of this patent subsequent to Jan. 31, 2012, has been disclaimed.

Int. Cl.[6] E21B *10/46;12/04*

U.S. Cl. 175—401 **24 Claims**



1. In an earth-boring bit of the fixed-cutter variety including a gage surface proximal to a sidewall of a borehole as the bit rotates about its axis, the gage surface having a plurality of gage inserts secured in sockets formed in the gage surface, an improved gage insert comprising:

an elongated cylindrical body secured in an aperture in the gage surface, the body formed of a hard, fracture-tough material;

a cutting end adapted to extend, during drilling operation, a selected distance from the gage surface, the cutting end formed of a super-hard, abrasion-resistant material, the cutting end having a face substantially normal to a longitudinal axis of the body;

at least one cutting surface connecting the face and body of the insert at a selected angle to define a cutting edge to shear the sidewall of the borehole; and

the selected angle of the cutting surface defining a negative rake angle with respect to the sidewall of the borehole being sheared.

5,467,837

ROTARY DRILL BIT HAVING AN INSERT WITH LEADING AND TRAILING RELIEF PORTIONS

Thomas R. Miller, Waynesburg, and Daniel C. Sheirer, Bedford, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 115,381, Sep. 1, 1993, abandoned. This application Apr. 13, 1995, Ser. No. 421,283

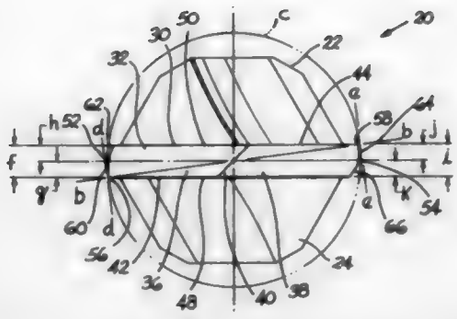
Int. Cl.[6] E21B *10/46*

U.S. Cl. 175—420.1 **30 Claims**

1. A roof drill bit comprising:

a tool body having a cutting insert affixed thereto, said cutting insert having one face, an opposite face, and a side surface joining said one face and said opposite face;

said side surface having a leading side relief portion adjacent to the one face and a trailing side relief portion adjacent to the opposite face, said leading side relief portion being relieved at an angle so that the interior angle between the one face and the leading side relief portion is less than 90 degrees, said trailing side relief portion being relieved to a greater degree than said leading side relief portion; and



said leading side relief portion extending from the one face a distance of between about one-third to about two-thirds the thickness of the cutting insert, and said trailing side relief portion extending from the opposite face a distance of between about one-third to about two-thirds the thickness of the cutting insert.

5,467,838

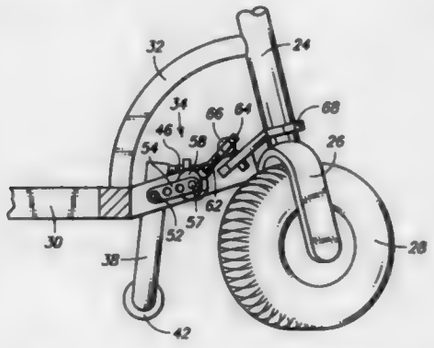
AUTOMATICALLY DEPLOYABLE VEHICLE STABILIZATION SYSTEM

Donald P. H. Wu, 169 Ken Tzu Ku-Shang Ken Tsun, Hsin Feng Hsiang, Taiwan, Prov. of China

Filed Jan. 19, 1994, Ser. No. 183,674

Int. Cl.[6] B62D *61/12*

U.S. Cl. 180—209 **20 Claims**



1. An automatically deployable vehicle stabilization system, comprising:

a vehicle frame;

a front vehicle wheel assembly coupled to the vehicle frame;

a pair of stability arms operatively coupled to the vehicle frame, the arms being movable between retracted and extended positions, the stability arms preventing the vehicle from overturning when in extended positions;

a drive mechanism operatively coupled to the front vehicle wheel assembly, the drive mechanism moving the stability arms into extended positions when the wheel assembly is positioned to turn the vehicle.

5,467,839

ALL TERRAIN VEHICLE

Oka Yoshio, Hermosa Beach, Calif., assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

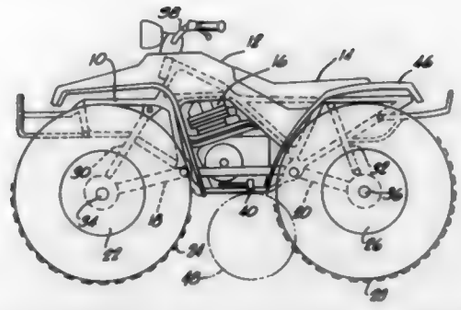
Continuation of Ser. No. 27,718, Mar. 19, 1987, abandoned. This application Nov. 12, 1991, Ser. No. 791,046

Int. Cl.[6] B60K *17/34;* **B62K** *5/00;11/04*

U.S. Cl. 180—233 **6 Claims**

1. An all terrain vehicle comprising

a center of gravity;



a frame including a front, a rear, two opposite sides and straddle seating;

front wheels each having a first center and a first inner extent and supporting said front of said frame and mutually spaced on said opposite sides thereof;

rear wheels each having a second center and a second inner extent and supporting said rear of said frame and mutually spaced on said opposite sides thereof;

an engine carried longitudinally between said front and said rear wheels by said frame;

footpegs fixed to said frame, having distal ends, associated with said straddle seating and positioned to opposite sides, respectively, of said frame lower than said center of gravity of the vehicle, said distal ends of said footpegs being inwardly of said inner extent of said front and rear wheels; and

tires on each of said front and rear wheels and extending to a lowermost extent, said tires on said rear wheels being of a diameter and location relative to said frame such that said tires on said rear wheels extend into a cylindrical space having an axis extending laterally of the vehicle, substantially aligned longitudinally with and below said center of gravity of the Vehicle and said cylindrical space having a diameter equal to the distance between the undermost side of said frame where aligned substantially longitudinally with said center of gravity of the vehicle and a level surface containing said lowermost extent of said tires.

5,467,840

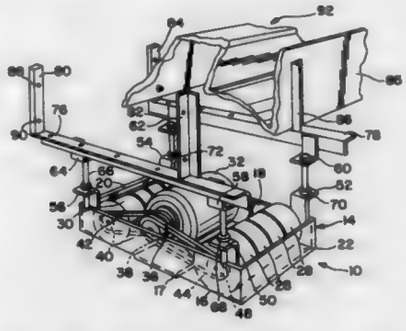
DRIVE UNIT FOR MOVEMENT OF TELESCOPIC SEATING SYSTEM

Mark Becher, Greer, and Kenneth R. Charron, Liberty, both of S.C., assignors to Charron Sports Services, Inc., Liberty, S.C.

Filed Aug. 18, 1993, Ser. No. 109,151

Int. Cl.[6] B60K *17/342;* **E04H** *3/12*

U.S. Cl. 180—251 **3 Claims**



3. A drive unit for extending and retracting a telescopic seating system, comprising:

a frame;

a front axle journaled into said frame;

a rear axle journaled into said frame;

a plurality of transversely spaced wheels mounted on said front axle and said rear axle;

drive means supported by said frame for imparting rotation to said front axle and to said rear axle; and

a mounting assembly for temporarily attaching said drive unit to a lowermost row of said telescopic seating system, said mounting assembly being detachably mounted to said frame, said mounting assembly comprising:

a. a longitudinal beam;

b. fastening means interconnecting said longitudinal beam and said frame;

c. a spacer spacing said longitudinal beam from said frame; and

d. an upright member connected to said longitudinal beam at a lower end and fastened to a row of bleachers proximate an upper end.

5,467,841

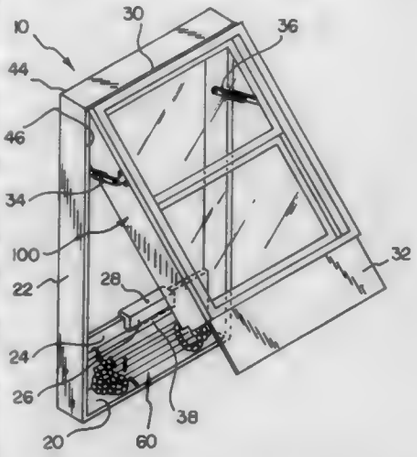
ESCAPE WINDOW FRAME ASSEMBLY

Frank K. Krumal, 5 Bradford St., Schenectady, N.Y. 12306

Filed Jun. 14, 1994, Ser. No. 260,255

Int. Cl.[6] A62B *1/00*

U.S. Cl. 182—70 **17 Claims**



1. A new escape window frame assembly for facilitating emergency egress from a building by using a window frame having a concealed collapsible escape ladder which is cleared for deployment when a window mounted within the frame is pivoted outwardly for providing an escape portal, the escape window frame assembly comprising:

a generally rectangular window frame for conventional mounting in a building wall window cutout, the frame having inward and outward facing sides for normal mounting facing the respective interior and exterior of the building, the frame also having a conventional prefabricated window assembly hingedly mounted therein such that the window assembly may pivot outwardly from the frame, the frame being slightly longer than the window assembly to provide an open space within the frame under the window assembly, the frame additionally having a partition extending across the open space covering the inwardly facing side of the open space;

releasable securement means whereby the window assembly is secured in a normally closed position within the frame, the releasable securement means comprising a shear pin extending through a hole in the window assembly opposite the hinge, the shear pin also extending through a hole in the frame such that outwardly directed firm hand pressure delivered against the window assembly proximal the shear pin will break the pin allowing the window assembly to pivot outwardly to an emergency open position;

latch means whereby the widow assembly is automatically releasably latched in the emergency open position when pivoted outwardly, the latch means comprising a pair of conventional cabinet door latching arm assemblies extending between the window frame and the window assembly, the latching arm assemblies being mounted to opposing sides of the window assembly and frame combination;

a cover plate extending from the bottom of the window assembly such that the outwardly facing side of the open space is covered when the window assembly is in the normally closed position, the cover plate being fixedly attached to the window assembly such that the outwardly facing side of the open space is uncovered when the window is pivoted to the emergency open position;

a rigid attachment bar extending horizontally across the inside of the open space, the bar being fixedly connected to the frame at both ends thereof; and

a flexible ladder fixedly connected at one end to the attachment bar, the ladder having a normal storage position wherein the ladder is coiled resting within the open space of the frame, the ladder also having an emergency deployed position wherein the ladder extends from the frame downwardly to an escape staging area outside the building below the escape window frame assembly.

5,467,842

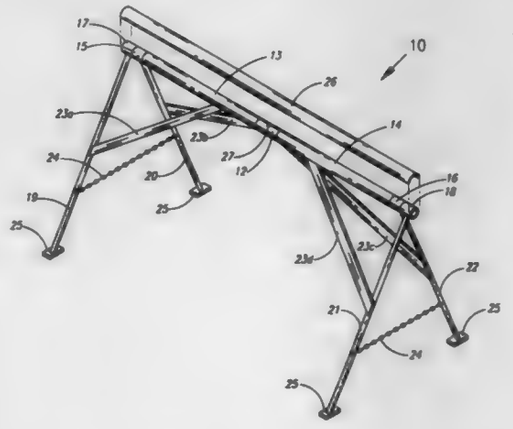
COLLAPSIBLE SAW HORSE

John Meloy, 820 N. Creek, Dewey, Okla. 74029

Filed Dec. 29, 1994, Ser. No. 366,257

Int. Cl.[6] B27B *27/00*

U.S. Cl. 182—153 **9 Claims**



1. An improved collapsible saw horse, comprising:

a. a crossbar having a plurality of rotatable sleeves disposed over an inner, horizontal member;

b. a plurality of legs, each connected to a collar complementary to said horizontal member, said collars being of a shape similar to said rotatable sleeves such that when said sleeves and collars are disposed over said horizontal member a smooth profile is obtained; and

c. a plurality of braces angled from said legs to said rotatable sleeves and rigidly affixed to said rotatable sleeves, such that said legs and said rotatable sleeves are maintained in spatial relationship without being affixed to said horizontal member and such that said legs are collapsible.

5,467,843

ARRANGEMENT FOR GUIDING LUBRICATING OIL IN AN INTERNAL-COMBUSTION ENGINE

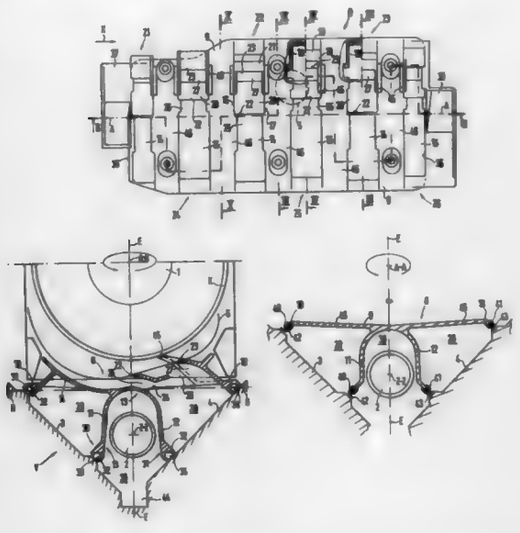
Hans-Joachim Esch, Heimsheim; Winfried Distelrath, Stuttgart, and Kurt Trieb, Markgroeningen, all of, Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Germany

Filed Jul. 12, 1994, Ser. No. 274,189

Claims priority, application Germany, Jul. 12, 1993, 43 23 220.5

Int. Cl.[6] F01M *1/04*

U.S. Cl. 184—6.5 20 Claims



1. An arrangement for guiding oil in an internal-combustion engine, comprising:

a basin which is arranged between an engine crankshaft drive and an oil sump and has at least one drain opening between the engine crankshaft drive and the oil sump, and

an intermediate shaft which rotates in parallel to the crankshaft and is surrounded at least partially by two struts projecting away from the basin,

wherein the struts form, together with the basin, a profile which receives the intermediate shaft and which is closed with respect to the crankshaft drive.

15. An arrangement for guiding oil in an internal-combustion engine, comprising:

a basin which is arranged between an engine crankshaft drive and an oil sump and has at least one drain opening, and

an intermediate shaft which rotates in parallel to the crankshaft and is surrounded at least partially by two struts projecting away from the basin,

wherein the struts form, together with the basin, a profile which receives the intermediate shaft and which is closed with respect to the crankshaft drive,

and wherein a bottom of the basin has a first and a second drain opening which are arranged behind one another in the rotating direction of the crankshaft and adjacent to the profile,

and wherein the bottom has curved segments in the area of a violin-shaped connecting rod contour, which curved segments follow the contour and are situated in front of the drain openings,

and wherein the basin has at least one scraper lip behind the respective first and second drain opening, which points in the direction of the crankshaft drive and against its rotating direction and which extends to close to the violin-shaped connecting rod contour,

and wherein the scraper lip is arranged on a roof-type shaped-out area of the basin provided with lateral walls, a drain duct which has the first drain opening being constructed between one strut and one shaped-out area.

5,467,844

ASSIGNING A HALL CALL TO A FULL ELEVATOR CAR

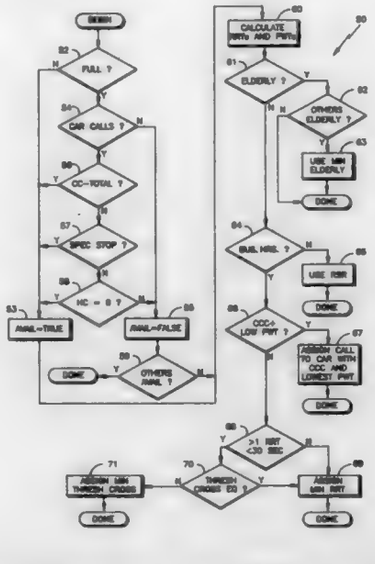
Bruce A. Powell, Canton; Jannah Stanley, Cromwell; Bertram F. Kupersmith, Avon, all of Conn.; Masanori Sahara, Yamato; Paul Simcik, Kawasaki, both of, Japan, and Zuhair S. Bahjat, Farmington, Conn., assignors to Otis Elevator Company, Farmington, Conn.

Continuation of Ser. No. 881,751, Dec. 20, 1991, abandoned.

This application Jul. 28, 1994, Ser. No. 287,404

Int. Cl.[6] B66B *1/20;1/18*

U.S. Cl. 187—387 4 Claims



1. A method of dispatching a group of elevator cars in a building including assigning hall calls to available elevator cars for service thereto, comprising, for each specific hall call to be assigned:

for each given car in the group

determining if said given car is fully loaded, and if it is not, providing an available signal indicative of the fact that said given car is available to answer hall calls, but if it is fully loaded, determining whether said given car has any registered car calls, and if it has not, resetting said available signal, thereby indicating that said given car is not available to answer hall calls, but if said given car has registered car calls, determining if all of said car calls are intervening car calls between the present position of said given car and said specific hall call, and if so, providing said available signal;

assigning hall calls to cars related to said available signals; and

dispatching said cars to answer assigned hall calls.

5,467,845

ROPE BRAKING DEVICE

William M. Scruggs, Joplin, Mo., assignor to Engineered Resources, Inc., Joplin, Mo.

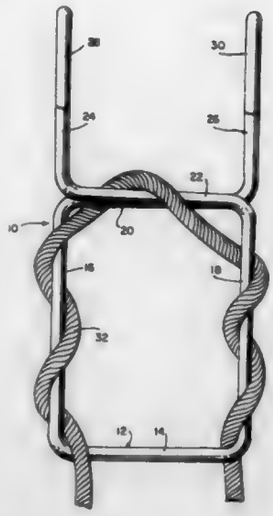
Filed Oct. 17, 1994, Ser. No. 323,738

Int. Cl.[6] B65H *59/14;59/16*

U.S. Cl. 188—65.2 2 Claims

1. A rope braking device for lowering an object from a higher elevation to a lower elevation comprises rod means forming a substantially rectangular frame having sides, a bottom and a top and hook means connected to said frame for supporting said device from a fixed support, wherein a rope is adapted to be entwined about said sides, bottom and top of said frame to provide frictional braking of the rope through said frame for lowering an object secured to one end of the rope,

wherein said rod means and said hook means are comprised of a single, one-piece rod having an intermediate portion bent to form said frame with said top being comprised of two sub-



stantially parallel, contiguous rod portions and having opposite end portions forming a pair of hooks for supporting said device.

5,467,846

DISC BRAKE ASSEMBLY

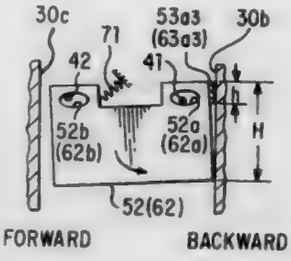
Kazuo Abe; Masashi Ishihara; Hitoshi Ikeuchi; Shinsuke Sugano, all of Toyota; Toshiharu Okuda, Susono; Shigemi Sakakibara, Numazu; Hidetoshi Shimizu, Mishima, and Yasuaki Ichiba, Susono, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed May 12, 1994, Ser. No. 241,713

Claims priority, application Japan, May 13, 1993, 5-111762; Dec. 15, 1993, 5-315231

Int. Cl.[6] F16D *65/38*

U.S. Cl. 188—73.37 **4 Claims**



1. A disc brake assembly for a wheeled vehicle including a caliper member mounted on a vehicle body structure in such a manner as to straddle a portion of a rotary brake disc secured for a road wheel of tile vehicle, a friction pad supported on said caliper member to be moved toward and away from one side surface of said brake disc in an axial direction for engagement therewith and disengagement therefrom, said friction pad having a backing plate and at least one shim-after "plate" secured thereto by hanger pins accommodated in elongated holes within the backing plate, the backing plate to be engaged at one side end face thereof with a torque receiving portion of said caliper member in braking operation, and a fluid actuator mounted within said caliper member to press said friction pad against the one side surface of said brake disc,

wherein a side projection is provided on at least an upper or lower portion of the one side end face of said backing plate for engagement with the torque receiving portion of said caliper member or on at least an upper or lower portion of the torque receiving portion of said caliper member for engagement with tile one side end face of said backing plate or on a side end surface of said at least one shim, said side projection being arranged to apply a rotational force to said backing plate in a rotational direction of said brake disc when engaged with the torque receiving portion of said caliper member or engaged with tile one side end face of said backing plate and the abutment of the hanger pins to the perimeter of the elongated holes assisted by a spring, provide resistance to the rotational force.

5,467,847

DISC BRAKE

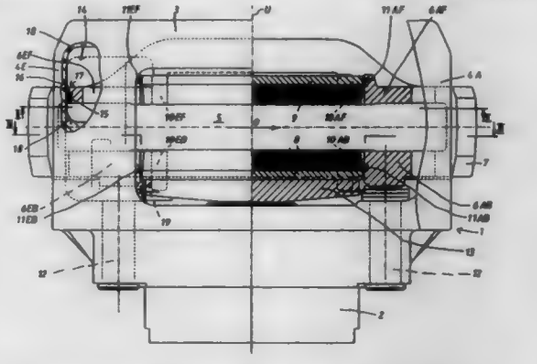
Paul Antony, Worms; Wolfgang Falter, Heidelberg; Andreas Kiessig, Leizig, and Matthias Berg, Schriesheim, all of, Germany, assignors to Perrot Bremsen GmbH, Mannheim, Germany

Filed Sep. 2, 1994, Ser. No. 299,107

Claims priority, application Germany, Sep. 2, 1993, 43 29 675.0; Dec. 21, 1993, 43 43 737.0

Int. Cl.[6] F16D *55/18*

U.S. Cl. 188—73.39 **14 Claims**



11. A disc brake comprising a brake bracket, a brake disc, a brake shoe, a first rotation preventing means for preventing the brake shoe from rotating with the brake disc and for bracing the brake shoe against the brake bracket, a pressure plate for pressing the brake shoe against the brake disc, second rotation preventing means for preventing rotation of the pressure plate and for bracing the pressure plate against the brake bracket, wherein the brake shoe and the pressure plate are slidable with respect to each other in a plane parallel to the brake disc, wherein the first rotation preventing means is located to brace said brake shoe against the brake bracket on a disc-outgoing side of the brake bracket, and wherein the second rotation preventing means is located for bracing the pressure plate against the brake bracket on a disc-incoming side of the brake bracket.

5,467,848

SLIDER ASSEMBLY FOR AUTOMOTIVE BRAKE CALIPER

Marijan Knez, Corona, Calif., assignor to Aeromatics Automotive, Inc., Chino, Calif.

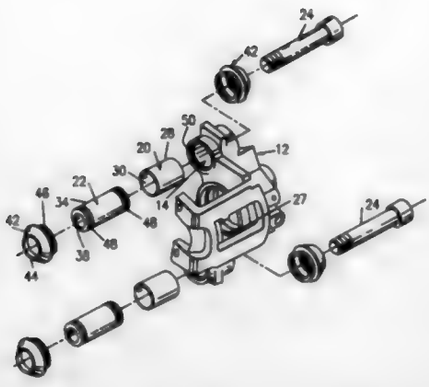
Filed Aug. 18, 1993, Ser. No. 109,177

Int. Cl.[6] F16D *65/14*

U.S. Cl. 188—73.45 **10 Claims**

1. A slider assembly for slidably attaching an automotive brake caliper to an automotive chassis in close proximity to a wheel rotor, the automotive brake caliper having first and second caliper apertures, the slider assembly comprising:

(a) a first sleeve insert consisting of a hollow tube having a first interior surface and a first exterior surface, the first sleeve insert being sized and dimensioned to be interference fitted into the first caliper aperture and being made of a bearing material with the first interior surface having a circular cross-section and a bearing finish;



(b) a second sleeve insert consisting of a hollow tube having a second interior surface and a second exterior surface, the second sleeve insert being sized and dimensioned to be interference fitted into the second caliper aperture and being made of a bearing material with the second interior surface having a circular cross-section and a bearing finish;

(c) a first hard, wear-resistant slide pin slidably disposed within the first interior surface of the first sleeve insert, the first slide pin having a first outer surface which is sized and dimensioned to closely conform to the first interior surface, the first outer surface of the first slide pin having a bearing finish, whereby the first interior surface and the first outer surface form a first sliding bearing interface having opposed ends;

(d) a second hard, wear-resistant slide pin slidably disposed within the second interior surface of the second sleeve insert, the second slide pin having a second outer surface which is sized and dimensioned to closely conform to the second interior surface, the second outer surface of the second slide pin having a bearing finish, whereby the second interior surface and the second outer surface form a second sliding bearing interface having opposed ends;

(e) a first mount having means for fixably attaching the first slide pin to the automotive chassis; and

(f) a second mount having means for fixably attaching the second slide pin to an automotive chassis;

wherein the first and second sliding bearing interfaces support and guide the brake caliper on the first and second slide pins.

5,467,849

BRAKE BAND

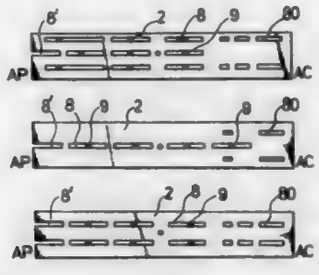
Hirofumi Nakagomi; Yoshihisa Harada, and Shigeki Umezawa, all of Shizuoka, Japan, assignors to NSK-Warner K.K., Tokyo, Japan

Filed Apr. 25, 1994, Ser. No. 231,679

Claims priority, application Japan, Apr. 30, 1993, 5-030971 U

Int. Cl.[6] F16D *53/00*

U.S. Cl. 188—77 W **14 Claims**



1. A brake band suitable for use in a vehicle transmission, said brake band comprising a band portion and a brake lining bonded at an outer peripheral surface thereof on an inner peripheral surface of said band portion and having an apply side end and an anchor side end located opposite to each other relative to a circumferential length of said brake band, the improvement wherein said brake lining is provided with oil dependent, friction surface cooling means and oil discharging means and, adjacent to said anchor side end of said brake band, with means for promoting the formation of an oil film, and further wherein said friction surface cooling means and said means for promoting are arranged asymmetrically relative to a central line through said brake lining transverse to a longitudinal central axis of said brake lining;

wherein said means for promoting is an oil reservoir formed of at least one oil recess without any oil discharging means arranged in said brake lining in the vicinity of said anchor side end.

5,467,850

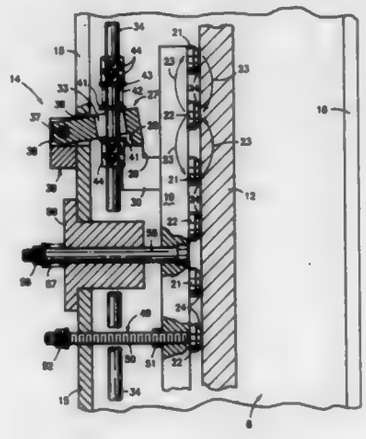
PERMANENT MAGNET, MAGNETODYNAMIC SAFETY BRAKE FOR ELEVATORS AND THE LIKE

Clement A. Skalski, Avon, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Dec. 16, 1993, Ser. No. 168,567

Int. Cl.[6] B60L *7/28*

U.S. Cl. 188—165 **11 Claims**



1. A magnetodynamic safety brake, a safety brake engaging system and a car that travels along a magnetic, electrically conductive guide rail with a flat surface which may be engaged by the surface of said safety brake, said car having said safety brake engaging system for actuating said safety brake in the case of overspeeding of the car or other emergency, comprising:

an elongated yoke of low reluctance magnetic, electrically conductive material mounted on said car adjacent to and parallel with the flat surface of the guide rail;

a plurality of magnetic poles disposed on said yoke in spaced relationship, each including a permanent magnet, alternate ones of said permanent magnets being disposed with opposite polar orientation, thereby to provide loops of magnetic flux between adjacent ones of said magnetic poles;

lift/release means for holding said safety brake in a lifted position spaced away from the flat surface of the guide rail a sufficient distance so that eddy current forces between said magnetic poles and the guide rail are minimal and responsive to the safety brake engaging system of the car to cause said lift/release means to release said safety brake in response to the safety brake engaging system of the car reacting to a car emergency condition, and thereby allow said safety brake to be pulled toward the flat surface of the guide rail by attractive magnetic force, so that said magnetic poles contact the flat surface of the guide rail to provide frictional and magnetodynamic braking to the car.

5,467,851

SHOCK ABSORBER WITH A CHECK VALVE MODULE AND A CHECK VALVE MODULE FOR A SHOCK ABSORBER

Günter Handke, Euerbach; Lars Rosberg, Schweinfurt, and Andreas Zietsch, Röthlein, all of, Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

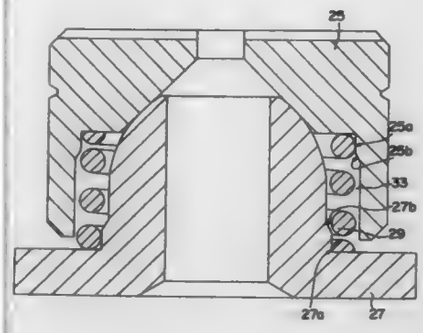
Filed Mar. 15, 1994, Ser. No. 213,190

Claims priority, application Germany, Mar. 16, 1993, 43 08 328.5; Sep. 17, 1993, 43 31 584.4

Int. Cl.[6] F16F 9/46; F16K 31/02; B60G 17/08

U.S. Cl. 188—299

12 Claims



1. A shock absorber comprising:

a cylinder defining a chamber therein, said cylinder containing a damping fluid;

a piston rod rod sealingly projecting into said cylinder and being axially displaceable with respect to said cylinder;

a piston being attached to said piston rod, said piston being slidably disposed within said cylinder to sealingly divide said chamber into first and second chambers;

means for permitting fluid communication between said first and second chambers;

said means for permitting fluid communication comprising check valve means, said check valve means having first aperture means and second aperture means, said check valve means being configured for transmitting fluid between said first aperture means and said second aperture means;

said check valve mean comprising:

a first body portion and a second body portion;

spring means for biasing said first body portion and said second body portion towards one another, said spring means having a first portion and a second portion;

said first portion of said spring means having means for being fixedly retained on said first body portion;

said second portion of said spring means having means for being fixedly retained on said second body portion;

first means, for fixedly retaining said first portion of said spring means on said first body portion;

second means, for fixedly retaining said second portion of said spring means on said second body portion;

said first retaining means and said second retaining means being configured to hold said first body portion, said second body portion and said spring means together as a modular, interchangeable unit during assembly of said shock absorber;

said first portion of said spring means has an inner diameter portion and an outer diameter portion, and said second portion of said spring means has an inner diameter portion and an outer diameter portion;

one of said inner diameter portion and said outer diameter portion of said first portion of said spring means is fixedly retained on said first body portion;

one of said inner diameter portion and said outer diameter portion of said second portion of said spring means is fixedly retained on said second body portion;

said first retaining means comprises one of:

means for providing a form fit between said first portion of said spring means and said first body portion to fixedly retain said first portion of said spring means on said first body portion; and

means for providing a force fit between said first portion of said spring means and said first body portion to fixedly retain said first portion of said spring means on said first body portion; said second retaining means comprises one of:

means for providing a form fit between said second portion of said spring means and said second body portion to fixedly retain said second portion of said spring means on said second body portion;

means for providing a force fit between said second portion of said spring means and said second body portion to fixedly retain said second portion of said spring means on said second body portion;

said spring means comprises a spring having a central longitudinal axis and two ends;

said spring comprises a plurality of contiguous coils, each of said coils describing about one revolution about said central longitudinal axis of said spring, said plurality of coils comprising a first terminal coil at a first end of said spring and a second terminal coil at a second end of said spring;

said first portion of said spring comprises said first terminal coil;

said second portion of said spring comprises said second terminal coil;

said check valve means comprises:

a seat;

said modular, interchangeable unit being disposed against said seat; and

means for permitting displacement of said modular, interchangeable unit away from said seat to promote fluid communication between said first aperture means and said second aperture means;

the means for permitting displacement of the modular, interchangeable unit away from the seat comprises:

armature means; and

electromagnetic means for activating the armature means to permit displacement of the modular, interchangeable unit away from the seat;

the first body portion comprises a control chamber discharge valve body;

the second body portion comprises a supplemental discharge valve body;

the supplemental discharge valve body is for being disposed against the seat on the check valve plate;

the control chamber discharge valve body has an interior surface;

the interior surface of the control chamber discharge valve body has a first cylindrical portion and a second cylindrical portion;

the first cylindrical portion is configured to be out of contact with the spring;

the supplemental discharge valve body has an outer surface;

the outer surface of the control chamber discharge body has a first portion and a second portion, the second portion being generally cylindrical;

the first portion of the outer surface is configured to be out of contact with the spring; and

the check valve means further comprises:

the coils of the spring being of generally constant diameter;

the first retaining means comprising first means for providing a force fit between the first portion of the spring and the control chamber discharge valve body;

the first means for providing a force fit comprising:

the second cylindrical portion having a smaller diameter than the first cylindrical portion;

the second cylindrical portion having an axial dimension configured such that the outer diameter portion of only the first terminal coil of the spring is graspingly engaged by the second cylindrical portion, to provide a force fit of the first terminal coil of the spring with respect to the control chamber discharge valve body; and

the interior surface of the control chamber discharge valve body further having a frustoconical transition portion

between the first cylindrical portion and the second cylindrical portion; and

the second retaining means comprising second means for providing a force fit between the second portion of the spring and the supplemental discharge valve body; and

the second means for providing a force fit comprising:

the second portion of the outer surface having a larger diameter than the first portion;

the second portion of the outer surface having an axial dimension configured such that the inner diameter portion of only the second terminal coil of the spring is graspingly engaged by the second cylindrical portion, to provide a force fit of the second terminal coil of the spring with respect to the supplemental discharge valve body; and

the outer surface of the supplemental discharge valve body further having a frustoconical transition portion between the first cylindrical portion and the second cylindrical portion.

5,467,852

TWIN-PIPE SHOCK ABSORBER

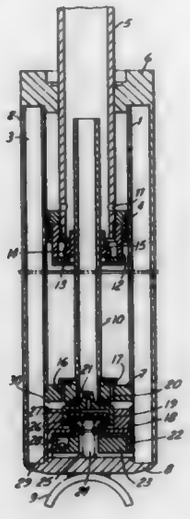
Cornelis de Kock, Oud-Beijerland, Netherlands, assignor to Koni, B.V., Netherlands

Continuation of Ser. No. 113,888, Aug. 30, 1993, Pat. No. 5,423,402, which is a continuation of Ser. No. 474,847, Sep. 25, 1990, abandoned. This application Feb. 28, 1995, Ser. No. 396,312

Claims priority, application Netherlands, Apr. 6, 1988, 8800882

Int. Cl.[6] F16F *9/34;9/44*

U.S. Cl. 188—322.14 **7 Claims**



1. A shock absorber comprising:

a work cylinder and an oil reservoir;

a piston slidably received in said working cylinder and defining a first working chamber on one side of said piston and a second working chamber on the other side of said piston;

a piston rod extending from said piston into said first working chamber adjacent one side of said working cylinder;

an upstream valve placed in said piston;

a hydraulic passageway connecting said first and second working chambers;

a metering orifice placed in said hydraulic passageway, said metering orifice in hydraulic communication with said piston, both said piston and said metering orifice capable of movement independently of one another, wherein said metering orifice has a constant area opening within said hydraulic passageway; and

means coupled to said metering orifice for regulating the damping effect of said metering orifice on a fluid contained in said working cylinder.

5,467,853

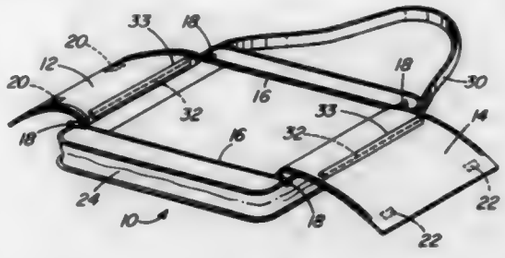
CHILDREN'S ACTIVITY CASE

Wendy Pelletier, Box 1185, Station A, Prince George, British Columbia, Canada

Filed Jun. 15, 1994, Ser. No. 260,724

Int. Cl.[6] A47B *3/10*

U.S. Cl. 190—11 **4 Claims**



1. A children's activity case comprising:

a flexible satchel made from fabric, having a substantially rectangular board member in a substantially rectangular base of the satchel with four sides extending.,upwards and joined at corners;

opposing flaps on top of two opposing sides of the satchel, each flap having parallel edges, and an outer and inner surface, the flaps having zippers on the parallel edges, the flaps overlapping at the center when closed to form a substantially rectangular top surface, substantially the same size and parallel to the base of the satchel, attachment means on the flaps to retain the flaps closed, the flaps having pockets on the inner surface thereof, and

a carrying strap attached to the activity case.

5,467,854

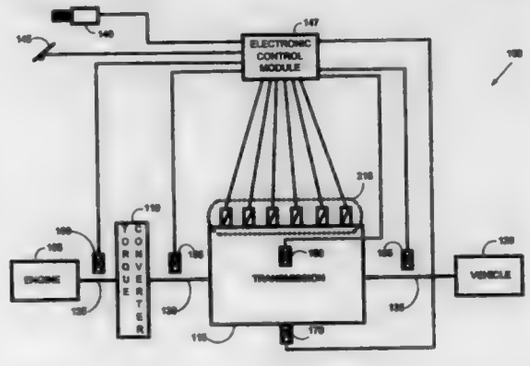
METHOD OF CONTROLLING CLUTCH-TO-CLUTCH SHIFTS FOR A POWERSHIFT TRANSMISSION

Todd D. Creger, Metamora; Randall M. Mitchell, Washington; Alan L. Stahl, Peoria, all of Ill., and James R. Talbott, Fitchburg, Mass., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jun. 7, 1994, Ser. No. 257,391

Int. Cl.[6] F16D *25/10;48/06*

U.S. Cl. 192—87.18 **11 Claims**



1. A method of controlling a powershift transmission, the transmission comprising:

a plurality of speed changing clutches;

a plurality of direction changing clutches;

a plurality of pressure control valves individually connected to the clutches;

a hydraulic pump adapted to deliver pressurized hydraulic oil to the plurality of pressure control valves, predetermined ones of the pressure control valves metering hydraulic fluid to the clutches in response to receiving a clutch command signal, the method producing a shift from a first transmission ratio to a second transmission ratio through disengagement of an off-going clutch associated with the first transmission ratio and engagement of an on-coming clutch associated the second transmission ratio, in accordance to the following steps:

commanding a pressure control valve associated with an on-coming speed clutch to fill the clutch;

commanding a pressure control valve associated with an off-going direction clutch to reduce the clutch pressure to cause the direction clutch to release in response to the on-coming speed clutch being filled;

thereafter, commanding the on-coming speed clutch pressure control valve to gradually increase the clutch pressure to engage the speed clutch; and

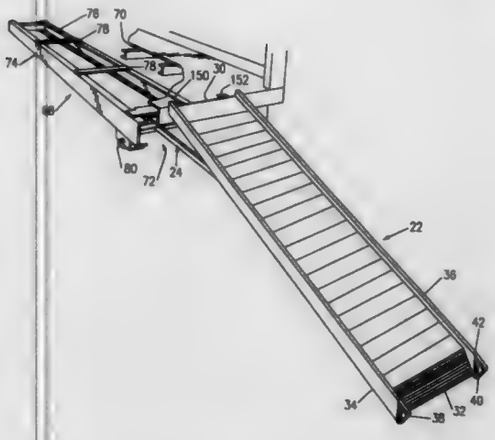
commanding a pressure control valve associated with an on-coming direction clutch to gradually increase the direction clutch pressure to engage the direction clutch in response to the on-coming speed clutch being engaged.

5,467,855

RAMP WEIGHT-REDUCING ASSEMBLY

Birk C. Sorensen, Whittier, Calif., assignor to EMTEK Products, Inc., City of Industry, Calif.

Filed Jun. 29, 1994, Ser. No. 268,244
Int. Cl.[6] B65G *11/00*
U.S. Cl. 193—5 **7 Claims**



1. A ramp weight-reducing assembly for use with a front portion of a ramp having a predetermined weight to reduce the weight manually lifted by an operator raising said front portion to a working surface, said weight-reducing ramp assembly comprising:

a ramp connector pivotally connected to said ramp;

weight reducing means for reducing the weight lifted by an operator when raising said from portion of said ramp, by applying a biasing force to the ramp and connected between said ramp and ramp connector;

engaging means for connecting said front portion of said ramp to said working surface;

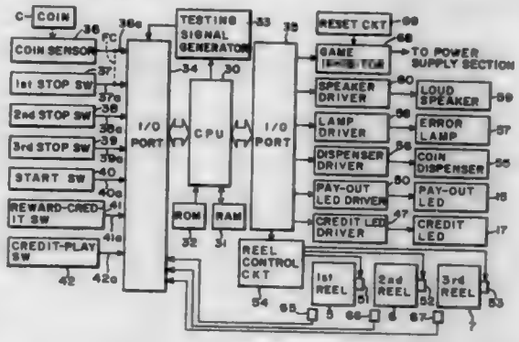
whereby said weight reducing means opposes the force of said predetermined weight of said ramp by applying said biasing force before and during a period when said operator manually lifts said ramp and engages said front portion of said ramp with said working surface.

5,467,856

GAMING MACHINE AND METHOD OF DETECTING FRAUD IN THE SAME

Kazuo Okada, Tokyo, Japan, assignor to Kabushiki Kaisha Universal, Tochigi, Japan

Filed Jul. 8, 1993, Ser. No. 87,402
Claims priority, application Japan, Jul. 8, 1992, 4-180912
Int. Cl.[6] G07F *17/34*
U.S. Cl. 194—202 **24 Claims**



18. A method of detecting fraudulent operation in a gaming machine by a test signal generating means, said gaming machine and said test signal generating means receiving power from a common power supply;

wherein, a first signal enabling execution of a game is input upon a first external operation to a controller through a first signal line, a second signal is input upon a second external operation to said controller through a second signal line, and thereafter a reward for said game is determined, said method comprising the steps of:

outputting a test signal to said second signal line;

checking said first signal line; and

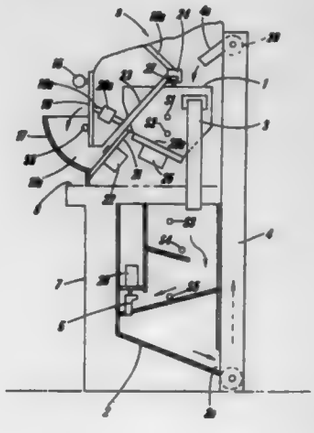
if said test signal is detected through said first signal line, inhibiting payment of said reward, detection of said test signal indicating said fraudulent operation.

5,467,857

SLOT MACHINE HAVING UNITARY COIN RESTORATION SYSTEM

Takatoshi Takemoto, Tokyo, Japan, assignor to Kabushiki Kaisha Ace Denken, Tokyo, Japan

PCT No. PCT/JP93/00001, § 371 Date Jul. 28, 1994, § 102(e) Date Jul. 28, 1994, PCT Pub. No. WO93/14842, PCT Pub. Date Aug. 5, 1993
PCT Filed Jan. 28, 1993, Ser. No. 256,837
Claims priority, application Japan, Jan. 28, 1992, 4-013397
Int. Cl.[6] G07F *17/34*
U.S. Cl. 194—206 **24 Claims**



21. A slot machine having unitary coin restoration system comprising a game execution system for executing a game, a coin dispensing/adjustment system for dispensing coins and making adjustment, and a coin handling system, characterized in that

said coin handling system comprises

a coin dispensing mechanism for dispensing coins from inside to outside of said slot machine:

a coin taking-in mechanism for taking in coins from outside to inside of said slot machine;

an internal hopper for holding coins;

a coin storage tank having a capacity larger than that of said internal hopper; and

an adjustment mechanism for moving coins between said internal hopper and said coin storage tank for adjusting a quantity of coins held in said internal hopper,

said coin dispensing mechanism having at least a coin dispenser for dispensing coins from said internal hopper and a tray for holding coins dispensed through said coin dispenser,

said coin taking-in mechanism having at least a coin taking-in device for taking in coins from said tray to the inside of said slot machine and a taking-in sensor for counting the number of taken-in coins,

said adjustment mechanism comprising:

an overflow passage for introducing coins exceeding an upper quantity limit in said internal hopper into said coin storage tank;

a transport mechanism for transporting coins stored in said coin storage tank to said internal hopper;

a lower limit sensor for detecting that said internal hopper holds a lower limit quantity of coins in said internal hopper;

an upper limit sensor for detecting that said internal hopper holds an upper limit quantity of coins in said internal hopper; and

a proper quantity sensor for detecting that said coin storage tank stores a proper quantity of coins in said coin storage tank, and

that said game execution system comprises:

a game execution section for executing a game upon receipt of an instruction and stopping the game upon receipt of an instruction; and

a coin taking-in switch for instructing said coin taking-in mechanism to take in coins required for execution of a game,

said coin taking-in mechanism for taking in as many coins as required for a game upon receipt of a coin taking-in instruction from said coin taking-in switch.

5,467,858

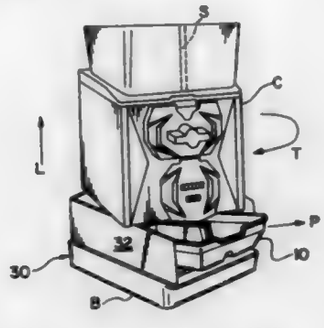
COIN BOX INSERT FOR BULK VENDING MACHINES

Steven A. Kovens, Reistertown, and Michael T. Doyle, Columbia, both of Md., assignors to Parkway Machine Corporation, Timonium, Md.

Filed Jul. 26, 1993, Ser. No. 98,051

Int. Cl.[6] G07F 9/06

U.S. Cl. 194—350 **9 Claims**



5. A container having a U-shaped floor defining a base and two legs and a generally planar area, a peripheral upper edge spaced at a select distance above said floor and dimensioned to substantially conform to the internal dimensions of the base of a coin operated bulk vending machine, bifurcated walls including a flaring first section rising at an angle from the floor to a point below the peripheral edge, a second wall section rising substantially perpendicular to the floor to the peripheral edge, an elongated transverse slot to accommodate a perpendicularly projecting shaft from the machine said slot extending from the side wall to beyond the center of the container for accommodating transverse translation of said container relative to said base, said slot forming a discontinuity along one side of the periphery of said container, said slot being defined by first and second wall sections, where said container can be transversely translated uninterruptedly relative to base floor of the vending machine.

5,467,859

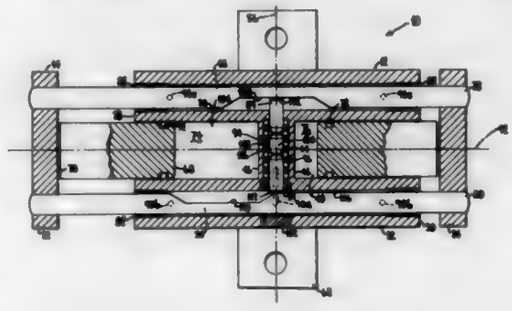
VIBRATOR FOR TRANSPORTING ARTICLES

Karl M. Sahlberg, Grillby, Sweden, assignor to Vibro Industries, Inc., Fogelsville, Pa.

Filed Jan. 19, 1994, Ser. No. 187,299

Int. Cl.[6] B65G 25/00

U.S. Cl. 198—750.7 **16 Claims**



1. A vibrator for transporting articles, comprising:

a carriage having an article-carrying surface;

a base having spaced ends and defining an inlet, a vent, a piston cavity and a manifold, the carriage being attached to the base;

a piston arrangement disposed in the piston cavity for reciprocating movement between two positions, the piston arrangement bearing on the carriage;

at least one seal between the piston arrangement and the piston cavity, the piston arrangement, the seal and the piston cavity forming two expansion chambers that are respectively enlarged and contracted with movement of the piston arrangement, the manifold communicating with the inlet, the vent, and the expansion chambers for supplying and exhausting air to the expansion chambers;

a mechanism outside of the expansion chambers, associated with the manifold and operated by the piston arrangement to move between a first position in which one said expansion chamber communicates with the inlet and the other said expansion chamber communicates with the vent, and a second position in which said one expansion chamber communicates with the vent and said other expansion chamber communicates with the inlet, whereby the piston arrangement is reciprocated; and,

regulating means, associated with one of the expansion chambers, for regulating one of air flow into said one expansion chamber and air flow out from said one expansion chamber, such that the piston arrangement and the carriage move relatively more forcefully in one of the opposite directions than the other, and articles on the surface are transported in a direction opposite thereto.

5,467,860

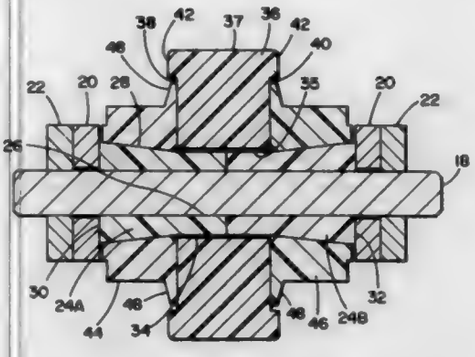
CHAIN FOR ACCUMULATING CONVEYOR

Robert T. Clopton, Magnolia, Ky., assignor to Tekno, Inc., Cave City, Ky.

Continuation-in-part of Ser. No. 203,445, Feb. 28, 1994, Pat. No. 5,409,096, which is a continuation-in-part of Ser. No. 968,584, Oct. 29, 1992, Pat. No. 5,314,059. This application Oct. 3, 1994, Ser. No. 316,943

Int. Cl.[6] B65G *17/24*

U.S. Cl. 198—779 4 Claims



1. A link for a conveyor chain, comprising:

a connecting pin having a center and first and second ends;

an inner sleeve mounted over said pin; said inner sleeve having a tapered outer surface;

a large diameter product roller mounted over said inner sleeve near the center of the pin, said large diameter product roller having an outside surface for carrying products, an inside surface, and first and second side surfaces;

first and second rail rollers mounted over said inner sleeve adjacent to said first and second side surfaces of said product roller, respectively, said first and second rail rollers having tapered inside diameters with a shape that supplements the tapered outer surface of the inner sleeve, so that the supplementary tapered surfaces on the inner sleeve and the rail rollers urge the first and second rail rollers against the first and second side surfaces of the product roller, respectively.

5,467,861

CONVEYOR WITH THREE PLANE LOCKING SYSTEM

Robert Weakamp, 720 Dartmouth Dr., Buffalo Grove, Ill. 60089

Continuation-in-part of Ser. No. 959,888, Oct. 13, 1992, abandoned. This application Jan. 31, 1994, Ser. No. 189,267

Int. Cl.[6] B65G *47/00*

U.S. Cl. 198—345.3 21 Claims

1. A combination carrier and precision stop assembly for use in a conveyor system, the combination comprising:

a carrier;

a stop assembly;

the carrier including

an upper surface for supporting a workpiece and an undersurface for frictionally engaging a moving conveyor,

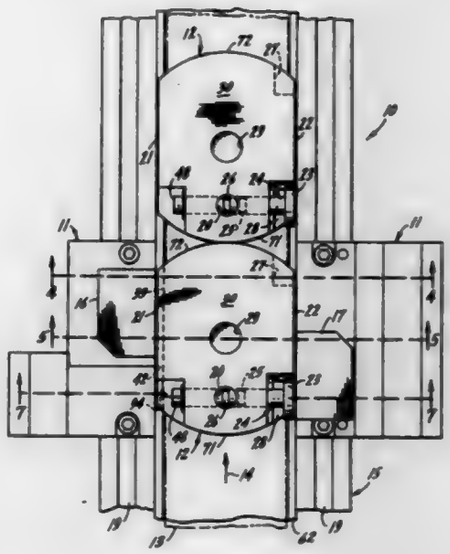
means for engaging one side of the stop assembly, means for engaging a second opposing side of the stop assembly, the carrier being vertically raised upon engagement of the two opposing sides of the stop assembly and allowing the conveyor to move forward underneath the carrier without frictionally engaging the undersurface of the carrier,

means for receiving an initial braking mechanism to initially stop the carrier upon arrival at the stop assembly,

the stop assembly including

the initial braking mechanism and means for activating the initial braking system for initially stopping the carrier upon arrival at the stop assembly,

means for engaging and lifting opposing sides of the carrier.



5,467,862

APPARATUS FOR INTERFACING INDEXING AND CONTINUOUS MOTION MACHINES AND METHOD OF UTILIZING APPARATUS

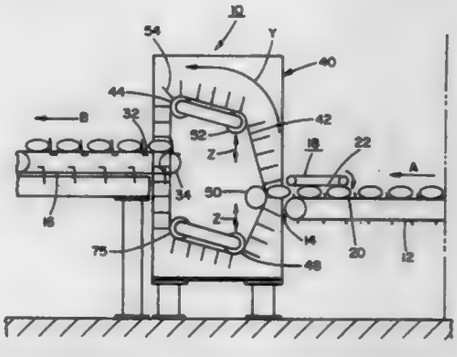
Thomas J. Helmstetter, Piscataway, N.J., assignor to Chicopee, Milltown, N.J.

Continuation of Ser. No. 857,217, Mar. 25, 1992, Pat. No. 5,271,489. This application Sep. 28, 1993, Ser. No. 127,537

The portion of the term of this patent subsequent to Dec. 21, 2010, has been disclaimed.

Int. Cl.[6] B65G *1/00*

U.S. Cl. 198—347.1 13 Claims



1. An apparatus for converting an indexing motion of advance for a sequence of intermittently supplied articles of manufacture into a continuous motion of advance; said apparatus comprising:

(a) at least one indexing conveyor for receiving and transporting said intermittently supplied articles towards a discharge end of said conveyor;

(b) at least one receiving conveyor advancing in a continuous motion for continually transporting said articles to at least one workstation communicating with a discharge end of said conveyor;

(c) at least one interfacing means operatively connected between said indexing conveyor and said continuous motion conveyor receiving said intermittently advanced articles from said indexing conveyor and converting the rate of advance of said articles towards said receiving conveyor to produce a uniform and continuous flow of said articles; and

(d) article-spacing means operatively connected to said indexing conveyor for transferring said articles from the discharge end

of said indexing conveyor to said interfacing means at a higher rate of speed than the advance of said articles on said indexing conveyor.

5,467,863

SORTING SYSTEM HAVING HORIZONTAL TRANSFER APPARATUS

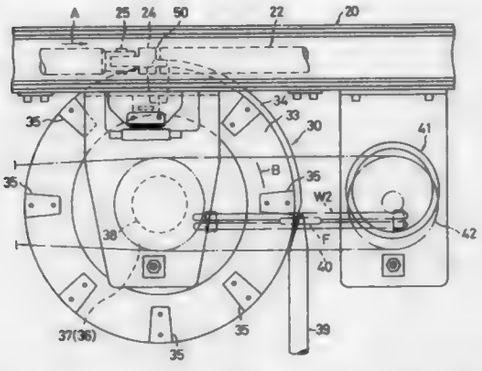
Toru Hirao; Hideki Sato, both of Hanno, and Toshio Kaube, Hidaka, all of, Japan, assignors to Tsubakimoto Chain Co.

Filed Aug. 10, 1994, Ser. No. 288,391

Claims priority, application Japan, Aug. 13, 1993, 5-048265 U

Int. Cl.[6] B65G 47/44

U.S. Cl. 198—360 **1 Claim**



1. An apparatus for sorting articles on hangers, said apparatus comprising means which moves articles along an elongated guide rail, said guide rail having at least one gap, a pivotable sorting member normally bridging said gap, said sorting member being pivotable downwardly to open the gap, means comprising a sorting chute for receiving articles from said guide rail when said sorting member is pivoted downwardly, and a horizontal transfer apparatus comprising:

means, comprising a horizontally extending, rotatable, disc-shaped, article-receiving member, disposed beneath the pivotable sorting member, for conveying an article horizontally from said sorting member to said sorting chute; and

ridge-shaped guide means extending along a portion of the perimeter of the disc-shaped article-receiving member, from a position beneath said pivotable sorting member to a position adjacent to the sorting chute, for preventing articles from falling off the disc-shaped article-receiving member.

5,467,864

DUAL PURPOSE APPARATUS TO MANIPULATE WORKPIECES

Gary W. McCoy, Mars; John M. Zwigart, New Brighton, and Mark R. Tweedy, Valencia, all of Pa., assignors to Carl Strutz & Co., Inc., Mars, Pa.

Continuation-in-part of Ser. No. 882,939, May 14, 1992, Pat. No. 5,333,720. This application Aug. 1, 1994, Ser. No. 285,331

Int. Cl.[6] B65G 47/24

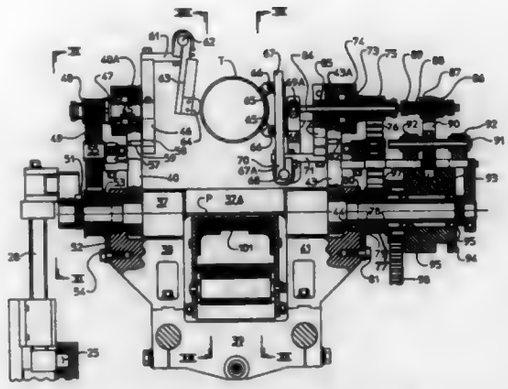
U.S. Cl. 198—409 **14 Claims**

1. An apparatus to selectively orientate workpieces undergoing manipulation, the apparatus including the combination of:

means for delivering a workpiece in a plane at a first orientation to a workpiece receiving site;

gripper means including at least one displacable gripper for supporting a workpiece at the workpiece receiving site;

pivot means including a pivot shaft coupled to at least one pivot arm for pivoting said gripper means between the workpiece receiving site and a workpiece transfer site;



gripper positioning means supported by said pivot arm for interconnecting said gripper means with said pivot arm;

means selectively operable for pivoting said gripper means at a predetermined fixed relation with said pivot arm while said pivot arm and said gripper means pivot between said workpiece receiving site and said workpiece transfer site for establishing one selective orientation of the workpiece;

means selectively operable for rotatably positioning said gripper means relative to said pivot arm while said pivot arm and said gripper means pivot between said workpiece receiving site and said workpiece transfer site for establishing a second selective orientation of the workpiece;

means for moving the displacable gripper into a workpiece gripping position at the workpiece receiving site and for moving the displacable gripper into a workpiece release position at the workpiece transfer site;

means for conveying the workpiece in a second orientation at the workpiece transfer site in a plane along a path of travel; and

means to position said pivot means to a preselected position between and relative to each of said means for delivering and said means for conveying by moving said pivot means toward or away from said means for delivering, said pivot means being moved to position said gripper relative to the workpiece on said means for delivering to compensate for varying length workpieces and for selectively establishing said workpiece receiving site, said pivot means being positioned to prevent damaging impact of the work piece with said means for conveying and means for delivering and without changing the distance between the plane of said means for delivering and the plane of said means for conveying.

5,467,865

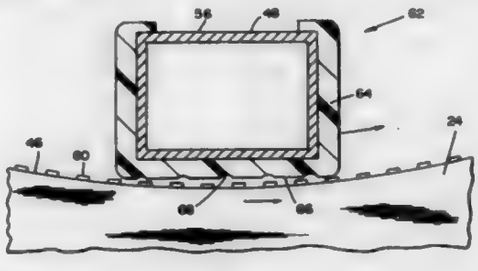
CONVEYOR BELT WITH TEXTURED EDGE

Guy L. Irwin, 512 Oreland Mill Rd., Oreland, Pa. 19075

Continuation of Ser. No. 748,440, Aug. 22, 1991, Pat. No. 5,137,141, which is a continuation of Ser. No. 410,348, Sep. 21, 1989, abandoned. This application Aug. 6, 1992, Ser. No. 927,923

Int. Cl.[6] B65G 21/18

U.S. Cl. 198—778 **1 Claim**



1. In a spiral conveyor system,

a capstan rotatable about a vertical axis, the capstan including a plurality of circularly spaced capstan bars, the bars having outer surfaces which traverse a generally cylindrical travel path during capstan rotation,

a belt comprising a succession of plastic link units interconnected end-on-end with each other, the link units being telescoping with each other at a belt side margin so that the belt can longitudinally foreshorten at said side margin incident winding it in a spiral belt run around the capstan with link unit side edges in friction drive contact with the capstan bar outer surfaces whereby the rotation of the capstan frictionally drives the belt through the spiral belt run, and

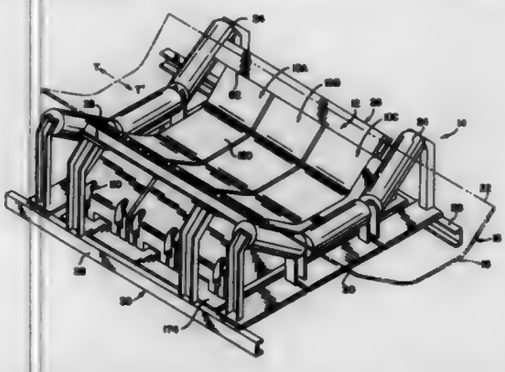
cooperating means carried on said belt side edges and on said capstan bar outer surfaces for enhancing frictional contact therebetween, the cooperating means comprising projections on one of the belt side edges and the capstan bar outer surfaces and grooves, projections being on said belt link side edges or the capstan bar outer the grooves being on the other of the belt side edges and the capstan bar outer surfaces.

5,467,866

CONVEYOR IMPACT PILLOW

R. Todd Swinderman, Kewanee, Ill., assignor to Martin Engineering Company, Neponset, Ill.

Filed Nov. 29, 1993, Ser. No. 158,510
Int. Cl.[6] B65G *15/60*
U.S. Cl. 198—841 **15 Claims**



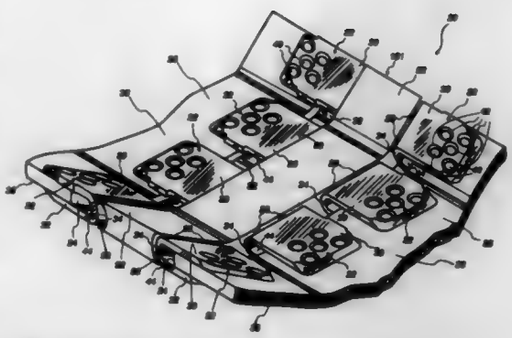
1. An impact pillow for supporting a conveyor belt in the impact zone of a conveyor transfer point including a shell having an upper support surface over which the conveyor belt slides and a substantially enclosed cushioning chamber defined interior to said shell, said chamber adapted to receive and contain a cushioning substance, said shell adapted to substantially enclose the cushioning substance within said cushioning chamber, said shell including a port in communication with said cushioning chamber, whereby said impact pillow resiliently supports the moving conveyor belt as material is loaded onto the conveyor belt at the transfer point and absorbs impact forces on the conveyor belt during the loading process.

5,467,867

SPLICE ASSEMBLIES FOR CONNECTING BELT ENDS

Edward C. Musil, and William J. Daniels, both of Orland Park, Ill., assignors to Flexible Steel Lacing Company, Downers Grove, Ill.

Continuation-in-part of Ser. No. 61,163, May 13, 1993, Pat. No. 5,348,143. This application Apr. 20, 1994, Ser. No. 230,540
The portion of the term of this patent subsequent to Sep. 20, 2004, has been disclaimed.
Int. Cl.[6] B65G *15/30*
U.S. Cl. 198—844.2 **20 Claims**



1. In a conveyor belt, the combination comprising:

a belt having first and second ends spliced together into an endless belt;

first belt fasteners secured across the first belt end and being spaced to allow troughing of the belt between the first belt fasteners;

second belt fasteners secured across the second belt end and being spaced to allow troughing of the belt between the second belt fasteners;

a plurality of belt splices each extending between a pair of first and second belt fasteners and interconnecting the belt fasteners to form therewith the splice to form the endless belt; and

the belt splices including at least one longitudinally extending, flexible, elongated tensile member connected to the respective first and second belt fasteners for taking the tension loads between the respective belt fasteners and the belt ends;

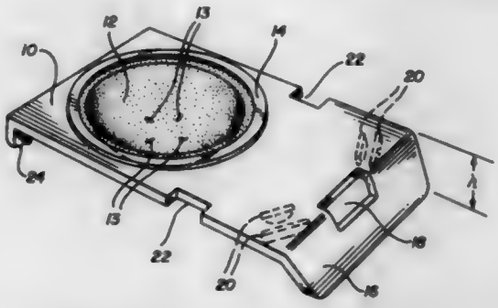
the belt splices extending in a direction transverse to the longitudinal direction to be closely adjacent other belt splices to reduce the space between adjacent belt splices and the amount of sifting of material from the conveyor belt and through the belt splices.

5,467,868

OPHTHALMIC LENS PACKAGE

Richard Abrams; Russell J. Edwards; James A. Ebel, and Darren S. Keene, all of Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Continuation of Ser. No. 995,607, Dec. 21, 1992, abandoned. This application Dec. 28, 1993, Ser. No. 174,580
Int. Cl.[6] A45C *11/04*
U.S. Cl. 206—5.1 **22 Claims**



1. A package containing an ophthalmic lens for inspection, processing and storage of the lens, said package comprising:

a substantially planar first surface,

a concave bowl formed in said surface, said bowl having a radius of curvature sufficiently small to cause the lens to center therein by gravity, yet larger than the radius of curvature of the lens placed therein,

said bowl having a depth less than the diameter of the lens contained therein,

said bowl being translucent such that light transmitted through the bowl is substantially isotropic, imparting substantially no non-uniformity to the light source,

a sealing area circumferentially about the circular boundary of the first planar surface and the concave bowl, and

a sealing sheet substantially parallel with said first planar surface covering the concave bowl, thereby forming a cavity enclosing the lens placed therein, and hermetically sealed along said sealing area.

17. A package containing an ophthalmic lens for inspection, processing and storage of the lens, said package comprising:

a member having a substantially planar first surface and a substantially planar second surface,

a concave bowl formed in said surface, said bowl extending in a first direction from said first surface and having a radius of curvature sufficiently small to cause the lens to center therein by gravity, yet larger than the radius of curvature of the lens placed therein, said bowl comprising a substantially hemispherical structure,

said second surface extending in said first direction from an edge of the first surface at an angle between said surfaces greater than zero and less than 180 degrees,

a sealing area circumferentially about the circular boundary of the first surface and the concave bowl, and

a sealing sheet substantially parallel with said first surface covering the concave bowl, thereby forming a cavity enclosing the lens placed therein, and hermetically sealed along said sealing area.

5,467,869

EYEGLASS LENS PACKAGING

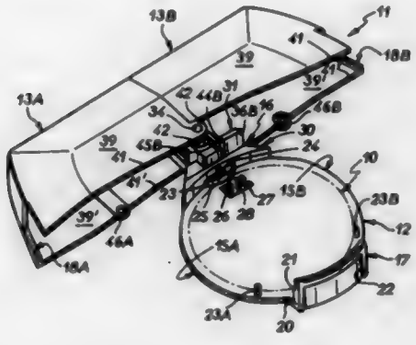
François Elie, Paris, and Vincent Rossin, Montrouge, both of, France, assignors to Essilor International Cie Generale d'Optique, Charenton le Pont, France

Filed Nov. 21, 1994, Ser. No. 345,455

Claims priority, application France, Nov. 23, 1993, 93 13988

Int. Cl.[6] B65D *85/38*

U.S. Cl. 206—45.13 **17 Claims**



1. Display container for eyeglass lenses including a plate adapted to receive an eyeglass lens to be displayed and two half-shells pivoted to the edge of said plate about a pivot axis globally perpendicular thereto and each mobile between a closed position wherein, juxtaposed to each other, they conjointly form a protective shell around said plate, and an open position in which they uncover said plate, wherein said plate has a globally circular contour, has no rim over at least part of its edge and has locally projecting from it at least three locking pegs for holding said eyeglass lens.

5,467,870

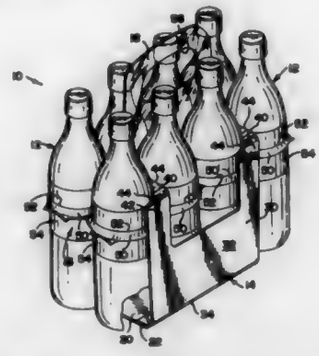
WRAPPER, CARRIER, AND HANDLE ASSEMBLY AND PACKAGE COMPRISING SAME AND CONTAINERS

James A. Broskow, Buffalo Grove, and Leslie S. Marco, Bloomingdale, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Oct. 3, 1994, Ser. No. 317,312

Int. Cl.[6] B65D *75/00*

U.S. Cl. 206—162 **7 Claims**



1. A wrapper, carrier, and handle assembly for wrapping partially and carrying substantially identical containers as a package, such as substantially identical bottles, the assembly comprising

(a) a wrapper formed from a paperboard sheet, folded, and seamed so as to have a bottom wall, two lateral walls providing expansive surfaces for labelling, and struts extending across the wrapper, above the bottom wall, the struts including two struts dividing the package and the containers in the package into two endmost regions and an intermediate region,

(b) a carrier formed from sheet-form, resilient, polymeric material so as to have band segments defining container-receiving apertures in a generally rectangular array, which comprises two longitudinal rows and at least three transverse ranks including two endmost ranks and at least one intermediate rank, the carrier having a longitudinal midline between the longitudinal rows of container-receiving apertures, and

(c) a handle attached to the carrier and extending upwardly from the longitudinal midline of the carrier,

wherein the wrapper, carrier, and handle respectively are sized, shaped, and assembled so that the carrier is disposed above the bottom wall and below the struts, so that the container-receiving apertures of the endmost ranks are disposed within the endmost regions of the package, so that the container-receiving apertures of each intermediate rank are disposed within the intermediate region of the package, and so that the handle extends upwardly between two of the struts, through the intermediate region of the wrapper.

5,467,871

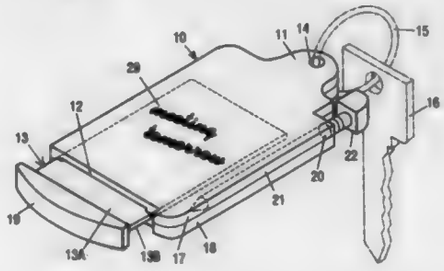
KEY CHAIN NOTE HOLDER WITH TRANSPARENT HOUSING

Norman DeField, 2641 Grand Ave., Billings, Mont. 59102

Filed Sep. 6, 1994, Ser. No. 300,760

Int. Cl.[6] A45C *11/32*; **G09F** *3/20*

U.S. Cl. 206—232 **17 Claims**



1. A note card apparatus, comprising:

a flat, rigid note card having two opposing major surfaces, a first of said surfaces being erasable and arranged to receive hand-written notes thereon such that said notes can be erased from said first surface,

a rigid, hollow housing having an elongated slot extending into said housing and shaped and sized to receive said note card therein,

said hollow housing being flat and having first and second major sides so that when said note card is inserted into said slot of said housing, each of said major sides of said housing will be adjacent one of said opposing major surfaces of said note card,

said hollow housing and said note card including cooperating locking means for locking said note card within said housing for holding said note card to resist withdrawal thereof from said housing when said note card is fully inserted into said housing, but for allowing said note card to be withdrawn from said housing by manual force after it is fully inserted into said housing,

said note card being shaped to be insertable into said slot of housing in either of first and second orientations such that, in said first orientation, said first and second surfaces of said note card are adjacent said first and second sides of said housing, respectively, and in said second orientation, said first and second surfaces of said note card are adjacent said second and first sides of said housing, respectively,

said note card having an outer edge which includes a grip portion for facilitating grasping said note card for pulling it out of said housing,

one of said two major sides of said hollow housing being transparent so that when said note card is positioned in said housing, said transparent side displays an adjacent major surface of said note card therethrough and also protects any writing on said note card from accidental erasure, and

a hole extending through said housing, said hole adapted to receive a holding ring,

said housing having a recess extending into said housing for removably receiving an elongated writing instrument, and locking means for securely locking said writing instrument within said recess,

whereby said notes can be written on said writing surface when said note card is out of said housing and said note card can be inserted into said slot so that said writing surface is adjacent said transparent side so that said notes are visible therethrough, and said note card can also be inserted into said slot with said writing surface facing said opaque side so that said notes are hidden from view for security, and said housing protects said notes from accidental erasure when said note card is received therein.

5,467,872

RIGID HINGED-LID PACKET FOR TOBACCO PRODUCTS, PARTICULARLY CIGARETTES

Alessandro Minarelli, Bologna, Italy; Giuseppe Venturi, Richmond, Va., and Roberto Osti, Zola Predosa, Italy, assignors to G.D Societa'Per Azioni, Bologna, Italy

Filed Feb. 15, 1994, Ser. No. 196,710

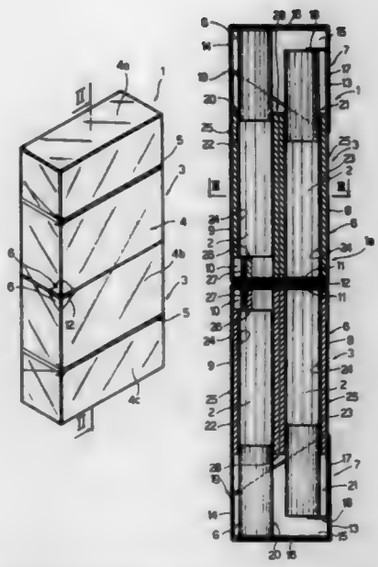
Claims priority, application Italy, Feb. 23, 1993, BO93A060

Int. Cl.[6] A24F *15/06;15/20;* **B65D** *85/10;25/04*

U.S. Cl. 206—256 **9 Claims**

1. A rigid, hinged-lid packet for tobacco products, particularly cigarettes, comprising

an intermediate portion with two opposite open ends, two lids hinged to said intermediate portion and movable in relation to the same between two positions wherein respective said open ends are respectively closed and opened, said intermediate portion housing two opposite orderly groups of said products, and each said group being accessible by opening a respective said lid;



and at least one substantially rigid reinforcing structure housed inside said intermediate portion and having a number of seats engaged by respective said products;

the reinforcing structure comprising a number of independent, substantially rigid sleeves, each having a central hole defining a respective said seat for at least one respective said product; said seats being arranged in a front row and a rear row inside said intermediate portion;

each seat in the rear row having inner supporting means for axially offsetting each respective product in relation to a corresponding product in the front row;

each said supporting means comprising a portion of said reinforcing structure, which is cut and folded inwards of the respective said seat.

5,467,873

BLISTER PACKAGING WITH SPRING MEANS THEREIN

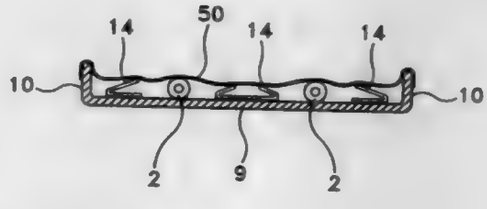
Gerhard Kastenhofer, Effretikon, Switzerland, assignor to Schneider (Europe) A.G., Bulach, Switzerland

Filed Mar. 24, 1994, Ser. No. 217,396

Claims priority, application European Pat. Off., Jun. 18, 1993, 93109814

Int. Cl.[6] B65D *73/00*

U.S. Cl. 206—363 **17 Claims**



1. A package comprising:

(a) a support member;

(b) a cover member sealed to the support member to form an airtight chamber under pressure;

(c) mechanical spring means disposed between the cover member and the support member for exerting force on each member, the mechanical spring means configured to maintain a separation between the support member and the cover member; and

(d) a catheter disposed in the airtight chamber.

16. A package comprising:

(a) a support member forming a U-shaped edge configured to facilitate stacking of the package;
(b) a cover member sealed to the support member to form an airtight chamber under pressure;
(c) spring means disposed between the cover member and the support member for exerting force on each member, the spring means configured to maintain a separation between the support member and the cover member upon a decrease of the pressure; and
(d) a catheter disposed in the airtight chamber.

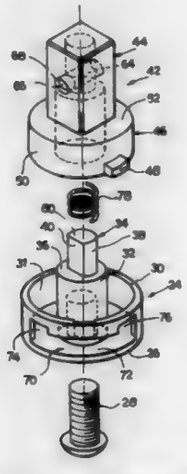
17. A package comprising:
(a) a support member;
(b) a cover member sealed to the support member to form an airtight chamber under negative pressure;
(c) spring means disposed between the cover member and the support member for exerting force on each member, the spring means configured to maintain a separation between the support member and the cover member and
(d) a catheter disposed in the airtight chamber.

5,467,874

BALL LOCK SOCKET HOLDER

Eugene Whitaker, 501 E. Spruce, Deming, N.M. 88030

Filed Jan. 10, 1995, Ser. No. 370,860
Int. Cl.[6] B65D *85/20*
U.S. Cl. 206—378 **10 Claims**



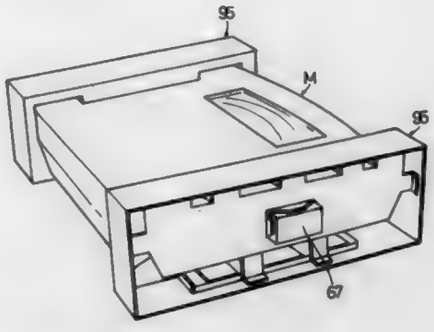
1. A holder for sockets having a wrench receiving end including a bore therein having an interior wall provided with a detent comprising;
an elongated support member including a plurality of spaced apart attachment mechanisms affixed thereto,
a mounting member engaging each said attachment mechanism and having a lower base connected to an upper stub, said stub adapted to be engaged by the bore of a socket,
a spring intermediate said mounting member and attachment mechanism and normally biasing said mounting member vertically away from said attachment mechanism,
said stub provided with a transverse bore having a normally freely movable ball therein,
a fixed cam element on said attachment mechanism disposed within said mounting member stub and intersecting said transverse bore,
a guide channel in said attachment mechanism communicating with opposite catch means defining lock and unlock positions, and
a tab on said mounting member disposed within said guide channel, whereby
upon rotary displacement of said mounting member said tab is shifted between said opposite catch means to alternately cause said cam element to block said ball in a fixed position projecting from said stub to retain a socket by disposition of said ball within the socket detent and thence allow said ball to freely move away from the socket detent and the socket to be removed from the holder.

5,467,875

MULTIPLE STRUCTURE PAPER PROTECTOR AND THE APPARATUS FOR ITS PRODUCTION

Shizuo Sato, 1608-11, Onza-Higashi-Hongo, Kawaguchi-Shi, Saitama-Ken, Japan

Continuation of Ser. No. 88,530, Jul. 9, 1993, abandoned. This application Apr. 24, 1995, Ser. No. 428,796
Claims priority, application Japan, Jul. 13, 1992, 4-208514
Int. Cl.[6] B65D *85/30*
U.S. Cl. 206—588 **3 Claims**



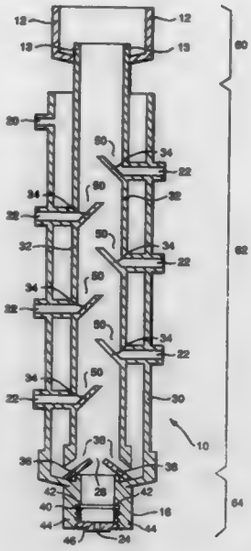
1. A multiple structure paper protector including at least two paper blanks forming inner and outer surfaces of the protector and assembled as a three-dimensional body, comprising:
a first blank having a rectangular central bottom panel for supporting an article to be protected by said paper protector in contacting relationship therewith;
inner panels around said central panel, each inner panel being hingedly connected to a respective outer edge of said central panel and extending upwardly at an angle thereto providing sides around said central panel forming a hollow article receiving chamber, said inner panels having inner and outer surfaces and outer extremities spaced from said central panel;
first mid panels hingedly connected to said outer extremities of said inner panels and folded at an angle outwardly therefrom with respect to said central panel, said first mid panels having upper and lower sides;
a second blank having a central opening of substantially the same shape as said central panel;
inner reinforcing panels around said central opening, each inner reinforcing panel being hingedly connected to an outer edge of said central opening and extending upwardly on said outer surface of a respective inner panel of said first blank;
a second mid panel on said second blank hingedly connected to said inner reinforcing panels and folded with respect thereto to extend substantially parallel to said first mid panels on said lower sides of said first mid panels in surrounding relationship with respect to said inner panels; and
outer panels hingedly connected to outer extremities of said first mid panels and folded downwardly at an angle with respect thereto and with respect to said second mid panel forming hollow spaces between said inner panels and said outer panels having a width substantially the same as the width of said first and second mid panels to provide an impact absorbing zone substantially around said central panel for an article within said paper protector.

5,467,876

METHOD AND APPARATUS FOR CONCENTRATION OF MINERALS BY FROTH FLOTATION

Gary W. Hicks, Rolla, and William L. Cornell, Salem, both of Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 4, 1995, Ser. No. 416,562
Int. Cl.[6] B03D 1/24
U.S. Cl. 209—170 10 Claims



1. A froth flotation apparatus for concentrating minerals by froth flotation of a slurry containing a mixture of mineral particles and gangue particles, said apparatus comprising:

a) a flotation column defined by an outer wall and having a top portion, a bottom portion and a central portion, for providing generally vertical flow of the slurry in said column;

b) slurry feed means for introducing the slurry into said flotation column in the lower half of the central portion thereof;

c) bubble introducing means disposed in the bottom portion of said flotation column for generating bubbles of gas;

d) froth overflow means disposed in the top portion of said flotation column including an outlet for discharging a froth fraction of the slurry;

e) a plurality of vertically spaced tail ports disposed alternately on opposite sides of the central portion of said flotation column for discharging a non-float fraction of the slurry; and

f) a single, fluid-impermeable baffle having at least two edges associated with each tail port, each of said baffles being angled upwardly with one edge of the baffle affixed to the outer wall of said flotation column below said tail port and the other edge of the baffle disposed within the area of vertical flow in the central portion of said flotation column, said baffles being of sufficient size to block the vertical flow in at least 50% of the horizontal cross-sectional area of said flotation column to thereby create a quiescent flow zone in the area of each tail port.

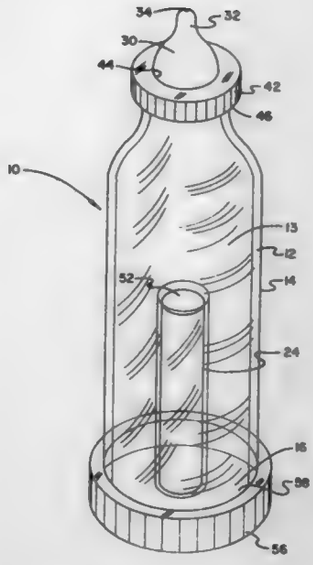
5,467,877

BABY BOTTLE WITH RECESSED BOTTOM FOR THE REMOVABLE RECEIPT OF A COLD SUBSTANCE

Thomas C. Smith, 3815 Cottonwood, Longview, Wash. 98632

Filed Jun. 14, 1994, Ser. No. 260,241
Int. Cl.[6] F25D 3/08
U.S. Cl. 215—11.1 1 Claim

1. A new and improved baby bottle with a recessed bottom for the removable receipt of a cold substance comprising, in combination:



a baby bottle having a one piece main body portion with a side wall with concentric interior and exterior surfaces and having a cylindrical cross-sectional configuration over the majority of its extent, the main body portion having a closed lower end forming a base with a flat surface perpendicular to the axis of the side wall and with an open upper end of a reduced diameter, with screw threads formed exteriorly adjacent to the open upper end;

a cylindrical extension formed within the interior of the bottle between the side walls from the central portion of the base, the extension extending for about fifty percent of the length of the bottle;

screw threads formed in the exterior surface of the main body portion adjacent to the lower end thereof, the screw threads adjacent to the lower end being of a greater diameter than the screw threads adjacent to the upper end;

a nipple with a hole at its upper end and a radially extending flange at its lower end;

a nipple cap formed with a circular aperture for the passage therethrough of the nipple and a downwardly extending flange with internal threads to removably couple the nipple and cap to the upper end of the bottle during use;

a cylindrical insert of a cold frozen material positionable within the recess, the insert being of a length essentially the same as that of the recess with a diameter slightly less than the interior diameter of the recess; and

a separate imperforate cap with a planar central circular portion and an upstanding peripheral wall with internal threads adapted to mate with the external threads at the lower end of the main body portion to preclude inadvertent removal of the insert material from the recess and to present a smooth continuous closed lower surface for the safety of a baby handling the baby bottle.

5,467,878

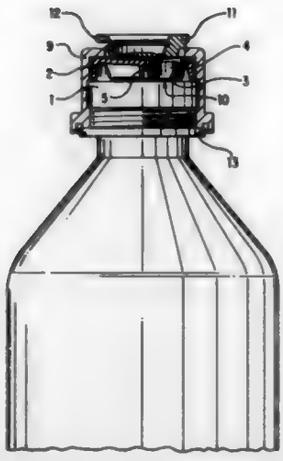
CLOSURE FOR AN INJECTION BOTTLE

Klaus Derksen, Karlsbad-Ittersbach, Germany, assignor to Firma Carl Freudenberg, Weinheim, Germany

Filed Nov. 17, 1993, Ser. No. 153,727
Claims priority, application Germany, Nov. 17, 1992, 42 38 682.9
Int. Cl.[6] B65D 39/00
U.S. Cl. 215—253 5 Claims

1. A closure for an injection bottle comprising:

an insert part for covering the mouth of a bottle and having at least one hole for permitting insertion of a syringe;



a cylindrical section having an inside diameter and an inner circumferential surface for allowing sealed insertion of the syringe, and having a top section end and a bottom section end;

an intermediate ring having a top ring end, a bottom ring end and a main part extending between the top ring end and bottom ring end, the top ring end connected to the insert part at the hole and the bottom ring end connected to the bottom section end; the main part of the intermediate ring spaced apart from the cylindrical section; and

a closure cap for sealing the bottle in a liquid-type manner and for attaching the insert part to the injection bottle, the closure cap having a tear off-part for permitting access to the insert part.

5,467,879

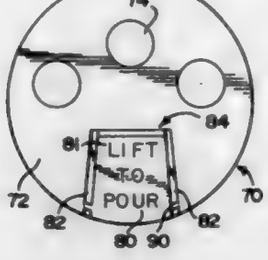
LINERLESS CLOSURE AND FITMENT ASSEMBLY

David N. Moore, 23144 W. Lee St., Plainfield, Ill. 60544

Filed Dec. 1, 1993, Ser. No. 160,572

Int. Cl.[6] B65D *51/20;41/62*

U.S. Cl. 215—253 **4 Claims**



4. A fitment to be used with a closure and a container for holding desired contents having a neck with a lip at an uppermost end of the neck defining a mouth; said fitment spanning the mouth and comprising:

an upper dispensing surface, a bottom-surface, and a pouring means;

said pouring means comprising a door; said door having an upper surface and a lower surface and being pivotally connected to said dispensing surface for movement from a closed position to an open position; said door initially secured in said closed position by a strut, said strut having an upper surface and a lower surface, the upper surface of said strut being co-planar with the Upper surface of the door and with the upper dispensing surface of the fitment, the lower surface of said strut being co-planar with the lower surface of the door and with the bottom surface of the fitment, for making a seal with said closure and a seal with said lip, whereby when the closure is in place, said closure prohibits the sifting of the contents from said container.

5,467,880

TAMPER-REVEALING SCREW-CAP FOR A CONTAINER

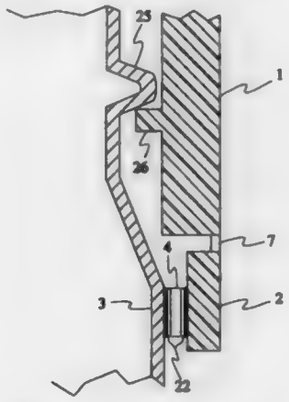
Makoto Etoh, and Kiyoshi Kawaguchi, both of Kanagawa, Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Feb. 1, 1994, Ser. No. 189,934

Claims priority, application Japan, Jan. 27, 1993, 5-302152

Int. Cl.[6] B65D *41/34*

U.S. Cl. 215—256 **23 Claims**



1. A tamper-revealing container, comprising:

a screw cap having first threads;

a container body having a wall and a mouth;

said mouth having second threads shaped to thread with said first threads;

said screw cap being threadable on said container body;

an annular band attached to a lower end of said screw cap;

a fixing element;

means for attaching said fixing element to said annular band;

said fixing element, with said annular band attached thereto, surrounding, at least partly, said container body;

means for resisting a rotation of said fixing element around said container body, said means for resisting being separate from said attaching means;

said means for resisting having a shear strength characterized by a first torque;

said first torque being a first force applied to said fixing element to defeat said means for resisting;

means for permitting peeling said annular band and said fixing element from said screw cap and said wall; a second force required peeling said band; and said first force being greater than said second force.

5,467,881

METHOD OF MANUFACTURING AN MR READ HEAD WHICH ELIMINATES LEAD-TO-SHIELD SHORTS AT THE ABS OF THE MR READ HEAD

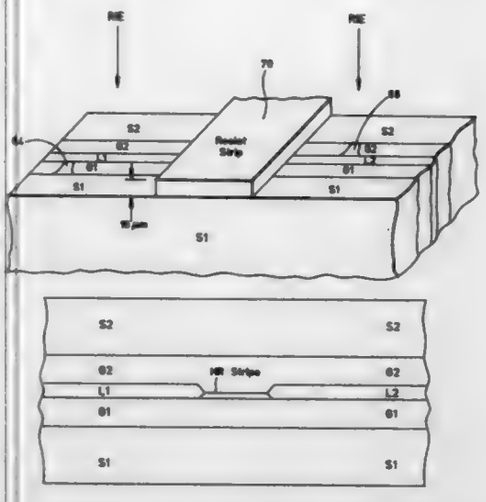
Hardayal S. Gill, Portola Valley, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1994, Ser. No. 267,269

Int. Cl.[6] B44C *1/22*

U.S. Cl. 216—22 **13 Claims**

1. A method of eliminating lead to shield shorts at the air bearing surface (ABS) of a magnetoresistive (MR) read head where the MR read head includes an MR stripe and a pair of conductive leads sandwiched between first and second insulative gap layers, the first and second insulative gap layers being sandwiched between first and second conductive shield layers, each of the MR stripe, the pair of conductive leads, the first and second insulative gap layers,



the first and second conductive shield layers having an edge surface at the ABS of the MR read head, the pair of leads being connected to the MR stripe at opposite ends of the surface edge of the MR stripe, the method comprising the step of:

etching the edge surfaces of the first and second insulative gap layers to remove conductive material between the pair of leads and the first and second conductive shields layers; and

during the step of etching, protecting the edge surface of the MR stripe from being etched.

5,467,882

SIGNAL LINE STRUCTURE FOR A TFT-LCD AND METHOD FOR FABRICATING THE SAME

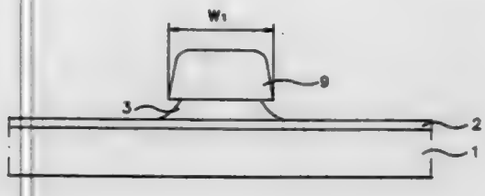
Byung C. Ahn, Kyungki-do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 29, 1993, Ser. No. 145,772

Claims priority, application Rep. of Korea, Nov. 7, 1992, 20859/1992

Int. Cl.[6] C30B *33/00*

U.S. Cl. 216—23 **6 Claims**



1. A method for fabricating a signal line for TFT-LCD, comprising the steps of:

forming a first metal and a second metal, in this order, on a glass substrate;

defining the width (W_1) of said second metal and subsequently, applying an etching process to said second metal;

depositing a third metal entirely on the resulting structure and defining the width (W_2) of the signal line so as to simultaneously remove the unnecessary portions of said first metal and said third metal.

5,467,883

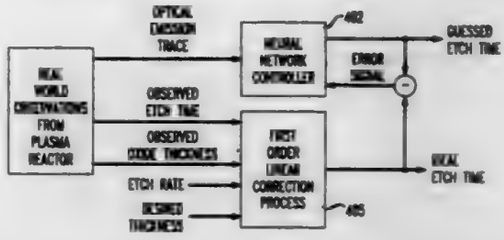
ACTIVE NEURAL NETWORK CONTROL OF WAFER ATTRIBUTES IN A PLASMA ETCH PROCESS

Robert C. Frye, Piscataway; Thomas R. Harry, Trenton; Earl R. Lory, Pennington, and Edward A. Rietman, Madison, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation-in-part of Ser. No. 990,308, Dec. 14, 1992, abandoned. This application Nov. 27, 1993, Ser. No. 150,261

Int. Cl.[6] H05H *1/00*; **G01N** *21/00*

U.S. Cl. 216—60 **20 Claims**



1. A method for using a neural network to control a set of one or more variables in a process to yield a product resulting from said process, said product characterized by a set of one or more quality attributes, said method comprising the steps of:

a. measuring a set of one or more process signatures during said process to form a record of said process signatures reflected by a relation between said set of one or more quality attributes and said set of one or more variables;

b. providing data from said record to said neural network; and

c. using said neural network to control said set of one or more variables in said process to yield said product resulting from said process based on said data.

5,467,884

METAL CONTAINER FOR TRANSPORT AND STORAGE OF LIQUIDS

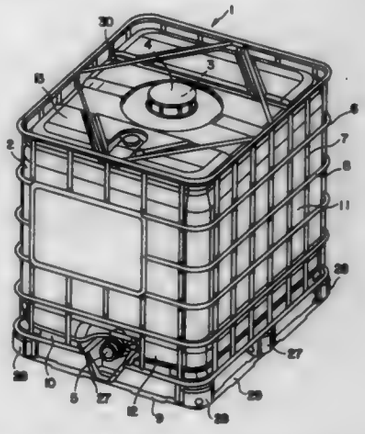
udo Schutz, Selters, Germany, assignor to Schutz-Werke GmbH & Co. KG, Selters, Germany

Filed Dec. 5, 1994, Ser. No. 353,350

Claims priority, application Germany, Dec. 4, 1993, 43 41 338.2

Int. Cl.[6] B65D *19/00*

U.S. Cl. 220—1.5 **9 Claims**



1. A metal container (1) for transport and storage of liquids with a sealable fill opening (3) and a discharge and flush opening for connection to a discharge fitting, the container (1) being welded together to comprise a unitary assembly of a jacket (11), a bottom part (12) with a drainage bottom (16) and a cover (13) of sheet metal, the container standing in a flat bottom pan (10) of sheet metal formed as a pallet (9), the bottom pan (10) matching in shape

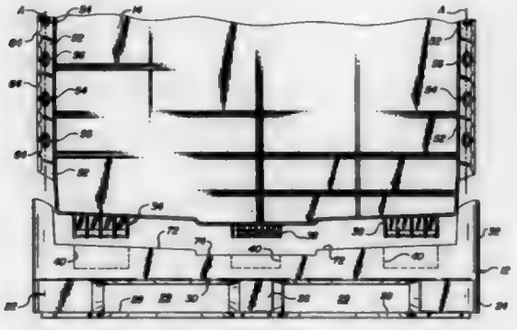
the drainage bottom (**16**) of the container (**1**) and having reinforcing beads (**20***a*, **20***b*) with bases (**21**) which lie in a common horizontal plane (**22—22**) and which form chambers (**23**) opening downwardly, the flat bottom pan (**10**) having an outer support edge (**19**) extending downwardly which forms a hollow support collar (**24**), and the bottom pan (**10**) being attached to an underlying pallet frame (**29**).

5,467,885

COLLAPSIBLE MATERIAL HANDLING CONTAINER

Robert M. Blinstrub, 1783 Lexington Dr., Troy, Mich. 48084

Filed Nov. 29, 1993, Ser. No. 158,755
Int. Cl.[6] B65D *6/18*
U.S. Cl. 220—6 **5 Claims**



1. A collapsible container (**10**) comprising;

a base (**12**) having a plurality of sides (**30**, **32**), a pair of opposed sidewalls (**14**) having hinges (**34**) connecting said sidewalls (**14**) to said base (**12**), said hinges (**34**) defining a pair of hinge axes (**68**) disposed in a common horizontal plane, and a pair of opposed end walls (**16**) having hinges (**36**) connecting said end walls (**16**) to said base (**12**), said hinges (**36**) defining a pair of hinge axes (**70**) disposed on a common horizontal plane, said walls (**14**, **16**) rotatably moveable about their respective hinge axes (**68**, **70**) between a collapsed position wherein said walls (**14**, **16**) are folded one on top of the other and an upright position wherein said walls (**14**, **16**) extend vertically upward from said base (**12**) to define an interior (**18**) of the container (**10**);

said base sides (**30**) for said opposed sidewalls (**14**) defining a pair of ramping surfaces (**72**) disposed at oppositely opening acute angles with said hinge axes (**68**) for said sidewalls (**14**) for supporting at least one of said opposed end walls (**16**) along said ramping surfaces (**72**) at an angle to the horizontal when said end wall (**16**) is in its collapsed position.

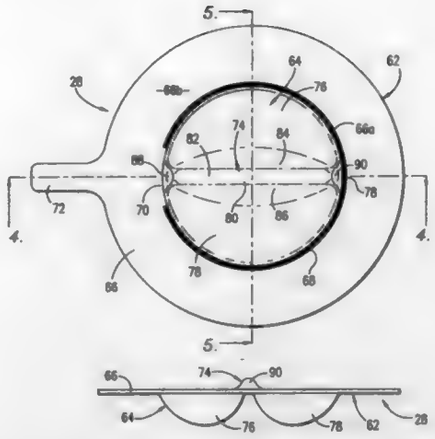
5,467,886

LOW BURST PRESSURE, MULTIPLE DOMED, SCORED RUPTURE DISC

James O. Hinrichs, Odessa, Mo., assignor to Fike Corporation, Blue Springs, Mo.

Filed Nov. 14, 1994, Ser. No. 337,866
Int. Cl.[6] B65D *25/00*
U.S. Cl. 220—89.2 **16 Claims**

1. In a multiple-dome, scored rupture disc having a non-apertured disc body provided with a generally circular, central region, an outer relatively flat annular section having an inner edge surrounding and joined to the central region, and an arcuate line of weakness in the annular section in generally circumscribing relationship to the central region except for a non-scored hinge portion, and wherein the central region is divided into separate, side-by-side, semi-circular, concavo-convex bulges extending outwardly in one direction from the annular section of the body, the improvement comprising:



a diametrical ridge extending across the central region of the disc body between opposed portions of the inner edge of the annular section thereof and dividing the central region into said separate bulges, said diametrical ridge having an outer margin spaced outwardly from a plane through the adjacent face of the annular section of the disc body in a direction opposite said one direction and presenting upright end segments at each end of the ridge,

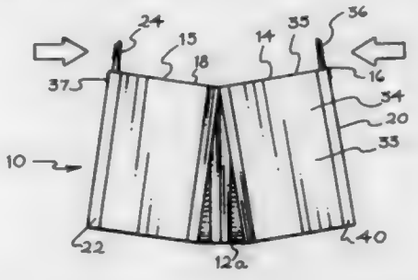
the distance between said outer margin of the ridge and said plane through the annular section of the disc body in a direction perpendicular to said plane being from about 0.3% to about 3% of the diameter of said central region of the body.

5,467,887

EXPANDABLE END CLOSURE FOR RECLOSABLE PACKAGE

Edmund A. Weaver, Racine, Wis., assignor to Kraft Foods, Inc., Northfield, Ill.

Filed Aug. 5, 1994, Ser. No. 286,750
Int. Cl.[6] B65D *51/28*
U.S. Cl. 220—212 **8 Claims**



1. An end closure for reclosable food packages, said end closure having an open position facilitating application of said end closure to said packages and removal therefrom, and a closed position permitting said end closure to fit snugly on said packages, said end closure comprising:

a substantially rectangular end wall having an inner surface and an outer surface, said end wall having a pair of opposing longitudinal edges and a pair of opposing transverse edges;

a pair of longitudinal side walls having inner and outer surfaces, each of said longitudinal side walls extending substantially perpendicularly to said end wall along one of said longitudinal edges; and

a pair of transverse side walls having inner and outer surfaces, each of said transverse side walls extending substantially perpendicularly to said end wall along one of said transverse edges;

said transverse side walls adjoining said longitudinal side walls;

said transverse side walls having expansion joints to permit planar expansion of said transverse side walls and corresponding relative displacement between said longitudinal side walls, thus permitting said end closure to move between said open position and said closed position;

a pair of tabs extending substantially perpendicularly from said end wall to facilitate the application of said end closure to said package by effecting planar expansion of said transverse side walls and corresponding relative displacement of said longitudinal side walls to move said end closure from said closed position to said open position in response to manual relative compression of said tabs, wherein said tabs have a plurality of parallel ridges on the surface thereof for facilitating the application of manual relative compression of said tabs.

5,467,888

AUXILIARY DEVICE FOR SEALING CANS FOR BEVERAGES

Paul Brändström, and Runo Nord, both of Söderhamn, Sweden, assignors to Paul & Martha Brandstrom AB, Sweden

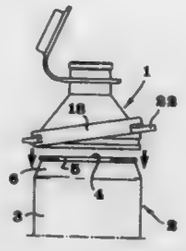
PCT No. PCT/SE93/00884, § 371 Date Mar. 16, 1994, § 102(e) Date Mar. 16, 1994, PCT Pub. No. WO94/13545, PCT Pub. Date Jun. 23, 1994

PCT Filed Oct. 27, 1990, Ser. No. 196,217

Claims priority, application Sweden, Dec. 11, 1992, 9203725

Int. Cl.[6] B65D *25/48;45/32*

U.S. Cl. 220—319 **9 Claims**



1. Auxiliary device suitable for sealing cans for beverages having on an end wall a disposable opener mechanism, the auxiliary device including a tubular element tapering from a comparatively wide collar to a narrower spout portion and which, adjacent the collar, includes means for snapping the auxiliary device onto the opening end of the can, said spout portion, including means for permitting both closing and opening of said spout portion as desired, characterized in that a locking ring cooperates with said collar for clamping the collar to said end wall, the locking ring being connected to the auxiliary device by a connection comprising a tongue projecting from the outside of said collar and a slot formed in the locking ring and into which said tongue engages, the connection permitting pivoting of the ring between locking and unlocking positions.

5,467,889

NESTABLE ELASTIC FUEL TANK AND METHOD FOR MAKING SAME

Larry J. Ashton, Mapleton; Michael G. Allman, Spanish Fork, and Benko Ta-Ala, Provo, all of Utah, assignors to AeroTrans, Salt Lake City, Utah

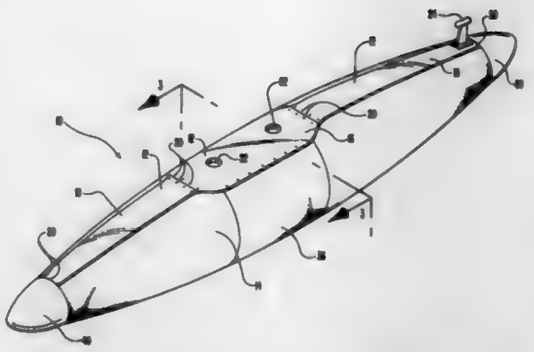
Filed Jul. 12, 1994, Ser. No. 273,658

Int. Cl.[6] B65D *88/24*

U.S. Cl. 220—562 **21 Claims**

1. A fuel tank for an aircraft, said fuel tank comprising:

a rigid securement configured and disposed for securing said fuel tank to the aircraft; and



a skin connected to said securement, said skin and said securement substantially defining a fuel chamber for containing fuel, said skin comprising an elastic fiber and a tensile fiber embedded in a flexible matrix, said skin deformable between a filled position and an empty position, such that when in said filled position said elastic fiber is lengthened in response to the placement of fuel in said chamber and said tensile fiber resists further lengthening of said elastic fiber, and when in said empty position said elastic fiber is contracted thereby substantially reducing the volume of said chamber relative to said filled position.

5,467,890

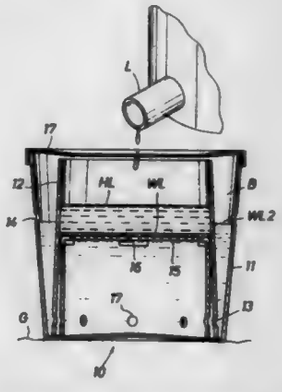
CONTAINER FOR COLLECTING LEAKING HYDROCARBONS

Geary W. Hussey, Stafford, Tex., assignor to B. Ann Hough, San Antonion, Tex.

Filed May 4, 1994, Ser. No. 237,652

Int. Cl.[6] B65D *81/00*

U.S. Cl. 220—571 **4 Claims**



1. For use in collecting hydrocarbons from a leaking source,

a container adapted to be disposed in an upright position and having an outer wall and an inner wall dividing the container into first and second side-by-side sections,

the upper end of the first section being open to receive such hydrocarbons when arranged beneath the leaking source,

said inner wall having first openings connecting the lower ends of the first and second sections of the container,

said outer wall having second openings connecting the second section to the outside of the container intermediate its upper and lower ends, whereby, upon priming of the container with water, additional water entering the first section will flow by gravity through the first openings into the second section and through the second openings out of the container, and being otherwise imperforate whereby hydrocarbons are maintained at a level in said first section above the water therein and a generally horizontal wall extending across the first section at a level beneath the openings in the outer wall and having third

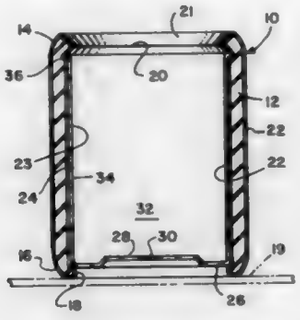
openings therein to permit hydrocarbons and water to flow therethrough and into and through the first openings into the second section.

5,467,891

BEVERAGE CONTAINER INSULATOR

Michael L. Perry, Wichita Falls, Tex., assignor to Robert S. Scheurer, Wichita Falls, Tex.

Filed Apr. 13, 1995, Ser. No. 421,397
Int. Cl.[6] B65D *23/08*
U.S. Cl. 220—739 **9 Claims**



1. A beverage container insulator comprising:

a generally cylindrical outer sleeve member formed of a flexible, resilient insulating plastic foam and having an opening edge at least at one end of the sleeve member;

an inner liner disposed in the sleeve member and substantially retained in the sleeve member by an interference fit between at least part of the liner and the sleeve member, respectively, the sleeve member extending beyond opposed ends of the liner and having inwardly curved top and bottom ends, respectively; and,

a coating layer of polymer plastic disposed on the sleeve member.

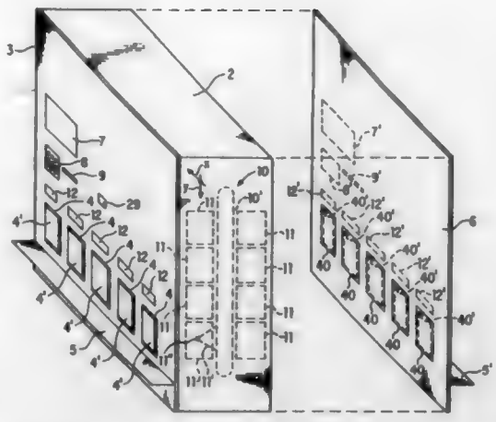
5,467,892

VENDING DEVICE

Hans Schlamp, Munich, Germany, assignor to Accumulata Verwaltungsgesellschaft GmbH, Munich, Germany

Division of Ser. No. 10,934, Jan. 29, 1993, Pat. No. 5,385,265. This application Sep. 9, 1994, Ser. No. 304,033
Claims priority, application Germany, Jan. 31, 1992, 42 02 801.9
Int. Cl.[6] G07F *11/00*
U.S. Cl. 221—7 **8 Claims**

1. Vending system with a number of compartments that serve as receptacles for goods, comprising a computing unit with a memory, at least one display unit and at least one input device is provided, whereby at least one compartment is assigned to a merchant by the computing unit to load at least one compartment after the merchant has entered his identifying merchant code into the input device, and whereby the computing unit makes the withdrawal of goods from the compartment loaded with goods possible by releasing a compartment after the customer has entered an identification code into the input device, the compartments are part of a storage unit that is provided with a transport device which can, under control of the computing unit, transport any compartment into the area of an opening that can be locked, or remove a container from any compartment and transport it into the area of an opening that can be locked, and the opening can be released by the computing unit in order to load at least one compartment with goods after the identification code of the merchant has been entered, and in order to withdraw goods from a compartment after the identification code of the customer has been entered;



the storage unit is provided with an endless conveyor belt as the transport device in which several rows of compartments arranged next to each other are arranged atop one another in such a way that the compartments of one row are aligned with the compartments of the row arranged on top of it, and the compartments can be transported in a elevator-like manner behind openings arranged next to each other in a wall of the storage unit in accordance with the distance between the compartments of one row;

openings are provided to load the compartment with goods and to withdraw goods from the compartments; and

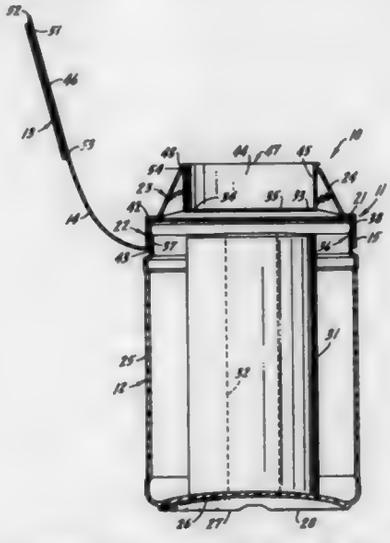
a display unit which can be controlled by the computing unit is assigned to each opening, and the display unit serves the purpose of displaying the compartment reserved for the customer during the withdrawal from it or to display an empty compartment reserved for the merchant during the loading process.

5,467,893

STORAGE AND DISPENSING CANISTER FOR MOIST CLOTH

Henry J. Landis, II, and Russel J. Landis, both of Chicago Ridge, Ill., assignors to Sanford Corporation, Bellwood, Ill.

Filed Apr. 13, 1994, Ser. No. 226,960
Int. Cl.[6] B65H *1/00*
U.S. Cl. 221—34 **4 Claims**



1. A combination container and towelette assembly with moisture-retaining freshness seal for the storage and dispensing of moist towelettes, the assembly comprising:

an injection molded plastic cylindrical container for accommodating a cylindrical roll of towelettes inside the container, the container including a bottom, a sidewall and an open top portion, the top portion including an outwardly projecting collar, the sidewall of the container having an inside diameter that is substantially wider than the diameter of the roll of the towelettes,

a removable factory-installed moisture-retaining freshness seal disposed on the open top portion of the container for sealing the roll of towelettes inside the container and protecting the towelettes from exposure to the atmosphere,

an injection molded plastic cap for matably engaging and sealing the top portion of the container, the cap including

a lower closure portion including an inwardly projecting collar, the inwardly projecting collar of the lower closure portion of the cap being disposed below the outwardly projecting collar of the top portion of the container when the cap is matably engaged over the top portion of the container,

the cap also including an upper closure portion disposed above the lower closure portion, a flexible web disposed between the upper closure portion and the lower closure portion, an open top and a top closure member,

the upper closure portion including an interior sidewall extending from the flexible web upward to the open top, the interior sidewall having a diameter at least as wide as the diameter of the roll of towelettes, the top closure member for matably engaging the open top of the upper closure portion,

the web including a first slit and a second slit that intersect one another for passing towelettes through the web, the first and second slits enabling towelettes to be passed from the container through the web to the upper closure portion by the consumer,

an area bound by the top closure member, the interior sidewall of the upper closure portion and the flexible web providing an area sufficiently large enough for the storage of a plurality of partially used towelettes,

the strap attaching the top closure member to the cap, the strap forming a loop when the top closure member is matably engaged with the open top of the cap, manual tension applied to the strap adjacent to a first point where the strap is connected to the cap enabling the inwardly projecting collar of the lower closure portion of the cap to be pulled over the outwardly projecting collar of the top portion of the container thereby removing the cap from the container.

5,467,894

INTERLEAVING DISPENSER FOR DISPENSING OBJECTS STACKED WITHIN A PACKAGE

Gene M. Altonen, West Chester, and G. Scott Kerr, Mason, both of Ohio, assignors to The Proctor Gamble Company, Cincinnati, Ohio

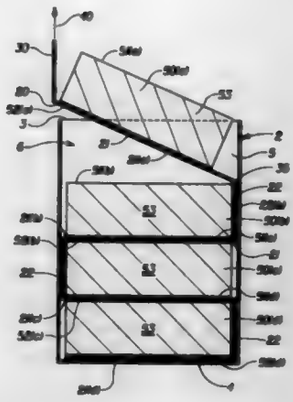
Filed Jun. 1, 1994, Ser. No. 251,867
Int. Cl.[6] B65H *5/28;* **G07F** *11/68*
U.S. Cl. 221—71 **16 Claims**

1. A dispensing package containing a plurality of objects, said objects being three-dimensional having a pair of substantially opposing faces connected by peripheral edges, said package comprising:

(a) a container comprising a top, a bottom and a body joined to said top and said bottom

so as to form an interior chamber containing said objects, said objects being stacked within the container in face to face relation, with said body surrounding said peripheral edges of said objects, said stacked objects thereby defining an uppermost object adjacent to said top of said container and a lowermost object adjacent to said bottom of said container; and

(b) an interleaving dispenser comprising a bendable member having alternating horizontal and vertical panels connected to each other along lines of weakness, said member being disposed within said package with said horizontal panels substantially parallel to said top and bottom of said container, one



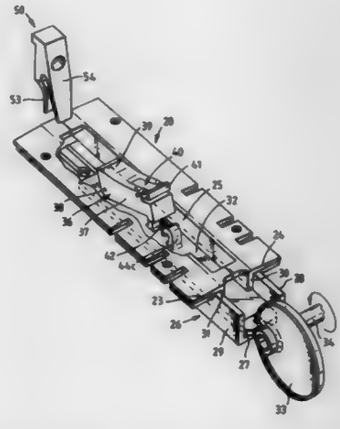
of said horizontal panels being inserted between each adjacent set of abutting objects along their faces and one horizontal panel being inserted between said bottom of said container and a face of said lowermost object adjacent to said bottom of said container, said member further including a means, adjacent said top of said container, for pulling said member away from said top of said container such that said horizontal panels of said member are lifted towards said top, thereby dispensing said objects from said package.

5,467,895

TICKET DISPENSING MACHINE

Man K. Fung, Brisbane, Australia, assignor to TDM Pty Ltd, Queensland, Australia

Filed Nov. 7, 1994, Ser. No. 336,665
Int. Cl.[6] B65G *59/06*
U.S. Cl. 221—259 **13 Claims**



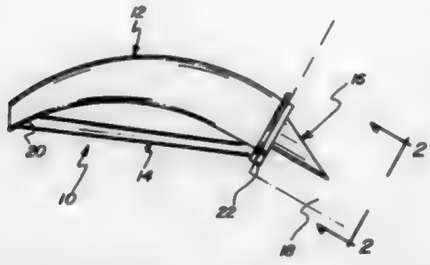
1. A device for pushing a lowermost ticket in a vertical column of tickets located in a ticket dispensing machine, the device having a main body adapted to be pivotally mounted adjacent a forward portion to a reciprocating arm member, the main body having an upper surface adapted to contact or be closely spaced from the under side of the lowermost ticket, a rocker arm pivotally attached to a rear position of a main body and having a portion which can engage with the rear edge of the lowermost ticket, the main body adapted to be biased against the lowermost ticket in use.

5,467,896

NO DRIP POUR SPOUT

Lyle W. Hols, 8800 Topanga Canyon, Apartment 8, Chatsworth, Calif. 91304

Filed Apr. 25, 1994, Ser. No. 231,925
Int. Cl.[6] B67D 5/00
U.S. Cl. 222—83 4 Claims



1. A new and improved no drip pour spout for preventing loss of liquids during pouring from a container wherein said container is a can having a substantially planar lid comprising:

a tapering curved tubular spout member having a larger end thereof affixed to a first major side of a multiply perforated platelike interface member wherein a large perforation is disposed in substantial alignment with a bore of said larger end of the spout member and a smaller end thereof opens freely and having a small aperture disposed a short distance from a free end,

a curved lip member affixed to a second major side of the multiply perforated platelike interface member wherein said second major side is an outer surface opposing said first major side and a small perforation is disposed between the lip member and the bore of said larger end of the spout member,

a lid penetration means which penetrably engaged the lid and directs fluid within the container to the large perforation of the multiply perforated interface member, and

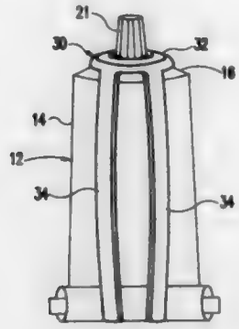
a liquid recovery conduit interconnecting said small perforation in said multiply perforated interface member and said small aperture in said spout member.

5,467,897

RESILIENT COLLAPSIBLE TUBE WITH DEVICE FOR PREVENTING TUBE UNROLLING

David E. Williams, P.O. Box 60627, San Diego, Calif. 92166

Filed Apr. 24, 1995, Ser. No. 427,251
Int. Cl.[6] B65D 35/08
U.S. Cl. 222—107 9 Claims



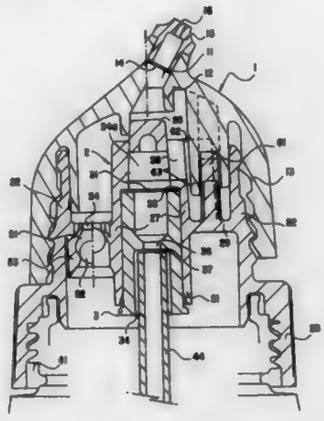
1. In combination, a resilient collapsible tube having a closed first end and a second end defining a dispensing spout, said tube having a longitudinal direction extending between said first and second ends, said tube being collapsible to progressively collapsed positions, and means for retaining the tube in said progressively collapsed positions, said retaining means comprising at least one elastic loop in tension extending around both of said ends of the tube.

5,467,898

LIQUID FOAM-DISCHARGING, SQUEEZABLE VESSEL

Nobuaki Hori, Yokohama, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Continuation of Ser. No. 56,879, May 5, 1993, abandoned.
This application Oct. 27, 1994, Ser. No. 329,790
Int. Cl.[6] B05B 11/04
U.S. Cl. 222—190 4 Claims



1. A liquid foam-discharging squeezable vessel, comprising a squeezable vessel body; and a twist cap screwed onto the body,

wherein said twist cap comprises an outer cap and an inner cap, said inner cap being screwed onto the neck of the vessel body by a screw portion extending downwardly formed inside the periphery of said inner cap, two independent fluid-passing mechanisms being provided at about a center portion of said vessel and at a position adjacent to the center portion within the inner cap, one of said fluid-passing mechanisms being a pipe-shaped member functioning as a check valve mechanism which contains therein a vertically movable ball, wherein said pipe-shaped member has an upper opening and is capable of coming into continuous contact with said ball, wherein said pipe-shaped member further has a lower opening and is capable of coming into point-to-point contact with said ball, the other fluid-passing mechanism being another inserted pipe-shaped portion having an opening fully covered by a net screen and further having a mixing chamber formed therein, and the outer cap having a nozzle fully covered with another net screen on one end located nearer to the contents of the vessel, wherein said pipe-shaped portion includes grooves at a lower portion thereof and away from said net screens for passing therethrough air for mixing with liquid in a mixing chamber to form foam, said grooves directly abutting a narrow opening which in turn directly abuts a central portion of said mixing chamber.

5,467,899

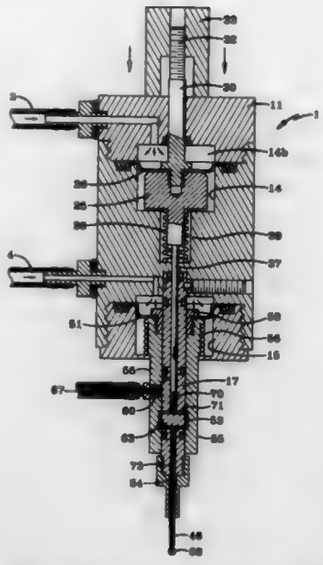
DISPENSING DEVICE FOR FLOWABLE MATERIALS

Kenneth L. Miller, Indianapolis, Ind., assignor to Liquid Control Corporation, North Canton, Ohio

Filed Feb. 8, 1994, Ser. No. 193,432
Int. Cl.[6] B67D 5/46; G01F 11/06
U.S. Cl. 222—309 23 Claims

1. A dispenser for dispensing a predetermined amount of a flowable material from a supply of said material including:

a housing formed with a material receive chamber and a separate material dispense chamber, said receive chamber having a



material inlet opening and said dispense chamber having a material outlet opening;

first means movable between first and second positions for selectively providing material communication between said material receive and dispense chambers, said first means permitting the flow of material between the material receive and dispense chambers and for trapping said material in said receive chamber by blocking the material inlet opening when in the first position, and for preventing communication between said receive and dispense chambers and for unblocking the material inlet opening when in the second position to permit the flow of material into the receive chamber, and for blocking the material inlet opening before providing communication between the receive and dispense chambers when moving between the second and first positions;

second means for forcing a predetermined amount of material out of the receive chamber and into the dispense chamber and subsequently out of the material outlet opening when said first means is in the first position wherein the receive chamber is in communication with the dispense chamber and the material inlet opening is blocked; and

third means for selectively moving the first means between the first and second positions.

5,467,900

PRECOMPRESSION VALVE FOR TRIGGER SPRAYER

Wilhelmus J. J. Maas, and Petrus L. W. Hurkmans, both of Someren, Netherlands, assignors to AFA Products, Inc., Forest City, N.C.

Filed Mar. 16, 1994, Ser. No. 214,950

Int. Cl.[6] G01F *11/36*

U.S. Cl. 222—341 **38 Claims**

1. A trigger sprayer comprising:

a body having a cylinder therein;

liquid inlet means in communication with said cylinder;

an outlet waterway in communication with said cylinder;

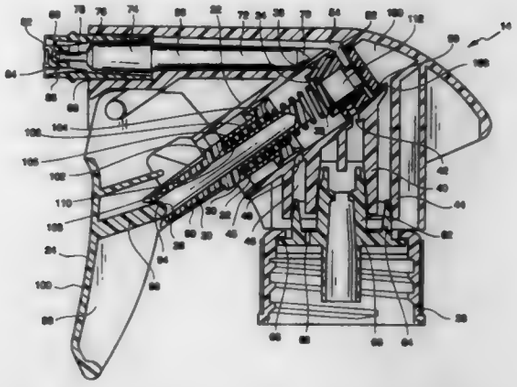
outlet nozzle means including a nozzle which has an outlet orifice and which is movable to and from a position in communication with said waterway;

a piston having an inner end and an outer end and being received in said cylinder;

a trigger operatively coupled to said body and acting on said outer end of said piston;

precompression valve means in a fluid path between said piston and said outlet orifice;

said precompression valve means being operable to allow liquid in a first part of said fluid path to reach said outlet orifice only after a predetermined pressure is established in said cylinder and to stop liquid from reaching said outlet orifice when the pressure in said cylinder falls below said predetermined pressure;



said precompression valve means comprising a valve body in said fluid path and having passage means, including a space, communicating between said piston and said outlet orifice, and comprising a spring valve element in said space whereby, when pressure is built up in said passage means upon movement of said piston into said cylinder, said spring valve element is caused to flex allowing liquid under pressure to escape past said spring valve element into a second part of said fluid path and out said outlet orifice in said nozzle; and,

biasing means for biasing said piston away from said precompression valve means.

5,467,901

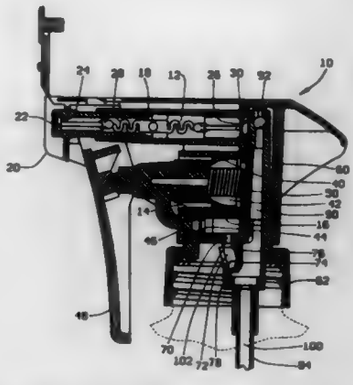
TRIGGER SPRAYER OPERABLE IN UPRIGHT, DOWNTURNED & INVERTED POSITIONS

Donald D. Foster, St. Charles, and Philip L. Nelson, Ellisville, both of Mo., assignors to Contico International, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 242,281, May 13, 1994. This application Oct. 21, 1994, Ser. No. 327,181

Int. Cl.[6] B67D *5/42*

U.S. Cl. 222—376 **20 Claims**



1. A spray dispenser for dispensing a liquid from a container in an upright orientation, an inverted orientation and a downturned orientation of the dispenser, the spray dispenser comprising:

a housing having an orifice through which the liquid is dispensed and having means for attaching the housing to the liquid container;

means in the housing for pumping liquid from the container and dispensing the liquid through the orifice when the spray dispenser is in both the upright orientation and the downturned orientation;

a vent passage in the housing extending between an interior of the container and an exterior environment of the container and housing for venting the container to the exterior environment; and

means in the housing for preventing the liquid in the container from flowing through the vent passage when the spray dispenser is in the downturned orientation and the means for pumping and dispensing the liquid is dispensing the liquid through the orifice.

5,467,902

AEROSOL DEVICE FOR DISPENSING A COMPOSITION WITH RELATIVELY HIGH VISCOSITY

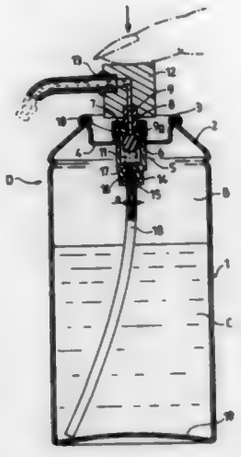
Jean-Pierre Yquel, Colombes, France, assignor to L'Oreal, Paris, France

Filed May 6, 1994, Ser. No. 232,263

Claims priority, application France, Dec. 2, 1991, 91 14915

Int. Cl.[6] B65D *83/00*

U.S. Cl. 222—402.1 **5 Claims**



1. Aerosol device for dispensing a composition with relatively high viscosity, in particular a gel or an emulsion, comprising a can intended to be used with the head upwards, containing the composition and a pressurized gaseous propellant agent acting directly on the composition, a dispensing valve being placed at the upper part of the can on an opening of this can, while a dip-tube connected to the valve extends as far as the vicinity of the bottom of the can, characterized in that the composition (C) to be dispensed has a viscosity (measured on a Brookfield DV III viscometer, needle no. 7) lying in the range of 4000 to 10,000 millipascal.second, preferably of 6000 to 8000 millipascal.second, for a speed of 100 revolutions/minute and of 30,000 to 150,000 millipascal.second, preferably of 50,000 to 120,000 millipascal.second, for a speed of 2.5 revolutions/minute, and in that the dip-tube consists of a semi-capillary tube (18) whose internal diameter (e) lies between 0.7 and 1.5 mm.

5,467,903

APPARATUS FOR DISPENSING MEASURED AMOUNTS OF GRANULAR PRODUCT

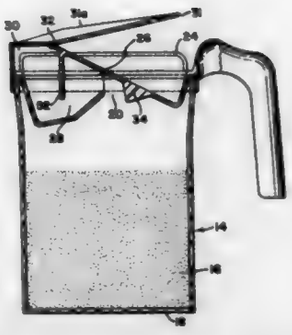
Gerald R. Sorensen, Elgin, and Raymond J. Gradecki, Mundelein, both of Ill., assignors to NCM International, Inc., Arlington Heights, Ill.

Filed Apr. 20, 1994, Ser. No. 230,309

Int. Cl.[5] G01F *11/26*

U.S. Cl. 222—455 **8 Claims**

6. An apparatus for dispensing a measured amount of granular product, said apparatus comprising:



a container having an open end, wherein said open end is upwardly oriented when said container is in an upward position and said open end is downwardly oriented when said container is in an inverted position;

a dispenser covering said container open end, said dispenser including a first chamber, a second chamber and a spout, wherein product moves from said container to said first chamber when said container is rotated from said upward position to said inverted position, product moves from said first chamber to said second chamber when said container is subsequently rotated from said inverted position to said upward position, and product moves from said second chamber to exit said dispenser through said spout when said container is subsequently rotated from said upward position to said inverted position; and,

means for breaking lumps of said granular product prior to said granular product entering said first chamber, said lump breaking means comprising spaced planar projections extending downwardly from said dispenser.

5,467,904

REINFORCED CERAMIC TUBE

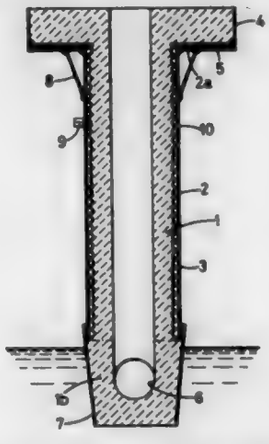
Richard D. Shaw, "Dunedin", High Elms Road, Down, Orpington, Kent BR6 7JN, United Kingdom

Filed Oct. 25, 1993, Ser. No. 140,482

Claims priority, application United Kingdom, Jan. 26, 1992, 9222453

Int. Cl.[6] B22D *41/58*

U.S. Cl. 222—603 **7 Claims**



1. A refractory article comprising an elongated tube of ceramic material, said tube having an outer surface, a metallic support sleeve having an interior surface directly connected to said outer surface along at least a portion of a length of said tube, the ceramic tube and the metallic support sleeve being keyed to one another to expand and contract together so that radial stability and structural integrity of said tube are maintained by said metallic support sleeve, and a tubular sleeve member positioned about and spaced

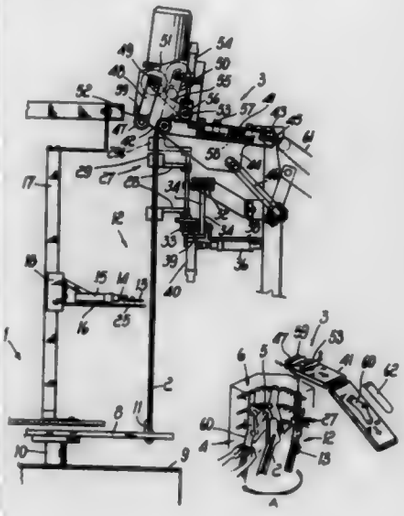
from said metallic support sleeve, said metallic support sleeve being provided with at least one aperture, a gas inlet nozzle secured within said tubular sleeve so that gas entering through said nozzle flows into the space about said metallic support sleeve and into said at least one aperture so as to enter and fill cracks formed in the ceramic tube .

5,467,905

REMOVAL DEVICE FOR MACHINES FOR CHECKING, DRYING AND PRESSING SOCKS

Carmelo A. Cortese, Via Porrettana 134/4, 40037 Sasso Marconi, Italy

Filed Oct. 17, 1994, Ser. No. 323,551
Claims priority, application Italy, Jan. 22, 1993, B093A0423
Int. Cl.[6] A47G *25/90*
U.S. Cl. 223—112 8 Claims



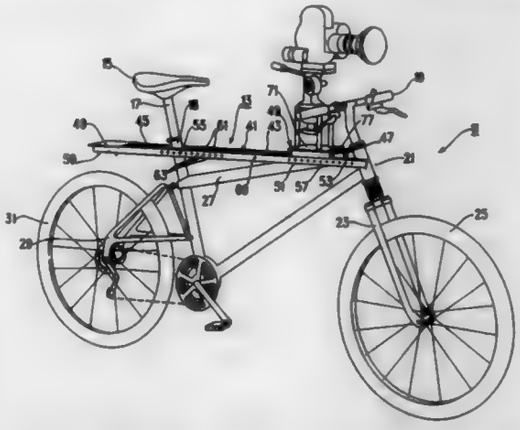
1. A removal device for machines for checking, drying and pressing socks, which comprises a carousel on the peripheral region whereof multiple shaped elements are distributed, respective socks being meant to be fitted on said shaped elements, said carousel being suitable to be moved stepwise at appropriate processing stations, wherein said device comprises, at a station for removing said socks from the corresponding shaped elements: a lifting tooth for entering a longitudinal slot of said shaped elements so as to act on the top of the sock and actuated by actuation means which act along an axis that lies horizontally and radially with respect to said carousel, said actuation means being slideably supported along a post that is rigidly coupled to a fixed frame of the machine and parallel to said shaped elements; means for gripping the top of said shaped elements and for lifting the end of the sock which have at least two arms that can oscillate on a horizontal plane, have a corresponding pad, and can be actuated so as to mutually open and close on supporting means which are meant for alternating vertical sliding; two rollers around which a removal belt winds, a conterrotating abutment roller supported at the end of an oscillating arm being suitable to cooperate with one of said rollers during removal; and a tube for delivering a flow of compressed air which lies above the region where said abutment roller acts and is suitable to direct the sock onto said removal belt.

5,467,906

CAMERA BICYCLE

Mark L. Forman, 300 W. 23rd St., New York, N.Y. 10011

Filed Aug. 17, 1992, Ser. No. 930,330
Int. Cl.[6] B62J *11/00*
U.S. Cl. 224—39 10 Claims



1. A camera mounting assembly for a bicycle having a front portion having a steering head and a rear portion having a seat post, a distance between said steering head and said seat post equal to a length, comprising:

an elongate supporting means having an elongation and having at least a central portion having a length at least equal to said distance between said steering head and said seat post;

support mounting means for fixedly mounting said elongate supporting means on said front portion of said bicycle and substantially horizontally on said bicycle between said steering head and said post seat, said elongate supporting means comprising a rear portion extending rearwardly from said seat post;

a camera mounting means for mounting a camera thereon; and

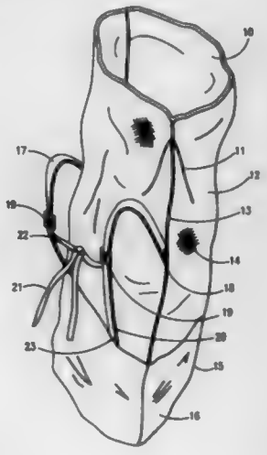
at least one connecting means for selectively securing said camera mounting means on a portion of said elongate supporting means in the direction of elongation of said elongate supporting means.

5,467,907

TURKEY TOTE

Richard J. Celik, R.R. #2 Box 259 Arch Bridge Rd., Ghent, N.Y. 12075

Filed Mar. 10, 1992, Ser. No. 848,917
Int. Cl.[6] A45F *3/04*; B65D *30/08*
U.S. Cl. 224—103 8 Claims



1. A hunter's personal safety gamepack comprising:

a) waterproof bottom section (16);

b) top section (12), made up of tick-interdicting mesh, securely fastened to bottom section (16);

c) closure means (11), arranged for selective closure of said top section (12); and

d) suspension system (17–23) securely affixed to said bottom section (16) and said top section (12);

whereby a substantial quantity of game may be safely carried without hands and without transfer of game body fluids or tick infestation from game to hunter in a vessel which affords concealment of its contents, providing personal safety to the hunter.

5,467,908

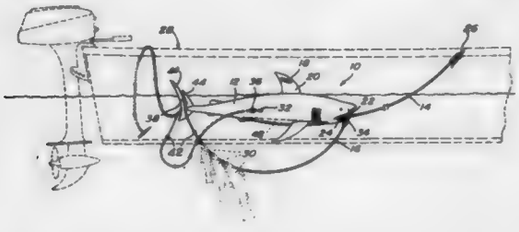
FLOATING FISH STRINGER

Stephane Coté, 1928 Bayonne, Terrebonne, Québec, Canada

Filed Nov. 16, 1994, Ser. No. 340,723

Int. Cl.[6] A01K *65/00*

U.S. Cl. 224—103 **10 Claims**



1. A fish stringer for underwater maintenance of live captured fish, said fish stringer comprising, in combination:

a buoyant element having a generally oblong shape and ballast in its underside,

a towing line secured at one end thereof to said buoyant element and to be releasably secured at the opposite end to a watercraft, an angler or a fixed object,

a fish stringing line secured at one end thereof to said buoyant element and having a needle element at the other end thereof for threading said fish stringing line through the gills and mouth of captured fish, said fish stringing line extending generally underwater below said buoyant element,

adjustment means for adjusting the operational length of said fish stringing line, said operational length consisting of the length of fish stringing line along which said captured fish may travel, said adjustment means comprising:

a narrow slot on said buoyant element,

a plurality of spaced apart protuberances on said fish stringing line, said protuberances being shaped and dimensioned to easily pass through the gills and mouth of captured fish, wherein said fish stringing line may be inserted crosswise and may be longitudinally slidable in said slot in a range of displacement corresponding to the space on said fish stringing line between successive protuberances, wherein said protuberances are larger than said slot and will prevent said fish stringing line from being be longitudinally slid past any of said protuberances;

wherein during use, as more fish are captured by an angler and threaded by the gills and mouth on said fish stringing line, the operational length of said fish stringing line may be readily adjusted by placing said fish stringing line crosswise in said slot between any chosen protuberances on said fish stringing line, whereby said protuberances will constitute operational length delimiters.

5,467,909

FIREARM HOLDING DEVICE

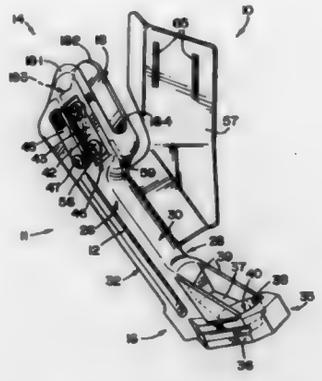
Franco Resca, 5 Wallace Street, Kilnerpark, Pretoria, and Enrico Cupido, 868 Honoria Street, Garsfontein, Pretoria both of, South Africa

Filed Jun. 7, 1994, Ser. No. 255,759

Claims priority, application South Africa, Jun. 8, 1993, 93/4035

Int. Cl.[6] F41C *33/02*

U.S. Cl. 224—244 **15 Claims**



1. A firearm holding device which includes

a principal support member comprising an elongate body having two ends and provided with a receiving formation at one end thereof for releasably receiving at least a portion of a trigger guard of the firearm, the body leaving the remainder of the firearm exposed;

automatically releasing retaining means on the principal support member, the retaining means operating to retain the firearm in the device when the firearm is positioned in the device, and automatically to release the firearm when it is withdrawn from the device;

a secondary support member spaced from the receiving formation, for supporting a portion of the firearm which is spaced forwardly of the trigger guard when the firearm is positioned in the device;

said secondary support member being a support bracket securable to the elongate body at graduated locations along the length of the elongate body, and on which the muzzle end of the firearm is supported in use; and,

connecting means secured to the principal support member, for connecting the principal support member to support means for the device.

5,467,910

LOAD CARRYING FRAME FOR VEHICLES

Donald H. Ritter, 2075 Wildwood Dr., Cedarburg, Wis. 53012, and Daniel S. Ritter, N. 70, W. 5528 Bridge, Cedarburg, Wis. 53012

Filed Jul. 29, 1994, Ser. No. 282,370

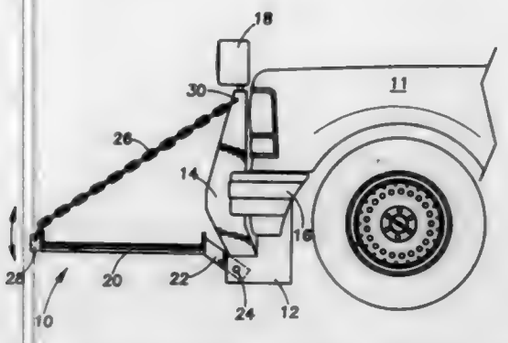
Int. Cl.[6] B60R *9/06*

U.S. Cl. 224—499 **2 Claims**

1. A load carrying platform for a vehicle equipped with a snow plow frame, said snow plow frame adapted to selectively support a snow plow blade therefrom and having an upper frame portion and a lower frame portion, said platform adapted to be selectively supported by said snow plow frame when said snow plow blade is not supported therefrom, said platform comprising:

a rectangular platform frame having a frame length equal to or less than the width of the vehicle and having a frame width less than the frame length;

arm means connected on a proximal side of the platform frame adapted to mate with connecting means located on the lower frame portion;



support means comprising chain links for connecting a distal side of the platform frame to the upper frame portion;

a plurality of frame supporting means connected in a spaced relation to an underside of the platform frame for supporting the platform frame;

said arm means being positioned on the proximal side of the platform frame such that said underside is in an elevated position relative to said connecting means, said arm means comprising aperture means, said connecting means comprising a pin means adapted to be inserted through said aperture means for connecting said platform frame in a hinged relation relative to said snow plow frame; and

a plurality of apertures spaced about the platform frame for receiving load strapping hooks.

5,467,911

SURGICAL DEVICE FOR STAPLING AND FASTENING BODY TISSUES

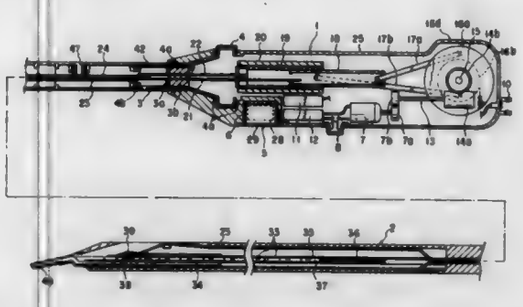
Minoru Tsuruta; Toshihiko Suzuta; Akio Nakada; Seiji Kuramoto; Hiroki Hibino; Shiro Bito, and Akito Mukaizawa, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1994, Ser. No. 231,241

Claims priority, application Japan, Apr. 27, 1993, 5-101163; Apr. 27, 1993, 5-101169; Apr. 27, 1993, 5-101170; Jun. 8, 1993, 5-137422

Int. Cl.[6] A61B *17/068*

U.S. Cl. 227—175 **20 Claims**



1. A surgical device for applying surgical fasteners to body tissues in order to fasten the body tissues together, comprising:

an operation section having a housing having an inner space completely sealed from the outside;

drive means electrically driven and arranged in the inner space of said operation section;

an insertion section including a housing which has a first end portion containing the fasteners and having an opening through which the fasteners are to be applied, and a second end portion removably coupled to the housing of said operation section;

fastener-applying means located in the housing of said insertion section, for applying the fasteners from said opening to body tissues; and

force-transmitting means for transmitting drive force from said drive means to said fastener-applying means.

5,467,912

REFLOW SOLDERING APPARATUS FOR SOLDERING ELECTRONIC PARTS TO CIRCUIT SUBSTRATE

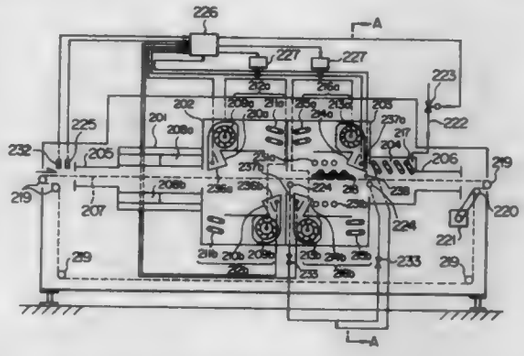
Haruo Mishina, Ushiku; Masafumi Wada, Nagareyama; Mituo Fukuda, Matsudo; Masato Itagaki, Kashiwa, and Shinya Yamama, Abiko, all of, Japan, assignors to Hitachi Techno Engineering Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1993, Ser. No. 155,798

Claims priority, application Japan, Nov. 27, 1992, 4-318601; Dec. 15, 1992, 4-334535

Int. Cl.[6] B23K *35/38;1/012*

U.S. Cl. 228—10 **8 Claims**



1. A reflow soldering apparatus, comprising:

a conveyer which transfers a processing object composed of a circuit substrate which is applied with solder and is mounted with electronic members to a preheating chamber, a reflow chamber and a cooling chamber,

a means for soldering said electronic members to said circuit substrate by melting said solder with impinging a hot inert gas upon said processing object for preheating and main heating during transferring through said preheating chamber and said reflow chamber and by cooling said solder with exposing said processing object to a cool inert gas during transferring through said cooling chamber,

means for outputting a signal indicating that a processing object is conveyed into said preheating chamber, and

means for controlling said hot inert gas blown onto said processing object and inert gas supplied to at least said reflow chamber, wherein the control means reduces both the amount of said hot inert gas blown and the amount of said inert gas supplied to at least said reflow chamber in accordance with a signal output from said signal output means indicating that no processing object is being conveyed into said preheating chamber.

5,467,913

SOLDER BALL SUPPLY DEVICE

Masatoshi Namekawa; Yoshiteru Ibuki; Norio Iguchi, all of Tanashi, and Masateshi Okuno, Nagano, all of, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, and Miyota Co., Ltd., Nagano, both of, Japan

PCT No. PCT/JP94/00337, § 371 Date Oct. 11, 1994, § 102(e) Date Oct. 11, 1994, PCT Pub. No. WO94/28580, PCT Pub. Date Dec. 8, 1994

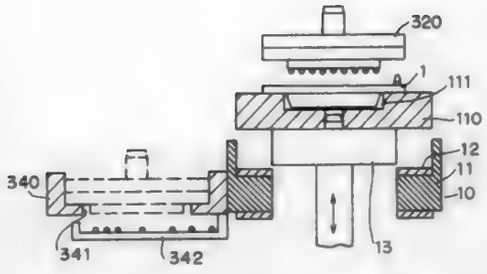
PCT Filed Mar. 2, 1994, Ser. No. 319,660

Claims priority, application Japan, May 31, 1993, 5-154311

Int. Cl.[6] B23K *3/00;3/06*

U.S. Cl. 228—41 **16 Claims**

1. A solder ball supply device comprising:



a discharger in which solder ball holding cavities are provided matrixwise, and

a solder ball supply means which is provided with a head section with a number of air suction holes provided at the same pitch as the solder ball holding cavities in said discharger, and which takes out a large number of solder balls at one time from solder ball holding cavities at the head section to transfer and supply them to the specified place.

5,467,914

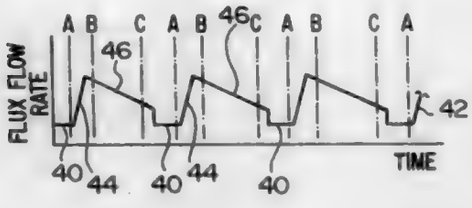
METHOD AND APPARATUS FOR FLUXING AND SOLDERING TERMINALS ON A PRINTED CIRCUIT BOARD

John P. Peterson, Chapel Hill, and Paul Brinkley, Morrisville, both of N.C., assignors to Northern Telecom Limited, Montreal, Canada

Filed Nov. 21, 1994, Ser. No. 345,470

Int. Cl.[6] B23K *1/20;31/02*

U.S. Cl. 228—102 **11 Claims**



1. A method of fluxing and soldering terminals on a printed circuit board comprising:

moving the printed circuit board along a passline through a flux application station;

directing a wall of flux across a surface of the board as it moves through the flux application station while decreasing in controlled manner the flow rate of the flux directed at the board surface until the board has passed completely through the wall of flux whereby the thickness of flux upon the board surface decreases from a leading end to a trailing end of the board;

moving the board out of the flux application station in an upwardly inclined manner towards a solder application station thereby causing the flux to flow towards the trailing end of the board to redistribute the flux towards providing a constant flux thickness over the board; and

then moving the board through the solder application station to apply solder to the terminals.

5,467,915

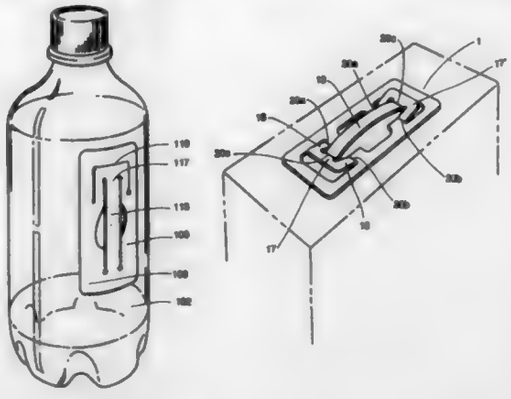
LIFT-UP HANDLE

Larry J. Mattson, Charlotte, N.C., assignor to Roberts Systems, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 964,790, Oct. 21, 1992, abandoned. This application Dec. 14, 1993, Ser. No. 166,640

Int. Cl.[6] B65D *5/465*

U.S. Cl. 229—117.24 **11 Claims**



2. A handle comprising:

a platform having an outer perimeter and an interior portion;

a flexible strap having a first end and a second end;

a first hinge in communication with said first strap end, a first strap score line connecting said first strap end to said first hinge;

a second hinge in communication with said second strap end, a second strap score line connecting said second strap end to said second hinge; and

first and second hinge score lines connecting each said first hinge and said second hinge to said interior portion; whereby through said first and second strap score lines and said first and second hinge score lines, both ends of said strap are unitary with said platform.

8. A handle comprising:

a platform having an outer perimeter and an interior portion;

a flexible strap having a first end and a second end, said first end and said second end each defining a respective strap score line, each said strap score line being further connected to a respective first and second hinge, each said hinge further connected by a first web and a second web to an interior portion of said platform, each said first web and said second web defining a score line adjacent said interior platform portion.

5,467,916

PAPERBOARD BOX WITH LOCKING TAB

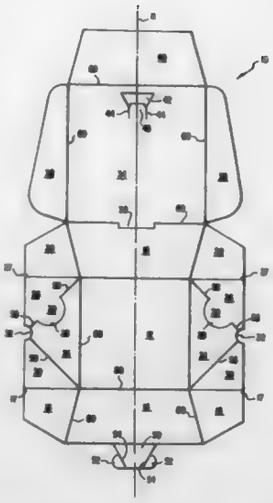
Jonathan T. Beales, Memphis, Tenn., assignor to International Paper Company, Purchase, N.Y.

Filed Jun. 16, 1994, Ser. No. 261,280

Int. Cl.[6] B65D *5/30*

U.S. Cl. 229—195 **8 Claims**

1. A unitary blank of paperboard for forming a collapsible tray, said blank including a lower portion and an upper portion, said upper and lower portions being joined together along a hinge line, said lower portion adapted to form a tray, said lower portion including a central, tray bottom forming panel, said bottom forming panel having upper and lower edges each of which is foldably secured to respective lower front and upper rear tray wall forming panels, a lateral panel foldably secured to each of respective left and right edges of said lower tray panel, a lateral panel secured to each of respective left and right edges of said upper tray wall forming panel, a first triangular panel secured to each of respective left and right edges of said central tray bottom forming panel, each of said first triangular panels foldably secured to respective second and third triangular panels, said first triangular panel and said



second and third triangular panels adapted to form tray sidewall panels, said tray sidewall panels adapted to be folded to an erected position from a collapsed position, the upper portion of said blank having a top lid forming panel having a latching opening at its upper portion thereof, a latching tongue extending into said latching opening, the lower edge of said lower central tray bottom forming panel hingedly secured to a latching flap, said latching flap having right and left sides and having a tab foldably secured to each respective left and right side.

5,467,917

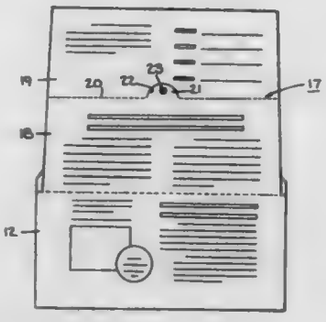
ENVELOPE

Richard Potter, 23410 Los Encinos Way, Woodland Hills, Calif. 91367

Continuation of Ser. No. 654, Jan. 5, 1993, abandoned. This application May 23, 1994, Ser. No. 247,264

Int. Cl.[6] B65D *27/06;27/04;27/34*

U.S. Cl. 229—301 **15 Claims**



1. An envelope comprising

a front ply defining a face of the envelope;

a back ply secured directly to said front ply along a common transverse edge to define a pocket therewith;

an extension integral with said back ply, said extension including a first panel connected to and extending from said back ply and a second panel connected to and folded under said first panel;

first adhesive means securing said extension directly to said back ply; and

said first panel having at least one tab extending therefrom with said first adhesive means thereon and said second panel includes an opening of a size reciprocal to said tab and aligned with said tab to receive said tab with said panels in an opened-out flattened condition.

5,467,918

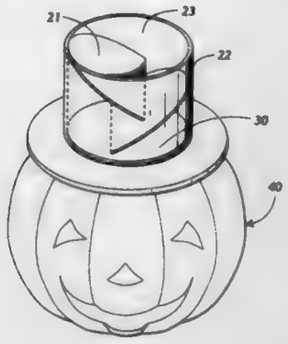
CONTROLLED ACCESS COLLECTION CONTAINER

Michael W. Glover, 203 County Rd. 1094, Cullman, Ala. 35055

Filed Mar. 14, 1994, Ser. No. 209,259

Int. Cl.[6] B65D *91/00*

U.S. Cl. 232—43.1 **10 Claims**



1. A lightweight, controlled access collection container comprising:

a deposit means comprising:

a vertical chute means having a top opening and a bottom opening;

and,

a slide assembly situated within said chute means;

a trap means attached to said deposit means near the bottom opening of said vertical chute means comprising:

a hinged door; and,

a retracting mechanism;

a containment means attached to said deposit means comprising a lightweight, hollow receptacle having a top opening and a bottom opening; and

a locking mechanism situated within the bottom opening of said containment means comprising a conventional door and lock assembly.

5,467,919

AIR CONDITIONING SYSTEM PROVIDING FOR INDIVIDUAL WORK STATION CONTROL

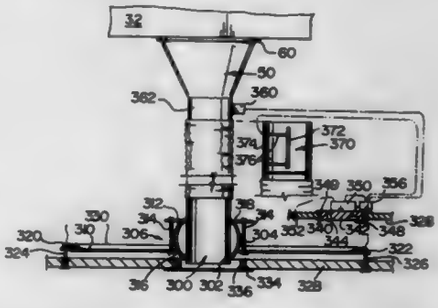
Robert T. Tamblyn, Suite 200 2 Sheppard Ave. E., North York Ont., Canada

Continuation-in-part of Ser. No. 753,382, Aug. 30, 1991, Pat. No. 5,275,333. This application Aug. 30, 1993, Ser. No. 113,070

Claims priority, application Canada, Aug. 31, 1992, 2077199

Int. Cl.[6] F24F *7/00*

U.S. Cl. 236—49.3 **7 Claims**



1. In an air conditioning system, means for controlling the flow of conditioned air from a duct to a predetermined location of an occupied area of a building comprising:

fitting means secured at one end thereof to said duct and having a moveable valve mounted therein for selectively controlling flow of conditioned air therethrough, said fitting means

including motor means and motor control means for controlling operation of said valve;

outlet means and means mounting said outlet means in association with an aperture in a ceiling tile adjacent said location to be conditioned and spaced from said fitting means;

said outlet means including nozzle means having an inner end and an outer end;

flexible conduit means connected to another end of said fitting means and extending from said fitting means to and connected with the inner end of said nozzle means;

said means mounting said outlet means including means for mounting said nozzle for selected, limited universal movement relative to said ceiling tile aperture;

remote signal receiving means located adjacent said outlet means for receiving a transmitted signal and including thermostat means and relay means in electrical circuit with said motor means; and

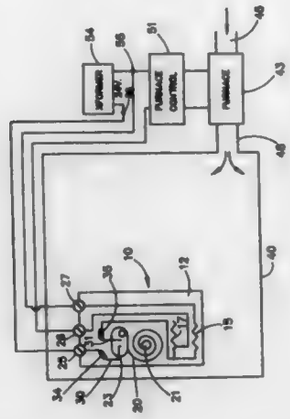
remote controlled signal transmitter means signal compatible with said receiving means whereby an occupant in said location may remotely set the thermostat through actuation of said transmitter means, said relay means being responsive to said thermostat to control said motor and the position of said valve in said fitting and thus control the flow of conditioned air through said outlet to said location as a result of said thermostat setting.

5,467,920

THERMOSTAT WITH ADJUSTMENT FOR THE CYCLING RATE OF THE HEATING PLANT

Richard B. Porter, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 16, 1994, Ser. No. 261,369
Int. Cl.[6] G05D *23/00*
U.S. Cl. 236—68 B **11 Claims**



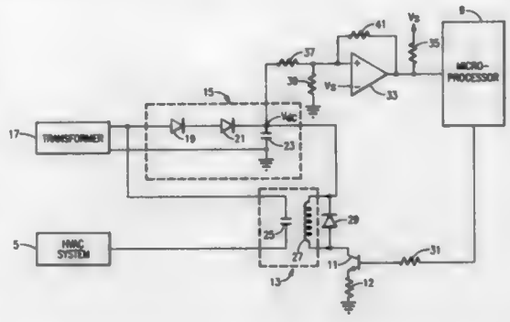
1. A thermostat for controlling application of power from a power supply having first and second terminals to a space temperature control device, said thermostat having a temperature-sensitive element; a switch having first and second terminals and controlled by the temperature-sensitive eleme opening responsive to a rise above a selected temperature value in the air temperature ambient to the temperature-sensitive element and having a first terminal for connection to the first terminal of the power supply; an anticipator resistor mounted proximate to the temperature-sensitive element and having a first terminal connected to the second terminal of the switch and a second terminal for connection to the second terminal of the power supply; and a cycle rate control resistor mounted proximate to the temperature-sensitive element and having a first terminal connected to the second terminal of the switch and a second terminal for connection to the space temperature control device.

5,467,921

THERMOSTAT HAVING SHORT CIRCUIT PROTECTION

William O. Shreeve, Huntington, Ind.; Laurie L. Werbowsky, Jamesville, N.Y., and Thomas W. Essig, Fort Wayne, Ind., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 23, 1994, Ser. No. 311,230
Int. Cl.[6] H02H *3/00*; **G05D** *15/00*
U.S. Cl. 236—78 R **15 Claims**



1. A thermostat for controlling activation of a system for conditioning air, said thermostat comprising:

activating circuitry connected to said system for conditioning air for activating said system for conditioning air;

a controller connected to said activating circuitry, said controller generating a control signal for said activating circuitry so as to cause said activating circuitry to activate or deactivate said system for conditioning air; and

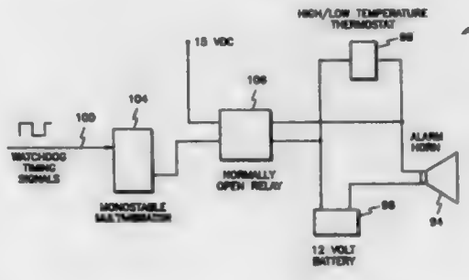
short circuit protection circuitry connected to said controller, said short circuit protection circuitry indicating to said controller when a short circuit condition has occurred so that said controller sets the control signal to deactivate said activating circuitry for a predetermined period of time.

5,467,922

POULTRY ENVIRONMENTAL CONTROL SYSTEMS AND METHODS

Richard A. Carey, Stone Mountain; Marlon M. Moses, Norcross, and Wayne D. R. Daley, Stone Mountain, all of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Division of Ser. No. 113,851, Aug. 30, 1993. This application Sep. 19, 1994, Ser. No. 308,387
Int. Cl.[6] G05D *23/00*
U.S. Cl. 236—94 **2 Claims**



1. A system for accurately controlling the environment in an enclosure for poultry by insuring continuous operation of monitoring and control systems associated with said enclosure, comprising:

heating means disposed in said enclosure;

temperature sensing means for sensing temperature within said enclosure and for generating temperature feedback signals indicative thereof;

humidity sensing means for sensing humidity within said enclosure and for generating humidity feedback signals indicative thereof;

fan means for blowing air out of said enclosure;

a control means for controlling said heaters and said fans in response to said temperature feedback signals and said humidity feedback signals;

program means associated with said control means, said program means for executing a list of instructions pertaining to said heating means and said fan means, said program means for generating watchdog timing signals indicative of the operation of said program means; and

alarm means for monitoring said watchdog timing signals and for signalling an alarm upon failure to receive a watchdog timing signal within a predefined time period.

5,467,923

METHOD AND DEVICE FOR THE MONOLITHIC APPLICATION OF A THERMAL-INSULATION AND/OR FIRE-PROTECTION COMPOUND TO A SURFACE

Walter Potuznik, Vienna, and Josef Himmel, Maria Enzersdorf, both of, Austria, assignors to Burian Gesellschaft m.b.H. & Co. KG, Vienna, Austria

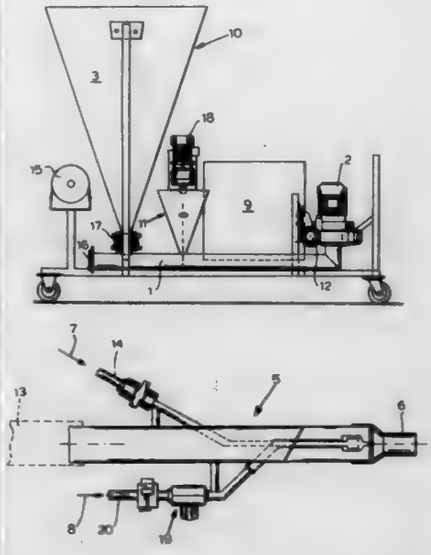
PCT No. PCT/AT92/00137, § 371 Date Sep. 23, 1993, § 102(e) Date Sep. 23, 1993, PCT Pub. No. WO93/16250, PCT Pub. Date Aug. 19, 1993

PCT Filed Nov. 4, 1992, Ser. No. 122,439

Claims priority, application Austria, Feb. 17, 1992, 266/92

Int. Cl.[6] E04F *21/12*

U.S. Cl. 239—8 **4 Claims**



1. A method of applying a monolithic fire-resistant insulating coating to a structure, comprising the steps of:

(a) generating a constant flow of air by suction;

(b) feeding into said constant flow of air at an upstream location therealong at least one fire-retardant insulating material selected from the group which consists of vermiculite, perlite and rock wool;

(c) feeding into said constant flow of air at a location downstream from said upstream location a pulverulent hardener, thereby forming a mixture of said fire-retardant insulating material and said hardner in said constant flow of air;

(d) then blowing said flow of air with said mixture therein through a conduit to a nozzle;

(e) feeding compressed air to said nozzle separately from said flow of air and said mixture and through a pipe separate from said conduit;

(f) supplying a binding agent to said nozzle through a line separate from said pipe and said conduit and forming a coating composition by combining said mixture with said binding agent in said nozzle; and

(g) spraying said composition onto said structure from said nozzle with said compressed air.

5,467,924

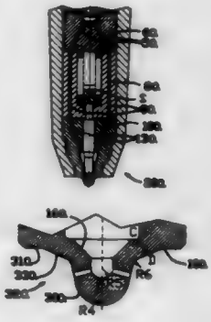
UNIT INJECTOR OPTIMIZED FOR REDUCED EXHAUST EMISSIONS

Alfred J. Buescher, 17001 Shaker Blvd., Shaker Heights, Ohio 44120, and Frank DeLuca, Enfield, Conn., assignors to Alfred J. Buescher, Shaker Heights, Ohio

Filed Sep. 20, 1994, Ser. No. 309,030

Int. Cl.[6] F02M *47/00;65/00*

U.S. Cl. 239—88 **10 Claims**



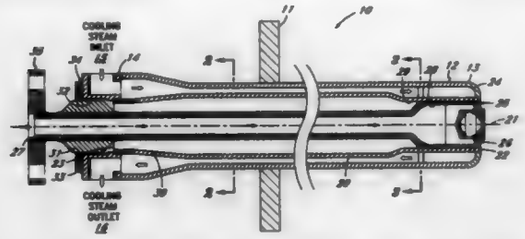
1. In a diesel unit injector of the EMD type having a plunger and bushing assembly to meter and deliver fuel, a check valve cage and check valve for preventing reverse flow of the fuel, a spring cage and a spring and spring seat within the cage, an injection nozzle body, a high pressure seal nozzle valve slidable in said nozzle body under the bias of said spring, axially extending fuel ducts in said check valve cage, spring cage and nozzle body, a housing-nut surrounding said plunger and bushing assembly, check valve cage and check valve, spring cage, spring and spring seat, injection nozzle body, high pressure seal nozzle valve, and axially extending fuel ducts, and threadedly clamping said bushing assembly, check valve cage and nozzle body in stacked relationship, said housing-nut having an open lower end, said nozzle body having an end face exposed through said open lower end of said housing-nut, said end face comprising an inverted central dome of a given radius forming a nozzle tip, an edge zone substantially normal to the central axis of the injector, and a fairing zone between said dome and said edge zone, said faring zone being shaped to fair said dome into said edge zone, a fuel sac formed in said tip and having a hemispherical sac bottom of a radius smaller than said dome radius, the centers of said dome radius and said sac bottom radius each lying on the central longitudinal axis of said injector, said nozzle body having a valve seat against which said valve seats under the bias of said spring and through which fuel flows into said sac under control by said valve, said sac communicating with nozzle spray holes through which fuel flows into the engine combustion chamber, the points of communication between said sac and said nozzle spray holes being spaced below said valve seat, the improvement wherein said center of said dome radius of the nozzle body is located below said center of said sac bottom radius.

7. A device as in claim 1, said high pressure seal nozzle valve having a valve stem, said valve stem having a bearing portion, the axial length of said nozzle body being substantially no greater than the axial length of said spring cage, and the length of said bearing portion of said valve stem being substantially less than the length of the valve spring as confined within said spring cage, whereby the mass of said valve is reduced and its closing velocity is correspondingly increased.

5,467,925
SULFUR GUN ASSEMBLY WITH RAPID SERVICE CAPABILITY

Marcos D. Riano, Rte. 12, Box 544 (Crow Ct.), Lake City, Fla. 32025

Filed Sep. 6, 1994, Ser. No. 301,063
Int. Cl.[6] B05B *15/00*
U.S. Cl. 239—132.3 **8 Claims**



1. A sulfur gun assembly which may be easily and rapidly disassembled for service comprising:

an outer casing supported by a furnace wall in a generally horizontal manner, said outer casing having a furnace end and an exterior end, said outer casing having a steam inlet and a steam outlet for cooling a sulfur gun during use, said outer casing mounted coaxially with a sulfur gun longitudinal axis;

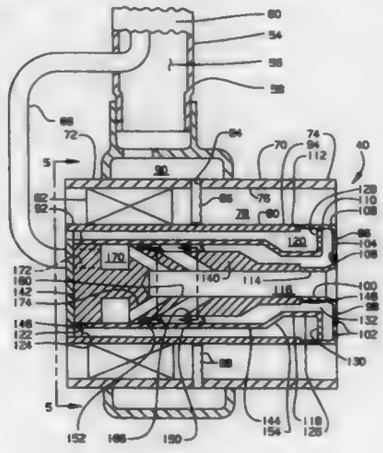
an inner casing passing from the furnace end to the exterior end of said outer casing, said inner casing also being mounted coaxially with said sulfur gun longitudinal axis and also having a furnace end and an exterior end, and said inner casing being sealed to said outer casing at the furnace end and the exterior end to provide a steam tight chamber between the inner and outer casing;

a sulfur gun having a longitudinal barrel and a nozzle, an exterior end, a nozzle end and a nozzle outside diameter, said gun held coaxially within said inner casing, said sulfur gun being free of any attachment at the nozzle end to said inner casing, said sulfur gun being slidable in and out of said inner casing whereby the sulfur gun may be readily removed from the inner casing for service without having to remove the outer or inner casing from the furnace wall.

5,467,926
INJECTOR HAVING LOW TIP TEMPERATURE

Dennis D. Idleman, Lakeside; Douglas C. Rawlins, Murrieta, and Virendra M. Sood, Encinitas, all of Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.

Filed Feb. 10, 1994, Ser. No. 194,769
Int. Cl.[6] F23D *11/12;* **F23R** *3/14*
U.S. Cl. 239—132.5 **16 Claims**



1. A fuel injection nozzle comprising:

means for delivering premixed primary air and combustion fuel through the fuel injection nozzle during operation thereof;

means for delivering pilot fuel through the fuel injection nozzle;

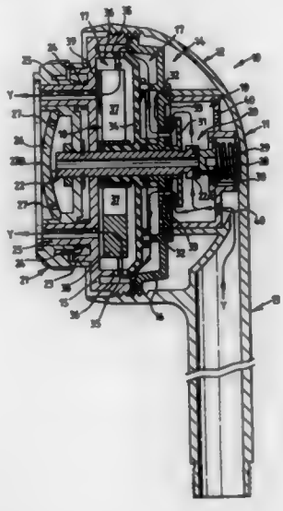
means for delivering pilot combustion air through the fuel injection nozzle during operation thereof; and

an end piece having a combustion side and an air side positioned opposite the combustion side, said combustion side being cooled by said pilot combustion air being in contacting relationship with said air side prior to being mixed with said pilot fuel and passing through the fuel injection nozzle during operation thereof.

5,467,927
SHOWER HEAD WITH SELECTIVELY USABLE VIBRATING AND PULSATING ELEMENT

Man H. Lee, Shatin, Hong Kong, assignor to Brand New Technology Limited, Kowloon, Hong Kong

Filed Sep. 20, 1994, Ser. No. 308,935
Claims priority, application United Kingdom, Sep. 21, 1993, 9319480
Int. Cl.[6] B05B *3/04;* **A61H** *23/04*
U.S. Cl. 239—383 **11 Claims**



1. A shower head comprising:

a body which has a forward chamber, the chamber having a front side, and a tubular rear end through which water is supplied to the forward chamber for exit from the forward chamber through the front side;

a vibration generator provided within the forward chamber for generating vibration of the shower head, the vibration generator being driven by water flowing through the chamber; and

a switch for enabling and disabling operation of the vibration generator, the switch being located at the front side of the forward chamber of the body, and wherein the switch is associated with the front side of the forward chamber so that depression of the front side relative to the forward chamber enables operation of the vibration generator.

5,467,928

OXY-FUEL CUTTING TIP HAVING GAS OUTLET PASSAGES

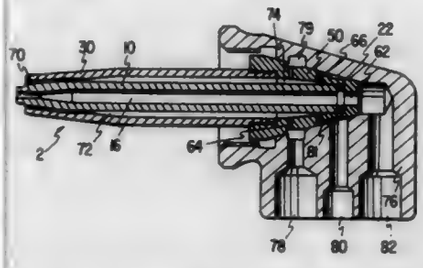
Richard Goulet, Montreal; Claude Forest, Joliette; Michel Landry, Mascouche; Pierre Beaubien, Montreal; Michael Finkelstein, and Vivek V. Vaidya, both of Pointe-Claire, all of, Canada, assignors to Canadian Liquid Air Ltd. - Air Liquide Canada Ltee, Montreal, Canada

Continuation-in-part of Ser. No. 755,064, Sep. 5, 1991, Pat. No. 5,273,216. This application Oct. 20, 1993, Ser. No. 138,073

The portion of the term of this patent subsequent to Dec. 28, 2010, has been disclaimed.

Int. Cl.[6] B05B *7/06*

U.S. Cl. 239—404 **9 Claims**



1. An oxy-fuel cutting tip comprising:

a mixer having respective cutting oxygen, preheat oxygen and fuel gas inlet passages;

a tip core fittable into said mixer so as to communicate with said cutting oxygen inlet and having a cutting oxygen passage extending therethrough to an outlet end thereof; and

a skirt concentrically surrounding said tip core so as to form an annular passage therebetween, said skirt being formed adjacent an outlet end thereof to define a tapered outlet portion having internal grooves, an opposite end of said skirt opposite said outlet end being fittable into said mixer such that said annular passage communicates with said preheat oxygen and fuel gas inlet passages and such that said internal grooves cooperate with said tip core to define outlet passages for gas in said annular passage,

wherein the outlet end of said tip core comprises an annular chamfer extending beyond the outlet end of said skirt, wherein said preheat oxygen inlet passage comprises means for introducing the preheat oxygen into a tapered extension of said annular passage with first circumferential flow velocity component, and wherein said fuel gas inlet passage comprises means for introducing the fuel gas into said annular passage with a second circumferential flow velocity component which is opposite to said first circumferential flow velocity component, whereby said circumferential flow velocity components are substantially cancelled.

5,467,929

AERATOR FOR LIQUIDS

Orlando Bosio, Casaleldo, Italy, assignor to AMFAG S.r.l., Castelgoffredo, Italy

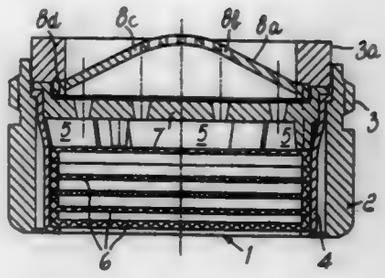
Filed May 12, 1994, Ser. No. 241,528

Claims priority, application Italy, May 20, 1993, MN93U0015

Int. Cl.[6] E03C *1/084*

U.S. Cl. 239—428.5 **2 Claims**

1. Aerator (1) for liquids, comprising a containment body (4) connectable to an end of a liquid conveyance duct, a perforated plate (7) contained within said body (4), a plurality of meshes (6) disposed within said body (4), and a diaphragm (8), said diaphragm comprising a solid wall (8a) partially provided with liquid passage holes (8b, 8c), said diaphragm being seated on said plate (7) on a part of said ..body (4) connectable to an end of a liquid conveyance duct, wherein said liquid passage holes (8b, 8c) are present only on a middle portion of said solid wall (8a).



5,467,930

SOLID WASTE PROCESSING DEVICE

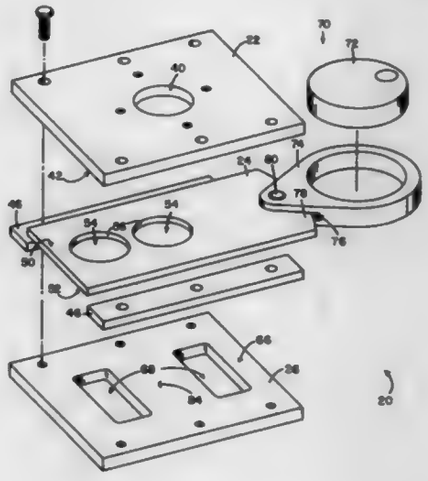
Mark S. Lefevre, Lansing, Mich., assignor to Lefevre Corporation, Lansing, Mich.

Continuation-in-part of Ser. No. 134,279, Oct. 12, 1993, Pat. No. 5,340,039. This application Aug. 12, 1994, Ser. No. 289,687

The portion of the term of this patent subsequent to Aug. 23, 2011, has been disclaimed.

Int. Cl.[6] B02C *1/06*

U.S. Cl. 241—84 **20 Claims**



1. A solid waste material processing device comprising:

a frame;

an infeed plate connected with and fixed relative to said frame, the waste material being fed to a first side of said infeed plate, said infeed plate having a generally planar infeed surface on a second side of said infeed plate and having an infeed aperture extending through said infeed plate;

a knife blade with a generally planar knife surface that abutts said infeed surface in sliding engagement, said knife having a knife hole extending through said knife blade; and

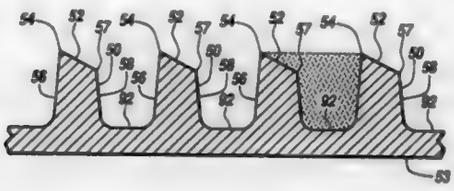
a drive connected with said frame and operatively connected with said knife blade to slide said knife blade relative to said infeed plate, said drive positioning said knife hole in one of a first position aligned with said infeed aperture and a second position out of alignment with said infeed aperture, the waste material being shorn between said infeed plate and said knife when said drive slides said knife to said second position.

5,467,931

LONG LIFE REFINER DISC

John Dodd, Arvada, Colo., assignor to Beloit Technologies, Inc., Wilmington, Del.

Filed Feb. 22, 1994, Ser. No. 199,906
Int. Cl.[6] B02C 7/12
U.S. Cl. 241—261.2 8 Claims



1. A disc for a refiner for use with wood chips and wood fibers comprising:

a base member which extends radially about an axis; and

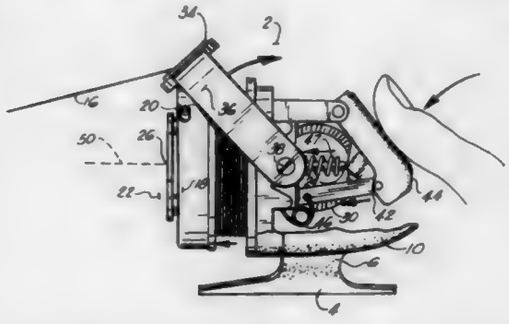
a plurality of elongate refiner bars integrally formed with the base member and extending outwardly from the base member, wherein each bar has a leading side surface which extends upwardly from the base member to a selected height above the base member, a trailing side surface which extends upwardly from the base member to a second selected height which is less than the first selected height, and wherein an uppermost surface extends between the leading side surface and the trailing side surface and is inclined substantially from the radial plane of the base member, and wherein a cutting edge is defined where the leading side surface meets the uppermost surface and a trailing edge is defined where the trailing side surface meets the upper most surface.

5,467,932

LINE GUIDE FOR FISHING REELS

John W. Puryear, 119 E. Beach Blvd., Biloxi, Miss. 39530

Filed Mar. 30, 1993, Ser. No. 40,104
Int. Cl.[6] A01K 89/01
U.S. Cl. 242—236 2 Claims



1. In a fishing reel of the type having a non rotating line spool mounted with its axis in line with a fishing rod, a fishing line passing through a line guide from a front end of the line spool, a line winding member rotatably mounted to rotate about said line spool axis to wind said fishing line onto said line spool, the improvement comprising:

a feathering line guide, comprising:

a thumb plate, depressed responsive to finger pressure;

means for positioning said line guide, proportional to said finger pressure on said thumb plate, to any point between a position directly in front of said line spool axis to a position to one side of said spool;

means responsive to said finger pressure on said thumb plate for disengaging said line winding member as said line guide traverses from a position directly in front of said line spool axis to a position to a side of said line spool; and

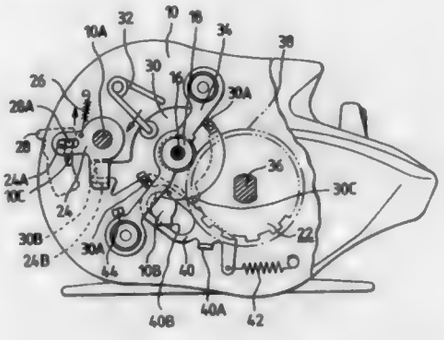
means for biasing said line guide to a position in front of said line spool as said thumb plate is released.

5,467,933

CLUTCH MECHANISM IN A FISHING REEL

Takeo Miyazaki, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 302,424
Claims priority, application Japan, Sep. 10, 1993, 5-250003
Int. Cl.[6] A01K 89/015
U.S. Cl. 242—261 3 Claims



1. A clutch mechanism in a fishing reel which comprises a pinion which is detachably engaged with a spool rotatably mounted on a reel frame body, and is turned by the rotation of the handle, and which, when engaged with said spool, is turned together with said spool, said clutch mechanism comprising:

a clutch member for causing said pinion to engage with and disengage from said spool;

urging means for urging said clutch member at all times so as to disengage said pinion from said spool;

locking means for locking said clutch member against the urging force of said urging means so that said pinion is engaged with said spool; and

releasing means which is externally operated to release said locking means.

5,467,934

BRAKING SYSTEM FOR BOBBIN-HOLDER SUPPORTS

Maria del Mar Segura Salvador, and Silvia B. Segura Salvador, both of Plaza de la Constitucion 2, 04230 Buercal de Almeria, Spain

Continuation-in-part of Ser. No. 910,704, Jul. 8, 1992, abandoned. This application Mar. 24, 1994, Ser. No. 217,506
Claims priority, application Spain, Jul. 8, 1991, 9101594
Int. Cl.[6] B65H 23/08
U.S. Cl. 2.42—421.4 5 Claims

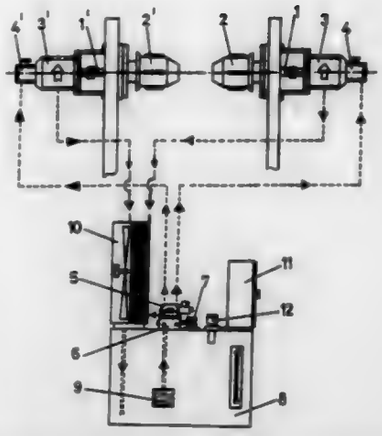
1. A braking system for bobbin holders comprising:

(a) first and second rotatable bobbin holders facing each other for supporting a bobbin between them, rotation of the bobbin causing the bobbin holders to rotate;

(b) first and second gear pumps respectively connected to the first and second holders such that the pumps are rotated by rotation of the respective holder connected thereto; each pump being adapted for receiving a fluid under pressure and being responsive to the fluid in the pump for controlling rotation of the gear pump;

(c) a first and a second reduction unit each being attached to a respective one of the gear pumps, the first reduction unit being adapted for regulating flow of the fluid into the first gear pump and the second reduction unit being adapted for regulating flow of the fluid into the second gear pump; and

(d) a closed oleo-hydraulic circuit comprising the reduction units and the gear pumps, the oleo-hydraulic circuit including



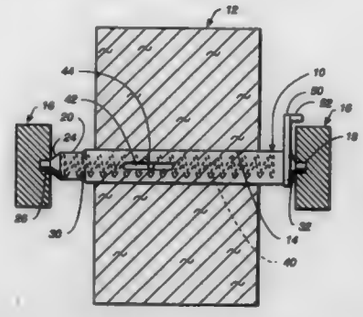
means for increasing the pressure of the fluid to the respective pumps as rotation of the bobbin increases above a predetermined speed, the increased pressure of the fluid to the respective pumps being predetermined so as to brake the pumps and thereby to brake the bobbin holders.

5,467,935

APPARATUS FOR SUPPORTING A CORELESS PAPER ROLL AND FOR IMPEDING ROTATION OF THE ROLL DURING PAPER DISPENSING

John R. Moody, Antioch, Calif., assignor to James River Paper Company, Inc., Richmond, Va.

Filed Aug. 16, 1994, Ser. No. 291,418
Int. Cl.[6] B65H *23/08;16/02*
U.S. Cl. 242—422.4 **7 Claims**



1. Roll support spindle apparatus to be inserted into and extend through the central aperture of a coreless paper roll defined by the innermost convolution of the coreless paper roll, the coreless paper roll having a uniform width, and said roll support spindle apparatus for rotatably supporting the coreless paper roll between two mounting elements having indents, for exerting a braking force on the coreless paper roll to prevent free-wheeling of the coreless paper roll during unwinding thereof, and for resisting inadvertent dislodgement of the roll support spindle apparatus and the coreless paper roll from the mounting elements due to end-wise force exerted on the coreless paper roll while the coreless paper roll is supported in the roll support spindle apparatus, said roll support spindle apparatus comprising, in combination:

a double-ended inner spindle member having a first inner spindle end and a second inner spindle end, said first inner spindle end including a projection for insertion into a first mounting element indent;

an outer spindle member defining an outer spindle member interior and having an outer spindle open end and an outer spindle closed end, said outer spindle closed end including a projection for insertion into a second mounting element indent, said inner spindle member being telescopically received within the outer spindle member interior with the second inner spindle end located within the outer spindle member interior and with the projections spaced from one another;

spring means within the outer spindle interior continuously biasing said inner spindle member and said outer spindle member away from each other; and

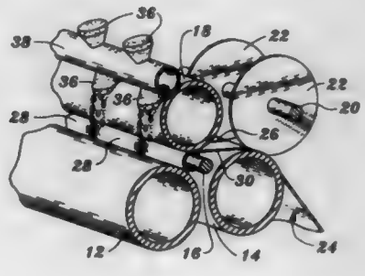
spindle stop means affixed to said outer spindle member at the outer spindle closed end closely adjacent to the projection of the outer spindle closed end for engagement with a mounting element receiving the projection of the outer spindle closed end to engage the mounting element receiving the projection of the outer spindle closed end during unwinding of a coreless paper roll supported by the roll support spindle apparatus to prevent rotation of the outer spindle member whereby said outer spindle member will exert a frictional braking force on the coreless paper roll to impede rotation of the coreless paper roll during dispensing of paper therefrom, said spindle stop means including a first stop element projecting laterally outwardly from said outer spindle member at the outer spindle closed end closely adjacent to the projection of the outer spindle closed end and a second stop element affixed to said first stop element and projecting laterally outwardly from said first stop element in a direction away from the coreless paper roll, said second stop element engaging the mounting element receiving the projection of the outer spindle closed end upon rotation of the coreless paper roll to prevent rotation of said outer spindle member, and said first stop element including an abutment surface for engaging the coreless paper roll upon sliding movement of the coreless paper roll axially along the outer spindle member in the direction of the spindle stop means and said spring means within the outer spindle interior having sufficient biasing strength to prevent telescopic movement of said inner spindle member relative to said outer spindle member due to end-wise force exerted on the coreless paper roll in the direction of the first inner spindle end to prevent dislodgement of the roll support spindle apparatus from the mounting elements.

5,467,936

APPARATUS AND METHOD FOR FORMING CORELESS PAPER ROLL PRODUCTS

John R. Moody, Antioch, Calif., assignor to James River Paper Company, Inc., Richmond, Va.

Division of Ser. No. 286,644, Mar. 7, 1994, Pat. No. 5,387,284.
This application Nov. 3, 1994, Ser. No. 338,845
Int. Cl.[6] B65H *35/02;18/08;19/28;75/28*
U.S. Cl. 242—525.7 **5 Claims**



1. A method of forming coreless paper roll products, said method comprising the steps of:

transporting a paper web toward an elongated winder shaft having an outer peripheral surface, said paper web having a plurality of slits formed therein defining web segments, each said web segment having side edges defining a predetermined web segment width;

establishing contact between said paper web and the outer peripheral surface of said elongated winder shaft with said

slits located at predetermined spaced locations along said elongated winder shaft a distance equal to said predetermined web segment width;

after the step of establishing contact between said paper web and the outer peripheral surface of said elongated winder shaft, rotating said elongated winder shaft to wind the paper web about the outer peripheral surface of said elongated winder shaft with the side edges of adjacent web segments positioned immediately adjacent to one another and located at one of said predetermined spaced locations to form a plurality of coreless paper roll products aligned with each other, extending axially along said elongated winder shaft, and having coreless paper roll product ends at said spaced locations;

during winding of said paper web about said elongated winder shaft, applying liquid to the web segments only at the side edges thereof while maintaining the web segments substantially free of liquid between the side edges thereof;

stopping rotation of said elongated winder shaft after the coreless paper roll products have attained a predetermined diameter;

terminating liquid application to the web segment side edges during winding of said paper web and prior to said coreless paper roll products attaining said predetermined diameter so that only inner convolutions of said coreless paper roll products are moistened at the coreless paper roll product ends; and

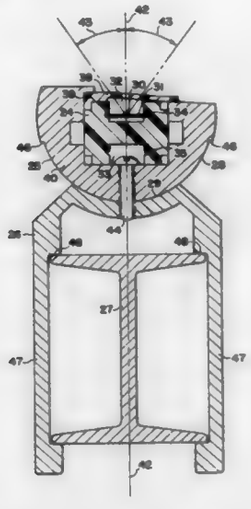
removing said coreless paper roll products from said elongated winder shaft.

5,467,937

TRACK ASSEMBLY FOR A CUTTING TAPE

Peter A. Rodriquez, Atlantic Beach, and Craig R. Austin, Jacksonville, both of Fla., assignors to Sandar Industries, Inc., Jacksonville, Fla.

Filed Nov. 15, 1993, Ser. No. 152,750
Int. Cl.[6] B65M *19/28*
U.S. Cl. 242—526.2 **23 Claims**



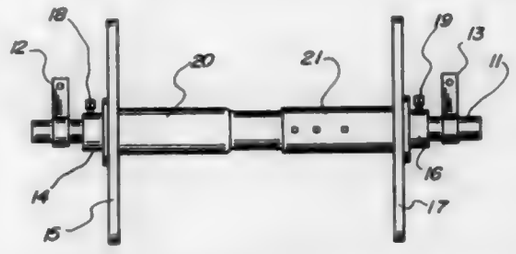
1. A track assembly for guiding a cutting tape transversely across a moving web of paper being wound up on a roll, said assembly including a track, a track carrier, and a carrier support; said track being an elongated member having an H-shaped transverse cross-section symmetrical about its longidutinal centerline, and having an upper and a lower longitudinal U-shaped slot, each said channel being defined by a pair of spaced walls and a bottom and being generally rectangular in transverse cross section, said pair of spaced walls having formed therein aligned grooves parallel to said centerline for receiving a cutting tape therebetween; said track carrier being a semi-cylindrical member having a longitudinal centerline and a longitudinal trough adapted to seat said elongated member thereon; said carrier support being an elongated hollow structure having two parallel side walls joined to a concave top adapted to form a seat for said track carrier, said carrier support having spaced ledges along said side walls on inside surfaces thereof facing each other and adapted to form shelves to fit around and contain an elongated, load-supporting, connecting beam; said semi-cylindrical track carrier being adapted to be securely fastened to said concave top in any selected position rotatably spaced about said longitudinal centerline of said track.

5,467,938

SPOOL HAVING ADJUSTABLE END PLATES

David W. Redman, Rte. 14, Box 72, Hendersonville, N.C. 28792

Filed Sep. 20, 1993, Ser. No. 123,049
Int. Cl.[6] B65H *49/00;75/14*
U.S. Cl. 242—599.1 **4 Claims**



1. A spool apparatus, comprising,

a central shaft, the central shaft having a first support hanger and a second support hanger spaced relative to one another mounted to said central shaft, and

a first collar positioned in adjacency to the first hanger and a second collar positioned about said central shaft in adjacency to the second hanger, a first end plate secured to the first collar and a second end plate secured to the second collar, with the first end plate and the second end plate arranged in a parallel spaced relationship receiving the central shaft coaxially therethrough, and

a first support tube fixedly and coaxially mounted to the first end plate and extending towards the second end plate, and a second support tube telescopingly receiving the first support tube, with the second support tube fixedly and coaxially mounted to the second end plate and extending towards the first end plate, and

latch means for securing the first support tube and the second support tube in a telescoping relationship to one another, wherein the latch means includes a row of second support tube apertures directed along the second support tube, and a pin receiving aperture directed through the first support tube, with the pin receiving aperture arranged for alignment with one of said second support tube apertures, and a lock pin positioned within the pin receiving aperture and a lock pin spring mounted to said lock pin and fixedly secured within said first support tube to direct said lock pin into said pin receiving aperture and into one of said support tube apertures.

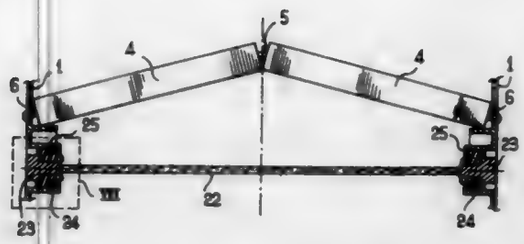
5,467,939

COLLAPSIBLE DRUM

Pierre Georges, Clermont-Ferrand, France, assignor to E M S, Randan, France

Filed Jul. 26, 1994, Ser. No. 279,842
Claims priority, application France, Jul. 30, 1993, 93 09448
Int. Cl.[6] B65H *75/24*
U.S. Cl. 242—607.1 **6 Claims**

1. A collapsible drum comprising flange plates associated with a hub made up of hinged elements, each of which comprises two portions having respective ends that face each other and that are connected together, and respective opposite ends that are connected to respective ones of the flange plates via hinge means



disposed so that the portions of each of the hinged elements are substantially in alignment and are substantially perpendicular to the flange plates when the drum is in an in-use position, and so that the portions of each of the hinged elements are collapsed so that they extend along a direction that is substantially parallel to the flange plates when the drum is in a storage position, the portions of the hinged elements being provided with respective side surfaces disposed so as to touch one another in substantially radial planes of the hub when the drum is in the in-use position, wherein it is provided with at least one reinforcing and locking member extending axially inside the hub and providing a resilient link tending to urge the flange plates towards each other.

5,467,940

ARTILLERY ROCKET

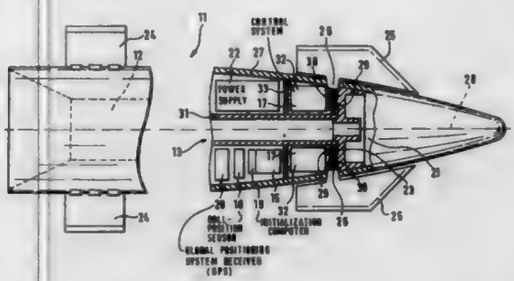
Raimar Steuer, Leinburg, Germany, assignor to Diehl GmbH & Co., Nuremberg, Germany

Filed Jul. 22, 1994, Ser. No. 278,779

Claims priority, application Germany, Jul. 28, 1993, 43 25 218.4

Int. Cl.[6] F41G *7/20;* **F42B** *10/64;10/34*

U.S. Cl. 244—3.11 **4 Claims**



1. An artillery rocket including a warhead carrying a payload; a motor for launching said rocket into a ballistic trajectory above a specified target area over which the payload is to be released, said rocket comprising a flight controller for the control of a control system for a plurality of canard control surfaces; a navigational receiver with actual positional coordinates for actuating said flight controller; said flight controller, said control system for the control surfaces, said navigational receiver, a roll-position sensor, and a power supply being arranged within a casing of a rocket nose cone ahead of said warhead; said control system in conjunction with a control transmission arrangement for the canard control surfaces being mounted between a front main bulkhead of the rocket and a further intermediate bulkhead rearwardly thereof; said canard control surfaces engaging with shaft portions extending radially into the casing relative to the longitudinal axis of said casing, said plurality of said canard control surfaces being settable independently of each other, and each said canard control surface having a separate said transmission arrangement operatively associated therewith.

5,467,941

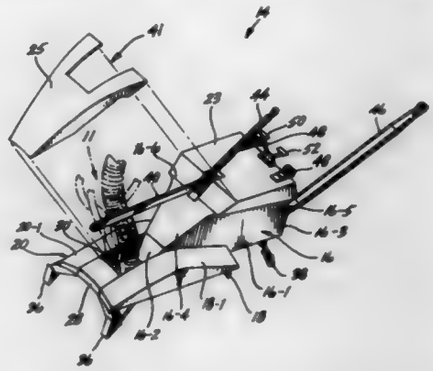
PYLON AND ENGINE INSTALLATION FOR ULTRA-HIGH BY-PASS TURBO-FAN ENGINES

Wan T. Chee, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 30, 1993, Ser. No. 175,859

Int. Cl.[6] B64D *27/00*

U.S. Cl. 244—54 **25 Claims**



1. A pylon for supporting a turbo-fan jet engine from an airplane wing and resisting static and dynamic forces generated by the engine and a nacelle of the engine, said pylon comprising:

(a) a bifurcation portion, including an upper end for attachment to the wing of an airplane, a lower end for attachment to the core of a turbo-fan jet engine, and opposing sides;

(b) a left cowl beam and a fight cowl beam, each extending outwardly from the opposing sides of the bifurcation portion near the lower end thereof, said cowl beams each including a first end connected to the bifurcation portion, and a second end opposite the first end, the second end of each cowl beam extending to a location forward of the bifurcation portion;

(c) wing attachment means for attaching the upper end of said bifurcation portion to the wing of an airplane; and

(d) engine attachment means for attaching the lower end of said bifurcation portion and said cowl beams to the core of a turbo-fan jet engine.

5,467,942

TEMPERATURE SENSING OPTICAL SYSTEM

Gregory L. Abbas, Fall City; Edward J. Vertatschitsch, Bellevue; Michael de La Chapelle, Bellvue, and Charles R. Porter, Redmond, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 752,109, Aug. 28, 1991, Pat. No. 5,294,075. This application Oct. 1, 1993, Ser. No. 130,519

Int. Cl.[6] B64C *5/00*

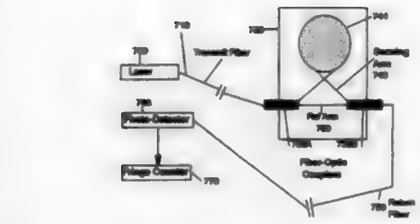
U.S. Cl. 244—75 R **23 Claims**

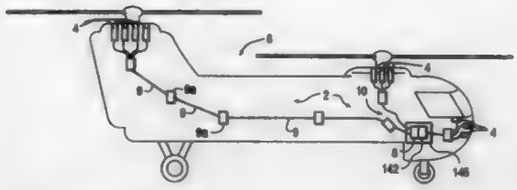
1. An optical sensing system for sensing the temperature at a first location, comprising:

electro-optical means for outputting a modulated optical signal and a chirped rf signal, the envelope of the modulated optical signal having a phase that has a known relation to the phase of the chirped rf signal;

light guide means coupled to said electro-optical means for receiving and transmitting the modulated optical signal along an optical path;

temperature sensing fiber optically coupled to said light guide means and having a first end and a second end, said first end having an associated reference reflector and said second end having an associated target reflector, said temperature sensing fiber receiving said modulated optical signal at said first end and guiding said modulated optical signal along a temperature sensing optical path within said first and second ends, wherein said reference reflector reflects a portion of said modulated optical signal as a reference optical signal and said target





reflector reflects a portion of said modulated optical signal as a target optical signal;

transducing means, having an output and two inputs, coupled to said temperature sensing optical fiber, one of the two inputs being electrically coupled to said electro-optical means for receiving the chirped rf signal and the other of the two inputs being optically coupled to said light guide means for receiving the reference optical signal and the target optical signal having first and second time delays with respect to the chirped rf signal, respectively, said transducing means producing at its output a multi-frequency electrical signal which includes a first frequency corresponding to the first time delay a second frequency corresponding to the second time delay; and

temperature detecting means coupled to the output of said transducing means for processing the multi-frequency signal and determining a difference frequency corresponding to the difference between the first frequency and the second frequency and representing the temperature at said first location.

5,467,943

WINDOW STRUCTURE EQUIPPED ON SIDE WALLS OF A CABIN IN THE BODY OF AN AIRPLANE

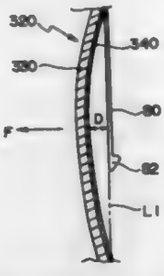
Katsuhiko Umeda, Tokyo, Japan, assignor to Jamco Corporation, Tokyo, Japan

Filed Nov. 12, 1993, Ser. No. 150,819

Claims priority, application Japan, Aug. 19, 1993, 5-204878

Int. Cl.[6] B64C *1/14*; B63B *19/02*

U.S. Cl. 244—129.3 **4 Claims**



1. A window structure equipped on the side walls of a cabin in the body of an airplane comprising:

a window frame mounted on the body;

a window frame body member;

a transparent board supported inside said body member of the window frame to seal the pressure inside the cabin;

a dust cover mounted in a position closer to the cabin than the transparent board; and

a shade which is able to take an up and down movement mounted close to the surface of the dust cover facing the cabin for blocking light;

wherein the dust cover comprises of:

a transparent resin board; and

a non-elastic transparent film stuck on the surface of the transparent resin board facing the shade.

5,467,944

DETECTOR FOR INDICATING ICE FORMATION ON THE WING OF AN AIRCRAFT

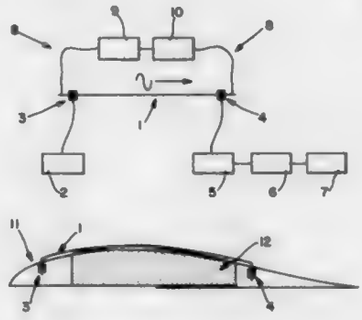
Mauri Luukkala, Espoo, Finland, assignor to Soundek Oy, Finland

Filed Sep. 7, 1993, Ser. No. 116,880

Claims priority, application Finland, Sep. 8, 1992, 924007

Int. Cl.[6] B64D *15/22*

U.S. Cl. 244—134 F **38 Claims**



1. A device which uses ultrasonic transmissions to detect ice formation on a material comprising an acoustic waveguide electrically insulated from said material having a first end and a second end, ultrasonic transmitter means for sending at least one ultrasonic pulse through said first end of said acoustic waveguide, ultrasonic receiver means for measuring the intensity of said ultrasonic pulse at the second end of said ultrasonic waveguide and means for detecting damage to said waveguide, said intensity of said ultrasonic pulse being reduced by ice formation on said acoustic waveguide.

5,467,945

APPARATUS FOR IMPROVED BLOCK CONTROL OF TRAIN OPERATION

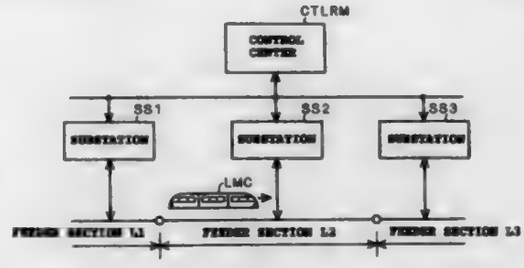
Kiyoto Kubota, Mishima; Hiroto Takeuchi, Tokyo, and Shinichiro Kato, Shizuoka, all of, Japan, assignors to Central Japan Railway Company, Japan

Filed Mar. 7, 1994, Ser. No. 206,761

Claims priority, application Japan, Apr. 8, 1993, 5-082088

Int. Cl.[6] B61L *21/04*

U.S. Cl. 246—26 **21 Claims**



1. An apparatus for controlling movement of a train along a railway system, the railway system being formed by a plurality of feeder sections and a plurality of substations being spaced along the railway system, each of said plurality of substations being assignable one of said plurality of feeder sections, and each of said plurality of substations, when activated, supplying power to the

assigned feeder section for controlling operation of a train running along the assigned feeder section, said apparatus comprising:

route determining means for determining a route to be taken by the train;

assigning means for assigning a said feeder section, along the determined route, to a said substation whereby said assigned feeder section and said substation are electrically controllable;

substation locking means for locking said assigned feeder section to said substation such that cancellation of the assignment of said assigned feeder section to said substation is prohibited until predetermined conditions occur;

direction designation means for designating a moving direction of the train along said assigned feeder section locked to said substation;

operational control means for controlling operation of the train according to a control route, said control route being determined from said assigned feeder section locked to said substation and from information concerning the moving direction of the train;

linkage locking means for linking and locking a plurality of serially arranged individual control routes with one another to form an enlarged control route, and all of said substations along the linked and lock enlarged control route cooperate with one another for controlling operation of the train;

wherein said apparatus further comprises:

passage determination means for determining whether a train leaves any one of said feeder sections included within said enlarged control route;

automatic linkage unlocking means for automatically unlocking each said feeder section locked by said linkage locking means when said passage determination means determines that the train left that feeder section;

automatic substation unlocking means for automatically unlocking the substation locked to the unlocked feeder section, said automatic substation unlocking means only operating after said automatic linkage unlocking means automatically unlocks the feeder section; and

assignment cancellation means, included within said assigning means, for canceling the assignment of the substation for the feeder section which was unlocked from the substation.

5,467,946

CIRCUIT ARRANGEMENT FOR THE BUSY INDICATION OF TRACK SECTIONS OF A MODEL RAILWAY

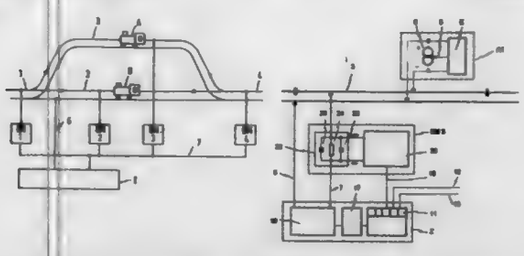
Peter Doehler, Kaulbachstrasse 59, 80539 Munich, Germany

Filed Oct. 11, 1994, Ser. No. 321,437

Claims priority, application Germany, Jan. 16, 1993, 43 35 390.0

Int. Cl.[6] A63H *19/00*

U.S. Cl. 246—122 A **6 Claims**



1. A circuit for producing a busy signal when an engine is positioned on any of a plurality of track sections (1,2,3,4) electrically isolated from each other in a model railway system including a plurality of engines digitally controlled by a control center (Z) having one busy indicator (BM) assigned to each track section, each of said engines including a digital receiver (E) and a signal generator (8) responsive to receipt of a predetermined address signal from said control center to transmit a busy signal to the busy indicator (BM) associated with the track section upon which the respective engine is positioned, said control center being operative to transmit intermittently a digital control signal and address signal to each track section and to the digital receiver (E) of any engine positioned thereon, each digital receiver (E) of a respective engine comprises a decoding device, which only effects operation of its associated signal generator (8) upon conformance of the received address signal with its predetermined address signal, and each digital control signal of the control center (Z) comprises a different address signal for each engine, and whereby each of said engine is identified by assigned control signals and busy signals, and characterized in that:

a) the signal generator (8) of each engine comprises a d.c. source providing a d.c. signal of a given polarity to the associated busy indicator as a busy signal,

b) each busy indicator includes one direct voltage comparator (20),

c) and means is operative between the intermittent digital control signals to produce voltage-free sections as measurement gaps whereby the d.c. signal is determined by the comparator.

5,467,947

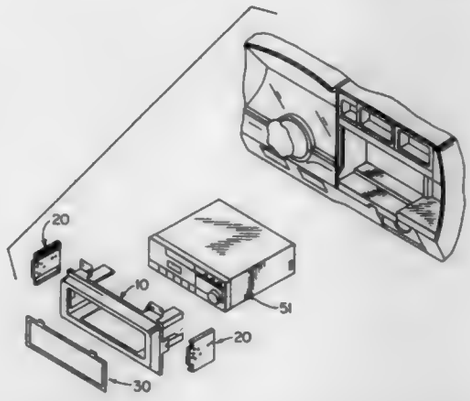
MOUNTING KIT FOR MOUNTING ONE OF SEVERAL TYPES OF AUDIO EQUIPMENT IN AN AUTOMOTIVE DASHBOARD

R. Spencer Quilling, II, DeLeon Springs, Fla., assignor to Metra Electronics Corporation, Holly Hill, Fla.

Filed Apr. 8, 1994, Ser. No. 224,722

Int. Cl.[6] G12B *9/00*

U.S. Cl. 248—27.1 **28 Claims**



1. A mounting kit for mounting to a support in a vehicle one of a plurality of types of components, said kit comprising:

a component housing for housing a component, said housing including a main body having an aperture through which the component protrudes, means for securing said housing to the vehicle support, and a plurality of legs defining a space within which the component is housed;

at least one shaft support with a shaft aperture therein, said shaft support attachable to said housing at a position where said shaft aperture will receive a control shaft of the component; and

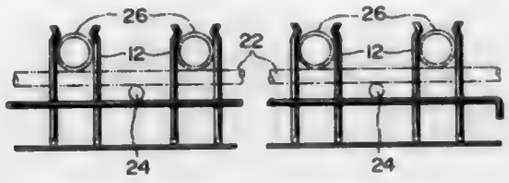
at least one side bracket attachable adjacent a pair of said legs for securing the component to said housing.

5,467,948

APPARATUS FOR RETAINING COOLING PIPES FOR AN ICE RINK

Duncan S. Gillespie, 434 S. Marks St., Thunder Bay, Ont., P7E1M5, Canada

Filed Jun. 27, 1994, Ser. No. 265,952
Int. Cl.[6] F16M *13/00*
U.S. Cl. 248—68.1 **14 Claims**



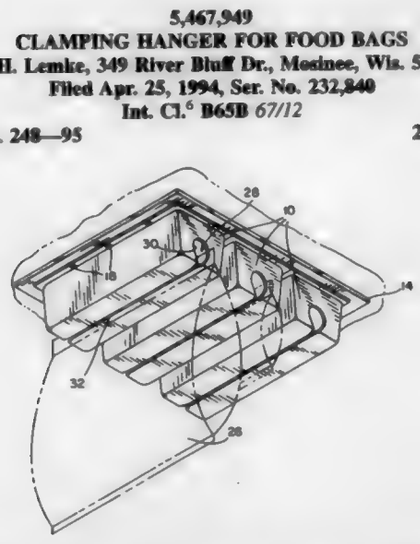
8. Pipe support section or chair comprising:
a base plate adapted to rest on the ice-rink floor surface;
at least one pipe retaining element integrally connected to said base plate and projecting vertically therefrom at the position over and above the floor surface,
an upper portion of said pipe retaining element being provided with a cooling pipe locking means adapted to releasably lock said cooling pipe;
a bar supporting means for supporting a plurality of reinforcement bars provided to support said pipes and to reinforce the complete ice rink structure;
said bar supporting means integrally connected to said pipe retaining element, said bar supporting element being spaced on predetermined distance between said base plate and the upper portion of said pipe retaining element;
said pipe support sections being made of a rigid material, such as steel or the like.

5,467,949

CLAMPING HANGER FOR FOOD BAGS

Stuart H. Lemke, 349 River Bluff Dr., Mosinee, Wis. 54455

Filed Apr. 25, 1994, Ser. No. 232,840
Int. Cl.[6] B65B *67/12*
U.S. Cl. 248—95 **2 Claims**



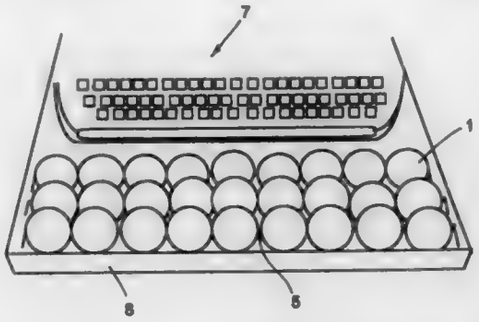
1. A clamping hanger for sealing and storing a food bag having an end with a thickness along which the food bag is suspended from a support surface lying in a generally horizontal plane, said clamping hanger comprising:
a generally rectangular base adapted to be mounted to the support surface; and
a one-piece clamping member attached to said base, said clamping member having a pair of identical, arcuate-shaped, substantially rigid jaws converging together to form a mouth, said mouth having an enlarged guideway gradually tapering into a slit, said slit having a width smaller than the thickness of the end of the food bag, such that the end of the food bag is received in said enlarged guideway and slidably drawn along said slit for frictional retention therein.

5,467,950

MULTIPURPOSE FOREARM/WRIST SUPPORT FOR USERS OF DATA INPUT DEVICES

David Dumitru, 3701 Wilson St., Austin, Tex. 78704

Filed Feb. 9, 1993, Ser. No. 15,331
Int. Cl.[6] B43L *15/00*
U.S. Cl. 248—118.1 **7 Claims**



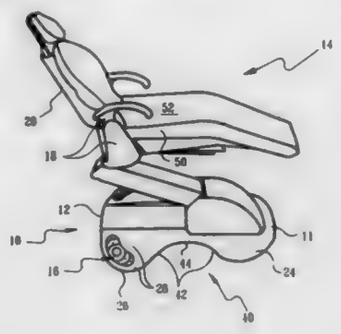
1. An arm or wrist support for users of electronic computing devices, comprising:
a base having a bottom surface and a top surface with an upwardly extending side wall at each end of said top surface defining a space above the top surface and between the side walls:
bead means secured within said space by rod means in a way that the bead means are suspended slightly above, or in light contact with the top surface allowing for rotational movement of the bead means; and
fastening means securing said rod means to said base;
wherein the user's arms or wrists will be supported upon the bead means and will receive a massage effect due to the rotational movement of the bead means against the arms and or wrists; and
wherein the bead means are located above only a front portion of the top surface of the base while a back portion of the top surface provides a tray upon which an interface device for the electronic computing device may be placed so that the bead means are positioned to support the arms and wrists while the user operates the interface device.

5,467,951

BASEPLATE CONFIGURATION

Barry S. Young, Tualatin, Oreg., assignor to MDT Corporation, Torrance, Calif.

Filed Oct. 21, 1993, Ser. No. 140,611
Int. Cl.[6] F16M *11/20*
U.S. Cl. 248—188.1 **16 Claims**



1. In a professional service chair including a seat mounted atop a pedestal upstanding from a baseplate, an improved baseplate comprising:

a central section configured so that its surface perimeter is located within the vertical projection of the edges of said chair seat; and

structural enlargements, extending fore and aft from said central section and being structured and arranged to provide stable support for said pedestal.

5,467,952

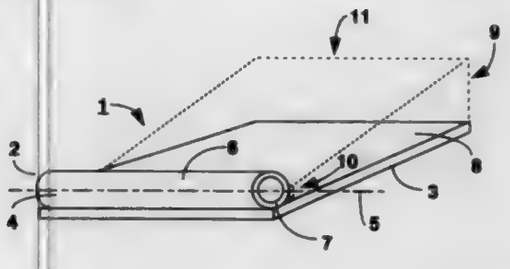
WRIST SUPPORT FOR A KEYBOARD

John R. Martin, 5635 Nebeshonee La., Rockford, Ill. 61103

Filed Oct. 28, 1993, Ser. No. 141,983

Int. Cl.[6] B43L *15/00*

U.S. Cl. 248—118.1 12 Claims



10. An improved device for supporting the wrists of a person using a keyboard, including a front edge, which is adjacent to the person during the person's use of the keyboard, the improved device comprising:

a tubular member having a top wrist supporting surface and having a flexible side wall so that the top wrist supporting surface may flex while supporting the person's wrist during the person's use of the keyboard;

a tray having an upper surface adapted to support the keyboard wherein said member is secured to said upper surface of said tray by a blind fastener and said member is adjacent to the front edge of the keyboard.

5,467,953

SUPPORTING STAND FOR A MUSICAL INSTRUMENT KEYBOARD

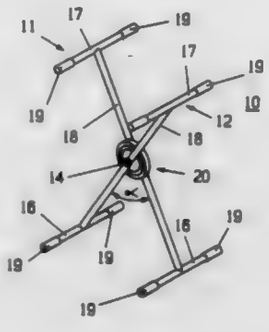
Mario Malizia, Via Berardi 19, 60022 Castelfidardo (AN), Italy

Filed Aug. 2, 1994, Ser. No. 284,897

Claims priority, application Germany, Aug. 31, 1993, 9313078 U

Int. Cl.[6] F16M *11/00*

U.S. Cl. 248—166 6 Claims



1. A stand for a musical instrument keyboard, comprising:

two double-T stand segments which are connected with one another so as to be swivelable out of a rest position into a working position in the manner of a pair of scissors;

a locking gear mechanism for determining a swivel angle and, accordingly, a working height of stand segment associated with the swivel axis of the stand segments;

said locking gear mechanism having a catch member which is associated with one stand segment and the other stand segment having an associated locking member of the locking gear mechanism acting against force of a spring;

said locking gear mechanism having a directional locking gear having a locking disk with a plurality of catch notches for determining working positions;

said locking member being in the form of a catch lever which is arranged tangentially to the locking disk and engages in the catch notches in the radial direction;

a ratchet member being associated with said catch lever and being supported so as to be swivelable between a first and second stop;

said catch lever being held out of engagement with the locking disk between the first and second stops via said ratchet member and then being released so as to engage in said locking disk after being moved into a first working position associated with the first stop and which can be disengaged from said locking disk after occupying a final working position determined by the second stop, in which final working position said ratchet member is dragged along by the catch lever.

5,467,954

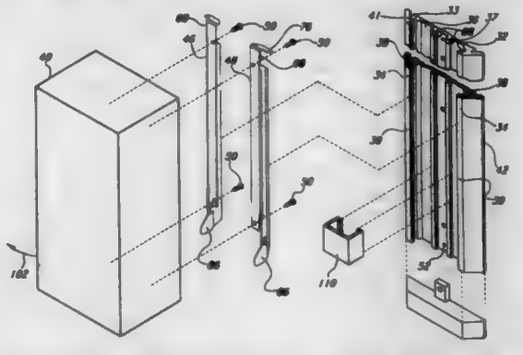
TRACK MOUNTING SYSTEM FOR ELECTRONIC DEVICES

William O. Wekell, Renton, Wash., assignor to SpaceLabs Medical, Inc., Redmond, Wash.

Filed Jan. 13, 1994, Ser. No. 180,675

Int. Cl.[6] A47B *67/02*

U.S. Cl. 248—201 16 Claims



14. A mounting bracket formed from a single planar sheet for mounting a medical device to a mounting plate, the mounting plate having a pair of vertically oriented parallel tracks extending forwardly from a forward surface of the mounting plate, the tracks include a forwardly extending leg projecting from said forward surface and a transversely extending leg projecting from a forward edge of said forwardly extending leg, whereby an elongated track gap is formed between each transversely extending leg and the forward surface of the mounting plate, comprising:

a base portion fastened to the medical component; and

a resilient mounting finger extending rearwardly and downwardly from its respective base portion when said mounting fingers are inserted in respective track gaps, each of said mounting fingers having a distance between forward and rear edges that causes said forward edge to contact the transversely extending leg of said track and said rear edge to contact the forward surface of said mounting plate when said mounting fingers are inserted into said track gaps with said electronic device projecting downwardly and forwardly away from said mounting plate whereby pivotal movement of said

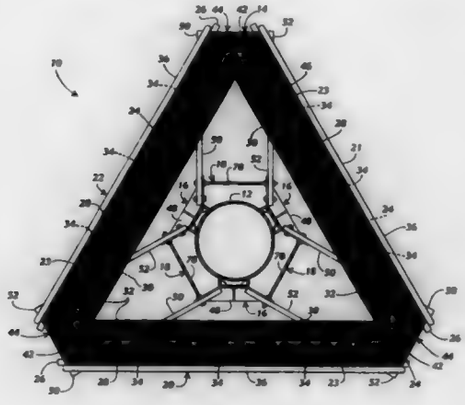
base portion toward said mounting plate about said mounting fingers causes the forward and rear edges of respective mounting tabs to frictionally engage the transversely extending legs of said track and the forward surface of said mounting plate, and downward forces exerted on said medical instrument impart a pivotal torque to said mounting fingers that increase the frictional engagement between the forward and rear edges of said mounting fingers and the transversely extending legs of said track and the forward surface of said mounting plate, respectively.

5,467,955

ANTENNA MOUNTING PLATFORM FOR A MONOPOLE TOWER

Stacy C. Beyersmith, Tucker, Ga., assignor to Bellsouth Corporation, Atlanta, Ga.

Filed Jul. 28, 1994, Ser. No. 282,279
Int. Cl.[6] H01Q 1/12
U.S. Cl. 248—219.3 **12 Claims**



1. An antenna mounting platform for mounting at selectable positions along the length of a monopole tower comprising:

a frame having an interior opening for receiving the monopole;

a plurality of brackets mounted to the frame and extending into the interior opening, the brackets being spaced about the interior opening so that when the antenna mounting platform is mounted to the monopole, the brackets are spaced about the circumference of the monopole, the brackets each comprising:

a base;

a pair of arms spaced from one another and extending from the base toward the monopole when the interior opening receives the monopole; and

first and second outriggers spaced from one another and extending between and mounted to the base and the frame so that the first and second outriggers mount the base to the frame and the first outrigger of each bracket is positioned adjacent the second outrigger of an adjacent bracket; and

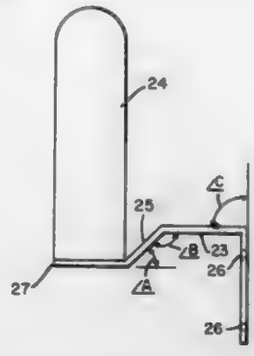
a number of connecting members corresponding to the number of brackets for connecting the brackets, each connecting member connecting adjacent brackets and being operable to selectively (1) compress the associated first and second outriggers together and thereby force the arms of the brackets against the monopole and hold the mounting platform at a location on the monopole, and alternatively, (2) decompress the associated first and second outriggers and thereby release the brackets from against the monopole so that the mounting platform is movable along the length of the monopole.

5,467,956

SHEET ROLL DISPENSER

Boone D. Herr, Rte. 1, Box 23, Viroqua, Wis. 54665

Filed Jun. 8, 1993, Ser. No. 73,668
Int. Cl.[6] A47F 5/00
U.S. Cl. 248—309.2 **2 Claims**



1. A sheet roll dispenser for storage and use of an individual roll of webbing formed with a hollow core of a predetermined diameter, said dispenser comprising: a vertical mounting bracket,

a generally rectangular horizontal support member connected to said mounting bracket, said support member having an abrasive top surface and being formed in two sections, a first section extending from said mounting bracket, an angle section extending from said first section at a first predetermined angle and a second section extending from said angle section at a second predetermined angle different from said first predetermined angle,

an upstanding cylinder formed in said horizontal support member, said mounting bracket, horizontal support member, and upstanding cylinder forming a sheet roll dispenser of unitary construction,

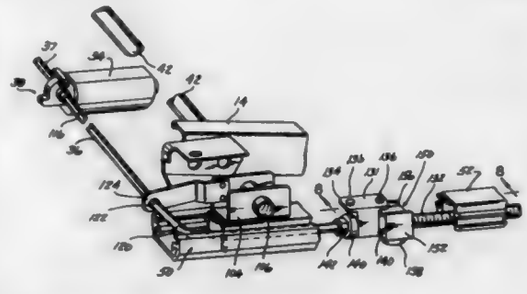
said angle section of said support member along with said abrasive top surface minimizing overfeed when said sheet roll is relatively small.

5,467,957

VEHICLE POWER SEAT ADJUSTER WITH SELF-ALIGNING DRIVE NUT

Derek K. Gauger, Ann Arbor, Mich., assignor to ITT Corporation, New York, N.Y.

Filed Dec. 15, 1993, Ser. No. 167,731
Int. Cl.[6] B60N 2/00
U.S. Cl. 248—429 **8 Claims**



1. A power seat adjuster comprising:

a lower track;

an upper track movably mounted on the lower track;

a lead screw;

drive means coupled to the lead screw for rotating the lead screw;

a drive block having a threaded bore extending therethrough threadingly receiving the lead screw; and

co-acting means, formed on the drive block and the lower track, for axially fixedly mounting the drive block to the lower track and for allowing the drive block to move in a rotational movement about an axis vertically transverse to the bore and a vertical translating movement with respect to the lower track.

5,467,958

ADJUSTABLE DOCUMENT HOLDER STAND

John J. Selvaggio, 5695 Cherokee Rd., Lyndhurst, Ohio 44124

Continuation of Ser. No. 85,684, Jul. 2, 1993, abandoned, which is a continuation-in-part of Ser. No. 812,041, Feb. 10, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,476

Int. Cl.[6] A47B *97/04*

U.S. Cl. 248—449 **1 Claim**

1. A multipurpose adjustable document holder stand comprising: three elongated sections which includes one middle elongated section, a left elongated section, a right elongated section, each of said three elongated section having generally the same length; three approximately same length paper clamps, each of said clamps fixed to a respective one of said elongated sections, for clamping various size documents; two hinges connect pivotally said three elongated sections, to allow the raising and lowering of said left and right sections relative to the middle section; an elongated tubular telescoping structure for height adjustment whereby, said elongated tubular telescoping structure consists of one upper inner elongated tubular section and one lower outer elongated tubular section; whereby, one end of said upper tubular section is inserted into said a slightly larger dimensioned lower outer elongated tubular section, the opposite end of said upper tubular section is secured to said middle elongated section; a cross shaped tubular base secured to a bottom portion of said lower outer elongated tubular section; an adjustable ledge clamped to said elongated tubular telescoping structure, for adjusting the height and supporting various sized rigid displays; and an upper clip located at the top and center of said middle elongated section, for securing the top portion of a rigid display when said display is supported on said adjustable ledge.

5,467,959

CHRISTMAN TREE CLAMPING STAND

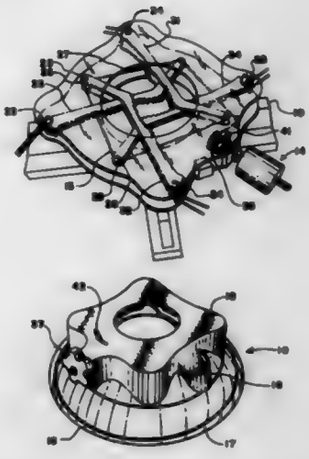
Mark R. Behringer, 66 Hancock St., Reading, Mass. 01867

Filed Jan. 30, 1995, Ser. No. 380,730

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—523 **7 Claims**

1. A stand device for use with a cut Christmas tree having a substantially flat stump surface, said stand comprising:



a) a base adapted to rest securely upon a flat floor,

b) horizontally disposed platform means disposed atop said base and having a central aperture,

c) four gripping arms, each arm having a proximal extremity pivotably attached to said platform means, and a distal extremity provided with a rounded bearing surface, the sites of said pivotal attachment defining a substantially square locus symmetrically disposed about said aperture, said arms being substantially flat and bounded by an outer edge and opposed inner edge provided with a series of teeth, two of said arms, constituting a first pair, and whose proximal extremities are attached to said platform means in diametrically opposed sites, being slidably interactive with the remaining two arms which constitute a second pair, the manner of such interaction being such as to constrain all arms to movement upon a plane parallel to said platform means while causing all said inner edges to be directed toward the center of said aperture,

d) a tightening cable deployed in a circuitous path substantially parallel to said platform means in contact with said bearing surfaces, whereby, as the length of said path is shortened, said arms are moved with uniform force toward said aperture, said movement representing a closing action of the arms

e) turning means for shortening said circuitous path while applying tensile force to said cable, including means for storage of a portion of said cable in a helically wound state,

f) releasible pawl means for enabling said turning means to be secured at any rotative position while maintaining said tensile force,

g) spring means interactive between the proximal extremity of each arm and said platform means to provide a force resistive of the closing action of the arms, and

h) stationary securing means associated with said base for engaging said flat stump surface.

5,467,960

TWO-WAY HVAC FLUID CONTROL VALVE

John M. Morris, Auburn, and Charles J. Green, Seattle, both of Wash., assignors to GT Development Corporation, Tukwila, Wash.

Filed Jun. 22, 1994, Ser. No. 264,031

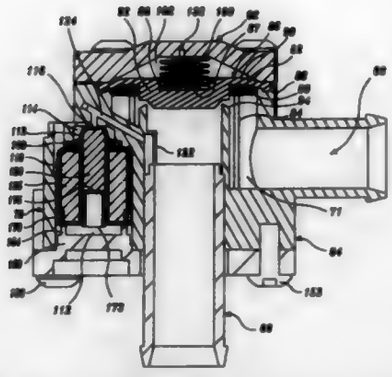
Int. Cl.[6] F16K *31/02;31/126*

U.S. Cl. 251—30.01 **10 Claims**

1. A two-way fluid control valve for an HVAC unit, the control valve comprising:

(a) upper and lower housings that include a fluid inlet and a fluid outlet;

(b) a flexible diaphragm valve member located between the fluid inlet and the fluid outlet, the valve member being movable between an open position in which fluid may flow between the fluid inlet and the fluid outlet and a closed position in



which the valve member prevents fluid from flowing between the fluid inlet and the fluid outlet, the valve member being biased into the closed position by biasing means that extends between the upper housing and the valve member, the diaphragm valve member including a peripheral edge that forms a seal between the upper and lower housings, a thickened center section, and a flexible middle section that extends between the peripheral edge and the center section; and

(c) a three-way solenoid that directly controls the movement of the valve member between the open and closed positions, the solenoid including a normally closed port, a normally open port, and a common port, the fluid inlet being in fluid connection with one of the normally closed port and the normally open port, the fluid outlet being in fluid connection with the other of the normally open port and the normally closed port, and a pressure chamber adjacent one surface of the valve member being in fluid connection with the common port.

5,467,961

ELECTROMAGNETICALLY ACTUATED VALVE

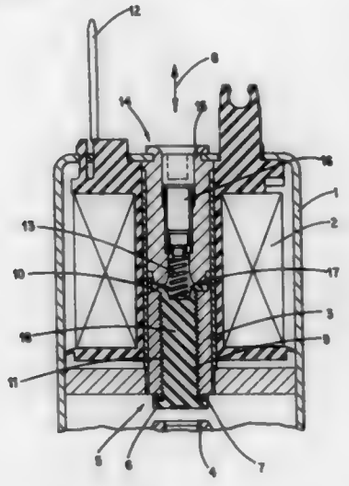
Andreas Sausner, Neu Isenburg, and Stefan Knapp, Waldmichelbach, both of, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Continuation-in-part of Ser. No. 215,218, Mar. 21, 1994. This application May 6, 1994, Ser. No. 239,082

Claims priority, application Germany, May 6, 1993, 43 15 013.6

Int. Cl.[6] F16K *31/06*

U.S. Cl. 251—129.15 **9 Claims**



1. An electromagnetically actuated valve, comprising:

a valve housing;

a metallic magnet armature having a first end and a second end and an axially extending through-bore penetrating therethrough, the through bore being completely filled by an elastomeric material which extend through the first end to provide a stop buffer on the first end of the magnet armature and through the second end to provide an elastomeric sealing member on the second end of the magnet armature that is form-lockingly joined to the magnet armature via a grooved undercut that extends on the periphery of the magnet armature, said undercut and said sealing member being in engagement with one another;

at least one annularly-shaped solenoid coil that is arranged within the valve housing and which, along a portion of its interior annulus, surrounds the magnet armature, said magnet armature being capable of axially reciprocal motion with respect to the solenoid coil; and

a valve seat, against which the sealing member of the magnet armature may selectively be brought into operative engagement.

5,467,962

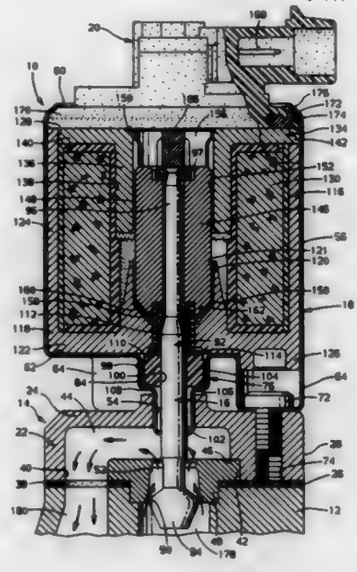
ACTUATOR FOR AN EXHAUST GAS RECIRCULATION VALVE

Raul A. Bircann, Penfield, and Dwight O. Palmer, Rochester, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 9, 1994, Ser. No. 303,331

Int. Cl.[6] F16K *31/06*

U.S. Cl. 251—129.15 **2 Claims**



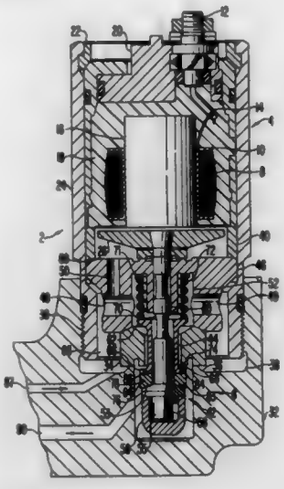
1. A valve assembly for metering exhaust gas to the intake of an internal combustion engine comprising an electromagnetic solenoid actuator having a magnetic circuit comprising a stationary pole piece, an armature moveable within said pole piece, and an air gap separating said pole piece and said armature, said air gap defined by a sleeve member constructed of non-magnetic material and having axially extending slots formed therein and operable to transfer air from a space above said armature to a space below said armature when said armature moves axially, relative to said pole piece.

5,467,963

TWO-PIECE COLLET ADJUSTING NUT FOR A FUEL INJECTOR SOLENOID VALVE

John D. Crofts, Edinburgh; Rodney M. Shurman, Columbus, and Gayle L. Wheeler, Deputy, all of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Apr. 13, 1994, Ser. No. 227,126
Int. Cl.[6] F16K *31/06*
U.S. Cl. 251—129.18 12 Claims



1. A control valve comprising;
a valve housing having a central bore and a valve seat;
a valve element positioned in said housing and movable between an open position allowing fluid to pass through said valve seat and a closed position in sealing engagement with said valve seat;
a valve operation means for moving said valve element between said open and closed positions including a reciprocating armature plunger member extending through said central bore and an armature secured to said armature plunger;
a valve stroke adjustment means for adjustably mounting said valve element relative to said valve operation means for permitting adjustment to within an acceptable tolerance of a predetermined distance between said valve element and said valve seat when said valve element is in its open position without creating a path of leakage when said valve element is in its closed position, said valve stroke adjustment means including a nut positioned concentrically about a threaded end portion of said armature plunger for controlling the distance travelled by said armature relative to said valve operation means, said nut having a spherical sealing surface on one end and a segmented collet on the other end; and
a locking means for radially securing said valve adjustment means for maintaining said predetermined distance between said valve element and said valve seat when said valve element is in its open position, said locking means including a cap contacting said segmented collet end of said nut to create an interference fit between said segmented collet and said armature plunger.

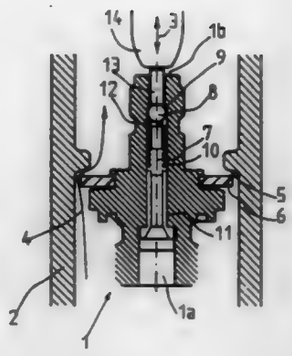
5,467,964

QUICK COUPLING COMPONENT WITH PRESSURE REDUCTION MEMBER

Thure Ekman, Skovde, Sweden, assignor to Dart Engineering AG, Zug, Switzerland

Filed May 24, 1994, Ser. No. 247,999
Claims priority, application Sweden, May 28, 1993, 9301829
Int. Cl.[6] F16L *37/28*
U.S. Cl. 251—149.6 26 Claims

1. A quick coupling component, comprising:
at least one valve member for opening and closing a main flow;



a pressure reduction channel provided in at least one valve member; and
a pressure reduction member arranged in said pressure reduction channel, said pressure reduction member including:
a shut-off element arranged in said pressure reduction channel, said shut-off element including a spherical surface and moving between an open position and a closed position;
a seat arranged in said pressure reduction channel, said seat including a seat surface, wherein in said closed position a first portion of said shut-off element surface bears against said seat surface, thereby sealing said pressure reduction channel, said seat surface substantially corresponding to said shut-off element first surface portion, said seat surface including a degree of fineness substantially corresponding to a degree of fineness of said shut-off element, at least one of said seat and said shut-off element being formed of a material having a hardness substantially exceeded by a hardness of another of said seat and said shut-off element, at least one of said seat and shut-off element being formed of a material having an elasticity contributing to a function sealing of said shut-off element against said seat in said closed position;
a force transmission member for maintaining said shut-off element in said closed position, said force transmission member including a surface designed to contact said shut-off element along a second portion of said surface of said shut-off element; and
an activation member for separating said shut-off element from said seat surface into said open position counter to an action of said force transmission member.

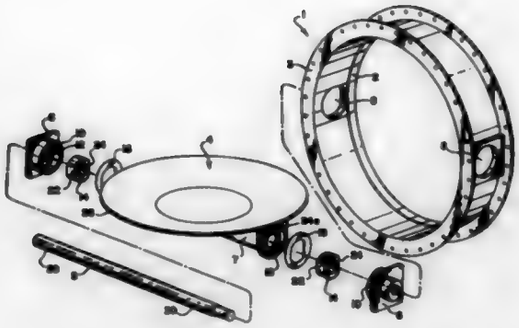
5,467,965

VALVE SYSTEM

John E. Chapman, 23 Sophia Street, Kingston Tas. 7050, Australia

PCT No. PCT/AU92/00530, § 371 Date Apr. 4, 1994, § 102(e) Date Apr. 4, 1994, PCT Pub. No. WO93/07408, PCT Pub. Date Apr. 15, 1993
Continuation of Ser. No. 211,514, Apr. 4, 1994, abandoned.
This PCT application Oct. 2, 1992, Ser. No. 361,879
Claims priority, application Australia, Jan. 2, 1991, PK8679
Int. Cl.[6] F16K *1/226*
U.S. Cl. 251—160 20 Claims

1. A valve system comprising;
an elongate valve body having a valve seat at one end,
a valve plate, operable between an open and closed position, forming a seal with the said valve seat in the closed position, and
a valve plate support structure including;
a transmission member seated within an abutment plate housing, the transmission member having a shaped portion to interact with an abutment plate formed within the abutment plate housing, and operable to effect movement of the valve plate; and



a shaft, associated with and to remain connected to the transmission member during operation, and operable to effect movement of the transmission member by rotational movement of the shaft;

wherein rotational movement of the said shaft will result in independent rotational movement and linear movement of the said transmission member within the abutment plate housing, the said rotational movement being imparted directly by the rotational movement of the shaft, the said linear movement being imparted by the relative forces between the shaped portion of the transmission member and the abutment plate upon further rotation of the shaft, and operable to effect independent rotational movement and linear movement of the valve plate.

5,467,966

SEALS

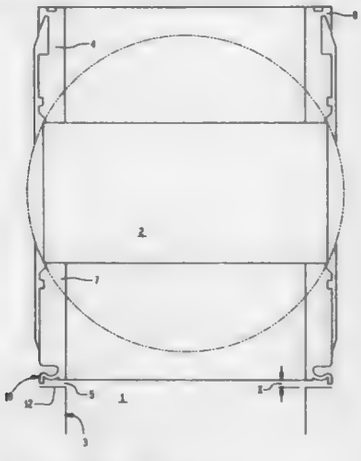
Terence P. Nicholson, Hexham, Great Britain, assignor to Specialist Sealing Ltd., Channel Islands

Filed Sep. 6, 1994, Ser. No. 301,894

Claims priority, application United Kingdom, Sep. 7, 1993, 9318544; Jan. 11, 1993, 9320910

Int. Cl.[6] F16K *3/10*

U.S. Cl. 251—174 **16 Claims**



1. A gate valve which comprises:

a valve body;

a valve gate member movable slidably in said valve body;

fluid inlet and outlet flow passages in said valve body, said valve gate member being arranged for movement to selectively prevent and permit fluid flow between said flow passages; and

at least one gate valve seat member located in said valve body between said valve gate member and a respective flow passage, said gate valve seat member being mounted in a floating manner in said valve body and having a first seal region arranged to make slidable sealing contact with said valve gate member and a second seal region arranged to make sealing contact internally with said valve body adjacent a respective flow passage, wherein the improvement is characterized in that:

said floating gate valve seat member incorporates an integral resilient seal element comprising, in cross-section, a resilient limb integral at one end with and spaced over its length from the remainder of said floating gate valve seat member, said resilient limb being arranged and adapted to make resilient sealing contact with said valve body and having an outer surface with an arcuate profile which is convex outwardly from said floating gate valve seat member and towards said valve body.

5,467,967

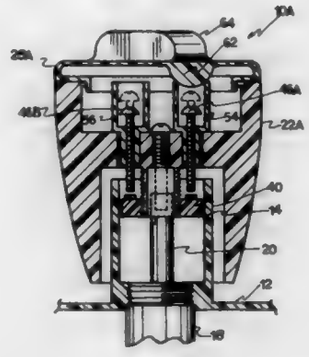
WATER TEMPERATURE CONTROL DEVICE

Gregory T. Gillooly, 6895 Arbor La., Bryans Road, Md. 20616

Filed Jan. 18, 1995, Ser. No. 374,210

Int. Cl.[6] F16K *5/00*

U.S. Cl. 251—288 **13 Claims**



1. A faucet wherein the maximum amount to which the faucet can be opened is settable by a user, comprising:

a face plate having a sleeve portion, said sleeve portion having first and second open ends, a longitudinal axis, and a hollow interior, said face plate being capable of fitting over a valve having a valve stem so as to allow the valve stem to pass through said first open end and be housed substantially within said hollow interior of said sleeve portion;

a knob having a top portion and a bottom portion, said bottom portion having a cavity receiving a portion of said sleeve portion proximate said second open end, said knob further having a threaded sleeve provided within said cavity, said threaded sleeve passing through said second open end and being positioned within said sleeve portion;

a fastener passing substantially centrally through said knob and engageable with the valve stem;

a setscrew having a longitudinal axis and passing through said knob so as to penetrate into said cavity and have a portion thereof be positioned within said cavity, said longitudinal axis of said setscrew passing between said threaded sleeve and said sleeve portion; and

a stop collar matingly engaging said threaded sleeve, whereby turning said knob causes said stop collar to move along said threaded sleeve and said knob is substantially prevented from turning once said stop collar contacts said setscrew.

5,467,968

TRANSMISSION LINE INSTALLATION

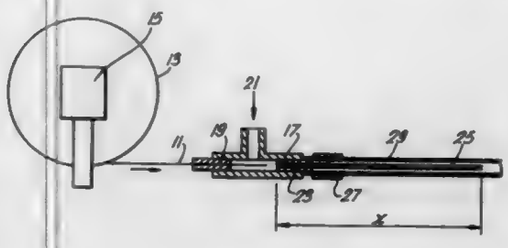
Nicholas W. Proud, Needham Market, and Robert A. Freeman, Ipswich, both of, England, assignors to British Telecommunications public limited company, London, England

Division of Ser. No. 603,711, Nov. 21, 1990, Pat. No. 5,199,689. This application Jan. 5, 1993, Ser. No. 723

Claims priority, application United Kingdom, Jun. 2, 1988, 8813068

Int. Cl.[6] B66F *3/24*

U.S. Cl. 254—134.4 6 Claims



1. Apparatus for advancing a transmission line along a duct with viscous drag of a fluid medium, comprising an inlet chamber connectable to a fluid source and a duct with a small diameter feed portion close to the chamber, so that a transmission line introduced to the feed portion via the chamber can be advanced through the feed portion and introduced into a larger diameter portion of the duct by virtue of the flow of said fluid through the feed portion from said chamber into said larger diameter portion, which larger diameter portion of duct is, during advancement of the transmission line, stationary with respect to the feed portion.

5,467,969

ROPE JACK DEVICE FOR A SHUTTLE

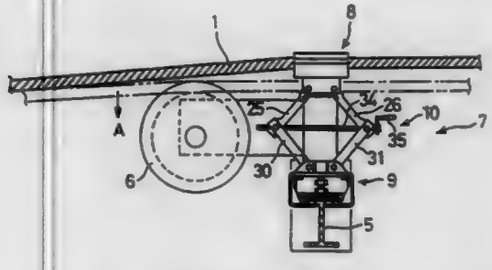
Osamu Kobayashi, Yotsukaido, and Takashi Yoshida, Chiba, both of, Japan, assignors to Otis Elevator Company, Farmington, Conn.

Filed Aug. 27, 1993, Ser. No. 113,864

Claims priority, application Japan, Aug. 27, 1992, 4-227675

Int. Cl.[6] B25B *25/00;* B66F *3/00;* B60V *3/04*

U.S. Cl. 254—251 5 Claims



1. A jack for a rope that provides motive force to a vehicle, said rope being guided by a rotatable guide wheel, said guide wheel being supported by a support, said jack comprising:

a rope holder adapted to securely hold said rope;

a holder adapted to be mounted on said support so that said holder does not interfere with said guide wheel and;

a unit interconnecting said rope holder and said holder for moving said rope holder away from said holder to move said rope away from said guide wheel;

whereby when said rope is moved away from said guide wheel, said guide wheel may be freely removed from the support without encountering any interference from said jack.

5,467,970

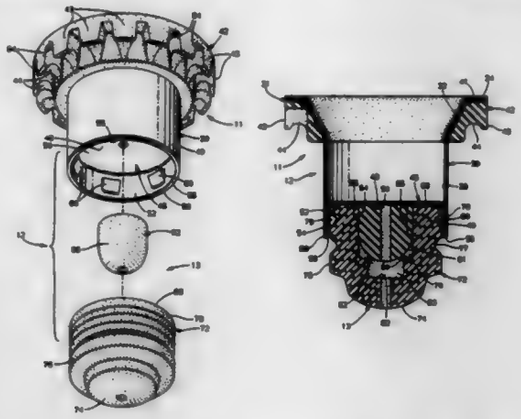
VEHICLE SUSPENSION SYSTEM WITH JOUNCE BUMPER

John J. Ratu, Carson City; Alvin K. Jones, Romeo, and Charles K. Maddox, Linden, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 6, 1994, Ser. No. 254,731

Int. Cl.[6] F16F *5/00*

U.S. Cl. 267—220 10 Claims



1. In a vehicle suspension system including a bumper stop, a jounce bumper comprising:

a rigid support having a rigid cylindrical wall, a first open end and a first substantially closed end;

a first bumper member having a second open end and a second substantially closed end, the first bumper member defining a cylindrical passage bordered by an inner cylindrical wall at the second open end, wherein the second open end is mounted radially interior of the rigid cylindrical wall and abuts the first substantially closed end of the rigid support; and

a second bumper member of cylindrical shape and size to fit within the cylindrical passage, having a radially exterior surface radially interfacing with a predetermined axial length of the inner cylindrical wall, wherein the second bumper member is trapped between the second substantially closed end of the first bumper member and the first substantially closed end of the rigid support,

wherein, during compression of the first bumper member, the second bumper member axially compresses and creates a radially outwardly directed force that cooperates with the rigid cylindrical wall to trap the second open end of the first bumper member between the second bumper member and the cylindrical wall, resulting in a decrease in the potential compression of the first bumper member, wherein the spring rate of the first bumper member is passively increased by the second bumper member cooperating with the rigid cylindrical wall.

5,467,971

STRUT ASSEMBLY WITH INTEGRAL BEARING AND SPRING SEAT

Diane M. Hurtubise, Kettering; Perry K. Arnold, Beavercreek, both of Ohio; David P. Kudla, Grand Blanc, Mich., and Lawrence E. Armstrong, Centerville, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 8, 1994, Ser. No. 287,035

Int. Cl.[6] B60G *13/00*

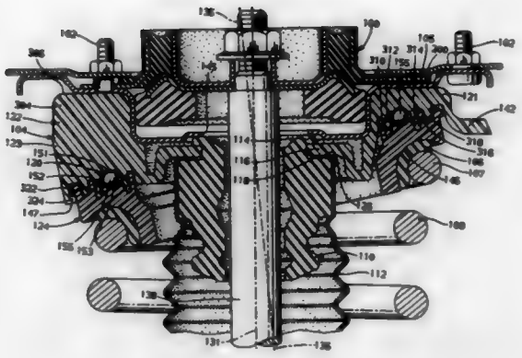
U.S. Cl. 267—220 3 Claims

1. A vehicle suspension comprising:

a jounce bumper with an axially upper snap portion; and

an integral wedge, bearing and spring seat including

an annular wedge body including a wide end and narrow end, the annular wedge body including a first axial side forming a seat portion and a second axial side including a first



annular surface having an axially aligned u-shaped profile, wherein the annular wedge body includes a radially inward extending annular wedge seat having an axially upper surface to which the axially upper snap portion of the jounce bumper engages;

an annular seat including a first axial side forming a seat for one of (a) a spring and (b) a spring isolator, and a second axial side including a second annular surface having an axially aligned u-shaped profile, wherein the first and second annular surfaces face each other;

a first annular track having an axially aligned u-shaped profile seated in the first annular surface;

a second annular track having an axially aligned u-shaped profile seated in the second annular surface, wherein the first and second annular tracks form a bearing race; and

a set of spherical bearings within the bearing race, wherein the annular wedge body is between the annular seat and a vehicle body.

5,467,972

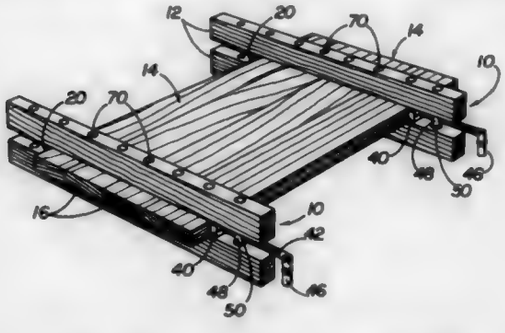
PANEL CLAMPING APPARATUS

Leonard G. Lee; John S. Lynn, both of Ottawa; Francis A. McLean, Oxford Station; Edwin C. Tucker, Ottawa, and Lloyd Sevack, Nepean, all of, Canada, assignors to Lee Valley Tools, Ltd., Ottawa, Canada

Continuation-in-part of Ser. No. 961,489, Oct. 15, 1992, Pat. No. 5,284,331. This application Jan. 11, 1994, Ser. No. 180,031

Int. Cl.[6] B25B *1/00*

U.S. Cl. 269—118 **20 Claims**



1. A clamping apparatus for use with a rail comprising:

a. a fixed jaw post having two post ends and a pad located intermediate the two fixed jaw post ends,

b. a clamping jaw post having two post ends and a threaded hole through the clamping jaw post intermediate the two clamping jaw post ends,

c. positioned within the threaded hole, a clamping screw having two ends,

d. a clamping pad attached to one of the screw ends, and

e. means for turning the clamping screw attached to the other of the clamping screw ends.

5,467,973

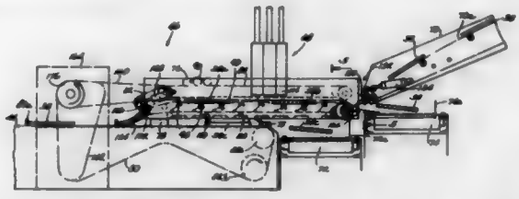
APPARATUS AND METHOD FOR ADDRESSING VARIABLE THICKNESS SIGNATURES

William T. Graushar, Wauwatosa; John C. Geres, West Allis, and Todd J. Dettmering, Menomonee Falls, all of Wis., assignors to Quad/Tech, Inc., Sussex, Wis.

Filed Apr. 21, 1993, Ser. No. 51,067

Int. Cl.[6] B41F *13/54*

U.S. Cl. 270—1.1 **12 Claims**



1. A signature customizing system of the type including a conveyor line, a plurality of feeders for selectively delivering and processing signatures on said conveyor line in groups of completed books of variable thickness, and a printer located adjacent said conveyor for printing information on said books, the system comprising:

compensation means operatively connected with said conveyor line for maintaining a constant distance between said printer and said books regardless of the variable thickness of said books in order to preserve the quality of printing on said books, said compensation means including an upper belt means and a lower belt means, said upper and lower belt means for receiving said books therebetween, and means for biasing said lower belt means upwardly when a book is between said upper belt and said lower belt to press said book against said upper belt means.

5,467,974

PAPER SHEET STACKING MECHANISM FOR MAIL SORTING SYSTEM

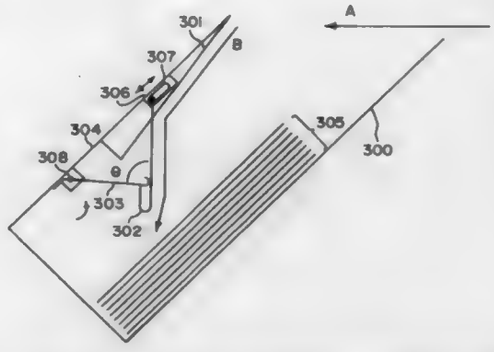
Tadashi Ishiwata; Tetsuo Ogata, and Ikuhiro Aota, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 13, 1994, Ser. No. 258,826

Claims priority, application Japan, Jun. 11, 1993, 5-140792

Int. Cl.[6] B65H *31/26*

U.S. Cl. 271—220 **11 Claims**



1. A paper sheet stacking mechanism to be installed within a stacking box into which paper sheets deposited through an input slit are to be stacked, comprising:

a movable guide place for guiding the sheets deposited through the input slit, supported by a first shaft provided on a top plate of the stacking box, pivoting on said first shaft when the volume of sheets stacked in the stacking box has surpassed a prescribed level;

a supporting plate for preventing said movable guide plate from being pivoted on said first shaft before the volume of sheets stacked in the stacking box has surpassed the prescribed level,

said supporting plate having one end which pivots on a second shaft provided on the top plate and another end positioned in contact with a face of said movable guide plate opposite to the input slit; and

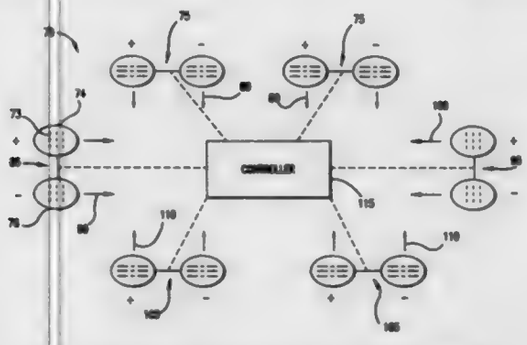
a releasing mechanism for disengaging said movable guide plate from said supporting plate and for permitting said movable guide plate to pivot on said first shaft, when the volume of sheets stacked in the stacking box has surpassed the prescribed level.

5,467,975

APPARATUS AND METHOD FOR MOVING A SUBSTRATE

Babur B. Hadimioglu, Mountain View; Martin G. Lim, Union City; Richard G. Stearns, Los Gatos, and Calvin F. Quate, Stanford, all of Calif., assignors to Xerox Corporation, Rochester, N.Y.

Filed Sep. 30, 1994, Ser. No. 316,343
Int. Cl.[6] B65H *5/12*
U.S. Cl. 271—267 **19 Claims**



1. A device for moving an object, the device comprising:

a base element;

a drive mechanism coupled with the base element to move the base element in first and second directions; and

a plurality of movable members formed of an electrodeposited material fixedly secured to the base element to move with the base element, the members being in contact with the object such that movement of the base element in the first direction causes the members to change configuration to move the object in a direction other than the first direction, and such that movement of the base element in the second direction causes the members to reverse the change in configuration and to slip with respect to the object.

5,467,976

DEVICE INCLUDING A DIVERTING MECHANISM FOR CHANGING THE CONVEYING DIRECTION OF PRODUCTS IN A FOLDER

Louis J. Doucet, 7 Kyle Dr., Salem, N.H. 03079

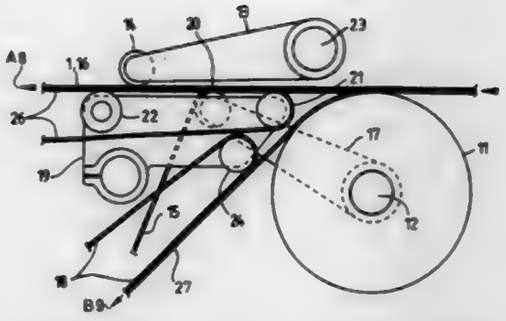
Filed Oct. 13, 1994, Ser. No. 322,721
Int. Cl.[6] B65H *39/10*
U.S. Cl. 271—13 **17 Claims**

2. A device for changing the conveying direction of products in a folding apparatus, comprising:

a first conveying mechanism arranged along a horizontal transport path;

a take-over mechanism and a second conveying mechanism [means] arranged along an inclined transport path, the inclined transport path being inclined relative to said first conveying mechanism;

upper and lower diverting mechanisms provided adjacent to the first conveying mechanism on said horizontal transport path; and



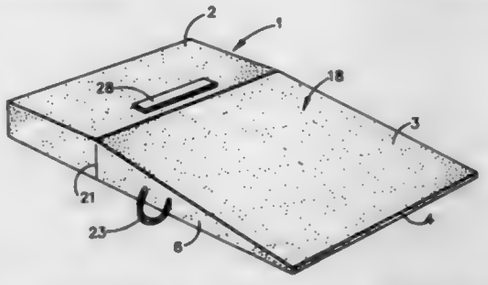
a deflection mechanism coupled to the upper and lower diverting mechanisms the deflection mechanism deflecting the upper and lower diverting mechanisms onto the inclined transport path.

5,467,977

PORTABLE PITCHING MOUND

John W. Beck, 707 Loda Dr., Cincinnati, Ohio 45245

Filed Dec. 18, 1991, Ser. No. 809,381
Int. Cl.[6] A63B *71/00*
U.S. Cl. 273—25 **16 Claims**



1. A portable pitching mound comprising an expanded plastic core defining the shape of the mound, a flexible, artificial turf material covering all the top and peripheral edge surfaces of said core, said mound having a planar, horizontal, top surface part on which a conventional rubber is mounted, said mound having a planar bottom.

5,467,978

TRAINING DEVICE FOR BASEBALL BATTING

Joseph J. Paluch, 2403 Carianne Pl., Mississauga, Ontario, Canada

Filed Jul. 29, 1994, Ser. No. 282,558
Int. Cl.[6] A63B *69/40*
U.S. Cl. 273—26 E **7 Claims**

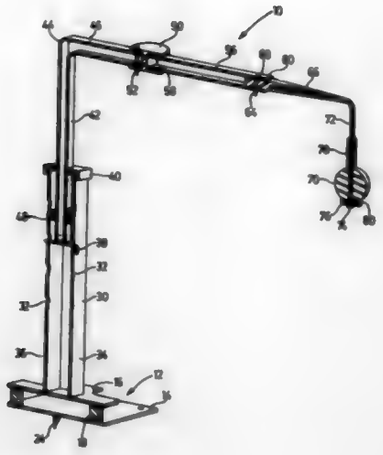
1. A batting practise device, comprising:

a) a base portion and a first support member attached thereto, the base portion being adapted to be anchored to a surface;

b) a second support member engaging with said first support member, the second support member being movable with respect to said first support member to a plurality of positions for adjusting the distance of said second support member from said base portion, including means for retaining the second support member in any one of said plurality of positions;

c) a resilient coupling member mounted to an end portion of said second support member spaced from said first support member;

d) a flexible arm having opposite end portions, said flexible arm being mounted at one of said opposite end portions to said resilient coupling member;



e) a flexible member extending from the other end portion of said flexible arm and having a free end portion; and

f) a ball attached to said free end portion of said flexible member.

5,467,979

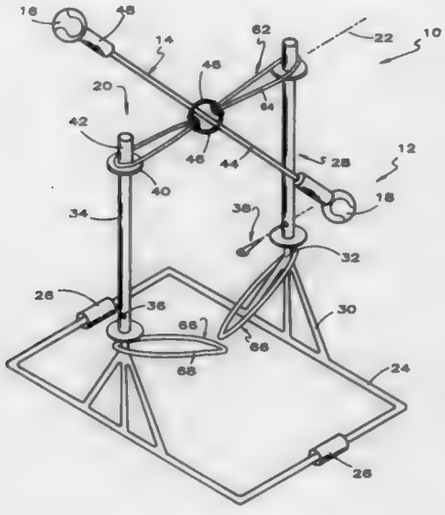
BASEBALL BATTING PRACTICE DEVICE

Rene A. Zarate, 813 Madison, Alice, Tex. 78332

Filed Aug. 23, 1993, Ser. No. 109,999

Int. Cl.[6] A63B *69/40*

U.S. Cl. 273—26 R **12 Claims**



1. A baseball batting practice device comprising

a frame providing first and second spaced supports;

a rod having a ball on at least one end thereof; and

means mounting the rod on the supports for arcuate movement about a plurality of closely spaced axes spaced from the ball, the mounting means including

a first resilient member fixed to the rod intermediate the ends thereof and attached to the first support and

a second resilient member fixed to the rod intermediate the ends thereof and attached to the second support, rotation of the rod about the said axis acting to twist the first and second resilient members upon said at least one ball being hit by a batter.

5,467,980

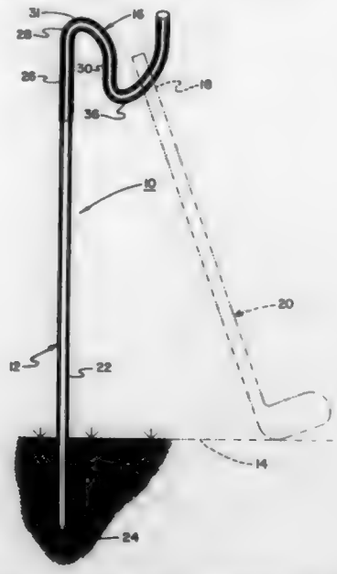
GOLF CLUB SUPPORTING DEVICE

Larry Weisenstein, 16 Spyglass Hill Ct., Holmdel, N.J. 07733

Filed Oct. 26, 1994, Ser. No. 329,284

Int. Cl.[6] A63B *57/00*

U.S. Cl. 273—32 B **6 Claims**



1. A golf club supporting device comprising, in combination:

a substantially circular cross section elongated stake having an upper distal end and a lower end being shaped so as to define a piercing tip forming a ground engaging means, the ground engaging means being capable of piercing and engaging a ground surface during an insertion of the elongated stake thereinto; and

a handle engaging means coupled to the upper distal end of the elongated stake for engaging a handle of a golf club to support the golf club relative to the ground surface, the handle engaging means capable of various orientations when the circular cross section of the elongated stake permits rotation of the ground engaging means relative to the ground surface, the handle engaging means including an upper portion of the elongated stake shaped so as to define a first integral bend continuing into a connection portion extending into a substantially spaced and parallel orientation relative to the upper portion so as to define a first U-hook, the handle engaging means further comprising a second integral bend continuing from the connecting portion and extending into a terminating portion positioned in a substantially spaced and parallel orientation relative to the connecting portion to define a second U-hook, the first U-hook residing within a first plane, and the second U-hook residing within, a second plane, wherein the second plane is oriented perpendicularly relative to the first plane.

5,467,981

FOOTBALL WITH TAIL APPENDAGE

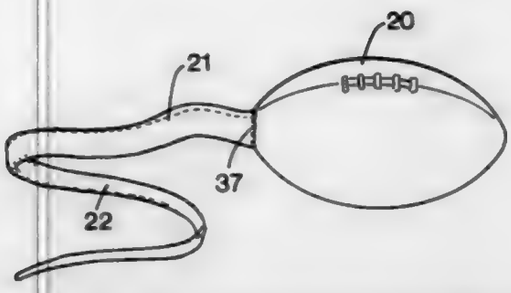
Elliot Rudell, 1619 Gramercy Ave., Torrance, Calif., and George Foster, Signal Hill, Calif., assignors to Elliot Rudell, Torrance, Calif.

Continuation-in-part of Ser. No. 873,727, Apr. 27, 1992, Pat. No. 5,228,690. This application Jun. 28, 1993, Ser. No. 82,491

Int. Cl.[6] A63B *43/02*

U.S. Cl. 273—65 EF **11 Claims**

1. A football having an ovaloid shape with back and front tips, a longitudinal axis, an elliptical longitudinal cross section and generally circular transverse cross section and having at its back tip, a limp tail appendage attached at one end only to said football substantially in alignment with the longitudinal axis of said foot-



ball said tail appendage being substantially continuously limp from its point of attachment to said ball to a free unattached end thereof so that said football may be thrown in a normal manner and said appendage is free to extend backward of said football in flight to provide sufficient drag to cause the back tip of the football to align itself with the front tip thereof, thereby resulting in a straight and accurate flight of the football.

5,467,982

TENNIS RACKET

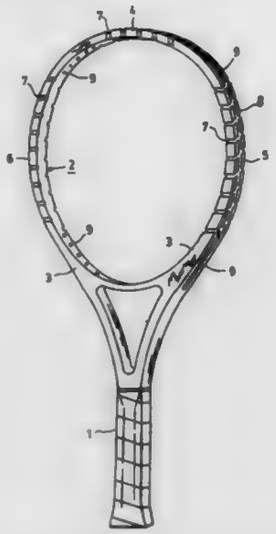
Kuni Tseng, 6F-1, No. 342, Keelung Road, Sec. 1, Taipei, Taiwan, Prov. of China

Filed Jun. 22, 1993, Ser. No. 80,888

The portion of the term of this patent subsequent to Aug. 21, 2011, has been disclaimed.

Int. Cl.[6] A63B *49/02*

U.S. Cl. 273—73 C **5 Claims**



1. A tennis racket comprising:

a shaft and a substantially elliptical frame having top and opposite lateral portions and a shoulder at each lower end of said lateral portions converging into said shaft, said frame including a striking surface defined by interwoven strings;

wherein said frame is formed with a plurality of transverse grooves at said top and lateral portions, the grooves extending from one face parallel with said striking surface, around the outside of said frame to the opposite face, the grooves terminating in stringing tubes;

the frame further including a single longitudinal groove extending circumferentially at substantially a center line on the outside face of said frame from said shoulder at one of said lateral portions, crossing over all said transverse grooves to said shoulder at the other lateral portion and having series of central stringing holes passing through said frame from said outside to inside surfaces at the sections other than said top and opposite lateral portions, where said transverse grooves are not present, so that

the string may pass through the grooves and stringing tubes so that the insertion point of the string through the frame is not always at the central portion of the frame.

5,467,983

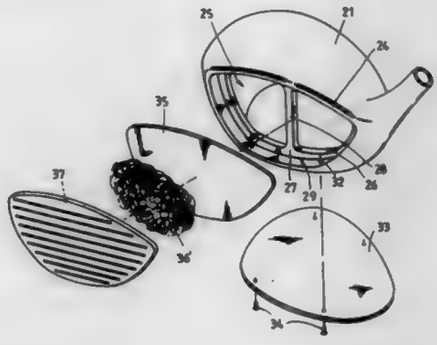
GOLF WOODEN CLUB HEAD

Archer C. C. Chen, 35, Yichaone E. Road, Taipin, Taichung County, Taiwan, Prov. of China

Filed Aug. 23, 1994, Ser. No. 294,364

Int. Cl.[6] A63B *53/04*

U.S. Cl. 273—78 **1 Claim**



1. A golf wooden club head comprising:

a casing of a hollow construction and provided in a bottom surface thereof with an opening and further provided with a recessed front surface in communication with an interior space of said casing having an inner wall provided with a shoulder which is located a predetermined distance from a front surface open end and which extends around the edge of said open end, said shoulder having a ring-shaped shoulder surface which is provided with at least a rib portion having a surface which faces outwards and is coplanar with said shoulder surface, said front surface open end forming a receiving space in conjunction with said shoulder surface;

a bottom plate fastened to said bottom surface of said casing such that said opening of said bottom surface is sealed off by said bottom plate;

a base plate fastened to said shoulder surface for separating said receiving space from said interior space of said casing so as to make said interior space airtight and to make said receiving space a recessed slot;

a support layer made of a bulk molding compound of a fiber-reinforced resin material, said support layer forming a part of a ball-striking surface of a golf wooded club head by being hardened in said recessed slot under heat and pressure; and

a ball-striking plate pre-arranged on said bulk molding compound and made integrally with said support layer for forming said ball-striking surface of said wooden club head;

wherein said shoulder of said casing is provided with at least two projections extending outwards and perpendicular to said shoulder surface; and

wherein said ball-striking plate is provided with at least two holes corresponding in location to and engageable with said two projections.

5,467,984

BALANCED GOLF CLUB

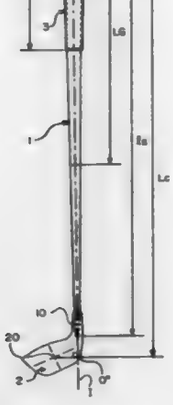
Jean-Luc Veux, Rumilly, and Benoit Vincent, Annecy Le Vieux, both of, France, assignors to Taylor Made Golf Company, Inc., Carlsbad, Calif.

PCT No. PCT/FR91/00813, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO93/07935, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 17, 1991, Ser. No. 211,436

Int. Cl.[6] A63B *53/00*; G01M *1/12*

U.S. Cl. 273—81 R **37 Claims**



1. A golf club comprising:
a shaft having a lower end and an upper end;
a head mounted at the lower end of the shaft;
a grip mounted at the upper end of the shaft;
a total mass of less than 340 grams;
an equivalent pendulum length (LPE);
a club length (LC); and
a ratio of equivalent pendulum length to club length (LPE/LC) less than 0.87.

5,467,985

OBJECTIONAL AIR SKELLY GAME

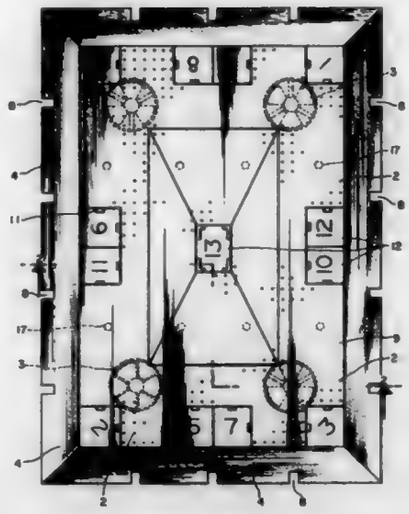
Darryl L. Jones, 1569 Bruckner Blvd. #14B, Bronx, N.Y. 10472

Filed Sep. 14, 1994, Ser. No. 305,840

Int. Cl.[6] A63F *7/07*

U.S. Cl. 273—126 R **5 Claims**

1. An air cushion board game comprising
a top layer and a bottom layer of material, said bottom layer is disposed below and connected to the top layer in an air tight manner by way of an angled side ramp which is flush with the adjacent ground;
a plurality of legs to support the bottom layer above the adjacent ground;
an opening, said opening being the space between the attached top and bottom layers and the side ramp;
a plurality of ducts for receiving air into the opening are arranged in the bottom layer and along the ramp and are in gaseous communication with the outside air;
a playing surface having boxes numbered 1–13 in designated areas is attached to the top layer;
two pegs protrude outwardly from the perimeters of boxes numbered 1–12; and
four pegs protrude outwardly from the perimeter of the box numbered 13;
a plurality of apertures; said apertures are evenly arranged throughout the entire playing surface on the top layer, excluding the areas of boxes #1–13;



a multiplicity of air fans; said fans operatively positioned under the top layer in a substantially uniform pattern which blow air thru the apertures in the top layer thereby creating an air cushion on the top layer;
power means; said power means is positioned between the top layer and the bottom layer and is adjacent and attached to the fans so as to operate the air fans;
a game top having an area and weight such that it floats upon the air cushioned playing surface of the top layer when pushed.

5,467,986

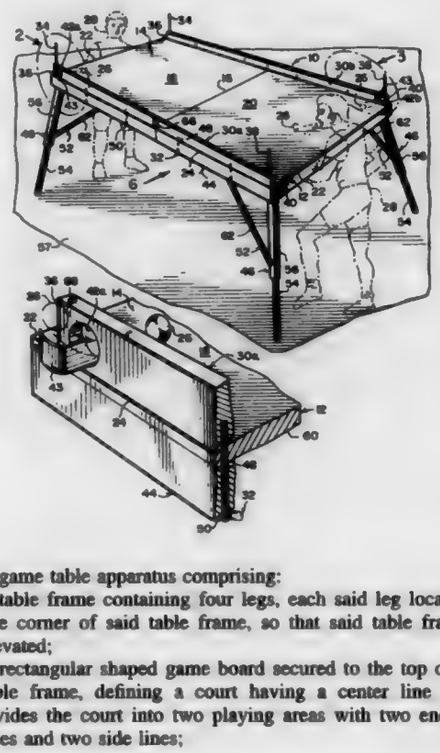
PNEUMATICALLY PROJECTED BALL TABLE GAME

Kenneth E. Weiland, P.O. Box 706, Enosburg Falls, Vt. 05450

Filed Sep. 9, 1993, Ser. No. 118,519

Int. Cl.[6] A63B *71/00*

U.S. Cl. 273—129 AP **11 Claims**



1. A game table apparatus comprising:
a) a table frame containing four legs, each said leg located in one corner of said table frame, so that said table frame is elevated;
b) a rectangular shaped game board secured to the top of said table frame, defining a court having a center line which divides the court into two playing areas with two end goal lines and two side lines;

c) a small lightweight hollow ball, whereby when said game board is elevated, at least two players can each stand behind one of the end goal lines and try to blow with their mouth, said small lightweight hollow ball over the opposite end goal line to receive a point each time during the play of the game;

d) a pair of side rails, each of said side rails being attached to one of said side lines, respectively, said first side rail having a side opening therethrough at said first end, said second side rail having a side opening therethrough at the second end, so that said side openings are diagonally opposite from each other, and a pair of L-shaped servers, each inserted into one said side opening, so that each player can insert said small lightweight hollow ball through their respective side opening in said side rail, to make a serve during the play of the game;

e) means for attaching each said side rail over one of the side lines on said game board, so as to deflect said small lightweight hollow ball and prevent it from falling over the side lines during the play of the game;

f) a first pair of goal posts, located opposite and representing said first player, mounted upright on the same first ends of said first and second side rails, so that said first pair of goal posts will be opposite from each other at one end goal line to represent the first player; and

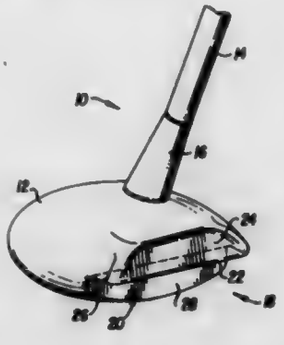
g) a second pair of goal posts, located opposite and representing said second player, mounted upright on the same second ends of said first and second side rails, so that said second pair of goal posts will be opposite from each other at the other end goal line to represent the second player.

5,467,987

GOLF PUTTERS

James E. Perkins, 1110 Wannamaker Ave., and Michael G. Bufflkin, 2813 W. Juniper Rd., both of Florence, S.C. 29501

Filed Sep. 9, 1993, Ser. No. 118,219
Int. Cl.[6] A63B *53/04*
U.S. Cl. 273—175 17 Claims



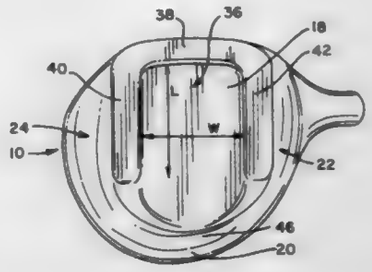
9. A golf putter comprising a club head having a forward striking face and a base, said striking face comprising first, second and third planar surfaces, a striking edge defined by the intersection between said first and second planar surfaces, said first planar surface being located above said striking edge and inclined rearwardly from a vertical axis passing through said striking edge, said second planar surface extending horizontally and rearwardly from said striking edge, said third planar surface extending between said second planar surface and said base, said striking edge being located at a predetermined height above said base so as to impart a substantially immediate forward roll to a golf ball struck by said striking edge.

5,467,988

GOLF CLUB HEAD

William D. Henwood, Norcross, Ga., assignor to Nicklaus Golf Equipment Company, L.C., West Palm Beach, Fla.

Continuation of Ser. No. 20,065, Feb. 19, 1993, which is a continuation of Ser. No. 779,351, Oct. 18, 1991, abandoned.
This application Nov. 12, 1993, Ser. No. 152,439
Int. Cl.[6] A63B *53/04*
U.S. Cl. 273—167 A 6 Claims



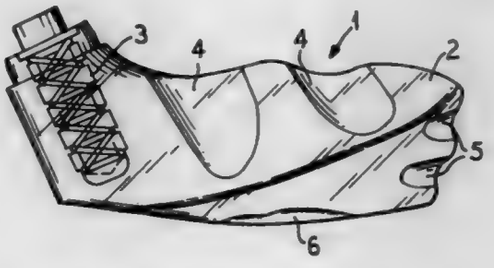
1. In a golf club head comprising an integral hollow metal body having a front striking face, an upper wall, a rear wall, a heel, a toe, a bottom wall forming a sole, and a hosel extending upwardly at a predetermined angle from the heel of the body for attaching the head to a shaft, the improvement wherein the bottom wall includes a recessed cavity inwardly of the body throughout an extended area which lies rearwardly of the front striking face and inwardly of the heel and toe such that the ground engaging sole area of the head comprises a front rail portion adjacent the front striking face and side rail portions joined to the front rail portion and extending toward the rear wall adjacent the heel and the toe, the recessed cavity having a generally rectangular shape in plan view and having a size and depth sufficient to result in a concentration of club head weight in the heel and toe area and produce an elevation in the center of gravity of the head relative to the ground engaging sole area, said side rail portion and said recessed cavity forming a generally rectangular opening adjacent said rear wall.

5,467,989

GOLF CLUB HEAD WITH ACRYLIC CLUB BODY AND METHOD FOR MANUFACTURING SAME

Robert Good, Kildeer, and Richard Carobus, Elgin, both of Ill., assignors to The Clear Difference Co., Elgin, Ill.

Continuation of Ser. No. 157,626, Nov. 23, 1993, abandoned.
This application Nov. 10, 1994, Ser. No. 338,823
Int. Cl.[6] A63B *53/04*
U.S. Cl. 273—167 R 6 Claims



1. A golf club head comprising:

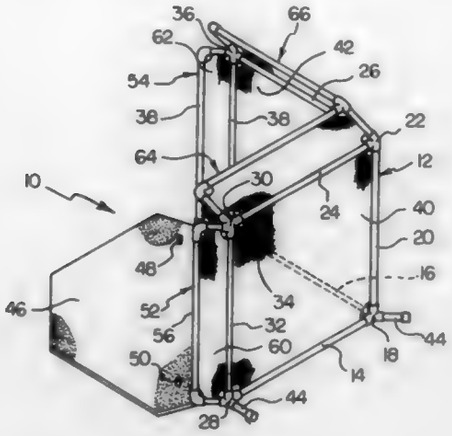
driver club body consisting of a solid, molded unitary mass of polymethylmethacrylate having a plurality of non-planar exterior surfaces, and a planar exterior ball-striking surface, and said driver club body having an unflawed interior and forming means, when swung, for transferring a force upon impact of said ball-striking surface with a ball for driving said ball with said driver club body remaining structurally intact.

5,467,990

AMBIDEXTROUS GOLF DRIVING NET

Jeremy T. Kitzhaber, 6706-D W. Dogwood Dr., USAFA, Colo. 80840

Filed Jun. 14, 1994, Ser. No. 260,262
Int. Cl.[6] A63B 69/36
U.S. Cl. 273—181 F 3 Claims



1. An ambidextrous golf driving net comprising:

a main frame assembly including a first lower frame rail and a second lower frame rail orthogonally joined together by a lower center joiner; a center support post orthogonally extending from said lower center joiner to an upper center joiner; a first upper frame rail extending from said upper center joiner parallel to and spaced from said first lower frame rail, and a second upper frame rail extending parallel to and spaced from said second lower frame rail; with the first lower frame rail terminating at a first lower outer joiner and the first upper frame rail terminating at a first upper outer joiner such that a first outer support post vertically extends between said first outer joiners to support said first frame rails in a first spaced, parallel position; with the second lower frame rail terminating in a second lower outer joiner and the second upper frame rail terminating in a second upper outer joiner such that a second outer support post vertically extends between said second outer joiners to support said second frame rails in a second parallel, spaced position;

a first main net extending between said first frame rail;

a second main net extending between the second frame rails;

a mat coupled to said frame means, said mat being positioned between said nets, said mat having a left-handed tee positioned in front of said first main net, and a right handed tee positioned in front of said second main net, wherein a left-handed golfer can utilize said left-handed tee during a left-handed stroke to drive a golf ball into said first main net, and a right-handed golfer can utilize said right-handed tee during a right-handed stroke to drive said golf ball into said second main net, with said second main net further being operable to contain an errant golf ball driven from said left-handed tee, and said first main net further being operable to contain said errant golf ball driven from said right-handed tee;

a first lateral net assembly means extending from said first outer support post; and a second lateral net assembly means extending from said second outer support post, said first and second lateral net assembly means being operable for further containing and arresting said errant golf ball; and

a first overhead net assembly means extending at an acute angle from said first upper frame rail, and a second overhead net assembly means extending at an acute angle from said second upper frame rail, said first and second overhead support means being operable for still further container and arresting said errant golf ball.

5,467,991

DETACHABLE GOLF SWING TRAINING DEVICE USING TWO LIGHT BEAMS

Walter White, IV, 1039 Lenox Crest, Atlanta, Ga. 30324, and Philip H. Burrus, IV, 4653 Arrowhead Trail, Lilburn, Ga. 30247

Continuation-in-part of Ser. No. 148,497, Nov. 8, 1993, abandoned. This application Mar. 15, 1994, Ser. No. 212,984
Int. Cl.[6] A63B 69/36
U.S. Cl. 273—186.3 7 Claims

1. In a portable and detachable golf swing plane practice device for use with a golf club having a club shaft on which is a head at one end and a handle at the other:

a portable unit comprising a base and a battery means on said base for supporting a removable battery,

a switch on said base electrically connected to said battery means,

a first light means mounted on said base for directing light in a direction parallel to said club shaft toward said club head,

a second light means mounted on said base for directing light in a direction parallel to said club shaft toward said handle,

electrical wiring for connecting said battery means, said switch, said first light means, and said second light means,

means for attaching said entire unit on said club shaft and for readily detaching the same unit therefrom whereby said entire unit may be readily installed or removed from said club.

5,467,992

GOLF SWING TRAINING METHOD

Scott Harkness, Bracebridge, Canada, assignor to Dynalaser Inc., Ontario, Canada

Continuation-in-part of Ser. No. 997,929, Dec. 29, 1992, abandoned. This application Jan. 6, 1994, Ser. No. 178,415
Int. Cl.[6] A63B 69/36
U.S. Cl. 273—187.2 4 Claims

1. A method of diagnosing golf swing conditions related to a golfer's head movement, comprising the steps of:

(a) placing an apparatus on a golfer's head for projecting a visible light spot onto a surface having particular areas thereon;

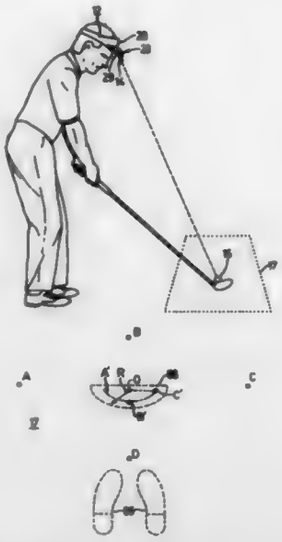
(b) observing, subsequent to the step (a), an initial position of the light spot on the surface prior to performing the golf swing,

the initial position being:

an originating point for any subsequent light movement; and

a reference point about which the particular areas on the surface are oriented;

(c) the golfer performing, subsequent to the step (b), a golf swing;



(d) observing, subsequent to the step (c), a path of movement of the light spot over the surface relative to the originating point resulting from the movement of the golfer's head caused by his golf swing;

(e) providing the golfer with a set of cause and effect relations, an effect being a particular area of the surface over which a portion of the observed path might be positioned, and a related cause being a particular swing mechanics explanation for why the golfer's head moved, such head movement causing the condition manifest as the portion of the observed path becoming positioned in the particular area of the surface; and

(f) comparing, subsequent to the step (d), the observed path of the light spot with the set of cause & effect relations to obtain a diagnosis of a cause for a particular swing condition, related to the golfer's head movement.

5,467,993

GOLF TRAINING APPARATUS

Norman Higginson, 44 Wigshaw Lane Culcheth, Warrington Cheshire, WA3 4NB, Great Britain

PCT No. PCT/GB91/01454, § 371 Date Jun. 15, 1994, § 102(e) Date Jun. 15, 1994, PCT Pub. No. WO92/04082, PCT Pub. Date Mar. 19, 1992

PCT Filed Aug. 29, 1991, Ser. No. 979,858

Claims priority, application United Kingdom, Aug. 31, 1990, 9019055

Int. Cl.[6] A63B *69/36*

U.S. Cl. 273—191 A **21 Claims**

1. A golf training apparatus comprising:

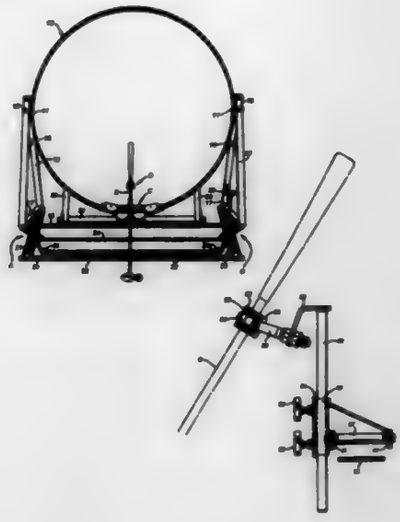
(i) spaced side support means mounted on base elements and height adjustable relative to the base elements;

(ii) a guide track of looped configuration pivotally mounted between the side support means, the looped configuration of the guide track defining a golf club swing path;

(iii) means for pivotally adjusting the guide track relative to the side support means, independent of height of the side support means;

(iv) a carriage slidably mounted on the guide track, the carriage comprising bearing surfaces contacting opposite surfaces of the guide track; and

(v) means for holding a golf club shaft, said means comprising an elongate shaft connecting member axially adjustably connected to the carriage.



5,467,994

GOLF BALL

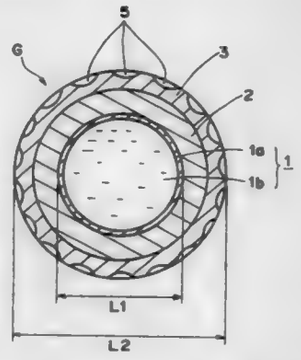
Keiji Moriyama, Akashi; Tadahiro Ebisuno, Nishinomiya, and Kazushige Sugimoto, Akashi, all of, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Oct. 31, 1994, Ser. No. 331,819

Claims priority, application Japan, Nov. 2, 1993, 5-274690

Int. Cl.[6] A63B *37/08;37/14*

U.S. Cl. 273—222 **4 Claims**



1. A golf ball comprising a liquid center, a rubber thread layer formed around said liquid center, and a cover covering said rubber thread layer;

wherein said liquid center has a diameter of 29.5 to 32.0 mm and the ratio, Y, of the sum total of the flat surface area surrounded by an outer edge of each dimple to the surface area of the same sphere having no dimples formed thereon is within the range of 0.80 to 0.84.

5,467,995

MORE CHALLENGING BACKGAMMON TYPE GAME

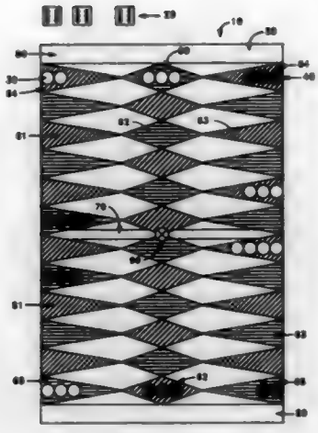
Mark A. Miller, 3099 Minerva Lake Rd., Columbus, Ohio 43231, and Ronald H. Miller, 1141 Erie, Bellefontaine, Ohio 43311

Filed Aug. 5, 1994, Ser. No. 286,288

Int. Cl.[6] A63F *3/00*

U.S. Cl. 273—248 **8 Claims**

1. A method of playing a game on a substrate having a matrix of three rows of twelve landing zones, a safety zone and a bar zone with a first and second set of markers, a roving marker and a random number generator, comprising the steps of:



placing said first set of markers on predetermined landing zones;
placing said second set of markers on predetermined landing zones;
placing said roving marker on said bar;
alternately generating random numbers;
selectively moving a respective first or second marker along a path a number of zones corresponding to at least one of said generated random numbers; and each player at his/her option selectively moving said roving marker a number of zones corresponding to another of said generated random numbers.

5,467,996

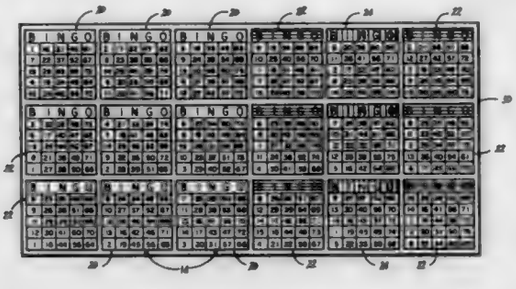
MULTIPLE BINGO GAME APPARATUS

Thomas W. Greer, Muskegon, Mich., assignor to The Reliable Corporation of America, Muskegon, Mich.

Continuation of Ser. No. 938,856, Aug. 28, 1992, Pat. No. 5,338,042, which is a division of Ser. No. 788,039, Nov. 5, 1991, Pat. No. 5,160,146. This application May 12, 1993, Ser. No. 61,858

Int. Cl.[6] A63F *3/06*

U.S. Cl. 273—269 **20 Claims**



1. An improved bingo game apparatus comprising;
a sheet of paper;
at least three first bingo game matrices printed on the sheet of paper, the first bingo game matrices being identified by a first common indicia;
at least two second bingo game matrices, but less than the number of first bingo game matrices, printed on the sheet of paper, the second bingo game matrices being identified by a second common indicia; and
at least one third bingo game matrices, but less than the number of second bingo game matrices, printed on the sheet of paper, the third bingo game matrices being identified by a third common indicia;
wherein, one prize is awarded for a winning combination on a first bingo game matrix, another prize is awarded for a winning combination on a second bingo game matrix, and still another prize is awarded for a winning combination on a third bingo game matrix.

5,467,997

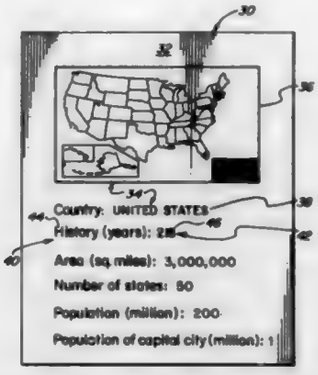
METHOD OF USING INFORMATIONAL PLAYING CARDS

Ramin Bashirzadeh, 2807 Windsor Ridge Dr., Westborough, Mass. 01581

Filed Dec. 13, 1994, Ser. No. 354,547

Int. Cl.[6] A63F *1/00*

U.S. Cl. 273—302 **10 Claims**



1. A method of playing a game, for two or more players, using a deck of informational playing cards, the method comprising the steps of:
(a) providing a plurality of playing cards, each of the cards having a front surface and a back surface, the front surface having:
(1) a primary printed indicia of one member of a class of items, the class being the same for all of the cards, the one member being unique for each of the cards; and
(2) secondary printed indicia depicting a plurality of statistical elements, the plurality of elements being directly related to the one member depicted in the primary printed indicia, each of the plurality of elements having a textual portion and a numerical related to the textual portion, the textual portion of each of the elements being substantially identical to the textual portion of the corresponding element on each of the cards, the numerical portion of each of the elements having a value which varies among the corresponding elements on each of the cards and corresponds to the member depicted in the primary indicia;
(b) deciding among the players:
(1) the basis for selecting the first initiating player;
(2) the basis for selecting subsequent initiating players;
(3) the basis for determining which of the statistical elements in a set prevails over the other statistical elements in the set, the set being comprised of the statistical elements on an exposed front surface of only one of the cards in each of a plurality of hands of the players, having substantially identical textual portions, there being only one prevailing statistical element for each of the sets; and
(4) the basis for determining which of the players has won the game;
(c) dealing each of the plurality of informational playing cards, one at a time and with its front surface down, to the players, in rotation, to create a hand of cards for each of the players;
(d) after steps (a) through (c), exposing the front surface of only one of the cards in each of the hands by the player who has been dealt the hand, so that the exposed front surface is visible only to the player who has been dealt the hand;
(e) selecting, using the basis decided upon among the players in step (b)(1), one of the players as the first initiating player to begin play;
(f) selecting by the first initiating player, from the exposed front surface of the only one card in the hand of the first initiating player, a statistical element most likely to prevail over the other statistical elements in the set containing the selected statistical element;
(g) reading aloud, by the first initiating player, the selected statistical element;

(h) after reading aloud the selected statistical element, reading aloud, by the other players, the other statistical elements of the set containing the selected statistical element;

(i) determining which of the statistical elements, in the set containing the selected statistical element, prevails over the other statistical elements in the set, using the basis decided upon by the players in step (b)(3);

(j) giving the trick to the player having the prevailing statistical element, the trick comprising the card with the exposed front surface of each of the hands;

(k) after giving the trick, selecting a subsequent initiating player in accordance with the basis decided upon by the players in step (b)(2); and

(l) repeating steps (d) through (k), with the subsequent initiating player selected in step (k) replacing the initiating player in step (e), until it is determined by the players that one of the players has won the game, in accordance with the basis decided upon by the players in step (b)(4).

5,467,998

NON-TOXIC, EDIBLE, AND BIODEGRADABLE SKEET AND METHOD OF MAKING THE SAME

Deborah Hellings, P.O. Box 37247, Tallahassee, Fla. 32315

Filed Aug. 1, 1994, Ser. No. 283,539

Int. Cl.[6] F41J *9/16;* A01K *5/00*

U.S. Cl. 273—363 **3 Claims**

1. A biodegradable fragile flying target comprising:

a baked compound of edible material;

said baked compound consists of flour, a granular edible element, and water;

said edible element is twice the volume of the volume of said flour;

said edible element is selected from the group consisting of birdseed, corn, grain, rice, grass, and wood; and

said flying target having an aerodynamic structure and constructed to retain its integral configuration when thrown by a trap mechanism and is easily breakable by a shotgun blast.

5,467,999

MASTER ARCHER TARGET

Michael Valencic, and David Valencic, both of 212 Altermoor Dr., Natrona Heights, Pa. 15065, assignors to Michael Valencic, and David Valencic, both of Natrona Heights, Pa.

Filed Nov. 22, 1994, Ser. No. 343,641

Int. Cl.[6] F41J *3/00*

U.S. Cl. 273—402 **6 Claims**

1. An archery target, comprising;

a molded, one-piece construction of high-impact plastic,

said target having a plurality of open bulls-eyes of three different sizes, each size of bulls-eyes being in a horizontal line, one size per line,

said target being adapted to be mounted to desired backstop, so that arrow may pass through the open bulls-eyes to lodge in the backstop, whereby when said backstop becomes weakened or disfigured due to repeated shots, said target can be relocated to another part of the backstop or to another backstop.

5,468,000

REMOTELY ACTIVATED LOCATION IDENTIFYING ARROW ATTACHMENT

Tommy L. Bennett, Rte. 3, Box 4032, Palatka, Fla. 32177

Filed Apr. 13, 1995, Ser. No. 421,302

Int. Cl.[6] F42B *6/04*

U.S. Cl. 273—416 **5 Claims**

1. A remotely activated location identifying arrow attachment comprising:

a receiver means for coupling to an arrow between an arrow shaft and a hock thereof and for selectively generating an audio signal; and,

a transmitter means for generating a signal to activate the receiver means from a remote location to facilitate audible identification of a location of the arrow subsequent to shooting thereof.

5,468,001

SWITCHING AND CONTROL SYSTEM WITH FOUR VIDEO GAME BOARDS

Eduardo M. Hermo, Paris, Spain, assignor to Sega, S.A., Madrid, Spain

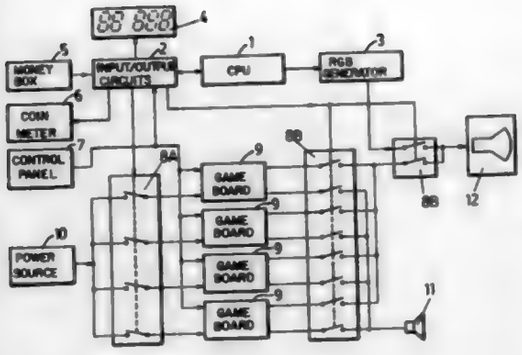
Filed Jan. 14, 1992, Ser. No. 820,360

Claims priority, application Spain, Aug. 1, 1991, 9101809

Int. Cl.[6] A63F *9/22*

U.S. Cl. 273—434 **3 Claims**

1. A switching and control system for a plurality of video game boards for video game machines, comprising a CPU including a microprocessor and a circuitry for the program hardware; input/



output circuits communicating with the CPU; a single power source; a system RGB generator connected to and receiving signals from the CPU; at least one loudspeaker; at least one monitor screen; a first group of switches connected in common to said power source and also connected to said input/output circuits and to said video game boards and being operated for switching a selected video game board to said source power; and a second group of switches connected to said video game boards, said input/output circuits, said RGB generator, said loudspeaker and said monitor screen and being operated for switching an audio signal and a color and synchronism signal to said loudspeaker and said monitor screen, respectively, for said selected video game board which is selected in accordance with a set program in the CPU and orders received from the user, said RGB generator being connected to said monitor screen through said second group of switches and to the CPU to provide that information sent by the CPU is viewed on said monitor screen as moves are made on said video game boards and under program control.

5,468,002

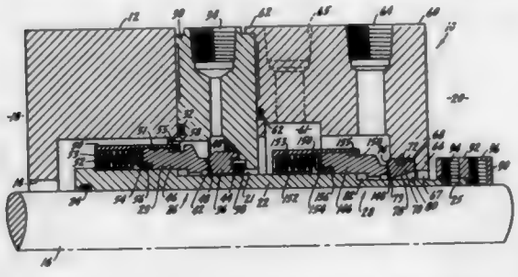
MECHANICAL END FACE SEAL HAVING AN IMPROVED MATING RING

James R. Wasser, Gurnee, Ill., assignor to John Crane Inc., Morton Grove, Ill.

Filed Oct. 25, 1993, Ser. No. 142,175

Int. Cl.[6] F16J 15/34

U.S. Cl. 277—65 **15 Claims**



1. A mechanical end face seal for providing fluid tight sealing between a housing containing a fluid and a shaft extending through an aperture in the housing, the shaft rotating relative to the housing, the seal comprising:

a) a first ring having a generally radially extending sealing face;

b) a second ring having a generally radially extending sealing face shaped and dimensioned to be in opposite mating relationship to the sealing face of said first ring, the portions of said second ring sealing face which sealingly engage said first ring sealing face defining a seal interface, one of the rings being disposed coaxially with said shaft and being nonrotatably connected with and sealed against the housing, and the other of the rings being sealed to and connected coaxially with the shaft to rotate therewith, said first ring being disposed adjacent the ambient environment downstream of said seal, one of said rings being movable axially relative to the shaft;

c) a biasing means adapted to urge the axially movable ring toward the other ring to bring the sealing faces close to each other to provide a rotatable sealing engagement relative to one another,

said first seal ring having a frusto-conical inner diameter surface, the first seal ring inner diameter being narrower at the portion of the first seal ring adjacent the seal interface and becoming wider at the portion of the first seal ring adjacent the radially extending wall opposite said sealing face, the first seal ring inner diameter together with said shaft defining a substantially frusto-conical, annular space therebetween; and

d) the seal further including a fluid circulation means attached to and rotating with said shaft, the fluid circulation means being disposed downstream of said seal and being spaced from and in close proximity to said first seal ring radially extending wall opposite the sealing face of said one ring, said fluid circulation means being shaped and dimensioned to pump ambient fluid during shaft rotation from the ambient environment outside said housing into the frusto-conical space defined by the first ring inner diameter and into direct contact with the frusto-conical inner diameter surface of said first seal ring, and to circulate said ambient fluid through said frusto-conical space, whereby the ambient fluid directly cools at least said first seal ring.

5,468,003

REINFORCED CORE HEAVY DUTY GASKET

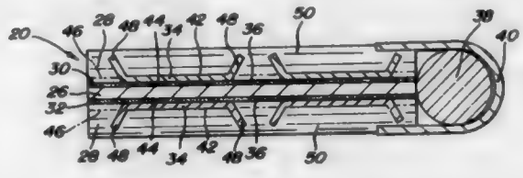
Thomas E. Staab, Hinsdale; Kanu G. Shah, Arlington Heights; Paul E. Gallo, Berwyn, and Paul V. Rakauskas, Melrose Park, all of Ill., assignors to Dana Corporation, Toledo, Ohio

Continuation of Ser. No. 23,403, Feb. 26, 1993, Pat. No. 5,362,074. This application Dec. 27, 1993, Ser. No. 173,885

The portion of the term of this patent subsequent to Nov. 8, 1974, has been disclaimed.

Int. Cl.[6] F16J 15/12

U.S. Cl. 277—235 B **18 Claims**



1. A gasket adapted to be positioned between and clamped by mating members, the gasket comprising:

a gasket body with a central metal shim, a pair of outer facing layers positioned on opposite sides of said shim, each of said facing layers having an inner surface and an outer surface, a core disposed between said inner surface of each of said facing layers and said shim, said cores including opposing first and second planar faces, said first planar face of each of said cores positioned against one of said facing layers, wherein said cores include at least one tang extending away from said first planar face into said one of said facing layers to clinch said cores to said one of said facing layers, and a sealing medium disposed between said second planar face of each of said cores and said shim.

5,468,004

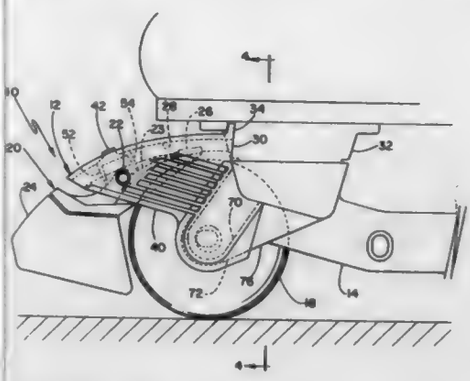
ANTI-LOCK BRAKE FOR IN-LINE SKATE

Scott B. Olson, Minneapolis; Louis F. Polk, III, Excelsior, and Adam A. Luedke, Minnetonka, all of Minn., assignors to O.S. Designs, Inc., Waconia, Minn.

Continuation of Ser. No. 99,233, Jul. 29, 1993, abandoned. This application May 12, 1995, Ser. No. 439,698

Int. Cl.[6] A63C 17/14

U.S. Cl. 280—11.2 **18 Claims**



1. A brake for use with a recreational device having a rear wheel having a ground engaging surface, rotatably mounted in a device frame, the brake comprising:

(a) a rigid brake housing having securing means formed integral to said brake housing for selectively securing said brake housing to said device frame proximate said rear wheel, whereby said brake housing securing means independently, securely, frictionally receives said device frame, said brake housing defined by a pair of side members and an end member extending therebetween and together defining a clearance, said side members each having a distal end adapted to abut said device frame proximate said rear wheel;

(b) an elongated braking member pivotably coupled to each said brake housing side members at a respective pivot point and at least partially disposed within said clearance, said braking member having a first end extending outside the clearance and including a ground engaging member, and having a second end disposed opposite said pivot points and substantially with said clearance proximate said rear wheel ground engaging surface when said brake is coupled to said recreational device; and

(c) a resilient member disposed between said first end of said braking member and said housing end member for resiliently restraining said second end from engaging said rear wheel until the user causes the first end of the braking member to engage the ground with a sufficiently large force, said resilient member has a generally U-shape, said resilient member straddling said braking member pivot point.

5,468,005

FOLDABLE CART

Ching S. Yang, Tainan, Taiwan, Prov. of China, assignor to Goonng Chyli Industrial Co., Ltd., Tainan Hsien, Taiwan, Prov. of China

Filed Jul. 5, 1994, Ser. No. 270,373

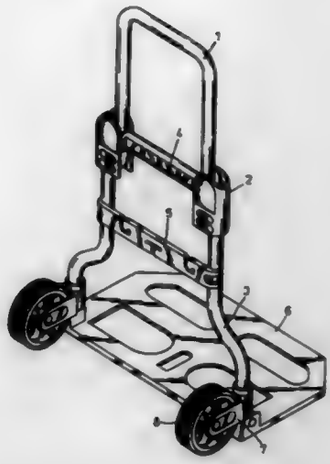
Int. Cl.[6] B62B 1/04

U.S. Cl. 280—40 **1 Claim**

1. A foldable cart comprising a handle having two ends turned 90 degrees downwardly and pivotally connected to a pair of legs, a pair of U-shaped members at said pivotal connection of said handle and said legs, a pair of wheel frames and a loading platform being secured to the bottom portions of said legs, and the improvement comprising:

said loading platform having a pair of fixturing housings at respective rear corners and a pair of guiding blocks secured in said fixturing housings, each of said fixturing housings having an aperture formed through an outer wall thereof, a rectangular recess formed in an inside surface of said outer wall and a bulge portion formed at top portion of an inner wall thereof, each said guiding block having conical gear teeth formed on a top portion thereof, a boss at one side disposed within said rectangular recess and having an aperture formed concentric with said guiding block and disposed in alignment with said aperture of said fixturing housing,

each said wheel frame having a sleeve formed at a rear end portion thereof, said sleeve having an inner diameter slightly larger than an outer diameter of each said leg, a crown gear being integrally formed at a bottom portion of each said sleeve to be meshingly engaged with said conical gear teeth of a respective guiding block, a block being integrally formed on a bottom portion of each said wheel frame having a slanted flank disposed in engaged relationship with said bulge portion of said fixturing housing when said loading platform is in an extended position.



5,468,006

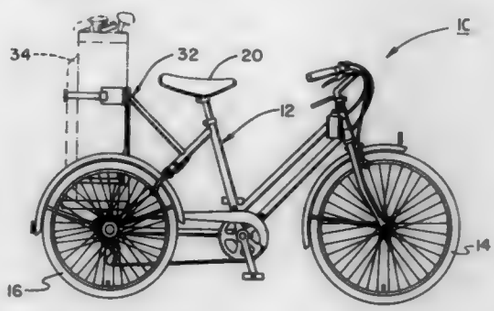
MANUAL GOLF CART

Robert J. Delserro, 215 Smith Manor Blvd., West Orange, N.J. 07052

Filed Sep. 28, 1994, Ser. No. 314,136

Int. Cl.[6] B62J 7/02; 11/00

U.S. Cl. 280—202 **1 Claim**



1. A manual golf cart comprising:

a cycle including a frame having a pair of spaced axle mounts; a steerable front wheel mounted to said frame; a rear wheel shaft rotatably mounted to said axle mounts of said frame; a pair of spaced rear wheels mounted to opposed ends of said rear wheel shaft; a pedal assembly rotatably coupled to said frame and mechanically coupled to said rear wheel shaft; and a handle bar extending through a portion of said frame to effect steering rotation of said front wheel;

a golf bag holding means for supporting and securing a golf bag relative to said cycle, said golf bag holding means comprising a substantially semi-cylindrical member having a reduced center portion extending upwardly from a flat base member, the flat base member being formed in a planar generally circular configuration positioned horizontally between the rear wheels of the cycle, the flat base member adapted to retain golf clubs and other golf related accessories thereupon, said reduced center portion terminating at an upper distal end thereof in a pair of arcuate lateral arms; a lower strap coupled to said semi-cylindrical member proximal to said flat base member thereof; and an upper strap extending from a first one of said arcuate lateral arms to be selectively coupled to a second one of said lateral arms, said semi-cylindrical member of said golf bag holding means being secured to said frame of said cycle by a pair of support brackets which extend from said flat base member outwardly to engage said axle mounts on respectively opposed sides of said golf bag holding means;

a brace member extending between said frame and an upper portion of said semi-cylindrical member between said arcuate lateral arms, the brace member extending perpendicularly from the frame and maintaining the golf bag holding means in a vertical orientation;

a drink holding means for supporting a beverage container relative to said frame of said cycle, said drink holding means comprising an extension bracket fixedly secured to a forwardmost portion of said frame; a closed bottom cylinder fixedly secured to said extension bracket; and interior insulation extending coextensively about an interior side wall surface of said closed bottom cylinder; and,

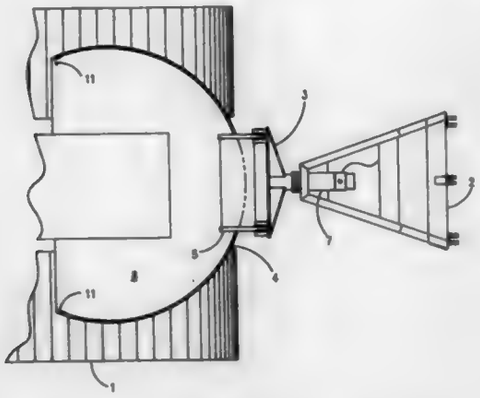
a writing pad means for supporting a writing instrument and a scorecard relative to said frame of said cycle, said writing pad means comprising a cylindrical clamp secured about a portion said handle bar; an L-bracket secured to said cylindrical clamp and extending therefrom; a planar member coupled to a distal end of said L-bracket and supported thereby; said planar member including a substantially flat top surface; a spring loaded clip coupled to said flat top surface of said planar member; and a pocket secured to said flat top surface of said planar member for receiving and securing said writing instrument thereto, wherein said handle bar can be rotated to position said writing pad means laterally of said cycle.

5,468,007

TOWING HITCH

Ronald Kanerva, Lively, Canada, assignor to The Shop Industrial 510851 Ontario Ltd., Lively, Canada

Filed Oct. 22, 1993, Ser. No. 139,713
Claims priority, application Canada, Jan. 14, 1993, 2107992
Int. Cl.[6] B06D *1/00*
U.S. Cl. 280—499 **24 Claims**



1. A towing hitch for attaching a towing vehicle to a towed object comprising, in combination:

an arcuate guide defining a plane and attachable in generally transverse orientation to a towing vehicle such that the guide faces convexly towards the rear of the towing vehicle, the guide comprising a tray attachable in generally transverse orientation to a towing vehicle, and an arcuate plate rigidly mounted generally perpendicularly on the tray;

a traveller adapted to travel freely along the guide;

a rigid coupling having two ends, a first end attached to the traveller and a second end attachable to the object;

a first pivot means providing an axis of rotation for the first end relative to the second end generally parallel to the plane of the guide and generally perpendicular to the axis of the coupling; and

a second pivot means providing an axis of rotation for the first end relative to the second end generally parallel to the axis of the coupling;

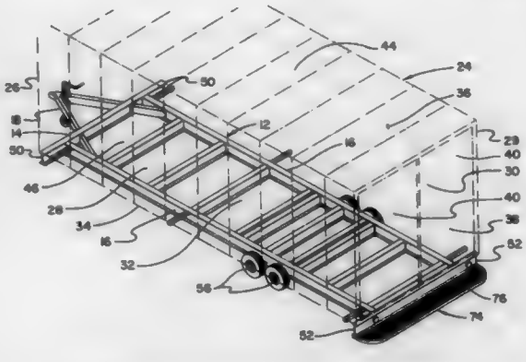
the first pivot means being located substantially adjacent one of the two ends of the coupling, and the second pivot means being located substantially adjacent the other of the two ends of the coupling.

5,468,008

LOW DECK TRAILER

Michael R. Hecht, 2075 Lakewood Rd., Toms River, N.J. 08755

Filed Aug. 3, 1994, Ser. No. 285,089
Int. Cl.[6] B60D *3/00;63/06*
U.S. Cl. 280—638 **5 Claims**



1. A new and improved low deck trailer comprising, in combination:

a rigid and essentially rectangular metallic frame having a front end, a rear end, two parallel sides, a top surface, a bottom surface and an edge therearound, the front end having a forwardly extending V-shaped extension with a hitch disposed thereon for being towed by a motor vehicle;

a rigid metallic container disposed on the top surface of the frame and adapted for receiving items to be stored, the container comprises four vertical plates coupled together end to end to define a rectangular configuration having a front wall, a rear wall, two parallel sidewalls with an upper peripheral edge therearound, a lower peripheral edge therearound, and a space therebetween, the rear wall further having an aperture with doors coupled thereto to allow access to the space through the aperture when opened and to prevent access to the space when closed, a first horizontal plate disposed above the space in contact with the upper peripheral edge to define a roof, and a second horizontal plate disposed below the space in contact with the lower peripheral edge to define a deck for holding items to be stored;

lateral supports extending outwardly from the sides of the frame at forward, rearward and intermediate locations;

four tires secured to and disposed under the frame, each tire having a diameter of between about 14 and 15 inches with its center beneath the frame and its upper extent beneath the upper surface of the frame, the tires being located closer to the rear end than the front end;

two parallel and spaced axles, each axle having two ends, with springs coupled beneath the sides of each end having a tire coupled thereto the frame for supporting the axles;

a fifth wheel coupled to a forward extent of the V-shaped frame with an adjustment mechanism to vary the height thereof; and

a step having a horizontal long leg coupled to the rear end of the frame extending away from the frame at an elevation beneath the frame.

5,468,009

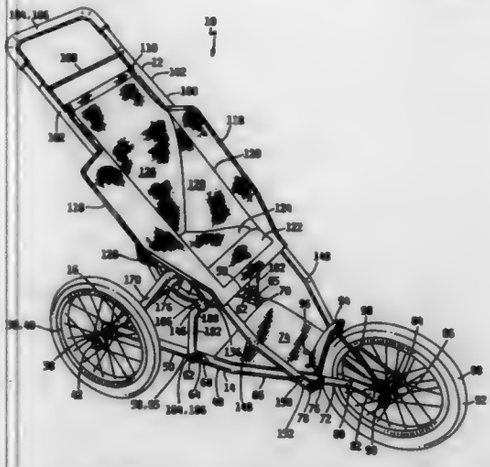
COLLAPSIBLE FOLDING STROLLER

David Eyman, Cincinnati, Ohio, and Thomas J. Schmidlin, Newport, Ky., assignors to TRI Industries, Inc., Bloomington, Minn.

Continuation-in-part of Ser. No. 30,703, Mar. 12, 1993, Pat. No. 5,356,171. This application Jul. 6, 1994, Ser. No. 271,101

Int. Cl.[6] B62B 7/00

U.S. Cl. 280—650 **27 Claims**



1. A conveniently transportable, collapsible jogging infant stroller for safely and smoothly carrying an infant at walking speed and at a relatively higher speed than the normal average walking speed of approximately 3–4 miles per hour, comprising:

(a) a contractible lower frame portion having a rear end supporting two rear wheels, an intermediate portion and a front fork end supporting a front wheel, wherein the lower frame portion comprises a pair of opposing rear links extending forwardly of the rear end and each rear link forms a pivotal connection to one of a pair of opposing forward links which form the front fork end and said rear links are arranged in a parallel relation to said forward links when said stroller is in an upright erect condition;

(b) a pivotable upper frame portion having an upper handle end, an intermediate seat portion supporting a flexible infant holder and a lower end pivotally attached to the lower frame portion; and

(c) a releasable locking means adapted to secure the stroller in said upright erect condition for use and when released to permit pivoting of the upper frame portion and contraction of the lower frame portion inwardly upon itself as to move the stroller to a collapsed and contracted condition for transportation and storage.

5,468,010

HAND TRUCK APPARATUS

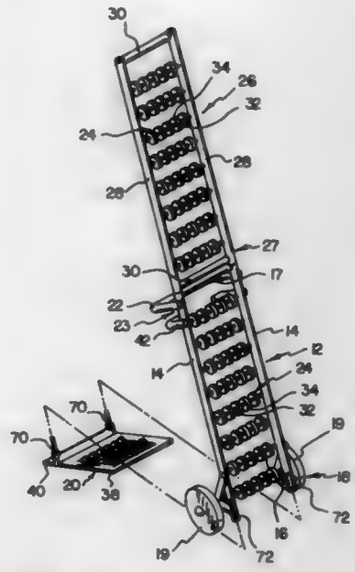
Marion K. Johnson, 224 Tiger Cir., Gilbert, S.C. 29054

Filed Aug. 1, 1994, Ser. No. 283,846

Int. Cl.[6] B62B 1/02

U.S. Cl. 280—652 **6 Claims**

1. A hand truck apparatus, comprising:



a frame assembly which includes a pair of lateral frame members spaced apart from each other by and connected to a first primary frame member located at a first end of said frame assembly and a second primary frame member located at a second end of said frame assembly, wherein said pair of lateral frame members, said first primary frame member, and said second primary frame member are contiguous to a common plane,

a wheel assembly carried by said frame assembly at said first end of said frame assembly, wherein said wheel assembly includes two wheels located at said first end of said frame assembly and positioned laterally away from said pair of lateral frame members, wherein said wheel assembly includes wheel supports supporting said two wheels, wherein said wheel supports are connected to said frame assembly,

a platform assembly connected to said first end of said frame assembly at substantially a right angle to said frame assembly, wherein said platform assembly includes a platform frame member connected to said first end of said frame assembly, and a plurality of roller assemblies supported by said platform frame member, wherein each of said roller assemblies includes an axle member connected transversely between opposite sides of said platform frame member, and a plurality of roller wheels supported by said axle member,

a handle assembly connected to said frame assembly at said second end of said frame assembly,

a plurality of roller assemblies connected transversely between said lateral frame members, wherein each of said roller assemblies includes an axle member connected transversely between said lateral frame members, and a plurality of roller wheels supported by said axle member, and

an extension assembly having a first end adapted to be connected to said second end of said frame assembly, wherein said extension assembly includes a pair of lateral extension frame members spaced apart from each other by and connected to a pair of transverse extension frame members located at respective ends of said extension assembly, wherein said extension assembly also includes a plurality of roller assemblies connected transversely between said lateral extension frame members,

wherein said lateral extension frame members of said extension assembly include peg elements, and wherein said lateral frame members of said frame assembly include wells adapted to receive said peg elements of said extension assembly when said extension assembly is in a use mode.

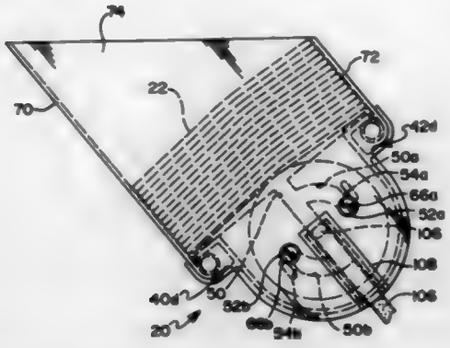
5,468,011
SIMPLIFIED AIR BAG MODULE

Michael W. Donegan, Bellbrook; Richard P. Nuchols, Loveland; James L. Webber, Spring Valley, and Jerry A. Mc Cann, Miamisburg, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 897,118, Jun. 11, 1992, abandoned. This application Mar. 9, 1994, Ser. No. 206,244

Int. Cl.[6] B60R *21/20*

U.S. Cl. 280—728.2 **9 Claims**



1. Mounting means for mounting an air bag inflator to a reaction canister having side walls and end walls which define a gas discharge opening, comprising

a pair of spaced mounting lugs extending from one end of the inflator,

a mounting lug extending from the other end of the inflator,

a mounting aperture formed in one end wall,

a pair of spaced mounting apertures formed in the other end wall,

grooves formed in the end walls extending from an entry at the gas discharge opening to the apertures, said grooves channeling the mounting lugs into the mounting apertures to orient the inflator relative to the container and prevent relative rotation, and

spring means on the end walls resisting passage of the lugs into the apertures and thereafter trapping the lugs in the apertures to secure the inflator in the container and prevent removal of the inflator from the container by movement of the lugs out of the apertures through the grooves.

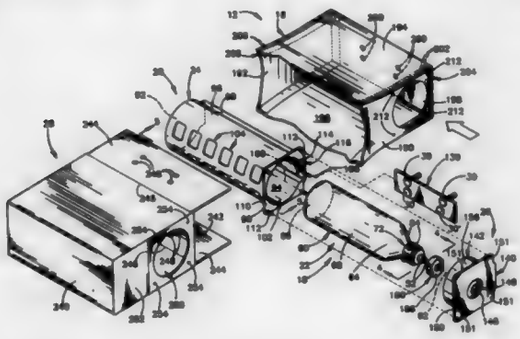
5,468,012
AIR BAG MODULE

Joseph J. Mihm, North Branch, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Jun. 13, 1994, Ser. No. 259,298

Int. Cl.[6] B60R *21/16*

U.S. Cl. 280—728.2 **18 Claims**



1. Apparatus comprising:

an inflatable vehicle occupant restraint;

inflator means for providing inflation fluid for inflating said restraint, said inflator means having an axis, a first axial end portion, a second axial end portion, and at least one fluid outlet opening;

a diffuser structure having first and second end portions, said diffuser structure defining a chamber which extends from said first end portion of said diffuser structure to said second end portion of said diffuser structure, said diffuser structure further including fluid outlet means for directing said inflation fluid to flow outward from said chamber; and

supporting means for supporting said inflator means in said chamber with said first axial end portion of said inflator means being supported at said first end portion of said diffuser structure, and with said second axial end portion of said inflator means being supported at said second end portion of said diffuser structure;

said supporting means including an end cap and means for fastening said end cap to said first end portion of said diffuser structure in a fastened position in which said end cap imparts an axially directed supporting force to said inflator means, said supporting force urging said inflator means axially inward of said chamber at said first end portion of said diffuser structure and axially outward of said chamber at said second end portion of said diffuser structure;

said end cap having surface means for deflecting said inflation fluid from said end cap toward said fluid outlet means.

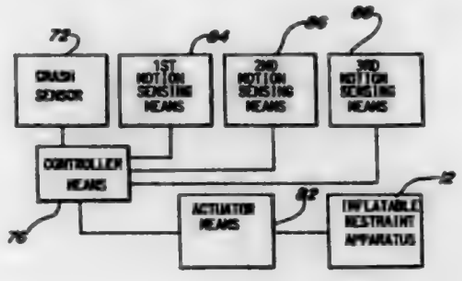
5,468,013
DUAL AIR BAG SYSTEM FOR OCCUPANT RESTRAINT

Lennart A. Gille, West Hills, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 161,711, Dec. 3, 1993, Pat. No. 5,435,594. This application Aug. 25, 1994, Ser. No. 295,954

Int. Cl.[6] B60R *21/24;21/28;21/32*

U.S. Cl. 280—729 **20 Claims**



1. An inflatable restraint system for use in a vehicle for protecting at least one vehicle occupant from injury during collision or other loss of vehicle control, the system comprising:

an air bag housing;

at least one air bag securely attached to said air bag housing;

inflating means for inflating said at least one air bag;

a crash sensor being operative with said inflating means for controlling the inflation of said at least one air bag:

deflating means for controlling deflation of said at least one air bag directly in response to cessation of motion of said vehicle; and

motion sensing means for sensing motion of the vehicle, said motion sensing means being operative with said deflating means for controlling the deflation of said at least one air bag;

whereby controlled deflation of said at least one air bag further protects the at least one occupant from injuries which often result from collision or other loss of vehicle control.

5,468,014

MOTOR VEHICLE SEAT WITH CHILD'S SAFETY SEAT ATTACHMENT

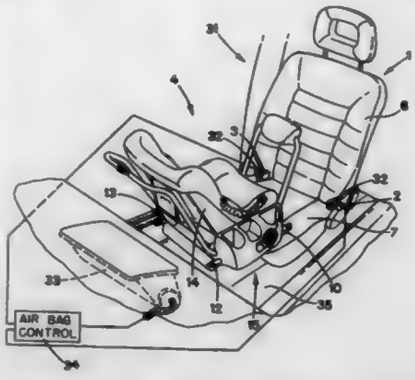
Hans-Peter Gimbel, Treburr; Walter P. Trutter, Wiesbaden, and Martin Specht, Feldafing, all of, Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 6, 1993, Ser. No. 161,387

Claims priority, application Germany, Dec. 23, 1992, 42 43 826.8

Int. Cl.[6] B60R *21/32*

U.S. Cl. 280—735 **17 Claims**



1. A motor vehicle with at least one passenger seat which has seat belt-type attachment devices for a child's safety seat to be secured thereon, the child safety seat having a supporting structure with fixably connected securing devices for connection to the seat belt-type attachment device, and the motor vehicle having at least one air bag in the region of the passenger seat, wherein at least one seat belt-type attachment device for the, child's safety seat is provided with a sensor, which reacts to the attachment of the child's safety seat, for deactivating the air bag.

5,468,015

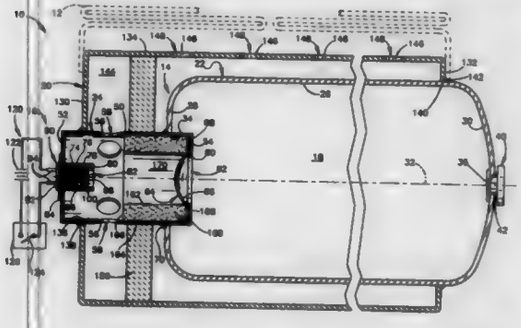
APPARATUS FOR INFLATING AN INFLATABLE VEHICLE OCCUPANT RESTRAINT

George W. Goetz, Rochester, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Jun. 21, 1994, Ser. No. 263,149

Int. Cl.[6] B60R *21/26*

U.S. Cl. 280—737 **22 Claims**



1. Apparatus for use in inflating an inflatable vehicle occupant restraint, said apparatus comprising:

pressure vessel means for defining a closed storage chamber containing inflation fluid;

actuator means for opening said storage chamber to release said inflation fluid from said storage chamber, said actuator means including a charge of pyrotechnic material;

directing means for directing said inflation fluid from said pressure vessel means into the vehicle occupant restraint to inflate the vehicle occupant restraint; and

heating means for increasing the volume of said inflation fluid at a location outside of said storage chamber by heating said inflation fluid outside of said storage chamber, said heating means including a body of combustible material which, when ignited, produces combustion products and emits said combustion products into said inflation fluid, said body of combustible material being located outside of said storage chamber between said storage chamber and the vehicle occupant restraint;

said pressure vessel means and said directing means at least partially defining an enclosed fluid flow space communicating said pressure vessel means with the vehicle occupant restraint, said apparatus further comprising combustion arrestor means for blocking the propagation of combustion, said combustion arrestor means being permeable to said inflation fluid and being located in said enclosed fluid flow space between said pressure vessel means and the vehicle occupant restraint.

5,468,016

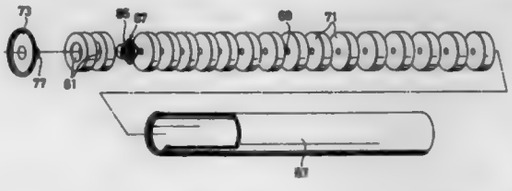
GAS GENERATING AGENT PACK OF AIR BAG INFLATION GAS GENERATOR

Hirokazu Koburi, and Junichi Kishimoto, both of Fukushima, Japan, assignors to Nippon Koki Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1993, Ser. No. 152,217

Int. Cl.[6] B60R *21/28*

U.S. Cl. 280—741 **5 Claims**



1. A gas generating agent pack of an air bag inflation gas generator comprising a plurality of gas generating agents having a through hole formed at a center of said gas generating agents, said gas generating agents being accommodated in a stacked state in an axial direction within a longitudinal cylindrical pack, said longitudinal cylindrical pack having an open end, a cap for sealing said open end of said cylindrical pack, said cap having an end face, said end face being adjacent to said gas generating agents, a projection extending downwardly from said cap into said cylindrical pack, said protection accommodating an igniter formed at the center of the cap, an igniter for igniting an ignition agent, whereby said igniter extends downwardly into said through hole of said gas generating agents disposed at said open end of said cylindrical pack, and an ignition agent being positioned within said through hole of the gas generating agents of said open end of said cylindrical pack, such that said ignition agent is disposed between said end face of the projection of said cap and gas generating agents of said plurality of gas generating agents.

5,468,017

AUTO IGNITION PACKAGE FOR AN AIR BAG INFLATOR

Thomas A. Kirsch, and Lloyd G. Green, both of Mesa, Ariz., assignors to TRW Inc., Lyndhurst, Ohio

Filed Oct. 17, 1994, Ser. No. 323,630

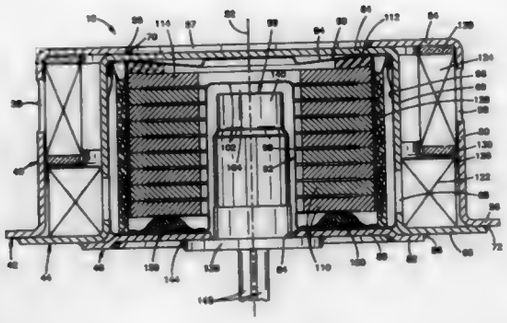
Int. Cl.[6] B60R *21/26*

U.S. Cl. 280—741 **26 Claims**

1. An apparatus for inflating an inflatable vehicle occupant restraint, said apparatus comprising:

a housing;

gas generating material within said housing to provide gas to inflate the inflatable vehicle occupant restraint when said gas generating material is ignited; and



an annular auto ignition packet within said housing, said annular auto ignition packet containing material having an ignition temperature below an ignition temperature of said gas generating material.

5,468,018

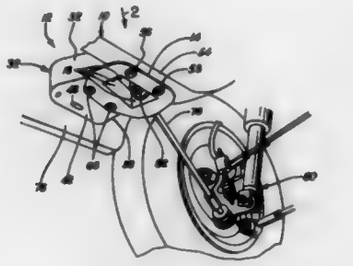
TORQUE BOX ASSEMBLY FOR A VEHICLE

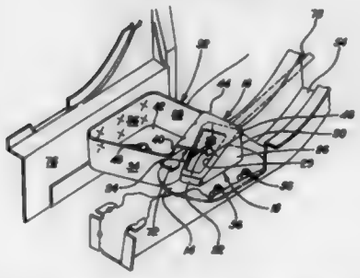
Forrest C. Redman, Lapeer; John O. Heimbecher, Berkley; Edwin L. Etnyre, Warren; James J. Shavrnoch, Frankenmuth, and Paul A. Ferranti, Macomb, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 27, 1994, Ser. No. 313,621

Int. Cl.[6] B62D *7/22*

U.S. Cl. 280—788 **13 Claims**





1. A torque box assembly for a vehicle having side rails, floor pan, and body side sills, a rear suspension trailing link with a resilient end assembly, said torque box assembly comprising a first box including four walls formed on a plate member, said rear suspension trailing link having its resilient end assembly mounted in an opening formed in one of said four walls, a second box including four walls and a bottom wall, first fastener means for securing said bottom wall to said plate member, and second fastener means for securing said plate member to at least one of said side rails.

5,468,019

BELT PRETENSIONER WITH A PYROTECHNIC GAS GENERATOR

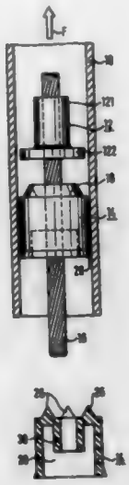
Meinhard Blise, Mutlangen, and Helmut Mika, Waldstetten, both of, Germany, assignors to TRW Repa GmbH, Alfdorf, Germany

Filed Mar. 14, 1994, Ser. No. 213,193

Claims priority, application Germany, Mar. 20, 1993, 93 04 152.7

Int. Cl.[6] B60R *22/46*

U.S. Cl. 280—805 **12 Claims**



1. A drive unit for a pretensioner in a vehicle safety belt system, comprising a cylinder, a piston slidably received in said cylinder, a cable connected to said piston, and a pyrotechnic gas generator which produces pressurized gas upon vehicle-sensitive activation to drive said piston through said cylinder, said piston being formed of a first metallic piston part firmly connected with said cable and at least a second piston part made from a thermoplastic material and forming a sealing contact with said cylinder, and damping means between said first piston part and said second piston part, said damping means comprising raised conical portions connected with said second piston part and facing said first piston part and being designed to deform under the action of a force.

5,468,020

AUXILIARY SAFETY HARNESS

Danya Scime, 2780, Dunmark Road, Alberton, Ontario, Canada

Filed Sep. 30, 1994, Ser. No. 316,496

Int. Cl.[6] B60R *22/00*

U.S. Cl. 280—808 **10 Claims**

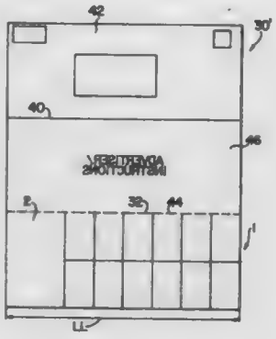
1. An auxiliary safety harness suitable for use by a child sitting on a vehicle seat provided with a releasable lap belt, said harness comprising:

a pelvic guard positionable to extend laterally across the front pelvic area of the child and having a portion which extends downwardly between the child's legs, said pelvic guard having at least one retainer loop through which the lap belt can pass to retain the pelvic guard in position when the lap belt is fastened,

a flexible connecting portion extending downwardly from the downwardly extending portion of the pelvic guard to an upper end portion whereby, in use, the flexible connecting portion can be positioned to extend between the child's bottom and the vehicle seat and upwardly between the child's back and the back part of the seat, and

said upper end portion having releasable securing means to enable the upper end portion to be releasably secured to the back part of the seat.

5,468,021
CARRY CARD OFFER STRIP
Victor A. Ovadia, 1929 Boulevard, West Hartford, Conn. 06107
Division of Ser. No. 960,717, Oct. 14, 1992, Pat. No. 5,308,118.
This application Apr. 6, 1994, Ser. No. 223,744
Int. Cl.[6] B42D 15/00
U.S. Cl. 283—56 8 Claims



1. A carry card for displaying in a compact and discernable manner a plurality of advertiser discount offers, said carry card comprising:

sheet material having a given length and a given width and having an identification face portion and an offer strip portion, said identification face portion having printed thereon a logo identifying said carry card, and said offer strip portion having printed thereon at least one advertiser discount offer;

said identification face portion having a first given dimension extending in a direction parallel to the direction of said given length of said sheet material and has a second given dimension extending generally orthogonally to the first given dimension and parallel to said given width of said sheet material;

said offer strip portion being integrally nondetachably formed with said identification face portion and including a plurality of fold lines extending parallel to said second given dimension of said identification face portion and being spaced from one another by a distance equal to said first given dimension of said identification fact portion;

said fold lines dividing said offer strip portion into individual nondetachable blocks having third and fourth dimensions;

at least one advertiser discount offer is printed in at least one of said blocks;

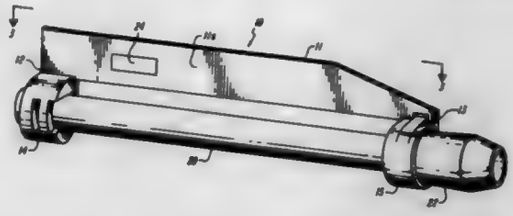
said carry card face portion and said offer strip portion combine to define said given length of said carry card sheet as defined by said carry card face portion first given dimension and the third dimension of each of said blocks making up said offer strip portion;

a distribution vehicle having a given width dimension and a given length dimension;

said given length of said carry card sheet being equal to one of said distribution vehicle given length and given width dimensions, and

wherein said one of said distribution vehicle given length and given width dimensions to which said carry card sheet length is equal having an associated side edge to which said carry card sheet along an associated side edge thereof as taken along its length is connected and each of said distribution vehicle and said carry card sheet having complementary shapes separated from one another by a separation line bordering said associated carry card sheet side edge and one of said distribution vehicle length and width dimensions to which the carry card sheet is attached.

5,468,022
SAMPLE TUBE IDENTIFICATION FLAG
Benjamin Linder, Cambridge; Don Lee, Waltham, both of Mass.; Amy Battles, Boise, Id., and Bradley S. Thomas, Timonium, Md., assignors to Massachusetts Institute of Technology, Mass.
Filed Jun. 14, 1994, Ser. No. 259,444
Int. Cl.[6] B42D 15/00
U.S. Cl. 283—072 23 Claims



1. An identification flag for a sample tube, said flag comprising:

a longitudinally extending planar element; and

tube connectors extending laterally from said planar element, said tube connectors being engageable with opposite portions of said tube to secure said planar element to said tube in a laterally spaced relationship with respect to an intermediate portion of said tube located between said opposite portions.

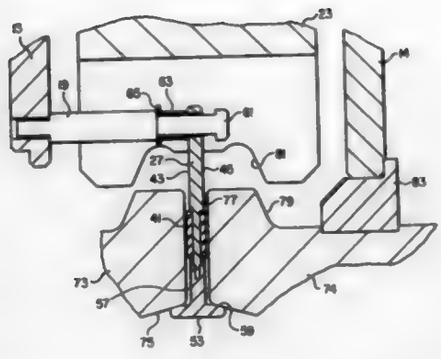
5,468,023
SUBSEA FLOW LINE CONNECTOR
Gary L. Galle, Houston, and Frank C. Adamek, Pasadena, both of Tex., assignors to Abb Vetco Gray Inc., Houston, Tex.
Filed Nov. 8, 1993, Ser. No. 148,445
Int. Cl.[6] F16L 17/06; F16J 15/02
U.S. Cl. 285—24 17 Claims

1. A seal assembly for sealing between two hubs of a subsea flowline, each hub having a longitudinal axis, a primary seal seat and radially outward therefrom a secondary seal seat, the seal assembly comprising in combination:

a rigid carrier having a hole therethrough and two sides;

a primary seal secured to the carrier within the hole;

a pair of elastomeric secondary seals, one on each side of the carrier, each having a secured portion secured to the carrier and a free portion extending radially from the secured portion and being free to slide relative to the carrier, the secondary seals having axial thicknesses selected such that contact by the secondary seal seats when the hubs are brought together moves the free portion of each secondary seal radially, wiping



across a portion of the secondary seal seats, to enhance sealing of the secondary seals.

5,468,024

QUICK CONNECTOR

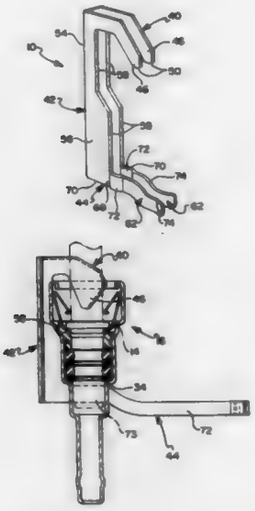
Anthony K. Carman, Waterford, and Duane J. Pontbriand, Metamora, both of Mich., assignors to ITT Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 35,823, Mar. 23, 1993, Pat. No. 5,360,237. This application Nov. 1, 1994, Ser. No. 332,673

The portion of the term of this patent subsequent to Nov. 1, 2011, has been disclaimed.

Int. Cl.[6] F16L *35/00*

U.S. Cl. 285—81 **19 Claims**



1. A locking clip for use in retaining a male member, having an upset portion, within a female connector, having a recess for receiving said male member and said upset, comprising:

a retaining head for engaging said upset when said male member is positioned within said recess of said female connector; and

a base portion distal from said retaining head and having two spaced leg members that each have an inner surface spaced apart a distance slightly less than an outer diameter of said female connector such that said inner surfaces bias against said female connector, said leg members having a cam surface that engages said female connector to facilitate the insertion of said retaining head into said recess of said female connector.

5,468,025

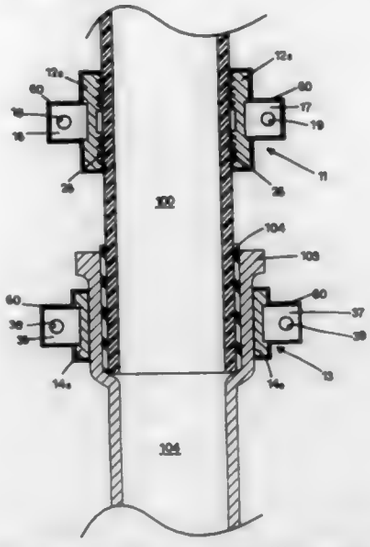
SEWER LINE VENT CLAMP ASSEMBLY

Nicholas Adinolfe, 2534 Transit Rd., and Joseph P. Adinolfe, 2770 Coomer Rd., both of Newfane, N.Y. 14108

Continuation-in-part of Ser. No. 81,099, Jun. 25, 1993, abandoned. This application Sep. 14, 1994, Ser. No. 305,850

Int. Cl.[6] F16L *55/07*

U.S. Cl. 285—114 **2 Claims**



1. A sewer line vent clamp assembly in combination with a sewer vent pipe and a sewer trap, said sewer vent pipe being a thin-walled PVC sewer vent pipe having a substantially smooth outer circumference, said sewer trap having a flared housing on one end thereof to accept said thin-walled PVC sewer vent pipe thereby defining a primary joint between said sewer vent pipe and said sewer trap, said sewer line vent clamp assembly comprising:

a first and a second clamp set removably connected to each other;

said first clamp set consisting of a first arcuate member and a second arcuate member, each arcuate member having an outer circumferential surface, and an inner circumferential surface having dimensions substantially the same as the outer circumference of said thin-walled PVC sewer vent pipe about which the first clamp set is placed, each of said arcuate members having two securing flanges extending radially from circumferential ends of said arcuate members and a connecting flange extending radially and circumferentially from said outer circumferential surface, said first and said second arcuate members of said first clamp set being biased against each other with said thin-walled PVC sewer vent pipe therebetween by releasible fasteners which engage said securing flanges extending from the ends of said first and second arcuate members, said first and said second arcuate members of said first clamp set having on the inner circumferential surface thereof a plurality of ribs having a triangular cross-section and located in two widely separated edge regions extending circumferentially across said inner circumferential surface;

said second clamp set consisting of a third and a fourth arcuate member, each arcuate member having an outer surface and two securing flanges extending radially from circumferential ends thereof, and a connecting flange extending radially and circumferentially from each of said outer surface of said arcuate members, said third and said fourth arcuate members of said second clamp set being held against each other with said sewer trap therebetween by releasible fasteners which engage said securing flanges extending from the ends of said third and fourth arcuate members, said third and said fourth arcuate members having a smooth inner surface for engaging said sewer trap about its flared housing; and

connecting means for releasibly connecting said first and said second clamp sets, said connecting means being rod elements

having threaded ends and matingly threaded nuts capable of being threadibly secured thereto, said rod elements engaging said first and second clamp sets through said connecting flanges, whereby;

installation of the sewer line vent clamp assembly securely connects the thin-walled PVC sewer vent pipe and the sewer trap together to prevent the introduction of ground water into a sewer system.

5,468,026

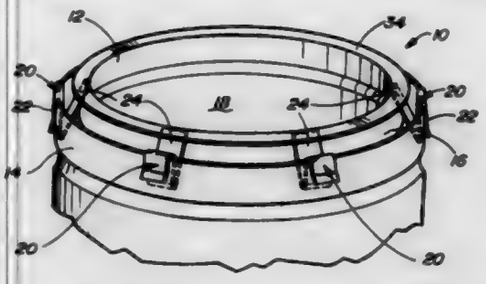
SPACER CLIP FOR CHIMNEY

James W. Annestedt, Memphis, Tenn., assignor to American Metal Products Company, Los Angeles, Calif.

Filed Aug. 3, 1993, Ser. No. 101,208

Int. Cl.[6] F16L *39/00;9/18*

U.S. Cl. 285—133.1 **11 Claims**



1. In a double-walled chimney formed by joining double-walled chimney sections in adjourning axial alignment, each of said chimney sections having an inner wall and an outer wall in concentrive spaced apart relationship, the outer wall having a diameter greater than the inner wall to form an annulus therebetween, the improvement comprising:

a plurality of spacer clip circumferentially positioned on said outer wall to maintain the concentric spaced apart relationship of the walls, said spacer clip mounted to said outer wall and including an integral biasing arm engaging said inner wall, said outer wall received within a clip member integral with said biasing arm, said clip member forming a slot receiving said outer wall for detachably mounting said spring clip thereto.

5,468,027

TUBE COUPLINGS

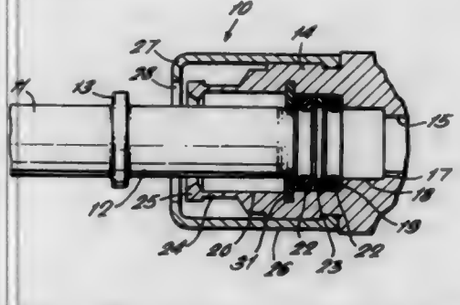
John D. Guest, 'Iona', Cannon Hill Way, Maidenhead, Berkshire, United Kingdom

Filed Feb. 14, 1995, Ser. No. 389,782

Claims priority, application United Kingdom, Feb. 14, 1994, 9402758

Int. Cl.[6] F16L *39/00*

U.S. Cl. 285—319 **10 Claims**



1. A tube coupling comprising a coupling body having a throughway open at one end to receive an end part of a tube provided with an annular head, sealing means in the throughway to form a sealing engagement with the end part of the tube located in the throughway, a locking device engageable with the annular bead on the tube adjacent to the end part of the tube to hold the end part of the tube in the coupling body in engagement with said sealing means and means on the body to provide a resistance to entry of the tube into the throughway prior to engagement of the locking device with the tube bead so that a force applied to the tube to overcome the resistance also overcomes any resistance offered by the locking device to ensure that the tube bead is engaged with the locking device.

5,468,028

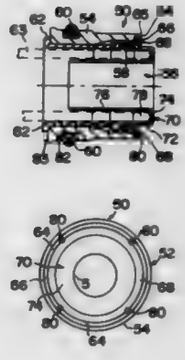
QUICK CONNECT TUBE COUPLINGS

Darwin C. Olson, Franklin, Tenn., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 19, 1994, Ser. No. 358,889

Int. Cl.[6] F16L *21/06*

U.S. Cl. 285—322 **13 Claims**



1. In a quick-connect coupling, useful to connect a tube within a bore formed in a body, wherein the coupling includes a tubular tube support of an outside diameter suitable for frictionally engaging the inner wall of a tube; a sleeve having an inner diameter greater than the outer diameter of the tube and an outer diameter engaging the diameter of the bore; a collet having an outer diameter engaging the inner diameter of the sleeve and an inner diameter greater than the outer diameter of the tubular tube support and slightly less than the outer diameter of the tube, wherein the tube is frictionally retained between the collet and the tubular tube support, and an exterior seal for sealing with the bore: the improvement comprising:

a first end of the sleeve being fixed to the tubular tube support the tubular tube support having a tube support portion and a mounting flange joined to the tube support portion by an L-shaped portion having an axially extending section connected to the mounting flange and a radially extending section connected to the tube support portion to form an annular trough between the axially extending section and tube support portion for receiving the end of the tube, the radially extending mounting flange being fixed to the first end of the sleeve;

an interior O-ring disposed between the radially extending mounting flange and the end of the collet for sealing with the tube; and

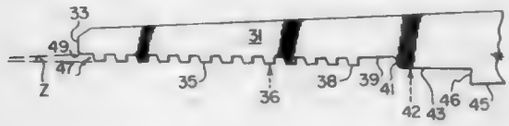
an exterior annular groove in the sleeve for receiving the exterior seal.

5,468,029

PIPE COUPLING

Thomas L. Blose, Houston, Tex.; David L. Britten, Calgary, Canada; Kevin J. Humphreys, and Trent M. V. Kaiser, both of Edmonton, Canada, assignors to Ipsco Enterprises Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 467,620, Jan. 19, 1990, abandoned, and Ser. No. 770,566, Oct. 3, 1991, Pat. No. 5,330,239.
This application Jul. 14, 1994, Ser. No. 275,906
Int. Cl.[6] F16L *25/00*
U.S. Cl. 285—328 27 Claims



1. A pipe connection of the type having a female component and a mating male component, each matingly threaded for connection therebetween, and each provided with a sealing area adjacent the threaded area, the sealing area of the coupling components being formed as mating frusto-conical surfaces, at least one of such surfaces having controlled surface roughness; the respective sealing areas of the components being in axially aligned sealing engagement when the pipe connection has been assembled; characterized in that:

(a) the slopes of the frusto-conical sealing surfaces are each relatively shallow;

(b) the slope of the frusto-conical sealing surface of the male component is selected to be slightly less than that of the frusto-conical sealing surface of the female component such that the sealing bearing load relative to axial distance of the contacting sealing surfaces of the components when the components have been assembled qualitatively simulates that of a pair of mating shrunk-fit circular cylindrical sealing surfaces;

(c) the slope of the load thread pitch line of the male component relative to the axis thereof is slightly steeper than the load thread pitch line of the female component relative to the axis thereof; and

(d) load thread interference and manufacturing tolerances are selected to generate over the effective sealing areas of the components a sealing force at least equal to a designed minimum value, and selected such that the effective sealing area for each of said components is at least about ⅓ of the available sealing surface on such component.

5,468,030

TUBE CLAMP AND COUPLING

Dennis R. Walling, Lafayette, Ind., assignor to Caterpillar Inc., Peoria, Ill.

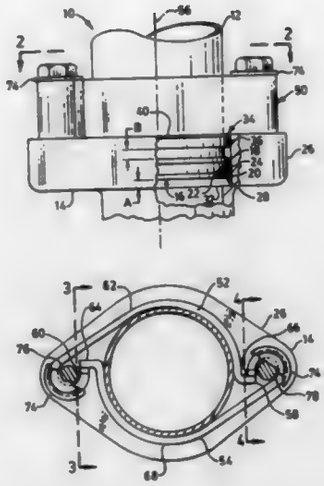
which is a continuation of Ser. No. 177,046, Jan. 4, 1994, abandoned. This application Mar. 28, 1995, Ser. No. 411,914
Int. Cl.[6] F16L *21/06*
U.S. Cl. 285—364 18 Claims

1. An interlocking clamp assembly adapted for receipt clamped about a tube, the tube defining a central axis and the clamp assembly assembling onto the tube axially along the central axis, the clamp assembly comprising:

a first clamping member, said first clamping member defining a first seat portion, a first seat engaging portion and a first tube engaging portion between said first seat portion and said first seat engaging portion; and

a second clamping member, said second clamping member defining a second seat portion interlockable with said first seat engaging portion, a second seat engaging portion interlockable with said first seat portion and a second tube engaging portion between said second seat portion and said second seat engaging portion;

said first seat portion including a first axial lead-in portion and said second seat engaging portion including a second axial lead-in portion, said first seat engaging portion and said second seat portion radially flexing relative to one another as said second seat portion is axially received in said first axial lead-in portion and said second seat engaging portion and said first seat portion radially flexing relative to one another as said first seat portion is axially received in said second axial leads-in portion to resiliently compress said first tube engaging portion and said second tube engaging portion about the tube and resiliently restrain said first seat engaging portion against said second seat portion and said second seat engaging portion against said first seat portion to interlock said first clamping member with said second clamping member.

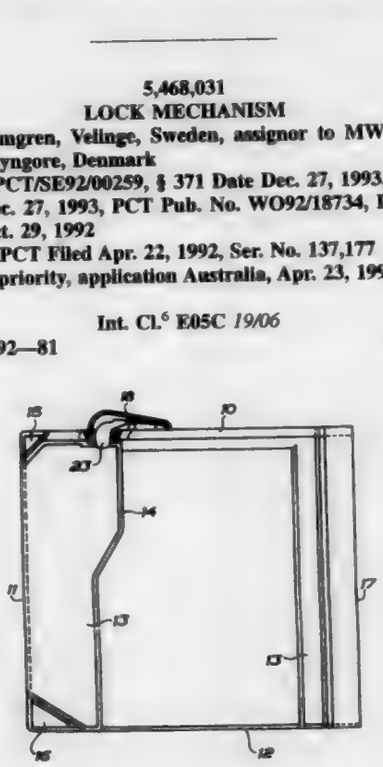


5,468,031

LOCK MECHANISM

Bertil Holmgren, Velinge, Sweden, assignor to MW Trading APS, Glyngore, Denmark

PCT No. PCT/SE92/00259, § 371 Date Dec. 27, 1993, § 102(e) Date Dec. 27, 1993, PCT Pub. No. WO92/18734, PCT Pub. Date Oct. 29, 1992
PCT Filed Apr. 22, 1992, Ser. No. 137,177
Claims priority, application Australia, Apr. 23, 1991, 75230/91
Int. Cl.[6] E05C *19/06*
U.S. Cl. 292—81 3 Claims



1. Safety device for a box including two hingedly interconnected rectangular box halves, comprising:

a frame to be mounted on an outside of the box encircling the box to prevent opening thereof;

a flat spring blade of a material allowing the spring blade to be magnetically attracted;

means for fixedly mounting said spring blade to said frame at one end thereof, said spring blade projecting toward the other free end of the spring blade from said mounting means;

a flap being bent from said spring blade to project therefrom transversely of a plane of the spring blade at said other free end thereof towards an interior of said frame to lockingly engage a box encircled by the frame and thus to prevent removal of the frame from the box; and

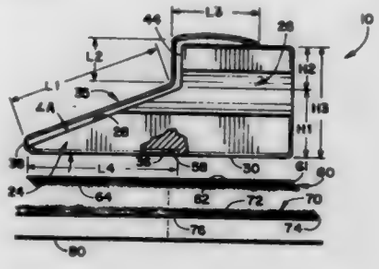
a housing enclosing said spring blade exteriorly of the frame, said flap being disengaged from the box by magnetically attracting said spring blade from the outside of said housing.

5,468,032

DOOR STOP ASSEMBLY

Robert J. Hebert, 936 Ashton Ct., Vista, Calif. 92083, and John J. Hebert, 1113 Calle Del Baston, Lake San Marcos, Calif. 92069

Filed Nov. 23, 1994, Ser. No. 344,108
Int. Cl.[6] E05C *17/54*; E05F *5/02;5/06*
U.S. Cl. 292—343 **6 Claims**



1. A door stop assembly adapted for introduction between the sliding door and the stationary door of a sliding patio door assembly comprising:

a wedge block having a wedge portion and a block portion;

said wedge portion having a top surface having a front edge and a rear edge; said wedge portion also having a bottom surface having a front edge, a rear end and a pair of laterally spaced side walls; (the) said front (ends) edges of said top surface and said bottom surface are oriented toward each other at an acute angle; said wedge portion has a height H1 at its rear end;

said block portion having a front end, a rear wall, a top wall, a bottom wall, and laterally spaced side walls; (the) said front end of said block portion being contiguous with (the) said rear end of said wedge portion; said block portion having a front wall that extends upwardly from (the) said rear edge of (the) said top surface of said wedge portion to form a shoulder abutment wall having a height H2;

a spring having a top leg member with a front end and a rear edge, said spring having a bottom leg member with a front end and (the) said front ends of said leg members are oriented toward each other at an acute angle;

(the) said top leg member of said spring has a front section, a middle section, and a rear section; said front section having a top surface and a rear end; said middle section having a top end and a bottom end; said rear section having a rear edge;

the bottom leg member of said spring being secured to (the) said bottom surface of said wedge portion and (the) said front section of said top leg member being positioned above (the) said top surface of (the) said wedge portion of said wedge block in a spaced relationship thereto;

the middle section of (the) said top leg member of said spring extends upwardly from (the) said rear end of its front section; said middle section being spaced forwardly of (the) said shoulder abutment wall of said block portion and it has a top end;

the rear section of (the) said top leg member of said spring extends rearwardly from (the) said top end of (the) said middle section of said spring; said rear section having a concave curvature along its longitudinal axis so that any pressure applied to (the) said top surface of (the) said front section of said spring will transfer that pressure to (the) said rear edge of (the) said rear section of said leg member and force it downwardly against the (the) said top wall of said block portion;

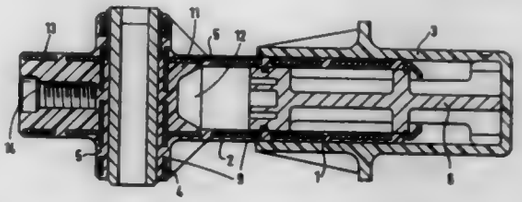
means (of the) on said bottom surface of said wedge block for preventing it from sliding with respect to a support surface upon which it would be placed.

5,468,033

IMPACT ABSORBING BUMPER MOUNT AND METHOD OF MAKING

Wolfgang Dohrmann, Eitorf-Irlenborn, and Metin Ayyildiz, Köln, both of, Germany, assignors to Fichtel & Sachs AG, Eitorf, Germany

Filed Nov. 26, 1993, Ser. No. 158,634
Claims priority, application Germany, Dec. 1, 1992, 42 40 364.2
Int. Cl.[6] F16F *9/02;9/06;9/16*; B62D *21/15*
U.S. Cl. 293—133 **20 Claims**



1. An impact absorbing bumper mount for mounting a bumper to a motor vehicle to absorb an impact of the motor vehicle during a collision with an obstacle, said mount comprising:

a first tubular member, the first tubular member defining a longitudinal axis, and said first tubular member having an interior surface and an exterior surface;

a second tubular member at least partially disposed within said first tubular member, said second tubular member being movable into and out of the first tubular member along the longitudinal axis of said first tubular member, and the second tubular member having an interior surface and an exterior surface;

means for attaching said first tubular member to one of the bumper and the motor vehicle;

means for attaching said second tubular member to the other of the bumper and the motor vehicle;

a work piston connected to the first tubular member;

said work piston being movably disposed within said second tubular member;

at least said second tubular member comprising a protective coating on at least the exterior surface thereof; and

said protective coating being configured to minimize adherence of said first tubular member to said second tubular member.

5,468,034

APPARATUS FOR PULLING ARROWS FROM SURFACES IN WHICH THEY ARE EMBEDDED

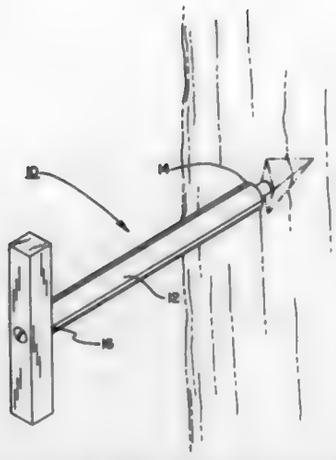
Larry L. Kopel, 206 N. 5th St., Marshalltown, Iowa 50158

Filed Sep. 15, 1994, Ser. No. 306,603
Int. Cl.[6] B23P *19/04*; B65G *7/12*
U.S. Cl. 294—1.1 **3 Claims**

1. An apparatus for pulling arrows from surfaces in which they are embedded comprising, in combination:

a cylindrical shank having a front end and a rear end with a length of about three and a half inches and a diameter of about three-eighths inch;

an aperture formed in the front end, the aperture extending axially within the front end and formed in a cylindrical



configuration, the aperture including a non-threaded outboard section and an inboard section having a reduced diameter with internal threads, the threaded inboard section of the aperture adapted to receive the external threads at the trailing end of a broad-head arrow;

a threaded aperture extending forwardly from the rear end of the shank;

a T-handle having a rectangular cross-section with a length of about two and one-fourth inches and a central aperture extending therethrough with internal threads formed in the aperture and a countersunk hole thereadjacent, the cross-section of the T-handle being square about three-eights inches on each side; and

a flat head bolt with a leading end and a counter-sunk head positioned within the countersunk hole and extending into the threaded rear end of the shank whereby the leading end may be threadably attached to the trailing end of a broad-head arrow and a linear force applied by a user grasping and pulling the T-handle along the axis of the shank.

5,468,035

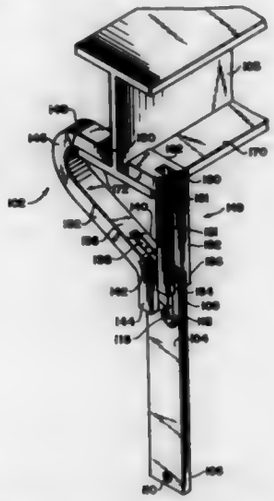
GRAPPLE HANGER MECHANISM

Edward Fountain, 298 Roberts Ave., Yonkers, N.Y. 10703

Filed Apr. 19, 1993, Ser. No. 47,978

Int. Cl.[6] B66D *3/00*

U.S. Cl. 294—85 **3 Claims**



1. A grappling hanger device comprising a frame plate, and a first end thereof and a second end thereof, a slotted keyhole aperture in said plate adjacent said second end and including a circular section, a primary grappling hook carried rotably and slidingly in said keyhole opening, said primary grappling hook having a base end, said base end of said grappling hook having a rectangular cross bar sliding in said keyhole opening in said plate, the width of said bar being slightly less than the diameter of said circular section of said keyhole opening and greater than the distance between the walls of the slotted portion of said keyhole opening and the thickness slightly less than the distance between the walls of the slotted portion of said keyhole opening, and latch means fixed to and extending from said second end of said frame plate and lockable over said primary grappling hook, and lifting means at said first end of said frame plate said lifting means being above said primary grappling hook when said primary hook is not latched and below said primary hook when said primary hook is latched, said frame plate rotating about 180° around said cross bar, and said lifting means moveable to and from above said hook in the unlatched state and to and from below said hook in the latched state.

5,468,036

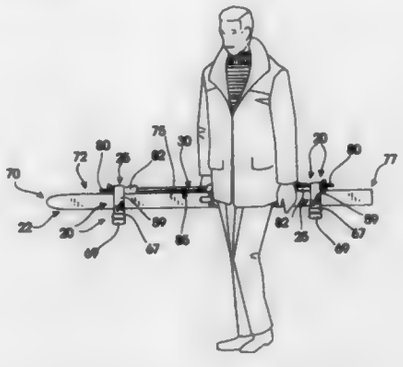
SKI AND SKI POLE TRANSPORT STRAP SYSTEM

Ronny W. Brown, 109 Spring River Rd., Sherwood, Ark. 72116

Filed Feb. 14, 1994, Ser. No. 195,312

Int. Cl.[6] A63C *11/02*

U.S. Cl. 294—147 **16 Claims**



1. A strap for bundling and orienting a set of skis and poles for convenient carrying, said strap comprising:

an elongated body comprising an inner side, an opposite outer side provided with fastener material, an inner end, and a remote end;

a gripping surface affixed to said inner side of said body proximate said inner end, for frictionally enveloping a pair of skis to be bound by said strap;

a fastener material backing disposed on said body inner side and extending from said gripping surface to said remote end for releasably engaging said body outer side fastener material when said strap is wrapped around said skis; and,

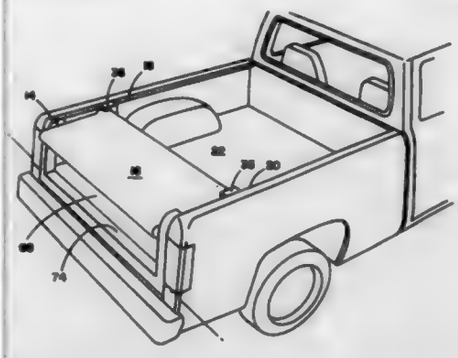
a ski pole band for separately, releasably binding ski poles to the previously bound skis, said ski pole band extending from a central portion of said body and comprising an inner side provided with fastener material adapted to selectively mate with said body outer side fastener material, and a smooth, protective outer side for normally guarding the resulting outer circumference of the installed strap.

5,468,037

DUAL PIVOT PICKUP TAILGATE

Francis C. Peterson, 807 College, Prescott, Wis. 54021; Jerome A. Grunstad, 3872 - 67th St. East, Inver Grove Heights, Minn. 55076-2232, and Leo F. Wildgen, 9431 - 10th Avenue South, Bloomington, Minn. 55420

Filed May 26, 1992, Ser. No. 888,188
Int. Cl.[6] B62D *35/00*
U.S. Cl. 296—57.1 6 Claims



1. A tailgate assembly for use with a utility vehicle having a cargo area, having two sides, and a bed floor, said tailgate comprising:

gate frame means for carrying gate panel means;

mounting means coupled to said gate frame for mounting said gate frame proximate said bed floor, and for permitting partial rotation about a first gate frame hinge axis, said hinge axis being fixed and being located substantially a the level of said bed floor;

said gate panel means pivotally mounted for rotation about a second gate frame hinge axis, said second axis being parallel to said first axis;

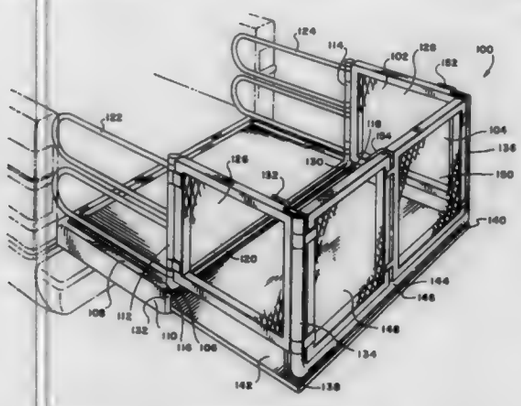
whereby rotation of said gate panel means about said second axis coupled with rotation of said gate frame means about said first axis can move said gate panel means from a position orthogonal to said bed to a second position substantially parallel to said bed and located above said bed.

5,468,038

MULTIPLE CONFIGURATION TAILGATE EXTENDER

Gregory M. Sauri, 822 W. Centerville Rd. #130, Garland, Tex. 75041

Filed Sep. 6, 1994, Ser. No. 301,126
Int. Cl.[6] B62D *33/02*
U.S. Cl. 296—57.1 12 Claims



1. An extender for a vehicle tailgate, comprising:

an extension member movable between a stowed position and an operative position;

the extension member being hingedly connected to an upper edge of an inner wall of the tailgate, the inner wall being recessed with respect to sides of the tailgate such that the extension member is substantially flush with respect to the tailgate sides when in the stowed position;

the extension member having first and second side posts located at first and second outer corner portions of the tailgate, respectively;

the extension member having a plurality of closure members adapted to form vertical closures when the extension member is in the operative position; and

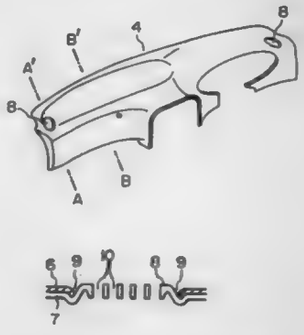
the extension member closure members being hingedly connected to the extension member side posts.

5,468,039

INSTRUMENT PANEL FOR AUTOMOBILE

Masahito Matsumoto, and Nobuhiro Usui, both of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

PCT No. PCT/JP93/01169, § 371 Date Apr. 21, 1994, § 102(e) Date Apr. 21, 1994, PCT Pub. No. WO94/04386, PCT Pub. Date Mar. 3, 1994
PCT Filed Aug. 20, 1993, Ser. No. 211,966
Claims priority, application Japan, Aug. 21, 1992, 4-222592
Int. Cl.[6] B60K *37/00*; B60H *1/00*
U.S. Cl. 296—70 4 Claims



1. An instrument panel for an automobile in which a skin material is integrally laminated to a surface of a thermoplastic resin core material and which is obtained by feeding the skin material between a pair of male and female molds so designed that a desired instrument panel shape is obtained and subsequently press-molding a molten thermoplastic resin after or while feeding the molten thermoplastic resin between the skin material and the male mold or the female mold, characterized in that the instrument panel has on its surface at least one exposed portion with at least one perforation formed through the exposed portion, wherein an end of the integrally laminated skin material at a boundary with the exposed portion is embedded into the exposed portion and fixed therein.

5,468,040

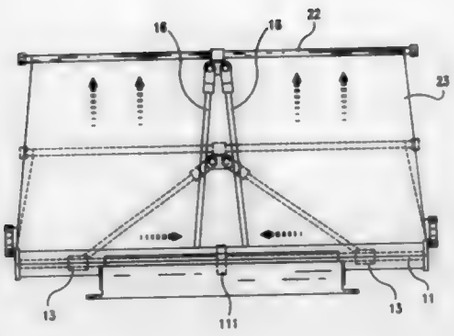
POWER-OPERATED AUTOMOBILE SUNSHADE

Shih-Fang Peng Hsieh, 2F-3, No. 390, Kuang Fu S. Rd., Sung Shan District, and Cheng-Liang Lee, 1F, No. 2, Alley 30, Lane 268, Fu Te St., Sung Shan District, both of Taipei, Taiwan, Prov. of China

Filed Feb. 1, 1994, Ser. No. 189,635
Int. Cl.[6] B60J *3/02*; E06B *9/72*
U.S. Cl. 296—97.4 2 Claims

1. An automobile sunshade comprising:

a base unit, said base unit comprised of a base frame installed in an automobile at the bottom of the windshield, and a carrier mounted on said base frame by clamping plates thereof, said base frame comprising a motor, a single-threaded screw rod



driven by said motor, and a top slot disposed above said single-threaded screw rod, said carrier comprising a rear flange and a front flange respectively and longitudinally disposed on two opposite sides thereof, and a bottom slot in a middle aligned with said top slot;

a transmission mechanism, said transmission mechanism comprised of a double-threaded screw rod having two reversed threads on two opposite ends thereof, a worm gear mounted around said double-threaded screw rod in a middle between said reversed threads and meshed with said single-threaded screw rod, a guard tube covered around said double-threaded screw rod and fastened to said front flange of said carrier, two screw nuts respectively threaded onto said reversed threads, two first end caps respectively affixed to said screw nuts, a connector, two second end caps connected together by said connector, two elongated rods respectively connected between said first end caps and said second end caps, said connector having a center through hole; and

a shade roller fastened to said rear flange, said shade roller comprised of a cylindrical casing held within said rear flange, a reversible mechanism controlled reel fastened inside said cylindrical casing, a slat inserted through a center through hole on said connector and disposed outside of a shade tube, and a shade body having one end connected to said reversible mechanism controlled reel and an opposite end connected to said slat;

whereby said screw nuts are moved toward each other along said double-threaded screw rod as said single threaded screw rod is driven by said motor to turn said double-threaded screw rod through said worm gear, causing said elongated rods to move said slat upward in lifting said shade body over the rear windshield of the automobile.

5,468,041

SWIVEL BEARING BRACKET FOR VEHICLE SUN VISORS

Lothar Viertel, Altforweiler, Germany, and Patrick Welter, La Chambre, France, assignors to Gebr. Happich GmbH, Germany

Filed Jun. 28, 1994, Ser. No. 267,808

Claims priority, application Germany, Aug. 9, 1993, 43 26 660.6

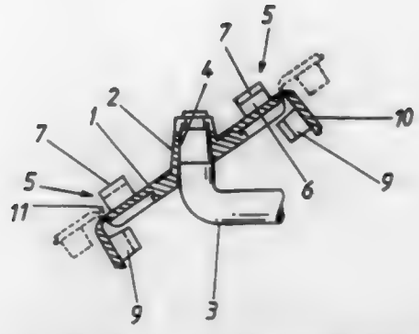
Int. Cl.[6] B60J *3/02*

U.S. Cl. 296—97.9 **15 Claims**

1. A swivel bearing bracket for a vehicle sun visor for being attached on the ceiling of the vehicle comprising:

a flange like base body having a rear side, a shaft support on the rear side for supporting an end region of a sun-visor shaft, and a passage opening through the base body for the shaft to extend to the support;

first and second fastening elements formed on the rear side of the base body, each fastening element being spaced from the shaft support, each fastening element including hook means which hook on to the ceiling of the vehicle by movement of the base body to move the hooks in respective opposite directions;



the ceiling of the vehicle having a respective opening therein for each fastening element, each ceiling opening having a cross section that is greater than the cross section of the hook means at the opening, whereby the hook means may be pushed into the respective opening, and after turning of the base body in one direction, the hook means hook onto the ceiling to hold the base body to the ceiling;

a respective additional pin for each of the hook means and introducible into the respective opening along with the hook means in the ceiling and upon such insertion, the pin being positioned with respect to the hook means for holding the hook means hooked to the ceiling.

5,468,042

COMPARTMENT CONFINING CONSTRUCTION WITH AN OPENING, A CLOSURE UNIT FOR THE OPENING AND A POSITIONING UNIT FOR THE CLOSURE UNIT

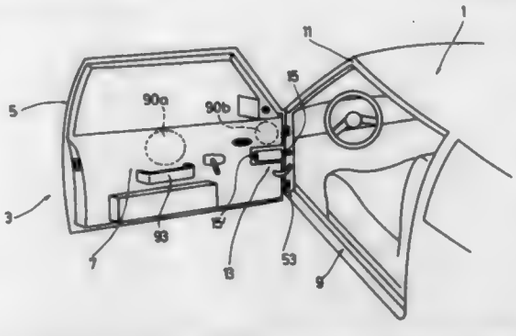
Heinrich-Josef Heinrichs; Stephan Enders, Koblenz, and Klaus Koch, Dahlheim, all of, Germany, assignors to Stabilus GmbH, Koblenz, Germany

Filed Jul. 20, 1993, Ser. No. 95,149

Claims priority, application Germany, Jul. 22, 1992, 42 24 132.4

Int. Cl.[6] B60J *5/04*

U.S. Cl. 296—146.4 **28 Claims**



1. A compartment confining construction comprising an opening and a closure unit having two main side faces and movably mounted on said compartment confining construction for movement between a closing position and a fully opened position with respect to said opening through intermediate positions, a fluid based positioning unit being connected to both said compartment confining construction and said closure unit, said fluid based positioning unit being provided with at least one flow path, a movement of said closure unit corresponding to a flow of fluid through said at least one flow path, fluid flow control means being provided for controlling said flow of fluid through said at least one flow path and thereby controlling the movement of said closure unit, said fluid flow control means being actuatable by electric actuating means, said fluid based positioning unit being a passive positioning unit, said flow of fluid occurring in response to movement of said closure unit when said closure unit is moved by an external force, said passive fluid based positioning unit comprising two working

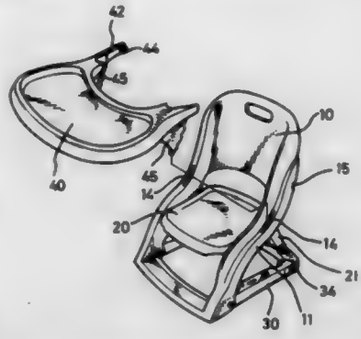
chambers interconnected by said at least one flow path, and said at least one flow path being provided with said flow control means.

5,468,043

FOLDABLE CHAIR

Jui-Lung Chien, Taichung City, Taiwan, Prov. of China, assignor to Jina Manufacturer Thai Co., Ltd., Bangkok THX

Filed Aug. 16, 1994, Ser. No. 291,102
Int. Cl.[6] A47B *83/02*
U.S. Cl. 297—153 **4 Claims**



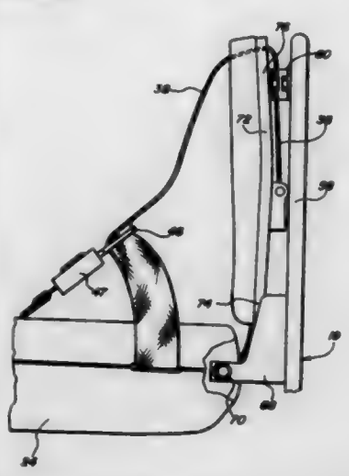
1. A foldable chair comprising a seat, a back, two front legs and two rear legs, said rear legs being connected to said seat, said seat being disposed between said front legs and pivotally engaged to an inner side of each of said front legs, each of said front legs having a slot defined therein, a dining board having two side arms extending horizontally therefrom, each said side arm having a catch extending transversely from a distal end thereof engageable with said back, each said side arm having a plate extending downwardly from an underside thereof insertable into said slot.

5,468,044

ENERGY ABSORBING CHILD SEAT

Sorin Coman, Madison Heights, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Jul. 13, 1994, Ser. No. 274,497
Int. Cl.[6] B60N *2/42;* **B60R** *21/00*
U.S. Cl. 297—216.11 **8 Claims**



1. A seat assembly for a vehicle having a body structure, said seat assembly comprising:

a child seat subassembly including a generally upright back support panel, a seat cushion, and a restraint system for restraining a passenger positioned on the seat cushion and said back support panel; and

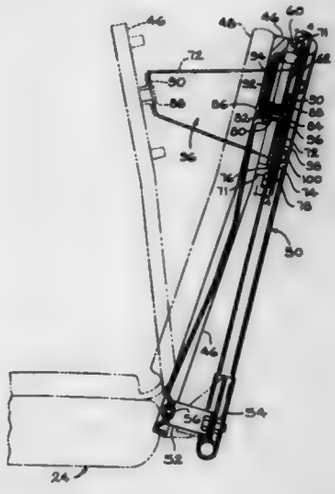
mounting means for operatively coupling said restraint system to said body structure forming a load path for transferring restraint loads from said restraint system to said body structure, said mounting means including at least one plastically deformable member in said load path configured to absorb energy by limited plastic deformation in bending during a vehicle collision at a load less than a failure load of said plastically deformable member, said plastically deformable member being a plate bent into a generally U-shape configuration having spaced opposite sides each having an initial length and a bottom portion having an initial length connected to said sides at bends in said plate, said sides being spaced apart by said length of said bottom portion, said deformable member being located in said load path so that a vehicle frontal collision applies a load on said deformable member to pull said sides further apart, said member deforming during a vehicle collision by bending to increase the length of said bottom portion and decrease the length of at least one of said sides whereby said sides are spaced further apart following the collision.

5,468,045

ENERGY ABSORBING CHILD SEAT

James L. Weber, West Bloomfield, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Jul. 28, 1994, Ser. No. 282,397
Int. Cl.[6] B60N *2/42;* **B60R** *21/00*
U.S. Cl. 297—216.11 **26 Claims**



1. A seat assembly for a vehicle having a body, said seat assembly comprising:

a seat frame adapted to be attached to the vehicle body;

a child seat for a child occupant, said child seat including a back panel, a seat support adjacent to said back panel and a restraint system operatively connected between said back panel and said seat support to restrain a passenger positioned on said seat support and said back panel whereby at least a portion of the load applied to said restraint system by a seat occupant during a vehicle collision is transferred to said back panel; and

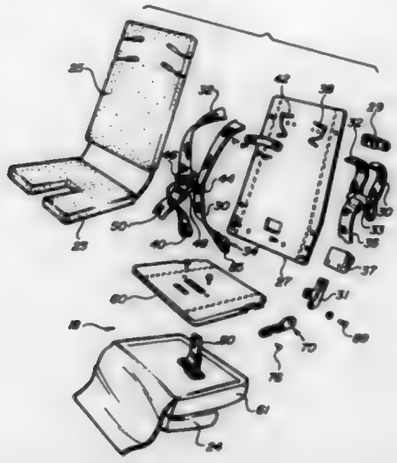
coupling means for coupling said back panel to said frame, forward of said frame, and for permitting fore and aft movement of said back panel relative to said frame, said coupling means including an elastic diaphragm attached to said back panel and to said seat frame and which is drawn tightly therebetween whereby said diaphragm is stretched upon forward movement of said back panel to absorb energy.

5,468,046

SEAT BELT MOUNTING FOR INTEGRAL CHILD SEAT

James L. Weber, W. Bloomfield, and Dianna L. Subo, Novi, both of Mich., assignors to Hoover Universal, Inc., Plymouth, Mich.

Filed Jul. 13, 1994, Ser. No. 274,253
Int. Cl.[6] A47C *15/00*
U.S. Cl. 297—238 **9 Claims**



1. A vehicle seat assembly having a seat back with an integral child seat, said child seat comprising:

a back support with upper and lower ends mounted to said seat back;

a seat support rotatably mounted to said seat back for rotation about a pivot axis adjacent to said lower end of said back support, said seat support being movable between an upright position stowed within said seat back and a forwardly extending, generally horizontal use position, said seat support having spaced apart left and right opposite sides;

a restraint system operatively connected between said back support and said seat support to restrain a passenger having legs positioned on the seat support and said back support, said restraint system including left and right belts each having a first end connected to said seat support at said left and right sides thereof, respectively, at locations spaced from said pivot axis so that said first ends of said belts rotate with said seat support, said belts extending upwardly from said seat support, overlying said back support and passing into said back support near the upper end thereof, a buckle mounted to said seat support midway between said left and right sides so as to be located between the legs of a passenger positioned on the seat support and left and right clasps slidably carried on said left and right belts, respectively, for insertion into said buckle;

said seat support including a seat pan having left and right sides and left and right belt anchors attached to said seat pan at said left and right sides thereof, respectively, for attaching said first ends of said left and right belts to said seat support; and

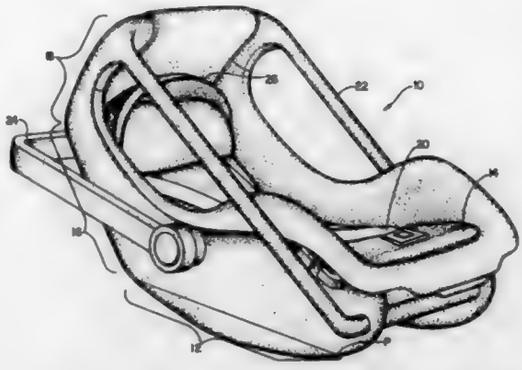
said seat further comprising means for pivotally mounting said anchors to said seat back whereby said seat support is mounted to said seat back.

5,468,047

CHILD SAFETY SEAT

Dan Goor; Robert P. Harnisch; Robert L. Browne, and Stephen T. Long, all of Colorado Springs, Colo., assignors to GA International, Inc., Colorado Springs, Colo.

Filed Feb. 24, 1994, Ser. No. 201,200
Int. Cl.[6] A47C *1/08;7/62;* B60N *2/42*
U.S. Cl. 297—250.1 **9 Claims**



1. A child safety seat comprising:

a base having a first end and a second end that define a plane;

a backrest secured to said first end of said base at an obtuse angle with respect to said plane;

a rigid head protector immobily secured to said backrest at an acute angle with respect to said plane defined by said base; and

a longitudinal member secured to said head protector and a portion of said base proximate said second end of said base;

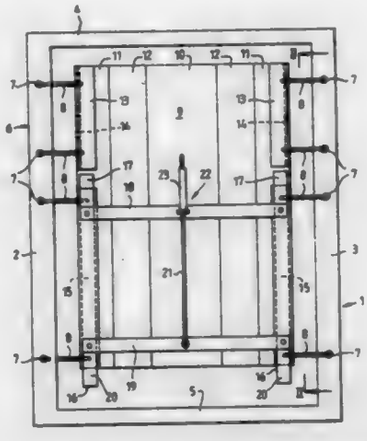
wherein said head protector has a first side and a second side, said longitudinal member is U-shaped having a first end and a second end, said first end of said longitudinal member being secured to said first side of said head protector, and said second end of said longitudinal member being secured to said second side of said head protector.

5,468,048

SEAT BACK WITH ADJUSTABLE SUPPORT

Clive Clemens, Etwall, and Robert E. Wain, Burton on Trent, both of, United Kingdom, assignors to Pirelli Tyres Limited, London, England

PCT No. PCT/GB93/00327, § 371 Date Feb. 3, 1994, § 102(e) Date Feb. 3, 1994, PCT Pub. No. WO93/25404, PCT Pub. Date Dec. 23, 1993
PCT Filed Feb. 16, 1993, Ser. No. 190,122
Claims priority, application United Kingdom, Jun. 9, 1992, 9212129
Int. Cl.[6] A47C *3/00*
U.S. Cl. 297—284.4 **9 Claims**



1. A seat back for use in a seat for adjustably supporting a back of an occupant, said seat back comprising: a rigid frame having opposite sides between which is supported a flexible panel, marginal regions of the panel adjacent the opposite sides of the frame being provided with pockets in which are located central regions of respective wire or strip springs, end regions of each spring extending outwardly from its respective pocket and rearwardly in a curved manner; an upper cross member located rearwardly of the

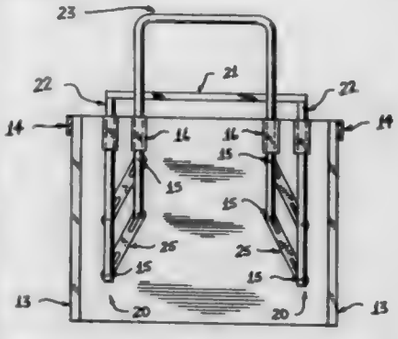
panel and interconnecting upper curved regions of each spring; a lower cross member located rearwardly of the panel and interconnecting lower curved regions of each spring; and means for forcing the upper and lower cross members towards each other whereby the central regions of the springs are urged to bow forwardly and thereby increase the force which the panel located between the central regions of the springs applies to a back of an occupant.

5,468,049

MANUALLY OPERATED UPLIFT APPARATUS

Gary L. Johnston, P.O. Box 183, Cowarts, Ala. 36321

Continuation-in-part of Ser. No. 759,233, Sep. 13, 1991, Pat. No. 5,303,982, and a continuation-in-part of Ser. No. 144,034, Nov. 1, 1993. This application Apr. 12, 1994, Ser. No. 226,353
The portion of the term of this patent subsequent to Apr. 19, 2011, has been disclaimed.
Int. Cl.[6] A47C *3/30*
U.S. Cl. 297—339 **11 Claims**



1. A manually operated uplift apparatus comprising;
a frame
a substantially horizontal seat moveable in a substantially vertical direction with respect to said frame, with said seat maintaining a substantially horizontal position while moving in the substantially vertical direction;
a substantially horizontal hand engagement handle for receiving a downward force from the user, said hand engagement handle moveable independently of said seat in the substantially vertical direction with respect to said frame, with said hand engagement handle maintaining a substantially horizontal position while moving in the substantially vertical direction;
a power translating mechanism operatively connected between said seat, said hand engagement handle, and said frame for translating the downward force applied by the user on said hand engagement handle into an upward force on the seat, thereby assisting the user into a raised position.

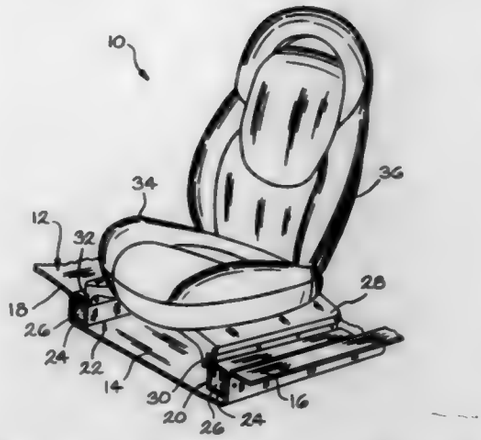
5,468,050

VEHICLE SEAT ASSEMBLY WITH UNITARY FRAME STRUCTURE

Jack K. Hall, New Hudson, and John B. Delphia, White Lake, both of Mich., assignors to Hoover Universal, Inc., Plymouth, Mich.

Filed Jan. 13, 1994, Ser. No. 181,297
Int. Cl.[6] A47C *1/02*
U.S. Cl. 297—344.1 **10 Claims**

1. A seat assembly for a motor vehicle having a body, said seat assembly comprising:
a pair of fixed rails extending fore and aft and being laterally spaced from one another, said fixed rails being adapted to be mounted to the vehicle body;
a pair of slide rails extending fore and aft and being laterally spaced from one another, said slide rails being carried by said fixed rails for fore and aft sliding movement relative to said fixed rails;



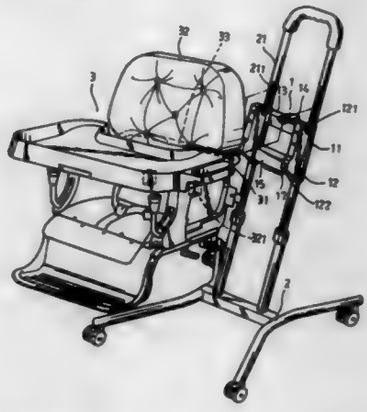
a support member having laterally spaced side edges, said support member being fixed to said slide rails along said side edges forming a unitary frame structure whereby said unitary frame structure is movable fore and aft relative to said fixed rails;
a generally horizontal seat cushion having spaced lateral sides mounted upon said unitary frame structure; and
a generally upright seat back mounted upon said unitary frame structure and extending upwardly therefrom;
said unitary frame structure extending outwardly beyond said lateral sides of said seat cushion to said side edges and said slide rails.

5,468,051

ADJUSTABLE HIGHCHAIR

Y. H. Huang, Tainan City, Taiwan, Prov. of China, assignor to Lu Kuang Incorporation, Tainan City, Taiwan, Prov. of China

Filed Aug. 23, 1994, Ser. No. 294,577
Int. Cl.[6] A47C *1/06*
U.S. Cl. 297—344.18 **1 Claim**



1. An adjustable highchair, comprising:
a seat support having a pair of sleeves slidingly disposed on a pair of struts having a connecting bar and a container;
a seat having a pair of armrests and a crossbar extending from said armrests, said seat being detachably coupled to said seat support;
said container having a pair of grooves formed at respective opposing upper inner portions thereof, a pair of through bores formed in respective opposing sides of said container in open communication with a respective interior portion of said sleeves, and a first block extending from an inner wall of said container, said container further having a pair of first pins located on opposing sides of said first block, a plurality of first

apertures formed in an upper edge of said container and a plurality of second apertures formed in a lower edge of said container;

a cover for forming a closure for said container having a second block extending from inner wall thereof and disposed in aligned relation with said first block of said container, said cover further having a pair of second pins disposed on opposing sides of said second block and in aligned relation with said pair of first pins, a plurality of third apertures formed through an upper edge of said cover and disposed in aligned relation with said plurality of first apertures and a plurality of fourth apertures formed through a lower edge of said cover and disposed in aligned relation with said plurality of second apertures; and,

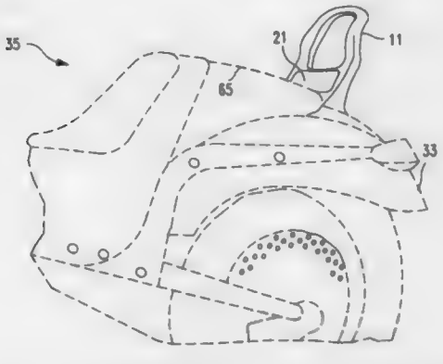
a sliding mechanism disposed within said container and enclosed by said cover, said sliding mechanism including a pair of engaging members slidingly disposed within said grooves of said container, a first spring disposed between said pair of engaging members, a linking member centrally disposed below said pair of engaging members and a second spring for biasing said linking member, each of said engaging members having (1) a third pin formed on a distal end thereof for insertion into a respect through bore of said container, (2) an opening formed in a proximal end thereof to receive said first spring therein for urging said engaging members outwardly, and (3) an arcuate camming surface formed on a bottom portion thereof, said linking member having a pair of arcuate camming surfaces disposed at respective opposing ends of a top portion thereof for matingly engaging said arcuate camming surfaces of said pair of engaging members, and a bore formed centrally in said top portion for receipt of one end of said second spring, an opposing end of said second spring being engaged with said first block of said container for urging said linking member downwardly, said linking member having a gripping area formed in a bottom portion thereof, and a pair of spaced slotted openings formed therethrough adapted to respectively receive therein said pair of first pins form one side and said pair of second pins from an opposing side thereof, whereby said third pins of said engaging members will be displaced from said container through bores responsive to said gripping area being pushed upwardly to thereby free said seat support to slide along said struts of said seat frame until said gripping area is released and said third pins of said engaging members are reinserted into said through bores of said container.

5,468,052

SISSY BAR KIT FOR POST-MANUFACTURE INSTALLATION ON A MOTORCYCLE

Steven Vaughn, 13 Vaughn Ter., Saugerties, N.Y. 12477

Filed Jun. 27, 1994, Ser. No. 265,942
Int. Cl.[6] A47C *15/00*
U.S. Cl. 297—352 **4 Claims**



1. A sissy bar kit for installation on the rear fender of an existing motorcycle, said kit comprising:

a bar with an inverted U-shape; said bar having a longitudinal axis and having an upper end and two lower ends; the upper end being rounded, said bar including a pair of lugs rigidly mounted on the lower end of the bar, and lying in a plane at an obtuse angle to the longitudinal axis of the bar, each lug having an opening extending through it substantially at right angles to the plane of the lugs, said bar further including a back plate extending between the two lower ends of the bar, the back plate being substantially in a plane at an acute angle to the longitudinal axis of the bar, the back plate having a lower edge which is concave;

a cushion mounted on the back plate above the lugs;

a support member which has a upper surface which is convex and a lower surface which is concave, the upper surface and the lower surface being generally equispaced from one another, the support member having two protrusions which are generally symetrically located on the lower surface, each protrusion having a flat vertical surface and a flat horizontal surface and the flat horizontal surfaces of both protrusions lying substantially in the same plane, the support member having a pair of openings extending through the support member at the protrusions, such openings through the support member having a longitudinal axis which is generally at right angles to the plane of the flat horizontal surfaces, the pair of holes through the support member being aligned with the openings in the lugs; and

bolt means to extend through the openings in the lugs and the openings in the support member.

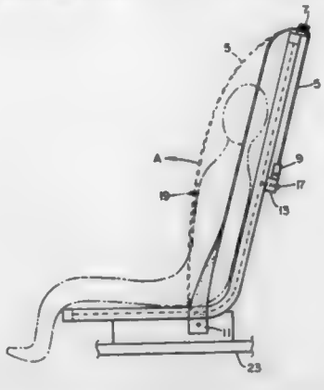
5,468,053

ENERGY ABSORBING BEAM CONSTRUCTION FOR USE WITH VEHICLE SEAT BELT RESTRAINING SYSTEMS

Kurt P. Thompson, Richmond, and Jeffrey W. Wiese, Glen Allen, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed May 4, 1994, Ser. No. 237,909
Int. Cl.[6] A62B *35/00;35/04;* **B60R** *22/14*
U.S. Cl. 297—472 **16 Claims**

1. In a vehicle having at least one seat and at least one seat belt



restraining system therefore, the seat belt restraining system comprising a belt and a seat belt retracting mechanism, the improvement comprising an energy absorbing beam construction for use with the seat belt restraining system which comprises:

(a) a longitudinally-extending energy absorbing beam having a first end and a second end;

(b) means for attaching the first end of said energy absorbing beam to a component of the seat belt restraining system; and

(c) means for fastening the second end of said energy absorbing beam to said vehicle so that said second end is fixed and said first end is free to move transversely to a longitudinal axis of said beam when a force is applied to said first end by said seat belt restraining system;

(d) wherein said energy absorbing beam is a longitudinally extending hollow beam having sides thereof configured to

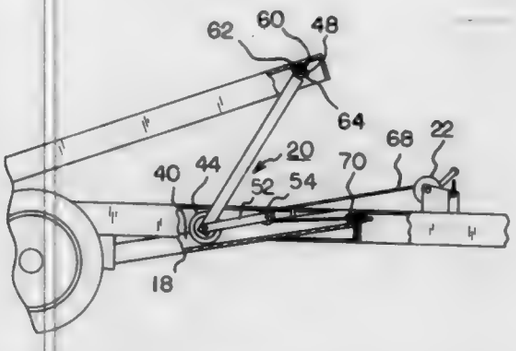
provide controlled plastic deformation of the beam, said free end of said beam moving and said beam deforming elastically when forces less than a given magnitude are exerted on said free end by said seat belt restraining system and said beam deforming plastically in a controlled manner when forces greater than the forces of the given magnitude are exerted on said free end by said seat belt restraining system to absorb collision energy and minimize injury to a vehicle occupant using said seat belt restraining system.

5,468,054

PIVOTING TRAILER ASSEMBLY

Richard F. Soules, R.D. #2, Box 114, Eldred, Pa. 16731

Filed Jan. 27, 1994, Ser. No. 160,265
Int. Cl.[6] B60P *1/14*
U.S. Cl. 298—19 V **4 Claims**



2. A trailer assembly comprising:

a trailer frame, the trailer frame adapted to be connected to a towing vehicle at its forward end;

a trailer bed, the rearward end of the trailer bed being pivotally connected to the rearward end of the trailer frame to enable the trailer bed to pivot with respect to the horizontal;

a lifting ramp coupled to the trailer frame, the lifting ramp extending along the trailer frame and having a forward end;

a lifting assembly including a lifting arm having upper and lower ends, a pivotal connection assembly connecting the upper end of the arm and the trailer bed at its forward end, a wheel connected to the lower end of the lifting arm, the wheel adapted to ride along an upper surface of the lifting ramp, a pulley arm coupled to the lower end of the lifting arm with a pulley connected to a forward end of the pulley arm;

a cord having a first end anchored to the forward end of the lifting ramp and a second end, the pulley adapted to ride along the length of the cord intermediate its ends; and a winch assembly positioned at the forward end of the trailer frame, the winch assembly having a spool with a first end with a first peripheral edge and a second end with a second peripheral edge, the second end of the cord coupled to the spool.

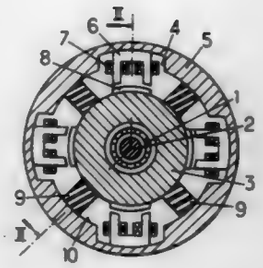
5,468,055

DEVICE FOR ATTENUATING THE ROLLING NOISE OF VEHICLES

Jean-Michel Simon, Clamart, and Didier Barat, Chateu-Landon, both of, France, assignors to Hutchinson, France

Filed May 13, 1994, Ser. No. 242,096
Claims priority, application France, May 14, 1993, 93 05862
Int. Cl.[6] F16F *15/00*
U.S. Cl. 301—6.91 **7 Claims**

1. A device for attenuating rolling noise or vibrations of a wheel of a vehicle, where the wheel includes a component surrounding a shaft about which the wheel rotates, said attenuating device comprising:



an accelerometer secured to the component which provides signals representing accelerations of the wheel in vertical and horizontal directions;

an inertial mass distributed about the shaft;

a controlled actuator connecting said inertial mass to the component;

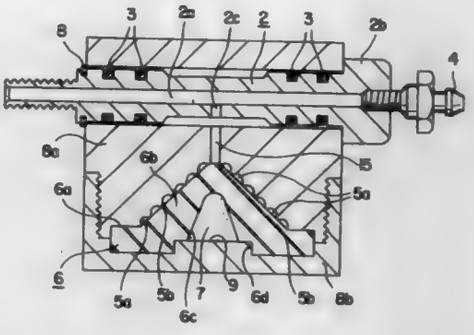
an electrical current feeding means for supplying powering current to said actuator in response to signals received from said accelerometer such that said actuator moves said inertial mass to create loads tending to cancel out the noise or vibrations of the wheel.

5,468,056

AUXILIARY BRAKE FOR AUTOMOBILE

Jae C. Kim, 441-1, Seongnae-3dong, Kangdong-ku, Seoul, Rep. of Korea

Filed Nov. 4, 1994, Ser. No. 334,247
Int. Cl.[6] B60T *17/00;* **F16L** *55/04*
U.S. Cl. 303—87 **4 Claims**



1. A pressure compensator for use with an auxiliary brake for an automobile, comprising:

an upper housing having an approximately conic inner surface defining a plurality of circumferential recesses;

a resilient diaphragm having an approximately conic upper operating portion cooperating with said inner surface to define an oil operating space and whereby said recess allow said diaphragm to provide a desired pressure compensation over a greater range of operating oil pressures;

a lower housing supporting said diaphragm and mounted to said upper housing; and

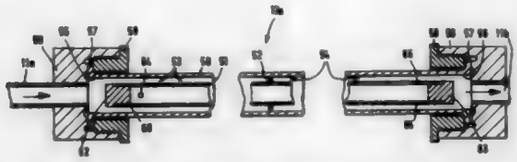
an oil line connecting means for allowing oil to flow into and out of said oil operating space.

5,468,057

HYDRAULIC VEHICLE BRAKE SYSTEM WITH A HYDRAULIC UNIT FOR WHEEL SLIP CONTROL

Friedrich Megerle, Asperg; Guenther Hohl, Stuttgart; Erich Ludewig, Markgroeningen, and Guenter Kaes, Stuttgart, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Division of Ser. No. 50,788, Apr. 21, 1993, Pat. No. 5,417,481.
This application Feb. 24, 1995, Ser. No. 393,792
Claims priority, application Germany, Apr. 24, 1992, 42 13 524.9
Int. Cl.[6] B60T *17/04*; F15D *1/02*
U.S. Cl. 303—87 8 Claims



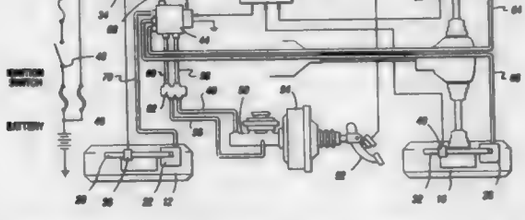
1. A hydraulic brake system for a vehicle, having a master brake cylinder, at least one wheel brake, a hydraulic unit that for wheel slip control includes at least one pump and at least one control valve, at least one damping device connected in the hydraulic vehicle brake system for damping pressure waves rising in the hydraulic pressure fluid in the vehicle brake system, at least one main brake line between the master cylinder and the hydraulic unit, and at least one wheel brake line between the hydraulic unit and the at least one wheel brake, the at least one damping device is embodied as a reflection damping device (**17**, **18**, **19**, **20**; **17***a*, **17***b*) and is installed between the master cylinder (**3**) and the at least one wheel brake (**6**, **7**, **8**, **9**), said reflection device (**17***a*, **17***b*, **17***c*) has an outer damper line (**50**, **50***a*, **50***b*) with a length of substantially 500 mm and with an inside diameter that is larger than the inside diameter of the brake line (**11**, **12**, **13**, **14**), and a substantially coaxially disposed inner damper line (**51**, **51***a*, **51***b*) with a length of substantially 400 mm and a diameter that substantially matches the diameter of the brake line, and, a reflector (**52**) installed in a pressure-tight fashion between ends (**60**, **61**) of the inner damper line (**51**), in such a manner that two chambers (**53**, **54**) are formed, one on each end of the reflector (**52**, **70**, **71**, **86**) between the outer damper line (**50**) and the inner damper line (**51**).

5,468,058

ANTILOCK SYSTEM WITH PROPORTIONAL CONTROL AND PRESSURE MEMORY

Herbert L. Linkner, Jr., Dexter, Mich., assignor to Kelsey-Hayes Company, Livonia, Mich.

Filed Mar. 14, 1995, Ser. No. 404,022
Int. Cl.[6] B60T *8/32*
U.S. Cl. 303—115.2 12 Claims



1. An antilock brake system for a wheeled vehicle having wheel brakes and a driver actuated master brake cylinder, wheel speed sensor means for detecting wheel speeds, an electronic controller means for detecting an incipient wheel lockup in response to wheel speeds detected by said wheel speed sensor means, said controller means including memory registers for storing motor voltage during operation of said antilock brake system and a brake pressure distribution circuit connecting said master brake cylinder and said wheel brakes;

a power cylinder assembly having a brake pressure piston, an electric motor means for powering said piston and a selectively engageable clutch means for drivably connecting said motor means to said piston;

a solenoid-operated valve means in said pressure distribution circuit having a first state in which said master cylinder is connected to said wheel brakes and a second state in which said master cylinder is isolated from said wheel brakes, said power cylinder assembly being connected to said wheel brakes when said valve assembly assumes said second state;

means for applying a controlled memory voltage to said motor means when said clutch means is disengaged to accelerate rotary portions thereof, thereby storing rotary inertia energy when said valve means is in said second state;

means for interrupting voltage applied to said motor means and for simultaneously disengaging said clutch means to effect a dumping of pressure in successive cycles from said wheel brakes to said power cylinder assembly as said brake pressure back-drives said piston;

means for reapplying said clutch means to effect a first rate of pressure buildup;

means for monitoring back EMF voltage of said motor means following said dumping of pressure from said wheel brakes as pressure builds up at said first rate upon re-engagement of said clutch means and as said inertia energy is converted to a brake pressure increase, said monitoring means including means for detecting a predetermined voltage value that is a function of said memory voltage; and

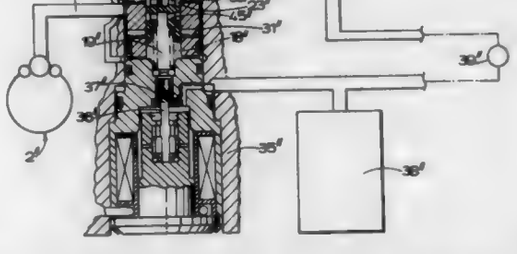
means for establishing, when said predetermined voltage value is detected, a modified rate of pressure buildup, slower than said first rate, at said wheel brakes by applying a voltage to said motor means to effect said modified rate of wheel brake pressure buildup, whereby brake cycle time is increased and vehicle stopping distance is reduced as effective wheel brake pressure levels are increased.

5,468,059

HYUDRAULIC ANTI-LOCK BRAKING SYSTEMS FOR VEHICLES

Glyn P. R. Farr, Warwickshire, England, assignor to Lucas Industries public limited company, England

Continuation of Ser. No. 857,912, May 15, 1992, abandoned.
This application Jul. 22, 1994, Ser. No. 278,995
Claims priority, application United Kingdom, Sep. 28, 1990, 9021232; Jan. 25, 1990, 9023259
Int. Cl.[6] B60T *8/32*;*8/48*;*8/50*
U.S. Cl. 303—116.1 18 Claims



1. An hydraulic anti-skid braking system for a vehicle having a wheel, and comprising a brake for braking said wheel, a brake actuation means, a source of operating fluid for applying said brake

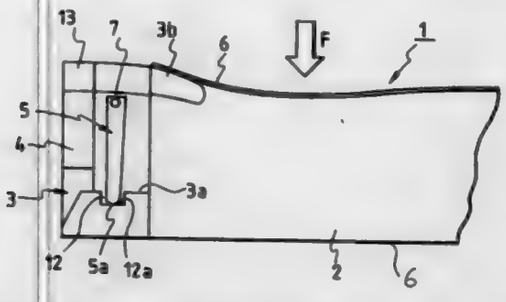
in addition to said brake actuation means, sensing means for sensing the speed of rotation of said wheel and generating signals indicative of speed of rotation of said wheel, an electronic control unit connected to said sensing means, a modulator assembly between said brake and said source, for modulating a supply of operating fluid to said brake from said source, said electronic control unit controlling said modulator in accordance with said signals from said sensing means, said modulator assembly incorporating means responsive to said electronic control unit to isolate said brake actuation means from said brake and relieve the pressure of said operating fluid applied to said brake and, at the termination of said signal, to control a re-application of said brake at a controlled rate, wherein said modulator assembly comprises means defining a bore, a valve spool working in said bore, a first solenoid operated valve disposed in a first passage extending from said source to said brake, a second passage between first and second ends of said first passage, and a second solenoid operated valve in said second passage, said second solenoid operated valve determining said re-application of said brake by establishing a pressure differential across said valve spool, in turn to meter said supply of brake applying fluid to said brake.

5,468,060

RECORDING AND/OR REPRODUCING DEVICE PROVIDED WITH SHUTTER

Takuya Nagai, Sendai, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1994, Ser. No. 313,700
Claims priority, application Japan, Jan. 7, 1993, 5-251690
Int. Cl.[6] A47B *77/08*
U.S. Cl. 312—223.2 **6 Claims**



5. A recording and reproducing device including:

a front panel having an insertion slot for receiving a recording medium therethrough; and

a shutter pivotally connected to one of a chassis, a shield cover and said front panel so as to open and close said insertion slot of said front panel, said device comprising a groove arranged on an inner surface of an inward projection of said front panel so as to receive a free surface of said shutter therein.

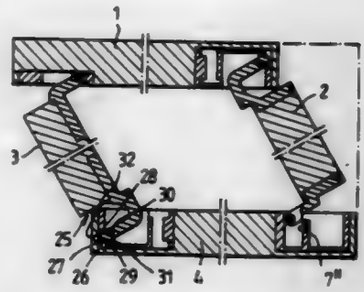
5,468,061

CABINET BODY STRUCTURE AND ARTICULATED JOINT MEANS FOR USE WITH THE STRUCTURE

Bror Fries, Hishult, Sweden, and Yusho Nakamoto, Hiroshima, Japan, assignors to A/S Grorud Jernvarefabrik, Oslo, Norway

Filed Jun. 21, 1994, Ser. No. 211,976
Claims priority, application Norway, Jan. 23, 1991, 914165
Int. Cl.[6] A47B *43/00*; **E05D** *11/10*
U.S. Cl. 312—258 **15 Claims**

1. A cabinet body structure having articulated joint means for joining adjacent end sections of structural parts of said cabinet body for enabling showing and mounting of such cabinet body; said body structure comprising first and second side panels, a top panel and a base panel, adjacent end sections of said side, top and



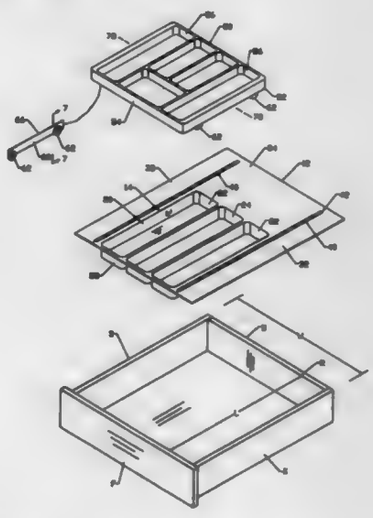
base panels being provided with said articulation joint means to join adjacent panels together, thereby enabling movement of said first and second side panels, together with said top panel and base panel from a storage position and in mutually parallel relationship until said side panels are vertical, and fixing said body in an erected position, wherein said articulation joint means include a first type of articulation device located at internal corners of the cabinet and being subjected to an increase in included angle upon erection of the cabinet body, said first type device comprising a first cup-shaped member being pivotably connected at an uppermost open section thereof to a first arm, said first arm being provided with a first rotatable fixation pin adapted for engagement with a first ledge on said member for interlocking said member and said arm, and a second type of articulation device to be located at internal corners and being subjected to a decrease in included angle upon erection of the cabinet body, said second type device comprising a second cup-shaped member and a second arm with ends of a pivot shaft thereof each movable in an oblong bearing slot in said member as said second arm moves between its outer positions, said second arm being provided with a second ledge adapted for engagement with a second fixation pin rotatably mounted in said second member for interlocking said arm with said member.

5,468,062

DOUBLE TIERED STORAGE TRAYS FOR A DRAWER

Richard J. H. Finnegan, 706 Athol Street, Whitby, Ontario, Canada

Filed Aug. 4, 1993, Ser. No. 102,183
Int. Cl.[6] A47B *88/22*
U.S. Cl. 312—301 **19 Claims**



1. A two tiered rack for use in drawers, comprising:

a base tray having a longitudinal axis and a transverse axis; said base tray having a storage portion defined in part by a pair of

upstanding longitudinal walls and a pair of upstanding transversely aligned walls to form a perimeter of said storage portion;

said base tray also having a flange portion comprising a pair of flanges respectively extending outwardly from each of said longitudinally aligned upstanding walls;

a pair of longitudinally aligned, upwardly facing tracks respectively disposed on said base tray adjacent the juncture of said pair of flanges with respective said upstanding walls;

an upper tray having a longitudinal axis and a transverse axis;

bearing means disposed on transversely opposed sides of said upper tray in cooperative engagement with said tracks to support said upper tray above said base tray for movement thereon between a forward position in which said upper tray closes said storage portion and a rearward position in which access is provided to said storage portion;

wherein said tracks are formed on said pair of flanges.

5,468,063

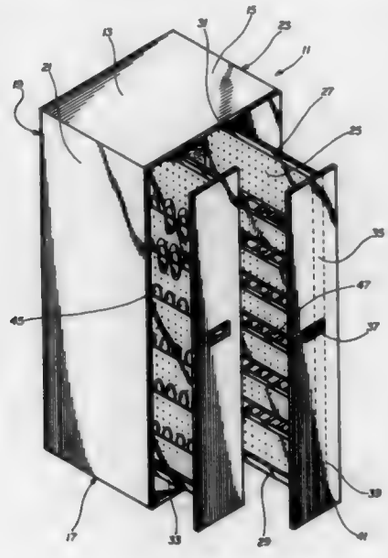
ACCESSORIES ORGANIZER

Laura M. Simonek, 2240 N. Beckley, Lancaster, Tex. 75134

Filed Aug. 30, 1993, Ser. No. 112,956

Int. Cl.[6] A47B *88/00*

U.S. Cl. 312—334.28 **12 Claims**



1. An accessories organizer, comprising:

a cabinet having a back, a top, a bottom, and two sides;

a vertical panel, mounted in the cabinet for movement into and out of the cabinet;

a removable accessory holder, attached to the panel for holding accessories; and

a drawer front attached to the panel for closing the cabinet when the panel is in the cabinet, wherein the drawer front is attached to the panel along a line that is offset from both side edges of the drawer front, wherein the drawer front is attached to the panel along a line that is offset from the midline of the drawer front, to provide more room on one side of the panel for larger accessories.

5,468,064

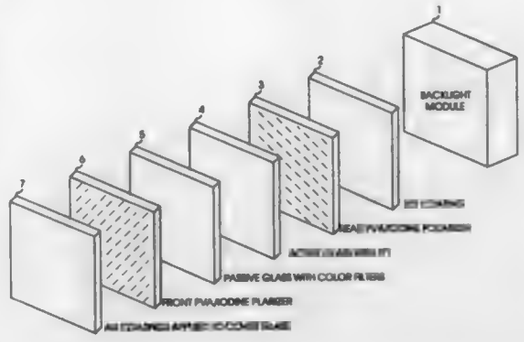
NIGHT VISION COMPATIBLE COLOR CORRECTION SYSTEM

J. Michael Lengyel, Ramona, Calif., and Ronald C. Robinder, Albuquerque, N.M., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 29, 1993, Ser. No. 129,934

Int. Cl.[6] G02F *1/1335*

U.S. Cl. 359—63 **17 Claims**



1. An active matrix liquid crystal display (LCD) flat panel apparatus for optically eliminating background luminance and eliminating fluorescence of the liquid crystal materials, the panel comprising:

a first layer of tinted glass;

a first polarizer layer located between an observer and the first layer of tinted glass;

an active glass thin film transistor (TFT) layer located between the observer and the first polarizer layer;

a second polarizer layer in crossed configuration with that of the first polarizer layer, the second polarizer layer located between the observer and the active glass TFT layer, the second polarizer layer blocking the transmission of a majority of the wavelengths of light that have passed through the first polarizer layer; and

a second layer of tinted glass located between the observer and the second polarizer layer, the second layer of tinted glass blocking the transmission of a majority of the wavelengths of light that have leaked through the first and second polarizer layers.

5,468,065

MOLDED TAPE CASSETTE

Ko Ishikawa, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 47,294, Apr. 19, 1993. This application Feb. 3, 1994, Ser. No. 191,076

Claims priority, application Japan, Apr. 30, 1992, 4-111139

Int. Cl.[6] G11B *23/087*

U.S. Cl. 360—132 **5 Claims**

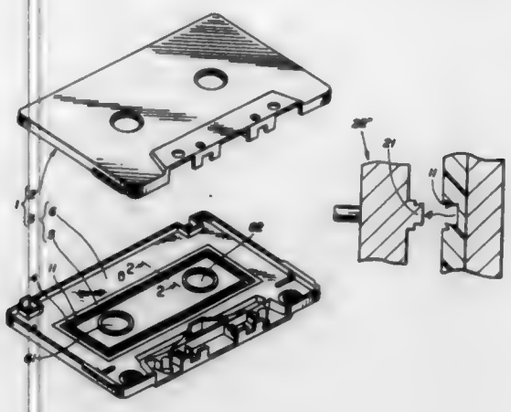
1. A molded cassette comprising:

upper and lower cassette halves united to constitute a case, each cassette half including:

a first plastic layer having an inner surface facing an interior of said case; and

a second plastic layer formed on an outer surface of said first plastic layer,

wherein said first plastic layer is formed with a groove exposed to the interior of said case, said groove being formed with side walls having terraced portions such that a top portion of said groove is wider than a bottom portion of said groove, and said side walls of said groove are formed with burrs entirely positioned within said groove.

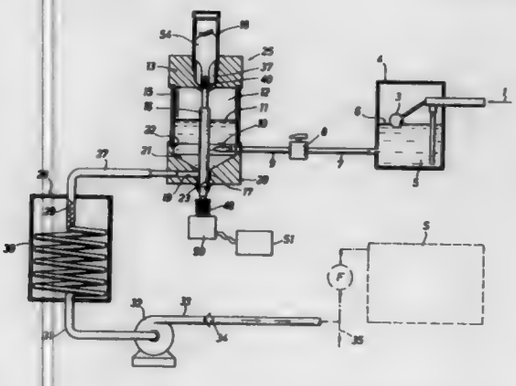


5,468,066

APPARATUS AND METHOD FOR INJECTING DRY PARTICULATE MATERIAL IN A FLUID FLOW LINE

Carl L. Hammonds, 19114 Cloyanna La., Humble, Tex. 77346

Filed Oct. 14, 1994, Ser. No. 323,434
Int. Cl.[6] B01F *13/06*
U.S. Cl. 366—139 25 Claims



1. Apparatus for injecting a dry particulate material into a pressurized fluid flow line comprising:

a mixing chamber for mixing the dry particulate material with liquid;

a liquid supply having an inlet line communicating with said mixing chamber to supply pressurized liquid thereto;

material supply means over said mixing chamber for selectively supplying dry particulate material to said mixing chamber for mixing with liquid supplied by said inlet line;

an outlet line from said mixing chamber in fluid communication with liquid having the dry particulate material therein; and

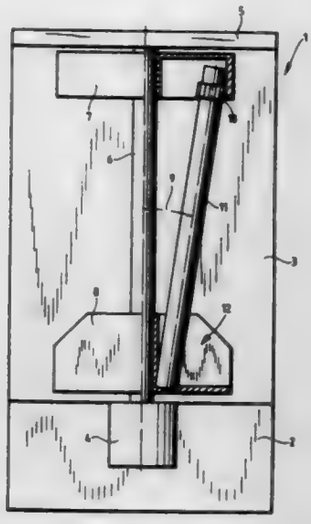
pump means in said outlet line for exerting a vacuum in said mixing chamber and said fluid flow line upstream of said pump, said pump injecting mixed liquid and particulate material from said mixing chamber within said pressurized fluid flow line.

5,468,067

METHOD FOR MIXING LIQUID MEDIA HAVING DIFFERENT SPECIFIC WEIGHTS

Ernst Berkhan, Weinheim, and Hubert Muth, Mauer, both of, Germany, assignors to Desaga GmbH, Heidelberg, Germany

Continuation of Ser. No. 120,255, Sep. 13, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 331,295
Claims priority, application Germany, Sep. 15, 1992, 42 30 861.5
Int. Cl.[6] B01F *11/00*
U.S. Cl. 366—208 3 Claims



3. Method for mixing a plurality of specimens having different specific weights in an intermittent mixer including a generally vertical central rotary axle, a drive motor means for intermittently rotating the rotary axle, and a receiving rotor which is integral with a bottom of the rotary axle, the method comprising the steps of:

filling at least one replaceable elongate container having top and bottom ends with the specimens such that the at least one container is partially filled with the specimens;

sealing the at least one elongate container;

placing the at least one container in the intermittent mixer such that the bottom end of the at least one container contacts the receiving rotor, so that the at least one container is inclined, such that a horizontal distance between the bottom end of the at least one container to the rotary axle is less than a horizontal distance between the top end of the at least one container and the rotary axle; and

intermittently rotating the rotary axle with the at least one container.

5,468,068

METHOD OF TINT MIXING AND DELIVERY

Wesley E. Hotchkiss, III, 212 Flametree Cir., Windsor, Calif. 95492

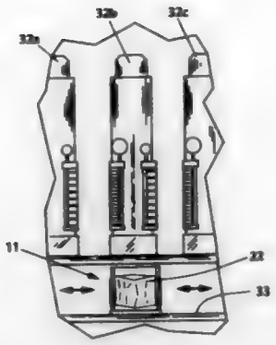
Filed Oct. 17, 1994, Ser. No. 323,794
Int. Cl.[6] B01F *15/04*
U.S. Cl. 366—348 6 Claims

1. A method for tinting neutral-color base materials, including the steps of:

providing a plurality of tint compound dispensing and metering stations;

providing an impervious plastic bag having an openable upper end;

depositing measured amounts of a plurality of selected tinting compounds from selected ones of said dispensing and metering stations into the impervious plastic bag to form a tinting mixture;



sealing the open upper end of the impervious plastic bag to form a hermetically sealed package;

providing a container of neutral-color base material;

subsequently disposing the hermetically sealed package above the container of neutral-color base material, puncturing said package and discharging all the contents of the package into the container of base material, thereafter mixing said base material and said contents of the package.

5,468,069

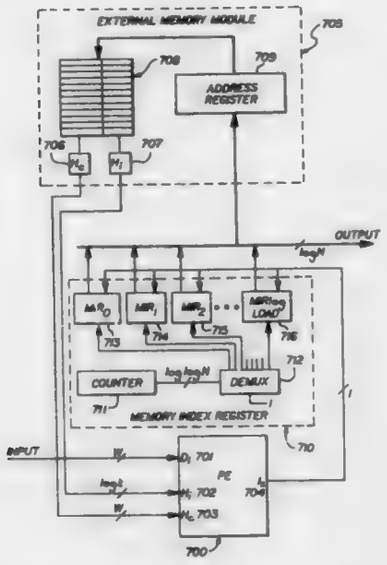
SINGLE CHIP DESIGN FOR FAST IMAGE COMPRESSION

Viktor K. Prasanna, Pacific Palisades; Cho-Li Wang, Monterey Park, both of Calif., and Heonchul Park, Seoul, Rep. of Korea, assignors to University of So. California, Los Angeles, Calif.

Filed Aug. 3, 1993, Ser. No. 100,928

Int. Cl.[6] **G06K** *9/36;9/68*

U.S. Cl. 382—253 **20 Claims**



1. An apparatus for compressing data in the form of a plurality of input vectors into a set of identification indices associated with a set of codebook vectors, said apparatus comprising:

a. means for receiving the plurality of input vectors;

b. search means connected to the means for receiving the plurality of input vectors, wherein said search means consist of:

(1) means for selecting a set of training vectors;

(2) means for defining an n-dimensional box containing all training vectors, wherein n represents codebook vector dimension;

(3) means for recursively splitting the n-dimensional box using a constant value hyperplane into two subboxes, wherein each subbox contains an equal number of training vectors, until a predetermined number of subboxes is obtained;

(4) means for determining a centroid of each subbox; and

(5) means for assigning a codevector to each centroid;

c. means for storing the set of codebook vectors and the set of constant value hyperplanes;

d. means for searching the set of codebook vectors and matching the plurality of input vectors to the set of codebook vectors using the constant value hyperplanes and assigning an identification index to each input vector based on the closest codebook vector; and

e. means for transmitting the set of identification indices and the set of codebook vectors.

5,468,070

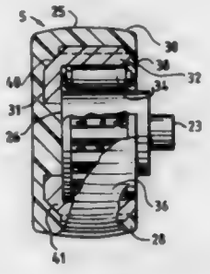
COMPOSITE ROLLER ASSEMBLY

John Riedel, Bettendorf, Iowa, and James Grubaugh, East Moline, Ill., assignors to Sears Manufacturing Company, Davenport, Iowa

Filed Nov. 5, 1993, Ser. No. 149,178

Int. Cl.[6] **F16C** *21/00;33/62;13/00*

U.S. Cl. 384—127 **3 Claims**



1. A composite roller assembly, mountable to a bearing shaft located on a seat suspension assembly, comprising:

a cylindrical metal insert having an external surface and including first and second ends and an inner bore which defines a first opening at said first end;

an inwardly extending annular flange disposed at said second end of said metal insert, said annular flange defining an inner shoulder and a second opening having a diameter that is less than the diameter of said inner bore;

a needle bearing assembly axially disposed in press-fit relation within said inner bore and abutting said inner shoulder;

a one-piece cup-shaped plastic body molded on said cylindrical metal insert, said plastic body having a base enclosing said second end of said metal insert and an open end that is co-extensive with said first end of said metal insert; and

a boss formed in the base of said plastic body extending axially within said second opening.

5,468,071

BEARING SHELL FOR HEAVILY LOADED BEARINGS WITH A ROLLED STRIP INTERFERENCE OR FORCE FIT LINING

Daniel Tourneux, Firminy; RenéMariatte, Saint Paul en Jarez, and Bernard Dajoux, Andrezieux, all of, France, assignors to Centre Stephanois De Recherches Mecaniques Hydromecanique et Frottement, Andrezieux-Boutheon, France

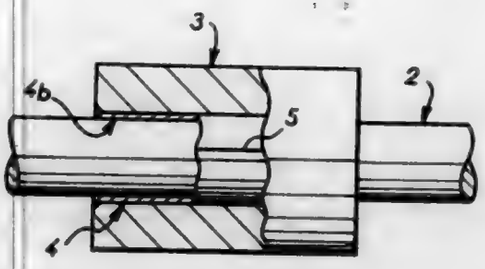
Filed Jul. 7, 1993, Ser. No. 86,842

Claims priority, application France, Jul. 10, 1992, 92 08603

Int. Cl.[6] **F16C** *33/02*

U.S. Cl. 384—276 **12 Claims**

1. Bearing shell for heavily loaded bearings operating in an abrasive environment comprising a generally annular bearing body



having an axial bore, a rolled cylindrical lining of rectangular strip steel having an interference or force fit with the bore, said lining having a bearing surface for contact with a rotating shaft, said bearing surface being surface hardened to a relative depth, defined as the depth divided by the thickness of the strip, between 0.23 and 0.27, said strip having an excess circumferential length relative to the developed circumferential length of the neutral fiber of an unstressed lining in the bore between 0.3 and 9%.

5,468,072

SYSTEM AND METHOD FOR SUPPORTING A SHAFT OR AXLE IN A SUPPORT COMPONENT

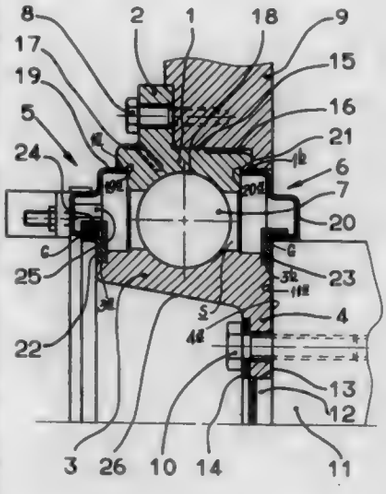
Egon Ekdahl, Kungsbacka, Sweden; Jiri Gurka, Behamberg, Austria; Rupert Huber, Steyr, Austria; Hubert Köttritsch, Amstetten, Austria; Gottfried Kufe, Traun, Austria; Johann Müllner, Steyr, Austria, and Helmut Weninger, Steyr, Austria, assignors to SKF GmbH, Schweinfurt, Germany

Filed Mar. 23, 1994, Ser. No. 216,804

Claims priority, application Germany, Mar. 26, 1993, 93104990.2

Int. Cl.[6] F16C *19/00*

U.S. Cl. 384—448 **17 Claims**



1. A system for supporting a shaft member at one end of a support component, including a bearing inner ring and a bearing outer ring, a row of rolling elements in the space between the rings, characterized in that the bearing outer ring (1,27, 34) has a radially outwardly directed flange (2) which can be fastened to the support component (9), the bearing inner ring (3) (32) having a radially inwardly directed flange 4 which can be fastened to the end surface of the shaft member (11), a cylindrical centering surface (15) on the bearing outer ring (1), (27), (34) for centering guidance in a corresponding bore in the support component (9), a cylindrical centering surface (13) on the bearing inner ring for centering guidance on a corresponding section of the shaft member (11).

5,468,073

BEARING ARRANGEMENT

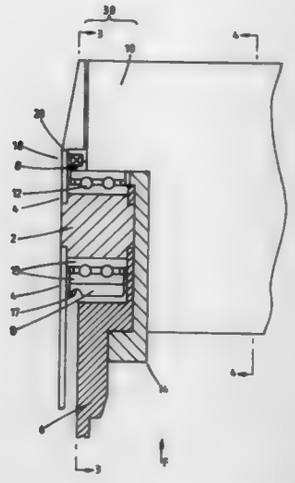
Stephen J. Willacy, West Yorkshire, England, assignor to Lucas Industries Public Limited Company, England

Filed Sep. 7, 1994, Ser. No. 302,613

Claims priority, application United Kingdom, Sep. 11, 1993, 9319041

Int. Cl.[6] F16C *33/76*

U.S. Cl. 384—477 **8 Claims**



1. A bearing arrangement for a movable member for directing a fluid flow from a first direction, said bearing arrangement comprising a bearing sleeve, a bearing, and a shield for shielding said bearing from the fluid flow, said bearing sleeve enclosing said bearing and being attached to and movable with the movable member.

5,468,074

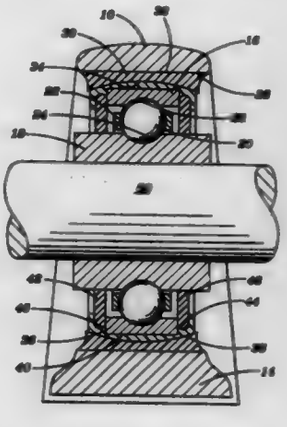
BEARING ASSEMBLY

Maksimilijan Godec, Torrington; John A. Larson, New Hartford, and Walter P. Waskiewicz, Bristol, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Oct. 31, 1994, Ser. No. 332,178

Int. Cl.[6] F16C *23/08*

U.S. Cl. 384—495 **4 Claims**



1. A bearing assembly comprising:

a metal stationary housing having a bore of constant diameter extending entirely through the housing;

a single outer assembly ring fixedly retained in the stationary housing bore, said outer assembly ring having an outer sur-

face complementary to and substantially the same length as the surface of said bore and a concave inner surface around its entire circumference;

a single inner assembly ring slidably retained in the outer assembly ring, said inner assembly ring having a generally spherical outer surface complementary with and in full contact with the outer assembly ring concave inner surface, and an annular groove around its inner surface, the base surface of the groove providing an annular surface of constant diameter throughout its length; and

a bearing having a metal ring with an inner surface shaped to serve as a raceway for rolling members in the bearing, said bearing ring having an outside surface complementary with the base surface of the inner assembly ring annular groove.

5,468,075

Patent Not Issued For This Number

5,468,076

PRINT GAP ADJUSTING DEVICE

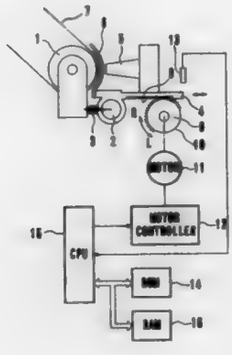
Takahisa Hirano; Masanori Takai, and Mitsuhiro Taniguchi, all of Shizuoka, Japan, assignors to Kabushiki Kaisha Tec, Shizuoka, Japan

Filed Jun. 24, 1994, Ser. No. 265,105

Claims priority, application Japan, Jun. 25, 1993, 5-154810

Int. Cl.[6] B41J *25/308*

U.S. Cl. 400—59 **12 Claims**



1. A print gap adjusting device comprising:

a platen;

a carrier adapted to be reciprocatively driven along an axial direction of said platen;

a print head mounted on said carrier;

a driving portion for driving said carrier in a direction perpendicular to said axial direction;

minimum space detecting means for detecting a condition where the space between said platen and said print head becomes smaller than a predetermined value as a result of a thickness of a sheet of paper fed on said platen between said platen and said print head; and

control means for controlling said driving portion to increase the space between said platen and said print head according to a detection signal from said minimum space detecting means.

5,468,077

METHOD AND APPARATUS FOR COMBINING CHARACTERS

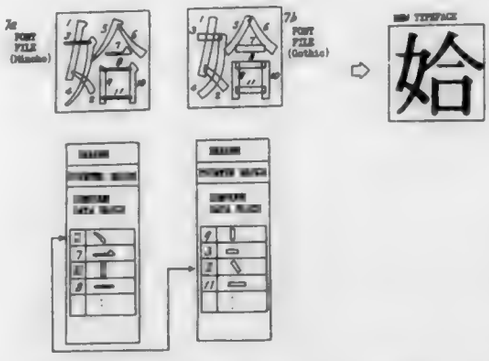
Tomoko Motokado; Shinichiro Motokado, both of Kawasaki, and Mutsumi Ohtomo, Higashi, all of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 22, 1994, Ser. No. 263,741

Claims priority, application Japan, Jul. 16, 1993, 5-199301

Int. Cl.[6] B41J *11/44*

U.S. Cl. 400—76 **28 Claims**



1. A character combining method for combining a character pattern of a first typeface with a character pattern of a second typeface to generate a character pattern of a third typeface, the method comprising steps of:

providing a first plurality of part patterns for each character pattern of the first typeface;

providing a second plurality of part patterns for each character pattern of the second typeface;

providing a plurality of common typeface structure codes corresponding to respective part patterns of said first and second plurality and affixing a common typeface structure code to each part pattern of said first and second plurality wherein a respective common typeface structure code affixed to a corresponding part pattern is identical for the first and the second typeface;

searching, from said first and second plurality of part patterns, for corresponding part patterns for the character pattern of said first typeface and the character pattern of said second typeface, based on identical common typeface structure codes affixed to said corresponding part patterns; and

combining said corresponding part patterns to prepare part patterns of a character pattern of said third typeface.

5,468,078

PRINTER COLOR INK RIBBON POSITIONING CONTROL

Naoki Asai; Choji Morozumi; Yoshikazu Ito; Kiyoshi Ito, and Akira Koyabu, all of Suwa, Japan, assignors to Seiko Epson Corporation, Japan

Continuation-in-part of Ser. No. 996,453, Dec. 23, 1992, Pat. No. 5,360,279. This application Oct. 7, 1994, Ser. No. 320,806

Claims priority, application Japan, Dec. 25, 1991, 3-343448; Dec. 2, 1992, 4-323379

The portion of the term of this patent subsequent to Nov. 1, 2011, has been disclaimed.

Int. Cl.[6] B41J *35/10*

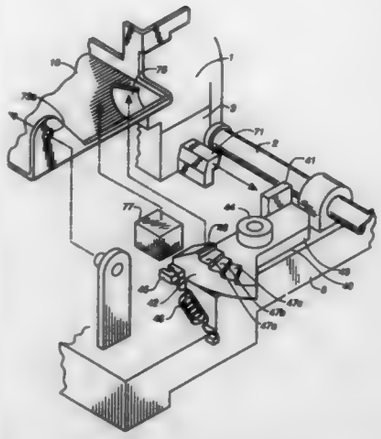
U.S. Cl. 400—215 **3 Claims**

1. A printer for use with an ink ribbon having at least two printing tracks, comprising:

a print head that moves along a predetermined path adjacent to a recording medium;

line drive means for reciprocating said print head along said path in first and second directions;

a multi-track ink ribbon comprising a plurality of printing tracks having portions thereof disposed between said print head and



recording medium, wherein said print head prints images on the recording medium with said multi-track ink ribbon; and

ribbon shift means for positioning a preselected one of said tracks on said ink ribbon adjacent said print head for use in printing in response to movement of said print head, said ribbon shift means comprising:

printing track setting means for moving said ribbon in one direction to set at one desired track height from among several preselected track heights corresponding to a selected one of predetermined amounts of movement of said print head in the first direction to a first end portion of said path, and

printing track releasing means for moving said ribbon in an opposite direction to release from the set track height in response to movement of said print head in the second direction to a second end portion of said path.

5,468,079

PRINTER FOR PRINTING ON CARDS

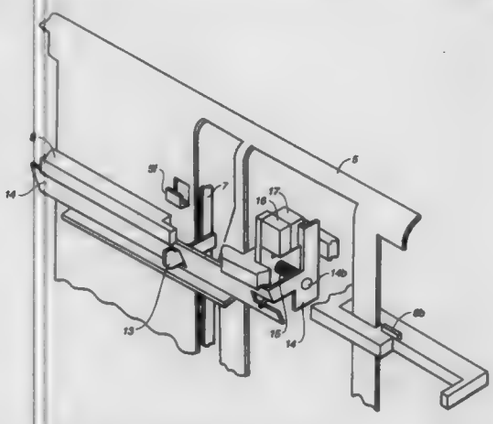
Keiji Murakoshi; Mitsuhiko Nebashi; Makoto Ikegami, and Noboru Otsuki, all of Suwa, Japan, assignors to Seiko Epson Corporation, Japan

Filed Feb. 1, 1994, Ser. No. 190,749

Claims priority, application Japan, Feb. 4, 1993, 5-017713; May 21, 1993, 5-120146

Int. Cl.[6] B41J *13/10*

U.S. Cl. 400—521 **33 Claims**



1. A printing apparatus for printing on a card-like medium having one edge, comprising:

printing means for printing on the card-like medium, having means for moving said printing means in a direction perpendicular to the relative movement of the card-like medium;

a slider having a card stop against which the one edge of the card-like medium stops;

holding means for selectively holding and releasing the card-like medium to and from said slider;

a guide frame having at least one guide portion engaged with said slider for reciprocating said slider parallel to said guide frame; and

transport drive means for commonly supplying drive power to said slider for moving said slider along said guide member for printing by said printing means and to said holding means for selectively holding and releasing the card-like medium.

5,468,080

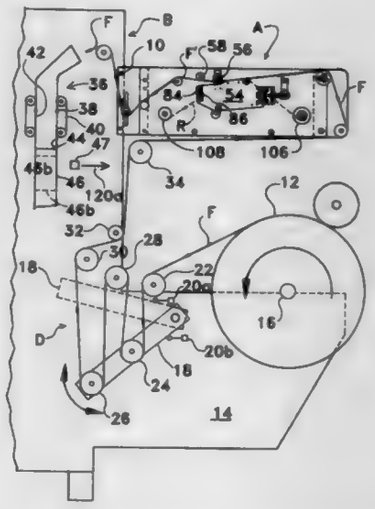
POLY BAG PRINTER FOR PACKAGING MACHINE

William B. Jones, 4109 Creek Stone Ct., Stone Mountain, Ga. 30083

Filed Mar. 25, 1993, Ser. No. 36,967

Int. Cl.[6] B41J *15/16*

U.S. Cl. 400—618 **50 Claims**



1. A printer apparatus for applying print to plastic film used in forming poly bags, said plastic film being supplied from a plastic film supply roll from which said plastic film is fed to said printer whereupon said plastic film is imprinted and delivered to a packaging machine for completion of said poly bag, said printer apparatus comprising:

a printer frame;

at least one infeed directional roll for guiding said plastic film;

a printer carriage movably carried by said print frame for reciprocating movement in a generally vertical direction, said print carriage having a first position in which said print carriage is moved to a retracted position to allow said plastic film to pass through said printer frame, and said print carriage having a second position in which said print head is moved to a printing position for transferring print onto said plastic film during a print cycle;

a print head carried by said carriage for applying print to a prescribed area of said plastic film;

a driven platen roller disposed adjacent to said print head when said print carriage is moved to said second position, said plastic film being frictionally held between said platen roller and said printer carriage when said printer carriage is moved to said second position to grip and hold said plastic film in a print position;

a roller nip disposed downstream of said driven platen roller through which said plastic film is positively advanced in a printing relation to said print head together with said driven platen roller during a print cycle, said roller nip including at least one driven film roller;

a ribbon feed roll containing a supply of ribbon carrying an ink media for transfer onto said plastic film;

at least one driven ribbon roller for positively advancing said ribbon across said printer carriage in operation print transfer position relative to said print head; and

a synchronized drive assembly for driving said platen and ribbon rollers to incrementally advance said plastic film and said ribbon in superposed relation across said print head at the same speed during said print cycle.

5,468,081

TAPE CUTTING APPARATUS

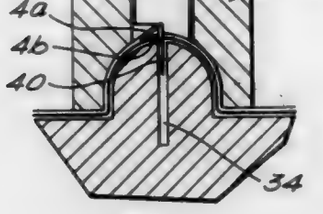
Michael R. Cane, and Robert C. L. Day, both of Cambridge, United Kingdom, assignors to Esselte Dymo N.V., St. Niklaas, Belgium

Filed Jun. 27, 1994, Ser. No. 266,819

Claims priority, application United Kingdom, Jul. 12, 1993, 9314390

Int. Cl.[6] B41J *11/68*

U.S. Cl. 400—621 **15 Claims**



1. A tape cutting apparatus for cutting off a portion of tape, said tape comprising a first and a second layer secured to one another by an adhesive layer, said apparatus comprising:

an arcuate tape support surface for supporting tape during a cutting operation;

a blade mounted for movement between a first position, in which said blade cooperates with the arcuate tape support surface to cut said tape, and a second non-cutting position; and

means to cause the first and second layers to tend to separate from one another at a cut edge of the tape, said means including

means for pulling the tape downwardly over the arcuate support surface and holding the tape in tension against the arcuate surface during cutting.

5,468,082

PRESSURIZED WRITING INSTRUMENT WITH STIRRING WEIGHT

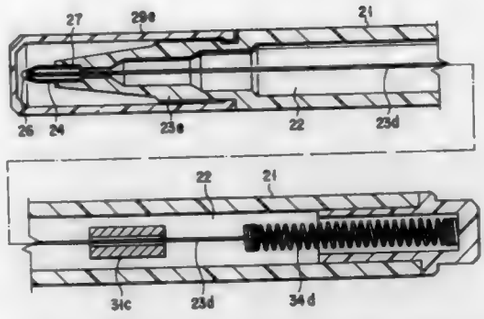
Jiro Hori, 61-2, Kamihiroya, Tsurugashima-shi, Saitama-ken, Japan

Filed Apr. 26, 1994, Ser. No. 233,522

Claims priority, application Japan, Apr. 26, 1993, 5-099308; Apr. 26, 1993, 5-099309

Int. Cl.[6] B43K *7/00;7/03;9/00*

U.S. Cl. 401—4 **5 Claims**



1. A writing instrument which is provided with: a main body; an ink reservoir defined inside the main body; nib provided at a front end portion of the main body; and an ink passage for allowing communication between the ink reservoir and the nib, and in which not only ink but also pressurized air is sealed in an interior of the ink reservoir, and the ink is supplied to the nib utilization of pressure produced by the pressurized air, said writing instrument comprising;

valve means provided in the nib and having a valve function, said valve means including a valve member, said valve member being moved to a distal end position and preventing the ink from flowing out by shutting off communication between the ink reservoir and an external region when the writing instrument is not in use, and said valve member being moved to a position opposing the distal end position by writing pressure and permitting the ink to flow out by allowing the communication between the ink reservoir and the external region when the writing instrument is in use;

urging means, made of a push member, for urging the valve member toward the distal end position, thereby maintaining the valve member in a closed state, said urging means being extended axially and received in the ink reservoir and having a distal end portion which is led to the distal end position by way of the ink passage, said distal end portion of the urging means having a distal end which is in contact with the valve member and which elastically urges the valve member toward the distal end position;

a cap slidably fitted on the front end portion of the main body and maintaining a hermetical state, air inside the cap being compressed when the cap is fitted around the distal front end portion of the main body, said compressed air moving the valve member in an opposite direction to that of the distal end position, thus setting the valve member in an open state, said compressed air flowing from said cap into the ink reservoir by way of both a pen body and the ink passage, thereby replenishing the pressurized air sealed in the ink reservoir;

a stirring weight received in said ink reservoir and being movable at least in an axial direction thereof, said stirring weight being moved inside the ink reservoir and stirring the ink contained in the ink reservoir when the writing instrument is shaken, said stirring weight interfering with the urging means when moved in said ink reservoir and displacing the urging means, thus permitting the urging means to stir the ink contained in the ink passage, said displaced urging means momentarily releasing the valve member from an urged state, thereby permitting the compressed air inside the cap in the fitted state to easily flow into the ink reservoir by way of the nib.

5,468,083

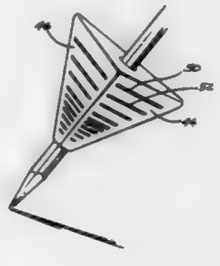
INSTRUMENT HAND GRIP

David M. Chesar, 286 S. 4th St., Byesville, Ohio 43723

Filed Jan. 18, 1994, Ser. No. 181,826

Int. Cl.[6] B43K *23/00*

U.S. Cl. 401—6 **12 Claims**



1. A hand grip attachment to a writing instrument for facilitating the manual gripping of the instrument, the attachment comprising: a tetrahedral pyramidal polyhedron attached to the instrument wherein the polyhedron has edges joining apexes, the apexes being spaced at least one inch apart, the polyhedron having substantially flat sides and a base, the writing instrument extending from one of the apexes with said base being opposite the writing instrument.

5,468,084

LIPSTICK WITH REPLACEABLE WAXSTICK CASE UNIT

Christian Boninsegni, Le Landeron, Switzerland, and Hans-Georg Geike, Nuremberg, Germany, assignors to H. Huck GmbH & Co. KG, Nuremberg, Germany

Filed Jan. 3, 1994, Ser. No. 176,386

Claims priority, application Germany, Jan. 5, 1993, 43 00 089.4

Int. Cl.[6] A45D *40/04;40/16*

U.S. Cl. 401—78 **7 Claims**

1. A lipstick, comprising:

spiral tube means having a front end, through which a waxstick extends during use, a rear end, an inner surface, and a spiral groove formed in said inner surface;

a slotted sleeve extending in said spiral tube means for relative rotation thereto and having at least one axial slot;

a removable end piece for closing the rear end of said spiral tube means; and

a replaceable prefabricated waxstick unit insertable into said slotted sleeve when said end piece is removed, and axially displaceable between two end positions, one of said spiral tube means and said slotted sleeve including stop means for limiting displacement of said waxstick unit in a direction toward the front end of said spiral tube means, and said spiral groove and said axial slot being open at said rear end to enable insertion and removal of said waxstick unit, said waxstick unit comprising:

a waxstick;

a case for receiving the waxstick and having a cup portion for supporting said waxstick, at least one boss provided on said cup portion and extending through said at least one axial slot of said slotted sleeve and engageable in said spiral groove upon insertion of said waxstick unit for enabling the displacement of said waxstick unit between the two end positions upon rotation of said slotted sleeve relative said spiral tube means, and a grip portion for enabling the insertion and removal of said waxstick unit into and out of said slotted sleeve, said grip portion being formed as an extension of said cup portion; and

a protection cap, closed at one end, for covering a portion of said waxstick projecting from said case, said protection cap having an open end portion supported on said case and defined by resilient end means, said resilient end means being compressed, upon the insertion of said waxstick unit through said slotted sleeve, and expanding upon complete displacement of said protection cap out of said slotted sleeve, said protection cap being assembled with said case and said waxstick being form-injected into said cup-portion of said case and said protection cap before the insertion of said waxstick unit into said slotted sleeve.

5,468,085

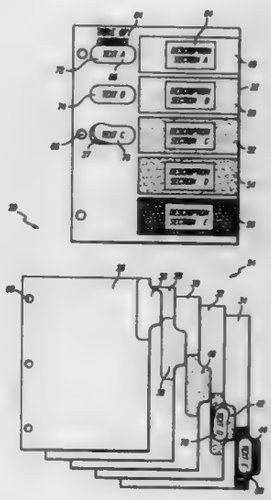
USER-CUSTOMIZABLE INDEX DIVIDER SHEET SET AND TABLE OF CONTENTS SHEET ASSEMBLY

Brant D. Kline, La Canada, Calif., assignor to Avery Dennison Corporation, Pasadena, Calif.

Continuation of Ser. No. 332,840, Nov. 1, 1994. This application Dec. 2, 1994, Ser. No. 349,176

Int. Cl.[6] B42F *13/00*

U.S. Cl. 402—79 **26 Claims**



1. A user-customizable index divider sheet set and table of contents sheet assembly, comprising:

first and second index divider sheets, each having along an outer edge thereof outwardly-extending respective first and second index tabs, said first and second tabs being at least partially vertically offset from one another, with said divider sheets aligned;

a table of contents sheet having a front side, and generally on an outer portion of said front side, first and second at least substantially vertically-spaced and visually-different descriptive field areas, said field areas being positioned such that with said divider sheets and said table of contents sheet aligned, said first descriptive field area is horizontally aligned with said first tab and said second descriptive field area is horizontally aligned with said second tab;

a first label attached to said front side of said table of contents sheet, releasable therefrom by a user after printing thereon or in said first descriptive field area and securable by the user to said first tab; and

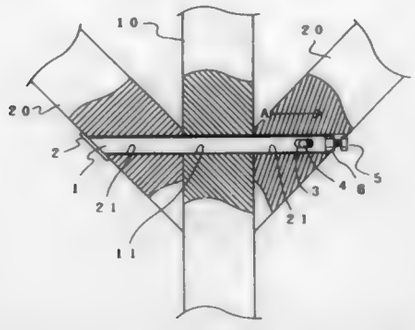
a second label attached to said front side of said table of contents sheet, releasable therefrom by a user after printing thereon or in said second descriptive field area and securable by the user to said second tab.

5,468,086

METAL CONNECTOR FOR CONSTRUCTION

Shigeru Goya, 27-1, Kumoji 3-chome, Naha-shi, Okinawa-ken, Japan

Filed Nov. 19, 1993, Ser. No. 154,522
Claims priority, application Japan, Dec. 9, 1992, 4-094351 U; May 31, 1993, 5-034073 U
Int. Cl.[6] F16B 9/00; E04B 7/06
U.S. Cl. 403—260 6 Claims



1. A metal connector for connecting wooden members to each other, comprising:

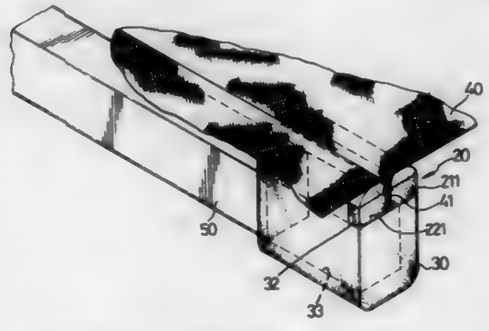
a main metal member in a form of a tube which passes through holes formed in said wooden members, a stop provided at one end of said main metal member at an angle corresponding to a connecting angle of one of the wooden members attached thereto, elongated holes formed in lateral sides of said main metal member in a vicinity of the other end thereof, a pin situated in said elongated holes by passing through openings formed in one of said wooden members, and a tightened bolt provided at said other end of said main metal member so that a distal end of said bolt abuts against said pin when the bolt is tightened.

5,468,087

MEANS FOR FIXING A GORE TO RIBS OF A LARGE UMBRELLA

Pai-Feng Tung, No. 2, Chenghsing Rd., Sanmin Dist., Kaohsiung, Taiwan, Prov. of China

Filed Apr. 29, 1994, Ser. No. 236,983
Int. Cl.[6] A45B 25/00
U.S. Cl. 403—294 2 Claims



1. A fixing means for fixing a gore with a plurality of sewing edges to a large umbrella having a plurality of ribs, said fixing means comprising:

a block including a cavity adapted to snugly receive a distal end of a rib of a large umbrella and an engaging slot; and

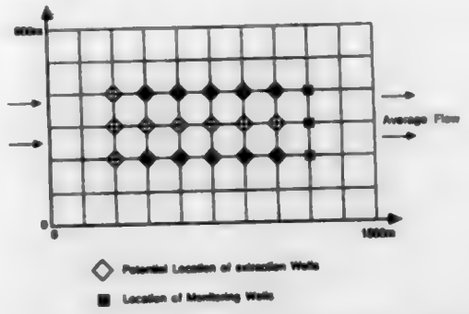
a pair of clamping members each having a plurality of piercers on one surface thereof for clamping a sewing edge of a gore therebetween and being fittingly received in said engaging slot of said block.

5,468,088

FEEDBACK CONTROL OF GROUNDWATER REMEDIATION

Christine A. Shoemaker, and Gregory J. Whiffen, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Dec. 30, 1993, Ser. No. 175,815
Int. Cl.[6] B09B 3/00; E03B 3/12
U.S. Cl. 405—52 12 Claims



1. A method of groundwater remediation utilizing differential dynamic programming (DDP) with feedback, comprising the steps of:

a) establishing a remediation groundwater pumping policy;

b) setting parameters for the remediation groundwater pumping policy established in step (a);

c) computing said remediation groundwater pumping policy using a feedback law;

d) applying said remediation groundwater pumping policy to groundwater at a groundwater site to be remediated; and

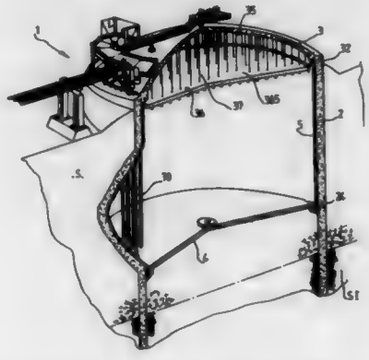
e) remediating said groundwater at said groundwater site.

5,468,089

BURIED STORAGE TANK WITH A SINGLE FLUID-TIGHT VESSEL FOR THE CONFINEMENT OF A LIQUEFIED GAS FOR EXAMPLE AND ARRANGEMENT OF SUCH STORAGE TANKS

Jean M. Claude, Rambouillet, and Gerardus H. M. Evers, Crespieres, both of, France, assignors to Societe Nouvelle Technigaz, Montigny-Le-Bretonneux, and Soletanche Enterprise, Nanterre, both of, France

Filed Jan. 26, 1994, Ser. No. 186,975
Claims priority, application France, Jan. 28, 1993, 93 00881
Int. Cl.[6] B65G 5/00
U.S. Cl. 405—52 15 Claims



1. In a storage tank for confining a fluid such as a liquefied gas, adapted to be installed in cargo loading harbor terminals and to be buried in loose ground which may contain water exerting pressure forces on the tank, said tank comprising a rigid structure including a concrete enclosure, a bottom slab, a covering dome and a

fluid-tight heat-insulating envelope which defines a loading space for the fluid in an interior of the structure, said enclosure having the shape of a thick and substantially fluid-tight wall, and said rigid structure being located in a cavity in the ground having a bottom face, lateral faces and a shape substantially corresponding to the shape of said structure, wherein the improvement comprises

said enclosure having a base extending at least to a substantially water-tight layer of the ground beneath said bottom face of said cavity and said bottom slab, and

said enclosure having an upper end integral with a periphery of said covering dome in one piece of material.

5,468,090

BENDING WEIR

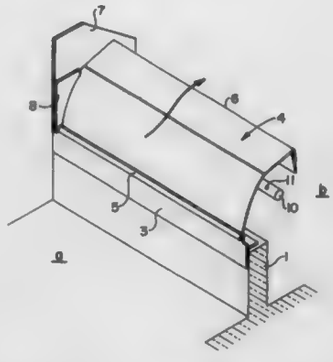
Hansjoerg Brombach, Von-Berlichingen-Strasse 21, D-6990 Bad-Mergentheim-Neunkirchen, Germany

Filed Jul. 13, 1993, Ser. No. 90,710

Claims priority, application Germany, Jul. 15, 1992, 42 23 259.7

Int. Cl.[6] E02B *7/44*

U.S. Cl. 405—94 **20 Claims**



1. A flap weir for controlling water flow in response to water pressure, the weir comprising:

a horizontal base wall;

two side walls laterally bounding the base wall;

a flap having front and rear oppositely facing surfaces, the flap being sealingly fixed by a fixed edge in unrotatable manner to the base wall so that a free edge opposite the fixed edge forms an overflow edge, the flap extending laterally up to the side walls such that the passage of water laterally between the flap and the side walls is negligible;

wherein, when undeformed, the flap assumes a closed position, the position of the overflow edge being modified when the flap is deformed; and wherein said flap is constructed of a resilient material of uniform thickness that is yieldable in an opening direction in response to a predetermined water pressure, said flap storing a spring force when in the open position, said spring force returning said flap to the closed position when said water pressure is reduced below said predetermined water pressure.

5,468,091

INSERTING LININGS INTO PIPES

Kevin E. Arnold, 1 Mill Flats, Ashton, Oundle, Northamptonshire, PE8 5LB, and Keith Baylis, 134 Bellemoor Road, Shirley, Southampton SO1 2RA, both of, Great Britain

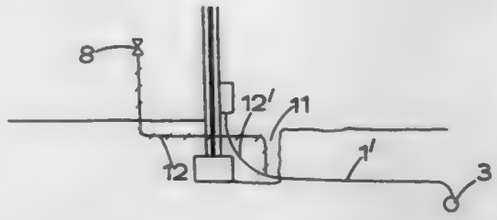
PCT No. PCT/GB91/01327, § 371 Date Feb. 2, 1993, § 102(e) Date Feb. 2, 1993, PCT Pub. No. WO92/02755, PCT Pub. Date Feb. 20, 1992

PCT Filed Aug. 2, 1991, Ser. No. 983,550

Claims priority, application United Kingdom, Aug. 3, 1990, 9017081; Nov. 29, 1990, 9025990

Int. Cl.[6] F16L *55/165*

U.S. Cl. 405—154 **13 Claims**



1. A method of lining a pipe (1), which has an underground connection with a further pipe (2), the method comprising:

inserting a tubular liner (20) into the pipe from an end (5) opposite to the underground connection (2) such that the liner extends adjacent to the connection;

injecting a sealant between the liner and the pipe and between the liner and the underground connection, so as to close-off the annular space defined between the liner and the pipe in a region adjacent to said underground connection, the sealant being introduced into the pipe remote from the underground connection;

positioning a detector in the pipe and adjacent to the underground connection; and

detecting when the sealant between the liner and the pipe has reached the region adjacent to the underground connection.

5,468,092

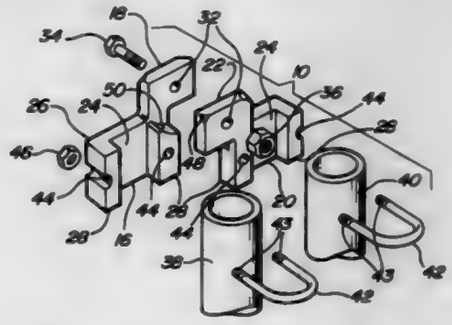
CLAMP FOR CONDUIT SECTIONS

Eugene K. Saunders, 6148 Thorncrest Dr., Bloomfield Hills, Mich. 48301

Filed Dec. 7, 1993, Ser. No. 163,137

Int. Cl.[6] F16B *2/02*

U.S. Cl. 403—385 **12 Claims**



1. A clamp for connecting successive sections of a conduit, comprising:

a first clamping section having a first substantially rectangular shaped base portion and a first connecting portion extending from a corner of said first base portion, said first connecting portion having a substantially planar face with a through hole formed through said face;

a second clamping section having a second substantially rectangular shaped base portion and a second connecting portion

extending from a corner of said second base portion, said second connecting portion having a substantially planar face with a through hole formed through said face, said second connecting portion aligning with said first connecting portion so that said through holes form a continuous channel though said connecting portions;

a bolt extending through said continuous channel formed by said through holes for pivotally securing said first clamping section to said second clamping section;

a first U-shaped bolt for surrounding a first conduit section, opposite ends of said first bolt mounting to said first base portion for securing said first conduit section to said first base portion; and

a second U-shaped bolt for surrounding a second conduit section, opposite ends of said second bolt mounting to said second base portion for securing said second conduit section to said second base portion;

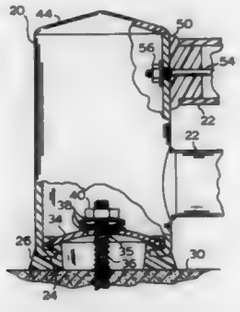
said bolt for pivotally securing said second clamping section to said first clamping section providing for an adjustable angle between said conduit sections.

5,468,093

RESILIENT SAFETY BARRIER

William L. Voigt, Bermuda Run, N.C., assignor to Voigt Products, Incorporated, Bermuda Run, N.C.

Filed Aug. 19, 1994, Ser. No. 292,855
Int. Cl.[6] E01F *15/00*
U.S. Cl. 404—6 **5 Claims**



1. A resilient safety barrier with a barrier member having an end that is resiliently supported on the surface of a base, comprising:

A block of resilient material for flexibly supporting the end of the barrier member on the base and having:

a shape approximating that of the end of the member,

a perimeter approximately the size of the barrier member, with the end of the barrier member supported by the block of resilient material at substantially the perimeter of the block of resilient material, and

a surface by which the block rests on the base; and

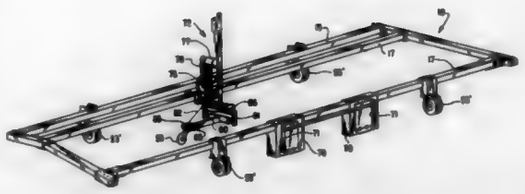
a resilient fastener for biasing the barrier member and the block of resilient material toward the base, so as to allow limited, non-destructive, shock-absorbent movement of the barrier member with respect to the base.

5,468,094

MACHINE WHICH HOLDS TOOLS FOR CLEANING AND FILLING JOINTS IN PAVEMENT

Timothy P. Vanderpan, and Robert L. Kruger, both of Sioux Falls, S. Dak., assignors to Robert L. Kruger, Sioux Falls, S. Dak.

Filed Aug. 6, 1993, Ser. No. 102,837
Int. Cl.[6] E01C *23/12*
U.S. Cl. 404—75 **2 Claims**



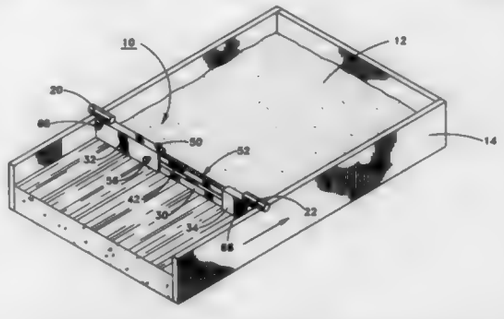
1. A portable carrier for controlling the position of tools and sand blasting nozzles for cleaning and filling joints in pavement comprising a frame adapted to be moved over said pavement, carriage means movably mounted on said frame adapted to move on said frame transversely of said pavement, and holding means on said carriage adapted to hold said nozzle in a position directed toward said joint, said holding means including a holding frame slidably mounted relative to said carriage means, a guide wheel adapted to run in said joint, said guide wheel being mounted on fork means, said fork means being slidable on an axle on said carrier frame and spring means engaged with said bracket means to bias said bracket means to the center of said axle.

5,468,095

ADJUSTABLE CONCRETE ROD

Peter J. Dawson, 24835 Arnold Dr., Sonama, Calif. 95476

Filed Nov. 29, 1993, Ser. No. 158,382
Int. Cl.[6] E01C *19/12;19/22*
U.S. Cl. 404—118 **10 Claims**



1. An adjustable concrete rod for leveling the surface of uncured concrete, said concrete being disposed within a concrete form, said adjustable concrete rod comprising:

(a) an elongate member having a lower edge for the engagement and leveling of said uncured concrete;

(b) a first handle extending outwardly from a proximal end of said elongate member, and

(c) a second handle extending outwardly from a distal end of said elongate member,

(d) said handles adapted to engage upper edges of a concrete form in which said uncured concrete is poured,

(e) said handles being manually graspable to move said elongate member along said surface of said concrete, with said lower edge in contact therewith, while said handles are in engagement with said upper edges of said concrete form;

(f) a securing means to permit selective lengthwise adjustment of said elongate member;

(g) said elongate member further comprises a housing and a bar, said bar being telescopingly insertable into said housing allowing relative axial movement therewith;

(h) said securing means further comprising a means to releasably secure said bar at a selected point within said housing;

(i) said bar comprises a substantially rectangular cross-section having upper, lower, and side surfaces, and further comprises lengthwise lateral flanges extending from and along said side surfaces;

(j) said housing comprises internal upper and side surfaces, and further comprises lengthwise channels defined in and extending along said side surfaces; and

(k) said securing means further comprises a substantially full engagement of said upper and side surfaces of at least a

portion of said bar with said internal upper and side surfaces of at least a portion of said housing, respectively, and by a substantially full engagement of a corresponding portion of said flanges with said channels, securing said bar and said housing against a relative rotational movement.

5,468,096

MEANS FOR SECURING A COVER OVER A DRAINAGE CHANNEL

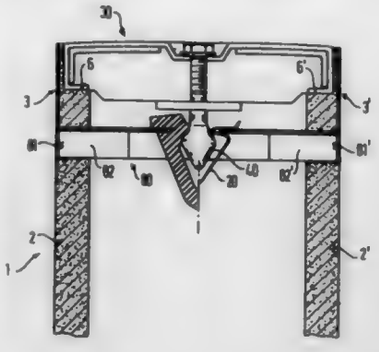
Heinrich Sauerwein, Nubbel; Wolfgang Arm, Rendsburg, and Jan Witt, Eckernforde+, all of, Germany, assignors to ACO Severin Ahlmann GmbH & Co., KG, Rendsburg, Germany

Filed Dec. 3, 1993, Ser. No. 161,936

Claims priority, application Germany, Dec. 10, 1992, 42 41 707.4

Int. Cl.[6] E02B *11/00*

U.S. Cl. 405—36 **16 Claims**



1. A means for securing a cover to a drainage channel body defining a drainage channel wherein said channel body is provided with at least two cutouts located substantially opposite one another in inner side walls defining said channel, and comprising:

at least one cross-bar having two ends for inserting respectively into said cutouts so that the cross-bar is fixedly mounted transversely across the drainage channel,

a clamping means located at at least one of said ends of said cross-bar for retaining said cross-bar in place after insertion of said ends into said cutouts, and

a fixing means for attachment of said cover to said channel body including means for attachment of said cover to said cross-bar,

wherein said clamping means is resiliently deformable so that the force needed to deform it resiliently during insertion of said ends of said cross-bar into said cutouts is less than the force needed to disengage said cross-bar from said channel body.

5,468,097

METHOD OF CIRCULATING GROUND WATER IN GROUND REGIONS WITH A FALL OF GROUND WATER LEVEL

Bruno Bernhardt, Reutlingen, Germany, assignor to Ieg Industrie-Engineering GmbH, Reutlingen, Germany

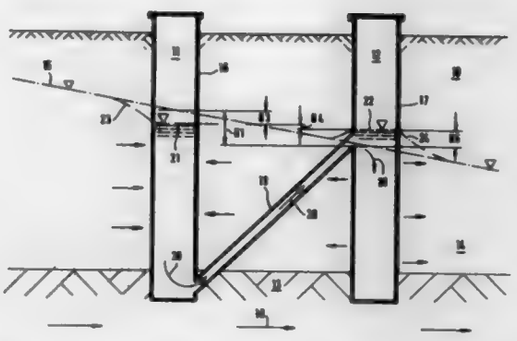
Filed Nov. 16, 1993, Ser. No. 153,177

Claims priority, application Germany, Nov. 19, 1992, 42 38 969.0

Int. Cl.[6] E02B *11/00*

U.S. Cl. 405—52 **10 Claims**

1. A method of circulating ground water in a ground region with a fall of a ground water level, comprising the steps of forming a first well shaft with a water permeable shaft wall in a ground region through which ground water flows; forming at least one second well shaft with a water permeable shaft wall at a distance from said first shaft wall in a ground region with a lower ground



water level than in said first well shaft; providing a transverse connection between said first well shaft and said at least one second well shaft so that the ground water can flow from said first well shaft under the action of a ground water level fall into said at least one second well shaft, said providing a transverse connection including connecting said well shafts by a pipe extending from a lower shaft end of said first well shaft to said at least one second well shaft closely under a ground water level in said at least one second well shaft.

5,468,098

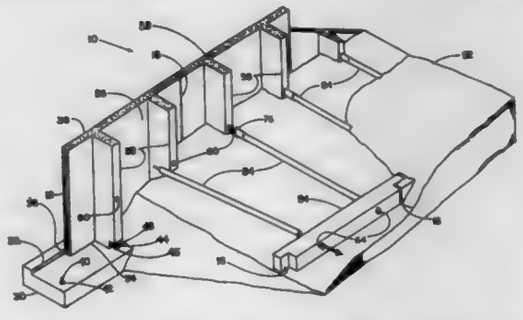
SEGMENTAL, ANCHORED, VERTICAL PRECAST RETAINING WALL SYSTEM

John W. Babcock, 510 S. 7500 East, Huntsville, Utah 84317

Filed Jul. 19, 1993, Ser. No. 93,171

Int. Cl.[6] E02D *5/00*

U.S. Cl. 405—262 **34 Claims**



1. A segmental, anchored, vertical precast retaining wall system, said retaining wall system comprising:

a foundation means for supporting the retaining wall system;

an assembly of base wall panels attached to the foundation means side by side to form a base tier with each base wall panel including a pair of generally T-shaped vertical tee stems formed with a horizontal and a vertical bearing surface; shaped vertical tee stems formed with a horizontal and a vertical bearing surface;

an assembly of upper tier wall panels stacked on the base tier wall panels, each upper tier wall panel including a pair of generally T-shaped vertical tee stems formed with a horizontal and a vertical bearing surface for contact with the horizontal and vertical bearing surfaces of the base wall panel tee stems;

tie rod means attached to the base wall panels and to the upper tier wall panels for securing the wall panels against earth loads;

means for sealing the tie rod means including a tie rod sleeve surrounding each tie rod means;

anchor mean embedded in backfill at different vertical levels and removably attached to the tie rod means; and

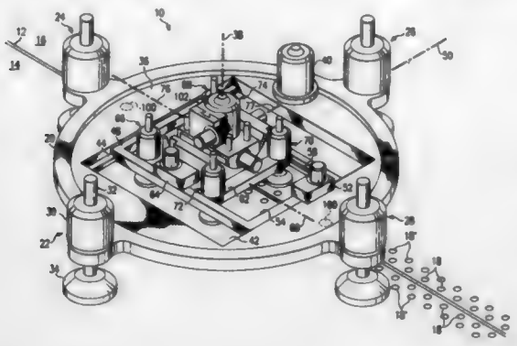
means for displacing the means for sealing relative to the tie rod means upon settling of the backfill to prevent shear forces at points of attachment of the tie rod means.

5,468,099

SEAM TRACKING DRILLING MACHINE

Michael J. Wheetley, Bedford, and David A. Schaller, Dallas, both of Tex., assignors to Vought Aircraft Company, Dallas, Tex.

Filed Aug. 11, 1993, Ser. No. 104,621
Int. Cl.[6] B23B *35/00;* **B62D** *57/02*
U.S. Cl. 408—1 R **15 Claims**



13. A method for moving a robotic carriage over a surface without the use of rails, comprising:

actuating a first plurality of selectively actuatable supports extending from a first carriage to support the first carriage on the surface, the first carriage having a frame, a platform positioned in the frame and a first drive for selectively rotating the platform with respect to the frame about a rotational axis;

deactuating a second plurality of selectively actuatable supports extending from a third carriage, the third carriage movable relative to a second carriage, the second carriage movable relative to the first carriage;

selectively moving the second or third carriage relative to the first carriage;

actuating the second plurality of selectively actuatable supports to support the third carriage on the surface and deactuating the first plurality of selectively actuatable supports to remove support of the first carriage from the surface; and

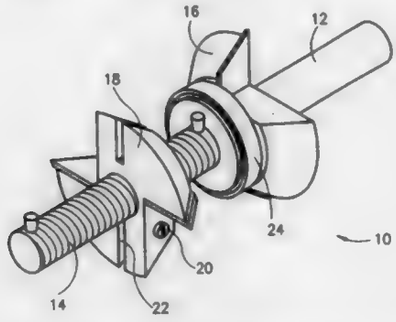
selectively moving the first or second carriage relative to the third carriage.

5,468,100

ADJUSTABLE GAP TWO-MEMBER ROTARY TOOL

Moshe Naim, Kfar Tavor, Israel, assignor to Kant-ly Ltd., Tel Aviv, Israel

Filed Dec. 12, 1994, Ser. No. 354,331
Int. Cl.[6] B23C *5/16*
U.S. Cl. 409—234 **8 Claims**



1. A rotary device for simultaneously treating two or more regions of a workpiece, comprising:

(a) a rotatable shaft, said shaft including an externally threaded portion;

(b) a first tool mounted on, connected to, or integrally formed with, said shaft;

(c) a second tool, mounted on said externally threaded portion of said shaft, said second tool being internally threaded so that rotation of said second tool axially displaces said second tool along said shaft; and

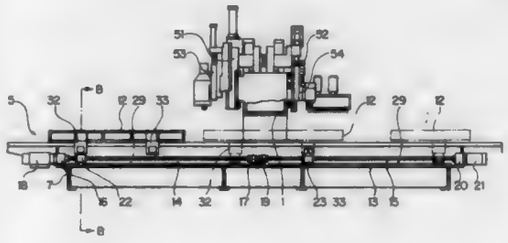
(d) means for fixing said second tool at a location along said externally threaded portion of said shaft.

5,468,101

WOOD WORKING MACHINE AND TABLE TRANSLATION APPARATUS FOR THE SAME

Isao Shoda, 116-4, Okabu-cho, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Jul. 5, 1994, Ser. No. 270,836
Claims priority, application Japan, Jul. 5, 1993, 5-191731
Int. Cl.[6] B23B *7/04;* **F16H** *29/20*
U.S. Cl. 409—202 **4 Claims**



1. A table translation apparatus for a wood working machine wherein a carrier is mounted for leftward and rightward sliding movement on a beam secured to a pair of left and right columns and extending horizontally leftwardly and rightwardly and a plurality of working heads are mounted for upward and downward movement on said carrier, comprising:

a bed extending forwardly and backwardly below and perpendicularly to said beam;

a table mounted for horizontal forward and backward sliding movement on said bed for moving a piece of wood placed thereon forwardly and backwardly so as to pass below said beam;

a pair of front and rear screw shafts supported for co-axial rotation at both a front portion and a rear portion of said bed and connected to be driven to rotate forwardly or reversely independently of each other by a motor;

a pair of front and rear shuttles held in threaded engagement with said front and rear screw shafts, respectively, for being moved forwardly and rearwardly along a rail by forward or reverse rotation of said front and rear screw shafts, respectively;

a front side clutch provided on the front side of said table for releasably connecting said table and said front side shuttle to each other; and

a rear side clutch provided on the rear side of said table for releasably connecting said table and said rear side shuttle to each other;

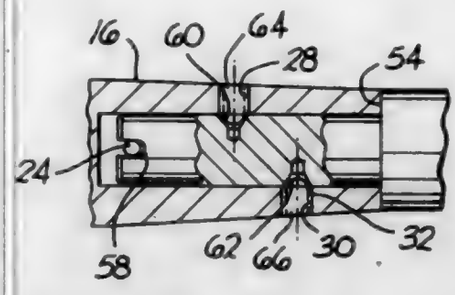
said table being moved forwardly or rearwardly by forward or reverse rotation of said front side screw shaft when said table is connected to said front side shuttle by said front side clutch whereas said table is moved forwardly or rearwardly by forward or reverse rotation of said rear side screw shaft when said table is connected to said rear side shuttle by said rear side clutch.

5,468,102

MILLING TOOL HOLDER

Stojan Stojanovski, 1950 Birchwood, Troy, Mich. 48084

Filed Sep. 2, 1994, Ser. No. 300,376
Int. Cl.[6] B23C *5/26;* **B23B** *31/00*
U.S. Cl. 409—234 **4 Claims**



1. A tool holder assembly comprising:

an elongated tool holder body (**10**) having a longitudinal axis, an end surface (**18**), and an elongated shank-receiving bore (**20**) extending from said end surface along said longitudinal axis;

a tool holder head (**12**) adapted to support at least one cutting insert; said tool header head comprising a cylindrical shank (**56**) slidably receivable in said shank-receiving bore, and an annular seat (**54**) axially alignable with said end surface;

means (**24**, **58**) for preventing relative rotation between said tool holder head and said tool holder body when said shank is slidably inserted into the bore;

means for biasing said tool holder head along said longitudinal axis so that said annular seat has pressure engagement with said end surface on the tool holder body;

said biasing means comprising two threaded openings (**28**, **30**) in said tool holder body extending normal to said longitudinal axis in a common plane containing said longitudinal axis; said threaded openings being spaced about one hundred eighty degrees apart in the circumferential direction, said threaded openings also being spaced in the axial direction so that said openings communicate with said bore at axially spaced points therealong;

said shank having two frusto-conical recesses (**60**, **62**) adapted to register with said threaded openings when said shank is inserted into said bore;

a threaded fastener (**64**, **66**) threaded into each of said threaded openings to penetrate a respective frusto-conical recess, whereby said tool holder head is biased along said longitudinal axis.

5,468,103

LOCKING SYSTEM WITH AN IDENTIFICATION MARK FOR THREADED FASTENERS

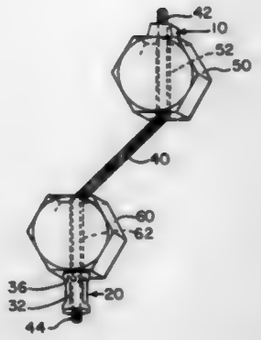
Plato J. Leeson, Rockford, Ill., assignor to Yonco Corporation, Rockford, Ill.

Filed Aug. 5, 1994, Ser. No. 286,637
Int. Cl.[6] F16B *39/04;39/20;* **B23P** *19/04*
U.S. Cl. 411—87 **17 Claims**

1. A locking system for connecting an anchor and at least one threaded fastener for preventing loosening of the fastener, each of the anchor and the fastener having a body and a lock wire aperture therethrough of a size sufficient to closely receive a locking wire, the system comprising:

a flexible multi-strand wire having first and second ends, the first end of the wire having a restraining head of a dimension sufficient to interfere with the lock wire apertures, the wire being threaded through each of the lock wire apertures in a predetermined direction, and

a ferrule having a cylindrical barrel carrying an identification mark, the ferrule having an axial aperture through which the second end of the locking wire is threaded, the locking wire being tensioned between the restraining head on the first end and the ferrule on the second end, crimped deformations on the ferrule engaging the strands of the locking wire for securely locking the ferrule to the locking wire, the deformations being associated with the identification mark sufficiently closely that the ferrule cannot be removed from the locking wire without compromising the identification marks.

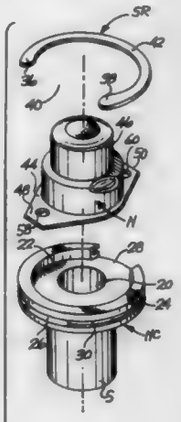


5,468,104

WALL NUT ASSEMBLY

Leonard F. Reid, Bellevue, and Charles M. Copple, Kent, both of Wash., assignors to Fatigue Technology, Inc., Seattle, Wash.

Filed Aug. 10, 1994, Ser. No. 288,298
Int. Cl.[6] F16B *37/04;39/28*
U.S. Cl. 411—113 **26 Claims**



1. A wall nut assembly, comprising:

a nut comprising a nut base having an inner side and an outer side, and a nut central portion projecting axially from said nut base on said outer side, said nut base including first and second opposite end portions, each said end portion projecting radially outwardly from said nut central portion;

a nut cage mountable on a wall at an opening in the wall, said nut cage including a nut cage base having a base opening positioned to be aligned with the wall opening when the nut cage is mounted on the wall, said nut cage base further including a nut central portion receiving region and a fence at least partially surrounding said region, said fence projecting axially from said nut cage base, said fence including a socket extending radially outwardly from the nut central portion receiving region, said socket being sized to receive the first end portion of the nut base, said socket being adapted to engage and restrain the first end portion of the nut base against both circumferential and axial movement, said fence

further including a channel diametrically opposite the socket, said channel extending radially outwardly from the nut central portion receiving region, said channel being sized to receive the second end portion of the nut base, said channel being adapted to engage and restrain the second end portion of the nut base against circumferential movement; and

a nut retainer connectable to said nut cage, said nut retainer including a bridge portion adapted to bridge across said channel,

wherein in use the nut cage is mounted on a wall at a wall opening, the nut is placed in the nut cage, with the nut central portion positioned in the nut central portion receiving region, with the first end portion of the nut base positioned in said socket, and with the second end portion of the nut base positioned in the channel, and then the nut retainer is positioned to place its bridge portion across the channel so that it will block movement of the second end portion of the nut base axially out from the channel.

5,468,105

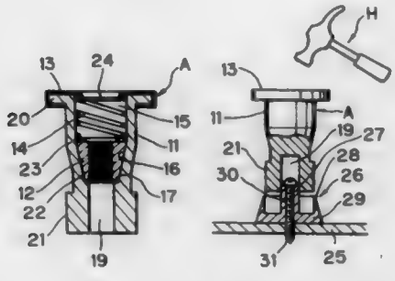
CEILING INSERT

Minekazu Iwamoto, No. 34-7, Kamitakada 1-chome, Nakanaku, Tokyo, Japan

Continuation of Ser. No. 74,611, Jun. 11, 1993, abandoned. This application Jun. 6, 1994, Ser. No. 254,663

Int. Cl.[6] F16B *37/08;39/02*

U.S. Cl. 411—433 **9 Claims**



1. A ceiling insert in combination with a supplemental base member for locating the insert on a ceiling board while the insert is cast in concrete, the insert comprising an outer cylinder body having an upper hole of large diameter, a central hole below said upper hole having a taper such that the diameter of the central hole decreases downwardly away from the upper hole and having a step portion at a bottom end of the central hole, a straight lower hole below the step portion having a smooth inner surface and having a diameter less than the diameter of the bottom end of the central hole, said lower hole extending from the step portion through a lower end of the insert, a tapered split nut installed in the central hole of said outer cylinder body, a coil spring installed in the upper hole above the split nut, and a lid body as a cover fixed to a top end face of the outer cylinder body, wherein the coil spring is compressed by the lid body and the split nut and the split nut is urged downward by the coil spring against the step portion of the central hole, the supplemental base member comprising a continuous outer ring and a central tube defining an annular space therebetween for removably engaging a lower end of the insert with said central tube extending into the lower hole of the insert, the supplemental base member further including a screw extending downwardly within the central tube for securing the supplemental base member to the ceiling board.

5,468,106

HYDRAULIC TENSIONING DEVICE

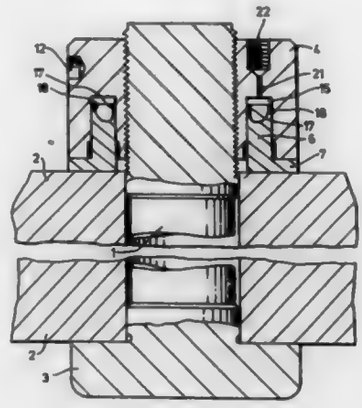
Harry D. Percival-Smith, Manchester, England, assignor to Pilgrim Moorside Limited, England

PCT No. PCT/GB91/01482, § 371 Date Feb. 1, 1994, § 102(e) Date Feb. 1, 1994, PCT Pub. No. WO93/05306, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 2, 1991, Ser. No. 190,083

Int. Cl.[6] F16B *37/08*

U.S. Cl. 411—434 **6 Claims**



1. A hydraulic tensioning device comprising two relatively axially displaceable annular metallic bodies effecting an annular piston and cylinder arrangement including a fluid chamber defined between radially innermost and radially outermost walls comprising the cylinder,

said radially outermost cylinder wall surrounding an associated radially outermost piston wall and said radially innermost cylinder wall being surrounded by an associated radially innermost piston wall,

said radially outermost and radially innermost piston walls being formed with corresponding annular metallic webs, extending axially into the fluid chamber and tapering along their whole lengths to edges and providing, by operative engagement with their associated cylinder walls in response to fluid pressure in the chamber, sole sealing means of the arrangement,

the radially innermost web being thinner than, and having a shallower taper than, the radially outermost web at their edges and at corresponding distances from their edges to confer greater flexibility on said radially innermost web, said webs between themselves defining, for part of the chamber, asymmetry in elevational cross section relative to an axial direction.

5,468,107

SPLIT NAIL

Takao Wakai, Higashiosaka, Japan, assignor to Wakai & Co., Ltd., Osaka, Japan

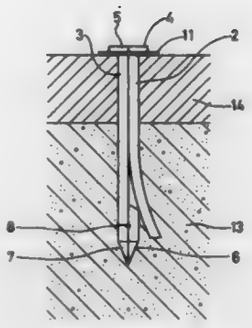
Filed Sep. 8, 1994, Ser. No. 302,320

Claims priority, application Japan, Feb. 3, 1994, 6-011696

Int. Cl.[6] F16B *15/04*

U.S. Cl. 411—448 **3 Claims**

1. A split nail comprising a long leg and a short leg each having a head at one end and a pointed tip at the other end, said long leg and said short leg being joined together near their tips, said long leg being formed at a portion above said joint portion with a cut extending obliquely upwards toward the central axis of said split nail so that a breakable portion is formed in said long leg between the end of said cut and the contact surface between said long leg and said short leg, and a washer for clamping said legs at a portion above said cut.

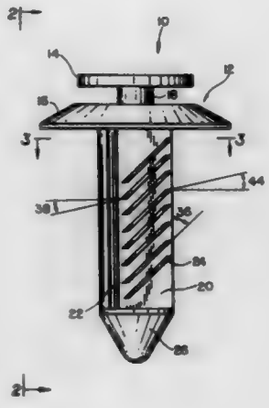


5,468,108

SPIRAL FLEX TREE FASTENER

Kathleen A. Sullivan, Kankakee, and Brian R. Peek, Mokena, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Sep. 12, 1994, Ser. No. 304,154
Int. Cl.[6] F16B 19/00
U.S. Cl. 411—510 20 Claims



1. A spiral flex tree fastener for removable insertion into a hole defined within a panel, comprising:

a head;

an elongated shank having a longitudinal axis and extending axially from said head; and

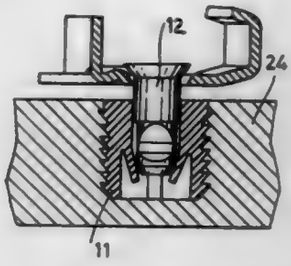
two sets of substantially planar, flexible fins disposed upon opposite sides of said elongated shank, said flexible fins being disposed parallel to each other within each one of said sets of fins, each one of said sets of fins extending axially along said elongated shank, each one of said fins within each one of said sets of fins being disposed at a predetermined angle with respect to said longitudinal axis of said elongated shank such that said fins within said two sets of fins together define spiral loci about said fastener shank and about said longitudinal axis of said fastener shank, and each one of said flexible fins having a radial extent which is greater than the radial distance extending between an edge portion of said hole and said longitudinal axis of said elongated shank so that when said fastener is inserted into said hole, said flexible fins will flex against the walls of said panel defining said hole so as to hold said fastener therein.

5,468,109

QUICK REMOVABLE FASTENERS IN PARTICULAR FOR FURNITURE

Franco Ferrari, Frazione Deviscio, 2, 22053 Lecco, and Carlo Migli, Lecco, both of, Italy, assignors to Franco Ferrari, Italy

Filed Feb. 1, 1994, Ser. No. 189,882
Claims priority, application Italy, Feb. 11, 1993, MI93U0113; Nov. 12, 1993, MI93U0878
Int. Cl.[6] F16B 37/14
U.S. Cl. 411—553 24 Claims



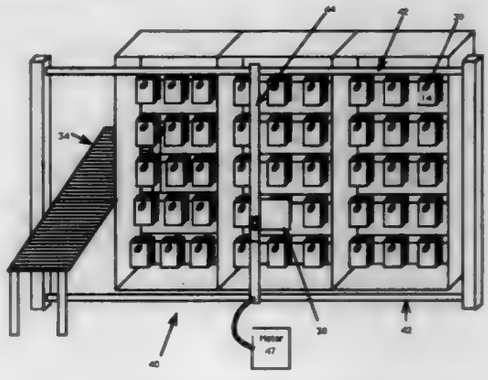
1. A removable fastener for securing a first part, such as a furniture accessory, to a second part which has a hole in a surface thereof, comprising a dowel anchor disposed to be press fit into said hole and having thereon means of lateral engagement with said second part in said hole, and said dowel anchor having therein an opening in which is seated one end of an element which in turn is constrained adjacent its opposite end to the first part, and between said one end of the element and said opening there being separable mutual constraint means, and characterized in that said element is a dowel constrained at one end to the first part and disposed to be axially insertable at its opposite end into the opening in the dowel anchor, and said constraint means comprising elastic yielding elements on said dowel anchor projecting into engagement with opposite sides of the dowel adjacent said one end thereof.

5,468,110

AUTOMATED SYSTEM FOR SELECTING PACKAGES FROM A STORAGE AREA

Sean C. McDonald, Pittsburgh, Pa.; Ellen J. Hertz, Clemmons, N.C.; James A. Smith, Allison Park, Pa., and Gregory Toto, Santa Cruz, Calif., assignors to Automated Healthcare, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 871,832, Apr. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 469,217, Jan. 24, 1990, abandoned. This application Aug. 25, 1994, Ser. No. 295,495
Int. Cl.[6] B65G 1/04
U.S. Cl. 414—273 22 Claims



1. A system for selecting and delivering packages to fill orders comprising:

a) a storage area comprised of a plurality of storage area locations each location having package holding means sized and configured to hold a plurality of individual packages each individual package having a machine readable label which identifies a type of package, the packages being held in a manner so that each package can be placed into and removed from the storage area locations and so that the machine readable label on at least one package in a storage location can be read without removing the package from the storage location, each location having a distinct x, y coordinate;

b) automated picking means sized and configured to be able to hold packages, to select packages from the storage area locations and place packages in the storage area locations in accordance with computer controlled instructions, the picking means having a gripper for grasping and moving the packages and having a picking means storage location sized and configured to hold a plurality of packages in a face to face relationship after the plurality of packages have been retrieved from the storage area and prior to delivery of the plurality of packages to a desired destination separate from the picking means;

c) means for moving the automated picking means to selected storage locations;

d) a computer having at least one memory which contains a program for directing the picking means to chosen storage area locations and a database containing at least one x, y coordinate location in the storage area for each package held within the storage area the computer being connected to the automated picking means and the means for moving the automated picking means; and

e) a package reader associated with the picking means and being positioned for reading the machine readable labels on packages located within the storage area, wherein only one type of package is stored in each x, y coordinate location.

5,468,111

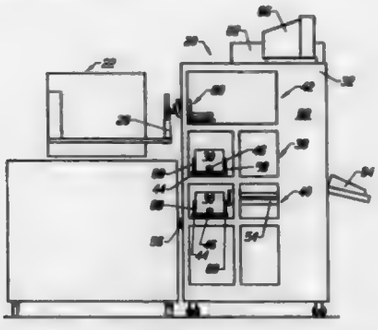
DISC LOADING AND UNLOADING ASSEMBLY

Alan Flint, San Diego County; Quy Nguyen, and William G. Jacobs, both of Santa Clara County, all of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 823,883, Jan. 22, 1992, abandoned. This application Sep. 13, 1993, Ser. No. 121,037

Int. Cl.[6] B65G *49/05*

U.S. Cl. 414—416 **12 Claims**



1. An apparatus for transferring discs between manufacturing machinery comprising:

at least two storage cassettes vertically spaced-apart and being removably mounted on substantially fixed support means and each defining a recess formed for receipt of a plurality of discs arranged in a spaced side-by-side manner;

a loading assembly mounted adjacent said cassettes and including a loading arm having mechanical gripping means formed for gripping engagement with opposed edges of said discs, said loading arm being mounted for vertical aligning movement with each cassette, and mounted for substantial horizontal movement relative an endmost portion of a vertically aligned cassette for sequentially retrieving an endmost disc from said vertically aligned cassette and placing said endmost disc into shuttle means movably mounted proximate said arm for shuttling said endmost disc therefrom to at least one disc manufacturing machine wherein said disc is further processed; and

an unloading assembly for retrieving said processed disc from said shuttle means subsequent to said disc manufacturing machine and placing said processed disc into a third storage cassette formed for receipt therein.

5,468,112

WAFER CONTAINER AND WAFER ALIGNING APPARATUS

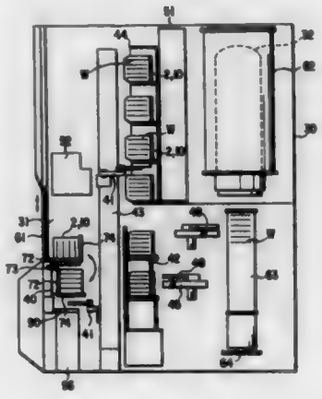
Katsumi Ishii, Kanagawa, and Masao Takikawa, Sagamihara, both of, Japan, assignors to Tokyo Electron Limited, Tokyo, and Tokyo Electron Tohoku Limited, Esashi, both of, Japan

Filed Oct. 5, 1993, Ser. No. 131,391

Claims priority, application Japan, Jan. 5, 1992, 4-288194; Jan. 5, 1992, 4-288195

Int. Cl.[6] G01P *13/00*

U.S. Cl. 414—416 **12 Claims**



1. A container for storing a plurality of substantially circular wafers, comprising:

first and second end walls opposite to each other, the first end wall having a reference plane;

first and second side walls opposite to each other and connecting the first and second end walls;

a first opening defined by the first and second end walls and the first and second side walls, the first opening serving as an opening through which the wafers are inserted in or withdrawn from the container;

a second opening defined by the first and second end walls and the first and second side walls, the second opening being opposite to the first opening and smaller than the first opening;

a plurality of slots for holding the wafers one by one at intervals, each slot including a pair of grooves which are formed in inner surfaces of both the side walls, have a V-shaped cross-section, and divergently open toward a central portion of the container, one of surfaces defining each groove serving as a supporting surface on which a wafer is disposed when the container is positioned such that the reference plane is placed on a horizontal plane, the supporting surfaces of the pair of grooves having a pair of converging portions which converge toward the second opening; and

a pair of contact surfaces which are respectively brought into contact with sides of each of the wafers held by the slots, each contact surface being formed on the converging portion of each supporting surface and restricting the position of each wafer so that the wafer is positioned at the same height on the supporting surfaces of the pair of grooves;

wherein

a cross-section of said slot at said converging portion which comprises said contact surfaces differs from a cross-section of the slot in a remainder of the slot such that an inclination of the wafer away from the horizontal plane is substantially prevented; and

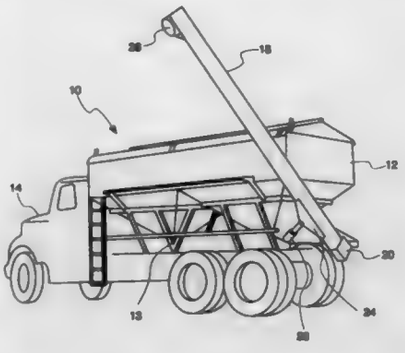
the contact surfaces are formed by filling means.

5,468,113

ONE-PIECE FOLDING AUGER FOR BULK MATERIAL TENDER

Harold A. Davis, Willmar, Minn., assignor to Willknight, Inc., Wayzata, Minn.

Filed Aug. 9, 1993, Ser. No. 104,370
Int. Cl.[6] B65G *33/14*; B60P *1/40*
U.S. Cl. 414—523 **20 Claims**



1. A portable self-unloading particulate matter tender suitable for mounting on a vehicle for ground travel, said tender comprising:

a longitudinal extending frame having a first and second end;

a container supported by the frame, the container comprising first and second end walls, first and second side walls defining a chamber having a generally rectangular configuration formed by the side walls connecting the end walls, the side walls including converging and sloping lower portions to provide the chamber with a lower particulate matter collecting portion, the collecting portion having at least one discharge opening and a first means for moving the particulate matter from the at least one discharge opening to one of the first and second ends of the frame; and

a pivotable discharge system for selectively communicating with the first means for moving to discharge the particulate matter to a predetermined deposit location being located lateral to the container, the discharge system comprising:

an elongated member having a continuous outer wall,

an intake end selectively communicable with said first means for moving to receive the particulate matter and being pivotally mounted adjacent one of the first and second ends of the frame for multi-axis pivoting of the member and a discharge end located opposite the intake end for discharging the particulate matter from the member,

a first pivotal mount for pivotally mounting the intake end to enable the member to pivot about a first axis,

a second pivotal mount for pivotally mounting the intake end to enable the member to pivot about a second axis, the second pivotal mount being pivotable by and about the first pivotal mount,

said first and second pivotal mounts cooperating to pivot the member between a stowed position in which the member extends substantially parallel and adjacent to one of the first and second side walls to a discharging position in which the member extends to locate the discharge end upward and lateral with respect to the container and to connect the intake end to the first means for moving,

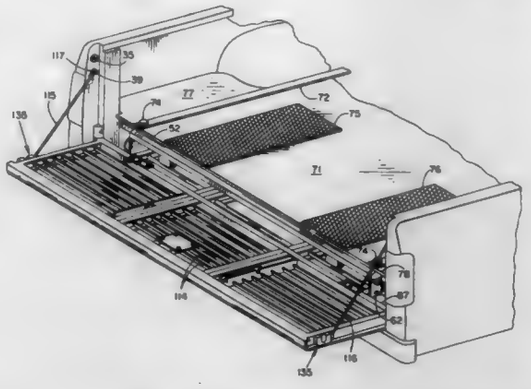
a second means for mechanically moving the particulate matter through the member from the intake end to the discharge end and means for selectively pivoting the elongated member through the first and second pivotal mounts between the stowed position and the discharge position.

5,468,114

LOADING DEVICE FOR PICK-UP TRUCKS

Scott J. Hickerson, P.O. Box 337, Thief River Falls, Minn. 56701

Filed Jun. 20, 1994, Ser. No. 263,371
Int. Cl.[6] B62D *33/03*
U.S. Cl. 414—537 **16 Claims**



1. A truck having vehicle loading and unloading apparatus mounted thereon, comprising:

a. a pick-up truck having an elongated load-bearing bed with opposite sides at its rear-end portions;

i. said pick-up truck having an upstanding rearwardly extending side wall disposed at each of said opposite sides of said bed;

ii. each of said side walls having latch means at its rear-end for securing one end of a tailgate normally carried by such a pick-up truck;

b. a generally rectangular elongated rigid frame assembly fixedly and rigidly secured to said bed in superimposed relation thereto and extending longitudinally thereof;

i. said frame assembly having a pair of laterally spaced parallel slideways each being adjacent opposite sides of said frame assembly;

c. a platform fixedly mounted upon said frame assembly in superimposed relation thereto;

d. two only ramp sections pivotally connected in tandem relation, one of said ramp sections being disposed forwardly of the other and slidably mounted within said slideways for limited sliding relative movement longitudinally of said frame assembly between a forward, retracted loaded position and a rearwardly extending loading position;

e. means carried by said frame assembly at its rear end portions for arresting rearward movement of said ramp sections as said sections reach loading position, and for permitting downward pivoted movement of said sections relative to said frame assembly into the loading position;

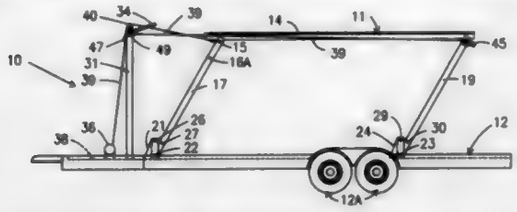
f. means associated with said two ramp sections for releasably securing same in extended planar relation while in the loading position; and

g. latching means carried by said rearmost ramp section for cooperating with said latch means of said sidewalls for securing said rearmost ramp section in an upright position while said ramp sections are in the retracted loaded position, whereby said upright ramp section will function as an end gate for said pick-up truck.

5,468,115
BILEVEL TRAILER WITH A LOWERABLE UPPER DECK

Brady A. Alvis, 298 69th St., North, Clearwater, Fla. 34624

Filed Dec. 2, 1994, Ser. No. 348,598
Int. Cl.[6] B60P 1/02
U.S. Cl. 414—556 8 Claims



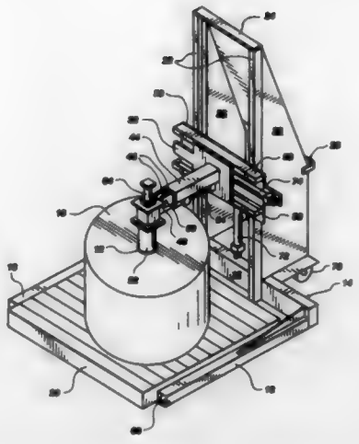
1. A bilevel trailer comprising in combination,
(a) a lower level having load carrying means thereon and including ground wheels,
(b) an upper level having an upper position spaced vertically above said lower level and a lower position in which said upper level rests on and is solely supported by said lower level,
(c) a pair of laterally spaced and parallel forward posts including means pivotally connecting the same to both said levels adjacent the forward end of said levels,
(d) a pair of laterally spaced and parallel rearward posts including means pivotally connecting the same to both said levels adjacent the rearward end of said levels with said rearward posts being maintained in a continuous parallel relationship with said forward posts while the upper level is moved between its upper and lower positions,
(e) releasable locking means for locking said posts in an upright position for holding said upper level in its upper position and for unlocking said posts whereby said upper level can move to its lower position resting on said lower level, and
(f) moving means for moving said upper level between its upper and lower positions and for pivoting said posts about said pivotally connecting means while maintaining said posts and said levels in a parallelogram configuration,
(1) said moving means including a winch means, a single elongated cable operatively connected to said winch means and pulley means connecting said cable to said posts.

5,468,116
MANIPULATION AND TRANSPORT DEVICE FOR ROLLED MATERIALS

Ronald E. Reichert, South Orem, and Donald Beuch, South Midvale, both of Utah, assignors to RTI Corporation, Orem, Utah

Continuation of Ser. No. 55,219, Apr. 29, 1993. This application Feb. 21, 1995, Ser. No. 391,643
Int. Cl.[6] B66C 1/54
U.S. Cl. 414—607 17 Claims

1. A device for the transport of rolled materials having a hollow core, said device comprising:
a moveable support;
at least one rigid vertical support member mounted on the moveable support;
at least one horizontal member mounted to the at least one vertical support member to selectively move thereon in a vertical dimension;
lifting means for selectively causing the horizontal member to raise and lower;
an elongate, selectively expandable mandrel mounted at one end to the at least one horizontal member to selectively pivot vertically, to selectively move linearly in a lateral direction with respect to the at least one vertical support member, and to selectively frictionally couple to the core of rolled material by radial expansion therein and to release the core by contracting therein;

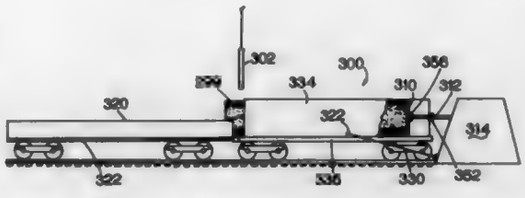


means for selectively moving the mandrel linearly in a lateral direction with respect to the at least one vertical support member;
means for causing the mandrel to selectively expand or contract radially; and
means for causing the mandrel to selectively pivot in the vertical dimension.

5,468,117
HEATING OF TANK CAR WALLS FOR EJECTING FROZEN OR CONGEALED CARGO

Mikhail A. Lobko, and Irina P. Lobko, both of 12372 Bennington Pl., Apt. 24, St. Louis, Mo. 63146

Filed Sep. 8, 1994, Ser. No. 303,235
Int. Cl.[6] B65G 67/24
U.S. Cl. 414—786 6 Claims



1. A method for unloading a cold solidified oil or chemical cargo load from a tank car, comprising the steps of:
a. providing a tank car mounted upon a wheeled chassis for land transportation, wherein the tank car comprises an approximately cylindrical cargo tank enclosed within a longitudinal wall, a first end wall, and a second end wall which can be temporarily opened and moved to a non-obstructing position, thereby providing an opening which allows ejection of the cold solidified cargo from the tank while the cargo remains in a solidified state;
b. heating a substantial portion of the longitudinal tank wall to an extent that generates a layer of melted liquified oil or chemical immediately adjacent to the longitudinal tank wall without causing substantial thawing of remaining cargo which remains in solidified form surrounded by the layer of liquified fluid;
c. applying sufficient force to a first end of the cold solidified cargo to eject the cold solidified cargo out of the cargo tank through the opening created by movement of the second end wall away from the longitudinal wall, wherein the cold solidified cargo is received by a suitable receiving device positioned at a height which minimizes bending forces from being imposed on the longitudinal wall of the cargo tank during ejection of the cold solidified cargo from the cargo tank.

5,468,118

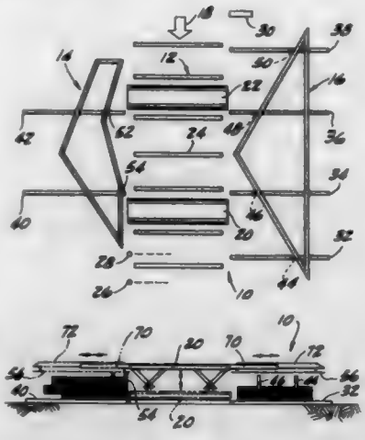
APPARATUS FOR STACKING WOOD ROOF TRUSSES

Robert A. LePoire, Okemos, Mich., assignor to Mitek Holdings, Inc., Wilmington, Del.

Filed Nov. 17, 1993, Ser. No. 154,342

Int. Cl.[6] B65G *57/03;57/16*

U.S. Cl. 414—788.9 **16 Claims**



1. Apparatus for stacking wood roof trusses horizontally into bundles suitable for banding, said apparatus comprising, in combination, a stacking station, conveyor means adapted to convey roof trusses individually and in a horizontal plane along an axis to a position adjacent said stacking station, transporter means positionable in a home position adjacent said stacking station and below said plane, means for raising said transporter means so as to engage a truss and raise the entire truss above said plane, means effective to move the transporter means and raised truss carried by said transporter means perpendicular to said axis off of said conveyor means to a position above said stacking station, means for lowering said transporter means and truss onto said stacking station to deposit the truss at the stacking station and means for returning the transporter means to its home position.

5,468,119

PERIPHERAL PUMP, PARTICULARLY FOR FEEDING FUEL TO AN INTERNAL COMBUSTION ENGINE FROM A FUEL TANK OF A MOTOR VEHICLE

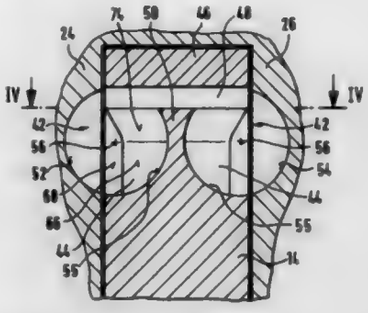
Michael Huebel, and Klaus Reymann, both of Gerlingen, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 3, 1994, Ser. No. 191,003

Claims priority, application Germany, Mar. 9, 1993, 43 07 353.0

Int. Cl.[6] F04D *5/00*

U.S. Cl. 415—55.1 **13 Claims**



1. Peripheral pump comprising

an impeller rotatable in a rotation direction, having a rotation axis and including a central hub portion, an outer peripheral closed ring and a plurality of blades in a peripheral portion thereof and spaced from each other in the rotation direction of the impeller, said blades connecting said outer peripheral closed ring and said central hub portion so as to form a plurality of intervening spaces, each of said intervening spaces being located between adjacent ones of said blades;

a pump chamber having at least one chamber wall facing in a direction of said rotation axis, said impeller being positioned in said pump chamber, and said at least one chamber wall having a ring-shaped duct therein spaced radially from said rotation axis to a same extent as said blades are spaced from said rotation axis and said ring-shaped duct extending radially only from said central hub portion to said outer peripheral closed ring so that said ring-shaped duct has a radial extent equal to that of said blades;

wherein a front side of each of said blades facing in said rotation direction of said impeller has a planar front surface extending from said central hub portion to said outer peripheral ring; and

wherein a rear side of each of said blades facing opposite to said rotation direction of said impeller has at least one blade edge surface inclined relative to said at least one chamber wall and pointing to said at least one chamber wall in said rotation direction of said impeller, at least in an edge region of said blade, to prevent turbulent flow in said intervening space.

5,468,120

MULTIPLE-PURPOSE UTILITY VEHICLE

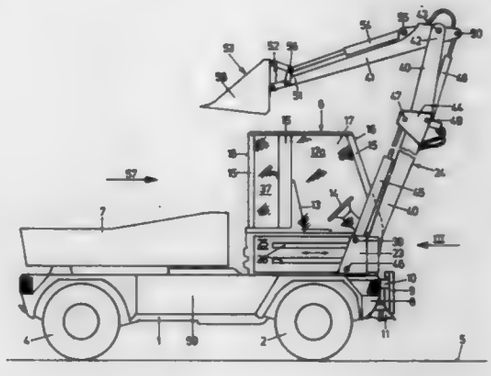
Adolf Krob, Konz-Niedermenning, Germany, assignor to Faun GmbH, Germany

Filed Apr. 29, 1994, Ser. No. 235,685

Claims priority, application Germany, May 15, 1993, 43 16 364.5

Int. Cl.[6] B60P *1/54*

U.S. Cl. 414—695 **6 Claims**



1. A multiple-purpose utility vehicle comprising:

a vehicle frame (**1**);

front wheels (**2**, **3**);

rear wheels (**4**), said front wheels (**2**, **3**) and said rear wheels (**4**) supporting said vehicle frame (**1**) on the ground and defining a contact surface;

a direction of forward travel (**57**);

a driver's cabin (**6**) extending over a part of and being stationary with respect to said vehicle frame (**1**) and having a front wall (**16**), a side wall (**17**) and a rear wall (**18**); a holding device (**23**) in the vicinity of said side wall (**17**) of the driver's cabin (**6**), the holding device (**23**) having a guide rail (**25**) which extends along the driver's cabin (**6**) substantially in the direction of travel (**57**) of the vehicle and which is stationary with respect to the frame (**1**), and a supporting carriage (**27**) which is displaceably guided on the guide, rail (**25**) in the direction of travel (**57**);

a working boom (**24**) which is supported on the supporting carriage (**27**) and which is pivotable by more than 240° about a rotational axis (**38**) perpendicular to the contact surface

from a position oriented in the direction of travel (57) of the vehicle and forward of the front wall (16) into a position opposite to the direction of travel (57) and backward of the rear wall (18) and which working boom (24) has a free outer end (51) and is pivotably movable by pivoting actuators (45, 48, 54);

a rotary actuator (35) on said supporting Carriage (27) positioning said working boom (24) about said rotational axis (38); and

a tool (53) which is attached to the free outer end (51) of the boom (24).

5,468,121

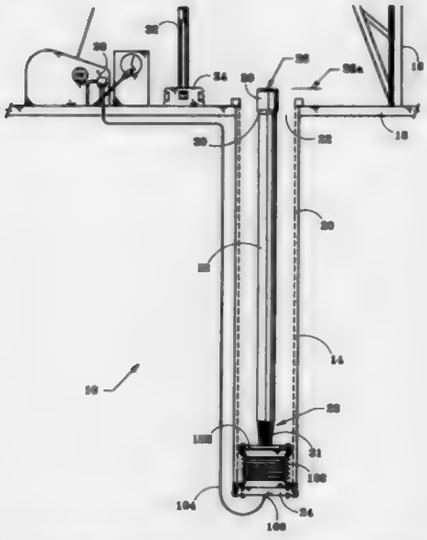
APPARATUS AND METHOD FOR POSITIONING DRILL PIPE IN A MOUSEHOLE

Huey Stogner, P.O. Box 803, Houston, Tex. 77001

Filed Feb. 8, 1994, Ser. No. 193,260

Int. Cl.[6] E21B *19/00*

U.S. Cl. 414—745.2 **13 Claims**



1. An apparatus for positioning drill pipe in a mousehole including a longitudinal cylindrical sleeve having an open top end adjacent a drilling rig floor and a bottom end depending therefrom, comprising:

a lifting member mountable in the mousehole having a surface for engaging a lower ,end of a drill pipe received in the mousehole; and

an elevator for raising and lowering the lifting member with respect to the bottom end of the mousehole to elevate an upper end of the drill pipe with respect to the top end of the mousehole.

5,468,122

UNIFORM MECHANICAL WET GRAIN UNLOADING SYSTEM

Larry Van Fossen, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

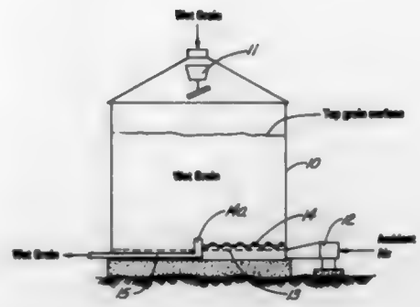
Filed Jun. 27, 1994, Ser. No. 265,914

Int. Cl.[6] B65G *65/30*

U.S. Cl. 414—786 **1 Claim**

1. A process for uniformly removing wet grain from a wet grain container having a top and bottom, the process comprising the steps of:

supporting the wet grain on a horizontal perforated floor disposed above the bottom of the grain container;



providing a continuous upward flow of ambient air in a path through the perforated floor and upwardly through the wet grain in the grain container, wherein the ambient air flow is about ½ cubic feet per minute per bushel of wet grain in the grain container;

removing a layer of wet grain that has relatively uniform thickness from an area immediately above the perforated floor; and

discharging the removed wet grain from the grain container.

5,468,123

SYSTEM FOR VENTILATING THE TURBINE DISKS AND STATOR OF A TURBO JET ENGINE

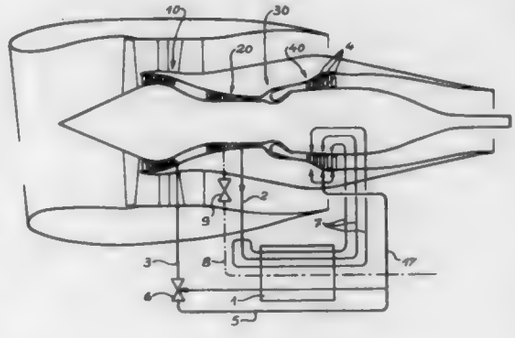
Michel Guimier, Mormant, and Philippe M. Paris, Le Mee Sur Seine, both of, France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "Snecma", Paris, France

Filed Jul. 26, 1994, Ser. No. 280,541

Claims priority, application France, Aug. 5, 1993, 93 09657

Int. Cl.[6] F01D *5/08;25/12*

U.S. Cl. 415—178 **5 Claims**



1. A system for ventilating disks and a turbine stator of a turbo jet engine and including:

a first sampling of high pressure air at a relatively high temperature for cooling the disks,

a sampling of low pressure air at a relatively low temperature for cooling the stator,

a heat exchanger applied to these two air samplings so as to cool the hot air existing at high pressure, the cold air at low pressure thus being reheated so as to allow for optimal cooling of the disks and stator during full capacity operating phases of the turbo jet engine, wherein, with the first high pressure air sampling being divided into several cooling tubes, the system has:

a branch circuit connection placed on the low pressure sampling so as to short-circuit the heat exchanger, and

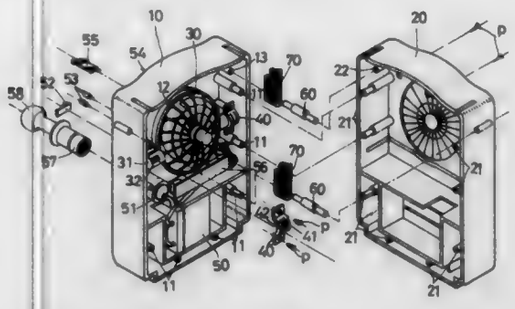
a valve placed upstream of the branch circuit connection and controlled in such a way as to regulate feeding of this branch circuit connection according to the capacity of the turbo jet engine.

5,468,124

PORTABLE ELECTRIC FAN

Guey-Shin Chen, 58, Ma Yuan West St., Taichung, Taiwan, Prov. of China

Filed Jul. 11, 1994, Ser. No. 272,844
Int. Cl.[6] F04D *25/08*
U.S. Cl. 416—63 **2 Claims**



1. A portable electric fan comprising:
a front housing and a rear housing matching each other;
a plurality of screws;
each of said front and rear housings having a plurality of stubs engaged with said screws to secure said front and rear housings together;
a fan device having two shafts extending outward therefrom, and each of said shafts having a plurality of notches formed transversely in an outer peripheral portion thereof;
an opening being formed in said front housing to match said fan device;
two fastening devices secured to said shafts respectively with said screws which are inserted and screwed into said stubs to support said shafts;
at least a battery being disposed in a lower portion of a hollow interior between said front and rear housings to provide electric energy for said fan device;
an electric board and a socket being disposed in a middle portion of said hollow interior between said front and rear housings;
at least a rod being disposed in an upper portion of said hollow interior between said front and rear housings; and
a strap device being engaged with said rod to carry said electric fan;
wherein said fan device is rotated about the axes of said shafts and is manually rotated to a predetermined angular position upwardly and downwardly by a user.

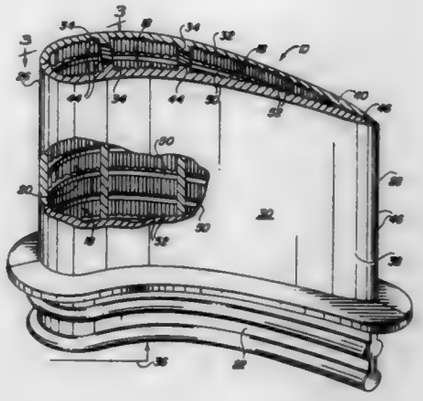
5,468,125

TURBINE BLADE WITH IMPROVED HEAT TRANSFER SURFACE

Nnaemhe Okpara, Peoria, and Chester L. Henry, Tempe, both of Ariz., assignors to AlliedSignal Inc., Morris Township, N.J.

Filed Dec. 20, 1994, Ser. No. 359,504
Int. Cl.[6] F01D *5/18*
U.S. Cl. 416—97 R **11 Claims**

1. In a turbo machinery blade having an internal flow path formed therein for flow-through passage of a cooling gas stream, the improvement comprising:
a heat transfer surface formed on said blade in a position lining at least a portion of said flow path;
said heat transfer surface including a plurality of turbulator vanes having a height to protrude partially into the flow path to disrupt flow of the cooling gas stream;
said heat transfer surface further including a plurality of heat transfer ribs formed in sets disposed between adjacent pairs of said turbulator vanes and extending generally parallel to the direction of flow of the cooling gas stream through said flow path, said heat transfer ribs protruding partially into the flow path with a height substantially less than the height of said turbulator vanes.

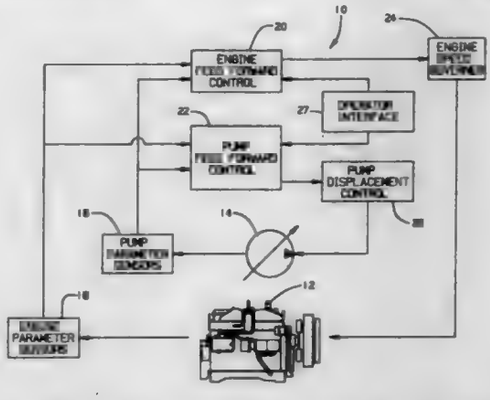


5,468,126

HYDRAULIC POWER CONTROL SYSTEM

Michael S. Lukich, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 23, 1993, Ser. No. 173,453
Int. Cl.[6] F04B *49/00*
U.S. Cl. 417—53 **29 Claims**



1. An apparatus for controlling a hydraulic system having an engine and a variable displacement pump, comprising:
one or more pump sensors each connected to the variable displacement pump for sensing a pump operating parameter level and responsively producing pump signals;
a fuel control means for controlling the amount of fuel injected into the engine, said fuel control means including an electronic governer control for producing a fuel signal;
an engine feedforward means for receiving pump signals from one or more of the pump sensors and responsively processing said pump signals to produce a supplemental fuel signal, said engine feedforward means being a control of the proportional, integral, derivative type; and
means for combining said fuel signal and said supplemental fuel signal to produce a supplemented fuel signal.

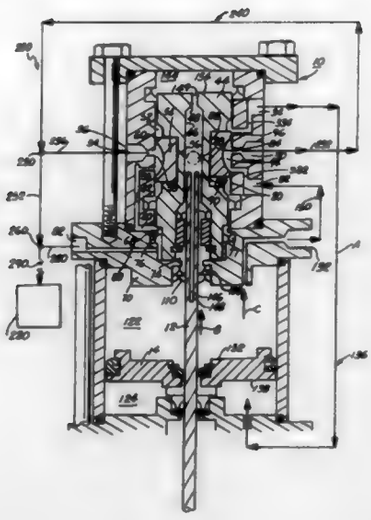
5,468,127

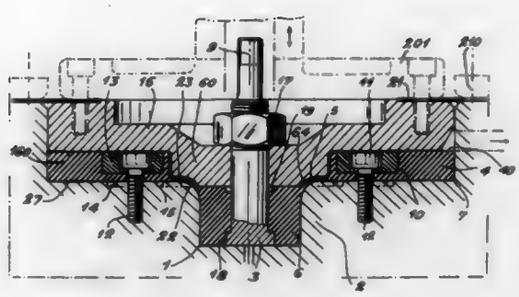
PILOT CONTROL VALVE HAVING MEANS FOR RECOVERING EXHAUST FLUIDS

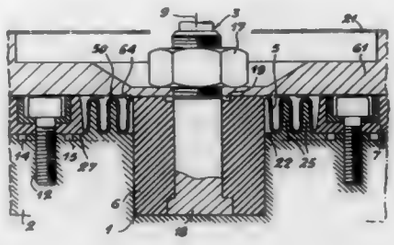
Andrew C. Elliott, New Orleans, and Ray A. Guccione, Marrero, both of La., assignors to CheckPoint Fluidic Systems International Ltd., New Orleans, La.

Filed Jan. 31, 1995, Ser. No. 381,557
Int. Cl.[6] F04B *9/08*; **F15B** *9/08*
U.S. Cl. 417—53 **28 Claims**

1. A pilot control valve having means for recovering exhaust fluids, comprising:







(a) a valve body having a longitudinal bore therein;
(b) inlet means for communicating control fluid to said bore;
(c) a valve means disposed in said bore and shiftable in said bore between first and second positions thereof, said valve means having position means for communicating said control fluid from said bore to a longitudinal movement means, said longitudinal movement means being disposed proximate said valve means and movable by said control fluid from a first position of said longitudinal movement means to a second position of said longitudinal movement means for contacting a first pressure receiving surface included with said valve means for initially moving said valve means from its first position, said valve means moving to a first position intermediate said first and second positions of said valve means after initial movement of said valve means for communicating said control fluid from said bore to a second pressure receiving surface included with said valve means for moving said valve means to its second position;
(d) exhaust fluid recovery means in fluid communication with said bore in all said positions of said valve means.

5,468,128
SEALED PISTON PUMP

Karim Benallikhodja, Valence, France, assignor to IMAJE, Bourg les Valence, France

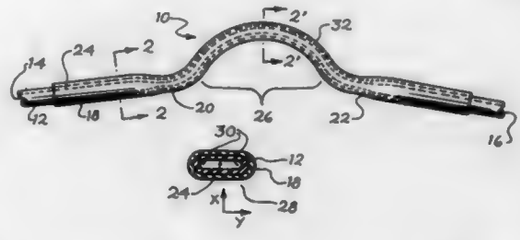
Filed Nov. 23, 1993, Ser. No. 157,382
Claims priority, application France, Nov. 27, 1992, 92 14333
Int. Cl.[6] F04B *17/00*
U.S. Cl. 417—413.1 **10 Claims**

1. A sealed piston pump comprising a pump body with an open cavity hollowed out in the center of a face of the pump body, at least two holes being pierced on said face, wherein said sealed piston pump furthermore comprises a circular single-piece set formed by:
a central cylindrical piston having dimensions substantially equal to those of said cavity, coupled by means of a rod to a driving member that works in an alternating motion along its longitudinal axis, in said cavity between a low position defined by the bottom of the cavity and a high position defining a chamber with variable volume;
a ring, having dimensions substantially equal to those of the face of said pump body, there being positioned and hollowed, on a face of the ring opposite said pump body, an annular channel whose bottom is perforated at the position of the holes of the pump body;
a deformable thinned part, connecting an upper rim of said piston to the internal circumference of said ring and perfectly matching the shape of the neck of said cavity when the piston is in the low position; and wherein said pump body and said single-piece set are fixedly joined in an imperviously sealed way.

5,468,129
PERISTALTIC PUMP

Bengt Sundén, Älvsjö ; Bo Forsström, Stockholm, both of, Sweden; Charles E. Soderquist, Barrington, and Steven D. Storckman, Glen Ellyn, both of Ill., assignors to Cole Parmer Instrument Company, Niles, Ill.

Filed Aug. 5, 1994, Ser. No. 286,884
Int. Cl.[6] F04B *43/08*
U.S. Cl. 417—477.12 **23 Claims**



1. A pumptube suitable for use in a peristaltic pump having a pumptube passageway and a plurality of pressure rollers for contacting and compressing the pumptube whereby a fluid can be transferred, said pumptube comprising
(a) inlet and outlet ends;
(b) a pumping section located between the inlet and outlet ends; and
(c) a fluid passageway extending through the pumptube from the inlet end to the outlet end;
wherein at least the pumping section of the pumptube comprises an inner tube contained within an outer tube, wherein the inner tube is a first rigid fluoroplastic tubing and the outer tube is a second rigid fluoroplastic tubing such that the outside diameter of the inner tube and the inner diameter of the outer tube are closely matched, and wherein the pumptube is preformed to fit within pumptube passageway such that the pumptube within the pumping section is flattened into an oval-like shape with an oval-like fluid passageway such that the pressure rollers contact and compress the pumping section of the pumptube essentially along the flattened side of the oval-like shape; and
wherein said pumptube is prepared by a method comprising

(a) forming a length of tubing comprising at least an inner tube within an outer tube, wherein the inner tube is a rigid fluoroplastic tube and the outer tube is a rigid fluoroplastic tube, wherein the inside diameter of the outer tube and the outside diameter of the inner tube are closely matched, and wherein the length of tubing has a fluid passageway extending throughout the length of the tubing;

(b) heating a central portion of the length of tubing to a temperature in the range of about 375° to 600° F.;

(c) shaping the heated central portion of the length of tubing to conform approximately to the configuration of the pumptube passageway in the peristaltic and to have a flattened, oval-like shape with an oval-like fluid passageway such that the pressure rollers of the peristaltic pump will contact and compress the flattened side of the flattened, oval-like shape and the oval-like fluid passageway when the pumptube is installed in the peristaltic pump; and

(d) cooling the shaped length of tubing to a temperature below which the flattened, oval-like shape and oval-like fluid passageway are maintained in the pumptube.

5,468,130

COATING STRUCTURE FOR A MOVABLE MEMBER IN A COMPRESSOR

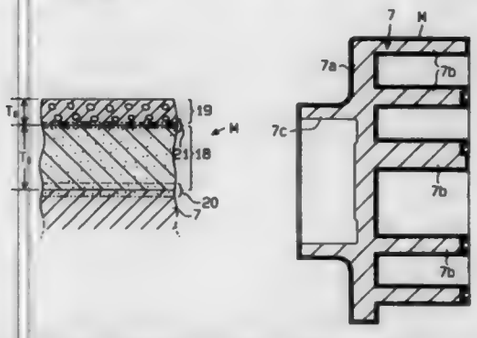
Kiyohiro Yamada; Masao Iguchi; Izuru Shimizu, and Yasushi Watanabe, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Aug. 22, 1994, Ser. No. 293,645

Claims priority, application Japan, Aug. 23, 1993, 5-208062

Int. Cl.[6] F01C *1/04*

U.S. Cl. 418—55.2 **23 Claims**



1. A compressor having a movable member that slides on a fixed member, said compressor comprising:

said movable member being made of aluminum alloy;

an inner layer coating said movable member, said inner layer being made of a material capable of adhering to the aluminum alloy; and

an outer layer coating said inner layer and contacting the fixed member, said outer layer having greater hardness than the inner layer.

5,468,131

METHOD FOR COOLING THE SHAFT OF A GEAR PUMP ROTOR, A GEAR PUMP ROTOR, AND A GEAR PUMP COMPRISING SUCH A ROTOR

Peter Blume, Zürich, and Roger Stehr, Bülach, both of, Switzerland, assignors to MAAG Pump Systems AG, Zurich, Switzerland

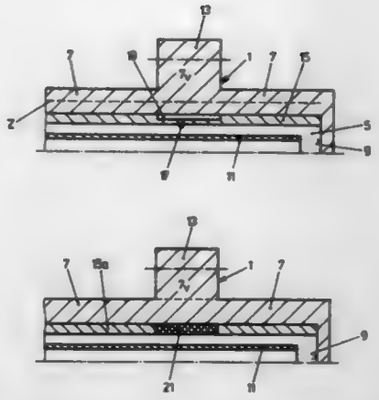
Filed Feb. 17, 1995, Ser. No. 390,018

Claims priority, application European Pat. Off., Feb. 17, 1994, 94102363

Int. Cl.[6] F01C *21/06*

U.S. Cl. 418—94 **14 Claims**

1. Method for cooling a shaft of a gear pump rotor in which a cooling medium is driven axially through the shaft, wherein a lower heat conduction to the cooling medium per axial dimension unit is established in a toothed area of the shaft than in other shaft areas to be cooled.



5,468,132

WATER TURBINES

Michael James Snell, Gloucester, and Leonard Stanley Snell, Bristol, both of, England, assignors to Snell (Hydro Design) Consultancy Limited, Stroud, England

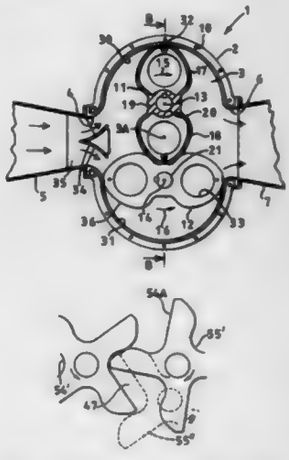
PCT No. PCT/GB92/01999, § 371 Date May 24, 1994, § 102(e) Date May 24, 1994, PCT Pub. No. WO93/14314, PCT Pub. Date Jul. 22, 1993

PCT Filed Nov. 2, 1992, Ser. No. 244,493

Claims priority, application United Kingdom, Jan. 7, 1992, 9200217

Int. Cl.[6] F01C *1/24*

U.S. Cl. 418—206 **8 Claims**



1. A water turbine comprising a turbine chamber (3), at least one inlet port and at least one outlet port (4, 6) opening into the chamber (3) for the passage of inlet and outlet water flows, and rotors (11, 12) arranged within the chamber (3) with their axes of rotation (13, 14) parallel so as to be rotatable by the inlet water flow, each of the rotors (11, 12) having two or more substantially equiangularly distributed lobes (17, 18) and the arrangement being such that adjacent rotors rotate in opposite directions with their lobes in mesh with one another, wherein each lobe of each rotor has a profile which is recessed at its trailing edge relative to a normal meshing lobe profile so as to define between the rotors a space (47) for taking up water trapped between the meshing lobes such that the volume of the space (47) does not decrease during rotation of the rotors, and wherein the overall throughflow cross-section of said at least one inlet port (4) is less than the overall throughflow cross-section of said at least one outlet port (6) so as

to ensure that the velocity of inlet water flow is high in relation to the velocity of outlet water flow.

5,468,133

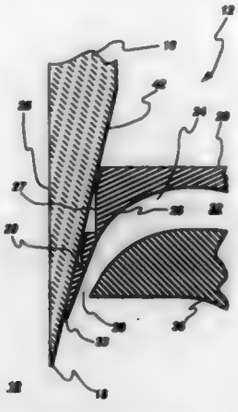
GAS SHIELD FOR ATOMIZATION WITH REDUCED HEAT FLUX

Steven A. Miller, Amsterdam, N.Y.; David P. Mourer, Danvers, Mass., and Milivoj K. Brun, Ballston Lake, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 920,067, Jul. 27, 1992, abandoned. This application Feb. 14, 1994, Ser. No. 195,179

Int. Cl.[6] B22F *9/08*

U.S. Cl. 425—7 **5 Claims**



1. A close coupled gas atomization apparatus for atomization of metals having melting temperatures above 1000° C. wherein the apparatus comprises a melt guide means, including a melt guide tube having an orifice, a gas distribution means, and a gas supply means, the gas distribution means being operatively connected to the gas supply means to receive gas therefrom and being operatively positioned relative to the melt guide means to direct gas to a metal melt exiting downwardly from the orifice thereby atomizing the metal melt, the gas distribution means comprising:

means, operatively disposed about the melt guide tube orifice, for directing atomizing gas into an atomization zone for atomizing melt flowing from the melt guide tube, the directing means including a gas plenum for distributing the atomizing gas around the melt guide tube, a gas orifice operatively positioned relative to the atomization zone and a gas shield having a lower end in contact with the melt guide tube and being operatively located between the melt guide tube and the gas orifice for shielding the atomizing gas from heat orginating in the melt flowing through the melt guide tube, the gas shield having at least two parallel annular grooves, operatively positioned in a surface of the gas shield most proximate the melt guide tube and above the lower end, for reducing the amount of heat conducted from the melt flowing through the guide tube to the gas distribution means wherein freeze-off in the melt guide tube is prevented.

5,468,134

COOLING AND THICKNESS CONTROL FOR EXTRUDED PRODUCTS

Robert E. Cree, 127 Bartle Ave., Newark, N.Y. 14513

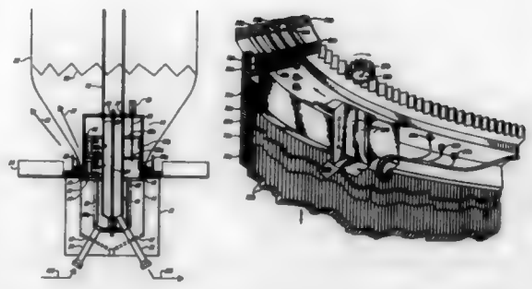
Filed Dec. 1, 1993, Ser. No. 160,233

Int. Cl.[6] B29C *55/28*

U.S. Cl. 425—72.1 **31 Claims**

1. An air cooling device for an extrusion line for producing a running length of extrudate from a die,

said cooling device constructed to provide a distributed flow of cooling air contacting a surface of the extrudate at a region downstream from said die,



said cooling device having a series of adjustable members associated with respective zones of air flow for varying the volumetric flow at said zones, and

at least one movable actuator constructed to move serially from one zone to another and, at each zone, constructed to adjust the position of the respective adjustable member to adjust the volumetric flow in said zone.

5,468,135

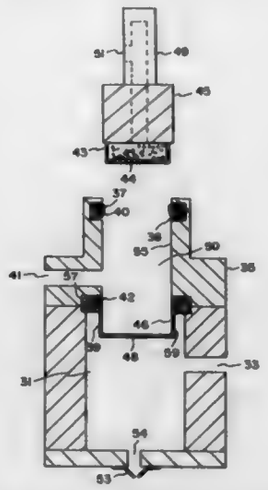
APPARATUS FOR MANUFACTURE OF CONTAINERS FOR MATERIALS BEING HEATED

James E. Thomas, Monroe, N.C., assignor to CEM Corporation, Matthews, N.C.

Division of Ser. No. 867,891, Apr. 13, 1992, Pat. No. 5,252,274. This application Oct. 4, 1993, Ser. No. 131,008

Int. Cl.[6] B29C *43/36*

U.S. Cl. 425—85 **20 Claims**



1. An apparatus for manufacturing containers of a material selected from the group consisting of microfibers of quartz, glass and mixed quartz and glass, which containers can be subsequently sintered so as to be useful for holding materials to be heated, which comprises:

1)complementary female and male molds, each of which has complementary bottom and side walls of microporous material that are permeable to water;

2) means for delivering a dilute dispersion of microfibers of a material selected from the group consisting of quartz, glass and mixed quartz and glass to the interior of the female mold;

3) a vacuum chamber which is external to the female mold and which communicates with the exterior thereof, which vacuum chamber is large enough to hold the water from said dilute aqueous dispersion, which dispersion is that which contains an amount of microfibers sufficient to form said container;

4) means for applying and releasing a pressure differential between the interior and exterior of the female mold, with the higher pressure being on the interior, so as to draw water from said dispersion through the mold and to deposit said microfi-

bers on the female mold interior, and subsequently to facilitate release of said formed container;

5) means for moving the male mold substantially vertically into the female mold so that it is in contact with the formed container in the female mold, and for withdrawing the male mold from the female mold, with the formed container on the male mold, after release of the pressure differential between the interior and exterior of the female mold, so that the interior of the container is finished;

6) means for applying vacuum to the interior of the male mold, to promote adherence of the container to the male mold during said withdrawal from the female mold;

7) means for applying a pressure differential between the interior and exterior of the male mold, with the higher pressure being on the interior thereof, to release the container from the mold after withdrawal from the female mold; and

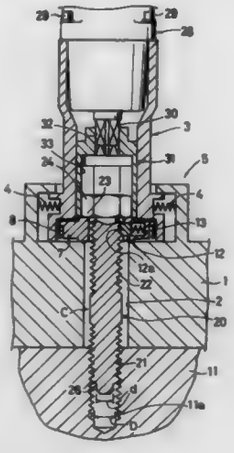
8) a smoothing form, of shape conforming to the container exterior, which is positioned about the line of travel of the container, as said container is withdrawn from the female mold on the male mold, so that the exterior of the container is smoothed by the form as the container passes through said form.

5,468,136

CLAMPING APPARATUS

Akira Arisato, and Keitaro Yonezawa, both of Kobe, Japan, assignors to Kabushiki Kaisha Kosmek, Japan

Filed Jul. 29, 1994, Ser. No. 282,544
Claims priority, application Japan, Jul. 30, 1993, 5-208549
Int. Cl.[6] B29C *33/30*
U.S. Cl. 425—192 R **8 Claims**



1. A clamping apparatus comprising:

a base (1) provided with a through hole (2) having a first end and a second end;

a first internally threaded member (11) arranged to face the first end of the through hole (2);

a second internally threaded member (12) supported by the base (1) adjacent the second end of the through hole (2);

a clamp rod (20) inserted into the through hole (2);

an alignment clearance (C) provided between the through hole (2) and the clamp rod (20);

the clamp rod (20) being provided with a first external thread (21) adapted to engage with the first internally threaded member (11), a second external thread (22) adapted to engage with the second internally threaded member (12), a pressing portion (23) adapted to press the base (1) from the second end of the through hole (2) and a rotating portion (24); and

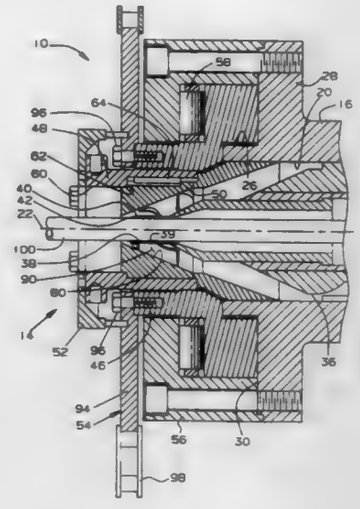
a rotating means (28) supported by the base (1) to rotate the rotating portion (24).

5,468,137

APPARATUS FOR EXTRUDING A VISCOUS MATERIAL

David C. Becktel, East Peoria; Harry B. Newman, Washington, and Phillip E. Moldenhauer, Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Aug. 16, 1993, Ser. No. 106,677
Int. Cl.[6] B29C *47/24*
U.S. Cl. 425—381 **4 Claims**



1. An apparatus for extruding a hose liner made of a viscous material containing discontinuous reinforcing fibers, said extruding apparatus having an inlet end, an outlet end, a main body having an inner body surface defining a body bore having an axis, an inlet passage opening into said body bore, a mandrel, and a helicoid assembly being mounted along the axis of the body bore, the apparatus further comprising;

an extruder head assembly rotatably connected adjacent the outlet end to the body;

an extruding die having a die body, said die body defining an extruding passage, said extruding passage defined by an inner surface including a generally cylindrical surface adjacent the outlet end, said cylindrical surface defining an exit diameter having a preselected cross-sectional area, and a generally conical surface decreasing in diameter towards the outlet end of the apparatus until the generally conical surface connects to the exit diameter, said extruding passage defining an extruding space in communication with the body bore and said inlet passage so that viscous material is extruded onto the mandrel from the extruding passage, said helicoid assembly including a tubular nose defining a helicoid bore, an outer peripheral cylindrical surface and a distal end, said helicoid bore being in axial alignment with the axis of the body bore, said outer peripheral surface defining a preselected diameter, said nose being disposed within the extruding passage of the extruding die with the distal end being adjacent said exit diameter, said extruding die being connected to and rotatable with the rotating extruder head assembly;

a plurality of helical vanes connected to and extending from the die body inward into the extruding passage for spirally orientating discontinuous reinforcing fibers within the viscous material, said helical vanes being disposed at a helix angle in the range of about 40 to about 70 degrees with respect to the axial center line of the extruding die and said helical vanes reducing in width toward the exit diameter;

said mandrel extending coaxially through the helicoid bore and the extruding die passage, said mandrel being axially moveable toward the outlet end of the apparatus; and

means for rotating the extruder head assembly relative to the extruding body.

5,468,138

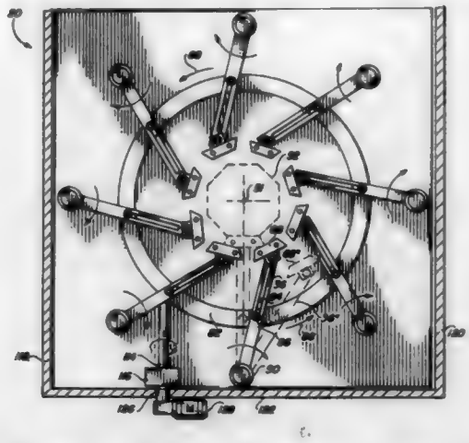
APPARATUS FOR STRETCHING POLYMER FILMS

Charles F. Bosse, and Rajagopal R. Kowligi, both of Tempe, Ariz., assignors to IMPRA, Inc., Tempe, Ariz.

Division of Ser. No. 977,562, Nov. 17, 1992, Pat. No. 5,321,109. This application Mar. 29, 1994, Ser. No. 219,447

Int. Cl.[6] B29C 55/10;55/16;55/20

U.S. Cl. 425—383 11 Claims



1. An apparatus for uniformly expanding a polymer film in multiple directions, the polymer film having a center, the apparatus comprising in combination:

a. a plurality N of symmetrically-disposed expansion arms, each expansion arm having first and second opposing ends, and each of said expansion arms being pivotally mounted for pivoting the second ends of each expansion arm toward or away from the center of said film;

b. a plurality N of film gripping members, each of said film gripping members being adapted to releasably engage a peripheral portion of the film to be expanded, and each of said film gripping members being pivotally secured to the second end of an associated expansion arm;

c. pivot means for simultaneously pivoting the plurality N of expansion arms in a direction for uniformly moving the second ends of said expansion arms away from the center of the film; and

d. each of said film gripping members pivoting as its associated expansion arm pivots away from the center of the film to continuously maintain the stretching force applied by each film gripping member along a radial path extending outward from the center of the film.

5,468,139

HEATING ENCLOSURE WITH A THERMOFORMING INSERT

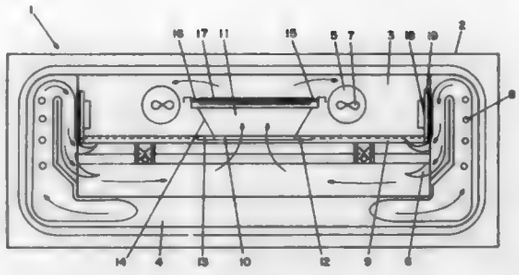
Adolf Stender, Duderstadt, Germany, assignor to Otto Bock Orthopaedische Industrie Besitz- und Verwaltungs-KG, Duderstadt, Germany

Filed May 10, 1994, Ser. No. 240,366

Claims priority, application Germany, May 10, 1993, 9307066 U

Int. Cl.[6] B29C 51/42

U.S. Cl. 425—383 6 Claims



1. A heating enclosure for producing thermoformed plastic shanks, comprising:

a) an approximately funnel-shaped thermoforming insert which is adapted to be fixed in an upright position in an interior space of the enclosure, wherein said insert is adapted as an air flow guidance device, said funnel-shaped insert having a lower opening with a first funnel diameter which defines an air flow inlet, said funnel-shaped insert having an upper opening with a second funnel diameter which defines an air flow outlet, said second funnel diameter being larger than said first funnel diameter;

b) a sheet receiver arranged directly above the air flow outlet of said insert, said sheet receiver being structured to receive plastic sheets to be thermoformed in a substantially horizontal configuration; and

c) an air flow guidance means for guiding air in a closed circuit through the heating enclosure, said air flow guidance means comprising at least one upper air extraction opening arranged to extract air from said interior space of said enclosure, an air-recirculation duct arranged outside the interior space of the enclosure and connected to the at least one upper air extraction opening, an air recirculation fan arranged in the air-recirculation duct, a heater arranged in the air-recirculation duct, for heating the extracted air, and at least one lower air-blow-in opening connected to the air-recirculation duct, said lower air-blow-in opening leading into said enclosure interior space.

5,468,140

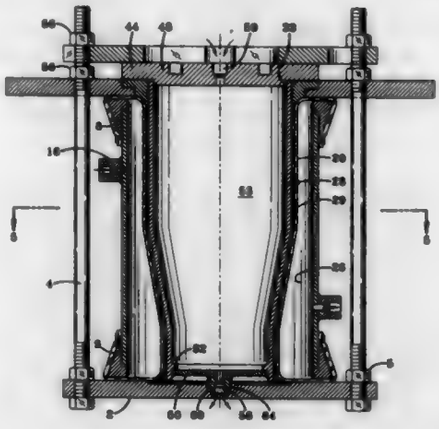
TAPERED AIRSLEEVE CURING PRESS

Keith E. Hoffman, Atlanta; Robert F. Elliott, Westfield, and David J. Mickler, Anderson, all of Ind., assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Apr. 1, 1992, Ser. No. 861,671

Int. Cl.[6] B29C 35/00

U.S. Cl. 425—389 9 Claims



1. An apparatus for curing a tapered elastomeric airsleeve including:

a) a top plate and a base;

b) a hollow support tube having top and bottom opposite open ends mounted between the top plate and base;

c) a cylindrical elastomeric bladder mounted inside said tube with corresponding top and bottom open ends forming an annular expansion chamber between said bladder and said tube;

d) means for sealing the open ends of the bladder with respect to the top plate and base to form a separate internal curing chamber within the expansion chamber;

e) a sleeve cartridge having a tapered outer contour with a cylindrical wall portion and an inwardly tapered wall portion

located within the curing chamber for slidably receiving a similarly contoured preshaped elastomeric airsleeve thereon; and

f) means for introducing a heated fluid into the expansion chamber to expand the bladder generally radially inwardly toward the sleeve cartridge to conform and cure the tapered airsleeve against the contour of said sleeve cartridge.

5,468,141

MOLD FOR INJECTION MOLDING OF THERMOPLASTIC RESIN

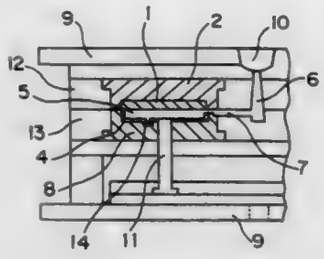
Hiroyuki Iwami, Osaka; Masayoshi Fukuoka, Yawata, and Hiroyuki Kanayama, Osakasayama, all of, Japan, assignors to Taiyo Manufacturing Works Co., Ltd., Osaka, Japan

Filed Jan. 18, 1994, Ser. No. 182,494

Claims priority, application Japan, Jan. 22, 1993, 5-009527

Int. Cl.[6] B29C *45/03*

U.S. Cl. 425—542 **13 Claims**



1. A mold for injection molding of a thermoplastic resin comprising a cavity block, a core block, and a cavity formed between the cavity block and the core block and adapted to be filled with a molten resin, wherein:

the cavity block includes an insulating layer on a cavity side thereof, the insulating layer being made of a material selected from the group consisting of ceramic materials, porcelain enamel, glass materials, heat resistant plastic materials and their composites;

the core block includes a release layer on a cavity side thereof, the release layer being made of a material selected from the group consisting of fluorocarbon resins, fluorocarbon resin composite materials, silicone resin composite materials and metal platings with fluorocarbon resin dispersion, the release layer further being adapted to effect both mold releasing and heat insulation; and

the molten resin filling the cavity is released more rapidly from the core block than from the cavity block.

5,468,142

GAS LIGHT CONTROL APPARATUS

Walter Koziol, Antioch, Ill., assignor to Modern Home Products Corp., Antoich, Ill.

Filed Feb. 8, 1994, Ser. No. 193,315

Int. Cl.[6] F23Q *9/14*

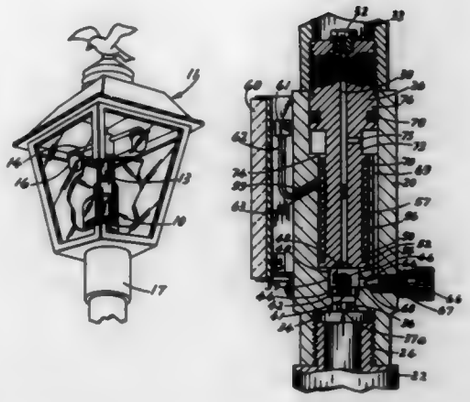
U.S. Cl. 431—18 **20 Claims**

1. A gas light control apparatus for effecting a dimming of the gas light under selected conditions comprising:

a body member adapted to be connected to a gas intake conduit of a gas lamp;

first and second passageways extending through said body member each having a gas input end and an output end;

a magnetically attractable ball member operatively positioned to open and close said gas input end of one of said first and second passageways, said magnetically attractable ball member composed of a plastic material having magnetically attractable metal carried by said plastic material;



magnetic means operatively associated with said ball member to magnetically attract said ball member to a position to close one of said first and second passageways; and

a solar cell connected to said magnetic means, said ball member being magnetically attractable to said magnetic means by current supplied solely by said solar cell.

5,468,143

GAS-FUELED INFRARED HEATER

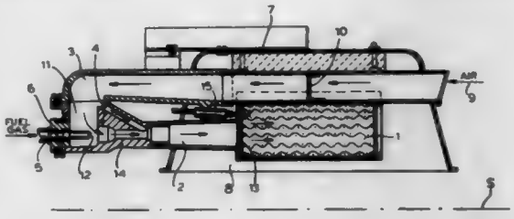
Horst Weber, Lüdenscheid, and Alfred Normann, Alsbach, both of, Germany, assignors to Colsman & Co. GmbH, Werdohl-Kleinhammer, Germany

Filed May 20, 1994, Ser. No. 246,666

Claims priority, application Germany, May 20, 1993, 43 16 946.5

Int. Cl.[6] F23D *14/16*

U.S. Cl. 431—243 **16 Claims**



1. A gas-fueled infrared radiator for heating purposes, in said radiator comprising:

a reflector;

a glow element in said reflector heated by combustion gases and radiating heat toward a surface to be heated and toward said reflector, said reflector radiating heat toward said surface;

means on said reflector receiving a fuel gas and air and generating combustion gases for heating said glow element;

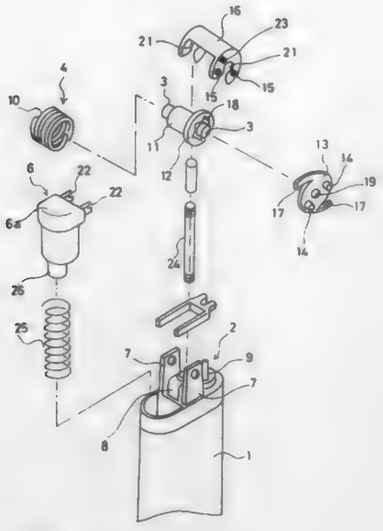
an air duct extending through said reflector in heat-exchanging relationship with said glow body for preheating of air from said glow body and connected to said burner for delivering preheated air thereto; and

a heat-resistant air filter in said duct in a region thereof heated by said glow element for filtering particulates from the air, filtered particulates on said filter being destroyed by heat from said glow element conducted to said filter.

5,468,144
GAS LIGHTER

Masayuki Iwahori, 15-19 Nakadahoncho, Shizuoka-shi, Shizuoka 422, Japan

Filed Jun. 24, 1994, Ser. No. 265,210
Claims priority, application Japan, Jun. 25, 1993, 5-180869
Int. Cl.[6] F23Q *1/04*
U.S. Cl. 431—254 **6 Claims**



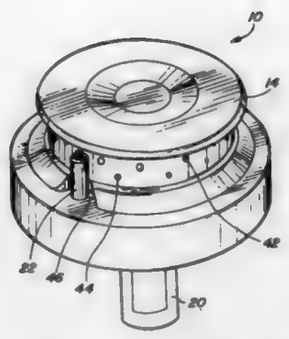
1. A gas lighter comprising:
a lighter body for retaining liquid gas and provided with gas injection means;
a push-down member depressably attached to said lighter body and urged in a direction opposite to a depressing direction by a returning elastic member, said push-down member having engage portions;
rotary ignition means rotatably attached to said lighter body, with a flint elastically abutting on said rotary ignition means, said rotary ignition means rubbing against said flint when being rotated;
a ratchet attached coaxially to said rotary ignition means and having a plurality of ratchet teeth on an inner surface thereof;
a rotary body attached to said ratchet coaxially and rotatably and having at least one engage pawl formed on an outer surface thereof, engageable with said ratchet teeth of said ratchet; and
a cover, attached to said lighter body for covering said rotary ignition means, said ratchet and said rotary body being rotatable together with said rotary body, said cover having engage shafts engageable with said engage portions of said push-down member which, when said push-down member is depressed, cause said cover and said rotary body to rotate in a first direction, thereby causing said engage pawl to engage with said ratchet teeth of said ratchet thereby rotating said ratchet and said rotary ignition means to make sparks, and wherein when said push-down member is released, said cover and said rotary body rotate in a second direction opposite said first direction, thereby disengaging said engage pawl from said ratchet teeth.

5,468,145
SEALED GAS BURNER ASSEMBLY

William J. Ferlin, Plymouth, Mich., assignor to Lincoln Brass Works, Inc., Detroit, Mich.

Filed Jan. 24, 1994, Ser. No. 185,464
Int. Cl.[6] F23Q *3/00*
U.S. Cl. 431—266 **14 Claims**

1. A gas burner assembly comprising:
a burner cap having a burner port section defining a plurality of burner ports, a skirted section having a localized recessed area

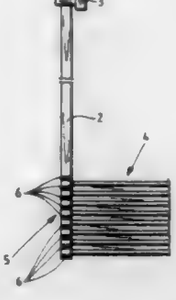


defining a harbor, and a base section, said skirted section being angularly disposed between said burner port section and said base section, said base section defining a shoulder having a first electrode aperture, said first electrode aperture located within said harbor defined by said skirted section;
a plate disposed within said base section, said plate in conjunction with said burner cap defining a gas chamber, said gas chamber being supplied with an air/gas mixture, said plate further defining a second electrode aperture in general alignment with said first electrode aperture; and
an electrode assembly extending through said first and second electrode apertures into said harbor formed by said skirted section of said burner cap, said electrode assembly being disposed outside of said gas chamber adjacent to said burner port section.

5,468,146
BILLET LIVE ROLLER FEED BED UPSTREAM OF COOLING BEDS

Hans H. Hartmann, Aliquippa, Pa.; Hans-Peter Drügh, Zülpich, and Hans J. Reismann, Düsseldorf, both of, Germany, assignors to SMS Schloemann-Siemag AG, Düsseldorf, Germany

Continuation of Ser. No. 881,446, May 11, 1992, abandoned.
This application Dec. 6, 1993, Ser. No. 163,196
Claims priority, application Germany, May 10, 1991, 41 15 363.4
Int. Cl.[6] B22D *47/00;* **F27D** *15/02*
U.S. Cl. 432—77 **5 Claims**



1. A billet live roller feed bed, arranged upstream of a cooling bed for transferring a plurality of billets onto the cooling bed, which extend transverse to said roller feed bed, said roller feed bed comprising transverse conveyor rollers for transferring the plurality of billets from the billet live roller feed bed in a conveyance direction onto the cooling bed,
wherein said conveyor rollers have an entry position configured at ends of said conveyor rollers remote from the cooling bed

and a braking position configured at ends of said conveyor rollers adjacent to the cooling bed, and

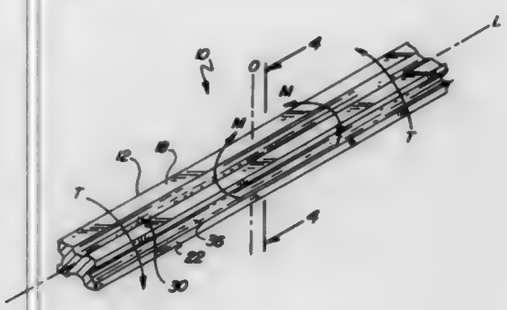
wherein said conveyor rollers have a first screw turn having a pitch proceeding from said entry position and corresponding at least to a largest occurring billet dimension, and a second screw turn extending in said brake position and having a zero pitch across a 180° sector of said conveyor rollers, whereby one of the plurality of billets dwells at said entry and brake positions while others of the plurality of billets are conveyed laterally between said entry and brake position and away from said brake position.

5,468,147

ORTHODONTIC WIRE

Stephen C. Yao, 2075 Sutter St., #503, San Francisco, Calif. 94115

Filed Jul. 21, 1994, Ser. No. 278,098
Int. Cl.[6] A61C *3/00*
U.S. Cl. 433—20 **3 Claims**



1. A orthodontic wire comprising:

a length of wire for use in the construction of an orthodontics structure wherein said wire extends through a tooth bracket secured to an individual tooth within a patient's mouth, said wire having an upper surface spaced from and parallel to a lower surface, and an outer surface spaced from and parallel to an inner surface;

said wire being symmetrically oriented about a longitudinal axis and having an upper longitudinal cutout extending along said upper surface of said wire and parallel to said longitudinal axis, and a lower longitudinal cutout extending along said lower surface of said wire and parallel to said longitudinal axis, wherein said upper longitudinal cutout defines an upper longitudinal groove, and said lower longitudinal cutout defines a lower longitudinal groove;

said wire further having an outer longitudinal cutout extending along said outer surface of said wire and parallel to said longitudinal axis, and an inner longitudinal cutout extending along said inner surface of said wire and parallel to said longitudinal axis, wherein said outer longitudinal cutout defines an outer longitudinal groove, and said inner longitudinal cutout defines an inner longitudinal groove.

wherein said longitudinal grooves cooperate with a shape of an exterior of the wire to define corner projections against which torquing forces can be applied to said wire.

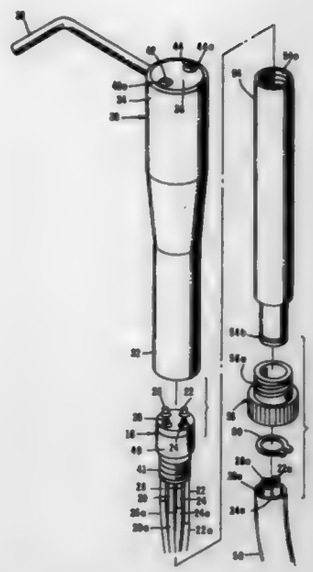
5,468,148

REMOTELY CONTROLLED DENTAL SYRINGE

Melvin D. Ricks, 245 Berkshire Ave., La Canada, Calif. 91011

Filed Dec. 28, 1993, Ser. No. 174,413
Int. Cl.[6] A61G *17/02;17/06*
U.S. Cl. 433—80 **18 Claims**

1. A dental syringe for controllably directing a flow of air and water into a patient's mouth from a remote source of air and water, said dental syringe comprising:



(a) a hand-held dispensing unit including:

(i) dispensing means for dispensing air and water, said dispensing means including a handle comprising a generally cylindrically shaped body portion having an axial center line and including an upper end portion, said handle further including a head portion disposed proximate said upper end portion, said head portion having a top surface extending generally perpendicular to said axial center line and being provided with first and second apertures, said dispensing means further including a dispensing tip connected to said head portion, and having an air outlet, a water outlet, and first and second control air passageways in communication with said first and second apertures; and

(ii) connector means associated with said dispensing means for interconnecting said air outlet and said water outlet thereof with the remote sources of air and water respectively, and for connecting said first and second control air passageways with the remote source of air;

(b) first valve means associated with said connector means for controlling the flow of air through said air outlet of said dispensing means in response to at least a partial closure of said first aperture to cause a restriction of the flow of air through said first control air passageway of said dispensing means; and

(c) second valve means associated with said connector means for controlling the flow of water through said water outlet of said dispensing means in response to at least a partial closure of said second aperture to cause a restriction of the flow of air through said second control air passageway of said dispensing means.

5,468,149

DUAL FUNCTION PROSTHETIC LOCKING DEVICE FOR ENDOSSEOUS DENTAL IMPLANTS

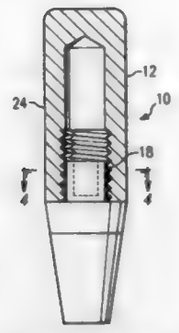
James V. D'Alise, 120 Oad Brook Center Mall, Oak Brook, Ill. 60521

Continuation of Ser. No. 944,091, Sep. 14, 1992, abandoned. This application Apr. 21, 1994, Ser. No. 232,448
Int. Cl.[6] A61C *8/00*
U.S. Cl. 433—173 **1 Claim**

1. A dual function prosthetic locking device for an endosseous dental implant body comprising:

a dental endosseous implant body to replace a natural tooth root having a rigid metal body placeable in the jaw bone,

said rigid metal body comprising a multi-sided receptacle formed from a plurality of walls with circular screw threads in



its inside diameter, said circular screw threads extending substantially the entire depth of the walls;

wherein said receptacle allows for a similarly threaded metal prosthetic attachment to be screwed into the metal body joining it as a unit;

wherein said receptacle of said metal body also allows a custom fitted metal prosthetic attachment with a multi-sided stem to be inserted into the implant body locking it into place with said multi-sided receptacle of the implant body so that the implant body and custom fitted metal prosthetic attachment function as one unit.

5,468,150

MEANS FOR FASTENING ARTIFICIAL TEETH

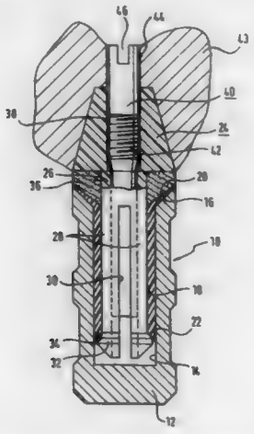
Dierk Brammann, Bramfelder Strasse 103a, D-22305 Hamburg, Germany

Filed Aug. 24, 1994, Ser. No. 295,301

Claims priority, application Germany, Jan. 21, 1993, 9316043 U

Int. Cl.[6] A61C *8/00*

U.S. Cl. 433—173 **17 Claims**



1. An apparatus for fastening a dental implant in a jaw comprising:

an implant primary portion formed with a longitudinal blind bore closed at a distal end thereof, the implant primary portion adapted and designed for insertion into the jaw;

a shell formed with a longitudinal through bore adapted and designed for coaxial retention within the blind bore so as to extend to less than the closed distal end of the blind bore;

a secondary portion having a longitudinal axis with a distally extending shank terminating in a distal enlargement and a longitudinal through bore, the shank having a distal slot parallel to the longitudinal axis, the secondary portion also having a proximally enlarged head of larger cross-section than the blind bore, the shank sized and adapted for being fully coaxially retained within the longitudinal through bore of the shell, so that the distal enlargement extends past a distal end of the shell;

a top adapted and arranged to be matingly positioned on the enlarged head, the top provided with a longitudinal through bore in coaxial alignment with the through bore of the secondary portion; and

an elongated mandrel sized and adapted to be longitudinally retained within the top through bore and within the through bore of the secondary portion for retaining the top in position against the enlarged head and for urging sections of the slotted shank radially outward.

5,468,151

DUMMY FOR PRACTICING CARDIOPULMONARY RESUSCITATION (CPR) OF A HUMAN BEING

Einar Egelandsdal, Forus, Norway; Geoffrey C. Garth, Long Beach; John Hamilton, Torrance, both of Calif.; David Johnson, Hopewell Junction, N.Y.; Tore Laerdal, Gausel, Norway, and Charles A. Patterson, Westminster, Calif., assignors to Asmund S. Laerdal A/S, Stavanger, Norway

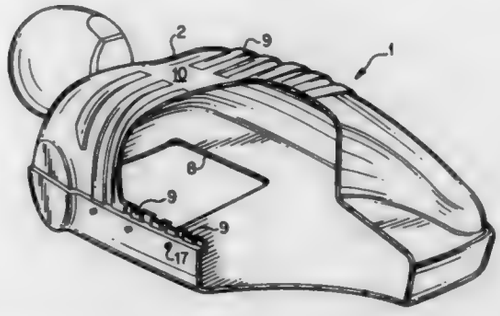
Continuation of Ser. No. 920,711, Jul. 28, 1992, Pat. No. 5,330,514. This application Oct. 19, 1993, Ser. No. 138,030

Claims priority, application Germany, Jan. 23, 1992, 42 01 768.8

The portion of the term of this patent subsequent to Jul. 19, 2011, has been disclaimed.

Int. Cl.[6] G09B *23/28*

U.S. Cl. 434—265 **23 Claims**



1. A dummy for practicing cardiopulmonary resuscitation (CPR) of a human being, comprising a simulation of the thorax and the head, wherein the thorax simulation is formed by a hollow body of plastic material that has a through-opening and has an internal cavity that is in constant air exchange relationship with the atmosphere via the through-opening, so that the pneumatic pressure that exists within the cavity does not vary during the course of its use, and wherein the hollow body is of a wall thickness which is so selected that the compressibility and return force of the thorax simulation correspond to those of a human thorax.

5,468,152

EDUCATIONAL CHILDREN'S CLOTHING

Mary K. Lenart, 6250 Cloverly Dr., Solon, Ohio 44139

Continuation of Ser. No. 44,985, Apr. 7, 1993, abandoned. This application Sep. 27, 1994, Ser. No. 312,664

Int. Cl.[6] G09B *25/00*

U.S. Cl. 434—429 **20 Claims**

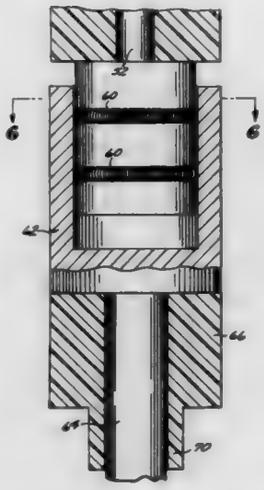
1. An article of clothing worn by a child for learning an educational concept having a plurality of members consistent with a theme of said educational concept, said article of clothing comprising a garment to be worn by a child having a plurality of pockets, each of said pockets displaying at least one member of said educational concept and containing a removable object displaying at least one member of said educational concept, and each of said removable objects is secured to one of said pockets to prevent disassociation of said objects from said garment.

5,468,153

WIRELINE SWIVEL AND METHOD OF USE

Robert L. Brown; John D. Holodnak; Gene McBride, and Demmie L. Mosley, all of Lafayette, La., assignors to Drilling Measurements, Inc.

Filed Dec. 15, 1993, Ser. No. 168,816
Int. Cl.[6] H01R *39/00*
U.S. Cl. 439—13 15 Claims



1. A rotatable electric connector to be used on a single conductor wireline used in connection with subterranean drilling, the rotatable electric connector comprising:

a housing enclosing a chamber;

lubricating oil contained in the chamber;

a first shaft concentrically mounted in the housing and protruding therefrom, and connectable to one end of the wireline;

a first member concentrically aligned with and attached to the first shaft;

a second member concentrically aligned with the first member, the first and second members having matching rotationally complementary surfaces, said first and second members being immersed in the lubricating oil;

a second shaft concentrically aligned with and attached to the second member, one of the first and second shafts being rotatably mounted in the housing in bearings, the second shaft protruding from the housing and connectable to the other end of the wireline;

at least one conductive wire spring wiper disposed circumferentially on one of the first and second members in contact with the complementary surfaces of the first and second members immersed in the lubricating oil and forming electrical contact between the rotationally complementary surfaces; and

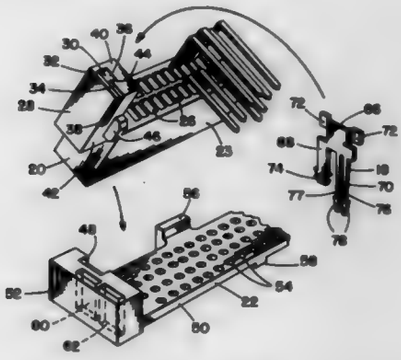
means for equalizing the pressure of the lubricating oil in the housing with external pressure outside of the housing.

5,468,154

MULTI-PIECE HOUSING CARD EDGE CONNECTOR WITH MOUNTING ARMS

Maxwell K. Yip, Trumbull; Nino R. Suffredini, Monroe; Ronald P. Sidor, Stratford, all of Conn., and Robert C. White, Cliffside Park, N.J., assignors to Burndy Corporation, Norwalk, Conn.

Filed Dec. 15, 1993, Ser. No. 167,578
Int. Cl.[6] H01R *13/648*
U.S. Cl. 439—79 15 Claims



1. An electrical connector comprising:

a housing having a first member and a second member;

electrical contacts fixedly connected to the first member and extending through the second member; and

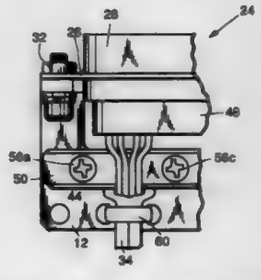
at least two spaced retention members, each retention member individually and independently fixedly connecting the first and second members to each other and having a mounting section for mounting the housing to a printed circuit board, wherein the retention members each include a first section interlockingly positioned in a first retention member receiving area in the first member and each first retention member receiving area has a slot shape with a large section, a small section, and apertures on two orthogonal sides of the first member into the slot shape.

5,468,155

CONNECTOR ACCESSORY FOR SHIELD TERMINATION

Paul A. Johnston, Hawthorne, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 21, 1994, Ser. No. 310,189
Int. Cl.[6] H01R *13/648*
U.S. Cl. 439—98 6 Claims



4. A connector accessory for providing a ground path for the shielding braid which surrounds a plurality of insulated conductors coupled to a connector having an integral flange, said accessory comprising a generally L-shaped bracket having a generally U-shaped portion with integrally formed first and second fingers extending in a generally perpendicular direction therefrom, a clamping bar adapted to secure said shielding braid to said U-shaped portion of said bracket, each of said fingers adapted to be fastened to said flange for securing said conductor to said acces-

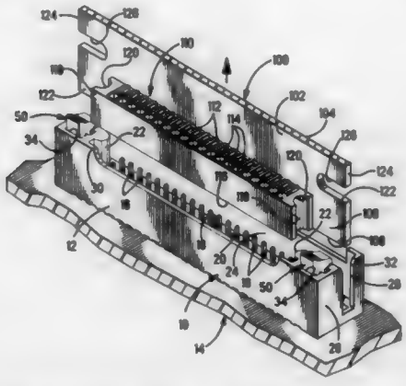
sory and forming an electrically conductive path between said braid and said connector.

5,468,156

LOCKING SYSTEM FOR INTERCONNECTION OF DAUGHTER BOARD AND MOTHER BOARD ASSEMBLIES

Bernadette M. Flinchbaugh, York Haven; Harold R. Paley, Middletown; John E. Knaub, Carlisle; Christopher J. Schmid, Harrisburg, and Adrian L. Meinyk, York, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Sep. 27, 1994, Ser. No. 312,842
Int. Cl.[6] H01R *13/62*
U.S. Cl. 439—157 **14 Claims**



1. A locking system for use in an interconnection of a daughter board assembly of a daughter board and a connector along an edge thereof, and a mother board assembly of a mother board having a connector mounted thereon, the connectors including respective housings containing respective arrays of contacts matable at a mating interface, the locking system comprising:

a pair of latch members pivotally held in respective latch-receiving cavities at opposed ends of said housing of said mother board connector outwardly of said array of contacts thereof, with said latch members being pivotable between closed and open positions;

each said latch member having a latching projection at an upper end protruding into a board-receiving region of said mother board connector from a common side when said latch member is in a closed position, and retracted from said board-receiving region when said latch member is in an open position;

said daughter board includes openings proximate side edges near said edge and outwardly of ends of said connector mounted on said edge and associated with said latching projections;

each said latch member further including a foot at a lower end disposed within said mother board connector to traverse the bottom of said board-receiving region and be engaged by an edge surface of a daughter board inserted into said board-receiving region;

each said latch member including an actuation section exposed to permit engagement for pivoting said latch member from said closed position to said open position; and

each said latch member further including a pivot section disposed along a body section between said upper and lower ends cooperable with a corresponding pivot section of said mother board connector to permit pivoting of said latch member upon engagement by and receipt of force from said edge surface of said daughter board during board insertion into said board-receiving region to rotate said latching projection through openings of said daughter boards and to permit pivoting of said latch member upon manual engagement of said actuation section for unlatching said latch member from said daughter boards

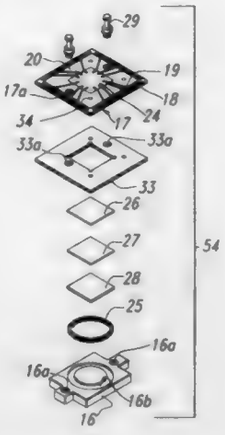
whereby the locking system is independent of said connector mounted on said daughter board edge.

5,468,157

NON-DESTRUCTIVE INTERCONNECT SYSTEM FOR SEMICONDUCTOR DEVICES

Randal D. Roebuck, Dallas, Tex.; Fariborz Agahdel, Los Gatos, Calif., and Salvatore P. Rizzo, Norwood, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 29, 1993, Ser. No. 146,354
Int. Cl.[6] H01R *13/15*
U.S. Cl. 439—264 **21 Claims**



1. An interconnect system for providing electrical connection to contact pads on a semiconductor device, comprising:

a socket having a plurality of conductors, said conductors including retractable contact portions;

a carrier assembly mounted on said socket for carrying a semiconductor device, said carrier assembly including a substrate having a compliant membrane, a plurality of contact bumps containing oxide-penetrating particles on a top surface of said compliant membrane for contacting bond pads on the semiconductor device, a fence attached to said top surface of said compliant membrane and defining a cavity in which the semiconductor device is inserted, said fence for positioning the semiconductor device so that the bond pads on the semiconductor device are aligned with said contact bumps, said substrate also including a plurality of conductive pads electrically connected to said contact bumps, said retractable contact portions selectively contacting said conductive pads to electrically connect the semiconductor device to said conductors.

5,468,158

NON-DESTRUCTIVE INTERCONNECT SYSTEM FOR SEMICONDUCTOR DEVICES

Randal D. Roebuck, Dallas, Tex., and Salvatore P. Rizzo, Norwood, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 146,726, Oct. 29, 1993, Pat. No. 5,397,245. This application Jan. 20, 1995, Ser. No. 375,863
Int. Cl.[6] H01R *13/15*
U.S. Cl. 439—264 **4 Claims**

1. A carrier assembly for carrying a semiconductor device, comprising:

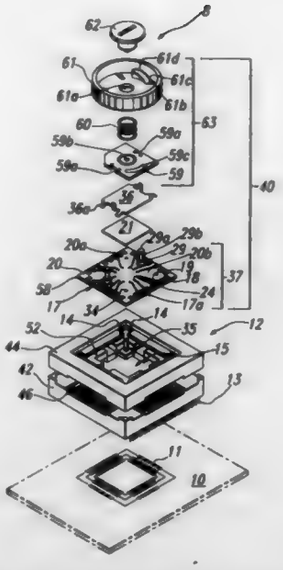
a base;

a thin film interconnect extending over a top surface of said base;

a plurality of contact bumps on a top surface of said thin film interconnect for contacting bond pads on the semiconductor device;

a pair of posts extending from said base, each of said posts having a shaft having a first diameter and a head having a second diameter greater than said first diameter;

a lid having a pair of openings through which said shafts of said posts extend;



a rotary latch attached to said lid and having a pair of ramps, each of said ramps having an opening through which said posts extend, each of said openings having a first portion smaller than a head of an associated one of said posts;

a spring positioned between said lid and said rotary latch, said rotary latch applying force to said lid through said spring, whereby rotation of said rotary latch causes said heads to move up said ramps to increase the force applied by said rotary latch to said lid through said spring.

5,468,159

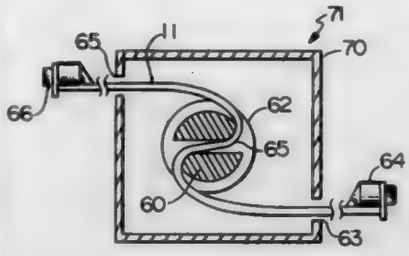
PORTABLE EXTERNAL FLEXIBLE CABLE AND PACKAGE USING SAME

William L. Brodsky, Binghamton, and James D. Herard, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 44,330, Apr. 7, 1993, abandoned. This application Aug. 10, 1994, Ser. No. 288,179

Int. Cl.[6] H01R *13/72*

U.S. Cl. 439—501 **11 Claims**



8. A portable external flexible cable system comprising:

(a) a flexible circuitry cable having a first end and a second end, said cable further including,

an essentially planar elongated segment of flexible circuit material including a dielectric having at least one edge and a plurality of metal conductive lines;

a sheath of webbed netting wrapped substantially entirely around said flexible circuit material for providing reinforcement of said flexible circuit material;

an overcoat of material totally surrounding and encasing said sheath of webbed netting and said flexible circuit material;

at least one round strand of reinforcement fibers positioned along said edge of said flexible circuit material and encased within said sheath of webbed netting, said strand of reinforcement fibers preventing tearing of said flexible circuit and protecting said metal conductive lines from metal fatigue, said strand not being securedly attached to said dielectric of said flexible circuit and adapted for moving independently of said dielectric during twisting, pulling or other similar motion of said flexible cable;

(b) a storage case having at least one opening on an exterior face;

(c) a retention and retraction device for said flexible circuitry cable disposed within said case, said retention and retraction device further including,

a spool for reeling said flexible cable;

a retainer rod disposed in rotational communication with said spool for positioning said flexible circuitry cable such that said flexible circuitry cable is coiled around said spool when said spool is rotated in a first direction and said flexible circuitry cable is released from said coiled position when said spool is rotated in a second direction;

a coil spring disposed between an inner wall of said case and said spool for biasing said spool;

a ratchet wheel disposed within said case, said ratchet wheel concentric with said spool;

a release button positioned in said first opening of said case;

an actuation lever integral with said button and disposed such that the lever extends toward said ratchet wheel, said lever having a length such that depression of said button causes said lever to release said ratchet wheel such that said coil spring forces said spool to rotate and retract said cable;

(d) said flexible circuitry cable extending through said second opening of said storage case and terminating at said first end and said second end of said cable;

(e) a first connector attached to said flexible circuitry cable at said first end; and

(f) a second connector attached to said flexible circuitry cable at said second end.

5,468,160

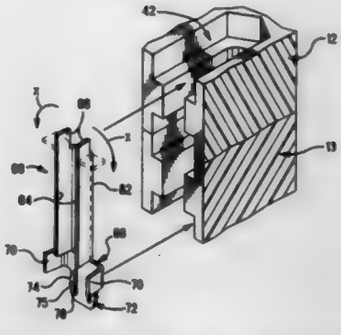
MOUNTING BRACKET FOR AN ELECTRICAL CONNECTOR

John L. Broschard, III, Hershey, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Aug. 16, 1994, Ser. No. 291,229

Int. Cl.[6] H01R *13/73*

U.S. Cl. 439—567 **14 Claims**



1. A mounting bracket for securing an electrical connector to a circuit board where the connector has a hold down recess for receiving the bracket, the bracket comprising:

a main body portion, a lower body portion, and a boardlock portion, said main body portion having wings bent towards each other so as to be substantially parallel which are adapted to form a compression fit in the recess, said wings having bendable tabs extending upwardly therefrom for securing the bracket in the recess;

said lower body portion having arms bent towards each other which are adapted to form a compression fit within said recess; and

said boardlock portion extending below the connector when the bracket is inserted in the hold down recess for securing said connector to the circuit board.

5,468,161

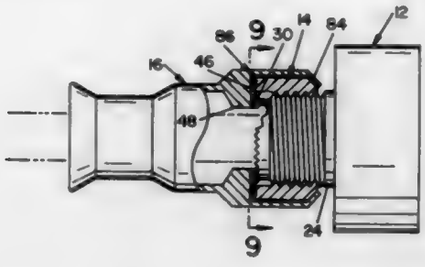
SEMI-PERMANENT ELECTRICAL CONNECTOR AND BACKSHELL ASSEMBLY

James R. Wright, Guilford, N.Y., assignor to Simmonds Precision Engine Systems, Inc., Akron, Ohio

Filed Jun. 29, 1994, Ser. No. 268,704

Int. Cl.[6] H01R *9/03*

U.S. Cl. 439—610 **22 Claims**



1. A backshell and connector assembly for use with a harness assembly having a plurality of conductors, comprising:

a connector having a cylindrical extension projecting therefrom that terminates in an endface, said endface having a periphery and tooth-like projections extending from said endface at said periphery, the conductors being connected to a plurality of contacts disposed within said connector such that the conductors extend from said endface;

an annular adapter sleeve that receives and holds said cylindrical extension with the conductors passing through said adapter sleeve, said adapter sleeve defining a locking surface within said adapter sleeve that faces said endface with said tooth-like projections in close proximity to said locking surface, said locking surface having at least one dog extending therefrom that engages said tooth-like projections, said at least one dog being displaceable away from said tooth-like projections; and,

a backshell for supporting the conductors, said backshell having a tubular deformable portion that is installed over said adapter sleeve and held in place by deforming said deformable portion over a mating portion of said adapter sleeve, said backshell being engaged against rotation to said adapter sleeve, said backshell defining a stopping surface that prevents said at least one dog from displacing away from said tooth-like projections upon installation of said deformable portion over said adapter sleeve;

whereby said adapter sleeve can rotate relative to said cylindrical extension before said deformable portion is installed due to said at least one dog being displaceable away from said tooth-like projections, and said adapter sleeve cannot rotate relative to said cylindrical extension after said deformable portion is installed due to said stopping surface preventing said at least one dog from displacing away from said tooth-like projections.

5,468,162

LOCKING CONNECTOR

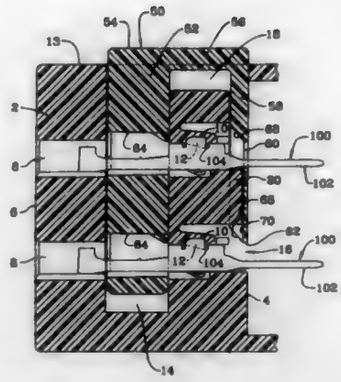
Kenzo Oda, Hadano, Japan, assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jan. 25, 1995, Ser. No. 378,853

Claims priority, application Japan, Feb. 9, 1994, 6-036552

Int. Cl.[6] H03R *13/436*

U.S. Cl. 439—752 **10 Claims**



1. A locking electrical connector comprising a housing, at least one contact, each contact having a front end matable with other contacts at a joining surface on said connector, and a locking device whose main body is inserted through a side wall of said housing in a direction substantially normal to the side wall, the locking device being engaged with each contact retained in said housing, characterized by the fact that:

said main body of said locking device has an extension emerging from the surface of a pressure section thereof in a direction towards said joining surface, and

a contact positioning part extending from said extension along the joining surface which comes close to front ends of said contacts or in contact with said contacts when said locking device is completely inserted in the housing, thus preventing displacement of said front ends of said contacts.

5,468,163

ELECTRICAL TERMINAL FOR USE WITH SHORT CIRCUIT SPRING CONTACTS

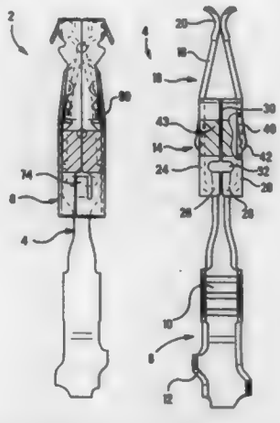
Bernhard Egenolf, Dreieich, Germany, assignor to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 13, 1994, Ser. No. 258,649

Claims priority, application United Kingdom, Jul. 22, 1993, 9315160

Int. Cl.[6] H01R *4/48*

U.S. Cl. 439—839 **14 Claims**



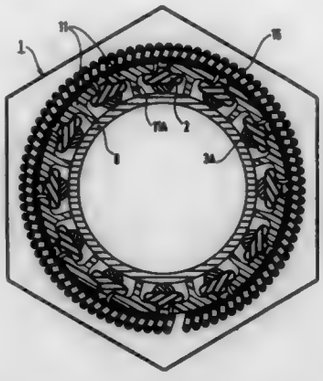
1. An electrical terminal comprising an inner contact body and an outer back-up spring, the inner contact body comprising a contact section for mating with a complementary terminal, and a body section, the outer back-up spring surrounding and securely attached to the body section and comprising spring arms biasable against the inner body contact section for increasing the spring strength thereof, characterized in that the body section comprises contacts protruding outwardly therefrom for resiliently biasing against the outer back-up spring for making electrical contact between the backup spring and the inner contact body.

5,468,164

FEMALE CONTACT, IN PARTICULAR FOR A HIGH TENSION SECTION SWITCH

Daniel Demissy, Montreal, Canada, assignor to GEC Alsthom T & D, Inc., La Praire, Canada

Filed Aug. 19, 1994, Ser. No. 293,224
Claims priority, application France, Aug. 20, 1993, 93 10148
Int. Cl.[6] H01R *13/187*
U.S. Cl. 439—843 **7 Claims**



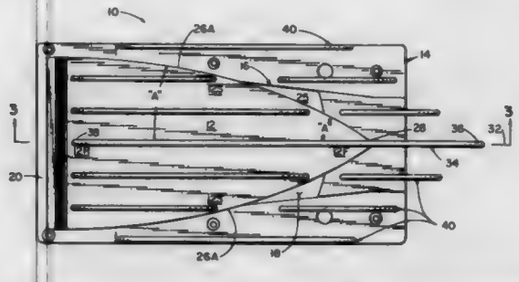
1. A female contact, in particular for a high tension section switch, the female contact comprising two interleaved thimbles, a metal first thimble made by extruding a block of metal and then machining it, said first thimble having metal contact fingers designed for co-operating electrically with a male contact, the other thimble including fingers of an insulating material, the insulating fingers limiting the displacement of the metal contact fingers in a radial direction and in a lateral direction to predetermined values that are less than the elastic limit of deformation of the metal contact fingers, and serving in particular to prevent contact between the metal contact fingers.

5,468,165

GRASS AND DEBRIS EXCLUSION PLATE FOR MARINE JET PUMPS

David R. Weber, Belleair, and Christopher S. Clark, Indian Rocks Beach, both of Fla., assignors to D. R. Weber, Inc., Belleair, Fla.

Filed Sep. 13, 1994, Ser. No. 305,256
Int. Cl.[6] B63H *11/01*
U.S. Cl. 440—46 **15 Claims**



1. A debris exclusion device for excluding debris from the jet intake of a jet drive of a watercraft, the jet intake having an opening defined by front, rear and opposing side portions, the debris exclusion device comprising in combination:

a non-articulated exclusion plate having a forward portion, a rearward portion and opposing side portions; and

means for coupling said rearward portion of said exclusion plate relative to a rearward portion of the intake of the jet drive such that said exclusion plate is positioned about the intake of the jet drive with said forward portion and said side portions of said exclusion plate being positioned spaced apart from the forward and the side portions of the jet intake, respectively, allowing water flow therebetween,

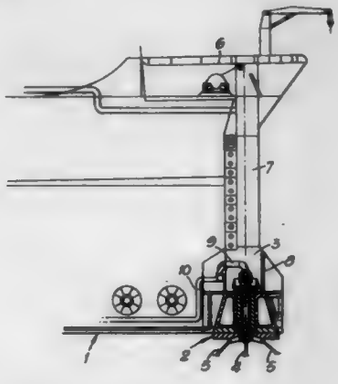
whereby, upon operation of the jet drive and forward movement of the watercraft, a positive pressure is created interiorly of said exclusion plate that produces a flow of water about said coupling means thereby precluding an accumulation of debris about said coupling means.

5,468,166

SYSTEM FOR ROTATABLY MOUNTING A VESSEL TO A LOADING BUOY

Kare Breivik, Tau; Arne Smedal, Farvik, and Kare Syvertsen, Arendal, all of, Norway, assignors to Den Norske Stats Oljeselskap A.S., Stavanger, Norway

PCT No. PCT/NO92/00058, § 371 Date Aug. 8, 1994, § 102(e) Date Aug. 8, 1994, PCT Pub. No. WO93/11035, PCT Pub. Date Jun. 10, 1993
PCT Filed Mar. 30, 1992, Ser. No. 244,347
Claims priority, application Norway, Nov. 27, 1991, 914652
Int. Cl.[6] B63B *22/02*
U.S. Cl. 441—5 **12 Claims**



1. A system for connection of a submerged loading/unloading buoy to a floating vessel, said buoy comprising an inner member and an outer member rotatably mounted on said inner member and said vessel having a submerged downwardly open receiving space adapted to receive said buoy therein, said system comprising:

latching means within said receiving space for releasably latching said outer member to said vessel when said buoy is received within said receiving space whereby said vessel and said outer member can turn about said inner member,

at least one transfer line extending to said inner member,

a tube system in said vessel,

connecting means for establishing a transfer connection between said tube system and said inner member, said connecting means comprising swivel means coupled to the upper end of said inner member by a flexible joint which allows angular displacement thereof about the axis of connection, said cer tral member comprising a hollow shaft.

5,468,167

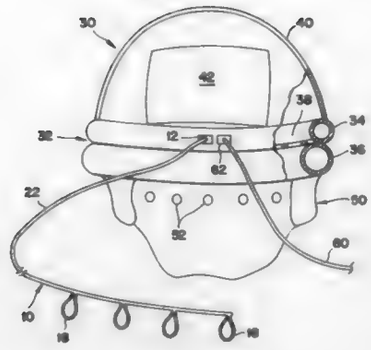
LIFE RAFT UTILITY TETHER

James A. Givens, 3198 Main Rd., Tiverton, R.I. 02878

Filed Jul. 29, 1994, Ser. No. 282,479
Int. Cl.[6] B63B *35/58*
U.S. Cl. 441—40 **25 Claims**

1. A survival apparatus for a life raft, comprising:

a flotation platform for carrying at least one life raft occupant, the flotation platform comprising a peripherally disposed buoyant member and a floor spanning an interior space bounded by the buoyant member, the floor being supported thereby;



a stabilizing bag depending below the flotation platform, the stabilizing bag having a plurality of openings to fill with water when the flotation platform is deployed;

an elongated tether attached by a first end to an external surface of the flotation platform, the tether having linking means for securing at least one person to the tether, said linking means being spaced a predetermined distance from the first end, said tether being accessible without the necessity of deploying the life raft; and,

a control line attached at an upper end to the tether adjacent the first end and extending below the stabilizing bag to an opposite side of the flotation platform, the control line attached to one of the stabilizing bag and the flotation platform, wherein lifting the control line forces water from the stabilizing bag through the openings in the stabilizing bag.

5,468,168

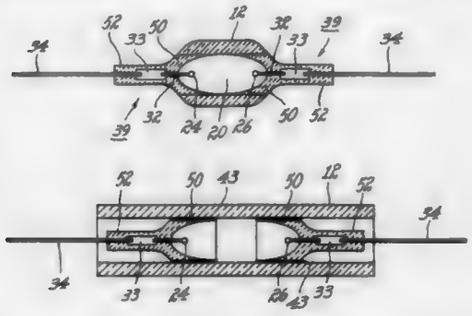
MEANS FOR SUPPORTING AND SEALING THE LEAD STRUCTURE OF A LAMP AND METHOD FOR MAKING SUCH LAMP

Edward J. Balaschak, Cleveland; Curtis E. Scott, Mentor, and George E. Sakoske, Chagrin Falls, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 976,061, Nov. 13, 1992, Pat. No. 5,374,872. This application Sep. 7, 1994, Ser. No. 301,859

Int. Cl.[6] H01J *9/32*

U.S. Cl. 445—26 **12 Claims**



1. A method of making a lamp comprising (i) a tubular envelope of vitreous light-transmitting material enclosing an internal space (ii) light-generating means within said internal space for generating light when electric current is passed therethrough, and (iii) conductive metallic lead structure projecting into said internal space for supplying current to said light-generating means, the method comprising:

(a) providing about said lead structure a body of vitreous material that is sealed to said lead structure, the body being formed by pressing particles of vitreous material into a compact and sintering said compact, said body incorporating a metal having generally the same coefficient of thermal expansion as the metal of said conductive lead structure, said metal distributed within said body in such a manner that the concentration of said metal is higher in the region of said conductive lead structure than in said interface region,

(b) inserting said body and said lead structure, combined as a subassembly, into an opening in said envelope communicating with said internal space, and

(c) forming a seal between said envelope and said body in the interface region between said envelope and said body.

5,468,169

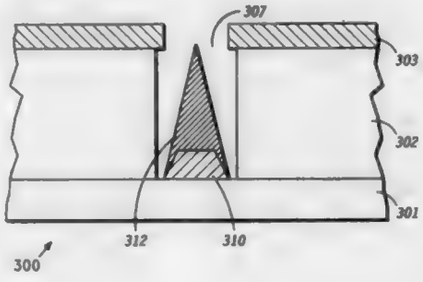
FIELD EMISSION DEVICE EMPLOYING A SEQUENTIAL EMITTER ELECTRODE FORMATION METHOD

Robert C. Kane, Woodstock, Ill., and Kevin B. Hilgers, Mesa, Ariz., assignors to Motorola, Schaumburg, Ill.

Filed Jul. 18, 1991, Ser. No. 732,295

Int. Cl.[6] H01J *9/02*

U.S. Cl. 445—50 **2 Claims**



1. A method of forming a field emission device including an electron emitter comprising the steps of:

providing a supporting substrate having a major surface;

depositing an insulator layer on the major surface of the supporting substrate;

depositing a conductive layer on the insulator layer;

selectively etching a part of each of the conductive layer and insulator layer to form a chamber wherein the major surface of the supporting substrate is exposed and an aperture to the chamber lies generally in the conductive layer;

depositing a first lift-off layer on the conductive layer by means of evaporative material deposition;

performing a first substantially normal evaporative material deposition on the first lift-off layer to partially close the aperture to the chamber and form a portion of an electron emitter within the chamber disposed on the major surface of the supporting substrate, the first substantially normal evaporative material deposition being terminated prior to formation of a conic/wedge shaped electron emitter within the chamber;

selectively removing the first lift-off layer and substantially all of any material disposed thereon;

depositing a second lift-off layer on the conductive layer by means of evaporative material deposition; and

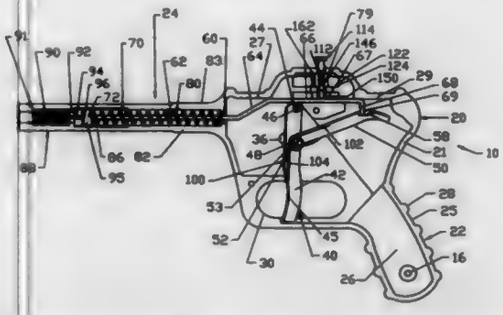
performing a second substantially normal evaporative material deposition on the second lift-off layer to at least partially close the aperture to the chamber such that a substantially conic/wedge shaped electron emitter is formed within the chamber, the second material deposition being disposed substantially on the portion of the electron emitter formed by the first material deposition.

5,468,170

COLLECTOR'S MODEL DISINTEGRATOR PISTOL (CMDF)

Ellis Kantor, P.O. Box 410110, Creve Coeur, and Daniel H. Heymann, HCO Services 12921 Nimes Dr., St. Louis, both of Mo. 63141

Division of Ser. No. 144,244, Nov. 1, 1993, Pat. No. 5,389,027.
This application Sep. 16, 1994, Ser. No. 307,157
Int. Cl.[6] A63H *3/31;17/045*
U.S. Cl. 446—23 13 Claims



1. A method of forming a toy sparking pop gun pistol comprising:

forming a wax pattern in the shape of a pistol including a pair of mirror image halves defining a hollow handle portion, hollow body portion, and a hollow barrel portion having a distal end;

forming a head portion above said body portion;

forming at least one trigger opening in each body portion half;

forming a flint opening within said head portion.

forming a trigger opening with the pattern;

forming at least one spark opening in the pattern;

forming opposed slots within said body portion;

detailing an external surface of each pistol half;

applying a ceramic coating to said mirror image halves;

placing each of said mirror image halves in an investment mold;

heating said was pattern sufficiently to vaporize and remove each said pattern from each mold;

pouring a molten alloy into each mold to form cast mirror image half sections of said pistol;

removing the thus investment cast mirror image halves from the molds;

assembling said mirror image half sections together to form said pistol;

providing shoulder means in said barrel portion of said halves to house a rod resilient means and a cylinder within said barrell;

separately forming a generally elongated trigger member and a generally elongated link member having a rod engagement slot;

assembling said trigger member in a vertically orientated position extending downwardly between said cast half body portions so that the the trigger is located between said formed slots in said body portion;

placing a dowel pin through an opening in the trigger member and extending into said opposed slots, and attaching said link and said trigger member so that said link extends rearwardly and inclines upwardly in said body portion;

separately forming a piston rod having a piston head, a rod body portion, a horizontal portion having a roughened surface and a distal end having a downwardly extending projection;

locating said piston rod within said barrel;

locating a separately formed resilient means within said barrel engaging said positioned;

locating a separately formed cylinder within said barrel; and placing the piston rod into the cylinder;

placing flint material within said flint opening within said head portion;

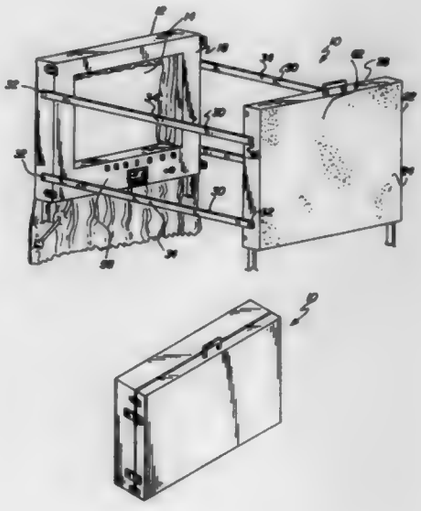
locating said distal end of said piston rod within the body portion of the pistol and extending into said rod engagement slot in said link; connecting the pistol half sections together with fastening means whereby when an operator grasps the trigger member, the trigger member and the link may be moved rearwardly against the bias of the resilient means, with the body portion of the pistol guiding the piston rod until such time as the distal end of the piston rod slips out of the rod engagement slot, whereby the piston rod moves rapidly forwardly under the bias of said rod resilient means, creating a high pressure surge in said cylinder; said roughened portion of the piston rod engages said flint material and a spark ignites within said head portion; and wherein said piston rod created pressure surge escapes around a cylinder obstruction means within said cylinder causing an audible pop.

5,468,171

PORTABLE PUPPET THEATER SYSTEMS

Roy Taylor, P.O. Box 192, Moncton, New Brunswick, Canada

Filed Oct. 21, 1994, Ser. No. 326,921
Int. Cl.[6] A63J *19/00*
U.S. Cl. 446—82 3 Claims



1. A new and improved portable puppet theater system comprising, in combination:

a vertically disposed first front section having a rectangular configuration having an enlarged opening therethrough;

a vertically disposed second rear section in a rectangular configuration having a periphery generally corresponding to that of the first section;

a pair of side bars pivotably coupling the sides of the front section and rear section, the side bars also being pivotable at the centers thereof, to allow the front and rear sections to be moved toward each other for a collapsed orientation and away from each other for an operative orientation;

a pelmet positioned across the upper edge of the opening with side curtains at the sides of the opening movable between a closed position in contact with each other and an open position allowing viewing through the opening;

a plurality of lights located adjacent the upper edge of the opening;

a tape player located adjacent to the lower edge of the opening;

speakers mounted on the front face of the front section beneath the opening;

a microphone operatively coupled to the speakers;

a control panel on the back face of the front section for controlling the lights and the microphone along with the tape player;

a porous see-through backdrop constituting the central extent of the rear section; and

motor means coupled with respect to the curtains to draw them together or to separate them under the control of an operator.

5,468,172

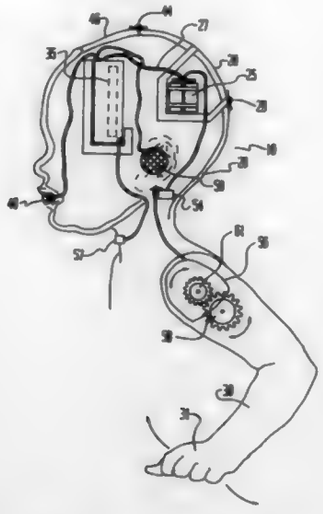
DOLL INCLUDING RECORDED MESSAGE MEANS

Pauline R. Basile, 418 S. Valley Forge Rd., Devon, Pa. 19333

Continuation of Ser. No. 957,242, Oct. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 741,648, Aug. 7, 1991, abandoned. This application May 18, 1994, Ser. No. 245,523

Int. Cl.[6] A63H *3/28;13/00*

U.S. Cl. 446—299 **17 Claims**



1. A soft, flexible doll comprising: a head, body, motor, battery and at least one appendage thereon;

recording means inserted within said doll for recording and playing a personal audible message to be audibly played back;

said motor disposed within said doll for activating said appendage to move in a cyclical oscillating motion, said doll comprising disengagement means for discontinuing said oscillating motion upon encountering a resistance that would otherwise cause said motor to generate a force that may injure a child; and

means for simultaneously activating said motor and, thereby, said appendage, upon activation of said recording means for playback of said personal audible message.

5,468,173

AUTOMATIC DEBURRING MACHINE

George R. Winton, III, 242 Ashbourne Tr., Lawrenceville, Ga. 30243

Filed Sep. 30, 1993, Ser. No. 129,953

Int. Cl.[6] B24B *9/00;7/06*

U.S. Cl. 451—59 **1 Claim**

1. An apparatus for deburring a substantially flat surface of a workpiece, said apparatus comprising:

conveyor means for moving the workpiece in a first linear direction, the workpiece contacting a surface of said conveyor means;

a plurality of abrasive wheel means;

wheel assembly means for supporting said plurality of abrasive wheel means, said wheel assembly means having a first axis of rotation perpendicular to said surface of said conveyor means;

said plurality of abrasive wheel means each having a respective second axis of rotation extending radially from said first axis of rotation and parallel to said surface of said conveyor means;

said wheel assembly means simultaneously rotating each one of said plurality of abrasive wheel means about respective said second axes of rotation as said wheel assembly means rotates about said first axis of rotation and oscillating in a second linear direction perpendicular to said first linear direction and parallel to said surface of said conveyor means;

said plurality of abrasive wheel means contacting the substantially flat surfaces of the workpiece as the workpiece moves in said first linear direction;

each of said wheel assembly means comprising;

a housing for supporting each of said plurality of abrasive wheel means wherein said housing is supported by a first end of an assembly drive shaft; and

said housing comprising;

a plurality of wheel shafts, each one of said plurality of wheel shafts disposed parallel to said surface of said conveyor means and each one of said plurality of wheel shafts rotates about a respective corresponding axis of rotation of said plurality of abrasive wheel means;

one end of said plurality of wheel shafts being attached to a respective one of said plurality of abrasive wheel means;

a plurality of bevel gears, each one of said plurality of bevel gears is attached to a second end of a respective corresponding said wheel shaft;

a miter gear meshed with each one of said plurality of bevel gears;

a wheel drive shaft disposed perpendicular to said surface of said conveyor means and first end of said wheel drive shaft is fastened to said miter gear;

a first wheel pulley fastened to a second end of said wheel drive shaft opposite said first end; and

a second wheel pulley attached at a second end of said assembly drive shaft opposite said first end;

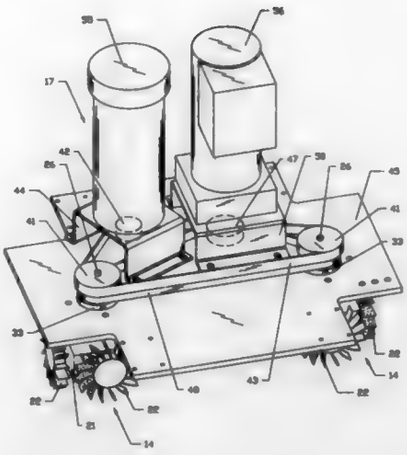
said apparatus further comprising;

a first wheel belt contacting each of said first wheel pulleys;

a second wheel belt contacting each of said second wheel pulleys;

first motor means for rotating said first wheel pulleys; and

second motor means for rotating said second wheel pulleys.



5,468,174

RECYCLABLE ABRASIVE BLASTING SYSTEM

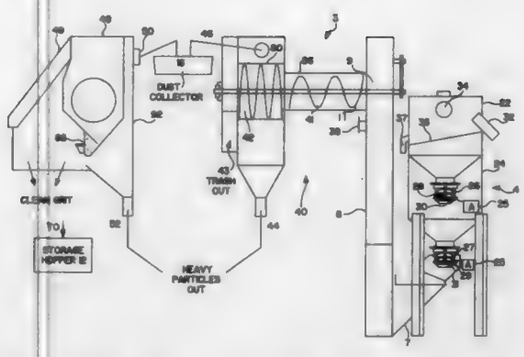
David P. Bachand, Plantsville, Conn., and Gerald P. McNamara, Warwick, R.I., assignors to IPEC Advanced Systems, Inc., North Kingstown, R.I.

Continuation of Ser. No. 976,495, Nov. 13, 1992, abandoned. This application Nov. 19, 1993, Ser. No. 156,403

Int. Cl.[6] B24C *9/00*

U.S. Cl. 451—75 **20 Claims**

18. A recyclable abrasive blasting system for blasting abrasive against a surface to be cleaned and receiving particles comprising



abrasive debris and dust, so as to recover the abrasive which has been blasted against the surface during the cleaning thereof, said recyclable abrasive blasting system comprising:

a blasting assembly comprising;

a storage hopper for containing clean abrasive,

blast pots for receiving abrasive from said storage hopper,

a blasting hose for propelling abrasive from said blast pots against a surface to be cleaned;

an autodump tank comprising;

a plurality of chambers, each having an inlet for receiving said particles,

a screen for separating debris from said particles,

an outlet for separating dust from said particles, and a plurality of valves for metering said particles traveling through said autodump tank, said valves activated in response to an actuator, to maintain a negative pressure in at least one of said chambers at all times;

an elevator comprising;

an inlet for receiving said particles from said means for metering, and

a passageway for transporting said particles, and

an outlet for discharging said particles;

a classifier comprising;

a housing having an inlet for receiving said particles being discharged from said outlet of said elevator,

a first auger having a motor for imparting rotary motion thereto, a plurality of augers, wherein said augers concentrically surround said first auger in rotating cooperation therewith wherein each of said augers comprises a screen having a spiral member attached thereto, whereby each of said screens separate debris from abrasive, and each of said spiral members effectuates an even distribution of particles in said housing,

a plurality of outlets for routing debris outside of said housing of said classifier;

a particle separator comprising,

a housing having means for receiving said particles from said classifier,

a hingedly mounted rod for creating a curtain of particles,

a blower for creating a partial vacuum for separating abrasive from debris in said curtain of particles, yielding a clean abrasive available for reuse, a dust collector for separating dust from debris,

and a plurality of outlets for discharging debris and dust separately from said housing of said particle separator;

and a storage container for receiving said clean abrasive from said particle separator, such that said abrasive may be reused in said blasting assembly.

5,468,175

DISHWASHER WHEREIN LIQUID IS CIRCULATED WITH GRANULES AND SEPARATION DEVICE FOR SEPARATING GRANULES FROM THE LIQUID

Bengt Nilén, Lund, Sweden, assignor to Viptop AB, Lund, Sweden

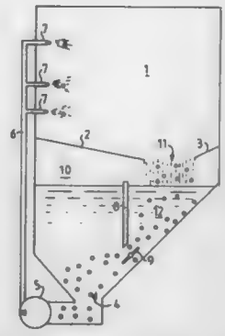
PCT No. PCT/SE92/00123, § 371 Date Nov. 8, 1993, § 102(e) Date Nov. 8, 1993, PCT Pub. No. WO92/15237, PCT Pub. Date Sep. 17, 1992

PCT Filed Feb. 28, 1992, Ser. No. 108,673

Claims priority, application Sweden, Mar. 1, 1991, 9100594

Int. Cl.[6] B24C *3/00*

U.S. Cl. 451—87 **9 Claims**



1. Heavy-duty dishwasher for washing with granules heavier than liquid, comprising a washing chamber, a spray device for spraying washing liquid against articles to be washed in the washing chamber, a tank which is joined to an outlet opening from the washing chamber, a circulation pump having a suction side joined to a bottom outlet from the tank and a pressure side joined to means for conducting liquid sucked in from the tank to the spray device, and a dividing wall defining an upwardly open tank chamber for storing granules heavier than liquid in the tank, said dividing wall having an upper end disposed beneath the upper limit of the tank, and the outlet opening of the washing chamber being disposed above the tank chamber defined by the dividing wall, said dividing wall at its lower end comprising a portion pivotable between a first position in which the tank chamber defined by the wall is closed at its lower end, and a second position in which the lower portion of the tank chamber is in communication with the rest of the tank, said lower portion of the tank being tapered to the bottom outlet, and said lower end of the dividing wall being located spaced laterally from and higher than the bottom outlet.

5,468,176

DISK-SHAPED TOOL BIT FOR AN ANGLE GRINDER

Karl E. Udert, Triesen, Liechtenstein, and Walter Winkler, Gams, Switzerland, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

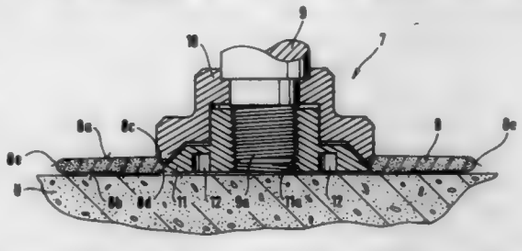
Filed Nov. 1, 1993, Ser. No. 146,894

Claims priority, application Germany, Nov. 2, 1992, 42 36 964.9

Int. Cl.[6] B24B *23/00*

U.S. Cl. 451—359 **5 Claims**

1. A disk-shaped tool bit for a manually operated power tool



comprises an annular disk-shaped carrier member having a central

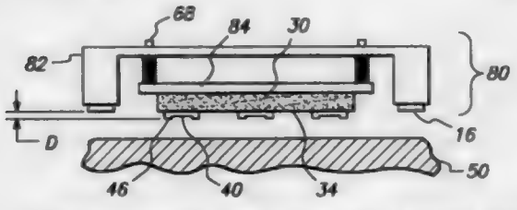
axis of rotation, a radially outer circumferentially extending peripheral surface extending generally in the axial direction and a pair of oppositely facing side face surfaces extending generally radially inwardly from said peripheral surface transversely of the axial direction, and a central through opening extending between said side face surfaces, said peripheral surface and at least a part of each of said side surfaces adjacent said peripheral surface are covered with abrasive grains, wherein the improvement comprises that a first surface extending transversely of said side face surfaces defines said central through opening, said central through opening has a mid-plane located between said side face surfaces and extending perpendicularly to the central axis of rotation, and said first surface comprises a pair of second surfaces each tapering inwardly toward the axis of rotation from a different one of said side face surfaces.

5,468,177

LAPPING FIXTURE FOR DISK SLIDERS

David J. Kindler, Concord, and David J. Dupuis, Westminster, both of Mass., assignors to Quantum Corporation, Milpitas, Calif.

Filed Feb. 26, 1993, Ser. No. 23,274
Int. Cl.[6] B24B *7/07*
U.S. Cl. 451—364 **4 Claims**



1. A fixture for holding disk sliders against a lapping surface comprising:

a base having a positioning surface for contacting a reference surface;

a compliant pad on the base having a contact surface facing outwardly from the base for carrying sliders, the compliant pad being dimensioned and positioned relative to the positioning surface effective to cause each slider to be in pressing contact relation with the lapping surface when the positioning surface is in contact with the reference surface; and

wherein the base further comprises means for adjusting tile contact surface orientation, the means for adjusting the contact surface orientation being effective to orient the contact surface relative to the positioning surface of the base, the means for adjusting the contact surface orientation comprising:

a plate, the compliant pad being on the plate: and

a retainer for coupling the plate to the base, the retainer being effective to maintain an adjustable orientation of the compliant pad relative to the positioning surface of the base.

5,468,178

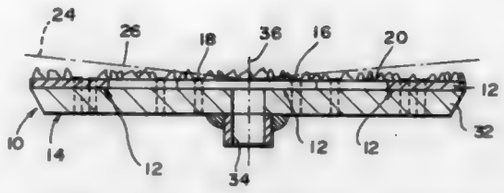
ROTARY DEVICE FOR REMOVING PAINT FROM A SURFACE

Frederick A. Kitko, and Frederick R. Kitko, both of 110 Sioux Ave., Bismarck, N. Dak. 58501

Continuation-in-part of Ser. No. 480,787, Feb. 16, 1990, abandoned. This application Apr. 22, 1991, Ser. No. 688,387
Int. Cl.[6] B24D *7/00*
U.S. Cl. 451—548 **7 Claims**

1. The method of removing paint from a surface using a paint removing apparatus adapted to be rotated for abrading and efficiently removing paint from a painted surface while minimizing the effect on the surface, said apparatus comprising:

(a) a rigid disc member to driven rotatably about a central axis in a given direction and having at least one disk surface; and



(b) a plurality abrasive chips disposed on an annularly shaped surface raised with respect to said disk surface, each abrasive chip having at least one cutting edge and secured to said annularly shaped surface to present its cutting edge to abrade the painted surface, said annularly shaped surface being disposed at a radical distance from said central axis to define a central surface of said disk surface free of said abrasive chips, said abrasive chips being secured to said annularly shaped surface so that said one cutting edge of some of said abrasive chips has a negative rake with respect to said given direction to effect efficient removal of the abraded paint particles from the painted surface and to prevent said abrasive chips from being clogged with the abraded particles of paint, said method compromising the step of:

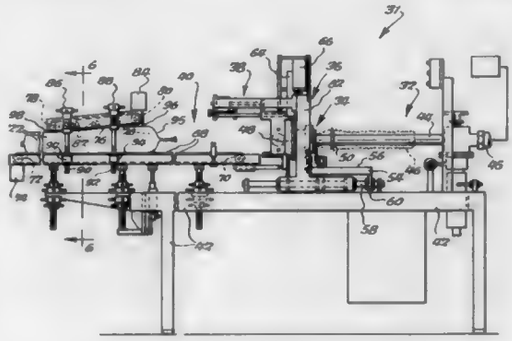
rotating said disc member at a rotational velocity in the order of 10,000 rpm, whereby paint adjacent said free area is removed.

5,468,179

APPARATUS AND METHODS FOR PREPARING LOAF SHAPED SAUSAGE PRODUCTS IN SLACK FILLED FOOD CASINGS

Thomas R. Stanley, Georgetown, Ill., and Mark D. Kelley, Kansas City, Mo., assignors to Teepak, Inc., Westchester, Ill.

Filed Feb. 26, 1993, Ser. No. 23,410
Int. Cl.[6] A22C *7/00;11/02*
U.S. Cl. 452—37 **16 Claims**



1. An apparatus for filling tubular food casings comprising in combination pump means for pressurizing a meat emulsion, stuffing horn means for receiving the pressurized meat emulsion from said pump means and for delivering to a first interior region of a casing mounted on the stuffing horn means, said casing having first and second undivided interior regions, said meat emulsion being located in said first interior region while maintaining said second interior region substantially free of said meat emulsion so as to provide a partially filled casing, means for gathering and closing said partially filled casing at terminal ends thereof, means for automatically uniformly distributing and shaping the meat emulsion in both regions of the partially filled casing, and means associated with the closing means and with the distributing means which causes the closing means to close the casing before the distributing means uniformly distributes the meat emulsion and wherein the means for automatically distributing and shaping the meat emulsion comprises discharge table means for engaging and evenly distributing the meat emulsion in said partially filled casing, said discharge table means comprising lower conveyor means for

transporting said closed, partially filled casing downstream from said stuffing horn means, and continuous overhead belt means for engaging the upper portion of said partially filled casing moving on said lower conveyor means, said overhead belt means being movable with and spaced from said lower conveyor means and having a product inlet end and a product outlet end, and means for positioning said overhead belt means in a plane which is nonparallel with said lower conveyor means, said overhead belt means and said lower conveyor means being configured to distribute the meat emulsion into the form of a loaf.

5,468,180

APPARATUS FOR REMOVING THE SKIN FROM THE BODIES OF SLAUGHTERED POULTRY

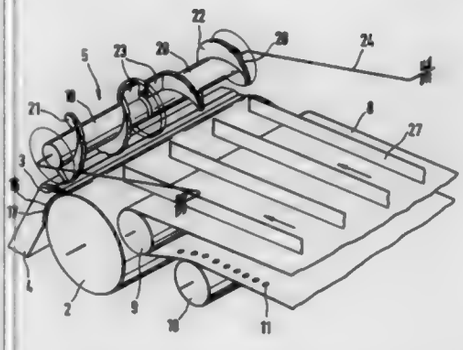
Holger Jordan, New Bedford, Mass., and Sigurd Richartz, Lübeck, Germany, assignors to Nordischer Maschinenbau Rud. Baader GmbH & Co KG, Lubeck, Germany

Filed Dec. 15, 1994, Ser. No. 356,574

Claims priority, application European Pat. Off., Dec. 17, 1993, 93120351

Int. Cl.[6] A22B *5/16*

U.S. Cl. 452—127 **27 Claims**



1. An apparatus for removing the skin from the bodies or body parts of slaughtered poultry, comprising

a) rotationally driven skin entraining means defining a direction and an axis of rotation and having a non-skid or gripping outer surface,

b) knife means defining a cutting edge, said cutting edge being arranged to opposed said outer surface and being spaced from the same by a gap,

c) pressing means arranged downstream of said cutting edge with respect to the rotation direction of the skin entraining means and having a pressing surface facing said outer surface and being spaced from the same by a gap, and

d) auxiliary conveying means arranged above said knife means and being resiliently displaceable away from said knife means under spring force or gravity, wherein said auxiliary conveying means further comprises at least one rotationally driven rotary member, which has an axis of rotation running essentially parallel to the axis of the skin entraining means and defines a circumference around which is disposed a helical web.

5,468,181

COIN PROCESSING APPARATUS

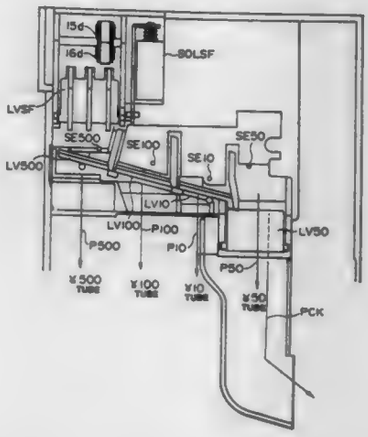
Takeshi Ishida, Sakado; Kenji Koyama, Kawagoe; Hiroshi Kasama, Tsurugashima; Kenji Nishiumi, Sakado, and Kenji Nakajima, Ogose, all of, Japan, assignors to Kabushiki Kaisha Nippon Conlux, Japan

Division of Ser. No. 67,733, May 26, 1993, Pat. No. 5,346,047, which is a continuation of Ser. No. 761,411, Sep. 17, 1991, abandoned. This application Jun. 20, 1994, Ser. No. 262,731

Claims priority, application Japan, Sep. 20, 1990, 2-250684; Nov. 20, 1990, 2-314561; Nov. 20, 1990, 2-314562; Nov. 20, 1990, 2-314563; Nov. 20, 1990, 2-314564; Nov. 20, 1990, 2-319464

Int. Cl.[6] G07D *3/14*

U.S. Cl. 453—3 **6 Claims**



1. A coin processing apparatus comprising:

coin discriminating means for discriminating whether coins inserted through a coin slot are genuine or false and types of denominations of the coins;

a plurality of coin tubes for accumulating coins whose denominations have been discriminated by said coin discriminating means, by types of denominations;

an inclined coin rolling passage diagonally arranged along said plurality of coin tubes, for passing the coins discriminated by said coin discriminating means therethrough;.

a plurality of overflow sensors respectively disposed in said plurality of coin tubes and each adapted to detect an amount of coins held in a corresponding one of said plurality of coin tubes and generate an overflow output when the amount of coins held therein reaches a predetermined number;

a plurality of coin distributing means respectively disposed along said inclined coin rolling passage and in correspondence with said plurality of coin tubes, each being adapted to selectively execute a first distributing operation for introducing a coin passing through said inclined coin rolling passage to a corresponding one of said coin tubes and a second distributing operation for introducing the same to an ensuing one of said coin tubes in accordance with a discrimination output of said coin discriminating means; a cash box disposed at a distal end of said inclined coin rolling passage;

prohibition setting means which, if an overflow output is generated from any of said plurality of overflow sensors, is adapted to set in a prohibited state the first distributing operation of said coin distributing means corresponding to all the coin tubes in stages following said coin tube corresponding to said overflow sensor from which the overflow output is being generated; and

control means for sequentially canceling the prohibited state of the first distributing operation of each of said coin distributing means as the coin passes through each of said coin distributing means.

5,468,182

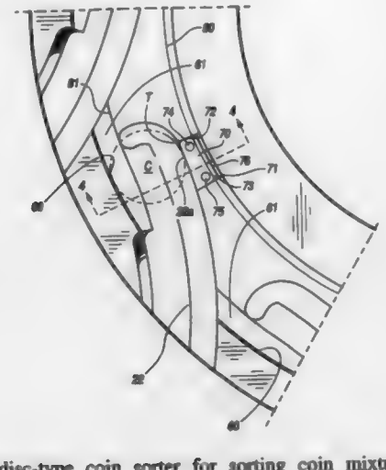
DISC-TYPE COIN SORTER WITH ADJUSTABLE TARGETING INSERTS

Joseph J. Geib, Mt. Prospect, Ill., assignor to Cummins-Allison Corp., Mount Prospect, Ill.

Continuation-in-part of Ser. No. 102,573, Aug. 5, 1993, Pat. No. 5,401,211. This application Aug. 31, 1994, Ser. No. 299,064

Int. Cl.[6] G07D *3/00*

U.S. Cl. 453—10 **4 Claims**



1. A disc-type coin sorter for sorting coin mixtures which include coins of mixed diameters, said sorter comprising:

a rotatable disc having a resilient top surface,

a stationary sorting head having a lower surface positioned parallel to an upper surface of said disc and spaced slightly therefrom,

the lower surface of said sorting head forming a queuing region for aligning the outer edges of coins of all denominations at a common radius, a plurality of exit channels for receiving the queued coins and guiding coins of different diameters to different exit stations along the periphery of the sorting head, and

an adjustable insert forming an inboard wall of a radially innermost end of at least one of said exit channels, said insert being releasably mounted in the lower surface of said sorting head for movement, when the insert is released, in a direction transverse to the direction of coin movement adjacent said insert.

5,468,183

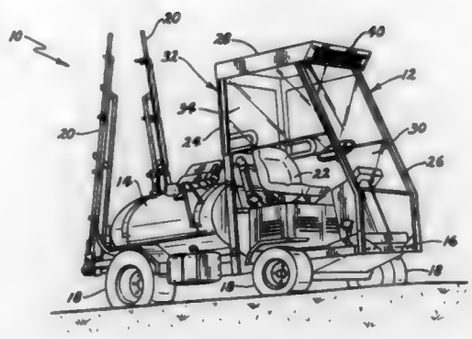
CLEAN AIR OPERATOR ENCLOSURE

Kent S. Hahn, Evansville, Ind., assignor to Hahn, Inc., Evansville, Ind.

Filed Jan. 27, 1994, Ser. No. 187,252

Int. Cl.[6] B60H *3/06*

U.S. Cl. 454—136 **19 Claims**



1. An operator enclosure for a commercial spray vehicle, the vehicle including a chassis and an operator cab, the enclosure comprising:

(a) a plurality of generally vertical elongate uprights attached at their lower ends to the vehicle chassis and extending upwardly therefrom, establishing a generally rectangular operator enclosure configuration;

(b) a generally rectangular top cover attached to the upper ends of the uprights; and

(c) a plurality of substantially transparent panels spanning laterally between adjacent uprights and extending downwardly from the top cover only part of the way to the chassis, such that when the operator is seated within the cab only his or her upper torso and head are surrounded by the panels and a substantial gap exists between the bottom edges of the panels and the chassis, wherein a windshield panel is located toward the front of the operator enclosure and a side panel is located on each side of the operator enclosure, and wherein the windshield panel extends considerably below the side panels such that the bottom edges of the side panels are considerably higher than the bottom edge of the windshield panel.

5,468,184

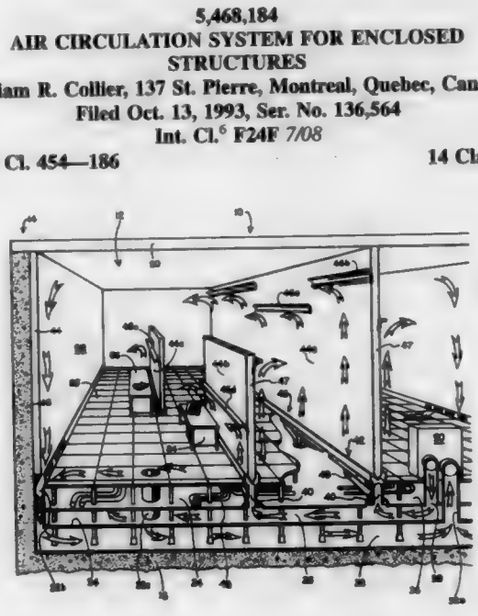
AIR CIRCULATION SYSTEM FOR ENCLOSED STRUCTURES

William R. Collier, 137 St. Pierre, Montreal, Quebec, Canada

Filed Oct. 13, 1993, Ser. No. 136,564

Int. Cl.[6] F24F *7/08*

U.S. Cl. 454—186 **14 Claims**



11. A room including an air distribution system therein, said room being defined in part by a floor and by a plurality of walls directed inwardly towards the interior of said room and having flat, obstruction-free surfaces, a plurality of air distributor units disposed along the baseboard areas of said walls, with each distributor unit including a center section extending longitudinally along said baseboard, a flow-forming section including a pair of opposed walls tapering towards each other and being spaced closely apart from each other at their uppermost ends to define therebetween an elongated outlet area of narrow cross-section, said walls having deflector units disposed in the areas above said distributor units, said deflector units having curved inner surfaces extending upwardly and curving inwardly towards the room interior, at least one supply conduit for supplying forced circulation air to the interior of said distributor units and at least one return conduit for returning air to said supply source for recirculation.

5,468,185

AIR DISTRIBUTION SYSTEM

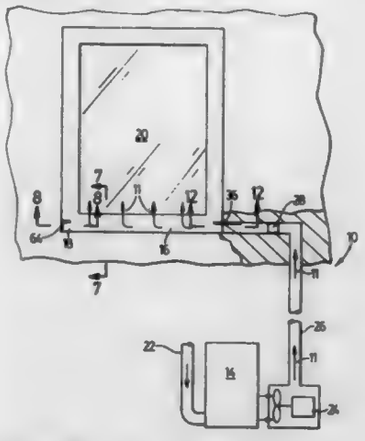
Archie A. Truitt, 119 - 33 Street West, Saskatoon, Saskatchewan S7L 0T9, Canada

Continuation-in-part of Ser. No. 115,630, Sep. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 921,145, Jul. 29, 1992, Pat. No. 5,277,657. This application May 20, 1994, Ser. No. 246,457

The portion of the term of this patent subsequent to Jan. 11, 2011, has been disclaimed.

Int. Cl.[6] E06B 7/08

U.S. Cl. 454—198 25 Claims



1. An air distribution outlet comprising:

an elongate air duct;

a distribution divider for dividing the duct longitudinally to define

inlet and outlet portions;

the duct defining an inlet port at one end of the inlet portion for communication with an air source and an outlet port in the outlet portion extending longitudinally of the duct;

the distribution divider defining a communication passage extending longitudinally of the duct for air communication between the inlet and the outlet portions, the passage increasing in width with increasing distance from said inlet port; and

a plurality of fins located on the distribution divider extending across the air communication passage and extending into the inlet portion, the fins increasing in length with increasing distance from the inlet port;

whereby air entering the inlet port is distributed by the distribution divider substantially evenly to the outlet port.

5,468,186

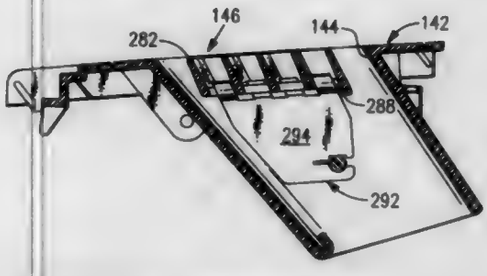
SNAP-ON AIR DEFLECTORS FOR AIR CONDITIONER

Theodore S. Bolton, Liverpool, and Stephen Stopyra, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 9, 1994, Ser. No. 208,399

Int. Cl.[6] F24F 13/075

U.S. Cl. 454—202 3 Claims



1. An adjustable louver assembly comprising;

a substantially box-like member having a plurality of longitudinally extending parallel louvers the outermost of said plurality of louvers forming the top and bottom thereof and including two lateral sides interconnecting said top and bottom louvers;

an open front and back side, a plurality of ribs perpendicular to and interconnecting each of said horizontal louvers, each of said connecting ribs having a circular cross section;

a plurality of planar air deflectors having complimentary means formed on an edge thereof to engage one of said ribs to thereby mount said deflector for pivotable motion about said rib with said deflector extending perpendicular to said horizontal louvers said complimentary means comprising at least three mounting tabs extending from said edge, each of said tabs having an arcuate surface configured to engage a side of said rib to which the deflector is attached, at least two of said arcuate surfaces being oriented to engage one side of said rib, and, at least one of said arcuate surfaces being oriented to engage the other side of said rib.

5,468,187

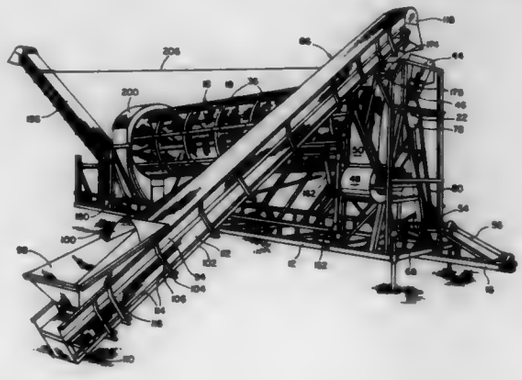
PEANUT CLEANER

Charles L. Edwards, Jr., 50 Water St., Tarboro, N.C. 27886

Filed Feb. 15, 1994, Ser. No. 196,753

Int. Cl.[6] A01F 11/00

U.S. Cl. 460—126 12 Claims



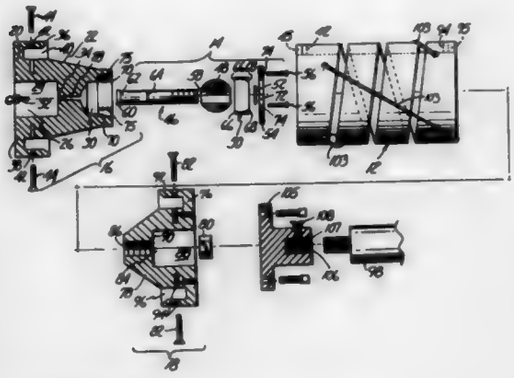
1. A cleaner for peanuts, said cleaner including a reticulated, generally cylindrical drum having substantially open opposite ends and journaled for rotation about the longitudinal center axis of the drum with said axis being slightly inclined relative to the horizontal and one of said ends disposed uppermost, feed means operative to convey peanuts to be cleaned into the interior of said one end of said drum at a substantially constant and controlled rate, and drive means operative to rotate said drum, said feed means including (1) an upstanding gravity discharge chute including a lower outlet end opening into said one end of said drum and an upper, upwardly opening inlet end disposed outwardly of said one drum end, (2) harvested peanut supply means operative to downwardly free fall discharge, at said controlled rate, peanuts into said inlet end from a location spaced vertically thereabove and (3) cleaning air discharge means operative to discharge a flow of cleaning air at a controlled rate along a path transverse to said inlet end from one side thereof toward the opposite side thereof, whereby loose lights and fines may be blown laterally of said flow and outwardly from said opposite side of said chute inlet end intermediate the latter and said location.

5,468,188

UNIVERSAL COUPLING

Stanley J. Day, 21 Dellwood Cove, St. Paul, Minn. 55128

Filed Oct. 2, 1992, Ser. No. 955,680
Int. Cl.[6] F16D *3/52*
U.S. Cl. 464—60 **20 Claims**



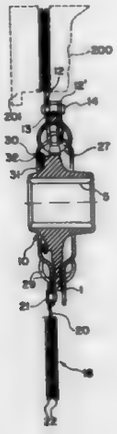
1. A joint comprising:
a first drive shaft;
a second drive shaft;
a socket disposed within the first drive shaft;
a ball attached to the second drive shaft and disposed within the socket of the first drive shaft; and
a spring having two ends, the spring being formed of a polymer matrix, the matrix formed to a force sufficiently flexible for permitting non-axial connection of the first and the second drive shafts, sufficiently resilient for absorbing and dampening torsional shock loads in a variable velocity system, sufficiently stiff for transmitting torsional motion from the first drive shaft to the second drive shaft, and sufficiently stiff for transferring rotational forces through the joint, the spring being attached at one end to the first shaft and at the other end to the second shaft and being deposed about the ball and socket.

5,468,189

TORSION DAMPER, IN PARTICULAR FOR A MOTOR VEHICLE

Carl Putman, Saleux, France, assignor to Valeo, Paris, France

Filed Jan. 28, 1993, Ser. No. 8,800
Claims priority, application France, Jan. 28, 1992, 92 00876
Int. Cl.[6] F16D *3/14*
U.S. Cl. 464—68 **6 Claims**



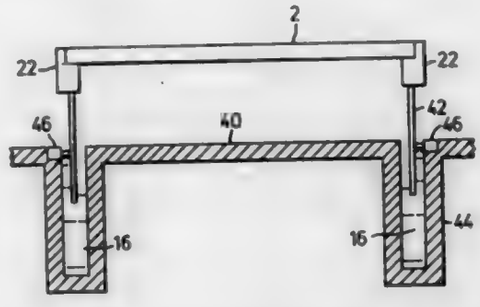
1. A torsion damper comprising:
a first rotatable part comprising a hub plate defining a plurality of slots;
a second rotatable part comprising a pair of guide rings positioned on either side of the hub plate, wherein each said guide ring is formed with housing portions facing toward said slots in the hub plate, said housing portions defining a housing area;
mounting means for mounting said first and second rotatable parts coaxially with each other, said first and second rotatable parts being mounted for relative rotation of a predetermined angular displacement:
a plurality of circumferentially acting resilient members mounted between said rotatable parts for resisting said relative rotation, said resilient members being carried both in said slots and in said housing area;
friction means associated with said rotatable parts for resisting said angular displacement; and,
a hub integrally formed with said hub plate to define a thickened junction zone joining said hub to said hub plate, said hub plate having on one side a friction ridge adjacent said slots, said friction ridge defining a friction surface for frictionally contacting on one of said guide rings;
wherein said slots are formed in said hub plate by a laser beam which cuts out the slots and the hub plate defines a varying thickness at an adjacent outer radial position with respect to said slots.

5,468,190

MULTI-PURPOSE ARENA

Felim McCaffrey, Toronto, Canada, assignor to Hatch Associates Ltd., Mississauga

Filed Apr. 16, 1993, Ser. No. 46,851
Int. Cl.[6] E04B *9/00*
U.S. Cl. 472—82 **11 Claims**



1. In an arena for spectator events which comprises a platform on which events may be presented, first banked seating arranged around the platform, means for raising and lowering the platform between a first raised position adjacent the first banked seating and a second lowered position, and second banked seating insertable onto a peripheral portion of the platform beneath and within the first banked seating when the platform is in said second lowered position, the improvement wherein the means for raising and lowering the platform comprises an air vessel disposed beneath and secured to the platform, the air vessel providing an enclosed air space having a horizontal cross-sectional area substantially coextensive with the platform, and an upward facing reaction surface forming a lower boundary of said air space is provided at least when the platform is above its lowered position, together with means providing a seal between the vessel and the reaction surface, means for introducing air into the air space to lift said platform, and means for displacing air from the air space to lower said platform.

5,468,191

VARIABLE EFFECTIVE DIAMETER PULLEYS FOR VARIABLE SPEED TRANSMISSION OF POWER

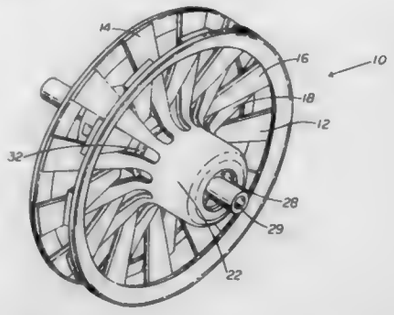
Russell E. Monahan, Ann Arbor, Mich., assignor to NTN Corporation, Osaka, Japan

Filed Apr. 30, 1993, Ser. No. 56,122

The portion of the term of this patent subsequent to Mar. 21, 2012, has been disclaimed.

Int. Cl.[6] F16H *55/46*

U.S. Cl. 474—8 20 Claims



1. A variable effective diameter pulley comprising a pair of opposed hubs and a pair of opposed sheaves adapted to engage a belt, the sheaves each including a plurality of tangs extending generally outwardly toward the pulley periphery and each sheave including a separate peripheral ring, each ring being attached to the tips of the tangs of the corresponding sheave and the tangs of each sheave being formed integrally with the corresponding hub whereby the tangs of the sheaves interleave during at least a portion of the range of effective diameters of the pulley.

5,468,192

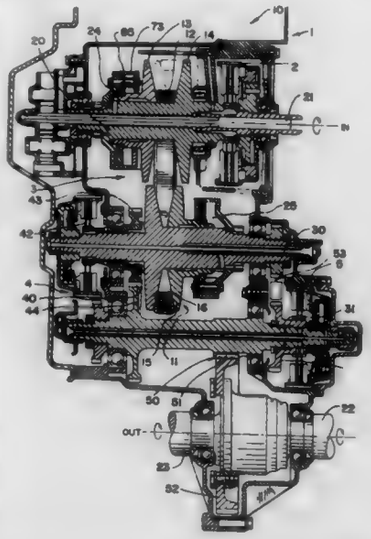
ADJUSTABLE PULLEY IN A CONTINUOUSLY VARIABLE TRANSMISSION

Francis B. Robbins, Dryden, N.Y., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Division of Ser. No. 58,552, May 5, 1993, Pat. No. 5,407,394. This application Dec. 21, 1994, Ser. No. 361,210

Int. Cl.[6] F16H *61/00*

U.S. Cl. 474—28 4 Claims



1. A continuously variable transmission system to provide transmission of torque from a power input to a power output, comprising:

an input shaft disposed for operative connection to a power input;

an output shaft disposed for operative connection to a power output;

a continuously variable drive system having a first adjustable pulley mounted to a first shaft, the first adjustable pulley comprising a first flange fixed to the first shaft, a first disc fixed to the first shaft, a second flange mounted around the first shaft between the first flange and the first disc, the second flange capable of axial movement along the first shaft, the second flange having a foot parallel to the shaft with the foot having a wall extending normal to and away from the shaft, an inner ring disposed around the foot and having a first extension extending normal to and toward the first disc, whereby a first piston is defined by the first disc, the first shaft, the wall, and the extension, a guide disposed substantially normal to the first disc and parallel with the first extension, with the wall further having a bore to slidably receive the guide to provide a radial drive connection between the second flange and the first shaft and allowing axial movement of the second flange, a second pulley mounted on the output shaft and a belt interconnecting the first adjustable pulley and the second pulley; and

a clutch system to selectively connect the continuously variable drive system with the output shaft;

the second flange further having a second extension engaging the inner ring whereby a second piston is defined by the inner ring, the foot, the second flange and the second extension.

5,468,193

INSCRIBED PLANETARY GEAR DEVICE HAVING POWDER INJECTION MOLDED EXTERNAL GEAR

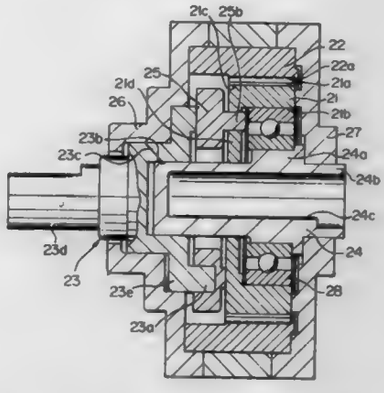
Katuyoshi Yamaguchi, Nagoya, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 19,827, Feb. 19, 1993, abandoned, which is a continuation of Ser. No. 778,547, Oct. 18, 1991, abandoned. This application Sep. 17, 1993, Ser. No. 122,667

Claims priority, application Japan, Jan. 25, 1990, 2-288019

Int. Cl.[6] F16W *1/32*

U.S. Cl. 475—162 6 Claims



1. An inscribed planetary gear device, comprising: a primary shaft; an externally-toothed gear having an axially extending cylindrical bore fitted around a bearing carried at an eccentricity by said primary shaft; an internally-toothed gear inscribed by said externally-toothed gear; a secondary shaft extending coaxially with said primary shaft; and an Oldham's ring disposed between said externally-toothed gear and said secondary shaft for transmitting to said secondary shaft only the rotation of said externally-toothed gear taking place about the axis of said externally-toothed gear; wherein said Oldham's ring is formed with at least one Oldham's projection projecting toward said externally-toothed gear, said externally-toothed gear is provide with a counter flange at an end

thereof on the sides of said Oldham's ring to extend radially inwardly, said flange being formed with at least one Oldham's groove to receive said Oldham's projection, and said externally-toothed gear is formed by metal powder injection molding so as to prevent distorted and deterioration of the roundness of said externally-toothed gear.

5,468,194

POWER TRANSMISSION FOR MECHANICAL PRESS

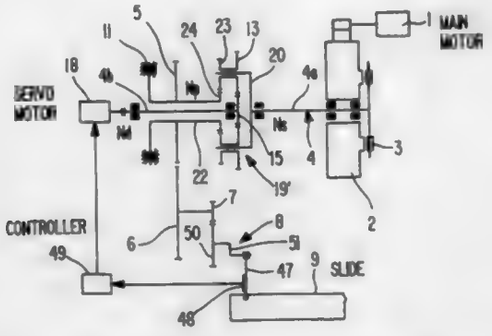
Keiichiro Hayashi, Kamakura, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 337,408, Nov. 8, 1994, which is a division of Ser. No. 31,883, Mar. 16, 1993, Pat. No. 5,425,682. This application Feb. 17, 1995, Ser. No. 389,941

Claims priority, application Japan, Mar. 16, 1992, 4-89259; Jan. 23, 1992, 4-307946; Nov. 4, 1992, 4-317962; Dec. 25, 1992, 4-358010; Jan. 29, 1993, 5-32395

Int. Cl.[6] F16H *1/28*

U.S. Cl. 477—3 **1 Claim**



1. In a power transmission for a mechanical press wherein rotational energy stored in a flywheel through driving of a main motor is taken through a power transmission shaft by a transmission gear and is transmitted to a slide drive, an improvement which comprises first and second shaft sections into which said power transmission shaft is divided and which are adjacent to said flywheel and said power take-off gear, respectively, a planetary gearing between the shaft sections adapted to be driven by a servo motor, said transmission gear being mounted on an output section of the planetary gearing and a load cell on said slide drive for detecting any overload acting on a slide, a signal from said load cell being transmitted to said servo motor.

5,468,195

APPARATUS AND METHOD FOR CONTROL OF A VEHICLE FITTED WITH AN AUTOMATIC CONTINUOUSLY VARIABLE TRANSMISSION

Masuo Kashiwabara, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Feb. 25, 1994, Ser. No. 202,120

Claims priority, application Japan, Feb. 25, 1993, 5-036362

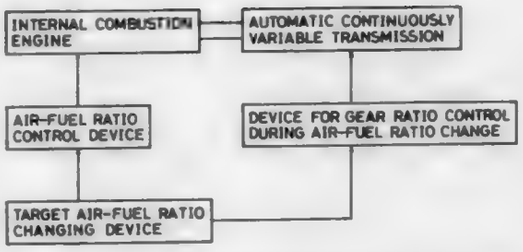
Int. Cl.[6] B60K *41/14*

U.S. Cl. 477—46 **12 Claims**

1. An apparatus for controlling a vehicle fitted with an automatic continuously variable transmission, said apparatus comprising:

air-fuel ratio control means for controlling an air-fuel ratio of an engine intake mixture to conform to a target air-fuel ratio,

target air-fuel ratio changing means for changing the target air-fuel ratio in said air-fuel ratio control means in accordance with operating conditions, and means for speed change control during air-fuel ratio change, for forcibly changing the gear ratio in the automatic continuously variable transmission fitted to the engine, towards a ratio which suppresses changes



in vehicle drive torque, at the time of a changing the setting of the target air-fuel ratio by said target air-fuel ratio changing means.

5,468,196

METHOD AND AN APPARATUS FOR CONTROLLING A CAR EQUIPPED WITH AN AUTOMATIC TRANSMISSION HAVING A LOCKUP CLUTCH

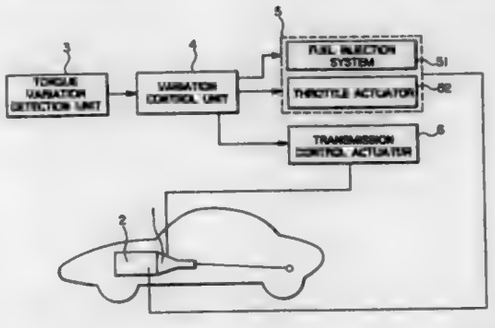
Toshimichi Minowa, Ibaraki; Yutaka Nishimura; Ken'ichi Kawashima, both of Katsuta; Hiroshi Kuroiwa, Hitachi, and Masahiko Ibamoto, Katsuta, all of, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 2, 1993, Ser. No. 25,211

Claims priority, application Japan, Mar. 2, 1992, 4-044376

Int. Cl.[6] B60K *41/02;41/04;41/22*

U.S. Cl. 477—62 **26 Claims**



1. A method for controlling a car equipped with an automatic transmission having a lockup clutch, comprising the steps of:

detecting a variation of a generated torque when said lockup clutch is engaged;

reducing an engine torque by controlling an engine when the width of said detected variation of the torque has exceeded a predetermined value; and

changing the transmission ratio to a lower gear ratio by controlling said automatic transmission so as to compensate for a reduction of the driving torque due to said reduction of the engine torque.

5,468,197

SHIFT RAIL POSITION SENSOR FOR VEHICLE TRANSMISSION

John M. Loeffler, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Mar. 1, 1994, Ser. No. 204,628

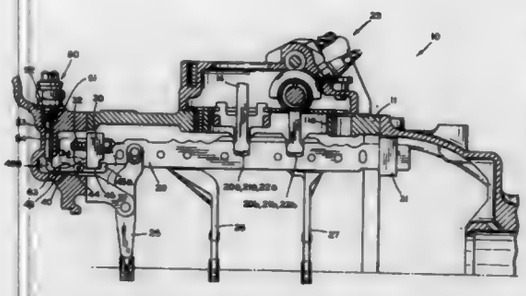
Int. Cl.[6] B60K *20/02*

U.S. Cl. 477—99 **22 Claims**

1. A transmission comprising:

a case containing an input shaft and an output shaft;

a shift rail supported for movement within said case between a first position, wherein said input shaft is not connected to said output shaft, and a second position, wherein said input shaft is



connected to said output shaft, said shift rail having a surface including a first surface portion and a second surface portion;

a neutral start switch supported on said case and operable in first and second conditions; and

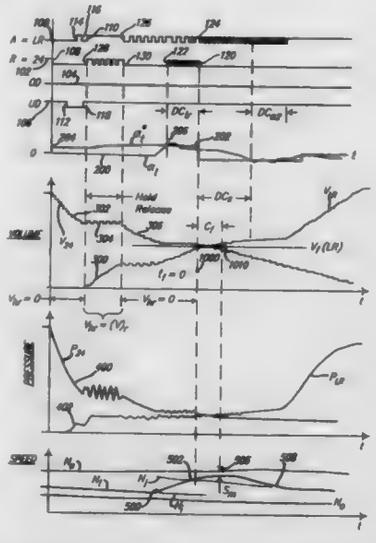
an actuator lever mounted on said case for pivoting movement relative thereto, a first end of said actuator lever slidably engaging said surface of said shift rail and a second end of said actuator lever engaging said neutral start switch, said first end of said actuator lever engaging said first surface portion when said shift rail is in said first position so as to maintain said actuator lever in a first position to operate said neutral start switch in said first condition, said first end of said actuator lever engaging said second surface portion when said shift rail is in said second position so as to maintain said actuator lever in a second position to operate said neutral start switch in said second condition.

5,468,198

METHOD OF CONTROLLING COASTDOWN AND COASTDOWN/TIP-IN IN AN AUTOMATIC TRANSMISSION

Gerald L. Holbrook, Rochester Hills; Maurice B. Leising, Clawson, and David L. Kwapis, Troy, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 4, 1994, Ser. No. 206,521
Int. Cl.[6] F16H *61/06*
U.S. Cl. 477—143 **26 Claims**



1. In an electronic controller for an electronically controlled vehicle automatic transmission system wherein the vehicle includes sensors for providing signals indicative of vehicle operating conditions, the transmission system includes a plurality of solenoid-actuated valves being movable and having logical operating states (ON and OFF) responsive to an electrical signal to control flow of a fluid to cause application or release of a friction element and wherein said electronic controller includes means for receiving input signals from said sensors indicative of predetermined vehicle conditions, memory means for storing information, processor means for performing calculations and generating output signals, and means for applying said output signals to said solenoid-actuated valves, a method of controlling a coastdown shift comprising the steps of:

prefilling an apply friction element so as to partially fill the apply friction element by selectively turning ON an apply element valve;

calculating a time remaining to nearly fill the apply friction element to cause engagement of the apply friction element;

monitoring a signal indicative of speed of a turbine of a torque converter of the vehicle; and

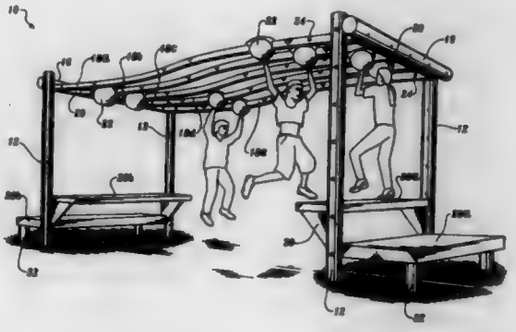
turning OFF a release friction element valve to release a release friction element when turbine speed reaches a target gear speed and once the time to nearly fill the apply element equals a predetermined value.

5,468,199

SLIDING-HANDGRIP AMUSEMENT APPARATUS

Russell L. Keeler, and John M. Underbrink, both of Olympia, Wash., assignors to BigToys, Inc., Olympia, Wash.

Filed Dec. 17, 1993, Ser. No. 168,957
Int. Cl.[6] A63G *21/20*
U.S. Cl. 482—35 **3 Claims**



1. An amusement apparatus for users to traverse while hanging by their hands above a ground surface, the apparatus comprising:

(a) at least three substantially horizontal members positioned side by side, each of said substantially horizontal members having a generally smooth, unobstructed top surface along substantially the entire length of said horizontal members, wherein said substantially horizontal members include first ends and second ends, said substantially horizontal members being smooth and unobstructed between said ends;

(b) at least one handgrip assembly frictionally coupled to each of said substantially horizontal members, each handgrip assembly including at least one handle, said handgrip assemblies being continuously and smoothly slidable along substantially the entire length of said substantially horizontal members, each of said handgrip assemblies having a surface riding on one of said substantially horizontal members such that, when one of said handgrip assemblies is unweighted, it will smoothly slide along one of said substantially horizontal members while, when weighted, said handgrip assembly holds onto the smooth top of substantially horizontal members, wherein said handgrip assemblies each include a channel having a closed top side and two ends, an opening being disposed at each end, each of said channels slidably engaging one of said substantially horizontal members, the top side of said channel riding on the top of one of said substantially horizontal members, the length of said channel being greater than the height of said channel, such that said handgrip assembly rides smoothly on one of said substantially horizontal members without substantial rockering; and

(c) a structure for supporting said substantially horizontal members above the ground surface, said first and second ends being attached to said structure;

wherein said substantially horizontal members include curved portions along their length, and wherein said channels are wider near their middles than near their ends so that said handgrip assemblies accommodate said curved portions of said substantially horizontal members, the ends providing closer fitting engagement with the sides of said substantially horizontal members to eliminate lateral sloppiness of said handgrip assemblies on said substantially horizontal members.

5,468,200

WEIGHTED EXERCISE GLOVE HAVING WEBBED FINGERS

Ned Hoffman, Berkeley, Calif., assignor to Sports-Mitt International, Berkeley, Calif.

Continuation-in-part of Ser. No. 398,360, Aug. 25, 1989, Pat. No. 5,004,227, which is a continuation-in-part of Ser. No. 289,191, Dec. 23, 1988, Pat. No. 4,923,418. This application Mar. 14, 1991, Ser. No. 669,177

The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.

Int. Cl.[6] A63B *31/04*

U.S. Cl. 482—55 **9 Claims**

1. An exercise glove for use in swimming comprising:

a mitt having a backhand portion, a palm portion and being constructed substantially of elastic materials resistant to deterioration in saltwater environments, said backhand portion having an external side facing away from the palm portion and an internal side facing towards the palm portion;

a plurality of finger sleeves for receiving the fingers of a user, each said finger sleeve having a proximal end connected to the mitt and an open distal end extending away from the mitt and configured to allow a finger to extend through the distal end when the mitt is worn;

a webbing disposed between at least two of said finger sleeves extending from said mitt to a point near the proximal ends of each said two finger sleeves; and

a plurality of pockets, each said pocket configured to receive a weight, said pockets being disposed upon the internal side of the backhand portion.

5,468,201

LOADING APPARATUS FOR EXERCISE DEVICE

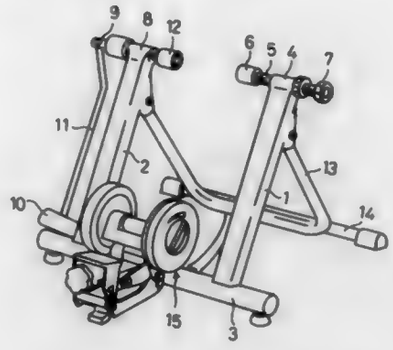
Koji Minoura, Gifu, Japan, assignor to Minoura Co., Ltd., Gifu, Japan

Continuation-in-part of Ser. No. 509,539, Mar. 30, 1990, now Re. 34,479. This application Feb. 9, 1993, Ser. No. 14,684

Claims priority, application Japan, Dec. 25, 1992, 4-347239

Int. Cl.[6] A63B *23/04*

U.S. Cl. 482—61 **13 Claims**



1. A loading apparatus for use with a bicycle having one wheel and a pedaling mechanism for exerting a resistive load onto the wheel, the apparatus comprising:

a rotary disk being rotatable by the pedaling mechanism to generate the resistive load;

a rotary shaft connected to the rotary disk for applying the resistive load to the wheel;

eddy current generating means for generating an eddy current on said rotary disk;

said eddy current generating means including at least two members being generally oppositely disposed relative to said rotary disk;

each one of said members including a plurality of magnets being generally, concentrically, continuously arranged about said rotary shaft, whereby adjacent magnets have alternating polarities and whereby a magnetic flux is produced by the magnets; and

adjustment means for varying the magnitude of said magnetic flux, wherein said adjustment means is arranged to permit a first one of said members to move relative to a second one of said members, for gradually varying the polarity relationship of two opposite magnets in order to adjust the resistive load as a generally linear function of the movement of said first member relative to said second member.

5,468,202

MULTI-HIP EXERCISER

Theodore G. Habing, Long Beach, Calif., assignor to Pacific Fitness Corporation, Cypress, Calif.

Continuation of Ser. No. 190,994, Feb. 3, 1994, Pat. No. 5,354,252, which is a division of Ser. No. 918,251, Jul. 22, 1992, Pat. No. 5,308,304. This application Jun. 20, 1994, Ser. No. 262,148

Int. Cl.[6] A63B *21/062*

U.S. Cl. 482—100 **5 Claims**

1. An exercise machine comprising:

a frame;

an operable member for performing an exercise;

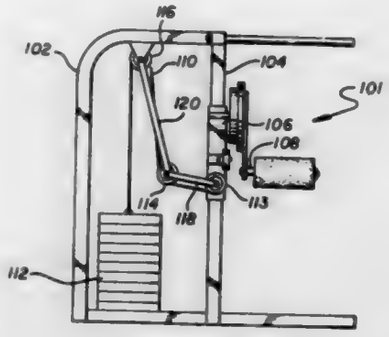
a means for providing exercise resistance;

a third pulley rotatably mounted on the frame;

a second linkage arm having a first end and a second end, the first end pivotally mounted on the frame;

a second pulley rotatably mounted on the second linkage arm adjacent the second end thereof;

a cable reeved around the third and second pulleys and operatively coupled to the operable member and the means for



providing exercise resistance for communicating the exercise resistance to the operable member; and

a first linkage arm having a first end and a second end, the first end pivotally coupled to the second linkage arm coaxially with the second pulley, and a first pulley rotatably mounted on the first linkage arm adjacent the second end thereof, wherein the cable is reeved around the first, second and third pulleys.

5,468,203

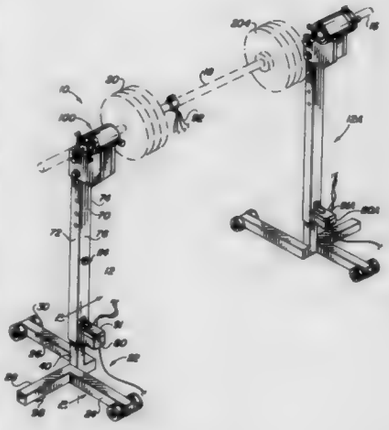
WEIGHT LIFTING SAFETY DEVICE

Charles U. Okonkwo, P.O. Box 25226, Tempe, Ariz. 85282

Filed Aug. 1, 1994, Ser. No. 283,606

Int. Cl.[6] A63B *21/078*

U.S. Cl. 482—104 **10 Claims**



1. A weight lifting safety device attachable to a barbell having a bar, said device comprising:

(a) a pair of spaced-apart, substantially vertical support members, each of said support members having:

(i) a base;

(ii) an upper tube member;

(iii) bracket means on said tube attachable to the end of said bar;

(iv) an upright member slidable with respect to said tube member and having a base at the lower end;

(v) locking means for selectively securing said upright member to said tube member at selected positions; and

(b) actuation means for selectively releasing said locking means whereby the weight lifter can lift the barbell and said stands and may selectively actuate said actuation means to cause said uprights to descend by gravity to engage a supporting surface and stabilize the barbell.

5,468,204

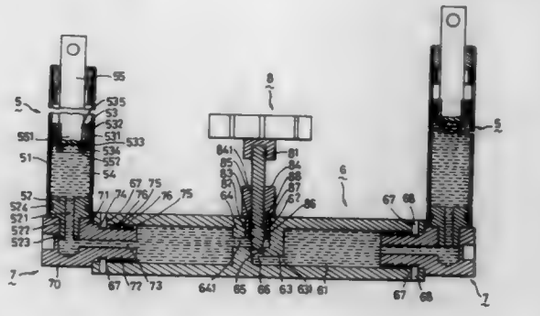
HYDRAULIC EXERCISER WITH RECIPROCATING HYDRAULIC CYLINDER PAIR

Yi-Fa Huang, Tao-Yuan Hsien, Taiwan, Prov. of China, assignor to Michelle Hsiu-Feng Wang, Chia-Yi City, Taiwan, Prov. of China

Filed Oct. 5, 1994, Ser. No. 321,816

Int. Cl.[6] A63B *21/008*

U.S. Cl. 482—112 **2 Claims**



1. A hydraulic exerciser including a base;

a pair of driven units mounted pivotably on said base;

an elongated hollow support secured on said base and extending between said driven units, said hollow support having an axial through bore formed therethrough; and

a pair of hydraulic cylinders, each of said hydraulic cylinders including a cylinder body, a piston disposed movably inside said cylinder body, a piston rod having a first end connected to said piston and a second end which extends out of said cylinder body and which is connected to a respective one of said driven units, and a plug unit which is secured on one end of said cylinder body and which mounts pivotably said cylinder body on a respective one of two ends of said hollow support;

said piston, said cylinder body and said plug unit cooperatively defining a volume variable fluid chamber which is filled with hydraulic fluid;

said plug unit being formed with a fluid passage for communicating said fluid chamber and said through bore of said hollow support;

wherein said plug unit includes a first plug member extending sealingly and securely into said one end of said cylinder body and having an axial threaded extension which extends out of said one end of said cylinder body, and a second plug member having a head section formed with a radial threaded hole which engages threadedly said threaded extension and a shank section extending sealingly and rotatably into said respective one of said two ends of said hollow support;

wherein said fluid passage includes an axial hole formed through said first plug member and an axial blind hole formed through said shank section of said second plug member and communicated fluidly with said axial hole of said first plug member; and

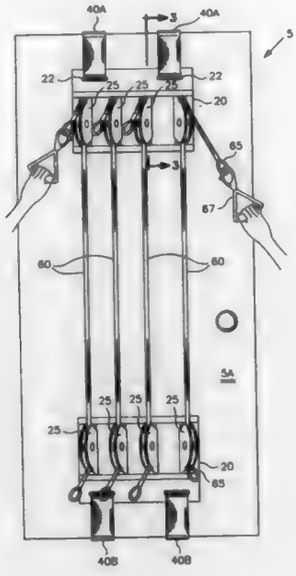
wherein said shank section of said second plug member is formed with an annular peripheral groove, each of said two ends of said hollow support being formed with a radial pin hole that is aligned with said annular peripheral groove of a corresponding said second plug member, said plug unit further including a pin extending into a corresponding said pin hole and said annular peripheral groove of said second plug member to mount rotatably said second plug member on said hollow support.

5,468,205

PORTABLE DOOR MOUNTED EXERCISE APPARATUS

Michael McFall, 130 Manzanita La., Thousand Oaks, Calif. 91360, and Paul Aagaard, 458 Havenside, Newbury Park, Calif. 91320

Filed Nov. 2, 1994, Ser. No. 333,608
Int. Cl.[6] A63B 21/04
U.S. Cl. 482—129 6 Claims



1. An exercise apparatus for mounting on a door, the exercise apparatus comprising:

identical upper and lower bases adapted to be in contact with a front vertical surface of a door in mutual vertical alignment one above the other, each of the bases providing a plurality of pulley holders each pivotally mounted to the base in side by side alignment with free lateral turning thereon, each of the holders having a rotatably, vertically mounted pulley, freely rotatable within each of the holders such that the pulleys in the upper base and the pulleys in the lower base form corresponding vertically aligned pairs of pulleys, each of the bases further including attachment means for holding the base against the front vertical surface of the door;

at least one pair of mounting straps, each of the straps attached to the attachment means of the upper and lower bases, the straps being adapted to lay against the front vertical surface of the door, and to extend around the upper and lower edges of the door, and being capable of being mutually joined together on a rear surface of the door so that the straps are capable of being in tension on the door;

a plurality of elastic cords, each of the cords extending between the corresponding pairs of pulleys, each of the cords being wrapped around one pulley in the upper base and one corresponding pulley in the lower base and completing at least 90 angular degrees of wrap around each of the pulleys so that the ends of the cords are capable of extending away from the door front surface, the ends of the cords terminating in an attachment joint, each joint having a size unable to fit between its respective pulley and holder so that the cords are placed under tension when holding the bases in position on the door; and

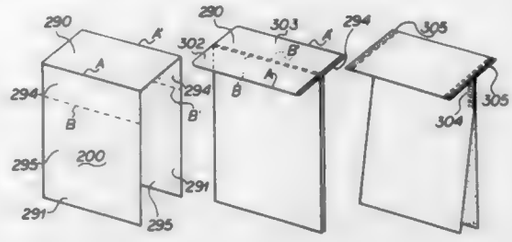
at least one handle having attachment means for engaging the attachment joint of any one of the cords.

5,468,206

CONTAINER

Jerry E. Buchanan, Alpharetta, Ga., assignor to Jebco Packaging Systems, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 916,889, Jul. 20, 1992, Pat. No. 5,273,362, which is a continuation-in-part of Ser. No. 517,787, May 2, 1990, Pat. No. 5,135,464. This application Mar. 19, 1993, Ser. No. 34,490
Int. Cl.[6] B31B 1/64
U.S. Cl. 493—189 5 Claims



1. A method of producing a container from a sheet of flexible material having a thermally bondable inside surface, and with the method comprising the steps of

folding the material along first and second parallel fold lines to form an uncreased central portion between the first and second fold lines which forms the container bottom wall straddled by two end portions which form the container sides,

folding the two end portions respectively along third and fourth fold lines parallel to the first and second fold lines to form the two end portions into two first portions overlying the uncreased central portion and two second portions overlying each other,

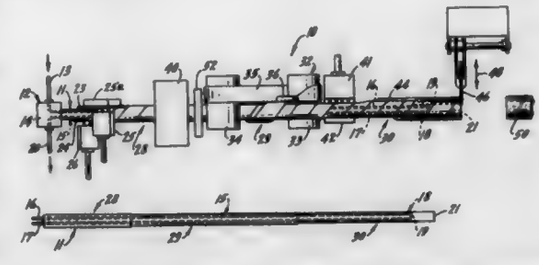
thermally bonding together side edges of the first portions and side edges of the uncreased central portion, and thermally bonding together side edges of the second portions.

5,468,207

METHOD AND APPARATUS OF MANUFACTURING A PAINT ROLLER

Lawrence J. Bower, Milwaukee; Ronald R. Delo, Waukesha, and Gerald D. VanZeeland, New Berlin, all of Wis., assignors to Newell Operating Company, Freeport, Ill.

Filed Jun. 14, 1993, Ser. No. 76,448
Int. Cl.[6] B31C 13/00
U.S. Cl. 493—297 16 Claims



1. In a method of making a paint roller, the steps of forming a continuous tubular core by heating and wrapping strip core material around a former having internal cooling means and means for accommodating radial inward shrinkage of said strip core material while continuously advancing and cooling the outer surface of the thus formed continuous tubular core in a downstream direction,

applying heat to the exterior surface of the thus formed continuous tubular core while said continuous tubular core is being advanced toward a discharge location, and

forming a fabric cover on the continuous tubular core by wrapping strip fabric material around the heated surface of the continuous tubular core while said continuous tubular core is

being advanced in said downstream direction whereby a continuous paint roller structure is formed.

5,468,208

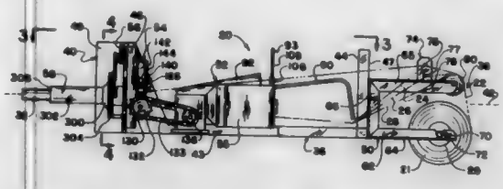
DOWNSIZED CUSHIONING DUNNAGE CONVERSION MACHINE AND PACKAGING SYSTEMS EMPLOYING THE SAME

Steven E. Armington, Kirtland, and John E. Silvis, Fairport, both of Ohio, assignors to Ranpak Corp., Concord, Ohio

Continuation of Ser. No. 592,572, Oct. 5, 1990, Pat. No. 5,322,477. This application Dec. 22, 1993, Ser. No. 174,196

Int. Cl.[6] B31F *5/02;1/00*

U.S. Cl. 493—352 **6 Claims**



6. A method of producing cut sections of relatively low density pad-like cushioning dunnage product, comprising the steps of:

supplying a sheet-like stock material;

converting the sheet-like stock material into a strip of a pad-like cushioning dunnage product;

cutting such strip into cut sections of a desired length; and

circumferentially constraining such cut sections.

5,468,209

SEALING FOR A FOLDIN BALDE SHAFT

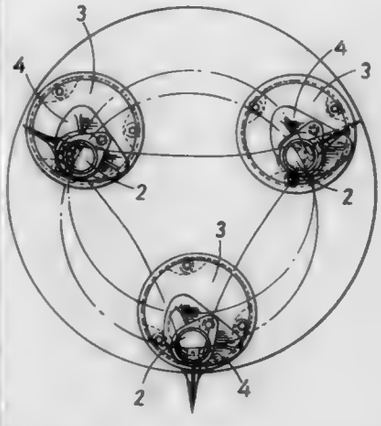
Ulrich Rohrhiursch, Unterroth, and Georg Schmid, Gablingen, both of, Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach, Germany

Filed Aug. 3, 1993, Ser. No. 116,890

Claims priority, application Germany, Aug. 5, 1992, 42 25 810.3

Int. Cl.[6] B68H *45/16*

U.S. Cl. 493—424 **11 Claims**



7. A folding cylinder having an interior oil space and a center axis, comprising:

a plurality of folding blade shafts (2) circumferentially arranged about the folding cylinder and including means for executing a hypocycloidal movement, each of the folding blade shafts having a center axis;

a plurality of disks (4), each of the folding blade shafts carrying one of said disks (4), each said disk (4) having a center axis, a collar and comprising a bearing (10) surrounding an associated folding blade shaft (2) and a sealing ring (13) at said collar facing the oil space (6) of the folding cylinder;

a plurality of covering disks, each one of the covering disks being eccentrically and rotatably attached to a respective one of the folding blade shafts (2) so as to be eccentric to the center axes of the folding blade shaft and the folding cylinder;

means (5) arranged on each folding blade shaft (2) for pressing the disk (4) against the covering disk (3);

each said covering disk (3) comprising a first means for rotatably mounting said covering disk (3) to said folding cylinder; and a second means for rotatably mounting said disk (4) on said covering disk (3).

5,468,210

PROCESS OF THERMAL TREATMENT IN TISSUE

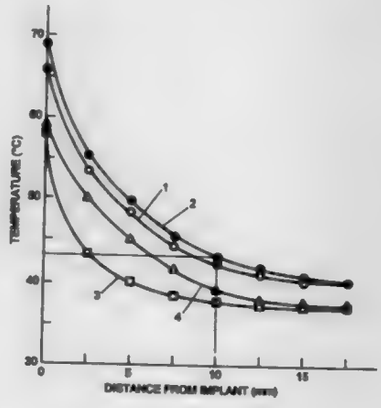
Masaaki Matsui; Toshifumi Shimizu, and Tatsuya Kobayashi, all of Aichi, Japan, assignors to Tanaka Kikinzoku Kogyo K.K., Japan

Continuation of Ser. No. 968,426, Oct. 29, 1992, abandoned. This application Apr. 22, 1994, Ser. No. 232,359

Claims priority, application Japan, Jan. 29, 1991, 3-309854

Int. Cl.[6] A61B *17/52*

U.S. Cl. 600—10 **5 Claims**



1. A process of thermal treatment in a tissue comprising embedding a needle-like implant element in an organism and externally applying a high frequency magnetic field so as to generate heat utilizing eddy current loss characterized in that the implant element comprises a magnetic exothermic electroconductive member at least part of which is covered with a non-magnetic film having thermally insulating properties; wherein the film controls the amount of heat generated from the magnetic exothermic electroconductive member reaching said tissue with the application of the high frequency magnetic field, and said film thereby preventing excessive generated heat, detrimental to said tissue, from reaching said tissue.

5,468,211

INTERNAL RING RELEASING DEVICE FOR A VACUUM CONSTRICTION SYSTEM

Daniel P. Welch, Zimmerman, Minn., assignor to Mentor Corporation, Santa Barbara, Calif.

Filed Oct. 6, 1993, Ser. No. 132,646

Int. Cl.[6] A61F *5/00*

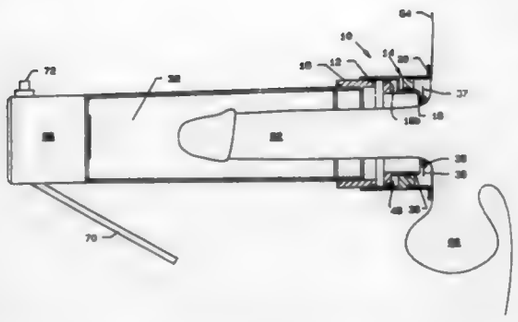
U.S. Cl. 600—38 **10 Claims**

1. An internal ring release device (IRRD) comprising:

a. a cylindrical housing;

b. a piston slidably engaged into said housing and including an outer rim engaging an inner wall of said housing;

c. means for supporting a constriction ring at one end of said piston and internal to said cylindrical housing; and,



d. means for causing said piston to move from a first position to a second position whereby said constriction ring thereby slides off said end of said piston about a base of a penile erection.

5,468,212

DEVICE FOR CONTROLLING PREMATURE EJACULATION

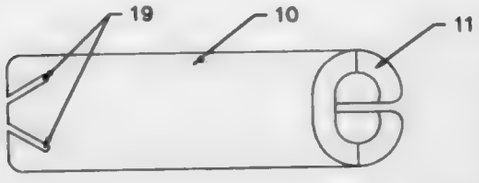
Ernest K. Shooter, 44 Musgrave Road, Durban 4001, South Africa

Filed Jul. 28, 1994, Ser. No. 281,636

Claims priority, application South Africa, Jan. 24, 1994, 94/0471

Int. Cl.[6] A61F *5/00*

U.S. Cl. 600—39 **3 Claims**



1. A device for controlling premature ejaculation comprising: a tubular member having a longitudinal axis, and extending in the direction of said longitudinal axis from a first end to an opposite second end; said tubular member having an external surface which generally extends in a rotational direction relative to said longitudinal axis from a first edge to an opposite second edge; said first edge being spaced from said second edge in said rotational direction, for the length of said tubular member from said first end to said opposite second end, to form an opening between said first edge and said second edge; a first length of said opening adjacent said first end and a second length of said opening adjacent said second end, each of said first length and second length having a width which is substantially smaller than a third length of said opening intermediate of and extending between said first length and said second length; said tubular member being sufficiently flexible for it to be removably located on a penis and hard enough to provide a texture and feel similar to that of the surface of the penis; and a first portion of said tubular member adjacent said first end and said first length forming a front flange having an edge which is shaped complementally to the rear of the glans of the penis, and having an elasticity for imparting a sufficient inward pressure to control premature ejaculation.

5,468,213

MECHANICAL PENILE PROSTHESIS

Mark Polyak, Minnetonka, Minn., assignor to American Medical Systems, Inc., Minnetonka, Minn.

Filed Sep. 22, 1994, Ser. No. 310,918

Int. Cl.[6] A61F *2/26*

U.S. Cl. 600—40 **6 Claims**

1. A mechanical penile prosthesis for implantation in a corpus cavernosum of a patient, which comprises an elongated tubular outer sheath made from a prestretched elastic material and having a distal portion, a proximal portion and an intermediate portion, the distal portion defining a substantially rigid tip, the proximal portion defining a substantially rigid tip, each of said tips terminating in a rounded end, and the intermediate portion defining a hollow tubular chamber having a longitudinal axis, an inner surface and a substantially circular cross-section, a central core having a distal end and a proximal end positioned along said longitudinal axis and anchored at each of said distal and proximal ends to each of said tips, and an articulated member positioned within the chamber about said central core, which articulated member comprises a plurality of alternating rings and discs, each of said rings being defined by a toroid having a curved surface, a substantially circular cross-section and an outer circumference, each of said discs being defined by a toroid having a flattened upper surface and a flattened lower surface, each a said upper and lower surfaces having a peripheral portion with an outer circumference, wherein each peripheral portion has a tapered or convex profile, such that the tapered profile is tangential to or the convex profile is complimentary to the curved surface of the rings adjacent to lock disc.

5,468,214

THERAPY APPARATUS FOR TREATMENT WITH ACOUSTIC WAVES

Klaus Herrmann, Nuernberg, and Guenther Krauss, Erlangen, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 266,245, Jun. 27, 1994, abandoned. This application Mar. 21, 1995, Ser. No. 408,196

Claims priority, application Germany, Jul. 27, 1993, 43 25 213.3

Int. Cl.[6] A61B *17/22*

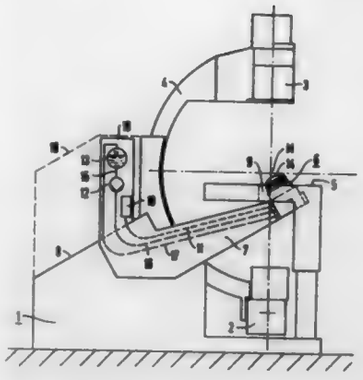
U.S. Cl. 601—2 **18 Claims**

1. A therapy apparatus comprising:

a base part;

a source of therapeutic acoustic waves for treating the body;

at least one apparatus component for use with said source of therapeutic acoustic waves disposed a fixed distance from, and having a fixed spatial orientation relative to, said source of therapeutic acoustic waves and being connected to said source of therapeutic acoustic waves via a connecting line; and



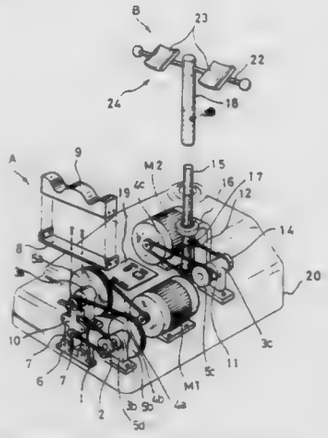
means mounted on said base part for adjusting a position of said source of therapeutic acoustic waves in at least one degree of freedom relative to said base part, said means for adjusting comprising a carrier to which said source of therapeutic acoustic waves and said apparatus component are attached permanently at said fixed distance from each other and permanently in said fixed spatial orientation relative to each other, and said means for adjusting comprising means for adjusting said carrier relative to said base part in said one degree of freedom.

5,468,215

EXERCISE UNIT FOR WHOLE BODY

Chan-Min Park, Pusan, Rep. of Korea, assignor to Mi-Ran Ahn, Pusan, Rep. of Korea

Filed Jul. 26, 1994, Ser. No. 280,308
Int. Cl.[6] A61H *1/00*
U.S. Cl. 601—23 **8 Claims**



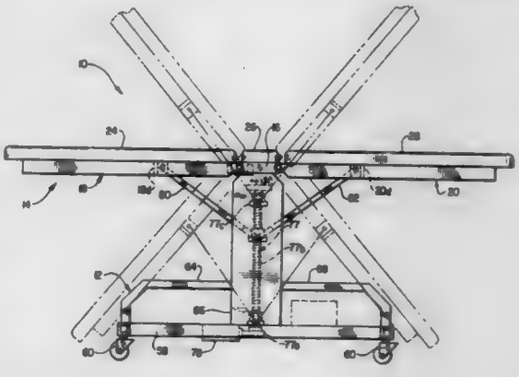
1. An exercise unit for whole body comprising:
a lateral vibration part having:
a first driving motor;
a plurality of reduction pulleys, including a first and a last pulley rotatably supported by bearing housings and connected to a shaft of the first driving motor via a belt, the reduction pulleys being connected to each other in power transmission;
means for converting the rotative motion of the reduction pulley into a rectilinear reciprocating motion; and
a foot rest member mounted on the converting means via a bracket; and
a swing vibration part having:
a second driving motor;
a reduction pulley rotatably supported by a bearing housing and connected to a shaft of the second driving motor via a belt;
an eccentric shaft fixed to a shaft of the pulley;
a bearing member surrounding the eccentric shaft;
a second connecting rod connected at an end to a side of the bearing member;
a rotating shaft rotatably supported by a supporting member;
a pivot member mounted on an outer periphery of the rotating shaft and connected to the other end of the second connecting rod; and
a foot rest assembly mounted on the rotating shaft.

5,468,216

KINETIC REHABILITATION DEVICE EMPLOYING CONTROLLED PASSIVE MOTION

Gregory E. Johnson, Austin, Tex.; Uriel G. Ashworth, Chase City, Va., and Mark Salerno, Huntington, N.Y., assignors to Physicians Consulting Incorporated, Austin, Tex.

Filed Oct. 12, 1994, Ser. No. 322,174
Int. Cl.[6] A61H *1/00*
U.S. Cl. 601—24 **11 Claims**



1. A kinetic rehabilitation device, comprising:
a base;
a body support, comprising:
a central stationary support rigidly connected to said base; and first and second supports pivotally connected to and extending outwardly from diametrically opposed ends of said stationary support;
a vertical guide housed within said base;
a connector mounted on said guide for vertical movement;
a first arm extending between and pivotally connected to said connector and said first support and a second arm extending between and pivotally connected to said connector and said second support for driving said first and second supports pivotally about said stationary support; and
means for driving said connector.

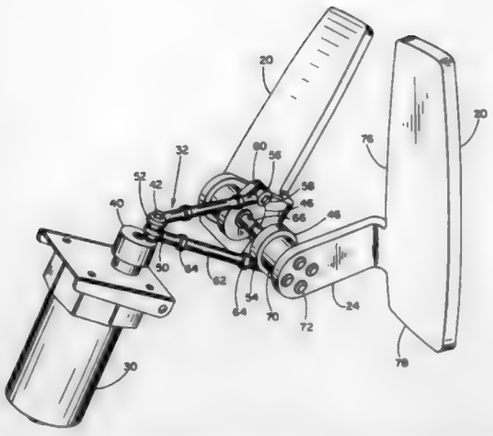
5,468,217

LOWER EXTREMITY PHLEBO PUMP

Mario C. Garcia, West St. Paul; Kristofer T. Lund, St. Paul, and William H. Park, Sunfish Lake, all of Minn., assignors to Prevent Products Inc., West St. Paul, Minn.

Filed Mar. 7, 1994, Ser. No. 207,301
Int. Cl.[6] A61H *1/00*
U.S. Cl. 601—32 **11 Claims**

1. A foot exercise machine, comprising:
(a) a support;
(b) a motor carried by said support and having a first rotatable cam;
(c) a shaft extending between a first and second end and supported by said support;
(d) a pair of foot pads, one foot pad journaled for rotation about each of said shaft ends, each foot pad having a heel and toe



for supporting a foot of a patient, each said foot pads having an integral second cam coaxially disposed about said shaft;

(e) a pair of elongated drive members each having one end rotatably coupled to said motor first cam, and an opposing end rotatably coupled to one of each said foot pad second cams such that rotation of said motor first cam imparts rotation of each foot pad second cams about said shaft; and

(f) said drive members are rotatably coupled to said motor first cam at a common point.

5,468,218

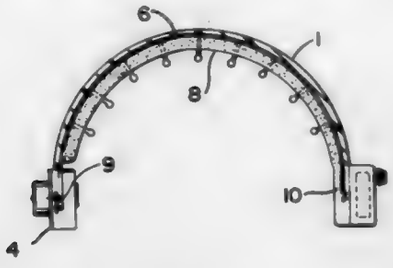
FOREHEAD STIMULATOR APPARATUS

James K. Ward, 3839 Ryans Lake Ter., Cumming, Ga. 30130

Filed Feb. 22, 1994, Ser. No. 199,712

Int. Cl.[6] A61H 7/00

U.S. Cl. 601—144 **4 Claims**



1. An apparatus for massaging a human forehead, the apparatus comprising:

(a) an elongated stimulator beam, the beam being desirable generally semi-circular in shape and constructed of a material flexible that the beam follows to the degree at contour of the forehead and when flexed follows a second contour of the forehead, the second contour being different from the first contour, the beam further having a generally "C" shaped cross-section, the cross-section comprising an opening, the opening disposed toward the center of the semi-circular shape;

(b) a stimulator belt comprising a drive belt retained within the cross-section of the beam and constructed of a material flexible to the degree that the drive belt is oscillateable along a longitudinal axis of the beam when the beam follows the first contour and when the beam is flexed to conform with the second contour of the forehead, the stimulator belt further comprising a plurality of stimulator elements constructed of a suitable soft material, the plurality of elements being attached to the drive belt and wherein at least a portion of the stimulator elements protrude through the opening; and

(c) an oscillating means for oscillating the stimulator belt along the longitudinal axis of the beam, the oscillating means disposed on the stimulator beam.

5,468,219

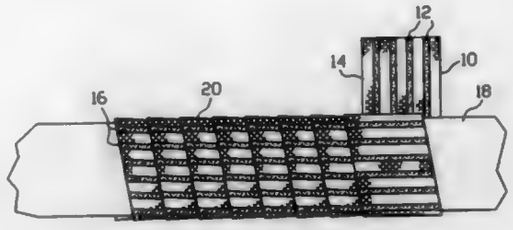
POROUS FIBERGLASS CAST SYSTEM FOR THE SETTING OF BROKEN APPENDAGES

Warren S. Crippen, 50 Georgian Village, Castleknock, Dublin 15, Ireland

Filed Feb. 20, 1992, Ser. No. 838,168

Int. Cl.[6] A61F 5/00

U.S. Cl. 602—6 **10 Claims**



1. A support means for an injured or broken appendage, comprising, a woven fiberglass fabric bandage, having interengaging fastening strips attached to a front face and a rear face respectively of said woven fiberglass fabric bandage, wherein said interengaging fastening strips are either sewn or woven respectively across the width of said front face of said fiberglass bandage and down the length of said rear face of said fiberglass bandage.

5,468,220

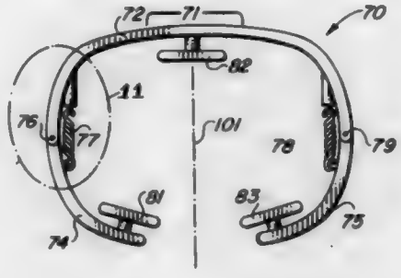
CARPAL TUNNEL BRACELET

Benjamin M. Sucher, 5261 E. Fanfol Dr., Paradise Valley, Ariz. 85253

Filed Feb. 27, 1995, Ser. No. 395,120

Int. Cl.[6] A61F 5/00

U.S. Cl. 602—21 **7 Claims**



1. An orthopedic appliance for the treatment or prevention of carpal tunnel syndrome by slowly and gently stretching the transverse carpal ligament over a period of several hours, said appliance comprising:

a C-shaped member having a central portion, a first arm extending in a first direction from said central portion to a free end, and a second arm extending in a second direction, opposite the first, from said central portion to a free end;

a first pad attached near the free end on the interior of said first arm;

a second pad attached near the free end on the interior of said second arm;

a third pad attached to the interior of said central portion;

wherein, when said appliance is worn on a wrist, said third pad presses upon a dorsal part of the wrist while said first pad and said second pad press in the opposite direction on the edges of the palm to flatten the palm and stretch the transverse carpal ligament.

5,468,221

IMPLANTABLE CATHETER MADE OF HIGH COLD FLOW MATERIAL

Wolfgang Schöner, Hainholzweg 20, 3400 Gottingen, Germany

Continuation of Ser. No. 838,266, Mar. 12, 1992, abandoned.
This application Jun. 20, 1994, Ser. No. 262,367
Claims priority, application Germany, Sep. 14, 1989, 39 30 770.0

Int. Cl.[6] A61M 5/00

U.S. Cl. 604—8 14 Claims

1. An implantable catheter having two ends of about 5 mm in length, comprising:

an inner layer made of a medically tolerated, elastic, plastically deformable synthetic material,

a middle layer coaxially arranged thereon, made of a second medically tolerated, elastic, plastically deformable synthetic material, further containing a radiopaque material, and

an outer layer coaxially arranged thereon, made of a third medically tolerated, elastic, plastically deformable synthetic material, said outer layer being roughened at said ends of said implantable catheter,

wherein each of said synthetic materials has a cold flow at a temperature of from 34° C. to 40° C. under a weight load of 40 g/0.2 mm^2 for 63 days which results in an increase in the initial length of at least 50% in the direction of the longitudinal axis,

wherein the implantable catheter undergoes cold flow to increase in length in the implanted state in line with the growth of a body in which it is implanted, and

wherein said synthetic materials are neither hydrolyzable nor fermentatively or enzymatically degradable.

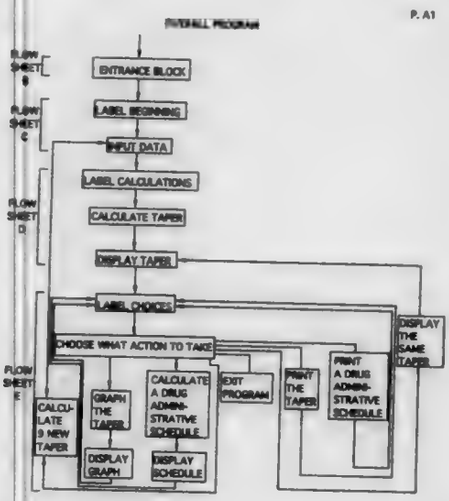
5,468,222

PROCESS FOR DETERMINING DRUG TAPER SCHEDULES

Steven I. Altchuler, Rochester, Minn., assignor to Mayo Foundation for Medical Education & Research, Rochester, Minn.

Continuation of Ser. No. 518,519, May 3, 1990, abandoned.
This application Apr. 21, 1993, Ser. No. 25,890
Int. Cl.[6] A61M 31/00

U.S. Cl. 604—49 1 Claim



1. A method of tapering a patient from a medicament, comprising:

a. predetermining the initial dose of said medicament as a first parameter;

b. predetermining at least one of the parameters selected from the group consisting of an intermediate dose of said medicament, the final dose of said medicament, the duration of said taper, and the percent decrement between said initial dose and said final dose as a second parameter;

c. calculating a tapering schedule in accordance with the algorithm

$$G(t)=Rnd[a,M]$$

wherein G(t) is the amount of said medicament given at time t, Rnd is a rounding function which rounds a to the nearest multiple of M; a is $K_1k_2^t$, wherein k_1 is the initial dose of said medicament, k_2 is said second parameter, and t is time, and M is the minimum dosage size available;

d. administering said medicament to said patient in a dosage amount in accordance with said calculated tapering schedule;

e. observing the clinical response of said patient to said administration;

f. modifying said dosage amount if said response indicates that said dosage amount is too high or too low, until the response of said patient to said modified dosage amount is stable;

g. recalculating a tapering schedule in accordance with the algorithm in part (c) using as said first parameter said initial dose and as said second parameter said modified dosage amount; and,

h. administering said medicament to said patient in a dosage amount in accordance with said recalculated tapering schedule.

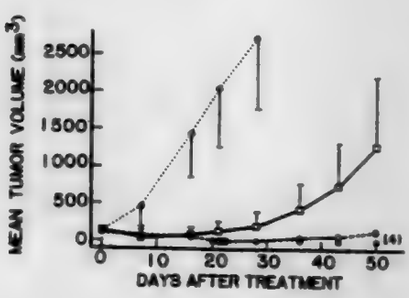
5,468,223

ELECTROCHEMOTHERAPY

Lluis Mir, Verrières le Buisson, France, assignor to C.N.R.S. Paris, Villejuif Cedex, France

Filed Nov. 30, 1992, Ser. No. 983,172
Int. Cl.[5] A61M 31/00

U.S. Cl. 604—51 9 Claims



1. A method of treating a human patient having at least one tumor cell comprising:

administering a chemotherapeutic composition to the human patient by systemic, local or direct tumor injection such that the composition is delivered to the cell;

applying an electrical impulse(s) via electroporation to the human patient transcutaneously and at the site of the tumor cell(s), of a sufficient strength and time for the impulse to cause electroporation of the tumor cell whereby the chemotherapeutic composition is delivered across the cell membrane, and wherein the delivery due to electroporation provides reduced toxicity and reduced side effects as compared with administering the chemotherapeutic composition in the absence of electroporation.

5,468,224

METHODS OF COLOR CODING INJECTABLE MEDICATIONS

Tarek O. Souryal, 7019 Hillcrest, Dallas, Tex. 75205

Continuation of Ser. No. 159,681, Nov. 30, 1993, abandoned. This application Jan. 23, 1995, Ser. No. 376,687

Int. Cl.[6] A61M *31/00*

U.S. Cl. 604—51 3 Claims

1. A method for distinguishing a medication frequently used in emergency medicine and intended for injection through tile skin of a patient from other such medications, said method comprising the steps of:

(a) assigning a color to said medication;

(b) adding a suitably colored material to said medication; and

(c) injecting tile combination resulting from steps (a) and (b) through the skin of a patient.

5,468,225

RAPID EXCHANGE CATHETER

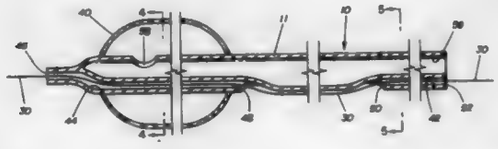
Paul S. Teirstein, 402 Coast Blvd., South, La Jolla, Calif. 92037

Continuation of Ser. No. 92,332, Jul. 15, 1993, Pat. No. 5,336,184. This application Feb. 17, 1994, Ser. No. 197,970

The portion of the term of this patent subsequent to Aug. 9, 2011, has been disclaimed.

Int. Cl.[6] A61M *29/00;31/00*

U.S. Cl. 604—102 14 Claims



1. An operative catheter, for use through a guiding catheter having a releasable seal, said operative catheter comprising:

an elongated catheter body having a distal end and a proximal end;

an operative means mountable on said catheter body adjacent said distal end of said catheter body, for performing a diagnostic or therapeutic operation on a patient;

a communicative means extending through said catheter body from said proximal end of said catheter body to said operative means;

a distal guidewire channel formed on said catheter body adjacent said distal end of said catheter body, said distal guidewire channel terminating at a first distal port and a first proximal port; and

a proximal guidewire channel separate from and substantially axially aligned with said distal guidewire channel, said proximal guidewire channel being formed on said catheter body adjacent said proximal end of said catheter body, said proximal guidewire channel terminating at a second distal port and a second proximal port;

wherein said second distal port and said second proximal port are longitudinally positioned along said catheter body so that installation of said operative catheter within the guiding catheter, with said operative means adjacent a distal end of the guiding catheter, locates the releasable seal on the guiding catheter between said second distal port and said second proximal port.

5,468,226

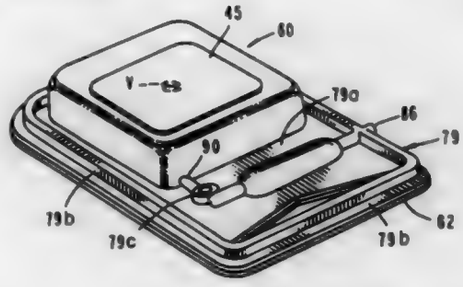
FLUID DELIVERY APPARATUS HAVING A STORED ENERGY SOURCE

Marshall S. Kriesel, St. Paul, Minn., assignor to Science Incorporated, Bloomington, Minn.

Division of Ser. No. 69,937, May 28, 1993, Pat. No. 5,336,188, which is a continuation-in-part of Ser. No. 46,438, May 18, 1993, Pat. No. 5,411,480, which is a continuation-in-part of Ser. No. 870,021, Apr. 17, 1992, Pat. No. 5,222,560, which is a continuation of Ser. No. 870,269, Apr. 17, 1992, Pat. No. 5,205,820, which is a continuation-in-part of Ser. No. 642,208, Jan. 16, 1991, Pat. No. 5,169,389, which is a continuation-in-part of Ser. No. 367,304, Jun. 16, 1990, Pat. No. 5,019,047. This application Feb. 3, 1994, Ser. No. 192,035

Int. Cl.[6] A61H *37/00*

U.S. Cl. 604—132 8 Claims



1. A fluid delivery device for delivering fluids to a patient at a controlled rate comprising:

(a) a base substantially plate like having a width and first and second portions, said first portion having a fluid inlet;

(b) a distendable member overlying and connected to said base;

(c) cover means receivable over said base for sealably enclosing said distendable member, said cover member having a first interior wall portion defining in cooperation with said base a first chamber superimposed over said first portion of said base, and a second interior wall portion defining a second chamber superimposed over said second portion of said base; said cover means further having a fluid inlet passageway in communication with said second portion of said base;

(d) fluid flow means for interconnecting said first and second portions of said base; and

(e) said distendable member being movable from a first position proximate said base to a second distended position wherein said member is located proximate said interior wall portions of said cover means upon introduction of fluid under pressure into said fluid inlet of said base, said distendable member in its distended position having a tendency to return toward a less distended position and forming in cooperation with said base a chamber having a height substantially less than said width of said base.

5,468,227

POULTRY VACCINATOR

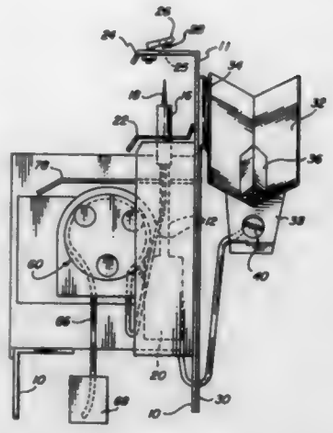
Ora Haskell, 199 Prospect Hill Rd., Colchester, Conn. 06415

Filed Apr. 4, 1994, Ser. No. 222,223

Int. Cl.[6] A61M *5/20;* A61D *7/00*

U.S. Cl. 604—156 5 Claims

1. Apparatus for inoculating poultry and the like, comprising: structure providing an injection location; a substance-delivery system, including a delivery device and supply means operatively connected to said delivery device; mounting means for mounting said delivery device for movement between a delivery position adjacent said injection location and a position displaced therefrom; drive means capable of actuation for effecting movement of said delivery device from said displaced position to said delivery position; actuating means for selectively actuating said drive means for effecting movement of said delivery device to said delivery position; and first and second position-controlling means, said first



position-controlling means constituting support means adjacent said injection location for providing stationary underlying support for the body of a bird to be inoculated while permitting lateral extension of at least one wing, and said second position-controlling means constituting wing-positioning means for engaging a wing of a bird so supported by said support means, and for positioning the wing at said injection location, said injection location being spaced laterally from said support means and requiring extension of the wing of the bird from its body so as to permit engagement of the wing by said wing-positioning means.

5,468,228

INTRAVENOUS CANNULA CONNECTOR

Rowan D. Gebert, 21 Cumberland Street, Eaglemont, Victoria, 3084, Australia

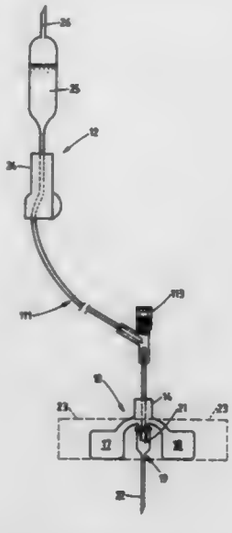
PCT No. PCT/AU92/00638, § 371 Date May 27, 1994, § 102(e) Date May 27, 1994, PCT Pub. No. WO93/10848, PCT Pub. Date Jun. 10, 1993

PCT Filed Nov. 27, 1992, Ser. No. 244,579

Claims priority, application Australia, Nov. 29, 1991, PK9751; Mar. 16, 1992, PL1371

Int. Cl.[6] A61M *39/00;25/02*

U.S. Cl. 604—174 **22 Claims**



1. An intravenous cannula connector comprising:

(a) a body portion;

(b) a pair of lateral arm portions formed integrally with the body portion;

(c) a pair of flat wings set forward relative to the central body portion and connected to the lateral arm portions and adapted to facilitate taping of the cannula connector to the skin of a patient; and

wherein the lateral arm portions and wing portions are formed integrally with the body portion.

5,468,229

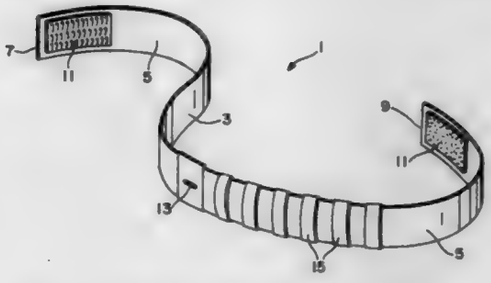
PERITONEAL DIALYSIS CATHETER SUPPORT BELT

Janice Chandler, 287 Moore St., Greenville, S.C. 29605

Filed Nov. 2, 1994, Ser. No. 333,254

Int. Cl.[6] A61M *25/02*

U.S. Cl. 604—179 **10 Claims**



1. A belt for a peritoneal dialysis patient comprising:

an inner surface, an outer surface, a first end and a second end, said second end being reversibly securable to said first end;

an aperture defined by said belt;

a plurality of holders immediately adjacent said aperture along one portion

of said outer surface;

wherein said belt secures and supports the entire external portion of a peritoneal catheter extending from an exit site on a patient's body, said aperture receiving and orienting said catheter toward said plurality of holders, said plurality of holders receiving and securing said catheter.

5,468,230

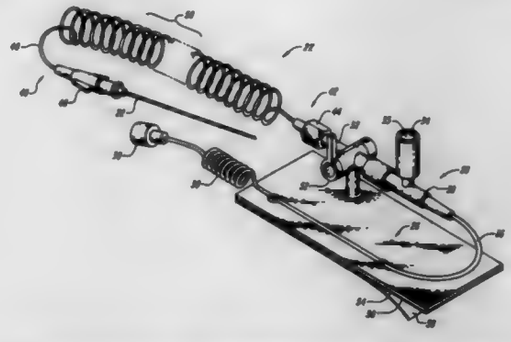
ANESTHESIA DOCKING STATION

Stephen B. Corn, Boston, Mass., assignor to Children's Medical Center Corporation, Boston, Mass.

Continuation of Ser. No. 48,760, Apr. 16, 1993, abandoned. This application May 12, 1994, Ser. No. 242,031

Int. Cl.[6] A61M *5/32*

U.S. Cl. 604—110 **12 Claims**



1. A device for anchoring an infusion line and a drug-delivering catheter to a patient comprising:

a support base having first and second oppositely facing surfaces;

means for adhering the support base to a body of a patient with the second surface in contact with the body of the patient;

an adapter mechanism mounted on the first surface of the support base, the adapter mechanism having at least a first port and a second port in fluid communication with each other, the first port being adapted to receive; and

a catheter adapter line attached at a proximal end to the second port and connectable at a distal end to a connector at a proximal end of a drug-delivery catheter, the catheter adapter line comprising extensible means for relieving tensile strain between the second port and the distal end of the catheter adapter line.

5,468,231

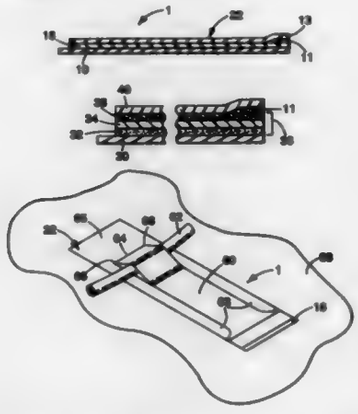
REFASTENABLE TUBE AND CABLE RESTRAINT FOR SURGICAL USE

Charles L. Newman, West Lakeland Township, Minn., and Winfried Kipp, Borken, Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 208,990, Mar. 10, 1994, abandoned. This application May 18, 1994, Ser. No. 245,012

Int. Cl.[6] A61M *25/02*

U.S. Cl. 604—180 **25 Claims**



1. A tube restraint, comprising:

an attachment strip of flexible material having on its underside a coating of adhesive suitable for adhering to a surface;

a holding strip of flexible material having a fixed end, a repositionable end and a bridging strip there between, wherein said holding strip is cut through its top surface in a manner so as to retard peel at the fixed end;

an adhesive layer between the bottom surface of said holding strip and the top surface of said attachment strip at least at each end of said restraint; and

a means to facilitate easy opening and closing of said bridging strip.

5,468,232

SYRINGE

Masateru Naganuma, Kanagawa, Japan, assignor to Seikagaku Kogyo Kabushiki Kaisha(Seikagaku Corporation), Tokyo, Japan

PCT No. PCT/JP92/00951, § 371 Date Jan. 27, 1993, § 102(e) Date Jan. 27, 1993, PCT Pub. No. WO93/02725, PCT Pub. Date Feb. 18, 1993

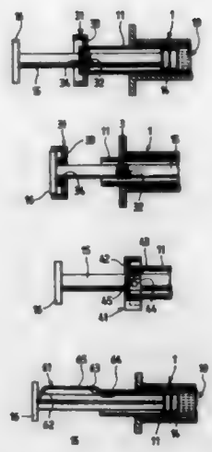
PCT Filed Jul. 24, 1992, Ser. No. 966,199

Claims priority, application Japan, Jul. 26, 1991, 3-209862

Int. Cl.[6] A61M *5/24;5/28*

U.S. Cl. 604—200 **3 Claims**

1. A syringe comprising a tubular holder defining an interior and having an injection needle-mounting portion provided at a distal end thereof; a discharge needle fixedly mounted on said mounting portion with its pointed end extended into the interior of said holder; and a cartridge including a tubular body of a predetermined



length, a closure member which is mounted on an open distal end of said tubular body, and is pierceable by said discharge needle, a piston inserted to a predetermined position from an open proximal end, and a liquid sealed by said tubular body, said closure member and said piston, said cartridge being fitted in said holder so as to move back and forth within the interior of said holder, and being disposed at a position where said closure member is spaced apart from said discharge needle;

wherein said piston includes a piston rod; and said tubular body is of such a length that when said tubular body is inserted a maximum depth into said holder, the proximal end thereof is not completely received in said holder; and further comprising means for releasably locking said piston rod and in turn said piston with respect to said tubular body of said cartridge such that said piston advances together with said tubular body when said cartridge is advanced so as to pierce said closure member with said discharge needle, in which said means for releasably locking comprises a spacing holder member which is removably mounted on that portion of said piston rod projected from said tubular body in such a manner that the opposite ends of said spacing holder member are engaged with a proximal end head of said piston rod and a proximal end face of said tubular body, respectively.

5,468,233

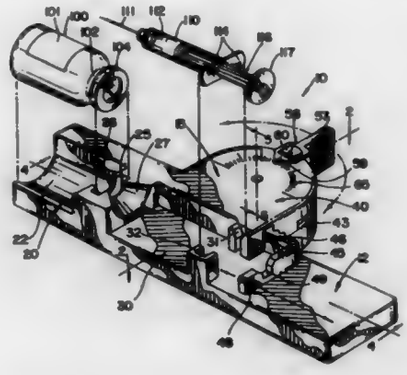
HYPODERMIC DOSAGE MEASURING DEVICE

Steven Schraga, 1841 NE. 146 St., North Miami, Fla. 33181

Filed Dec. 6, 1993, Ser. No. 161,461

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—207 **11 Claims**



1. A hypodermic dosage measuring device to be utilized with a hypodermic syringe of the type including a needle, a dosage holding area, a flanged handle portion, and a plunger element

slidably disposed therein, and a conventional drug vial having a body, a neck, and a head portion through which the needle is inserted into the body of the vial; said hypodermic dosage measuring device comprising:

a vial holding portion connected to a syringe holding portion by a dose adjustment portion;

said vial holding portion comprising a recess adapted to hold the head of the drug vial non-slidably therein,

said syringe holding portion including at least one channel member for receiving a side of the flanged handle portion of the syringe non-slidably therein, and being sufficiently spaced from said vial holding portion such that the needle of the syringe is disposed within the vial upon the vial being positioned in said vial holding portion and the handle portion of the syringe being positioned in said channel member;

said dosage adjustment portion including an elongate, generally L-shaped plunger holder;

said plunger holder including an elongate, toothed track segment slidable in a longitudinal direction parallel to a length of the syringe,

said plunger holder further including a plunger engagement segment extending perpendicular from a proximal end of said toothed track segment so as to engage the plunger such that longitudinal movement of said track segment results in corresponding longitudinal movement of the plunger of the syringe,

said dosage adjustment portion further including a gear element, said gear element including a plurality of teeth thereon such that movement of said gear element results in corresponding movement of said track segment,

handle means extending from and fixed to said gear element to facilitate movement of said gear element, and

dosage indicating indicia on said measuring device to visually indicate an amount of drug drawn into the syringe based on the position of said handle means relative to said dosage indicating indicia, wherein a position of said handle means relative to said indicating indicia visually indicates a relative position of said plunger engagement segment with respect to said vial holding portion.

5,468,234

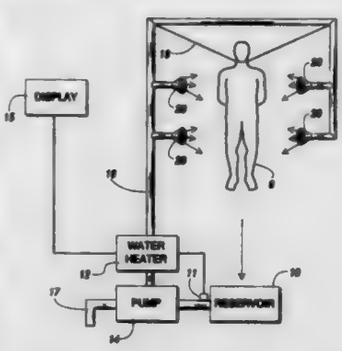
APPARATUS AND METHOD FOR SHOWER PUVA TREATMENT

Edmond I. Griffin, Atlanta, and Dolores A. Dehdashti, Smyrna, both of Ga., assignors to Edmond I. Griffin, Atlanta, Ga.

Filed Dec. 2, 1994, Ser. No. 348,462

Int. Cl.[6] A61M *35/00*

U.S. Cl. 604—290 **18 Claims**



1. An apparatus uniformly delivering a psoralen solution to a body, comprising:

a reservoir containing said psoralen solution;

means for pumping said psoralen solution from said reservoir to a plurality of jettisoning means;

said jettisoning means positioned such that said psoralen solution emitted from said jettisoning means uniformly covers said body;

means for routing said psoralen solution emitted from said Jettisoning means back into said reservoir; and

wherein said psoralen solution is recirculated during operation of said apparatus.

5,468,235

OSTOMY POUCH AND FILTER ASSEMBLY WITH SUCCESSIVE FLAP VENTS

Phillip A. La Gro, Hawthorn Woods, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed Mar. 6, 1995, Ser. No. 398,768

Int. Cl.[6] A61F *5/44*

U.S. Cl. 604—333 **10 Claims**

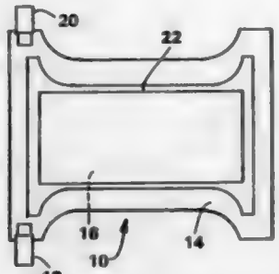
1. An ostomy pouch having first and second walls of flexible polymeric film sealed to each other about their edges; one of said walls having a first flap vent in the form of a curvilinear slit defining at least one flap normally assuming a closed position coplanar with immediately surrounding portions of said one wall but flexing outwardly into an open position to vent gases from said pouch when the pressure therein exceeds ambient pressure; and a deodorizing filter assembly secured to said one wall within said pouch for deodorizing gases exiting said pouch through said first flap vent; said assembly including a planar filter enclosed in a flat envelope having an inner panel of gas-permeable liquid-impervious sheet material and an outer panel of flexible gas- and liquid-impervious sheet material; said outer panel being sealed to said one wall of said pouch along a continuous seal line spaced from and extending about said first flap vent to define a vent chamber between said outer panel and said one wall; wherein the improvement comprises

said outer panel of said filter assembly being provided with a second flap vent in the form of a curvilinear slit defining at least one flap normally assuming a closed position coplanar with said outer panel but capable of flexing outwardly into said vent chamber to vent gases from said pouch; said flap of said second flap vent being restrained against inward flexure by contact with said planar filter of said assembly.

5,468,236
DISPOSABLE ABSORBENT PRODUCT INCORPORATING CHEMICALLY REACTIVE SUBSTANCE

Dennis Everhart, Alpharetta; Elizabeth A. Deibler, Dunwoody, and Julie R. Taylor, Snellville, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 9, 1993, Ser. No. 73,901
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—361 **25 Claims**



1. A disposable absorbent product comprising a chemically reactive means, wherein:

said chemically reactive means has an end point adapted to provide a visual indication of the presence of a substance in mammalian bodily excrement;

said chemically reactive means is adapted to provide said visual indication as a result of interacting with said substance;

the end point of said chemically reactive means is adapted to be reached within a period of time which begins with a first insult of said chemically reactive means by said substance and ends when said disposable absorbent product is discarded;

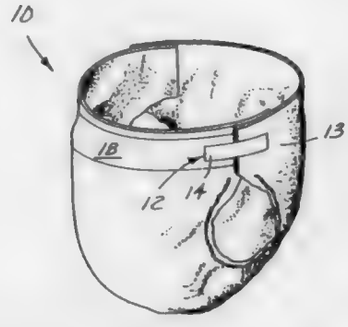
said chemically reactive means is adapted to have a stable end-point, such that said visual indication remains valid within a period of time which begins when the end point is reached and ends no sooner than when said disposable absorbent product is discarded; and

said disposable absorbent product is utilized in the same manner as a product which lacks said chemically reactive means but which otherwise is functionally similar to said disposable absorbent product.

5,468,237
PRESSURE-SENSITIVE ADHESIVE AND DISPOSABLE DIAPER CLOSURE SYSTEM

John A. Miller, Woodbury; Ruben E. Velasquez Urey, and Earl Tate, Jr., both of St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 747,745, Aug. 20, 1991, abandoned. This application Jun. 10, 1992, Ser. No. 896,415
Int. Cl.[6] A61F *13/15;* **B32B** *7/12;* **C08L** *9/00*
U.S. Cl. 604—390 **25 Claims**



1. A pressure-sensitive adhesive composition comprising a functional adhesive mixture of;

30 to 60 weight percent of an elastomeric component consisting essentially of 4 to 55 percent polyisoprene having a number average molecular weight of greater than 100,000 and 45 to 96 percent of an AB(A) block copolymer wherein the A block is 10 to 50 percent of the copolymer and comprises a ring alkylated styrene or styrene and the B block is derived primarily from isoprene, said block copolymer comprising less than 95 weight percent diblock copolymer, and

70 to 40 weight percent of a tackifying component comprising solid tackifying resin, solid tackifying resin with a liquid tackifying resin or plasticizing oil, or a solid tackifying resin with liquid tackifying resin and plasticizing oil so as to provide an adhesive mixture having a composite midblock glass transition temperature in the range of 240 to 270 Kelvin.

14. A pressure-sensitive adhesive tape comprising a backing and coated onto said backing an adhesive layer of a functional adhesive mixture of;

30 to 60 weight percent of an elastomeric component consisting essentially of 4 to 55 percent polyisoprene having a number average molecular weight of greater than 100,000 and 96 to 45 percent of an AB(A) block copolymer wherein the A block is 10 to 50 percent of the copolymer and comprises a ring alkylated styrene or styrene and the B block is derived primarily from isoprene, said block copolymer comprising less than 95 weight percent diblock copolymer, and

40 to 70 weight percent of a tackifying component comprising solid tackifying resin, solid tackifying resin with a liquid tackifying resin or plasticizing oil, or solid tackifying resin with liquid tackifying resin and plasticizing oil so as to provide an adhesive mixture having a composite midblock glass transition temperature in the range of 240 to 270 Kelvin.

25. A diaper consisting of an absorbent pad, a liquid-impermeable outer layer attached to one face of said pad, and a liquid-permeable inner layer attached to an opposite face of said pad, a reinforcing layer attached to said outer layer, and a fastening tab having a free end for attachment to said reinforcing layer, an opposite end of said fastening tab permanently attached to said diaper, said free end comprising a backing and an adhesive layer of a functional adhesive mixture of;

30 to 60 weight percent of an elastomeric component consisting essentially of 4 to 55 percent polyisoprene having a number average molecular weight of greater than 100,000 and 96 to 45 percent of an AB(A) block copolymer wherein the A block is 10 to 50 percent of the copolymer and comprises a ring alkylated styrene or styrene and the B block is derived primarily from isoprene, said block copolymer comprising less than 95 weight percent diblock copolymer, and

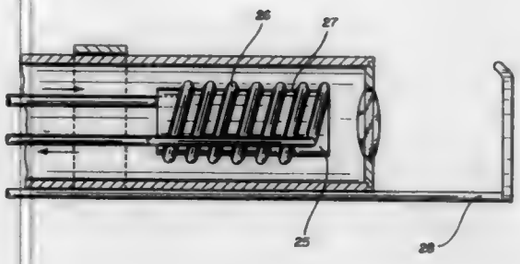
40 to 70 weight percent of a tackifying component comprising solid tackifying resin, solid tackifying resin with a liquid tackifying resin or plasticizing oil, or solid tackifying resin with liquid tackifying resin and plasticizing oil so as to provide an adhesive mixture having a composite midblock glass transition temperature in the range of 240 to 265 Kelvin.

5,468,238
ENDOSCOPIC LASER INSTRUMENT

Steven H. Mersch, Germantown, Ohio, assignor to Ethicon, Inc., Somerville, N.J.

Filed Jun. 11, 1993, Ser. No. 74,626
Int. Cl.[6] A61B *17/36*
U.S. Cl. 606—15 **8 Claims**

1. An endoscopic instrument that provides a spatially coherent beam for use in an endoscopic procedure, said instrument having a distal end to be positioned within a body cavity of a mammal, a proximal end for manipulating said instrument from outside a body of a mammal and an elongated shaft portion connecting said distal and proximal ends, a diode laser and a focussing means for providing said spatial coherent beam, disposed in the distal end of said shaft portion and means for supplying power to said laser at the distal end of the instrument.



5,468,239

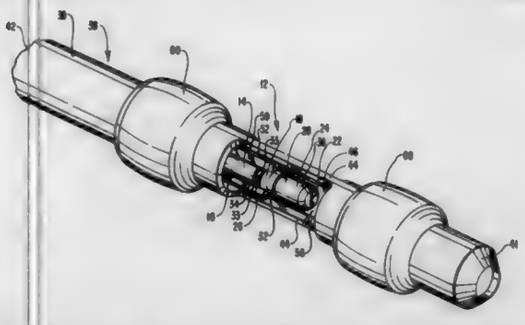
APPARATUS AND METHODS FOR USING A CIRCUMFERENTIAL LIGHT-EMITTING SURGICAL LASER PROBE

Howard M. C. Tanner, and James L. Sorenson, both of Salt Lake City, Utah, assignors to Sorenson Laboratories, Inc., Salt Lake City, Utah

Continuation of Ser. No. 870,005, Apr. 13, 1992, abandoned. This application Sep. 24, 1993, Ser. No. 126,674

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—15 44 Claims



1. A laser apparatus for placement into a body cavity and for redirecting laser light at a target site, the target site being comprised of body tissue or the like that is circumferentially located about the laser apparatus, the laser apparatus comprising:

a probe means for insertion and placement comprising: lightguide means for guiding laser light along a pathway to a distal end of the lightguide means;

tip means, joined to the lightguide means at the distal end thereof, for redirecting the laser light onto the target site but without focusing it such that the redirected laser light contacts the circumferentially located target site about substantially its entire periphery in a substantially continuous and uninterrupted annular pattern of substantially uniform power distribution; and

placement means surrounding the probe means for supporting the probe means and for simultaneously isolating the target site from adjacent body tissue so as to protect the tissue from increased thermal conditions while laser light is directed through the laser probe, and wherein the placement means comprises window mean for allowing the redirected laser light to reach the target site through the placement means.

5,468,240

MANUAL CONTROL DEVICE FOR LAPAROSCOPIC INSTRUMENT

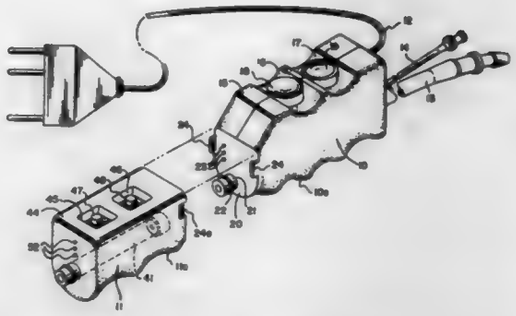
John S. Gentelia, Madison; Ronald E. Eggan, Jr., Rome; Frank R. Williams, and William Wheatley, both of Utica, all of N.Y., assignors to Conmed Corporation, Utica, N.Y.

Filed Dec. 3, 1992, Ser. No. 985,147

Int. Cl.[6] A61B *17/39*

U.S. Cl. 606—42 5 Claims

1. A manual control device for a laparoscopic electrical patient treatment instrument, said device comprising, a handle, conduit means extending through said handle for effecting connection to a vacuum source and a fluid pressure source, an electrical circuit extending through said handle, said handle comprising two mating parts, a first said part operatively associated with said electrical circuit and having a first digitally operable control means for controlling electrical curetage and electrical coagulation, a second said part having a second digitally operable control means for controlling vacuum and fluid pressure passing through said conduit means, and interlock means disabling said electrical circuit upon actuation of said second control means.



5,468,241

SUPPORT DEVICE FOR THE HUMAN VERTEBRAL COLUMN

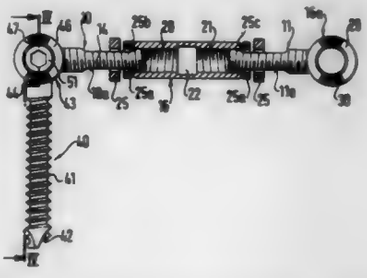
Peter Metz-Stavenhagen, Bad Wildungen, and Klaus F. A. Behrens, Rickling, both of, Germany, assignors to Howmedica GmbH, Schoenkirchen, Germany

Continuation of Ser. No. 875,578, Apr. 27, 1992, abandoned, which is a continuation of Ser. No. 735,203, Jul. 24, 1991, abandoned, which is a continuation of Ser. No. 579,212, Sep. 5, 1990, abandoned, which is a continuation of Ser. No. 313,404, Feb. 21, 1989, abandoned. This application Feb. 10, 1994, Ser. No. 195,895

Claims priority, application Germany, Feb. 18, 1988, 8802112 U

Int. Cl.[6] A61B *17/56*

U.S. Cl. 606—61 29 Claims



1. An implantable back device comprising in operable communication:

(a) a turnbuckle having a central longitudinal axis with a first bolt and a second bolt extending in opposite directions therefrom along said axis and movable along said axis, said first bolt and said second bolt each having at least one toothed face facing in a direction perpendicular to said axis and rotatable with respect thereto;

(b) at least a first pedicle screw and a second pedicle screw, each having a threaded first end and a second end, wherein said second end of said first and second pedicle screws has at least one toothed face to be interfaced with and clamped to a respective toothed face of either said first bolt or said second bolt; and

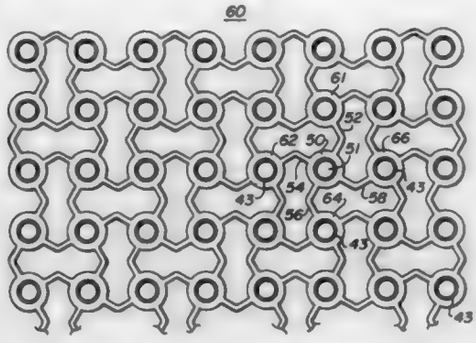
(c) a clamping means for clamping together said toothed face of a pedicle screw and said toothed face of a bolt of said turnbuckle.

5,468,242

FORM-FITTING MESH IMPLANT

Erhard Reisberg, Endingen, Germany, assignor to Leibinger Gmbh, Germany

Filed Nov. 19, 1993, Ser. No. 155,936
Int. Cl.[6] A61B 17/56
U.S. Cl. 606—69 9 Claims



1. A form-fitting mesh implant for the fixation and immobilization of bone fragments and bridging of bone defects or gaps at one or more sites of a patient including:

a mesh of biocompatible metallic material having a plurality of plate sections forming a grid with an interior area and an exterior periphery;

an orifice in each plate section for receiving a bone screw; and

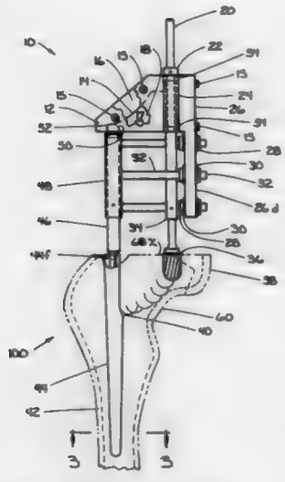
four arms integrally formed with each plate section in the interior area, each arm having at least two arm sections connected at a bend and connecting a plate section in the interior area with an adjacent plate section such that the arm can be selectively compressed, stretched, and contoured primarily by deformation at said bend to fixate bone fragments in a particular anatomical shape.

5,468,243

FEMORAL SUPERIOR NECK REMODELLING MEANS AND METHOD

Alan A. Halpern, 1400 Low Rd., Kalamazoo, Mich. 49008

Filed Oct. 27, 1993, Ser. No. 143,858
Int. Cl.[6] A61B 17/16;17/17
U.S. Cl. 606—80 19 Claims



1. A rotary reamer device adapted for use in providing an excavation in a femoral superior neck, comprising the following elements in combination:

positioning means adapted to position said rotary reamer device with respect to said femoral neck,

cam follower means at a proximal end of said positioning means,

rotary reamer means mounted in mounting means for rotation with respect to said femoral neck and adapted for longitudinal and lateral movement with respect to said positioning means by cooperating sleeve and rod means and comprising associated longitudinally-varied camming surface means in said mounting means in moveable contact relationship with said cam follower means,

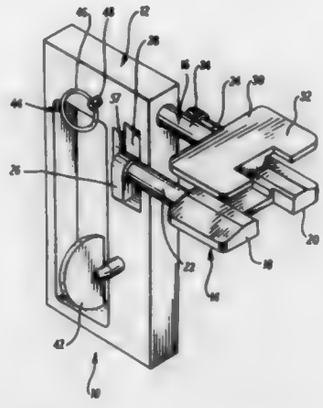
whereby generally lateral movement of said rotary reamer means and its mounting means causes said cam follower means to travel along said camming surface means and said rotary reamer means and its mounting means to seek a longitudinal elevation corresponding to said camming surface means and thereby create in said femoral head a cavity corresponding in longitudinal depth to said camming surface means.

5,468,244

SURGICAL APPARATUS FOR USE IN JOINT REPLACEMENT SURGERY

Stephen F. Attfield, Long Eaton, and Andreas Sambatakakis, Off Osmaston Road, both of, United Kingdom, assignors to Howmedica International, Inc., Ireland

Continuation of Ser. No. 971,353, Nov. 4, 1992, abandoned.
This application Feb. 25, 1994, Ser. No. 201,728
Claims priority, application United Kingdom, Nov. 6, 1991, 9123555
Int. Cl.[6] A61B 17/56
U.S. Cl. 606—90 18 Claims



1. Surgical apparatus for use in the surgical replacement of joints between bones, said apparatus comprising:

(a) first planar bone engaging means mounted on a main body part and including a first bone engaging surface adapted to engage one of the bones at said joint;

(b) second planar bone engaging means mounted on the main body part and including a second bone engaging surface facing away from the first bone engaging surface and adapted to engage the other of the bones at said joint;

(c) displacement means for displacing the first bone engaging means away from the second bone engaging means thereby to tension soft tissue between said bones;

(d) wherein at least one of the first and second bone engaging means is adapted to be oriented by the bone engaged thereby upon tensioning of said soft tissue between the bones; and

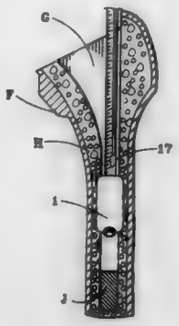
(e) locking means to lock the second bone engaging means such that the second bone engaging surface is parallel to the first bone engaging surface.

5,468,245

BIOMEDICAL CEMENT BONDING ENHANCER

Joseph H. Vargas, III, 3 Albert Cree Dr., Rutland, Vt. 05701

Filed Feb. 3, 1994, Ser. No. 191,105
Int. Cl.[6] A61B *17/56*
U.S. Cl. 606—94 11 Claims



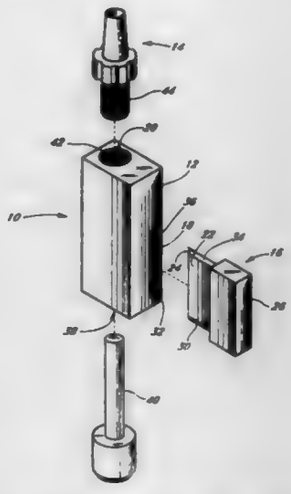
1. A biomedical cement bonding enhancer, comprising:
a) a first hollow syringe body containing gelatinous cement;
b) a plunger fitted to said first hollow syringe body;
c) an opening at the base of said first hollow syringe body;
d) a hollow extension of said opening circumscribed by screw threading means permanently affixed to the base of said first hollow syringe body;
e) a long, hollow, rigid tube with a first open end and a second open end;
f) a hollow cap containing threading about the interior walling of said cap which said cap is permanently affixed to said first open end of said long, hollow, rigid tube which said threading serves to receive said screw threading means;
g) inflatable material with two open ends in the shape of a hollow cylinder permanently affixed at each of said two open ends of said inflatable material to that portion of the exterior surface of said long, hollow, rigid tube in proximity to said second open end of said long, hollow, rigid tube such that said inflatable material completely circumscribes said portion of the said exterior surface of said long, hollow, rigid tube;
h) a second hollow syringe body;
i) an opening at the base of said second hollow syringe body;
j) a plunger fitted to said second hollow syringe body;
k) a hollow extension of said opening at the base of said second hollow syringe body which said hollow extension is permanently affixed to said base of said second hollow syringe body;
l) a hollow valve unit fitted at a first end to said hollow extension of said opening at the base of said second hollow syringe body;
m) a piece of flexible tubing;
n) a hollow connector connecting a first end of said piece of flexible tubing to the second end of said hollow valve unit;
o) an open portal with walling which said open portal is molded to the exterior surface of said long. hollow, rigid tube;
p) an enclosed hollow canal encased by the said walling of said open portal leading from a first hole cut through the wall of said long, hollow, rigid tube to a point in the proximity of the opening of said open portal which said enclosed hollow canal serves to receive the second end of said piece of flexible tubing;
q) a second enclosed hollow canal leading from said first hole cut through the wall of said long, hollow, rigid tube and running along the interior surface of said long, hollow, rigid tube to a second hole in the said wall of said long, hollow, rigid tube which said second hole is located within that portion of said wall circumscribed totally by said inflatable material.

5,468,246

INTRAOCULAR LENS INJECTOR

Larry W. Blake, Coto de Caza, Calif., assignor to Iovision, Inc., Irvine, Calif.

Filed Jul. 2, 1993, Ser. No. 86,930
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—107 11 Claims



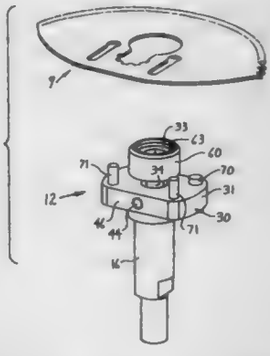
1. A device for rolling an intraocular lens, comprising:
a body having a passageway having a central axis and an intraocular lens receiving channel having a central axis which is not coincident with and does not intersect said central axis of said passageway; and
a shuttle member moveable within said intraocular lens receiving channel, said shuttle member having an end which cooperates with said passageway to roll said intraocular lens upon itself into a spiral.

5,468,247

SAW BLADE FOR POWERED MEDICAL HANDPIECE

John T. Matthai, and Richard F. Huyser, both of Kalmazoo, Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Continuation of Ser. No. 67,740, May 26, 1993, abandoned.
This application Oct. 19, 1994, Ser. No. 326,043
Int. Cl.[6] A61B *17/14*
U.S. Cl. 606—178 29 Claims



21. A cast cutter saw blade insertable in a chuck of a powered cast cutter handpiece, the blade comprising:
cutting means for cutting upon powered movement of the blade;
a key-hole shaped holddown opening through the blade, said key-hole shaped holddown opening having a narrowed end and lock means along the edge of said narrowed end of said holddown opening, said lock means comprising edge means upset out of the plane of the blade around said narrowed end

for biting an axially opposed chuck clamping member to resist loosening of the latter.

5,468,248

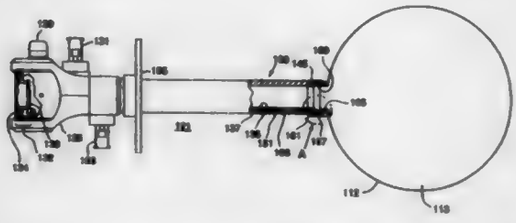
ENDOSCOPIC INFLATABLE RETRACTION DEVICES FOR SEPARATING LAYERS OF TISSUE

Albert K. Chin, Palo Alto, and John P. Lunsford, San Carlos, both of Calif., assignors to Origin Medsystems, Inc., Menlo Park, Calif.

Division of Ser. No. 911,714, Jul. 10, 1992, which is a continuation-in-part of Ser. No. 794,590, Nov. 19, 1991, Pat. No. 5,309,896, which is a continuation-in-part of Ser. No. 706,781, May 29, 1991, abandoned. This application Aug. 24, 1993, Ser. No. 111,211

Int. Cl.[6] A61B *17/02*

U.S. Cl. 606—192 **34 Claims**



1. Apparatus for separating a first layer of tissue from a second layer of tissue and for maintaining separation of the first layer of tissue from the second layer of tissue while providing access to at least one of the layers of tissue, the apparatus comprising:

(a) a main envelope, the main envelope defining a main inflatable chamber;

(b) introducing means for:

(1) introducing the main envelope in a collapsed state between the first layer of tissue and the second layer of tissue,

(2) inflating the main envelope into an expanded state to separate the first layer of tissue from the second layer of tissue, and to create a working space therebetween, and

(3) returning the main envelope to a collapsed state after the working space has been created, the introducing means comprising a single cannula, the single cannula including a main cannula portion whereto the main envelope is attached, and additionally including a bore having a distal end, the bore including a circumferential groove at the distal end;

(c) engaging means for detachably engaging the main envelope with the circumferential groove;

(d) disengaging means for disengaging the engaging means from the circumferential groove and for withdrawing the main envelope from the working space through the bore of the single cannula after the main envelope has been returned to its collapsed state; and

(e) insufflating means for introducing insufflation gas into the working space to maintain the separation of the first layer of tissue from the second layer of tissue, the insufflating means including an auxiliary envelope attached to a second portion of the single cannula, the auxiliary envelope defining an auxiliary inflatable chamber.

5,468,249

Patent Not Issued For This Number

5,468,250

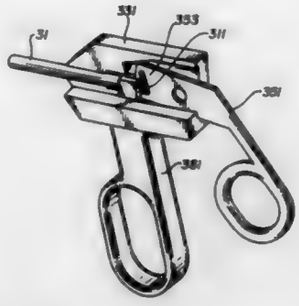
ENDOSCOPIC MECHANISM WITH FRICTION MAINTAINING HANDLE

Joseph F. Paraschac, Cincinnati, and Edward J. Bielile, IV, Westchester, both of Ohio, assignors to Ethicon, Inc., Somerville, N.J.

Filed Apr. 1, 1993, Ser. No. 41,798

Int. Cl.[6] A61B *17/00;17/28*

U.S. Cl. 606—205 **10 Claims**



1. A handle assembly comprising:

a pair of handles pivotable about one another;

a drive rod engaged with one of said handles and reciprocal motion therein between a proximal and a distal position, said drive rod attached to a drive ball; and

a cam slot contained on one of said handles, said cam slot having a smooth engaging surface that engages said drive ball, said cam slot configured to frictionally maintain said drive ball and said drive rod in a sequence of frictionally fixed predetermined positions intermediate to said proximal and distal positions with respect to said handles.

5,468,251

SURGICAL SUTURING DEVICE

Terry Buelna, Laguna Beach, Calif., assignor to Advanced Surgical, Inc., Princeton, N.J.

Filed Oct. 12, 1993, Ser. No. 134,561

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—223 **14 Claims**

6. A surgical suturing device comprising:

an elongated shaft having a proximal end and a distal end;

an inverted needle attached to the distal end of the shaft and having a sharpened proximal tip;

a pair of spaced-apart apertures located on the needle immediately distal to the sharpened tip for separately securing opposite ends of a length of suture thereto, wherein one end of suture can be removed from the needle without dislodging the other end of suture;

a shield slidably mounted on the shaft, the shield being movable along the shaft between a first position in which the sharpened tip is exposed, and a second position in which the sharpened tip is covered by the shield: and

a slide slidably disposed near the proximal end of the shaft and connected to the shield, wherein the shield is movable between the first and second positions by movement of the slide, the shield being movable proximally from the first position to the second position by proximal translation of the slide.

5,468,252

PACKAGED SYNTHETIC ABSORBABLE SURGICAL ELEMENTS

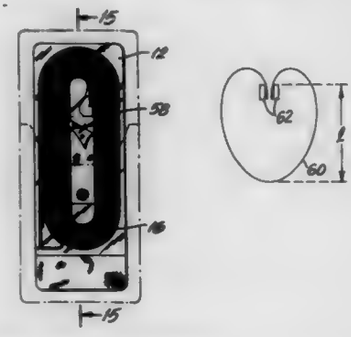
Donald S. Kaplan, Weston; Matthew E. Hermes, Easton; Ross R. Muth, Brookfield; David L. Brown, Wallingford, and Henry A. Holzwarth, Weston, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 568,089, Aug. 16, 1990, Pat. No. 5,222,978, which is a continuation-in-part of Ser. No. 89,735, Aug. 26, 1987, abandoned, and Ser. No. 221,308, Jul. 19, 1988, Pat. No. 5,051,272, and Ser. No. 388,152, Aug. 1, 1989, abandoned, and Ser. No. 395,476, Aug. 18, 1989, abandoned, and Ser. No. 491,215, Mar. 9, 1990, Pat. No. 5,019,093, which is a continuation of Ser. No. 344,745, Apr. 28, 1989, abandoned, and a continuation-in-part of Ser. No. 227,699, Aug. 3, 1988, abandoned, and Ser. No. 89,732, Aug. 26, 1987, abandoned. This application Jun. 22, 1993, Ser. No. 80,942

The portion of the term of this patent subsequent to Jun. 29, 2010, has been disclaimed.

Int. Cl.[6] A61B 17/06

U.S. Cl. 606—228 14 Claims



1. A surgical package comprising:

(i) a substantially moisture impervious pouch;

(ii) a suture retainer disposed in said pouch, said retainer having at least one curved passageway therein; and

(iii) a sterile synthetic absorbable suture susceptible to hydrolysis of about size 3/0 or larger, said suture being disposed in said passageway and having an out of package vertical hanging length greater than about 85% of actual length and Gurley stiffness below about 5.0.

5,468,253

ELASTOMERIC MEDICAL DEVICE

Rao S. Bezwada, and Angelo G. Scopelianos, both of Whitehouse Station, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jan. 21, 1993, Ser. No. 7,316

Int. Cl.[6] A61B 17/04; C08G 63/08

U.S. Cl. 606—230 22 Claims

1. A component for a medical device formed from a bioabsorbable elastomer wherein the elastomer consists essentially of a random copolymer of: a) from about 35 to about 45 weight percent of a first monomer selected from the group consisting of ε-caprolactone, trimethylene carbonate, an ether lactone and combinations thereof, and b) the balance of the copolymer being substantially a second monomer selected from the group consisting of glycolide, para-dioxanone and combinations thereof, wherein the random copolymer exhibits an inherent viscosity of from about 0.6 dL/g to about 4.0 dL/g.

5,468,254

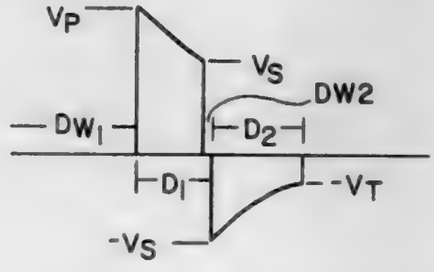
METHOD AND APPARATUS FOR DEFIBRILLATION USING A MULTIPHASIC TRUNCATED EXPONENTIAL WAVEFORM

Stephen J. Hahn, Roseville, Minn., and David K. Swanson, Mountain View, Calif., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Jul. 26, 1993, Ser. No. 97,463

Int. Cl.[6] A61N 1/39

U.S. Cl. 607—5 16 Claims



1. A method for defibrillating a heart by applying electrical energy shocks to the heart through electrodes, the method comprising:

A. applying a first shock having a first duration and a first polarity to the heart through the electrodes,

B. applying at least a second shock, follwing said first shock, to the heart through the electrodes, said second shock having a second polarity opposite to said first polarity, and having a second duration which is longer than said first duration, a ratio of the duration of the first shock to the duration of the second shock being at least two to three but less than one to one.

5,468,255

USE OF NONIONIC ORGANIC DIALKYL COMPOUNDS FOR PREVENTING FATTY SPEW ON LEATHER

Rudolf Zauns-Huber, Duesseldorf; Emil Ruscheinsky, Leverkusen, and Fredi Wolter, Moenchengladbach, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/01807, § 371 Date Feb. 17, 1995, § 102(e) Date Feb. 17, 1995, PCT Pub. No. WO94/02649, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 10, 1993, Ser. No. 373,317

Claims priority, application Germany, Jul. 18, 1992, 42 23 704.1

Int. Cl.[6] C14C *9/00*

U.S. Cl. 8—94.22 12 Claims

1. A process for oiling leather comprising contacting a leather substrate with a fatty spew inhibiting composition comprising an oiling component in combination with a dialkyl ether additive having a pour point below 6° C., said additive corresponding to general formula II:

$$R^3—O—R^4 \quad (II)$$

wherein R^3 and R^4, independently of one another represent an alkyl group containing 1 to 32 carbon atoms, said alkyl group being saturated or unsaturated, linear or branched, said dialkyl ether additive having a total number of carbon atoms per ether molecule in the range from 14 to 36.

5,468,256

SUBSTITUTE 4-{4'-{BIS-(B-HYDROXYETHYL)AMINO{PHENYLAZO{-BENZENESULFONIC ACID AMIDES AND HAIR DYE COMPOSITIONS CONTAINING SAME

Hans-Jürgen Braun, Ueberstorf, Switzerland, assignor to Wella Aktiengesellschaft, Darmstadt, Germany

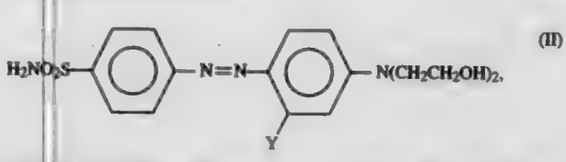
Filed Apr. 15, 1994, Ser. No. 211,788

Claims priority, application Germany, Aug. 19, 1992, 42 27 403.6

Int. Cl.[6] A61K *7/13;* C09B *46/00*

U.S. Cl. 8—405 11 Claims

9. 4-[4'-[Bis-(β-hydroxyethyl)amino]phenylazo]benzenesulfonic acid amides of formula (II)



(II)

wherein Y is selected from the group consisting of fluorine, chlorine and bromine.

5,468,257

PROCESS FOR DYING LEATHER WITH PIGMENTS AND CATIONIC BINDERS

Joachim Probst, Leverkusen; Fritz Novotny, Bergisch Gladbach; Harro Träubel, and Ludger Heiliger, both of Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 17, 1993, Ser. No. 169,567

Claims priority, application Germany, Dec. 24, 1992, 42 44 006.8

Int. Cl.[6] D06P *3/32*

U.S. Cl. 8—436 5 Claims

1. In the process of dyeing leather, prior to finishing, with an aqueous dye liquor comprising a pigment and a pigment binder, the improvement wherein said leather is dyed with an aqueous dye liquor in which the binder is a binder prepared by the polymerization of

a) 5 to 60% by weight of a member of the group consisting of N,N-C_1–C_4-dialkylamino-C_1–C_6-alkyl acrylate, N,N-C_1–C_4-dialkylamino-C_1–C_6-alkylacrylamides, N,N-C_1–C_4-dialkylamino-C_1–C_6-methacrylamides, and mixtures thereof,

b) 0 to 90% by weight of a member of the group consisting of methyl methacrylate, acrylonitrile, methacrylonitrile, styrene, α-methylstyrene, p-methylstyrene, p-chlorostyrene and mixtures thereof,

c) 0 to 70% by weight of a member of the group consisting of C_1–C_{22}-alkyl acrylates, C_1–C_{22}-alkyl methacrylates, and mixtures thereof, with the exception of methyl methacrylate, and

d) 0 to 40% by weight of monoethylenically unsaturated compounds which are free of amino and ammonium groups and have an average molecular weight (number average) of 400 to 6,000 and a water solubility below 1 g/l at 25° C., the percentages given being based on the sum of components a) to d),

followed by neutralization, quaternization or both.

5,468,258

THERMAL DYE TRANSFER METHODS UTILIZING HETEROCYCLIC HYDRAZONO DYES

Wilhelmus Janssens, Aarschot, and Luc Vanmaele, Lochristi, both of, Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

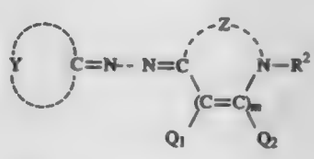
Filed Dec. 17, 1993, Ser. No. 169,335

Claims priority, application European Pat. Off., Jan. 20, 1993, 93200138

Int. Cl.[6] D06P *5/20*

U.S. Cl. 8—471 3 Claims

1. Method of forming an image by image-wise heating a dye-donor element comprising a support having thereon a dye layer comprising a binder and at least one heterocyclic hydrazono dye corresponding to the following general formula (I):



(I)

wherein:

Z represents the atoms necessary to complete a heterocyclic ring system, or a substituted heterocyclic ring system, including a heterocyclic ring system carrying a fused-on aliphatic or aromatic ring system,

Y represents the atoms necessary to complete a heterocyclic coupler system or substituted heterocyclic coupler system,

R^2 represents an alkyl group, a substituted alkyl group, a cycloalkyl group, a substituted cycloalkyl group, an aryl group, or a substituted aryl group,

m is 0 or 1, and

each of O_1 and O_2 independently represents hydrogen or a substituent;

and causing transfer of the image-wise heated dye to a receiver sheet.

5,468,259

DYEABLE POLYOLEFIN COMPOSITIONS AND DYEING POLYOLEFIN COMPOSITIONS

Paresh J. Sheth, 3102 Deer Creek, Sugarland, Tex. 77478, and Roger R. Kolm, 66 N. Turtle Rock Ct., The Woodlands, Tex. 77380

Continuation-in-part of Ser. No. 987,810, Dec. 1, 1992, abandoned. This application Nov. 18, 1993, Ser. No. 154,682

Int. Cl.[6] D06P *3/79;* D01F *6/46;6/52;* C08L *23/12*

U.S. Cl. 8—497 33 Claims

1. A process for dyeing fibers based on a polypropylene comprising:

(a). forming into a fiber a composition of about 98 to 85 percent by weight of a polypropylene and a selected amount of an ethylene copolymer comprising about 70 to 80 percent by weight ethylene and about 30 to 18 percent by weight of an alkyl acrylate wherein the alkyl has one to four carbon atoms, the amount of ethylene copolymer in the composition selected to provide said alkyl acrylate in an amount between 0.2–2.0% by weight and to provide said ethylene in an amount less than 10% by weight of the sum of the polypropylene and ethylene copolymer;

(b). exposing the fiber to a disperse dye.

5,468,260

HYDROGEN-ABSORBING ALLOY FOR NEGATIVE ELECTRODE

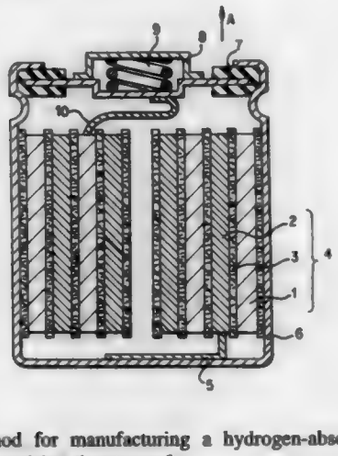
Masao Takee; Mamoru Kimoto; Yoshito Tikano; Husago Mixitaki; Yoshinori Mastuura; Koji Nishio, and Nobohiro Furukawa, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Division of Ser. No. 26,462, Mar. 4, 1993, abandoned. This application Dec. 2, 1994, Ser. No. 352,722

Claims priority, application Japan, Mar. 5, 1992, 4-048697

Int. Cl.[6] H01M *4/04*

U.S. Cl. 29—623.5 **5 Claims**



1. A method for manufacturing a hydrogen-absorbing alloy electrode, comprising the steps of:

preparing a combination of materials for a hydrogen-absorbing alloy having one of a formula selected from $ANi_aCo_bMn_c$ and $ANi_aCo_bMn_cX_d$, in said formula A being a Misch Metal or mixture of rare earth elements including Lanthanum, the ranges of "a", "b", "c" and "d" being respectively defined by $2.5 \leqq a \leqq 3.5$, $0 \leqq b \leqq 1.5$, $0 \leqq c \leqq 1.0$ and $0 < d \leqq 0.3$, the value of a+b+c in the formula $ANi_aCo_bMn_c$ being 3.85 to 5 and the value of a+b+c+d in the formula $ANi_aCo_bMn_cX_d$ being 3.85 to 5, in said formula $ANi_aCo_bMn_cX_d$ X is an element selected from the group consisting of of Iron (Fe), Copper (Cu), Molybdenum (Mo), Tungsten (W), Boron (B), Aluminum (Al), Silicon (Si) and Tin (Sn);

melting said materials to obtain a melted mixture;

cooling said melted mixture at a first cooling speed until a nucleus formation temperature is reached;

quenching at a second cooling speed faster than said first cooling speed to produce said hydrogen-absorbing alloy; and

placing said hydrogen-absorbing alloy on a conductive substrate,

whereby said hydrogen-absorbing alloy is composed of at least three elements, one of said at least three elements has a density distribution profile, said density distribution profile having at least two adjacent high density peaks and a lowest density point between said at least two adjacent high density peaks, wherein a density difference between one of said at least two adjacent high density peaks and said lowest density point is not less than 3.0 wt % and a distance between said two adjacent high density peaks is not less than 20 μm.

5,468,261

REVERSIBLE TRANSFORMATION OF HYDROCARBONS

Guy I. Z. Kalocsai, Panoroma Park, Australia, assignor to Skylab International Limited, Valletta, Malta

PCT No. PCT/AU91/00499, § 371 Date Sep. 7, 1993, § 102(e) Date Sep. 7, 1993, PCT Pub. No. WO92/07917, PCT Pub. Date May 14, 1992

PCT Filed Oct. 4, 1993, Ser. No. 50,182

Claims priority, application Australia, Nov. 2, 1990, PK3135

Int. Cl.[6] C10L *5/00*

U.S. Cl. 44—268 **19 Claims**

1. A method for the reversible transformation of a hydrocarbon or derivative thereof, said method comprising:

(a) contacting said hydrocarbon or derivative thereof with a first reagent, said first reagent comprising an organic or inorganic acid, salt or base; and

(b) subsequently contacting the resultant mixture with at least one second reagent, said second reagent comprising an alkali, a solution of elastomer or a latex;

wherein substantially all of said hydrocarbon or derivative and said first and second reagents are converted to a homogenous product of a pre-defined elasticity which can be controlled by the choice of said first and second reagents.

5,468,262

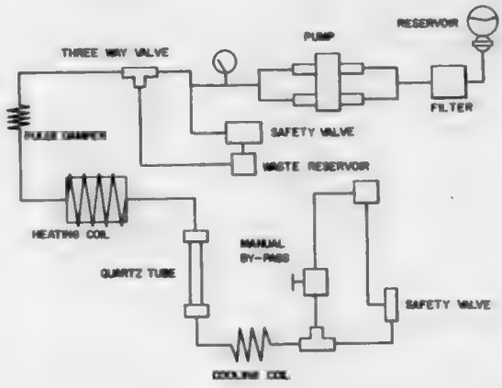
THERMAL STABILITY ADDITIVES FOR JET FUELS

William P. Acker, Wappingers Falls; Robert T. Hahn, Beacon; Thomas J. Mach, Port Jervis, and Rodney L. Sung, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 19, 1993, Ser. No. 47,529

Int. Cl.[6] C10L *1/22*

U.S. Cl. 44—348 **8 Claims**



1. A thermally stable liquid jet fuel composition comprising:

(a) a major portion of a liquid fuel; and

(b) a portion effective to provide thermal stability of about 0.2 to about 2.0 wt % of a thermal stabilizing additive prepared by

(i) reacting a polyamine, an aldehyde and a phenol containing active hydrogen to form a phenol - aldehyde - amine condensate; and

(ii) reacting said phenol - aldehyde - amine condensate and a succinic acid anhydride bearing a polyolefin - derived substituent containing residual unsaturation, thereby forming a phenol - aldehyde amine Mannich condensate polyamine succinimide product additive; and

(iii) recovering said product additive.

5,468,263

FUEL COMPOSITION CONTAINING ALKYLPHENYL POLY(OXYALKYLENE) POLYAMINE ACID ESTER

Hyun-jong Chung; Sang-chul Yim, both of Seoul; Bon-chul Ku, Kyoungsangnam-do; Ho-young Guen, Kyoungsangnam-do, and Duk-han Kim, Kyoungsangnam-do, all of, Rep. of Korea, assignors to Yukong Limited, Seoul, Rep. of Korea

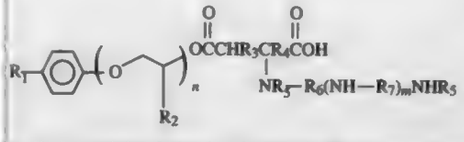
Filed Feb. 18, 1994, Ser. No. 201,165

Claims priority, application Rep. of Korea, Feb. 19, 1993, 93-2298

Int. Cl.[6] C10L *1/18*

U.S. Cl. 44—39 L 8 Claims

1. An alkyphenyl poly(oxyalkylene) polyamine acid ester compound of formula (V) for a fuel detergent, comprising at least one primary or secondary nitrogen atom and a repeating unit of alkylene oxide with at least more than 2 carbon atoms,



(V)

wherein, R_1 is straight chained or branched alkyl group containing from 4 to 25 carbon atoms, R_2 is an alkyl group containing from 1 to 3 carbon atoms and R_5 is H or an alkyl group containing from 1 to 3 carbon atoms, independently, R_3 and R_4 are H or alkyl groups containing from 1 to 3 carbon atoms, independently, R_6 and R_7 are alkylene groups containing from 2 to 6 carbon atoms n is an integer which makes the molecular weight of the compound to be 400 to 4000 and m is 0 or an integer between 1 and 5.

5,468,264

NON-METALLIC ANTI-KNOCK FUEL ADDITIVE

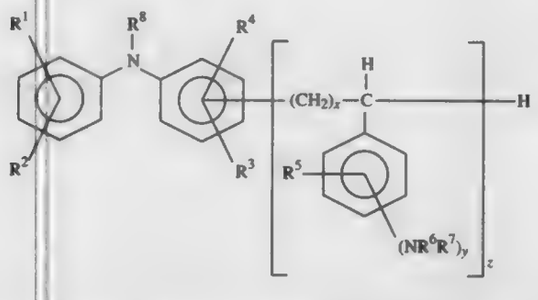
Thomas F. DeRosa, Passaic, N.J.; William M. Studzinski, Beacon, N.Y.; Joseph M. Russo, Poughkeepsie, N.Y.; Benjamin J. Kaufman, Hopewell Junction, N.Y., and Robert T. Hahn, Beacon, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Nov. 1, 1994, Ser. No. 332,685

Int. Cl.[6] C10L *1/22*

U.S. Cl. 44—426 14 Claims

1. A gasoline composition comprising a major portion of gasoline and a minor portion of one or more polyaryl amines, effective to increase the octane number of the gasoline composition, represented by the formula:



where R^1–R^5 are independently hydrogen or C_1–C_8 aliphatic hydrocarbons; R^6–R^8 are independently hydrogen or C_1–C_6 aliphatic hydrocarbons; x is between 0 and about 2, inclusive, and y is between 0 and about 3, inclusive; and z is between about 1 and about 50, inclusive.

5,468,265

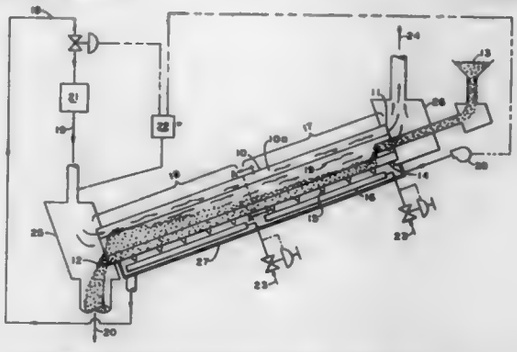
METHOD FOR TREATING COAL

Robert J. Adams, Pittsburgh, Pa., assignor to RJA Associates, Pittsburgh, Pa.

Continuation of Ser. No. 740,458, Aug. 5, 1991, Pat. No. 5,254,139. This application Aug. 12, 1993, Ser. No. 105,750

Int. Cl.[6] C10L *5/00*

U.S. Cl. 44—505 12 Claims



1. An improved fuel coal made by the process of:

passing said coal through externally heated rotating retort means having an external shell temperature of about 500°–1000° F. in the drying section and an external shell temperature of about 350°–550° F. in the treatment section;

shock heating said coal in the drying section of said retort means, thereby driving off said moisture from said coal such that said coal contains about 1% or less by weight moisture;

treating said shock heated dried coal in the treating section of said retort means wherein the surface of said dried coal witnesses a temperature of 350°–550° F. by heating the shell to this temperature and causing the coal to be maintained at a temperature of 300°–450° F. for a sufficient time period by passing a cooling oxygen lean blanket gas stream, maintained at about 2–8% oxygen concentration by volume, at said 300°–450° F., thus causing the oxygen content of said blanket gas to catalyze the molecular simplification of it surface hydrocarbon molecules without allowing said coal to become exothermic; and

recovering said treated coal from said retort means.

5,468,266

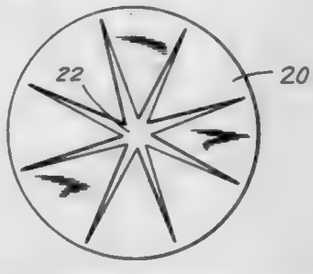
METHOD FOR MAKING A CARBONACEOUS HEAT SOURCE OCNTAINING METAL OXIDE

Azzedine Bensalem, Brooklyn, N.Y.; Sarojini Deevi; Seetharama C. Deevi, both of Midlothian, and Donald M. Schleich, Carquefou, France, assignors to Philip Morris Incorporated, New York, N.Y.

Filed Jun. 2, 1993, Ser. No. 71,313

Int. Cl.[6] C10L *9/00;11/00*

U.S. Cl. 44—542 37 Claims



1. A method for producing a heat source comprising a carbonaceous material and a metal oxide, wherein the method comprises the steps of:

a) mixing a hydroxylated organic chemical, wherein the hydroxylated chemical compound is selected from the group consisting of diols and triols, and a metal oxide precursor to

form a sol, wherein the metal oxide precursor is selected such that the formed metal oxide is an iron oxide, the metal oxide capable of reducing an amount of carbon monoxide produced upon combustion of the carbonaceous material;

b) heating the mixture from step a) to form a polymeric or oligomeric species containing the selected metal and organic species;

c) treating a carbonaceous material with the sol; and

d) heating the product of step c) to evaporate liquid from the sol and then decompose the polymeric or oligomeric species of the sol to form the metal oxide to form a heat source comprising the carbonaceous material and the metal oxide.

27. A carbonaceous heat source comprising carbon and a metal oxide, wherein the heat source is made according to the method of claim **2** or **1**.

5,468,267

ROLLING APPARATUS

Raymond J. Dufty, 466 Brisbane Road, Arundel, Gold Coast, 4214 Queensland, and Ronald S. Kaye, 5 Sunbird Avenue, Paradise Point, Gold Coast, 4216, Queensland, both of, Australia

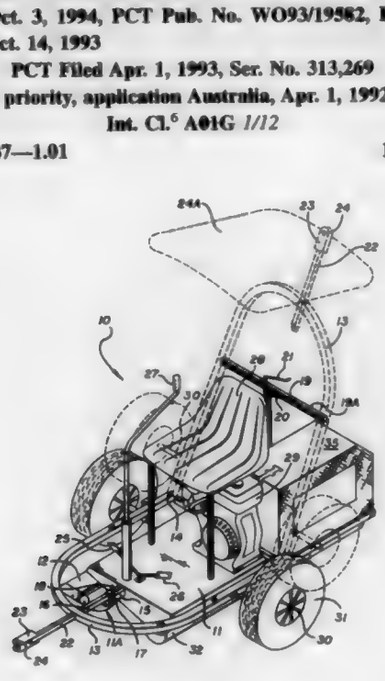
PCT No. PCT/AU93/00140, § 371 Date Oct. 3, 1994, § 102(e) Date Oct. 3, 1994, PCT Pub. No. WO93/19582, PCT Pub. Date Oct. 14, 1993

PCT Filed Apr. 1, 1993, Ser. No. 313,269

Claims priority, application Australia, Apr. 1, 1992, PL1637

Int. Cl.[6] A01G *1/12*

U.S. Cl. 47—1.01 **18 Claims**



1. Rolling apparatus for rolling of level surfaces of turf or grass, comprising:

(i) a mobile main frame; and

(ii) an undercarriage having at least three ground contacting idler rollers which are unevenly spaced, said undercarriage being pivotally attached by a universal pivot joint to the main frame whereby said undercarriage is pivotable with respect to the main frame in any direction.

5,468,268

METHOD OF MAKING AN ABRASIVE COMPACT

Klaus Tank, 9 Warbleton Avenue, Esserwold, Johannesburg; Alan R. Jarvis, 320 Suncrest, Isipingo Road, Bellevue East, Johannesburg, and Aulette Stewart, 45 Arend Avenue, Randburg, all of, South Africa

Filed May 27, 1994, Ser. No. 249,939

Claims priority, application South Africa, May 27, 1993, 93/3717

Int. Cl.[6] B24D *18/00*

U.S. Cl. 51—293 **11 Claims**

1. A method of making an abrasive compact which includes the step of subjecting a mass of ultra-hard abrasive particles to conditions of elevated temperature and pressure suitable for producing an abrasive compact wherein at least 25 percent of the mass of ultra-hard abrasive particles consists of particles having at least three different average particle sizes within an average particle size range of 10 to 100 microns and at least 4 percent of the mass of ultra-hard abrasive particles have an average particle size of less than 10 microns.

5,468,269

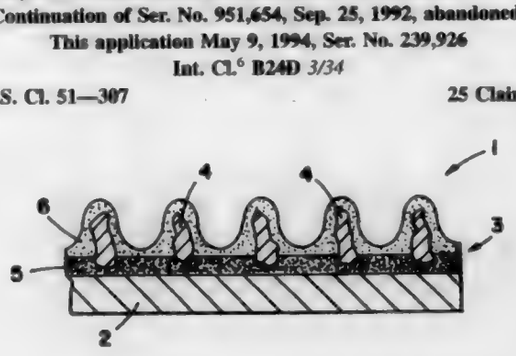
ABRASIVE GRAIN CONTAINING ALUMINA AND ZIRCONIA

Henry A. Larmie, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 951,654, Sep. 25, 1992, abandoned. This application May 9, 1994, Ser. No. 239,926

Int. Cl.[6] B24D *3/34*

U.S. Cl. 51—307 **25 Claims**



1. A method of preparing abrasive grain material; said method comprising the steps of:

(a) preparing a dispersion of alumina hydrate and zirconia particles, wherein at least about 97% by weight of said zirconia particles are less than about 0.2 micrometer in size;

(b) forming alumina base grits from said dispersion; and

(c) sintering said alumina base grits to provide abrasive grain comprising about 70 to about 99.9 percent by weight alumina and at least about 0.1 percent by weight zirconia, based on the total weight of said abrasive grain, said alumina being present as one of alpha alumina, alumina reaction product, or a combination thereof, said zirconia being present as one of zirconia or zirconia and zirconia reaction product,

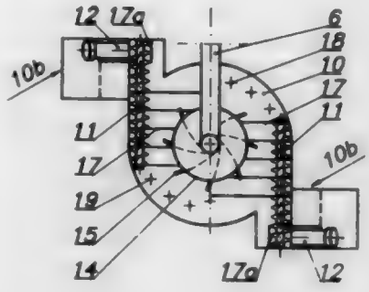
with the proviso that said zirconia particles are present in said dispersion in an amount sufficient to increase densification of said abrasive grain of step (c) as compared to an abrasive grain made according to steps (a), (b), and (c) without the presence of zirconia in said abrasive grain.

5,468,270

ASSEMBLY FOR WET CLEANING OF COMBUSTION GASES DERIVED FROM COMBUSTION PROCESSES, ESPECIALLY THE COMBUSTION OF COAL, COKE AND FUEL OIL

Wacław Borszyński, ul. Olimpijska 11 m.40, 94-043 Łódź, Poland

Filed Nov. 10, 1993, Ser. No. 149,788
Claims priority, application Poland, Jul. 8, 1993, 299617
Int. Cl.[6] B01D *47/00*
U.S. Cl. 55—228 28 Claims



1. An assembly for wet cleaning of combustion gases derived from combustion processes, said assembly being disposed between a furnace installation and a chimney, comprising:

at least one dust extracting device having a dust extracting fluid contained therein, said dust extracting device having an outlet, and

at least one dust absorbing device connected to the outlet of the dust extracting device, wherein the dust absorbing device includes a vessel having an absorbing fluid contained therein,

wherein combustion gases are introduced into said dust extracting fluid and are discharged therefrom through a filtering means disposed in said dust extracting fluid, wherein the dust extracting device includes a main vessel having a bottom which forms a ridge roof structure, a first auxiliary vessel and a second auxiliary vessel situated such that in a view from above, the main vessel and the first and second auxiliary vessels form a shape approximating a letter Z, wherein a middle part of the letter Z is made up of the main vessel, and the arms of the letter Z are made up of the first and second auxiliary vessels,

wherein the main vessel is equipped with a first helical conveyor and a second helical conveyor provided in first and second low portions, respectively, of the ridge roof structure, said first and second conveyors provided for discharging sediments to first and second sediment tanks provided in the first and second auxiliary vessels, respectively,

first and second devices for discharging waste fluid disposed in the first and second sediment tanks, respectively,

wherein at an outlet for introducing a stream of combustion gases into the dust extracting fluid, a guide is provided which substantially encloses the stream of combustion gases, and wherein the filtering means is disposed above the guide, and

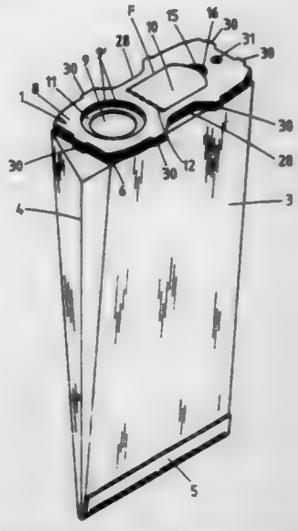
wherein the vessel of said dust absorbing device includes a coaxially disposed duct for outputting cleaned flue gases, and a filtering means is provided in the dust absorbing device extending toward a bottom of the dust absorbing device with respect to the duct.

5,468,271

DUST FILTER BAG FOR A VACUUM CLEANER

Ralf Sauer, Essen; Stefan Kraut-Reinkober, Leverkusen; Ludger Helmes, Velbert, and Werner Hoyer, Wuppertal, all of, Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Germany

Filed Oct. 27, 1993, Ser. No. 144,871
Claims priority, application Germany, Nov. 3, 1992, 42 37 035.3
Int. Cl.[6] B01D *46/00*
U.S. Cl. 55—357 14 Claims



1. A dust filter bag for a vacuum cleaner, having a holding plate comprising plural layers of a firm paper material including a first layer and a second layer and a third layer of the firm paper material, a dust filter bag element attached to the holding plate, the holding plate having a sealing-closable opening for a suction pipe of a vacuum cleaner, the filter bag further comprising a closure element for closing the opening upon displacement of the closure element from an open position alongside of the opening into a closed position;

wherein the closure element extends within said first layer of the firm paper material and lies on said second layer of the firm paper material, at least in an open position, and the holding plate further comprises a gasket of flexible material which is gripped between said second layer and said third layer of said plural layers in a region of the opening.

5,468,272

FILTER BAG FOR VACUUM CLEANERS

Uwe Schmierer, Dietenhofen, Germany, assignor to Branofilter GmbH, Dietenhofen, Germany

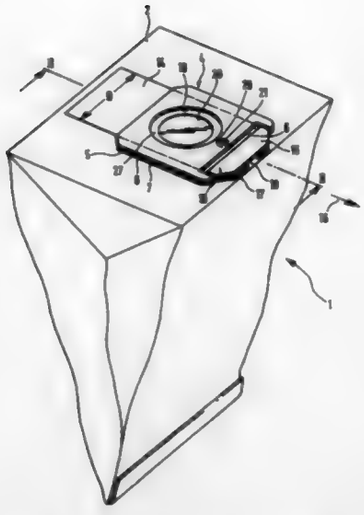
Filed Apr. 13, 1994, Ser. No. 227,039
Claims priority, application Germany, May 7, 1993, 43 15 203.1
Int. Cl.[6] B01D *46/00*
U.S. Cl. 55—367 19 Claims

1. A filter bag for a vacuum cleaner comprising:

a filter bag body, said filter bag body being formed with an inlet opening;

a base unit attached to said filter bag body adjacent said bag body opening, said base unit having two spaced apart body layers, said body layers each being formed with an opening, said body layer openings being concentric with said bag body opening;

a door slidably disposed between said body layers, said door having a first section formed with a door opening that can be selectively positioned in alignment with said body layer openings to place said door in an opened position and said door being further adapted so as to move said door opening out of



alignment with said body layer openings so that a second section of said door is located substantially between said body layer openings to place said door in a closed position; and

an abutment element attached to one said body layer and positioned to extend into said door opening when said door is moved to said closed position.

5,468,273

STRATAL POROUS FILTER MATERIAL

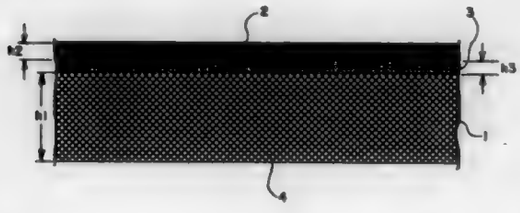
Lev K. Pevzner; Mikhail Y. Lakhovskiy, and Boris S. Oborin, all of Yekaterinburg, Russian Federation, assignors to Intot, Ltd., Yekaterinburg, Russian Federation

Filed Dec. 3, 1993, Ser. No. 162,528

Claims priority, application Russian Federation, Dec. 7, 1992, 92010317020557

Int. Cl.[6] **B01D** *39/00; C22C 1/04*

U.S. Cl. 55—523 **5 Claims**



1. A stratal porous filter material, comprising:

a base layer, said base layer being made of a highly porous honeycomb nickel-based material having pores sized between 0.3 to 2.0 mm;

said base layer having a thickness based on a 20 to 110 ratio of h:d, d being the size of pores and h being the thickness of the base layer;

a working layer formed on the surface of said base layer, said working layer made of 0.35 to 2.50 mm thick porous spherical powder material;

an intermediate layer formed between said base layer and said working layer, said intermediate layer comprising a combination of said nickel-based and said porous spherical powder materials having a thickness of 0.3 to 5.0 d.

5,468,274

PROCESS AND APPARATUS FOR MAKING MINERAL WOOL FIBRES

Svend Grove-Rasmussen, Roskilde, Denmark, assignor to Rockwool International A/S, Denmark

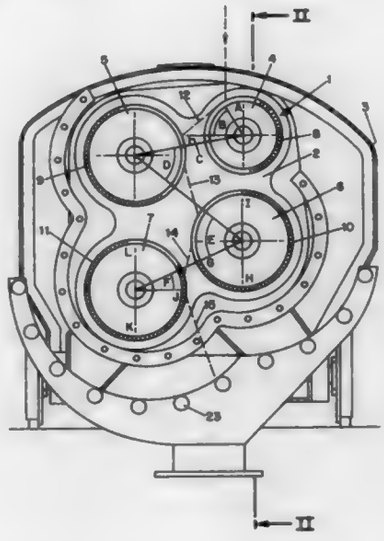
PCT No. PCT/EP32/00005, § 371 Date Jul. 15, 1993, § 102(e) Date Jul. 15, 1993, PCT Pub. No. WO92/12939, PCT Pub. Date Aug. 6, 1992

PCT Filed Jan. 15, 1992, Ser. No. 90,025

Claims priority, application United Kingdom, Jan. 16, 1991, 9100887

Int. Cl.[6] **C03B** *37/05*

U.S. Cl. 65—469 **25 Claims**



1. Fiberizing apparatus for forming mineral wool comprising a set of at least four rotors each mounted for rotation about a different substantially horizontal axis and arranged such that when the rotors are rotating, melt poured on to the periphery of the top rotor in the set is thrown on to the periphery of the subsequent rotors in turn while at the same time fibres are thrown off the rotors,

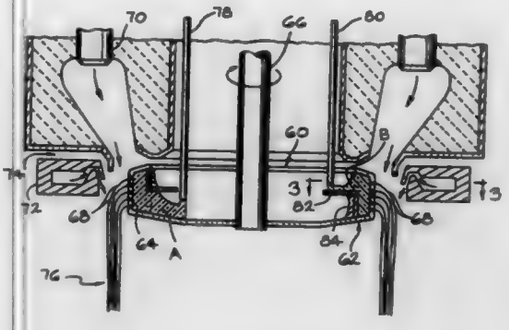
wherein the top rotor is provided with driving means and has a size such that it rotates to give an acceleration field of at least 50 km/s^2 and the second and third rotors each have driving means and a size such that it rotates to give a greater acceleration field than the top rotor, and the axes of the top and second rotors are arranged such that the shortest straight line drawn from the axis of the top rotor to the axis of the second rotor makes an angle of from 0 to 20° below the horizontal, and wherein F is the included angle between the horizontal and the shortest straight line joining the axes of the third and fourth rotors, E is the included angle between the lines joining the axes of the third and fourth rotors and the second and third rotors, while D is the included angle between shortest straight lines joining the axes of the first and second rotors with the axes of the second and third rotors; angle C is the included angle between the shortest straight line joining the first and second rotors and the horizontal, and angle B is the included angle between the shortest straight line joining the axis of the first rotor and the point on the surface of the first rotor at which the mineral melt strikes the first rotor and the horizontal toward the second rotor; and wherein angle B is from 40 to 65° and the sum of C, D, E and F is from 120 to 150°.

5,468,275

APPARATUS HAVING ELONGATED ORIFICES FOR CENTRIFUGING DUAL-COMPONENT, CURLY, GLASS FIBERS

David C. K. Lin, Worthington, and Patrick M. Gavin, Newark, both of Ohio, assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Continuation of Ser. No. 147,762, Nov. 5, 1993, abandoned. This application Jul. 14, 1994, Ser. No. 275,179
Int. Cl.[6] C03B 37/04;37/075
U.S. Cl. 65—497 16 Claims



1. Apparatus for making dual-glass fibers comprising:
a. a spinner having an orificed peripheral wall for centrifuging glass fibers, the spinner being divided by baffles into a series of compartments positioned circumferentially around the interior of the peripheral wall;
b. glass supply means for supplying a first molten glass and a second molten glass to the spinner;
c. dividing means for directing the first glass into alternate compartments and for directing the second glass into the remaining compartments so that adjacent compartments contain different glass; and
d. a series of orifices in the peripheral wall positioned in alignment with the baffles, the orifices being wider than the width of the baffles to provide communication to each of two adjacent compartments to enable centrifuging of both the first and second glasses from a single orifice, the orifices being elongated with an aspect ratio within the range of from about 4:1 to about 30:1.

5,468,276

FERTILIZER CHIP AND PROCESS FOR MAKING SAME

Timothy J. Roth, Allentown, Pa., and William R. Welliver, Ship Bottom, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 23, 1994, Ser. No. 247,916
Int. Cl.[6] C05F 3/00; C05G 5/00
U.S. Cl. 71—15 6 Claims

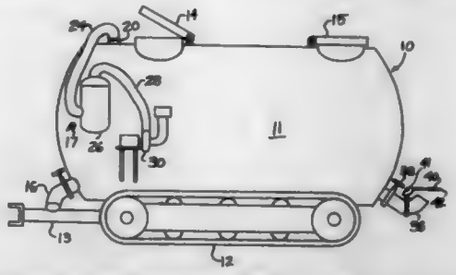
1. In a process for producing a particulate agricultural fertilizer, the improvement which comprises:
a) mixing flyash and a manure in a weight ratio of from 2.3 to 4.0 weight parts flyash per weight part manure thereby forming a blend;
b) adjusting the moisture content of the blend to a level of from about 5% to 28% by weight thereby forming a moist blend;
c) compacting the moist blend in a compaction zone comprising a roller press under a pressure of from 4 tons force to 20 tons force per linear inch of roller width and thereby converting the moist blend into a sheet having a thickness of from 0.08 to 0.54 inches;
d) maintaining the sheet under compaction for a period of from 0.1 to 0.5 seconds; and,
e) fracturing the sheet into particulate material.

5,468,277

COAL COMBUSTION FLY ASH SOIL AMENDMENT

Gerald L. Rehbein, White Bear Lake, and Paul D. Montain, Lino Lakes, both of Minn., assignors to Rehbein, Inc., Centerville, Minn.

Filed Sep. 12, 1994, Ser. No. 304,523
Int. Cl.[6] C05D 3/02;3/04;9/00
U.S. Cl. 71—24 23 Claims



1. A method of agricultural field utilization of tonnage quantities of a composite powder of coal combustion fly ash containing desulfurization residue to amend agricultural soil of the type having a soil-water pH below 6.5 in a manner that prevents the escape of fugitive dust from the powder and effectively manages any cementitious tendencies of the powder, comprising:
(i) providing said composite powder as a product wherein said desulfurization residue includes at least one of the group consisting of calcium sulfate and hydrates of calcium sulfate, wherein calcium compounds and any compounds of silicon and aluminum as present in the composite powder do not cause a mixture of the powder with an equal weight quantity of water to harden to a cementitious state earlier than about 2 hours after the powder is mixed with the water, wherein said desulfurization residue and one or more of the oxides, hydroxides, and carbonates of elements selected from the group consisting of calcium, magnesium, potassium, and sodium are present in an amount sufficient to cause the composite powder to exhibit a calcium carbonate equivalent liming potential greater than 20, and wherein plant nutrient elements including boron in addition to sulfur and calcium are present at least in part in a form available for plant uptake,
(ii) adding said powder to water in an enclosed mixing tank having a capacity of at least about 2,000 gallons, said powder being added at a ratio of about 10 parts by weight of said powder to between about 8 and 20 parts by weight of said water,
(iii) mixing said powder and water together in said mixing tank for a time in excess of about 5 minutes as said powder is added to said water, said mixing being sufficient to produce a substantially uniform distribution of said powder as discrete particulate in the water so as to form a soil treatment composition in slurry form having a consistency easily flowable through a vertical pipe of about 1-inch diameter,
(iv) applying said treatment composition on the surface of the agricultural soil to be amended before said composition hardens to a cementitious state, said application being accomplished so as to provide a substantially uniform coating of said composition on the soil at a thickness no greater than about 7 millimeters thick, said composition being applied at a quantity such that each acre is covered with composition containing at least about 5 tons of said composite powder up to about 20 tons of said composite powder, said quantity being sufficient to amend the top portion of said agricultural soil that supports plant growth, from the surface thereof down to a depth of at least 4 inches but no more than about 9 inches, to elevate the pH of said top portion above about 6.5 and insufficient to elevate the total plant-available boron content in the said top portion above about 25 pounds per acre, and
(v) thereafter working the soil sufficiently to distribute said applied treatment composition substantially uniformly throughout said top portion so that said composition effectively is made available for elevating the pH of said top portion and so that plant nutrient elements contained in said composition are substantially uniformly distributed in said top

portion, said working of the soil being accomplished at any time following application of said treatment composition on the soil, whether before or after said composition on the soil hardens to any cementitious state, any said hardened cementitious state of said composition as a layer on soil being characterized by the fact that the layer is easily broken up into fragments by working the soil.

5,468,278

CERMET ALLOY

Yuichi Nakahara, Narita, and Katsuhiko Kojo, Fukaya, both of, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Nov. 10, 1993, Ser. No. 149,939

Claims priority, application Japan, Nov. 11, 1992, 4-326162; May 21, 1993, 5-142709

The portion of the term of this patent subsequent to Sep. 28, 2010, has been disclaimed.

Int. Cl.[6] C22C *29/00*

U.S. Cl. 75—236 **3 Claims**

3. A cermet alloy having a structure comprising 60 to 90 wt. % of a hard phase and 10 to 40 wt. % of a bonding phase, said hard phase comprising titanium carbide and titanium nitride or titanium carbide-nitride, said bonding phase comprising at least one of Co and Ni and further comprising Ti, Mo and W, wherein the Ti, Mo and W contents in the bonding phase satisfy the following conditions: 1.0≦Mo (wt. %)/Ti (wt. %) and 7 (wt. %)≦Ti+Mo+W.

5,468,279

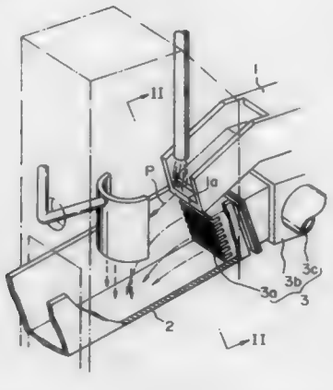
METHOD FOR WATER-GRANULATING CALCIUM FERRITE SLAG

Akiyoshi Yamashiro, Kagawa, Japan, assignor to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Sep. 19, 1994, Ser. No. 308,519

Int. Cl.[6] C22B *7/04*

U.S. Cl. 75—640 **4 Claims**



1. A method for water-granulating calcium ferrite slag which is produced in copper converting processing and which contains 10 to 30 weight % of CaO, comprising the steps of:

causing water to flow at a flow velocity of 7 to 25 m/sec; and

introducing the calcium ferrite slag into said flow of water such that the weight ratio of water to slag amounts to no less than 100.

5,468,280

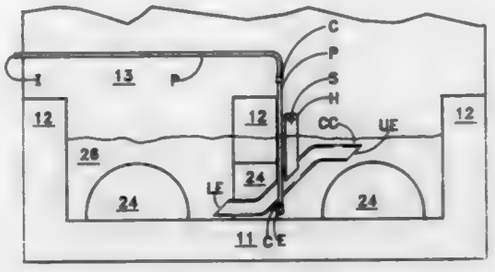
MOLTEN METAL CONVEYING MEANS AND METHOD OF CONVEYING MOLTEN METAL FROM ONE PLACE TO ANOTHER IN A METAL-MELTING FURNACE WITH SIMULTANEOUS DEGASSING OF THE MELT

Larry D. Areaux, Nathrop, Colo., assignor to Premelt Pump, Inc., Kalamazoo, Mich.

Continuation-in-part of Ser. No. 799,114, Nov. 27, 1991, Pat. No. 5,203,910. This application Apr. 19, 1993, Ser. No. 49,830

Int. Cl.[6] C21C *7/02*

U.S. Cl. 75—708 **34 Claims**



1. An improved method for the conveyance of molten metal from one place to another in a molten metal pool or mass in a metal-melting furnace or out of said molten metal pool, while simultaneously degassing the same, comprising the steps of:

providing an elongated conveying conduit having a lower end and an upper end, at least a portion of said conduit being inclined upwardly from the horizontal,

providing a gas feed means having a gas inlet port and a gas exit port,

positioning the exit port of said gas feed means with respect to the lower end of said conveying conduit so as to enable release of gas from said exit port into said conveying conduit at or adjacent its lower end,

submerging the exit port of said gas feed means and the lower end of said conveying conduit in a molten metal mass or pool,

introducing inert gas into said gas feed means and causing said gas to emerge from the exit port thereof at a supersonic velocity into said conveying conduit at or adjacent its lower end and to rise up the incline therein, and

inducing concomitant flow of molten metal in said conveying conduit by means of said gas exiting from the exit port of said gas feed means and into said conveying conduit at or adjacent its lower end and rising up the incline therein.

5,468,281

PROCESS FOR THE SEPARATION OF COBALT FROM NICKEL

Derek G. E. Kerfoot, St. Albert, Canada, assignor to Sherritt Gordon Limited, Fort Saskatchewan, Canada

PCT No. PCT/CA93/00213, § 371 Date Nov. 17, 1994, § 102(e) Date Nov. 17, 1994, PCT Pub. No. WO93/23578, PCT Pub. Date Nov. 25, 1993

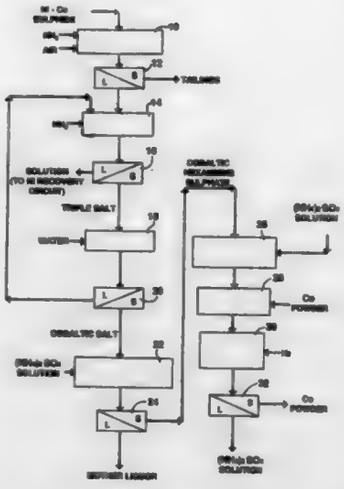
PCT Filed May 19, 1993, Ser. No. 335,701

Claims priority, application Canada, May 19, 1992, 2068982

Int. Cl.[6] C22B *3/14;3/44;* **C01G** *51/00*

U.S. Cl. 75—710 **16 Claims**

1. A process for separating cobalt in the form of cobalt (III) hexammine sulphate from an aqueous solution containing cobalt (III) hexammine and nickel (II) hexammine sulphate with a Ni:Co ratio greater than 1:1, comprising adding ammonium sulphate to provide an effective amount of ammonium sulphate, saturating the solution with an effective amount of ammonia at a temperature whereby the triple salt of cobalt (III) hexammine sulphate, nickel (II) hexammine sulphate and ammonium sulphate is precipitated, recovering the precipitated triple salt from the solution, and repulping the triple salt with an effective mount of water or aqueous ammonia solution to selectively leach nickel (II) hexammine sul-



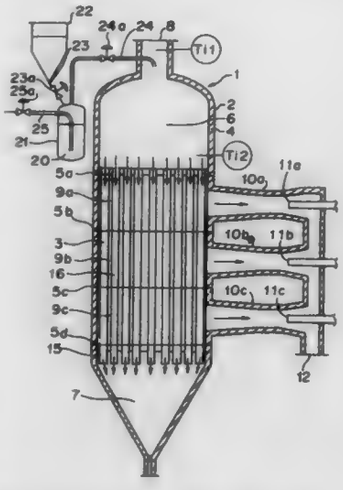
phate to produce a crystalline cobalt (III) hexammine sulphate, with a Co:Ni weight ratio of at least 100:1, and a nickel enriched solution.

5,468,282

METHOD FOR OPERATING A FILTRATION APPARATUS FOR FLUE GAS

Hiroshi Yugami, Yachimata; Minoru Yamada, Tokorozawa; Noriyuki Oda, and Yasuhiko Endo, both of Tokyo, all of, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Feb. 18, 1994, Ser. No. 198,261
Claims priority, application Japan, Feb. 18, 1993, 5-052919
Int. Cl.[6] B01D *46/00*
U.S. Cl. 95—8 **12 Claims**



1. A method for operating a filtration apparatus for flue gas, which comprises removing dust from flue gas discharged from a burner using mainly solid flue, said dust-containing flue gas being at a pressure of at least 3 atmospheres, which comprises:

a) introducing incombustible powder by means of injected compressed gas into the filtration apparatus upon detecting arrival of unburned combustible duct from the burner, or upon detecting an increase in flue gas temperature; and

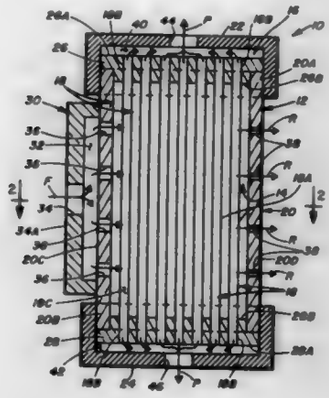
b) suspending said incombustible powder in the dust-containing flue gas to suppress combustion of the combustible dust or to suppress said increase in flue gas temperature, in said filtration apparatus.

5,468,283

HOLLOW FIBER MEMBRANE MODULES WITH TRANSVERSE GAS FLOW TAILORED FOR IMPROVED GAS SEPARATION

Erick M. French, Golden, and James S. French, Evergreen, both of Colo., assignors to Transfair Corporation, Wheatridge, Colo.

Filed Jul. 21, 1994, Ser. No. 278,421
Int. Cl.[6] B01D *53/22;63/02*
U.S. Cl. 95—45 **69 Claims**



1. A gas separation method, comprising the steps of:

(a) providing an elongated pressure vessel having a pair of opposite ends and defining at least one permeate flow outlet therethrough at one of said opposite ends and an interior cavity formed between said opposite ends;

(b) providing a core of hollow fiber membranes disposed in said interior cavity of said pressure vessel and including at least one end support member mounted across said one of said opposite ends of said pressure vessel and a multiplicity of hollow fiber membranes extending through said interior cavity of said pressure vessel, said hollow fiber membranes having short lengths falling within a range of from 3 to 60 centimeters and being of a type for separating gases, each of said hollow fiber membranes having at least one open end, a hollow interior bore communicating with said open end, and an exterior surface defining a membrane gas separation area within said interior cavity of said pressure vessel, said each hollow fiber membrane at said open end thereof being attached to said end support member such that said hollow interior bore of said each hollow fiber membrane is positioned in communication with said permeate flow outlet at said one end of said pressure vessel;

(c) providing at least one feed manifold connected to and extending along a first side of said pressure vessel and defining a feed flow chamber therewith;

(d) introducing a flow of feed gas in a first stream thereof into said feed flow chamber from externally of said feed manifold;

(e) diverting the first stream into a plurality of second streams and introducing the second streams into said interior cavity of said pressure vessel from said feed flow chamber such that said second streams distribute the flow of feed gas throughout a greater volume of said interior cavity of said pressure vessel so as to produce a greater degree of mixing and contact of the flow of feed gas with said membrane gas separation areas defined by the exterior surfaces of said hollow fiber membrane than otherwise would be produced by said first stream introduced directly into said interior cavity;

(f) producing a flow of a permeate portion of the feed gas in said interior bores of said hollow fiber membranes and discharging said flow of said permeate portion of the feed gas from said one end of said pressure vessel through said permeate flow outlet thereof; and

(g) producing a flow of a retentate portion of the feed gas in said interior cavity of said pressure vessel about and outside of said hollow fiber membranes and discharging said flow of said retentate portion of the feed gas from a second side portion of said pressure vessel separate from said first side portion thereof.

10. A hollow fiber membrane gas separation module, comprising:

(a) an elongated pressure vessel having a pair of opposite ends and an interior cavity formed between said opposite ends, at least one of said opposite ends defining an open region of said pressure vessel;

(b) a core of hollow fiber membranes disposed in said interior cavity of said pressure vessel, said core including at least one end support member mounted across said one end of said pressure vessel defining said open region thereof and a multiplicity of hollow fiber membranes extending through said interior cavity of said pressure vessel, said hollow fiber membranes having short lengths falling within a range of from 3 to 60 centimeters and being of a type for separating gases, each of said hollow fiber membranes having at least one open end, a hollow interior bore communicating with said open end and an exterior surface defining a membrane gas separation area within said interior cavity of said pressure vessel, said each hollow fiber membrane at said open end thereof being attached to said end support member such that said hollow interior bore of said each hollow fiber membrane is positioned in communication with said open region at said one end of said pressure vessel; and

(c) means for guiding flow of feed gas under a predetermined pressure from externally of said pressure vessel into said interior cavity thereof and from said interior cavity thereof to externally of said pressure vessel such that the feed gas enters said interior cavity through a first side portion of said pressure vessel, flows across said interior cavity in transverse relation to said hollow fiber membranes therein and contacts said exterior surfaces of said hollow fiber membranes defining said membrane gas separation areas so as to produce a flow of a permeate portion of the feed gas exiting said pressure vessel through said open region at said one end thereof after traveling through said interior bores of said hollow fiber membranes and a flow of a retentate portion of the feed gas exiting said interior cavity through a second side portion of said pressure vessel separate from said first side portion thereof after traveling across said interior cavity outside of said hollow fiber membranes;

(d) said flow guiding means including at least one feed manifold connected to and extending along said first side portion of said pressure vessel and defining a feed flow chamber therewith, said feed manifold including an outer wall portion having at least one outer perforation defined therein for introducing the flow of feed gas in a first stream thereof into said feed flow chamber from externally of said pressure vessel, said feed manifold also including an inner wall portion having a plurality of inner perforations defined therein for diverting said first stream into a plurality of second streams and introducing said second streams into said interior cavity of said pressure vessel from said feed flow chamber of said feed manifold such that said second streams distribute the flow of feed gas throughout a greater volume of said interior cavity of said pressure vessel so as to produce a greater degree of mixing and contact of the flow of feed gas with said membrane gas separation areas defined by said exterior surfaces of said hollow fiber membranes than otherwise would be produced by said first stream introduced directly into said interior cavity.

5,468,284

METHOD OF WATERPROOF WOOD AND ASSOCIATED COMPOSITION

Jeffrey C. Sturm, Pittsburgh, Pa., assignor to Kop-Coat, Inc., Pittsburgh, Pa.

Filed Jun. 27, 1994, Ser. No. 266,273

Int. Cl.[6] C09K *3/18*

U.S. Cl. 106—2 **33 Claims**

17. A wood waterproofing composition comprising

about 1.3 to 2.75 weight percent of a quaternary ammonium compound,

about 1 to 2 weight percent of a hydrated starch solution,

about 2.5 to 5.0 weight percent of a slack wax emulsion, and

about 90 to 95 weight percent water.

5,468,285

CERAMIC CORE FOR INVESTMENT CASTING AND METHOD FOR PREPARATION OF THE SAME

Steven Kennerknecht, 629 LesErables, Laval sur la Lac, Quebec, Canada

Continuation-in-part of Ser. No. 182,354, Jan. 18, 1994, Pat. No. 5,387,280. This application Feb. 6, 1995, Ser. No. 384,147

Int. Cl.[6] B28B *7/34*

U.S. Cl. 106—38.3 **4 Claims**

1. A green mix for preparing a fired acid-soluble ceramic core for investment casting comprising:

an acid-soluble alkaline earth borate binder in an amount from about 35% to about 50% by weight;

an alkaline earth carbonate porogen in an amount from about 4% to about 17%; and

an aluminum nitride refractory filler in an amount forming the balance of the total binder plus porogen plus filler.

5,468,286

ENZYMATICALLY DEBRANCHED STARCHES AS TABLET EXCIPIENTS

Chung Wai-Chiu, Westfield, and James J. Kasica, Whitehouse Station, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Sep. 30, 1994, Ser. No. 316,664

Int. Cl.[6] C09D *103/02;* **C08L** *3/02*

U.S. Cl. 106—210 **11 Claims**

1. A process for preparing a tablet, comprising the steps:

a. enzymatically treating a starch containing greater than 90% amylopectin with an alpha-1,6-D-glucanohydrolase to debranch the starch and yield at least 20%, by weight, of a short chain amylose of from about 5 to 65 anhydroglucose units linked by alpha-1,4-D-glucoside bonds;

b. drying the starch;

c. blending the starch with at last one active agent to form a blend; and

d. compressing the blend to form a tablet;

wherein the starch is characterized by sufficient compressibility for use as an excipient, a binder, a binder-disintegrant, a binder-diluent, filler or diluent, a moisture absorbent, a glidant, lubricant or flow agent, a surface gloss or hardness agent, or a combination thereof, in the tablet.

5,468,287

WATER COLOR

Mitsuo Hattori; Hitoshi Furuta; Taro Takahashi, and Hirokazu Maeda, all of Ibaraki, Japan, assignors to Fuji Oil Co., Ltd., Osaka, Japan

Filed Jun. 24, 1994, Ser. No. 265,443

Int. Cl.[6] C09D *105/14*

U.S. Cl. 106—217 2 Claims

1. A product prepared from the process of preparing a water color, comprising kneading together water, a pigment, and a water-soluble polymer, wherein the water-soluble polymer is water-soluble hemicellulose derived from soybean.

5,468,288

MASTICATING AGENT FOR RUBBER

Lothar Steger, Müchen; Horst Syrowatka, Brühl, both of, Germany, and Walter Schütte, New Town, Pa., assignors to Rhein Chemie Rheinau GmbH, Mannheim, Germany

Continuation of Ser. No. 163,738, Dec. 6, 1993, abandoned.

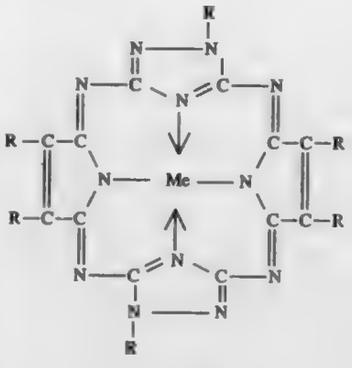
This application Feb. 13, 1995, Ser. No. 387,374

Claims priority, application Germany, Dec. 16, 1992, 42 42 499.2

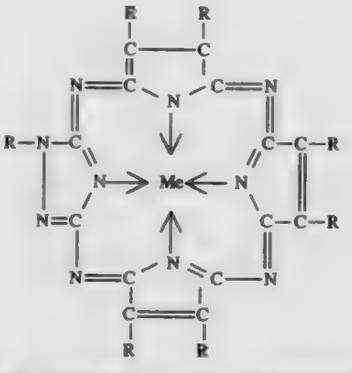
Int. Cl.[6] C09D *191/00;* C08C *4/00;* C08L *91/00*

U.S. Cl. 106—243 10 Claims

1. A masticating agent for rubber which consists essentially of 76 to 89.9% by weight of tallow fatty acid with an addition of 0.1 to 3% by weight, based on the masticating agent, of a 16-membered, metal-containing ring compound corresponding to Formula I or Formula II:



(I)



(II)

in which Me stands for an at least divalent metal atom and R stands for alkyl, aryl or cycloalkyl groups which may also pairwise form carbocyclic or heterocyclic rings and from 10 to 20% by weight of zinc oxide.

5,468,289

SURFACE-MODIFIED PIGMENTS

Gerhard Herget; Margarete Herbski, both of Ober-Ramstadt, and Karl Osterried, Dieburg, all of, Germany, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany

Continuation of Ser. No. 28,867, Mar. 10, 1993, abandoned.

This application Sep. 30, 1994, Ser. No. 317,581

Claims priority, application Germany, Mar. 11, 1992, 42 07 723.0

Int. Cl.[6] C09C *1/28*

U.S. Cl. 106—415 17 Claims

1. A surface-modified pigment comprising a layered silicate platelet-shaped substrate having thereon at least one metal oxide or metal hydroxide, wherein said pigment further comprises a an additional coating of a mixture comprising at least two metal oxides which are silica, alumina or zirconium dioxide, whereby said pigment settles to form a softer cake and redisperses easier in comparison to a pigment without said recoating.

5,468,290

CERAMIC ADHESIVE

Kurtis C. Kelley, Washington, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jul. 29, 1994, Ser. No. 282,354

Int. Cl.[6] C04B *28/26*

U.S. Cl. 106—635 22 Claims

1. A ceramic adhesive, comprising:

a ceramic matrix, said ceramic matrix being formed from a mixture of a metallic oxide and an alkali silicate in water; and

silicon carbide whiskers dispersed within said ceramic matrix;

wherein said ceramic matrix is formed from a mixture, comprising, in the range of about 50% to about 80% by weight metallic oxide and in the range of about 50% to about 20% by weight alkali silicate in water, and said silicon carbide whiskers being present in the range of about 3% to about 25% by weight of said ceramic matrix; and

wherein said metallic oxide is selected from a group consisting of magnesium oxide, aluminum oxide, zirconium oxide, silicon dioxide and mixtures thereof.

5,468,291

METAL SHREDDER RESIDUE-BASED LANDFILL COVER

Bruce P. Waterson, North Smithfield, R.I.; Dennis L. Caputo, Bellaire, and William R. McLaughlin, Houston, both of Tex., assignors to Hugo Neu & Sons Inc., New York, N.Y., and Proler International Corp., Houston, Tex.

Filed Mar. 26, 1993, Ser. No. 37,263

Int. Cl.[6] C04B *18/04*

U.S. Cl. 106—697 32 Claims

1. A daily landfill cover material comprised of a compactable, rebounding mixture including, predominantly, water-containing metal shredder residue with waste pieces having a maximum size of about 1 to 2 inches, and said mixture further including inorganic cementitious particle component attached to said residue waste pieces, said cementitious particle component being present in sufficient amount to increase the density of said mixture for enhancing the stability of said cover upon exposure to wind and rain and to reduce the ignitability of flammable residue-waste pieces.

5,468,292

GROUTING LIQUID FOR INJECTION INTO A GROUND

Kenji Kayahara, Kanagawa, and Shunsuke Shimada, Tokyo, both of, Japan, assignors to Kyokado Engineering Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1994, Ser. No. 264,048
Claims priority, application Japan, Jun. 28, 1993, 5-178570
Int. Cl.[6] C04B 7/14
U.S. Cl. 106—789 4 Claims

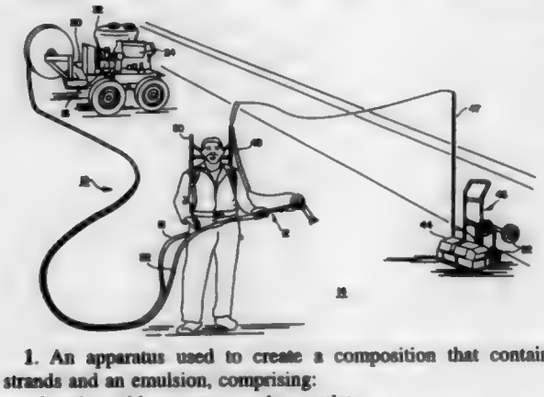
1. A grouting liquid for injection into a ground consisting of slag or a combination of slag and cement, an alkali metal aluminate, and water, said slag being fine grain having a specific surface area of 5000 cm^2/g or more, and said alkali metal aluminate having a mole ratio ($\{Me_2O\}/\{Al_2O_3\}$) of 2.8 or more, in which Me is an alkali metal, and $\{Me_2O\}$ and $\{Al_2O_3\}$ represent molar concentration of Me_2O, and Al_2O_3, respectively.

5,468,293

APPARATUS AND METHOD FOR CONSTRUCTING A SPRAY IN PLACE STRUCTURE

Greg Jones, 1340 Paseo Gracia, San Dimas, Calif. 91773, and Daryn Wyatt, 8581 Hamilton, Alta Loma, Calif. 91701

Division of Ser. No. 225,752, Apr. 11, 1994, which is a continuation of Ser. No. 931,144, Aug. 17, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 283,586
Int. Cl.[6] B05B 7/00
U.S. Cl. 118—308 13 Claims



1. An apparatus used to create a composition that contains strands and an emulsion, comprising:

a housing with a passage and an outlet;

cutting means for cutting a single thread into a group of short strands and a group of long strands, wherein each strand has a longitudinal axis; and,

spray means operatively connected to said passage for spraying said strands through said passage and out of said outlet so that the longitudinal axis of said long strands is essentially perpendicular to said outlet.

5,468,294

APPARATUS FOR IMPREGNATION OF AN OBJECT WITH CURABLE RESIN

Willy Kress, Bisingen, Germany, assignor to Kress-Elektrik GmbH & Co. Elektromotorenfabrik, Bisingen, Germany

Division of Ser. No. 869,938, Apr. 15, 1992, Pat. No. 5,385,757. This application May 24, 1994, Ser. No. 248,418
Claims priority, application Germany, Apr. 19, 1991, 41 12 776.5
Int. Cl.[6] B05C 5/00
U.S. Cl. 118—668 10 Claims

1. An apparatus for trickle resin impregnation of an object by a stream, comprising means located above the object for applying a liquid synthetic resin in conjunction with a curing agent on the object to be impregnated, said applying means including means for supplying the resin separately in an amount in a stream and free of the curing agent, said supplying means including a nozzle having

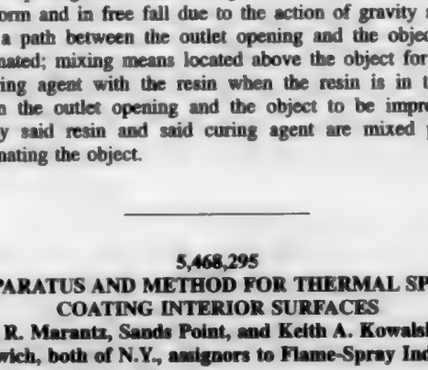
an outlet opening from which emerges the resin to flow downwards in jet form and in free fall due to the action of gravity so as to follow a path between the outlet opening and the object to be impregnated; mixing means located above the object for mixing the curing agent with the resin when the resin is in the path between the outlet opening and the object to be impregnated; whereby said resin and said curing agent are mixed prior to impregnating the object.

5,468,295

APPARATUS AND METHOD FOR THERMAL SPRAY COATING INTERIOR SURFACES

Daniel R. Marantz, Sands Point, and Keith A. Kowalsky, East Norwich, both of N.Y., assignors to Flame-Spray Industries, Inc., Stony Brook, N.Y.

Filed Dec. 17, 1993, Ser. No. 169,332
Int. Cl.[6] B05B 5/00; C23C 4/00;16/00; B23K 9/04
U.S. Cl. 118—723 DC 23 Claims



22. A thermal spray coating apparatus for simultaneously thermal spray coating a plurality of bores having generally parallel longitudinally axis:

said thermal spray apparatus having a plurality of deflecting nozzles spaced in parallel relation to be received in each of said bores, said deflecting nozzles each having an axial bore, said thermal spray apparatus directing a stream of coating particles entrained in a first gas stream axially through each of said axial bores of said deflecting nozzles, said deflecting nozzles each having a plurality of spaced radially extending ports surrounding each of said axial bores;

a supply of compressed gas selectively communicating with each of said ports supplying deflecting gas to said ports;

a valve assembly operable to selectively communicate said supply of compressed gas to said radially extending ports sequentially about the circumference of said deflecting gas nozzles; and

a transfer mechanism simultaneously moving said deflecting nozzles axially through said bores, said compressed gas deflecting said stream of coating particles radially outward onto said internal surfaces of said bores as said deflecting

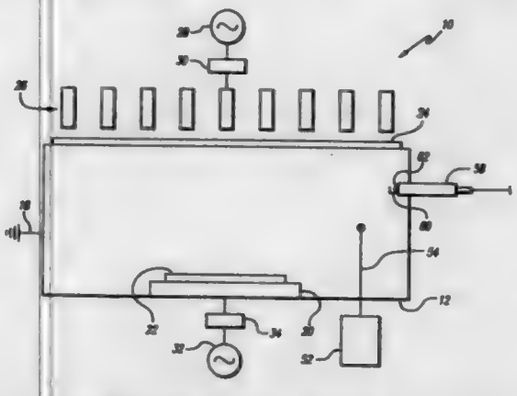
nozzles are moved axially through said bores, simultaneously coating said internal surfaces of said bores.

5,468,296

APPARATUS FOR IGNITING LOW PRESSURE INDUCTIVELY COUPLED PLASMA

Roger Patrick, Santa Clara; Philippe Schoenborn, San Jose; Mark Franklin, Scotts Valley, and Frank Bose, San Jose, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 17, 1993, Ser. No. 169,571
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—723 MP **7 Claims**



1. A plasma generation apparatus, comprising:
a vacuum chamber, including a gas inlet, a vacuum outlet, and an aperture;
a dielectric window disposed in the aperture and forming a substantially vacuum seal with the container;
a substantially planar coil disposed outside the vacuum chamber adjacent the window;
starter means for initiating a plasma discharge within the vacuum chamber at pressures in the low 5 millitorr range, wherein a plasma discharge within the chamber is initiated by said starter means and then maintained by energy provided to the plasma from the substantially planar coil;
wherein said starter means includes an electrode disposed within the chamber and electrically coupled to an external power source, wherein a plasma discharge within the chamber is initiated at low pressures;
a target pedestal disposed within the chamber and electrically coupled to said external power source; and
an RF power splitter between the external power source, the target pedestal and the starter means electrode.

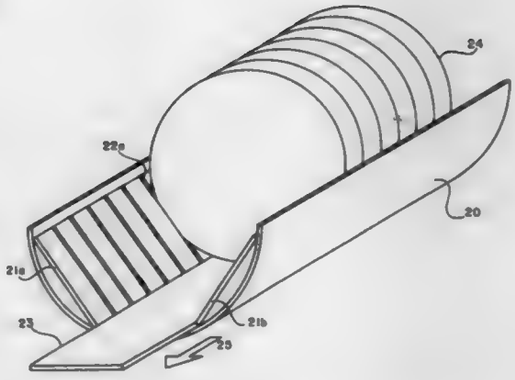
5,468,297

WAFER BOAT FOR SUPPORTING SILICON WAFERS

Xavier Letort, Saint Cyr/Loire, France, assignor to SGS-Thomson Microelectronics, S.A., Saint-Genis, France

Filed Feb. 16, 1994, Ser. No. 196,976
Claims priority, application France, Feb. 24, 1993, 93 02340
Int. Cl.[5] C23C *16/00*; B65D *85/48*
U.S. Cl. 118—728 **37 Claims**

12. A wafer-supporting boat for holding semiconductor wafers having outer edges, comprising:
a cradle having a horizontal axis;
means, within the cradle, for supporting the semiconductor wafers, comprising a first part on one side of the horizontal axis and a second part on an opposing side of the horizontal axis, wherein the first and second parts are independently moveable within the cradle along the outer edges of the semiconductor wafers; and
means, within the cradle, for aligning the wafers in parallel and in a substantially vertical orientation.

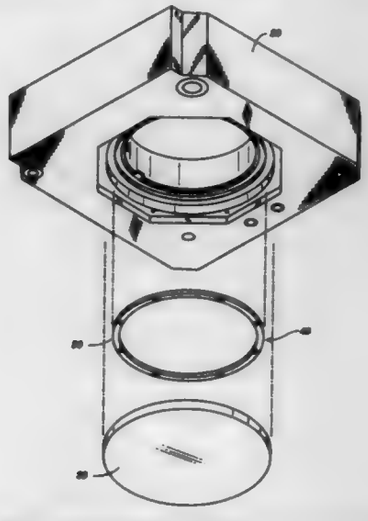


5,468,298

BOTTOM PURGE MANIFOLD FOR CVD TUNGSTEN PROCESS

Lawrence C. Lei, Milpitas, and Clasy Leung, Fremont, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Apr. 13, 1994, Ser. No. 226,907
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—728 **15 Claims**



1. A bottom purge manifold for a substrate processing chamber comprising:
a ring configured to obstruct a generally annular bottom purge channel opening of a processing chamber, wherein when said ring is in position obstructing said opening, said ring and said channel are configured to create a series of predefined passages generally equally distributed about said ring from an inside of said annular bottom purge channel to a location outside of said annular bottom purge channel;
wherein a gas disposed at said location outside of said annular bottom purge channel communicates freely with a processing surface of a substrate being processed in the processing chamber;
wherein said ring further comprises a retaining mechanism to assist said ring in maintaining its position the location where said ring obstructs said channel opening;
wherein said retaining mechanism comprises a set of retaining flanges configured to extend into said annular bottom purge channel opening along opposite walls of said opening and further are configured to urge a portion of each of said flanges into its adjacent wall to create a frictional force to assist in preventing said ring from being released from said location where said ring obstructs said channel opening.
13. A substrate processing chamber, comprising:

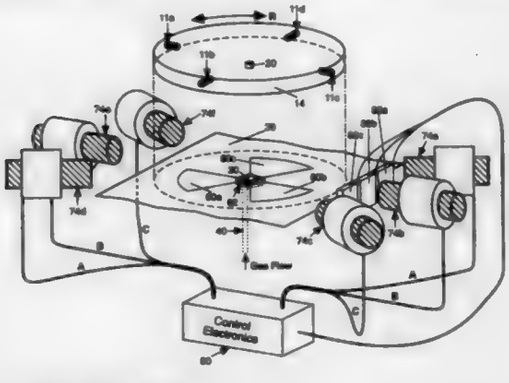
an upper chamber containing a processing gas for processing a substrate;
a pedestal holding said substrates and separated from a side wall by a gap;
a lower chamber separated from said upper chamber by said pedestal;
a gas channel groove formed near and surrounding a bottom of said lower chamber and facing a vertical axis of said upper and lower chambers for supplying a purge gas flow from said lower chamber to said upper chamber through said gap to purge said processing gas form said lower chamber; and
a manifold cover member removably insertable in said gas channel groove and having a plurality of aperatures formed therethrough for passage of said purge gas into said lower chamber;
wherein said manifold member includes a plurality of fan-shaped recesses extending from respective ones of said apertures to said lower chamber.

5,468,299

DEVICE COMPRISING A FLAT SUSCEPTOR ROTATING PARALLEL TO A REFERENCE SURFACE ABOUT A SHAFT PERPENDICULAR TO THIS SURFACE

Charles S. Tsai, 2653 S. Daytona Ave., Hacienda Hts., Calif.

Filed Jan. 9, 1995, Ser. No. 370,167
Int. Cl.[6] C23C *16/00;* **B05C** *13/00*
U.S. Cl. 118—730 **12 Claims**



3. A device comprising
a reference surface,
a rotatable platform, said platform being supported from said reference surface by a rotary bearing means,
at least one ferromagnetic element integrated within said platform, said element being of a volume smaller than said platform,
a magnetic actuating means to supply magnetic fields to interact with said element,
wherein rotary movement of said platform is obtained by a force of magnetic interaction between said element and said magnetic actuating means.

5,468,300

PROCESS FOR PRODUCING REFINED SUGAR DIRECTLY FROM SUGARCANE

Jean-Pierre Monclin, Wilmar, Minn., assignor to International Food Processing Incorporated, Thibodaux, La.

Filed Apr. 7, 1994, Ser. No. 224,319
Int. Cl.[6] C13D *1/00;3/12;3/16*
U.S. Cl. 127—43 **34 Claims**

1. A process for producing refined sugar directly from sugarcane stalks in the absence of added chemical components comprising the following steps:
(a) extracting cane juice from the sugarcane stalks;
(b) heating the extracted cane juice;
(c) raising the pH of the extracted cane juice;
(d) ultra-clarifying the extracted cane juice to remove particulate matter and/or undissolved solids greater than from about 0.1 to 1.0 micron, wherein said ultraclarifying is performed by a process step selected from the group consisting of ultrafiltration, ultracentrifugation, and screening;
(e) treating the ultra-clarified cane juice by contacting the ultra-clarified cane juice with an adsorbent resin, wherein said adsorbent resin is made at least in part from a macroporous copolymer of a monovinyl aromatic monomer and a crosslinking monomer, wherein the macroporous copolymer has been post-crosslinked in the swollen state in the presence of a Friedel-Crafts catalyst and functionalized with hydrophilic groups;
(f) separating the treated cane juice from the adsorbent resin;
(g) separating refined sugar from the treated cane juice; and
(h) wherein, in steps (a) through (d), the cane juice includes particulate and colloidal matter from said sugarcane stalks and is maintained in a liquid condition.

5,468,301

PROCESS FOR PRODUCING REFINED SUGAR

Jean-Pierre Monclin, Wilmar, Minn., assignor to International Food Processing Incorporated, Thibodaux, La.

Continuation of Ser. No. 224,319, Apr. 7, 1994. This application Aug. 3, 1994, Ser. No. 285,041
Int. Cl.[6] C13D *1/00;3/12;3/16*
U.S. Cl. 127—43 **24 Claims**

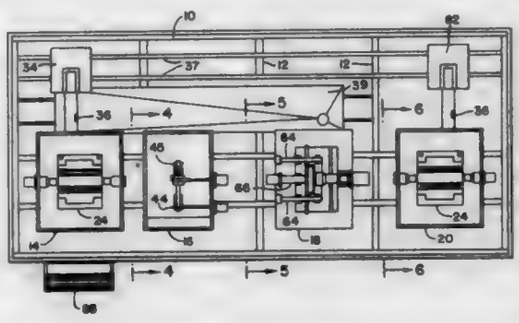
1. A process for producing refined sugar from raw sugar in the absence of added chemical components comprising the following steps:
(a) melting said raw sugar to produce liquor;
(b) ultra-clarifying the liquor to remove particulate matter and/or undissolved solids of greater than from about 0.1 to 1.0 micron, wherein said ultra-clarifying is performed by a process step selected from the group consisting of ultra-filtration, ultra-centrifugation, and screening;
(c) treating the ultra-clarified liquor by contacting the ultra-clarified liquor with an adsorbent resin, wherein said adsorbent resin is made at least in part from a macroporous copolymer of a monovinyl aromatic monomer and a crosslinking monomer, wherein the macroporous copolymer has been post-crosslinked in the swollen state in the presence of a Friedel-Crafts catalyst and functionalized with hydrophilic groups;
(d) separating the treated liquor from the adsorbent resin; and
(e) separating refined sugar from the treated liquor.

5,468,302

SEMICONDUCTOR WAFER CLEANING SYSTEM

Jerry Thietje, 2223 Bruynswick Rd., Wallkill, N.Y. 12589

Filed Jul. 13, 1994, Ser. No. 274,250
Int. Cl.[6] B08B *3/02*
U.S. Cl. 134—1 **12 Claims**



11. The method of cleaning semiconductor wafers to near absolute purity comprising the steps of:

storing and rinsing a plurality of wafers in spaced relation alongside one another in a vertical plane within a loading enclosure;

transporting a sequence of individual wafers from the loading enclosure to a separate cleaning enclosure while the wafer is still wet and maintained in a vertical plane;

rotating the wafer in a vertical plane within the cleaning enclosure; and

simultaneously washing and rinsing opposite surfaces of the rotating wafer by a combination of high pressure streams and ultrasonic spray pulses of deionized water.

5,468,303

RUST, CORROSION, AND SCALE REMOVER

Glenn C. Thomas, Sr., Cleveland, Ohio, assignor to ZT Corporation, Cleveland, Ohio

Filed Feb. 25, 1994, Ser. No. 201,744
Int. Cl.[6] C23F *15/00;14/00*
U.S. Cl. 134—3 **13 Claims**

1. A rust, corrosion, and scale removing composition for use in removing rust, corrosion, and scale, said composition consisting essentially of an additive concentrate and water, said additive concentrate consisting essentially of, on a parts by weight basis, 1.5 to 5 parts glycolic acid, 0.2 to 1 parts tetrasodium salt of ethylenediaminetetraacetic acid, 2 to 6 parts citric acid, and 1 to 3 parts trisodium citrate dihydrate, said composition being an aqueous solution., said composition being free from the presence of toxic chemicals listed in the EPA SARA Title III, Sec. 313 toxic chemical list (40 CFR 372.65, Jul. 1, 1993 Ed.).

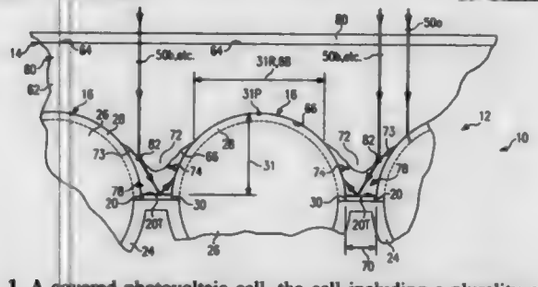
11. A method of removing scale from a cooling system which comprises (a) draining any coolant from the cooling system; (b) adding to the cooling system a composition consisting essentially of an additive concentrate and water, said additive concentrate consisting essentially of, on a parts by weight basis, 1.5 to 5 parts glycolic acid, 0.2 to 1 parts tetrasodium salt of ethylenediaminetetraacetic acid, 2 to 6 parts citric acid, and 1 to 3 parts trisodium citrate dihydrate, said composition being an aqueous solution, said composition being free from the presence of toxic chemicals listed in the EPA SARA Title III, Sec. 313 toxic chemical list (40 CFR 372.65, Jul. 1, 1993 Ed.); (c) circulating said composition through the cooling system for an effective period of time to remove scale from the surfaces of the cooling system; and (d) removing from the cooling system the composition and the scale removed from the cooling system surfaces.

5,468,304

OUTPUT-INCREASING, PROTECTIVE COVER FOR A SOLAR CELL

Milfred D. Hammerbacher, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 14, 1994, Ser. No. 212,542
Int. Cl.[6] H01L *31/052;31/0384;31/18*
U.S. Cl. 136—246 **39 Claims**



1. A covered photovoltaic cell, the cell including a plurality of spaced semiconductor particles having portions extending away from a reflective surface so that the particle portions are exposed to radiant energy directed at the cell; a substantial amount of the radiant energy which impinges on the reflective surface between adjacent particle portions being wasted due to its being reflected so as to not fall upon the particle portions, the cell comprising:

a layer of radiant energy-transparent material having a free surface and an opposed, irregular surface, wherein

first portions of the irregular surface conform to the polar regions of adjacent particle portions, and

second portions of the irregular surface between the pole-conforming portions thereof have surfaces which are non-perpendicular to the direction of the otherwise wasted radiant energy, spaces being defined between the second portions of the irregular surface and the reflective surface;

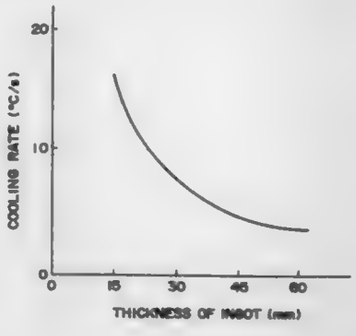
both (a) the angular relationship between the surfaces of the second portions of the irregular surface and the otherwise wasted radiant energy and (b) the refractive indices of the layer and the spaces being such that a significant amount of the otherwise wasted radiant energy which passes through the layer and each layer-space interface between adjacent particles is reflected by the reflective surface onto the particle portions.

5,468,305

METHOD OF LOWERING PERMEABILITY OF DIFFICULT-TO-WORK CO ALLOY

Hiroyuki Uchida; Kazuo Yoshikawa, and Seiji Nishi, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 25, 1994, Ser. No. 328,524
Claims priority, application Japan, Jan. 25, 1993, 5-266605
Int. Cl.[6] H01F *1/00*
U.S. Cl. 148—120 **13 Claims**



1. A method of lowering the permeability of a difficult-to-work Co alloy, which comprises:

a) preparing a Co alloy by melting, said Co alloy comprising:

i) 0.1 to 40 atomic % of Ni or 0.1 to 40 atomic % of Pt, or both; and

ii) 0.5 to 10 atomic % of one or more elements selected from the group consisting of Ta, Mo, W, V, Nb, Hf, Zr, Ti and B, with the proviso that the upper limit of B is 5 atomic %,

the balance being 50 atomic % or more of Co and inevitable impurities;

b) preparing a sheet-shaped ingot having a thickness of 30 mm or less using said Co alloy; and

c) covering the surface of said ingot with a metal capsule or coating said ingot with a glass lubricant, and hot-rolling and performing reduction of said ingot at least twice, with re-heating therebetween, whereby an entire reduction of 30% or more is obtained.

5,468,306

Patent Not Issued For This Number

5,468,307

NON-CHROMATED OXIDE COATING FOR ALUMINUM SUBSTRATES

Matthias P. Schriever, 27636 128th Pl., SE., Kent, Wash. 98031

Continuation-in-part of Ser. No. 621,132, Nov. 30, 1990, , which is a continuation of Ser. No. 732,568, Jul. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 525,800, May 17, 1990, Pat. No. 5,298,092. This application Nov. 21, 1994, Ser. No. 342,990

Int. Cl.[6] C23C *22/68;22/66;22/60*

U.S. Cl. 148—261 **10 Claims**

1. An aqueous chemical bath for producing an oxide film cobalt conversion coating on a metal substrate, said chemical bath consisting essentially of a bath prepared by reacting:

(a) in the presence of an oxidizer;

(b) a cobalt-II salt;

(c) a metal nitrate salt; and

(d) ammonium acetate;

(e) wherein said cobalt-II salt is CoX_2 wherein X is one or more selected from the group consisting of Cl, Br, NO_3, CN, SCN, $\frac{1}{3}PO_4$, $\frac{1}{2}SO_4$, $C_2H_3O_2$, or $\frac{1}{2}CO_3$;

(f) wherein the concentration of said cobalt-II salt is from about 0.01 moles per liter of final solution to the saturation limit of the cobalt-II salt employed;

(g) wherein said metal nitrate salt is selected from the group consisting of $Mg(NO_3)_2.6H_2O$, $Ca(NO_3)_2.6H_2O$, $NaNO_3$, KNO_3, or $LiNO_3$;

(h) wherein the concentration of said metal nitrate salt is from about 0.03 to 2.5 moles per liter of final solution; and

(i) wherein the concentration of said ammonium acetate is from about 0.06 to 6.0 moles per liter of final solution.

5,468,308

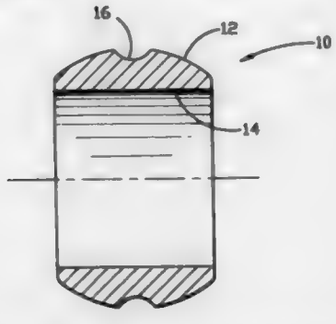
SURFACE TREATED CAST IRON BEARING ELEMENT

Joseph F. Braza, Simsbury, and John A. Larson, Collinsville, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Aug. 22, 1994, Ser. No. 294,220

Int. Cl.[6] C22C *37/00;* **C21D** *1/09*

U.S. Cl. 148—321 **20 Claims**



1. A method of making a desired bearing element comprising the following steps:

casting a bearing blank of cast iron, the bearing blank having a configuration near a final shape of the desired bearing element;

remelting a first surface of the bearing blank, the first surface corresponding to a sliding contact surface of the desired bearing element, other portions of the bearing blank remaining in a solid state; and

quenching the remelted first surface such that fine particles of iron carbide precipitate in a remelted zone, the remelted zone having increased hardness and decreased presence of graphite particles relative to said other portions.

5,468,309

HYDROGEN STORAGE ALLOY ELECTRODES

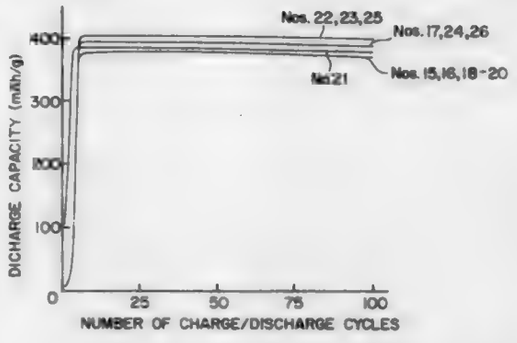
Hajime Seri, Izumiohtsu; Yasuharu Yamamura, Katano; Yoichiro Tsuji; Yoshio Moriwaki, both of Osaka, and Tsutomu Iwaki, Yawata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 13, 1993, Ser. No. 120,244

Claims priority, application Japan, Sep. 14, 1992, 4-244530; Nov. 2, 1992, 4-294215; Nov. 2, 1992, 4-294216

Int. Cl.[6] C22C *22/00*

U.S. Cl. 148—421 **11 Claims**



1. A hydrogen storage alloy electrode comprising a hydrogen storage alloy or its hydride, wherein the major phase of the alloy is a Laves phase of C15 ($MgCu_2$) type, and the composition of the alloy is specified by the formula $ZrMn_wM_xCr_yNi_z$, in which M is at least one element selected from V and Mo, and $0.6 \leqq w \leqq 0.8$, $0.1 \leqq x \leqq 0.3$, $0 < y \leqq 0.2$, $1.2 \leqq z \leqq 1.5$, and the Mn concentration on the alloy surface is lower than that inside the alloy.

7. A hydrogen storage alloy electrode comprising a hydrogen storage alloy or its hydride, wherein the major phase of the alloy is a Laves phase of C15 ($MgCu_2$) type, and the composition of the alloy is specified by the formula $ZrMn_wM_xCr_yNi_z$, in which M is at least one element selected from V and Mo, and $0.6 \leqq w \leqq 0.8$, $0.1 \leqq x \leqq 0.3$, $0 < y \leqq 0.2$, $0.8 \leqq z < 1.2$, and the Mn concentration on the alloy surface is lower than that inside the alloy.

5,468,310

HIGH TEMPERATURE ABRASION RESISTANT COPPER ALLOY

Akira Fujiki, and Makoto Kano, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 1, 1994, Ser. No. 189,780

Claims priority, application Japan, Feb. 1, 1993, 5-014772; Feb. 4, 1993, 5-017670

Int. Cl.[6] C22C *9/01*

U.S. Cl. 148—435 **4 Claims**

1. A high temperature abrasion resistant copper alloy consisting essentially of:

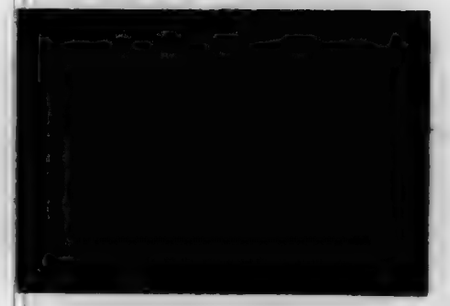
aluminum in an amount ranging from 1.0 to 15.0% by weight;

cobalt in an amount ranging from 0.5 to 10.0% by weight;

titanium in an amount ranging from 0.3 to 8.0% by weight; and

balance containing copper and impurities;

said copper alloy having a structure in which at least one of intermetallic compounds is dispersed, each intermetallic com-



pound containing at least two metals selected from the group consisting of aluminum, titanium, cobalt and copper.

5,468,311

BINDER SYSTEM FOR CROSSLINKED DOUBLE BASE PROPELLANT

James H. Godsey; James L. Jacox; Robert F. Keller, all of Salt Lake City, Utah, and Richard J. Legare, Conyers, Ga., assignors to Hercules Incorporated, Wilmington, Del.

Filed Mar. 5, 1979, Ser. No. 22,123
Int. Cl.[6] C06B *49/10*
U.S. Cl. 149—19.4 7 Claims

1. An improved crosslinked double base propellant composition, the improvement comprising a binder system consisting essentially of nitrocellulose having an intrinsic viscosity of from about 0.4 deciliters/gram to about 1.5 deciliters/gram, an aliphatic diisocyanate, a polyester polyol or polyethe polyol having a molecular weight of from about 400 to about 4000 and a hydroxyl functionality of from about 2.0 to about 2.8, energetic nitrate ester plasticizer and a binder stabilizer, wherein the ratio by weight of NCO groups of the diisocyanate to the combined hydroxyl groups of the nitrocellulose and the polyol is from about 0.7/1.0 to about 1.2/1.0, the ratio by weight of the stabilized energetic nitrate ester plasticizer to the combined weight of nitrocellulose, polyol, binder stabilizer and diisocyanate is from about 2.1/1.0 to about 4.5/1.0, and the ratio by weight 0f nitrocellulose to polyol is from about 0.03/1 to 0.8/1, said binder system containing from about 1.3% to about 4.3% by weight of a binder stabilizer, said nitrate ester plasticizer comprising from about 68% to about 82% by weight of the binder system and said binder system comprising from about 23% to about 30% by weight of the propellant composition.

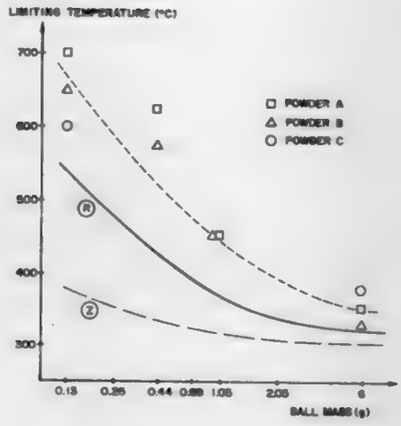
5,468,312

IGNITION-SENSITIVE LOW-VULNERABILITY PROPELLENT POWDER

Bernard Martin, Buffancourt, and Alain Lefumeux, Orsay, both of, France, assignors to Societe Nationale des Poudres et Explosifs, Paris Cedex, France

Continuation of Ser. No. 24,708, Mar. 1, 1993, abandoned. This application Jun. 28, 1994, Ser. No. 267,159
Claims priority, application France, Mar. 11, 1992, 92 02879
Int. Cl.[6] C06B *45/10*
U.S. Cl. 149—19.4 9 Claims

1. A low vulnerability ammunition propellant composition for ballistic ammunition having resistance to impact and to thermal shocks and good sensitivity to ignition which consists essentially of 1) an energetic filler which is a member selected from the group consisting of cyclotrimethylene trinitramine, cyclotetramethylene tetranitramine, nitroguanidine and triaminoguanidine nitrate, 2) an organic polymer which is an inert or energetic binder, the ratio by weight of said binder to said energetic filler being about 20:80, and 3) at least one additive which is a member selected from the group consisting of lithium fluoride, ammonium fluoride and lithium nitrate in the amount of 0.5–3% by weight of said composition.



5,468,313

PLASTISOL EXPLOSIVE

Ingvar A. Wallace, II; Paul C. Braithwaite, both of Brigham City, and Jamie B. Neidert, Ogden, all of Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed Nov. 29, 1994, Ser. No. 346,587
Int. Cl.[6] C06B *31/50*
U.S. Cl. 149—53 17 Claims

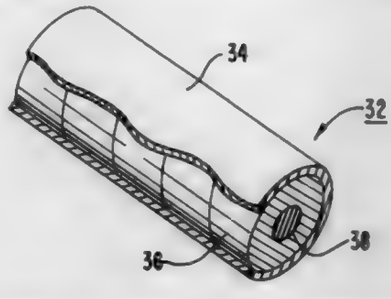
1. A castable explosive composition comprising:
a plastisol nitrocellulose (PNC) binder;
an energetic plasticizer, wherein the ratio of energetic plasticizer to PNC is in the range from about 0.5 to 5, by weight; and
a high explosive having a concentration in the explosive composition greater than 65 weight percent, wherein the explosive composition has a detonation velocity above 8000 m/s.

5,468,314

PROCESS FOR MAKING AN ELECTRICAL CABLE WITH EXPANDABLE INSULATION

Gordon L. McGregor, Landenberg, Pa.; Raymond B. Minor, Elkton, Md.; William Hardie, Landenberg, Pa., and Michael Kennedy, Elkton, Md., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Continuation-in-part of Ser. No. 23,642, Feb. 26, 1993. This application Dec. 13, 1993, Ser. No. 166,118
Int. Cl.[6] H01B *13/08;13/14;13/22*
U.S. Cl. 156—56 24 Claims



1. A method for producing an energy conductive cable which comprises:
providing a conductor;
surrounding the conductor with an electrically insulative composite layer of expandable polymer, the polymer being of a kind that forms a lattice structure of polymeric nodes and fibrils upon expansion, and unexpanded expandable microspheres, the microspheres being adapted to expand when subjected to an energy source;
jacketing the conductor and the composite layer within a sheath;

subjecting the composite layer to the energy source to expand the microspheres so as to enlarge the composite layer and form a resilient protective layer within the cable, the composite layer forming a lattice structure with polymeric nodes, fibrils, and microspheres, the composite layer having substantial areas of open air spaces therein, the enlarged composite layer forming a snug fit around the conductor.

5,468,315

METHOD OF AND APPARATUS FOR PRODUCING MULTILAYER CERAMIC BOARD

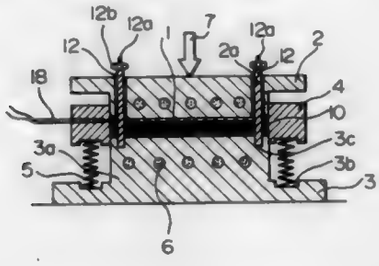
Ken'ichi Okada, Yokohama; Masahiro Takagi, Hadano; Hiroshi Hasegawa, Kanagawa, and Ryoji Iwamura, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 23, 1993, Ser. No. 95,221

Claims priority, application Japan, Jul. 27, 1992, 4-199424

Int. Cl.[6] B32B *18/00*

U.S. Cl. 156—64 **16 Claims**



1. An apparatus for producing a multilayer ceramic board comprising:

a lower mold member adapted for stacking thereon a stack of green sheets having conductive wiring patterns printed on at least one sheet

an upper mold member positioned above said lower mold member and adapted for downward movement into contact with a top surface of the uppermost sheet of the stack of green sheets to apply a pressing load on the stack of green sheets toward the lower mold member,

a restraining mold member

support means resiliently supporting said restraining mold member with an inner wall surface of said restraining mold member in contact with peripheral wall portions of said upper and lower mold members to restrain flow of the green sheets in a direction perpendicular to a pressing direction of the pressing load on the stack of green sheets, while permitting downward movement of said restraining mold member with the stack of green sheets as the stack of green sheets is compressed in response to the downward movement of said upper mold member due to the pressing load, whereby said restraining mold member travels downwardly toward said lower mold member in accordance with the compression of the stack of green sheets, thereby minimizing generation of frictional force between the peripheral edges of the green sheets and said inner wall surface of the restraining mold member so as to minimize camber and to result in substantially uniform density in the resulting multilayer ceramic board.

5,468,316

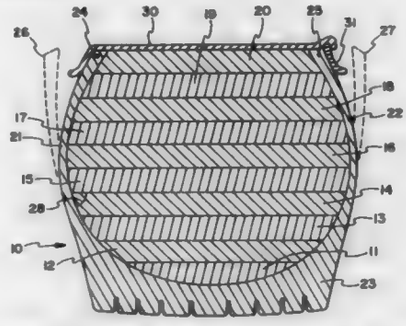
METHODS OF MANUFACTURING AND INSTALLING ELASTOMERIC FILLS FOR USE IN PNEUMATIC TIRE CASINGS

Bernard J. O'Coin, Oakville, Canada, assignor to Jaicos Holdings Inc., Ontario, Canada

Continuation of Ser. No. 661,133, Feb. 27, 1991, which is a continuation-in-part of Ser. No. 337,760, Apr. 13, 1989, abandoned. This application Apr. 7, 1995, Ser. No. 418,771

Int. Cl.[6] B29D *30/04*

U.S. Cl. 156—64 **9 Claims**



1. A method of forming a fill to be inserted in casings for pneumatic tires, comprising the steps of:

a) obtaining at least a first profile of the interior of a predetermined size casing for pneumatic tires;

b) determining at least one angle of contact between at least one strip of a fill and a sidewall of the casing from the profile;

c) said step of obtaining at least a first profile includes:

i) inserting a first time a flexible member into the casing of a tire; and,

ii) deforming the flexible member to conform to the interior of the casing to obtain the first profile thereof;

d) performing said first insertion step when the tire casing is in a relaxed state;

e) spreading the tire casing;

f) inserting a second time the flexible member in the tire casing subsequent to said spreading step;

g) deforming the flexible member to conform to the interior of the casing to obtain a second profile;

h) using the second profile in determining width of the at least one strip of fill;

i) forming the at least one strip of fill from an elastomeric material, the at least one strip of fill having first and second sides; and,

j) orienting at least one of the first and second sides at an angle corresponding to the at least one angle of contact.

5,468,317

METHOD OF BONDING A URETHANE ADHESIVE TO NON-POROUS SUBSTRATES

Harry W. Hsieh, Troy, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 286,295, Aug. 5, 1994, which is a continuation-in-part of Ser. No. 72,206, Jun. 3, 1993, abandoned. This application Feb. 24, 1995, Ser. No. 395,243

Int. Cl.[6] B60J *1/00*

U.S. Cl. 156—108 **7 Claims**

1. A process for the bonding of a vehicle window to a vehicle window flange which consists essentially of the steps of:

(A) applying along the periphery of one side of the window a primer composition which comprises a solution or dispersion of: (1) about 2 percent to about 30 percent by weight, based on the weight of the composition, of a film-forming resin; (2) about 2 percent to about 80 percent by weight, based on the weight of the composition, of a reaction product of an epoxy silane and an amino silane, wherein the amino silane contains at least two amine groups per molecule, which is prepared by (a) contacting neat an amino silane and epoxy silane in

amounts such that the molar ratio of epoxy silane to amino silane is less than about 1.8:1; and then (b) adding additional epoxy silane so that the molar ratio of epoxy silane to amino silane is at least about 2:1; and (3) at least about 5 percent by weight, based on the weight of the composition, of a volatile organic solvent; with the proviso that the reaction product of a polyisocyanate and a compound containing at least one silane group and at least one isocyanate reactive group is not present;

(B) superimposing on the primer composition a bead of a moisture-curable urethane adhesive comprising an isocyanate-functional prepolymer and dimorpholinodiethyl ether; and

(C) installing the window by contacting the adhesive with the vehicle window flange and allowing the adhesive and primer composition to cure.

5,468,318

HIGH FLEXURAL STRENGTH CERAMIC FIBER REINFORCED SILICON CARBOXIDE COMPOSITE

Roger Y. Leung, Schaumburg; Gerald T. Stranford, Palatine, and Stephen T. Gonczy, Mt. Prospect, all of Ill., assignors to AlliedSignal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 464,470, Jan. 12, 1990. This application May 15, 1990, Ser. No. 523,620

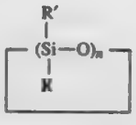
The portion of the term of this patent subsequent to Nov. 2, 2010, has been disclaimed.

Int. Cl.[6] C03B *29/00*

U.S. Cl. 156—89 **2 Claims**

1. A method of preparing fiber reinforced glass composites having a non-brittle failure mode when exposed to temperatures up to about 1300° C. comprising:

(a) reacting (1) a cyclosiloxane monomer having the formula



where n is an integer from 3 to 30, R is hydrogen, and R' is an alkene of from 2 to 20 carbon atoms in which one vinyl carbon atom is directly bonded to silicon or (2) two or more different cyclosiloxane monomers having the formula of (1) where for at least one monomer R is hydrogen and R' is an alkyl group having from 1 to 20 carbon atoms and for the other monomers R is an alkene from 2 to 20 carbon atoms in which one vinyl carbon is directly bonded to silicon and R' is an alkyl group of from 1 to 20 carbon atoms, said reaction taking place in the presence of an effective amount of hydrosilylation catalyst;

(b) applying the reaction product of (a) to at least one refractory fiber having a carbon coating about 0.01 μm to 5 μm thick and selected from the group consisting of boron, silicon carbide, graphite, silica, quartz, S-glass, E-glass, alumina, aluminosilicate, boron nitride, silicon nitride, boron carbide, titanium boride, titanium carbide, zirconium oxide, and zirconia-toughened alumina to form a prepreg;

(c) laying-up plies of the prepreg of (b) to form a green structure;

(d) curing the green structure of (c) at a temperature not greater than 250° C.;

(e) pyrolyzing the cured structure of (d) at a temperature of about 800° C. to about 1400° C. in non-oxidizing atmosphere;

(f) recovering the pyrolyzed product of (e) as the fiber reinforced glass composite;

(g) impregnating the pyrolyzed product of (f) with the reaction product of (a);

(h) pyrolyzing the impregnated product of (g) at 800° C.– 1400° C.;

(i) repeating steps (g) and (h) until the composite is capable of non-brittle failure at temperatures up to about 1300° C.

5,468,319

METHOD OF SWITCHING COMPONENT ELEMENTS OF ROAD VEHICLE TIRES

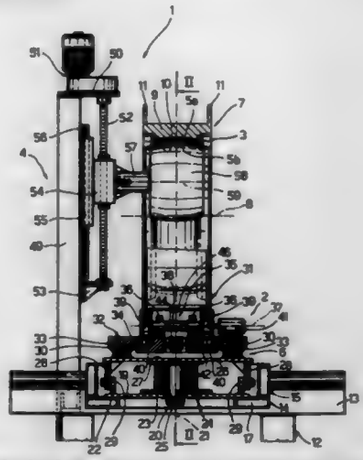
Karl J. Siegenthaler, Rome, Italy, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Nov. 22, 1994, Ser. No. 343,388

Claims priority, application Italy, Dec. 21, 1993, TO93A0982

Int. Cl.[6] B29D *30/08*

U.S. Cl. 156—123 **4 Claims**



1. A method of stitching component elements of road vehicle tires; the method comprising stages consisting in placing a first component element inside a second component element housed inside a hollow body with adjustable supporting means; inserting stitching means inside the first component element and the hollow body; moving the stitching means into a raised position to engage the first element and compress the second element between the first element and the hollow body; adjusting said supporting means so that the hollow body weighs at least partly on the stitching means; and rolling the stitching means in contact with the first element.

5,468,320

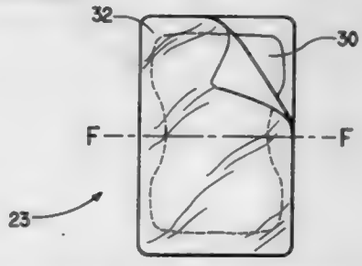
PROCESS FOR ELASTIC NONWOVEN UNDERGARMENT WITH A STITCHBONDED OUTER SHELL

Dimitri P. Zafiroglu, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 907,902, Jul. 6, 1992, abandoned. This application Apr. 7, 1994, Ser. No. 224,347

Int. Cl.[6] B32B *31/18;* **D04B** *23/08;* **A61F** *13/16*

U.S. Cl. 156—148 **6 Claims**



1. An improved process for making an anatomically form-fitting elastic undergarment that has a stretchable outer shell which is fabricated with a waist opening and two leg openings, the process comprising cutting and seaming operations performed on an elastic nonwoven sheet to form the outer shell for the garment and optionally attaching to its inner surface an absorbent structure for containment of body exudates, the improvement comprising the steps of

stitchbonding with an elastic thread under tension a deformable nonwoven layer of weighing 17 to 65 grams per square meter and consisting essentially of substantially non-bonded fibers

of 1 to 22 dtex to form an elastic stitchbonded nonwoven sheet comprising an array of parallel spaced-apart rows of elastic strands extending in a length direction of the sheet and being incorporated with the deformable nonwoven layer,

heat setting the stitchbonded elastic nonwoven sheet while contracting the sheet in a first direction and stretching the sheet in a direction perpendicular to the first direction, to provide a heat-set sheet having an elastic stretch of at least 70% in the first direction and a simultaneous contraction in a direction perpendicular to the first direction of at least 20%, the contraction being at least 20% when the elastic stretch is 70%,

feeding the heat-set stitchbonded elastic nonwoven sheet to the cutting and seaming operations, in a direction substantially parallel to or perpendicular to the first direction of the sheet, at substantially uniform tension across the width of the sheet, and

selectively cutting and seaming the heat-set stitchbonded elastic nonwoven sheet in a flat trapezoidal or rectangular geometry with the first direction parallel to the waist direction of the undergarment being fabricated, to form the outer shell with the parallel rows of elastic strands being positioned in substantially the same direction throughout the shell.

5,468,321

APPARATUS AND METHOD FOR JOINING TWO WEBS TOGETHER

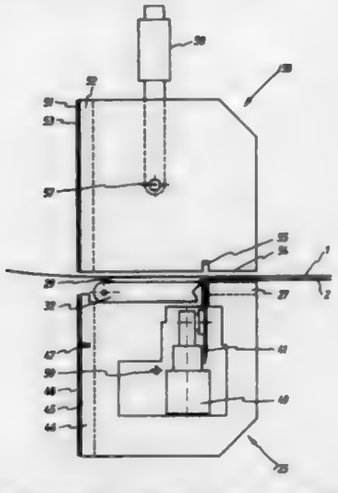
Martinus J. C. van Liempt, Arnhem, and Theodoor A. Buchmeyer, Eindhoven, both of, Netherlands, assignors to Stork Contiweb B.V., Netherlands

Filed Feb. 4, 1993, Ser. No. 21,129

Claims priority, application Netherlands, Feb. 4, 1992, 9200199

Int. Cl.[6] B65H *69/06;21/00*

U.S. Cl. 156—159 **24 Claims**



18. Method of joining an expiring web to a new web in such a way that, when they are joined, the webs lie in one plane, a part of the new web being brought into contact with the expiring web, both webs simultaneously being cut through along one cutting line, and a bonding strip being applied to at least one side of the webs for the purpose of joining the webs, the method comprising the steps of:

retaining the new web upstream of the cutting line, at least during cutting and application of the bonding strip, against a first contact surface,

prior to cutting, placing the new web downstream of the cutting line, at least in an area near the cutting line, at a distance from the expiring web,

positioning the expiring web downstream of the cutting line against a second contact surface, which lies on the same side of the expiring web as the first contact surface and in line with the first contact surface,

retaining the expiring web, at least during cutting and application of the bonding strip against the second contact surface,

cutting both the webs simultaneously along the cutting line,

removing the expiring web upstream of the cutting line, and

applying the bonding strip over those parts of the new and expiring webs which are located along the cutting line on the side of the webs opposite the first and second contact surfaces.

5,468,322

LOOP MACHIEN FOR HELICALLY WINDING STRIP

Stanley W. O. Menzel, Dry Creek, Australia, assignor to Rib Loc Australia Pty Ltd, Dry Creek, Australia

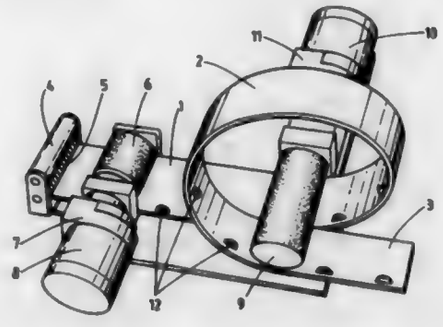
PCT No. PCT/AU92/00523, § 371 Date Mar. 29, 1994, § 102(e) Date Mar. 29, 1994, PCT Pub. No. WO93/06986, PCT Pub. Date Apr. 15, 1993

PCT Filed Sep. 30, 1992, Ser. No. 211,287

Claims priority, application Australia, Jan. 2, 1991, PK8686

Int. Cl.[6] B29C *53/00*

U.S. Cl. 156—195 **11 Claims**



1. An apparatus for helically winding tubes or pipes from tube forming plastic strip comprising:

a ring-shaped, rigid winding head formed from a length of metal band, having a free leading edge and a free trailing edge, each of said edges extending axially of the head, the inner surface of said head forming a spiral path extending between said leading and trailing edges and along which the strip is directed when the apparatus is in use, said free leading edge being spaced from said free trailing edge so as to form a circumferential gap which extends axially across the width of said head;

strip guide means to guide the strip to feed horizontally into the leading end of said path;

roller means arranged to drive the strip into and around said spiral path and for joining together adjacent edges of the strip when thus driven, said roller means comprising a pair of driven vertically spaced parallel elongate rollers extending axially of the head and respectively positioned above and below said circumferential gap and being coextensive therewith;

power means for driving said pair of rollers of said roller means;

arranged and constructed so that during operation of the apparatus, the tube forming strip is driven around said path in frictional engagement with said inner surface of the head to thereby form a cylindrical helix, the convolutions of which are joined along adjacent edges.

5,468,323

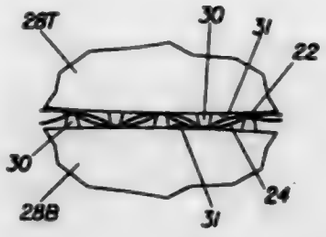
APPARATUS AND PROCESS FOR MAKING A DUAL PLY CELLULOSIC FIBROUS LAMINATE

Kevin B. McNeil, Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 898,041, Jun. 12, 1992, Pat. No. 5,294,475. This application Nov. 15, 1993, Ser. No. 151,670

Int. Cl.[6] B32B *31/08*

U.S. Cl. 156—209 **6 Claims**



4. A process for manufacturing a cellulosic fibrous structure having two laminae joined in face-to-face relationship, said process comprising the steps of:

providing two laminae to be joined in face-to-face relationship;

providing an apparatus having two pattern rolls, each with a periphery and radially oriented protuberances extending therefrom to distal ends, said pattern rolls juxtaposed in axially parallel relationship to form a first nip therebetween, said pattern rolls being adapted to receive a cellulosic fibrous structure interposed therebetween, the distal ends with a predetermined surface of the protuberances of each said pattern roll flushly contacting the periphery of the other said pattern roll along said entire predetermined surface of said distal end of said protuberance prior to interposing a cellulosic fibrous structure therebetween; and

forwarding said laminae through said nip defined by said pattern rolls so that both laminae are compacted between the distal ends of the protuberances of one said pattern roll and the periphery of the other said pattern roll, whereby each said lamina is joined to and contacts the other said lamina at a plurality of sites coincident with the distal ends of said protuberances.

5,468,324

SPIN-ON AND PEEL POLYMER FILM METHOD OF DATA RECORDING DUPLICATION AND MICRO-STRUCTURE FABRICATION

Gilbert H. Hong, 12820 Alta Tierra, Los Altos Hills, Calif. 94022

Filed Mar. 8, 1994, Ser. No. 207,878

Int. Cl.[6] B29C *41/00;* **B32B** *31/00*

U.S. Cl. 156—247 **10 Claims**

1. A method of manufacturing optical data storage disks from a master recording disk that has physical surface features which represent data, comprising the steps of:

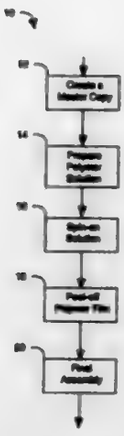
creating a first plurality of physical surface features that correspond to data onto a surface of a master recording disk;

preparing a liquid solution of polymers;

spinning-on said solution onto said master recording disk while rotating;

drying said solution on said master recording disk; and

peeling-off a polymer film formed from a drying of said solution on said master recording disk, wherein said peeled-off film has a second plurality of physical surface features duplicating said data embodied in said surface of the master recording disk.



5,468,325

PROCESS FOR APPLYING AN ADHESIVE BAND HAVING ONE ADHESIVE SIDE

Ulrich Eckelt, TE-Leeden, and Karl-Ernst Timmerbell, Ennepetal, both of, Germany, assignors to Windmöller & Hölscher, Lengerich, Germany

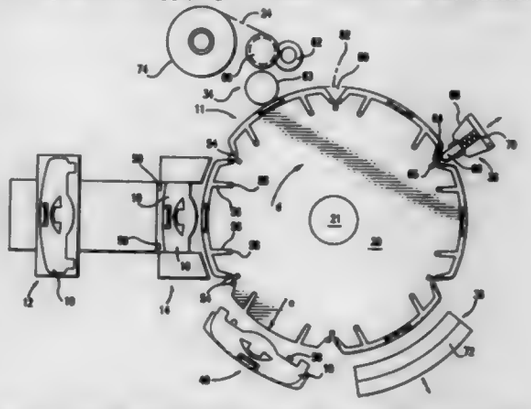
Filed Oct. 25, 1993, Ser. No. 140,823

Claims priority, application Germany, Jan. 26, 1992, 42 36 100.1; Feb. 5, 1993, 43 03 410.1

Int. Cl.[6] B32B *31/10;31/18*

U.S. Cl. 156—259 **1 Claim**

1. A process for applying an adhesive band with one adhesive side to a narrow rim of an elongated workpiece, particularly a coathanger of corrugated paper, comprising the following steps:



a) removing a plurality of workpieces (**10**) from a magazine (**12**),

b) sorting the workpieces (**10**) into corresponding compartments (**18**) of a compartmented disk carousel (**20**) that rotates on an axis (**22**),

c) cyclically rotating the compartmented disk carousel (**20**) forward, wherein the workpieces (**10**) placed in the compartments (**18**), which are positioned one on top Of the other, are transported to processing stations,

d) at another processing station, pressing an adhesive band strip, which has one adhesive side, onto the narrow rim (**11**) of each of the elongated workpieces (**10**), which project from the compartments (**18**) of the carousel.

e) at a further processing station, cutting the adhesive band strips and pressing them onto lateral profiles of the narrow rims (**11**),

f) at yet another processing station, folding and pressing the projecting edges (**26**) of the adhesive band strip against the workpieces, and

g) ejecting each processed workpiece **10**,

wherein an adhesive band (**24**) with one adhesive side is removed from a tape roll (**74**) and conducted over a shaft (**6**) and circular

knives (62) cut into the adhesive band (24), such that the adhesive band (24) is divided into a plurality of parallel adhesive band strips, the number of which corresponds to the number of the workpieces (10) positioned one above the other in the compartmented disk carousel (20).

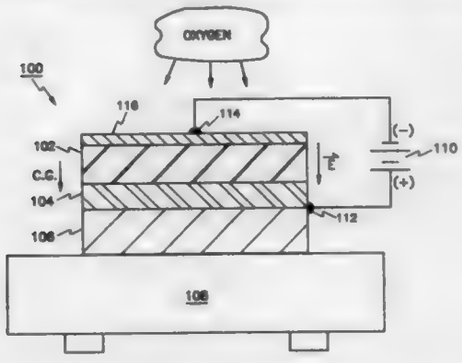
5,468,326

APPARATUS FOR POLISHING A DIAMOND OR CARBON NITRIDE FILM BY REACTION WITH OXYGEN TRANSPORTED TO THE FILM THROUGH A SUPERIONIC CONDUCTOR IN CONTACT WITH THE FILM

Jerome J. Cuomo, Lincolndale, N.Y., and Joseph E. Yehoda, Fogelsville, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 6,343, Jan. 19, 1993, Pat. No. 5,403,619.
This application Mar. 13, 1995, Ser. No. 402,824
Int. Cl.[5] B01J *15/00;19/08*
U.S. Cl. 156—345 **9 Claims**

1. An apparatus for polishing a diamond or a carbon nitride film



in an atmosphere having oxygen, comprising:

(a) a superionic conductor layer having a first surface in contact with the film to form an interface with said first surface; and

(b) means for contacting said superionic conductor layer with oxygen at a second surface thereof, wherein

said superionic conductor layer is capable of conducting the oxygen from the second surface to said interface for reaction with carbon in the film and thereby polishing the film.

5,468,327

METHOD AND DEVICE FOR CONTINUOUS FORMATION OF BRAID REINFORCED THERMOPLASTIC STRUCTURAL AND FLEXIBLE MEMBERS

Andrew Pawlowicz, Midland, Mich.; Craig Douglas, Lexington; Amad Tayebi, Westford, both of Mass., and Stephen Orroth, Windham, N.H., assignors to University of Massachusetts Lowell, Lowell, Mass.

Filed Jan. 24, 1994, Ser. No. 186,451
Int. Cl.[6] B29C *70/34;* **D04C** *3/00*
U.S. Cl. 156—393 **13 Claims**

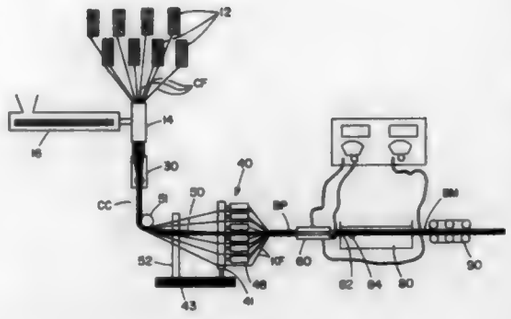
1. Apparatus for forming a braid reinforced thermoplastic member, the apparatus comprising:

a weaving mandrel

means for supporting the weaving mandrel such that the weaving mandrel is stationary;

a braiding device for weaving fibers coated with thermoplastic with second fibers onto the weaving mandrel to form a braided preform;

a heating die for melting the thermoplastic of the coated fibers of the braided preform to form a continuous matrix of thermoplastic between the coated fibers and the second fibers to produce the member; and



a cooling bath for receiving and cooling the member exiting from the heating die;

wherein the weaving mandrel extends through the heating die and into the cooling bath and includes:

a center bore of the weaving mandrel formed therein,

a fluid tube in the bore of the weaving mandrel for conveying a cooling fluid into the mandrel, and

a plug, sealing the center bore of the weaving mandrel, for restricting circulation of the cooling fluid from a portion of the mandrel within the heating die.

5,468,328

TIRE MOLDER SHOULDER BLADDER

Chun-Sik Kim; Young-Rok Yoon, and Seong-keun Kim, all of Kwangju, Rep. of Korea, assignors to Kumho & Co., Inc., Seoul, Rep. of Korea

Division of Ser. No. 897,130, Jun. 11, 1992, Pat. No. 5,324,375.
This application Jun. 24, 1994, Ser. No. 266,086
Claims priority, application Rep. of Korea, Jun. 11, 1991, 9599/1991; Jun. 27, 1991, 10808/1991
Int. Cl.[6] B29D *30/18*
U.S. Cl. 156—401 **2 Claims**

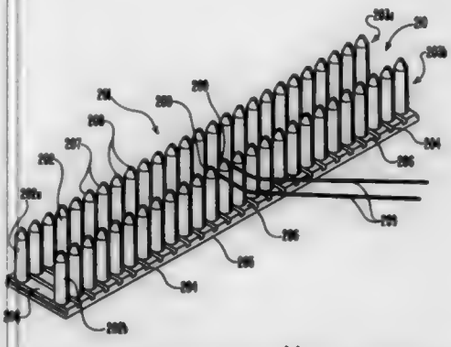
1. A shoulder bladder for use in manufacture of green tires comprising an inner-rubber member forming an inflatable portion of the bladder, the inner-rubber member being encased in body-ply and cover-rubber layers, the inner-rubber member, body-ply and cover-rubber layers extending longitudinally while the inner-rubber member is uninflated so that in proximity to a lower corner of the bladder while the rubber member is uninflated there are overlapping portions of opposite ends of the body-ply layer, one end of the cover-rubber layer being aligned with the end of the body-ply layer closest to the lower corner while the rubber member is uninflated, the other end of the cover-rubber layer being near an upper corner of the bladder while the rubber member is uninflated, the upper and lower corners being substantially aligned while the rubber member is uninflated, steel cord means fixedly mounted relative to and projecting away from the cover-rubber layer having a first edge close to the lower corner and approximately aligned with the aligned ends of the cover-rubber and body ply layers; and a cord-rubber composition (a) extending from and adhered to a bottom portion of the cover-rubber layer, (b) around and adhered to the steel cord means, (c) extending around both of said corners, and (d) extending along the body ply layer and ending next to the cover-rubber layer, the cord-rubber composition being adhered to the cover-rubber layer where the cord-rubber composition extends from the steel cord means to the top surface of the cover-rubber layer.

5,468,329

UNIVERSAL PIN STRIP AND RING FOR FILAMENT WINDING

Randall J. Philpot; Douglas G. Olsen; Sandra C. Ventrello; Eric R. Welsh, and Daniel K. Buckmiller, all of Salt Lake City, Utah, assignors to Advanced Composites, Inc., Salt Lake City, Utah

Filed Mar. 1, 1994, Ser. No. 204,076
Int. Cl.[6] B65H *81/00*
U.S. Cl. 156—429 **18 Claims**



1. A pin strip useful for securing filament in a stationary position with respect to a mandrel during a filament winding process, the pin strip comprising:

(a) an elongate backing strip having a proximal side and a distal side, the distal side of said backing strip being adapted to contact a mandrel on which the pin strip may be installed,

(b) a plurality of anchor pins arranged on the proximal side of said backing strip, said anchor pins being adapted to secure filament with respect to a mandrel on which the pin strip may be installed,

(c) a plurality of guide pins arranged on the proximal side of said backing strip, said guide pins being adapted to cause filament secured by one of said anchor pins to conform to the contour of a mandrel on which the pin strip may be installed, and

(d) a plurality of reinforcing ribs on the proximal side of said backing strip, said reinforcing ribs being adapted to reinforce the pin strip against forces placed on it by filament when the pin strip is used to secure filament during a filament winding process;

wherein the pin strip has a longitudinal axis;

wherein the dimensional measurement of the pin strip along said longitudinal axis exceeds the dimensional measurement of the pin strip orthogonal to said longitudinal axis;

wherein said anchor pins are arranged in a first row; and

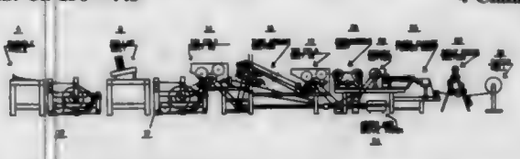
wherein said guide pins are arranged in a second row, said second row being generally parallel to said first row.

5,468,330

APPARATUS FOR MANUFACTURING A DISPOSABLE VACUUM CLEANER BAG

Michael D. Ryan, P.O. Box 1686, and Lowell H. Ryan, P.O. Box 823, both of Mattituck, N.Y. 11952

Filed Jul. 1, 1994, Ser. No. 270,122
Int. Cl.[6] B01D *46/02*; B32B *31/10*
U.S. Cl. 156—443 **4 Claims**



1. A vacuum cleaner bag manufacturing apparatus comprising:

a) a shingle table upon which stacks finished vacuum cleaner bags which are received from a collar section;

b) at least one collar section which automatically locates and glues collars onto processed vacuum cleaner bags and receives processed vacuum cleaner bag material from a conveyor;

c) at least one conveyor which receives processed vacuum cleaner bag material from a second tri-fold section;

d) a first tri-fold section which folds and seals one end and receives processed vacuum cleaner bag material from a forwarding section;

e) a second tri-fold section which folds and seals opposite ends and receives processed vacuum cleaner bag material from a turn around section;

f) a turn around section which turns bag over end to end so that opposite ends may be folded and sealed and receives processed vacuum cleaner bag material from said first tri-fold section;

g) a forwarding section moves cut bag lengths from a rotary cutter to said first tri-fold section;

h) a rotary cutter cuts vacuum cleaner material bag material which is received from a quick change former section and moves cut bag material to said forwarding section;

i) at least one motor and drive train which powers said vacuum cleaner bag manufacturing apparatus;

j) a quick change former section utilizing quick change rotary wheels which receives processed vacuum cleaner bag material from a print press section;

k) a print press section which receives vacuum cleaner bag material from a paper roller and feeds said vacuum cleaner bag material to said quick change former section after printing on said material; and

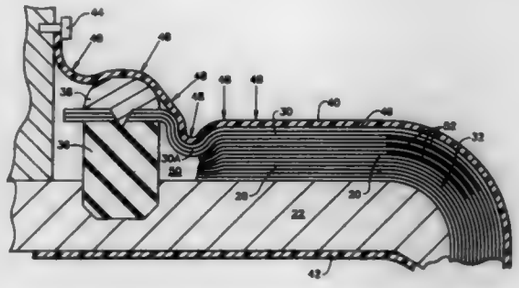
l) a paper roller which feeds vacuum cleaner bag material to said print press section.

5,468,331

APPARATUS FOR MAKING A BONDED LAMINATED ARTICLE BEND PORTION

Peter Makarenko; Stacy E. Harris, both of Albuquerque, and Robert R. Martin, Tijeras, all of N.M., assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 73,395, Jun. 8, 1993, Pat. No. 5,348,602.
This application May 2, 1994, Ser. No. 236,818
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—494 **4 Claims**



1. Apparatus for making a bonded laminated article bend portion defined by a plurality of superimposed layers disposed about and extending beyond a bend in the article, the bend portion including a radially outer portion defined by at least one of the superimposed layers, and a radially inner portion, the apparatus comprising:

a rigid bend portion support shaped to carry the inner portion of a preform of the bend;

holding means to secure the preform of the bend portion to the support; and,

force means to apply force to the radially outer portion of the layers, at a first area away from the bend, to generate tension in the outer portion of the preform in a direction away from the bend.

5,468,332

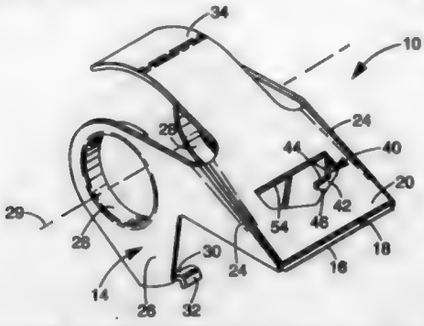
TAPE DISPENSER

Philip C. Dretzka; Tighe M. Belden; Eugene N. Reshanov, all of Minneapolis, and Bruce E. Samuelson, West Lakeland, all of Minn., assignors to Minnesota Mining And Manufacturing Company, St. Paul, Minn.

Filed Sep. 29, 1993, Ser. No. 129,422

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—527 **24 Claims**



8. A tape dispenser for a roll of tape including a supply length of the tape wound around a core, which core has opposite ends and a through opening defined by a cylindrical inner surface between the ends, said dispenser comprising means for defining a cutting edge adapted to transversely cut the tape, and a frame of a polymeric material, said frame comprising:

a cutter support portion having said means for defining a cutting edge along one end and having spaced side edges disposed at about right angles with respect to said cutting edge;

opposite side wall portions attached along said opposite side edges of the cutter support portion and having opposed adjacent inner surfaces; at least one hub portion projecting from one of said side wall portions, said hub portion having a peripheral surface adapted to support the cylindrical inner surface of the core for rotation about an axis generally parallel to said tape cutting edge, and being adapted to project into the opening in the core from one end of the core to support the roll of tape for rotation about the hub portion; and

opposed spaced locating tab portions projecting toward each other from the side wall portions at a distance from said axis that is significantly less than the distance between said cutting edge and said axis, said locating tab portions having retaining surfaces adjacent the cutter support portion That are spaced from the support portion so that a first plane passing through the axis of the hub portions and the cutting edge is disposed at an angle of at least 12 degrees with respect to a second plane that passes through the axis of the hub portions and is tangent to the retaining surfaces of the locating tab portions, said locating tab portions having opposed cam surfaces extending from the side wall portions to the adjacent inner ends of the locating tab portions on the sides of said locating tab portions opposite said retaining surfaces, said dispenser having unobstructed space adjacent the retaining surfaces between said first plane and said second plane, parts of the cam surfaces along the lengths of the cam surfaces being disposed at cam angles of greater than about 45 degrees with respect to the surfaces adjacent the cutter support portion of imaginary planes passing through said axis of the hub portion and said parts of the cam surfaces when the measurements of said cam angles are taken in planes normal to the surfaces of the imaginary planes;

said cam surfaces causing tape being pulled from the roll of tape on the hub portions on the side of said locating tab portions opposite said retaining surfaces to be guided between and around said tab portions when relative movement is caused between said dispenser and said tape being withdrawn to bring said cutting edge into engagement to transversely cut the tape, and said retaining surfaces affording releasable adhesion thereto by a newly cut end portion of the tape to retain that end portion of the tape in a position projecting from the roll at which it may easily be manually engaged to afford withdrawing another length of tape from the roll.

5,468,333

APPARATUS FOR SEALING FILM WEBS OF A THERMOPLASTIC SYNTHETIC MATERIAL

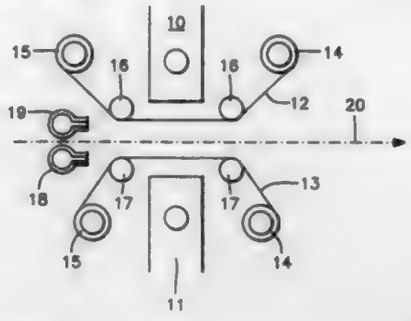
Friedhelm Mundus, Lengerich, and Hans-Ludwig Voss, Tecklenburg, both of, Germany, assignors to Windmoeller & Hoelscher, Lengerich, Germany

Filed Apr. 20, 1993, Ser. No. 48,241

Claims priority, application Germany, Apr. 22, 1992, 9205480 U

Int. Cl.[6] B32B *31/20*

U.S. Cl. 156—537 **12 Claims**



7. A device for sealing superposed sheets of thermoplastic plastic material, said device comprising:

two heatable sealing members movable toward and away from each other,

two separating foils, each of said two separating foils being located on a front surface of a different one of said two heatable sealing members when said two sealing members are in a welding position,

means for moving said two separating foils away from said two heatable sealing members when said heatable sealing members are moved apart so that said separating foils and said heatable sealing members are moved into a position in which a first insulating air cushion is formed between each separating foil and each heatable sealing member and a second insulating air cushion is formed between each of said separating foils and the sheets of thermoplastic material for the protection of the sheets from heat radiated by said two heatable sealing members, and

rows of air-blast nozzles located to blow air into said second insulating air cushion in a direction parallel to a conveyance direction of the sheets.

5,468,334

FRICTION WELDING

John G. Searle, Cannock, England, assignor to Rolls-Royce plc, London, England

Filed May 13, 1994, Ser. No. 242,342

Claims priority, application United Kingdom, May 13, 1993, 9309864

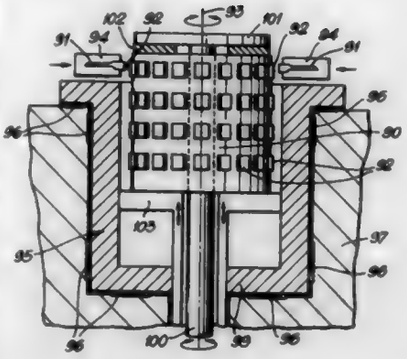
Int. Cl.[6] B23K *20/12*

U.S. Cl. 156—580 **15 Claims**

1. A workpiece holder for holding a workpiece having first and second opposed ends and an outer surface during a friction welding operation, comprising:

a first clamp member adapted to engage the first end of the workpiece,

a second clamp member adapted to engage the second end of the workpiece, the first and second clamp members being movable towards each other to engage the first and second ends of the workpiece, the second clamp member comprising a drum-like structure defining a chamber or recess into which the workpiece is partially received in use, the second clamp member being adapted to support the workpiece at a height within the chamber such that a location on the workpiece at which the friction welding operation joins a radially disposed component to the workpiece is a portion of the outer surface of the workpiece, and



clamp force means for urging the first and second clamp members to frictionally engage the workpiece with a force substantially greater than a weld pressure and a weld reciprocatory friction force acting on the radially disposed component and the workpiece.

5,468,335

APPARATUS FOR PRODUCING CARPETED PANELS

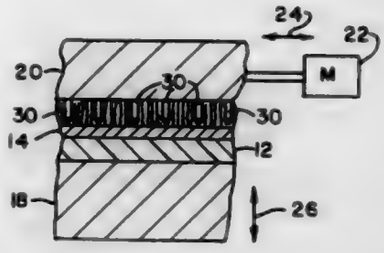
Sylvio J. Mainolfi, Watertown; Gerald F. Patry, Brookfield, and Henry A. Pensiero, Stamford, all of Conn., assignors to Branson Ultrasonics Corporation, Danbury, Conn.

Continuation of Ser. No. 666,006, Mar. 7, 1991, abandoned, which is a division of Ser. No. 539,198, May 11, 1990, Pat. No. 5,026,445. This application Feb. 27, 1992, Ser. No. 842,736

Int. Cl.[6] B29C *65/00*

U.S. Cl. 156—580.2 **5 Claims**

1. Apparatus for vibrationally welding carpet panels, said carpet



panels comprising a thermoplastic substrate and a carpet having thermoplastic fibers extending out from one side thereof, said apparatus comprising:

a pair of platens movable between an open position in which said substrate and said carpet may be positioned on said platens in superposed position for welding and removed from said platens after welding and a closed position in which said platens provide forced engagement between said carpet and said substrate;

one of said platens having a plurality of closely spaced elongate pins extending therefrom, each of said pins having a length much greater than its width and being of sufficient length that said pins penetrate through said fibers and apply pressure between said carpet and said substrate, said pins in at least certain areas of said carpet being spaced substantially equally from each other and having a density of from nine to eighty-one pins per square inch; and

drive means for vibrating at least one of said platens relative to the other platen while the platens are in their closed positions applying pressure between said carpet and said substrate via said pins thereby to effect vibrational welding of said carpet to said substrate substantially without impairing the cosmetic appearance of said carpet.

5,468,336

FLEXURAL SPRING SUPPORT FOR VIBRATORY APPARATUS

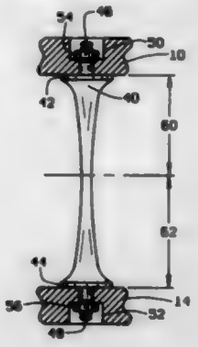
Wilfried Lotz, Neuberg, Germany, and Donald C. Lovett, Rochester, N.Y., assignors to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Sep. 6, 1994, Ser. No. 301,123

Int. Cl.[6] B29C *65/06*

U.S. Cl. 156—580.2 **8 Claims**

1. A flexural spring support for a vibratory apparatus compris-



ing:

a first member adapted to be coupled to a stationary frame;

a second member disposed opposite and spaced from said first member and intended to undergo translating motion in a plane responsive to motive means acting upon said second member;

a plurality of elongated, spaced flexural springs coupling said first member to said second member;

each of said flexural springs including a flange at either end, the underside of each flange resting upon the surface of a respective one of said members;

fastening means disposed for causing the underside of each flange to be in forced engagement with the respective member surface, and

said forced engagement being of such magnitude as to substantially inhibit relative motion between a respective flange and associated member surface responsive to translating motion of said second member.

5,468,337

METHOD OF MENDING A DEFECT IN A PHASE SHIFT PATTERN

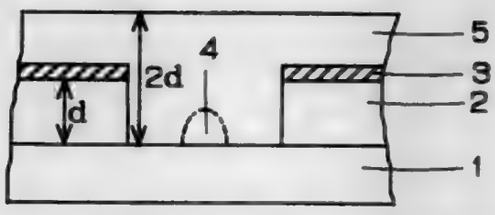
Hiroshi Miyatake, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1993, Ser. No. 43,523

Claims priority, application Japan, Jun. 2, 1992, 4-141248

Int. Cl.[6] B44C *1/22*

U.S. Cl. 216—24 **13 Claims**



1. A method of mending a black defect area in a mask which has a phase shifter formed on a mask substrate in the shape of a pattern, said black defect area being made of said phase shifter and located in said phase shift pattern where it is not supposed to be, comprising the steps of: permanently forming a mending phase shifter on an around-black-defect which includes said black defect area to a thickness causing light passing therethrough to be phase shifted(±10°) by an integer multiple of 360° and eliminating an adverse optical effect of said black defect area, said mending phase

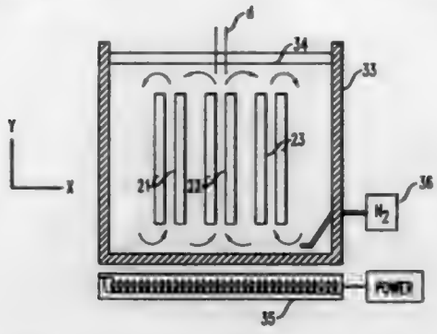
shifter being made of material which has the same refractive index as that of said phase shifter.

5,468,338

METHODS FOR SELECTIVELY WET ETCHING SUBSTRATES

Muhammed A. Shahid, Ewing Township, Mercer County, N.J., assignor to AT&T IPM Corp., Coral Gables, Fla.

Filed Jul. 22, 1994, Ser. No. 279,146
Int. Cl.[6] B05D *5/00*
U.S. Cl. 216—90 **18 Claims**



1. A method for selectively etching a first surface of each of a plurality of wafers comprising the steps of: masking the entirety of each wafer except certain exposed portions of each first surface to be selectively etched; immersing the wafers in a heated etch bath for a sufficient time to etch a distance into each exposed portion; the bath being contained by a vessel having bottom and side surfaces; removing the wafers; the invention being characterized in that:

the wafers are arranged in the etch bath, with the first surface of each wafer facing a surface of another wafer;

the first surfaces of all the wafers are substantially parallel and are all substantially transverse to a bottom surface of the vessel;

the bottom surface of the vessel is externally heated to make in the etch bath a temperature gradient that is at a maximum at the bottom surface of the vessel and a minimum at a top surface of the bath;

said temperature gradient being sufficient to thermally induce along each wafer first surface etch bath currents that are directed vertically upwardly;

the first surface of each wafer being sufficiently close to a surface of another wafer surface to accelerate the vertical upward flow of etch bath currents by capillary action.

5,468,339

PLASMA ETCH PROCESS

Subhash Gupta, San Jose, and Susan H. Chen, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 9, 1992, Ser. No. 960,499
Int. Cl.[6] H01L *21/00*
U.S. Cl. 216—67 **12 Claims**

1. In a method for plasma etching a SiO_x material comprising

(a) establishing a plasma in a vacuum container in a confined region between two closely displaced planar electrodes by providing a flow of reactive gases to said confined region and RF power at a frequency on the order of 400 KHz across said electrodes,

(b) fastening said SiO_x material to be etched to one of said electrodes,

The Improvement Comprising,

1. said reaction gases including CHF_3,

2. cooling said plasma by inelastic collisions, and

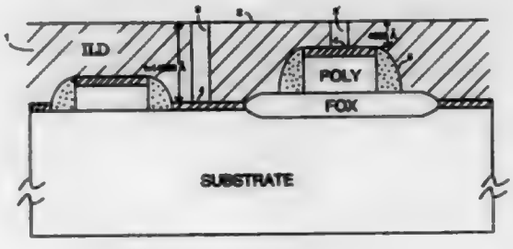
3. selecting the said flow of gases to obtain a total chamber pressure, p, where 10.0 Torr>p>1.5 Torr wherein said step of cooling includes causing a high volume flow rate of light mass gas to be included in said reaction gases, which flow rate of said light mass gas is approximately 50–100 times greater than the flow rate of CHF_3, wherein said light mass gas comprises Helium.

5,468,340

HIGHLY SELECTIVE HIGH ASPECT RATIO OXIDE ETCH METHOD AND PRODUCTS MADE BY THE PROCESS

Subhash Gupta, 1578 Meadow Ridge Cir., San Jose, Calif. 95131; Susan Chen, 1468 Mallard Way, Sunnyvale, Calif. 94087, and Angela Hui, 2139 Devon Pl., Milpitas, Calif. 95035

Continuation-in-part of Ser. No. 960,499, Oct. 9, 1992. This application Nov. 30, 1993, Ser. No. 159,634
Int. Cl.[6] H01L *21/00*; H05H *1/00*
U.S. Cl. 216—67 **8 Claims**



1. In a method for plasma etching high aspect ratio holes or openings into a wafer substrate having a silicon compound (SiO_x) layer thereon, said wafer also having a metal silicide (MSi_x) layer underlying said SiO_x layer and an overlying lithographically developed etch mask layer having covered and uncovered regions, where the steps include:

(a) installing said wafer in an etching reactor vacuum container having a pair of electrodes;

(b) compressing the surface of said substrate opposite from the surface having said SiO_x layer to be etched to one of said electrodes;

(c) establishing a plasma in said vacuum container at a total pressures Pr greater than 1500 millitorr in a confined region between said two electrodes, said electrodes being displaced by gap distance less than 1.5 cm and providing (1) a flow of reaction gases consisting of CHF_3 and N_2 and He to said confined region and (2) RF power P at a frequency on the order of 400 KHz across said electrodes;

(d) cooling said plasma by inelastic collisions by causing a high flow rate of said He gas in relation to the flow rates of the remaining said reaction gases;

(e) adjusting the distance D, power P and a total pressure Pr and the flow rates of said N_2, CHF_3 and He to obtain a high selectivity etch rate of said silicon compound as compared to the etch rate of said metal silicide;

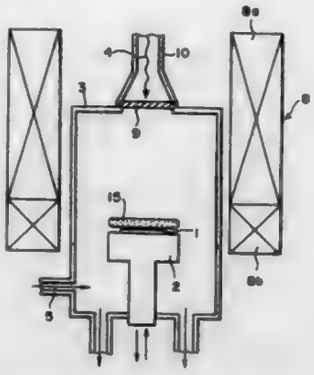
(f) discontinuing said etching of said wafer when all uncovered regions of said developed etch pattern mask have been etched down to said underlying metal silicide layer;

wherein flow rates of $He/CHF_3/N_2$ are substantially in the ratio 2300/60/20 whereby the etch rate of said SiO_x is very much faster than the etch rate of said metal silicide.

5,468,341
PLASMA-ETCHING METHOD AND APPARATUS THEREFOR

Seiji Samukawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 28, 1994, Ser. No. 219,177
Claims priority, application Japan, Dec. 28, 1993, 5-334488
Int. Cl.[6] H05H *1/00*
U.S. Cl. 216—69 5 Claims



1. A plasma-etching method for etching a surface of an object by directing reaction gas plasmas excited by high frequency electric fields to impinge on the object thereby to impact nonmasked regions of the surface of the object, the method comprising the steps of:

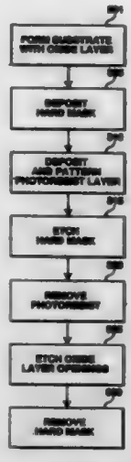
pulse-modulating said high frequency electric fields by a signal of a frequency higher than 10 kHz; and

introducing said pulse-modulated high frequency electric fields into a plasma generation chamber to produce said reaction gas plasmas.

5,468,342
METHOD OF ETCHING AN OXIDE LAYER

James E. Nulty, and Pamela S. Trammel, both of San Jose, Calif., assignors to Cypress Semiconductor Corp., San Jose, Calif.

Filed Apr. 28, 1994, Ser. No. 234,478
Int. Cl.[6] H01L *21/306;* C03C *15/00;* B44C *1/22*
U.S. Cl. 156—643.1 63 Claims



1. A method of etching an oxide layer comprising the steps of:

providing a substrate having said oxide layer thereon;

depositing a hard mask layer on said oxide layer, wherein said hard mask layer comprises a material selected from the group consisting of silicon nitride, polysilicon, aluminum, a refractory metal, and a refractory metal silicide;

forming a patterning layer on said hard mask layer;

forming a patterning layer opening in said patterning layer to form a hard mask layer exposed region;

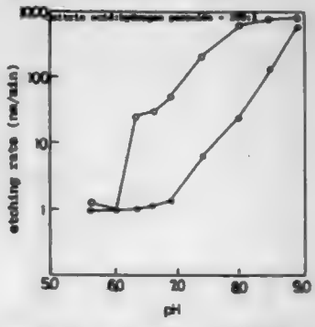
forming a hard mask layer opening in said hard mask layer exposed region to form an oxide layer exposed region; and,

forming an oxide layer opening in said oxide layer exposed region by exposing said oxide layer exposed region to a plasma.

5,468,343
ETCHING SOLUTION AND ETCHING METHOD FOR SEMICONDUCTORS AND METHOD FOR EVALUATING GAAS SURFACE

Toshiaki Kitano, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1994, Ser. No. 214,765
Claims priority, application Japan, Mar. 19, 1993, 5-059758; Mar. 9, 1994, 6-038028
Int. Cl.[6] H01L *21/00;* C09K *13/00*
U.S. Cl. 156—656.1 6 Claims

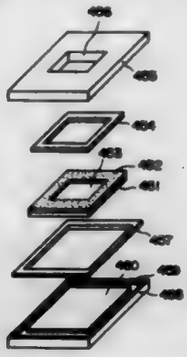


1. An etching method for etching an InGaAs layer selectively with respect to an InAlAs layer comprising etching with a solution comprising a mixture of an organic acid and hydrogen peroxide, and a base in sufficient quantity so that the solution has a pH of 5.15 to 5.3.

5,468,344
METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICES

Shunsuke Inoue, Yokohama; Junichi Hoshi, Hadano, and Takanori Watanabe, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1994, Ser. No. 186,541
Claims priority, application Japan, Jan. 29, 1993, 5-032442
Int. Cl.[6] H01L *21/306;* B44C *1/22;* C03C *15/00*
U.S. Cl. 156—657.1 8 Claims



1. A process for etching a member for use in a semiconductor device comprising:

placing the member to be etched in a holding means placed in contact with the peripheries of said member, so that a small clearance between the member and the holding means is

created; said holding means and member together with a sealing member facing said member defining a substantially sealed space; providing a gas into said sealed spaces at a pressure sufficient to force gas through the clearance between the member and the holding means; and injecting an etching agent against the opposite side face of the member which is not blasted with said gas to etch the member.

5,468,345

METHOD OF MAKING A HIGH-DEFINITION PRINTED CIRCUIT

Ronald K. Kirby, and James W. Watson, both of 11060 NW. 28th St., Coral Springs, Fla. 33065

Filed May 4, 1994, Ser. No. 237,835

Int. Cl.[6] B44C *1/22;* **C23F** *1/02*

U.S. Cl. 216—51 **4 Claims**

1. A method of making a printed circuit board on a substrate strip, which consists of the major steps of:

preparing said substrate;

sputtering a ¼ micron base metal coating of copper onto at least one side of said substrate;

applying a photoresist to said copper coating;

exposing said photoresist in a pattern, developing said photoresist to remove the unexposed portions of said substrate and consequently to bare the sputtered copper coating therebeneath;

copper pattern plating a ½ mil layer of copper onto the bared portions of the sputtered coating of copper;

pattern plating a ½ mil layer of tin-lead onto said ½ rail copper later, said tin-lead layer acting as an etch resistant mask;

stripping the photoresist;

etching to remove the sputtered ¼ micron copper coating in those regions where the photoresist has been stripped;

stripping the tin-lead layer; and

cutting said strip to the desired board size.

5,468,346

GLASS TREATMENT

Robert S. Bruce, West Midlands, and Christopher W. G. Hall, Worcestershire, both of, United Kingdom, assignors to Pilkington Aerospace Limited, England

Filed Mar. 24, 1994, Ser. No. 217,097

Claims priority, application United Kingdom, Mar. 27, 1993, 9306444

Int. Cl.[6] C03C *15/00;27/12*

U.S. Cl. 216—34 **19 Claims**

1. A method of treating a glass ply having a chemically strengthened surface to produce a treated strengthened glass component for subsequent assembly into a laminated glazing which method comprises encapsulating the glass ply with each of its major faces and its edge faces protected by an adjacent layer of thermoplastic material with hot melting of the thermoplastic material onto such strengthened glass surface prior to incorporation of the glass ply into the required laminated glazing.

5,468,347

METHOD FOR SEPARATING BORIC ACID

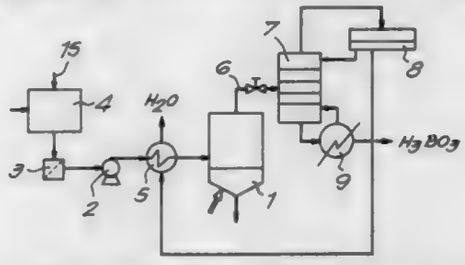
Aimé Bruggeman, Retie, and Johan Braet, Nazareth, both of, Belgium, assignors to Studiecentrum Voor Kernenergie, Brussels, Belgium

Filed Jun. 16, 1994, Ser. No. 260,786

Claims priority, application Belgium, Jun. 16, 1993, 9300608

Int. Cl.[6] B01D *1/00;3/38;* **G21F** *9/08*

U.S. Cl. 159—47.3 **12 Claims**



1. A method for removing boric acid from an aqueous boric acid solution which comprises introducing an aqueous boric acid solution into an evaporator wherein said temperature in the evaporator is more than 100° C. and the pressure in the evaporator is above atmospheric pressure; said solution having a substantially neutral or acidic pH; evaporating said boric acid from said solution by contacting said solution with stem whereby said stem becomes enriched with boric acid and the boric acid content of said solution is reduced so as to produce a boric acid depleted solution; removing said boric acid enriched steam from the evaporator and removing said boric acid depleted solution from the evaporator.

5,468,348

MULTI-PLY WEB FORMER AND METHOD

James Blackledge, Leyland, England; Nazzareno Salvai, Turin, Italy, and James A. Turner, Wigan, England, assignors to Beloit Technologies, Inc., Wilmington, Del.

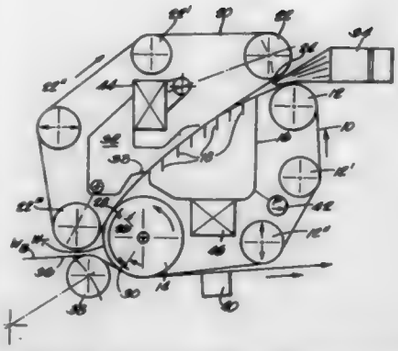
Continuation of Ser. No. 960,378, Jan. 4, 1993, abandoned. This application Sep. 14, 1994, Ser. No. 306,844

Claims priority, application European Pat. Off., Jul. 10, 1990, 90113178

Int. Cl.[6] D21F *11/04*

U.S. Cl. 162—132 **2 Claims**

1. A method for forming a multi-ply web, comprising the steps:



forming a base ply web on a traveling foraminous base forming wire;

bringing first and second looped forming wires into co-running engagement in a forming zone extending between a guide roll and a turning roll disposed within the first looped forming wire wherein the overall, substantially continuous contour of the forming zone has the first forming wire having an inner surface curved concave downwardly, and the second forming wire having an inner surface curved convex upwardly path of travel;

projecting an aqueous top ply stock stream onto one or the other, or both, of the first and second looped forming wires and into a throat formed by the converging first and second forming wires;

dewatering the top ply stock stream through the first forming wire by applying sub-atmospheric air pressure to the stock stream solely beneath its concave downwardly path of travel to thereby form a lower web surface of a top ply web;

expressing water upwardly through the second forming wire over its path of travel solely by wire tension and centrifugal force to thereby form an upper web surface of the top ply web;

collecting the water expressed through the second forming wire within the second forming wire at one or more locations above the convex upwardly curved inner surface of the second forming wire;

bringing the upper web surface of the top ply web into co-running engagement with the base ply web to effect ply-bonding therewith to form a multi-ply web.

5,468,349

PAPER MACHINE WIRE AND PRESSING SECTIONS WITH IMPERVIOUS PRESSING BELT

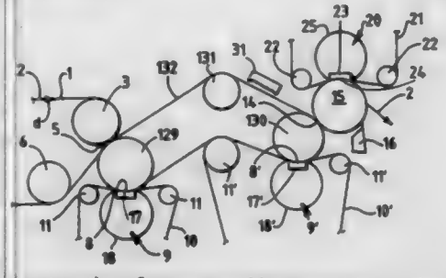
Christian Schiel, Heidenheim, Germany, assignor to J. M. Voith GmbH, Heidenheim, Germany

Filed Jun. 17, 1994, Ser. No. 261,831

Claims priority, application Germany, Jun. 26, 1993, 43 21 406.1

Int. Cl.[6] D21F *3/04*

U.S. Cl. 162—358.3 **5 Claims**



1. In a wet portion of a paper machine comprising a wire section and a pressing section, a plurality of roll presses in said pressing section, each roll press comprising two rolls defining a press nip, and a water impervious belt having a smooth closed surface, said belt being disposed in a continuous loop about at least first and second press rolls disposed consecutively with respect to a direction of conveyance of a paper web through the machine,

each said press roll being coupled with a counter element defining first and second respective press nips of the pressing section, said counter element selected from the group consisting of shoe units and counter rolls, and wherein said belt deflects at least about 90° about at least one of the first and second press rolls,

the improvement wherein the belt is disposed immediately downstream of the wire section with respect to the direction of conveyance of a paper web through the machine and arranged so that the belt directly removes a paper web from the wire section and further comprising means for guiding the belt about the first and second press rolls in such a way that the belt deflects at least about 180° about each of the press rolls.

5,468,350

APPARATUS FOR MANUFACTURING ULTRAPURE WATER

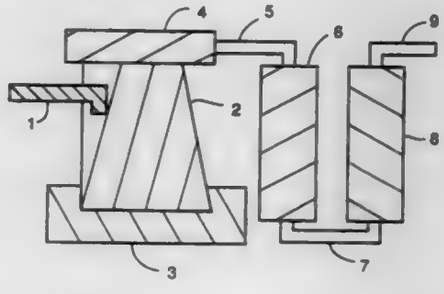
Cozy Ban, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1993, Ser. No. 91,580

Claims priority, application Japan, Jan. 21, 1992, 4-282703

Int. Cl.[6] C02F *1/04;1/32*

U.S. Cl. 202—176 **6 Claims**



1. An apparatus for manufacturing ultrapure water, comprising:

a container for accommodating water to be treated and evaporating the water to be treated;

water to be treated supplying means attached to said container for supplying the water to be treated into the container;

heating means for heating said water to be treated in said container and evaporating the water to be treated;

cooling means for cooling vapor of said water to be treated evaporated from the inside of said container and changing the vapor into distilled water;

means for conveying said distilled water from said cooling means directly to an ultraviolet irradiator;

ultraviolet light irradiation means associated with said ultraviolet irradiator for irradiating said distilled water with ultraviolet light, thereby decomposing an organic impurity contained in the distilled water; and

means for removing organic decomposed substances contained in said distilled water irradiated with the ultraviolet light.

5,468,351

APPARATUS FOR RECOVERING FRESH WATER AND APPARATUS FOR CONCENTRATING LIQUID

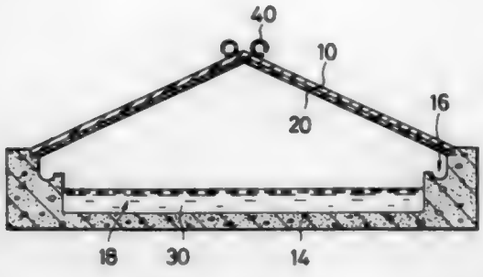
Toshizumi Hirota, Hiratsuka; Hitoshi Kobayashi, Tokyo; Yasunobu Nakagoshi, Kobe, and Yukio Amino, Tokyo, all of, Japan, assignors to Mitsubishi Corporation; Mitsubishi Gas Chemical Company, Inc., both of Tokyo, and Nihon Polytech Co., Ltd., Hyogo, all of, Japan

Filed Feb. 7, 1994, Ser. No. 192,608

Claims priority, application Japan, Feb. 26, 1993, 5-061461

Int. Cl.[6] B01D *3/00*; C02F *1/14*

U.S. Cl. 202—234 10 Claims



1. An apparatus for distilling liquid, comprising:

a structure comprising a roof member having a gradient, an inner surface and a lower end portion, and a base member, said roof member being positioned over said base member and having cross-section having a form selected from the group consisting of a corrugated form and a repeated angular concavoconvex form;

a liquid reservoir member provided on said base member for storing liquid to be distilled by solar energy transmitted through said roof member;

means for preventing condensed liquid on the inner surface of the roof member from dropping down from the roof member and for improving the transmission of sunlight through the roof member comprising a cellulose-based film having one surface from which said film is saponifed to a 2 to 50 μm depth and another surface which is attached to said inner surface of said roof member; and

a liquid recovery member positioned in one of two positions, said first position being in said roof member and said second position being on said base member adjacent to said lower end portion of said roof member, for recovering distilled liquid that is condensed on said saponified surface of said cellulose-based film.

5. An apparatus for distilling liquid, comprising:

a structure comprising a roof member having a gradient and an inner surface, a base member, and a wall member, said roof member having a cross-section having a form selected from the group consisting of a corrugated form and a repeated angular concavoconvex form, and said wall member supporting said roof member over said base member;

a liquid reservoir member provided on said base member for storing liquid to be distilled by solar energy transmitted through said roof member;

means for preventing condensed liquid on the inner surface of the roof member from dropping down from the roof merit and for improving the transmission of sunlight through the roof member comprising a cellulose-based film having one surface from which said film is saponified to a 2 to 50 μm depth and another surface which is attached to at least said inner surface of said roof member; and

a liquid recovery member positioned in one of three positions, said first position being in said roof member, said second position being in said wall member and said third position being on said base member, for recovering distilled liquid that is condensed on said saponified surface of said cellulose-based film.

5,468,352

PROCESS FOR PREPARING PERFLUOROPOLYETHERS

Gerhard Jäger, Heideweg, and Hans Millauer, An den, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 78,564, Jun. 17, 1993, abandoned.

This application Feb. 14, 1995, Ser. No. 389,062

Claims priority, application Germany, Jul. 1, 1992, 42 21 555.2

Int. Cl.[6] C25B *3/08*

U.S. Cl. 204—59 F 8 Claims

1. A process for preparing perfluoropolyethers of the formula

$$CF_3-CF_2-(CF_2-O-\underset{\displaystyle CF_3}{\underset{|}{CF}})_x-(\underset{\displaystyle CF_3}{\underset{|}{CF}}-O-CF_2)_y-CF_2-CF_3$$

in which x and y are an integer from 1 to 4, by electrolytic decarboxylation of perfluorocarboxylic acid of the formula

$$CF_3-CF_2-(CF_2-O-\underset{\displaystyle CF_3}{\underset{|}{CF}})_x-COOH$$

in which x is an integer from 1 to 4, which comprises carrying out the electrolytic decarboxylation at temperatures from −10° to 90° C. in an aqueous electrolyte fluid consisting essentially of from 1 to 50% by weight of aliphatic nitrile having an alkyl radical of from 1 to 6 carbon atoms and from 20 to 50% by weight of perfluorocarboxylic acid, and wherein during the electrolytic decarboxylation, more perfluorocarboxylic acid is metered in proportional to the extent to which it is consumed by the process of electrolytic decarboxylation.

5,468,353

MIST SUPPRESSANT FOR SOLVENT EXTRACTION METAL ELECTROWINNING

Ann T. Anich, St. Paul, and Michael J. Sierakowski, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 5, 1994, Ser. No. 238,311

Int. Cl.[6] C25C *1/12*

U.S. Cl. 204—105 R 7 Claims

1. A method for recovery of metal values comprising the steps of (A) leaching metal ore with an aqueous acidic solution to produce an aqueous acidic solution containing metal values, (B) liquid-liquid solvent extraction of said metal values from said aqueous acidic solution containing metal values to produce an organic solvent solution containing metal values, (C) stripping of said metal values from said organic solvent solution containing metal values into an acidic aqueous electrolyte containing strong acid to produce an electrolyte solution containing metal values, (D) electrowinning of said metal values from said electrolyte containing metal values in an electrolytic cell, said cell comprising one or more insoluble anodes and a metallic cathode, and (E) recycling said electrolyte after step (D) for re-use in step (C) wherein the improvement comprises electrowinning said metal values from electrolyte containing sufficient fluoroaliphatic surfactant to inhibit the formation of acidic mist above said electrolyte, wherein said surfactant is soluble in said electrolyte, is not significantly extracted into said organic solvent solution, does not interfere with the solvent extraction step, and does not form a foam blanket on the surface of said electrolyte during said electrowinning step.

5,468,354

PROCESS FOR HEAVY METAL ELECTROWINNING

Gianni Zoppi, Dino di Sonvico, Switzerland, assignor to Ecochem Aktiengesellschaft, Triesen, Liechtenstein

Filed May 2, 1994, Ser. No. 235,914

Claims priority, application Switzerland, May 3, 1993, 01352/93

Int. Cl.[6] C25C *1/08;1/16*

U.S. Cl. 204—213 3 Claims

1. A process for electrowinning a metal from a complex thereof in an aqueous solution, comprising:

(a) providing a water-soluble chloro-ammino complex of a metal selected from the group consisting of zinc, nickel, cadmium and cobalt;

(b) forming an aqueous solution of said complex, having a pH in the range of about 6 to about 8; and

(c) subjecting said solution to electrolysis in an electrolytic cell having an anode disposed in an anodic compartment and a cathode disposed in a cathodic compartment, while the anodic and cathodic compartments are freely intercommunicated without being separated by a diaphragm or membrane, whereby:

said metal is deposited at said cathode and ammonia is liberated and immigrates towards said anode, and

chloride is oxidized to Cl_2 at said anode, said Cl_2 reacts with said ammonia, and N_2 is developed at said anode and restored to ammonia in said electrolyte, by controlling pH in said electrolyte to constantly be within the range of 6–8.

5,468,355

METHOD FOR PRODUCING RADIOISOTOPES

Ruth E. Shefer, Newton; Robert E. Klinkowstein, Winchester; Barbara J. Hughey, Lexington, all of Mass.; Michael J. Welch, and Carmen S. Dence, both of St. Louis, Mo., assignors to Science Research Laboratory, Somerville, Mass., and Washington University, St. Louis, Mo.

Filed Jun. 4, 1993, Ser. No. 72,277

Int. Cl.[6] B01D *5/00*

U.S. Cl. 204—157.2 44 Claims

1. A method of producing oxides of ^{13}N, comprising:

bombarding a face of a carbon-containing target with high energy particles to generate ^{13}N in a surface layer of the bombarded face of the target, and

combusting the target in gaseous oxygen to extract oxides of ^{13}N from the target, the combusting being primarily confined to the depth of the surface layer containing the ^{13}N.

5,468,356

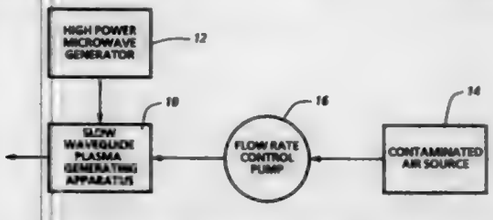
LARGE SCALE PURIFICATION OF CONTAMINATED AIR

Han S. Uhm, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1991, Ser. No. 749,244

Int. Cl.[6] B01D *53/34*

U.S. Cl. 204—164 21 Claims



1. In a method of purifying contaminated air by introduction of microwave energy into an electric field to which the contaminated air is exposed, including the steps of: positioning within said electric field a body of the contaminated air inducing breakdown thereof into ionization products; and controlling exposure time of the contaminated air within the electric field to limit recombination of said ionization products into a discharge plasma having atomic oxygen of a dominant density at a saturation level.

5,468,357

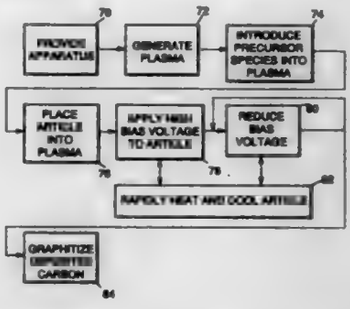
DENSIFICATION OF POROUS ARTICLES BY PLASMA ENHANCED CHEMICAL VAPOR INFILTRATION

Kamleshwar Upadhya, Quartz Hill, and Wesley P. Hoffman, Palmdale, both of Calif., assignors to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Dec. 27, 1994, Ser. No. 364,157

Int. Cl.[6] C01B *31/00*

U.S. Cl. 204—173 20 Claims



1. A method of densifying a porous article, comprising the steps of:

providing a porous article having porosity at a first depth below a surface of the article;

creating a plasma adjacent to the surface of the article;

introducing a gaseous source of a densifying species into the plasma; and

electrically biasing the article with respect to the plasma to a polarization opposite in sign to an ionization state of the densifying species and to a first voltage sufficient to deposit the densifying species to the first depth below the surface of the article.

5,468,358

FABRICATION OF FIBER-REINFORCED COMPOSITES

Tihiro Ohkawa, La Jolla, and Frederick H. Elsner, Carlsbad, both of Calif., assignors to General Atomics, San Diego, Calif.

Filed Jul. 6, 1993, Ser. No. 88,075

Int. Cl.[6] C25D *13/02*

U.S. Cl. 204—181.5 20 Claims

1. A method of making a fiber-reinforced carbon, ceramic or metal matrix composite material, which method comprises the following steps:

providing an array of reinforcing fibers which array has electrically insulating characteristics, said fibers of array having interstices,

disposing said array in a liquid slurry in juxtaposition to a surface of a first electrode, said slurry including a liquid medium and a mass of particles of a size so as to be suspended within said liquid medium, said particles having an electrical charge,

providing a second electrode in contact with said slurry and spaced from said first electrode,

impregnating said fiber array with particles by creating an electric field in said slurry by applying voltage to said electrodes so that said particles migrate through said fiber array toward said surface of said first electrode where said migrating particles aggregate against said first electrode surface and gradually fill the interstices of said fiber array,

removing said particle-impregnated array from said slurry, and

drying said impregnated array and consolidating said impregnated array by subjecting same to heat under conditions which consolidate said aggregated particles and thereby form a dense fiber-reinforced composite material.

5,468,359

METHOD OF DETERMINING PRESENCE OF AN ANALYTE BY ISOELECTRIC FOCUSING

Janusz B. Pawliszyn, Waterloo, Canada, assignor to Anthony R. Torres, Centerville, Utah

Continuation of Ser. No. 819,325, Jan. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 657,066, Feb. 19, 1991, Pat. No. 5,153,666, which is a continuation-in-part of Ser. No. 271,008, Nov. 14, 1988, Pat. No. 4,993,832. This application Feb. 25, 1994, Ser. No. 201,669

Int. Cl.[6] G01N *27/26;27/447*

U.S. Cl. 204—183.2 **3 Claims**

1. A method of determining the presence of an analyte in a sample by isoelectric focusing when the analyte does not have an isoelectric point, comprising the steps of obtaining a sample to be tested for the presence of an analyte; adding to the sample a reagent which will react with the analyte if present in the sample to form a product of the reaction which has an isoelectric point; subjecting the sample with added reagent to isoelectric focusing; detecting the results of the isoelectric focusing to determine if product of the reaction is present in the sample, presence of the product of the reaction indicating presence of the analyte.

5,468,360

ELECTROLYTIC CHLORINATION

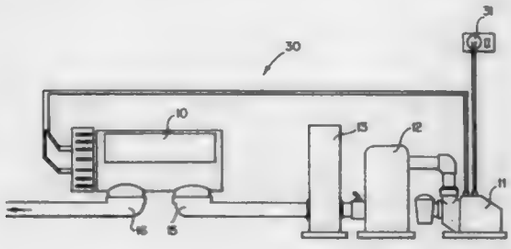
Lennie F. David, 4 Crimea Street, St. Kilda, Victoria 3182, and Peter J. Roberts, 38 Robinson Street, East Brighton, Victoria 3187, both of, Australia

Filed Sep. 9, 1994, Ser. No. 303,821

Claims priority, application Australia, Sep. 9, 1993, PM1103

Int. Cl.[6] C02F *1/461*

U.S. Cl. 204—228 **4 Claims**



1. A pool filtration and chlorination system comprising an electrolytic chlorinating cell positioned within a filter line of a pool or spa, the filter line including a pump driven by an a.c. induction motor, the motor comprising a rotor and a stator, the stator having at least two windings including a primary stator winding and a secondary winding magnetically coupled to the primary stator winding such that operation of said motor causes a stepped down voltage to be induced in the secondary winding, and the secondary winding being electrically connected to the electrolytic cell to power the electrolytic cell.

5,468,361

MEMBRANE GUARD FOR A MEMBRANE ELECTRODE CELL

H. Frederick Hess, Jr., Wheaton, Ill., and H. Frederick Hess, III, Valparaiso, Ind., assignors to UFS Corporation, Valparaiso, Ind.

Continuation of Ser. No. 66,991, May 24, 1993, abandoned, which is a continuation of Ser. No. 678,733, Apr. 1, 1991, Pat. No. 5,213,671. This application Sep. 23, 1994, Ser. No. 311,825

Int. Cl.[6] C25D *17/00;17/10*

U.S. Cl. 204—252 **8 Claims**

1. A membrane electrode cell for electrocoat painting of a counter-electrode, comprising:

a tubular membrane structure having an inner surface and an outer surface, wherein at least a portion of the outer surface of the tubular membrane structure comprises a membrane having an outer surface;

an electrode disposed substantially within the tubular membrane structure, wherein the electrode is positioned within the tubular membrane structure in a manner to allow passage of a flushing fluid between the electrode and the inner surface of the tubular membrane structure; and

a tubular guard having an inner surface and an outer surface, wherein the tubular membrane structure and electrode are positioned within the tubular guard in a substantially concentric manner wherein the tubular guard may serve to prevent physical contact between the counter-electrode or other object and the outer surface of the tubular membrane structure, wherein the tubular guard is comprised of a non-conductive material and has a plurality of openings in the surface thereof, wherein the openings have substantially curved surfaces along portions of the periphery thereof.

5,468,362

APPARATUS FOR TREATING SUBSTRATES IN A VACUUM CHAMBER

Peter Mahler, Hainburg, and Wolfgang Stang, Kefenrod, both of, Germany, assignors to Leybold Aktiengesellschaft, Hanau, Germany

Filed Jan. 21, 1994, Ser. No. 185,095

Claims priority, application Germany, Apr. 13, 1993, 43 12 014.8

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—298.11 **12 Claims**

1. Apparatus for treating substrates, said apparatus comprising

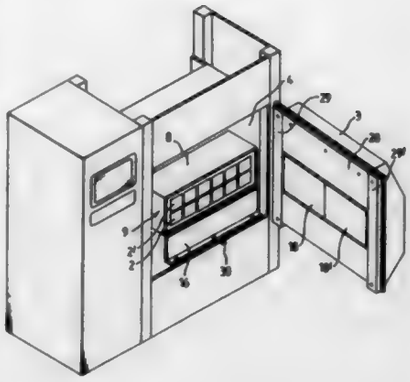
a chamber having an opening therein,

means for holding a plurality of substrates in a plane adjacent to said opening,

door means for closing said opening,

source means fixed to said door for treating said substrates,

a plate-like mask in said chamber, said mask being movable in a plane parallel to said plane in which said substrates are held,



means for moving said plate-like mask into a position between said source means and said means for holding said substrates, and,

panel means cooperable with said mask to shield said means for holding said substrates from said source means when said plate-like mask is in said position between said source means and said means for holding said substrates.

5,468,363

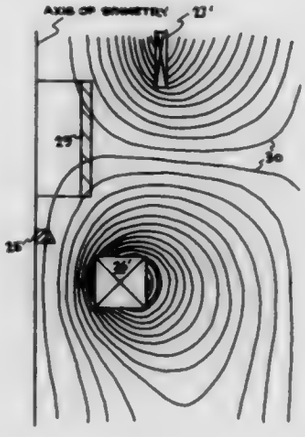
MAGNETIC-CUSP, CATHODIC-ARC SOURCE

Steven Falabella, Livermore, Calif., assignor to Regents of the University of California, Oakland, Calif.

Filed Apr. 25, 1994, Ser. No. 232,661

Int. Cl.[6] C23C *14/32*

U.S. Cl. 204—298.41 **20 Claims**



1. A cathodic-arc source, comprising:

a cathode;

a first coil producing a first magnetic field, said cathode being positioned in the center of said first coil;

a second coil, axially aligned with said first coil and producing a second magnetic field in a direction opposite to the direction of said first magnetic field;

said first and second magnetic fields creating a plane of zero magnetic field between said first and second coils; and

a hollow annular anode positioned intermediate said first and second coils and located in said plane of zero magnetic field;

whereby a straight-through magnetic field is produced for ion transport through said second coil while providing a low impedance path for electrons from said cathode to said anode creating stable arc discharges.

5,468,364

BASE SEQUENCING APPARATUS

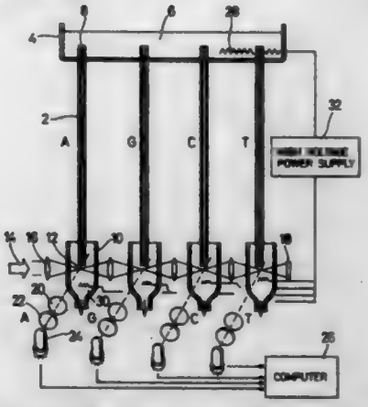
Hidehiko Fujii, Kyoto, Japan, assignor to Shimadzu Corporation, Japan

Filed May 24, 1993, Ser. No. 65,065

Claims priority, application Japan, May 29, 1992, 4-163507

Int. Cl.[6] G01N *27/26;27/447*

U.S. Cl. 204—299 R **10 Claims**



1. A base sequencing apparatus provided with a gel electrophoresis apparatus for electrophoresing nucleic acid fragments treated by the Sanger method through electrophoresis lanes provided for respective types of end bases for determining base sequences of nucleic acids from order of elution, said base sequencing apparatus comprising:

means for guiding the nucleic acid fragments being eluted from the electrophoresis lanes under a strong acid environment;

an ultraviolet ray irradiation means for irradiating the nucleic acid fragments under said strong acid environment with ultraviolet rays; and

a fluorescence detection means for detecting fluorescence components generated from irradiated nucleic acid fragments.

5,468,365

VISCOUS ELECTROPHORESIS POLYMER MEDIUM AND METHOD

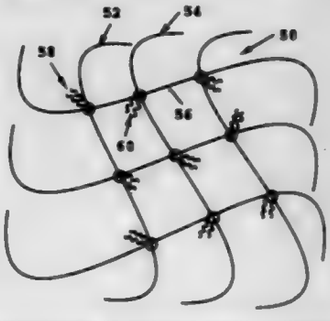
Steven M. Menchen, Fremont, Calif.; Mitchell A. Winnik, Toronto, Canada, and Ben F. Johnson, Palo Alto, Calif., assignors to Applied Biosystems, Inc., Foster City, Calif.

Continuation-in-part of Ser. No. 950,863, Sep. 24, 1992, Pat. No. 5,290,418. This application Sep. 22, 1993, Ser. No. 125,623

The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl.[6] C25B *7/00*

U.S. Cl. 204—299 R **28 Claims**



1. An electrophoresis separation medium comprising

a matrix of aggregated copolymers in an aqueous medium, said copolymers being formed of contiguous linear hydrophilic polymer segments having a selected combined length, and a hydrophobic polymer segment carried on each of the free ends of the contiguous hydrophilic segments, said medium being characterized by:

(i) the ability of the medium to effect a high-resolution electrophoretic separation of biopolymer molecules in a defined molecular size range, and

(ii) a concentration of the copolymer which is above the interpolymeric-aggregation transition concentration, defined by the concentration of copolymer sufficient to produce a marked rise in viscosity of an aqueous dispersion of the copolymer.

5,468,366

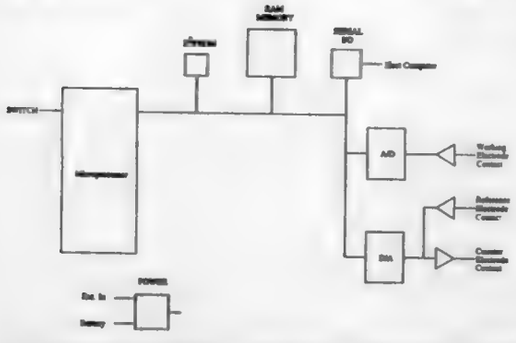
COLLOIDAL-GOLD ELECTROSENSOR MEASURING DEVICE

Steven Wegner, Chapel Hill; Michael A. Harpold; Terence M. McCaffrey, both of Durham; Susan E. Morris, Chapel Hill; Marek Wojciechowski, Cary; Junguo Zhao, Chapel Hill; Robert W. Henkens; Najih Naser, both of Durham, and John P. O'Daly, Carrboro, all of N.C., assignors to Andcare, Inc., Durham, N.C.

Continuation-in-part of Ser. No. 73,806, Jun. 7, 1993, Pat. No. 5,368,707, which is a continuation-in-part of Ser. No. 821,732, Jan. 15, 1992, Pat. No. 5,217,594. This application Sep. 30, 1994, Ser. No. 316,433

Int. Cl.[6] G01N *27/26*

U.S. Cl. 204—403 **22 Claims**



1. An electrode comprising a conducting substrate onto which is deposited 10–30 μg/cm^2 of colloidal gold admixed with a cationic polymer.

5,468,367

ANTIFOULANT FOR INORGANIC FOULING

Ghazi Dickakian, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Linden, N.J.

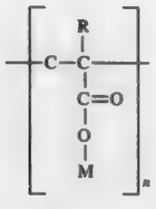
Filed Feb. 16, 1994, Ser. No. 197,507

Int. Cl.[6] C10G *9/16*

U.S. Cl. 208—48 AA **6 Claims**

1. A method of treating a crude oil containing no more than 5 wt. % water to inhibit inorganic fouling which comprises

(a) introducing into the crude oil an effective amount of a water soluble antifoulant having the following formula:



where

R is selected from the group consisting of H and C;

M is an alkaline earth metal;

n is an integer ranging from 10 to 200; and

(b) passing the crude oil containing the antifoulant through a preheater of a distillation unit, wherein the preheater is operated at a temperature of between 300° to 500° F.

5,468,368

LUBRICANT HYDROCRACKING PROCESS

Charles L. Baker, Jr., Thornton, Pa.; Cynthia T. Chu, Morrestown, N.J.; Dominick N. Mazzone, Wenonah, N.J., and Nancy M. Page, Sewell, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jun. 21, 1993, Ser. No. 78,338

The portion of the term of this patent subsequent to Feb. 28, 2009, has been disclaimed.

Int. Cl.[6] C10G *45/10;65/08;69/10*

U.S. Cl. 208—58 **26 Claims**

1. A process for producing a lubricant from a hydrocracked distillate boiling range product containing at least 10 wt. % aromatics comprising hydroprocessing the feed over a catalyst comprising a composition of matter comprising an inorganic nonpillared crystalline phase exhibiting, after calcination, an X-ray diffraction pattern with at least one peak at a position greater than about 18 Angstrom Units d-spacing with a relative intensity of 100, and a benzene adsorption capacity of greater than about 15 grams benzene per 100 grams anhydrous crystal at 50 torr and 25° C. in the presence of hydrogen and conditions sufficient to convert said hydrocracked distillate boiling range product to a lubricant of reduced aromatics.

5,468,369

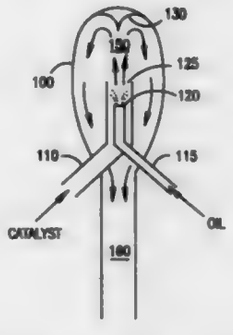
FCC PROCESS WITH UPFLOW AND DOWNFLOW REACTOR

Gregory P. Muldowney, Glen Mills, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 27, 1993, Ser. No. 176,978

Int. Cl.[6] C10G *11/00;11/05*

U.S. Cl. 208—113 **17 Claims**



1. A process for the fluidized catalytic cracking of a hydrocarbon feed oil containing liquid hydrocarbons boiling above 650° F. to catalytically cracked products comprising:

a) upflow vaporization of liquid feed by contacting liquid feed with a source of regenerated zeolite containing catalyst, in a base portion of a vertical vaporizer comprising a vertical tube at feed vaporization conditions including a hydrocarbon residence time of 0.05 to 5.0 seconds, and wherein said vaporization conditions are sufficient to vaporize the feed and convert less than 50%, by weight, of the feed to products boiling below 650° F., to produce a vaporized mixture of feed which is completely vaporized and catalyst which is discharged up from said vertical vaporizer;

b) reversing the direction of flow of said feed and catalyst; and

c) downflow cracking of said vaporized mixture in a vertical tube downflow reactor having a height of 5 to 150 feet, a top portion receiving said feed and catalyst and a bottom portion discharging cracked products and spent catalyst, said reactor

operating at downflow cracking conditions including a hydrocarbon residence time of 0.05 to 5.0 seconds, and sufficient to convert additional amounts of feed to cracked products boiling below 650° F. to produce a downflow cracking reactor product mixture of spent cracking catalyst and cracked hydrocarbons which are discharged from the bottom of said tube downflow reactor and wherein at least 50 wt % of said vaporized hydrocarbons are cracked products boiling below 650° F. and wherein said vaporizer has a volume and said tube downflow reactor has a volume and the ratio of vaporizers(vaporizer+downflow reactor) volume is from 5:95 to 50:50;

d) separating said tube downflow reactor product mixture in a solids/vapor separation means to produce a vapor phase of cracked products which is recovered as a product and a solids rich stream of spent cracking catalyst containing coke and strippable hydrocarbons;

e) stripping said spent catalyst in a stripping means operating at catalyst stripping conditions to produce stripped catalyst containing coke;

f) regenerating said stripped catalyst in a catalyst regeneration means at catalyst regeneration conditions including contact with an oxygen containing gas to produce regenerated catalyst; and

g) recycling said regenerated catalyst to said base portion of said vertical vaporizer.

5,468,370

PREPARATION OF A CATALYST FROM METAL OXIDES BY REDUCTION AND PARTIAL CARBURIZATION BY REACTION GASES

Marc-Jacques Ledoux; Jean-Louis Guille; Cuong Pham Huu, all of Strasbourg; Hugh Dunlop, Egreve, and Marie Prin, Moirans, all of, France, assignors to Pechiney Recherche, Courbevoie, France

Continuation-in-part of Ser. No. 933,933, Aug. 24, 1992, abandoned. This application Dec. 7, 1993, Ser. No. 162,293

Claims priority, application France, Sep. 6, 1991, 91 12374

Int. Cl.[6] C10G *35/06*; B01J *27/22*;*37/18*

U.S. Cl. 208—134 **22 Claims**

16. Process for reforming or isomerizing a reaction gas mixture comprising hydrogen and at least one hydrocarbon, comprising the steps of:

a) providing particles of an oxide of a transition metal element;

b) exposing said particles to said reaction gas mixture under conditions of temperature, pressure and reaction gas mixture composition sufficient for catalysis of said reforming or isomerizing, such that a catalyst is formed comprising a core of particles of said oxide, which core is covered with a surface layer comprising an oxycarbide of said element in equilibrium with a carbide and an oxide of said element; and

c) allowing a reforming or isomerizing reaction to proceed under said conditions of temperature, pressure and composition, and catalyzed by said catalyst.

5,468,371

CATALYST FOR RESIDUAL CONVERSION DEMONSTRATING REDUCED TOLUENE INSOLUBLES

Gerald V. Nelson, Nederland; Govanon Nongbri, and Roy E. Pratt, both of Port Neches, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 11, 1994, Ser. No. 226,191

The portion of the term of this patent subsequent to Jul. 25, 2012, has been disclaimed.

Int. Cl.[6] C10G *45/04*;*47/12*

U.S. Cl. 208—216 PP **14 Claims**

1. A process for hydrotreating a charge hydrocarbon feed containing components boiling above 1000° F., toluene insolubles formets, sulfur, metals, asphaltenes, carbon residue, and nitrogen which comprises

contacting said charge hydrocarbon feed with hydrogen at isothermal hydrotreating conditions in the presence of, as catalyst, a porous alumina support bearing 2.5–6 wt % of a non-noble Group VIII metal oxide, 13–24 wt % of a Group VIB metal oxide, 0–2 wt % of silica, and 0–2 wt % of a phosphorus oxide, said catalyst having a Total Surface Area of 175–220 m^2/g, a Total Pore Volume of 0.6–0.8 cc/g, and a Pore Diameter Distribution wherein less than about 33% of the Total Pore Volume is present as primary micropores of diameter less than about 100 Å, at least about 41% of the Total Pore Volume is present as secondary micropores of diameter of about 100Å–200 Å and about 16–26% of the Total Pore Volume is present as mesopores of diameter ≧200 Å, thereby forming hydrotreated product containing decreased contents of components boiling above 1000° F., toluene insolubles, sulfur, metals, carbon residue, asphaltenes and nitrogen; and

recovering said hydrotreated product containing decreased content of components boiling above 1000° F., toluene insolubles, sulfur, metals, carbon residue, asphaltenes and nitrogen.

5,468,372

PROCESS OF HYDROTREATING AND/OR HYDROCRACKING HYDROCARBON STREAMS OR TAIL GAS TREATING SULFUR-CONTAINING GAS STREAMS

James D. Seamans, Woodlands; Charles T. Adams, Houston; Wendy B. Dominguez, Rosenberg, and Andrew A.-J. Chen, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 969,660, Oct. 30, 1992, Pat. No. 5,292,702, which is a continuation of Ser. No. 737,630, Jul. 30, 1991, Pat. No. 5,215,954. This application Dec. 13, 1993, Ser. No. 166,133

Int. Cl.[6] C10G *45/04*

U.S. Cl. 208—216 R **44 Claims**

1. In a process of hydrotreating and/or hydrocracking hydrocarbon streams or tail gas treating sulfur-containing gas streams which comprises contacting the streams in the presence of hydrogen with a hydrotreating and/or hydrocracking or tail gas treating catalyst containing sulfides of metals of Group VIB and/or Group VIII of the periodic Table at temperatures ranging from about 100° C. to about 425° C., the improvement which comprises using a catalyst prepared by (a) contacting a presulfidable metal oxide(s)-containing catalyst with elemental sulfur at a temperature such that said elemental sulfur is substantially incorporated in the pores of said catalyst by sublimation and/or melting and (b) heating said sulfur-incorporated catalyst in the presence of a liquid olefinic hydrocarbon at a temperature greater than about 150° C.

5,468,373

MULTIPLE-EFFECT WATER TREATMENT APPARATUS

Wu-Chang Chou, c/o Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei, Taiwan, Prov. of China

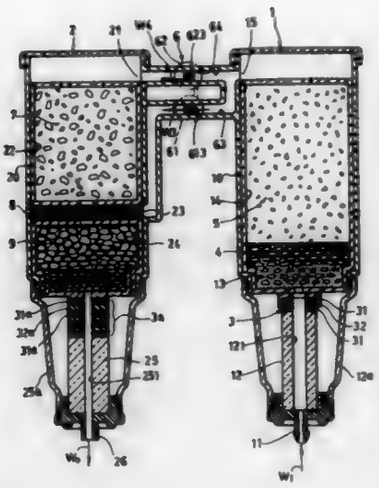
Filed May 16, 1994, Ser. No. 243,378

Int. Cl.[6] C02F *9/00*

U.S. Cl. 210—94 **5 Claims**

1. A water treatment apparatus comprising:

a primary treating column (1) including an inlet water passage



(121) for directing a raw water supply through said inlet water passage (121) of said primary column, a primary magnetizing means (3) surrounding the inlet water passage (121) for primarily magnetizing the raw water supply fed into said primary column, an iodine disinfection layer (4) containing iodine compound packed in said primary column for killing bacteria in the raw water supply, and an activated carbon layer (5) containing activated carbon in said primary column (1) and downstream connected to said iodine disinfection layer (4) for adsorbing odors and poisonous materials in the raw water supply;

a secondary treating column (2) downstream connected to and communicating with said primary treating column (1) by a switching valve means (6) and having an ion exchange layer (7) containing ion exchange resins packed in a first portion of said secondary column (2) for removing ions in the water, a screening filter (8) retained in a middle portion (23) of said secondary column (1), a mineralizing layer (9) containing quartz rock and coral rock for dissolving mineral ions from said rocks into the water and packed in a second portion in said secondary column (2) and partitioned from said ion exchange layer (7) with said screening filter (8), and a secondary magnetizing means (3a) disposed around a discharge tube (25) connected to said secondary column (2) for magnetizing treated water from said secondary column following said mineralizing layer (9); and

said switching valve means (6) including: a first conduit (63) connected between the primary treating column (1) and the middle and second portions of the secondary column (2), a first valve (61) rotatably mounted in the first conduit (63), a second conduit (64) connected between the primary column (1) and the first portion of the secondary column (2), a second valve (62) rotatably mounted on the second conduit (64), and a linking rod (65) pivotally connecting the first valve (61) and the second valve (62) for simultaneously opening the first valve (61) and closing said second valve (62) for directing water from said primary column (1) into said screening filter (8) and said mineralizing layer (9) in said secondary column (2) for eliminating an ion exchange operation in said first portion of said secondary column and for simultaneously closing said first valve (61) and opening said second valve (62) for directing water into said ion exchange layer (7) in said secondary column (2) for an ion exchange therein.

5,468,374

MINIATURIZED SENSOR COMPONENT FOR MEASURING CONCENTRATIONS OF SUBSTANCES IN LIQUIDS, AND METHOD OF MANUFACTURING SUCH A COMPONENT

Meinhard Knoll, Geschwister Scholl-Strasse 9, D-4430 Steinfurt-Burgsteinfurt, Germany

PCT No. PCT/EP92/02505, § 371 Date Nov. 4, 1993, § 102(e) Date Nov. 4, 1993, PCT Pub. No. WO93/10443, PCT Pub. Date May 27, 1993

PCT Filed Nov. 2, 1992, Ser. No. 90,107

Claims priority, application Germany, Nov. 13, 1991, 41 37 261.1

Int. Cl.[6] B01D *69/00;* **G01N** *27/40*

U.S. Cl. 210—96.2 **25 Claims**

1. In a miniaturized sensor component for measuring concentra-

tions of substances in liquids and comprising a support that contains cavities accommodating a membrane, whereby the membrane is produced in situ by polymerization or by precipitation from a solution, an electric lead is either mechanically connected to or integrated into the membrane and is in contact with the membrane, the improvement wherein the membrane support is a capillarized solid and the membrane is produced in the capillaries by impregnating the support with a liquid, comprising membrane forming material and active components, that subsequently either polymerizes or evaporates leaving a residue.

17. Miniaturized sensor component as in claim **1**, for use with a reference electrolyte, further comprising a reference in the form of a capillarized solid with an electrolyte, one side of which is bonded to a membrane support and ion-selective material and the other side of which is bonded to a silver and silver-chloride lead.

5,468,375

WASTEWATER PRETREATMENT TANK ASSEMBLY

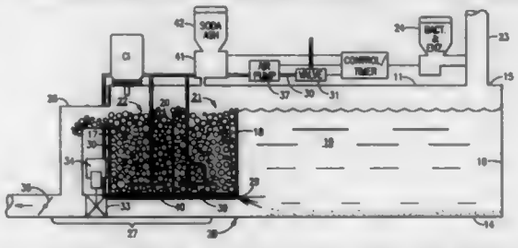
Joseph R. Lira, Fayetteville, N.Y., assignor to Nova Power Systems, Ltd., Fayetteville, N.Y.

Filed May 9, 1994, Ser. No. 239,745

Int. Cl.[6] B01D *21/30*

U.S. Cl. 210—139 **11 Claims**

1. Wastewater pretreatment tank assembly to be interposed



between a wastewater source and a sewer system that leads to a downstream treatment facility, the tank assembly comprising a shell having a bottom, a top, first and second end walls, and first and second weirs interposed between the end walls, said first end wall and said first weir defining a first chamber; means coupled to said wastewater source for introducing wastewater into said first chamber so that sludge in said wastewater settles to the bottom in said first chamber and is digested; the first and second weirs defining a second, stripping chamber, and including means for stripping ammonia from wastewater that has spilled from said first chamber over said first weir into said second chamber; said second weir and said second end wall defining a third aeration chamber, and including means for aerating wastewater in said third chamber that has spilled over said second weir; a drain overflow constructed and arranged for directing aerated wastewater into said sewer system and having a port open to said third chamber for conveying

wastewater from said third chamber into said sewer system; and a sludge evacuation conduit having an inlet end in communication with the bottom of said first chamber, an outlet end connectable to said sewer system, and valve means interposed in said sludge evacuation conduit and connectable for normally retaining in said first chamber wastewater and sludge, up to the level of said first weir, and that is selectively openable for permitting discharge of the digested sludge from the first chamber into said sewer system.

4. Wastewater pretreatment tank assembly according to claim 1, wherein said valve means includes a sluice valve having a gate that is lifted to open the sluice valve, and means for automatically raising said sluice valve gate at scheduled times for automatically discharging the digested sludge.

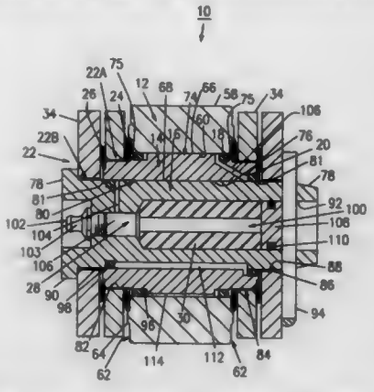
5,468,376

PRESSURE SEALED CHAIN

Donald C. Bates, Santa Paula, Calif., assignor to Southern California Edison, Rosemead, Calif.

Filed Oct. 4, 1993, Ser. No. 130,889
Int. Cl.[6] B01D *33/056*
U.S. Cl. 210—160 **47 Claims**

1. An assembly for hingeably connecting pairs of link plates of a



chain, each link plate having a longitudinal axis, the assembly comprising:

(a) a tubular, hollow bushing having a longitudinal axis;

(b) a pin rotatably mounted within the bushing for relative rotational movement between the bushing and the pin, the bushing and the pin having axially extending adjoining surfaces which define (i) an axially extending bushing-pin interface therebetween and (ii) opposed bushing-pin edges;

(c) mounts for mounting one pair of the link plates to the bushing and another pair of link plates to the pin, with the bushing longitudinal axis transverse to the longitudinal axis of the link plates, relative rotational movement between the bushing and the pin resulting in hinged movement between the two pairs of link plates; and

(d) at least one bushing-pin seal positioned in the bushing-pin interface between the opposed bushing-pin edges for preventing an influx of contaminants into the bushing-pin interface.

5,468,377

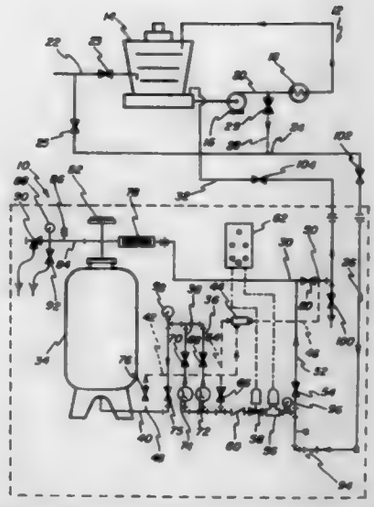
SOLID HALOGEN FEED SYSTEM

J. Steven Clavin, Langhorne; Bradley J. Peters, Warrington, and Henry M. Schrandt, Collegeville, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Oct. 21, 1993, Ser. No. 140,251
Int. Cl.[6] C02F *1/76*
U.S. Cl. 210—167 **2 Claims**

1. Apparatus adapted for use in combination with a cooling water system comprising:

(a) tank means for containing a solid treatment product for treating water;



(b) first flow path means for conveying water to said tank;

(c) second flow path means for conveying treated water from said tank to said cooling water system;

(d) an eductor means;

(e) third flow path means connected at a first junction to said first flow path means for draining water from said tank through said eductor means to said water system wherein said third flow path means is connected to said second flow path means at a connection point, said third flow means including a discharge valve means located between said connection point and said tank means for preventing flow of water to said tank means through said second flow path means during said draining of water from said tank through said third flow path.

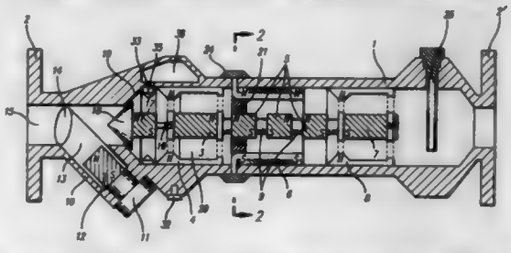
5,468,378

MAGNETIC CONDITIONERS FOR TREATING LIQUIDS

Jose L. de la Torre Barreiro, Rafael Calvo No. 30, 28010 Madrid, Spain

Filed Oct. 25, 1993, Ser. No. 143,414
Claims priority, application Spain, Feb. 4, 1993, 9300201
Int. Cl.[6] C02F *1/48*
U.S. Cl. 210—192 **6 Claims**

1. A magnetic conditioner for treating liquids, comprising:



a tubular body made of a nonmagnetic material, said body including a longitudinal axis, a central flow passage extending along said axis, and including an inlet end and an outlet end spaced along said axis and communicating with said central flow passage, said inlet and outlet ends each respectively terminating in a companion flange; and

a core located within said tubular body for establishing three independent magnetic fields aligned coaxially along said longitudinal axis, said core comprising first, second, and third magnets or groups of magnets, each of said magnets or groups of magnets being aligned coaxially along said longitudinal axis, each of magnets or groups of magnets having magnetic poles spaced apart along said longitudinal axis, each of said magnets being separated apart from one another by spacers, said core including first, second, and third magnetically permeable bodies spaced apart from and coaxially surrounding

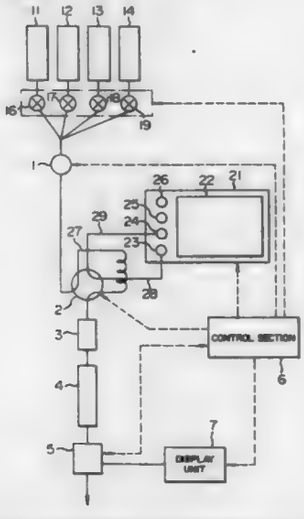
said first, second, and third magnets or groups of magnets, respectively, wherein said first magnet or group of magnets includes a south pole facing said inlet end and a north pole facing a north pole of said second magnet or group of magnets, wherein the second magnet or group of magnets includes a south pole facing a south pole of said third magnet or group of magnets, and wherein said third magnet or group of magnets includes a north pole facing said outlet end, and wherein said core further includes an auxiliary magnet or group of magnets coaxially aligned with said longitudinal axis and located between said first magnet or group of magnets and said inlet end, said auxiliary magnet or group of magnets including a north pole facing said inlet end and a south pole adjacent the south pole of said first magnet or group of magnets, telescoping shaft means for permitting axial movement of said auxiliary magnet or group of magnets along said longitudinal axis relative to said first magnet or group of magnets, wherein a conical plug is attached to a front of said auxiliary magnet or group of magnets and facing said inlet end, wherein said housing includes a truncated cone-shaped seat located between said conical plug and said inlet for receiving said conical plug, whereby a magnetic force caused by the like-pole interaction between the auxiliary magnet or group of magnets and said first group of magnets biases the plug toward said truncated cone-shaped seat, and whereby a greater stream of water flowing though the conditioner causes a greater axial movement of the plug and said auxiliary magnet or group of magnets in a direction away from said seat and towards said first magnet or group of magnets resulting in a greater influence of the auxiliary magnet or group of magnets on the first magnet or group of magnets, and a greater radial magnetic field established between said first magnet or group of magnets and said first magnetically permeable body.

5,468,379

SOLUTION FOR SUPPRESSING DETERIORATION OF A SEPARATION COLUMN FOR ANALYZING HEMOGLOBINS

Kenji Yasuda, Tokyo; Yoshinori Takata, Chiba; Harumi Tsuruta, Ibaraki; Sadabumi Ohnuma, and Junkichi Miura, both of Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 38,396, Mar. 29, 1993, Pat. No. 5,358,639. This application Jun. 9, 1994, Ser. No. 257,306
Claims priority, application Japan, Apr. 1, 1992, 4-079508
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—198.2 **4 Claims**



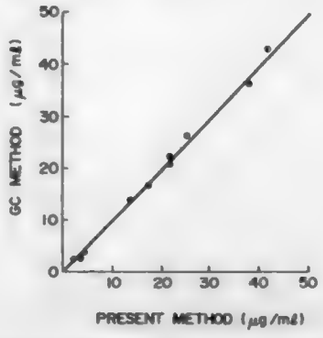
1. A solution for suppressing deterioration of a separation column for analyzing hemoglobins, which comprises 1 to 100 mM of S-(carboxyalkyl)-L-cysteine as a deterioration-suppressing reagent and 0.01 to 1.0% of a surfactant capable of solubilizing contaminants originating from blood samples.

5,468,380

METHOD FOR QUANTITATIVELY MEASURING SUGAR-ALCOHOL, COLUMN AND KIT THEREFOR

Masahiko Yabuuchi, Omiya; Hiroshi Akanuma, Yokohama; Minoru Masuda, Ageo; Kazuo Katoh, Kobe; Tsuneo Nakamura, Omiya; Shigeru Tajima, Fujioka; Masashi Hashiba, Gunma; Hiroshi Hayami; Tomoko Takezawa, both of Fujioka, and Masachika Hirayama, Omiya, all of, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 7,656, Jan. 22, 1993, Pat. No. 5,407,806, which is a continuation of Ser. No. 504,659, Apr. 4, 1990, abandoned. This application Jan. 4, 1995, Ser. No. 368,471
Claims priority, application Japan, Apr. 26, 1989, 1-104712
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—198.2 **4 Claims**



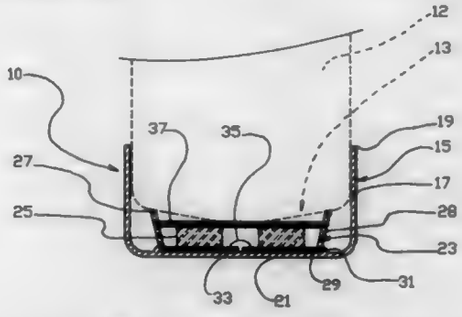
1. A column packed with strongly basic anion-exchange resins and an aqueous solution of boric acid, the resins comprising hydrophilic high molecular weight carriers having quaternary ammonium groups introduced, but not having any aromatic ring.

5,468,381

MAGNETIC FILTER ADAPTER

Carlton R. Williamson, 1117 Henson Dr., Hurst, Tex. 76053

Filed May 31, 1994, Ser. No. 251,839
Int. Cl.[6] B01D *35/06*
U.S. Cl. 210—223 **20 Claims**



1. A magnetic filter adapter for use with a fluid filter having a cylindrical housing which includes a closed end and a semi-open end for communicating with a fluid system, the filter adapter comprising:

a non-magnetic semi-rigid hollow adaptive housing, including a cylindrical side wall between a housing open end and a housing closed end, and further having an interior-diameter and an axial height sufficient for frictionally engaging the exterior housing surface of the fluid filter;

an inner magnetic-field concentrating cup formed of a material which can be magnetized in the presence of an external magnetic field, and including a cup open end, a cup side wall and a cup closed end; said cup having an exterior diameter less than the interior diameter of the adaptive housing and further having an axial height which is less than the axial height of the adaptive housing; said cup further being affixed within said adaptive housing such that the external surface of the cup closed end is substantially in coaxial contact with an inner surface of the adaptive housing closed end, and the cup open end is in magnetic contact with the fluid filter closed end when said filter is engaged by the adaptive housing; and

a magnet having a pair of opposed ends and a diameter less than the diameter of the concentrating cup and being affixed within said concentrating cup such that one of said opposed ends of the magnet is in substantially coaxial contact with an inner surface of said cup closed end; said magnet further having a height which is less than the axial height of said concentrating cup such that the other of said opposed ends does not contact the fluid filter when said filter is engaged by the adaptive housing.

5,468,382

DEPTH FILTER MEDIA

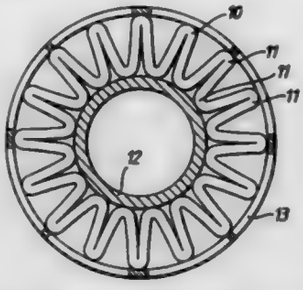
Nigel J. D. Cook; Kenneth R. Weight, both of Hampshire; Richard G. Gutman, West Sussex; Roger A. Buttery, and Michael Grimes, both of Hampshire, all of, England, assignors to Pall Corporation, East Hills, N.Y.

Continuation of Ser. No. 756,598, Sep. 9, 1991, Pat. No. 5,279,731. This application Dec. 30, 1993, Ser. No. 176,274

The portion of the term of this patent subsequent to Jan. 18, 2011, has been disclaimed.

Int. Cl.[6] B01D *27/06*

U.S. Cl. 210—232 **49 Claims**



1. A filter element comprising a generally cylindrical depth filter medium without any side seal, said filter medium being formed by at least one continuous sleeve of fibrous filter medium provided with pleats extending along the length of the fibrous filter medium and parallel to one another around the fibrous filter medium, an inner support core within the pleated depth filter medium and contacting inward ends of the pleats.

5,468,383

FLUID FILTER HOLDER

Thomas J. McKenzie, 6230 N. Camino Pimera Alta, Tucson, Ariz. 85718

Filed Feb. 28, 1994, Ser. No. 202,429

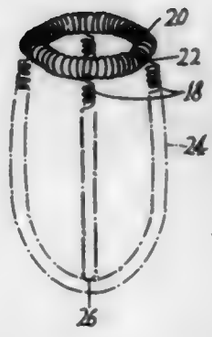
Int. Cl.[6] B01D *35/00;35/02*

U.S. Cl. 210—232 **9 Claims**

1. A fluid filter holder for use with fluid spraying equipment comprising a suction pipe connected through a pump to a fluid spraying nozzle:

said fluid filter holder comprising:

(a) a ring member of semi-rigid flexible and expandable material for flexible attachment to and closely surrounding the end of said suction pipe; and



(b) a plurality of thin loops of flexible and expandable material, said loops having ends secured to said ring member around the periphery of said ring member with their intermediate portions extending away from said ring member and secured together where they cross, thus to form the bottom of said filter holder.

5,468,384

MODULE FOR FILTERING, SEPARATING, PURIFYING GASES OR LIQUIDS, OR FOR CATALYTIC CONVERSION

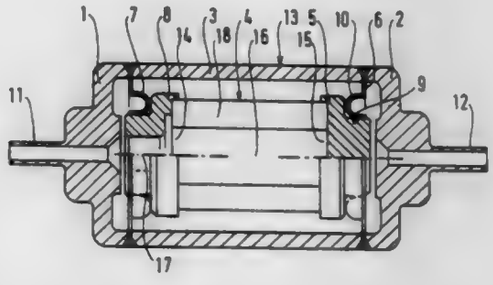
Daniel Garcera, Tarbes; Edouard Toujas, Bazet, and Jacques Gillot, Laloubere, all of, France, assignors to Societe Anonyme Dite Societe Des Ceramiques Techniques, Bazet, France

Continuation of Ser. No. 970,787, Nov. 3, 1992, Pat. No. 5,415,772. This application Nov. 9, 1994, Ser. No. 338,227

Claims priority, application France, Jan. 20, 1992, 9212535

Int. Cl.[6] B01D *35/00;53/34*

U.S. Cl. 210—232 **17 Claims**



1. A module for filtering, separating and purifying fluids such as gases or liquids, or for catalytic conversion, comprising:

a substantially cylindrical housing having an internal surface and an external surface which define a housing wall,

at least one rigid element, which is placed inside said housing, which is made from a dense or porous material selected from a group consisting of a ceramic, carbon, sintered glass and sintered metal, which has opposite ends, of which at least one of the opposite ends is substantially cylindrical, which has an external surface, and which has an axis parallel to that of the housing,

at least one metal part in the form of an elastically deformable ring, fixed firstly to the housing and connected secondly to said one end of said element,

a connection, between said ring and said one end of said element, comprising a thermal or mechanical hoop fitting, said ring being hoop fitted on said one end or vice versa; and

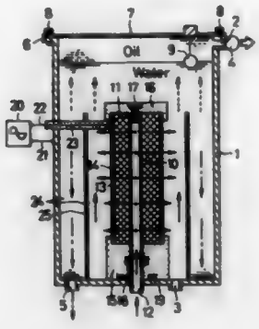
an open volume, limited by the internal surface of said housing and the external surface of said element, through which said fluids are allowed to propagate.

5,468,385

CHARGED COALESCER TYPE OIL-WATER SEPARATING APPARATUS

Noboru Inoue, 727 Funaki-cho, Ono-shi, Hyogo 675-13, Japan

Filed Oct. 5, 1994, Ser. No. 318,101
Claims priority, application Japan, Jan. 7, 1993, 5-251420
Int. Cl.[6] B01D 17/06
U.S. Cl. 210—243 1 Claim



1. A charged coalescer type oil-water separating apparatus comprising:

an outer cylinder grounding electrode also serving as a main body container;

a central cylinder electrode provided inside the outer cylinder grounding electrode, given the same potential as the outer cylinder grounding electrode, and having a plurality of liquid passing holes and one open end serving as an inlet of a pressurized subject liquid;

a cylindrical, coalescer type filter element detachably interposed between the outer cylinder grounding electrode and the central cylinder electrode, a mesh size of the filter element decreasing in a step-like manner toward an outside of the filter element in its radial direction, an inner cylindrical surface of the filter element being in contact with or in close proximity to the central cylinder electrode;

an oil-water separating space provided between the filter element and the outer cylinder grounding electrode, a top portion and a bottom portion of the oil-water separating space serving as a separated oil accumulation space communicated with a separated oil outlet and as a separated water accumulation space communicated with a separated water outlet respectively;

a cylindrical charge electrode made of a perforated metal plate or a mesh-like metal body and disposed outside the filter element so as to be in contact with or in close proximity to an outer cylindrical surface of the filter element; and

bypass cylinder electrode disposed in the oil-water separating space between the filter element and the separated water outlet so as to be concentric with the outer cylinder grounding electrode, for elongating a liquid passing path,

means for applying a voltage large enough to lower or eliminate a zeta potential of impurity particles in the subject liquid between the outer cylinder grounding electrode and the cylindrical charge electrode and between the central cylinder electrode and the cylindrical charge electrode; and

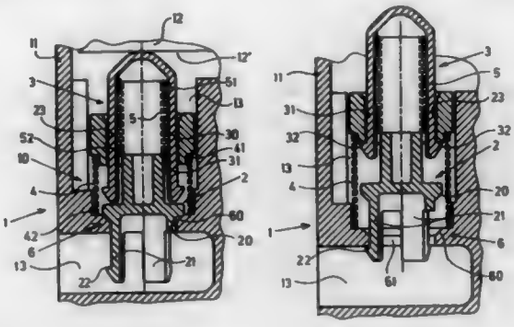
pump means for introducing a pressurized subject liquid from an outside of the container into an internal space of the central cylinder electrode, and passed through the filter element from its inside to outside to produce a primary processed liquid that has been subjected to filtration and preliminary cohesion, which primary processed liquid is introduced into the oil-water separating space, where separated oil and water are accumulated in the respective accumulation spaces during a process that the primary processed liquid flows upward and downward, and the accumulated separated oil and water are finally discharged from the container.

5,468,386

FILTER ASSEMBLY AND PREASSEMBLED DRAIN VALVE UNIT THEREFOR

Wilhelm Ardes, Ascheberg, Germany, assignor to Ing. Walter Hengst GmbH & Co. KG, Muenster, Germany

Filed Mar. 15, 1994, Ser. No. 212,945
Claims priority, application Germany, Mar. 19, 1993, 43 08 772.8
Int. Cl.[6] B01D 35/14
U.S. Cl. 210—248 19 Claims



1. A filter comprising:

a filter housing;

a replaceable filter cartridge;

a side drain conduit extending along an axis for draining said filter housing upon removal of said filter cartridge;

a seal seat in said side drain conduit;

a preassembled valve unit comprising a sealing member and an activating member, said sealing member engageable with said seal seat, said valve unit being mounted in said side drain conduit so as to project said activating member into an area occupied by said filter cartridge;

a first spring element biassing said sealing member in a direction away from said seal seat;

said sealing member maintained in a closed position relative to said seal seat upon engagement of said activating member of said valve unit by said filter cartridge when said filter cartridge is inserted into said housing, and said sealing member being moveable along said axis relative to said seal seat into an open position by said first spring element upon a removal of said filter cartridge;

a second spring element forming a part of said preassembled valve unit and being arranged between said sealing member and said activating member;

said second spring element having a higher stiffness than said first spring element;

said activating member and said sealing member penetrating each other along a part of their axial length and guiding each other and being axially displaceable relative to each other along said axis to effect greater and lesser axial penetration;

an extent of said activating member and said sealing member being displaceable relative to one another in an axial direction of lesser penetration being limited by stopper means provided at at least one of said activating member and said sealing member;

said preassembled valve unit being formed of said sealing member, said activating member and said second spring element being held together by said stopper means without a separate housing; and

said preassembled valve unit having a wall portion sized relative to said side drain conduit so as to axially guide said preassembled valve unit as it moves in said side drain conduit after insertion of said valve unit into said side drain conduit.

5,468,387

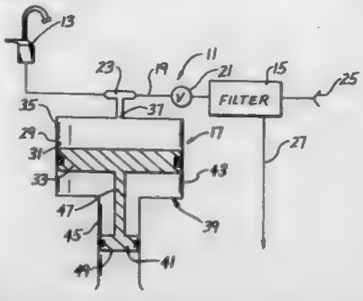
STORAGE TANK AND REVERSE OSMOSIS SYSTEM UTILIZING THE SAME

Donald F. Solomon, 45640 Denizen Heights Rd., Hemet, Calif. 92544

Continuation-in-part of Ser. No. 55,235, Apr. 28, 1993, abandoned, which is a division of Ser. No. 998,800, Dec. 30, 1992, Pat. No. 5,232,591. This application Jan. 13, 1995, Ser. No. 372,456

Int. Cl.[6] B01D 61/10

U.S. Cl. 210—257.2 16 Claims



14. A storage tank for receiving fluid and storing the fluid under pressure, said storage tank comprising:

a container having an interior space and a pressure responsive wall defining a fluid storage chamber, said fluid storage chamber having an inlet through which fluid can be supplied to the storage chamber and an outlet through which fluid can be discharged from the storage chamber;

said pressure responsive wall being displaceable as fluid is supplied to the storage chamber to increase the volume of the storage chamber;

a variable volume container, movement of the pressure responsive wall to increase the volume of the storage chamber reducing the volume of the variable volume container;

a compressible medium under pressure in the variable volume container to resist reduction in the volume of the variable volume container when fluid is being supplied to the storage chamber and to move the pressure responsive wall to discharge fluid from the storage chamber;

the change in volume of the fluid storage chamber for a given displacement of the pressure responsive wall being greater than the change in volume of the variable volume container; and

said variable volume container including a compressible medium container having the compressible medium therein and a volume reducing member, at least one of the volume reducing member and the compressible medium container being driven by the pressure responsive wall to force the volume reducing member into the compressible medium container to reduce the volume of the compressible medium container as the pressure responsive wall moves to increase the volume of the fluid storage chamber.

5,468,388

FILTER MODULE WITH DEGASSING FEATURE

Norman H. Goddard, Osterode, and Peter Schnefer, Bilshausen, both of, Germany, assignors to Sartorius AG, Germany

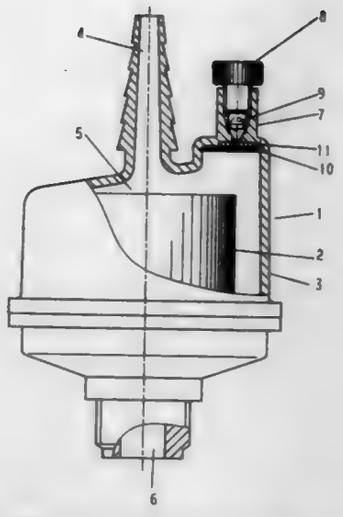
Filed Jun. 21, 1994, Ser. No. 263,798

Claims priority, application Germany, Jul. 1, 1993, 43 21 927.6

Int. Cl.[6] B01D 63/00

U.S. Cl. 210—321.75 2 Claims

1. A pressurizable filter module for high purity filtration of aqueous media which is adapted for high pressure testing of its integrity, said module comprising a housing, a cartridge filter element, a liquid feed inlet port, a liquid feed inlet plenum, a liquid filtrate port, a gas-tight manually closeable degassing fitting, and a hydrophobic membrane between said inlet plenum and said degassing fitting, said hydrophobic membrane being secured on its periphery to said housing.



5,468,389

DOUBLE-ACTING PUSHER CENTRIFUGE

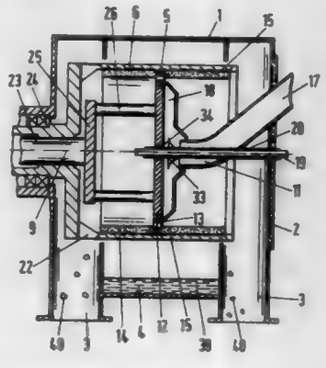
Niklaus Keller, Effretikon, Switzerland, assignor to Sulzer-Escher Wyss AG, Zurich, Switzerland

Filed Jun. 10, 1994, Ser. No. 258,043

Claims priority, application European Pat. Off., Jul. 22, 1993, 93810529

Int. Cl.[6] B04B 3/02

U.S. Cl. 210—360.2 10 Claims



1. A twin pusher centrifuge comprising:

a centrifuge housing;

a feeding unit for supplying a product mixture into the centrifuge housing;

a sieve drum defining a lengthwise axis, first and second oppositely located ends and an inner wall, the sieve drum being rotatably coupled within the housing for separating the product mixture into liquid and solid matter, the solid matter being directed radially outward to form filter cakes on the inner wall of the sieve drum; and

a pusher floor device positioned within the sieve drum for reciprocal axial movement therein and having an outer annular region facing the inner wall of the sieve drum, the outer annular region having opposite sides for alternatively pushing at least a portion of the solid matter in the filter cakes through the oppositely located ends of the seive drum to thereby discharge the portion of the solid matter from the seive drum, the pusher floor device including a plurality of axial through-flow openings communicating with the opposing sides of the outer annular region and a plurality of radial feed openings in communication with the feeding unit for directing the solid

matter of the product mixture through the axial throughflow openings to one of the opposing sides of the outer annular region.

5,468,390

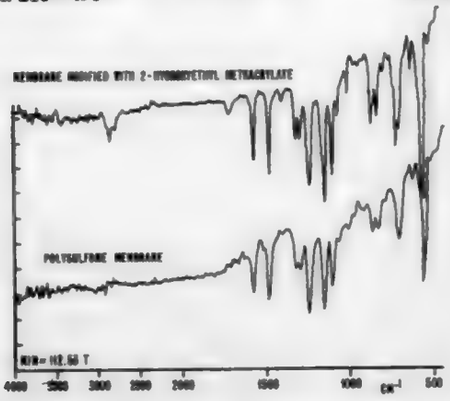
LOW FOULING ULTRAFILTRATION AND MICROFILTRATION ARYL POLYSULFONE

James V. Crivello, Clifton Park; Georges Belfort, Slingerlands, and Hideyuki Yamagishi, Troy, all of N.Y., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Continuation of Ser. No. 980,477, Nov. 23, 1992, abandoned. This application Dec. 22, 1993, Ser. No. 171,847

Int. Cl.[6] B01D *71/68*

U.S. Cl. 210—490 **11 Claims**



8. A modified aryl polysulfone membrane having low fouling characteristics, comprising:

an aryl polysulfone membrane having a surface onto which hydrophilic monomers are chemically grafted and attached to the base aryl sulfone to modify the original hydrophobic membrane to a modified hydrophilic water-wetting membrane;

the membrane being made by the process consisting essentially of:

placing an aryl polysulfone membrane into the presence of a hydrophilic vinyl monomer dissolved in a solvent and without any sensitizer or free radical initiator; and

exposing the membrane to nonionizing ultraviolet light for a selected period of time for modifying the membrane by chemically grafting and attaching the monomer at the surface of the membrane by covalent bonding without any sensitizer or free radical initiator.

5,468,391

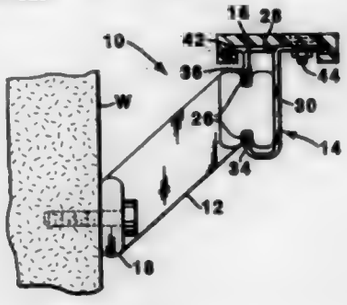
SLUDGE FLIGHT SUPPORT RAIL ASSEMBLY

Stephen B. Wilcher, Harleysville, Pa., assignor to FMC Corporation, Chicago, Ill.

Filed Jul. 1, 1994, Ser. No. 269,879

Int. Cl.[6] B01D *21/18*

U.S. Cl. 210—525 **5 Claims**



1. In combination with a sludge collector mechanism having a sludge flight extending between the longitudinal sidewalls of a settling tank for scraping settled sludge off the bottom of the settling tank and skimming floating waste from the surface of the water contained in the settling tank, the improvement comprising:

a support rail assembly for maintaining an end of the flight on a level generally even with the surface of the water, the support rail assembly comprising a longitudinal track on which the end of the flight is slideably supported and at least one mounting bracket for securing the track relative to the sidewall of the settling tank;

wherein the track comprises a cross section having a substantially horizontal rail portion, a transverse stem extending downward from the underside of the rail portion, and two opposing fingers, one extending upward from the bottom of the stem and one extending downward from the underside of the rail portion;

wherein the mounting bracket comprises a mounting plate through which the mounting bracket can be bolted to the sidewall and a mounting head having two opposing grooves into which the two opposing fingers are slideable received to thereby connect the track to the mounting bracket;

wherein the track and the mounting bracket are constructed of non-metallic materials.

5,468,392

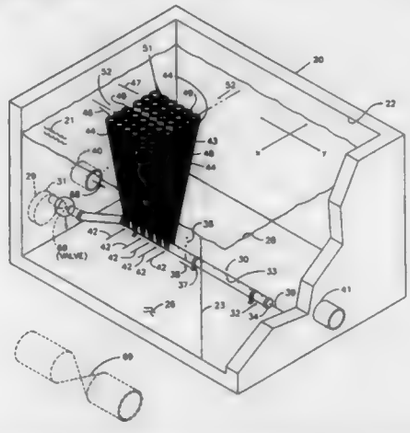
SUBMERGED FIXED-FILM BIOLOGICAL WASTE TREATMENT METHOD AND SYSTEM

Christopher D. Hanson, Arvada, and Charles L. Meurer, Golden, both of Colo., assignors to Meurer Research, Inc., Golden, Colo.

Filed Nov. 26, 1993, Ser. No. 159,986

Int. Cl.[6] C02F *3/10*

U.S. Cl. 210—615 **19 Claims**



14. A method of controlling the positioning of a structure which supports aerobic microorganisms in a container for treating liquid waste, said waste including a biodegradable waste product and having an upper surface, said container having a bottom, said method comprising the steps of:

mounting a gas supply pipe in said container above said bottom to define a space between said bottom and said pipe;

providing two separate buoyant supports in said container, each of said supports floating at or near the upper surface of said waste;

providing said structure in the form of an elongated porous tube which extends through said space to define first and second ends of said structure and a middle of said structure positioned under said pipe;

connecting each of said ends of said tube one of said buoyant supports to extend said tube and provide an elongated support for said microorganisms; and

flowing gas from said pipe to induce an upward flow of said waste above said pipe, said upward flow maintaining each of

said buoyant supports apart from the other of said tubes to extend said tubes from said middle.

5,468,393

METHODS OF CONTROLLING SCALE FORMATION IN THE PRESENCE OF METAL IONS IN AQUEOUS SYSTEMS

Davor F. Zidovec, Jacksonville, Fla., and Alexander D. Fisher, deceased, late of Jacksonville, Fla., assignors to Betz PaperChem, Inc., Jacksonville, Fla.

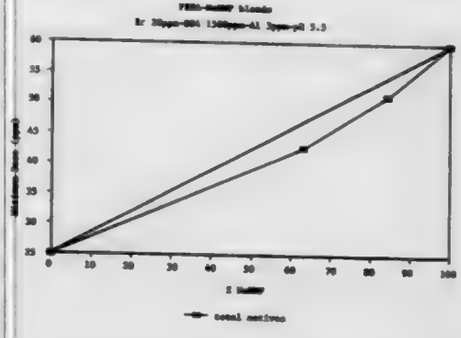
Continuation-in-part of Ser. No. 52,303, Apr. 23, 1991, Pat. No. 5,368,740. This application Oct. 20, 1994, Ser. No. 326,452

The portion of the term of this patent subsequent to Nov. 29, 2011, has been disclaimed.

Int. Cl.[6] C02F *5/10;5/14*

U.S. Cl. 210—697 **2 Claims**

1. A method of increasing barium, calcium and magnesium scale



control activity of polyepoxysuccinic acid in an acidic aqueous system containing barium, calcium and magnesium and including metal ions comprising Al^{+3} and Fe^{+3} in concentrations sufficient to adversely affect said scale control activity which comprises adding a sufficient amount for the purpose of a metal ion binding agent selected from the group consisting of sodium tripolyphosphate, polyacrylic acid, citric acid, tartaric acid and sodium hexametaphosphate to the aqueous system.

5,468,394

PRECIPITATION AND SEPARATION OF SALTS, SCALE SALTS, AND NORM CONTAMINANT SALTS FROM SALINE WATERS AND SALINE SOLUTIONS

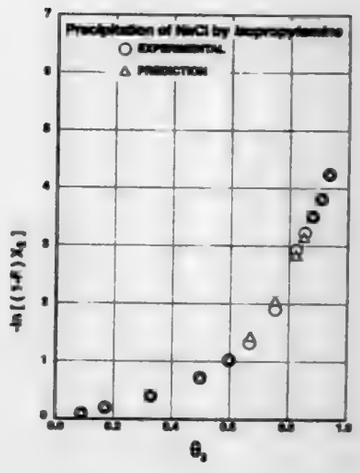
Mansour S. Bader, 1200 N. Perkins Rd., 2C, Stillwater, Okla. 74075

Filed May 31, 1994, Ser. No. 251,489

Int. Cl.[6] C02F *1/58;1/60*

U.S. Cl. 210—729 **6 Claims**

1. A method of removing salt from an aqueous solution comprising said salt and water, said method comprising the step of (a) adding an effective amount of a miscible organic solvent to said solution to cause at least a portion of said salt to form a solid precipitate, wherein said organic solvent is an amine selected from the group consisting of isopropylamine, propylamine, diisopropylamine, dimethylamine, ethylamine, and diethylamine and wherein said salt is a scale salt selected from the group consisting of sulfates, carbonates, and silicates of barium, calcium, and strontium.



5,468,395

PROCESS AND APPARATUS FOR DEMINERALIZING WATER

Didier Carron, Saint-Maur-des-Fosses; Philippe Deblay, Chatenay-Malabry, and Robert Desage, Verneuil-sur-Seine, all of, France, assignors to C.O.G.I.A. Societe Anonyme, Orsay, France

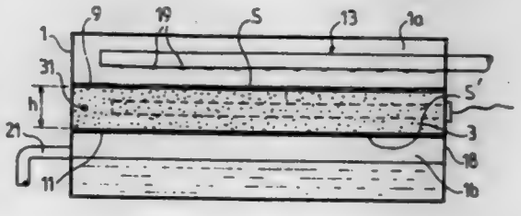
Filed Feb. 24, 1993, Ser. No. 21,845

Claims priority, application France, Feb. 24, 1992, 92 02107

Int. Cl.[6] B01D *35/18;* **C02F** *1/00*

U.S. Cl. 210—774 **26 Claims**

1. Apparatus for demineralizing water comprising:



porous material for demineralizing water comprising a fibrous microporous body including interfiber spaces in communication with one another, an upstream surface, a downstream surface, and a porosity of at least 50%;

supply means for supplying water to be demineralized to said upstream surface of said fibrous microporous body to cause percolation of the water through said fibrous microporous body from said upstream surface toward said downstream surface;

heating means for heating said fibrous microporous body, at least during percolation of the water, to a temperature of at least 60° C. so as to rapidly increase the temperature of the water to be demineralized that comes into contact with said fibrous microporous body; and

means for collecting demineralized water after percolation through said fibrous microporous body.

18. A method for demineralizing water comprising:

heating a fibrous microporous body to about 60° C., the fibrous microporous body comprising interfiber spaces in communication with one another, an upstream surface, a downstream surface, and a porosity of at least 50%;

supplying a sufficient quantity of water to be demineralized to said upstream surface, percolating the water through the fibrous microporous body and through the downstream surface; and

collecting demineralized water.

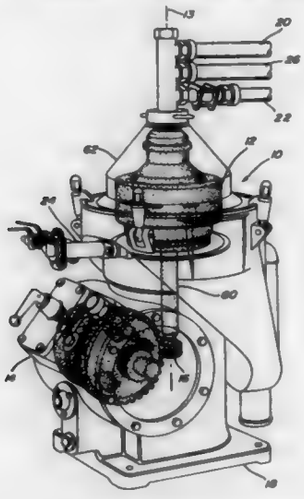
5,468,396

CENTRIFUGAL CLEANING OF PULP AND PAPER PROCESS LIQUIDS

Lawrence H. Allen, Pointe Claire, and Christine L. Lapointe, Dorion, both of, Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe-Claire, Canada

Filed Mar. 16, 1994, Ser. No. 213,639
Int. Cl.[6] B01D *21/26*
U.S. Cl. 210—787 **12 Claims**

1. A process for removal of a dispersed contaminant less dense



than water, from pulp and paper mill process liquids, said contaminant being selected from the group consisting of dispersed wood resins and wood resin soaps, comprising:

feeding an aqueous pulp and paper mill liquid containing said contaminant through an inlet into a centrifuge having an axis of centrifugal rotation, said centrifuge being effective to separate a fraction less dense than water, from water,

centrifuging said aqueous liquid about said axis to separate said aqueous liquid as an aqueous fraction which flows radially outwardly of said axis during the centrifuging and a less dense contaminant fraction which migrates towards said axis during the centrifuging and forms said contaminant fraction about said axis, in said centrifuge, and

recovering said aqueous fraction at a first outlet, as a first discrete fraction from said centrifuge, and said contaminant fraction at a second outlet, as a second discrete fraction from said centrifuge.

5,468,397

GAS BACKWASH OF PLEATED FILTERS

Steven D. Barboza, Baltimore, Md.; William P. Seeley, Shrewsbury, Pa., and Anthony C. Shucosky, Timonium, Md., assignors to Memtec America Corporation, Timonium, Md.

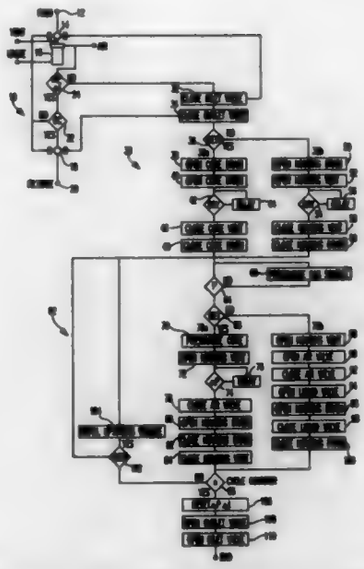
Filed Mar. 16, 1993, Ser. No. 32,009
Int. Cl.[6] B01D *29/66*
U.S. Cl. 210—798 **11 Claims**

1. The method of gas backwashing pleated filters in a filter housing, said pleated filter having pores, said pores having a bubble point, said pleated filter defining an upstream volume and a downstream volume within said housing, comprising the steps of:

A. Discontinuing filtration;

B. Withdrawing filtrate from said down-stream volume within said housing, establishing a gas pressure of at least about twice said bubble point of said filter in said downstream volume within said housing, and venting said upstream volume to ambient pressure;

C. Flowing gas from said downstream volume within said housing, through said pleated filter, and into an upstream volume within said housing, at an applied pressure sufficient to blow solids out of said pores of said filter medium;



D. Withdrawing solids within said up-stream volume of said housing by entrainment of material removed from said pleated filter in a wash liquid; and

E. Repeating steps B, C, and D in a cycle until said pleated filter is cleaned to the required extent.

5,468,398

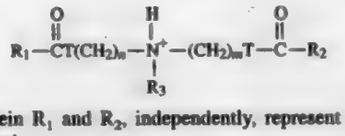
LIQUID FABRIC SOFTENING COMPOSITION

Amjad Farooq, Somerset; Ammanuel Mehreteab, Piscataway, both of N.J.; Guy Broze, Grace-Hollogne, Belgium, and Cristina Bielli, Morganville, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 20, 1993, Ser. No. 65,207
Int. Cl.[6] D06M *13/10;13/352*
U.S. Cl. 252—88 **13 Claims**

1. A stable, aqueous, free flowing, pourable and water dispensable fabric softener composition comprising:

(A) a fabric softening effective amount of an inorganic or organic acid salt per formula (I):



(I)

wherein R_1 and R_2, independently, represent C_{12} to C_{30} alkyl or alkenyl,

R_3 represents $(CH_2CH_2O)_pH$,

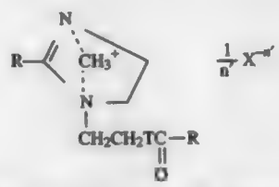
T represents NH,

n=1to5,

m=1 to 5, and

p=1.5 to 3.5;

(B) a viscosity controlling and softening improving effective amount of a cyclic imidazolinium compound of formula (II):



(II)

wherein each R represents an alkyl or alkenyl group having from 12 to 20 carbon atoms, and

T represents NH, and

X represents a counter-anion of valence n';

(C) an aqueous solvent including an anti-gelling effective amount of electrolyte;

(D) the weight ratio of formula (I) formula (II) is from about 1:0.7 to about 0.7to 1; and

(E) the total amount of (A) and (B) is in the range of from about 2 to about 35% by weight based on the total composition.

5,468,399

COLLOIDAL PRODUCTS CONTAINING SULFUR AND/OR PHOSPHORUS AND/OR BORON, THEIR PREPARATION AND THEIR UTILIZATION AS ADDITIVES FOR LUBRICANTS

Bruno Delfort, Paris; Bertrand Daoudal, Pontigny; Jacques Lallement, Aubervilliers; Maurice Born, Nanterre; Jean-Claude Hipeaux, Colombes, and Pierre Marchand, Orgeval, all of, France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Nov. 18, 1993, Ser. No. 153,926

Claims priority, application France, Nov. 18, 1992, 92 13933

Int. Cl.[6] C10M *159/12;135/10*

U.S. Cl. 252—18 **31 Claims**

1. A colloidal product containing at least one element selected from the group consisting of sulphur and phosphorus, and optionally boron, as well as at least one element selected from the group consisting of magnesium, calcium and zinc, said colloidal product having been produced in micellized form by a neutralization reaction of at least one acid with at least one basic non-micellized derivative of at least one metal selected from the group consisting of magnesium, calcium and zinc, in the presence of at least one surface active agent exempt from overbased product, said acid being selected from the group consisting of:

(1) a sulphurated carboxylic acid corresponding to the general formula

$$X—R^1—S_x—R^3—S_y—R^2—COOH$$

in which R^1 and R^2 each represent a divalent hydrocarbon radical, R^3 represents a simple bond or a divalent hydrocarbon radical, X represents a hydrogen atom or a carboxylic group; x and y each have an average value of 1 to 4 when R^3 is a divalent hydrocarbon radical and the sum (x+y) has an average value of 1 to 4 when R^3 represents a simple bond, and

(2) an acid containing sulphur and phosphorous formed in situ between (a) a phosphorus sulphide and (b) water or an aliphatic monoalcohol, or a mixture of water and an aliphatic monoalcohol.

5,468,400

LUBRICANT AND METHOD FOR LUBRICATING IMAGING MACHINE COMPONENTS

Steven B. Michlin, 5310 Bentley Suite 105, West Bloomfield, Mich. 48322

Continuation-in-part of Ser. No. 914,530, Jul. 17, 1992, Pat. No. 5,308,515. This application May 2, 1994, Ser. No. 236,374

Int. Cl.[6] C10M *103/00*

U.S. Cl. 252—21 **18 Claims**

1. A method for applying a lubricating powder on components of printing, copy, and facsimile machines, said lubricating powder comprising a mica-group mineral, said method comprising mixing said lubricating powder with a solvent to form a slurry or suspension, applying said slurry or suspension on said components, and then allowing said solvent to evaporate.

5,468,401

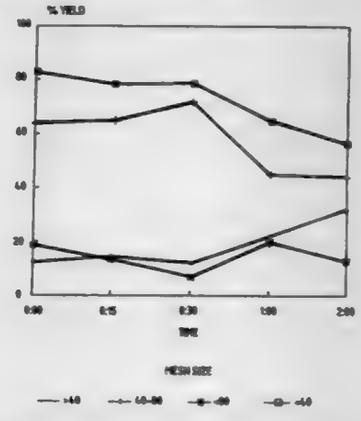
CARRIER-FREE METALWORKING LUBRICANT AND METHOD OF MAKING AND USING SAME

Andrew F. Lum, La Mirada; Juan M. Uribe, Valinda; John M. Hogan, Long Beach, all of Calif.; Richard A. Persinger, Winfield, Ill.; James F. Miller, Rowland Heights, Calif., and Ramesh A. Navaratnam, Plainfield, Ill., assignors to Chem-Trend, Incorporated, Howell, Mich.

Continuation of Ser. No. 954,936, Sep. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 664,104, Mar. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 367,311, Jun. 16, 1989, abandoned. This application Mar. 3, 1995, Ser. No. 398,388

Int. Cl.[6] C10M *125/02*

U.S. Cl. 252—22 **21 Claims**



1. A carrier-free pulverulent lubricant composition comprising at least two particulate lubricant components, and at least one of said components being graphite, the particles of said composition consisting essentially of particulate lubricant components which have become fused together in a heterogeneous mass in the substantial absence of a melted matrix.

5,468,402

LUBRICANT FOR USE IN HOT ROLLING OF STAINLESS STEEL

Seio Hachiya; Ken-ichi Shinoda, both of Tokyo, and Yuichi Higo, Hiroshima, all of, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

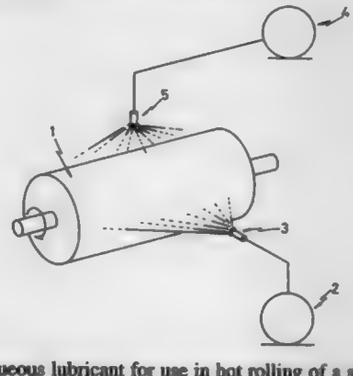
PCT No. PCT/JP90/00415, § 371 Date Sep. 21, 1992, § 102(e) Date Sep. 21, 1992, PCT Pub. No. WO91/14757, PCT Pub. Date Oct. 3, 1991

PCT Filed Mar. 28, 1990, Ser. No. 927,265

Claims priority, application Japan, Sep. 28, 1987, 62-243099

Int. Cl.[6] C10M *173/00*

U.S. Cl. 252—25 **9 Claims**



1. An aqueous lubricant for use in hot rolling of a stainless steel slab which is a non-oily lubricant to be sprayed over surfaces of hot rolling rolls during the hot rolling of stainless steel, which

lubricant comprises a viscous aqueous solution of water soluble high molecular weight thickener and from 1 to 30% by weight of iron oxide powder dispersed in said aqueous solution, at least 90% by weight of said iron oxide powder having a particle size not exceeding 10 μm, said lubricant having a viscosity within the range between 1×10^3 and 5×10^5 cP (centipoise) at ambient temperature.

5,468,403

PHOSPHORUS- AND MONO- OR DI-SULFIDE-CONTAINING ADDITIVES FOR LUBRICATION OILS

Michael G. Romanelli, Brooklyn, N.Y.; Raymond F. Watts, Long Valley, and Maryann Devine, Lincroft, both of N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Dec. 22, 1993, Ser. No. 173,731

Int. Cl.[6] C10M *135/20*

U.S. Cl. 252—47.5 **9 Claims**

1. An oil-soluble reaction product composition comprising:

(a) at least one reaction product of hydrocarbyl-substituted succinic acids and succinic anhydrides with polyamines

(b) at least one inorganic phosphorus-containing compound, and

(c) at least one mono- or di-sulfide-containing alkanol.

5,468,404

LUBRICATING OIL ADDITIVES, THEIR PREPARATION AND USE

William D. Carlisle, Hull, England, assignor to BP Chemicals (Additives) Limited, London, United Kingdom

Continuation of Ser. No. 49,618, Apr. 16, 1993, abandoned, which is a continuation of Ser. No. 674,656, Mar. 25, 1991, abandoned. This application Apr. 14, 1994, Ser. No. 227,703

Claims priority, application United Kingdom, Mar. 31, 1990, 90/07313; Dec. 21, 1990, 90/27825

Int. Cl.[6] C10M *149/12;149/22*

U.S. Cl. 252—51.5 R **7 Claims**

1. A process for preparing an oil-soluble compound for use as a dispersant additive which comprises reacting an aliphatic polyepoxide with a dispersant having at least one reactive nitrogen-containing moiety and having amino hydrogen in a first step using in said first step an amount of at least 0.75 equivalents of polyepoxide to amino hydrogen present in the dispersant, and in a second step reacting the product of the first step with a compound (A) having a molecular weight lower than said first dispersant and having at least two amino hydrogens, a second portion of dispersant being added at the same time as, or subsequent to, reaction of compound (A) with the product of the first step.

5,468,405

USE OF PARTIALLY DEHYDRATED CASTOR OILS AS LUBRICANTS

Johann Klein; Frank Bongardt, both of Duesseldorf, and Karl-Heinz Schmid, Mettmann, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP92/02663, § 371 Date May 26, 1994, § 102(e) Date May 26, 1994, PCT Pub. No. WO93/11207, PCT Pub. Date Jun. 10, 1993

PCT Filed Nov. 19, 1992, Ser. No. 244,356

Claims priority, application Germany, Nov. 27, 1991, 41 38 910.7

Int. Cl.[6] C10M *129/76*

U.S. Cl. 252—56 R **19 Claims**

1. In a process of lubricating, the improvement wherein the lubricant used therein contains a partly dehydrated castor oil with an hydroxyl value in the range of from 110 to 130 mg KOH/g.

5,468,406

MIXTURES OF ESTERS OF HIGHLY BRANCHED CARBOXYLIC ACIDS

Karl-Heinz Schmid, Mettmann; Frank Bongardt, Duesseldorf, and Reinhold Wuest, Knarst, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP92/01903, § 371 Date Feb. 28, 1994, § 102(e) Date Feb. 28, 1994, PCT Pub. No. WO93/05009, PCT Pub. Date Mar. 18, 1993

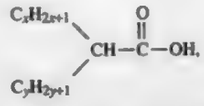
PCT Filed Aug. 20, 1992, Ser. No. 199,206

Claims priority, application Germany, Aug. 29, 1991, 41 28 646.4

Int. Cl.[6] C10M *105/34;105/38*

U.S. Cl. 252—56 S **19 Claims**

1. Mixtures of esters of carboxylic acids corresponding to general formula (I):



(I)

in which x and y may be the same or different and stand for a number of 4 to 22, with the proviso that x+y is an integer of 10 to 42, and polyol mixtures of

a) 60 to 99.9% by weight of branched aliphatic saturated polyols containing 2 to 6 primary hydroxyl groups and 4 to 10 carbon atoms and

b) 0.1 to 40% by weight of aliphatic, saturated, unbranched diols containing 2 to 12 carbon atoms,

these percentages by weight being based on the polyol mixture .

5,468,407

DIALKYLBENZENE MONOSULFONATE COLLECTORS USEFUL IN ORE FLOTATION

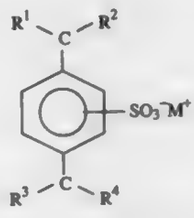
Kevin A. Frazier; Juan M. Garces, and Guo-shuh J. Lee, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 3, 1994, Ser. No. 333,659

Int. Cl.[6] B03D *1/02*

U.S. Cl. 252—61 **7 Claims**

1. A composition comprising an isomeric mixture of dialkylbenzene monosulfonic acids or salts thereof, the mixture containing greater than about 60 weight percent of the para dialkylbenzene isomer and greater than about 80 weight percent of the combined di(2-alkyl)benzene and di(3-alkyl)benzene isomers, the para dialkylbenzene monosulfonic acid or salt being represented by the formula:



wherein M is a hydrogen ion, a metal ion having a valence of +1, ammonium ion, or a (hydrocarbyl)ammonium ion; and wherein R^1, R^2, R^3, and R^4 are each alkyl moieties such that the combined number of carbon atoms in R^1, R^2, R^3, and R^4 is equal to or greater than 10.

5,468,408

ELECTROLYTE COMPOSITION FOR SCREEN PRINTING AND MINIATURIZED OXYGEN ELECTRODE AND PRODUCTION PROCESS THEREOF

Akio Sugama; Hiroaki Suzuki, and Naomi Kojima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 850,834, Mar. 13, 1992, Pat. No. 5,281,323. This application Nov. 3, 1993, Ser. No. 145,245
Claims priority, application Japan, Mar. 20, 1991, 3-057220; May 28, 1991, 3-123787
Int. Cl.[6] H01G 9/022; G01N 27/26
U.S. Cl. 252—62.2 3 Claims

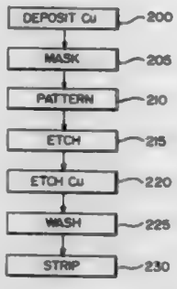
1. An electrolyte composition for screen printing, comprising:
an organic solvent;
a water soluble inorganic salt in the form of a fine powder of a size to pass through a screen printing mesh, said salt powder being dispersed in said organic solvent, said inorganic salt being selected from potassium chloride and sodium chloride; and
polyvinyl pyrrolidone dissolved in said organic solvent.

5,468,409

COPPER ETCHANT USEFUL FOR MAKING FINE-LINE COPPER ELEMENTS

Dennis L. Dull, Sumner, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 3, 1993, Ser. No. 147,183
Int. Cl.[6] C23F 1/34
U.S. Cl. 252—79.2 4 Claims



1. An aqueous saline solution for etching copper to close tolerance to define fine-line elements with features of about 3–10 mil±0.25 mil. consisting essentially of:
an effective amount of cupric chloride dissolved in initially deionized water to form an acid capable of etching the copper; and
at least about 125 gm/l chloride salt dissolved in the acid to negate migration effects during etching.

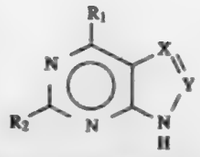
5,468,410

PURINE CLASS COMPOUNDS IN DETERGENT COMPOSITIONS

Petrus A. Angevaare, 841 Bernard Pl., Ho-Ho-Kus, N.J. 07423, and Richard G. Gary, 436 67th St., West New York, N.J. 07093

Continuation-in-part of Ser. No. 136,629, Oct. 14, 1993, abandoned. This application Sep. 8, 1994, Ser. No. 302,284
Int. Cl.[6] C11D 3/28;3/395;7/32;7/54
U.S. Cl. 252—95 20 Claims

1. An automatic dishwashing detergent composition comprising:
a) 1 to 20 weight percent of a bleaching agent selected from the group of a peroxygen agent, a hypohalite agent and its corresponding salts, and mixtures thereof;
b) 0.05 to about 10 weight percent of a purine class compound which prevents silver tarnishing and having a formula:


(I)

wherein X is nitrogen or C—R_3, Y is nitrogen or C—R_4, and R_1, R_2, R_3 and R_4 are independently a hydrogen, an oxygen, a hydroxy, an alkoxy, an amine, a straight or branched alkyl chain having 1 to 20 carbon atoms, an amido, an amidoalkyl, an alkylthio, an alkenyl or a hydroxyalkyl, provided that a pK_a value of the purine class compound is more than 1 unit below a pH value of an aqueous solution of a detergent composition in which it is incorporated;
c) 1 to 75 weight percent of a builder; and
d) 0 to 40 weight percent of a surfactant
wherein the detergent composition has a pH in a range of about 7 to about 11 and substantially prevents tarnishing of silver and silver plated articles in an automatic dishwasher.

5,468,411

POWDERED AUTOMATIC DISHWASHING COMPOSITION CONTAINING ENZYMES

Nagaraj S. Dixit, Plainsboro; Robert D'Ambrogio, Piscataway; Divaker Kenkare, Asbury, all of N.J., and Julien Drapier, Seraing, Belgium, assignors to Colgate Palmolive Co., Piscataway, N.J.

Continuation-in-part of Ser. No. 932,124, Aug. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 800,297, Nov. 29, 1991, abandoned, which is a continuation-in-part of Ser. No. 708,576, May 31, 1991, Pat. No. 5,173,207, and a continuation-in-part of Ser. No. 708,559, May 31, 1991, abandoned, and a continuation-in-part of Ser. No. 708,557, May 31, 1991, abandoned. This application Nov. 5, 1993, Ser. No. 147,413
Int. Cl.[6] C11D 3/386;3/37;3/08/3;395
U.S. Cl. 252—99 25 Claims

1. A free flowing powdered dishwashing composition having improved enzymes stability consisting essentially of a physical mixture of agglomerated beads having a maximum particle size of less than about 2,000 microns of at least one alkali metal detergent builder salt selected from the group consisting of an alkali metal carbonate and an alkali metal citrate and mixtures thereof, an alkali metal silicate, a low molecular weight noncrosslinked polyacrylate homopolymer, a low molecular weight non crosslinked polyacrylate copolymer, an alkali metal sulfate and a nonionic surfactant and a blend portion of the composition comprising at least one protease enzyme and an amylase enzyme, wherein the maximum particle size of the particles of said blend are less than about 2,000 microns, wherein the agglomerated beads comprises a core of at least one said alkali metal detergent builder salt, said alkali metal silicate, said low molecular weight non crosslinked polyacrylate polymer, said low molecular weight polyacrylate copolymer, and said alkali metal sulfate and a coating absorbed on said core of said alkali metal detergent builder salt, said alkali metal silicate, said low molecular weight noncrosslinked polyacrylate homopolymer, said low molecular weight polyacrylate copolymer, and said alkali metal sulfate, said coating comprising said nonionic surfactant, wherein the dishwashing composition consisting essentially of approximately by weight:
(a) 2 to 40 percent of at least one said alkali metal detergent builder salt;
(b) 3 to 30 percent of said alkali metal silicate;
(c) 1 to 10 percent of said low molecular weight non crosslinked polyacrylate homopolymer;
(d) 1.0 to 12.0 percent of said nonionic surfactant;
(e) 0 to 1.5 percent of said anti-foaming agent;
(f) 0.5 to 6.0% of said low molecular weight noncrosslinked polyacrylate copolymer, said copolymer being selected from

the group consisting of a copolymer of an acrylate and olefin and a copolymer of an acrylate and maleic anhydride;

(g) 5 to 45% of said alkali metal sulfate;

(h) 0.5 to 15.0 percent of at least one said protease enzyme; and

(i) 0.3 to 8.0 percent of said amylase enzyme, said composition having less than 8.0 weight percent of water.

5,468,412

LOW FOAMING AQUEOUS CLEANING AND PASSIVATING TREATMENT FOR METALS

Edward A. Rodzewich, Flourtown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 107,382, Aug. 16, 1993, abandoned. This application Sep. 14, 1994, Ser. No. 306,041

Int. Cl.[6] C11D *3/48;3/30*

U.S. Cl. 252—106 **4 Claims**

1. A cleaning and passivating treatment solution for metal surfaces for use in soft water, which is resistant to foaming, comprising an essentially phosphate free aqueous solution of from 10 to 30% wt. monoethanolamine, from 2 to 10% wt. boric acid, from 0.2 to 1.8% wt. a nonionic surfactant having a cloud point below about 25° C., and from 2.0 to 10% wt. a hydrotropic coupling agent consisting of caprylic acid in combination with a C9 or C 10 fatty acid in a ratio of about 6 to 1 and optionally up to about 0.2% to wt. a biocidal agent.

5,468,413

STABLE, AQUEOUS LAUNDRY DETERGENT COMPOSITION HAVING IMPROVED SOFTENING PROPERTIES

Francesco de Buzzaccarini, Fairfield; Timothy J. Farwick, Cincinnati, and Yeuqian Zhen, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 25, 1994, Ser. No. 232,509

The portion of the term of this patent subsequent to Nov. 14, 2012, has been disclaimed.

Int. Cl.[6] C11D *1/04;1/29;1/62;1/65*

U.S. Cl. 252—117 **30 Claims**

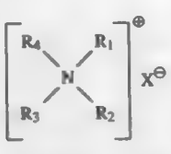
1. A substantially clear, aqueous, isotropic heavy duty liquid laundry detergent composition comprising, by weight of the composition:

a) from about 10% to about 40% of an anionic surfactant component which comprises, by weight of the composition:

(i) from about 5% to 40% of alkyl polyethoxylate sulfates wherein the alkyl group contains from 10 to 22 carbon atoms and the polyethoxylate chain contains from 1 to 15 ethylene oxide moieties; and

(ii) no more than about 5% of alkyl benzene sulfonates; and

b) from about 1% to about 10% of quaternary ammonium fabric-softening agent having the formula



wherein R_1 and R_2 are individually selected from the group consisting of C_1–C_4 alkyl, C_1–C_4 hydroxy alkyl, benzyl, and $-(C_2H_4O)_xH$ where x has a value from 2 to 5; X is an anion; and (1) R_3 and R_4 are each a C_8–C_{14} alkyl or (2) R_3 is a C_8–C_{22} alkyl and R_4 is selected from the group consisting of C_1–C_{10} alkyl, C_1–C_{10} hydroxy alkyl, benzyl, and $-(C_2H_4O)_xH$ where x has a value from 2 to 5;

c) from about 1% to about 10% of a fatty acid containing from about 8 to about 20 carbon atoms; provided that the anionic surfactant and quaternary ammonium fabric-softening agent are present in a weight ratio of at least about 3:1 wherein said composition is free from suspended crystals, precipitates or more than one liquid or liquid crystalline phase.

5,468,414

BUILT LIQUID DETERGENTS WITH BORIC-POLYOL COMPLEX TO INHIBIT PROTEOLYTIC ENZYME

Rajan K. Panandiker, The Procter & Gamble Company, Ivorydale Technical Center, Cincinnati, Ohio 45217; Christiaan A. J. Thoen, and Pierre M. A. Lenoir, both of Procter & Gamble European Technical Center N.V. Temselaan ILL, B-1820 Strombeek-Bever, Belgium

Continuation of Ser. No. 38,566, Mar. 26, 1993, abandoned, which is a continuation of Ser. No. 693,515, Apr. 30, 1991, abandoned. This application Dec. 21, 1994, Ser. No. 361,023

Int. Cl.[6] C11D *3/386;3/02;3/18;3/26*

U.S. Cl. 252—135 **1 Claim**

1. A liquid detergent composition comprising:

A) a boric-polyol complex formed by reacting a boron compound selected from the group consisting of boric acid, borax and boric oxide, with a vicinal polyol selected from 3-chloro-1,2-propanediol, 1 -phenyl- 1,2-ethanediol and propylgallate; wherein in forming said complex the boron compound is used in an amount which comprises from about 0.05% to 20% by weight of the composition and the vicinal polyol is used in an amount which comprises from about 0.1% to 30% by weight of the composition, and wherein the molar ratio of boron compound to vicinal polyol ranges from about 3:1 to 1:10;

B) from about 0.0001 to 1.0 weight % of active proteolytic enzyme;

C) a performance-enhancing amount of a second enzyme selected from the group consisting of lipase, amylase, cellulase and mixtures thereof;

D) from about 1 to 80 weight % of a surfactant selected from anionic surfactants, nonionic surfactants and mixtures thereof; and

E) from about 0.1 to 30 weight % of alphahydroxyacid builder.

5,468,415

PAINT STRIPPER COMPOSITION

Chester P. Jarema, Sterling Heights, Mich., assignor to Specialty Environmental Technologies, Inc., Auburn Hills, Mich.

Continuation of Ser. No. 911,188, Jul. 9, 1992, Pat. No. 5,298,184. This application Feb. 10, 1994, Ser. No. 194,496

The portion of the term of this patent subsequent to Mar. 29, 2011, has been disclaimed.

Int. Cl.[6] C11D *7/22;7/26;7/32;* **C09D** *9/00*

U.S. Cl. 252—171 **9 Claims**

1. A paint stripper having a long shelf life and improved odor, said composition consisting essentially of:

from about 10% to about 55% by weight of d-limonene;

from about 45% to about 90% by weight N-methyl pyrrolidone; and

an effective amount of a thickener;

wherein the d-limonene, N-methyl pyrrolidone and thickener are equal to approximately 100% by weight.

5,468,416
DETERGENT ENZYMES

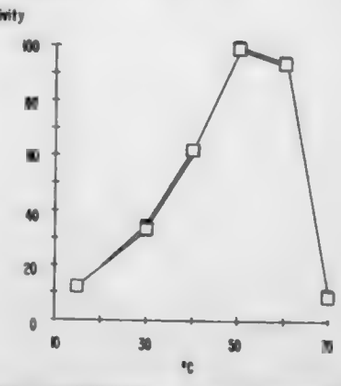
Helle Outtrup, Ballerup; Dorrit A. Aaslyng, Roskilde; Claus Dambmann, Soeborg, and Shamkant A. Patkar, Lyngby, all of, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK92/00273, § 371 Date Feb. 8, 1994, § 102(e) Date Feb. 8, 1994, PCT Pub. No. WO93/05134, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 11, 1992, Ser. No. 193,112

Int. Cl.[6] C11D *3/386*

U.S. Cl. 252—174.12 **8 Claims**



1. A detergent composition comprising a surfactant and a protease derived from a strain of the genus Verticillium selected from the group consisting of *Verticillium bulbillosum* CBS No. 145.70, *Verticillium bulbillosum CBS No.* 146.70, *Verticillium bulbillosum CBS No.* 247.68, and *Verticillium suchlasporium var. suchlasporium* CBS No. 464.88, wherein the protease has a pH optimum in the range of 8–11 and a temperature optimum in the range of 45°–65° C.

5,468,417
SILICONE CONTAINING VOC COMPLAINT PAINT REMOVER

Gary E. LeGrow, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 179,053, Jan. 7, 1994, Pat. No. 5,403,402. This application Aug. 8, 1994, Ser. No. 287,450

Int. Cl.[6] C11D *7/50*

U.S. Cl. 252—174.15 **11 Claims**

1. A composition for removing a coating painted on a surface consisting essentially of a solvent consisting essentially of 70–75% by weight acetone; 5–10% by weight water; and 15–20% by weight volatile silicone fluid having a vapor pressure less than 0.10 mm Hg; the volatile silicone fluid being (i) a volatile short chain linear silicone fluid having only methyl groups and alkyl groups with 6–12 carbon atoms as substituents on silicon atoms, or (ii) a volatile short chain linear silicone fluid having only methyl groups and phenyl groups as substituents on silicon atoms.

5,468,418
DETERGENT COMPOSITION CONTAINING MIXTURE OF HYDRATABLE AND NON-HYDRATABLE SALTS

Kenneth L. Rabone, Merseyside, England, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 920,493, Aug. 20, 1992, abandoned. This application Nov. 30, 1994, Ser. No. 346,989

Claims priority, application United Kingdom, Feb. 26, 1990, 9004259

Int. Cl.[6] C11D *3/60;3/04;3/14;17/00*

U.S. Cl. 252—174.25 **9 Claims**

1. A liquid, non-aqueous composition comprising:

liquid nonionic surfactant in an amount of 25 to 75% by weight having suspended therein

20 to 75% of a solid particulate material with a surface weighted mean particle size in the range 1 to 100 microns which comprises

i) from 10 to 20% by weight of one or more water-soluble salts which form hydrate(s) stable at 20° C. but are present in a substantially anhydrous state, selected from the group consisting of sodium tripolyphosphate, sodium carbonate, sodium percarbonate, sodium perborate, sodium sulphate, sodium silicate, sodium sesquicarbonate, sodium citrate and sodium nitrilotriacetate together with

ii) from 30 to 50% by weight of one or more salts which has no stable hydrate at 20° C., selected from the group consisting of sodium bicarbonate, calcite, feldspar and dolomite,

the average particle size of all water-soluble salts in said particulate material being 10 microns or greater,

said composition further comprising 0.5 to 5% by weight of a suspended carrier material selected from the group consisting of silica, alumina, magnesia, ferric oxide and mixtures thereof, said carrier material having a surface weighted mean particle size in the range from 1 to 900 millimicrons,

all of the above percentages being by weight based on the whole composition.

5,468,419
PREPARATION OF C_9 ALCOHOL MIXTURE AND PLASTICIZER

Chihiro Miyazawa; Souichi Orita, and Akio Tsuboi, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Continuation of Ser. No. 738,916, Aug. 1, 1991, Pat. No. 5,189,105, which is a continuation of Ser. No. 438,569, Nov. 20, 1989, abandoned, which is a continuation of Ser. No. 152,495, Feb. 5, 1988, abandoned. This application Aug. 5, 1991, Ser. No. 740,403

Claims priority, application Japan, Feb. 9, 1987, 62-27561

The portion of the term of this patent subsequent to Feb. 23, 2010, has been disclaimed.

Int. Cl.[6] C09K *3/00;* **C07C** *27/20*

U.S. Cl. 252—182.12 **14 Claims**

1. A method of preparing a C_9 alcohol mixture, comprising the steps of:

(a) obtaining a C_9 alcohol mixture by dimerizing butene fractions to obtain a C_8 olefin, hydroformylating the C_8 olefin and hydrogenating the hydroformylated product, and

(b) distilling said alcohol mixture to obtain a distilled alcohol mixture comprising from 10–50% by weight of a first group component having a retention time not longer than the retention time of isobutyl n-caprylate, from 10–40% by weight of a second group component having a retention time longer than that of isobutyl n-caprylate and not longer than that of methyl n-caprate and from 30–70% by weight of a third group component having a retention time longer than that of methyl n-caprate, as divided into such three components by gas chromatography using a capillary column packed with a polyethylene glycol having a number average molecular weight of 15,000–20,000 as an isomer separating agent.

2. A process for preparing a plasticizer, comprising the steps of:

(a) obtaining a C_9 alcohol mixture by dimerizing butene fractions to obtain a C_8 olefin, hydroformylating the C_8 olefin and hydrogenating the hydroformylated product, and

(b) distilling said alcohol mixture to obtain a distilled alcohol mixture comprising from 10–50% by weight of a first group component having a retention time not longer than the retention time of isobutyl n-caprylate, from 10–40% by weight of a second group component having a retention time longer than that of isobutyl n-caprylate and not longer than that of methyl n-caprate and from 30–70% by weight of a third group component having a retention time longer than that of methyl n-caprate, as divided into such three components by gas

chromatography using a capillary column packed with a polyethylene glycol having a number average molecular weight of 15,000–20,000 as an isomer separating agent, and

(c) reacting said distilled alcohol mixture with a carboxylic acid anhydride to form said plasticizer.

5,468,420

POLYOL COMPOSITIONS AND RIGID POLYISOCYANATE-BASED FOAMS CONTAINING 2-CHLOROPROPANE AND ALIPHATIC HYDROCARBON BLOWING AGENTS

Thomas L. Fishback, Gibraltar, and Thomas B. Lee, Southgate, both of Mich., assignors to BASF Corporation, Mt. Olive, N.J.

Division of Ser. No. 291,631, Aug. 17, 1994. This application May 22, 1995, Ser. No. 446,992

Int. Cl.[6] C08K *3/00*

U.S. Cl. 252—182.24 **10 Claims**

1. A homogeneously soluble polyol composition comprising:

a) one or more compounds having at least two isocyanate active hydrogens comprising a polyoxyalkylene polyether polyol;

b) 2-chloropropane; and,

c) a blowing agent comprising C_4–C_6 aliphatic hydrocarbon compound.

5,468,421

CYCLOHEXANE DERIVATIVE AND LIQUID CRYSTAL COMPOSITION CONTAINING THE SAME

Shuichi Matsui; Yasuyuki Goto; Yuichi Onji, and Atsuko Fujita, all of Chiba, Japan, assignors to Chisso Corporation, Osaka, Japan

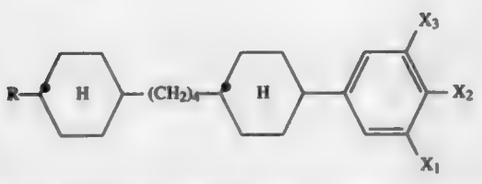
Filed Apr. 28, 1993, Ser. No. 53,417

Claims priority, application Japan, Apr. 28, 1992, 4-110351

Int. Cl.[6] C02K *19/30*; C07C *255/50;25/13*

U.S. Cl. 252—299.63 **12 Claims**

1. A phenyl-4-cyclohexylbutylcyclohexane derivative expressed by the formula



(I)

wherein R represents a hydrogen atom or a linear or branched alkyl group of 1 to 15 carbon atoms, and X_1, X_2 and X_3 are each independent and X_1 and X_3 each represent a hydrogen atom or a halogen atom and X_2 represents (1) a hydrogen atom, (2) a linear or branched alkyl group of 1 to 15 carbon atoms, wherein one $—CH_2CH_2—$ bond may be replaced by a —CH=CH— bond and one non-adjacent $—CH_2—$ bond may be replaced by an oxygen atom, (3) a halogen atom, (4) a cyano group, (5) a trifluoromethyl group or (6) a trifluoromethoxy group.

5,468,422

COMPOSITION FOR USE IN WASHING AND CLEANSING VULCANIZATION MOLDS

Cesare Khouzam, Milan, and Gianfranco Ferroni, Monza, both of, Italy, assignors to Silvani Antincedi, Milan, Italy

PCT No. PCT/IT92/00011, § 371 Date Sep. 21, 1993, § 102(e) Date Sep. 21, 1993, PCT Pub. No. WO92/16346, PCT Pub. Date Oct. 1, 1992

PCT Filed Feb. 4, 1992, Ser. No. 119,173

Claims priority, application Italy, Mar. 22, 1991, MI91A0787

Int. Cl.[6] C11D *1/42;1/20*

U.S. Cl. 252—544 **6 Claims**

1. A tire or rubber article vulcanization mold cleaning composition, consisting essentially of:

(a) from 10 to 80% of an amine selected from the group consisting of monomethylethanolamine, dimethylpropanolamine, ethylhexoxyburylamine, aminoethylethanolamine, diethanolamine, monoethanolamine, and a mixture thereof,

(b) from 2 to 20% of a nonionic or anionic surface active agent selected from the group consisting of a fatty acid-modified alkanolamine containing 12 to 18 carbon atoms, a fatty alcohol and an alkyl phenol alkoxylated with 4 to 20 moles of alkylene oxide; an alkylaryl sulfonate, a sulfonated α-olefin, an ethoxylated or non-ethoxylated sulfate alcohol, and a mixture thereof, and

(c) from 80 to 10% of a solvent selected from the group consisting of diethylene glycol dimethylether, diethylene glycol diethylether, ethylene glycol monomethylether, ethylene glycol monoethylether, ethylene glycol monopropylether, ethylene glycol monobutylether, ethylene glycol monophenylether, diethylene glycol monomethylether, diethylene glycol monoethylether, diethylene glycol monopropylether, diethylene glycol monobutylether, triethylene glycol monomethylether, triethylene glycol monoethylether, triethylene glycol monopropylether, triethylene glycol monobutylether, anisole, and isophorone.

5,468,423

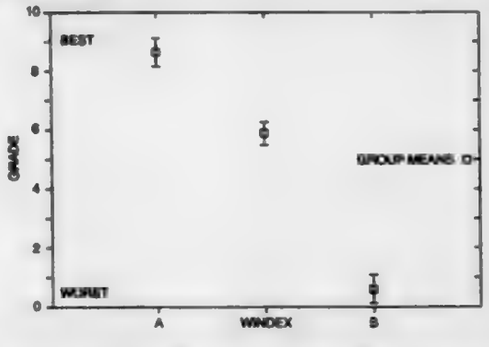
REDUCED RESIDUE HARD SURFACE CLEANER

Aram Garabedian, Jr., Fremont; Scott C. Mills, Livermore; William P. Sibert, Stockton; Clement K. Choy, Alamo, and Fernando J. Rebelo do Couto, Pleasanton, all of Calif., assignors to The Clorox Company, Del.

Continuation-in-part of Ser. No. 832,275, Feb. 7, 1992, Pat. No. 5,252,245. This application Oct. 8, 1993, Ser. No. 134,348

Int. Cl.[6] C11D *1/66;3/26;3/28;3/43*

U.S. Cl. 252—546 **13 Claims**



1. An aqueous, hard surface cleaner with significantly improved residue removal and substantially reduced filming/streaking, said cleaner consisting essentially of

(a) about 1–50% of a solvent selected from C_{1-6} alkanol, $C_{3\geq 24}$ alkylene glycol ether, and mixtures thereof;

(b) about 0.5–10% of a nonionic surfactant;

(c) about 0.01–2% of a buffering system which comprises a nitrogenous buffer selected from the group consisting of: ammonium or alkaline earth carbamates; and

(d) the remainder as substantially all water.

5,468,424

LIQUID-LIKE FLAME RETARDANT ADDITIVES FOR POLYMERS

Ronald J. Wieneckoski, Morrisville, Pa., assignor to Amspec Chemical Co., Inc., Gloucester City, N.J.

Filed Jul. 30, 1993, Ser. No. 99,512
Int. Cl.[6] C09K 21/00
U.S. Cl. 252—609 10 Claims

1. A dispersion of particulate solids dispersed in a liquid carrier, which dispersion is pourable at room temperature, said dispersion consisting essentially of at least 85 weight percent of said particulate solids dispersed in said carrier liquid, said dispersion containing from about 1 to about 3 percent by weight of a hyperdispersing agent, the remainder of said dispersion comprising said carrier liquid, wherein said particulate solids comprise a mixture of antimony oxide in powder form and at least one other particulate solid, and wherein said other particulate solid is a powder of a lead stabilizing compound.

5,468,425

GAS-LIQUID CONTACT APPARATUS INCLUDING TRAYS WITH VAPOR APERTURES IN OVERLAPPING PANEL MARGINS

Dale E. Nutter, 7935 S. New Haven St., Tulsa, Okla. 74136

Continuation-in-part of Ser. No. 77,613, Jun. 17, 1993, Pat. No. 5,360,583, and a continuation-in-part of Ser. No. 216,297, Mar. 23, 1994. This application Aug. 1, 1994, Ser. No. 283,625
Int. Cl.[6] B01F 3/04
U.S. Cl. 261—114.3 14 Claims

1. A fluid contact tray for supporting a body of liquid moving thereacross in a generally horizontal flow direction from an upstream location to a downstream location, comprising,

a deck formed of a plurality of interconnected panels with apertures for introducing ascending vapors under pressure into said liquid,

a first said panel having a margin area,

a second said panel having a margin area which overlies and is connected to said margin area of said first panel,

a plurality of apertures formed in said margin area of said first panel,

a plurality of apertures formed in said margin area of said second panel,

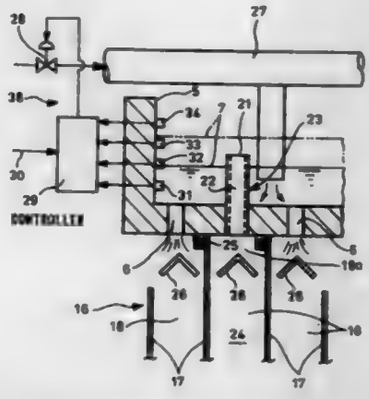
said apertures in the margin area of the first panel overlapping said apertures in said margin area of the second panel so that ascending vapors flow through the overlapping margin areas via the apertures which overlap, said apertures in the margin area providing the tray with a more uniform apertures distribution and a greater open area than would exist if the margin areas of the panels had no apertures for ascending vapors.

5,468,426

PROCESS FOR COOLING WATER AND COOLING TOWER

Kanji Kato, Chiba, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 23, 1994, Ser. No. 311,735
Claims priority, application Japan, Dec. 29, 1993, 5-349672
Int. Cl.[6] B01F 3/04
U.S. Cl. 261—153 33 Claims



1. In a process for cooling water in which the water to be cooled is sprayed through water spray ports at a bottom of an upper water vessel into a filler unit having a plurality of heat exchange surface members extending in parallel with each other to define flow passages therebetween and concurrently ambient air is sucked transversely into the flow passages, whereby the water flowing down over the heat exchange surface members is cooled by the ambient air in a cross flow manner,

an improvement which comprises sectioning some of said flow passages so as to supply said water to said some of flow passages through upper water intake ports located higher than said water spray ports of said upper water vessel;

in a normal condition with no fear of white smoke being generated, maintaining the water in said upper water vessel at a level higher than said upper water intake ports, thereby spraying said water over all of said heat exchange surface members and effecting direct cooling of the water in every flow passage by the ambient air,

and in a condition with a possibility of the white smoke being generated, maintaining said water in said upper water vessel at a level below said upper water intake ports so that the spray of said water into the flow passages communicated with said upper water intake ports is interrupted, whereby the direct cooling by the ambient air of said water in the flow passages into which said water is sprayed is effected simultaneously with dry heating of the ambient air flowing through the flow passages into which no water is sprayed and wet air resulting from said direct cooling is mixed with dry air resulting from said dry heating.

5,468,427

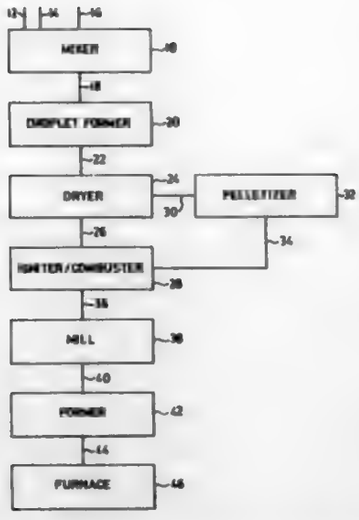
PROCESS FOR MAKING ULTRA-FINE CERAMIC PARTICLES

Gregory C. Stangle, Alfred; Koththavasal R. Venkatachari, Hornell; Steven P. Ostrander, Scotia, and Walter A. Schulze, Alfred Station, all of N.Y., assignors to Alfred University, Alfred, N.Y.

Filed Sep. 27, 1993, Ser. No. 127,637
Int. Cl.[6] C01B 13/34; C01G 1/00; C01F 1/00
U.S. Cl. 264—3.4 17 Claims

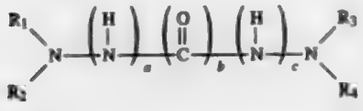
1. A process for producing ultra-fine ceramic particles, comprising the steps of:

(a) forming droplets of a ceramic precursor mixture containing a metal cation, a nitrogen-containing fuel, a solvent, and an anion capable of participating in an anionic oxidation-



reduction reaction with the nitrogen containing fuel, wherein said nitrogen-containing fuel is of the formula $R(HA)_a$, wherein:

1. a is an integer of from 0 to 2,
2. HA is selected from the group consisting of HNO_3, HCl, HBr, HI, H_2SO_4, H_2O, and CH_3COOH,
3. R is of the formula



wherein:

(a) R_1, R_2, R_3, and R_4 are independently selected from the group consisting of hydrogen, alkyl of from 1 to about 4 carbon atoms, and phenyl;

(b) b is an integer of from 1 to 2, c is an integer of from 0 to 2, and a plus c is at least 1, and

4. R contains at least four hydrogen atoms, provided that the ratio of hydrogen atoms to oxygen atoms in R is at least 3;

(b) removing at least about 85 weight percent of the solvent from the droplets of the ceramic precursor mixture to form particles comprising the metal cation, the anion, and the nitrogen-containing fuel, thereby forming dried particles; and

(c) subjecting said dried particles to a temperature of from about 500 to about 600 degrees centigrade and an atmosphere with a relative humidity of less than about 60 percent, thereby causing said dried particles to react in an explosive manner.

5,468,428

SPATIALLY MODIFIED ELASTIC LAMINATES

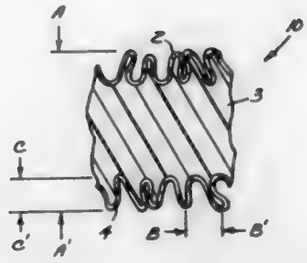
Thomas P. Haeschen, St. Paul, Minn.; Dennis L. Krueger, Hudson, Wis., and Gregory P. Karp, Brooklyn Park, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 502,330, Mar. 30, 1990, Pat. No. 5,344,691. This application Jun. 2, 1994, Ser. No. 252,898

Int. Cl.[6] B29C *35/02*

U.S. Cl. 264—483 **8 Claims**

1. A method of forming a zone activatable inelastic laminate comprising the steps of providing a multilayer laminate of elastomeric core and thermoplastic skin layers and treating said laminate at certain regions in one or more layers to provide preferential activation zones wherein said preferential activation zones will preferentially elongate and recover to form an elastic zone.



5,468,429

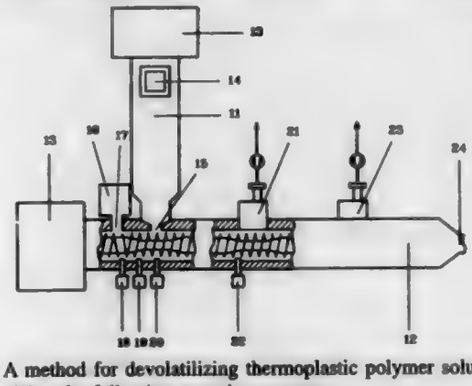
ULTRASOUND-ENHANCED DEVOLATILIZATION OF THERMOPLASTIC PLASTICS

Tzu-Li Li, 2F, No. 100 Wan-An St., Hsin-Chung City, Taipei; I-Chung Tung, 136-3, Ln. 89, Kaung-Fu Rd., Sec. 1, Hsinchu, both of, Taiwan, Prov. of China, and Duncan Yu, M-37, 44 Center Grove Rd., Randolph, N.J. 07869

Filed Apr. 15, 1994, Ser. No. 228,199

Int. Cl.[6] B01D *1/26;* **B29B** *13/08*

U.S. Cl. 264—442 **3 Claims**



1. A method for devolatilizing thermoplastic polymer solutions comprising the following steps in sequence:

(i) passing a preheated thermoplastic polymer solution through a heatable zone to maintain a solution temperature which is above the normal boiling points of volatile components and below the boiling point of said polymer in said solution;

(ii) scattering down said solution at an outlet of said heatable zone disposed in a vessel, by means of force produced by ultrasonic horns and gravity, to a plurality of vertical heating plates whose temperature is maintained above the melting point of said polymer but below the temperature at which said polymer suffers significant degradation, while the devolatilization of said polymer solution proceeds under atmospheric pressure;

(iii) flowing said solution along the surfaces of said vertical heating plates toward an outlet of said vessel by gravity and then into a feed inlet of a first extruder, which feed inlet of said first extruder is connected to said outlet of said vessel;

(iv) operating said first extruder to extrude said solution into a feed inlet of a second extruder, each of said first and second extruders having a casing with a cylindrical bore, a feed inlet, a discharge end and a plurality of openings and an extruder screw which is rotatable in said cylindrical bore of said casing and is driven by drive means located at the end of said casing opposite said discharge end, while the rotation speed of said screw of said first extruder is suitably controlled so that the screw channel is partially filled by said polymer solution in the vicinity of said feed inlet of said second extruder, which feed inlet of said second extruder is connected to said discharge end of said first extruder;

(v) allowing volatile components to escape through one of said openings on said casing which is located in the region between said feed inlet and said drive means of said second extruder and connected to vacuum means for producing reduced presssure therein, and in said region a plurality of

ultrasonic horns are disposed for producing sonic or ultrasonic vibrations in said solution;

(vi) propelling said solution forward toward said discharge end of said second extruder;

(vii) allowing volatile components to escape through a first one of said openings downstream from said feed inlet of said second extruder, around which a plurality of ultrasonic horns are disposed for producing sonic or ultrasonic vibrations in said solution;

(viii) allowing volatile components escape through each of the remaining openings on said casing of said second extruder, wherein each of the remaining openings is any opening located between said first one of said openings and said discharge end of said second extruder, around which a plurality of ultrasonic horns for producing sonic or ultrasonic vibrations in said solution can also be disposed to increase devolatilizing efficiency; and

(ix) discharging said polymer from said discharge end of said second extruder at a volatile content or less than 1000 ppm.

5,468,430

PROCESS OF MAKING MULTICOMPONENT OR ASYMMETRIC GAS SEPARATION MEMBRANES

Okan M. Ekiner, and Gregory K. Fleming, both of Wilmington, Del., assignors to L'Air Liquide S.A., Paris Cedex, France

Filed May 19, 1994, Ser. No. 246,201

Int. Cl.[6] D01D *5/12;5/247;* **D01F** *8/04*

U.S. Cl. 264—28 **2 Claims**

1. A process for making a multicomponent gas separation membrane comprising the steps of:

a. dissolving first polymer or polymers in a suitable solvent to form a core solution;

b. dissolving second polymer or polymers in a solvent to form a sheath solution having at least 27–35 weight percent of said second polymer or polymers;

c. coextruding the core and sheath solutions at a temperature of 85°–100° C. through a spinneret having at least one hollow fiber spinning orifice to provide at least one nascent multicomponent hollow fiber membrane;

d. drawing said nascent multicomponent hollow fiber membrane through an air gap of 7–9 cm at a draw ratio of 3.0–6.0;

e. introducing said nascent multicomponent hollow fiber membrane into a coagulation bath at a temperature of 0°–20° C. to solidify the nascent multicomponent hollow fiber membrane into a hollow fiber membrane.

2. A process for making an asymmetric gas separation membrane comprising the steps of:

a. dissolving polymer or polymers in a solvent to form a sheath solution having 27–35 weight percent of said polymer or polymers;

b. extruding the solution at a temperature of 85°–100° C. through a spinneret having at least one hollow fiber spinning orifice to provide at least one nascent hollow fiber membrane;

c. drawing said nascent hollow fiber membrane through an air gap of 7–9 cm at a draw ratio of 3.0–6.0;

d. introducing said nascent hollow fiber membrane into a coagulation bath at a temperature of 0°–20° C. to solidify the nascent hollow fiber membrane into a hollow fiber asymmetric membrane.

5,468,431

METHOD FOR PREPARING MOLDABLE MIXTURES OF INCOMPATIBLE PLASTICS

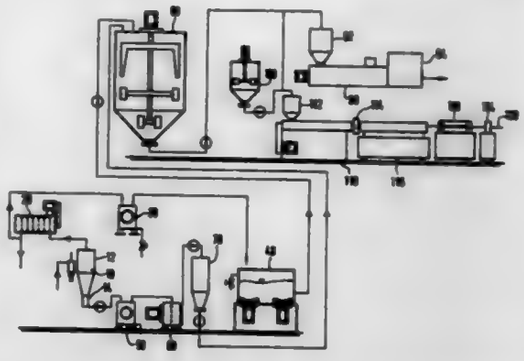
Wilhelm Helling, Schluchtweg 25, 4517 Hilter, Germany, assignor to Wilhelm Helling, Hilter, Germany

Filed Jul. 2, 1992, Ser. No. 908,294

Claims priority, application Germany, Jul. 5, 1991, 41 22 382.0

Int. Cl.[6] C08J *11/04*

U.S. Cl. 264—37 **5 Claims**



1. A method for preparing a mixture of plastics that are incompatible for processing in shaping processes, said method comprising the steps of providing the mixture of plastics as an initial starting material having a first part, which is composed essentially of uniform material of a chemical group of substances, and a second part; separating the first part of the initial starting material from the second part; subjecting the second part to a surface processing of the constituents to form a processed second part, said surface processing being selected from a group of processes consisting of surface enlarging, surface modifying and surface enlarging with surface modification; subsequently recombining the first separated part and the processed second part to form a new mixture, wherein the second part of the new mixture is essentially uniformly distributed in the first part of the new mixture, and adding a substance during a further processing of the new mixture to cause a physical and chemical linking of inherently incompatible plastics constituents in the new mixture, said substance being added in a range of 2% to 20% by weight with reference to the total quantity of the new mixture, so that when the new mixture is processed in a subsequent shaping process, a uniform product is produced.

5,468,432

PROCESS FOR THE PREPARATION OF FILLED URETHANE-BASED REINFORCED MOLDINGS

Michael F. Hurley, Oakdale; Clifford J. Lau, Sewickley, and Bin Lee, Coraopolis, all of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 123,318, Sep. 17, 1994, abandoned. This application Apr. 4, 1995, Ser. No. 416,103

Int. Cl.[6] B29C *45/00*

U.S. Cl. 264—45.3 **10 Claims**

1. A reaction injection molding process for preparing a molded product comprising reacting

(a) an organic polyisocyanate with a mixture consisting essentially of

(b) one or more compounds containing at least two isocyanate-reactive groups;

(c) 2 to 20% by weight, based on the weight of the molded product, of rigid fibers having a diameter of from 7 to 10 micrometers and a length ranging from the diameter of a fiber up to 2 millimeters;

(d) optionally, an inert gas dissolved in component (b)in an amount sufficient to produce a molded product having a density of at least 0.80 g/cm^3;

(e) 0 to 15% by weight, based upon the weight of the molded product, of a filler other than rigid fibers added to component (b); and

(f) optionally, a mold release agent.

5,468,433

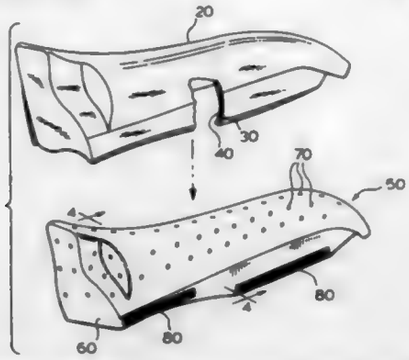
PROCESS FOR MANUFACTURING A PADDED ELEMENT USING A COVER PREFORMING MANDREL

Brian Perry, Maple, and Frank Donato, Weston, both of, Canada, assignors to Woodbridge Foam Corporation, Mississauga, Canada

Filed Nov. 18, 1993, Ser. No. 153,957

Int. Cl.[6] B29C *44/06;51/00*

U.S. Cl. 264—46.4 **20 Claims**



1. A process for manufacturing a padded element comprising the steps of:

(i) placing a trim cover on a mandrel, the trim cover having a finished outer surface and an inner surface comprised of a thermoformable foam layer;

(ii) heating the trim cover, while the trim cover is on the mandrel, to a temperature sufficient to shape the thermoformable foam layer;

(iii) shaping the trim cover to substantially the same shape as the mandrel to produce a shaped trim cover;

(iv) transferring the shaped trim cover from the mandrel to a lower mold having a shape substantially complementary to the shaped trim cover;

(v) placing an upper mold over the lower mold to define a mold cavity;

(vi) dispensing a liquid foamable polymeric composition in the mold cavity; and

(vii) expanding the liquid foamable polymeric composition to fill substantially the mold cavity thereby forming the padded element.

5,468,434

PROVISION OF COVER IMPERMEABILITY IN MOLD IN PLACE SEAT COMPONENT METHOD

Fred D. Powell, Dearborn Heights; Raymond J. Phelan, Lake Orion, both of Mich.; James McCormack, Belle River, Canada; Peter Budansew, Essex, Canada; Larry Demoe, Belle River, Canada, and Alex Poschun, Islington, Canada, assignors to Atoma International Inc., Newmarket, Canada

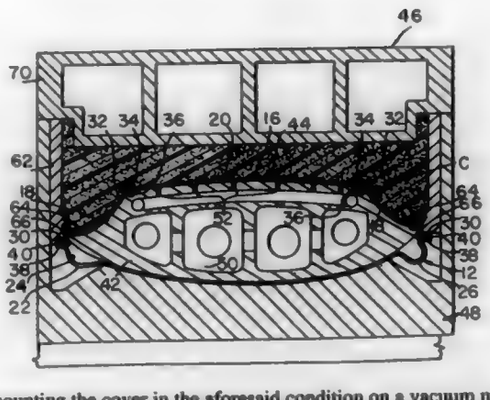
Filed Mar. 1, 1994, Ser. No. 203,353

Int. Cl.[6] B29C *44/14*

U.S. Cl. 264—46.8 **17 Claims**

1. A method of making a cushioned seat component which includes the steps of

providing a cover in a condition in which it is devoid of an imperforate film laminated thereto and having an exterior surface which is to present the major exterior appearance of the seat component and which includes a panel portion to be cushioned, the panel portion of the cover being perforate between the interior and exterior surfaces thereof,



mounting the cover in the aforesaid condition on a vacuum mold so that the exterior surface of the panel portion is facing a mold surface of the vacuum mold having a shape corresponding with the desired exterior surface shape of the panel portion,

mounting an imperforate film over the interior surface of the panel portion while the cover is mounted on the vacuum mold,

applying a vacuum to the vacuum mold so as to draw the exterior surface of the panel portion into conformity with the mold surface of the vacuum mold having said shape corresponding with the desired exterior surface shape of the panel portion so that said panel portion is brought generally into conformity with its desired final shape, with the film preventing passage of air through the cover from the interior surface thereof to the exterior surface thereof,

activating an activatable adhesive layer provided between the interior surface of the panel portion and the imperforate film so as to adhere the imperforate film to the panel portion while said panel portion remains generally in conformity with its desired final shape, and

foaming and curing a foamable material within a cooperating mold generally surrounding the film on the interior surface of the panel portion while the exterior surface thereof is engaged with the mold surface of the vacuum mold having said shape corresponding with the desired exterior surface shape of the panel portion so as to provide a cushion body of foamed material constituting an inner layer of a bonded laminate including said panel portion as an outer layer with the film between the inner and outer layers.

5,468,435

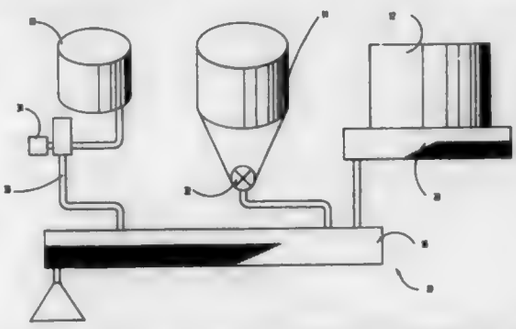
CONTAMINANT SOLIDIFYING AND STABILIZING APPARATUS AND PROCESS

Albert G. Hancock, Jr., Midland, Tex., assignor to Texas Incinerator Co., TX, Midland, Tex.

Filed May 9, 1994, Ser. No. 240,118

Int. Cl.[6] B29C *39/02*

U.S. Cl. 264—109 **18 Claims**



1. A process for transforming contaminated materials into a solid and stable composition which substantially prevents the leachabil-

ity of the contaminated material and allows for environmentally safe transportation and land disposal of the contaminated material comprising the steps of:

placing a contaminated material into a holding container, said holding container in communication flow with a mixing chamber through a flow port;

releasing said contaminated material into said mixing chamber at a predetermined rate;

adding a first solidification agent to said mixing chamber at a predetermined rate corresponding proportionally to said predetermined rate of said contaminated material;

mixing said contaminated material and said first solidification agent, said mixing resulting in a mixture where there is substantial amalgamation of said first agent and said contaminated material;

pouring said mixture at a predetermined rate from said mixing chamber into a mold; and

drying of said mixture in said mold for creation of a solid, chemically stable product;

whereby said product is a collection of inter-connected matrices in which said contaminated material is physically isolated from contact with the environment, thereby providing a means for safely transporting said product from a contamination site to a disposal site, and allowing for said product to be utilized as a construction material.

5,468,436

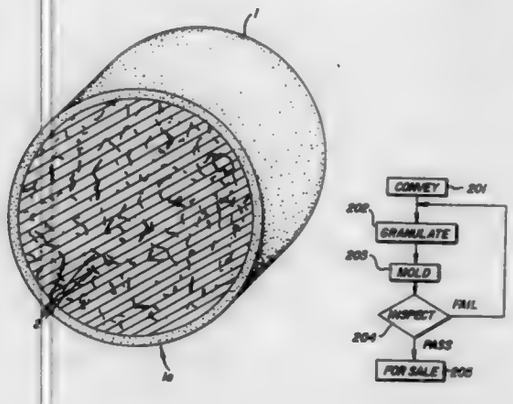
CONTINUOUS FEED, LOW PRESSURE PROCESS FOR MANUFACTURING THERMOPLASTIC POSTS

Ralph Kirtland, 969 Kinzley Ct., Staunton, Va. 24401

Division of Ser. No. 51,206, Apr. 22, 1993, abandoned. This application Feb. 27, 1995, Ser. No. 394,810

Int. Cl.[6] B29C 47/00

U.S. Cl. 264—112 **7 Claims**



1. A process for manufacturing thermoplastic posts, comprising the steps of:

forming thermoplastic scrap material containing a plurality of contaminants into granules;

feeding the granules of thermoplastic scrap material through a chamber in a molding device, wherein the chamber has a substantially constant diameter, thereby placing the granules under compression and raising the temperature of the granules;

heating an outer portion of the granules as the granules pass through the chamber, producing a molten outer layer of the thermoplastic scrap material being fed through said chamber;

cooling the molten outer layer of thermoplastic scrap material as it leaves the chamber to form an outer wall having a desired thickness; and

cutting the cooled thermoplastic scrap material to produce at least one thermoplastic post having a desired length.

5,468,437

PROCESS FOR PRODUCING STABILIZED NON-WOVEN THERMOPLASTIC COMPOSITES

Walter L. Hall, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 18, 1994, Ser. No. 182,883

Int. Cl.[6] B29C 59/02

U.S. Cl. 264—119 **10 Claims**

8. A process for producing a fiber reinforced thermoplastic sheet, said process comprising the steps of:

a) forming a dilute aqueous slurry of:

(i) particulates of a solid, water insoluble, heat-fusible organic polymer and

(ii) reinforcing glass fibers having lengths of from 0.1 to 2.0 inches, said organic polymers being selected from the group consisting of polyolefins, polycarbonates, polyamides, polyesters, rubber modified graft copolymers, polyvinyl chlorides, polyvinyl aromatics, polyphenylene ethers, and mixtures thereof,

b) collecting the particulates and fibers in the form of a continuous mat by dewatering the slurry over a porous support,

c) applying a stabilizer composition to a surface of said mat, said stabilizer composition comprising a stabilizer component selected from the group consisting of hindered amines, hindered phenolics and organic phosphorous materials,

d) stamping said mat at an elevated pressure and elevated temperature to consolidate the organic polymer particulates.

5,468,438

PRODUCTION METHOD OF MOLDING STRIPS

Yukihiko Yada, Nagoya, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Ohbu, Japan

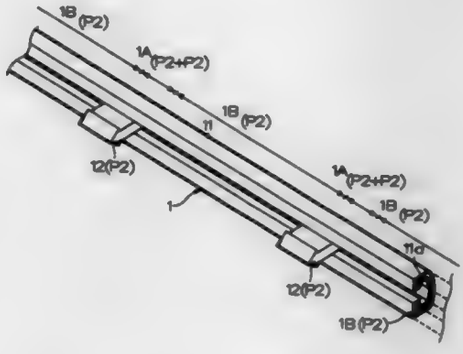
PCT No. PCT/JP93/00866, § 371 Date Jun. 30, 1994, § 102(e) Date Jun. 30, 1994, PCT Pub. No. WO94/00311, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 25, 1993, Ser. No. 193,068

Claims priority, application Japan, Jun. 26, 1992, 4-193187

Int. Cl.[6] B29C 47/02

U.S. Cl. 264—139 **9 Claims**



1. A method for forming a molding strip comprising:

extruding a molding strip through an extrusion port by extruding first and second resin materials through said extrusion port, with said first and second resin materials being different from one another such that said second resin material is removable from said first resin material after extrusion, the step of extruding the molding strip including extruding said second material to form superfluous portions; and

removing said superfluous portions from the molding strip to provide varying cross-sectional shapes along a length of said molding strip.

5,468,439
PROCESS FOR MANUFACTURING FINITE EXTRUDED PROFILES

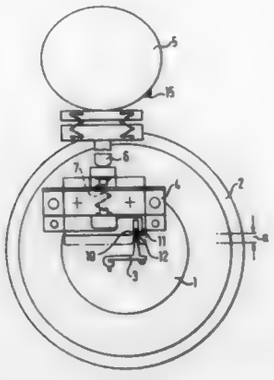
Jurgen Kranz, Lindau, Germany, assignor to Metzeler Automotive Profiles GmbH, Lindau Bodensee, Germany

Filed Apr. 21, 1994, Ser. No. 230,819

Claims priority, application Germany, Apr. 22, 1993, 43 13 194.8

Int. Cl.[6] B26F *1/24*

U.S. Cl. 264—145 **9 Claims**



1. Process for manufacturing finite extruded profiles from elastomer material with at least one projecting sealing lip of different contour over the length of the profile, the sealing lip being extruded with maximum cross-section and then reduced to the specified contour configuration comprising the steps of:

incising grooves in the sealing lip by contacting the lip with two needles which act laterally on the sealing lip;

controlling the depth of contact (a) by a cam disk, the specified contour configuration in the corresponding profile area being incised in the form of grooves;

vulcanizing the profiles; and

severing the projecting profile section after vulcanization.

3. Device for manufacturing an extruded profile having a profile area that changes along the length of the profile comprising:

an extrusion die;

two hard metal needles disposed at an angle to each other and arranged in a variator disposed downstream of the extrusion die in a vertically movable manner and a vertical ram, the variator being vertically movable via the said ram and in active connection with a cam disk and shaped to produce a specified contour of the profile area.

5,468,440
PROCESS OF MAKING ORIENTED FILM OR STRUCTURE

James J. McAlpin, Houston; Jeffrey W. C. Kuo, Seabrook, and Donald C. Hylton, Houston, all of Tex., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Filed May 6, 1994, Ser. No. 239,150

Int. Cl.[6] B29C *55/02;55/22*

U.S. Cl. 264—291 **17 Claims**

1. A process for forming an oriented structure comprising the steps of:

(a) forming a structure from a polypropylene resin, said polypropylene resin produced from a metallocene catalyst; and,

(b) orienting the structure by applying stress at a temperature in the range of from about 20° C. to about 35° C. above the HDT value of the polypropylene.

5,468,441
PROCESS FOR PREPARING HIGH-MOLECULAR WEIGHT POLYESTERS

Walter K. Homann, Dülmen; Thomas Große-Puppendahl, Haltern, and Wilhelm Brügging, Recklinghausen, all of, Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Aug. 22, 1994, Ser. No. 293,557

Claims priority, application Germany, Sep. 6, 1993, 43 30 062.6

Int. Cl.[6] C08G *63/80*

U.S. Cl. 264—331.21 **14 Claims**

1. A process for preparing a high-molecular weight polyester comprising:

polycondensing an aromatic dicarboxylic acid with a mixture of alkanediols and alkenediols with substantial exclusion of oxygen and in the presence of a catalyst until a viscosity number in the range from 50 to 140 cm^3/g is reached; and then

postcondensing the polycondensed material in the solid-phase in the presence of a free-radical former added to the postcondensed material in an amount within the range from 0.001 to 8% by weight until the required viscosity number is reached.

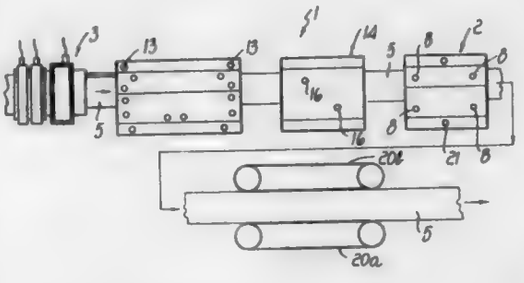
5,468,442
APPARATUS AND PROCESS FOR GAUGING AND CONTROLLING EXTRUDED PROFILED ELEMENTS

Romano Brambilla, Modena, Italy, assignor to Brabor S.r.l., Ubersetto di Fiorano, Italy

Filed May 25, 1994, Ser. No. 249,010

Int. Cl.[6] B29C *47/90*

U.S. Cl. 264—519 **13 Claims**



1. Apparatus for gauging and controlling extruded profiled elements, particularly for extruded profiled elements made of synthetic material, comprising at least one cooling gauge arranged downstream of an extrusion die and at least one control and correction gauge arrangeable downstream of said at least one cooling means, along the extrusion direction, said control and correction gauge being provided with a passage that is shaped so as to match the profile of the extruded profiled element and as to allow said extruded profiled element to cross said at least one control and correction gauge, said at least one control and correction gauge having means for heating preset regions of said profiled element and means for cooling preset regions of said profiled element to correct and/or stabilize the profile of said profiled element.

9. Control and gauging process for extruded profiled elements, particularly for extruded profiled elements made of synthetic material, consisting in

passing said profiled elements, after extrusion, through at least one cooling gauge so as to cool said profiled elements;

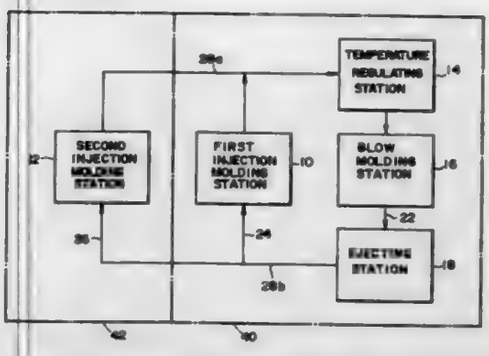
passing said profiled element through at least one gauge and correction means;

heating and cooling, within said at least one gauge and correction means, preset regions of the profiled element in order to correct any anomalies in the profile of said extruded element and to stabilize said profile.

5,468,443
METHOD AND APPARATUS OF INJECTION STRETCH BLOW MOLDING

Minoru Takada; Kouichi Satoh; Kazuyuki Yokobayashi, all of Ueda, and Shuichi Ogihara, Komoro, all of, Japan, assignors to Nissei ASB Machine Co., Ltd., Nagano, Japan

Filed Apr. 12, 1993, Ser. No. 44,707
Claims priority, application Japan, Apr. 24, 1992, 4-131559; Jan. 28, 1992, 4-314154
Int. Cl.[6] B29C 49/06;49/28
U.S. Cl. 264—537 25 Claims



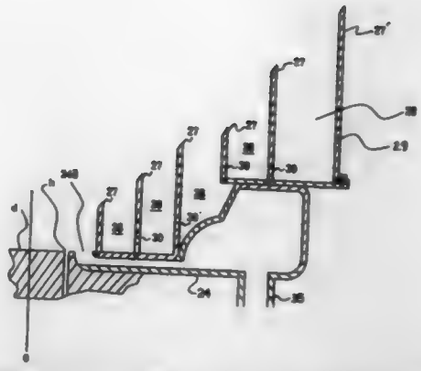
1. An injection stretch blow molding method of sequentially circulating a plurality of neck mold moving units for supporting and conveying neck molds adapted to hold neck portions of hollow containers and preforms used to mold the hollow containers at least through preform injection molding, blow molding and ejecting stations, the preform injection molding step, the blow molding step for blow molding the hollow containers from the preforms having potential heat provided by the injection molding step and the product ejecting step being repeatedly carried out, said method comprising the steps of providing injection molding stations of M in number for blow molding stations of N in number ($M>N\geq 1$), providing an injection mold clamped with said neck molds for molding the preforms and an injection unit for injecting resin into said injection mold in each of the injection molding stations of M in number, setting an injection start time for one of the injection units staggered from any preceding injection start time for another of the injection units by a time equal to $N\times T/M$, where T is an injection molding cycle time in at least one of the injection molding stations, injection molding the preforms in at least one of the injection molding stations at an injection molding start time staggered from any preceding injection molding start time for another of the injection molding stations by a time equal to $N\times T/M$, moving at least one neck mold moving unit holding the injection molded preforms sequentially to an empty one of said blow molding stations, and blow molding the preforms into the hollow containers, wherein each of the blow molding stations has a blow molding cycle time which is set within $N\times T/M$, and wherein the neck mold moving units are provided in a quantity at least equal to a total quantity of stations.

5,468,444
PRODUCTION OF ORIENTED THERMOPLASTIC FILMS BY BLOWN-FILM EXTRUSION

Takao Yazaki; Masataka Noro; Takashi Matsui; Noriyuki Kobayashi; Hironari Sano, and Koji Yamamoto, all of Mie, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed May 27, 1994, Ser. No. 250,613
Claims priority, application Japan, Aug. 23, 1993, 5-227804
Int. Cl.[6] B29C 55/28
U.S. Cl. 264—566 13 Claims

1. A process for producing an orientated blown film of a thermoplastic resin by blown film extrusion, comprising blowing air into an extruded bubble of resin extruded from a ring die to expand the bubble and cooling the expanded bubble with air from an externally placed air cooling ring, and at least one rectifying cylinder placed downstream in the direction of film extrusion and expansion, wherein said blown film extrusion is carried out under such conditions that the ratio of (b) the final diameter of the expanded bubble to (a) the diameter of the bubble at the crystallizing temperature of the thermoplastic resin ((b)/(a)) ranges from 1.5 to 10.



13. An apparatus suitable for orienting a thermoplastic film prepared by blown film extrusion through a ring die, said ring die being surrounded circumferentially with one or a plurality of concentric cooling air rings, said apparatus comprising:

a plurality of concentric rectifying cylinders each defined by an innermost and outermost wall, the innermost wall of the innermost of said cylinders having a diameter larger than the diameter of the largest of said cooling air rings, the height of the innermost and outermost walls of said cylinders increasing in proportion to the radial distance from said ring die such that the outermost cylinder outermost wall height is greater than the innermost cylinder innermost wall height, each cylinder being open at the end furthest downstream from said ring die, and each cylinder closed at the end furthest upstream,

each of said cylinders provided with a venting device connecting the interior of said cylinder to the interior of the next outermost cylinder, the outermost of said cylinders having a plurality of openings in the outermost wall of said outermost cylinder, said openings communicating with the environment surrounding said apparatus, said openings and said venting device(s) located in the respective rectifying cylinder(s) at a position closer to the upstream closed end of the cylinder than the downstream open end of the cylinder wherein said cylinder(s) are concentric about said cooling air ring(s) and are placed downstream in the direction of film extrusion.

5,468,445
CERAMIC VIA COMPOSITION, MULTILAYER CERAMIC CIRCUIT CONTAINING SAME, AND PROCESS FOR USING SAME

Jon A. Casey, Poughkeepsie, N.Y.; Renuka S. Divakaruni, Ridgefield, Conn.; Govindarajan Natarajan, Pleasant Valley; Srinivasa S. N. Reddy, LeGrangeville, both of N.Y., and Manfred Sammet, Schoenaich, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

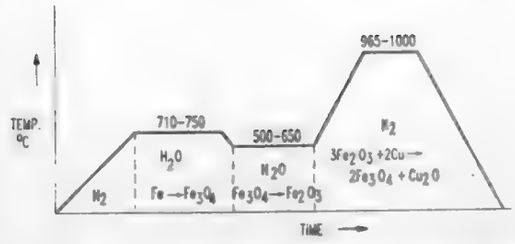
Division of Ser. No. 890,898, May 29, 1992, Pat. No. 5,336,444. This application Jul. 28, 1994, Ser. No. 281,716
Int. Cl.[6] B22F 7/08
U.S. Cl. 419—19 6 Claims

1. A process for producing substrates having co-fired dielectric material and metal composition comprising:

providing to said dielectric material a fritless metallurgical paste, wherein said paste comprises

a conductive first metal wherein said conductive first metal is copper and comprises about 95% to 75% based on the total metals in said fritless metallurgical paste composition;

an oxidizable second metal selected from the group consisting of iron, nickel and cobalt, wherein said oxidizable second



metal comprises about 5% to 25% based on the total metals in said fritless metallurgical paste composition; and

an organic medium in which said first and second metals are dispersed; and

firing said fritless metallurgical paste and dielectric material at a temperature sufficient to effect removal of said organic medium, sintering of said first metal, and oxidation of said second metal.

5,468,446

PELLETIZING OR GRANULATING PROCESS

Peter C. Morgan; Alan D. Hart, and Philip D. Morgans, all of Filton, Great Britain, assignors to British Aerospace PLC, and BAeSEMA Ltd., both of Hampshere, England

Filed Feb. 28, 1994, Ser. No. 202,464

Claims priority, application United Kingdom, Mar. 3, 1993, 9304355

Int. Cl.[6] B22F *1/02*; C01B *3/08*

U.S. Cl. 419—64 **8 Claims**

1. A process of pelletising or granulating a material comprising calcium hydride which is reactive in water to produce hydrogen gas, the process comprising the steps of:

passing a mixture of carbon dioxide gas and water vapor over and/or through the material for a time sufficient to form a desired thickness of a coating on the material to provide a desired amount of control over the reaction of the calcium hydride in water, the coating comprising calcium carbonate and optionally calcium hydroxide; and

compacting the material coated with calcium carbonate to produce said pellets or granules.

5,468,447

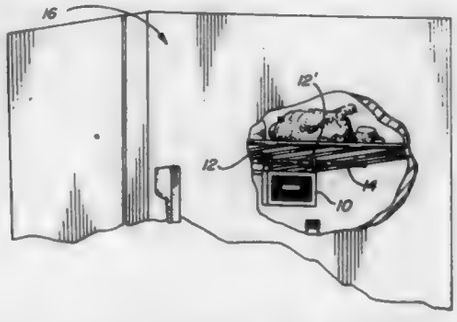
REFRIGERATOR FRESHENER

Edward M. Bermas, Greenwich, Conn., assignor to Harrison-Clifton Inc., Greenwich, Conn.

Continuation of Ser. No. 159,732, Nov. 30, 1993, abandoned. This application Dec. 13, 1994, Ser. No. 354,935

Int. Cl.[6] A61L *9/00*

U.S. Cl. 422—5 **4 Claims**



3. A process for maintaining a fresh environment within a refrigerator, by acting immediately to delay the buildup of odors when aromatic foods are placed therein and continuing to maintain low odor levels for extended times, comprising:

providing a refrigerator freshening device which is capable of suspension from a wire rack in a refrigerator, is effective to reduce the level of food odor in the refrigerator, and comprises

a front panel including a front wall member and side wall members, the front wall member having an outside surface, an inside surface, and a grid structure including holes which extend through the front wall member from the inside surface to the outside surface;

a back panel, including a rear wall member and side wall members, the rear wall member having an outside surface, an inside surface, and a grid structure including holes which extend through the rear wall member from the inside surface to the outside surface;

a package constructed of flexible, porous material enclosing an absorbent, in particulate form, consisting essentially of from 75 to 95 percent of active carbon having pores wherein at least 30 percent of the pores have a diameter of from about 15 to less than about 50 Å and from 5 to 25 percent of an odor-absorbing zeolite having an organophilic character and a surface area of at least 400 square meters per gram wherein the front panel receives the back panel in nesting relation ship and encloses the package of adsorbent material; and

at least one hook is provided to enable suspension of the device from a refrigerator shelf; and

suspending the container from a refrigerator shelf to permit the normal movement of air within the refrigerator to pass by and be deodorized by the active carbon and the zeolite.

5,468,448

PEROXIDE DISINFECTION METHOD AND DEVICES THEREFOR

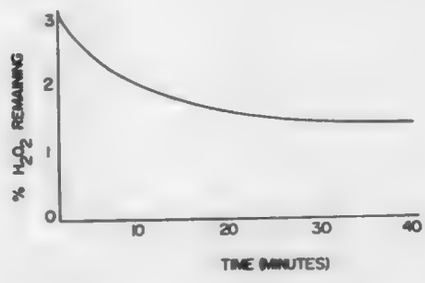
Paul C. Nicolson, Dunwoody; Kenneth R. Seamons, Marietta; Fu-Pao Tsao; Larry A. Alvord, both of Lawrenceville, and Earl C. McCraw, Jr., Duluth, all of Ga., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 852,364, Jun. 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 636,280, Dec. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 458,123, Dec. 28, 1989, Pat. No. 5,078,798. This application Aug. 26, 1993, Ser. No. 112,637

The portion of the term of this patent subsequent to Apr. 26, 2011, has been disclaimed.

Int. Cl.[6] A61L *2/16*

U.S. Cl. 422—30 **14 Claims**



1. A method of disinfecting a hydrogen peroxide stable contact lens comprising inserting said contact lens into a container such that said contact lens contacts a hydrogen peroxide containing disinfecting solution disposed in said container and providing a hydrogen peroxide decomposition means in said container to control the decomposition of hydrogen peroxide, said means constructed and arranged to permit said contact lens to have a cumulative (% peroxide) (min) exposure from the time said decomposition means contacts said peroxide containing solution, time zero, over a period of no greater than 12 hours of at least 20% peroxide·minute.

5,468,449

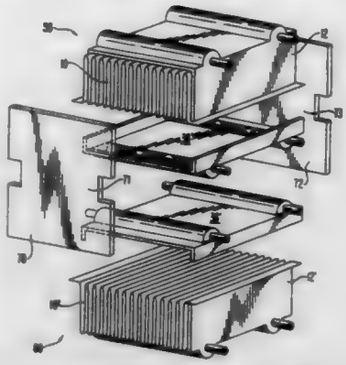
EXCHANGER AND METHOD FOR MANUFACTURING THE SAME

Axel Sjogren, Lakewood; Gary Carson, Golden, both of Colo.; Steven Estergreen, Mulino, Oreg.; Timothy Taga, and Rodger Stewart, both of Broomfield, Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Division of Ser. No. 970,781, Nov. 3, 1992, and a continuation-in-part of Ser. No. 970,781, Nov. 3, 1992. This application Jul. 11, 1994, Ser. No. 272,524

Int. Cl.[6] B01D *61/00;* **A61M** *1/14*

U.S. Cl. 422—46 **31 Claims**



1. An exchanger manufacturing method comprising the steps of:

folding sheet material in a series of pleats having apices;

placing the folded sheet material in a casing having an opening defined by walls with distal edges;

covering the distal edges with end portions of the sheet material; and

affixing a cover to the casing by melting a portion of the cover and contacting the cover with the sheet material covering the distal edges of the walls.

5,468,450

EXPANDING VEHICLE FOR COLORIMETRIC DIAGNOSTIC ASSAYS

Richard D. Michael, 7910 Milbury Rd., Baltimore, Md. 21207

Filed Dec. 16, 1993, Ser. No. 168,753

Int. Cl.[6] G01N *21/00*

U.S. Cl. 422—56 **3 Claims**

1. An animal litter for adsorption of animal excreta and identification of a predetermined characteristic of the excreta, comprising an animal litter material and particles of a dried and compressed diagnostic assay vehicle, with at least one chromogen in a non-aqueous solvent in the vehicle, the vehicle being inert to the chromogen, the dried and compressed vehicle being expandable by at least three fold when wetted by water in the animal excreta, and the chromogen being selected to react to the predetermined characteristic of the excreta to which the assay is directed.

5,468,451

DEVICE FOR INDICATING THE PRESENCE OF CARBON DIOXIDE IN A PATIENT'S EXHALED AIR

Andras Gedeon, Täby, Sweden, assignor to Minco AB, Täby, Sweden

PCT No. PCT/SE93/00554, § 371 Date Feb. 10, 1994, § 102(e) Date Feb. 10, 1994, PCT Pub. No. WO94/00756, PCT Pub. Date Jan. 6, 1994

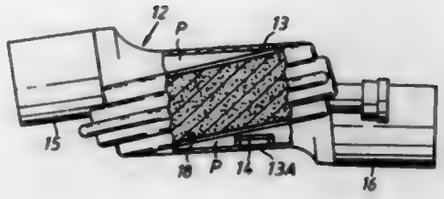
PCT Filed Jun. 22, 1993, Ser. No. 190,189

Claims priority, application Sweden, Jun. 29, 1992, 9201995

Int. Cl.[6] A61B *5/097*

U.S. Cl. 422—58 **4 Claims**

1. A device for indicating presence of CO_2 in a patient's exhaled breath, comprising:



a CO_2 detector including an indicator element which undergoes a reversible color change in response to exposure thereof to air containing CO_2 in concentrations of a same order of magnitude as a CO_2 concentration of the patient's exhaled breath;

a heat-moisture exchanger further comprising a housing which includes a first connecting port adapted to be connected to the trachea of a patient and a second connecting port adapted to be connected selectively to a ventilator and an anaesthesia machine and which has mounted in a flow-through passage extending between the connecting ports an exchanger element for the regenerative exchange of heat and moisture between firstly, air which flows through the flow through passage in one direction and, secondly, air which flows through the flow-through passage in an opposite direction;

the indicator element being disposed in the flow-through passage away from and on the downstream side of the heat-moisture exchanger element in direction of flow of the patient's breath and remote from the first connection port, said indicator element being viewable from outside the housing;

the indicator element having a response time for colour changes responsive to CO_2 which is sufficiently short to enable the indicator element to change color upon each breath.

5,468,452

QUANTITATIVE ANALYSIS COMBINING HIGH PERFORMANCE LIQUID CHROMATOGRAPH AND MASS SPECTROMETER

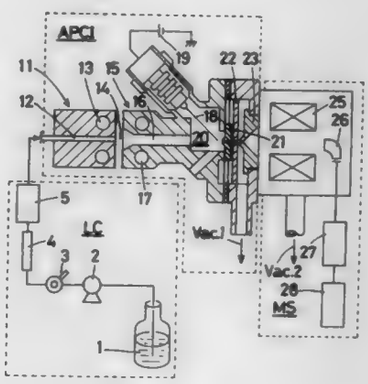
Teruhiko Hagiwara, 26-19, Kitahara-cho 1-chome, Tanashi-shi, Tokyo 188, Japan

Filed Sep. 2, 1994, Ser. No. 300,319

Claims priority, application Japan, Jun. 14, 1994, 6-131968

Int. Cl.[6] G01N *30/02*

U.S. Cl. 422—70 **4 Claims**



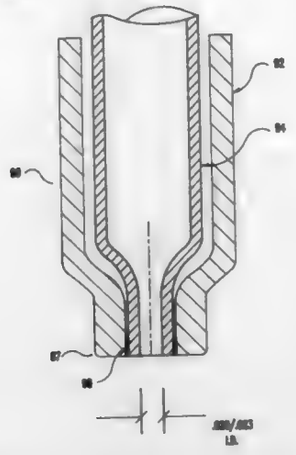
1. A quantitative analyzing apparatus comprising: a high-performance liquid chromatograph, a mass spectrometer, and an atmospheric pressure chemical ionization interface for linking the liquid chromatograph to the mass spectrometer, wherein the interface includes an ionization chamber housing a corona discharge electrode comprised of a material selected from group consisting of a silver alloy and a non-plated iron.

5,468,453

LOW CARRYOVER PIPETTE PROBE

Robert W. Holt, Hackettstown, and Thomas Palmieri, Paramus, both of N.J., assignors to Cirrus Diagnostics, Inc., Chester, N.J.

Filed Jun. 14, 1993, Ser. No. 76,450
Int. Cl.[6] B01L 3/02
U.S. Cl. 422—100 4 Claims



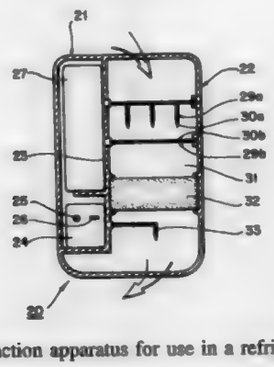
1. A pipette probe for an automated chemical analyzer which reduces carryover contamination, comprising:
a rigid barrel having an interior surface and an exterior surface, said exterior surface being coated with a non-wettable material;
a contiguous section of polytetrafluoroethylene tube positioned coaxial within said barrel, said polytetrafluoroethylene tube having a fluid dispensing end and a connection end, said polytetrafluoroethylene tube and said barrel having a restricted diameter at said fluid dispensing end; and
a seal means for attaching said interior surface of said barrel to said polytetrafluoroethylene tube at said fluid dispensing end, said non-wettable material and said contiguous section of polytetrafluoroethylene tube forming non-wettable surfaces which reduce carryover contamination by preventing fluid from adhering to the probe.

5,468,454

COMPACT STERILIZING DEODORIZING AND FRESHNESS-PRESERVING APPARATUS FOR USE IN A REFRIGERATOR

Chun T. Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 6, 1994, Ser. No. 223,678
Int. Cl.[6] A61L 9/22
U.S. Cl. 422—121 4 Claims



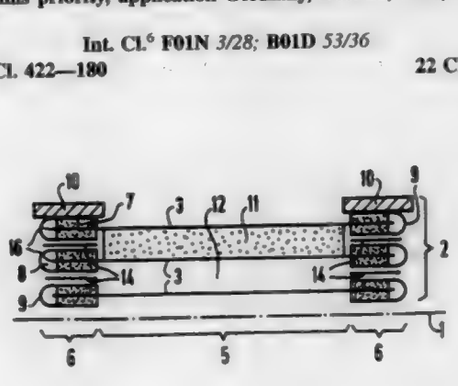
1. A multi-function apparatus for use in a refrigerator comprising:
a housing;
a power source portion disposed in said housing for rectifying output of a power source and for generating a plurality of voltages; and
a multi-function additional means disposed in said housing supplied with said voltages for generating corona discharge to perform sterilizing/deodorizing functions for purifying air in storage compartments of a refrigerator and for generating ions in the purified air;
said multi-function additional means comprising:
a plurality of pointed electrodes and a strip shaped electrode facing said plurality of pointed electrodes supplied by the voltages to generate corona discharge for ionizing air passing introduced around the plurality of pointed electrodes;
an ozone solving portion disposed on a side of said strip shaped electrode opposite from said plurality of pointed electrodes for preventing emission of ozone outside the housing by reducing the ozone to oxygen thus providing purified air; and
an ionizing electrode means disposed downstream from said ozone solving portion for generating said ions in the purified air which passes through said ionizing electrode means, said ionizing electrode means having a pointed end which is curved downward along the direction the purified air passes through said ionizing electrode means.

5,468,455

HONEYCOMB BODY WITH AN INTERNAL STRUCTURE THAT IS RETAINED IN A FRAME AND A METHOD OF PRODUCING THE SAME

Rolf Brück, Bergisch-Gladbach, Germany, assignor to Emitec Gesellschaft fuer Emissionstechnologie mbH, Lohmar, Germany

Filed Jun. 21, 1994, Ser. No. 263,144
Claims priority, application Germany, Dec. 21, 1991, 41 42 597.9
Int. Cl.[6] F01N 3/28; B01D 53/36
U.S. Cl. 422—180 22 Claims



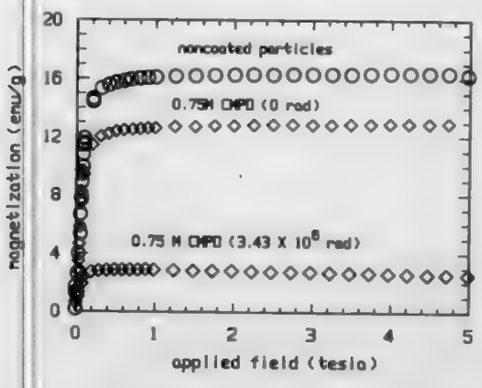
1. A honeycomb body assembly, comprising:
a) a honeycomb body defining an axis along which a flow of fluid is to be conducted through said honeycomb body;
b) said honeycomb body being delimited by two end surfaces oppositely disposed along the axis;
c) said honeycomb body including an internal structure disposed between said end surfaces for conducting an electric current for heating said honeycomb body, said internal structure being formed of a plurality of at least partially structured sheet-metal layers defining channels for conducting the fluid through said honeycomb body;
d) metal support configurations each supporting an individual one of said sheet-metal layers at a respective one of said end surfaces; and
e) an electric insulation disposed between and each of said support configurations and a respective one of said sheet-metal layers.

5,468,456

BATCH EXTRACTING PROCESS USING MAGNETICPARTICLE HELD SOLVENTS

Luis Nunez, Elmhurst, and George F. Vandergrift, Bolingbrook, both of Ill., assignors to The University of Chicago, Chicago, Ill.

Filed Feb. 4, 1994, Ser. No. 191,643
Int. Cl.[6] B01D *11/00;* C01G *56/00;57/00;* C22B *60/02*
U.S. Cl. 423—10 20 Claims



1. A process for selectively removing metal values from a mixture containing same, comprising contacting a magnetic particle with a liquid solvent which selectively dissolves the metal values to absorb the liquid solvent onto the magnetic particle, contacting the solvent-containing magnetic particles with a mixture containing the metal values to transfer metal values into the solvent carried by the magnetic particles, said magnetic particles being present in the mixture in an amount not greater than about 1% by weight, and magnetically separating the magnetic particles.

5,468,457

METHOD OF MAKING TUNGSTEN-COPPER COMPOSITE OXIDES

Leonid P. Dorfman, Athens; Michael J. Scheithauer, Ulster; David L. Houck, Towanda, and Nelson E. Kopatz, Sayre, all of Pa., assignors to Osram Sylvania Inc., Danvers, Mass.

Filed Dec. 22, 1994, Ser. No. 362,024
Int. Cl.[6] C01G *41/00;3/00*
U.S. Cl. 423—61 12 Claims

1. A method of making a tungsten-copper composite oxide, comprising the steps of combining an amount of an oxide of tungsten and an amount of an oxide of copper to form a mixture, the oxide of tungsten or the oxide of copper, or both, being in a hydrated form, milling the mixture, dehydrating the mixture and firing the mixture at a temperature and for a time sufficient to form the tungsten-copper composite oxide.

5,468,458

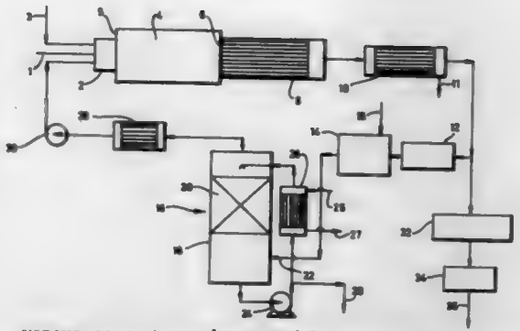
TREATMENT OF GAS STREAMS

Richard W. Watson, Ilkley, England, assignor to The BOC Group plc, Windlesham, England

Filed Apr. 1, 1993, Ser. No. 41,800
Claims priority, application United Kingdom, Apr. 6, 1992, 9207496; Apr. 21, 1992, 9208550; Jan. 15, 1992, 9221700
Int. Cl.[6] B01D *53/86;* C01B *17/04;17/16;17/48*
U.S. Cl. 423—222 18 Claims

1. A method of treating a feed gas stream comprising hydrogen sulphide, comprising the steps of:

a) in a first reactor converting to sulphur dioxide a part of the hydrogen sulphide content of the feed gas stream by combustion thereof and reacting thus formed sulphur dioxide with residual hydrogen sulphide to form sulphur vapour and water vapour, so as to produce a sulphur-containing gas stream comprising hydrogen sulphide, sulphur dioxide, water vapour and sulphur vapour;



b) extracting sulphur vapour from the sulphur-containing gas stream;

c) in a second reactor reducing to hydrogen sulphide at least part of the sulphur content of the gas stream from which sulphur vapour has been extracted, there being no catalysed reaction between the hydrogen sulfide and sulphur dioxide between steps a) and c);

d) extracting water vapour from the reduced gas stream so as to form a secondary gas stream comprising hydrogen sulphide;

e) returning at least part of the secondary gas stream to the first reactor and taking as a purge stream at least one of a part of the gas stream intermediate steps (b) and (c) and another part of the secondary gas stream; and

f) discharging the purge stream.

5,468,459

GAS STREAM TREATMENT METHOD FOR REMOVING PER-FLUOROCARBONS

Satish S. Tamhankar, Scotch Plains, and Ramakrishnan Ramachandran, Allendale, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Feb. 28, 1995, Ser. No. 395,344
Int. Cl.[6] B01J *31/02*
U.S. Cl. 423—240.S 12 Claims

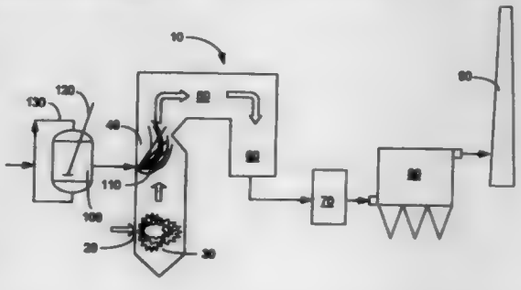
1. A method of treating a per-fluorocarbon containing gas stream to remove per-fluorocarbon from said gas stream, said method comprising contacting the per-fluorocarbon contained within said per-fluorocarbon containing gas stream with calcium hydride at a temperature in a temperature range of between about 450° C. and about 900° C.

5,468,460

STABILIZATION OF CALCIUM-BASED SLURRIES FOR SOX REDUCTION BY IN-FURNACE INJECTION

M. Linda Lin, Naperville, Ill., assignor to Nalco Fuel Tech, Naperville, Ill.

Filed Jan. 10, 1994, Ser. No. 179,447
Int. Cl.[6] C01F *11/00;* B01D *53/50*
U.S. Cl. 423—266 10 Claims



1. A method for stabilizing a slurry of a calcium-based sorbent for reducing SO_x by in-furnace injection of the sorbent into hot combustion gases produced by the combustion of a sulfur-containing carbonaceous fuel, comprising:

(a) preparing an aqueous slurry comprising

a calcium-containing material which is capable of reacting with sulfur oxides at temperatures above 400° F. to form calcium sulfites and sulfates, and a stabilizer system comprising a generally hydro phobic surfactant having an HLB of less than about 8 and a more hydrophilic surfactant having an HLB of at least about 8, wherein the HLB values of the hydrophobic and the hydrophilic surfactants differ by at least about 3; and,

(b) injecting the slurry into the combustion gases in a furnace at a location where the temperature is at least about 400° F.

5,468,461

ANTICORROSIVE PRIMER COMPOSITION

Yasushi Hosoda, Amagasaki; Toshiaki Shiota, Takatsuki; Nobukazu Suzuki; Satoshi Ikeda, both of Ibaraki; Taketosi Odawa, Hirakata; Koichi Kimura, Osaka, and Hisataka Yamamoto, Tokyo, all of, Japan, assignors to Nippon Paint Co., Ltd., and Sumitomo Metal Industries, Ltd., both of Osaka, Japan

Continuation of Ser. No. 70,228, Jun. 2, 1993, abandoned. This application Aug. 25, 1994, Ser. No. 294,812

Claims priority, application Japan, Jun. 3, 1992, 4-142806

Int. Cl.[6] **C08G** *18/58;59/56;* **C08K** *3/36;5/00*

U.S. Cl. 523—435 **16 Claims**

1. An anticorrosive primer composition comprising:

(1) 100 parts by weight of an epoxy resin having a number-average molecular weight of from 500 to 10,000, wherein the epoxy resin is selected from the group consisting of glycidyl ethers, glycidyl esters, glycidylamines, linear aliphatic or alicyclic epoxides, and acrylate-modified epoxy resins or urethane-modified epoxy resins,

(2) from 10 to 60 parts by weight of an aromatic polyamine having at least two primary or secondary amine groups and containing from 2% to 30% by weight, based on the aromatic polyamine, of a promoter selected from the group consisting of phenol compounds and cresol compounds,

(3) from 10 to 60 parts by weight of a polyisocyanate which is non-blocked or blocked with a blocking agent having a release-initiating temperature of below 160° C.,

(4) from 10 to 40 phr, based on the sum of components (1), (2), and (3), of silica particles of colloidal silica or fumed silica or a mixture of these,

(5) from 0.5 to 5 phr, based on the sum of components (1), (2), and (3), of a lubricant,

and an organic solvent.

5,468,462

GEOGRAPHICALLY DISTRIBUTED TRITIUM EXTRACTION PLANT AND PROCESS FOR PRODUCING DETRITIATED HEAVY WATER USING COMBINED ELECTROLYSIS AND CATALYTIC EXCHANGE PROCESSES

Alistair I. Miller, Ontario, and Dino A. Spagnolo, Petawawa, both of, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Dec. 6, 1993, Ser. No. 161,395

Int. Cl.[6] **C01B** *5/00;4/00;* **B01J** *8/00*

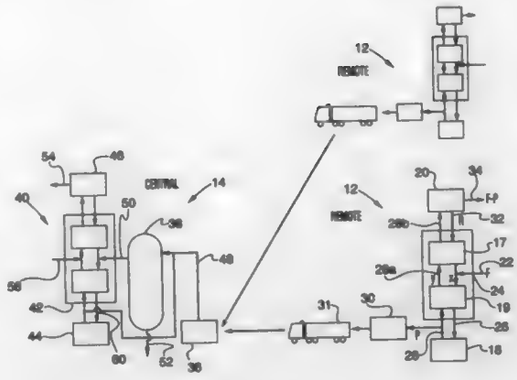
U.S. Cl. 423—580.2 **21 Claims**

11. A process for detritiating heavy water comprising the steps of:

at a remote site,

a) receiving a feed of tritium rich heavy water from a source;

b) producing a tritium rich DT/D_2 gas mixture and a tritium lean DT/D_2 gas mixture from said feed;



c) forming tritium lean heavy water from said tritium lean DT/D_2 gas mixture for return to the source;

d) forming a hydride of said tritium rich DT/D_2 gas mixture;

e) transporting the hydride to a tritium extraction plant at a central site; and

at the central site,

f) reforming a tritium enriched DT/D_2 gas mixture from said hydride in a de-hydriding unit;

g) separating tritium gas from said tritium rich DT/D_2 gas mixture by a central cryogenic distillation process;

h) separating a tritium lean DT/D_2 gas mixture by the central cryogenic distillation process; and

i) forming tritium lean heavy water from said tritium lean DT/D_2 gas mixture and transporting same to said source at the remote site.

5,468,463

PROCESS FOR THE PREPARATION OF VERY PURE TITANIUM DIOXIDE

Kai Bütje, Duisburg, and Jürgen Kischkewitz, Ratingen, both of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 59,485, May 10, 1993, abandoned. This application Jul. 29, 1994, Ser. No. 282,387

Claims priority, application Germany, May 15, 1992, 42 16 122.3

Int. Cl.[6] **C01G** *23/04;23/02*

U.S. Cl. 423—612 **10 Claims**

1. A process for the preparation of pure titanium dioxide, consisting essentially of reacting titanium tetrachloride with sulphuric acid at a concentration of 25–35% by weight to form a titanyl sulphate solution under conditions that prevent the crystallization of titanyl sulphate in said solution, separating the resulting hydrogen chloride, concentrating the solution and then adding sulphuric acid to adjust the weight ratio of sulphuric acid to titanium dioxide to between 1.7 and 2.0 and adjusting the titanium dioxide concentration to between 250 and 300 g/l, hydrolyzing the solution to form a precipitate of titanium dioxide hydrate, filtering off the resulting titanium dioxide hydrate precipitate, and then calcining the precipitate to form titanium dioxide in the rutile or anatase form.

5,468,464

PROCESS FOR THE PREPARATION OF METAL HYDRIDES

Matthew A. Rossback, Albany, and Timothy R. McQueary, Sweet Home, both of Oreg., assignors to Teledyne Industries, Inc., Albany, Oreg.

Continuation of Ser. No. 37,514, Mar. 24, 1993, abandoned, which is a continuation of Ser. No. 721,891, Jun. 27, 1991, abandoned. This application Jan. 7, 1994, Ser. No. 178,631

Int. Cl.[6] C01B 6/24

U.S. Cl. 423—644 3 Claims

1. A process for the production of an easily comminutable hydride product comprising the steps of:

a) evacuating a gas-tight container containing a charge of ferroalloy at a temperature of from about 10° C. to about 50° C., wherein the non-ferrous metal of the ferroalloy is niobium which is 63–65% by weight of the ferroniobium,

b) providing an overpressure of a hydrogen containing gas of from about 2 psig to about 15 psig on the charge of ferroalloy for a sufficient period of time and at a temperature of from about 10° C. to about 50° C. until hydrogen take up by the charge has ceased, and

c) recovering the friable hydride product produced.

3. The hydride product of the reaction between hydrogen and ferroniobium, wherein ferroniobium containing about 63% to about 65% by weight niobium is contacted at a temperature of from about 18° C. to about 30° C. with a hydrogen-containing gas for a sufficient period of time at a pressure of from about 2 to about 15 psig to produce a hydride containing from between about 200 ppm to about 2000 ppm hydrogen which exhibits an X-ray diffraction line at about 2.43 Å.

5,468,465

TREATED APATITE PARTICLES FOR X-RAY DIAGNOSTIC IMAGING

Edward A. Deutsch; Karen F. Deutsch, both of Maryland Heights; William P. Cacheris, Florissant; William H. Ralston, St. Charles; David H. White, Ballwin; Dennis L. Nosco, Florissant; Robert G. Wolfangel, Ballwin; Janet B. Wilking, Ferguson; Linda Meeh, St. Louis, and Steven R. Woulfe, Ballwin, all of Mo., assignors to Mallinckrodt Medical, Inc., St. Louis, Mo.

Division of Ser. No. 948,540, Sep. 22, 1992, Pat. No. 5,344,640, which is a continuation-in-part of Ser. No. 784,325, Oct. 22, 1991, abandoned. This application Jul. 6, 1994, Ser. No. 271,921

Int. Cl.[6] A61K 49/04

U.S. Cl. 424—9.4 12 Claims

1. A method for enhancing x-ray images of body organs and tissues which comprises:

(a) administering to a patient a diagnostically effective amount of a composition which consists essentially of apatite particles incorporating a substantially radiopaque species therein, and a pharmaceutically acceptable carrier; and (b) imaging the organs and tissues using x-ray techniques.

5,468,466

COMPOSITIONS OF IODOPHENYL SULFONATES FOR X-RAY VISUALIZATION OF THE GASTROINTESTINAL TRACT

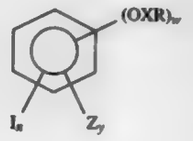
Edward R. Bacon, East Green Bush; Sol J. Daum; Kimberly G. Estep, both of Albany, all of N.Y.; Kurt A. Josef, Clifton Park, Pa.; Brent D. Douty, Coatesville, Pa., and Carl R. Illig, Phoenixville, Pa., assignors to Sterling Winthrop, Inc., Malvern, Pa.

Division of Ser. No. 40,823, Mar. 31, 1993, Pat. No. 5,318,769. This application Feb. 1, 1994, Ser. No. 190,752

Int. Cl.[6] A61K 49/04

U.S. Cl. 424—9.45 26 Claims

1. A compound of the formula or a pharmaceutically acceptable salt thereof:



wherein

X= —SO_2—;

Z= H, halo, C_1–C_{20} alkyl, cycloalkyl, lower alkoxy, cyano, where the alkyl and cycloalkyl group; can be substituted with halogen or halo-lower-alkyl groups;

R= C_1–C_{25} alkyl, cycloalkyl, aryl or halo-lower-alkyl, each of which may be optionally substituted with halo, fluoro-lower-alkyl, lower-alkoxy, hydroxy, carboxy or lower-alkoxy carbonyl, lower-alkenyl, lower-alkynyl, lower-alkylene or lower-alkoxycarbonyloxy;

n=1–5;

y= 0–4; and

w=1–4;

with the proviso that when n=1, Z=H or OCH_3, and w=1, R cannot be CF_3, C_2H_4Cl, or a phenyl group substituted by CH_3, OCH_3, F, or CO_2CH_3.

5,468,467

METHODS FOR THE IN VIVO MEASUREMENT OF THE CONCENTRATION OF NON-IMAGING NMR-DETECTABLE XENOBIOTIC COMPOUNDS

Michael F. Tweedle, Princeton; Harry W. Strauss, Skillman, and Adrian D. Nunn, Ringoes, all of N.J., assignors to Bracco International B.V., Amsterdam, Netherlands

Filed Apr. 23, 1993, Ser. No. 52,959

Int. Cl.[6] A61B 5/055

U.S. Cl. 424—9.361 16 Claims

1. A method for the non-spectroscopic, non-imaging determination in vivo of the concentration of an NMR-detectable, paramagnetic xenobiotic compound, comprising the steps of:

(a) recording one or more in vivo measurements of the intensity of a magnetic resonance (NMR) signal from said xenobiotic compound, without substantially varying the magnetic field strength or radiation energy frequency over time to obtain a spectrum and without substantially varying the magnetic field strength spatially to obtain an image, at a measurement site of a living subject by employing an NMR detection system which is capable of measuring the intensity of said signal and which is located at said measurement site; and

(b) determining the concentration of said xenobiotic compound by a comparison of the signal intensity of said one or more measurements obtained in step (a) with the signal intensity of a standard.

5,468,468

METHOD FOR MAKING A MONOCLONAL ANTIBODY, MONOCLONAL ANTIBODIES TO α PDGFR AND METHOD OF IN VIVO IMAGING

William J. LaRochelle, Gaithersburg; Jacalyn Pierce, Potomac, both of Md.; Roy A. Jensen, Franklin, Tenn., and Stuart A. Aaronson, Great Falls, Va., assignors to The United States of America, as represented by the Secretary of the Department of Health & Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 915,884, Jul. 20, 1992, which is a continuation of Ser. No. 308,282, Feb. 9, 1989, abandoned. This application Jun. 25, 1993, Ser. No. 81,216

Int. Cl.[6] G01N *33/58;* A61K *51/00;* C07K *16/28;* C12N *5/12*

U.S. Cl. 424—1.49 15 Claims

1. A monoclonal antibody or fragment thereof which specifically binds to an epitope on α PDGF receptor, inhibits PDGF binding with PDGF receptor, antagonizes PDGF and does not bind β PDGF receptor.

5,468,469

METHODS OF USING AZO DYES AND THEIR DERIVATIVES

Adorjan Aszalos, Bethesda; James L. Weaver, Gaithersburg, and P. Scott Pine, Rockville, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

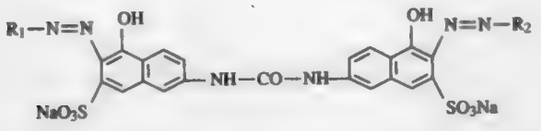
Continuation of Ser. No. 930,315, Aug. 11, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 203,654

Int. Cl.[6] G01N *1/00*

U.S. Cl. 514—150 15 Claims

1. A diagnostic method for detecting CD4-positive T4 lymphocytes in a sample, which method comprises:

contacting a sample with a compound having the formula:



and pharmaceutically acceptable salts thereof, wherein R_1 and R_2 are individually benzene or naphthalene which are independently non-, mono-, or disubstituted with OH, NaOOC, NHCOZ, SO_3Na, Z, or OZ, wherein Z is an alkyl group, under sufficient conditions to allow binding of said T4 lymphocytes and said compound,

removing unbound compound from said sample, and

detecting the presence of compound in said sample as indicative of the presence of T4 lymphocytes.

5,468,470

BENZOFURAN DERIVATIVES AND THE USE THEREOF AS STABILIZERS AGAINST UV RADIATIONS

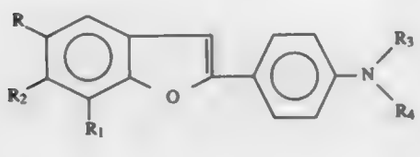
Giuseppe Raspanti, Bergamo, Italy, assignor to 3V Inc., Weehawken, N.J.

Division of Ser. No. 102,801, Aug. 6, 1993, Pat. No. 5,362,481. This application Aug. 8, 1994, Ser. No. 286,957

Int. Cl.[6] A61K *7/42;* C07D *307/82*

U.S. Cl. 424—59 12 Claims

1. Compounds of the formula (I)



wherein R and R_1 are hydrogen or a C_1–C_8 straight or branched alkyl group, R_2 is hydrogen or a C_1–C_4 alkoxy group, R_3 is hydrogen or a C_1–C_{18} straight or branched alkyl group, R_4 is a C_1–C_8 straight or branched alkyl group.

5,468,471

TITANIUM DIOXIDE DISPERSIONS, COSMETIC COMPOSITIONS AND METHODS FOR USING SAME

Julius R. Zecchino, Closter, N.J.; Steven Messin, Plainview, N.Y.; Cathleen Corcoran, Stamford, Conn., and Kenneth T. Chung, Greenlawn, N.Y., assignors to Estee Lauder, Inc., New York, N.Y.

Continuation of Ser. No. 23,498, Feb. 26, 1993, abandoned. This application Aug. 19, 1994, Ser. No. 293,416

Int. Cl.[6] A61K *7/42;47/00*

U.S. Cl. 424—59 13 Claims

1. An organic dispersion of microfine titanium dioxide comprising titanium dioxide selected from the group consisting of inorganically coated TiO_2, organically coated TiO_2 and uncoated TiO_2, of a particle size prior to agglomeration of about 10 nm to about 100 nm; and a cosmetically acceptable branched chained organic compound, without any dispersing agent; wherein said organic dispersion is formed by processing a mixture of said TiO_2 and said organic compound so as to effectively disperse said TiO_2 in said organic compound.

5,468,472

TOPICAL PROCESS FOR LIGHTENING THE SKIN OR TREATING PIGMENTAL BLEMISHES USING A COMPOSITION CONTAINING 4-THIORESORCIN DERIVATIVES

Alain LaGrange, Coupvray, and Herv´´ Borowiak, Sevran, both of, France, assignors to L'Oreal, Paris, France

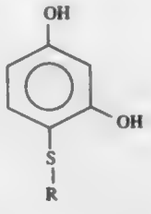
Filed Apr. 28, 1994, Ser. No. 234,555

Claims priority, application France, May 6, 1993, 93 05452

Int. Cl.[6] A61K *7/00;9/127;7/48*

U.S. Cl. 424—62 9 Claims

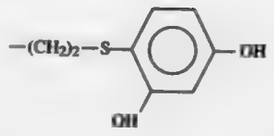
1. A topical process for lightening the skin or treating pigmental blemishes consisting in applying to the part of the skin to be treated a composition containing an effective amount sufficient to lighten the skin or treat pigmental blemishes of a 4-thioresorcin derivative corresponding to the following formula:



(I)

wherein:

R represents a C_1–C_6 alkyl radical, a C_1–C_6 haloalkyl radical, an aryl radical, an aralkyl radical which is unsubstituted or substituted by a lower alkyl or lower alkoxy radical or a halogen atom, the radical $—C_nH_{2n}—COOR'$ where n is an integer between 1 and 5 and R' represents a C_1–C_6 alkyl radical, a morpholinoalkyl or piperidino-alkyl radical in which the alkyl radical is C_1–C_6, or the radical



5,468,473

ANTIPERSPIRANT FOR HANDS AND FEET

Patricia Mulles, Babylon, N.Y., assignor to Innova Products, Inc., Naples, Fla.

Filed Feb. 9, 1994, Ser. No. 194,096
Int. Cl.[6] A61K *7/32;7/34;7/38;7/48*
U.S. Cl. 424—66 **14 Claims**

1. A low concentration antiperspirant lotion composition for the hands and feet based upon about 100% by weight of the composition containing no silicone products comprising,

(a) an effective amount of an aqueous alcohol carrier solvent,

(b) an effective amount of a thickener—absorber mixture of about 0.25% 0.16% or 0.15% by weight hydroxylalkylcellulose in combination with about 4.5% or 3.5% by weight colloidal silica and at least one silicate of about 4.0% or 3.0% by weight, and

(c) an effective amount of about 2.7% 2.5% 2.25% or 1.75% by weight of an aluminum or zirconium antiperspirant active material,

wherein the lotion composition has a pH of about 5.8 to 6.0.

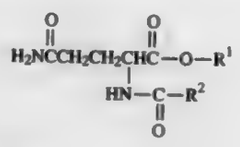
5,468,474

N-ACYLGLUTAMINE DERIVATIVES AND COSMETIC COMPOSITIONS

Shinkichi Honda, Abiko; Kenji Torii, Inashiki; Yoichiro Arai, Kodama; Masaji Kasai, Fujisawa; Hiromasa Kato, Sunto; Takao Iida, Tama; Tomoya Takahashi, Tsuchiura; Yoshiharu Yokoo, Ushiku; Toshikazu Kamiya, and Tatsuya Tamaoki, both of Machida, all of, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

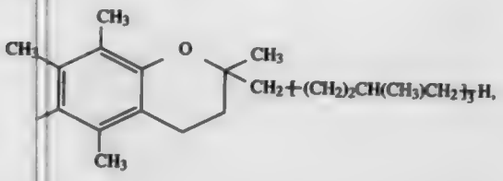
PCT No. PCT/JP93/01785, § 371 Date Jul. 27, 1994, § 102(e) Date Jul. 27, 1994, PCT Pub. No. WO94/13624, PCT Pub. Date Jun. 23, 1994
PCT Filed Dec. 9, 1993, Ser. No. 256,942
Claims priority, application Japan, Dec. 9, 1992, 4-329663
Int. Cl.[6] A61K *7/06;* **C07D** *311/20;* **C07C** *69/00*
U.S. Cl. 424—70.1 **8 Claims**

1. An N-acylglutamine derivative of formula (I):

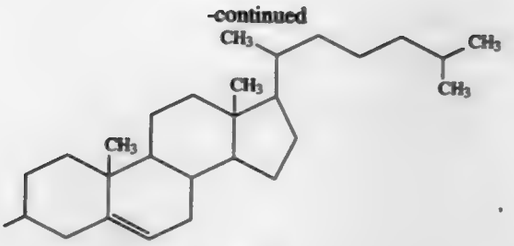


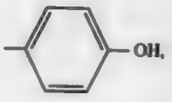
(I)

wherein R^1 represents



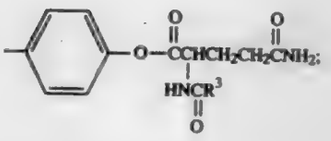
-continued





-continued

or



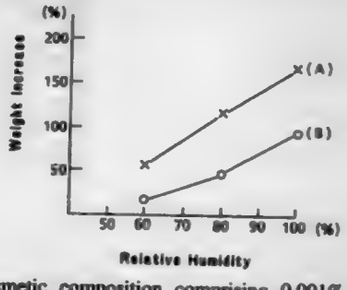
wherein R^3 represents an alkyl having 1 to 6 carbon atoms; and R^2 represents an alkyl having 1 to 6 carbon atoms.

5,468,475

COSMETIC COMPOSITION WITH CHOLINE DERIVATIVE

Masao Shaku; Sayuri Ohkura; Hideo Kuroda; Ai Kano, all of Yokohama, and Nobuo Nakabayashi, 5-6-20, Koganehara, Matsudo-shi, Chiba-ken, all of, Japan, assignors to Pola Chemical Industries Inc., and Nobuo Nakabayashi

Filed Nov. 15, 1993, Ser. No. 153,414
Claims priority, application Japan, Nov. 17, 1992, 4-306751
Int. Cl.[6] A61K *7/06;31/78;31/66*
U.S. Cl. 424—70.16 **5 Claims**



1. A cosmetic composition comprising 0.001% to 10% by weight of a homopolymer of 2-methacryloyloxyethylphosphorylcholine and a cosmetically acceptable carrier, said homopolymer having a molecular weight greater than 5,000.

5,468,476

REDUCTION OF HAIR GROWTH

Gurpreet S. Ahluwalia, 8632 Stable View Ct., Gaithersburg, Md. 20879; Douglas Shander, 16112 Howard Landing Dr., Gaithersburg, Md. 20878, and James P. Henry, 6776 Wood Duck Ct., Frederick, Md. 21701

Filed Mar. 16, 1994, Ser. No. 213,931
Int. Cl.[6] A61K *7/06;7/15;7/155*
U.S. Cl. 424—73 **25 Claims**

1. A method of reducing mammalian hair growth which comprises

selecting an area of skin of a mammal from which hair is growing and from which reduced hair growth is desired; and applying to said area of skin of a mammal from which hair is growing and from which reduced hair growth is desired an inhibitor of nitric oxide synthetase in an amount effective to reduce hair growth.

5,468,477

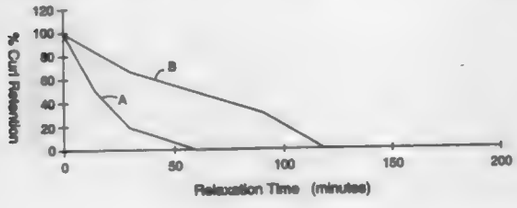
VINYL-SILICONE POLYMERS IN COSMETICS AND PERSONAL CARE PRODUCTS

Kanta Kumar; Ramesh C. Kumar, both of Maplewood, and Smarajit Mitra, West St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 881,946, May 12, 1992, abandoned. This application Aug. 3, 1993, Ser. No. 101,415

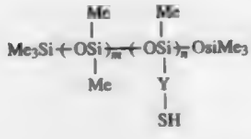
Int. Cl.[6] A61K *47/34;* **C08G** *77/28;77/442*

U.S. Cl. 424—78.17 **2 Claims**



1. A polymer that is the reaction product of

a) 5–40 weight percent of a mercapto-functional silicone compound of the formula



wherein the mole ratio of m/n is 9-49,

Y is selected from C1–10 alkylene and alkarylene having at least 10 carbons, wherein the bracketed groups may be randomly distributed throughout the compound, said compound having a total number average molecular weight of 350– 20,000;

b) 0–25 weight percent of a free radically polymerizable soft monomer; and

c) 35–95 weight percent of a free radically polymerizable hard monomer;

said components b) and c) forming a vinyl portion of said polymer: wherein the glass transition temperature of the vinyl portion of the polymer is about 60°–110° C.;

said polymer comprising 25–35 parts of the mercapto-functional silicone compound, 15–25 parts of methyl acrylate, 45–55 parts of methyl methacrylate and 5– 15 parts of methacrylic acid.

5,468,478

CONJUGATES OF SUPEROXIDE DISMUTAGE COUPLED TO HIGH MOLECULAR WEIGHT POLYALKYLENE GLYCOLS

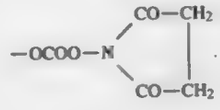
Mark Saifer, Berkeley; Ralph Somack, Oakland, and L. David Williams, Fremont, all of Calif., assignors to Oxis International, Inc., Portland, Oreg.

Continuation of Ser. No. 774,841, Oct. 11, 1991, Pat. No. 5,283,317, which is a continuation of Ser. No. 560,996, Aug. 1, 1990, Pat. No. 5,080,891, which is a continuation of Ser. No. 380,205, Jul. 13, 1989, Pat. No. 5,006,333, which is a continuation-in-part of Ser. No. 81,009, Aug. 3, 1987, abandoned. This application Oct. 18, 1993, Ser. No. 138,301

Int. Cl.[6] A61K *31/765*

U.S. Cl. 424—78.27 **19 Claims**

1. A polyalkylene glycol which is a polyethylene glycol or a polyethylene glycol-polypropylene glycol copolymer wherein all of the polyalkylene glycol has an average molecular weight as determined by HPLC using PEG as standard of about 35,000–200,000 and is unsubstituted at one terminal and is substituted at another terminal by a group of the formula:



5,468,479

COMPOSITIONS CONTAINING LACTIC ACID BACTERIUM *STREPTOCOCCUS SALIVARIUS*

Aizo Matsushiro, Osaka, Japan, assignor to Toshio Kawanishi, Kobe, and Kazusumi Tsutsumi, Osaka, both of, Japan

Filed Jun. 26, 1992, Ser. No. 905,279

Claims priority, application Japan, Jun. 28, 1991, 3-158033

Int. Cl.[6] A01N *63/00;* **A61K** *47/00;* **A23L** *1/28;* **C12N** *9/46*

U.S. Cl. 424—93.44 **3 Claims**

1. An ingestible composition comprising a biologically pure live *Streptococcus salivarius* M-33 deposited as accession number FERM BP-3885 which persists in the oral cavity and which produces dextranase.

5,468,480

PHARMACEUTICAL COMPOSITION OF PURIFIED CHYMOPAPAIN

Alan J. Barrett; David J. Buttle, both of Cambridgeshire, United Kingdom, and Daniel H. Rich, Madison, Wis., assignors to The Boots Company PLC, Nottingham, England

Division of Ser. No. 768,325, Dec. 13, 1991, Pat. No. 5,380,656. This application Sep. 8, 1994, Ser. No. 302,369

Claims priority, application United Kingdom, Apr. 28, 1989, 8909836

Int. Cl.[6] A61K *38/48;* **C12N** *9/50*

U.S. Cl. 424—94.65 **6 Claims**

1. A composition comprising chymopapain which has a specific activity against 1mM of N-α-benzoyl-DL-arginine p-nitroanilide at 37° C. and pH 6.0 of between 800 and 1700 units per mg and which contains less than 0.2% each of papaya proteinase III (PPIII), papain and papaya proteinase IV (PPIV) in combination with a pharmaceutically acceptable carrier and a pharmaceutically acceptable reducing agent, wherein said reducing agent prevents inactivation of said chymopapain by oxidation.

5,468,481

MHC CLASS II-PEPTIDE CONJUGATES USEFUL IN AMELIORATING AUTOIMMUNITY

Somesh D. Sharma, Los Altos; Brian R. Clark, Redwood City, and Bernard L. Lerch, Palo Alto, all of Calif., assignors to Amergen, Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 690,840, Apr. 23, 1991, Pat. No. 5,260,422, which is a continuation-in-part of Ser. No. 576,084, Aug. 30, 1990, Pat. No. 5,130,297, which is a continuation of Ser. No. 210,594, Jun. 23, 1988, abandoned, and a continuation-in-part of Ser. No. 635,840, Dec. 28, 1990, Pat. No. 5,284,935, which is a continuation-in-part of Ser. No. 367,751, Jun. 21, 1989, Pat. No. 5,194,425. This application Apr. 14, 1992, Ser. No. 869,293

The portion of the term of this patent subsequent to Jul. 14, 2009, has been disclaimed.

Int. Cl.[6] A61K *39/385;* C07K *14/74*

U.S. Cl. 424—125.1 22 Claims

1. An MHC Class II-peptide complex capable of inducing non-responsiveness in a target T cell, the complex consisting of a preselected antigenic peptide and an isolated MHC Class II component, the MHC Class II component having an antigen binding pocket to which the antigenic peptide is bound so that the antigenic peptide is recognized by the target T Cell.

5,468,482

PALATABLE ORALLY ADMINISTERED LIQUID MEDICAMENTS FOR RELIEF OF DISCOMFORT AND FLAVORING COMBINATIONS THEREFOR

Henry D. Calam, Peekskill, N.Y., and Hans A. Schaeffer, Linden, N.J., assignors to Calam & Associates, Inc., Peekskill, N.Y.

Continuation of Ser. No. 693,725, Apr. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 523,036, May 8, 1990, Pat. No. 5,011,688, which is a continuation-in-part of Ser. No. 309,078, Feb. 2, 1989, abandoned, which is a continuation of Ser. No. 74,548, Jul. 17, 1987, abandoned. This application Aug. 24, 1992, Ser. No. 934,883

The portion of the term of this patent subsequent to Apr. 30, 2008, has been disclaimed.

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 19 Claims

1. A liquid composition comprising:

(i) at least one active pharmaceutical agent including at least one and at most two types of agents which are selected from the group consisting of the following types of agents: analgesics, antihistamines, and diuretics; each active pharmaceutical agent being present in an effective amount with at least one from the group being unpleasant in taste, and each being dissolved in a liquid vehicle;

(ii) 5–25 percent by volume alcohol; and

(iii) an active flavor enhancing composition selected from the group consisting of (a) citrus and mint ingredients, (b) vanilla and mint ingredients, and (c) citrus, vanilla and mint ingredients; said active flavor enhancing composition being present in an amount sufficient to mask the unpleasant taste of any such active pharmaceutical agent present in the liquid composition.

5,468,483

***BACILLUS THURINGIENSIS* ANTI-GIARDIA TREATMENT**

Mark Thompson, Del Mar, and Frank H. Gaertner, San Diego, both of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Continuation of Ser. No. 91,527, Jul. 12, 1993, abandoned, which is a continuation of Ser. No. 654,166, Feb. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 538,355, Jun. 14, 1990, abandoned. This application Jul. 21, 1994, Ser. No. 278,685

Int. Cl.[6] A01N *63/02;* A61K *39/07;38/16*

U.S. Cl. 424—93.461 5 Claims

1. A process for treating a mammalian host infected with a protozoan pest of the genus Giardia which comprises administering to said host an effective protozoan inhibiting mount of a *Bacillus thuringiensis* microbe having substantially the antiprotozoan activity of *Bacillus thuringiensis* PS81F, the inclusion bodies from said microbe, or a purified protein toxin having the amino acid sequence shown in SEQ ID NO. 2.

5,468,484

METHOD OF PREVENTION OF PSEUDOMONAS INFECTION

Robert S. Hodges, Edmonton; Randall T. Irvin, Sherwood Park; William Paranchych, Edmonton; Pamela A. Sokol, and Donald E. Woods, both of Calgary, all of, Canada, assignors to S.P.I. Synthetic Peptides Incorporated, Edmonton, Canada

Continuation-in-part of Ser. No. 721,759, Jun. 25, 1991, Pat. No. 5,223,604. This application Jun. 28, 1993, Ser. No. 84,739

Int. Cl.[6] A61K *39/395;39/40;* C07K *15/28;* C12P *21/08*

U.S. Cl. 424—141.1 3 Claims

1. A method of preventing infection by *Pseudomonas aeruginosa* in a subject, comprising

administering to the subject a monoclonal antibody characterized by immunoreactivity with an Exo S peptide epitope formed by the sequence SEQ ID NO: 2 (C A T T A T G P N G S C), and by immunoreactivity with a Pseudomonas pilin peptide selected from the group consisting of SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9 and SEQ ID NO: 10.

5,468,485

AVIRULENT MICROBES AND USES THEREFOR

Roy Curtiss, III, St. Louis, Mo., assignor to Washington University, St. Louis, Mo.

Continuation of Ser. No. 332,285, Mar. 31, 1989, abandoned, which is a continuation-in-part of Ser. No. 200,934, Jun. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 58,360, Jun. 4, 1987, abandoned. This application Feb. 18, 1993, Ser. No. 20,259

The portion of the term of this patent subsequent to Mar. 15, 2011, has been disclaimed.

Int. Cl.[6] A61K *39/00;39/02;* C12N *1/21;15/00*

U.S. Cl. 424—184.1 6 Claims

1. A vaccine for immunization of an individual comprising a live avirulent *S. choleraesuis* obtained from a pathogenic strain of *S. choleraesuis*, said avirulent *S. choleraesuis* being made avirulent by an inactivating mutation in a cya gene and an inactivating mutation in a crp gene.

5,468,486

VACCINE CONTAINING A PROTEIN ALKALOID CONJUGATE FOR THE TREATMENT OF FESCUE TOXICOSIS

Bradford B. Reddick; Kimberly D. Gwinn, and Jack W. Oliver, all of Knoxville, Tenn., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

Continuation of Ser. No. 823,146, Jan. 21, 1992, abandoned. This application Mar. 3, 1994, Ser. No. 205,194

Int. Cl.[6] A61K *39/385;39/00;* **C07K** *14/37;14/765*

U.S. Cl. 424—194.1 **6 Claims**

1. A method for the treatment of the symptoms of fescue toxicosis in cattle and horses comprising injecting a subject cow or horse with a vaccine including from about 5 μg to about 1 mg of a protein-alkaloid conjugate per mL of a pharmaceutically acceptable carrier, wherein the alkaloid of the protein-alkaloid conjugate is selected from the group consisting of ergonovine, ergonovinine, ergovaline, ergosine, β-ergosine, ergonine, ergotamine, ergoptine, β-ergoptine, ergocornine, ergostine, ergovalinine, α-ergocryptine, β-ergocryptine, ergocristine, ergosinine, β-ergosinine, ergoninine, ergotaminine, ergoptinine, β-ergoptinine, ergocorninine, ergostinine, α-ergocryptinine, β-ergocryptinine, ergocristinine, ergothioneine, ergotinine, ergotoxine, perloline, N-acetylloline, and halostachine, wherein the protein of the protein-alkaloid conjugate is selected from the group consisting of bovine serum albumin and ovalbumin, and wherein the conjugate is a carbodiimide reaction product in which said alkaloid is coupled to said protein.

5,468,487

EXTRACTED SUBSTANCE HAVING ANTI-HIV ACTIVITY

Young B. Han, 266-5 Jeongrung-dong, Seongbuk-ku; Jeong J. Mun; Hong K. Kyung; Jong B. Kim, all of Seoul; Kyung T. Kim, Kyungsangbuk-do; Hae R. Kim; Jeong H. Kim, both of Seoul; Hyun G. Shin, Kyungki-do; Kyung R. Kim, Seoul; Eun K. Hong, Kyungki-do, and Choon W. Kim, Seoul, all of, Rep. of Korea, assignors to Young Bok Han, and Korean Association of Creation Research, both of Seoul, Rep. of Korea

Filed Jun. 22, 1993, Ser. No. 79,608

Claims priority, application Rep. of Korea, Jun. 23, 1992, 1992-10894

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 **4 Claims**

1. A process for preparing an extract having an activity of inhibiting HIV-induced syncytium formation in vitro which comprises the steps of:

(a) mixing a non-fat starch from *Ricinus Communis L* and a root of Coptis sp. in a weight ratio from 2:5 to 5:2;

(b) extracting the resulting mixture with an organic solvent at a temperature of 20° to 25° C. for 20 to 25 hours;

(c) subjecting the resulting extract repeatedly to filtration under reduced pressure to obtain a filtrate and a residue;

(d) drying the residue to remove remaining organic solvent, and then adding distilled water thereto;

(e) heating the aqueous suspension obtained from step (d) at 100° C. for 3 to 4 hours to obtain an aqueous extract;

(f) concentrating the aqueous extract under a reduced pressure, and then saturating the concentrate in vacuo to remove the precipitates;

(g) adding chloroform to the aqueous extract, followed by agitating the mixture and separating the phases;

(h) removing the chloroform phase and then further extracting the aqueous phase with hexane;

(i) refining the aqueous phase with a talc and subjecting the refined aqueous phase to filtration under reduced pressure to obtain a filtrate;

(j) further filtering the filtrate through a membrane filter and then lyophilizing the filtrate to give a yellowish brown powder.

5,468,488

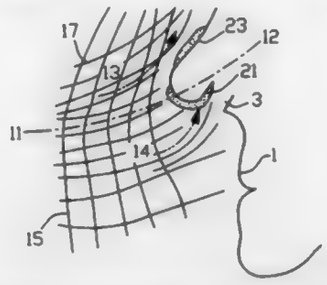
ELECTROSTATICALLY CHARGED NASAL APPLICATION PRODUCT AND METHOD

Ashok L. Wahi, 628 Brookside La., Somerville, N.J. 08876

Filed Jun. 24, 1993, Ser. No. 80,775

Int. Cl.[6] A61K *9/10;9/06*

U.S. Cl. 424—78.03 **14 Claims**



1. The method of restricting the flow of charged airborne contaminants into a human nasal passage, which consists essentially of:

(1) applying directly to an area near a human nasal passage, a topical application for creating an artificial electrostatic field in said area near a human nasal passage, said topical application consisting essentially of a plurality of masses of one or more electrostatic polymers, said masses having an average cross-sectional area of about 1 square millimeter to about 50,000 square millimeters, so as to create an artificial electrostatic field to reduce the flow of charged airborne contaminants passing into said human nasal passage, said topical application and said created artificial electrostatic field is removable from said area near said human nasal passage, and a carrier having said plurality of masses dispersed through at least a portion thereof; and,

(2) removing said topical application from said area near said human nasal passage after it has reduced the flow of charged airborne contaminants to said human nasal passage.

5,468,489

DENTIFRICE CONTAINING ANTIBACTERIAL MATERIAL

Shuji Sakuma, and Kiminori Atsumi, both of Tokyo, Japan, assignors to Sangi Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 986,451, Dec. 7, 1992, abandoned, which is a continuation-in-part of Ser. No. 870,906, Apr. 20, 1992, abandoned. This application Jun. 20, 1994, Ser. No. 262,378

Claims priority, application Japan, Jan. 29, 1991, 3-282636

Int. Cl.[6] A61K *7/16*

U.S. Cl. 424—49 **17 Claims**

1. A dentifrice comprising:

a phosphate containing calcium; and

an antibacterial metal carded in a metallic state by said calcium containing phosphate, said antibacterial metal being at least one metal selected from the group consisting of silver, copper and zinc.

5,468,490

LIPIDIC FURANS USEFUL FOR SKIN THERAPEUTICS

S. Richard Huber, Camarillo, Calif., and David F. Counts, Coram, N.Y., assignors to Conkle & Olesten, Los Angeles, Calif.

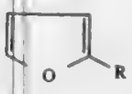
Filed Oct. 25, 1993, Ser. No. 142,808

Int. Cl.[6] A61K *31/34*

U.S. Cl. 424—78.03 **9 Claims**

1. A method for enhancing the metabolism of skin and mucosal tissue and thereby improving its health and appearance, comprising

the step of administering a pharmacologically effective amount of lipidic furans to a person, said lipidic furans having the following general formula:



wherein R is selected from the group consisting of one of a straight C_{9-36} alkyl chain, having the formula $—(CH_2)_nCH_3$, wherein n=8 to 35; a straight unsaturated alkenyl C_{9-36} chain with a single double bond, of the formula $—(CH_2)_n—CH=CH—(CH_2)_m—CH_3$, wherein n and m≠0 and n+m=7 to 34, a straight unsaturated C_{9-36} chain, containing two to six double bonds, with the formula $CH_3—(CH_2)_m—(CH=CH)_x—(CH_2)_n—$, wherein m, x and n≠0, and m+2x+n=8 to 35; a straight unsaturated chain, having the formula $—(CH_2)_7CH=CH—CH_2—CH=CH(CH_2)_4—CH_3$; a straight unsaturated C_{9-36} chain containing one to six double bonds and one triple bond, having the formula $CH_3—(CH_2)_m—C≡C—(CH=CH—Ch_2)_x—(CH_2)_n—$, wherein m, x and n≠0 and m+3x+n=6 to 33, a straight unsaturated chain C_{9-36} containing one to six double bonds and two to six triple bonds, having the structure $CH_3—(CH_2)_m—(C=C—CH_2)_y—(CH=CH—CH_2)_x—(CH_2)_n—$, wherein m, y, x and n≠0 and m+3y+3x+n=8 to 35.

5,468,491

METHOD FOR PRODUCING OAT EXTRACT

Ronald G. Targan, 40 Glenside Rd., South Orange, N.J. 07079

Filed Jan. 11, 1994, Ser. No. 179,808

Int. Cl.[6] A61K *31/70;* **C12C** *1/00;* **A21D** *8/04*

U.S. Cl. 424—195.1 **13 Claims**

1. A method of producing oat extract, consisting essentially of the steps:

(a) combining rolled oats, oat flour, and enzymes for facilitating the conversion of starch into sugar, in a ratio of approximately 15 kg rolled oats to 1.67 kg oat flour to 1 kg of enzymes, to form an oat/enzyme grist;

(b) mixing the oat/enzyme grist with water, in a ratio of approximately 1 kg of oat/enzyme grist to 1.9 liters of water, to form an oat/enzyme solution;

(c) heating the oat/enzyme solution to a temperature of approximately 50 degrees celsius;

(d) maintaining the temperature of the oat/enzyme solution at approximately 50 degrees celsius for about three hours;

(e) heating the oat/enzyme solution from approximately 50 degrees celsius to approximately 65 degrees celsius; and

(f) maintaining the temperature of the oat/enzyme solution at about 65 degrees celsius for approximately 2.5 hours;

(g) agitating the mixture of the oat/enzyme solution during steps (d), (e), and (f);

(h) adjusting the pH of the oat/enzyme solution to approximately a pH of 5.8;

(i) transferring the pH adjusted oat/enzyme solution to a filtration vessel;

(j) separating undissolved solids from the pH adjusted oat/enzyme solution to produce filtered oat wort by passing the pH adjusted oat/enzyme solution through a filter contained in the filtration vessel; and

(k) concentrating the filtered oat wort to produce oat extract.

5,468,492

COSMETIC COMPOSITION

Erzsébet Szalóki; Ilona Kristóf; Veronika Pál, and Eva Szabó, all of Debrecen, Hungary, assignors to Biogal Gyógyszergyár RT, Debrecen, Hungary

Filed Dec. 27, 1993, Ser. No. 174,202

Claims priority, application Hungary, Jul. 27, 1993, P 93 02175

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 **12 Claims**

1. A topical cosmetic composition which comprises a hair fallout reducing effective amount of a mixture of an extract of *Gingko biloba* (maidenhair tree) leaves and an extract of the root of *Liquirita officinalis* (sweet root) combined with one or more cosmetically acceptable solid or liquid carrier, and optionally combined with one or more cosmetically acceptable supplementary ingredient.

5,468,493

FOOD PRODUCT CONTAINING ANTIMICROBIAL COMPOSITION PREPARED BY DRY DISTILLATION OF BAMBOO

Toshikazu Funkunaga, Hyogo, Japan, assignor to Shiraimatsu Shinyaku Kabushiki Kaisha, Minakuchi, and Itochu Fine Chemical Corporation, Tokyo, both of, Japan

Filed Jan. 31, 1994, Ser. No. 188,722

Claims priority, application Japan, Feb. 2, 1993, 5-039516

Int. Cl.[6] A61K *35/78;* **A23L** *1/00*

U.S. Cl. 424—195.1 **1 Claim**

1. A food composition comprising a food product and an antimicrobial component obtained by the dry distillation of bamboo under a reduced pressure of 10 to 50 mmHg at a temperature of 130° to 220° C.

5,468,494

IMMUNOGENIC COMPOSITIONS AGAINST HUMAN GASTRIN 17

Philip C. Gevas, Honolulu, HI.; Stephen Grimes; Stephen L. Karr, both of Davis, Calif.; Dov Michaeli, Larkspur, Calif., and Robert Scibienski, Woodland, Calif., assignors to Aphton Corp., Woodland, Calif.

Filed Nov. 12, 1993, Ser. No. 151,219

Int. Cl.[6] A61K *39/385;* **C07K** *7/06;7/08;17/06*

U.S. Cl. 424—195.11 **7 Claims**

1. A immunogenic composition comprising the peptide pGlu-Gly-Pro-Trp-Leu-Glu-Glu-Glu-Glu-Ser-Ser-Pro-Pro-Pro-Pro-Cys SEQ ID NO.: 1, coupled to an immunogenic carrier.

5,468,495

METHODS OF PREVENTING AND REDUCING THE SIZE OF *STRIAE DISTENSAE* LESIONS

Albert M. Kligman, 210 W. Rittenhouse Sq., Philadelphia, Pa. 19103

PCT No. PCT/US90/04939, § 371 Date Mar. 6, 1992, § 102(e) Date Mar. 6, 1992, PCT Pub. No. WO91/03240, PCT Pub. Date Mar. 21, 1991

Continuation-in-part of Ser. No. 402,271, Sep. 1, 1989, Pat. No. 5,134,163. This PCT application Aug. 30, 1990, Ser. No. 836,320

The portion of the term of this patent subsequent to Jul. 28, 2009, has been disclaimed.

Int. Cl.[6] A61K *7/00;31/07*

U.S. Cl. 424—401 **8 Claims**

1. A method of eliminating or reducing the size of striae distensae lesions comprising applying topically to the area of the skin affected with said lesions a composition comprising an amount of a retinoid effective to reduce or eliminate said lesions.

5,468,496

TWO-PHASE COSMETIC OR DERMATOLOGICAL COMPOSITION

Philippe Touzan, Ramonville-Saint-Agne; Liliane Lukassen, Chevilly-Larue, and Nathalie Louvet, L'Hay-Les-Roses, all of, France, assignors to L'Oreal, Paris, France

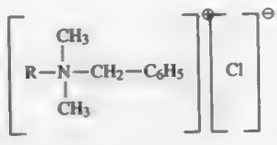
Filed Dec. 14, 1993, Ser. No. 165,997

Claims priority, application France, Dec. 18, 1992, 92 15309

Int. Cl.[6] A61K *7/02*

U.S. Cl. 424—401 8 Claims

1. A cosmetic or dermatological composition comprising an aqueous phase and a separate oily phase in a ratio of between 30:70 and 60:40, at least one of the said phases containing an anionic, nonionic or amphoteric surfactant, said aqueous phase containing a demixing agent in a proportion of between 0.025% and 5% by weight, said demixing agent having the formula:



(I)

in which:

R represents a saturated linear alkyl radical having from 12 to 16 carbon atoms, or a mixture of compounds of formula (I), and said anionic, nonionic or amphoteric surfactant being present in a proportion of more than 0.25% by weight relative to the weight of the composition and being selected from the group consisting of anionic, nonionic and amphoteric surfactant when being present in the aqueous phase or said anionic, nonionic or amphoteric surfactant being a fat-soluble nonionic surfactant when being present in the oily phase, wherein said composition is nonfoaming.

5,468,497

FUMING, HOT-VAPORIZING INSECTICIDE FOR KILLING FLIES, AND METHOD FOR KILLING FLIES WITH THE SAME

Yoshio Katsuda, Nishinomiya, Japan, assignor to Dainihon Jochugiku Co., Ltd., Osaka, Japan

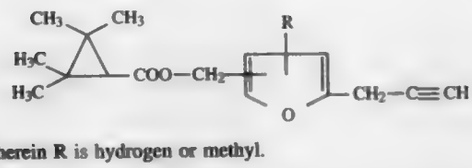
Filed Aug. 30, 1994, Ser. No. 298,153

Claims priority, application Japan, Sep. 3, 1993, 5-254637; Sep. 10, 1993, 5-260344; Mar. 18, 1994, 6-074468; May 10, 1994, 6-120595

Int. Cl.[6] A01N *25/00*

U.S. Cl. 424—405 36 Claims

1. A fuming, hot-vaporizing insecticide for killing flies, characterized by containing as the active ingredient, propargylfurylmethyl 2,2,3,3-tetramethylcyclopropanecarboxylate of the general formula I:



(I)

wherein R is hydrogen or methyl.

5,468,498

SULFOPOLYMER/VANADIUM OXIDE ANTISTATIC COMPOSITIONS

Eric D. Morrison, West St. Paul; David R. Boston, Woodbury; Steven T. Hedrick; William L. Kausch, both of Cottage Grove; Wayne K. Larson, Maplewood, and Simon S. Fung, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 893,279, Jun. 4, 1992, Pat. No. 5,427,835.

This application Mar. 20, 1995, Ser. No. 406,548

Int. Cl.[6] C08K *3/22;3/10;* C08L *81/08*

U.S. Cl. 524—408 14 Claims

1. An aqueous mixture comprising colloidal vanadium oxide and a dispersed sulfonated polymer comprising at least one unit containing a salt of a —SO_3H group in an amount more than zero and up to 15 percent by weight solids based on the sulfonated polymer and vanadium oxide composition, said vanadium oxide being present in the range of 0.2 to 50 weight percent on a dry basis of total solids, the aqueous mixture being present in an amount sufficient to provide said article with antistatic properties.

5,468,499

LIPOSOMES CONTAINING THE SALT OF PHOSPHORAMIDE MUSTARD AND RELATED COMPOUNDS

Kenneth K. Chan, Dublin, and Aeumporn Srigritsanapol, Columbus, both of Ohio, assignors to Ohio State University, Columbus, Ohio

Filed Nov. 15, 1993, Ser. No. 152,493

Int. Cl.[6] A61K *37/22;9/52*

U.S. Cl. 424—450 9 Claims

1. A pharmaceutical composition comprising:

dichlorodiethyl phosphoramide drug selected from the group consisting of isophospboramide mustard, cyclohexylamine salt of phosphoramide mustard or mixtures thereof, and liposomes comprising sphingomyelin and cholesterol;

wherein the dichlorodiethyl phosphoramide drug is entrapped within the liposome.

5,468,500

SOURSOP FLAVOR

Manuel Rodriguez-Flores, Mayagüez, and Sonia Rivera-Gonzalez, San Sebastián, both of, Puerto Rico, assignors to University of Puerto Rico, San Juan, Puerto Rico

Filed Oct. 29, 1993, Ser. No. 145,279

Int. Cl.[6] A61K *35/78;47/14;* A23L *1/222;2/02*

U.S. Cl. 424—441 16 Claims

1. An imitation soursop flavoring composition comprising a mixture of about 9.2–10.4% methyl butanoate, about 11.5–13% methyl 2-butenoate, about 7.0–7.5% butanoic acid, about 25.7–29.9% methyl hexanoate, about 42.2–46.8% methyl 2-hexenoate, about 2.3% hexanoic acid and about 0.4– 0.5% 3,7-dimethyl-1,6-octadien-3-ol, said mixture in a solution at a concentration needed to enhance flavor of soursop nectars and juices; to impart a soursop pulp flavor to a product including soursop flavored candies, dry beverage powders, yogurt, ice cream, ice milk, sherbets, syrups, jams, jellies, gelatins, puddings, pie fillings, carbonated, non-carbonated and alcoholic beverages, and liqueurs, and to impart a pleasant taste as well as to mask any unpleasant aftertaste in pharmaceutical preparations including chewable tablets and lozenges.

5,468,501

ARTICLE USEFUL FOR ADMINISTRATION OF PHARMACOLOGICALLY-ACTIVE SUBSTANCES TRANSDERMALLY, ORALLY OR BY MEANS OF IMPLANT

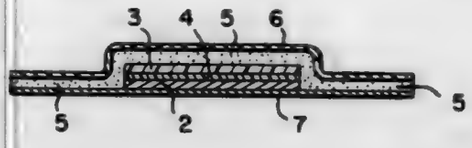
Agis Kydonieus, Kendall Park; Kishore R. Shah, Bridgewater, both of N.J., and Bret Berner, Ardsley on Hudson, N.Y., assignors to Hercon Laboratories Corporation, New York, N.Y.

Continuation of Ser. No. 974,672, Nov. 10, 1992, abandoned, which is a continuation of Ser. No. 503,600, Apr. 3, 1990, abandoned, which is a continuation of Ser. No. 16,796, Feb. 20, 1987, abandoned, which is a continuation-in-part of Ser. No. 847,635, Apr. 3, 1986, Pat. No. 4,758,434, which is a continuation-in-part of Ser. No. 657,911, Oct. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 413,658, Sep. 1, 1982, abandoned. This application Feb. 8, 1995, Ser. No. 385,205

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.[6] A61F *13/00*

U.S. Cl. 424—443 **32 Claims**



1. A device for the controlled release and delivery to animal tissue of a pharmacologically-active agent comprising an impermeable backing layer, a plasticized polyvinyl chloride layer, and an adhesive layer, said plasticized polyvinyl chloride layer comprising by weight from about 20 up to about 60% of a polyvinyl chloride resin, from about 20 up to about 70% of plasticizer and from about 0.5 up to about 35% of said pharmacologically-active substance which when a surface of said plasticized polyvinyl chloride layer is in contact with a tissue either exterior to the epidermis or subdermally or in contact with a tissue of an animal to be treated with said pharmacologically-active agent, said pharmacologically-active agent is absorbed into and through said tissue and thence into circulatory system of said animal, said pharmacologically-active agent being uniformly dispersed in said plasticized polyvinyl chloride layer in an amount such that an effective amount of said pharmacologically-active agent is absorbed into said animal in a prescribed period of time wherein the pharmacologically-active agent is selected from the group consisting of isosorbide dinitrate, nicotine, indomethacin, clonidine, glyceryl trinitrate, quanfacine and prostaglandin.

5,468,502

IBUPROFEN ENHANCING SOLVENT SYSTEM

Andrew A. Argiriadi, Cherry Hill; Robert G. Blank, Hammonton, both of N.J., and David H. Giamalva, Glen Allen, Va., assignors to American Home Products Corporation, Madison, N.J.

Filed Dec. 20, 1994, Ser. No. 359,489

Int. Cl.[6] A61K *9/64;31/19*

U.S. Cl. 424—456 **10 Claims**

1. In a pharmaceutically acceptable highly concentrated clear microcolloidal solution of ibuprofen suitable for filling soft gels for oral administration comprising, based on the weight of the clear solution, at least about 25% by weight of ibuprofen, about 1%–10% by weight of water and about 50%– 74% of at least one pharmaceutically acceptable solubilizing material selected from the class consisting of non-ionic polyethoxylated surface active agents having a hydrophile-lipophile balance within the range of 8 to 25 and non-ionic polyalkylene glycol polymers having a hydrophile-lipophile balance within the range of 8 to 25 alone or in combination with a solvent system having a solubility parameter within the range 8.0 and 15.0, the improvement which comprises incorporating into the solution as an ibuprofen solubility enhancer about 1% to 10% by weight of ammonium acetate.

5,468,503

ORAL PHARMACEUTICAL PREPARATION RELEASED AT INFRAGASTROINTESTINAL TRACT

Akiya Yamada, Takamatsu; Takahiko Wato; Naoki Uchida, both of Kagawa; Misuzu Fujisawa, Takamatsu; Shigeyuki Takama, Kagawa, and Yukiko Inamoto, Takamatsu, all of, Japan, assignors to Teikoku Seiyaku Kabushiki Kaisha, Kagawa, Japan

PCT No. PCT/JP92/01037, § 371 Date Jun. 25, 1993, § 102(e) Date Jun. 25, 1993

PCT Filed Aug. 13, 1992, Ser. No. 78,294

Int. Cl.[6] A61K *9/62*

U.S. Cl. 424—461 **5 Claims**

1. An oral pharmaceutical preparation for releasing a principal agent in the infragastrointestinal tract, comprising:

(a) a hard capsule comprising chitosan and a lubricating agent selected from the group consisting of talc, magnesium stearate, aluminum stearate and calcium stearate;

(b) a solid pharmaceutical preparation comprising said principal agent and a solid water-soluble organic acid which is one or more acids selected from the group consisting of citric acid, tartaric acid, malic acid, succinic acid, adipic acid and benzoic acid; and,

(c) an enteric coating comprising one or more polymers selected from the group consisting of hydroxypropyl methyl cellulose phthalate, hydroxypropyl methyl cellulose acetate succinate, cellulose acetate phthalate, methacrylate copolymer and shellac;

wherein said solid pharmaceutical preparation (b) is filled in said hard capsule (a) and said enteric coating (c) is formed on the surface of said hard capsule (a).

5,468,504

EFFERVESCENT PHARMACEUTICAL COMPOSITIONS

Alain E. E. Schaeffer, Evreux, France, assignor to Laboratoires Glaxo S.A., Paris, France

Continuation of Ser. No. 75,527, Jun. 17, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 396,533

Claims priority, application United Kingdom, Dec. 21, 1990, 9027827

Int. Cl.[6] A61K *9/46*

U.S. Cl. 424—466 **8 Claims**

1. An effervescent pharmaceutical composition for oral use for migraine comprising 20 mg to 150 mg of a compound which is 3-[2-(dimethylamino)ethyl]-N-methyl- 1H-indole-5-methanesulphonamide succinate (1:1) salt as the active ingredient and 25% to 55% (w/w) sodium bicarbonate as the base component and 25% to 55% (w/w) monosodium citrate as acid component, which components react in the presence of water to generate a gas.

5,468,505

LOCAL DELIVERY OF FIBRINOLYSIS ENHANCING AGENTS

Jeffrey A. Hubbell; Jennifer L. Hill-West, both of Austin, and Randall C. Dunn, Houston, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 22,687, Mar. 1, 1993, Pat. No. 5,410,016, which is a continuation-in-part of Ser. No. 843,485, Feb. 28, 1992, abandoned. This application Dec. 10, 1993, Ser. No. 165,392

Int. Cl.[6] C08G *63/08;67/00;* **A61K** *9/58*

U.S. Cl. 424—484 **17 Claims**

1. A method for preventing tissue adhesions comprising administering to a site where adhesion is to be prevented an effective

amount of a fibrinolytic enhancing agent selected from the group consisting of urokinase, thrombolytic agents, proteases specifically cleaving fibrin, anti-plasmin inhibitors, and fibrin deposition blockers in a topically applied biocompatible, biodegradable polymeric matrix which conforms in situ to the tissue and releases the agent in a controlled manner over a period of between one and thirty days.

5,468,506

CONCENTRATED BIOAVAILABLE CALCIUM SOURCE

Mark B. Andon, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 964,316, Oct. 21, 1992, abandoned. This application Jan. 21, 1994, Ser. No. 184,771

The portion of the term of this patent subsequent to Mar. 28, 2012, has been disclaimed.

Int. Cl.[6] A23L *1/304*

U.S. Cl. 426—74 **8 Claims**

1. A bioavailable calcium composition consisting essentially of a) soluble calcium, b) an edible acid component comprising a mixture of citric acid and malic acid, and c) sugar; wherein said edible acid component has a weight ratio of citric acid to malic acid of from about 90:10 to about 10:90; wherein the weight ratio of said edible acid component to said soluble calcium is from about 3:1 to about 17: 1; wherein said sugar comprises from about 25% to about 99% fructose, on a dry weight basis, and wherein the weight ratio of sugar to edible acid component is from about 1:1 to about 40:1.

5,468,507

COMPOSITION CONTAINING A DESIRED FLAVORING AGENT AND MEDIUM CHAIN TRIGLYCERIDES

Al F. Czap, P.O. Box 3200, Sandpoint, Id. 83864-0360

Filed Jul. 13, 1993, Ser. No. 91,069

Int. Cl.[6] A23D *9/00*

U.S. Cl. 426—99 **6 Claims**

6. A composition comprising a desired flavoring agent in combination with at least about 60% medium-chain triglycerides wherein the composition is contained within a vessel capable of emitting the composition as a spray, wherein said vessel is an aerosol container and said composition further comprises aerosol propellants that permit said composition to be emitted from said aerosol container as an aerosol spray.

5,468,508

PRESERVATION OF FRESH FRUIT JUICES AND FRUIT JUICE BLENDS

Chiu H. Wu, Vancouver, and William D. Powrie, North Vancouver, both of, Canada, assignors to The University of British Columbia, Vancouver, Canada

Continuation-in-part of Ser. No. 779,368, Oct. 17, 1992, abandoned. This application Feb. 11, 1993, Ser. No. 16,566

Int. Cl.[6] A23L *2/06;3/3418;* B65B *31/00*

U.S. Cl. 426—316 **17 Claims**

1. A process for preserving fresh fruit juice extracted from ripe fresh fruit comprising extracting unheated fresh juice from the edible portion of the ripe fresh fruit, and immediately thereafter gasifying the unheated fresh juice at a temperature between about −1° C. to about 30° C. by introducing a gas mixture comprising about 1% to about 20% vol oxygen and about 5% to about 90% vol carbon dioxide into said fresh juice, such that after said introduction step the dissolved oxygen concentration level in the unheated fresh juice is between about 2 to 9 ppm and the dissolved carbon dioxide concentration level in the unheated fresh juice is between about 100 and about 1500 ppm and wherein the concentration of oxygen in the unheated fresh juice is sufficient to enable limited aerobic enzymatic reactions to occur in the unheated fresh juice and to prevent anaerobic off-flavour development and the concentration of carbon dioxide in the unheated fresh juice is sufficient to inhibit microbial growth, respiration, senescence and oxidation of ascorbic acid in the unheated fresh juice, and thereafter directly placing the unheated gasified fresh juice in a high gas-barrier container, sealing the container and rapidly cooling the unheated fresh juice in the sealed container.

5,468,509

PROCESS FOR PRODUCING WATER-CONTAINING MILK CHOCOLATE

Raphael Schlup, Bern, Switzerland, and Theodore S. Lioutas, Sarasota, Fla., assignors to Kraft Jacobs Suchard, Zurich, Switzerland

Filed Mar. 29, 1994, Ser. No. 219,589

Int. Cl.[6] A23G *1/00*

U.S. Cl. 426—548 **9 Claims**

1. A process for producing a water-containing milk chocolate composition containing from about 1 to about 16 weight percent water which comprises:

(1) mixing cocoa butter with cocoa ingredients in the presence of an edible emulsifier to coat completely said cocoa ingredients;

(2) blending water, sweetener and milk solids to form an aqueous product;

(3) blending said cocoa butter-coated cocoa ingredients of step (1) with said aqueous product of step (2) with a minimum of mixing to form a uniform mixture without producing high viscosities, and thereafter, without a conching step;

(4) tempering said resulting mixture of step (3) to temperatures in the range from about 27° C. to about 32° C.

5,468,510

LOW CALORIE MEAT PRODUCTS

Bent Christensen, and Frits Mogensen, both of Hjørring, Denmark, assignors to Danish Crown Inc. A/S, Copenhagen, Denmark

Continuation of Ser. No. 623,747, Dec. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 597,719, Oct. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 566,223, Aug. 13, 1990, abandoned, which is a continuation-in-part of Ser. No. 517,663, May 1, 1990, abandoned. This application Jan. 25, 1994, Ser. No. 186,028

Claims priority, application Denmark, Dec. 11, 1989, 6250/89; Apr. 26, 1990, 1036/90; Aug. 2, 1990, 1852/90; Jan. 10, 1990, 245/90

Int. Cl.[6] A23L *1/317*

U.S. Cl. 426—574 **76 Claims**

1. A low calorie meat product comprising:

(a) a mixture comprising

(1) comminuted lean meat that contains at least 1% fat and that is substantially free from visible fat, the proportion of which is in the range of 20–95% by weight, calculated on the mixture,

(2) a vegetable fat replacement ingredient comprising dietary fiber and starch in a weight ratio which is in the range of 1:20 to 1:4, the proportion of the dietary fiber being at least 5% by weight of the fat replacement ingredient dry matter when determined as non-starch polysaccharides (NSP), and the proportion of the starch being at least 50% of the fat replacement ingredient dry matter, which fat replacement ingredient is capable of having or being brought into a homogeneous consistency essentially without sensory recognizable particles in the mixture, the proportion of said vegetable fat replacement ingredient being in the range of 5–80% by weight, calculated on the mixture,

(b) optionally added salt, the proportion of which when added being in the range of 0.1–4% by weight, calculated on the mixture, and

(c) optionally added water, the proportion of which when added is in the range of 5–50% by weight, calculated on the mixture, wherein the product has a fat content which is at the most 15% by weight when the product is a hamburger product and the content of fat being at the most 10% by weight when the product is not a hamburger product, with the provisos that (i) when the comminuted lean meat is fish meat, the fat does not comprise hardened fat and (ii) the dietary fiber is not konjak mannan, and wherein the contribution of fat in the low calorie meat product to the total energy content of the low calorie meat product is less than 50%.

5,468,511

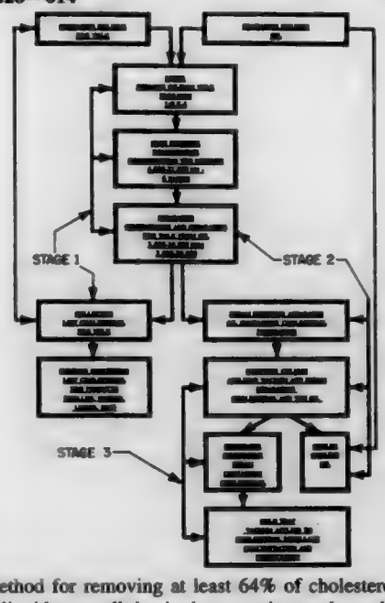
METHOD FOR REMOVAL OF CHOLESTEROL AND FAT FROM LIQUID EGG YOLK WITH RECOVERY OF FREE CHOLESTEROL AS A BY-PRODUCT

Gideon Zeidler, Los Angeles, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 842,530, Feb. 28, 1992, abandoned. This application Jul. 6, 1993, Ser. No. 88,227

Int. Cl.[6] A23L *1/32;1/015*

U.S. Cl. 426—614 **16 Claims**



1. A method for removing at least 64% of cholesterol from an untreated liquid egg yolk in single extraction cycle, and for recovering extracted cholesterol as a second product, said method comprising steps:

(a) forming an egg yolk-oil emulsion by mixing in a mixer or a blender about 1 part, by weight, untreated egg yolk, with about 0.5–2 parts, by weight, of an extraction soybean oil wherein said oil is without added monoglyceride;

(b) submitting said emulsion to ultra high pressure homogenization to extract cholesterol from the egg yolk into the extraction oil, said homogenization performed at a pressure from about 4,000 psi to about 21,000 psi in an ultra high pressure homogenizer able to withstand pressure from at least 4,000 psi to about 21,000 psi, said homogenization further performed under vacuum in an airless system comprising an aerator, for 2–10 minutes, with minimum six passes of the emulsion of step (a) through the ultra high pressure homogenizer in the single extraction cycle, said homogenization performed at extraction temperature between 40°–45° C.;

(c) separating the liquid egg yolk having reduced amount of cholesterol by at least 64% from the extraction oil containing cholesterol extracted from the egg yolk;

(d) removing about 80% of cholesterol from the extraction oil of step (c) by steam stripping;

(e) recovering the extraction oil of step (d); and

(f) recovering solid cholesterol as the second product.

5,468,512

FAT-REPLACING INGREDIENT AND METHOD OF MAKING

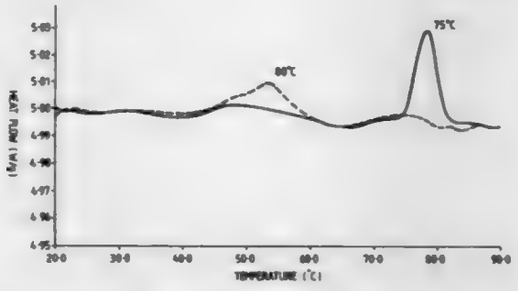
Jozephus J. Verschuren, Poortugaal; Wilhelmus A. M. Castenmiller, Vlaardingen; Ivo A. van Amerongen, Rotterdam, and Loillbrord C. van Der Meijs, Vlaardingen, all of, Netherlands, assignors to Van den Bergh Foods Company, Division of Conopco, Inc., Lisle, Ill.

Filed Jan. 10, 1994, Ser. No. 179,392

Claims priority, application European Pat. Off., Jan. 13, 1993, 93200077

Int. Cl.[6] A23L *1/09*

U.S. Cl. 426—658 **10 Claims**



1. A pasteurised oligofructose having a main DSC peak which has an onset temperature of more than 70° C.

5,468,513

HONEY PRODUCTS

Robert N. Fackrell, and Lorenzo P. Griffeth, both of Preston, Id., assignors to Creamery Hollow U.S.A., Inc., Preston, Ohio

Continuation-in-part of Ser. No. 221,068, Mar. 31, 1994. This application Apr. 21, 1994, Ser. No. 230,632

Int. Cl.[6] A23C *15/16;15/06;15/18;* **A23D** *7/015*

U.S. Cl. 426—663 **39 Claims**

1. A method of making a honey butter which comprises the steps of: providing a feedstock comprising sweet cream or whey cream; pasteurizing said feedstock; blending honey with the pasteurized feedstock in an amount ranging from 20 to 80 percent based on the weight of the product; homogenizing the resulting, honey-containing mixture; cooling said mixture to a temperature in the range of 33° to 65° F.; and whipping the cooled mixture; the providing, pasteurization, and homogenizing of said feedstock and said mixture being so carried out as to effect a phase reversal and consequent formation of an emulsion of liquid in feedstock fat.

5,468,514

METHOD OF PRODUCING A PH-RESPONSIVE MEMBRANE

Katsuhiko Tomita, Ohtsu, Japan, assignor to Horiba, Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 797,907, Nov. 26, 1991, abandoned. This application Jul. 12, 1994, Ser. No. 273,635

Claims priority, application Japan, Nov. 30, 1990, 2-339487

Int. Cl.[6] B05D *5/12*

U.S. Cl. 427—77 **18 Claims**

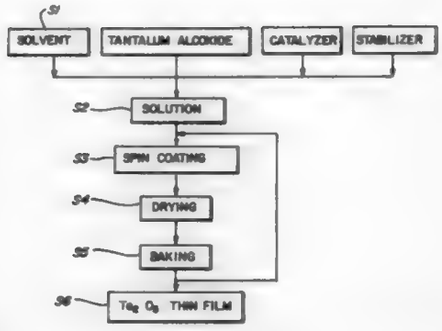
1. A method for producing a pH-responsive membrane, comprising the steps of:

preparing an anhydrous coating solution of tantalum alkoxide, an anhydrous solvent, a stabilizer, and a catalyst;

providing an electrode substrate;

coating the electrode substrate with the anhydrous coating solution under anhydrous conditions to form a film of tantalum alkoxide;

drying the coated substrate to remove the solvent; and



heating the dried coated substrate to decompose the tantalum alkoxide, thereby forming a pH-responsive membrane of tantalum pentoxide.

5,468,515

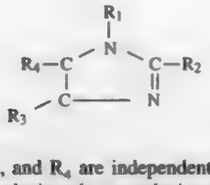
COMPOSITION AND METHOD FOR SELECTIVE PLATING

Donald Ferrier, Thomaston, and Eric Yakobson, Waterbury, both of Conn., assignors to MacDermid, Incorporated, Waterbury, Conn.

Filed Oct. 14, 1994, Ser. No. 324,114
Int. Cl.[6] B05D *5/12*
U.S. Cl. 427—98 **10 Claims**

1. A process for the preparation of printed circuit boards, said printed circuit boards comprising metallic and plastic surfaces, said process comprising:

a) Contacting the printed circuit board with an activator solution comprising an imidazole compound described by:



Wherein, R_1, R_2, R_3, and R_4 are independently selected from the group consisting of substituted or unsubstituted alkyl groups, substituted or unsubstituted aryl groups, halogens, nitro groups and hydrogen,

b) Subsequently, contacting the printed circuit board with an electroless plating solution, wherein plating occurs on the metallic surfaces and substantially no plating occurs on the plastic surfaces.

5,468,516

PROCESS FOR PRODUCING NONIONIC DETERGENT GRANULES

Hiroyuki Yamashita; Hiroyuki Kondo; Kouichi Hatano; Katsunori Nakano; Kouji Toyoda, and Takashi Senzaki, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 878,452, May 5, 1992, abandoned.
This application Jul. 13, 1994, Ser. No. 274,563
Claims priority, application Japan, May 17, 1991, 3-112926; May 17, 1991, 3-112927; May 17, 1991, 3-112928; Aug. 2, 1991, 3-194265; Aug. 2, 1991, 3-194266; Aug. 2, 1991, 3-194267; Dec. 4, 1991, 3-320517
Int. Cl.[6] C11D *1/66;11/00;* **B05D** *1/12*
U.S. Cl. 427—180 **19 Claims**

1. A process for producing nonionic detergent granules having a bulk density of from 0.6 to 1.2 g/ml which comprises the following steps (1) to (3):

(1) mixing a detergent material comprising a nonionic surfactant;

(2) granulating a mixture obtained in said step (1) by agitating in an agitating mixer provided at the center position thereof with a rotation shaft having an agitation impeller with a clearance between the agitation impeller and an inner wall of the mixer of from 1 to 30 mm, wherein the agitation impeller agitates the mixture at a Froude number of from 1 to 4 to form a layer of said mixture on said inner wall of said mixer so as to increase a bulk density of granules of the mixture, step (2) being carried out for a period of time sufficient to granulate said mixture obtained in said step (1), whereafter step (3) is carried out; and

(3) mixing the granules obtained in said step (2) with from 0.5 to 30 parts by weight of fine particles of a silicate compound or a metal soap having a mean primary particle size of 10 μm or less to thereby coat the surface of the granules with the fine particles, whereby the nonionic detergent granules have excellent powder fluidity and non-caking property,

wherein said detergent material is selected from the following materials (b) and (d):

(b) a detergent material comprising from **20** to **89** parts by weight of a builder, from 1 to 20 parts by weight of a porous oil absorbent carrier and from 10 to 60 parts by weight of a nonionic surfactant; and

(d) a detergent material comprising from **20** to **89** parts by weight of a mixture of a builder and a spray-dried particulate wherein a weight ratio of the builder to the spray-dried particulate is from 5:95 to 95:5, from 1 to 20 parts by weight of a porous oil absorbent carrier, and from 10 to 60 parts by weight of a nonionic surfactant;

wherein said builder is an organic or inorganic powder builder, said spray-dried particulate is obtained by spray-drying a slurry comprising an organic or inorganic builder and a surfactant selected from the group consisting of anionic, cationic, and nonionic surfactants, and said porous oil absorbent carrier has a pore volume of from 100 to 600 $cm^3/100$ g measured in a mercury porosimeter, a specific surface area of from 20 to 700 m^2/g measured by the BET method and an oil absorption of 100 ml/100 g or more, wherein said oil absorption is measured by determining a quantity of boiled linseed oil absorbed to the porous oil absorbent carrier.

5,468,517

METHOD FOR TREATING SHAPED ARTICLE MADE OF POLYPROPYLENE RESIN BEFORE COATING

Katsuo Miyazaki; Takahide Maeda; Takeshi Ogawa, all of Utsunomiya; Sonoko Kakui, Chiba; Satoshi Ikeda, Yamato, and Yoshiki Yamane, Tokyo, all of, Japan, assignors to Nippon Paint Co., Ltd., Osaka, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

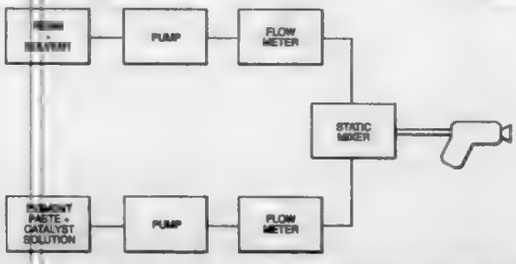
Filed Jul. 5, 1994, Ser. No. 270,590
Claims priority, application Japan, Jul. 5, 1993, 5-191690
Int. Cl.[6] B05D *3/00;3/12*
U.S. Cl. 427—322 **37 Claims**

1. A method for treating a shaped article made of a polypropylene resin before coating, comprising the step of degreasing and deterging a surface of said shaped article with an aqueous alkaline solution comprising (a) 5–50 g/liter of a builder and (b) 1–10 g/liter of an ethylene oxide adduct of aryl- or aralkyl-substituted phenol at a temperature of 50°–70° C., said ethylene oxide adduct of aryl- or aralkyl-substituted phenol having a hydrophilic-lipophilic balance (HLB) of 8 to less than 12.

5,468,518
COMBINED PRIMER/BASECOAT ISLAND COATING SYSTEM

Maureen M. Lein, Chester; Richard C. Elsfeller, Greenland; Alfred T. Poliquin, Dover; Mark Burns, Rochester, and John T. Russell, Dover, all of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed May 25, 1994, Ser. No. 248,957
Int. Cl.[6] B05D *1/02;3/00*
U.S. Cl. 427—421 **1 Claim**



1. A process for manufacturing a metallized part comprising the steps of:

providing a part, as a substrate, made from a material selected from the group consisting of thermoplastic urethanes, thermoplastic urethane alloys, polyester alloys, thermoplastic olefins and aluminum;

spray depositing directly on the substrate a combined primer/basecoat layer consisting of, by weight, a polymer material clear urethane resin 20–40%, black pigment paste 10–30%, solvent blend 40–60% including a catalyst 0.5–2.0% selected from the group consisting of metal and amine catalysts, covering the substrate, flashing and curing the combined primer/basecoat layer;

vacuum depositing directly on the combined primer/basecoat layer a layer of a corrosion prone metal material to form a discontinuous film covering the combined primer/basecoat layer including a plurality of discrete islands of the corrosion prone metal material appearing macroscopically as a continuous film of such metal and having a plurality of macroscopically unobservable channels between the islands to maintain the film electrically non-conductive over the combined primer/basecoat layer; and

spray depositing a layer of clear resinous protective dielectric topcoat to completely cover the layer of vacuum deposited corrosion prone metal material and filling the channels for bonding the corrosion prone metal material to the base layer throughout the bottom of the channels by an adhesion force greater than two orders of magnitude in strength as compared to the adhesion force between the topcoat and a continuous layer of the corrosion prone metal material, flashing and curing the topcoat layer.

5,468,519
METHOD FOR FORMING AN ORIENTATION FILM INCLUDING COUPLING AN ORGANIC COMPOUND TO A SILANE COUPLING AGENT IN A MAGNETIC OR ELECTRICAL FIELD

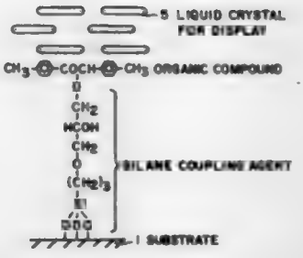
Hisashi Akiyama, Ayama, and Shuji Miyoshi, Yamatokoriyama, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 8, 1993, Ser. No. 163,863
Claims priority, application Japan, Dec. 11, 1992, 4-331624
Int. Cl.[6] B05D *3/14;* **G02F** *1/13*
U.S. Cl. 427—532 **13 Claims**

1. A method for forming an orientation film comprising:

a first step wherein a silane coupling agent is chemically adsorbed on a substrate surface, and

a second step wherein an organic compound comprising a functional group capable of coupling with the silane coupling agent is coupled with the silane coupling agent, said second step comprising



(a) applying a magnetic field in a selected direction to a mixture of: 1) a liquid crystal compound being in a liquid crystal phase when heated, and 2) the organic compound,

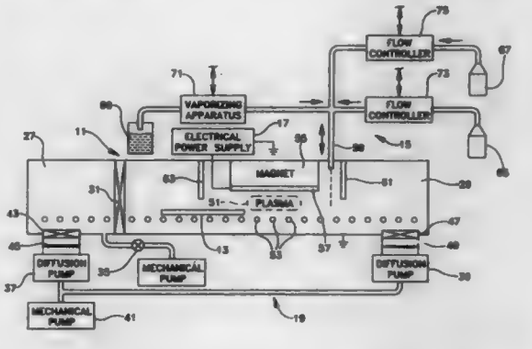
(b) contacting the mixture with the substrate, and

(c) heating the substrate contacted with mixture to a temperature sufficient for coupling of the silane coupling agent and the organic compound during application of the magnetic field, wherein the organic compound coupled with the silane coupling agent is directed to a direction corresponding to the selected direction of the magnetic field.

5,468,520
PROCESS FOR BARRIER COATING OF PLASTIC OBJECTS

Joel L. Williams, Cary; Susan L. Burkett, Hillsborough, both of N.C., and Shel McGuire, Omaha, Nebr., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 125,704, Sep. 23, 1993, Pat. No. 5,364,666. This application Jun. 24, 1994, Ser. No. 265,164
Int. Cl.[6] B05D *3/06*
U.S. Cl. 427—560 **9 Claims**



1. A method of sequentially depositing a silicon oxide based film on a plastic substrate in a previously evacuated chamber by glow discharge comprising:

(a) introducing a first reactive gas comprising a hydrogen silicide into a first chamber;

(b) introducing a second reactive gas comprising at least one gas selected from the group consisting of oxygen and an oxygen containing compound into said first chamber;

(c) admitting microwaves into said first chamber;

(d) producing a magnetic field in said first chamber, said magnetic field and said microwaves being sufficient to produce a region of electron cyclotron resonance in said first chamber which produces a plasma of both said reactive gases;

(e) exposing a substrate to said plasma of both gases in said region, thereby deposition a first coating of SiO_x on said substrate;

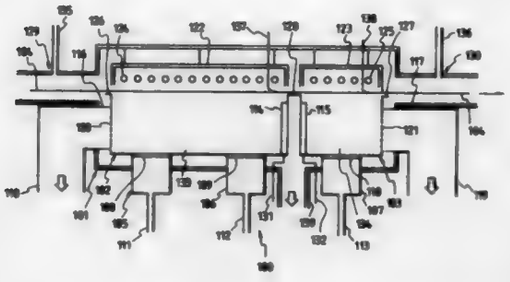
(f) removing or redistributing foreign particles from the surface of said substrate and

(g) repeating steps (a) through (e) above, thereby depositing a second coating of SiO_x on said substrate.

5,468,521
METHOD FOR FORMING A PHOTOELECTRIC DEPOSITED FILM

Masahiro Kanai; Yasushi Fujioka, both of Hikone; Takehito Yoshino, and Tadashi Hori, both of Nagahama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 967,238, Oct. 27, 1992, abandoned. This application Nov. 2, 1994, Ser. No. 334,032
Claims priority, application Japan, Jan. 28, 1991, 3-281644
Int. Cl.[6] B05D *3/06*; **H01L** *31/00*
U.S. Cl. 427—575 **26 Claims**



1. A method of forming a photoelectric deposited film which has substantially uniform conductivity comprising the steps of:

continuously moving an elongated substrate into or out of a chamber;

flowing a first source gas containing a plurality of materials as a deposited film source from a first gas discharge means to a first gas exhaust means in a direction parallel to said elongated substrate and opposite to a conveying direction of said substrate to form a first film;

applying a discharge energy to said first gas;

varying at least one of the discharge energy and first source gas flow to vary the composition distribution of said first film in the direction of film thickness;

flowing a second source gas containing a plurality of materials from a second gas discharge means to a second gas exhaust means in a direction parallel to said elongated substrate and parallel to said conveying direction of said elongated substrate to form a second film on said first film to form the deposited film which comprises the first and second films;

applying a discharge energy to said second gas;

varying at least one of the discharge energy and second source gas flow to vary the composition distribution of said second film in the direction of film thickness;

whereby the variation in composition distribution of said first and second films enhances the photoelectric conversion efficiency of the deposited film.

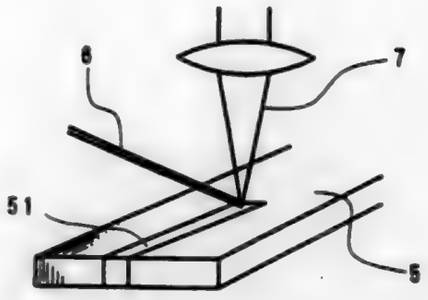
5,468,522
METHOD OF MANUFACTURING A COMPOSITE MAGNETIC COMPONENT

Yoshinobu Honkura; Hiroyuki Toki, and Toyokatsu Usami, all of Aichi, Japan, assignors to Aichi Steel Works, Ltd., Tokai, Japan

Filed Aug. 31, 1993, Ser. No. 113,895
Claims priority, application Japan, Aug. 31, 1992, 4-257461; Aug. 31, 1992, 4-257462
Int. Cl.[6] B05D *3/06*
U.S. Cl. 427—597 **10 Claims**

1. A method of manufacturing a composite magnetic component, comprising:

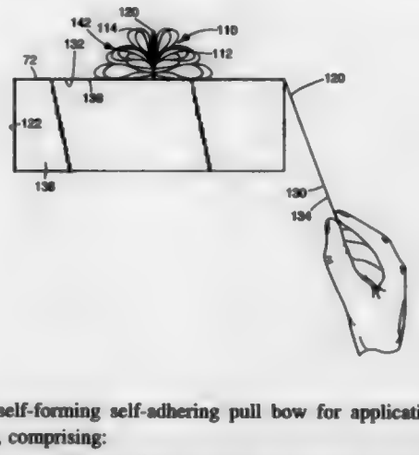
irradiating, with an energy beam, a portion of a magnetic base member made of a magnetic material, while feeding a feed metal for forming a non-magnetic region to said portion for composition modification in the entire thickness thereof, so that said non-magnetic region has a magnetic flux property modified from that of said magnetic base member.



5,468,523
METHOD AND APPARATUS FOR FORMING PREFABRICATED SELF-FORMING SELF-ADHERING PULL BOW AND PULL BOW FORMED THEREBY

Charles P. Huss, Stillwater; Arthur L. Fry, Maplewood, and Steven R. Leseman, Lexington, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 15, 1993, Ser. No. 31,560
Int. Cl.[6] D04D *7/10*
U.S. Cl. 428—5 **16 Claims**



1. A self-forming self-adhering pull bow for application to a package, comprising:

(a) a pair of aligned ribbon bands, each having a first width, a first end, and a second end, with facing major surfaces;

(b) a pair of aligned drawstrings, each having a second width less than said first width of said ribbon bands, a first end and a second end, with facing major surfaces;

(c) said ribbon bands and said drawstrings being bonded together at said first ends thereof;

(d) said ribbon bands being bonded together in at least one spaced paired locations on opposite sides of said drawstrings, so that said drawstrings are constrained between said ribbon bands but unbonded thereto other than at said first ends, each of said pairs of spaced bonded locations on opposite sides of said drawstrings forming a fold line extending across said ribbon bands, about which said ribbon bands will fold to form loops when a bow is formed by gathering said bonded areas adjacent said second ends; and

(e) at least a portion of said facing major surfaces of said drawstrings having a layer of a pressure sensitive adhesive coated thereon, and wherein said drawstrings may be separated and the exposed layers of pressure sensitive adhesive applied to an object to adhere the bow to the object.

5,468,524

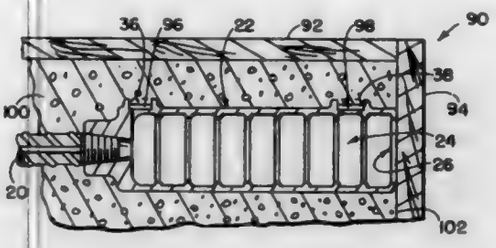
REINFORCING BAR SPLICE AND SYSTEM FOR FORMING PRECAST CONCRETE MEMBERS AND STRUCTURES

Julian Albrigo; Edward D. Ricker, both of Chagrin Falls, and Louis J. Colarusso, Macedonia, all of Ohio, assignors to Erico International Corporation, Solon, Ohio

Division of Ser. No. 33,122, Mar. 18, 1993, Pat. No. 5,366,672. This application Oct. 15, 1993, Ser. No. 139,509

Int. Cl.[6] B25G *3/34*

U.S. Cl. 428—34.1 19 Claims



1. A reinforcing bar splice joining in substantial axial alignment a first and second steel reinforcing bar in steel reinforced concrete structures comprising a generally cylindrical sleeve having one and an other end, said one end being open to form an axially elongated chamber and receiving an end of said first reinforcing bar telescoped therein, a substantially volume stable grout within said chamber securing said first reinforcing bar to said sleeve, internal threads at said other end of said sleeve, said second steel reinforcing bar having matching threads on one end, and being threadedly connected to said sleeve whereby said first and second steel reinforcing bars are joined in substantial axial alignment.

5,468,525

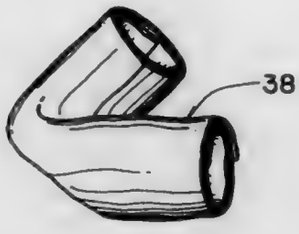
SPIRAL COILS SUITABLE FOR CUSHIONING USE

Ridley Watts, Gates Mills, Ohio, assignor to Patriot Packaging Corporation, Stow, Ohio

Division of Ser. No. 861,247, Mar. 31, 1992, Pat. No. 5,257,492, which is a continuation-in-part of Ser. No. 681,087, Apr. 5, 1991, Pat. No. 5,181,614. This application Jul. 23, 1993, Ser. No. 97,362

Int. Cl.[6] B65D *55/30*

U.S. Cl. 428—34.1 12 Claims



1. Cushioning coils each being comprised of a thin, flexible, resilient strip stretched on one side to wind the strip into a loose coil shape having overlapping, unsecured, convolutions having a common central axis and that are resiliently deformable transversely of the axis to provide cushioning for an item packed in the coils, at least some of said cushioning coils having a fold transverse to said central axis, the fold creating an axial variation in the shape of said folded coils such that adjacent convolutions near opposite ends of the coil are spaced from each other farther than they are adjacent the fold.

5,468,526

MULTILAYER BARRIER FILM FOR OSTOMY APPLICATIONS

Scott I. Allen, Newark, Ohio; Duane F. Foye, Beaverton, Mich., and Michael Ferguson, Granville, Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 20, 1993, Ser. No. 123,270

Int. Cl.[6] B32B *27/36;7/08*

U.S. Cl. 428—35.4 10 Claims

1. A multilayer barrier film having a heat seal strength of at least about 1.0 lb/inch width of said film, said film comprising a barrier layer of a homopolymer of vinylidene chloride or a copolymer of vinylidene chloride with vinyl chloride or methyl methacrylate, said barrier layer being coextruded with or coated onto a water soluble film layer, said water soluble layer comprising a blend of a water soluble polymer and a thermoplastic polyurethane, wherein said water soluble polymer is selected from the group consisting of polyvinyl alcohol, polycaprolactone and polyethyloxozaline.

5,468,527

TRANSPARENT, NON-HEAT-SEALABLE, ORIENTED, MULTILAYER POLYOLEFIN FILM, PROCESS FOR THE PRODUCTION THEREOF, AND THE USE THEREOF

Herbert Peiffer, Mainz; Ursula Murschall, Nierstein, and Gunter Schloegl, Kelkheim, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 23, 1994, Ser. No. 200,169

Claims priority, application Germany, Feb. 27, 1993, 43 06 155.9

Int. Cl.[6] B29D *22/00*

U.S. Cl. 428—35.7 20 Claims

1. A transparent, non-heat-sealable, oriented, multilayer polyolefin film comprising a base layer which comprises polypropylene, and at least one non-heat-sealable outer layer, wherein the non-heat-sealable outer layer contains from about 0.1 to 0.6% by weight of SiO_2, based on the weight of the outer layer, said SiO_2 having been subjected to organic aftertreatment coating and having a mean particle diameter from 2 to 6 μm.

5,468,528

BULK BAG WITH INTERNAL BAFFLES

Daniel R. Schnaars, 402 Harwel Dr., Lafayette, La. 70503, and Randall H. Curtis, 208 C Dublin Cir., Lafayette, La. 70506

Continuation of Ser. No. 164,207, Dec. 9, 1993, abandoned. This application Mar. 14, 1995, Ser. No. 403,566

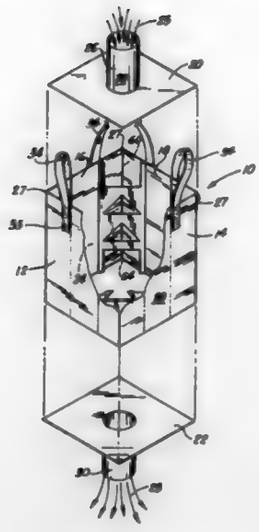
Int. Cl.[6] B65D *30/10;33/02;33/14*

U.S. Cl. 428—35.7 12 Claims

1. An improved bulk material fabric transport bag, comprising:

a) four first panels of fabric, each of said panels having a first edge and a second edge, and positioned to form and define a corner of said bag, such that a first portion of each fabric panel defines a portion of one bag wall, a second portion of each fabric panel defines a portion of a second bag wall, and a third portion of the panel folded so that the second edge of said fabric panel interconnects to the first edge of the panel, the third portion defining an interior baffle member straddling each corner of the bag, the three of said portions of the fabric panel defining together a substantially triangular fabric configuration;

b) second panels of fabric sewn intermediate two adjacent corner panels, each said second panel fabric together with the



four corner panels defining the interior space of the bag when the intermediate panels are interconnected with each corner panel; and

c) a plurality of triangular-shaped openings formed in each of the third portions of the corner panels defining the interior baffle members of the bag for allowing material to flow through the baffle members and for providing strength to the bag when the bag is filled with bulk material,

wherein the triangular-shaped openings are spaced along the length of the baffle members, each opening being spaced sufficiently apart from an adjacent opening to provide a fabric bridge sufficient to withstand the force of bulk material filling the bag.

5,468,529

MAGNETIC FILTER MATERIAL COMPRISING A SELF-BONDING NONWOVEN FABRIC OF CONTINUOUS THERMOPLASTIC FIBERS AND MAGNETIC PARTICULATE WITHIN THE FIBERS

Oh K. Kwon; Ung S. Choi, both of Seoul; Ki Y. Choi, Kyeongsangbuk, all of, Rep. of Korea; N. K. Minhkin, Gomel, Belarus, and Yoon M. Jung, Kyeongsangbuk, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 67,972, May 27, 1993, abandoned. This application Jan. 12, 1995, Ser. No. 371,686

Claims priority, application Rep. of Korea, Aug. 28, 1992, 92-15606

Int. Cl.[6] B01D *39/02;24/00;* **D04H** *1/04;* **B32B** *5/16*

U.S. Cl. 428—36.1 **6 Claims**

1. A magnetic filter material which is made of a spray-spun planar or cylindrical, self-bonded, nonwoven structure comprising randomly arranged substantially continuous fibrous material, consisting essentially of 40 to 99% by weight of a polymer selected from the group consisting of polycarbonate, polyethylene, polypropylene, polyamide, polyimide, polyester, polytetrafluoroethylene and polyacrylonitrile and 1 to 60% by weight of a magnetic substance selected from the group consisting of barium ferrite, strontium ferrite, and samarium-cobalt.

5,468,530

PPE/PA MOLDING MATERIALS FOR THE PRODUCTION OF MOLDINGS BY MEANS OF BLOW MOLDING, PROFILE EXTRUSION AND PIPE EXTRUSION

Walter Götz, Ludwigshafen, and Axel Gottschalk, Neustadt, both of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 16, 1994, Ser. No. 341,998

Claims priority, application Germany, Nov. 22, 1993, 43 39 509.0

Int. Cl.[6] B29D *23/00;* **C08K** *5/51;* **C08L** *71/12;77/00*

U.S. Cl. 428—36.4 **10 Claims**

1. A high molecular weight thermoplastic molding material obtained by mixing

A) 20–80% by weight of a polyphenylene ether and

B) 0–70% by weight of conventional additives and processing assistants

into a melt of

C) 10–80% by weight of a low molecular weight polyamide having a viscosity number of from 40 to 185 ml/g

and subsequently carrying out solid-phase postcondensation.

5,468,531

ELASTIC FIXING ROLL

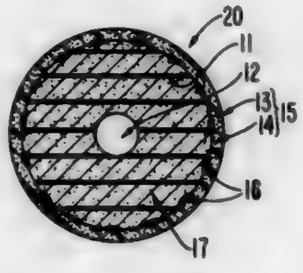
Hiroyasu Kikukawa, and Hiroshi Kato, both of Okayama, Japan, assignors to Japan Gore-Tex, Inc., Japan

Filed May 18, 1994, Ser. No. 245,298

Claims priority, application Japan, May 18, 1993, 5-139577

Int. Cl.[6] B32B *1/08*

U.S. Cl. 428—36.5 **4 Claims**



1. An elastic fixing roll comprising:

(a) a release surface material comprising porous polytetrafluoroethylene film impregnated with cross-linked synthetic rubber, said release surface material being 3 to 1000 micrometers thick;

(b) a porous body material comprising open-celled synthetic polymer foam,

said open-celled foam having a pore volume in the range 30 percent to 90 percent, and having the internal surfaces of its pores coated with a reinforcing material of cross-linked synthetic rubber so as to maintain porosity in the reinforced foam,

said porous body material having a bulk density in the range 50 to 300 kg/m^3 and a surface hardness of 70 degrees or less;

wherein said release surface material is adhered to the outer surface of said porous body material by a non-continuous layer of adhesive.

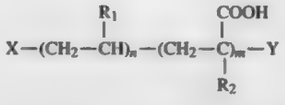
5,468,532

MULTILAYER GRAPHIC ARTICLE WITH COLOR LAYER

Chia-Tie Ho, Woodbury, Minn.; Carl W. McMullen, Roberts, Wis., and Raymond M. Sawka, Woodbury, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 10, 1992, Ser. No. 988,759
Int. Cl.[6] B32B *7/12;27/36*
U.S. Cl. 428—40 **35 Claims**

1. A multilayer graphic article comprising a substrate, at least one color layer disposed on the substrate, and a protective surface layer that overlies the substrate and the color layer, the color layer being intermediate the substrate and the surface layer and visible through the surface layer, wherein the substrate is a polymeric film formed from a material selected from the group consisting of alpha-olefins, ethylene-modified copolymers and terpolymers, polyurethanes and rubbery polymers, and further wherein the color layer comprises a color agent in a crosslinked copolymeric binder that is blended or supplemented with a polyurethane dispersion secondary binder, the copolymeric binder comprising the copolymerization product of an olefinic monomer and a second monomer having a pendant carboxyl group, the copolymeric binder having the formula:



wherein R_1 is selected from the group consisting of hydrogen and C_{1-6} alkyl groups; R_2 is selected from the group consisting of H, C_{1-6} alkyl groups, R_3—COOH wherein R_3 is any alkyl group, —CN, and ester groups; X and Y are independently selected from the group consisting of residues of the olefinic monomer and residues of the second monomer; n is a number selected such that the olefinic monomer provides 99 to 70 mol-% of the copolymeric binder; and m is a number selected such that the second monomer correspondingly provides 1 to 30 mol-% of the copolymeric binder; the formula including basic salts thereof.

5,468,533

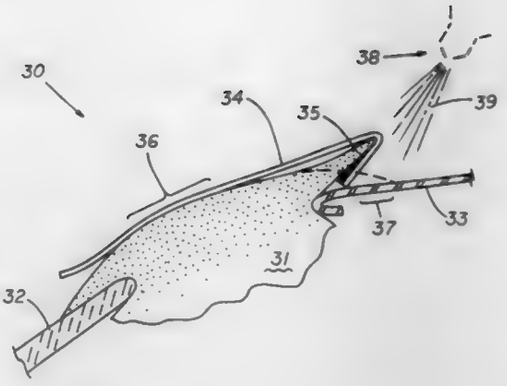
MASKING MATERIAL

Ron B. Lipson, West Bloomfield, Mich., assignor to Kwik Paint Products, Detroit, Mich.

Filed Jan. 21, 1994, Ser. No. 184,827
Int. Cl.[6] C09J *7/02*
U.S. Cl. 428—40 **14 Claims**

1. In a masking tape having two outwardly facing surfaces and two spaced-apart longitudinal edges defining a width, the improvement comprising:

a longitudinal portion of the width of the tape, beginning at one of its edges, being stiffened as compared to the rest of the tape, the stiffened portion being generally wedge-shaped in transverse cross section, the thickest portion of the wedge being oriented away from the longitudinal centerline of the tape, one of the outwardly facing surfaces of the tape being entirely non-adhesive, including the longitudinally stiffened



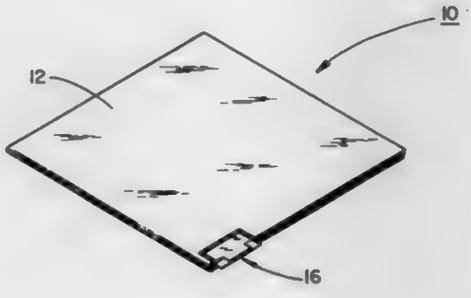
portion, the other outwardly facing surface of the tape including an adhesive but excluding the longitudinally stiffened portion.

5,468,534

ATTACHABLE DINNER NAPKIN

Ernest Godfrey, and Edith Godfrey, both of 3334 Liverpool Point, Inverness, Fla. 34452

Filed Aug. 19, 1994, Ser. No. 292,219
Int. Cl.[6] B32B *3/06*
U.S. Cl. 428—40 **12 Claims**



1. An attachable dinner napkin comprising:

a napkin formed of an absorbent material;

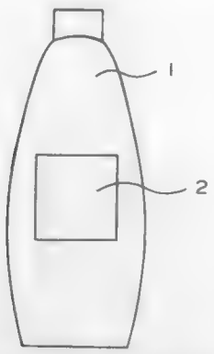
an adhesive attaching means for securing the napkin to clothing of an individual, said adhesive attaching means comprising an upper plate spaced from a lower plate with an edge joiner extending between said upper and lower plates, said edge joiner being of a height approximately equal to a thickness of said napkin with said edge joiner being positioned into abutting relationship with an edge of said napkin, means to secure said upper and lower plates to said napkin, said means to secure said upper and lower plates to said napkin comprising a further adhesive coupling said napkin to said plates, said adhesive attaching means further comprising a napkin handle, said napkin handle comprising an extension of said lower plate which projects from an intersection of said edge joiner and said lower plate beyond said edge of the napkin, and an adhesive coupled to said upper plate.

5,468,535

LABEL FOR A SQUEEZABLE CONTAINER AND SQUEEZABLE CONTAINER BEARING SAME

Yasuyuki Amano, Urawa; Takeshi Ikeda, Warabi; Eiji Aizawa, Kawaguchi, and Takanori Saito, Misato, all of, Japan, assignors to Lintec Corporation, Tokyo, Japan

Division of Ser. No. 926,671, Aug. 10, 1992, Pat. No. 5,376,417. This application Sep. 14, 1994, Ser. No. 305,622
Claims priority, application Japan, Aug. 8, 1991, 3-223373
Int. Cl.[6] B32B *27/06;27/32*
U.S. Cl. 428—40 11 Claims



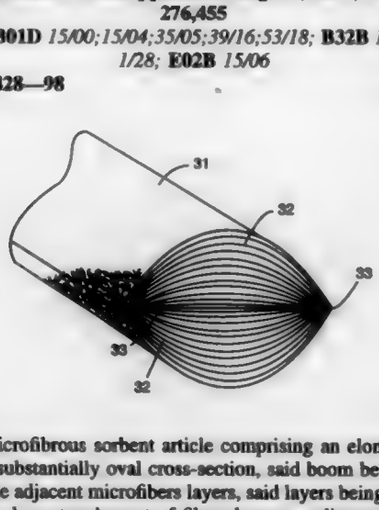
1. A squeezable container with a deformable label affixed to a surface thereof by a pressure-sensitive adhesive, wherein the Young's Modulus of said label is from 1500–4500 kg/cm^3 and the tensile strength is 250 kg/cm^2 or more, which label is a film consisting essentially of a :Low density polyethylene homopolymer having a density of 0.920 to 0.930 g/cm^3 and a linear copolymer of ethylene and another α-olefin of 4–8 carbon atoms, said copolymer having a density of 0.920 to 0.940 g/cm^3, present in an amount effective to prevent the label from breaking or peeling off from the squeezable container.

5,468,536

SORBENT ARTICLES

William C. Whitcomb, Cottage Grove; Thomas I. Insley, Lake Elmo, and Simon S. Fung, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 10,565, Jan. 28, 1993, Pat. No. 5,360,654. This application Aug. 29, 1994, Ser. No. 276,455
Int. Cl.[6] B01D *15/00;15/04;35/05;39/16;53/18;* B32B *1/00;* C02F *1/28;* E02B *15/06*
U.S. Cl. 428—98 6 Claims



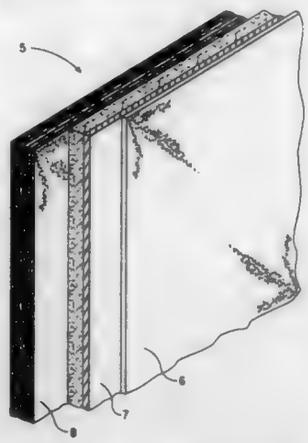
1. A microfibrous sorbent article comprising an elongate boom having a substantially oval cross-section, said boom being formed of multiple adjacent microfibers layers, said layers being bonded to each other by entanglement of fibers between adjacent layers and ion exchange, selectively absorbent, selectively reactive or catalytic particulate material.

5,468,537

PROTECTIVE GARMENTS COMPRISING AN OUTER SHELL FABRIC OF WOVEN ARAMID FIBERS WHICH ELONGATE WHEN EXPOSED TO A FLAME

Gary G. Brown, Wilmington, Del.; Hamid M. Ghorashi, Midlothian, Va., and Donald E. Shaffer, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1993, Ser. No. 128,432
Int. Cl.[6] B32B *3/06;5/02;* D03D *3/00;* B27N *9/00*
U.S. Cl. 428—101 8 Claims



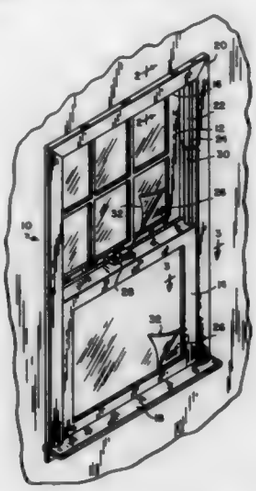
1. An improved garment that offers protection against heat and flame made of a multi-layered fabric comprising, in order, a flame resistant outer shell, a moisture barrier and a thermal insulating liner, wherein the improvement comprises an outer shell comprising a fabric woven from an aramid fiber and attached to the moisture barrier so that the fabric is free for limited movement relative to the moisture barrier wherein the aramid fiber of the fabric elongates at least 1% in a flame and the fabric extends laterally and expands away from the moisture barrier within 3 seconds from exposure to a heat source of at least 1.8 cal/cm^2-seconds.

5,468,538

PAINT MASKING KIT FOR WINDOWS AND METHOD OF USING SAME

Paul W. Nameche, 14 Lake Rd., Magnolia, Mass. 01930

Filed Jan. 5, 1994, Ser. No. 177,431
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—101 29 Claims



1. A paint masking kit for windows, comprising:

a container including a plurality of reusable window balance covers having predetermined sizes and shapes for covering a header and balance portions of a window; and

a predetermined amount of a plastic sheet material for covering glass portions of said window.

5,468,539

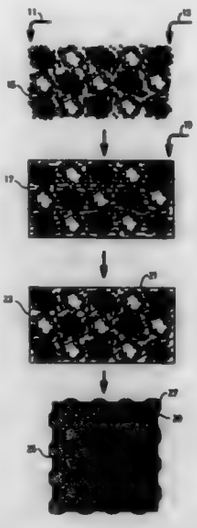
PRECAST SURFACE PAVING OVERLAY COMPRISING RUBBER CRUMBS AND CLAY PARTICLES

Henry Crivelli, 1505 N. Riverside Dr., Pompano Beach, Fla. 33062

Continuation-in-part of Ser. No. 110,125, Aug. 20, 1993, abandoned, which is a division of Ser. No. 631,893, Dec. 21, 1990, Pat. No. 5,258,222. This application Feb. 28, 1994, Ser. No. 202,450

Int. Cl.[6] B32B *5/16*

U.S. Cl. 428—141 **1 Claim**



1. An overlay for outdoor surfaces, said overlay consisting essentially of:

(a) recycled crumbs composed of black tire rubber and white tire rubber, said rubber crumbs having fibrillar surfaces with asperities;

wherein said black tire rubber, by weight thereof, consists essentially of from 8 to 25% of organic solvent residue, from 5 to 10% of an inorganic residue, from 25 to 45% of carbon black, from a trace to 2% moisture, and from 35 to 50% of vulcanized hydrocarbon rubber;

wherein said white tire rubber, by weight thereof, consists essentially of from 8 to 25% of organic solvent residue, from 5 to 10% of an inorganic residue, from 25 to 45% of a first clay, from a trace to 2% moisture, and from 35 to 50% of vulcanized hydrocarbon rubber;

wherein said rubber crumbs have a mesh size averaging approximately 16;

(b) a second clay in particle form composed of aluminosilicate;

wherein said second clay particles have a mesh size averaging approximately 350;

(c) a binder composed primarily of ethylene-proplylenediene rubber and a vulcanizing agent selected from the group consisting of sulfur and peroxide;

wherein said rubber crumbs and said second clay particles are present in approximately equal amounts by weight, and, in parts by total weight of said overlay, the combination of said rubber crumbs and said second clay particles ranges from 45 to 65, and said binder ranges from 25 to 35;

wherein said binder thoroughly contacts the surfaces of said rubber crumbs and said second clay particles;

wherein said rubber crumbs and said second clay particles form an internal phase that is closely packed;

wherein said binder forms an external phase;

wherein said overlay has a hardness of at least 40 Shore A;

wherein said overlay is approximately ¼ inch in thickness; and

wherein said overlay has at its upper surface communicating channels and stippled lands.

5,468,540

RETROREFLECTIVE ARTICLE COMPRISING A TRANSPARENT BASE SHEET AND NACREOUS PIGMENT COATING, METHOD FOR MAKING SUCH A BASE SHEET, AND METHOD FOR MAKING A FORMING MASTER

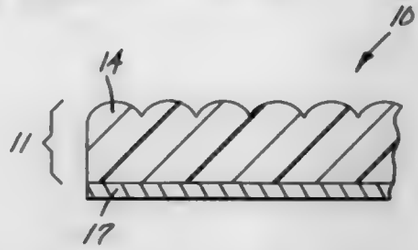
Shih-Lai Lu, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 613,136, Nov. 15, 1990, Pat. No. 5,254,390. This application Jul. 29, 1993, Ser. No. 99,184

The portion of the term of this patent subsequent to Oct. 19, 2010, has been disclaimed.

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—156 **10 Claims**



1. A retroreflective article comprising a transparent base sheet having first and second broad faces, said second face being substantially planar and said first face having an array of substantially hemi-spheroidal microlenses thereon, said microlenses being wider and shorter than portions of true spheres, the shape of said microlenses and thickness of said base sheet being such that collimated light substantially orthogonally incident to said array is focused approximately at said second face, wherein said second face has a nacreous pigment coating thereon.

5,468,541

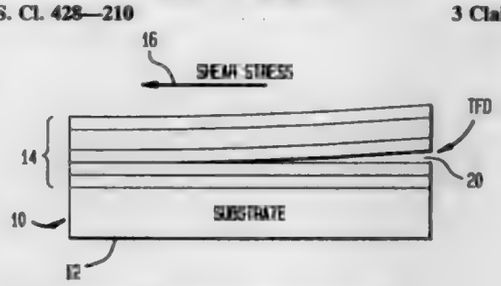
THIN FILM DELAMINATION TEST CHIP

Chen-Chung Hsu, Tai-Chung, Taiwan, Prov. of China, assignor to United Microelectronics Coproration, Hsin Chu City, Taiwan, Prov. of China

Filed Sep. 7, 1993, Ser. No. 117,571

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—210 **3 Claims**



1. A delamination test structure comprising:

a substrate,

a plurality of thin films stacked on said substrate,

a plurality of conductive films and vias incorporated in said thin films, and

a plurality of conductive paths formed from said plurality of conductive films and vias, said plurality of conductive paths detecting a delamination in said thin films and detecting at which specific thin film the delamination occurs.

5,468,542

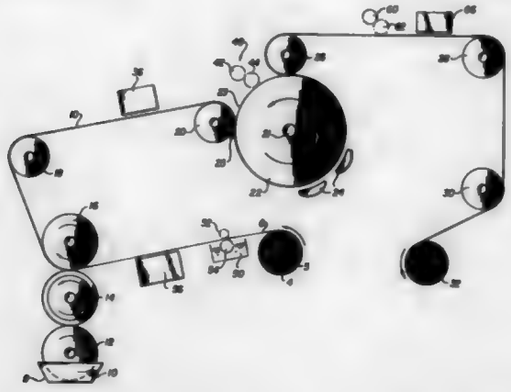
METHOD FOR PRODUCTION OF A COATED SUBSTRATE WITH CONTROLLED SURFACE CHARACTERISTICS

Earl T. Crouch, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 171,207, Mar. 18, 1988, abandoned, which is a continuation of Ser. No. 812,619, Dec. 23, 1985, abandoned. This application Feb. 22, 1990, Ser. No. 484,467

Int. Cl.[6] B05D *3/06;* B32B *27/36;7/02*

U.S. Cl. 428—215 14 Claims



1. A method for producing a high optical quality, flexible, transparent, abrasion resistant polycarbonate article, said article having a polycarbonate film substrate and an abrasion resistant radiation cured coating adhered to said substrate, said substrate having a thickness selected from the range of about 5 mil to about 30 mil, said coating having a thickness selected from the range of 0.05 mil to 5.0 mil, said method comprising the steps of:

(a) applying an ultraviolet radiation curable uncured coating material and a photoinitiator to at least one surface of the substrate;

(b) passing the substrate having the uncured coating thereon through a compression nip defined by a nip roll and a casting drum, said casting drum having a metal surface, said compression nip applying an exact pressure to said uncured coating and substrate to exclude air from within said coating and to press simultaneously said coating into full dual anaerobic contact with both (a) the substrate to remove and to exclude any air between said coating and said substrate to provide improved adhesion between said coating and said substrate and (b) the drum to exclude any air between said coating and said drum to provide improved surface appearance; and

(c) curing the uncured coating by directing the ultraviolet radiant energy through the substrate from the surface opposite the surface having the coating thereon to contact and cure the radiation-curable coating while the coating is in anaerobic contact with the drum.

5,468,543

PROCESS FOR PRODUCING A SKI COATING STRIP MADE OF ULTRA HIGH MOLECULAR-WEIGHT POLYETHYLENE

Robert Schamesberger, Eisenstadt, Austria, assignor to Isosport Verbundbauteile Gesellschaft m.b.H., Austria

PCT No. PCT/AT92/00121, § 371 Date May 19, 1993, § 102(e) Date May 19, 1993, PCT Pub. No. WO93/05853, PCT Pub. Date Apr. 1, 1993

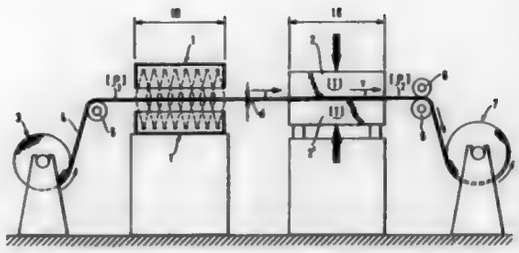
PCT Filed Sep. 25, 1992, Ser. No. 50,448

Claims priority, application Austria, Sep. 26, 1991, 1934/91

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—220 9 Claims

1. A process for manufacturing a strip of ski-coating material made at least in part of a polyethylene of ultra high molecular weight, said process comprising the steps of:



continuously moving a ski-coating material of a thickness between 0.5 and 1.5 mm from a roll of said material first into a heating zone to be uniformly heated to a temperature of at least 140° C. and then into a cooling zone formed at least in part by a cooled sizing apparatus to be uniformly cooled and sized for a dwell time between 8 and 30 second to a temperature of at most ambient temperature and winding said cooled and sized material onto a take-up roll.

5,468,544

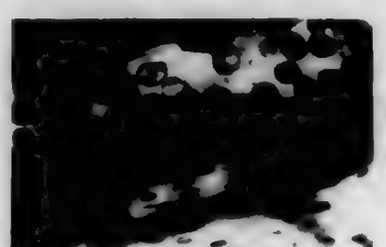
COMPOSITE MATERIALS USING BONE BIOACTIVE GLASS AND CERAMIC FIBERS

Michele S. Marcolongo, Lansdowne; Paul Ducheyne, Rosemont; Frank Ko, Philadelphia, all of Pa., and William LaCourse, Alfred, N.Y., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Nov. 15, 1993, Ser. No. 152,962

Int. Cl.[6] B32B *18/00;27/00;33/00*

U.S. Cl. 428—224 12 Claims



1. A biocompatible composite of tows of bone bioactive fibers comprising at least 19% Na_2O by mole intermingled with tows of structural fibers in a non-bioabsorbable polymeric matrix.

5,468,545

LONG WEAR LIFE FLAME-RETARDANT COTTON BLEND FABRICS

George R. Fleming, 2709 Dobbs Dr., Phenix City, Ala. 36867, and James R. Green, 22 Robin Dr., Hockessin, Del. 19707

Filed Sep. 30, 1994, Ser. No. 315,443

Int. Cl.[6] B32B *7/00*

U.S. Cl. 428—259 6 Claims

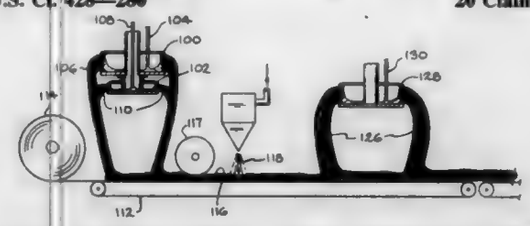
1. Wash resistant durable fabrics, including woven fabrics comprising: 50 to 95% cotton fibers; 5–30% non-flame-retardant thermoplastic fibers in which warp yarns for woven fabrics are comprised of 50 to 95% cotton and 5 to 30% non-flame-retardant thermoplastic fibers; said fibers being uniformly treated with a durable flame retardant of a prepolymer of urea and tetrakis (hydroxymethyl) phosphonium salt which has been applied, ammoniated and oxidized in a manner such that after exposure to five washes and twenty-four hours emersion in boiling water, the cotton fabrics burn less than 15 mm (6") at cut edges and retain at least 2.0% and no more than 3.0% phosphorus by weight of fabric.

5,468,546

METHOD OF MAKING A HIGHWAY REINFORCEMENT PRODUCT

James E. Loftus, Newark, and Kevin P. Gallagher, Pataskala, both of Ohio, assignors to Owens-Corning Fiberglas Technology, Inc., Summit, Ill.

Filed Dec. 22, 1994, Ser. No. 362,327
Int. Cl.[6] B05D 5/00; B32B 13/02
U.S. Cl. 428—289 20 Claims



8. The method for making a highway reinforcement product comprising:

a. supplying molten asphalt to a rotating asphalt spinner;

b. centrifuging asphalt fibers from the asphalt spinner;

c. feeding a reinforcement mat beneath the asphalt spinner; and,

d. collecting asphalt fibers on top of the reinforcement mat to produce a highway reinforcement product.

5,468,547

Patent Not Issued For This Number

5,468,548

DIRECTIONALLY SOLIDIFIED EUTECTIC REINFORCING FIBERS AND FIBER REINFORCED COMPOSITES CONTAINING THE FIBERS

Anthony F. Giamei, Middletown, and Earl R. Thompson, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 2, 1993, Ser. No. 100,879
Int. Cl.[6] D04H 1/00; D02G 3/00; C04B 35/02;35/48
U.S. Cl. 428—294 9 Claims

3. A fiber reinforced, high temperature composite article comprising a matrix and a plurality of directionally solidified eutectic fibers dispersed in the matrix, wherein the matrix has a coefficient of thermal expansion within 25% of the coefficient of thermal expansion of the eutectic fiber and comprises a noneutectic material.

5,468,549

Patent Not Issued For This Number

5,468,550

EPDM ROOFING MEMBRANE WITH IMPROVED BURN RESISTIVITY

James A. Davis, Indianapolis; Edward G. Kane, Carmel; Brian S. Alexander, Sheridan, all of Ind., and William F. Barham, Hope, Ark., assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Jun. 6, 1994, Ser. No. 254,841
Int. Cl.[6] B32B 9/00
U.S. Cl. 428—327 23 Claims

1. A vulcanizable elastomeric roof sheet material for roofing having improved burn resistivity and prepared from a polymeric composition of matter, devoid of flame retardant rubber chemical additives comprising:

at least one polymer selected from the group consisting of polyolefins prepared from monomers containing at least 2 carbon atoms and mixtures thereof, said polymer having a crystallinity of up to about 2 percent by weight;

about 20 to 125 parts by weight of one or more non-black mineral fillers per 100 parts of said polymer;

about 50 to 110 parts by weight of one or more black fillers per 100 parts of said polymer; and

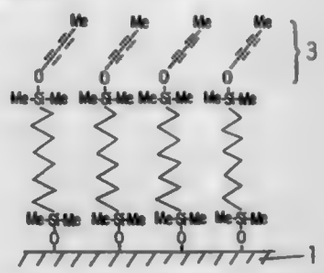
from about 50 to 70 parts by weight of a processing material, per 100 parts of said polymer said composition of matter being devoid of flame retardant rubber chemical additives, heavy metals and halogen-containing polymers.

5,468,551

FUNCTIONAL LAMINATED CHEMICALLY ADSORBED FILMS

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 872,166, Apr. 22, 1992, abandoned.
This application Mar. 24, 1994, Ser. No. 217,029
Claims priority, application Japan, Apr. 30, 1991, 3-098917
Int. Cl.[6] B32B 7/04
U.S. Cl. 428—333 8 Claims



1. A chemically adsorbed functional film comprising:

A) a substrate;

B) an inner portion formed of straight chain molecules, which comprise Si atoms at opposing ends of each straight chain; and

C) an outer functional portion, which comprises functional organic groups, wherein said functional organic groups are selected from the group consisting of conductive groups and photofunctional groups;

wherein said Si atoms at the first ends of said inner portion bond covalently with the outer functional portion and Si atoms at second ends opposing the first ends of the straight chain molecules of said inner portion bond covalently with the substrate.

5,468,552

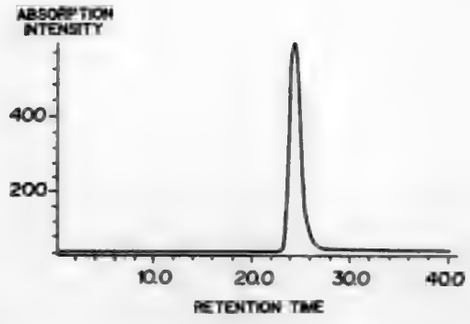
MAGNETIC RECORDING MEDIUM COMPRISING A MAGNETIC FILM LAYER AND A COATING OF PURIFIED PERFLUOROPOLYETHER LUBRICANT

Yukio Ohnuki, Yokohama; Satoshi Kurosawa, Ebina, and Akio Kondo, Konan, all of, Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Continuation of Ser. No. 753,230, Aug. 30, 1991, Pat. No. 5,292,585. This application Aug. 26, 1993, Ser. No. 111,785
Claims priority, application Japan, Aug. 30, 1990, 2-226768; Nov. 1, 1990, 2-293701
The portion of the term of this patent subsequent to Aug. 30, 2008, has been disclaimed.
Int. Cl.[6] G11B 5/00
U.S. Cl. 428—336 3 Claims

1. A magnetic recording medium comprising a magnetic film layer having coated thereon a layer of purified perfluoropolyether lubricant having the formula:

Piperonyl-OCH_2OF_2O-$(OF_2OF_2O)_n$-$(OF_2O)_m$-OF_2CH_2O-Piperonyl



wherein n and m are integers ≧1 which lubricant has a weight-average molecular weight of at least 2000 and a weight-average molecular weight/number average molecular weight ratio of not more than 1.3 and which contains no chemical species having a molecular weight of less than about 700, said lubricant having such a purity that no impurities are substantially detected by permeation chromatography.

5,468,553

CLOTH SUITABLE FOR TEXTILE PRINTING AND INK-JET TEXTILE PRINTING METHOD

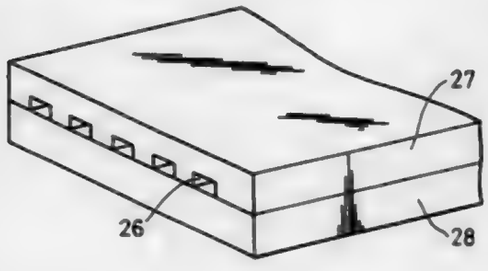
Shoji Koike, and Tomoya Yamamoto, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1993, Ser. No. 8,330

Claims priority, application Japan, Jan. 27, 1992, 4-034063

Int. Cl.[6] D03D *3/00*

U.S. Cl. 428—224 **9 Claims**



1. A cloth for ink-jet textile printing that comprises silk threads made up mainly of silk fibers, said silk threads and silk fibers respectively having a thickness of 14 to 147 denier and 2.5 to 3.5 denier, and said cloth having a moisture percentage of 17 to 112% by weight.

5,468,554

DYED ANTISTAIN NYLON WITH CATIONIC DYE MODIFIER

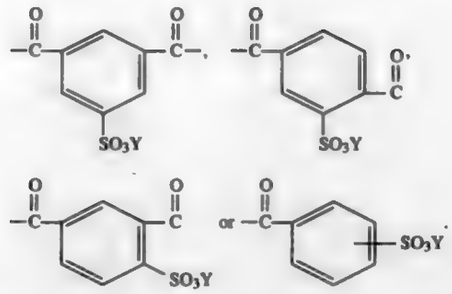
William T. Windley, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 960,521, Oct. 13, 1992, abandoned, which is a division of Ser. No. 564,687, Aug. 8, 1990, Pat. No. 5,164,261. This application Jun. 15, 1994, Ser. No. 260,163

Int. Cl.[6] B32B *27/02*; C08G *69/26*

U.S. Cl. 428—357 **10 Claims**

1. A shaped article having a stain-resistance rating of at least 4 the Stain Rating Scale of the Stain Test Method with respect to acid dyes formed of a modified polyamide which is polyhexamethylene adipamide or a copolymer of hexamethylene diamine, adipic acid and ε-scaprolactam which contains from 1 to 4 weight percent based on final modified polymer weight of a cationic dye modifier of the formula



where Y is H, Li, Na, K or Cs, and which contains at least 0.0048 weight percent of an acid dyestuff based on modified polymer weight.

5,468,555

YARN FORMED FROM CORE-SHEATH FILAMENTS AND PRODUCTION THEREOF

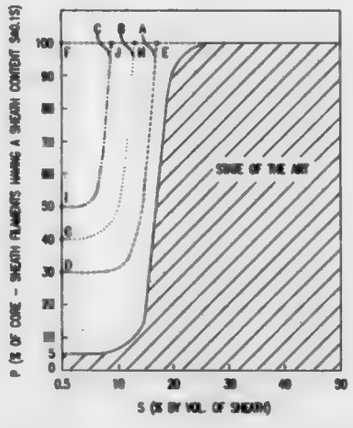
Franciscus A. T. Lijten, Heveadorp, and Johannes J. Meerman, Arnhem, both of, Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 139,883, Oct. 22, 1993, abandoned, which is a continuation of Ser. No. 635,185, Jan. 3, 1991, abandoned. This application Oct. 25, 1994, Ser. No. 328,605

Claims priority, application Germany, May 16, 1989, 39 15 819.5; Aug. 9, 1989, 39 26 246.4

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—365 **8 Claims**



1. A yarn comprising core-sheath filaments, said yarn having a proportion of core-sheath filaments P having a substantially identical sheath content S, wherein a core and a sheath of the core-sheath filaments have been produced by extruding spinnable polymers, and out of 100% of the core-sheath filaments in the yarn, the proportion of core-sheath filaments P, in %, having sheath content within a range of (S±0.1 S) %, is a value defined by an area of FIG. 1 bounded by and including curve DE, line EF and line DF, wherein curve DE is represented by the formula $P=30+(0.1\ S)^8$%.

5,468,556

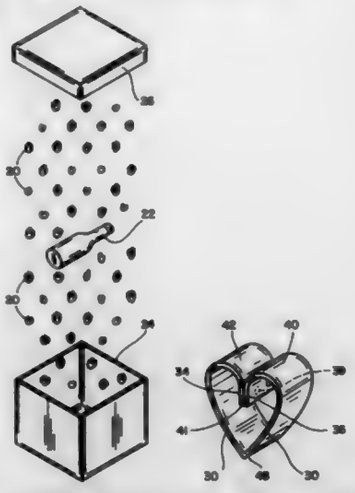
SHAPED LOOSE-FILL PACKAGING PARTICLE AND METHOD FOR MAKING THE SAME

Gunter G. Fuss, San Mateo, and Vladimir Yampolsky, San Carlos, both of Calif., assignors to Free-Flow Packaging Corporation, Redwood City, Calif.

Filed Aug. 27, 1993, Ser. No. 113,777

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—369 43 Claims



1. A shaped particle for use as a loose fill material to cushion an article within a container, said shaped particle comprising:

a single strip of thin stiff bendable non-foam material which is curled back upon itself to form a single-layer loop with two opposing end regions coming together in back-to-back relationship on one side of the loop and extending into the loop;

said end regions extending into the loop a distance sufficient to preclude other similar shaped particles from nesting within the loop.

5,468,557

CERAMIC INSULATED ELECTRICAL CONDUCTOR WIRE AND METHOD FOR MANUFACTURING SUCH A WIRE

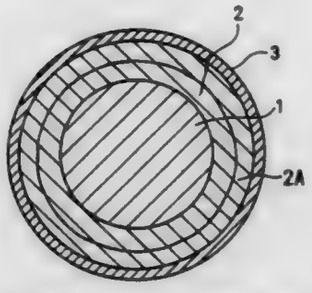
Masanobu Nishio; Kazuo Sawada; Shinji Inazawa, and Kouichi Yamada, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 464,447, Jan. 12, 1990, abandoned. This application Feb. 18, 1993, Ser. No. 19,135

Claims priority, application Japan, Jan. 12, 1989, 1-5676

Int. Cl.[6] B32B *9/00;15/04*

U.S. Cl. 428—384 8 Claims



1. A ceramic insulated electrical conductor wire comprising a copper conductor, a stainless steel layer surrounding said copper conductor, a distinct chromium oxide layer having a thickness in the range from 10 nm to 1000 nm formed on said stainless steel layer, and a vapor deposition ceramic insulator bonded by said chromium oxide layer to said stainless steel layer, said stainless steel layer and said chromium oxide layer together isolating said copper conductor from adversely influencing said vapor deposition ceramic insulator for an improved bonding strength between said stainless steel layer and said ceramic insulator and thus between said vapor deposition ceramic insulator and said copper conductor.

5,468,558

PROCESS FOR PREPARING FRACTURE-RESISTANT SOL/GEL PARTICLES

Helmut Derleth, and Karl H. Bretz, both of Nienburg/Weser, Germany, assignors to Solvay Catalysts GmbH, Hanover, Germany

Filed May 14, 1993, Ser. No. 61,313

Claims priority, application Germany, May 22, 1992, 42 16 868.6

Int. Cl.[6] B32B *19/00;* B01J *35/00;13/00*

U.S. Cl. 428—402 10 Claims

9. Sol/gel particles having particle diameters of from 1 to 6 mm and comprising a silicon dioxide matrix, said particles containing from 1 to 85% by weight, relative to the total solids content of the sol/gel particles, of a filler having a particle size of from 1 to 50 nm, and wherein said particles have a pore volume of at most 1.01 ml/g.

5,468,559

IMPACT RESISTANT LAMINATED WINDOWS AND MANUFACTURE THEREOF

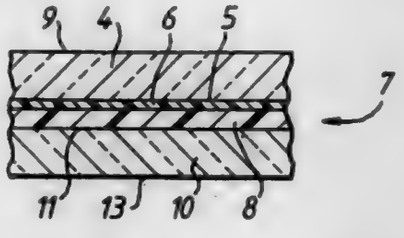
Vladimir Solinov, and Igor Boguslavski, both of Moscow, Russian Federation, assignors to Flachglas Intg Glasveredelungs GmbH, Germany

Division of Ser. No. 105,949, Aug. 13, 1993. This application Aug. 15, 1994, Ser. No. 290,619

Claims priority, application Germany, Aug. 15, 1992, 42 27 050.2

Int. Cl.[6] B32B *17/00*

U.S. Cl. 428—410 39 Claims



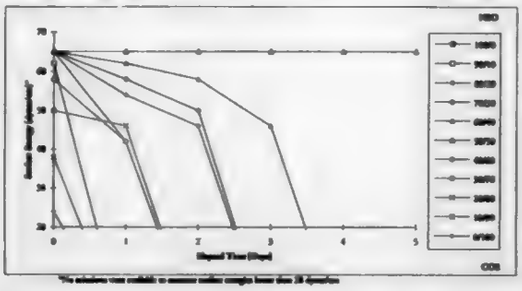
1. A laminated window having improved impact strength, the laminated window comprising a glass sheet as the outer sheet and a connecting sheet combined with the outer sheet by way of an organic bonding interlayer, one of the sheets being a pre-product glass sheet, the pre-product glass sheet having been produced by the steps of: etching at least one face of a tempered or non-tempered glass sheet substrate to produce a virgin surface which comprises silanol groups; cleaning the virgin etched surface by washing; removing mobile water from the cleaned virgin surface by a drying treatment, the silanol groups being retained; and applying a protective layer to the dried surface which adheres firmly to the surface and wherein the protective layer of the pre-product glass sheet is adhered to the outer sheet by the bonding interlayer, the materials of the protective layer and of the bonding interlayer being compatibly adherable together.

5,468,560

PRODUCT AND PROCESS FOR POLYMERIC ARTICLE WITH IMPROVED SURFACE

Mary C. McPherson, Orange County, and Maria A. Hozbor, Santa Clara County, both of Calif., assignors to The BOC Group, Inc., Murray Hill, N.J.

Filed Apr. 19, 1994, Ser. No. 230,025
Int. Cl.[6] B32B 27/38
U.S. Cl. 428—413 13 Claims



1. A process for modifying of at least one surface of an article or substrate produced from a polymeric material comprising exposing said surface to be modified to a low temperature plasma gas composition in a chamber containing the article or substrate, wherein said gas composition consists essentially of a mixture of from 80 to 40 mol % N_2O with 20 to 60 mol % CO_2 for a time sufficient to modify said surface.

5,468,561

ETCHING AND PATTERNING AN AMORPHOUS COPOLYMER MADE FROM TETRAFLUOROETHYLENE AND 2,2-BIS(TRIFLUOROMETHYL)-4,5-DIFLUORO-1,3-DIOXOLE (TFE AF)

Chih-Chen Cho, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 5, 1993, Ser. No. 148,779
Int. Cl.[6] B32B 9/00
U.S. Cl. 428—421 12 Claims

1. A device comprising:

a. a substrate; and

b. a copolymer made from tetrafluoroethylene and 2,2-bis(trifluoromethyl)-4,5-difluoro-1,3-dioxole (TFE AF) layer on top of said substrate.

5,468,562

METALLIZED POLYMERIC IMPLANT WITH ION EMBEDDED COATING

Mohammad Farivar, Chestnut Hill, and Piran Sioshansi, Lincoln, both of Mass., assignors to Spire Corporation, Bedford, Mass.

Continuation of Ser. No. 6,749, Jan. 21, 1993, abandoned, which is a division of Ser. No. 663,361, Mar. 1, 1991, abandoned. This application Feb. 10, 1994, Ser. No. 195,824
Int. Cl.[6] B32B 9/00
U.S. Cl. 428—457 6 Claims

1. A biomedical device capable of insertion within a subject, the device formed from a unitary flexible polymeric material having an outer surface, the outer surface being coated with an infection reducing material by ion beam assisted deposition, wherein the coating includes atoms of the infection reducing material embedded in the outer surface only partially through the polymeric material to a predetermined depth from the outer surface, and wherein the coating is a substantially uniform, dry coating having a thickness extending outward from the outer surface of between about 0.5 microns and about 10 microns.

5,468,563

REFLECTION-REDUCED, BONDABLE STRETCHED FILM AS WINDOW FILM FOR ENVELOPES

Ulrich Reiners, Neuenkirchen; Anton Krallmann, Fallingbostel; Eberhard Albinus, and Jürgen Böhner, both of Bomlitz, all of, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Filed Apr. 8, 1994, Ser. No. 225,219
Claims priority, application Germany, Apr. 16, 1993, 43 12 388.9
Int. Cl.[6] B32B 27/08
U.S. Cl. 428—515 8 Claims

1. An envelope window comprising a transparent reflection-reduced, bondable biaxially stretched film, longitudinally stretched by a ratio of 3:1 to 7:1 and transverse stretched by a ratio of 7:1 to 12:1, having at least two layers, at least one of which is a reflection reduced layer and at least one of which is a core layer, said reflection-reduced layer having a thickness of from 1 μm to 4 μm and being pretreated with low pressure plasma pretreatment with oxygen as process gas, and having a surface gloss of less than 60 gloss units and a haze of less than 40% and wherein said reflection-reduced layer consists essentially of

5–60 wt. % of an ethylene-based copolymer modified 5–15% of a random copolymer prepared from polypropylene and ethylene with an ethylene content of 2 to 6 wt. %,

25–90 wt. % of polypropylene copolymers produced using a block copolymerization process; and said core layer consists essentially of 95–100 wt. % of an isotactic polypropylene with a melt index of 0.5 to 8 g/10 min (230° C./21.2N), and 5 to 0 wt. % of an antistatic agent, slip agent or both.

5,468,564

TRANSFER PAPER AND METHOD OF MANUFACTURING THE SAME

Teiichi Ohtani; Shoichi Endo; Teruhisa Shimada, and Yoshihiro Kuroyama, all of Tokyo, Japan, assignors to Nippon Paper Industries Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1994, Ser. No. 231,094
Claims priority, application Japan, Apr. 23, 1993, 5-120698; Apr. 14, 1994, 6-100814
Int. Cl.[6] B32B 29/00
U.S. Cl. 428—537.5 17 Claims

1. A transfer paper comprising:

a support paper coated on at least one side with a transfer layer having a thickness of not less than 3 μm and having one or more constituent layers;

the outermost constituent layer of said transfer layering being a coated layer containing at least a pigment and a binder,

said coated layer having in the part extending to the depth of at least 3 μm below the surface a hole distribution curve having at least one peak showing average pore diameter within the range of 0.1 to 1.0 μm and a height ranging from 0.1 to 1.0 ml/g with respect to pore volume when measured with a porosimeter of mercury injection type,

wherein the average oil absorption of said pigment is within the range of 20 ml/100 g to 400 mg/100 g and the content of binder in the coating composition for forming the coated layer is within the range of 2/a to 30/a parts by weight wherein a is the bulk density of said pigment.

5,468,565

METHOD FOR PRODUCING COMPOSITE MATERIAL MAINLY COMPOSED OF CARBON AND BORON

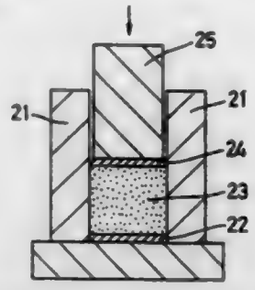
Osamu Okada; Hiroaki Ogura, and Toshiaki Sogabe, all of Kagawa, Japan, assignors to Toyo Tanso Co., Ltd.

Division of Ser. No. 104,410, Aug. 10, 1993, which is a continuation of Ser. No. 729,723, Jul. 15, 1991, abandoned. This application Jan. 7, 1994, Ser. No. 178,845

Claims priority, application Japan, Jul. 30, 1990, 2-203620; Aug. 9, 1990, 2-212074; Dec. 5, 1990, 2-413604

Int. Cl.[6] B22F *5/00*

U.S. Cl. 428—552 6 Claims



1. An oxidation resistant carbon material including a composite material mainly composed of a carbon and boron, said composite material being obtained by impregnating a carbon material with a boron oxide and/or a hydrate compound thereof; and baking such carbon material under pressure by inert gas at a temperature of not lower than 1500° C., wherein the total amount of mineral impurities other than boron compound is not larger than 20 ppm and the amount of residual free B_2O_3 is not larger than 0.1% by weight.

5,468,566

SYNTHESIS OF HIGHLY PHASE PURE BSCCO SUPERCONDUCTORS

Stephen E. Dorris, La Grange Park; Roger B. Poeppel, Glen Ellyn, both of Ill.; Barton C. Prorok, Harrisville, Pa.; Michael T. Lanagan, Woodridge, and Victor A. Maroni, Naperville, both of Ill., assignors to University of Chicago, Chicago, Ill.

Division of Ser. No. 43,652, Apr. 6, 1993, Pat. No. 5,354,535. This application Sep. 13, 1994, Ser. No. 305,272

Int. Cl.[6] B22F *7/00;* H01B *12/04*

U.S. Cl. 428—552 19 Claims

1. An article of manufacture of 2223 (Bi,Pb)y-Sr-Ca-Cu superconductor comprised of a substantially oxide phase pure 2223 superconductor phase with less than 2–3 percent of any second phase oxide aside from said 2223 superconductor phase and a fractional content y of Bi and Pb together being about 2.1 to 2.3.

5,468,567

SLIDE MEMBER

Yoshikazu Fujisawa; Takeshi Narishige, and Yuzuru Miyazaki, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 989,733, Dec. 10, 1992, Pat. No. 5,310,606, which is a continuation of Ser. No. 642,812, Jan. 18, 1991, abandoned. This application May 9, 1994, Ser. No. 240,018

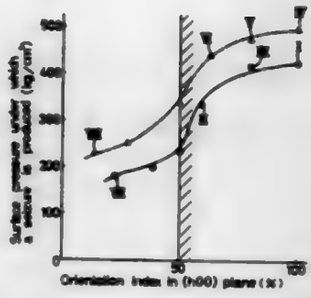
Claims priority, application Japan, Jan. 19, 1990, 2-10119; Jan. 19, 1990, 2-10120; Jan. 19, 1990, 2-10121

The portion of the term of this patent subsequent to May 10, 2011, has been disclaimed.

Int. Cl.[6] F16C *33/12*

U.S. Cl. 428—645 13 Claims

1. A slide member comprising a surface layer of a Pb alloy on a slide surface for a mating member, wherein said Pb alloy has a



crystal form with an orientation index in a (h00) plane by Miller indices being set in a range 60 to 100%.

5,468,568

PRINTING ROLLER WITH A SLEEVE OF THERMALLY WOUND FIBER-REINFORCED THERMOPLASTICS AND A PLASMA-SPRAYED COATING OF COPPER OR COPPER ALLOY

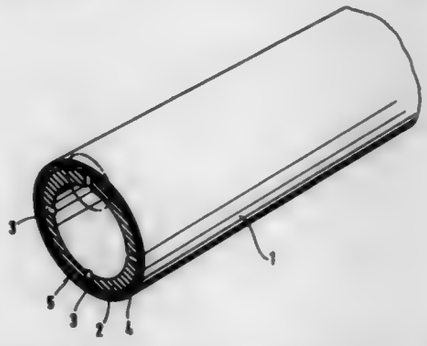
Heinrich Köhn, Brechen; Frank Herberg, Frankfurt am Main, and Dieter Jaculi, Bad Homburg, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 15, 1994, Ser. No. 228,425

Claims priority, application Germany, Apr. 19, 1993, 9305806 U

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—245 20 Claims



1. A printing roller, comprising a core cylinder and a sleeve of plastic, said sleeve comprising a tubular base body composed of fiber-reinforced thermoplastic material and a plasma-sprayed layer of copper or copper alloy coated on the outer surface of the tubular base body.

5,468,569

USE OF STANDARD UNIFORM ELECTRODE COMPONENTS IN CELLS OF EITHER HIGH OR LOW SURFACE AREA DESIGN

Michael F. Pyszczek, LeRoy; Esther S. Takeuchi, East Amherst, and Mark J. Kane, Buffalo, all of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

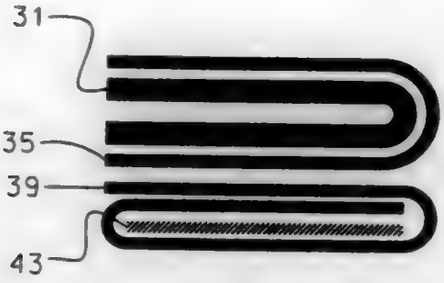
Filed Mar. 15, 1994, Ser. No. 213,629

Int. Cl.[6] H01M *6/10;6/00*

U.S. Cl. 429—94 25 Claims

1. A method of configuring an electrode having a low electrochemical surface area from a standard electrode having a high electrochemical surface area, said method comprising the steps of:

(a) folding a first standard electrode, comprising a cathode, at one or more locations between the ends thereof, thereby folding the cathode upon itself, resulting in a folded cathode



having an electrochemical surface area reduced to a fraction of that of the unfolded first standard electrode from which it is configured;

(b) placing the cathode folded according to step (a) in a face-to-face relationship with an unfolded second standard electrode, comprising an anode having an electrochemical surface area corresponding to the size of the folded cathode, with a separator therebetween in assembling a cell stack useful in the manufacturing of an electrochemical cell.

5,468,570

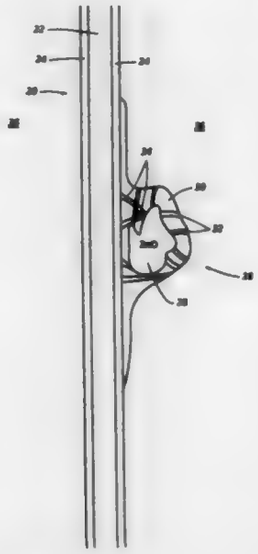
LIGHTWEIGHT ZINC ELECTRODE

William A. Ferrando, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 26, 1995, Ser. No. 379,380

Int. Cl.[6] H01M *4/38;4/48*

U.S. Cl. 429—217 **15 Claims**



1. A zinc electrode comprising

A. a sintered mat of nickel metal coated graphite fibers; and

B. a zinc active material/hydrogel/inert polymer matrix composite material comprising

(1) from about 55 to about 80 weight percent of a zinc active material that is zinc, zinc oxide, zinc hydroxide, or mixtures thereof wherein the weight percentage is based on the equivalent amount of zinc oxide, and with

(2) the remainder of the zinc active material/hydrogel/inert polymer matrix composite material being a hydrogel/inert polymer matrix composite material comprising

(a) from about 4 to about 20 weight percent of the hydrogel, and with

(b) the remainder of the hydrogel/inert polymer matrix composite material being an impervious, inert matrix polymer,

wherein the zinc active material and the hydrogel are each dispersed within the inert polymer matrix;

wherein the zinc active material/hydrogel/inert polymer matrix composite material surrounds the individual nickel metal coated graphite fibers of the sintered mat and the nickel metal coated graphite fibers provide paths of electrical conductivity throughout the zinc active material/hydrogel/inert polymer matrix composite material.

5,468,571

SECONDARY BATTERY

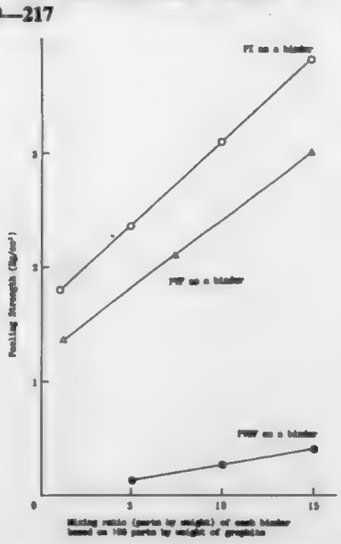
Masahisa Fujimoto; Koji Nishio, both of Osaka, and Toshihiko Saito, Tsuzuki, all of, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 106,621, Aug. 16, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 412,230

Claims priority, application Japan, Nov. 19, 1992, 4-335659

Int. Cl.[6] H01M *4/62;4/58*

U.S. Cl. 429—217 **4 Claims**



1. A secondary battery with a negative electrode consisting essentially of an electrode collector metal and a carbon powder capable of occluding and discharging cations, particles constituting said carbon powder being consolidated and adhered to said collector metal with a binder, said binder consisting essentially of a polyimide resin.

5,468,572

PRE-COMPRESSED GLASS FIBER SEPARATORS FOR BATTERIES

George C. Zguris, Canterbury, N.H., and Frank C. Harmon, Jr., Ayer, Mass., assignors to Hollingsworth & Vose Company, East Walpole, Mass.

Division of Ser. No. 881,160, May 11, 1992, Pat. No. 5,336,275. This application Aug. 8, 1994, Ser. No. 287,081

Int. Cl.[6] H01M *2/16*

U.S. Cl. 429—247 **15 Claims**

1. A sheet useful as a separator in a valve regulated lead acid battery comprising a case containing the separator, at least one positive plate, at least one negative plate and an amount of electrolyte which is absorbed in the separator in the valve regulated lead acid battery, said sheet comprising

glass fibers formed into a resilient web having a first thickness, when dry, and

an amount of resiliency suppressing liquid carried in said web, said amount being substantially less than the amount of electrolyte which is absorbed in the separator in the valve regulated lead acid battery,

wherein said web containing said resiliency suppressing liquid has been compressed and wherein the amount of resiliency suppressing liquid carried in said web is controlled so that it is operable, when the compression is released, to suppress the resiliency of the web to maintain said web at a second thickness which is at least ten percent less than said first thickness,

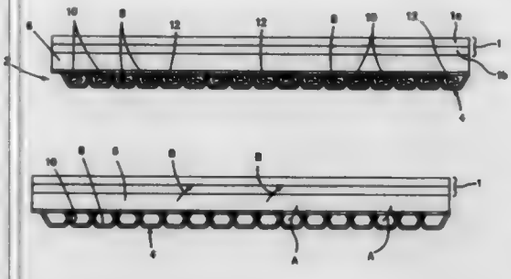
said sheet being operable, when placed in the battery case with the at least one negative plate and the at least one positive plate, and exposed to said amount of electrolyte, to expand in thickness and increase the pressure between the separator and the plates.

5,468,573

ELECTROLYTE PASTE FOR MOLTEN CARBONATE FUEL CELLS

Lawrance J. Bregoli, Southwick, Mass., and Mark L. Pearson, New London, Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Jun. 23, 1994, Ser. No. 264,540
Int. Cl.[6] H01M *8/14*
U.S. Cl. 429—16 **6 Claims**



1. A method for providing a supply of reserve electrolyte in a molten carbonate fuel cell stack, said method comprising the steps of:

a) providing an excess amount of electrolyte in the fuel cell stack, said excess electrolyte being contained in a pasty electrolyte mixture comprising solid electrolyte particles which are dispersed in a carrier vehicle; and

b) heating the stack to a temperature, which temperature will cause the carrier vehicle to be heat-dissipated from the stack, and which temperature will also cause the electrolyte particles to melt and migrate into a porous electrolyte reservoir plate component of the stack.

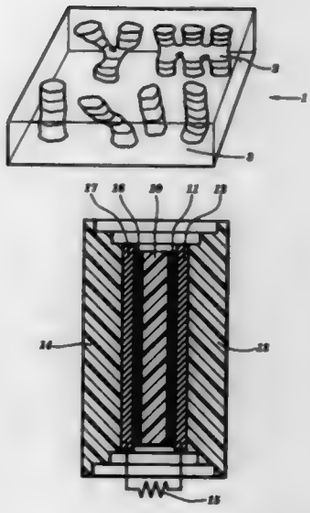
5,468,574

FUEL CELL INCORPORATING NOVEL ION-CONDUCTING MEMBRANE

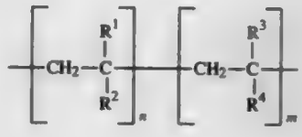
Scott G. Ehrenberg, Fishkill; Joseph Serpico, Troy; Gary E. Wnek, Latham, and Jeffrey N. Rider, Troy, all of N.Y., assignors to Dais Corporation, Fishkill, N.Y.

Filed May 23, 1994, Ser. No. 247,285
Int. Cl.[6] H01M *8/10;* **C08J** *5/20*
U.S. Cl. 429—33 **7 Claims**

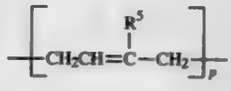
1. A water-insoluble membrane comprising a plurality of acid-stable polymer molecules each having at least one ion-conducting polymer segment covalently bonded to at least one flexible connecting polymer segment, said membrane having said ion-conducting polymer segments ordered such that a plurality of continuous hydrogen-ion-conducting channels penetrate the membrane from a first face to a second face, said hydrogen-ion-



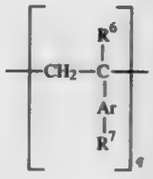
conducting channels being regions containing anionic species situated in an elastic matrix, said elastic matrix formed by said flexible connecting polymer segments, wherein the flexible connecting polymer segment is chosen from the group



and the group



and wherein the ionic conducting component is chosen from the group



wherein R^1, R^2, R^3 and R^4 are chosen independently from the group consisting of hydrogen and lower alkyl;

R^5 is hydrogen, chlorine or lower alkyl;

R^6 is hydrogen or methyl;

R^7 is a mixture of hydrogen and a residue chosen from the group consisting of $—SO_3H$, $—P(O)(OR^8)OH$, $—R^9—SO_3H$ and $—R^9—P(O)(OR^8)OH$ where R^8 is hydrogen or lower alkyl and R^9 is lower alkylene;

Ar is phenyl; and

m, n, p and q are zero or integers from 50 to 10,000.

5,468,575

MAINTENANCE-FREE HIGH CAPACITY LEAD BATTERY OR ACCUMULATOR

Gunther K. Holland, Budingen-Düdelsheim, and Wolfgang Kügler, Ortenberg, both of, Germany, assignors to Accumulatorenfabrik Sonnenschein GmbH, Budingen, Germany

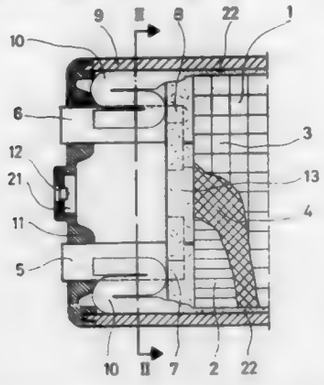
Filed Dec. 17, 1993, Ser. No. 169,429

Claims priority, application Germany, Dec. 17, 1992, 42 42 661.8

Int. Cl.[6] H01M 2/12;10/52

U.S. Cl. 429—56 9 Claims

1. Gas-tight, maintenance free high capacity lead accumulator



having a case (9) closed at one end by a cover (11) and containing a plate group (1) including positive (2) and negative electrode plates (3) separated by separators (4) and with a first free space formed between the plate group (1) and the case cover (11), and with a second free space smaller than said first free space formed between the opposed edges of the electrode plates and the opposed side walls of said case (9), and with a charging hole (21) and a pressure control valve (12) mounted in said cover (11), said positive (2) and negative electrode plates (3) respectively being connected via connecting straps (7,8), respectively, to positive (5) and negative poles (6) that are mounted in the case cover (11) in a sealed way, and a thixotrope in which sulfuric acid is bound being filled in as an electrolyte around the connecting straps (7,8) and collecting devices being provided in said case (9) for absorbing free liquid and gaseous electrolyte produced in said case (9) when the case is placed on its side or in the horizontal position of the accumulator, characterized in that said first and second free spaces have mounted therein highly porous fibrous webs (10,22,15,14) of a material selected from the group consisting of glass, mineral or synthetic fibers at least portions of which are arranged as said collecting devices, whereby the liquid and gaseous electrolyte as a function of the charging state of the accumulator can be stored in said devices and can again be released under changed charging conditions without releasing the pressure control valve (12) at correspondingly increased internal pressure.

5,468,576

METHOD FOR MANUFACTURING EXPOSURE MASK

Tsuyoshi Shibata; Koji Hashimoto, and Katsuhiko Hieda, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 18, 1992, Ser. No. 853,436

Claims priority, application Japan, Mar. 29, 1991, 3-067268

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—5 1 Claim

1. A method of manufacturing an exposure mask comprising the steps of:

(a) forming a patterned shading film, having openings, on a first of two opposite surfaces of a transparent substrate, said transparent substrate having a chemical composition which is different from the chemical composition of said shading film;

(b) coating a photoresist film over said patterned shading film formed on part of the first surface of said transparent substrate, the photoresist film comprising a material which is resistant to selective deposition of silicon dioxide;

(c) exposing said photoresist film to light which is projected toward said photoresist film from a point opposite the other surface of the two opposite surfaces of the transparent substrate through said transparent substrate and the openings of said patterned shading film to partially develop said photoresist film;

(d) after step (c), removing the undeveloped portion of said photoresist film located over said patterned shading film in order to form pattern openings through the photoresist film;

(e) after step (d), immersing said transparent substrate in a solution in which silicon dioxide is dissolved;

(f) then, initiating selective deposition of silicon dioxide on said pattern shading film and on the first surface of said transparent substrate within the pattern openings of the photoresist film to thereby form a phase shifter; and

(g) after step (f) removing the remaining developed portion of said photoresist film wherein said exposure of said photoresist film is terminated at a point and time such that the developed portion of said photoresist film remains separated from said shading film to form an exposed surface of said transparent substrate between said shading film and said photoresist film prior to the immersing step.

5,468,577

PHOTOMASK HAVING PATTERNS TO REDUCE POWER OF A STEPPER

Sang M. Bae, Bubaleub, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

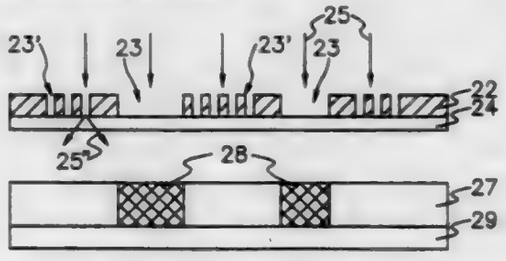
Filed Jun. 10, 1994, Ser. No. 258,193

Claims priority, application Rep. of Korea, Jun. 12, 1993, 1993-10716

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—5 4 Claims

1. A photomask comprising:



at least one first pattern region through which light can penetrate without diffraction to a desired location of a photosensitive film suitable for development; and

a second pattern region including a plurality of fine patterns formed to serve as openings for diffracting the light to provide increased light energy reaching the desired location beyond only irradiation as a result of the first pattern region, whereby the light energy from diffracting light is insufficient for development of the photosensitive film outside of the desired location.

5,468,578

METHOD OF MAKING MASKS FOR PHASE SHIFTING LITHOGRAPHY TO AVOID PHASE CONFLICTS

J. Brett Rolfson, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

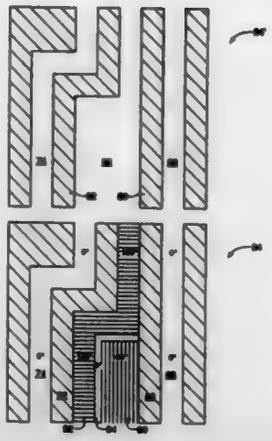
Filed Sep. 26, 1994, Ser. No. 312,408

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—5 19 Claims

1. A method of fabricating an alternating aperture phase shifting mask comprising:

depositing an opaque layer on a transparent substrate;



forming a pattern of openings through the opaque layer to the substrate to form a mask pattern that includes transparent areas and opaque areas;

identifying areas of phase conflict in a desired phase shifting mask pattern wherein areas of a same phase occur in close proximity;

forming connecting transparent areas for connecting adjacent transparent areas of the mask pattern together in the phase conflict areas; and

forming phase shift areas in every other transparent area and in the connecting transparent areas.

5,468,579

Patent Not Issued For This Number

5,468,580

CONDITION OPTIMIZATION METHOD FOR MEASURING OVERLAY ACCURACY OF PATTERN

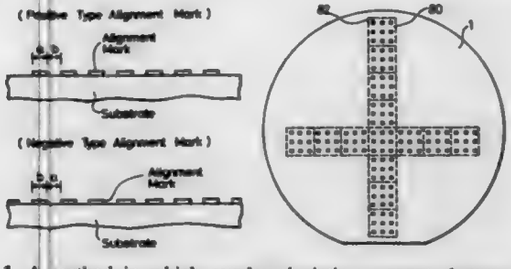
Yasushi Tanaka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 3, 1993, Ser. No. 115,553

Claims priority, application Japan, Sep. 3, 1992, 4-258824; Jan. 22, 1993, 5-025989

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—22 **5 Claims**



1. A method in which overlay deviation amounts between a plurality of first overlay measurement patterns and second overlay measurement patterns formed on a substrate are measured by an overlay metrology system and measurement conditions of said overlay metrology system are optimized on the basis of measured results of said overlay deviation amounts, comprising the steps of:

forming on a substrate a plurality of first overlay measurement patterns, each being formed of a first center measurement mark and a plurality of periphery measurement marks disposed at the periphery of said center measurement mark;

forming on a substrate a plurality of second overlay measurement patterns, each being formed of a second center measurement mark and a plurality of second periphery measurement marks disposed at the periphery of said second center measurement mark, a relative position relationship between said first center measurement mark and said first periphery measurement mark being equal to a relative position relationship between said second center measurement mark and said second periphery measurement mark from a design standpoint such that said second center measurement mark is formed at substantially a central portion of said first center measurement mark and that a plurality of second periphery measurement marks are formed at substantially central portions of a plurality of first periphery measurement marks;

measuring the center measurement mark overlay deviation amount between said first center measurement mark and said second center measurement mark by an overlay metrology system in each of said first overlay measurement pattern and a corresponding second overlay measurement pattern to measure a periphery measurement mark overlay deviation amount between said first periphery measurement mark and the corresponding second periphery measurement mark; and

obtaining an overlay deviation amount difference by subtracting the center measurement mark overlay deviation amount from each of said periphery measurement mark overlay deviation amounts in each of said first overlay measurement pattern and the corresponding second overlay measurement pattern, wherein measurement conditions of said overlay metrology system are adjusted such that fluctuations of the overlay deviation amount differences are minimized.

5,468,581

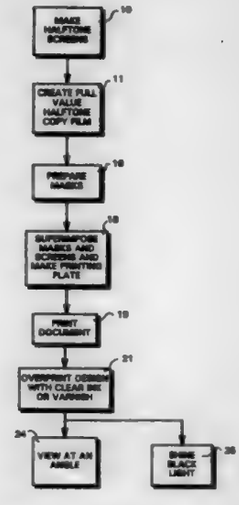
VERIFICATION LATENT IMAGE

Robert P. Coe, Grand Island, N.Y., and Theodore Blend, Buckhannon, W. Va., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Nov. 4, 1993, Ser. No. 145,639

Int. Cl.[6] G03F 9/00

U.S. Cl. 430—22 **13 Claims**



1. A method of producing a security feature on a document disposable in a plane, comprising the steps of:

(a) making first and second halftone line screens of the same design;

(b) superimposing the first and second screens one upon the other so that the designs provided thereon are juxtaposed;

(c) producing a copy film having a full value halftone using the screens;

(d) making image masks;

(e) juxtaposing the image masks and copy film to produce a printing plate;

(f) printing the design with latent image on a document using the printing plate; and

(g) overprinting at least part of the design with an ink or varnish; and

wherein steps (a)–(g) are practiced so as to produce an image in the design on the document which is not readily visible to the naked human eye when viewed generally perpendicular to the plane of the document, but which is readily visible by the naked human eye when the document is tilted so that it is viewed distinctly non-perpendicular to the plane of the document.

5,468,582

FUSED OPTICAL LAYER AND METHOD OF MAKING

Thomas H. Blair, Schaumburg, Ill., and Michael S. Lebby, Apache Junction, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 24, 1992, Ser. No. 996,748

Int. Cl.[6] G03G *13/22*

U.S. Cl. 430—54 **14 Claims**

1. A method for making a fused optical layer comprising the steps of:

providing a light source for projecting a directed light beam;

providing a photosensitive layer having a first charged surface, the first charged surface locally changes to a second charge in response to being exposed to the directed light beam;

projecting the directed light beam onto the first charged surface, thereby locally generating the second charge in the first charged surface of the photosensitive layer;

exposing the photosensitive layer to an optical media material that is optically clear having a charge different than the second charge, thereby selectively attracting the optical media material to portions of the photosensitive layer having the second charge;

passing a substrate having a charge different than the charge associated with the photosensitive layer in close proximity to the photosensitive layer having the optical media material attracted thereto, thereby attracting the optical media material from the photosensitive layer to the substrate; and

heating the substrate to fuse the optical media material together forming a clear optical layer with a refractive index ranging from 1.3 to 1.7.

5,468,583

CYCLIC BIS-DICARBOXIMIDE ELECTRON TRANSPORT COMPOUNDS FOR ELECTROPHOTOGRAPHY

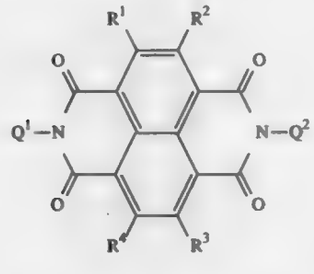
William T. Gruenbaum; Teh-Ming Kung, and Ralph H. Young, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 28, 1994, Ser. No. 365,524

Int. Cl.[6] G03G *5/047;5/09*

U.S. Cl. 430—58 **20 Claims**

14. A photoconductor element comprising: an electrically conductive layer, a charge generating layer and a charge transport layer comprising a polymeric binder and at least one cyclic bis-dicarboximide of Formula (I):



(I)

wherein:

Q^1 and Q^2, which may be the same or different, are branched alkyl; unsubstituted straight-chain alkyl; unsubstituted cyclic alkyl; alkyl-substituted cyclic alkyl, unsubstituted, straight-chain, unsaturated alkyl; or H, wherein Q^1 and Q^2 cannot both be H; and

R^1, R^2, R^3, and R^4, which may be the same or different, are hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, or halogen.

5,468,584

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER HAVING INTERMEDIATE LAYER CONTAINING FINE POWDER PARTICLES OF TIN OXIDE CONTAINING PHOSPHOROUS AND APPARATUS EMPLOYING SAME

Shintetsu Go; Yoshio Kashizaki, both of Yokohama; Koichi Suzuki, Kawasaki; Kazuma Sato, Yokohama, and Akira Shimada, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 159,563, Dec. 1, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 410,395

Claims priority, application Japan, Dec. 1, 1992, 4-343598

Int. Cl.[6] G03G *5/14*

U.S. Cl. 430—65 **10 Claims**

1. An electrophotographic photosensitive member comprising in sequence:

a supporting member;

an intermediate layer containing fine particles of tin oxide containing phosphorous; and

a photoconductive layer.

5,468,585

RESIN COMPOSITION FOR USE IN AN ELECTROPHOTOGRAPHIC TONER

Katsuru Matsumoto, Yokosuka; Nobuhiro Hirayama, Hiratsuka; Shoji Kawasaki, Yokohama; Kenji Uchiyama, Odawara; Katsuo Uramoto, and Tamami Fukui, both of Yokohama, all of, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Dec. 23, 1994, Ser. No. 363,267

Claims priority, application Japan, Dec. 24, 1993, 5-326852; Jul. 28, 1994, 6-176764

Int. Cl.[6] G03G *9/097;9/087*

U.S. Cl. 430—110 **7 Claims**

1. A resin composition for use in an electrophotographic toner which comprises an ethylenic polymer (L) having a weight-average molecular weight (M_w) of not greater than 20,000 and an acid value of 2 to 100 mg KOH/g, and an ethylenic polymer (H) having a time constant (τ) of 1.2 to 25 as obtained from the following equation (1) for defining the triboelectric charging speed, a weight-average molecular weight (M_w) of not less than 150,000, and a M_w to number-average molecular weight (M_n) ratio (M_w/M_n) of not less than 5.0.

$$Q=(Q_{max})\times(1-\exp(-t/\tau)) \quad (1)$$

where

t: Mixing time for triboelectric charging (min)

τ: Time constant for triboelectric charging (min)

Q: Quantity of electric charge (μC/g) at the mixing time for triboelectric charging (t)

Q_{max}: Maximum quantity of electric charge (μC/g).

5,468,586

SYSTEM FOR CONTROLLING THE COLOR OF TONER MIXTURES

James M. Proper, and Peter F. Erhardt, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 23, 1994, Ser. No. 247,821

Int. Cl.[6] G03G *9/09*

U.S. Cl. 430—137 **9 Claims**

1. An apparatus for mixing toner resin with a liquid colorant to form a toner mixture of a selected color, comprising:

a toner extruder having the resin being conveyed therethrough;

means for adding the colorant to the toner resin in said toner extruder to form the toner mixture of a selected color; and

means for measuring the color of the toner mixture after mixing in said toner extruder and transmitting a signal indicative of the color.

5,468,587

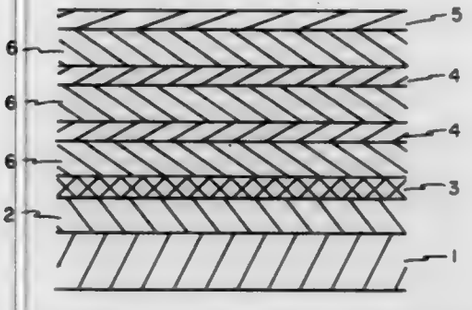
HYDROGEN BOND ACCEPTING GROUPS ON THERMAL SOLVENTS FOR IMAGE SEPARATION SYSTEMS

David S. Bailey; Albert J. Mura, Jr., both of Rochester, and Shari L. Eiff, Rush, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

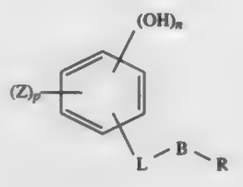
Filed Jun. 8, 1993, Ser. No. 73,826

Int. Cl.[6] G03C *8/40;8/12*

U.S. Cl. 430—203 **36 Claims**



1. An aqueous-developable chromogenic photographic heat-transferable non-aqueous dye-diffusion-transfer photographic element comprising radiation sensitive silver halide, a dye-providing compound that forms or releases a heat-transferable image dye upon reaction of said compound with the oxidation product of a primary amine developing agent, a hydrophilic binder, and a thermal solvent for facilitating non-aqueous diffusion transfer wherein said thermal solvent has the formula (II)



(II)

wherein

n is 1, 2 or 3;

is 0 to 5-n;

Z is a substituent, where each Z consists independently of groups selected from alkyl groups of 1 to 8 carbon atoms or halogens;

L is an alkyl group of 1 to 6 carbon atoms or an alkoxy group of 2 to 6 carbon atoms or is absent;

B is a hydrogen bond accepting group selected from the group of sulfur or XGY where X and Y are each independently absent, O, or NR^b, where R^b is hydrogen or a primary alkyl, primary alkylaryl, or aryl group of from 1 to 8 carbons, and where G is a sulfonyl group;

at least one OH group and any hydrogen bond accepting atom in B cannot hydrogen bond to form a ring of either 5 or 6 atoms.

R is an alkyl, aryl, or arylalkyl group of 1 to 18 carbon atoms;

the calculated log of the octanol/water partition coefficient (clogP) is greater than 3 and less than 10.

5,468,588

PROCESS FOR MANUFACTURING DIFFUSION TRANSFER PRINTING PLATES

Michael T. Macioch, Baldwin, Wis.; Douglas M. Gates, White Bear Lake, Minn., and Timothy M. Leary, Rochester, N.Y., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 18, 1994, Ser. No. 324,576

Int. Cl.[6] G03C *8/28;* **G03F** *7/07*

U.S. Cl. 430—229 **4 Claims**

1. A method of manufacturing a photosensitive element, which can be exposed and developed by diffusion transfer processes to form a lithographic printing plate, comprising the steps of:

(a) providing a support layer,

(b) coating a negative acting silver halide emulsion layer onto said support layer, and

(c) coating a physical development nucleation layer comprising particles onto said silver halide emulsion layer,

wherein the coating of said physical development nucleation layer is performed with a coating composition which is at a temperature above 0° C. and below 15° C.

5,468,589

RESIST MATERIAL AND PATTERN FORMATION PROCESS

Fumiyoshi Urano; Hirotoshi Fujie; Keiji Oono, and Takaaki Negishi, all of Kawagoe, Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, and Matsushita Electric Industrial Co., Ltd., Kodoma, both of, Japan

Filed Jun. 15, 1992, Ser. No. 898,265

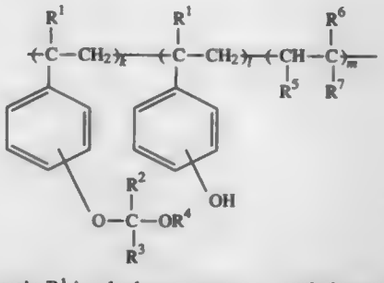
Claims priority, application Japan, Jun. 18, 1991, 3-173197; Sep. 26, 1991, 3-274829

Int. Cl.[6] G03F *7/004*

U.S. Cl. 430—170 **10 Claims**

1. A photoresist composition comprising an admixture of:

(a) a polymer having repeating units of the formula:

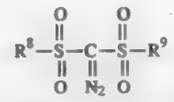


(I)

wherein R^1 is a hydrogen atom or a methyl group; R^2 and R^3 are independently a hydrogen atom, or a linear, branched or cyclic alkyl group having 1 to 6 carbon atoms provided that R^2 and R^3 cannot be hydrogen atoms at the same time, and R^2 and R^3 together being able to form an alkylene chain having 2 to 5 carbon atoms; R^4 is a linear, branched or cyclic alkyl group having 1 to 10 carbon atoms, a linear, branched or cyclic haloalkyl group having 1 to 6 carbon atoms, or an aralkyl group; R^5 is a hydrogen atom or a cyano group; R^6 is a hydrogen atom or a methyl group; R^7 is a hydrogen atom, a cyano group or —COOY; Y is a linear, branched or cyclic alkyl group having 1 to 6 carbon atoms; R^5 and R^7 may bind to each other to form —CO—O—CO—; k and l are indepen-

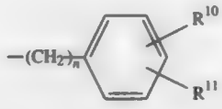
dently a natural number ($0.1 \leqq k/(k+l) \leqq 0.9$); and m is zero or a natural number (when m is a natural number, $0.05 \leqq m/(k+l+m) \leqq 0.50$),

(b) at least one compound selected from compounds of the following formulae III, V, VI and VII:

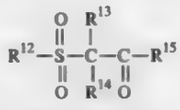


(III)

wherein R^8 and R^9 are independently a linear, branched or cyclic alkyl group having 1 to 10 carbon atoms, a haloalkyl group having 1 to 10 carbon atoms, or a group of the formula:

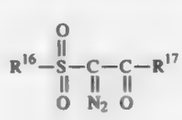


wherein R^{10} and R^{11} are independently a hydrogen atom, a linear or branched alkyl group having 1 to 5 carbon atoms, or a haloalkyl group having 1 to 5 carbon atoms which may be either linear or branched; and n is zero or a natural number;



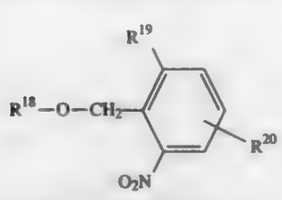
(V)

wherein R^{12} is a linear, branched or cyclic alkyl group having 1 to 10 carbon atoms, an aralkyl group, a trifluoromethy group, a phenyl group or a tolyl group; R^{13} and R^{14} are independently a hydrogen atom, or a linear or branched alkyl group having 1 to 5 carbon atoms; and R^{15} is a linear, branched or cyclic alkyl group having 1 to 10 carbon atoms, a phenyl group, a halogen-substituted phenyl group, an alkyl-substituted phenyl group, an alkoxy-substituted phenyl group, or an alkylthio-substituted phenyl group;



(VI)

wherein R^{16} is a linear, branched or cyclic alkyl group having 1 to 10 carbon atoms, an aralkyl group, a trifluoromethyl group, a phenyl group or a tolyl group; and R^{17} is a linear, branched or cyclic alkyl group having 1 to 10 carbon atoms, an aralkyl group or an alkoxy group; and



(VII)

wherein R^{18} is a trichloroacetyl group, a p-toluenesulfonyl group, a p-trifluoromethylbenzenesulfonyl group, a methanesulfonyl group or a trifluoromethanesulfonyl group; and R^{19} and R^{20} are independently a hydrogen atom, a halogen atom or a nitro group; which generates an acid upon exposure to light, and

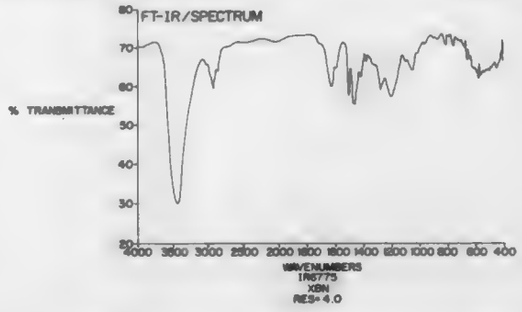
(c) a solvent capable of dissolving the components (a) and (b).

5,468,590

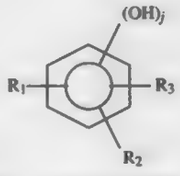
POSITIVE RESIST COMPOSITION

Kazuhiko Hashimoto; Haruyoshi Osaki; Chinehito Ebina; Kyoko Nagase, all of Osaka; Hiroshi Moriuma, Nara, and Yasunori Uetani, Osaka, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 995,608, Dec. 22, 1992, abandoned.
This application Nov. 29, 1994, Ser. No. 348,994
Claims priority, application Japan, Dec. 27, 1991, 3-346693
Int. Cl.[6] G03F *7/023;7/30*
U.S. Cl. 430—191 **16 Claims**

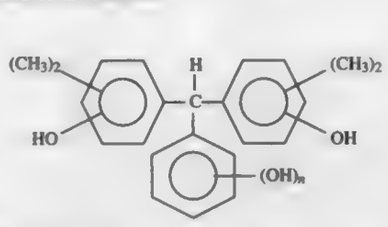


1. A positive resist composition comprising, in admixture, a photoimaging amount of a quinone diazide compound and a bindingly effective amount of an alkali-soluble resin containing a resin (A) which is obtained by a condensation reaction of an aldehyde compound, at least one phenol compound of the formula:



(I)

wherein R_1, R_2 and R_3 are independently a hydrogen atom, or a C_1–C_4 alkyl or alkoxy group, and j is 1 or 2, and at least one compound of the formula:



(II)

wherein n is 0, 1 or 2

wherein said resin (A) has an area of a GPC pattern for the molecular weight, as converted to polystyrene, of not larger than 1000, said area not exceeding 30% of the whole pattern area, excluding the unreacted phenol compound.

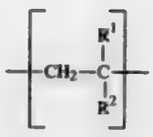
5,468,591

BARRIER LAYER FOR LASER ABLATIVE IMAGING

Glenn T. Pearce, Fairport, and Richard P. Henzel, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 14, 1994, Ser. No. 259,586
Int. Cl.[6] G03C *5/16*
U.S. Cl. 430—201 **18 Claims**

1. An ablative recording element comprising a support having thereon, in order, a barrier layer and a colorant layer comprising a colorant dispersed in a polymeric binder, said colorant layer having an infrared-absorbing material associated therewith, and wherein said barrier layer comprises a hydrophobic vinyl polymer having recurring units of the following formula:



wherein:

R^1 and R^2 each independently represents cyano, isocyanate, azide, sulfonyl nitro, phosphoric, phosphonyl, heteroaryl, or

where

X is O, S, NR, or $N^+(R)_2$;

R^3 is R, OR, O–M^+, OCOOR, SR, NHCOR, NHCON $(R)_2$, $N(R)_2$ or $N^+(R)_3$;

M^+ is an alkali or ammonium moiety; and

R is hydrogen, halogen, or an alkyl or cycloalkyl group.

5,468,592

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Kazumi Nii; Takashi Hoshimiya; Kazunobu Katoh, and Toshihide Ezoe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Mar. 31, 1994, Ser. No. 220,641

Claims priority, application Japan, Mar. 31, 1993, 5-094925

Int. Cl.[6] G03C *1/06*

U.S. Cl. 430—264 **20 Claims**

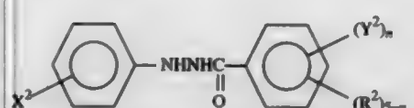
1. A silver halide photographic material having on a support at least one light-sensitive silver halide emulsion layer, wherein said emulsion layer, a hydrophilic colloid layer adjacent thereto, or both, contain at least one compound selected from the group consisting of compounds represented by general formula (1) or (2):

(1)

wherein X^1 represents an alkyl group, an alkoxy group, an amino group or an alkylthio group, and the total number of carbon atoms contained in X^1 ranges from 1 to 6;

Y^1 represents an alkyl substituted aryloxy group; and

R^1 represents hydrogen, an alkyl group or an aryl group, and the total number of carbon atoms contained in Y^1 and R^1 ranges from 4 to 30;



(2)

wherein X^2 has the same meaning as X^1 in general formula (1);

Y^2 represents an electron withdrawing group;

R^2 represents hydrogen, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an amino group, an alkylthio group, or an arylthio group;

n represents an integer of from 1 to 5; and

plural Y^2 or R^2 groups may be the same or different.

5,468,593

OPTICAL RECORDING MEDIUM

Nobutoshi Asai; Takashi Iwamura, and Shin-Ichiro Tamura, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 23, 1992, Ser. No. 856,119

Claims priority, application Japan, Mar. 22, 1991, 3-083385

Int. Cl.[6] G11B *7/24*

U.S. Cl. 430—273 **5 Claims**

1. An optical recording medium comprising a flexible base and a recording layer adapted for recording and/or reproducing the information formed thereon,

said recording layer having formed thereon a protective film of a high polymer material having a contact angle with respect to water of not less than 100° with respect to water at 25° C. and a glass transition temperature of not lower than 100° C.,

said protective film having a film thickness of not less than 0.25 λ/n and not more than 0.5 λ/n, where λ is a wavelength of a playback light and n is a refractive index of the protective film.

5,468,594

IMAGE FORMING PROCESS

Tamotsu Suzuki; Mikio Totsuka; Chiyomi Niitsu, and Fumiaki Shinozaki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 936,747, Aug. 27, 1992, abandoned. This application Jun. 30, 1994, Ser. No. 268,777

Claims priority, application Japan, Sep. 2, 1991, 3-248299

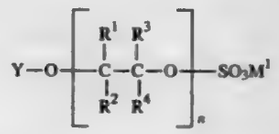
Int. Cl.[6] G03F *9/00*

U.S. Cl. 430—294 **6 Claims**

1. An image forming process comprising the steps of:

imagewise exposing to light a light-sensitive image forming material comprising either a support and a light-sensitive resin layer containing pigment thereon, or a support, a colorant layer containing the pigment thereon and a light-sensitive resin layer provided on the colorant layer, and

developing the image forming material by the use of a developing solution which contains at least one compound having the following formula (1):



wherein each of R^1, R^2, R^3, and R^4 independently represents hydrogen, an alkyl group having 1 to 5 carbon atoms which may be substituted with halogen or an aryl group which may be substituted with methyl, M^1 represents hydrogen, potassium or an ammonium group, Y represents hydrogen or $—SO_3M^2$ (in which M^2 represents sodium, potassium or an ammonium group and M^2 may be the same as or different from M^1) and n represents a number in the range of 1 to 1000, to remove a portion of the pigment-containing light-sensitive resin layer or both the colorant layer and the light-sensitive resin layer provided thereon so as to form on the support an image composed of the remaining portion of the layer or layers.

5,468,595

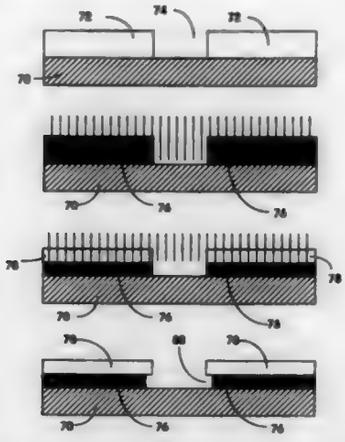
METHOD FOR THREE-DIMENSIONAL CONTROL OF SOLUBILITY PROPERTIES OF RESIST LAYERS

William R. Livesay, San Diego, Calif., assignor to Electron Vision Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 11,158, Jan. 29, 1993. This application Feb. 28, 1994, Ser. No. 202,446

Int. Cl.[6] G03F *7/20;* G03C *5/00;* H01L *21/30*

U.S. Cl. 430—296 24 Claims



1. A method for controlling solubility of a resist to selected solvents, comprising the steps of:

patterning the resist using a selected lithography process;

exposing the resist with a uniform blanket electron beam;

controlling the energy of the electron beam, to select the depth within the resist at which the electron beam is most effective, the controlling step including selecting an electron beam energy appropriate to a desired depth of effective electron dose, wherein a higher energy beam produces a maximum electron dose relatively deep in the resist, and a lower energy beam produces a maximum electron dose near the surface of the resist;

controlling electron dosage at the selected resist depth, thereby effecting a desired change in solubility at the selected resist; and

thereby forming layers of selected solubility within the resist, to produce a desired edge profile in the patterned resist.

5,468,596

PHOTOSENSITIVE RECORDING ELEMENT AND PRODUCTION OF A RELIEF PRINTING PLATE

Thomas Loerzer, Neustadt; Thomas Telser, Weinheim; Thomas Zwez, Karlsruhe, and Bernhard Albert, Maxdorf, all of, Germany, assignors to BASF Lacke + Farben AG, Muenster, Germany

Continuation of Ser. No. 179,939, Jan. 11, 1994, abandoned. This application Jan. 13, 1995, Ser. No. 372,829

Claims priority, application Germany, Jan. 15, 1993, 43 00 856.9

Int. Cl.[6] G03F *7/038*

U.S. Cl. 430—306 2 Claims

1. A photosensitive recording element comprising

(A) a dimensionally stable substrate,

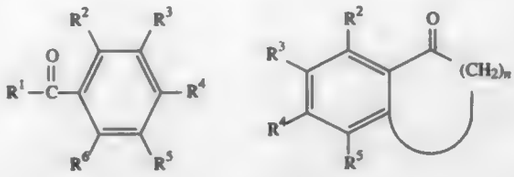
(B) a photopolymerizable relief-forming recording layer and, optionally, an adhesion-promoting layer arranged between (A) and (B), a release layer (C) applied to that side of the recording layer (B) which faces away from the substrate (A), and, optionally, a cover sheet (D) applied thereon, the photopolymerizable relief-forming recording layer (B) containing

b_1) at least one polymeric binder,

b_2) at least one photopolymerizable olefinically unsaturated monomer which is compatible with b_1),

b_3) at least one photopolymerization initiator and

b_4) at least one further photosensitive organic compound wherein one or more aryl alkyl ketones of the formula (I) and (II) serving to provide a tack-free surface



where R^1 may be alkyl or alkanediyl, each of 1 to 24 carbon atoms, cycloalkyl or cycloalkanediyl, each of 3 to 12 carbon atoms, n may be 2, 3, 4, 5 or 6 and R^2, R^3, R^5 and R^6 are each H, and R^4 is H or alkoxy of 1 to 24 carbon atoms are used as the photosensitive organic compound b_4).

5,468,597

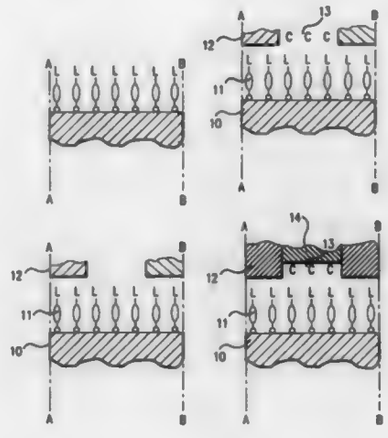
SELECTIVE METALLIZATION PROCESS

Gary S. Calabrese, North Andover, Mass.; Jeffrey M. Calvert, Burke, Va.; Mu-San Chen, Ellicott; Walter J. Dressick, Fort Washington, both of Md.; Charles S. Dulcey, Washington, D.C.; Jacque H. Georger, Jr., Holden, and John F. Bohland, Jr., Berlin, both of Mass., assignors to Shipley Company, L.L.C., Marlborough, Mass.

Filed Aug. 25, 1993, Ser. No. 111,640

Int. Cl.[6] G03F *7/00*

U.S. Cl. 430—315 18 Claims



1. A process for patterning a substrate in a selective pattern, said process comprising the steps of:

(a) providing a prepared substrate having a resist coating with a relief image therein defining recesses which bare the substrate surface within said recesses and a film of ligating groups capable of binding with an electroless plating catalyst on the substrate within the recesses of said resist coating;

(b) contacting at least the film of the ligating groups in said recesses with a solution of an electroless plating catalyst; and

(c) depositing metal over the catalyzed surface to form a metal deposit in a desired selected pattern.

5,468,598

SOLID PARTICLE DISPERSIONS FOR IMAGING SYSTEMS

David D. Miller; Mary C. Brick, both of Rochester, and Mridula Nair, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 18, 1994, Ser. No. 228,839
Int. Cl.[6] G03C *11/00*
U.S. Cl. 430—372 15 Claims

1. A process for preparing a stable, solid particle dispersion of a substantially water-insoluble compound useful in imaging selected from the group consisting of filter dyes and thermal transfer dyes, comprising the steps of:

(a) forming a coarse aqueous slurry of solid particles of said compound and a hydrophobic, water-soluble polymer in an amount of 0.1 to 100%, by weight based on the weight of said compound; and

(b) milling said slurry for time sufficient to provide particles of the desired average particle size;

wherein the polymer is an uncharged or weakly anionically charged water-soluble or water-dispersible homopolymer or copolymer in which at least 10 mole % of the repeat units contain an uncharged pendant group that terminates in (a) a CH_3 unit, (b) a ring containing at least two contiguous CH_2 units, or (c) an aromatic group.

5,468,599

SILVER HALIDE PHOTOGRAPHIC MATERIAL WITH REDUCED FOG AND IMPROVED RESIDUAL STAIN

Raffaella Biavasco, Savona, Italy; Mark Kirk, Bishop's Stortford, United Kingdom, and Giovanni Giribone, Carcare, Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 26, 1994, Ser. No. 329,529
Claims priority, application European Pat. Off., Nov. 27, 1993, 93119176
Int. Cl.[6] G03C *1/06;1/825*
U.S. Cl. 430—512 15 Claims

1. A black-and-white silver halide photographic material having at least one silver halide light-sensitive emulsion layer on at least one side of a support, wherein said silver halide emulsion layer comprises tabular silver halide grains having a grain thickness of 0.3 micrometers or less and accounting for at least 50% of the total projected area, characterized in that a phthalocyanine blue pigment having a maximum absorption wavelength of from 640 to 700 nm is present in at least one hydrophilic colloid layer of said photographic material.

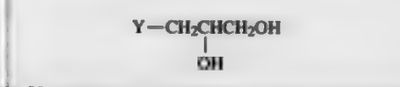
5,468,600

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Toshiyuki Watanabe, and Hiroo Takizawa, both of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

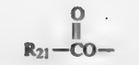
Filed Jul. 15, 1994, Ser. No. 275,442
Claims priority, application Japan, Jul. 21, 1993, 5-179651
Int. Cl.[6] G03C *1/08;7/26;7/32*
U.S. Cl. 430—546 17 Claims

1. A silver halide color photographic material comprising a support having provided thereon at least one light-sensitive silver halide emulsion layer which comprises a high boiling organic solvent represented by the following formula (SO):

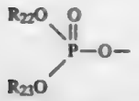


(SO)

wherein Y represents a substituent group represented by the following formula (A) or (B):



(A)



(B)

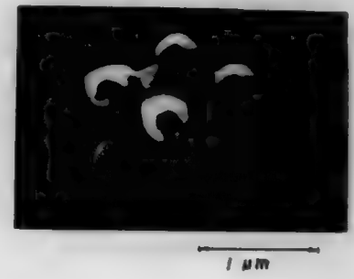
wherein R_{21} in the formula (A) represents an aliphatic or aryl group containing 9 to 40 carbon atoms, and R_{22} and R_{23} in the formula (B) each represents an aliphatic or aryl group containing 6 to 40 carbon atoms.

5,468,601

DEPOSITION SENSITIZED EMULSIONS AND PROCESSES FOR THEIR PREPARATION

Xin Wen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1994, Ser. No. 226,584
Int. Cl.[6] G03C *1/035*
U.S. Cl. 430—567 13 Claims



1. A radiation-sensitive emulsion comprised of silver halide grains having a face centered cubic crystal lattice structure and six {100} crystal faces, wherein

a site director containing a benzothiazolium ring with a 5-position electron withdrawing ring substituent is adsorbed to the crystal faces,

from 0.5 to 50 mole percent of the total silver forming the face centered cubic crystal lattice structure of the grains is located at intersections of the {100} crystal faces to form protrusions, and

the silver halide forming the protrusions and the silver halide forming the crystal faces are of the same silver halide composition.

5,468,602

METHOD FOR PRODUCING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shigeaki Takahashi, Hino, Japan, assignor to Konica Corporation, Japan

Filed Nov. 2, 1994, Ser. No. 333,527
Claims priority, application Japan, Nov. 10, 1993, 5-281420
Int. Cl.[6] G03C *1/015;1/34*
U.S. Cl. 430—569 11 Claims

1. A method for producing a silver halide photographic light-sensitive material comprising the steps of

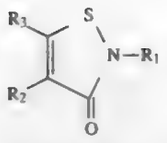
forming silver halide crystal nuclei,

growing said nuclei to form a silver halide emulsion,

chemically sensitizing said silver halide emulsion with a selenium compound, and

coating and drying said silver halide emulsion on a support,

wherein a compound represented by formula I is added to said silver halide emulsion during the time between the moment of completion of said nuclei forming step and the moment of completion of said chemically sensitizing step,



(1)

wherein R_1 is a hydrogen atom, a straight chain or branched chain alkyl group, a cycloalkyl group, an alkenyl group, an aralkyl group, an alkoxyl group, an aryl group, a heterocyclic group, a carbamoyl group, a thiocarbamoyl group or a sulfamoyl group; R_2 and R_3 are each independently a hydrogen atom, a halogen atom, an alkyl group, a cycloalkyl group, an aryl group, a cyano group, an alkylthio group, an arylthio group, alkylsulfoxido group, an alkylsulfonyl group or a heterocyclic group, and the groups each represented by R_2 and R_3 may be combined with each other to form a benzene ring.

5,468,603

PHOTOTHERMOGRAPHIC AND THERMOGRAPHIC ELEMENTS FOR USE IN AUTOMATED EQUIPMENT

Thomas J. Kub, West Lakeland Township, County of Washington, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 16, 1994, Ser. No. 340,587

Int. Cl.[6] G03C *1/498*

U.S. Cl. 430—619 **6 Claims**

1. A photothermographic element comprising a support having coated thereon:

(a) a photothermographic emulsion layer comprising a photosensitive silver halide, a non-photosensitive reducible source of silver, a reducing agent for silver ion and a binder;

(b) a layer adjacent to said photothermographic silver emulsion layer comprising a binder and a polymeric fluorinated surfactant; and

(c) an outermost layer which is not removed during imaging of said photothermographic element and which is positioned on the side of said support opposite from said photothermographic emulsion layer, said outermost layer consisting essentially of a plurality of optically transparent organic polymeric beads.

5,468,604

PHOTOGRAPHIC DISPERSION

Paul L. Zengerle; David D. Miller; Thomas H. Whitesides; John B. Rieger, all of Rochester; Vincent J. Flow, III, Kendall, and Walter H. Isaac, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 18, 1992, Ser. No. 978,104

Int. Cl.[6] G03C *1/005;1/494*

U.S. Cl. 430—631 **28 Claims**

1. A method for stabilizing a photographic dispersion comprising an aqueous medium and a dispersed liquid organic phase comprising a photographically useful compound which is (i) soluble in organic solvents, (ii) substantially insoluble in water, and (iii) subject to particle growth of at least 10% of its initial particle size when maintained in said dispersion, which method comprises adding to said dispersed phase, a hydrophobic, photographically inert compound which has a $\log P_{(calc)}$ greater than 9 and does not solidify or gel the dispersed phase, said photographically inert compound being added in an amount sufficient to inhibit particle growth of said photographically useful compound in said dispersion, wherein said amount is from 1 to 10% by weight, based upon the weight of the photographically useful compound.

5,468,605

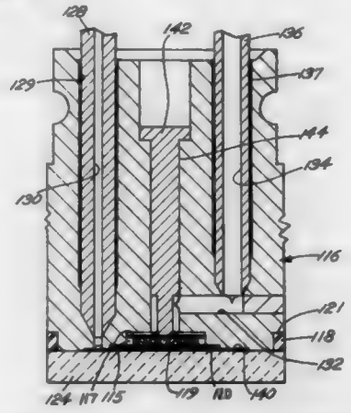
TRANSVERSE FLOW PLUNGERS FOR MICROPHYSIOMETERS

Albert K. M. Harris, Livermore, Calif.; Gregory L. Kirk, Montgomery Township, Somerset County, N.J.; John C. Owicki, Palo Alto, Calif.; Timothy D. Dawes, Scotts Valley, Calif., and Richard C. Kuo, Fremont, Calif., assignors to Molecular Devices Corp., Sunnyvale, Calif.

Filed Oct. 15, 1993, Ser. No. 137,605

Int. Cl.[6] C12M *1/34;1/40;* **C12Q** *1/02;1/25*

U.S. Cl. 435—4 **18 Claims**



1. In a method of operating a microphysiometer including a plunger assembly having a plunger body with a microchamber at one end for receiving a sample that maintains diffusive contact between the sample and a wall of the microchamber, and inlet and outlet passage means in the plunger body communicating with the microchamber, the improvement comprising the steps of passing a medium through the inlet passage means and directing the medium on one side of the sample through the microchamber between the wall and the sample to the outlet passage means on the opposite side of the sample and, wherein the distance between the sample and wall is 10–200 μm.

5,468,606

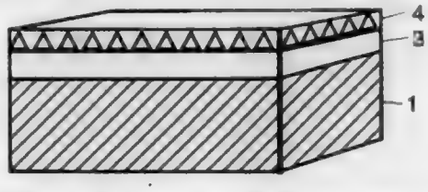
DEVICES FOR DETECTION OF AN ANALYTE BASED UPON LIGHT INTERFERENCE

Gregory R. Bogart, Fort Collins; Garret R. Moddel, Boulder; Diana M. Maul, Thornton, and Jeffrey B. Etter, Boulder, all of Colo., assignors to Biostar, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 873,097, Apr. 24, 1992, abandoned, Ser. No. 653,064, Feb. 11, 1991, abandoned, and Ser. No. 917,121, Sep. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 408,296, Sep. 18, 1989, abandoned, said Ser. No. 873,097is a continuation-in-part of Ser. No. 408,291, Sep. 18, 1989, abandoned. This application Jul. 31, 1992, Ser. No. 923,304

Int. Cl.[6] G01N *33/543;33/545;33/551;33/552*

U.S. Cl. 435—5 **47 Claims**



1. An optical assay device for detecting the presence or amount of an analyte of interest comprising:

a substrate consisting of one or more layers having an optically active surface exhibiting a first color in response to light impinging thereon, and exhibiting a second color comprising a combination of wavelengths of light different from said first color in response to said light when said analyte is present on said surface,

an anti-reflective film provided on said substrate,

an attachment layer selected from the group consisting of a polymeric silane, polymeric siloxane, and a dendrimer, on said anti-reflective film and,

a specific binding layer for said analyte, attached to said attachment layer.

5,468,607

PRODUCTION OF INTERFERON

Michel Revel, Rehovot, Israel, and Pierre Tiollais, Paris, France, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Nov. 20, 1980, Ser. No. 208,925

Claims priority, application Israel, Nov. 21, 1979, 58765

Int. Cl.[6] C12N *15/22;15/70;* **C12Q** *1/68*

U.S. Cl. 435—6 **9 Claims**

1. A process for producing and identifying microorganism colonies having genetic material containing a nucleotide sequence hybridizable to mRNA translatable to interferon in 50% formamide at 52° C., comprising:

a) cultivating host cells capable of producing interferon when exposed to an inducer of interferon;

b) exposing said host cells to a said inducer of interferon;

c) extracting messenger RNAs from said induced host cells;

d) fractionating the obtained mRNAs to obtain those fractions that exhibit interferon producing capability;

e) reverse transcribing the mRNAs of said fractions that exhibit interferon producing capability into corresponding double stranded cDNAs;

f) inserting said cDNAs into vectors capable of transfecting a microorganism;

g) transfecting microorganisms with said vectors;

h) cultivating said microorganisms under conditions suitable to cause selective development of initial colonies of said microorganisms with said modified vectors;

i) forming duplicate colonies of said initial colonies;

j) freeing in situ the DNAs of both said initial and duplicate colonies;

k) hybridizing the DNAs freed from one of said initial and duplicate colonies with cDNA probes synthesized from mRNAs extracted from an induced culture of cells capable of producing the same type of interferon, when exposed to an inducer of interferon, as is produced by said host cells (induced cDNA probes);

l) hybridizing the DNAs freed from the other of said initial and duplicate colonies with cDNA probes synthesized from mRNAs extracted from a non-induced culture of cells capable of producing the same type of interferon, when exposed to an inducer of interferon, as is produced by said host cells (non-induced cDNA probes);

m) identifying microorganisms, the freed DNAs of the initial and duplicate colonies of which hybridize with said induced cDNA probes but do not hybridize with said non-induced cDNA probes;

n) determining whether the freed DNAs of the microorganisms identified in step m) hybridize in 50% formamide at 52° C. to mRNAs which are translatable to an interferon; and

o) identifying those of said identified microorganisms of step m) in which the freed DNAs have been determined to hybridize to mRNAs translatable to interferon in step n),

whereby there are produced and identified microorganism colonies having genetic material containing a nucleotide sequence which is hybridizable with mRNA for interferon.

5,468,608

PRODUCTION OF INTERFERON

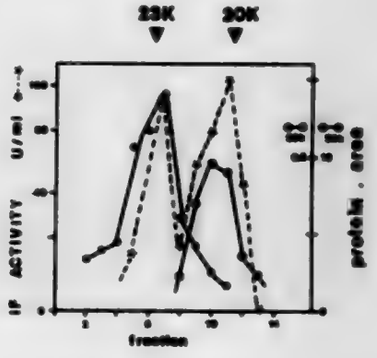
Michel Revel, Rehovot, Israel, and Pierre Tiollais, Paris, France, assignors to Yeda Research & Development Co., Ltd., Rehovot, Israel

Division of Ser. No. 208,925, Nov. 20, 1980. This application Sep. 28, 1982, Ser. No. 425,935

Claims priority, application Israel, Nov. 21, 1979, 58765

Int. Cl.[6] C12N *15/22*

U.S. Cl. 435—91.11 **5 Claims**



1. An mRNA which consists essentially of an mRNA which is translatable to human fibroblast interferon β2 polypeptide.

5,468,609

PRODUCTION OF INTERFERON

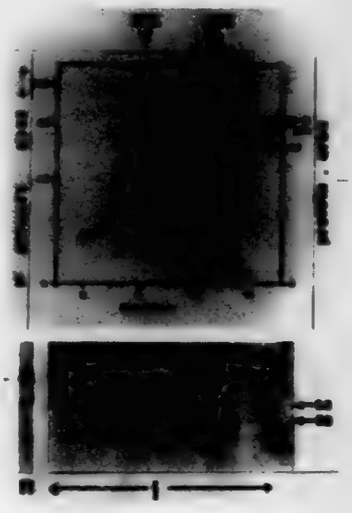
Michel Revel, Rehovot, Israel, and Pierre Tiollais, Paris, France, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Division of Ser. No. 208,925, Nov. 20, 1980. This application Sep. 28, 1982, Ser. No. 425,933

Claims priority, application Israel, Nov. 21, 1979, 58765

Int. Cl.[6] C07K *14/52;* **C12P** *21/00*

U.S. Cl. 530—351 **1 Claim**



1. Human interferon β-2 essentially free of human interferon β-1.

5,468,610

THREE HIGHLY INFORMATIVE MICROSATELLITE REPEAT POLYMORPHIC DNA MARKERS

Mihael H. Polymeropoulos, Bethesda, and Carl R. Merril, Rockville, both of Md., assignors to The Government of the United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 707,501, May 29, 1991, abandoned. This application Jun. 9, 1993, Ser. No. 74,275

Int. Cl.[6] C12Q *1/68*; C12P *19/34*; C07H *21/04*

U.S. Cl. 435—6 **12 Claims**

1. A DNA fragment consisting of a nucleotide sequence selected from the group consisting of a sequence according to SEQ ID NO:1, a sequence according to SEQ ID NO:2, a sequence according to SEQ ID NO:3, a sequence according to SEQ ID NO:4, a sequence according to SEQ ID NO:5, or a sequence according to SEQ ID NO:6.

5,468,611

METHOD FOR HLA TYPING

Lee A. Baxter-Lowe, New Berlin, and Jack A. Gorski, Mukwonago, both of Wis., assignors to The Blood Center Research Foundation, Inc., Milwaukee, Wis.

Continuation of Ser. No. 544,218, Jun. 27, 1990, abandoned. This application Apr. 8, 1993, Ser. No. 45,530

Int. Cl.[6] C12Q *1/68*; C12P *19/34*

U.S. Cl. 435—6 **16 Claims**

1. A method for selecting a donor for purposes of bone marrow transplantation from the donor to a recipient, which comprises determining the HLA type of the recipient, determining the HLA type of one or more potential donors, and selecting the donor having an HLA type most similar to the recipient, wherein the improvement comprises:

(A) determining if the recipient's HLA-DR allele(s) correspond(s) to an allele selected from the group consisting of HLA-DRw52c, DR12a,b, DR3a,b, DR5a–e, DRNew1, DR6a–e, DR8a–d, DRw53a–c, DR4a–f, DR7, DR9, DR2a–c B3, DR2a–d B1, DR10, and DR1a–c;

(B) determining if each donor's HLA-DR allele(s) corresponds to an allele selected from the group; and

(C) selecting the donor having HLA-DR allele(s) that most closely match the recipient.

5,468,612

9804 GENE AND METHODS OF USE THEREOF

Edward H. Cohen, Somerville, and Bryan E. Landgraf, Walpole, both of Mass., assignors to Cytomed, Inc., Cambridge, Mass.

Filed Nov. 19, 1993, Ser. No. 154,916

Int. Cl.[6] C12Q *1/68*; C12N *5/00;15/00*; C07H *17/00*

U.S. Cl. 435—6 **5 Claims**

1. A substantially pure preparation of a 9804 DNA having the sequence of SEQ ID NO:1.

5,468,613

PROCESS FOR DETECTING SPECIFIC NUCLEOTIDE VARIATIONS AND GENETIC POLYMORPHISMS PRESENT IN NUCLEIC ACIDS

Henry A. Erlich, Oakland; Glenn Horn, Emeryville; Randall K. Saiki, Richmond, and Kary B. Mullis, Kensington, all of Calif., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 899,344, Aug. 22, 1986, which is a continuation-in-part of Ser. No. 839,331, Mar. 13, 1986, abandoned. This application Mar. 9, 1990, Ser. No. 491,210

Int. Cl.[6] C12Q *1/68*; C12P *19/34*; C12N *9/12;15/11*

U.S. Cl. 435—6 **32 Claims**

1. A process for detecting the presence of a nucleotide variation in sequence in a nucleic acid contained in a sample, which process comprises:

(a) treating the sample, together or sequentially, with four different nucleoside triphosphates, an agent for polymerization of the nucleoside triphosphates, and two oligonucleotide primers, for said nucleic acid containing said variation under hybridizing conditions, such that a primer hybridizes to said nucleic acid and an extension product of the primer is synthesized which is complementary to said variation in sequence, wherein said primers are selected such that the extension product synthesized from one primer, when separated from its complement, can serve as a template for synthesis of the extension product of the other primer;

(b) treating the sample under denaturing conditions to separate the primer extension products from their templates;

(c) treating the sample, together or sequentially, with said four nucleoside triphosphates, an agent for polymerization of the nucleoside triphosphates, and oligonucleotide primers such that a primer extension product is synthesized using each of the single strands produced in step (b) as a template wherein at least one primer is labeled with a detectable moiety;

(d) repeating steps (b) and (c) a sufficient number of times to result in detectable amplification of the nucleic acid containing the sequence variation;

(e) treating a membrane to which is attached a sequence-specific oligonucleotide capable of hybridizing with the amplified nucleic acid sequence only if a sequence of the oligonucleotide is complementary to a region of the amplified sequence; and,

(f) detecting whether an amplified sequence in the nucleic acid sample has hybridized to the oligonucleotide attached to the membrane.

5,468,614

SYSTEM TO DETECT PROTEIN-PROTEIN INTERACTIONS

Stanley Fields, East Setauket, and Ok-Kyu Song, Stony Brook, both of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

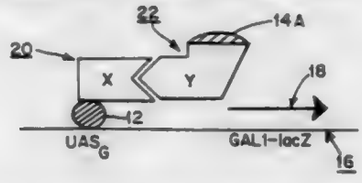
Continuation of Ser. No. 469,285, Jan. 24, 1990, Pat. No. 5,283,173. This application Feb. 1, 1994, Ser. No. 189,910

The portion of the term of this patent subsequent to Feb. 1, 2011, has been disclaimed.

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **12 Claims**

C Interaction Between Hybrids Reconstitutes GAL4 Activity



1. A kit for detecting binding between a first test protein and a second test protein or fragments thereof in a host cell, the kit comprising in a container:

(a) a first vector, which comprises:

(i) a first gene, which comprises:

(1) a promoter that functions in a host cell,

(2) a DNA sequence that encodes a DNA-binding domain and which is functionally associated with the promoter of the first gene, and

(3) a means for inserting a DNA sequence encoding a first test protein or a fragment thereof into the first vector in such a manner that the first test protein is capable of being expressed as part of a hybrid protein containing the DNA binding domain,

(ii) a means for replicating the first vector in the host cell, and

(iii) a first marker gene, the expression of which in the host cell permits selection of cells containing the first marker gene from cells that do not contain the first marker gene, and

(b) a second vector, which comprises:

(i) a second gene, which comprises:

(1) a promoter that functions in the host cell,

(2) a DNA sequence that encodes a transcriptional activation domain which is functionally associated with the promoter of the second gene, and

(3) a means for inserting a DNA sequence encoding the second test protein or a fragment thereof into the vector, in such a manner that the second test protein is capable of being expressed as part of a hybrid protein containing the transcriptional activation domain

(ii) a means for replicating the second vector in the host cell, and

(iii) a second marker gene, the expression of which in the host cell permits selection of cells containing the second marker gene from cells that do not contain the second marker gene; and

(c) a host cell containing a detectable gene having a binding site for the DNA-binding domain wherein the detectable gene expresses a detectable protein when the detectable gene is activated by the transcriptional activation domain when the transcriptional activation domain is in sufficient proximity to the detectable gene;

the host cell being incapable of expressing a protein having the function of:

(i) the first marker gene;

(ii) the second marker gene;

(iii) the DNA-binding domain; and

(iv) the transcriptional activation domain;

wherein binding of the first test protein and the second test protein in the host cell results in measurably greater expression of the detectable gene than the simultaneous presence of the DNA-binding domain and the transcriptional activation domain in the absence of an interaction between the first test protein and the second test protein.

5,468,615

BINDING ASSAY EMPLOYING A SYNTHETIC GENE FOR D4 DOPAMINE RECEPTORS

Christopher L. Chio, and Rita M. Huff, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 1, 1993, Ser. No. 86,439
Int. Cl.[6] C12N *15/12*
U.S. Cl. 435—7.2 **14 Claims**

1. A method of screening a compound as an inhibitor of dopamine binding to the human dopamine receptor D4 comprising:

(a) adding a compound to a eukaryotic cell transformed with an expression vector comprising the nucleotide sequence of SEQ ID NO:1 wherein the vector is capable of expressing D4 dopamine receptor in a transformed eukaryotic cell culture; and

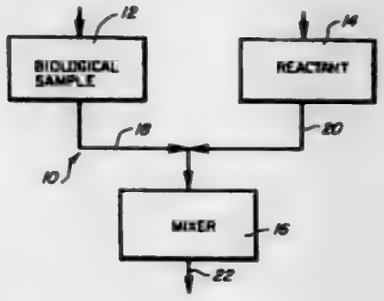
(b) assaying the affinity of said compounds for the D4 dopamine receptor.

5,468,616

METHOD AND APPARATUS FOR RAPID MIXING OF SMALL VOLUMES FOR ENHANCING BIOLOGICAL REACTIONS

Wallace H. Coulter, Miami Springs; John D. Hollinger, Miami; Kenneth H. Kortright, Cooper City; Thomas Russell; Carlos Rodriguez, both of Miami, and Ronald Paul, North Miami Beach, all of Fla., assignors to Coulter Corporation, Miami, Fla.

Division of Ser. No. 517,309, May 1, 1990, Pat. No. 5,238,812, which is a continuation of Ser. No. 25,337, Mar. 13, 1987, abandoned. This application Apr. 29, 1993, Ser. No. 58,692
Int. Cl.[6] C12Q *1/24*; G01N *33/543*
U.S. Cl. 435—7.2 **28 Claims**



1. An apparatus for accelerating the rate of a reaction in a sample containing cells and into which sample a selected reactant is introduced for mixing to provide a suspension for making a quantitative and/or qualitative determination, said apparatus comprising:

means for introducing into a volume of sample of about 5 to 1,000 microliters containing a plurality of cells, at least one reactant including microspheres with an antibody bonded thereto preferential at least to some of said cells for providing a suspension suitable for making the determination;

means for mixing the resultant suspension of sample and reactant substantially at room temperature for a significantly reduced period of time on the order of approximately two to sixty seconds sufficient to accelerate the rate of reaction between the cells and reactant without impairing the cellular properties of interest or the accuracy of the determination; and

means for performing immediately following said mixing at least one of separating some of said cells from said sample or determining a property of said cells without an incubation period.

5,468,617

STEROID/THYROID HORMONE RECEPTOR-RELATED GENE, WHICH IS INAPPROPRIATELY EXPRESSED IN HUMAN HEPTOCELLULAR CARCINOMA, AND WHICH IS A RETINOIC ACID RECEPTOR

Hughes Blaudin De The, 75003 Paris; Agnes Marchio, 75011 Paris; Pierre Tiollais, 75013 Paris; Anne DeJean, 75014 Paris; Nigel Brand, Faculty of Medicine, 67085 Strasbourg; Martin Petkovich, Faculty of Medicine, 67085 Strasbourg; Andree Krust, Faculty of Medicine, 67085 Strasbourg, and Pierre Chambon, Faculty of Medicine, 67085 Strasbourg, all of, France

Division of Ser. No. 95,706, Jul. 22, 1993, Pat. No. 5,358,848, which is a division of Ser. No. 989,902, Dec. 11, 1992, Pat. No. 5,317,090, which is a continuation of Ser. No. 860,577, Mar. 30, 1992, abandoned, which is a continuation of Ser. No. 751,612, Aug. 21, 1991, abandoned, which is a continuation of Ser. No. 330,405, Mar. 30, 1989, abandoned, which is a continuation-in-part of Ser. No. 278,136, Nov. 30, 1988, abandoned, which is a continuation-in-part of Ser. No. 209,009, Jun. 20, 1988, Pat. No. 5,149,781, which is a continuation-in-part of Ser. No. 134,130, Dec. 17, 1987, Pat. No. 5,223,606, which is a continuation-in-part of Ser. No. 133,687, Dec. 16, 1987, abandoned. This application Feb. 2, 1994, Ser. No. 190,555

Int. Cl.[6] G01N *33/48*

U.S. Cl. 435—7.8 **11 Claims**

1. A method for assaying a fluid for the presence of an agonist or antagonist to retinoic acid receptor RAR-β, wherein the method comprises

(A) providing an aqueous solution containing a known concentration of a polypeptide of RAR-β;

(B) incubating the polypeptide with the fluid suspected of containing the agonist or antagonist under conditions sufficient to bind the receptor to the agonist or antagonist; and

(C) determining whether there is change in concentration of the polypeptide in the aqueous solution;

wherein the polypeptide contains the amino acid sequence

MetPheAspCysMetAspValLeuSerValSer
ProGlyGlnIleLeuAspPheTyrThrAla
SerProSerSerCysMetLeuGlnGluLysAla
LeuLysAlaCysPheSerGlyLeuThrGln
ThrGluTrpGlnHisArgHisThrAlaGlnSer
IleGluThrGlnSerThrSerSerGluGlu
LeuValProSerProProSerProLeuProPro
ProArgValTyrLysProCysPheValCys
GlnAspLysSerSerGlyTyrHisTyrGlyVal
SerAlaCysGluGlyCysLysGlyPhePhe
ArgArgSerIleGlnLysAsnMetIleTyrThr
CysHisArgAspLysAsnCysValIleAsn
LysValThrArgAsnArgCysGlnTyrCysArg
LeuGlnLysCysPheGluValGlyMetSer
LysGluSerValArgAsnAspArgAsnLysLys
LysLysGluThrSerLysGlnGluCysThr
GluSerTyrGluMetThrAlaGluLeuAspAsp
LeuThrGluLysIleArgLysAlaHisGln
GluThrPheProSerLeuCysGlnLeuGlyLys

-continued

TyrThrThrAsnSerSerAlaAspHisArg
ValArgLeuAspLeuGlyLeuTrpAspLysPhe
SerGluLeuAlaThrLysCysIleIleLys
IleValGluPheAlaLysArgLeuProGlyPhe
ThrGlyLeuThrIleAlaAspGlnIleThr
LeuLeuLysAlaAlaCysLeuAspIleLeuIle
LeuArgIleCysThrArgTyrThrProGlu
GlnAspThrMetThrPheSerAspGlyLeuThr
LeuAsnArgThrGlnMetHisAsnAlaGly
PheGlyProLeuThrAspLeuValPheThrPhe
AlaAsnGlnLeuLeuProLeuGluMetAsp
AspThrGluThrGlyLeuLeuSerAlaIleCys
LeuIleCysGlyAspArgGlnAspLeuGlu
GluProThrLysValAspLysLeuGlnGluPro
LeuLeuGluAlaLeuLysIleTyrIleArg
LysArgArgProSerLysProHisMetPhePro
LysIleLeuMetLysIleThrAspLeuArg
SerIleSerAlaLysGlyAlaGluArgValIle
ThrLeuLysMetGluIleProGlySerMet
ProProLeuIleGlnGluMetMetGluAsnSer
GluGlyHisGluProLeuThrProSerSer
SerGlyAsnThrAlaGluHisSerProSerIle
SerProSerSerValGluAsnSerGlyVal
SerGlnSerProLeuValGln.

5,468,618

ARTICLE FOR PERFORMING IMMUNOLOGICAL ASSAYS UTILIZING ORGANIC DYES TO IMMOBILIZE IMMUNOLOGICALLY REACTIVE COMPONENTS TO A SOLID PHASE SUPPORT AND METHODS FOR PRODUCING AND UTILIZING SAME

Lyle T. Sinor; Ralph A. Eatz; Darryl L. Stone, all of Roswell, Ga., and Fred V. Plapp, Overland Park, Kans., assignors to Immucor, Inc., Norcross, Ga.

Continuation of Ser. No. 571,991, Aug. 24, 1990, abandoned, which is a division of Ser. No. 215,041, Jul. 15, 1988, Pat. No. 4,963,478. This application Aug. 18, 1993, Ser. No. 109,011

Int. Cl.[6] G01N *33/543;33/554;33/555*

U.S. Cl. 435—7.21 **5 Claims**

5. An article for performing solid-phase immunological assays, said article comprising:

a solid-phase support;

a coating on said support comprising an organic dye capable of immobilizing whole cells and having a net-positive charge and a hydrophobic aromatic ring structure adsorbed to said support, wherein said organic dye is selected from the group consisting of azo dyes, tetrazolium salts, triphenylmethanes, xanthenes, acridines, quinolines, thiazoles, indamines, azins, aminoazins, thiazins and phthalocyanins; and

a monolayer of an immunologically reactive component immobilized to said organic dye, wherein said immunologically

reactive component is whole cells selected from the group consisting of erythrocytes, leukocytes, platelets and tissue cells.

5,468,619

SCREENING METHOD FOR IDENTIFYING WOMEN AT INCREASED RISK FOR IMMINENT DELIVERY

Andrew E. Senyei, San Juan Capistrano, and David C. Casal, Mountain View, both of Calif., assignors to Adeza Biomedical Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 787,271, Nov. 4, 1991, abandoned. This application May 12, 1993, Ser. No. 61,755

Int. Cl.[6] G01N *33/543*

U.S. Cl. 435—7.94 **13 Claims**

1. An immunoassay method of screening for an increased risk of impending delivery comprising:

a) obtaining a secretion sample from the vaginal cavity or the cervical canal from a pregnant patient after week 12 of pregnancy; and

b) determining the level of total fibronectin in the sample, wherein an elevated

level of total fibronectin in the sample suggests an increased risk of impending delivery.

5,468,620

METHODS AND DEVICE FOR GLYCOSYLATION ANALYSIS

James O. Molloy, Belmont, and Denise V. Pollard-Knight, St. Albans, both of, United Kingdom, assignors to Fisons PLC, Suffolk, England

PCT No. PCT/GB92/00414, § 371 Date Nov. 29, 1993, § 102(e) Date Nov. 29, 1993, PCT Pub. No. WO92/15706, PCT Pub. Date Sep. 17, 1992

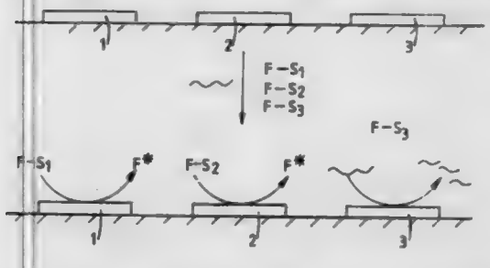
PCT Filed Mar. 9, 1992, Ser. No. 104,077

Claims priority, application United Kingdom, Mar. 9, 1991, 9105043; Jul. 19, 1991, 9115608

Int. Cl.[6] C12Q *1/34;* **C12M** *1/40;* **G01N** *33/53*

U.S. Cl. 435—7.1 **8 Claims**

1. A method of assaying a sample for one or more oligosaccharides of a group of preselected analyte oligosaccharides, which method comprises



(a) providing a biosensor comprising a surface comprising a plurality of discrete spatial sets of adjacent enzymatic and binding regions, wherein the enzymatic region of each set has immobilized thereon a glycosidase which hydrolyzes a preselected one of said analyte oligosaccharides to produce a known saccharide reaction product and the adjacent binding region has immobilized thereon a binding partner which specifically binds to said known saccharide reaction product and to said known saccharide reaction product conjugated to a detectable label:

(b) providing a labelled reagent comprising each of said known saccharide reaction products conjugated to said detectable label;

(c) contacting said sample with said biosensor;

(d) before, after, or simultaneously with step (c), contacting said biosensor with said labelled reagent; and

(e) measuring the amount of said detectable label bound in each said binding region as an indication of the presence or amount of each of said preselected analyte oligosaccharides in said sample.

5. A biosensor having a surface upon which are immobilized, in discrete spatial regions, a plurality of different specific binding partners for products of glycosidase reactions of oligosaccharide analytes;

wherein said biosensor is based on frustrated total reflection, and comprises

(a) a cavity layer of transparent dielectric material of refractive index n_3,

(b) a dielectric base of refractive index n_1, and

(c) interposed between the cavity layer and the base, a dielectric spacer layer of refractive index n_2, n_2 being less than both n_1 and n_3.

5,468,621

METHOD OF QUANTITATIVE ASSAY FOR 1,5-ANHYDROGLUCITOL

Ryo Kojima; Yoshiro Sato, both of Koriyama, and Takeshi Nagasawa, Urawa, all of, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Feb. 23, 1993, Ser. No. 21,250

Claims priority, application Japan, Mar. 2, 1992, 4-044714

Int. Cl.[6] C12Q *1/26;1/28*

U.S. Cl. 435—25 **7 Claims**

1. A quantitative assay for 1,5-anhydroglucitol which comprises:

A) treating a specimen with a phosphorylating enzyme in the presence of 5 to 500mM adenosine-5'-triphosphate in a pH range of 7.2 to 8.5, to selectively eliminate sugars other than 1,5-anhydroglucitol and

B) reacting the product of step A), without removing the residual ATP, with pyranose oxidase in the above pH range.

5,468,622

SALT STABILIZATION OF ANTIBODY-ENZYME CONJUGATES HEAT-DRIED INTO PAPER

Karen L. Richards, Edina, Minn., assignor to Immunomatrix, Inc., Washington, D.C.

Continuation of Ser. No. 504,116, Apr. 3, 1990, abandoned. This application Jul. 26, 1993, Ser. No. 97,859

Int. Cl.[6] G01N *33/531;33/532;33/535*

U.S. Cl. 435—28 **6 Claims**

1. A method for stabilizing the activity of a dry enzyme-antibody conjugate comprising:

(a) forming an aqueous solution comprising

(i) a peroxidase-antibody conjugate, and

(ii) a source of manganese metal ion in an amount sufficient for stabilizing the catalytic and binding activity of said conjugate; and

(b) drying the solution at a temperature between 40°–100° C. form a manganese ion conjugate in which both the catalytic and binding activity of the peroxidase antibody conjugate is stabilized.

5,468,623

METHOD OF CONVERTING BIG ENDOTHELIN-1 TO ENDOTHELIN-1 WITH HUMAN APOLIPOPROTEIN B

Tatsuya Ohwaki, and Hiroshi Sakai, both of Ohimachi, Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 308,543, Sep. 21, 1994, abandoned. This application Feb. 23, 1995, Ser. No. 393,036

Claims priority, application Japan, Sep. 21, 1993, 5-234650

Int. Cl.[6] C12P *21/02;* **C12N** *9/48;9/50;9/64*

U.S. Cl. 435—68.1 **1 Claim**

1. A method of converting big endothelin-1 to endothelin-1 comprising:

contacting said big endothelin-1 with isolated, purified human apolipoprotein B having a proteolytic activity for cleaving said big endothelin-1 to produce said endothelin-1.

5,468,624

CELL LYSIS ACTIVITY OF A MODIFIED FRAGMENT OF THE GLUCOCORTICOID RECEPTOR

E. Brad Thompson, and Lynne V. Nazareth, both of Galveston, Tex., assignors to Board of Regents, the University of Texas System, Austin, Tex.

Filed Jul. 2, 1993, Ser. No. 87,151

Int. Cl.[6] C12N *15/16*

U.S. Cl. 435—69.1 9 Claims

1. A polynucleotide free of total cellular DNA and encoding a cell lysis factor, the polynucleotide comprising the nucleotide sequence of SEQ ID NO: 1.

5,468,625

α-L-RHAMNOSIDASE FOR OBTAINING RHAMNOSE, A PROCESS FOR ITS PREPARATION AND ITS USE

Johannes Meiwes, Idstein; Dieter Wullbrandt, Hofheim, and Carlo Giani, Frankfurt am Main, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 24, 1993, Ser. No. 156,718

Claims priority, application Germany, Nov. 27, 1992, 42 39 859.2

Int. Cl.[6] C12P *19/02;* C12N *1/14;9/24;9/26*

U.S. Cl. 435—71.1 5 Claims

1. A purified culture of Penicillium sp. DSM 6825.

5,468,626

METHOD FOR SEPARATING A SULFUR COMPOUND FROM CARBONACEOUS MATERIALS

Steven W. Johnson; Daniel J. Monticello; Phillip R. Gibbs, all of The Woodlands, Tex., and Charles F. Kulpa, Niles, Mich., assignors to Energy BioSystems Corporation, The Woodlands, Tex., and University of Notre Dame, Notre Dam, Ind.

Filed Dec. 17, 1993, Ser. No. 169,433

Int. Cl.[6] C12P *11/00;3/00;* C10G *32/00*

U.S. Cl. 435—130 17 Claims

1. A method of separating a sulfur compound from a fossil fuel containing sulfur compounds, comprising the steps of:

a) contacting said fossil fuel with a biosorption agent which binds said sulfur compound, thereby forming a sulfur-biosorption complex;

b) separating said sulfur-biosorption complex from the fossil fuel;

c) introducing said separated sulfur-biosorption complex to an aqueous phase having an effective amount of oxygen and water to form a reaction medium, optionally adding a biocatalyst which degrades the sulfur compound; and

d) incubating the medium for a sufficient period of time under conditions which allow further reaction between the biosorption agent and/or the biocatalyst and the sulfur compound to produce an organic product and an inorganic sulfur.

5,468,627

PROCESS OF PREPARING BUTYRIC ACID OR 2- OR 3-METHYLBUTYRIC ACID BY OXIDIZING THE CORRESPONDING BUTANOLS WITH GLUCONOBACTER ROSEUS IAM 1841 OR IFO 3990

Ian Gatfield, Hoexter, and Theodor Sand, Holzminden, both of, Germany, assignors to Haarmann & Reimer GmbH, Holzmiden, Germany

Continuation of Ser. No. 691,164, Apr. 24, 1991, abandoned, which is a continuation of Ser. No. 180,419, Apr. 12, 1988, abandoned. This application Mar. 8, 1993, Ser. No. 27,915

Claims priority, application Germany, Apr. 24, 1987, 37 13 688.2

Int. Cl.[6] C12P *7/52;* C12N *1/20*

U.S. Cl. 435—141 7 Claims

1. A process for the preparation of n-butyric acid comprising (a) oxidizing n-butanol with the strain *Gluconobacter roseus* DSM 9363 to produce n-butyric acid and (b) recovering the n-butyric acid produced in (a).

5,468,628

COMPOUNDS AND METHODS FOR GENERATING OXYGEN AND FREE RADICALS USED IN GENERAL OXIDATION AND REDUCTION REACTIONS

Steven D. Aust; David P. Barr, both of Logan; Thomas A. Grover, Hyde Park; Manish M. Shah, and Namhyun Chung, both of Logan, all of Utah, assignors to Utah State University Foundation, Logan, Utah

Continuation of Ser. No. 1,106, Jan. 5, 1993, Pat. No. 5,389,356. This application Jan. 4, 1995, Ser. No. 368,555

Int. Cl.[6] C12P *3/00;* C02F *3/02*

U.S. Cl. 435—168 14 Claims

1. A method of selectively oxidizing or reducing a targeted substrate, the method including the steps of;

providing a peroxidase to serve as a free radical generating catalyst;

adding a suitable mediator which can be oxidized by said peroxidase to form the free radical of said mediator, whereby said free radical of said mediator is generated by a reaction between said peroxidase and said mediator, said free radical of said mediator being an oxidizing agent;

adding hydrogen peroxide which can be oxidized by said free radical of said mediator to form superoxide,

whereby said superoxide is generated by a reaction between said free radical of said mediator and said hydrogen peroxide; and

exposing at least one of said free radical of said mediator or said superoxide so generated to a targeted substrate, said substrate reacting in a oxidation/reduction reaction with at least one of said free radical of said mediator or said superoxide.

5,468,629

METHOD OF PROMOTING IN VITRO HOMOLOGOUS RECOMBINATION TRANSFECTION IN MAMMALIAN CELLS USING THE RECA PROTEIN

Cornelia Calhoun, 3638 Washington St., San Francisco, Calif. 94115

Filed Apr. 13, 1993, Ser. No. 47,154

Int. Cl.[6] C12N *15/90*

U.S. Cl. 435—172.3 4 Claims

1. An in vitro method for the transfection of living mammalian cells comprising the steps of:

growing living mammalian cells under physiological conditions suitable for the growth of said cells;

preparing at least one stable nucleoprotein complex with a single-strand DNA sequence of a length of between 200 and 700 bases, and with RecA protein molecules bound to said single-strand DNA sequence, wherein said sequence is substantially identical or complementary to a genomic sequence in said mammalian cells;

mixing said nucleoprotein complex with said living cells, to form an incubation mixture, and;

incubating said incubation mixture for a sufficient period of time to allow said DNA sequence to be transformed into the genome of said cells, said transfection occurring without the additional assistance of a viral vector, calcium phosphate, DEAE-dextran precipitation, lipofection, electroporation, microinjection, or any artificial means for permeating the cell membranes of said cells.

5,468,630

CDNA CLONE FOR HUMAN INDUCIBLE NITRIC OXIDE SYNTHASE AND PROCESS FOR PREPARING SAME

Timothy R. Billiar; Andreas K. Nussler; David A. Geller, and Richard L. Simmons, all of Pittsburgh, Pa., assignors to University of Pittsburg of the Commonwealth System of Higher Education, Pittsburgh, Pa.

Continuation of Ser. No. 981,344, Nov. 25, 1992, abandoned. This application Sep. 28, 1994, Ser. No. 314,917

Int. Cl.[6] C12N *9/02;15/53;15/70;15/79*

U.S. Cl. 435—189 **23 Claims**

1. An isolated nucleic acid molecule comprising a nucleotide sequence encoding a human inducible nitric oxide synthase protein.

5,468,631

GENE ENCODING ENZYME HAVING FLAVIN REDUCING ACTIVITY AND NITROREDUCTASE ACTIVITY

Shuhei Zenno, Kanagawa; Satoshi Inouye, Tokyo; Hiromasa Kaneh, Kanagawa, and Kaoru Saigo, Tokyo, all of, Japan, assignors to Chisso Corporation, Osaka, Japan

Continuation of Ser. No. 987,216, Dec. 8, 1992, abandoned. This application Mar. 28, 1995, Ser. No. 412,108

Claims priority, application Japan, Dec. 16, 1991, 3-351717; Jan. 16, 1992, 4-279029

Int. Cl.[6] C12N *9/02;1/20;* **C12P** *21/06;* **C07H** *19/00*

U.S. Cl. 435—189 **7 Claims**

1. An isolated and purified gene containing a nucleotide sequence shown in SEQ ID NO: 1 and encoding an enzyme having a flavin reducing activity and a nitroreductase activity.

5,468,632

RECOMBINANT DNA COMPOUNDS AND EXPRESSION VECTORS ENCODING PARA-NITROBENZYL ESTERASE ACTIVITY FROM BACILLUS

Cathleen A. Cantwell; Roland L. Hodges, both of Indianapolis; Derek McGilvray, Martinsville; Stephen W. Queener; James R. Swartling, both of Indianapolis, and Joseph M. Zock, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 975,206, Nov. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 811,096, Dec. 20, 1991, abandoned. This application Sep. 22, 1993, Ser. No. 124,674

Int. Cl.[6] C12N *15/55;9/18;1/21;15/63*

U.S. Cl. 435—197 **26 Claims**

1. An isolated DNA compound that encodes *Bacillus subtilis* para-nitrobenzyl (PNB) esterase of the amino acid sequence:

Met Thr His Gln Ile Val Thr Thr Gln Tyr Gly Lys Val Lys Gly
1 5 10 15

Thr Thr Glu Asn Gly Val His Lys Trp Lys Gly Ile Pro Tyr Ala
20 25 30

Lys Pro Pro Val Gly Gln Trp Arg Phe Lys Ala Pro Glu Pro Pro
35 40 45

Glu Val Trp Glu Asp Val Leu Asp Ala Thr Ala Tyr Gly Pro Ile
50 55 60

Cys Pro Gln Pro Ser Asp Leu Leu Ser Leu Ser Tyr Thr Glu Leu
65 70 75

Pro Arg Gln Ser Glu Asp Cys Leu Tyr Val Asn Val Phe Ala Pro
80 85 90

Asp Thr Pro Ser Gln Asn Leu Pro Val Met Val Trp Ile His Gly
95 100 105

Gly Ala Phe Tyr Leu Gly AlaGly Ser Glu Pro Leu Tyr Asp Gly
110 115 120

Ser Lys Leu Ala Ala Gln Gly Glu Val Ile Val Val Thr Leu Asn
125 130 135

Tyr Arg Leu Gly Pro Phe Gly Phe Leu His Leu Ser Ser Phe Asp
140 145 150

Glu Ala Tyr Ser Asp Asn Leu Gly Leu Leu Asp Gln Ala Ala Ala
155 160 165

Leu Lys Trp Val Arg Glu Asn Ile Ser Ala Phe Gly Gly Asp Pro
170 175 180

Asp Asn Val Thr Val Phe Gly Glu Ser Ala Gly Gly Met Ser Ile
185 190 195

Ala Ala Leu Leu Ala Met Pro Ala Ala Lys Gly Leu Phe Gln Lys
200 205 210

Ala Ile Met Glu Ser Gly Ala Ser Arg Thr Met Thr Lys Glu Gln
215 220 225

Ala Ala Ser Thr Ala Ala AlaPhe Leu Gln Val Leu Gly Ile Asn
230 235 240

Glu Ser Gln Leu Asp Arg Leu His Thr Val Ala Ala Glu Asp Leu
245 250 255

Leu Lys Ala Ala Asp Gln Leu Arg Ile Ala Glu Lys Glu Asn Ile
260 265 270

-continued

Phe Gln Leu Phe Phe Gln ProAla Leu Asp Pro Lys Thr Leu Pro
275 280 285

Glu Glu Pro Glu Lys Ser Ile Ala Glu Gly Ala Ala Ser Gly Ile
290 295 300

Pro Leu Leu Ile Gly Thr Thr Arg Asp Glu Gly Tyr Leu Phe Phe
305 310 315

Thr Pro Asp Ser Asp Val His Ser Gln Glu Thr Leu Asp Ala Ala
320 325 330

Leu Glu Tyr Leu Leu Gly Lys Pro Leu Ala Glu Lys Ala Ala Asp
335 340 345

Leu Tyr Pro Arg Ser Leu Glu Ser Gln Ile His Met Met Thr Asp
350 355 360

Leu Leu Phe Trp Arg Pro AlaVal Ala Tyr Ala Ser Ala Gln Ser
365 370 375

His Tyr Ala Pro Val Trp Met Tyr Arg Phe Asp Trp His Pro Glu
380 385 390

Lys Pro Pro Tyr Asn Lys Ala Phe His Ala Leu Glu Leu Pro Phe
395 400 405

Val Phe Gly Asn Leu Asp Gly Leu Glu Arg Met Ala Lys Ala Glu
410 415 420

Ile Thr Asp Glu Val Lys Gln Leu Ser His Thr Ile Gln Ser Ala
425 430 435

Trp Ile Thr Phe Ala Lys Thr Gly Asn Pro Ser Thr Glu Ala Val
440 445 450

Asn Trp Pro Ala Tyr His GluGlu Thr Arg Glu Thr Val Ile Leu
455 460 465

Asp Ser Glu Ile Thr Ile GluAsn Asp Pro Glu Ser Glu Lys Arg
470 475 480

Gln Lys Leu Phe Pro Ser Lys Gly Glu
485 489

His Thr Val Ala Ala Glu Asp Leu
250 255

Leu Lys Ala Ala Asp Gln Leu
260

Arg Ile Ala Glu Lys Glu Asn Ile
265 270

Phe Gln Leu Phe Phe Gln Pro
275

Ala Leu Asp Pro Lys Thr Leu Pro
280 285

Glu Glu Pro Glu Lys Ser Ile
290

Ala Glu Gly Ala Ala Ser Gly Ile
295 300

Pro Leu Leu Ile Gly Thr Thr
305

Arg Asp Glu Gly Tyr Leu Phe Phe
310 315

Thr Pro Asp Ser Asp Val His
320

Ser Gln Glu Thr Leu Asp Ala Ala
325 330

-continued

Leu Glu Tyr Leu Leu Gly Lys
335

Pro Leu Ala Glu Lys Ala Ala Asp
340 345

Leu Tyr Pro Arg Ser Leu Glu
350

Ser Gln Ile His Met Met Thr Asp
355 360

Leu Leu Phe Trp Arg Pro Ala
365

Val Ala Tyr Ala Ser Ala Gln Ser
370 375

His Tyr Ala Pro Val Trp Met
380

Tyr Arg Phe Asp Trp His Pro Glu
385 390

Lys Pro Pro Tyr Asn Lys Ala
395

Phe His Ala Leu Glu Leu Pro Phe
400 405

Val Phe Gly Asn Leu Asp Gly
410

Leu Glu Arg Met Ala Lys Ala Glu
415 420

Ile Thr Asp Glu Val Lys Gln
425

Leu Ser His Thr Ile Gln Ser Ala
430 435

Trp Ile Thr Phe Ala Lys Thr
440

Gly Asn Pro Ser Thr Glu Ala Val
445 450

Asn Trp Pro Ala Tyr His Glu
455

Glu Thr Arg Glu Thr Val Ile Leu
460 465

Asp Ser Glu Ile Thr Ile Glu
470

Asn Asp Pro Glu Ser Glu Lys Arg
475 480

Gln Lys Leu Phe Pro Ser Lys Gly Glu
485 489

wherein Ala is an alanine residue, Arg is an arginine residue, Asn is an asparagine residue, Asp is an aspartic acid residue, Cys is a cysteine residue, Gln is a glutamine residue, Glu is a glutamic acid residue, Gly is a glycine residue, His is a histidine residue, Ile is an isoleucine residue, Leu is a leucine residue, Lys is a lysine residue, Met is a methionine residue, Phe is a phenylalanine residue, Pro is a proline residue, Ser is a serine residue, Thr is a threonine residue, Trp is a tryptophan residue, Tyr is a tyrosine residue, and Val is a valine residue.

5,468,633

HUMAN ENDOTHELIN CONVERTING ENZYME OBTAINED FROM BLOOD OR PLACENTA

Tatsuya Ohwaki, and Hiroshi Sakai, both of Ohimachi, Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1994, Ser. No. 288,395

Claims priority, application Japan, Aug. 13, 1993, 5-201368

Int. Cl.[6] C12N *9/48;9/50;9/64*

U.S. Cl. 435—212 2 Claims

1. An isolated, purified human endothelin converting enzyme having the following properties:

(1) Action: converts big endothelin to endothelin;

(2) Substrate specificity: acts on big endothelin-1, big endothelin-2, or big endothelin-3;

(3) Optimum pH: pH 6.5–7.5;

(4) Molecular weight: about 5.4×10^5 as measured on gel-filtration using a column of crosslinked agarose gel bead (exclusion limit 5×10^6 Daltons);

(5) Inhibitors: inhibited by ethylenediaminetetraacetate (EDTA), phosphoramidon, thiorphan, phenylmethanesulfonyl fluoride (PMSF), and chymostatin;

(6) Hydrated density: not greater than about 1.210 g/ml;

(7) Formation of precipitate: precipitation by adding 0.65% dextran sulfate (M.W. 500,000) and 0.2M manganese chloride;

(8) Influence of oxidation: inactivated by oxidation by copper ion.

5,468,634

AXL ONCOGENE

Edison T. Liu, Chapel Hill, N.C., assignor to The University of North Carolina at Chapel Hill, Chapel Hill, N.C.

Continuation of Ser. No. 718,572, Jun. 24, 1991, abandoned. This application Jan. 13, 1995, Ser. No. 372,892

Int. Cl.[6] C12N *15/12;5/10;15/85;15/86*

U.S. Cl. 435—240.2 17 Claims

1. An isolated DNA molecule encoding a mammalian axl receptor which exhibits axl oncogene activity selected from the group consisting of:

(a) an isolated DNA molecule which encodes a human axl oncogene selected from the group consisting of DNA having the sequence given herein as SEQ ID NO: 1 and DNA having the sequence given herein as SEQ ID NO: 3; and

(b) isolated DNA differing from the isolated DNAs of (a) above in nucleotide sequence due to the degeneracy of the genetic code, and which encodes an axl receptor.

5,468,635

IN VITRO METHOD FOR STIMULATING CELL GROWTH BY CULTURING CELLS IN A SERUM-FREE CULTURE MEDIUM COMPRISING HUMAN LYSOZYME

Koji Komiya; Tetsuya Takezono, both of Yokohama; Noritsugu Yabe, and Hisao Matsui, both of Shimotsuga, all of, Japan, assignors to Nippon Oil Co., Ltd., Japan

Continuation of Ser. No. 7,021, Jan. 21, 1993, abandoned, which is a continuation of Ser. No. 685,686, Apr. 16, 1991, abandoned. This application May 16, 1994, Ser. No. 243,074

Claims priority, application Japan, Apr. 17, 1990, 2-100650; Feb. 15, 1991, 3-042868

Int. Cl.[6] C12N *5/00*

U.S. Cl. 435—240.21 5 Claims

1. An in vitro method for stimulating the growth of T lymphoblastoid cells and peripheral blood lymphocytes comprising culturing said T lymphoblastoid cells or peripheral blood lymphocytes in a serum-free culture medium comprising human lysozyme, as a growth-stimulating agent, in a concentration of about 4–100 mg/liter.

5,468,636

BACILLUS THURINGIENSIS FOR CONTROLLING PESTS IN THE FAMILY APHIDIDAE

Jewel M. Payne, San Diego, Calif.; Raymond J. C. Cannon, Sittingbourne, United Kingdom; H. Ernest Schnepf, San Diego, and George E. Schwab, La Jolla, both of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Division of Ser. No. 935,310, Aug. 24, 1992, Pat. No. 5,262,159. This application Nov. 3, 1993, Ser. No. 147,189

Int. Cl.[6] C12N *1/21;15/32;15/11*

U.S. Cl. 435—252.3 5 Claims

1. An isolated nucleotide sequence comprising DNA encoding a *Bacillus thuringiensis* protein which is toxic to aphids but does not control nematodes, wherein a portion of the nucleotide sequence coding for said toxin can be identified using polymerase chain reaction with the pair of primers consisting of either (1) SEQ ID NO. 10 or SEQ ID NO. 14 and complement of SEQ ID NO. 11, SEQ ID NO. 12, or SEQ ID NO. 13; or (2) SEQ ID NO 11 and the complement of SEQ ID NO. 12 or SEO ID NO. 13, wherein the nucleotide sequence coding for said toxin is not the nucleotide sequence shown in SEQ ID NO. 1.

5,468,637

S. LAVENDOFOLIAE DKRS CELL CULTURE PRODUCING ANTI-TUMOR ACLACINOMYCINS A, B, Y AND AGLYCONES

Won T. Cho, Chungcheongbuk-do; Wan S. Kim, Seoul; Myung K. Kim, Seoul; Jin K. Park, Seoul; Hak R. Kim, Seoul; Sang K. Rhee, Seoul, all of, Rep. of Korea; A. G. Domracheva, Moscow, Russian Federation; T. B. Panichkina, Moscow, Russian Federation; L. A. Saburoba, Moscow, Russian Federation; L. M. Nobikoba, Moscow, Russian Federation, and Y. E. Bartochevichi, Moscow, Russian Federation, assignors to Dongkook Pharmaceutical Co., Ltd., and Ki Beom Kwon, both of Seoul, Rep. of Korea

Filed Feb. 4, 1994, Ser. No. 192,165

Claims priority, application Rep. of Korea, Sep. 3, 1993, 17589

Int. Cl.[6] C07H *17/04;15/244;* C12N *1/20*

U.S. Cl. 435—252.35 3 Claims

1. A *S. lavendofoliae* DKRS cell culture having the Accession No. KCTC 0092BP, and being capable of expressing a product selected from the group consisting of aclacinomycins A, B, and Y, and aglycones thereof.

5,468,638

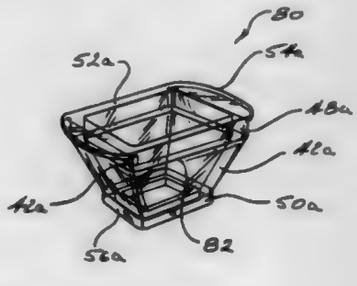
CELL CULTURE INSERT

Susan Barker, Tenafly; I-Hsi Chu, West Orange; Oresta N. Fedun, Wanaque, and Tadeusz A. Tyndorf, Manalapan, all of N.J., assignors to Becton, Dickinson nand Company, Franklin Lakes, N.J.

Filed Sep. 28, 1992, Ser. No. 952,004

Int. Cl.[6] C12M *3/06*

U.S. Cl. 435—304.1 13 Claims



1. A cell culture insert comprising:

a hollow chamber including an upper portion, a lower portion, sidewalls including an inner and outer surface extending from said upper portion to said lower portion and arranged with respect to one another to form at least three junctions, and a projecting flange extending radially outward from said upper portion beyond at least one sidewall,

wherein said upper portion comprises an outer circumference and a top surface and sail lower portion comprises an outer circumference and a bottom surface,

further comprising a transitional portion between said upper portion and said lower portion wherein said sidewalls extend from said upper portion to said transitional portion and from said transitional portion to said lower portion,

wherein said outer circumference of said upper portion is substantially the same as said outer circumference of said lower portion, and

wherein said transitional surface has an outer circumference substantially greater than said outer circumference of said upper portion and said outer circumference of said lower portion.

5,468,639

ISOLATED DNA MOLECULE ENCODING SHET2 OF *SHIGELLA FLEXNERI* 2A

ALessio Fasano, Ellicott City; Myron M. Levine, Columbia; James P. Nataro, Catonsville, and Fernando Noriega, Columbia, all of Md., assignors to University of Maryland at Baltimore, Baltimore, Md.

Continuation-in-part of Ser. No. 894,774, Jun. 5, 1992, abandoned. This application Dec. 2, 1993, Ser. No. 160,317

Int. Cl.[6] C12N *15/00;* C07H *19/00;21/00;* C12P *21/04*

U.S. Cl. 435—320.1 **4 Claims**

1. An isolated DNA molecule encoding ShET2 which consists of the amino acid sequence encoded by the DNA of SEQ ID NO:2.

5,468,640

CYANIDE-FREE HEMOGLOBIN REAGENT

Jeffrey Benezra, Bronx, N.Y., and Michael J. Malin, Park Ridge, N.J., assignors to Bayer Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 978,062, Nov. 18, 1992, abandoned, which is a continuation of Ser. No. 762,175, Sep. 20, 1991, abandoned, which is a continuation of Ser. No. 359,017, May 30, 1989, abandoned, which is a division of Ser. No. 284,804, Dec. 13, 1988, Pat. No. 4,853,338, which is a continuation of Ser. No. 52,646, May 20, 1987. This application Feb. 7, 1994, Ser. No. 192,940

Int. Cl.[6] G01N *33/72*

U.S. Cl. 436—66 **8 Claims**

1. A reagent composition for use in determining total hemoglobin in a whole blood sample, said composition consisting essentially of an ionic surfactant selected from the group consisting of a cationic surfactant, an anionic surfactant, and a zwitterionic surfactant, or a mixture thereof, said surfactant at a concentration of from about 2 to about 5 grams per deciliter; wherein said composition has a pH of from about 11.3 to about 13.7 and is free of ionic cyanide; and further wherein said composition rapidly denatures hemoglobin structure, thereby exposing heme and resulting in a green reaction product in an optically clear solution that allows for the determination of total hemoglobin in said whole blood sample.

5,468,641

DEVICE FOR VALIDATING UROBILINOGEN TEST DEVICES

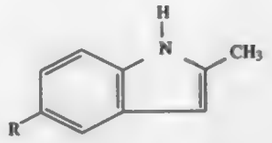
Robert P. Hatch, Elkhart, and Marilyn J. Radtke, South Bend, both of Ind., assignors to Bayer Corporation, Elkhart, Ind.

Continuation-in-part of Ser. No. 72,441, Jun. 7, 1993, abandoned. This application May 3, 1994, Ser. No. 238,003

Int. Cl.[6] G01N *33/48;33/72*

U.S. Cl. 436—97 **14 Claims**

1. A test control method for a reagent system containing p-dimethylaminobenzaldehyde comprising (a) combining the reagent system with an aqueous solution of an indole of the formula:



where R is $-(CH_2)_n SO_3^-$ wherein n is 2 to 6 or $-[OCH_2-(CH_2-)_x]_m SO_3^-$ wherein X is 2 or 3 and m is 1 or 2 and (b) determining the formation of color in the aqueous solution.

5,468,642

DEVICE FOR MONITORING THE BORON CONTENT OF BOROPHOSPHOSILICATE

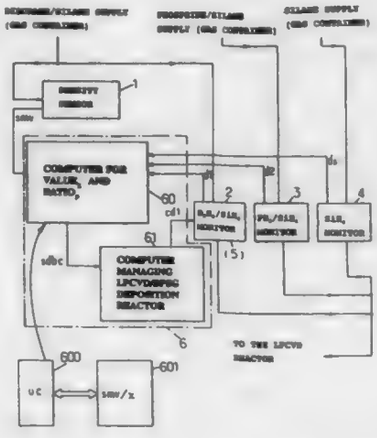
Alain Y. P. Charpentier, Nantes, France, assignor to Matra MHS of France, Nantes, France

Division of Ser. No. 221,965, Apr. 4, 1994. This application Mar. 17, 1995, Ser. No. 405,770

Claims priority, application France, Apr. 6, 1993, 93 04069

Int. Cl.[6] G01N *35/06*

U.S. Cl. 436—114 **6 Claims**



1. A device for monitoring the boron content of the borophosphosilicate obtained by oxidation of silane, of diborane and of phosphine in a reactor, said reactor being supplied from a line for supplying a first, diborane/silane gas mixture and a second, phosphine/silane gas mixture and a flow of silane, said monitoring being carried out by monitoring the ratio ρ=diborane/(diborane+silane) of the mixture resulting from the mixing of the first and second gas mixtures said device comprising:

means for measuring the density of said first mixture, delivering a density measurement signal for the first mixture,

means for measuring the density of the first and respectively second mixture and of the flow of silane, said measurement means being connected to the corresponding supply line of said reactor, each measurement means being connected to the corresponding supply line of said reactor and delivering a corresponding mass flow-rate measurement signal,

means for controlling the mass flow-rate of said first mixture, said controlling means being connected to the first-mixture supply line of the reactor,

computing means receiving the density measurement signal of the first mixture and the mass flow-rate signals for the first and respectively second mixture and for the flow of silane and delivering a mass flow-rate correction control signal to said control means, thereby allowing regulation of the value of the ratio ρ= diborane/(diborane+silane) and the boron content of the borophosphosilicate obtained in the reactor by monitoring the residual hydrogen content of said first mixture.

5,468,643

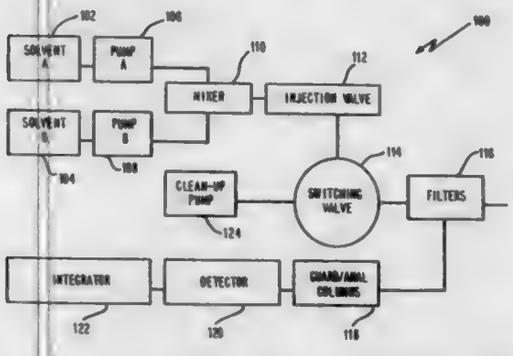
SWITCHING VALVE SYSTEM FOR DIRECT BIOLOGICAL SAMPLE INJECTION FOR LC ANALYSIS

Syang Y. Su, Gaithersburg, and Gerald K. Shiu, Laurel, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 751,009, Aug. 28, 1991, abandoned. This application Aug. 10, 1993, Ser. No. 104,522

Int. Cl.[6] G01N *30/02*

U.S. Cl. 436—161 **7 Claims**



5. A method for performing liquid chromatographic analysis using a liquid chromatography (LC) analysis system that includes sources and flow means to provide controlled flows of a sample, a reactant, a carrier fluid to carry the reactant, and a clean-up fluid for cleaning flow passages, wherein a selected constituent of the sample is to be reacted to form the movable particulate reaction products to enable analysis of other constituents of the sample by LC equipment, comprising the steps of:

connecting a first multi-port valve provided with a sample loop and a first plurality of movable passages which are selectively disposable to convey directed flows therethrough to respective sources of a sample, a reactant and a carrier fluid;

connecting a second multi-port valve to said first multi-port valve, said second multi-port valve comprising a second plurality of movable passages which are selectively disposable to receive a flow output from said first multi-port valve and to convey the received output as a conveyed output, said second multi-port valve also being provided with filtering means for filtering particulates of predetermined size from a flow containing particulates;

adjusting said first multi-port valve to a first position and receiving a quantity of a sample to fill at least said sample loop;

adjusting said first multi-port valve to direct a flow of a reactant carried in a carrier fluid through said sample loop to mix with and move the sample contained therein as said flow output flowed to said second multi-port valve;

adjusting said second multi-port valve to a first position to flow said flow output received from said first multi-port valve through said filtering means to remove therefrom precipitated particulate products of a reaction between the reactant and a constituent of the sample; and

flowing the filtered flow to said LC equipment for analysis of remaining constituents in the sample.

5,468,644

SPECTROSCOPIC INVESTIGATION USING ORGANOMETALLIC COMPOUNDS

George R. Stephenson, Norwich, and Colin S. Creaser, Wymondham, both of, England, assignors to British Technology Group Limited, London, England

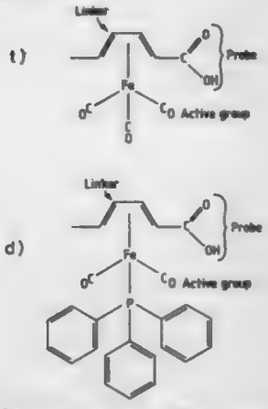
PCT No. PCT/GB92/00825, § 371 Date Nov. 9, 1993, § 102(e) Date Nov. 9, 1993, PCT Pub. No. WO92/19968, PCT Pub. Date Nov. 12, 1992

PCT Filed May 7, 1992, Ser. No. 146,063

Claims priority, application United Kingdom, May 9, 1991, 9110017

Int. Cl.[6] G01N *31/22*

U.S. Cl. 436—163 **13 Claims**



1. A method of investigating the pH of a solution, said method comprising the steps off

mixing an organometallic compound with the solution, said organometallic compound having a —=COOH probe group affected by the pH of the solution and linked to a metal-ligand system, said system comprising at least one group active in the infrared or Raman region of the spectrum;

observing the shape(s) of spectral response curves and/or wavenumber position(s) of peaks of spectral response curves of that region of the spectrum of said system;

comparing said shape(s) and/or position(s) with the corresponding shape(s) and/or position(s) in known solutions; and

determining the pH of the solution by interpolation or extrapolation if necessary.

5,468,645

METHOD FOR REAL-TIME COLORIMETRIC MEASUREMENT OF EXPOSURE TO AIRBORNE POLLUTANTS

Kirollos S. Kirollos, 1502 Canterford Ct., Virginia Beach, Va. 23464; Gueorgui M. Mihaylov, 900 E. Piney Branch Dr., Virigina Beach, Va. 23451; Kevin L. Lockerby, 1017 Woodsmans Reach, Chesapeake, Va. 23320, and Roman A. Stobnicki, 48 Nestor St., Franklin, N.J. 07416

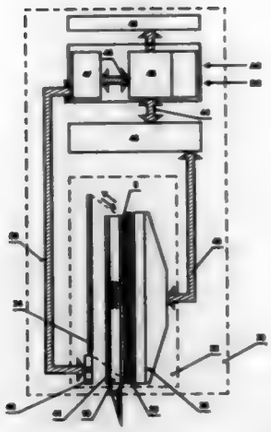
Filed Jul. 26, 1993, Ser. No. 97,112

Int. Cl.[6] G01N *21/78;31/22*

U.S. Cl. 436—164 **9 Claims**

1. A method for providing a quantitative determination of the concentration of a preselected pollutant gas or vapor in the atmosphere comprising the steps of:

(a) forming a series arrangement of gas diffusion cells with each cell having a chromophoric reagent chemical responsive to said pollutant gas or vapor, and each cell being exposed to the atmosphere having a different diffusion resistance means to provide a predetermined diffusion resistance to said pollutant gas or vapor and with the arrangement providing a constant diffusion pathlength through each cell such that said gas diffusion cells all respond in coincidence to the concentration of said pollutant gas in the atmosphere and in a relationship corresponding to the arrangement of said cells whereby the exposure of each cell to said pollutant gas or vapor can be



sampled with a constant response time independent of the concentration of the gas and the sampling time;

(b) illuminating each of said cells with light from a light source;

(c) optically scanning reflected light from said cells to form color video signal data representative of the primary color components of the color image formed in the cell from the reaction of the chromophoric reagent and pollutant, with the magnitude of the signal data corresponding to the color intensity;

(d) converting said color video data into corresponding digital data for at least one primary color component of the reflected light;

(e) feeding said digital data into a microprocessor programmed to automatically compute a quantitative value of exposure dosage for said given pollutant gas or vapor in the atmosphere as a function of said digital data for at least said one primary color component in accordance with the following mathematical relationship:

$D=\chi f(C)$ where

D corresponds to the exposure dosage;

C corresponds to said digital data and

χ equals a predetermined color intensity coefficient corresponding to said given pollutant gas or vapor and

(f) displaying the computed exposure dosage as a quantitative value.

5,468,646

CHEMILUMINESCENT ACRIDINIUM SALTS

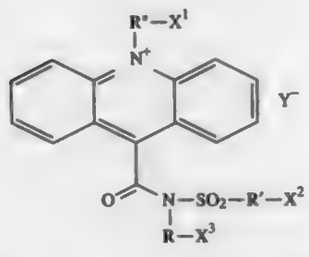
Phillip G. Mattingly, and Larry G. Bennett, both of Grayslake, Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 371,763, Jun. 23, 1989, abandoned, which is a continuation of Ser. No. 921,979, Oct. 22, 1986, abandoned. This application Jan. 3, 1995, Ser. No. 368,258

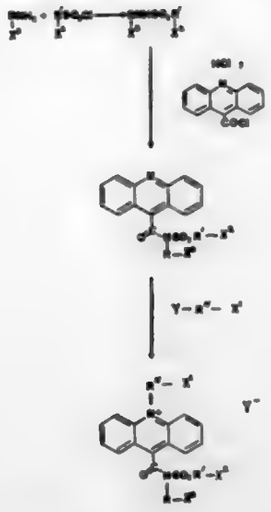
Int. Cl.[6] G01N *31/00*

U.S. Cl. 436—501 **26 Claims**

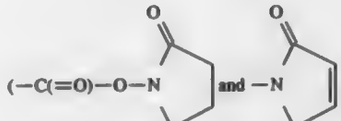
1. A chemiluminescent conjugate comprising an antibody conjugated to a chemiluminescent compound of the formula:



wherein R, R', R", X^1, X^2, and X^3 independently comprise substituents which do not interfere with chemiluminescence measurement, linkage to the antibody is through one of X^1, X^2 and X^3, and wherein Y— is an anion with the proviso that R-X^3, R'-X^2 and R"-X^1 may be hydrogen,



wherein X^1, X^2 and X^3 are independently members of the group consisting of hydrogen, (—CO_2H), (—C(=O)OZ^1) wherein Z^1 is alkyl, (—C(=O)NZ^2Z^3) wherein Z^2 or Z^3 is H, alkyl or aryl, (—C(=O)OZ^4) wherein Z^4 is aryl, (—CN), (—C(=O)N(Z^5)—C(=O)—Z^5) wherein Z^5 is H, alkyl or aryl, (F, Cl, Br, or I), (—N=C=O), (—N=C=S), (—SO_3^-), sulfonyl halide (—SO_2Z^6) wherein Z^6 is (Cl or F), (—C(=O)—Z^7) wherein Z^7 is (F, Cl, or Br),



groups;

wherein R independently comprises a member selected from the group consisting of alkylene, alkenylene and substituted alkylene groups and wherein R' and R" independently comprise a member selected from the group consisting of alkylene, arylene, alkenylene, substituted alkylene, and substituted arylene groups, such that:

one or more hydrogens or open valences of said member is replaced by an alkyl, aryl, alkylene, alkenylene, substituted alkyl, substituted alkylene, substituted aryl, alkoxy, aryloxy, halo, nitro, amino, protected amino, substituted amino, hydroxy, protected hydroxy, oxo, thio, imino, mercapto or substituted mercapto group;

or such that one or more carbon atoms of the member is replaced by a heteroatom.

5,468,647

METHOD FOR IMMUNOCHROMATOGRAPHIC ANALYSIS

Carl N. Skold, Mountain View; Armen B. Shanafelt, San Francisco; Vartan Ghazarossian, Menlo Park, and Edwin F. Ullman, Atherton, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

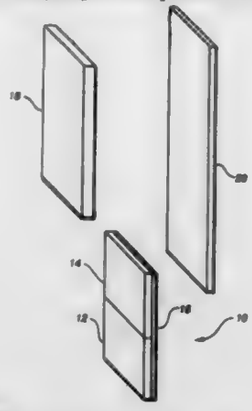
Continuation of Ser. No. 105,271, Aug. 12, 1993, abandoned, which is a continuation of Ser. No. 714,791, Jun. 13, 1991, Pat. No. 5,248,619, which is a division of Ser. No. 194,708, May 17, 1988, Pat. No. 5,039,607. This application Sep. 1, 1994, Ser. No. 299,860

The portion of the term of this patent subsequent to Sep. 28, 2010, has been disclaimed.

Int. Cl.[6] G01N *33/543;33/558*

U.S. Cl. 436—514 3 Claims

1. A device for analyzing for the presence of an analyte, which



device comprises:

(a) a first bibulous member, at least a portion thereof having a first member of a specific binding pair non-diffusively bound thereto and capable of binding said analyte with the proviso that, when said analyte is not capable of binding to said first member of the specific binding pair, a first reagent capable of binding said analyte and said first member of the specific binding pair is present in relation to said analyte,

(b) an absorbent member in terminable liquid receiving relationship with said first bibulous member,

(c) a second bibulous member, at least a portion thereof having a second member of a specific binding pair non-diffusively bound thereto, said second bibulous member being adapted to establish a liquid receiving relationship with said first bibulous member, said second member being capable of binding a second reagent in relation to the amount of analyte and

(d) means for terminating the liquid receiving relationship between said first bibulous member and said absorbent member and establishing a liquid receiving relationship between said first bibulous member and said second bibulous member.

5,468,648

INTERRUPTED-FLOW ASSAY DEVICE

Howard M. Chandler, Yarmouth, Me., assignor to SmithKline Diagnostics, Inc., San Jose, Calif.

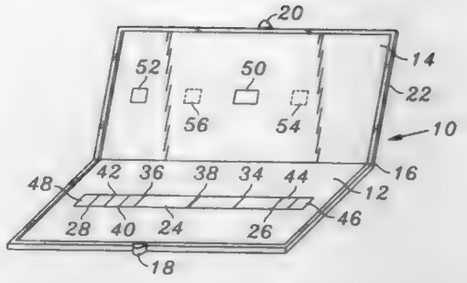
Continuation-in-part of Ser. No. 40,430, Mar. 31, 1993, which is a continuation-in-part of Ser. No. 888,831, May 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 706,639, May 29, 1991. This application Dec. 7, 1993, Ser. No. 163,341

Int. Cl.[6] G01N *33/543*

U.S. Cl. 436—518 25 Claims

1. An assay device for detecting at least two analytes in an aqueous sample, a first analyte that is an antigen and a second analyte that is an antibody, the assay device comprising:

(a) a first opposable component comprising at least one chromatographic medium having (1) a first end comprising a conjugate zone impregnated with a labeled specific binding



partner to the first analyte, (2) an intermediate first zone comprising an immobilized specific binding partner to the first analyte, and (3) a second end having a second zone comprising an immobilized antigen which specifically binds to the second analyte;

(b) a second opposable component having an absorber which is brought into fluid communication with an area of the at least one chromatographic medium between the first and second zones thereof when the first and second opposable components are brought into physical contact; and

(c) a labeled specific binding partner to the second analyte impregnated in either the first or the second opposable component in a zone in downstream fluid communication with the second zone;

wherein the first and second opposable components are capable of being brought into physical contact to provide a unidirectional chromatographic specific binding assay for the first analyte and a bidirectional chromatographic specific binding assay for the second analyte by physically contacting the absorber to the first opposable component after migration of an applied aqueous sample from the first end to the second end of the first opposable component in order to reverse fluid flow direction between the first and second ends, and detecting the first and second analytes by detecting formation of labeled ternary complexes in the first and second zones, respectively.

5,468,649

PROCESS FOR LABELING ACRIDINIUM TO MICROPARTICLES AND APPLICATION IN AN INSTRUMENT

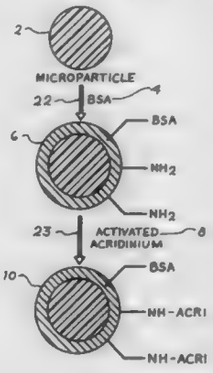
Dinesh O. Shah, Vernon Hills; Tarun Chandra, Rolling Meadows, and Kurt Klosterman, Gurnee, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Feb. 15, 1994, Ser. No. 196,536

Int. Cl.[6] G01N *33/543;33/546*

U.S. Cl. 436—518 12 Claims

1. A method of preparing an activated acridinium microparticle,



the method comprising the steps of:

(a) activating a 10-methyl-N-tosyl-N-(2-carboxyethyl)-9-acridinium carboximide trifluoromethane sulfonate:

(b) coating a microparticle with a proteinaceous compound, the proteinaceous compound being selected from the group consisting of albumin and an antibody; and

(c) coupling activated 10-methyl-N-tosyl-N-(2-carboxyethyl)-9-acridinium carboximide trifluoromethane sulfonate to said proteinaceous compound.

5,468,650

CLASS MICROFIBER HISTAMINE ASSAY DEVICE

Per Stahl Skov, Copenhagen, and Ole-Christian Bjarno, Holte, both of, Denmark, assignors to A/S Lundbeck Export Division Ltd., Copenhagen, Denmark

Continuation of Ser. No. 816,759, Jan. 2, 1992, abandoned, which is a division of Ser. No. 392,363, Aug. 10, 1989, Pat. No. 5,098,831, which is a continuation-in-part of Ser. No. 258,528, Oct. 17, 1988, Pat. No. 5,041,390. This application Feb. 28, 1994, Ser. No. 203,683

Int. Cl.[6] G01N *33/552;33/543;33/49*

U.S. Cl. 436—527 **14 Claims**

1. In a diagnostic test device for use in an assay for histamine comprising a plurality of crushed glass microfibers which hinds histamine and which are deposited onto a carrier,

the improvement which comprises that the crushed glass microfibers have been conglomerated by a binder which reduces the affinity of the conglomerated crushed glass microfibers towards interfering components in a sample while their histamine-binding capacity is substantially retained; said binder being a polar organic polymer having a solubility parameter sphere substantially encompassing the solubility parameters for histamine.

5,468,651

METHOD FOR DETERMINING HAPTENS, USE OF METHOD AND COMPONENTS USEFUL IN METHOD

Colin H. Self, Ponteland, United Kingdom, assignor to Cambridge Patent Developments Limited, United Kingdom

Continuation of Ser. No. 465,107, Feb. 16, 1990, abandoned. This application Jul. 18, 1994, Ser. No. 276,766

Claims priority, application United Kingdom, Nov. 28, 1987, 8727898; Jan. 30, 1988, 8802097

Int. Cl.[6] G01N *33/53*

U.S. Cl. 436—548 **57 Claims**

1. A method of determining a hapten which method comprises:

(i) contacting the hapten with a primary binding partner of the hapten, whereby the hapten becomes bound to some of the primary binding partner;

(ii) contacting unbound primary binding partner with a secondary binding partner therefor, wherein the secondary binding partner is (a) a conjugate of the hapten or hapten analog and a macromolecule or (b) an anti-idiotypic antibody which specifically binds the primary binding partner;

(iii) contacting the primary binding partner with a selective antibody which binds the primary binding partner which has bound thereto the hapten but which does not bind the primary binding partner which has bound thereto its secondary binding partner; and

(iv) determining the amount of selective antibody bound to the primary binding partner as a determination of the amount of hapten.

5,468,652

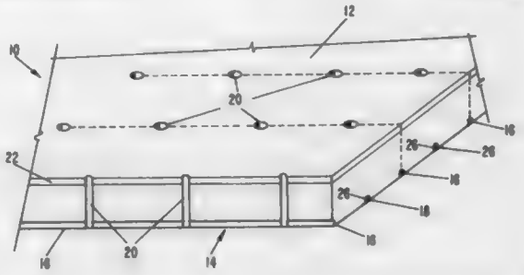
METHOD OF MAKING A BACK CONTACTED SOLAR CELL

James M. Gee, Albuquerque, N.M., assignor to Sandia Corporation, Albuquerque, N.M.

Division of Ser. No. 92,298, Jul. 14, 1993, abandoned. This application Aug. 11, 1994, Ser. No. 289,161

Int. Cl.[6] H01L *31/18*

U.S. Cl. 437—2 **15 Claims**



1. A method for making a back-contacted photovoltaic cell, comprising:

diffusing phosphorus into the front surface of a planar p-type silicon substrate to achieve a sheet resistance of about 100 ω/□;

forming a dielectric layer on top of the phosphorus diffusion and on the back surface of the substrate;

laser scribing a first set of spaced apart grooves into the back surface and laser drilling an array of holes through the substrate to form vias such that portions of the first set of grooves are proximate to the holes;

diffusing phosphorus into the vias and the first set of grooves;

forming a second set of spaced apart grooves interdigitated with the first set;

metallizing the vias and the first and second sets of grooves; and

forming separate electrical contacts to the metallizations over the first and second sets of grooves.

5,468,653

PHOTOELECTRIC CONVERSION DEVICE AND METHOD OF MAKING THE SAME

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 748,421, Aug. 22, 1991, which is a division of Ser. No. 443,015, Nov. 29, 1989, Pat. No. 5,077,223, which is a continuation of Ser. No. 785,586, Oct. 8, 1985, which is a division of Ser. No. 564,213, Dec. 22, 1983, Pat. No. 4,581,476, which is a continuation-in-part of Ser. No. 525,459, Aug. 22, 1983, Pat. No. 4,591,892. This application Dec. 13, 1993, Ser. No. 165,536

Claims priority, application Japan, Dec. 23, 1982, 57-228158

The portion of the term of this patent subsequent to Dec. 31, 2008, has been disclaimed.

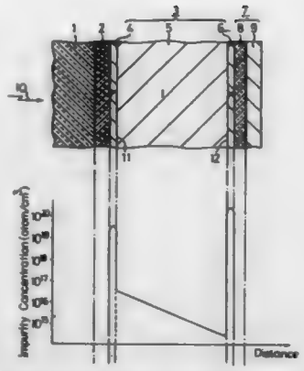
Int. Cl.[6] H01L *21/20*

U.S. Cl. 437—4 **19 Claims**

1. A manufacturing method of a photoelectric conversion device comprising the steps of:

forming a p-type non-single crystalline Si_xC_{1-x} ($0<x<1$) layer on a substrate in a reaction chamber;

depositing a substantially intrinsic crystalline non-single silicon semiconductor layer on said p-type layer by introducing process gas into said reaction chamber together with a dopant gas comprising boron, the introducing ratio of the dopant gas to the process gas being continuously decreased throughout the deposition of the intrinsic semiconductor layer in order that the boron concentration in the intrinsic semiconductor layer is continuously decreased from the interface between the p-type and intrinsic semiconductor layers so that the ratio of the boron concentration at the interface between an n-type and intrinsic layers to that at the interface between the p-type and intrinsic layers is 1/10 to 1/100;



forming the n-type non-single microcrystalline semiconductor layer; and

forming an electrode arrangement for said conversion device.

5,468,654

METHOD OF MANUFACTURING AN INSULATED GATE BIPOLAR TRANSISTOR

Masana Harada, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

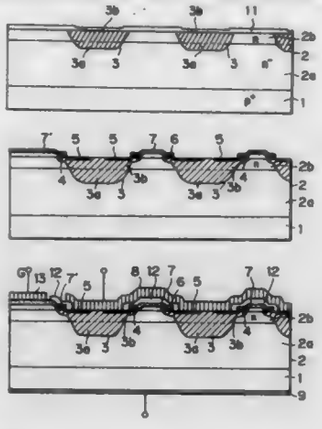
Division of Ser. No. 455,775, Dec. 28, 1989, Pat. No. 5,047,813. This application Jul. 22, 1991, Ser. No. 733,803

Claims priority, application Japan, Aug. 19, 1987, 62-206857

Int. Cl.[6] H01L *29/739*

U.S. Cl. 437—6 **7 Claims**

1. A method of manufacturing a semiconductor device, comprising the steps of:



preparing a first semiconductor layer of a first conductivity type;

forming a second semiconductor layer of a second conductivity type on a surface of said first semiconductor layer;

forming a first well region of the first conductivity type in a surface of said second semiconductor layer;

forming a third semiconductor layer of the second conductivity type on surfaces of said second semiconductor layer and said first well region, said third semiconductor layer having a higher impurity concentration than said second semiconductor layer;

forming a second well region of the first conductivity type into said third semiconductor layer on said first well region, so that said second well region is coupled with said first well region;

forming a semiconductor region of the second conductivity type in a surface of said second well region;

forming an insulation film on the surface of said well region between said semiconductor region and said third semiconductor layer;

forming a control electrode on a surface of said insulation film;

forming a first electrode on said semiconductor region and said second well region; and

forming a second electrode on a back surface of said first semiconductor layer.

5,468,655

METHOD FOR FORMING A TEMPORARY ATTACHMENT BETWEEN A SEMICONDUCTOR DIE AND A SUBSTRATE USING A METAL PASTE COMPRISING SPHERICAL MODULES

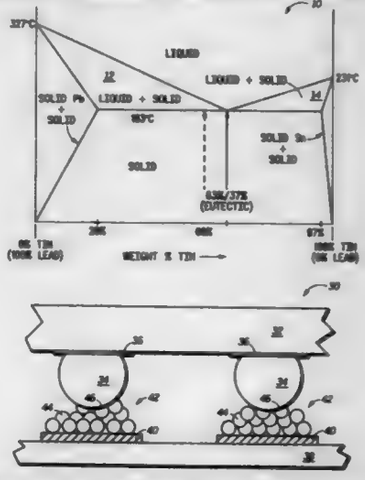
Stuart E. Greer, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1994, Ser. No. 332,311

Int. Cl.[6] H01L *21/283;21/58;21/60;21/66*

U.S. Cl. 437—8 **20 Claims**

1. A method for forming a temporary attachment between a semiconductor die and a substrate, comprising the steps of:



placing a metal paste, composed of substantially spherical metallic nodules, upon a contact pad of the substrate;

partially melting the metal paste at approximately a lowest melting temperature of the metal paste to obtain a first partial liquidus region to partially fuse the spherical metallic nodules together;

aligning an interconnect protrusion on an active surface of the semiconductor die to the contact pad; and

reheating the metal paste at approximately a lowest melting temperature of the metal paste to obtain a second partial liquidus region to join the interconnect protrusion to the contact pad with a tack joint to form an electrical contact between the semiconductor die and the contact pad.

5,468,656

METHOD OF MAKING A VCSEL

Chan-Long Shieh, Paradise Valley; Michael S. Lebby, Apache Junction, and John Lungo, Mesa, all of Ariz., assignors to Motorola, Schaumburg, Ill.

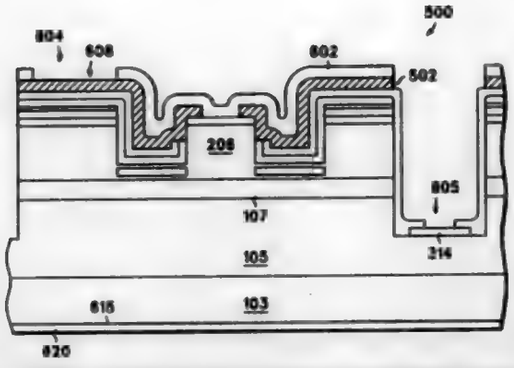
Filed Nov. 29, 1994, Ser. No. 346,558

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—23 **8 Claims**

1. A method for making a ridge vertical cavity surface emitting laser comprising the steps of:

providing a substrate with a surface, the surface having disposed thereon a first stack of distributed Bragg reflectors, an active area, a second stack of distributed Bragg reflectors, a contact region, and a dielectric layer, wherein the first stack of distributed Bragg reflectors are on the surface, wherein the active area is on the first stack of distributed Bragg reflectors, wherein the second stack of distributed Bragg reflectors are on the active area, wherein the contact region is on the second stack of distributed Bragg reflectors, and wherein the dielectric layer is on the contact region;



patterning a first isolation trench through the dielectric layer, the contact region, and into a portion of the second stack of distributed Bragg reflectors making a ridge, wherein the first isolation trench encloses a portion of the dielectric layer, the contact area and a portion of the second stack of distributed Bragg reflectors;

patterning a second isolation trench circumscribing the first isolation trench through the dielectric layer, the contact region, the second stack of distributed Bragg reflectors, the active region and a portion of the first stack of distributed Bragg reflectors;

forming a first electrical contact on the first stack of distributed Bragg reflectors; and

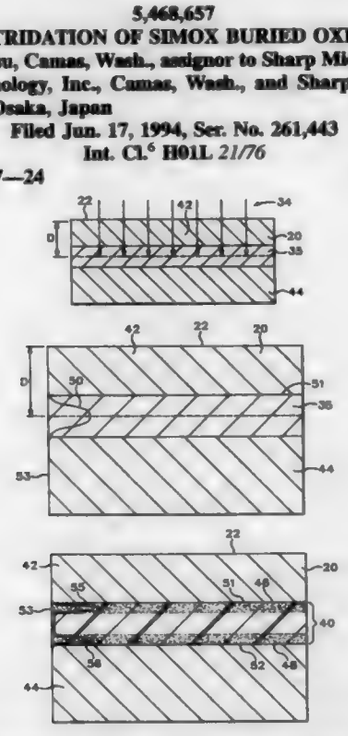
forming a second electrical contact on the contact region of the ridge.

5,468,657

NITRIDATION OF SIMOX BURIED OXIDE

Sheng T. Hsu, Camas, Wash., assignor to Sharp Microelectronics Technology, Inc., Camas, Wash., and Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 17, 1994, Ser. No. 261,443
Int. Cl.[6] H01L *21/76*
U.S. Cl. 437—24 **16 Claims**



1. In a process for making a semiconductor substrate in which a buried insulating layer is formed between upper and lower semiconductor regions, a method of increasing the electrical isolation between the upper and lower semiconductor regions comprising the following steps:

(a) forming a buried insulating layer in a buried insulator region;

(b) implanting nitrogen ions into the substrate to form a distribution of nitrogen ions centered at the same general depth as the center of the buried insulating layer region; and

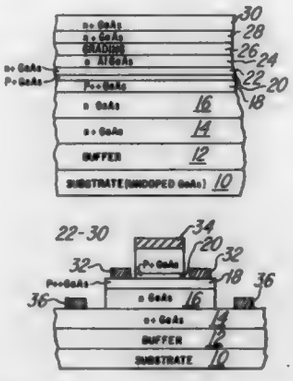
(c) heating the substrate to cause migration of nitrogen ions to the interface regions between the buried insulating layer and the upper and lower semiconductor regions, whereby the nitrogen passivates said interface regions.

5,468,658

METHOD OF MAKING MULTILAYER BASE HETEROJUNCTION DEVICE HAVING ONE OF BASE LAYER AS A DIFFUSION BARRIER BETWEEN BASE-EMITTER JUNCTION

Burhan Bayraktaroglu, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 980,399, Jun. 18, 1992, abandoned, which is a division of Ser. No. 672,809, Mar. 21, 1991, Pat. No. 5,132,764. This application Dec. 7, 1993, Ser. No. 164,641
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—31 **8 Claims**



1. A method of forming a heterojunction device, said method comprising the steps of:

a. forming an n type collector layer over a substrate;

b. forming a p type first base layer over said n type collector layer;

c. forming a p type second base layer over said p type first base layer, with said p type second base layer being less heavily doped than said p type first base layer;

d. forming an n type emitter layer over said p type second base layer, wherein said n type emitter layer is formed of a material having a larger energy band gap than that of said p type second base layer, and whereby, said p type second base layer serves as a diffusion barrier between said p type first base layer and said n type emitter layer.

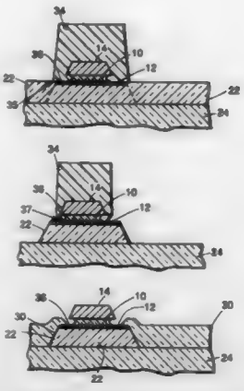
5,468,659

REDUCTION OF BASE-COLLECTOR JUNCTION PARASITIC CAPACITANCE OF HETEROJUNCTION BIPOLAR TRANSISTORS

Madjid Hafizi, Santa Monica; William E. Stanchina, Thousand Oaks, and William W. Hooper, Westlake Village, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 10, 1994, Ser. No. 209,339
Int. Cl.[6] H01L *21/265;21/20*
U.S. Cl. 437—31 **8 Claims**

1. A method for providing a base-collector junction area that is approximately the same as a base-emitter junction area in a heterojunction bipolar transistor comprising (1) a substrate, (2) a collector layer formed on said substrate, an electrical contact to said collector layer, a base layer formed on said collector layer, an electrical contact to said base layer, an emitter layer formed on said base layer, and an electrical contact to said emitter layer, said collector layer extending away from said emitter layer so as to support said electrical contact to said base layer, said method comprising:



(a) removing all of said base layer and said collector layer that extend away from said emitter layer to leave an unfilled volume;

(b) backfilling said unfilled volume with a dielectric material; and

(c) depositing said electrical contact to said base layer on said dielectric material,

wherein prior step (a), a photoresist layer is formed over at least said electrical contact to said emitter layer and over said emitter layer and said base layer, said photoresist layer is patterned to protect said electrical contact to said emitter layer and over said emitter layer and said base layer, and

prior to step (b), said photoresist layer is treated so as to shrink its volume and form an undercut portion which allows subsequent lift-off of said dielectric material.

5,468,660

PROCESS FOR MANUFACTURING AN INTEGRATED BIPOLAR POWER DEVICE AND A FAST DIODE

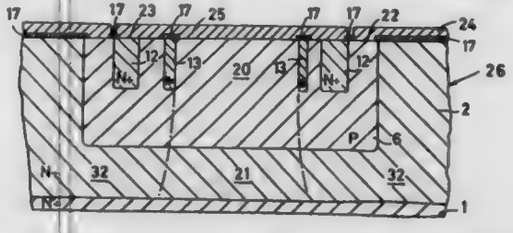
Ferruccio Frisina, and Giuseppe Feria, both of Catania, Italy, assignors to Consorzio per la Ricerca Sulla Microelettronica Nel Mezzogiorno, and SGS-Thomson Microelectronics S.r.l., both of, Italy

Division of Ser. No. 852,310, Mar. 18, 1992, Pat. No. 5,343,068. This application May 31, 1994, Ser. No. 251,514

Claims priority, application Italy, Mar. 28, 1991, M191A0836

Int. Cl.[6] H01L *21/77*

U.S. Cl. 437—31 **4 Claims**



1. A process for the manufacture of an integrated structure containing a bipolar power device with high current density and a fast diode, comprising the steps of: growing an epitaxial layer on a substrate semiconductor material with dopant of a first type, forming an oxide layer over said epitaxial layer, masking and etching the oxide layer to define a base region, implanting and diffusing dopant of a second type into said base region, forming a second oxide layer over said epitaxial layer, masking and etching said second oxide layer to define an emitter region and at least one annular region which laterally delimits a portion of said base region, implanting and diffusing dopant of the first type into said emitter region and into said at least one annular region, introducing impurities into the entire structure to increase the lifetime of minority carriers, implanting inside said portion of the base region ions suitable for reducing the lifetime of the minority carriers, and diffusing them in depth into an underlying portion of the epitaxial layer and down to the substrate.

5,468,661

METHOD OF MAKING POWER VFET DEVICE

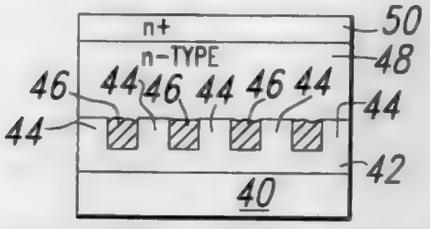
Han-Tzong Yuan; Donald L. Plumton; Tae S. Kim, all of Dallas, and Jau-Yuann Yang, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 17, 1993, Ser. No. 78,388

The portion of the term of this patent subsequent to Aug. 30, 2011, has been disclaimed.

Int. Cl.[6] H01L *21/8258*

U.S. Cl. 437—40 **9 Claims**



1. A method of forming a vertical transistor device comprising:

a. forming a n-type first drain/source layer over a substrate;

b. patterning a top portion of said first drain/source layer to form a channel and a trench, wherein said trench is formed where said first drain/source layer is removed after patterning and said channel is formed adjacent to said trench in said top portion of said first drain/source layer that is not removed during patterning;

c. forming a p-type carbon doped gate structure in said trench; and

d. forming a n-type second drain/source layer over said gate structure and said channel.

5,468,662

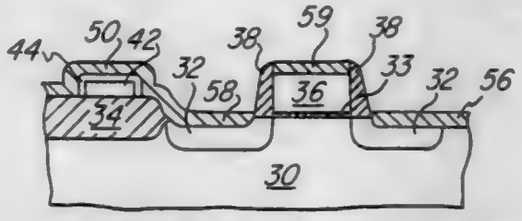
METHOD OF MAKING THIN FILM TRANSISTOR AND A SILICIDE LOCAL INTERCONNECT

Robert H. Havemann, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 955,942, Oct. 2, 1992, Pat. No. 5,403,759. This application Dec. 7, 1994, Ser. No. 350,785

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—40 **11 Claims**



1. A method of fabricating a transistor on a wafer comprising:

a. forming a doped polysilicon transistor body with source/drain regions on top of an insulator;

b. forming a gate oxide on top of said transistor body;

c. depositing a first metal layer over said transistor body, and a portion of said insulator;

d. annealing said first metal layer to create silicided regions above said source/drain regions, then removing unsilicided portions of said first metal layer, and then depositing a second metal layer over said transistor body;

e. forming an amorphous silicon layer over said second metal layer, said amorphous silicon layer patterned in a gate and a local interconnect configuration;

f. annealing to form silicided to form silicided regions above said source/drain regions within said transistor body, and where said second metal layer reacts with said amorphous silicon layer to create a silicided gate and a silicided local interconnect; and

g. etching unsilicided metal to leave silicided source/drain regions, a silicided gate, and a silicided local interconnect.

5,468,663

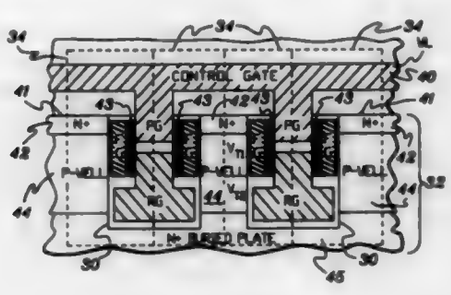
METHOD OF FABRICATING THREE-DIMENSIONAL DIRECT-WRITE EEPROM ARRAYS

Claude L. Bertin, South Burlington, Vt.; Donelli J. DiMaria, Ossining, N.Y.; Makoto Miyakawa, and Yoshinori Sakaue, both of Tokyo, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 850,734, Mar. 12, 1992. This application Mar. 16, 1995, Ser. No. 405,128

Int. Cl.[6] H01L 21/8247

U.S. Cl. 437—43 10 Claims



1. A method for fabricating a semiconductor device memory array, said method comprising the steps of:

(a) providing a substrate of a first conductivity type material and having a first surface, said substrate including a buried plate region having a higher concentration of said first conductivity type material and a well region of a second conductivity type material, said well region extending from said first surface of said substrate to said buried plate region of said substrate, said substrate further including a diffusion region of said first conductivity type material extending from said first surface partially into said well region of said second conductivity type material;

(b) forming a trench mask on said first surface of said substrate, said trench mask exposing said first surface of said substrate through an elongated opening, said elongated opening being aligned over said first surface of said substrate such that said diffusion region of first conductivity type material is at least partially disposed under said trench mask adjacent said elongated opening in said mask;

(c) etching through said elongated mask opening to form a trench in said semiconductor substrate, said trench extending through said well region of second conductivity type material to said buried plate region of first conductivity type material;

(d) forming a polysilicon structure in a bottom portion of said substrate trench as a base for a recall gate;

(e) forming in said trench at least two sidewall floating gates having top and side surfaces, the top surface of each of said floating gates substantially overlapping said diffusion region of first conductivity type material disposed within said well region of second conductivity type material;

(f) depositing a spacer layer on the exposed side surfaces of said floating gates;

(g) forming a polysilicon extension of said recall gate partially up said spacer layer on said side surfaces of said floating gates; and

(h) forming at least one polysilicon program gate in said trench above said recall gate extension, said at least one program gate being disposed in an upper portion of said elongated trench and extending partially down said spacer layer on said side surfaces of said floating gates.

5,468,664

METHOD OF MAKING SEMICONDUCTOR DEVICE WITH ALIGNMENT MARKS

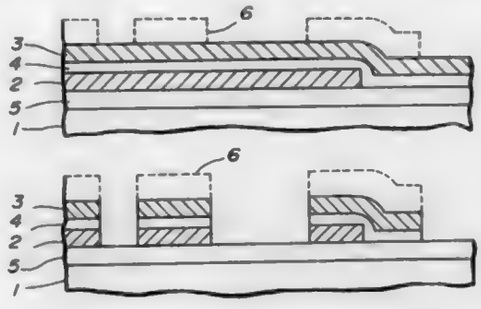
Tatsuya Kajita, Tokyo, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 932,728, Aug. 24, 1992, Pat. No. 5,391,902, which is a continuation of Ser. No. 524,767, May 17, 1990, abandoned. This application Nov. 16, 1994, Ser. No. 342,021

Claims priority, application Japan, May 20, 1989, 1-127502

Int. Cl.[6] H01C 21/8247

U.S. Cl. 437—43 15 Claims



1. A method of producing a semiconductor device comprising the steps of:

preparing a stacked structure including a base layer, a patterned lower layer formed on a surface of said base layer, an intermediate layer which covers the surface of said base layer in its entirety including said lower layer, and an upper layer which covers a surface of said intermediate layer in its entirety, said lower layer having an etching rate greater than an etching rate of said intermediate layer;

patterning said upper and lower layers in a chip region containing electrically coupled elements that form part of an electric circuit on said base layer so that said upper layer and said intermediate layer are aligned to one side surface of said lower layer in at least a part of said chip region; and

patterning said upper layer in a peripheral region including no elements which form said electric circuit so that said intermediate layer and said upper layer cover one side surface of said lower layer in at least a part of said peripheral region, said peripheral region surrounding said chip region on said base layer.

5,468,665

PROCESS FOR MAKING A SEMICONDUCTOR MOS TRANSISTOR EMPLOYING A TEMPORARY SPACER

Chang-Jae Lee, Chungcheongbuk-do, and Hyunsang Hwang, Seoul, both of, Rep. of Korea, assignors to Goldstar Electron Co., Ltd., Cheongju, Rep. of Korea

Filed Jan. 23, 1995, Ser. No. 376,514

Claims priority, application Rep. of Korea, Jan. 21, 1994, 94-1110

Int. Cl.[6] H01L 21/335;21/8238

U.S. Cl. 437—44 24 Claims

1. A process for forming a MOSFET comprising the steps of:

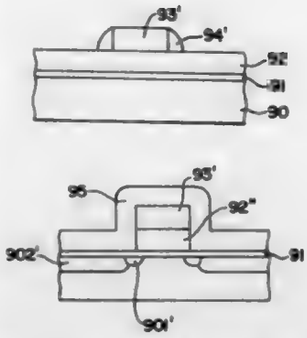
(a) forming a first insulating layer, a conductive layer and an auxiliary layer upon a semiconductor substrate;

(b) etching portions of the auxiliary layer to form an auxiliary layer pattern;

(c) forming a temporary layer side wall spacer at the sides of the auxiliary layer pattern;

(d) etching portions of the conductive layer utilizing the auxiliary layer pattern and the temporary layer spacer as a mask, and forming a high concentration first dopant buried layer within the semiconductor substrate; and

(e) removing the temporary layer spacer, forming a gate electrode by etching the conductive layer utilizing the auxiliary



layer pattern as a mask, and forming a low concentration second dopant buried layer within the semiconductor substrate.

20. A process for formation of a CMOS semiconductor device, comprising the steps of:

(a) forming a first insulating layer, a conductive layer and an auxiliary layer upon a semiconductor substrate;

etching portions of the auxiliary layer to form an auxiliary layer pattern;

forming a temporary layer side wall spacer at the sides of the auxiliary layer pattern;

(b) defining an NMOS region, and etching the conductive layer using the temporary side wall spacer and the auxiliary layer pattern of the NMOS region as a mask;

forming an n type heavily doped region using the etched conductive layer as a mask;

removing the temporary side wall spacer, and etching the conductive layer using the auxiliary layer pattern as a mask to form an NMOS gate electrode;

forming an n type lightly doped region using the NMOS gate electrode as a mask;

(c) defining a PMOS region, and etching the conductive layer using the temporary side wall spacer and the auxiliary layer pattern of the PMOS region as a mask;

forming a p type heavily doped region using the etched conductive layer as a mask;

removing the temporary side wall spacer, and etching the conductive layer using the auxiliary layer pattern as a mask to form a PMOS gate electrode; and

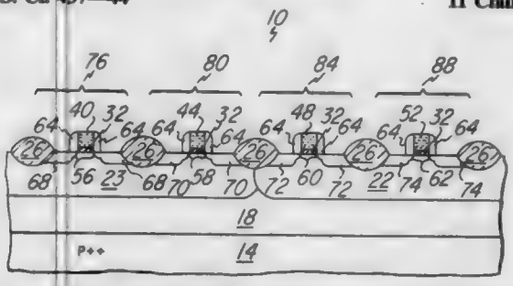
forming a p type lightly doped region using the PMOS gate electrode as a mask.

5,468,666

USING A CHANGE IN DOPING OF POLY GATE TO PERMIT PLACING BOTH HIGH VOLTAGE AND LOW VOLTAGE TRANSISTORS ON THE SAME CHIP

Richard A. Chapman, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 29, 1993, Ser. No. 55,999
Int. Cl.[6] H01L 21/265
U.S. Cl. 437—44 **11 Claims**



1. A method for forming a semiconductor device having a semiconductor body, comprising the steps of:

a. forming a gate oxide over a surface of said semiconductor body;

b. depositing a layer of polysilicon over said gate oxide;

c. masking said polysilicon layer overlying a high voltage NMOS region and exposing a first portion of said polysilicon layer overlying a low voltage NMOS region;

d. implanting said first portion of said polysilicon layer with an n-type dopant at a first dopant implant dose;

e. etching said polysilicon layer and said gate oxide to form at least one high voltage NMOS gate in said high voltage NMOS region and at least one low voltage NMOS gate in said low voltage NMOS region; and

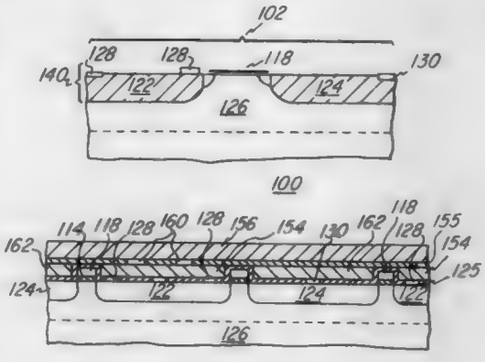
f. implanting first and second source/drain regions on opposite sides of said high voltage NMOS gate, third and fourth source/drain regions on opposite sides of said low voltage NMOS gate, said high voltage NMOS gate and said low voltage NMOS gate with said n-type dopant at a second dopant implant dose.

5,468,667

METHOD OF PLACING SOURCE CONTACTS FOR EFFICIENT ESD/EOS PROTECTION IN GROUNDED SUBSTRATE MOS INTEGRATED CIRCUIT

Carlos H. Diaz, Urbana, Ill.; Charvaka Duvvury, Plano, Tex., and Sung-Mo Kang, Champaign, Ill., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 40,957, Mar. 31, 1993, Pat. No. 5,404,041.
This application Dec. 15, 1994, Ser. No. 356,768
Int. Cl.[6] H01L 21/8234
U.S. Cl. 437—50 **6 Claims**



1. A method of forming an ESD/EOS protection circuit comprising the steps of:

a. forming a plurality of gates over a surface of a semiconductor body;

b. forming a plurality of source regions and a plurality of drain regions, wherein each of said source regions is self-aligned with a first side of one of said plurality of gates and each of said drain regions is self-aligned with a second side of one of said plurality of gates;

c. forming a plurality of drain contacts over each of said drain regions at a first distance from said plurality of gates; and

d. forming a plurality of source contacts arranged into a plurality of rows and columns over each of said source regions at a second distance from said plurality of gates, wherein said second distance is less than said first distance.

5,468,668

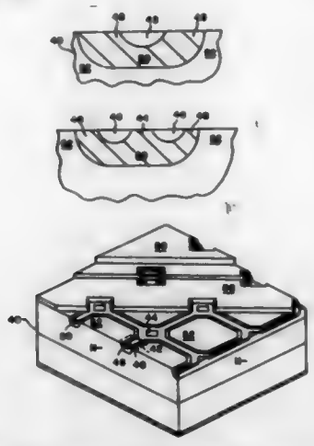
METHOD OF FORMING MOS-GATED SEMICONDUCTOR DEVICES HAVING MESH GEOMETRY PATTERN

John M. S. Neilson, Norristown; Carl F. Wheatley, Jr., Drums; Frederick P. Jones, Mountaintop, all of Pa., and Victor A. K. Temple, Clifton, N.Y., assignors to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 158,444, Nov. 29, 1993, Pat. No. 5,399,892. This application Jan. 4, 1995, Ser. No. 368,612

Int. Cl.[6] H01L *21/77*

U.S. Cl. 437—51 **10 Claims**



1. A method of making a MOS-gated semiconductor device comprising the steps of:

a. growing an epitaxial layer of a first conductivity type on a substrate of either the first or a second conductivity type;

b. doping a body region of the second conductivity type in a mesh pattern in the epitaxial layer so that the body region forms ribbons extending from nodes in the mesh pattern;

c. doping source contact regions of the second conductivity type into the body region at the nodes of the mesh pattern; and

d. doping source regions of the first conductivity type in the body region to a depth less than the depth of the body region so as to form channel regions of the first conductivity type on both sides of the source regions.

5,468,669

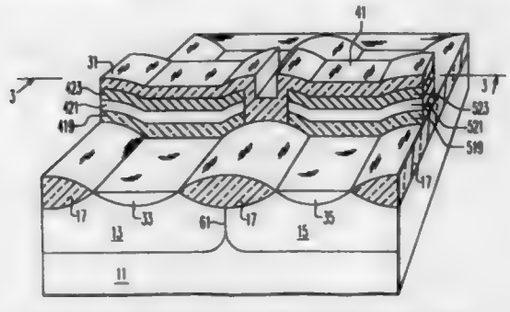
INTEGRATED CIRCUIT FABRICATION

Kuo-Hua Lee, Wescosville, Pa.; Horng-dar Lin; Ran-Hong Yan, both of Holmdel, N.J., and Chen-Hua D. Yu, Allentown, Pa., assignors to AT&T Corp., Murray Hill, N.J.

Filed Oct. 29, 1993, Ser. No. 145,272

Int. Cl.[6] H01L *21/253;21/335*

U.S. Cl. 437—51 **6 Claims**



6. A method of integrated circuit fabrication comprising:

forming an n tub and a p tub in a silicon substrate; there being layer a boundary between said tubs;

forming a field oxide over said boundary;

forming a blanket oxide layer over said substrate;

forming a blanket polysilicon layer contacting said oxide layer, whereby that portion of said polysilicon layer overlying said n tub is p-type and that portion of said polysilicon layer overlying said p tub is n-type;

forming a blanket tungsten silicide layer contacting said polysilicon layer;

forming an opening through at least said tungsten silicide layer and said polysilicon layer, exposing oxide, said opening having sides and a bottom;

forming a blanket layer of titanium nitride contacting said layer of tungsten silicide and contacting said sides and bottom of said opening, patterning said titanium nitride layer and said tungsten silicide layer and said polysilicon layer and said oxide layer together whereby that portion of said polysilicon layer overlying said n tub is severed from that portion of said polysilicon layer overlying said p tub and that portion of said tungsten silicide layer overlying said n tub is severed from that portion of said tungsten silicide layer overlying said p tub;

and further whereby said titanium nitride layer maintains electrical conduction between the said severed portions of said polysilicon layer and said tungsten silicide layer.

5,468,670

METHOD FOR FABRICATING A SEMICONDUCTOR MEMORY DEVICE HAVING A STACKED CAPACITOR CELL

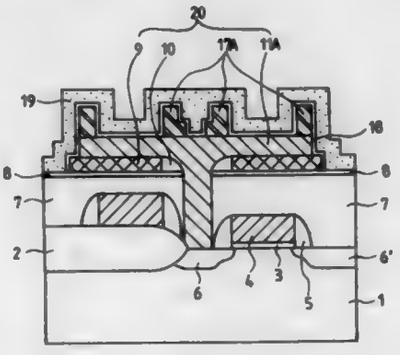
Eui K. Ryou, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Jul. 12, 1994, Ser. No. 273,904

Claims priority, application Rep. of Korea, Jul. 14, 1993, 1993-13268; Aug. 17, 1993, 1993-15934

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—52 **6 Claims**



1. A method for fabricating a dynamic random access memory cell, comprising the steps of:

forming a planarizing insulating film over a semiconductor substrate including a metal oxide transistor, sequentially depositing an etch barrier layer and a polysilicon layer over the planarizing insulating film, and etching a portion of the polysilicon layer corresponding to a contact region by use of a storage electrode contact mask, thereby forming polysilicon spacers respectively on side walls of the polysilicon layer;

etching a portion of the etch barrier layer corresponding to the contact region and a portion of the planarizing insulating film disposed beneath the portion of the etch barrier layer by using the polysilicon layer and the polysilicon spacers as a mask, thereby forming a contact hole through which the semiconductor is partially exposed; then

sequentially forming a polysilicon layer for a first storage electrode and a first oxide film, then forming a photoresist pattern at a storage electrode contact region, and a second oxide film over an exposed portion of the first oxide film;

removing the photoresist pattern, then forming another photoresist pattern for a storage electrode mask, and removing respective exposed portions of the second oxide film, the first

oxide film, the polysilicon layer for the first storage electrode and the polysilicon layer, thereby primarily forming a storage electrode pattern;

removing the photoresist pattern for the storage electrode, forming a polysilicon layer for a second storage electrode, and forming spacers of a third oxide film respectively on side walls of the polysilicon layer for the second storage electrode;

etching the polysilicon layer for the second storage electrode until both the second oxide film and the etch barrier layer are exposed, thereby forming a storage electrode pattern having a double cylindrical structure; and

removing respective remaining portions of the third oxide film spacers, the second oxide film and the first oxide film, forming a dielectric film for a capacitor over the storage electrode pattern, and forming a plate electrode over the dielectric film.

5,468,671

METHOD FOR FABRICATING STACKED CAPACITOR OF SEMICONDUCTOR MEMORY DEVICE

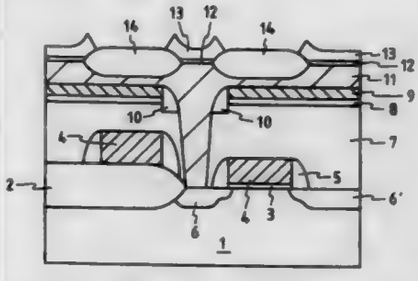
Eui K. Ryou, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries, Co. Ltd., Rep. of Korea

Filed Nov. 18, 1994, Ser. No. 341,765

Claims priority, application Rep. of Korea, Nov. 19, 1993, 93-24749

Int. Cl.[6] H01L *21/70;27/00*

U.S. Cl. 437—52 **21 Claims**



1. A method for fabricating a capacitor of a semiconductor memory device, comprising the steps of:

preparing a semiconductor substrate formed with a transistor having an impurity diffusion region;

sequentially forming a planarized insulating oxide film, a barrier layer, and a first electrode layer over the semiconductor substrate;

etching respective portions of the first electrode layer, the barrier layer and the insulating oxide film in a continued manner in accordance with an etch process using a contact hole mask, thereby forming a first contact hole;

forming electrode material spacers respectively on side walls of the first contact hole such that the insulating oxide film is partially exposed through a region defined by the electrode material spacers;

forming a second contact hole for exposing the impurity diffusion region in accordance with a selective etch process using the first electrode layer and the electrode material spacers as an etch barrier;

forming a second electrode layer after the formation of the second contact hole such that the second electrode layer is in electrical contact with the impurity diffusion region;

growing a sacrificial oxide film pattern having a bird's beak shape on a portion of the second electrode lawyer disposed in both sides of a region where the first contact hole is located;

sequentially etching the second electrode layer and the first electrode layer under a condition that the sacrificial oxide film pattern is used as an etch barrier until an upper surface of the barrier layer is exposed, thereby forming a second-electrode layer pattern and a first-electrode layer pattern;

wet etching the sacrificial oxide film pattern, thereby completely exposing an upper surface of the second-electrode layer pattern; and

sequentially forming a dielectric film and a plate electrode over the first-electrode layer pattern and the second-electrode layer pattern.

5,468,672

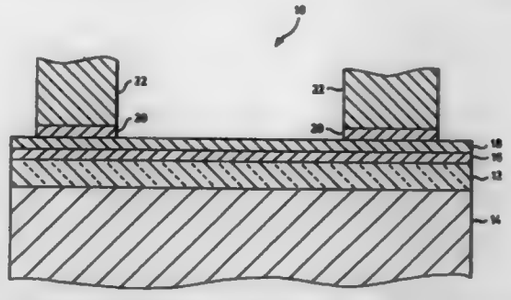
THIN FILM RESISTOR AND METHOD OF FABRICATION

Warren C. Rosvold, Sunnyvale, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Jun. 29, 1993, Ser. No. 84,883

Int. Cl.[6] H01C *1/012*

U.S. Cl. 437—60 **6 Claims**



1. A method of fabricating a thin film resistor, comprising the steps of:

sputter depositing a thin film of a resistive material having a thickness and a temperature coefficient of resistance on an insulative substrate in a reactive medium to increase, for a given sheet resistance, the thickness of the thin film while also increasing the temperature coefficient of resistance of the resistive material; and

depositing on the thin film a cap layer comprising chromium silicon monoxide and heat treating the thin film and the cap layer wherein free chromium from the cap layer diffuses into the resistive material of the thin film to reduce the increased temperature coefficient of resistance of the resistive material resulting from the sputter depositing in the reactive medium.

5,468,673

AVALANCHE DIODE INCORPORATED IN A BIPOLAR INTEGRATED CIRCUIT

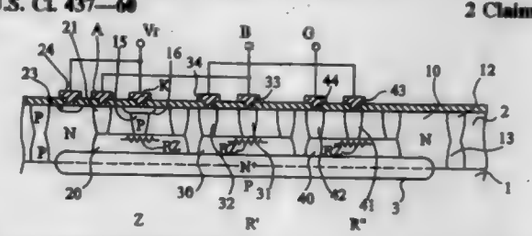
Gérard Le Roux, Sappey-En-Chartreuse, and Jacques Le Meun, Grenoble, both of, France, assignors to SGS-Thomson Microelectronics, S.A., Pouilly, France

Continuation of Ser. No. 202,919, Feb. 28, 1994, Pat. No. 5,414,295. This application Mar. 28, 1995, Ser. No. 411,986

Claims priority, application France, Mar. 1, 1993, 93 02617

Int. Cl.[6] H01L *29/72;29/90*

U.S. Cl. 437—60 **2 Claims**



2. A method for fabricating an avalanche diode, to be used to supply a reference voltage which is insensitive to a manufacturing process of the reference diode, the method comprising the steps of:

formulating an avalanche diode in a bipolar circuit technology including a first conductivity type epitaxial layer coating a second conductivity type substrate;

forming at least one resistor, in series with the avalanche diode, in the bipolar circuit using the same structure as the avalanche

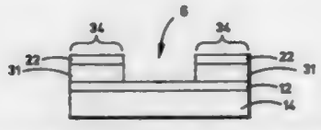
diode except that an active junction of the avalanche diode is omitted from the at least one resistor such that the avalanche diode is insensitive to a voltage ratio of an internal resistance of the avalanche diode and the resistance of the series resistor and is also insensitive to temperature variations.

5,468,674

METHOD FOR FORMING LOW AND HIGH MINORITY CARRIER LIFETIME LAYERS IN A SINGLE SEMICONDUCTOR STRUCTURE

Howard W. Walker, and Graham A. Garcia, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 8, 1994, Ser. No. 260,155
Int. Cl.[6] H01L *21/76*
U.S. Cl. 437—62 **5 Claims**



1. A method for forming a semiconductor structure having a layer with a low minority carrier lifetime and a layer with a high minority carrier lifetime, comprising the steps of:

forming a first silicon dioxide layer having an exposed surface on a layer of low minority carrier lifetime epitaxial silicon-on-sapphire;

forming a second silicon dioxide layer having an exposed surface on a layer of high minority carrier lifetime bulk silicon;

positioning the exposed surfaces of the first and second silicon dioxide layers in contact;

annealing the first and second silicon dioxide layers to form a bonded structure having an annealed silicon dioxide layer;

thinning the bulk silicon layer of the bonded structure; and

patterning the bulk silicon layer and the annealed silicon dioxide layer to form mesas of high minority carrier lifetime bulk silicon and to expose regions of low minority carrier lifetime epitaxial silicon on the bonded structure.

5,468,675

METHOD FOR MANUFACTURING A DEVICE SEPARATION REGION FOR SEMICONDUCTOR DEVICE

Hiroyuki Kaigawa, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

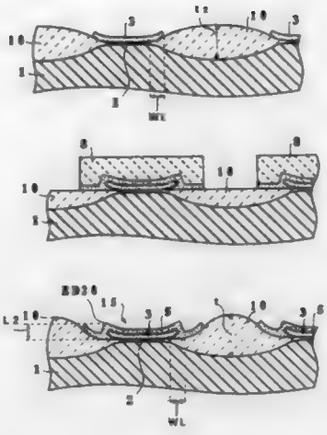
Filed May 26, 1994, Ser. No. 249,433
Claims priority, application Japan, May 26, 1993, 5-123752
Int. Cl.[6] H01L *21/76*
U.S. Cl. 437—69 **4 Claims**

1. A method for manufacturing a device separation region for semiconductor devices, comprising the steps of:

forming an oxide layer on a substrate and then using a first mask, growing by thermal oxidation first portions relative to second portions of said oxide layer to a first thickness, said first portions having first surfaces and said second portions having second surfaces;

altering said first surfaces to become altered first surfaces which are substantially level with said second surfaces;

growing further by thermal oxidation and with use of a second mask said first portions relative to said second portions of said oxide layer to a second thickness, said second thickness being thicker than said first thickness.

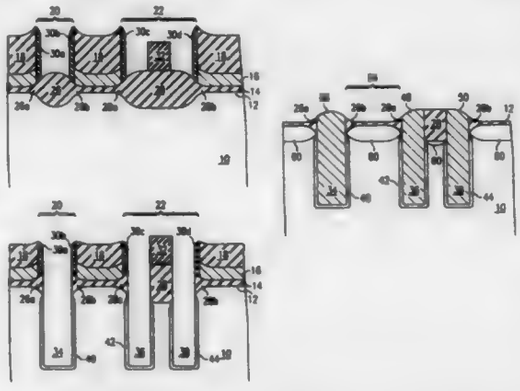


5,468,676

TRENCH ISOLATION STRUCTURE AND METHOD FOR FORMING

Sudhir K. Madan, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 949,656, Sep. 23, 1992, Pat. No. 5,350,941.
This application Jun. 17, 1994, Ser. No. 261,618
Int. Cl.[6] H01L *21/76*
U.S. Cl. 437—70 **15 Claims**



1. A method of forming an isolation structure in a semiconductor layer between first and second active regions in order to electrically isolate the first and second active regions one from the other, the semiconductor layer comprising an outer surface, the method comprising the steps of:

forming a LOCOS structure on the outer surface, the LOCOS structure formed to comprise a first bird's beak structure disposed adjacent the first active region and a second bird's beak structure disposed adjacent the second active region;

forming a first and second trench through the LOCOS structure between the first and second bird's beak structures and the semiconductor layer; and

forming a first trench plug in the first trench and a second trench plug in the second trench, the first and second trenches each comprising sidewalls defining an interface between each of the first and second trench plugs and the semiconductor layer.

5,468,677

ISOLATION STRUCTURE OF SEMICONDUCTOR DEVICE AND METHOD FOR FORMING THE SAME

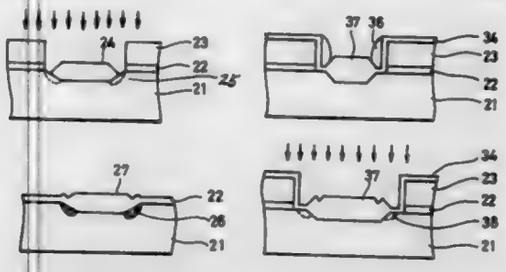
Young K. Jun, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-Do, Rep. of Korea

Filed Dec. 21, 1994, Ser. No. 360,602

Claims priority, application Rep. of Korea, Jan. 21, 1994, 26961/1994

Int. Cl.[6] H01L *21/76*

U.S. Cl. 437—70 11 Claims



1. A method for forming an isolation structure of a semiconductor device, comprising the steps of:

forming an insulating film on a first portion of a substrate except for a field region;

forming a field insulating film on a second portion of the substrate corresponding to the field region;

partially exposing the second surface portion of the substrate by a predetermined width along an edge of the field insulating film;

implanting channel stop ions in the exposed portion of the substrate; and

annealing the implanted channel stop ions and thereby forming a channel stop diffusion region.

5,468,678

METHOD OF MANUFACTURING P-TYPE COMPOUND SEMICONDUCTOR

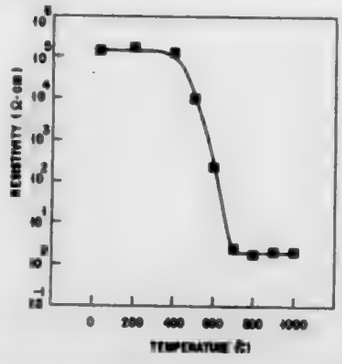
Shuji Nakamura; Naruhito Iwasa, and Masayuki Senoh, all of Anan, Japan, assignors to Nichia Chemical Industries, Ltd., Tokushima, Japan

Division of Ser. No. 970,145, Nov. 2, 1992, Pat. No. 5,306,662. This application Jan. 12, 1994, Ser. No. 180,326

Claims priority, application Japan, Nov. 8, 1991, 3-321353; Dec. 24, 1991, 3-357046; Jan. 22, 1992, 4-32763; Jan. 29, 1992, 4-40280

Int. Cl.[6] H01L *21/203*

U.S. Cl. 437—107 8 Claims



1. A method of manufacturing a p-type II-VI compound semiconductor by a vapor phase epitaxy method, comprising the steps of:

growing a II-VI compound semiconductor by introducing a reaction gas containing a hydrogen compound of a p-type impurity; and

annealing said II-VI compound semiconductor at a temperature of not less than 300° C. and less than 700° C. to remove hydrogen atoms from the II-VI compound semiconductor.

5,468,679

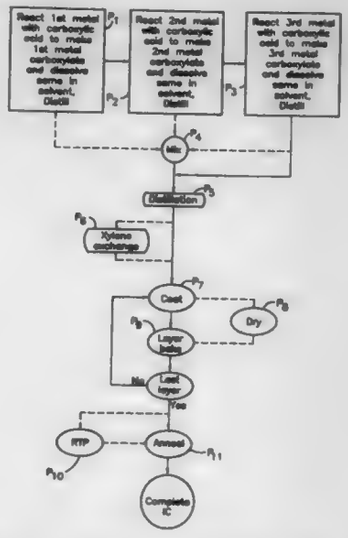
PROCESS FOR FABRICATING MATERIALS FOR FERROELECTRIC, HIGH DIELECTRIC CONSTANT, AND INTEGRATED CIRCUIT APPLICATIONS

Carlos A. Paz de Araujo; Michael C. Scott; Joseph D. Cuchiaro, and Larry D. McMillan, all of Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 981,133, Nov. 24, 1992, Pat. No. 5,423,285, which is a continuation-in-part of Ser. No. 965,190, Oct. 23, 1992, which is a continuation-in-part of Ser. No. 807,439, Dec. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 660,428, Feb. 25, 1991, abandoned. This application Nov. 18, 1993, Ser. No. 154,760

Int. Cl.[6] H01L *21/20;21/324*

U.S. Cl. 437—110 14 Claims



1. A method of fabricating an integrated circuit including a layered superlattice material, said method comprising the steps of:

providing an integrated circuit substrate and a precursor liquid including a plurality of metal moieties in effective amounts for spontaneously forming a layered superlattice material upon thermal treatment of said precursor liquid;

forming a film of said precursor on said integrated circuit substrate;

heating said film to form a layered superlattice material on said integrated circuit substrate; and

completing the fabrication of said integrated circuit substrate to form thereon a plurality of interconnected electrical devices.

5,468,680

METHOD OF MAKING A THREE-TERMINAL FUSE

Simon S. Cohen, Burlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

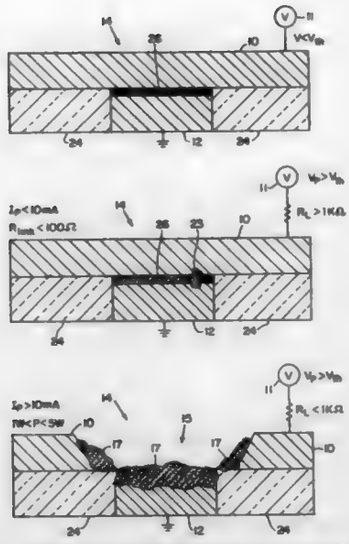
Filed Mar. 18, 1994, Ser. No. 210,344

Int. Cl.[6] H01L *21/14;21/44*

U.S. Cl. 437—170 6 Claims

1. A method of cutting across a conductive line at a breakpoint comprising:

providing a control electrode adjacent to the breakpoint with an insulator between the conductive line and the control electrode; and



applying a voltage across the insulator between the conductive line and the control electrode to create a transient conductive link between the conductive line and the control electrode through the insulator while applying sufficient current through the transient conductive link to heat around the link sufficiently to cut across the conductive line at the breakpoint to interrupt the continuity of the conductive line.

5,468,681

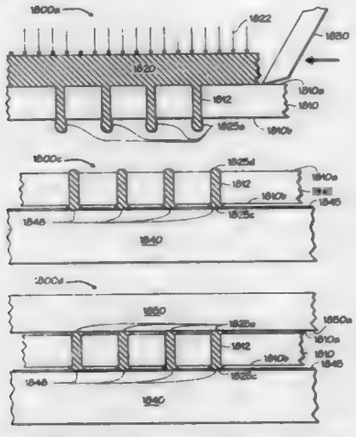
PROCESS FOR INTERCONNECTING CONDUCTIVE SUBSTRATES USING AN INTERPOSER HAVING CONDUCTIVE PLASTIC FILLED VIAS

Nicholas F. Pasch, Pacifica, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

which is a continuation-in-part of Ser. No. 105,547, Aug. 12, 1993, Ser. No. 105,269, Aug. 12, 1993, Ser. No. 106,157, Aug. 12, 1993, and Ser. No. 105,838, Aug. 12, 1993, Pat. No. 5,347,162, each , Aug. 12, 0which is a continuation-in-part of Ser. No. 981,096, Nov. 24, 1992, Pat. No. 5,299,730, which is a continuation of Ser. No. 775,009, Oct. 11, 1991, Pat. No. 5,168,346, which is a continuation of Ser. No. 576,182, Aug. 30, 1990, Pat. No. 5,111,279, which is a continuation of Ser. No. 400,572, Aug. 28, 1989, abandoned. This application Jun. 15, 1994, Ser. No. 260,078

Int. Cl.[6] H01L *21/28;21/58;21/603*

U.S. Cl. 437—183 **5 Claims**



1. A method of forming conductive plastic structures in a flip-chip assembly, comprising:

providing a first substrate with first conductive pads disposed on a surface thereof;

providing a second substrate with corresponding second conductive pads disposed on a surface thereof;

providing a preformed planar structure having a first face, a second opposite face, and through holes extending from the first face to the second face, each through hole having an end in each face of the preformed planar structure;

forcing a conductive plastic material through the through holes from a forcing end of the through holes such that raised globs of the conductive plastic material extend from an opposite end of the through holes;

removing the conductive plastic material from the face of the preformed planar structure corresponding to the forcing end of the through holes such that the plastic material in the through holes is flush with the forcing ends on the through holes;

aligning the raised globs with corresponding first conductive pads;

pressing the first substrate and preformed planar structure together such that the raised globs contact the corresponding first conductive pads and spread to form a liquid seal over the first conductive pads and between the first substrate and the preformed planar structure, and such that raised bumps of conductive material are formed at the forcing ends of the through holes;

aligning the raised bumps with corresponding second conductive pads; and

pressing the second first substrate and preformed planar structure together such that the bumps contact the corresponding second conductive pads and spread to form a liquid seal over the second conductive pads and between the substrate and the preformed planar structure.

5,468,682

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE USING THE ABRASIVE

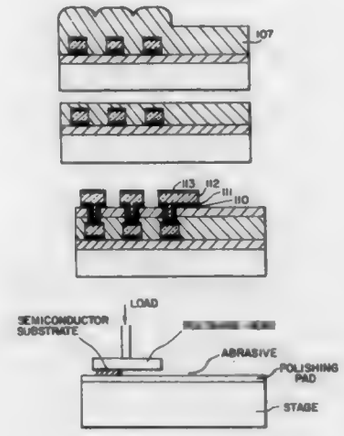
Tetsuya Homma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 13, 1994, Ser. No. 355,008

Claims priority, application Japan, Dec. 21, 1993, 5-322516

Int. Cl.[6] H01L *21/463*

U.S. Cl. 437—195 **6 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of: forming a first wiring layer on an insulating film covering a semiconductor substrate, forming an interlayer insulating film having a silicon oxide film to cover said first wiring layer and said insulating film, and polishing said interlayer insulating film by use of an abrasive containing fine particles of fluorinated silicon oxide to thereby make a surface of said interlayer insulating film even.

5,468,683

METHOD OF MANUFACTURING AN OPTOELECTRONIC SEMICONDUCTOR DEVICE HAVING A SINGLE WIRE BETWEEN NON-PARALLEL SURFACES

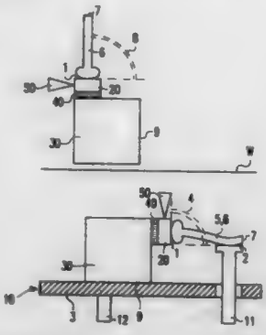
Hermanus A. Van De Pas, Wijchen; Rudolf P. Tijburg, and Johannes A. De Poorter, both of Eindhoven, all of, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 110,598, Aug. 23, 1993, abandoned. This application Sep. 22, 1993, Ser. No. 125,375

Claims priority, application European Pat. Off., Sep. 25, 1992, 92202949

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—209 13 Claims



1. A method of manufacturing an optoelectronic semiconductor device, comprising the steps of:

connecting a wire having a first end and a second end to one of an optoelectronic semiconductor element having a first contact surface and a carrier support having a second contact surface at the first end of the wire:

attaching the optoelectronic semiconductor element to the carrier support so that the first contact surface and the second contact surface enclose an angle between the surfaces; and

connecting the wire to a different one of the first contact surface and the second contact surface at the second end of the wire, whereby the non parallel surfaces of the optoelectronic semiconductor element and the carrier support are connected by a single wire.

5,468,684

INTEGRATED CIRCUIT WITH LAYERED SUPERLATTICE MATERIAL AND METHOD OF FABRICATING SAME

Hiroyuki Yoshimori, Kanagawa; Hitoshi Watanabe, Tokyo, both of, Japan; Carlos A. Paz De Araujo; Shuzo Hiraide, both of Colorado Springs, Colo.; Takashi Mihara, Saitama, Japan, and Larry D. McMillan, Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo., and Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 981,133, Nov. 24, 1992, Pat. No. 5,423,285, and Ser. No. 965,190, Oct. 23, 1992, abandoned, each , Oct. 23, 0which is a continuation-in-part of Ser. No. 807,439, Dec. 13, 1991, abandoned. This application May 21, 1993, Ser. No. 65,666

Int. Cl.[6] H01L *21/465*

U.S. Cl. 437—228 46 Claims

1. A method of fabricating an integrated circuit, said method comprising the steps of:

providing a substrate comprising silicon;

forming a first electrode on said substrate;

annealing said first electrode;

forming an intermediate layer on said first electrode before patterning of said first electrode, said intermediate layer comprising a material selected from a group consisting of ferroelectric materials and layered superlattice materials;

annealing said intermediate layer;

forming a second electrode on said intermediate layer; then, subsequent to the above steps, patterning said first electrode, said intermediate layer, and said second electrode.

5,468,685

METHOD FOR PRODUCING A SEMICONDUCTOR INTEGRATED CIRCUIT

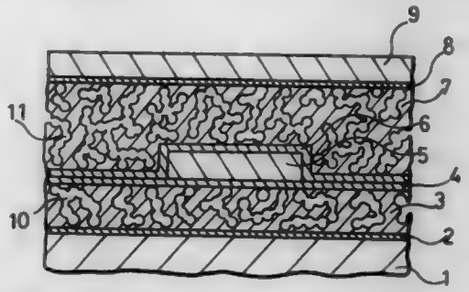
Shinji Orisaka, and Minoru Noda, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 35,263, Mar. 22, 1993. This application Oct. 27, 1994, Ser. No. 329,908

Claims priority, application Japan, Mar. 31, 1992, 4-109210

Int. Cl.[6] H01L *21/311*

U.S. Cl. 437—228 5 Claims



1. A method for producing an interlayer insulating film comprising:

applying a mixture of a main constituent of an interlayer insulating film and solid particles comprising a material different from the main constituent to a wafer where the interlayer insulating film is to be formed and solidifying the main constituent; and

selectively etching the solid particles with an etchant that etches the solid particles but does not etch the main constituent.

5,468,686

METHOD OF CLEANING AN ETCHING CHAMBER OF A DRY ETCHING SYSTEM

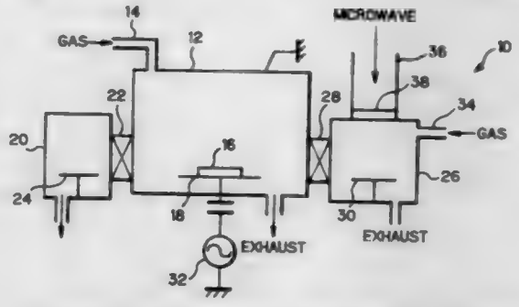
Hiedaki Kawamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 30, 1994, Ser. No. 351,074

Claims priority, application Japan, Dec. 1, 1993, 5-301373

Int. Cl.[6] H01L *21/312*

U.S. Cl. 437—229 3 Claims



1. A method of cleaning an etching chamber of a dry etching system having said etching chamber in which a single semiconductor substrate is disposed and etched, and at least one auxiliary chamber communicated to said etching chamber via a gate valve and capable of accommodating said semiconductor substrate, said method comprising the steps of:

(a) introducing halogen gas into said etching chamber to etch a single semiconductor substrate by plasma, said semiconductor substrate having an aluminum film and a resist film provided on said aluminum film in a desired pattern;

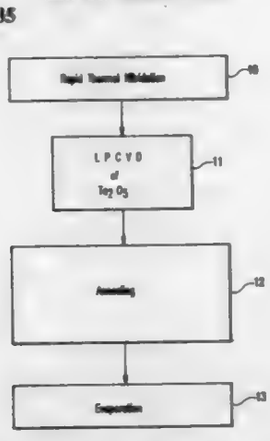
(b) replacing, while leaving said semiconductor substrate in said etching chamber, said halogen gas with cleaning gas containing oxygen gas and capable of removing remaining chlorine to thereby generate plasma; and
(c) effecting dry etching in said etching chamber.

5,468,687

METHOD OF MAKING Ta_2O_5 THIN FILM BY LOW TEMPERATURE OZONE PLASMA ANNEALING (OXIDATION)

Dan Carl, Mountainview, Calif.; David M. Dobuzinsky; Son V. Nguyen, both of Hopewell Junction, N.Y., and Tue Nguyen, Vancouver, Wash., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 27, 1994, Ser. No. 281,399
Int. Cl.[6] H01L *21/70*
U.S. Cl. 437—235 **5 Claims**



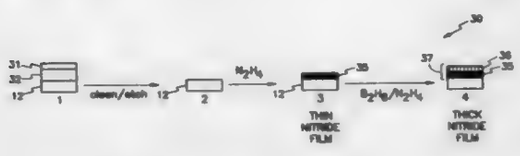
1. A method of producing high dielectric constant Ta_2O_5 thin films comprising the steps of:
subjecting a p- or n-type silicon substrate to a rapid thermal nitridation;
depositing by low pressure chemical vapor deposition (LPCVD) a thin Ta_2O_5 film on the nitrided substrate; and
annealing the Ta_2O_5 film with a low temperature ozone and oxygen enhanced plasma.

5,468,688

PROCESS FOR THE LOW TEMPERATURE CREATION OF NITRIDE FILMS ON SEMICONDUCTORS

Paul A. Kohl, Atlanta, and Kirkland W. Vogt, Doraville, both of Ga., assignors to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Nov. 1, 1993, Ser. No. 146,876
Int. Cl.[6] H01L *21/18*
U.S. Cl. 437—237 **9 Claims**



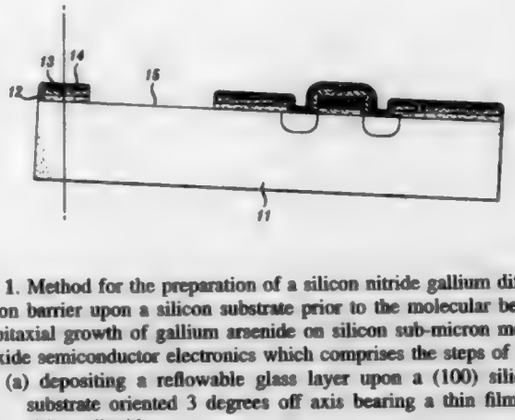
1. A process for creating nitride films on group III–V semiconductors at low temperatures, comprising the steps of:
cleaning a surface of a group III–V semiconductor;
treating said surface with hydrazine in the absence of high energy particles to create a nitride film directly on said surface; and
maintaining said semiconductor at a temperature which is less than about 400° C. during creation of said nitride film.

5,468,689

METHOD FOR PREPARATION OF SILICON NITRIDE GALLIUM DIFFUSION BARRIER FOR USE IN MOLECULAR BEAM EPITAXIAL GROWTH OF GALLIUM ARSENIDE

John E. Cunningham, Lincroft; Keith W. Goossen, Aberdeen; William Y. Jan, Scotch Plains, and James A. Walker, Howell, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Nov. 16, 1993, Ser. No. 153,719
Int. Cl.[6] H01L *21/02;21/20*
U.S. Cl. 437—241 **7 Claims**



1. Method for the preparation of a silicon nitride gallium diffusion barrier upon a silicon substrate prior to the molecular beam epitaxial growth of gallium arsenide on silicon sub-micron metal oxide semiconductor electronics which comprises the steps of
(a) depositing a reflowable glass layer upon a (100) silicon substrate oriented 3 degrees off axis bearing a thin film of silicon dioxide,
(b) subjecting the resultant structure to a gaseous mixture comprising nitrogen and silane in a plasma enhanced chemical vapor deposition chamber, the ratio of nitrogen to silane being less than 300:1, thereby forming a silicon nitride layer, and
(c) depositing gallium arsenide by molecular beam epitaxial growth on said silicon nitride layer.

5,468,690

COMBUSTIBLE SLURRY FOR JOINING METALLIC OR CERAMIC SURFACES OR FOR COATING METALLIC, CERAMIC AND REFRACTORY SURFACES

Jainagesh A. Sekhar; V. Subramanian, and Necip S. Canarslan, all of Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

Continuation of Ser. No. 787,091, Nov. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 753,216, Aug. 30, 1991, abandoned. This application Feb. 15, 1994, Ser. No. 196,905
Int. Cl.[6] C04B *35/00;35/56;35/44*
U.S. Cl. 501—1 **8 Claims**

1. A slurry for coating metallic or ceramic and refractory surfaces, comprising:
a liquid suspending medium selected from the group consisting of monoaluminum phosphate, and colloidal silica; and
particulate constituents suspended in said medium capable of undergoing exothermic reaction by combustion synthesis when ignited, said constituents being selected from the group consisting of from 75% to 85% titanium, and 15% to 25% crystalline carbon; from 75% to 85% titanium, and 15% to 25% amorphous carbon; from 60% to 68% titanium, and 32% to 40% aluminum; from 35% to 41% aluminum, 30% to 36% titanium dioxide, and 27% to 31% boron oxide; from 50% to 97.5% aluminum oxide, 2% to 25% titanium, and 0.5% to 25% amorphous carbon; and mixtures thereof.

5,468,691

Patent Not Issued For This Number

5,468,692

NON-BROWNING CATHODE RAY TUBE GLASSES

Heather Boek, Corning; Nicholas F. Borrelli, Elmira, and George F. Hares, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 19, 1994, Ser. No. 358,477
Int. Cl.[6] C03C *3/095*
U.S. Cl. 501—64 4 Claims

1. A glass essentially free from ZnO, PbO and other easily reducible metal oxides other than Sb_2O_3 which is essentially colorless, and which exhibits essentially no browning discoloration upon being exposed to high voltage electrons, a linear coefficient of thermal expansion (25°–300° C.) between about $97–100\times10^{-7}$/° C., an annealing point not lower than about 475° C., a strain point not lower than about 440° C., an electrical resistivity expressed as Log R greater than 9 at 250° C. and greater than 7 at 350° C., and a liquidus temperature below about 1100° C., said glass consisting essentially, expressed in terms of weight percent on the oxide basis, of

SiO_2	55–60	K_2O	5.75–10
Al_2O_3	1–3	$Na_2O + K_2O$	10.5–14
ZrO_2	0–3.5	K_2O/Na_2O(wt)	1.6–2.6
Li_2O	0.6–2	K_2O/Na_2O(mol)	>1
SrO	7.5–13.5	CeO_2	0.5–1
BaO	14–16	TiO_2	0.25–1
Na_2O	3–5	Sb_2O_3	0.15–0.5 .

5,468,693

LEAD-FREE GLASSES EXHIBITING CHARACTERISTICS OF CRYSTAL

Marie J. M. Comte, Velizy, France, assignor to Corning Incorporated, Corning, N.Y.

Filed Nov. 3, 1994, Ser. No. 333,718
Claims priority, application France, Dec. 10, 1993, 93 14881
Int. Cl.[6] C03C *3/078*
U.S. Cl. 501—72 4 Claims

1. Glasses essentially free from lead characterized in that they exhibit a density of at least 2.9 g/cm^3 and an index of refraction of at least 1.545, and which consist essentially of the following compositions, expressed in terms of weight percent on the oxide basis, of

SiO_2	53–62	ZnO	8–13
Li_2O	0–2	SrO + BaO + ZnO	27–32
Na_2O	2–7	CaO	0–5
K_2O	3–11	Al_2O_3	0–3
$Li_2O + Na_2O + K_2O$	8–14	ZrO_2	0–4
SrO	0–3	$SiO_2 + Al_2O_3 +$	56–65.
BaO	15–19		

5,468,694

COMPOSITION FOR PRODUCING LOW TEMPERATURE CO-FIRED SUBSTRATE

Tomoyuki Taguchi; Hideyuki Kuribayashi, both of Hyogo; Jun Tanaka, Kagoshima; Tomomi Konaga, Kagoshima, and Yoshihiro Morigami, Kagoshima, all of, Japan, assignors to Yamamura Glass Co. Ltd., Nishinomiya, and Kyocera Corporation, Kyoto, both of, Japan

Filed Nov. 22, 1993, Ser. No. 156,059
Claims priority, application Japan, Nov. 21, 1992, 4-335554; Aug. 4, 1993, 5-213401; Aug. 26, 1993, 5-235437
Int. Cl.[6] C03C *3/064*
U.S. Cl. 501—77 20 Claims

9. A composition for a glass-ceramic substrate complete with a firing process under low temperature comprising 80% through 99.9% by weight of a crystallizable glass powder and 0.1% through 20% by weight of an inorganic filler having a minimum of 1.4 m^2/g of mean specific surface area,

wherein oxide components of said crystallizable glass powder are shown below in terms of percent by weight.

Al_2O_3:	45%–58%	SiO_2:	20%–35%
B_2O_3:	5%–15%	MgO:	5%–20%
Li_2O:	0%–2%	Na_2O:	0%–2%
K_2O:	0%–2%		

0%–4% of R_2O; wherein R_2O is a combination of at least two oxides selected from the group consisting of Li_2O, Na_2O and K_2O.

5,468,695

LEAD-FREE THICK FILM PASTE COMPOSITION

Alan F. Carroll, Raleigh, N.C., and Kenneth W. Hang, West Chester, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 99,027, Jul. 29, 1993, Pat. No. 5,378,408.
This application Oct. 27, 1994, Ser. No. 329,812
Int. Cl.[6] C04B *3/064;3/066;* C03C *3/066;8/04*
U.S. Cl. 501—79 1 Claim

1. A lead-free glass composition having a softening point log (eta)=7.6 poise from 400° C.–650° C., a log (eta) specific viscosity in the range from 2 at 500° C. to 5 at 700° C. and consisting essentially of by weight 68–75% Bi_2O_3, 5–15% SiO_2, 5–9% B_2O_3, 0.8–5% Al_2O_3, 0.3–3% CaO, 9–15% ZnO.

5,468,696

HIGHLY CORROSION RESISTANT α-SIALON-LIKE SINTERED BODY AND PROCESS FOR PREPARATION THEREOF

Kenki Ishizawa, Tokyo; Nobuo Ayuzawa; Akira Shiranita, both of Okayama, and Masamichi Takai, Bizen, all of, Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

PCT No. PCT/JP92/01115, § 371 Date Mar. 2, 1994, § 102(e) Date Mar. 2, 1994, PCT Pub. No. WO93/04997, PCT Pub. Date Mar. 18, 1993
PCT Filed Sep. 1, 1992, Ser. No. 199,308
Claims priority, application Japan, Sep. 4, 1991, 3-250344
Int. Cl.[6] C04B *35/599*
U.S. Cl. 501—98 6 Claims

1. A highly corrosion resistant α-sialon sintered body consisting essentially of an α-sialon composition represented by the composition formula

$$M_x(Si,Al)_{12}(O,N)_{16}$$

wherein M is at least one α-sialon-soluble element selected from the group consisting of Yb, Er and Dy, and $0<x\leqq0.8$, and Sc_2O_3, wherein said Sc_2O_3 is insoluble in the α-sialon com-

position and is present in an amount of 0.01 to 15 wt % based on the weight of the sintered body, and wherein the sintered body contains as an intergranular phase a Sc_2O_3—SiO_2 complex having a mole ratio of Sc_2O_3 to SiO_2 within the range of 1:0.1 to 1:50.

5,468,697

COMPOSITE ULTRAFINE PARTICLES OF ALUMINUM NITRIDE AND RARE EARTH NITRIDE, METHOD FOR PRODUCTION AND SINTERED ARTICLE THEREOF

Tadashi Yamaguchi, Sendai; Katsutoshi Nozaki, Wako; Akihisa Inoue, 11-806, Kawauchijutaku, Mubanchi, Kawauchi, and Tsuyoshi Masumoto, 3-8-22, Kamisugi, both of Aoba-ku, Sendai-shi, Miyagi-ken, all of, Japan, assignors to Yoshida Kogyo K.K., Tokyo; Tsuyoshi Masumoto; Akihisa Inoue, both of Miyagi, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, all of, Japan

Filed Mar. 15, 1994, Ser. No. 212,864

Claims priority, application Japan, Mar. 16, 1993, 5-080325; Mar. 16, 1993, 5-080326; Sep. 8, 1993, 5-246063

Int. Cl.[6] C04B *35/581*

U.S. Cl. 501—98 **9 Claims**

1. Composite ultrafine particles comprising:

(A) ultrafine particles of aluminum nitride having a morphologically anisotropic structure, said particles having a shape and size selected from the group consisting of (a) a hexagonal column or whisker 5 to 200 nm in width or thickness and 50 to 1,000 nm in length and (b) a strip 5 to 50 nm in thickness and 10 to 1,000 nm in width or length, and said particles substantially comprising any one of a composite phase of aluminum nitride and nitride of a rare earth element, a solid solution of rare earth element in aluminum nitride, and a single crystal of aluminum nitride; and

(B) ultrafine particles of nitride of the rare earth element.

5,468,698

METHOD FOR THE PREPARATION OF A PARTICULATE CARRIER FOR A POLYMERIZATION CATALYST

Jukka Koskinen, Espoo, and Thomas Garoff, Helsinki, both of, Finland, assignors to Borealis Holding A/S, Lyngby, Denmark

PCT No. PCT/FI92/00324, § 371 Date May 11, 1994, § 102(e) Date May 11, 1994, PCT Pub. No. WO93/11166, PCT Pub. Date Jun. 10, 1993

PCT Filed Nov. 27, 1992, Ser. No. 240,732

Claims priority, application Finland, Nov. 29, 1991, 915632

Int. Cl.[6] B01J *35/08;37/00*

U.S. Cl. 502—9 **16 Claims**

1. A method of preparing a particulate carrier for an olefin polymerization procatalyst comprising a transition metal compound, the method comprising:

a) providing a melt $MgCl_2$—C_2H_5OH complex containing on average 3.3 to 5.5 C_2H_5OH molecules per $MgCl_2$ molecule,

b) spraying the melt $MgCl_2$—C_2H_5OH complex through a nozzle and dispersing it into a chamber having an upper and lower portion, wherein a particulate carrier is formed from the complex, and

c) removing the particulate carrier from the chamber,

provided that during the spraying of the melt in step b) the removal rate of C_2H_5OH from the $MgCl_2$—C_2H_5OH complex is controlled—with the aid of heat—so that the particulate carrier obtained contains on average 2.0 to 3.2 C_2H_5OH molecules per each $MgCl_2$ molecule.

5,468,699

MOLECULAR SIEVE - PHOTOACTIVE SEMICONDUCTOR MEMBRANES AND REACTIONS EMPLOYING THE MEMBRANES

Zhenyu Zhang, Bronx, N.Y., and James R. Fehlner, Salem Township, Wayne County, Pa., assignors to Inrad, Northvale, N.J.

Filed Jul. 30, 1992, Ser. No. 921,786

Int. Cl.[6] B01J *29/00*

U.S. Cl. 502—60 **20 Claims**

1. A membrane for affecting the composition of material coming in contact with the membrane, comprising:

an inert porous substrate having a pore size from about 2.5 to 50 microns and semiconductor material including TiO_2 supported by the porous substrate, the semiconductor material including a photoactive polymeric metal/semimetal oxide matrix and molecular sieve material impregnated within the matrix, the molecular sieve material including zeolitic material having pore size from about 3 to 12 angstroms.

5,468,700

HYDROCARBON CONVERSION CATALYST FOR USE IN SELECTIVELY MAKING MIDDLE DISTILLATES

John W. Ward, Yorba Linda, Calif., assignor to UOP, Des Plaines, Ill.

Division of Ser. No. 830,139, Jan. 31, 1992, Pat. No. 5,288,396, which is a division of Ser. No. 573,735, Aug. 28, 1990, Pat. No. 5,116,792, which is a continuation of Ser. No. 332,517, Mar. 3, 1989, Pat. No. 4,990,476, which is a continuation-in-part of Ser. No. 196,942, Apr. 4, 1988, Pat. No. 4,879,019, which is a division of Ser. No. 28,654, Mar. 20, 1987, Pat. No. 4,762,813, which is a continuation of Ser. No. 793,567, Oct. 31, 1985, abandoned, which is a continuation-in-part of Ser. No. 699,919, Feb. 8, 1985, Pat. No. 4,610,973, which is a continuation of Ser. No. 531,924, Sep. 13, 1983, Pat. No. 4,517,074, which is a division of Ser. No. 84,761, Oct. 15, 1979, Pat. No. 4,419,271. This application Nov. 2, 1993, Ser. No. 144,419

The portion of the term of this patent subsequent to Aug. 9, 2005, has been disclaimed.

Int. Cl.[6] B01J *29/06*

U.S. Cl. 502—60 **25 Claims**

1. A process for making a hydrocarbon conversion catalyst which comprises:

(a) extruding a mixture of a first inorganic refractory oxide component, a second inorganic refractory oxide component and a modified Y zeolite, and

(b) calcining said extrudates in the presence of steam at a water vapor partial pressure greater than about 5.0 p.s.i.a. under conditions such that the unit cell size of said modified Y zeolite is reduced to a value between about 24.20 and about 24.45 angstroms.

5,468,701

PROCESS FOR REGENERATING SPENT ACID-ACTIVATED BENTONITE CLAYS AND SMECTITE CATALYSTS

Robert S. Nebergall, Lombard; Dennis R. Taylor, Palatine, and Carolyn J. Kucharz, Chicago, all of Ill., assignors to American Colloid Company, Arlington Heights, Ill.

Division of Ser. No. 17,382, Feb. 12, 1993, Pat. No. 5,358,915. This application May 23, 1994, Ser. No. 247,259

Int. Cl.[6] B01J *20/34;38/60*

U.S. Cl. 502—80 **18 Claims**

1. Acid-activated bentonite clay that has been regenerated, after oil bleaching by

removing a majority of said oil from said acid-activated clay by extraction with water and essentially without an organic solvent, at a temperature of about 80° C. to about 370° C.; and

oxidizing said clay, with an aqueous oxidant solution, after said oil removal step, to a degree sufficient such that the capacity to adsorb carotenoids and/or chlorophyll is restored to at least 98% of its original activity for adsorption of carotenoids and/or chlorophyll.

5,468,702

METHOD FOR MAKING A CATALYST SYSTEM

Moses O. Jejelowo, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Wilmington, Del.

Filed Jul. 7, 1994, Ser. No. 271,598

Int. Cl.[6] C08F *4/02;4/648*

U.S. Cl. 502—104 **25 Claims**

1. A method of forming a catalyst system, the method comprising the steps of:

a) aging an activator that has been combined with a support for a period of time greater than 24 hours; and

b) combining a metallocene catalyst component with the aged activator.

5,468,703

TITANIUM CATALYST COMPONENT FOR ETHYLENE POLYMERIZATION, ETHYLENE POLYMERIZATION CATALYST, AND PROCESS FOR ETHYLENE POLYMERIZATION USING THE SAME

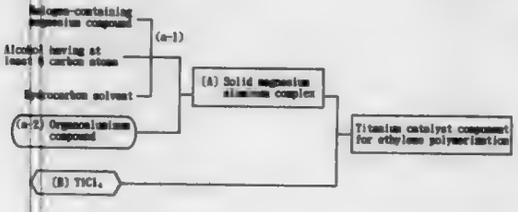
Mamoru Kioka, and Tsuneo Yashiki, both of Yamaguchi, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Oct. 4, 1993, Ser. No. 130,789

Claims priority, application Japan, Jan. 5, 1992, 4-266068

Int. Cl.[6] B01J *31/00;* C08F *4/02*

U.S. Cl. 502—108 **15 Claims**



1. A process for preparing a titanium catalyst component for ethylene polymerization comprising:

mixing a halogen-containing magnesium compound, a monoalcohol having at least 6 carbon atoms and a hydrocarbon solvent to form a magnesium solution (a-1),

contacting the magnesium solution (a-1) with an organoaluminum compound to form a solid magnesium aluminum complex (A) containing no reducing organic group, and

contacting the solid magnesium aluminum complex (A) with a tetravalent titanium compound (B) to thereby form a titanium catalyst component,

wherein titanium atoms contained in the titanium catalyst component are substantially tetravalent and wherein the molar ratio of alkoxy groups derived from the monoalcohol, unconverted monoalcohol or combination thereof to titanium is in the range of 0.26 to 6.0.

5,468,704

COMPONENTS AND CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

Giampiero Morini, Voghera; Enrico Albizzati, Arona; Umberto Giannini; Raimondo Scordamaglia, both of Milan, and Luisa Barino, Novara, all of, Italy, assignors to Montell North America Inc., Wilmington, Del.

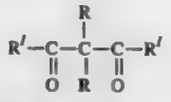
Filed Sep. 30, 1994, Ser. No. 315,747

Claims priority, application Italy, Jan. 1, 1993, MI93A2102

Int. Cl.[6] B01J *31/02;31/38*

U.S. Cl. 502—115 **8 Claims**

1. A solid catalyst component for the polymerization of olefins, comprising a magnesium halide in active form and, supported on said magnesium halide, a titanium halide or titanium halogen alcoholate and an electron-donor compound selected from 1,3-diketones of formula:


(I)

wherein the radicals R are the same or different, the radicals R^I are the same or different, and are not bonded to one another to form a cyclic structure, and R and R^I are C_1–C_{20} alkyl, C_3–C_{20} cycloalkyl, C_6–C_{20} aryl, C_7–C_{20} arylalkyl or alkylaryl radicals or hydrogen, with the proviso that at least one of the R radicals is not hydrogen and can be bonded with the other R radical to form a cyclic structure, and at least one of the R^I radicals, is a branched alkyl, cycloalkyl or aryl radical, or is bonded to one or both R radicals to form a cyclic structure, said 1,3-diketone being fixed on the catalyst component such that the mole ratio between said 1,3-diketone and the titanium supported on said magnesium halide is higher than or equal to 0.1.

5,468,705

STORAGE-STABLE SOLUTION OF CARBONATED MAGNESIUM METHOXIDE IN METHANOL AND ITS USE

Hartwig Rauleder; Burkhard Standke; Hans-Joachim Kötzsch, and Reinhold Schenk, all of Rheinfelden, Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Dec. 15, 1993, Ser. No. 167,353

Claims priority, application Germany, Jan. 7, 1993, 43 00 186.6

Int. Cl.[6] C07F *3/02;* D21H *17/12;25/02;* B01J *31/12*

U.S. Cl. 502—151 **5 Claims**

1. A storage-stable solution of carbonated magnesium methoxide of the formula $Mg(CH_3O)_2\ (CO_2)_n$ in methanol, wherein the magnesium content of the solution is from 3 to 8% by weight, based on the total weight of the solution, and the CO_2 content n is from 1.13 to 2.2.

4. A method of preserving paper, comprising applying a storage-stable solution of carbonated magnesium methoxide of the formula $Mg(CH_3O)_2\ (CO_2)_n$ in methanol, wherein the magnesium content of the solution is from 3 to 8% by weight, based on the total weight of the solution, and the CO_2 content n is from 1.13 to 2.2, to paper.

5. A method of preparing a catalyst for the polymerization of an olefin, comprising forming spherical magnesium methoxide from a storage-stable solution of carbonated magnesium methoxide of the formula $Mg(CH30)_2\ (CO_2)_n$ in methanol, wherein the magnesium content of the solution is from 3 to 8% by weight, based on the total weight of the solution, and the CO_2 content n is from 1.13 to 2.2.

5,468,706

STORAGE-STABLE SOLUTION OF A MIXTURE OF CARBONATED MAGNESIUM METHOXIDE, CARBONATED MAGNESIUM ETHOXIDE AND THEIR CARBONATED MIXED ALKOXIDE IN A COMBINATION OF METHANOL AND ETHANOL AND USES THEREOF

Hartwig Rauleder; Burkhard Standke; Hans-Joachim Kötzsch, and Reinhold Schork, all of Rheinfelden, Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Dec. 15, 1993, Ser. No. 167,354

Claims priority, application Germany, Jan. 7, 1993, 43 00 185.8

Int. Cl.[6] C07F 3/02; D21H 17/12;25/02; B01J 31/12

U.S. Cl. 502—151 5 Claims

1. A storage-stable solution of a mixture of carbonated magnesium methoxide of the formula $Mg(CH_3O)_2\ (CO_2)_n$, carbonated magnesium ethoxide of the formula $Mg(C_2H_5O)_2\ (CO_2)_n$ and a carbonated mixed alkoxide of the formula $Mg(CH_3O)_x\ (C_2H_5O)_y\ (CO_2)_n$ in a combination of methanol and ethanol, x and y each being greater than 0 and less than 2 and the sum of x and y being equal to 2, wherein the magnesium content of the solution is from 0.1 to 11% by weight, based on the total weight of the solution, and the CO_2 content n is from 1.0 to 2.2.

4. A method for preserving paper, comprising applying a solution of a mixture of carbonated magnesium methoxide of the formula $Mg(CH_3O)_2\ (CO_2)_n$, carbonated magnesium ethoxide of the formula $Mg(C_2H_5O)_2\ (CO_2)_n$ and a carbonated mixed alkoxide of the formula $Mg(CH_3O)_x\ (C_2H_5O)_y\ (CO_2)_n$ in a combination of methanol and ethanol, x and y each being greater than 0 and less than 2 and the sum of x and y being equal to 2, wherein the magnesium content of the solution is from 0.1 to 11% by weight, based on the total weight of the solution, and the CO_2 content n is from 1.0 to 2.2, to said paper.

5. A method for preparing a catalyst for the polymerization of olefins, comprising forming spherical magnesium methoxide, magnesium ethoxide or a mixture thereof from a solution of carbonated magnesium methoxide of the formula $Mg(CH_3O)_2\ (CO_2)_n$, carbonated magnesium ethoxide of the formula $Mg(C_2H_5O)_2\ (CO_2)_n$ and a carbonated mixed alkoxide of the formula $Mg(CH_3O)_x\ (C_2H_5O)_y\ (CO_2)_n$ in a combination of methanol and ethanol, x and y each being greater than 0 and less than 2 and the sum of x and y being equal to 2, wherein the magnesium content of the solution is from 0.1 to 11% by weight, based on the total weight of the solution, and the CO_2 content n is from 1.0 to 2.2.

5,468,707

COORDINATION CATALYST SYSTEMS

Ludwig Pohl, Darmstadt; Fike Poetsch, Mühltal; Herbert Schumann, Berlin; Karin Weiss, Bayreuth; Karl-Heinz Thiele, Halle, and Hans-Ludwig Hirsch, Reinheim, all of, Germany, assignors to Merck Patent Gesellschaft mit Beschrankter Haftung, Darmstadt, Germany

PCT No. PCT/EP93/03204, § 371 Date Jul. 29, 1994, § 102(e) Date Jul. 29, 1994, PCT Pub. No. WO94/12278, PCT Pub. Date Jun. 9, 1994

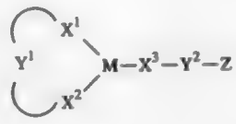
PCT Filed Nov. 16, 1993, Ser. No. 256,988

Claims priority, application Germany, Dec. 1, 1992, 42 40 294.8; Mar. 3, 1993, 43 06 569.4

Int. Cl.[6] B01J 31/00; C08F 4/42

U.S. Cl. 502—153 11 Claims

1. A coordination Catalyst system based on transition metal compounds of subgroup IV to VIII and a cyclic organometallic compound of main group III of the Periodic Table of Elements, wherein said cyclic organometallic compound is a compound of the formulae I or II



(I)

in which

M is B, Al, Ga, In,

X^1, X^2, X^3 are, in each case independently of one another, CHR^1, NR^2, O, S,

Y^1, Y^2 are, in each case independently of one another,

$-(CH_2)_m-$,

$o\text{-}(CH_2)_p-C_6H_4-(CH_2)_q-$,

$o\text{-}(CH_2)_p-C_6H_6-(CH_2)_q-$,

$o\text{-}(CH_2)_p-C_6H_8-(CH_2)_q-$,

$o\text{-}(CH_2)_p-C_6H_{10}-(CH_2)_q-$,

$o\text{-}(CH_2)_p-C_5H_4-(CH_2)_q-$,

$o\text{-}(CH_2)_p-C_5H_6-(CH_2)_q-$,

$o\text{-}(CH_2)_p-C_5H_8-(CH_2)_q-$,

$-(CH_2)_p-CH=CH-(CH_2)_q-$,

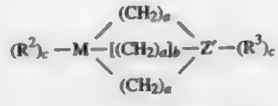
Z is NR^3R^4, PR^3R^4, OR^5, SR^5,

R^1 is H, OH, halogen, C_{1-6}-alkyl or C_{1-6}-alkoxyl, C_{5-7}-cycloalkyl, phenyl,

R^2, R^3, R^4, R^5 are, in each case independently of one another, H or C_{1-6}-alkyl, C_{5-7}-cycloalkyl, phenyl, R^3 and R^4 together also a C_{4-6}alkylene bridge,

m is a number from 1 to 6,

p, q are, in each case independently of one another, a number from 0 to 2,



(II)

having M, R^2 and R^3 as defined above and in which

Z' is N, P,

a is a number from 2 to 4,

b, c are the numbers 0 or 1 with b+c=1.

5,468,708

GROUP VIII METAL CATALYST COMPOSITION

Neil A. Cooley, Teddington, and Adrian P. Kirk, Surbiton, both of, England, assignors to BP Chemicals Limited, London, England

Filed Apr. 1, 1994, Ser. No. 222,465

Claims priority, application United Kingdom, Apr. 6, 1993, 9307207; Nov. 30, 1993, 9324583

Int. Cl.[6] B01J 31/26;31/24

U.S. Cl. 502—162 7 Claims

1. A catalyst composition for preparing polyketones comprising (a) a palladium compound containing at least one ligand capable of

coordinating to the palladium, and (b) a boron hydrocarbyl compound.

5,468,709

CATALYSTS FOR HYDROTREATING HYDROCARBON OILS AND METHOD OF PREPARING THE SAME

Eiji Yamaguchi; Yuji Uragami, both of Ichikawa; Hideharu Yokozuka, Tokyo; Kikoo Uekusa, Chiba; Toshio Yamaguchi, Tokyo; Satoshi Abe, Nihama; Tetsuro Kamo, Ichikawa, and Takao Suzuki, Tokyo, all of, Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

Filed Nov. 18, 1993, Ser. No. 154,005

Claims priority, application Japan, Nov. 18, 1992, 4-331294; Dec. 9, 1992, 4-351549; Nov. 15, 1993, 5-308760

Int. Cl.[6] B01J *27/18*

U.S. Cl. 502—210 **19 Claims**

1. A catalyst for hydrotreating hydrocarbon oils, comprising an impregnated alumina carrier substance having a porous surface, wherein said catalyst has been prepared by a process consisting of the steps of simultaneously impregnating an alumina carrier substance with components in a mixture to form an impregnated substance, and then drying said impregnated substance at a temperature of less than 200° C. such that supported active metal salts on said impregnated substance are not decomposed to form oxides,

wherein said components in said mixture comprise: at least one active metal element selected from the Group VI metals in the periodic table; at least one active metal element selected from the Group VIII metals in the periodic table; phosphoric acid; and an additive agent, wherein said additive agent exhibits lower coordinate ability than alcoxycarboxylic acid and is at least one substance selected from the group consisting of dihydric or trihydric alcohols having 2–10 carbon atoms per one molecule, ethers of said alcohols, monosaccharides, disaccharides and polysaccharides,

and wherein both said active metals and said at least one additive are dispersed and adsorbed on the surface of said alumina carrier substance and remain at fixed sites during drying so as to suppress aggregation of active metals when employed in a subsequent presulfurization process, and wherein said temperature is such that moisture is removed from said impregnated substance but decomposition and evaporation of the adsorbed additive is prevented.

11. A method for preparing a hydrotreating catalyst for hydrocarbon oils consisting of the steps of:

simultaneously impregnating an alumina carrier substance having a porous surface with a solution comprising: at least one active metal element selected from the Group VI metals in the periodic table; at least one active metal element selected from the Group VIII metals in the periodic table; phosphoric acid; and at least one additive selected from the group consisting of dihydric and trihydric alcohols having 2–10 carbon atoms per one molecule, ethers of said alcohols, monosaccharides, disaccharides, and polysaccharides, to form an impregnated carrier substance containing supported active metals and said at least one additive; and

drying said impregnated carrier substance at a temperature of less than 200° C. at which moisture content is removed but said active metal salts are not decomposed to form oxides, wherein both said active metals and said at least one additive are dispersed and adsorbed on the porous surface of said alumina carrier substance and are fixed at sites during drying to suppress aggregation of active metals during subsequent presulfurization.

5,468,710

COMPOSITIONS COMPRISING SULFIDED NICKEL AND ALUMINA USEFUL AS DEHYDROGENATION CATALYSTS

Daniel E. Resasco, Norman, Okla.; Bonita K. Marcus, Radnor, Pa.; Chen-Shi Huang, Claymont, Del., and Vincent A. Durante, West Chester, Pa., assignors to Sun Company, Inc. (R&M), Philadelphia, Pa.

Continuation-in-part of Ser. No. 874,499, Apr. 27, 1992. This application Sep. 30, 1994, Ser. No. 316,659

Int. Cl.[6] C07C *5/333;* **B01J** *27/043*

U.S. Cl. 502—222 **11 Claims**

1. Composition of matter comprising sulfided nickel and nonacidic alumina, and having a ratio of the nickel $2P_{3/2}$ peak area to the Al(2s) peak area, as determined by X-ray photoelectron spectroscopy of at least about 0.7, said ratio being determined by a spectrometer having an instrument transmission function inversely proportional to the kinetic energy of photoelectrons.

5,468,711

INFORMATION RECORDING MEDIUM AND PRINTING METHOD USING THE SAME

Akira Suzuki; Yoshihiko Hotta, both of Mishima, and Hiroyuki Uemura, Numazu, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

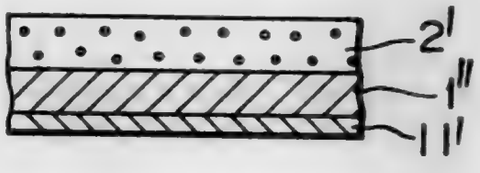
Filed Oct. 27, 1993, Ser. No. 141,639

Claims priority, application Japan, Jan. 27, 1992, 4-311260

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—201 **30 Claims**

21. A printing method of printing a sublimation transfer image



and a milky-white image on an information recording medium, which comprises (a) a support; (b) a thermosensitive recording layer provided at least on one side of support, said thermosensitive recording layer comprising a matrix resin and an organic low-molecular-weight material which is dispersed in said matrix resin, the transparency of said thermosensitive recording layer being reversibly changeable depending upon the temperature thereof; (c) a thermal transfer image receiving layer for thermal printing thereon by thermal transfer recording, which is provided at least on one side of said support, opposite to said thermosensitive recording layer; and (d) a colored layer or a light reflection layer which is provided between said thermosensitive recording layer and said support, in a portion right under said thermosensitive recording layer, comprising the steps of:

superimposing a sublimation thermal image transfer recording sheer on said thermal transfer image receiving layer of said information recording medium;

applying heat imagewise to said sublimation thermal image transfer recording sheet, thereby printing a sublimation transfer image on said thermal transfer image receiving layer, and

applying heat imagewise to a portion of said thermosensitive recording layer above said colored layer or said light reflection layer, thereby printing a milky-white image on said portion of said thermosensitive recording layer.

5,468,712

THERMAL TRANSFER DYE IMAGE-RECEIVING SHEET

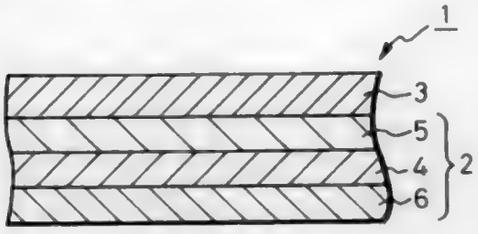
Toshihiro Minato; Masaru Kato, both of Tokyo, and Kenji Yasuda, Yachiyo, all of, Japan, assignors to Oji Paper Co., Ltd., Tokyo, Japan

Filed Jun. 25, 1992, Ser. No. 904,142

Claims priority, application Japan, Jul. 10, 1991, 3-170081

Int. Cl.[6] B41M 5/035;5/38

U.S. Cl. 503—227 6 Claims



1. A thermal transfer dye image-receiving sheet comprising:

(1) a substrate sheet comprising:

(a) a core sheet comprising a member selected from the group consisting of polyester films and polyamide films,

(b) a front layer formed on a front surface of the core sheet to provide a front surface of the substrate sheet and consisting of a biaxially oriented thermoplastic film comprising a mixture of a thermoplastic resin with a filler and provided with a void structure, and having a porosity of from 10% to 40%, and

(c) a back layer formed on a back surface of the core sheet and consisting of a thermoplastic film; and

(2) a dye image-receiving layer formed on a front surface of the front layer of the substrate sheet and comprising a dye-receiving resin material,

said biaxially oriented thermoplastic film for the front layer of the substrate sheet having a multilayered structure, and the front surface of the front layer having

a Bekk smoothness of 1000 seconds or more and a glossiness of 50% or less.

5,468,713

THERMAL TRANSFER RECORDING MEDIUM AND METHOD FOR THERMAL TRANSFER RECORDING

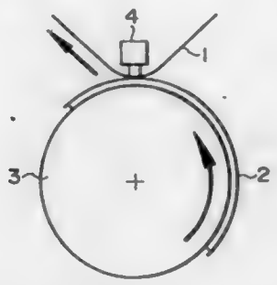
Hideo Fujimura, and Yoshinori Nakamura, both of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Division of Ser. No. 800,329, Dec. 3, 1991, Pat. No. 5,254,523. This application Jul. 15, 1993, Ser. No. 91,384

Claims priority, application Japan, Dec. 5, 1990, 2-404643; Dec. 5, 1990, 2-404644; Dec. 5, 1990, 2-404645

Int. Cl.[6] B41M 5/035;5/38

U.S. Cl. 503—227 1 Claim



1. A thermal transfer image-receiving sheet having a thermal-transfer-recorded image formed thereon by sublimation thermal transfer recording, wherein said sheet comprises a substrate and a dye receiving resin, and the image-recorded surface of said sheet has a contact angle to tetradecane of 10° or greater.

5,468,714

HEAT TRANSFER SHEET

Katsuyuki Oshima; Masaki Kutsukake; Hideaki Sato, and Kenichiro Sudo, all of Tokyo, Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 5,089, Jan. 15, 1993, abandoned, which is a continuation of Ser. No. 625,660, Dec. 12, 1990, Pat. No. 5,217,942. This application Jan. 31, 1994, Ser. No. 188,735

Claims priority, application Japan, Dec. 15, 1989, 1-323892; Dec. 15, 1989, 1-323893

Int. Cl.[6] B41M 5/035;5/38

U.S. Cl. 503—227 10 Claims

6. A method for thermal recording comprising:

providing (a) a heat transfer sheet and (b) an image-receiving card comprising a dyeable vinyl chloride resin and having no dye-receiving layer on a surface thereof, said heat transfer sheet comprising a substrate film, and a dye layer system formed on said substrate film, said dye layer system comprising two layers, only the outer surface layer of which contains an additive comprising a silicone graft acetoacetal resin, said dye layer system comprising a binder and substantially the same amount of dye in each of said two layers, wherein said dye is allowed to migrate and transfer thermally onto the surface of said image-receiving card;

bringing said dye layer system of said heat transfer sheet into direct contact with the surface of said image-receiving card; and

applying thermal energy to a back side of said substrate film of said heat transfer sheet using at least one thermal head to carry out thermal recording directly on the surface of said image-receiving card.

5,468,715

BLENDED FUNGICIDE COMPOSITIONS

Amy L. Joseph, Hopewell, N.J.; Keith A. Jones, Yardley, Pa.; Anthony E. Winston, East Brunswick, and M. Stephen Lajoie, Basking Ridge, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Division of Ser. No. 881,693, May 12, 1992, abandoned. This application Jun. 2, 1993, Ser. No. 70,225

Int. Cl.[6] A01N 55/04;59/00;59/06; C05G 3/02

U.S. Cl. 504—101 6 Claims

1. A fungicide composition which is a dry blend formulation comprising (1) an inorganic ingredient selected from the group consisting of alkali metal and ammonium bicarbonates, (2) an inorganic ingredient selected from the group consisting of alkali metal and ammonium bicarbonates and carbonates, wherein the combination of the inorganic ingredients contains about 10–80 weight percent of at least two different alkali metal or ammonium cations, and (3) about 0.01–10 weight percent of a fungicidal triphenyltin compound; wherein the composition contains a fertilizer-effective amount and ratio of nitrogen, phosphorus and potassium elements.

5,468,716

BICARBONATE FUNGICIDE PRODUCT WITH A COMBINATION OF SURFACTANT INGREDIENTS

Anthony E. Winston, East Brunswick, N.J., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Division of Ser. No. 171,671, Dec. 22, 1993, Pat. No. 5,415,877, which is a continuation-in-part of Ser. No. 52,266, Apr. 23, 1993. This application Oct. 3, 1994, Ser. No. 316,475

Int. Cl.[6] A01N 59/00;59/06; C05G 3/02;3/06

U.S. Cl. 504—101 5 Claims

1. A fungicidal fertilizer powder composition which is a dry blend formulation comprising (1) between about 55–98 weight percent of an ingredient selected from the group consisting of alkali metal and ammonium bicarbonates; (2) between about 2–40

weight percent of a combination of surfactant ingredients selected from the group consisting of (a) alkali metal C_8–C_{14} dialkyl sulfosuccinate salts, and (b) C_{10}–C_{20} alkyl sulfate salts, wherein the weight ratio of sulfosuccinate salt to sulfate salt is between about 2:1 and 1:5; (3) between about 0–20 weight percent of hydrophilic polymer; (4) between about 0–15 weight percent of anti-caking ingredient; and (5) between about 5–30 weight percent of an ingredient selected from the group consisting of phosphorus-containing compounds; wherein the composition ingredients have a formulated fertilizer-effective amount and ratio of nitrogen, phosphores and potassium elements.

5,468,717

OXIME ETHER DERIVATIVES, THEIR PREPARATION AND FUNGICIDES CONTAINING THESE DERIVATIVES

Bernd Wenderoth, Lampertheim; Siegbert Brand, Weinheim; Franz Schuetz, Ludwigshafen; Thomas Kuekenhoehner, Frankenthal; Franz Roehl; Eberhard Ammermann, both of Ludwigshafen, and Gisela Lorenz, Neustadt, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 620,456, Dec. 4, 1990, Pat. No. 5,334,577, which is a continuation of Ser. No. 411,638, Sep. 25, 1989, abandoned. This application May 4, 1994, Ser. No. 237,841

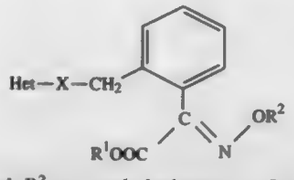
Claims priority, application Germany, Jan. 14, 1988, 38 35 028.9

Int. Cl.[6] **C07D** *215/16;* **A01N** *43/40*

U.S. Cl. 504—130 **10 Claims**

1. Oxime ether derivatives of the formula I

(I)



where R^1 and R^2 are each hydrogen or C_1–C_5-alkyl, Het is quinolyl, unsubstituted or substituted by halogen, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_1–C_2-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_1–C_4-alkyl, aryl, aryl-C_1–C_4-alkyl, C_1–C_4-alkylcarbonyl, C_1–C_4-alkoxycarbonyl or cyano, and X is oxygen or sulfur, and their plant-tolerated acid addition salts, metal complexes and N-oxides.

5,468,718

LIQUID, PHYTOACTIVE COMPOSITIONS AND METHOD FOR THEIR PREPARATION

Jan Burval, San Rafael, and Jimmy H. Chan, Martinez, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Continuation of Ser. No. 90,445, Jul. 12, 1993, abandoned, which is a continuation of Ser. No. 174,295, Mar. 28, 1988, abandoned, which is a continuation-in-part of Ser. No. 789,854, Oct. 21, 1985, abandoned. This application Apr. 13, 1995, Ser. No. 422,752

Int. Cl.[6] **A01N** *57/20;57/12*

U.S. Cl. 504—206 **12 Claims**

1. A liquid phytoactive composition comprising:

(a) an herbicidally effective, agriculturally acceptable salt of an N-phosphonomethyl-N-carboxymethyl compound;

(b) one or more liquid nonionic alkyl polyglycoside surfactants;

(c) a dispersing medium selected from the group consisting of water and polar organic solvents for said N-phosphonomethyl-N-carboxymethyl compound; and

(d) an insert adjuvant.

5,468,719

N-ACYL-N-PHENYLTETRAHYDROPHTHALAMIC ACID DERIVATIVES, METHODS OF PRODUCING SAME, AND HERBICIDES CONTAINING SAME AS EFFECTIVE COMPONENTS

Tetsu Takematsu, Utsunomiya; Takeo Komata; Takashi Kume, both of Kawagoe; Kiyoshi Suzuki, Utsunomiya; Matsue Kawamura, Kawagoe; Yumiko Shirakawa, Kawagoe, and Knoru Mori, Kawagoe, all of, Japan, assignors to Central Glass Company, Limited, Yamaguchi, Japan

PCT No. PCT/JP93/00245, § 371 Date Oct. 22, 1993, § 102(e) Date Oct. 22, 1993, PCT Pub. No. WO93/17005, PCT Pub. Date Feb. 9, 1993

PCT Filed Feb. 26, 1993, Ser. No. 133,200

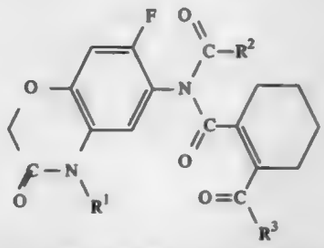
Claims priority, application Japan, Feb. 26, 1992, 4-039809

Int. Cl.[6] **A01N** *43/04;* **C07D** *265/36*

U.S. Cl. 504—224 **36 Claims**

1. An N-acyl-N-phenyltetrahydrophthalamic acid derivative represented by the formula (I),

(I)



wherein R^1 represents an alkyl group, an alkenyl group, an alkynyl group, an alkoxyalkyl group, a haloalkyl group, a haloalkenyl group, a haloalkynyl group or a cyanoalkyl group, each said alkyl, alkenyl or alkynyl group being a C_1–C_4 group, R^2 represents a lower alkyl group or a halogenated lower alkyl group, and R^3 represents a lower alkoxy group, a lower alkenyloxy group, a lower alkynyloxy group, a lower alkoxyalkoxy group, a benzyloxy group, a lower haloalkyloxy group or a lower alkoxycarbonylalkoxy group.

5,468,720

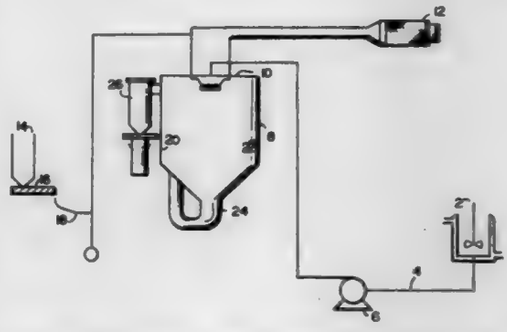
HIGH CONCENTRATED, SOLID MEPIQUAT CHLORIDE PRODUCTS AND PROCESSES FOR MAKING DRY FORM SOLID MEPIQUAT CHLORIDE POWDER AND TABLETS

Rudolph E. Lisa, Riverview; Terence K. Kilbride, Bloomfield Hills, both of Mich., and Karl-Friedrich Jager, Chenoversts, Germany, assignors to BASF Corporation, Mt. Olive, N.J.

Filed Jul. 20, 1993, Ser. No. 95,122

Int. Cl.[6] **A01N** *43/40;43/58;25/12*

U.S. Cl. 504—236 **52 Claims**



1. A method of making a dry, flowable powder of an aqueous hygroscopic plant growth regulator comprising the steps of:

drying an aqueous liquid hygroscopic plant growth regulator feed solution in a spray dryer to obtain a solid particulate

consisting essentially of at least 95% by weight of said hygroscopic plant growth regulator; and during said drying mixing with said plant growth regulator an effective amount between 0.2 to 3 parts by weight per 100 parts by weight of said plant growth regulator of an inert flow aid sufficient to inhibit hygroscopicity of said plant growth regulator such that said powder remains free-flowing and non-caking after said powder is stored in a sealed container for one month at room temperature and 50° C.

5,468,721

PHENOXYMETHYLPYRIMIDINE DERIVATIVE AND USE THEREOF AS HERBICIDE

Norio Sasaki; Sachio Kudo; Michi Watanabe; Keiji Endo, and Shinji Kawaguchi, all of Aml, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP92/00560, § 371 Date Oct. 29, 1993, § 102(e) Date Oct. 29, 1993, PCT Pub. No. WO92/19603, PCT Pub. Date Dec. 11, 1992

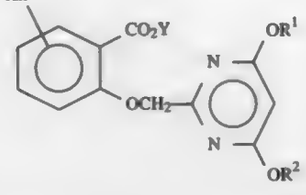
PCT Filed Apr. 28, 1992, Ser. No. 140,062

Claims priority, application Japan, Apr. 30, 1991, 3-098511

Int. Cl.[6] C07D *239/52;* **A01N** *43/54*

U.S. Cl. 504—243 **11 Claims**

1. A phenoxymethylpyrimidine derivative represented by the following formula (1)



(1)

wherein

X is a halogen atom, a lower alkyl group, a lower alkoxy group, a lower acyloxy group or a nitro group,

n is an integer of 0, 1, 2,

Y is a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group, a lower alkyl group substituted by substituents selected from halogen atoms, lower alkoxy groups, lower alkylthio groups, a carboxyl group, carboxyalkyl groups, a phenyl group, phenyl groups substituted by halogen atom(s), lower alkyl group(s) or lower alkoxy group(s), heterocyclic groups, and heterocyclic groups substituted by halogen atom(s), lower alkyl group(s), lower alkoxy group(s) or lower alkylthio group(s), a lower alkenyl group which is substituted by substituent(s) selected from halogen atoms, lower alkoxy groups, lower alkylthio groups, a carboxyl group, carboxyalkyl groups, a phenyl group, phenyl groups substituted by halogen atom(s), lower alkyl group(s) or lower alkoxy group(s), heterocyclic groups and heterocyclic groups substituted by halogen atom(s), lower alkyl group(s), lower alkoxy group(s) and lower alkylthio group(s), a lower alkynyl group which is substituted by substituent(s) selected from halogen atoms, lower alkoxy groups, lower alkylthio groups, a carboxyl group, carboxyalkyl groups, a phenyl group, phenyl groups substituted by halogen atom(s), lower alkyl group(s) or lower alkoxy group(s), heterocyclic groups and heterocyclic groups substituted by halogen atom(s), lower alkyl group(s), lower alkoxy group(s) and lower alkylthio group(s), an alkali metal atom, an alkaline earth metal atom or an ammonium cation optionally, substituted by alkyl group(s), wherein each of the aforementioned heterocyclic groups is selected from the group consisting of pyridyl, thienyl, furyl, pyrimidyl, pyrazolyl, imidazoyl, triazoyl and thiazolyl and

R^1 and R^2 each independently is a lower alkyl group.

5,468,722

PYRAZOLE DERIVATIVES

Mitsuru Shibata; Masashi Sakamoto; Kazuyoshi Koike, and Ichiro Nasuno, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00274, § 371 Date Aug. 23, 1994, § 102(e) Date Aug. 23, 1994, PCT Pub. No. WO93/18031, PCT Pub. Date Sep. 16, 1993

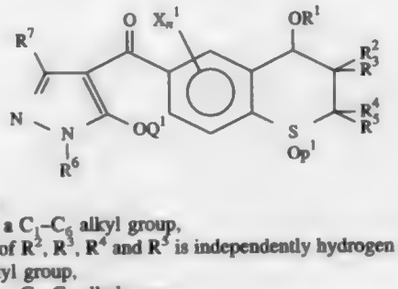
PCT Filed Mar. 3, 1993, Ser. No. 290,943

Claims priority, application Japan, Mar. 3, 1992, 4-045821

Int. Cl.[6] A01N *43/56;* **C07D** *231/20*

U.S. Cl. 504—282 **7 Claims**

1. A pyrazole compound of the formula (I),



(I)

wherein

R^1 is a C_1–C_6 alkyl group,

each of R^2, R^3, R^4 and R^5 is independently hydrogen or a C_1–C_4 alkyl group,

R^6 is a C_1–C_4 alkyl group,

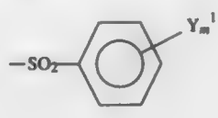
R^7 is hydrogen or a C_1–C_4 alkyl group,

X^1 is a C_1–C_4 alkyl group or a halogen atom,

n is an integer of 1 to 3,

p^1 is an integer of 0 to 2, and

Q^1 is hydrogen, $—SO_2—R^8$ or



in which

R^8 is a C_1–C_6 alkyl group,

Y is hydrogen, a C_1–C_4 alkyl group or a halogen atom, and

m^1 is an integer of 1 to 3, or a salt thereof.

5,468,723

METHOD FOR FORMING A SUPERCONDUCTING WEAK LINK DEVICE

Toshikazu Nishino, Kawasaki; Haruhiro Hasegawa, Kokubunji, and Ushio Kawabe, Tokyo, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

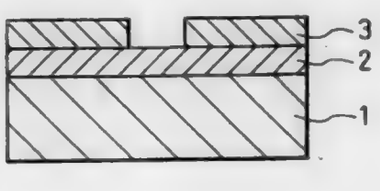
Continuation of Ser. No. 4,247, Jan. 14, 1993, Pat. No. 5,334,580, which is a continuation of Ser. No. 742,524, Aug. 7, 1991, Pat. No. 5,232,905, which is a continuation of Ser. No. 145,315, Jan. 19, 1988, abandoned. This application May 4, 1994, Ser. No. 238,858

Claims priority, application Japan, Jan. 30, 1987, 62-18393; Apr. 13, 1987, 62-88804

Int. Cl.[6] H01L *39/24;* **B05D** *3/06*

U.S. Cl. 505—330 **8 Claims**

1. A method for fabricating a superconducting device compris-



ing the steps of:

forming a conductor layer on a substrate;

forming a superconductor layer on the conductor layer, both of the superconductor layer and the conductor layer being made of same elements but having different relative proportions of said elements;

patterning photoresist on the superconductor layer; and

etching a part of the superconductor layer using the patterned photoresist as a mask to form at least two superconductor regions.

5,468,724

HIGH TEMPERATURE OXIDE SUPERCONDUCTOR

Takahiro Wada; Shin-ichi Koriyama; Takeshi Sakurai; Nobuo Suzuki; Takayuki Miyatake; Hisao Yamauchi; Naoki Koshizuka, and Shoji Tanaka, all of Tokyo, Japan, assignors to International Superconductivity Technology Center, Tokyo; Matsushita Electric Industrial Co., Ltd., Kadoma; Kyocera Corporation, Kyoto; Mitsubishi Metal Corporation; The Tokyo Electric Power Company, Incorporated, both of Tokyo, and Kabushiki Kaisha Kobe Seiko Sho, Kobe, all of, Japan

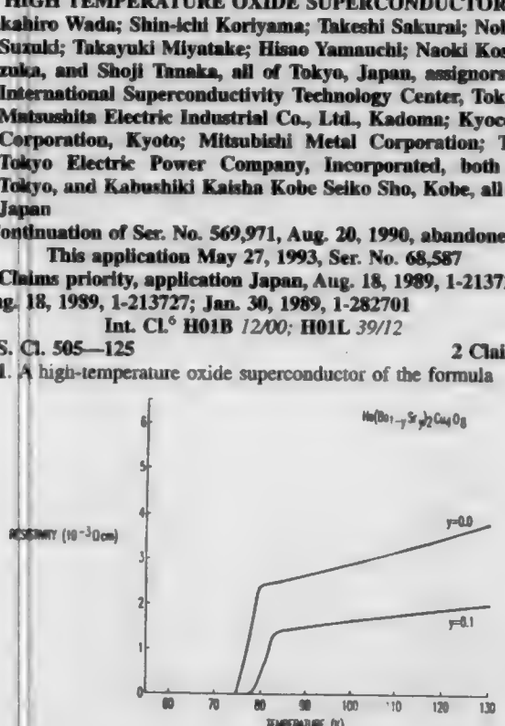
Continuation of Ser. No. 569,971, Aug. 20, 1990, abandoned. This application May 27, 1993, Ser. No. 68,587

Claims priority, application Japan, Aug. 18, 1989, 1-213726; Aug. 18, 1989, 1-213727; Jan. 30, 1989, 1-282701

Int. Cl.[6] H01B *12/00;* **H01L** *39/12*

U.S. Cl. 505—125 **2 Claims**

1. A high-temperature oxide superconductor of the formula



$(R_{1-x}Ca_x)(Ba_{1-y}Sr_y)_2Cu_4O_8$

wherein

x is 0,

R is Nd or Sm, and y is 0.3.

5,468,725

ALCOHOL FREE PERFUME

Eric P. Guénin, Piscataway; Karen A. Trotzinka, Wanamassa; Leslie C. Smith, Plainsboro; Craig B. Warren, Rumson, all of N.J.; Marina A. Munteanu, New York, N.Y.; Siew L. Chung, Old Bridge, and Chee-Teck Tan, Middletown, both of N.J., assignors to International Flvos & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 130,179, Oct. 1, 1993, Pat. No. 5,320,863, which is a continuation of Ser. No. 84,610, Jul. 1, 1993, Pat. No. 5,283,056. This application Jun. 3, 1994, Ser. No. 253,315

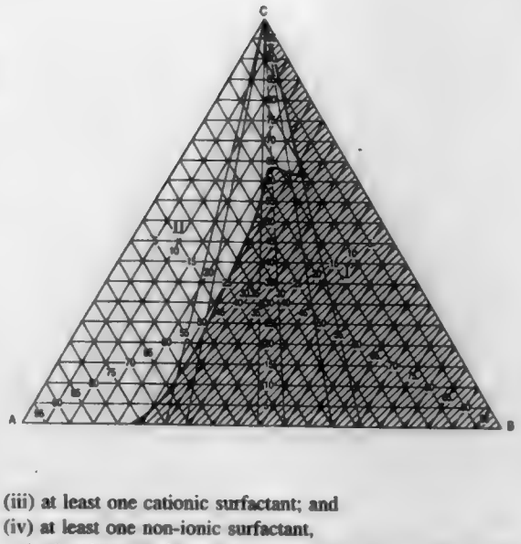
Int. Cl.[6] A61K *7/46*

U.S. Cl. 512—2 **6 Claims**

1. An alcohol-free transparent perfume consisting essentially of an alcohol-free perfume base, water and a stable transparent oil-in-water microemulsion fragrance concentrate consisting of:

(i) water;

(ii) at least one hydrophobic perfume oil;



(iii) at least one cationic surfactant; and

(iv) at least one non-ionic surfactant,

in the absence of lower alkanols wherein the mixing ratio of water, oil and surfactant is defined according to the shaded area of FIG. 1 and

wherein the transparent microemulsion perfume has a viscosity in the range of from about 1 up to about 18,000 centipoises at a temperature in the range of from about 20° C. up to 30° C.; and a refractive index in the range of from 1.4 up to 1.6 at a temperature in the range of from 20° C. up to 30° C.

5,468,726

TREATMENT OF NEUROPSYCHIATRIC DISORDERS

Ramón Cacabelos, Santiago De Compostela, Spain, assignor to Ares Holding 89 N.V., Netherlands Antilles, Netherlands

Division of Ser. No. 148,667, Jan. 26, 1988, Pat. No. 4,939,124. This application Feb. 23, 1990, Ser. No. 484,146

Int. Cl.[6] A61K *37/36*

U.S. Cl. 514—2 **5 Claims**

1. A method of treating neuropsychiatric disorders evidencing somatotropinergic deficiency which consists essentially of administering to a subject an effective amount of growth hormone releasing factor.

5,468,727

METHODS OF NORMALIZING METABOLIC PARAMETERS IN DIABETICS

William T. Phillips; Joyce G. Schwartz, and Gary M. Green, all of San Antonio, Tex., assignors to Board of Regents, The University of Texas System

Continuation-in-part of Ser. No. 626,579, Dec. 13, 1990, Pat. No. 5,187,154. This application Feb. 16, 1993, Ser. No. 19,159

The portion of the term of this patent subsequent to Feb. 16, 2010, has been disclaimed.

Int. Cl.[6] C07K *14/00;* **A61K** *38/16*

U.S. Cl. 514—12 **10 Claims**

1. A method of maintaining the following glucose metabolic indicators at or near normal levels; blood glucose, C-peptide and insulin levels at fasting and during oral glucose tolerance tests, hemoglobin A1C, insulin sensitivity and GIP levels in a human having a early non-insulin dependent diabetic condition and exhibiting rapid grastric emptying, comprising administering to said individual a therapeutically effective dose of POT II, cholecystokinin, cholestyramine or camostat to effectively raise plasma cholecystokinin levels to about 2–3 fold of basal fasting levels of cholecystokinin in said human.

5,468,728

USE OF ORALLY ABSORBABLE MOTILIN PREPARATIONS TO ENHANCE MOTILITY OF DIGESTIVE TRACT

Kiichi Sawai; Masayasu Kurono; Takahiko Mitani; Makoto Sato; Hiroyuki Oowaki; Bunkichi Kato, and Haruo Takahashi, all of Nagoya, Japan, assignors to Sanwa Kagaku Kenkyusho Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 860,471, Mar. 30, 1992, abandoned. This application Sep. 8, 1993, Ser. No. 117,653

Claims priority, application Japan, Apr. 3, 1991, 3-071253

Int. Cl.[6] A61K *38/00;* C07K *5/00;7/00;17/00*

U.S. Cl. 514—12 2 Claims

1. A method of enhancing motility of the digestive tract in a mammal which comprises orally or nasally administering to a mammal in need of such enhancement a pharmaceutical preparation comprising a peptide exhibiting motilin activity, a peptide lyric enzyme inhibitor and a surface active agent.

5,468,729

METHOD FOR TREATMENT OF AUTOIMMUNE HEPATITIS

Paul B. Chretien, Rockville, Md., and Milton G. Mutchnick, West Bloomfield, Mich., assignors to Alpha 1 Biomedicals, Bethesda, Md., and The Board of Governers of Wayne State University, Detroit, Mich.

Filed Oct. 26, 1993, Ser. No. 141,013

Int. Cl.[6] A61K *38/04;31/56;* C07K *14/475;* C07J *51/00*

U.S. Cl. 514—12 14 Claims

1. A method of treating autoimmune hepatitis in a patient, comprising administering to a patient in need of such treatment a drug regimen comprising an immunomodulatory amount of Thymosin α_1 (Tα_1) and an anti-inflammatory amount of a corticosteroid.

5,468,730

METHODS FOR THE TREATMENT OF NON-IGE-MEDIATED DISEASES

Gary S. Hahn, Cardiff by the Sea, Calif., assignor to Dura Pharmaceuticals, Inc., San Diego, Calif.

Continuation of Ser. No. 878,867, May 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 411,489, Nov. 23, 1989, abandoned, , which is a continuation-in-part of Ser. No. 382,623, Nov. 23, 1989, Pat. No. 5,061,692. This application Sep. 8, 1992, Ser. No. 942,671

The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.

Int. Cl.[6] A61K *38/00;* C07K *5/00;7/00;17/00*

U.S. Cl. 514—17 6 Claims

1. A method for the treatment of chemically-induced, non-IgE-mediated irritation or inflammation comprising administering to a mammalian subject, in a pharmaceutically acceptable carrier, a therapeutically effective amount of a peptide, or a pharmaceutically acceptable salt thereof, said peptide having the amino acid sequence Asp-Ser-Asp-Pro-Arg or Asp-Ser-Asn-Pro-Arg.

5,468,731

PEPTIDE COMPOUNDS, A PROCESS FOR PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Masaaki Matsuo, Toyonaka; Daijiro Hagiwara, Moriguchi, and Hiroshi Miyake, Kyoto, both of, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

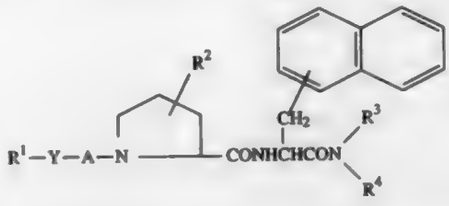
Continuation of Ser. No. 193,873, Feb. 8, 1994, abandoned, which is a continuation of Ser. No. 947,983, Sep. 21, 1992, abandoned, which is a continuation of Ser. No. 819,678, Jan. 13, 1992, abandoned, which is a continuation of Ser. No. 629,645, Dec. 7, 1990, abandoned. This application Jun. 28, 1994, Ser. No. 266,793

Claims priority, application United Kingdom, Dec. 22, 1989, 8929070

Int. Cl.[6] A61K *38/00;* C07K *5/00;7/00;17/00*

U.S. Cl. 514—18 10 Claims

1. A compound of the formula



wherein

R^1 is phenyl, benzofuryl, indazolyl, indolyl or 1-lower alkylindolyl,

R^2 is hydroxy or lower alkoxy,

R^3 is lower alkyl,

R^4 is phenyl(lower)alkyl or halophenyl(lower)alkyl,

A is carbonyl and

Y is a bond or lower alkenylene,

and a pharmaceutically acceptable salt thereof.

5,468,732

PHOSPHORUS CONTAINING RENIN INHIBITORS

Ronald T. Wester, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

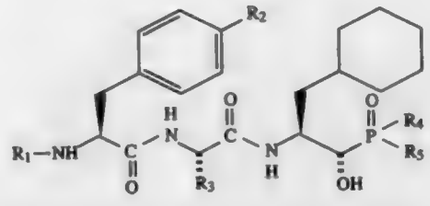
PCT No. PCT/US89/00636, § 371 Date Aug. 2, 1991, § 102(e) Date Aug. 2, 1991, PCT Pub. No. WO90/09081, PCT Pub. Date Aug. 9, 1990

PCT Filed Feb. 16, 1989, Ser. No. 741,442

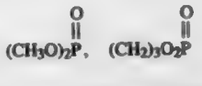
Int. Cl.[6] A61K *38/00;* C07F *9/02;9/22;9/36*

U.S. Cl. 514—19 15 Claims

1. A compound of the formula

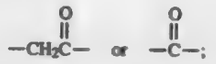


or a pharmaceutically acceptable salt thereof, wherein R_1 is



or X—Y— where X is morpholino, N-methylpiperazino, piperidino, pyrrolidin-1-yl, pyrrolyl, 3-oxopyrrolidin-1-yl, imidazolyl, cis-4-hydroxycyclohexyl, trans-4-hydroxycyclohexyl, acetylalkyl

having three to six carbon atoms, alkyl having one to three carbon atoms, 4-oxopiperidino, 4-oxocyclohexyl, alkoxy having one to five carbon atoms or 4-hydroxypiperidino and Y is



R_2 is hydrogen or methoxy; R_3 is alkyl having one to four carbon atoms, methoxyalkyl said alkyl having one to three carbon atoms, methythioalkyl said alkyl having one to three carbon atoms, hydroxymethyl, imidazol-4-ylmethyl, methylsulfonylmethyl, methylsulfinylmethyl or carbamylethyl; R_4 and R_5 when considered separately are each alkyl having one to three carbon atoms, benzyloxy, alkoxy having one to four carbon atoms, dimethylamino or hydroxy; and R_4 and R_5 when taken together are alkylene having four to six carbon atoms, alkylenedioxy having three to four carbon atoms or mono- or dimethylalkylenedioxy having four to six carbon atoms.

5,468,733

INHIBITORS OF FARNESYL-PROTEIN TRANSFERASE

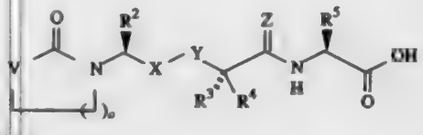
S. Jane deSolms, Norristown; Elizabeth A. Giuliani, Lansdale, and Samuel L. Graham, Schwenksville, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 30, 1993, Ser. No. 130,032

Int. Cl.[6] A61K *38/00;* **C07D** *207/12;207/24;211/40*

U.S. Cl. 514—19 **25 Claims**

1. A compound which inhibits Ras farnesyl-transferase having the formula I:



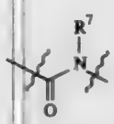
I

wherein:

V is CH_2;

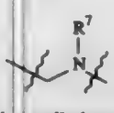
R^2, R^3, R^4 and R^5 are independently the side chains of naturally occurring amino acids, including their oxidized forms which may be methionine sulfoxide or methionine sulfone, or in the alternative may be substituted or unsubstituted aliphatic or aromatic groups, such as allyl, cyclohexyl, phenyl or saturated chains of 2 to 8 carbon atoms which may be branched or unbranched, wherein the aliphatic substituents may be substituted with an aromatic ring;

X-Y is



a)

or



b)

;

R^7 is an alkyl group, wherein the alkyl group comprises straight chain or branched chain hydrocarbons of 1 to 6 carbon atoms, which may be substituted with an aromatic group;

Z is H_2 or O;

m is 0, 1 or 2; and

o is 0, 1, 2 or 3;

or the pharmaceutically acceptable salt thereof.

5,468,734

PROPHYLACTIC AND REMEDIAL PREPARATION FOR DISEASES ATTENDANT ON HYPERGLYCEMIA, AND WHOLESOME FOOD

Kenji Seri, Yashio; Kazuko Sanai, Zama; Shigenori Negishi, and Toshiro Akino, both of Soka, all of, Japan, assignors to Godo Shusei Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 28,369, Mar. 8, 1993, abandoned. This application Jan. 4, 1995, Ser. No. 368,755

Claims priority, application Japan, Mar. 10, 1992, 4-086196; Dec. 21, 1992, 4-355368

Int. Cl.[6] A61K *31/70;31/715;* **A23L** *1/09*

U.S. Cl. 514—23 **5 Claims**

1. A method of remedying a disease attendant on hyperglycemia, which comprises administering to a patient of the disease attendant on hyperglycemia an effective amount of at least one monosaccharide selected from the group consisting of L-arabinose, L-fucose, 2-deoxy-D-galactose, D-xylose, L-xylose, D-ribose, D-ribulose, D-lyxose and D-xylulose.

5,468,735

TYLOSIN ANIMAL FEED PREMIX

Mary B. Schadewald, Indianapolis, and Peter W. Vanevenhoven, West Terre Haute, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 993,430, Dec. 21, 1992, abandoned. This application Apr. 6, 1994, Ser. No. 224,107

Int. Cl.[6] A61K *31/70;47/00;* **A23L** *1/00*

U.S. Cl. 514—30 **30 Claims**

1. An animal feed premix composition, comprising corn cob granules, and, incorporated in the corn cob granules, a tylosin antibiotic agent and an effective amount of a pharmaceutically acceptable buffer which neutralizes the acidity of said corn cob granules so as to increase the stability of the tylosin antibiotic agent against hydrolysis in the presence of moisture within said corn cob granules.

5,468,736

HORMONE REPLACEMENT THERAPY

Gary D. Hodgen, Norfolk, Va., assignor to The Medical College of Hampton Road, Norfolk, Va.

Filed Feb. 25, 1993, Ser. No. 23,692

Int. Cl.[6] A61K *31/56*

U.S. Cl. 514—179 **20 Claims**

1. A method of hormone replacement therapy which comprises administering to a woman in need of such therapy, estrogen in an hormone replacement therapy effective amount and antiprogestin in an amount which is effective both to inhibit estrogen-induced endometrial proliferation and to effect a state of substantial amenorrhea, in the absence of progestin administration.

5,468,737

WOUND HEALING ACCELERATED BY SYSTEMIC ADMINISTRATION OF POLYSACCHARIDE FROM ALOE

Bill H. McAnalley, Grand Prairie; Robert H. Carpenter, Bastrop, and Harley R. McDaniel, Grand Prairie, all of Tex., assignors to Carrington Laboratories, Inc., Irving, Tex.

Continuation-in-part of Ser. No. 136,076, Oct. 13, 1993, which is a continuation-in-part of Ser. No. 864,583, Apr. 7, 1992, Pat. No. 5,308,838, which is a division of Ser. No. 558,905, Jul. 27, 1990, Pat. No. 5,118,673, which is a continuation-in-part of Ser. No. 229,164, Aug. 5, 1988, Pat. No. 5,106,616, which is a continuation-in-part of Ser. No. 144,872, Jan. 14, 1988, Pat. No. 4,851,224, which is a continuation-in-part of Ser. No. 869,261, Jun. 5, 1986, Pat. No. 4,735,935, which is a continuation-in-part of Ser. No. 810,025, Dec. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 754,859, Jul. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 750,321, Jun. 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 649,967, Sep. 12, 1984, abandoned, which is a continuation of Ser. No. 375,720, May 7, 1982, abandoned. This application Apr. 7, 1994, Ser. No. 224,487

Int. Cl.[6] A61K *31/715;45/05*

U.S. Cl. 514—54 27 Claims

1. A method of promoting and accelerating healing of a wound in an animal, said method comprising:

systemically administering to said animal an amount of a bioactive polymeric mannan derivative effective in promoting and accelerating wound healing.

5,468,738

FUNGICIDE AND ITS USE

Minahiro Okabayashi, and Zhi-ping Bai, both of Tsukuba, Japan, assignors to Tokuyama Corporation, Yamaguchi, Japan

Filed Sep. 15, 1993, Ser. No. 121,319

Claims priority, application Japan, Sep. 16, 1992, 4-246814; Sep. 16, 1992, 4-246815; Mar. 30, 1993, 5-071889

Int. Cl.[6] A01N *55/10;25/08;* C09D *5/14*

U.S. Cl. 514—63 23 Claims

1. A fungicidal composition containing, as an active ingredient, a metal complex of the formula (I),

$$[M\{W\text{—}Si(OA^1)_kA^2_{3-k}\}_g]Z_f \quad (I)$$

wherein

M is silver ion, copper ion or zinc ion,

each of A^1 and A^2 is independently a lower alkyl group

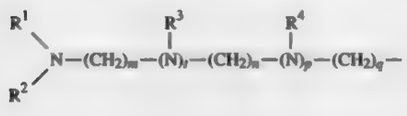
f is 1 or 2,

k is an integer of 1 to 3,

g is an integer of 1 to 6,

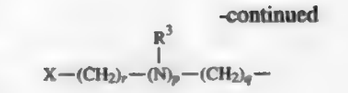
Z is an anion, and

W is a group of the formula (a-1) or (a-2),



(a-1)

-continued



(a-2)

in which:

each of R^1, R^2, R^3 and R^4 is independently a hydrogen atom, a lower alkyl group or a lower aminoalkyl group, or R^1 and R^2 together form a group of —$CH_2CH_2NHCH_2CH_2$—,

m is 0, 2 or 3,

n is 0, 2 or 3,

p is 0 or 1,

q is an integer of 1 to 6,

t is 0 or 1,

r is 0, 1 or 2, and

X is a nitrogen-containing heterocyclic group,

provided that when p in the formula (a-1) is 0, n is 0, that when t in the formula (a-1) is 0, m is 0, and that when r in the formula (a-2) is 0, p is 0, or metal complex immobilized particles obtained by immobilizing the above metal complex on solid particle surfaces, and a fungicidal carrier therefor.

5,468,739

METHODS FOR CONTROLLING ASIATIC CLAMS

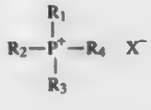
Wilson K. Whitekettle, Jamison; Joseph C. Petrille, North Wales, and Michael W. Werner, Warrington, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Oct. 31, 1994, Ser. No. 332,277

Int. Cl.[6] A01N *57/00;* C02F *1/68*

U.S. Cl. 514—75 4 Claims

1. A method for controlling the fouling potential of Asiatic clams in an aqueous system of the type prone to such fouling and containing Asiatic clams comprising intermittently adding to said aqueous system an amount effective to control fouling of a tetraalkyl phosphonium salt compound having the formula



wherein R_1, R_2, and R_3 are alkyl groups containing about 1 to 16 carbon atoms, R_4 is an alkyl group containing about 1 to 24 carbon atoms, and X is an anion selected from the group consisting of chloride, bromide, iodide, sulfate, carbonate, phosphate, and borate.

5,468,740

1,4-DIAZEPINE DERIVATIVE AND ITS PHARMACEUTICAL USE

Kazuo Okano; Shuhei Miyazawa; Richard S. J. Clark; Shinya Abe; Tetsuya Kawahara; Naoyuki Shimomura; Osamu Asano; Hiroyuki Yoshimura; Mitsuaki Miyamoto; Yoshimori Sakuma; Kenzo Muramoto; Hiroshi Obaishi; Koukichi Harada; Hajime Tsunoda; Satoshi Katayama; Kouji Yamada; Shigeru Souda; Yoshimasa Machida; Kouichi Katayama, and Isao Yamatsu, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

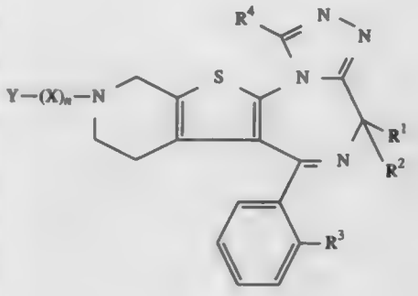
Division of Ser. No. 318,971, Oct. 6, 1994, which is a division of Ser. No. 751,632, Aug. 26, 1991, Pat. No. 5,382,579, which is a continuation of Ser. No. 506,928, Apr. 10, 1990, abandoned, which is a continuation-in-part of Ser. No. 421,929, Oct. 16, 1989, abandoned. This application Feb. 10, 1995, Ser. No. 386,533

Claims priority, application Japan, Jan. 31, 1988, 63-275460; Nov. 24, 1988, 63-297068; Dec. 16, 1988, 63-318016; Dec. 28, 1988, 63-331622

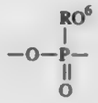
Int. Cl.[6] A61K *31/675;* C07F *9/00*

U.S. Cl. 514—81 13 Claims

1. A triazolo-1,4-diazepine compound or pharmacologically acceptable salt thereof, having the formula:



wherein R^1 and R^2 are the same or different and represent a hydrogen atom or a lower alkyl group, R^3 represents a hydrogen atom or a halogen atom, R^4 represents a hydrogen atom or a lower alkyl group, X represents



wherein R^6 represents a lower alkyl group, n is 1, and Y represents a lower alkyl group.

11. A method for treating a disease against which anti-PAF activity is effective, which comprises administering to a patient in need thereof a pharmacologically effective amount of the compound or the salt thereof as defined in claim 1.

5,468,741

USE OF LOW LEVELS OF MIFEPRISTONE TO TREAT LEIOMYOMATA

Samuel S. C. Yen, La Jolla, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed May 28, 1993, Ser. No. 68,554

Int. Cl.[6] A61K *31/56*

U.S. Cl. 514—179 10 Claims

1. A method for treating leiomyomata in women comprising the administration of a daily unit dosage of between 0.1 to 0.6 mg mifepristone per kilogram of body weight said amount effective to alleviate the symptoms of uterine leiomyomata without clinically significant antiglucocorticoid activity and with the proviso that the total dosage does not exceed 25 mg per day.

5,468,742

8-VINYL- AND 9-ETHINYL-QUINOLONE-CARBOXYLIC ACIDS

Uwe Petersen, Leverkusen; Thomas Himmler, Odenthal; Thomas Schenke, Odenthal; Andreas Krebs, Odenthal; Klaus Grohe, Odenthal; Klaus-Dieter Bremm, Wuppertal; Karl G. Metzger, Wuppertal; Rainer Endermann, Wuppertal, and Hans-Joachim Zeiler, Wuppertal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

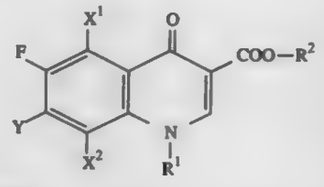
Continuation-in-part of Ser. No. 62,495, May 14, 1993, abandoned, which is a division of Ser. No. 913,502, Jul. 14, 1992, abandoned. This application Nov. 1, 1993, Ser. No. 146,569

Claims priority, application Germany, Jul. 19, 1991, 41 23 918.0

Int. Cl.[6] A61K *31/47;31/535;* C07D *471/04;498/02*

U.S. Cl. 514—287 10 Claims

1. Quinolonecarboxylic acid compounds of the formula (I)



(I)

in which

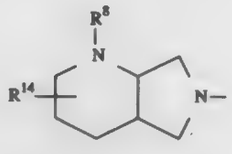
R^1 represents straight-chain or branched C_1–C_4-alkyl which is optionally substituted by hydroxyl, halogen or C_1–C_3-alkoxy, or represents optionally halogen- or C_1–C_3-alkyl-substituted C_3–C_6-cycloalkyl, C_2–C_4 alkenyl, or R^1 furthermore represents C_1–C_3-alkoxy, amino, monoalkylamino having 1 to 3 C atoms, dialkylamino having 2 to 6 C atoms, or phenyl which is optionally monosubstituted to trisubstituted by halogen,

R^2 represents hydrogen, alkyl having 1 to 4 carbon atoms or (5-methyl-2-oxo-1,3-dioxol-4-yl)-methyl,

X^1 represents hydrogen, fluorine, chlorine, amino or methyl,

X^2 represents ethinyl,

Y represents



R^8 represents hydrogen or methyl,

R^{14} represents hydrogen or methyl,

or their pharmaceutically acceptable hydrates and acid addition salts or the alkali metal salts, alkaline earth metal salts, silver salts and guanidinium salts.

5. The compound 1-cyclopropyl-7-(1S,6S-2,8-diazabicyclo[4.3.0]non-8-yl)-8-ethinyl-6-fluoro-1,4-dihydro-4-oxo- 3-quinolinecarboxylic acid.

5,468,743

IMIDAZO[2,1-B]BENZAZEPINE DERIVATIVES, COMPOSITIONS AND METHOD OF USE

Frans E. Janssens, Bonheiden; Gaston S. M. Diels, Ravels, and Joseph E. Leenaerts, Rijkevorsel, all of, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

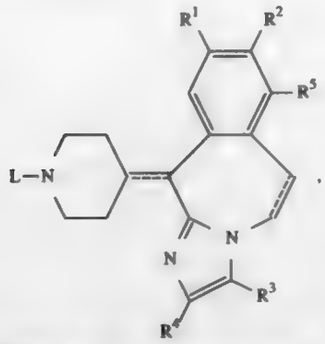
PCT No. PCT/EP92/01330, § 371 Date Nov. 29, 1993, § 102(e) Date Nov. 29, 1993, PCT Pub. No. WO92/22551, PCT Pub. Date Dec. 23, 1992

Continuation-in-part of Ser. No. 853,631, Mar. 18, 1992, abandoned, which is a continuation of Ser. No. 714,486, Jun. 13, 1991, abandoned. This PCT application Jun. 9, 1992, Ser. No. 142,474

Int. Cl.[6] C07D *487/04;* A61K *31/55*

U.S. Cl. 514—214 **16 Claims**

1. A compound of the formula:



(I)

a pharmaceutically acceptable addition salt or a stereochemically isomeric form thereof, wherein:

each of the dotted lines independently represents an optional bond;

R^1 represents hydrogen, halo, C_{1-4}alkyl, or C_{1-4}alkyloxy;

R^2 represents hydrogen, halo, C_{1-4}alkyl, or C_{1-4}alkyloxy;

R^3 represents hydrogen, C_{1-4}alkyl, ethenyl substituted with hydroxycarbonyl or C_{1-4}alkyloxycarbonyl, C_{1-4}alkyl substituted with hydroxycarbonyl or C_{1-4}alkyloxycarbonyl, hydroxyC_{1-4}alkyl, formyl or hydroxycarbonyl;

R^4 represents hydrogen, C_{1-4}alkyl, hydroxyC_{1-4}alkyl, phenyl or halo;

R^5 represents hydrogen, C_{1-4}alkyl or halo;

L represents C_{1-6}alkyl; C_{1-6}alkyl substituted with one substituent selected from the group consisting of hydroxy, halo, C_{1-4}alkyloxy, hydroxycarbonyl, C_{1-4}alkyloxycarbonyl, C_{1-4}alkyloxycarbonylC_{1-4}alkyloxy, hydroxycarbonylC_{1-4}alkyloxy, C_{1-4}alkyloxycarbonylamino, C_{1-4}alkylaminocarbonyl, C_{1-4}alkylaminocarbonylamino, C_{1-4}alkylaminothiocarbonylamino, aryl, aryloxy and arylcarbonyl; C_{1-6}alkyl substituted with both hydroxy and aryloxy; C_{3-6}alkenyl; C_{3-6}alkenyl substituted with aryl;

wherein each aryl is phenyl or phenyl substituted with halo, cyano, hydroxy, C_{1-4}alkyl, C_{1-4}alkyloxy, aminocarbonyl or phenyl substituted with C_{1-4}alkyloxycarbonyl or hydroxycarbonyl; or

L represents a radical of the formula:

—Alk—Y—Het^1 (a-1),

—Alk—NH—CO—Het^2 (a-2), or

—Alk—Y—Het^3 (a-3); wherein

Alk represents C_{1-4}alkanediyl;

Y represents O, S or NH;

Het^1, Het^2 and Het^3 each represent:

furanyl, thienyl, oxazolyl, thiazolyl or imidazolyl each optionally substituted with one or two C_{1-4}alkyl substituents;

pyrrolyl or pyrazolyl optionally substituted with formyl, hydroxyC_{1-4}alkyl, hydroxycarbonyl, C_{1-4}alkyloxycarbonyl or with one or two C_{1-4}alkyl substituents;

thiadiazolyl or oxadiazolyl optionally substituted with amino or C_{1-4}alkyl;

pyridinyl, pyrimidinyl, pyrazinyl or pyridazinyl each optionally substituted with C_{1-4}alkyl, C_{1-4}alkyloxy, amino, hydroxy or halo; or

imidazo[4,5-c]pyridin-2-yl;

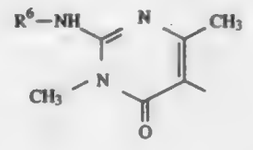
and Het^3 may also represent a member selected from the group consisting of:

(a) 4,5-dihydro-5-oxo-1H-tetrazolyl substituted with C_{1-4}alkyl;

(b) 2-oxo-3-oxazolidinyl;

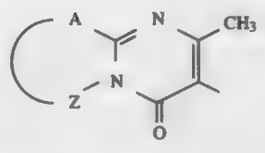
(c) 2,3-dihydro-2-oxo-1H-benzimidazol1-yl; and

(d) a radical of the formula:



(b-1)

or



(b-2)

wherein:

R^6 represents hydrogen or C_{1-4}alkyl; and

A-Z represents —S—CH=CH—, —S—CH_2—CH_2—, —S—CH_2—CH_2—CH_2—, —CH=CH—CH=CH—, —CH_2—CH_2—CH_2—CH_2—, —$N(CH_3)$—$C(CH_3)$=CH— or —CH=C (CH_3)—O—.

5,468,744

COMPOSITION COMPRISING A TRAMADOL MATERIAL AND ANY OF CODEINE, OXYCODONE OR HYDROCODONE AND THEIR USE

Robert B. Raffa, Norristown, and Jeffrey L. Vaught, Perkasie, both of Pa., assignors to McNeilab, Inc., Spring House, Pa.

Continuation of Ser. No. 976,728, Nov. 16, 1992, abandoned, which is a continuation of Ser. No. 755,923, Sep. 6, 1991, abandoned. This application Jun. 30, 1994, Ser. No. 268,382

Int. Cl.[6] A61K *31/485;31/135*

U.S. Cl. 514—282 **12 Claims**

1. A pharmaceutical composition comprising a tramadol material selected from the group consisting of tramadol, its stereoisomers and its pharmaceutically acceptable salts and an opioid selected from the group consisting of codeine and oxycodone, wherein the weight ratio of the tramadol material to the opioid is of from about 1:20 to about 20:1.

5,468,745

AMINO AND NITRO CONTAINING TRICYCLIC COMPOUNDS USEFUL AS INHIBITORS OF ACE

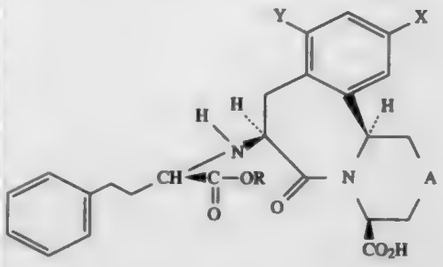
Gary A. Flynn, and Douglas W. Beight, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 164,047, Dec. 8, 1993, Pat. No. 5,389,628, which is a division of Ser. No. 46,326, Apr. 12, 1993, Pat. No. 5,308,841, which is a division of Ser. No. 979,029, Nov. 20, 1992, abandoned, which is a division of Ser. No. 905,494, Jun. 25, 1992, Pat. No. 5,208,230, which is a continuation of Ser. No. 777,625, Oct. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 633,572, Dec. 21, 1990, abandoned. This application Aug. 18, 1994, Ser. No. 292,638

Int. Cl.[6] A61K *31/55;* C07D *487/04*

U.S. Cl. 514—214 9 Claims

1. A compound of the formula



wherein

A is N—B wherein B is R_1 or COR_2 wherein R_1 is hydrogen, a C_1–C_4 alkyl or an Ar—Z— group wherein Ar is aryl and Z is a bond or a C_1–C_4 alkylene and R_2 is a—CF_3, a C_1–C_{10} alkyl or an Ar—Z group;

R is hydrogen or a C_1–C_4 alkyl; and

X and Y are each independently hydrogen, nitro or amino, with the proviso that one of X and Y is hydrogen and one of X and Y is other than hydrogen; and pharmaceutically acceptable salts thereof.

5,468,746

COMPOUNDS ACTIVE ON THE CARDIOVASCULAR SYSTEM

Cesare Casagrande, Arese; Stefania Montanari, and Francesco Santangelo, both of Milan, all of, Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

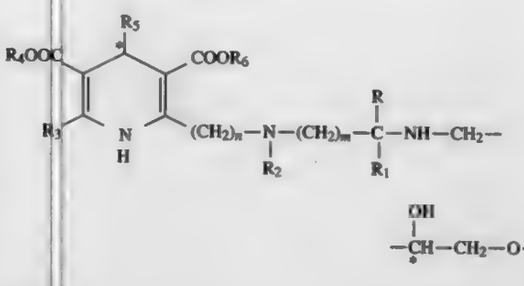
Continuation of Ser. No. 386,236, Jul. 28, 1989, abandoned. This application Jun. 21, 1991, Ser. No. 719,103

Claims priority, application Italy, Jul. 29, 1988, 21541; Jul. 29, 1988, 21542

Int. Cl.[6] A61K *31/535;* C07D *401/06;405/06;417/06*

U.S. Cl. 514—235.5 19 Claims

1. A compound of the formula



wherein

Ar is an optionally substituted mono- or dicyclo aromatic or heteroaromatic ring system, having at most 10 ring atoms, any heteroaromatic ring having at least 5 ring atoms, any substituent of a substituted ring system being a member selected from the group consisting of halogen, hydroxy, C_1–C_5 alkyl, C_2–C_5 alkenyl, C_1–C_3 alkoxy, allyloxy, alkoxyalkyl having from 1 to 5 carbon atoms in each of the alkyl and alkoxy moieties and optional unsaturation in the chain, phenoxy, phenylalkoxy, aminocarbonylalkyl having from 1 to 3 carbon atoms in the alkyl moiety, cyano, carboxy, carbamoylalkyl, aminocarboxy, amino, mono-alkylamino and dialkylamino wherein the nitrogen atom is optionally a ring member;

each of R and R_1 is, independently, hydrogen or C_1–C_3 alkyl;

R_2 is a straight-chain or branched unsubstituted or aryl-substituted C_1–C_7 alkyl, straight-chain or branched unsubstituted or aryl-substituted C_2–C_7 alkenyl, or X—R_7, where X is CO, CS or SO_2, and R_7 is alkyl or alkoxyalkyl having from 1 to 5 carbon atoms in each of the alkyl and alkoxy moieties, hydroxy, C_1–C_3 alkoxy, phenyl, mono-alkylamino or di-alkylamino having from 1 to 5 carbon atoms in each alkyl moiety or C_1–C_5 alkylthio;

R_3 is cyano, amino or optionally-fluoro-substituted C_1–C_3 alkyl;

each of R_4 and R_6 is, independently, alkyl or alkoxyalkyl having from 1 to 5 carbon atoms in each alkyl and alkoxy moiety;

R_5 is an optionally-substituted ring selected from the group consisting of phenyl, napthyl, tetrahydronaphthyl and indanyl, wherein any ring substituent is a member selected from the group consisting of halogen, hydroxy, alkyl, alkenyl, alkoxy, alkenyloxy, alkoxyalkyl, alkanoyl, trifluoromethyl, amino, nitro, carbamoyl, cyano, alkylthio, carbamoylalkyl and alkanoylamino having up to six carbon atoms in the alkyl moiety;

each of m and n is, independently, 1, 2 or 3;

or a salt thereof with an organic or inorganic pharmaceutically-acceptable acid.

5,468,747

FUNGICIDAL COMPOSITIONS AND METHODS OF USE EMPLOYING PYRIMIDINE DERIVATIVES

John M. Clough, Marlow; Christopher R. A. Godfrey, Great Hollands; Ian T. Streeting, Wokingham, and Rex Cheetham, Bracknell, all of, Great Britain, assignors to Zeneca Limited, London, United Kingdom

Division of Ser. No. 113,232, Aug. 30, 1993, Pat. No. 5,395,837, which is a continuation of Ser. No. 900,267, Jul. 20, 1992, Pat. No. 5,264,440, which is a division of Ser. No. 818,431, Dec. 27, 1991, Pat. No. 5,145,856, which is a continuation of Ser. No. 478,403, Feb. 12, 1990, abandoned. This application Dec. 2, 1994, Ser. No. 352,858

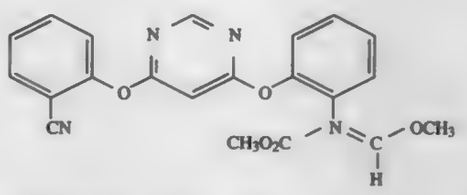
Claims priority, application United Kingdom, Feb. 10, 1989, 8903019

Int. Cl.[6] A61K *31/535;* A01N *43/54;59/02;59/20*

U.S. Cl. 514—239.5 5 Claims

1. A fungicidal composition comprising a fungicidally effective amount of the compound (E)-methyl 2-(2-[6-(2-cyanophenoxy)pyrimidin-4-yloxy]-phenyl)-3-methoxypropenoate having the formula:

(I)



and a complementary effective amount of a compound selected from the group consisting of (RS)-1-aminopropylphosphonic acid, (RS)-4-(4-chloro-phenyl)-2-phenyl-2-(1H-1,2,4-triazol-1-ylmethyl)butyronitrile, (RS)-4-chloro-N-

(cyano(ethoxy)methyl)benzamide, (Z)-N-but-2-enyloxymethyl-2-chloro-2', 6'-diethylacetanilide, 1-(2-cyano-2-methoxyiminoacetyl)-3-ethyl urea, 1-[(2RS,4RS;2RS,4RS)-4-bromo-2-(2,4-dichlorophenyl)-tetrahydrofurfuryl]-1H-1,2,4-triazole, 3-(2,4-dichlorophenyl)-2-(1H-1,2,4-triazol-1-yl)quinazolin-4(3H)-one, 3-chloro-4-[4-methyl-2-(1H-1,2,4-triazol-1-methyl)-1,3-dioxolan-2-yl]phenyl-4-chlorophenyl ether, 4-bromo-2-cyano-N,N,-dimethyl-6-trifluoromethylbenzimidazole-1-sulphonamide, 4-chlorobenzyl N-(2,4-dichlorophenyl)-2-(1H-1,2,4-triazol-1-yl)thioacetamidate, 5-ethyl-5,8-dihydro-8-oxo(1,3)-dioxolo(4,5-g)quinoline-7-carboxylic acid, alpha-[N-(3-chloro-2,6-xylyl)-2-methoxyacetamido]-gammabutyrolactone, anilazine, benalaxyl, benomyl, biloxazol, binapacryl, bitertanol, blasticidin S, bupirimate, buthiobate, captafol, captan, carbendazim, carboxin, chlorbenzthiazone, chloroneb, chlorothalonil, chlorozolinate, copper oxychloride, copper sulphate, Bordeaux mixture, cycloheximide, cymoxanil, cyproconazole, cyprofuram, di-2-pyridyl disulphide 1,1'-dioxide, dichlofluanid, dichlone, diclobutrazol, diclomezine, dicloran, dimethamorph, dimethirimol, diniconazole, dinocap, ditalimfox, dithianon, dodemorph, dodine, edifenphos, etaconazole, ethirimol, ethyl (Z)-N-benzyl-N-([methyl-(methylthioethylideneamino-oxycarbonyl)amino]thio)-beta-alaninate, etridiazole, fenapanil, fenarimol, fenfuram, fenpiclonil, fenpropidin, fenpropimorph, fentin acetate, fentin hydroxide, flutolanil, flutriafol, fluzilazole, folpet, fosetylaluminium, fuberidazole, furalaxyl, furconazole-cis, guazatine, hexaconazole, hydroxyisoxazole, imazalil, iprobenfox, iprodione, isoprothiolane, kasugamycin, mancozeb, maneb, mepronil, metalaxyl, methfuroxam, metsulfovax, myclobutanil, N-(4-methyl-6-prop-1-ynylpyrimidin-2-yl)aniline, neoasozin, nickel dimethyldithiocarbamate, nitrothal-isopropyl, nuarimol, ofurace, organomercury compounds, oxadixyl, oxycarboxin, pefurazoate, penconazole, pencycuron, phenazin oxide, phthalide, polyoxin D, polyram, probenazole, prochloraz, procymidone, propamocarb, propiconazole, propineb, prothiocarb, pyrazophos, pyrifenox, pyroquilon, pyroxyfur, pyrrolnitrin, quinomethionate, quintozene, streptomycin, sulphur, techlofthalam, tecnazene, tebuconazole, tetraconazole, thiabendazole, thiophanate-methyl, thiram, tolclofos-methyl, triacetate salt of 1,1'-iminodi(octamethylene)diguanidine, triadimefon, triadimenol, triazbutyl, tricyclazole, tridemorph, triforine, validamycin A, vinclozolin and zineb.

5,468,748

9H-INDENO[1,2-B]PYRAZINE DERIVATIVES

Peter Faarup, Skråplanet 15, 3500 Værløse; Palle Jakobsen, Langkær Vænge 14, 3500 Værløse; Anker S. Jørgensen, Bryggergade 6 1st, 2100 København Ø, and Henrik Kiltgaard, Birkerød Parkvej 34, 3460 Birkerød, all of, Denmark

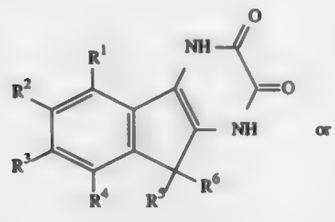
Filed Jan. 31, 1994, Ser. No. 189,524

Claims priority, application Denmark, Feb. 2, 1993, 0122/93

Int. Cl.[6] A61K *31/495;* **C07D** *491/10;495/10;241/38*

U.S. Cl. 514—250 **12 Claims**

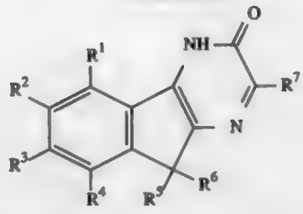
1. A compound of formula (I) or a tautomeric form thereof selected from the group consisting of



(I)

or

-continued



wherein

R^1, R^2, R^3 and R^4 independently are hydrogen, halogen, C_{1-6}-alkyl or C_{1-6}-alkoxy;

R^5 and R^6 together form a 1,3-dioxolane, 1,3-dioxane, 1,3-dithiolane or 1,3-diothiolane oxide group, which group is optionally substituted with one or two methyl group(s), hydroxymethyl, piperidinomethyl or (4-methyl-1-piperazinyl)methyl; and

R^7 represents hydrogen, phenyl or $—CH_2OR^8$ wherein R^8 is hydrogen or benzyl;

or a pharmaceutically acceptable salt thereof.

5,468,749

METHOD FOR TREATMENT OF SUBSTANCE ADDICTION

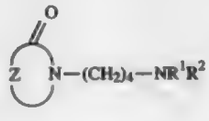
Frank H. Gawin, 35 Cottage St.; Robert Byck, 197 McKinley Ave., both of New Haven, Conn. 06511; Marc Alderdice, 94 Logwood Dr., Evansville, Ind. 47710, and Jeffrey Schwimmer, 8219 Petersburg Rd., Evansville, Ind. 47711

Continuation-in-part of Ser. No. 238,440, Aug. 30, 1988, abandoned. This application Jun. 16, 1989, Ser. No. 367,823

Int. Cl.[6] A61K *31/50;31/495*

U.S. Cl. 514—252 **16 Claims**

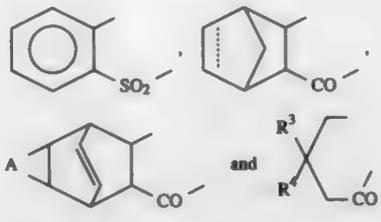
1. A method for treatment of substance addiction, the substance addiction comprising the habitual use of tobacco, the method comprising administration of a therapeutically effective regimen of a Formula I azapirone compound or a pharmaceutically effective acid addition salt thereof to a patient in need of such treatment;



I

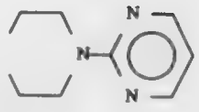
wherein

Z is a member selected from the group consisting of

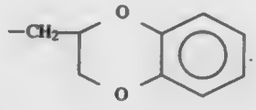


with the dotted and solid line representing either a single or a double chemical bond; A being selected from the group consisting of O, CH_2, CH_2CH_2 and CH=CH;

R^3 and R^4 being independently selected from hydrogen and C_{1-4} alkyl or R^3 and R^4 can be taken together as a butanediyl or pentanediyl chain; and R^1 and R^2 are either taken together as



or R^1 is hydrogen and R^2 is



5,468,750

HETEROCYCLE-COUPLED SUBSTITUTED PYRROLO[3,2-C]PYRIDIN-2-CARBOXYLIC ACIDS

André Bachy, Toulouse; Laurent Fraisse, Jurancon; Peter Keane, Portet sur Garonne; Etienne Mendes, Toulouse; Jean-Claude Vernieres, and Jacques Simiand, both of Muret, all of, France, assignors to Elf Sanofi, Paris, France

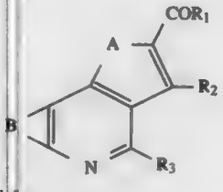
Division of Ser. No. 109,073, Aug. 19, 1993, Pat. No. 5,360,799. This application Jul. 12, 1994, Ser. No. 273,943

Claims priority, application France, Aug. 27, 1992, 92 10329

Int. Cl.[6] A61K *31/44;31/495;* **C07D** *495/14;495/04*

U.S. Cl. 514—255 **6 Claims**

1. A compound of formula



I

in which

A represents S;

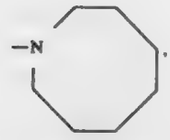
R_1 is selected from the group consisting of OH, $(C_1–C_{12})$alkyl, $(C_1–C_{12})$alkoxy, benzyloxy, phenyl, benzyl $(C_1–C_4)$alkyl NZ_1Z_2, and NZ_1Z_2;

R_2 is selected from the group consisting of OH, SH, $(C_1–C_4)$alkoxy, $(C_1–C_4)$alkylthio, and NZ_1Z_2;

R_3 is selected from the group consisting of H, $(C_1–C_4)$alkyl, $(C_1–C_4)$alkylthio, $(C_1–C_4)$alkoxy, phenyl, and benzyl;

B is selected from the group consisting of phenyl; pyridyl; phenyl substituted by one or more groups selected from halo, $(C_1–C_6)$alkyl, $(C_1–C_6)$alkoxy, CF_3, $CH_2NZ_1Z_2$, and NZ_1Z_2 wherein Z_1 and Z_2 are selected, independently of each other, from the group consisting of H, $(C_1–C_6)$ alkyl, formyl, and benzyl or $—NZ_1Z_2$ is selected from the group consisting of pyrrolidinyl, piperidinyl, morpholino, hexahydroazepino,

piperazino, piperazino substituted in position 4 by $(C_1–C_6)$alkyl, benzyl or diphenylmethyl; and pyridyl substituted by one or more groups selected from halo, $(C_1–C_6)$alkyl, $(C_1–C_6)$alkoxy, CF_3, $CH_2NZ_1Z_2$, and NZ_1Z_2wherein Z_1 and Z_2 are selected, independently of each other, from the group consisting of H, $(C_1–C_6)$alkyl, formyl, and benzyl, or NZ_1Z_2 is selected from the group consisting of pyrrolidinyl, piperidinyl, morpholino, hexahydroazepino,



piperazino, and piperazino substituted in position 4 by $(C_1–C_6)$alkyl, benzyl or diphenylmethyl; or its salt with an acid or a base.

5,468,751

AMINOPYRIMIDINE DERIVATIVES AS MICROBICIDES, INSECTICIDES AND ACARICIDES

Odd Kristiansen, Möhlin; Helmut Zondler, Bottmingen, and Urs Müller, Mütchenstein, all of, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

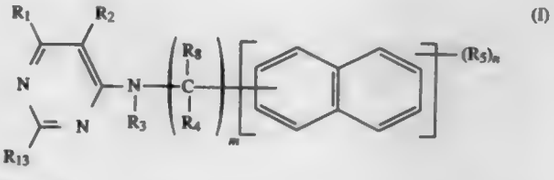
Continuation of Ser. No. 15,079, Feb. 8, 1993, abandoned, which is a continuation of Ser. No. 910,939, Jul. 19, 1992, abandoned, which is a division of Ser. No. 741,716, Aug. 7, 1991, abandoned. This application Sep. 23, 1993, Ser. No. 126,154

Claims priority, application Switzerland, Aug. 10, 1990, 2603/90; Feb. 8, 1991, 390/91

Int. Cl.[6] A61K *31/505;* **C07D** *239/42;239/47*

U.S. Cl. 514—256 **14 Claims**

1. A compound of formula I



(I)

wherein:

R_1 is hydrogen; $C_1–C_5$alkyl; $C_1–C_5$haloalkyl having from 1 to 3 halogen atoms; $C_2–C_5$alkoxyalkyl; $C_2–C_5$alkenyl; $C_2–C_5$haloalkenyl; or halogen;

R_2 is hydrogen; $C_1–C_5$alkyl; $C_1–C_3$haloalkyl having from 1 to 3 halogen atoms; $C_3–C_5$alkoxyalkyl; nitro; cyano; $S(O)_p$-$C_1–C_4$alkyl or halogen;

R_3 is hydrogen; $C_1–C_5$alkyl; benzyl; $—CO—R_6$; or SR_7;

R_4 and R_8 are each independently of the other hydrogen; $C_1–C_5$alkyl; $C_1–C_5$haloalkyl having from 1 to 3 halogen atoms; $C_2–C_6$alkoxyalkyl; or $C_3–C_6$cycloalkyl;

R_5 is halogen; $C_1–C_5$alkyl; $C_1–C_3$alkoxy; $C_1–C_6$alkoxyalkyl; $C_1–C_3$haloalkyl; $C_1–C_3$alkylthio; $C_1–C_3$haloalkoxy; $C_1–C_3$haloalkylthio; cyano; or nitro;

R_6 is $C_1–C_5$alkyl; phenyl; or phenyl substituted by halogen and/or by $C_1–C_3$alkyl;

R_7 is phenyl; phenyl mono- or di-substituted by halogen, nitro or by cyano; benzyl; benzyl mono- or di-substituted in the ring by halogen, nitro or by cyano; $C_1–C_5$alkyl; or $C_1–C_5$alkyl substituted by halogen or by cyano;

R_9 is $C_1–C_5$alkyl;

R_{10} is hydrogen or $C_1–C_3$alkyl;

R_{13} is hydrogen or $C_1–C_4$alkyl;

m is 1, 2 or 3;

n is 0, 1 or 2; and

p is 0, 1 or 2.

5,468,752

TREATMENT OF CONDITIONS OF ABNORMALLY INCREASED INTRAOCULAR PRESSURE BY ADMINISTRATION OF HPMPC AND RELATED PHOSPHONYLMETHOXYALKYLCYTOSINES

William R. Freeman, 2361 Lozana St., Del Mar, Calif. 92014

Filed Apr. 4, 1994, Ser. No. 222,128

Int. Cl.[6] A61K *31/505*

U.S. Cl. 514—272 **19 Claims**

1. A method for the treatment of abnormally increased intraocular pressure which comprises administering a therapeutically effective amount of a phosphonyl-methoxypropyl cytosine compound.

5,468,753

USE OF A 1-(2-NAPHTHYLETHYL)-4-(3-TRIFLUOROMETHYLPHENYL)-1,2,3,6-TETRAHYDROPYRIDINE FOR THE MANUFACTURE OF A MEDICAMENT FOR THE TREATMENT OF CEREBRAL AND NEURONAL DISEASES

Francois X. Coude, Toulouse; Jacqueline Fournier, Plaisance du Touch, both of, France, and Umberto Guzzi, Milan, Italy, assignors to Sanofi, Paris, France

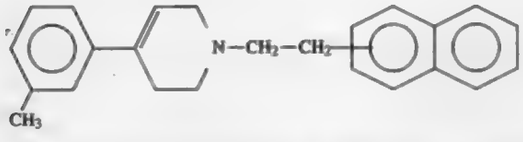
Continuation of Ser. No. 789,044, Nov. 7, 1991, Pat. No. 5,270,320, which is a continuation-in-part of Ser. No. 703,835, May 21, 1991, Pat. No. 5,229,389. This application Oct. 20, 1993, Ser. No. 142,069

The portion of the term of this patent subsequent to Dec. 14, 2010, has been disclaimed.

Int. Cl.[6] A61K *31/435*

U.S. Cl. 514—277 **4 Claims**

1. A method for treating a mammal having a disorder which raises said mammal's susceptibility to neuronal degenerative processes which comprises administering a compound or a pharmaceutically acceptable salt thereof to said mammal having said disorder; said compound having the formula:



wherein said compound is chronically administered in a pharmaceutically effective amount to reduce said susceptibility to neuronal degenerative processes associated with said disorder.

5,468,754

11,7 SUBSTITUTED CAMPTOTHECIN DERIVATIVES AND FORMULATIONS OF 11,7 SUBSTITUTED CAMPTOTHECIN DERIVATIVES AND METHODS FOR USES THEREOF

Frederick H. Hausheer, San Antonio, and Kochat Haridas, Houston, both of Tex., assignors to BioNumerik Pharmaceuticals, Inc., San Antonio, Tex.

Filed Apr. 19, 1994, Ser. No. 229,527

Int. Cl.[6] A61K *31/475*

U.S. Cl. 514—283 **36 Claims**

1. An 11-hydroxy-7-ethyl camptothecin solution consisting essentially of 11-hydroxy-7-ethyl camptothecin dissolved in dimethylacetamide and a pharmaceutically acceptable acid wherein said acid is an organic carboxylic acid selected from the group consisting of citric acid and taurocholic acid in an admixture with citric acid.

5,468,755

THERAPEUTIC PROCESS FOR THE TREATMENT OF THE PATHOLOGIES OF TYPE II DIABETES

Anthony H. Cincotta, Andover, Mass., and Albert H. Meier, Baton Rouge, La., assignors to The Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Continuation of Ser. No. 813,135, Dec. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 463,327, Jan. 10, 1990, abandoned, which is a continuation-in-part of Ser. No. 192,332, May 10, 1988, abandoned. This application Nov. 24, 1993, Ser. No. 158,153

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—288 **39 Claims**

1. A method for modifying or regulating glucose metabolism in an animal or human subject in need of such treatment comprising administering to said subject a prolactin-inhibiting compound on a timed daily basis in a dosage amount and for a period sufficient to achieve in said subject at least one of the following modifications: decrease in insulin resistance, reduction of hyperinsulinemia, increase in glucose tolerance, and reduction of hyperglycemia.

5,468,756

IMIDAZONAPHTHYRIDINE DERIVATIVES

Fumio Suzuki, Mishima; Takeshi Kuroda, Shizuoka; Shigeto Kitamura, Machida, and Kenji Ohmori, Mishima, all of, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

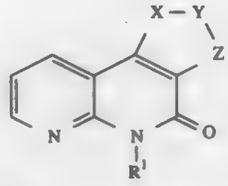
Division of Ser. No. 999,658, Dec. 29, 1992, Pat. No. 5,364,859, which is a continuation of Ser. No. 706,852, May 29, 1991, abandoned. This application May 12, 1994, Ser. No. 241,631

Claims priority, application Japan, Jun. 1, 1990, 2-143460; Nov. 30, 1990, 2-334657

Int. Cl.[6] C07D *471/00;* **A61K** *31/44*

U.S. Cl. 514—293 **7 Claims**

1. An imidazonaphthyridine derivative represented by formula (I):

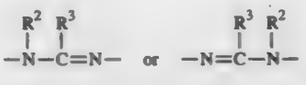


(I)

wherein:

R^1 represents lower alkyl or substituted or unsubstituted aryl; and

X—Y—Z represents



wherein R^2 represents $—C(R^5)H—(CH_2)_n—R^4$ (wherein R^4 represents substituted or unsubstituted aryl group having 6–10 carbon atoms, hydroxy-substituted lower alkyl, lower alkanoyloxy, lower alkanoyl, carboxy, lower alkoxycarbonyl, cycloalkyl, hydroxy, lower alkoxy, halogen or NR^6R^7 wherein R^6 and R^7 independently represents hydrogen or lower alkyl; R^5 represents hydrogen, lower alkyl, or phenyl; and n represents an integer of 0 to 3); and R^3 represents hydrogen, mercapto, hydroxy, lower alkyl, or aryl

or a pharmaceutically acceptable salt thereof.

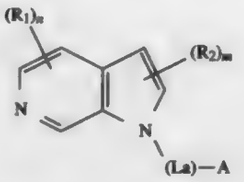
5,468,757

6-AZAINDOLE THROMBOXANE SYNTHASE INHIBITORS

Joseph A. Jakubowski, Indianapolis; Alan D. Palkowitz, Carmel, and Sandra K. Sigmund, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 31, 1994, Ser. No. 189,212
Int. Cl.[6] A61K *31/435*; C07D *471/04*
U.S. Cl. 514—300 12 Claims

1. A 6-azaindole compound which inactivates TXA_2 synthase in mammalian blood platelets, or a pharmacologically acceptable salt, solvate, or prodrug thereof, said compound represented by the formula (II):



(II)

wherein;

n is an integer from zero to 3;

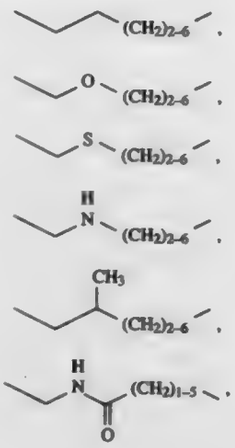
m is an integer from zero to 2;

R_1 is a radical at position 4, 5, or 7 where each R_1 is independently selected from hydroxy, halogen, cyano, sulfo, nitro, amino, substituted amino, carboxyl, acyl, carbamyl, carbonyl, alkoxycarbonyl, aryl, aryloxy, C_1–C_{12} alkyl, C_2–C_{12} alkenyl, C_2–C_{12} alkynyl, C_1–C_{12} alkoxy, C_4–C_8 cycloalkyl, C_1–C_{12} halogenated alkyl, C_1–C_{12} hydroxylated alkyl, aminoalkyl, cyanoalkyl, C_1–C_{12} substituted phenyl, the phenyl of which may optionally be substituted by alkyl, halo, hydroxy, or C_2–C_6 alkenyl, C_2–C_6 alkynyl, C_1–C_6 alkylthio, acyl, C_1–C_6 alkoxy, or C_1–C_6 alkylsulfonyl;

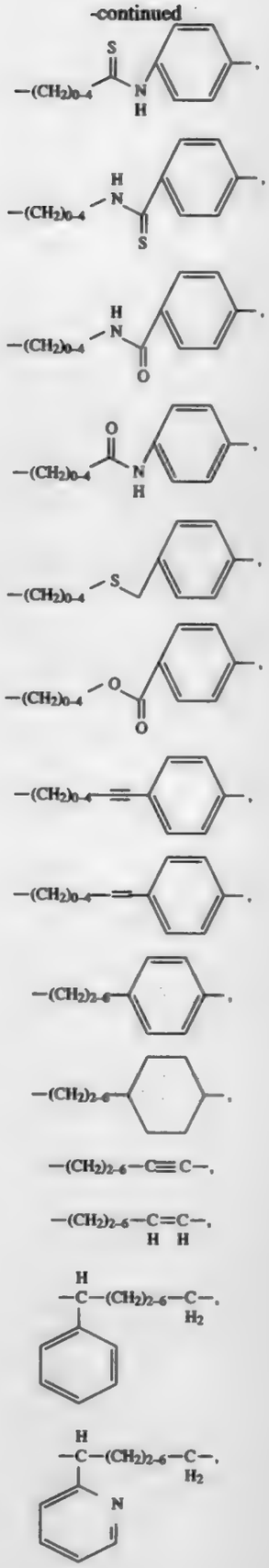
R_2 is a radical at position 2 or 3 where each R_2 is independently selected from hydroxy, halogen, cyano, sulfo, nitro, amino, substituted amino, carboxyl, acyl, carbamyl, carbonyl, alkoxycarbonyl, aryl, aryloxy, C_1–C_{12} alkyl, C_2–C_{12}alkenyl, C_2–C_{12} alkynyl, C_1–C_{12} alkoxy, C_4–C_8 cycloalkyl, C_1–C_{12} halogenated alkyl, C_1–C_{12} hydroxylated alkyl, aminoalkyl, cyanoalkyl, C_1–C_{12} substituted phenyl, the phenyl of which may optionally be substituted by alkyl, acyl, halo, hydroxy, or C_2–C_6 alkenyl, C_2–C_6 alkynyl, C_1–C_6 alkylthio, C_1–C_6 alkoxy, or C_1–C_6 alkylsulfonyl;

positions 2, 3, 4, 5, and 7 in formula (II) not substituted by R_1 or R_2 are substituted with hydrogen;

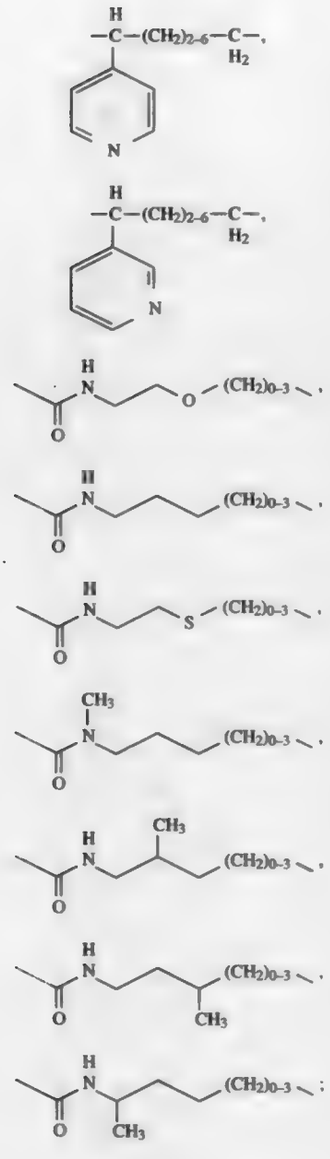
(L_a) is a divalent linking group selected from the formulae;



-continued

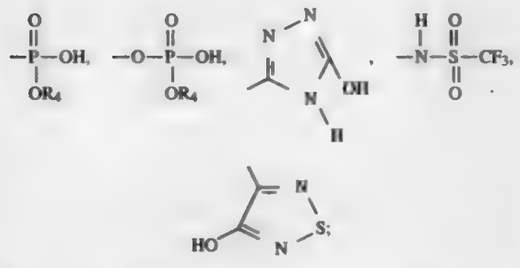


-continued



and

A is an acidic group selected from;
-5-tetrazolyl,
$-SO_3H$,
-carboxyl,



where R_4 is selected from hydrogen, C_1–C_{12} alkyl, phenyl or substituted phenyl.

5,468,758

CRYSTALLINE FORMS OF ENDO-2,3-DIHYDRO-N-(8-METHYL)-8-AZABICYCLO[3.2.1]OCT-3-YL)-2-OXO-1H-BENZIMIDAZOLE-1-CARBOXAMIDES

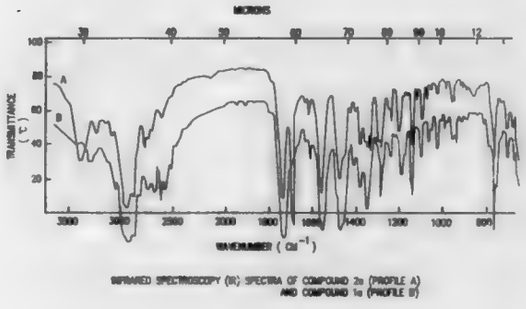
Enzo Cereda, Tortona A1; Antoine Ezhaya, Milan; Marco Turconi, Voghere; Enrica Dubini, and Grazia Maffione, both of Milan, all of, Italy, assignors to Boehringer Ingelheim Italia S.p.A., Florence, Italy

Continuation of Ser. No. 25,448, Mar. 2, 1993, abandoned. This application Jun. 22, 1994, Ser. No. 264,104

Claims priority, application Italy, Mar. 26, 1992, MI9200720; Mar. 26, 1992, MI9200723

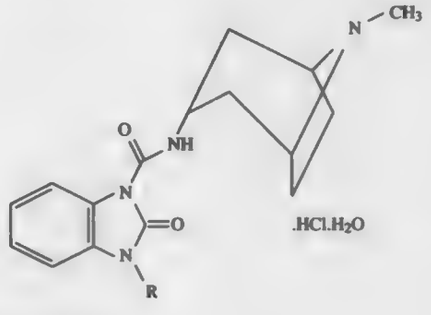
Int. Cl.[6] A61K *31/46;* **C07D** *451/12*

U.S. Cl. 514—304 **2 Claims**



INFRARED SPECTROSCOPY (IR); SPECTRA OF COMPOUND 2a (PROFILE A) AND COMPOUND 1a (PROFILE B)

1. Crystalline monohydrates of endo-2,3-dihydro-N-(8-methyl-8-azabicyclo[3.2.1.]oct-3-yl)-2-oxo-1H-benzimidazole-1-carboxamide hydrochloride and endo-3-ethyl- 2,3-dihydro-N-(8-methyl-8-azabicyclo[3.2.1]oct-3-yl)-2-oxo- 1H-benzimidazole-1-carboxamide hydrochloride, of formula



(Compound 2a: R=H)
(Compound 2b: R=C_2H_5).

5,468,759

SYNERGISTIC MICROBICIDAL COMBINATIONS CONTAINING 4,5-DICHLORO-2-OCTYL-3-ISOTHIAZOLONE AND CERTAIN COMMERCIAL BIOCIDES

Jemin C. Hsu, Fort Washington, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 810,602, Dec. 19, 1991, Pat. No. 5,292,763. This application Nov. 18, 1993, Ser. No. 131,849

Int. Cl.[6] A61K *31/425;* **A01N** *43/80;33/02*

U.S. Cl. 514—372 **6 Claims**

1. A microbicidal composition, the first component of which is 4,5-dichloro-2-octyl-3-isothiazolone and the second component of which is 5-bromo-5-nitro-1,3-dioxane, wherein the ratio of the first component to the second component is in the range of from about 1:1.6 to about 1:200.

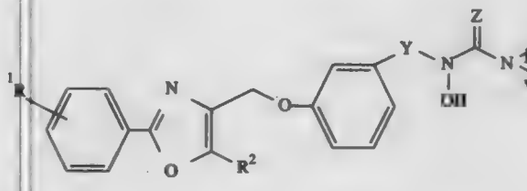
5,468,760

ARALKYL-N-HYDROXYUREAS AS INHIBITORS OF 5-LIPOXYGENASE AND OXIDATION OF LOW DENSITY LIPOPROTEIN

Michael S. Malamas, Jamison, and James A. Nelson, Washingtons Crossing, both of Pa., assignors to American Home Products Corporation, Madison, N.J.

Filed Nov. 8, 1993, Ser. No. 148,474
Int. Cl.[6] A61K *31/42*
U.S. Cl. 514—374 **1 Claim**

1. A method of treating atherosclerosic plaque formation in a mammal in need thereof which comprises administration of a therapeutically effective amount of a compound having the formula:



wherein

R^1 and R^3 are independently hydrogen, fluorine, chlorine, bromine, iodine, C_1–C_6 alkyl, trifluoromethyl, C_1–C_6 alkoxy, or C_1–C_6 trifluoroalkoxy; R^2 and R^4 are hydrogen or methyl independently;

R^5 is hydrogen, methyl or hydroxy;

X and Z are independently oxygen or sulfur; and

Y is —CH_2—, —$CH(CH_3)$—, or —CH=CHCH(CH_3)—.

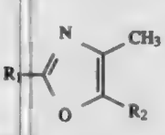
5,468,761

4-METHYL-5-SUBSTITUTED-1,3-OXAZOLES HAVING ANTI-INFLAMMATORY ACTIVITY

Guillaume de Nanteuil, Suresnes; Michel Vincent, Bagneux; Christine Lila, Viroflay; Jacqueline Bonnet, Paris, and Armel Fradin, Neuilly Sur Seine, all of, France, assignors to Adir et Compagnie, Courbevoie, France

Filed Dec. 9, 1993, Ser. No. 164,464
Claims priority, application France, Dec. 11, 1992, 92 14912
Int. Cl.[6] A61K *31/42*
U.S. Cl. 514—374 **5 Claims**

1. A compound selected from those of formula (I):

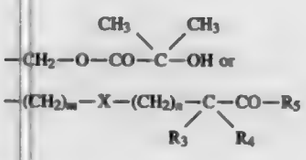


(I)

in which:

R_1 represents 1-adamantyl; dicyclopropylmethyl; (C_3–C_6) cycloalkyl which is unsubstituted or substituted by halogen, hydroxy, or linear or branched (C_1–C_6) alkoxy; or bicyclo[2.2.2]oct-1-yl which is unsubstituted or substituted at the 4-position by halogen, linear or branched (C_1–C_6) alkoxy, or hydroxy;

R_2 represents:

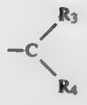


in which:

m represents 1, 2 or 3,

X represents oxygen or sulfur or N—R in which R is hydrogen or linear or branched (C_1–C_6) alkyl,

R_3 or R_4, which are identical or different, represent hydrogen, linear or branched (C_1–C_6) alkyl, trifluoromethyl, or the group



forms (C_3–C_6) cycloalkyl,

n represents 0, 1 or 2,

R_5 represents hydroxy a linear or branched (C_1–C_6) alkoxy, which is unsubstituted or substituted by one or two linear or branched (C_1–C_6) alkyl;

its enantiomers, diastereoisomers or epimers to its addition salts with a pharmaceutically acceptable acid or base.

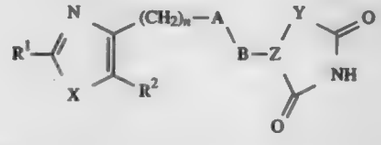
5,468,762

AZOLIDINEDIONES AS ANTIHYPERGLYCEMIC AGENTS

Michael S. Malamas, Jamison, Pa., and Iwan Gunawan, Somerset, N.J., assignors to American Home Products Corporation, Madison, N.J.

Filed May 18, 1994, Ser. No. 245,734
Int. Cl.[6] C07D *413/12;413/10;* A61K *31/42*
U.S. Cl. 514—376 **9 Claims**

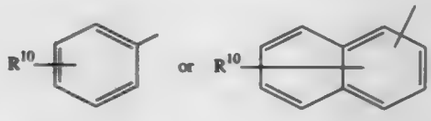
1. A compound according to formula I below



I

wherein:

R^1 is C_1–C_6 alkyl, C_3–C_8 cycloalkyl, thienyl, furyl, pyridyl,



where

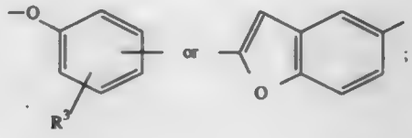
R^{10} is hydrogen, C_1–C_6 alkyl, fluorine, chlorine, bromine, iodine, C_1–C_6 alkyoxy, trifluoroalkyl or trifluoroalkoxy;

R^2 is hydrogen or C_1–C_6 alkyl;

X is O or S;

n is 1 or 2;

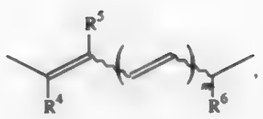
A is



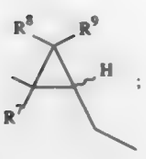
where

R^3 is hydrogen, C_1–C_6 alkyl, halogen, C_1–C_6 alkoxy, trifluoroalkyl or trifluoroalkoxy;

B is



or



where

R^4 is hydrogen, C_1–C_6 alkyl, allyl, C_6–C_{10} aryl, C_6–C_{10} aryl—$(CH_2)_{1-6}$—, fluorine, chlorine, bromine, iodine, trimethylsilyl or C_3–C_8 cycloalkyl;

R^5 is hydrogen, C_1–C_6 alkyl, C_6–C_{10} aryl, or C_6–C_{10} aryl—$(CH_2)_{1-6}$—;

m is 0, 1, or 2;

R^6 is hydrogen or C_1–C_6 alkyl;

R^7 is hydrogen or C_1–C_6 alkyl;

R^8 and R^9 are selected independently from hydrogen, C_1–C_6 alkyl, fluorine, chlorine, bromine, or iodine;

Y is O;

Z is CH;

or a pharmaceutically acceptable salt thereof.

5,468,763

USE OF A GLYCINE B PARTIAL AGONIST FOR MEMORY AND LEARNING ENHANCEMENT OR TREATMENT OF A COGNITIVE DISORDER

Alex A. Cordi, St. Louis; Gail E. Handelmann, Chesterfield, and Joseph B. Monahan, Black Jack, all of Mo., assignors to G. D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 727,175, Jul. 9, 1991, abandoned, which is a continuation of Ser. No. 438,494, Dec. 1, 1988, Pat. No. 5,087,633, which is a continuation-in-part of Ser. No. 127,121, Dec. 1, 1987, Pat. No. 4,904,681. This application Nov. 12, 1992, Ser. No. 975,298

The portion of the term of this patent subsequent to Feb. 11, 2009, has been disclaimed.

Int. Cl.[6] A61K *31/41*

U.S. Cl. 514—380 **6 Claims**

1. A method to improve cognitive function or to treat cognitive dysfunction in a subject in need thereof, which method comprises administering to the subject a thereapeutically-effective amount of a Glycine B partial agonist.

5,468,764

ANGIOTENSIN II RECEPTOR ANTAGONISTS FOR THE TREATMENT OF DISTURBANCES IN CARDIAC RHYTHM

Holger Heitsch, Hofheim am Taunus; Wolfgang Linz, Mainz; Adalbert Wagner, Hattersheim am Main, and Heinz-Werner Kleemann, Bad Homburg, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

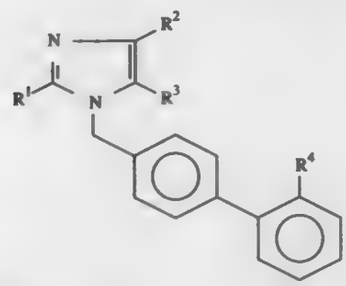
Filed Jun. 29, 1993, Ser. No. 83,337

Claims priority, application Germany, Jul. 1, 1992, 42 21 536.6; Aug. 27, 1992, 42 28 554.2

Int. Cl.[6] A61K *31/41*

U.S. Cl. 514—382 **6 Claims**

1. A method for the treatment of disturbances in cardiac rhythm in a mammal comprising the step of administering to a mammal in recognized need thereof an effective amount of an antagonist for angiotensin II receptors of the AT_1 subtype having the formula (I)



(I)

in which

R^1 is $(C_1$–$C_7)$-alkyl, $(C_3$–$C_7)$-alkenyl or $(C_3$–$C_7)$-alkylnyl,

R^2 is Cl or —S(O)$_r$—R^{19};

R^3 is —CH_2OR^5 or —CO—R^6;

R^4 is —SO_2—NH—CO—NR^7R^9, —SO_2—NH—CO—OR^7, —SO_2—NH—CO—R^7, —SO_2—N=CH—$N(CH_3)_2$ or tetrazoyl;

R^5 is hydrogen;

R^6 is hydrogen or OR^7;

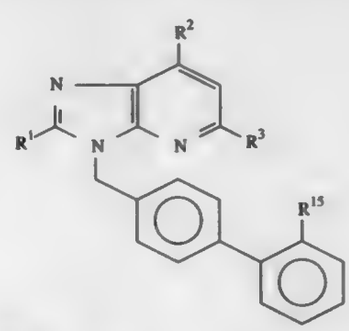
R^7 and R^9 are identical or different and are hydrogen, $(C_1$–$C_6)$-alkyl, $(C_3$–$C_8)$-cycloalkyl, $(C_3$–$C_6)$-cycloalkyl-$(C_1$–$C_3)$-alkyl, $(C_6$–$C_{12})$-aryl, $(C_6$–$C_{10})$-aryl-$(C_1$–$C_4)$-alkyl, $(C_2$–$C_6)$-alkenyl, $(C_3$–$C_6)$-alkenoyl or $(C_3$–$C_6)$-alkynyl;

R^{19} is $(C_1$–$C_8)$-alkyl; and

r is 0, 1 or 2;

or a physiologically tolerable salt thereof.

4. A method for the treatment of disturbances in cardiac rhythm in a mammal comprising the step of administering to a mammal in recognized need thereof an effective amount of an antagonist for angiotensin II receptors of the AT_1 subtype having the formula (II)



(II)

in which

R^1 is $(C_1$–$C_7)$-alkyl, $(C_3$–$C_7)$-alkenyl or $(C_3$–$C_7)$-alkylnyl;

R^2 and R^3 are identical or different and are hydrogen or $(C_1$–$C_4)$-alkyl;

R^{15} is —SO—NR^{18}—CO—OR^{17}, —SO_2—NR^{18}—CO—NHR^{16}, —SO_2—NH—CO—R^{17} or tetrazoyl;

R^{16} and R^{17} are identical and are $(C_1–C_4)$-alkyl, $(C_2–C_6)$-alkenyl, $(C_3–C_8)$-cycloalkyl-$(C_1–C_4)$-alkyl, phenyl or phenyl-$(C_1–C_4)$-alkyl;

R^{18} is hydrogen or $(C_1–C_6)$-alkyl;

or a physiologically tolerable salt thereof.

5,468,765

BENZIMIDAZOLE ANTHELMINTIC AGENTS

Bernard J. Banks; Christopher J. Dutton, both of Sandwich, United Kingdom, and Alexander C. Goudie, Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/EP93/00422, § 371 Date Dec. 23, 1994, § 102(e) Date Dec. 23, 1994, PCT Pub. No. WO93/18010, PCT Pub. Date Sep. 16, 1993

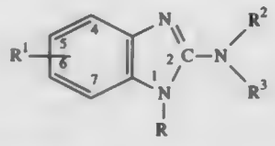
PCT Filed Feb. 23, 1993, Ser. No. 302,707

Claims priority, application United Kingdom, Mar. 12, 1992, 9205368

Int. Cl.[6] A61K *31/415;* **C07D** *235/32;401/04;405/04*

U.S. Cl. 514—395 **13 Claims**

1. A compound of formula (I)

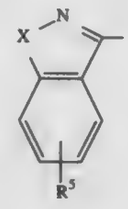


(I)

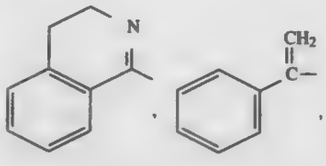
or their non-toxic salt,

in which R is H, $—CO_2(C_1–C_{10}$ alkyl), —cholester-3-yl) or a group of the formula $—CO_2(CH_2)_nCOOH$ or $—CO_2(CH_2)_nCO_2(C_1–C_6$alkyl) in which n is an integer of from 1 to 10;

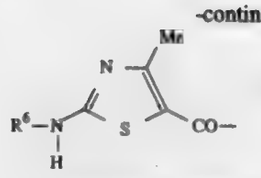
R^1 is either (i) benzoyl, phenyloxy, phenylthio, phenylsulfinyl, phenylsulfonyl, phenylsulfonyloxy, $C_1–C_6$ alkylthio, $C_1–C_6$ alkylsulfinyl, $C_1–C_6$ alkylsulfonyl or $(C_3–C_7$ cycloalkyl)carbonyl, said phenyl groups, and the phenyl portion of said benzoyl group, optionally having 1 to 3 substituents each independently selected from halo, $C_1–C_4$ alkyl, halo($C_1–C_4$ alkyl), $C_1–C_4$ alkoxy, $C_1–C_4$ alkylthio, $C_1–C_4$ alkylsulfinyl, $C_1–C_4$ alkylsulfonyl, $C_2–C_4$ alkanoyl, nitro, isothiocyanato, and cyano; or (ii) a group of the formula:



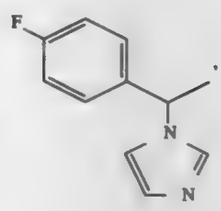
where X is O,S,SO,SO_2 or NR^4 in which R^4 is hydrogen, $C_1–C_4$ alkyl, phenyl or phenyl($C_1–C_4$ alkyl), said phenyl groups being optionally substituted by 1 or 2 substituents each independently selected from $C_1–C_4$ alkyl, halo, hydroxy and $C_1–C_4$ alkoxy; and R_5 is H, $C_1–C_4$ alkyl, halo, hydroxy or $C_1–C_4$alkoxy;

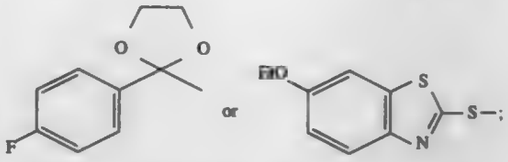


-continued



where R^6 is $C_1–C_4$ alkyl, allyl or phenyl





R^1 being in the 5(6)-position when R is H, and in the 5- or 6-position when R is other than H; and R^2 and R^3 are each independently $—CO_2(C_1–C_4$ alkyl).

5,468,766

1,5,6,7-TETRAHYDRO-4H-INDAZOL-4-ONES

Wolfgang Eberlein; Wolfhard Engel; Gerhard Mihm; Klaus Rudolf, and Günther Engelhardt, all of Biberach, Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Germany

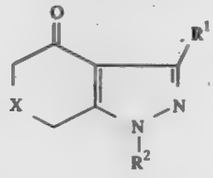
Filed Sep. 29, 1993, Ser. No. 128,506

Claims priority, application Germany, Sep. 29, 1992, 42 32 544.7

Int. Cl.[6] A61K *31/415;* **C07D** *231/56*

U.S. Cl. 514—403 **5 Claims**

1. 1,5,6, 7-tetrahydro-4H-indazol-4-ones of the formula



wherein

R^1 is a hydrogen atom and R^2 is a straight-chained or branched C_{2-6}-alkyl group and X is a methylene group which may be substituted by one or two methyl groups.

5,468,767

ANTIDEPRESSANT 3-(AMINOCYCLOALKENYL)-INDOLE-5-NITRILE DERIVATIVES

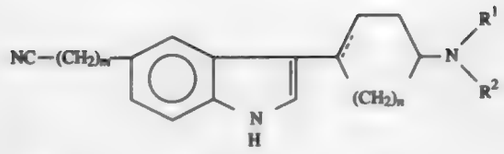
Joseph A. Cipollina, Middletown; Ronald J. Mattson, Meriden, and Charles P. Sloan, Wallingford, all of Conn., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Filed Jan. 6, 1994, Ser. No. 178,073

Int. Cl.[6] A61K *31/40;* **C07D** *405/00*

U.S. Cl. 514—414 **9 Claims**

1. A compound of Formula I or a pharmaceutically acceptable acid addition salt thereof



wherein

R^1 is hydrogen or C_{1-4} alkyl;

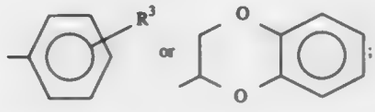
R^2 is C_{1-4} alkyl, $-(CH_2)_p-Ar$;

m is zero or 1;

n is an integer from 1 to 3;

p is zero or an integer from 1 to 4;

Ar is



R^3 is hydrogen, halogen or C_{1-4} alkoxy; and

the solid plus dotted line represents a single or double covalent bond.

5,468,768

ANTIMIGRAINE DERIVATIVES OF INDOLYLCYCLOALKANYLAMINES

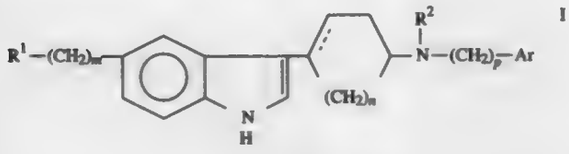
Joseph A. Cipollina, Middletown; Jonas A. Gylys, Southington; Ronald J. Mattson, Meriden, and Charles P. Sloan, Wallingford, all of Conn., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Filed Jan. 6, 1994, Ser. No. 178,079

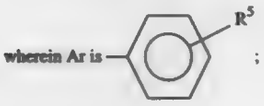
Int. Cl.[6] A61K *31/40;* **C07D** *209/08*

U.S. Cl. 514—415 **6 Claims**

1. A compound of Formula I or a pharmaceutically acceptable acid addition salt thereof



wherein Ar is



R^1 is $-CONHR^3$;

R^2 is hydrogen and lower alkyl;

R^3 is hydrogen, lower alkyl and phenyl-lower-alkylene;

R^5 is hydrogen, halogen, or lower alkoxy;

m is zero or 1;

n is an integer from 1 to 3;

p is zero or an integer from 1 to 4; and

the solid and dotted line represent either a single or double covalent bond.

5,468,769

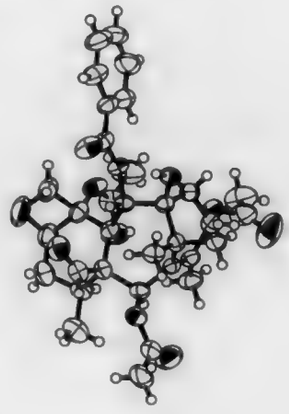
PACLITAXEL DERIVATIVES

Larry L. Klein, Lake Forest, and Clarence J. Maring, Grayslake, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

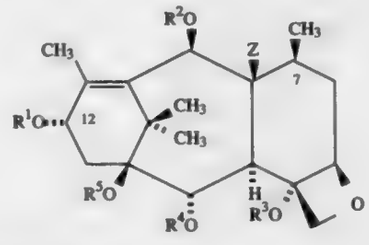
Filed Jul. 15, 1993, Ser. No. 92,124

Int. Cl.[6] A61K *31/335;* **C07D** *305/14*

U.S. Cl. 514—449 **8 Claims**

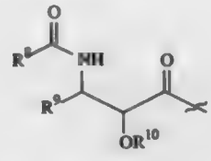


1. A compound or prodrug thereof having the formula



or a prodrug thereof, wherein

R^1 is selected from the group of hydrogen, alkanoyl and a radical having the formula



in which R^8 is selected from the group consisting of hydrogen, alkyl, phenyl, substituted phenyl, alkoxy, substituted alkoxy, amino, substituted amino, phenoxy and substituted phenoxy; R^9 is selected from the group consisting of hydrogen, alkyl, hydroxyalkyl, alkoxyalkyl, aminoalkyl, phenyl and substituted phenyl; and R^{10} is selected from the group consisting of hydrogen, alkanoyl, substituted alkanoyl and aminoalkanoyl;

R^2 and R^3 are acetyl;

R^4 is phenylcarbonyl;

R^5 is hydrogen; and

Z is —CHO.

5,468,770

GREEN LEAF VOLATILES AS INHIBITORS OF BARK BEETLE AGGREGATION PHEROMONES

Joseph C. Dickens, Starkville, Miss.; Ronald F. Billings, Lufkin, Tex., and Thomas L. Payne, Blacksburg, Va., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C., and Texas A&M University System, College Station, Tex.

Division of Ser. No. 662,601, Mar. 1, 1991, Pat. No. 5,273,996. This application Dec. 17, 1993, Ser. No. 168,839

Int. Cl.[6] A01N *31/00;31/02*

U.S. Cl. 514—450 13 Claims

1. A composition for inhibiting or disrupting the response of pine bark beetles to their aggregation pheromones consisting essentially of an effective amount of: (1) a six carbon alcohol green leaf volatile effective as an inhibitor of the pheromone response of said pine bark beetles; and (2) an additional component effective as an inhibitor or repellant of the pheromone response of said pine bark beetles, wherein said additional component is selected from the group consisting of verbenone, dipentene, endo-brevicomin, and mixtures thereof.

5,468,771

CHOLESTEROL LOWERING COMPOUND

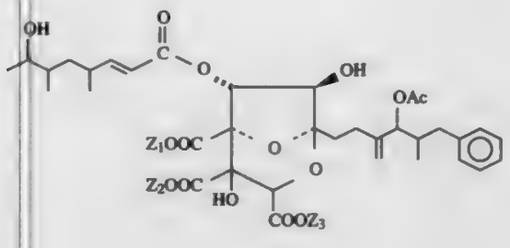
Magda M. Gagliardi, Somerset; Shieh-Shung T. Chen, Morganville; Byron H. Arison, Watchung; George M. Garrity, Westfield; Leeyuan Huang, Watchung; John G. MacConnell, Westfield, all of N.J., and Raymond F. White, Palmyia, Va., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 741,699, Aug. 7, 1991, abandoned. This application Feb. 2, 1994, Ser. No. 190,110

Int. Cl.[6] A61K *31/35;* C07D *319/04*

U.S. Cl. 514—452 5 Claims

1. A compound of structure:



wherein Z_1, Z_2 and Z_3 are each independently selected from the group consisting of

(a) B;

(b) C_{1-5} alkyl;

(c) C_{1-5} alkyl substituted with a member of the group consisting of

(i) phenyl,

(ii) phenyl substituted with methyl,

methoxy, halogen (Cl, Br, I, F), or hydroxy; or a pharmaceutically acceptable salt thereof.

5,468,772

TRIPTERININ COMPOUND AND METHOD

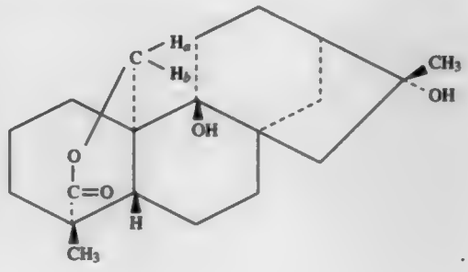
Ren S. Xu, Palo Alto, and Tien W. Wiedmann, Stanford, both of Calif., assignors to Pharmagenesis, Inc., Palo Alto, Calif.

Filed Mar. 10, 1993, Ser. No. 31,288

Int. Cl.[6] A61K *31/35*

U.S. Cl. 514—453 7 Claims

1. A purified compound having the structural formula:



5,468,773

METHODS FOR INHIBITING BONE LOSS AND CARTILAGE DEGRADATION USING WORTMANNIN AND ITS ANALOGS

Jeffrey A. Dodge, Indianapolis, and Masahiko Sato, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

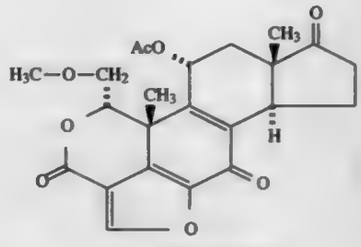
Division of Ser. No. 112,012, Aug. 25, 1993, abandoned. This application Jun. 13, 1994, Ser. No. 259,315

Int. Cl.[6] A61K *31/365;31/34*

U.S. Cl. 514—453 4 Claims

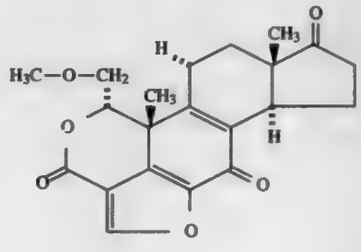
1. A method of inhibiting bone resorption in a subject comprising administering to said subject a pharmaceutically effective dose of a compound selected from

(Ia)

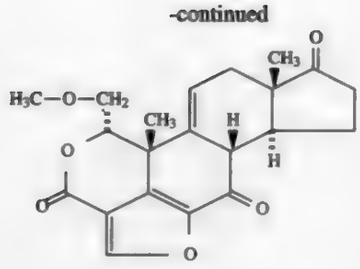


[Wortmannin]

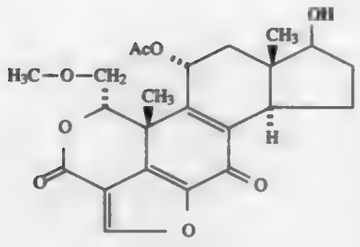
(Ib)



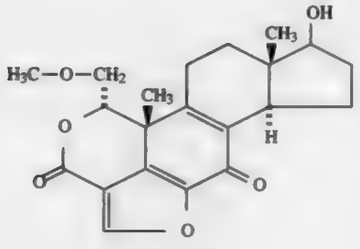
-continued



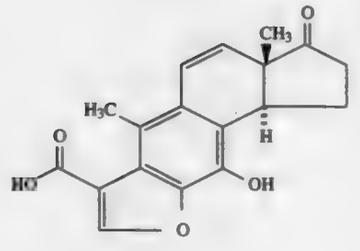
(II)



(IIIa)

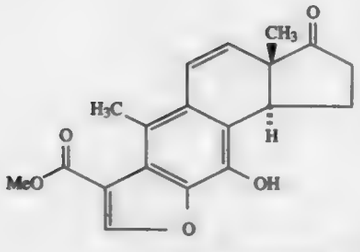


(IIIb)



(IVa)

and



(IVb)

or a pharmaceutically acceptable salt thereof.

5,468,774

TETRONIC, THIOTETRONIC AND TETRAMIC ACID DERIVATIVES AS PHOSPHOLIPASE A2 INHIBITORS

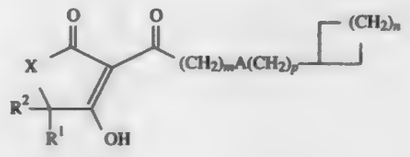
Guy A. Schiehser, Yardley, Pa.; Craig E. Caufield; Nancie A. Senko, both of Plainsboro, N.J., and Gregory F. VonBurg, Princeton, N.J., assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 303,096, Sep. 8, 1994, abandoned, which is a division of Ser. No. 71,627, Jun. 3, 1993, Pat. No. 5,366,993, which is a continuation-in-part of Ser. No. 874,928, Apr. 28, 1992, abandoned. This application Mar. 14, 1995, Ser. No. 403,318

Int. Cl.[6] A61K *31/34;* **C07D** *307/46*

U.S. Cl. 514—471 **12 Claims**

7. A method for treating immunoinflammatory conditions in mammals which comprises administering to a mammal so afflicted an effective amount of a compound having the formula



wherein

X is O;

R^1 and R^2 are each, independently, hydrogen, C_1-C_{10} alkyl, $C_3$14 C_{20} cycloalkyl, phenylloweralkyl, or substituted phenylloweralkyl substituted by halo, lower alkyl, lower alkoxy, halo lower alkyl, amino, monoloweralkylamino, diloweralkylamino or sulfonamido;

A is O, S, NR or a chemical bond;

R, if present, is hydrogen or loweralkyl;

m is0–15;

n is0–20;

p is0–15,

where m+p≦15;

and the pharmacologically acceptable salts thereof.

5,468,775

ENAMINONE ESTERS

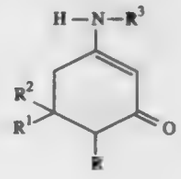
Kenneth R. Scott, Silver Spring; Jesse M. Nicholson, Upper Marlboro, and Ivan O. Edafiogbo, Oxon, all of Md., assignors to Howard University, Washington, D.C.

Continuation-in-part of Ser. No. 844,068, Mar. 2, 1992, abandoned. This application Mar. 2, 1993, Ser. No. 24,970

Int. Cl.[6] A61K *31/24*

U.S. Cl. 514—541 **7 Claims**

1. An enaminone having the formula:



wherein

R is from the group consisting of $COOCH_3$ and $COOC_2H_5$;

R^1 is from the group consisting of H and CH_3;

R^2 is from the group consisting of H when R^1 is CH_3 and CH_3 when R^1 is H; and

R^3 is from the group of first radicals consisting of benzyl, phenethyl, disubstituted phenyl and trisubstituted phenyl, wherein the substituted species are second radicals having positive lipophilicity selected from the group consisting of F, Cl, Br, and I.

5,468,776

PHYSIOLOGICALLY ACTIVE AND NUTRITIONAL COMPOSITION

Shlomo Yehuda, Tel Aviv, Israel, assignor to Bar Ilan University, Israel

Division of Ser. No. 820,562, Jan. 14, 1992, Pat. No. 5,288,755, which is a division of Ser. No. 376,289, Jul. 6, 1989, Pat. No. 5,120,763, which is a continuation-in-part of Ser. No. 120,830, Nov. 16, 1987, Pat. No. 4,851,431, and a continuation-in-part of Ser. No. 263,548, Oct. 27, 1988, abandoned, and a continuation-in-part of Ser. No. 359,562, Jun. 1, 1989, abandoned. This application Jul. 20, 1993, Ser. No. 94,770

Int. Cl.[6] A61K *31/20;31/70;31/595;31/525*

U.S. Cl. 514—560 28 Claims

1. A method for treating Alzheimer's disease and related dementias, said method comprising administering to a person having the symptoms thereof, a symptom-alleviating effective amount of a composition which comprises (a) from about 16.7 to about 22.2% by weight of at least one compound selected from the group consisting of linolenic acid and derivatives thereof, calculated as the free acid, said derivatives of linolenic acid being both physiologically hydrolyzable and pharmacologically acceptable, and (b) from about 77.8 to about 83.3% by weight of at least one compound selected from the group consisting of linoleic acid and derivatives thereof, calculated as the free acid, said derivatives of linoleic acid being both physiologically hydrolyzable and pharmacologically acceptable, provided that said composition is administered in absence of a carrier or diluent which comprises at least one member of the group consisting of C_{8-18} saturated fatty acids, oleic acid and derivatives of these acids.

5,468,777

METHOD AND AGENTS FOR PREVENTING AND REVERSING THE STAINING OF TEETH

Dennis S. France, Morris Plains, N.J.; Anthony Cerami, Shelter Island, N.Y.; Peter C. Ulrich, Old Tappan, N.J.; Laura A. Norton, Ridgewood, N.J., and David L. Neer, Allendale, N.J., assignors to The Rockefeller University, New York, N.Y., and Alteon Inc., Ramsey, N.J.

Continuation-in-part of Ser. No. 825,598, Jan. 27, 1992, Pat. No. 5,334,617, which is a continuation-in-part of Ser. No. 805,200, Dec. 10, 1991, Pat. No. 5,238,968, which is a division of Ser. No. 481,869, Feb. 20, 1990, Pat. No. 5,128,360, which is a continuation-in-part of Ser. No. 220,504, Jul. 18, 1988, abandoned, which is a division of Ser. No. 798,032, Nov. 14, 1985, Pat. No. 4,758,583, which is a continuation-in-part of Ser. No. 590,820, Mar. 19, 1984, Pat. No. 4,665,192. This application Apr. 29, 1994, Ser. No. 236,228

Int. Cl.[6] A61K *31/195;31/155;7/16*

U.S. Cl. 514—562 11 Claims

1. A method of inhibiting and reversing the discoloration of teeth and tongue resulting from nonenzymatic browning in the oral cavity which comprises administration to a subject in need of such therapy an amount effective to inhibit said discoloration of a composition comprising cysteine or a cysteine derivative of formula I

(I)

wherein R is hydrogen or an acyl group; or a pharmaceutically acceptable salt thereof.

5,468,778

METHOD OF LOWERING INTRAOCULAR PRESSURE BY ADMINISTERING A PHARMACEUTICAL COMPOSITION CONTAINING 7-(5-SUBSTITUTED CYCLOPENTYL) AND 7-(5-SUBSTITUTED-CYCLOPENTENYL) 5-HEPTENOIC ACIDS AND DERIVATIVES

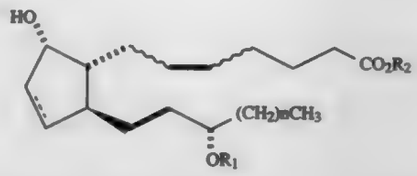
Michael E. Garst, Newport Beach; Robert M. Burk, Laguna Beach; Ming F. Chan, San Diego, and Michael B. Roof, Los Angeles, all of Calif., assignors to Allergan, Inc., Irvine, Calif.

Filed Sep. 24, 1992, Ser. No. 950,855

Int. Cl.[6] A61K *31/19;31/215*

U.S. Cl. 514—573 23 Claims

1. A method for lowering intraocular pressure in the eye of a mammal, which comprises administering to the mammal a pharmaceutical composition containing a pharmaceutically acceptable excipient and an effective amount of a compound having the formula



wherein the dotted line represents a bond or the absence of a bond, wavy lines attached to a double bond indicate cis or trans configuration about the double bond;

R_1 represents H, or CO-R_3 where R_3 is lower alkyl of 1 to 6 carbons, or carbocyclic aryl.

R_2 represents H or lower alkyl of 1 to 6 carbons, and

n is an integer between 0 and 8.

5,468,779

METHOD FOR RECYCLING PAINTED PLASTIC MATERIALS

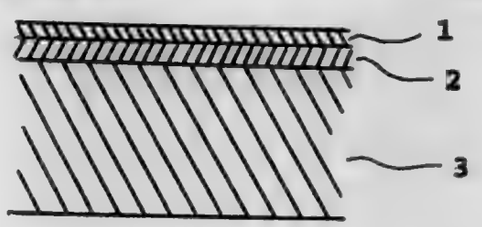
Naotaka Yamamoto, Ayase, and Noriko Oohori, Fujisawa, both of, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Mar. 17, 1994, Ser. No. 214,259

Claims priority, application Japan, Mar. 29, 1993, 5-095400; Jul. 26, 1993, 5-203580

Int. Cl.[6] C08J *11/00;* C11D *7/32*

U.S. Cl. 521—46.5 8 Claims



1. A method of recycling painted plastic material comprising,

coarse-crushing a thermoplastic plastic material with a baking paint film for the thermoplastic plastic material,

supplying a paint film decomposition agent to said coarse-crushed plastic material with the paint film in an amount of 0.1 to 5.0% by weight relative to the coarse-crushed plastic material with the paint film, said film decomposition agent being a heterocyclic compound selected from the group consisting of 2-mercaptoimidazoline, benzotriazole, 3-amino-1,2,4-triazole, 2-methylimidazole, N-cyclohexyl-2-benzothiazole-sulfaneamido, 2-phenylimidazole and imidazole, and

heating and kneading the coarse-crushed plastic material with the paint film decomposition agent so that the paint film is

dissolved and particles of the dissolved paint film are uniformly spread in the plastic material.

5,468,780

METHOD OF RECYCLING UNSATURATED POLYESTER RESIN WASTE

Shizuo Kubota; Osamu Ito, and Hiroyuki Miyamoto, all of Wakayama, Japan, assignors to Miyaso Chemical Co., Tanabe, Japan

Filed Mar. 6, 1995, Ser. No. 398,689

Claims priority, application Japan, Jun. 21, 1994, 6-138762; Dec. 20, 1994, 6-316285

Int. Cl.[6] C08J *11/04*

U.S. Cl. 521—48.5 **14 Claims**

1. A method of recycling unsaturated polyester resin waste, comprising the steps of:

preparing unsaturated polyester resin waste; and

glycolytically degrading said unsaturated polyester resin waste, thereby obtaining glycolic raw material.

5,468,781

POLYPROPYLENE RESIN EXPANDED PARTICLES

Toshihiko Sugano, and Toshihiro Gotoh, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, and Mitsubishi Yuka Badische Company Limited, Yokkaichi, both of, Japan

Continuation of Ser. No. 198,256, Feb. 18, 1994, abandoned. This application Mar. 1, 1995, Ser. No. 396,896

Claims priority, application Japan, Feb. 18, 1993, 5-029180

Int. Cl.[6] C08J *9/22;9/228*

U.S. Cl. 521—60 **8 Claims**

1. Polypropylene resin expanded particles comprising as a base resin an isotactic propylene polymer obtained by the polymerization of a corresponding monomer or monomers with a polymerization catalyst derived from a metallocene compound, wherein said metallocene compound has a structure of formula:

$$Q(C_5H_{4-m}R^1_m)(C_5H_{4-n}R^2_n)MeXY$$

wherein:

$(C_5H_{4-m}R^1_m)$ and $(C_5H_{4-n}R^2_n)$ are conjugated five-membered rings, wherein R^1 and R^2 are each, independently, selected from the group consisting of C_1–C_{20} hydrocarbon groups, halogens, silicon-containing C_1–C_{24} hydrocarbon groups, phosphorous containing C_1–C_{18} hydrocarbon groups, nitrogen containing C_1–C_{18} hydrocarbon groups, and boron containing C_1–C_{18} hydrocarbon groups, wherein when two R^1's or two R^2's are present, the R^1's or the R^2's can be bonded at their respective ω-terminus to form a ring; m denotes an integer of $0 \leqq m \leqq 4$; and n denotes an integer of $0 \leqq n \leqq 4$;

Q is a bonding group which crosslinks the conjugated five-membered rings;

Me is a transition metal in Group IVB-VIB of the Periodic Table; and

X and Y are each, independently; selected from the group consisting of hydrogen, halogen, C_1–C_{20} hydrocarbon groups, C_1–C_{20} alkoxy groups, an amino group, C_1–C_{20} alkylamino groups, silicon-containing C_1–C_{24} hydrocarbon groups and phosphorous containing C_1–C_{18} hydrocarbon groups.

5,468,782

FLUOROPOLYMER COMPOSITIONS

Ashok Mehan, Union City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 18, 1995, Ser. No. 388,340

Int. Cl.[6] C08L *27/04;27/18*

U.S. Cl. 521—134 **15 Claims**

1. A composition which comprises

(1) a copolymer of ethylene and chlorotrifluoroethylene (ECTFE) which has a crystallinity of at least 50%, and

(2) a polymer of tetrafluoroethylene (PTFE) which has a crystallinity of at least 50% and which is in the form of fine particles dispersed in the ECTFE;

the ratio by weight of the ECTFE to the PTFE being 1:1 to 9:1.

5,468,783

MODIFIED AROMATIC POLYISOCYANATES AND THEIR USE FOR THE PRODUCTION OF RIGID FOAMED MATERIALS

Herbert Gebauer, Krefeld; Pramod Gupta, Bedburg, and Christian König, Kaarst, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 40,699, Mar. 31, 1993, Pat. No. 5,424,386. This application Mar. 1, 1995, Ser. No. 396,937

Claims priority, application Germany, Apr. 8, 1992, 42 11 774.7

Int. Cl.[6] C08G *18/00;18/10*

U.S. Cl. 521—159 **5 Claims**

1. In a process for producing rigid foamed materials containing polyurethane groups and optionally isocyanurate groups by the reaction of

a) one or more polyisocyanates with

b) one or more compounds having molecular weights of from 400 to 10,000 and containing at least two hydrogen atoms reactive to isocyanates,

in the presence of

c) water and/or readily volatile organic substances as the foaming agent, optionally in the presence of

d) one or more compounds of molecular weight 32 to 399 containing at least two hydrogen atoms reactive to isocyanates,

the improvement wherein polyisocyanate a) is an aromatic polyisocyanate comprising a bottoms product containing isocyanate groups with a tolylene diisocyanate content less than 200 ppm, and is obtained by

A) mixing distillation bottoms from tolylene diisocyanate production with polyisocyanates or polyisocyanate mixtures of the diphenyl methane series with an NCO content of at least 15 weight %, optionally modified with urethane and/or allophanate,

B) working up the mixture by distillation, the mixture being heated before or during distillation work-up to temperatures of 190° to 250° C. and by this means substantially replacing the tolylene diisocyanate which is reversibly chemically bound in the distillation residue by the polyisocyanate mixed therewith, and

C) reacting the distillation bottoms obtained in step B) with 0.1–10 weight % of a polyether alcohol of molecular weight from 206 to 948, said polyether alcohol being obtained by the reaction of alkylene oxides with C_6–C_{30} hydrocarbons containing 1–3 active hydrogen atoms.

5,468,784

PHOTOPOLYMERIZABLE RESIN COMPOSITION

Makoto Yanagawa, Saitama, and Hiroshi Yamamoto, Tokyo, both of, Japan, assignors to Tamura Kaken Corporation, Japan

Filed Feb. 23, 1994, Ser. No. 200,727

Int. Cl.[6] C08F *2/46;* **C03F** *7/004*

U.S. Cl. 522—31 **6 Claims**

1. A photopolymerizable resin composition which comprises, as a uniform blend:

(a) a prepolymer having an average molecular weight of from 20,000 to 70,000, which is a copolymer of a first monomer selected from the group consisting of alkyl esters of acrylic acid and methacrylic acid and a second monomer selected from the group consisting of acrylate acid esters and meth-

acrylic esters having an epoxy group in a molecule, the said copolymer being modified by the reaction of from 20% to 80% of the epoxy groups therein with acrylic acid or methacrylic acid to introduce acryloyl groups or methacryloyl groups, respectively, and by the reaction of the remainder of the epoxy groups with an onium group-containing compound;

(b) a photopolymerization initiator; and

(c) a reactive diluent having at least two ethylenically unsaturated linkages per molecule.

5,468,785

COBALOXIME PHOTOINITIATED FREE RADICAL POLYMERIZATIONS

Michael P. Greuel, White Bear Twp, Minn.; Labros D. Arvanitopoulos, Akron, and H. James Harwood, Stow, both of Ohio, assignors to University of Akron, Akron, Ohio

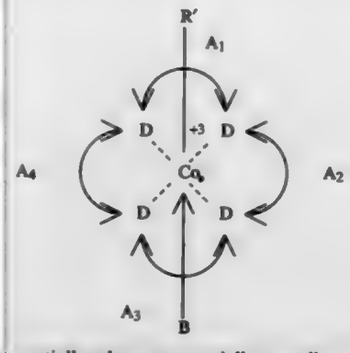
Filed Apr. 15, 1994, Ser. No. 228,302

Int. Cl.[6] C08F *2/48;4/44;18/08;20/18*

U.S. Cl. 522—63 **24 Claims**

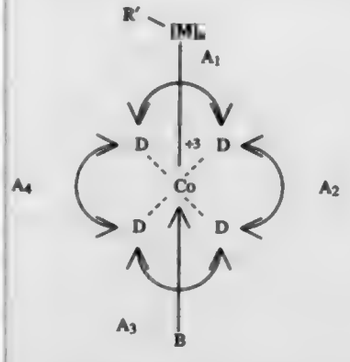
1. A free radical polymerization process which comprises the step of photolyzing a cobalt(III) complex in a partially polar solvent having a bulk solvent donor number of at least 4.4 wherein the cobalt complex is of formula (XIII)

(XIII)



having essentially planar equatorially coordinated ligands and a pair of axially coordinated ligands which have at least one carbon-cobalt bond, and inserting at least one free radically polymerizable monomer into the photolyzed carbon-cobalt bond, thereby forming a polymeric chain of repeating monomeric units which is terminated with a cobalt-carbon bond as shown in formula (XIV)

(XIV)



wherein

A_{1-4} are equatorial coordinating ligands with the cobalt,

B is a coordinating base ligand which does not destroy the essentially planar conformation of the equatorial ligands,

D is a coordinating atom of the ligand and is selected from the group consisting of oxygen and nitrogen,

R' is a head group which is initially attached to the cobalt by a carbon-cobalt bond in the equatorial axis of the cobalt complex, but which becomes attached to an end of the at least one inserting monomer after the insertion of the monomer,

M is the free radically polymerizable monomer, and

n is an integer indicating the number of repeat units of the monomer in the polymer chain,

the cobalt atom in the complex being capable of alternating between Co^{+2} and Co^{+3} in response to the photolytic cleavage of the carbon-cobalt bond, the cobalt complex remaining attached to the last monomeric unit through the terminal carbon-cobalt bond after the initial concentration of monomer has been polymerized.

5,468,786

RADIATION-CURABLE REACTION RESIN SYSTEM

Heiner Bayer, Olching; Barbara Lehner, and Michael Rogalli, both of Munich, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 729,653, Jul. 15, 1991, abandoned. This application Feb. 2, 1994, Ser. No. 191,141

Claims priority, application Germany, Aug. 1, 1990, 42 24 449.0

Int. Cl.[6] C08F *2/46*

U.S. Cl. 522—170 **6 Claims**

1. A UV-curable resin composition consisting essentially of: a substantially homogeneous, storage stable resin solution of at least one radical polymerizable curable reaction resin selected from the group consisting of N-vinyl pyrrolidone, trimethylolpropane triacrylate and mixtures of the foregoing resins; from about 3 to about 50% by weight of an engineering thermoplastic resin having a high modulus selected from the group consisting of polyethersulfones, polyetherimides, polyesters, polysulfones, polyacrylates, polycarbonates, polyamideimides, polyimides and polyamides: a photoinitiator capable of generating radicals upon exposure to UV radiation selected from aromatic ketone photoinitiators; and optionally including an additive selected from the group consisting of colorants, pigments, flow modifiers, stabilizers, flame retardants and fillers, said resin composition being curable upon exposure to UV radiation to provide a substantially homogenous cured shaped article including continuous phase and discontinuous phase, the discontinuous phase having an average particle size of between from about 0.05 μm to about 50 μm.

5,468,787

BIOMATERIALS FOR TISSUE REPAIR

Michael Braden, 68 Cravells Road, Harpenden, Herts AL5 1BD, England; Sandra Downes, 74 Mill Way, Bushey, Watford, Herts WD2 2AG, England; Mangala P. Patel, 45 Ellesmere Avenue, Mill Hill, London NW7 3EX, England, and Kenneth W. M. Davy, 11 Chapel Gardens, Lindford, Nr Bordon, Hants GU35 OTA, England

PCT No. PCT/GB92/02128, § 371 Date Jun. 16, 1994, § 102(e) Date Jun. 16, 1994, PCT Pub. No. WO93/09819, PCT Pub. Date May 27, 1993

PCT Filed Nov. 17, 1992, Ser. No. 244,322

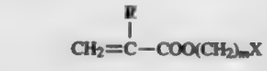
Claims priority, application United Kingdom, Nov. 18, 1991, 9124487

Int. Cl.[6] A61L *25/00;* **A61K** *37/36;* **C08L** *33/14*

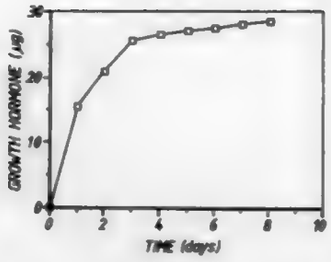
U.S. Cl. 523—113 **8 Claims**

1. A method of promoting repair of cartilage in a human or animal body, which comprises the steps of:

introducing to cartilage requiring repair in said body a curable monomer/polymer composition, the monomer component having the formula I



where R is a hydrogen atom or a methyl group, m is 0, 1 or 2 and X is a 3 to 6 membered heterocyclic ring and the polymer compo-



nent being selected from the group consisting of acrylate and methacrylate polymers and copolymers thereof; and

causing or allowing the composition to cure in contact with said cartilage and promote repair of said cartilage.

5,465,788

AGGLOMERATION OF LATICES BY ORGANIC ACID - ANHYDRIDE MIXTURES

Donald M. Kulich, Marietta, Ohio, assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 60,392, May 11, 1993, abandoned. This application Jul. 13, 1994, Ser. No. 274,595

Int. Cl.[6] C08F *279/02*

U.S. Cl. 523—335 **26 Claims**

1. A process for agglomerating rubber particles in an aqueous latex, said process providing reduced levels of coagulum, said process comprising:

a) adding an organic acid to said latex to facilitate agglomeration of said particles; and

b) adding an organic anhydride to said latex to facilitate agglomeration of said particles.

22. A process for agglomerating rubber particles, said process comprising:

(A) adding a water soluble organic acid selected from the group consisting of acetic, malic, propionic, acrylic, and oxalic acids and a water soluble organic anhydride selected from the group consisting of acetic, maleic, and propionic anhydrides to an aqueous latex containing small rubber particles having a weight average particle size diameter of 0.05 to 0.20 microns, and

(B) agglomerating said small rubber particles contained in said latex to large agglomerated rubber particles having a weight average particle size diameter of between 0.30 to 1.0 microns, wherein said agglomerated particles are then admixed with an amount of small rubber particles having a weight average particle size diameter of 0.05 to 0.20 microns wherein said acid and said anhydride are added to said latex in a mole ratio to each other of between 1:9 and 9:1 respectively whereby the said large agglomerated rubber particles are essentially free of coagulum.

5,468,789

METHOD FOR MAKING RADIATION CURABLE SILICON CONTAINING POLYACRYLATE HARDCOAT COMPOSITIONS AND COMPOSITIONS MADE THEREBY

Larry N. Lewis, Scotia; George F. Medford, Ballston Lake, and Arnold Factor, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 12, 1994, Ser. No. 304,299

Int. Cl.[6] C08K *5/3432;* **C08L** *43/04*

U.S. Cl. 524—99 **25 Claims**

1. A method for making a radiation curable silicon containing polyacrylate hardcoat composition comprising devolatilizing at a temperature in the range of about 25° C. to about 100° C. under a non-oxidizing atmosphere, a mixture comprising, by weight,

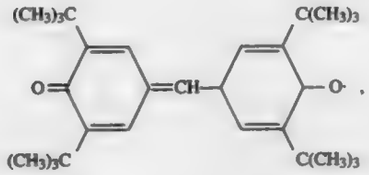
(i) 100 parts of a water miscible organic solvent,

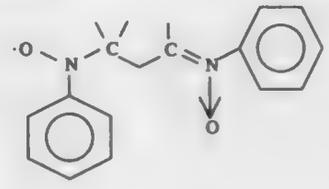
(ii) 1 to about 200 parts of an aqueous colloidal silica dispersion,

(iii) 0.5 to about 50 parts of alkoxysilylacrylate,

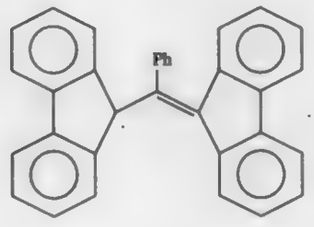
(iv) 10 to about 400 parts of reactive acrylic monomer, and

(v) an effective amount of anaerobic gelation inhibitor selected from the group consisting of 2,2,6,6-tetramethylpiperidinyloxy, 4-hydroxy-2,2,6,6-tetramethylpiperidinyloxy, bis(4-hydroxy-2,2,6,6-tetramethylpiperidinyloxy sebacate diradical, 2,2-diphenyl-1-picrylhydrazyl, 1,3,5-triphenylverdazyl, 1-nitroso-2-naphthol, a nitrone,





and



5,468,790

TRIAZINE POLYMER AND USE THEREOF

Konstantinos I. Papathomas, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 997,964, Dec. 29, 1992, abandoned. This application Sep. 13, 1994, Ser. No. 304,826

Int. Cl.[6] C08K *5/34;* **C08G** *73/06*

U.S. Cl. 524—100 **16 Claims**

1. A composition containing a triazine polymer that comprises a reaction product of (a) monocyanate; and (b) dicyanate, prepolymers thereof or mixtures thereof, wherein the amount of (a) is about 5 to about 50% by weight of the total of (a) and (b), and correspondingly, the amount of (b) is about 50% to about 95% by weight based upon the amount of (a) and (b); and

filler having a maximum particle size of about 49 microns and being substantially free of alpha particle emissions; wherein the amount of the polymer is about 30% to about 50% by weight of the total of polymer and filler and correspondingly, the amount of filler is about 50% to about 70% by weight based upon the weight of polymer and filler.

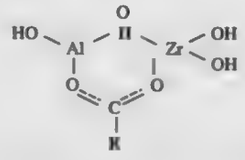
5,468,791

PRIMERS CONTAINING ZIRCOALUMINATE COUPLING AGENTS FOR IMPROVED ADHESION

San C. Yuan, Farmington Hills, Mich., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 17, 1994, Ser. No. 343,866
Int. Cl.[6] C08K 5/15;5/04
U.S. Cl. 524—108 8 Claims

1. An improved solvent borne primer composition comprising a liquid carrier and a binder selected from the group consisting of a polyester, polyester urethane or an epoxy polyester and containing a crosslinking agent selected from the group consisting of a monomeric alkylated melamine formaldehyde crosslinking agent, a polymeric alkylated melamine formaldehyde crosslinking and any mixtures thereof and containing pigments in a pigment to binder weight ratio of about 10/100 to 200/100; where the improvement is the use of about 0.1–10% by weight, based on the weight of the binder, of a zircoaluminate coupling agent of the formula



where R is selected from the group consisting of $H_2N(CH_2)_2$, $H_3C(CH_2)_{12}$, $H_2N(CH_2)_4CH(NH_2)$, $HOCH_2CH(NH_2)$ and $HSCH_2CH(NH_2)$; wherein the primer provides excellent adhesion to waterborne basecoats that are applied over the primer.

5,468,792

CLARIFYING COMPOSITIONS, PROCESS FOR MAKING AND POLYOLEFIN COMPOSITIONS CONTAINING THEM

Joseph Metrick, Wilmington, and Jeffrey D. Abata, Newark, both of Del., assignors to Montell North America Inc., Wilmington, Del.

Continuation of Ser. No. 145,287, Oct. 29, 1993, abandoned. This application May 5, 1995, Ser. No. 435,247
Int. Cl.[6] C08K 5/15;5/51; C09K 15/32
U.S. Cl. 524—108 9 Claims

1. A clarifying composition consisting essentially of a mixture of (a) from 5% to 90% by weight of the total weight of the clarifying composition of a phosphonite stabilizer composition, the main component of which is tetrakis-(2,4-di-tert-butylphenyl)-4,4-biphenylene diphosphite, and (b) from 95% to 10% by weight of the total weight of the clarifying composition of a sorbitol-based compound having a melting point greater than 200° C., such that the amount of phosphonite stabilizer Composition is effective to depress the melting point of said sorbitol-based compound.

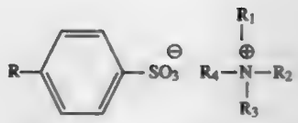
5,468,793

PLASTIC COMPOSITIONS WITH ANTISTATIC PROPERTIES

James J. Ward, Collierville, and William P. Chatham, Memphis, both of Tenn., assignors to Wico Corporation, Greenwich, Conn.

Filed Jul. 25, 1994, Ser. No. 279,810
Int. Cl.[6] C08K 5/17;5/42
U.S. Cl. 524—159 6 Claims

1. A method for reducing the tendency of acrylic resins to acquire a static electric charge which method comprises adding to the resin an effective amount of at least one substituted ammonium salt of a long-chain alkylbenzene sulfonic acid and a fatty acid, the salt having the formula:



wherein R is a straight or branched chain alkyl group having from 10 to 14 carbon atoms, R_1 is hydroxyethyl or an alkyl group having from one to six carbon atoms, R_2 and R_3 are the same or different and are hydroxyethyl, an alkyl group having from one to six carbon atoms, or hydrogen, and R_4 is hydrogen or an alkyl group having from one to six carbon atoms and the fatty acid having from 16 to 24 carbon atoms.

5,468,794

ROOM TEMPERATURE ADDITION-CURABLE SILICONE ADHESIVE COMPOSITIONS AND N-HETEROCYCLIC SILANE ADHESION PROMOTERS

Judith Stein, Schenectady, and Mark W. Davis, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 165,625, Dec. 13, 1993, Pat. No. 5,380,788. This application Sep. 13, 1994, Ser. No. 303,364
The portion of the term of this patent subsequent to Jan. 10, 2012, has been disclaimed.
Int. Cl.[6] C08K 5/54
U.S. Cl. 524—188 9 Claims

1. A room temperature vulcanizable addition-curable composition, comprising by weight,

(A) 100 parts of a vinyl-containing polydiorganosiloxane composition comprising:

(i) about 50 to about 100 parts of an essentially cyclic-free vinyl containing polydiorganosiloxane having a viscosity of from about 100 to about 100,000 centipoise at 25° C. and organo groups attached to silicon by carbon-silicon bonds, selected from the class consisting of alkyl radicals having 1 to 8 carbon atoms, phenyl radicals, fluoroalkyl radicals having 3 to 10 carbon atoms and mixtures thereof, where the essentially cyclic-free vinyl containing polydiorganosiloxane has a vinyl content of from about 0.02 to about 2.0 weight %, and

(ii) from about 0 to about 50 parts of a solid, benzene-soluble vinyl-containing resin copolymer comprising,

$(R)_3SiO_{1/2}$ units and $SiO_{4/2}$ units,

where R is a vinyl radical, or a monovalent hydrocarbon radical free of aliphatic unsaturation and containing no more than six carbon atoms, the ratio of $(R)_3SiO_{1/2}$ units to $SiO_{4/2}$ units being from about 0.5:1 to about 1.5:1, and the resin having a vinyl content of from about 1.5 to about 3.5% by weight,

(B) from about 1 to about 20 parts of a hydrogen-containing polysiloxane having an average unit formula,

$R^1_cH_bSiO_{(4-c-b)/2}$,

where R^1 is a monovalent hydrocarbon radical, or halogenated monovalent hydrocarbon radical having from 1 to about 10 carbon atoms and free of aliphatic unsaturation, "a" has a value of from about 0 to about 3, "b" has a value of from about 0 to about 3, and the sum of "a"+"b" has a value of from 0 to 3,

(C) a catalytic amount of a hydrosilylation catalyst,

(D) an effective amount of a bis[trialkyloxysilylalkyleneoxy]pyridine adhesion promoter having the formula,

$[(R^2O)_3S,R^3O]_2C_5H_3N$

where R^2 is a $C_{(1-4)}$ alkyl radical and R^3 is a $C_{(2-8)}$ alkylene radical,

(E) from about 0 to about 200 parts of an extending filler, and

(F) from about 0 to about 50 parts of a reinforcing filler, and in the absence of (A) (ii), an amount effective for reinforcement.

5,468,795

METHOD FOR PRIMING WET OR DRY ROAD SURFACES

Harald Guder, Wuppertal, Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 17, 1993, Ser. No. 79,158

Int. Cl.[6] C08K *5/07*; F21V *7/22*; E01C *7/00*

U.S. Cl. 524—361 **16 Claims**

1. A method of bonding an adhesive-backed preformed pavement marking to a road surface comprising, in order:

(a) applying a priming composition to said road surface, said priming composition comprising a homogeneous liquid solution containing polymeric material and at least one water-miscible solvent in an amount sufficient to provide adhesion between wet or dry road surface materials and adhesive-coated articles, said polymeric material comprising an aromatic and/or aliphatic hydrocarbon resin and/or hydrocarbon resin having phenolic functionality;

(b) permitting said solvent to evaporate such that a residue forms on said road surface; and (c) applying an adhesive-backed preformed pavement marking over said residue on said road surface.

5,468,796

CREPING CHEMICAL COMPOSITION AND METHOD OF USE

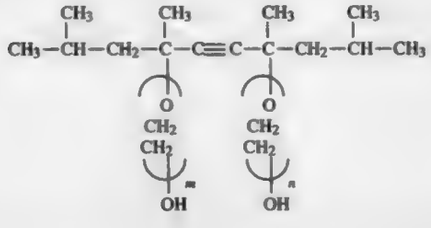
Franklin M. C. Chen, Appleton, and Frank G. Druecke, Oshkosh, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 17, 1994, Ser. No. 291,804

Int. Cl.[6] C08K *5/06*

U.S. Cl. 524—377 **32 Claims**

1. A creping adhesive comprising a cationic oligomer and from about 0.05 to about 20 dry weight percent of an ethoxylated acetylenic diol having the formula:



wherein the sum of m+n is from about 1 to about 10, and wherein the amount of the cationic oligomer is from about 5 to about 95 weight percent of the amount of the ethoxylated acetylenic diol.

5,468,797

POLYCARBOXYLIC ACID THICKENERS, EMULSIFIERS, AND SUSPENDING AIDS HAVING IMPROVED WETTABILITY CHARACTERISTICS

Daniel J. Adams, Cuyahoga Falls; Zahid Amjad, Brecksville; Solomon Lemma, Broadview Heights, and Carl J. Long, II, Elyria, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 198,007, Feb. 17, 1994, Pat. No. 5,373,044, which is a continuation-in-part of Ser. No. 935,616, Aug. 26, 1992, Pat. No. 5,288,814. This application Nov. 29, 1994, Ser. No. 346,121

Int. Cl.[6] C08F *2/26*; *2/08*

U.S. Cl. 524—379 **3 Claims**

1. An improved process for wetting and dispersing, in an aqueous medium, an interpolymer of

(1) at least one olefinically unsaturated carboxylic acid or anhydride containing at least one activated carbon-to-carbon olefinic double bond and at least one carboxyl group, in an amount of more than 15% by weight based upon the weight of the interpolymer, and

(2) at least one steric stabilizer having at least one hydrophilic moiety and at least one hydrophobic moiety, selected from the group consisting of linear block copolymeric steric stabilizers, having a hydrophobic moiety having a length of more than 50 Angstroms, random copolymeric comb steric stabilizers, and mixtures thereof,

comprising adding to said aqueous medium a low surface tension surface active agent capable of reducing the surface tension of water to less than about 40 dynes per centimeter at 25° C. in an amount of 0.0001% to 5.0% by weight based upon the weight of the aqueous medium and adding to said aqueous medium said interpolymer.

5,468,798

BASECOAT FOR A COATING SYSTEM

Lawrence D. Leech, West Chester, Pa., assignor to Whitford Corporation, West Chester, Pa.

Filed Feb. 18, 1994, Ser. No. 198,445

Int. Cl.[6] C08K *3/08*; C08L *79/08*

U.S. Cl. 524—440 **17 Claims**

1. A basecoat for a coating system, comprising:

a high temperature polymer resin of sufficient binding capacity to adhere to a substrate; and

a filamentary powder dispersed throughout said polymer resin to form an adhesive mixture which with appropriate application to a suitable substrate results in the basecoat having an internal spongelike structure and a rough top surface including a plurality of filaments projecting up from said polymer resin and capable of anchoring at least one finish coat to the basecoat.

5,468,799

AQUEOUS POLYMER DISPERSION HAVING A BROAD PARTICLE SIZE DISTRIBUTION

Oral Aydin, Mannheim; Michael Portugall, Wachenheim; Josef Neutzner, Neustadt, and Walter Maechtle, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 38,864, Mar. 29, 1993, Pat. No. 5,350,787. This application Mar. 31, 1994, Ser. No. 220,688

Claims priority, application Germany, Apr. 29, 1992, 42 13 965.1

The portion of the term of this patent subsequent to Jun. 20, 2012, has been disclaimed.

Int. Cl.[6] C08L *13/02*

U.S. Cl. 524—457 **14 Claims**

1. An aqueous polymer dispersion whose solids volume concentration is ≦50% by volume and which has all the following polymer particle size distributions:

from 5–25% by weight of the polymer≦200 nm
from 15–40% by weight of the polymer≦400 nm
from 35–75% by weight of the polymer≦600 nm
from 45–90% by weight of the polymer≦800 nm
100% by weight of the polymer≦1600 nm,
the polymer being formed from free radically polymerizable monomers.

5,468,800

BINDER WHICH IS CROSSLINKABLE AT ROOM TEMPERATURE

Karl J. Fölsch, Mainz; Marita Kaufmann, and Jürgen Hartmann, both of Weiterstadt, all of, Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

Filed Feb. 3, 1994, Ser. No. 190,839

Claims priority, application Germany, Feb. 3, 1993, 93 01 444.9

Int. Cl.[6] C08F *2/22*

U.S. Cl. 524—458 **14 Claims**

1. An aqueous binder composition, comprising:
(A) a film-forming aqueous plastic dispersion; and
(B) a crosslinking component,
wherein said plastic dispersion (A) comprises an emulsion polymer with polymerized units of an ethylenically-unsaturated, radically polymerizable monomer with an alkylene urea side group, and
wherein said crosslinking component (B) contains at least two protected or unprotected aldehyde groups.

5,468,801

DUAL STABILIZED MICROPARTICLES

Joseph A. Antonelli, Riverton, N.J., and Christopher Scopazzi, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 813,184, Dec. 24, 1991, abandoned. This application Sep. 22, 1994, Ser. No. 310,053

Int. Cl.[6] C08L *51/00*

U.S. Cl. 524—504 **15 Claims**

1. A stabilized microparticle or core characterized as having dual stabilization comprising a microparticle having two kinds of stabilizers attached thereto:
(a) a first kind of stabilizing polymer which is a substantially linear acrylic polymer attached exclusively at a terminal end thereof to the microparticle; and
(b) a second kind of stabilizing polymer which is a graft polymer comprising an acrylic polymer backbone not soluble in the organic liquid, which backbone is attached to microparticle at a randomly distributed number and location of sites, and a plurality of side chains, pendant from the backbone, which is soluble in organic liquid.

5,468,802

LOW VOLATILE ORGANIC CONTENT AUTOMOTIVE REFINISH COATING COMPOSITION

Truman F. Wilt, Clinton; Joseph M. Carney, Pittsburgh; Stephen J. Thomas, Aspinwall; James A. Claar, Mars, and William J. Birkmeyer, Oakmont, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 18, 1994, Ser. No. 276,366

Int. Cl.[6] C08J *3/00;* **C08K** *5/205;* **C08L** *51/00;75/00*

U.S. Cl. 524—539 **22 Claims**

1. An automotive refinish coating composition having a volatile organic content not exceeding 3.0 pounds per gallon comprising:
A. a hydroxyl functional polyester having an acid value less than 4 mg KOH per gram of polyester polymer, prepared from reactants comprising:
a) from about 15 percent to about 50 percent of a polyol or mixture of polyols, each having a formula molecular weight from about 50 to about 2000;
b) from about 15 percent to about 50 percent of a long chain monocarboxylic acid or mixture of monocarboxylic acids, each having from 6 to 24 carbon atoms;
c) from about 15 percent to about 30 percent of 1,4-cyclohexane dicarboxylic acid; the percentages based on the total weight of reactants used in preparing the polyester; and
B. a polyisocyanate curing agent.

5,468,803

MEDICAL IMPLEMENT, POLYMER COMPOSITION, AND OPTICAL MATERIAL

Nobukazu Takahashi; Tohru Hosaka; Koji Minami, all of Yokohama; Yuichiro Konishi; Teiji Kohara, both of Kawasaki, and Tadao Natsuume, Yokosuka, all of, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Mar. 1, 1993, Ser. No. 24,294

Claims priority, application Japan, Mar. 3, 1992, 4-080330; May 21, 1992, 4-154454; Dec. 28, 1992, 4-361130

Int. Cl.[6] C08L *9/06;* **C08F** *32/08*

U.S. Cl. 524—553 **16 Claims**

1. A transparent thermoplastic norbornene polymer composition comprising a thermoplastic norbornene polymer having a number average molecular weight of 10,000–200,000 as determined by gel permeation chromatographic analysis in toluene, said norbornene polymer containing 0.01 to 10% by weight of a compounding ingredient in the form of a polymeric elastomer dispersed as microdomains in the norbornene polymer.

5,468,804

WATER-SOLUBLE OR WATER-DISPERSIBLE POLYISOCYANATE COMPOSITION, A PROCESS FOR ITS PREPARATION AND ITS USE IN COATING COMPOSITIONS

Lutz Schmalstieg, Köln; Wolfgang Kremer, Kerken; Martin Brahm, Engelskirchen; Joachim Probst, and Werner Kubitza, both of Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 15, 1994, Ser. No. 306,335

Claims priority, application Germany, Sep. 23, 1993, 43 32 322.7

Int. Cl.[6] C08J *3/00;* **C08K** *3/20;* **C08L** *75/00;* **B32B** *27/00*

U.S. Cl. 524—591 **11 Claims**

1. A water-dispersible or water-soluble polyisocyanate composition obtained by the partial urethanization of the isocyanate groups of 2,4- and/or 2,6-diisocyanatotoluene by reaction with monohydric and polyhydric alcohols, wherein the polyisocyanate composition has, based on solids,
a) an average NCO functionality of 1.9 to 3.3,
b) a content of isocyanate groups (expressed as NCO, molecular weight 42) of 8 to 18% by weight,
c) a content of ethylene oxide units (expressed as C_2H_4O, molecular weight 44) of 5 to 40% by weight which are arranged in terminal polyether chains containing an average of 7 to 25 alkylene oxide units in which at least 70 mol-% of the alkylene oxide units are ethylene oxide units, and
d) a urethane group content (expressed as $CHNO_2$, molecular weight 59) of 13 to 33% by weight.

5,468,805
ROOM-TEMPERATURE-CURABLE ORGANOPOLYSILOXANE COMPOSITION METHOD FOR ITS PREPARATION

Masayuki Oniahi, Chiba Prefecture, Japan, assignor to Dow Corning Toray Silicon Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1994, Ser. No. 230,663
Claims priority, application Japan, May 18, 1993, 5-139333
Int. Cl.[6] C08L *83/06*
U.S. Cl. 524—731 **20 Claims**

1. A room-temperature-curable organopolysiloxane composition comprising

(A) 100 weight parts organopolysiloxane that contains at least 2 silicon-bonded alkoxy groups in each molecule and that has a viscosity at 25° C. of 0.02 to 1,000 Pa.s,

(B) 0.1 to 20 weight parts, per 100 weight parts of (A), alkoxysilane with the following general formula or partial hydrolysis condensate thereof

$$R^1_aSi(OR^2)_{(4-a)}$$

R^1 is a monovalent hydrocarbon group; R^2 is a monovalent hydrocarbon group or an alkoxy-substituted monovalent hydrocarbon group; and a is zero, 1, or 2,

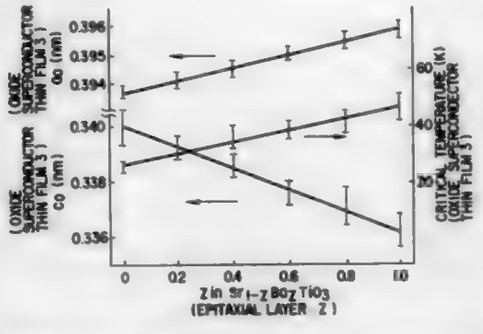
(C) 0.01 to 20 weight parts, per 100 weight parts of (A), condensation-reaction catalyst, and

(D) 1 to 1,000 weight parts, per 100 weight parts of (A), thickening material comprising an addition reaction-crosslinking organopolysiloxane composition or a free radical reaction-crosslinking organopolysiloxane composition wherein component (D) exhibits thickening without gelation or rubber formation upon heating said room temperature curable composition.

5,468,806
METHOD OF MANUFACTURING AN OXIDE SUPERCONDUCTOR THIN FILM

Kiyoshi Yamamoto; Nobuyuki Sugii; Koichi Kubo; Michiharu Ichikawa, and Hisao Yamauchi, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd.; Hitachi Ltd., both of Tokyo; Kabushiki Kaisha Toshiba, Kawasaki; Central Research Institute of Electric Power Industry, and International Superconductivity Technology Center, both of Tokyo, all of, Japan

Continuation of Ser. No. 53,463, Apr. 27, 1993, abandoned.
This application Dec. 1, 1994, Ser. No. 347,847
Claims priority, application Japan, Apr. 24, 1992, 4-106717
Int. Cl.[6] C30B *25/16*
U.S. Cl. 505—238 **19 Claims**



1. A method of controlling a critical temperature of a thin film of an oxide superconductor said oxide superconductor being represented by general formula (I) given below:

$$A_{1-x}B_xCuO_y \quad (I)$$

where "A" is at least one element selected from the group consisting of Ca, Sr and Ba, "B" is at least one rare earth element, "x" falls within a range of between 0 and 0.5, and "y" falls within a range of between 1.95 and 2.30,

said oxide superconductor having a crystal structure of tetragonal system, the lattice constant in a-axis falling within a range of between 0.385 nm and 0.410 nm, and the lattice constant in c-axis being an integer number of times a value falling within a range of between 0.310 nm and 0.350 nm, said method comprising the steps of:

forming on a substrate, by epitaxial growth, a critical temperature control film with a crystal having a lattice constant which controls the critical temperature of the crystal of said oxide superconductor; and

forming on said critical temperature control film, by a thin film forming technique, a thin film made of the oxide superconductor having a critical temperature which is controlled by said critical temperature control film.

5,468,807
RESIN COMPOSITION

Iwao Tsurutani, Chiba; Takafumi Manabe, and Ikuo Emoto, both of Sakai, all of, Japan, assignors to Ube Rexene Corporation, Tokyo; Ube Industries, Ube, both of, Japan, and Rexene Corporation, Dallas, Tex.

Continuation of Ser. No. 924,552, Aug. 5, 1992, abandoned.
This application Aug. 2, 1994, Ser. No. 284,271
Claims priority, application Japan, Aug. 8, 1991, 3-223459
Int. Cl.[6] C08L *23/10;23/16;23/20*
U.S. Cl. 525—240 **7 Claims**

1. A resin composition consisting essentially of:

(a) 20–80% by weight of an amorphous polyolefin selected from the group consisting of copolymers of propylene with a minor amount of an other alpha-olefin component and having a boiling n-heptane insoluble content of 10% by weight or less, and a number average molecular weight Mn of 1,000–7,100, and

(b) 80–20% by weight of a crystalline polypropylene, wherein the composition has a tensile modulus (80° C.) of 30 kg/cm^2 to less than 2,00 kg/cm^2 and the Shore D hardness Hs (23° C.) and the common logarithm y of the tensile modulus (80° C.) satisfy the following formulas (1) and (2):

$$10 \leqq Hs\ (23°\ C.) \leqq 55 \quad (1)$$

$$Y \leqq 0.04163\ Hs\ (23°\ C.) + .8665 \quad (2)$$

5,468,808
REDUCTION OF FLOW MARKS IN RUBBER MODIFIED POLYPROPYLENE

Andrew J. Peacock, Houston, Tex., assignor to Exxon Chemical Patents Inc., Wilmington, Del.

Filed Sep. 12, 1994, Ser. No. 304,754
Int. Cl.[6] C08L *23/10;23/12;23/18*
U.S. Cl. 525—240 **18 Claims**

1. A composition comprising

a blend of (i) a polymer of propylene containing units of crystalline propylene having at least 25% crystallinity and of (ii) at least one high molecular weight rubber having a weight average molecular weight of at least about 100,000,

wherein said blend has a melt flow rate (MFR) at 230° C. of about 1 to about 50 g/10 min.

with a visco-elastic liquid added in the range of about 0.5 to about 10 weight % of total composition weight wherein said visco-elastic liquid is a rubber having weight average molecular weight less than about 40,000 and which is liquid at room temperature.

5,468,809

POLYOLEFIN COMPOSITIONS HAVING GOOD TRANSPARENCY AND IMPACT RESISTANCE

Renato Ghiselini; Giuliano Cecchin, and Decio Malucelli, all of Ferrara, Italy, assignors to Montell North America Inc., Wilmington, Del.

Continuation of Ser. No. 21,365, Feb. 23, 1993, abandoned. This application Oct. 13, 1994, Ser. No. 322,850

Claims priority, application Italy, Feb. 24, 1992, MI92A0401; Feb. 24, 1992, MU92A0402

Int. Cl.[6] C08L *23/10;23/16;23/20;23/04*

U.S. Cl. 525—240 2 Claims

1. A polyolefin composition comprising (by weight):

A) from 25 to 60 parts of a crystalline random copolymer of propylene with ethylene and/or an α-olefin of formula CH_2=CHR, wherein R is a C_2–C_8 alkyl radical, said copolymer containing more than 85% by weight of propylene, and having a haze value lower than 25%;

B) from 40 to 75 parts of a component comprising (a) an elastomeric copolymer of ethylene with propylene and/or α-olefin of formula CH_2=CHR, wherein R is a C_2–C_8 alkyl radical, and optionally with minor proportions of a diene, containing 30–70 parts of ethylene, and (b) one or more of the polymers selected from the group consisting of LLDPE, LDPE and HDPE having a Melt Index higher than 0.5 g/10 min., said (a) and (b) being present in such proportions that the ratio between the density d_A of (A) and the calculated average density d_B of (B) is comprised from 0.980 to 1.015, and said elastomeric copolymer (a) being present in an amount of 10–20 parts with respect to the total composition, said polyolefin composition having a haze value of less than 30%, as measured according to ASTM-D 1003 on a 1 mm thick sample.

5,468,810

PROCESS FOR PRODUCING A PROPYLENE BLOCK COPOLYMER

Tetsuo Hayakawa; Tokuji Inoue, and Hiroyuki Asaga, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Jul. 26, 1994, Ser. No. 280,522

Claims priority, application Japan, Jul. 27, 1993, 5-185175; Jun. 17, 1994, 6-135913

Int. Cl.[6] C08F *297/08*

U.S. Cl. 525—244 15 Claims

1. A process for producing a propylene block copolymer comprising the steps of:

(1) bringing a first feed material in a liquid phase and consisting of a member selected from the group consisting of propylene and mixtures of propylene with at least one ethylenically unsaturated hydrocarbon monomer different from propylene into contact with a catalyst comprising a catalytic solid component (A) containing titanium, a catalytic component (B) comprising at least one organic aluminum compound and a catalytic component (C) comprising at least one silicon compound having at least one alkoxyl group, to prepare a first crystalline polymer mixture containing the catalyst; and

(2) feeding a second feed material in a gas phase and consisting of propylene and at least one ethylenically unsaturated hydrocarbon monomer different from propylene, into the resultant first crystalline polymer mixture, without deactivating the catalyst in the first crystalline polymer mixture, in the presence of a saturated hydrocarbon compound having 6 or more carbon atoms and in a total amount sufficient to provide a saturated vapor pressure thereof in this copolymerization system, to copolymerize the second feed material into a second elastomeric copolymer in the presence of the first crystalline polymer and thereby to form a propylene block copolymer comprising crystalline polymeric fractions derived from the first crystalline polymer produced in step (1) and elastomeric copolymer fractions derived from the second elastomeric copolymer produced in step (2), the elastomeric copolymer fractions being incorporated or mixed into the crystalline polymeric fractions.

5,468,811

HYDROPHILIC COMPOSITE POLYMER ARTICLES FORMED FROM A SETTABLE PASTE COMPRISING A MIXTURE OF HYDROPHILIC POLYMER AND UNSATURATED MONOMER

Daniel G. Moro, Randolph; Samuel H. Ronel, Princeton, and Petr Kuzma, Monmouth Junction, all of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Continuation of Ser. No. 55,418, Apr. 29, 1993, abandoned, which is a continuation of Ser. No. 773,984, Oct. 9, 1991, abandoned, which is a continuation of Ser. No. 430,843, Nov. 2, 1989, abandoned. This application Aug. 24, 1994, Ser. No. 295,357

The portion of the term of this patent subsequent to Sep. 3, 2011, has been disclaimed.

Int. Cl.[6] A61L *15/16;15/07;15/24;* C08F *265/06*

U.S. Cl. 525—263 21 Claims

1. A process for producing a stable, hard or semi-hard, shaped composite article which comprises:

(a) forming a homogeneous, moldable intermediate material which material remains stable for a significant period of time without becoming hard; comprising a mixture consisting essentially of (1) a particulate, water-insoluble, water-swellable hydrophilic (co-)polymer formed from a monomer selected from the group consisting of a hydroxyalkyl 2-alkenoate, a hydroxy-(C_2–C_4alkoxyC_2–C_4alkyl) alkenoate, an alkoxy(C_2–C_4alkoxyC_2–C_4alkyl) alkenoate, a N-(C_1–C_2alkyl)-2-alkenamide, a N,N-di(C_1–C_4alkyl)-2-alkenamide, and mixtures thereof; (2) a polymerizable monoethylenically unsaturated monomer selected from the group consisting of a hydroxyalkyl 2-alkenoate, a hydroxy(C_2–C_4alkoxyC_2–C_4) alkenoate, an alkoxy(C_2–C_4alkoxyC_2–C_4alkyl) alkenoate, a N-vinylpyrrolidone, a N-(C_1–C_4alkyl)-2-alkenamide, a N,N-di(C_1–C_4alkyl)-2-alkenamide, and mixtures thereof, wherein said polymer (1) and monomer (2) are in a ratio of between 1:2 and 2:1 by weight; (3) a cross-linking monomer agent in an amount of from about 0.05 to 10 weight percent based on the total weight of the polymer and monomer in said paste; and (4) a free radical initiator;

said material characterized by a setting time of up to about one hour and remaining in a moldable form for a significant period of time in order to provide a working time sufficient to form the material into a desired shape;

(b) molding said material to a desired shaped form;

(c) allowing said shaped form to set; and

(d) curing said shaped form whereby there is obtained a homogeneous, stable hard or semi-hard shaped article.

5,468,812

POLYMERIZABLE FLUOROCHEMICAL SURFACTANTS

Imelda A. Muggli, St. Paul, and Roger R. Alm, Lake Elmo, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 679,430, Apr. 2, 1991, abandoned. This application Sep. 26, 1994, Ser. No. 311,364

Int. Cl.[6] C08F *8/00*

U.S. Cl. 525—293 22 Claims

1. A polymerizable, organic-soluble, oligomeric fluorochemical surfactant composition comprising one or more fluorinated oligomers, each comprising at least two pendent fluoroaliphatic groups containing from 6 to 12 carbon atoms, at least two organic-solubilizing groups, and at least one pendent free-radically polymerizable olefinic group selected from the group consisting of ethenyl acrylate groups, ethenyl vinyl ether groups, and 2-propenyl. methacrylate groups.

5,468,813

POWDER COATING

Akimitsu Uenaka, Suita; Yuji Toyoda, Neyagawa; Koichi Tsutsui, Kyoto, and John Kenny, Neyagawa, all of, Japan, assignors to Nippon Paint Co., Ltd., Japan

Filed Nov. 1, 1994, Ser. No. 332,744

Claims priority, application Japan, Nov. 11, 1993, 5-307153

Int. Cl.[6] C08F *8/00*

U.S. Cl. 525—385 **14 Claims**

1. A powder coating comprising a binder resin and a curing agent, characterized in that said curing agent has particle size characteristics such that the average particle size is 0.3 to 7 μm and particles having a particle size not smaller than 20 μm account for not more than 10% by weight of all curing agent particles.

5,468,814

POLYMERS HAVING OXIDIC FUNCTIONALITY AND DERIVATIVES THEREOF

Harald D. H. Stover, Dundas, Canada; Pei Li, Kowloon, Hong Kong; Lorenzo Ferrari, Sarnia, Canada; Robert T. Shaver, Brantford, Canada, and Djordje Vlaovic, Winnipeg, Canada, assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Division of Ser. No. 968,803, Oct. 30, 1992, Pat. No. 5,376,732. This application Sep. 15, 1994, Ser. No. 306,332

Int. Cl.[6] C08F *8/06*

U.S. Cl. 525—390 **17 Claims**

1. A process for selectively oxidizing benzylic carbon atoms in a precursor polymer containing benzylic carbon atoms, wherein said benzylic carbon atoms are pendant from phenyl rings which are in the backbone of said precursor polymer, comprising reacting oxygen with said precursor polymer and an effective amount of a catalyst for said oxidation, under conditions effective to oxidize a portion of said benzylic carbon atoms to —C(O)H and a portion of said benzylic carbon atoms to —C(O)OH.

5,468,815

LOW COEFFICIENT OF FRICTION SILICONE RELEASE FORMULATIONS INCORPORATING HIGHER ALKENYL-FUNCTIONAL SILICONE GUMS

Larry D. Boardman, Woodbury; Kurt C. Melancon, Hugo; Trang D. Chau, Minneapolis, and John J. Erickson, Little Canada, all of Minn., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Filed Jan. 12, 1994, Ser. No. 180,212

Int. Cl.[6] C08G *77/08*

U.S. Cl. 525—478 **12 Claims**

1. A curable coating composition comprising:

(a) an ethylenically unsaturated organopolysiloxane base polymer having a viscosity of from 25 to about 5,000 centipoise at 25° C.

(b) an organohydrogenpolysiloxane crosslinking agent;

(c) an effective amount of a precious metal containing hydrosilylation catalyst; and

(d) from 0.1 to 20 weight percent of the composition of a higher alkenyl-functional organopolysiloxane gum;

wherein said gum is a triorganosiloxy endblocked polydiorganosiloxane polymer having an average molecular weight of at least 75,000 as measured by gel permeation chromatography and having the formula comprising $R_2SiO_{2/2}$ and $R_3SiO_{1/2}$ units wherein each R group is independently selected from the group consisting of saturated and ethylenically unsaturated, hydrocarbon radicals, provided that at least two of said R groups are higher alkenyl radicals.

5,468,816

SILICONE RELEASE COMPOSITIONS

Simon R. Hurford, Cardiff, and Bhukandas Parbhoo, Barry, both of, Wales, assignors to Dow Corning Limited, Barry, Wales

Filed Oct. 28, 1994, Ser. No. 330,952

Claims priority, application United Kingdom, Nov. 5, 1993, 9322794

Int. Cl.[6] C08F *283/12*

U.S. Cl. 525—479 **20 Claims**

1. A release modifier which comprises (i) a MQ resin consisting essentially of units of the formulae SiO_2 (Q) and $R_3SiO_{1/2}$ (M) wherein R is selected from the group consisting of a monovalent hydrocarbon group having up to 3 carbon atoms, a hydrogen atom and an alkenyl group of the formula —R'CH=CH_2, wherein R' denotes an alkylene group of from 0 to 3 carbon atoms, provided there is at least one group —R'CH=CH_2 present per MQ molecule and (ii) a α,ω-diolefin having the general formula CH_2=CH—$(CH_2)_n$—CH=CH_2, wherein n denotes an integer with a value of from 4 to 18.

5,468,817

VULCANIZABLE COMPOSITIONS BASED ON MODIFIED ACRYLIC RUBBERS

Joseph Da Lio, Ravenna; Laura Lanzavecchia, Milan, and Giuseppe Savini, Ravenna, all of, Italy, assignors to Enichem Elastomeri S.r.l., Milan, Italy

Division of Ser. No. 263,570, Jun. 22, 1994. This application Mar. 30, 1995, Ser. No. 413,893

Claims priority, application Italy, Jul. 23, 1993, MI93 A 001640

Int. Cl.[6] C08F *2/00;224/00;218/04;220/04;220/10;220/44*

U.S. Cl. 526—79 **1 Claim**

1. Procedure for the preparation of the elastomeric copolymer obtained from the statistic polymerization of:

a) a monomer selected from the formula CH_2=CR'—CO—OR, wherein R is a monofunctional radical selected from linear or branched C1–C6 alkyl radicals and C1–C6 alkoxyalkyl radicals, and R' is selected from —H and —CH_3;

b) (meth)acrylonitrile;

c) a third monomer selected from the group consisting of:

c1) a chlorinated vinyl ester,

c2) a mixture of an unsaturated carboxylic acid, and an aliphatic or aromatic diepoxy compound,

c3) a mixture consisting of an unsaturated carboxylic acid and a chlorinated vinyl ester; with the further condition that the elastomeric copolymer has a Mooney ML_{1+4} viscosity (100° C.) of at least 10:

preparing two solutions containing equal or different quantities of copolymerizable monomers,

charging one of the two solutions into a reactor and partially polymerizing same,

feeding the second of the two solutions into the first partially polymerized suspension previously obtained, and

continuing polymerization up until a desired degree of conversion is obtained.

5,468,818

SYNDIOTACTIC VINYLAROMATIC POLYMERIZATION PROCESS USING LOW HYDROGEN PARTIAL PRESSURES

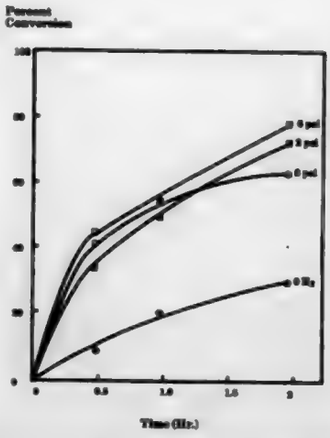
Thomas H. Newman, Midland, and Karen K. Borodychuk, Mt. Pleasant, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 13, 1995, Ser. No. 402,446

Int. Cl.[6] C08F *4/64;12/08*

U.S. Cl. 526—170 **4 Claims**

1. A process for preparing syndiotactic polymers of vinylaromatic monomers comprising contacting one or more vinylaromatic



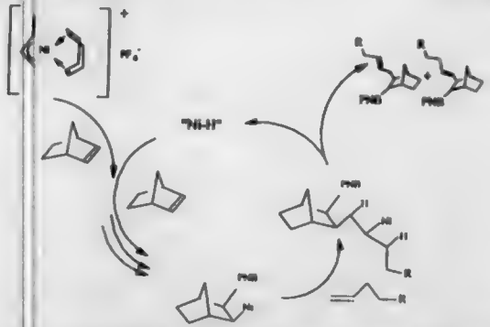
monomers and one or more catalyst systems comprising a pentamethylcyclopentadienyltitanium based metal complex capable of preparing syndiotactic vinylaromatic polymers under coordination polymerization conditions in the presence of hydrogen gas at a hydrogen partial pressure from 10 to 45 kPa and maintaining said partial pressure of hydrogen continuously throughout the polymerization.

5,468,819

PROCESS FOR MAKING POLYMERS CONTAINING A NORBORNENE REPEATING UNIT BY ADDITION POLYMERIZATION USING AN ORGANO (NICKEL OR PALLADIUM) COMPLEX

Brian L. Goodall, Fairlawn; George M. Benedikt, Solon; Lester H. McIntosh, III, Cuyahoga Falls, and Dennis A. Barnes, Medina, all of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Filed Nov. 16, 1993, Ser. No. 153,250
Int. Cl.[6] C08F *4/80;4/76;4/78*
U.S. Cl. 526—171 **44 Claims**



1. In an essentially anhydrous reaction mixture in which a processable addition polymer is formed by coordination polymerization, said reaction mixture including at least one multi-ringed monoolefinically unsaturated cycloolefin monomer selected from the group consisting of bicyclo[2.2.1.]hept-2-ene ("norbornene" "NB") and substituted embodiments thereof, wherein said substituents, if present, are selected from the group consisting of (C_1–C_{20})alkyl, (C_1–C_{20})haloalkyl, (C_5–C_{12})cycloalkyl, (C_1–C_6)alkylidenyl, aryl, haloaryl, (C_7–C_{15})aralkyl, (C_7–C_{15})haloaralkyl, (C_3–C_{20})alkenylyl, and (C_4–C_{20})alkylene with the proviso that the double bond is not a terminal double bond, a solvent for said monomer, and, a single component ionic catalyst of a Group VB, VIB, VIIB or VIII metal in an amount effective to convert said at least one monomer into said addition polymer, the improvement consisting essentially of,

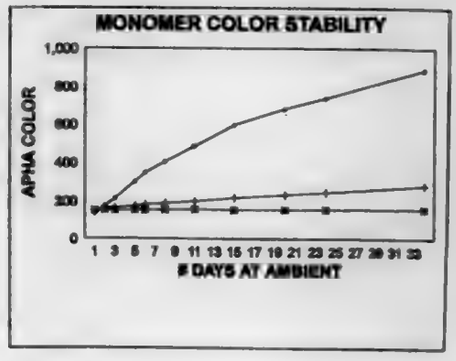
a minor molar amount relative to the moles of said monomer, of an olefinic chain transfer agent selected from the group consisting of ethylene and a compound having a single olefinic non-styrenic double bond between adjacent carbon atoms together having at least 3 hydrogen atoms, said olefinic chain transfer agent being present in a predetermined amount correlatable with a desired number average molecular weight Mw in the range from about 20,000 to about 500,000, of said addition polymer.

5,468,820

REACTIVE DILUENT FOR RADIATION CURING OF FILM-FORMING POLYMERS

James A. Dougherty, Pequannock, and Philip F. Wolf, Bridgewater, both of N.J., assignors to ISP Investments Inc., Wilmington, Del.

Filed Jan. 14, 1994, Ser. No. 182,870
Int. Cl.[6] C08F *226/06;226/02;220/10*
U.S. Cl. 526—264 **10 Claims**



1. A reactive diluent mixture suitable for radiation curing of an acrylate or methacrylate monomer or oligomer which comprises between about 25 and about 90 wt. % of an N-vinyl lactam containing from 6 to 9 carbon atoms and between about 10 and about 75 wt. % of a noncyclic N-vinyl amide containing from 3 to 7 carbon atoms.

5,468,821

CROSSLINKED ABSORBENT PRESSURE SENSITIVE ADHESIVE AND WOUND DRESSING

Donald H. Lucast, North St. Paul; Cheryl L. Moore, Afton, and Ruth A. James, Minneapolis, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 47,637, Apr. 14, 1993, Pat. No. 5,407,717.
This application Jan. 17, 1995, Ser. No. 373,586
Int. Cl.[6] C08F *226/06;216/36;220/10;216/18*
U.S. Cl. 526—264 **22 Claims**

1. An absorbent pressure-sensitive adhesive comprising a crosslinked copolymer of A, B, C and PX wherein:

(a) A is an acrylate monomer selected from the group consisting of (i) an acrylate or methacrylate ester of a non-tertiary C_{4-12} alcohol, and (ii) an acrylate or methacrylate ester of a mixture of non-tertiary C_{1-14} alcohols with a resultant average of between about 4–12 carbon atoms per alcohol molecule;

(b) B is a hydrophilic alkylene oxide acrylate monomer having an average of about 3 to 40 alkylene oxide units;

(c) C is a hydrophilic N-vinyl lactam monomer; and

(d) PX is a crosslinking monomer effective for crosslinking the copolymer upon exposure to ultraviolet radiation.

5,468,822

POLYBUTADIENE COMPOSITION AND PROCESS FOR PRODUCING SAME

Nobiro Tsujimoto, Edogawa; Kenichi Hongyo, Ichihara; Yoshisuke Baba, Chiba; Michinori Suzuki, and Kazuhiro Akikawa, both of Ichihara, all of, Japan, assignors to UBE Industries, Ltd., Yamaguchi, Japan

Filed Feb. 8, 1994, Ser. No. 193,806
Claims priority, application Japan, Feb. 9, 1993, 5-02136
Int. Cl.[6] C08F *36/06;2/18*
U.S. Cl. 526—340.1 6 Claims

1. A polybutadiene composition comprising at least two polybutadiene components which differ from each other in melting temperature and each having, as a principal structure, a 1,2-polybutadiene structure, wherein a polybutadiene component having the highest melting temperature has a melting temperature of at least 155° C., another polybutadiene component having the lowest melting temperature has a melting temperature of at least 105° C. but not more than 155° C.; the difference in the melting temperature between the highest melting temperature polybutadiene component and the lowest melting temperature polybutadiene component is in a range of from 20° C. to 125° C.; and the highest melting temperature polybutadiene component is present in an amount of 5 to 65% by weight based on the total weight of the composition.

5,468,823

SEMICRYSTALLINE MANUFACTURED ARTICLES MADE OF SYNDIOTACTIC POLY-P-METHYLSTYRENE (S-PPMS)

Gaetano Guerra, Salerno; Paolo Corradini; Claudio DeRosa, both of Naples; Mauro Iuliano, Salerno; Leone Oliva, and Vittorio Petraccone, both of Naples, all of, Italy, assignors to Montecatini Tecnologie S.p.A., Italy

PCT No. PCT/EP92/01710, § 371 Date Feb. 12, 1993, § 102(e) Date Feb. 12, 1993, PCT Pub. No. WO93/03211, PCT Pub. Date Feb. 18, 1993
PCT Filed Jul. 28, 1992, Ser. No. 977,445
Claims priority, application Italy, Jul. 29, 1991, MI91A2102
Int. Cl.[6] C08F *112/12;* C08J *5/18;* C08L *25/16;* D01F *6/20*
U.S. Cl. 526—347.1 10 Claims

1. Semicrystalline manufactured articles made of syndiotactic poly-p-methylstyrene wherein the polymer is present in a crystalline form characterized by a melting point of 225° C., and the degree of crystallinity ranges from 5% to 40%.

5,468,824

SILICONE COMPOSITIONS FOR THE FORMATION OF CURED RELEASE COATINGS

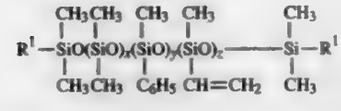
Atsushi Togashi, and Takateru Yamada, both of Chiba, Japan, assignors to Dow Corning Toray Silicon Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1994, Ser. No. 295,299
Claims priority, application Japan, Sep. 17, 1993, 5-254696
Int. Cl.[6] C08G *77/04;77/06;* C08L *83/05;83/07*
U.S. Cl. 528—12 15 Claims

1. A silicone release coating composition comprising:

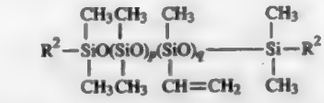
(A) a mixture of:

(i) 90.0 to 99.0 weight percent of a polydiorganosiloxane having the general formula:



wherein R^1 is independently selected from the group consisting of a hydroxyl group, a vinyl group, a methyl group, and a phenyl group, x, y, and z are positive integers such that $0.86 \leqq x/(x+y+z) < 0.94$, $0.04 < y/(x+y+z) \leqq 0.07$, and $0.03 \leqq z/(x+y+z) \leqq 0.07$ and

(ii) 1.0 to 10.0 weight percent of a polydiorganosiloxane having the general formula:



wherein R^2 is independently selected from the group consisting of a hydroxyl group, a vinyl group, and a methyl group, p and q are positive integers such that $0.995 \leqq p/(p+q) \leqq 1.0$ and $0 \leqq q/(p+q) \leqq 0.005$;

(B) an organohydrogenpolysiloxane compound having at least 3 silicon-bonded hydrogen atoms in each compound;

(C) a platinum catalyst; and

(D) an organic solvent.

5,468,825

COATING COMPOSITION FOR CARRIERS FOR USE IN ELECTROPHOTOGRAPHY AND CARRIERS USING THE SAME

Mitsuhiro Takarada, Takasaki; Yuji Yoshikawa, and Kenji Yamamoto, both of Annaka, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1994, Ser. No. 185,354
Claims priority, application Japan, Jan. 22, 1993, 5-027557
Int. Cl.[6] C08G *77/08*
U.S. Cl. 528—15 12 Claims

1. A coating composition for an electrophotographic carrier, which coating composition comprises:

100 parts by weight of an organopolysiloxane of the following average unit formula (1)

$$R^1_a Si(OR^2)_b O_{(4-(a+b))/2} \quad (1)$$

wherein R^1 represents an alkyl group having from 1 to 10 carbon atoms or a phenyl group, R^2 represents a hydrogen atom or an alkyl, alkenyl or alkoxyalkyl group, each having from 1 to 10 carbon atoms for the alkyl and alkenyl and from 2 to 10 carbon atoms for the alkoxyalkyl, a is a value of $0.9 \leqq a \leqq 1.3$, and b is a value of $0 < b < 1.2$;

not less than 1 part by weight of an organosilane of the following general formula (2) serving as a crosslinking agent for the organopolysiloxane

$$(CH_3)_2SiX_2 \quad (2)$$

wherein each X represents an alkenoxy group or oxime having from 2 to 10 carbon atoms; and

a catalyst for curing the organopolysiloxane, said catalyst being selected from the group consisting of organotitanium, organotin, organozinc, organocobalt, organoiron and organoaluminum compounds, and aminosilanes and mixtures thereof.

5,468,826

ADHESION PROMOTING ADDITIVES AND CURABLE ORGANOSILOXANE COMPOSITIONS CONTAINING SAME

Theresa E. Gentle, and Michael A. Lutz, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed May 10, 1994, Ser. No. 240,426
Int. Cl.[6] C08G *77/08*
U.S. Cl. 528—15 14 Claims

1. An organosiloxane copolymer corresponding to the general formula

$$\{XR^1{}_2SiO_{1/2}\}_a\{SiO_2\}_b\{(R^2O)_3SiR^3(R^1)_2SiO_{1/2}\}_c\{R^4{}_xR^5{}_ySiO_{(4-x-y)/2}\}_d\{R^1{}_v(R^2O)_wSiO_{(4-v-w)/2}\}_e\{R^2O_{1/2}\}_f\{HO_{1/2}\}_g$$

wherein each R^1 is individually selected from monovalent hydrocarbon or halogenated hydrocarbon radicals that are substantially free of ethylenic unsaturation and contain from 1 to 10 carbon atoms;

each R^2 is individually selected from alkyl radicals containing 1 to 10 carbon atoms;

R^3 is a divalent hydrocarbon radical containing from 2 to 10 carbon atoms;

each R^4 is individually selected from monovalent hydrocarbon radicals containing an epoxy, acryloxyalkyl or methacryloxyalkyl group;

R^5 is R^1 or OR^2;

X is hydrogen or an alkenyl radical;

a, b, c, d, e, f and g represent mole fractions with a total value of 1;

a, b, c, and d are all greater than zero;

e, f and g are 0 or a positive number less than 1;

x is 1, 2, or 3;

y is 0, 1, or 2;

x+y is 1, 2or3;

v and w are each 0, 1, 2, or 3;

and v+w is 1, 2 or 3.

5,468,827

EPOXY-FUNCTIONAL MQ ORGANOPOLYSILOXANES

Yoshitsugu Morita, Chiba, Japan, assignor to Dow Corning Toray Silicon Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1994, Ser. No. 259,817

Claims priority, application Japan, Jun. 29, 1993, 5-185627

Int. Cl.[6] C08G *77/14;77/18*

U.S. Cl. 528—15 **14 Claims**

1. An organopolysiloxane having the general formula

$$(R^2{-}SiO^1{}_{/2})_a(R^3{-}SiO^1{}_{/2})_b(SiO^4{}_{/2})_c$$

wherein each R^1 is a monovalent group independently selected from the group consisting of hydrocarbon groups and halogenated hydrocarbon groups; R^2 is selected from the group consisting of the hydrogen atom, monovalent hydrocarbon group and halogenated hydrocarbon groups; R^3 is selected from the group consisting of epoxy-functional organic groups, alkoxysilylalkyl groups and alkyl groups having at least 6 carbon atoms; a is zero or a positive number; b is a positive number; c is a positive number; a/c has a value of zero to <4; b/c has a value of 0.05 to 4; and (a+b)/c has a value of 0.2 to 4, with the proviso that neither R^1 nor R^2 is an alkenyl group and that said organopolysiloxane has in its molecule at least one said epoxy-functional organic group and at least one said alkyl group having at least 6 carbons.

5,468,828

SILICONE RELEASE COMPOSITION

Simon R. Hurford, Cardiff, and Bhukandas Parbhoo, Barry, both of, Wales, assignors to Dow Corning Limited, Barry, Wales

Filed Oct. 28, 1994, Ser. No. 328,786

Claims priority, application United Kingdom, Nov. 5, 1993, 9322793

Int. Cl.[6] C08G *77/06*

U.S. Cl. 528—15 **17 Claims**

1. A release modifier for silicone release compositions comprising a MQ resin consisting essentially of units of the formulae

SiO_2 (Q) and $R_3SiO_{1/2}$ (M)

wherein R is selected from the group consisting of monovalent hydrocarbon groups having up to 3 carbon atoms, a hydrogen atom, an alkenyl group of the formula —R'CH=CH_2 and an oxyalkenyl group of the formula —OR'CH=CH_2, wherein R' denotes an alkylene group of from 4 to 12 carbon atoms, provided there is at least one group selected from the group consisting of —R'CH=CH_2 and —OR'CH=CH_2 present per MQ molecule and that no more than 50% of all M units comprise a substituent selected from the group consisting of —R'CH=CH_2 and —OR'CH=CH_2 groups.

5,468,829

IN-SITU REINFORCED SILICONE ELASTOMER USING RESIN PRECURSOR

Debora F. Bergstrom; Gary T. Burns, and Patricia A. Giwa-Agbomeirele, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 11, 1994, Ser. No. 321,569

Int. Cl.[6] C08G *77/06*

U.S. Cl. 528—18 **17 Claims**

1. A method for preparing an in situ reinforced silicone elastomer, the method comprising:

(A) forming a mixture comprising a diorganosiloxane polymer described by formula

$$Q_{3-a}R_aSi(OSiR_2)_xOSiR_aQ_{3-a},$$

a five to 10 time stoichiometric excess of a hydrolyzable siloxane described by formulas

$$R_3Si(OSiQ^1R)_m(OSiRR^1)_nOSiR_3,$$

$$(RQ^1SiO)_y, \text{ and}$$

$$Si(OSiR_2Q^1)_4$$

and a tin salt catalyst and

(B) contacting the mixture with water effecting formation of an in situ reinforced silicone elastomer;

where each R is independently selected from a group consisting of alkyls comprising one to six carbon atoms, alkenyls comprising two to six carbon atoms, and aryls; each R^1 is independently selected from a group consisting of hydrogen and R; each Q is independently selected from a group consisting of hydroxy, acyloxys comprising one to six carbon atoms, alkoxys comprising one to six carbon atoms, and substituted alkoxys comprising one to six carbon atoms; each Q^1 is independently described by formula

$$—R^2SiQ_{3-b}R_b,$$

where R^2 is a divalent hydrocarbon radical comprising one to 12 carbon atoms, R is as previously described, Q is as previously described, and b=0 to 2; a=0 to 2, x=0 to 1000, m=3 to 500, n=0 to 497, m+n=3 to 500, and y=3 to 10.

5,468,830

PROCESS FOR PREPARING ORGANOPOLYSILOXANE GUM

Yoshio Inoue; Susumu Sekiguchi, and Minoru Igarashi, all of Annaka, Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

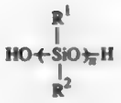
Filed Jan. 31, 1994, Ser. No. 189,333

Claims priority, application Japan, Jan. 29, 1993, 5-034211

Int. Cl.[6] C08G *77/04*

U.S. Cl. 528—26 **18 Claims**

1. In a process for preparing an organopolysiloxane gum by effecting condensation polymerization of a silanol-terminated organosiloxane of the following formula (1):

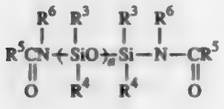


(1)

wherein R^1 and R^2 each are a halogen- or cyano-substituted or unsubstituted monovalent hydrocarbon group and letter n is an integer of 2 to 3,000,

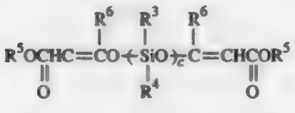
the improvement comprising adding a silane or siloxane having two hydrolyzable groups in a molecule to said orgnopolysiloxane of formula (1) in such an amount to give a resultant composition having a molar ratio of the silanol groups in said organosiloxane of formula (1) to the hydrolyzable groups in said silane or siloxane of from 0.5 to 3, and condensation polymerizing the resultant composition to form an organopolysiloxane having a high degree of polymerization of at least 1×10^3 and a total content of low-molecular weight cyclic siloxanes having from three to 25 monomer units of up to 5,000 parts by weight per million parts by weight of the organopolysiloxane,

wherein the silane or siloxane having two hydrolyzable groups in a molecule is selected from the group consisting of the following formulae (3) to (6):



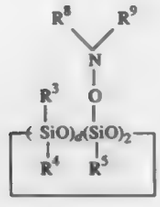
(3)

wherein R^3, R^4, R^5, and R^6 are each independently a halogen- or cyano-substituted or unsubstituted monovalent hydrocarbon group, and letter a is a positive number of 0 to 100;



(4)

wherein R^3, R^4, R^5 and R^6 are each independently a halogen- or cyano-substituted or unsubstituted monovalent hydrocarbon group and letter c is a positive number of 1 to 100;



(5)

wherein R^3, R^4, R^5, R^8 and R^9 are each independently a halogen- or cyano-substituted or unsubstituted monovalent hydrocarbon group arid letter d is an integer of 2 to 10; and

(6)

wherein R^3, R^4, and R^5 are each independently a halogen- or cyano-substituted or unsubstituted monovalent hydrocarbon group and letter e is a positive number of 0 to 1,000.

5,468,831

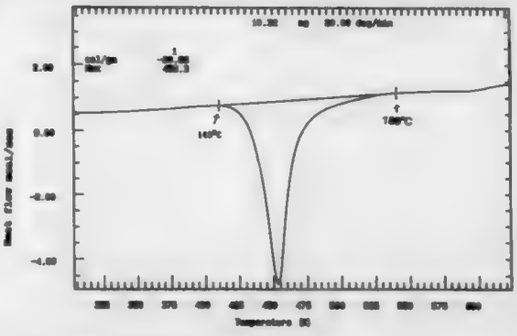
ONE-PACKAGE STRUCTURAL ADHESIVE

Gerd M. Lenke, Canton, and H. William Cocain, Cuyahoga Falls, both of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Filed Dec. 21, 1993, Ser. No. 171,944

Int. Cl.[6] C08G *18/00*

U.S. Cl. 528—44 **19 Claims**



1. An adhesive composition comprising:

a) a prepolymer comprising the reaction product of one or more polyols with one or more polyisocyanates wherein the NCO:OH ratio is from about 10:1 to 30:1,

b) a curative comprising melamine and/or cyanoguanidine having from 0 to 2 substituents which are independently alkyls of 1 to 8 carbon atoms or phenyl, said melamine and/or cyanoguanidine of the curative having reactive NH_2 groups, being in particle form, and having at least 98 wt. % of its particles of a particle diameter of less than 25 μm, and

c) one or more mineral fillers

wherein the ratio of the NCO groups of the prepolymer to the NH_2 groups of the curative is from 1.2 to 2.2 and wherein the adhesive composition has the capacity to form a structural bond between two parts in 10 minutes or less at 150° C.

5,468,532

HEAT-CURABLE REACTION RESIN MIXTURES AND THE USE THEREOF

Lutz Schrader, Krefeld; Hans-Dieter Jakob, Leverkusen; Hanns-Peter Müller, Odenthal, and Johann Niggemann, Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 1, 1995, Ser. No. 432,289

Claims priority, application Germany, May 9, 1994, 44 16 323.1

Int. Cl.[6] C08G *18/18;18/20*

U.S. Cl. 528—53 **5 Claims**

1. Heat-curable reaction resin mixtures comprising

a) at least one organic polyisocyanate,

b) at least one organic compound having epoxy rings, and

c) a mixture of compounds containing amine groups wherein said mixture consists of:

1) at least one compound selected from the group consisting of:

i) at least one tertiary amine corresponding to the formula:

$$R^2-N(R^1)-R^3, \quad (I)$$

wherein:

R^1 and R^2 represent: a C_1–C_{15} alkyl group, and

R^3 represents a C_1–C_{15} aralkyl group;

ii) N-methylmorpholine,

iii) diazadicyclooctane, and

iv) mixtures thereof; and

2) at least one tertiary amine corresponding to the formula:

$$R^5-N(R^4)-R^6, \quad (II)$$

wherein:

R^4 represents: a C_1–C_{15} alkyl group, and

R^5 and R^6 represent: a C_7–C_{15} aralkyl group,

wherein the weight ratio of component c) 1) to component c) 2) is 1:99 to 20:80, component c) is present in quantities of from 0.5 to 5% by weight, based on the total weight of components a) and b), and said polyisocyanate and said organic compound having epoxy rings are present in quantities such that there are from 0.05 to 0.30 equivalents of epoxy rings present per equivalent of isocyanate groups present.

5,468,833

MOISTURE CURING, ONE-COMPONENT COATING COMPOSITIONS AND THEIR USE FOR THE PRODUCTION OF COATINGS

Jürgen Schwindt, Leverkusen; Karl-Heinz Hentschel, Bergisch Gladbach, and Lutz Schmalstieg, Cologne, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 20, 1994, Ser. No. 359,493

Claims priority, application Germany, Jan. 7, 1994, 44 00 224.6

Int. Cl.[6] **C08G** *18/00;18/70;* **B32B** *27/00*

U.S. Cl. 528—67 **13 Claims**

1. The present invention relates to moisture-curing one-component coating compositions containing as binder a polyisocyanate component consisting essentially of

A) 100 parts by weight of an optionally carbodiimide- and/or uretoneimine-modified polyisocyanate or polyisocyanate mixture of the diphenyl methane series having an NCO content of 20 to 33% by weight,

B) 40 to 150 parts by weight of one or more NCO prepolymers which have an NCO content of 1.5 to 12% by weight and are prepared by reacting

a) at least one aromatic polyisocyanate having an NCO content of 25 to 48.3% by weight with

b) a less than equivalent quantity of a polyhydroxyl component containing

b1) one or more polyols containing ether, ester, thioether and/or carbonate groups and having a molecular weight of 134 to 10,000, and

b2) up to 40% by weight, based on the total weight of component b), of one or more monohydric to hexahydric alcohols which have a molecular weight of 32 to 300 and do not correspond to the definition of b1), and

C) 10 to 90 parts by weight of an aliphatic polyisocyanate component containing one or more lacquer polyisocyanates based on hexamethylene diisocyanate and having a maximum viscosity of 3,000 mPa.s at 23° C., an NCO content of 17 to 24% by weight and a monomeric hexamethylene diisocyanate content of at most 0.5% by weight.

5,468,834

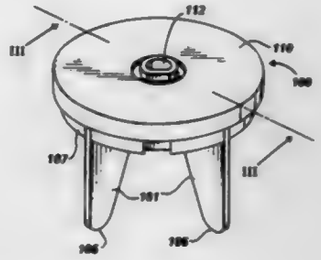
SHEET REGISTRATION DEVICE

Robert N. Finsterwal, Webster; Richard L. Carlston; Edward L. Schlueter, Jr., both of Rochester, and Lucille M. Sharf, Pittsford, all of N.Y., assignors to Xerox Croporation, Stamford, Conn.

Filed Sep. 30, 1991, Ser. No. 767,711

Int. Cl.[6] **C08G** *18/32;18/48;* **B65H** *9/10*

U.S. Cl. 528—76 **20 Claims**



1. A sheet registration device including a hub having an axis of rotation and a plurality of resilient plastic blades arranged in radial planes passing through said axis and extending in the direction of said axis beyond one end of the hub towards sheet-engaging tips lying in a common plane normal to said axis said blade being made of a polyurethane elastomer obtained by the reaction of a polytetramethylene ether glycol having the formula $HO[(CH_2)_4O]_nH$ where n is from 8 to 41, and from about 20 to about 95 parts by weight per 100 parts by weight of said glycol of a diisocyanate selected from the group consisting of diphenylmethane diisocyanates, toluene diisocyanates, naphthalene diisocyanates and blends thereof and a sufficient amount of linking agents to provide a crosslinked elastomer, said linking agents comprising a mixture of from about 75 to 60% by weight of a diol having the formula $HO(R_1)$ OH where R_1 is a straight or branched chain alkyl group having from 2 to 12 carbon atoms and from about 25 to 40% by weight of a triol having the formula: $R'—C—[(OH)_a(CH_2OH)_b]$ where R' is H, CH_3 or C_2H_5, a is O or 1, b is 2 or 3 and a+b=3.

5,468,835

POLYETHERPOLYURETHANE END CAPS FOR OIL FILTERS

Stephen M. Singer, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Apr. 20, 1994, Ser. No. 230,287

Int. Cl.[6] **C08G** *18/48;18/32*

U.S. Cl. 528—76 **9 Claims**

1. An improved solvent-resistant thermoset polyetherpolyurethane end cap for an oil filter formed by the catalytic urethane-forming reaction between a methylene bridged polyarylpolyisocyanate component and a polyether polyol component, the improvement which comprises:

the polyol component of the urethane-forming reaction comprising a diol first component having a molecular weight of from about 75 to about 200 and a polyether polyol mixture second component of

from about 15% to about 90% by weight of a polyether polyol having no oxyethylene groups, a functionality greater than 2 and a hydroxyl number of from about 30 to about 60; and

from about 10% to about 85% by weight of a polyether polyol having no oxyethylene groups, a functionality greater than 2 and a hydroxyl number of from about 170 to about 110;

wherein the polyol component includes from about 10% to about 25% by weight of the diol and, correspondingly, from about 90% to about 75% by weight of the polyether polyol mixture second component.

5,468,836

PROCESS FOR THE PREPARATION OF POLYCARBONATE

Yoshimichi Okano; Tatsuya Kanno; Tsutomu Yamato; Yasuhiro Oshino; Michiyo Tanigawa; Takaaki Kuwana, and Yutaka Fukuda, all of Hyogo, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP93/00104, § 371 Date Sep. 13, 1993, § 102(e) Date Sep. 13, 1993, PCT Pub. No. WO93/15129, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 28, 1993, Ser. No. 119,065

Claims priority, application Japan, Jan. 29, 1992, 4-013643; Jan. 29, 1992, 4-013644; Jan. 29, 1992, 4-013645; Jan. 29, 1992, 4-013646; Jan. 29, 1992, 4-013647

Int. Cl.[6] C08G *64/00*

U.S. Cl. 528—204 3 Claims

1. A process for the preparation of a polycarbonate comprising a step of reacting a dihydric phenol with a carbonic acid diester in an amount of 0.90 to 1.50 mole per mole of the dihydric phenol in the presence of a transesterification catalyst comprising (a) a nitrogenous basic compound and (b) a compound in an amount of 10^{-8} to 10^{-2} mole per mole of the dihydric phenol containing an element selected from the group consisting of Group IIb, IVb and Vb elements of the periodic table in a melt transesterification process to prepare a polycarbonate having a branching parameter G of from 0.1 to 1.0 and terminal hydroxyl groups of 20 mole % or lower.

5,468,837

PROCESS FOR THE MANUFACTURE OF POLY-EPSILON-CAPROLACTONES AND POLY-EPSILON-CAPROLACTONES WHICH HAVE HIGH MOLECULAR MASSES OBTAINABLE BY THIS PROCESS

Henri Wautier, Braine-le-Comte, Belgium, assignor to Solvay (Société Anonyme), Brussels, Belgium

Filed Apr. 29, 1994, Ser. No. 235,676

Claims priority, application Belgium, May 17, 1993, 09300507

Int. Cl.[6] C08G *63/08*

U.S. Cl. 528—357 10 Claims

1. In a process for the manufacture of poly-ε-caprolactones by continuous polymerization of ε-caprolactone as a melt in an extruder, the improvement comprising a polymerization initiator chosen from aluminium alkoxides including at least one aluminoxane-carbon bond.

5,468,838

PROCESS FOR THE PREPARATION OF POLYSUCCINIMIDE, POLYASPARTIC ACID AND THEIR SALTS

Günther Boehmke, and Gerd Schmitz, both of Leverkusen, Germany, assignors to Bayer AG, Leverkusen, Germany

Filed Mar. 14, 1994, Ser. No. 209,716

Claims priority, application Germany, Mar. 31, 1993, 43 10 503.3

Int. Cl.[6] C08G *73/10;85/00*

U.S. Cl. 528—363 12 Claims

1. A process for the preparation of polysuccinimide by reaction of maleic anhydride or maleic acid, fumaric acid or mixtures thereof with ammonia and polymerization of the reaction product, which comprises carrying out the polymerization in the presence of a solubilizing agent.

5,468,839

HYDROXY-FUNCTIONAL POLYETHER FINISHING PROCESS

Galen J. Suppes, Pearland, and Hans R. Friedli, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 857,048, Mar. 24, 1992, abandoned. This application Jun. 22, 1993, Ser. No. 81,952

Int. Cl.[6] C08G *59/00*

U.S. Cl. 528—403 8 Claims

1. A method of preparing a hydroxy-functional polymer consisting essentially of contacting (a) a hydroxy-functional polyether containing a Group IA or Group IIA metal ion in an amount up to about 200 ppm, and (b) an acid which is either soluble in the hydroxy-functional polyether or which is present in a concentration such that it forms a stable suspension in the hydroxy-functional polyether above the solubility level, in an amount that is sufficient to neutralize the basic catalyst such that a salt is formed, said salt being formed in an amount that is (a) insufficient to significantly promote trimerization reactions if the hydroxy-functional polyether is reacted with an isocyanate compound, and (b) soluble or forming a stable suspension in the hydroxy-functional polyether above its solubility level.

5,468,840

PREPARATION PROCESS OF POLYOXYALKYLENE POLYOLS AND PROCESS OF ALKYLENE OXIDE RECOVERY

Tomoki Tsutsui; Tsukuru Izukawa, both of Aichi; Kazuhiko Ohkubo, Kanagawa, and Yoshitsugu Sakaki, Aichi, all of, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Aug. 29, 1994, Ser. No. 296,604

Claims priority, application Japan, Sep. 7, 1993, 5-221914

Int. Cl.[6] C08G *59/68*

U.S. Cl. 528—408 3 Claims

1. A process for recovering an alkylene oxide polymerization catalyst comprising:

a) adding a neutralizing agent composed of water and a mineral acid or an organic acid to crude polyoxyalkylene polyol containing an alkali metal compound alkylene oxide polymerization catalyst;

b) dehydrating and drying the liquid obtained in step a) and thereafter removing a deposited alkali metal salt by filtration;

c) forming an aqueous alkali metal salt solution from the deposited alkali metal salt of step b); and

d) contacting the aqueous alkali metal salt solution of step c) with an OH-type anion exchange resin so as to adsorb the anion of the mineral acid or the organic acid so as to recover the alkylene oxide polymerization catalyst.

5,468,841

POLYMERIZATION OF ENERGETIC, CYCLIC ETHER MONOMERS USING BORON TRIFLUORIDE TETRAHYDROFURANATE

Aslam A. Malik, Cameron Park; Thomas G. Archibald, Fair Oaks; Roland P. Carlson, Davis, and Gerald E. Manser, El Dorado Hills, all of Calif., assignors to Aerojet General Corporation, Sacramento, Calif.

Filed Apr. 13, 1994, Ser. No. 226,919

Int. Cl.[6] C08G *65/22*

U.S. Cl. 528—408 11 Claims

1. A method for polymerizing an energetic, oxetane monomer which is capable of cationic polymerization, said method comprising:

providing an energetic, oxetane monomer capable of cationic polymerization;

providing an initiator precursor and boron trifluoride tetrahydrofuranate (BF_3•THF), said initiator precursor being such that it

will form an adduct with said boron trifluoride tetrahydrofuranate which will in turn initiate cationic polymerization of said energetic, oxetane monomer;

combining said initiator precursor with said boron trifluoride tetrahydrofuranate to form a mixture; and

bringing said mixture of said initiator precursor and said boron trifluoride tetrahydrofuranate into contact with said energetic, oxetane monomer so as to effect polymerization of said energetic, oxetane monomer.

5,468,842

ANNEALED LINEAR HIGH DENSITY POLYETHYLENE AND PREPARATION THEREOF

Edward G. Howard, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 95,363, Jul. 20, 1993, Pat. No. 5,382,643, which is a continuation of Ser. No. 903,408, Jun. 23, 1992, abandoned. This application Oct. 4, 1994, Ser. No. 317,493

Int. Cl.[6] C08F *6/00*

U.S. Cl. 528—481 **2 Claims**

1. A process for preparing polyethylene consisting essentially of the following steps:

(a) forming an article of non-annealed folded chain linear polyethylene having a density of at least 0.94 g/cm^3 and melt index in the range of about 0.02 to 10;

(b) annealing the article of step (a) by subjecting said article in an inert atmosphere to a temperature of about 250° to about 335° C., for at least about 30 min without agitation; and

(c) cooling the article non-precipitously to a temperature of about 120° C. or below.

5,468,843

ACETIC ANHYDRIDE ACTIVATION FOR C-TERMINAL PROTEIN SEQUENCING

Victoria L. Boyd, San Carlos; MeriLisa Bozzini, Burlingame, both of Calif., and G. Marc Loudon, West Lafayette, Ind., assignors to Perkin-Elmer, Norwalk, Conn.

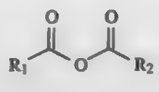
Filed Sep. 8, 1994, Ser. No. 302,154

Int. Cl.[6] C07K *1/10;* G01N *33/68*

U.S. Cl. 530—345 **18 Claims**

1. A method of forming a thiohydantoin moiety at tile C-terminus of a polypeptide, the method comprising the steps of:

treating the polypeptide with an anhydride under basic conditions such that an oxazolone moiety is formed at the C-terminus of the polypeptide, the anhydride being defined by tile formula:



wherein R_1 and R_2 are selected from the group consisting of C_1–C_6 alkyl, C_1–C_6 alkenyl with the proviso that double bonded carbons are not conjugate with the double bonded oxygens, C_7–C_{13} alkylaryl with the proviso that double bonded carbons are not conjugate with the double bonded oxygens, and halo-substituted C_1–C_6 alkyl, C_1–C_6 alkenyl, or C_7–C_{13} alkylaryl with the proviso that double bonded carbons are not conjugate with the double bonded oxygens; and

treating the polypeptide with thiocyanate under acidic conditions so that the oxazolone moiety is converted into a thiohydantoin moiety.

5,468,844

PROCESS FOR THE MEMBRANE-FILTERING OF PROTEIN SOLUTIONS

Paul Smith, Stirling, Canada, assignor to Protose Technologies Inc.

Filed Jan. 7, 1994, Ser. No. 178,843

Int. Cl.[6] B01D *24/32;* C07K *1/34;14/47;14/76*

U.S. Cl. 530—366 **12 Claims**

1. In a process for the membrane filtration of a protein solution, the improvement of: applying a high shear force at the surface of said membrane, said high shear force being generated by relative rotation, at a speed of between about 1,000 to about 3,450 RPM, between a membrane disc and a solid disc which are spaced in close proximity to one another with a space therebetween of about ⅛" to about ¼".

5,468,845

ANTIBODIES TO OSTEOGENIC PROTEINS

Hermann Oppermann, Medway; Engin Ozkaynak, Milford; Thangavel Kuberasampath, Medway, and David C. Rueger, Hopkinton, all of Mass., assignors to Stryker Corporation, Kalamazoo, Mich.

Division of Ser. No. 841,646, Feb. 21, 1992, Pat. No. 5,266,683, which is a continuation-in-part of Ser. No. 827,052, Jan. 28, 1992, Pat. No. 5,250,302, Ser. No. 579,865, Sep. 7, 1990, Pat. No. 5,108,153, Ser. No. 621,849, Dec. 4, 1990, abandoned, Ser. No. 621,988, Dec. 4, 1990, abandoned, Ser. No. 810,560, Dec. 20, 1991, abandoned, Ser. No. 569,920, Aug. 20, 1990, abandoned, Ser. No. 600,024, Oct. 18, 1990, abandoned, Ser. No. 599,543, Oct. 18, 1990, abandoned, Ser. No. 616,374, Nov. 21, 1990, Pat. No. 5,162,114, and Ser. No. 483,913, Feb. 22, 1990, Pat. No. 5,171,594, said Ser. No. 827,052is a division of Ser. No. 179,406, Apr. 8, 1988, Pat. No. 4,968,590, said Ser. No. 579,865is a division of Ser. No. 179,406, Sep. 7, 0, said Ser. No. 621,849is a division of Ser. No. 232,630, Aug. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 179,406, Aug. 15, 0, said Ser. No. 621,988is a division of Ser. No. 315,342, Feb. 23, 1989, Pat. No. 5,011,691, which is a continuation-in-part of Ser. No. 232,630, Feb. 23, 0, said Ser. No. 810,560is a continuation of Ser. No. 660,162, Feb. 22, 1991, abandoned, which is a continuation of Ser. No. 422,699, Oct. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 315,342, Oct. 17, 0, said Ser. No. 569,920is a continuation-in-part of Ser. No. 422,699, Oct. 17, 0, and Ser. No. 483,913, Oct. 17, 0, which is a continuation-in-part of Ser. No. 422,613, Oct. 17, 1989, Pat. No. 4,975,526, which is a continuation-in-part of Ser. No. 315,342, Oct. 17, 0, said Ser. No. 600,024is a continuation-in-part of Ser. No. 569,920, Oct. 18, 0, said Ser. No. 599,543is a continuation-in-part of Ser. No. 569,920, Oct. 18, 0, said Ser. No. 616,374is a division of Ser. No. 422,613, Oct. 18, 0. This application Nov. 1, 1993, Ser. No. 147,023

Int. Cl.[6] C07K *16/18;14/435*

U.S. Cl. 530—387.9 **5 Claims**

1. An isolated antibody having binding specificity for an epitope on a protein comprising an amino acid sequence selected from the group consisting of:

residues 335–431 of Seq. ID No. 1 (OPS) and residues 330–451 of Seq. ID No. 1 (OP7), and allelic and species variants thereof.

5,468,846

MONOCLONAL ANTIBODIES AND METHOD FOR THE DETERMINATION OF HUMAN G-CSF

Takanori Ichikawa, Takasaki; Tomoaki Kuwaki, Maebashi; Shigeru Matsuki, Takasaki, and Katsumi Tachibana, Maebashi, all of, Japan, assignors to Kirin-Amgen Inc., Wilmington, Del.

Filed Feb. 22, 1994, Ser. No. 199,493

Claims priority, application Japan, Jun. 30, 1993, 5-162268

Int. Cl.[6] G01N *33/53;* C12N *5/20;* A61K *35/14*

U.S. Cl. 530—388.23 2 Claims

1. The monoclonal anti-G-CSF antibody K35-2B produced by hybridoma cell line FERM Accession No.: BP 4340 or a G-CSF binding fragment thereof.

5,468,847

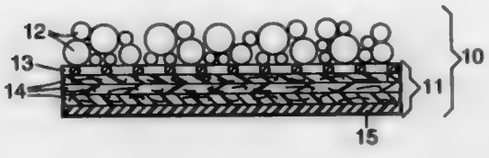
METHOD OF ISOLATING AND PURIFYING A BIOMACROMOLECULE

Steven M. Heilmann, Afton; Gary J. Drtina, Woodbury; Philip D. Eitzman, Lake Elmo; Louis C. Haddad, Mendota Heights; Frederick W. Hyde, New Brighton; Todd W. Johnson, Minneapolis; Jerald K. Rassmussen, Stillwater, and Michael G. Williams, Vadnais Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 10, 1994, Ser. No. 209,700

Int. Cl.[6] C07K *1/16;1/18;* B01D *15/08;61/08*

U.S. Cl. 530—413 30 Claims



1. A method of separating a biomacromolecule from a solution mixture comprising the steps of

a) providing a separation system containing a dead end filter cartridge comprising a composite filter medium including a porous filtration layer on the upstream surface of which is located a layer of stationary phase particulates capable of binding with a biomacromolecule, a reservoir containing a solution mixture comprising at least one biomacromolecule as a solute, and a pump and associated tubing to form a closed loop assembly, and

b) recirculation pumping the solution mixture through the filter cartridge at a flow rate of at least 37 mL/min. so as to bind said at least one biomacromolecule to the stationary phase particulates so as to form a biomacromolecule:stationary phase particulates product.

5,468,848

BASIC AZO DYESTUFFS OF THE 3-CYANO-2,4,6-TRIAMINO PYRIDINE SERIES

Karin Hassenrück, Düsseldorf, and Peter Wild, Odenthal, both of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

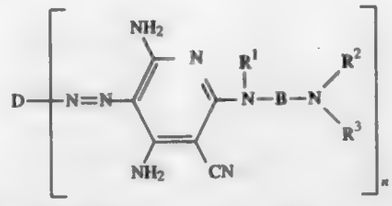
Filed Jun. 21, 1994, Ser. No. 263,329

Claims priority, application Germany, Jun. 28, 1993, 43 21 422.3

Int. Cl.[6] C09B *29/42;35/031;* D06P *1/41;* D21H *21/28*

U.S. Cl. 534—759 6 Claims

1. An azo dyestuff of the formula



wherein

R^1 represents hydrogen, alkyl or aryl or

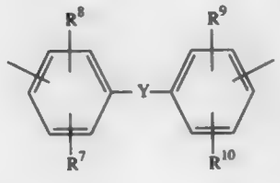
R^1 and R^2, together with B and the two nitrogen atoms to which they are bonded, form an optionally substituted 5- or 6-membered heterocyclic ring, and in this-case B represents a direct bond, —CH_2— or —CH_2CH_2—,

R^2 and R^3 independently of one another represent hydrogen, alkyl, alkenyl or aralkyl or

R^2 and R^3, together with the nitrogen atom to which they are bonded, form an optionally substituted 5- or 6-membered heterocyclic ring,

n represents 2 and

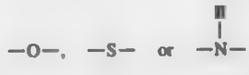
D represents the radical of a tetrazo component of the formula



wherein

R^7–R^{10} independently of one another represent hydrogen, SO_3H, C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine or bromine,

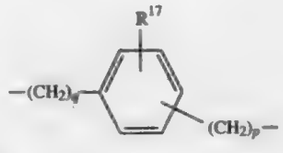
B represents C_2–C_5-alkylene which is optionally interrupted by



wherein

R represents hydrogen, or represents C_1–C_4-alkyl which is optionally substituted by chlorine, bromine, hydroxyl, cyano, C_1–C_4-alkoxy, amino and mono- and di-C_1–C_4-alkylamino, or represents C_6–C_{10}-aryl which is optionally substituted by fluorine, chlorine, bromine, C_1–C_4-alkyl or C_1–C_4-alkoxy, or

B represents a radical of the formula



wherein

q represents 0, 1, 2 or 3,

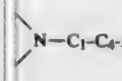
p represents 1, 2 or 3,

$(CH_2)_p$ is bonded to the radical NR^2R^3 and

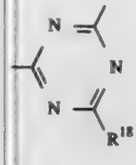
R^{17} represents hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, chlorine or bromine,

Y represents a direct bond or a bridge member of the formula —CO—NH—, —CO—, —NH—CO—NH—, —CH_2—CH_2—, —CH=CH—, —CH_2—, —$C(CH_3)_2$—,

—O—, —S—, —NH—,

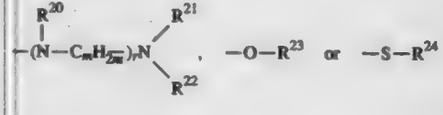


—N=N—, —NH—CO—CH=CH—CO—NH—, —NH—CO—CH_2—CH_2—CO—NH— or



wherein

R^{18} represents alkyl or aryl or represents a radical of the formula



wherein

m represents 2 or 3,

r represents 0 or 1 and

R^{20}, R^{21}, R^{22}, R^{23} and R^{24} independently of one another represent hydrogen, alkyl, alkenyl, aryl, aralkyl or cycloalkyl, or

R^{21} and R^{22}, together with the N atom to which they are bonded, form a 5- or 6-membered ring.

5,468,849

REBECCAMYCIN ANALOGS BY TRYPTOPHAN ANALOGS FEEDING

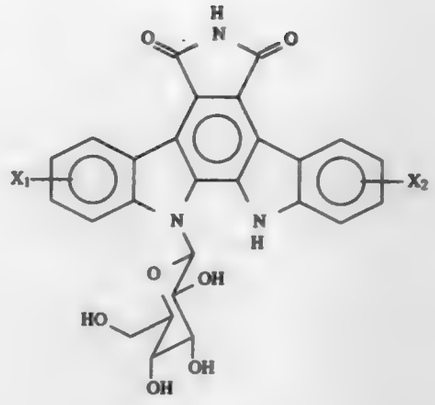
Kin S. Lam, Cheshire; Daniel R. Schroeder, Higganum; Jacqueline Mattei, Branford; Salvatore Forenza, and James A. Matson, both of Cheshire, all of Conn., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Continuation of Ser. No. 60,951, May 13, 1993, abandoned, which is a continuation of Ser. No. 648,751, Feb. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 489,430, Mar. 6, 1990, abandoned. This application Mar. 21, 1994, Ser. No. 216,075

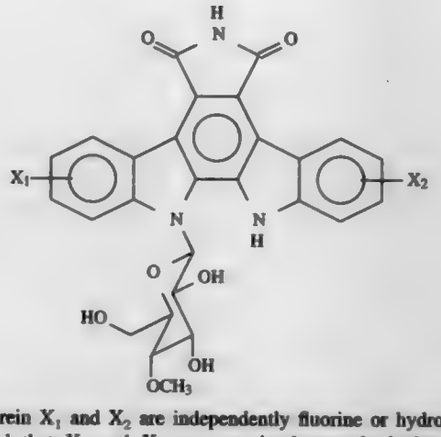
Int. Cl.[6] **C07G** *3/00;* **C07H** *11/00;17/02;* **C12P** *19/28*

U.S. Cl. 536—18.5 **6 Claims**

1. A process for producing the rebeccamycin analogs of formula II or III



(II)



(III)

wherein X_1 and X_2 are independently fluorine or hydrogen, provided that X_1 and X_2 are not simultaneously hydrogen, or a pharmaceutically acceptable acid addition salt thereof, which comprises cultivating a rebeccamycin-producing strain of *Saccharothrix aerocolonigenes* in an aqueous nutrient medium in the presence of a fluoro-tryptophan analog, until a recoverable amount of the desired rebeccamycin analog is produced by said organism in said culture medium and recovering the desired rebeccamycin analog from the culture medium in a substantially pure form.

5,468,850

PROCESS FOR PREPARING HIGH 2-O-α-D-GLUCOPYRANOSYL-L-ASCORBIC ACID CONTENT PRODUCT

Takahiko Mandai; Masaru Yoneyama, and Shuzo Sakai, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara, and Seibutsu Kagaku Kenkyujo, both of Okayama, Japan

Filed Oct. 21, 1992, Ser. No. 964,303

Claims priority, application Japan, Jan. 23, 1991, 3-339282

Int. Cl.[6] **C07H** *1/06;17/04;* **C07D** *307/62*

U.S. Cl. 536—18.5 **7 Claims**

1. A process for preparing a high 2O-α-D-glucopyranosyl-L-ascorbic acid content product from a solution containing 2-O-α-D-glucopyranosyl-L-ascorbic acid and a saccharide derivative of L-ascorbic acid exhibiting a direct reducing activity, said product being substantially free of direct reducing activity 5-O-α-D-glucopyranosyl-L-ascorbic acid and 6-O-α-D-glucopyranosyl-L-ascorbic acid, which process comprises:

(a) allowing a saccharide transferring enzyme optionally with glucoamylase to act on a solution containing an α-glucosyl

saccharide and L-ascorbic acid to form 2-O-α-D-glucopyranosyl-L-ascorbic acid;

(b) subjecting the resultant solution containing 2-O-α-D-glucopyranosyl-L-ascorbic acid and a saccharide derivative of L-ascorbic acid exhibiting a direct reducing activity to an oxidation treatment under aerobic conditions and optionally in the presence of an oxidation-accelerating effective amount of an acid, alkali, metal salt oxidation accelerator, or activated charcoal to oxidize said saccharide derivative of L-ascorbic acid to substantial completeness and provide a solution containing 2-O-α-D-glucopyranosyl-L-ascorbic acid and an oxide of said saccharide derivative of L-ascorbic acid;

(c) fractionating the solution from step (b) by column chromatography using a strongly acidic-acidic cation exchange resin to elute, in sequence, (i) a fraction rich in said oxide of said saccharide derivative of L-ascorbic acid, (ii) a fraction rich in a mixture of said oxide of said saccharide derivative of L-ascorbic acid and 2-O-α-D-glucopyranosyl-L-ascorbic acid, and (iii) a fraction rich in said 2-O-α-D-glucopyranosyl-L-ascorbic acid; and

(d) recovering the resultant high 2-O-α-D-glucopyranosyl-L-ascorbic acid content product substantially free of direct reducing activity 5-O-α-D-glucopyranosyl-L-ascorbic acid and 6-O-α-D-glucopyranosyl-L-ascorbic acid.

5,468,851

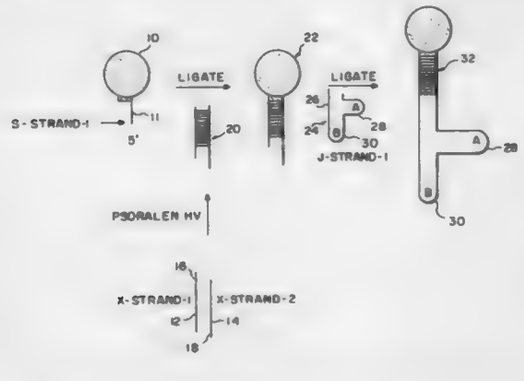
CONSTRUCTION OF GEOMETRICAL OBJECTS FROM POLYNUCLEOTIDES

Nadrian C. Seeman, New York, and Yuwen Zhang, Queens, both of N.Y., assignors to New York University, New York, N.Y.

Division of Ser. No. 805,564, Dec. 12, 1991, Pat. No. 5,278,051. This application Sep. 2, 1993, Ser. No. 114,301

Int. Cl.[6] C07H *21/04*

U.S. Cl. 536—22.1 **2 Claims**



1. A single-stranded polynucleotide having self-hybridizing segments of complementary sequences and segments capable of forming hairpin loops, the sequence of said polynucleotide being selected such that, when allowed to self-hybridize, a branched junction with at least two branches ending in hairpin loops, is formed, each said branch, near the hairpin loop thereof, having a recognition site for a growth enzyme, such that cleavage with said growth enzyme destroys said hairpin loop and creates a ligatable end.

5,468,852

OLIGONUCLEOTIDES FOR DETECTING BACTERIA

Tetsuo Ohashi, Kyoto; Jun Tada, Muko; Shigeru Fukushima, Otsu; Hiroko Ozaki, Kyoto; Naoyuki Nishimura; Yoshinari Shirasaki, both of Kyoto, and Koichi Yamagata, Osaka, all of, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Aug. 19, 1992, Ser. No. 932,379

Claims priority, application Japan, Feb. 18, 1992, 4-030755; Mar. 24, 1992, 4-066082

Int. Cl.[6] C07H *21/04*

U.S. Cl. 536—24.33 **3 Claims**

1. A synthetic oligonucleotide for detecting the trh gene of *Vibrio parahaemolyticus*, consisting of a polynucleotide having a sequence selected from the group consisting of SEQ. I.D. NO.:1, the complement of SEQ. I.D. NO.:1, SEQ. I.D. NO.:2 and the complement of SEQ. I.D. NO.:2.

5,468,853

SYNTHESIS OF 5-RADIOHALO-2'-DEOXYURIDINE

Janina Baranowska-Kortylewicz, Omaha, Nebr., assignor to Board of Regents University of Nebraska, Lincoln, Nebr.

Filed Dec. 30, 1993, Ser. No. 176,146

Int. Cl.[6] C07H *19.073;19/10;* A61K *31/70*

U.S. Cl. 536—28.55 **18 Claims**

1. A method of preparing 5-radiohalo-2'-deoxyuridine or 5'-nucleotides thereof, comprising:

(a) mixing 5-trimethylstannyl-2'-deoxyuridine with an aqueous solution consisting of a radiohalide selected from the group consisting of radioiodide, radiobromide and radioastatine, and NaOH to form a first mixture at a temperature between about 0° C. and about 37° C.;

(b) adding an oxidant to said first mixture to form a second mixture, wherein said oxidant is selected from the group consisting of H_2O_2/CH_3COOH, Iodogen and Chloramine-T.

(c) sonicating the second mixture;

(d) evaporating at room temperature the solvent from said second mixture by using a stream of inert gas or air to form a residue;

(e) reconstituting the residue;

(f) filtering said residue;

(g) purifying the filtered residue on a reversed phase medium to yield said 5-radiohalo-2'-deoxyuridine or 5'-nucleotides thereof.

5,468,854

CHARACTERIZATION OF SPECIFIC DRUG RECEPTORS WITH FLUORESCENT LIGANDS

R. Tyler McCabe, Silver Spring, and Brian R. de Costa, Rockville, both of Md., assignors to Pharmaceutical Discovery Corporation, Elmsford, N.Y.

Continuation of Ser. No. 739,183, Aug. 1, 1991, abandoned. This application Jul. 22, 1993, Ser. No. 95,937

Int. Cl.[6] C07D *487/04;519/00*

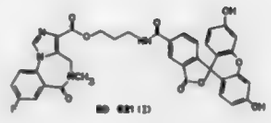
U.S. Cl. 540—498 **6 Claims**

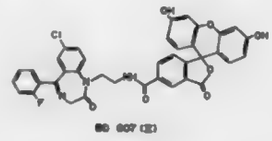
1. A fluorescently labelled conjugate comprising

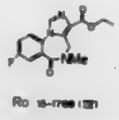
ligand, and

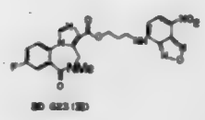
a fluorescent label bound to the ligand to form a fluorescently labelled conjugate wherein the label, when bound to the ligand, does not hinder binding of the ligand to a benzodiazepine receptor,

wherein the fluorescently labeled conjugate binds specifically to the receptor with an affinity of less than or equal to one micromolar and the label is directly detectable in the visible spectrum.









5,468,855

BISLACTONES

Rudolf Zink, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

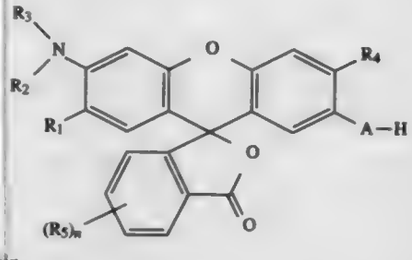
Filed Aug. 31, 1994, Ser. No. 298,899

Claims priority, application Switzerland, Sep. 9, 1993, 2704/93-8

Int. Cl.[6] C07D *417/00;405/00;307/83*

U.S. Cl. 544—60 **9 Claims**

1. A bislactone of formula (1)



(3)

wherein

R_1 is hydrogen or C_1–$c_4$alkyl;

R_2 and R_3 are each independently of the other hydrogen; C_1–C_8alkyl; unsubstituted or C_1–C_4alkyl- or halogen-substituted C_4–$c_7$cycloalkyl; phenyl which is unsubstituted or substituted by C_1–C_4alkyl, hydroxy or halogen; phenyl-C_1–C_4alkyl; C_3–C_6alkenyl; C_1–C_4alkoxy; C_1–C_4alkoxy-C_1–C_4alkyl; 2-tetrahydrofuranyl; or

R_2 and R_3, together with the linking nitrogen atom, are a pyrrolidino, piperidino, morpholino, thiomorpholino or piperazino ring which is unsubstituted or substituted by C_1–C_4alkyl;

R_4 is hydrogen or C_1–C_4alkyl;

R_5 is halogen; nitro; C_1–C_4alkyl; C_1–C_4haloalkyl; amino; mono-C_1–C_4alkylamino; di-C_1–C_4alkylamino; or COR_6;

n is 0; 1; 2; 3; or 4;

R_6 is hydrogen; hydroxy; C_1–C_8alkyl; C_1–C_8alkoxy; C_1–C_8haloalkyl; unsubstituted phenyl or phenyl which is substituted by halogen, C_1–C_4alkyl, C_1–C_4haloalkyl or C_1–C_4alkoxy; phenyl-C_1–C_4alkyl or phenyl-c_1–C_4alkoxy;

A is —(SO)O— or —(CO)O—;

Q is a saturated or unsaturated aliphatic radical having a molecular weight in the range from 28 to 150, or is a cycloaliphatic or araliphatic radical containing not more than 10 carbon atoms.

5,468,856

TRIAZINES SUBSTITUTED WITH THIOALKYLMETHACRYLATE GROUPS

Marie-Christine Berthe, Vandoeuvre Les Nancy; Paul Caubere, Nancy, and Yves Fort, Vandoeuvre Les Nancy, all of, France, assignors to Atochem, Paris, France

Division of Ser. No. 725,810, Jul. 9, 1991, Pat. No. 5,332,850.

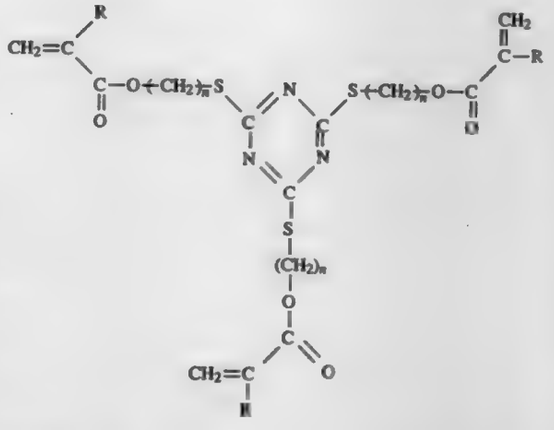
This application Mar. 17, 1994, Ser. No. 214,480

Claims priority, application France, Jul. 9, 1990, 90 08698

Int. Cl.[6] C07D *251/38*

U.S. Cl. 544—219 **6 Claims**

1. An acrylic or methacrylic compound of the formula:



wherein

n is an integer ranging from 1 to 20 inclusive, and R is a hydrogen atom, methyl or CHOHR' wherein R' is any of; (a) a straight-chain or branched alkyl optionally substituted by hydroxyl, alkoxy or ester substituents; (b) a straight-chain, branched or cyclic alkenyl; (c) an aryl radical, optionally substituted by halogen, nitro or alkoxy, or an unsaturated heterocyclic radical; (d) an alkylaryl; and (e) an arylalkyl radical.

5,468,857

FUNGICIDES

Alan J. Buckley, Oldham Lancs; Michael G. Huchings, Prestwich; Ian Ferguson, Todmorden; Kevin Beautement, Berkshire; John M. Clough, Buckinghamshire; Patrick J. Crowley, Berkshire; Christopher R. A. Godfrey, Berkshire; Paul J. deFraine, Berkshire; Vivienne M. Anthony, Berkshire, and Stephen P. Heaney, Berkshire, all of, England, assignors to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 242,760, Sep. 9, 1988, Pat. No. 5,334,748.

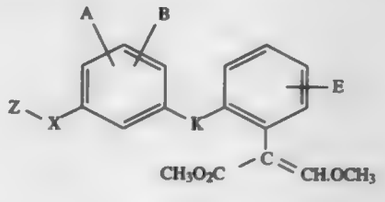
This application Feb. 3, 1994, Ser. No. 191,163

Claims priority, application United Kingdom, Sep. 9, 1987, 8721221; Sep. 15, 1987, 8721706; Jan. 22, 1988, 8801485; Mar. 17, 1988, 8806317; Jun. 21, 1988, 8814734

Int. Cl.[6] C07D *239/02*

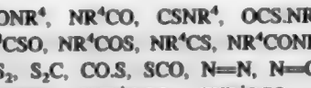
U.S. Cl. 544—298 **13 Claims**

1. A fungicidal compound of the formula (I):



(I)

or a stereoisomer thereof, wherein K is oxygen or sulphur; Z is optionally substituted heteroaryl; X is O, $S(O)_m$, NR^4, CR^1R^2, CHR^9, CO, $CR^1(OR^2)$, $C{=}CR^1R^2$, CHR^1CHR^2, $CR^1{=}CR^2$, $CHR^1CR^2{=}CH$, $C{=}C$, $OCHR^1$, CHR^1O, $OCHR^1O$, $S(O)_nCHR^1$, $S(O)_nCHR^1O$, $CHR^1S(O)_m$, CHR^1OSO_2, NR^4CHR^1, CHR^1NR^4, CO_2, O_2C, SO_2O, OSO_2, CO.CO, $COCHR^1$, $COCHR^1O$, CHR^1CO, $CHOH.CHR^1$, $CHR^1.CHOH$.



$CONR^4$, $OCONR^4$, NR^4CO, $CSNR^4$, $OCS.NR^4$, $SCO.NR^4$, NR^4CO_2, NR^4CSO, NR^4COS, NR^4CS, NR^4CONR^4, $S(O)_nNR^4$, $NR^4S(O)_m$, CS_2, S_2C, CO.S, SCO, N=N, $N{=}CR^1$, $CR^1{=}H$, $CHR^1CHR^2CH(OH)$, CHR^1OCO, CHR^1SCO, CHR^1NR^4CO, $CHR^1NR^4CONR^4$, CHR^1CHR^2CO, $O.N{=}CR^1$, $CHR^1O.N{=}CR^2$, $COOCR^1R^2$, $CHR^1CHR^2CHR^3$, $OCHR^1CHR^2$, $(CH_2)_mO$, CHR^1OCHR^2, CHR^1CHR^2O, $OCHR^1$, CHR^2O, $S(O)CHR^1CHR^2$, $CHR^1S(O)_nCHR^2$, $CHR^1CHR^2S(O)_m$, $CR^1{=}NNR^4$, $NR^4N{=}CR^1$, CHR^1CONR^2, $CHR^1OCO.NR^2$, $CH{=}CHCH_2O$, $COCHR^1CHR^2O$, or $(R^5)_2P^+CHR^2Q^-$, A, B and E, which may be the same or different, are H, halo, hydroxy, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} haloalkyl, C_{1-4} haloalkoxy, C_{1-4} alkylcarbonyl, C_{1-4} alkoxycarbonyl, phenoxy, nitro or cyano; R^1, R^2 and R^3, which may be the same or different, are H, C_{1-4} alkyl or phenyl; R^4 is H, C_{1-4} alkyl or COR^1; R^5 is optionally substituted phenyl; is substituted phenyl; Q^- is a halide anion; n is 0, 1 or 2 and m is 3, 4 or 5.

5,468,858

N-ALKYL AND N-ACYL DERIVATIVES OF 3,7-DIAZABICYCLO-[3.3.1]NONANES AND SELECTED SALTS THEREOF AS MULTI-CLASS ANTIARRHYTHMIC AGENTS

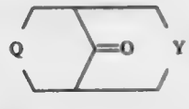
Kenneth D. Berlin, Stillwater, Okla.; Gregory L. Garrison, Chelmsford, Mass.; Subbiah Sangiah, Stillwater, Okla.; Cyril R. Clarke, Perkins, Okla.; Chun-Lin Chen, Stillwater, Okla.; Ralph Lazzara, Oklahoma City, Okla.; Benjamin J. Scheiag, Oklahoma City, Okla.; Eugene S. Patterson, Oklahoma City, Okla., and George E. Burrows, Stillwater, Okla., assignors to The Board of Regents of Oklahoma State University Physical Sciences, Stillwater, Okla.

Filed Oct. 28, 1993, Ser. No. 144,639

Int. Cl.[6] **C07D** *471/08;495/20;* **A61K** *31/435*

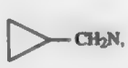
U.S. Cl. 546—18 **5 Claims**

1. 3-Alkyl-7-substituted -3-azabicyclo[3.3.1]nonan- 9-ones characterized by the formula:



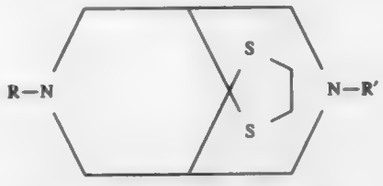
[with and without HX and 2 HX]

X=ClO_4, Cl, Br, HSO_4, citrate, fumarate, or maleate; where Q=$(H_3C)_2CHN$,



$C_6H_5CH_2N$ or n-C_3H_7N and or Y=$(H_3C)_2CHN$, $C_6H_5CH_2N$ with the proviso that when either one of Q or Y is $C_6H_5CH_2N$, then the other Q or Y group cannot be $(H_3C)_2CHN$ or $C_6H_5CH_2N$.

2. 3-Alkyl-7-substituted-9,9-(1,3-dithiolan-2-yl)-3-azabicyclo[3.3.1]nonanes characterized by the formula:



[With and without HX and 2 HX]

wherein

X= ClO_4, Br, Cl, HSO_4, citrate, fumarate, or maleate; R=$(H_3C)_2CH$— or cyclopropylmethyl and R'= $(H_3C)_2CH$— or $C_6H_5CH_2$—.

3. 3-Alkyl-7-substituted-3-azabicyclo[3.3.1] nonanes characterized by the formula:

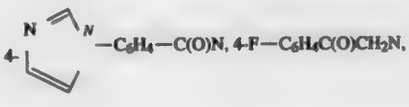
[With and without HX or 2 HX]

wherein

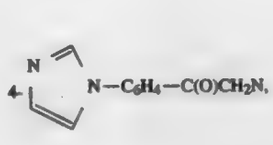
X=ClO_4, Cl, Br, HSO_4, titrate, fumarate, or maleate; Q=$(H_3C)_2CHN$;

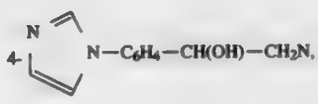
Z= CH_2; and

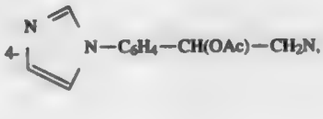
Y=4-O_2N—C_6H_4—C(O)N, 4-H_2N—C_6H_4—C(O)N, 4-$AcHNC_6H_4$—C(O)N, 4—H_3CSO_2NH—C_6H_4—C(O)N, 4-F—C_6H_4—C(O)N, 4-O_2N—$C_6H_4CH_2C(O)N$, 4-H_2N—$C_6H_4CH_2C(O)N$, 4—$AcHNC_6H_4CH_2C(O)N$, 4-$H_3CSO_2NHC_6H_4CH_2C(O)N$,



—C_6H_4—C(O)N, 4-F—$C_6H_4C(O)CH_2N$,







5,468,859

PROCESS FOR ASYMMETRIC TOTAL SYNTHESIS OF CAMPTOTHECIN ANALOGUES

Joseph Fortunak, Exton, Pa.; John Kitteringham, Hertford, England; Nicholas Sisti, Jeffersonville, and Jeffery Wood, Blue Bell, both of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Division of Ser. No. 75,963, Jun. 10, 1993, Pat. No. 5,405,963. This application Dec. 23, 1994, Ser. No. 363,502

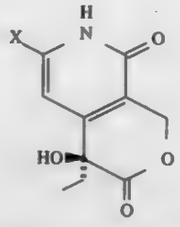
Int. Cl.[6] C07D *491/22*

U.S. Cl. 546—48 8 Claims

1. A process for the asymmetric synthesis of camptothecin analogues comprising:

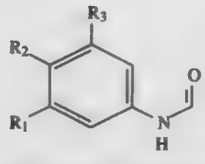
a) forming a chiral cis dioxolanone having a diester function, of the absolute configuration desired in the camptothecin analogue;

b) converting said cis dioxolanone to form a compound of Formula (I)



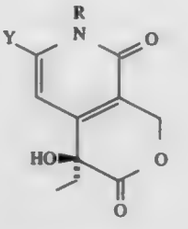
(I)

wherein X is selected from a group consisting of a good leaving group, a cyano group, a carboxylic acid, and an N-aryl carboxylic amide derivative of Formula (A);



(A)

c) converting said compound of Formula (I) into a compound of Formula (II)



(II)

wherein:

R is propargyl or substituted propargyl of Formula (B)

(B)

anil

Y is selected from a group consisting of a good leaving group, a cyano group, carboxylic acid, and N-aryl carboxylic amide derivative of Formula (A); and

d) converting said compound of Formula (II) into a camptothecin analogue.

5,468,860

NEW FINASTERIDE PROCESSES

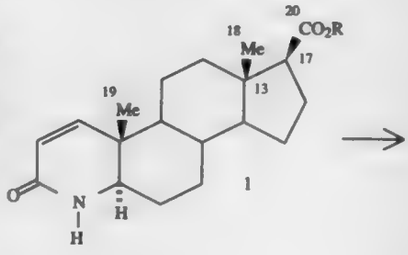
Ulf H. Dolling, Westfield; James A. McCauley, Belle Mead, and Richard J. Varsolona, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

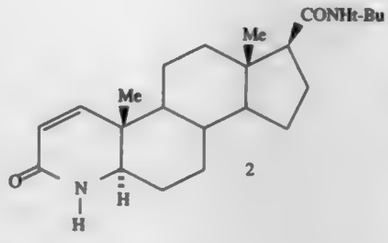
Continuation-in-part of Ser. No. 978,535, Nov. 19, 1992, abandoned. This application Jan. 29, 1993, Ser. No. 10,734

Int. Cl.[6] C07D *221/04*

U.S. Cl. 546—77 10 Claims

1. A process for producing finasteride 2:





where

R is methyl or ethyl, comprising the steps of

(1) contacting the magnesium halide salt of the 4-aza steroid ester 1 with t-butylamino magnesium halide, wherein the molar ratio of t-butylamino magnesium halide to said ester magnesium halide salt is at least about 2:1, in an inert organic solvent under an inert atmosphere at ambient temperature,

(2) heating the reaction mixture in the range from 25° C. to 100° C., and

(3) recovering said product finasteride 2.

5,468,861

8-CHLORO-1-CYCLOPROPYL-6,7-DIFLUORO-1,4-DIHYDRO-4-OXO-3-QUINOLINECARBOXYLIC ACID AND ALKYL ESTERS THEREOF

Uwe Petersen, Leverkusen; Klaus Grobe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

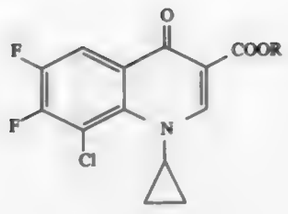
Division of Ser. No. 875,572, Apr. 27, 1992, which is a continuation of Ser. No. 735,500, May 17, 1985, abandoned. This application Sep. 30, 1994, Ser. No. 316,314

Claims priority, application Germany, Jun. 4, 1984, 34 20 743.0

Int. Cl.[6] C07D *215/56*

U.S. Cl. 546—156 4 Claims

1. The compound 8-chloro-1-cyclopropyl-6,7-difluoro-1,4-dihydro-4-oxo-3-quinolinecarboxylic acid or an alkyl ester thereof of the formula



in which
R is H or alkyl.

5,468,862

SYNTHESIS OF SOLVENT YELLOW 33 (D & C YELLOW 11) WITH EXCESS PHTHALIC ANHYDRIDE ACID AS A SOLVENT

Puthalath K. Sujeeth, Maryland Heights, Mo., assignor to Warner-Jenkinson Company, St. Louis, Mo.

Filed Apr. 25, 1994, Ser. No. 232,703
Int. Cl.[6] C07D *215/14*
U.S. Cl. 546—173 **7 Claims**

1. A process for the preparation of a quinophthalone comprising the steps of:

(A) condensing a neat reaction mixture of quinaldine and a stoichiometric excess amount of a reagent, wherein the reagent is selected from the group consisting of phthalic anhydride, phthalic acid and mixtures thereof;

(B) quenching the reaction mixture with water;

(C) adding a base to the reaction mixture in an amount sufficient to react with the excess amount of reagent to form a phthalic acid salt;

(D) isolating the quinophthalone from the reaction mixture.

5,468,863

PROCESS FOR THE PREPARATION OF SUBSTITUTED 2,3-DIFLUOROPYRIDINES

Ralf Pfirmann, Griesheim, and Theodor Papenfuhs, Frankfurt am Main, both of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Feb. 18, 1993, Ser. No. 19,096
Claims priority, application Germany, Feb. 20, 1992, 42 05 170.3
Int. Cl.[6] C07D *211/38*
U.S. Cl. 546—345 **21 Claims**

1. A process for the preparation of a substituted 2,3-difluoropyridine, which comprises reacting, a substituted 2,3-dihalopyridine with a fluoride salt, wherein said substituted 2,3-dihalopyridine is a substituted 2,3-dichloropyridine, a substituted 2-chloro-3-fluoropyridine or a substituted 3-chloro-2-fluoropyridine, the fluoride salt being potassium fluoride, rubidium fluoride or tetraalkyl(C_1–C_{18})ammonium fluoride or a mixture thereof or a mixture of these fluorides individually or mixed with one another with cesium fluoride, the proportion of cesium fluoride in any said mixture containing cesium fluoride being not more than 50% by weight, in the presence of a phase transfer catalyst, without removing resulting substituted 2,3-difluoropyridine continuously from the reaction mixture.

5,468,864

PROCESS FOR PREPARING 2,6-DICHLOROPYRIDINE

Rahim Hani, Cheshire; Richard H. Dumas, East Haven; David F. Gavin, Cheshire, all of Conn.; Charles H. Harrison; Michael A. Kennedy, both of Rochester, N.Y.; Henry W. Schiessl, Northford, Conn.; Robert E. McMahon, Elizabethtown, Ky., and Steven A. Manke, Wallingford, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Feb. 3, 1994, Ser. No. 190,956
Int. Cl.[6] C07D *213/61*
U.S. Cl. 546—345 **11 Claims**

1. A process for preparing 2,6-dichloropyridine, in a molar selectivity of at least 81.5%, which comprises reacting a catalyst-free reaction mixture that is free of an organic solvent and that consists essentially of 2-chloropyridine and chlorine in the presence of ultraviolet light and a hydrogen chloride scavenger at a reaction temperature of between about 90° C. and about 185° C.

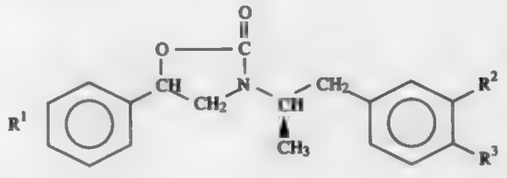
5,468,865

STEREOPREFERENTIAL SYNTHESIS OF 3-(1-PHENYLPROP-2-YL)-5-PHENYLOXAZOLIDINONES

Muppala S. Raju, and Vikram Khetani, both of Bridgewater, N.J., assignors to Celgene Corporation, Warren, N.J.

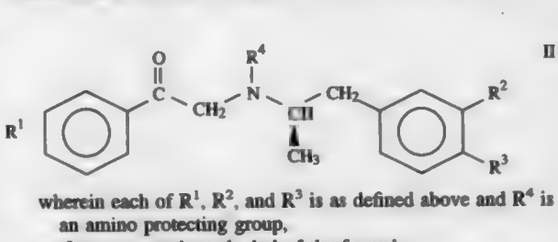
Filed May 3, 1994, Ser. No. 237,190
Int. Cl.[6] C07D *263/20*
U.S. Cl. 548—229 **21 Claims**

1. A process for the preparation of an (R,R)-oxazolidin-2-one diastereoisomer of the formula:



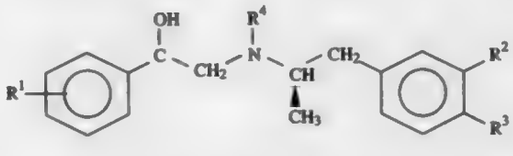
wherein
R^1 is hydrogen, halogeno, alkyl, alkoxy or trifluoromethyl, and
R^2 is hydrogen, lower alkyl, carbo(lower alkoxy), or lower alkoxy group; and
R^3 is hydrogen, lower alkyl, carbo(lower alkoxy), or lower alkoxy group,
substantially free of the corresponding (S,R)-oxazolidin-2-one diastereoisomer comprising the steps of:

(i) reducing an acid addition salt of a ketone of the formula:



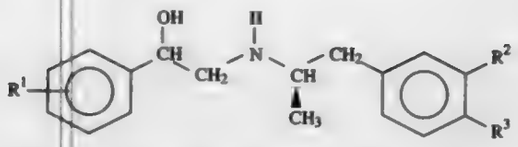
II

wherein each of R^1, R^2, and R^3 is as defined above and R^4 is an amino protecting group,
to form a secondary alcohol of the formula:



wherein the secondary alcohol is of predominantly one chiral form in preference to the other;

(ii) removing the R^4 amino protecting group to form a secondary amine of the formula:



wherein each of R^1, R^2, and R^3 is as defined above, and

(iii) allowing said secondary amine to react with a carbonic acid derivative to preferentially form said (R,R)-oxazolidin-2-one.

5,468,866

METHODS FOR SYNTHESIZING AND PROCESSING BIS-(1(2)H-TETRAZOL-5-YL)-AMINE

Thomas K. Highsmith, North Ogden; Robert M. Hajik, Willard; Robert B. Wardle, Logan; Gary K. Lund, Ogden, and Reed J. Blau, Richmond, all of Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed Jan. 4, 1994, Ser. No. 177,737

Int. Cl.[6] C07D *403/12*

U.S. Cl. 548—251 **43 Claims**

1. A process for preparing bis-(1(2)H-tetrazol- 5-yl)-amine comprising the steps of:

(a) combining an azide salt, a dicyanamide salt, and an acid reagent in water, such that at least one mole of the dicyanamide salt is present for every two moles of the azide salt and at least one mole of the acid reagent is present for each mole of the azide salt and wherein the acid reagent has a pK_a in the range from about 3 to about 9, wherein the combined ingredients form a reaction solution;

(b) heating the reaction solution to a temperature greater than 65° C., wherein the combining step occurs either prior to or during said heating step;

(c) acidifying the reaction solution with a strong acid after the reaction is substantially complete to protonate the bis-(1(2)H-tetrazol-5-yl)-amine product; and

(d) isolating the bis-(1(2)H-tetrazol-5-yl)-amine product.

5,468,867

PROCESS FOR PREPARING1-BUTYL-2-[2'-(2H-TETRAZOL-5-YL)BIPHENYL-4-YLMETHYL1-1H-INDOLE-3-CARBOXYLIC ACID

Lawrence E. Fisher, Mountain View; Lee A. Flippin, Woodside, and Michael G. Martin, San Francisco, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 27, 1994, Ser. No. 250,129

Int. Cl.[6] C07D *471/04*

U.S. Cl. 548—253 **17 Claims**

1. A process for the preparation of 1-butyl-2-[2'-(2H-tetrazol-5-yl)-biphenyl-4-ylmethyl] -1H-indole-3-carboxylic acid which process comprises:

(A) (i) treating 1-butyl-1H-indole-3-carboxylic acid with an organometallic base to give 2-metalated 1-butyl-1H-indole-3-carboxylic acid,

(ii) optionally treating the 2-metalated 1-butyl-1H-indole-3-carboxylic acid with a metal halide to give 2-transmetalated 1-butyl-1H-indole-3-carboxylic acid and

(iii) reacting the 2-metalated or 2-transmetalated 1-butyl-1H-indole-3-carboxylic acid with protected 2'-(2H-tetrazol-5-yl)biphenyl-4-carbaldehyde to give protected 1-butyl-2-[2'-(2H-tetrazol-5-yl)biphenyl-4-yl(hydroxy)methyl]-1 H-indole-3-carboxylic acid;

(B) dehydroxylating to give protected 1-butyl-2-[2'-(2H-tetrazol-5-yl)-biphenyl-4 -ylmethyl]-1H-indole-3-carboxylic acid and

(C) deprotecting.

5,468,868

PROCESS FOR THE SELECTIVE CHLORINATION OF 4,5-DIHYDRO-1-PHENYL-1H-1,2,4-TRIAZOL-5-ONE

Marc Halfon, Cranbury, N.J.; Craig A. Polsz, Newtown, Pa., and John H. Hoare, Turnersville, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Dec. 16, 1993, Ser. No. 168,737

Int. Cl.[6] C07D *249/12*

U.S. Cl. 548—263.2 **5 Claims**

1. A process for the selective chlorination of a 4,5-dihydro-1-phenyl-1H- 1,2,4-triazol-5-one selected from 4,5-dihydro-3-methyl-1-phenyl-1H-1,2,4-triazol-5-one and 4-difluoromethyl-4,5-dihydro-3-methyl-1-phenyl-1H-1,2,4-triazol-5-one in the 4-position of the phenyl ring which comprises adding excess chlorine over a period of one to three hours to a solution of the 4,5-dihydro-1-phenyl-1H-1,2,4-triazol-5-one in a solvent selected from N,N-dimethylformamide, N,N-dimethylacetamide, and acetonitrile at a temperature in the range of 0° to 80° C. and recovering the 1-(4-chlorophenyl)- 4,5-dihydro-1H-1,2,4-triazol-5-one.

5,468,869

PROCESS FOR PRODUCTION OF (AZOLYLMETHYL)-(BIPHENYLMETHYL)CYCLOPENTANOL DERIVATIVES

Satoru Kumazawa, Iwaki, and Hiroyuki Enari, Tokyo, both of, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

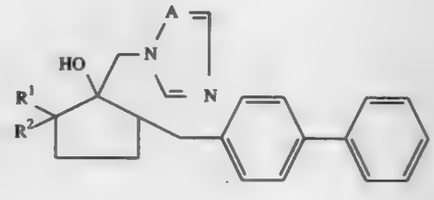
Filed Sep. 22, 1993, Ser. No. 124,763

Claims priority, application Japan, Sep. 24, 1992, 4-277719

Int. Cl.[6] C07D *249/08;233/60*

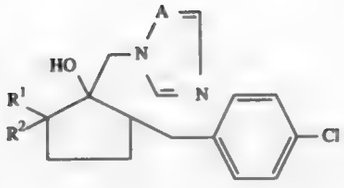
U.S. Cl. 548—267.8 **1 Claim**

1. A process for the production of an (azolylmethyl) (4-phenylbenzyl)cyclopentanol derivative represented; by the following formula (I):



(I)

wherein R^1 and R^2 denote independently a hydrogen atom or a C1–C5 alkyl group, and A represents CH or N, which comprises: reacting an (azolylmethyl) (4-chlorobenzyl) cyclopentanol derivative represented by the following formula (II):



(II)

wherein R^1, R^2 and A represent each the same meaning as described above, with benzene by light irradiation.

5,468,870

DYES AND DYE-DONOR ELEMENTS FOR USE IN THERMAL DYE SUBLIMATION TRANSFER

Luc J. Vanmaele, Lochristi, Belgium, assignor to AGFA-GAVAERT, N.V., Mortsel, Belgium

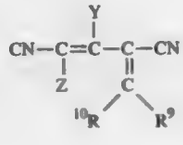
Division of Ser. No. 933,814, Aug. 24, 1992, Pat. No. 5,371,228, which is a division of Ser. No. 709,821, Jun. 4, 1991, Pat. No. 5,142,089,. This application Oct. 20, 1994, Ser. No. 326,399

The portion of the term of this patent subsequent to Dec. 6, 2011, has been disclaimed.

Int. Cl.[6] C07D *231/38;* **C07C** *255/23;255/30*

U.S. Cl. 548—370.1 **5 Claims**

1. Dye corresponding to the following formula



wherein

Z represents CN, $COOR^1$ or $CONR^2R^3$;

R^1, R^2 and R^3 each independently represent hydrogen, alkyl, cycloalkyl, aryl, or R^2 and R^3 together represent the necessary atoms to close a heterocyclic nucleus;

Y represent OR^4 or NR^5R^6;

R^4 represents hydrogen, alkyl, cycloalkyl, aryl, SO_2R^7, COR^7, CSR^7, POR^7R^8;

R^5 and R^6 each independently has one of the significances given to R^4 or represent amino, or R^5 and R^6 together represent the necessary atoms to close a heterocyclic nucleus, including a heterocyclic nucleus with an aliphatic or aromatic ring fused-on, with the proviso that R^5 and R^6 do not both represent hydrogen;

R^7 and R^8 each independently represent alkyl, cycloalkyl, alkenyl, aralkyl, aryl, alkyloxy, aryloxy, alkylthio, arylthio, amino or a heterocyclic group or R^7 and R^8 together represent the necessary atoms to close a 5-or 6-membered ring and

R^9 and R^{10} each independently represent hydrogen, alkyl, cycloalkyl, aryl, alkenyl, alkynyl, a heterocyclic ring, cyano, halogen, SO_2R^7, COR^7, CSR^7, POR^7R^8 or R^9 and R^{10} together represent the necessary atoms to close a ring including a heterocyclic ring.

5,468,871

PREPARATION OF N-SUBSTITUTED PYRAZOLES

Klaus Ebel; Juergen Schroeder, both of Ludwigshafen; Carsten Groening, Mannheim; Toni Dockner, Meckenheim, and Hans R. Merkle, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

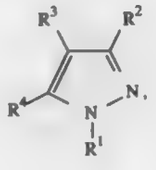
Continuation of Ser. No. 251,040, May 31, 1994, abandoned. This application Nov. 7, 1994, Ser. No. 334,613

Claims priority, application Germany, Jun. 8, 1993, 43 18 960.1; Feb. 8, 1994, 44 03 815.1

Int. Cl.[6] C07D *231/12*

U.S. Cl. 548—373.1 **9 Claims**

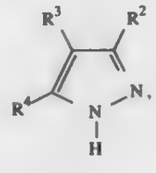
1. A process for the preparation of N-substituted-pyrazoles of the formula



I

wherein R^1 is C_1–C_{12}-alkyl or C_7–C_{20}-phenylalkyl and R^2, R^3 and R^4 independently denote hydrogen, C_1–C_{12}-alkyl, phenyl, C_7–C_{20}-alkylphenyl and C_7–C_{20}-phenylalkyl, which comprises:

reacting a pyrazole of the formula



II

wherein R^2, R^3 and R^4 have the meanings above, with an alcohol or ether of the formula

$R^1—O—R^5$ III,

wherein R^5 is hydrogen or R^1, at a temperature of from 200° to 550° C. and a pressure of from 0.001 to 50 bar in the presence of a heterogeneous catalyst selected from the group consisting of aluminum oxide, dioxide, titanium dioxide, zirconium

dioxide and mixtures thereof, said catalyst being optionally doped with phosphoric acid.

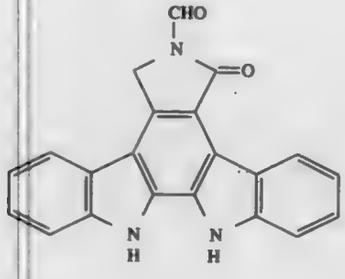
5,468,872

K-252A FUNCTIONAL DERIVATIVES POTENTIATE NEUROTROPHIN-3 FOR THE TREATMENT OF NEUROLOGICAL DISORDERS

Marcie A. Glicksman, Swarthmore; David P. Rotella, Downingtou; Nicola Neff, Rose Valley, all of Pa., and Chikara Murakata, Tokyo, Japan, assignors to Cephalon, Inc., West Chester, Pa., and Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1993, Ser. No. 122,893
Int. Cl.[6] C07D *487/12*
U.S. Cl. 548—416 **3 Claims**

1. A compound represented by the following formula:



or a pharmaceutically acceptable salt thereof.

5,468,873

PROCESS FOR PREPARING AMIDE N-CARBOXAMIDES

John M. Gruber, Mountain View, Calif., assignor to Catalytica, Inc., Mountain View, Calif.

Division of Ser. No. 188,432, Jan. 28, 1994. This application Apr. 18, 1995, Ser. No. 424,774
Int. Cl.[6] C07D *209/30*
U.S. Cl. 548—486 **11 Claims**

1. A process for preparing an amide N-carboxamide, comprising: reacting a N'-acyl amide N-carboxamide with an alcohol in the presence of an aprotic weak Lewis acid catalyst to produce said amide N-carboxamide.

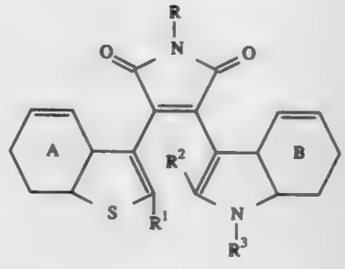
5,468,874

BENZOTHIOPHENE/INDOLE-SUBSTITUTED MALEIMIDE DERIVATIVES, PHOTOCHROMIC MATERIAL COMPRISING SAID DERIVATIVES AND OPTICAL RECORDING MATERIAL USING THE SAME MATERIAL

Fumio Sugai, and Masahiro Irie, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

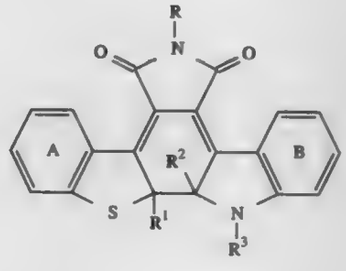
Filed Mar. 25, 1994, Ser. No. 218,258
Claims priority, application Japan, Mar. 26, 1993, 5-068926
Int. Cl.[6] C07D *495/12;409/14*
U.S. Cl. 548—454 **9 Claims**

1. A compound represented by the following formula:



(1)

or the following formula (2):



(2)

wherein R is a monovalent hydrocarbon group selected from the group consisting of lower alkyl, phenyl, tolyl, benzyl and phenethyl, or said monovalent hydrocarbon group substituted with a cyano group, an amide group, a carboxyl group or an alkoxycarbonyl group;

R^1 and R^2, independently, represent a member selected from the group consisting of a hydrogen atom, a lower alkyl group and a group of the formula $—XR^4$, where X represents an oxygen atom or a sulfur atom and R^4 represents a lower alkyl group, with the proviso that at least one of R^1 and R^2 is an alkoxy group or alkylthio group represented by the formula $—XR^4$;

R^3 is an alkyl group of from about 8 to about 26 carbon atoms or an acyl group of from 2 to about 26 carbon atoms; and

benzene rings A and B may each have a substituent selected from the group consisting of a lower alkyl group, a lower alkoxy group and a halogen atom.

5,468,875

1-AZABICYCLOHEPTANE DERIVATIVES

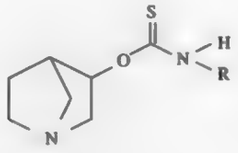
Annmarie L. Sabb, Pennington, and Reinhardt P. Stein, Monmouth Junction, both of N.J., assignors to American Home Products Corporation, Madison, N.J.

Filed Dec. 22, 1994, Ser. No. 362,695

Int. Cl.[6] C07D *209/02*

U.S. Cl. 548—512 **18 Claims**

1. A compound of the formula:



where

R is H, alkyl of 1 to 6 carbon atoms, haloalkyl or 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, alkenyl of two to 6 carbon atoms or alkynyl of 2 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

5,468,876

INTERMEDIATES FOR THE STEREOCONSERVATIVE SYNTHESIS OF 1-SUBSTITUTED (S)-AND (R)-2-AMINOMETHYLPYRROLIDINES

Hans-Jügen Federsel, Stockholm; Thomas Hö, åkarp; Sten I. Rämsby, Södertälje, and Peter H. E. Ström, Veberöd, all of, Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

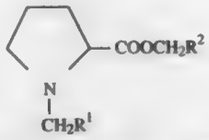
Division of Ser. No. 974,683, Nov. 12, 1992, Pat. No. 5,300,660, which is a continuation of Ser. No. 561,278, Aug. 1, 1990, abandoned, which is a continuation of Ser. No. 364,074, Jun. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 141,605, Dec. 30, 1987, abandoned. This application Feb. 24, 1994, Ser. No. 203,985

Claims priority, application Sweden, May 22, 1986, 8602339

Int. Cl.[6] C07D *207/09*

U.S. Cl. 548—535 **8 Claims**

6. An (R)- or (S)-isomer of the compound of the formula II with at least 95% optical purity,



(II)

wherein R^1 and R^2 are the same or different and represent a hydrogen atom, a lower alkyl, lower alkenyl or lower alkynyl group, a cycloalkyl group, or a group $(CH_2)_m$ Ph, wherein m is 0–3 and Ph is an unsubstituted or substituted phenyl group with one or more substituents selected from the group consisting of halo, trifluoromethyl, lower alkyl, hydroxy, methoxy, ethoxy and methylenedioxy, with the proviso that when R^2 is hydrogen then R^1 and R^2 are different and with the further proviso that when R^2 is hydrogen and R^1 is a group $(CH_2)_m$Ph wherein m is O, then Ph is unsubstituted or substituted with one or more substituents selected from the group consisting of halo, trifluoromethyl, hydroxy, lower alkyl, ethoxy and methylenedioxy; or a salt thereof.

5,468,877

HALOALKYLTHIO, -SULFINYL AND -SULFONYL ARYLPYRROLE INSECTICIDAL AND ACARICIDAL AGENTS

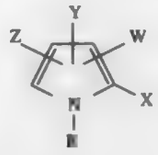
Keith D. Barnes, Newtown, Pa.; Victor M. Kamhi, Hamilton Square, N.J., and Robert E. Diehl, Yardley, Pa., assignors to American Cyanamid Company, Wayne, N.J.

Division of Ser. No. 803,289, Dec. 4, 1991, Pat. No. 5,306,827. This application Oct. 12, 1993, Ser. No. 135,508

Int. Cl.[6] C07D *207/36*

U.S. Cl. 548—543 **1 Claim**

1. A compound having the structural formula



wherein

W is $S(O)_nCF_2R_1$;

R_1 is H, F, Cl, Br, CF_2H, CCl_2H, CClFH, CF_3 or CCl_3;

n is an integer of 0, 1 or 2;

X is phenyl substituted with one to three halogen, CN, NO_2, CF_3 or R_2CF_3 or R_2CF_2B groups;

B is $S(O)_n$ or O;

R_2 is H, F, CF_2H, CClFH or CF_3;

Y is Cl, Br, CF_3, CN or $S(O)_n$ CF_2R_1;

Z is H, Cl, Br or CF_3;

R_7 is phenyl optionally substituted with one to three halogen atoms, one to two C_1–C_4 alkyl groups, one or two C_1–C_4 alkoxy groups, CF_3, CN, NO_2 or R_2CF_2B.

5,468,878

CYCLOHEXANEDIONE DERIVATIVES

Ichiro Nasuno; Mitsuru Shibata; Masashi Sakamoto, and Kazuyoshi Koike, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

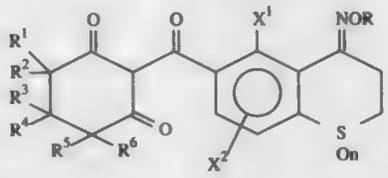
Filed Feb. 2, 1995, Ser. No. 379,642

Claims priority, application Japan, Jan. 15, 1992, 4-277186; Dec. 4, 1992, 4-325727

Int. Cl.[6] C07D *335/06;311/08;* A01N *43/18*

U.S. Cl. 549—23 **11 Claims**

1. A cyclohexanedione compound of the formula (I),



(I)

wherein:

R is a C_1-C_4 alkyl group, each of R^1 to R^6 is independently hydrogen or a C_1-C_4 alkyl group,

X^1 is a C_1-C_4 alkyl group,

X^2 is hydrogen or a C_1-C_4 alkyl group, and

n is an integer of 0 to 2, or a salt thereof.

5,468,879

DISUBSTITUTED ACETYLENES BEARING HETEROBICYCLIC GROUPS AND HETEROAROMATIC OR PHENYL GROUPS HAVING RETINOID LIKE ACTIVITY

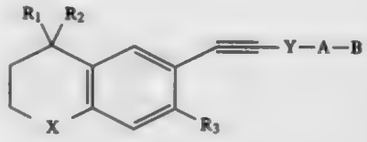
Roshantha A. S. Chandraratna, El Toro, Calif., assignor to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 836,635, Feb. 14, 1992, Pat. No. 5,264,578, which is a continuation-in-part of Ser. No. 326,191, Mar. 20, 1989, Pat. No. 5,089,509, which is a continuation-in-part of Ser. No. 246,037, Sep. 19, 1988, abandoned, which is a continuation of Ser. No. 28,279, Mar. 20, 1987, abandoned. This application Sep. 24, 1993, Ser. No. 126,933

Int. Cl.[6] C07D *335/04;311/04;311/76*

U.S. Cl. 549—23 **20 Claims**

1. A compound of the formula



wherein R_1 and R_2, independently are n-alkyl groups having 2 to 8 carbons, or cyclo or branch-chained alkyl groups of 3 to 8 carbons;

R_3 is hydrogen or lower alkyl;

X is S, or O;

Y is a heteroaryl group selected from a group consisting of thienyl and furyl;

A is $(CH_2)_n$ where n is 0–5, lower branched chain alkyl having 3 to 6 carbons, cycloalkyl having 3 to 6 carbons, alkenyl having 2 to 6 carbons and 1 or 2 double bonds, alkynyl having 2 to 6 carbons and 1 or 2 triple bonds;

B is hydrogen, COOH or a pharmaceutically acceptable salt thereof, $COOR_3$, $CONR_6R_7$, $—CH_2OH$, CH_2OR_8, CH_2OCOR_8, CHO, $CH(OR_9)_2$, $CHOR_{10}O$, $—COR_{11}$, $CR_{11}(OR_9)_2$, or $CR_{11}OR_{10}O$, where R_5 is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or R_5 is phenyl or lower alkylphenyl, R_6 and R_7 independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or phenyl or lower alkylphenyl, R_8 is alkyl of 1 to 10 carbons, phenyl or lower alkylphenyl, R_9 is lower alkyl, R_{10} is divalent alkyl radical of 2–5 carbons and R_{11} is an alkyl, cycloalkyl or alkenyl group containing 1 to 5 carbons.

5,468,880

METHOD OF PRODUCING α, β-UNSATURATED KETONES

Ryuji Ueno, and Tomio Oda, both of Hyogo, Japan, assignors to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo, Osaka, Japan

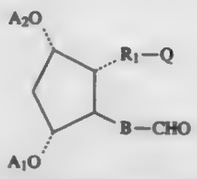
Filed May 31, 1994, Ser. No. 244,566

Claims priority, application Japan, Sep. 30, 1992, 4-261283

Int. Cl.[6] C07D *305/00*

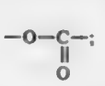
U.S. Cl. 549—263 **4 Claims**

1. A method of producing an α,β-unsaturated ketone which comprises reacting an aldehyde expressed by the formula:

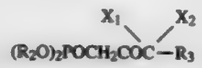


(4)

where, A_1 and A_2 represent a hydrogen atom or a hydroxyl protection group; B represents a simple bond of $—CH_2—$; R_1 represents a bivalent saturated or unsaturated aliphatic hydrocarbon residue having a carbon number of 1 to 10; Q represents a —COOH group or a derivative thereof; provided that $-OA_1$ and Q may form

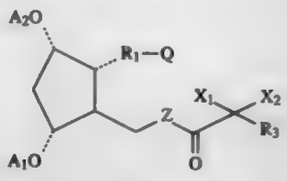


with a 2-oxoalkyl phosphonate expressed by the formula:



(2)

where, X_1 and X_2 represent hydrogen atom, lower alkyl group or halogen atom; R_2 represents a lower alkyl group; R_3 represents a saturated or unsaturated aliphatic hydrocarbon group having a carbon number of 1 to 10 which may have a lower alkoxy group, a saturated or unsaturated cycloalkyl group having a carbon number of 3 to 7, a saturated or unsaturated phenyl group or a saturated or unsaturated phenoxy group, the resulting α,β-unsaturated ketone bing expressed by the formula:



(5)

where A_1, A_2, R_3, X_1 and X_2 have same meanings as defined above; and Z represents =CH— or —CH=CH—, the reaction being carried out under the presence of at least one kind of base selected from the group consisting of alkali hydride, alkoxide, amide, organic alkali, sulfinylcarbonion compounds, secondary amine, tertiary amine, aromatic heterocyclic compound and alkali hydroxide, and a zinc compound.

5,468,881

METHOD OF PRODUCING CIS-WHISKEY LACTONE

Takashi Ebata; Katsuya Matsumoto; Koshi Koseki; Hiroshi Kawakami; Hajime Matsushita, all of Yokohama; Hajime Yoshikoshi, and Masakazu Okaniwa, both of Tokyo, all of, Japan, assignors to Japan Tobacco Inc., and Yuji Gosei Kogyo Co., Ltd., both of Tokyo, Japan

PCT No. PCT/JP91/01780, § 371 Date Aug. 27, 1992, § 102(e) Date Aug. 27, 1992, PCT Pub. No. WO92/12143, PCT Pub. Date Jul. 23, 1992

PCT Filed Dec. 27, 1991, Ser. No. 920,578

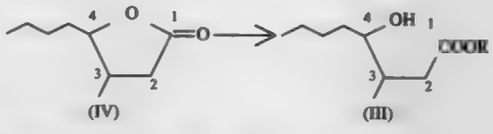
Claims priority, application Japan, Dec. 27, 1990, 2-407648

Int. Cl.[6] C07D *307/02*

U.S. Cl. 549—295 **10 Claims**

1. A method of producing cis-whiskey lactone, comprising:

(a) hydrolyzing the lactone portion of 3,4-trans-whiskey lactone represented by formula (IV) and adding an alkyl group to the hydrolyzed portion, thereby obtaining the 3,4-trans compound represented by formula (III),

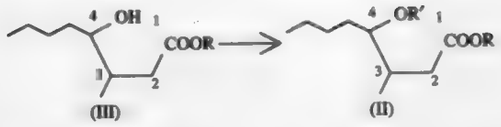


(IV) (III)

wherein R represents an alkyl group;

(b) reacting said 3,4-trans compound (III) obtained in step (a) with an acyl compound in the presence of triphenylphosphine and azodicarboxylate, thereby obtaining the 3,4-cis compound

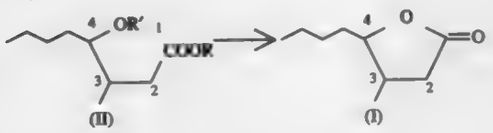
represented by formula (II),



(III) (II)

wherein R represents an alkyl group and R' represents an acyl group; and

(c) hydrolyzing and lactonizing said 3,4-cis compound (II) obtained in step (b), thereby obtaining 3,4-cis-whiskey lactone represented by formula (I),



(II) (I)

wherein R and R' are the same as in step (b).

5,468,882

2-AMINOMETHYL-CHROMANS

Rudolf Schohe-Loop, Wuppertal; Hans-Georg Heine, Krefeld; Bodo Junge, Wuppertal; Thomas Glaser, Overath; Jean M. V. De Vry, Roesrath; Wolfgang Dompert, and Henning Sommermeyer, both of Cologne, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

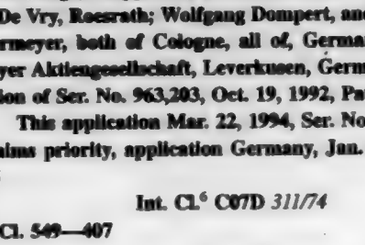
Division of Ser. No. 963,203, Oct. 19, 1992, Pat. No. 5,318,968. This application Mar. 22, 1994, Ser. No. 215,995

Claims priority, application Germany, Jan. 28, 1991, 41 35 474.5

Int. Cl.[6] C07D *311/74*

U.S. Cl. 549—407 **3 Claims**

1. Aminomethyl-chromans of the formula



(I)

in which

A, B and D are identical or different and represent hydrogen, fluorine, chlorine, bromine, cyano, trifluoromethyl, trifluoromethoxy or hydroxyl, or represent straight-chain or branched alkyl or alkenyl having in each case up to 4 carbon atoms, or represent a group of the formula $—NR^2R^3$ or $—OR^6$,

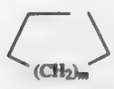
wherein

R^2 and R^3 are identical or different and denote hydrogen or straight-chain or branched alkyl having up to 4 carbon atoms and

R^6 denotes straight-chain or branched alkyl or alkenyl having up to 4 carbon atoms, which are optionally substituted by cyclopropyl or phenyl, or

A has one of the abovementioned meanings and

B and D together form a radical of the formula



wherein m denotes the number 1 or 2;

E represents a direct bond, or represents straight-chain or branched alkylene or alkenylene having in each case up to 7 carbon atoms, which are optionally substituted by phenyl,

G represents phenyl or naphthyl which are optionally substituted by fluorine, chlorine, bromine, hydroxyl, difluoromethyl, trifluoromethyl, difluoromethoxy or trifluoromethoxy or by straight-chain or branched alkyl or alkoxy having in each case up to 4 carbon atoms, the latter optionally being substituted by phenyl or phenoxy, and

R_1 represents hydrogen or represents straight-chain or branched alkyl having up to 4 carbon atoms, or represents the radical of the formula —E'—G' wherein

E' and G' have the meaning given above for E and G and are identical or different from these radicals, or an isomer or salt thereof.

5,468,883

PREPARATION OF VITAMIN E

Paul Grafen, Weisenheim; Hans Kiefer, Neustadt, and Hagen Jaedicke, Ludwigshafen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/00498, § 371 Date Sep. 9, 1994, § 102(e) Date Sep. 9, 1994, PCT Pub. No. WO93/19057, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 5, 1993, Ser. No. 302,743

Claims priority, application Germany, Mar. 17, 1992, 42 08 477.6

Int. Cl.[6] C07D *311/72*

U.S. Cl. 549—411 **4 Claims**

1. A process for preparing dl-α-tocopherol or dl-α-tocopheryl acetate by acid-catalyzed reaction of 2,3,5-trimethylhydroquinone with phytol or isophytol in a solvent at elevated temperature, with or without subsequent esterification of the resulting tocopherol with acetic anhydride, wherein the reaction is carried out in the presence of a mixture of ortho-boric acid and oxalic acid, tartaric acid or citric acid.

5,468,884

LIQUID DETERGENT COMPOSITIONS

Claude Eckhardt, Riedisheim, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 12, 1993, Ser. No. 152,331

Claims priority, application Switzerland, Nov. 17, 1992, 3528/92

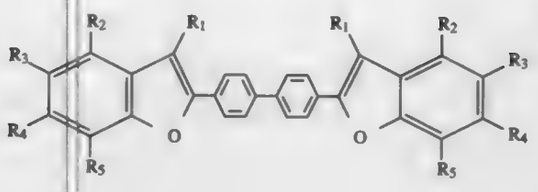
The portion of the term of this patent subsequent to Jan. 18, 2011, has been disclaimed.

Int. Cl.[6] C11D *1/83*

U.S. Cl. 549—437 **19 Claims**

1. A highly concentrated, aqueous liquid detergent composition comprising

a) 0.01 to 2% by weight, based on the weight of the detergent composition, of one or more than one disulfonated fluorescent whitening agent of formula (1)



(I)

wherein

R_1, R_2, R_3, R_4 and R_5 are each independently of one another a sulfonic acid radical, hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, halogen, CN, phenoxy or benzyloxy, with the proviso that only one of R_1 to R_5 is a sulfonic acid radical,

b) 6 to 22% by weight of water, based on the weight of the detergent composition, and

c) one or more surfactants.

5,468,885

EPOXIDIZER OXYGEN RECOVERY

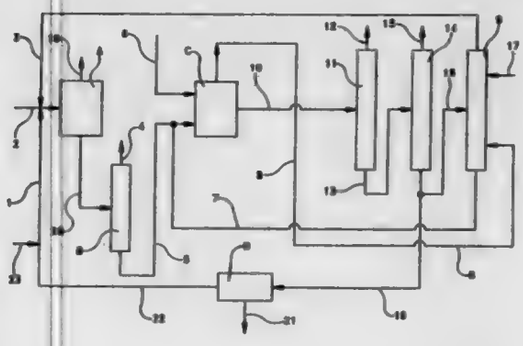
John C. Jubin, Jr., West Chester, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Continuation-in-part of Ser. No. 310,546, Sep. 22, 1994, which is a continuation-in-part of Ser. No. 171,144, Dec. 20, 1993, abandoned. This application Dec. 28, 1994, Ser. No. 365,397

Int. Cl.[6] C07D *301/12;303/04*

U.S. Cl. 549—531 **4 Claims**

1. In a process for the epoxidation of an olefin with hydrogen



peroxide wherein a gas mixture of the olefin and oxygen from hydrogen peroxide decomposition is separated from the liquid epoxidation reaction mixture, the improvement which comprises absorbing the olefin from the gas mixture in a liquid absorbent and adding an inert gas to the oxygen in amount sufficient to prevent formation of flammable gas compositions.

5,468,886

(CYCLO)ALIPHATIC EPOXY COMPOUNDS

Bettina Steinmann, Praroman; Jean-Pierre Wolf, Courtaman; Adrian Schulthess, Tentlingen, and Max Hunziker, Düdingen, all of, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

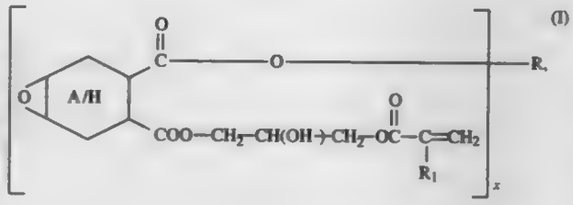
Filed Dec. 20, 1993, Ser. No. 169,938

Claims priority, application Switzerland, Dec. 23, 1992, 3943/92

Int. Cl.[6] C07D *303/38;* **G03C** *5/00*

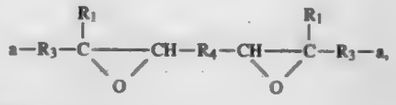
U.S. Cl. 549—549 **20 Claims**

1. A (cyclo)aliphatic epoxy compound of formula I or II



(I)

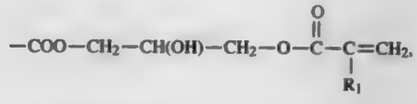
and



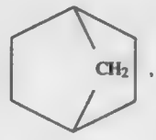
(II)

wherein

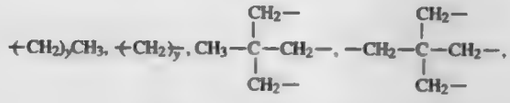
a is a radical of formula



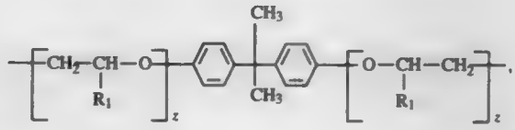
A is a cyclohexyl radical or a hydrogenated radical of formula



R is a radical of formula



a monovalent to hexavalent aliphatic alcohol radical, an aromatic-aliphatic alcohol radical, a monovalent to tetravalent polyether or polyester radical, a monovalent to tetravalent polycaprolactone radical, a monovalent to tetravalent polyurethane radical or a radical of formula



and

R_1 is hydrogen or CH_3,

x is an integer from 1 to 6,

y is an integer from 2 to 20,

z is an integer from 1 to 10, and

R_3 and R_4 are each independently of the other an aliphatic, aromatic or cycloaliphatic hydrocarbon radical.

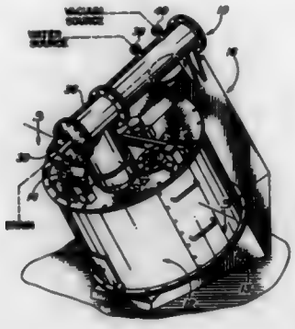
5,468,887

PRODUCTION OF FATTY ACID METHYL ESTERS AND SOAPS THEREFROM

Shyam K. Gupta, Scottsdale, Ariz., assignor to The Dial Corp., Phoenix, Ariz.

Filed Mar. 13, 1992, Ser. No. 851,463
Int. Cl.[6] C07C *51/00*
U.S. Cl. 554—169 **11 Claims**

1. A process for making fatty acid methyl esters from fats and



oils comprising introducing said fats and oils and methanol into an enclosed mixing vessel along with caustic as a catalyst, causing the foregoing materials to be subjected to intensive counter-current or co-current mixing in said vessel for a period of time sufficient to convert said fats and oils to fatty acid methyl esters, and thereafter separating glycerin from said esters.

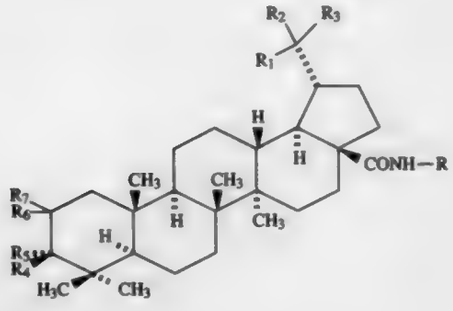
5,468,888

LUPANE DERIVATIVES, THEIR PREPARATION AND THE PHARMACEUTICAL COMPOSITIONS WHICH CONTAIN THEM

Romaine Bouboutou, Arcueil; Norbert Dereu, Viry Chatillon, both of, France; Michel Evers, Liège, Belgium; Jean-Christophe Gueguen, Saint-Cloud, France; Claude James, Lesigny, France; Christèle Poujade, Joinville, France; Daniel Reisdorf; Yves Ribeill, both of Thiais, France, and Françoise Soler, Paris, France, assignors to Rhone-Poulenc Rorer S.A., Antony Cedex, France

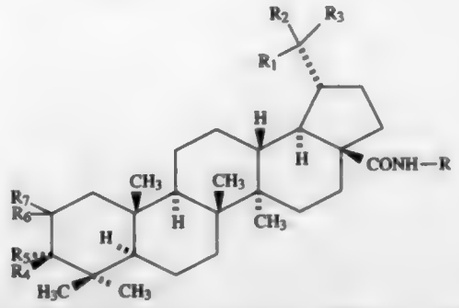
Filed May 12, 1994, Ser. No. 243,341
Int. Cl.[6] C07C *233/80*
U.S. Cl. 554—58 **8 Claims**

1. New lupane derivative of general formula:



in which:

R represents a radical of general formula:



(I)

in which R' and R", which are identical or different, are hydrogen atoms or alkyl radicals,

X is a bond or represents a carbamoyl, N-methylcarbamoyl, aminocarbonyl or N-methylaminocarbonyl radical,

Y is a bond or represents a phenylene radical,

R^o and R^{oo}, which are identical or different, are hydrogen atoms or alkyl radicals (it being understood that R^o and R^{oo} are not necessarily identical on each unit $—CR^oR^{oo}—$), or R^o is hydroxyl, hydroxyalkyl, phenyl, benzyl, carbamoylmethyl or else, when Y is a bond and X is carbamoyl, R^o can form a 5- or 6-membered ring with the nitrogen atom contained in X, it being possible for this ring to additionally comprise another hetero atom chosen from oxygen or sulphur and,

n, m and p are integers from 0 to 16 such that m+n+p is between 4 and 16,

R_1 is a methyl radical, or forms, with R_3, a methylene radical or an oxo radical,

R_2 is a hydroxyl, methyl or hydroxymethyl radical or a radical $—CH_2OR'_2$, $—CH_2SR'_2$ or $—CH_2NHR'_2$ for which R'$_2$ is alkyl, hydroxyalkyl, dihydroxyalkyl, acetamidoalkyl or acetyl, or R_2 is an amino radical substituted with a hydroxyalkyl or carboxyhydroxyalkyl radical, or a dialkylamino radical, the alkyl parts of which can form, with the nitrogen atom to which they are joined, a 5- or 6-membered heterocycle optionally containing another hetero atom chosen from oxygen, sulphur or nitrogen and, optionally, N-alkyl,

R_3 is a hydrogen atom or forms, with R_1 or R_2, a methylene radical or an oxo radical,

R_4 and R_5 are different and represent a hydrogen atom or a hydroxyl radical, or together form an oxo, hydroxyimino or optionally substituted (with a carboxyl or dialkylamino radical, the alkyl parts of which can form, with the nitrogen atom to which they are joined, a 5- or 6-membered heterocycle optionally containing another hetero atom chosen from oxygen, nitrogen or sulphur and optionally substituted with an alkyl radical) alkyloxyimino radical and

R_6 and R_7 are hydrogen atoms, or else

R_4 and R_5, and R_6 and R_7 together form oxo radicals, it being understood that the alkyl radicals are straight or branched and contain 1 to 4 carbon atoms, as well as their salts when they exist.

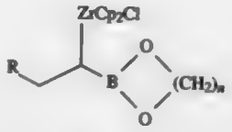
5,468,889

BORYL ZIRCONOCENE ORGANIC 1,1-DIMETALLIC COMPOUNDS

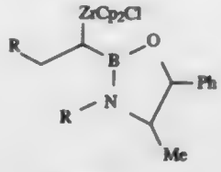
Morris Srebnik, Sylvania; Bin Zheng, and Laurent Deloux, both of Toledo, all of Ohio, assignors to The University of Toledo, Toledo, Ohio

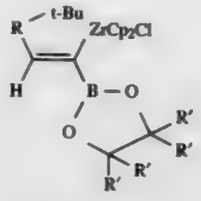
Filed Jun. 20, 1994, Ser. No. 261,780
Int. Cl.[6] C07F *7/00;17/00;5/02*
U.S. Cl. 556—7 **19 Claims**

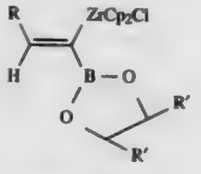
1. An organic bimetallic compound containing Zr and B in which Cp_2 is bis(cyclopentadienyl), the compound having the following structure:

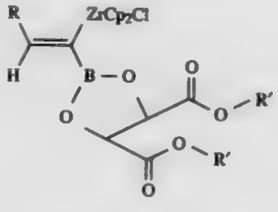


n = 2,3



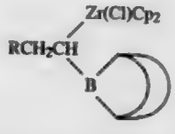






where R is an organic radical having 2 to 20 carbon atoms that is aliphatic, aromatic, heteroaromatic, or cyclic, or their halogenated substituted derivatives; where R^1 is an alkyl group of 1 to 8 carbon atoms; where Ph is phenyl, Me is methyl and t-Bu is tert-butyl.

10. A 1,1-bimetallic compound having the following formula:



, where R is an alkyl except tert-butyl, alkenyl, cycloalkyl, phenyl, alkyl-phenyl and their chloro- or bromo-substituted derivatives; where

is B-borabicyclo[3.3.1]nonyl, and where Cp_2 is bis(cyclopentadienyl).

5,468,890

IODONIUM SALTS AND PROCESS FOR THE PREPARATION THEREOF

Christian Herzig, Taching am See, and Silke Scheiding, Unterschleissheim, both of, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

PCT No. PCT/EP92/02932, § 371 Date Jun. 8, 1994, § 102(e) Date Jun. 8, 1994, PCT Pub. No. WO93/13110, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 17, 1992, Ser. No. 244,920

Claims priority, application Germany, Dec. 20, 1991, 41 42 327.5

Int. Cl.[6] C07F 7/18;5/02;9/00

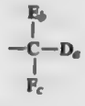
U.S. Cl. 556—12

6 Claims

1. An iodonium salt of the general formula

$$A\text{-}I^{+}\text{-}B\ X^{-}$$

where A is a radical of the general formula



in which

C is a monovalent aromatic hydrocarbon radical having from 6 to 14 carbon atoms per radical or a monovalent aromatic hydrocarbon radical containing at least one oxygen and/or sulfur atom and having from 5 to 14 ring atoms per radical,

D, E and F are each substituents of C, where

D is a radical of the formula

$$-(O)_x-(R)_y-SiR_3^1,$$

E is a radical of the formula

$$-OR^2,$$

F is a radical of the formula

$$-R^3,$$

a is 1, 2 or 3,

b is 0, 1 or 2,

c is 0, 1 or 2,

x is 0 or 1,

y is 0 or 1, with the proviso that the sum of x+y= 1 or 2,

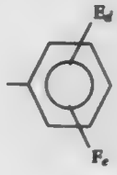
R is a divalent aliphatic hydrocarbon radical having from 1 to 18 carbon atoms per radical, which is uninterrupted or interrupted by at least one oxygen atom and/or one sulfur atom and/or one carboxyl group,

R^1 is a monovalent hydrocarbon radical having from 1 to 18 carbon atoms per radical, which is uninterrupted or interrupted by at least one oxygen atom,

R^2 is a monovalent hydrocarbon radical having from 1 to 18 carbon atoms per radical, which is uninterrupted or interrupted by at least one oxygen atom, and

R^3 is a monovalent hydrocarbon radical having from 1 to 10 carbon atoms per radical, which is uninterrupted or interrupted by at least one oxygen atom and/or one sulfur atom,

B is a radical of the formula



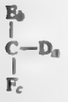
where E and F are each a radical bound to the benzene ring in the 2-, 3-, 4-, 5- or 6-position, and the radicals E and F have the meaning specified for them above,

d is 0, 1 or 2,

e is 0. 1 or 2 and

X^- is a tosylate anion or a weakly nucleophilic or non-nucleophilic anion Y^- selected from the group consisting of $CF_3CO_2^-$, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, ClO_4^-, HSO_4^- and $CF_3SO_3^-$.

5. A process for preparing an iodonium salt, which comprises, in a 1st stage, reacting a silane of the formula



in which C is a monovalent aromatic hydrocarbon radical having from 6 to 14 carbon atoms per radical or a monovalent aromatic hydrocarbon radical containing at least one oxygen and/or sulfur atom and having from 5 to 14 ring atoms per radical,

D, E and F are each substituents of C, where

D is a radical of the formula

$$—(O)_x—(R)_y—SiR^1_3,$$

E is a radical of the formula

$$—OR^2,$$

F is a radical of the formula

$$—R^3,$$

a is 1, 2 or 3,

b is 0, 1 or 2,

c is 0, 1 or 2,

x is 0 or 1,

y is 0 or 1, with the proviso that the sum of x+y=1 or 2,

R is a divalent aliphatic hydrocarbon radical having from 1 to 18 carbon atoms per radical, which is uninterrupted or interrupted by at least one oxygen atom and/or one sulfur atom and/or one carboxyl group,

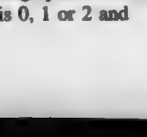
R^1 is a monovalent hydrocarbon radical having from 1 to 18 carbon atoms per radical, which is uninterrupted or interrupted by at least one oxygen atom,

R^2 is a monovalent hydrocarbon radical having from 1 to 18 carbon atoms per radical, which is uninterrupted or interrupted by at least one oxygen atom, and

R^3 is a monovalent hydrocarbon radical having from 1 to 10 carbon atoms per radical, which is uninterrupted or interrupted by at least one, oxygen atom and/or one sulfur atom, with [hydroxy(tosyloxy)iodo]benzene, the benzene ring of which may be unsubstituted or substituted, of the formula

where TsO is a tosyloxy radical and

B is a radical of the formula



where E and F are each a radical bound to the benzene ring in the 2-, 3-, 4-, 5- or 6-position, and the radicals E and F have the meaning specified for them above,

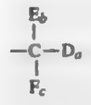
d is 0, 1 or 2 and

e is 0, 1 or 2,

in the presence of acids and in the presence or absence of a polar solvent to give an iodonium tosylate of the formula

$$A\text{-}J^+\text{-}B\ TsO^-$$

where TsO is a tosylate anion and A is a radical of the formula



and B, C, D, E, F, a, b and c have the meaning specified for them above, and, if desired, in a 2nd stage, reacting the iodonium tosylate thus obtained with an alkali metal salt of the formula

$$M^+y^-$$

where M^+ is an alkali metal cation and

Y^- is a weakly nucleophilic or non-nucleophilic anion selected from the group consisting of $CF_3CO_2^-$, BF_4^-, PF_6^-, AsF_6^-, SbF_6^-, ClO_4^-, HSO_4^- and $CF_3SO_3^-$, in the presence of an organic solvent.

5,468,891

MOLYBDENUM-CONTAINING FRICTION-REDUCING ADDITIVES

Anne C. Udding, Castricum; Peter A. Van Leeuwen, Amsterdam, both of, Netherlands, and Michael Pearson, Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 7, 1994, Ser. No. 271,814

Claims priority, application European Pat. Off., Aug. 20, 1993, 93306626

Int. Cl.[6] C07F *11/00*

U.S. Cl. 556—61 **9 Claims**

1. A molybdenum-containing complex prepared by reacting an alkaline earth metal salt of a carboxylic acid, an amine and a source of cationic molybdenum, wherein the ratio of the number of equivalents of acid groups to the number of moles of molybdenum (eq:mol) is in the range from 1:10 to 10:1, and the ratio of the number of equivalents of acid groups to the number of moles of amine (eq:mol) is in the range from 20:1 to 1:10.

2. A. molybdenum-containing complex prepared by reacting a carboxylic acid or metal salt thereof, an amine and a source of cationic molybdenum, wherein the ratio of the number of equivalents of acid groups to the number of moles of molybdenum (eq:mol) is in the range from 1:10 to 10:1, and the ratio of the number of equivalents of acid groups to the number of moles of amine (eq:mol) is in the range from 20:1 to 1:10 wherein the carboxylic acid or metal salt thereof is selected from C_1–C_{24} alkyl salicylic acids and alkali metal and alkaline earth metal salts thereof.

5,468,892

PROCESS FOR THE PRODUCTION OF AN ALUMINUM TRIFORMATE SOLUTION CONTAINING ALKALI METAL AND/OR ALKALINE EARTH METAL, HIGHLY CONCENTRATED ALUMINUM TRIFORMATE SOLUTIONS CONTAINING ALKALI AND/OR ALKALINE EARTH METAL, AND THEIR USE

Loert de Riese-Meyer, and Rudolf Zauns-Huber, both of Duesseldorf, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Filed Dec. 20, 1993, Ser. No. 167,837

Int. Cl.[6] C07F *5/06*

U.S. Cl. 556—171 **20 Claims**

1. A process for the production of a solution comprising aluminum triformate by neutralization of an aqueous aluminate liquor

containing aluminum and at least one member selected from the group consisting of alkali metal and alkaline earth metal which comprises: neutralizing the aluminate liquor by introducing the aluminate liquor into formic acid the neutralization being carried out;

i) at a temperature of 5° C. to 110° C. when the aluminum content is from 10 to 80 g/l; or

ii) at a temperature below 25° C. when the aluminum content is from above 80 to 350 g/l, to form a neutralized mixture containing a precipitated solid, and heating the neutralized mixture containing the precipitate to form a clear aluminum triformate solution.

5,468,893

PREPARATION OF SULFUR-CONTAINING ORGANOSILICON COMPOUNDS

Dane K. Parker, Massillon; Richard T. Musleve, and Robert C. Hirst, both of Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 272,366, Jul. 19, 1994, Pat. No. 5,405,985. This application Dec. 19, 1994, Ser. No. 358,499

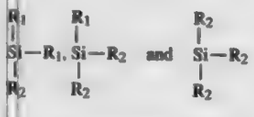
Int. Cl.[6] C07F 7/08

U.S. Cl. 556—427 **16 Claims**

1. A process for the production of organosilicon compounds of the formula

$$Z—Alk—S_n—Alk—Z \quad (I)$$

in which Z is selected from the group consisting of



where R_1 is an alkyl group of 1 to 4 carbon atoms, cyclohexyl or phenyl;

R_2 is alkoxy of 1 to 8 carbon atoms, or cycloalkoxy of 5 to 8 carbon atoms;

Alk is a divalent hydrocarbon of 1 to 18 carbon atoms and n is an integer of 2 to 8; comprising reacting (A) a compound of the formula:

$$Z—Alk—X \quad (II)$$

when X is Cl, Br or I; with (B) a compound of the formula

$$Me_2S_n \quad (III)$$

where Me is ammonium, or an alkali metal;

wherein the reaction is conducted in the presence of a phase transfer catalyst, an aqueous phase and a salt of one of the following formulae

$$XY \quad (IV)$$

or

$$X_2SO_4 \quad (V)$$

wherein X is selected from the group consisting of Li, Na, K,Rb and Cs; and wherein Y is selected from the group consisting of Fl, Cl and Br.

5,468,894

METHOD OF MANUFACTURING $FSi(OR)_3$

Ryuichi Yamaguchi; Koichi Kiso; Kiyoshi Tazuke; Hideaki Machida; Katsuhiro Mihirogi, and Yukichi Takamatsu, all of Kanagawa, Japan, assignors to TRI Chemical Laboratory Inc., Kanagawa, Japan

Filed Mar. 22, 1994, Ser. No. 215,568

Int. Cl.[6] C07F 7/08

U.S. Cl. 556—477 **13 Claims**

1. A method of manufacturing $FSi(OR)_3$, comprising the steps of reacting $Si(OR)_4$ with HF, and purifying said $FSi(OR)_3$, wherein R is an alkyl group, a phenyl group, or an alkyl phenyl group.

5,468,895

AMINE STABILIZED AMORPHOUS PHOSPHITE

James A. Mahood, Morgantown, W. Va., assignor to General Electric Company, Pittsfield, Mass.

Filed Oct. 19, 1994, Ser. No. 325,726

Int. Cl.[6] C09K 15/32

U.S. Cl. 558—71 **13 Claims**

1. A solid amorphous stabilizer composition exhibiting enhanced hydrolytic stability comprising:

(A) a phosphorus ester compound selected from the group consisting of phosphites and phosphonites, said phosphorus ester compound being present at a level of from 90 percent by weight to 99.9 percent by weight based on the total weight of the stabilizer composition, and

(B) an aliphatic polyamine selected from the group consisting of the following formulae: $H_2N—R^{10}—NH_2$, $R^{12}—NH—R^{11}—NH—R^{12}$, and $R^{12}—N(R^{12})—R^{11}—N(R^{12})—R^{12}$, wherein R^{10} is selected from C_6 to C_{10} divalent alkyl radicals, R^{11} is selected from C_1 to C_{10} divalent alkyl radical, and R^{12} is selected from C_1 to C_{10} monovalent alkyl radicals, said aliphatic polyamine being present at a level of from 0.1 percent by weight to 10 percent by weight based on the total weight of the composition.

12. A method for making a stabilizer composition exhibiting enhanced hydrolytic stability, said method comprising:

(a) melt blending a phosphorus compound and an aliphatic polyamine; said composition comprising from 90 to 99.9 weight percent of said phosphorus compound and from 0.1 to 10 weight percent of said polyamine based on the total weight of the composition, said aliphatic polyamine being selected from the group consisting of the following formulae: $H_2N—R^{10}—NH_2$, $R^{12}—NH—R^{11}—NH—R^{12}$, and $R^{12}—N(R^{12})—R^{11}—N(R^{12})—R^{12}$, wherein R^{10} is selected from C_6 to C_{10} divalent alkyl radicals, R^{11} is selected from C_1 to C_{10} divalent alkyl radical, and R^{12} is selected from C_1 to C_{10} monovalent alkyl radicals.

5,468,896

DITHIOCARBAZATE COMPOUNDS

Jong K. Choi; In B. Jhung; Jae C. Lee; Jong S. Sa; Sung J. Jo, and Jin H. Cho, all of Daejeon, Rep. of Korea, assignors to Lucky Ltd., Seoul, Rep. of Korea

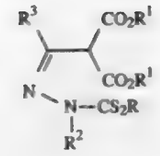
Division of Ser. No. 166,864, Dec. 15, 1993, Pat. No. 5,405,965. This application Feb. 10, 1995, Ser. No. 386,825

Claims priority, application Rep. of Korea, Dec. 17, 1992, 92-24734; Dec. 17, 1992, 92-24736; Dec. 22, 1992, 92-25112; Mar. 9, 1993, 93-3512

Int. Cl.[6] C07C 337/04

U.S. Cl. 558—233 **1 Claim**

1. An ethylidene dithiocarbazate compound represented by the following general formula (IV),



(IV)

wherein

R represents C_1–C_4 alkyl, C_2–C_4 alkenyl, aralkyl or aryl,

R^1 represents hydrogen, C_1–C_4 alkyl, allyl or propargyl,

R^2 represents hydrogen, C_1–C_4 alkyl, or a phenyl group which can contain one or more substituent selected from the group consisting of halogen atom, nitro and methyl at an optional position, and

R^3 represents hydrogen, methyl, ethyl or phenyl.

5,468,897

BI-AROMATIC ESTERS, A PROCESS FOR THEIR PREPARATION AND THEIR USE IN HUMAN OR VETERINARY MEDICINE AND IN COSMETIC COMPOSITIONS

Braham Shroot, Antibes; Jean-Michel Bernardon, Nice, and William R. Pilgrim, Valbonne, all of, France, assignors to Centre International de Recherches Dermatologiques Galderma (Cird Galderma), Valbonne, France

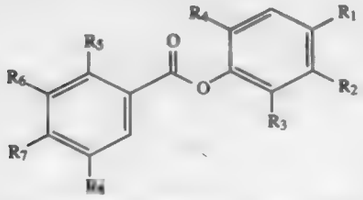
Division of Ser. No. 991,192, Dec. 16, 1992, Pat. No. 5,332,856, which is a division of Ser. No. 553,087, Jul. 17, 1990, Pat. No. 5,200,550. This application May 4, 1994, Ser. No. 237,991

Claims priority, application France, Jul. 18, 1989, 89 09652

Int. Cl.[6] C07C *321/00;69/76*

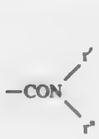
U.S. Cl. 560—18 **20 Claims**

1. A bi-aromatic ester having the formula



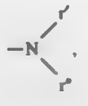
(I)

wherein R_1 represents hydrogen, OH, —CH_3, —CH_2OH, —$CH(OH)CH_3$,



or SO_2R_{10},

R_{10} represents OH, alkyl having 1–6 carbon atoms or



r' and r" represent hydrogen, alkyl having 1–6 carbon atoms, aryl, aralkyl, monohydroxyalkyl or polyhydroxyalkyl, or r' and r" taken together form a heterocycle,

R_2 represents hydrogen, alkyl having 1–6 carbon atoms, OR_9, fluorine or —CF_3,

R_9 represents hydrogen, alkyl having 1–6 carbon atoms, monohydroxyalkyl or polyhydroxyalkyl,

R_3, R_4 and R_5 represent hydrogen, fluorine, OH, —CH_3, —OCH_3 —CF_3, —COOH or —CH_2OH,

R_6 and R_8 represent hydrogen, α-substituted alkyl having 3–15 carbon atoms, α,α'-disubstituted alkyl having 4–12 carbon atoms, cycloalkyl having 3–12 carbon atoms, mono-or polycyclic cycloalkyl having 5–12 carbon atoms whose linking carbon is trisubstituted, —SR_{11}, —SO_2R_{11} or —SOR_{11},

R_{11} represents alkyl having 1–6 carbon atoms or cycloalkyl, with the proviso that R_6 and R_8 do no simultaneously represent hydrogen,

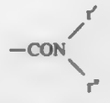
R_7 represents hydrogen, alkyl having 1–6 carbon atoms, alkenyl, alkenyloxy, OR_{12} or SR_{13}, SOR_{14} or SO_2R_{14},

R_{12} represents hydrogen, alkyl having 1–6 carbon atoms, alkenyl, monohydroxyalkyl, polyhydroxyalkyl or —$(CH_2)_n$—COR_{15}, wherein n is 0.1 or 2, and R_{15} represents hydrogen, OH, alkyl having 1–6 carbon atoms or alkoxy having 1–6 carbon atoms,

R_{13} represents hydrogen, alkyl having 1–6 carbon atoms or aralkyl,

R_{14} represents OH, alkyl having 1–6 carbon atoms or aralkyl,

with the proviso that when R_1 represents —CH_2OH, —$CH(OH)CH_3$,



and R_2 represents hydrogen, then:

(i) either R_3 and R_4 are other than hydrogen or —CH_3,

(ii) or R_7 is other than OR_{12} and R_6 or R_8 is cycloalkyl having more than 7 carbon atoms,

(iii) or R_7 represents OR_{12}, but R_6 and R_8 are other than hydrogen,

(iv) or R_7 represents OR_{12} but R_5 is other than hydrogen.

5,468,898

SUBSTITUTED NAPHTHYLENE COMPOUNDS EXHIBITING SELECTIVE LEUKOTRIENE B_4 ANTAGONIST ACTIVITY

Fu-Chih Huang, Gwynedd; Wan K. Chan, Wayne; Charles A. Sutherland, Greenlane, and Robert A. Galemmo, Jr., Collegeville, all of Pa., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Collegeville, Pa.

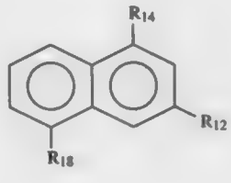
PCT No. PCT/US91/06447, § 371 Date Apr. 23, 1993, § 102(e) Date Apr. 23, 1993, PCT Pub. No. WO92/04315, PCT Pub. Date Mar. 19, 1992

Continuation-in-part of Ser. No. 580,243, Sep. 10, 1990, abandoned. This PCT application Sep. 6, 1991, Ser. No. 777,246

Int. Cl.[6] C07C *233/51;* **C07D** *257/04*

U.S. Cl. 560—41 **6 Claims**

1. A compound of the formula



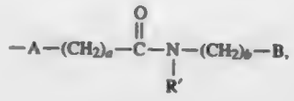
where:

R_{12} is

—$(CH_2)_d$—D—$(CH_2)_e$—E

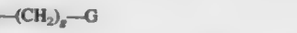
where D is a chemical bond, O, $—CH_2$ or $—(CH=CH)_x$ where x is 1 or 2 and E is —COOR' or tetrazolyl where R' is hydrogen or C_{1-6} alkyl;

R_{14} is



where A is $—CH_2$ or O; B is phenyl or substituted phenyl where the substituents are C_{1-6} alkyl, halo C_{1-6} alkyl, C_{1-6} alkoxy or halo and R' is hydrogen or C_{1-6} alkyl;

R_{18} is



where F is O or $—CH_2$ and G is phenyl or substituted phenyl where the substituents are C_{1-6} alkyl, halo C_{1-6} alkyl, C_{1-6} alkoxy or halo; and

a, b, d, e, f and g are independently 0–4; or a pharmaceutically acceptable salt thereof.

5,468,899

PROCESS FOR PURIFYING α,β-UNSATURATED ESTERS

William Bauer, Jr., 2046 Winthrop Rd., Huntingdon Valley, Pa. 19006; Nelson I. Quiros, 111 Cobbler Ct., Telford, Pa. 18969, and Rita K. Upmacis, 560 Riverside Dr., Apt.7-B, New York, N.Y. 10027

Filed Jan. 11, 1995, Ser. No. 371,176

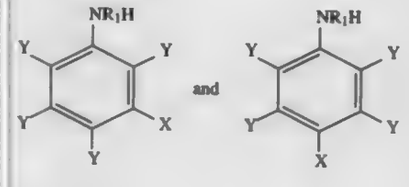
Int. Cl.[6] C07C *67/48*

U.S. Cl. 560—218 **10 Claims**

1. A process for purifying an α,β-unsaturated carboxylic acid ester containing carbonyl impurities, comprising:

a) admixing the α,β-unsaturated carboxylic acid ester containing carbonyl impurities with:

1) from 1 to 100 molar ratio of a phenylenediamine, based upon moles of carbonyl impurities, the phenylenediamine having the formulas



where

X is NR1R2 and

R_1, R_2, and Y are independently selected from hydrogen, C_1 to C_4 alkyl, phenyl, or naphthyl; and

2) from 1 to 1500 equivalent ratio, based on equivalents of the phenylenediamine, of an acid selected from a C_1 to C_4 carboxylic acid, a sulfonic acid, phosphoric acid, sulfuric acid, or mixtures thereof, to form a treated ester mixture; and

b) holding the treated ester mixture up to 100 hours at a temperature of from 20° C. to 150° C.

5,468,900

CONVERSION OF NYLON 6 AND/OR NYLON 6,6 TO ADIPIC ACID

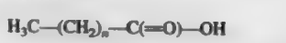
Edward F. Moran, Jr., Gibbstown, N.J., and Ronald J. McKinney, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1994, Ser. No. 314,744

Int. Cl.[6] C07C *55/14*

U.S. Cl. 562—590 **15 Claims**

11. A method for converting a mixture of polycaprolactam and polyhexamethylene adipamide to adipic acid comprising supplying an acid of the formula



where n is 0 to 4 and the mixture of the polymers to an autoclave in the amount of at least one mole of acid for every mole of repeat units of polycaprolactam and at least two moles of acid for every mole of repeat units of polyhexamethylene adipamide, heating the mixture at a temperature of at least 150° C., and at autogenous pressure or greater for a time sufficient to depolymerize both polymers and form a mixture of 6-alkylamidohexanoic acid, adipic acid and N,N'-hexamethylene bisalkylamide, oxidizing the 6-alkylamidohexanoic acid and N,N'-hexamethylene bisalkylamide to a mixture of adipic acid and alkylamide and separating the adipic acid from the mixture.

5,468,901

PROCESS FOR THE PREPARATION OF OPTICALLY ACTIVE METHIONINE AMIDE

Wilhelmus H. J. Boesten, and Quirinus B. Broxterman, both of Sittard, Netherlands, assignors to DSM N.V., Netherlands

Filed Jul. 9, 1993, Ser. No. 88,553

Claims priority, application Netherlands, Jul. 9, 1992, 9201230

Int. Cl.[6] C07C *233/05;237/06*

U.S. Cl. 564—198 **11 Claims**

1. A process for preparing optically active methionine amide comprising:

(a) converting, at least in part, a mixture of the Schiff bases of D- and L-methionine amide with an optically active L- or D-mandelic acid into a salt of the methionine amide and the carboxylic acid in the presence of water and an organic solvent wherein the amount of L- or D-mandelic acid, respectively, is less than about 1.2 equivalents, relative to the amount of the Schiff base of D- or L-methionine amide, respectively, present in the mixture of Schiff bases of D- and L-methionine amide, and the amount of water used is at least equimolar relative to the amount of mandelic acid,

(b) separating a portion consisting substantially of one of the diastereoisomers of said salt from the reaction mixture obtained in (a); and

(c) converting the salt into the optically active methionine amide.

5,468,902

ONIUM BORATES/BORATES OF ORGANOMETALLIC COMPLEXES AND CATIONIC INITIATION OF POLYMERIZATION THEREWITH

Frederic Castellanos, Mulhouse; Jacques Caverzan, Villeurbanne; Jean-Pierre Fouassier, Morschwiller-le-bas, and Christian Priou, Villeurbanne, all of, France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Mar. 23, 1993, Ser. No. 35,838

Claims priority, application France, Mar. 23, 1992, 92 03440

Int. Cl.[6] C07F *5/02;11/00*

U.S. Cl. 568—6 **6 Claims**

1. An onium borate, the cationic moiety of which having the formula (I):

$$[(R^1)_n—A—(R^2)_m]^+$$

in which A is an element of Groups 15 to 17 of the Periodic Table; R^1 is a C_6–C_{20} heterocyclic or carbocyclic aryl radical; R^2 is R^2 or a linear or branched C_1–C_{30} alkenyl or alkyl radical, said radicals R^1 or R^2 optionally being substituted by at least one C_1–C_{25} alkoxy, C_1–C_{25} alkyl, nitro, chloro, bromo, cyano, carboxyl, ester or mercapto substituent; n is an integer ranging from 1 to v+1; with v being the valence of A; and m is an integer ranging from 0 to v−1, with the proviso that n+m=v+1; and the anionic borate moiety of which having the formula:

$$[BX_aR_b]^-$$

in which a and b are integers ranging from 0 to 4 and a+b=4; the symbols X are each a halogen atom when a ranges up to 3 and an OH functional group when a ranges up to 2; and the symbols R, which may be identical or different, are each a phenyl radical substituted by at least one electron-withdrawing substituent or by at least two halogen atoms, or an aryl radical containing at least two aromatic ring members, or such aryl radical bearing at least one electron-withdrawing substitutent.

5,468,903

REGIOSELECTIVE SULFONYLATION REACTION OF SUBSTITUTED AROMATIC COMPOUNDS

Kenneth R. Randles; Brian G. Gott, and Stephen T. A. K. Daley, all of Huddersfield, England, assignors to Zeneca Limited, London, United Kingdom

Filed Mar. 1, 1993, Ser. No. 22,709

Claims priority, application United Kingdom, Mar. 3, 1992, 9204529

Int. Cl.[6] C07C *315/00*

U.S. Cl. 568—28 **14 Claims**

1. A process for preparing a compound comprising a monocyclic aromatic ring at least a first substituent and a substituted sulphonyl group at the position para to said first substituent, the process comprising mixing a reactant comprising the monocyclic aromatic ring with said first substituent and hydrogen in the position of the ring para to said first substituent, with a sulphonic acid halide derivative in the presence of a naturally occurring or synthetic zeolite capable of catalysing a sulphonylation reaction between said reactant and said sulphonic acid halide, under conditions in which said reaction will occur, wherein said sulphonic acid halide derivative is selected from optionally substituted alkyl, optionally substituted alkenyl and optionally substituted alkynyl sulphonic acid halides.

5,468,904

FLUORINE-CONTAINING BENZOPHENONE DERIVATIVES AND USE THEREOF

Ryoko Osawa; Takashige Maekawa; Tatsuo Momii, and Satoshi Kamata, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Feb. 4, 1994, Ser. No. 191,591

Claims priority, application Japan, Feb. 9, 1993, 5-044564; Jul. 28, 1993, 5-205874; Dec. 28, 1993, 5-337237

Int. Cl.[6] C07C *49/786*

U.S. Cl. 568—333 **10 Claims**

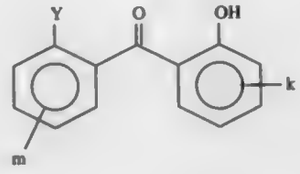
1. A fluorine-containing benzophenone derivative of the formula (1), (2) or (3):

$$\Phi^1(—X^1—Q^1—R_f^1)_n \quad (1)$$

$$\Phi^2—X^2—Q^2—R_f^2—Q^3—X^3—\Phi^3 \quad (2)$$

$$\Phi^4—X^4—Q_f—X^5—\Phi^5 \quad (3)$$

wherein Φ^1 is a 2-hydroxybenzophenone structure of the formula ka-1:



(ka-1)

(wherein Y is a hydrogen atom or a hydroxyl group, each of k and m indicates the number of bond sites, k is an integer of from 0 to 3, and m is an integer of from 0 to 3, provided that $1 \leqq (k+m) \leqq 4$), n corresponds to (k+m) and is an integer of from 1 to 4, each of Φ^2, Φ^3, Φ^4, and Φ^5 is a 2-hydroxybenzophenone structure of the formula ka-1 wherein (k+m) is 1, each of X^1, X^2, X^3, X^4 and X^5 is a single bond or an oxygen atom, Q^1 is a single bond or a bivalent linking group having a carbon atom directly bonded to X^1, each of Q^2 and Q^3 is a single bond or a bivalent linking group, R_f^1 is a monovalent polyfluorohydrocarbon group having from 2 to 22 carbon atoms, in which some of the carbon atoms may be substituted by ether oxygen atoms, F_f^2 is a bivalent polyfluorohydrocarbon group having from 2 to 22 carbon atoms, in which some of the carbon atoms may be substituted by ether oxygen atoms, and Q_f is a bivalent linking group having at least one $Q^4—R_f^1$ (wherein Q^4 is a bivalent linking group, and R_f1 is as defined above), wherein said bivalent linking group is $—(CH_2)_p—$, $—(CH_2)_g—CH(OR^1)—(CH_2)_q—$, $—(CH_2)_a—COO—(CH_2)_b—$, $—(CH_2)_c—COO—(CH_2)_d—N(R^3)SO_2—$ or $—(CH_2)_e—OCO—(CH_2)_f—N(R^4)SO_2—$ (wherein p is an integer of from 2 to 8, g is an integer of from 0 to 8, q is an integer of from 1 to 8, each of a and c is an integer of from 0 to 6, each of b, d, g and f is an integer of from 1 to 8, R^1 is a hydrogen atom or an acyl group, and each of R^3 and R^4 is an alkyl group having from 1 to 3 carbon atoms.

5,468,905

BICYCLO[4,1,0]HEPTANE-2,4-DION DERIVATIVES, ITS SYNTHETIC INTERMEDIATES AND PROCESS FOR THE MANUFACTURE THEREOF

Junji Suzuki, Takaoka; Masami Hatano, and Shinichi Imaizumi, both of Odawara, all of, Japan, assignors to Nippon Soda Co., Ltd., Tokyo, Japan

PCT No. PCT/JP92/00084, § 371 Date May 25, 1994, § 102(e) Date May 25, 1994, PCT Pub. No. WO92/13821, PCT Pub. Date Aug. 20, 1992

PCT Filed Jan. 29, 1992, Ser. No. 117,158

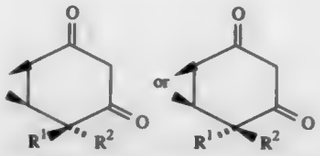
Claims priority, application Japan, Jan. 31, 1991, 3-029202

Int. Cl.[5] C07C *45/48*

U.S. Cl. 568—346

2 Claims

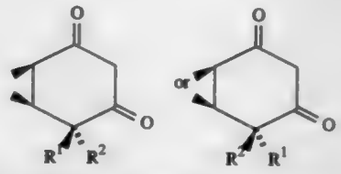
1. A compound represented by the formula (I):



(I)

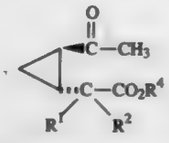
wherein R^1 and R^2 denote each independently hydrogen, C_1–C_6 alkyl or —$COOR^3$ and R^3 denotes C_1–C_6 alkyl, with the proviso that both R^1 and R^2 cannot denote —$COOR^3$.

2. A process for preparing a compound represented by the formula (I):



(I)

wherein R^1 and R^2, denote each independently hydrogen, C_1–C_6 alkyl or —$COOR^3$ and R_3 denotes C_1–C_6 alkyl with the proviso that both R^1 and R^2 cannot denote —$COOR^3$ characterized in that the compound is prepared by forming a ring closure in a compound represented by the formula (II):



(II)

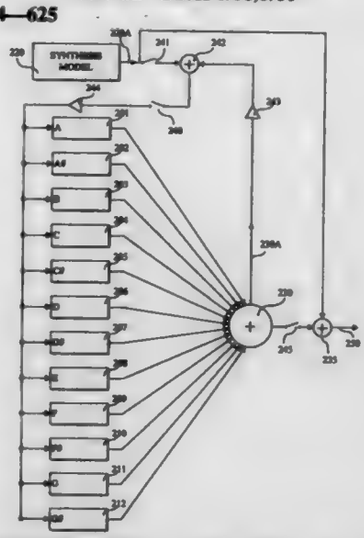
wherein R^1 and R^2 are as defined above and R_4 denotes C_1–C_6 alkyl.

5,468,906

SOUND SYNTHESIS MODEL INCORPORATING SYMPATHETIC VIBRATIONS OF STRINGS

Bryan J. Colvin, Sr., San Jose, and Perry R. Cook, Palo Alto, both of Calif., assignors to Media Vision, Inc., Fremont, Calif.

Filed Sep. 2, 1993, Ser. No. 116,165
Int. Cl.[6] G10H *1/08;5/00*
U.S. Cl. 84—625 17 Claims



1. A method for improving a sound synthesis model to account for sympathetic vibrations of strings, the method comprising the steps of:

scaling an output signal of the sound synthesis model by an amount that indicates the strength of string coupling;

generating a plurality of string sound signals from the scaled output signal using a plurality of single-string emulators; and

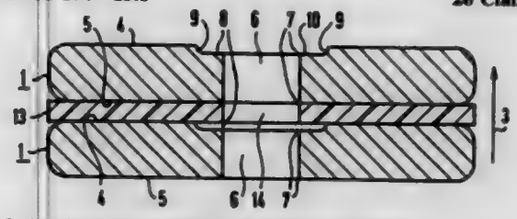
summing the output signal from the sound synthesis model with said plurality of string sound signals.

5,468,907

ELECTRICAL CONDUCTOR WITH A LONGITUDINAL GROOVE AND SLOTS PERPENDICULAR THERETO AND A METHOD FOR PRODUCING THE SAME

Georg Frankenhauser, and Erhard Wedemann, both of Mülheim a.d. Ruhr, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Division of Ser. No. 145,465, Oct. 29, 1993. This application Dec. 14, 1994, Ser. No. 355,977
Claims priority, application Germany, Apr. 29, 1991, 41 14 003.6
Int. Cl.[6] H01B *7/34*
U.S. Cl. 174—15.6 26 Claims



1. An electrical conductor assembly, comprising:

a) a plurality of identical conductors having a longitudinal direction and a stacking direction perpendicular to the longitudinal direction;

b) at least one insulating layer to be inserted between each two respective conductors and stacked with said conductors in the stacking direction;

c) each of said conductors having two substantially flat main sides oriented perpendicular to the stacking direction and having a maximum thickness in the stacking direction;

d) each of said conductors having at least one set of slots formed therein in succession approximately in the longitudinal direction, each of said slots leading approximately in the stacking direction through a respective one of said conductors and having a sharp-edged mouth in each of said main sides; and

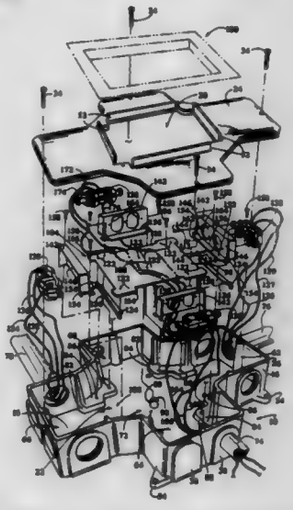
e) at least one of said main sides of each of said conductors having a longitudinal groove formed therein, being associated with said set of slots, being oriented approximately parallel to the longitudinal direction, defining two groove walls disposed approximately parallel to the stacking direction, defining a groove bottom disposed approximately perpendicular to the stacking direction and having a groove depth as measured in the stacking direction being small relative to the maximum thickness, and said mouth formed in said main side at each of said slots being spaced apart from each of said groove walls in said groove bottom.

5,468,908

FLOOR BOX FOR IN-FLOOR SERVICE DISTRIBUTION SYSTEMS

Richard L. Arthur, Vienna, W. Va.; Timothy S. Bowman, Memphis, Tenn., and J. David Harmon, Pittsburgh, Pa., assignors to Walker Systems, Inc., Parkersburg, W. Va.

Continuation-in-part of Ser. No. 722,872, Jun. 28, 1991, Pat. No. 5,285,009. This application Jan. 10, 1994, Ser. No. 179,247
Int. Cl.[6] H02G *3/08*
U.S. Cl. 174—48 10 Claims



1. A floor box for use with one or more in-floor service distribution systems comprising:

a bottom;

a continuous side wall extending generally perpendicularly from the bottom to an upper edge;

a top overlying the bottom adjacent to the upper edge defining a box interior;

the box interior including a central region extending from the bottom to the top, a first wiring compartment extending from the central region and a second wiring compartment wiring compartment spaced from the first wiring compartment and extending from the central region;

the sidewall adjacent to the first and second wiring compartments constructed for connection to and communication with a service distribution system;

a blocking plate positioned in the central region, the blocking plate overlying and being spaced apart from the bottom;

the blocking plate partitioning the central region to define a conductor tunnel between the blocking plate and the bottom and to define a connection region adjacent to the blocking plate opposite the conductor tunnel;

a first bracket positioned between the first wiring compartment and the connection region;

a second bracket positioned between the second wiring compartment and the connection region;

the top defining an access opening adjacent to the central region sized to allow insertion of the blocking plate, first bracket, and second bracket into the central region through the access opening; and

the blocking plate, the first bracket, and the second bracket being separate from one another and removably secured to the body at separated locations, whereby the blocking plate, first bracket, and the second bracket are each independently removable through the access opening.

5,468,909

INSULATING PART WITH IMPROVED HEAT TRANSFER ELEMENT

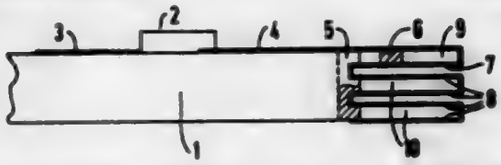
Eduard Schönberger; Stefan Gruber, both of Kümmersbruck; Hermann Kasowski, Kastl, and Heinz Schmidt, Kümmersbruck, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 21, 1994, Ser. No. 184,614

Claims priority, application Germany, Jan. 22, 1993, 9300864 U

Int. Cl.[6] **H05K** *7/20*

U.S. Cl. 174—16.1 **23 Claims**



1. An insulating part for an electronic device, comprising a first cooling surface electrically and thermally coupled to an electronic component of the device, one or more additional cooling surfaces, and a heat transfer element electrically and thermally coupling said first cooling surface and said one or more additional cooling surfaces, wherein said heat transfer element is arranged in a recessed portion of the insulating part, and said recessed portion is arranged in a base portion of said one or more additional cooling surfaces.

5,468,910

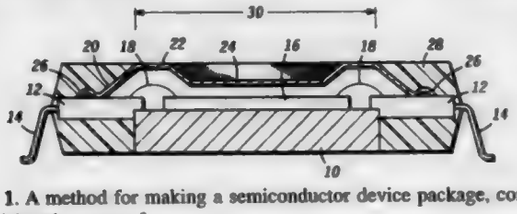
SEMICONDUCTOR DEVICE PACKAGE AND METHOD OF MAKING

James H. Knapp, Chandler, and Keith E. Nelson, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 100,236, Aug. 2, 1993, abandoned. This application Jan. 19, 1995, Ser. No. 375,061

Int. Cl.[6] **H01L** *23/28;23/12;* **H05K** *7/20;1/18*

U.S. Cl. 174—52.2 **13 Claims**



1. A method for making a semiconductor device package, comprising the steps of:

providing a supportive substrate comprising a printed wire board, the printed wire board comprising a plurality of edges and a plurality of exterior electrical leads extending laterally from the plurality of edges;

attaching a first semiconductor die to a first surface of the supportive substrate;

electrically connecting the semiconductor die to the printed wire board with a plurality of wires;

covering the plurality of wires and the first semiconductor die with a first protective lid of a uniform thickness having a raised portion shaped to conform to the plurality of wires and having a lowered portion overlying the first semiconductor die and parallel to the first semiconductor die, the first protective lid attached to the first surface of the supportive substrate thereby sealing the semiconductor die and the plurality of wires; and

partially encapsulating the first protective lid and a portion of the electrical leads with a molding compound such that a portion of the first protective lid overlying the semiconductor die remains exposed.

10. A semiconductor device package comprising:

a supportive substrate comprising a plurality of edges and a plurality of exterior leads extending laterally from the plurality of edges;

a semiconductor die attached to a first surface of the supportive substrate and electrically connected, with a plurality of wire bonds, to the plurality of leads;

a protective lid of a uniform thickness covering the semiconductor die, the protective lid having a raised portion shaped to conform to the wire bonds and having a lowered portion overlying the semiconductor die parallel to the semiconductor die, the protective lid attached to the first surface thereby sealing the semiconductor die and the plurality of wires; and

molded material partially encapsulating the protective lid and a portion of the leads, a portion of the protective lid overlying the semiconductor die remaining exposed.

5,468,911

SCREENING HULL FOR ELECTRICAL CABLE

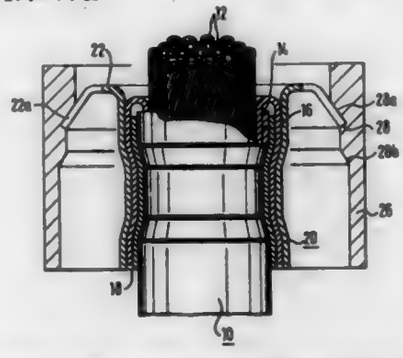
Ludger Leve, Erkrath, and Jurgen Sieroks, Haan, both of, Germany, assignors to Framatome Connectors International, Courbevole, France

Filed Aug. 16, 1993, Ser. No. 106,988

Claims priority, application Germany, Aug. 14, 1992, 42 26 904.0

Int. Cl.[6] **H02G** *15/02;15/08;15/064;* **H01R** *4/10*

U.S. Cl. 174—74 R **5 Claims**



1. Fastening means for an electrical cable, comprising a screening hull with peripheral screening against external electrical and/or magnetic interferences, said screening hull comprising:

(a) an inner hull (**18**) adapted to be slid on a cable sheath (**16**); and

(b) an outer hull (**20**) adapted to be slid coaxially with play over said inner hull (**18**) and having a radially outwardly projecting deformable collar (**22**);

(c) said inner and outer hulls (**18**,**20**) being separated by a distance such that a free end of cable screening (**14**), which is folded back from an end of said cable over said inner hull (**18**), can be received between said inner and outer hulls, and that said inner and outer hulls (**18**, **20**) can be fastened relative to the cable (**10**) by means of a crimping operation;

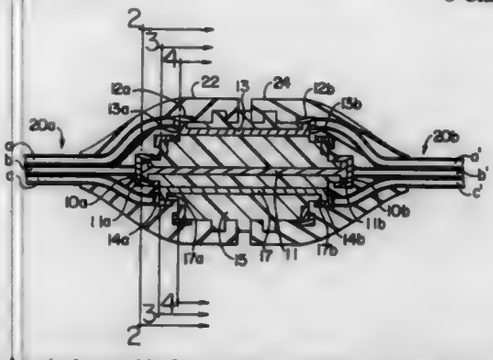
(d) said collar (**22**) being flanged in the direction of the outer hull (**20**), so that a cross section of said collar is substantially U-shaped.

5,468,912

SWIVEL ASSEMBLY FOR MULTI-CONDUCTOR CORD

Leon Zalewski, P.O. Box 280676, East Hartford, Conn. 06128

Filed May 3, 1994, Ser. No. 237,192
Int. Cl.[6] H01R 39/00
U.S. Cl. 174—86 3 Claims



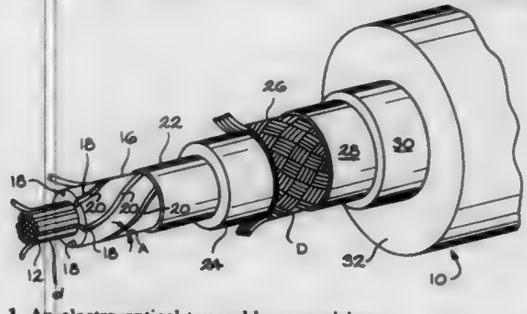
1. A swivel assembly for a multi-conductor cord, said assembly comprising a pair of outer shells, said shells being aligned on a common axis and provided in opposed relationship to one another, each shell having a central conductor terminal and at least one annular terminal for another conductor spaced radially and axially from said central conductor terminal, a core rotatably received on said aligned shell axes and having a central conductive element electrically connecting said central conductor terminals of said shells, said core also having at least one conductive element spaced radially from said central conductive element, and conductive annular slip rings electrically connected to the opposite ends of said at least one conductive element for mating with said annular terminals of said shells during rotational movement of said core relative to said shells.

5,468,913

ELECTRO-OPTICAL COAXIAL TOW CABLE

Peter E. Seaman, Niantic, and Thomas R. Stottlemyer, Mystic, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 110,256, Aug. 19, 1993, abandoned.
This application Feb. 9, 1995, Ser. No. 387,000
Int. Cl.[6] G02B 6/44; H01B 7/18; H02G 3/00
U.S. Cl. 174—102 R 4 Claims



1. An electro-optical tow cable, comprising:

a plurality of round core conductors for transmitting electrical communication signals, said core conductors being grouped at the center of said cable and substantially uniformly distributed about a center line of said cable;

a first layer of dielectric material circumscribing said core conductors, said first layer of dielectric material having in a peripheral surface thereof a helical groove having a rounded bottom;

at least one round fiber optic transmitter disposed within said groove adjacent said bottom of said groove and circumscribing said core conductors and extending the axial length of said tow cable;

a first layer of protective tape wrapped around said first dielectric layer, said groove and said tape cooperating to form a passageway containing therein said fiber optic transmitter, said fiber optic transmitter being free to move within said passageway;

a second layer of dielectric material extruded onto said tape and abutting and circumscribing said first layer of protective tape;

a coaxial shield abutting and circumscribing said second dielectric layer; and

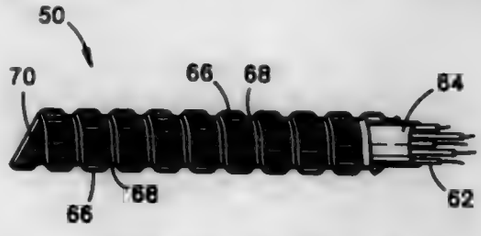
a second layer of protective tape wrapped around and abutting and circumscribing said coaxial shield.

5,468,914

ARMORED CABLE

James W. Falciglia, East Greenwich, R.I., and Anthony J. Mauro, Assonet, Mass., assignors to Monogram Industries Inc., New Bedford, Mass.

Division of Ser. No. 865,334, Apr. 8, 1992. This application Oct. 19, 1993, Ser. No. 139,314
The portion of the term of this patent subsequent to Sep. 27, 2011, has been disclaimed.
Int. Cl.[6] H01B 7/36
U.S. Cl. 174—112 30 Claims



1. A set of armored cables, each armored cable in said set comprising

a conductive tubular structure having an internal passage, an outer surface, a first end, and a second end, the internal passage being sized and configured to enclose one or more conductors, said tubular structure being made of a material having a first visual appearance, and

a pattern of visible indicia, of different visual appearance from said first visual appearance, applied on said outer surface, said pattern being repeated along the length of said armored cable,

each armored cable in said set including a said pattern of visible indicia of different visual appearance than all other armored cables in said set.

11. A method of making an armored cable sheath comprising

forming a metal strip into an interlocking helical configuration to produce a conductive tubular structure having an internal passage, an outer surface, a first end, and a second end, said internal passage sized and configured to enclose one or more conductors, and

selectively applying visible indicia in a pattern on said outer surface.

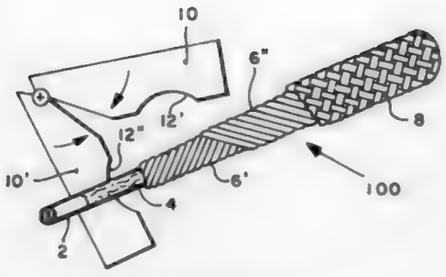
5,468,915

STRIPPABLE FIBERGLASS INSULATED CONDUCTOR

Edward A. Green, 4419 State Rte. 82, Mantua, Ohio 44255

Filed Mar. 24, 1993, Ser. No. 36,382
Int. Cl.[6] H01B 7/00
U.S. Cl. 174—124 R 16 Claims

1. An electrical conductor having at least one layer of fiberglass in close proximity thereto that has been treated with a solution operative to render the fiberglass sufficiently frangible upon heat aging to enhance the strippability of the fiberglass from the conductor.



5,468,916

MEANS FOR FIXING WINDING OVERHANGS IN ELECTRICAL MACHINES

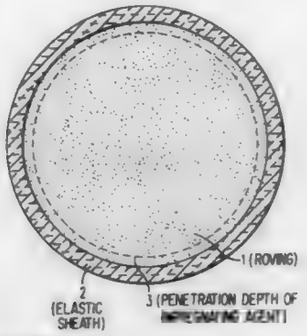
Michael Litenas, Laufenburg, Germany, and Roland Schuler, Wettingen, Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Apr. 30, 1993, Ser. No. 54,236

Claims priority, application Germany, Jun. 10, 1992, 42 18 969.1

Int. Cl.[6] H01B *5/16*

U.S. Cl. 174—127 **4 Claims**



1. A string comprising:

a core of fibers extending substantially in a longitudinal direction of said string, said fibers forming a roving which is elastic in a direction perpendicular to said longitudinal direction; and

an elastic sheath surrounding said roving, wherein said elastic sheath is impregnated, at least in a region near an outer surface thereof, with a conductive impregnating agent which is inert toward an impregnating resin which is subsequently applied to said string.

5,468,917

CIRCUITIZED STRUCTURE INCLUDING FLEXIBLE CIRCUIT WITH ELASTOMERIC MEMBER BONDED THERETO

William L. Brodsky, Binghamton; James D. Herard, Vestal; Thomas G. Macek, Endicott; Timothy L. Sharp, Berkshire, and George J. Shovlowsky, Owego, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 23, 1994, Ser. No. 217,141

Int. Cl.[6] H05K *1/14*

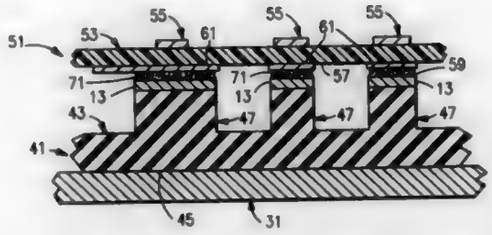
U.S. Cl. 174—255 **16 Claims**

1. A circuitized structure comprising:

a flexible circuit including at least one layer of dielectric material having a plurality of electrically conductive members on a first surface thereof;

an elastomeric member including a plurality of upstanding portions;

a plurality of metallic pad members, selected ones of said pad members being secured to a respective one of said upstanding portions of said elastomeric member; and



means for bonding each of said selected ones of said pad members to said flexible circuit at locations relative to respective ones of said electrically conductive members, said means for bonding comprising an adhesive.

5,468,918

CONDUCTIVE MEMBER FOR ELECTRIC CIRCUIT AND ELECTRIC CIRCUIT BODY, AND METHOD FOR FABRICATING THEM

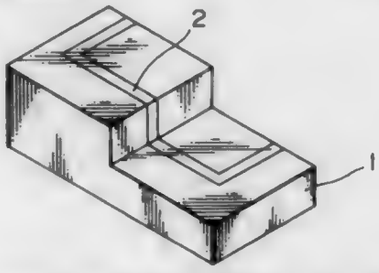
Toshiaki Kanno; Makoto Katsumata; Hidenori Yamanashi, and Hitoshi Ushijima, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Dec. 16, 1993, Ser. No. 167,343

Claims priority, application Japan, Dec. 21, 1992, 4-340374

Int. Cl.[6] H05K *1/00*

U.S. Cl. 174—256 **10 Claims**



1. A conductor member for an electric circuit comprising:

a conductive plastic mold in which carbon fibers or graphite fibers are dispersedly contained, wherein said carbon or graphite fibers have a diameter of 5 μm or less and a length of 100 μm or less; and

a metallic layer at least partially provided on the surface of said conductive plastic mold.

5,468,919

PRINTED CIRCUIT BOARD DEVICE WITH SURFACE-MOUNTED BAR-LIKE CONNECTORS

Minoru Shiozaki, Inazawa; Mikio Yasuda, Ichinomiya; Isamu Chimoto, Nishikasugai, and Kameki Ishimoto, Ichinomiya, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 12, 1994, Ser. No. 226,666

Claims priority, application Japan, Apr. 12, 1993, 5-084547

Int. Cl.[6] H05K *1/18*

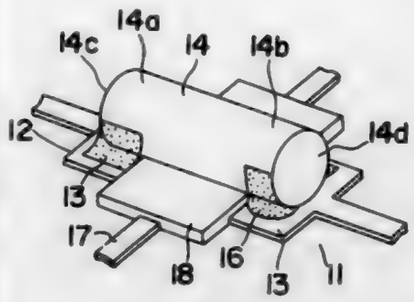
U.S. Cl. 174—261 **22 Claims**

1. A printed circuit board device comprising:

a bar-like connector made of a high electrically conductive metal material;

said bar-like connector smoother on a side surface than on end surfaces thereof;

said bar-like connector connected primarily at a portion of the side surface adjacent each end by connectors of an electrically conductive bonding agent to a pair of lands, respectively, on said printed circuit board.

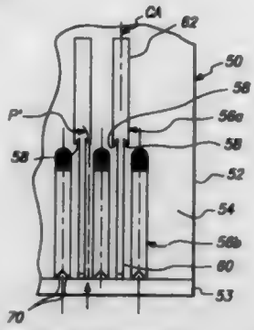


5,468,920

PRINTED CIRCUIT BOARD HAVING RAISED CONDUCTOR PADS

Mark P. August, Los Gatos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Jul. 22, 1994, Ser. No. 279,018
Int. Cl.[6] H05K *1/00*
U.S. Cl. 174—267 10 Claims



1. A printed circuit board installable in a cardedge connector having a plurality of contacts arranged to engage respective electrically conductive pads on the printed circuit board, the printed circuit board comprising a base having a side edge extending along one side thereof and a plurality of electrically conductive raised pads disposed on a surface of the base, at least one of the pads forming a frontal edge arranged to be engaged by a contact during installation of the circuit board into the connector, the frontal edge defining a pair of frontal edge segments disposed on opposite sides of a center axis of the pad, each of the frontal edge segments extending in a direction toward the center axis and away from the side edge for directing toward the pad center axis a contact which is offset laterally with respect to the pad center axis during installation of the printed circuit board into the cardedge connector.

5,468,921

EXTENDED COMMUNICATION CABLE FOR A LIGHT PEN OR THE LIKE

Carl D. Blake, and Karl E. Harrar, both of Tucson, Ariz., assignors to Boeckeler Instruments, Inc., Tucson, Ariz.

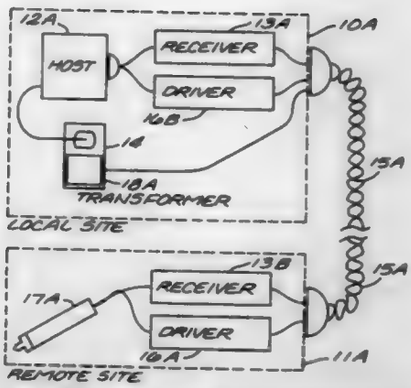
Filed Aug. 11, 1994, Ser. No. 289,199
Int. Cl.[6] G08C *21/00*
U.S. Cl. 178—18 19 Claims

1. A communication system comprising:

a) an electronic host apparatus having a first receiver unit in operative communication therewith, said first receiver unit receiving power from said host apparatus;

b) a digital input mechanism generating a first digital signal;

c) a first driver unit in operative communication with said digital input mechanism, said driver unit further communicating with said first receiver unit via a cable system, said first driver unit for receiving said first digital signals from said digital input mechanism and sending said first digital signals to said host apparatus via said cable system and said first receiver unit;



d) a second driver unit in operative communication with said host apparatus, said second driver unit receiving data from said host apparatus and being powered therefrom;

e) a second receiver unit in operative communication with said digital input mechanism, said cable system communicating a second digital signal from said second driver unit to said digital input mechanism via said second receiver unit; and,

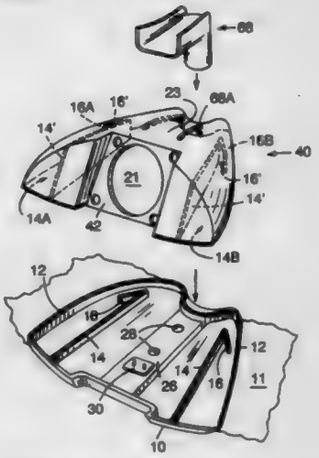
f) transformer means for converting electricity from an alternating-current electrical source into a first direct-current electrical flow, said first direct-current electrical flow being communicated to said first driver unit via said first receiver unit and said cable system, said first direct-current electrical flow further being communicated to said second receiver unit via said first driver unit and said cable system.

5,468,922

SUPPORTED VEHICLE ELECTROACOUSTICAL TRANSDUCING

Michio Hanba, Kawasaki, Japan, assignor to Bose Corporation, Framingham, Mass.

Filed Sep. 30, 1992, Ser. No. 954,572
Int. Cl.[6] H05K *5/00*
U.S. Cl. 181—150 15 Claims



1. A loudspeaker enclosure for mounting on the rear deck of a vehicle comprising,

a main chamber having a loudspeaker driver mounting panel,

at least one subchamber adjacent to said main chamber,

and at least one subport intercoupling said main chamber and said at least one subchamber,

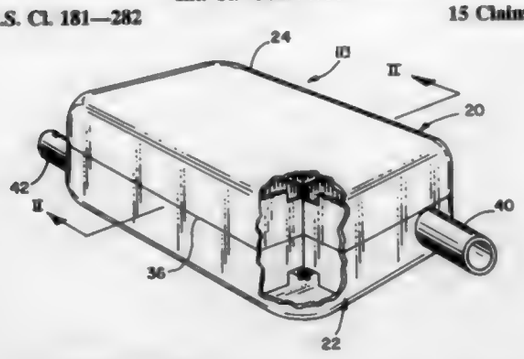
said at least one subport characterized by acoustic mass and said at last one subchamber characterized by acoustic compliance with the acoustic mass of said at least one subport and the acoustic compliance of said at least one subchamber establishing a mass-compliance resonant frequency of the order of 250 Hz.

5,468,923

MOLDED MUFFLER

Hendrik Kleyn, Grandville, Mich., assignor to Kleyn Die Engravers, Inc., Jenison, Mich.

Filed Feb. 7, 1994, Ser. No. 192,594
Int. Cl.[6] F01N 7/18
U.S. Cl. 181—282 15 Claims



1. A muffler comprising:

an assembly of two polymeric muffler halves, said muffler halves each including an outer wall defining an interior and an exterior of said muffler, and a plurality of integral baffle walls disposed within said interior of said muffler, wherein said interior of said muffler is divided into a plurality of chambers, said outer walls and said baffle walls each including mating edges, said muffler halves being joined along said mating edges of said outer walls and said baffle walls;

one input pipe and one output pipe each disposed on and extending through said outer wall of said muffler, wherein said interior of said muffler is in communication with said exterior of said muffler; and

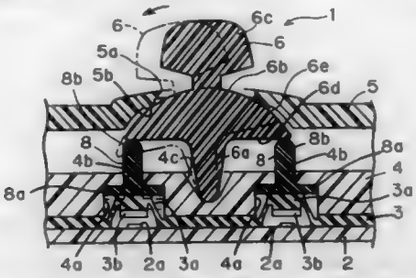
a plurality of gas flow openings disposed within said baffle walls, wherein said plurality of chambers are in communication with each other and said input and output pipes, said gas flow openings disposed such that they do not intersect said mating edges of said muffler halves.

5,468,924

JOY STICK SUPPORT STRUCTURE FOR MULTI-DIRECTIONAL SWITCH

Kiyotaka Naitou, and Junichi Kojima, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Filed Jun. 7, 1994, Ser. No. 254,927
Claims priority, application Japan, Jul. 1, 1993, 5-190790; Sep. 13, 1993, 5-054760 U
Int. Cl.[6] H01N 25/04
U.S. Cl. 200—6 A 12 Claims



1. A support structure for a joystick for a multidirectional switch, said switch comprising at least three circumferentially spaced switch portions, each of said switch portions comprising a first contact and a second contact, said multidirectional switch having a neutral position, wherein each said first contact and said second contact are separated from each other, and an actuating position, wherein at least one said first contact is in contact with a corresponding said second contact, said switch portions yieldably urging said joystick into said neutral position, inclination of said joystick selectively operating said switch portions, and a cover panel for covering said switch portions and having a through hole through which an operating portion of said joystick projects,

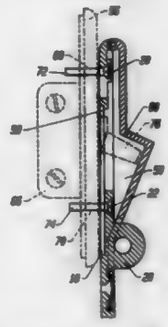
said joystick comprising a support portion supported pivotally about one end thereof adjacent said switch portions, a slidable contact spherical portion bulging from the other end of said support portion and having a spherical surface slidably abutting, through at least part of its circumference, against an inner peripheral surface of said through hole when pivoted, said operating portion projecting from said spherical surface.

5,468,925

ENCLOSURE FOR AN ELECTRICAL SWITCH

Jafar Mohsen, 409 Honker La., Suisun City, Calif. 94585

Filed Apr. 21, 1994, Ser. No. 231,023
Int. Cl.[6] H01H 9/28
U.S. Cl. 200—43.22 10 Claims



1. An enclosure selectively usable for one of a plurality of electrical switch actuators movable between first and second opposite actuator positions, and associated cover secured thereto by at least one exposed fastener extending through a fastener opening in said cover, a first of said actuators movable in a first predetermined path and a second of said actuators movable in a second predetermined path different from said first predetermined path comprising:

a. a plate, said plate being capable of being positioned against the cover associated with the electrical switch actuator;

b. holding means for selectively maintaining said positioning of said plate against the cover associated with the electrical switch actuator in a first position corresponding to said first actuator position and in a second position inverted from said first position corresponding to said second actuator position, said holding means adapted to cooperate with said exposed fastener of the cover associated with the switch actuator;

c. a flap, said flap being linked to said plate and being movable relative to said plate to selectively lie against the plate and to lie away from said plate, said flap having a first wall portion defining a first compartment adapted to intersect said first predetermined path and having a second wall portion defining an adjacent second compartment adapted to intersect said second predetermined path, said respective wall portions defining stop means for preventing movement of a selected switch actuator when said plate is selectively positioned in said first position and said second position inverted from said first position; and

d. securing means for preventing movement of said flap relative to said plate when said plate is selectively positioned in said first position and said second position inverted from said first position.

5,468,926

SWITCH DEVICE

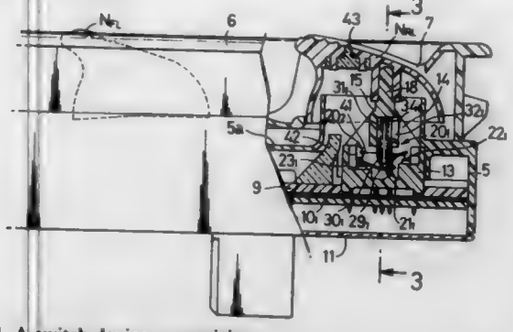
Hiroshi Sato, Saitama, Japan, assignor to Toyo Denso Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1994, Ser. No. 233,783

Claims priority, application Japan, Apr. 27, 1993, 5-022239 U

Int. Cl.[6] H01H *21/82*

U.S. Cl. 200—558 **11 Claims**



1. A switch device, comprising:

a conductive plate embedded in a housing of synthetic resin and having a projecting end projecting from said housing, said projecting end having a non-bent, flat, plate-like configuration;

a pair of stationary contacts fixed on the housing on opposite sides of said conductive plate;

a movable contact continuously provided with first and second opposing inclined portions along a longitudinal axis thereof defining a substantially V-shape and provided at outer ends of said inclined portions with contact portions capable of being individually brought into contact with said stationary contacts, said first inclined portion of said movable contact being pivotally supported about a transverse axis thereof on said projecting end of said conductive plate;

an operating member mounted on said housing and about an axis parallel to said axis of pivoting movement of said movable contact; and

an urging pin carried on said operating member and biased toward the movable contact by a spring, said urging member being slidable on said moving contact between opposite sides of said conducting plate;

wherein said switch device is switchable in order to selectively bring said contact portions into and out of contact with said stationary contacts depending upon the sliding movement said urging on said movable contact in response to swinging movement of said operating member, and further wherein said first inclined portion of said movable contact is integrally provided, at opposite lateral sides thereof, with support sections for receiving said projecting end of said conductive plate, and wherein each support section is formed in a trapezoidal shape by a protruding portion protruding sideways from said first inclined portion, a supporting plate portion continuously formed on an edge of said protruding portion adjacent the first inclined portion and extending on the side of said first inclined portion, and a limiting plate portion continuously formed on an edge of said protruding portion adjacent the second inclined portion.

5,468,927

WIRE BONDING APPARATUS

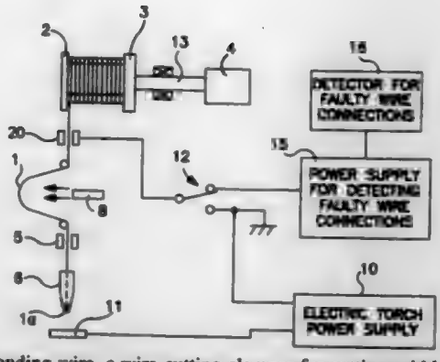
Yoshimitsu Terakado, Tokyo, Japan, assignor to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Sep. 21, 1994, Ser. No. 309,936

Claims priority, application Japan, Sep. 21, 1993, 5-257645

Int. Cl.[6] B23K *20/10;101/38*

U.S. Cl. 219—56.21 **6 Claims**



4. A wire bonding apparatus comprising a wire spool for feeding out a bonding wire, a slack forming means for forming a slack in said bonding wire, a wire-cutting clamper for cutting said bonding wire, a capillary for guiding said bonding wire to bonding points, an electrical torch for forming a ball on said bonding wire, which are arranged vertically, an electric torch power supply connected to said electrical torch and a power supply for detecting faulty electrical connections connected to a faulty wire connection detector, said apparatus further comprising:

an electrical connection clamper for accomplishing an electrical connection between said bonding wire and said electric torch power supply or said power supply for detecting faulty electrical connections, said electrical connection clamper being provided between said wire spool and said wire cutting clamper; and

a switch means for selectively connecting said electric torch power supply and said power supply for detecting faulty electrical connections to said electrical connection clamper.

5,468,928

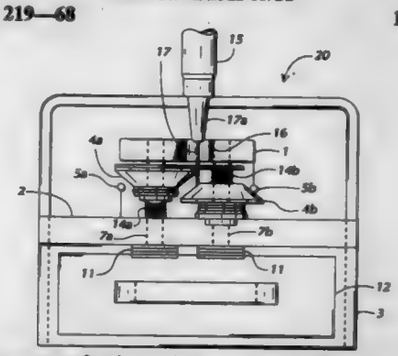
PORTABLE APPARATUS FOR DESTROYING SYRINGE-TYPE NEEDLES

Richard D. Yelvington, Jacksonville, Fla., assignor to Inventive Services, Inc., Jacksonville Beach, Fla.

Continuation-in-part of Ser. No. 75,670, Jun. 11, 1993. This application Mar. 29, 1994, Ser. No. 219,767

Int. Cl.[6] B23K *11/22*

U.S. Cl. 219—68 **12 Claims**



1. An apparatus for destroying metal needles having a shaft and a tip, said apparatus comprising:

a housing having an air intake opening, an exhaust opening and a needle entry portal formed therein;

first and second electrodes contained in said housing, said first and second electrodes mounted on mounting means a predetermined distance away from each other in an overlapping relationship to each other;

a fan contained in said housing, said fan disposed a predetermined distance away from said first and second electrodes;

a power source contained in said housing, said power source connected by a first conductive lead to said first electrode and by a second conductive lead to said second electrode to provide a voltage differential across said first and second electrodes;

a switching means contained in said housing, said switching means electrically coupled to said power source, to said fan,

and to either of said first or second leads such that when a metal needle is inserted between said first and second electrodes, the metal needle forms a resistive load between said first and second electrodes which causes the metal needle to be incinerated and which causes said switching means to turn said fan on for a predetermined period of time, whereby said fan pulls smoke and emissions produced during incineration through said housing.

5,468,929

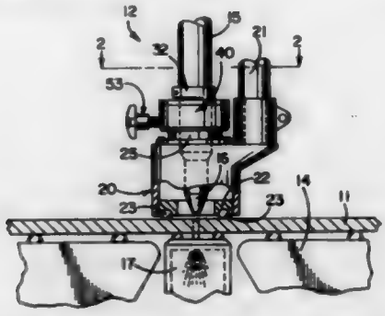
APPARATUS FOR ADJUSTING THE STAND-OFF HEIGHT OF A PLASMA ARC TORCH OR THE LIKE

Theodore F. Brotund, Rockford, and Eugene H. Paquet, Byron, both of Ill., assignors to W. A. Whitney Co., Rockford, Ill.

Filed Dec. 22, 1994, Ser. No. 361,639

Int. Cl.[6] B23K *10/00*

U.S. Cl. 219—121.56 **10 Claims**



1. Apparatus for establishing the standoff height of a metal melting tool with respect to an underlying metal workpiece, said apparatus comprising a main support for attachment to a metal melting tool and adapted to be held in a vertically fixed position during melting of a workpiece by the tool, an adaptor fixedly connected to said tool and telescoped into said support for up and down sliding relative thereto, a collar rotatably supported on said adaptor, adjusting means for providing vertical movement of said adaptor relative to said support in response to rotation of said collar, Said rotation being motivated by an externally applied force, and locking means coacting between said support, said adaptor and said collar for preventing vertical movement of said adaptor relative to said support when said locking means is engaged, while permitting such vertical movement when said locking means is released and said collar is rotated on said adaptor.

5,468,930

LASER SPUTTERING APPARATUS

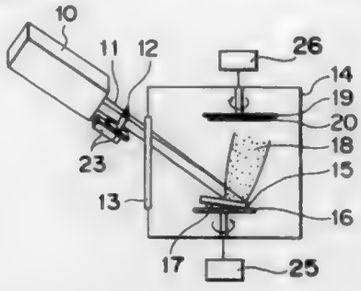
Yukio Nishikawa, Ikeda; Kunio Tanaka, Osaka, and Yoshikazu Yoshida, Izumi, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 10, 1993, Ser. No. 29,410

Claims priority, application Japan, Mar. 11, 1992, 4-052535

Int. Cl.[6] B23K *26/02;26/00*

U.S. Cl. 219—121.6 **6 Claims**



1. A laser sputtering apparatus comprising:

a vacuum chamber;

a target-supporting member rotatably mounted in said vacuum chamber for supporting a target for rotation about a first rotational axis;

a target-inclining member mounted on said target-supporting member for inclining the target relative to said target-supporting member;

a substrate-supporting member for supporting a substrate parallel with said target-supporting member, said substrate-supporting member being rotatably mounted in said vacuum chamber for rotation about a second rotational axis, said second rotational axis being not coaxial with said first rotational axis;

first and second rotary driving devices for rotating said target-supporting member and said substrate-supporting member about said first and second rotational axes, respectively, such that at least one of a rotational direction and an angular velocity of said substrate-supporting member is different than that of said target-supporting member;

a laser oscillator for emitting a laser beam; and

an optical device for causing irradiation of the target supported on said target-supporting member, said optical device comprising a condenser lens and a moving mechanism for moving said condenser lens along an optical axis of the laser beam emitted by said laser oscillator.

5,468,931

TOOL ASSEMBLY FOR A PUNCH PRESS HAVING A LASER WELDING APPARATUS

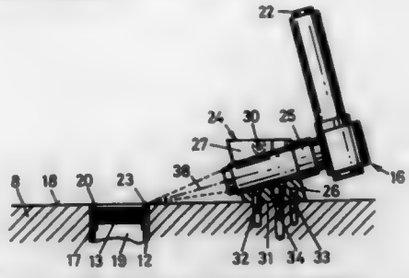
Ingomar J. K. Summeraner, and Waldemar Hellwig, both of Arbon, Switzerland, assignors to Bruderer AG, Frasnacht, Switzerland

Filed Sep. 23, 1993, Ser. No. 126,062

Claims priority, application Switzerland, Jan. 23, 1992, 03300/92

Int. Cl.[6] B23K *26/00*

U.S. Cl. 219—121.63 **7 Claims**



1. A tool assembly for a punch press comprising:

at least one laser welding apparatus, said laser welding apparatus including a focusing device and at least one supporting block for a guided supporting of said focusing device, said focusing device having a predetermined focal length and a predetermined focal point;

a lower tool having a working surface, which has at least one recess at which a die is inserted, said die having a cutting edge which is aligned with said working surface;

said supporting block being designed and arranged so that a laser beam emitted by said focusing device when mounted to said supporting block is focused to a predetermined welding point at the die which corresponds to said predetermined focal point of said focusing device to perform a welding operation on workpieces located thereat;

said supporting block including at least one side guiding surface for positioning said focusing device relative to said predetermined welding point;

said supporting block having a bottom guiding surface for resting on a supporting surface to set a height position of said focusing device relative to said working surface.

5,468,932

METHOD OF GENERATING A PATTERN IN THE SURFACE OF A WORKPIECE

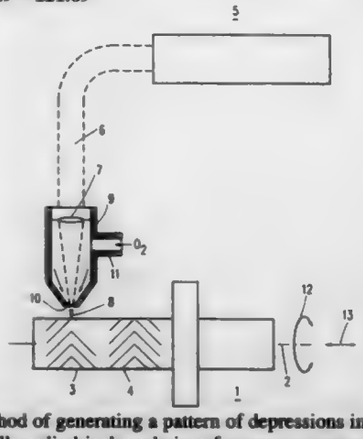
Heinz J. Jacob, Norderstedt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 23,255, Feb. 25, 1993, abandoned. This application Dec. 16, 1993, Ser. No. 168,701

Claims priority, application Germany, Feb. 27, 1992, 42 06 002.8

Int. Cl.[6] B23K *26/14*

U.S. Cl. 219—121.69 **4 Claims**



1. A method of generating a pattern of depressions in the surface of a generally cylindrical workpiece for use as a groove bearing in a rotary anode X-ray tube, said cylindrical workpiece being constituted of molybdenum or of a molybdenum alloy having a melting point at a first temperature and having an oxide having a sublimation point at a second temperature below the first temperature, comprising the steps:

a) providing a laser beam source,

b) directing the laser beam at the cylindrical surface of the workpiece to form a heated spot at a third temperature lying below the first temperature but above the second temperature,

c) moving the heated spot over the surface of the workpiece to trace the pattern of depressions to be formed,

d) while carrying out step c), directing a jet of oxygen at the heated spot,

e) step d) being carried out while controlling the energy of the laser beam such that only a local region of the workpiece oxidizes and the oxide sublimates to form the pattern of depressions.

5,468,933

ROD FLAME GLOW PLUG HAVING A COFE ALLOY REGULATING COIL AND A HOUSING HAVING A FUEL CONNECTION FOR A METERING DEVICE

Martin Eller, Ludwigsburg, Germany, assignor to Beru Ruprecht GmbH & Co. KG, Ludwigshafen, Germany

Filed Jan. 19, 1994, Ser. No. 183,341

Claims priority, application Germany, Jan. 19, 1993, 43 01 252.3

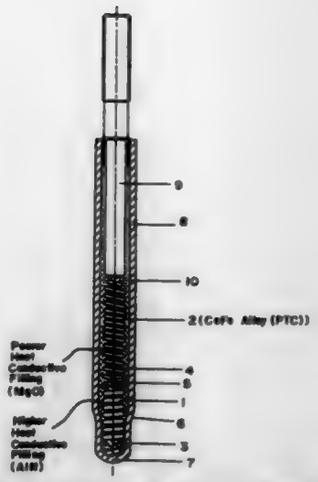
Int. Cl.[6] F23Q *7/00*; F02N *17/047*; H05B *3/48*

U.S. Cl. 219—270 **13 Claims**

1. Rod flame glow plug for preheating intake air of an autoignition internal combustion engine comprising:

a housing having a fuel connection for a metering device and an electric connection for a power supply at a first end portion thereof and having an axially extending inner space at an opposite end portion thereof, and

at least one heating rod, said heating rod being located in the axially extending inner space of the housing so as to project from said housing at a free end of the heating rod, said heating rod being formed of a glow tube filled with an electrically insulative filling material and a coil assembly having at least one regulating coil and at least one heating coil, the glow tube having a closed end and the coils of said



coil assembly being embedded in the filling material and being connected in series to one another and to the electric connection with the at least one heating coil located nearer to the closed tip end of the glow tube than the at least one regulating coil;

wherein the regulating coil is formed of a CoFe alloy; and wherein a distance between each of plural adjacent windings of the at least one regulating coil in an area of the end thereof which is connected to the at least one heating coil is greater than a distance between windings of the at least one regulating coil in other areas thereof.

5,468,934

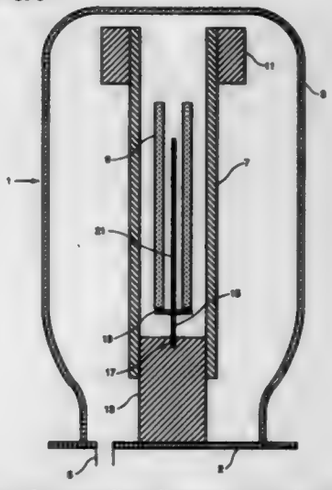
APPARATUS FOR ANNEALING DIAMOND WATER JET MIXING TUBES

Thomas R. Anthony, Niskayuna, and James F. Fleischer, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 15, 1994, Ser. No. 267,181

Int. Cl.[6] F27B *5/16*

U.S. Cl. 219—390 **6 Claims**



1. Apparatus for annealing diamond water jet mixing tubes, comprising:

an enclosure having means for charging a gas to a pressure up to about 5 atmospheres;

a cylindrical heating tube having a predetermined length and diameter positioned vertically in said enclosure, said tube being of a refractory metal and having an upper end, a lower end, a cylindrical wall and a length effective to avoid large

thermal gradients in an area surrounding a diamond mixing tube to be annealed therein;

heating means for isothermally heating said heating tube to a temperature in the range of about 1100°–2000° C.;

a rack centered horizontally in and with respect to the wall of said heating tube and fixed to a rack base, said rack being of a refractory material and comprising a vertical rod and a horizontal support fixed to said vertical rod, said support being of a size to support said mixing tube and being spaced from said rack base at a distance such that said mixing tube is contained entirely within and vertically centered in said heating tube.

5,468,935

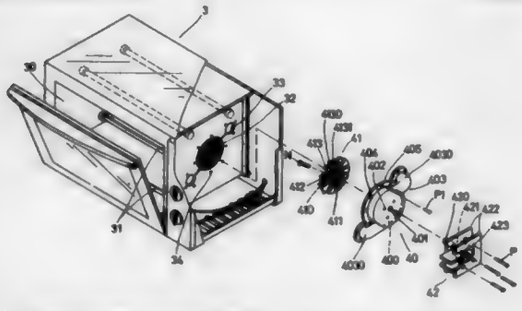
L-ELECTRIC CONVENTIONAL ROASTER OVEN WITH WHIRLPOOL AIR CIRCULATION

Ching-Haiang Wang, No. 9, Lane 110, Sec. 4, Si-Men Road, Tainan, Taiwan, Prov. of China

Filed Dec. 10, 1994, Ser. No. 360,256

Int. Cl.[6] F27D *7/04;* **A21B** *1/26*

U.S. Cl. 219—400 **3 Claims**



1. A roaster oven comprising:

a) an oven housing including a hollow roast chamber for containing an article to be roasted, an electric heating tube at each of an upper portion and a lower portion of the roast chamber, a front wall, an air inlet, and two air outlets in the front wall, the air outlets being positioned at an upper right side and a lower left side of the air inlet;

b) a whirlpool circulating device including a fan housing, a fan, and a power source for driving the fan;

c) the fan housing including a center air current chamber having an air opening, a bottom wall, an outer side, a center shaft hole in the bottom wall and a whirlpool circulating tube extending tangentially from each of an upper side and a lower side of the current chamber, with each circulating tube having an air opening;

d) the fan being positioned within the air current chamber and including a shaft sleeve;

e) the power source being secured on the outer side of the fan housing and including a motor, a transmitting shaft having a first end secured to the motor and a second end extending through the center shaft hole of the fan housing and secured with the shaft sleeve of the fan;

f) the air openings of the current chamber being fixed to the air inlet and the air openings of the circulating tubes being fixed to the air outlets; and

g) wherein when the fan is rotated by the motor, air is blown into the roast chamber through the air inlet and heated by the electric heating tubes, with the heated air being thereafter directed through the air outlets and into the whirlpool circulating tubes from which the air is caused to circulate as a whirlpool and be redirected into the roast chamber through the air inlet for thoroughly and evenly roasting an article placed within the roast chamber.

5,468,936

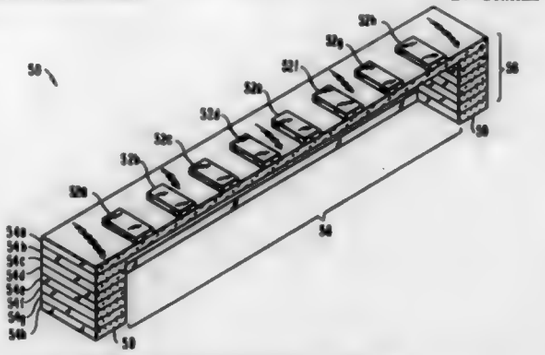
HEATER HAVING A MULTIPLE-LAYER CERAMIC SUBSTRATE AND METHOD OF FABRICATION

Seetharama C. Deevi, Midlothian; Mohammad R. Hajaligol; Pamela D. Lieberman, both of Richmond; Walter A. Nichols, Chesterfield, and Michael L. Watkins, Chester, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 23, 1993, Ser. No. 35,733

Int. Cl.[6] H05B *3/16;3/26*

U.S. Cl. 219—553 **27 Claims**



1. An electrically powered heater comprising:

a plurality of adhered ceramic layers forming a multiple-layer ceramic substrate, said multiple-layer substrate having a first surface substrate layer and a second surface substrate layer, said second surface substrate layer comprising border portions adhered to an inner side of said first surface substrate layer along an outer border of said first surface substrate layer; and

a resistive heating element disposed on an outer side of said first surface substrate layer, wherein an internal cavity is defined by the inner side of said first surface substrate layer and inner sides of the border portions of second surface substrate layer.

5,468,937

IMPURITY REMOVING SYSTEM FOR THE DELIVERY OF HIGH PURITY GASES

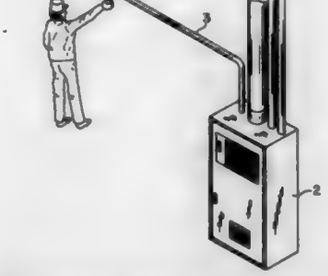
Kazuo Yokogi, Tokyo, Japan, assignor to Teisan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1994, Ser. No. 222,924

Claims priority, application Japan, Apr. 7, 1993, 5-080802

Int. Cl.[6] H05B *6/10*

U.S. Cl. 219—634 **17 Claims**



1. An impurity removing system for the delivery of high purity gases comprising;

(a) a length of pipe for conveying a supply of high purity gases having an outer surface and an inner surface;

(b) a dielectric layer coated on the inner surface of the length of pipe, and;

(c) an impurity removing high frequency induction heater for supplying electrical energy to the dielectric layer which is converted to thermal energy in the dielectric layer coated on the inner surface of the length of pipe.

5,468,938

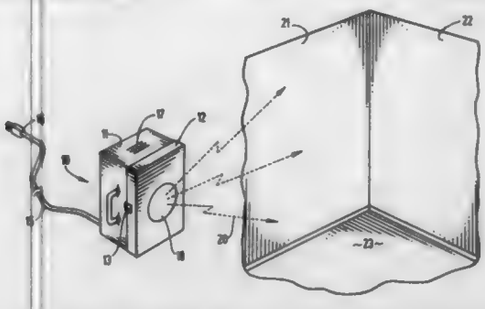
MICROWAVE RADIATION INSERT EXTERMINATOR

Stephen Roy, 10117 Sepulveda Blvd., Suite 206, Mission Hills, Calif. 91345

Continuation of Ser. No. 408,273, Sep. 18, 1989, abandoned. This application Jan. 26, 1994, Ser. No. 188,356

Int. Cl.[6] H05B *6/80*

U.S. Cl. 219—690 **12 Claims**



1. An insect exterminating device emitting a microwave frequency signal for exterminting insects located in a structure comprising:

a portable housing adapted to be transported from place to place for repeated use, said portable housing capable of being hand lifted and positioned within a structure;

a low powered magnetron assembly disposed within said housing for generating microwave energy as high frequency waves less than three meters in length;

a variable length horn-shaped wave guiding means operably coupled to said magnetron assembly for radiating said microwave energy through said wave guiding means to uniformly expose a specific target area external to said housing to said microwave energy whereby any insects located in the target area are exterminated by said microwave energy;

power supply means within said portable housing operably connected to said magnetron assembly for powering said magnetron assembly;

said housing includes a fan and vent means in close proximity to said magnetron assembly for cooling said magnetron assembly;

an overheating protection circuit operably coupling said magnetron assembly to said power supply including a temperature sensor enclosed in said magnetron assembly;

a digital timer circuit operatively coupled between said magnetron assembly and said power supply and including an operational starting circuit with a start button;

said power supply further includes a power transformer control coupling a high voltage power transformer to said digital timer assembly; and,

an output of said power transformer coupled to said magnetron assembly via a high voltage rectified power supply.

5,468,939

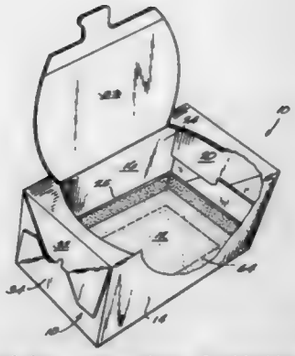
MICROWAVE COOKING CONTAINER WITH REFLECTORS

John A. MacLean, IV, 11428 N. Vega Ave., Mequon, Wis. 53092

Filed Jul. 1, 1994, Ser. No. 270,024

Int. Cl.[6] H05B *6/80*

U.S. Cl. 219—727 **17 Claims**



1. A microwave cooking container having bottom, side, front, rear and top walls,

the bottom wall of said container and the lower portions of the side, front and rear walls defining a food receiving space in the lower portion of the container,

the upper portion of the container defining a food expansion space to accommodate expansion of the food product as a result of the heating thereof,

means disposed on the bottom wall and along the lower portion of each of the front, rear and side walls for reflecting microwave radiation inwardly toward said food receiving space, the top wall and the upper portions of said side, front and rear walls being free of said means for reflecting, whereby microwave radiation may pass through the top wall and the upper portions of the side, front and rear walls for impacting said food receiving space and microwave radiation impacting the means for reflecting is reflected back into the food receiving space.

5,468,940

MICROWAVE OVEN FOR SIMULTANEOUSLY COOKING TWO DISHES OF FOOD

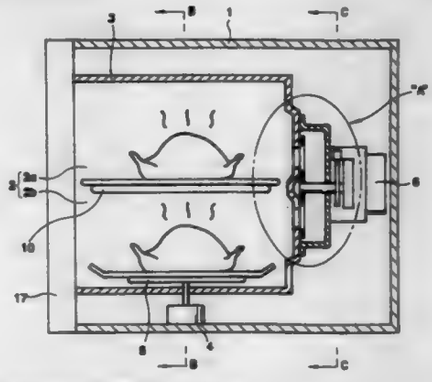
Hyung J. Kang, Kwangmyung, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Nov. 10, 1994, Ser. No. 336,910

Claims priority, application Rep. of Korea, Nov. 13, 1993, 24123/1993

Int. Cl.[6] H05B *6/72*

U.S. Cl. 219—746 **4 Claims**



1. A microwave oven comprising:

a cavity having a magnetron provided at one side of the cavity;

a shelf mounted detachably in said cavity, said shelf dividing said cavity into an upper heating zone and a lower heating zone; and

an upper sensor and a lower sensor mounted to said cavity in positions corresponding to said upper and lower heating zones, said upper and lower sensors sensing the vapor or gas output from the upper and lower heating zones respectively;

means for comparing and determining signals from said upper and lower sensors to provide an output signal;

a step motor, adjacent to the magnetron, for generating torque on a motor shaft upon receipt of a controlling signal;

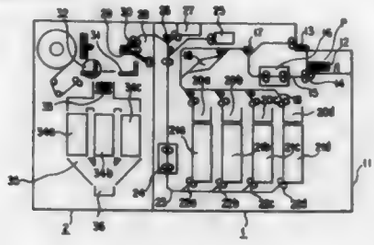
a motor controlling means for applying the controlling signal to the step motor in response to the output signal from the comparing and determining means; and

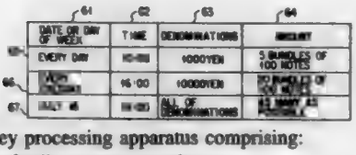
a microwave inflow means driven by the motor shaft for selectively controlling flow of microwave energy into the upper and lower heating zones according to a rotation direction and rotation angle of the motor shaft.

5,468,941
MONEY PROCESSING APPARATUS HAVING TIMER MEANS

Kazuhito Sasaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 14, 1994, Ser. No. 274,683
Claims priority, application Japan, Jul. 16, 1993, 5-176534
Int. Cl.[6] G06F *17/00*
U.S. Cl. 235—379 **9 Claims**



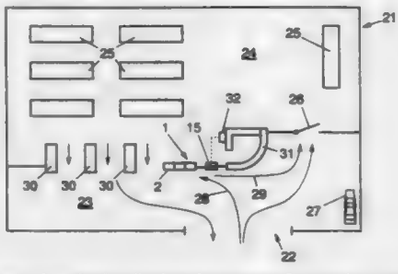


1. A money processing apparatus comprising:
means for feeding money one by one;
means for discriminating denominations of the money fed from the feeding means;
means for storing the money for each of the denominations discriminated by the discriminating means;
means for setting a predetermined time and date;
means for producing present time and date, and producing a signal when the present time and date coincide with said predetermined time and date respectively; and
means for removing the money from the storing means in response to the signal produced from the producing means and forming a bundle of a predetermined number of money.

5,468,942
DISPENSING DEVICE FOR HAND SCANNERS ACCESSIBLE FROM TWO SIDES

Leendert Oosterveen, CH Hoogland; Jacobus H. M. Lombaers, WC Utrecht, and Johannes Dorsman, VL Dordrecht, all of, Netherlands, assignors to Ahold Retail Services AG, Klosters, Switzerland

Filed Apr. 18, 1994, Ser. No. 229,265
Int. Cl.[6] G06K *15/00*
U.S. Cl. 235—383 **22 Claims**

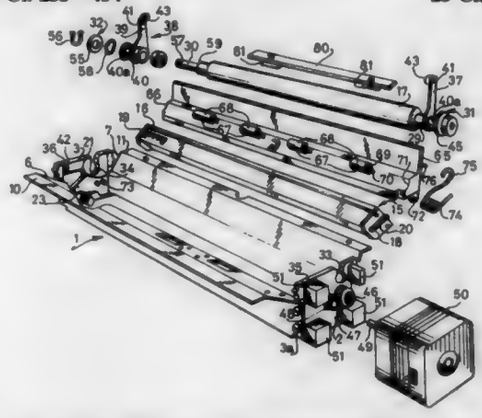


1. A dispensing device for hand scanners for use in a self-service store adapted for use of a self-scanning system, comprising:
a) an identification device for the customers; and
b) a plurality of accommodating elements for hand scanners;
c) a rack with front and rear sides and lateral ends, said rack including said accommodating elements for said scanners, said accommodating elements being positioned in said rack so as to be accessible from two otherwise separate sections of the store through the front side and the rear side of said rack, respectively; and
d) a plurality of hand-scanners, one of which is positioned in each of at least some of said accommodating elements so that they are each accessible from said two otherwise separate sections of the store through said front side and said rear side of said rack, respectively.

5,468,943
DEVICE FOR ANALYZING INFORMATION MEDIA WITH AN ELASTICALLY MOUNTED IMAGE SENSOR

Jean-Marie Gatto, and Dominique Bertrand, both of Paris, France, assignors to International Des Jeux, France

Filed Sep. 15, 1993, Ser. No. 121,503
Claims priority, application France, Sep. 17, 1992, 92 11112; Dec. 31, 1992, 92 16008; Jan. 13, 1993, 93 00215
Int. Cl.[6] G06K *7/10*
U.S. Cl. 235—454 **25 Claims**



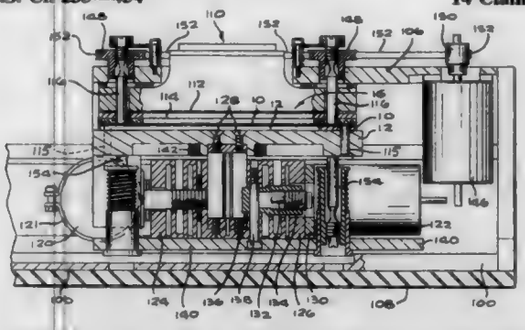
1. A device for analyzing an information medium, particularly gaming slips or receipts, the analysis device comprising:
means for inserting the medium;
means for reading the information on the medium; and
means for processing the information read from the medium with a view to converting it into digital data and to transmitting it,
the reading means comprising,
an image detector (**15**;**115**;**215**) of elongate shape suspended in a casing (**1**,**2**,**3**;**201**) and having, at its ends, mounting means (**20**) interacting with complementary mounting means (**21**) provided in the corresponding end walls (**2**,**3**) of the casing, elastic members (**23**) interposed between the image detector (**15**) and the casing (**22**), and
means for entraining the information media past the image detector, comprising a roll (**17**) and an electric motor (**50**) for rotating the roll, the roll (**17**;**123**;**217**) being mounted in the end walls (**2**,**3**) of the casing by means of latches (**37**,**38**) and holding the image detector (**15**;**115**;**215**) in the casing, the elastic members (**23**) applying the image detector (**15**;**115**;**215**) against the surface of the roll either in the presence of an information medium between the image detector (**15**;**115**;**215**) and the roll (**17**;**123**;**217**), or when it is empty,
wherein the casing of the device in cross-section has the shape of a flared U which is closed at its ends by flanges (**2**,**3**) made of plastic and in that the image detector (**15**) includes, at its ends, mounting plates (**18**,**19**) provided with ribs (**20**) interacting with inclined furrows (**21**) made in the end flanges (**2**,**3**) of the casing (**1**), the mounting plates (**18**,**19**) and the inclined furrows (**21**) constituting the complementary means for mounting the image detector (**15**) in the casing.

5,468,944

HIGH-SPEED OPTICAL RECORDING AND PLAYBACK APPARATUS CAPABLE OF RECORDING AND RETRIEVING DIGITAL DATA FROM AN OPTICAL STORAGE CARD

Sydney Urshan, 6830 Morella Ave., North Hollywood, Calif. 91605; Curtis K. Deckert, 18061 Darmel Pl., Santa Ana, Calif. 92705, and Oscar Gonzales, 730 Nowita Pl., Venice, Calif. 90291

Filed Jun. 16, 1993, Ser. No. 77,095
Int. Cl.[6] G06K *7/00*
U.S. Cl. 235—454 **14 Claims**



1. Digital data recording and playback apparatus comprising: a flat, two-dimensional array of laser/photo diodes; support means for positioning an optical storage card below the array; a first mechanism engaging said support means for moving the card in both the X- and Y-directions to align the card with the laser/photo diode array and subsequently to position the laser/photo diode array over any one particular location on the card; a second mechanism engaging said support means to turn the card to a particular angular position with respect to the laser/photo diode array for aligning purposes; a third mechanism engaging said support means for moving the card in the Z-direction with respect to said laser/photo diode array for focusing purposes; and electronic circuitry connected to said array for processing electric signals generated from and introduced to said array.

5,468,945

METHOD AND APPARATUS FOR LOCATING AND DECODING A POSTNET FORWARDING BAR CODE IN A FIELD OF POSTNET BAR CODES

George R. Huggett, Mercer Island, and William M. McDonald, Lake Stevens, both of Wash., assignors to Intermec Corporation, Everett, Wash.

Filed Feb. 25, 1994, Ser. No. 201,764
Int. Cl.[6] G06K *7/10*
U.S. Cl. 235—462 **10 Claims**

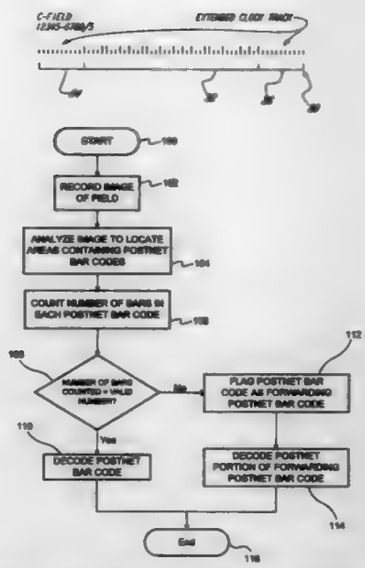
1. In a bar code reader, an apparatus for locating and decoding in a field on a document a Postnet bar code designating a zip code address, said Postnet bar code appearing either alone or as part of a forwarding bar code, said Postnet bar code consisting of one of several valid numbers of bars, said forwarding bar code composed of a Postnet bar code designating a forwarding address zip code followed or preceded by a number of bars with the total number of bars in said forwarding bar code being different from any of said valid number of bars, said apparatus comprising:

means for recording an image of the field in a memory;

means for analyzing the image recorded in the memory to locate areas in the field that potentially contain all of the bar codes in the field;

means responsive to said means for analyzing for counting the number of bars in each bar code and identifying as said forwarding Postnet bar code a bar code having a number of bars different from any of said valid numbers of bars; and

means responsive to said means for analyzing and said means for counting for decoding said Postnet bar code appearing alone if said means for counting did not identify a forwarding bar code in said field and for decoding said Postnet bar code



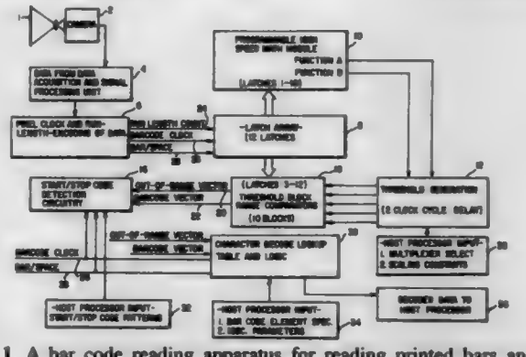
appearing as pan of said forwarding bar code if said means for counting identified a forwarding bar code in said field whereby said means for analyzing is used both to identify said forwarding bar codes and to decode said Postnet bar codes.

5,468,946

METHOD AND APPARATUS FOR DECODING MULTI-LEVEL BAR CODES OR BI-LEVEL BAR CODES

James A. Oliver, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 29, 1994, Ser. No. 236,431
Int. Cl.[6] G06K *7/10*
U.S. Cl. 235—462 **20 Claims**



1. A bar code reading apparatus for reading printed bars and spaces, each defining an element having a predetermined number of modules per element, said apparatus comprising:

a) means for scanning an item and generating a data signal;

b) means for converting said data signal to a run-lengthcount of pixels per element;

c) means for loading a next element run length count into a sequential latch array;

d) means for summing the run length count for a predetermined number of elements in the sequential latch array;

e) means for comparing the run length count in each latch in the sequential latch array to a plurality of threshold values to determine if the run length count is within a range associated with a valid bar code element;

f) means for determining the number of modules associated with each element;

g) means for identifying an initializing pattern; and

h) means for accessing a look-up table to decode character information based on the number of modules in each element after detection of the initializing pattern.

5,468,947

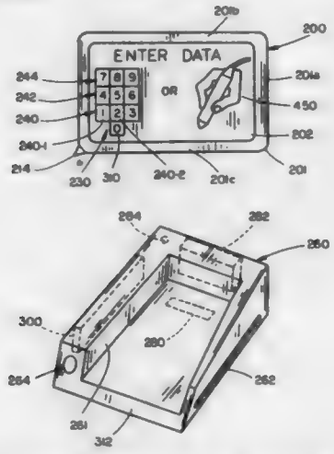
POCKET SIZE DATA CAPTURE UNIT WITH PROCESSOR AND SHELL MODULES

Arvin D. Danielson, Solon, and Dennis A. Durbin, Cedar Rapids, both of Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 451,322, Dec. 15, 1989, Pat. No. 5,227,614, and a continuation-in-part of Ser. No. 947,036, Sep. 16, 1992, Pat. No. 5,308,966, which is a continuation of Ser. No. 875,791, Apr. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 422,052, Oct. 16, 1989, abandoned, which is a division of Ser. No. 894,689, Aug. 8, 1986, Pat. No. 4,877,949, said Ser. No. 451,322is a continuation-in-part of Ser. No. 143,921, Jan. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 897,547, Aug. 15, 1986, abandoned. This application Mar. 29, 1993, Ser. No. 40,313

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—472 **22 Claims**



1. A hand-held data processing system, comprising:

a self-contained computerized processing module for computerized processing of data;

said processing module having a graphical display with a display screen occupying substantially an entire broad side of the processing module;

means for displaying information over substantially the entire surface of the display screen;

said self-contained computerized processing module having a size so as to be readily contained in a shirt pocket; and

said processing module further including optical reader means for effecting the input of optical information.

5,468,948

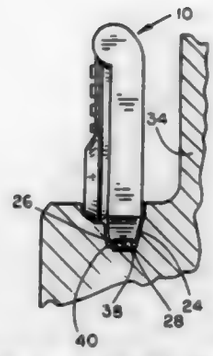
HAND-HELD DATA TERMINAL AND COMMUNICATOR

Steven E. Koenck; Phillip Miller, and Darald R. Schultz, all of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Continuation of Ser. No. 25,039, Mar. 1, 1993, Pat. No. 5,324,925, which is a continuation-in-part of Ser. No. 996,908, Dec. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 951,263, Sep. 25, 1992, abandoned. This application Jun. 23, 1994, Ser. No. 264,820

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—472 **3 Claims**



1. A hand-held portable terminal and docking system, comprising:

(a) a housing;

(b) a keypad disposed within said housing for entering information into said terminal;

(c) a display disposed within said housing for displaying information;

(d) a low power, frequency hopping, transceiver disposed at least partially within said housing for receiving and transmitting information by said terminal, wherein said low power frequency hopping transceiver further comprises voice communication means;

(e) at least one of a scanner and a bar code reader disposed within said housing for optically reading information stored in coded information sets;

(f) a battery disposed within said housing for providing electrical power thereto;

(g) a computer, disposed within said housing, for processing information input and output said terminal; and

(h) a dock for removably receiving at least one hand-held portable terminal for at least one of recharging said battery disposed within said housing and communicating with said at least one hand-held portable terminal.

5,468,949

PORTABLE LASER DIODE SCANNING HEAD

Jerome Swartz, Setauket; Howard M. Shepard, Great River, both of N.Y.; Eric F. Barkan, San Francisco, Calif.; Mark J. Krichever; Boris Metlitsky, both of Hauppauge, N.Y.; Edward Barkan, South Setauket, N.Y., and Alexander M. Adelson, Peekskill, N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Division of Ser. No. 931,728, Aug. 18, 1992, Pat. No. 5,250,797, which is a division of Ser. No. 690,705, Apr. 24, 1991, Pat. No. 5,149,950, which is a division of Ser. No. 454,144, Dec. 21, 1989, Pat. No. 5,021,641, which is a division of Ser. No. 295,151, Jan. 9, 1989, Pat. No. 4,897,532, which is a continuation of Ser. No. 148,669, Jan. 26, 1988, Pat. No. 4,825,057, which is a division of Ser. No. 706,502, Feb. 28, 1985, abandoned. This application Jun. 11, 1993, Ser. No. 74,641

The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—472 **21 Claims**

1. A light scanning system for reading light-reflective indicia, comprising:

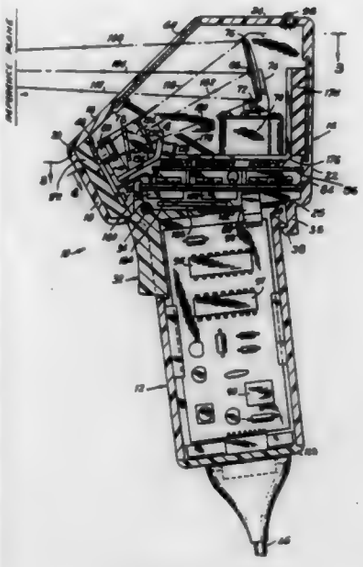
(a) a hand-held scanning head having a body portion and a handle portion;

(b) means within the body portion for generating a scanning light beam and for directing said light beam along a first optical path toward said indicia for reflection therefrom;

(c) sensor means mounted in the body portion for detecting the variable intensity of at least a returning portion of said light beam traveling along a second optical path away from said indicia back toward the head;

(d) said handle portion being connected to said body portion and accommodating at least one printed circuit board such that said circuit board is adapted to be electrically connected to said scanning light beam generating means; and

(e) means for changing said at least one printed circuit board or for adding a further printed circuit board in said handle portion to change system operation.



5,468,950

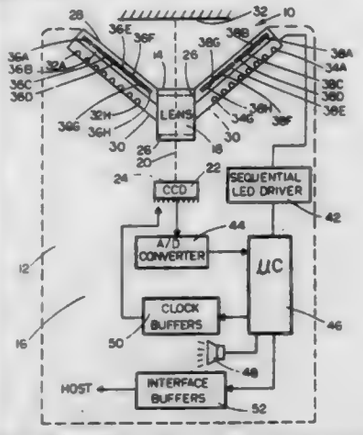
CHROMATIC RANGING METHOD AND APPARATUS FOR READING OPTICALLY READABLE INFORMATION OVER A SUBSTANTIAL RANGE OF DISTANCES

George E. Hanson, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Division of Ser. No. 945,174, Sep. 14, 1992, Pat. No. 5,359,185, which is a continuation-in-part of Ser. No. 913,693, Jul. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 881,096, May 11, 1992, abandoned. This application Jul. 28, 1994, Ser. No. 281,884

Int. Cl.[6] G06K 7/10

U.S. Cl. 235—472 3 Claims



1. A method of focusing an image of optical information over a substantial range of distances, comprising:

(a) sequentially reflecting light of varying wavelengths from optically readable information such that sequentially different wavelength images of said optically readable information are produced;

(b) refracting each sequentially different wavelength image of optically readable information produced by said varying wavelengths of light such that refracted light images are incident on the light receiving plane of a photosensitive array;

(c) producing a digital information set corresponding to each of said refracted light images of said optically readable information; and

(d) decoding said digital information set corresponding to said refracted light image having the sharpest focus.

5,468,951

AUTOMATIC HAND-SUPPORTABLE CODE SYMBOL SCANNING DEVICE WITH IMPROVED LASER BEAM POINTING EFFICIENCY

Carl H. Knowles, Moorestown; George B. Rockstein, Audubon; David M. Wilz, and Charles A. Naylor, both of Sewell, all of N.J., assignors to Metrologic Instruments, Inc., Blackwood, N.J.

Continuation of Ser. No. 898,919, Jun. 12, 1992, Pat. No. 5,340,973, which is a continuation-in-part of Ser. No. 761,123, Sep. 17, 1991, Pat. No. 5,340,971, which is a continuation-in-part of Ser. No. 583,421, Sep. 17, 1990, Pat. No. 5,260,553. This application Aug. 19, 1994, Ser. No. 293,695

The portion of the term of this patent subsequent to Aug. 23, 2011, has been disclaimed.

Int. Cl.[6] G06K 7/10

U.S. Cl. 235—472 19 Claims

1. An automatic code symbol reading system comprising:

(A) a hand-supportable laser scanning device including

(1) a hand-supportable housing having a light transmissive window through which visible light can exit and enter said hand-supportable housing,

(2) an activatable laser beam source in said hand-supportable housing for producing, when activated, a visible laser beam directed through said light transmissive window and into a scan field defined external to said hand-supportable housing, said scan field being characterized as having at least one scanning plane of essentially planar extent,

(3) an activatable scanning mechanism in said hand-supportable housing for repeatedly scanning, when activated, said visible laser beam across said scan field,

(4) light detection means in said hand-supportable housing for detecting intensity of laser light reflected off a bar code symbol as said visible laser beam is repeatedly scanned across said scan field and said code symbol therein, and for automatically producing scan data indicative of the detected intensity of said reflected laser light, and

(5) object detection means in said hand-supportable housing for detecting an object within an object detection field defined external to said hand-supportable housing, and producing in response thereto an activation signal, said object detection field being characterized as having volumetric extent and said hand-supportable laser scanning device having an operative scanning range measured from about said light transmissive window out towards a region within scan field, and said object detection field spatially encompassing at least a portion of said scan field within said operative scanning range;

(B) processing means for processing produced scan data so as to detect and decode said code symbol on said detected object, and upon detecting and decoding said code symbol on said detected object, automatically producing symbol character data representative of said decoded code symbol; and

(C) control means for controlling operation of said automatic code symbol reading system, said control means including

(1) means for automatically activating said activatable laser beam source and said activatable scanning mechanism for up to a predetermined time period in response to the production of said activation signal, and

(2) means for automatically deactivating said activatable laser beam source and said activatable scanning mechanism in response to said processing means failing to detect and decode said code symbol on said detected object within said predetermined time period.

5,468,952

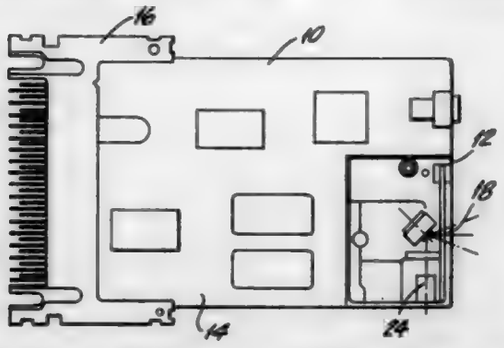
MINIATURE HIGH SPEED SCAN ELEMENT MOUNTED ON A PERSONAL COMPUTER INTERFACE CARD

Edward R. Alexander, Orlando, Fla.; Ron Goldman, Westbury, N.Y.; Yajun Li, Oakdale, N.Y.; Simon Bard, Setauket, N.Y.; Askold Strat, Patchogue, N.Y.; Joseph Katz, and Boris Metlitsky, both of Stony Brook, N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Continuation-in-part of Ser. No. 228,172, Apr. 15, 1994, which is a continuation of Ser. No. 884,734, May 15, 1992, abandoned. This application Jun. 20, 1994, Ser. No. 269,424

Int. Cl.[6] G06K *19/06*

U.S. Cl. 235—492 **20 Claims**



1. A scanning device for reading bar code symbols, comprising:

(a) a light source for generating a light beam;

(b) a sensor for detecting the intensity of reflected light from said light beam and generating an electrical signal proportional to the intensity of said reflected light: and

(c) signal processing means in said device to receive said electrical signal and to produce a digitized signal corresponding to the bar code symbol;

wherein said scanning device is housed in a PCMCIA card.

5,468,953

DYNAMICALLY VARIABLE MACHINE READABLE BINARY CODE AND METHOD FOR READING AND PRODUCING THEREOF

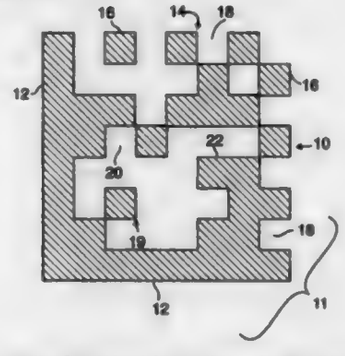
Dennis G. Priddy, Safety Harbor, and Robert S. Cymbalski, Clearwater, both of Fla., assignors to International Data Matrix, Inc., Clearwater, Fla.

Continuation of Ser. No. 907,769, Jun. 30, 1992, Pat. No. 5,329,107, which is a continuation of Ser. No. 627,080, Dec. 13, 1990, Pat. No. 5,126,542, which is a continuation of Ser. No. 513,362, Apr. 24, 1990, Pat. No. 5,033,609, which is a continuation of Ser. No. 190,205, May 5, 1988, Pat. No. 4,939,354. This application Jun. 23, 1994, Ser. No. 264,481

The portion of the term of this patent subsequent to Jul. 3, 2010, has been disclaimed.

Int. Cl.[6] G06K *7/10;19/06*

U.S. Cl. 235—494 **4 Claims**



1. An apparatus for generating a dynamically variable machine optically readable binary code, said apparatus comprising processing means for receiving data and in response thereto producing a plurality of data elements forming said binary code, said data elements forming a two dimensional array of data elements having a perimeter, said code having a variable number of data elements and density indicia for determining the density of data contained within the code, said density indicia being disposed independently of the positioning of said two dimensional array of data elements, said density indicia being a function of the number of data elements in said code, and printing means for printing said binary code.

5,468,954

PHOTO-ELECTRIC CONVERTER HAVING VARIABLE ACCUMULATION TIME

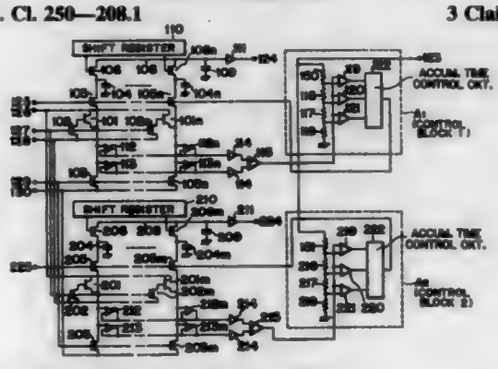
Tatsuo Furukawa, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 901,170, Jun. 19, 1992, Pat. No. 5,272,328. This application Aug. 31, 1993, Ser. No. 114,066

Claims priority, application Japan, Jun. 21, 1991, 3-149147

Int. Cl.[6] H01J *40/14*

U.S. Cl. 250—208.1 **3 Claims**



1. An image pickup apparatus, comprising:

a first sensor;

a first monitor signal output means for outputting a first monitor signal which corresponds to a level of an accumulated signal in said first sensor;

first control means for controlling an accumulation time of said first sensor based on said first monitor signal and a first reference level;

a second sensor;

a second monitor signal output means for outputting a second monitor signal which corresponds to a level of an accumulated signal in said second sensor; and

second control means for controlling an accumulation time of said second sensor based on said second monitor signal and a second reference level different from said first reference level, and for compensating a level difference between a level of the output signal of said first sensor and a level of the output signal of said second sensor.

5,468,955

NEUTRAL BEAM APPARATUS FOR IN-SITU PRODUCTION OF REACTANTS AND KINETIC ENERGY TRANSFER

Lee Chen, Austin, Tex.; Dragan Podlesnik, San Jose, Calif., and Akihisa Sekiguchi, Tarrytown, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

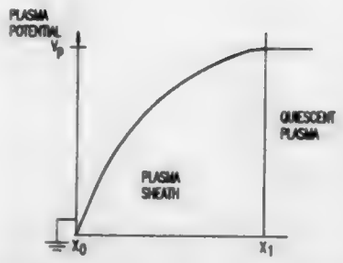
Filed Dec. 20, 1994, Ser. No. 359,974

Int. Cl.[6] H05H *3/02*

U.S. Cl. 250—251 **20 Claims**

1. A method of extracting particles from a plasma through an aperture including the step of

regulating the relative populations of ions, electrons, and neutral particles extracted from the plasma in accordance with dimensions of said aperture in combination with at least one of



differential vacuum pumping across said aperture and control of ion density in said plasma.

5,468,956

Patent Not Issued For This Number

5,468,957

EJECTION OF IONS FROM ION TRAPS BY COMBINED ELECTRICAL DIPOLE AND QUADRUPOLE FIELDS

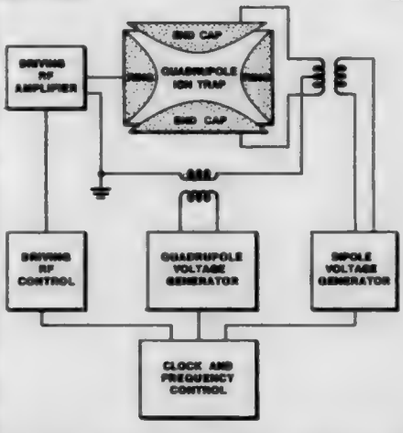
Jochen Franzen, Bremen, Germany, assignor to Bruker Franzen Analytik GmbH, Bremen, Germany

Filed May 19, 1994, Ser. No. 245,967

Claims priority, application Germany, May 19, 1993, 43 16 738.1

Int. Cl.[6] H01J *49/42*

U.S. Cl. 250—282 **19 Claims**



1. A method for mass-to-charge selective ejection of ions with improved mass resolution from an RF quadrupole ion trap comprising:

a) defining an ion trap with a ring electrode and two end cap electrodes, with perforations in at least one of the end cap electrodes;

b) creating an RF quadrupole storage field by applying an RF drive voltage to the ring electrode;

c) filling the ion trap with ions of interest:

d) ejecting a quantity of said ions which have a selected mass-to-charge ratio through the perforations in one of the end cap electrodes by resonantly exciting axial secular oscillations of said quantity of ions using a combination of a weak dipolar AC excitation field and a strong quadrupolar AC excitation field: and

e) measuring the ejected ion current.

5,468,958

QUADRUPOLE ION TRAP WITH SWITCHABLE MULTIPOLE FRACTIONS

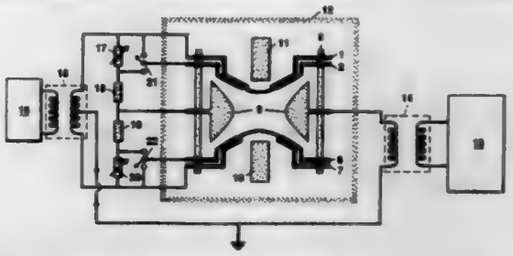
Jochen Franzen, and Yang Wang, both of Bremen, Germany, assignors to Bruker-Franzen Analytik GmbH, Bremen, Germany

Filed Jul. 20, 1994, Ser. No. 277,667

Claims priority, application Germany, Jul. 20, 1993, 43 24 224.3

Int. Cl.[6] H01J *49/42*

U.S. Cl. 250—292 **13 Claims**



1. An RF quadrupole ion trap comprising:

electrodes adapted for generating a quadrupole storage field, and an RF source for applying a first RF voltage to the electrodes for generating the quadrupole field, wherein at least one of the electrodes comprises a plurality of component electrodes, each of the component electrodes being mutually electrically insulated from each other, and the component electrodes being positioned facing the interior of the ion trap on a hyperboloidal surface with rotational symmetry, such as to permit the application to the ion trap by means of the component electrodes of at least one higher multipole field superposed on the quadrupole field;

means for applying a second RF voltage to the component electrodes having the same frequency as the first RF voltage, for generating the at least one higher multipole field; and

switching means for enabling selective activation and deactivation of the at least one higher multipole field during operation of the ion trap.

5,468,959

SCANNING PROBE MICROSCOPE AND METHOD FOR MEASURING SURFACES BY USING THIS MICROSCOPE

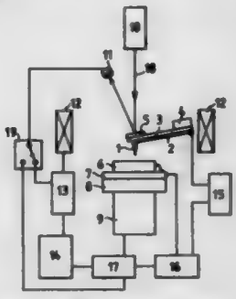
Takao Tohda, Ikoma; Hiroyuki Kado, Osaka, and Shinichi Yamamoto, Tsuchiura, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 18, 1994, Ser. No. 210,397

Claims priority, application Japan, Mar. 19, 1993, 5-59863

Int. Cl.[6] H01J *37/28*

U.S. Cl. 250—306 **21 Claims**



1. A scanning probe microscope comprising:

a cantilever having a distal end equipped with an electrically conductive probe, said electrically conductive probe allowing current to flow and having a fine tip whose voltage is controllable;

a position control mechanism for controlling position of a sample with respect to a base end of said cantilever;

a small displacement measuring mechanism for measuring a deflection amount of said cantilever; and

a deflection control mechanism, independent of said position control mechanism, for maintaining deflection of said cantilever at a constant value using an output of said small displacement measuring mechanism.

5,468,960

PYROELECTRIC INFRARED DETECTOR

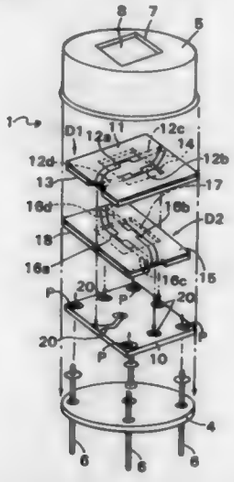
Tadashi Sugimoto, Koga; Shingo Ohkawa, Otsu; Hiroyuki Amano, Otsu, and Norikazu Murata, Otsu, all of, Japan, assignors to Optex Co., Ltd., Shiga, Japan

Filed May 10, 1994, Ser. No. 241,222

Claims priority, application Japan, May 12, 1993, 5-110116; Dec. 27, 1993, 5-329394

Int. Cl.[6] G01J 5/06

U.S. Cl. 250—338.3 **16 Claims**



1. A pyroelectric infrared detector used in an intrusion detection system, the detector comprising:

a housing having an opening;

a light transmissive filter covering the opening in the housing;

a group of at least two infrared transmissive pyroelectric layers, each layer having a top surface and a bottom surface, the top surface of each layer facing the opening, and each layer in the group of layers disposed in layered relation with respect to each other layer;

a substrate layer electrically connected to each pyroelectric layer in the group of layers, the substrate layer located such that the group of layers is between the substrate layer and the opening, the substrate layer comprising an electric circuit including a field-effect transistor for converting an impedance;

a plurality of electrodes, at least one electrode formed on each of the top and bottom surfaces of each of the pyroelectric layers for transmitting electric charges occurring on each of the top surfaces caused by thermal changes due to infrared incidence on each top surface; and

means for supporting the group of pyroelectric layers and the substrate layer at spaced intervals so that the substrate layer and the group of pyroelectric layers are free from mutual thermal influence.

5,468,961

INFRARED GAS ANALYSER AND HUMIDITY SENSOR

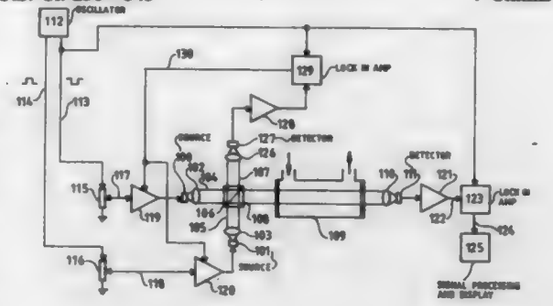
Lewis Gradon; Andrew B. Clark, and Paul J. Seakins, all of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Continuation-in-part of Ser. No. 957,240, Oct. 6, 1992, abandoned. This application Mar. 31, 1994, Ser. No. 221,037

Claims priority, application New Zealand, Jan. 8, 1991, 240154

Int. Cl.[6] G01N 21/61

U.S. Cl. 250—343 **7 Claims**



6. An infrared gas analyser comprising a first source of infrared radiation of a first selected wavelength, the first selected wavelength being strongly absorbed by a selected gas to constitute a measurement wavelength, a second source on infrared radiation of a second selected wavelength, the second selected wavelength, the second selected wavelength selected so as to be minimally absorbed by said selected gas to constitute a reference wavelength, a gas sample cell through which radiation from both the first and second source is passed and through which said gas or gases pass in use, an infrared radiation detector adapted to detect radiation at said selected wavelengths, means defining a radiation path between said sources and said detector with said sample cell being positioned intermediately of said sources and said detector, a synchronous demodulator fed with the output of said detector and a synchronizing signal which converts the output signal from the infrared detector to a signal proportional to the concentration of the selected gas present in the gases passing through said sample cell, a first switched power supply for said first source of infrared radiation, a second switched power supply for said second source of infrared radiation and means for alternately switching the outputs of said first and second power supplies to energize alternately the respective first and second sources of infrared radiation, said switching being in phase with said synchronizing signal, means for setting the levels of the power supply outputs, said levels being predetermined to ensure the amplitude of the output signal from the infrared radiation detector remains constant when the concentration of said selected gas in said sample cell is zero, radiation combining means in said radiation path prior to said sample cell which combines radiation from said first source of infrared radiation with radiation from said second source of radiation, and said combining means is also a radiation splitting means which derives a further radiation path of combined radiation and including a second infrared radiation detector positioned in said further radiation path, a second synchronous demodulator fed with the output of said second infrared radiation detector and said synchronizing signal which produces a signal representative of the imbalance of radiation intensities generated by the first and second infrared radiation sources respectively, and means responsive to said imbalance signal which controls the outputs of both power supplies to keep the ratio of the radiation intensities from the first and second infrared radiation sources constant.

5,468,962

INFRARED GAS ANALYZER

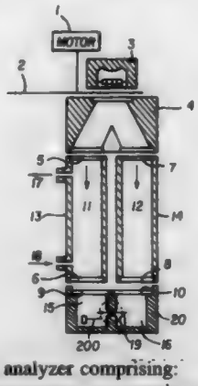
Mitsuru Ohishi; Wataru Nakagawa, and Masahiro Uno, all of Tokyo, Japan, assignors to Fuji Electric Co., Ltd., Japan

Filed Sep. 23, 1994, Ser. No. 309,510

Claims priority, application Japan, Sep. 24, 1993, 5-236999; Jun. 30, 1994, 6-148808

Int. Cl.[6] G01N *21/61*

U.S. Cl. 250—343 **14 Claims**



1. An infrared gas analyzer comprising:

an infrared radiation source; a measuring cell, into which a gas to be analyzed is introduced and in which an infrared beam fed from said radiation source is absorbed by said gas to be analyzed; and a detecting means;

wherein said detecting means includes two detector cells including gas enclosed therein having the same absorption wavelength range with said gas to be analyzed, a gas flow channel connecting said detector cells to each other, and a plurality of thermal sensors; and

wherein each thermal sensor includes a pair of thermo-elements, disposed in said gas flow channel, for detecting a gas flow in said gas flow channel and converting the detected gas flow to an electric signal.

5,468,963

SURVEILLANCE SYSTEM

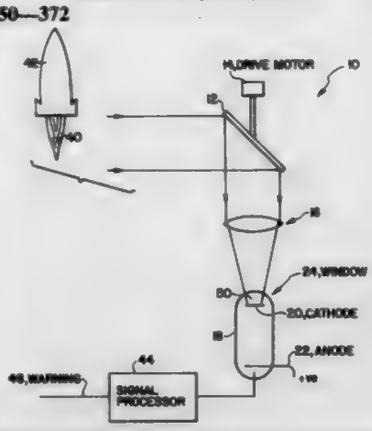
Gary Bishop, Bristol, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Filed May 19, 1988, Ser. No. 199,887

Claims priority, application United Kingdom, May 19, 1987, 8711838

Int. Cl.[6] G01J *1/42;1/20*

U.S. Cl. 250—372 **9 Claims**



1. A method of detecting the approach of a rocket-driven missile, the method comprising:

using optical apparatus to receive electromagnetic radiation from a field-of-view within which said rocket driven missile may be located; and

using detector means to receive, within said radiation, only components associated with a missile exhaust plume and having a wavelength within a predetermined ultra-violet ozone absorption waveband; and

detecting the presence of the missile within said field of view when said components are detected.

5,468,964

MILLIMETER WAVE SENSOR FOR MONITORING EFFLUENTS

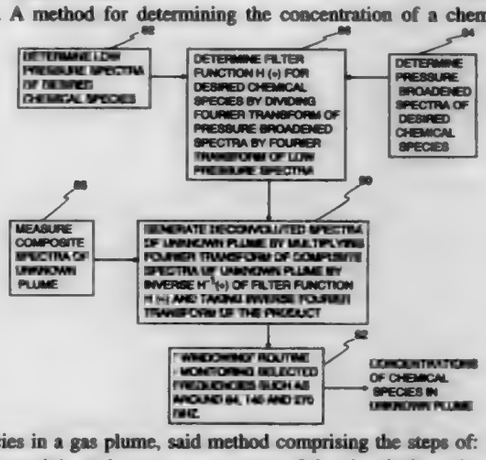
Nachappa Gopalsami, Naperville; Sasan Bakhtiari, Bolingbrook; Apostolos C. Raptis, and Stephen L. Dieckman, both of Downers Grove, all of Ill., assignors to The University of Chicago, Chicago, Ill.

Filed Jun. 20, 1994, Ser. No. 262,998

Int. Cl.[6] G01N *22/00*

U.S. Cl. 250—393 **12 Claims**

1. A method for determining the concentration of a chemical



species in a gas plume, said method comprising the steps of:

determining a low pressure spectra of the chemical species;

determining a pressure broadened spectra of said chemical species as measured at atmospheric pressure;

dividing a Fourier transform of said pressure broadened spectra by a Fourier transform of said low pressure spectra to provide a filter function for said chemical species;

measuring a pressure broadened composite spectra of a gas plume of unknown composition;

multiplying the Fourier transform of said composite spectra by an inverse of said filter function to provide a product function; and

determining the inverse Fourier transform of the product function to provide the concentration of said chemical species in the gas plume.

5,468,965

CIRCULAR, CONFINED DISTRIBUTION FOR CHARGED PARTICLE BEAMS

Robert W. Garnett, Los Alamos, N.M., and M. Christian Dobelbower, Toledo, Ohio, assignors to The Regents of the University of California, Office of Technology Transfer, Alameda, Calif.

Filed Sep. 9, 1994, Ser. No. 303,963

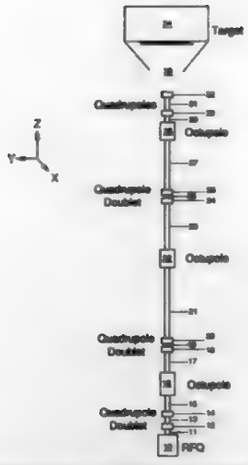
Int. Cl.[6] H01J *37/14*

U.S. Cl. 250—396 ML **5 Claims**

1. Magnetic optics for manipulating a charged particle beam to form said beam to a circular beam having a generally uniform particle distribution over a target at a predetermined location, said optics comprising:

first magnetic optics for forming a charged particle beam to a known rectangular configuration at a known first location; and

second magnetic optics for receiving said charged particle beam having said rectangular configuration and affecting said



charged particle beam to output said charged particle beam with a phase-space distribution effective to fold corner portions of said beam toward a core region of said beam wherein said beam forms a circular configuration having a generally uniform spatial particle distribution over a target plane at a predetermined second location.

5,468,966

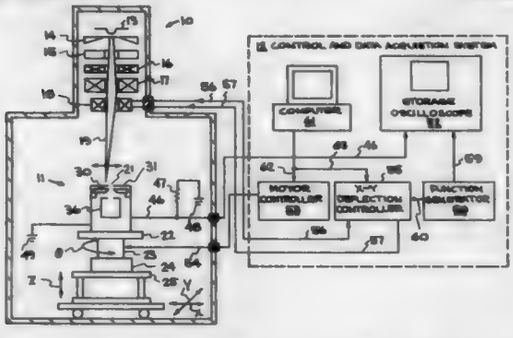
SYSTEM FOR TOMOGRAPHIC DETERMINATION OF THE POWER DISTRIBUTION IN ELECTRON BEAMS

John W. Elmer, Pleasanton; Alan T. Teruya, and Dennis W. O'Brien, both of Livermore, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Division of Ser. No. 996,892, Dec. 28, 1992, Pat. No. 5,382,895. This application Aug. 1, 1994, Ser. No. 283,438

Int. Cl.[6] G01R *13/00*

U.S. Cl. 250—397 **11 Claims**



1. An apparatus for producing beam profiles from a beam of energy for use, such as in computer tomographic reconstruction and imaging of the beam of energy, comprising:

means for producing a beam of energy;

a modified Faraday cup assembly having a rotatable section and positioned to be swept by said beam of energy produced by said beam producing means; and

control and data acquisition means operatively connected to said means for producing a beam of energy and to said modified Faraday cup assembly, said control and data acquisition means being connected to control deflection of said beam of energy and to control rotation of said rotatable section of said modified Faraday cup assembly.

5,468,967

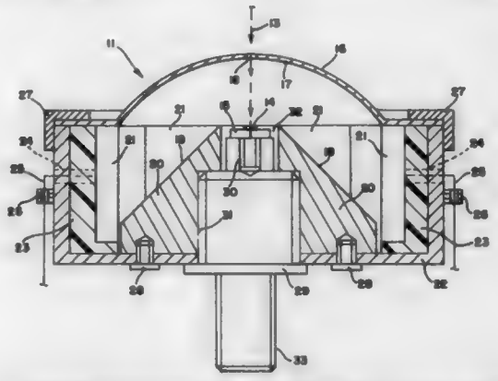
DOUBLE REFLECTION CATHODOLUMINESCENCE DETECTOR WITH EXTREMELY HIGH DISCRIMINATION AGAINST BACKSCATTERED ELECTRONS

Daniel S. H. Chan; Kin Leong, and Jacob C. H. Phang, all of Singapore, Singapore, assignors to National University of Singapore, Singapore

Filed Aug. 26, 1994, Ser. No. 295,048

Int. Cl.[6] H01J *37/244*

U.S. Cl. 250—397 **14 Claims**



1. Cathodoluminescence detector apparatus for the vacuum chamber specimen stage of an electron microscope being used for cathodoluminescence microscopy and analysis, comprising:

a) an adaptor unit for mounting the apparatus on said vacuum chamber specimen stage and having means for supporting a specimen;

b) at least one photosensitive member responsive to radiation emitted from a specimen being scanned by an electron beam of the electron microscope;

c) means secured to said adaptor unit for supporting said at least one photosensitive member;

d) means for coupling a detection signal from said at least one photosensitive member;

e) double reflecting means located adjacent said specimen and said at least one photosensitive member and having respective reflective surfaces for reflecting radiation emitted from said specimen to said photosensitive member and collecting backscattered electrons from said specimen for removal, said double reflecting means further comprising,

f) parabolic reflector means for receiving the radiation from said specimen, and

g) planar reflector means for receiving the radiation from said first reflector means and then directing the reflected radiation to said photosensitive member.

5,468,968

AIR QUALITY MONITORING SYSTEM AND PROCESS

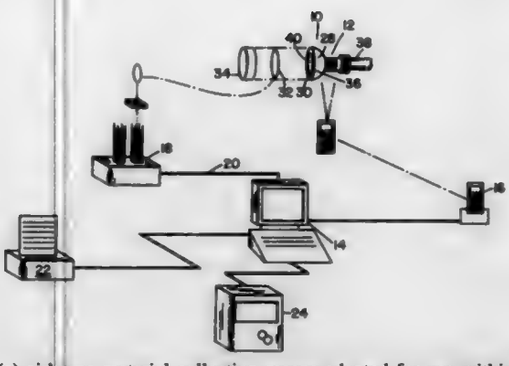
William H. Bailey; Lonnie L. Byers, both of Johnson City; Robert G. Holley, Jonesborough; James M. Lamie, Erwin; Robert M. Sparks, Elizabethton; Mike L. West, Johnson City, and Richard P. Storey, Erwin, all of Tenn., assignors to Nuclear Fuel Services, Inc., Erwin, Tenn.

Filed Dec. 13, 1991, Ser. No. 807,110

Int. Cl.[6] G01T *1/02;7/04*

U.S. Cl. 250—435 **16 Claims**

1. A system for the collection of property data on samples of airborne particulate materials, and of bar coded record data comprising identification of said samples and of each sample collection means and its location, of worker(s) total time exposure periods, and of said worker(s) exposure history, said property data comprising α, β radiation counts, said system providing one or more facets of enhanced property data accuracy, data security, data retrievability, accountability of personnel, chain or data custody, or use of worker record data and being adapted for ultimately attaining active worker minimal radiation exposure, said system comprising:



(a) airborne material collection means adapted for use within a workplace and having bar coded indicia means thereon containing record data for said worker(s) including collection means identification;

(b) computer means adapted for receiving and processing said record data and said property data;

(c) retrieval means being adapted for accessing said bar coded record data for one or more workers entering and leaving said workplace during the collection period, and further being adapted for interfacing with said computer means for the selective transport of said record data of said one or more workers thereto; and

(d) analysis means adapted for measuring said radiation and providing radiation property data on materials collected by said collection means, and further being adapted for interfacing with said computer means for the transport of said property data thereto;

(e) said computer means being adapted for providing additional record data and for correlating all record data and said property data and calculating total radiation exposure levels for each of said one or more workers and reporting and/or forwarding the same to data storage or to further data processing facilities.

5,468,969

METHOD AND APPARATUS FOR ELECTRON BEAM LITHOGRAPHY

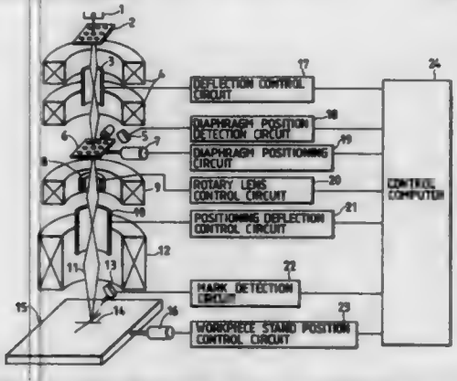
Hiroyuki Itoh, Katsuta; Hideo Todokoro, Tokyo; Yasunari Sohda, Hachiouji, and Yoshinori Nakayama, Sayama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 17, 1993, Ser. No. 153,157

Claims priority, application Japan, Nov. 19, 1992, 4-309121

Int. Cl.[6] H01J *37/04*

U.S. Cl. 250—492.23 **7 Claims**



1. Electron beam lithography method comprising the steps of:

selecting a first opening from a group of openings in a first collective-exposure shaping diaphragm by mechanically moving the first collective-exposure shaping diaphragm,

emitting an electron beam through the first selected opening,

deflecting the electron beam from the first selected opening to scan a reference mark and detecting electrons reflected from said reference mark for obtaining position data,

comparing the position data with reference data to obtain position correction data;

deflecting the electron beam from the first selected opening in accordance with the correction data; and

wherein the first collective-exposure shaping diaphragm is replaced with a second diaphragm and said correction data is obtained with respect to said second diaphragm.

5,468,970

DEVICE FOR COLLIMATING BEAMS OF A RADIATION

Menhard Kocsis, Meylan, and Bela Farago, Notre Dame de Mesage, both of, France, assignors to Institut Max Von Laue - Paul Langevin, Grenoble Cedex, France

Filed Dec. 14, 1993, Ser. No. 166,746

Claims priority, application France, Dec. 14, 1992, 92 15028

Int. Cl.[6] G21K *1/02*

U.S. Cl. 250—505.1 **8 Claims**

1. Device for collimating divergent beams of a radiation, said device comprising a plurality of parallel plys of wires which are made of or coated with a material able to absorb the radiation so as to collimate a beam of the radiation which propagates along a direction which is substantially parallel to the plys.

5,468,971

VERIFICATION DEVICE FOR CURRENCY CONTAINING AN EMBEDDED SECURITY THREAD

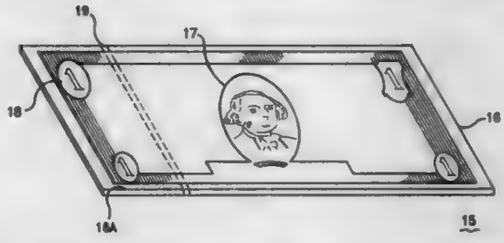
Steven Ebstein, 67 Pelham St., Newton, Mass. 02159; Robert A. Gonsalves, 16 Lexington St., Woburn, Mass. 01801, and Richard A. Menelly, 87 Beldew Rd., Burlington, Conn. 06013

Filed Mar. 14, 1994, Ser. No. 212,217

The portion of the term of this patent subsequent to Mar. 21, 2012, has been disclaimed.

Int. Cl.[6] G06K *5/00*

U.S. Cl. 250—556 **20 Claims**



1. Apparatus for authenticating and denominating currency paper comprising;

a first light emitter arranged along one side of a paper containing an embedded security thread providing an optical pattern corresponding to indicia contained on said security thread;

a first light detector arranged along an opposite side of said paper receiving said optical pattern; and

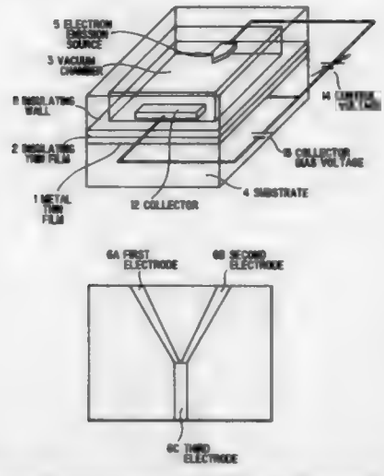
logic circuit means connecting with said first light detector comparing said optical pattern to stored values contained therein.

5,468,972

VACUUM DEVICE FOR CONTROLLING SPATIAL POSITION AND PATH OF ELECTRON

Keizo Yamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 30, 1994, Ser. No. 220,227
Claims priority, application Japan, Mar. 30, 1993, 5-071404
Int. Cl.[6] H01L *29/06*
U.S. Cl. 257—10 **9 Claims**



1. A vacuum device for controlling spatial position and path of electrons, comprising:

at least one electron emission source for emitting electrons into a vacuum chamber;

at least one collector for collecting said electrons emitted into said vacuum chamber; and

means for generating an electric potential, said generating means being covered with an insulating layer facing an interior of said vacuum chamber and positioned at a region between said electron emission source and said collector, said generating means comprising first to third electrodes which generate first to third electric potentials, a terminating end of said first electrode being positioned in the vicinity of starting ends of said second and third electrodes, whereby said generating means generates an electric potential on said insulating layer to control spatial position and path of said electrons in said vacuum chamber.

5,468,973

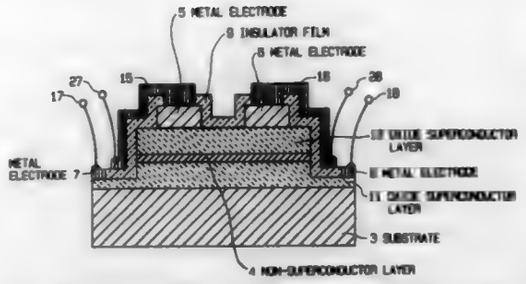
STACKED JOSEPHSON JUNCTION DEVICE COMPOSED OF OXIDE SUPERCONDUCTOR MATERIAL

Keizo Harada, and Hideo Itozaki, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Continuation of Ser. No. 944,809, Sep. 14, 1992, abandoned, which is a continuation of Ser. No. 667,737, Mar. 11, 1991, abandoned. This application Mar. 31, 1994, Ser. No. 221,276
Claims priority, application Japan, Mar. 9, 1990, 2-58514
Int. Cl.[6] H01L *39/22*
U.S. Cl. 257—33 **11 Claims**

1. A stacked Josephson junction device including a first and second high temperature copper oxide superconductor layer and a non-superconductor layer derived from the superconductor formed between the first and second high temperature copper oxide superconductor layers, the first and second high temperature copper oxide superconductor layers having the composition expressed by the general formula:

$$LnBa_2Cu_3O_v$$



where Ln is selected from the group consisting of yttrium and a rare earth element;

and where $6<v\leqq7$; and the non-superconductor layer having the composition expressed by the general formula:

$$Bi_2Y_xSr_yCu_zO_w$$

where the values of x, y, z and w are

$0\leqq x\leqq2$,

$1\leqq y\leqq3$,

$1\leqq z\leqq3$, and

$6\leqq w\leqq13$.

5,468,974

CONTROL AND MODIFICATION OF DOPANT DISTRIBUTION AND ACTIVATION IN POLYSILICON

Sheldon Aronowitz, San Jose; Yen-Hui J. Ku, and Yu-Lam Ho, both of Cupertino, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed May 26, 1994, Ser. No. 249,867
Int. Cl.[6] H01L *29/04;21/265*
U.S. Cl. 257—51 **29 Claims**

1. A process for controlling dopant distribution and activation in polysilicon which comprises:

implanting into polysilicon a dopant and an atomic species which is electrically neutral in said polysilicon and is capable of interacting with said dopant, said atomic species being characterized by accumulating along grain boundaries and being capable of blocking diffusion of said dopant along said grain boundaries of said polysilicon; and

annealing the resulting polysilicon containing said dopant and said atomic species.

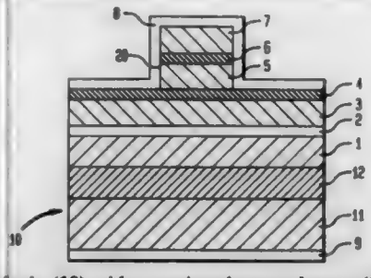
5,468,975

OPTOELECTRONIC SEMICONDUCTOR DEVICE

Adriaan Valster, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 62,679, May 17, 1993, abandoned.
This application Dec. 8, 1994, Ser. No. 352,283
Claims priority, application European Pat. Off., May 18, 1992, 92201399
The portion of the term of this patent subsequent to Jan. 10, 2012, has been disclaimed.
Int. Cl.[6] H01L *33/00*
U.S. Cl. 257—97 9 Claims

1. An optoelectronic semiconductor device comprising a semi-



conductor body (10) with a semiconductor substrate (11) of a first conductivity type on which are at least present in that order a first cladding layer (1) of the first conductivity type, an active layer (2), a second cladding layer (3) of a second conductivity type, an intermediate layer (4), and a third cladding layer (5) also of the second conductivity type, the thickness of the second cladding layer (3) being such that the distance between the active layer (2) and the intermediate layer (4) is such that during operation a part of the radiation generated in the active layer (2) reaches the intermediate layer (4), the intermediate layer (4) comprising a semiconductor material having a lower bandgap than that of the second (3) and third (5) cladding layers, characterized in that the semiconductor material of the intermediate layer (4) has a lattice constant which is different from the lattice constant of the substrate (11) and has a bandgap which is greater than the energy of the radiation emitted by the active layer (2).

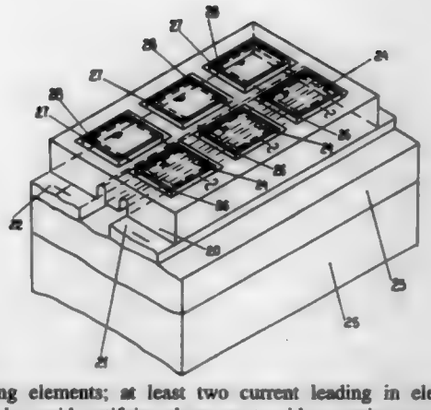
5,468,976

SEMI CONDUCTOR RECTIFYING MODULE

Yury Evseev, Ul.Bratskaya 19, k.1,kv,90, Moscow, Russian Federation; Lubomir Rachinsky, ul. Zvenigorodskaya 8 kv 104; Natalia Tetervova, Ul.Reliefnaya 4 kv 22, both of Zaporozhie, Ukraine; Kazimir Seleninov, ul Lianemere 37 kv 18, Tallinn, Estonia; Evgeniy Dermenzhi, ul.Sadovi Proezd 1 ky 49, Reytov, U.S.S.R.; Olga Nasekan, Ul.Rustavi 3 kv 42, Saporozhie, Ukraine; Eva Druyanova, ul Vintera 34 kv 2, Saporozhie, Ukraine, and Roman Ribak, Pr. Lenina 190 kv 26, Saporozhie, Ukraine

Filed Aug. 9, 1994, Ser. No. 288,226
Claims priority, application U.S.S.R., Aug. 27, 1993, 93042893; Aug. 27, 1993, 93042905; Aug. 27, 1993, 93042907; Aug. 27, 1993, 93042908
Int. Cl.[6] H01L *29/06;23/16;39/02*
U.S. Cl. 257—177 40 Claims

1. A semiconductor rectifying module, comprising a metal base; a dielectric heat conducting spacer arranged on said metal base; two current leading out electrodes arranged on said spacer; and rectifying elements of anode and cathode groups arranged with their cathodes and anodes on said electrodes correspondingly, said rectifying elements being composed of a semiconductor with at least two layers having different conductivity types, one of said layer being composed of semiconductor material of a first type conductivity, each of said rectifying elements being surrounded by a side layer composed of semiconductive material of a first type conductivity, and being provided with an upper reserved separating groove between said side layer and a remaining part of said



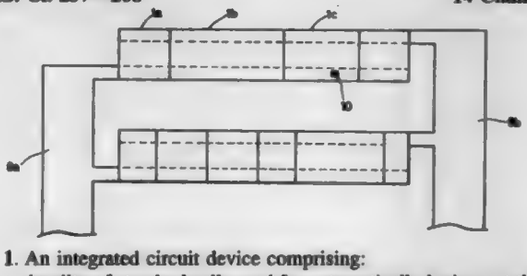
rectifying elements; at least two current leading in electrodes arranged on said rectifying elements at a side opposite to said base.

5,468,977

STANDARD CELLS INTERCONNECTION STRUCTURE INCLUDING A MODIFIED STANDARD CELL

Hirohisa Machida, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 779,752, Oct. 21, 1991, abandoned.
This application May 13, 1994, Ser. No. 242,153
Claims priority, application Japan, Jan. 23, 1990, 2-286809
Int. Cl.[6] H01L *23/522;23/528;23/538*
U.S. Cl. 257—208 14 Claims



1. An integrated circuit device comprising:

a plurality of standard cells used for automatically laying out the integrated circuit device in a CAD system, each of said standard cells having a prescribed configuration;

a modified standard cell having a configuration which is different from said prescribed configuration, and

a local signal line common to all standard cells and at least said one modified standard cell, each standard cell including:

at least one I/O terminal crossing said common local signal line and isolated from said common local signal line by an insulator film, and

at least one active element coupled to said at least one I/O terminal, and

said at least one modified standard cell including a coupling interconnection layer extending through an insulator film within said cell for coupling said common local signal line to said at least one I/O terminal.

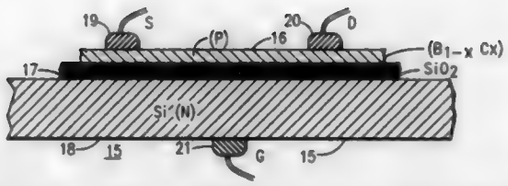
5,468,978

FORMING $B_{1-x}C_x$ SEMICONDUCTOR DEVICES BY CHEMICAL VAPOR DEPOSITION

Peter A. Dowben, 303 Halton Rd., Dewitt, N.Y. 13224

Filed Jul. 7, 1993, Ser. No. 87,975
Int. Cl.[6] H01L *49/00;29/161;27/01;29/08*
U.S. Cl. 257—258 12 Claims

1. A heterojunction semiconductor device formed by deposition of a film of a P-type boron carbide onto an N-type substrate material, where said boron carbide has the stoichiometry of its boron and carbon selected so as to achieve a suitable semiconduc-



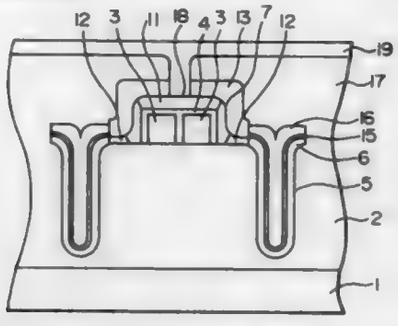
tor band gap on the order of 0.7 to 1.8 eV, and wherein said boron carbide film has a resistivity on the order of about 10^4 to 10^{10} ohm centimeters.

5,468,979

SEMICONDUCTOR DEVICE HAVING TRENCH TYPE CAPACITORS FORMED COMPLETELY WITHIN AN INSULATING LAYER

Tomofune Tani, Sagamihara; Ichiro Murai, and Kenji Anzai, both of Tokyo, all of, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 54,067, Apr. 29, 1993, abandoned. This application Aug. 23, 1994, Ser. No. 294,787
Claims priority, application Japan, Apr. 30, 1992, 4-138006
Int. Cl.[6] H01L *29/68;29/78;29/92*
U.S. Cl. 257—304 **12 Claims**



1. A semiconductor device comprising:
a semiconductor substrate;
an insulating film having a thickness formed on said semiconductor substrate;
a trench formed within said insulating film, said trench having a depth smaller than the thickness of said insulating film:
a capacitor formed in said trench;
a transistor including a gate electrode formed on said insulating film, a gate insulating film formed to cover said gate electrode and a semiconductor film formed on said gate insulating film, said semiconductor film including first conductivity type first and second regions spaced from each other and a second conductivity type third region disposed between said first and second regions, said first and second regions serving as a source and a drain of said transistor; and
wherein an integral single layer is constituted by either one of said source or drain and a semiconductor layer of said capacitor.

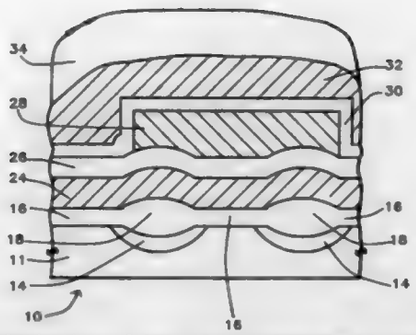
5,468,980

BURIED BIT LINE DRAM CELL

Ming-Tzong Yang; Chen-Chiu Hsue, and Gary Hong, all of Hsin, Taiwan, Prov. of China, assignors to United Microelectronics Corporation, Hsinchu, Taiwan, Prov. of China

Division of Ser. No. 192,364, Feb. 7, 1994, Pat. No. 5,364,808. This application Nov. 4, 1994, Ser. No. 334,046
Int. Cl.[6] H01L *27/108;29/76*
U.S. Cl. 257—306 **26 Claims**

1. A semiconductor device manufactured by the process comprising the following steps:



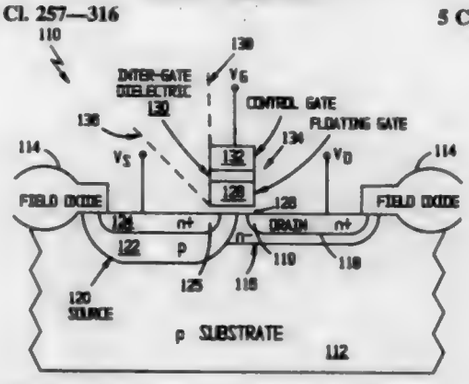
a) implanting ions of dopant into predetermined locations in a doped semiconductor substrate of said device, said dopant being of sufficient concentration to form a buried conductor region therein,
b) forming a dielectric layer on the surface of said doped substrate forming a thick dielectric over said implanted ions,
c) formation of a first polysilicon layer on said silicon dioxide layer,
d) patterning said first polysilicon layer by forming a mask with openings and etching said polysilicon through said openings in said mask to form conductor lines,
e) forming a second dielectric layer on the surface of said first polysilicon layer on said device,
f) forming a second polysilicon layer on said second dielectric layer,
g) forming a photolithographic mask and etching portions of said second polysilicon layer to form a first capacitor plate therefrom,
h) forming a third dielectric layer on the surface of said second polysilicon layer on said device,
i) formation of a third polysilicon layer on said third dielectric layer, and
j) patterning said third polysilicon layer by forming a mask and etching said polysilicon through said mask to form a top capacitor plate.

5,468,981

SELF-ALIGNED BURIED CHANNEL/JUNCTION STACKED GATE FLASH MEMORY CELL

James Hsu, Saratoga, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 1, 1994, Ser. No. 299,868
Int. Cl.[6] H01L *29/78*
U.S. Cl. 257—316 **5 Claims**



1. A one-transistor memory cell structure comprising:
a substrate (**112**);
an n^- buried channel/junction region (**116**) disposed in said substrate;
an n^+-type drain region (**118**) disposed in said substrate and on a first side of said n^- buried channel/junction region defining a drain side;

a source structure (**120**) disposed in said substrate and on a second side of said n^- buried channel/junction region defining a source side;

said source structure including a first p-type source region (**122**) and a second n^+-type source region (**124**) disposed in said first p-type source region;

said p-type source region (**122**) being formed by implanting on the source side with a large tilt angle;

a tunnel oxide (**126**) disposed on said substrate;

a stacked gate structure (**134**) disposed on said tunnel oxide and being formed over said n^- buried channel/junction region (**116**)

said stacked gate structure (**134**) including a floating gate (**128**), an inter-gate dielectric (**130**) disposed on said floating gate, and a control gate (**132**) disposed on said inter-gate dielectric;

said tunnel oxide (**126**) overlying a portion (**119**) of said n^+-type drain region (**118**), said first p-type source region (**122**), and a portion (**125**) of said second n^+ source region (**124**); and

said channel length of said memory cell being set by said p-type source region (**122**) on said source side, and is independent of critical dimensions of said stacked gate structure, thereby rendering scalability to small size and suitable for high density and low voltage power supply applications.

5,468,982

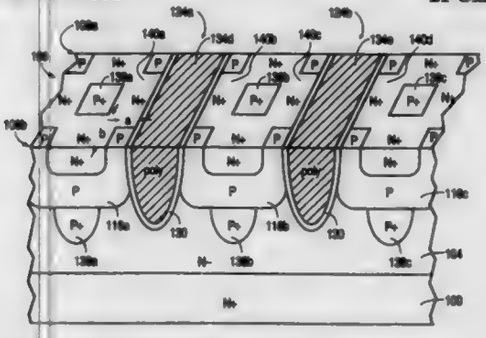
TRENCHED DMOS TRANSISTOR WITH CHANNEL BLOCK AT CELL TRENCH CORNERS

Fwu-Iuan Hshieh, Saratoga; Sze-Hon Kwan, Sunnyvale; Mike F. Chang, Cupertino; Yueh-Se Ho, Sunnyvale; Jan Van Der Linde, Saratoga, and King Owyang, Atherton, all of Calif., assignors to Siliconix incorporated, Santa Clara, Calif.

Filed Jun. 3, 1994, Ser. No. 253,527

Int. Cl.[6] **H01L** *29/68;21/265*

U.S. Cl. 257—331 **21 Claims**



1. A trenched transistor cell comprising:

a substrate of a first conductivity type and defining at least two intersecting trenches;

an insulating layer lining the trenches;

a conductive material filling the trenches;

a source region of the first conductivity type and extending from a principal surface of the substrate adjacent to the trenches into the substrate; and

a body region of a second conductivity type opposite the first type and extending from the principal surface adjacent to the trenches into the substrate;

wherein at a corner of the cell defined by the two intersecting trenches, the source region is spaced apart from the trenches.

5,468,983

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

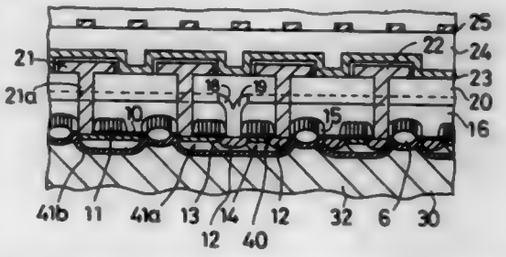
Junji Hirase, and Shin Hashimoto, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 1, 1994, Ser. No. 203,627

Claims priority, application Japan, Mar. 3, 1993, 5-041600

Int. Cl.[6] **H01L** *29/78;33/00*

U.S. Cl. 257—344 **10 Claims**



1. A semiconductor device formed near a surface of a semiconductor substrate, wherein an outer peripheral part of an integrated circuit region is defined as a dummy cell region and a center part except the outer peripheral part of the integrated circuit region is defined as an active cell region, the semiconductor device comprising:

a plurality of cell forming regions located in the integrated circuit region including the active cell region and the dummy cell region, and each separated by an isolation;

active cells each formed in a region included in the active cell region of each cell forming regions, and each having at least one field effect semiconductor element whose construction elements are at least a gate and two source/drain regions accompanying two P-N junction parts therebetween; and

dummy cells each formed partly or entirely in a region included in the dummy cell region of each cell forming region, and each having an element not functioning as a semiconductor element,

wherein, at least one of the dummy cells is a first type dummy cell having a semiconductor element of which construction is such that at least one of the P-N junction parts is excluded from a same construction as the field effect semiconductor element in the active cell and at least the gate, and a contact, are included in the dummy cell.

5,468,984

ESD PROTECTION STRUCTURE USING LDMOS DIODES WITH THICK COPPER INTERCONNECT

Taylor R. Efland, Richardson; Dave Cotton, and Dale J. Skelton, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 2, 1994, Ser. No. 333,407

Int. Cl.[6] **H01L** *27/085*

U.S. Cl. 257—356 **2 Claims**

1. An ESD protection circuit for LDMOS devices, comprising:

a gate input for coupling to the gate terminal of an LDMOS transistor;

a reference voltage input for coupling to a reference voltage; and

a plurality of zener diodes serially coupled between said gate input and said reference voltage input, each one of said zener diodes comprising:

a diffusion well diffused into a semiconductor substrate;

a plurality of cathode diffusion regions of a first semiconductivity type;

a plurality of anode diffusion regions of a second semiconductivity type, spaced apart from an interdigitated with said cathode diffusions so that said anode and cathode diffusions alternate;

a plurality of first metal cathode stripes, each overlying and in electrical contact with a respective one of said cathode diffusions;

a plurality of first metal anode stripes, each overlying and in electrical contact with a respective one of said anode diffusions;

a second metal anode buss partially overlying each of said first metal anode stripes and each of said first metal cathode stripes, and selectively electrically contacting said first metal anode stripes;

a second metal cathode buss spaced apart from said second metal anode buss, said second metal cathode buss partially overlying each of said first metal anode stripes and each of said first metal cathode stripes, and selectively electrically contacting said first metal cathode stripes;

a thick copper third level anode shorting buss partially overlying and in electrical contact with said second metal anode buss, said thick copper third level anode shorting buss substantially lowering the resistance of the diode anode; and

a thick copper third level cathode shorting buss partially overlying and in electrical contact with said second metal cathode buss, said thick copper third level cathode shorting buss substantially lowering the resistance of the diode cathode.

5,468,985

SEMICONDUCTOR DEVICE

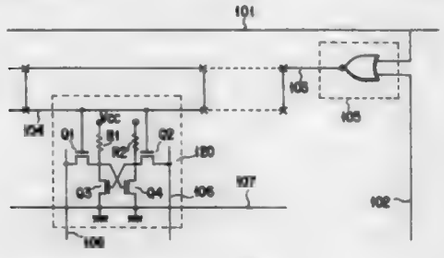
Takayuki Harima, Kawaguchi, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 28, 1994, Ser. No. 234,061

Claims priority, application Japan, May 1, 1993, 5-128184

Int. Cl.[6] H01L *27/10;27/15*

U.S. Cl. 257—385 **8 Claims**



1. A semiconductor device comprising:

a semiconductor substrate;

a plurality of memory cells formed on said semiconductor substrate;

first row selection lines formed over said semiconductor substrate, for transmitting a signal from a row selection decoder;

column selection lines formed over said semiconductor substrate, for transmitting a signal from a column selection decoder;

second row selection lines formed over said semiconductor substrate and connected to said plurality of memory cells;

shunt lines formed over said semiconductor substrate, for lowering the resistances of said second row selection lines;

an intermediate buffer for selecting one of said second row selection lines via a corresponding one of said shunt lines based on signals from said first row selection lines and said column selection lines;

a first metal wiring layer formed over said semiconductor substrate;

a second metal wiring layer formed over said first metal wiring layer with an insulation film disposed therebetween and having wirings used as at least said shunt lines of said second row selection lines; and a third metal wiring layer formed over said second metal wiring layer with an insulation film disposed therebetween and having wirings used as at least said first row selection lines; wherein the wiring width of said first row selection line is made larger than that of said shunt line of said second row selection line.

5,468,986

SEMICONDUCTOR STATIC RANDOM ACCESS MEMORY DEVICE WITH COVERED DRIVER TRANSISTORS

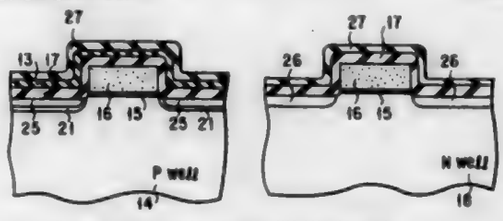
Mitsuhiro Yamanashi, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 27, 1994, Ser. No. 250,490

Claims priority, application Japan, May 31, 1993, 5-129622

Int. Cl.[6] H01L *27/02;29/78*

U.S. Cl. 257—389 **4 Claims**



1. A static random access memory comprising:

a semiconductor substrate having a main surface;

a first and a second driver transistor formed on said main surface, each said driver transistor having a first source region, a first drain region, a first gate insulating film, and a first gate electrode provided on said first gate insulating film, said first and said second driver transistors being coupled to each other to form a flip-flop formation for storing data;

a first and a second transfer transistor formed on said main surface, each said transfer transistor having a second source region, a second drain region, a second gate insulating film, and a second gate electrode provided on said second gate insulating film, said second gate electrodes being connected to a word line, said second drain regions being electrically connected to said first gate electrodes correspondingly, said second source regions being connected to bit lines;

a first insulating film covering said driver transistors and said transfer transistors; and

a second insulating film provided at both sides of said first gate electrodes with said first insulating film intervening therebetween, said second insulating film not provided on said first and second transfer transistors and having a higher dielectric constant than that of said first insulating film to increase an overlap capacitance between said first gate electrodes and one of said first source and said first drain regions.

5,468,987

SEMICONDUCTOR DEVICE AND METHOD FOR FORMING THE SAME

Shunpei Yamazaki, Tokyo; Hongyong Zhang, and Yasuhiko Takamura, both of Kanagawa, all of, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Mar. 25, 1993, Ser. No. 37,162

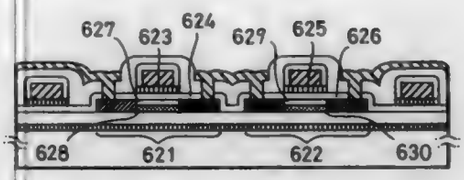
Claims priority, application Japan, Mar. 27, 1992, 4-102202; Apr. 6, 1992, 4-113027; Apr. 17, 1992, 4-124324

Int. Cl.[6] H01L *29/34;21/86*

U.S. Cl. 257—412 **17 Claims**

1. An insulated gate thin film transistor comprising:

a semiconductor layer formed on an insulating surface having source, drain and channel regions therein;



a first insulating layer provided on said semiconductor layer;

a second insulating layer located over said channel region with said first insulating layer therebetween, said second layer having opposed side edges;

a gate electrode located over said channel region with said first insulating layer and said second insulating layer interposed therebetween; and

an anodic oxide coating covering a surface of said gate electrode, said oxide coating being formed by anodic oxidizing a surface of said gate electrode,

wherein said first insulating layer extends beyond said side edges of the second insulating layer to cover a major surface of said source and drain regions and said side edges of the second insulating layer are approximately coextensive with edges of said anodic oxide coating.

5,468,988

LARGE AREA, THROUGH-HOLE, PARALLEL-CONNECTED PHOTOVOLTAIC DEVICE

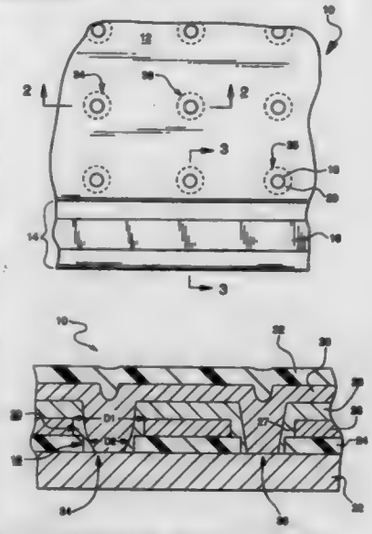
Troy Glatfelter, Royal Oak, and Mark Lycette, Berkley, both of Mich., assignors to United Solar Systems Corporation, Troy, Mich.

Filed Mar. 4, 1994, Ser. No. 206,071

The portion of the term of this patent subsequent to Feb. 15, 2011, has been disclaimed.

Int. Cl.[6] H01L *27/14;31/00*

U.S. Cl. 257—431 **12 Claims**



1. A large area photovoltaic device comprising:

a monolithic, metal substrate member;

an electrically insulating layer disposed upon a top surface of said substrate member;

a bottom electrode layer disposed upon a top surface of said electrically insulating layer, said bottom electrode layer having a first plurality of first holes, each with a diameter D_1, in the range of 25–75 microns defined therethrough, so as to expose an edge portion of said bottom electrode layer about the periphery of each of said first holes, said first holes being spaced apart by a distance in the range of 1–5 millimeters;

a semiconductor body disposed upon a top surface of the bottom electrode layer, said semiconductor body at least partially filling each of said first holes so as to cover the edge portion of the bottom electrode layer, said semiconductor body including a second plurality of second holes defined therethrough, each of said second holes being generally concentric with one of said first holes and having a diameter "D_2" which is less than D_1, and is the range of 10–50 microns, each of said second holes also passing through said electrically insulating layer and having a portion of said substrate exposed at the bottom thereof; and

a transparent, electrically conductive layer disposed atop said semiconductor body, said transparent, electrically conductive layer at least partially filling said second hole and establishing electrical contact with the portion of said substrate exposed therein.

5,468,989

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING AN IMPROVED VERTICAL BIPOLAR TRANSISTOR STRUCTURE

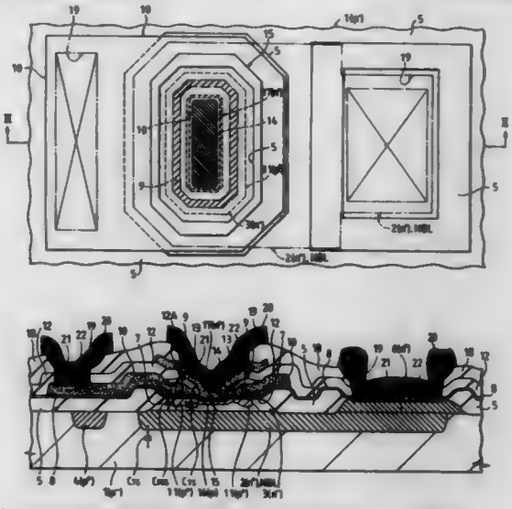
Hirotaka Nishizawa; Seiichiro Azuma, both of Akishima; Kazuaki Ootoshi, Ohme; Masataka Miyama, Fuchu; Shuji Kawata, Ohme; Osamu Kasahara, Hinode, and Sinichi Suzuki, Ohme, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi VLSI Engineering Corp., Kodaira, both of, Japan

Continuation of Ser. No. 552,519, Jul. 16, 1990, abandoned, which is a continuation-in-part of Ser. No. 360,119, May 31, 1989, abandoned. This application Oct. 20, 1992, Ser. No. 963,926

Claims priority, application Japan, Jun. 2, 1988, 63-136097; Jul. 14, 1989, 1-182265

Int. Cl.[6] H01L *29/72*

U.S. Cl. 257—517 **7 Claims**



1. A semiconductor integrated circuit device comprising:

(a) a semiconductor body having a main surface;

(b) a first semiconductor layer of a first conductivity type formed at said main surface of said semiconductor body, said first semiconductor layer being used as a collector region of a bipolar transistor;

(c) a field oxide film which is selectively formed on a surface of said first semiconductor layer and which surrounds an active region of said surface of said first semiconductor layer in which base and emitter regions of said bipolar transistor are to be formed, said field oxide film having first substantially parallel edges and second substantially parallel edges which are perpendicular to said first substantially parallel edges, said active region having a substantially rectangular plane figure which is defined by said first and second substantially parallel edges;

(d) a second semiconductor layer of a second conductivity type opposite to said first conductivity type which is formed at said active region of said surface of said first semiconductor layer and which is used as said base region of said bipolar transistor;

(e) a base lead-out electrode of said bipolar transistor partially overlying said active region and extending on said field oxide film, said base lead-out electrode contacting a periphery of said second semiconductor layer and surrounding an emitter forming region of said bipolar transistor, said base lead-out electrode having first inner edges and second inner edges which respectively oppose said first and second substantially parallel edges of said field oxide film, the distance between said first inner edges and said first substantially parallel edges being substantially the same as that between said second inner edges and said second substantially parallel edges;

(f) a third semiconductor layer of said first conductivity type which is formed in said emitter forming region at said active region and which is used as said emitter region of said bipolar transistor;

(g) an emitter electrode of said bipolar transistor which is formed over said emitter region;

(h) a base electrode of said bipolar transistor which is formed on said base lead-out electrode over said field oxide film; and

(i) a collector electrode of said bipolar transistor formed on said surface of said first semiconductor layer which is outside of said active region;

wherein said field oxide film is formed so as to cut off the corners of said active region defined by intersections of said first and second substantially parallel edges to form slanted edges in place of each of said corners of said active region, so that the distance between each of the slanted edges of said active region and each of the corners of said base lead-out electrode defined by intersections of said first and second inner edges is substantially the same as the distance between each of said first and second inner edges and each of said first and second substantially parallel edges, thereby reducing an area of said active region in which said base lead-out electrode is overlapped.

5,468,990

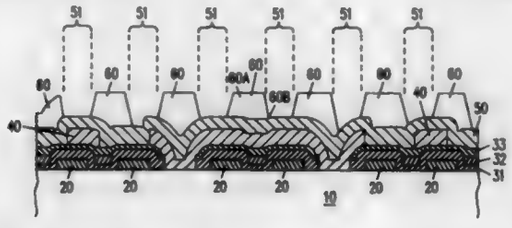
STRUCTURES FOR PREVENTING REVERSE ENGINEERING OF INTEGRATED CIRCUITS

Keith E. Daum, Redwood City, Calif., assignor to National Semiconductor Corp., Santa Clara, Calif.

Filed Jul. 22, 1993, Ser. No. 96,153

Int. Cl.[6] H01L *29/34*

U.S. Cl. 257—632 **11 Claims**



1. An integrated circuit comprising:

active circuitry;

a passivation layer overlying the active circuitry; and

a tamper resistant structure overlying the passivation layer, wherein the tamper resistant structure and the passivation layer have the same composition, and the tamper resistant structure is thicker than the passivation layer and has openings which expose portions of the passivation layer, whereby chemical removal of the tamper resistant structure damages portions of the passivation layer and makes analysis of the active circuitry more difficult.

5,468,991

LEAD FRAME HAVING DUMMY LEADS

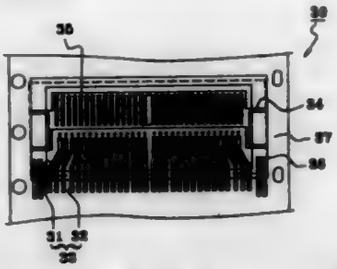
Joon K. Lee, Seoul, and Hyeon J. Jeong, Inchon, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Japan

Filed Nov. 30, 1993, Ser. No. 158,740

Claims priority, application Rep. of Korea, Dec. 31, 1992, 9227632

Int. Cl.[6] H01L *23/48;29/46;29/54*

U.S. Cl. 257—666 **5 Claims**



1. A semiconductor chip package having a lead frame having upper and lower sides and a semiconductor chip mounted thereon, said lead frame comprising:

(a) a plurality of connection leads formed on a first side of said lead frame, each said connection lead comprising inner and outer portions, said connection leads being electrically connected to said semiconductor chip; and

(b) a plurality of dummy leads formed on a second side of said lead frame opposite said first side, and functioning as a heat sink for eliminating heat from said semiconductor chip.

5,468,992

ELECTRONIC CIRCUIT PACKAGE INCLUDING PLURAL BARE CHIPS MOUNTED ON A SINGLE WIRING SUBSTRATE

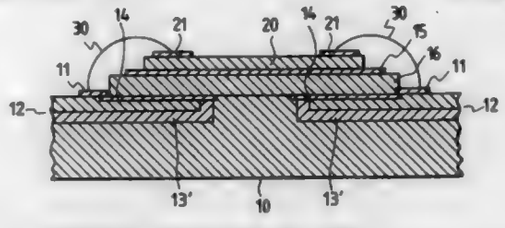
Nobuyasu Kanekawa, Los Angeles, Calif.; Hirokazu Ihara, Machida, Japan; Masatsugu Akiyama, Yokohama, Japan; Kiyoshi Kawabata, Abiko, Japan; Hisayoshi Yamanaka, Hitachi, Japan, and Tetsuya Okishima, Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 28, 1992, Ser. No. 843,234

Claims priority, application Japan, Feb. 28, 1991, 3-034038

Int. Cl.[6] H01L *23/28;27/04;* **H05K** *3/10*

U.S. Cl. 257—676 **11 Claims**



1. An electronic circuit package comprising:

a multilayer wiring substrate, wherein said multilayer wiring substrate includes internal wiring conductors;

an insulating layer formed on a portion of a surface of said multilayer wiring substrate;

a plurality of die bonding grounds formed on a surface of said insulating layer;

a plurality of semiconductor bare chips formed on said die bonding ground;

wiring pads formed on said semiconductor bare chips and on said multilayer wiring substrate along the periphery of said die bonding ground, wherein said semiconductor bare chips are connected to said wiring conductors through wire bonding between wire bonding pads formed on said semiconductor bare chips and the wiring substrate;

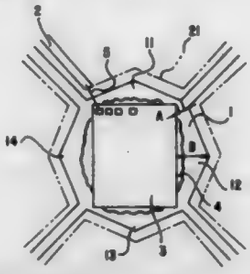
wherein a portion of said multilayer wiring substrate under said die bonding ground is used as a via hole region for affecting connection between said wiring conductors.

5,468,993

SEMICONDUCTOR DEVICE WITH POLYGONAL SHAPED DIE PAD

Koji Tani, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 15,446, Feb. 9, 1993, abandoned. This application Dec. 5, 1994, Ser. No. 353,345
Claims priority, application Japan, Feb. 14, 1992, 4-028208
Int. Cl.[6] H01L *23/28*
U.S. Cl. 257—676 **6 Claims**



1. A semiconductor device, comprising:

a rectangular semiconductor chip bonded to a die pad of a lead frame in which a plurality of leads are arranged around the die pad, wherein the die pad is formed in a polygonal shape, with a finite number of straight edged sides and with at least six sides, and an area where the semiconductor chip is electrically connected with the leads around the semiconductor chip and said semiconductor chip are sealed with resin,

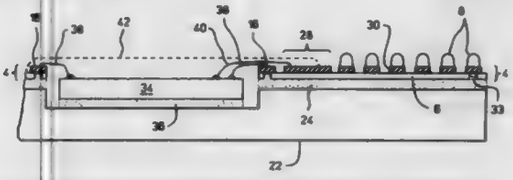
wherein a distance between said semiconductor chip and a peripheral wall of said die pad is larger at a central portion of each side of said chip than at each corner of the chip, wherein the leads are arranged such that a line connecting all leads is substantially parallel with the peripheral wall of said die pad.

5,468,994

HIGH PIN COUNT PACKAGE FOR SEMICONDUCTOR DEVICE

Rajendra D. Pendse, Fremont, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 10, 1992, Ser. No. 988,640
Int. Cl.[6] H01L *23/02;23/48;29/46;29/54*
U.S. Cl. 257—693 **12 Claims**



1. A metal leadless integrated circuit package comprising:

a metal body;

an integrated circuit die thermally coupled to said metal body;

a flexible circuit laminated on said metal body, said flexible circuit including at least a dielectric layer, a wiring formed on said dielectric layer and operatively connected to said integrated circuit die, and at least one opening through at least said dielectric layer of said flexible circuit for electrically connecting a portion of said wiring layer to said metal body;

wherein said wiring layer includes wiring traces and a plurality of pads, and said flexible circuit has a plurality of openings through at least said dielectric layer beneath said pads or said traces,

wherein said metal body includes at least a cavity formed therein for receiving said integrated circuit, and a wire-bondable finish on at least a region surrounding the cavity, and

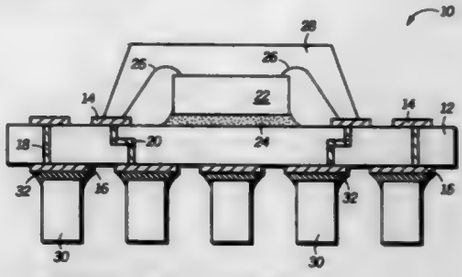
wherein said integrated circuit includes at least ground bonding pads which are down-bonded to said wire-bondable finish.

5,468,995

SEMICONDUCTOR DEVICE HAVING COMPLIANT COLUMNAR ELECTRICAL CONNECTIONS

Leo M. Higgins, III, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1994, Ser. No. 270,548
Int. Cl.[6] H01L *23/50*
U.S. Cl. 257—697 **13 Claims**



1. A semiconductor device comprising:

a semiconductor die;

a substrate having a die mounting area, a plurality of conductive traces, and a plurality of conductive lands connected to the plurality of conductive traces, wherein the semiconductor die is mounted in the die mounting area;

means for electrically connecting the semiconductor die to the plurality of conductive traces;

a package body covering the semiconductor die and the means for electrically connecting the semiconductor die; and

a plurality of elongated external electrical connections connected to the plurality of conductive lands by way of a plurality of conductive joints, wherein each elongated external electrical connection comprises an innermost polymeric core which has a length and a width, the length being greater than the width, and an outer metallic coating along the length of each innermost polymeric core.

5,468,996

ELECTRONIC PACKAGE ASSEMBLY AND CONNECTOR FOR USE THEREWITH

Benson Chan, Vestal; Fletcher L. Chapin, Maine; Vincent M. Fiacco; John R. Mankus, both of Endicott, and Robert S. Pokrzywa, Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

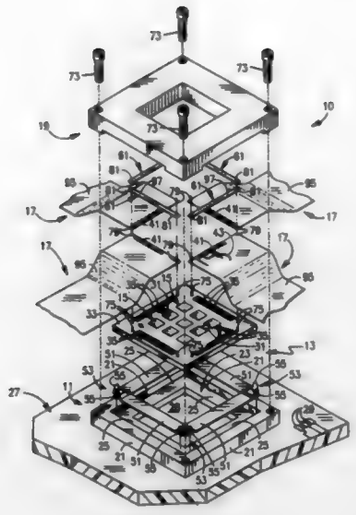
Filed Mar. 25, 1994, Ser. No. 218,002
Int. Cl.[6] H01L *23/34*
U.S. Cl. 257—723 **7 Claims**

1. A flexible circuitized substrate comprising:

a dielectric layer including first and second opposing surfaces;

a plurality of contact pads spacedly located on said first surface of said dielectric layer; and

a conductive layer located on said second surface of said dielectric layer substantially opposite said plurality of contact pads, said conductive layer comprising a plurality of spaced pads located on said dielectric layer substantially opposite selected ones of said plurality of contact pads, and an interim elongated pad located on said dielectric layer between selected ones of said spaced pads and separating said selected ones of said spaced pads, said conductive layer being of a configuration for assuring enhanced flexibility of said flexible circuitized substrate in the region of said plurality of contact pads.

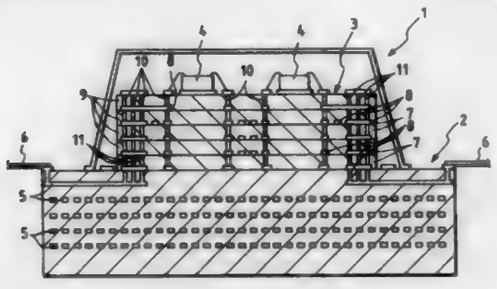


5,468,997

INTEGRATED CIRCUIT PACKAGE HAVING A MULTILAYERED WIRING PORTION FORMED ON AN INSULATING SUBSTRATE

Ryuji Imai, and Rokuro Kanbe, both of Aichi, Japan, assignors to NGK Spark Plug Co., Ltd., Aichi, Japan

Continuation of Ser. No. 102,963, Aug. 6, 1993, abandoned, which is a continuation of Ser. No. 895,995, Jun. 8, 1992, abandoned. This application Dec. 30, 1994, Ser. No. 368,384
Claims priority, application Japan, Jun. 10, 1991, 3-137949
Int. Cl.[6] H01L 23/48;29/44
U.S. Cl. 257—734 3 Claims



1. An integrated circuit package comprising:

a multilayer wiring portion having a first surface on which at least one integrated circuit is mounted and a second surface opposite the first surface, the multilayer wiring portion having a plurality of laminated wiring layers, said plurality of wiring layers including insulating films having a low dielectric constant and conductor films;

an insulating substrate formed of insulating material for mounting the second surface of said multilayer wiring portion thereto, said insulating substrate being provided with substrate wiring electrically connected through said multilayer wiring portion to the at least one integrated circuit; and

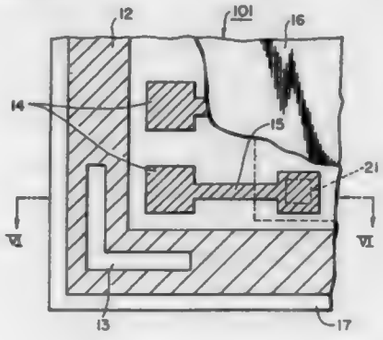
an electrical connection for electrically connecting said at least one integrated circuit with the substrate wiring of said insulating substrate, the electrical connection including a grouping of a plurality of coextensive conductor columns extending through the multilayer wiring portion, said conductor columns of the grouping being electrically connected in parallel by the multilayer wiring portion to improve reliability of the electrical connection.

5,468,998

RESIN MOLDED TYPE SEMICONDUCTOR DEVICE HAVING A CONDUCTOR FILM

Yuji Hara, Akishima; Satoru Ito, and Tatsuro Toya, both of Tokyo, all of, Japan, assignors to Hitachi, Ltd., and Hitachi Microcomputer Engineering Ltd., both of Tokyo, Japan

Continuation of Ser. No. 72,405, Jun. 7, 1993, Pat. No. 5,371,411, which is a continuation of Ser. No. 703,765, May 21, 1991, Pat. No. 5,229,642, which is a division of Ser. No. 419,007, Oct. 10, 1989, Pat. No. 5,023,699, which is a continuation of Ser. No. 191,080, May 6, 1988, abandoned, which is a continuation of Ser. No. 902,539, Sep. 2, 1986, abandoned, which is a continuation of Ser. No. 744,151, Jun. 13, 1985, Pat. No. 4,625,227, which is a continuation of Ser. No. 292,585, Aug. 13, 1981, abandoned. This application Aug. 22, 1994, Ser. No. 293,559
Claims priority, application Japan, Sep. 1, 1980, 55-119817
The portion of the term of this patent subsequent to Nov. 25, 2001, has been disclaimed.
Int. Cl.[6] H01L 29/34;29/40;27/02;23/48
U.S. Cl. 257—775 8 Claims



1. A semiconductor integrated circuit device comprising:

a substantially tetragonal semiconductor substrate having a major surface including a first peripheral edge and a second peripheral edge adjacent to said first peripheral edge to define a corner of said major surface of said substantially tetragonal semiconductor substrate;

a plurality of active circuit elements which are formed on said major surface of said substantially tetragonal semiconductor substrate;

a plurality of bonding pads formed on said major surface of said substantially tetragonal semiconductor substrate;

a metal wiring electrically connecting one of said plurality of active circuit elements and one of said bonding pads, and a broad metal wiring formed adjacent to said first and second peripheral edges of said major surface of said substantially tetragonal semiconductor substrate, said broad metal wiring including a first portion extending in parallel with said first peripheral edge, a second portion extending in parallel with said second peripheral edge and a connecting portion connecting said first portion with said second portion;

an inorganic passivation film formed over said metal wiring and said broad metal wiring; and

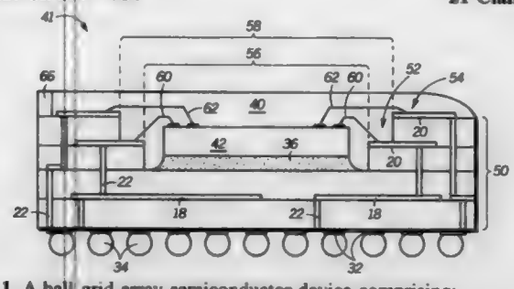
a thermosetting sealing resin which is formed over said inorganic passivation film and which encapsulates said semiconductor substrate, said broad metal wiring having a slit formed in said connection portion and said second portion and extending to said first portion, and the width of said broad metal wiring being sufficient to act as wiring for supplying a power source or a ground potential for said plurality of active circuit elements.

5,468,999

LIQUID ENCAPSULATED BALL GRID ARRAY SEMICONDUCTOR DEVICE WITH FINE PITCH WIRE BONDING

Paul T. Lin, and Michael B. McShane, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 26, 1994, Ser. No. 249,602
Int. Cl.[6] H01L *23/02;23/12;23/48*
U.S. Cl. 257—784 21 Claims



1. A ball grid array semiconductor device comprising:

a package substrate having a first surface and an opposing second surface, wherein the first surface has a first plurality of conductive traces formed thereon and has a conductive bond post at an end of each trace, and wherein the second surface has a plurality of conductive terminal pads arranged in an array configuration and electrically connected to the plurality of conductive traces;

a semiconductor die mounted to the package substrate, the die having a periphery and sides, and having a plurality of bond pads located about the periphery of the die, wherein the bond pads are positioned in two rows, an inner row and an outer row, along the sides of the die;

a first plurality of wire bonds electrically connecting the plurality of bond pads to the bond posts of the first plurality of conductive traces, wherein each wire bond of the first plurality is bonded to be approximately orthogonal to a side of the die, and wherein each wire bond of the first plurality is formed of a conductive wire having a diameter of less than approximately 25 μm;

a plurality of conductive balls attached to the plurality of conductive terminal pads on the second surface of the package substrate; and

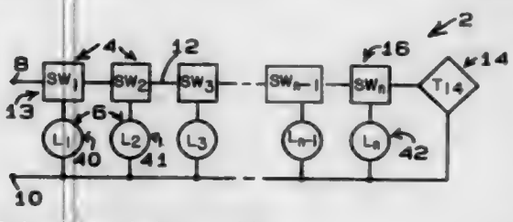
a glob top encapsulant covering the die, the first plurality of wire bonds, and at least a portion of the first surface of the package substrate.

5,469,000

SWITCHING DEVICE WITH A PLURALITY OF SWITCHES TO AN INPUT SIGNAL LEVEL

Hendrik M. Geysen, 31 Old Menzies Creek Road, Menzies Creek, Victoria 3159, Australia

PCT No. PCT/AU90/00343, § 371 Date Mar. 10, 1992, § 102(e) Date Mar. 10, 1992, PCT Pub. No. WO91/03103, PCT Pub. Date Mar. 7, 1991
PCT Filed Aug. 10, 1990, Ser. No. 834,340
Claims priority, application Australia, Aug. 15, 1989, PJ5780/89; Dec. 22, 1989, PJ8005/89
Int. Cl.[6] H02J *1/00*
U.S. Cl. 307—39 33 Claims



1. A switching device comprising:

a plurality of switching means connected serially to one another and having at least a first one of said switching means connected to an input terminal; and

a plurality of load means connected in parallel, each between a corresponding switching means of said plurality of switching means, and a common output terminal which receives current signals from said plurality of load means;

said plurality of switching means each having a first state in which the corresponding load means is deactivated and inhibited from providing a respective current signal, and a second state in which the corresponding load means is activated to provide said respective current signal, said second state being adopted on the application of a trigger signal to said input terminal when, except for the first switching means, the preceding switching means is in said second state, a subsequent application of said trigger signal causing the switching means to revert to said first state;

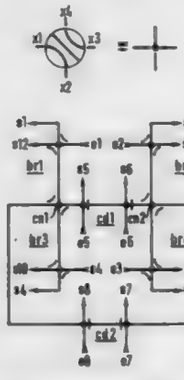
wherein, on placing the first switching means in said second state and the remaining switching means in said first state, sequentially applying said trigger signal causes said plurality of switching means to sequentially adopt said second state and then subsequently revert to said first state.

5,469,001

SWITCH NETWORK

Bruno Vaillant, Toulouse, France, assignor to Societe Anontme Dite Alcatel Espace, Courbevoie, France

Filed Nov. 24, 1993, Ser. No. 156,905
Claims priority, application France, Nov. 27, 1992, 92 14313
Int. Cl.[6] H04L *12/00*
U.S. Cl. 307—113 8 Claims



8. Network of switches comprising N input ports and T output ports adapted to connect mutually and individually any P inputs and any P outputs (P≦N and P≦T), the switches having four poles and enabling a first pole to be connected to a second, a third or a fourth pole and, correspondingly, said third pole to be connected to said fourth, first or second pole, the structure of said network comprising a plurality of nodal switches each of said nodal switches being connected to at least one of the other nodal switches by at least one path, and a plurality of cords, a cord being a chain comprising at least one cord switch, each cord switch providing access to at least one input or output and being connected to two other switches at most, each cord being further connected to two nodal switches, in which network at least one nodal switch is connected to at least three cords or branches, or a combination of three cords or branches, a branch being an arrangement comprising a switch one pole of which is connected to an input port, two poles which are available for the connection of two output ports at most and one pole of which is connected to one pole of a nodal switch.

5,469,002

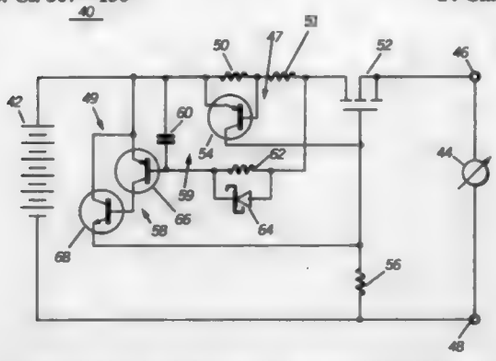
BI-LEVEL CURRENT LIMITING CIRCUIT AND BATTERY USING SAME

Scott M. Garrett, Duluth, Ga., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1994, Ser. No. 298,812

Int. Cl.[6] H02J *7/04*

U.S. Cl. 307—150 **14 Claims**



1. A battery pack for powering an electronic device for use in a volatile atmospheric conditions, said battery pack comprising:

at least one battery cell;

means for establishing a steady state current level output from said battery pack;

means for establishing a maximum current level output from said battery pack;

sense resistor means coupled to said means for establishing said steady state and said maximum current levels; and

a pass device, electrically coupled to said electronic device, and responsive to said means for establishing said maximum and said steady state current levels.

5,469,003

HIERARCHICALLY CONNECTABLE CONFIGURABLE CELLULAR ARRAY

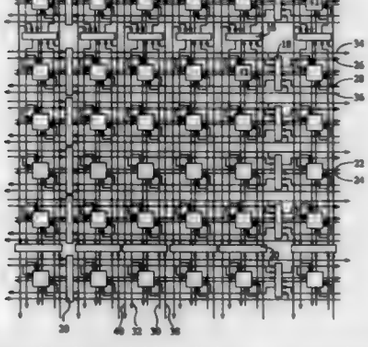
Thomas A. Kean, Edinburgh, Scotland, assignor to Xilinx, Inc., San Jose, Calif.

Filed Nov. 5, 1993, Ser. No. 148,793

Claims priority, application United Kingdom, Nov. 5, 1992, 9223226

Int. Cl.[6] H03K *19/177*

U.S. Cl. 326—39 **28 Claims**



1. An hierarchically-scalable cellular array comprising:

a plurality of cells;

a first routing resource for interconnecting each cell to its adjacent neighboring cells, said first routing resource including a first plurality of lines having a length n, where n is a predetermined distance;

a second routing resource including a second plurality of lines having a length N×n where N>1, said second routing resource connecting said cells into blocks of cells and interconnecting said blocks of cells; and

a third routing resource including a third plurality of lines having a length $N^m \times n$ where $n \geq 2$ and where $N^m \times n \leq T$, the total length of said cellular array, said third routing resource interconnecting groups of said blocks of cells.

5,469,004

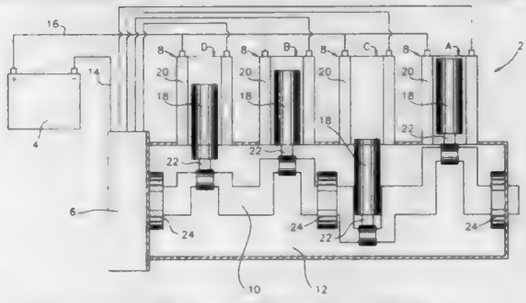
ELECTRIC VEHICLE SOLENOID MOTOR

Frank M. Jachim, 3869 Riviera Clr., Bonita Springs, Fla. 33923

Filed May 13, 1994, Ser. No. 242,644

Int. Cl.[6] H02K *33/00*

U.S. Cl. 310—24 **20 Claims**



1. An electric vehicle solenoid motor, comprising:

a crankshaft disposed in a housing, said crankshaft having an eccentric lobe;

at least one solenoid having a core operatively connected to said crankshaft;

a power distribution control assembly disposed adjacent said crankshaft at the location of said eccentric lobe;

an electrical power source operatively connected to said solenoid so as to pass electric power through said power distribution control assembly to said solenoid; and

wherein said power distribution control assembly has at least one power director disposed about said crankshaft, said power director having a contact rod and a contact plate, said contact rod being moveable by said eccentric lobe of said crankshaft such that rotation of said crankshaft causes linear displacement of said contact rod so that said contact plate of said power director allows passage of electrical power from said electrical power source to said solenoid by engaging said contact plate with contacts connected to terminals of said solenoid.

5,469,005

BRUSHLESS MOTOR

Kiichi Asama, and Hiroo Ashibe, both of Komagane, Japan, assignors to Sankyo Seiki Mfg. Co., Ltd., Nagano, Japan

Filed Apr. 13, 1994, Ser. No. 227,114

Claims priority, application Japan, Apr. 16, 1993, 5-025259

Int. Cl.[6] H02K *11/00;1/14*

U.S. Cl. 310—68 B **4 Claims**

1. A brushless motor comprising:

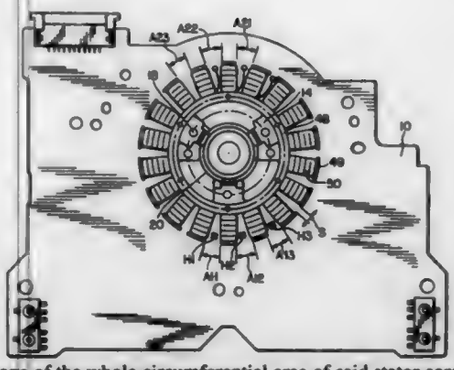
a rotor;

a driving magnet which is rotated integrally with said rotor;

a stator core disposed so as to oppose said driving magnet and being wound therearound with a coil, said stator core having salient poles with umbrella portions except for notched portions thereof;

a magnetic sensor disposed in the vicinity of said stator core in a first notched portion prepared by partly removing two corresponding adjacent salient-pole umbrella portions of said stator core for detecting a magnetic pole of the driving magnet; and

a second notched portion being formed by partly removing two corresponding adjacent salient-pole umbrella portions in a



zone of the whole circumferential area of said stator core, said second notched portion being magnetically balanced with said first notched portion.

5,469,006

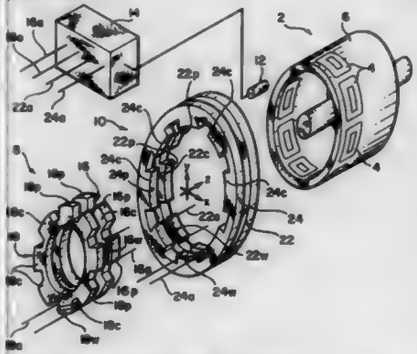
LORENTZ FORCE MAGNETIC BEARING UTILIZING CLOSED CONDUCTIVE LOOPS AND SELECTIVELY CONTROLLED ELECTROMAGNETS

Joseph F. Pinkerton, Austin, Tex., assignor to Magnetic Bearing Technologies, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 996,192, Dec. 23, 1992, Pat. No. 5,302,874, which is a continuation-in-part of Ser. No. 950,607, Sep. 25, 1992, abandoned. This application Dec. 6, 1993, Ser. No. 162,313

Int. Cl.[6] H02K *7/02*

U.S. Cl. 310—90.5 **19 Claims**



17. A magnetic bearing system, comprising,

an object which includes a closed loop of electrically conductive material which is unconnected electrically to any power source,

a stationary set of electromagnets for producing a plurality of selectively controllable magnetic fields,

said object being rotatable about an axis of rotation so that, when the electromagnets are energized, said loop travels along a prescribed circular path relative to and through said magnetic fields,

said loop having opposed first and second legs, said electromagnets including two concentric rings of magnets, a first said ring of magnets having poles which face said first said leg but not said second leg, a second said ring of magnets having poles which face said second leg but not said first leg,

said electromagnets, when energized, producing magnetic fields positioned to subject said loop to magnetic flux to produce electromotive forces in said loop so that an electrical current is induced in said loop; said electrical current having a direction which, in the presence of said magnetic fields, exerts Lorentz forces on said loop in a lateral direction; and

control means for selectively energizing said electromagnets and changing the strengths of said magnetic fields to affect the position of said loop and said object relative to said electromagnets.

5,469,007

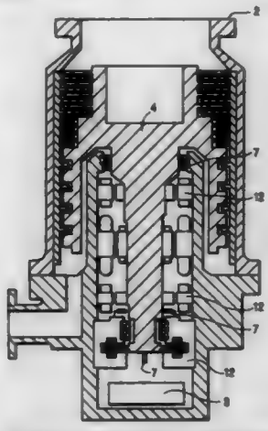
MAGNETIC BEARING ARRANGEMENT

Katsuhisa Toyama, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1993, Ser. No. 162,322

Int. Cl.[6] H02K *5/24;* **G05B** *11/32*

U.S. Cl. 310—90.5 **7 Claims**



1. A magnetic bearing arrangement, comprising:

a structure having a magnetic bearing for supporting a suspended object with magnetic force;

a position sensor for detecting the suspended position of the suspended object and providing a detection signal in response thereto;

a circuit unit for receiving the detection signal from said position sensor comprising control elements for regulating inherent features of said structure having said magnetic bearing including a central position regulator, a positional feedback gain adjustment and a control circuit tuned to a natural frequency of the suspended object; and

a magnetic bearing control apparatus for receiving the detection signal from said circuit unit after the detection signal has been subjected to central position regulation and a positional feedback gain adjustment and passed through said control circuit tuned to a natural frequency of the suspended object and for controlling the magnetic force of said magnetic bearing of said structure;

wherein said circuit unit is provided and located outside of said magnetic bearing control apparatus such that said magnetic bearing control apparatus can be interchanged with respect to said structure having said magnetic bearing independently of said circuit unit.

5,469,008

MOTOR WITH A BEARING LUBRICATED BY MAGNETIC FLUID

Takeshi Nakajima; Ichiro Hashimoto; Tomoyuki Saitou; Fusanori Ohira; Sueo Akashi; Nobukatu Sone, and Katsutoshi Nii, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 13, 1993, Ser. No. 165,451

Claims priority, application Japan, Dec. 11, 1992, 4-331377

Int. Cl.[6] H02K *7/14;7/09*

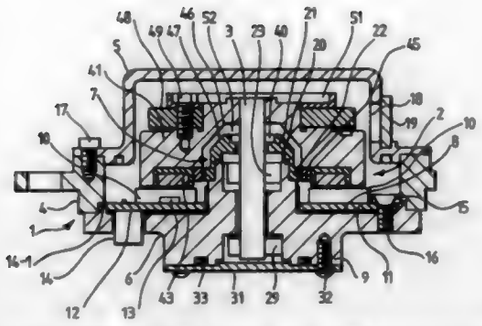
U.S. Cl. 310—90.5 **9 Claims**

1. A motor comprising:

a stator having a base part and a hollow projection projecting from said base part;

a rotor having a shaft and an annular part, said rotor being positioned with respect to said stator so that said annular part of said rotor extends around said hollow projection of said stator and said shaft of said rotor extends into said hollow projection of said stator towards said base of said stator and is rotatable relative thereto about a rotation axis;

drive means for applying a rotative force to said rotor relative to said stator to rotate said rotor about said rotation axis;



a radial bearing mounted between said shaft and said hollow projection of said stator;

magnetic fluid disposed between said shaft and said hollow projection of said stator for lubrication of said radial bearing;

a magnetic seal mounted between said shaft and said hollow projection of said stator for sealing said magnetic fluid, said magnetic seal being further from said base part of said stator than said radial bearing in the direction of said rotation axis; and

a magnetic thrust bearing mounted between said hollow projection of said stator and said annular part of said rotor, said magnetic thrust bearing being axially disposed towards said base part of said stator in the direction of said rotation axis relative to said magnetic seal.

5,469,009

TURBINE GENERATOR

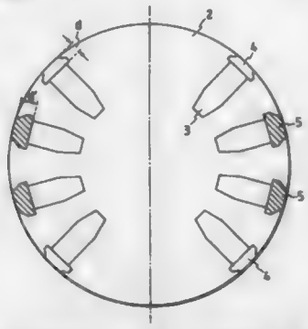
Shinichi Wakui; Kazumasa Ide, both of Hitachi; Haruo Koharagi, Jyuou; Miyoshi Takahashi; Kado Miyakawa, both of Hitachi, and Yasuomi Yagi, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 15, 1994, Ser. No. 261,381

Claims priority, application Japan, Jun. 18, 1993, 5-147280

Int. Cl.[6] H02K *3/46*

U.S. Cl. 310—214 **13 Claims**



1. A turbine generator which is designed to be started with thyristors comprising a stator (**16**) provided with armature windings (**18**) and a rotor (**2**) disposed facing said stator (**16**) and provided with a plurality of slots (**3**) arranged in circumferential direction with a predetermined interval and extending along axial direction, field windings disposed in said slots (**3**) and wedges (**4**, **5**) having a damper effect inserted in said slots (**3**) so as to retain said field windings therein,

when assuming that the direction of magnetomotive force induced by said field windings as d axis and the direction perpendicular to d axis as q axis, the physical property or the configuration of said wedges (**4**) positioned at q axis side on said rotor (**2**) being varied from the physical property or the configuration of said wedges (**4**) positioned at d axis side on said rotor (**2**) in such a manner that the heating of the respective wedges (**4**, **5**) due to resistance loss caused by current flowing therethrough during starting with thyristors of the turbine generator is uniformalized in circumferential direction of said rotor (**2**), and a thermal balance between said wedges (**5**) positioned at q axis side on said rotor (**2**) and said wedges (**4**) positioned at d axis side on said rotor (**2**) is maintained during starting with thyristors of the turbine generator.

5,469,010

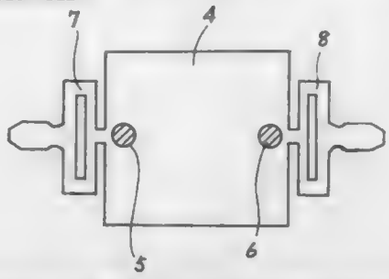
METHOD OF ADJUSTING FREQUENCY OF NS-GT CUT QUARTZ RESONATOR

Hirofumi Kawashima, Sendai, Japan, assignor to Seiko Electronic Components Ltd., Japan

Filed Mar. 3, 1994, Ser. No. 205,946

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—312 **2 Claims**



1. A method of adjusting a frequency-to-temperature coefficient of a coupling resonator comprising the steps of: providing an NS-GT cut quartz coupling resonator having a first order temperature coefficient α_+ and a vibrational portion vibratable in at least two coupled together modes of vibration including a primary vibrational mode and a subvibrational mode; calculating a normalized frequency δ of the coupled vibrational modes according to the relationship $\alpha_+=m\delta+n$, where m is a constant defined by the relationship $m=K\alpha_{Km}-R^2(\alpha_1-\alpha_2)$ where K is given as a function of a coupling coefficient Km where K^2m is defined by $K^2m=-\{[(f_1^2f_-^2)/(f_1^2f_2^2)]-1\}$, α_{Km} is the first order temperature coefficient of the coupling coefficient Km, $R=f_2/f_-$, f_1 is the resonant frequency of the uncoupled primary vibrational mode, f_2 is the resonant frequency of the uncoupled subvibrational mode, f_1 is the resonant frequency of the coupled primary vibrational mode, f_- is the resonant frequency of the coupled subvibrational mode, α_1 is the first order temperature coefficient of the uncoupled primary vibrational mode and α_2 is the first order temperature coefficient of the uncoupled subvibrational mode, and where n is a constant defined by the relationship $n=(\alpha_1-\alpha_2f_{MP}^2)/(1-f_{MP}^2)$, where $f_{MP}=f_-/f_+$; and adding weights to or removing weights from the vibrational portion of the resonator at a predetermined position thereof so as to adjust the normalized frequency δ of the coupled vibrational modes to set the first order temperature coefficient α_+ to substantially zero.

5,469,011

UNIBODY ULTRASONIC TRANSDUCER

Ali R. Safabakhsh, Wyane, Pa., assignor to Kulicke & Soffa Investments, Inc., Wilmington, Del.

Filed Dec. 6, 1993, Ser. No. 161,847

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—325 **16 Claims**

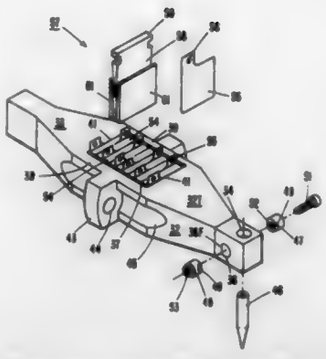
1. An ultrasonic transducer, comprising:

a monolithic body,

a substantially rectangular aperture through said one piece body formed by two axial sides and two transverse sides,

said one piece body having a tool holder end extended axially from a first transverse side,

said one piece body having a balance end extending axially from a second transverse side,



transducer driver means comprising a plurality of piezoelectric crystals in a stack axially aligned in said rectangular aperture, and

wedge means located in the center of said stack of piezoelectric crystals in said rectangular aperture in alignment of said transducer driver means for placing said transducer driver means in a compression mode between said two transverse sides.

5,469,012

ELECTRONIC COMPONENT

Yoshihisa Suzuki; Yuuichi Sugawara; Susumu Ishihara, and Ikuo Katoh, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

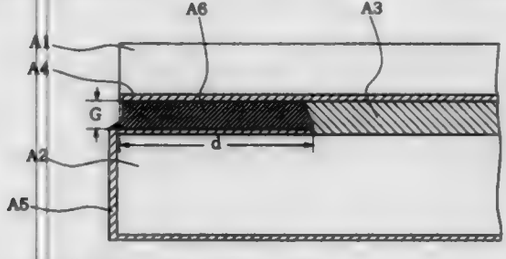
PCT No. PCT/JP93/00923, § 371 Date Feb. 1, 1995, § 102(e) Date Feb. 1, 1995, PCT Pub. No. WO94/05134, PCT Pub. Date Mar. 3, 1994

PCT Filed Jul. 5, 1993, Ser. No. 374,528

Claims priority, application Japan, Aug. 26, 1992, 4-250722

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—348 **7 Claims**



1. An electronic component comprising:

a piezoelectric element having a lead electrode at the edge; a supporting member being positioned at a location that faces said piezoelectric element across a gap G, and having an external connecting terminal at a location that faces said lead electrode;

a resin layer being positioned between said piezoelectric element and said supporting member, being indented by the distance d from the edge of said piezoelectric element and bonding said piezoelectric element to said supporting member, said distance d satisfying the relationship d>G with said gap G; and

a solder filling the space formed by said gap G over said distance d and connecting said lead electrode and said external connecting terminal.

5,469,013

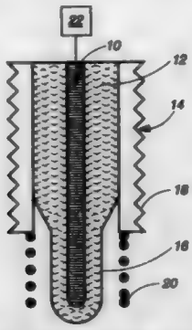
LARGE DISCHARGE-VOLUME, SILENT DISCHARGE SPARK PLUG

Michael Kang, Los Alamos, N.M., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 31, 1993, Ser. No. 41,020

Int. Cl.[6] H01T *13/20*

U.S. Cl. 313—138 **2 Claims**



1. A large discharge-volume, silent discharge spark plug for generating self-terminating microdischarges, which comprises:

a grounded, generally cylindrical first electrode having an open structure;

an elongated second electrode located axially to said first electrode;

a dielectric barrier material covering said second electrode, whereby an annular volume is created between said first electrode and said dielectric barrier material; and

means for providing alternating voltage to the second electrode such that self-terminating microdischarges occur between the first electrode and the dielectric material through the annular volume.

5,469,014

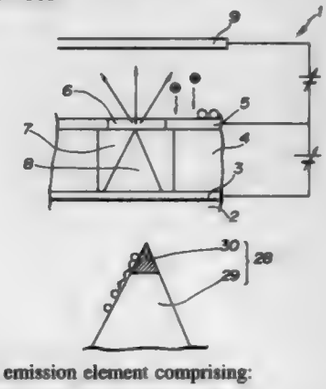
FIELD EMISSION ELEMENT

Shigeo Itoh; Teruo Watanabe; Makoto Miyamori; Norio Nishimura, all of Mobara; Junji Itoh, and Seigo Kanemaru, both of Tsukuba, all of, Japan

Filed Feb. 3, 1992, Ser. No. 829,251

Int. Cl.[6] H01J *1/30*

U.S. Cl. 313—308 **4 Claims**



1. A field emission element comprising:

an emitter having a tip portion; and

a gate;

said emitter tip portion comprising a material exhibiting an oxygen bonding strength lower than that of a material for the remaining portion of said emitter.

5,469,015

FUNCTIONAL VACUUM MICROELECTRONIC FIELD-EMISSION DEVICE

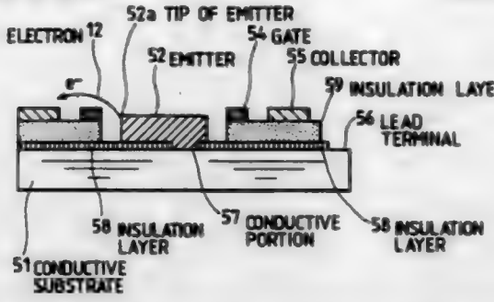
Akira Kaneko, Tokyo; Toru Kanno, and Keiko Morishita, both of Kawasaki, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 800,371, Nov. 29, 1991, abandoned. This application Apr. 13, 1994, Ser. No. 227,228

Claims priority, application Japan, Nov. 28, 1990, 2-332411; Nov. 28, 1990, 2-332412; Mar. 26, 1991, 3-061574; Nov. 26, 1991, 3-310491

Int. Cl.[6] H01J *1/30*

U.S. Cl. 313—309 **26 Claims**



24. A vacuum microelectronic field-emission device comprising:

(a) a substrate;

(b) an emitter portion formed on said substrate to have at least a wedge portion extending in parallel to said substrate, said emitter portion being electrically connected to a conductive layer on said substrate, said emitter portion being electrically insulated from said substrate;

(c) a gate portion formed on said substrate and spaced apart from a tip of said emitter portion on said substrate by a first predetermined distance, said gate portion substantially surrounding said emitter portion, said gate portion being electrically insulated from said substrate and from said emitter portion; and

(d) a collector portion formed on said substrate and spaced apart from said tip of said emitter portion on said substrate by a second predetermined distance, said collector portion substantially surrounding said gate portion, said collector portion being electrically insulated from said substrate and from said emitter and said gate portions, further comprising:

an insulation layer formed a third predetermined distance apart from a tip of said emitter, said insulation layer covering a portion of said substrate and a portion of said conductive layer, said insulation layer supporting said gate and collector portions,

said insulation layer and said emitter portion being formed such as to expose said conductive layer to cause it to function as a lead terminal.

5,469,016

P-F CONNECTOR STRUCTURE FOR A CATHODE-RAY TUBE

Se-Ki Chun, Gumi-Shi, Rep. of Korea, assignor to Orion Electric Co., Ltd., Kyungsangbuk-Do, Rep. of Korea

Filed Nov. 5, 1993, Ser. No. 149,218

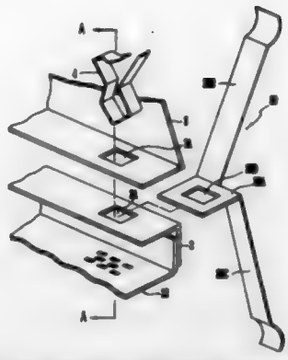
Int. Cl.[6] H01J *29/02*

U.S. Cl. 313—402 **1 Claim**

1. A P-F connector comprising:

a fixed portion formed at an end of said P-F connector and located between a mask and an inner shield, thereby fixing to the mask and the inner shield by a clip and through holes formed on the fixed portion, the mask and the inner shield respectively; and

a connecting portion formed at another end of said P-F connector and electrically connecting a funnel and a panel, said connecting portion including (i) a first connecting portion connected to a conducting layer of an inside wall of the funnel



and (ii) a second connecting portion connected to a fluorescent layer of an inside wall of the panel; wherein said connecting portion is divided into said first and second connecting portions in a longitudinal direction and said first and second connecting portions are bent in opposite directions relative to each other.

5,469,017

PERMANENT MAGNET FOCUS UNIT WITH INTEGRAL ASTIGMATISM CORRECTOR

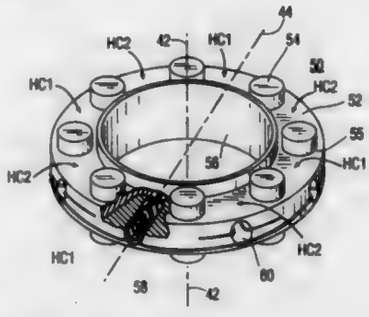
Jean M. Perreaut, Dijon; Bruno F. Roussel, and Didier Thibaudin, both of Genlis, all of, France, assignors to Thomson Tubes & Displays, S.A., Paris, France

Filed Mar. 22, 1993, Ser. No. 35,386

Claims priority, application European Pat. Off., Mar. 27, 1992, 92400871

Int. Cl.[6] H01J *29/70*

U.S. Cl. 313—431 **19 Claims**



1. An apparatus, comprising:

an annular form adapted for mounting on a neck of a cathode ray tube in which an electron beam is established;

a plurality of permanent magnets disposed on said form for generating a first field for focusing said electron beam, each of said permanent magnets having a longitudinal axis substantially parallel to said electron beam;

an annular winding disposed on said form for generating a second field for focusing said electron beam, said annular winding having a longitudinal axis substantially parallel to said electron beam; and,

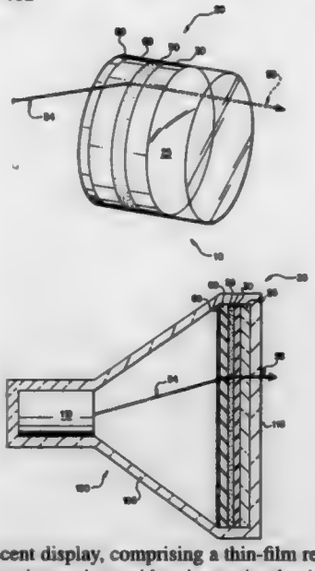
a plurality of windings disposed on said form in an annular array and coupled for generating a third field for correcting astigmatic aberrations in said electron beam, each of said plurality of windings having a longitudinal axis substantially perpendicular to said electron beam.

5,469,018

RESONANT MICROCAVITY DISPLAY

Stuart M. Jacobsen; Steven M. Jaffe; Hergen Eilers, all of Athens, and Michieal L. Jones, Winterville, all of Ga., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed Jul. 20, 1993, Ser. No. 94,767
Int. Cl.[6] H01S 3/08
U.S. Cl. 313—461 **31 Claims**



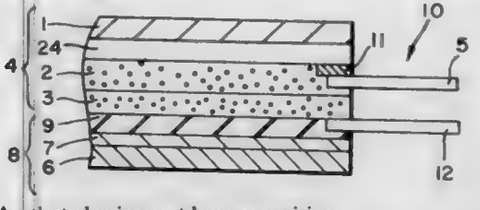
1. A luminescent display, comprising a thin-film resonant microcavity with an active region, said active region having a phosphor disposed therein for emitting light.

5,469,019

THIN ELECTROLUMINESCENT LAMP AND PROCESS FOR FABRICATING THE SAME

Naoyuki Mori, Shiga, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 24, 1994, Ser. No. 201,395
Claims priority, application Japan, Feb. 24, 1993, 5-033877
Int. Cl.[6] H01J 1/54;9/24; G09G 3/10
U.S. Cl. 313—509 **8 Claims**



1. An electroluminescent lamp comprising:

a front side transparent film and a rear side transparent film;

a transparent electrode formed on said front side transparent film;

a luminous layer provided to said transparent electrode and being formed of a moistureproof-coated phosphor powder distributed in fluororesin;

a reflective insulation layer provided to said luminous layer and being formed of a high dielectric material distributed in fluororesin;

a rear electrode formed of a conductive material having a migration property lower than that of silver and thermally-compress-bonded to said reflective insulation layer; and

an adhesive layer provided between said rear electrode and said rear side transparent film,

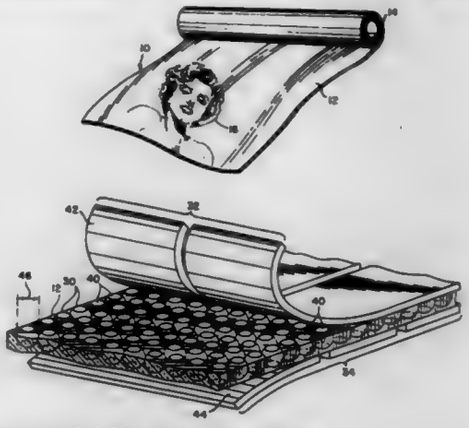
said luminous layer, said reflective insulation layer and said rear electrode being in a laminate form and being positioned such that, between said front side transparent film and said rear side transparent film, a peripheral portion of said transparent electrode and a peripheral portion of said adhesive layer are extended and exposed, and such that a peripheral portion of said front side transparent film having said transparent electrode thereon and a peripheral portion of said rear side transparent film having said adhesive layer are in a securely thermally-compress-bonded state.

5,469,020

FLEXIBLE LARGE SCREEN DISPLAY HAVING MULTIPLE LIGHT EMITTING ELEMENTS SANDWICHED BETWEEN CROSSED ELECTRODES

Bradley R. Herrick, Marlborough, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 14, 1994, Ser. No. 212,411
Int. Cl.[6] H01J 63/04; G09F 13/00
U.S. Cl. 313—511 **16 Claims**



1. An extended film display, comprising

a flexible film having two opposing sides;

a pair of crossed electrodes, one on each different ones of said opposing sides of said film;

a number of light-emitting elements dispersed in said film, said elements extending from one side of said film to the other, said elements being sandwiched between a crossover between said crossed electrodes and being sufficiently small to permit numbers of said elements to exist at said crossover, whereby activation of said electrodes at said crossover activates numbers of said elements therebetween; and

means including said crossed electrodes for selectively activating said elements.

5,469,021

GAS DISCHARGE FLAT-PANEL DISPLAY AND METHOD FOR MAKING THE SAME

Martin P. Lepselter, Summit, N.J., assignor to BTL Fellows Company, LLC, and Spectron Corporation of America, L.L.C., both of Summit, N.J.

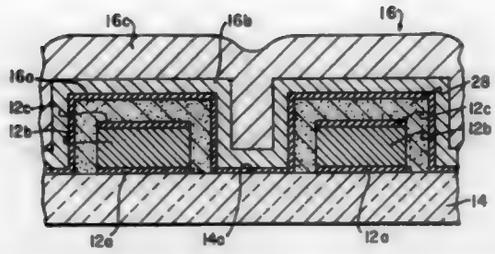
Filed Jun. 2, 1993, Ser. No. 70,511
Int. Cl.[6] H01J 17/20
U.S. Cl. 313—582 **8 Claims**

1. A flat-panel plasma display structure, comprising:

a substrate;

a first set of conductors on said substrate;

a second set of conductors on said substrate and disposed at an angle to said first set of conductors and at a preselected distance therefrom, said second set of conductors crossing over said first set of conductors, said preselected distance determined by the selective removal of a sacrificial layer formed between said first and second sets of conductors to thereby define a discharge space between said conductors at the crosspoints;



a gas in said discharge space, the gas being at substantially atmospheric pressure; and

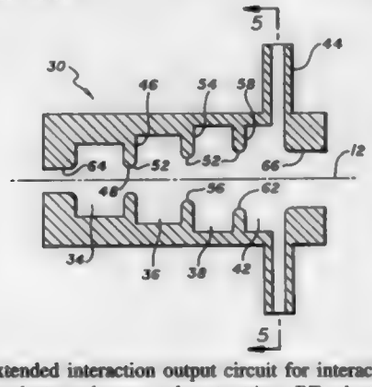
a capping means on said substrate for covering at least a portion of said first and second sets of conductors and for sealing said gas.

5,469,022

EXTENDED INTERACTION OUTPUT CIRCUIT USING MODIFIED DISK-LOADED WAVEGUIDE

Syeda R. Begum, Sunnyvale, and Robert S. Symons, Los Altos, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jul. 30, 1993, Ser. No. 99,746
Int. Cl.[6] H01J 23/40
U.S. Cl. 315—5.39 **25 Claims**



1. An extended interaction output circuit for interacting with a modulated electron beam and outputting RF electromagnetic energy, said circuit comprising:

a plurality of linearly disposed cavities being separated by disks having a single respective hole for transmission of said electron beam and for coupling said electromagnetic energy between said adjacent cavities;

wherein, said linearly disposed cavities act as an RF filter having successively tapered impedances to reduce reflections of said electromagnetic energy propagating through said circuit.

5,469,023

CAPACITIVE STUB FOR ENHANCING EFFICIENCY AND BANDWIDTH IN A KLYSTRON

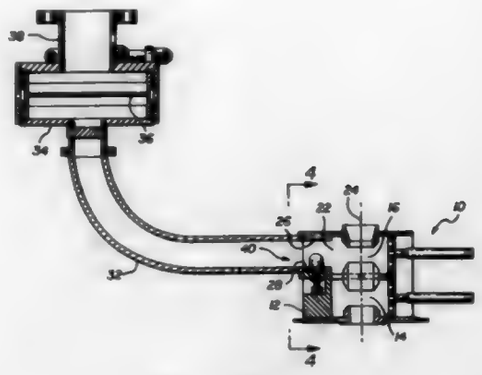
Mark F. Kirshner, Redwood City, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 21, 1994, Ser. No. 185,484
Int. Cl.[6] H01J 23/40
U.S. Cl. 315—5.39 **7 Claims**

1. An apparatus for adjusting an impedance level of an iris coupling RF power from a klystron to an evacuated output waveguide, said apparatus comprising:

a capacitive stub extending from an inner surface of a broad wall of said output waveguide into a position adjacent at least a portion of said iris; and

means coupled to said stub for adjusting said position of said stub from external to said output waveguide.

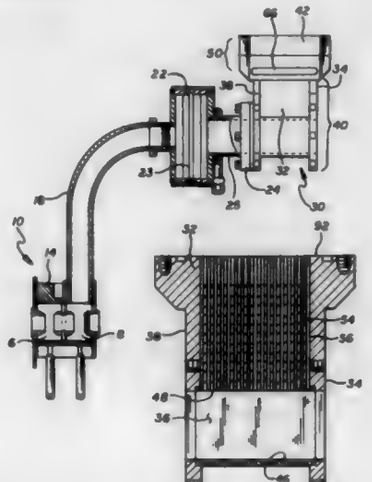


5,469,024

LEAKY WALL FILTER FOR USE IN EXTENDED INTERACTION KLYSTRON

Mark F. Kirshner, Redwood City, and Robert S. Symons, Los Altos, both of Calif., assignors to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 21, 1994, Ser. No. 185,485
Int. Cl.[6] H01J 23/40
U.S. Cl. 315—5.39 **6 Claims**



1. A leaky wall filter for use with an extended interaction klystron (EIK), comprising:

an output waveguide adapted to receive RF energy from said EIK;

a plurality of guidelets intersecting perpendicularly with a wall of said output waveguide, said guidelets capable of propagating 2π mode oscillation frequencies, produced by said EIK, out of said output waveguide;

means for suppressing said 2π mode oscillation frequencies comprising a plenum, a window, and a water load, said plenum being disposed at an end of said guidelets opposite to said output waveguide, said window being disposed between said plenum and said water load, and having a first surface facing said plenum and a second surface facing said water load, said window capable of coupling said 2π mode oscillation frequencies from said plenum into said water load;

wherein some RF energy adapted to be received from said EIK is capable of propagating into said guidelets due to insertion loss and is capable of being converted into thermal energy within said water load.

5,469,025

FAULT TOLERANT ACTIVE MATRIX DISPLAY DEVICE

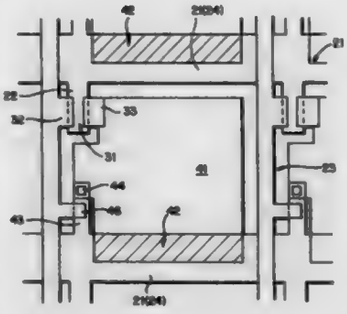
Yuzuru Kanemori, Tenri; Mikio Katayama, Ikoma; Kiyoshi Nakazawa, Fujiidera; Naofumi Kondo, Nara; Masaya Okamoto, Nara; Hiroaki Kato, Nara; Kozo Yano, Yamatokoriyama; Katsumi Irie, Gojo; Kumiko Otsu, Osaka; Hiroshi Fujiki, Sakai; Toshiaki Fujihara, Tenri; Hideji Marumoto, Kitakatsuragi; Hidenori Negoto, Ikoma, and Kazuyori Mitsumoto, Tenri, all of, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Continuation of Ser. No. 48,061, Apr. 19, 1993, abandoned, which is a continuation of Ser. No. 706,974, May 29, 1991, abandoned. This application Mar. 22, 1995, Ser. No. 408,183

Claims priority, application Japan, Sep. 27, 1990, 2-259447; Sep. 28, 1990, 2-261477; Feb. 21, 1991, 3-027530; Feb. 21, 1991, 3-027531

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—169.3 3 Claims



1. An active matrix display device comprising:

a first insulating substrate and a second insulating substrate;

a gate bus having a branch formed thereon and an adjacent gate bus having a projection formed thereon and a source bus having a first projection formed thereon and a second projection formed thereon, the gate bus, the adjacent gate bus, and the source bus being arranged on the first insulating substrate;

a pixel electrode bordered by the gate bus, the adjacent gate bus, and the source bus;

a switching element which is connected to the pixel electrode, to the branch of the gate bus, and to the first projection of the source bus;

wherein the second projection of the source bus extends toward the pixel electrode, and the projection of the adjacent gate bus extends toward the pixel electrode, the second projection of the source bus being overlaid on the projection of the adjacent gate bus with the insulating layer sandwiched therebetween, the projection of the adjacent gate bus being provided with an electroconductive member at a top end thereof with the insulating layer sandwiched therebetween, the electroconductive member being electrically connected to the pixel electrode; and

the display device further comprising a protective layer overlaid at least on the second projection of the source bus and the electroconductive member for containing a release of molten molecules therefrom, wherein the electroconductive member is fused to the projection of the adjacent gate bus through said insulating layer and the second projection of the source bus is fused to the projection of the adjacent gate bus through said insulating layer; and

wherein direct electrical communication of the source bus and the pixel electrode is attained, regardless of a voltage on the gate bus, through the fused electroconductive member and the fused second projection of the source bus.

5,469,026

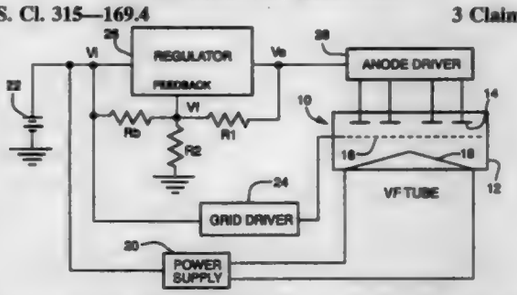
METHOD AND APPARATUS FOR VF TUBE POWER SUPPLY

Wayne A. Madsen, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Nov. 9, 1993, Ser. No. 149,497

Int. Cl.[6] G09G *3/10;* H05B *41/00*

U.S. Cl. 315—169.4 3 Claims



1. In a vacuum fluorescent display having an anode, a grid, and a filament wherein display brightness is a function of grid voltage and anode voltage, an energy efficient power supply comprising:

an unregulated source providing a source voltage for the power supply, wherein the source voltage is subject to variation;

means for supplying unregulated source voltage to the grid, whereby the display brightness is subject to the level of grid voltage;

a regulate source supplied by the unregulated source and coupled to the anode for supplying a regulated voltage to the anode; and

means for maintaining display brightness by adjusting the anode voltage to compensate for the effect of unregulated source voltage variations, wherein the means for maintaining display brightness includes:

regulator feedback means for determining the anode voltage; and

first and second resistors coupling the unregulated voltage source and the anode, respectively, to the feedback means such that as the unregulated voltage changes in one direction the anode voltage is changed in the other direction to minimize the net effect of voltage changes on brightness.

5,469,027

DEVICE FOR OPERATING A HIGH PRESSURE GAS DISCHARGE LAMP

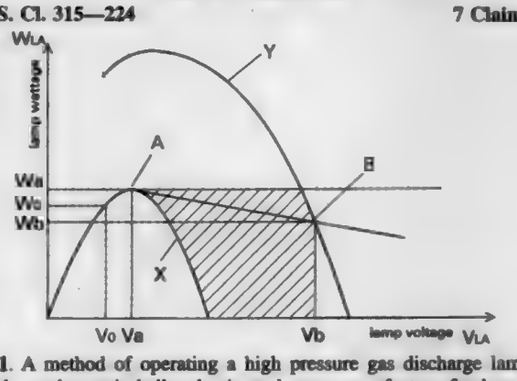
Kiyoaki Uchihashi; Hiroshi Nishimura, both of Kobe, and Noriyuki Fukumori, Neyagawa, all of, Japan, assignors to Matsushita Electric Works, Ltd., Kadoma, Japan

Filed Oct. 6, 1994, Ser. No. 321,824

Claims priority, application Japan, Jun. 28, 1994, 6-146796

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—224 7 Claims



1. A method of operating a high pressure gas discharge lamp with an electronic ballast having a lamp power factor of substantially 1.0, said discharge lamp having a rated lamp voltage and exhibiting an increasing lamp voltage throughout expected lamp life, said method comprising the steps of:

obtaining a lamp equi-luminescence performance curve X along which a lamp voltage and a lamp wattage vary in such a manner as to keep arc luminescence of an arc developing between electrodes of the lamp at substantially constant level, said arc luminescence being defined to be a maximum luminescence of the arc having varying luminescence along the length of said arc, said constant level being determined to be the luminescence that the lamp gives when operated by said electronic ballast at said rated lamp voltage;

analyzing said lamp performance curve X to determine a specific lamp voltage Va at which said performance curve X gives a maximum lamp wattage Wa;

operating said lamp in accordance with a first load characteristic for controlling and increasing said lamp wattage, substantially along said lamp performance curve X, until the lamp voltage increases to said specific lamp voltage Va; and

operating said lamp, after said lamp voltage increases beyond said specific lamp voltage Va, in accordance with a second load characteristic for controlling and keeping said lamp wattage above the lamp performance curve X, but not exceeding said maximum lamp wattage Wa, and for keeping said arc luminescence below a predetermined limit level.

5,469,028

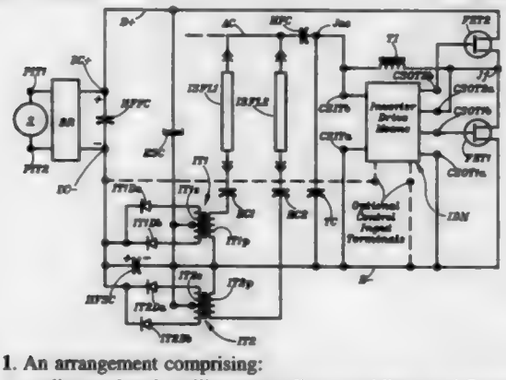
ELECTRONIC BALLAST DRAWING SINUSOIDAL LINE CURRENT

Ole K. Nilssen, 408 Caesar Dr., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 856,392, Mar. 23, 1992, which is a continuation-in-part of Ser. No. 734,188, Jul. 22, 1991, which is a continuation-in-part of Ser. No. 643,023, Jan. 18, 1991, which is a continuation-in-part of Ser. No. 787,692, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 644,155, Aug. 27, 1984, abandoned, which is a continuation of Ser. No. 555,426, Nov. 23, 1983, abandoned, which is a continuation of Ser. No. 178,107, Aug. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 973,741, Dec. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 890,586, Mar. 20, 1978, Pat. No. 4,184,128. This application Jun. 22, 1992, Ser. No. 901,989

Int. Cl.[6] G05F *1/00*

U.S. Cl. 315—291 **27 Claims**



1. An arrangement comprising:

an ordinary electric utility power line providing an AC power line voltage at a pair of power line terminals; and

an electronic ballast having input terminals connected with the power line terminals and output terminals connected in circuit with a gas discharge lamp; the electronic ballast being characterized by: (i) including pre-conditioning circuitry functional to cause a substantially sinusoidal current to be drawn from the power line terminals; (ii) having other circuitry operative to provide a high-frequency current from its output terminals, the high-frequency current having a fundamental frequency several times higher than that of the AC power line voltage; and (iii) including yet additional electronic circuitry connected with its input terminals and operative to provide a substantially constant DC voltage at a pair of DC terminals, the absolute magnitude of the DC voltage being substantially equal to the absolute peak magnitude of the AC power line voltage, the DC terminals being connected with an inverter circuit disposed within the electronic ballast and operative to cause the provision of said high-frequency current.

5,469,029

DEFLECTION APPARATUS FOR RASTER SCANNED CRT DISPLAYS

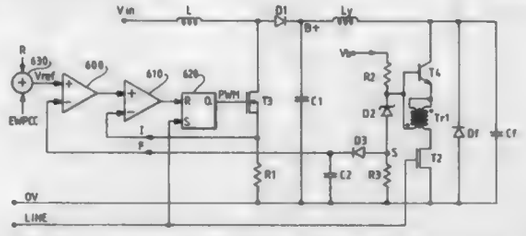
Frederick S. Jackson, Newton Mearns, Scotland, and David Leaver, Hassocks, United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 25, 1994, Ser. No. 248,983

Claims priority, application United Kingdom, May 26, 1993, 9310853; Jun. 15, 1993, 9312270

Int. Cl.[6] H01J *29/70;29/76*

U.S. Cl. 315—408 **20 Claims**



1. Deflection apparatus for a raster scanned cathode ray tube display, the apparatus comprising:

a flyback circuit (T2,T4,Ly,Df,Cf) including a switch (T2,T4) comprising a bipolar transistor (T4) connected in series with an inductor (Ly), the switch (T2,T4) being responsive to a line drive signal (LINE) to alternately open and close a current path through the inductor (Ly) between a first voltage level (B+) and a second voltage level (0 V) lower than the first voltage level (B+) to generate a raster scan current signal in a deflection coil of the display, the amplitude of the raster scan signal being determined as a function of the first voltage level (B+) and the frequency of the line drive signal (LINE);

a feedback circuit (D2,R3,D3,C2) connected to the base electrode of the bipolar transistor T4 for generating a feedback signal (F) as a function of current flowing out of the transistor (T4) via the base electrode of the bipolar transistor (T4); and

a regulator (600-630,T3,L,D1,C1) connected to the flyback circuit (T2,T4,Ly,Df,Cf) for varying the first voltage level (B+) as a function of the feedback signal (F) to maintain a constant raster scan width despite variations in the frequency of the line drive signal (LINE).

5,469,030

DIRECT CURRENT MOTOR DRIVE APPARATUS

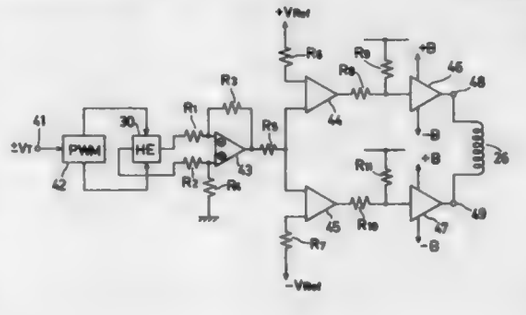
Seiji Takei, and Kouji Obara, both of Kanagawa, Japan, assignors to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1993, Ser. No. 117,615

Claims priority, application Japan, Sep. 10, 1992, 4-268067

Int. Cl.[6] H02K *23/00*

U.S. Cl. 318—254 **8 Claims**



1. A direct current motor drive apparatus comprising:

a pulse modulation device that modulates a torque command signal into a corresponding pulse signal;

an electromagnetic conversion device for providing an output signal based on said pulse signal from said pulse modulation device;

a comparison device that compares the output signal of said electromagnetic conversion device to first and second reference voltages, said first voltage being more positive than said second voltage, and outputs a portion of the output signal which is either greater than said first voltage or less than said second voltage while preventing another portion of the output signal which is less than said first voltage and greater than said second voltage from being output; and

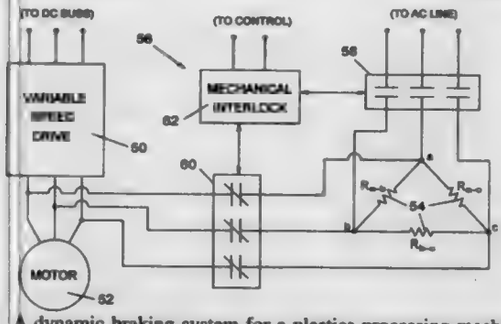
a power amplification device that amplifies the portion of the output signal output by said comparison device and supplies the amplified output signal to an excitation coil.

5,469,031

DYNAMIC BRAKING FOR ELECTRIC MOTORS IN A PLASTICS PROCESSING MACHINE

Edward A. Chorey, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 21, 1994, Ser. No. 326,971
Int. Cl.[6] H02P *3/22*
U.S. Cl. 318—375 **8 Claims**



1. A dynamic braking system for a plastics processing machine having at least one mechanical drive system powered by an electric motor, comprising:

(a) electrical components necessary for normal operation of the plastics processing machine, the electrical components having sufficient impedance to function alternately in a primary function during normal operation and in a secondary function as resistive elements for dynamic braking,

(b) switching means for disconnecting the electric components from their primary function and connecting them to the windings of the electric motor for their secondary function during dynamic braking.

5,469,032

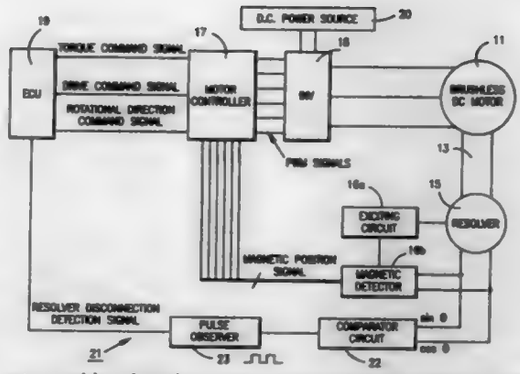
ELECTRIC MOTOR CONTROL WITH MALFUNCTION DETECTION

Shinichi Otake, Okazaki, Japan, assignor to Aisin AW Co., Ltd., Japan

Filed Sep. 14, 1993, Ser. No. 120,383
Claims priority, application Japan, Sep. 14, 1992, 4-244772
Int. Cl.[6] H02P *5/00*
U.S. Cl. 318—439 **3 Claims**

1. An electric motor having a control with malfunction detection comprising:

a motor including a rotor having permanent magnets and a stator coil energizable by a multiphase current for generating an output torque when fed with a motor current;



rotor position detecting means connected to the spindle of said rotor for detecting the magnetic position of said rotor and for generating a voltage waveform characterizing the detected magnetic position;

a motor controller for controlling the multiphase current to said motor stator coil on the basis of the magnetic position waveform from said rotor position detecting means;

a comparator circuit for comparing the magnetic position waveform with a predetermined voltage and for outputting a pulse signal in accordance with the comparison;

a pulse observing circuit for observing the pulse signal from said comparitor circuit and for outputting a malfunction signal if said pulse signal contains no pulse in a constant period; and

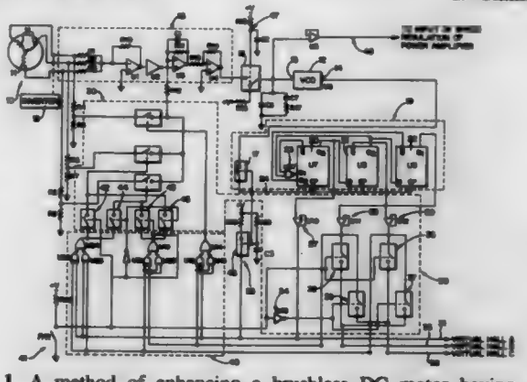
a control unit for outputting a signal to said motor controller for stopping said multiphase current to said motor stator coil in response to the malfunction signal from said pulse observing circuit.

5,469,033

VIRTUAL HALL-EFFECT SIGNAL GENERATING FOR A BRUSHLESS SENSORLESS ELECTRICAL ROTARY MACHINE

Hao Huang, Montevideo, Minn., assignor to SL Montevideo Technology, Inc., Montevideo, Minn.

Filed May 20, 1994, Ser. No. 246,859
Int. Cl.[6] H02P *6/18*
U.S. Cl. 318—439 **19 Claims**



1. A method of enhancing a brushless DC motor having a plurality of Hall-effect sensors and a frequency-to-voltage conversion circuit comprising the steps of:

(a) deactivating or removing the Hall-effect sensors and the frequency-to-voltage conversion circuit; and

(b) connecting a commutation error detector circuit and the DC motor to a voltage controlled oscillator and operatively connecting a solid-state circuit to the voltage controlled oscillator to provide output signals substantially the same as the Hall-effect sensors to thereby functionally replace the Hall-effect sensors.

10. A brushless sensorless electrical rotary machine comprising:

a rotor and a stator and including a plurality of windings driven by a multiphase inverter for selectively energizing said windings in sequence;

a voltage controlled oscillator for controlling the frequency of the multiphase inverter, and having an output and an input;

a solid state virtual Hall signal generator circuit operatively connected to the voltage controlled oscillator output to provide output signals substantially the same as those of Hall-effect sensors: and

wherein said virtual Hall signal generator comprises a programmable logic chip connected to an ML 4410 or ML 4411 chip.

5,469,034

Patent Not Issued For This Number

5,469,035

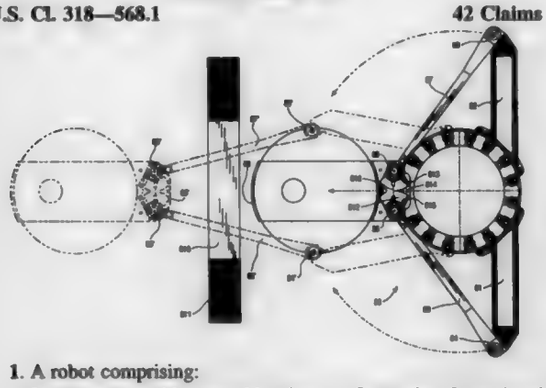
TWO-AXIS MAGNETICALLY COUPLED ROBOT

Robert B. Lowrance, Los Gatos, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 25,204, Mar. 2, 1993, Pat. No. 5,355,066, which is a division of Ser. No. 644,852, Jan. 22, 1991, Pat. No. 5,227,708, which is a continuation of Ser. No. 424,771, Oct. 20, 1989, abandoned. This application Aug. 30, 1994, Ser. No. 298,382

Int. Cl.[6] B25J *9/14*

U.S. Cl. 318—568.1 **42 Claims**



1. A robot comprising:

a first arm assembly rotatable about a first axis of rotational symmetry;

a second arm assembly rotatable about a second axis of rotational symmetry; and

a drive mechanism coupled to the first arm assembly and the second arm assembly for rotating the first arm assembly and the second arm assembly, said drive mechanism comprising a first motor and a first magnetic coupler coupled to the first motor, wherein the first magnetic coupler rotates the first arm assembly in response to activation of the first motor and comprises

a first set of magnets coupled to the first motor and retained in a first ring that maintains the first set of magnets in a plane during rotation of the first set of magnets, and

a second set of magnets coupled to the first arm assembly and retained in a second ring that maintains the second set of magnets in the plane during rotation of the second set of magnets,

wherein the first set of magnets rotates in response to rotation motion created by activation of the first motor, and further wherein the first set of magnets are magnetically coupled to the second set of magnets, such that rotations of the first set of magnets are imparted to the second set of magnets to cause rotation of the second set of magnets to rotate the first arm assembly.

5,469,036

APPARATUS FOR FEEDING ELECTRICITY TO MOTOR DRIVING MEANS OF A MOVABLE BODY

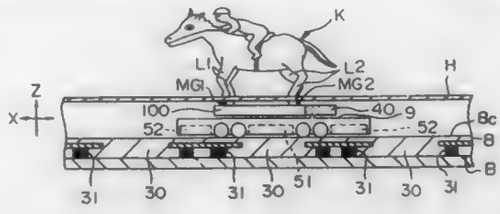
Tetsutaro Eto, Tokyo, Japan, assignor to Eto Denki Co., Tokyo, Japan

Filed Mar. 29, 1994, Ser. No. 219,795

Claims priority, application Japan, Mar. 29, 1993, 5-070422

Int. Cl.[6] A63F *9/14*

U.S. Cl. 318—581 **6 Claims**



1. A power feeding apparatus for an electric drive unit disposed on a moving-member-side, the power feeding apparatus comprising:

a moving member disposed on a track plate surface;

electric drive means mounted on the moving member to move and drive the moving member along the track plate surface;

a plurality of primary coils in parallel disposed along and below the track plate surface;

a secondary coil assembly mounted on the moving member to receive electric power from the primary coils;

a power control circuit for supplying the electric power from the secondary coil assembly to the electric drive means; and

a phase control circuit by which one of two adjacent coils of said primary coils receives an alternating current opposite in phase to an alternating current of the other one of the two adjacent coils.

5,469,037

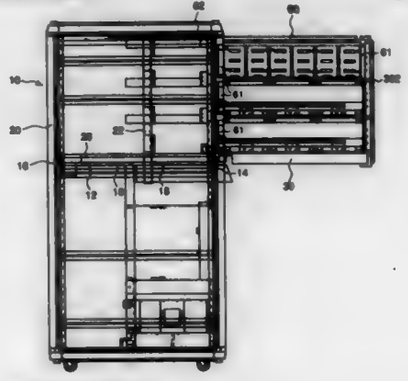
LINEAR ACCELERATED DEVICE

Kevin D. McMurtrey, Sr., Ft. Lauderdale; Arthur M. Rossi, Hollywood; Robert J. Cichon, Jr., Plantation; Karen A. Briggs, Stuart, and Jonathan C. Ely, Pompano Beach, all of Fla., assignors to Encore Computer Corporation, Ft. Lauderdale, Fla.

Filed Jun. 2, 1994, Ser. No. 252,996

Int. Cl.[6] G11B *33/02;* H05K *5/00*

U.S. Cl. 318—626 **16 Claims**



1. Apparatus comprising:

a) a housing having a front, a rear and two sides;

b) an elongated slide mounted front to rear in the housing;

c) an elongated drawer having at least one open side mounted on the slide for withdrawing the drawer from the front of the housing and exposing the open side thereof;

d) a linear actuator means mounted in the housing adjacent the slide and being connected for moving the drawer from a

closed position wholly contained in the housing to an open position withdrawn from the housing with the at least one open side exposed;

e) said linear actuator means including a screw and a screw bearing mounting the screw in the housing, a carriage connected to the drawer driven by the screw, a motor connected to drive the screw and control means for controlling the motor to moderate starting and stopping of the motor to avoid shocks to the drawer;

f) mounting means having I/O connections for mounting an array of disc drives in the drawer to be accessible from the at least one open side of the drawer; and

g) cabling means for introducing I/O cables to the mounting means with the cables terminated in connections that mate with the I/O connections of the mounting means.

5,469,038

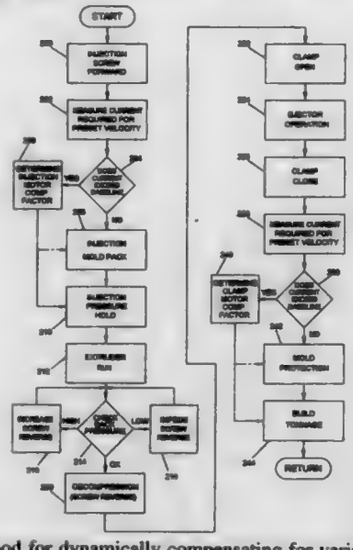
METHOD FOR COMPENSATING FOR EFFICIENT VARIATIONS IN AN ELECTRIC MOTOR

Jeff L. Silvey, Hillsboro, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed May 10, 1994, Ser. No. 240,128

Int. Cl.[6] B29C *45/77*; G05B *11/01*

U.S. Cl. 318—632 **2 Claims**



1. A method for dynamically compensating for variations in the operating efficiency of an electric motor used to drive a mechanism in a plastics processing machine for a cycle of operation that includes (i) a closed loop control period during which current supplied to the motor is controlled to achieve a preset operating parameter and (ii) an open loop control period during which a predetermined current is supplied to the motor, comprising the steps of:

(a) determining a baseline current supplied to the motor during the closed loop control period that achieves the preset operating parameter under established operating conditions;

(b) measuring the current supplied to the motor during the closed loop control period for each cycle of machine operation;

(c) comparing the measured current to the baseline current for the closed loop control period to ascertain a deviation from the baseline current due to changes in the operating efficiency of the motor;

(d) determining an efficiency compensation factor based on the deviation ascertained in step (c); and

(e) adjusting the predetermined current supplied to the motor during the open loop control period based on the compensation factor determined in step (d), thereby assuring consistent machine performance during the open loop control period in each cycle.

5,469,039

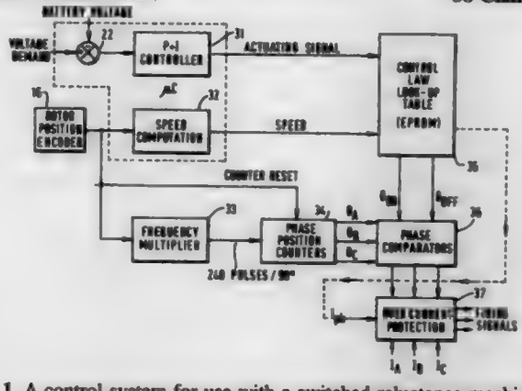
CONTROL OF SWITCHED RELUCTANCE MACHINES

John M. Stephenson, Leeds, and William F. Ray, Attenborough, both of, England, assignors to Switched Reluctance Drives Limited, Leeds, England

Filed Sep. 24, 1992, Ser. No. 950,599

Int. Cl.[6] H02P *8/00*

U.S. Cl. 318—701 **38 Claims**



1. A control system for use with a switched reluctance machine having: a rotor with rotor poles, a stator defining at least one set of stator poles, and at least one phase winding associated with the at least one set of stator poles, the at least one phase winding defining at least one phase period, the control system comprising:

(a) a switching arrangement;

(b) position sensing means for generating an angular position signal indicative of the angular position of the rotor with respect to the stator; and

(c) control means, operatively coupled to the switch arrangement and the position sensing means, for operating the switched reluctance machine in a continuous current mode of operation, the control means comprising: actuating signal means for producing an actuating signal indicative of a demand for output from the switched reluctance machine and control law function means, operatively coupled to the actuating signal means, for generating switch arrangement turn-on and turn-off signals which operably control volt-seconds applied to the at least one phase winding in response to the angular position signal to inhibit progressive flux growth through actuation of the switch arrangement such that current in the at least one phase winding is non-zero throughout the at least one phase period.

5,469,040

OPERATING CIRCUIT INCLUDING AN OSCILLATING CIRCUIT CAPACITOR COUPLED TO AN AUXILIARY WINDING FOR AN APPARATUS THAT MEASURES THE UNBALANCE OF A ROTARY MEMBER

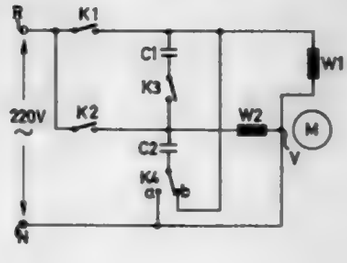
Karl Rothamel, Seeheim, Germany, assignor to Hofmann Werkstatt-Technik GmbH, Germany

Filed Jul. 21, 1992, Ser. No. 915,608

Claims priority, application Germany, Jul. 22, 1991, 41 24 285.8

Int. Cl.[6] H02P *3/00*

U.S. Cl. 318—785 **9 Claims**



1. An operating circuit for an apparatus for measuring the unbalance of a rotary member mounted to be driven by a rotary drive, said operating circuit comprising:

a main power supply line;

an auxiliary power supply line;

a single-phase ac motor with a single-phase main winding in said main power supply line;

an auxiliary winding in said auxiliary power supply which is electrically displaced through 90° line with respect to said main winding;

an oscillating circuit capacitor which with said auxiliary winding forms an oscillating circuit for operating said rotary member; and

means for switching said oscillating circuit capacitor into a parallel connection with said auxiliary winding under a condition of approximately load-free operation.

5,469,041

PULSE-CONTROLLED CONVERTER AND ELECTRIC MOTOR CONTROLLER

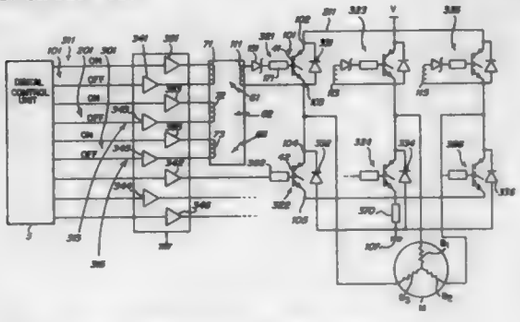
Jean-Marie Bourgeois, Roquefort la Bedoule, France, assignor to SGS-Thomson Microelectronics, S.A., Pouilly, France

Filed Jul. 7, 1993, Ser. No. 88,303

Claims priority, application France, Jul. 10, 1992, 92 08637

Int. Cl.[6] H02M *7/5387*

U.S. Cl. 318—810 **20 Claims**



1. A pulse-controlled converter comprising:

a digital control unit to produce control pulses;

a transformer, coupled to the digital control unit, receiving control pulses from the digital control unit, and having a primary winding and a secondary winding;

a primary circuit, coupled between the digital control unit and the primary winding, amplifying pulses provided by the digital control unit to the transformer;

a first switch, including a gate terminal, coupled to a dc current source, receiving dc current and passing dc current when in a closed state;

a secondary circuit, coupled between the secondary winding and the gate terminal of the first switch, cooperating with the digital control unit to provide controlling pulses to the first switch to control the first switch to periodically interrupt the dc current; and

a second switch, coupled to the digital control unit and to the first switch, receiving dc current from the first switch, and controlled by the digital control unit to sample the dc current and provide an ac output;

wherein said secondary circuit provides a pulse to the first switch when the first switch is open and the second switch switches states.

5,469,042

CHARGING MONITOR FOR ELECTRICAL ACCUMULATORS

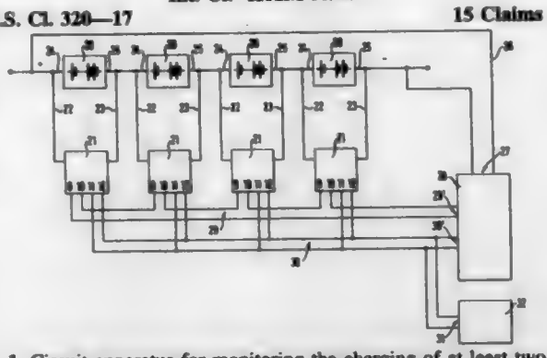
Klaus Rübling, Fuldabrück, Germany, assignor to Gagen Batterie AG, Germany

Filed Aug. 3, 1993, Ser. No. 101,611

Claims priority, application Germany, Aug. 4, 1992, 42 25 746.8

Int. Cl.[6] H01M *10/46*

U.S. Cl. 320—17 **15 Claims**



1. Circuit apparatus for monitoring the charging of at least two electrical accumulators (**20**) or accumulator cells connected to one another in series with a charging current source (**28**), the apparatus comprising one monitoring module (**21**) for each accumulator (**20**) or for each accumulator cell to be monitored, with each monitoring module (**21**) having a charging current limitation circuit (**40**, **42**) and a first signal generator (**36**) for displaying the state of operation of the charging current limitation circuit (**40**, **42**) which is acted on in dependence on a temperature signal corresponding to the temperature of the accumulator (**20**) or of the accumulator cell, the limitation circuit including a bypass line (**40**, **42**) with a variable resistance (**41**) connected in parallel to the accumulator (**20**) or to the accumulator cell and further comprising a control signal circuit (**29**) connected with the first signal generators (**36**), with the output signal of the control signal circuit being applied to the charging current source (**28**) in order to control the charging current delivered by it, the control signal circuit (**29**) being in the form of a hard-wired AND-circuit.

5,469,043

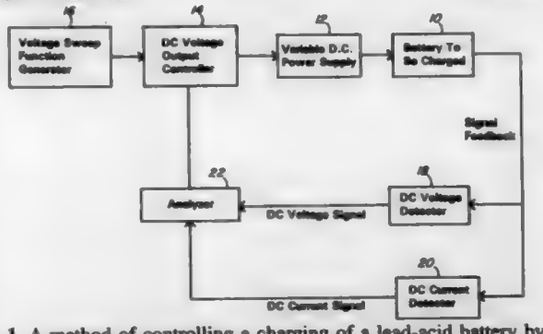
METHOD FOR OPTIMIZING THE CHARGING OF LEAD-ACID BATTERIES AND AN INTERACTIVE CHARGER

Jing-Yih Cherng, Eagan, and James K. Klang, Rosemount, both of Minn., assignors to GNB Battery Technologies Inc., Mendota Heights, Minn.

Continuation of Ser. No. 960,583, Oct. 13, 1992, abandoned. This application Jul. 14, 1994, Ser. No. 272,997

Int. Cl.[6] H01M *10/44*

U.S. Cl. 320—31 **9 Claims**



1. A method of controlling a charging of a lead-acid battery by adjusting a charging voltage in accordance with periodic voltage sweeps which comprises detecting the voltage of the battery being charged, lowering the voltage being applied to the battery until a minimum acceptable level of current is detected, initiating a volt-

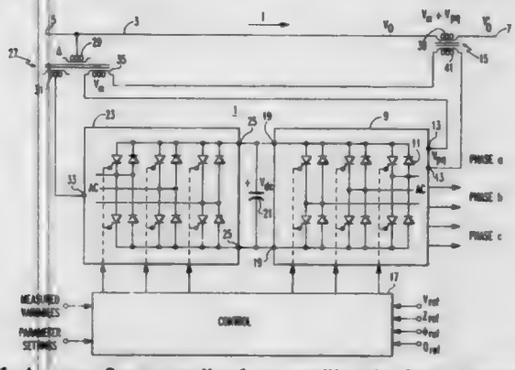
age sweep over a predetermined range at an augmented voltage rate with time, detecting whether a maximum current for a charger power supply has been reached, setting the charging voltage at that point if the maximum current has been reached and stopping the voltage sweep at that point, continuing the voltage sweep when the charger current has not been maximized, determining voltage and current values at intervals during the voltage sweep, selecting the charging voltage based upon the current-voltage values determined, terminating the voltage sweep, delaying for a predetermined period of time and thereafter initiating a further voltage sweep.

5,469,044

TRANSMISSION LINE POWER FLOW CONTROLLER WITH UNEQUAL ADVANCEMENT AND RETARDATION OF TRANSMISSION ANGLE

Laszlo Gyugyi, Penn Hills Township, Pa., and Robert J. Nelson, Orlando, Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 5, 1995, Ser. No. 368,947
Int. Cl.[6] G05F *1/70*; H02M *1/12*; H02J *1/02*
U.S. Cl. 323—207 **17 Claims**



1. A power flow controller for controlling the flow of electric power flowing between two ends of an alternating current transmission line carrying alternating current at a selected transmission line voltage and a fundamental frequency, said controller comprising:

switching power converter means generating a controllable alternating voltage at said fundamental frequency of said alternating current with a controllable magnitude and phase angle relative to said transmission line voltage;

bias voltage generating means generating an alternating bias voltage at said fundamental frequency of said alternating current and at a predetermined phase angle with respect to said transmission line voltage, said alternating bias voltage having a predetermined amplitude:

coupling means vectorially summing said controllable alternating voltage and said alternating bias voltage to generate a combined voltage, and injecting said combined voltage into said transmission line in series with said transmission line voltage; and

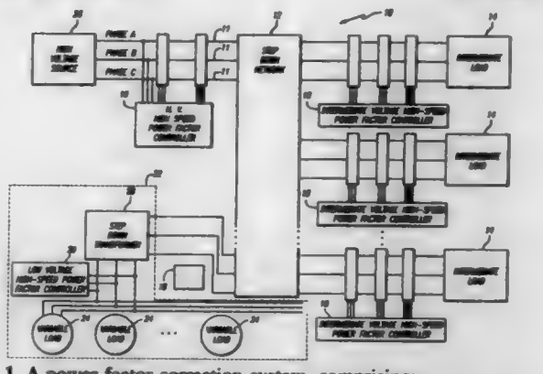
control means controlling the controllable magnitude and phase angle of the controllable alternating voltage generated by said switching power converter means at said fundamental frequency to a magnitude and any phase angle relative to said transmission line voltage to selectively adjust, in combination with said bias voltage, individually and in coordination, effective impedance of said transmission line, effective phase angle between voltages at said two ends of said transmission line, and transmission line voltage magnitude to control power flow in said transmission line between unequal maximum power flow control limits.

5,469,045

HIGH SPEED POWER FACTOR CONTROLLER

Donald C. Dove, 9450 East Ave., T-8, Littlerock, Calif. 93543, and Howard D. Kent, 11635 Gerald Ave., Granada Hills, Calif. 91344

Filed Dec. 7, 1993, Ser. No. 163,966
Int. Cl.[6] G05F *1/70*
U.S. Cl. 323—211 **25 Claims**



1. A power factor correction system, comprising:

a voltage sensor having an input coupled across a first and second power line;

a current sensor having an input coupled to one of said first and second power lines;

a digital microprocessor;

circuitry for coupling signals from said voltage sensor to said microprocessor;

circuitry for coupling signals from said current sensor to said microprocessor;

said microprocessor including programming means for determining a phase difference between a sensed voltage and a sensed current, and providing first, second, third and fourth switching outputs responsive to said phase difference;

a transformer having a first winding and a second winding;

a first and second capacitor;

a first switching device having an input coupled to said first switching output and having a first output coupled in series with said first winding forming a first switching path, said first switching path being disposed across said power lines;

a second switching device having an input coupled to said second switching output and having a second output coupled in series with said first winding forming a second switching path, said second switching path being disposed across said power lines; a third switching device having an input coupled to said third switching output and having a third output coupled in series with said first capacitor and said second winding forming a third switching path; and

a fourth switching device having an input coupled to said fourth switching output and having a fourth output coupled in series with said second capacitor and said second winding forming a fourth switching path;

wherein a power factor associated with said first and second power lines is corrected by selectively switching energy between magnetic and electric forms in said capacitors and said windings.

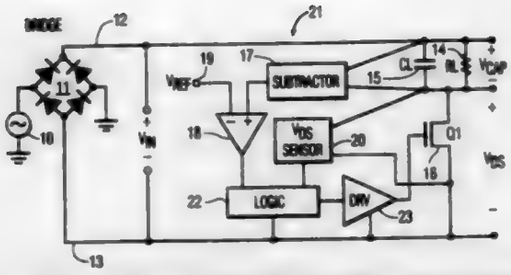
5,469,046

TRANSFORMERLESS LOW VOLTAGE SWITCHING POWER SUPPLY

Stephen L. Wong, Scarsdale, and Naveed Majid, Mohegan Lake, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 30, 1993, Ser. No. 55,655
Int. Cl.[6] G05F *1/565*
U.S. Cl. 323—286 **17 Claims**

1. A switching type regulated power supply for energizing a load comprising:



first and second input terminals for supplying a pulsatory type rectified voltage to the power supply,

means for coupling a load capacitor and a switching transistor to said input terminals so that the switching transistor controls current flow through the load capacitor,

a pair of output terminals coupled to the load capacitor, and

a control circuit having input means coupled to the load capacitor and to the switching transistor and an output coupled to a control electrode of the switching transistor, said control circuit including means responsive to a differential voltage of the load capacitor and a voltage produced across the switching transistor for controlling the switching transistor in a manner so as to charge the load capacitor twice during each cycle of the pulsatory rectified voltage.

5,469,047

TRANSISTOR CIRCUIT

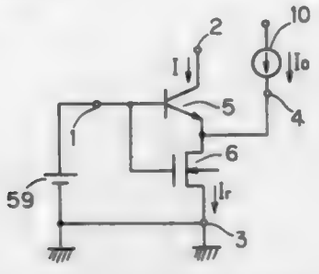
Toshio Kumamoto; Takahiro Miki, and Hiroyuki Kouno, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 871,725, Apr. 21, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 311,433

Claims priority, application Japan, Jan. 14, 1991, 3-264653

Int. Cl.[6] G05F *3/16*

U.S. Cl. 323—312 **6 Claims**



1. A constant-current transistor circuit comprising:

a first terminal;

a second terminal;

a third terminal;

a first bipolar transistor having a first conductivity type collector electrode being connected to said second terminal, a second conductivity type base electrode being connected to said first terminal, and a first conductivity type emitter electrode; and

a first MOS transistor having a first conductivity type drain electrode being connected to said emitter electrode of said first bipolar transistor, a first conductivity type source electrode being connected to said third terminal, and a gate electrode being directly connected to said base electrode of said first bipolar transistor and at the same potential as said base electrode, wherein a base to emitter voltage V_{BE} of the bipolar transistor is less than the threshold voltage V_{TH} of the MOS transistors so that both the bipolar transistor and said MOS transistor operate in a pentode region and said first MOS transistor and said first bipolar transistor function as a current source with said first terminal serving as a single bias terminal for said current source.

5,469,048

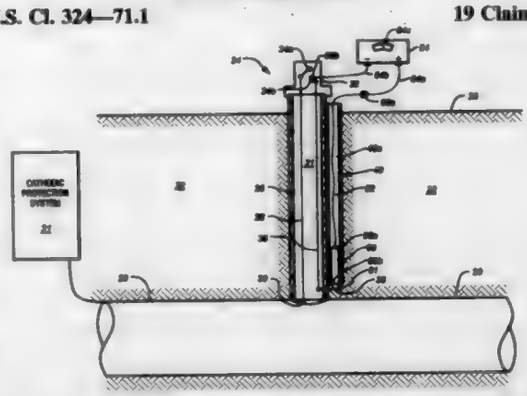
CATHODIC PROTECTION MEASUREMENT APPARATUS

Charles W. Donohue, Farmington, N.M., assignor to Meridian Oil Inc., Houston, Tex.

Filed Jun. 13, 1994, Ser. No. 258,687

Int. Cl.[6] G01N *27/42*

U.S. Cl. 324—71.1 **19 Claims**



1. A cathodic protection measurement apparatus for measuring the level of cathodic protection provided from a cathodic protection system to a metal structure buried in the soil, the measurements taken at an access point of a test station, the cathodic protection measurement apparatus comprising:

an electrically conductive test wire having a first end electrically connected to the metal structure and a second end provided to the access point;

a normally-closed switch located at the access point, said switch having a first contact and a second contact, wherein said first contact is electrically connected to said second end of said test wire;

a metal coupon buried in the soil surrounding the metal structure;

an electrically conductive coupon wire having a first end electrically coupled to said second contact of said switch and a second end electrically connected to said coupon;

a reference electrode having a measuring surface and a terminal, wherein said measuring surface contacts the soil at a measuring location substantially near said coupon;

an electrically conductive electrode wire having a first end coupled to said reference electrode terminal and a second end provided to the access point; and

an access tube provided between the surface of the soil and the buried metal structure providing an access channel;

wherein said cathodic protection current is provided from the cathodic protection system to said coupon while said switch is closed, and wherein said cathodic protection current provided to said coupon is interrupted when said switch is opened.

5,469,049

SYSTEM CHECKING AND TROUBLESHOOTING PACKAGE FOR AN ELECTRONIC METERING DEVICE

Forrest W. Briese, Norcross, Ga.; Charles C. Hyder, Danbury Essex, England; John M. Schlarb, Duluth, Ga.; Christophe J. A. Fouquet, Norcross, Ga., and Coy S. Lowe, Talking Rock, Ga., assignors to Schlumberger Industries, Inc., Norcross, Ga.

Filed Mar. 26, 1993, Ser. No. 37,938

Int. Cl.[6] G01R *1/04*

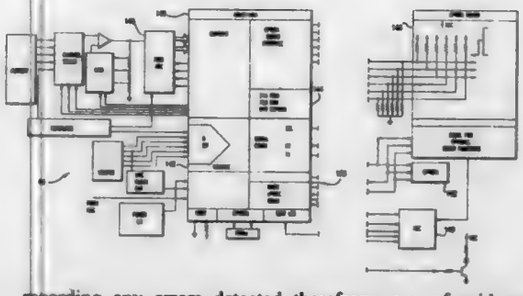
U.S. Cl. 324—76.77 **11 Claims**

2. In a solid state electronic meter including means for ascertaining current and voltage information from a multi-phase electrical system metered thereby, a meter self-checking and electrical system diagnostic device, said device including:

(a) a microprocessor;

(b) a storage memory;

(c) first logic for periodically performing a preselected set of diagnostic tests on said multi-phase electrical system and



recording any errors detected therefrom, one of said predefined multi-phase electrical system diagnostic tests being a polarity, cross-phase and energy flow check, and wherein said first logic includes logic for calculating for each phase a voltage phasor, a current phasor, and a phase angle for each voltage phasor and each current phasor relative to a selected base phasor; and

(d) display means for displaying the error messages identifying any errors discovered in said multi-phase electrical system diagnostic tests performed during a predefined period.

5,469,050

HIGH-VOLTAGE MEASUREMENT DEVICE

Dieter Lorenz, and Jorg Gorablenkow, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, München, Germany

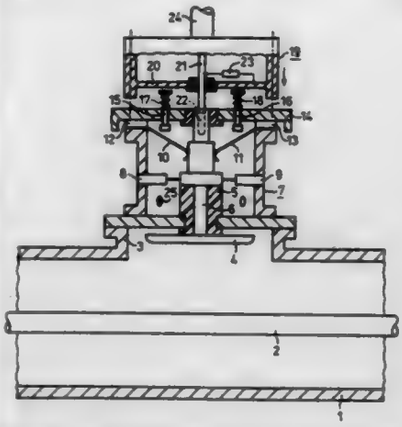
PCT No. PCT/DE92/00840, § 371 Date Jun. 7, 1994, § 102(e) Date Jun. 7, 1994, PCT Pub. No. WO93/10462, PCT Pub. Date May 27, 1993

PCT Filed Oct. 1, 1992, Ser. No. 240,721

Claims priority, application Germany, Nov. 11, 1991, 41 37 865.2

Int. Cl.[6] G01R *19/00*

U.S. Cl. 324—126 **14 Claims**



1. A high-voltage measurement device for an electrical high-voltage switchboard plant, the switchboard plant having an encapsulating housing with a built in measurement electrode and an electrical conductor which conducts a measurement signal produced by the measurement electrode, which is connected with the electrode, and which passes through a wall of the encapsulating housing in an insulated manner, said high-voltage measurement device comprising:

a grounded spring contact, said spring contact

arranged outside the encapsulating housing,

biased to rest against the conductor thereby grounding the conductor when no measurement device is connected to the conductor, and

adapted to be moved off from the conductor, such that it no longer contacts the conductor, when a switchboard housing is connected to a measurement housing of the high voltage measurement device.

5,469,051

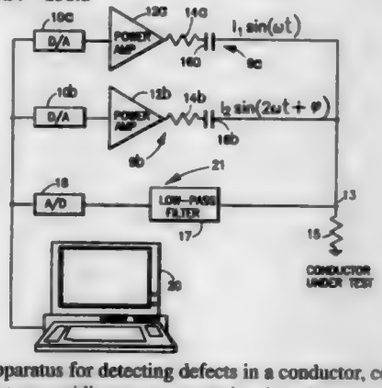
ELECTRICAL DEFECT DETECTOR FOR CIRCUIT LINES

Edward J. Yarmchuk, Mahopac, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Apr. 29, 1994, Ser. No. 235,776

Int. Cl.[6] G01R *19/25*

U.S. Cl. 324—158.1 **11 Claims**



8. An apparatus for detecting defects in a conductor, comprising:

a computer providing a computer signal; and

first and second paths communicating said computer signal to a conductor, the first path comprises at least a first D/A converter, wherein said second path comprises at least a second D/A converter, wherein the first D/A converter is capable of producing a first frequency signal and said second D/A converter is capable of producing a second frequency signal;

first capacitor connected in said first path for adjusting a phase of the first frequency signal and second capacitor connected in said second path for adjusting a phase of the second frequency signal as applied to the conductor; and

a low-pass filter and an A/D converter means connected between said computer and said first and second paths and said conductor for detecting defects in said conductor based upon a DC output from said conductor.

5,469,052

VELOCITY SENSOR WHICH SENSES DIFFERENTIAL VELOCITY BY SENSING CHANGES IN MAGNETIC FLUX

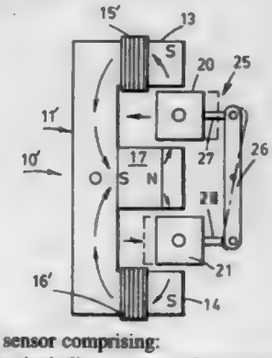
Rand H. Hulsing, II, Redmond, Wash., assignor to AlliedSignal Inc., Morris Township, N.J.

Continuation of Ser. No. 653,585, Feb. 8, 1991, Pat. No. 5,243,278. This application Jun. 8, 1993, Ser. No. 73,829

The portion of the term of this patent subsequent to Sep. 7, 2010, has been disclaimed.

Int. Cl.[6] G01P *3/48;3/54*

U.S. Cl. 324—174 **34 Claims**



1. A velocity sensor comprising:

A core member including a magnet for creating a magnetic flux field;

flux return path means for splitting and returning said flux to the magnet, said flux return path means including multiple, spaced apart flux return paths for returning said flux to the

magnet and a coil associated in operative relationship with each of the return paths in a paired return path means, the coils of a coil pair being connected in series but oppositely wound relationship to one another, so that common mode error signals induced in the coil pairs are cancelled;

said flux return path means further including multiple pole piece means arranged with one pole piece disposed in overlapped, closely adjacent relationship with each of the flux return paths, said pole pieces being coupled together for simultaneous equal but opposite movement for compensating for external forces acting on the pole pieces, each of said multiple pole piece means being dimensioned and positioned in the respective flux return path so that the magnitude of flux flowing through the respective flux return path is sensitive to relative movement of the respective pole piece along a sensitive degree of freedom while being generally insensitive to relative movement of the respective pole piece in other degrees of freedom; and

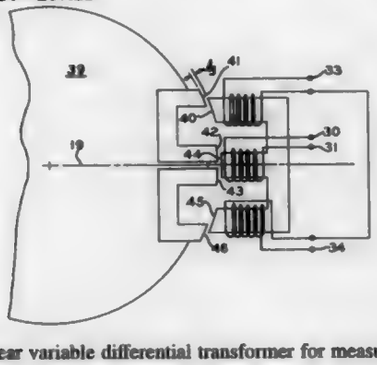
coil means respectively associated with each of said flux return paths so that a change in flux carried in the respective flux return path induces a voltage in the associated coil means, said voltage being indicative of sensed velocity, said coil means including a coil in operative association with each return path.

5,469,053

E/U CORE LINEAR VARIABLE DIFFERENTIAL TRANSFORMER FOR PRECISE DISPLACEMENT MEASUREMENT

Darren R. Laughlin, Albuquerque, N.M., assignor to A - Tech Corporation, Albuquerque, N.M.

Filed Nov. 2, 1992, Ser. No. 969,882
Int. Cl.[6] G01B *7/14;7/30;* **G01R** *33/00*
U.S. Cl. 324—207.18 **5 Claims**



1. A linear variable differential transformer for measuring linear displacement comprising:

a first and second spaced apart magnetic U core pieces, each having a pair of pole pieces;

an E core made of magnetic material having first, second and third pole pieces, facing said first and second magnetic U core pole pieces and forming an air gap therewith;

a first transformer winding supported by said second pole piece of said E core adapted to be connected to a source of alternating voltage;

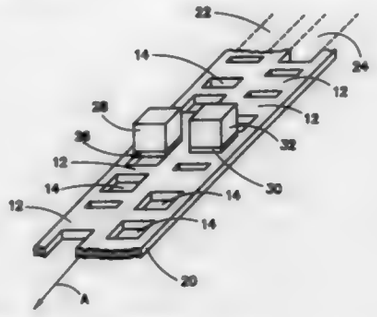
second and third transformer windings supported by said first and third pole pieces of said E core, said second and third windings differentially-connected together to provide an output voltage proportional to the minute linear displacement between said U cores and said E core.

5,469,054

POSITION SENSOR WITH TWO MAGNETICALLY SENSITIVE DEVICES AND TWO TARGET TRACKS WHICH ARE SENSED IN COMBINATION WITH EACH OTHER TO PROVIDE A SYNTHESIZED SIGNAL

Robert E. Bicking, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 22, 1993, Ser. No. 52,350
Int. Cl.[6] G01B *7/14;7/30*
U.S. Cl. 324—207.2 **8 Claims**



1. A position sensor, comprising:

a first target comprising a first plurality of ferromagnetic and nonferromagnetic segments aligned to define a first path, said first plurality of ferromagnetic and nonferromagnetic segments comprising ferromagnetic segments of unequal dimensions along said first path and nonferromagnetic segments of unequal dimensions along said first path;

a second target comprising a second plurality of ferromagnetic and nonferromagnetic segments aligned to define a second path, said second plurality of ferromagnetic and nonferromagnetic segments comprising ferromagnetic segments of unequal dimensions along said first path and nonferromagnetic segments of unequal dimensions along said first path;

a first magnetically sensitive device, disposed proximate said first path, having a first output signal representative of the magnetic characteristic of a most proximate one of said first plurality of ferromagnetic and nonferromagnetic segments, said first output signal having high and low magnitudes which represent the presence and absence of said ferromagnetic segments proximate said first magnetically sensitive device;

a second magnetically sensitive device, disposed proximate said second path, having a second output signal representative of the magnetic characteristic of a most proximate one of said second plurality of ferromagnetic and nonferromagnetic segments, said second output signal having high and low magnitudes which represent the presence and absence of said ferromagnetic segments proximate said second magnetically sensitive device;

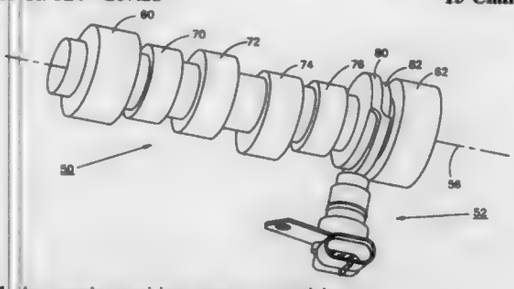
means for providing a third output signal as a function of said first and second output signals, said first and second pluralities of ferromagnetic and nonferromagnetic segments being arranged to cause said third output signal to provide a preselected signal pattern, said preselected signal pattern comprising a plurality of high and low magnitudes that are the result of an EXCLUSIVE-OR combination of the high and low magnitudes of said first and second signal, each of said high and low magnitudes of said third output signal being the direct result of the instantaneous magnitude of the high and low magnitudes of said first and second output signals and independent of previous magnitudes of said high and low magnitudes of said first and second output signals caused by said ferromagnetic and nonferromagnetic segments of said first and second targets not currently proximate said first or second magnetically sensitive devices.

5,469,055

ENGINE SHAFT WITH INTEGRALLY FORMED COMPLEMENTARY TARGETS

Douglas L. Mueller, and Gustavo L. Sumcad, both of Freeport, Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 4, 1994, Ser. No. 238,106
Int. Cl.[6] G01B 7/30; G01D 5/12
U.S. Cl. 324—207.21 15 Claims



1. An angular position sensor, comprising:

a single-piece rotatable shaft having a central axis;

a first radially enlarged integral portion of said shaft having a first segment and a second segment, said first segment having a first surface at a first radial distance from said central axis and said second segment having a second surface at a second radial distance from said central axis;

a second radially enlarged integral portion of said shaft having a third segment and a fourth segment, said third segment having a third surface at a third radial distance from said central axis and said fourth segment having a fourth surface at a fourth radial distance from said central axis, said first and second radially enlarged integral portions of said shaft being disposed in axially adjacent relation with each other, said first and second radially enlarged integral portions of said shaft each comprising ferromagnetic material, said first and second radially enlarged integral portions being formed from said single-piece rotatable shaft; and

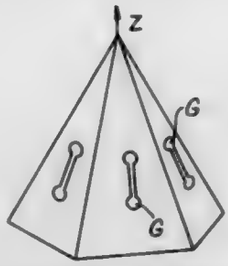
a magnetically sensitive device disposed proximate said first and second radially enlarged integral portions of said shaft and aligned with a plane which extends between said first and second radially enlarged integral portions of said shaft, said plane being generally perpendicular to said central axis.

5,469,056

PLANAR GRADIOMETERS ARRANGED ON NON-PARALLEL SURFACES FOR DETERMINATION OF A GRADIENT TENSOR OF A MAGNETIC FIELD

Wolfgang Eschner, Daisendorf, Germany, and Wolfgang Ludwig, Taegerwilen, Switzerland, assignors to Dornier GmbH, Germany

Filed Feb. 15, 1991, Ser. No. 656,416
Claims priority, application Germany, Feb. 17, 1990, 40 05 079.3
Int. Cl.[6] G01R 33/022;33/035
U.S. Cl. 324—248 8 Claims



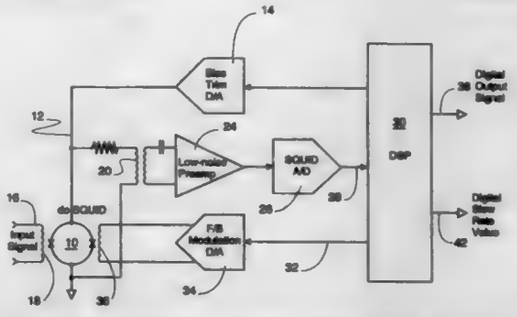
1. Apparatus for determining five linear independent components of a gradient tensor of a magnetic field comprising, a plurality of at least five planar gradiometers arranged on at least three non parallel surfaces wherein each gradiometer includes at least two field detecting coils arranged in a common plane, being one of the at least three surfaces.

5,469,057

METHOD AND APPARATUS FOR EXTENDING THE DYNAMIC RANGE OF DC-SQUID MEASUREMENTS USING A FLUX TRACKING LOOP

Stephen E. Robinson, Albuquerque, N.M., assignor to University of New Mexico, Albuquerque, N.M.

Filed Mar. 8, 1994, Ser. No. 208,541
Int. Cl.[6] G01R 33/035
U.S. Cl. 324—248 13 Claims



1. A digital flux tracking loop (dFTL) for tracking input signals to a SQUID comprising:

current means for biasing said SQUID with a current effective to cause said SQUID to output a periodic junction voltage V_j having a period Φ_o, said V_j having an amplitude as a function of magnetic flux Φ within said SQUID;

first processor means for modulating said magnetic flux within said SQUID by a four-phase modulation current to output at least three junction voltages containing information indicative of flux tracking and modulation lock errors; and

second processor means for combining said at least three junction voltages and outputting first and second signals functionally related to said flux tracking and modulation lock errors, respectively, said first and second signals forming feedback signals effective to form a flux tracking loop with said SQUID.

5,469,058

FEEDBACK ENHANCED SENSOR, ALTERNATING MAGNETIC FIELD DETECTOR

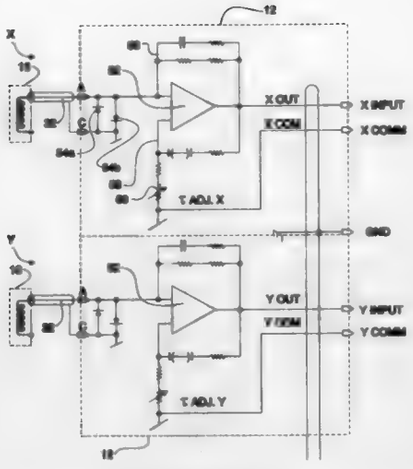
Curt Dunnam, 5244 Perry City Rd., Trumansburg, N.Y. 14886

Filed Dec. 30, 1992, Ser. No. 998,965
Int. Cl.[6] G01R 33/02
U.S. Cl. 324—258 16 Claims

1. An active sensor system for detecting a time-varying magnetic field, comprising:

a) a coil assembly having a ferromagnetic core; and

b) an operational amplifier operatively connected to said coil assembly, said operational amplifier having a positive feedback path to substantially cancel the combined dissipative loss of resistance and core eddy currents of said coil assembly, and incorporating a capacitively reactive element in said positive feedback path to inhibit direct current offset and increase attenuation at excitation frequencies below a cut-off value, and a negative feedback path to control the composite gain of said active sensor system, whereby said active sensor system is operative in an approximate frequently range of between 0.001 Hz to 10 KHz.



5,469,059

METHOD FOR THE SIMULTANEOUS DETECTION OF ACCELERATION AND VELOCITY DISTRIBUTION IN MOVING FLUIDS

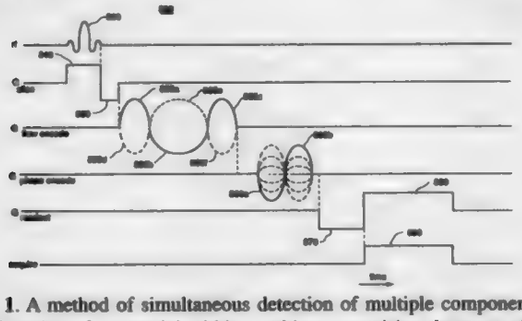
Charles L. Dumoulin, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 30, 1993, Ser. No. 175,448

The portion of the term of this patent subsequent to Jul. 25, 2012, has been disclaimed.

Int. Cl.[6] G01R *33/20*

U.S. Cl. 324—306 2 Claims



1. A method of simultaneous detection of multiple components of motion of a material within a subject comprising the steps of:

a) placing said subject into a magnetic field to polarize nuclear spins;

b) applying a radiofrequency (RF) pulse of a selected frequency and amplitude;

c) applying a slice select magnetic field gradient in a slice select direction perpendicular to a slice desired to be imaged, simultaneously with the application of the RF pulse, thereby causing nutation of resonant nuclei, 'nuclear spins' in a slice of said subject, to create transverse spin magnetization;

d) applying an acceleration-encoding magnetic field gradient pulse of a selected polarity, in an acceleration-encoding direction, to said subject to cause the transverse spin magnetization to acquire an acceleration-induced phase shift;

e) applying a higher-order phase encoding pulse, being a magnetic field gradient pulse of a selected amplitude which induces a phase shift proportional to velocity and is oriented in a phase encoding direction which is independent of the slice select direction and the acceleration-encoding direction

f) applying a readout magnetic field gradient pulse in a readout direction substantially orthogonal to the slice-select direction;

g) acquiring an MR response signal in the presence of the readout magnetic field gradient pulse;

h) Fourier transforming the MR response signal to result in an intermediate data set;

i) repeating steps 'b'–'h' plurality, Y times, each repetition having a unique amplitude for the higher order phase encoding gradient pulse; to result in Y intermediate data sets;

j) Fourier transforming the Y intermediate data sets with respect to the amplitudes of the higher order phase encoding pulse to result in a complex two dimensional (2D) transformed data set having a spatial first dimension, and a velocity second dimension, the 2D transformed data set having a plurality of complex entries with the phase of each complex entry indicating acceleration, and the amplitude indicating the number of nuclear spins at a given velocity and spatial position of the material within said subject.

5,469,060

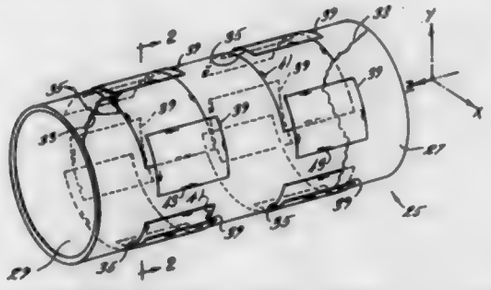
TIME ENCODED MAGNETIC RESONANCE IMAGING

Mary E. Meyerand, 6676 Parkedge Cir., Franklin, Wis. 53132

Filed Aug. 19, 1993, Ser. No. 109,302

Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—309 36 Claims



1. A method for magnetic resonance imaging of a sample, comprising the steps of:

generating a static magnetic field orientated in a first direction, the sample being disposed within said static magnetic field, whereby a magnetization vector of a plurality of atomic particles of the sample align with said static magnetic field in said first direction;

generating a first generally linear magnetic field gradient oriented in a second direction, the sample being exposed to said first linear magnetic field gradient to define a two dimensional slice of the sample in a first plane generally perpendicular to said second direction;

generating a first radio frequency pulse at a resonance frequency of the atomic particles, said first radio frequency pulse oriented in a third direction, said third direction being generally perpendicular to said first direction, the sample being exposed to said first radio frequency pulse, said first radio frequency pulse having a first time duration wherein said magnetization vector is rotated into a second plane generally perpendicular to said first direction;

generating a two dimensional, non-uniform, magnetic field gradient oriented in said second plane, the sample being exposed to said two dimensional, non-uniform, magnetic field gradient at a time other than when said sample is exposed to said first radio frequency pulse;

generating a spin echo in the sample, whereby radio frequency signals are emitted from the atomic particles at different times which correspond to two dimensional spacial positions in said slice;

generating a second generally linear magnetic field gradient oriented in a fourth direction, said fourth direction being generally perpendicular to said second direction, the sample being exposed to said second linear magnetic field gradient;

detecting said radio frequency signals emitted from the atomic particles to provide a detected signal indicative of a time domain function of said radio frequency signals detected for said two dimensional slice; and

processing said detected signal to transform said detected signal indicative of the time domain function of said radio frequency

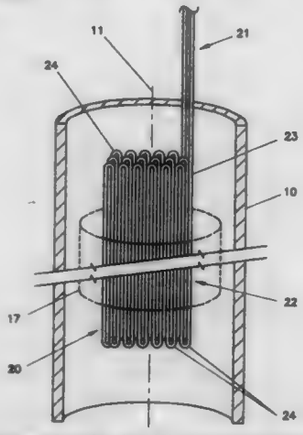
signals detected to processed signals indicative of a set of frequency domain functions of said radio frequency signals detected.

5,469,061

SPECTROMETER CAPILLARY VESSEL AND METHOD OF MAKING SAME

John C. Linehan, Richland; Clement R. Yonker, Kennewick; Thomas S. Zemanian, Richland, and James A. Franz, Kennewick, all of Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Filed Apr. 2, 1993, Ser. No. 42,351
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—321 **16 Claims**



1. A material sample tube for a spectrometer having a measurement zone, said material sample tube, comprising:

(a) non-magnetic material, and

(b) said non-magnetic material sample tube having a plurality of continuous and unbroken passes through said spectrometer measurement zone.

5,469,062

MULTIPLE DEPTHS AND FREQUENCIES FOR SIMULTANEOUS INVERSION OF ELECTROMAGNETIC BOREHOLE MEASUREMENTS

Wallace H. Meyer, Jr., Spring, Tex., assignor to Baker Hughes, Inc., Houston, Tex.

Filed Mar. 11, 1994, Ser. No. 212,194
Int. Cl.[6] G01V *3/28;3/30;3/38*
U.S. Cl. 324—338 **33 Claims**

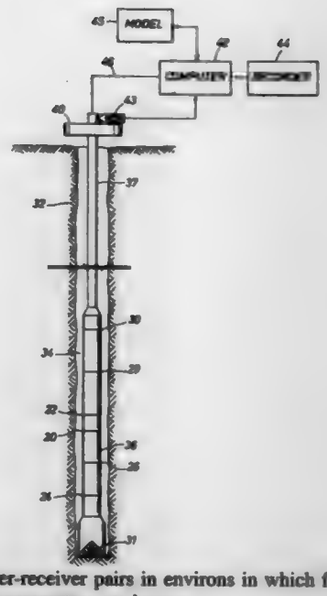
30. A wave propagation apparatus for measuring electromagnetic properties of earth formation penetrated by a borehole and simultaneously correcting said measurements for the adverse effects of drilling fluid invasion and bed boundary conditions, comprising:

(a) a borehole instrument comprising one or more transmitter-receiver pairs with the transmitter components of said transmitter-receiver pairs operating at at least one frequency;

(b) power and control circuits for said transmitters and receivers contained within said borehole instrument;

(c) a conveyance apparatus for conveying said borehole instrument along the borehole;

(d) a model of the response of said borehole instrument which relates the responses of the receiver components of said transmitter-receiver pairs to electromagnetic radiation produced by the operation of said transmitter components in a plurality of formation and borehole conditions representative of the environs in which said borehole instrument is expected to operate, and wherein said model is obtained from determinations of the responses of said receiver components of said



transmitter-receiver pairs in environs in which formation and borehole parameters are known;

(e) a downhole processor contained within said borehole instrument for mathematically processing the responses of the receiver components of said transmitter-receiver pairs with said borehole instrument response model thereby obtaining processed data, said processed data comprising parameters of interest selected from said plurality of formation and borehole parameters;

(f) a depth indicator for tracking the depth of said borehole instrument along said borehole;

(g) a data transfer system for transferring said processed data or said responses of said receivers or both to the surface of the earth; and

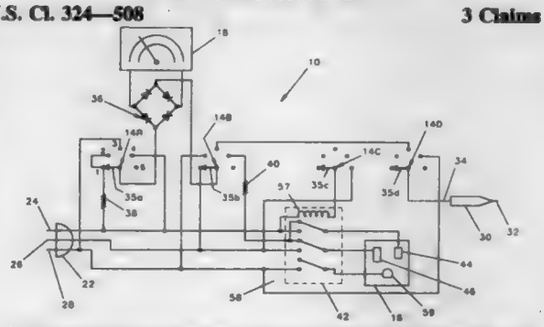
(h) a recorder for recording said processed data as a function of depth along said borehole at which said responses of said receivers used to generate said processed data are measured.

5,469,063

METHOD AND APPARATUS FOR TESTING FOR A HIGH VOLTAGE ON THE CHASSIS OF AN ELECTRONIC APPARATUS

Robert A. Winter, Sioux Falls, S. Dak., assignor to Bowden's Automated Products, Inc., Viborg, S. Dak.

Filed Aug. 23, 1993, Ser. No. 110,519
Int. Cl.[6] G01R *31/02*
U.S. Cl. 324—508 **3 Claims**



1. An instrument for testing a piece of electronic equipment, said piece of electronic equipment being of the type which has an AC plug having a high voltage contact, a low voltage contact, and the piece of equipment also having a chassis, said device comprising in combination:

connector means for connecting said instrument to a source of AC power, said connector means including a high voltage contact and a low voltage contact,

a socket for receiving an AC plug of a piece of electronic equipment, said socket having means for receiving a high voltage contact and means for receiving a low voltage contact,

first circuit means for conductively connecting said high voltage contact of said connector means to said means for receiving a high voltage contact and conductively connecting said low voltage contact of said connector to said means for receiving a low voltage contact,

second circuit means for simultaneously connecting both said high voltage contact and said low voltage contact of said electronic equipment directly to said high voltage contact of said connector means,

a conductive probe having a tip and a lead extending therefrom, said lead connected to a ground,

detection means along said lead for detecting a potential between said high voltage contact of said source of AC power to said tip of said probe when an AC plug of a piece of electronic equipment is inserted into said socket and said tip of said probe is contacted against the chassis of a piece of electronic equipment, and said connector is attached to a source of AC power,

switch means for selectively configuring one of said first circuit means and said second circuit means;

third circuit means for testing for an AC potential between said high voltage contact and said low voltage contact of said connector means when said connector means is connected to a source of AC power,

fourth circuit means for testing for an AC potential between ground and said high voltage contact of said connector means when said connector means is connected to a source of AC power,

fifth circuit means for testing for an AC potential between a ground contact of said instrument and earth ground, and

second switch means for selectively configuring said instrument for one of said first circuit means, said second circuit means, said third circuit means, said fourth circuit means, and said fifth circuit means.

5,469,064

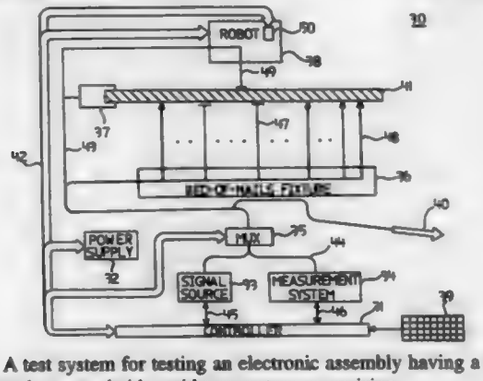
ELECTRICAL ASSEMBLY TESTING USING ROBOTIC POSITIONING OF PROBES

Ronald K. Kerschner; John M. Heumann; John E. McDermid; Ed. O. Schlotzhauer, and David T. Crook, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 820,711, Jan. 14, 1992, Pat. No. 5,274,336. This application Sep. 15, 1993, Ser. No. 122,031

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—537 **21 Claims**



1. A test system for testing an electronic assembly having a first side and a second side, said test system comprising:

an electrical test means;

a bed-of-nails fixture means with mounting means for fixing said first side of said electronic assembly at a predetermined position adjacent said bed-of-nails fixture, said bed-of-nails fixture means having a plurality of test probes arranged to spatially correspond with predetermined electrical test access sites on said first side of said electronic assembly;

at least two test probes for obtaining electrical test access at predetermined sites on said second side of said electronic assembly;

robotic test probe positioning means with at least two test probe heads for individually positioning said at least one two test probes in an X-direction, a Y-direction and a Z-direction spatially adjacent said second side of said electronic assembly, said robotic test probe positioning means repositioning said at least two test probes via said at least two test probe heads during testing relative to each of said predetermined test access sites on said second side of said electronic assembly; and

a controller for implementing and controlling the testing of said electronic assembly, wherein after a user selects a test to be run said controller implements said test and instructs said robotic test probe positioning means to individually move said at least two test probes to selected sites adjacent said second side of said electronic assembly, said controller further instructs said electrical test means to measure, excite and ground selected sites on said first side of said electronic assembly via said bed-of-nails fixture means and to measure, excite and ground selected sites on said second side of said electronic assembly via said at least two test probes.

5,469,065

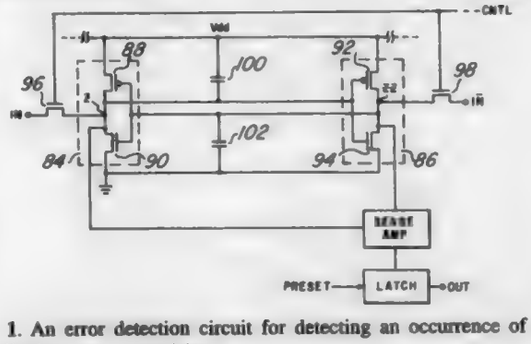
ON CHIP CAPACITOR BASED POWER SPIKE DETECTION

Theodore W. Houston, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 901,743, Jun. 22, 1992, Pat. No. 5,361,033, which is a division of Ser. No. 737,584, Jul. 25, 1991, Pat. No. 5,157,335, which is a continuation of Ser. No. 395,853, Aug. 18, 1989, abandoned. This application Aug. 3, 1994, Ser. No. 285,457

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—537 **3 Claims**



1. An error detection circuit for detecting an occurrence of a spike in power comprising:

a pair of terminals for connecting power to the error detection circuit;

first and second inverters for storing a first logic state, each of said first and second inverters connected between said pair of terminals and each having an input and an output;

a first transistor connected between the input of said first inverter and the output of the second inverter and having a gate connected to the input of the second inverter;

a second transistor connected between the output of the first inverter and the input of the second inverter and having a gate connected to the input of the first inverter; and

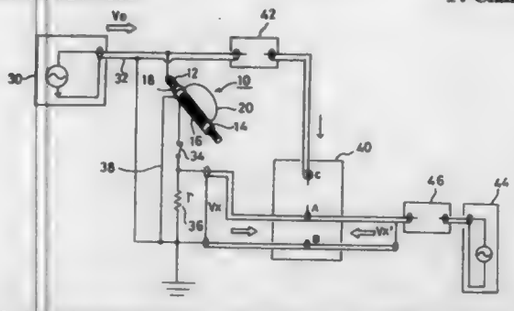
circuitry operable for producing a second logic state in said first and second inverters in connection with said occurrence of a spike in power which is delivered to the error detection circuit, said circuitry comprising a pair of capacitors wherein each capacitor is connected between the output of one inverter and one of said power terminals.

5,469,066

METHOD AND APPARATUS FOR MEASURING DETERIORATION OF POWER CABLE INSULATION

Akira Ito, and Hiroaki Kamohara, both of Kitashigeyasu, Japan, assignors to Daiden Kabushiki Kaisha, Kitashigeyasu, Japan

Filed Oct. 22, 1993, Ser. No. 139,702
Claims priority, application Japan, Jan. 23, 1992, 4-309485
Int. Cl.[6] G01R *31/02*
U.S. Cl. 324—551 **14 Claims**



1. A method for testing a power cable for localized treeing, the cable comprising a central conductor, an insulation layer surrounding the conductor and an electrically conductive insulation shield surrounding the insulation layer, comprising:

preparing a sample of cable to be tested;

connecting the insulation shield layer of the cable to a grounded resistor;

measuring the dielectric loss of the insulation layer of the cable sample; and

determining the localized treeing of the insulation layer based on the magnitude of the dielectric loss as measured during the measuring step;

said measuring step comprising:

generating an AC test signal;

applying the AC test signal to the central conductor to cause a voltage drop across the resistor;

generating a voltage signal which is 180 degrees out of phase with the reactive component of the voltage drop across the resistor;

adding the voltage signal to the voltage drop across the resistor to cancel out the reactive component of the voltage drop;

adjusting the magnitude of the voltage signal such that the sum of the voltage signal and the voltage drop as measured by a lock-in amplifier is reduced to a

minimum to provide a signal indicative of the active component of the voltage drop; and

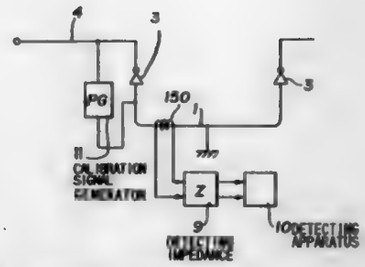
measuring the active component of the voltage drop using the lock-in amplifier.

5,469,067

DETECTING PARTIAL DISCHARGE USING A DETECTION COIL AND ANALYSIS OF OUTPUT SIGNAL AND NOISE FREQUENCY SPECTRUMS

Takeshi Endoh; Tomoaki Imai, and Mikio Hagiya, all of Ibaraki, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Division of Ser. No. 784,728, Oct. 28, 1991, Pat. No. 5,323,117, which is a continuation of Ser. No. 473,279, Jan. 31, 1990, abandoned. This application Dec. 8, 1993, Ser. No. 163,572
Claims priority, application Japan, Jan. 25, 1989, 1-277928; Nov. 29, 1989, 1-309743; Nov. 29, 1989, 1-309744; Dec. 2, 1989, 1-314096
Int. Cl.[6] G01R *31/08*
U.S. Cl. 324—551 **3 Claims**



1. A method for detecting partial discharge in a plastic solid insulation of a wire shielded electric power cable, comprising the steps of:

providing a single detecting coil wound around said wire shielded electric power cable with a predetermined number of turns;

detecting a frequency spectrum of noise obtained from said wire shielded electric power cable;

supplying a calibration pulse to said wire shielded electric power cable;

detecting a frequency spectrum of an output signal obtained from said wire shielded electric power cable which is supplied with said calibration pulse; and

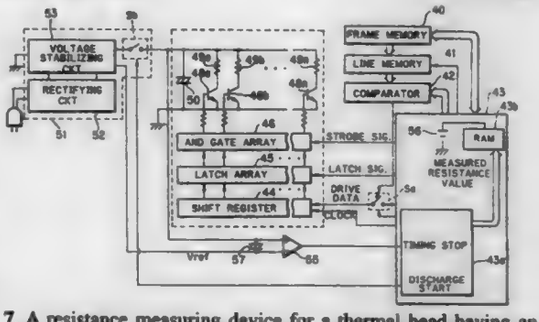
comparing said frequency spectrums of said noise and said output signal to detect said partial discharge.

5,469,068

THERMAL PRINTER AND DEVICE AND METHOD FOR MEASURING RESISTANCE OF THERMAL HEAD OF THERMAL PRINTER

Nobuo Katsuma, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Aug. 31, 1993, Ser. No. 113,807
Claims priority, application Japan, Sep. 1, 1992, 4-233626
Int. Cl.[6] G01R *27/02;* **B41J** *2/35*
U.S. Cl. 324—678 **21 Claims**



7. A resistance measuring device for a thermal head having an array of parallel connected heating elements which are heated by a voltage supplied from a power supply circuit during printing, an array of drive switches which are connected in series to said heating elements in one to one relation, and a switch control circuit for ON-OFF controlling of said drive switches, the resistance measuring device comprising:

a capacitor connected to said power supply circuit in parallel with said heating element array;

a charge switch connected between said power supply circuit and said capacitor, said charge switch being turned ON to charge said capacitor up to a first voltage level by said power supply circuit and being turned OFF to disconnect said heating element and said capacitor from said power supply circuit;

discharge time measuring means for measuring discharge time required to discharge said capacitor from said first voltage level to a second voltage level when said charge switch is turned OFF and one of said drive switches is turned ON to discharge said capacitor through a corresponding one of said heating elements; and

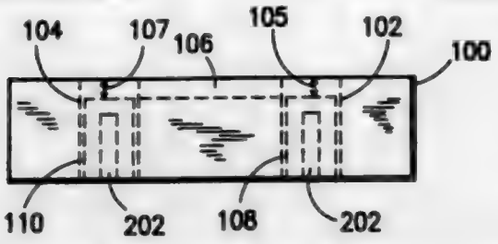
resistance value calculating means for calculating a resistance value of said corresponding one of said heating elements on the basis of said measured discharge time.

5,469,069

METHOD AND APPARATUS FOR MEASURING RESISTIVITY OF GEOMETRICALLY UNDEFINED MATERIALS

On-Kok Chang, 1031 Belvedere La., San Jose, Calif. 95129

Filed Mar. 19, 1993, Ser. No. 35,142
Int. Cl.[6] G01R 27/02
U.S. Cl. 324—693 13 Claims



1. Apparatus for measuring electrical characteristics of a material comprising:

means for receiving a sample of material, said receiving means having a first charge conducting region with a first cross-sectional area and a second charge conducting region with a second cross-sectional area, said first cross-sectional area being greater than said second cross-sectional area, said first charge conducting region having at least two well regions formed in a non-conductive material and said second charge conducting region having a channel region formed in said non-conductive material for interconnecting said two wells regions; and

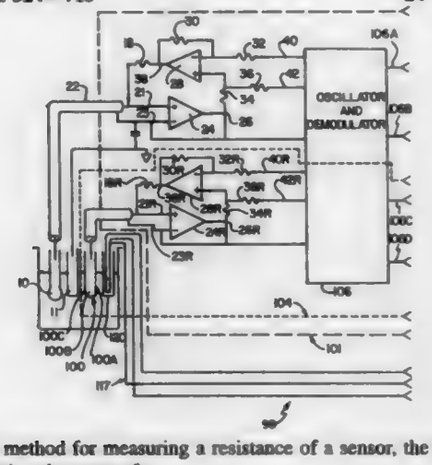
means for receiving and conducting an electric charge through said first and second charge conducting regions, said conducting means further including a conductive cylinder located in each of said well regions, each of said conductive cylinders having a first flat conductive surface for contacting said material in said first charge conducting region.

5,469,070

CIRCUIT FOR MEASURING SOURCE RESISTANCE OF A SENSOR

Roland H. Koluvek, Orange, Calif., assignor to Rosemount Analytical Inc., La Habra, Calif.

Filed Oct. 16, 1992, Ser. No. 962,133
Int. Cl.[6] G01N 27/02
U.S. Cl. 324—713 24 Claims



1. A method for measuring a resistance of a sensor, the method comprising the steps of:

injecting a first test current into the sensor;

measuring a substantially stable first voltage level across the sensor when the first test current is present;

injecting a second test current into the sensor, the second test current being substantially equal to but opposite in polarity to the first test current;

measuring a substantially stable second voltage level across the sensor when the second test current is present;

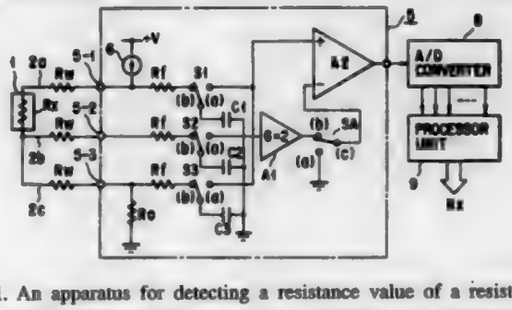
calculating the resistance of the sensor as a function of the measured first voltage level and the measured second voltage level.

5,469,071

RESISTOR SENSOR INPUT APPARATUS

Yoshinori Obata, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 6, 1994, Ser. No. 354,126
Claims priority, application Japan, Dec. 7, 1993, 5-306375
Int. Cl.[6] G01R 27/14
U.S. Cl. 324—713 17 Claims



1. An apparatus for detecting a resistance value of a resistor sensor to which a reference current is supplied, and inputting a detected resistance to an external device said apparatus comprising:

a first signal line connecting a first end of the resistor sensor and a first contact terminal provided in the apparatus;

a second signal line connecting a second end of the resistor sensor and a second contact terminal provided in the apparatus;

a third signal line connecting the second end of the resistor sensor and a third contact terminal provided in the apparatus;

a reference resistance element having a first end connected to the third contact terminal and a second end connected to a ground;

a reference current source for supplying the reference current to the first signal line through the first contact terminal;

a first voltage holding means for holding a voltage E_1 across the first signal line and the ground;

a second voltage holding means for holding a voltage E_2 across the second signal line and the ground;

a third voltage holding means for holding a voltage E_3 across the first and second ends of the reference resistance element;

a differential amplifier, having first and second input terminals, for detecting the voltage E_3 held by the third voltage holding means and detecting a differential voltage E_{def} corresponding to a difference between the voltage E_1 held by the first voltage holding means and a voltage E_2 held by the second voltage holding means, obtained by amplifying the voltage E_2 with a gain corresponding to resistance of the first and second signal lines; and

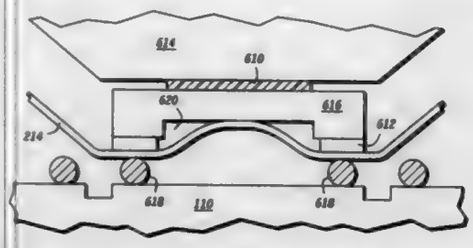
switching means, inserted between the differential amplifier and the first to third voltage holding means, for connecting the third voltage holding means to the first input terminal of the differential amplifier, when the voltage E_3 is detected by the differential amplifier, and respectively connecting the first and second voltage holding means to the first and second input terminals of the differential amplifier, when the voltage E_{def} is detected by the differential amplifier.

5,469,072

INTEGRATED CIRCUIT TEST SYSTEM

William M. Williams; Anthony Angelo, both of Gilbert, and Gregory L. Westbrook, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 1, 1993, Ser. No. 143,770
Int. Cl.[6] G01R 1/073
U.S. Cl. 324—754 2 Claims



1. An integrated circuit test system, comprising:

a semiconductor die including a plurality of die electrical contacts;

a plurality of external electrical contacts corresponding to the die electrical contacts;

a force focusing member exerting an isolated force against the external electrical contacts, the isolated force being aligned with the die electrical contacts, wherein the force focusing member comprises an elastomeric pressure pad configured to have pad portions aligned with the die electrical contacts; and

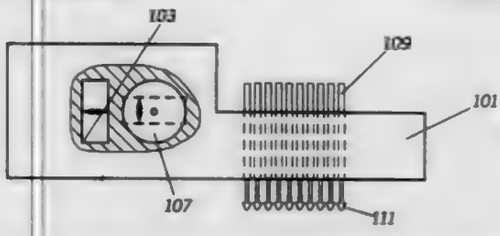
a rigid force applicator and an elastomeric pedestal, the elastomeric pedestal located between the rigid force applicator and a rigid portion of the force focusing member, the elastomeric pedestal allowing the force focusing member to adjust to a position occupying a plane parallel with the semiconductor die.

5,469,073

METHOD AND APPARATUS FOR ULTRASONICALLY ENERGIZING PIN SEATING IN TEST FIXTURE DEVICES

Henry F. Liebman, Tamarac; Alan Clayton, Wilton Manors, and Walter A. Horneman, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 6, 1994, Ser. No. 271,318
Int. Cl.[6] G01R 1/04;1/073
U.S. Cl. 324—757 10 Claims



6. An apparatus for use with a test fixture system comprising:

a housing;

at least one ultrasonic transducer fixedly attached to the housing for providing movement in response to ultrasonic energy produced therefrom;

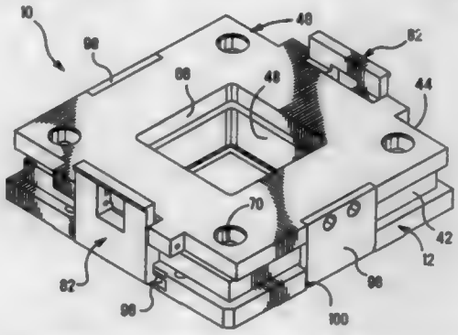
at least one contact probe fixedly attached to the housing for providing contact with a test point on a device under test, the contact probe moving in accordance with the ultrasonic energy produced by the at least one ultrasonic transducer in a direction substantially circular to the test point to pierce obstructing material in the path of the at least one contact probe.

5,469,074

CHIP SOCKET TESTING APPARATUS WITH ADJUSTABLE CONTACT FORCE

William W. Drabenstadt, Camp Hill; Richard C. Fowler, East Berlin; Soren Grindersiev, Hummelstown, all of Pa., and Robert D. Iribeck, Greensboro, N.C., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Feb. 8, 1994, Ser. No. 193,347
Int. Cl.[6] H01R 9/09; G01R 1/04
U.S. Cl. 324—758 9 Claims



1. An electrical test socket assembly for testing electrical circuits, comprising:

a contact force member comprising an upper latching member and a lower floating member which is mounted to said upper latching member by at least one fastener but is movable relative to said upper latching member, said contact force member further includes at least one spring disposed between said upper latching member and said lower floating member;

a base member for mountably receiving said contact force member;

and said upper latching member further includes a body portion which comprises a top side of said upper latching member in a direction away from said base member, said top side includes a fastener aperture formed therein for receiving said fastener,

whereby an operator can manipulate said fastener when said contact force member has been mounted on said base member in a closed position.

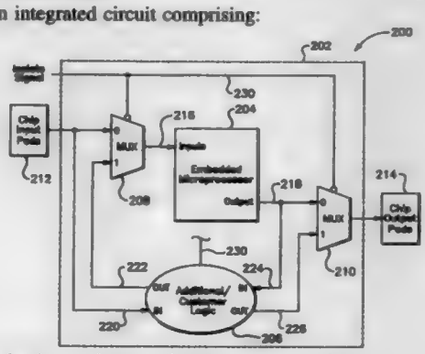
5,469,075

TESTABLE EMBEDDED MICROPROCESSOR AND METHOD OF TESTING SAME

Timothy P. Oke; Russell E. Cummings, II, both of Milpitas, and Nachum M. Gavrielov, Palo Alto, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 132,747, Oct. 6, 1993, abandoned, which is a continuation of Ser. No. 628,202, Dec. 13, 1990, Pat. No. 5,254,940. This application Nov. 29, 1994, Ser. No. 346,581
Int. Cl.[6] G01R 31/28;31/318
U.S. Cl. 324—763 5 Claims

1. An integrated circuit comprising:



a die having an input pad and an output pad;

a microprocessor disposed on said die and having an input and an output;

additional logic disposed on said die and having a first output, a second output, a first input that is connected to said input pad and a second input that is connected to said output of said microprocessor;

an input multiplexer for selectively connecting said input pad or said first output of said additional logic to said input of said microprocessor;

an output multiplexer for selectively connecting said output of said microprocessor or said second output of said additional logic to the output pad; and

means for forcing said additional logic to a predefined state; in which

said input multiplexer and said output multiplexer have control inputs that are responsive to a control signal having a normal state or a test state;

when said control signal has said normal state, said input multiplexer is controlled to connect said first output of said additional logic to said input of said microprocessor, and said output multiplexer is controlled to connect said second output of said additional logic to said output pad;

when said control signal has said test state, said input multiplexer is controlled to connect said input pad to said input of said microprocessor, and said output multiplexer is controlled to connect said output of said microprocessor to said output pad and said means forces said additional logic to said predefined state.

5,469,076

STATIC CURRENT TESTING APPARATUS AND METHOD FOR CURRENT STEERING LOGIC (CSL)

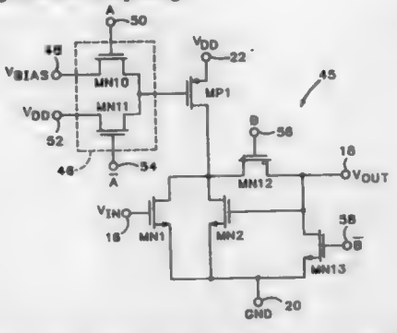
Rajeev Badyal, Fort Collins, Colo., and Scott Linn, Corvallis, Oreg., assignors to Hewlett-Packard Corporation, Palo Alto, Calif.

Filed Oct. 20, 1993, Ser. No. 140,348

Int. Cl.[6] H03K *19/00;19/094*

U.S. Cl. 326—16 **23 Claims**

1. A logic circuit comprising:



a folded source coupled logic gate having an input, an output, and a bias node, the logic gate consuming a substantially constant current during a normal operating mode; and

bias switching means for switching the bias node between a source of bias voltage in the normal operating mode and a source of shut-off voltage in a static current testing mode.

5,469,077

FIELD PROGRAMMABLE ANTIFUSE DEVICE AND PROGRAMMING METHOD THEREFOR

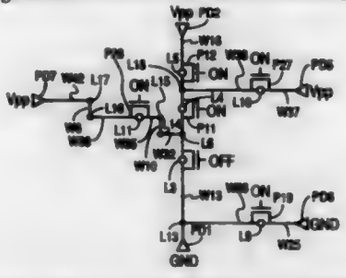
William D. Cox, Milpitas, Calif., assignor to QuickLogic Corporation, Santa Clara, Calif.

Continuation of Ser. No. 138,819, Oct. 15, 1993, abandoned, which is a continuation of Ser. No. 907,904, Jul. 2, 1992, Pat. No. 5,327,024. This application Jun. 22, 1994, Ser. No. 263,985

Int. Cl.[6] H03K *19/177*

U.S. Cl. 326—38 **7 Claims**

1. In a programmable device, a method for reducing a resistance



between a first portion of an antifuse to be programmed and a conductor carrying a first programming voltage, comprising:

establishing a first conductive programming branch from a source of said first programming voltage to said first portion of said antifuse to be programmed, said first conductive programming branch comprising a first wire and a second wire disposed in a first routing track and a first pass transistor and a second pass transistor, said first wire, said second wire, said first pass transistor and said second pass transistor being electrically connected in series; and

establishing a second conductive programming branch from a source of said first programming voltage to a location on said first conductive programming branch, said location being spaced from said first portion of said antifuse to be programmed, said second conductive programming branch comprising a first wire and a second wire disposed in a second routing track and a first pass transistor and a second pass transistor, said first wire, said second wire, said first pass transistor and said second pass transistor of said second conductive programming branch being electrically connected in series, said first routing track extending in a dimension substantially perpendicular to a dimension in which said second routing track extends.

5,469,078

PROGRAMMABLE LOGIC DEVICE ROUTING ARCHITECTURE

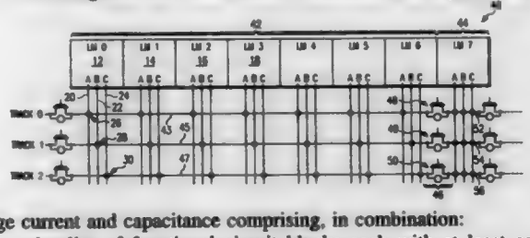
Mark G. Harward, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 6, 1994, Ser. No. 177,891

Int. Cl.[6] H03K *19/177*

U.S. Cl. 326—41 **9 Claims**

1. An integrated electronic circuit architecture having low leak-



age current and capacitance comprising, in combination:

a plurality of functional circuit blocks each with at least one connection lead;

a plurality of conductors disposed generally orthogonally to and crossing said connection leads;

said plurality of conductors comprising a first group of conductors and a second group of conductors, the conductors in said

first group of conductors having greater length than the conductors in said second group;

a plurality of segmentation fusible devices each disposed between one conductor in said first group of conductors and one said conductor in said second group of conductors thereby forming a plurality of conductors with at least one conductor in said first group of conductors coupled to at least one conductor in said second group of conductors;

a first plurality of user-programmable antifuse elements disposed along each of the conductors in said first group of conductors at the crossing point of some but not all of said connection leads crossing said first group of conductors for selectively providing a connection between a conductor in said first group of conductors and the connection lead crossing at the position of a blown antifuse element; and

a second plurality of user-programmable antifuse elements disposed along each of the conductors in said second group of conductors at the crossing point of all of said connection leads crossing said second group of conductors for selectively providing a connection between each said connection lead crossing each conductor in said second group of conductors at the position of a blown antifuse element.

5,469,079

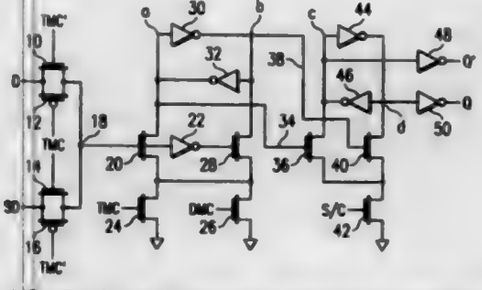
FLIP-FLOP FOR USE IN LSSD GATE ARRAYS

Shivaling S. Mahant-Shetti, Richardson, and Robert J. Landers, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 13, 1994, Ser. No. 305,238

Int. Cl.[6] H03K *19/173*

U.S. Cl. 326—46 **8 Claims**



1. A flip-flop for use in gate arrays designed in compliance with LSSD design rules comprising, in combination:

a flip-flop input terminal;

a data input terminal;.

a scan data input terminal:

a selectively actuated switch to couple either said data input terminal or said scan data input terminal to said flip-flop input terminal;

a master flip-flop comprising two inverters coupled back-to-back;

a first switch coupled between said master flip-flop and said flip-flop input terminal to set said master flip-flop at a first time to a state indicative of the state of the signal at said flip-flop input terminal;

a slave flip-flop comprising two inverters coupled back-to-back;

a second switch coupled between said master flip-flop and said slave flip-flop to set said slave flip-flop at a second time after said first time to a state indicative of the state of the state of said master flip-flop;

said first switch includes a first N-channel transistor coupled between said flip-flop input terminal and said master flip flop; and

said first switch additionally includes a second N-channel transistor coupled to said master flip-flop and an inverter coupled between said second N-channel transistor and said flip-flop input terminal.

5,469,080

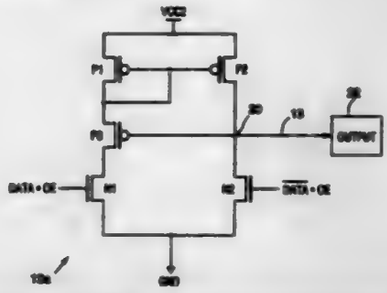
LOW-POWER, LOGIC SIGNAL LEVEL CONVERTER

Ilhun Son, Palo Alto, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Jul. 29, 1994, Ser. No. 283,272

Int. Cl.[6] H03K *19/0185*

U.S. Cl. 326—81 **24 Claims**



1. An apparatus including a logic circuit, said circuit comprising:

an input circuit for receiving an input logic signal which includes first and second logic states with first and second logic transitions and a first logic level difference therebetween;

an output node for providing an output logic signal which corresponds to said input logic signal; and

a current mirror circuit, coupled to said input circuit and said output node, for receiving therefrom and providing thereto said input and output logic signals, respectively, wherein said current mirror circuit is nonconductive during said first logic state of said input logic signal.

5,469,081

CIRCUIT FOR INTERCONNECTING INTEGRATED SEMICONDUCTOR CIRCUITS

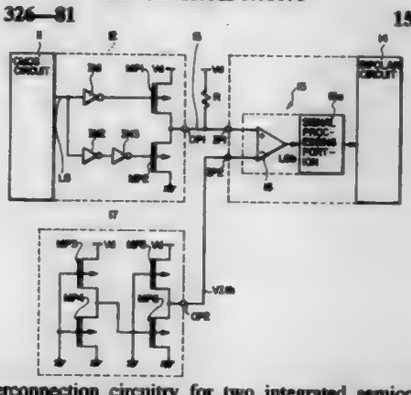
Satomi Horita; Yasushi Aoki; Masahiro Wakana, all of Tokyo; Hiroshi Okamoto, Miyagi; Kiyohiko Chiba, Miyagi, and Shizue Daikoku, Miyagi, all of, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 848,098, Mar. 9, 1992, abandoned. This application Aug. 8, 1994, Ser. No. 292,142

Claims priority, application Japan, Mar. 7, 1991, 3-069085; Aug. 22, 1991, 3-211160

Int. Cl.[6] H03K *19/0175*

U.S. Cl. 326—81 **15 Claims**



a first p-channel MOS transistor, having a gate which is connected with an output of said inverter circuit; and

a second p-channel MOS transistor having a drain which is coupled to the source of said first MOS transistor, and a gate which is coupled to an output of said inverter circuit;

a first node common to the source of said first p-channel MOS transistor and the drain of said second p-channel MOS transistor being connected with one end of said signal path;

a second portion, comprising:

an input circuit for the other of said integrated semiconductor circuits, said input circuit comprising a circuit for discriminating whether the level of the signal on said signal path is greater than a reference signal;

a third portion, comprising:

a reference signal generator circuit for generating said reference signal at a level which is substantially intermediate a maximum and a minimum value of said second level.

5,469,082

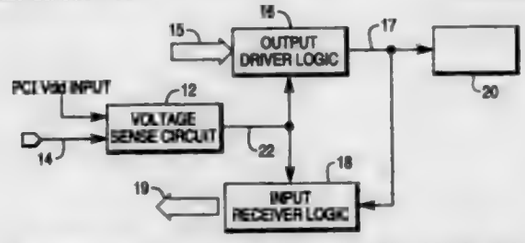
PERIPHERAL COMPONENT INTERFACING SYSTEM WITH BUS VOLTAGE/LOGIC SUPPLY COMPARISON MEANS

Philip W. Bullinger, Loveland, and Michael J. McManus, Fort Collins, both of Colo., assignors to AT&T Global Information Solutions Company, Dayton, Ohio, and Hyundai Electronics America, Milpitas, Calif.

Filed Dec. 8, 1994, Ser. No. 352,331

Int. Cl.[6] H03K *19/0175*

U.S. Cl. 326—81 **13 Claims**



1. Apparatus for adjusting the voltage levels of logic signals present at a circuit node intended to function as an input and output interface for logic circuitry, comprising:

a voltage sense circuit responsive to an enabling signal for comparing a bus supply voltage and a logic circuit supply voltage, and for producing a first output signal as a result of that comparison;

an output driver logic circuit responsive to said first output signal for introducing a voltage level to said circuit node corresponding to a logic output voltage level; and

a receiver logic circuit responsive to said first output signal for driving said logic circuitry with a voltage having a level corresponding to said first output signal.

5,469,083

CIRCUIT CONFIGURATION FOR SYNCHRONOUS CLOCK GENERATION OF AT LEAST TWO CLOCK SIGNALS

Harald Puester, Erkrath, and Hans-Gerd Kirchhoff, Ratingen, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 16, 1994, Ser. No. 340,259

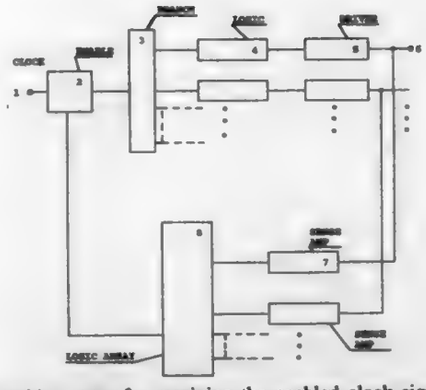
Claims priority, application Germany, Nov. 16, 1993, 43 39 159.1

Int. Cl.[6] H03K *19/00;* **H03L** *7/00*

U.S. Cl. 326—93 **5 Claims**

1. A circuit configuration for synchronous clock generation of at least two clock signals, comprising:

an enable stage for receiving a clock signal and enabling the clock signal under the control of an enable signal;



a branching stage for receiving the enabled clock signal from said enable stage and generating at least two clock signals from the enabled clock signal;

other stages each being connected downstream of said branching stage for receiving a respective one of the clock signals generated by said branching stage, each of said other stages having an output at which a respective output clock signal can be picked up;

amplifiers each being connected to the output of a respective one of said other stages and being associated with a respective one of the output clock signals, for detecting edges of the output clock signals; and

a logic array connected to said amplifiers for logical linking of the output signals generated by said amplifiers, said logic array generating the enable signal for controlling said enable stage.

5,469,084

BICMOS OUTPUT DRIVER

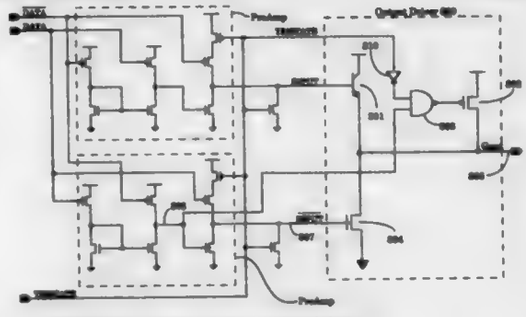
Raymond E. Bloker, San Jose, Calif., assignor to Cypress Semiconductor Corp., San Jose, Calif.

Continuation of Ser. No. 991,568, Dec. 16, 1992, Pat. No. 5,362,997. This application Jul. 22, 1994, Ser. No. 279,495

The portion of the term of this patent subsequent to Nov. 8, 2011, has been disclaimed.

Int. Cl.[6] H03K *19/08*

U.S. Cl. 326—110 **11 Claims**



1. A BiCMOS Output Driver comprising:

an input node;

an output node;

a bipolar transistor and a diode coupled in series between a first operating potential and said output node, the base of said bipolar transistor coupled to said input node;

a MOS transistor coupled between said first operating potential and said output node; and

an isolation circuit turning on said MOS transistor when said input node is high and turning off said MOS transistor when said input node is low wherein said isolation circuit has an input capacitance significantly less than said MOS transistor, said isolation circuit having at least one logic device coupled between the gate of said MOS transistor and the base of said bipolar transistor.

5,469,085

SOURCE FOLLOWER USING TWO PAIRS OF NMOS AND PMOS TRANSISTORS

Tadashi Shibata, 5-2, Nihondaira, Taihaku-ku, and Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku, both of Sendai-shi Miyagi-ken 980, Japan

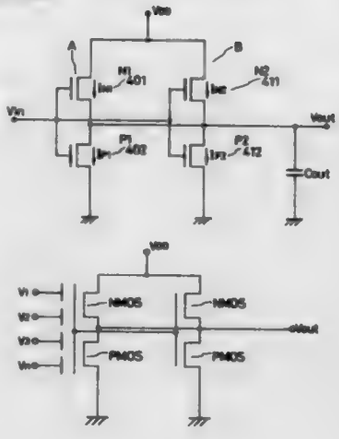
PCT No. PCT/JP92/00019, § 371 Date Oct. 13, 1993, § 102(e) Date Oct. 13, 1993, PCT Pub. No. WO92/12575, PCT Pub. Date Jul. 23, 1992

PCT Filed Jan. 13, 1992, Ser. No. 87,675

Claims priority, application Japan, Jan. 12, 1991, 3-013780; Jul. 2, 1991, 3-188147

Int. Cl.[6] H03K *19/0948*

U.S. Cl. 326—121 2 Claims



1. A source follower circuit comprising:

a first NMOS transistor having a first source, a first drain, and a first floating gate;

a second NMOS transistor having a second source, a second drain, and a second floating gate;

a first PMOS transistor having a third source, a third drain, and a third floating gate;

a second PMOS transistor having a fourth source, a fourth drain, and a fourth floating gate;

said first, second, third, and fourth sources connected together and to an output terminal;

said first and second drains connected together;

said third and fourth drains connected together;

said first, second, third, and fourth floating gates connected together; and

a plurality of input gates respectively connected to a plurality of input terminals and capacitively coupled to one or more of said floating gates;

the threshold voltages of said first, second, third, and fourth transistors selected so that they comply with one of

$$V_{TN2}>V_{TP1}>V_{TN1}>V_{TP2} \text{ and}$$

$$V_{TP1}>V_{TN2}>V_{TP2}>V_{TN1}$$

wherein

V_{TN1} is a threshold voltage of said first NMOS transistor;

V_{TN2} is the threshold voltage of said second NMOS transistor;

V_{TP1} is a threshold voltage of said first PMOS transistor; and

V_{TP2} is the threshold voltage of said second PMOS transistor.

5,469,086

FLOATING DETECTION CIRCUIT

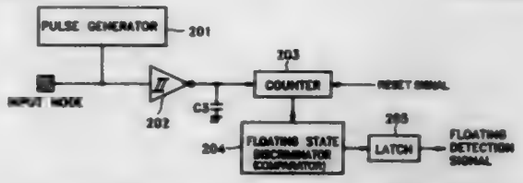
Sam-yong Bahng, and Suk-ki Kim, both of Bucheon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Jan. 19, 1994, Ser. No. 182,985

Claims priority, application Rep. of Korea, Jan. 19, 1993, 93-590

Int. Cl.[6] H03K *5/19;1/04*

U.S. Cl. 327—18 21 Claims



1. A floating detection circuit for detecting the floating state of an input node which can receive an externally applied DC signal, comprising:

a pulse generator coupled to said input node, for supplying a pulse signal to the input node;

a counter for receiving said pulse signal and counting the number of pulses included in the pulse signal during predetermined intervals; and

a comparator for comparing the number of pulses with a predetermined reference number, so as to produce a floating detection signal, wherein said floating detection signal indicates whether or not the input node is in a floating state.

5,469,087

CONTROL SYSTEM USING HARMONIC FILTERS

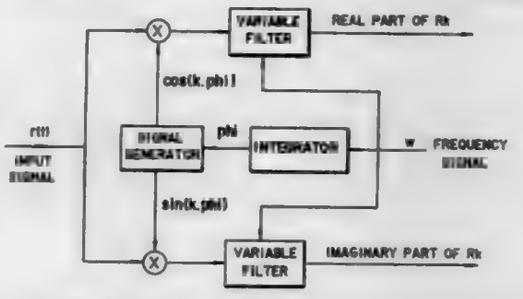
Graham P. Eatwell, Caldecote, Great Britain, assignor to Noise Cancellation Technologies, Inc., Linthicum, Md.

PCT No. PCT/US92/05228, § 371 Date Dec. 2, 1994, § 102(e) Date Dec. 2, 1994, PCT Pub. No. WO94/00911, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 25, 1992, Ser. No. 347,422

Int. Cl.[6] H04B *1/10*

U.S. Cl. 327—40 17 Claims



1. A method for obtaining the complex harmonic amplitudes of an input signal with varying fundamental frequency, said method comprising

multiplying said input signal by a pair of sinusoidal signals at the frequency of each harmonic component to be identified and

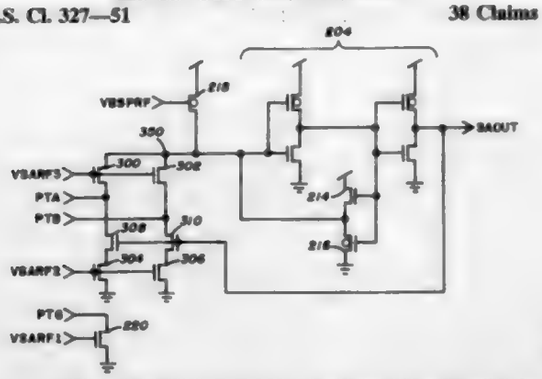
passing the resulting signals through low-pass filters with variable bandwidth to provide estimates of the real and imaginary parts of the desired complex harmonic amplitude.

5,469,088

CASCADE ARRAY CELL PARTITIONING FOR A SENSE AMPLIFIER OF A PROGRAMMABLE LOGIC DEVICE

Bradley A. Sharpe-Geisler, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 19, 1993, Ser. No. 34,537
Int. Cl.[6] G11C *8/00;11/34;11/409*
U.S. Cl. 327—51 38 Claims



1. A sense amplifier connected to a plurality of array cells, the sense amplifier including an amplifier having an amplifier input and an amplifier output, and a current source connected to the amplifier input, the sense amplifier further comprising:

a product term A line connected to a first plurality of array cells in the plurality of array cells;

a product term B line connected to a second plurality of array cells in the plurality of array cells;

a first cascode having a source-to-drain path connected on a first end to the current source and the amplifier input and connected on a second end to the product term A line; and

a second cascode having a source-to-drain path connected on a first end to the current source and the amplifier input and connected on a second end to the product term B line.

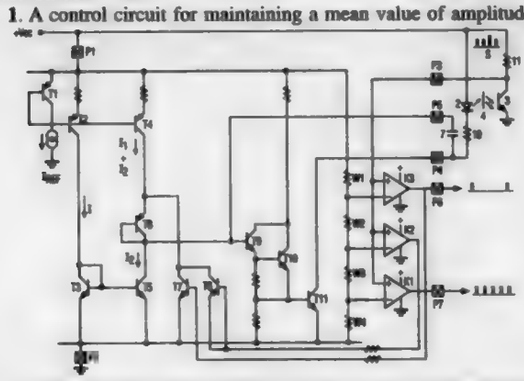
5,469,089

CIRCUIT ARRANGEMENT FOR REGULATING SIGNALS

Albrecht Rothermel; Günter Gleim, and Karin Rothermel, all of Villingen, Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany

Continuation of Ser. No. 9,468, Jul. 26, 1993, abandoned. This application Feb. 10, 1995, Ser. No. 387,969
Claims priority, application Germany, May 28, 1990, 40 17 124.8
Int. Cl.[6] H03K *5/19;5/00;3/42*
U.S. Cl. 327—56 5 Claims

1. A control circuit for maintaining a mean value of amplitudes



of generated pulses having different levels and representing different functions whereby pulses of a first level represent control pulses and pulses of a second level represent data pulses indicating that a function must be performed, comprising:

a detector for providing said generated pulses;

means for adjusting the mean level of said generated pulses;

a reference voltage source for providing first, second and third reference voltages having three different levels;

first, second and third comparators, each of said comparators receiving said generated pulses and a corresponding one of said reference voltages, a first of said comparators receiving the lowest reference voltage level and producing control pulses when said generated pulses reach said lowest reference voltage, a second of said comparators receiving the second highest reference voltage level and producing level limiting pulses to said adjusting means to maintain the mean level of said generated pulses constant, and a third of said comparators receiving the highest reference voltage and producing data pulses when said third reference voltage is reached; and

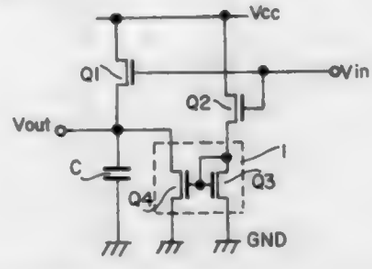
means for inhibiting said adjusting means in response to said data pulses, so that said adjustment means does not respond to said data pulses.

5,469,090

TRANSISTOR CIRCUIT FOR HOLDING PEAK/BOTTOM LEVEL OF SIGNAL

Tetsuya Narahara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 4, 1993, Ser. No. 101,731
Claims priority, application Japan, Aug. 4, 1992, 4-207684
Int. Cl.[6] G01R *19/00;* H03K *5/153*
U.S. Cl. 327—58 8 Claims



1. A transistor circuit comprising

a first transistor supplied with an input voltage and connected between a first power supply line and an output terminal,

a capacitor connected between said output terminal and a second power supply line and producing an output voltage at said output terminal, said first transistor, when rendered conductive, charging said capacitor with a first current,

a second transistor supplied with said input voltage and producing a second current responsive to said input voltage irrespective of whether said input voltage is larger or smaller than said output voltage, and

a current circuit coupled to receive said second current and discharging said capacitor with a third current relative to said second current, said third current for discharging said capacitor existing concurrently with and being smaller than said first current to thereby allow said output voltage to follow said input voltage when said first transistor is rendered conductive.

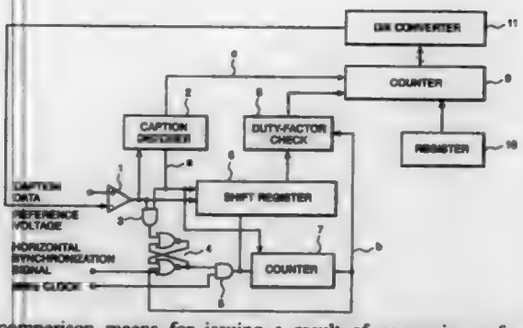
5,469,091

DATA SLICE CIRCUIT

Shinichi Takahashi, Milton, Wash.; Masayuki Nakaimuki, Takatsuki, and Yukihiro Yagi, Kyoto, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd.k, Kadoma, Japan

PCT No. PCT/JP92/00360, § 371 Date Nov. 20, 1992, § 102(e) Date Nov. 20, 1992, PCT Pub. No. WO92/17029, PCT Pub. Date Oct. 1, 1992
PCT Filed Mar. 25, 1992, Ser. No. 952,724
Claims priority, application Japan, Mar. 25, 1991, 3-060051
Int. Cl.[6] H03K *5/153;12/00*
U.S. Cl. 327—73 5 Claims

1. A data slice circuit comprising:



comparison means for issuing a result of comparison of an arbitrary one period of a data signal with a first reference voltage;

product means for producing a product of an output of said comparison means and a signal having a frequency of at least two times a frequency of said data signal;

bit storage means for storing an output of said product means as a bit train;

duty-factor check means for checking a duty-factor of said data signal of said arbitrary one period by checking said bit train stored in said bit storage means in compliance with a predetermined rule; and

reference voltage variation means for varying said first reference voltage in accordance with an output of said duty-factor check means and for providing said first reference voltage to said comparison means.

5,469,092

ELECTRONIC CIRCUIT INCLUDING MEANS FOR REFLECTING SIGNAL CURRENT AND FEED FORWARD MEANS FOR COMPENSATING OPERATIONAL SPEED THEREOF

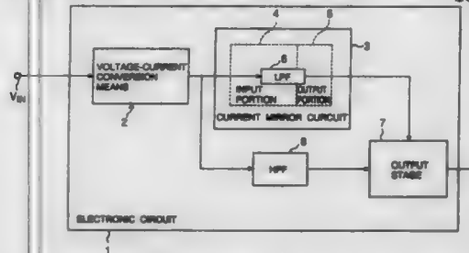
Tetsuro Itakura, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1994, Ser. No. 305,471

Claims priority, application Japan, Sep. 13, 1993, 5-336818; Jun. 24, 1994, 6-142091

Int. Cl.[6] H02M *11/00*

U.S. Cl. 327—103 **10 Claims**



1. An electronic circuit including signal current reflection means having an input portion and an output portion comprising:

voltage-current conversion means for generating an output current in proportion with an input voltage;

said signal current reflection means including the input portion having an input terminal for receiving the output current from said voltage-current conversion means and the output portion for outputting the current after reflection, and including low frequency signal passing means provided between a control electrode of a transistor constituting said input portion and a control electrode of a transistor constituting said output portion and for passing through a low frequency signal component occurring in said control electrodes of said transistors; and

feedforward means provided between said input terminal of the input portion of the signal current reflection means and an output stage of the electronic circuit and for causing a high frequency signal component supplied to the signal current reflection means to flow into the output stage wherein said output portion is coupled to said output stage.

5,469,093

CURRENT MIRROR DRIVE CIRCUIT WITH HIGH BREAKDOWN VOLTAGE

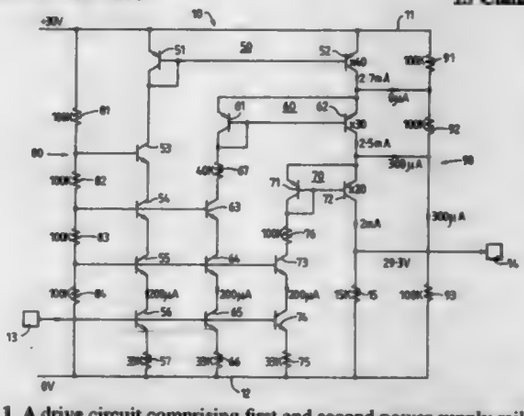
Iain R. MacDonald, Renfrewshire, United Kingdom, assignor to Plessey Semiconductors Limited, United Kingdom

Filed Nov. 2, 1994, Ser. No. 333,264

Claims priority, application United Kingdom, Nov. 3, 1993, 9322699

Int. Cl.[6] H03B *1/00*

U.S. Cl. 327—108 **13 Claims**



1. A drive circuit comprising first and second power supply rails; a plurality of output transistors, each output transistor having first and second main terminals and a control terminal, said output transistors being connected in series at their main terminals between the first and second power supply rails by way of a load element; a like plurality of driving circuit means for applying driving signals to said control terminals of respective output transistors in dependence upon respective input currents to said driving circuit means, said driving circuit means being arranged such as to allow the respective output transistor control terminal to float in dependence upon an output voltage established across said load element; a like plurality of input means arranged to establish an input current in respective ones of said driving circuit means in dependence upon an input signal to said drive circuit, thereby to establish a desired output voltage across said load element, each of said input means comprising at least one input transistor having first and second main terminals and a control terminal; first and second biasing means connected between said first and second power supply rails, and means connecting said first and second biasing means to said output transistors and said input means, respectively, to apply to said main terminals of said output transistors, and to main terminals of input transistors within said input means, respectively, voltages intermediate those of said first and second power supply rails, such that voltages appearing across the main terminals of the respective transistors are less than a rated voltage for said transistors.

5,469,094

POWER TRANSISTOR DRIVER STAGE WITH OPTIMALLY REDUCED TURN-OFF DELAY

Maurizio Nessi, Como, Italy, assignor to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

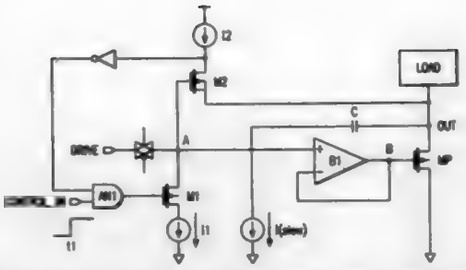
Filed May 31, 1994, Ser. No. 251,699

Claims priority, application European Pat. Off., May 31, 1993, 93830246

Int. Cl.[6] H03B *1/00*

U.S. Cl. 327—110 **21 Claims**

1. A circuit for driving a power transistor which has a control terminal and two current-carrying terminals, comprising:



a first current generator connected to drive a first node, said first node being operatively connected to drive the control terminal of the power transistor;

an additional current generator operatively connected, through a respective pass transistor, to drive said first node with a current of the same sign as, and greater magnitude than, the current provided by said first current generator, when said pass transistor is turned on; and

a comparator operatively connected to detect the voltage difference between said first node and a current-carrying terminal of the power transistor, and to selectively enable or disable said additional current generator.

5,469,095

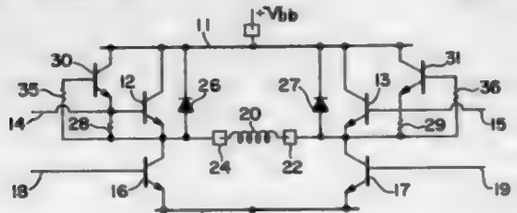
BRIDGE CIRCUIT FOR DRIVING AN INDUCTIVE LOAD WITH A SHOOT-THROUGH PREVENTION CIRCUIT

Roger Peppiette, Shrewsbury, Mass., and Alberto Bilotti, Florida, Argentina, assignors to Allegro Microsystems, Inc., Worcester, Mass.

Filed Jun. 27, 1994, Ser. No. 265,854

Int. Cl.[6] H03K *19/094*; G05F *1/46*

U.S. Cl. 327—110 **12 Claims**



1. A half wave bridge circuit for driving an inductive load, of the kind including a positive voltage supply conductor, a ground conductor, a load terminal, an NPN source driver transistor connected collector-to-emitter between said supply conductor and said load terminal, an NPN sink driver transistor connected collector-to-emitter between said load terminal and said ground conductor, a bridge-control source-input conductor to which one bridge-control signal may be directly applied is connected directly to the base of said source driver transistor; a bridge-control sink-input conductor to which another bridge-control signal may be directly applied is connected directly to the base of said sink driver transistor, a fly-back diode connected cathode-to-anode across one of said driver transistors collector-to-emitter; wherein the improvement comprises:

a) a base resistor connected from the emitter to the bridge-control input conductor of said one driver transistor;

b) an auxiliary protective NPN transistor having a collector connected to said collector of said one driver transistor, and having an emitter connected to said bridge-control input conductor of said one driver transistor; and

c) an auxiliary resistor connected from said bridge-control input conductor of said one driver transistor to the base of said auxiliary transistor.

5,469,096

POWER-TRANSISTOR SLEW-RATE CONTROLLER EMPLOYING ONLY A SINGLE CAPACITOR PER HALF-BRIDGE

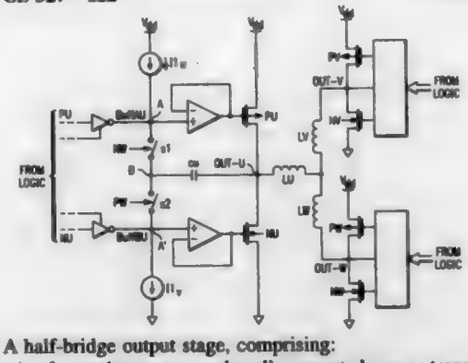
Maurizio Nessi, Como, and Giona Fucili, Magenta, both of, Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Milan, Italy

Filed May 31, 1994, Ser. No. 251,693

Claims priority, application European Pat. Off., May 31, 1993, 93830247

Int. Cl.[6] H03K *3/00*

U.S. Cl. 327—112 **23 Claims**



1. A half-bridge output stage, comprising:

a pair of complementary push-pull-connected power transistors, each transistor having a control terminal which is driven by the combination of a respective logic driving buffer with a respective integrating stage that controls the slew-rate of a respective driving signal, output by the integrating stage, connected to said control terminal;

wherein the two integrating stages are both connected to a single shared integration capacitor, a terminal of said integration capacitor being connected to an input of only one of said integrator stages at a time by two switches controlled in phase opposition to each other by a pair of control signals that have shifted timing with respect to said pair of driving signals.

5,469,097

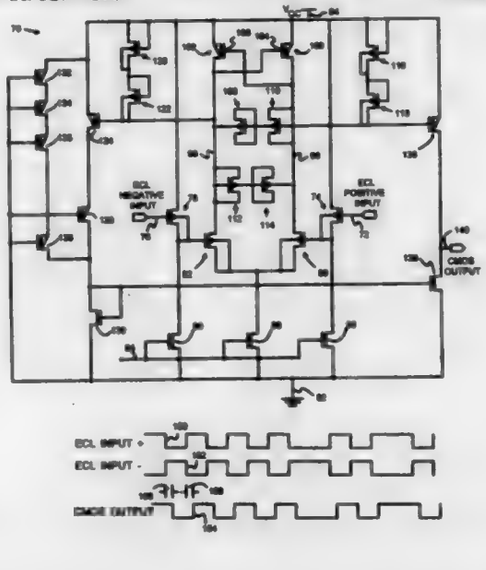
TRANSLATOR CIRCUIT WITH SYMMETRICAL SWITCHING DELAYS

Kenneth Ho, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 118,067, Sep. 8, 1993, abandoned. This application May 10, 1995, Ser. No. 438,456

Int. Cl.[6] H03K *5/08; 19/0175; 5/12*

U.S. Cl. 327—170 **17 Claims**



1. A translator circuit for providing symmetrical switching delays having a differential amplifier including a first signal line and a second signal line complementary to the first signal, the circuit comprising a first voltage clamp means coupled to the first signal line and to the second signal line for limiting a voltage differential between the first signal line and the second signal line, the first voltage clamp including:

a first pair of p-n diodes coupled in series between the first signal line and the second signal line for limiting the voltage differential between the first signal line and the second signal line; and

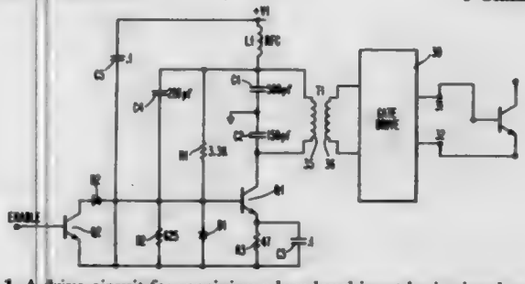
a second pair of p-n diodes coupled in series between the second signal line and the first signal line for limiting the voltage differential between the second signal line and the first signal line wherein the first and second pair of p-n diodes further increase symmetry in rise and fall delays output from the translator circuit.

5,469,098

ISOLATED GATE DRIVE

Robert W. Johnson, Jr., Raleigh, N.C., assignor to Exide Electronics Corporation, Raleigh, N.C.

Filed Mar. 29, 1993, Ser. No. 39,932
Int. Cl.[6] H03K *3/16*
U.S. Cl. 327—190 **6 Claims**



1. A drive circuit for receiving a low-level input logic signal and transferring same into a high-level output logic signal isolated from the source of the input logic signal, said circuit having an input terminal for receiving said input logic signal and output terminals for providing said output logic signal to a switching device, said circuit further comprising:

a) a transformer having a primary and a secondary,

b) an input drive circuit for receiving said input logic signal, said input drive circuit comprising an oscillator, said oscillator having a resonant circuit producing a carrier signal at a predetermined carrier frequency, said resonant circuit including said transformer primary, and connecting means for connecting said input logic signal to said oscillator so as to modulate said carrier signal, and

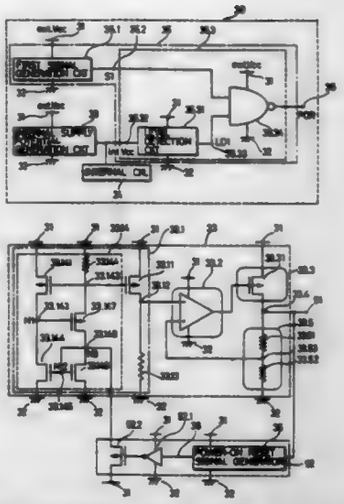
c) an output drive circuit connected between said transformer secondary and said output terminals for demodulating the logic signal from said transformer secondary and providing a shaped logic signal to said output terminals.

5,469,099

POWER-ON RESET SIGNAL GENERATOR AND OPERATING METHOD THEREOF

Yasuhiro Konishi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha

Filed Apr. 13, 1993, Ser. No. 45,387
Claims priority, application Japan, Jun. 17, 1992, 4-157986
Int. Cl.[6] H03K *5/13*
U.S. Cl. 327—198 **23 Claims**



1. A power-on reset signal generator for a semiconductor integrated circuit device including internal supply potential generation means receiving an external supply potential for generating an internal supply potential and an internal circuit receiving said internal supply potential from said internal supply potential generation means, said power-on reset signal generator comprising:

first signal generation means receiving said external supply potential for generating a signal which changes, after an elapse of a prescribed time from a start time of change of said external supply potential from the ground level to a first level, from the ground level to a second level; and

second signal generation means receiving said internal supply potential from said internal supply potential generation means and said signal from said first signal generation means for generating a power-on reset signal,

said second signal generation means activating said power-on reset signal in response to said change of said external supply potential from the ground level to said first level and inactivating said power-on reset signal in response to reaching of said signal from said first signal generation means to a first prescribed level and reaching of said internal supply potential to a second prescribed level.

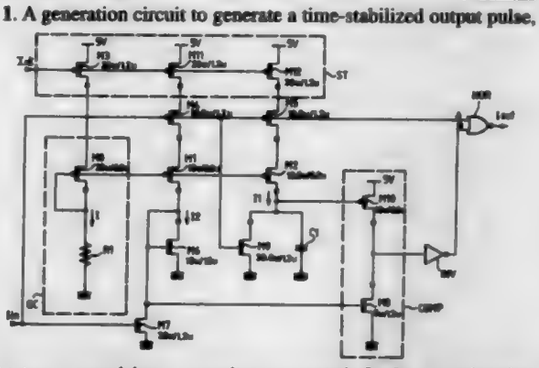
5,469,100

CIRCUIT FOR THE GENERATION OF A TIME-STABILIZED OUTPUT PULSE

Sylvie Wuidart, Pourrieres, and Tien-Dung Do, Aix-en-Provence, both of, France, assignors to SGS Thomson Microelectronics, S.A., Gentilly, France

Filed Jun. 16, 1994, Ser. No. 260,705
Claims priority, application France, Jun. 23, 1993, 93 07601
Int. Cl.[6] H03H *11/26;* **H03K** *3/033*
U.S. Cl. 327—262 **4 Claims**

1. A generation circuit to generate a time-stabilized output pulse,



of a type comprising a capacitor connected, firstly, to a charging circuit and, secondly, to a discharging circuit, said charging and discharging circuits being controlled by an input pulse, wherein said generation circuit comprises a comparator constituted by:

a first transistor biased by said capacitor, the capacitor being, firstly, discharged through the discharging circuit for a first level of the input pulse and, secondly, charged for a second level of the input pulse, through the charging circuit at a fixed current given by a first current mirror of a current generator,

a second transistor in series with the first transistor, said second transistor being, firstly, turned off for the first level of the input pulse and, secondly, biased for the second level of the input pulse by a fixed bias voltage defined by a current given by a second current mirror of said current generator, said comparator delivering an output signal having, for the second level of the input pulse, a component with a variable level, corresponding to a charge of the capacitor, variations of this component being defined by a value of the charging current of the capacitor and by the bias voltage of the second transistor so that, said output signal of the comparator being applied to logic means of comparison of the input pulse, a duration of output pulse of the logic means is determined by said value of the charging current of the capacitor and said bias voltage of the second transistor.

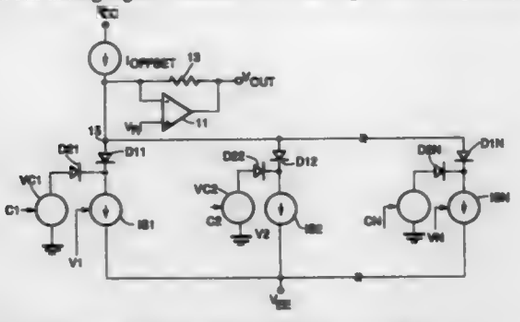
5,469,101

ANALOG SIGNAL SELECTION AND SUMMING CIRCUIT HAVING MULTIPLEXING CAPABILITY

Ronald J. Yepp, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 30, 1993, Ser. No. 159,356
Int. Cl.[6] G06F 7/42
U.S. Cl. 327—361 **3 Claims**

1. An analog signal selection and summing circuit comprising:



a summing amplifier having a current summing input;

a plurality of voltage controlled current sources responsive to a plurality of input voltages;

a plurality of controlled voltage sources respectively associated with said current sources;

a plurality of switching means respectively associated with said current sources for switching outputs of said current sources to said summing input pursuant to control by the associated controlled voltage source, each of said switching means comprises first and second current steering diodes which are controlled such that current of the associated voltage controlled current source is steered to summing node when the associated controlled voltage source provides a first predetermined voltage, and the current of the associated voltage controlled current source is steered to the controlled voltage source when the associated voltage source provides a second predetermined voltage.

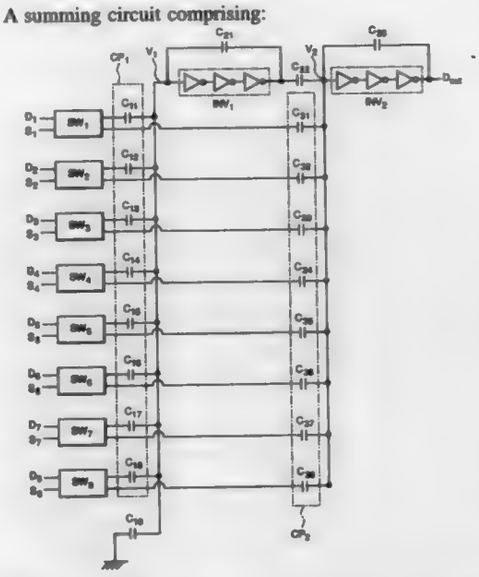
5,469,102

CAPACITIVE COUPLED SUMMING CIRCUIT WITH SIGNED OUTPUT

Guoliang Shou; Weikang Yang; Sunao Takatori, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan Inc., Tokyo, Japan

Filed Feb. 15, 1994, Ser. No. 196,837
Claims priority, application Japan, Feb. 16, 1993, 5-051502
Int. Cl.[6] G06G 7/42
U.S. Cl. 327—361 **3 Claims**

1. A summing circuit comprising:



a plurality of input terminals, each receiving an input voltage;

a first capacitive coupling having a first plurality of capacitances corresponding to said plurality of input terminals;

a second capacitive coupling having a second plurality of capacitances corresponding to said input terminals;

a plurality of switching means corresponding to said plurality of input terminals, each switching means connecting a corresponding one of said plurality of input terminals to a corresponding capacitance of said first capacitive coupling or said second capacitive coupling in response to a sign signal, said sign signal indicating whether the input voltage each received at each input has a positive value or a negative value, said switching means connecting said input terminal to a corresponding capacitance of said first capacitive coupling when said sign signal is positive and to a corresponding capacitance of said first capacitive coupling when said sign signal is positive and to a corresponding capacitance of said second capacitive coupling when said sign signal is negative;

a first linear amplifier having a first amplifier input and a first amplifier output, said first inverter input being connecting to an output of said first capacitive coupling;

a coupling capacitance connected to said first amplifier output; and

a second linear amplifier having a second amplifier input and a second amplifier output, said second amplifier input connected to said coupling capacitance and to an output of said second capacitive coupling.

5,469,103

DIODE CIRCUIT FOR HIGH SPEED SWITCHING TRANSISTOR

Hisao Shigekane, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 783,333, Oct. 28, 1991. This application Mar. 22, 1994, Ser. No. 215,616

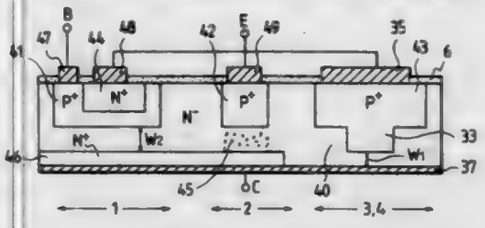
Claims priority, application Japan, Dec. 28, 1990, 2-408533

The portion of the term of this patent subsequent to Sep. 20, 2011, has been disclaimed.

Int. Cl.[6] H01L *29/48;29/56;29/72*

U.S. Cl. 327—478 2 Claims

1. A high speed switching transistor circuit, comprising:



a transistor having a base, an emitter, and a collector;

a constant voltage diode having a first end of a first conductivity type connected to the emitter of the transistor and a second end of a second conductivity type;

a reverse current preventive diode having a first end of the first conductivity type connected to the collector of the transistor and a second end of the second conductivity type connected to the second end of the constant voltage diode; and

a high speed diode reverse-bias connected between the collector and the emitter of the transistor.

5,469,104

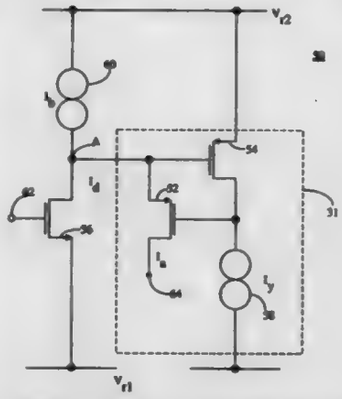
ACTIVE FOLDED CASCODE

Douglas S. Smith, Scotts Valley, and Edward C. Bee, San Jose, both of Calif., assignors to Elantec, Inc., Milipitas, Calif.

Filed Mar. 28, 1994, Ser. No. 218,726

Int. Cl.[6] H03F *1/22;1/56*

U.S. Cl. 327—491 10 Claims



1. An active folded cascode circuit having improved impedance, gain, and bandwidth properties, the active folded cascode circuit comprising:

first and second reference voltages;

an amplifier transistor having first, second, and third electrodes, the first electrode forming a gain node, the second electrode forming an input of the active folded cascode circuit, and the third electrode being connected to the second reference voltage;

a follower transistor having first, second, and third electrodes, the third electrode being connected to the gain node and the first electrode forming an output of the active folded cascode circuit;

a feedback transistor having first, second, and third electrodes, the first and second electrodes being connected to the second and third electrodes, respectively, of the follower transistor, and the third electrode being connected to the first reference voltage;

a first current source connected to the first electrode of the amplifier transistor, for providing bias current to the amplifier transistor and output current to the follower transistor, according to a signal applied to the input of the active folded cascode circuit; and

a second current source connected to the first electrode of the feedback transistor to provide bias current to the feedback transistor; the biased feedback transistor maintaining the third electrode of the follower circuit at a fixed voltage relative to the first reference voltage and coupling the voltage at the third electrode of the follower transistor to the second electrode of the follower transistor to reduce the impedance of the gain node of the active folded cascode circuit.

5,469,105

TRANSMITTER AND POWER AMPLIFIER THEREFOR

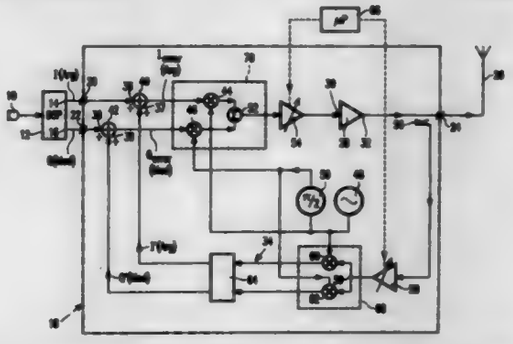
Geoffrey S. Sparks, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 15, 1994, Ser. No. 290,410

Claims priority, application United Kingdom, Aug. 13, 1993, 9316869

Int. Cl.[6] H03G *3/20*

U.S. Cl. 330—129 9 Claims



1. A transmitter having a linearised power amplifier circuit comprising a forward gain path including a power amplifier output stage having an input and an output and a feedback loop coupled between said output and input, the feedback loop including means for deriving a portion of the power amplifier output stage's output and a feedback function stage, means for combining an output of the feedback loop with a representation of a modulating signal, a first gain control element in the forward gain path of the power amplifier output stage and a second gain control element in the feedback loop, and means for controlling the first and the second gain control elements such that the product of their gains remains substantially constant.

5,469,106

VOLTAGE CONTROLLED AMPLIFIER WHICH REDUCES DIFFERENTIAL GAIN

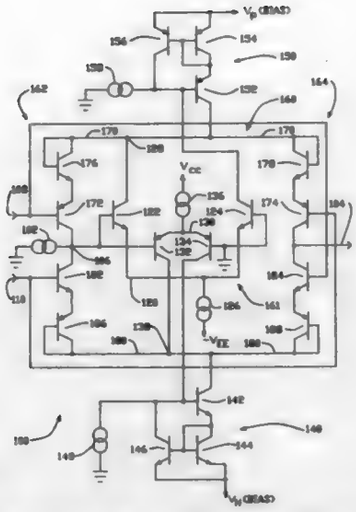
Ronald N. Dow, San Jose, Calif., assignor to Elantec, Inc., Milpitas, Calif.

Filed Oct. 25, 1994, Ser. No. 328,701

Int. Cl.[6] H03F *3/45*

U.S. Cl. 330—254 22 Claims

1. A voltage controlled amplifier adapted to receive at least a first gain control signal and an input signal, said voltage controlled amplifier further adapted to present an output signal which is an amplification of said input signal, said amplification based on said gain control signal, comprising:



a first gain control port, adapted to receive said first gain control signal;

an input port, adapted to receive said input signal;

an output port, adapted to present said output signal;

a first differential pair of transistors, connected to said gain control port, said input port and said output port;

a second differential pair of transistors, connected to said gain control port, said input port, said output port and said first differential pair of transistors, said second differential pair being of an opposite conductivity type than said first differential pair;

a plurality of matching transistors, each of said plurality of matching transistors connected to and complimentary to one transistor of said first and second differential pairs; and

an amplifier connected to said input port and said first differential pair.

5,469,107

MICROWAVE AMPLIFIER

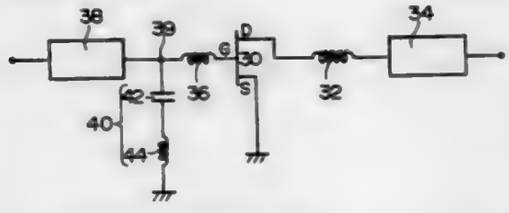
Masaki Kohno, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1993, Ser. No. 94,302

Claims priority, application Japan, Jul. 22, 1992, 4-194392

Int. Cl.[6] H03F *1/02;3/60*

U.S. Cl. 330—277 **3 Claims**



1. A microwave amplifier comprising:

a field effect transistor having a source, a drain, and a gate;

a first substrate having metallized front and rear surfaces, an output-side matching circuit disposed on the front surface of said first substrate and connected by first wires to the drain of said field effect transistor said the first wires having an inductance;

a second substrate having metallized front and rear surfaces, an input-side matching circuit disposed on the front surface of said second substrate and connected to the gate of said field effect transistor by second wires, said second wires having inductance wherein the metallized front surface of said second substrate includes a metallized area connected to the gate electrode of said field effect transistor by said second wires and a metallized region surrounded by and electrically isolated from the metallized area and including a via hole electrically connecting the metallized region to the metallized rear surface of said second substrate;

a third substrate including a metallized front surface and a non-metallized rear surface mounted on the metallized area on the front surface of said second substrate adjacent the metallized region; providing a capacitance; and

at least one third wire having an inductance and electrically connecting the metallized region on the front surface of said second substrate to the metallized front surface of said third substrate to which said second wires are connected, thereby providing a series circuit including the capacitance and the inductance of said third wire with the capacitance connected to a junction of said input-side matching circuit and said second wires and the inductance of said third wire is connected to the metallized rear surface of said second substrate through said via hold, the metallized rear surface of said second substrate representing system ground.

5,469,108

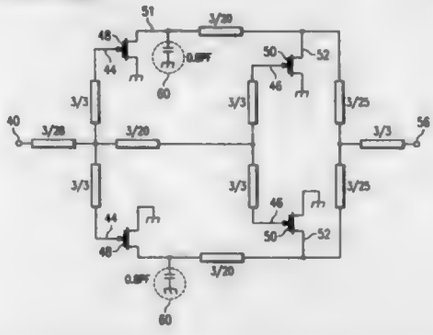
REACTIVELY COMPENSATED POWER TRANSISTOR CIRCUITS

Hua Q. Tserng, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 15, 1994, Ser. No. 290,252

Int. Cl.[6] H03F *3/60;3/68;3/195*

U.S. Cl. 330—286 **10 Claims**



1. A circuit for high-frequency amplification, comprising:

an input transmission line;

an output transmission line;

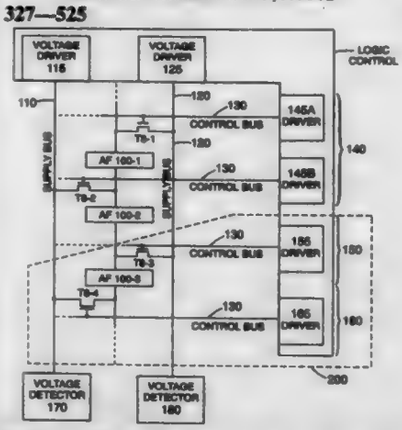
a plurality of transistors, each of said transistors having an input terminal and an output terminal, wherein said plurality of transistors is arranged in a sequence such that said input terminals of said transistors are coupled to said input transmission line sequentially along said input transmission line, and wherein said output terminals are coupled to said output transmission line sequentially along said output transmission line; and

a capacitor coupled between one of said terminals of a transistor of said sequence, wherein said input and output terminals of said transistors are pads of metallization, a bottom plate of said capacitor comprises one of said pads of metallization, and a top plate of said capacitor is coupled to a terminal of said transistor that is coupled to a reference potential.

5,469,109
METHOD AND APPARATUS FOR PROGRAMMING ANTI-FUSE DEVICES

John O. Paivinen, San Jose, Calif., assignor to Quicklogic Corporation, Santa Clara, Calif.

Continuation of Ser. No. 210,000, Mar. 11, 1994, which is a continuation of Ser. No. 931,048, Aug. 17, 1992, Pat. No. 5,294,846. This application Feb. 9, 1995, Ser. No. 385,800
Int. Cl.[6] H03K *19/173;19/082*
U.S. Cl. 327—525 **4 Claims**



1. A circuit for selectively programming anti-fuse devices that are connected to form an array of anti-fuse devices, to minimize signal race conditions of logic signals, comprising:

a plurality of anti-fuse devices connected in series strings to form columns of anti-fuse devices in the array, each anti-fuse device having a first node at a first end and second node at a second end;

a first voltage supply bus;

a second voltage supply bus;

a plurality of first and second transistors each having a control terminal for placing the transistor in an ON condition, wherein each first transistor connects the first node of an anti-fuse device to the first voltage supply bus and each second transistor connects the second node of an anti-fuse device to the second voltage supply bus;

a plurality of control bus lines connected to the control terminals of each of the plurality of first and second transistors, operable to turn ON selected transistors; and

a control logic circuit connected to the control bus lines operable to program selected anti-fuse devices such that a voltage appears across an anti-fuse device and a current is delivered to that anti-fuse device to program it to a desired impedance.

5,469,110
CHARGE PUMPING CIRCUIT USING NON-OVERLAPPING CLOCK CONTROL

Tzuoe-Hsiang Liao, Hsinchu, Taiwan, Prov. of China, assignor to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

Filed Jun. 27, 1994, Ser. No. 265,748
Int. Cl.[6] G05F *1/10*
U.S. Cl. 327—536 **5 Claims**

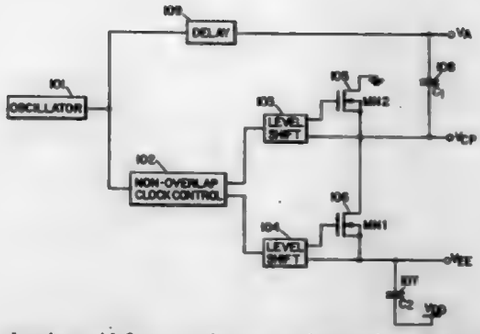
1. A charge pumping circuit for deriving a negative voltage equal in magnitude to a high-level positive supply voltage, comprising:

oscillator means for generating osicllatory clock signals having a first phase and a second phase in a clock period;

a non-overlapping clock control unit having a first and a second output terminals, said control unit generating two non-overlapping out-of-phase clock signals at said first and said second output terminals respectively in response to said oscillatory clock signals;

a first capacitor;

a charging and discharging means, controlled by said non-overlapping clock signals from said oscillator means, for



charging said first capacitor to a voltage value equal to said high-level positive supply voltage during said first phase and discharging said first capacitor during said second phase;

a second capacitor having a negative voltage output terminal;

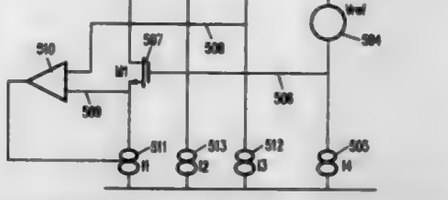
transferring means, controlled by said non-overlapping clock signals from said second output terminal, for maintaining a voltage value output at said negative voltage terminal during said first phase and transferring charges discharged from said first capacitor to said second capacitor during said second phase so that after a plurality of said oscillatory clock periods, said negative voltage is derived at said negative voltage output terminal of said second capacitor;

said charging and discharging means comprising delay means connected between said oscillator means and said first capacitor.

5,469,111
CIRCUIT FOR GENERATING A PROCESS VARIATION INSENSITIVE REFERENCE BIAS CURRENT

Kwok-F Chiu, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 24, 1994, Ser. No. 295,331
Int. Cl.[6] G05F *1/10*
U.S. Cl. 327—538 **6 Claims**



1. A reference bias current generation circuit, comprising:

a first bipolar transistor having a collector coupled to a first supply voltage, a base terminal and an emitter terminal;

a second bipolar transistor having a collector coupled to said first supply voltage, a base terminal coupled to said base terminal of said first bipolar transistor and an emitter terminal;

a first MOS transistor having a drain terminal coupled to said emitter terminal of said first bipolar transistor, a gate terminal and a source terminal;

an operational amplifier having a first input terminal coupled to said emitter terminal of said second bipolar transistor and a second input terminal coupled to said source terminal of said first MOS transistor, said operational amplifier providing an output signal having a magnitude indicative of the difference between the voltages at said first and second input terminals;

a first current source coupled between said source terminal of said first MOS transistor and a second supply voltage, said first current source receiving and responsive to said output signal of said operational amplifier;

a second current source coupled to said emitter terminal of said second bipolar transistor and said second supply voltage; and

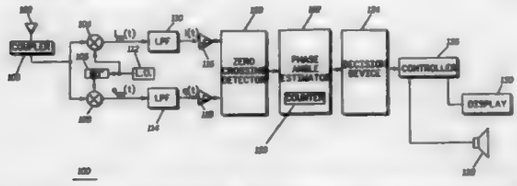
means, coupled to the base terminal of the first bipolar transistor and the gate terminal of the first MOS transistor, for compensating the current through said first MOS transistor variations due to a shift in the threshold voltage of said first MOS transistor.

5,469,112

COMMUNICATION DEVICE WITH ZERO-CROSSING DEMODULATOR

Edward K. B. Lee, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 15, 1994, Ser. No. 290,161
Int. Cl.[6] H04L 27/14
U.S. Cl. 329—302 14 Claims



1. A communication device for receiving an information signal, comprising:

a first mixer for producing a first in-phase component;

a second mixer for producing a first quadrature phase component;

a multi-level detector for detecting the contents of the information signal using the in-phase and quadrature components, the detector comprising:

means for detecting the direction of instantaneous phase rotation at zero crossings;

a bi-directional counter for incrementing when a positive direction is detected and decrementing when a negative direction is detected; and

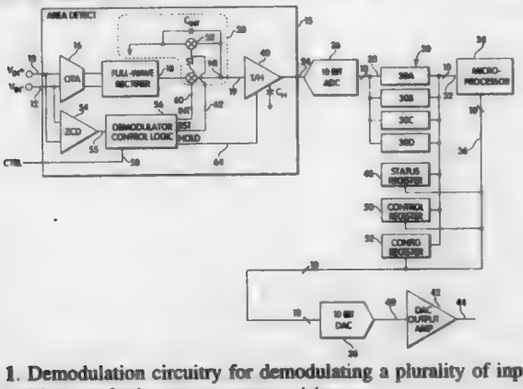
means for extrapolating the contents of the information signal from the counter.

5,469,113

RECTIFIER AND INTEGRATOR CIRCUIT FOR DISK DRIVE SERVO SYSTEM

Michel Steyaert; Wim Dehaene, both Leuven; Jan Craninckx, Herent, all of, Belgium; Mairtin Walsh, and Peter Real, both of Limerick, Ireland, assignors to Analog Devices, Inc., Norwood, Mass.

Filed Sep. 13, 1994, Ser. No. 305,212
Int. Cl.[6] G11B 5/596; H03D 1/02
U.S. Cl. 329—311 7 Claims



1. Demodulation circuitry for demodulating a plurality of input signal bursts of a burst pattern comprising:

an input sequentially receiving the plurality of input signal bursts;

translation circuitry, coupled to the input, for sequentially translating each input signal burst to a translated current;

a rectifier circuit, coupled to the translation circuitry for sequentially rectifying each translated current and producing a rectified driving signal; and

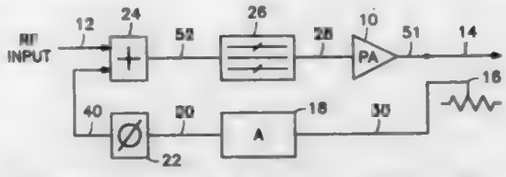
an integrator, coupled to the rectifier circuit, for sequentially integrating each rectified driving signal.

5,469,114

LOSS LESS RF FEEDBACK FOR POWER AMPLIFIER LINEARIZATION

Vinod K. Saxena, Simi Valley, Calif., assignor to Advanced Milliwave Laboratories, Inc., Camarillo, Calif.

Filed Oct. 3, 1994, Ser. No. 317,178
Int. Cl.[6] H03F 1/34
U.S. Cl. 330—107 7 Claims



1. A method of improving the linearization of a radio frequency amplifier comprising the steps of:

extracting a small portion of the output power of said amplifier producing a feedback signal;

transmitting said feedback signal through a phase shifter allowing the phase to change in the transmission feedback loop to approximately ±135 degrees;

transmitting said feedback signal through a summer with an input signal producing a summed signal;

transmitting said summed signal through a filter altering the value of Q by at least one hundred producing a filtered signal; and

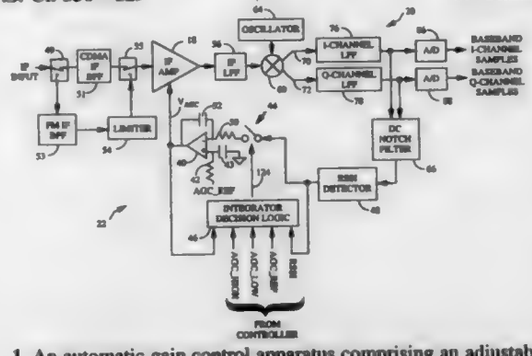
transmitting said filtered signal into said power amplifier.

5,469,115

METHOD AND APPARATUS FOR AUTOMATIC GAIN CONTROL IN A DIGITAL RECEIVER

Paul E. Peterzell; Nathaniel B. Wilson, both of San Diego, Calif., and Peter J. Black, St. Lucia, Australia, assignors to QUALCOMM Incorporated, San Diego, Calif.

Filed Apr. 28, 1994, Ser. No. 235,811
Int. Cl.[6] H03G 3/30
U.S. Cl. 330—129 39 Claims



1. An automatic gain control apparatus comprising an adjustable gain amplifier, said adjustable gain amplifier having an input port for receiving an input signal, a control port for receiving a gain control signal, and an output port for providing an output signal, said automatic gain control apparatus comprising:

means for generating a received power signal based on the power of said output signal;

saturating integrator means for comparing, in response to an integration enable signal, said received power signal to a reference signal and for generating said gain control signal; and

decision means for creating said integration enable signal in response to the value of said gain control signal, the value of said received power signal, and the value of said reference signal.

5,469,116

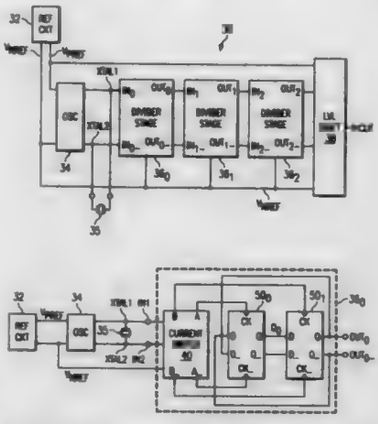
CLOCK GENERATOR CIRCUIT WITH LOW CURRENT FREQUENCY DIVIDER

William C. Slemmer, Dallas, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jan. 27, 1994, Ser. No. 188,153

Int. Cl.[6] H03B *5/30;5/36*

U.S. Cl. 331—74 **17 Claims**



1. A clock generator circuit in an integrated circuit, comprising:

a reference circuit for producing a reference voltage;

an oscillator circuit, coupled to said reference circuit, for producing an input periodic signal having a voltage range defined by said reference voltage;

a frequency divider, connected to said oscillator circuit to receive the input periodic signal, for producing an output periodic signal at a frequency other than that of the input periodic signal, comprising:

a first divider stage, comprising:

a first current switch, having inputs for receiving the input periodic signal from said oscillator circuit, for producing current source control signals responsive to the input periodic signal, said input periodic signal having a frequency; and

a first plurality of latches, each of said first plurality of latches having a data input and a data output, and each including a first current source controlled by one of the current source control signals from said first current switch responsive to which it stores a data state corresponding to a voltage level received at its data input, wherein said first plurality of latches are interconnected in a sequence between the data input and data output, to form a counter so that the signal at the data output of the last of said first plurality of latches in the sequence has a frequency that is divided down from the frequency of the input periodic signal; and

a level shift circuit, connected to said frequency divider to receive the output periodic signal, for amplifying the output periodic signal.

5,469,117

VOLTAGE-CONTROLLED FREQUENCY OSCILLATOR

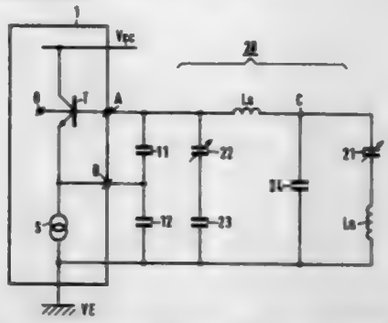
Pascal Philippe, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 5, 1994, Ser. No. 223,471

Claims priority, application France, Apr. 14, 1993, 93 04380

Int. Cl.[6] H03B *5/00*

U.S. Cl. 331—109 **8 Claims**



1. A voltage-controlled frequency oscillator comprising:

an amplifier device having a first and a second electrode for defining a main current path, and a control electrode for controlling the conduction of current in the main current path;

a capacitive divider bridge for providing a feedback coupling between the first electrode and the control electrode of the amplifier device, the capacitive divider having a first end coupled to the control electrode, and a second end coupled to a reference voltage, and an intermediate junction point connected to the first electrode; and

a tuning circuit coupled between the control electrode and the reference voltage and including (i) a first parallel branch including a tuning inductance in series with a first variable capacitance, (ii) a second parallel branch, coupled to the first parallel branch, coupled to the control electrode of the amplifier device and having a second variable capacitance, (iii) a third parallel branch coupled to the second parallel branch and including a fixed capacitance, and (iv) a series inductance having a first end coupled to the first and third parallel branches and a second end coupled to the control electrode of the amplifier device, the series inductance having an inductance value which is less than an inductance value of the tuning inductance.

5,469,118

INTEGRATED OSCILLATOR CIRCUITS

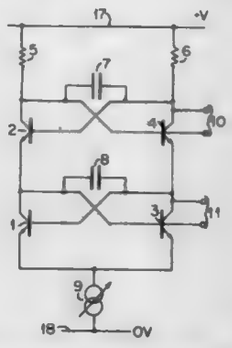
Rodney J. Lawton, Swindon, United Kingdom, assignor to Plessey Semiconductors Limited, United Kingdom

Filed Nov. 22, 1994, Ser. No. 343,708

Claims priority, application United Kingdom, Nov. 24, 1993, 9324155

Int. Cl.[6] H03B *27/00;* **H03K** *3/283*

U.S. Cl. 331—113 R **6 Claims**



1. A stable sine-wave oscillator circuit comprising first and second bipolar transistors having their emitter/collector paths con-

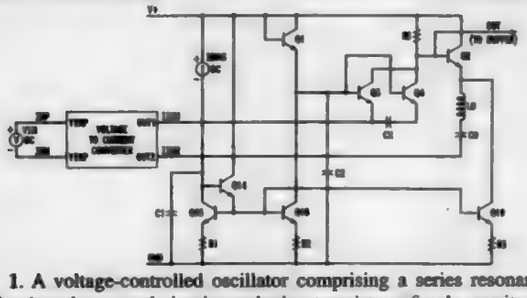
nected in series with first load means between a first supply voltage conductor and one terminal of a current source the other terminal of which is connected to a second supply voltage conductor, third and fourth bipolar transistors having their emitter/collector paths connected in series with second load means between said first supply voltage conductor and said one terminal of said current source, a first capacitor connected between the collector electrodes of said second and fourth transistors and a second capacitor connected between the collector electrodes of said first and third transistors, the base and collector electrodes of said second and fourth transistors being cross-connected and the base and collector electrodes of said first and third transistors being cross-connected.

5,469,119

LINEAR VOLTAGE-CONTROLLED OSCILLATOR USING FIXED CAPACITORS IN LIEU OF VARACTORS

Irving G. Post, Lower Alsace Township, Berks County, Pa., assignor to AT&T Corp., Murray Hill, N.J.

Filed Jul. 14, 1993, Ser. No. 92,141
Int. Cl.[6] H03B *5/12*
U.S. Cl. 331—117 R **10 Claims**



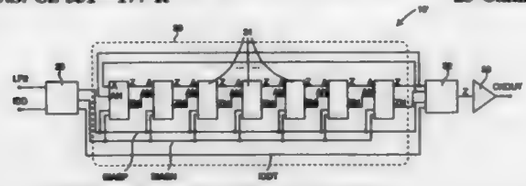
1. A voltage-controlled oscillator comprising a series resonant circuit and a control circuit employing transistors, fixed capacitors and no varactors for varying the effective amount of capacitance present in said resonant circuit so that the resonant frequency varies substantially linearly with control voltage.

5,469,120

HIGH PERFORMANCE VOLTAGE CONTROLLED OSCILLATOR

Trung T. Nguyen, San Jose, and Jin Zhao, Milpitas, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 7, 1994, Ser. No. 351,636
Int. Cl.[6] H03B *5/04;5/24;* **H03L** *1/00;7/099*
U.S. Cl. 331—177 R **23 Claims**



1. A voltage controlled oscillator, comprising:

(a) a bias voltage generator having an input and a pair of outputs comprising a first voltage control signal and a second voltage control signal which vary in response to variances in said input, wherein said bias voltage generator maintains a voltage floor at said outputs when said input indicates zero error correction;

(b) a sequence of delay stages including a first delay stage, a last delay stage, and at least one intermediate delay stage, each delay stage having inputs and outputs, where inputs of all but said first delay stage are coupled to outputs of a preceding delay stage and to said first voltage control signal and a second voltage control signal, and where outputs of the last differential stage are fed back to inputs of said first differential stage, wherein each of said delay stages includes a process variation compensation circuit; and

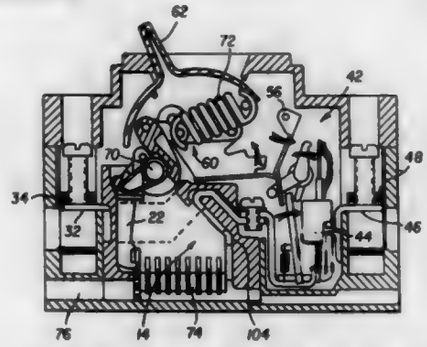
(c) an amplifier circuit having inputs and outputs, said inputs being coupled to outputs of the last delay stage.

5,469,121

MULTIPLE CURRENT-LIMITING CIRCUIT BREAKER WITH ELECTRODYNAMIC REPULSION

Jean-Luc Payet-Burin, Voreppe, France, assignor to Merlin Gerin, France

Filed Mar. 21, 1994, Ser. No. 216,051
Claims priority, application France, Apr. 7, 1993, 9304298
Int. Cl.[6] H01H *75/00*
U.S. Cl. 335—16 **6 Claims**



1. A multipole current-limiting circuit breaker, comprising:

a molded insulating case having a front panel and housing therein a plurality of poles, said front panel having an aperture;

a current interrupting device housed in the insulating case and including a stationary contact and a movable contact provided in each pole, and an arc extinguishing chamber positioned to extinguish arcs generated between the movable and stationary contacts;

an operating mechanism having a toggle biased via a spring device;

a trip device for activating the operating mechanism;

an operating handle connected to said operating mechanism and passing through the aperture in the front panel of the case;

a switching bar for supporting the movable contact of each of the poles, said switching bar comprising an insulating material and being mechanically coupled to said toggle which rotates the switching bar between open and closed positions, and having a recess for each movable contact which extends therethrough, each of said movable contacts being fork-shaped and including a common base supporting two contact arms, and a supporting shank extending from the common base, said common base having two balancing slots extending along a surface thereof, each of said movable contacts being pivotally secured to said switching bar via a spindle extending into said supporting shank such that the axis of rotation of each movable contact is eccentric to an axis of rotation of the switching bar, each of said movable contacts being adapted to pivot from a rest position to an active position by electrodynamic repulsion, such that the movable contact is separated from said stationary contact;

biasing means for providing a contact force for each of said movable contacts, and for slowing pivoting return movement of each movable contact to the rest position, said biasing means comprising a spirally-wound spring mounted to float in a respective recess of the insulating bar, said spirally-wound spring including a bearing arm which is slidable in the two balancing slots, whereby a contact point of the bearing arm and the two balancing slots varies, to change an application point of a biasing force exerted on each movable contact via the spirally-wound spring during movement of each movable contact from the rest position to the active position.

5,469,122

DEFLECTION YOKE

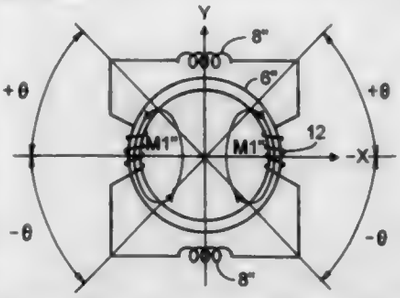
In J. Yoon, Suwon, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 27, 1993, Ser. No. 173,762

Claims priority, application Rep. of Korea, Dec. 30, 1992, 92-26405

Int. Cl.[6] H01H *1/00;* H01J *29/06;1/52;29/56*

U.S. Cl. 335—214 8 Claims



1. In a deflection yoke including a coil separator with a neck portion and a screen portion, horizontal and vertical deflection coils respectively provided on inner and outer portions of said coil separator, toroidal ferrite cores mounted to wrap said vertical deflection coil, and leakage magnetic-field canceling coils fixed on said screen portion of said coil separator for generating a magnetic field to attenuate a leakage magnetic field from said horizontal deflection coil, the improvement of said deflection yoke comprising:

induction coils not connected to said horizontal deflection coil but connected to said leakage magnetic-field canceling coil and adjacently provided at said horizontal deflection coil to directly induce horizontal deflection current from said horizontal deflection coil for said leakage magnetic-field canceling coils, and

wherein said induction coils are wound continuously about inner and outer portions of said toroidal ferrite cores in directions between said neck and screen portions of said coil separator.

5,469,123

FERROMAGNETIC ROOM SHIELDING FOR THE SUPERCONDUCTING HIGH FIELD MAGNET OF AN NMR SPECTROMETER

Wolfgang Müller, Karlsruhe, Germany, assignor to Bruker Analytische Messtechnik GmbH, Rheinstetten, Germany

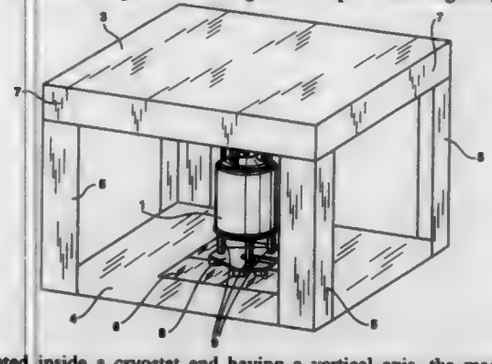
Filed Apr. 5, 1995, Ser. No. 417,088

Claims priority, application Germany, May 5, 1994, 44 15 847.5

Int. Cl.[6] H01F *7/00;* H05K *9/00;* G01V *3/00*

U.S. Cl. 335—301 5 Claims

1. A room magnetic shielding for a superconducting magnet



located inside a cryostat and having a vertical axis, the magnet producing a static magnetic field having a homogeneity of $<10^{-7}$ within an investigational volume of an NMR spectrometer, the magnetic shielding comprising:

a first horizontal ferromagnetic means, having a first amount of ferromagnetic material, located below the cryostat at a first separation from a center of the investigational volume;

a second horizontal ferromagnetic means, having a second amount of ferromagnetic material, located above the cryostat at a second separation from the center of the investigational volume which is 1.5 to 3 times the first separation, the second amount of ferromagnetic material being 1.5 to 3 times the first amount of ferromagnetic material; and

vertical ferromagnetic side means magnetically connecting the first and second ferromagnetic means.

5,469,124

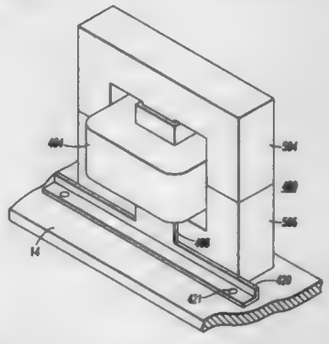
HEAT DISSIPATING TRANSFORMER COIL

Patricia A. O' Donnell, Davidsonville; Charles S. Kerfoot, Pasadena, and Joseph J. Springer, Bel Air, all of Md., assignors to Westinghouse Electric Corp., Baltimore, Md.

Filed Jun. 10, 1994, Ser. No. 258,141

Int. Cl.[6] H01F *27/10;27/26*

U.S. Cl. 336—61 17 Claims



1. A transformer for use in an electric vehicle electronics module, comprising:

a hollow coil form of thermally conductive material, said coil form having an upper portion including two open ends, an intermediate portion, and a base portion;

windings wrapped around the upper portion of the coil form and being in thermal contact therewith;

a lower E-core inserted in a first open end of the upper portion of the coil form;

an upper E-core inserted in a second open end of the upper portion of the coil form, so that the upper and lower E-cores are in mutual alignment;

said intermediate portion protruding from the lower end of said upper portion and extending to said base portion, and including a generally flat core contact surface, said core contact surface covering a portion of a front side of the lower E-core when the lower E-core is inserted in the first open end of the upper portion of the coil form;

said base portion comprising a bifurcated flange member projecting orthogonally outward substantially equidistantly from the lower end of said intermediate portion, thereby connecting the coil form in thermal contact with a cold plate so that the coil form provides a thermal path from the windings to the cold plate.

5,469,125

ROTARY ELECTRONIC DEVICE

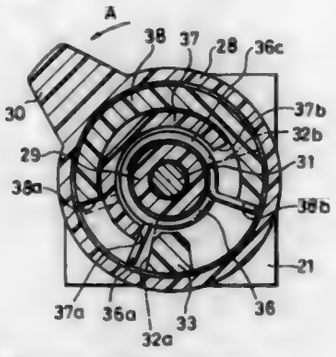
Hideki Shigemoto, Moriguchi; Hiroshi Matsui, Hirakata, and Jun Sugahara, Kume, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadnoma, Japan

Filed Apr. 14, 1994, Ser. No. 227,646

Claims priority, application Japan, Apr. 15, 1993, 5-088403; May 27, 1993, 5-125737; Jan. 8, 1993, 5-252847

Int. Cl.[6] H01C *10/32*

U.S. Cl. 338—162 8 Claims



1. A rotary electronic device comprising:

a holder having a circular through-hole defined therein, a protrusion and a protruding portion extending therefrom;

a rotary variable resistor having connection terminals and a rotary shaft, said rotary shaft being concentrically arranged with respect to said circular through-hole, said rotary variable resistor being disposed at an end portion of said holder;

a rotary operation shaft rotatably provided within said circular through-hole, one end of said rotary operation shaft being coupled to said rotary shaft of said rotary variable reaistor, and another end of said rotary operation shaft including a stopping step portion for engaging said protrusion of said holder so as to restrain a turning angle of said rotary operation shaft and a step portion; and

a rotation return mechanism including a torsion coil spring disposed on a circumference of said rotary operation shaft, wherein said torsion coil spring has hook portions at both ends thereof, said hook portions of torsion coil spring engaging two portions of said step portion of said rotary operation shaft near said stopping step portions and two portions of said protruding portion of said holder, said two portions of said protruding portion having a same facing angle as said two portions of said step portion.

5,469,126

I/Q-MODULATOR AND I/Q-DEMODULATOR

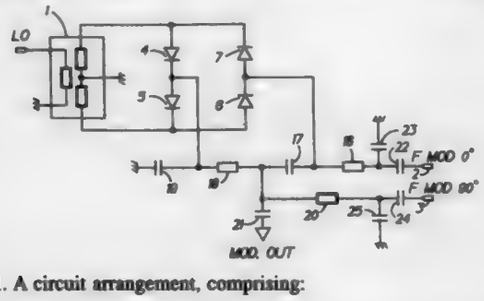
Simo Murtojarvi, Salo, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland

Filed Sep. 7, 1994, Ser. No. 301,614

Claims priority, application United Kingdom, Sep. 11, 1993, 9318860

Int. Cl.[6] H04L *27/36;27/38*

U.S. Cl. 332—105 16 Claims



1. A circuit arrangement, comprising:

a diode bridge having first and second terminals coupled to a first frequency signal and third and fourth terminals coupled to a first node of a first phase shift network and to a first node of a second phase shift network, respectively;

said first phase shift network having a second node for passing therethrough a second frequency signal, said second node being coupled to ground potential through a first capacitance having a value that represents a high impedance to said second frequency signal;

said second phase shift network having a second node for passing therethrough a third frequency signal, said second node of said second phase shift network being coupled to ground potential through a second capacitance having a value that represents a high impedance to said third frequency signal; and

a third capacitance coupled between said first node of said first phase shift network and said first node of said second phase shift network, said third capacitance having a value that represents a high impedance to said second frequency signal and to said third frequency signal.

5,469,127

AMPLIFICATION APPARATUS AND METHOD INCLUDING MODULATOR COMPONENT

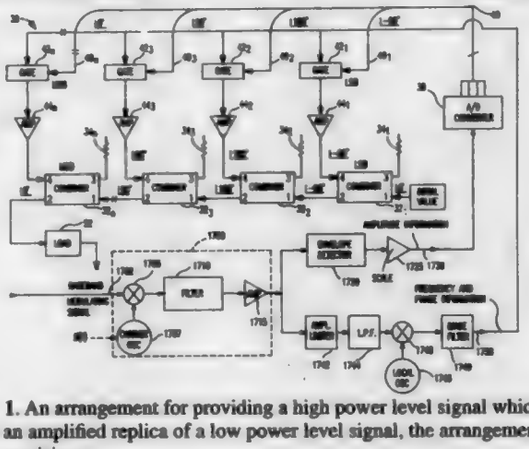
Timothy P. Hulick, Schwenksville, and Julian L. Brookes, Lansdale, both of Pa., assignors to Acrodyne Industries, Inc., Blue Bell, Pa.

Continuation-in-part of Ser. No. 45,790, Apr. 14, 1993, and Ser. No. 84,026, Jun. 30, 1993, Pat. No. 5,367,272, which is a continuation of Ser. No. 924,525, Aug. 4, 1992, Pat. No. 5,260,674. This application Jun. 7, 1994, Ser. No. 255,722

The portion of the term of this patent subsequent to Nov. 9, 2010, has been disclaimed.

Int. Cl.[6] H03C *1/06;1/60;5/00*

U.S. Cl. 332—149 37 Claims



1. An arrangement for providing a high power level signal which is an amplified replica of a low power level signal, the arrangement comprising:

A) means for providing a first elemental signal and a second elemental signal which collectively contain information representing the low power level signal; and

B) a modulator, the modulator including:

1) a first input connected to receive the first elemental signal;

2) a second input connected to receive the second elemental signal; and

3) means for performing a modulation operation by modulating the first elemental signal onto the second elemental signal to provide the high power level signal; wherein the means for performing the modulation operation includes:

a) means for determining when a magnitude of the first elemental signal is at or above a given magnitude threshold;

b) means for providing a modified first elemental signal in response to the means for determining;

c) a plurality of component signal generation devices, responsive to the modified first elemental signal, the component signal generation devices outputting a corresponding plurality of component signals having respective magnitudes which are affected by the modified first elemental signal;

d) means for compensating for a difference between the first elemental signal and the modified first elemental signal, the means for compensating including means for increasing the magnitude of a component signal output by a component signal generation device other than a mathematically least significant component signal generation device; and

e) means for combining the plurality of component signals output from the component signal generation devices and for providing the high power level signal as indicative of a combination of the component signals.

5,469,128

CIRCUIT ELEMENTS FOR MICROWAVE AND MILLIMETER-WAVE BANDS AND METHOD OF PRODUCING SAME

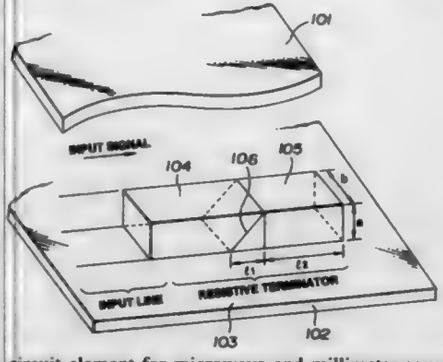
Umeo Kawanishi; Nobuhisa Hirayama; Takeshi Hamabe, Yokohama, and Toru Takagi, Yokosuka, all of, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, and Nippon Valqua Industries, Ltd., Tokyo, both of, Japan

Filed Sep. 14, 1994, Ser. No. 305,624

Claims priority, application Japan, Sep. 17, 1993, 5-254708; Sep. 17, 1993, 5-254712

Int. Cl.[6] H01P *1/26*

U.S. Cl. 333—22 R **9 Claims**



1. A circuit element for microwave and millimeter-eave bands, comprising:

a dielectric line made of a pure dielectric resin; and

a high-frequency wave absorbing member made of a pure dielectric resin containing at least one of first, second and third powders dispersed therein, the first powder having a high specific inductive capacity, the second powder having a high magnetic premeability, the third powder having a high specific resistance, the high-frequency wave absorbing member being fusion bonded as a unit to the dielectric line.

5,469,129

IMPEDANCE TRANSFORMING THREE-PORT POWER DIVIDER/COMBINER USING LUMPED ELEMENTS

Michael Dydyk, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

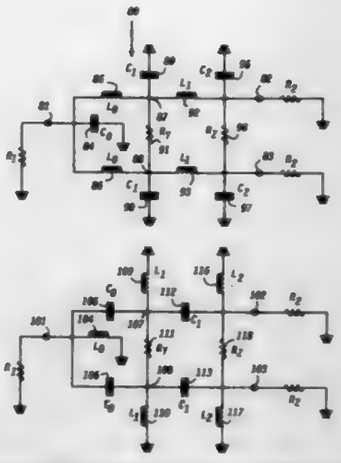
Filed Aug. 29, 1994, Ser. No. 297,067

Int. Cl.[6] H03H *7/48*

U.S. Cl. 333—124 **24 Claims**

1. An impedance transforming three-port power divider/combiner comprising:

first, second, and third ports, wherein the first port has a first terminating impedance and the second and third ports each have a second terminating impedance different from the first terminating impedance;



first, second, and third lumped elements, wherein the first lumped element is a capacitor and the second and third lumped elements are inductors and the first lumped element is coupled between the first port and an electrical ground, the second lumped element is coupled between the first port and the second port, and the third lumped element is coupled between the first port and the third port;

a first resistor coupled between the second and third ports; and

first and second capacitors, wherein the first capacitor is coupled between the second port and the electrical ground and the second capacitor is coupled between the third port and the electrical ground, such that a signal to be divided input to the first port results in identical divided output signals at the second and third ports and signals to be combined input to the second and third ports result in a combined output signal at the first port.

5,469,130

HIGH FREQUENCY PARALLEL STRIP LINE CABLE COMPRISING CONNECTOR PART AND CONNECTOR PROVIDED ON SUBSTRATE FOR CONNECTING WITH CONNECTOR PART THEREOF

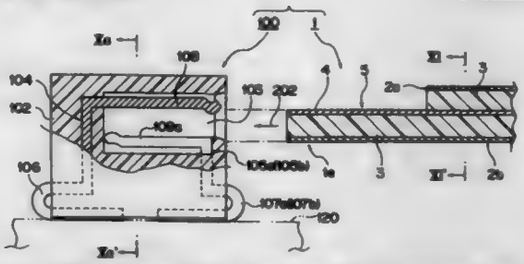
Takekazu Okada, Kameoka; Yuichi Maruyama, Nagaokakyo, and Kazuya Sayanagi, Osaka, all of, Japan, assignors to Murata Mfg. Co., Ltd., Japan

Filed Nov. 29, 1993, Ser. No. 158,945

Claims priority, application Japan, Nov. 27, 1992, 4-318510; May 14, 1993, 5-112723

Int. Cl.[6] H01P *1/04*

U.S. Cl. 333—246 **5 Claims**



1. A surface mount device connector for connecting with a connector part of a high frequency parallel strip line cable comprising a pair of thin-film earth conductors formed on both surfaces of a dielectric body so as to oppose each other, a thin-film center conductor formed in said dielectric body so as to be located between said pair of earth conductors, and said connector part formed in one end of said high frequency parallel strip line cable so as to expose one end of said center conductor, said connector comprising:

a dielectric case having a bottom surface, said dielectric case being mounted on a substrate so that the bottom surface of said dielectric case is in contact with said substrate;

a connection slot formed in said dielectric case receiving said connector part of said high frequency parallel strip line cable thereinto;

an elastic center conductor terminal mounted in said dielectric case so as to extend through said connection slot to the bottom of said dielectric case, for electrically connecting an electrical conductor formed on said substrate to said center conductor of said high frequency parallel strip line cable; and

at least one elastic earth conductor terminal mounted in said dielectric case so as to extend through said connection slot to the bottom surface of said dielectric case, for electrically connecting an electrical earth conductor formed on said substrate to at least one of said earth conductors of said high frequency parallel strip line cable.

5,469,131

HYBRID INTEGRATED CIRCUIT DEVICE

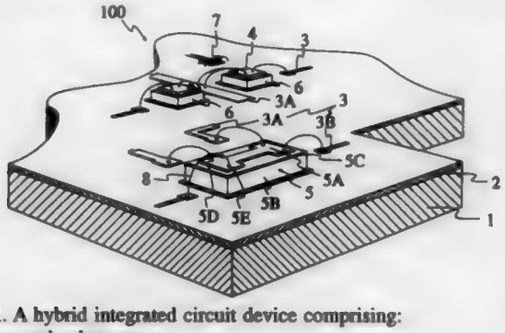
Ryoichi Takahashi; Katsumi Okawa, and Yusuke Igarashi, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 30, 1993, Ser. No. 114,329

Claims priority, application Japan, Aug. 28, 1992, 4-229960; Sep. 17, 1992, 4-247913; Sep. 22, 1992, 4-252899; Sep. 28, 1992, 4-258374; Sep. 28, 1992, 4-258376; Sep. 28, 1992, 4-258379

Int. Cl.[6] H01C *1/012*

U.S. Cl. 338—306 **18 Claims**



1. A hybrid integrated circuit device comprising:

a metal substrate;

an insulating resin layer on said metal substrate;

a plurality of conductive paths and a plurality of bottom pads on said insulating resin layer;

said plurality of conductive paths providing connections to a plurality of semiconductor elements affixed to said bottom pads;

means for detecting a current flowing in said semiconductor elements;

said means for detecting including a resistance pattern on a resin film;

said resin film being affixed to said bottom pads;

said resistance pattern having at least a first pair of bonding pads for detecting current and at least a second pair of bonding pads for detecting voltage; and

means for connecting at least one of said at least a first and second pairs to said plurality of conductive paths.

5,469,132

TRANSDUCER APPARATUS RESPONSIVE TO EXTERNAL PERTURBATION

Peter A.-F. Lam, 20104 Wayne Ave., Torrance, Calif. 90503

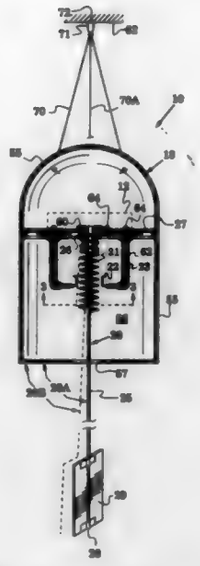
Filed Dec. 31, 1992, Ser. No. 999,291

Int. Cl.[6] G08B *3/00*

U.S. Cl. 340—392.1 **21 Claims**

1. Display apparatus, comprising:

a first elongate member;



a display member;

means supporting said first elongate member and said display member for relative movement with respect to one another, in response to an external perturbation, from a stable substantially vertical orientation to an unstable activate orientation;

an electrically responsive sound transducer; and

circuit means, responsive to relative movement of said first elongate and display members to said unstable activate orientation, for energizing said transducer to produce audible sound.

5,469,133

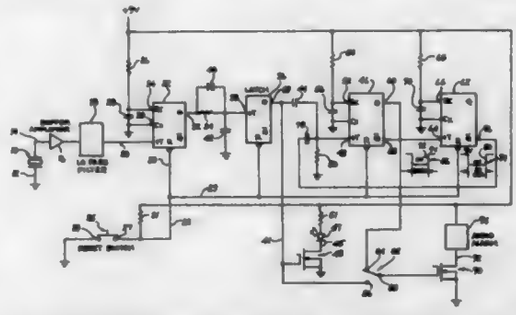
TELEPHONE PAGER ALARM ENHANCEMENT AND METHOD THEREFOR

Scott E. Hensler, 3320 E. University Dr., Mesa, Ariz. 85213; Scott I. Bergman, 6436 E. Northridge St., Mesa, Ariz. 85205, and Mike P. Costello, 19102 E. Via De Arboles, Queen Creek, Ariz. 852422

Filed Nov. 29, 1993, Ser. No. 158,397

Int. Cl.[6] G08B *5/22;* **H04B** *3/36*

U.S. Cl. 340—407.1 **13 Claims**



1. An enhanced alarm circuit for signaling an individual when said individual is being paged, comprising, in combination:

a telephone,pager of the type that vibrates in response to receiving a signal representing said individual's telephone pager number;

means for sensing the vibration of the telephone pager and for providing a plurality of trigger signals in response thereto;

means for providing a recognition pulse of a desired duration in response to at least two successive said trigger signals having a time interval therebetween less than a known time; and

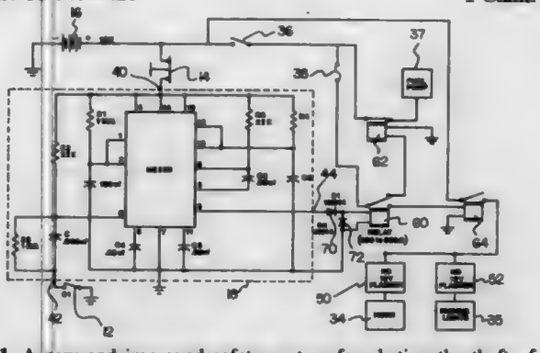
means for issuing an alarm in response to said recognition pulse.

5,469,134

SAFETY SYSTEMS FOR ABATING THE THEFT OF VEHICLES

Ronald R. Garrett, 516 Oci Dr., Jacksonville, N.C. 28540, and Dennis S. Topcik, Rte. 4 Box 238A Hwy. 20, Burton, S.C. 29907

Filed Jan. 4, 1994, Ser. No. 177,146
Int. Cl.[6] B60R 25/10
U.S. Cl. 340—426 1 Claim



1. A new and improved safety system for abating the theft of vehicles comprising, in combination:

a vehicle having a dashboard, a closeable driver's side door, a horn, a plurality of parking lights, a single pole single throw switch with a first terminal and a second terminal, an electric fuel pump, a fuse coupled to the first terminal of the single pole single throw switch, and an electric battery with a positive terminal and a grounded negative terminal;

a door sensor switch coupled to the vehicle at a location near the door thereof, the door sensor switch having a first terminal and a grounded second terminal and with the door sensor switch generating a control signal at the first terminal thereof when the door of the vehicle is closed;

a disarm switch having a first terminal and a second terminal and with the second terminal coupled to the positive terminal of the battery, the disarm switch further coupled to the dashboard of the vehicle, the disarm switch triggerable by an authorized driver when the vehicle door is closed;

an electrically energizable control box having a first input terminal, a second input terminal, and an output terminal, the first input terminal coupled to the first terminal of the disarm switch for receiving electrical power from the battery, the second input terminal coupled to the first terminal of the door sensor switch for receiving the control signal therefrom, and with the output terminal transmitting an alarm signal beginning three minutes after receiving the control signal, unless the disarm switch is triggered by the authorized driver within about three minutes following closing of the vehicle door, and with the control box further automatically terminating transmission of the alarm signal from the output terminal thereof at three minutes after the beginning of alarm signal transmission;

flasher means secured with respect to the horn of the vehicle and parking lights of the vehicle blasting the horn and flashing the parking lights when activated; and

a single pole double throw relay, a normally closed first single pole single throw relay, and a normally open second single pole single throw relay with the first single pole single throw relay coupled to first terminal of the single pole single throw switch and the fuel pump and the negative terminal of the battery, the second single pole single throw relay coupled to the second terminal of the single pole single throw switch and the negative terminal of the battery and the flasher means, and the single pole double throw relay coupled to the first single pole single throw relay and the second single pole single throw relay and the fuse, the relays having an activated mode of operation for allowing the flasher means to be energized and for preventing the fuel pump from being activated upon receipt of the alarm signal at the single pole single throw relay, the relays having another activated mode of operation for preventing the flasher means from being energized and for allowing the fuel pump to be deactivated of upon termination of transmission of the alarm signal at the single pole single throw relay, and the relays further having a deactivated mode of operation when the pole single throw switch is opened; and

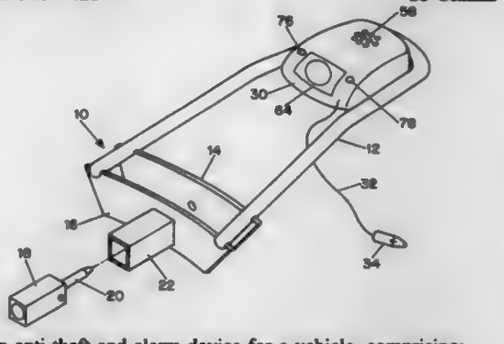
a first diode and a second diode, each diode having a negative terminal and a negative terminal, with the positive terminal of the first diode coupled to the output terminal of the control box and the positive terminal thereof coupled to the single pole double throw relay and with the positive terminal of the second diode coupled to the positive terminal of the first diode and the negative terminal thereof coupled to the negative terminal of the battery, and with the diodes operable for preventing inadvertent energization of the flasher means and deactivation of the fuel pump.

5,469,135

VEHICLE SECURITY DEVICE AND ALARM

Joseph E. Solow, Dix Hills, N.Y., assignor to WOLO Manufacturing Corporation, Deer Park, N.Y.

Filed May 10, 1994, Ser. No. 240,861
Int. Cl.[6] B60R 25/10
U.S. Cl. 340—426 18 Claims



1. An anti-theft and alarm device for a vehicle, comprising:

a U-shaped rod having two ends rigidly connected to parallel lock plates, said lock plates extending perpendicular to the plane of said U-shaped rod and being spaced to receive a steering wheel of the vehicle with said U-shaped rod extending therefrom over a dash board of the vehicle;

a lock member extendable between said parallel lock plates in a position corresponding to the inside of said steering wheel whereby when said lock member is extended, said U-shaped rod is locked to said steering wheel in a position overlying said dash board; and

a self-contained electronic alarm mounted between the two ends of said U-shaped rod and secured thereto, for sensing tampering with said vehicle and for signaling an alarm in response thereto.

5,469,136

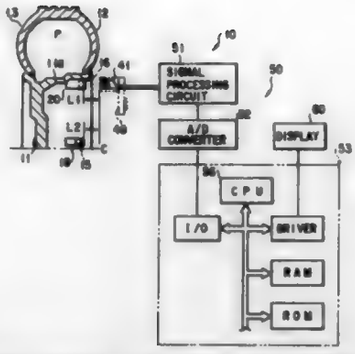
TIRE INFLATION PRESSURE MONITORING APPARATUS

Kousuke Matsubara, and Takeo Fukumura, both of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokahama, Japan

Filed Aug. 31, 1994, Ser. No. 298,830
Claims priority, application Japan, Aug. 31, 1993, 5-215728; Aug. 31, 1993, 5-215729
Int. Cl.[6] B60C 23/04
U.S. Cl. 340—445 7 Claims

1. A tire inflation pressure monitoring apparatus for detecting the inflation pressure of a tire attached to a wheel, comprising:

reference means including a reference magnet fixed to the wheel;



a transducer attached to the wheel and including a movable magnet whose position shifts for a distance corresponding to the inflation pressure of the tire in the axial direction of the wheel;

a stationary-side member facing the wheel at a distance therefrom in the axial direction thereof;

a magnetic sensor attached to the stationary-side member, the sensor being situated in a position such that the sensor can detect the magnetism of the reference magnet and the movable magnet when the wheel rotates and adapted to generate outputs of magnitudes corresponding to the minimum distance from the reference magnet and the minimum distance from the movable magnet as the wheel rotates;

means for storing a previously obtained computation formula or map indicative of the relationships between the outputs of the magnetic sensor and the minimum distances from the magnets to the magnetic sensor;

electric circuit means for obtaining data associated with the minimum distances from the magnetic sensor to the magnets according to the computation formula or map on the basis of the outputs obtained by means of the magnetic sensor in detecting the inflation pressure of the tire, and obtaining the tire inflation pressure according to a pressure computation formula or map indicative of the relationship between the tire inflation pressure and the distance between the magnets on the basis of the obtained data; and

notifying means for notifying of information relating to the tire inflation pressure obtained by said electric circuit means.

5,469,137

DIGITAL/ANALOG INDICATION UNIT

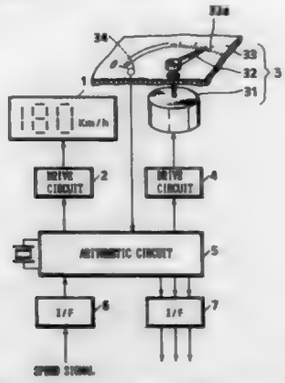
Masanori Muto, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Sep. 2, 1993, Ser. No. 115,059

Claims priority, application Japan, Sep. 4, 1992, 4-237172; May 14, 1993, 5-112993

Int. Cl.[6] **G09F** *9/35*

U.S. Cl. 340—462 **2 Claims**



1. A digital/analog indication unit for indicating continuously changing vehicle speed comprising:

a digital indicator having a display means for indicating numerals corresponding to a first detected value received from a vehicle speed sensor;

an analog indicator having a dial plate with scales provided on the surface thereof, an indication needle, and a pulse motor connected to said indication needle, wherein said indication needle is rotated by said pulse motor to point to one of said scales; and

indication control means for performing a continuous updating operation to provide an updated indication of the numerals displayed by said digital indicator in accordance with a second detected value received from the sensor, and for activating said pulse motor following the updating operation of said digital indicator to rotate said indication needle to point to a scale of said analog indicator, said scale corresponding to said updated indication of said digital indicator.

5,469,138

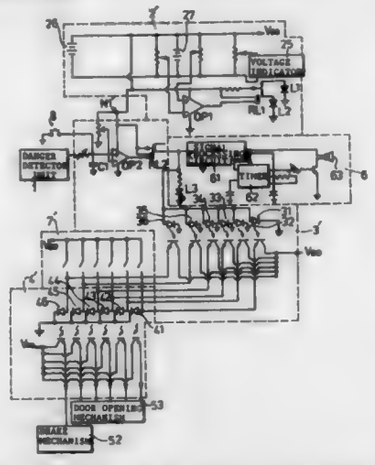
DANGER DETECTOR-TYPE AUTOMATIC CONTROL DEVICE

Hsin-Tan Tsai, No. 50-8, Fu-Hsing St., Hua-Lien City, Taiwan, Prov. of China

Filed May 28, 1993, Ser. No. 69,301

Int. Cl.[6] **B60Q** *9/00;* **B60R** *21/00*

U.S. Cl. 340—500 **5 Claims**



1. An automobile safety device for an automobile with an automatic brake mechanism, an automatic door opening mechanism, a dc power supplying unit which generates a power signal output, a manual control unit which is operable so as to generate movement signals for activating selectively said brake mechanism and said door opening mechanism, and a driving control unit which is connected to said manual control unit and which activates selectively said brake mechanism and said door opening mechanism upon reception of said movement signals, said automobile safety device comprising:

a danger detector unit, including a fire detector, for generating a danger signal upon detection of a danger condition; and

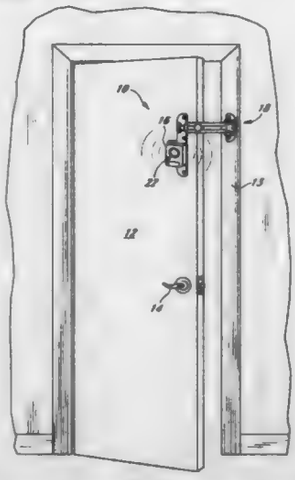
an override unit connected to said danger detector unit and to said power supplying unit and to said driving control unit, said override unit receiving said danger signal from said danger detector unit and said power signal from said power supplying unit, said override unit bypassing said manual control unit and controlling said driving control unit so as to activate simultaneously said brake mechanism and said door opening mechanism upon reception of said danger signal.

5,469,139

DOOR BLOCK ALARM

Joseph Y. Ko, 12 Morning Dove, Laguna Niguel, Calif. 92677

Filed Feb. 16, 1995, Ser. No. 389,291
Int. Cl.[6] G08B *13/08*
U.S. Cl. 340—545 **12 Claims**



1. A latch and alarm device for doors, comprising:

a mounting plate including a first and second portion and having an arm extending substantially perpendicular to said first portion, said mounting plate configured to be mounted on a door;

a latch plate adapted to be mounted on the frame of the door and including a rotatable latch for capturing said arm so that motion of the door is limited;

a high output alarm unit operated by a battery;

a force sensor for detecting attempted forced entry through the door;

an ON/OFF switch for electrically coupling/decoupling said alarm unit and said sensor from said battery;

a panic switch for immediate activation of said alarm unit; and

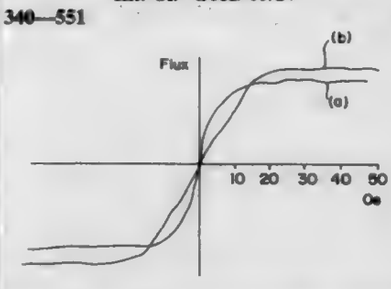
a housing mounted on said second portion of said mounting plate and including said alarm unit, said sensor, said switches and said battery, whereby when a) said arm is captured in said latch, b) said ON/OFF switch is set to ON, and c) a force greater than a nominal value is detected, said alarm unit emits an alarm sound.

5,469,140

TRANSVERSE MAGNETIC FIELD ANNEALED AMORPHOUS MAGNETOMECHANICAL ELEMENTS FOR USE IN ELECTRONIC ARTICLE SURVEILLANCE SYSTEM AND METHOD OF MAKING SAME

Nen-chin Liu, Parkland; Ming-Ren Lian, Clearwater, and Jimmy Cantey, Fort Lauderdale, all of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Jun. 30, 1994, Ser. No. 269,651
Int. Cl.[6] G08B *13/24*
U.S. Cl. 340—551 **53 Claims**



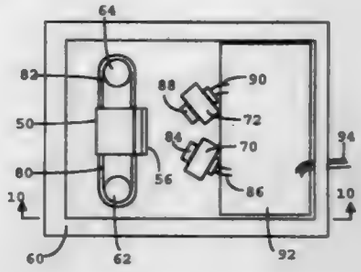
1. A marker for use in a magnetomechanical electronic article surveillance system, comprising an amorphous magnetostrictive strip formed of an alloy of iron and cobalt in which the proportion of cobalt is at least 30% by atomic percent.

5,469,141

OPTICAL MOTION SENSOR AND METHOD FOR OPERATING SAME

John Ghazarian, Las Vegas, Nev., assignor to George Sellman, Murrieta, Calif.

Filed Mar. 16, 1994, Ser. No. 214,867
Int. Cl.[6] G08B *13/08*
U.S. Cl. 340—566 **19 Claims**



1. A motion sensor for use in a security system, said motion sensor comprising:

a housing member;

a mass member;

support means for resiliently supporting said mass member within said housing member, said mass member being supported by said support means in a rest position relative to said housing member when said housing member is not subject to motion, said mass member being resiliently moveable in bidirectional movement in any of three mutually orthogonal axes of movement from said rest position to any of a plurality of different positions relative to said housing member when said housing member is subjected to motion;

a light emitter, located in said housing member, for emitting light;

a light detector, located in said housing member, for detecting light and for generating an electrical output signal indicative of the light detected by said light detector; and

means, located in said housing member, for defining a light path between said light emitter and said light detector when said mass member is in said rest position, said light path between said light emitter and said light detector being altered when said mass member moves from said rest position to any of said plurality of different positions, said electrical output signal varying whenever said light path between said light emitter and said light detector is altered.

5,469,142

ELECTRONIC ARTICLE SURVEILLANCE SYSTEM HAVING ENHANCED TAG DEACTIVATION CAPACITY

Adam S. Bergman, and Douglas A. Drew, both of Boca Raton, Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Aug. 10, 1994, Ser. No. 288,087
Int. Cl.[5] G08B *13/24*
U.S. Cl. 340—572 **20 Claims**

9. A method for deactivating electronic article surveillance tags, comprising the steps of:

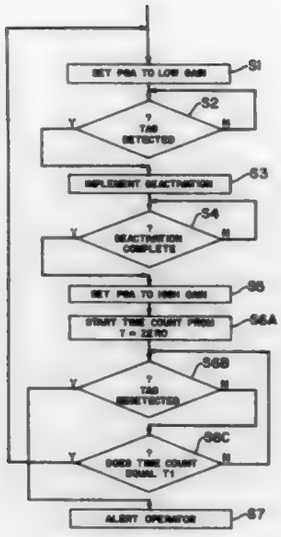
(a) establishing a tag detection field;

(b) providing a receiver having at least first and second different tag detection sensitivities;

(c) setting said receiver to said first tag detection sensitivity and, upon detection of a tag by said receiver, applying a tag deactivating field to said tag;

(d) reestablishing said tag detection field; and

(e) setting said receiver to said second tag detection sensitivity.



5,469,143

SLEEP AWAKENING DEVICE FOR DRIVERS OF MOTOR VEHICLES

David E. Cooper, 1607 E. Libra Dr., Tempe, Ariz. 85283

Filed Jan. 10, 1995, Ser. No. 370,637

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—575 **3 Claims**

1. A sleep awakening device for awakening drivers of motor vehicles who are falling asleep while driving, the sleep awakening device comprising:

a pair of eyeglasses to be worn by the driver, the pair of eyeglasses including a microswitch mounted on a temple member thereof and a sensing lever extending forwardly and inwardly from said microswitch, the sensing lever being positioned to be in constant contact with an upper eyelid muscle of the driver and to move downwardly and upwardly in concert with said upper eyelid muscle as it closes and opens, respectively; and

a control unit electrically connected to said microswitch, the control unit including light means for providing a visual indication each time the driver's upper eyelid closes, the control unit further including adjustable time delay means and horn means for providing an audible signal when the driver's upper eyelid muscle has remained closed for a predetermined period of time to which said time delay means has been adjusted.

5,469,144

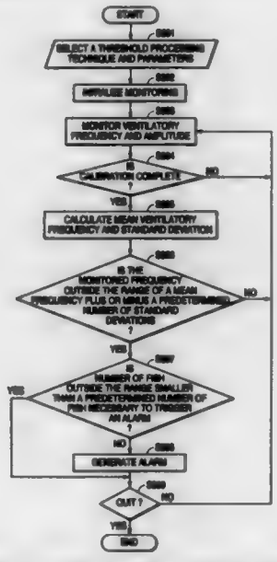
METHOD AND APPARATUS USING THRESHOLD TECHNIQUES FOR GENERATING AN ALARM IN A BIO-SENSOR

Pawel Gradzki, Lebanon, N.J.; Mark Kaynor, and David Gruber, both of Christiansburg, Va., assignors to Biological Monitoring, Inc., Blacksburg, Va.

Continuation of Ser. No. 871,734, Apr. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 611,744, Nov. 13, 1990, abandoned. This application Nov. 4, 1994, Ser. No. 337,236

Int. Cl.[6] G01B *21/00*

U.S. Cl. 340—603 **14 Claims**



1. A method for processing and assessing a bio-electric waveform as generated by neuromuscular activity of aquatic organisms, comprising the steps of:

a) non-contact monitoring of ventilatory and locomotor behavior variables of aquatic organisms;

b) converting the ventilatory and locomotor behavior variables into frequency components;

c) selecting one of two waveform processing techniques for quantifying the monitored ventilatory and locomotor behavior frequencies;

d) comparing the monitored quantified ventilatory and locomotor behavior frequencies with a mean frequency changing with time and one of plus and minus a predetermined number of standard deviations;

e) generating, based on the comparison in said step d), a warning when the ventilatory and locomotor behavior frequencies of the aquatic organisms are one of statistically greater than and less than a predetermined value; and

f) outputting an alarm when an alarm state occurs when a predetermined number of warnings are simultaneously generated for a predetermined number of aquatic organisms.

5,469,145

WET DIAPER DETECTOR

Lonnie Johnson, 1640 Roswell St., Suite A, Smyrna, Ga. 30080

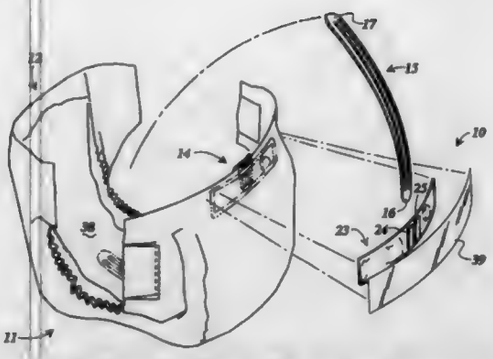
Continuation-in-part of Ser. No. 890,162, May 29, 1992, Pat. No. 5,266,928. This application Nov. 29, 1993, Ser. No. 158,612

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—604 **13 Claims**

1. An apparatus for use with a diaper to detect the occurrence of a wet condition in the diaper and produce an alarm signal in response to such detection, said apparatus comprising:

a housing having a front surface and a rear surface and being sized to contain electronic components and to be affixed to the



exterior surface of a diaper with said rear surface of said housing positioned against the diaper's exterior surface;

capacitive sensor means located on said rear surface of said housing, said sensor means having a first conductor capacitively coupled to a second conductor, said capacitive sensor means being configured and positioned on said housing rear surface to be positioned against the exterior surface of the diaper when said housing is affixed to the diaper with no portion of said capacitive sensor means extending into the interior of the diaper;

circuit means in said housing for monitoring the electrical capacitance between said first conductor and said second conductor of said capacitive sensor means;

means for producing an electrical signal when the electrical capacitance between said first conductor and said second conductor meets a pre-established criteria;

means responsive to said electrical signal for producing an alarm; and

means for removably affixing said housing to the exterior surface of the diaper with said capacitive sensor means held against the diaper,

whereby the capacitance between the first and second conductors increases as a result of the dielectric effects of a wetted diaper and the increased capacitance triggers an alarm indicative of a wet diaper condition.

5,469,146

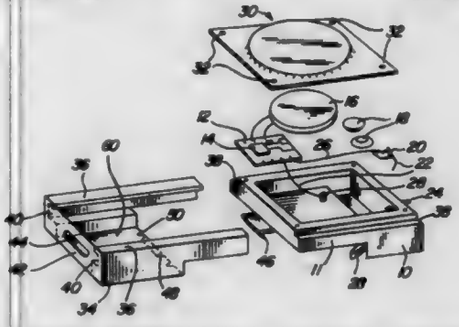
DEVICE FOR ATTACHING TO AND DETECTING WETNESS IN DIAPERS

Yener Gurler, 273 Saint Henry Dr., Fremont, Calif. 94539

Filed Aug. 12, 1994, Ser. No. 289,515

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—605 **13 Claims**



1. A device for signaling presence of moisture in a fabric item which comprises:

a module box having a slide section slidably coupled thereto;

a pair of probes;

support means for coupling said probes to said module box, said support means supporting said probes at a distance from one another, each of said probes having an end extending downwardly from said module box;

means for slidably mounting said support means on said slide section, said mounting means integrally coupled to said slide section such that said probes are adapted for trapping a fold of said fabric item between said slide section and said probe ends; and

means connected to said probes for emitting a signal responsive to conduction of electrical current between said probes, said signal emitting means retained in said module box.

5,469,147

SMOKE DETECTOR DEVICE, ESPECIALLY FOR A SPACE IN AN AIRCRAFT

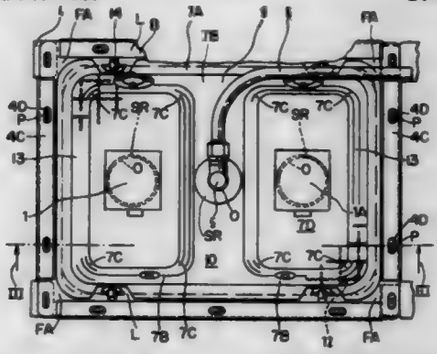
Heiko Trey, Ganderkesee; Thomas Grabow, Weyhe-Leeste, and Eckhard Steinbrink, Stuhr, all of, Germany, assignors to Deutsche Aerospace Airbus GmbH, Hamburg, Germany

Filed Mar. 10, 1993, Ser. No. 28,982

Claims priority, application Germany, Mar. 12, 1992, 42 07 807.5

Int. Cl.[6] G08B *17/10*

U.S. Cl. 340—628 **14 Claims**



1. An apparatus for signalling a smoke detection in an enclosed space comprising a mounting for attaching said apparatus in a recess of a wall or ceiling enclosing said enclosed space (**8**), at least a first smoke detector (**1**) secured to said mounting, said first smoke detector (**1**) having a smoke detector inlet (**11**) facing toward said enclosed space (**8**) and defining a smoke detector inlet plane, a smoke guide rim comprising an outer edge forming an entrance (**9**) for collecting smoke to be detected, a guide rim bottom (**10**) having an opening (O) surrounding said smoke detector inlet (**11**) approximately in said smoke detector inlet plane, and a funnel collar (**7**) having slanted walls tapering from said smoke collecting entrance (**9**) to said bottom (**10**) for guiding smoke from said smoke collecting entrance (**9**) to said smoke detector inlet (**11**), said funnel collar (**7**) narrowing from said outer edge toward said bottom (**10**) for directing a smoke stream toward said smoke detector inlet (**11**) surrounded by said bottom opening (O) in said guide rim bottom **10**.

5,469,148

FREQUENCY MONITORING DEVICE

Hans-Martin Baumann, Gutach, and Rolf Müller, München, both of, Germany, assignors to Papst Licensing GmbH, Spaichingen, Germany

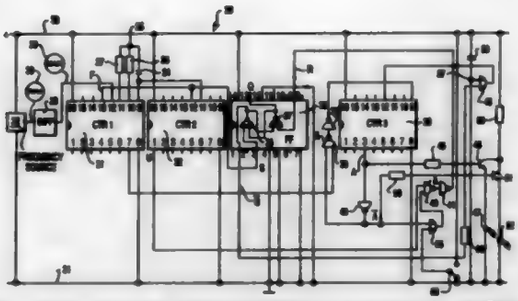
PCT No. PCT/EP89/00296, § 371 Date Nov. 1, 1991, § 102(e) Date Nov. 1, 1991, PCT Pub. No. WO90/11531, PCT Pub. Date Oct. 4, 1990

PCT Filed Mar. 20, 1989, Ser. No. 761,886

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—658 **13 Claims**

1. A device for monitoring a frequency (f) for relatively long lasting deviations from a desired value (**f0**), in which a first counter is provided for counting cycles of a frequency (CLK) higher than a substantial multiple of **f0**, the first counter being reset by a pulse of the frequency (f) to be monitored and then counting cycles of frequency (CLK) until the next such pulse is received, the count of the first counter increasing upon decrease of the frequency (f) to be monitored, and when the count of the first counter reaches a first



elevated count the first counter emitting a deviation signal (Flag), the device for monitoring comprising:

monitoring means including a second counter for monitoring the time interval of the recurrence of said deviation signals, said second counter starting counting at each deviation signal and having a preset count or level that is normally not reached between two successive deviation signals but is reached if no further deviation signal appears, the second counter emitting a reset signal, if said preset count or level is reached; and

a third counter starting counting at the first deviation signal and having a further preset count or level representing a time interval (Ta), the third counter triggering an alarm signal if the preset count or level is reached or being reset by said reset signal if said preset count or level is not reached.

5,469,149

METHOD AND APPARATUS FOR PRODUCING A WOUND PACKAGE OF AN ENDLESS THERMOPLASTIC MATERIAL

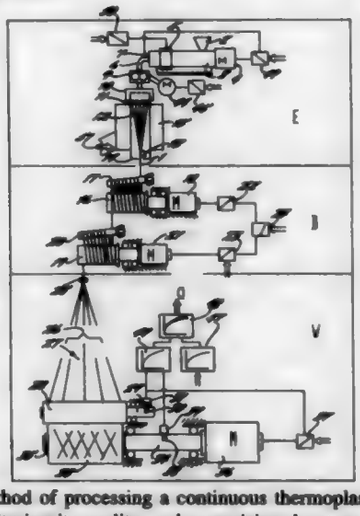
Tobias Binner, Radevormwald, and Klaus Schafer, Remscheid, both of, Germany, assignors to Barmag AG, Remscheid, Germany

Filed Jul. 19, 1993, Ser. No. 93,764

Claims priority, application Germany, Jul. 18, 1992, 42 23 751.3; Sep. 5, 1992, 42 29 779.6; Dec. 9, 1992, 42 41 343.5; Mar. 2, 1993, 43 06 422.1; Jun. 11, 1993, 43 19 312.9

Int. Cl.[6] G08B *21/00*

U.S. Cl. 34—677 **31 Claims**



1. A method of processing a continuous thermoplastic material while monitoring its quality, and comprising the steps of

advancing the continuous thermoplastic material along a path of travel,

winding the advancing thermoplastic material into a package,

monitoring the weight and diameter of the package while it is being wound so as to permit the calculation of the density of the package, and including generating a control signal which is a function of the monitored weight,

comparing the control signal with a predetermined reference signal, and

generating an output signal at least during periods when the difference between the control signal and the reference signal exceeds a predetermined deviation, and such that the output signal represents the quality of the continuous material in the wound package.

5,469,150

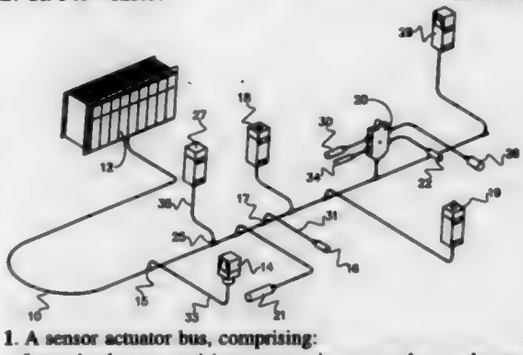
SENSOR ACTUATOR BUS SYSTEM

Hans J. Sitte, Freeport, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 993,831, Dec. 18, 1992, abandoned. This application Dec. 27, 1994, Ser. No. 364,061

Int. Cl.[6] G08C *19/16;* **G05B** *23/02;* **H04J** *3/14*

U.S. Cl. 340—825.07 **11 Claims**



1. A sensor actuator bus, comprising:

a four-wire bus comprising a two-wire power bus and a two-wire communication bus;

a plurality of sensors, each of said sensors being connected to said two-wire power bus and to said two-wire communications bus, said two-wire power bus and said two-wire communications bus being disposed in a common cable, each of said plurality of sensors comprising a means for formulating a data packet containing information representing a status of said sensor associated with said formulating means and a means for transmitting said data packet on said two-wire communication bus, each of said sensors being connected in signal communication with said two-wire communications bus and connected in electrical communication with said two-wire power bus, said transmitting means being connected in signal communication with said formulating means, said data packet comprising a direction bit, seven priority bits for identifying an associated sensor and three message bits, said data packet being arranged in conformance with a Controller Area Network protocol system.

5,469,151

REMOTE CONTROL CAR ALARM SYSTEM WITH WIRELESS MODULE INTERCONNECT

Patrick M. Lavelle, Sayville; John DiCroce, Oceanside, and Thomas C. Malone, Miller Place, all of N.Y., assignors to Audiovox Corporation, Hauppauge, N.Y.

Continuation of Ser. No. 788,858, Nov. 7, 1991, abandoned. This application Jan. 14, 1994, Ser. No. 181,671

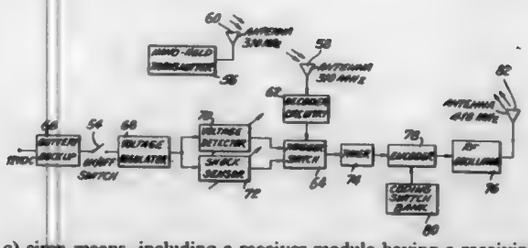
Int. Cl.[6] H04Q *1/00*

U.S. Cl. 340—825.36 **19 Claims**

1. A security system for deterring a security breach in an unattended vehicle having passenger and engine compartments, comprising:

a) sensor means for sensing a security compromising event and including timer means and a transmitter module for transmitting a wireless signal having a predetermined length in response to said sensed event;

b) means for interiorly mounting the sensor means within the passenger compartment;



c) siren means, including a receiver module having a receiving antenna for receiving said wireless signal, and for sounding an alarm in response to receiving said wireless signal; and

d) means for interiorly mounting the siren means within the engine compartment.

5,469,152

REMOTE CONTROL DEVICE THAT TRANSMITS SIGNALS INDICATING TERMINATION OF KEY PRESSING OPERATIONS

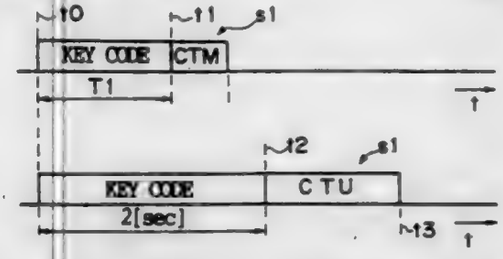
Hirotaka Yamamoto, and Tamiya Tanaka, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 885,085, May 18, 1992, abandoned. This application Jul. 6, 1994, Ser. No. 271,277

Claims priority, application Japan, May 20, 1991, 3-143870

Int. Cl.[6] H04Q *9/14;7/00*

U.S. Cl. 340—825.63 **7 Claims**



1. A remote control device for transmitting a control signal to activate a selected function of an electronic system having a plurality of functions, comprising:

at least one selecting means for activation by a user and each associated with at least two of said functions

generating means for determining a key code signal corresponding to an activated one of said selecting means;

control means for determining whether an activation period of said activated one of said selecting means is greater or less than a predetermined time period and for appending a first time code signal to said key code signal when said activation period is less than said predetermined time period, and for appending a second time code signal to said key code signal when said activation period is greater than said predetermined time period, wherein said first time code signal and said key code signal form a first remote control signal and said second time code signal and said key code signal form a second remote control signal; and

transmitting means for transmitting either said first or second remote control signals for controlling said electronic system.

5,469,153

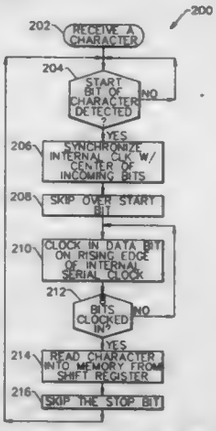
METHOD OF SERIALLY PROCESSING BINARY CHARACTERS ASYNCHRONOUSLY RECEIVED BY AN ELECTRICAL ENERGY METER

Kenneth W. Atherton, Saco; Kevin P. Grogan, South Berwick, both of Me.; Richard A. Balch, North Hampton, and Mark J. Pils, Barrington, both of N.H., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 30, 1992, Ser. No. 968,948

Int. Cl.[6] G08C *17/00;* **G08B** *29/00*

U.S. Cl. 340—870.28 **7 Claims**



1. In an electrical energy meter of the type containing a serial input/output port, a microprocessor-controlled electronic register containing memory and an execution clock therein for controlling register operations, a serial receiver and transmitter, connected between the electronic register and the serial input/output port, and a main crystal oscillator, a method of serially processing a string of binary input characters asynchronously received at a first data rate at the serial input/output port and transferred by the serial receiver to the electronic register, comprising the steps of:

detecting receipt of a first of the string of binary input characters at the serial input/output port of said electrical energy meter;

sampling the detected first binary input character by generating a first sampling clock signal internal to the electronic register of said electrical energy meter which is phase-synchronized with a least significant bit of the detected first binary input character, but has a frequency unequal to the first data rate;

detecting receipt of a second of the string of binary input characters at the serial input/output port; and

sampling the detected second binary input character by generating a second sampling clock signal internal to the electronic register which is phase-synchronized with the least significant bit of the detected second binary input character and has a frequency equal to the frequency of the first sampling clock signal.

5,469,154

MULTICONNECTION SWITCHING NETWORKS

Richard M. Karp, Berkeley, Calif., assignor to DVA Ltd., Alamo, Calif.

Continuation of Ser. No. 657,447, Feb. 19, 1991, abandoned. This application Sep. 30, 1993, Ser. No. 129,337

Int. Cl.[6] H04Q *1/00*

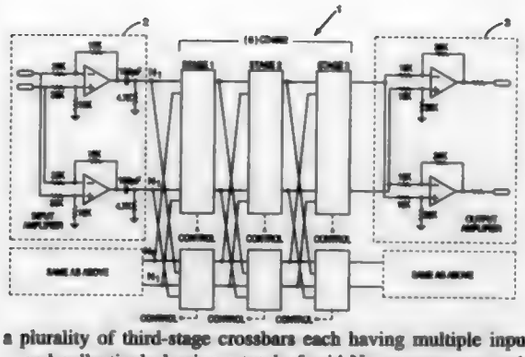
U.S. Cl. 340—825.8 **10 Claims**

1. A switching network for selectively connecting any one of N_2 output ports to any one of N_1 input ports, wherein N_1 and N_2 are positive integers, comprising

a plurality of first-stage crossbars collectively having a total of said N_1 input ports and each crossbar having multiple outputs;

a plurality of second-stage crossbars each having multiple inputs and multiple outputs;

means connecting each output of each first-stage crossbar to one input of two second-stage crossbars;



a plurality of third-stage crossbars each having multiple inputs and collectively having a total of said N_2 output ports; and

means connecting each second-stage crossbar to each third-stage crossbar.

5,469,155

WIRELESS REMOTE BORING APPARATUS GUIDANCE SYSTEM

John T. Archambeault, Joliet, Ill.; David J. Gasmovic, Simpsonville, S.C., and Morio Mizuno, Iwakura, Japan, assignors to McLaughlin Manufacturing Company, Inc., Greenville, S.C.

Continuation of Ser. No. 9,447, Jan. 27, 1993, abandoned.
This application Jul. 11, 1994, Ser. No. 273,278
Int. Cl.[6] G01V *1/00*; E21B *7/04*
U.S. Cl. 340—853.4 **8 Claims**

1. A boring apparatus useable by at least two operators to produce an underground bore substantially horizontally through the earth from an initial location, said apparatus comprising:

a boring machine having a boring rod including a directional boring head, said boring machine further including manipulative controls actuatable by a first operator to guide said boring head;

a signal generating probe associated with said boring head for generating informational signals about said boring head including information indicative of the location and depth thereof;

a portable assembly adapted to be carried by a second operator during operation at a location approximately directly above the boring head, said portable assembly including a first graphic display device for producing a first visual display indicative of information about said boring head;

said portable assembly further including a probe receiver for directly receiving the informational signal from said signal generating probe, said probe receiver operatively connected to said first graphic display device for yielding the first visual display;

said portable assembly further including a transmitter for wirelessly transmitting the informational signal from the portable assembly;

a receiver device located at the boring machine, said receiver device including a second graphic display device for producing a second visual display indicative of information about the boring head;

said receiver device operative to receive the informational signal as wirelessly transmitted by said transmitter of said portable assembly, said receiver device operatively connected to said second graphic display device for yielding the second visual display,

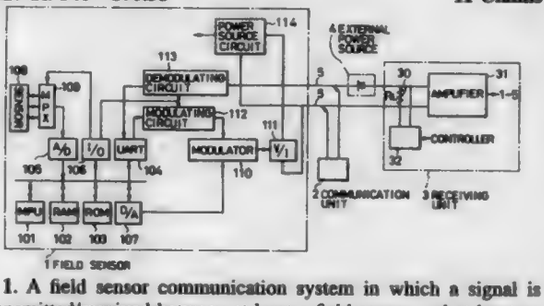
whereby said first operator and said second operator may each view a visual display showing information about the boring head such that the second operator may keep the portable assembly substantially directly above the boring head and the first operator may control the direction of the boring head.

5,469,156

FIELD SENSOR COMMUNICATION SYSTEM

Makoto Kogure, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 547,215, Jul. 3, 1990, abandoned.
This application May 1, 1992, Ser. No. 877,137
Claims priority, application Japan, Jul. 4, 1989, 1-172749
Int. Cl.[6] H04B *3/54*
U.S. Cl. 340—870.38 **11 Claims**



1. A field sensor communication system in which a signal is transmitted/received between at least a field sensor and at least an upper level unit, which is one of an upper level receiving unit and an upper level communication device, via a signal transmission line, at least one of said field sensor and said upper level unit of said field sensor communication system, comprising:

means for determining whether there is any communication error in a received digital transmission signal by comparing the transmitted signal with the received signal; and

means for changing the amplitude level of said digital transmission signal in accordance with an output of said determining means.

5,469,157

BARRICADE LIGHT WITH LIGHT EMITTING DIODE

Thom D. Carpenter, and Lee R. Heimann, both of Elgin, Ill., assignors to CBD, Inc., Elgin, Ill.

Filed Feb. 10, 1994, Ser. No. 194,414
Int. Cl.[6] B60Q *7/00*
U.S. Cl. 340—908.1 **18 Claims**

1. A barricade light for construction project comprising:

a) a printed circuit board for use in the barricade light;

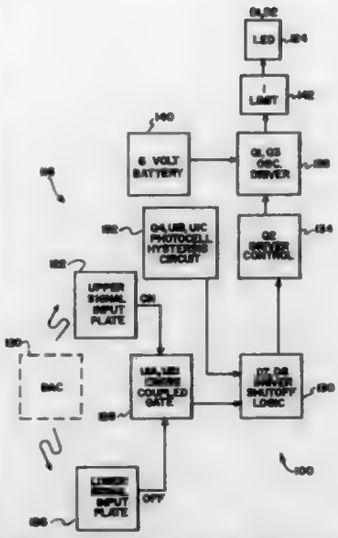
b) a light emitting diode being mounted in the printed circuit board;

c) the printed circuit board including a pulse activated switch for turning the light emitting

diode off and

d) the printed circuit board including a means to shut the light emitting diode off in daylight and on in the dark; and

e) a means to operate the pulse activated switch to turn the barricade light off for the barricade light to be stored and on to



activate the means to shut the light emitting diode off in daylight and on in the dark.

5,469,158

APPARATUS FOR CORRECTING THE DETECTED HEADING OF A VEHICLE

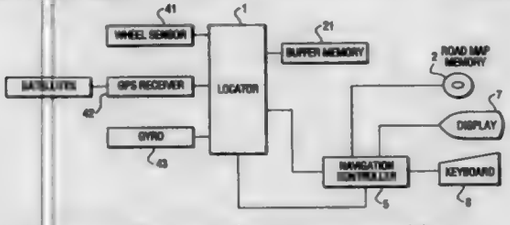
Kazuya Morita, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 45,598, Apr. 9, 1993, abandoned. This application Jun. 21, 1994, Ser. No. 263,417

Claims priority, application Japan, Apr. 20, 1992, 4-099777; Apr. 20, 1992, 4-099778

Int. Cl.[6] G08G *1/0969;* **G06F** *19/00*

U.S. Cl. 340—988 **6 Claims**



1. A vehicle heading correcting apparatus comprising:

a gyro,

integrating means for integrating output data of said gyro;

a global positioning system receiver for receiving waves from a plurality of satellites revolving around the earth to measure Doppler shift which occurs by receiving waves during travel of a vehicle, and for outputting heading data of the vehicle;

acquisition means for acquiring said heading data of said vehicle supplied from said global positioning system receiver;

first computing means for computing a first turning angle of said vehicle based on two consecutive data of said heading data acquired by said acquisition means;

second computing means for computing a second turning angle of said vehicle based on an integrated value of said output data of said gyro obtained by said integrating means during a period of time that said two consecutive data are acquired;

offset computing means for computing a difference between said first and second turning angles and for computing an offset value of said output data of said gyro by dividing said difference by said period of time; and

offset correcting means for correcting said output data of said gyro with said offset value calculated by said offset computing means.

5,469,159

METHOD CAPABLE OF JUDGING VALIDITY OR INVALIDITY OF A STATUS OF SWITCHING ELEMENTS IN A KEYBOARD SWITCH DEVICE

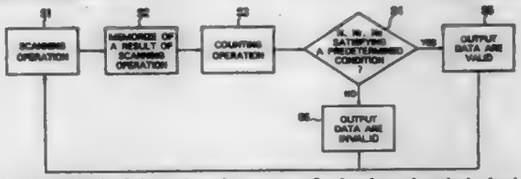
Makoto Fukazawa, Chofu, Japan, assignor to Mitsumi Electric Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1992, Ser. No. 896,104

Claims priority, application Japan, Sep. 9, 1991, 3-255931

Int. Cl.[6] H04B *15/00*

U.S. Cl. 341—22 **16 Claims**



1. A method of detecting the status of a keyboard switch device including a plurality of row conductors, a plurality of column conductors which intersect said row conductors, and a matrix of a plurality of switching elements respectively provided at said intersections of said row conductors and said column conductors and operable in response to keyboard operation, compriaing the steps of:

(a) scanning said row conductors and said column conductors to detect the status of each switching element;

(b) memorizing a result of said scanning operation in a memory unit as memorized information;

(c) counting, with reference to said memorized information, a closed element total number N representative of a total number of the switching elements detected as being closed;

(d) counting, with reference to said memorized information, a closed row total number Nr representative of a total number of the row conductors which include the switching elements detected as being closed;

(e) counting, with reference to said memorized information, a closed column total number Nc representative of a total number of the column conductors which include the switching elements detected as being closed;

(f) judging whether or not said closed element total number N, said closed row total number Nr, and said closed column total number Nc satisfies one of the following formulae (1) and (2):

$$N=Nr, \quad (1)$$

$$N=Nc; \quad (2)$$

and

(g) providing said memorized information as valid data accurately representing the status of the keyboard switch device when one of said formulae (1) and (2) is satisfied.

5,469,160

COMPUTER KEYBOARD

Suimin Yang, 2 Political Affairs Teaching & Research Navy Political Affairs Institute, Dalian City, Liaoning Prov., China

Filed Jun. 18, 1993, Ser. No. 78,087

Claims priority, application China, Jun. 18, 1992, 92216253.0

Int. Cl.[6] H03K *17/94*

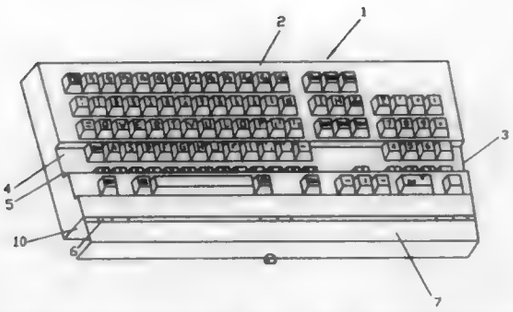
U.S. Cl. 341—22 **9 Claims**

1. A computer keyboard comprising a front, basic keys, functional keys, a main surface and a surface which is at an angle with the main surface;

the front being a part of the keyboard closest to an operator when the keyboard is in use;

the keys having an upper surface and a back, and being arranged in alignment in substantially parallel fixed rows;

the substantially parallel fixed rows being on the main surface and on the surface which is at an angle with the main surface, each key being in a fixed position with respect to each of the other keys;



the back of the keys being that part by which the keys are attached to the keyboard;

the surface which is at an angle with the main surface being closer to the front of the keyboard than the main surface; and

the angle being such that the backs of the keys on the surface which is at an angle with the main surface are toward the front of the keyboard.

5,469,161

ALGORITHM FOR THE IMPLEMENTATION OF ZIV-LEMPEL DATA COMPRESSION USING CONTENT ADDRESSABLE MEMORY

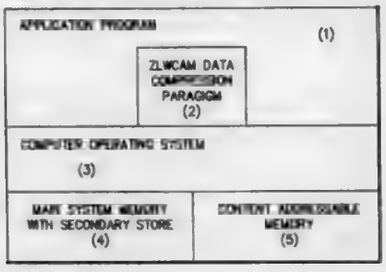
John D. Bezek, Owego, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 13, 1992, Ser. No. 930,136

Int. Cl.[6] H03M 7/30

U.S. Cl. 341—51 **9 Claims**

1. A computer system for processing Ziv-Lempel compressed



data, comprising

a functional unit having, in combination, a computer operating system, a main memory and a content addressable memory, and a secondary memory for retrieval and storage of data, and a means to address secondary memory for retrieval and storage of data,

an application program and a ZLWCAM data compression paradigm, said ZLWCAM data compression paradigm including means for processing data from said application program and compressing it to utilize less data storage in said secondary memory,

said content addressable memory being utilized during execution of said ZLWCAM data compression paradigm to accelerate the process of compression of application program data, and

means for determining if a data field of an item of compressed data specifies another item of compressed data.

5,469,162

DATA MODULATION METHOD

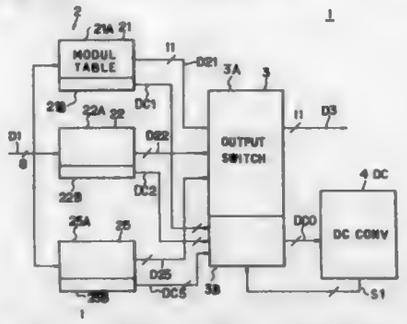
Yasuyuki Chaki, Chiba; Yoshihide Shimpuku, Kanagawa, and Hiroyuki Ino, Tokyo, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1993, Ser. No. 39,730

Claims priority, application Japan, Mar. 31, 1992, 4-105970

Int. Cl.[6] H03M 7/00

U.S. Cl. 341—58 **7 Claims**



1. A data modulation method for modulating m-bit data to a modulation code of n bits with fewer direct current components in a code system as a whole, wherein n bits are larger than m bits, comprising the steps of:

constituting a group of modulation codes by gathering modulation codes with respective code weights having one of a plurality Of predetermined values from all modulation codes composed of n bits, and then forming a plurality of modulation tables storing a respective plurality of subgroups of modulation codes obtained by subdividing said group of modulation codes, each subgroup comprising modulation codes with respective code weights having one of a corresponding combination of two or more of said plurality of predetermined values; and

sequentially modulating a plurality of said m-bit data to a respective plurality of said n-bit modulation codes by using said modulation tables, said m-bit data being modulated by

converting said m-bit data to a plurality of n-bit candidate modulation codes with respective code weights using said respective plurality of modulation tables,

selecting one of said plurality of n-bit candidate modulation codes with respective code weights, based on a digital sum variation of code weights accumulated until a time at which said m-bit data is converted to said plurality of n-bit candidate modulation codes, and then supplying said selected one of said plurality of n-bit candidate modulation codes as said n-bit modulation code, and

updating said digital sum variation of code weights using a corresponding code weight of said selected one of said plurality of n-bit candidate modulation codes.

5,469,163

MULTIPLE RESONANT TUNNELING CIRCUITS FOR POSITIVE DIGIT RANGE-4 BASE-2 TO BINARY CONVERSION

Albert H. Taddiken, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 24, 1993, Ser. No. 65,969

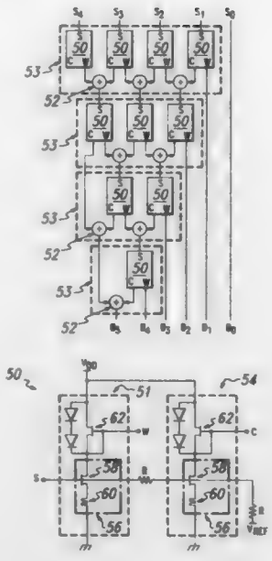
Int. Cl.[6] H03M 7/02

U.S. Cl. 341—83 **21 Claims**

1. An apparatus for converting a range-N digit into an L-digit binary word, said apparatus comprising:

a voltage divider network having an input; and

a first level and second level folding circuits, the input of each of said first and second level folding circuits connected to said network and the output being a digit in said L-digit binary word, wherein when said range-N digit is applied to said voltage divider input, said L-digit binary word representing the same numerical value as that of said range-N digit.

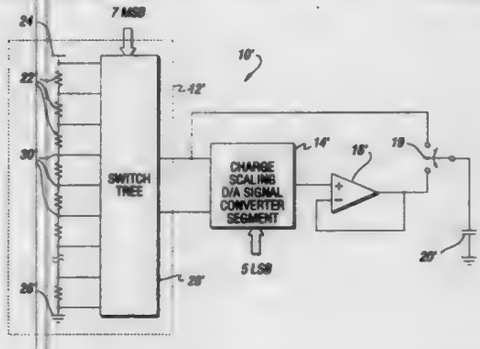


5,469,164

CIRCUIT AND METHOD FOR DIGITAL TO ANALOG SIGNAL CONVERSION

Christopher J. Kemp, Monument, Colo., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1993, Ser. No. 129,899
Int. Cl.[6] H03M 1/68
U.S. Cl. 341—145 19 Claims



1. A digital to analog (D/A) signal convertor for converting an (N+K)-bit digital input signal to an analog output signal, the output signal for use in conjunction with a capacitive load, the convertor comprising:

first convertor means for converting an N-bit digital input signal to first and second partial analog output signals;

second convertor means for converting the first and second partial analog output signals and a K-bit digital input signal to a complete analog output signal;

signal conditioner means for converting the complete analog output signal to a final analog output signal; and

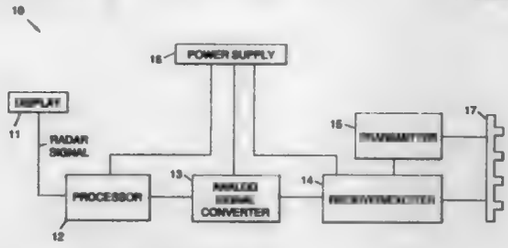
switch means for first applying the first partial analog output signal to the capacitive load and then applying the final analog output signal to the capacitive load.

5,469,165

RADAR AND ELECTRONIC WARFARE SYSTEMS EMPLOYING CONTINUOUS TRANSVERSE STUB ARRAY ANTENNAS

William W. Milroy, Playa Del Rey, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 23, 1993, Ser. No. 173,291
Int. Cl.[6] H01Q 3/22
U.S. Cl. 342—13 7 Claims



1. A radar system comprising:

a continuous transverse stub antenna array;

a transmitter coupled to the continuous transverse stub antenna array;

a receiver/exciter coupled to the transmitter and the continuous transverse stub antenna array;

an analog signal converter coupled to the receiver/exciter;

a radar display;

a processor coupled to the analog signal converter and radar display for processing received radar return signals to produce a radar image that is displayed on the display; and

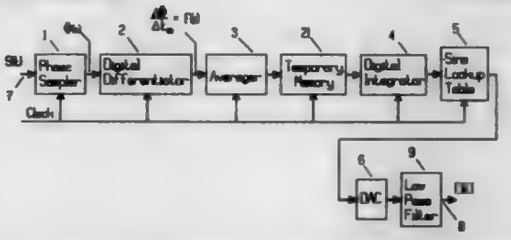
a power supply coupled to the processor, the analog signal converter, and the receiver/exciter for providing operational power thereto.

5,469,166

METHOD TO GENERATE A CONTINUOUS PERIODIC SIGNAL FROM A SHORT SAMPLE OF THE SIGNAL

Zvi Y. Regev, 24217 Highlander Rd., West Hills, Calif. 91307

Filed Jul. 19, 1994, Ser. No. 276,911
Int. Cl.[6] G01S 7/38
U.S. Cl. 342—14 5 Claims



1. A system where a continuous signal is formed by a succession of two or more replicas of a stored signal, each represented as a sequence of measurements of the phase of the stored signal, a process for amelioration of phase discontinuities between replicas comprising:

a means of generating from the succession of replicas a derivative signal in which each value is a measure of the rate of change of phase of the succession of replicas followed by

a means of generating from the derivative signal an average derivative signal, in which each value is a moving average of a number of preceding values of the derivative signal followed by

a means of selecting the derivative of phase during the replication period and, at the point of transition between replicas for selecting the average derivative signal and followed by

a means of accumulating the selected output values.

5,469,167

SYNTHETIC APERTURE RADAR FOR NONLINEAR TRAJECTORIES USING RANGE RELATIVE DOPPLER PROCESSING AND INVARIANT MAPPING

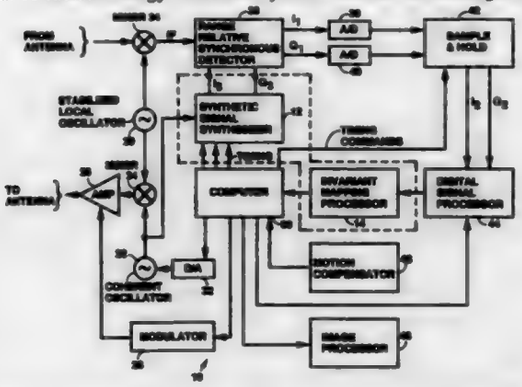
Robert J. Polge, Baton Rouge, La., and Augustus H. Green, Jr., Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 137,455, Oct. 18, 1993, abandoned. This application May 1, 1995, Ser. No. 432,353

Int. Cl.[6] G01S *13/90;7/483*

U.S. Cl. 342—25 **12 Claims**

1. A radiant energy detection system wherein electromagnetic



energy is transmitted toward an object, the system having detection means for detecting presence of a received target signal, signal processing means for processing received signals, a computer for providing command, timing, and synchronizing control signals for the detection system operation, a synthetic signal synthesizer coupled between said detection means and said computer for receiving command and timing control signals from said computer and for providing in-phase and quadrature (I and Q) output signals to said detection means, said detection means providing I and Q outputs to said signal processing means; and wherein said synthetic signal synthesizer comprises an impulse generator having an input coupled to receive said timing signals from said computer and having an output; first and second modulators each having respective first and second inputs, said first inputs being coupled to said computer for receiving I and Q sequences from the computer and said second inputs being coupled to receive said output of said impulse generator, said timing signals being indicative of real time occurrence of return signals from target scatterers and prompting the impulse generator to provide the output pulses to the second inputs of said modulators, said modulators modulating the received output pulses with the respective I or Q sequence received from the computer to provide a modulated output that is precisely coordinated with the return signal from the scatterers present in the I and Q sequence signals; each modulator having an output pulse train; and first and second low pass filters having respective inputs coupled to respective first and second modulator outputs for receiving respective outputs therefrom; said first and second filters having an impulse response which matches the impulse response of the system and providing I and Q outputs respectively.

5,469,168

OCEANOGRAPHIC AND METEOROLOGICAL DATA

Stuart J. Anderson, Glen Osmond, Australia, assignor to THE COMMONWEALTH OF AUSTRALIA, C/-The Secretary, Department of Defence, Canberra, Australia

PCT No. PCT/AU92/00225, § 371 Date Nov. 8, 1993, § 102(e) Date Nov. 8, 1993, PCT Pub. No. WO92/21041, PCT Pub. Date Nov. 26, 1992

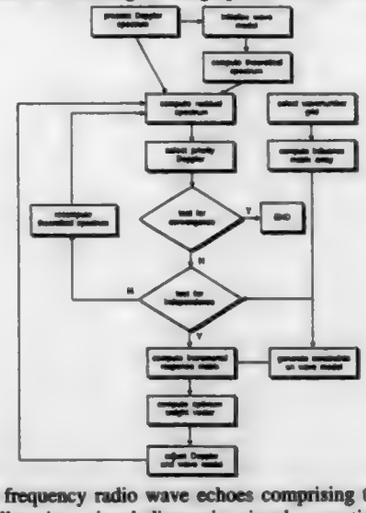
PCT Filed May 15, 1992, Ser. No. 146,026

Claims priority, application Australia, May 16, 1991, PK6187; May 16, 1991, PK6188

Int. Cl.[6] G01S *13/95*

U.S. Cl. 342—26 **31 Claims**

1. A method of obtaining oceanographic and meteorological data



from high frequency radio wave echoes comprising the steps of: resource allocation; signal diagnosis; signal correction; adaptive task assignment; method selection; processing, storage and display; and performance evaluation wherein:

the resource allocation step includes the steps of determining optimum parameters for the high frequency radio waves to which the method is to be applied;

the signal diagnoses step includes the steps of automatic examination and classification of received signals in terms of data quality and suitability for various levels of detailed analysis;

the signal correction step includes the steps of application of ameliorative signal processing techniques to improve signal quality by removing contamination and distortion;

the adaptive task assignment step includes the steps of nominating the oceanographic and meteorological information to be extracted on the basis of data suitability, availability of collateral information and requirements;

the method selection step further comprises the steps of choosing which technique should be employed to estimate each parameter; the processing, storage and display step includes the steps of execution of a requested task, storing processed data on disk or tape if desired and presentation of results on colour displays; and

the performance evaluation step includes the steps of real-time and offline assessment of the accuracy of remote sensing output, display of discrepancies and feedback.

5,469,169

RECEIVER FOR BISTATIC DOPPLER RADAR NETWORK

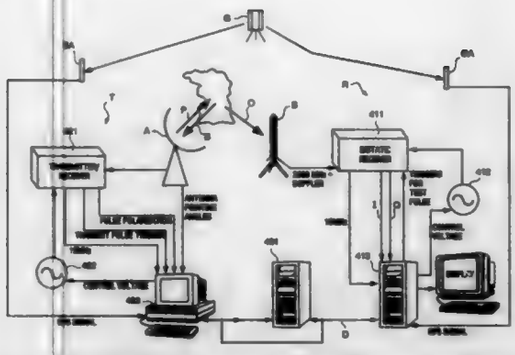
Charles L. Frush, Longmont, Colo., assignor to University Corporation for Atmospheric Research, Boulder, Colo.

Filed Nov. 30, 1993, Ser. No. 158,764

Int. Cl.[6] G01S *13/95*

U.S. Cl. 342—26 **16 Claims**

1. A radar receiver for determining presence and locus of scatterers in a predefined space, wherein a transmitter transmits a focused beam of high frequency energy into said predefined space



in a predetermined scan pattern, with said beam comprising a series of pulses, each having a pulse origination time as it is emanated from said transmitter, and wherein a timing source transmits deterministic timing signals to said radar receiver, apparatus for synchronizing operation of said receiver with said transmitter comprising:

means receiving said deterministic timing signal,

means, responsive to pulse origination scheduling data generated in said receiver exclusive of said transmitter, for determining pulse origination times of said pulses emanating from said transmitter; and

means, responsive to receipt of components of said transmitted beam that are reflected from scatterers in said predefined space and responsive to said determined pulse origination times, for generating data indicative of locus of said scatterers in said predefined space.

5,469,170

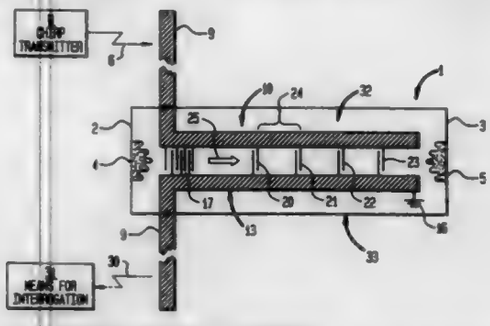
PASSIVE SAW-ID TAGS USING A CHIRP TRANSDUCER

Elio A. Mariani, Hamilton Square, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 20, 1994, Ser. No. 326,553

Int. Cl.[6] G01S *13/80*; H01L *41/08*

U.S. Cl. 342—51 **48 Claims**



1. An SAW-ID tag device, comprising:

a piezoelectric substrate with temperature-stable characteristics, having a top surface and a bottom surface;

an upper bus bar, a lower bus bar, a plurality of electrode taps and an input chirped SAW transducer disposed on said top surface of the piezoelectric substrate;

said input chirped SAW transducer being capable of providing a dispersive, complementary matched filter response to a chirp waveform input signal and being connected to said upper bus bar and said lower bus bar;

a built-in antenna being connected to said upper bus bar and said lower bus bar;

said plurality of electrode taps being disposed between said upper bus bar and said lower bus bar and being connected to said upper bus bar and said lower bus bar;

a transmitter generating an expanded FM chirp waveform;

said plurality of electrode taps being spaced at predetermined distances from each other establishing a time-ordered code;

said input chirped SAW transducer, receiving said expanded FM chirp waveform as an expanded input chirp signal through said antenna and compressing said input expanded chirp signal into a narrow, compressed pulse signal propagating toward said plurality of electrode taps;

said plurality of electrode taps producing a plurality of narrow, compressed pulse samples propagating a time-ordered pulse train output to said antenna; and

said antenna transmitting a time-ordered pulse train output signal back to a means for interrogation identifying said SAW-ID tag device.

5,469,171

HF BACKGROUND NOISE MEASUREMENT IN HF ENVIRONMENTS

George F. Earl, and Bruce D. Ward, both of Adelaide, Australia, assignors to The Commonwealth of Australia, Canberra Act, Australia

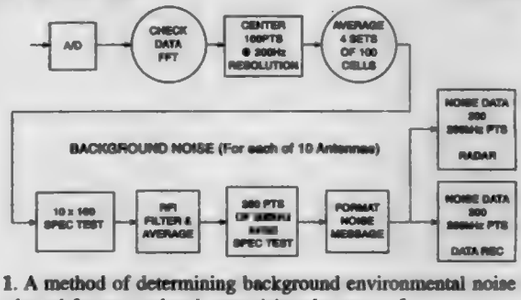
PCT No. PCT/AU92/00197, § 371 Date Dec. 8, 1993, § 102(e) Date Dec. 8, 1993, PCT Pub. No. WO92/19981, PCT Pub. Date Nov. 12, 1992

PCT Filed May 1, 1992, Ser. No. 140,087

Claims priority, application Australia, May 2, 1991, PK5953

Int. Cl.[6] H01Q *3/00*

U.S. Cl. 342—159 **18 Claims**



1. A method of determining background environmental noise in a selected frequency band comprising the steps of:

accumulating a plurality of scans of analogue signals from each of a plurality of input sources;

transforming the accumulated signals;

averaging the transformed signals from a number of scans;

rejecting those digital signals affected by radio frequency interference (RFI) to produce substantially RFI free averaged signals;

scaling the RFI free averaged signals to produce absolute signals;

further averaging the produced absolute signals to produce a background noise level; and

displaying the background noise level as a function of frequency on a visual display means.

5,469,172

CALIBRATION METHOD AND APPARATUS FOR RECEIVING TRANSPONDER REPLY SIGNALS

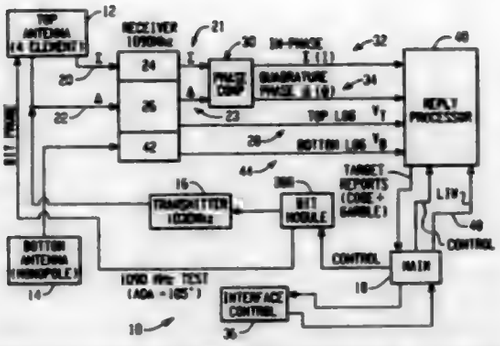
William E. Schleder, and Albert D. Eggleston, both of Dublin, Ohio, assignors to BF Goodrich FlightSystem, Inc., Columbus, Ohio

Filed Nov. 16, 1993, Ser. No. 153,737

Int. Cl.[6] G01S *7/40*

U.S. Cl. 342—174 **23 Claims**

1. In combination, means for receiving one or more electromagnetic data encoded signals from a transmitter and producing in response to each data signal two signals having a phase relationship, said receiving means comprising an antenna; signal processing means for using said phase relationship to determine information related to said data signals; and means for coupling a calibration input signal into said antenna to produce two calibration signals having a known phase relationship; said signal pro-



cessing means using said known phase relationship to compensate for phase errors when processing said data signals.

5,469,173

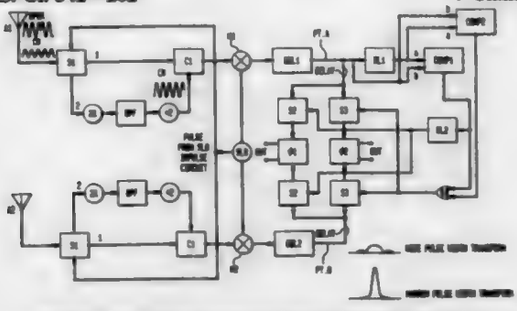
MONITORING PHASE CHARACTERISTICS OF BPSK AND CW SIGNALS

William J. Skudera, Jr., Oceanport, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 7, 1994, Ser. No. 224,606

Int. Cl.[6] G01S *7/28*

U.S. Cl. 342—202 **7 Claims**



1. A system for contemporaneously monitoring phase characteristics of BPSK and CW signals, comprising:

a pair of physically separated antennas;

a dual channel chirp-Z processor;

individual circuits for connecting the antennas to the chirp-Z channels through first and second paths, each first path passing antenna signals directly to the chirp-Z channel and each second path passing antenna signals to the chirp-Z channel through means for deriving the fundamental CW frequency of BPSK and CW signals;

individual detectors for monitoring phase characteristics of BPSK and CW signals from transforms derived concurrently by the dual channels of the chirp-Z processor; and

circuit means for discerning whether the transforms derived concurrently from the chirp-Z channels relate to BPSK or CW signals and passing such transforms to the appropriate phase detector in accordance with the type of signal to which they relate.

5,469,174

PULSE TRANSMITTER FOR TERMINATING REFLECTED WAVES

John McCorkle, 8709 Oxwell La., Laurel, Md. 20708-2453

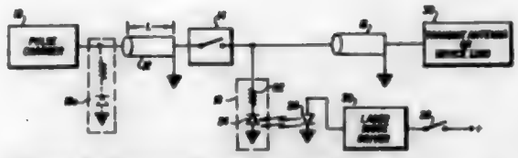
Filed Dec. 1, 1993, Ser. No. 160,303

Int. Cl.[6] G01S *13/00*

U.S. Cl. 342—203 **11 Claims**

1. A pulse transmitter for terminating reflected waves, comprising:

a pulse charger for generating a pulse for charging a transmission line;



a charge line connected to said pulse charger;

an output cable for receiving a pulse from said charge line;

a transmit switch connected between said charge line and said output cable;

a shunt element connected between said transmit switch and ground; and wherein said charge line is of length L and said pulse received by said output cable from said charge line is of approximately 2 L in length.

5,469,175

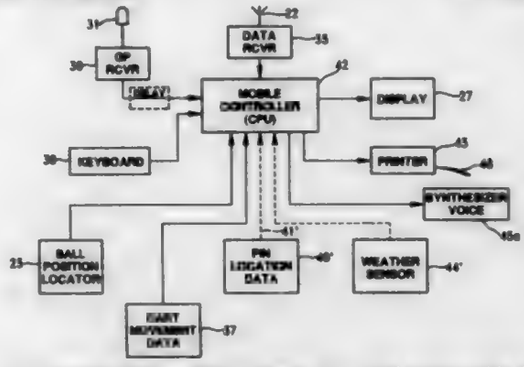
SYSTEM AND METHOD FOR MEASURING DISTANCE BETWEEN TWO OBJECTS ON A GOLF COURSE

Bertho Boman, Fort Lauderdale, Fla., assignor to Golf Scoring Systems Unlimited, Inc., Davie, Fla.

Filed Mar. 29, 1993, Ser. No. 38,268

Int. Cl.[6] G01S *5/02;3/02;* A63B *55/00;* G01C *21/00*

U.S. Cl. 342—357 **32 Claims**



1. A system for providing a player on a golf course with the distance between a golf ball on said golf course and a stationary object on said golf course, where the location of said object is previously known and defined by object location data, said system comprising:

a) a first unit transmitting an error data signal to each of a plurality of mobile units on said golf course which mobile units are remotely spaced from said golf ball, said first unit including;

i) a fixed receiving means, positioned in a fixed location, said fixed location being accurately defined by known location data, said known location data preserved and stored for use, said receiving means receiving navigation signals from navigation satellites and deriving, from said navigation signals, first location data generally defining said fixed location,

ii) a location data comparing means for receiving and comparing said known location data and said first location data and for generating said error data signal corresponding to differences between said known location data and said first location data, and

iii) data transmission means for transmitting said error data signal to said mobile units;

b) each of said mobile units including;

i) a mobile receiving means for receiving navigation signals from navigation satellites and for deriving, from said navigation signals, second location data generally defining the location of said mobile unit,

ii) data receiving means for receiving said error data signal transmitted from said data transmission means,

iii) a data adjusting means for receiving said second location data from said mobile receiving means and for receiving said error data signal from said data receiving means and

for adjusting said second location data with said error data signal for generating a third location data accurately defining the location of said mobile unit,

iv) a golf ball locating means for measuring and determining ball distance data defining the distance said golf ball is positioned from said location of said mobile unit and for determining a ball direction data defining the direction said golf ball is positioned from said mobile unit,

v) a data shifting means for receiving said third location data from said data adjusting means and for receiving said ball distance data and said ball direction data from said golf ball locating means and for shifting said third location data by said ball distance data and said ball direction data for generating a ball location data defining the location of said golf ball,

vi) a calculation means for receiving said object location data and said ball location data and for calculating a distance between said golf ball and said object on said golf course.

5,469,176

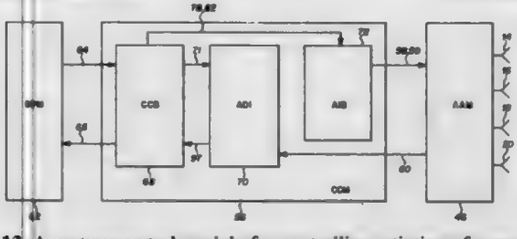
FOCUSED ARRAY RADAR

Sheldon Sandler, Lexington; Alan Crandall, Lunenberg; Daniel Schwarzkopf, Stow; Gilbert Johnson, Holliston, and Rudolph Borkowski, Townsend, all of Mass., assignors to Geo-Centers, Inc., Newton Centre, Mass.

Filed Aug. 31, 1993, Ser. No. 115,409

Int. Cl.[6] H01Q *3/22*

U.S. Cl. 342—375 **21 Claims**



13. A custom control module for controlling a timing of respective RF pulsed signals transmitted by a plurality of antenna elements so as to form a transmit antenna illumination pattern for studying sub-surface strata, and for controlling timing of a plurality of antenna elements receiving a plurality of back-scattered RF pulsed signals so as to form a receive antenna illumination pattern for studying the sub-surface strata, the custom control module comprising:

a custom control board for generating and outputting a plurality of transmit and a plurality of receive control signals, delayed relative to one another; and

an array interface board, responsive to the plurality of transmit and the plurality of receive control signals, for amplifying the plurality of transmit and the plurality of receive control signals and for outputting a plurality of amplified transmit and a plurality of amplified control signals, to the plurality of antenna elements.

5,469,177

ANTENNA ASSEMBLY AND METHOD THEREFOR

Tonya A. Rush, Barrington; Steven P. Moehling, Crystal Lake, and Kenneth J. Roback, Arlington Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 15, 1993, Ser. No. 121,393

Int. Cl.[6] H01Q *1/24*

U.S. Cl. 343—702 **12 Claims**

1. An antenna assembly for a radio having radio circuitry, said antenna assembly comprising:

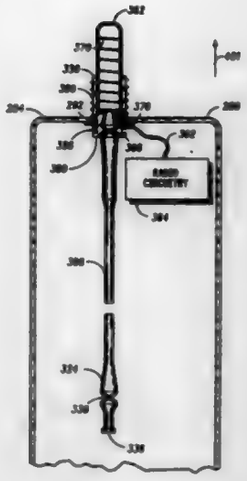
an antenna shaft defining a longitudinal axis and having a proximal side portion and a distal side portion;

a support tube positioned about the antenna shaft, said support tube having an inner diameter of dimensions permitting translation of the antenna shaft through the support tube to permit the support tube to be positioned about the proximal side portion of the antenna shaft or, alternately, to permit the support tube to be positioned about the distal side portion of the antenna shaft; and

a detent mounted upon the support tube and engageable alternately with the proximal side portion and the distal side portion of the antenna shaft, thereby to maintain positioning of the proximal side portion of the antenna shaft at the support tube or the distal side portion of the antenna shaft at the support tube, respectively;

wherein the detent comprises a spring clip forming a U-shaped spring having a first spring arm and a second spring arm wherein the first and second spring arms are each engageable with the antenna shaft; and

wherein the proximal-side portion of the antenna shaft comprises a proximal-side tapered mandrel portion of gradually-increasing diametral dimensions wherein translation of the antenna shaft through the support tube out of the position at which the distal side portion of the antenna shaft is positioned at the support tube and into the position at which the proximal side portion of the antenna shaft is positioned at the support tube causes expansive forces to be exerted upon the first and second spring arms of the spring clip as the proximal-side, tapered mandrel portion of the antenna shaft is translated through the support tube.



5,469,178

LOW PROFILE ANTENNA SYSTEM FOR A CARDLIKE COMMUNICATION RECEIVER

Tuan K. Nguyen, Boca Raton; Pha Nguyen, Lake Worth; Donna A. Clark, West Palm Beach, and Robert A. Marinelli, Boynton Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

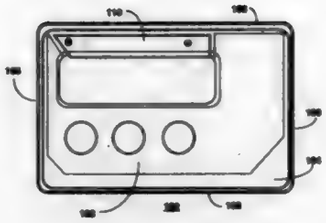
Continuation of Ser. No. 954,230, Sep. 30, 1992, abandoned. This application May 31, 1994, Ser. No. 252,137

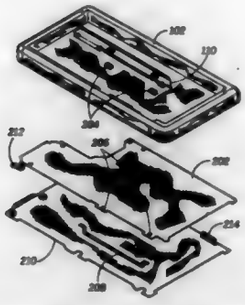
Int. Cl.[6] H01Q *1/24*

U.S. Cl. 343—702 **15 Claims**

1. A low profile antenna system comprising:

a frame, having i front surface and four contiguous side surfaces, for supporting and partially enclosing a printed circuit board having first and second surfaces, said first surface supporting components of a receiver thereon, said front surface of said frame including therewith a first conductive plate and an isolated portion thereof positioned apart from and substantially parallel to said first surface of said printed circuit board, said isolated portion coupling to said first surface of said printed circuit board and forming a first portion of a loop antenna therewith;





a conductor, positioned apart from and substantially parallel to said second surface of said printed circuit board, and coupled thereto and forming a second portion of said loop antenna; and

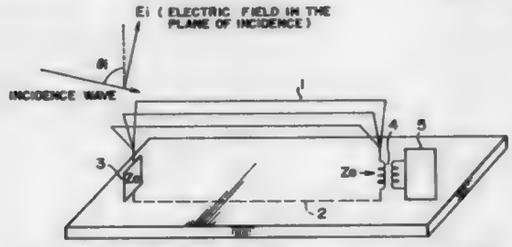
a second conductive plate, positioned adjacent and substantially parallel to said conductor, and mechanically coupled to said frame for forming a rear surface therefor, said second conductive plate being capacitively coupled to said conductor and providing therefrom a means for enhancing the sensitivity of said loop antenna.

5,469,179

PARAMETRICALLY AMPLIFYING TRAVELING-WAVE ANTENNA

Horishi Kikuchi, 3-8-18, Komagome, Toshima-ku, Tokyo 170, Japan

Filed Apr. 5, 1994, Ser. No. 223,534
Claims priority, application Japan, Apr. 6, 1993, 5-079534
Int. Cl.[6] H01Q *11/02*
U.S. Cl. 343—731 **11 Claims**



1. A parametrically amplifying traveling-wave antenna utilizing parametric amplification through strong coupling or resonance between an induced line wave and an incident sky wave comprising:

base-plate means having electrical constants satisfying the following resonance condition:

$$Q' - Q - \frac{\delta_c}{4a} > 0$$

where

-continued

$$Q = Re \frac{1}{k_2^2 - k_1^2} \int_0^\infty \{u - \sqrt{u^2 - (k_2^2 - k_1^2)}\} e^{-(2h-a)u}\, du$$

$$Q' = Re \int_0^\infty \frac{e^{-(2h-a)u}}{\eta u + \sqrt{u^2 - (k_2^2 - k_1^2)}}\, du$$

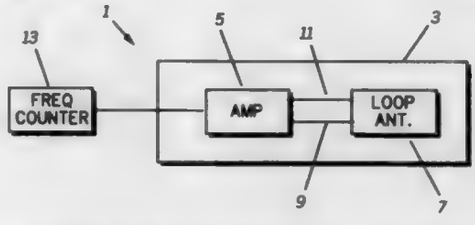
and Q and Q' are extended Carson's functions including corrections arising from finite earth conductivity and permitivity, u is an integral variable in a Fourier representation of the correction functions, Re stands for the real part, $k_1^2=\omega^2\epsilon_1\mu_1$, $k_2^2=\omega^2\epsilon_2\mu_2-j\omega\sigma_2\mu_2$, k is the wave number, σ, ϵ, and μ are, respectively, conductivity, dielectric constant, and permeability, $\omega=2\pi f$ is the angular frequency, $[\eta^2]$ $\eta=k_2^2/k_1^2$, h and a are, respectively, the height and radius of a wire conductor, $\delta_c=\sqrt{2/(\omega\sigma_c\mu_c)}$ is skin depth of the wire conductor, $\mu_1=\mu_2=\mu_0$, where μ_0 is vacuum permeability, and where subscripts c, 1, and 2 refer to the wire conductor, a dielectric medium 1, and the base-plate means or ground medium 2, the wire conductor having ends and being disposed above the base-plate means or ground, the ends being terminated so that no signal reflections are produced at the ends.

5,469,180

METHOD AND APPARATUS FOR TUNING A LOOP ANTENNA

James T. Wiggenhorn, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1994, Ser. No. 236,802
Int. Cl.[6] H01Q *11/12*
U.S. Cl. 343—744 **7 Claims**



1. An apparatus for tuning the frequency of a loop antenna to a selected operating frequency comprising:

an amplifier attached to the loop antenna, the loop antenna being adjustable for providing a predetermined degree of phase shift allowing the amplifier to achieve oscillation at an oscillating frequency; and

a frequency counter attached to the amplifier for monitoring the oscillating frequency of the amplifier to determine when the loop antenna is correctly adjusted through the amplifier's oscillation at the selected operating frequency.

5,469,181

VARIABLE HORIZONTAL BEAMWIDTH ANTENNA HAVING HINGEABLE SIDE REFLECTORS

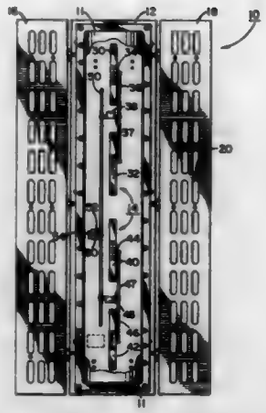
George D. Yarsunas, Vincentown, N.J., assignor to Celwave, Marlboro, N.J.

Filed Mar. 18, 1994, Ser. No. 210,273
Int. Cl.[6] H01Q *21/12*
U.S. Cl. 343—815 **18 Claims**

1. A broadband directional antenna comprising:

a) a flat central reflector plate;

b) dipole means arranged on said central reflector plate for radiating a radio frequency signal, including a binary feed network having a microstrip transmission line and a colinear array of radiating elements; and



c) at least one flat side reflector plate being hinged to said central reflector plate for adjusting the horizontal radiation beamwidth of the radio frequency signal.

5,469,182

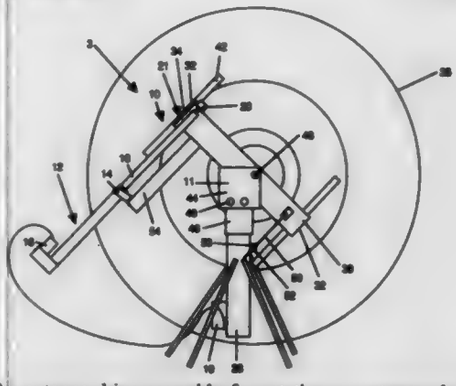
ANTENNA DRIVE ASSEMBLY

Frank Chaffee, Spring Green, Wis., assignor to Orbitron Division of Greenbriar Products, Inc., Spring Green, Wis.

Filed Aug. 20, 1993, Ser. No. 109,806

Int. Cl.[6] H01Q *3/04*

U.S. Cl. 343—882 **13 Claims**



1. An antenna drive assembly for rotating an antenna about an axis of rotation, the drive assembly adapted for use with an antenna base assembly located at a latitude on earth, the antenna base assembly including a vertically oriented base, a pivotable axis member pivotably secured to the base at an adjustable angle based on the latitude; a driving arm extending from the axis member; and an axial rotating mount connecting the axis member to the antenna such that the antenna can be rotated about an axis of rotation extending through the connection between the axial rotating mount and the axis member, the drive assembly comprising:

a linear actuator pivotably mounted to the driving arm, the linear actuator having at one end an extensible and retractable portion,

a first link pivotably connected at one end to the extensible and retractable portion of the linear actuator and pivotably connected at the other end to the axial rotating mount; and

a second link pivotably connected at one end to the driving arm and pivotably connected at the other end to the first link, such that the first and second links cause the antenna to be rotated through a greater sweep of the sky than would be possible if the linear actuator connected directly to the axial rotating mount.

5,469,183

SYNCHRONOUS DISPLAY CONTROL APPARATUS

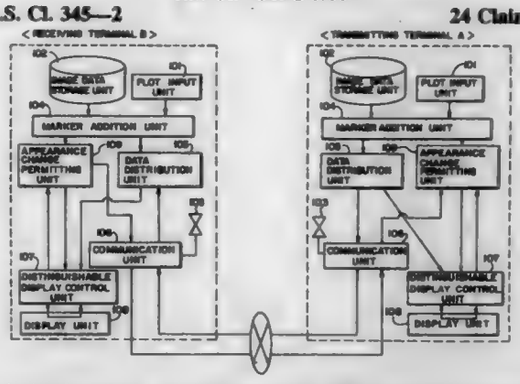
Ayako Takatsuji, Hirakata, and Noritake Okada, Kadoma, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 14, 1993, Ser. No. 77,250

Claims priority, application Japan, Jun. 12, 1992, 4-153875

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—2 **24 Claims**



1. A transmitting terminal connected with a receiving terminal over a communication line in a synchronous display system for displaying data to be displayed synchronously both on a transmitting terminal display and a receiving terminal display, comprising:

data segment means for segmenting the data into a plurality of parts at predetermined intervals;

communication means for transmitting the segmented data to the receiving terminal and then receiving a reply therefrom every time a part of the segmented data has been received for display on the receiving terminal display;

display means for visualizing the data; and

display control means for controlling the display means to be driven to display the same part as is transmitted to the receiving terminal, at first distinguishably from the other parts which have been already transmitted for display, and then indistinguishably therefrom when the communication means receives a reply from the receiving terminal that the same part has been received for display on the display means.

5,469,184

DIRECTLY VIEWABLE SPEED DISPLAY SYSTEM

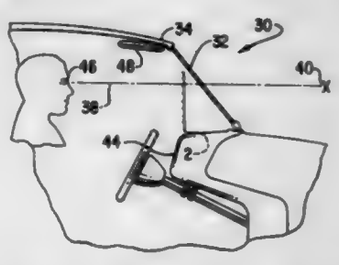
Wilbur S. Mount, 5806 College Creek Pl., Williamsburg, Va. 23188

Continuation-in-part of Ser. No. 685,071, Apr. 15, 1991, Pat. No. 5,321,415. This application May 11, 1994, Ser. No. 240,899

The portion of the term of this patent subsequent to Jun. 14, 2011, has been disclaimed.

Int. Cl.[6] G09G *3/00*; B60Q *1/00*

U.S. Cl. 345—7 **14 Claims**



1. A speed display system for use in a vehicle, intended to be operated by a sighted human operator, said operator having an optical focus point which is changeable, said display system comprising:

at least one illumination device, the illumination of which represents a speed scale,

at least one illumination device distinct from the first mentioned illumination device, the illumination of which represents an actual speed of the vehicle,

means to cause illumination of said speed scale and said actual speed illumination devices,

said illuminated speed scale and actual speed illumination devices being mounted in said vehicle so as to be directly viewable by the operator of the vehicle when the operator's optical focus point is directed towards the path of the vehicle.

5,469,185

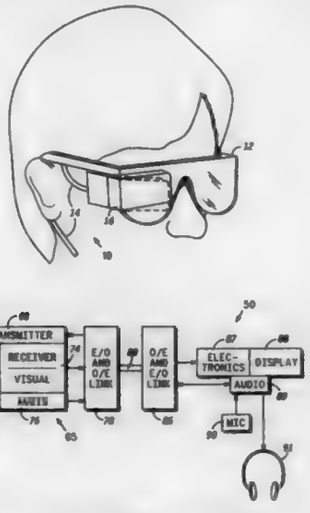
REMOTE SENSORY UNIT AND DRIVER

Michael S. Lebby, Chandler, and Karen E. Jachimowicz, Goodyear, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 844,872, Mar. 2, 1992, abandoned. This application Aug. 13, 1993, Ser. No. 105,664

Int. Cl.[6] G09F *9/35;* **G02B** *6/00*

U.S. Cl. 345—8 **6 Claims**



6. A remote sensory unit and driver comprising:

a remote visual display having an array of pixels on a semiconductor chip with each pixel including at least one light generating device and the array of pixels being arranged in a regular pattern of rows and columns for producing a real image on a surface of the semiconductor chip, and including an optical waveguide having an inlet positioned adjacent the array of pixels for receiving a real image provided thereby and an outlet spaced from the inlet and defining the viewing aperture, the optical waveguide defining an optical path therethrough from the inlet to the outlet and constructed to transmit an image from the inlet to the outlet, and optical means positioned along the optical waveguide at predetermined areas in the optical path for magnifying a real image supplied at the inlet and providing a magnified virtual image at the outlet, the optical means including a diffractive optical element, the visual display further including input/output means for receiving light signals and converting the light signals to the real image, the input/output means of the visual display including transducers for converting at least some light signals received from a driver into electrical signals for controlling the electronic display;

an interconnect including a plurality of fiber optics having first and second ends, the first end being attached to the visual display; and

a driver having input/output means with the second end of the interconnect attached thereto, the input/output means of the driver including transducers for converting electrical signals generated by the driver into light signals for controlling the electronic display, the driver providing operating signals including the generated light signals to the display by way of the interconnect when the driver is energized.

5,469,186

DISPLAY DEVICE WITH FACE PLATE RESPONSIVE TO MULTIPLE WAVE LENGTH BEAMS

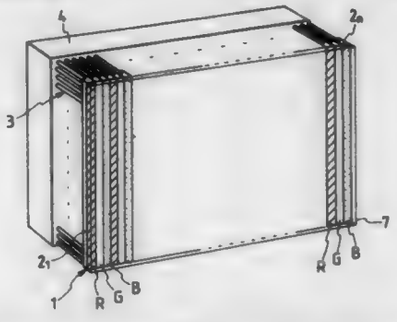
Satoru Tanaka; Fumio Matsui, and Yasushi Murata, all of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 348,362, May 8, 1989, abandoned. This application Jun. 21, 1991, Ser. No. 721,930

Claims priority, application Japan, Jul. 15, 1988, 63-176653; Jul. 15, 1988, 63-176654; Jul. 17, 1988, 63-176652

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—32 **17 Claims**



1. A display device comprising: a face plate comprising a light emitting layer having multiple columnar members, adjacent members of which are sensitive to different wavelength invisible rays, said face plate emitting light in a plurality of different colors in response to said different wavelength invisible rays, respectively; and means for selectively irradiating said light emitting layer with each of said different wavelength invisible rays; wherein each of said multiple columnar members has a parallelogram shaped cross-section with light receiving and emitting portions on opposite ends thereof, such that an axis of said parallelogram running between light receiving and emitting portions is not perpendicular to said face plate, to prevent invisible rays from being transmitted directly through the columnar member.

5,469,187

LARGE SCALE ELECTRONIC DISPLAY SYSTEM

Zvi Yaniv, Farmington Hills, Mich., assignor to Advanced Technology Incubator, Inc., Farmington Hills, Mich.

Continuation-in-part of Ser. No. 28,812, Mar. 10, 1993, abandoned. This application Jun. 3, 1994, Ser. No. 253,906

Int. Cl.[6] H04N *5/66*

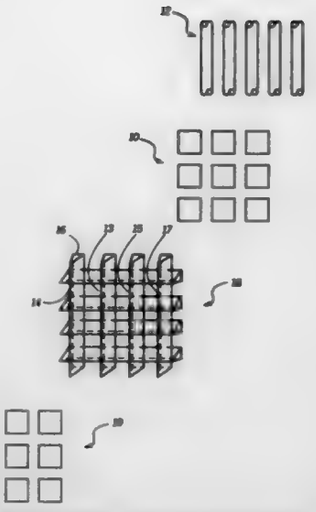
U.S. Cl. 345—98 **21 Claims**

1. A large area liquid crystal display comprising:

a substantially rectangular support structure adapted for viewing by a plurality of viewers, and having a viewer proximal and a viewer distal side, said structure comprised of a plurality of elongated triangular members, coated with a reflective material, and arranged horizontally and vertically so as to define an X-Y matrix of substantially parallel rows and columns, the space between each two adjacent horizontal and each two adjacent vertical triangular members defining an opening, and each said opening having a length dimension greater that the width dimension;

discrete liquid crystal picture elements, each liquid crystal picture element adapted to present a large image area to viewers of the information displayed thereupon;

a liquid crystal picture element being operatively disposed in each one of the openings in the X-Y matrix of said support structure;



discrete, electronic switching elements electrically connected to the liquid crystal picture elements for simultaneously addressing specific elements in the rows and columns of the matrix; and

a control optical element operatively disposed adjacent to the viewer proximal side of the support structure, said control optical element comprising a holographic diffuser, and is adapted to control diffusion in both the horizontal and vertical direction.

5,469,188

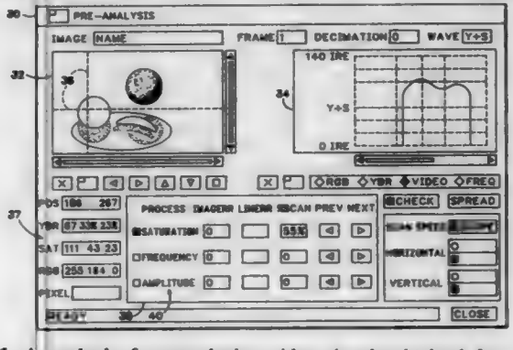
PRE-ANALYSIS OF VIDEO SIGNALS OBTAINED FROM DIGITAL IMAGES

Suresh Krishnamurthy, Bangalor, Ind.; Robert A. McCormick, Beaverton, Oreg.; Kenneth F. Cone, Portland, Oreg.; Gary L. Brown, Lake Oswego, Oreg., and Ronald W. Bryant, Mt. Angel, Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Apr. 27, 1992, Ser. No. 874,447

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—117 **8 Claims**



1. A method of pre-analyzing video signals obtained from a digital image to be displayed to identify potential distortion areas in the displayed digital image when the video signals are encoded and decoded comprising the steps of:

storing the digital image in a specified digital video format in a frame buffer store;

scanning the stored digital image to produce a video signal;

analyzing the video signal according to parameters determined by a selected one from a plurality of analysis functions to generate an error signal; and

displaying the error signal.

5,469,189

DISPLAY APPARATUS AND METHOD WITH MULTI-WINDOW FUNCTION

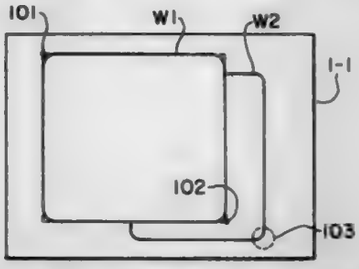
Yasuhiro Noguchi; Hiroshi Kuwahara; Isao Yasuda, all of Hitachi, and Kazuo Takei, Ibaraki, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 3, 1989, Ser. No. 346,791

Claims priority, application Japan, May 6, 1988, 63-109046

Int. Cl.[6] G09G *1/06*

U.S. Cl. 345—118 **4 Claims**



1. A display apparatus having a multi-window function for displaying at least one window on a display screen, said display apparatus comprising:

preset means for presetting coordinate data defining a window having a rectangular outer frame composed of a plurality of straight sides, wherein each of said straight sides includes a set of pixels aligned in a straight line, each set of pixels aligned in a straight line includes a corner pixel at both ends of the straight line, and each corner pixel in each straight line represents a corner of said outer frame; and

rounding means for performing a predetermined rounding processing for rounding each corner of said window such that all of the pixels except the corner pixels of said outer rectangular frame of said window are displayed on the display screen;

wherein each of the corner pixels of said rectangular outer frame represents a virtual intersection of a number of said sides of said rectangular frame, and said rounding means performs said rounding processing such that each of said virtual intersections is prevented from being displayed on the display screen; and

wherein said preset means presets coordinate data defining a rectangular inner frame of said window, said rectangular inner frame is composed of a plurality of straight sides, each of said straight sides of said rectangular inner frame includes a set of pixels aligned in a straight line, each set of pixels aligned in a straight line included within the straight sides of said rectangular inner frame includes an inner corner pixel at both ends of the straight line, and each inner corner pixel in each straight line represents an inner corner of said rectangular inner frame, and said rounding means performs said rounding processing such that all of the pixels of said rectangular inner frame are displayed on the display screen within said rectangular outer frame and the number of pixels in each side of said rectangular outer frame is not greater than the number of pixels in a corresponding side of said rectangular inner frame.

5,469,190

APPARATUS FOR CONVERTING TWENTY-FOUR BIT COLOR TO FIFTEEN BIT COLOR IN A COMPUTER OUTPUT DISPLAY SYSTEM

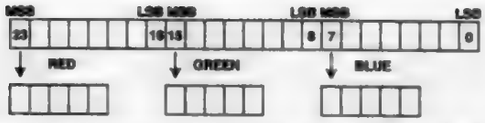
Anthony Masterson, Saratoga, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 23, 1991, Ser. No. 813,147

Int. Cl.[6] G09G *5/04*

U.S. Cl. 345—155 **13 Claims**

1. An apparatus for converting representations of color pixels in a twenty-four bit color format to representations in a fifteen bit color format comprising an individual circuit for each color component in a first format having eight bits, each of said individual circuits comprising:



a decision circuit having a first input and a second input and an output such that said first input is coupled to a first input of said individual circuit and said second input is coupled to a second input of said individual circuit, said first input of said decision circuit receives lowest order bits of a color component in said first format wherein said decision circuit is responsive to a value of said lowest order bits indicating whether five highest order bits of said color component should be incremented, said second input of said decision circuit receives a plurality of pixel address bits identifying a pixel location of said color component wherein said pixel location, depending on a desired pattern of pixels, selectively enables said decision circuit to be responsive to said value of said lowest order bits;

an incrementer circuit having a first input and a second input and an output such that said second input is coupled to said output of said decision circuit and said output of said incrementer circuit is coupled to said output of said individual circuit, said first input of said incrementer circuit receives said five highest order bits of said color component in said first format, said second input receives a signal from said output of said decision circuit wherein said signal selectively enables said incrementer circuit to increment said five highest order bits of said color component in said first format, said output of said incrementer circuit provides data representing said color component in a second format having five bits which has been selectively incremented, said output of said individual circuit truncates said lowest order bits after said decision circuit selectively enables said incrementer circuit.

5,469,191

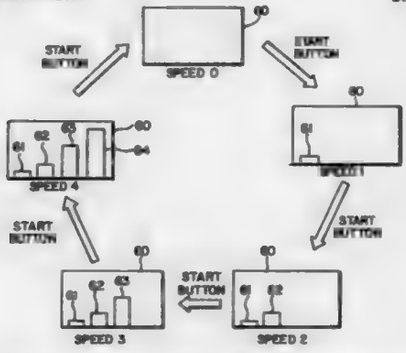
CURSOR CONTROL SYSTEM

Jay Smith, III, 348 Bentel Ave., Los Angeles, Calif. 90049, and Jeffrey W. Fort, 4825 San Gordiano Ave., Santa Barbara, Calif. 93111

Continuation of Ser. No. 639,592, Jan. 9, 1991, abandoned. This application Nov. 30, 1992, Ser. No. 983,117

Int. Cl.[6] G09G *3/02*

U.S. Cl. 345—157 **15 Claims**



1. A cursor movement system capable of moving a cursor in straight lines and in smooth curves comprising:

a display;

a cursor movable on said display, said cursor being rotatable on its own axis for selecting a forward direction of said cursor, and including a rotatable direction indicating means for indicating the forward direction;

a move switch which may be activated for moving said cursor without drawing a line;

movement control means for moving said cursor in the forward direction at a selected speed of forward movement in response to an activation of said move switch;

an operable member for providing one of a finite plurality of discrete directional signals in response to an activation of said operable member; and

rotational control means for rotating the rotatable direction indicating means of said cursor at a predetermined speed of rotation in response to the discrete directional signal, the rotatable direction indicating means of said cursor rotating towards the direction indicated by the discrete directional signal,

whereby said move switch and said operable member may be simultaneously activated to move the cursor forward in a smooth curve of a predetermined radius.

5,469,192

METHOD AND APPARATUS FOR INCREASING THE FUNCTIONALITY OF COMPUTER SYSTEM POINTING DEVICES BY SIMULTANEOUS ACTUATION OF BUTTONS THEREON

Paul G. Allen, and Arthur T. Whitten, both of 110 110th Ave. NE., Suite 700, Bellevue, Wash. 98004

Filed Mar. 12, 1993, Ser. No. 31,006

Int. Cl.[6] G09G *3/02*

U.S. Cl. 345—157 **1 Claim**

1. A method for using a navigation palette for creating and editing a multimedia slide presentation on a computer system, said computer system including a programmed computer, an input device coupled to said computer and selected from the group consisting of trackball and mouse, and a display device coupled with said computer, the method forming a programmed user interface and comprising the steps of:

determining if two buttons on said input device are actuated substantially simultaneously;

determining if said navigation palette is currently shown on said display means;

if said navigation palette is shown on said display device, hiding said navigation palette;

if said navigation palette is not shown on said display means, determining if said navigation palette was previously created;

if said navigation palette is not shown on said display means and if said navigation palette was previously created, showing said navigation palette on said display device;

if said navigation palette is not shown on said display means and if said navigation palette was not previously created, creating said navigation palette by

a) creating a palette window,

b) reading resource data from said computer, said resource data for defining portions of said navigation palette,

c) creating graphical control symbols as specified in said resource data;

d) adjusting the size of said navigation palette as required to include said graphical control symbols in said navigation palette, and;

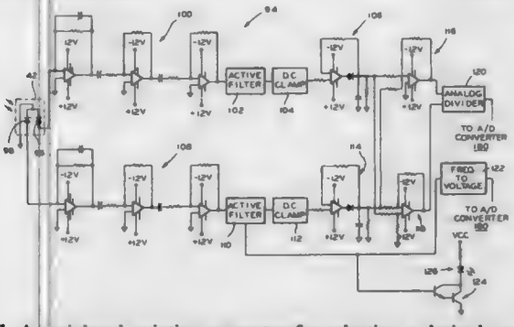
showing said navigation palette on said display device.

5,469,193

CORDLESS POINTING APPARATUS

John J. Giobbi, Crown Point, Ind., and David H. Burke, Glenwood, Ill., assignors to Prelude Technology Corp., Cedar Lake, Ind.

Filed Oct. 5, 1992, Ser. No. 956,408
Int. Cl.[6] G09G *3/02*
U.S. Cl. 345—158 **17 Claims**



1. A peripheral pointing apparatus for selecting a desired position for transmission to a processing system, comprising:

a hand-held pointer including a transmitter continually transmitting a through the air signal;

a fixed base unit positioned in proximity to said pointer including a receiver for receiving the through the air transmitted signal, the receiver including spaced apart first and second pairs of photodiodes and a receive circuit connected to said photodiodes, the receive circuit developing a first angle signal representing a first angle of said inter relative to said base unit using said first pair of photodiodes and a second angle signal representing a second angle of said pointer relative to said base unit using said second pair of photodiodes, processing means for processing the first angle signal and the second angle signal to determine position of the pointer relative to the fixed base receiver in response to the received signal, and transmission means for transmitting information representing the determined position to a processing system.

5,469,194

APPARATUS AND METHOD FOR PROVIDING DIFFERENT INPUT DEVICE ORIENTATIONS OF A COMPUTER SYSTEM

Michael B. Clark, Glendale, and Daniel S. Venolia, San Francisco, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 13, 1994, Ser. No. 242,540
Int. Cl.[6] G09G *5/08*
U.S. Cl. 345—173 **14 Claims**

1. In a computer system having an input device for controlling a position of a cursor on a display screen, a method of compensating for a physical orientation of said input device relative to said display screen, said method comprising the steps of:

determining said physical orientation of said input device in relation to said display screen;

if said input device has a horizontal orientation, transmitting a first set of values corresponding to an X axis and a second set of values corresponding to a Y axis generated by said input device to said computer system, wherein a horizontal movement indicated by said input device corresponds to a horizontal movement of said cursor and a vertical movement indicated by said input device corresponds to a vertical movement of said cursor;

if said input device has a vertical orientation:

exchanging said first set of values generated by said input device with said second set of values generated by said input device, wherein said second set of values correspond to said X axis and said first set of values correspond to said Y axis;

changing a sign of said first set of values corresponding to said Y axis;

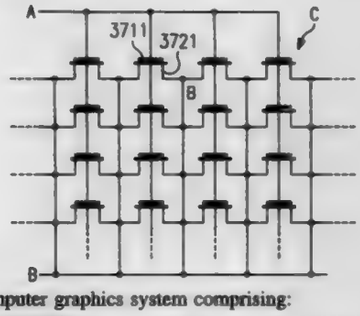
transmitting said first set of values corresponding to said Y axis and said second set of values corresponding to said X axis, wherein a horizontal movement indicated by said input device in said vertical orientation corresponds to a horizontal movement of said cursor and a vertical movement indicated by said input device in said vertical orientation corresponds to a vertical movement of said cursor.

5,469,195

INTEGRATED CIRCUIT CAPACITORS, BUFFERS, SYSTEMS AND METHODS

Henry T. Yung, Richardson; Louis J. Izzi, Plano, and William R. Krenik, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 994,166, Dec. 21, 1992, abandoned, which is a continuation of Ser. No. 647,114, Jan. 24, 1991, abandoned. This application Aug. 9, 1994, Ser. No. 288,137
Int. Cl.[6] G09G *1/28*
U.S. Cl. 345—199 **3 Claims**



1. A computer graphics system comprising:

a digital computer;

a video memory connected to said digital computer and operable to store color codes for information in a video image; and

a palette device connected to said video memory and including palette integrated circuity on an integrated circuit die, said palette integrated circuitry having:

a dot clock buffer with transistors connected to supply rails and having an output distributed directly to the rest of the palette circuitry;

an integrated circuit capacitor on the integrated circuit die of said palette device, the capacitor comprising a plurality of parallel-connected field effect transistors each having a

source, a gate, and a drain, said gate of each of said parallel-connected field effect transistors is connected to a first common supply rail, and said source and said drain of each of said parallel-connected field effect transistors is connected to a second common supply rail, wherein said parallel-connected transistors are connected to form said capacitor having low resistance and high capacitance; and

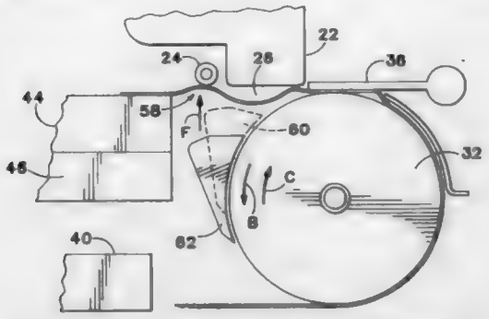
wherein said source or said drain of one parallel-connected field effect transistor is shared with another parallel-connected field effect transistor so as to form the source or drain of said other parallel-connected field effect transistor, and a first metal layer is disposed above said field effect transistors so as to interconnect the sources and drains of the parallel-connected field effect transistors and a second metal layer is disposed above said first metal layer so as to provide a connection from said first metal layer to said second common supply rail.

5,469,196

PRINT MATERIAL VARIABLE SUPPORT MECHANISM

Sandra Y. Okazaki, Vancouver, Wash., and John P. Harmon, Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 30, 1993, Ser. No. 85,864
Int. Cl.[6] B41J *25/308*
U.S. Cl. 347—8 **9 Claims**



1. A wet ink printer mechanism to reduce buckling of print medium toward a printhead during printing, the printer mechanism comprising:

a moveable platen positioned adjacent a print medium during printing, the platen supporting the print medium during relatively low ink density printing;

a drive mechanism operatively connected to the platen such that the drive mechanism selectively moves the platen away from the print medium during relatively high ink density printing, thereby allowing the print medium to buckle away from a printhead during relatively high ink density printing; and

a platen control device including an ink density sensing mechanism, the platen control device operatively connected to the drive mechanism to effect movement of the platen away from the print medium when the ink density sensing mechanism senses relatively high ink density during printing.

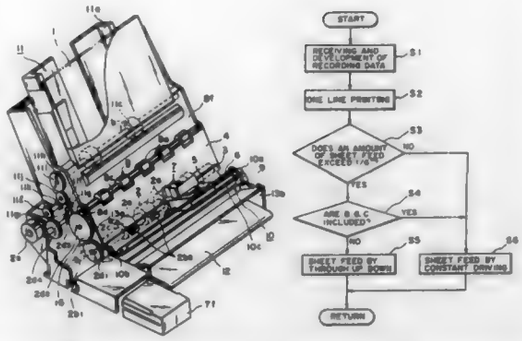
5,469,197

RECORDING APPARATUS FOR CONTROLLING CONVEYANCE SPEED OF RECORDING MEDIUM IN ACCORDANCE WITH A TYPE OF RECORDING DATA TO BE RECORDED

Soichi Hiramatsu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 763,254, Sep. 20, 1991, abandoned.
This application Sep. 1, 1993, Ser. No. 115,126
Claims priority, application Japan, Sep. 21, 1990, 2-252271
Int. Cl.[6] B41J *2/01;19/96*
U.S. Cl. 347—16 **13 Claims**

1. A recording apparatus for recording various types of recording data on a recording sheet, said apparatus comprising:



recording means for recording an image having a predetermined width onto the recording sheet in accordance with a predetermined amount of recording data such that a main scan is effected in a first direction, the recording data being one of at least two types;

relative moving means operable in more than one operation mode for relatively moving the recording means and the recording sheet in a second direction different from the first direction by a distance corresponding to the predetermined width upon every completion of the main scan by the recording means, wherein a recording operation for a single recording sheet is completed by means of alternately repeating the main scan by the recording means and relative movement by the relative moving means; and

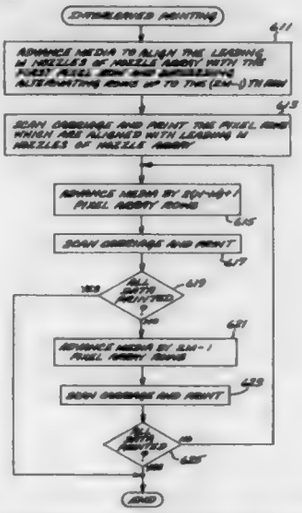
control means for selecting the operation mode of the relative moving means regarding the relative movement of the distance corresponding to the predetermined width, upon every completion of the main scan in accordance with the type of the recording data recorded in the main scan, and activating said relative moving means in the selected operation mode.

5,469,198

MULTIPLE PASS PRINTING FOR ACHIEVING INCREASED PRINT RESOLUTION

Anne P. Kadonaga, Del Mar, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 3, 1992, Ser. No. 925,715
Int. Cl.[6] B41J *2/04*
U.S. Cl. 347—41 **13 Claims**



1. A method of operating a swath type printer to print pixel rows of a rectilinear pixel array having pixels arranged in pixel rows and pixel columns respectively aligned with the carriage axis and the media axis, the pixel array having a pixel row pitch along the media axis that is one-half the predetermined nozzle pitch, the swath type printer having a movable carriage that is movable along

a carriage axis and a thermal ink jet nozzle array supported by the movable carriage for printing onto a print media that is selectively movable along a media axis, the nozzle array having at least N nozzles adjacent to each other along the media axis and spaced apart along the media axis by a predetermined nozzle pitch, the method comprising the steps of:

(A) advancing the print media to align leading M nozzles of the array with a first and succeeding alternating pixel rows to be printed up to an (M+1)th pixel row, wherein M is not greater than N and the leading M nozzles are those first encountered by advance of the print media;

(B) scanning the carriage and printing the pixel rows aligned with the leading M nozzles of the array;

(C) advancing the media by 2(N-M)+1 pixel rows; and

(D) scanning the carriage and printing the pixel rows aligned with the N nozzles of the array.

5,469,199

WIDE INKJET PRINTHEAD

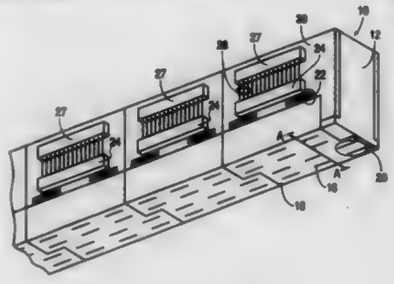
Ross R. Allen, Belmont; Si-Ty Lam, Pleasanton, both of Calif., and Paul H. McClelland, Monmouth, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 849,650, Mar. 9, 1992, Pat. No. 5,305,018, which is a continuation of Ser. No. 568,000, Aug. 16, 1990. This application Apr. 2, 1992, Ser. No. 864,890

The portion of the term of this patent subsequent to Mar. 1, 2011, has been disclaimed.

Int. Cl.[6] B41J *2/05;2/145*

U.S. Cl. 347—42 **22 Claims**



1. An inkjet printhead comprising:

a strip of material having a plurality of nozzle sections and a plurality of conductor sections, each of said conductor sections extending beyond an associated one of said nozzle sections, a front surface of said strip for facing a recording medium for printing thereon,

each of said nozzle sections containing a group of orifices formed in said strip of material,

each of said conductor sections including a plurality of conductors affixed to a surface of said strip of material and having first ends leading to an associated one of said nozzle sections for conducting electrical signals, said conductors having second ends terminating at a location remote from an associated one of said nozzle sections for connection to an ink printer;

a plurality of substrates affixed to a back surface of said strip, each of said substrates opposing one said group of orifices, each of said substrates containing individually energizable ink injection elements for causing an amount of ink to be ejected from an associated one of said orifices, said first ends of said conductors being connected to electrodes on said substrates; and

a fluid channel leading to each of said orifices and interposed between said substrates and said orifices, said fluid channel for allowing ink to flow proximate to said orifices,

wherein said plurality of nozzle sections extends substantially across an entire width of a recording medium to be printed upon such that printing may be performed substantially across said entire width of said recording medium while said strip is fixed in position and said recording medium is moved with respect to said strip.

5,469,200

POLYCRYSTALLINE SILICON SUBSTRATE HAVING A THERMALLY-TREATED SURFACE, AND PROCESS OF MAKING THE SAME

Haruhiko Terai, Yokohamashi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

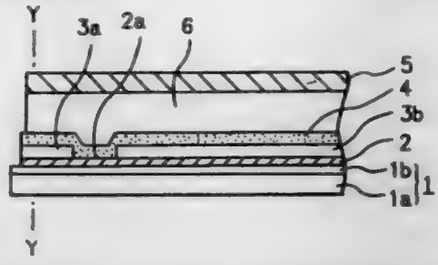
PCT No. PCT/JP92/01482, § 371 Date Nov. 16, 1993, § 102(e) Date Nov. 16, 1993, PCT Pub. No. WO93/09953, PCT Pub. Date May 27, 1993

PCT Filed Nov. 12, 1992, Ser. No. 84,264

Claims priority, application Japan, Nov. 12, 1991, 3-295852

Int. Cl.[6] B41J *2/05*

U.S. Cl. 347—63 **16 Claims**



1. A process for producing a substrate for liquid jet recording head provided with an electrothermal converting body comprising a heat generating resistor capable of generating thermal energy and a pair of wirings electrically connected to said heat generating resistor is formed, characterized by comprising:

providing a member composed of a polycrystalline material as a constituent base member of said substrate, and

thermally oxidizing the surface of said polycrystalline member and thermally softening the surface of said polycrystalline member at a temperature in the range of 1230° C. to 1330° C., to thereby form a thermal oxide layer on the surface of said polycrystalline member.

5,469,201

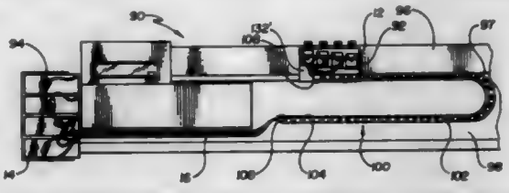
INK SUPPLY LINE SUPPORT SYSTEM FOR A CONTINUOUS INK REFILL SYSTEM FOR DISOSABLE INK JET CARTRIDGES

Paul R. Erickson, Prior Lake, and Tim C. Schooler, Eden Prairie, both of Minn., assignors to LaserMaster Corporation, Eden Prairie, Minn.

Continuation of Ser. No. 139,576, Oct. 20, 1993, and a continuation-in-part of Ser. No. 231,275, Apr. 22, 1994, Pat. No. 5,367,328. This application Aug. 30, 1994, Ser. No. 298,122

Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—85 **43 Claims**



1. An ink supply line support apparatus for a continuous ink refill system for a large format ink jet printer having a print bed that is greater than 61 cm (24 inches) wide and having a print

carriage that traverses across a print medium and receives at least one disposable ink jet cartridges, the ink refill system including at least one disposable ink jet cartridge removably mountable in the print carriage, at least one ink reservoir external to the print carriage, and at least one flexible ink supply line that couples the at least one ink reservoir to the at least one ink jet cartridges so as to supply ink to the ink jet cartridge during operation of the ink jet printer, the ink supply line support apparatus comprising:

an elongate guide structure having a length greater than 30.5 cm (12 inches) and having a first end operably connected to the ink jet printer at a fixed location and a second end operably connected to the print carriage, the second end being movable relative to the first end in a first orientation along a direction in which the print carriage traverses, but being substantially rigid relative to the first end in a second orientation that is transverse to the first orientation and the guide structure including means for supporting at least a portion of the at least one ink supply line on an exposed surface of the guide structure; and

attachment means positioned along the exposed surface of the guide structure for detachably securing the portion of the at least one ink supply line to the guide structure.

5,469,202

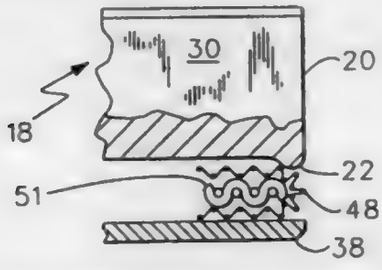
CONTINUOUS INK JET CATCHER WITH IMPROVED SCREEN STRUCTURE

David J. Stephens, Springboro, Ohio, assignor to Scitex Digital Printing, Inc., Dayton, Ohio

Filed Mar. 20, 1992, Ser. No. 855,994

Int. Cl.[6] G01D *15/18*

U.S. Cl. 347—90 **5 Claims**



1. A catcher assembly in an ink jet print head, comprising:

a) a catcher body defining a catcher throat; and

b) screen means disposed in said catcher throat for wicking ink into said catcher throat, said screen means having a first relatively fine mesh screen portion folded around a second relatively coarse screen portion, whereby the fine mesh screen is protected against compression.

5,469,203

PARASITIC RESISTANCE COMPENSATION FOR A THERMAL PRINT HEAD

Edward Hauschild, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 24, 1992, Ser. No. 981,045

Int. Cl.[6] B41J *2/325*

U.S. Cl. 347—190 **12 Claims**

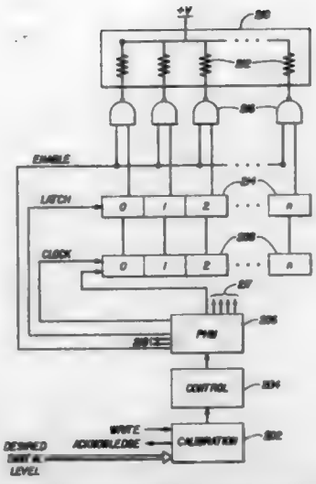
1. A thermal printer system comprising:

a plurality of thermal print elements coupled between first and second terminals, said thermal print elements arranged for printing of an image represented in a data signal;

power supply means coupled to said first and second terminals for supplying current to said print elements; and

control means for applying a selected pulse count to said thermal print elements, said control means including:

modifying means for modifying said selected pulse count in a manner determined by a total pulse count supplied to said



thermal print elements during a print period, wherein said modifying means further includes (1) memory means for storing said selected pulse count, (2) weighting means coupled to said memory means for producing a pixel-specific weighted pulse count which is representative of an energy to be applied to each of said thermal print elements, and (3) averaging means coupled to said weighting means for determining an average of pixel-specific weighted pulse counts.

5,469,204

PRINTING WITHOUT MARGINS

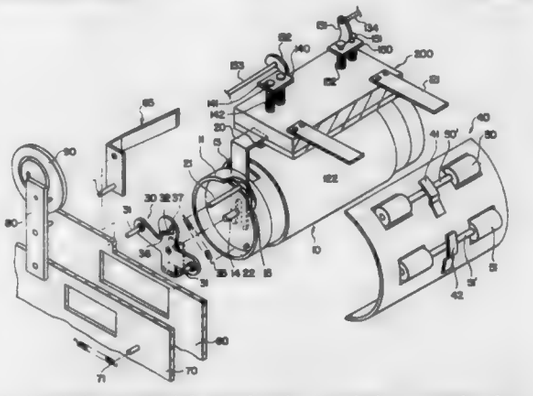
Jong-woo Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Sep. 28, 1994, Ser. No. 314,385

Claims priority, application Rep. of Korea, Sep. 28, 1993, 1993-20338

Int. Cl.[6] B41J *13/22*

U.S. Cl. 347—218 **9 Claims**



1. A printing method for performing a printing operation by a print head while supplying a sheet to a rotating drum and transmitting the sheet clamped by a clamp that rotates together with the drum, said printing method comprising the steps of:

activating said clamp such that only one side of a leading edge of said sheet is clamped by said clamp at an initial supplying location of the drum, then rotating the drum to locate the leading edge of the sheet at an initial printing location of the drum;

releasing the clamp so that the leading edge of the sheet is unclamped after the leading edge has reached the initial printing location;

printing on the sheet starting from the leading edge and

reactivating the clamp a point beyond the initial printing location to clamp the sheet and allow the sheet to be transported by rotation of the drum,

controlling the print head such that when the leading edge of said sheet is located at the initial printing location, an unclamped side of the leading edge of said sheet is pressed by the print head, and after said releasing step said one side of the leading edge of the sheet is pressed by the print head.

5,469,205

IMAGE SCANNING APPARATUS

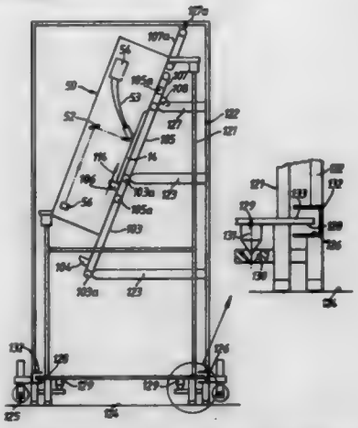
Gerard Boeve, and Gentil Verbeke, both of Edegem, Belgium, assignors to Agfa-Gevaert N. V., Mortsel, Belgium

Filed Aug. 5, 1993, Ser. No. 102,221

Claims priority, application European Pat. Off., Aug. 19, 1992, 92202540

Int. Cl.[6] B41J *2/435*

U.S. Cl. 347—263 **8 Claims**



1. Image scanning apparatus having an apparatus sub-frame carrying means for transporting a recording medium towards and away from a scanning station, and a scanning station mounted on a scanning station sub-free which scanning station comprises means for transporting a recording medium and scanning means for scanning the thus-transported recording medium with a beam of radiation, said scanning station sub-frame and said apparatus sub-frame being each adapted and arranged to rest upon a floor independently of the other, characterised in that said apparatus sub-frame carries wheels which are lowerable into contact with a said floor in order to jack up that sub-frame, and wherein said sub-frames have shoulders which are arranged to come into contact during jacking of the wheeled sub-frame whereby jacking of said wheeled sub-frame effects jacking of the scanning station sub-frame of the apparatus.

5,469,206

SYSTEM AND METHOD FOR AUTOMATICALLY CORRELATING USER PREFERENCES WITH ELECTRONIC SHOPPING INFORMATION

Hugo J. Strubbe, Yorktown Heights, and Robert McFarlane, New Rochelle, both of N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 889,201, May 27, 1992, Pat. No. 5,223,924. This application Jun. 1, 1993, Ser. No. 70,130

The portion of the term of this patent subsequent to Jun. 29, 2010, has been disclaimed.

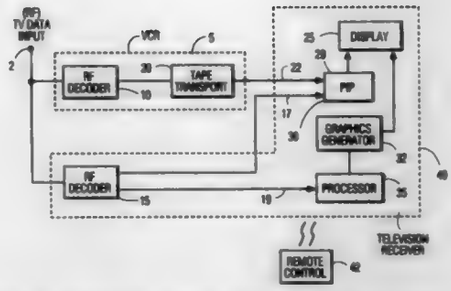
Int. Cl.[6] H04N *7/10*

U.S. Cl. 348—7 **4 Claims**

1. An apparatus for providing a personalized information database for use in a system comprising means for receiving, storing and displaying an electronic information database comprising a plurality of summary records, said apparatus comprising:

means for selecting, and indicating preference or dislike for, first selected records of said summary records;

means for storing said first selected records;



means for analyzing said first selected records to isolate first search information;

means for using said first search information to select second selected records from said summary records; and

means for storing said second selected records so as to form said personalized information database.

5,469,207

METHOD OF LABELLING A BROADCAST SIGNAL INCLUDING TRANSMITTING A SEQUENCE OF PROGRAM LABELS

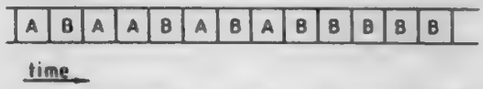
John P. Chambers, Tadworth, United Kingdom, assignor to British Broadcasting Corporation, London, United Kingdom

Continuation-in-part of Ser. No. 741,471, Aug. 5, 1991, abandoned. This application Dec. 27, 1993, Ser. No. 174,190

Claims priority, application United Kingdom, Dec. 6, 1989, 8927615

Int. Cl.[6] H04H *1/00*

U.S. Cl. 348—9 **7 Claims**



7. A method of operating a broadcast receiver, the method comprising:

receiving a broadcast signal;

receiving a sequence of periodically transmitted program labels indicative of the identity of the program being transmitted as said broadcast signal;

detecting in said sequence of program labels a predetermined pattern of different labels identifying a new program to be transmitted as said broadcast signal;

and operating at least one function of said broadcast receiver, in response to detection of said predetermined pattern of different labels, at a predetermined time after detection thereof;

said predetermined pattern of different labels being transmitted at irregular intervals.

5,469,208

DEQUANTIZATION USING DECREMENTS AND MULTIPLY

David Dea, Honeybrook, Pa., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 67,857, May 26, 1993, abandoned. This application Aug. 26, 1994, Ser. No. 296,858

Int. Cl.[6] H04N *7/24*

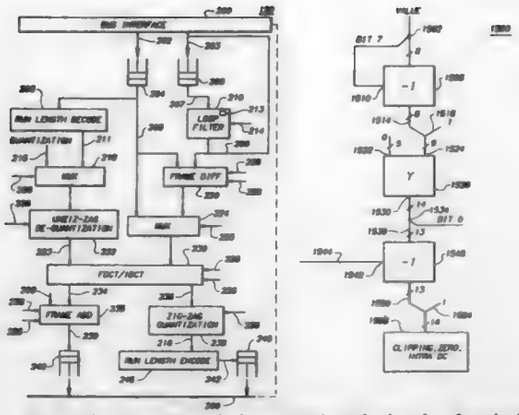
U.S. Cl. 348—27 **33 Claims**

1. A computer-implemented process for dequantizing a quantized signal, comprising the steps of:

(a) transforming the quantized signal into a first conditionally decremented signal using a first conditional decrementing device;

(b) transforming the first conditionally decremented signal into a first shifted signal;

(c) transforming the first shifted signal into a multiplication output signal using a multiplication device, wherein an output



of the first conditional decrementing device is electrically connected to an input of the multiplication device;

(d) transforming the multiplication output signal into a second shifted signal;

(e) transforming the second shifted signal into a second conditionally decremented signal using a second conditional decrementing device, wherein an output of the multiplication device is electrically connected to an input of the second conditional decrementing device; and

(f) transforming the second conditionally decremented signal into a dequantized signal.

5,469,209

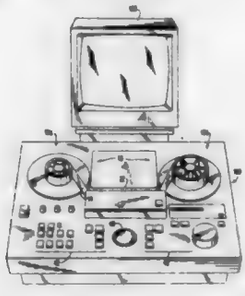
APPARATUS FOR GENERATING VIDEO SIGNALS REPRESENTING A PHOTOGRAPHIC IMAGE PREVIOUSLY RECORDED IN A FRAME ON A PHOTOGRAPHIC FILM-TYPE MEDIUM

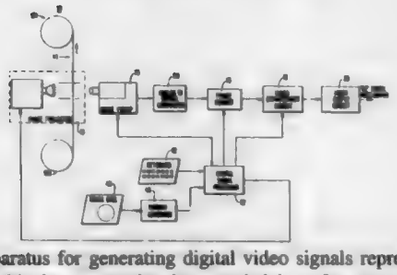
Erhan H. Gunday, New York, N.Y.; Michael Doliton, Maywood; Paul Foung, Dumont, both of N.J., and John R. Lee, New York, N.Y., assignors to Sony Electronics, Inc., Park Ridge, N.J.

Division of Ser. No. 731,079, Jul. 16, 1991, Pat. No. 5,249,056. This application May 24, 1993, Ser. No. 66,969

Int. Cl.[6] H04N *5/253*

U.S. Cl. 348—96 **27 Claims**





1. Apparatus for generating digital video signals representing a photographic image previously recorded in a frame on a photographic film-type medium, comprising:

image pickup means for producing video signals in response to a light image of said photographic image projected thereto;

digitizing means coupled to said image pickup means for digitizing the video signals produced thereby so as to provide corresponding digital video data;

memory means for storing a video frame interval of said digital video data;

enhancement means coupled to said memory means for selectively digitally enhancing said digital video data read from said memory means in accordance with a conversion function for providing enhanced video data; and

a digital signal processor for controlling at least said image pickup means, said memory means and said enhancement means, and for supplying an operator controlled conversion function to said enhancement means.

5,469,210

IMAGE PICKUP APPARATUS WITH CONTROL FOR OUTPUT OF NON-VIBRATING IMAGES

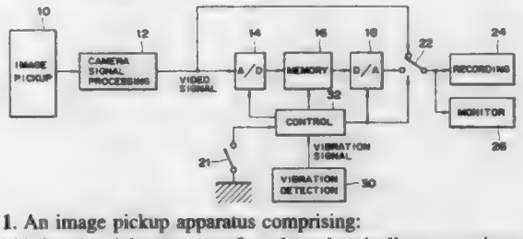
Kazuhiro Noguchi, Kawasaki; Shigeru Ogino, Tokyo, and Takashi Kobayashi, Mitaka, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 843,916, Feb. 27, 1992, abandoned. This application Aug. 12, 1993, Ser. No. 105,778

Claims priority, application Japan, Mar. 1, 1991, 3-035969; Mar. 18, 1991, 3-052271

Int. Cl.[6] H04N *5/232*

U.S. Cl. 348—208 **18 Claims**



1. An image pickup apparatus comprising:

(A) image pickup means for photoelectrically converting an object image and generating an image pickup signal;

(B) memory means for storing the image pickup signal generated from the image pickup means;

(C) vibration detecting means for detecting a degree of a vibration of the image pickup apparatus; and

(D) control means responsive to detection of vibration degree by said vibration detecting means for controlling said memory means so as to perform at least a storing operation of said memory means only during the detection of vibration of less than a predetermined value.

5,469,211

VIDEO CAMERA

Takanori Maruichi, Chiba; Naoki Kamaya, Tokyo, and Toshiyuki Yamauchi, Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

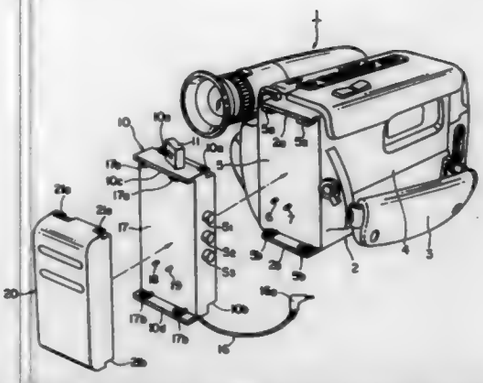
Continuation of Ser. No. 674,912, Mar. 26, 1991, abandoned. This application May 5, 1994, Ser. No. 238,580

Claims priority, application Japan, Mar. 29, 1990, 2-82243

Int. Cl.[6] H04N *5/30*

U.S. Cl. 348—211 **6 Claims**

1. A video camera comprising a camera body having a rear surface, first battery receiving means provided on said rear surface of the camera body, a battery unit from which power is to be supplied to said camera body, said battery unit having a front surface adapted to mate with said rear surface of the camera body and having first coupling means for releasable engagement with said first battery receiving means when said battery unit is mounted directly on said camera body, a removable remote control receiver having first and second opposed surfaces which are substantially coextensive and respectively adapted to mate with said rear surface of the camera body and said front surface of the battery unit, said



removable remote control receiver further having a peripheral surface extending between said first and second opposed surfaces so as to be substantially contiguous with outer surfaces of said camera body and said battery unit when said remote control receiver is interposed between said camera body and said battery unit, radiant signal receiving means integral with said removable remote control receiver and being permanently disposed at said peripheral surface for receiving a radiant energy wave signal from a remote control transmitter, second battery receiving means on said removable remote control receiver at said second surface of the latter for releasable engagement with said first coupling means when said remote control receiver is removably interposed between said camera body and said battery unit, second coupling means on said removable remote control receiver at said first surface of the latter for releasable engagement with said first battery receiving means when said remote control receiver is removably mounted on said camera body, and power means on said remote control receiver for supplying power from said battery unit to said remote control receiver and, through the latter, to said camera body when said removable remote control receiver is interposed between said camera body and said battery unit.

5,469,212

APPARATUS FOR COMPRESSION-ENCODING AND DECODING VIDEO SIGNALS

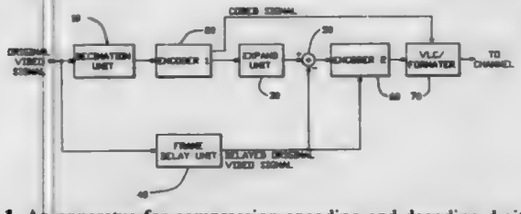
Choon Lee, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Apr. 6, 1993, Ser. No. 43,370

Claims priority, application Rep. of Korea, Apr. 11, 1992, 6061/1992

Int. Cl.[6] H04N *7/48*

U.S. Cl. 348—392 **9 Claims**



1. An apparatus for compression-encoding and decoding digital video signals comprising:

encoding means for encoding an original digital video signal, said encoding means including,

a decimation unit for reducing the size of each of said original digital video signals in a sub-sampling manner;

a first encoder unit for encoding each of signals subsampled by said decimation unit to video information proper to a limited bandwidth of said recording medium or said transmitting medium;

an expand unit for expanding a signal from said first encoder unit up to the size of each original video signal, in reversely proportional to the reduction achieved by the decimation unit;

a frame delay unit for delaying each original video signal for a frame time during which the original video signal is processed through the decimation unit, the first encoder unit and the expand unit;

an adder unit for calculating a difference between each original video signal delayed by said delay unit and each corresponding expanded signal from the expand unit; a second encoder unit for encoding a differential signal from said adder unit; and

a VLC/formatter unit for encoding a signal from said second encoder unit in a variable length coding and formatting it to send the resulting signal to a channel of the transmitting medium or the recording medium;

decoding means for decoding each of the encoded original video signals and each corresponding one of the differential signals encoded in said encoding means and then received via a transmitting medium or played back from a recording medium, reading video signals, indicative of video portions including no differential signal, from video signals resulting from said decoding of the encoded original video signals, based on the edge information, adding each of the differential signals to each corresponding one of said read video signals, and outputting recovered video signals.

5,469,213

TIME-VARYING IMAGE SIGNAL CODING/DECODING SYSTEM

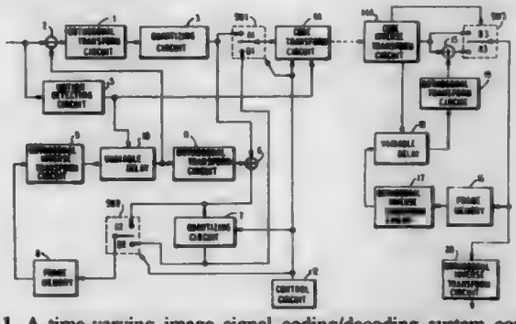
Toshio Koga, and Masayuki Okajima, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Division of Ser. No. 936,310, Aug. 28, 1992, Pat. No. 5,369,437. This application Aug. 25, 1994, Ser. No. 294,796

Claims priority, application Japan, Aug. 28, 1992, 3-215692; Aug. 28, 1992, 3-215693

Int. Cl.[6] H04N *7/50*

U.S. Cl. 348—401 **12 Claims**



1. A time-varying image signal coding/decoding system comprising at least a first station and a second station each having a time-varying image signal coding apparatus as its transmitter section and a time-varying image signal decoding apparatus as its receiver section, said time-varying image signal coding apparatus comprising:

orthogonal transform means for orthogonally transforming an inputted time-varying image signal on a block-by-block basis, each block comprising a plurality of pixels;

subtracting means for subtracting a first predicted signal from said orthogonally transformed signal to supply a prediction error signal

first quantizing means for quantizing said prediction error signal to supply a first quantized signal;

adding means for adding said first quantized signal and said first predicted signal to supply a local decoded signal;

second quantizing means for quantizing said local decoded signal to supply a second quantized signal;

first switching means for selectively connecting either said local decoded signal or said second quantized signal;

a first frame memory for delaying the signal selectively connected by said first switching means by a predetermined number of frames to supply the delayed signal as said first predicted signal;

second switching means for selectively connecting either said first or second quantized signal;

switching control means for giving a switching control signal to instruct said first and second switching means to selectively connect said second quantized signal when a second frame memory built into a time-varying image signal decoding apparatus is to be refreshed or to instruct said first and second switching means to selectively connect said local decoded signal and said first quantized signal, respectively, when said second frame memory is not to be refreshed, and instructing selective connection so that, when refreshing is to be accomplished, said block be refreshed on a group-by-group basis, each group consisting of a plurality of transform coefficients and approximately differing from others in frequency region; and

code transform means for subjecting to code transform said first and second quantized signals, selected by said second switching means, and said switching control signal, and transmitting the resultant transformed signals;

said time-varying image signal decoding apparatus comprising:

code inverse transform means for separating and reproducing a first or second quantized signal and a switching control signal by subjecting a sequence of codes transmitted from a time-varying image signal coding apparatus to code inverse transform;

adding means for adding a second predicted signal to said first quantized signal reproduced by said code inverse transform means;

third switching means for selectively connecting said second quantized signal when the switching control singal reproduced by said code inverse transform means instructs refreshing or the addition signal from said adding means if non-refreshing is instructed;

a second frame memory for delaying the signal selectively connected by said third switching means by a predetermined number of frames and supplying the delayed signal as said second predicted signal; and

orthogonal inverse transform means for reproducing said time-varying image signal by subjecting the signal selectively connected by said third switching means to inverse transform to said orthogonal transform; wherein

said time-varying image signal coding apparatus comprising:

orthogonal transform means for orthogonally transforming an inputted time-varying image signal on a block-by-block basis, each block comprising a plurality of pixels;

subtracting means for subtracting a first predicted signal from said orthogonally transformed signal to supply a prediction error signal;

first quantizing means for quantizing said prediction error signal to supply said first quantized signal;

adding means for adding said first quantized signal and said first predicted signal to supply a local decoded signal;

second quantizing means for quantizing said local decoded signal to supply said second quantized signal;

first switching means for selectively connecting either said local decoded signal or said second quantized signal;

a first frame memory for delaying the signal selectively connected by said first switching means by a predetermined number of frames to supply the delayed signal as said first predicted signal;

second switching means for selectively connecting either said first or second quantized signal;

switching control means for giving said switching control signal to instruct said first and second switching means to selectively connect said second quantized signal when a second frame memory built into the time-varying image signal decoding apparatus is to be refreshed or to instruct said first and second switching means to selectively connect said local decoded signal and said first quantized signal, respectively, when said second frame memory is not to be refreshed, and instructing selective connection so that, when refreshing is to be accomplished said block be refreshed on a group-by-group basis, each group consisting of a plurality of transform coefficients and approximately differing from others in frequency region; and

code transform means for subjecting to code transform said first and second quantized signals, selected by said second switching means, and said switching control signal, and transmitting the resultant transformed signals;

said time-varying image coding/decoding system being so structured as to transmit a sequence of codes from said first transmitter section to said second receiver section and to transmit a sequence of codes from said second transmitter section to said first receiver section; wherein

if a transmission path error occurs during a transfer from said first station to said second station, trouble information indicating the inability of said code inverse transform circuit of said second station to perform correct decoding is conveyed from said code inverse transform circuit to said switching control circuit of said second station; in accordance with this trouble information, said switching control circuit supplies said code transform circuit of said second station with a refresh transmit demand signal for said first station; said code transform circuit transmits this demand signal to said first station; said code inverse transform circuit of said first station, having received said refresh transmit demand signal, transfers this signal to said switching control circuit of said first station; in accordance with this, said switching control circuit supplies a refresh control signal for having said local decoded signal of said first station supplied to said code transform circuit of said first station as a refreshing signal; said code transform circuit subjects said local decoded signal for the refreshing purpose to variable-length coding and transmits it, together with a signal supplied from said switching control circuit, resulting from the encoding of the refresh control signal, to said second station via a transmission path; said code inverse transform circuit, having received said refresh control signal, causes the refreshing signal, which follows the refresh control signal, to be written into said frame memory of said second station.

5,469,214

DEVICE FOR RECURSIVE PROCESSING OF A VIDEO SIGNAL, COMPRISING A PLURALITY OF BRANCHES

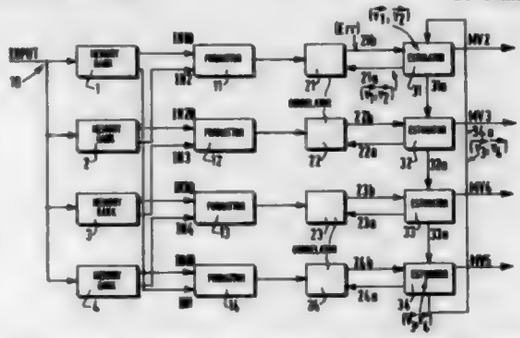
Paul Bazzaz, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1993, Ser. No. 168,730

Claims priority, application France, Dec. 22, 1992, 92 15507

Int. Cl.[6] H04N *7/13*

U.S. Cl. 348—416 **10 Claims**



1. A device for recursive processing of a video signal, comprising a plurality of n branches for processing, in parallel and in a recursive manner, each section of a plurality of n adjacent sections of a video signal, wherein n is an integer equal to 2 or greater,

each branch comprising at least a MEMORY BANK structure (1, 2, 3, 4) which includes:

a) means for demultiplexing the video signal into a plurality of n temporally adjacent sections T1 . . . Tn having a period which is equal to a single period T;

b) means for temporal decompression of each temporally adjacent section T1 . . . Tn for obtaining a spread of each decompressed section over a decompressed period having a duration of nT;

c) delay means for delaying each decompressed section by a time which is equal to the single period T and for aligning each delayed decompressed section with the subsequent non-delayed decompressed section;

each branch also comprising processing means (**11–21–31**; **12–22–32**; **13–23–33**; **14–24–34**) operating in parallel and being each coupled to the output of their respective MEMORY BANK structure,

each processing means processing one of said temporally adjacent sections in a recursive manner with at least one feedback loop (**21***a*–**21***b*–**31***a*; **22***a*–**22***b*–**32***a*; **23***a*–**23***b*–**33***a*; **24***a*–**24***b*–**34***a*).

5,469,215

METHOD AND APPARATUS FOR CONTROLLING AN ELECTRIC MOTOR WITH COMPENSATION OR TORQUE RIPPLE

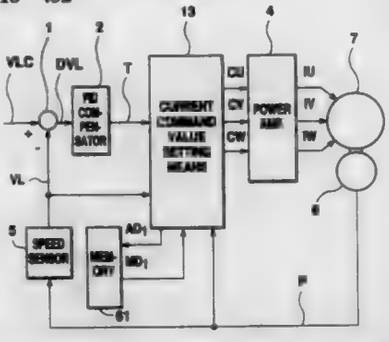
Masayuki Nashiki, Niwa, Japan, assignor to Okuma Corporation, Aichi, Japan

Filed Jul. 29, 1994, Ser. No. 282,434

Claims priority, application Japan, Aug. 2, 1993, 5-191020

Int. Cl.[6] **H02P** *7/00*

U.S. Cl. 318—432 **8 Claims**



1. An electric motor control system for compensating for rotational error caused by torque ripple in a torque controlled electric motor operated by a torque command signal, said control system comprising:

control information storage means for storing torque ripple error compensation control information as a function of torque command level and of both the rotational speed and rotational position of said electric motor;

a position sensor for sensing the rotational position of said electric motor and outputting a rotational position signal;

a speed sensor for sensing the rotational speed of said electric motor and outputting a rotational speed signal;

control information reading means connected to receive said torque command signal, said rotational position signal and said rotational speed signal and comprising means for reading from said control information storage means said stored torque ripple error compensation control information based on said torque command signal, said rotational position signal and said rotational speed signal;

motor current setting means connected to receive said torque ripple error compensation control information from said control information reading means for generating a motor current command for said motor in response to said torque ripple error compensation control information; and

means for supplying current to said motor in response to said motor current command.

5,469,216

APPARATUS AND METHOD FOR PROCESSING A DIGITAL VIDEO SIGNAL TO PRODUCE INTERPOLATED DATA

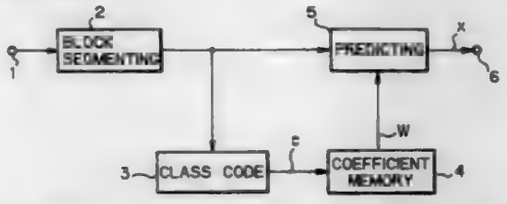
Kenji Takahashi, Tokyo, and Tetsujiro Kondo, Kanagawa, both of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 30, 1994, Ser. No. 351,200

Claims priority, application Japan, Dec. 3, 1993, 5-339541

Int. Cl.[6] **H04N** *7/12;7/01*

U.S. Cl. 348—441 **20 Claims**



1. Apparatus for processing a digital video signal to produce interpolated data, comprising:

memory means for storing predetermined coefficient data for respective class codes of pixel data at addresses corresponding to said respective class codes;

means for receiving a digital video signal having an inner block and an outer block of pixel data, said inner block of pixel data representing an image spatially located within an image represented by said outer block of pixel data;

means for determining a class code of said inner block of pixel data in accordance with values of said pixels of both said inner and outer blocks of pixel data;

means for retrieving said coefficient data from said memory means from an address corresponding to said class code of said inner block of pixel data; and

means for generating interpolated data from said received digital video signal and said retrieved coefficient data.

5,469,217

ARRANGEMENT FOR DOUBLING THE FIELD FREQUENCY OF A PICTURE SIGNAL

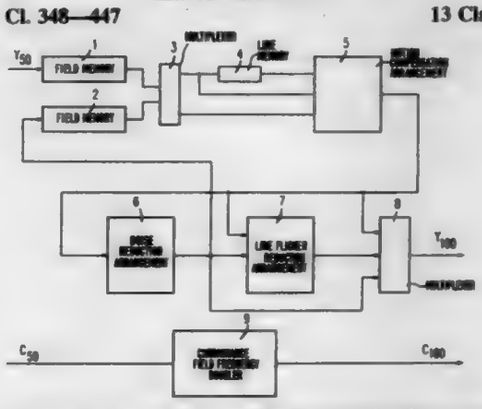
Achim Ibental, Elmshorn, and Martin Dammann, Sparrieshoop, both of, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1993, Ser. No. 146,287

Claims priority, application Germany, Nov. 4, 1992, 42 37 225.9

Int. Cl.[6] **H04N** *7/01*

U.S. Cl. 348—447 **13 Claims**



1. A system for converting an original picture signal representing a sequence of frames, each of which is composed of two interlaced fields, into a converted picture signal which has a double field frequency with respect to the original picture signal, comprising: a memory for doubling each field of the original picture signal, a motion compensation circuit receiving an output signal from the memory, a noise reduction circuit receiving an output signal from the motion compensation circuit, a line flicker reduction circuit

receiving output signals from the noise reduction circuit and the motion compensation circuit and a multiplexer for generating a converted picture signal that is obtained from the output signals of the noise reduction circuit, the line flicker reduction circuit or the motion compensation circuit, dependent on position with respect to time of each field to be generated of the converted picture signal with respect to the original picture signal.

5,469,218

IMAGE SIGNAL PROCESSING DEVICE WITH CONVERSION OF SAMPLE FREQUENCY OF DIGITAL COLOR-DIFFERENCE DATA SIGNALS

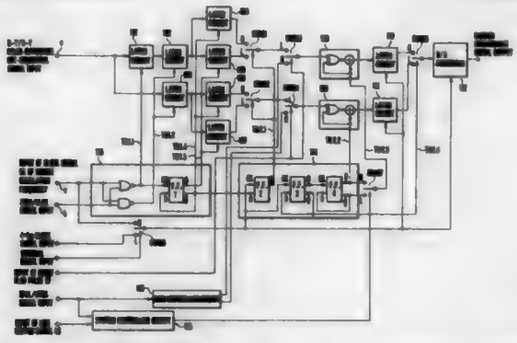
Yuji Sakaegi, and Eiji Ohara, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 20, 1992, Ser. No. 916,590

Claims priority, application Japan, Jul. 23, 1991, 3-206276; Nov. 21, 1991, 3-306236; Mar. 10, 1992, 4-051716

Int. Cl.[6] H04N *11/22*

U.S. Cl. 348—455 **9 Claims**



4. An image signal processing device for processing an image signal, comprising:

(A) a simultaneous conversion circuit for inputting dot-sequential digital color-difference data in which two kinds of digital color-difference data appear alternately in synchronism with a clock corresponding to a data rate of the dot-sequential digital color-difference data and for simultaneously forming the dot-sequential digital color-difference data into two kinds of digital color-difference data by simultaneous conversion;

(B) a data separating circuit for separating each of the two kinds of digital color-difference data outputted from said simultaneous conversion circuit into even-numbered digital data and odd-numbered digital data in synchronism with the clock signal corresponding to the data rate of the dot-sequential digital color-difference data, and outputting the even-numbered digital color-difference data and the odd-numbered digital color-difference data;

(C) a selecting circuit for selecting the digital color-difference data outputted from said data separating circuit in synchronism with clock signal having frequency which is an integer multiple of a color subcarrier frequency, and outputting the selected digital color-difference data; and

(D) digital data forming means for forming digital data corresponding to a chrominance signal by using the two kinds of digital color-difference data outputted from said selecting circuit.

5,469,219

RF-BASED HIGH-BANDWIDTH SIGNAL TRANSMISSION METHOD AND APPARATUS

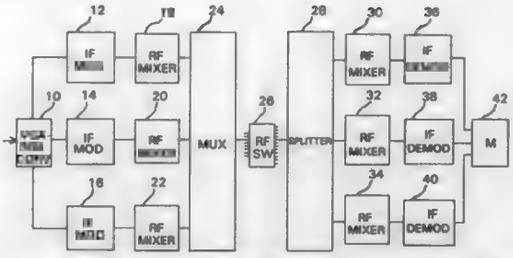
Keith Y. Mortensen, Brookfield, Conn., assignor to Microgno-sis, Inc., Danbury, Conn.

Filed Sep. 20, 1993, Ser. No. 123,897

Int. Cl.[6] H04N *7/08*

U.S. Cl. 348—492 **3 Claims**

1. Signal transmission apparatus for video signals comprising:



1) means for frequency-modulating each of a plurality of baseband input signals to produce a plurality of intermediate frequency signals;

2) means for frequency-shifting each of said plurality of intermediate frequency signals to an assigned-bandwidth radio-frequency signal;

3) means for combining each of said radio-frequency signals to form a multiplexed composite radio-frequency signal;

4) means for transmitting said multiplexed composite radio-frequency signal;

5) means for splitting said multiplexed composite radio-frequency signal into its component radio-frequency signals;

6) means for frequency-shifting said radio-frequency signals to a plurality of intermediate frequency signals; and

7) means for demodulating each of said intermediate frequency signals to produce baseband output signals corresponding to said baseband input signals.

5,469,220

VERTICAL SYNCHRONIZING CIRCUIT

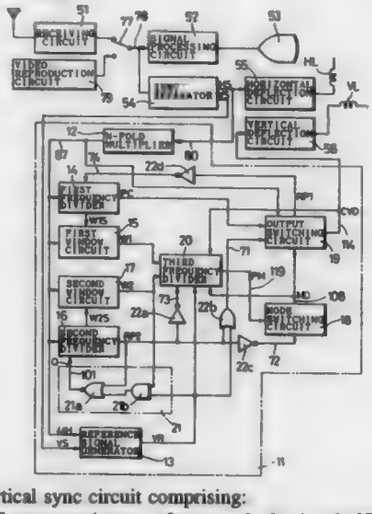
Kouji Kumada, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Sep. 15, 1994, Ser. No. 305,332

Claims priority, application Japan, Sep. 21, 1993, 5-234955

Int. Cl.[6] H04N *5/10*

U.S. Cl. 348—529 **6 Claims**



1. A vertical sync circuit comprising:

means for generating a reference clock signal 4fH having a frequency N times the frequency of a horizontal sync signal extracted from an input TV composite signal, wherein N is a natural number of 2 or more;

means for generating a reference signal VR in synchronism with a vertical sync signal VS extracted from the TV composite signal, on the basis of the vertical sync signal VS and the reference clock signal 4fH;

first discrimination signal generating means for generating and outputting a standard period signal PC having a period equal to that of the vertical sync signal as determined according to a particular TV broadcasting system and a first window signal W1 having a pulse width set in advance before or after the

output timing of the standard period signal PC on the basis of the reference clock signal 4fH;

second discrimination signal generating means for generating and outputting a second window signal W2 set in advance with a pulse width greater than the first window signal W1 on the basis of the reference clock signal 4fH; and

means for determining which of the first window signal W1 and the second window signal W2 contains the period of the reference signal VR, selecting either of the reference period signal PC or the reference signal VR on the basis of the result of determination, and outputting a sync signal having the same period as the selected signal.

5,469,221

VIDEO MULTIPLEXING SYSTEM FOR SUPERIMPOSITION OF SCALABLE VIDEO DATA STREAMS UPON A BACKGROUND VIDEO DATA STREAM

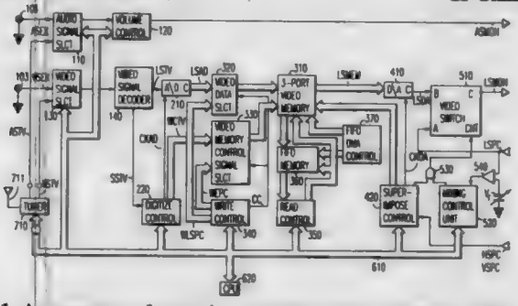
Kesatoshi Takeuchi, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 185,155, Jan. 29, 1994, which is a continuation of Ser. No. 39,708, Mar. 31, 1993, which is a continuation of Ser. No. 873,322, Apr. 14, 1992, which is a continuation of Ser. No. 474,768, May 14, 1990, abandoned. This application Aug. 23, 1994, Ser. No. 294,402

Claims priority, application Japan, Jul. 13, 1988, 1-175948; Dec. 28, 1988, 1-331874; Dec. 28, 1988, 1-331875; Dec. 28, 1988, 1-331876; Dec. 28, 1988, 1-331878; Feb. 7, 1989, 1-28430

Int. Cl.[6] H04N *5/445*

U.S. Cl. 348—564 **11 Claims**



1. An apparatus, for use in a computer system having a CPU, a CPU bus, a display controller, and a display device, for displaying at least one video image of variable resolution and position on said display device, said display device requiring a first vertical synchronizing signal and a first horizontal synchronizing signal for producing a display, said apparatus comprising:

a) a video decoder that receives a composite video signal, separates said composite video signal into a first luminance signal, a second vertical synchronizing signal and a second horizontal synchronizing signal, and provides said first luminance, said second vertical synchronizing and said second horizontal synchronizing signals as outputs;

b) an analog-to-digital (A/D) converter, coupled to said video decoder, that receives said first luminance signal as an input and produces a digital representation of said first luminance signal as an output;

c) a video memory, coupled to said A/D converter, having first and second read ports and one write port, said write port being connected to said output of said A/D converter, said video memory operable to store said digital representation of said first luminance signal;

d) means, coupled to said first read port of said video memory, for reading out said digital representation of said first luminance signal from said video memory, to thereby output said digital representation on said CPU bus; and

e) a video mixer, coupled to said second read port of said video memory, for selecting one of a plurality of luminance signals, said plurality including said first luminance signal and a second luminance signal supplied from said display controller, and producing as an output said selected luminance signal representing a combination of a first image represented by said first luminance signal and a second image represented by said second luminance signal.

5,469,222

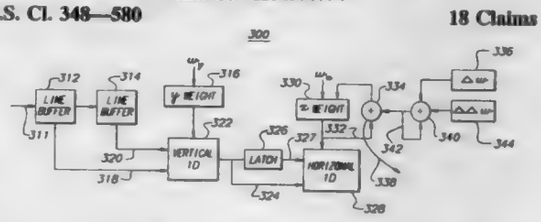
NON-LINEAR PIXEL INTERPOLATOR FUNCTION FOR VIDEO AND GRAPHIC PROCESSING

David L. Sprague, Gilbert, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 995,288, Dec. 23, 1992. This application Jun. 30, 1993, Ser. No. 85,240

Int. Cl.[6] H04N *9/74*

U.S. Cl. 348—580 **18 Claims**



1. A pixel interpolation system for non-linear interpolation of images having a lurality of input pixels and pixel positions, comprising:

one-dimensional interpolation means for receiving a plurality of pairs of input pixels and a sequence of corresponding interpolation weights to provide a plurality of sequential weighted sums of said pairs of input pixels at a plurality of said pixel positions in accordance with said interpolation weights;

means for providing said sequence of interpolation weights wherein differences between pairs of successive interpolation weights of said sequence of interpolation weights differ, wherein said means for providing said interpolation weights comprises means for providing a weight carry signal; and

means for applying said sequence of interpolation weights to said one-dimensional interpolation means.

5,469,223

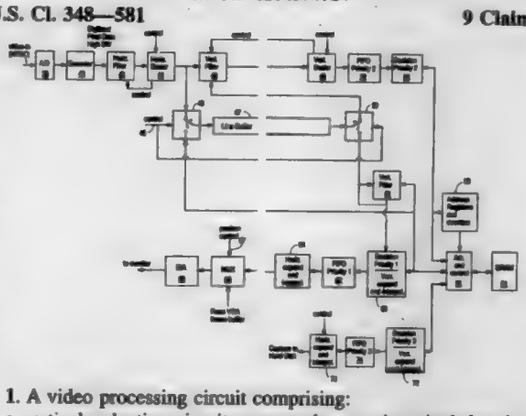
SHARED LINE BUFFER ARCHITECTURE FOR A VIDEO PROCESSING CIRCUIT

Scott A. Kimura, Saratoga, Calif., assignor to AuraVision Corporation, Fremont, Calif.

Continuation-in-part of Ser. No. 136,621, Oct. 13, 1993. This application Mar. 4, 1994, Ser. No. 206,491

Int. Cl.[6] H04N *7/24*

U.S. Cl. 348—581 **9 Claims**



1. A video processing circuit comprising:

a vertical reduction circuit connected to receive pixel data in a raster-scan format, said pixel data corresponding to a pixel image having a vertical height, said vertical reduction circuit for reducing said vertical height of said pixel image;

a data buffer connected to an output of said vertical reduction circuit for storing said pixel data;

a vertical expansion circuit connected to an output of said data buffer for expanding said vertical height of said pixel image;

a line buffer for temporarily storing a line of pixel data; and

a switching circuit connected between said line buffer, said vertical reduction circuit, and said vertical expansion circuit,

said switching circuit, in a first switch mode, connecting said line buffer to said vertical reduction circuit for receiving lines of pixel data for temporary storage, said line buffer outputting said lines of pixel data to said vertical reduction circuit so that said vertical reduction circuit can detect vertically adjacent pixels in adjacent lines of pixel data for reducing said vertical height of said pixel image,

said switching circuit, in a second switch mode, connecting said line buffer to said vertical expansion circuit for receiving lines of pixel data from said data buffer for temporary storage, said line buffer outputting said lines of pixel data to said vertical expansion circuit so that said vertical expansion circuit can detect vertically adjacent pixels in adjacent lines of pixel data for expanding said vertical height of said pixel image.

5,469,224

RECORDING SIGNAL SELECTION METHOD FOR VIDEO TITLING

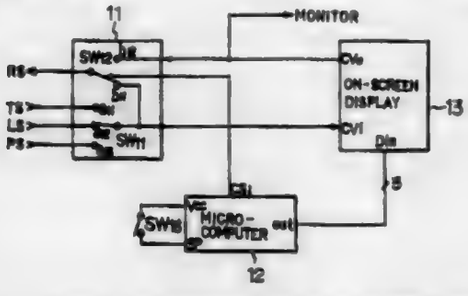
Chung H. Her, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 613,211, Nov. 13, 1990, abandoned. This application Jun. 30, 1992, Ser. No. 908,485

Claims priority, application Rep. of Korea, Nov. 13, 1989, 16435/1989

Int. Cl.[6] H04N *5/262;5/1278*

U.S. Cl. 348—589 **4 Claims**



1. A recording signal selection method for video titling apparatus having a microcomputer, comprising the steps of:

selecting a standard signal from a tuner signal, a line signal and a playback signal and outputting the selected standard signal as a first recording signal to a recording output terminal, in the absence of a control signal from said microcomputer;

outputting character data from said microcomputer in a titling mode of said apparatus, and superimposing said character data and the selected standard signal in said titling mode to produce a superimposed signal;

selectively controlling the microcomputer to output said control signal;

discriminating, with said microcomputer, whether the present mode of the apparatus is a recording mode or not during the transmission of said character data from the microcomputer in said titling mode, and, in response to the presence of said control signal and the detection of said recording mode in said titling mode, outputting said superimposed signal as a second recording signal to said recording terminal.

5,469,225

APPARATUS AND METHOD FOR ENHANCING TRANSIENT EDGE OF VIDEO SIGNAL

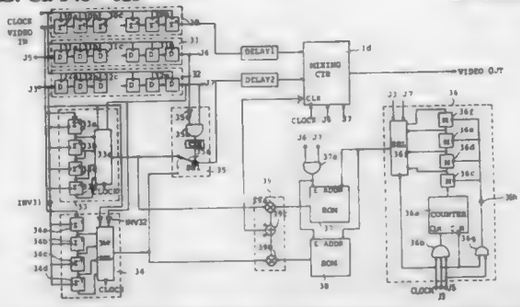
Sung H. Hong, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 2, 1993, Ser. No. 101,447

Claims priority, application Rep. of Korea, Aug. 3, 1992, 13948/1992

Int. Cl.[6] H04N *5/21*

U.S. Cl. 348—625 **24 Claims**



1. An apparatus for enhancing a transient edge of a video signal, comprising:

transient edge detecting means for first degree-differentiating said video signal, comparing an absolute value of the first degree-differentiated video signal with a reference value, detecting the transient edge of the video signal in accordance with the compared result and outputting a resultant transient edge detection signal;

transient edge dividing means for second degree-differentiating the absolute value of the first degree-differentiated video signal from said transient edge detecting means, third degree-differentiating the second degree-differentiated value and outputting a resultant transient edge divide signal which is divided into interpolation and replacement intervals;

transient edge interpolating means for interpolating a value which is obtained by weighting and averaging start and end pixel values of the transient edge based on the transient edge detection signal from said transient edge detecting means into the transient edge of said video signal in the interpolation interval of the transient edge divide signal from said transient edge dividing means and for replacing start and end pixel values of the transient edge of said video signal with the start and end pixel values of the transient edge based on the transient edge detection signal from said transient edge detecting means in the replacement interval of the transient edge divide signal from said transient edge dividing means; and

mixing means for outputting said video signal in a non-transient edge interval and the interpolated or replaced video signal from said transient edge interpolating means in a transient edge interval.

5,469,226

VIDEO SIGNAL PROCESSING TO DERIVE MOTION VECTORS REPRESENTING MOTION BETWEEN SUCCESSIVE FIELDS OR FRAMES

Morgan W. A. David, Farnham, and James E. Burns, Basingstoke, both of, England, assignors to Sony United Kingdom Limited, Staines

Filed Mar. 3, 1993, Ser. No. 25,741

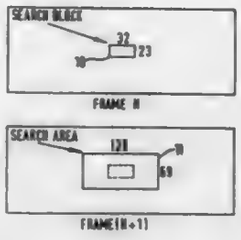
Claims priority, application United Kingdom, Mar. 31, 1992, 9207044

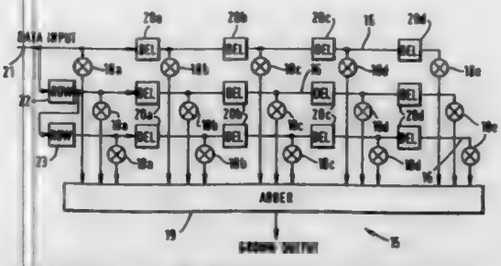
Int. Cl.[6] H04N *7/24;7/30;7/32*

U.S. Cl. 348—699 **7 Claims**

1. A method of processing a digital video signal to derive motion vectors representing motion between successive fields or frames of the video signal, comprising the steps of:

calculating a difference between the contents of each of a plurality of first regions in a first field or frame and the contents of a corresponding one of a plurality of second





regions in a succeeding field or frame, each said first region comprising a block of pixels and each said second region comprising a plurality of contiguous blocks of pixels, said block of said first region and one of said blocks of said second region representing a common block;

producing for each said first region in the first field or frame a first correlation surface representing said difference;

weighting the first correlation surfaces of a respective one of said first regions and of a plurality of first regions adjoining said respective first region, the first correlation surface of said respective first region having the greatest weighting to accentuate features of the first correlation surface of said respective first region relative to those of the adjoining first regions, all the points within a given correlation surface being weighted equally;

summing the weighted first correlation surfaces to generate a grown correlation surface; and

deriving from each grown correlation surface a motion vector representing the motion of the content of said common block as a function of a minimum value within the grown correlation surface.

5,469,227

VIDEO PROCESSING SYSTEM FEATURING A CHOICE BETWEEN INTER AND INTRA FIELD PROCESSING BASED ON MOTION IN CHROMINANCE SIGNALS

Jan S. Minker; Theodora L. Hamann, and Leendert T. Rozendaal, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1993, Ser. No. 148,144

Claims priority, application European Pat. Off., Nov. 11, 1992, 92203451

Int. Cl.[6] H04N *9/64*

U.S. Cl. 348—702 **8 Claims**

6. A video processing apparatus having an intra-field processing mode and an inter-field processing mode, in which a motion-dependent choice is made between these modes, comprising:

means for deriving U and V chrominance-difference signals from U and V chrominance signals, and

means for deriving a first linear combination of said U and V chrominance-difference signals when said V chrominance-difference signal exceeds said U chrominance-difference signal, and deriving a second linear combination of said U and V chrominance-difference signals in the opposite case, to obtain a motion signal for said motion-dependent choice.

5,469,228

MEMORY ADDRESS AND DISPLAY CONTROL APPARATUS FOR HIGH DEFINITION TELEVISION

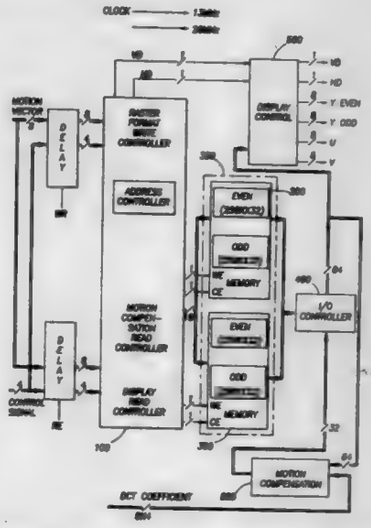
Beom S. Kim, Seoul; Jin H. Lee, Kyungki-do, and Kyoung B. Koo, Seoul, all of, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Dec. 28, 1993, Ser. No. 174,241

Claims priority, application Rep. of Korea, Dec. 31, 1992, 92-27240; Dec. 31, 1992, 92-27243

Int. Cl.[6] H04N *7/12;11/02*

U.S. Cl. 348—715 **5 Claims**



1. A memory address and display control apparatus for an HDTV comprising:

memory address control means for controlling memory read/write addresses in response to a motion vector and a control signal, said memory address control means having display read control means for generating a display read address, motion compensation read control means for generating a motion compensation read address, and raster format write control means for generating a raster format write address;

memory means having a previous frame memory for storing a video signal of a previous frame and a present frame memory for storing a video signal of a present frame;

multiplexing means for 2 to 1-multiplexing the output addresses from said memory address control means to alternately address said previous frame memory and said present frame memory in said memory means;

input/output control means for controlling data input/output of said memory means response to frame and invert frame signals;

display control means for receiving video data from said memory means and displaying the received video data;

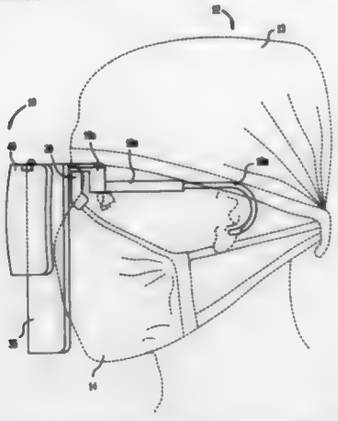
motion compensation means for receiving previous frame video data from said memory means and adding a DCT coefficient to the received previous frame video data to transform the received previous frame video data into present frame video data.

5,469,229

MULTI-PURPOSE PROTECTIVE EYE SHIELD

Steven S. Greenbaum, 35 Haymarket La., Bryn Mawr, Pa. 19010

Filed Mar. 20, 1992, Ser. No. 855,715
Int. Cl.[6] G02C *7/08;7/10*
U.S. Cl. 351—44 **14 Claims**



1. A device for protecting the eyes and surrounding area comprising:

two temple bars, each having at one end a curved ear piece adapted for resting on a wearer's ear:

a connecting bridge connecting each of the other ends of said temple bars and extending along the brow of the wearer and having holes formed said connecting bridge:

a nose support element extending downwardly from said connecting bridge and adapted for resting on the nose the wearer;

an outwardly extending projection bar having one end connected to said connecting bridge;

first coupling means connected to the other end of said projection bar;

a main lens coupled to said first coupling means;

first hinge means associated with said first coupling means for rotating said main lens;

second coupling means associated with said connecting bridge for coupling at least one interchangeable auxiliary lens to said connecting bridge and including mounting pins attached to said at least one auxiliary lens for engaging said holes formed on said connecting bridge; and

second hinge means associated with said second coupling means for rotating said at least one auxiliary lens.

5,469,230

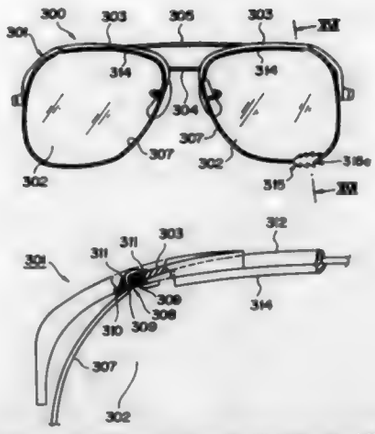
SPECTACLES WITH DECORATION

Masaru Murai; Takayuki Hirai; Isao Hyoi; Yoshimi Maeda, all Fukui, and Seiichi Susuki, Sakai, all of, Japan, assignors to Murai Co., Ltd., Fukui, Japan

Filed Oct. 5, 1992, Ser. No. 956,950

Claims priority, application Japan, Dec. 12, 1991, 3-109469 U; Dec. 12, 1991, 3-109470 U; Dec. 19, 1991, 3-110862 U; Feb. 21, 1992, 4-17195 U; May 21, 1992, 4-40290 U; May 22, 1992, 4-41159 U; May 22, 1992, 4-41161 U; May 25, 1992, 4-41868 U; May 25, 1992, 4-41869 U

Int. Cl.[6] G02C *11/02*
U.S. Cl. 351—52 **10 Claims**



1. Spectacles with a decoration comprising:

a pair of lenses;

spectacle frame bodies;

flexible lens holding members arranged around said lenses for holding said lenses within said spectacle frame bodies; and

a decoration fastened to said flexible lens holding member,

said decoration having fitting means for fitting to said flexible lens holding member;

said decoration being fitted to said flexible lens holding member by a fastening pipe through which said lens holding member is inserted, and

means for increasing the holding force of said holding member by partially bending said flexible lens holding member, and causing a component force of said flexible lens holding member to act on a portion with which said bent portion comes in contact so as to enlarge friction holding force of said decoration.

5,469,231

SIMPLE FRAME FOR ENCASING THE GLASS PIECES OF EYE GLASSES

Chien-Hsing Huang, No. 1, Alley 330, Lane 800, Yu Nung Rd., Tainan, Taiwan, Prov. of China

Filed Aug. 12, 1993, Ser. No. 105,544
Int. Cl.[6] G02C *1/08*
U.S. Cl. 351—92 **3 Claims**

1. A frame for encasing the lenses of eye glasses comprising:

two flexible strips, each strip being adapted to enclose a lens of the eye glasses, said strips being flexible to accommodate various shapes of lenses;

said strips comprising a first segment with a raised tongue thereon, said first segment extending for approximately one half the length of said strip

a second segment, said second segment being shorter and narrower than said first segment,

a third segment having a cross section identical to that of said first segment, said third segment being shorter than said second segment; wherein

said strips are wrapped around said lenses, a groove having been ground in an upper perimeter of said lenses to mate with the raised tongue of said strips,

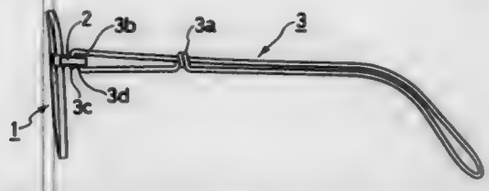
a joining point of said first segment and said third segment being chosen such that an earpiece of the eyeglasses is affixed at said joining point.

5,469,232

EYEGLASSES WITH SPRING TEMPLES

Masami Ichimura, Sabae, Japan, assignor to Sunreeve Company Limited, Fukui, Japan

Filed Dec. 9, 1994, Ser. No. 353,183
Int. Cl.[6] G02C 5/14
U.S. Cl. 351—111 2 Claims



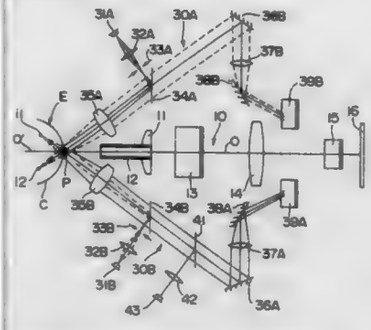
1. Eyeglasses with spring temples comprising glasses, a glasses frame and a pair of temples, said glasses frame having receiving members et either ends of the glasses frame, each of said receiving members having two engaging holes in parallel substantially along with the width direction of the free, said temples having mounting portions, said mounting portions being formed of two wire rods and having engaging pieces formed by bending the ends of two wire rods so as that the engaging pieces of the mounting portions are fitted into the two engaging holes to attach the temples to the frame and thereby the temples have a function of a spring.

5,469,233

OPHTHALMOLOGIC INSTRUMENT

Kenjiro Katsuragi, Tokyo, Japan, assignor to Kabushiki Kaisha Topcon, Tokyo, Japan

Filed Jun. 28, 1994, Ser. No. 266,530
Claims priority, application Japan, Jun. 29, 1993, 5-159097
Int. Cl.[6] A61B 3/10;3/14
U.S. Cl. 351—205 7 Claims



1. An ophthalmologic instrument comprising:

an alignment optical system for detecting an alignment of a principal optical system with a subject's eye in a way that alignment light emitted by an alignment light source is guided to the eye, is reflected thereby, and is received by a light receiving means;

means for detecting a quantity of the reflected alignment light received by said light receiving means;

means for comparing the quantity of the reflected alignment light detected by said detecting means with a predetermined quantity of reference light; and

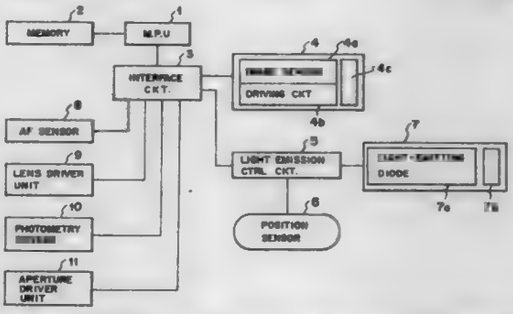
means for warning an operator of the reflected alignment light being less in quantity than the reference light if said comparing means judges that the quantity of the reflected alignment light is less than the predetermined quantity of the reference light.

5,469,234

METHOD OF DETECTING EYE COMPONENT INFORMATION FOR DETERMINING SIGHT AXIS DIRECTION, AND SIGHT AXIS DIRECTION DETECTION APPARATUS

Kazuki Konishi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1993, Ser. No. 45,194
Claims priority, application Japan, Apr. 14, 1992, 4-120062
Int. Cl.[6] A61B 3/10
U.S. Cl. 351—212 4 Claims



4. A method of detecting a Purkinje image based on a light beam radiated from projection means onto an eyeball and reflected by the eyeball using detection means consisting of a plurality of sensors, and detecting a position of a pupil ring portion of the eyeball using output signals from said detection means, comprising the steps of:

obtaining a position of the Purkinje image; and

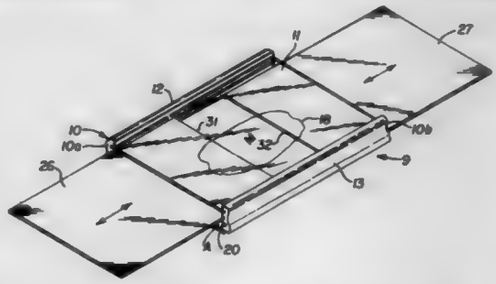
determining, when start and end points of a portion where the output signals from said sensors continuously increase over several pixels or more are not present near the Purkinje image and when start and end points of a portion where the output signals from said sensors continuously decrease over several pixels or more are not present near the Purkinje image, positions corresponding to the increase and the decrease as positions of pupil edges.

5,469,235

MATERIAL SELECTIVE DEVICE

Wayne N. Zako, 4606 S. Canyon Rd., Rapid City, S. Dak. 57702

Filed Jan. 26, 1995, Ser. No. 378,520
Int. Cl.[6] G03B 21/14
U.S. Cl. 353—97 12 Claims



1. A material selective device for an overhead projector having a transparent support member and a projection area through which light is projected via said support member to project light on a display surface comprising:

a frame having opposite first and second ends and adapted to be placed on said support member, said frame including a trans-

parent top member made of a rigid sheet of plastic material and a pair of opposed side members,

each said side member having a first slide groove opening along an inside face,

each said side member having a second slide groove below and spaced from said first slide groove,

a first movable masking member slidable in an opposite set of said first slide grooves below said top member, said first masking member having a first inner end edge and being incrementally movable between said first and second ends,

a second movable masking member slidable in a second set of opposite of said slide grooves below said first masking member, said second masking member having a second inner end edge and being incrementally movable between said first and second ends,

whereby the material on said top member and material on a transparency between said side members and material on the projector support member is selectively projected and displayed according to selected positions of said masking members relative to said first and second ends.

5,469,236

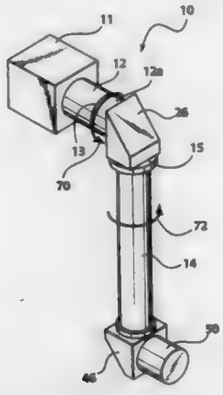
SNORKEL LENS SYSTEM

Wolfgang Roessel, Atlantic Beach, N.Y., assignor to Roessel/Cpt, Inc., Woodside, N.Y.

Filed Jan. 19, 1995, Ser. No. 374,958

Int. Cl.[6] G03B *17/48;* **G02B** *23/08*

U.S. Cl. 354—79 **8 Claims**



1. A snorkel lens system comprising:

a first tubular member having a fixed portion connected to a camera, and a rotatable portion having an opposite end, said first tubular member including a first axis of rotation centrally disposed therethrough;

a mirror housing having a first opening connected to said opposite end of said rotatable portion of said first tubular member and a second opening perpendicular to said first opening;

a second tubular member having a first end connected to said second opening of said mirror housing and a second opposite end, said second tubular member including a second axis of rotation centrally disposed therethrough, said second axis being perpendicular to said first axis;

a prism housing having a first opening connected to said second opposite end of said second tubular member and a second opening disposed perpendicular to said first opening; and

a lens housing connected to said second opening of said prism housing and having a front adapter for receiving additional attachment lenses, whereby said second tubular member in conjunction with said mirror housing and said rotatable portion of said first tubular member is rotatable about said first axis and said second tubular member is independently rotatable about said second axis, so that the lens attachments connected to said front adapter can be rotated about said two perpendicular axes in two perpendicular planes to provide a three dimensional filming effect.

5,469,237

DATA PRINTING APPARATUS

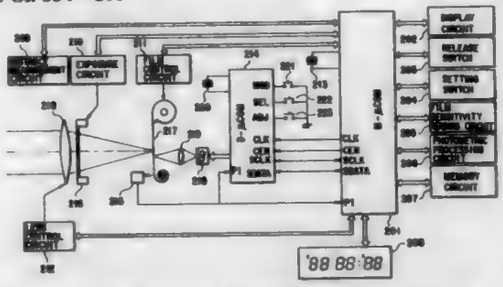
Junichi Itoh; Yuta Sato; Minoru Matsuzaki, all of Tokyo; Masaharu Hamada, Okaya, and Yuji Imai, Tokyo, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Division of Ser. No. 866,151, Apr. 9, 1992. This application Dec. 8, 1993, Ser. No. 164,402

Claims priority, application Japan, Apr. 15, 1991, 3-111064; Mar. 24, 1992, 4-066255

Int. Cl.[6] G03B *17/24*

U.S. Cl. 354—106 **12 Claims**



1. A camera having a date printing function, comprising:

a main body to which a photosensitive film can be loaded, said main body comprising:

feed means for feeding said photosensitive film;

a first controller for controlling camera elements including said feed means and including control of printing of a date on the film; and

film movement detector for outputting a film movement signal when said photosensitive film is fed by said feed means; and

a date printing device for printing a date on said photosensitive film, said date printing device comprising:

light emitting means including a plurality of light emitting elements;

a display device for displaying date data; and

second controller for selectively operating one of said plurality of light emitting elements to emit light in synchronism with said film movement signal from said film movement detector, to thereby control printing of a date on the film;

a clock which generates time clock signals;

a counter for counting said time clock signals, and for updating date data;

transfer means for transferring the date data updated by the counter, the display device displaying the date data transferred by said transfer means; and

wherein said first controller outputs control data for printing the date and a start signal for instructing a start of said date printing operation to said second controller prior to the feeding operation by said feed means, said control data including emitting light time information; and

wherein said second controller controls printing of the date on the film responsive to a film movement signal output from said film movement detector, to said control data which includes said emitting light time information, and to said start signal from said first controller.

5,469,238

FILTER FOR A PHOTOTHERMOGRAPHIC DEVELOPER

Robert M. Biegler, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 13, 1994, Ser. No. 322,977

Int. Cl.[6] G03D *7/00*

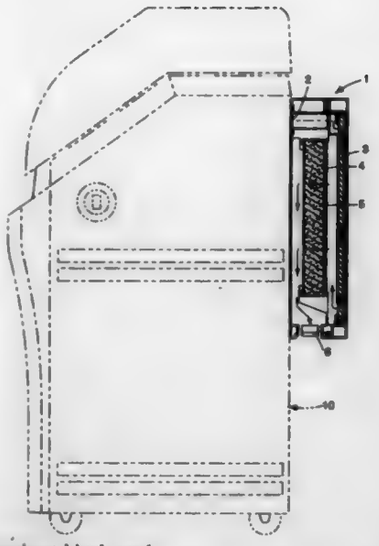
U.S. Cl. 354—300 **12 Claims**

1. A filter system for use with a photothermographic thermal developing apparatus comprising

a) an inlet through which hot processing gases are directed to

b) a heat conducting, condensate accumulator,

c) a particulate filter located at or after the exit of the heat conducting, condensate accumulator and upstream from,



d) an absorbent block, and

e) an outlet through which the filtered air leaves the filtering system.

5,469,239

IMAGE SENSING SYSTEM

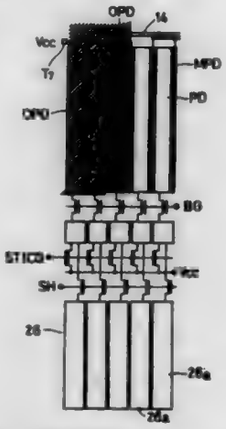
Tokuji Ishida; Toshio Norita, and Jun Hasegawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 90,008, Jul. 12, 1993, Pat. No. 5,371,567, which is a continuation of Ser. No. 774,168, Oct. 15, 1991, Pat. No. 5,227,834, which is a continuation of Ser. No. 437,512, Nov. 16, 1989, abandoned, which is a continuation of Ser. No. 141,080, Jan. 5, 1988, Pat. No. 4,905,033. This application Oct. 7, 1994, Ser. No. 319,632

Claims priority, application Japan, Jan. 6, 1987, 62-950; Mar. 18, 1987, 62-634

Int. Cl.[6] G03B *13/36*

U.S. Cl. 354—402 **11 Claims**



1. An image sensor, comprising:

a first light receiving device for photoelectric conversion of subject light;

an output device for outputting a signal generated by light reception of said first light receiving device;

a second light receiving device for photoelectric conversion of subject light;

a controller for controlling the output device so as to output a signal generated by light reception of said second light receiving device as well as the signal generated by said first light receiving device;

image detecting device for detecting an image of the subject light based on the output signal generated by said first light receiving device; and

a color temperature detecting device for detecting a color temperature of the subject light based on the output signal generated by said second light receiving device.

5,469,240

AUTOFOCUS CAMERA

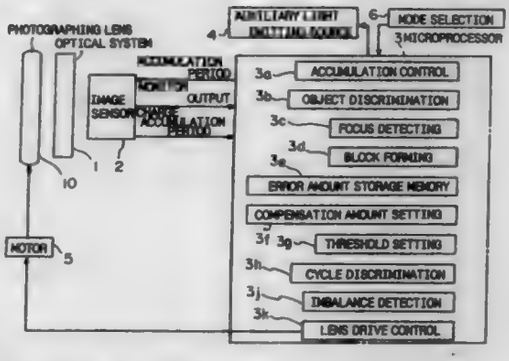
Shigeyuki Uchiyama, Tokyo; Yosuke Kusaka, Yokohama, and Syozo Yamano, Tokyo, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 114,619, Sep. 1, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 339,151

Claims priority, application Japan, Sep. 4, 1992, 4-236947

Int. Cl.[6] G03B *13/36*

U.S. Cl. 354—406 **6 Claims**



1. Autofocus camera comprising:

a pair of image sensors which, according to an incident object image, accumulate an electric charge to output signal trains;

an optical system which divides the light from a photographing lens into a pair of optical images and which directs the optical images to said image sensors respectively;

accumulation control means for controlling accumulation of the electric charge on said image sensors;

operation means for calculating an operation result representing a focus condition of said photographing lens on the basis of said output signal trains from said image sensors obtained through accumulation of the electric charge controlled by said accumulation control means;

reliability judgment means for comparing said operation result of said operation means with a judgment criteria to determine the reliability of said operation result;

lens drive control means for controlling driving of said photographing lens on the basis of said operation result that has been judged reliable;

accumulation judgment means for judging whether said accumulation of the electric charge has been made while said photographing lens is stopped or while said photographing lens is being driven by said lens drive control means; and

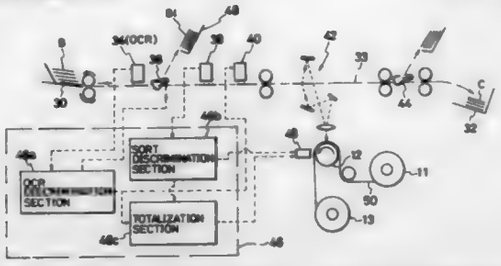
judgment criteria setup means for setting a loose criteria when said accumulation judgment means has confirmed that accumulation of the electric charge has been made while said photographing lens is stopped, and for setting a strict criteria for a low contrast object image when said accumulation judgment means has confirmed that accumulation of the electric charge has been made while said photographing lens is being driven.

5,469,241

MICROFILM CAMERA

Yutaka Takahashi, and Shinichi Shidara, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 19, 1993, Ser. No. 47,295
Claims priority, application Japan, Apr. 17, 1992, 4-124256
Int. Cl.[6] B06K 7/10
U.S. Cl. 355—64 11 Claims



1. A microfilm camera for reading an amount of money of an addressed bill or check brought into a bank, said amount of money being written in a column for writing said amount of money by a drawer of said addressed bill or check, for printing said amount of money for magnetic ink character recognition (MICR) and for photographing an image of said addressed bill or check on a microfilm, comprising:

an optical character reader (OCR) for reading said amount of money written by said drawer, an MICR printer disposed downstream of said OCR for printing said amount of money read by said OCR, and

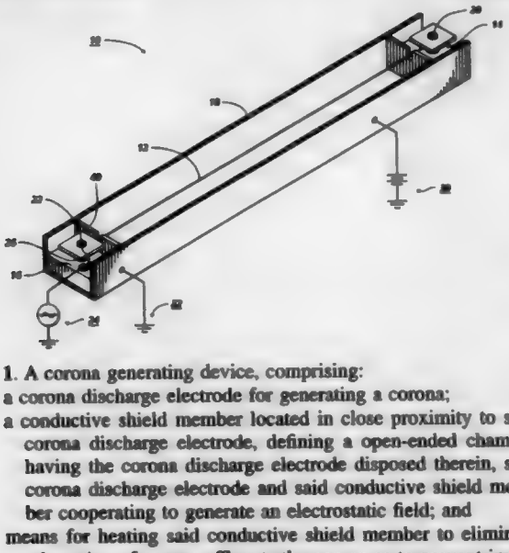
an optical system for photographing said image of said addressed bill or check on said microfilm after said addressed bill or check is printed for MICR by said MICR printer.

5,469,242

CORONA GENERATING DEVICE HAVING A HEATED SHIELD

Robert C. U. Yu, Webster; Geoffrey M. T. Foley, Fairport; William G. Herbert, Williamson; William W. Limburg, Penfield; Satchidanand Mishra, Webster; Richard L. Post, Penfield, and Donald C. Von Hoene, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 952,029, Sep. 28, 1992, abandoned.
This application Feb. 14, 1995, Ser. No. 389,084
Int. Cl.[6] G03G 15/00
U.S. Cl. 355—219 14 Claims



1. A corona generating device, comprising:

a corona discharge electrode for generating a corona;

a conductive shield member located in close proximity to said corona discharge electrode, defining a open-ended chamber having the corona discharge electrode disposed therein, said corona discharge electrode and said conductive shield member cooperating to generate an electrostatic field; and

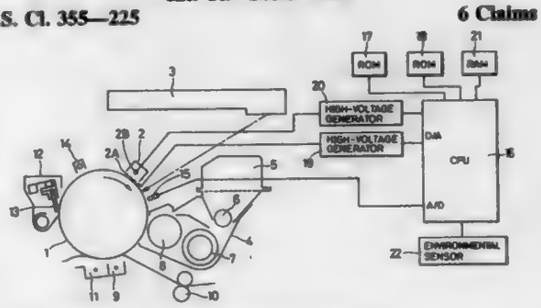
means for heating said conductive shield member to eliminate adsorption of corona effluents thereon so as to prevent image defects caused by desorption of corona effluents from said conductive shield member, said heating means including a substantially continuous layer of exothermic paint disposed on said conductive shield member.

5,469,243

IMAGE FORMING APPARATUS HAVING A FUNCTION TO CHARGE AT A LOW MAIN CHARGING VOLTAGE

Yasushi Saitoh; Masashi Matsumoto; Takao Ichihashi, and Shuji Yamada, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 16, 1994, Ser. No. 213,532
Claims priority, application Japan, Mar. 23, 1993, 5-062376
Int. Cl.[6] G03G 15/00
U.S. Cl. 355—225 6 Claims



1. An image forming apparatus comprising:

a photoreceptor;

charging means having a grid electrode and a main charging electrode, for charging a surface of the photoreceptor;

potential detecting means for detecting a charge potential of the surface of the photoreceptor;

data storage means for storing voltage data including combinations of a plurality of grid voltages and a plurality of main charging voltages corresponding to each grid voltage; and

controlling means for, prior to image formation, selecting out of the voltage data a combination for charging the surface of the photoreceptor at a desired charge potential with a lowest main charging voltage by repeating the charging and the potential detection until a detected potential coincides with the desired charge potential, a process in which the grid voltage is reduced successively from a highest grid voltage to a lowest grid voltage and at each grid voltage, the main charging voltage is reduced successively from a highest value to a lowest value at the grid voltage.

5,469,244

DEVELOPING AGENT DENSITY CONTROL METHOD OF VARYING DEVELOPMENT BIAS IN DENSITY CONTROL

Takao Ogata, Yokohama, and Takeshi Menjo, Tokyo, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1994, Ser. No. 209,256
Claims priority, application Japan, Mar. 19, 1993, 5-085407
Int. Cl.[6] G03G 21/00
U.S. Cl. 355—246 6 Claims

1. A developing agent density control method comprising the steps of:

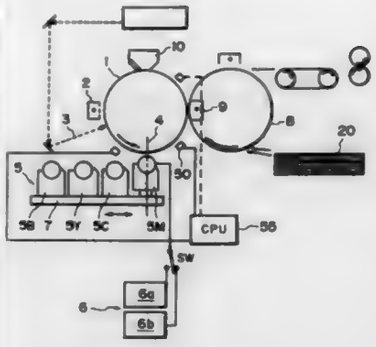
forming a density control latent image with a predetermined potential on an image carrier;

developing the density control latent image by applying a density control development bias and using a two-component developing agent having a toner and a carrier;

sensing a density of the density control image; and

controlling a toner-to-carrier ratio on the basis of the sensed density,

wherein the density control development bias causes a larger variation in output image density with respect to a variation in the toner-to-carrier ratio than that caused by a print development bias.



5,469,245

DEVELOPMENT METHOD AND APPARATUS AND MULTICOLOR IMAGE FORMING APPARATUS USING THESE

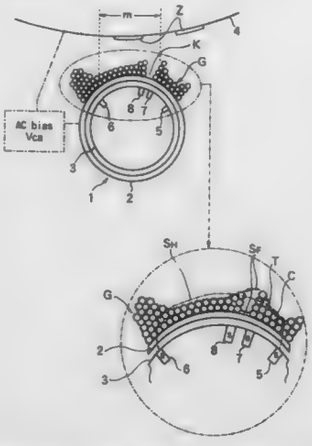
Taku Aoshima; Tsuneo Noami; Hiroh Soga; Takeshi Sumikawa; Nobumasa Furuya, and Tadakazu Edure, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1993, Ser. No. 121,238

Claims priority, application Japan, Sep. 14, 1992, 4-269125; Mar. 16, 1993, 5-081243; Aug. 25, 1993, 5-232417

Int. Cl.[6] G03G *15/09*

U.S. Cl. 355—251 **12 Claims**



1. In a development apparatus which includes a developer supporting body consisting of a rotatable non-magnetic sleeve and a magnet roll fixedly installed within the rotatable non-magnetic sleeve; a development method comprising the steps of:

supporting a two-component developer consisting of a toner and a magnetic carrier on the developer supporting body;

developing or making visible a latent image formed on a latent image supporting body from an effective development area on the developer supporting body with the two-component developer carried on the developer supporting body in a non-contact manner;

applying to the developer in the effective development area a horizontal magnetic field which is orientated in the circumferential direction of the developer supporting body, the effective development area facing the latent image supporting body; and

applying a developer movement promotion magnetic field locally to a part of the effective development area on the developer supporting body to expel the developer from that part of the effective development area and slide chains of the carrier of the developer in a developer expelled region at least in the circumferential direction of the developer supporting body.

5,469,246

DEVELOPING APPARATUS USING MONOCOMPONENT DEVELOPER

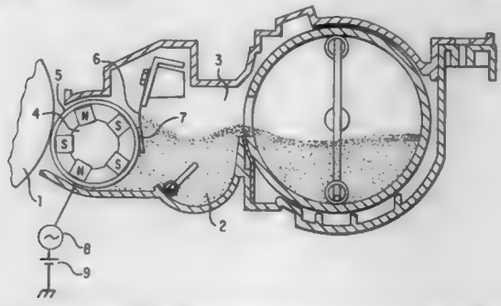
Takayuki Sunaga; Akihiko Kato; Takashi Sakamoto, and Hideaki Miyata, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 11, 1994, Ser. No. 321,312

Claims priority, application Japan, Jan. 5, 1994, 6-000093

Int. Cl.[6] G03G *15/09*

U.S. Cl. 355—251 **3 Claims**



1. A developing apparatus using monocomponent developer comprising:

developer application means for having a thin coat of monocomponent magnetic developer of a constant thickness applied to and held over a developer carrying body, the thin coat on said developer carrying body being moved close to an image carrying member;

transfer means for getting an alternating electric field applied between said developer carrying body and said image carrying member to transfer aerially said thin coat of monocomponent magnetic developer from said developer carrying body to said image carrying member; and

developing means for developing a latent image on said image carrying member using the transferred developer;

wherein the following conditions are met:

$$11\times10^5/Vp\text{-}p \leqq V_D \leqq 13\times10^5/Vp\text{-}p$$

$$3\times10^5/Vp\text{-}p \leqq G \leqq 5\times10^5/Vp\text{-}p$$

where, V_D stands for the dark developing potential in volts for the image developing region of said developing apparatus, Vp-p for the peak-to-peak value of said alternating electric field, and G for the gap in microns between said developer carrying body and said image carrying member.

5,469,247

TONED MEMBER CLEANING BY ELECTRIFIED ROLLER

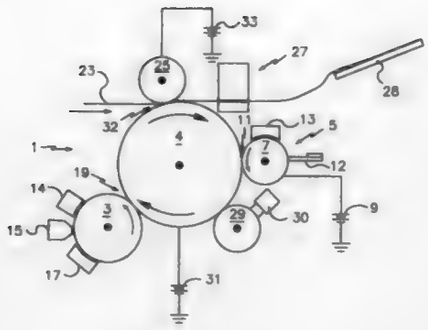
Kuangti T. Cheng; Ashok Murthy; Jeanne M. Saldanha-Singh, and Pramod K. Sharma, all of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.

Filed Jul. 5, 1994, Ser. No. 270,715

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—296 **12 Claims**

1. Electrophotographic imaging apparatus comprising a developer station to apply toner to develop electrostatic images into toned images, an endless toned member to receive said toned images and to transfer said toned images to another substrate at a transfer station, an endless cleaning member positioned past said transfer station, said cleaning member having a smooth outer surface in contact with said toned member, a source of electrical potential to bias said cleaning member to remove toner at said toned image to said cleaning member, means to rotate said cleaning member and said toned member at essentially the same surface speed and in the same direction where said toned member and said cleaning member are in contact, and an applicator station to apply an alkyl siloxane oil to said toner member located at or past said cleaning member and prior to said toned member receiving said toned images.



5,469,248

IMAGE FORMING APPARATUS HAVING MEANS FOR APPLYING A COMMON TRANSFER BIAS VOLTAGE TO FIRST AND SECOND TRANSFER ROLLERS

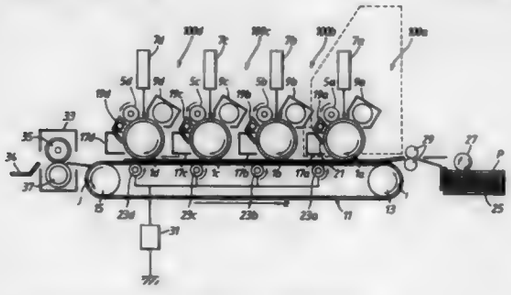
Shigeru Fujiwara; Masashi Takahashi, both of Kanagawa, and Haruhiko Ishida, Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 25, 1994, Ser. No. 186,149

Claims priority, application Japan, Feb. 1, 1993, 5-014345; Dec. 15, 1993, 5-313905

Int. Cl.[6] G03G *15/01*

U.S. Cl. 355—326 R 6 Claims



1. An image forming apparatus comprising:

first image forming means for forming a first image on a first image carrier;

second image forming means for forming a second image on a second image carrier;

conveying means confronting the first and second image carriers for conveying an image receiving medium to the first and second image carriers successively;

first transferring means for transferring the first image from the first image carrier to the image receiving medium, the first transferring means being located at a first distance from a first transfer position of the first image carrier along a conveying direction of the image receiving medium;

second transferring means for transferring the second image from the second image carrier to the image receiving medium, the second transferring means being located at a second distance from a second transfer position of the second image carrier shorter than the first distance along the conveying direction of the image receiving medium; and

applying means for applying a common transfer bias voltage to the first and second transferring means to form first and second electric fields at the first and second transfer positions, respectively.

5,469,249

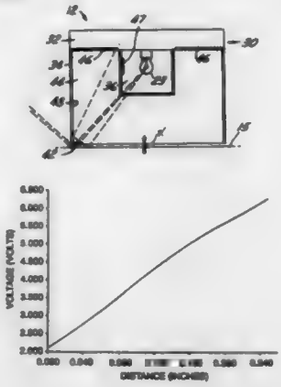
PHOTOSENSITIVE PROBES

Peter F. Magyar, Jr., deceased, late of Port Huron, Mich., and by Sheila Magyar, legal representative, 2713 Montego, Lansing, Mich. 48912

Continuation of Ser. No. 420,419, Oct. 12, 1989, Pat. No. 5,313,260. This application May 17, 1994, Ser. No. 245,104

Int. Cl.[6] G01C *3/08;* G01B *11/24*

U.S. Cl. 356—4.07 10 Claims



1. A non-contact measurement probe for determining distance between the probe and a workpiece, comprising:

a housing having a top body and sidewalls extending from said top body and said sidewalls terminating in an edge portion, said sidewalls and said top body defining a housing interior chamber,

a light source residing within said housing interior chamber,

means for directing light emanating from said light source to a location adjacent an edge portion of at least one of the said sidewalls,

a photo sensitive cell mounted within said housing interior chamber for receiving light reflected from said at least one of said sidewalls, whereby said workpiece is placed adjacent said edge portion of said at least one of said sidewalls and said photo sensitive receiver is sensitive to said light reflected from said workpiece and onto said at least one of said sidewalls.

5,469,250

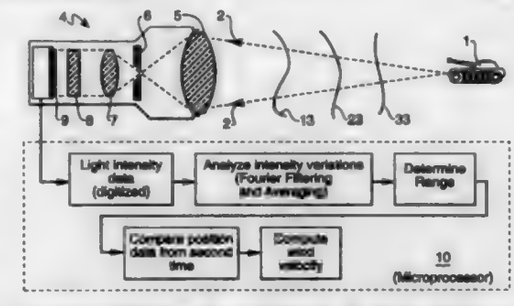
PASSIVE OPTICAL WIND PROFILOMETER

Richard B. Holmes, Woodland Hills, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed May 17, 1993, Ser. No. 62,081

Int. Cl.[6] G01P *3/36;* G01C *3/08*

U.S. Cl. 356—28 9 Claims



1. A wind profilometer for determining the wind velocity transverse to the line of sight to a luminous region comprising,

a camera having a pupil plane for obtaining a set of light intensity data at the pupil plane from the luminous region,

obtaining a first set of light intensity data from the luminous region at a first time,

obtaining a second set of light intensity data from the luminous region at a second time,

a means for relaying the light intensity data from the camera to a microprocessor,

a means for analyzing the light intensity data to analyze the intensity variations corresponding to scintillations of the light in the medium caused by schlieren and determining the range of the schlieren,

a means for comparing the first and second sets of light intensity data and computing the wind velocity between the camera and the luminous region by comparing the positions of the schlieren at different times.

5,469,251

APPARATUS FOR DETECTING FLUORESCENCE OF PARTICLES IN A FLUID AND ANALYZING THE PARTICLES

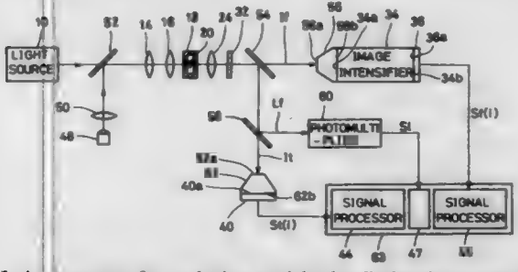
Tokihiro Kosaka, Kakogawashi; Shinichi Ogino, Nishiku, and Yasunori Maekawa, Mikishi, all of, Japan, assignors to Toa Medical Electronics Co., Ltd., Kobe, Japan

Filed Jun. 2, 1993, Ser. No. 70,667

Claims priority, application Japan, Jun. 12, 1992, 4-179297

Int. Cl.[6] G01N *15/14;21/53;33/48;21/64*

U.S. Cl. 356—73 **7 Claims**



1. An apparatus for analyzing particles by discharging a sample liquid containing particles to be detected from a nozzle of a flow cell, passing a sheath liquid around the sample liquid to form a sheath flow, emitting light to the sample liquid flow, detecting the light from the particles, and analyzing the particles according to detection signals associated with the detected light, comprising:

said flow cell for forming said sample liquid flow as a flat flow, thin in thickness and broad in width;

a light source for said emitting light emitted to said sample liquid;

an image intensifier for intensifying the fluorescence image of the particles excited by the light and emitted from the broad side of said sample liquid flow on an input plane of said image intensifier;

a one-dimensional image sensor extended at an output plane side of said image intensifier in a vertical direction to the flow direction of particles, for scanning a fluorescence image amplified by said image intensifier, and issuing an imaging signal Sf (i) at every scanning; and

signal processing means for performing at least one of processing signals and operating on the imaging signals SF (i) from thr one-dimensional image sensor.

5,469,252

FIBER OPTIC FLAW DETECTOR AND IDENTIFICATION SYSTEM

Joseph E. Doles, Franklin, and Robert J. Hadick, Centerville, both of Ohio, assignors to LaserMike, Inc., Dayton, Ohio

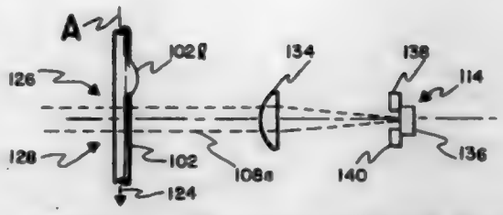
Continuation-in-part of Ser. No. 147,930, Nov. 5, 1993. This application Mar. 22, 1994, Ser. No. 215,809

Int. Cl.[6] G01N *21/89*

U.S. Cl. 356—73.1 **18 Claims**

1. A system for detecting a flaw in an optical fiber and for determining the type of said flaw, said system comprising:

a light source for generating a collimated beam of light rays for illuminating said optical fiber substantially orthogonal to a



longitudinal axis thereof, said optical fiber entering said beam at an entrance point and exiting said beam at an exit point generally opposite said entrance point, at least a portion of said beam illuminating said optical fiber being scattered by said fiber into an in-plane scattered light segment consisting of light rays which are scattered in a radial plane substantially perpendicular to said longitudinal axis of said optical fiber and an out-of-plane scattered light segment consisting of light rays which are scattered out of said radial plane, said out-of-plane scattered light segment resulting from flaws in said optical fiber;

a light detector assembly for detecting said out-of-plane scattered light segment of said beam and for producing a plurality of flaw signals representative thereof, said light detector assembly comprising:

a first photocell for receiving a first portion of said out-of-plane scattered light segment and for generating a lump signal representative thereof, said first portion being scattered out of said radial plane generally toward the side of said beam including said entrance point; and

a second photocell for receiving a second portion of said out-of-plane scattered light segment and for generating a neckdown signal representative thereof, said second portion being scattered out of said radial plane generally toward the side of said beam including said exit point; and

an electrical circuit for determining the type of said flaw in said optical fiber based on said plurality of flaw signals.

5,469,253

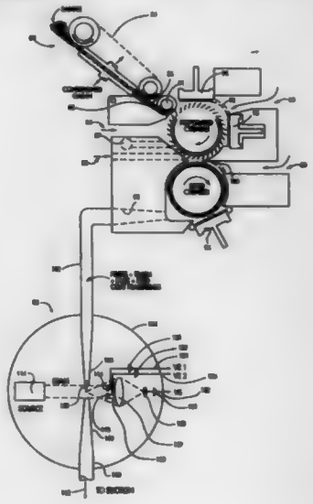
APPARATUS AND METHOD FOR TESTING MULTIPLE CHARACTERISTICS OF SINGLE TEXTILE SAMPLE WITH AUTOMATIC FEED

Frederick M. Shofner; Youe-T Chu; Joseph C. Baldwin; Michael E. Galyon; Benjamin M. Kacenas, all of Knoxville, and Gordon F. Williams, Norris, all of Tenn., assignors to Zellweger Uster, Inc., Knoxville, Tenn.

Continuation-in-part of Ser. No. 493,961, Mar. 14, 1990, Pat. No. 5,270,787. This application Oct. 16, 1992, Ser. No. 962,898

Int. Cl.[6] G01N *21/00;15/14;* **G01L** *5/04*

U.S. Cl. 356—238 **14 Claims**



5. An apparatus for measuring characteristics of entities in a sample of textile material, including fiber, trash and neps, comprising:

supply means for supplying a sample of textile material;

processor means including a processor input and a processor output, said processor input being positioned and operable to receive the textile sample from said supply means, said processor means being operable for processing said sample, releasing the entities of said sample one from the others, individualizing the entities of the sample to produce single entities, and producing entities at said processor output in an individualized condition;

sensor means for substantially simultaneously sensing a plurality of characteristics of a sample;

transport means for transporting individualized ones of said entities to said sensor means, said transport means including a single airstream for transporting and presenting individualized fibers, neps and trash in a random order to said sensor means;

said sensor means being operable to sense at least one characteristic of a portion of the fibers, a portion of the neps and a portion of the trash from each single sample of textile material as said fibers, neps and trash are randomly presented at said sensor means and for producing characteristic signals corresponding to said sensed characteristics to provide substantially simultaneous measurement of multiple data from the same sample of material;

analysis means for receiving said characteristic signals, analyzing said characteristic signals to identify segments of said characteristic signals that correspond to one of said fibers, trash or neps, and further analyzing said segments to distinguish and identify each segment as corresponding to one of either a fiber, a trash particle, or a nep, whereby said analysis means identifies at least a portion of the randomly presented fibers, neps and trash as being either fiber, nep or trash.

5,469,254

METHOD AND APPARATUS FOR MEASURING THREE-DIMENSIONAL POSITION OF A PIPE FROM IMAGE OF THE PIPE IN AN ENDOSCOPIC OBSERVATION SYSTEM

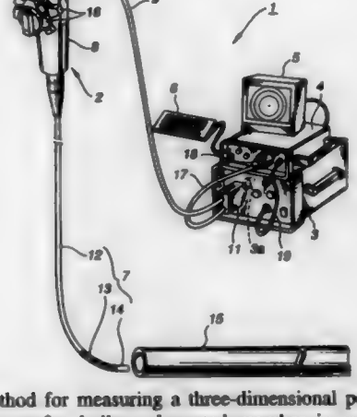
Yutaka Konomura, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1993, Ser. No. 43,207

Claims priority, application Japan, Apr. 6, 1992, 4-084066; Jul. 9, 1992, 4-182595; Aug. 14, 1992, 4-217049

Int. Cl.[6] G02B *23/26*

U.S. Cl. 356—241 **45 Claims**



1. A method for measuring a three-dimensional position of an inner surface of a hollow elongated member in an endoscopic observation system comprising:

an information calculation step for calculating information for setting a measuring coordinate system relating a position on an image of the elongated member having a uniform cross section and a three-dimensional position on the elongated member by extracting one cross-sectional configuration of the elongated member from a display screen on which the image of the elongated member is displayed, and by extracting a vanishing point corresponding to a darkest point in the image; and

a coordinate system setting step for setting the measuring coordinate system by using the information calculated in said information calculation step and known information on the elongated member and imaging means used to image the elongated member to enable calculation of the three-dimensional position on the elongated member corresponding to an arbitrary position in the image of the elongated member displayed on the display screen.

5,469,255

METHOD AND APPARATUS FOR SPECTROMETRIC MEASUREMENT OF PARTICULATE SURFACES

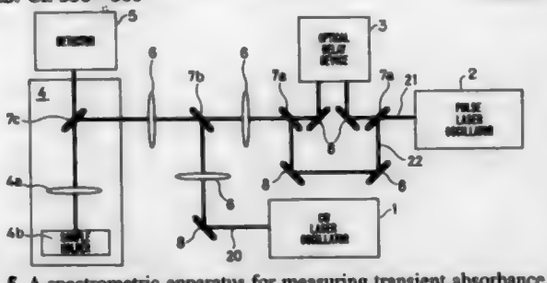
Kenji Kamada, Seciel-Uzumasa 206, 16-3, Uzumasa Miyamae-cho, Ukyo-ku, Kyoto-shi, Kyoto; Keiji Sasaki, 14-12, Koaza Torimae, Aza Enmyoji, Oyamazaki-cho, Otokuni-gun Kyoto; Noboru Kitamura, Mezon-Takano 502, 34-35, Tanaka Kamifurukawa-cho, Sakyo-ku, Kyoto-shi, Kyoto, and Hiroshi Masuhara, 2-4-16, Minamikonoeke-cho, Higashi-Osaka-shi, Osaka, all of, Japan

Filed Jan. 27, 1994, Ser. No. 186,991

Claims priority, application Japan, Jan. 28, 1993, 5-012957; Jan. 28, 1993, 5-012958

Int. Cl.[6] G01J *3/42;3/443*

U.S. Cl. 356—300 **5 Claims**



5. A spectrometric apparatus for measuring transient absorbance and transient absorption spectrum of a particulate substance at particulate interfaces in liquid phase, wherein the particulate substance is doped with a fluorescent pigment, by the utilization of optical resonance phenomena, said apparatus comprising:

(a) a pulse laser oscillator for generating laser beams of two wavelengths and exciting the fluorescent pigment and the substance to be measured, respectively;

(b) an optical delay device for causing delay of laser beams of one of the two wavelengths generated by said pulse laser oscillator;

(c) a microscope system for condensing laser beams generated by the pulse laser oscillator and irradiating the condensed beams to the particulate substance and the fluorescent pigment; and

(d) a detector for detecting light emission of the particulate substance and the fluorescent pigment.

5,469,256

MULTIPOLE MAGNETIC GEOMETRY FOR A RING LASER GYROSCOPE

David B. Hall, Crescenta, and Leo K. Lam, Canoga Park, both of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

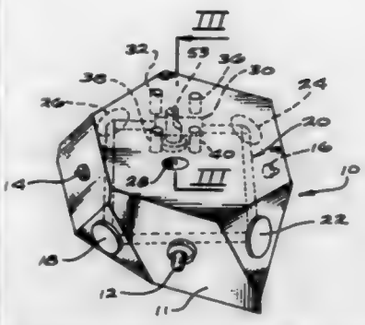
Filed Jul. 29, 1988, Ser. No. 228,308

Int. Cl.[6] G01C *19/64;* **H01S** *3/10*

U.S. Cl. 356—350 **14 Claims**

1. A ring laser gyroscope comprising:

a closed pathway defined by a bore cavity providing out-of-plane reciprocal image rotation of a plurality of electromagnetic waves propagating within said pathway; and,



means for providing non-reciprocal polarization rotation of said waves including magnetic means;

said magnetic means including a plurality of external magnetic elements, each magnetic element being adjustably mounted for rotation about its own axis and transversely directed with respect to the bore cavity defining said closed pathway.

5,469,257

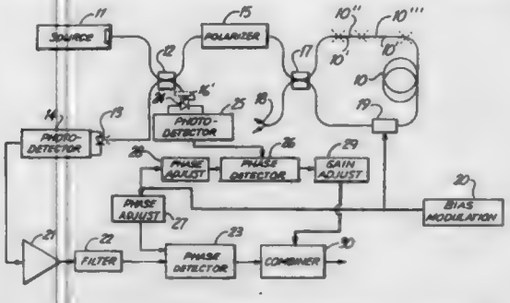
FIBER OPTIC GYROSCOPE OUTPUT NOISE REDUCER

James N. Blake, College Station, Tex.; Glen A. Sanders, Scottsdale, and Lee K. Strandjord, Glendale, both of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 24, 1993, Ser. No. 158,116

Int. Cl.[6] G01C *19/72*

U.S. Cl. 356—350 **16 Claims**



1. A noise reducer for reducing the results of optical noise occurring in a system having electromagnetic waves propagating in opposite directions in a coiled optical fiber to impinge on a first photodetector with a phase relationship, said noise reducer comprising:

a source capable of supplying an emitted electromagnetic wave characterized by having a selected intensity distributed over a first spectrum of frequencies and by having a further noise intensity distributed over a second spectrum of frequencies;

an optical processing subsystem having a pair of ports on a source side thereof, and at least one port on a loop side thereof, such that one of said pair of ports on said source side thereof is coupled to said source and that port remaining on said source side thereof is coupled to said first photodetector, and such that said port on said loop side thereof is coupled to an end of said coiled optical fiber so as to include in that optical path extending therefrom into that said end of said coiled optical fiber a phase modulator for modulating phases of electromagnetic waves passing therethrough and through said coiled optical fiber;

a second photodetector;

a second coupling means coupling electromagnetic waves from a selected location in selected one of said optical processing subsystem and said coiled optical fiber to said second photodetector such that electromagnetic waves emitted by said source propagate to said second photodetector with delays that are less than half that transit delay time required for electromagnetic waves to propagate through said coiled optical fiber; and

a noise reduction means coupled to said first and second photodetectors for providing system conversion signals based on electromagnetic waves impinging on said first photodetector and noise conversion signals based on electromagnetic waves impinging on said second photodetector, said noise reduction means being capable of combining representations of said system conversion signals and representations of corresponding said noise conversion signals to provide corresponding system output signals having smaller noise-to-signal ratios than do corresponding said system conversion signals used in forming same; and

wherein:

said optical processing subsystem further comprises a source coupler having a pair of ports on a source side thereof serving as said optical processing subsystem pair of source side ports, and a pair of ports on a loop side thereof, such that electromagnetic waves, occurring at said loop side port, are substantially transmitted through a coupling region in said source coupler to thereafter occur at least in part at both of said source side ports, and such that electromagnetic waves, occurring at said source side ports, are substantially transmitted through said coupling region to thereafter occur at least in part at both of said loop side ports;

said second coupling means couples electromagnetic waves from a said source coupler loop side port to said second photodetector; and

said second coupling means further comprises a selected length of optical fiber that is more dispersive than said coiled optical fiber at a primary wavelength of said source to couple electromagnetic waves from a said selected location in said optical processing subsystem to said second photodetector.

5,469,258

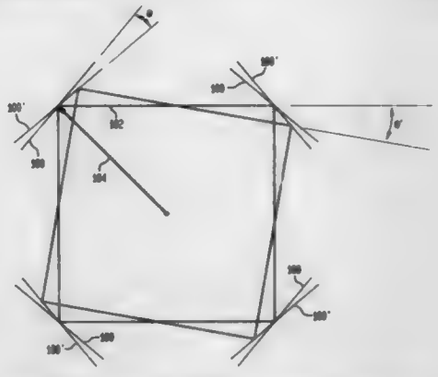
RING LASER GYROSCOPE WITH TILTING MIRRORS

Mark S. Grasso, Whippany, N.J., assignor to Allied Signal Inc., Morris Township, Morris County, N.J.

Filed Nov. 29, 1993, Ser. No. 158,666

Int. Cl.[6] G01C *19/70*

U.S. Cl. 356—350 **14 Claims**



1. A ring laser gyroscope with tilting mirrors comprising:

a frame;

cathode and anode means mounted on said frame for producing two counterpropagating waves traveling in opposite directions about an optical path within said frame;

four tiltable mirror assemblies mounted on said frame for defining said optical path;

path length control electronic means for maintaining a constant length of said optical path; and,

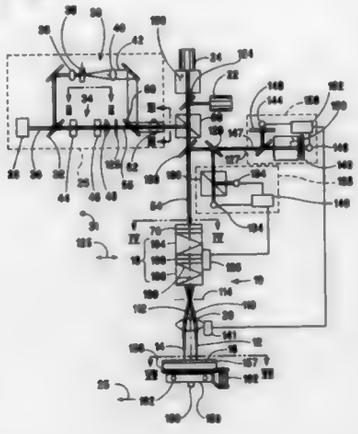
sinusoidal drive signal means connected to said four tiltable mirror assemblies for sinusoidally tilting said tiltable mirror assemblies to sinusoidally rotate said optical path.

5,469,259

INSPECTION INTERFEROMETER WITH SCANNING AUTOFOCUS, AND PHASE ANGLE CONTROL FEATURES

John A. Golby, Aschaffenburg, Germany; Miles J. Padgett, Impington, and Stephen P. Woodall, Histon, both of, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1994, Ser. No. 176,371
Int. Cl.[6] G01B 9/02
U.S. Cl. 356—351 11 Claims



1. Interferometer apparatus comprising:

illumination means for generating a coherent beam, wherein said coherent beam forms a collimated narrow line of illumination;

beam splitting means for splitting said coherent beam directed to said beam splitting means along an optical axis, into two orthogonally polarized sub-beams, having the same frequency, wherein said sub-beams are directed to travel from said beam splitting means at a divergent angle from one another, wherein each said sub-beam forms a polarized line of illumination, beam redirecting means for directing said sub-beams traveling at a divergent angle to travel in a convergent angle to intersect in a plane of intersection, wherein said beam splitting means and said beam redirecting means are configured so that motion of said beam splitting means and said beam redirecting means, being moved together in a lateral direction perpendicular to said optical axis, elongates an optical path traveled by one of said sub-beams while shortening an optical path traveled by another of said sub-beams;

beam projection means for projecting said sub-beams from said beam redirecting means to a test surface of a test sample, wherein said each said sub-beam projects a line on said test surface, said lines extending in a first direction parallel to one another;

first sensing means for sensing interference patterns produced as said sub-beams are reflected off said test surface;

scanning means for driving said test sample past said projection means in a direction perpendicular to said first direction, with said test surface exposed to said projection means;

phase angle sensing means for sensing a phase angle relationship between reflections of said sub-beams from said test sample; and

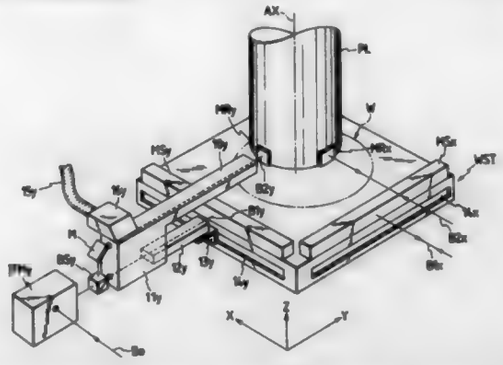
phase angle controlling means for varying said phase angle relationship in response to said phase angle sensing means, wherein said phase angle controlling means includes lateral drive means for moving said beam splitting means and said beam redirecting means together in said lateral direction.

5,469,260

STAGE-POSITION MEASURING APPARATUS

Shinichi Takagi, and Kenji Nishi, both of Kawasaki, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 37,401, Mar. 26, 1993, abandoned. This application Jul. 26, 1994, Ser. No. 280,542
Claims priority, application Japan, Apr. 1, 1992, 4-079594; Jul. 30, 1992, 4-203432
Int. Cl.[6] G01B 9/02;11/10; G01N 21/86
U.S. Cl. 356—358 7 Claims



1. A position measuring apparatus for detecting a position of a stage movable in a predetermined direction on a base, comprising:

a movable mirror having a reflecting surface perpendicular to the direction of movement of said stage and mounted on a portion of said stage;

a fixed mirror disposed fixedly relative to said base;

a light wave interferometer projecting coherent light beams substantially perpendicularly to respective ones of said movable mirror and said fixed mirror, causing the light beams reflected by respective ones of said movable mirror and said fixed mirror to interfere with each other and receiving said light beams, and photoelectrically detecting said interference beams and outputting a measurement signal;

a position detecting circuit for detecting the position of said stage based on said measurement signal;

first cover means covering a beam optical path from said light wave interferometer to said fixed mirror;

second cover means covering a beam optical path from said light wave interferometer to said movable mirror, said second cover means having its dimension in the direction of said beam optical path variable with the movement of said stage; and

gas supply means for supplying gas of controlled temperature to interiors of said first cover means and said second cover means at a predetermined flow rate.

5,469,261

MEASUREMENT OF LENS CHARACTERISTICS

Thomas Hellmuth, Danville; Charles E. Campbell, Berkeley, and Jay Wei, Fremont, all of Calif., assignors to Carl Zeiss, Inc., Thornwood, N.Y.

Continuation-in-part of Ser. No. 223,434, Apr. 5, 1994. This application Sep. 6, 1994, Ser. No. 301,260
Int. Cl.[6] G01B 9/02
U.S. Cl. 356—361 28 Claims

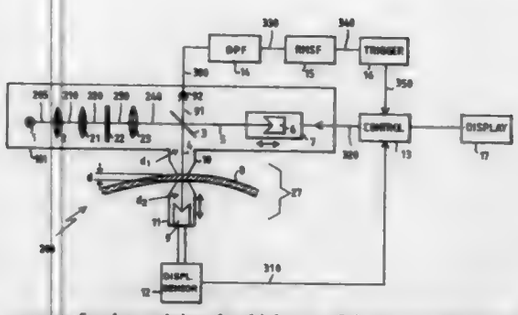
1. Apparatus for measuring the index of refraction of a material which comprises:

a source of a substantially spatially coherent beam of radiation and having a short temporal coherence length;

means, in response to the beam, for providing a sample beam and a reference beam;

translatable reflecting means, disposed to reflect the reference beam;

holding means for holding the material in the path of the sample beam, said holding means comprising reflecting means for reflecting the sample beam back through the material and



means for determining the thickness of the material where the sample beam passes through;

detector means, disposed to detect the reflected reference beam and the reflected sample beam, for producing a detector output signal in response thereto; and

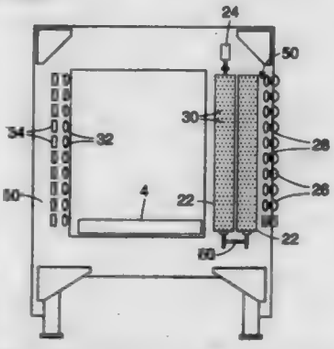
analysis means, in response to the detector output signal, for determining a position of the translatable reflecting means and, in response to the position of the translatable reflecting means and the thickness of the material, for determining the index of refraction of the material.

5,469,262

DIMENSION-MEASURING APPARATUS

Harry J. Keen, St. Johnsbury, and Mike Dunne, Peacham, both of Vt., assignors to Fairbanks Inc., Kansas City, Miss.

Filed Jul. 12, 1994, Ser. No. 273,809
Int. Cl.[6] G01B *11/04*
U.S. Cl. 356—386 **40 Claims**



1. An apparatus for measuring a dimension of an object on a conveyor, the apparatus comprising:

a source of light disposed on one side of the conveyor;

first and second scanning drums, each having a cylindrical surface coaxial with a central axis, each drum comprising a pattern of holes extending through the cylinder whereby the holes are arrayed in co-planar pairs, each member of each pair spaced 180 degrees from the other, each cylindrical drum positioned adjacent to the conveyor with the central axis of the drum parallel to the dimension to be measured with the first scanning drum positioned between the second scanning drum and the light source;

means for synchronously rotating the first and second drums at an angular velocity with the pattern of holes on each aligned with the other, whereby light from the light source passes through the aligned holes of the drums;

a light detector parallel with and on the other side of the conveyor from the light source, the scanning drums positioned between the source of light and the light detector, whereby light from the light source passes across the conveyor and through the holes aligned with the light source, the pattern of holes arranged so that as the scanning drums rotate a scanning pattern is detectable at the light detector, the light detector generating an output signal in response to the detected light; and

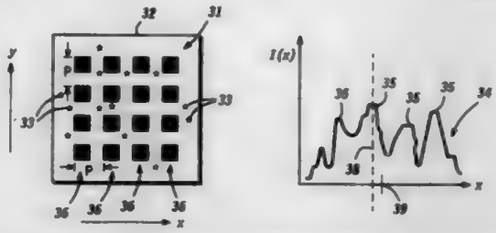
a controller for receiving the output signal from the light detector, the controller comprising means for determining from the scanning pattern and from the output signal the dimension of the object passing on the conveyor.

5,469,263

METHOD FOR ALIGNMENT IN PHOTOLITHOGRAPHIC PROCESSES

Whitson G. Waldo, III, Hutto, Tex.; Gong Chen, and Franco Cerrina, both of Madison, Wis., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1994, Ser. No. 269,978
Int. Cl.[6] G01B *11/00*
U.S. Cl. 356—401 **17 Claims**



1. A method for alignment in photolithographic processes comprising the steps of:

providing a photolithographic alignment target comprising features spaced at a characteristic spatial period;

illuminating the photolithographic alignment target;

obtaining an image of the target;

mathematically filtering out components of the image which lack the characteristic spatial period;

integrating the image in a first direction thereby creating an alignment signal I' (x);

determining, in response to the alignment signal, a linear position of the target in a second direction; and

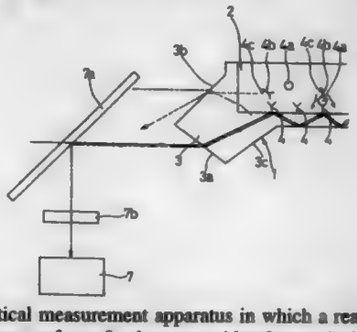
repositioning the target in response to determining the linear position of the target.

5,469,264

OPTICAL MEASUREMENT APPARATUS

Kazuhisa Shigemori, Kouga, Japan, assignor to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP93/01441, § 371 Date Jul. 7, 1994, § 102(e) Date Jul. 7, 1994, PCT Pub. No. WO94/08227, PCT Pub. Date Apr. 14, 1994
PCT Filed Oct. 6, 1993, Ser. No. 244,665
Claims priority, application Japan, Jan. 7, 1992, 4-268791
Int. Cl.[6] G01N *21/25*
U.S. Cl. 356—417 **12 Claims**



1. An optical measurement apparatus in which a reaction vessel is formed on a surface of at least one side of an optical waveguide, and which apparatus includes a signal light outgoing section for outgoing a signal light which is obtained by introducing a measurement light in said optical waveguide, and a detection section for detecting the signal light from said signal light outgoing sec-

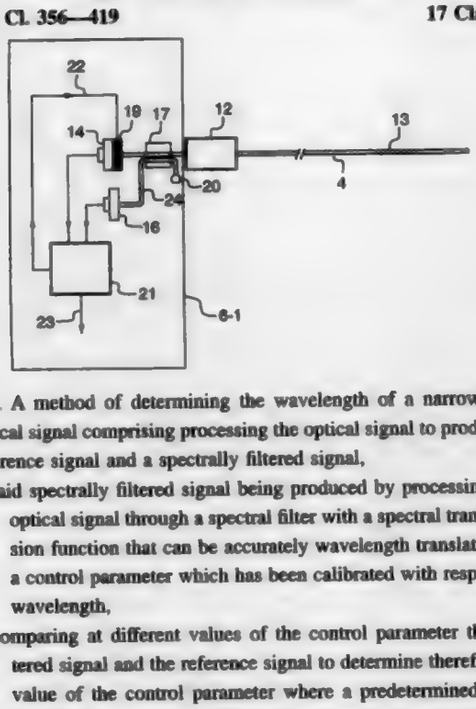
tion, the optical measurement apparatus further including preventing means, positioned near said signal light outgoing section, for preventing stray light, which is outgone from an interior of said reaction vessel to an edge section of said signal outgoing section, from being guided to a detection region of said detection section, and wherein said stray light being prevented from reaching said detection device by said preventing means has a same wavelength to that of said signal light.

5,469,265

METHOD AND APPARATUS FOR AN OPTOELECTRONIC SMART STRUCTURE INTERFACE WITH WAVELENGTH DEMODULATION OF LASER SENSORS

Raymond M. Measures, 214 Valleymede Drive, Richmond Hill, Ontario, Canada; Tino Alavie, 161 Bestview Drive, Willowdale, Ontario, Canada; Serge M. Melle, 6255 Beaulieu Rue. Apt. #1, Montréal, Québec, Canada; Trent Coroy, 127 Goerzen Street, Saskatoon, Saskatchewan, Canada; Beck Mason, 76 Glengrove Avenue West, Toronto, Ontario, Canada; Shawn E. Karr, 161 Bestview Drive, Willowdale, Ontario, Canada, and Kexing Liu, 1701 Graham Blvd., Apt. #3, Montréal, Québec, Canada

Filed Dec. 2, 1992, Ser. No. 984,688
Int. Cl.[6] G01J *3/51;* **G01B** *11/16*
U.S. Cl. 356—419 **17 Claims**



1. A method of determining the wavelength of a narrowband optical signal comprising processing the optical signal to produce a reference signal and a spectrally filtered signal,

said spectrally filtered signal being produced by processing the optical signal through a spectral filter with a spectral transmission function that can be accurately wavelength translated by a control parameter which has been calibrated with respect to wavelength,

comparing at different values of the control parameter the filtered signal and the reference signal to determine therefrom a value of the control parameter where a predetermined relationship of the spectrally filtered signal and reference signal is achieved,

and using the value of the calibrated control parameter at the predetermined relationship to determine the wavelength of the narrowband optical signal,

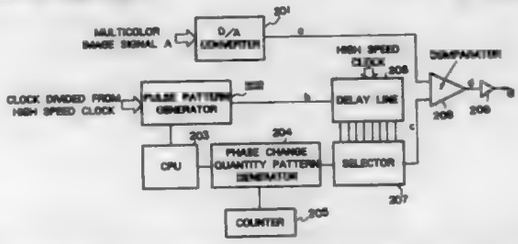
whereby the step of comparing the filtered signal and the reference signal compensates for source power variations and variable losses.

5,469,266

COLOR IMAGE PROCESSING APPARATUS WHICH USES DIFFERENT SCREEN ANGLES FOR DIFFERENT COLOR COMPONENTS

Akihiro Usami; Yoshinori Mochida, both of Yokohama; Atsutomo Yoshizawa; Yoshinori Ikeda, both of Kawasaki; Kazuhisa Kemmochi, Machida; Yukio Nagase, Kawasaki; Shinobu Arimoto, Yokohama; Masanori Yamada, Kawasaki; Hajime Suzuki, Yokohama, and Katsuhito Kato, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 945,584, Sep. 16, 1992, abandoned, which is a continuation of Ser. No. 642,279, Jan. 15, 1991, abandoned. This application Jun. 13, 1994, Ser. No. 259,123
Claims priority, application Japan, Jan. 19, 1990, 2-8370; Jan. 26, 1990, 2-16555; Jan. 26, 1990, 2-16561; Feb. 2, 1990, 2-22238; Jul. 10, 1990, 2-181771
Int. Cl.[6] H04N *1/40;1/52;* **G03G** *15/01*
U.S. Cl. 358—298 **26 Claims**



1. color image processing apparatus for forming a color image comprising at least three color components, said image processing apparatus comprising:

input means for inputting image data for each of the color components; and

image forming means for frame sequentially forming an image of each of the color components in accordance with the inputted image data;

wherein at least one of a first and a last image formed of one of a first of said at least three color components has a first screen angle, wherein two images respectively formed of at least a second and third of said at least three color components have a common second screen angle, and wherein the first screen angle is different from the second screen angle.

5,469,267

HALFTONE CORRECTION SYSTEM

Shenge Wang, Fairport, N.Y., assignor to The University of Rochester, Rochester, N.Y.

Filed Apr. 8, 1994, Ser. No. 225,121
Int. Cl.[6] H04N *1/21*
U.S. Cl. 358—298 **15 Claims**

1. A halftone correction system for obtaining dot overlap corrected halftone prints from a chosen digital printer, comprising:

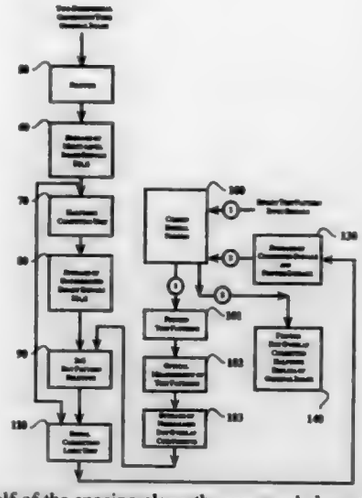
means for scanning a two-dimensional continuous tone image to produce multi-level digital image signals corresponding to optical characteristic features of each one of a multiplicity of image domains, the domains having an equidistant spacing from one another and being arranged in an orthogonal image coordinate system of rows and columns;

means for storing the multi-level digital image signals;

means for generating two-dimensional binary image signals which control the "on" and "off" states of printed dots and represent a potential printer-generated dot image;

means for storing the overlap-uncorrected binary dot image signals;

means for generating a two-dimensional virtual image screen having orthogonally intersecting screen lines defining a multiplicity of rectangular-shaped openings, the openings having the same equidistant spacing from one another as the printer-generated dot image and being arranged in an orthogonal screen coordinate system of-rows and columns parallel to the image coordinate system and offset therefrom by a distance of



one half of the spacing along the rows and along the columns, thereby positioning each intersection of screen lines over the center of each one of printed dots printed by the chosen printer;

means for selecting from the stored binary dot image signals two-dimensionally successive groupings of adjacent dots defined by a two-dot×two-dot pattern;

means for providing a sequence of binary test pattern digital signals corresponding to test patterns to the input of a chosen digital printer so that a printed output of the test patterns is produced on a printer medium as patches of arranged printed dots, the test patterns being sufficient in number to characterize the chosen printer;

means for measuring an average value of an optical characteristic feature of the printed output of each one of the test pattern patches;

means for storing the average values of the optical characteristic features of the test patterns as normalized average value extending over a range of signal levels identical to the range of signal levels provided by the multi-level digital image signals corresponding to the image domains;

means for establishing threshold levels for the multi-level digital image signals, the threshold levels being governed by the partial overlap of adjacent printed test pattern dots;

means for deriving a dot overlap correction of the uncorrected binary dot image signals in response to the selected two-dot×two-dot pattern, the correction including the threshold levels, the partial overlap of the chosen digital printer, and a halftoning computation;

means for storing digital dot printing signals containing the derived corrections of the binary dot image signals; and

means for initiating the printing by the chosen digital printer of a dot overlap corrected halftone print with the digital dot printing signals containing the derived corrections of the binary dot image signals on a printer medium substantially equivalent to the test pattern printer medium, whereby a dot overlap corrected halftone print of the two-dimensional continuous tone image is obtained.

5,469,268

DISPLAY MODEL-BASED ERROR CRITERION HALFTONING

David L. Neuhoff, Ann Arbor, Mich.; Thrasyvoulos N. Pappas, Summit, and Nambirajan Seshadri, Chatham, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Mar. 22, 1995, Ser. No. 409,474

Int. Cl.[6] H04N *1/387;1/405;* **G06K** *9/40*

U.S. Cl. 358—298 **21 Claims**

1. A method for generating an array of output binary signals suitable for application to a display device to generate a halftone

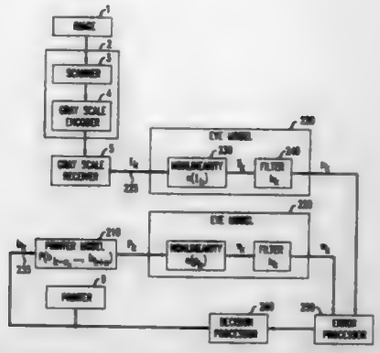


image in response to an array of input signals characterizing a gray-scale image, said method comprising the steps of:

(a) filtering said input signals using a first eye-model filter reflecting characteristics of human vision of derive first signals representative of an estimate of the gray scale image as perceived by a human eye;

(b) filtering sequences of binary signals using a filter reflecting characteristics representative of said display device to produce second signals representing an estimate of an output of said display device;

(c) filtering said second signal using a second eye-model filter to produce third signals;

(d) forming an error signal representative of a difference between said first and third signals; and

(e) selecting as the output binary signals to be applied to said display device one of said sequences of binary signals which sequence realizes a preselected error criterion.

5,469,269

HIGH SPEED OPTICAL INFORMATION SYSTEM AND METHOD

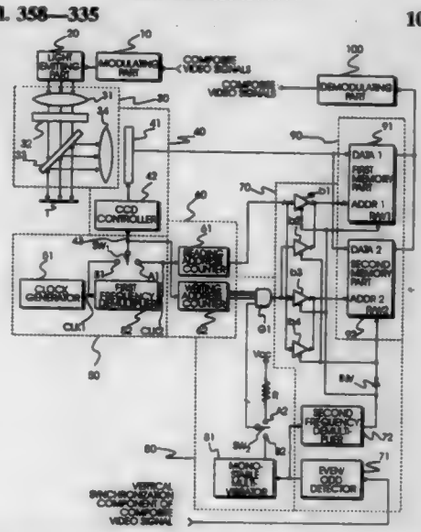
Jong K. Yun, Kyounggi, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyungki, Rep. of Korea

Filed Nov. 13, 1991, Ser. No. 791,198

Claims priority, application Rep. of Korea, Jan. 31, 1991, 91-1890

Int. Cl.[6] H04N *5/76*

U.S. Cl. 358—335 **10 Claims**



1. A high speed optical information search system, comprising:

scanning means for providing a scanned signal by scanning electrical/optical converted video signals on an optical magnetic tape in a form of vertical lines;

pick-up means for receiving the scanned signal from the scanning means in dependence upon surface conditions of said

optical magnetic tape, and for transmitting said scanned signal in dependence upon one of a first clock signal and a second clock signal;

memory means for storing data, corresponding to the scanned signal, from said pick-up means;

clock generating means for generating the first clock signal corresponding to a predetermined data transmission bit frequency, and for generating the second clock signal having a frequency corresponding to a multiple of the predetermined data transmission bit frequency;

a reading address counter for counting pulses of said first clock signal for reading the stored data from the memory means, said first clock signal corresponding to said predetermined data transmission bit frequency during one of a normal regeneration mode and a high speed search mode;

a writing address counter for counting pulses of said second clock signal for writing said data to the memory means, said second clock signal corresponding to the predetermined times of said predetermined data transmission bit frequency during said high speed search mode, and for counting the pulses of said first clock signal for writing said data to the memory means during the normal regeneration mode;

writing address control means for enabling provision of addresses from said writing address counter corresponding to the count of the pulses of the first clock signal to write enable the memory means during the normal regeneration mode, and for enabling provision of said addresses from said writing address counter corresponding to the count of the pulses of the second clock signal to write enable the memory means during the high speed search mode in response to a control signal pulse having a lesser duration than odd and even fields of a frame period;

demodulating means for demodulating said stored data from said memory means to generate composite analog video signals; and

writing/reading control means for detecting said odd and even fields from a vertical synchronizing component of said composite video signals of said demodulating means, and for producing control signals to control the writing and reading of said data by said memory means and said provision of said addresses by said writing address control means.

5,469,270

VIDEO EDITING APPARATUS

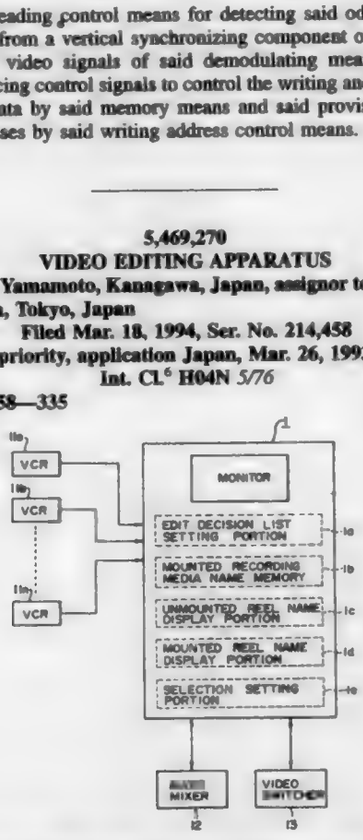
Tomoyuki Yamamoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 18, 1994, Ser. No. 214,458

Claims priority, application Japan, Mar. 26, 1993, 5-068353

Int. Cl.[6] H04N *5/76*

U.S. Cl. 358—335 **11 Claims**



1. A video editing apparatus for controlling a plurality of video reproducing apparatuses connected thereto and for editing a plurality of video signals supplied from said plurality of video reproducing apparatuses, said video editing apparatus comprising:

unmounted recording media name displaying means for displaying names of unmounted recording media which are not mounted on said plurality of video reproducing apparatuses connected to said video editing apparatus;

mounted recording media name displaying means for displaying both names of said plurality of video reproducing apparatuses connected to said video editing apparatus and names of mounted recording media which are mounted on said plurality of video reproducing apparatuses; and

recording media setting means for selecting one of said unmounted recording media corresponding to a name displayed by said unmounted recording media name displaying means, and for selecting one of said plurality of video reproducing apparatuses to mount the selected unmounted recording medium thereon.

5,469,271

UNIFIED COMPACT VIDEO CAMERA AND VCR

Mitsuo Hoshino, Saitama; Yuka Tsutsumi, Tokyo; Mitsuhiro Shimada, Chiba; Takashi Masuda; Yuji Morimiya, both of Kanagawa; Yoshihiro Ide, Tokyo; Takashi Kawaguchi, Kanagawa, and Yuichiro Nogo, Tokyo, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

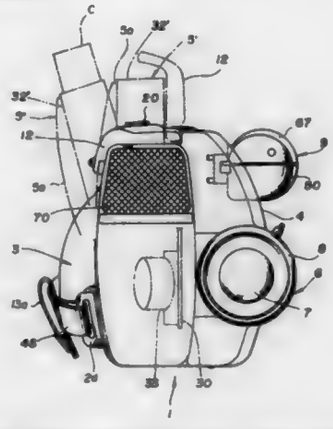
Continuation of Ser. No. 527,374, May 23, 1990, abandoned.

This application Apr. 1, 1994, Ser. No. 222,314

Claims priority, application Japan, May 30, 1989, 1-136355; May 30, 1989, 1-136356; May 30, 1989, 1-136357; May 30, 1989, 1-136358

Int. Cl.[6] H04N *5/247*

U.S. Cl. 358—335 **18 Claims**



1. A unified video camera and video cassette recording and/or reproducing apparatus, comprising:

a hollow body defining an interior space having a longitudinally extending median plane and an opening along the top and a side of said body to one side of said plane;

a video camera unit including a camera lens assembly disposed in said interior space and being offset toward the other side of said median plane;

a video cassette recording and/or reproducing unit disposed in said interior space and being offset toward said one side of said median plane in longitudinally overlapping relation to said video camera unit, said video cassette recording and/or reproducing unit including a cassette holder compartment movable between a loading position wholly within said body and an eject position in which a video cassette in said holder compartment projects out of said opening;

a grip strap extending along the exterior of said body at said side and being attached, at its ends, to a lower portion of said body so that an operator's hand can extend upwardly between said strap and said side of the body for cradling said body in the palm of such hand;

a lid mounted on said body for movement between a closed position for closing said opening at the top of said body when said cassette holder compartment is in said loading position

and an opened position leaving said opening unobstructed for movement of said cassette holder compartment to said eject position; and

said camera lens assembly has a power zoom mechanism and zoom control switch means for said power zoom mechanism mounted on said lid so that, in said closed position of the lid, said zoom control switch means are actuable by fingers of the operator's hand cradling said body.

5,469,272

DIGITAL SIGNAL RECORDING AND/OR REPRODUCING APPARATUS

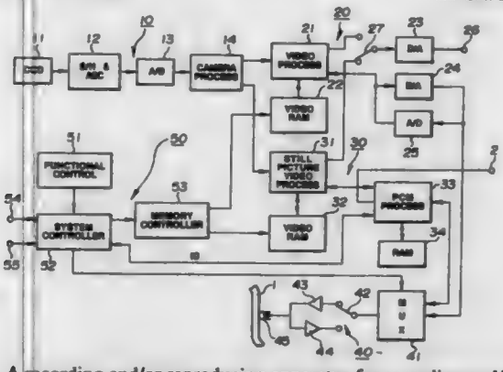
Yukio Kubota; Takayuki Sasaki, both of Kanagawa; Takao Takahashi, Tokyo, and Hiroshi Kobayashi, Chiba, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 842,708, Feb. 27, 1992, abandoned. This application Apr. 13, 1994, Ser. No. 227,183

Claims priority, application Japan, Mar. 5, 1991, 3-062476

Int. Cl.[6] H04N 5/76

U.S. Cl. 358—335 **12 Claims**



1. A recording and/or reproducing apparatus for recording and/or reproducing video signals representing motion pictures and digital signals representing PCM audio and/or still pictures in respective regions of each of a plurality of tracks on a magnetic tape, comprising:

helical scan recording means for recording video signals representing motion pictures and digital signals representing PCM audio and/or still pictures in corresponding regions on a magnetic tape;

discrimination code recording means for recording a discrimination code on said magnetic tape, said discrimination code indicating whether said digital signals represent PCM audio or still pictures recorded in a basic operating mode such that any of a predetermined group of reproducing devices is able to reproduce said still pictures, or in the alternative, still pictures recorded in a further operating mode such that at least one, but fewer than all, of the predetermined group of reproducing devices is able to reproduce said still pictures;

reproducing means for reproducing video signals representing motion pictures and digital signals representing PCM audio and/or still pictures recorded in respective regions on a selected magnetic tape;

discrimination code reproducing means for reproducing a discrimination code recorded on said selected magnetic tape, the reproduced discrimination code indicating whether said digital signals recorded on said selected magnetic tape were recorded in a basic operating mode such that any of said predetermined group of reproducing devices is able to reproduce the still pictures represented by the digital signals recorded on said selected magnetic tape or whether said digital signals recorded on said selected magnetic tape, were recorded in a further operating mode such that at least one, but fewer than all, of the predetermined group of reproducing devices is able to reproduce the still pictures represented by the digital signals recorded on said selected magnetic tape;

reproduction mode determining means for carrying out a determination of whether the recorded digital signals represent PCM audio, still pictures recorded in the basic operating mode, or still pictures recorded in the further operating mode, based on the discrimination code reproduced by said discrimination code reproducing means; and

controlling means for controlling said reproducing means in response to said reproduction mode determining means so that said reproducing means reproduces the digital signals recorded on said selected magnetic tape.

5,469,273

DECODING SYSTEM HAVING PARALLEL-PROCESSING CAPABILITY THEREIN

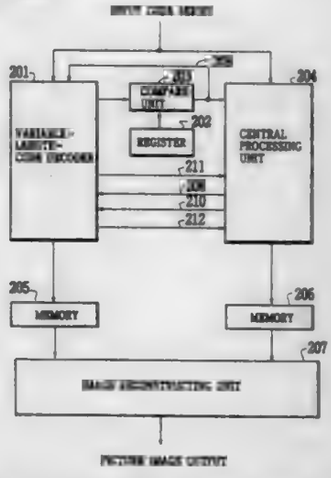
Tatsuhiko Demura, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 24, 1994, Ser. No. 184,920

Claims priority, application Japan, Jan. 22, 1993, 5-009021

Int. Cl.[6] H04N 1/41

U.S. Cl. 358—426 **9 Claims**



1. An image decoding system for processing compressed data including a digital code series comprising successive variable-length codes and successive fixed-length codes where the successive variable-length codes have an end information at an end portion of the successive variable-length codes and the successive fixed-length codes have a start information just before a start portion of the successive variable-length codes, the system comprising:

extracting means for extracting the successive variable-length codes and the successive fixed-length codes from the digital code series;

process means for processing the compressed data and for extracting the start information to generate a start signal;

self-running decoding means for decoding the variable-length codes upon receipt of the start signal;

compare means for comparing the variable-length codes with a predetermined value and for stopping the self-running decoding means to output an end signal to the process means when a variable length code equals the predetermined value;

image reconstructing means for reconstructing an image in accordance with a plurality of parameters obtained from the process means and the self-running decoding means,

wherein the process means reconstructs a motion vector and processes other parameters based on the compressed data, simultaneously with the decoding process by the self-running decoding means, and

wherein the compare means outputs an end signal upon receipt of said end information.

5,469,274

IMAGE PROCESSING APPARATUS FOR COMBINING DIFFERENTLY CORRECTED IMAGES

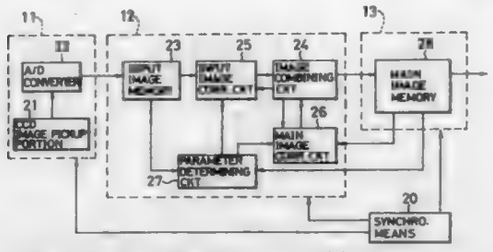
Keisuke Iwasaki, Yamato, and Kengo Takahama, Nara, both of, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Mar. 3, 1993, Ser. No. 26,454

Claims priority, application Japan, Mar. 12, 1992, 4-053417

Int. Cl.[6] H04N *1/387;* **G06K** *9/32;* **G06T** *3/00*

U.S. Cl. 358—450 **7 Claims**



1. An image processing apparatus comprising:

image inputting means for successively inputting images into said image processing apparatus;

input processing means for processing inputting images; and

image storing means for storing images outputted from said image processing means; wherein

said input processing means includes

image comparing means for comparing an image previously stored in said image storing means with an image currently inputted through said image inputting means to obtain a difference between the image previously stored and the image currently inputted;

image correction means for correcting the image previously stored in said storing means and the image currently inputted through said inputting means respectively in different ways based upon the difference obtained by said image comparing means, said image correction means including means for making an affine transformation of the image stored in said image storing means and means for making a parallel displacement of the image input through said image inputting means; and

image combining means for combining the corrected images with each other to supply said image storing means with a combined image, said image combining means including means for an addition of both images by a weighted mean.

5,469,275

METHOD AND APPARATUS FOR GRAYSCALE ADJUSTMENT

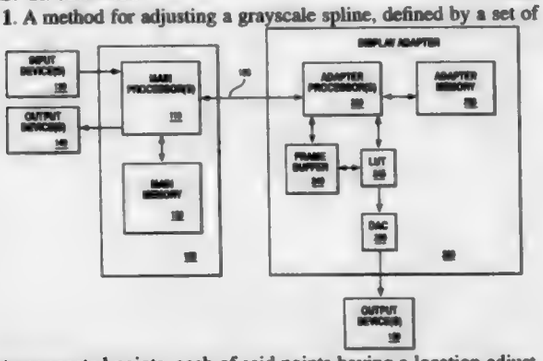
Albert D. Edgar, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 4, 1992, Ser. No. 925,710

Int. Cl.[6] H04N *1/40*

U.S. Cl. 358—458 **42 Claims**

1. A method for adjusting a grayscale spline, defined by a set of



interconnected points, each of said points having a location adjustable by a user through a user interface, for an output device comprising the steps of:

a) adjusting, responsive to user input of a location adjustment through said user interface, a location of a first point previously located on said grayscale spline;

b) adjusting a location of at least one other point, previously located on said grayscale spline, based on the adjusted location of the first point;

c) generating a grayscale spline through said first point and said at least one other point; and

d) producing an image with said output device using said generated grayscale spline.

5,469,276

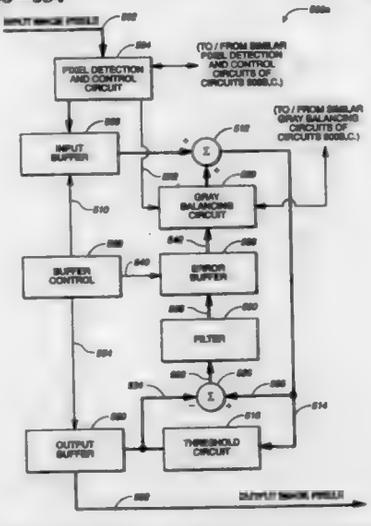
METHOD AND APPARATUS FOR REDUCING ARTIFACTS IN HALFTONE IMAGES USING GRAY BALANCE CORRECTION

Joseph S. Shu, San Jose, Calif., assignor to Seiko Epson Corporation, Japan

Filed Oct. 11, 1994, Ser. No. 320,539

Int. Cl.[6] H04N *1/52;1/405;* **G06T** *5/00*

U.S. Cl. 358—534 **20 Claims**



1. A method for improving the quality of a halftone image generated as a result of preprocessing operations performed on a plurality of streams of continuous-tone input pixels, each stream comprising pixels having values of a specific tonal color, the method comprising the steps of:

converting first input pixels, one from each stream, into a plurality of first quantization errors;

detecting a condition wherein the tonal values of second input pixels, one from each stream, are equal;

collectively processing said first quantization errors in response to said detecting step such that each value of said first quantization errors is transformed to a value equal to the average of said first quantization errors; and

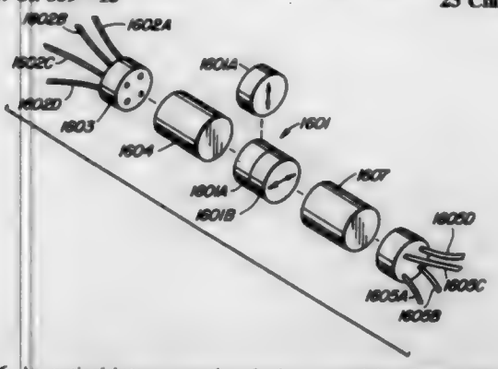
summing said averaged first quantization value from each stream with a respective second input pixel tonal value from each stream so as to maintain said condition throughout the preprocessing operations and thereby improve the quality of the halftone image.

5,469,277

OPTICAL INTERCONNECTION DEVICE

Mohsen Kavehrad, Cumberland, and Gang Yun, Ottawa, both of, Canada, assignors to University of Ottawa, Ottawa, Canada

Filed Feb. 7, 1992, Ser. No. 832,385
Int. Cl.[6] G03H 1/00; H04J 14/00; G02B 6/26
U.S. Cl. 359—15 23 Claims



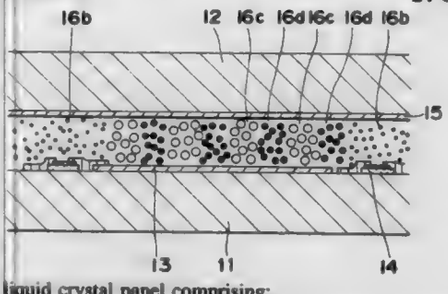
16. An optical interconnection device comprising Bragg diffraction means comprising at least one volume diffraction grating having a spatially varying refractive index, input means for directing input light beams onto said diffraction means, each input light beam resulting in a zero order light beam and a first order light beam leaving the Bragg diffraction means, and output means for receiving the zero order light beams and first order light beams leaving said Bragg diffracting means, the input means comprising first lens means for collimating spherical light beams before incidence upon the Bragg diffraction means and the output means comprising second lens means for converting planar output light beams to spherical light beams, wherein said input lens means comprises a first graded-index rod lens having one end juxtaposed to the Bragg diffraction means and said sources arrayed at its other end, the refractive index of the first rod lens varying radially so as to collimate spherical light beams, and the output lens means comprises a second graded-index rod lens having one end juxtaposed to the Bragg diffraction means and said receivers arrayed at its other end, the refractive index of the second rod lens varying radially to convert planar light beams leaving the Bragg diffraction means to spherical light beams.

5,469,278

LIQUID CRYSTAL PANEL AND VIEWFINDER FOR VIDEO CAMERA AND PROJECTION DISPLAY USING LIQUID CRYSTAL PANEL

Hiroshi Takahara, Neyagawa, and Hideki Ohmae, Suita, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 16,556, Feb. 11, 1993, abandoned. This application Nov. 18, 1994, Ser. No. 345,364
Claims priority, application Japan, Sep. 25, 1992, 4-256069
Int. Cl.[6] G02F 1/13
U.S. Cl. 359—51 24 Claims



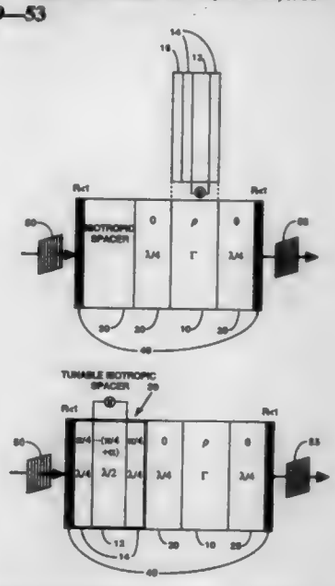
1. A liquid crystal panel comprising:
a first substrate having pixel electrodes arranged as a matrix;
a second substrate having a counterelectrode; and
a liquid crystal/polymer composite consisting of a liquid crystal component and a polymer component, said composite being interposed between said first and second electrode substrates, and said composite comprising of a first region and a second region defined on each of said pixel electrodes, an average pore size of said polymer component in said first region being different from that of said second region.

5,469,279

CHIRAL SMECTIC LIQUID CRYSTAL MULTIPASS OPTICAL FILTERS INCLUDING A VARIABLE RETARDER (AND A VARIABLE ISOTROPIC SPACER)

D. Gary Sharp, and M. Christina Johnson, both of Boulder, Colo., assignors to The University of Colorado Foundation, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 792,284, Nov. 14, 1991, Pat. No. 5,381,253, and Ser. No. 884,644, May 15, 1992, Pat. No. 5,243,455, which is a continuation-in-part of Ser. No. 522,215, May 11, 1990, Pat. No. 5,132,826, which is a continuation-in-part of Ser. No. 429,304, Oct. 30, 1989, abandoned. This application Oct. 27, 1992, Ser. No. 967,218
Int. Cl.[6] G02F 1/133;1/1335;1/13
U.S. Cl. 359—53 23 Claims



1. A tunable optical filter for receiving linearly polarized input light and for transmitting light of a selected design wavelength, comprising:
a front and a back reflector positioned to form a multipass cavity;
an exit polarizer positioned on the opposite side of said back reflector from said front reflector and oriented at angle θ with respect to the polarization of the input light;
a variable retarder positioned between said front and back reflectors and oriented at angle p with respect to the polarization of the input light, said variable retarder being a half- or full-wave retarder at the design wavelength;
a first quarter-wave retarder positioned between said front reflector and said variable retarder and oriented parallel or perpendicular to the polarization of the input light; and
a second quarter-wave retarder positioned between said back reflector and said variable retarder and oriented parallel or perpendicular to the polarization of the input light;
wherein said variable retarder is a multiple-element retarder comprising a planar-aligned chiral smectic liquid crystal half-wave retarder, the optic axis of which is rotatable by application of an electric field parallel to the smectic layers, said variable retarder further comprising third and fourth quarter-wave retarders positioned in series with and on first and second sides, respectively, of said liquid crystal half-wave

retarder, wherein said third and fourth quarter-wave retarders are oriented parallel or perpendicular to each other and at an angle of ρ±45° with respect to the polarization of the input light.

5,469,280

MULTI-LAYERED LIQUID CRYSTAL DISPLAY PANEL WITH AUXILIARY SUPPORTS FOR REINFORCEMENT OF INJECTION HOLES

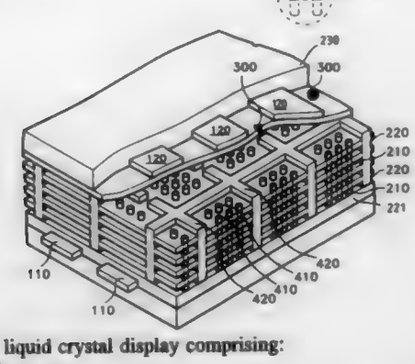
In-Sik Jang, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 29, 1994, Ser. No. 235,851

Claims priority, application Rep. of Korea, Apr. 29, 1993, 7336/93

Int. Cl.[6] G02F *1/133;1/1335;1/1333*

U.S. Cl. 359—53 **16 Claims**



1. A liquid crystal display comprising:
a substrate;
a plurality of first electrodes arranged on said substrate in a predetermined pattern;
a plurality of second electrodes which cooperate with said first electrodes to define a plurality of pixel areas;
a plurality of insulating layers for separating each said pixel area into a plurality of spaces between said first and second electrodes;
liquid crystal disposed in said spaces defined by said insulating layers to form at least two liquid crystal layers between said first and second electrodes;
main supports within each pixel area for securing said insulating layers in position; and
a plurality of auxiliary supports disposed adjacent to liquid crystal injection holes formed in said insulating layers, said auxiliary supports providing reinforcement for said injection holes to prevent deformation thereof.

5,469,281

DRIVING METHOD FOR LIQUID CRYSTAL DEVICE WHICH IS NOT AFFECTED BY A THRESHOLD CHARACTERISTIC CHANGE

Kazunori Katakura, Atsugi; Shinjiro Okada, Isehara, and Yutaka Inaba, Kawaguchi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

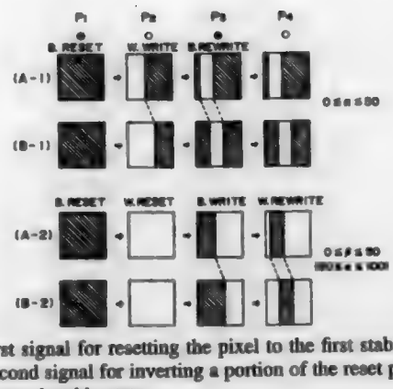
Filed Aug. 24, 1993, Ser. No. 111,509

Claims priority, application Japan, Aug. 24, 1992, 4-246021; Aug. 24, 1992, 4-246022; Aug. 24, 1992, 4-246023; Aug. 24, 1992, 4-246027

Int. Cl.[6] G02F *1/1343*

U.S. Cl. 359—56 **11 Claims**

1. A driving method for a liquid crystal device of the type including pixels comprising a liquid crystal having a first and a second stable state, comprising the steps of:
(A) providing a pixel having a transmittance (Ts) smaller than a prescribed transmittance (Tm), and sequentially applying to the pixel:



a first signal for resetting the pixel to the first stable state,
a second signal for inverting a portion of the reset pixel to the second stable state,
a third signal for partially inverting the invented portion of the pixel to the first stable state, and
a fourth signal for substantially not causing. inversion, and
(B) providing a pixel showing a transmittance (T_1) larger than the prescribed transmittance (Tm), and sequentially applying to the pixel:
a first signal for resetting the pixel to the first stable state,
a second signal for a resetting the pixel to the second stable state,
a third signal for inverting a portion of the pixel to the first stable state, and
a fourth signal for partially inverting the inverted portion of the pixel to the second stable state.

5,469,282

POWER SUPPLY SYSTEM FOR OPTICAL NETWORK UNIT OF A FIBER IN THE LOOP

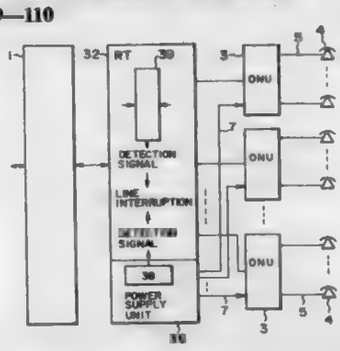
Yuzuru Ishioka, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 17, 1994, Ser. No. 210,228

Claims priority, application Japan, Sep. 20, 1993, 5-230105

Int. Cl.[6] H04B *10/08;* **H04M** *9/00*

U.S. Cl. 359—110 **9 Claims**



1. A power supply system for an optical network unit in a Fiber In The Loop system which comprises a remote terminal provided with a power supply unit and an optical network unit connected to a plurality of subscriber terminals, an electric current being supplied to the optical network unit from the power supply unit via a power supply line, said power supply system comprising:
current detecting means, provided to said power supply unit, for detecting a current supplied from said power supply unit to said optical network unit via said power supply line, said current increasing in response to an increase in a number of said subscriber terminals currently being in a communication state, said current detecting means outputting a current detection signal when the current supplied to said optical network unit exceeds a predetermined level; and
line interrupting means, provided in said remote terminal, for interrupting only those communication lines which are currently not in the communication state when said current detection signal is supplied by said current detecting means,

said communication lines being one of a plurality of lines provided to correspond respectively to the subscriber terminals so that communication signals are transmitted through the communication lines.

5,469,283

OPTICAL SYSTEM FOR CONNECTING CUSTOMER PREMISES NETWORKS TO A SWITCHING CENTER OF A TELECOMMUNICATION NETWORK PROVIDING INTERACTIVE AND NON-INTERACTIVE SERVICES

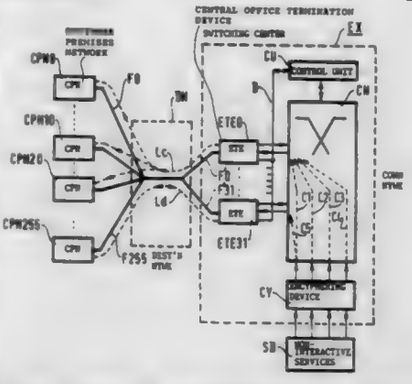
Paul Vinel, Velizy, and Philippe Perrier, Paris, both of, France, assignors to Societe Anonyme Dite: Alcatel CIT, Paris, France

Filed Apr. 28, 1993, Ser. No. 53,190

Claims priority, application France, Apr. 30, 1992, 92 05 399

Int. Cl.[6] H04B *10/20;10/00*

U.S. Cl. 359—118 **3 Claims**



1. An optical system for connecting customer terminals to a telecommunication network providing interactive and non-interactive services, said system comprising:

a connection network;

a plurality of central office termination devices, each comprising an optical sender and an optical receiver which are tuned to the same wavelength, which is different for each central office termination device, at least one of said central office termination devices being chosen as a control central office termination device;

a plurality of customer premises networks, each comprising an optical sender and an optical receiver which are tuned to the same wavelength, which is variable, the wavelength of the receiver being set to the wavelength of said control central office termination device when a customer premises network is not communicating with an interactive service;

an optical distribution network connecting the optical senders of all of said central office termination devices to the optical receivers of all of said customer premises networks, and connecting the optical senders of all of said customer premises networks to the optical receivers of all of said central office termination devices; and

control means for controlling the connection network and for assigning a different wavelength to each customer premises network;

wherein said control means controls the connection network to connect the non-interactive services to said control central office termination device in order to send non-interactive service signals at the wavelength of said control central office termination device, and

wherein each customer premises network comprises means for further receiving signals of at least one non-interactive service sent at the wavelength of said control central office termination device.

5,469,284

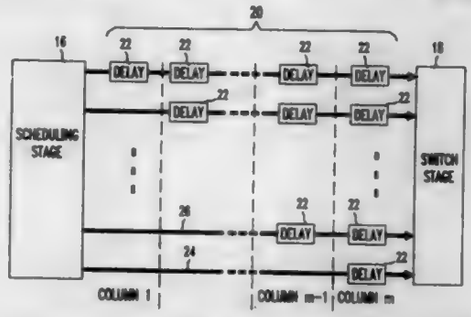
OPTICAL PACKET SWITCH

Zygmunt Haas, Holmdel, N.J., assignor to AT&T IPM Corp., Coral Gables, Fla.

Continuation of Ser. No. 807,915, Dec. 16, 1991. This application May 5, 1993, Ser. No. 58,999

Int. Cl.[6] H04J *14/08*

U.S. Cl. 359—139 **19 Claims**



5. An optical packet switch having a plurality of inputs for receiving optical data packets and a plurality of outputs, comprising:

means for detecting contentions between ones of the plurality of optical data packets for an output of the optical packet switch;

a plurality of feed-forward optical delay lines coupled to a means for switching, at least two of the plurality of optical delay lines being of different delay;

means for coupling predetermined ones of the plurality of inputs to selected ones of the plurality of optical delay lines to delay in time arrival of predetermined ones of the optical data packets at the means for switching so that contentions between the predetermined optical data packets for ones of the plurality of outputs are resolved, the coupling means being responsive to the detecting means; and

means for switching in the optical domain optical data packets received at the plurality of inputs to selected ones of the plurality of outputs of the optical packet switch.

5,469,285

METHOD AND EQUIPMENT FOR BIDIRECTIONAL DATA TRANSMISSION (FULL-DUPLEX)

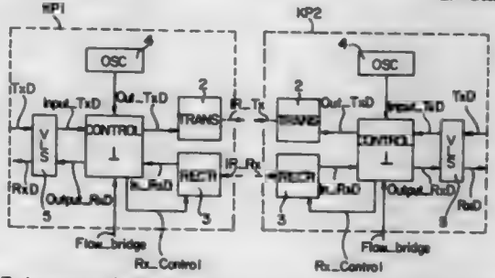
Max B. Gut, Weggis, Switzerland, assignor to Royale Consultants Ltd., Dublin, Israel

Filed Jan. 24, 1994, Ser. No. 186,452

Claims priority, application Switzerland, Jan. 26, 1993, 00222/93

Int. Cl.[6] H04B *10/00*

U.S. Cl. 359—152 **19 Claims**



17. Apparatus for bidirectional data communication with a direction of signal transmission which is switchable; said apparatus comprising:

first and second communicators (KP1, KP2), both having a transmitter and a receiver;

first and second control units for each of said communicators (KP1, KP2), for providing, to the communicator transmitter, a transmit control signal for enabling first signal (Out_TxD) to be output by the communicator and for providing, to the

communicator receiver, a receive control signal for enabling a second signal (In_RxD) to be received by the communicator; said control unit is further adapted to receive a clock signal from an oscillator for timing the operation of said control unit; and

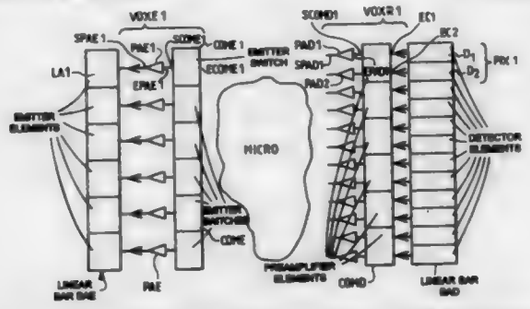
a voltage level shifter for providing to the control unit a third signal (Input_TxD) and for receiving from the control unit a fourth signal (Output_RxD), said voltage level shifter also for receiving a fifth signal (TxD) containing information to be transmitted through the communicator's control unit via the communicator's transmitter and said voltage level shifter passing on the received signal (In RxD) from the control unit as a sixth signal (RxD).

5,469,286

OPTOELECTRONIC INSTALLATION FOR THE INTERCONNECTION OF ELECTRONIC MODULES AND A CORRESPONDING OPTOELECTRIC CONNECTOR

Pierre Nicole, Saint Cloud, France, assignor to Dassault Electronique, Saint Cloud, France

Filed Oct. 28, 1993, Ser. No. 142,053
Claims priority, application France, Nov. 13, 1992, 92 13705
Int. Cl.[6] H04B *10/20*
U.S. Cl. 359—163 **22 Claims**



1. In an optoelectronic installation for the optical interconnection of first and second electronic modules including:

(a) a first optical emitter element associated with said first module and fed by a first outgoing signal to be transmitted between said first module and said second module; and

(b) a first optical receiver element associated with the second module, energized by the radiation emitted by said first emitter element and delivering a first incoming signal to said second module;

said first and second modules being positioned relative to each other according to a predetermined geometrical relationship;

the improvement wherein said first receiver element includes:

(c) at least one detector element subdivided into at least first and second detector subelements each having a photosensitive section of a general elongate rectangular shape and disposed longitudinally opposite the radiation emitted by the first emitter element, the first and second detector subelements being disposed with their longer sides next to each other, with their substep chosen to be equal to, at most, strictly half of the step of the first emitter element;

(d) an electronic receiving channel assigned to the first or second detector subelements; and

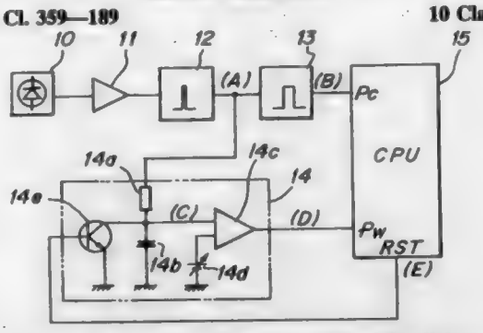
(e) main switching means capable of electrically connecting the first or the second detector subelement to the electronic receiving channel in accordance with a predetermined reception condition relating to the signals received by the said first and second detector subelements, which allows said electronic receiving channel to deliver the first incoming signal to the second module in spite of a relative transverse or longitudinal displacement between the first and second modules.

5,469,287

LASER LIGHT RECEIVING DEVICE WITH IMPROVED NOISE DISCRIMINATION

Mikio Iwakuni, Ichikawa, Japan, assignor to Uniden Corporation, Ichikawa, Japan

Filed Jun. 10, 1993, Ser. No. 74,410
Claims priority, application Japan, Sep. 24, 1992, 4-279444
Int. Cl.[6] H04B *10/04*
U.S. Cl. 359—189 **10 Claims**



1. A laser signal receiving apparatus for receiving light pulses transmitted from a laser transmitter, said apparatus comprising:

a light receiving section having a photo-electric converter for converting said light pulses into an electric pulse signal comprising a series of electric pulses;

a pulse-width detecting section for detecting a pulse-width of said series of electric pulses derived from said light receiving section; and

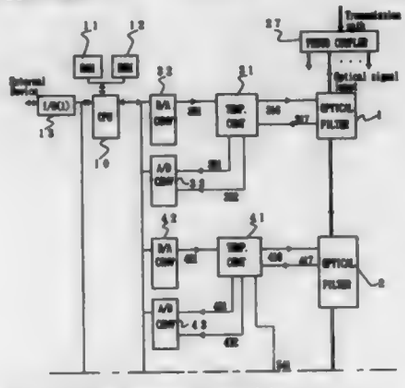
a controlling section, including (i) a counter terminal receiving said series of electric pulses, and (ii) a pulse-width detector terminal receiving an output of said pulse-width detecting section, for counting said electric pulses having a predetermined pulse-width on the basis of said output of said pulse-width detecting section.

5,469,288

OPTICAL FILTER, METHOD OF CONTROLLING TRANSMISSION WAVELENGTH THEREOF, AND OPTICAL RECEIVER USING THE METHOD

Hiroshi Onaka, and Hideyuki Miyata, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 24, 1993, Ser. No. 125,742
Claims priority, application Japan, Feb. 9, 1993, 5-044694
Int. Cl.[6] H04B *10/06*
U.S. Cl. 359—189 **12 Claims**



9. An optical signal receiver comprising:

an input terminal which receives a plurality of optical frequency-division multiplexing signals having a transmission bandwidth;

a first optical filter, coupled to said input terminal, which receives and filters the plurality of optical frequency-division multiplexing signals, said first optical filter having a filter

transmission bandwidth and outputting optical signals within the transmission bandwidth of the optical frequency-division multiplexing signals;

a second optical filter having a periodic transmission band characteristic, which receives the optical signals output from said first optical filter and outputs one optical signal of the received optical signals;

photo detecting means coupled between said first optical filter said second optical filter for detecting a reception of the optical signals;

memory means for storing a control parameter;

an oscillation source for generating a frequency signal having a frequency; and

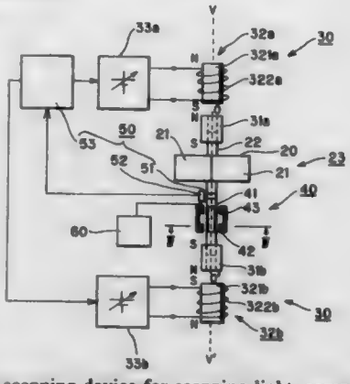
control means, coupled to said first and second optical filters, said photo detecting means, said memory means and said oscillation source, for sweeping the frequency of the frequency signal output by said oscillation source, fixing respective transmission wavelengths of said first and second optical filters to a wavelength of a desired optical signal according to the control parameter stored in said memory means, rewriting a current control parameter into said memory means as the control parameter, at each specified time while reception of the optical signals is detected by said photo detecting means, and stopping the rewriting of the current control parameter and allowing a free running, of said first and second optical filters with the control parameter stored in the memory means when the reception of the optical signals is not detected, until the reception of the optical signals is detected again.

5,469,289

LIGHT SCANNING DEVICE

Naoto Iwao, Nagoya, and Shoji Yamada, Konan, both of, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Jun. 3, 1994, Ser. No. 253,562
Claims priority, application Japan, Jun. 4, 1993, 5-134327
Int. Cl.[6] G02B *26/08*
U.S. Cl. 359—200 **22 Claims**



1. A light scanning device for scanning light, comprising:

a reflective mirror having a mirror surface for receiving and reflecting light, the reflective mirror having a rotational shaft which extends along its central axis;

a bearing device for rotatively supporting the rotational shaft about its central axis with a bearing stiffness;

a driving member for rotating the rotational shaft about the central axis so as to rotate the reflective mirror about the central axis to thereby cause the reflective mirror to scan reflected light;

a control unit for controlling the bearing stiffness of the bearing device; and

a detecting unit for detecting a rotational speed of the rotational shaft,

wherein the control unit is connected to the detecting unit for adjusting the bearing stiffness of the bearing device in response to the detected rotational speed, the rotational shaft is provided with a pair of permanent magnets, at their opposite ends along the central axis, the bearing device includes a pair of electromagnets, each electromagnet being located to confront a corresponding one of the pair of permanent magnets, and

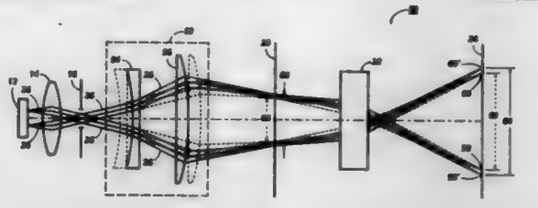
the control unit adjusts a magnetization intensity of each of the pair of electromagnets to thereby control the bearing stiffness of the bearing device.

5,469,290

TWO-ELEMENT ZOOM LENS FOR BEAM SEPARATION ERROR CORRECTION

Patrick Y. Maeda, Redondo Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 6, 1994, Ser. No. 254,713
Int. Cl.[6] G02B *26/08*
U.S. Cl. 359—210 **4 Claims**



1. A raster scanning system with spot separation error correction system comprising:

a light source for emitting a plurality of light beams;

a medium;

scanning means located between said light source and said medium for receiving the light beams and scanning the same in a fast-scan plane across said medium;

collimating means located between said light source and said scanning means for substantially collimating the light beams;

a spot separation error correction system for imaging the beams at an image plane on said scanning means in a cross-scan plane;

said spot separation error correction system having a first axially adjustable optical means being located in the path of the light beams between said collimating means and said scanning means;

said spot separation error correction system having a second axially adjustable optical means being located in the path of the light beam between said first axially adjustable optical means and said scanning means;

post scanning optical means being located between said scanning means and said medium for receiving the light beam from said scanning means and focusing the light beam onto said medium in both the fast-scan plane and the cross-scan plane; and

said first axially adjustable optical means and said second axially adjustable optical means being so constructed and arranged relative to each other that upon moving said first axially adjustable optical means and said second axially adjustable optical means toward each other or away from each other in the axial direction at a pre-determined relationship with each other the image plane of said spot separation error correction system remains on said scanning means and the magnification on said scanning means changes which substantially corrects the spot separation error on said medium.

5,469,291

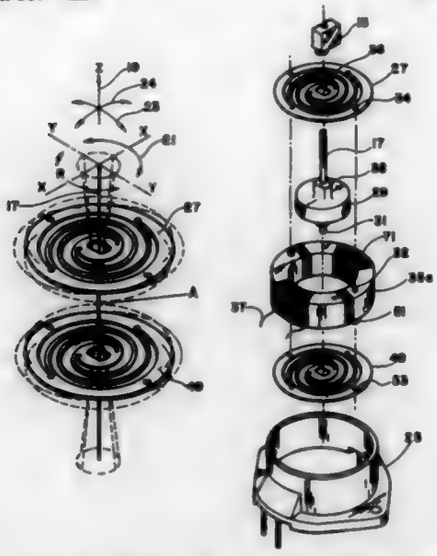
GYRATING PROGRAMMABLE SCANNER

George A. Plesko, Media, Pa., assignor to Gap Technologies, Inc., Media, Pa.

Continuation-in-part of Ser. No. 612,983, Nov. 15, 1990, Pat. No. 5,187,612. This application Jan. 21, 1993, Ser. No. 6,754

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—224 29 Claims



1. A device for providing angular displacement of a core with respect to an axis defined by said core, comprising;

a magnetic core element for producing a magnetic field, and defining a Z axis, said core element adapted for at least two movements selected from the group consisting of angular displacement in the X direction, angular displacement in the Y direction, and rotation about the Z axis;

coil means proximate said core element for introducing a distortion force in said core element in at least one of said X and Y directions or rotation about the Z direction as desired; and

mounting means for suspending said core element with respect to said coil means to permit relative movement therebetween in response to said distortion force.

5,469,292

METHOD OF AMPLIFYING AN OPTICAL SIGNAL, AN OPTICAL AMPLIFIER FOR PERFORMING THE METHOD, AND USE OF SUCH AN OPTICAL AMPLIFIER AS A SOURCE OF LIGHT

Anders O. Bjarklev, Roskilde, and Thomas P. Rasmussen, Frederiksberg, both of, Denmark, assignors to Lycom A/S, Broendby, Denmark

PCT No. PCT/DK92/00228, § 371 Date Jan. 12, 1994, § 102(e) Date Jan. 12, 1994, PCT Pub. No. WO93/02492, PCT Pub. Date Feb. 4, 1993

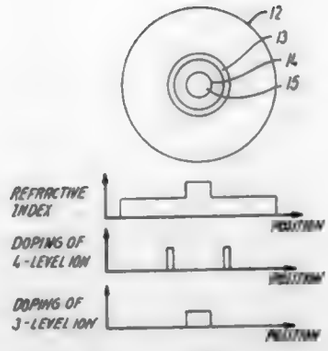
PCT Filed Jul. 17, 1992, Ser. No. 182,078

Claims priority, application Denmark, Jul. 19, 1991, 1376/91

Int. Cl.[6] H01S *3/07;* G02B *6/22*

U.S. Cl. 359—341 17 Claims

1. A method of amplifying an optical signal with an optical amplifier having a 4-level lasing system, said optical signal having a wavelength-dependent field distribution transverse to an optical wave guide (4) doped with active, light-emittable ions positioned in a cylindrical shell (13) coaxially with the axis of symmetry of the wave guide (4), in which cylindrical shell (13) the active ions are excited for stimulated emission of optical energy at a first wavelength corresponding to the signal by pumping of optical energy at one or more other wavelengths, said method comprising providing the cylindrical shell (13) with active ions at such a distance from the axis of symmetry of the wave guide (4) that the



active ions are excited for radiation of spontaneous emission in an area of the wave guide (4) where the reduction in the optical power originating from amplified spontaneous emission is grater than the reduction in the optical power originating from amplified signal light, the wavelength of the optical signal being greater than the wavelength at the dominating amplified spontaneous emission.

5,469,293

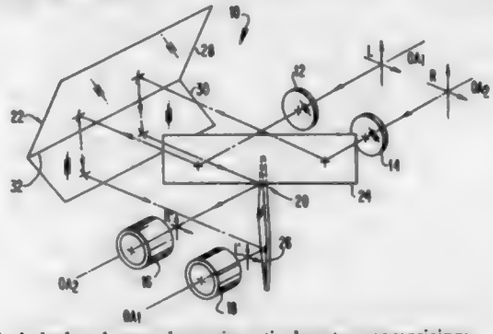
DUAL-PATH OPTICAL SYSTEM

Stephen D. Fantone, Lynnfield, Mass., assignor to Mobil Corporation, Lynnfield, Mass.

Filed Sep. 9, 1993, Ser. No. 118,881

Int. Cl.[6] G02B *23/00;5/04;5/08*

U.S. Cl. 359—412 10 Claims



1. A dual-path, pseudoscopic optical system comprising:

a pair of objectives arranged along separate optical axes that are spaced apart from one another by a predetermined distance;

a ninety-degree roof mirror system comprising upper and lower plane mirrors intersecting one another along a line substantially parallel to both optical axes of said objectives;

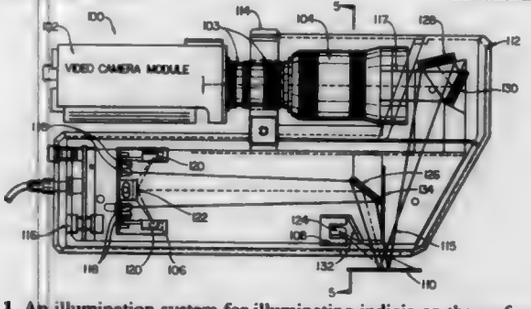
a pair of crossed plane mirrors arranged one above the other in planes that intersect one another approximately at a right angle, one of said crossed plane mirrors being positioned to intersect said optical axes of said objectives to fold them so that light rays travel to said upper mirror of said roof mirror system from which they are reflected to travel downwardly to said lower mirror of said roof mirror system after which they are folded again by said lower mirror of said roof mirror system to travel along a direction opposite to the one in which they entered said roof mirror system and offset with respect thereto, the other of said crossed plane mirrors being arranged to intercept rays reflected from said lower mirror of said plane mirror roof system and direct them rearwardly along two separate optical axes that are parallel to said optical axes of said objectives, vertically offset with respect thereto, but spaced apart by said predetermined distance by which said objective optical axes are spaced apart, said objectives, said roof mirror system, and said plane crossed mirrors being arranged to form pseudoscopic real images of an object space along said rearwardly extending optical axes; and

a pair of eyepieces arranged, respectively, along said rearwardly extending optical axes for observing said pseudoscopic images.

5,469,294
ILLUMINATION SYSTEM FOR OCR OF INDICIA ON A SUBSTRATE

Donald R. Wilt, Lexington, and Richard S. Sidell, Needham, both of Mass., assignors to XRL, Inc., Canton, Mass.

Continuation-in-part of Ser. No. 877,843, May 1, 1992, Pat. No. 5,231,536. This application Jul. 26, 1993, Ser. No. 98,136
Int. Cl.[6] C02B *27/02*
U.S. Cl. 359—436 **12 Claims**



1. An illumination system for illuminating indicia on the surface of a substrate, comprising:

a camera having a field of view that is oriented with its longitudinal axis generally perpendicular to a normal to the substrate;

first and second arrays of light sources defining optical paths that are respectively disposed to either side of an acute angle defined with respect to a normal to the substrate for illuminating the indicia on the substrate;

a first optical member confronting the first and second arrays of light sources so as to deviate light incident thereto from the first and second arrays of light sources towards the substrate;

a second optical member confronting the substrate so as to deviate light incident thereto from the substrate towards a third optical member;

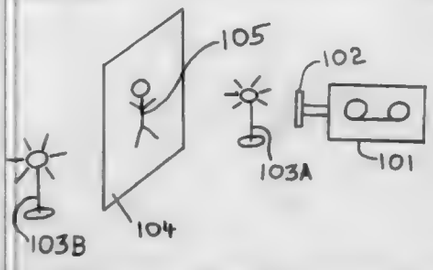
said third optical member confronting the second optical member so as to deviate light incident thereto from the second optical member towards the camera; and

first and second baffles respectively disposed along the optical paths of the first and second arrays of light sources that occlude the respective arrays and thereby prevent them from being imaged onto the second and the third optical members while allowing the indicia to be imaged by the second optical member and deviated, therefrom to the third optical member and thence to the camera allowing it to read the indicia.

5,469,295
DUAL POLARIZING REFLECTION FILTER THREE DIMENSIONAL IMAGE CREATION AND DISPLAY SYSTEM

Douglas Burke, 2507 Port Whitby, Newport Beach, Calif. 92660

Filed Jan. 18, 1994, Ser. No. 182,230
Int. Cl.[6] G02B *27/26;21/32;21/26*
U.S. Cl. 359—478 **3 Claims**



1. A method of collecting an image of a subject and a system of displaying said image in apparent three dimensions comprising:

(a) a means of collecting said image of said subject on a visual recording medium that isolates said subject on the medium so that only the isolated image of said subject is projected when light is projected through said medium and

(b) a means of projecting said image with polarized light, and

(c) a screen on which said image is projected being continuous and solid and composed of parallel plane layers consisting of a first transparent substrate on which is bound a polarizing layer with polarization oriented orthogonal to the polarization of said polarized light used to project said image, a transparent binding layer, and a second transparent substrate on which is deposited a partially reflective and transparent layer, and

(d) a real physical three dimensional physical object placed in front of and behind said screen, and

(e) said second transparent substrate on which said partially reflective and transparent layer is deposited being thin but thick enough so that it can be bound to said polarizing layer by means of said binding layer, and

(f) said second transparent substrate on which said partially reflective and transparent layer is deposited, said partially reflective and transparent layer and said transparent binding layer being composed of materials that do not change the polarization of light when light passes through them, and

(g) said binding layer being composed of material that does not ruin the polarizer, and

(h) said partially reflective and transparent layer being positioned in front of said polarizing layer so that said image when projected hits said partially reflective and transparent layer before it hits said polarizing layer, and

(i) said partially reflective and transparent layer being thin enough so that objects behind said screen can be seen from a position in front of said screen and thick enough to reflect enough of the said polarized light used to project said image so that said image can be seen on said screen, and

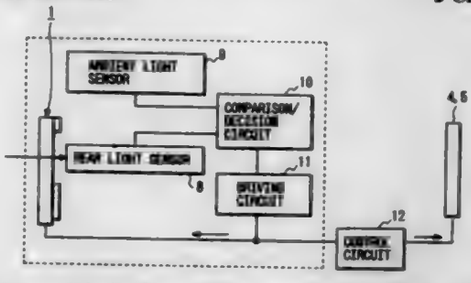
(j) said means of projecting said image with said polarized light being accomplished with light of intensity high enough so that said image can be seen on said screen.

(k) said polarizing layer being thick enough to absorb all of said polarized light used to project said image that passes through said partially reflective and transparent layer and into said polarizing layer.

5,469,296
CONTROL DEVICE FOR ANTIGLARE MIRROR

Kouichi Ohno; Hideki Miyatake, and Yutaka Yoshida, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Mar. 28, 1994, Ser. No. 218,640
Claims priority, application Japan, Mar. 29, 1993, 5-069832
Int. Cl.[6] G02F *1/15;* **G02B** *5/08*
U.S. Cl. 359—603 **5 Claims**



1. A control device for controlling the reflectivity of mirrors in a vehicle comprising:

an inner mirror having a gel-type electrochromic (EC) cell responsive to a voltage signal greater than a reference voltage to decrease the reflectivity of the inner mirror;

an outer mirror having a thin-film type EC cell responsive to a negative voltage signal for increasing the reflectivity of the outer mirror and responsive to a positive voltage signal for decreasing the reflectivity of the outer mirror;

a detector responsive to light intensity at the inner mirror for generating a first voltage signal having a value corresponding to the light intensity;

a driving circuit responsive to the value of the first voltage signal for generating a positive driving voltage having a value above a reference voltage at times when the intensity is above a certain level; and

a control circuit responsive to the positive driving voltage for varying the reflectivity of the outer mirror in accordance with the detected light intensity of the inner mirror.

5,469,297

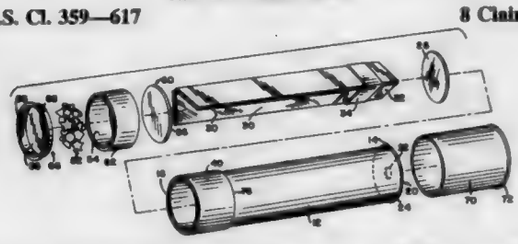
KALEIDOSCOPE KIT

Dorothea Marshall, and Ethan Allen, both of 1700 E. 56th St. - No. 3005, Chicago, Ill. 60637

Continuation of Ser. No. 65,595, May 21, 1993, abandoned. This application Mar. 30, 1995, Ser. No. 414,034

Int. Cl.[6] G02B *23/00*

U.S. Cl. 359—617 **8 Claims**



1. A kaleidoscope assembled from a kit allowing repeated assembly and at least partial disassembly by a user, the kaleidoscope comprising

(a) a tubular barrel having a proximal end and a distal end,

(b) at least two elongate reflectors extending within the barrel, approximately between the proximal and distal ends of the barrel, each reflector having a proximal end toward the proximal end of the barrel and a distal end toward the distal end of the barrel,

(c) a sleeve mounted rotatably on the barrel, the sleeve having an end portion extending beyond the distal end of the barrel,

(d) a removable case containing videnda and assembled from a tubular wall, a transparent end, and an at least partly transparent end, the case being mounted removably to the end portion of the sleeve so that the tubular wall is fitted into the end portion of the sleeve with a frictional interfit such that the case as a unit comprising the tubular wall and the transparent and at least partly transparent ends and containing videnda remains

conjointly with the sleeve, so that the transparent end faces and covers the distal end of each of the reflectors, and so that the at least partly transparent end faces oppositely, wherein the assembled case is removable from the sleeve, as a unit comprising the tubular wall and the transparent and at least partly transparent ends and containing videnda, so as to expose the reflectors for repair, cleaning, or replacement without requiring or resulting in disassembly of either the transparent end or the at least partly transparent end from the tubular wall of the case.

5,469,298

REFLECTIVE DISPLAY AT INFINITY

Michael J. Suman, Holland; Russell L. Clark, West Olive, and Richard M. Ferrell, Livonia, all of Mich., assignors to Prince Corporation, Holland, Mich.

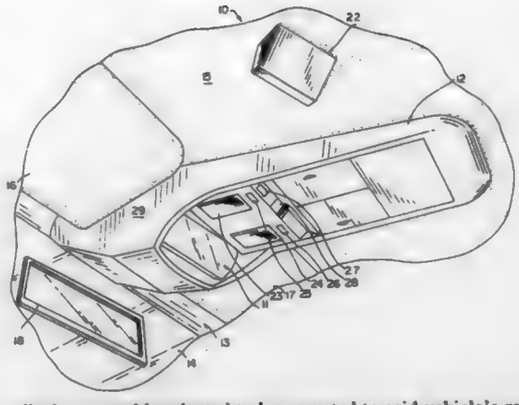
Filed Aug. 14, 1991, Ser. No. 745,484

Int. Cl.[6] G02B *27/14;7/182;* **G03B** *21/00*

U.S. Cl. 359—630 **10 Claims**

1. A focus at infinity display for a vehicle comprising:

an overhead console including a housing adapted to be mounted to a vehicle's roof structure;



a display assembly adapted to be mounted to said vehicle's roof structure, said display assembly including a display source producing an information image; and

a non-transparent spherical target mirror positioned within said overhead console housing, said target mirror having a reflecting surface facing a driver position and said display source for reflecting said information image whereby said overhead console and said display assembly are mounted to the vehicle's roof structure and said mirror is positioned in said overhead console such that the virtual image of said information image viewed by a driver of the vehicle viewing said mirror is substantially greater than the distance from the driver's eye to the mirror; and

further including a base positioned within said overhead console, said mirror pivotally attached to said base whereby the driver may adjust the position of said mirror for different driving positions of the driver of the vehicle.

5,469,299

OBJECTIVE LENS SYSTEM

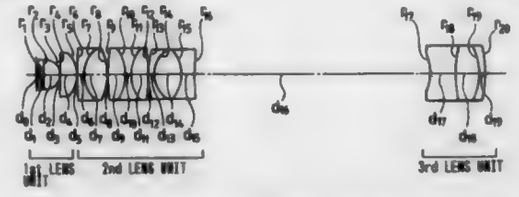
Chikara Nagano, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 793,160, Nov. 18, 1991, abandoned. This application Nov. 23, 1993, Ser. No. 155,917

Claims priority, application Japan, May 15, 1990, 2-122936

Int. Cl.[6] G02B *21/02;13/14*

U.S. Cl. 359—661 **14 Claims**



1. An objective lens system, which transmits ultraviolet rays, comprising in order from an object side thereof:

a first lens unit comprising a meniscus lens component having an object side concave surface having high curvature and a positive lens component having an emergence side convex surface;

a second lens unit comprising at least three cemented lens components; and

a third lens unit comprising a negative cemented lens component and having a negative refractive power as a whole;

each lens element in said first lens unit, said second lens unit, and said third lens unit being made of an optical material providing an internal transmittance of at least 50% for a ray having a wavelength of 300 nm when said optical material is 5 mm thick.

5,469,300

ZOOM LENS BARREL

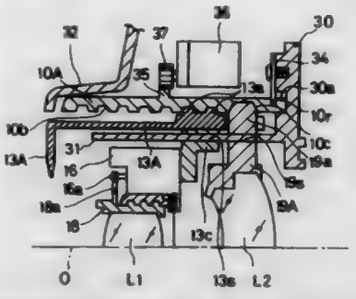
Hiroshi Nomura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 74,723, Jun. 10, 1993, abandoned, which is a continuation of Ser. No. 602,176, Oct. 23, 1990, abandoned. This application Nov. 4, 1994, Ser. No. 337,235

Claims priority, application Japan, Jan. 27, 1989, 1-281116; May 23, 1990, 2-133124; Jun. 1, 1990, 2-58107 U; Jul. 26, 1990, 2-79613 U; Jul. 26, 1990, 2-79614 U; Jul. 26, 1990, 2-79615 U; Aug. 8, 1990, 2-84337 U; Aug. 8, 1990, 2-84338 U

Int. Cl.[6] G02B *15/14*

U.S. Cl. 359—700 40 Claims



1. A zoom lens barrel having at least front and rear lens groups and a linear movement guide means for linearly guiding said front and rear lens groups in an optical axis direction, comprising:

a rotatable cam ring which comprises a first helicoid and at leant one cam groove, wherein said first helicoid has a plurality of spaced threads, and wherein said at least one cam groove is positioned among said threads, said at least one cam groove extending across at least one of said threads and an area adjacent to said at least one thread;

a front lens barrel which supports said front lens group and which has a second helicoid which is engaged by said first helicoid of said cam ring; and

a rear lens frame which supports said rear lens group and which has at least one cam pin which can be fitted in said cam groove of said cam ring.

5,469,301

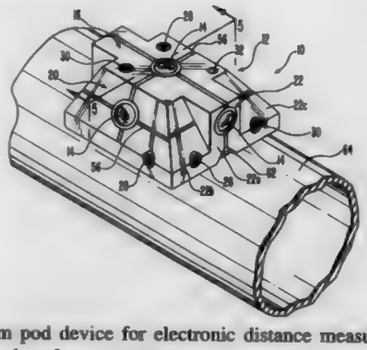
PRISM POD

Edgar E. Graham, 6919 Bluebird La., Alvin, Tex. 77511

Filed May 13, 1994, Ser. No. 242,166

Int. Cl.[6] G02B *5/04;* G01C *3/08*

U.S. Cl. 359—831 1 Claim



1. A prism pod device for electronic distance measurement on pipe and level surfaces comprising:

(a) a housing having multiple faces;

(b) means in the housing for removably attaching the housing to a center-line of a pipe;

(c) means in the housing for exactly relocating the housing to the center line of the pipe once the housing has been removed from the pipe;

(d) means in the housing for exactly relocating the housing to a point on a surface once the housing has been removed from the point;

(e) a multiplicity of prisms, each of the prisms being on separate faces of the housing; and

(f) means for directing the prisms to the center line of a pipe, whereby said distance measurements taken to each of the prisms are directed to the center line of the pipe.

5,469,302

ELECTROSTRICTIVE MIRROR ACTUATOR FOR USE IN OPTICAL PROJECTION SYSTEM

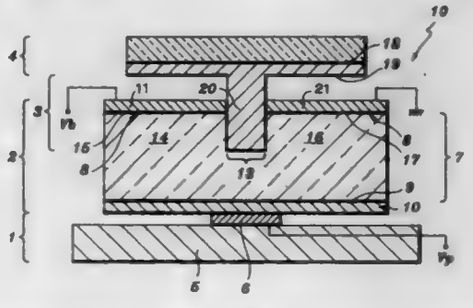
Dae-Young Lim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed May 20, 1994, Ser. No. 247,127

Claims priority, application Rep. of Korea, May 21, 1993, 1993-8158

Int. Cl.[6] G02B *7/182;26/08;* H01L *41/08*

U.S. Cl. 359—846 3 Claims



1. An electrostrictive mirror actuator for use in an optical projection system, comprising:

an active substrate including a substrate, a transistor and a connecting terminal thereof;

an electrostrictive actuator mounted on said active substrate, including an electrostrictive member having a top and a bottom surfaces, a common signal electrode, a bias electrode and a reference electrode, wherein the top surface of the electrostrictive member is evenly separated by a trench of a fixed depth formed thereon and running across the top surface, thereby creating a first actuating member having a first top surface and a second actuating member having a second top surface, said common signal electrode being located on the bottom surface thereof, said bias and said reference electrodes being located on the first top surface and the second top surface, respectively;

a hinge provided with a flat top surface and a bottom surface having a protrusion fitted to the trench; and

a mirror mounted on the flat top surface of said hinge.

5,469,303

BRIGHTNESS COMPENSATION FOR A LAMP SHADE IN AN OPTICAL SCANNER

Jeffrey Wun; Ting Shia, and Fang-Merng Guo, all of Hsinchu, Taiwan, Prov. of China, assignors to Umax Data Systems Inc., Hsinchu, Taiwan, Prov. of China

Filed Jun. 7, 1994, Ser. No. 254,942

Int. Cl.[6] G02B *27/00*

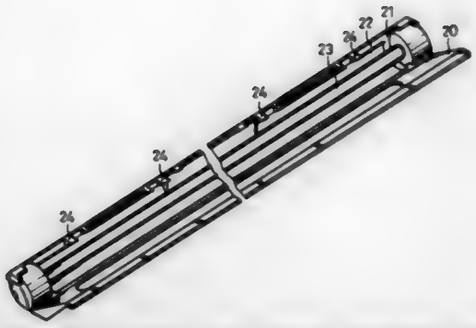
U.S. Cl. 359—896 2 Claims

1. An improvement of brightness compensation for a lamp shade in an optical scanner, comprising:

a lamp stand having a lamp tube disposed longitudinally in the center;

a lamp shade attached to said lamp stand and having a reflector disposed between two lateral sides of said lamp shade;

a plurality of protrudent means formed on the lateral sides of said lamp shade on which the reflector is attached, said



plurality of protrudent means cause the reflector to have a greater curvature at the lateral sides than that in a middle portion of the reflector.

5,469,304

TAPE MEDIUM RECORDING AND/OR REPRODUCING APPARATUS CAPABLE OF MINIMIZING DEVIATION OF RECORDING POSITION

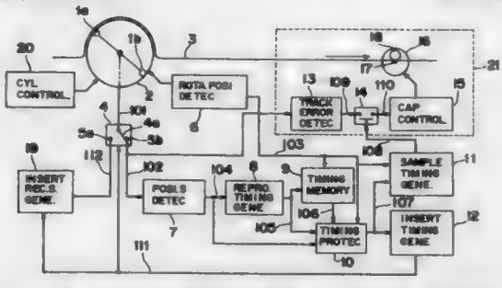
Yoshio Sakakibara, Neyagawa; Makoto Gotou, Nishinomiya, and Haruo Isaka, Yawata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 86,232, Jul. 1, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 320,573

Claims priority, application Japan, Jul. 3, 1992, 4-176598

Int. Cl.[6] G11B *27/02;27/10;5/584*

U.S. Cl. 360—13 **10 Claims**



1. A tape medium recording and/or reproducing apparatus for recording or reproducing information on or from a plurality of tracks on a tape medium, each of said plurality of tracks having first and second regions defined therein in a direction conforming to the direction of scan, each of said first regions having a position signal recorded therein while a tracking pilot signal is recorded in selected ones of the first regions, said tape medium recording and/or reproducing apparatus comprising:

a rotatable cylinder;

at least one magnetic head mounted on said cylinder for rotation together therewith, said magnetic head scanning the plurality of tracks successively to record or reproduce information on or from the second regions of the plurality of tracks on the tape medium and to reproduce the position signal from the first regions;

a rotational position detector means for detecting a rotational reference position of said cylinder to provide a reference position signal indicative thereof;

a positioning signal detector means for detecting the position signal in response to a reproduction signal from said magnetic head and for outputting a reproducing position signal indicative of a timing at which the position signal has been detected;

a reproduction timing generator means for generating a reproduction timing signal at a first timing determined by the reproducing position signal;

a timing memory means operable in response to the reproduction timing signal and the reference position signal to measure and store a length of time from the timing, at which the rotational reference position of said cylinder has been detected, to said first timing and also to output a signal indicative of the length of time;

a timing protector means for generating, when no positioning signal has been detected, a pseudo timing signal at said first timing and also for inserting the pseudo timing signal into the reproduction timing signal to provide a protection timing signal;

a sample timing generator means for outputting a sample timing signal at a second timing determined by the protection timing signal; and

a tracking control means for controlling said magnetic head to appropriately scan a target track in reference to a level determined by leakage components of respective tracking pilot signals which have leaked into the reproduction signal from the neighboring first regions in which the tracking pilot signals had been recorded and which have then been sampled by the sample timing signal.

5,469,305

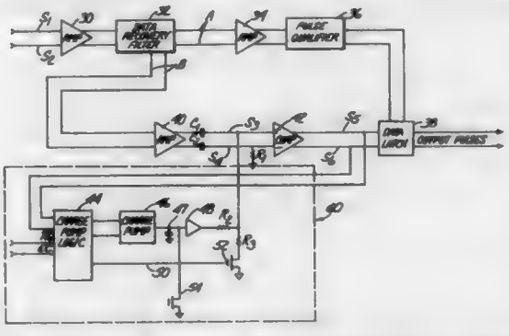
AC TIMING ASYMMETRY REDUCTION CIRCUIT INCLUDING SUMMING DC OFFSET VOLTAGE WITH TIMING SIGNAL

Timothy A. Madsen, and Russell J. Machalski, both of Bloomington, Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Dec. 17, 1993, Ser. No. 169,423

Int. Cl.[6] G11B *5/09;5/03*

U.S. Cl. 360—51 **15 Claims**



1. In a data recovery system which reads data from a magnetic medium and which derives timing information from a comparator, a method to compensate for AC timing asymmetry comprising:

detecting data transitions in the form of timing signals;

iteratively accumulating an approximate DC offset voltage based on timing asymmetry in the timing signal, the approximate DC offset voltage of successive iterations converging on an accurate offset voltage;

dividing the approximate DC offset voltage;

controlling the DC offset voltage division by predetermined switching of the approximate DC offset voltage between an active and an inactive state; and

summing the divided DC offset voltage and the timing signal.

5,469,306

DIGITAL SIGNAL REPRODUCING METHOD AND APPARATUS

Masaaki Hara, Kanagawa, Japan, assignor to Sony Corporatin, Tokyo, Japan

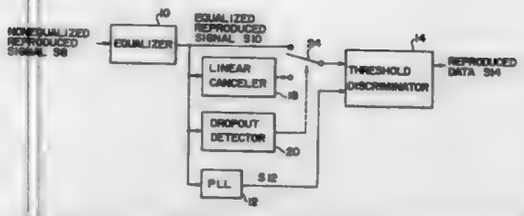
Filed Oct. 22, 1993, Ser. No. 139,750

Claims priority, application Japan, Nov. 2, 1992, 4-317851

Int. Cl.[6] G11B *5/035*

U.S. Cl. 360—65 **15 Claims**

1. A method of reproducing a digital signal recorded on a recording medium, comprising the steps of:



supplying the reproduced signal to a first signal compensating device having an equalization characteristic, and outputting a corresponding equalized signal;

detecting a dropout component in the equalized signal;

selectively supplying said equalized signal through a second signal compensating device having a fixed characteristic if said dropout component is detected; and

selecting the equalized signal output by said first signal compensating device when said dropout component is absent or the equalized signal supplied through said second signal compensation device when said dropout component is detected, thereby compensating for the detected dropout component.

5,469,307

MAGNETIC TAPE RECORDING/PLAYBACK APPARATUS FOR AUTOMATICALLY DETECTING A DESIRED PROGRAM

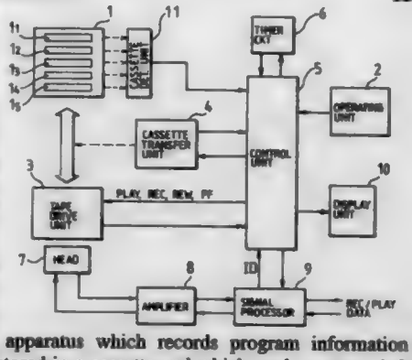
Tomoyasu Yamada, and Nobutoshi Fukuda, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 908,909, Jul. 2, 1992, abandoned, which is a continuation of Ser. No. 680,777, Apr. 2, 1991, abandoned, which is a continuation of Ser. No. 240,333, Sep. 6, 1988, abandoned. This application Sep. 3, 1993, Ser. No. 115,790

Claims priority, application Japan, Sep. 30, 1987, 62-244407; Sep. 30, 1987, 62-244408; Sep. 30, 1987, 62-244409; Sep. 30, 1987, 62-244410; Jan. 1, 1987, 62-245760; Jan. 2, 1987, 62-248069; Jan. 14, 1987, 62-257435

Int. Cl.[6] G11B *15/18*

U.S. Cl. 360—69 **12 Claims**



1. An apparatus which records program information onto a medium stored in a cassette and which reads program information which has been recorded on a medium stored in a cassette, the apparatus being of a type in which a cassette is extracted from a storage unit and transported to a drive unit for reading the information from the medium stored in the cassette, comprising:

operating means for operating the recording/reading apparatus;

means responsive to an instruction from said operating means for repetitively transporting in sequence a plurality of cassettes from said storage unit to said drive unit; and

control means for controlling a reading of program information stored in each of said plurality of cassettes transported to said drive unit for a single common predetermined period of time, said time being less than the total time required to read all the information stored in said cassette, after which said transport means automatically transports a next cassette in said sequence to the drive unit without substantial interruption.

5,469,308

MANAGEMENT APPARATUS FOR A PLURALITY OF CASSETTES

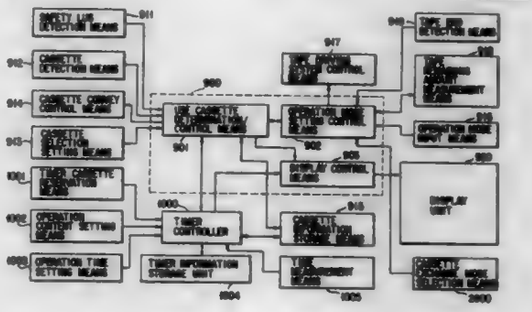
Keiji Hamoda, Fukaya; Ritsuo Yoshida, Kumagaya; Toshihiko Iijima; Chiemi Yamamoto, both of Fukaya, and Akihiko Kubo, Kumagaya, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 842,447, Feb. 27, 1992, abandoned. This application Aug. 15, 1994, Ser. No. 290,514

Claims priority, application Japan, Feb. 28, 1991, 3-034559; Mar. 11, 1991, 3-045074; Apr. 15, 1991, 3-111010; Apr. 15, 1991, 3-111043

Int. Cl.[6] G11B *15/68*

U.S. Cl. 360—71 **1 Claim**



1. A use management apparatus for a plurality of cassettes, comprising:

cassette information storage means for storing presence/absence information corresponding to each of a plurality of cassettes which are located at a plurality of carrying positions, and presence/absence information corresponding to safety lugs of said cassettes, said information stored in said cassette information storing means being used as input information;

use cassette determination/control means for determining a use cassette from said plurality of cassettes based on said input information;

cassette convey control means for conveying and mounting said use cassette on a tape driving section;

time reservation information storage means for storing a set of designation information, operation information and timer information, said timing information including timer start times for each timing operation;

timer measurement means for measuring and inputting a current time;

means for comparing said timing information with said current time to determine an amount of time remaining before a next timing operation, and for comparing said determined amount of time remaining with an amount of time necessary to measure a tape remaining amount on one of said cassettes; and

tape remaining amount measurement means for measuring a tape remaining amount on one of said plurality of cassettes and for storing said measured tape remaining amount in said cassette information storage means, said tape remaining amount being measured only when said determined amount of time remaining is greater than said amount of time necessary to measure said tape remaining amount on one of said cassettes, wherein

said determination of measured tape amounts is used by said use cassette determination/control means for determining which cassettes are selected as use cassettes.

5,469,309

MAGNETIC RECORDING/REPRODUCING APPARATUS WITH STOPPERS FOR LOADING BOATS

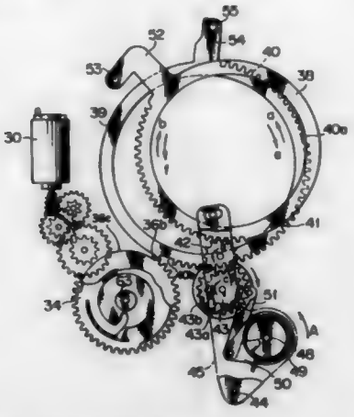
Akio Konishi; Yoshitomo Sakai, both of Hirakata; Yoshiyuki Saito, Kadoma, and Hideaki Yoshio, Moriguchi, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 867,468, Apr. 13, 1992, Pat. No. 5,369,536. This application Aug. 23, 1994, Ser. No. 294,019

Claims priority, application Japan, Apr. 17, 1991, 3-085057; Apr. 17, 1991, 3-085058; Apr. 17, 1991, 3-085066

Int. Cl.[6] G11B *15/665*

U.S. Cl. 360—85 **4 Claims**



1. A loading post driving device comprising:

a loading gear which is for driving a loading post to perform an operation of loading a tape and which has a toothless region;

a drive gear having an intermittent gear portion for engaging with and disengaging from said loading gear through said toothless region in order to drive said loading gear when engaged therewith;

biasing means for urging said loading gear to rotate in a direction so as to drive said loading post from an unloading position toward a loading terminal position, wherein a position of said loading post immediately after charging of a tape cassette is said unloading position and wherein a position where said loading post has fully drawn out a tape to perform a recording/reproducing operation on the tape is said loading terminal position;

a second loading gear which is for driving a second loading post to perform said operation of loading said tape;

a pendulum gear engaged with one of said loading gear and said second loading gear;

an intermediate gear, interposed between said pendulum gear and one of said loading gear and said second loading gear with which said pendulum gear is not engaged, for making rotational directions of said loading gear and said second loading gear opposite to each other; and

a swing plate on which said pendulum gear and said intermediate gear are mounted, said swing plate making said pendulum gear capable of moving within a predetermined range substantially along a circumferential direction of said one of said loading gear and said second loading gear with which said pendulum gear is engaged and making said intermediate gear capable of moving within a predetermined range substantially along a circumferential direction of said one of said loading gear and said second loading gear with which said pendulum gear is not engaged;

said biasing means urging one of said pendulum gear and said intermediate gear, to urge said loading gear and said second loading gear to rotate by said biasing means through said pendulum gear and said intermediate gear so that said loading post and said second loading post are positioned under pressure in said operation of loading said tape;

first shafts which pivotally support said pendulum gear and said intermediate gear on said swing plate;

a chassis; and

a second shaft fixed to said chassis, said swing plate being pivotally supported by said second shaft to swing relative to said chassis, whereby said first shafts move relative to said chassis when said swing plate pivots relative to said chassis;

wherein said toothless region is positioned in said loading gear so that said loading gear is capable of engagement with or disengagement from the intermittent gear portion of said drive gear at said loading terminal position, and

wherein when said drive gear disengages from said loading gear and subsequently said loading gear is biased to rotate further by said biasing means in said direction of driving said loading post from said unloading position toward said loading terminal position, there is no transmission of force between said drive gear and said loading gear.

5,469,310

AUTOMATED CASSETTE LOADER

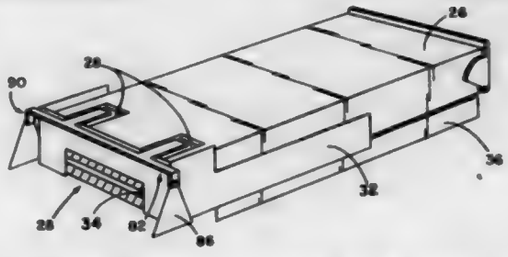
Richard T. Slocum, Aliso Viejo; James Bjordahl, Arcadia; Danny Louie, Monterey Park, and Donald Rasmussen, Arcadia, all of Calif., assignors to WangDAT, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 800,615, Nov. 27, 1991, which is a continuation of Ser. No. 435,726, Nov. 13, 1989, Pat. No. 5,089,920. This application Sep. 29, 1992, Ser. No. 953,411

The portion of the term of this patent subsequent to Feb. 18, 2009, has been disclaimed.

Int. Cl.[6] G11B *15/68*

U.S. Cl. 360—92 **55 Claims**



1. Apparatus for use in tape cassette loading systems, said apparatus comprising:

a magazine housing for holding tape cassettes in a first plurality of cassette positions in a first plane and in a second plurality of cassette positions in a second plane parallel therewith, each such cassette position in said first plurality separated from each such cassette position in said second plurality, wherein said cassettes are supported on their broad faces, said first plurality of cassette positions are in a first line and include a first transfer position disposed at a first end of said first line, said second plurality of cassette positions are in a second line and include a second transfer position disposed at a first end of said second line;

a cassette intake position at a second end of said first line of said first plurality of tape cassette positions;

a cassette exit position at a second end of said second line of said second plurality of tape cassette positions;

circulating means for sequentially circulating said cassettes, including first pushing means for pushing a multiplicity of cassettes along said first plane, second pushing means for pushing a multiplicity of cassettes along said second plane and shifting means for shifting cassettes between said first and second planes, said shifting means including:

paddle means for expelling a first one of said tape cassettes from said second transfer position to an adjacent position in said second plane;

plunger means for transferring a second one of said tape cassettes from said first transfer position in said first plurality into said second transfer position in said second plurality; and

cassette transport means including a cassette transport position for accepting a third one of said tape cassettes from said

cassette exit position and for transferring said third tape cassette to said cassette intake position, including:

a cassette holder;

means, coupled to the cassette holder, for moving the cassette holder between the first and second planes; and

lateral shifter means, coupled to the cassette holder, for moving said third tape cassette into and out of the cassette holder.

5,469,311

VIBRATION ABSORBING STRUCTURE FOR A MAGNETIC DISK APPARATUS

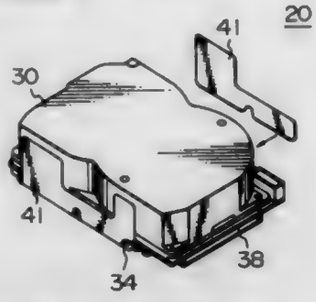
Hiroshi Nishida, Kanagawa; Kazuo Nakagoshi, Odawara; Kenjiro Kai, Kanagawa, and Katsumoto Onoyama, Hiratsuka, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 850,432, Mar. 12, 1992, abandoned. This application Jun. 13, 1994, Ser. No. 258,920

Claims priority, application Japan, Mar. 15, 1991, 3-051133

Int. Cl.[6] G11B *33/14*

U.S. Cl. 360—97.02 **14 Claims**



8. A magnetic disk apparatus comprising:

a) a magnetic disk drive mechanism;

b) a main frame;

c) a viscous elastic material substantially in the form of a sheet having a smaller thickness dimension relative to its length-width dimensions;

d) a clamp plate clamping said magnetic disk drive mechanism and said main frame with the viscous elastic material bonded in place among said main frame, said magnetic disk drive mechanism and said clamp plate.

5,469,312

THIN FILM MAGNETIC HEAD DEVICE HAVING A CORE RECESS SET TO A PREDETERMINED SPACING ROSS

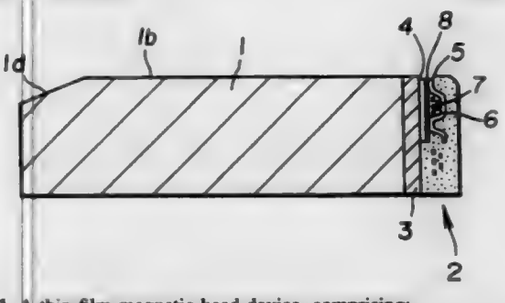
Takashi Watanabe, and Wataru Ishikawa, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 19, 1992, Ser. No. 853,831

Claims priority, application Japan, Mar. 29, 1991, 3-091553

Int. Cl.[6] G11B *5/187;5/127*

U.S. Cl. 360—103 **6 Claims**



1. A thin film magnetic head device, comprising:

a non-magnetic slider member having a first surface, including an air bearing portion, adapted to be positioned opposite to a hard disk and a substantially planar end surface extending generally perpendicular to said first surface, and having formed thereon a thin film magnetic head;

said thin film magnetic head comprising an insulating layer positioned on said end surface and, disposed on said insulating layer, a lower magnetic film, an upper magnetic film, and an insulating film between said upper and said lower magnetic films and wherein said lower magnetic film, said insulating film, and said upper magnetic film are recessed from said air bearing portion of said first surface of said slider member by a core recess quantity d, said core recess quantity being in the range determined by the area between a 0.5 dB curve and a 1.5 dB curve in a plot of core recess quantity as a function of track recording density.

5,469,313

SUPPORTING DEVICE FOR A MAGNETIC HEAD WHICH RECORDS/REPRODUCES INFORMATION FROM A MAGNETIC LAYER OF A PHOTOGRAPHIC FILM

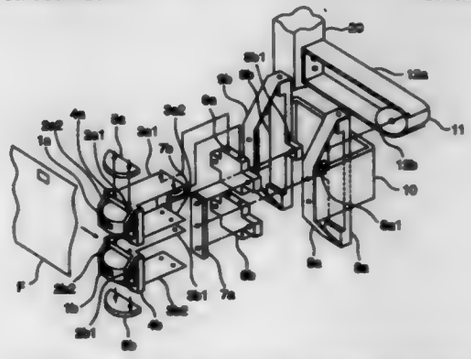
Shin Isozaki; Shozo Kikugawa, and Eiji Iwata, all of Hino, Japan, assignors to Konica Corporation, Japan

Filed Feb. 4, 1994, Ser. No. 191,875

Claims priority, application Japan, Feb. 9, 1993, 5-021449; Feb. 9, 1993, 5-021450

Int. Cl.[6] G11B *5/48;5/10;* **G03B** *31/00;17/24*

U.S. Cl. 360—104 **11 Claims**



1. An apparatus for recording or reproducing information on a magnetic layer provided on a photographic film, comprising:

a transport to convey the film along a predetermined passage;

a magnetic head to record or reproduce the information on the magnetic layer, the magnetic head having a tracking section on its one surface;

a first base member; and

two first supporting arms, fixed on the first base member, to support the magnetic head in close proximity to the passage so that the tracking section of the magnetic head is brought in contact with the film, wherein the two first supporting arms and the magnetic head are aligned along the passage, and the magnetic head is provided between the first supporting arms, each of the first supporting arms includes two arm portions, one end of the arm portions being fixed to the first base member in such a manner that the two arm portions are inclined to the first base member and imaginary lines which are colinear with and extended from the two arm portions cross each other at an imaginary line which is colinear with and extended from the tracking section of the magnetic head.

5,469,314

MINIATURE DISK DRIVE WITH DYNAMIC HEAD LOADING

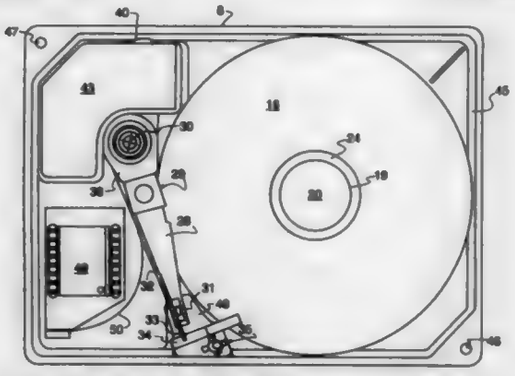
James H. Morehouse, Jamestown; David M. Furay, Boulder; Steven B. Volk, Boulder, and James A. Dunckley, Boulder, all of Colo., assignors to Intégral Peripherals, Inc., Boulder, Colo.

Division of Ser. No. 629,948, Dec. 19, 1990, abandoned. This application Aug. 24, 1993, Ser. No. 111,243

The portion of the term of this patent subsequent to Feb. 22, 2011, has been disclaimed.

Int. Cl.[6] G11B *5/54*

U.S. Cl. 360—105 **18 Claims**



1. A disk drive information storage device comprising:

disk means for recording and reproducing information; a housing having a first external dimension of about 51 mm;

a spin motor supported by said housing for rotating said disk means, said spin motor including a rotor for receiving said disk means and rotating said disk means about an axis;

an elongated actuator arm including a load beam, said actuator arm being pivotally supported about a center of rotation by said housing for rotation of one end of said load beam in a plane substantially parallel to a surface of said disk means, said load beam having a centerline and said load beam including at its outermost end a lift tab extending from said one end of said load beam along an axis which is skewed from said centerline of said load beam, said lift tab having a curvilinear portion;

a slider body including a transducer means for recording information on and reproducing information from said disk means;

means connected to said load beam and said slider body for supporting said slider body at a position intermediate said center of rotation and said lift tab; and

a cam assembly supported by said housing adjacent to said lift tab and the edge of said disk means, said cam assembly including a cam surface positioned in operative relationship with said curvilinear portion of said lift tab, a portion of said curvilinear portion of said lift tab contacting said cam surface and in cooperation with said cam surface providing a lifting force to said load beam.

5,469,315

MAGNETIC HEAD POSITIONER FOR A MAGNETIC DISK APPARATUS WITH LOW LOAD TORQUE

Yotaro Sanada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 27, 1994, Ser. No. 250,455

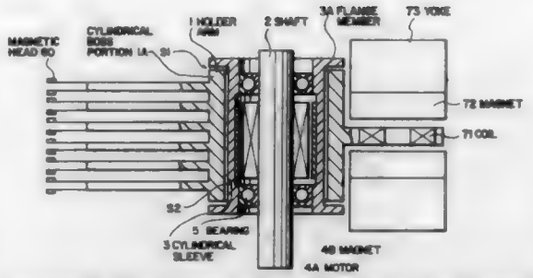
Claims priority, application Japan, May 27, 1993, 5-148597

Int. Cl.[6] G11B *5/55*

U.S. Cl. 360—106 **11 Claims**

1. A magnetic head positioner for a magnetic disk apparatus, comprising:

a holder arm having a plurality of magnetic heads mounted on one end thereof for reading and writing data, and a cylindrical boss portion in a center portion thereof;



positioning means coupled to the holder arm for intermittently positioning the plurality of magnetic heads;

a fixed shaft provided on a center axis of said cylindrical boss portion of said holder arm and acting as a center axis of a swinging motion of said holder arm;

a cylindrical sleeve interposed between said holder arm and said fixed shaft and rotatably supported on said fixed shaft with a first predetermined gap formed between an inner peripheral surface of said cylindrical boss portion of said holder arm and an outer peripheral surface of said cylindrical sleeve, said cylindrical sleeve having flange members at opposite end portions thereof sandwiching said cylindrical boss portion with a second predetermined gap formed between opposite end portions of said cylindrical boss portion and respective flange members; and

a motor mounted between said fixed shaft and said cylindrical sleeve which generates force to continuously rotate said cylindrical sleeve about said shaft and create dynamic hydraulic pressure in said first and second predetermined gaps, whereby the holder arm is freely rotatable with substantially no load in the radial direction thereof.

5,469,316

ACTUATOR FOR MAGNETIC DISKS AND HAVING A VCM SUPPORT WITH A RECESS

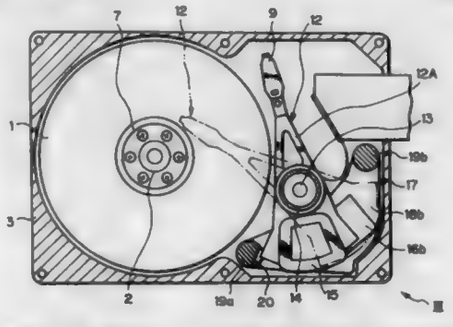
Hiroshi Koriyama, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Aug. 3, 1994, Ser. No. 285,402

Claims priority, application Japan, Aug. 10, 1993, 5-218084

Int. Cl.[6] G11B *5/55*

U.S. Cl. 360—106 **7 Claims**



1. A device for driving a magnetic head which is included in a magnetic data recording and reproducing apparatus for writing and reading data out of a magnetic recording medium, said device comprising:

an arm assembly comprising an arm carrying said magnetic head on one end and a coil on the other end, and a rotary shaft supporting said arm between said coil and said magnetic head and rotatably mounting said arm to a base of the magnetic recording and reproducing apparatus; and

a permanent magnet assembly comprising a pair of yokes, a pair of permanent magnets having opposite polarities thereof facing each other at a predetermined distance, and a pair of support members supporting said pair of yokes and said pair of permanent magnets, said supporting members being made

of magnetic material to be part of said yoke, said permanent magnet assembly being affixed to said base;

at least one of said support members being formed with a recess for receiving part of said arm assembly when said arm assembly is rotated, said support member having enough of said magnetic material adjacent said recess to prevent magnetic saturation.

5,469,317

THIN FILM MAGNETORESISTIVE HEAD FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS

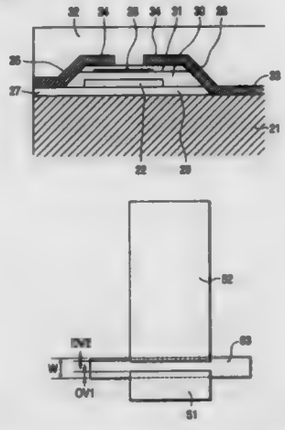
Yuji Nagata, Yao; Toshio Fukazawa, Fushimi; Kumiko Wada, Kawanishi, and Yoshihiro Tosaki, Ibaraki, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 82,813, Jun. 28, 1993, which is a continuation of Ser. No. 599,355, Oct. 5, 1990. This application Jun. 7, 1994, Ser. No. 255,802

Claims priority, application Japan, Jan. 11, 1989, 1-264406

Int. Cl.[6] G11B *5/127*

U.S. Cl. 360—113 **1 Claim**



1. In a method of manufacturing a magnetoresistive head having a magnetoresistive element with substantially parallel front and rear ends as formed on a magnetic substrate, a magnetic gap for leading a magnetic flux signal generated from a recording medium into the head, front and back magnetic yokes respectively overlapping said front and rear ends of the magnetoresistive element, a current supply electrode for supplying a drive current to the magnetoresistive element, and a bias electrode for applying a bias magnetic field to the magnetoresistive element, the improvement comprising:

positioning a photo mask for forming the front and back magnetic yokes at a position over the magnetoresistive element which is displaced in a direction from the front end of the magnetoresistive element toward the rear end of the magnetoresistive element by a displacement amount, which is larger than a maximum patterning error, from a central position in which the photo mask overlaps the front and rear ends of the magnetoresistive element by a same amount; and

forming the front and back magnetic yokes using the thus positioned photo mask.

5,469,318

MAGNETIC HEAD DEVICE WITH A CLEANING MECHANISM

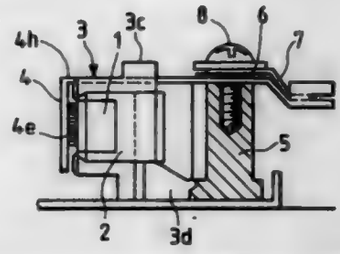
Naoto Inoue, and Kiyotaka Yamaguchi, both of Yamagata, Japan, assignors to Mitsumi Electric Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1994, Ser. No. 279,792

Claims priority, application Japan, Aug. 31, 1993, 5-52011 U

Int. Cl.[6] G11B *5/41*

U.S. Cl. 360—128 **7 Claims**



1. A magnetic head device with a cleaning mechanism, comprising:

a head mounting stand including a head setting space in which a magnetic head is set, and tape guides for regulating a running of a magnetic tape;

a cleaning device slidably moved on a front surface of the magnetic head, the cleaning device swingably supported by a shaft mounted on the head mounting stand, said shaft and said head mounting stand being integrally formed; and

a drive member engaged with a rear end portion of the cleaning device to swing the cleaning device,

wherein the shaft and the head mounting stand are formed as one unit by molding and wherein said shaft is formed simultaneously when said head mounting stand is molded,

said head mounting stand and said shaft being formed of a same material.

5,469,319

MAGNETIC TAPE CASSETTE HAVING TAPE EDGE REGULATING MEMBERS

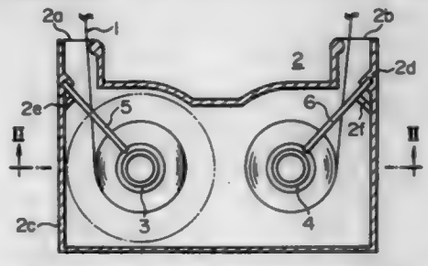
Hidekazu Takeda, Fujisawa; Nobuyuki Kaku, Kanagawa, and Kenji Ogiro, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 6,943, Jan. 21, 1993, abandoned. This application Jun. 20, 1994, Ser. No. 262,385

Claims priority, application Japan, Jan. 22, 1992, 4-009436

Int. Cl.[6] G03B *1/04;* **G11B** *15/32;23/04*

U.S. Cl. 360—132 **2 Claims**



1. A magnetic tape cassette adapted to be mounted on a magnetic recording/reproducing apparatus, for recording of signals on a magnetic tape contained in the cassette or reproducing of signals from the magnetic tape, said magnetic tape cassette comprising:

a cassette body casing; first and second cylindrical hub members, each cylindrical hub member rotatably mounted in said cassette body casing for rotation about an axis perpendicular to a bottom surface of said cassette body casing; a magnetic tape wound on an outer periphery of each of said cylindrical hub members to form first and second tape reels thereon, with each tape reel including from zero to a plurality of turns of tape, each tape reel having a top edge surface and a bottom

edge surface, adjacent a top surface and said bottom surface of said cassette body casing, respectively; said cylindrical hub members being adapted to, when said magnetic tape cassette is mounted on said magnetic recording/reproducing apparatus, be engaged with tape take-up shafts of said apparatus to drive said hub members and wind said magnetic tape from one of said tape reels to the other of said tape reels; and

first and second tape regulating means, each tape regulating means including a top and a bottom elongated rod member; each rod member having a proximal end securely attached to said cassette body casing, an elongated portion statically extending radially across an adjacent one of said tape reels and in line contact with the adjacent edge surface of all the turns of the tape of said adjacent one of said tape reels over the entire radius of said adjacent one of said tape reels, and a distal end overlapping an edge portion of the cylindrical hub member of said adjacent one of said tape reels, to maintain said top edge surface and said bottom edge surface of said tape reels at substantially constant levels in said magnetic tape cassette so as to minimize deviations of the turns of the tape from said top edge surface and said bottom edge surface.

5,469,320

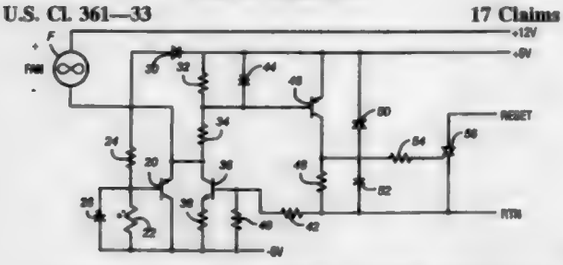
LOW POWER FAN DRIVE CIRCUIT FOR PERSONAL COMPUTERS

Richard E. Walker, and Hai N. Nguyen, both of Spring, Tex., assignors to Compaq Computer Corp., Houston, Tex.

Filed Oct. 29, 1993, Ser. No. 145,484

Int. Cl.[6] H02H *3/00*

U.S. Cl. 361—33 **17 Claims**



1. A fan drive circuit for operating a variable speed fan in a computer system having a power supply providing a high output voltage, an intermediate output voltage and a low output voltage, the fan having its positive terminal receiving the high output voltage and its negative terminal connected to a conductive negative connector when installed, wherein the speed of the fan is determined by the voltage differential between the high output voltage and a voltage applied to the negative connector, said fan drive circuit comprising:

a diode having an anode coupled to the negative fan connector and a cathode for receiving the intermediate output voltage, wherein the fan operates at least at a minimum desired speed;

a thermistor circuit coupled to the negative fan connector and for receiving the low output voltage, said thermistor circuit operative to proportionally lower the voltage of the negative fan connector and increase the speed of the fan as the ambient temperature of the power supply rises above a predetermined medium level;

a current source receiving the low output voltage and coupled to the negative fan connector, said current source operative to pull the negative fan connector to a predetermined minimum level when the fan draws less than a predetermined low level of current; and

a shut down circuit receiving the intermediate output voltage and coupled to the negative fan connector, said shut down circuit operative to shut down the power supply when the voltage at the negative fan connector reaches said predetermined minimum level.

5,469,321

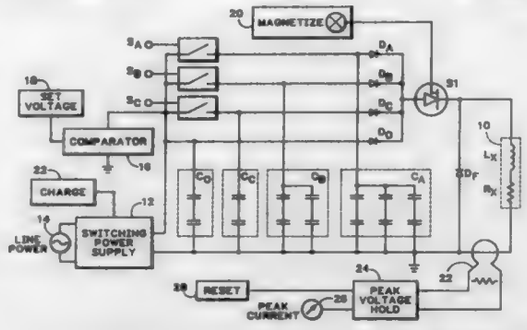
MAGNETIZING DEVICE HAVING VARIABLE CHARGE STORAGE NETWORK AND VOLTAGE CONTROL

Joseph J. Stupak, Jr., 7102 SW. 10th Ave., Portland, Oreg. 97219

Filed Nov. 13, 1992, Ser. No. 975,790

Int. Cl.[6] G01R *11/32*

U.S. Cl. 361—156 **16 Claims**



1. An electromotive force machine for generating high intensity magnetic fields comprising:

(a) a plurality of charge storage devices;

(b) a source of electrical currents;

(c) selector switches for selectively connecting certain charge storage devices to said source of electric current;

(d) a magnetizing coil fixture; and

(e) a discharge switch connected in parallel with said selector switches for coupling said selected certain charge storage devices to said magnetizing coil fixture.

5,469,322

CARBON BRUSH FOR DISCHARGING STATIC ELECTRICITY

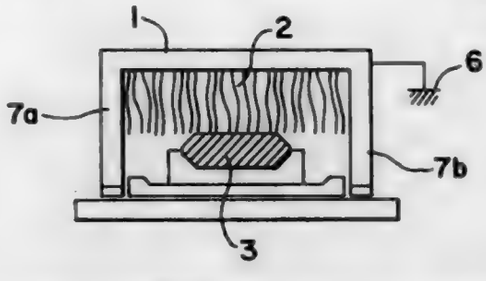
Jung Y. Seo, Daegu-si, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Cheongju, Rep. of Korea

Filed Dec. 18, 1992, Ser. No. 993,348

Claims priority, application Rep. of Korea, Dec. 20, 1991, 91-23620

Int. Cl.[6] H05F *3/00*

U.S. Cl. 361—220 **18 Claims**



1. A brush for discharging static electricity from a semiconductor device on a moving pathway, comprising:

a plurality of electrically conductive wires electrically connected to ground potential; and

a brush securing bar for securing the wires in a substantially aligned manner over the moving pathway;

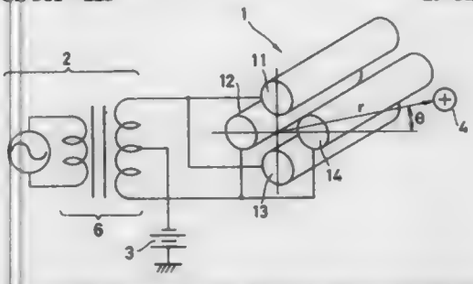
wherein static electricity accumulated on the semiconductor device is discharged through the wires to ground potential as the semiconductor device moves along the moving pathway.

5,469,323

METHOD AND APPARATUS FOR TRAPPING CHARGED PARTICLES

Toshihiko Kanayama, Tsukuba, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Mar. 5, 1992, Ser. No. 846,163
Claims priority, application Japan, Mar. 26, 1991, 3-086120
Int. Cl.[6] H01J 49/34
U.S. Cl. 361—225 25 Claims



1. A method for trapping charged particles, comprising the steps of:

providing a set of central electrodes around a central axis;

providing an outer electrode which substantially encloses said set of central electrodes;

generating a static DC electric field exerting on said charged particles forces directed to the central axis;

generating an AC electric field having an intensity which decreases with an increase in the distance from said central axis; and

superimposing said AC electric field on said DC electric field,

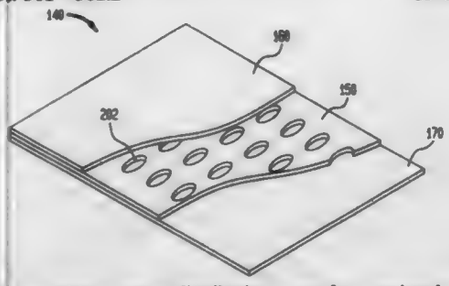
thereby trapping charged particles in a space between said set of central electrodes and said outer electrode.

5,469,324

INTEGRATED DECOUPLING CAPACITIVE CORE FOR A PRINTED CIRCUIT BOARD AND METHOD OF MAKING SAME

Watson R. Henderson, Broomfield; Floyd G. Paurus, Boulder, and Stanley R. Szerlip, Longmont, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Oct. 7, 1994, Ser. No. 319,651
Int. Cl.[6] H01G 4/018
U.S. Cl. 361—301.2 13 Claims



8. A capacitive power distribution core for a primed circuit board, comprising:

a first electrically conductive layer;

a second electrically conductive layer;

a perforated sheet of dielectric material disposed between said first and second electrically conductive layers, wherein said dielectric material is a ceramic; and

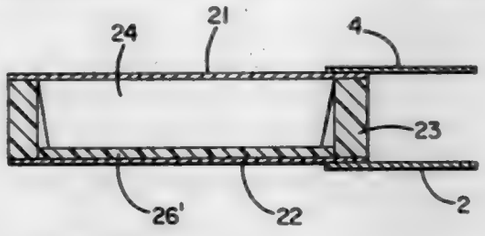
an adhesive filling perforations in said perforated sheet to bind said first electrically conductive layer to a first side of said perforated sheet and to bind said second electrically conductive layer to a second side of said perforated sheet.

5,469,325

CAPACITOR

David A. Evans, Seekonk, Mass., assignor to Evans Findings Co., East Providence, R.I.

Continuation-in-part of Ser. No. 35,224, Mar. 22, 1993, Pat. No. 5,369,547. This application Jul. 29, 1994, Ser. No. 282,229
The portion of the term of this patent subsequent to Nov. 29, 2011, has been disclaimed.
Int. Cl.[6] H01G 9/025
U.S. Cl. 361—526 15 Claims



1. A capacitor comprising:

a cathode comprising a porous coating including an oxide of at least one metal selected from the group consisting of ruthenium, iridium, nickel, rhodium, platinum, palladium, and osmium;

an anode spaced from the porous coating and including a metal selected from the group consisting of tantalum, aluminum, niobium, zirconium, and titanium;

a solid electrolyte disposed between and in contact with the porous coating and the anode and selected from the group consisting of polypyrrole, NAFION, polyaniline, and a gel of an aqueous electrolyte and silica; and

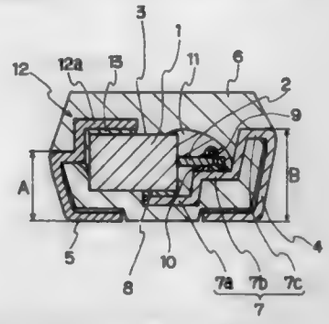
a container containing the anode and the electrolyte and on which porous coating is disposed.

5,469,326

SOLID ELECTROLYTIC CAPACITOR

Yasuo Kanetake, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Oct. 8, 1993, Ser. No. 133,342
Claims priority, application Japan, Jan. 15, 1992, 4-277399
Int. Cl.[6] H01G 9/04
U.S. Cl. 361—534 3 Claims



1. A solid electrolytic capacitor comprising:

a capacitor element;

an internal anode lead extending from a substantially central portion of one lateral surface of the capacitor element, other surfaces of the capacitor element perpendicular to said one lateral surface being adapted to serve as cathode terminal walls;

an external anode lead electrically connected to the internal anode lead through a fuse which is directly attached to said external and internal anode leads;

an external cathode lead electrically connected to one of the cathode terminal walls; and

a resin mold encapsulating the capacitor element as well as connecting portions associated therewith.

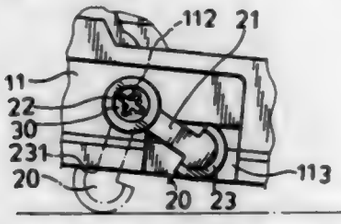
wherein the external anode lead connected to the internal anode lead, is bent to have at least two steps at one end portion, a lower step of said at least two steps being fixed to another one of the cathode terminal walls through an electrically insulating material, an upper step of said at least two steps being fixed to the internal anode lead through an intervening electrically insulating material, said external cathode lead is bent to be L-shaped at one end portion to sandwich and hold said capacitor element cooperatively with said lower step of the external anode lead.

5,469,327

PORTABLE COMPUTER WITH SUPPORTING LEGS

Samuel Cheng, Hsin-Tien, Taiwan, Prov. of China, assignor to Manufacturing Technology Resources Inc., Taiwan, Prov. of China

Filed May 27, 1994, Ser. No. 251,381
Int. Cl.[6] G06F *1/16*; H05K *5/02*
U.S. Cl. 361—680 **2 Claims**



1. A portable computer including a display unit and a keyboard unit having a housing with a rear portion pivoted to the display unit, wherein the improvement comprises two supporting members which are respectively disposed on two opposite sides of the rear portion of the housing, the housing having a groove unit formed in a bottom surface thereof, each of said supporting members including an elongated support body pivoted to the housing at a top end portion thereof, and a stopper projection secured to and protruding inward from a lower end portion of said support body, each of said stopper projections being rotatable relative to the housing between a supporting position in which a rear end portion of said stopper projection contacts the bottom surface of the housing so as to raise the rear portion of the housing, and a storage position in which said stopper projection is located in said groove unit of the housing, each of said supporting legs being inclined downwardly and rearwardly when said computer is placed on a horizontal table surface and when a corresponding one of said stopper projections is located in the supporting position.

5,469,328

ELECTRONICS CABINET WITH REDUCED ABSORPTION OF SOLAR RADIATION

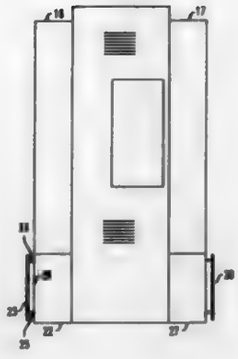
Stephen J. Palaszewski, Chester Township, Morris County, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Mar. 2, 1994, Ser. No. 204,824
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—690 **6 Claims**

1. A cabinet for housing electronic equipment comprising:

a compartment including at least one door, said compartment housing at least one battery; and

a plate mounted to the door outside the compartment so as to form an air gap of sufficient thickness to remove by natural convection heat absorbed by the plate due to solar radiation, said plate comprising a material which has a heat conductivity of at least



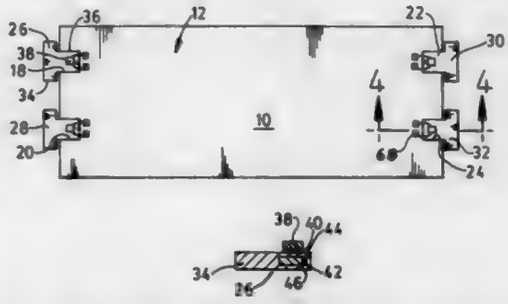
$$52 \frac{\text{watts}}{\text{meter deg } C.}$$

5,469,329

PRINTED CIRCUIT BOARD WITH BI-METALLIC HEAT SPREADER

Prathap A. Reddy, Farmington; Jay D. Baker, Dearborn, and Larry L. Kneisel, Novi, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 8, 1994, Ser. No. 287,033
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—704 **3 Claims**



1. A printed wiring board assembly comprising an electrically nonconductive component carrier sheet, multiple electronic components mounted on said carrier sheet and electrical wiring printed on said carrier sheet and defining with said components an electronic circuit;

at least one heat spreader formed of thermally conductive material connected to said carrier sheet, at least one of said components being bonded to a first part of said heat spreader;

a metallic layer disposed within said heat spreader, said metallic layer having a coefficient of thermal expansion that is less than the coefficient of thermal expansion of the metal of said heat spreader;

a localized area of said heat spreader directly adjacent to said metallic layer and to said heat generating device having an effective coefficient of thermal expression that is less than the coefficient of thermal expansion of other areas of said heat spreader;

a housing enclosing-said carrier sheet and said components, including a lower housing portion and an upper housing portion, said housing portions being formed of thermally conductive material;

a second part of said heat spreader being disposed between said housing portions and defining therewith parallel heat flow paths between said heat spreader and said housing portions wherein said housing portions act as a heat sink as thermal energy is transferred between said one component and said housing portions through said heat spreader.

5,469,330

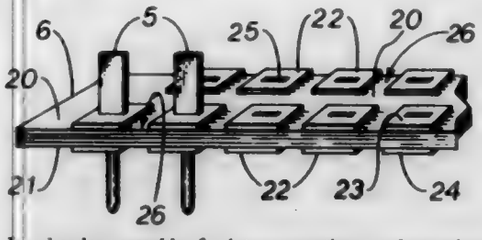
HEAT SINK HEADER ASSEMBLY

Chris Karabatsos, 42 Jumping Brook La., Kingston, N.Y. 12401, and Gary W. Smith, 12376 Darkwood Rd., San Diego, Calif. 92129

Continuation of Ser. No. 195,212, Feb. 14, 1994, abandoned. This application May 23, 1995, Ser. No. 448,324

Int. Cl.[6] H05H 7/20

U.S. Cl. 361—704 21 Claims



1. In a header assembly, for interconnecting an electronic module to a mother board, comprising an insulating strip and at least one row of spaced-apart pins inserted through holes between an upper face and a lower face of said strip, each of said pins having an upper portion projecting from said upper face and being shaped and dimensioned to interconnect with said module, and a lower portion projecting from said lower face and being shaped and dimensioned to interconnect with said mother board, any adjacent two of said pins being separated by a length of said strip, the improvement which comprises:

a plurality of collars of heat-dissipating material, one of said collars mounted around and in intimate contact with each of said pins, said collars having an outline to avoid electrical contact with an adjacent pin.

5,469,331

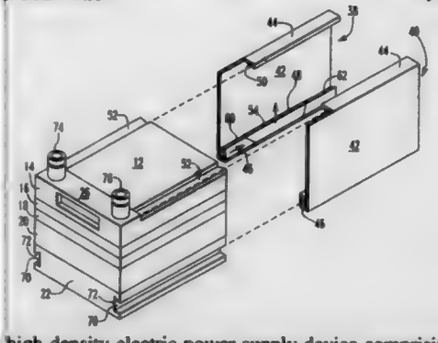
COOLING SYSTEM FOR MODULAR POWER SUPPLY DEVICE

Harry E. Conway, 3837 Paul Mill Rd., Ellicottt City, Md. 21042, and Robert A. Bourdelaise, 1113 Autumn Gold Dr., Gambrills, Md. 21054

Filed Apr. 7, 1994, Ser. No. 224,466

Int. Cl.[6] H05K 7/20

U.S. Cl. 361—716 4 Claims



1. A high density electric power supply device comprising:

a plurality of stacked circuit modules including top, bottom and intermediate modules;

each of said plurality of stacked circuit modules having elecrical contact elements retained in engagement with complementing contact elements on an adjacent one of said plurality of stacked circuit modules under a force having a direction to press said top and bottom modules against said intermediate modules;

each of at least said intermediate modules having supply and return ports parallel to the direction of said force;

at least some of said plurality of stacked circuit modules each having a passageway for circulation of cooling fluid between the supply and return ports therein;

a compressive seal circumscribing each of said supply and return ports on at least said intermediate modules for maintaining a continuous fluid-tight passageway through the supply and return ports among the stacked circuit modules, the compressive seals being maintained under compression by said force; and

retaining brackets extending between the top and bottom modules on at least two opposite sides of the stacked modules to maintain said force.

5,469,332

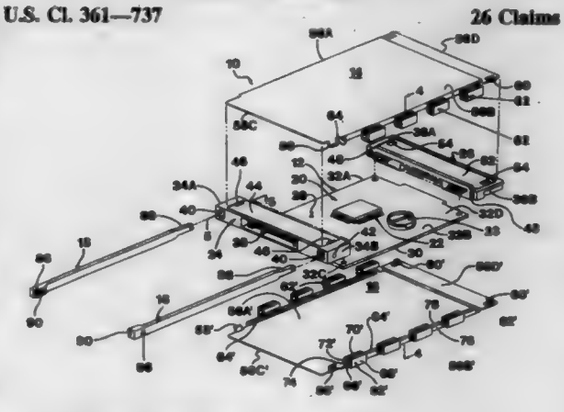
PC CARD ASSEMBLY

Joseph Alvité, Wyoming, Minn., assignor to Robodyne Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 197,633, Feb. 17, 1994, abandoned. This application Jul. 1, 1994, Ser. No. 269,893

Int. Cl.[6] H04K 1/14

U.S. Cl. 361—737 26 Claims



1. A PC card, comprising:

a board assembly, including:

a PC board having first and second opposite sides and first and second opposite ends;

one or more electrical components mounted to the PC board;

a first end housing having opposite sides, the first end housing mounted to the first end of the PC board and including key-receiving slots on the opposite sides;

a second end housing having opposite sides, the second end housing mounted to the second end of the PC board and including key-receiving slots on the opposite sides; and

a connector in at least one of the first and second end housings electrically interconnected to the PC board;

top and bottom covers having first and second opposite sides, the top and bottom covers extending over the PC board between the first and second end housings, and including tracks forming a keyway extending along the opposite sides of the PC board between the key-receiving slots on the first and second end housings;

elongated keys extending through the key-receiving slots on the first and second end housings and the keyway in the top and bottom covers, to secure the top and bottom covers onto the board assembly; and

key latches for latching the keys within the keyway.

5,469,333

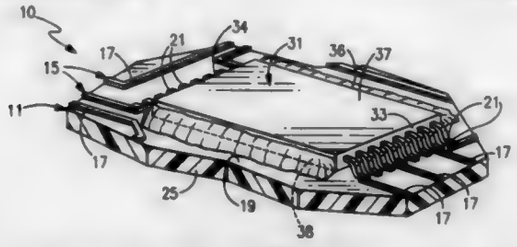
ELECTRONIC PACKAGE ASSEMBLY WITH PROTECTIVE ENCAPSULANT MATERIAL ON OPPOSING SIDES NOT HAVING CONDUCTIVE LEADS

James V. Ellerson; Richard J. Noreika, both of Endicott, and Jack A. Varcoe, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 57,205, May 5, 1993, abandoned. This application Jun. 1, 1994, Ser. No. 252,488

Int. Cl.[6] **H05K** *7/06;* **H01L** *21/58;23/28*

U.S. Cl. 361—779 **13 Claims**



1. An electronic package assembly comprising:

an organic substrate including a surface thereon having a plurality of electrical conductors positioned on said surface;

an electronic package including an elongated, electrically insulative housing having a lower surface located on said surface of said organic substrate and further including at least two pair of opposing sides, said package further including first and second pluralities of electrically conductive leads projecting from the opposing sides of a first of said pair of said opposing sides, respectively, and electrically connected to respective ones of said electrical conductors on said surface of said substrate;

a plurality of quantities of solder, each quantity of solder substantially covering one of said conductive leads and at least a portion of a respective one of said electrical conductors to provide an electrical connection therebetween; and

encapsulant material located on said surface of said organic substrate and on the opposing sides of a second of said pair of opposing sides of said insulative housing, said encapsulant material not being located on said opposing sides of said first of said pair of opposing sides while substantially preventing electrical disconnection between said projecting conductive leads and said solder during operation of said electronic package assembly, said disconnection caused by stresses occurring due to differences in the coefficient of thermal expansion of said organic substrate, solder and conductive leads during said operation.

5,469,334

PLASTIC QUAD-PACKAGED SWITCHED-MODE INTEGRATED CIRCUIT WITH INTEGRATED TRANSFORMER WINDINGS AND MOULDINGS FOR TRANSFORMER CORE PIECES

Balu Balakrishnan, Saratoga, Calif., assignor to Power Integrations, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 924,106, Aug. 3, 1992, abandoned, which is a division of Ser. No. 756,487, Sep. 9, 1991, Pat. No. 5,161,098. This application May 20, 1993, Ser. No. 64,860

Int. Cl.[6] **H05K** *7/02;* **H02J** *17/00;* **H01F** *5/04*

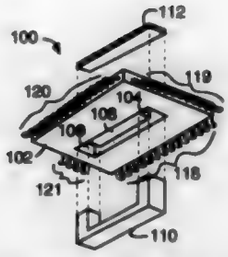
U.S. Cl. 361—782 **11 Claims**

1. An electronic power supply assembly, comprising:

a four-sided flat package of insulating material having a first hole and a second hole from a top surface to a bottom surface and separated from one another that provide for a magnetic core disposed within said first and second holes;

a first through third row of connection pins mounted along a first through a third edge of the four-sided flat package;

a fourth row of connection pins mounted along a fourth edge of the four-sided flat package;



a first plurality of individual parallel conductors enclosed within the four-sided flat package and each having an electrically-isolated segment that passes through an area between said first and second holes in the four-sided flat package and that electrically connect to respective pins of the first through third row of connection pins providing for the external connection of said segments with the first through third row of connection pins in a first single continuous spiral coil axial to said first and second holes; and

a second plurality of conductors enclosed within the four-sided flat package and having at least one electrically-isolated segment that passes through said area between said first and second holes in the four-sided flat package and that electrically connect to respective pins of the fourth row of connection pins providing for the external connection of said segments with the fourth row of connection pins in a second single continuous spiral coil axial to said first and second holes.

5,469,335

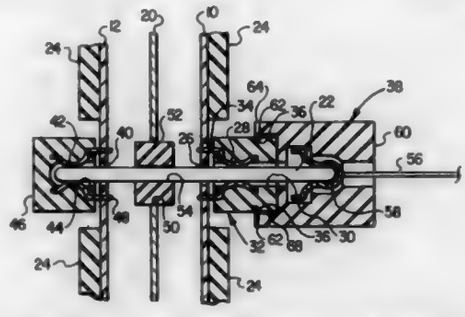
POWER DISTRIBUTION CONNECTOR APPARATUS FOR BACK-TO-BACK SANDWICHED CIRCUIT BOARDS

Michael R. Kluth, Tomball, and Roberta M. Reents, Austin, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Nov. 14, 1994, Ser. No. 339,488

Int. Cl.[6] **H05K** *7/14*

U.S. Cl. 361—800 **35 Claims**



1. A power distribution system for supplying power to a first circuit board, said first circuit board having a first contact member conductively mounted thereto, a first aperture through said first contact member substantially coaxially aligned with a first opening through said first circuit board, said system comprising:

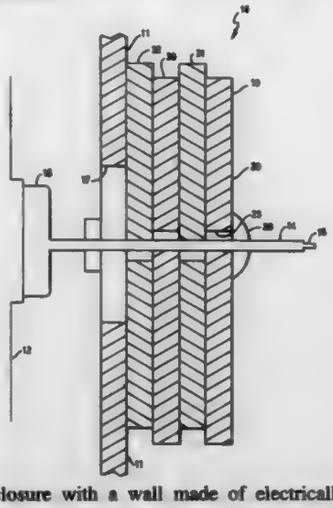
an elongated conductive rod removably positioned through said first aperture and said first opening and extending normally from said first circuit board, said rod being electrically connectable to said first circuit board by said first contact member and having a length sufficient to (a) enter a second aperture of a second contact member conductively mounted on a second circuit board parallel to and adjacent one side of said first circuit board and (b) contact a power connector adjacent an opposite side of said first circuit board to thereby allow said rod to distribute electrical current to multiple circuit boards.

5,469,336

NON-RADIATING ENCLOSURE INCLUDING A STACK OF CLOSURE PLATES HAVING SLATS STAGGERED ABOUT AN APERTURE IN A WALL OF THE ENCLOSURE

Roger R. Soulard, Dracut, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Mar. 29, 1994, Ser. No. 219,067
Int. Cl.[6] H05K 9/00; H02G 3/16; H01R 9/07
U.S. Cl. 361—818 11 Claims



1. An enclosure with a wall made of electrically conductive material defining an interior space and an exterior space, there being first electrical apparatus in said interior space connected by a cable to second electrical apparatus in said exterior space, said wall having an aperture for passage of said cable therethrough,

said enclosure including a closure structure comprising a stack of closure plates affixed to said wall and covering said aperture, each closure plate

being made from flat metal stock and having a generally flat form and

including a slot communicating with the periphery of the closure plate and sized to admit said cable,

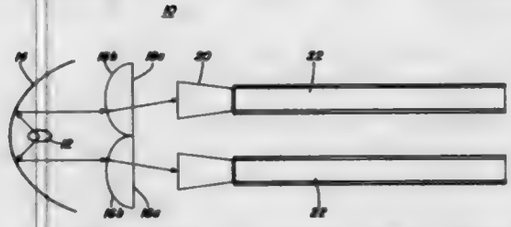
said closure plates being affixed to said wall in positions such that boundaries of the slots of a first set of plates bear on a first side of said cable and are spaced from a second side of said cable and boundaries of slots of a second set of said plates bear on said second side of said cable and are spaced from said first side of said cable.

5,469,337

MULTIPLE PORT HIGH BRIGHTNESS CENTRALIZED LIGHTING SYSTEM

William J. Cassarly, Richmond Heights; John M. Davenport, Lyndhurst, and Richard L. Hansler, Pepper Pike, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 14, 1994, Ser. No. 339,367
Int. Cl.[6] F21V 7/04
U.S. Cl. 362—32 17 Claims



1. A centralized lighting system having multiple outputs for distributing light output to a plurality of remote locations, said lighting system comprising:

a high brightness light source;

a reflector member configured in the form of a parabaloid and having associated therewith, an optical focal point, said light source being disposed at said optical focal point so that light is directed from said reflector member in an essentially parallel manner;

a plurality of lens members located in a common place each having a first surface receptive of light from said light source and said reflector member, said plurality of lens members further each having a second surface, means including said plurality of lens members being effective so as to focus said light from said light source and said reflector member into focussed light outputs;

a plurality of optical fibers each receptive of the of said focussed light outputs and effective so as to deliver light to one of said remote locations; and,

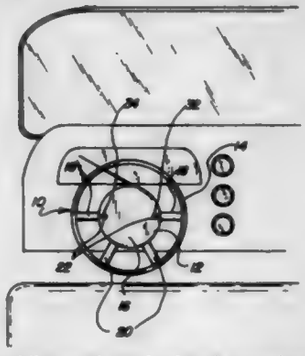
wherein said plurality of lens members are disposed at a spaced apart relation to said reflector member, said lens members, so arranged, being effective so as to provide a plurality of spatially separated light output spots to said plurality of optical fibers, said plurality of spatially separate light spots being substantially equal in terms of color and intensity.

5,469,338

AUTOMOBILE STEERING WHEEL AND TURN SIGNAL INDICATOR

Christopher A. Sims, P.O. Box 367, 10526 Old Hwy 43, Creola, Ala. 36525

Filed Jul. 28, 1994, Ser. No. 281,597
Int. Cl.[6] B60Q 1/00
U.S. Cl. 362—61 1 Claim



1. An automobile steering wheel and turn signal indicator for allowing a driver of an automobile to signal for a turn without removing his hands from the steering wheel comprising, in combination:

an automobile steering wheel having an annular handle, a generally circular central hub adapted to be coupled to a steering column of an automobile, a first pair of spokes symmetrically disposed about the hub and horizontally extended linearly outwards therefrom to the handle to form an angle of 180 degrees therebetween, a second pair of spokes symmetrically disposed about the hub below the first pair of spokes and angularly extended downwards and linearly outwards therefrom to the handle to form an angle of 60 degrees therebetween and with each spoke of the first pair and second pair having a length equal to the radial extent of the hub, and a diametrical pair of recessed switch holes disposed on the hub near the periphery thereof and aligned with the first pair of spokes; and

a turn signal indicator formed of a pair of disk-shaped push button switches with each push button switch extended through a separate switch hole to thereby define a left push button switch and a right push button switch, the right push button switch having an electrically conductive terminal adapted to be coupled between flasher circuitry and right turn signal lights of an automobile, the left push button switch having an electrically conductive terminal adapted to be coupled between flasher circuitry and left turn signal lights of

an automobile, the right push button switch having a depressed orientation adapted for completing a circuit between the right turn signal lights, flasher circuitry, and power supply of an automobile to thereby activate the right turn signal lights and a released orientation for breaking the circuit to thereby de-activate the right turn signal lights, the left push button switch having a depressed orientation adapted for completing a circuit between the left turn signal lights, flasher circuitry, and power supply of an automobile to thereby activate the left turn signal lights and a released orientation for breaking the circuit to thereby de-activate the left turn signal lights, whereby when a driver wishes to indicate a right turn, he can depress the right push button switch while simultaneously holding the steering wheel with both hands, and when a driver wishes to indicate a left turn, he can depress the left push button switch while simultaneously holding the steering wheel with both hands.

5,469,339

RECTANGULAR REFLECTOR CAPABLE OF AVOIDING SECONDARY REFLECTION BY SIDE WALLS

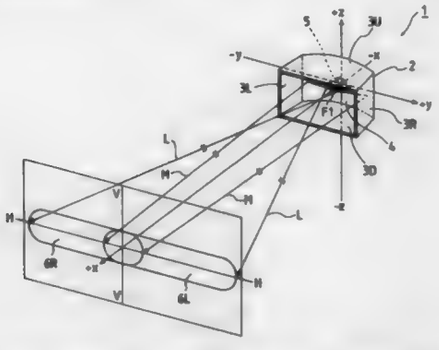
Katsuhiko Iiyama, and Naoki Uchida, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1993, Ser. No. 113,108

Claims priority, application Japan, Sep. 4, 1992, 4-260632

Int. Cl.[6] B60Q *1/04*

U.S. Cl. 362—61 **12 Claims**



1. A reflector for a vehicular lamp having a light source, said reflector having a reflecting surface and a wall portion surrounding it and being generally rectangular when viewed from a front side along an optical axis of the reflecting surface, the reflecting surface being defined by:

a reference curve located on a horizontal plane that includes the optical axis of the reflecting surface and formed by connecting parts of a plurality of different parabolas having different focus positions under a first-order continuity condition, the parabola closer to the optical axis having a longer focal length;

a reference focus being located at the focus position of the one of said plurality of parabolas having a shortest focal length; and

a quadratic cross-sectional curve obtained by cutting the reflecting surface by a vertical plane which includes a direction vector of a ray originating at said reference focus and being reflected from each point on the reference curve.

5,469,340

ILLUMINATION DEVICE FOR VEHICLES

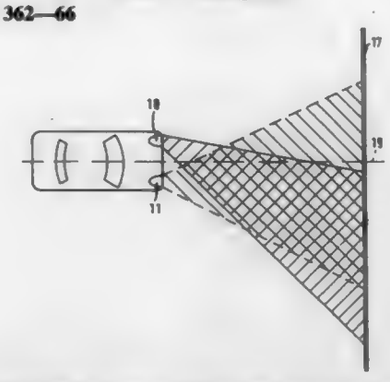
Frieder Heizmann, Denens, Switzerland, assignor to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 136,681, Oct. 14, 1993, abandoned. This application Nov. 8, 1994, Ser. No. 335,654

Claims priority, application Germany, Nov. 26, 1992, 42 37 470.0; Aug. 18, 1993, 43 27 690.3

Int. Cl.[6] B60Q *1/06*

U.S. Cl. 362—66 **9 Claims**



1. An illumination device for vehicles, comprising at least two headlights arranged on a front side of a vehicle and radiating different light beams having at least an upper bright-dark limit, said headlights being arranged so that a headlight arranged on a vehicle side facing away from an opposite traffic side radiates a horizontally dispersed light beam which has a substantially horizontal upper bright-dark limit and illuminates at least the opposite traffic side, while another headlight arranged on a vehicle side facing the opposite traffic side radiates a light beam which illuminates only a traffic side and an edge region outwardly adjoining the traffic side and has an upper bright-dark limit with at least a portion which is higher than said bright-dark limit of said light beam radiated by said headlight arranged on a vehicle side facing away from an opposite traffic side, said headlights being arranged so that said light beam radiated by said headlight arranged at the vehicle side facing away from the opposite traffic side has a lower substantially horizontal bright-dark limit, and said light beam radiated by said headlight arranged at the vehicle side facing the opposite traffic side also has a lower substantially horizontal bright-dark limit arranged so that said lower substantially horizontal bright-dark limit produced by said light beam from said headlight arranged on a vehicle side facing away from an opposite traffic side is located higher than said lower substantially horizontal bright-dark limit produced by said light beam of said headlight arranged on a vehicle side facing the opposite traffic side, and a region in front of the vehicle located under said lower substantially horizontal bright-dark limit being illuminated with at least a lower light intensity than a region located above said lower substantially horizontal bright-dark limit.

5,469,341

LIGHT BAR WITH REFLECTOR ASSEMBLY

Timothy M. Green, Fenton, Mo., assignor to Public Safety Equipment, Inc., St. Louis, Mo.

Filed Sep. 10, 1993, Ser. No. 119,741

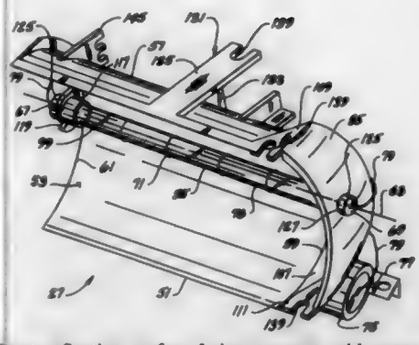
Int. Cl.[6] B60Q *1/02*

U.S. Cl. 362—83.3 **50 Claims**

1. In a light bar having an axis, said light bar being adapted to be mounted on a vehicle with its axis extending generally in side-to-side direction with respect to the vehicle, said light bar comprising at least one light reflector assembly, characterized in that said reflector assembly comprises:

a reflector body having a front reflective surface, a back, and first and second opposite ends,

a lamp mounted on the reflector body forward of said reflective surface,



said front reflective surface being concave with respect to an axis disposed forward of said reflective surface and extending in end-to-end direction relative to said reflector body, said reflective surface being adapted to reflect light emitted by said lamp in a generally forward direction generally perpendicular to said axis of the front reflective surface, and

an end piece at said first end of the reflector body, said end piece having a concave reflective surface facing generally toward said second end of said body for reflecting light emitted by said lamp in a direction generally transverse to the light reflected by said front reflective surface so as to be readily visible by a person standing to one side of the vehicle, said concave reflective surface of the end piece having a focal point located along said axis of the front reflective surface.

5,469,342

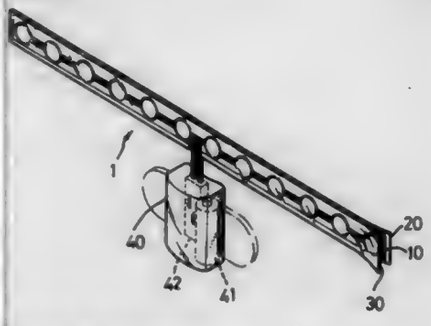
LIGHT-STRIP APPARATUS

Tseng L. Chien, 8th Fl.-6, No. 9, San Min Rd., Taipei, Taiwan, Prov. of China

Filed Jan. 25, 1994, Ser. No. 186,291

Int. Cl.[6] F21V *9/16*

U.S. Cl. 362—84 **8 Claims**



1. A light-strip apparatus comprising

a flexible lower strip;

a transparent flexible upper strip being detachably engaged to said lower strip thus together forming a sheath; and

an elongated interconnected flexible electroluminescent component being received in said sheath for emitting light;

a power box being attached to a substantially central portion of said flexible light-emitting means for providing AC power to enable said flexible light-emitting means to light up;

said power box having an attaching surface including a concave surface at a central portion thereof and two plain surfaces adjacent to said concave surface such that said attaching surface is allowed to be attached to an arcuate surface of an object by said concave surface thereof, or to be attached to a plain surface of an object by said two plain surfaces thereof.

5,469,343

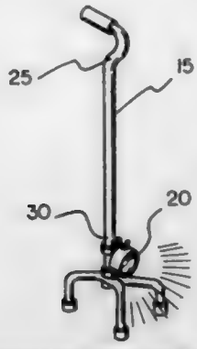
WALKING IMPLEMENT WITH ASSOCIATED LIGHTING DEVICE

Glen J. Speck, 2230 S. K St., Oxnard, Calif. 93033-4346

Filed Sep. 28, 1994, Ser. No. 314,098

Int. Cl.[6] A45B *3/021*

U.S. Cl. 362—102 **2 Claims**



1. A walking device with an associated light assembly comprising;

a walking implement having a first end, a second end and an intermediate extent therebetween;

a cylindrical light assembly housing having an upper extent, a lower extent, an outer surface, an inner surface, a closed rearward end, an open forward end, a male thread element extending about the open forward end, an aperture formed through the upper extent of the light assembly housing;

a cylindrical lens cap having a forward end and a rearward end, a circular transparent lens positioned within the forward end of the cylindrical lens cap, a female thread element extending about the rearward end of the cylindrical lens cap, the female thread element adapted to be engaged with the male thread element of the cylindrical light assembly housing;

a reflective element positioned within the cylindrical light assembly housing, an aperture formed within the reflective element, the reflective element positioned and adapted to reflect light towards the forward end of the light assembly housing;

a light positioned within the aperture of the reflective element, the light positioned and adapted to direct light towards the forward end of the light assembly housing;

a power source positioned within the light assembly housing, the power source being electrically coupled to the light;

a switch positioned within the aperture of the light assembly housing, the switch being operatively connected to the power source, the switch functioning to selectively deliver power to the light;

a mounting plate having an upper extent, a lower extent, a first side and a second side, the first side of the plate being secured to the closed rearward end of the light assembly housing, an upper aperture formed within the upper extent of the mounting plate, a lower aperture formed within the lower extent of the mounting plate, a first screw inserted through the upper aperture and into the walking implement, a second screw inserted through the lower aperture and into the walking implement, the screws and apertures together functioning as a means to positively secure the mounting plate to the walking implement;

an upper clip having a closed first end and an open second end, the closed first end of the upper clip being secured to the upper extent and second side of the mounting plate, the open second end of the upper clip positioned over and received the intermediate extent of the walking implement; and

a lower clip having a closed first end and an open second end, the closed first end of the lower clip being secured to the lower extent and second side of the mounting plate, the open second end of the lower clip positioned over and received the intermediate extent of the walking implement, the upper and lower clip together functioning as a means to secure to light assembly housing to the walking implement.

5,469,344

SUPPORT FOR DECORATIVE LIGHT STRING ON A BUILDING

Ted Kotsakis, 1702 Duke Ct., Eugene, Oreg. 97401

Filed Sep. 20, 1993, Ser. No. 123,055
Int. Cl.[6] F21V *21/00*
U.S. Cl. 362—145 **7 Claims**

1. A support for several light bulbs of a segment of a string of decorative light bulbs spaced along a conductor for decorating a building structure, said support comprising,

a rigid elongate member defining multiple openings extending therethrough and spaced therealong, each of said openings adapted for the inserted reception of one of said light bulbs of said several light bulbs,

friction means on said member at least partially defining each of said multiple openings for frictional engagement with one of the light bulbs when inserted therein, and

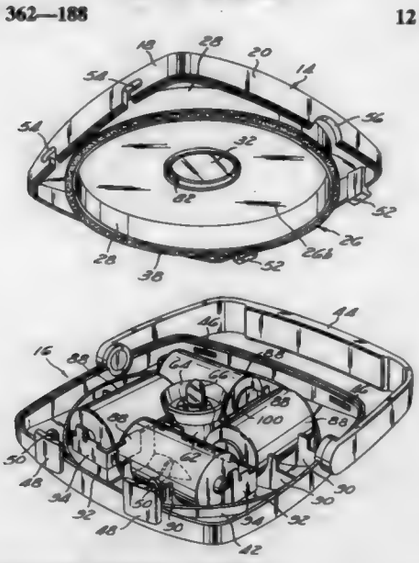
additional openings extending through said elongate member each for the reception of a retainer.

5,469,345

LOW PROFILE FLASHLIGHT/SPOTLIGHT

Tor H. Pettersen, Rancho Palos Verdes; John F. Scherbarth, Corona, and Bobby L. Hobbs, Chino, both of Calif., assignors to Diamond Light Industries, Costa Mesa, Calif.

Filed Dec. 8, 1993, Ser. No. 164,354
Int. Cl.[6] F21L *1/00*
U.S. Cl. 362—188 **12 Claims**



1. A low profile flashlight, comprising:

a housing comprising first and second housing halves which are releasably attachable to each other;

a lens disposed within the first half of said housing;

a light source disposed within the second half of said housing and reciprocally movable between multiple positions within the housing, including base, first and second positions, said light source comprising a reflector and a lamp which are maintained in fixed relation to each other when said light source is moved between the base, first and second positions; and

a power source disposed within the second half of the housing and circumventing said light source;

said light source being oriented relative said lens such that a divergent beam of light is transmitted from said lens when said light source is in the first position and a collimated beam of light is transmitted from said lens when said light source is in the second position;

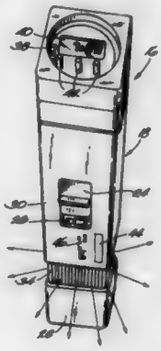
said beam of light becoming increasingly collimated as the light source is moved toward the second position and increasingly divergent as the light source is moved toward the first position.

5,469,346

TIME SETTABLE FLASHING LIGHT

Paul R. Haut, 1240 Ridgeway Rd., Brookfield, Wis. 53045, and William Schuster, Germantown, Wis., assignors to Paul R. Haut, Menomonee Falls, Wis.

Filed Oct. 26, 1993, Ser. No. 143,922
Int. Cl.[6] F21L *7/00*
U.S. Cl. 362—205 **5 Claims**



1. In combination:

a light and a battery;

an electronic clock having a display for displaying a time, and having a memory area for holding a settable alarm time, and having alarm output terminals for outputting a signal at the time held in the memory area;

an electronic control circuit for receiving the signal from the clock and, on receipt of that signal, causing the light to alternately be connected to and disconnected from the battery, resulting in the light flashing on and off;

said control circuit including a circuit portion to discontinue the flashing of the light after a predetermined length of time flashing;

a casing body into which the light is mounted;

a telescopic slider slidably mounted to said casing body and having a cone mirror, and a lateral lens positioned around the sides of the telescopic slider, said telescopic slider having a telescoped-in position wherein the light is associated with the cone mirror, and a telescoped-out position wherein the light is associated with the lateral lens; and

a telescoping switch mounted in association with the casing body and telescopic slider, said telescoping switch electrically connected to the electronic control circuit to prevent the electronic control circuit from beginning to flash the light at the predetermined time unless said telescopic slider is in its telescoped-out position, and to stop the flashing of the light before the end of the predetermined length of time when the telescopic slider is moved to its telescoped-in position.

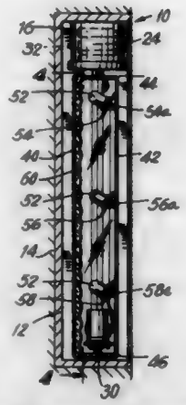
5,469,347

RETRO-FIT ILLUMINATED SIGN MODULE AND METHOD

George Duve, Washington, N.J., and Jeffrey S. Gieger, Dingmans Ferry, Pa., assignors to Area Lighting Research, Inc., Hackettstown, N.J.

Filed Feb. 7, 1994, Ser. No. 192,701
Int. Cl.[6] F21V *5/00*
U.S. Cl. 362—245 **11 Claims**

1. A module for retro-fitting an illuminated sign, comprising:



a) a housing having a generally planar back wall, a light-transmissive front wall overlying and spaced from the back wall, and side walls extending between the front and back walls;

b) a plurality of light sources mounted in the housing on the front wall and facing the back wall, said light sources being arranged in a plurality of longitudinally-extending rows spaced transversely apart of one another;

c) a plurality of generally planar support strips, one for each row, for supporting the light sources, each support strip being inclined relative to the generally planar back wall;

d) means for electrically energizing the light sources to emit light; and

e) reflector means for reflecting the light emitted by the energized light sources away from the back wall and toward and through the front wall in a generally uniform distribution pattern.

5,469,348

SUPPORT FOR A LIGHT TUBE AND METHOD OF USE

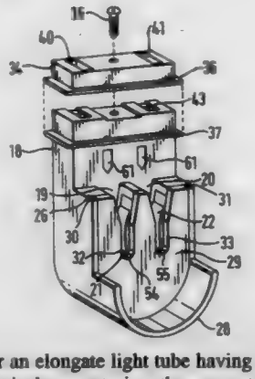
Yin H. Wong, 158 Jalan Dato Sulaiman, Century Garden, Post Code 80250, Johor Bahru, Malaysia

Filed May 12, 1994, Ser. No. 241,591

Claims priority, application United Kingdom, Nov. 22, 1993, 9323958

Int. Cl.[6] F21S *3/00*

U.S. Cl. 362—217 **5 Claims**



1. A support for an elongate light tube having at each end a pair of projecting electrical contact pins, the support comprising:

an elongate frame; and

first and second holders depending from the frame and positioned at respective ends of the elongate frame;

each holder having a holding structure which defines upwardly facing openings for receiving the contact pins of the light tube, each holder having electrical terminals located respectively in the region of the openings for contacting the pins of the light tube;

each said holding structure comprising a first body extending downwardly from the elongate frame and a second body which is spaced from the frame and projects from the first body in an inward direction generally along the direction of the elongate frame away from said end of the elongate frame, said second body having an upper face which faces towards the underside of the elongate frame, said upwardly facing openings being formed in the upper face of the second body;

said first body, said upper face of said second body, and the underside of said elongate frame defining together an entry space between the entrance to the openings and the elongate frame, said entry space extending without obstruction between said upper face of said second body and the underside of said elongate frame;

said upper face of said second body providing support means spaced from the underside of the elongate frame without obstruction therebetween for supporting said light tube temporarily by the pins thereof during installation before contact is made by the pins with said electrical terminals, whereby the light tube can be installed in the support by sideways movement of the pins into the respective entry space, followed by temporary support of the light tube by the pins thereof on the support means, followed by downward movement of the pins into the respective openings leading to the electrical terminals;

said second body having an inward face which faces in said inward direction, said holding structure including a third body positioned at a distal end of the second body and projecting from the bottom of said inward face of the second body in said inward direction, the third body being a curved arcuate body forming a cap for concealing the underside of the end of a light tube mounted on the support.

5,469,349

POWER SUPPLY CIRCUIT AND CONTROL CIRCUIT FOR USE IN A POWER SUPPLY CIRCUIT

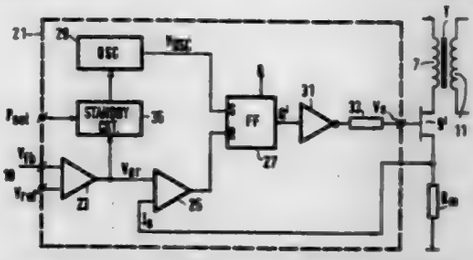
Antonius A. M. Marinus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 10, 1993, Ser. No. 105,212

Claims priority, application Netherlands, Aug. 10, 1992, 9201428

Int. Cl.[6] H02M *3/335*

U.S. Cl. 363—21 **13 Claims**



1. A power supply circuit having input terminals for receiving an input voltage and output terminals for supplying an output voltage, comprising:

(a) a transformer having a primary and a secondary winding,

(b) a power switch having main terminals and a control input, said power switch main terminals being connected in series arrangement with the primary winding of the transformer, said series arrangement being connected across the input terminals of the power supply circuit,

(c) the transformer secondary winding being coupled to the output terminals of the power supply circuit,

(d) a control circuit having a first input and a second input and an output coupled to the power switch control input and comprising an oscillator circuit,

(e) said control circuit generating a pulse-width modulated control signal at a first frequency for controlling the output voltage of the power supply circuit,

(f) first means responsive to a load connected to the power supply circuit output terminals for deriving a feedback signal and for coupling the feedback signal to the control circuit first input,

(g) second means for supplying an external power set signal to the control circuit second input,

(h) said control circuit further comprising switching means having an output connected to the oscillator circuit and having a first input for receiving a first signal related to the feedback signal and a second input for receiving the power set signal and in response to the first signal related to the feedback signal and to the power set signal for generating at its output a second signal which switches the frequency of the oscillator circuit when at the first frequency to a second frequency different from the first frequency and for generating at its output a third signal which switches the frequency of the oscillator circuit when at the second frequency to the first frequency,

(i) said external power set signal determining the minimum load power consumption when the frequency of the oscillator circuit must switch from the first to the second frequency.

5,469,350

VOLTAGE BOOSTING POWER FAILURE PROTECTED POWER SUPPLY DEVICE

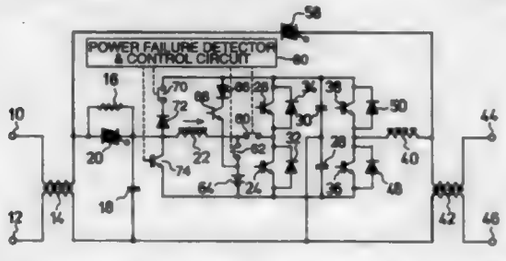
Hisashi Nishio, Suita; Toru Arai, Kyoto; Masaru Nishizuka, Shijonawate, and Atsushi Makitani, Toyonaka, all of, Japan, assignors to Sansha Electric Manufacturing Co., Ltd., Osaka, Japan

Filed Jun. 10, 1994, Ser. No. 257,702

Claims priority, application Japan, Aug. 19, 1993, 5-228341

Int. Cl.[6] H02H *7/125*

U.S. Cl. 363—55 **1 Claim**



1. A voltage boosting, power failure protected, power supply device comprising:

an inverter,

a pair of capacitors connected in series between input terminals of said invertor,

a pair of switching elements connected in series across the series connection of said capacitors,

a pair of diodes connected respectively in inverse parallel to said switching elements,

one input terminal of an a.c. power supply connected through a reactor to a junction of said switching elements,

another input terminal of said a.c. power supply connected to a junction of said capacitors, and

control means for putting one of said pair of switching elements into conduction when voltage across said terminals of said a.c. power supply has one polarity and putting the other of said pair of switching elements into conduction when said voltage has an opposite polarity, thereby charging said capacitors alternatingly;

wherein said device further comprises:

a normally-closed switch inserted between said junction of said switching elements and one end of said reactor,

a first normally-open switch and a storage battery connected in series between said one end of said reactor and one input terminal of said invertor,

a third switching element connected between the other end of said reactor and said one input terminal of said invertor,

a second normally-open switch connected between said other end of said reactor and an other input terminal of said invertor, and

means for sensing a power failure and opening said normally-closed switch, closing said first and second normally-open switches and putting said third switching element into intermittent conduction during a period of said power failure.

5,469,351

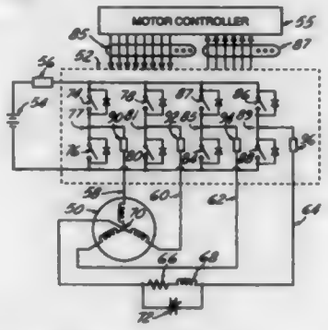
FAULT ISOLATION IN AN INDUCTION MOTOR CONTROL SYSTEM

Md A. Masrur, West Bloomfield; Xingyi Xu, and Feng Liang, both of Canton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 5, 1994, Ser. No. 270,967

Int. Cl.[6] H02M *5/458;* **H02H** *7/12*

U.S. Cl. 363—56 **14 Claims**



1. A fault isolation system comprising:

(a) an inverter comprising:

at least a first and a second phase portion, said first phase portion having a first output and said second phase portion having a second output;

a neutral portion having a third output;

(b) at least a first and a second overcurrent protection means, said first overcurrent protection means coupled in series with said first output and said second overcurrent protection means coupled in series with said second output; and

(c) an electrical load, said electrical load having at least a first phase and a second phase, the number of said phases being equal to the number of said phase portions of said inverter, said first phase of said electrical load coupled to said first output, said second phase of said electrical load coupled to said second output, said electrical load further having a neutral connection, said neutral connection coupled to said third output; wherein

said inverter further comprises a positive direct-current input and a negative direct-current input;

each said phase portion and said neutral portion of said inverter comprises a first switching means and a second switching means, both said switching means with a first side and a second side, said first side of said first switching means coupled to said positive direct-current input and said first side of said second switching means coupled to said negative direct-current input; and

said second sides of said first switching means and second switching means are coupled together to form said output of said portion of said inverter.

5,469,352

OPERATION HISTORY DISPLAY DEVICE OF NUMERICAL CONTROL APPARATUS

Masashi Yukutomo, Sagamihara; Shigeru Isohata, Hachioji, and Osamu Yamazaki, Hino, all of, Japan, assignors to Fanuc Ltd, Yamanashi, Japan

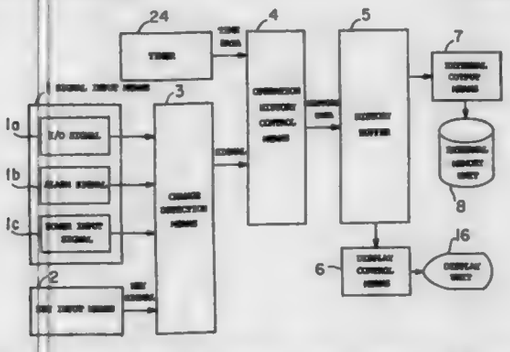
PCT No. PCT/JP93/01184, § 371 Date Apr. 15, 1994, § 102(e) Date Apr. 15, 1994, PCT Pub. No. WO94/06066, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 24, 1993, Ser. No. 211,772

Claims priority, application Japan, Sep. 1, 1992, 4-233251

Int. Cl.[6] G05B *19/408;19/409*

U.S. Cl. 364—192 **7 Claims**



1. An operation history display device of a numerical control apparatus for displaying a history of numerical control apparatus operational signals, comprising:

input means for inputting a numerical control operational signal to said numerical control apparatus;

change detection means for detecting a change of said numerical control operational signal and outputting the changed signal;

a timer for outputting a present time;

operation history control means for receiving the changed signal output from the change detection means and the present time from the timer and creating history data of the changed signal;

a history buffer for storing a name of the changed signal and said present time in a history buffer as history data; and

display control means for displaying said history data stored in said history buffer on a display unit in response to a predetermined operation performed by the operator.

5,469,353

RADIOLOGICAL IMAGE INTERPRETATION APPARATUS AND METHOD

Howard Pinsky, Mansfield; Scott S. Sheldon, Boston, both of Mass.; Nicholas A. Christakis, Philadelphia, Pa., and Michael Schmertzler, New Canaan, Conn., assignors to Access Radiology Corp., Waltham, Mass.

Filed Nov. 26, 1993, Ser. No. 158,140

Int. Cl.[6] G06F *17/60;159/00*

U.S. Cl. 364—413.01 **23 Claims**

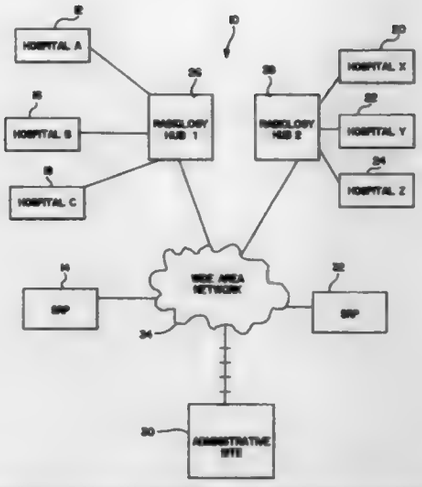
1. A method for providing interpretation of radiological images, comprising:

coupling a data processing system of an administrative site to a wide area network;

coupling a plurality of acquiring sites to the wide area network for acquiring radiological images and for generating identifying information abou a radiology study, the study including one or more of the images;

coupling a plurality of interpretation sites to the wide area network for gathering information about the interpretation sites and for communicating selected information between the interpretation sites and the administrative site;

receiving the identifying information about the study from one of the acquiring sites over the wide area network and through the data processing system;



utilizing the received identifying information to determine one or more study parameters from the received identifying information;

comparing the study parameters at the administrative site with information about the interpretation sites to select an optimum interpretation site to interpret the study from the available interpretation sites and from current information gathered over the wide area network;

routing the study onto the wide area network, under the control of the administrative site, to the selected interpretation site;

receiving report information at the administrative site about an interpretation of the study from the selected interpretation site over the wide area network; and

routing the study interpretation, under the control of the administrative site, to the acquiring site from which the study identifying information about the radiology study was received.

5,469,354

DOCUMENT DATA PROCESSING METHOD AND APPARATUS FOR DOCUMENT RETRIEVAL

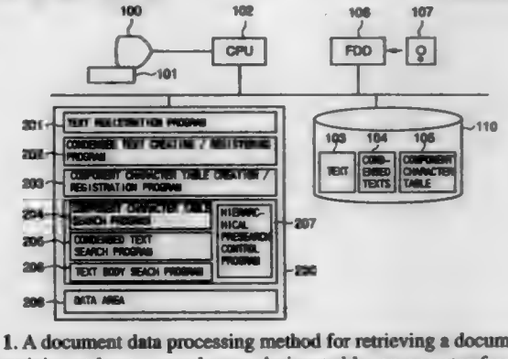
Atsushi Hatakeyama, Kokubunji; Hiromichi Fujisawa; Kanji Kato, both of Tokorozawa; Hisamitsu Kawaguchi, Sagamihara; Naoki Minegishi, Osaka; Katsumi Tada, Kokubunji, and Satoshi Asakawa, Hirakata, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 555,483, Aug. 9, 1990, Pat. No. 5,168,533. This application Feb. 28, 1992, Ser. No. 843,162

Claims priority, application Japan, Feb. 28, 1991, 3-058311; Dec. 25, 1991, 3-342695

Int. Cl.[6] G06F *17/21*

U.S. Cl. 364—419.19 **50 Claims**



1. A document data processing method for retrieving a document containing at least a search term designated by an operator from a document database registering therein document information in

terms of character code data while referring to textual content of said document, comprising steps of:

upon registration of text documents in said document database, creating condensed texts by decomposing each of textual character strings of the documents to be registered into fragmental character strings on the basis of at least one of character species including katakana character, hiragana character, kanji character, alphabetic character, numeric character, and symbol character and checking mutual inclusion relations possibly existing among said fragmental character strings resulting from said decomposition, to thereby create the condensed texts each constituted by a set of the fragmental character strings in which any character string found to be included by other character string is eliminated;

creating a component character table in which characters occurring in each of said condensed texts are registered without duplication; and

registering in said document database said condensed texts together with said component character table in addition to the texts of the document to be registered; and

upon retrieval of the document containing the designated search term, executing first a component character table search for thereby extracting those documents which contain all species of characters constituting the search term designated by the operator by consulting said component character table;

executing subsequently a condensed text search by consulting the condensed texts of the documents extracted through said component character table search for extracting only the documents corresponding to the condensed texts which contain the fragmental character strings constituting the search term designated by the operator to thereby select the documents containing the designated search term; and

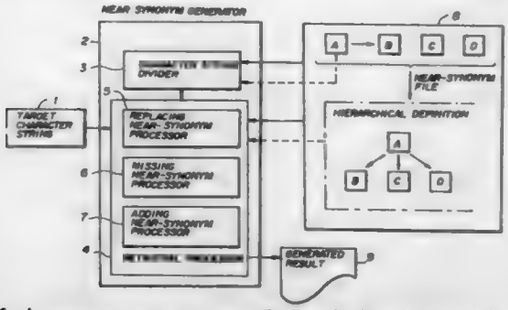
executing finally a text body search for extracting a document which satisfies query condition imposed on the search term by consulting the texts of the documents extracted through said component character table search and said condensed text search.

5,469,355

NEAR-SYNONYM GENERATING METHOD

Kouichi Tsuzuki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 2, 1993, Ser. No. 115,327
Claims priority, application Japan, Nov. 24, 1992, 4-312531
Int. Cl.[6] G06F *19/00*
U.S. Cl. 364—419.19 **12 Claims**



1. A synonymous term generating method implemented by a computer for generating synonymous terms of a target character string by retrieving a synonymous term file based on the target character string, said synonymous term file defining synonymous terms for one or a plurality of words, said synonymous term generating method comprising the steps of:

(a) retrieving the synonymous term file using words which form the target character string as keys, and extracting synonymous terms which are defined for each of the words used as the keys as the synonymous terms for each of the words forming the target character string;

(b) forming a synonymous term group from each of the words forming the target character string and the synonymous terms so as to form a plurality of such synonymous term groups, and selecting at least one of the words and synonymous terms from each of the synonymous term groups; and

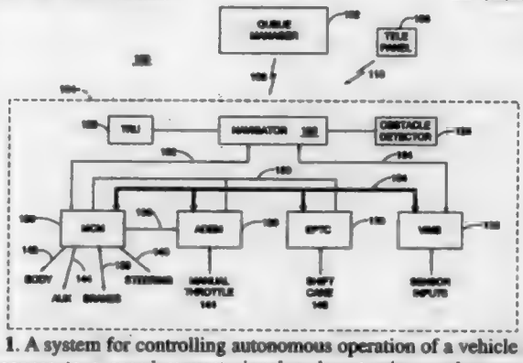
(c) generating the synonymous terms of the target character string by combining at least one of words and synonymous terms obtained by said step (b) in an order which is different from the order of the words forming the target character string.

5,469,356

SYSTEM FOR CONTROLLING A VEHICLE TO SELECTIVELY ALLOW OPERATION IN EITHER AN AUTONOMOUS MODE OR A MANUAL MODE

Mark R. Hawkins, Chillicothe, and Joel L. Peterson, East Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 1, 1994, Ser. No. 299,447
Int. Cl.[6] G06F *165/00*
U.S. Cl. 364—424.02 **12 Claims**



1. A system for controlling autonomous operation of a vehicle in response to a speed request signal and a steering angle request signal from a navigator and for selectively allowing manual operation of the vehicle, the system comprising:

machine control means for receiving an auto/manual select signal, said speed request signal and said steering angle request signal and for producing a speed control signal, a steering angle signal, and an auto/manual control signal;

speed control means for controlling the speed of the vehicle in response to said speed control signal and an operator input when said auto/manual control signal indicates autonomous operation and in response only to said operator input when said auto/manual control signal indicates manual operation; and

steering control means for controlling the steering angle of the vehicle in response to said steering angle control signal and an operator input when said auto/manual control signal indicates autonomous operation and in response only to said operator input when said auto/manual control signal indicates manual operation.

5,469,357

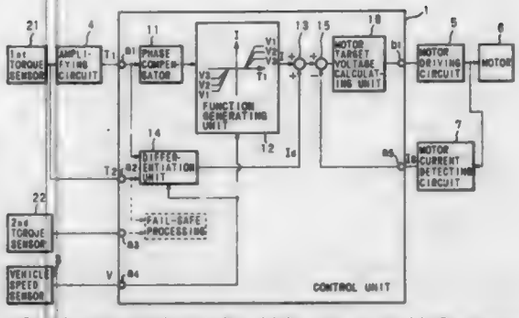
CONTROLLING APPARATUS FOR POWER STEERING

Mitsuhiko Nishimoto, Yoshino, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Continuation of Ser. No. 910,734, Jul. 8, 1992, abandoned.
This application Jan. 4, 1995, Ser. No. 368,726
Claims priority, application Japan, Jul. 9, 1991, 3-195898
Int. Cl.[6] B62D *5/04*
U.S. Cl. 364—424.05 **9 Claims**

8. A controlling apparatus for a power steering system including a first torque sensor and a second torque sensor for detecting steering torque applied to a steering wheel, and a steering assisting motor which is driven on the basis of a detecting signal of said first torque sensor, comprising:

means for amplifying the detecting signal of said first torque sensor and outputting a first torque detecting signal which saturates in a predetermined torque range;



a function generating unit which converts said first torque detecting signal according to a predetermined function to generate a driving current for said motor;

differentiation unit means having:

first means for differentiating said first torque detecting signal;

second means for differentiating the detecting signal of said second torque sensor;

first compensating means which compensates the differentiated first torque detecting signal corresponding to a detected signal of a vehicle state;

second compensating means which compensates the differentiated signal of said second torque sensor detecting signal corresponding to said detected signal of the vehicle state;

selecting means for judging whether or not said first torque detecting signal is in said predetermined torque range, outputting the output signal of said first compensating means when said first torque detecting signal is not in said predetermined torque range, and outputting the output signal of said second compensating means when said first torque detecting signal is in said predetermined torque range; and

means for adding the signal outputted from said differentiation unit means and the driving current of said motor for adjustment.

5,469,358

METHOD FOR GENERATING WHEEL ACCELERATION CONTROL SIGNALS AND WHEEL DECELERATION CONTROL SIGNALS

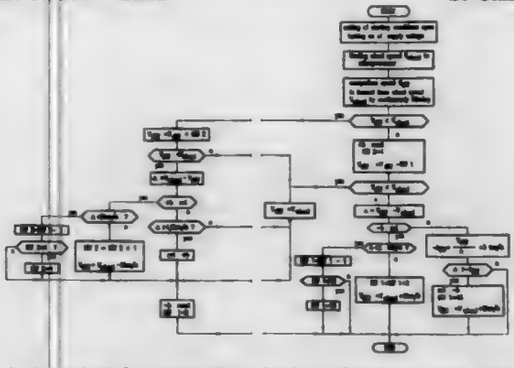
Gerhard Ruhnau, Neustadt, Germany, assignor to WABCO Westinghouse Fahrzeugbremsen GmbH, Hanover, Germany

Continuation of Ser. No. 738,162, Jul. 30, 1991, abandoned. This application Apr. 18, 1994, Ser. No. 229,386

Claims priority, application Germany, Jul. 30, 1990, 40 24 147.5

Int. Cl.[6] **G01C** *23/00*

U.S. Cl. 364—426.02 **20 Claims**



1. A method for generating wheel acceleration control signals and wheel deceleration control signals for an anti-lock control system comprising the following steps:

continuously filtering a current wheel speed (v_{wheel}) during operation of the wheel for obtaining by a microprocessor a wheel comparison speed (v_{dyn}) for indicating a difference between the current wheel speed and a previous wheel speed, wherein the wheel comparison speed (v_{dyn}) is filtered from the wheel speed (v_{wheel}), and wherein the filtered wheel comparison speed (v_{dyn}) decreases with a maximum slope of a constant first preset value of from −0.6 g to −1.0 g (g=gravity acceleration) in case of a wheel deceleration, and in case of a wheel acceleration increases with a maximum slope of a constant second preset value of from +0.3 g to +0.5 g (g=gravity acceleration); generating a deceleration signal (−b) when a difference (Δ) between the wheel comparison speed (v_{dyn}) and the current wheel speed (v_{wheel}) surpasses a third preset value; generating an acceleration signal (+b) when a difference (Δ) between the current wheel speed (v_{wheel}) and the wheel comparison speed (v_{dyn}) surpasses a fourth preset value; and supplying the generated deceleration signal and the generated acceleration signal to the anti-lock control system for controlling wheel behavior.

5,469,359

TRACTION CONTROL DEVICE FOR VEHICLES

Toshiaki Tsuyama, Higashi-Hiroshima; Toru Onaka, Hiroshima; Kazutoshi Nobumoto, Hiroshima, and Makoto Kawamura, Hiroshima, all of, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 711,876, Jun. 7, 1991, Pat. No. 5,365,443. This application Sep. 8, 1994, Ser. No. 301,417

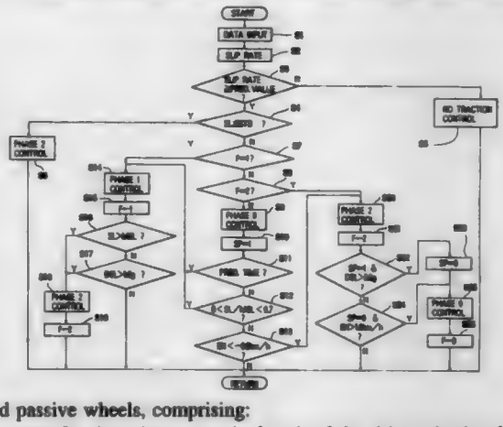
Claims priority, application Japan, Jun. 7, 1990, 2-149628

The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.

Int. Cl.[6] **B60T** *8/32;* **B60K** *31/00*

U.S. Cl. 364—426.03 **11 Claims**

1. A traction control device for a vehicle having drive wheels



and passive wheels, comprising:

means for detecting a speed of each of the drive wheels of the vehicle;

means for detecting a speed of each of the passive wheels of the vehicle;

means for calculating an actual slip rate of the drive wheels based on detected speeds of the drive and passive wheels;

means for establishing a target slip rate, from at least one of a plurality of vehicle operating parameters, to control a drive power to the drive wheels; and

means for matching the actual slip rate with the target slip rate by controlling driving power of the drive wheels to the road surface;

the driving power of the drive wheels to the road surface being first controlled based on a time differential of a difference between the actual slip rate and the target slip rate at least until a predetermined slip condition is satisfied for the first time and, thereafter, controlled based on the difference between the actual slip rate and the target slip rate.

5,469,360
VEHICLE POSITION DETECTING APPARATUS

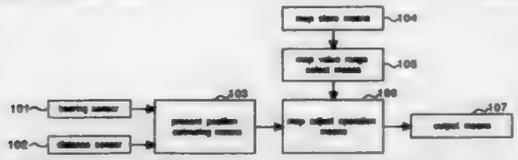
Yasuhiro Ihara, Katano; Mitsuhiro Yamashita, Osaka, and Yoshiki Ueyama, Sakai, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 21, 1992, Ser. No. 886,250

Claims priority, application Japan, Mar. 10, 1991, 4-51111; May 21, 1991, 3-115990; Jun. 24, 1991, 3-151417; Jan. 17, 1991, 3-269216

Int. Cl.[6] G05D *1/00;3/10*

U.S. Cl. 364—449 **9 Claims**



1. A vehicle position detecting apparatus comprising:

a bearing sensor for detecting a running bearing of a vehicle;

a distance sensor for detecting a running distance of the vehicle;

a present position estimating means for estimating a present position of the vehicle with respect to a reference position in accordance with the running bearing detected by the bearing sensor and the running distance detected by the distance sensor;

a map storing means for storing road data indicative of a road map;

a map range selecting means for estimating an error amount of the road data stored in the map storing means and determining a range as evaluation range to be used in a map match computing operation from a portion having a small error amount;

a map match computing means for effecting the map match computing operation so as to correct the present position on the road map with the use of the present position computed by the present position estimating means and the evaluation range selected by the map range selecting means;

an outputting means for outputting the present position of the vehicle corrected by the map computing means;

a bent road judging means for judging whether the vehicle is running on a bent road, wherein a tolerance error amount used in the map match operation is increased when the vehicle is judged to run on a bent road.

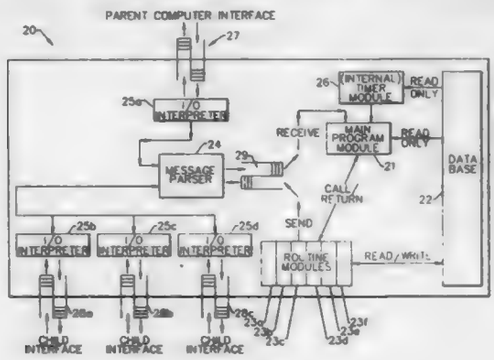
5,469,361
GENERIC CELL CONTROLLING METHOD AND APPARATUS FOR COMPUTER INTEGRATED MANUFACTURING SYSTEM

James R. Moyne, Ypsilanti, Mich., assignor to The Board of Regents Acting for and on Behalf of The University of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 742,838, Aug. 8, 1991, abandoned. This application Jun. 6, 1994, Ser. No. 254,483

Int. Cl.[6] G06F *15/00;* **G05B** *19/42*

U.S. Cl. 364—468 **31 Claims**



15. A computer integrated manufacturing system comprising:

a factory controller;

a plurality of manufacturing tool controllers;

a like plurality of manufacturing tools, a respective one of which is responsive to a respective one of said manufacturing tool controllers, for performing manufacturing operations; and

a plurality of generic cell controllers, hierarchically connected between said factory controller and said plurality of manufacturing tool controllers, each of said generic cell controllers comprising:

means for accepting manufacturing commands;

means, responsive to an accepted manufacturing command, for determining a sequence of steps to implement an accepted manufacturing command;

a plurality of manufacturing instruction generating means, a respective one of which is responsive to a respective step in the sequence of steps, for generating manufacturing instructions for implementing the respective step; and

means for accepting the manufacturing instructions generated by the plurality of manufacturing instruction generating means;

wherein said sequential step determining means comprises:

a database, having a plurality of entries for each of a corresponding plurality of manufacturing command, each entry including parameters for the associated manufacturing command and an indication of a sequence of steps for the associated manufacturing command;

means for matching an accepted command to a corresponding database entry; and

means for sequentially activating predetermined ones of said manufacturing instruction generating means, in a sequence determined by the corresponding database entry, and for providing the associated parameters from the corresponding database entry to the activated manufacturing instruction generating means;

at least one of said manufacturing instruction generating means including means for modifying at least one of said plurality of entries in said database, such that modified manufacturing instructions, having at least one of a modified sequence and modified parameters from that which was originally stored in said database, are generated by said plurality of generic cell controllers in response to an accepted manufacturing command.

5,469,362
DISPATCHING METHOD AND APPARATUS FOR MONITORING SCHEDULED MAIL

William M. Hunt, Shelton, and Ronald P. Sansone, Weston, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed May 16, 1994, Ser. No. 243,358

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—478 **6 Claims**

1. A mail monitoring system for scheduled dispatchment of mail to the postal service via common carrier, the combination comprising:

a mail production facility for printing addresses on a mailpiece, assembling one or more inserts into a mailpiece, determining the postage of each mailpiece and assembling similar destination mailpieces in the same tray;

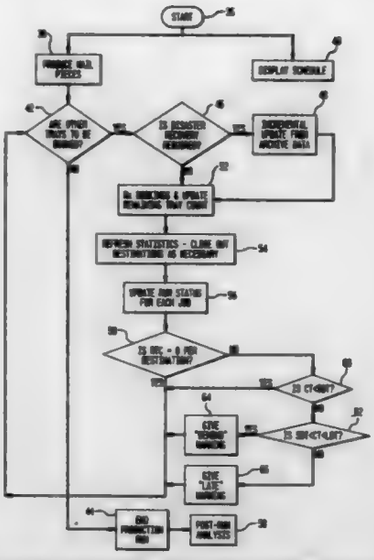
a first processor having mail lists therein in communication with said mail production facility; said first processor controls the printing of addresses on the mailpiece;

a second processor having a common carrier dispatching schedule therein in communication with said first processor and said mail production facility;

a tray collection unit for receiving mailpieces assembled in trays from said mail production facility;

a common carrier for receiving trayed mail from said tray collection unit; and

a third processor in communication with said common carrier and said second processor for monitoring the receipt of trayed



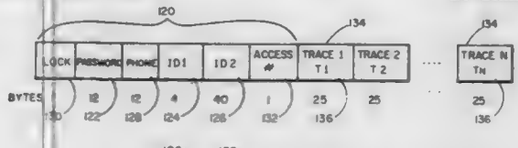
mail by said common carrier and comparing the receipt of the trayed mail by the common carrier with the dispatching schedule of said second processor to maintain the synchronization of the schedule of said carrier with the mail printed by said mail production facility.

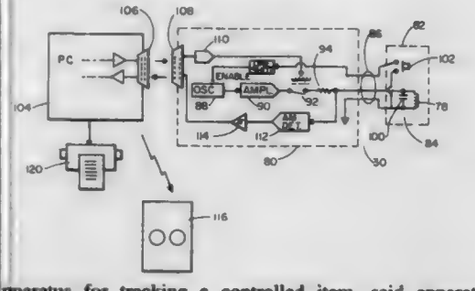
5,469,363

ELECTRONIC TAG WITH SOURCE CERTIFICATION CAPABILITY

Thomas V. Saliga, 4702 Baycrest Dr., Tampa, Hillsborough County, Fla. 33615

Filed May 19, 1994, Ser. No. 246,147
Int. Cl.[6] G06K *19/07*
U.S. Cl. 364—478 **20 Claims**





1. Apparatus for tracking a controlled item, said apparatus comprising:

a tag operatively associated with said item, said tag comprising

a tag microprocessor,

a non-volatile memory operatively connected to said microprocessor, said non-volatile memory containing, as separate records therein, an access attempt number record, a valid password, a secret identification record, and a lock record set at an initialization time,

means for receiving electrical power from an external source, and

first communication means for communicating with a local interrogation station:

said local interrogation station comprising

means for supplying electrical power to said tag,

second communication means operatively associated with said first communication means, and

a computer controlling said second communication means, said computer transmitting a test password to said tag by said second means;

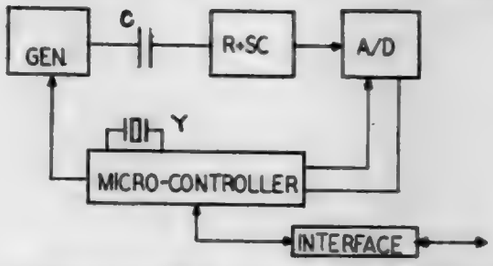
said tag microprocessor acting under program control to read said lock record and, if said lock record is set, to increment said access attempt record on receiving said test password and to transmit said secret identification record to said interrogation station only if said test password matches said valid password and said access attempt number is less than a predetermined value, said tag microprocessor storing a record only once in any portion of said memory, other than that portion used for said access attempt record, if said lock record is set.

5,469,364

APPARATUS AND METHODS FOR MEASURING AND DETECTING VARIATIONS IN THE VALUE OF A CAPACITOR

Bradley W. Hughey, 678 Schooner La., Elk Grove Village, Ill. 60007; Lucretiu Pisau, 4211 N. Keystone #1W, and Liviu Millen, 4207 N. Keystone #B, both of Chicago, Ill. 60641

Filed Mar. 15, 1993, Ser. No. 31,809
Int. Cl.[6] G01R *27/26*
U.S. Cl. 364—482 **50 Claims**



1. A method for measuring the value of a capacitor comprising:

(a) providing a capacitor to be measured having a value of capacitance, C;

(b) electrically connecting said capacitor to a detector circuit, said detector circuit including a known load impedance, R, connected in series with said capacitor, means for providing a voltage input, V, of known wave form to said detector circuit, means for measuring an instantaneous sample voltage, v, across a circuit element selected from the load impedance or the capacitor being measured after a known time interval T has elapsed, said sampling moment being in a predetermined fixed phase relationship to the input voltage V and means for precisely controlling said time interval T;

(c) applying said voltage input, V, to said detector circuit and measuring the sample voltage, v, across the circuit element after said time interval T; and

(d) thereafter, computing the value of said capacitor from the value of a single sample v, from said elapsed time interval T, from said known load impedance R, and from said known wave form of the input voltage V.

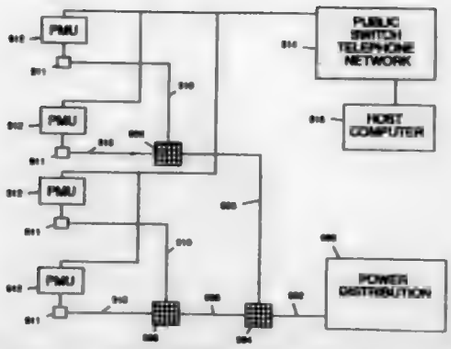
5,469,365

POWER MONITOR UNIT

Jon M. Diekema, Jenison; Joseph B. Steffler, Alto; Jerald W. Van Baren, Grand Rapids, and Vincent Sancimino, Roseville, all of Mich., assignors to Customs Ideas, Ada, and CPM, Roseville, both of Mich.

Filed Jan. 25, 1993, Ser. No. 27,326
Int. Cl.[6] G01R *21/00;11/02*
U.S. Cl. 364—483 **15 Claims**

1. A unit for use in a power service area at locations downstream from customer metering units, for monitoring power and reporting to a central location comprising:



a first input receiving an A/C power signal to be monitored;

means responsive to the A/C power signal for sensing a zero crossing of the A/C power signal;

means responsive to the zero crossing of the A/C power signal for timing a delay interval substantially equal to a 90 degree phase shift in the A/C power signal;

means responsive to the delay interval for sampling the A/C power signal at the end of the delay interval;

a static recording medium for recording samples of the A/C power signal;

processing means responsive to the recorded samples of the A/C power signal for detecting an anomaly in the A/C signal power signal in accordance with recorded configuration values;

an interface from the processing means to a communication network distinct from the A/C power signal medium;

said processing means further for reporting to a central location through the interface a unit-dependant time after detecting an anomaly or after a unit-depeadant routine interval;

said processing means further responsive to commands from the central location for reporting the recorded samples of the A/C power signal, for reporting a contemporaneous value of the A/C power signal, and for receiving and updating revised configuration values.

5,469,366

METHOD AND APPARATUS FOR DETERMINING THE PERFORMANCE OF NETS OF AN INTEGRATED CIRCUIT DESIGN ON A SEMICONDUCTOR DESIGN AUTOMATION SYSTEM

Dian Yang, Milpitas, and Hashain Karampurwala, San Jose, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Sep. 20, 1993, Ser. No. 124,094
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—489 **37 Claims**

1. A method of determining the performance of nets of an integrated circuit design comprising:

providing a semiconductor design automation system;

providing an integrated circuit design on the semiconductor design automation system, said integrated circuit design including a net-list, said net list including a plurality of nets, each net representing a plurality of interconnected first nodes;

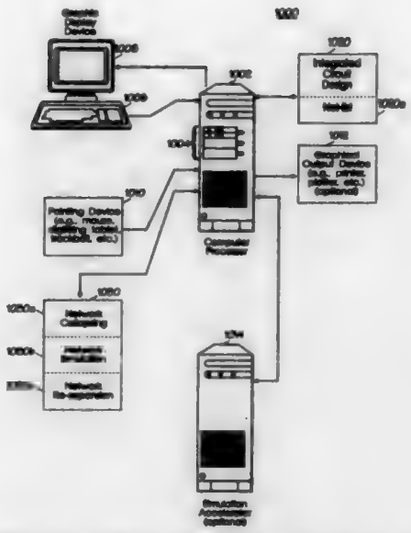
collapsing each net to a corresponding simplified equivalent circuit having a number of simplified nodes less than or equal to the plurality of first nodes represented by the net corresponding to the simplified equivalent circuit; and

simulating the simplified equivalent circuit for each of the plurality of nets, thereby determining a node voltage waveform for each simplified node of the corresponding simplified equivalent circuit;

the step of collapsing each net to a simplified equivalent circuit further comprising:

identifying superbranches of each net, each superbranch including a first subset of the plurality of first nodes, each node in the first subset being a superbranch node;

collapsing each superbranch of each net to a simplified node;



identifying generalized superbranches of each net, each superbranch including a second subset of the plurality of first nodes, each node in the second subset being a generalized superbranch node;

collapsing each generalized superbranch of each net to a simplified node;

identifying superpaths of each net, each superbranch including a third subset of the plurality of first nodes, each node in the third subset being a superpath node; and

collapsing each superpath of each net to two simplified nodes;

each superbranch node having a ground current associated therewith;

one superbranch node from each superbranch being a superbranch root node, the remaining superbranch node being superbranch child nodes; and

the step of collapsing each superbranch to a simplified node further comprising repeating, for each superbranch of each net, the steps of:

determining an effective superbranch root node ground current for the superbranch by totaling the ground currents of each superbranch node in the superbranch:

eliminating all child nodes of the superbranch; and

assigning the effective superbranch root node ground current to the superbranch root node;

until all superbranches have been operated upon.

5,469,367

METHODOLOGY AND APPARATUS FOR MODULAR PARTITIONING FOR THE MACHINE DESIGN OF ASYNCHRONOUS CIRCUITS

Ruchir Puri, and Jun Gu, both of Calgary, Canada, assignors to University Technologies International Inc., Calgary, Canada

Filed Jun. 6, 1994, Ser. No. 254,186
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—489 **19 Claims**

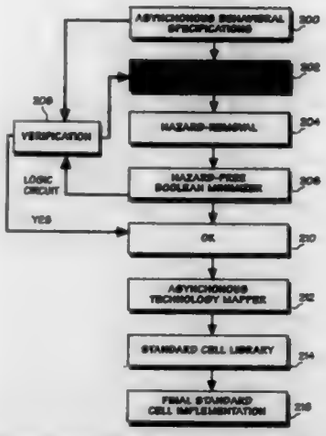
1. A computer implemented method for machine design of an asynchronous digital circuit on a semiconductor material having at least one output comprising the steps of:

defining asynchronous behavioral specifications for said asynchronous digital circuit to be designed;

generating a signal transition graph corresponding to said asynchronous behavioral specifications for said asynchronous digital circuit;

generating a complete state graph from said signal transition graph;

generating a modular state graph from said complete state graph for an output o_i;



generating state signal assignments to satisfy predetermined design constraints for said modular state graph;

propagating state signal assignments upward from said modular state graph to said complete state graph;

repeating said steps of generating said modular state graph, generating said state signal assignments, and propagating said state signals from said modular graph to said complete state graph for each output of said asynchronous digital circuit;

generating expanded state signals in said complete state graphs;

generating a design for logic circuits from said expanded complete state graph meeting each of said predetermined constraints and satisfying said asynchronous behavioral specification, and laying out said design for said logic circuits on said semiconductor material,

whereby practical asynchronous digital circuits are machine designed and laid out on said semiconductor material with minimized circuit structure and minimized circuit area implementation on said semiconductor material.

5,469,368

ARRAY OF CONFIGURABLE LOGIC BLOCKS EACH INCLUDING A FIRST LOOKUP TABLE OUTPUT COUPLED TO SELECTIVELY REPLACE AN OUTPUT OF SECOND LOOKUP WITH AN ALTERNATE FUNCTION OUTPUT

Om P. Agrawal, San Jose; Michael J. Wright, Menlo Park, and Ju Shen, San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Division of Ser. No. 271,872, Jul. 7, 1994, Pat. No. 5,422,823, which is a division of Ser. No. 12,573, Feb. 1, 1993, Pat. No. 5,329,460, which is a division of Ser. No. 394,221, Aug. 15, 1989, Pat. No. 5,212,652. This application Jun. 5, 1995, Ser. No. 462,934

Int. Cl.[6] H03K *17/693*

U.S. Cl. 364—489 **4 Claims**

1. A programmable integrated circuit comprising:

(a) a plurality of programmably configurable logic blocks for carrying out program-defined logic functions;

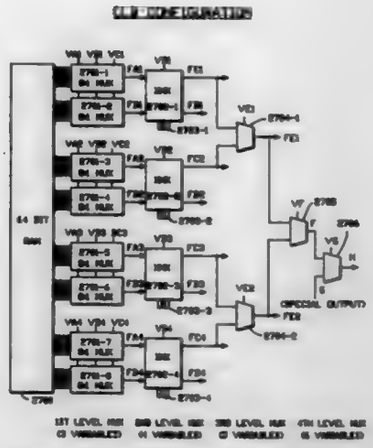
(b) a programmably configurable interconnect network for providing program-defined routing of signals between the plurality of programmably configurable logic blocks,

wherein said configurable logic blocks each includes:

(a.1) a programmable first memory area for storing a function-defining first set of lookup bits;

(a.2) a programmable second memory area for storing a function-defining second set of lookup bits;

(a.3) first select means coupled to the first memory area and responsive to a supplied first plurality of input signals for selecting and outputting a subset of the first set of lookup bits in accordance with the first plurality of input signals, wherein the combination of the first memory area and the first select means defines a first lookup table (first LUT);



(a.4) second select means coupled to the second memory area and responsive to a supplied second plurality of input signals for selecting and outputting a subset of the second set of lookup bits in accordance with the second plurality of input signals, wherein the combination of the second memory area and the second select means defines a second lookup table (second LUT);

(a.5) function substituting means, coupled to receive the output of the second LUT and responsive to a supplied substitution control signal, for selectively outputting in accordance with the substitution control signal one or another member of a group comprising the output of the second LUT and an alternate output;

(a.6) first internal connect means for coupling the output of the first LUT such that said coupled output of the first LUT defines the substitution control signal and thereby the output of the first LUT determines whether one or another member of said group comprising the output of the second LUT and the alternate output is output by the function substituting means.

5,469,369

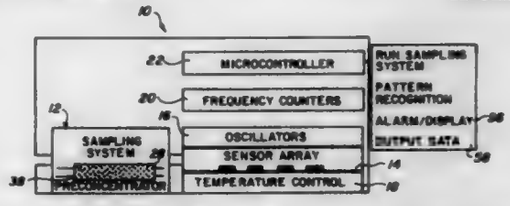
SMART SENSOR SYSTEM AND METHOD USING A SURFACE ACOUSTIC WAVE VAPOR SENSOR ARRAY AND PATTERN RECOGNITION FOR SELECTIVE TRACE ORGANIC VAPOR DETECTION

Susan L. Rose-Pehrsson, Alexandria; Daniel Di Lella, Lorton, both of Va., and Jay W. Grate, West Richland, Wash., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 2, 1992, Ser. No. 970,750

Int. Cl.[6] G01N *29/00*

U.S. Cl. 364—497 **12 Claims**



1. A method of identifying an unknown vapor as either belonging to a class or not, wherein the class comprises known vapors of interest, said method comprising the steps of:

introducing a sample of an unknown vapor into at least one sensor coated with a vapor-sensitive coating,

generating a weight vector corresponding to a N-space representation of the class;

generating a N-space representation of the unknown vapor and generating an unknown pattern vector based thereon; and

calculating the dot product of said unknown pattern vector and the weight vector to determine whether the unknown vapor is within said class, wherein the dot product producing a positive number is a member of the class in question while a negative number is not.

5,469,370

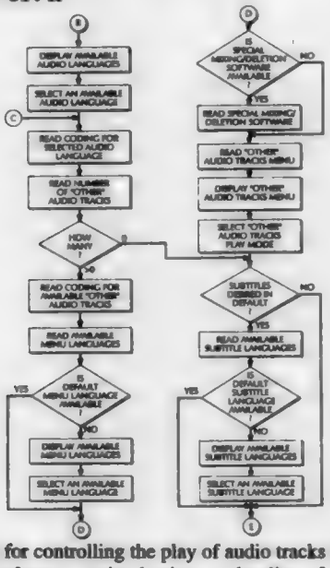
SYSTEM AND METHOD FOR CONTROLLING PLAY OF MULTIPLE AUDIO TRACKS OF A SOFTWARE CARRIER

Lewis S. Ostrover; Christopher J. Cookson, and Warren N. Lieberfarb, all of Los Angeles, Calif., assignors to Time Warner Entertainment Co., L.P., Burbank, Calif.

Filed Oct. 29, 1993, Ser. No. 145,326

Int. Cl.[6] G11B *27/028*

U.S. Cl. 364—514 R **34 Claims**



1. A system for controlling the play of audio tracks of a software carrier, said software carrier having a plurality of audio tracks synchronized with each other and each having recorded therein audio information to be selectively combined with audio information recorded in others of said tracks, and textual data defining audio contents of said tracks; comprising means for playing said software carrier and deriving therefrom said textual data and said audio information, means for displaying to a user a menu derived from said textual data to inform said user of audio information available to be combined, means for allowing said user to input a manner in which the available audio information is to be combined based upon displayed menu choices, means for phase inverting the audio information in at least one of said tracks, and means for combining selected audio information including phase inverted audio information in accordance with user inputs.

5,469,371

SURFACED DETECTION SYSTEM FOR AIRPORTS

Michael Bass, Winter Springs, Fla., assignor to University of Central Florida, Orlando, Fla.

Division of Ser. No. 811,817, Dec. 20, 1991, Pat. No. 5,375,058. This application Dec. 19, 1994, Ser. No. 358,776

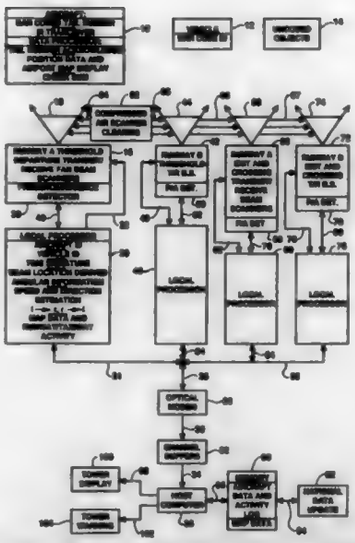
Int. Cl.[6] G06F *163/00*

U.S. Cl. 364—550 **2 Claims**

1. A system for monitoring the position and identity of an object located within a scanning region, comprising:

a machine readable code positioned upon and uniquely identifying said object;

a first optical scanner located adjacent said scanning region and having a scanning beam extent substantially encompassing



said scanning region for deriving first scan signals corresponding with said machine readable code and the azimuth of said object with respect to said first optical scanner;

a second optical scanner spaced a predetermined distance from said first optical scanner, located adjacent said scanning region and having a scanning beam extent substantially encompassing said scanning region for deriving second scan signals corresponding with said machine readable code and the azimuth of said object with respect to said second optical scanner;

readout means responsive to a data signal input for displaying information related to the position and identification of said object;

a memory retaining accessible identifying data corresponding with said code; and

control means responsive to said first and second scan signals and said predetermined distance for accessing said memory for said identifying data, for deriving the position of said object with respect to said first and second optical scanners, and for deriving said data signal input in correspondence therewith.

5,469,372

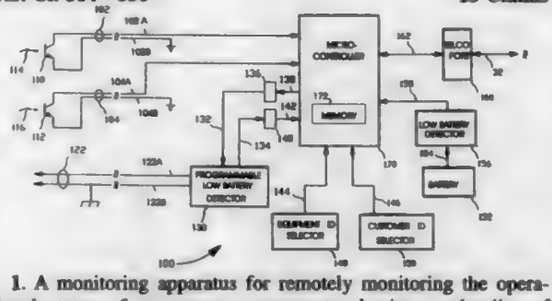
OXYGEN CONCENTRATOR REMOTE MONITORING APPARATUS

Raymond A. McBrearty, 842 Barnsdale Rd., Allentown, Pa. 18103, and William R. Haller, Bethlehem, Pa., assignors to Raymond A. McBrearty, Allentown, Pa.

Filed Aug. 29, 1994, Ser. No. 297,224

Int. Cl.[6] G01B *103/40*

U.S. Cl. 364—550 **13 Claims**



1. A monitoring apparatus for remotely monitoring the operational status of an oxygen concentrator having a plurality of diagnostic light emitting diodes wherein said light emitting diodes indicate the operational status of said oxygen concentrator comprising:

a hollow boot having an opened end for forceably fitting over said light emitting diode;

a photodetector mounted within said boot for detecting light emitted from said light emitting diode;

means responsive to said photodetector for determining the operational status of said oxygen concentrator;

a computer responsive to said determining means for receiving said operational status of said oxygen concentrator.

5,469,373

PRINTING APPARATUS AND METHOD THAT DESCRIMINATES WHICH ANALYZER SHOULD ANALYZE INFORMATION

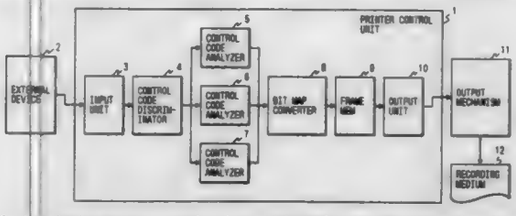
Masami Kashiwazaki, Kawasaki, and Satoshi Nagata, Tama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 11, 1993, Ser. No. 16,461

Claims priority, application Japan, Feb. 14, 1992, 4-028485; Mar. 3, 1992, 4-081545

Int. Cl.[6] G06F *15/00*

U.S. Cl. 364—550 **20 Claims**



1. A printing apparatus having a identification process for determining a kind of information input so as to identify one of a plurality of types of analyzers which should analyze the input information, said printing apparatus comprising:

control means for executing the identification process by a predetermined one of a plurality of identification standards so as to identify one of the analyzers and for executing the identification process again by a next one of the plurality of identification standards in the event that none of the analyzers has been successfully identified by the predetermined one identification standard, wherein said control means repeatedly executes the identification process by a next one of the plurality of identification standards until one of the analyzers is successfully identified; and

output means for outputting information generated by analyzing the input information with the one analyzer finally identified by said control means.

5,469,374

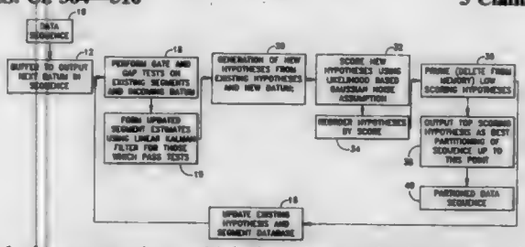
AUTOMATIC DATA SEGMENTATION MODULE FOR TARGET MOTION ANALYSIS APPLICATIONS

Marcus L. Graham, North Kingstown, R.I.; John F. MacDonald, Westport, Mass.; Kai F. Gong, Pawtucket, R.I., and Kathleen D. Keay, Fairhaven, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 23, 1993, Ser. No. 83,404

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—516 **5 Claims**



1. A target motion multiple hypotheses selection process for operating on a received data sequence for providing automatic data segmentation including forming new hypotheses and the selecting and outputting of the new hypothesis formed with the most likelihood of successful segmentation for target motion analysis application comprising the steps of:

retaining a set of existing hypotheses in a data base;

combining each such existing hypothesis with new hypotheses on the basis of an assumption that incoming datum to form a new datum is invalid;

combining each such existing hypothesis with incoming datum to form new hypotheses on the basis of an assumption that the new datum is associated with previous segments and updating these segments to include the new datum;

combining each such existing hypothesis with incoming datum to form a new hypotheses on the basis of an assumption that the new datum begins a new segment;

selecting and outputting the one new hypothesis formed with the most likelihood of successful segmentation; and

returning each new hypothesis formed to said data base for further processing with incoming datum.

5,469,375

DEVICE FOR IDENTIFYING THE TYPE OF PARTICLE DETECTED BY A PARTICLE DETECTING DEVICE

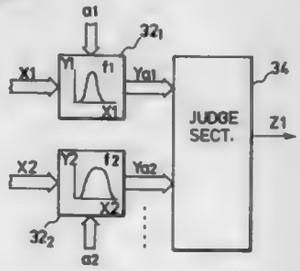
Tokihiro Kosaka, Kakogawa, Japan, assignor to Toa Medical Electronics Co., Ltd., Kobe, Japan

Filed Feb. 1, 1993, Ser. No. 11,812

Claims priority, application Japan, Jan. 30, 1992, 4-042319

Int. Cl.[6] G06F *15/46;15/52*

U.S. Cl. 364—555 **6 Claims**



1. A particle judging device comprising:

means for detecting each particle from a specimen in which plural kinds of particles exist intermixedly and producing at least two detection signals each representing the value of one of at least two characteristic parameters of said particle;

means for storing mean values and distribution widths for each of said characteristic parameters representative of various specific kinds of particle;

means for calculating respective deviations of each of said detection signals from a corresponding one of said mean values;

means for normalizing each respective deviation based upon a corresponding one of said distribution widths to obtain respective normalized deviations;

means for storing respective predetermined probability distribution functions;

means for determining respective probabilities for each of said respective normalized deviations based upon a corresponding one of said probability distribution functions;

means for weighting each of said respective probabilities of said normalized deviations in accordance with a predetermined rule to produce weighted probabilities; and

judging means for judging whether said particle belongs to any one of said specific kinds or not, on the basis of said weighted probabilities.

5,469,376

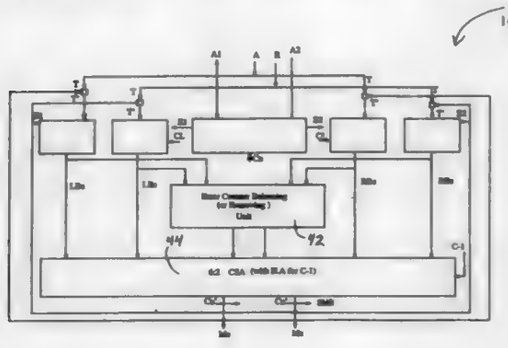
DIGITAL CIRCUIT FOR THE EVALUATION OF MATHEMATICAL EXPRESSIONS

Mohammad A. F. F. Abdallah, P.O. Box 16356, LSU, Baton Rouge, La. 70893

Filed Oct. 14, 1993, Ser. No. 136,298

Int. Cl.[6] G06F 7/38;7/02; G05B 1/00

U.S. Cl. 364—735 8 Claims



7. A digital circuit for determining the result of mathematical operations when supplied with three binary values having a fixed number of binary bits which correspond to: (i) an initial left boundary limit of a first interval, (ii) an initial right boundary limit of a first interval, and (iii) a given working value, said digital circuit comprising:

a first register having a plurality of bit storage locations and a corresponding number of data input and output lines, said data input lines being controlled by a control signal;

a second register having a plurality of bit storage locations and a corresponding number of data input and output lines, said data input lines being controlled by a control signal;

a third register having a plurality of memory locations and a corresponding number of data input and output lines, said data input lines being controlled by a control signal;

a fourth register having a plurality of memory locations and a corresponding number of data input and output lines, said data input lines being controlled by a control signal;

a shift left register having a plurality of memory locations, an input, a shift-output port operably connected to said data input lines of said first, second, third, and fourth registers, and a shift input, wherein the value stored in said shift register is shifted to the left and the most significant bit is shifted out the shift-output port each time said shift input is activated;

a 4:2 carry save adder wherein said outputs from said first, second, third and fourth registers are connected to the four inputs of said 4:2 carry save adder, the carry output of said 4:2 carry save adder is connected to said data input lines of said first and third registers, and the sum output of said 4:2 carry save adder is connected to said data input lines of said second and fourth registers, said carry output and said sum output being further operably connected to said input and said shift input of said shift register; and

means for controlling the initialization of said shift register and said first, second, third and fourth registers in a manner such that said first and third registers are set to zero, said second register is loaded with the initial left boundary limit, said fourth register is loaded with the initial right boundary limit, and said shift register is loaded with the given working value.

5,469,377

FLOATING POINT COMPUTING DEVICE FOR SIMPLIFYING PROCEDURES ACCOMPANYING ADDITION OR SUBTRACTION BY DETECTING WHETHER ALL OF THE BITS OF THE DIGITS OF THE MANTISSA ARE 0 OR 1

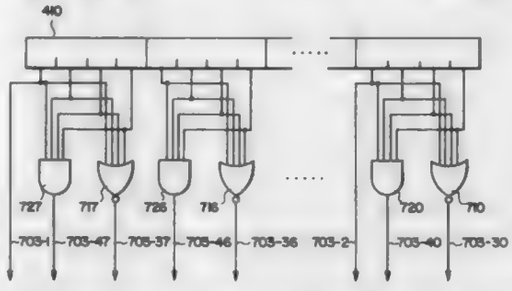
Yoshinobu Amano, Ibaragi, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 18, 1993, Ser. No. 107,568

Claims priority, application Japan, Aug. 18, 1992, 4-218857

Int. Cl.[6] G06F 7/38;7/00

U.S. Cl. 364—748 19 Claims



1. A floating point computing device which determines a resultant floating point number of an arithmetic operation, said floating point computing device comprising:

a mantissa register for storing at least a mantissa of a floating point number, wherein said mantissa register is capable of storing a plurality of digits and wherein said plurality of digits forms a mantissa numeral;

first detecting means for detecting whether all bits of at least one of said plurality of digits of said mantissa numeral are 0 or not;

second detecting means for detecting whether all bits of at least one of said plurality of digits of said mantissa numeral are 1 or not;

positive detecting means for detecting whether said mantissa numeral stored in said mantissa register is positive or not; and

rounding data generating means for generating a rounding constant according to a detection output, wherein said detection output is based on at least one of said first detecting means, said second detecting means, and said positive detecting means.

5,469,378

CONTENT ADDRESSABLE MEMORY HAVING MATCH LINE TRANSISTORS CONNECTED IN SERIES AND COUPLED TO CURRENT SENSING CIRCUIT

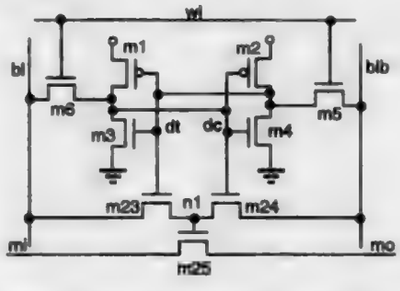
Richard Albon, and Neil Hastie, both of Devon, United Kingdom, assignors to Plessey Semiconductors Limited, United Kingdom

Filed Apr. 22, 1994, Ser. No. 231,252

Claims priority, application United Kingdom, Apr. 28, 1993, 9308778

Int. Cl.[6] G11C 15/04

U.S. Cl. 365—49 4 Claims



1. A contents addressable memory comprising a plurality of memory cells arranged in rows and columns, respective first and

second bit lines associated with each column of said plurality of memory cells, means for applying address bit values to said respective bit lines, each memory cell comprising:

electric circuit means for storing a binary value as a potential difference between first and second nodes of said electric circuit means;

first, second and third transistors each having an input/output path and a control electrode for controlling current flow in said input/output path;

means connecting the control electrodes of said first and second transistors to said first and second nodes respectively; and

means connecting the control electrode of said third transistor to said first and second bit lines by way of the input/output paths of said first and second transistors respectively, means connecting the input/output paths of the respective third transistors of the memory cells of a row in series to form a matchline path for said row, and current sensing means responsive to current flow in a said matchline path associated with any of said rows of memory cells to detect a match between the address bit values applied to said bit lines and the binary values stored in the respective electric circuit means of the memory cells of said row.

5,469,379

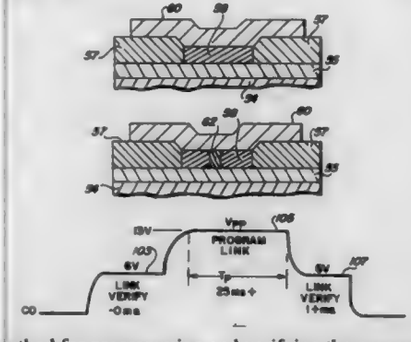
MULTI-LEVEL VROM PROGRAMMING METHOD AND CIRCUIT

Paul S. Levy, Chandler, Ariz., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jun. 30, 1994, Ser. No. 269,804

Int. Cl.[6] G11C *17/00*

U.S. Cl. 365—96 **10 Claims**



1. A method for programming and verifying the programming of vROM memories fabricated with fusible links between two metal layers wherein a programming voltage greater than a normal operating voltage is used to selectively fuse links between said two metal layers, said method including the steps of:

selecting a fusible link in said memory to be programmed;

checking first current flow at said operating voltage through said selected fusible link to determine whether said selected fusible link is already programmed;

applying a programming voltage higher than a normal operating voltage across said selected fusible link for a predetermined time to fuse an electrically conductive link between said two metal layers at said selected fusible link;

reducing said programming voltage to said operating voltage; and

checking second current flow through said selected fusible link to verify said two metal layers are electrically interconnected at said selected fusible link.

5,469,380

SEMICONDUCTOR MEMORY

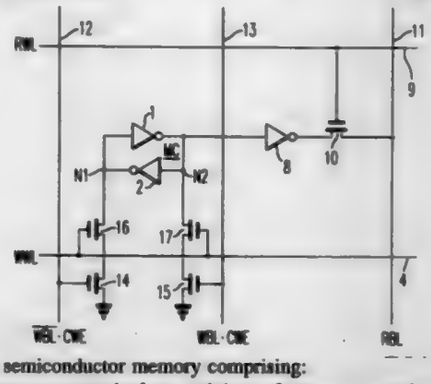
Masuya Ito, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1994, Ser. No. 179,666

Claims priority, application Japan, Jan. 18, 1993, 5-005532

Int. Cl.[6] G11C *11/00*

U.S. Cl. 365—154 **10 Claims**



1. A semiconductor memory comprising:

a first power supply for supplying a first power supply voltage;

a second power supply for supplying a second power supply voltage lower than said first power supply voltage;

a plurality of memory cells arranged in a matrix, each including first and second inverters in which high and low logic levels are specified respectively by said first and second power supply voltages, said first and second inverters being cross connected at their input and output, an input of said first inverter being a first node and an input of said second inverter being a second node;

a plurality of first switching means of a predetermined conductivity type provided in corresponding relation to said plurality of memory cells and each formed between a write power supply which is one of said first and second power supplies and said first node, each of said plurality of first switching means including first and second transistors of said predetermined conductivity type connected in series between said write power supply and said first node, and each of said first switching means being capable of transmitting a write voltage of said write power supply when it is on;

a plurality of second switching means of said predetermined conductivity type provided in corresponding relation to said plurality of memory cells and each formed between said write power supply and said second node, each of said plurality of second switching means including third and fourth transistors of said predetermined conductivity type connected in series between said write power supply and said second node;

a plurality of row write lines corresponding to rows of said plurality of memory cells, said row write lines being connected to control electrodes of said first and third transistors in corresponding rows;

a plurality of first column write lines corresponding to said first nodes of said plurality of memory cells, said first column write lines being connected to control electrodes of said second transistors in corresponding columns;

a plurality of second column write lines corresponding to said second nodes of said plurality of memory cells, said column write lines being connected to control electrodes of said fourth transistors in corresponding columns; and

write control means for selecting one of said plurality of memory cells as a selected memory cell on the basis of an external address signal and selecting respective ones of said first and second switching means which are in corresponding relation to said selected memory cell as selected first and second switching means, to turn on one of said selected first and second switching means and turn off the other selected switching means on the basis of external write data during a write operation, said write control means including:

row selecting means for selecting a row of said plurality of memory cells to be accessed on the basis of said address

signal and setting a row write line corresponding to said row to be accessed to a first voltage at which said first and third transistors turn on;

column selecting means for selecting a column of said plurality of memory cells to be accessed on the basis of said address signal and selecting first and second column write lines corresponding to said column to be accessed as said selected first and second column write lines; and

writing means for setting one of said selected first and second column write lines to a second voltage and setting the other selected column write line to a third voltage on the basis of said write data during a write operation, to turn on one of said second and fourth transistors which is connected to one selected column write line and to turn off the other transistor which is connected to the other selected column write line.

5,469,381

SEMICONDUCTOR MEMORY HAVING NON-VOLATILE SEMICONDUCTOR MEMORY CELL

Hirokazu Yamazaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

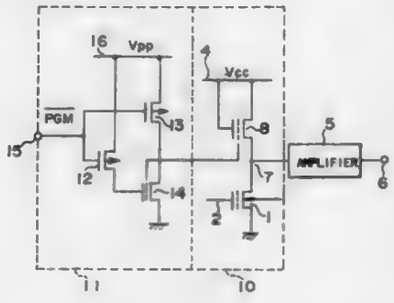
PCT No. PCT/JP92/00323, § 371 Date Nov. 16, 1992, § 102(e) Date Nov. 16, 1992, PCT Pub. No. WO92/16946, PCT Pub. Date Jan. 10, 1992

PCT Filed Mar. 18, 1992, Ser. No. 949,236

Claims priority, application Japan, Mar. 19, 1991, 3-055042

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.01 **15 Claims**



1. A semiconductor memory comprising:

a non-volatile semiconductor memory cell having a first charge storage gate and storing a memory content; and

a write-enabled load transistor having a second charge storage gate and a control gate maintained at a constant voltage, said load transistor connected to said semiconductor memory cell and reading out the memory content of said semiconductor memory cell.

5,469,382

DEVICE FOR DETECTING THE CONTENTS OF CELLS WITHIN A MEMORY, ESPECIALLY AN EPROM MEMORY, METHOD IMPLEMENTED WITH THIS DEVICE, AND MEMORY PROVIDED WITH THIS DEVICE

Emilio Yero, Aix En Provence, France, assignor to SGS-Thomson Microelectronics S.A., Gentilly, France

PCT No. PCT/FR92/00952, § 371 Date Jun. 11, 1993, § 102(e) Date Jun. 11, 1993, PCT Pub. No. WO93/07622, PCT Pub. Date Apr. 15, 1993

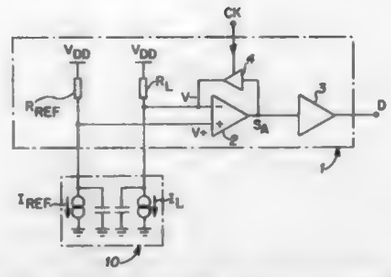
PCT Filed Oct. 9, 1992, Ser. No. 75,524

Claims priority, application France, Jan. 11, 1991, 91 12540

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—185.20 **13 Claims**

1. A device for detecting the content of cells of a memory, especially an EPROM memory, the cells being organized as a set



of bit lines, comprising comparison means for comparing a reference current associated with a reference column and a read current invoked in a cell of a bit line, said comparison means including a resistive reference element and a resistive read element through which said reference and read currents respectively travel, and which are connected at a first end to a supply voltage source and at a second end to a non-inverting input and an inverting input respectively of a differential amplifier, the differential amplifier delivering as output a detection signal, the device further comprising connecting means for selectively connecting the output of the differential amplifier to its inverting input for a predetermined preloading period.

5,469,383

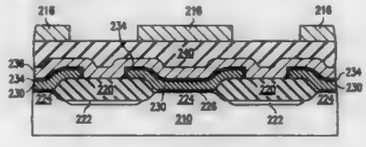
MEMORY CELL ARRAY HAVING CONTINUOUS-STRIP FIELD-OXIDE REGIONS

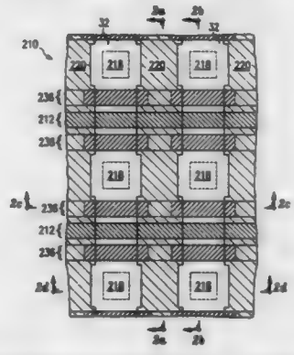
Dave J. McElroy, Allen; Manzur Gill, Arcola, and Pradeep L. Shah, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 954,368, Sep. 30, 1992, Pat. No. 5,350,706. This application Jun. 24, 1994, Ser. No. 265,349

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.01 **12 Claims**





5. A CMOS memory array having rows and columns of memory cells, made by a buried source line process, comprising:

a silicon substrate;

a thick field oxide region separating each column of memory cells, made by growing said thick field oxide regions in continuous strips;

a channel stop region implanted under each of said field oxide regions;

a source line along each row of memory cells, perpendicular to said field oxide regions, said source lines being made by fabricating a source line mask and by implanting a silicon dopant along areas not covered by said source line mask; and

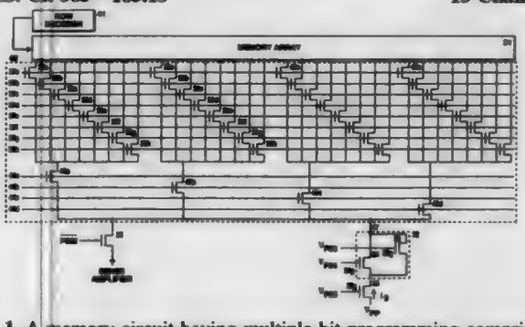
a number of memory cell transistors fabricated in said active areas, each memory cell having a gate, a drain, and a source, said sources being connected across rows of said transistors by said source lines.

5,469,384

DECODING SCHEME FOR RELIABLE MULTI BIT HOT ELECTRON PROGRAMMING

Timothy M. Lacey, Cupertino, Calif., assignor to Cypress Semiconductor Corp., San Jose, Calif.

Filed Sep. 27, 1994, Ser. No. 312,815
Int. Cl.[6] G11C *11/34;16/04*
U.S. Cl. 365—185.13 **15 Claims**



1. A memory circuit having multiple bit programming comprising:

(a) a memory array that includes a plurality of memory cells, a plurality of bit lines and a plurality of word lines wherein each memory cell is coupled to a bit line and a word line;

(b) a row decoder coupled to said memory array, said row decoder selects at least one of said plurality of word lines during a programming operation or a reading operation of said nonvolatile memory circuit;

(c) a column decoder coupled to said memory array that includes a programming column decoder and a read column decoder wherein said programming column decoder selects at least one of said bit lines during said programming operation of said nonvolatile memory circuit and said read column decoder selects at least one of said bit lines during said reading operation of said nonvolatile memory circuit;

(d) a load line circuit coupled to said column decoder, said load line circuit provides a resistance in a programming path from a programming input of said memory circuit to each of said memory cells during said programming operation;

(e) a sense amplifier coupled to said column decoder, said sense amplifier detects a change in voltage in one of said bit lines during said reading operation.

5,469,385

OUTPUT BUFFER WITH BOOST FROM VOLTAGE SUPPLIES

Scott E. Smith, Sugar Land; Duy-Loan T. Le, Missouri City, both of Tex.; Michael C. Stephens, Jr., Beaverton, Oreg., and Masayoshi Nomura, Ibaraki, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

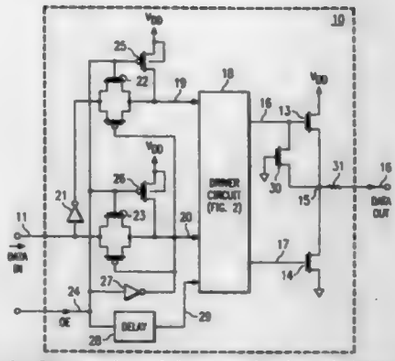
Filed May 11, 1993, Ser. No. 60,323
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—189.05 **8 Claims**

4. A memory device comprising:

A. an array of memory cells with each cell retaining one or another logic level representing a bit of data;

B. a first supply providing a first voltage relative to a reference and having a current capacity to supply the entire device, the first voltage being substantially equal to the one logic level to be output from the memory device;

C. a second supply providing a second voltage relative to the reference, the second supply having a current capacity less



than the first supply and the second voltage being at least one N-channel transistor threshold level greater than the first voltage; and

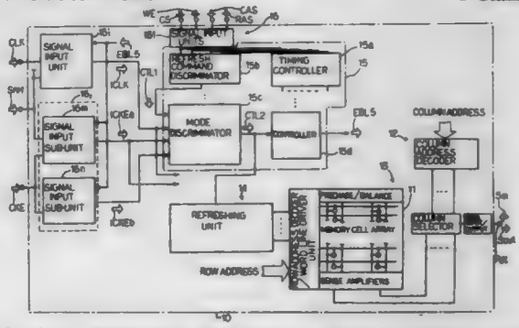
D. an output buffer coupled to the array of memory cells and having an N-channel MOS, output transistor connected between the first supply and an output terminal for producing a first voltage level on the output terminal to output a selected data bit of the one logic level, the output buffer including first switching circuits connecting the first supply to the gate of the N-channel transistor for a certain period and then connecting the second supply to the gate of the N-channel transistor.

5,469,386

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING LOW-POWER CONSUMPTION SIGNAL INPUT CIRCUIT RESPONSIVE TO HIGH-SPEED SMALL-AMPLITUDE INPUT SIGNAL

Takashi Obara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 25, 1994, Ser. No. 296,164
Claims priority, application Japan, Aug. 26, 1993, 5-211323
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—189.07 **6 Claims**



1. A semiconductor synchronous dynamic random access memory device:

a) a memory cell array implemented by a plurality of memory cells;

b) peripheral circuits operative to carry out a write-in sequence, a read-out sequence and a refreshing sequence;

c) a plurality of signal input units operative to respectively receive external signals for producing internal signals, and supplying said internal signals to said peripheral circuits and said memory cell array for said write-in sequence, said read-out sequence and said refreshing sequence,

at least one of said plurality of signal input units assigned to one of said external signals, having a first signal input circuit and a second signal input circuit selectively enabled with an enable signal,

said first signal input circuit having a current mirror stage responsive to said one of said external signals for producing one of said internal signals therefrom and a first activation stage responsive to said enable signal for making said current mirror stage responsive,

said second signal input circuit having a complementary logic stage responsive to said one of said external signals for producing another one of said internal signals therefrom and a second activation stage responsive to said enable signal for making said complementary logic stage responsive; and

d) a controlling unit operative to monitor some of said external signals for discriminating a predetermined condition where said semiconductor synchronous dynamic random access memory device decreases a power consumption, and changing said enable signal for activating said second signal input circuit instead of said first signal input circuit in said predetermined condition.

5,469,387

CIRCUIT FOR CLAMPING ENABLE CLOCK IN A SEMICONDUCTOR MEMORY DEVICE

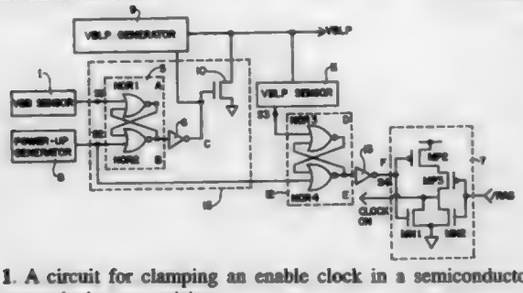
Tae-hoon Kim, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongju, Rep. of Korea

Filed Sep. 23, 1993, Ser. No. 125,953

Claims priority, application Rep. of Korea, Sep. 24, 1992, 92-18223

Int. Cl.[6] H03K 5/08; G11C 7/00

U.S. Cl. 365—189.09 **18 Claims**



1. A circuit for clamping an enable clock in a semiconductor memory device, comprising:

a) means for producing a back bias voltage set-up signal when a back bias voltage has reached a back bias reference voltage level;

b) means for producing a power-up signal when power from a power supply is setup;

c) means for generating a bit line pre-charge voltage;

d) controller means for holding the bit line pre-charge voltage to a ground voltage level according to the back bias set-up signal and the power-up signal;

e) means for generating a bit line pre-charge voltage set-up signal when the bit line pre-charge voltage has reached a bit line pre-charge reference voltage level;

f) enable clock pass signal generator means for producing an enable clock pass signal according to the bit-line set-up signal and the power-up signal; and

g) means for transferring the enable clock according to the enable clock pass signal.

5,469,388

ROW REDUNDANCY CIRCUIT SUITABLE FOR HIGH DENSITY SEMICONDUCTOR MEMORY DEVICES

Chan-Jong Park, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 23, 1993, Ser. No. 155,747

Claims priority, application Rep. of Korea, Nov. 23, 1992, 22113/1992

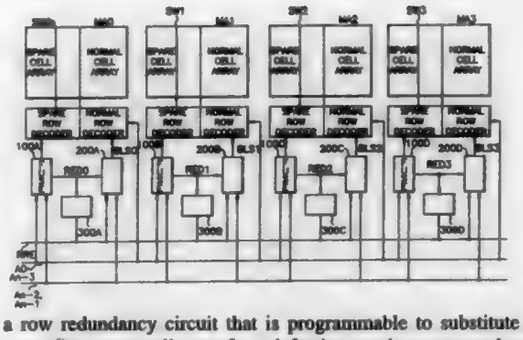
Int. Cl.[6] G11C 29/00;7/00

U.S. Cl. 365—200 **10 Claims**

1. A semiconductor memory device comprising:

a plurality of memory cell arrays, each memory cell array including a normal cell array and a spare cell array;

a plurality of decoders for addressing memory cell arrays; and



a row redundancy circuit that is programmable to substitute a row in a spare cell array for a defective row in any normal cell array responsive to a single redundancy enable signal supplied to each of said plurality of memory cell arrays through a single bus line.

5,469,389

SEMICONDUCTOR MEMORY WITH MEMORY MATRIX COMPRISING REDUNDANCY CELL COLUMNS ASSOCIATED WITH SINGLE MATRIX SECTORS

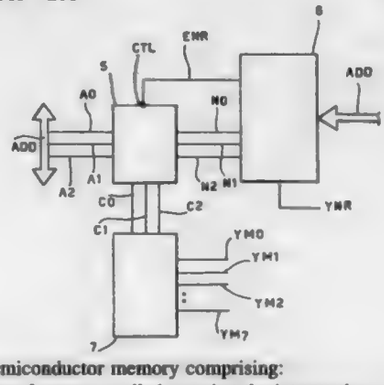
Marco Olivo, Bergamo, and Luigi Pascucci, Sesto S. Giovanni, both of, Italy, assignors to SGS-Thomson Microelectronics s.r.l., Milan, Italy

Filed Mar. 29, 1994, Ser. No. 219,204

Claims priority, application European Pat. Off., Mar. 31, 1993, 93830128

Int. Cl.[6] G11C 29/00

U.S. Cl. 365—200 **15 Claims**



1. A semiconductor memory comprising:

a matrix of memory cells located at the intersection of rows and columns of the matrix, the columns of memory cells being grouped together in packets and said packets being grouped together in sectors, the sectors together forming said matrix;

a first-level selection means for the selection of a particular column inside each packet in response to first-level selection signals;

second-level selection means for the selection of a particular packet inside each sector in response to second-level selection signals;

redundancy columns of redundancy memory cells suitable for replacing defective columns containing at least one defective memory cell, each of said redundancy columns being included in a respective packet of the matrix;

selection means for the selection of one of said redundancy columns as an alternative to the memory cell columns of the packets to which the redundancy columns belong;

a decoding circuit supplied with packet address signals for generating said second-level selection signals to drive said second-level selection means; and

control circuits to execute the replacement of a defective column with a redundancy column, said control circuits including

a recognition circuit for storing the addresses of each defective column and of a respective substitutive redundancy column,

for comparing address signals externally supplied to the memory with the addresses of the defective columns; and

switching means controlled by the recognition circuit to supply said decoding circuit with the packet address signals represented either by a sub-set of the externally supplied address signals or by signals supplied by the recognition circuit representing a sub-set of the address of one redundancy column respectively when the recognition circuit recognizes that the externally supplied address signals do not correspond or do correspond to a defective column, respectively.

5,469,390

SEMICONDUCTOR MEMORY SYSTEM WITH THE FUNCTION OF THE REPLACEMENT TO THE OTHER CHIPS

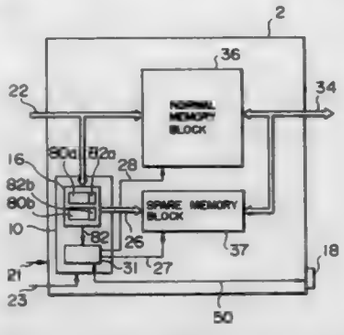
Toshio Sasaki, Tokyo, and Toshihiro Tanaka, Akigawa, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1994, Ser. No. 301,284

Claims priority, application Japan, Sep. 16, 1993, 5-229865

Int. Cl.[6] G11C *7/00;29/00*

U.S. Cl. 365—200 **30 Claims**



1. A semiconductor memory system comprising:

a normal memory block including a normal memory storing information and a normal decoder selecting a memory cell in said normal memory;

a spare memory block including a spare memory being used for replacement of said normal memory and a spare decoder selecting a memory cell in said spare memory; and

a program/comparison part having a part for storing a defect address of said semiconductor memory system and a part for storing a defect address of another semiconductor memory system;

wherein said program/comparison part compares at least one of the stored defect address of said semiconductor memory system and the stored defect address of said another semiconductor memory system with an address applied to said semiconductor memory system, and activating said spare decoder when said applied address coincides with said defect address of said another semiconductor memory system.

5,469,391

SEMICONDUCTOR MEMORY DEVICE INCLUDING REDUNDANCY CIRCUIT FOR REMEDYING DEFECT IN MEMORY PORTION

Yoshiyuki Haraguchi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1994, Ser. No. 305,523

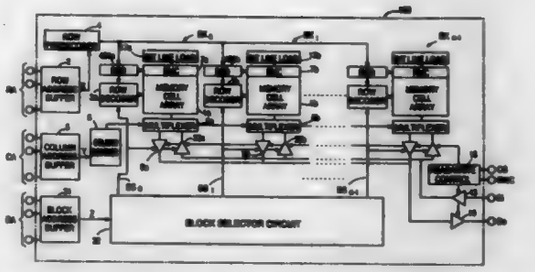
Claims priority, application Japan, Jan. 7, 1993, 5-251661

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—200 **11 Claims**

1. A semiconductor memory device including a redundancy circuit for replacing a defective memory cell with a redundancy memory cell, wherein

said redundancy circuit includes



a program circuit for carrying out a programming to replace said defective memory cell with said redundancy memory cell,

said program circuit includes

a first fuse for selecting between usage and nonusage of said redundancy memory cell,

a second fuse for selecting a designation signal designating said defective memory cell,

a transmission gate provided in series with said second fuse, and

a potential fixing circuit responsive to connection or disconnection of said first fuse for turning on or off said transmission gate.

5,469,392

SEMICONDUCTOR MEMORY

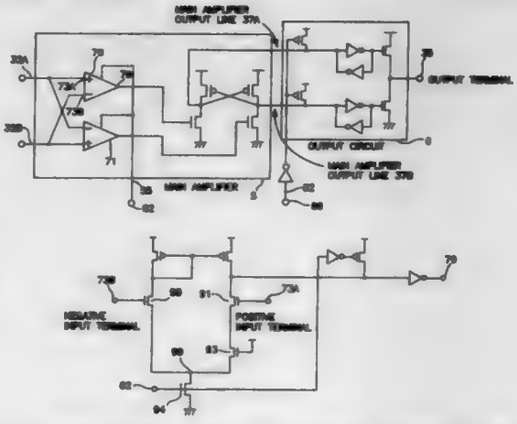
Makoto Ihara, Sakurai, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 116,906, Sep. 3, 1993, abandoned. This application Dec. 23, 1994, Ser. No. 363,978

Claims priority, application Japan, Sep. 8, 1992, 4-239813

Int. Cl.[6] G11C *7/06*

U.S. Cl. 365—205 **5 Claims**



1. A semiconductor memory comprising a memory cell for storing data;

a bit-line pair connected to said memory cell, whereby said bit-line pair is charged to an electric potential corresponding to the data stored in said memory cell;

a data-line pair to be electrically connected to said bit-line pair; and

a main amplifier having a pair of inputs respectively connected to said data-line pair for amplifying an electric potential difference of said data-line pair and outputting signals corresponding to said stored data to output lines,

said main amplifier including input offset means for causing the signals on said output lines of said main amplifier to remain at inactive levels until said electric potential difference exceeds a predetermined input offset voltage,

wherein said main amplifier identifies data as "L" or "H" after a period of time defined by a first time at which said main amplifier receives an activated signal for determining the timing of activating said main amplifier and a second time at

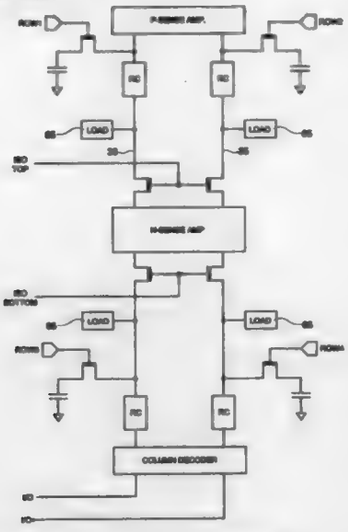
which the electric potential difference of said data-line pair exceeds the predetermined input offset voltage.

5,469,393

CIRCUIT AND METHOD FOR DECREASING THE CELL MARGIN DURING A TEST MODE

Mark R. Thomann, Boise, Id., assignor to Micron Semiconductor, Inc., Boise, Id.

Filed Sep. 15, 1993, Ser. No. 122,732
Int. Cl.[6] G11C *29/00;7/00*
U.S. Cl. 365—201 **22 Claims**



1. A monolithic memory device, comprising:

a) a storage cell for storing electrical data having an electrical potential;

b) a digit line, having first and second opposed sections, said digit line in electrical communication with said storage cell, said digit line accepting said data;

c) a first test load in electrical communication with said first section; and

d) a second test load in electrical communication with said second section, both of said first and said second test loads coupled to said digit line only during said test mode during accessing of said storage cell to increase a total load on said digit line without interrupting a current flow in said digit line during said test mode, said first and said second test loads thereby decreasing a difference in potential between said storage cell and said digit line during said test mode from a difference in potential between said storage cell and said digit line during a normal operation mode.

5,469,394

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE HAVING A STATUS REGISTER AND TEST METHOD FOR THE SAME

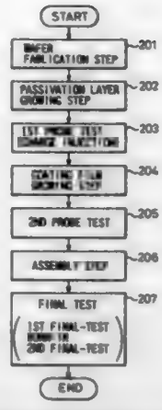
Sinsuke Kumakura; Hirokazu Yamazaki; Hisayoshi Watanabe, and Yasushi Kasa, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 192,821, Feb. 7, 1994, Pat. No. 5,402,380. This application Dec. 29, 1994, Ser. No. 365,847
Claims priority, application Japan, Mar. 17, 1993, 5-057135
Int. Cl.[6] G11C *7/00;* G01R *31/26;* H01L *21/66*
U.S. Cl. 365—201 **6 Claims**

1. A test method for a writable nonvolatile semiconductor memory, comprising:

a writing step for writing data;

an aging step where said nonvolatile semiconductor memory is placed under prescribed aging conditions; and



a verification step where data is read out and compared with the data written in said writing step for verification,

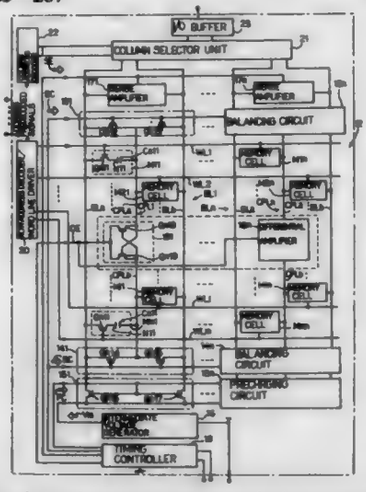
said aging step incorporates a step of forming a coating film for alleviating the stress applied to said nonvolatile semiconductor memory during assembly.

5,469,395

DYNAMIC RANDOM ACCESS MEMORY DEVICE EQUIPPED WITH DIFERENTIAL AMPLIFIER FOR CELL PLATE LINE

Shinichi Kuwabara, and Toshio Komuro, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 7, 1993, Ser. No. 162,284
Claims priority, application Japan, Dec. 7, 1992, 4-326370
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—207 **10 Claims**



1. A dynamic random access memory device comprising:

a) a plurality of addressable memory cells each implemented by a series combination of a first switching transistor and a storage capacitor for storing a data bit in the form of electric charge;

b) a plurality of bit line pairs each having first and second bit lines, input-and-out nodes of the first switching transistors of said plurality of addressable memory cells being selectively connected with said first and second bit lines of said plurality of bit line pairs;

c) an addressing means selectively connected with control nodes of said plurality of addressable memory cells, and operative to selectively connect said first or second bit lines of said plurality of bit line pairs through said input-and-output nodes to accumulating electrodes of the storage capacitors of addressed memory cells selected from said plurality of memory cells for producing first potential differences on said plurality of bit line pairs at a first timing;

d) a plurality of cell plate lines respectively associated with said plurality of bit line pairs, and each split into first and second sections, the first and second sections of said plurality of cell plate lines being selectively connected with counter electrodes of the storage capacitors of said plurality of addressable memory cells, second potential differences being produced between said first sections and said second sections of said plurality of cell plate lines at said first timing;

e) a precharging and balancing means operative to supply current from a current source to said plurality of bit line pairs and said plurality of cell plate lines for balancing said plurality of bit line pairs and said plurality of cell plate lines at a precharge level, said precharging and balancing means isolating said plurality of bit line pairs and said plurality of cell plate lines from said current source and from one another at a second timing before said first timing;

f) a plurality of sense amplifier circuits respectively connected with said plurality of bit line pairs for increasing said first potential differences on said plurality of bit line pairs at a third timing after said second timing; and

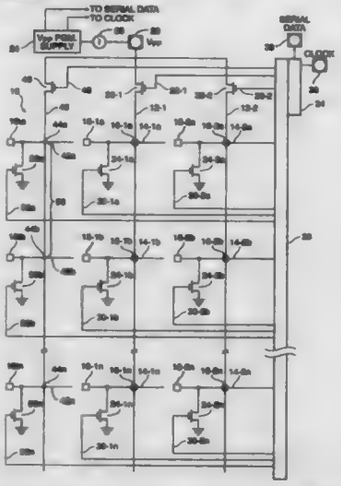
g) a plurality of amplifying means respectively associated with said plurality of cell plate lines, and each having two amplifying nodes respectively connected with said first and second sections of the associated cell plate line for increasing the second potential difference at a fourth timing after said third timing, said addressing means isolating said accumulating electrodes from said first or second bit lines of said plurality of bit line pairs at a fifth timing after said fourth timing, said precharging and balancing means changing the voltage level on said plurality of cell plate lines for boosting the voltage levels at said accumulating electrodes of the storage capacitors of said addressed memory cells at a sixth timing after said fifth timing.

5,469,396

APPARATUS AND METHOD DETERMINING THE RESISTANCE OF ANTIFUSES IN AN ARRAY

Abdelshafy A. Eltoukhy, San Jose, Calif., assignor to Actel Corporation, Sunnyvale, Calif.

Filed Jun. 7, 1994, Ser. No. 255,160
Int. Cl.[6] G11C *17/16*
U.S. Cl. 365—210 **1 Claim**



1. In an integrated circuit containing circuit structures including functional circuitry, interconnect conductors, antifuses for selectively connecting inputs and outputs of the functional circuitry to one another through the interconnect conductors, programming transistors for selectively placing a programming voltage potential across the antifuses through programming circuit paths, each of said programming circuit paths comprising at least one of said programming transistors, at least one of said interconnect conductors, a selected one of said antifuses, and at least one I/O pin of said integrated circuit, and addressing circuitry for turning on selected ones of the programming transistors to define said programming circuit paths, a method for determining the resistance of programmed ones of said antifuses comprising the steps of:

programming a selected antifuse by turning on said at least one of said programming transistors to create a programming circuit path having a programming circuit path resistance and by applying said programming voltage across said programming circuit path from said at least one I/O pin of said integrated circuit;

measuring a programming circuit current drawn by said programming circuit path while said programming voltage is being applied and calculating said programming circuit path resistance of said programming circuit path;

providing a reference circuit structure on said integrated circuit, said reference circuit structure containing reference circuit elements substantially identical to all circuit elements in said programming circuit path except that a metal via plug is used in place of said selected antifuse;

creating a reference circuit path through said reference circuit structure having a reference circuit path resistance and applying said programming voltage across said reference circuit path from said at least one I/O pin of said integrated circuit,

measuring a reference circuit current drawn by said reference circuit structure while said programming voltage is being applied and calculating said reference circuit path resistance of said reference circuit structure; and

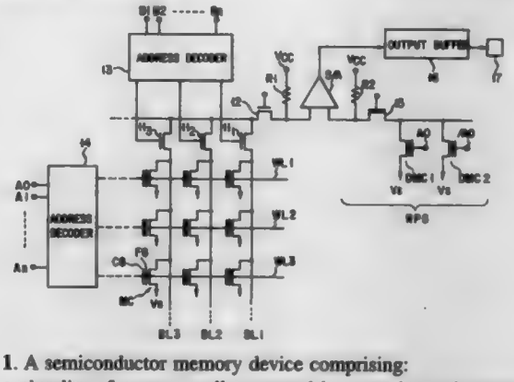
subtracting said programming circuit path resistance from said reference circuit path resistance.

5,469,397

SEMICONDUCTOR MEMORY DEVICE WITH A REFERENCE POTENTIAL GENERATOR

Chiaki Hoshino, Yokohama, and Norihisa Arai, Oomiya, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 8, 1994, Ser. No. 257,013
Claims priority, application Japan, Dec. 21, 1993, 5-322430
Int. Cl.[6] G11C *7/02*
U.S. Cl. 365—210 **8 Claims**



1. A semiconductor memory device comprising:

a plurality of memory cells arranged in a matrix, each memory cell containing a source region, a drain region, and a gate, and the characteristics of the memory cells in odd-numbered rows differing from those of the memory cells in even-numbered rows;

a plurality of word lines for connecting the gates of the memory cells fin the odd-numbered rows among said memory cells;

a plurality of word lines for connecting the gates of the memory cells in the even-numbered rows among said memory cells;

a plurality of bit lines to each of which one end of a current path of each of said memory cells is connected;

selecting means for selecting one bit line from these bit lines;

a first dummy cell whose characteristics are the same as those of said memory cells in the odd-numbered rows and which is selected together with said memory cells in an odd-numbered row and generates a first reference potential;

a second dummy cell whose characteristics are the same as those of said memory cells in the even-numbered rows and which is selected together with said memory cells in an even-numbered row and generates a second reference potential; and

sensing means to one input terminal of which said bit line selected by said selecting means is connected, and to another input terminal of which said first and second dummy cells-are connected, and which senses a potential on said bit line by using one of the first and the second reference potential generated by the first and the second dummy cell.

5,469,398

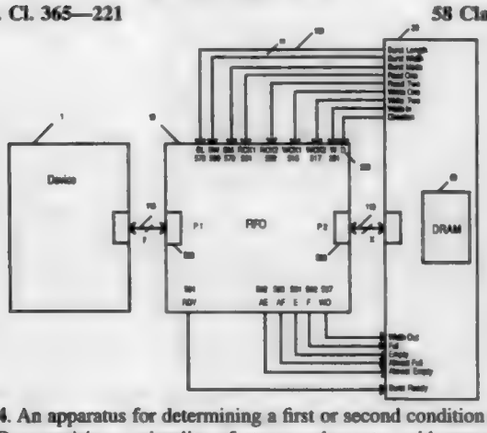
SELECTABLE WIDTH, BRUSTABLE FIFO

Michael Scott, Seal Beach; David Browning, Yorba Linda, and Michael Holt, Mission Viejo, all of Calif., assignors to Silicon Systems, Inc., Tustin, Calif.

Filed Sep. 10, 1991, Ser. No. 757,476

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—221 **58 Claims**



34. An apparatus for determining a first or second condition in a FIFO comprising a plurality of storage elements, said apparatus comprising:

pointer means for providing a plurality of counter outputs to indicate a location in said plurality of storage elements, said plurality of counter outputs comprising a read pointer and a write pointer to indicate a location to read from and write to in said storage elements respectively;

comparing means for receiving said plurality of counter outputs, for generating a third condition if a value of said read pointer is less than a value of said write pointer, for generating a fourth condition if a value of said read pointer is greater than a value of said write pointer, for generating said first condition if a value of said read pointer is equal to a value of said write pointer and said third condition exists, and for generating said second condition if a value of said read pointer is equal to a value of said write pointer and said fourth condition exists.

5,469,399

SEMICONDUCTOR MEMORY, MEMORY CARD, AND METHOD OF DRIVING POWER SUPPLY FOR EEPROM

Toshiro Sato; Tomoharu Tanaka; Tetsuhiko Mizoguchi, and Yuji Ide, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 15, 1994, Ser. No. 213,058

Claims priority, application Japan, Mar. 16, 1993, 5-056187

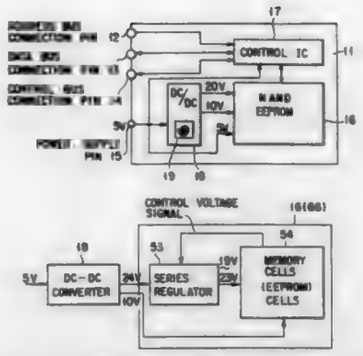
Int. Cl.[6] G11C *16/02*

U.S. Cl. 365—226 **20 Claims**

1. A semiconductor device comprising:

a semiconductor element driven by a predetermined DC power supply voltage; and

a power supply circuit including a DC—DC converter for converting an input DC voltage to an output DC voltage by means of a switching converter scheme using an inductance



element and a switching element, and a regulator for converting said output DC voltage to said predetermined DC power supply voltage to supply said predetermined DC power supply voltage to said semiconductor element.

5,469,400

SEMICONDUCTOR MEMORY DEVICE USING SERIAL POINTER

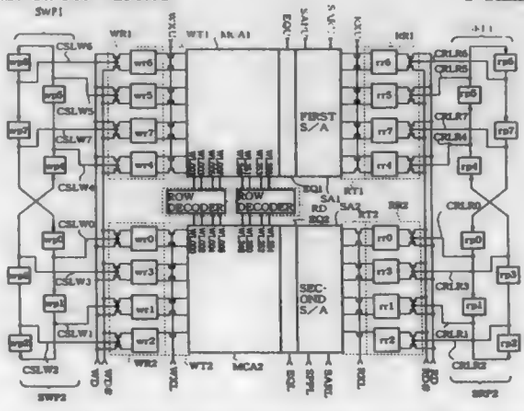
Satoshi Yamano, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 14, 1994, Ser. No. 306,163

Claims priority, application Japan, Sep. 29, 1993, 5-243206

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—230.01 **8 Claims**



1. A semiconductor memory device using a serial pointer, comprising:

a plurality of memory cells from which a first memory cell array to a p-th memory cell array are provided (where p is a random positive integer) for storing digital data, each memory cell array being arranged in rows and columns;

a row decoder, for selecting a word line in said first to the p-th memory cell array independently, said row decoder being located between a group of said first memory cell array to the p/2-th memory cell array and a group of said (p/2+1)-th memory cell array to p-th memory cell array;

first to p-th write registers for storing data for the first to the p-th memory cell arrays, each write register comprising a plurality of registers; and

a serial write pointer for serially selecting each register in the first to the p-th write registers, said serial write pointer comprising a plurality of pointers corresponding to said first to p-th write registers,

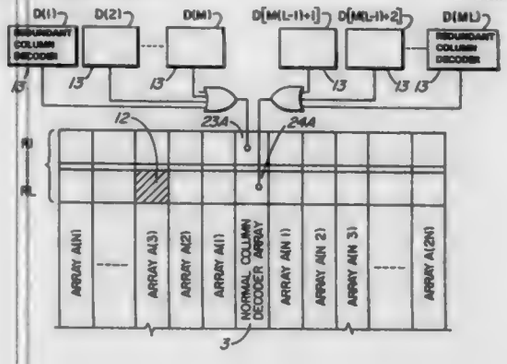
wherein in adjacent registers in each write register, the shift direction of one register indicated by said serial write pointer is opposed to the shift direction of the other register.

5,469,401

COLUMN REDUNDANCY SCHEME FOR DRAM USING NORMAL AND REDUNDANT COLUMN DECODERS PROGRAMMED WITH DEFECTIVE ARRAY ADDRESS AND DEFECTIVE COLUMN ADDRESS

Peter B. Gillingham, Kanata, Canada, assignor to Mosaid Technologies Incorporated, Kanata, Canada

Filed Jul. 14, 1992, Ser. No. 913,183
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—230.06 2 Claims



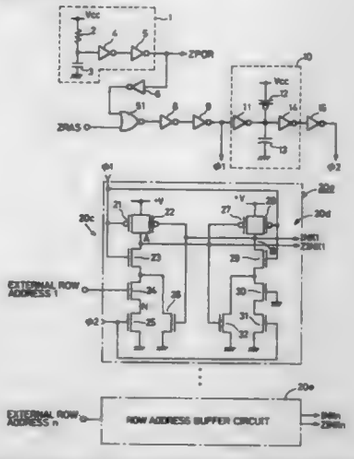
1. A dynamic random access memory (DRAM) comprising rowlines and columns crossing the rowlines, memory cells being associated with crossings of said rowlines and columns, means for connecting the memory cells to said columns under control of voltage carried on the rowlines, said rowlines, columns and memory cells being arranged in more than two adjacent arrays, fused circuit column decoder means for providing access to said columns in all of the arrays, means for disabling column access in any or all of the arrays and redundant column decoder means, each containing the address of an array and of a defective column in said array, coupled to a spare column or columns for enabling said spare column or columns using a redundant column decoder in any or all of the arrays when said defective column is addressed, said redundant column decoder comprising a column address input and an array address input, the array address input being programmed with the array address of said defective column(s), whereby memory cells of said spare column(s) associated only with a single array are substituted for said defective column, a first fused NOR gate for receiving said array address and providing an array address match signal when the array address matches plural unblown fuse lines therein, and a second fused NOR gate comprised of a group of MOS transistors of a first channel conductivity type equal in number to a number of lines for carrying both polarities of each column address, said group of MOS transistors having their source-drain circuits connected between ground potential and through individual programming fuses to an output bus, means for providing said column address to the gates of said group of MOS transistors, a pair of transistors of a second channel conductivity type opposite to that of said group of MOS transistors, having their source-drain circuits connected in series between a voltage rail V_{dd} and said output bus, a transistor of similar channel conductivity type as that of said group of MOS transistors having its source-drain circuit connected between said output bus and said ground potential and its gate connected to the gate of one of said pair of transistors, the gate of the other of said pair of transistors being connected to a precharge timing pulse, and a latch connected from said output bus in series with an inverter for providing a voltage level indicating a column address match.

5,469,402

BUFFER CIRCUIT OF A SEMICONDUCTOR MEMORY DEVICE

Tadaaki Yamauchi; Kei Hamade, and Yoshikazu Morooka, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 14, 1994, Ser. No. 305,632
Claims priority, application Japan, Sep. 16, 1993, 5-230154; Jul. 25, 1994, 6-172432
Int. Cl.[6] G11C 11/413
U.S. Cl. 365—230.08 7 Claims



6. A buffer circuit of a semiconductor memory device for transferring an external control signal that is active at a first logic level during a standby state into the semiconductor memory device, said buffer circuit comprising:

a CMOS inclusive OR gate for receiving said external control signal and an activation signal for activating said buffer circuit, and

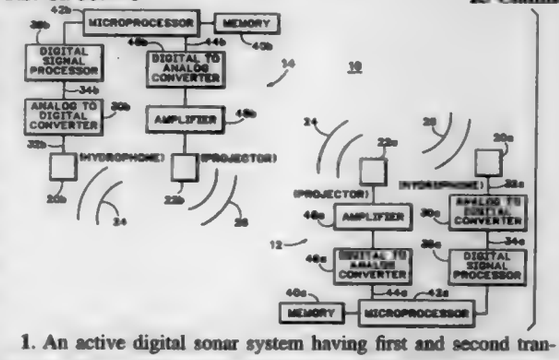
a CMOS logical product gate receiving data and an output of said CMOS inclusive OR gate during the standby state for providing said data to the semiconductor memory device in response to an output of said inclusive OR gate attaining a first logic level.

5,469,403

DIGITAL SONAR SYSTEM

Kenneth K. Young, and R. Jeffrey Wilkes, both of Seattle, Wash., assignors to Board of Regents of the University of Washington, Seattle, Wash.

Filed Aug. 11, 1992, Ser. No. 929,881
Int. Cl.[6] H04B 1/59
U.S. Cl. 367—6 25 Claims



1. An active digital sonar system having first and second transponders in acoustic communication through water, each transponder comprising:

transducer means for transmitting a transmitted sonar signal according to an electrical analog control signal and generating an electrical analog receipt signal in response to a received sonar signal;

signal converting means in communication with the transducer means for converting the analog receipt signal to a digital receipt signal and for converting a digital control signal to the analog control signal;

pattern storage means in data communication with the signal converting means for storing and delivering to the signal converting means a digital control signal corresponding to a multifrequency sonar transmission signal; and

digital signal processing means in data communication with the signal converting means and the pattern storage means for receiving and convoluting the digital receipt signal and a digital signal matching pattern corresponding to the received sonar signal.

5,469,404

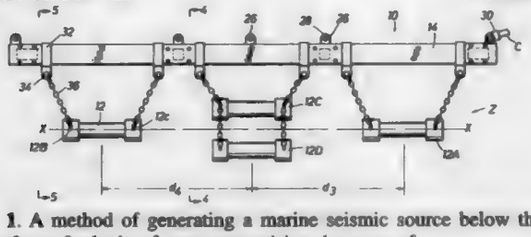
METHOD AND APPARATUS FOR SEISMIC EXPLORATION

Harold P. Barber, 33002 Wakefield Ct., Fulshear, Tex. 77441, and Clyde Lee, 6321 Del Monte, Houston, Tex. 77057

Continuation-in-part of Ser. No. 975,484, Nov. 12, 1992, abandoned. This application Aug. 11, 1994, Ser. No. 289,177

Int. Cl.[6] G01V *1/38*

U.S. Cl. 367—23 **9 Claims**



1. A method of generating a marine seismic source below the surface of a body of water comprising the steps of:

providing first, second and third pluralities of air guns with said second plurality having twice the number of air guns as first or third pluralities, said first plurality being located at a shallower water depth than said second plurality, and said third plurality being located in a grater water depth than said second plurality;

discharging said first, second and third pluralities of air guns in consecutive order; and

delaying the discharge of said second and third pluralities of air guns until the initial wavefront from the discharge of an upper plurality of guns has passed.

5,469,405

DETECTION METHOD AND APPARATUS

Wesley Tannenbaum, P.O. Box 959, Manomet, Mass. 02345

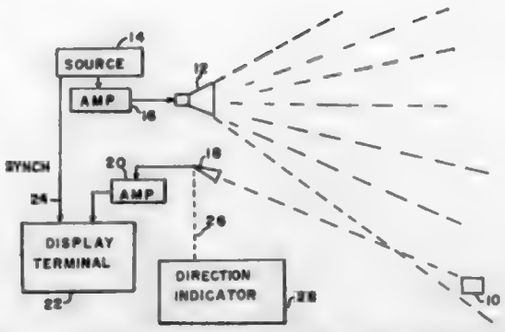
Filed Oct. 28, 1987, Ser. No. 118,774

Int. Cl.[6] H04B *1/06*

U.S. Cl. 367—135 **16 Claims**

1. A method for detecting the presence, at a selected site, of an electro acoustic transducing device having a mechanical resonance at an acoustic frequency, said method comprising the steps of

A. broadcasting at the site an acoustic signal having at least first and second components, where said first component includes a first frequency that is a unity or other multiple of an acoustic resonant frequency of the device, and said second component includes a second frequency less than said first frequency, and wherein arithmetic combinations of said first and second frequencies yield sum and difference frequencies suitable for acoustic propogation and for electro acoustic transduction, and



B. sensing an acoustic resonant response signal which includes a component with a frequency equal to at least one of the sum and the difference of said first and second frequencies.

5,469,406

METHOD OF EMITTING VERY LOW FREQUENCY HIGH POWER ACOUSTIC WAVES, AND CORRESPONDING TRANSDUCERS THEREFOR

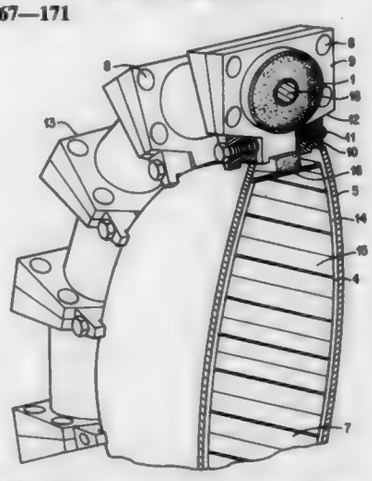
Alain A. Scarpitta, Toulon; Didier Boucher, and Gilles Grosso, both of Six Fours, all of, France, assignors to L'Etat Francais represente par le Deleque General pour l'Armement, Paris, France

Filed Dec. 1, 1994, Ser. No. 352,125

Claims priority, application France, Dec. 3, 1993, 93 14503

Int. Cl.[6] H04R *23/00*

U.S. Cl. 367—171 **12 Claims**



1. A method of emitting very low frequency acoustic waves in a liquid using at least one transducer, said transducer having at least one electro-acoustic motor and a flexible envelope that is an emitting surface for said acoustic waves, said at least one electro-acoustic motor being coupled to an assembling device and said assembling device being coupled to said flexible envelope such that each said at least one electro-acoustic motor is disposed in a peripheral ring around said flexible envelope, said flexible envelope having an internal cavity with an orifice through which said liquid enters, said flexible envelope having a shape that generally conforms to a shape of said internal cavity and being a constant distance from a baffle disposed within said internal cavity, said baffle being coupled to said at least one electro-acoustic motor, wherein said method comprises the steps of:

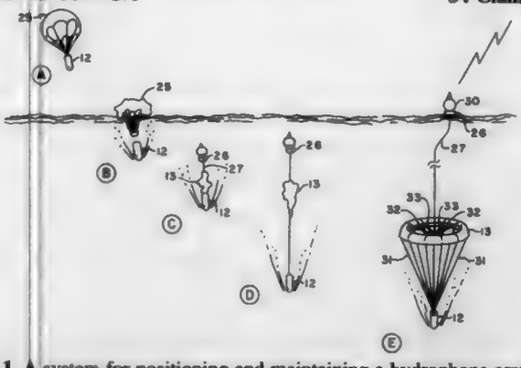
flowing said liquid into said internal cavity via said orifice such that said liquid contacts said baffle; and

producing said low frequency waves in said liquid by operating said at least one electro-acoustic motor, thereby causing said flexible envelope to vibrate.

5,469,407
PARACHUTE ARRAY

Roger I. Saunders, Hollis, N.H., assignor to Lockheed Sanders, Inc., Nashua, N.H.

Filed Jun. 1, 1981, Ser. No. 268,533
Int. Cl.[6] H04R *1/44*
U.S. Cl. 367—173 **34 Claims**



1. A system for positioning and maintaining a hydrophone array in a predetermined configuration, comprising:

a parachute including at least one canopy section and a plurality of guy wires; and

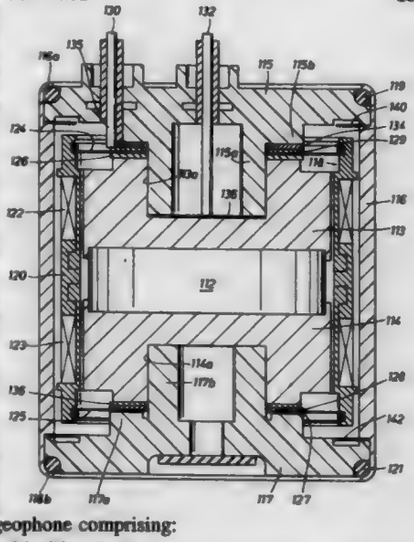
a plurality of hydrophones;

said hydrophones being coupled to said canopy section with at least one of said hydrophones being coupled to said canopy at one location and others coupled at different locations such that when said canopy section is inflated said canopy section will determine the configuration of the array.

5,469,408
HIGH RESOLUTION GEOPHONE

Daniel M. Woo, Missouri City, Tex., assignor to Shaw Industries Limited, Rexdale, Canada

Filed Jul. 20, 1994, Ser. No. 278,022
Int. Cl.[6] H04R *9/02*
U.S. Cl. 367—182 **18 Claims**



7. A geophone comprising:

a cylindrical housing,

a permanent magnet assembly comprising a cylindrical magnet and pole pieces positioned at opposite ends of the magnet with one end of each pole piece in engagement with one end of the magnet,

means for mounting the magnet assembly in the cylindrical housing with an annular space between the magnet assembly and the housing so that a magnetic field is established between the pole pieces and the cylindrical housing in the annular space,

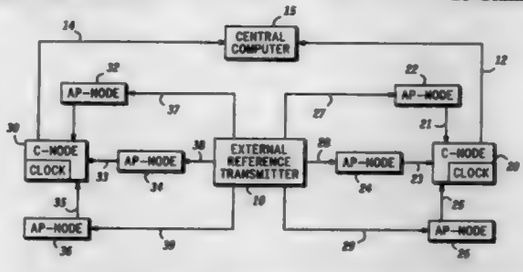
a coil form having two axially spaced coils of electrically conductive wire thereon, each coil having a length less than the length of each pole piece, wherein the length of each pole piece is measured from the end of the magnet it engages to the opposite end of the pole piece, and

spring means supporting the coil form in the annular space with each coil centered opposite one pole piece when the coil form is at rest for movement in the magnetic field along the longitudinal axis of the housing and the magnet due to seismic energy to produce an electrical signal.

5,469,409
METHOD FOR CLOCK CALIBRATION IN A POSITION DETERMINATION SYSTEM

Neal R. Anderson, Mesa; Bart J. Erickson, Scottsdale, and Keith Leung, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 14, 1994, Ser. No. 212,480
Int. Cl.[6] G04B *47/00;* **G04F** *5/00;* **G01S** *3/02*
U.S. Cl. 368—10 **18 Claims**



1. A method for clock calibration in a position determination system comprising the steps of:

receiving by a central computer time of arrival signals from each of a plurality of C-Nodes having an internal clock;

applying a C-Node to C-Node clock calibration by the central computer for each received time of arrival signal for each of the C-Nodes;

determining a new C-Node to C-Node clock calibration by the central computer for each of the C-Nodes; and

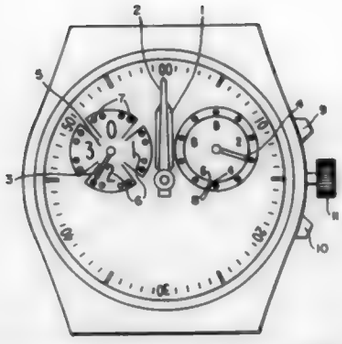
storing the new C-Node to C-Node clock calibration by the central computer for applying to subsequently received time of arrival signals.

5,469,410
WATCH WITH DATE DIAL

Jean-Claude Berney, Les Charbonnieres, Switzerland, assignor to Eta Sa Fabriques d'Ebauches, Grenchen, Switzerland

PCT No. PCT/CH93/00200, § 371 Date May 28, 1994, § 102(e) Date May 28, 1994, PCT Pub. No. WO94/03845, PCT Pub. Date Feb. 17, 1994
PCT Filed Aug. 10, 1993, Ser. No. 211,636
Claims priority, application Switzerland, Aug. 10, 1992, 02492/92
Int. Cl.[6] G04B *19/24;* **G04C** *3/14*
U.S. Cl. 368—28 **8 Claims**

1. A watch with date function comprising a plurality of display mobiles driven completely independently of each other by a plurality of stepping motors, characterised in that the watch comprises electronic means arranged in such a way as to display the date by means of two scales placed on two distinct dials, the tens of a month date being displayed on a first dial by a first of said display mobiles driven by a first motor, and the units of a month date being displayed on a second dial by a second of said display mobiles driven by a second motor; and



in that the tens scale is combined with a scale of leap years, said electronic means being arranged in such a way that said first display mobile simultaneously displays the tens and the year.

5,469,411

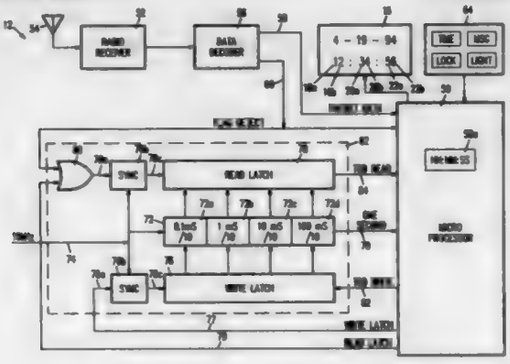
METHOD AND APPARATUS FOR ACCURATE TIME MAINTENANCE AND DISPLAY

Jeffrey R. Owen, Portland, Oreg., assignor to Seiko Communications Holding N.V., Netherlands

Continuation-in-part of Ser. No. 179,835, Jan. 7, 1994, Pat. No. 5,448,533, which is a continuation of Ser. No. 512,237, Apr. 18, 1990, abandoned. This application May 2, 1994, Ser. No. 236,534

Int. Cl.[6] G04C *11/00*

U.S. Cl. 368—47 **12 Claims**



1. A time keeping and display system comprising:

a time of day broadcast device providing a time of day reference; and

a time keeping and display device receiving intermittently said time of day reference and including a time keeping element maintaining time of day and driving a time of day display, a latch capturing a time of day value from said time keeping element in response to said time keeping and display device receiving said time of day reference, and a processing element calculating a time of day update as a function of said captured time of day value and said time of day reference, said processing element modifying said time keeping element as a function of said time of day update during a given execution time procedure.

5,469,412

ANALOG WATCH, MORE SPECIFICALLY A WRIST WATCH

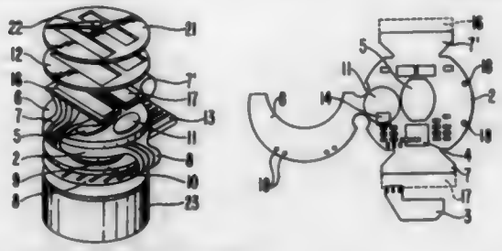
Edgar H. Weise, Stettfurt, Switzerland, assignor to Yperwatch S.A., Vaumarcus, Switzerland

Filed Aug. 26, 1994, Ser. No. 297,557

Claims priority, application Switzerland, Sep. 9, 1993, 02675/93

Int. Cl.[6] G04B *37/00*

U.S. Cl. 368—88 **10 Claims**



1. An analog watch comprising

(a) a watch housing;

(b) a nuclear radiation sensing unit supported in said watch housing and including

(1) a sensor element; and

(2) a display device;

(c) a flexible carrier received in said watch housing; said flexible carrier having a first and a second flat part connected to said flexible carrier and folded thereover onto opposite faces of said flexible carrier;

(d) an amplifier and evaluator circuit accommodated in said watch housing;

(e) a first intermediate plate disposed between said carrier and said first flat part;

(f) a second intermediate plate disposed between said carrier and said second flat part;

(g) a watch work mounted on said first intermediate plate;

(h) a battery mounted on said second intermediate plate; and

(i) conductor means printed on said carrier for connecting said battery and said sensor with said amplifier and evaluator circuit and for connecting said amplifier and evaluator circuit with said watch work and said display device.

5,469,413

MAGNETO-OPTIC RECORDING SYSTEM AND ASSOCIATED CONTROLLABLE HEAT SOURCE

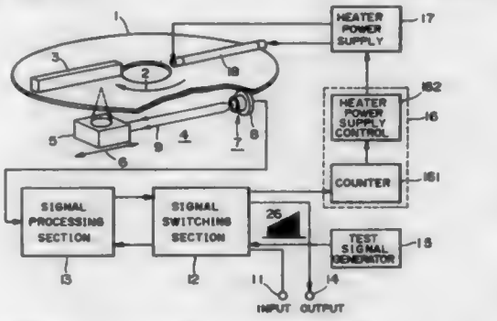
Hitoshi Kagawa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1994, Ser. No. 178,817

Claims priority, application Japan, Jan. 12, 1993, 5-003358; Dec. 28, 1993, 5-336185

Int. Cl.[6] G11B *11/00*

U.S. Cl. 369—13 **11 Claims**



1. A magneto-optic recording system comprising:

means for applying a magnetic field to a magneto-optic disc;

a pickup including means for directing a writing/reading laser beam to selected locations on the disc;

means for amplitude-modulating the laser beam with a test pulse signal comprising at least one test pulse to write the test pulse signal into the disc;

means for reading the test pulse signal written into the disc from the disc;

means for heating the disc; and

means for controlling the means for heating in response to the test pulse supplied from the means for reading.

5,469,414

POSITIONING CONTROL SYSTEM

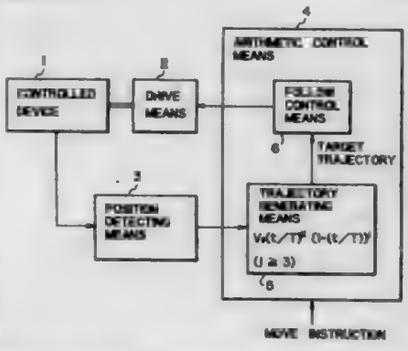
Eiji Okamura, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

Filed Nov. 23, 1992, Ser. No. 980,928

Claims priority, application Japan, Nov. 22, 1991, 3-307458; Dec. 9, 1991, 3-324148

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—32 **17 Claims**



1. A positioning control system for a controlled device comprising:

drive means for moving and positioning said controlled device to a designated position;

position detecting means for detecting the position of said controlled device; and

arithmetic control means for controlling said drive means in accordance with the position of said controlled device detected by said position detecting means and said designated position, wherein said arithmetic control includes:

moving time calculating means for calculating the target moving time for moving said controlled device by a certain moving distance from a current position of said controlled device to said designated position thereof;

gain calculating means for calculating a gain in accordance with said target moving time and said moving distance;

trajectory calculating means for calculating a target trajectory using an algebraic polynomial represented by said target moving time, said gain and an elapsed time, said algebraic polynomial at least making a target position said designated position when said elapsed time is equal to the target moving time; and

following control means for controlling said drive means in accordance with said target trajectory calculated by said trajectory calculator and the position of said controlled device detected by said position detecting means while causing the position of said controlled device to follow said target trajectory.

5,469,415

OPTICAL INFORMATION RECORDING OR REPRODUCING APPARATUS WITH ASYMMETRY COMPENSATION

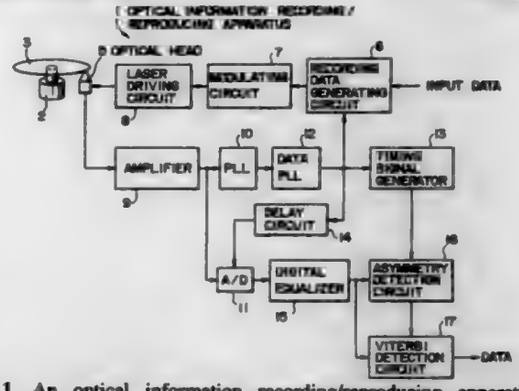
Goro Fujita, and Minoru Tobita, both of c/o Sony Corporation, 7-35, Kitashinagawa 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Oct. 28, 1993, Ser. No. 144,874

Claims priority, application Japan, Jan. 30, 1992, 4-316500

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—48 **8 Claims**



1. An optical information recording/reproducing apparatus which uses a viterbi algorithm for reproducing information recorded on an optical information recording medium, comprising:

a pit information detecting means, including means for irradiating the optical information recording medium with a laser beam, for detecting pit information represented by pits recorded on the optical information recording medium;

an asymmetry detecting means supplied with the detected pit information for detecting an asymmetry value of the pit information; and

a decoding means supplied with the detected pit information and the asymmetry value of the pit information for decoding the pit information on the basis of the asymmetry value by the viterbi algorithm

wherein the asymmetry value detected by the detecting means is a difference between a mean value (La+Lc)/2 of the pit information and an intermediate value Lb of the pit information, where La is a maximum value of the pit information, Lc is a minimum value of the pit information, and Lb is a ternary value of the pit information which is between La and Lc.

5,469,416

APPARATUS FOR REPRODUCING RECORDED DATA AND SELECTIVELY EITHER OF READ-ONLY OR RECORDED SYNCHRONIZATION INFORMATION FROM A MAGNETO-OPTICAL RECORDING MEDIUM

Tamotsu Yamagami, Kanagawa; Yoichiro Sako, Chiba, and Masanobu Yamamoto, Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

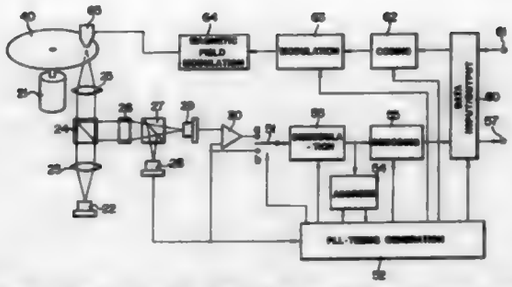
Continuation of Ser. No. 22,561, Feb. 25, 1993, which is a continuation of Ser. No. 689,057, Apr. 22, 1991. This application Feb. 3, 1994, Ser. No. 190,887

Claims priority, application Japan, Aug. 25, 1989, 1-219413; Aug. 31, 1989, 1-225314; Aug. 31, 1989, 1-225315

Int. Cl.[6] G11B 5/09

U.S. Cl. 369—48 **7 Claims**

3. A recording and/or reproducing apparatus for an optieal disc, the optical disc having a recording area and a pre-recorded area provided at a radially inner side of the recording area, the recording area being formed with a guide groove to guide a light beam radiated on the optical disc, with main information data and synchronization signals being recorded along the length of the guide groove, the pre-recorded area including a recording track, the guide groove on the recording track being provided with a



plurality of offset portions, each of the offset portions being offset in the radial direction of the optical disc according to synchronization signals and control data which is used to control the operation of the apparatus, the apparatus comprising:

an optical pickup including first and second photodetectors, the first photodetector receiving one of two light beams divided from a light beam reflected by the optical disc, the second photodetector receiving the other light beam divided from the reflected light beam;

a differential amplifier supplied with the output signals from the first and second photodetectors and outputting a difference signal;

a switch circuit controlled by a control signal, the switch circuit selecting either the output signal from the first photodetector or the difference signal output from the differential amplifier according to the control signal and outputting a selected output signal;

a signal processing unit supplied with the selected output signal from the switch circuit and applying a decoding process to the selected output signal to retrieve the synchronization signals from either the output of the first photo detector or the difference signal, and wherein the signal processing unit includes a control circuit supplied with the selected output signal for determining a type of the selected output signal and generating a corresponding control signal for the switch circuit.

5,469,417

INFORMATION RECORDING/REPRODUCING APPARATUS FOR RECORDING OR REPRODUCING DATA, AND CLOCK GENERATING CIRCUIT INFORPORATED THEREIN

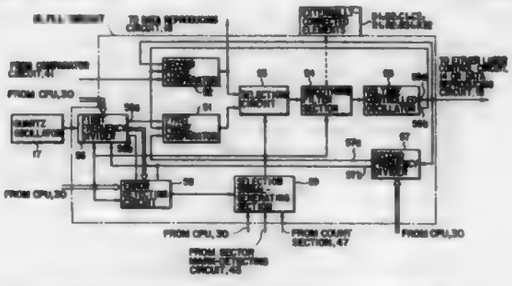
Koki Tanoue, Yokohama; Tsuneshi Yokota, Kawasaki, and Tomohisa Yoshimaru, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 17, 1994, Ser. No. 214,217

Claims priority, application Japan, Sep. 22, 1993, 5-278944

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—50 **2 Claims**



1. A data recording/reproduction apparatus comprising:

first output means for outputting a clock signal which is used as a reference when data is recorded on a recording medium and when data is reproduced therefrom;

data recording/reproducing means for recording and reproducing data with respect to the recording medium on the basis of the clock signal output from the first output means;

second output means for outputting a fundamental clock signal;

first comparison means for comparing a phase of the fundamental clock signal output from the second output means with a phase of the clock signal output from the first output means, and for producing an output signal based on a phase difference;

second comparison means for comparing a phase of a reproduction signal output from the data recording/reproducing means with the phase of the clock signal output from the first output means, and for producing an output signal based on a phase difference; and

control means for controlling the first output means to output a clock signal having a period based on the output signal of the first comparison means when data is recorded on the recording medium by the data recording/reproducing means, and for controlling the first output means to output a clock signal having a period based on the output signal of the second comparison means when data is reproduced from the recording medium by the data recording/reproducing means.

5,469,418

OPTICAL INFORMATION WRITE/READ DEVICE AND METHOD FOR WRITING DATA

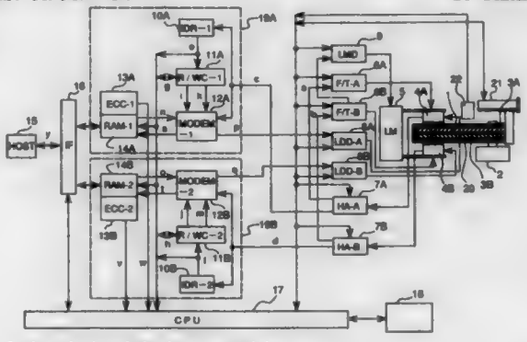
Isao Satoh, Neyagawa; Yuji Takagi, Hirakata, and Yuji Hisakado, Neyagawa, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 15, 1993, Ser. No. 91,276

Claims priority, application Japan, Jul. 16, 1992, 4-189203

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—54 **16 Claims**



1. A write/read device comprising:

a drive mechanism for supporting and driving an optical disk;

a first optical head means for writing and reading data on the optical disk supported by said drive mechanism;

a first servo means for focusing an optical beam generated by said first optical head on a first record side of the optical disk;

a first data write means for writing data on said first record side;

a first data read and check means for reading the data written by said first data write means and for checking for errors of the written data;

a second optical head means for writing and reading data on the optical disk supported by said drive mechanism, second optical head means being arranged at an opposite side to said first optical head means with respect to the optical disk supported by said drive mechanism;

a second servo means for focusing an optical beam from said second optical head on a second record side of said optical disk;

a second data write means for writing data on said second record side;

a second data read and check means for reading the data written by said second data write means and for checking for errors of the written data;

a head shift means for simultaneously moving said first and second optical heads; and

a control means for making said first data read and check means check for errors while said second data write means writes data and for making said second data read and check means check for errors while said first data write means writes data.

5,469,419

INFORMATION PROCESSING APPARATUS WITH RECORDING MEDIUM DISCHARGING MECHANISM FOR PREVENTING CHANGE OR LOSS OF INFORMATION OF RECORDING MEDIUM BY TEMPERATURE INCREASE OF THE APPARATUS

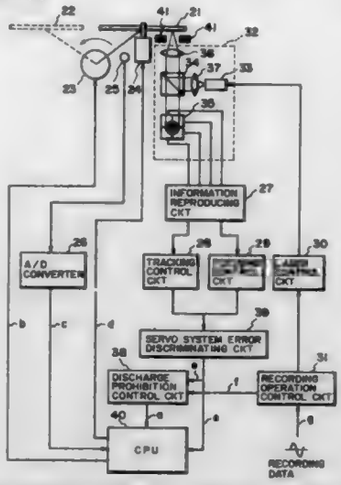
Ichiro Iida, Tokyo; Yoshitaka Ogino, Kawasaki, and Hideo Nakajima, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 104,392, Jul. 15, 1993, abandoned, which is a continuation of Ser. No. 500,568, Mar. 28, 1990, abandoned. This application Jan. 23, 1995, Ser. No. 376,668

Claims priority, application Japan, Dec. 15, 1989, 1-325002

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—58 **14 Claims**



1. An information processing apparatus for effecting a recording or reproducing operation for recording information on and/or reproducing information from a magnetooptical recording medium loaded in said apparatus, said apparatus comprising:

discharge means for discharging the magnetooptical recording medium from said apparatus;

detecting means for detecting a temperature in a vicinity of the magnetooptical recording medium; and

control means for controlling said discharging means by judging whether the temperature detected by said detecting means exceeds a predetermined value or not so as to cause said discharging means to discharge the magnetooptical recording medium from said apparatus in order to prevent information recorded on the magnetooptical recording medium from disappearing when it is judged that the detected temperature exceeds the predetermined value.

5,469,420

MULTI-VALUE RECORDED DATA DETECTING METHOD

Goro Fujita, Kanagawa, and Minoru Tobita, Tokyo, both of, Japan, assignors to Sony Corporation, Japan

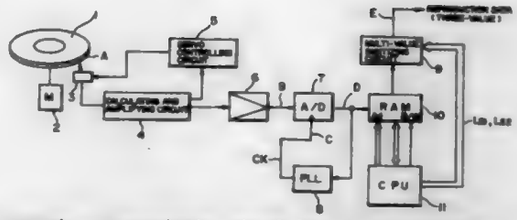
Continuation of Ser. No. 930,058, Aug. 14, 1992, abandoned. This application Jun. 15, 1994, Ser. No. 260,118

Claims priority, application Japan, Aug. 23, 1991, 3-235718

Int. Cl.[6] G11B *5/09*

U.S. Cl. 369—59 **5 Claims**

1. A multi-value recorded data detecting method, comprising the steps of:



convening a reproduction signal from a record medium, on which multi-value data having at least three values are recorded, from an analog signal into a digital signal in response to a reference clock signal to obtain signal level data;

storing in a random access memory the signal level data for at least one predetermined set of multi-value recorded data;

determining a distribution of signal level data stored in the random access memory for each predetermined set of multi-value recorded data, the distribution of signal level data corresponding to the number of samples at each number of bits within an analog-to-digital signal conversion range;

setting at least two threshold values in accordance with the distribution of signal level data; and

comparing the signal level data from the random access memory with the threshold values to generate multi-value reproduction data corresponding to the recorded data.

5,469,421

FLOPPY DISK DRIVE DEVICE

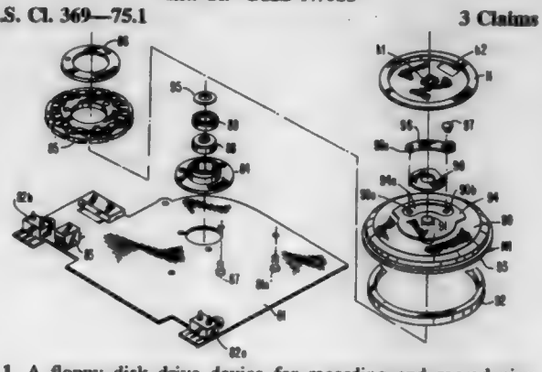
Tomoe Aruga; Hideya Yokouchi, and Kazuyoshi Fujimori, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 915,044, Jul. 16, 1992, abandoned, which is a continuation of Ser. No. 474,123, Jul. 5, 1990, abandoned. This application Nov. 7, 1994, Ser. No. 335,421

Claims priority, application Japan, Sep. 5, 1988, 63-221864; Feb. 2, 1989, 1-24647; May 15, 1989, 1-120727; May 15, 1989, 1-120728; Jul. 28, 1989, 1-195871; Jul. 28, 1989, 1-195874; Aug. 29, 1989, 1-222040

Int. Cl.[6] G11B *17/022*

U.S. Cl. 369—75.1 **3 Claims**



1. A floppy disk drive device for recording and reproducing information on a disk in a disk cartridge, the disk having a metal disk hub with a central hole and a drive hole partially offset from the central hole, comprising:

a spindle mounted for engagement by the central hole of the disk;

a spindle motor operatively coupled to said spindle for the rotation thereof;

a rotary member fixed to said spindle for rotation therewith;

a chucking magnet positioned to attract the metal disk hub of the disk toward said rotary member;

a chucking lever having first and second ends pivotally attached to said rotary member at essentially the first end; and

a drive pin mounted at essentially said second end of said chucking lever and positioned for engagement by the drive hole of the disk when aligned therewith, wherein said chuck-

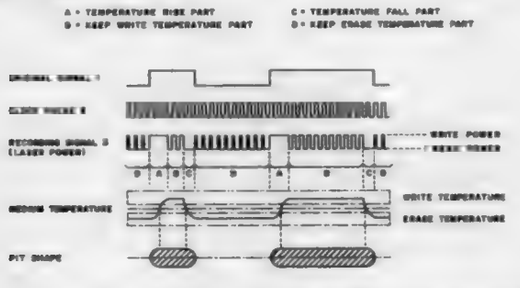
ing lever being formed of an elastic material so that said chucking lever may swing within a predetermined angle by the force of said chucking magnet attracting the metal disk hub of the disk to bear against said drive pin when disk chucking is not accomplished.

5,469,422

WRITING AND ERASING INFORMATION BY VARYING THE TEMPERATURE OF AN OPTICAL RECORDING MEDIUM

Mitoshi Sohmuta, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jan. 19, 1994, Ser. No. 183,147
Claims priority, application Japan, Jan. 18, 1993, 5-005464
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—100 **4 Claims**



1. An information recording method for recording data having two logic levels on a medium selected from a group consisting of a magneto-optical type recording medium and a phase transition type optical recording medium, said method comprising the steps of:

dividing an interval of one of said two levels into a first period, a second period, and a third period, said first period being a starting portion of one of said two levels, said second period following said first period and said third period following said second period;

generating a first DC signal as a recording signal to said medium at said first period;

generating a first pulse train of a predetermined frequency as said recording signal at said second period, said predetermined frequency being not less than a frequency of said two level data, said first pulse train being synchronized with said two level data, and a peak level of said first pulse train coinciding with a level of said first DC signal;

generating a second DC signal as said recording signal at said third period, a level of said second DC signal coinciding with a bottom level of said first pulse train;

generating a second pulse train as said recording signal when said data is the other of said two levels, a frequency of said second pulse train being said predetermined frequency, a pulse width of said second pulse train being narrower than a width of said first pulse train, a peak level of said second pulse train coinciding with said peak level of said first pulse train, and a bottom level of said second pulse train coinciding with said bottom level of said first pulse train; and

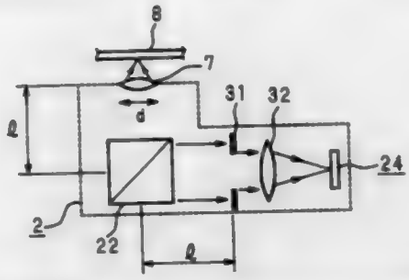
driving a laser diode to perform a laser irradiation of said medium-in response to said recording signal.

5,469,423

LASER POWER CONTROL OF AN OPTICAL HEAD WITH A PLURALITY OF BEAM SOURCES

Masahisa Shinoda; Naoyuki Egusa; Yasuyuki Sato, and Manabu Koike, all of Nagaokakyo, Japan, assignors to Mitsubishi Kenki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 16,861, Feb. 11, 1993, Pat. No. 5,359,588.
This application Jun. 2, 1994, Ser. No. 253,261
Claims priority, application Japan, Feb. 12, 1992, 4-025151; Jun. 8, 1992, 4-147306
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—112 **9 Claims**



1. An optical recording/reproducing apparatus comprising:

a separated two piece optical head including a fixed unit provided with a laser array having a plurality of beam sources and a moving unit provided with an objective lens to focus laser beams from the fixed unit onto an information recording/reproducing medium to record or reproduce information;

splitting means disposed in the moving unit for splitting a propagation direction of the laser beams from the fixed unit into a first direction toward said objective lens and a second direction which is different from said first direction;

an aperture stop disposed in said second direction, said aperture stop being optically equivalent to said objective lens;

detecting means provided after said aperture stop for detecting individual laser beam powers irradiating on the information recording/recorded medium; and

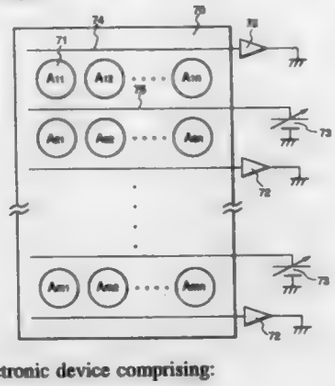
laser drive controlling means for controlling respective output powers from said plurality of beam sources on the basis of the detected respective laser beam powers.

5,469,424

ELECTRONIC DEVICE UTILIZING A MATERIAL CAPABLE OF STORING INFORMATION WHICH IS READABLE BY ILLUMINATION

Takashi Inushima, and Rimantas Vaitkus, both of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1994, Ser. No. 199,955
Claims priority, application Japan, Feb. 23, 1993, 5-057963
Int. Cl.[6] G01J 1/02
U.S. Cl. 369—120 **25 Claims**



8. An electronic device comprising:

a plurality of storage regions provided on a substance comprising a material selected from a group consisting of diamond, boron nitride, aluminum nitride, and a multi-layer thereof;

means for illuminating said storage regions with ultraviolet radiation using a first light;

means for illuminating said storage regions with a second light having a wavelength corresponding to an energy smaller than an energy bandgap of said substance to induce a photocurrent in said storage regions; and

means for measuring said photocurrent.

5,469,425

METHOD OF MANUFACTURING AN INDEX APPARATUS

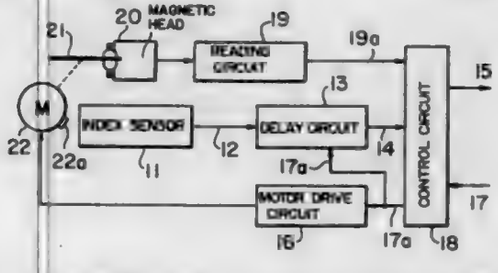
Hiroshi Nishizawa, Hanamaki, Japan, assignor to Matsushita Electric Industrial Co., Kadoma, Japan

Continuation of Ser. No. 906,463, Jun. 30, 1992, abandoned. This application Jun. 2, 1994, Ser. No. 253,222

Claims priority, application Japan, Jul. 4, 1991, 3-164277; Jul. 4, 1991, 3-164285

Int. Cl.[6] G11B *21/08*; H02K *29/00*

U.S. Cl. 369—189 **3 Claims**



1. A method of manufacturing an index apparatus electrically connected with a magnetic head for reading alignment media, said method comprising the steps of:

providing said magnetic head for reading alignment media relative to a motor for rotating said alignment media, said motor having a rotor with a magnet;

providing a position mark on said rotor;

providing an index sensor for detecting said position mark, said index sensor being positioned at a fixed position relative to said magnetic head, whereby

during operation of said motor, index burst signals are generated by said magnetic head reading said alignment media, said position mark rotating on said rotor is detected by said index sensor, index pulse signals are generated by said detection of said position mark, a time difference in occurrence between said index pulse signals and said index burst signals is determined for a given speed of said motor, and at least one of said motor speed and said index pulse signals is adjusted to maintain said determined time difference;

thermally transferring a first hot stamp section having a low light reflectance onto an outer periphery of said rotor; and

thermally transferring a second hot stamp section having a high light reflectance onto said first hot stamp section at said position mark to be detected by said index sensor, wherein said second hot stamp section has a smaller width than said first hot stamp section, and placement of said hot stamp sections is independent of poles of said magnet in said rotor.

5,469,426

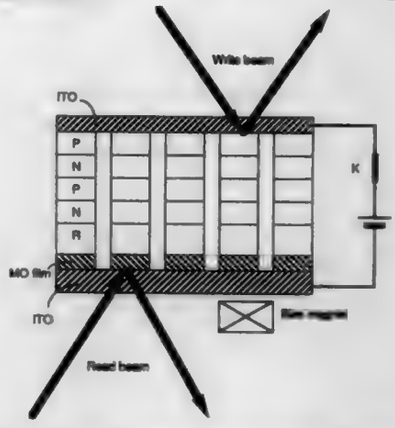
HIGH WRITE SPEED ERASABLE OPTICAL RECORDING DISK USING ACTIVE SEMICONDUCTOR DEVICES AT EACH PIXEL

Yu Wang, Department of Physics, University of Toledo, Toledo, Ohio 43606

Filed Jun. 18, 1993, Ser. No. 77,664

Int. Cl.[6] G11B *7/24*

U.S. Cl. 369—275.2 **14 Claims**



1. An erasable high write speed electro-optical recording disk comprising:

two layers of transparent electrically conductive ITO glass for connecting to DC electric power through an external switch with an optical medium sandwiched between the layers, said optical medium comprising:

a plurality of independent pixels, each pixel including a four layer semiconductor film, a resistor layer, and a recording layer.

5,469,427

TRANSMISSION LINE CONTROL SYSTEM AND INTERFACE UNIT THEREFOR

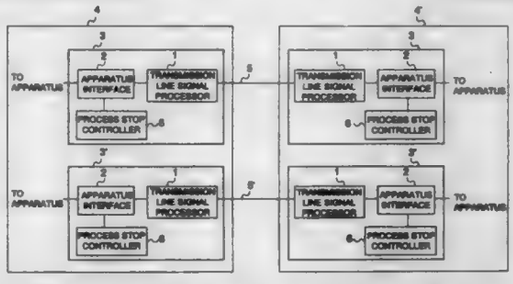
Kazumi Sato, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 25, 1994, Ser. No. 218,126

Claims priority, application Japan, Sep. 20, 1993, 5-233099

Int. Cl.[6] H04J *3/14*; G06F *11/00*

U.S. Cl. 370—16 **14 Claims**



1. A transmission line control system in combination with a transmission apparatus of a communication system having a redundant configuration and including a plurality of transmission apparatuses which are coupled via transmission lines of a working system and a protection system, the combination comprising:

each of said transmission apparatuses including interface boards each corresponding to each of the working and protection systems, respectively, each interface board including a transmission line signal processor which processes transmission signals exchanged with a respective transmission line, and an apparatus interface which provides an interface between the transmission apparatus and the transmission line signal processor; and

a process stop controller, provided in each interface board and being coupled to said apparatus interface; and means for supplying to said process stop controller of a respective interface board a working/protection judging signal such that said process stop controller stops processes in the apparatus interface coupled thereto when said judging signal indicates that said process stop controller belongs to the interface board corresponding to the protection system so that power consumption in the communication system is reduced.

5,469,428

LOOP-BACK SYSTEM IN A DUAL RING NETWORK

Nobuyuki Tokura, Yokosuka; Yoshio Kajiyama, Yokohama; Hideo Tatsuno, and Takashi Nakashima, both of Yokosuka, all of, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

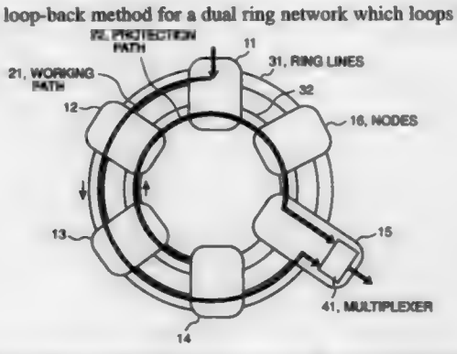
Filed Mar. 25, 1992, Ser. No. 858,364

Claims priority, application Japan, Mar. 26, 1991, 3-087711; Jul. 22, 1991, 3-181176; Jan. 21, 1992, 4-008736

Int. Cl.[6] H04L *12/42*

U.S. Cl. 370—161 **23 Claims**

1. A loop-back method for a dual ring network which loops back



information between two ring lines of opposite transmission directions, for transmitting the information to a path indicated by a path ID number or a time slot position from a periodic frame, comprising the steps of:

establishing a working path on a first of said two ring lines, between a transmission node and a receiving node, said working path having an inlet and outlet for transferring information to and from the ring network;

establishing a protection path on a second of said two ring lines, extending from a first node which is at or adjacent said receiving node, in a direction opposite to that of the working path, said protection path being in the form of a open ring and having an inlet and outlet for transferring information to and from the ring network;

multiplexing, at said receiving node, signals provided to said outlet of the protection path with signals provided to said outlet of said working path; and

detecting, in each node, a failure taking place on a line, and making a loop-back from a working path to the corresponding protection path in said node which detected the failure.

5,469,429

X-RAY CT APPARATUS HAVING FOCAL SPOT POSITION DETECTION MEANS FOR THE X-RAY TUBE AND FOCAL SPOT POSITION ADJUSTING MEANS

Masahiko Yamazaki; Yutaka Shibata; Kozi Natori; Mitsuru Yahata, and Kyojiro Nambu, all of Tochigiken, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

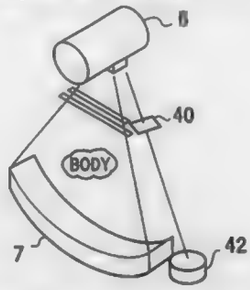
Filed May 20, 1994, Ser. No. 246,665

Claims priority, application Japan, May 21, 1993, 5-119656

Int. Cl.[6] A61B *6/00*

U.S. Cl. 378—19 **12 Claims**

1. An X-ray computerized tomographic (CT) apparatus having



an X-ray detector, the apparatus comprising:

an X-ray tube which is freely movable in at least one of a horizontal direction and a vertical direction;

detection means disposed in the vicinity of the X-ray detector for detecting a dislocated degree of the focal spot position of the X-ray tube; and

means for automatically controlling the focal spot position of the X-ray tube based on data obtained from the detection means so that the focal spot position of the X-ray tube remains fixed in a predetermined position;

where the detection means includes a storage means for storing a thermal information table of the X-ray tube in advance of a detecting process, so that the dislocated degree of the focal spot position of the X-ray tube is calculated.

5,469,430

METHOD AND DEVICES FOR SIMULTANEOUS TRANSMISSION OF TWO HETEROCHRONOUS BINARY SIGNALS ON THE SAME TRANSMISSION MEDIUM

Jean-Pierre Guerin, Trelevern; Jean-Francois Robin, Belle-Isle-en-Terre, and Francois Roudot, Pleumeur-Bodou, all of, France, assignors to Alcatel Cit, Paris, France

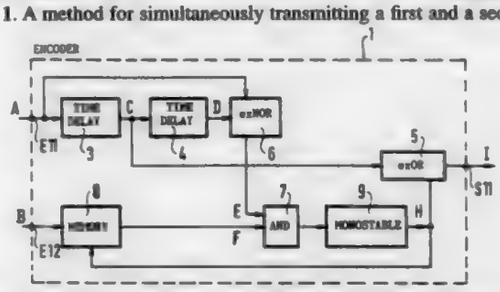
Filed Sep. 14, 1993, Ser. No. 120,543

Claims priority, application France, Sep. 15, 1992, 92 10968

Int. Cl.[6] H04J *15/00;* **H04L** *5/02*

U.S. Cl. 370—37 **12 Claims**

1. A method for simultaneously transmitting a first and a second



binary input signal as a single binary signal on a common physical medium, said second binary input signal being timed by a bit clock having a period greater than an allowed minimal bit duration of said first binary input signal, said first binary input signal being heterochronous with respect to said second binary input signal, said method comprising the steps of:

(a) delaying said first binary input signal for a first delay interval to produce a first delayed output signal;

(b) delaying said first delayed output signal for a second delay interval to produce a second delayed output signal, said second delay interval being substantially equal to said first delay interval;

(c) logically combining said first binary input signal and said second delayed output signal to produce an enabling signal that defines unguarded time intervals;

(d) generating a requesting signal each time a predetermined binary value is detected in said second binary input signal; and

(e) inserting a binary level inverting pulse whenever said enabling signal and said requesting signal are simultaneously present, between transitions of said first delayed output signal, to produce said single binary signal, said binary level inverting pulse having a fixed duration at least equal to said allowed minimal bit duration.

5,469,431

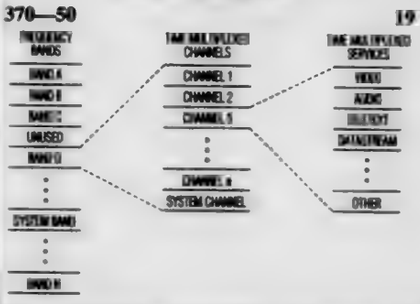
METHOD OF AND APPARATUS FOR CHANNEL MAPPING WITH RELATIVE SERVICE IDENTIFICATION

James W. Wendorf, Cortlandt Manor; Adam S. Hocek, New York, and Kenneth S. Singh, Harriman, all of N.Y., assignors to Philips Electronics North America Corp., New York, N.Y.

Filed Jul. 12, 1993, Ser. No. 89,961

Int. Cl.[6] H04J *4/00*

U.S. Cl. 370—50 **19 Claims**



1. A method of identifying availability and location of information streams corresponding to services, respectively transmitted over different ones of a multiplicity of channels, wherein each of a first plurality of said channels includes a second plurality of time-division multiplexed respective information streams corresponding to a second plurality of said services, a given channel of said first plurality of channels being transmitted with a given carrier frequency, comprising

transmitting, over a first channel, a global channel map including identification and locating information relating to all said information streams,

including in said global channel map a channel map table identifying how each respective one of said multiplicity of channels is transmitted, and a plurality of service map tables containing information identifying the location of multiplexed information streams corresponding to respective groups of said services, said second plurality of said services being one of said groups, and

transmitting, in one of said time-division multiplexed information streams included in said given channel, at least one shared parameter containing information for use by receivers receiving and utilizing different ones of said respective services being transmitted with said given carrier frequency,

whereby said receivers can use said at least one shared parameter without changing to a different carrier frequency.

5,469,432

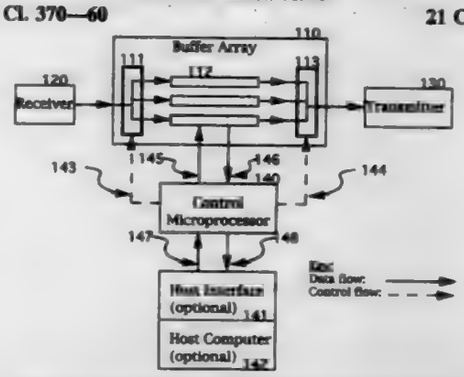
HIGH-SPEED DIGITAL COMMUNICATIONS NETWORK

Erann Gat, 2983 Margaret Dr., Pasadena, Calif. 91107

Filed Aug. 26, 1993, Ser. No. 111,975

Int. Cl.[6] H04L *12/46*

U.S. Cl. 370—60 **21 Claims**



1. A node of a communications network for transporting packets of digital data wherein said packets include a header portion containing data for controlling the transmission of packets through the network, and a payload portion containing data to be transported, said packets being of a predetermined fixed size, the size being no less than 512 bytes, said node comprising:

(a) buffer means comprising a plurality of memory buffers, each said memory buffer being of sufficient size to contain a packet in its entirety,

(b) transmitter means capable of transmitting in its entirety a packet contained in any one of said plurality of memory buffers onto a first unidirectional transmission medium,

(c) receiver means capable of receiving a packet from a second unidirectional transmission medium and storing said packet in its entirety into any one of said plurality of memory buffers, and

(d) processing means electrically connected to said memory buffers, said transmitter means, and said receiver means, said processing means being for:

i) controlling the selection of memory buffers from which packets are transmitted by said transmitter means,

ii) controlling the selection of memory buffers into which packets are stored by said receiver means, and

iii) accessing data contained in said memory buffers.

5,469,433

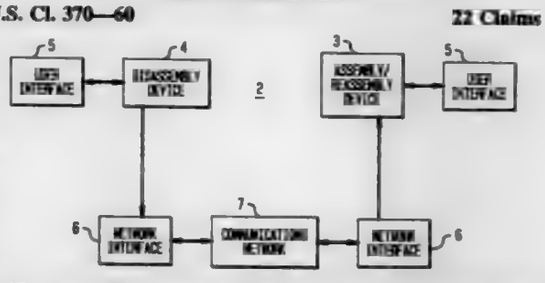
SYSTEM FOR THE PARALLEL ASSEMBLY OF DATA TRANSMISSIONS IN A BROADBAND NETWORK

Anthony J. McAuley, Glen Ridge, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Apr. 29, 1994, Ser. No. 235,062

Int. Cl.[6] H04L *12/56*

U.S. Cl. 370—60 **22 Claims**



17. A system for transmitting data through a telecommunications network, the system comprising:

means for dividing a data block into a plurality of data packets, and for inserting a packet descriptor data set into each data packet;

a first network interface connected to said means for dividing for transmitting the plurality of data packets to the network;

a second network interface for receiving a plurality of data packets from the network;

memory means for storing prior packet descriptor data sets, said memory means including a plurality of memory stages connected in parallel with each memory stage being formed to store a single packet descriptor data set; and

a control circuit connected to said memory means and said second network interface, said control circuit including means for comparing a packet descriptor data set of a received data packet with at least one prior packet descriptor data set stored in said memory means, processing means for updating the packet descriptor data set based on an output from the comparing means, and means for determining whether any packet descriptor data sets stored in said memory means designate a complete data block and for reading out from said memory means packet descriptor data sets designating a complete data block.

5,469,434

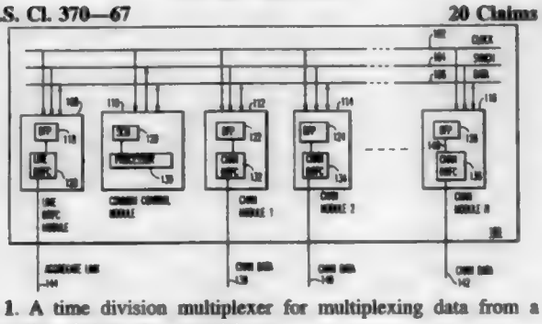
DISTRIBUTED FRAME PROCESSING FOR TIME DIVISION MULTIPLEXING

James P. Kurdzo, Watertown, and Alan B. Katze, Jr., Naugatuck, both of Conn., assignors to General DataComm, Inc., Middlebury, Conn.

Filed Jan. 21, 1993, Ser. No. 7,074

Int. Cl.[6] H04J *3/02*

U.S. Cl. 370—67 **20 Claims**



1. A time division multiplexer for multiplexing data from a plurality of channels, comprising:

a) a high speed bus having a first data rate;

b) a means for synchronizing;

c) a system communication manager means coupled to said high speed bus, and including intelligent processing means for generating a data frame;

d) a plurality of processors, each having a memory which stores said data frame, each one of said processors being coupled between a respective one of said channels and said high speed bus, and each of said processors being synchronized by said means for synchronizing, wherein said system communication manager means for transmitting said data frame to said plurality of processors over said high speed bus at predetermined times and at an effective second data rate slower than said first data rate, whereupon each of said processors stores said data frame in its memory, and said system communication manager means for causing said means for synchronizing to generate a synch signal which synchronizes said processors, wherein,

said data frame comprises a first sequence of instructions for said plurality of processors coupled to said channels, which instructions instruct said processors as to when to place data on said high speed bus, and each of said plurality of processors synchronously and simultaneously runs said data frame and places data on said high speed bus according to said instructions of said data frame when the channel with which a particular processor is associated is indicated by said data frame.

5,469,435

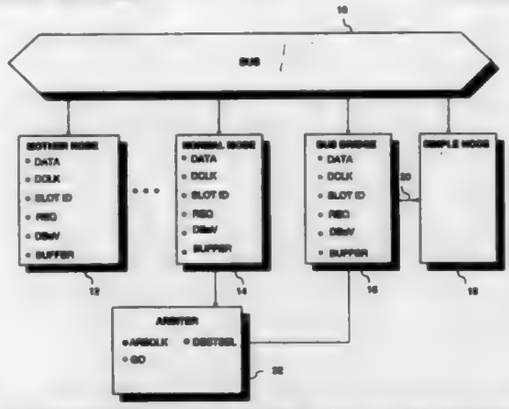
BUS DEADLOCK AVOIDANCE DURING MASTER SPLIT-TRANSACTIONS

William T. Krein, San Jose; Ronald R. Hochsprung, Los Gatos, and James D. Kelly, Aptos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jan. 25, 1994, Ser. No. 187,396

Int. Cl.[6] G06F *13/00*

U.S. Cl. 370—85.2 **27 Claims**



1. A process for operating a bus signal communication system having a plurality of nodes coupled to a bus for conducting split signal transactions by transferring requested information between a first node and a second node, such that each of the plurality of nodes functions either as a source or a destination node, the process comprising the steps of:

initiating a read-request operation by acquiring ownership of the bus by the first node, the read-request includes a first and a second split signal transactions;

sending a packet header from the first node to the second node during the first split signal transaction;

relinquishing ownership of the bus by the first node;

conducting other split signal transactions on the bus, the other split signal transactions include the first node functioning as a destination node to receive other split signal transactions from one of the plurality of nodes if one of the plurality of nodes is attempting to send a set of information to the first node and the second node functioning as a source node for conducting other split signal transactions to one of the plurality of nodes if the second node is attempting to send a set of information to one of the plurality of nodes;

acquiring ownership of the bus by the second node;

sending the requested information from the second node to the first node during the second split signal transaction; and

relinquishing ownership of the bus by the second node.

5,469,436

POLLING-TYPE DIGITAL COMMUNICATIONS SYSTEM HAVING PSEUDO-BALANCED MODE

James M. Brandner, 2745 50th Ave. SE., Rochester, Minn. 55904; Robert J. Manulik, 1448 Chippewa Dr. NW., Rochester, N.Y. 55901; Arthur J. Meyer, III, 505 7th St. SW., Oronoco, Minn. 55960, and Mark E. Schreiter, 2828 Paradise Ct. SW., Rochester, Minn. 55902

Filed Sep. 24, 1992, Ser. No. 950,629

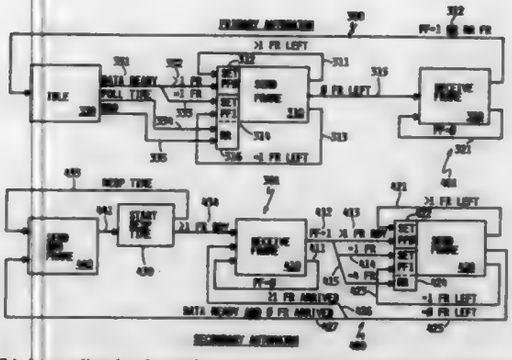
Int. Cl.[6] H04J *3/16*

U.S. Cl. 370—85.2 **29 Claims**

6. A method for transmitting digital data frames incorporating data items via an external communications network in both directions between a primary terminal and a secondary terminal, comprising the steps of:

(a) initiating at said primary terminal only a poll operation when a primary data item becomes available at said primary terminal, said poll operation including

(1) sending a first sequence having one or more data frames incorporating said primary data items;



(b) immediately thereafter, performing a response operation at said secondary terminal, said response operation including

(1) receiving said first sequence of data frames,

(2) sending a second sequence having one or more data frames incorporating secondary data items available at said secondary terminal,

(c) thereafter, at a time when a secondary data item becomes available at said secondary terminal, said time being independent of any poll operation from said primary terminal, sending a uniquely identifiable data frame to said primary terminal;

(d) initiating at said primary terminal a further poll operation at a further time determined by the receipt of said uniquely identifiable frame, independently of the availability of a primary data item at said primary terminal and independently of any prior poll operation.

5,469,437

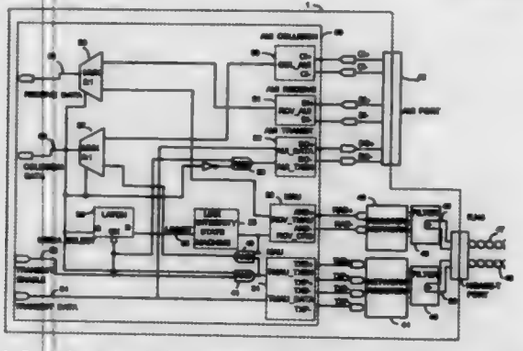
NETWORK CHIP WITH AUTO SENSING AND RECONFIGURATION

Thomas J. Runaldue, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jun. 12, 1992, Ser. No. 897,731

Int. Cl.[6] **H04L** *12/413*

U.S. Cl. 370—85.3 **3 Claims**



1. In a first circuit for coupling local area network signals to a second circuit for controlling the interchange of data between said local area network and the data bus of a computer in accordance with IEEE specification **802.3**, said first circuit including AUI collision, AUI receive and AUI transmit circuits coupled to an AUI port for receiving **10**Bbase2 or **10**Base5 coax media,

the improvement comprising:

a **10**Base-T MAU, said **10** Base-T MAU being incorporated into said first circuit, said **10**Base-T MAU including input and output terminals, said input and output terminals being a **10**Base-T port, said **10**Base-T MAU including a receiver MAU and a transmitter MAU;

circuit means for sensing whether valid signals are being received from said **10**Base-T port, wherein said circuit means for sensing includes a state machine for performing the logic of the Link Test Pass as defined by the IEEE **802.3** standard specification, said state machine providing an output LINST signal for asserting whether or not the Link Test Pass is being currently achieved and for providing a valid signal indication when said Link Test Pass is being achieved;

means responsive to said valid signal indication from said circuit means for sensing to cause the signals from said **10**Base-T port to be output from said **10**Base-T port to said second circuit if valid signals are received from said **10**Base-T ports or if said signals from said **10**Base-T port are not valid, to output signals from said AUI port to said second circuit; and

wherein said means responsive to said valid signal indication includes a pair of switches, said pair of switches being responsive to assertion of said valid signal received signal to select **10**Base-T port information.

5,469,438

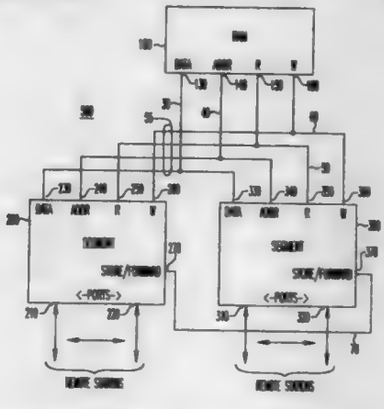
METHOD OF TRANSMITTING SIGNALS IN AN EXTENDIBLE LOCAL AREA NETWORK

Robert J. Baumert, and Clarence C. Jeh, both of Allentown, Pa., assignors to At&T IPM Corp., Coral Gables, Fla.

Filed Jan. 28, 1994, Ser. No. 188,623

Int. Cl.[6] **H04J** *3/00;* **H04L** *12/40*

U.S. Cl. 370—85.11 **23 Claims**



1. An extendible round robin local area hub network, said network comprising a hub station;

said hub station including a random access memory (RAM) unit and at least one hub station segment;

said at least one hub station segment being adapted to be coupled to at least N other hub station segments by a bidirectional control signal bus, N being a positive integer;

said at least one hub station segment including at least two ports, each of said ports being adapted to receive electrical signal packets from a remote station directly coupled to said at least one hub station segment;

said RAM unit and said at least one hub station segment being mutually coupled by a signal bus;

said signal bus mutually coupling said RAM unit and said at least one hub stationsegment comprising a bi-directional data bus, an address bus, a bi-directional RAM read signal bus, and a bi-directional RAM write signal bus.

5,469,439

TWO PRIORITY FAIR DISTRIBUTED ROUND ROBIN PROTOCOL FOR A NETWORK HAVING CASCADED HUBS

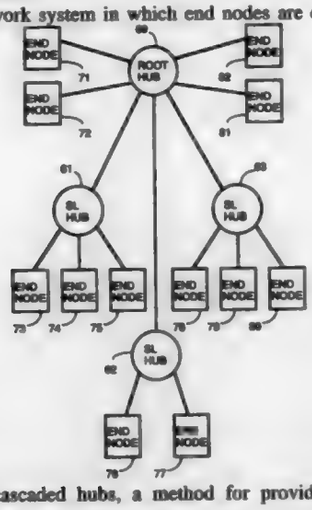
Patricia A. Thaler, Carmichael, Calif.; Jayant Kadambi, Monroe, Conn.; Michael Spratt, Bath, United Kingdom; Alan R. Albrecht, and Steven H. Goody, both of Granite Bay, Calif., assignors to Hewlett Packard Company, Palo Alto, Calif.

Filed May 4, 1994, Ser. No. 237,746

Int. Cl.[6] H04L *12/44*

U.S. Cl. 370—94.3 22 Claims

1. In a network system in which end nodes are connected to a



plurality of cascaded hubs, a method for providing for a two priority protocol, comprising the steps of:

(a) when at least one end node in the network system has a high priority network packet to send, acknowledging in turn each end node with a high priority network packet, each end node, when acknowledged, sending the high priority network packet; and,

(b) when at least one end node in the network system has a normal priority network packet to send and no end nodes have a high priority network packet, acknowledging in turn each end node with a normal priority network packet, including the following substep:

(b.1) acknowledging in turn, by a root hub, each second level hub which is connected to an end node which has a normal priority network packet to send, when each second level hub is acknowledged, performing the following substeps

(b.1.1) proceeding to acknowledge in turn, by the second level hub, each end node which is connected to the second level hub and which has a normal priority network packet, each end node, when acknowledged, sending the normal priority network packet, and,

(b.1.2) when the root hub receives a request for an end node to send a high priority packet, performing the following substeps,

(b.1.2.1) signaling by the root hub to the second level hub that a high priority request has been received, wherein the root hub signals the second level hub by forwarding a preempt signal from the root hub to the second level hub during an interpacket gap between transmission of network packets,

(b.1.2.2) ceasing from acknowledging in turn, by the second level hub, each end node which is connected to the second level hub and which has a normal priority network packet, and

(b.1.2.3) acknowledging in turn each end node with a high priority network packet, each end node, when acknowledged, sending the high priority network packet.

5,469,440

COMMUNICATIONS NETWORK AND METHOD

Christopher A. Wade, Suffolk, England, assignor to British Telecommunications, London, England

PCT No. PCT/GB92/01023, § 371 Date Nov. 23, 1993, § 102(e) Date Nov. 23, 1993, PCT Pub. No. WO92/22151, PCT Pub. Date Dec. 10, 1992

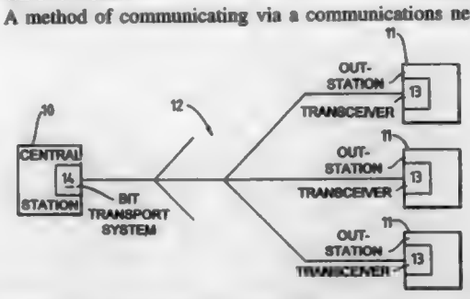
PCT Filed Jun. 8, 1992, Ser. No. 142,384

Claims priority, application United Kingdom, Jun. 6, 1991, 9112180

Int. Cl.[6] H04J *3/16*

U.S. Cl. 370—110.1 26 Claims

1. A method of communicating via a communications network



comprising a central station, a plurality of outstations, at least one outstation having one transducer for both transmitting signals to the central station and for receiving signals from the central station, and a transmission medium in the form of a branch arrangement between the central station and the outstations, the method comprising the steps of:

transmitting from the central station multiplexed signals for the outstations in the form of a stream of broadcast frames,

transmitting from the outstations return signals for the central station in the form of a stream of return frames in which the return signals are passively multiplexed,

each of said broadcast frames having a control portion and a traffic portion, the control portion including a series of contiguous first subframes each containing control information for a respective outstation, and the traffic portion including a series of contiguous second subframes each containing multiplexed blocks of traffic information for the outstations, and

at least one of the outstations using the same transducer for transmitting return signals that is used for receiving the broadcast frames.

5,469,441

DIGITAL TELEPHONE COMMUNICATION SYSTEM INCLUDING AN EXCHANGE AND A SERVICE STATION CONNECTED THERETO FOR SUPPLYING PROGRAMMING INFORMATION TO USER STATIONS BY WAY OF THE B CHANNELS OF THE SYSTEM

Piet B. Hesdahl, and Cornelis M. Klik, both of Hilversum, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 900,873, Jun. 18, 1992, abandoned. This application Oct. 17, 1994, Ser. No. 324,452

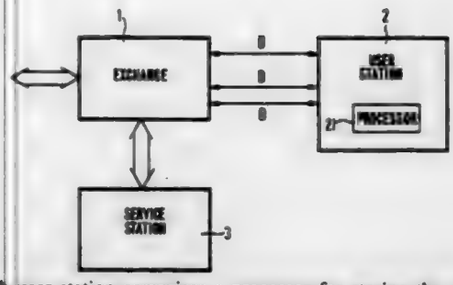
Claims priority, application European Pat. Off., Jun. 21, 1991, 91201592

Int. Cl.[6] H04J *3/12*

U.S. Cl. 370—110.1 7 Claims

1. A digital communication system comprising an exchange and a plurality of user stations, each user station being connected to the exchange by a telephone signalling channel (D) and a telephone communication channel (B) of greater bandwidth than the D channel; characterized in that:

said system further comprises a service station connected to the exchange and having a directory number, the service station storing programming information for at least several of the user stations;



each user station comprises a processor for storing the service station directory number and programming information supplied from the service station to the user station, the processor (i) automatically calling the service station to request additional programming information required by the user station whenever a call is received from the exchange by the user station for which call programming information is not already stored in said processor, and (ii) storing programming information transmitted by the service station in response to such request; and

the programming information supplied by the service station to a user station is transmitted via said exchange over a B channel.

5,469,442

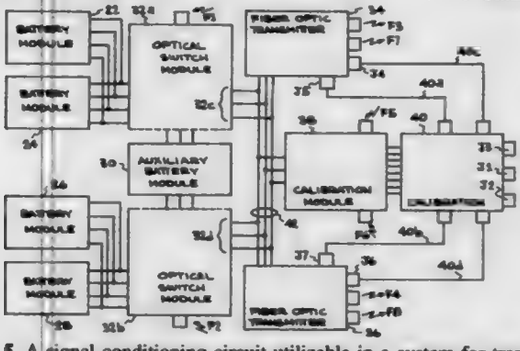
COMPACT SELF-CONTAINED ELECTRICAL-TO-OPTICAL CONVERTER/TRANSMITTER

Daniel A. Seligmann, Manteca; William C. Moss, San Mateo; Theodore C. Valk, Livermore, and Alan D. Conder, Tracy, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 933,642, Aug. 24, 1992, abandoned. This application Jul. 18, 1994, Ser. No. 283,473

Int. Cl.[6] H04J *3/12*

U.S. Cl. 370—110.4 **5 Claims**



5. A signal conditioning circuit utilizable in a system for transmitting analog data obtained from a transducer to a processor, comprising:

a housing;

a plurality of circuit elements contained within the housing and adapted to be electrically coupled to a transducer and optically coupled to a receiver/processor, said plurality of circuit elements comprising:

first means for receiving an analog electrical signal from the transducer;

second means for generating a linear reference signal;

third means for mixing the analog electrical signal with the linear reference signal to form a calibrated output signal, wherein said calibrated output signal comprises the analog electrical signal and the linear reference signal being displaced in time from each other;

fourth means for converting the calibrated output signal to an optical signal and for transmitting the optical signal to a processor; and

batteries for providing power to the signal conditioning circuit.

5,469,443

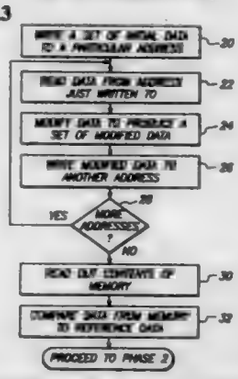
METHOD AND APPARATUS FOR TESTING RANDOM ACCESS MEMORY

Nirmal Saxena, San Jose, Calif., assignor to HaL Computer Systems, Inc., Campbell, Calif.

Filed Oct. 1, 1993, Ser. No. 130,376

Int. Cl.[6] G01R *31/28*

U.S. Cl. 371—21.3 **15 Claims**



1. For a memory having a plurality of storage locations, each storage location having a unique address, a method for testing said memory for defects, comprising the steps of:

(a) writing an initial set of data to a particular address in said memory;

(b) reading a set of stored data from the address just written to;

(c) modifying the stored data to produce a set of modified data;

(d) writing the modified data to another address in said memory;

(e) repeating steps (b) through (d) until all addresses in said memory have been written to; and

(f) comparing data values stored in said memory with reference data values to determine whether said memory contains any defects.

5,469,444

ELECTRICALLY ERASABLE AND PROGRAMMABLE NON-VOLATILE MEMORY SYSTEM WITH WRITE-VERIFY CONTROLLER USING TWO REFERENCE LEVELS

Tetsuo Endoh, Yokohama; Riichiro Shirota, Kawasaki; Kazunori Ohuchi; Ryouhei Kirisawa, both of Yokohama; Seiichi Aritome, Kawasaki; Tomoharu Tanaka, Yokohama, and Yoshiyuki Tanaka, Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 229,761, Apr. 19, 1994, Pat. No. 5,386,422, which is a continuation of Ser. No. 851,286, Mar. 12, 1992, Pat. No. 5,321,699. This application Nov. 16, 1994, Ser. No. 341,955

Claims priority, application Japan, Mar. 12, 1991, 3-72424

The portion of the term of this patent subsequent to Jun. 14, 2011, has been disclaimed.

Int. Cl.[6] G01R *31/28*

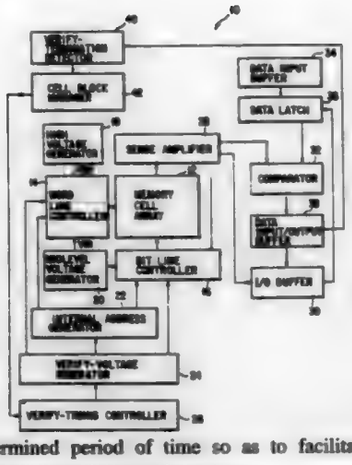
U.S. Cl. 371—215 **20 Claims**

1. A non-volatile semiconductor memory system comprising:

an array of rows and columns of memory cells comprising electrically erasable and programmable memory cell transistors;

charge/discharge control means connected to said array, for causing a sub-array of memory cell transistors selected from said array to change a threshold voltage thereof by changing the amount of electrical carriers being charged therein; and

verify means for verifying a resultant electrical state of said sub-array of memory cell transistors by checking their threshold voltages for variations using a first reference voltage and a second reference voltage potentially greater than the first voltage which voltages define a specific range, and for, when an irregular cell transistor remains among them to have an insufficient threshold voltage which is out of the range, performing an additional charge-amount change operation for a



predetermined period of time so as to facilitate the state thereof to come closer to the range.

5,469,445

TRANSPARENT TESTING OF INTEGRATED CIRCUITS

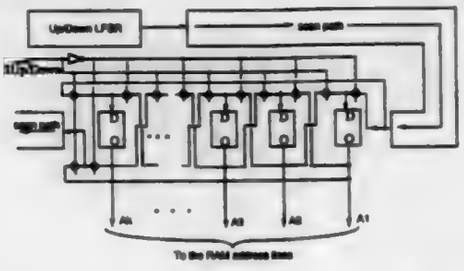
Michael Nicolaidis, Grenoble, France, assignor to Sofia Koloni Ltd., Athens, Greece

Filed Nov. 4, 1993, Ser. No. 140,156

Claims priority, application Greece, Mar. 5, 1992, 920100088

Int. Cl.[6] G06F *11/26*; G11C *29/00*

U.S. Cl. 371—22.3 **11 Claims**



1. A method for testing a memory coupled to a data compactor, comprising the following steps:

a) providing a transparent test sequence including a succession of read and write operations on each memory cell, such that the initial state of the memory cell is re-established at the end of the test sequence and wherein the results of a predetermined number of read operations are to be provided to the data compactor;

b) supplying the data compactor with data or the complements thereof, that the test sequence would provide if the memory cell were faultless;

c) storing the state of the data compactor corresponding to the supplied data;

d) carrying out the test sequence to change the state of the data compactor if faults are detected in the memory; and

e) comparing the state of the data compactor after carrying out the test sequence with the stored state.

5,469,446

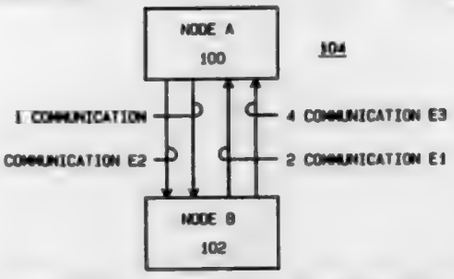
RETRY FILTER AND CIRCULATING ECHO METHOD AND APPARATUS

Ronald E. Fuhs; William A. Hammond, Jr., both of Rochester; George W. Nation, Eyota; Steven L. Rogers, and John C. Willis, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1994, Ser. No. 187,693

Int. Cl.[6] G08C *25/02*; H04L *1/20*

U.S. Cl. 371—33 **12 Claims**



1. A method of processing packets communicated between nodes via at least one unidirectional ring, said method comprising the steps of:

allocating a sequence identification for a packet and sending said packet including said allocated sequence identification at an origination node;

receiving said packet at a destination node;

establishing a packet filter utilizing said allocated sequence identification and generating and sending a first echo packet to said origination node responsive to receiving said packet at said destination node;

receiving said first echo packet at said origination node;

generating and sending a second echo packet to said destination node responsive to said received first echo packet at said origination node;

receiving said second echo packet at said destination node; and

generating and sending a third echo packet to said origination node responsive to receiving said second echo packet at said destination node.

5,469,447

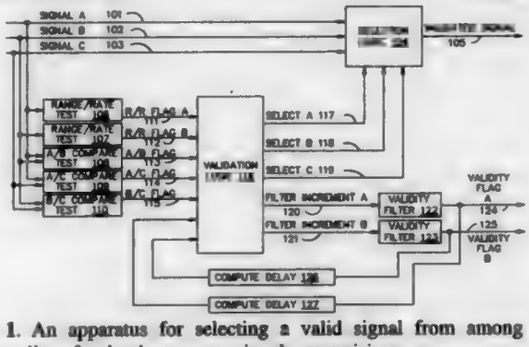
APPARATUS FOR SELECTING A VALID SIGNAL FROM A PLURALITY OF REDUNDANT MEASURED AND MODELLED SENSOR SIGNALS

George A. Brunemann, Jr., Cincinnati, and Paul R. Reismiller, West Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 248,849, May 25, 1994, abandoned, which is a continuation of Ser. No. 699,065, May 13, 1991, abandoned. This application Oct. 28, 1994, Ser. No. 331,294

Int. Cl.[6] G06F *11/08*; *15/40*

U.S. Cl. 371—36 **6 Claims**



1. An apparatus for selecting a valid signal from among a plurality of redundant sensor signals comprising:

a plurality of rate/range test circuits for receiving a first measured signal input and outputting a respective ranger/rate flag;

a plurality of comparison signal test circuits for comparing said first measured signal input to a modeled signal input and for outputting a respective first comparison flag;

a plurality of comparison signal test circuits for comparing said first measured input signal to a second measured input signal, and for outputting a respective second comparison flag;

a plurality of validity filters, each having as an input a filter increment signal, and each outputting a respective validity flag; and

validation logic for receiving as inputs said validity flags, said range/rate flags, and said first second comparison flags, and for providing as outputs a plurality of selection flags each selected according to a weighted value of said range/rate flags, said comparison flags, and said validity flags, and for generating a plurality of measured filter increment signals each having a magnitude and sign according to the weight value of said range/rate flags, said comparison flags, and said validity flags where the most negative value represents a valid measured signal and the most positive value represents an invalid measured.

5,469,448

ENCODING/DECODING CIRCUIT, AND DIGITAL VIDEO SYSTEM COMPRISING THE CIRCUIT

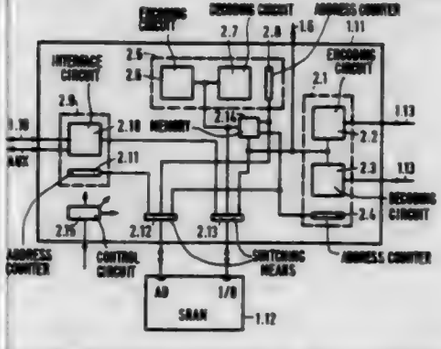
Adrianus J. M. Denissen, and Bernardus A. M. Zwaans, both of Groenewoudseweg 1, 5621 BA Eindhoven, Netherlands

Continuation of Ser. No. 822,792, Jan. 21, 1992, abandoned. This application Feb. 8, 1994, Ser. No. 193,613

Claims priority, application Netherlands, Feb. 7, 1991, 9100218

Int. Cl.[6] G06F *11/10*; H03M *13/00*

U.S. Cl. 371—37.4 **19 Claims**



1. An encoding/decoding circuit having a first operating mode as an encoder for encoding successive blocks of a series of data words supplied thereto, the data words in each block being sequentially encoded in accordance with first and second error protection codes to thereby form code words in each of said codes for recording on a record carrier; said circuit also having a second operating mode as a decoder for decoding each of successive blocks of recorded code words recovered from the record carrier, each recovered block of code words being sequentially decoded in accordance with said first and second error protection codes in reverse order to thereby recover decoded data words; said circuit comprising:

a first, a second and a third sub-circuit;

said first sub-circuit comprising: a first encoder for receiving a block of a first series of code words which has already been formed by the second sub-circuit in accordance with the second error protection code, said first encoder encoding said block of supplied data words in accordance with the first error protection code to thereby derive a second series of code words, said first and second series of code words being for recording on the record carrier; and a first decoder for receiving from the record carrier a block of code words which has been recorded thereon and decoding said block in accordance with the first error protection code to thereby derive a block of partially decoded code words; said first sub-circuit having a first system clock frequency;

said second sub-circuit comprising: a second encoder for also receiving a block of supplied data words and encoding in accordance with the second error protection code to form said first series of code words; and a second decoder for receiving said block of partially decoded code words and decoding in accordance with the second error protection code to thereby derive decoded data words, the decoded data words being data words from which the recorded block of code words was derived; said second sub-circuit having a second system clock frequency;

said third sub-circuit comprising interface means for receiving the supplied data words at a data word clock frequency and outputting the supplied data words to be encoded by said second encoder; said interface means also receiving the decoded data words derived by said second decoder and outputting said decoded data words at said data word clock frequency; said third sub-circuit having a third system clock frequency;

a frame memory for providing intermediate storage of (i) blocks of supplied data words outputted by said interface means, (ii) blocks of partially decoded code words produced by said first decoder from code words recorded on the record carrier, and (iii) blocks of decoded data words derived by said second decoder for supply to said interface means;

switching means coupled to each of said sub-circuits and to said frame memory for providing cyclically multiplexed access to said frame memory by each of said sub-circuits; and

control means for controlling said switching means so that said cyclically multiplexed access to said frame memory is at a frequency at least equal to the sum of said first, second and third system clock frequencies, whereby each of said sub-circuits is provided with cyclically multiplexed access to said frame memory at a frequency corresponding to the system clock frequency of the relevant sub-circuit.

5,469,449

FIFO BUFFER SYSTEM HAVING AN ERROR DETECTION AND RESETTING UNIT

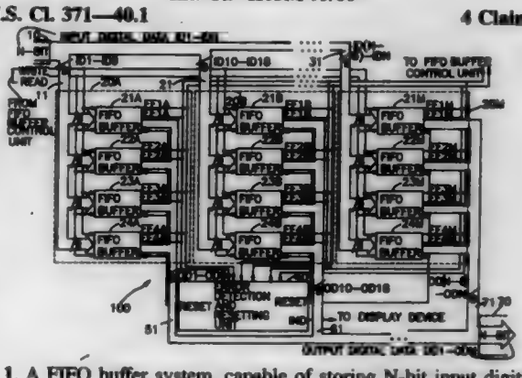
Yong-Gyu Park, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 11, 1994, Ser. No. 320,631

Claims priority, application Rep. of Korea, Jan. 28, 1993, 93-22616

Int. Cl.[6] H03M *13/00*

U.S. Cl. 371—40.1 **4 Claims**



1. A FIFO buffer system, capable of storing N-bit input digital data, for producing N-bit output digital data having a constant bit rate, N being a multiple of M and M being an positive integer, which comprises:

M number of data storage means arranged in parallel for temporarily storing the N-bit input digital data and producing the N-bit output digital data in synchronization, each of said data storage means synchronously storing (N/M)-bit input digital data and generating storage state signals including a full flag and an empty flag signals representative of the full and the empty states thereof, respectively; and

error detection and resetting means, responsive to the storage state signals generated by said M number of data storage means, for generating a reset signal for resetting the FIFO buffer system when there exists a discrepancy among the full flag signals or the empty flag signals.

5,469,450

NONVOLATILE MEMORY DEVICE INCLUDING MULTI-ECC CIRCUIT

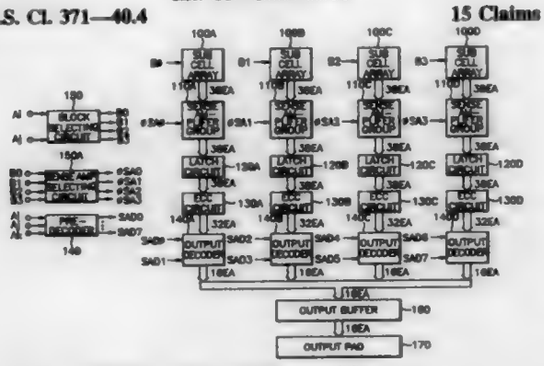
Sung-Hee Cho, and Hyong-Gon Lee, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 30, 1993, Ser. No. 99,331

Claims priority, application Rep. of Korea, Jul. 30, 1992, 13685/1992

Int. Cl.[6] G06F *11/10*

U.S. Cl. 371—40.4 **15 Claims**



1. A nonvolatile memory device comprising:

a memory cell array partitioned into a plurality of sub cell arrays, each of said sub cell arrays having both normal memory cells and parity cells for storing normal cell data and parity cell data;

a plurality of sense amplifier groups, each being connected to a different one of said plurality of sub cell arrays for sensing of cell data from one of said sub cell arrays;

a plurality of error checking and correcting circuits each being connected to a different one of said sense amplifier groups for repairing syndrome bits resulting from cell data stored in one of said sub cell arrays, each of said error checking and correcting circuits being placed in a respective different one of said sub cell arrays; and

a plurality of output decoders each being connected to a different one output of said error checking and correcting circuits.

5,469,451

ERROR DETECTION AND CORRECTION OF A SEMICONDUCTOR MEMORY DEVICE

Toru Henmi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 782,121, Oct. 25, 1991, abandoned. This application Nov. 23, 1994, Ser. No. 347,220

Claims priority, application Japan, Jan. 26, 1990, 2-288905

Int. Cl.[6] H03M *13/00*

U.S. Cl. 371—40.4 **4 Claims**

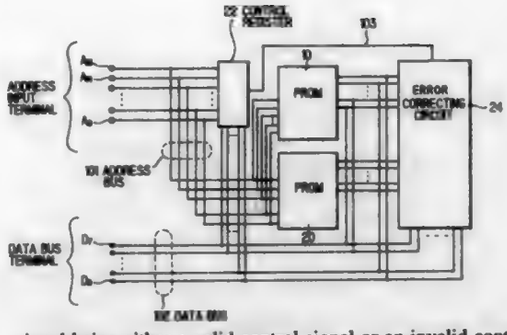
1. A semiconductor memory comprising:

a first PROM for storing first data;

a second PROM for storing second data;

an error correcting circuit, which when activated, corrects said first data with said second data and outputs corrected data, and which, when deactivated, outputs said first data uncorrected irrespective of whether or not said first data is in error;

a control register for receiving control data, for storing said control data, for responding to said control data stored therein and for outputting, in response to said control data, a control signal to control said error correcting circuit, said control



signal being either a valid control signal or an invalid control signal, such that said error correcting circuit is activated when said control register is outputting said valid control signal, and said error correcting circuit is deactivated when said control register is outputting said invalid control signal.

5,469,452

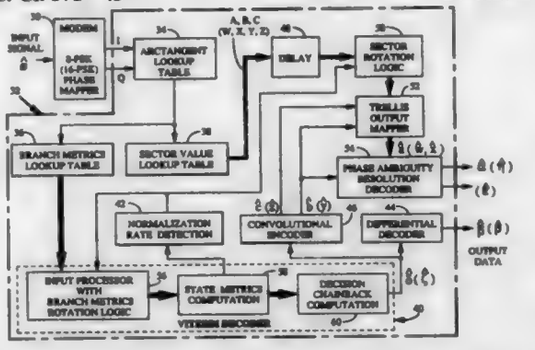
VITERBI DECODER BIT EFFICIENT CHAINBACK MEMORY METHOD AND DECODER INCORPORATING SAME

Ephraim Zehavi, Haifa, Israel, assignor to Qualcomm Incorporated, San Diego, Calif.

Filed Sep. 27, 1991, Ser. No. 767,167

Int. Cl.[6] G06F *11/10*

U.S. Cl. 371—43 **24 Claims**



1. An apparatus for decoding trellis coded data transmitted as a signal point of a set of signal points in a signal space coordinate system, comprising:

first decoder means for receiving first information relative to signal space coordinates of a received signal, and providing an output indicative of an estimate of a first data bit represented by said received signal;

encoder means for receiving and encoding said first data bit estimate according to a predetermined encoding format, and for providing an output of corresponding encoded data; and

trellis output mapping means for receiving second information corresponding in signal space to a region defined between two consecutive signal points of said set of signal points containing said signal space coordinates of said received signal receiving said encoded data, determining from said second information and said encoded data an estimate of at least one additional data bit represented by said received signal.

5,469,453

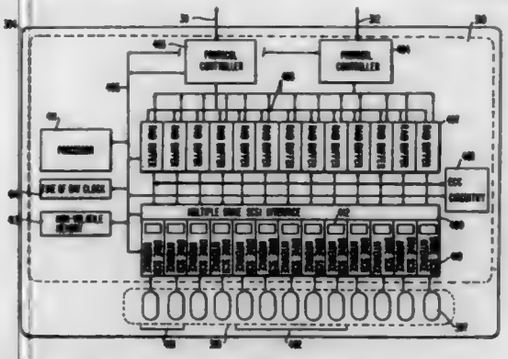
DATA CORRECTIONS APPLICABLE TO REDUNDANT ARRAYS OF INDEPENDENT DISKS

Joseph S. Glider, Mountain View; David T. Powers, Morgan Hill, and Thomas E. Idleman, Santa Clara, all of Calif., assignors to MTI Technology Corporation, Anaheim, Calif.

Continuation of Ser. No. 54,680, Apr. 29, 1993, abandoned, which is a continuation of Ser. No. 488,750, Mar. 2, 1990, Pat. No. 5,233,618. This application Feb. 21, 1995, Ser. No. 391,332

Int. Cl.[6] G06F *11/00;11/10*

U.S. Cl. 371—68.1 8 Claims



1. A mass data storage apparatus comprising:

a set of physical mass storage devices operatively interconnected so as to function as at least one logical mass storage device;

means for reading blocks of data from and writing blocks of data to the set of physical mass storage devices; and

means for validating blocks of data read from or written to the set of physical mass storage devices, wherein the validating means comprises means for, when writing a block of data to a device of the set, storing with the block of data on the device information defining the intended logical storage location for the block of data and, when reading a block of data from a device of the set, detecting whether the block of data that is read was misdirected within the apparatus when written by comparing the information defining the intended logical storage location stored with the read block of data and a logical address associated with the logical storage location from which the block of data is read.

5,469,454

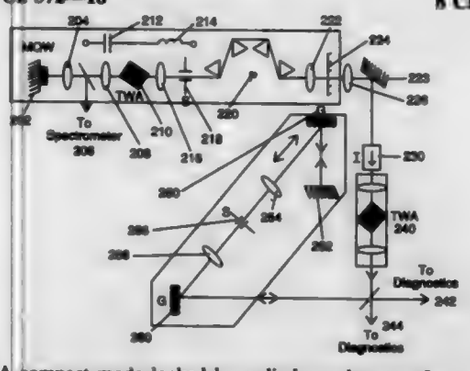
MODE LOCKED LASER DIODE IN A HIGH POWER SOLID STATE REGENERATIVE AMPLIFIER AND MOUNT MECHANISM

Peter J. Delfyett, Jr., Oviedo, Fla., assignor to University of Central Florida, Orlando, Fla.

Filed May 2, 1994, Ser. No. 236,373

Int. Cl.[6] H01S *3/098*

U.S. Cl. 372—18 5 Claims



1. A compact mode locked laser diode seed source for a solid state regenerative amplifier system comprising:

a standard wallplug power source for providing a bias signal;

an optical cavity excited and actively mode locked by the bias signal;

a saturable absorber adjacent to the power source for simultaneously passively modclocking the optical cavity, the combine interaction of the actively modclocking optical cavity and the passively modclocking optical cavity producing prechirped optical pulses;

means for compressing the prechirped optical pulses up to approximately 200 fs:

means for amplifying the compressed optical pulses; and

a solid state regenerative amplifier for receiving the amplified pulses and for outputting a high power ultrashort optical signal, wherein an output signal of up to approximately 290 fs is generated.

5,469,455

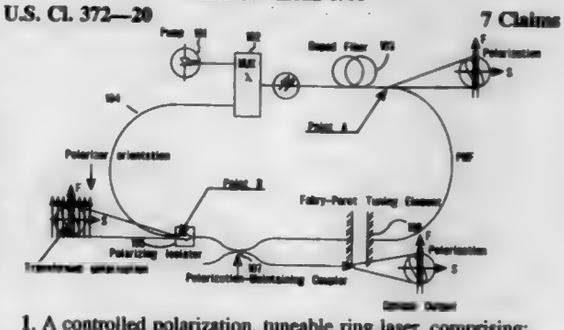
FIBER OPTIC RING LASER

Paul Reitz, Palmyra, and Hatem Abdelkader, Harrisburg, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Nov. 30, 1994, Ser. No. 347,538

Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—20 7 Claims



1. A controlled polarization, tuneable ring laser, comprising:

(a) A source for optical pumping coupled to means for multiplexing light signals;

(b) A first section of optical fiber connecting said means for multiplexing to a polarizing optical isolator, said polarizing optical isolator oriented so its transmission axis is substantially aligned with a polarization vector of light propagating in said first section of fiber;

(c) Means for optically tuning light traveling in said ring laser to a selected bandwidth connected to said polarizing optical isolator, said means for tuning light connected to an output coupler;

(e) A second section of optical fiber connected to said output coupler, said second section further making a connection to a section of doped optical fiber, said doped fiber further connected to said multiplexer, thereby completing a laser ring cavity; and

(f) Said second section of optical rotated so that at said connection of said second section to said section of doped fiber, a polarization vector of light propagating in said second section of optical fiber is oriented along a preferred orientation.

5,469,456

LASER DEVICE AND METHOD OF MANUFACTURE USING NON-METALIZED FIBER

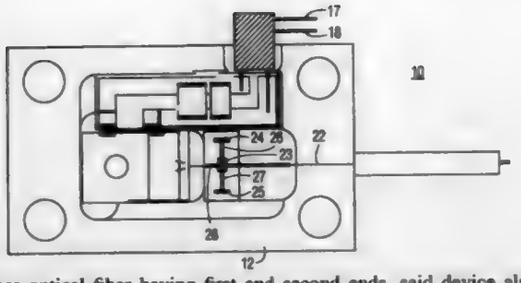
Lesley Rogers, Los Angeles, and Michael M. Ung, Ontario, both of Calif., assignors to Opto Power Corporation, City Of Industry, Calif.

Filed Mar. 31, 1994, Ser. No. 220,441

Int. Cl.[6] H01S *3/18;* G02B *6/30;6/42*

U.S. Cl. 372—43 11 Claims

1. A laser device including a semiconductor laser chip for generating light at an output position, said device also including a



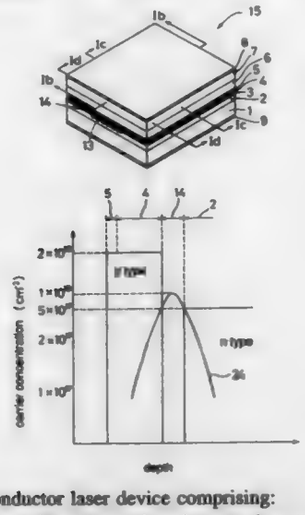
glass optical fiber having first and second ends, said device also including means for securing said first end at said output position, said means for securing including a solder an indium containing solder adhering directly to said optical fiber adjacent said first end in the absence of any metallized layer on said fiber.

5,469,457

SEMICONDUCTOR LASER WITH COD PREVENTING DISORDERED REGIONS

Yutaka Nagai, and Akihiro Shima, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1993, Ser. No. 149,958
Claims priority, application Japan, Apr. 12, 1993, 5-084738
Int. Cl.[6] H01S *3/18;3/085*
U.S. Cl. 372—45 **4 Claims**



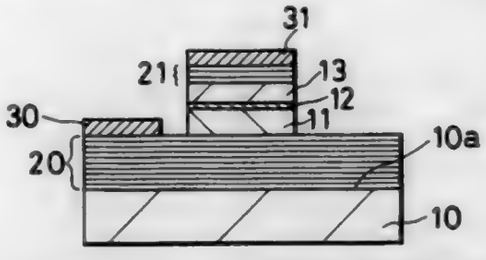
1. A semiconductor laser device comprising:
a first conductivity type semiconductor substrate having a front surface and a rear surface opposite said front surface;
a first conductivity type lower cladding layer disposed on the front surface of said semiconductor substrate;
an active layer including a multiple quantum well structure comprising alternatingly laminated barrier layers and well layers, disposed on said lower cladding layer, and having an effective energy band gap;
a second conductivity type upper cladding layer disposed on said multiple quantum well structure;
opposed facets transverse to said lower and upper cladding layers;
a ridge comprising a stripe-shaped second conductivity type semiconductor having a length extending in a laser resonator length direction of said semiconductor laser, spaced from said facets, disposed on said upper cladding layer, and having a refractive index;
a first conductivity type current blocking layer having an energy band gap larger than the effective energy band gap of said multiple quantum well structure and a refractive index smaller than the refractive index of said ridge, said current blocking layer being disposed on said upper cladding layer adjacent to, contacting, and surrounding said ridge;
a region disposed between said ridge and each of said facets adjacent each of said facets, and penetrating through said second conductivity type upper cladding layer and said multiple quantum well structure and into said first conductivity type lower cladding layer, and including a dopant impurity producing the first conductivity type conductivity in a concentration sufficient to disorder said multiple quantum well structure within the region without converting said second conductivity type upper cladding layer to the first conductivity type in said region:
a second conductivity type contact layer disposed on said current blocking layer and said ridge;
first and second electrodes disposed on said semiconductor substrate and said second conductivity type contact layer, respectively.

5,469,458

SURFACE-EMITTING SEMICONDUCTOR DEVICE

Takahiro Numai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 19, 1993, Ser. No. 154,472
Claims priority, application Japan, Nov. 27, 1992, 4-318710
Int. Cl.[6] H01S *3/19*
U.S. Cl. 372—45 **16 Claims**



1. In a surface-emitting semiconductor device comprising:
a semiconductor substrate having a surface inclined with its (100)-plane;
a first semiconductor cladding layer of a first electroconduction type formed directly or through a semiconductor layer on said surface of said substrate;
a semiconductor active layer formed on said first semiconductor cladding layer; and
a second semiconductor cladding layer of a second electroconduction type opposite in polarity to said first electroconduction type, said second semiconductor cladding layer being formed on said semiconductor active layer;
the improvement wherein said active layer is different in lattice constant from at least one of said first and second cladding layers, and a laser beam is emitted in a direction approximately perpendicular to said surface of said substrate, whereby the polarization direction of the laser beam is confined to a specific direction.

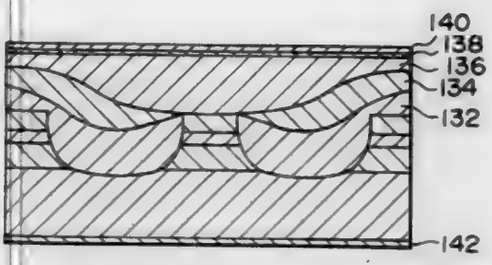
5,469,459

LASER DIODE ELEMENT WITH EXCELLENT INTERMODULATION DISTORTION CHARACTERISTIC

Tetsuro Okuda; Hirohito Yamada, and Toshitaka Torikai, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Jan. 7, 1994, Ser. No. 178,859
Claims priority, application Japan, Jan. 8, 1993, 5-001501; Apr. 21, 1993, 5-093460
Int. Cl.[6] H01S *3/19*
U.S. Cl. 372—46 **12 Claims**

1. A laser diode element comprising:
a semiconductor block having:
a first end surface;



a second end surface opposite to said first end surface;

a laser cavity which is formed between said first and said second end surfaces and which has a predetermined length L;

a plurality of coating layers which are coated on said first end surface to provide a reflectivity smaller than 5%; and

an active layer and a uniform grating which are formed in the direction of said laser cavity and which are coupled to each other at a predetermined coupling constant K;

said laser diode element being specified by a product of said predetermined coupling constant K and said predetermined length L and falling within a range between 0.4 and 1.0, both inclusive.

5,469,460

RING LASER

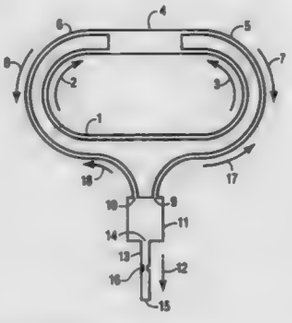
Raymond Van Roijen, and Engelbertus C. M. Pennings, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 9, 1994, Ser. No. 304,106

Claims priority, application European Pat. Off., Sep. 10, 1993, 93202635

Int. Cl.[6] H01S *3/083*

U.S. Cl. 372—94 **8 Claims**



1. A ring laser comprising:

a ring of semiconductor material for generating laser radiation; two waveguides;

a coupler for coupling laser radiation in the form of two waves travelling clockwise and counterclockwise, respectively, emerging out of said ring to said two waveguides;

a combiner having two inputs connected to said two waveguides, respectively, and further having an output;

an output waveguide connected to the output of said combiner; and

means for producing a well-defined phase difference in the laser radiation applied to the two inputs of said combiner to increase an output power, thereby rendering said ring laser more efficient.

5,469,461

ELECTRIC INDUCTION FURNACE

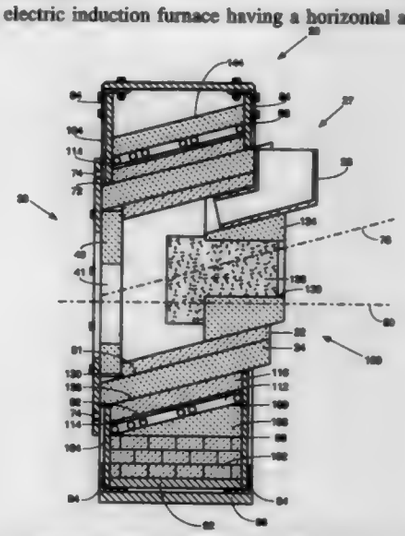
Martin Andren, 2813 R.F.D., Long Grove, Ill. 60047

Filed Apr. 1, 1993, Ser. No. 41,671

Int. Cl.[6] H05B *6/24*

U.S. Cl. 373—156 **3 Claims**

1. An electric induction furnace having a horizontal axis which



includes an electric coil for heating predetermined electrically conductive materials by induction, the improvement comprising:

a first crucible adapted to carry said predetermined electrically conductive materials defining a predetermined longitudinal axis;

a second crucible disposed generally concentrically around and in contact with said first crucible for carrying said first crucible, said first and second crucibles formed from at least one refractory-type material; and

means for rigidly carrying said first and second crucibles such that said predetermined longitudinal axis is disposed at a predetermined angle relative to said horizontal axis.

5,469,462

RECEIVING ARRANGEMENT INCLUDING A VARIABLE EQUALIZER WHICH VARIABLE EQUALIZER IS CONTROLLED ON THE BASIS OF ONE OR MORE SIGNAL PORTIONS PRODUCED BY THE VARIABLE EQUALIZER

Josephus A. H. M. Kahlman, and Albert M. A. Rijckaert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 4, 1993, Ser. No. 102,077

Claims priority, application European Pat. Off., Aug. 6, 1992, 92202428

Int. Cl.[6] G11B *5/35;* **H03H** *7/30;7/40;* **H03K** *5/159*

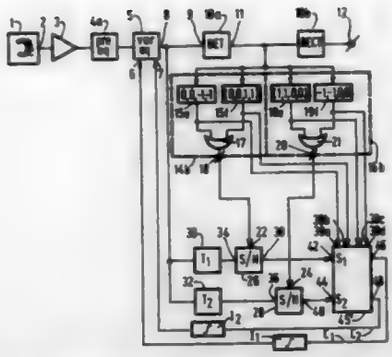
U.S. Cl. 375—232 **45 Claims**

1. An arrangement for producing a digital signal from an input signal obtained from a transmission medium, the arrangement comprising:

variable equalizer means for producing an equalized signal from the input signal on the basis of a first control signal and a second control signal;

signal detector means for producing the digital signal from the equalized signal;

control signal generator means for generating the first control signal and the second control signal on the basis of a first sample value and a second sample value, the first control signal being derived in whole or in part from a first arithmetical combination of the first sample value and the second sample value, and the second control signal being derived in whole or in part from a second arithmetical combination of



the first sample value and the second sample value, one of the first arithmetical combination and second arithmetical combination being the sum of the first sample value and the second sample value, and the other of the first arithmetical combination and second arithmetical combination being the difference between the first sample value and the second sample value;

bit sequence detector means for generating (a) a first selection signal upon detection of a first bit sequence in the digital signal and (b) a second selection signal upon detection of a second bit sequence in the digital signals the first bit sequence corresponding to a first signal portion of the equalized signal and the second bit sequence corresponding to a second signal portion of the equalized signal; and

sample-and-hold means for producing the first sample value and the second sample value, said sample-and-hold means being adapted to (a) sample the first signal portion in response to the first selection signal so as to produce the first sample value and (b) sample the second signal portion in response to the second selection signal so as to produce the second sample value.

5,469,463

EXPERT SYSTEM FOR IDENTIFYING LIKELY FAILURE POINTS IN A DIGITAL DATA PROCESSING SYSTEM

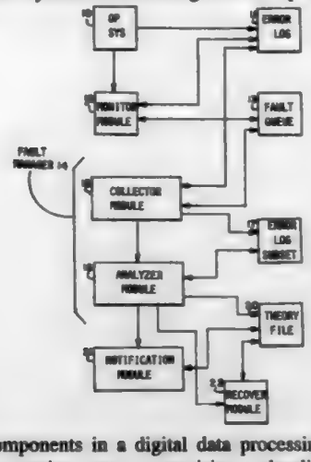
Herman Polich, Monument; James Nicholson, and Larry Emlich, both of Colorado Springs, all of Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 175,485, Mar. 30, 1988, abandoned. This application May 8, 1991, Ser. No. 700,112

Int. Cl.[6] **G06F** *11/30;11/34*

U.S. Cl. 395—182.18 **51 Claims**

35. An expert system for detecting one of a plurality of likely



failures of components in a digital data processing system, said digital data processing system comprising a plurality of units each comprising a plurality of said components, said expert system comprising

an operating system means for storing in an error log a plurality of error entries, each error entry containing a plurality of differing indicia identifying components of differing types associated with a single error event in said digital data processing system,

a monitor module means for monitoring said error entries to determine whether the number of error entries associated with a particular unit exceeds a threshold, generating a fault entry for each unit having error entries that exceed said threshold, each said fault entry identifying a unit and identifying said error entries associated with said unit, and inserting said fault entries into a fault queue,

a collector module means for retrieving a fault entry from said fault queue, retrieving, from said error log, stored error entries associated with a unit identified in said fault entry, and inserting said error entries into an error log subset,

an analyzer module means for analyzing said plurality of differing indicia contained within said error entries in said error log subset, by determining whether there is a substantially random distribution of indicia with respect to a plurality of components of a given type or a concentration of indicia with respect to one or more components of a given type as at least one step in identifying a pattern of indicia identifying components of differing types that corresponds with one of a plurality of failure theories, said analyzer module means storing said failure theory in a theory file,

a notification module means for querying said theory file, and, based on a failure theory in said theory file, notifying a user of likely failure of said component,

and a recovery module means for querying said theory file, and, based on a failure theory in said theory file, initiating recovery operations, to avoid data loss,

said operating system means, said monitor module means, said collector module means, said analyzer module means, said notification module means, and said recover module means being adapted for implementation by a digital data processing system.

5,469,464

TRANSMISSION SYSTEM FOR TRANSMITTING SIGNALS IN A BURST MODE

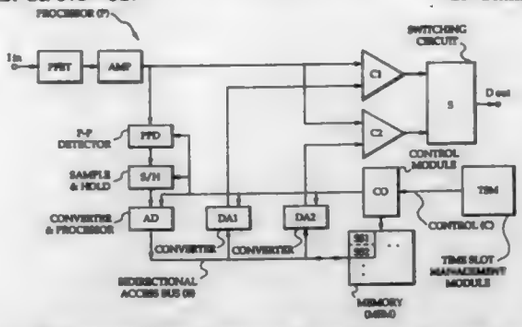
Jan L. B. De Groote, Schilde; Jan A. O. Vandewege, Gent; Joost Allaert, Kortrijk, and Hans A. G. Van Parys, Oostkamp, all of, Belgium, assignors to Alcatel, N.V., Rijswijk, Netherlands

Filed Sep. 9, 1993, Ser. No. 118,528

Claims priority, application European Pat. Off., Sep. 9, 1992, 92202737

Int. Cl.[6] **H04L** *25/06;25/10*

U.S. Cl. 375—317 **15 Claims**



1. Transmission system wherein bursts of information input signals are transmitted from a transmitter in a substation to a receiver in a main station, said receiver including signal processing means (P) provided with a memory (MEM) and first and second comparator circuits (C1, C2), first inputs of which are coupled to an input terminal of said receiver, where said input terminals receives said input signals (Iin) from said substation, said signal processing means (P) being responsive to said input signals (Iin) for providing a decision threshold signal related to a characteristic of said input signal and storing said decision threshold signal in

said memory (MEM), second inputs of said first and second comparator circuits being coupled with said memory via respective first (DA1) and second (DA2) digital-to-analog convertors, said first (DA1) and second (DA2) digital-to-analog convertors converting digital signals providing by said memory (MEM) into analog signals provided to said second inputs, each of said digital signals being indicative of a previously stored decision threshold signal, and said first and second comparator circuits comparing said characteristic of said input signal with one of said previously stored decision threshold signals, said memory (MEM) and said conventors (DA1, DA2) being controlled by control means (CO) to alternatively apply successive ones of said previously stored decision threshold signals to said second inputs of said first and second comparator circuits (C1, C2), and said signal processing means (P) additionally including switching means (S) to alternatively connect an output of said first (C1) and second (C2) comparator circuits with an output terminal (Dout) of said receiver depending on said previously stored decision threshold signal being provided to said second inputs of said second (C2) or said first (C1) comparator circuit respectively, wherein said system includes a plurality of substations for transmitting said bursts of information signals to said main station during assigned time slots, wherein said main station includes means (TSM) for providing a substation identification signal for identifying a current substation currently transmitting during a current assigned time slot and a next substation for transmitting in a next assigned time slot subsequent to said current assigned time slot, and wherein said signal processing means (P) is responsive to said substation identification signal, for retrieving from said memory, at least one time slot before receiving an input signal from said next substation, said previously stored decision threshold signal for said next substation for providing said previously stored decision threshold signal for said next substation to said first and second comparator circuits for comparing to an input signal received from said next substation.

5,469,465

METHOD AND APPARATUS FOR MITIGATING DISTORTION EFFECTS IN THE DETERMINATION OF SIGNAL USABILITY

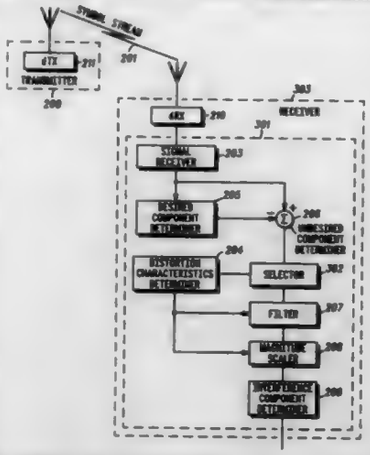
Mark A. Birchler, Roselle; Steven C. Jasper, Hoffman Estates, and Timothy J. Wilson, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 69,947, May 28, 1993, Pat. No. 5,406,588. This application Nov. 2, 1994, Ser. No. 333,409

Int. Cl.[6] H03D *1/04;* **H04L** *1/00*

U.S. Cl. 375—346 **7 Claims**

1. In a receiver that receives a stream of information symbols, a



method for mitigating distortion effects to enhance signal usability determination, the method comprises the steps of:

a) receiving a stream of information symbols to produce a symbol stream, wherein each information symbol of the symbol stream includes a desired component, an interference component, and a distortion component;

b) determining characteristics of the distortion component based on preestablished distortion information of the receiver and a transmitter that transmitted the symbol stream to produce distortion characteristics;

c) determining a representation of the desired component to produce a desired representation;

d) determining an undesired component based on the desired representation and the symbol stream;

e) determining at least one magnitude value based on the distortion characteristics;

f) when a magnitude of the undesired component is less than the at least one magnitude value, scaling the undesired component by a first predetermined value to produce a scaled undesired component;

g) when the magnitude of the undesired component is greater than the at least one magnitude value, scaling the undesired component by a second predetermined value to produce the scaled undesired component, wherein the second predetermined value is greater than the first predetermined value;

h) determining a representation of the interference component based on the scaled undesired component; and

i) determining an indicia of symbol stream usability based on the desired representation and the representation of the interference component.

5,469,466

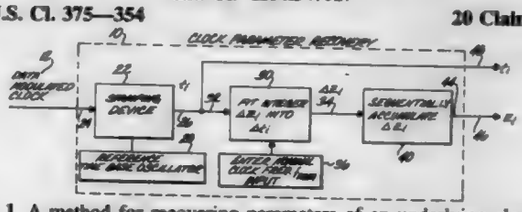
SYSTEM FOR HIGHLY REPEATABLE CLOCK PARAMETER RECOVERY FROM DATA MODULATED SIGNALS

David C. Chu, Woodside, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 182,887, Jan. 18, 1994, abandoned. This application Jan. 19, 1994, Ser. No. 183,466

Int. Cl.[6] H04L *7/027*

U.S. Cl. 375—354 **20 Claims**



1. A method for recovering parameters of an underlying clock from data signals comprising the steps of:

selectively sampling the data signals to produce a plurality of time stamps;

inputting a nominal clock cycle frequency; and

determining a nearest integral number of actual underlying clock cycles between adjacent time stamps as a function of the nominal clock cycle frequency and time stamps.

5,469,467

METHOD FOR SYNCHRONIZING THE REFERENCE FREQUENCY OSCILLATOR OF A METALLIC-BASED MICROCELL TO A MASTER OSCILLATOR

George P. Vella-Coleiro, Summit, N.J., assignor to AT&T Corp., Murray Hill, N.J.

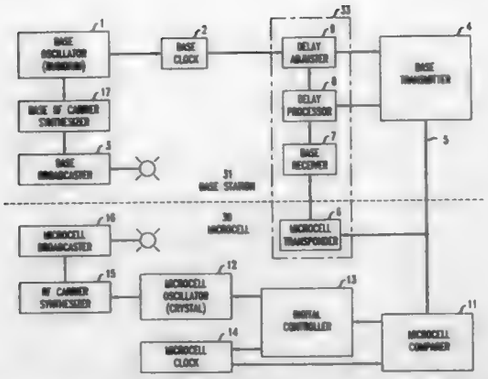
Filed Oct. 15, 1993, Ser. No. 138,583

Int. Cl.[6] H04L *7/00;* **H04B** *7/00*

U.S. Cl. 375—358 **20 Claims**

1. A device for synchronizing the broadcast frequency of a base station and a microcell linked together by a metallic medium, said device comprises:

(a) a base transmitter which transmits a base time-of-day signal to a microcell comparer;



(b) a microcell clock which generates a microcell time-of-day signal, and sends the microcell time-of-day signal to the microcell comparer;

(c) a microcell oscillator which provides said microcell clock with a microcell reference frequency;

(d) the microcell comparer which calculates a time difference between the base time-of-day signal and the microcell time-of-day signal, said microcell comparer outputs a correction signal to a the digital controller; and

(e) the digital controller which adjusts said microcell oscillator according to the correction signal.

5,469,468

OVERLAYING SPREAD-SPECTRUM SATELLITE SYSTEM AND METHOD

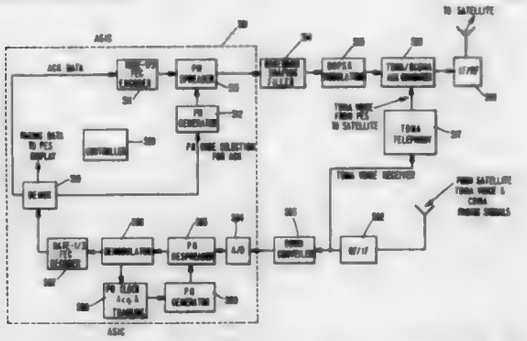
Donald L. Schilling, Sands Point, N.Y., assignor to Interdigital Technology Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 622,235, Dec. 5, 1990, Pat. No. 5,351,269. This application Sep. 27, 1993, Ser. No. 127,261

The portion of the term of this patent subsequent to Sep. 27, 2011, has been disclaimed.

Int. Cl.[6] H04K *1/00*

U.S. Cl. 375—200 **25 Claims**



1. A spread-spectrum satellite system for communicating data from a satellite to a plurality of remote pager units, said spread-spectrum satellite system having said plurality of remote pager units located in a same geographical region as covered by a mobile-satellite system, with the mobile-satellite system having a mobile bandwidth and having mobile-satellite users communicating using the mobile bandwidth, said spread-spectrum satellite system overlaying in spectrum the mobile bandwidth for simultaneous communication of mobile-satellite satellite voice and spread-spectrum satellite paging information, said spread-spectrum satellite system comprising:

a satellite, having an antenna beamwidth overlaying the same geographical region as covered by said mobile-satellite system, for communicating data to the plurality of remote pager units;

system means for converting a format of the data into a form suitable for communicating over radio waves;

system-product means for spread-spectrum processing the converted data;

system means for transmitting across at least part of the mobile bandwidth, simultaneously and non-interferingly with a transmission from said mobile-satellite system on the same part of the mobile bandwidth, the spread-spectrum-processed-converted data from the satellite to a respective one of the plurality of remote pager units; and

a plurality of remote pager units, located within the same geographical area as covered by said mobile-satellite system, for receiving on the same part of the mobile bandwidth the spread-spectrum-processed-converted data, each of said remote pager units including,

a remote antenna; and

remote-detection means coupled to said remote antenna for recovering data communicated from said satellite.

5,469,469

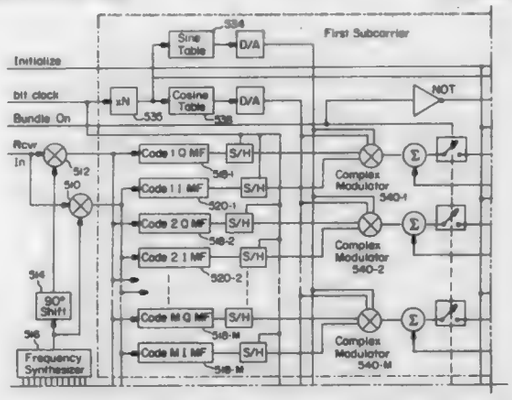
COMPOSITE SPREAD SPECTRUM SIGNAL INCLUDING MODULATOR DEMODULATOR

D. Mark Haines, Littleton, Mass., assignor to University of Massachusetts Lowell Research Foundation, Lowell, Mass.

Filed Dec. 7, 1993, Ser. No. 163,161

Int. Cl.[6] H04B *1/69*

U.S. Cl. 375—201 **32 Claims**



1. A method of transmitting information by generating a spread-spectrum modulated signal and transmitting the signal over a communications link, the method comprising:

determining selected chipping sequences from a plurality of possible chipping sequences for message bundles in response to data to be transmitted;

determining starting positions of said selected chipping sequences in response to data to be transmitted;

modulating a carrier signal with the selected chipping sequences and beginning the selected chipping sequences at the starting positions to perform simultaneously code shift key modulation and pulse position modulation for the message bundles; and

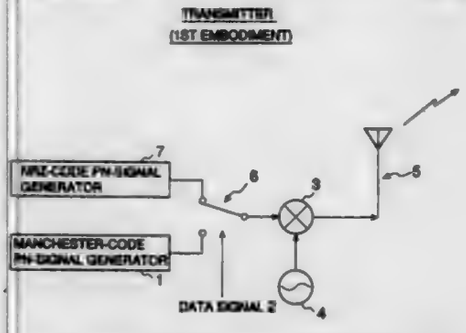
repeating at least a portion of said selected chipping sequences beginning at the starting positions in every message bundle for at least as long as multipath delays over the communications link.

5,469,470

SPREAD SPECTRUM COMMUNICATION SYSTEM USING TWO-PREDETERMINED-CODE PSEUDO-NOISE SIGNALS

Satoshi Takahashi, Yokohama, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

Filed Jan. 4, 1994, Ser. No. 177,328
Claims priority, application Japan, Jan. 8, 1993, 5-18114
Int. Cl.[6] H04L 9/00; H04J 13/02
U.S. Cl. 375—205 21 Claims



1. A spread spectrum communication system having a transmission terminal which comprises:

means for modulating, for a first data state of a data signal, a first-predetermined-code pseudo-noise signal onto a carrier band;

means for modulating, for a second data state of said data signal, a second-predetermined-code pseudo-noise signal onto said carrier band; and

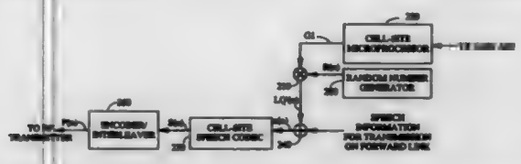
means for transmitting a communication signal comprising said first-predetermined-code pseudo-noise signal and said second-predetermined-code pseudo-noise signal.

5,469,471

METHOD AND APPARATUS FOR PROVIDING A COMMUNICATION LINK QUALITY INDICATION

Charles E. Wheatley, III, Del Mar, Calif., assignor to QUALCOMM Incorporated, San Diego, Calif.

Filed Feb. 1, 1994, Ser. No. 190,517
Int. Cl.[6] H04J 13/02
U.S. Cl. 375—205 34 Claims



1. In a communication system in which system users communicate information signals between one another via at least one cell-site using code division multiple access (CDMA) spread spectrum communication signals, a system for improving quality of signals transmitted to said at least one cell-site from a portable communication unit utilized by one of said system users, said cell-site and said portable communication unit each including a transmitter and a receiver wherein said receiver of said portable communication unit is operative to provide an output signal to said one system user, said system comprising:

first power measurement means, coupled to said cell-site receiver, for measuring signal power in each CDMA communication signal directed to said cell-site from said transmitter of said portable communication unit;

first power adjustment command generator means, coupled to said cell-site transmitter and to said first power measurement means, for generating a first set of power adjustment commands corresponding to deviations in power measurements of said first power measurement means from a first predetermined power level, said cell-site transmitter transmitting said first set of power adjustment commands;

means for generating a link quality signal at least partially in response to said first set of power adjustment commands; and

summing means for combining said link quality signal with said output signal provided to said one system user;

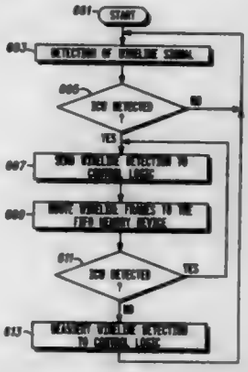
whereby in response to said link quality signal said one system user may adjust the position of said portable communication unit in order to improve said quality of said signals transmitted to said cell-site.

5,469,472

MESSAGE SUBSTITUTION IN A DIGITAL COMMUNICATION SYSTEM

Robert W. House, 351 Whitehall Ave., Northlake, Ill. 60164; Paul M. Bocci, 23W732 W. Pine Ave., Roselle, Ill. 60172, and James G. Edkins, 510 Shallow Cove, Lake Zurich, Ill. 60047

Continuation-in-part of Ser. No. 144,073, Oct. 29, 1993, abandoned. This application Sep. 15, 1994, Ser. No. 306,334
Int. Cl.[6] H04L 25/52
U.S. Cl. 375—211 12 Claims



1. In a frame-synchronous digital communications system supporting message traffic that is divided into digital frames, such frames consisting of digital voice information and such frames being subdivided into a plurality (n) of voice subframes, a method of substituting a second message in place of a first message, the method comprising the steps of:

(a) during the transmission of the first message, the first message including a sixth voice subframe, detecting the origination of the second message, the second message including a first voice subframe, by means of either a framing indication if the second message is RF originated or by an explicit message origination command if the second message is wireline originated;

(b) identifying a digital frame boundary as a transition point within the first message, such transition point being at the termination of the sixth voice subframe of the first message;

(c) completing transmission of the current frame of the first message, including the sixth voice subframe of the first message; and,

(d) after the transition point, substituting the second message for at least a portion of the first message, with the first voice

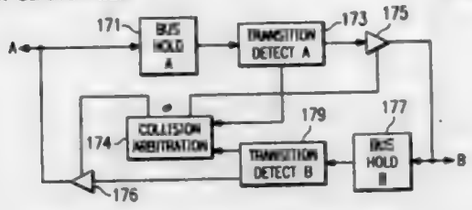
subframe of the second message beginning immediately after the sixth voice subframe of the first message.

5,469,473

TRANSCEIVER CIRCUIT WITH TRANSITION DETECTION

Mark T. McClear, and Christopher Wellheuser, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 15, 1994, Ser. No. 228,067
Int. Cl.[6] H04B *1/38;* **H04L** *5/16*
U.S. Cl. 375—219 **13 Claims**



1. A bidirectional transceiver circuit, comprising:

a first tri-state driver coupled to a first bidirectional data port;

a second tri-state driver coupled to a second bidirectional data port;

a first input transition detector circuit coupled to said first bidirectional data port and having a first transition detected output signal that indicates when either a rising edge or a falling edge transition has occurred at said first bidirectional data port;

a second input transition detector circuit coupled to said second bidirectional data port and having a second transition detected output signal that indicates when either a rising edge or a falling edge transition has occurred at said second bidirectional data port; and

collision arbitration control circuitry coupled to said first transition detected output signal and said second transition detected output signal, for enabling said first and second tri-state drivers to transmit data on said first and second bidirectional data ports, respectively, responsive to said second transition detected output signal and said first transition detection output signal, respectively.

5,469,474

QUANTIZATION BIT NUMBER ALLOCATION BY FIRST SELECTING A SUBBAND SIGNAL HAVING A MAXIMUM OF SIGNAL TO MASK RATIOS IN AN INPUT SIGNAL

Osamu Kitabatake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 24, 1993, Ser. No. 80,766
Claims priority, application Japan, Jun. 24, 1992, 4-165177
Int. Cl.[6] H04B *14/04;1/66*
U.S. Cl. 375—243 **5 Claims**

1. A quantization bit number allocating method for allocating optimum quantization bit numbers to a plurality of frequency subband signals, said method comprising the steps of:

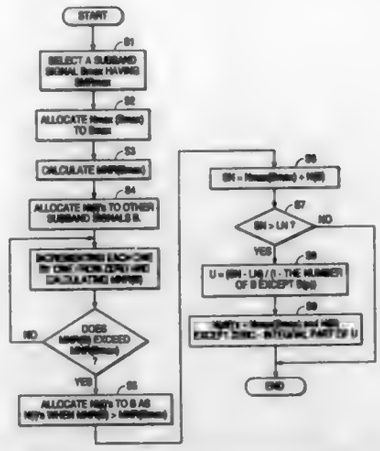
selecting, as a selected subband signal, one of said plurality of frequency subband signals having a maximum ratio of a maximal signal level to a mask level;

allocating to said selected subband signal, as a primary provisional bit number, a maximal quantization bit number allocatable to said selected subband signal;

calculating a primary mask-to-noise ratio of said selected subband signal;

setting a provisional bit number to each remaining frequency subband signal of said plurality of frequency subband signals which has not been selected;

incrementing, one by one starting from zero, each of the provisional bit numbers set to said remaining frequency subband



signals of said plurality of frequency subband signals, meanwhile calculating secondary mask-to-noise ratios for said remaining frequency subband signals of said plurality of frequency subband signals each time an associated provisional bit number of said provisional bit numbers is incremented by one;

allocating said provisional bit numbers to said frequency subband signals which have not been selected as secondary provisional bit numbers when said secondary mask-to-noise ratios individually exceed said primary mask-to-noise ratio;

summing up said primary and said secondary provisional bit numbers into a sum;

comparing said sum with a total of quantization bit numbers allocatable to said frequency subband signals;

using said primary and said secondary provisional bit numbers collectively as said optimal quantization bit numbers if said sum does not exceed said total; and

if said sum does exceed said total, performing the following steps of:

calculating a quotient by dividing a numerator difference, said numerator difference equals to said sum minus said total, by a denominator difference, said denominator difference equals to a predetermined integer minus the number of said remaining frequency subband signals, excluding at least one particular subband signal from said remaining frequency subband signals;

calculating bit number differences by subtracting an integral part of said quotient from said primary and secondary provisional bit numbers; and

using said bit number differences as said optimal quantization bit numbers if said bit number differences are not negative.

5,469,475

TRANSMITTER COMPRISING AN ELETRONIC ARRANGEMENT FOR GENERATING A MODULATED CARRIER SIGNAL

Johannes O. Voorman, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 31, 1991, Ser. No. 708,561
Claims priority, application Netherlands, Jun. 15, 1990, 9001360
Int. Cl.[6] H04L *27/04*
U.S. Cl. 375—247 **16 Claims**

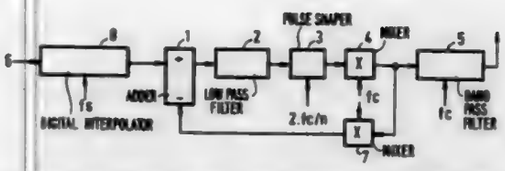
1. An electronic arrangement for generating a modulated carrier signal in a transmitter, the arrangement comprising

a) a sigma-delta (one-bit) signal converter including, in the forward feeding path of a closed signal loop, the following components in cascade in the following order

i) an adder, at an the input of the loop,

ii) a lowpass filter, and

iii) a pulse shaper driven with a specific sample rate, and



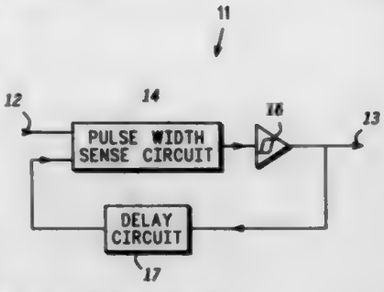
b) a first mixer driven with a carrier frequency fc and having an input coupled with an output of the pulse shaper, the carrier frequency fc being equal to or an integer multiple of half the specific sample rate.

5,469,476

CIRCUIT AND METHOD FOR FILTERING VOLTAGE SPIKES

Benson Liao, and Tuming Wang, both of Taipei, Taiwan, Prov. of China, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 21, 1994, Ser. No. 210,850
Int. Cl.[6] H04B *1/10*
U.S. Cl. 375—350 **19 Claims**



1. A spike filter circuit comprising:

a pulse width sense circuit having an input and an output, said pulse width sense circuit for filtering signals having a pulse width less than a minimum pulse width of a data bit, said pulse width sense circuit including:

a first transistor having a first electrode, a control electrode coupled to said input of said pulse width sense circuit, and a second electrode;

a first delay line having an input coupled to said input of said pulse width sense circuit and an output coupled to said second electrode of said first transistor, said first delay line having a first predetermined time delay; and

a latch having a first terminal coupled to said output of said pulse width sense circuit and a second terminal coupled to said first electrode of said first transistor.

5,469,477

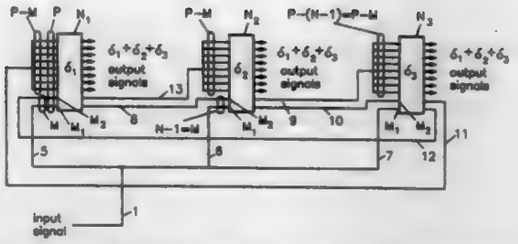
METHOD AND ARRANGEMENT FOR MINIMIZING SKEW

Per A. Holmberg, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Dec. 21, 1993, Ser. No. 170,879
Claims priority, application Sweden, Dec. 22, 1992, 9203882
Int. Cl.[6] H04L *7/00*
U.S. Cl. 375—356 **3 Claims**

1. A method of generating a large number of clock pulses having a time difference therebetween which at maximum equals a predefined value, said method comprising the steps of:

feeding a master clock pulse from a clock pulse source in parallel to a first number of driver circuits, each driver circuit having a respective skew and each comprising a first plurality of buffer circuits, each buffer circuit having an input and an output, by feeding said master clock pulse to a free input, thus subjecting said master clock pulse to a first delay,



feeding each one of said once delayed signals to a free input of a following driver circuit in order to subject said once delayed signals to a second delay, wherein

said step of feeding the delay signal is repeated until a total number of delays equals said first number of driver circuits minus 1, thus generating at each of the driver circuits an intermediate delayed signal which has been delayed said total number of times,

eventually feeding said intermediate delayed signals in parallel to a second number of free buffer circuits of a respective following driver circuit so as to subject said intermediate delayed signals to a final delay, thus generating at the outputs of said non-used buffer circuits a corresponding second number of clock pulses,

said second number of clock pulses appearing at each one of said driver circuits together forming said large number of clock pulses having a time difference therebetween which at maximum is the sum of the skews of each one of the driver circuits and which forms said predefined value.

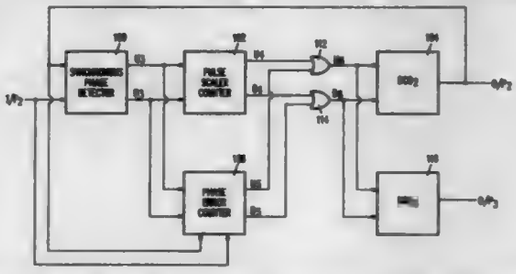
5,469,478

DIGITAL PHASE LOCK LOOP FOR JITTER FILTERING AND FREQUENCY OFFSET COMPENSATION

Johnny C. Lee, Santa Clara, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 15, 1994, Ser. No. 275,795
Int. Cl.[6] H03D *3/24*; H03L *7/00*
U.S. Cl. 375—376 **28 Claims**

1. A digital phase lock loop for providing a jitter filtered,



periodic output signal based on a periodic input signal which is subject to jitter and frequency offset, the phase lock loop comprising:

a phase detector that receives the input signal and the output signal, detects a phase difference between the input signal and the output signal, outputs at least one first up pulse in a number which is proportional to the phase difference when the input signal leads the output signal, and outputs at least one first down pulse in a number which is proportional to the phase difference when the output signal leads the input signal;

a pulse scaler counter that receives the first up pulse and the first down pulse, increments an up/down counter when the first up pulse is received, decrements the up/down counter when the first down pulse is received, outputs a second up pulse when the up/down counter overflows, and outputs a second down pulse when the up/down counter underflows;

a phase error counter that receives the input signal, the output signal, the first up pulse and the first down pulse, resets an up counter during each period of the input signal and the output signal, increments the up counter when the first up pulse is

received, for incrementing the up counter when the first down pulse is received, outputs a third up pulse when the up counter overflows and the input signal leads the output signal, and outputs a third down pulse when the up counter overflows and the output signal leads the input signal; and

a first digitally controlled oscillator that produces and outputs the output signal, and that receives the second up pulse, the second down pulse, the third up pulse and the third down pulse, with the first digitally controlled oscillator adjusting a phase of the output signal as follows:

(a) shifting the output signal in a leading direction when the second up pulse is received;

(b) shifting the output signal in a direction opposite the leading direction when the second down pulse is received;

(c) shifting the output signal in the leading direction when the third up pulse is received; and

(d) shifting the output signal in the direction opposite the leading direction when the third down pulse is received.

5,469,479

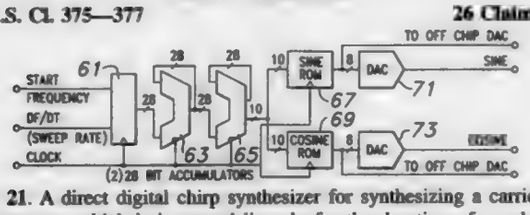
DIGITAL CHIRP SYNTHESIZER

Christopher T.-M. Chang, Dallas, and William A. White, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 27, 1992, Ser. No. 842,698

Int. Cl.[6] G01S *7/282*

U.S. Cl. 375—377 **26 Claims**



21. A direct digital chirp synthesizer for synthesizing a carrier frequency which is increased linearly for the duration of a pulse code, which comprises:

(a) a single semiconductor chip including thereon:

(i) a rate register for receiving a digital input signal;

(ii) accumulator means for adding the received digital input signal to a previously stored digital sum signal then stored in said accumulator means to provide and store in said accumulator means a later digital sum signal responsive to said adding; and

(iii) a function generator responsive to said later digital sum signal to generate an analog function signal corresponding to said later digital sum signal.

5,469,480

MID-LOOP OPERATING METHOD FOR NUCLEAR POWER PLANT, AND FACILITY THEREFOR

Youn-Won Park, and Jong-Kab Kim, both of Daejeon-Si, Rep. of Korea, assignors to Korea Institute of Nuclear Safety, Daejeon-Si, Rep. of Korea

Filed Feb. 2, 1994, Ser. No. 190,503

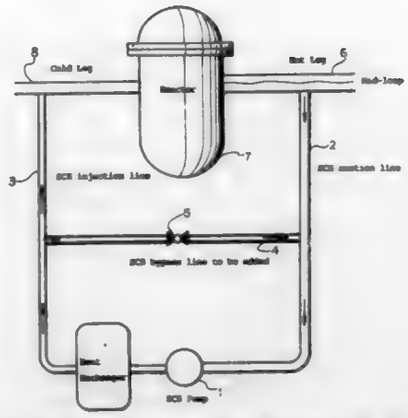
Claims priority, application Rep. of Korea, Nov. 29, 1993, 1993-25665

Int. Cl.[6] G21C *15/18*

U.S. Cl. 376—299 **2 Claims**

1. A mid-loop operating method carried out during nuclear refueling,

characterized in that a round-about pipe conduit is additionally installed between a suction pipe conduit and a discharge pipe conduit of a residual heat removing pump; and a flow rate adjusting valve is installed on said round-about pipe conduit, so that the flow passing through said pump can be maintained at a predetermined normal operation flow level during a mid-loop operation, and round-about flow rate is gradually increased in accordance with the decrease of a residual heat of an atomic reactor, whereby a suction flow rate is maintained



at a predetermined level, and introduction of air into the residual heat removing pump is prevented.

5,469,481

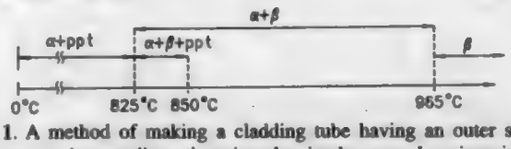
METHOD OF PREPARING FUEL CLADDING HAVING AN ALLOYED ZIRCONIUM BARRIER LAYER

Ronald B. Adamson, Fremont; Daniel R. Lutz, San Jose, and Joseph S. Armijo, Saratoga, all of Calif., assignors to General Electric Company, San Jose, Calif.

Continuation-in-part of Ser. No. 91,672, Jul. 14, 1993, Pat. No. 5,383,228. This application Mar. 21, 1994, Ser. No. 215,456

Int. Cl.[6] G21C *3/00*

U.S. Cl. 376—416 **17 Claims**



1. A method of making a cladding tube having an outer substrate, an intermediate zirconium barrier layer, and a zirconium-based inner liner having alloying elements, the substrate, barrier layer, and inner liner each having interior and exterior circumferential surfaces, the method comprising the following steps:

(a) bonding the zirconium barrier layer exterior circumferential surface to the substrate interior circumferential surface;

(b) bonding the inner liner outer circumferential surface to the zirconium barrier layer inner circumferential surface; and

(c) conducting a diffusion anneal after steps (a) and (b) at a time and temperature sufficient to cause the alloying elements from the inner liner to diffuse into the barrier layer to form a diffusion layer containing a concentration of alloying elements that decreases from the interior circumferential surface of the barrier layer to a location interior to the barrier layer where there is substantially no alloying elements, wherein the alloying elements in the diffusion layer impart corrosion resistance to the barrier layer.

5,469,482

SPLINE COUNTING MECHANISM

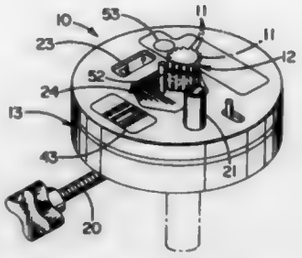
Douglas Vandenberg, St. Charles; Michael L. Philpott, Champaign; Phillip A. Green, Crystal Lake; Scott A. Eastman, Urbana, and Sean M. Carlini, Rockford, all of Ill., assignors to Aircraft Gear Corporation, Rockford, and The Board of Trustees of the University of Illinois, Urbana, both of Ill.

Filed Sep. 29, 1994, Ser. No. 315,071

Int. Cl.[6] G06M *1/02;1/276*

U.S. Cl. 377—3 **22 Claims**

1. A mechanism for determining the number of splines on a shaft member, said mechanism comprising a housing member, means for rotating one of said members relative to said other member, means



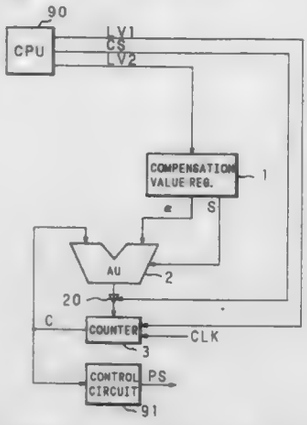
for normally locking said one member in a predetermined position with respect to said other member whereby said one member is normally stationary relative to said other member, means for releasing said locking means whereby said one member may be freely rotated through one revolution whereupon said locking means automatically re-locks, means for automatically counting the number of splines on said shaft member as said one member is rotated through one revolution, and means for displaying the number of splines on said shaft member after said one member has rotated through one revolution.

5,469,483

TIMER WITH A COMPENSATION VALUE TO INCREMENT OR DECREMENT A COUNT VALUE OF A COUNTER

Hideo Inoue, and Mitsuru Sugita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1994, Ser. No. 273,167
Claims priority, application Japan, Sep. 9, 1993, 5-224393
Int. Cl.[6] H03K *21/02;21/40*
U.S. Cl. 377—20 **14 Claims**



1. A timer which time-counts by loading an initial value to a counter and making said counter count to a predetermined value from said initial value, and which can extend or shorten a time-counting value by increasing or decreasing a count value of said counter by adding an optional compensation value to or subtracting an optional compensation value from the count value of said counter during the counting operation of said counter, the timer comprising:

controlling means for generating a compensation value during a counting operation of said counter;

holding means for holding the compensation value generated by said controlling means; and

operating means for adding or subtracting with the compensation value held in said holding means as an addend or a subtrahend,

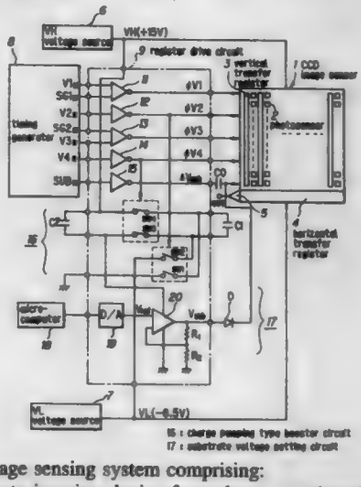
wherein the count value of said counter is increased or decreased when said operating means adds or subtracts the compensation value held in said holding means and the count value of said counter at that time and loads the result to said counter as the count value thereof and the compensation value having a sign bit for controlling said operating means to perform an addition or a subtraction of the count value.

5,469,454

IMAGE-SENSING-SYSTEM BOOSTER CIRCUIT FOR DRIVING IMAGE SENSOR

Yasushi Sato, and Nobuhiko Ohsawa, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 127,508, Sep. 28, 1993, abandoned.
This application May 16, 1994, Ser. No. 242,864
Claims priority, application Japan, Sep. 29, 1992, 4-285224
Int. Cl.[6] G11C *19/28;* **H01L** *27/14;* **H03K** *3/01;3/42*
U.S. Cl. 377—58 **20 Claims**



1. An image sensing system comprising:

a solid-state imaging device formed on a semiconductor body, said solid-state imaging device including a plurality of photo sensors formed in a major surface of a semiconductor body, said photo sensors receiving light incident thereon and generating charges corresponding to said incident light and accumulating said charges therein, a video signal output means for outputting a video signal corresponding to said accumulated charges, and a charge drain discharging said charges from the photo sensors;

a timing generator for generating a timing signal;

a first power supply source providing a first voltage to said solid-state imaging device;

a second power supply source providing a second voltage to said solid-state imaging device, said second voltage being higher than said first voltage; and

a driver means for said solid-state imaging device, including a driving circuit for driving said video signal output means in response to said timing signal, a booster circuit for receiving said first and second voltages and for providing a third voltage higher than said second voltage, said booster circuit being driven in synchronism with said timing signal, and a voltage setting means for setting a drive voltage of said charge drain based on said third voltage.

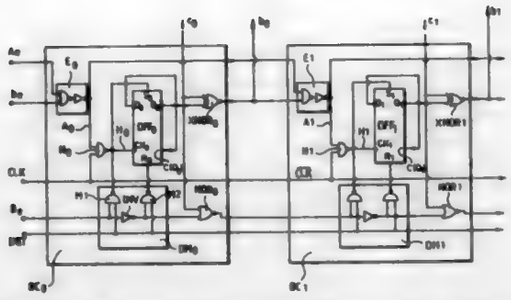
5,469,485

FREQUENCY DIVIDER

Richard Ferrant, St Ismier, France, assignor to Thomson-CSF Semiconducteurs Specifiques, Paris, France

Filed Feb. 24, 1994, Ser. No. 201,034
Claims priority, application France, Feb. 26, 1993, 93 02231
Int. Cl.[6] H03K *21/38*
U.S. Cl. 377—107 **9 Claims**

1. A frequency divider including a whole number N of divide-by-two binaries, for generating an N-bit code b_i(i:0,1,2, . . . N−1) said divider including a plurality of logic means associated with each of said binaries for receiving a binary code representing a



decimal integer value and outputting a frequency divided signal signifying a change in state of the most significant bit(b_{N-1}) generated by the Nth divide-by-two binary, each of said logic means including:

a gate means for applying a controlled clock signal to an associated one of said binaries;

a first Exclusive gate means responsive to an output of an associated one of said binaries and to one bit of said binary code to provide an associated one bit of said N-bit code b_i;

a demultiplexer means receiving an initialization signal for controlling set and reset positions of an associated one of said binaries.

a coincidence logic gate responsive to said one bit of said binary code and a control bit to provide a further control bit to a subsequent demultiplexer.

5,469,486

PROJECTION DOMAIN RECONSTRUCTION METHOD FOR HELICAL SCANNING COMPUTED TOMOGRAPHY APPARATUS WITH MULTI-COLUMN DETECTOR ARRAY EMPLOYING OVERLAPPING BEAMS

Hui Hu, Waukesha, Wis.; Norbert J. Pelc, Los Altos, Calif., and Armin H. Pfoh, New Berlin, Wis., assignors to General Electric Company, Waukesha, Wis.

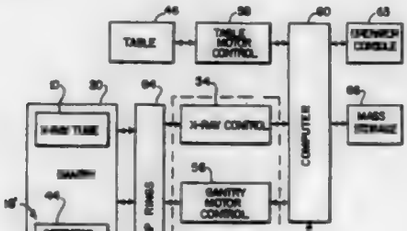
Continuation-in-part of Ser. No. 8,928, Jan. 26, 1993, Pat. No. 5,430,783, which is a continuation-in-part of Ser. No. 945,758, Sep. 16, 1992, Pat. No. 5,377,250, which is a continuation-in-part of Ser. No. 926,987, Aug. 7, 1992, Pat. No. 5,291,402.

This application Nov. 8, 1993, Ser. No. 151,456

The portion of the term of this patent subsequent to Jul. 4, 2012, has been disclaimed.

Int. Cl.[6] A61B *6/03*; G01N *23/083*

U.S. Cl. 378—4 **8 Claims**



5. A method of generating images of an imaged object comprising the steps of:

generating an x-ray beam along a beam axis, the beam including a plurality of rays along paths diverging across a translation axis about a central cone axis at ray angles;

rotating the beam axis throughout a plurality of beam angles about the translation axis;

receiving the rays of the x-ray beam after they pass through the imaged object to produce an intensity signal associated with each ray;

translating the imaged object along the translation axis with respect to the x-ray source during the rotation of the beam axis throughout the plurality of beam angles to obtain a projection set so that at least one voxel of the imaged object is illuminated by a first ray at a first beam angle and a second ray at a second beam angle, the first ray and the second ray being associated with beam angles differing by an integer multiple of 2π radians;

weighting the intensity signals associated with the first and second ray prior to reconstruction;

reconstructing a tomographic image from the weighted intensity signals from the first and second rays; and

displaying an image of the tomographic image.

5,469,487

CT SYSTEM WITH TWIN FAN BEAM HELICAL SCAN

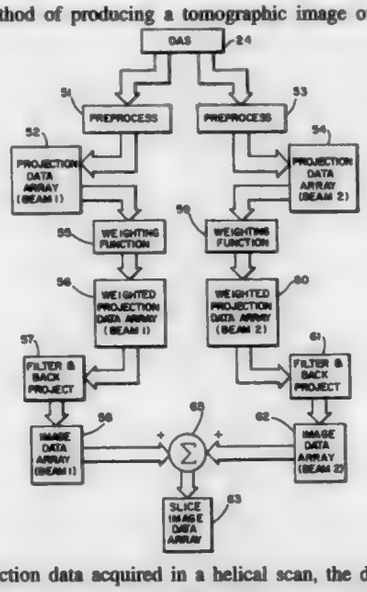
Hui Hu, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Dec. 30, 1993, Ser. No. 175,703

Int. Cl.[6] A61B *6/03*; G01N *23/083*

U.S. Cl. 378—9 **4 Claims**

1. A method of producing a tomographic image of an object



from projection data acquired in a helical scan, the data derived from a pair of x-ray fan beams disposed along a z axis and each producing a series of fan beam projections at a plurality of gantry angles θ about the z axis and each fan beam projection subtending an angle ϕ, the steps comprising:

a) acquiring a set of projections over gantry angles θ ranging over $180° + \phi$ as the imaged object is translated along the z axis, the set of projections forming a first data array indicating the attenuation of x-ray energy in the first fan beam by the object, and forming a second data array indicating the attenuation of x-ray energy in the second fan beam by the object;

b) multiplying the data in the first data array by a first set of weighting values;

c) multiplying the data in the second data array by a second set of weighting values;

d) combining the corresponding weighted data in the first and second data arrays;

e) producing the tomographic image from the combined first and second data arrays.

5,469,488

X-RAY CT SCANNER

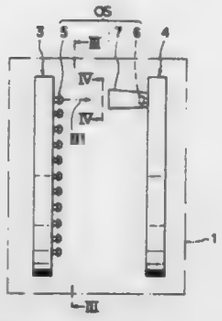
Masahiko Ono, Otawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Sep. 14, 1994, Ser. No. 305,842

Claims priority, application Japan, Sep. 16, 1993, 5-230543

Int. Cl.[6] H05G *1/02*

U.S. Cl. 378—15 **22 Claims**



1. An X-ray CT scanner comprising:

a gantry having X-ray diagnostic opening therethrough, and a rotator and a stator required for an X-ray scan, the rotator and stator being opposed to each other in an axial direction of the opening in a non-contact state and at least the rotator being formed into an annular shape; and

an optical transmission system for transmitting a light signal concerning the X-ray scan between the rotator and the stator along the axial direction, the optical transmission system comprising a plurality of light emitting elements for emitting the light signal, a light receiving element for receiving the light signal and a light collector for converging the light signal onto the light receiving element, one of the light emitting elements and the light receiving element being mounted on the rotator, and another of the light emitting elements and the light receiving element being mounted on the stator,

wherein the light collector is a cone-like member having an aperture at one side and a bottom at another side, the one side facing the other side, and the light receiving element being mounted at the bottom of the light collector.

5,469,489

PRODUCTION METHOD OF AN X-RAY MASK STRUCTURE, AN X-RAY MASK STRUCTURE PRODUCED THEREBY, AND A DEVICE FABRICATED BY USING THE X-RAY MASK STRUCTURE

Akira Miyake, Isehara; Yasuaki Fukuda, Hadano, and Hiroshi Maehara, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 92,037, Jul. 15, 1993, abandoned. This application Mar. 30, 1995, Ser. No. 413,930

Claims priority, application Japan, Jul. 20, 1992, 4-192194; Jun. 30, 1993, 5-161960

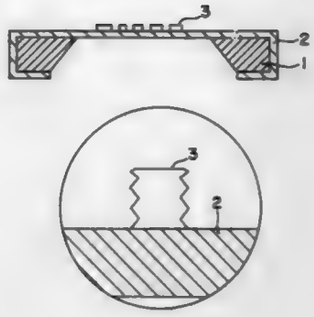
Int. Cl.[6] H01L *39/00*

U.S. Cl. 378—35 **17 Claims**

1. A method for producing an X-ray mask structure having an X-ray absorber on an X-ray transmissive membrane, said method comprising the steps of:

forming resist patterns having wavy side walls on an X-ray transmissive membrane; and

depositing an X-ray absorber material in the regions between resist patterns.



5,469,490

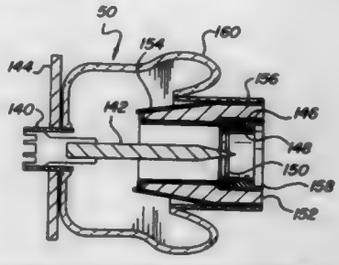
COLD-CATHODE X-RAY EMITTER AND TUBE THEREFOR

John Golden, 2859 Sowers Rd., Greensfork, Ind. 47345, and Phillip Golden, 196 S. Centerville Rd., Centerville, Ind. 47330

Division of Ser. No. 142,816, Oct. 26, 1993. This application Mar. 16, 1995, Ser. No. 405,548

Int. Cl.[6] H01J *35/04*

U.S. Cl. 378—122 **5 Claims**



1. A cold-cathode x-ray emitter tube comprising:

a rod like anode having a sharpened end and a blunt end;

an annular carbon cathode coaxially disposed about said tip in spaced relation therewith;

a conductive cathode support, a lead shielding cylinder carried by and within said support and disposed about said cathode coaxially with said anode rod;

a lead shielding plate disposed about the blunt surface and lying at plan right angles to the anode rod axis; and

an hermetic glass envelope surrounding the shielding cylinder end plate, said envelope having a reentrant shape about the sharpened end of the anode rod and being secured to said holder midlength thereof.

5,469,491

TELEPHONE ANSWERING SERVICE WITH INTEGRATED VOICE AND TEXTUAL MESSAGE STORAGE

John F. Morley, Jr., and Kent D. Anderson, both of Madison, Wis., assignors to American Tel-A-Systems, Inc., McFarland, Wis.

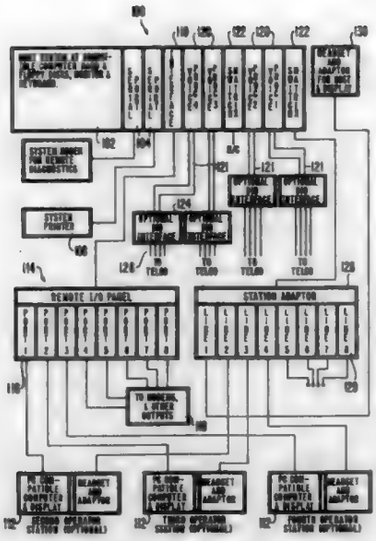
Continuation of Ser. No. 2,997, Jan. 11, 1993, abandoned, which is a continuation of Ser. No. 873,006, Apr. 24, 1992, Pat. No. 5,259,024, which is a continuation of Ser. No. 484,235, Feb. 23, 1990, Pat. No. 5,113,429, which is a continuation of Ser. No. 251,140, Sep. 29, 1988, Pat. No. 4,916,726. This application Feb. 2, 1994, Ser. No. 190,603

Int. Cl.[6] H04M *1/64;3/50*

U.S. Cl. 379—88 **80 Claims**

74. A telephone answering system for providing messages produced by the telephone answering system answering telephone calls to persons having telephone calls answered by the telephone answering system comprising:

a system memory for storing messages;



a textual message recording system for recording of textual messages provided by an operator who answers telephone calls made to persons having telephone calls answered by the telephone answering system in the system memory including decoding a telephone number of each telephone call to be answered by an operator to identify a characteristic to be used in answering a telephone call stored in the system memory, causing the identified characteristic to be displayed by a display device at an operator station at which an operator answers the telephone call to provide the operator answering the telephone call with the characteristic for use in answering the telephone call at the operator station, using the decoded telephone number to initiate ringing of the operator to cause the operator to answer each telephone call and causing the textual message recording system in response to a textual message provided by the operator to record a textual message to the person in the system memory and for reproducing the recorded textual messages from the system memory;

a voice message recording system for recording voice messages provided by a caller to persons having telephone calls answered by the telephone answering system in response to decoding of a telephone number of each telephone call to be answered by the voice message recording system;

a switch matrix connected to a plurality of lines, the switch matrix functioning to selectively connect the lines to telephone calls coupled to the telephone answering system; and

a controller controlling operation of the switch matrix, controlling the recording of messages by the voice message recording system and controlling reproduction of the recorded messages by the voice message recording system to provide access to messages recorded by the voice message recording system under the control of a single control program.

5,469,492

SYSTEMS FOR OPERATING X-RAY EQUIPMENT

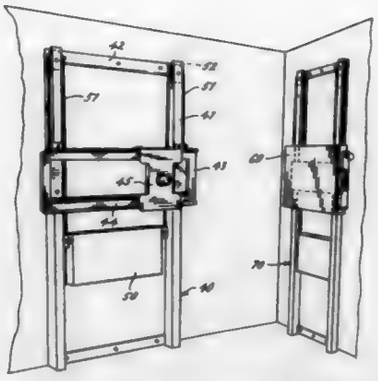
Robert L. Burbury, Elgin, Ill., and Phillip P. Nuccio, Benton Harbor, Mich., assignors to Optima Imaging, Inc., Wheeling, Ill.

Filed Mar. 13, 1992, Ser. No. 850,891
Int. Cl.[6] H05G *1/06*
U.S. Cl. 378—197 **13 Claims**

13. An assembly for mounting an X-ray generating apparatus, and permitting the horizontal and vertical adjustment thereof, which mounting assembly comprises:

(a) a wall mountable frame comprising a pair of horizontally spaced vertical members and one or more horizontal members extending transversely across said vertical members;

(b) a first carriage extending transversely across said vertical members of said frame;



(c) slidable engaging means for enabling said first carriage to travel vertically up and down in respect to said vertical members of said frame;

(d) a second carriage comprising means for attaching X-ray generating apparatus;

(e) slidable engaging means for enabling said second carriage to travel horizontally from side to side in respect to said first carriage;

(f) said mounting assembly comprising means for opposing the weight of said first and second carriages, said opposing means including a counterweight; and

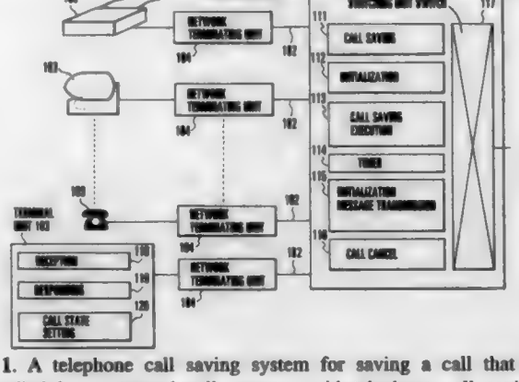
(g) said counterweight being pivotally mounted to a rod which is suspended by support means attached to the ends of said rod.

5,469,493

TELEPHONE CALL SAVING SYSTEM AND METHOD FOR AN INTEGRATED SERVICE DIGITAL NETWORK

Kaoru Kenyoshi, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 22, 1994, Ser. No. 264,143
Claims priority, application Japan, Jun. 25, 1993, 5-155472
Int. Cl.[6] H04M *1/24;3/00*
U.S. Cl. 379—9 **11 Claims**



1. A telephone call saving system for saving a call that is handled by a stopped call process, said telephone call saving system comprising:

a subscriber switching unit; and

a plurality of terminal units connected to said subscriber switching unit via individually associated subscriber lines,

said subscriber switching unit including:

call saving means for controlling an overall call saving process executed between said subscriber switching unit and each of said terminal units in response to a restart process which is started after a call process has been temporarily stopped,

initialization means for setting information indicating a confirmation of a call saving in a restart message to be transmitted to each of said terminal units on a basis of a

presence/absence of a call to be saved when a restart process is started, and for transmitting the message to each terminal unit, and

execution means for executing a call saving process with respect to a target call to be saved on a basis of a call state of the target call which is set in a state display message received from said subscriber switching unit, and

each of said terminal units including:

state setting means responsive to information indicating a confirmation of call saving with respect to each of said terminal units being set in the restart message from said subscriber switching unit for setting a call state of a target call in the state display message and for transmitting the message to said subscriber switching unit.

5,469,494

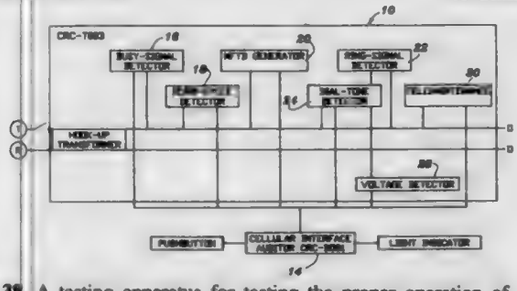
SELF-DIAGNOSTIC SYSTEM FOR CELLULAR-TRANSCEIVER SYSTEMS

Luis R. Ortiz Perez, Rio Piedras, and Alexis T. Ramos, Carolina, both of, Puerto Rico, assignors to Telular International, Inc., Buffalo Grove, Ill.

Filed Mar. 2, 1994, Ser. No. 205,029

Int. Cl.[6] H04M *1/24;3/08;3/22;11/00*

U.S. Cl. 375—27 **40 Claims**



38. A testing apparatus for testing the proper operation of an interface unit, which interface unit is capable of being coupled to a communications device for operatively coupling the communications device to a radio transceiver for at least one of calling out and receiving calls through the radio transceiver, comprising:

diagnostic means for monitoring the proper functioning of said interface unit; and

reporting means for at least sometimes reporting at least part of the results of the monitoring by said diagnostic means;

said diagnostic means comprising means for simulating the functions performed by a communications device for generating in said interface unit respective, corresponding responses in said interface unit, in order to determine if said interface unit is operating correctly.

5,469,495

METHOD AND APPARATUS FOR DELIVERING SECURED TELEPHONY SERVICE IN HYBRID COAXIAL CABLE NETWORK

Gregory J. Beveridge, Thornton, Colo., assignor to U S West Advanced Technologies, Inc., Boulder, Colo.

Continuation of Ser. No. 69,227, May 28, 1993, abandoned. This application Dec. 16, 1994, Ser. No. 357,558

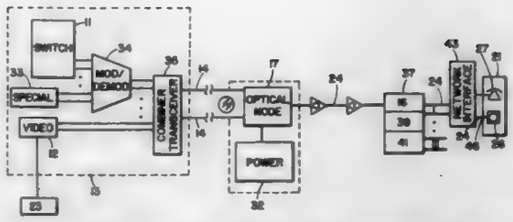
Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—56 **12 Claims**

1. A system for providing telephony services to a subscriber location comprising:

a logical bus network including a coaxial cable network having at least a first signal path and a second signal path to and from said subscriber location for transporting telephony signals in a downstream frequency range and an upstream frequency range;

a selective delivering device electromagnetically connected to said logical bus network, said selective delivering device



jamming telephony signals in said downstream frequency range on said second signal path and isolating telephony signals in said upstream frequency range on said first and second signal paths, said selective delivering device demodulating selected baseband telephony signals in the downstream frequency range on said first signal path and modulating baseband telephony signals in the upstream frequency range on said first signal path wherein said baseband telephony signals to and from said subscriber location cannot be monitored at another subscriber location on said logical bus network.

5,469,496

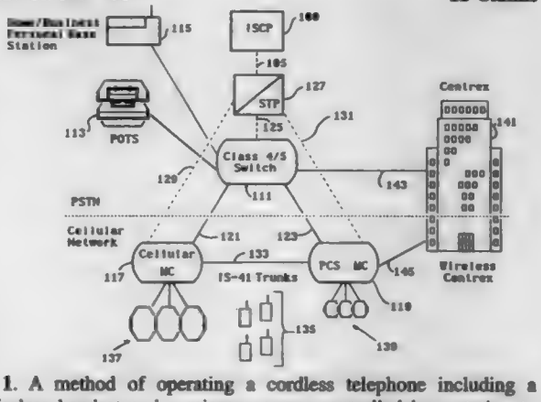
PERSONAL COMMUNICATIONS SERVICE USING WIRELINE/WIRELESS INTEGRATION

Mark J. Emery, Herndon, Va.; Brenda N. Tucker, Mitchellville, and Laurie D. Schwartz, Garrett Park, both of Md., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Division of Ser. No. 845,924, Mar. 5, 1992, abandoned. This application Apr. 19, 1994, Ser. No. 229,891

Int. Cl.[6] H04M *11/00;* **H04Q** *7/00;* **H04B** *1/00*

U.S. Cl. 379—58 **12 Claims**



1. A method of operating a cordless telephone including a wireless handset and a microprocessor-controlled base station to perform registration of said wireless handset with a land line telephone system having an advanced intelligent network (AIN) including an integrated service control point (ISCP) and a service switching point (SSP), the method comprising the steps of:

(a) automatically registering said wireless handset with said base station when said wireless handset comes within range of said base station;

(b) in response to the automatic registration, out-pulsing a predetermined telephone number to said land line telephone system;

(c) in response to said predetermined telephone number, sending a data query from said SSP to said ISCP;

(d) in response to said data query sending instructions from said ISCP, to said SSP to play a first announcement and collect digits from said base station;

(e) in response to said first announcement, out-pulsing digits from said base station representing a number associated with said wireless handset;

(f) in response to step (e) sending instructions from said ISCP to said SSP to play a second announcement to said base station and collect digits from said base station;

(g) in response to said second announcement outputting a serial number from said base station;

(h) storing data indicating registration of the handset with said base station in said ISCP; and

(i) cancelling previous registrations of said wireless handset with other radio-link system controllers than said base station.

5,469,497

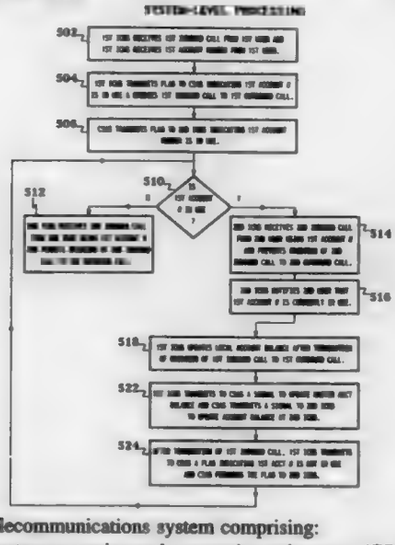
NETWORKED INTERACTIVE CALL MANAGEMENT SUBSYSTEMS WITH PREVENTION OF SIMULTANEOUS USE OF A SINGLE ACCOUNT NUMBER

George C. Pierce, Sarasota, and Don C. Fletcher, Lakeland, both of Fla., assignors to Teledebit, Sarasota, Fla.

Continuation of Ser. No. 5,658, Jan. 19, 1993, abandoned. This application Aug. 4, 1994, Ser. No. 285,881

Int. Cl.[6] H04M *17/00;1/66*

U.S. Cl. 379—115 **8 Claims**



1. A telecommunications system comprising:

(a) a customer service and accounting subsystem (CSAS);

(b) a first interactive call management subsystem (ICMS); and

(c) a second ICMS, wherein:

the first ICMS communicates with the CSAS along a first data link;

the second ICMS communicates with the CSAS along a second data link;

the first ICMS is located remotely from the second ICMS;

the first ICMS is located remotely from the CSAS;

the first ICMS may be accessed by one or more users dialing one or more telephone numbers of a first set of telephone numbers;

the second ICMS may be accessed by the users dialing one or more telephone numbers of a second set of telephone numbers;

each of the telephone numbers of the first set is different from all of the telephone numbers of the second set;

the first ICMS is adapted to receive and maintain a first inbound call from a first user;

the first ICMS is adapted to receive a first account number entered by the first user during the first inbound call;

the first ICMS is adapted to bridge the first inbound call to a first outbound call independent of the CSAS and the second ICMS, wherein the first ICMS maintains the first inbound call and the first outbound call during said bridging;

the first ICMS is adapted to transmit a flag to the CSAS during the first inbound call to indicate that the first account number is currently in use;

the CSAS is adapted to transmit the flag to the second ICMS during the first inbound call to indicate that the first account number is currently in use;

the second ICMS is adapted to receive a second inbound call from a second user during the first inbound call;

the second ICMS is adapted to receive the first account number entered by the second user during the second inbound call and during the first inbound call; and

the second ICMS is adapted to prevent bridging of the second inbound call to a second outbound call during the first inbound call, if the second ICMS has received the flag indicating that the first account number is currently in use.

5,469,498

POST-DELIVERY SUPPORT SYSTEM FOR PRIVATE BRANCH EXCHANGES

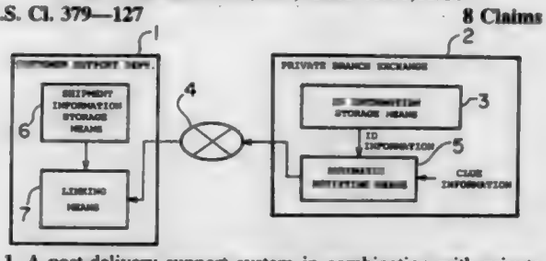
Toshiaki Abe, and Nobukatsu Wakabayashi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 25, 1994, Ser. No. 187,101

Claims priority, application Japan, Jan. 27, 1993, 5-011258

Int. Cl.[6] H04M *15/00;3/42;* **G06F** *15/00;15/20*

U.S. Cl. 379—127 **8 Claims**



1. A post-delivery support system in combination with private branch exchanges to be delivered to recipients, the post-delivery system permitting a customer support department to provide post-delivery support to delivered private branch exchanges, the post-delivery support system comprising:

identification information storage means arranged in a private branch exchange, for storing identification information of the private branch exchange;

clue information storage means arranged in said private branch exchange and providing information about said recipients; and

automatic notifying means arranged in the private branch exchange, for automatically notifying the identification information stored in the identification information storage means, and the clue information stored in the clue information storage means for providing a clue for tracing a recipient to whom the private branch exchange is delivered, to the customer support department via a public line to enable the customer support department to obtain information about said recipient.

5,469,499

SYSTEM FOR SECURING ACCESS TO EQUIPMENT CONNECTABLE TO A TELEPHONE COMMUNICATION CHANNEL

Leif Lanning, Route 1, Box 106, Buck Rd., Madrid, N.Y. 13660

Filed Nov. 29, 1993, Ser. No. 158,404

Int. Cl.[6] H04M *1/70*

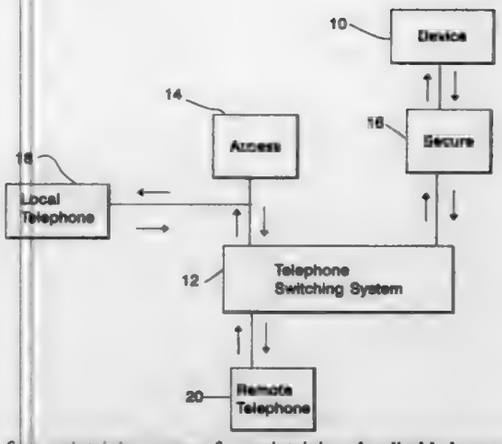
U.S. Cl. 379—196 **14 Claims**

1. A system for securing access to equipment connectable to a telephone communication channel, comprising:

a first sensing means for sensing ringing current on a first access telephone communication channel,

a controlling means for controlling ringing current on a secure telephone communication channel such that the equipment connectable to the secure telephone communication channel does not answer when ringing current is present on the secure telephone communication channel,

means for disabling the controlling means in direct response to the first sensing means when ringing current is sensed on the first access telephone communication channel, and



a first maintaining means for maintaining the disabled state of the controlling means for a pre-set time period after ringing current is first sensed on the first access telephone communication channel.

5,469,500

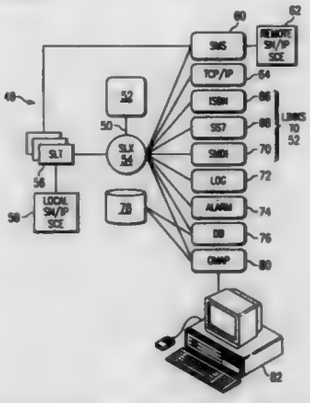
METHOD AND APPARATUS FOR DELIVERING CALLING SERVICES

Sohail Satter, and Steven E. Polsky, both of Irving, Tex., assignors to Voiceplex Corporation, Irving, Tex.

Filed Nov. 12, 1993, Ser. No. 151,543

Int. Cl.[6] H04M *3/42*

U.S. Cl. 379—201 **24 Claims**



1. A call processor operable to deliver calling services to callers, comprising:

a service creation environment for generating call processing instructions;

a memory accessible by the service creation environment, the memory including a service logic table in which the call processing instructions are stored;

a central processor including a service logic executive with access to the service logic table operable to execute the call processing instructions; and

a communications link allowing transmission of a data package to the call processor, whereby the service logic executive accesses the service logic table and executes the call processing instructions responsive to the data package to deliver the calling services.

5,469,501

COMMUNICATION EXCHANGE APPARATUS WITH SWITCHING OF COMMUNICATION TERMINAL INFORMATION

Kuniaki Otsuka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

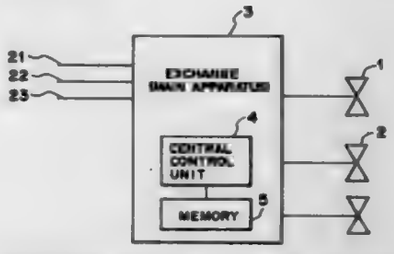
Continuation of Ser. No. 247,417, May 23, 1994, Pat. No. 5,392,340, which is a continuation of Ser. No. 779,824, Oct. 21, 1991, abandoned. This application Nov. 15, 1994, Ser. No. 340,576

Claims priority, application Japan, Jan. 22, 1990, 2-285252

The portion of the term of this patent subsequent to Feb. 21, 2012, has been disclaimed.

Int. Cl.[6] H04M *3/42*

U.S. Cl. 379—201 **21 Claims**



1. A communication apparatus coupled to a plurality of communication terminals comprising:

memory means for storing first and second information; and

reading means for reading, in a first mode, the first information from said memory means based on a predetermined operation by a first communication terminal and the second information from said memory means based on a predetermined operation by a second communication terminal,

wherein said reading means is adapted, in a second mode, to read the second information from said memory means based on the predetermined operation by the first communication terminal and the first information from said memory means, based on the predetermined operation by the second communication terminal, and

wherein the first and second modes are switched based on an operation by one of the first and second communication terminals.

5,469,502

TELECOMMUNICATION SYSTEM FOR SELECTING OPTIMUM TRANSFER RATE

Takashi Matsumoto, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

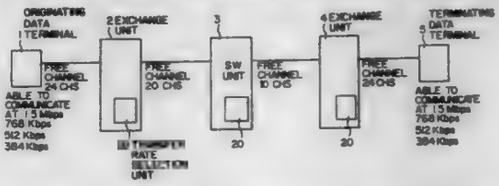
Continuation of Ser. No. 883,786, May 15, 1992, abandoned. This application Nov. 22, 1994, Ser. No. 343,209

Claims priority, application Japan, May 16, 1991, 3-111709

Int. Cl.[6] H04M *7/00*; H04J *3/22;3/12;15/00*

U.S. Cl. 379—230 **8 Claims**

1. A telecommunication method in a network in which at least



two exchange units are to be connected between an originating data terminal and a terminating data terminal which communicate over an interexchange unit circuit switched connection established by sending a call setup message from an originating exchange unit to a terminating exchange unit, and sending a call connect message from said terminating exchange unit to said originating exchange

unit in response to said call setup message in a signalling channel; the method comprising the steps of:

providing a transfer rate selection unit within each of said exchange units,

determining a plurality of available transfer rates within free channels in a trunk line to said terminating exchange unit, by the transfer rate selection unit within said originating exchange unit,

sending information about said plurality of available transfer rates included in said call setup message from said originating exchange unit, to said terminating exchange unit,

selecting a transfer rate information actually to be used in said circuit switched connection between said originating exchange unit and said terminating exchange unit from said information about a plurality of available transfer rates, by the transfer rate selection unit within said terminating exchange unit,

sending a selected transfer rate information, included in said call connect message from said terminating exchange unit to said originating exchange unit,

changing said available transfer rate provisionally determined by said transfer rate selection means within said originating exchange unit, to said selected transfer rate included in said call connect message,

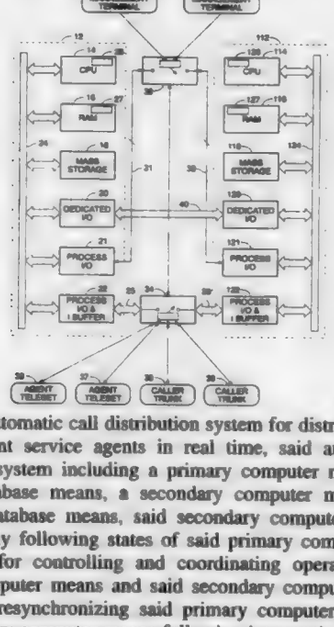
establishing said circuit switched connection, in accordance with said selected transfer rate between said exchange units to provide communication therebetween.

5,469,503

METHOD FOR RESYNCHRONIZING SECONDARY DATABASE AND PRIMARY DATABASE WITH PRESERVATION OF FUNCTIONALITY OF AN AUTOMATIC CALL DISTRIBUTION SYSTEM

Michael J. Butensky, Milpitas, Calif.; Richard A. Gibbs, Austin, Tex.; Kevin T. Collins, Fremont, Calif.; Yih-Nan Yang, Cupertino, Calif.; Eric M. Johnson, Los Altos, Calif., and Chris A. Grafft, Austin, Tex., assignors to Aspect Telecommunications Corporation, San Jose, Calif.

Continuation of Ser. No. 97,632, Jul. 27, 1993, abandoned.
This application Oct. 14, 1993, Ser. No. 138,547
Int. Cl.[6] H04M *3/00;* **G05B** *15/00;9/02;* **G06F** *11/00*
U.S. Cl. 379—265 **5 Claims**



1. In an automatic call distribution system for distributing client calls to client service agents in real time, said automatic call distribution system including a primary computer means with a primary database means, a secondary computer means with a secondary database means, said secondary computer means for synchronously following states of said primary computer means, and means for controlling and coordinating operation of said primary computer means and said secondary computer means, a method for resynchronizing said primary computer means with said secondary computer means following interruption of usage of said primary computer means, said resynchronization being without interruption of service to said client calls, said method comprising the steps of:

(a) using said controlling means in connection with said secondary computer means to lock said secondary database means against updating of configuration information; thereafter

(b) using said controlling means to copy selected database elements of said secondary database means to said primary computer means to replace selected elements of said primary database means; thereafter

(c) using said controlling means to copy memory elements from said secondary computer means to said primary computer means; thereafter

(d) using said controlling means to transfer operation from said secondary computer means with said secondary database means to said primary computer means with said primary database means;

(e) using said secondary computer means to unlock said secondary database means against updating of configuration information; and

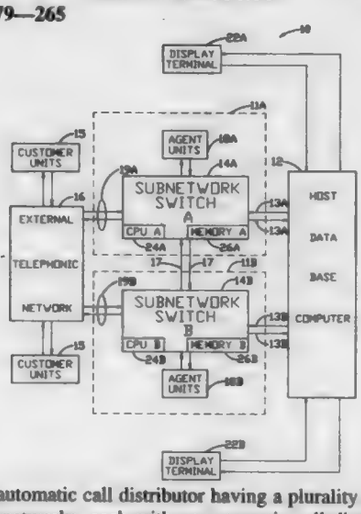
(f) resynchronizing said primary computer means and said secondary computer means.

5,469,504

AUTOMATIC CALL DISTRIBUTION WITH INTERSUBNETWORK CUSTOMER INFORMATION TRANSFER SYSTEM AND METHOD

David L. Blaha, 1650 Trafalgar La., Aurora, Ill. 60504

Continuation of Ser. No. 960,995, Oct. 14, 1992, abandoned.
This application Nov. 10, 1994, Ser. No. 337,572
Int. Cl.[6] H04M *3/58*
U.S. Cl. 379—265 **19 Claims**



1. In an automatic call distributor having a plurality of interconnecting subnetworks, each with an automatic call distributor subnetwork switch and an associated group of telephonic agent units for receiving customer calls from customer telephonic units of an external telephonic network, and a single host data base computer for storing customer information received from groups of display terminals respectively associated with the telephonic agent units of the plurality of different subnetworks, the improvement being an intersubnetwork customer information transfer system, comprising:

means, apart from the external telephonic network, for internally transferring a customer call from one agent unit of one of the plurality of subnetworks to another agent unit of another one of the plurality of subnetworks including information identifying the one agent unit via an internal intertandem trunk line connected between the automatic call distributor switch of the one subnetwork and the automatic call distributor switch of the other subnetwork; and

means responsive to the identifying information of the one agent unit transferred by said internally transferring means between the switch of the one subnetwork and the switch of the other subnetwork for enabling the single host database computer to

convey stored customer information obtained at the one agent unit and stored in the single host data base computer to the display terminal associated with the other agent unit of the other subnetwork to which the customer call is transferred for display.

5,469,505

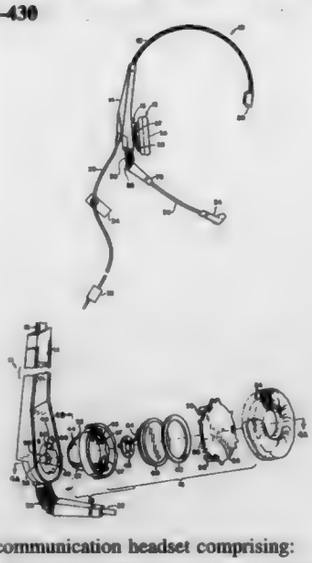
COMMUNICATIONS HEADSET HAVING A BALL JOINT-MOUNTED RECEIVER ASSEMBLY

Phillip A. Gattey, Los Gatos, and Wolfgang W. Jensen, Aptos, both of Calif., assignors to ACS Wireless, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 191,360, Feb. 3, 1994, abandoned, which is a continuation of Ser. No. 910,698, Jul. 8, 1992, abandoned. This application Jan. 25, 1995, Ser. No. 378,060

Int. Cl.[6] H04M *1/00;* **H04R** *25/00*

U.S. Cl. 379—430 **13 Claims**



1. A voice communication headset comprising:

a generally U-shaped, resilient head band having a first end and a second end;

a housing attached to said first end of said head band, said housing including a pair of opposed side walls and wherein a concave spherical surface is formed in one side wall thereof, said concave surface projecting inwardly towards the other side wall, said housing further including a stem fixedly attached thereto and projecting outwardly from said concave spherical surface;

a receiver assembly, including a transducer for converting electrical signals into audible sound waves, said receiver assembly further including a receiver cup having an outermost rear wall, said rear wall including an outwardly projecting convex spherical surface slidably mating with the concave surface of said housing, said convex surface further including an aperture for receiving the stem of said housing, with dimensions of the aperture being larger than the cross-sectional dimensions of the stem; and

a retainer attached to a distal end of said stem, wherein said retainer is larger than the aperture and slidably contacts the inner spherical surface of said receiver assembly to retain said receiver assembly on said housing and maintain engagement between the mating concave and convex spherical surfaces while allowing relative sliding motion therebetween, said receiver assembly cooperating with said housing, stem and retainer to define a ball and socket type joint, said joint allowing limited axial rotation and spherical pivoting of said receiver assembly with respect to said housing.

5,469,506

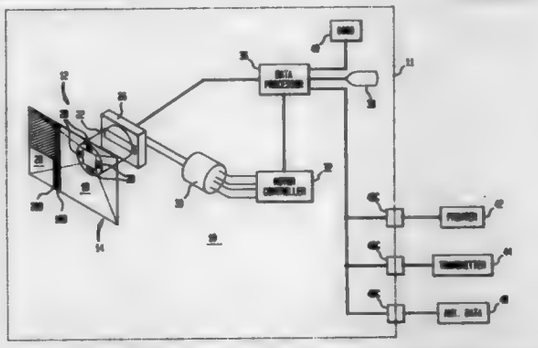
APPARATUS FOR VERIFYING AN IDENTIFICATION CARD AND IDENTIFYING A PERSON BY MEANS OF A BIOMETRIC CHARACTERISTIC

William Berson, Westport, and Kenneth C. Zemlok, Shelton, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 27, 1994, Ser. No. 265,872

Int. Cl.[6] H04L *9/32;9/00;9/30*

U.S. Cl. 380—23 **13 Claims**



2. An apparatus for verifying an identification card and the identity of a person to be identified by said card, said card including scannable indicia representative of an encryption of a biometric derived from a selected metric of said person to be identified, said apparatus comprising:

a) a scamper for scanning a field, said field comprising first and second sub-fields;

b) first means for positioning said card so that said indicia lie within said first sub-field;

c) second means for positioning a correspondingly selected biometric characteristic of a person presenting said card within said second sub-field; and

d) data processing means for:

d1) controlling said scanner to scan said field when said indicia and said correspondingly selected biometric are positioned within said first and second sub-fields respectively,

d2) receiving a data image of said indicia and said correspondingly selected biometric from said scanner;

d3) partitioning said data image into first and second sub-images corresponding to said first and second sub-fields respectively;

d4) recovering said encryption from said first sub-image;

d5) decrypting said encryption to recover said metric and verify said card;

d6) comparing said second sub-image to said metric; mad

d7) if said comparison is successful, outputting a signal indicating that said person presenting said card is said person to be identified by said card.

5,469,507

SECURE COMMUNICATION AND COMPUTATION IN AN INSECURE ENVIRONMENT

Ran Canetti, Tel Aviv, Israel, and Amir Herzberg, New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

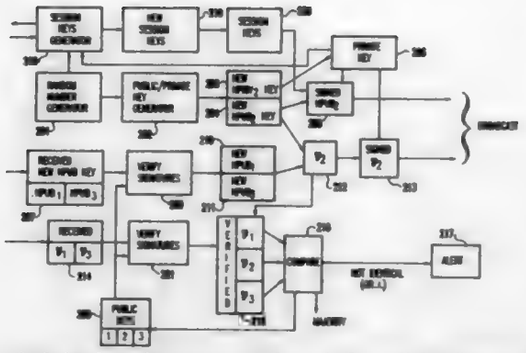
Filed Mar. 1, 1994, Ser. No. 203,965

Int. Cl.[6] H04K *1/00*

U.S. Cl. 380—30 **15 Claims**

1. A method for securing the communication and distributed computation between and among processors connected by a communication network, said method maintaining secret values for a sequence of periods, each secret value shared by two or more processors for one or several periods and comprising the steps of:

securely storing secret values in each processor;



calculating in each processor, at the end of a period, messages to be sent to other processors as a function of values held in said processor at that time;

transferring said messages to said processors by means of said communication network;

calculating in each processor new secret values as a function of messages received from said processors; and

periodically replacing the secret values by selecting at random public and private keys of a public-key cyrptosystem;

signing the public key with the old secret value stored in the processor; and

sending the signed public key to other processors connected to said communication network.

5,469,508

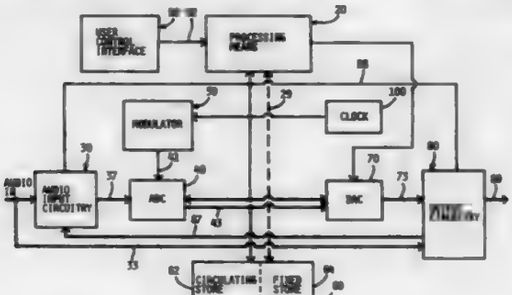
AUDIO SIGNAL PROCESSOR

Jeffrey J. Vallier, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Oct. 4, 1993, Ser. No. 131,780

Int. Cl.[6] H03G *3/00*

U.S. Cl. 381—63 **23 Claims**



1. A combined audio processor and sampler comprising:

an analog input for receiving audio input signals to be processed;

an analog-to-digital converter (ADC) for digitizing the audio input signals received from the analog input into samples;

a two function memory for receiving the samples from the ADC having:

a circulating store having a plurality of sequential locations for temporarily delaying the samples a predetermined amount, and

a fixed store having independently addressable locations for storing the samples for playback;

a digital-to-analog converter (DAC) for receiving the samples from the two function memory and converting them to analog output signals;

a processing means for controlling manipulation of the samples, the processing means controlling the predetermined amount of delay imparted by the circulating store and selectively addressing the independently addressable locations in the fixed store; and,

output means under the control of the processing means for selectively combining the audio input signals and the output of the DAC into a final output signal to achieve time delay effects.

5,469,509

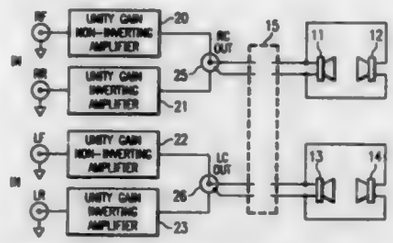
CAR AUDIO SYSTEM WITH HIGH SIGNAL OUTPUT

David Navone, Stockton, Calif., and Richard L. Clark, Burlington, N.C., assignors to Monster Cable International, Ltd., South San Francisco, Calif.

Filed Dec. 30, 1993, Ser. No. 175,928

Int. Cl.[6] H04S *1/00*

U.S. Cl. 381—28 **17 Claims**



1. A circuit for coupling an audio deck to a speaker system, said audio deck having at least a RC and a LC output coupled to provide first and second RC and third and fourth LC outputs, comprising:

(a) first non-inverting amplifying means,

(b) second inverting amplifying means,

(c) third non-inverting amplifying means,

(d) fourth inverting amplifying means,

(e) said amplifying means each having an input and an output,

(f) means connecting the input of the first amplifying means to one of the first and second RC deck outputs and the input of the second amplifying means to the other of the first and second RC deck outputs,

(g) means connecting the input of the third amplifying means to one of the first and second LC deck outputs and the input of the fourth amplifying means to the other of the first and second LC deck outputs,

(h) said first and second amplifying means outputs cooperating to provide audio signals to at least one RC speaker,

(i) said third and fourth amplifying means outputs cooperating to provide audio signals to at least one LC speaker.

5,469,510

ARBITRATION ADJUSTMENT FOR ACOUSTIC REPRODUCTION SYSTEMS

Henry F. Blind, Grosse Pointe Woods; Anthony J. Campagne, Brighton; James L. Czekaj, Madison; Nicholas L. Difiore, Farmington Hills; Earl R. Geddes, Livonia; Andrew C. Krochmal, Canton, and Myron L. Senyk, Sterling Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 28, 1993, Ser. No. 82,633

Int. Cl.[6] H03G *11/00*

U.S. Cl. 381—55 **8 Claims**

1. An acoustic production system comprising:

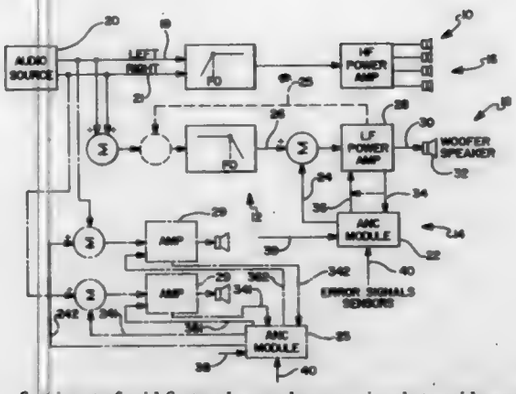
first and second independent signal sources providing first and second independent signal inputs respectively;

a power amplifier for generating a drive signal responsive to both source signal inputs;

a transducer for acoustically transmitting a response to said drive signal;

a clip detector for generating a clip detect signal when said drive signal is clipped; and

an arbitrator for selectively limiting the drive signal by limiting the source signal input to said amplifier from one of said first and second independent signal source inputs by reducing a



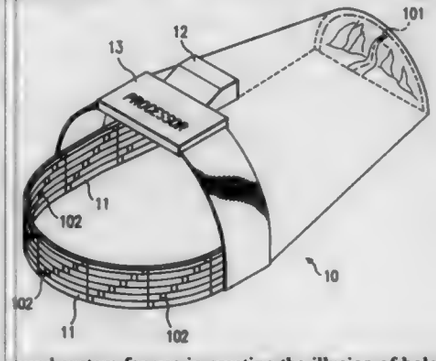
first input of said first and second source signals to said power amplifier and reducing the output of both said first and second input signals to said power amplifier after said first input is limited to a predetermined level in response to said clip detect signal.

5,469,511

METHOD AND APPARATUS FOR PRESENTATION OF ON-LINE DIRECTIONAL SOUND

Russell F. Lewis; Steven F. Martin, both of Dallas; Dale A. Cone, Garland, and Norman A. Josephson, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 5, 1990, Ser. No. 593,702
Int. Cl.[6] H04R *25/00*
U.S. Cl. 381—173 **12 Claims**



1. A sound system for use in creating the illusion of holographic sound in an artificial reality system, said sound system comprising:

a headband to be worn by a listener;

at least three discrete vibrationary elements placed circumferentially around said headband, each of said at least three discrete vibrationary elements adapted for receiving electrical impulse signals and for producing sound waves in response thereto; and

a processor for coordinating said impulse signals and said at least three discrete elements such that said vibrationary elements produce a directional sound field.

5,469,512

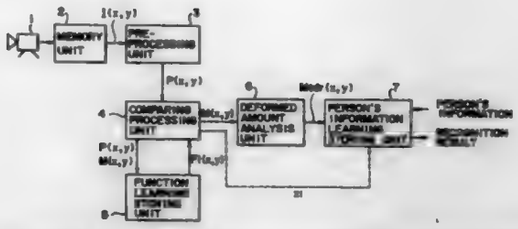
PATTERN RECOGNITION DEVICE

Masahiro Fujita, Saitama, and Shigeru Arisawa, Tokyo, both of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1993, Ser. No. 117,494
Claims priority, application Japan, Sep. 8, 1992, 4-265506
Int. Cl.[6] G06K *9/00*
U.S. Cl. 382—118 **6 Claims**

1. A pattern recognition device comprising:

a basic pattern storing means for storing a basic pattern;



a standard pattern storing means for storing a standard pattern;

a preparing means for preparing an input pattern on the basis of inputted information;

a comparing means for comparing the input pattern prepared by the preparing means with the basic pattern stored in the basic pattern storing means, and calculating at least a deformed amount of the input pattern to the basic pattern and a correlation amount;

an analyzing means for analyzing the deformed amount calculated by the comparing means and generating an analysis result; and

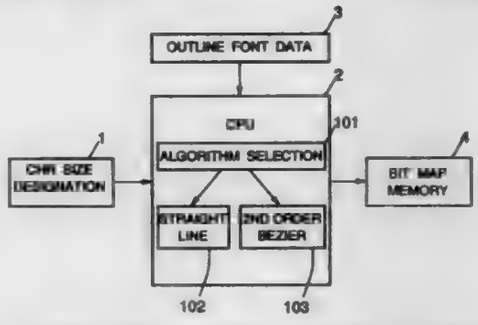
a standard pattern regenerating means for regenerating a standard pattern stored in the standard pattern storing means as a function of at least the analysis result from the analyzing means and the correlation amount calculated by the comparing means.

5,469,513

METHOD AND APPARATUS FOR GENERATING PATTERN

Tsuneaki Kurumida, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 959,471, Oct. 9, 1992, abandoned, which is a continuation of Ser. No. 666,838, Mar. 7, 1991, abandoned. This application Sep. 1, 1994, Ser. No. 299,882
Claims priority, application Japan, Mar. 9, 1990, 2-58762
Int. Cl.[6] G06K *9/46*
U.S. Cl. 382—203 **15 Claims**



1. A character pattern generating apparatus for generating bit map data from outline data, the outline data corresponding to a pattern having a curve portion and a straight portion, the outline data for the curve portion including a plurality of curve-generating control points which include an initial point, a terminal point and an intermediate point, said apparatus comprising:

discriminating means for discriminating output size of the bit map data; and

generating means for generating bit map data for the pattern in accordance with said plurality of control points in the outline data, said generating means being responsive to output size discrimination of said discriminating means by generating straight line bit map data for the curve portion of the pattern using straight-line connection of each of said plurality of control points.

5,469,514
OUTPUTTING APPARATUS

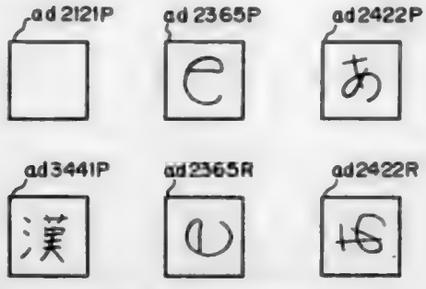
Yoshiaki Kawamura, Narashino, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 23,859, Feb. 24, 1993, abandoned, which is a continuation of Ser. No. 512,079, Apr. 12, 1990, abandoned, which is a continuation of Ser. No. 136,195, Dec. 21, 1987, abandoned. This application Jan. 19, 1995, Ser. No. 375,256

Claims priority, application Japan, Jan. 12, 1987, 62-5831

Int. Cl.[6] G06K 9/32

U.S. Cl. 382—297 24 Claims



1. A printer control apparatus comprising:

memory means for storing, for a character frequently used, font data disposed in a first direction and font data disposed in a second direction and storing, for a character less frequently used, font data disposed in the first direction;

a conversion table, provided for each of a plurality of character codes, for storing, at a first address corresponding to a character code, address information indicating a position in said memory means at which the font data in the first direction is stored and storing, at a second address remote from the first address by a prescribed distance common to every character code, address information indicating a position in said memory means at which the font data in the second direction is stored or identification information indicating that no font data in the second direction is stored for that character code;

means for deriving one of the first addresses of said conversion table corresponding to a character code for a character to be printed;

first determining means for determining whether a character should be printed in the first direction or in the second direction;

first generating means for generating a character pattern by reading the font data in the first direction stored in said memory means at the position indicated by the address information stored at the derived one first address of said conversion table, when said first determining means determines that the character should be printed in the first direction;

second determining means for determining whether information stored at one of the second addresses of said conversion table remote from the derived one first address by the prescribed distance is the address information or the identification information, when said first determining means determines that the character should be printed in the second direction; and

second generating means for generating a character pattern by reading the font data in the second direction stored in said memory means at the position indicated by the address information stored at the one second address of said conversion table, when said second determining means determines that the information stored at the one second address of said conversion table is the address information, and for generating a character pattern by reading the font data in the first direction stored in said memory means at the position indicated by the address information stored at the derived one first address of said conversion table and by rotating the read font data, when said second determining means determines that the information stored at the one second address of said conversion table is the identification information.

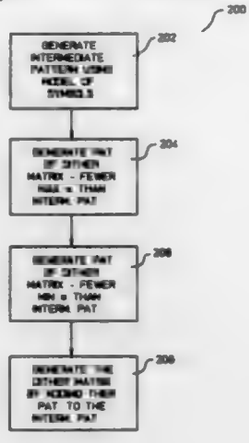
5,469,515
HALFTONE IMAGE FORMATION USING DITHER MATRIX GENERATED BASED UPON PRINTED SYMBOL MODELS

Qian Lin, 159 Gilbert Ave., Santa Clara, Calif. 95051

Filed May 3, 1993, Ser. No. 57,244

Int. Cl.[6] G06K 9/38

U.S. Cl. 382—237 13 Claims



1. A method of generating a halftone image from a grey scale image by means of a dither matrix,

the halftone image being represented by symbols printed by a printer,

the halftone image, the grey scale image and the dither matrix each occupying an area, the three areas being substantially equal to each other,

the halftone image and the grey scale image each having a plurality of pixels, each pixel having a value, and

the dither matrix having a plurality of elements that are generated by a plurality of patterns, each pattern also having a plurality of elements, each element in each pattern occupying a position in the dither matrix area, each element having a value,

the method comprising the steps of:

comparing the value of each pixel of the grey scale image with the value of an element in the dither matrix;

determining, based on the result of the comparison, the value of a corresponding pixel of the halftone image; and

forming said half tone image with said printer by printing said symbols in accordance with the determined pixel values;

wherein the dither matrix is generated by:

selecting a model indicative of the symbols printed by the printer;

generating an intermediate pattern having a plurality of elements, each element having either a maximum or a minimum value, the values of the elements being dependent on the model of the symbols, those elements having the maximum value being distributed substantially uniformly within the pattern;

generating a plurality of other patterns, each pattern having a different number of elements of the maximum value than the intermediate pattern; and

summing the intermediate pattern and the plurality of other patterns to get the dither matrix.

5,469,516

METHOD FOR GENERATING AND STORING DIGITIZED DENSITY THRESHOLDS FOR RASTERING A HALF TONE ORIGINAL IMAGE

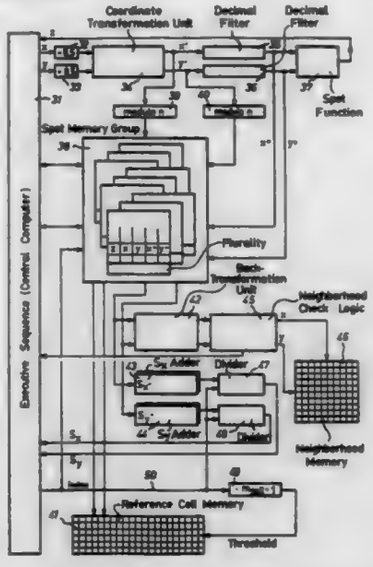
Ludo Kerz, Saulheim, Germany, assignor to Linotype-Hell AG, Eschborn, Germany

Continuation of Ser. No. 66,144, Jul. 23, 1993, abandoned. This application Dec. 29, 1994, Ser. No. 366,385

Claims priority, application Germany, Nov. 29, 1990, 40 38 057.2

Int. Cl.[6] G06K *9/40*; H04N *1/40*

U.S. Cl. 382—254 2 Claims



1. A method for reducing a disturbing restless pattern providing a restless impression in a half-tone screen separation created by use of a half-tone screen for production of a half-tone image, comprising the steps of:

providing a half-tone screen formed of a super cell, each super cell comprising a plurality of sub-cells, each sub-cell converting a gray tone to a half-tone raster spot according to a spot function, said spot function defining a threshold value for a corresponding element of a plurality of elements within the sub-cell employed to determine whether or not to expose pixels on the screen separation for creation of the half-tone spot within the sub-cell;

during assignment of said threshold values to said corresponding elements of said sub-cell, checking prior to the assignment of a next threshold value to a corresponding element a center of gravity of an area of elements to which the threshold values have already been assigned, and if, given an assignment of said next threshold value to said corresponding element, a center of gravity thereof would deviate from the previous center of gravity by more than a given threshold value, then assigning said next threshold value to a different substitute element of the sub-cell to reduce the deviation;

storing in computer memory the threshold value distribution for each sub-cell to form in memory the half-tone screen, and then using the stored half-tone screen to create the half-tone screen separation, said disturbing restless pattern being reduced or eliminated in said screen separation by insuring that adjacent raster spots on the screen separation are more equally spaced since the center of gravity of the area of the threshold value distribution within the sub-cells employed for creating said raster spots at a particular gray level has a reduced deviation for different gray levels.

5,469,517

MOTION COMPENSATION CIRCUIT

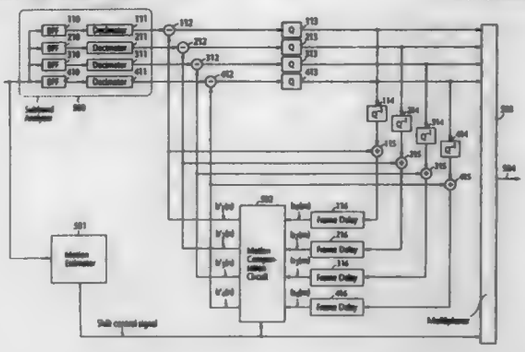
Mutsumi Ohta, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 6,843, Jan. 21, 1993, abandoned. This application Jul. 21, 1994, Ser. No. 278,631

Claims priority, application Japan, Jan. 21, 1992, 4-8010

Int. Cl.[6] G06K *9/36*

U.S. Cl. 382—252 10 Claims



1. A video coding apparatus comprising:

subband analyzer means for receiving an input video signal of successive frames sampled at an original rate, separating the input video signal into N subband signals and sampling the N subband signals at a rate lower than said original rate;

N subtractors receiving the N sampled subband signals, respectively, for deriving N prediction errors from the received N sampled subband signals and N prediction signals;

N quantizer means connected respectively to said N subtractors for producing N quantized prediction errors;

N dequantizer means for respectively dequantizing outputs of said N quantizer means;

N first adder means for summing outputs of said N dequantizer means with said N prediction signals and producing N locally reproduced subband signals;

N delay means connected respectively to outputs of said N first adder means for introducing a frame delay to each output of said N first adder means;

estimator means for estimating a motion vector from each of a plurality of blocks in each of said frames of the input video signal;

a plurality of finite impulse response (FIR) filters divided into N groups, each group corresponding to one of said N subband signals, one of the FIR filters of each group receiving a delayed signal from one of the delay means which corresponds to the subband signal corresponding to the group, and the remainder of the FIR filters in the group receiving a delayed signal from at least one of said delay means corresponding to at least one of the N subband signals of the other groups, each of said FIR filters having a tapped delay line for producing tap signals from the received delayed signal, a plurality of tap-weight multipliers for respectively multiplying the tap signals with tap weight coefficients which are controlled in response to said motion vector estimated by said estimator means, and an adder for summing output signals of said multipliers to produce an output signal of the FIR filter; and

N second adder means respectively corresponding to said N groups of FIR filters and said N first adder means, the second adder means summing the output signals of the FIR filters of the corresponding groups to produce said N prediction signals.

5,469,518

BACK-BOARD OPTICAL SIGNAL INTERCONNECTION MODULE USING FOCUSING GRATING COUPLER ARRAYS

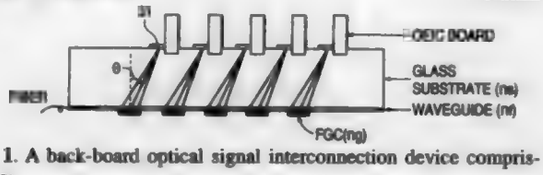
Seok-Ho Song, and Sang-Don Jung, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Dec. 15, 1994, Ser. No. 356,562

Claims priority, application Rep. of Korea, Nov. 15, 1994, 94-29914

Int. Cl.[6] G02B 6/30

U.S. Cl. 385—89 4 Claims



1. A back-board optical signal interconnection device comprising:

a glass substrate, a body of a back-board interconnection module;

input fiber arrays for connecting input signals to said glass substrate of the back-board interconnection module; photodiodes connected between said glass substrate and boards to detect optical signals distributed from the back-board interconnection module in each board and outputting electrical signals to opto electronic integrated circuit boards;

focusing grating coupler arrays; and

waveguides having said glass substrate on its upper surface and focusing grating couplers on its bottom to transmitting signals input through input fiber arrays to the glass substrate and distribute signals in focusing grating coupler arrays;

said focusing grating coupler arrays disposed on the bottom of the waveguides to distribute optical signals transmitted through said waveguides to each board.

5,469,519

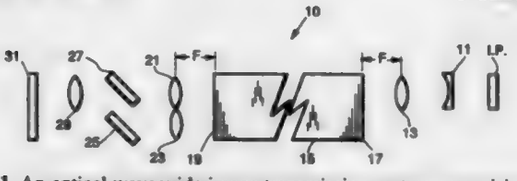
OPTICAL WAVEGUIDE IMAGE TRANSMISSION SYSTEM AND METHOD

David B. Chang, Tustin; Victor Vali, Laguna Hills, and I-Fu Shih, Los Alamitos, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 4, 1993, Ser. No. 13,288

Int. Cl.[6] G02B 6/32

U.S. Cl. 385—33 5 Claims



1. An optical waveguide image transmission system comprising:

an elongate optical waveguide having an input aperture and an output aperture;

means for injecting a Fourier transform of an image into a portion of said input aperture of said waveguide comprising:

means for collimating optical energy from said image, and

a first lens for transforming said collimated optical energy from said image into a Fourier transform, said first lens having a first focal length and being located a distance equal to said first focal length from said input aperture, such that said Fourier transform of said image is presented to said portion of said input aperture and such that said Fourier transform of said image and a mirror image of said Fourier transform of said image appear on said output aperture; and

means for transforming said Fourier transforms of said image at said output aperture comprising:

a second lens for transforming said Fourier transform of said image, said second lens having a second focal length and being located from said output aperture a distance equal to said second focal length,

a third lens for transforming said mirror image of said Fourier transform of said image, said third lens having a third focal length and being located from said output aperture a distance equal to said third focal length,

a grated mirror for passing said transformed image from said second lens to an image plane, and

a first mirror for reflecting said transformed mirror image from said third lens to said grated mirror;

wherein said grated mirror passes said reflected image from said first mirror in a right-side-up orientation along with said transformed image from said second lens to said image plane.

5,469,520

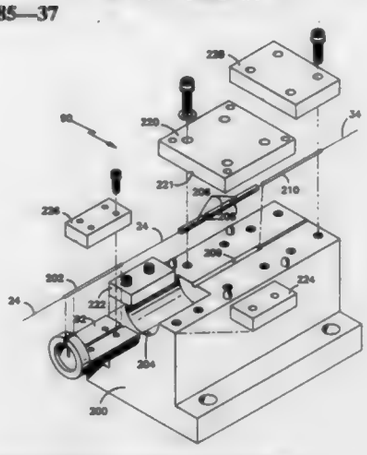
COMPRESSION-TUNED FIBER GRATING

William W. Morey, West Hartford, and Arnold L. Wilson, Bolton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 30, 1994, Ser. No. 316,183

Int. Cl.[6] G02B 6/34

U.S. Cl. 385—37 9 Claims



1. A tunable reflective element, comprising:

an optical waveguide which confines and propagates incident light;

a reflective element impressed in said waveguide which reflects said incident light at a reflection wavelength; and

compression means for compressing said reflective element so as to change said reflection wavelength, and for tuning said reflective element over a wavelength range greater than a predetermined range, said predetermined range being: 5 nm, 10 nm, 15 nm, 20 nm, or 30 nm.

5,469,521

SEAL BETWEEN BUFFER TUBE AND OPTICAL FIBER

Bruce Coutts, Laguna Hills, and Christopher A. Roe, Tustin, both of Calif., assignors to ITT Corporation, New York, N.Y.

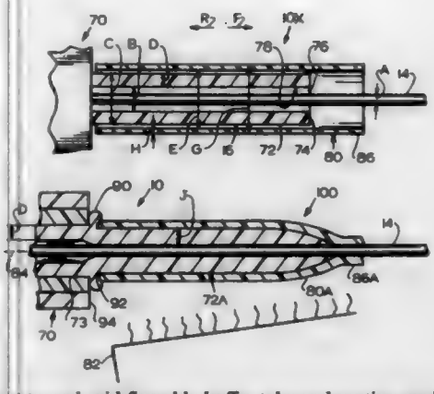
Filed May 23, 1994, Ser. No. 247,814

Int. Cl.[6] G02B 6/36

U.S. Cl. 385—77 10 Claims

1. A method for use with an optical cable which includes an optical fiber and a buffer tube that lies around said fiber and that has an inside diameter great enough so said fiber can slide within said buffer tube, where said fiber extends forward of a forward end portion of said buffer tube, for sealing the space between said fiber and said end portion of said buffer tube, comprising:

placing a heat shrinkable shrink tube around said buffer tube end portion, heating said shrink tube and said buffer tube end portion to cause said buffer tube end portion to become flowable and to shrink said shrink tube, to largely radially compress said flexible buffer tube end portion against said



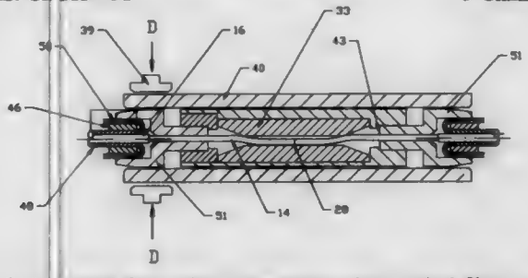
fiber to seal said flowable buffer tube end portion against said fiber and to shrink said shrink tube around said flowable buffer tube end portion, and allowing said flowable buffer tube end portion to solidify.

5,469,522

OPTICAL FIBER SPLICE INTERCONNECTION AND USAGE METHOD

Robert J. Fan, Canoga Park, Calif., assignor to LiteCom, Inc., Canoga Park, Calif.

Filed Dec. 2, 1993, Ser. No. 162,525
Int. Cl.[6] G02B *6/38*
U.S. Cl. 385—98 **9 Claims**



1. An optical fiber splice arrangement where optical fibers are brought together in an abutting central axis mutually—aligned orientation internal to an alignment means which has:

a square, triangular or other polygonal inside configuration continuing lengthwise therethrough thus forming alignment grooves in which optical fibers may be aligned in mutual abutment,

a round, smooth outside diameter configuration of the alignment means which will allow alignment means rotation as necessary when internal forces induced by optical fibers bent in a misalignment orientation to the central axis of the alignment means outside diameter are applied within the alignment means,

a smooth entry of generous oversized generally flared opening to accept fibers as they are urged slidingly therein, and guided at an angle to the entry axis,

an arrangement whereby the axes of two optical fibers are mutually aligned but are simultaneously misaligned with respect to the axis of the alignment means thereby causing fibers to be forced to one side of the alignment means upon entry,

an arrangement whereby optical fibers entering the alignment means will force the alignment means to rotate as required so that optical fibers will thus self-align with mutually coincidental axes in any one of the grooves thus formed by intersecting planes of the polygonal interior configuration, said groove providing for fiber-to-fiber abutment and alignment, the groove used being that closest to the fibers as they enter the alignment means,

an arrangement whereby the optical fiber endfaces will meet in precise axial alignment and abutment by mutual orientation in one of said offset grooves,

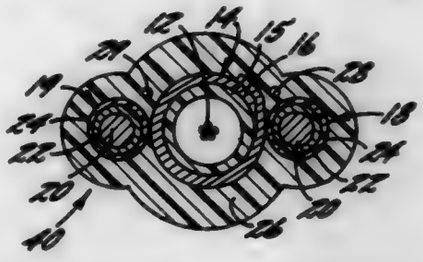
an arrangement whereby the end-to-end relative mutually abutting position of optical fibers is controlled by built-in stopping features of splice elements affixed with bias force to the fibers or buffer portion of said fibers within the splice assembly.

5,469,523

COMPOSITE FIBER OPTIC AND ELECTRICAL CABLE AND ASSOCIATED FABRICATION METHOD

Douglas J. Blew, and Bruce J. Carlson, both of Hickory, N.C., assignors to CommScope, Inc., Catawba, N.C.

Filed Jun. 10, 1994, Ser. No. 258,328
Int. Cl.[6] G02B *6/44*
U.S. Cl. 385—101 **36 Claims**



1. A composite fiber optic and electrical cable comprising:

an elongate core,

at least one optical fiber extending longitudinally within said core,

a pair of electrical power conductors extending longitudinally of and alongside said core,

an insulating layer of a first polymer material surrounding each of said electrical power conductors, and

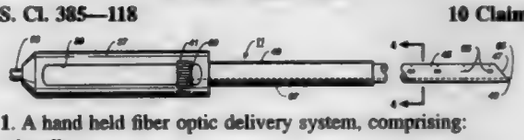
an outer jacket of a second polymer material surrounding said core and surrounding and encasing said electrical power conductors and their respective insulating layers and having properties enabling said outer jacket to be separated from said insulating layers, wherein said second polymer material is of a composition which forms a distinct mechanical separate phase from said first polymer material.

5,469,524

FIBEROPTIC DELIVERY SYSTEM AND METHOD OF USE

Victor C. Esch, Albuquerque, N.M., and Kirsten L. Valley, Mountain View, Calif., assignors to Indigo Medical, Incorporated, Palo Alto, Calif.

Filed May 12, 1994, Ser. No. 241,735
Int. Cl.[6] G02B *23/26*
U.S. Cl. 385—118 **10 Claims**



1. A hand held fiber optic delivery system, comprising:

a handle,

a flexible elongated tube carried by the handle in a manner to be slid in and out thereof for a distance along the length of the tube, said tube having a free end extending a distance from the handle,

a knob carried by the handle and attached to said tube therein in a manner to allow said tube to be slid in and out of the handle along the length of the tube,

a length of optical fiber positioned within said tube and handle, said optical fiber being restrained against movement along its length by attachment to the handle, and

a length of wire extending along the length of said tube, said wire being attached to said knob and extending a distance away from said free tube end, whereby said wire and tube are moved together along their lengths by movement of the knob with respect to the handle.

5,469,525

PHOTONIC DEVICES USING OPTICAL WAVEGUIDES INDUCED BY DARK SPATIAL SOLITONS

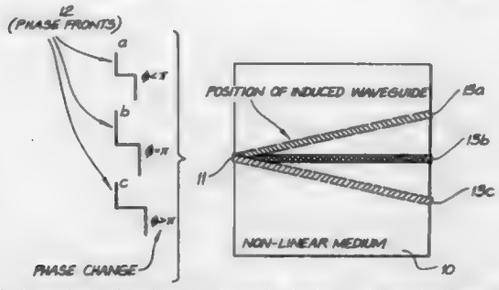
Barry Luther-Davies, Bruce, and Yang Xiaoping, Endeavour Hills, both of, Australia, assignors to The Australian National University, Acton, Australia

Filed Dec. 7, 1994, Ser. No. 313,169

Claims priority, application Australia, Apr. 7, 1992, PL 1803

Int. Cl.[6] G02F *1/35*

U.S. Cl. 385—122 **16 Claims**



1. A method of making a photonic device, said method comprising the steps of

(a) projecting a quasi-plane wave light beam into a body of an optically transparent material, said material having a third order non-linear susceptibility which is negative; and

(b) applying a perturbation to at least one point or region of the wavefront of said quasi-plane wave, to thereby format least one dark spatial soliton in the material at the or each location where the perturbation is incident upon the surface of the body;

whereby said or each dark spatial soliton effectively propagates through the body to create an optical waveguide in the material, extending from said or each location to an or a respective outlet region of the material, so that a second light beam, if incident upon said location or one of said locations, is conducted to the or the associated outlet region by the soliton-created optical waveguide.

5,469,526

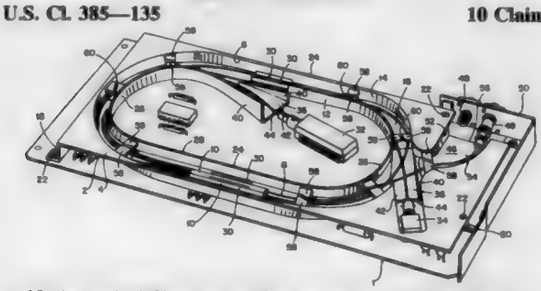
OPTICAL FIBER SUPPORT FOR PRINTED CIRCUIT BOARDS

David L. Rawlings, Bayville, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Jan. 7, 1994, Ser. No. 178,929

Int. Cl.[6] G02B *6/36*

U.S. Cl. 385—135 **10 Claims**



10. An optical fiber support for supporting an optical fiber in a raised position above the surface of a printed circuit board on which electrical components are mounted, the surface of the printed circuit board residing substantially in a first plane, which comprises:

means defining an optical fiber guiding raceway for receiving and guiding an optical fiber, the raceway residing substantially in a second plane disposed parallel to the first plane of the printed circuit board surface and spaced apart therefrom;

means for supporting the raceway defining means in spaced apart relation to the printed circuit board surface; and

at least one of an exit ramp and an entrance ramp, the at least one of an exit ramp and an entrance ramp being joined to the raceway and extending therefrom substantially to the surface of the printed circuit board and residing substantially in a plane which is transverse to the first and second planes of the raceway and printed circuit board surface, respectively, and providing support for the optical fiber from the raceway to the printed circuit board surface.

5,469,527

METHOD OF AND DEVICE FOR CODING SPEECH SIGNALS WITH ANALYSIS-BY-SYNTHESIS TECHNIQUES

Rosario Drogo de Iacovo, Rocca Imperiale Marina; Roberto Montagna, and Daniele Sereno, both of Turin, all of, Italy, assignors to SIP - Societa Italiana per l'Esercizio delle Telecomunicazioni p.A., Turin, Italy

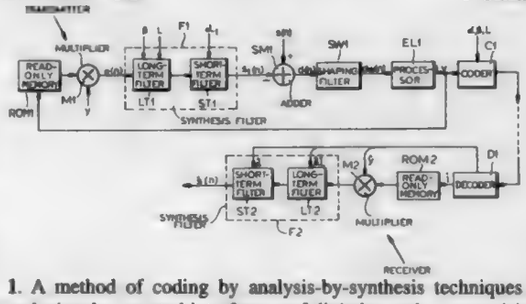
Division of Ser. No. 803,484, Dec. 4, 1991, Pat. No. 5,353,373. This application Feb. 16, 1994, Ser. No. 197,129

Claims priority, application Italy, Dec. 20, 1990, 68029 A/90

The portion of the term of this patent subsequent to Oct. 4, 2011, has been disclaimed.

Int. Cl.[6] G10L *9/00*

U.S. Cl. 395—2.29 **5 Claims**



1. A method of coding by analysis-by-synthesis techniques a speech signal converted into frames of digital samples, comprising the steps of:

(a) in a coding phase, generating at each frame a coded signal representing an excitation and constituted by a selected excitation signal, chosen out of a set of possible excitation signals for coding and submitted to a synthesis filtering to introduce into the selected excitation signal short-term and long-term spectral characteristics of an original speech signal to be coded and to produce a synthesized signal, the excitation signal chosen being that which minimizes a perceptually-significant distortion measure obtained by comparison of the original and synthesized signals and simultaneous spectral shaping of the compared signals;

(b) in a decoding phase subjecting another excitation signal, chosen out of an excitation signal set for decoding identical to the excitation set for coding of step (a) with excitation information contained in a respective coded signal, to another synthesis filtering corresponding to the synthesis filtering effected on the excitation signal during the coding phase in step (a);

(c) effecting an embedded coding for use in a network where the coded signals are organized into packets which are transmitted at a first bit rate and can be received at bit rates lower than the first bit rate but not lower than a predetermined minimum transmission rate, the various rates differing by discrete steps, the embedded coding comprising the steps of:

(c_1) splitting the sets of excitation signals for coding and decoding into a plurality of subsets, a first subset of which contributes to the respective excitation an amount of information required for transmission of the coded signals at the

minimum transmission rate, while other subsets have contributions corresponding each to one of said discrete steps, the contributions of said other subsets being used in a predetermined succession and being added to the contributions of the first subset and of preceding subsets in the succession to provide increase steps;

(c_2) filtering during the coding phase the contributions supplied by all subsets of excitation signals in such a manner that, at each frame, a memory of a filtering result relevant to at least one preceding frame is taken into account only when filtering the contribution to the excitation signal of the first subset, while the contributions to the excitation signals of all other subsets are filtered without taking into account the results of the filtering relevant to preceding frames; and

(c_3) still during the coding phase, inserting the contributions supplied by different subsets into different signal packets which can be distinguished from one another, the decrease from the first rate to one of the lower rates being achieved by discarding first packets containing the excitation contribution which has led to the attainment of the first rate and then packets containing the contribution to the excitation signals corresponding to preceding increase steps; and

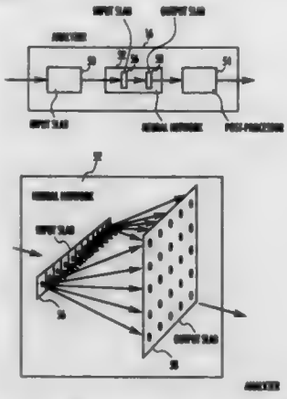
(d) during the decoding phase, receiving for each frame, the contribution to the excitation signals of the first subset if subjected to synthesis filtering for any bit rate of the coded signal, and, if the bit rate is higher than the minimum rate, filtering also contributions to the excitation signals of the subsets corresponding to the steps which have led to the bit rate, the filtering of the contribution to the excitation signals of the first subset being a filtering with memory and the filtering of the contributions to the excitation signals of the other subsets being a filtering without memory.

5,469,528

NEURAL LOAD DISTURBANCE ANALYZER

Larry D. Douglas, Copper Canyon, and Clarence W. Hutchinson, Jr., Arlington, both of Tex., assignors to Syseca, Inc., Marina del Ray, Calif.

Filed Sep. 16, 1992, Ser. No. 945,528
Int. Cl.[6] G06F *15/18;15/46*
U.S. Cl. 395—23 **7 Claims**



1. A neural load disturbance analyzer for classifying a utility, power load disturbance into one of a plurality of disturbance modes, the neural load disturbance analyzer comprising:

a pre-processor which samples a signal indicative of a utility, power load at a plurality of times, the pre-processor generating pattern data representative of a pattern indicative of the samples;

a trained neural network disposed to receive the pattern and determine a winning output representative of the utility, power load disturbance;

a post-processor disposed to monitor the winning output and select a disturbance mode representative of the utility, power load disturbance based on the winning output; and

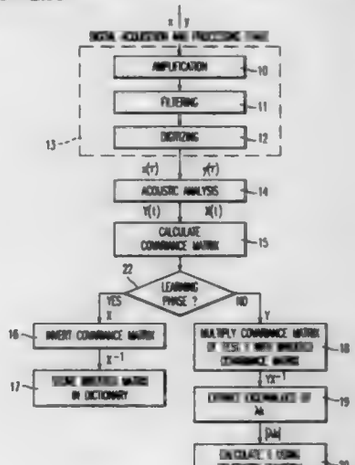
means for determining the probability of a utility, power load disturbance based on the number of occurrences of the winning output in the pattern data during a predetermined period relative to the total number of patterns presented to the neural network during the predetermined period.

5,469,529

PROCESS FOR MEASUKING THE RESEMBLANCE BETWEEN SOUND SAMPLES AND APPARATUS FOR PERFORMING THIS PROCESS

Frédéric Bimbot, Fontenay-Aux-Roses, and Luc Mathan, Lannion, both of, France, assignors to France Telecom Etablissement Autonome De Droit Public, Paris, France

Filed Sep. 21, 1993, Ser. No. 124,005
Claims priority, application France, Sep. 24, 1992, 92 11406
Int. Cl.[6] G10L *5/06;9/00*
U.S. Cl. 395—2.55 **12 Claims**



1. A process for measuring a resemblance between a plurality of sound samples, comprising:

a learning phase comprising the steps of:

acoustically analyzing a reference sound sample using a p^{th} order acoustical analysis to obtain a resultant vector signal of the reference sound sample;

calculating a covariance matrix X of size p×p using the resultant vector signal of the reference sound sample;

inverting said covariance matrix X to obtain an inverted covariance matrix X^{-1}; and

storing the inverted covariance matrix $X^{31\ 1}$ in a dictionary;

a test phase comprising the steps of:

acoustically analyzing a test sound sample using a p^{th} order acoustical analysis to obtain a resultant vector signal of the test sound sample;

calculating a covariance matrix Y of size p×p using the resultant vector signal of the test sound sample;

multiplying the covariance matrix Y with the inverted covariance matrix X^{-1} to obtain a product YX^{-1};

calculating p eigenvalues λk of YX^{-1};

determining a resemblance between the reference sound sample and the test sound sample using generalized sphericity functions using at least two of the following equations:

$$a(\lambda_1, \lambda_2, \ldots, \lambda_p) = \frac{1}{p} \sum_{k=1}^{p} \lambda_k$$

-continued

$$g(\lambda_1, \lambda_2, \ldots, \lambda_p) = \sqrt[p]{\prod_{k=1}^{p} \lambda_k}$$

$$h(\lambda_1, \lambda_2, \ldots, \lambda_p) = \left(\frac{1}{p} \sum_{k=1}^{p} \frac{1}{\lambda_k} \right)^{-1}$$

where a, g, and h represent respectively an arithmetic, geometric, and harmonic mean values of the eigenvalues λk,

wherein the learning phase and test phase each further perform the steps of:

amplifying the sound samples;

filtering the amplified sound samples; and

digitizing the filtered amplified sound samples.

5,469,530

UNSUPERVISED TRAINING METHOD FOR A NEURAL NET AND A NEURAL NET CLASSIFIER DEVICE

Shérif Makram-Ebeid, Dampierre-en-Yvelines, France, assignor to U.S. Philips Corporation, New York, N.Y.

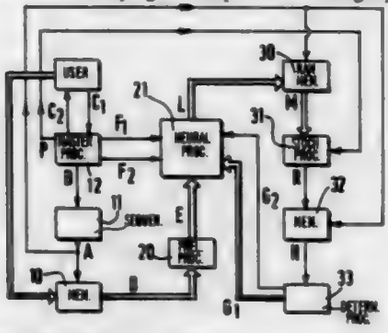
Filed May 22, 1992, Ser. No. 887,636

Claims priority, application France, May 24, 1991, 91 06278; Jul. 19, 1991, 91 09134

Int. Cl.[6] G06F *15/18*

U.S. Cl. 395—23 **6 Claims**

1. A device for classifying in unsupervised training a plurality of



input vectors into classes comprising:

(a) neural net having an input for receiving the input vectors and an output for providing a pattern of output activations associated with the input vector, and a memory for storing values of operational parameters of the net;

(b) a stochastic labeling means, coupled to the output, for generating weighting factors for each of the classes upon mutually correlating the output activations of the patterns and for perfoming a stochastic selection using probabilities of a single class on the basis of probabilities weighted by the weighting factors;

(c) an intensifying means coupled to the memory for intensifying differences between the patterns by modifying the values of the operational parameters upon re-supplying the test vectors in random order and for storing the modified values in the memory.

5,469,531

PROCESS FOR HYBRID POSITION/FORCE CONTROL FOR A ROBOT MANIPULATOR

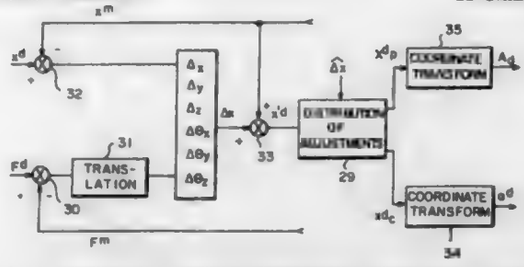
Serge Faure, Chuzelles; Alain Gaillet, Toulouse; Régis Lefebvre, Ecully, and Claude Reboulet, Labege, all of, France, assignors to Potain, Ecully, France

Filed Jan. 19, 1994, Ser. No. 183,230

Claims priority, application France, Jan. 19, 1993, 93 00681

Int. Cl.[6] G06F *15/50*

U.S. Cl. 395—86 **11 Claims**



1. A process for hybrid position/force control for a robot manipulator for grasping a load (4) , of the type which comprises a macro-manipulator (1) connected to a micro-manipulator (2) with a load grasping device (3), the process comprising:

inputting N set-point values of force (F^d) of contact of the load grasping device (3) or of the load (4) with the environment, and (6–N) first set-point values of position (χ^d) of the load grasping device (3), which correspond respectively to the six degrees of freedom of space;

comparing the set-point values of force and the first set-point values of position (F^d, χ^d) (at 30, 32) respectively to real force values and real position values (F^m, χ^m) input by respective sensors of force (28) and of position, to produce values of deviation;

translating the values of deviation (at 31) into increments of displacement (Δx, Δy, Δz, Δθx, Δθy, Δθz) for controlling the load grasping device (3);

adding the increments of displacement (at 33) to the real position values (χ^m) which represent an actual position, in order to constitute second set-point values of position (X^{sd}) of the load grasping device (3);

adjusting the second set-point values of position (χ^{sd}) of the load grasping device (3), by taking into account (at 29) real micro-manipulator position (Xp) of the macro-manipulator (1) and a macro-manipulator deformation (ΔX^) to yield third set-point values of position ($X^d{}_c$);

transforming the third set-point values of position ($X^d{}_c$) by a micro-manipulator manipulator transformer of coordinates (34) into articular micro-manipulator set-point values (a^d) for controlling micro-manipulator automatic controls of micro-manipulator actuating gears (24) of the micro-manipulator (2);

controlling the micro-manipulator actuating gears using the articular micro-manipulator set-point values (a^d);

directing to the macro-manipulator virtual set-point values of position ($X^*{}_pD$), taking into account the deformation (ΔX^) and an initial position ($X^o{}_p$) of the macro-manipulator (1);

selectively distributing the virtual set-point values ($X^*{}_pD$) (at 37) between realizable set-point values of position ($X^*{}_pD$) directed to the macro-manipulator (1) and non-realizable set-point values that are not realizable by the macro-manipulator (1) and which are directed to the micro-manipulator (2);

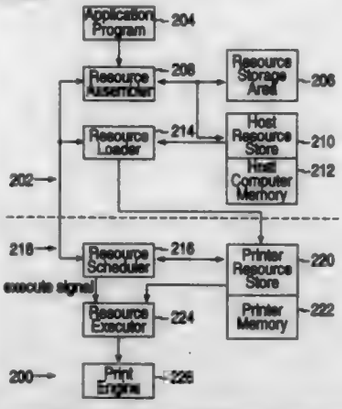
transforming the virtual set-point values of position ($X^*{}_pd$) by a macro-manipulator transformer of coordinates (35) into articular macro-manipulator set-point values (A^d) for controlling macro-manipulator automatic controls of macro-manipulator actuating gears (19, 20, 21, 22, 26, 27) of the macro-manipulator (1); and

controlling the macro-manipulator actuating gears using the articular macro-manipulator set-point values (A^d;.

5,469,532
SYSTEM AND METHOD FOR FONT WRAPPING PRINTER DATA

Brett C. Gerlach, Bellevue; Patrick Lee, Fremont; William B. McCormick, Bellevue, all of Wash., and George H. Douglas, Theodore, Ala., assignors to Microsoft Corporation, Redmond, Wash.

Filed Nov. 16, 1992, Ser. No. 976,201
Int. Cl.[6] G06K *15/00*
U.S. Cl. 395—102 **18 Claims**



1. A computer-printer system including a printer and a host computer for controlling and printing a document on the printer, the host computer having a data file for the document containing data describing a plurality of objects to be printed, the printer being able to operate selectively in a first or second alternative modes of operation, the system comprising:

a resource assembler within the host computer examining the data file, translating the data file into a set of primitives corresponding to the plurality of objects within a particular portion of the document, determining a set of resources which are required for printing said particular portion of the document; and

a framer assembling said selected resources and creating a data frame for transmission to the printer, said data frame containing first and second portions, said first portion containing a create font command sequence that is processed as a create font command with said second portion being processed as font data if the printer is operating in the first alternative mode, said font command sequence being ignored with said second portion being processed as printer data if the printer is operating in the second alternative mode.

5,469,533
RESOURCE-ORIENTED PRINTER SYSTEM AND METHOD OF OPERATION

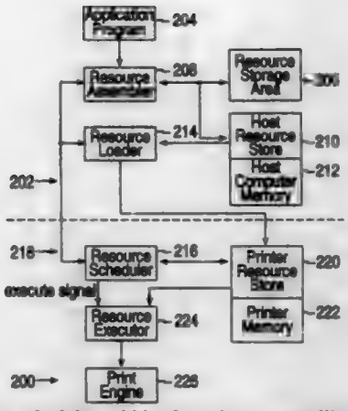
Stephen V. Dennis, Bothell, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Jul. 19, 1992, Ser. No. 911,767
Int. Cl.[6] G06F *13/14*
U.S. Cl. 395—114 **184 Claims**

17. A computer-printer system employing a printer and a host computer for controlling and printing a document on the printer, the host computer having a resource storage area for storing resources, a plurality of resources stored in the resource storage area, and a data file for the document containing data describing a plurality of objects to be printed, the printer containing a print engine, the system comprising:

a resource assembler examining the data file and selecting some of the resources from the resource storage area to form a selected set of resources required for printing the document, and translating the data file into a set of primitives corresponding to the plurality of objects within the document;

a resource store for storing said subset of required resources and said set of primitives;



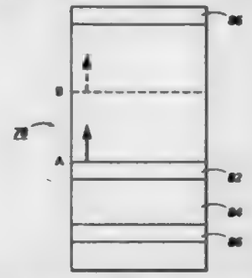
a resource scheduler within the printer controlling transfer of said required resources and said set of primitives to said resource store; and

a resource executor within the printer creating a bit-map data file corresponding to said required resources and said set of primitives and transferring said bit-map data file to the print engine for printing.

5,469,534
METHOD FOR TRANSLATING IMAGE PROCESSING DATA

Edward E. Brindle; John C. Czudak, both of Webster, and David B. Mensing, Hilton, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 14, 1994, Ser. No. 259,591
Int. Cl.[6] G06K *15/00*
U.S. Cl. 395—114 **3 Claims**



1. A method of operating an imaging system server having processing means, the server being adapted to translate a first job written in a first data form to a second data form and a second job, and including a memory defining entry locations therein, comprising the steps of:

loading untranslated data relating to the first job at a first entry location in the memory;

translating the untranslated data relating to the first job;

sequentially removing a series of blocks of untranslated data relating to the first job from the memory as the untranslated data is translated, each block being of a predetermined size;

loading translated data relating to the first job at a second entry location in the memory; and

sequentially loading a series of blocks of untranslated data relating to the second job at the first entry location in the memory, each block being of the predetermined size, each block of untranslated data relating to the second job replacing a removed block of untranslated data relating to the first job in an identical location in the memory, with blocks of untranslated data relating to the first job and blocks of untranslated data relating to the second job being retained in the memory simultaneously.

5,469,535

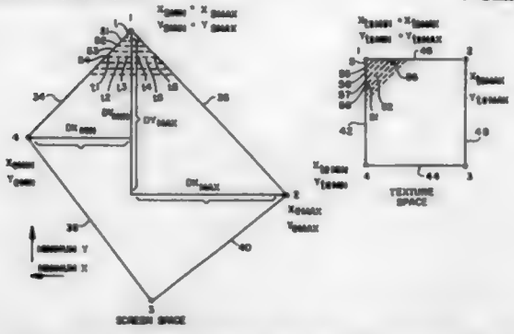
THREE-DIMENSIONAL, TEXTURE MAPPING DISPLAY SYSTEM

Eugene Jarvis, and Eric L. Pribyl, both of Chicago, Ill., assignors to Midway Manufacturing Company, Chicago, Ill.

Filed May 4, 1992, Ser. No. 878,151

Int. Cl.[6] G06T *15/70*

U.S. Cl. 395—130 **7 Claims**



1. In a display system adapted for use with video games to allow real-time animation of video games scenes with texture surfaces, said display system displaying three-dimensional projected texture mapped polygons on a two-dimensional display device having a screen composed of picture elements (pixels), said display system comprising:

a) host processing means responsive to input data from a host memory defining an overall image that is to be displayed in a three-dimensional form on a display device;

b) graphics co-processing means responsive to said host processing means for determining:

(i) destination addresses for each pixel on the screen of said display device and

(ii) a corresponding source address from which surface texture data is supplied for each said pixel; and

c) said graphics co-processing means including means for computing Z-mapping function values and delta and acceleration values therefrom, said graphics co-processing means using said delta and acceleration values to select said source addresses to display a reasonably accurate perspective of a three-dimensional texture mapped polygon on a two-dimensional display.

5,469,536

IMAGE EDITING SYSTEM INCLUDING MASKING CAPABILITY

Arthur M. Blank, San Diego, Calif., assignor to ImageWare Software, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 844,299, Feb. 25, 1992, Pat. No. 5,345,313, and a continuation-in-part of Ser. No. 919,584, Jul. 23, 1992. This application May 21, 1993, Ser. No. 65,750

Int. Cl.[6] G06F *15/66*

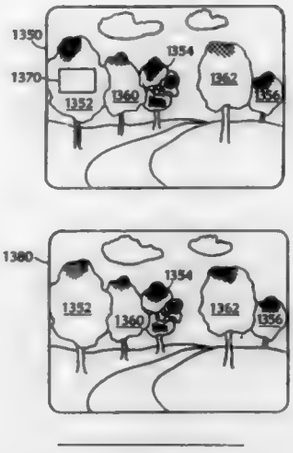
U.S. Cl. 395—131 **102 Claims**

1. In a computer system having a memory and a visual display, a digital method of editing an image having a plurality of pixels, each pixel having a color, comprising the steps of:

providing an image in digital form;

interactively selecting a plurality of colors from among those present in the image at at least one location on the visual display to form a set of selected colors wherein each color comprises a single discrete hue; and

manipulating, independent of inputs representative of any other image, only those pixels on the visual display having a color defined in the set of selected colors so as to change a visual feature of the image.



5,469,537

METHOD OF TRACING A DRAWING AND APPARATUS FOR EMBODYING THE METHOD

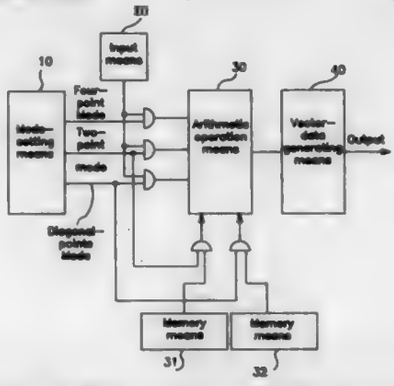
Nobuhiro Seki, Hyogo, Japan, assignor to International Technical Illustration Co., Ltd., Osaka, Japan

Filed Oct. 28, 1993, Ser. No. 141,958

Claims priority, application Japan, Jan. 28, 1992, 4-289845

Int. Cl.[6] G06T *11/00*

U.S. Cl. 395—133 **20 Claims**



9. An apparatus for tracing a drawing, which generates vector data corresponding to a draft plan by activating a drawing function to trace said draft plan shown on a display unit by a specific projection drawing comprising the following:

a mode-setting means **10** for setting a two-point mode for tracing an ellipse E of said draft plan based on a specific projection surface in said specific projection drawing and a pair of points Pi**0** and Pi**1** corresponding to a long diameter of said ellipse E of said draft plan;

an input means **20** which is capable of designating a pair of points Pi**0** and Pi**1** corresponding to both ends of the long diameter of said ellipse E of said draft plan;

a memory means **31** which stores known data of the ratio s of the long and short diameters of an ellipse on a specific projection surface of said specific projection drawing corresponding to a circle on a plane surface and data of the direction D of said long diameter specified by the projection surface;

an arithmetic operation means **30** for computing length m**0** of said long diameter and a center point P**0** of said long diameter corresponding to the center of said ellipse E, wherein said arithmetic operation means **30** also computes a length m**1** of a short diameter based on said ratio S of the long and short diameters and said length m**0** of the long diameter stored in said memory means **31**; and

a vector-data generating means **40** for generating vector data of said ellipse E based on said length m**0** and m**1** of said long

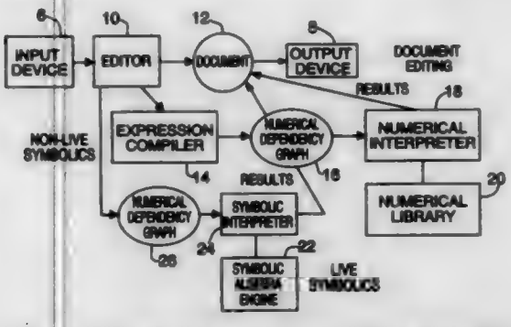
and short diameters, the direction D, and center point P0 of said long diameter of said ellipse E of said draft plan.

5,469,538

MATHEMATICAL DOCUMENT EDITOR AND METHOD PERFORMING LIVE SYMBOLIC CALCULATIONS FOR USE WITH AN ELECTRONIC BOOK

Allen M. Razdow, Cambridge, Mass., assignor to Mathsoft, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 204,841, Mar. 2, 1994. This application Mar. 4, 1994, Ser. No. 206,307
Int. Cl.[6] G06F *17/00*
U.S. Cl. 395—140 22 Claims



1. For use in an editable electronic book having hyperlinks and a table of contents with hyperlinks to corresponding sections of the electronic book, the electronic book including a first expression symbolically defining a first variable and a second expression including at least a symbolic evaluation operator and the first variable, a computer-based method for modifying symbolic expressions in real-time in the electronic book, the method comprising the steps of:

displaying the electronic book on a screen of a computer such that the first expression is displayed in the electronic book and the second expression is displayed at a position in the electronic book below or to the right of the first expression;

maintaining a data structure representing mathematical dependencies between expressions explicit in the expressions of the electronic book, the data structure including an acyclic directed graph including a first node representing the first expression and a second node representing the second expression;

performing a predetermined symbolic function on the second expression to produce a first resultant expression, the first resultant expression being mathematically equivalent to the second expression in combination with the first expression;

displaying the first resultant expression in the electronic book;

accepting as input from the user an instruction to modify the first expression in the electronic book;

displaying the modified first expression in the electronic book;

examining the data structure to determine all expressions that reference the first variable;

automatically and without further user intervention, passing the second expression as symbolic data and the modified first expression as symbolic data to the symbolic algebra engine;

at the symbolic algebra engine, automatically and without further user intervention, performing the predetermined symbolic function on the second expression to produce a modified resultant expression, the modified resultant expression being mathematically equivalent to the second expression in combination with the modified first expression;

adding the modified resultant expression to the data structure; and

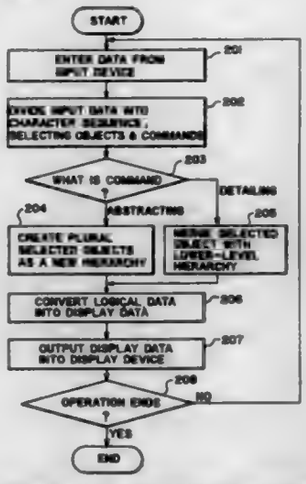
displaying the modified resultant expression in the electronic book in place of the resultant expression.

5,469,539

METHOD FOR ABSTRACTING/DETAILING STRUCTURING ELEMENTS OF SYSTEM SPECIFICATION INFORMATION

Yutaka Usuda, Yokohama, Japan, assignor to Hitachi Software Engineering Co., Ltd., Kanagawa, Japan

Filed Sep. 14, 1993, Ser. No. 120,458
Claims priority, application Japan, Sep. 18, 1992, 4-249909
Int. Cl.[6] G06T *11/60*
U.S. Cl. 395—155 1 Claim



1. A method for abstracting/detailing structuring elements of system specification information, wherein specification information is represented by a hierarchical tree-structure having stories of structuring elements at various levels, the method comprising the steps of:

selecting a first structuring element which is to be subjected to an abstracting or detailing process, the first structuring element being at a first level;

selecting between an abstracting process and a detailing process;

performing, if an abstracting process is selected, the steps of shifting the first structuring element to a second level lower than the first level, creating a second structuring element representative of the first structuring element, and placing the second structuring element at the first level into a position vacated by the first structuring element; and

performing, if a detailing process is selected, the steps of deleting the first structuring element, shifting a third structuring element, which is representative of the first structuring element and located at a second level lower than the first level, to the first level into a position vacated by the first structuring element.

5,469,540

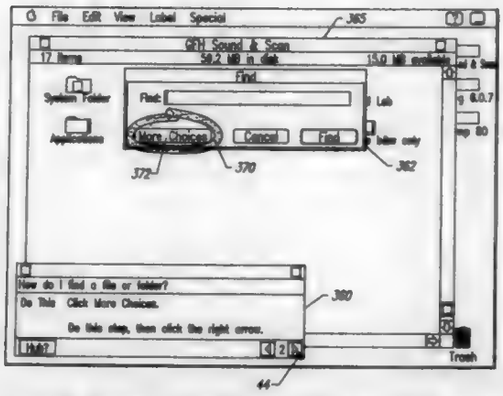
METHOD AND APPARATUS FOR GENERATING AND DISPLAYING MULTIPLE SIMULTANEOUSLY-ACTIVE WINDOWS

John R. Powers, III, Monte Sereno; James E. Palmer, Redwood City; Patricia J. Coleman, Menlo Park; Jeffrey A. Herman, Palo Alto, and Eli Cochran, Menlo Park, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jan. 27, 1993, Ser. No. 10,064
Int. Cl.[6] G06F *3/00*
U.S. Cl. 395—158 42 Claims

1. In a computer display system having a central processing unit (CPU) coupled to a display such that data is displayed on said display in a plurality of windows, a method for displaying said windows and operating upon said windows and said data in said windows by a user, comprising the steps of:

generating and displaying each of said plurality of windows at a different window layer according to a window order, wherein a window at a higher window layer covers a window at a lower window layer to the extent that any of said windows



overlap, wherein said step of generating and displaying each of said plurality of windows comprises the steps of

generating and displaying a first window at a first window layer, wherein said first window layer is a highest window layer;

generating and displaying a second window at a second window layer, wherein said first window has a portion that does not overlap with said second window;

both of said windows being simultaneously active; and

said user operating on both said first window and said second window without altering the window order of said plurality of windows.

5,469,541

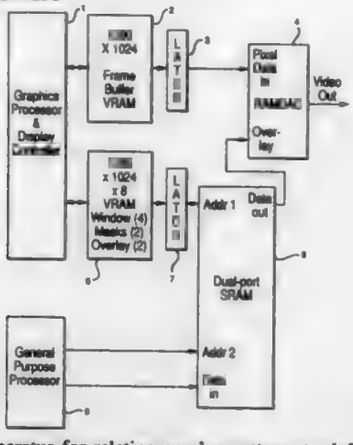
WINDOW SPECIFIC CONTROL OF OVERLAY PLANES IN A GRAPHICS DISPLAY SYSTEM

John A. Kingman; Steven P. Larky, and Michael T. Vanover, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 110,643, Aug. 19, 1993, abandoned, which is a continuation of Ser. No. 825,433, Jan. 21, 1992, abandoned, which is a continuation of Ser. No. 521,503, May 10, 1990, abandoned. This application Oct. 25, 1994, Ser. No. 328,591

Int. Cl.[6] G06F *15/20*

U.S. Cl. 395—158 **18 Claims**



1. An apparatus for relating overlay patterns to defined regions in a video display system, comprising:

frame buffer means for defining first and second regions in a display pattern of pixels subject to display;

overlay pattern means for defining an overlay pattern of pixels common to the first and second regions, said overlay pattern being stored independent of said display pattern, each overlay pattern pixel corresponding to at least one display pattern pixel without a plurality of overlay pattern pixels corresponding to pattern pixel;

controlling means, coupled to said overlay pattern means for selectively controlling visibility of the defined independently stored overlay pattern of pixels in the first and second regions; and

means, coupled to said frame buffer means and controlling means, for combining signals from said frame buffer means and said controlling means for display of an overlay pattern pixel or a display pattern pixel at each pixel of said first and second regions at all times.

5,469,542

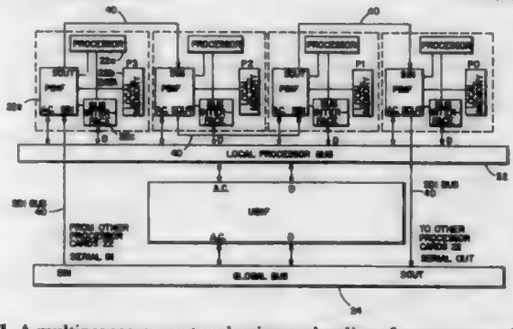
SERIAL DIAGNOSTIC INTERFACE BUS FOR MULTIPROCESSOR SYSTEMS

David J. Foster, White Plains; Armando Garcia, Yorktown Heights, and Robert B. Pearson, Cold Spring, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 22, 1991, Ser. No. 733,767

Int. Cl.[6] G06F *13/00;11/00*

U.S. Cl. 395—200.01 **15 Claims**



1. A multiprocessor system having a plurality of processor nodes each of which includes a local data processor having a plurality of external control signal lines, external data signal lines, and external address signal lines which couple said local data processor to a plurality of components disposed external to said local data processor, said multiprocessor system including diagnostic and control circuitry comprising:

a bit serial communications bus having an input and an output, said plurality of processor nodes being serially coupled along said bit serial communications bus; and

interface means comprising a first port for receiving a function code, a second port for coupling to said input of said bit serial communications bus, and a third port for coupling to said output of said bit serial communications bus, said interface means further comprising a formatting means having an input coupled to said first port and an output coupled to said second port, said formatting means being responsive to a reception of a function code from said first port for outputting the received function code as a corresponding packet to said second port;

wherein said diagnostic and control circuitry is further comprised of, in each of said plurality of processor nodes, nodal control means having an input coupled to a local nodal termination of said bit serial communications bus for receiving a packet therefrom and an output coupled to a local nodal origination of said bit serial communications bus for transmitting the packet thereto for reception by a next processor node or, for a last processor node coupled along said bit serial communications bus, for transmitting the packet to said bit serial communications bus for reception by said third port of said interface means, wherein said nodal control means is coupled to said local data processor and is responsive to a reception of a packet corresponding to a predetermined function for signalling said local data processor to terminate operation and, in response to said local data processor terminating operation, for controlling said local data processor external control signal lines, address signal lines and, if required, said local data processor data signal lines so as to

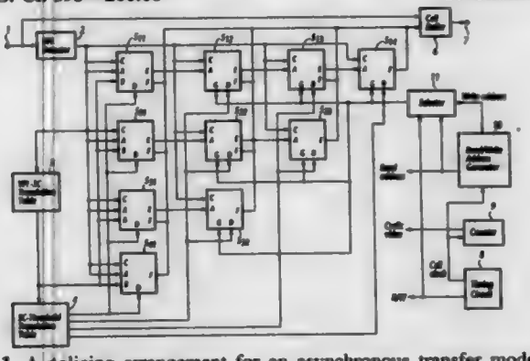
execute the predetermined function in cooperation with said plurality of components disposed external to said local data processor.

5,469,543

POLICING CIRCUITS ARRANGED IN MATRIX ARRAY FOR SELECTIVELY TRANSFERRING VIRTUAL PATH IDENTIFIER (VPI) RESPONSIVE TO EITHER VPI OR SERVICE CLASS IDENTIFIER (SCI) THRESHOLD VALUE

Motoo Nishihara; Takatoshi Kurano; Naoaki Yamanaka, all of Tokyo, and Youichi Sato, Kanagawa, all of, Japan, assignors to NEC Corporation, Japan

Filed Aug. 14, 1992, Ser. No. 931,039
Claims priority, application Japan, Aug. 14, 1991, 3-204285
Int. Cl.[6] G06F *7/02;7/04;7/10*
U.S. Cl. 395—200.06 **10 Claims**



1. A policing arrangement for an asynchronous transfer mode network, comprising:

a cell buffer for storing an incoming cell;

a virtual path identifier (VPI) detector for detecting a VPI contained in said incoming cell and extracting the detected VPI from the cell;

a translation table for converting the extracted VPI to a corresponding one of a plurality of threshold values;

a read/write control circuit for generating a read and write address; and

a matrix array of policing circuits each having a bridge memory, the policing circuits of the array being arranged in rows and columns and being connected column by column for transferring a VPI from one column of the array to an adjacent column along rows of the array in accordance with the read and write address supplied from the read/write control circuit wherein each policing circuit of one of the columns of the array, which is the earliest of the columns of the array to transfer the VPI along the rows of the array, is uniquely responsive to a VPI of a particular threshold value, and comprises an address controller for storing the VPI of the particular threshold value into a location of the bridge memory of the policing circuit corresponding to the value of the stored VPI and reading the stored VPI from the bridge memory so that said VPI is held in said bridge memory for a duration corresponding to the value of the said VPI.

5,469,544

CENTRAL PROCESSING UNIT ADDRESS PIPELINING

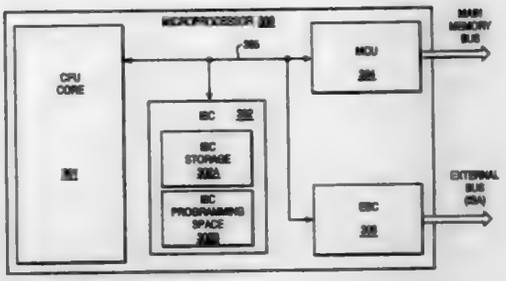
Deepak J. Aatresh, Sunnyvale; Tosaku Nakanishi, Cupertino, both of Calif., and Gregory S. Mathews, Boca Raton, Fla., assignors to Intel Corporation, Santa Clara, Calif.

Filed Nov. 9, 1992, Ser. No. 973,720
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—290 **20 Claims**

1. A computer system comprising:

a memory;

an external bus device; and



a microprocessor having

an internal bus,

a central processing unit (CPU) core, coupled to said internal bus, operable to transfer data to and from said internal bus,

a memory controller, coupled to said internal bus and said memory, to coordinate data transfers via said internal bus between said CPU core and said memory at a first frequency, and

an external bus controller, coupled to said internal bus and said external bus device, to coordinate data transfers via said internal bus between said CPU core and said external bus device at a second frequency different than said first frequency,

wherein said microprocessor generates addresses for burst and non-burst transferring and also generates a first address and a second address and said microprocessor further determines if a transfer is burst or non-burst transfer and

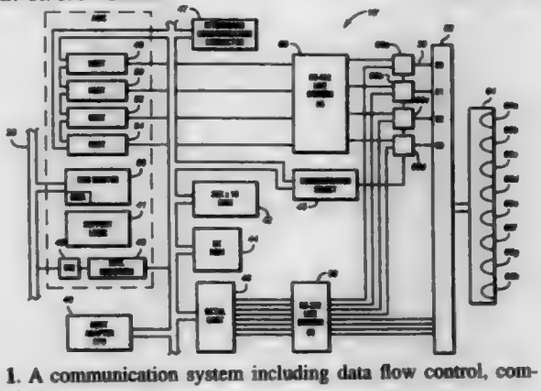
wherein, during separate transfers, the microprocessor pipelines addresses on the internal bus, such that said first address corresponding to said external bus device is driven on said internal bus while a data transfer occurs between said microprocessor and said memory and said second address corresponding to said memory is driven on said internal bus while a data transfer occurs between said microprocessor and said external bus device.

5,469,545

EXPANDABLE COMMUNICATION SYSTEM WITH DATA FLOW CONTROL

Michael R. Vanbuskirk, Plano, and Jon M. Meinecke, Denton, both of Tex., assignors to Compaq Computer Corp., Houston, Tex.

Continuation of Ser. No. 771,169, Oct. 3, 1991. This application Nov. 7, 1994, Ser. No. 335,557
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—200.01 **3 Claims**



1. A communication system including data flow control, comprising:

a host computer, comprising:

memory for storing data, wherein said memory includes a data buffer for containing data to be transferred to and from said host computer, and

a system bus coupled to said memory;

a plurality of TTY devices, each including:

a data buffer for containing data received from and to be sent to said host computer,

a port connected to said TTY data buffer for sending data from said TTY data buffer to said host computer, and for receiving data from said host computer and placing said data into said TTY data buffer, and

means connected to said TTY data buffer and said port for detecting when the level of data in said TTY data buffer reaches a first predetermined high level and a first predetermined low level, wherein if data in said TTY data buffer reaches said first predetermined high level, said means for detecting temporarily stops subsequent data from being received until data in said TTY data buffer empties to said first predetermined low level;

a host adapter including:

a system bus connected to said host computer system bus,

a plurality of device output buffers, each one of said plurality of device output buffers for containing data to be sent to a corresponding one of said plurality of TTY devices,

a communications port for sending and receiving data and commands,

a plurality of device input buffers, each one of said plurality of device input buffers for containing data sent from a corresponding one of said plurality of TTY devices, and

means connected to said host adapter system bus, said plurality of device input buffers, said plurality of device output buffers, and said host adapter communication port for transferring data from said data buffer of said host computer memory to said plurality of device output buffers, for transferring data from said plurality of device input buffers to said data buffer of said host computer memory, for transferring data from said host adapter communications port from said plurality of TTY devices to corresponding ones of said plurality of device input buffers, for transferring data from said plurality of device output buffers to said host adapter communications port to corresponding ones of said plurality of TTY devices, for sending a plurality of data flow commands to each of said plurality of TTY devices, said plurality of data flow commands including a stop-flow command for stopping a TTY device from sending subsequent data, and a start-flow command for enabling a TTY device to send subsequent data, and for determining when the level of data contained in each of said plurality of device input and output buffers reaches a second predetermined high level and a second predetermined low level, wherein if the amount of data in one of said plurality of device input buffers reaches said second predetermined high level, said host adapter transferring means sends said stop-flow command to a corresponding one of said plurality of TTY devices, and wherein said host adapter transferring means sends said start-flow command to said corresponding TTY device when the amount of data in said one of said plurality of device input buffers is emptied below said second predetermined low level; and

a data concentrator, comprising:

a plurality of device ports, each said device port connected to said port of a corresponding one of said plurality of TTY devices for sending data to and receiving data from said TTY device,

a plurality of device output buffers, each of said plurality of data concentrator device output buffers for containing data to be sent to a corresponding one of said plurality of TTY devices,

device buffer overflow means connected to said plurality of data concentrator device output buffers for detecting when the amount of data in each of said plurality of data concentrator device output buffers reaches a third predetermined high level and a third predetermined low level,

an input buffer for containing all data received from said plurality of TTY devices,

input buffer overflow means connected to said input buffer for detecting when the amount of data in said input buffer is greater than a fourth predetermined high level and less than a fourth predetermined low level,

a communications port connected to said host adapter communications port for sending data and commands to and receiving data and commands from said host adapter, and

means connected to said plurality of device ports, said plurality of data concentrator device output buffers, said device buffer overflow means, said input buffer, said input buffer overflow means, and said data concentrator communications port, for transferring data for each of said plurality of TTY devices from said data concentrator communications port to a corresponding one of said plurality of data concentrator device output buffers, for transferring data from each of said plurality of TTY devices and placing data in said input buffer and for transferring data in said input buffer to said data concentrator communications port, for sending one of a plurality of commands to said host adapter through said data concentrator communications port, wherein said plurality of commands includes a flow-off command and a flow-on command, wherein if the level of data in one of said plurality of data concentrator device output buffers reaches said third predetermined high level, said data concentrator transferring means sends a flow-off command for a corresponding one of said plurality of TTY devices to said host adapter to stop said host adapter from sending data to said corresponding TTY device, and wherein when the amount of data in said one of said plurality of data concentrator device output buffers empties to below said third predetermined low level, said data concentrator transferring means sends said flow-on command for said corresponding TTY device to said host adapter to instruct said host adapter to start sending data to said corresponding TTY device, and wherein if the level of data in said input buffer reaches said fourth predetermined high level, said data concentrator transferring means stops all of said plurality of TTY device ports from receiving data from said plurality of TTY devices, and wherein said data concentrator transferring means enables said plurality of TTY device ports to receive data from said plurality of TTY devices when the amount of data in said input buffer is lower than said fourth predetermined low level.

5,469,546

METHOD FOR RETRYING RECORDING INFORMATION INTO A NEXT LOGICAL BLOCK BY SENDING SENSE DATA INCLUDING ADDRESS INFORMATION TO HOST COMPUTER AND RESPONDING TO COMMAND THEREFROM

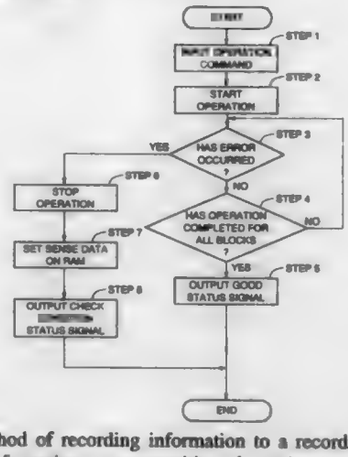
Hideki Hosoya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1992, Ser. No. 915,659

Claims priority, application Japan, Jul. 23, 1991, 3-205660

Int. Cl.[6] G06F *11/00;11/16*

U.S. Cl. 395—182.06 **6 Claims**



1. A method of recording information to a recording medium, incapable of erasing an overwriting, by using an information

processing system comprising an information recording apparatus to record information to the recording medium, a controller to control said information recording apparatus, and a host computer which is connected to said controller through a small computer interface, comprising the steps of:

setting a plurality of logical blocks to said recording medium;

assigning different logical block addresses to said logical blocks;

sending a Write command to designate some of said logical blocks into which the information is recorded from said host computer to said controller through said small computer interface;

controlling said information recording apparatus by the controller so as to record the information into the logical blocks designated by said Write command, sending a good status signal indicative of the completion of the recording from the controller to the host computer through the small computer interface when no error occurs until the completion of the recording of the information into all of the logical blocks designated by said Write command;

causing the controller to suspend the recording when an error occurs during the recording of the information;

causing the controller to produce sense data when the error occurs during the recording of the information, said sense data comprising (i) an information byte indicative of an address of the logical block in which the error has first occurred when it is been as a command, and (ii) a last written block byte indicative of an address of the logical block in which the recording has finally been executed before the recording is suspended;

sending a check condition status signal indicative of the occurrence of the error from the controller to the host computer through the small computer interface when the error occurs during the recording of the information;

sending a request status signal from the host computer to the controller through the small computer interface when the host computer receives the check condition status signal;

sending the sensed data from the controller to the host computer through the small computer interface when the controller receives the request status signal; and

causing the host computer to send a Write command for retrying recording into a logical block next to the logical block indicated by the last written block byte of the sensed data, to the controller through the small computer interface.

5,469,547

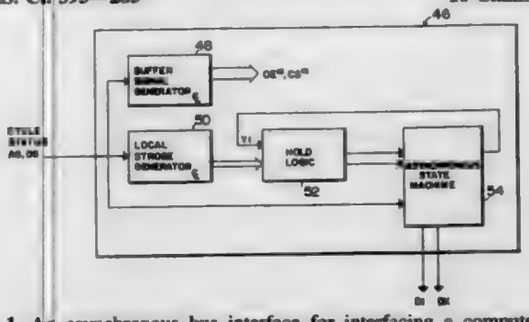
ASYNCHRONOUS BUS INTERFACE FOR GENERATING INDIVIDUAL HANDSHAKE SIGNAL FOR EACH DATA TRANSFER BASED ON ASSOCIATED PROPAGATION DELAY WITHIN A TRANSACTION

Chester W. Pawlowski, North Chelmsford, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 17, 1992, Ser. No. 916,327

Int. Cl.[6] G06F *13/14;13/38;13/42*

U.S. Cl. 395—285 **10 Claims**



1. An asynchronous bus interface for interfacing a computer system to an asynchronous bus, a transaction on said asynchronous bus including address and command information and at least two data transfers delineated by a master data strobe and terminated by a handshake signal, and wherein each said data transfers within said transaction may incur different propagation delays, comprising:

means for determining a cycle type for each said transaction from said address and command information, said cycle type representing data width, transfer direction, and starting address, and

means responsive to said means for determining a cycle type, said master data strobe, and said different propagation delays for generating an individually timed slave data handshake signal for each data transfer within a transaction, the individual timing of a slave data handshake signal for a particular data transfer within the transaction being dependent upon the propagation delay associated with the particular data transfer.

5,469,548

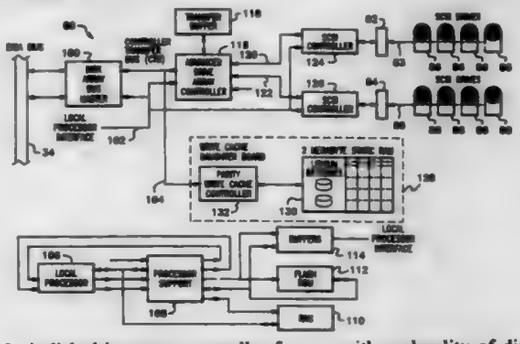
DISK ARRAY CONTROLLER HAVING INTERNAL PROTOCOL FOR SENDING ADDRESS/TRANSFER COUNT INFORMATION DURING FIRST/SECOND LOAD CYCLES AND TRANSFERRING DATA AFTER RECEIVING AN ACKNOWLDGEMENT

Ryan A. Callison, Spring; Gregory T. Chandler, Houston, and Thomas W. Grieff, Spring, all of Tex., assignors to Compaq Computer Corp., Houston, Tex.

Continuation of Ser. No. 960,582, Oct. 13, 1992, abandoned. This application Jun. 20, 1994, Ser. No. 263,018

Int. Cl.[6] G06F *7/22*

U.S. Cl. 395—441 **10 Claims**



1. A disk drive array controller for use with a plurality of disk drives forming an array and for installation in a host computer, the disk drive array controller comprising:

local processor means for controlling operation of the disk drive array controller;

buffer memory means for temporarily storing disk drive and command data;

means for transferring data between the disk drives and said buffer memory means, said means connected to said local processor means for receiving control information; and

means for transferring data between said buffer memory means and the host computer, said means including:

a bus for transferring host address information and data;

bus master means connected to said bus and said buffer memory means for providing host address information to said bus and transferring data between said bus and said buffer memory means, said bus master means including means for transferring a host memory address during a first bus slave load cycle, transfer count information during a second bus slave load cycle and data on following slave cycles and for providing a bus slave load signal with said first and second slave load cycles and a bus slave data request signal during said data cycles; and

bus slave means connected to said bus and to the host computer for receiving said host address information add for transferring data between said bus and the host computer, said bus slave means including means for loading said host memory address value during said first cycle after receipt of said bus slave load signal, for loading said transfer counter during said second cycle after receipt of said bus slave load signal, for

transferring data after receipt of said bus slave data request signal and for providing a bus slave acknowledge following receipt of each of said first and second slave load cycles and said data requests.

5,469,549

COMPUTER SYSTEM HAVING MULTIPLE ASYNCHRONOUS PROCESSORS INTERCONNECTED BY SHARED MEMORIES AND PROVIDING FULLY ASYNCHRONOUS COMMUNICATION THEREBETWEEN

Hugo R. Simpson, and Eric R. Campbell, both of Stevenage, Great Britain, assignors to British Aerospace Public Limited Company, London, England

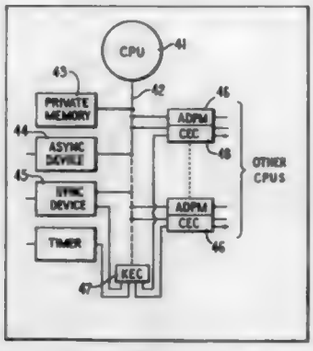
PCT No. PCT/GB91/00578, § 371 Date Dec. 9, 1991, § 102(e) Date Dec. 9, 1991, PCT Pub. No. WO91/16681, PCT Pub. Date Oct. 31, 1991

PCT Filed Apr. 12, 1991, Ser. No. 778,073

Claims priority, application United Kingdom, Apr. 12, 1990, 9008366

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.08 **16 Claims**



1. A distributed computer system comprising:

a plurality of asynchronous computer units each including a data processor and a private data memory linked to said data processor by way of a private data bus;

shared data memory means having a plurality of access ports linked between said private data buses of respective ones of said plurality of asynchronous computer units, said shared data memory means enabling any one of said plurality of asynchronous computer units to communicate with any other of said plurality of asynchronous computer units by way of a respective two-way data route comprising a respective individual area of shared data memory in said shared data memory means; and

communication control means connected to said private data bus of each of said plurality of asynchronous computer units and to said shared data memory means for responding to control data issued by said processor of any one of said plurality of asynchronous computer units to initiate communication via a route determined by said processor of said one of said plurality of asynchronous computer units;

said shared data memory means and said communication control means together providing a fully asynchronous intercommunication channel to any two of said plurality of asynchronous computer units in which each of said two of said plurality of asynchronous computer units can access said respective shared data memory area fully asynchronously with respect to accesses by said other of said two of said plurality of asynchronous computer units.

5,469,550

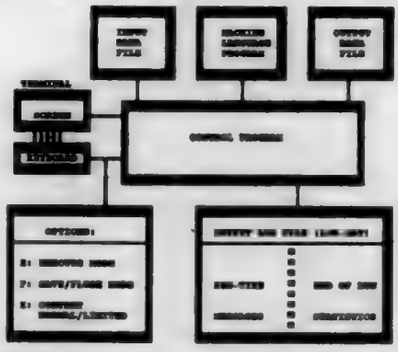
REVERSIBLE COMPUTER APPARATUS AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Ruknet Cezzar, 250 N. First St., Hampton, Va. 23664

Filed Jan. 28, 1992, Ser. No. 826,778

Int. Cl.[6] G06F *9/30*

U.S. Cl. 395—375 **9 Claims**



1. A reversible computer apparatus capable of executing instructions in both a forward execution mode and a reverse execution mode wherein some data values are overwritten in said forward execution mode, said reversible computer apparatus comprising:

microprocessor means having a plurality of registers;

microinstruction program memory and data memory;

said microinstruction program memory being programmed at a microprogramming level to incorporate an instruction set comprising a plurality of forward execution instructions and complementary reverse execution instructions, wherein a complementary reverse execution instruction is paired with each said forward execution instruction, each said reverse execution instruction being of opposite sense relative to its paired forward execution instruction;

stack means for saving only selected data values out of all data values overwritten during said forward execution mode; and

said microinstruction program memory being further programmed such that said apparatus is selectively operable in said forward execution mode which implements said forward execution instructions in a forward logical flow, and said reverse execution mode which implements said reverse execution instructions in a reverse logical flow which is substantially the opposite of said forward logical flow, wherein said microprocessor reverses execution of each said forward execution instruction by executing its complimentary paired reverse execution instruction, wherein after execution of each said reverse execution instruction all said data values overwritten by its paired forward execution instruction are restored to the state prior to execution of said paired forward execution instruction.

5,469,551

METHOD AND APPARATUS FOR ELIMINATING BRANCHES USING CONDITIONAL MOVE INSTRUCTIONS

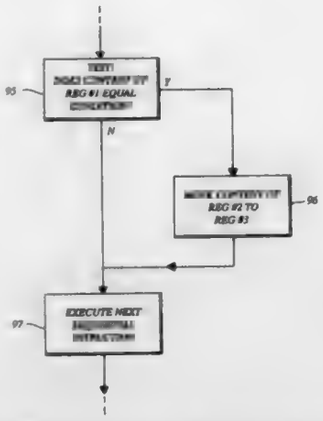
Richard L. Sites, Boylston, and Richard T. Witek, Littleton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 547,684, Jun. 29, 1990, abandoned. This application May 31, 1994, Ser. No. 251,626

Int. Cl.[6] G06F *9/315;9/38;15/76*

U.S. Cl. 395—375 **21 Claims**

1. A method of operating a processor and a memory external to said processor, said processor having a clock defining machine cycles, said processor executing sequential instructions and having at least first, second, and third registers in a register set accessible by executing said instructions, said first, second and third registers each being separately identified by first, second and third fields, respectively, of one of said instructions, said processor under control of said instructions loading to said first, second and third



registers from said memory and storing from said first, second and third registers to said memory via a data bus and said instructions being fetched from said memory by said same data bus, said third register having a multi-bit content, comprising the steps of:

a) storing first data in said first register;

b) in one of said machine cycles, in response to executing said one of said sequential instructions, conditionally moving said first data to said second register, depending upon whether a condition is true as indicated by said content of said third register; and

c) if said condition is false, executing a next one of said sequential instructions in an instruction cycle immediately following said one instruction cycle.

5,469,552

PIPELINED DATA PROCESSOR HAVING COMBINED OPERAND FETCH AND EXECUTION STAGE TO REDUCE NUMBER OF PIPELINE STAGES AND PENALTY ASSOCIATED WITH BRANCH INSTRUCTIONS

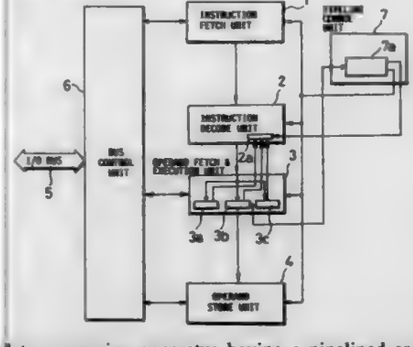
Masato Suzuki, and Tokuzo Kiyohara, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 795,337, Nov. 20, 1991, abandoned. This application Sep. 22, 1994, Ser. No. 310,627

Claims priority, application Japan, Nov. 21, 1990, 2-319008

Int. Cl.[6] G06F *9/38;9/30*

U.S. Cl. 395—375 **33 Claims**



1. A data processing apparatus having a pipelined architecture including at least an instruction fetch stage, an instruction decode stage, and a combined operand fetch and execution stage, the apparatus comprising:

instruction fetch means for fetching instructions from a memory;

instruction decode means for decoding instructions fetched by said instruction fetch means, said instruction decode means:

successively outputting an operand fetch command and an operation command when an instruction requires an operand fetch; and

outputting only the operation command when an instruction is for an operation requiring no operand fetch;

execution means including a plurality of arithmetic units each of said arithmetic units having registers, each of said arithmetic units receiving the operation command corresponding to a first instruction from said instruction decode means, and executing a predetermined operation on said first instruction in the combined stage based on the operation command, at least two arithmetic units being operable concurrently;

operand fetch means for receiving the operand fetch command corresponding to a second instruction following the first instruction from said instruction decode means and for fetching an operand from a storage device other than registers in said arithmetic units in accordance with the operand fetch command, said operand fetch means fetching the operand in the combined stage during a second machine cycle and during any following machine cycles of an operation performed by the execution means on said first instruction requiring at least two machine cycles for execution, the number of pipeline stages being reduced so that a penalty associated with branching is commensurately reduced, said operand fetch means being capable of operation concurrently with at least one of said arithmetic units;

trap activation enable data holding means for holding data indicating that trap activation is enabled upon occurrence of an execution exception during execution of an operation by one of said arithmetic units; and

concurrent execution control means responsive to said trap activation enable data holding means to inhibit concurrent operation of said operand fetch means and said arithmetic units.

5,469,553

EVENT DRIVEN POWER REDUCING SOFTWARE STATE MACHINE

Paul R. Patrick, Peyton, Colo., assignor to Quantum Corporation, Milpitas, Calif.

Continuation of Ser. No. 870,135, Apr. 16, 1992, abandoned. This application Dec. 16, 1994, Ser. No. 357,778

Int. Cl.[6] G06F *1/04;1/32;9/00*

U.S. Cl. 395—750 **10 Claims**

1. A computer peripheral control system for controlling operations of a computer peripheral device and including a processor for executing instructions and a memory for storing the instructions and a plurality of hardware subsystems of the device being connected to and controlled by said processor, and further comprising:

clock means for driving the processor at a predetermined clock rate;

a plurality of operation software state machines, each of said plurality of operation state machines having a plurality of steady states bridged by transitional states, at least a first one of the steady states being a power reduced steady state and at least a second one of the steady states being a ready steady

state, and comprising a sequence of instructions stored in the memory and executed in the processor, and each of said plurality of state machines for operating a corresponding one of the hardware subsystems of the device connected to the processor, an active one of said plurality of operation state machines executing instructions in the processor at a particular time;

event generating means within at least some of the hardware subsystems for generating an event;

event identification means within the processor, responsive to said event, for identifying the event for identifying one the hardware subsystems associated with the event and for identifying one of said plurality of operation state machines to process said event by executing instructions of said at associated operation state machine in the processor, said associated state machine thereupon transitioning through transitional states until a subsequent steady state is reached and operating particular hardware components of said associated one of the hardware subsystems;

said processor including event completion detection means for detecting arrival of said associated state machine at said subsequent steady state,

said associated operation state machine being responsive to the event completion detection means and including a power down transitional state reached from said subsequent steady state for transitioning said associated operation state machine to the first power reduced steady state for decreasing power to said particular hardware components.

5,469,554

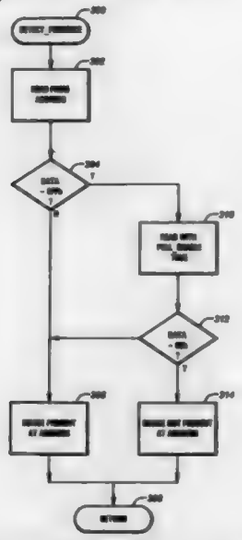
DETECTING THE PRESENCE OF A DEVICE ON A COMPUTER SYSTEM BUS BY ALTERING THE BUS TERMINATION

Brian B. Tucker, The Woodlands, and Brian V. Belmont, Houston, both of Tex., assignors to Compaq Computer Corp., Houston, Tex.

Filed Jun. 14, 1994, Ser. No. 259,636

Int. Cl.[6] G06F *11/20*

U.S. Cl. 395—420 **11 Claims**



1. A method of determining if a device is driving the data lines on a bus in response to a read operation in a system with a processor for initiating read operations and with a bus with address lines, control lines, and data lines, at least one of the data lines normally occupying a default state when undriven, a read of the one of the data lines while in the default state returning a default value in response, comprising the steps of:

(1) performing a first read operation, saving a first read value from the one of the data lines;

(2) determining that a device is driving the one of the data lines in response to said first read operation if said first read value is different from the default value;

(3) if at step (2) the read value was equal to the default value, pulling the one of the data lines to a state other than the default state;

(4) performing a second read operation, saving a second read value from the one of the data lines;

(5) determining that a device is driving the one of the data lines in response to said second read operation if said second read value equals the default value; and

(6) determining that a device is not driving the one of the data lines in response to either said first read operation or said second read operation if said second read value is different from the default value and said first read value is equal to the default value.

5,469,555

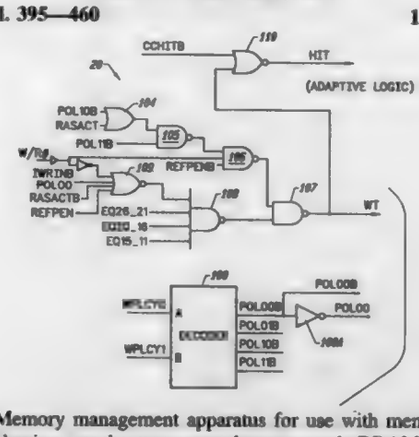
ADAPTIVE WRITE-BACK METHOD AND APPARATUS WHEREIN THE CACHE SYSTEM OPERATES IN A COMBINATION OF WRITE-BACK AND WRITE-THROUGH MODES FOR A CACHE-BASED MICROPROCESSOR SYSTEM

Subir K. Ghosh, and Dipankar Bhattacharya, both of Santa Clara, Calif., assignors to OPTi, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 878,730, May 4, 1992, Pat. No. 5,287,481, which is a continuation-in-part of Ser. No. 812,074, Dec. 19, 1991. This application May 28, 1992, Ser. No. 889,740

Int. Cl.[6] G06F *12/00;13/00*

U.S. Cl. 395—460 **14 Claims**



12. Memory management apparatus for use with memory subsystem having a cache memory and a page mode DRAM memory, said DRAM memory having a row address strobe (RAS#) input coupled to receive a RAS# signal provided by said memory subsystem control apparatus, for use in response to a cache hit data write access, comprising:

first determining means for determining whether said cache hit write access is also a DRAM page hit write access;

second determining means for determining whether said RAS# signal is active;

third determining means for determining whether a refresh of said DRAM is pending;

means, responsive to said first, second and third determining means, for writing said data to said memory subsystem using a write-through policy only if said cache hit write access is also a DRAM page hit write access, said RAS# signal is active, and no refresh of said DRAM is pending;

means, responsive to said first determining means, for writing said data to said memory subsystem using a write-back policy if said cache hit write access is not also a DRAM page hit write access;

means, responsive to said second determining means, for writing said data to said memory subsystem using a write-back policy also if said RAS# signal is inactive; and

means, responsive to said third determining means, for writing said data to said memory subsystem using a write-back policy also if a refresh of said DRAM is pending.

5,469,556

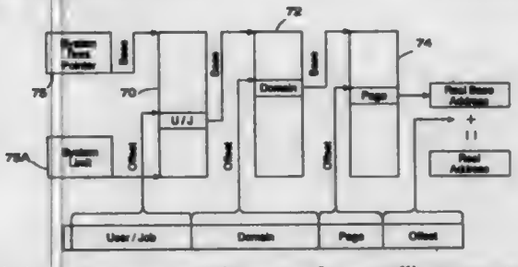
RESOURCE ACCESS SECURITY SYSTEM FOR CONTROLLING ACCESS TO RESOURCES OF A DATA PROCESSING SYSTEM

Daniel B. Clifton, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 449,677, Dec. 12, 1989, abandoned. This application Nov. 6, 1992, Ser. No. 972,510

Int. Cl.[6] G06F *12/14;11/30*

U.S. Cl. 395—490 **16 Claims**



1. A resource access security system for controlling access to a data processing system comprising:

a memory in which are stored one or more first tables, each respective first table being associated with a respectively different job/user privilege level and containing a list of domain entries of data processing resources, each domain entry having a respective domain clearance level, the number of domain entries in any first table being independent of the number of domain entries in any other first table, and one or more second tables, each respective second table being associated with a respectively different domain clearance level and containing a respective list of data processing resource entries, the number of data processing resource entries in any second table being independent of the number of entries in any other second table, and wherein each domain entry in said first table contains a pointer code which points to a second table associated with the domain clearance level of said each domain entry; and

a data processing system access controller which is operative to enable access to said data processing system in accordance with a prescribed relationship between entries of said first and second tables and a data processing system access code supplied thereto, said data processing access code containing a first component representative of a domain of data processing resources, and a second component representative of a data processing resource to be employed in the course of execution of a data processing task.

5,469,557

CODE PROTECTION IN MICROCONTROLLER WITH EEPROM FUSES

Tom Salt, Chandler, and Rodney Drake, Mesa, both of Ariz., assignors to Microchip Technology Incorporated, Chandler, Ariz.

Filed Mar. 5, 1993, Ser. No. 26,967

Int. Cl.[6] G06F *12/14;* **H04L** *9/00*

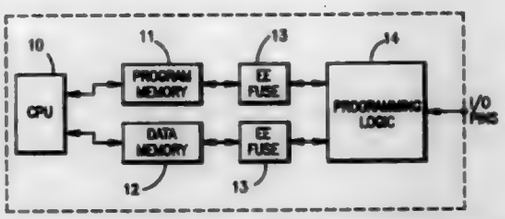
U.S. Cl. 395—425 **6 Claims**

1. A semiconductor microcontroller device fabricated at least in part on an integrated circuit chip for controlling the operation of an external system, comprising:

a central processing unit (CPU),

a program memory adapted to store instructions for execution by the CPU to control the operation of said external system,

a data memory adapted to be written to for storing selected data in a multiplicity of address locations of the data memory and



to be read for selective retrieval of the stored data by the CPU in conjunction with its control function,

an electrically erasable programmable read only memory (EEPROM) fuse connected to at least one of said program and data memories and arranged and adapted to be set to a first state to code protect the contents of said at least one of said program and data memories to which said fuse is connected, and to be reset to a second state to remove the code protection, and

logic means, connected to the EEPROM fuse and to each of said program and data memories, for erasing the contents of the memory protected by said fuse during a first half of a programming cycle of the device and for resetting said EEPROM fuse during a second half of said programming cycle.

5,469,558

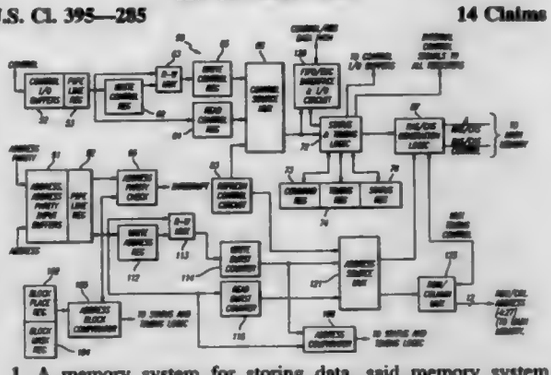
DYNAMICALLY RECONFIGURABLE MEMORY SYSTEM WITH PROGRAMMABLE CONTROLLER AND FIFO BUFFERED DATA CHANNELS

Donald A. Lieberman, San Jose, and John J. Nemec, Santa Clara, both of Calif., assignors to Multichip Technology, San Jose, Calif.

Continuation of Ser. No. 747,202, Aug. 16, 1991, abandoned. This application Apr. 18, 1994, Ser. No. 228,927

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—285 **14 Claims**



1. A memory system for storing data, said memory system coupled to a system bus, said system bus further coupled to one or more caches, said memory system comprising:

a memory;

control means for receiving address and control signals from said system bus to control transfers of the data between said memory and said system bus, said control means comprising an address path including a separate read address path and a separate write address path, and a control path including a separate read control path and a separate write control path; and

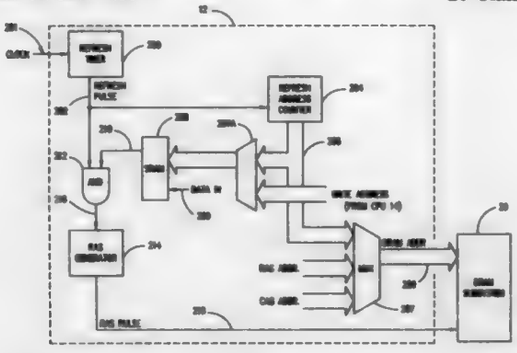
sending and receiving means, coupled between said system bus and said memory, and further coupled to said control means, said sending and receiving means for transferring the data, under control of said control means, between said system bus and said memory, said sending and receiving means including at least one write data path, said at least one write data path coupled to at least one write first-in-first-out (FIFO) buffer means for temporarily storing data received from said system bus as part of a bus transaction requiring the data to be stored in said memory to permit priority processing of bus transactions requiring data to be read out of said memory.

5,469,559

METHOD AND APPARATUS FOR REFRESHING A SELECTED PORTION OF A DYNAMIC RANDOM ACCESS MEMORY

Terry J. Parks, Round Rock, and David S. Register, Austin, both of Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Jul. 6, 1993, Ser. No. 88,061
Int. Cl.[6] G06F *12/02*
U.S. Cl. 395—433 **20 Claims**



1. A memory controller for selectively refreshing a dynamic random access memory (DRAM) subsystem of a computer having a central processing unit (CPU) and a memory connected to the CPU, the memory controller connected between the CPU and the DRAM subsystem, the DRAM subsystem having inputs for receiving a refresh address and a refresh request from the memory controller, the refresh address addressing a region of the DRAM subsystem to be refreshed when the refresh request is asserted, the memory controller comprising:

a refresh period timer for generating a refresh pulse upon each expiration of a refresh period;

a refresh address counter connected to said refresh period timer for generating said refresh address to said DRAM subsystem, said refresh address counter advancing said refresh address responsive to receipt of said refresh pulse;

a plurality of region descriptors at least one of which defines a refresh address range in which assertion of said refresh request is to be inhibited; and

logic circuitry connected to said refresh period timer for asserting said refresh request to said DRAM subsystem responsive to receipt of said refresh pulse, unless said refresh address falls within said refresh address range defined by said at least one region descriptor.

5,469,560

PRIORITIZING PENDING READ REQUESTS IN AN AUTOMATED STORAGE LIBRARY

Thomas W. Beglin, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 683,470, Apr. 10, 1991, abandoned. This application Apr. 5, 1994, Ser. No. 224,089
Int. Cl.[6] G06F *13/18;12/02*
U.S. Cl. 395—439 **19 Claims**

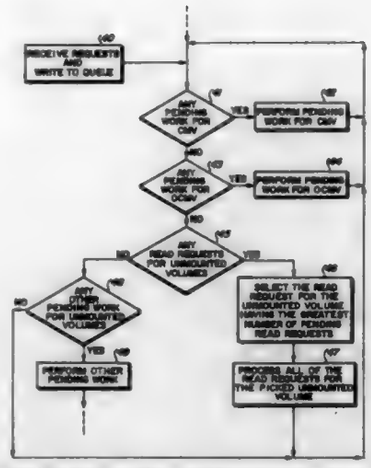
1. In an information processing system, a method of processing object and volume requests, and more specifically, reading objects from one or more volumes contained on a data storage media for minimizing an average response time for each user, said method comprising the steps of:

receiving read requests;

selecting an unmounted volume having a greatest number of pending read requests compared to a number of pending read requests of each volume of said other one or more volumes;

mounting the selected unmounted volume so that the selected unmounted volume becomes a currently mounted volume;

processing all of the pending read requests for the currently mounted volume; and



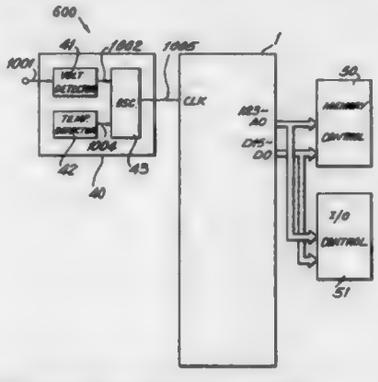
processing all of the pending read requests for an opposite side of the currently mounted volume before selecting another unmounted volume, whereby the average response time is minimized.

5,469,561

APPARATUS AND METHOD FOR CONTROLLING THE RUNNING OF A DATA PROCESSING APPARATUS

Koji Takeda, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 355,730, May 23, 1989, abandoned. This application Dec. 22, 1992, Ser. No. 995,310
Claims priority, application Japan, May 27, 1988, 63-130533; Sep. 19, 1988, 63-234003; Sep. 27, 1988, 63-241604
Int. Cl.[6] G06F *1/04*
U.S. Cl. 395—550 **24 Claims**



21. A data processing apparatus, comprising:

central processing unit means for accessing memory and at least one peripheral device in accordance with a unit of a bus cycle, said bus cycle including at least one clock cycle and involves bus access;

determination means for determining, at or about the start of said bus cycle, if said bus cycle controlled by said central processing unit means is a predetermined type of bus cycle and determining, at or about the start of said bus cycle, whether an address accessed by the central processing unit means is in a predetermined address range;

signal producing means for producing at least one identifying signal indicating the predetermined bus cycle and the predetermined address range access in accordance with the determination of the bus cycle type and address;

maintaining means for maintaining the at least one identifying signal at a constant logic level for a predetermined period;

extending means for extending the period of M clock pulses of said clock cycle comprising N clock pulses (M being an integer, M≦N) based on the at least one identifying signal; and

adjusting means for adjusting the timing of the control signal which controls bus access at or about the extending of said period of M clock pulses of said clock cycle;

whereby the running time of the central processing unit means varies based on the bus cycle type and address.

5,469,562

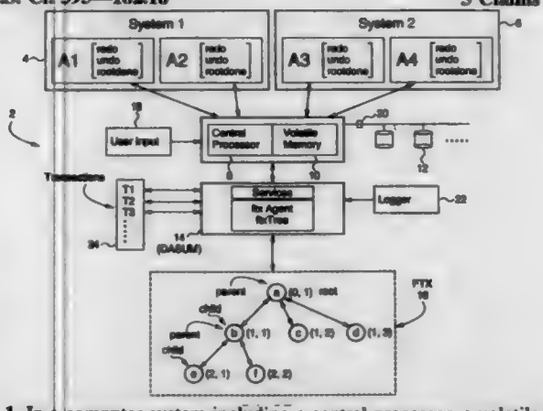
DURABLE ATOMIC STORAGE UPDATE MANAGER

Christian D. Saether, Seattle, Wash., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 26, 1992, Ser. No. 905,901

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—182.18 **3 Claims**



1. In a computer system including a central processor, a volatile memory, and a storage device for persistently storing data, and capable of executing a program, a method for ensuring proper storage of data intended to be persistently stored, the method comprising the following steps during normal runtime execution:

(1) decomposing the program into a plurality of agents;

(2) associating a chosen said agent with a transaction or subtransaction to be executed;

(3) providing to each said agent an agent-callable first service for establishing a sequential relationship among each said transaction and subtransaction within a fault tolerant structure;

(4) providing to each said agent an agent-callable second service for storing on said storage device a log containing information necessary to enable recovery from a transaction or subtransaction encountering a fault;

(5) each said agent executing said associated transaction or subtransaction by calling said first and second agent-callable services, wherein said associated transaction or subtransaction can generate a further subtransaction during execution, and wherein said second agent-callable service stores recovery information in said log when data modification for said associated transaction or subtransaction is completed;

(6) atomically maintaining each said transaction or subtransaction in said fault tolerant structure that contains information relating each said agent with a said associated transaction or subtransaction;

(7) providing each of a plurality of said agents with distinct first agent-specific fault recovery procedures for redoing data modifications produced by execution of said each agent and distinct second agent-specific fault recovery procedures for undoing said data modifications produced by execution of said each agent; and

(8) when recovering from a fault during execution of said program, sequentially executing said first agent-specific fault recovery procedures for those of said agents having recovery information stored in said log when predefined fault recovery criteria are met and sequentially executing said second agent-specific fault recovery procedures for those of said agents having recovery information stored in said log when said predefined fault recovery criteria are not met.

5,469,563

METHOD AND CONTROL APPARATUS FOR SELF DIAGNOSIS

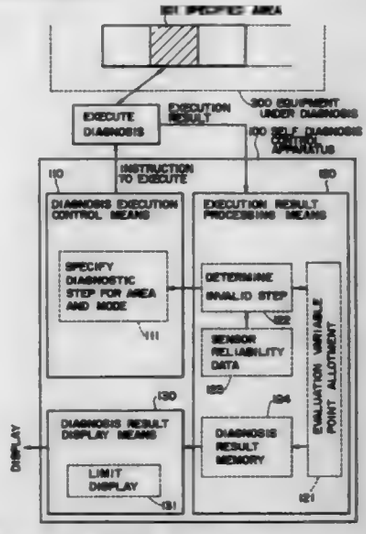
Shinya Morita, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 3, 1993, Ser. No. 101,198

Claims priority, application Japan, Aug. 3, 1992, 4-224522

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—183.01 **20 Claims**



9. A diagnosis system for diagnosing an apparatus having a plurality of functional areas, the diagnosis system comprising:

means for performing a plurality of diagnostic steps on one of said functional areas of said apparatus under diagnosis, said one functional area having a grade value representing its functional operativeness, each of said plurality of diagnostic steps producing a respective diagnostic result;

means for allocating a respective point value to each said respective diagnostic result; and

means for varying said grade value of said one functional area by said respective point value of each said respective diagnostic result.

5,469,564

DATA STORAGE DEVICE WITH ENHANCED DATA SECURITY

Tempaku Junya, Tokyo, Japan, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 13, 1994, Ser. No. 181,077

Claims priority, application Japan, Feb. 8, 1993, 5-020155

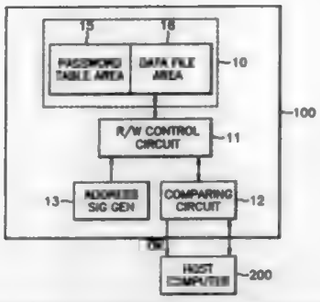
Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—188.01 **18 Claims**

1. A data storage device having a feature for preventing unauthorized access to data stored therein, comprising:

memory means having a first portion for storing an internal password and a second portion for storing address data indicating the location of said internal password in said first portion;

a control circuit responsive to an access request signal from an external device for reading said internal password from said first portion of said memory means in accordance with said address data stored in said second portion of said memory means;



a comparison circuit coupled to said control circuit for comparing said internal password read from said first portion of said memory means with an external password received from said external device and for generating a comparison output signal indicative of whether or not said internal and external passwords match;

an access permission signal generating circuit responsive to said comparison output signal for generating an access permission signal having first and second logic levels indicative of whether said external device is permitted or denied access to said data stored in said data storage device, respectively; and,

an interface circuit for interfacing said external device and said data storage device, said interface circuit including a first NOR gate having first and second input terminals, said first input terminal receiving a read request signal from said external device and said second input terminal receiving said access permission signal, and a second NOR gate having first and second input terminals, said first input terminal receiving a write request signal from said external device and said second input terminal receiving said access permission signal.

5,469,565

PERSONAL COMPUTER FOR DISABLING RESUME MODE UPON REPLACEMENT OF HDD

Kenji Hibi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 121,458, Sep. 16, 1993, Pat. No. 5,333,309, which is a continuation of Ser. No. 604,457, Oct. 29, 1990, abandoned. This application May 19, 1994, Ser. No. 246,157

Claims priority, application Japan, Jan. 31, 1989, 1-281738

The portion of the term of this patent subsequent to Jul. 26, 2011, has been disclaimed.

Int. Cl.[6] G06F *11/34*

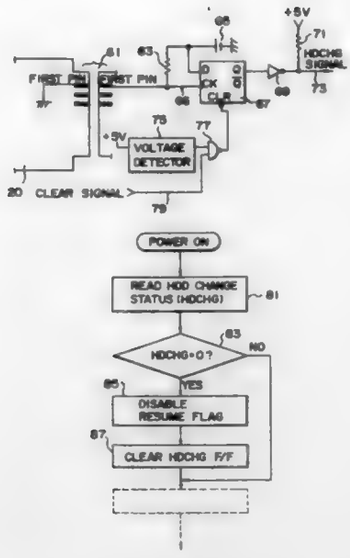
U.S. Cl. 395—181 **17 Claims**

1. A computer having a restarting function for restarting an operation at a state of the computer existing immediately preceding a power off operation in response to a power on operation, comprising:

a removable device removably connected to the computer through a connector;

a latch circuit latching a change of level of a signal from the connector when the removable device is removed from the computer during a time when the computer is in a power off state, and outputting a result signal; and

control means for determining whether or not the signal level from the connector has changed based on the result signal when the computer is provided on, and for inhibiting an execution of the restarting function when the result signal designates that the signal level has changed so that the computer does not restart at a state of the computer existing immediately preceding a power off operation.



5,469,566

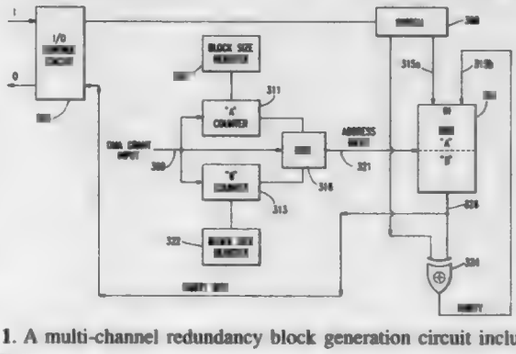
FLEXIBLE PARITY GENERATION CIRCUIT FOR INTERMITTENTLY GENERATING A PARITY FOR A PLURALITY OF DATA CHANNELS IN A REDUNDANT ARRAY OF STORAGE UNITS

Gerald L. Hoheustein, Boulder; Michael E. Nielson, Broomfield; Tin S. Tang, Boulder; Richard D. Carmichael, Longmont, and William A. Brant, Boulder, all of Colo., assignors to EMC Corporation, Hopkinton, Mass.

Continuation of Ser. No. 851,428, Mar. 12, 1992, abandoned. This application Mar. 10, 1995, Ser. No. 402,963

Int. Cl.[6] H03M *13/00*; G06F *11/00;11/10*

U.S. Cl. 395—182.04 **24 Claims**



1. A multi-channel redundancy block generation circuit including:

(a) data input means, coupled to a data bus, for receiving data blocks from a plurality of logical data channels on the data bus;

(b) memory means, coupled to the data input means and comprising a plurality of partitions, for separately storing data blocks corresponding to the plurality of logical data channels;

(c) redundancy block generation means, coupled to the data input means and the memory means, for intermittently combining at least a first data block received by the data input means from a first selected logical data channel and at least a second data block from the corresponding partition in the memory means to generate at least a first redundancy block corresponding to the first selected logical data channel and intermittently at times when the first data block is not being combined with another data block, combining at least a third data block received by the data input means from a second selected logical data channel and at least a fourth data block from the corresponding partition in the memory means to generate at least a second redundancy block corresponding to

the second selected logical data channel, such that the combining of the first data block and another data block is interleaved with the combining of the third data block and another data block;

(d) data output means, coupled to the data bus and to the memory means, for transmitting the generated redundancy blocks to corresponding data channels on the data bus.

5,469,567

SYSTEM FOR SECONDARY DATABASE DATA BLOCK BUFFERING WITH BLOCK SAVE GENERATIONS AND READ/WRITE ACCESS AND WITH SEPARATE MANAGEMENT

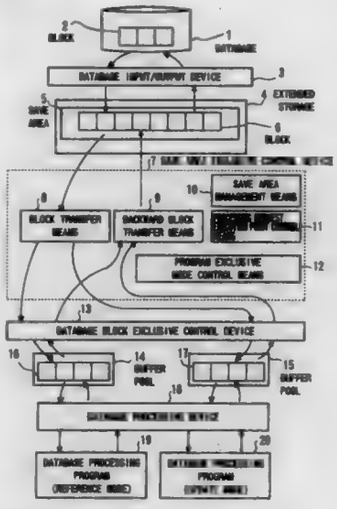
Hidemi Okada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 16, 1992, Ser. No. 852,062

Claims priority, application Japan, Mar. 14, 1991, 3-074551

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **7 Claims**



1. A database system comprising:

a database having a storage area divided into a plurality of blocks, said blocks storing data;

buffer means for reading and storing said blocks in said database upon a processing request from a database processing program for reference to or update of said blocks by said database processing program;

exclusive control means for accepting or excluding said processing request depending on whether said database processing program is in a reference mode or an update mode;

extended storage means located between said database and said buffer means and independent of said buffer means for temporarily saving said blocks to be transferred from said database to said buffer means or from said buffer means to said database and to keep the same block for a plurality of generations;

save control means provided with management means for managing said blocks saved by said extended storage at different times as different generations; and

means for transferring said blocks between said buffer means and said extended storage means according to said block generation.

5,469,568

METHOD FOR CHOOSING LARGEST SELECTIVITIES AMONG ELIGIBLE PREDICATES OF JOIN EQUIVALENCE CLASSES FOR QUERY OPTIMIZATION

Klaus B. Schiefer, Scarborough, Canada, and Arun N. Swami, San Jose, Calif., assignors to International Business Machines Corporatin, Armonk, N.Y.

Filed Jan. 7, 1993, Ser. No. 1,492

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **8 Claims**

1. A method for determining and selecting join selectivities for use by a query optimizer to improve the performance of a query in a relational database management system including a computer having memory, wherein the query optimizer is coupled to the memory of the computer and is adapted to execute the steps of the method in the memory, and wherein selectivity values for each eligible join predicate are known, said method comprising the machine-executed steps of:

determining the equivalence classes for a plurality of join attributes; and for each equivalence class performing the machine-executed steps of:

a) determining the eligible join predicates belonging to each of said equivalence classes; and

b) selecting the largest selectivity among said eligible join predicates in each of said equivalence classes.

5,469,569

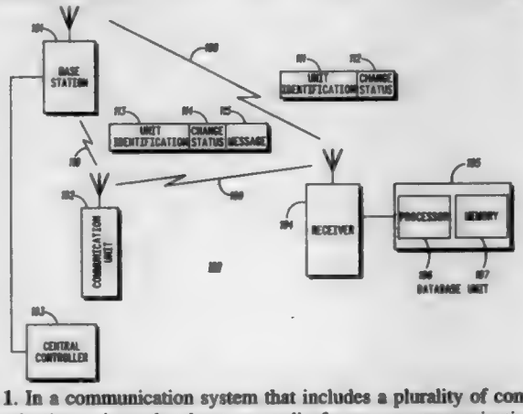
METHOD FOR DETECTING UNAUTHORIZED MODIFICATION OF A COMMUNICATION OR BROADCAST UNIT

Gary W. Grube, Palatine, and Timothy W. Markison, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 23,298, Feb. 26, 1993. This application Aug. 13, 1993, Ser. No. 106,020

Int. Cl.[6] G06F *12/14*

U.S. Cl. 395—600 **18 Claims**



1. In a communication system that includes a plurality of communication units and at least one radio frequency communication resource, a method of detecting an unauthorized modification of a communication unit of the plurality of communication units, the method comprises the steps of:

a) transmitting, by the communication unit via the radio frequency communication resource, at a predetermined time interval, a message, wherein the message comprises a communication unit ID and a software change status indicator;

b) receiving, by a receiver via the radio frequency communication resource, the message, thus forming a received message;

c) transporting, by the receiver, the received message to a database unit;

d) accessing, by the database unit, a stored software change status indicator based on the communication unit ID;

e) comparing, by the database unit, the software change status indicator with the stored software change status indicator; and

f) when the software change status indicator and the stored software change status indicator do not substantially match, indicating, by the database unit, that an unauthorized modification to the communication unit occurred.

5,469,570

SYSTEM FOR EXAMINING STATUSES OF TASKS WHEN ONE TASK IS INTERRUPTED IN DATA PROCESSING SYSTEM

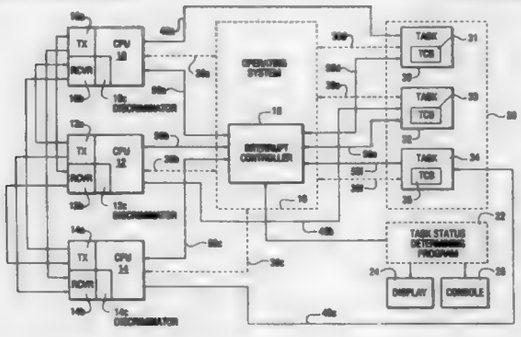
Tsugikazu Shibata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 612,666, Nov. 14, 1990, abandoned. This application Aug. 1, 1994, Ser. No. 284,048

Claims priority, application Japan, Nov. 14, 1989, 1-295294

Int. Cl.[6] G06F *15/163*

U.S. Cl. 395—650 **11 Claims**



1. A computer system, comprising:

memory means, said memory means containing an operating system;

a plurality of tasks, said plurality of tasks being stored in said memory means; and

a plurality of CPUs, said CPUs being assigned to said tasks on a one-to-one basis and executing corresponding tasks under the control of said operating system, each of said CPUs having a transmitter and a receiver for transmitting and receiving interrupt requests via dedicated signal lines, each transmitter of said CPUs being connected to each of the receivers in the remainder of said CPUs, the transmitter of a first of said CPUs outputting an interrupt request to each of the receivers of the remainder of said plurality of CPUs in response to the execution of a stop instruction in a first of said plurality of tasks, the execution of the stop instruction causing the first CPU to stop the first task, said remainder of said CPUs being responsive to said interrupt request to rapidly suspend the remainder of said plurality of tasks.

5,469,571

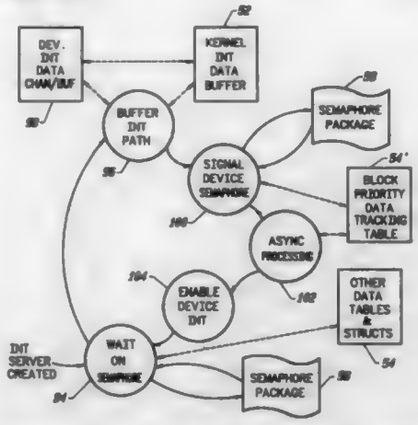
OPERATING SYSTEM ARCHITECTURE USING MULTIPLE PRIORITY LIGHT WEIGHT KERNEL TASK BASED INTERRUPT HANDLING

Mitchell Bunnell, Los Gatos, Calif., assignor to Lynx Real-Time Systems, Inc., San Jose, Calif.

Filed Jul. 15, 1991, Ser. No. 729,942

Int. Cl.[6] G06F *13/24*

U.S. Cl. 395—700 **12 Claims**



1. A computer system implementing a software architecture, having a processor to execute instructions providing for controlled responses to occurrences of interrupts, said system comprising:

a) first task means for performing a first function in response to an occurrence of an interrupt, said first task means having a first priority level that is one of a predetermined set of priority levels;

b) interrupt server task means for performing a second function in response to the occurrence of said interrupt, said interrupt server task means having a second priority level that is between predetermined ones of the priority levels of said predetermined set of priority levels, said second priority level being higher than said first priority level; and

c) kernel means for selecting one of a schedulable set of tasks for execution by the processor based upon the relative priority levels of said schedulable set of tasks, said kernel means, responsive to said interrupt, providing for disabling recognition of said interrupt by said kernel means and including said interrupt server task means in said schedulable set of tasks in response to said interrupt, said server task means including means for including said first task means in said schedulable set of tasks.

5,469,572

POST COMPILE OPTIMIZER FOR LINKABLE OBJECT CODE

James M. Taylor, 4535 Harvest Hill, Dallas, Tex. 75244

Filed Dec. 1, 1992, Ser. No. 984,082

Int. Cl.[6] G06F *9/45*

U.S. Cl. 395—700 **26 Claims**

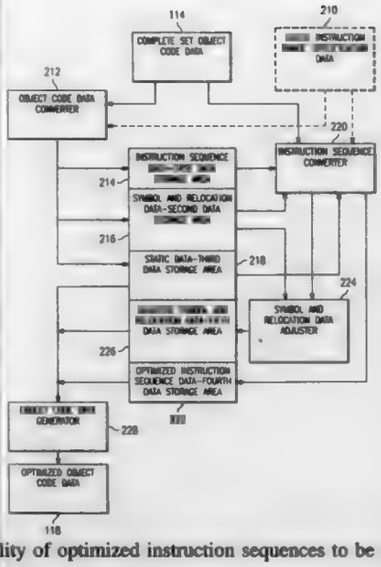
1. A system for generating data representing an optimized object code set for a data processing system from data representing a complete object code set, comprising:

(a) a memory area for storing data;

(b) means for forming a plurality of data storage areas within said memory area;

(c) first converter means for converting said data representing the complete object code set into data representing a first plurality of instruction sequences to be stored in a first data storage area, a first plurality of symbol and relocation data to be stored in a second data storage area and a plurality of static data to be stored in a third data storage area;

(d) second converter means coupled with the first and second data storage areas for converting said data representing said first plurality of instruction sequences into data representing a



plurality of optimized instruction sequences to be stored in a fourth data storage area;

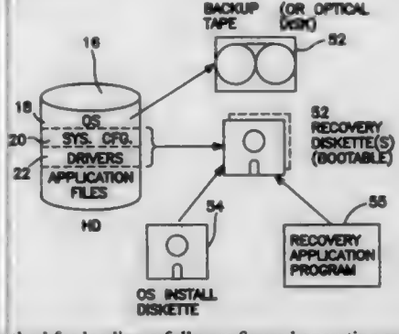
(e) adjuster means coupled with the second storage area for adjusting said first symbol and relocation data into a plurality of adjusted symbol and relocation data to be stored in a fifth data storage area such that said adjusted symbol and relocation data corresponds to said data representing the plurality of optimized instruction sequences; and

(f) data generating means coupled to said third, fourth and fifth storage areas for generating said data representing the optimized object code set from said static data, said data representing the plurality of optimized instruction sequences and said plurality of adjusted symbol and relocation data.

5,469,573
DISK OPERATING SYSTEM BACKUP AND RECOVERY SYSTEM

James K. McGill, III, Dover; Dorotea Abele, Sutton; Lonnie L. Colman, Natick; Manuel Gonsalves, Brookline, and Sanjeev Saxena, Millbury, all of Mass., assignors to Sytron Corporation, Westboro, Mass.

Filed Feb. 26, 1993, Ser. No. 23,091
Int. Cl.[6] G06F *11/14*
U.S. Cl. 395—700 **33 Claims**



1. A method for loading a fully configured operating system onto a storage device of a data processing system, comprising the steps of:

providing a first media comprising operating system files for installing the fully configured operating system onto the storage device;

providing a second media comprising configuration-specific data files;

initializing the data processing system from the second media to provide a temporary operating system and using the configuration-specific data files to configure the data processing system;

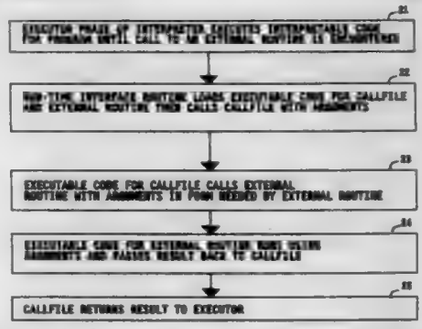
loading the fully configured operating system files from the first media to the storage device using the temporary operating system; and

reinitializing the data processing system from the storage device to install the fully configured operating system.

5,469,574
METHOD AND SYSTEM FOR INTERFACING INTERPRETED APPLICATIONS WITH COMPILED PROCEDURES USING SIGNATURE FILES

Daniel T. Chang, San Jose, Calif., and Yaron Wolfsthal, Haifa, Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 18, 1993, Ser. No. 79,188
Int. Cl.[6] G06F *9/45*
U.S. Cl. 395—700 **18 Claims**



1. A method of operating a computer system to process an interpretable program, the computer system including an interpreter, and having a processor and a memory, the method comprising the steps of:

executing the interpreter on the interpretable program until encountering a calling reference to a separately compiled procedure for accepting one or more arguments and responsively producing some result;

reading into the memory a signature file that identifies the arguments and any result of the separately compiled procedure; and

generating source code for a call file procedure that accepts from the interpreter the arguments identified in the signature file, passes the arguments to the separately compiled procedure and returns to the interpreter any result identified in the signature file.

5,469,575
DETERMINING A WINNER OF A RACE IN A DATA PROCESSING SYSTEM

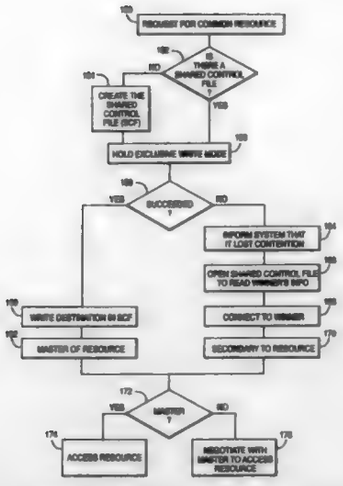
Hari H. Madduri, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 16, 1992, Ser. No. 961,750
Int. Cl.[6] G06F *12/14*
U.S. Cl. 395—200.03 **18 Claims**

1. In a distributed data processing system including a plurality of peers, a method for determining whether a peer has won a race for a system privilege, the method performed by any one peer of the plurality of peers, comprising the steps of:

searching for a share control file in a predetermined location in the distributed data system, the share control file containing an address of a master peer which has the system privilege;

responsive to the absence of the share control file, creating a share control file in the predetermined location, the share control file containing an address of the peer to become the master peer;



placing an exclusive write lock on the share control file; and,

maintaining the exclusive write lock on the share control file.

5,469,576

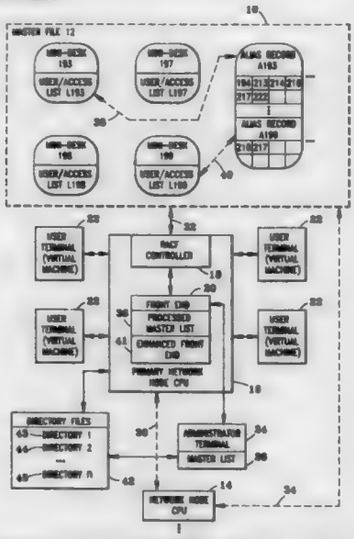
FRONT END FOR FILE ACCESS CONTROLLER

Norman J. Dauerer, Hopewell Junction, and Edward E. Kelley, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 22, 1993, Ser. No. 35,000

Int. Cl.[6] G06F *7/00*

U.S. Cl. 395—186 **16 Claims**



1. An improved access controller front end for use with an access controller in a data processing system; the access controller front end comprising:

means for detecting invalid and duplicate access authorizations;

means for denying access to said data processing system responsive to detection of any of said invalid or duplicate access authorizations;

means for retrieving data describing authorized users of said data processing system, which data is stored in a first file system within the access controller;

means for acquiring data describing authorized or unauthorized users of said data processing system, which data is obtained from at least one second file system, said at least one second file system being communicatively coupled with said data processing system;

means for comparing data retrieved from the controller describing authorized users with data obtained from said at least one second file system describing authorized or unauthorized users, so as to detect any matched data and mismatched data;

first means for sorting data cooperating with said means for comparing data, said means for sorting data sorting said data retrieved from the controller describing authorized users into at least a first set of sorted data and a second set of sorted data, said first set of sorted data relating to said matched data, said second set of sorted data relating to said mismatched data;

means for resolving at least a portion of any detected mismatches by updating data in said second set of sorted data with data obtained from said at least one second file system; and means for combining the matched data describing authorized users with the updated data describing authorized users, and recording the combined data within the access controller.

5,469,577

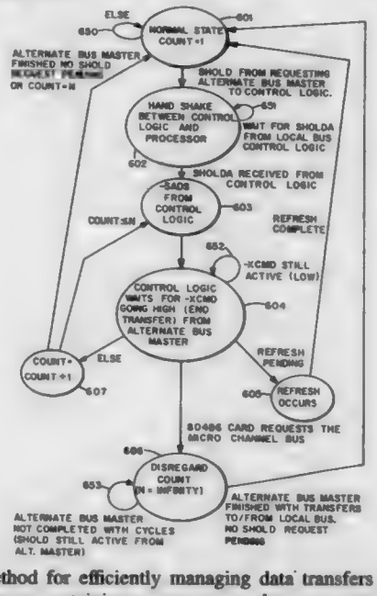
PROVIDING ALTERNATE BUS MASTER WITH MULTIPLE CYCLES OF BURSTING ACCESS TO LOCAL BUS IN A DUAL BUS SYSTEM INCLUDING A PROCESSOR LOCAL BUS AND A DEVICE COMMUNICATIONS BUS

Robert C. Eng; John W. Galella; Rex E. McCrary, all of Boca Raton; Mark G. McDonald, Delray Beach; Eric H. Stelzer, and Frederick C. Yentz, both of Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 752,725, Aug. 30, 1991, abandoned. This application May 27, 1994, Ser. No. 250,328

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—290 **10 Claims**



5. A method for efficiently managing data transfers in a computer system containing processor and memory subsystems, peripheral devices, and a dual bus structure; said dual bus structure including a local bus interconnecting said processor and memory subsystems, and a communications bus interconnecting said local bus and said peripheral devices; said processor subsystem exerting bus master control over said dual bus structure; said peripheral devices including at least one Alternate Bus Master bursting (ABMB) device adapted for operating as a bus master relative to said communications bus for conducting multiple cycles of burst data transfer activity over said buses during a single interval in which the respective ABMB device controls access to said communications bus; said method comprising:

while said ABMB device is in control of said communications bus, and conducting multiple cycles of burst data transfer activity over both said communications bus and said local bus:

(a) monitoring said system for occurrence of a predetermined condition; and, upon detection of said condition,

(b) suspending said ABMB device's access to said local bus to allow for said processor subsystem to perform a task relative to said memory subsystem, while permitting said ABMB device to retain control of said communications bus; and, upon completion of said task,

(c) permitting said ABMB device to reacquire access to said local bus and continue with other said cycles of data transfer activity over both said buses;

wherein said monitoring step comprises monitoring said system for occurrences of first and second priority conditions; said first condition being associated with a requirement for said processor subsystem to perform a time-critical task relative to said memory subsystem, and said second condition being associated with a requirement for said processor subsystem to perform a non-time-critical task relative to said memory subsystem;

wherein said suspending step is applied at the end of a given cycle of data transfer activity by said ABMB device when a said first priority condition is first detected during said given cycle, and said suspending step is applied after a predetermined number of n cycles (n>1) of said data transfer activity following said given cycle when a said second priority condition is first detected during said given cycle and no first priority condition is detected in said given cycle;

wherein access of said ABMB device to said local bus requires performance of a predetermined handshake procedure between parts of said processor subsystem controlling access to said dual bus structure, each performance of said handshaking procedure imposing a predetermined minimal delay on the respective access of said ABMB device to said local bus; and wherein:

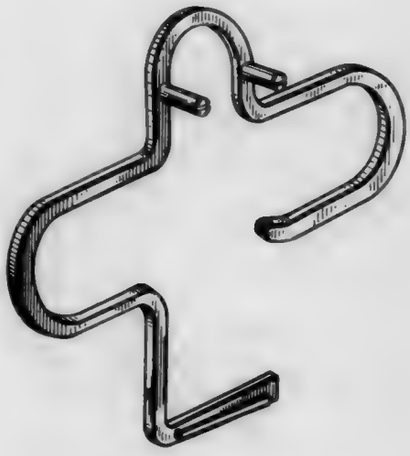
when said cycles of data transfer activity by said ABMB device are suspended due to detection of a said first priority condition during a said given cycle, performance of a single instance of said handshaking procedure is distributed over all cycles of data transfer activity prior to the suspension, including said given cycle, and performance of said handshaking procedure is repeated and distributed over cycles of data transfer activity which resume after the suspension ends; and

when said cycles of data transfer activity are suspended due to detection of a said second priority condition in said given cycle, performance of a single instance of said handshake procedure is distributed over all cycles of data transfer activity preceding the suspension, including said given cycle and said n cycles following said given cycle, and performance of said handshake procedure is repeated and distributed over any cycles of data transfer activity which resume after the suspension ends.

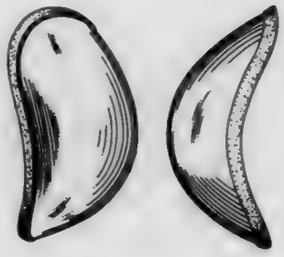
DESIGNS

NOVEMBER 21, 1995

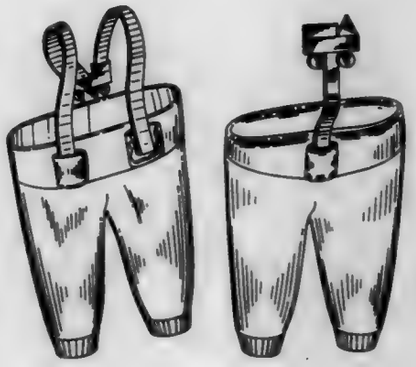
364,261
TIE TEACHER
Daniel Cianciotto, Commack, N.Y., assignor to Tie Teacher, Inc., Hauppauge, N.Y.
Filed Aug. 12, 1994, Ser. No. 27,116
Term of patent 14 years
U.S. Cl. D2—609



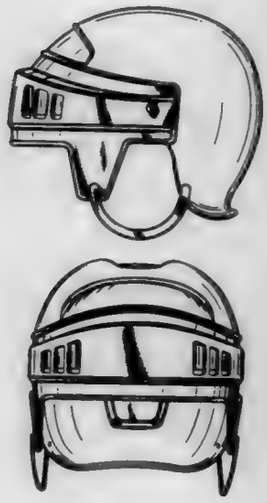
364,262
PROTECTIVE CUP
Shirley Magidson, Beverly Hills, and Madeleine Gomez, Burbank, both of Calif., assignors to Metric Products, Inc., Culver City, Calif.
Filed Feb. 14, 1994, Ser. No. 18,697
Term of patent 14 years
U.S. Cl. D2—711



364,263
COMBINED PANTS AND SUSPENDERS
Kimberly Kline, 7423 Courtland Cir., Manassas, Va. 22111
Filed Jun. 3, 1992, Ser. No. 892,013
The portion of the term of this patent subsequent to Mar. 21, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—746

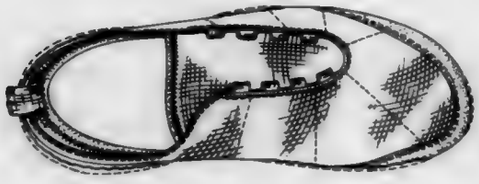


364,264
TOY HOCKEY HELMET
Ronald Sheer, Complete Athlete, Shoppingtown Mall, Erie Blvd.& E. Genesee St., Dewitt, N.Y. 13214
Filed Oct. 5, 1993, Ser. No. 13,889
Term of patent 14 years
U.S. Cl. D2—869

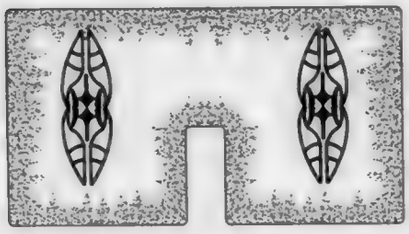


364,265
SHOE SOLE
Cecilia Murray, Duxbury, Mass., assignor to Reebok International Ltd., Stoughton, Mass.
Filed Jun. 24, 1994, Ser. No. 24,998
Term of patent 14 years
U.S. Cl. D2—951

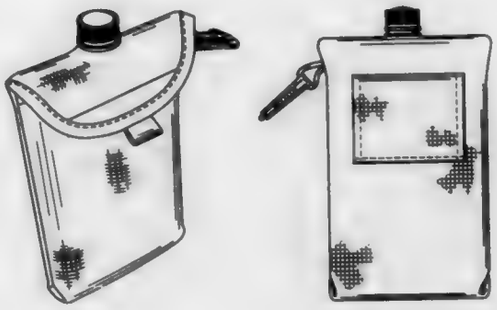
364,266
SHOE UPPER
Toren P. B. Orzeck, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Dec. 6, 1994, Ser. No. 32,083
Term of patent 14 years
U.S. Cl. D2—969



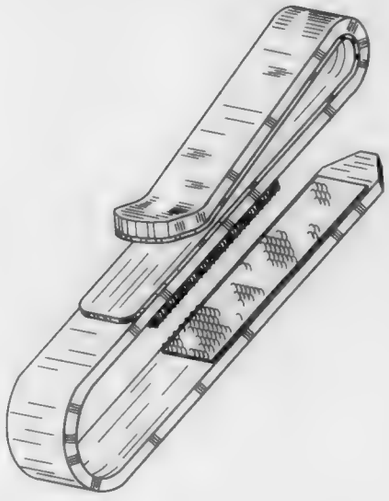
364,267
FOREARM CRUTCH PADS
Harold C. Poxleitner, P.O. Box 196, and Teena E. Davis, P.O. Box 4, both of Cottonwood, Id. 83522
Filed Jun. 4, 1993, Ser. No. 9,055
Term of patent 14 years
U.S. Cl. D3—8



364,268
FLEXIBLE FLASK
Dennis B. Brown, 343 W. 400 North, and Breon J. Robertson, 435 Boulevard, both of Logan, Utah 84321
Filed Sep. 22, 1994, Ser. No. 28,819
Term of patent 14 years
U.S. Cl. D3—202



364,269
KEY RING HOLDER WITH CLIP
Mark Sabosky, 1946 W. 248th St., Lomita, Calif. 90717
Filed Oct. 7, 1994, Ser. No. 29,502
Term of patent 14 years
U.S. Cl. D3—207



364,270

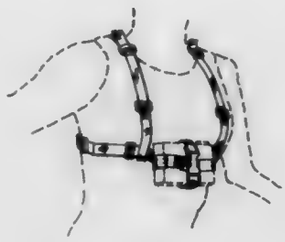
HARNESS FOR A RADIO CASSETTE PLAYER

Theodore J. Kellerman, 1 Fenimore Rd., Port Washington, N.Y. 11030

Filed May 22, 1992, Ser. No. 887,330

Term of patent 14 years

U.S. Cl. D3—218



364,271

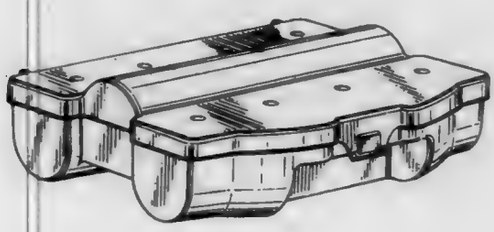
HARDWARE CONTAINER

Randall W. Calmeise, Oakwood Village, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Jun. 30, 1994, Ser. No. 25,375

Term of patent 14 years

U.S. Cl. D3—282



364,272

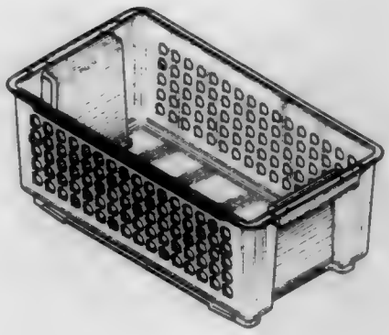
BASKET

Keith Brightbill, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio

Filed Aug. 12, 1994, Ser. No. 27,054

Term of patent 14 years

U.S. Cl. D3—312



364,273

UNIVERSAL FRAME FOR SUPPORTING DUFFLE BAGS

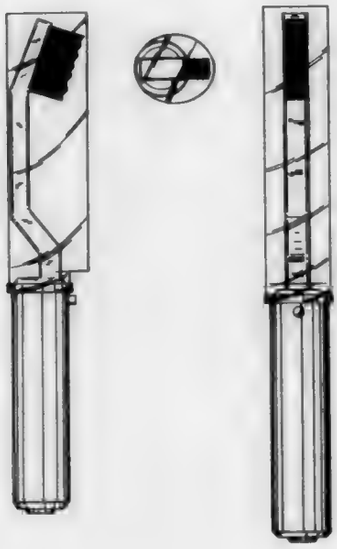
Kenneth E. Miller, Jr., 42884 Woodvale La., Columbiana, Ohio 44408

Filed Dec. 1, 1993, Ser. No. 15,892

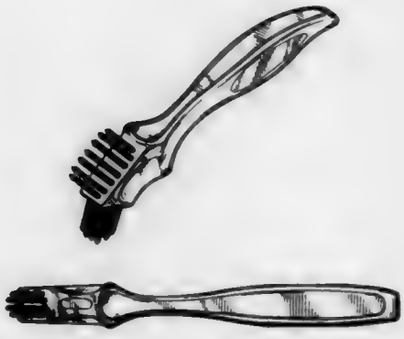
Term of patent 14 years

U.S. Cl. D3—318

364,274
COMBINED TOOTHBRUSH, TOOTHPASTE DISPENSER AND COVER
Julian Vasquez, 1817 Van Buren Dr., #213, Arlington, Tex. 76011
Filed Apr. 8, 1994, Ser. No. 21,074
Term of patent 14 years
U.S. Cl. D4—108

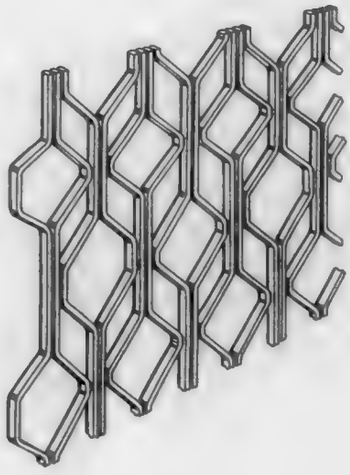


364,275
BRUSH
Martin Lewkowicz, Upper Montclair, N.J., assignor to Ranir/DCP Corporation, Grand Rapids, Mich.
Filed Sep. 14, 1994, Ser. No. 28,424
Term of patent 14 years
U.S. Cl. D4—119



364,276
BRUSH HANDLE
David A. Bird, Akron, and Vincent L. Haley, Orrville, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Dec. 13, 1994, Ser. No. 32,164
Term of patent 14 years
U.S. Cl. D4—138

364,277
MESH PANEL
Brian C. Worral, Lavender Bay, Australia, assignor to Alcan Australia Limited, Sydney, Australia
Filed Apr. 15, 1994, Ser. No. 21,542
Claims priority, application Australia, Jan. 25, 1993, 3391/93
Term of patent 14 years
U.S. Cl. D5—1



364,278

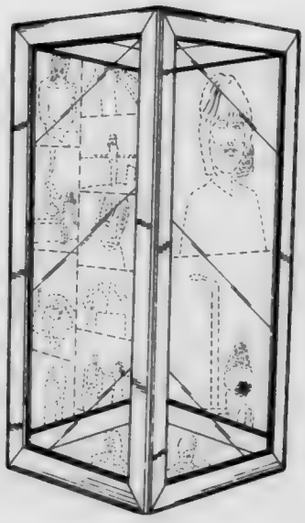
HANGING PICTURE FRAME

Donald R. Guyton, 7750 Rte. 669, McConnelsville, Ohio 43756

Filed Apr. 13, 1994, Ser. No. 21,255

Term of patent 14 years

U.S. Cl. D6—300



364,279

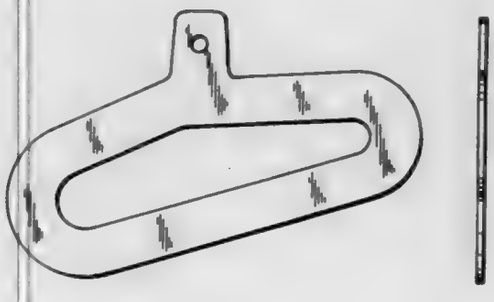
PLANAR HOSIERY HANGER

Marvin A. Hoffman, Mt. Sinai, N.Y., assignor to Sassi Hosiery Corp., New York, N.Y.

Filed May 19, 1994, Ser. No. 23,173

Term of patent 14 years

U.S. Cl. D6—319



364,280

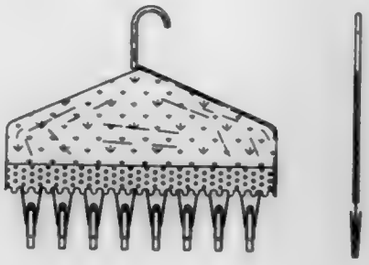
GARMENT HANGER

Nancy E. Maynard, 3973 Canning Ave., San Diego, Calif. 92111

Filed Oct. 4, 1994, Ser. No. 29,374

Term of patent 14 years

U.S. Cl. D6—326



364,281

BENCH

Donald H. Eason, Fort Collins, Colo., assignor to Ultimate Support Systems, Inc., Fort Collins, Colo.

Filed Mar. 2, 1995, Ser. No. 35,602

Term of patent 14 years

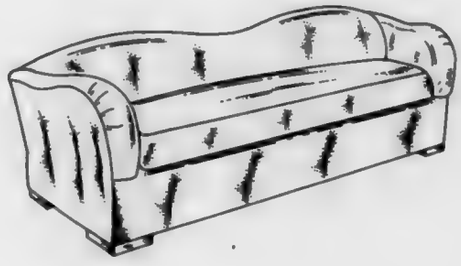
U.S. Cl. D6—349

364,282
FOLDABLE CHAIR FOR A COMBAT VEHICLE
Björn Andersson, Örnsköldsvik, Sweden, assignor to Hagglunds Vehicle AB, Ornskoldsvik, Sweden
Filed Sep. 8, 1994, Ser. No. 28,182
Claims priority, application Sweden, Mar. 10, 1994, 94-0557
Term of patent 14 years
U.S. Cl. D6—356

364,283
CHAIR
Paul Zaidman, Winnipeg, Canada, assignor to Paul Zaidman Designs Limited, Canada
Filed Mar. 3, 1994, Ser. No. 19,517
Claims priority, application Canada, Sep. 3, 1993, 03-09-93-4
Term of patent 14 years
U.S. Cl. D6—365

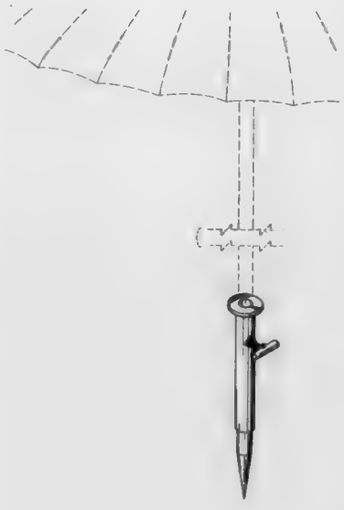
364,284
CHAIR
Camillo Prosperio, Erba, Italy, assignor to I.P.A.E. Societa Per Azioni, Merone, Italy
Filed Oct. 20, 1994, Ser. No. 29,967
Claims priority, application Hague Agreement, Jul. 21, 1994, DM/030210
Term of patent 14 years
U.S. Cl. D6—374

364,285
SOFA
Sally S. Lewis, 8727 Melrose Ave., Los Angeles, Calif. 90069-5086
Filed Oct. 21, 1993, Ser. No. 14,491
Term of patent 14 years
U.S. Cl. D6—381



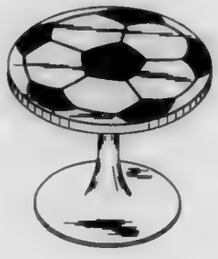
364,286
GROUND INSERTED UMBRELLA SUPPORT
Everett E. Loadholtz, Rte. 3, Box 200, MacClenny, Fla. 32063-9713

Filed Dec. 2, 1994, Ser. No. 32,085
Term of patent 14 years
U.S. Cl. D6—417



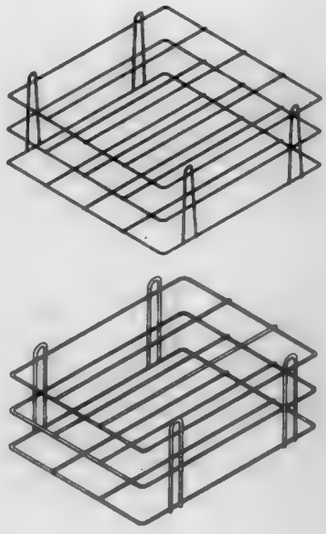
364,287
TABLE
Jeff Jurasinski, 8617 Boysenberry St., Tampa, Fla. 33615

Filed Feb. 8, 1994, Ser. No. 18,485
Term of patent 14 years
U.S. Cl. D6—451



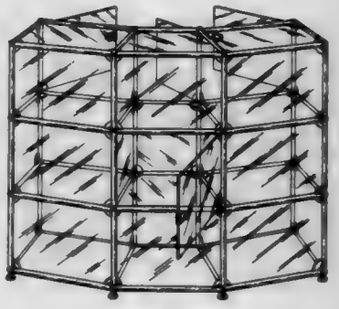
364,288
COMBINED BAKERS RACK AND ORGANIZER
Louise P. Kramer; Elizabeth A. Denis, both of St. Paul, and Brian H. Ye, Brooklyn Center, all of Minn., assignors to L & L Products, Inc., St. Paul, Minn.

Continuation-in-part of Ser. No. 10,115, Jun. 28, 1993, abandoned. This application Aug. 9, 1994, Ser. No. 26,905
Term of patent 14 years
U.S. Cl. D6—465

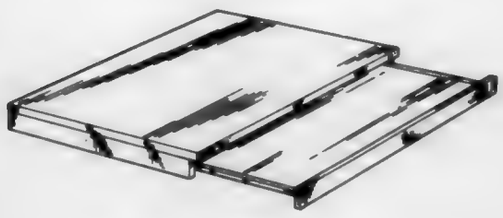


364,289
CURVED DISPLAY SHELF WITH TRANSPARENT SHELVES AND DOORS
André Gerber, Spiez, Switzerland, assignor to USM U. Schärer Söhne AG., Münsingen, Switzerland

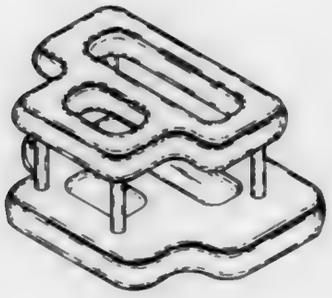
Filed Oct. 27, 1994, Ser. No. 30,346
Claims priority, application Switzerland, Apr. 27, 1994, 121 286
Term of patent 14 years
U.S. Cl. D6—470



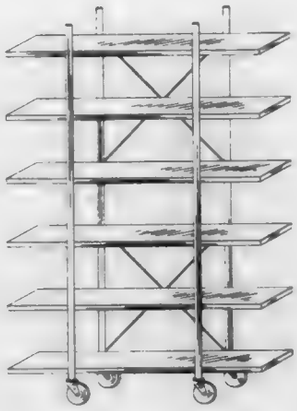
364,290
PULL-OUT SHELF ASSEMBLY
Malcolm Watts, po box 218, Mount Compass, South Australia, Australia
Filed Nov. 19, 1993, Ser. No. 15,902
Term of patent 14 years
U.S. Cl. D6—474



364,291
ORGANIZER FOR TV/VCR REMOTE CONTROL UNITS AND PROGRAM LISTING GUIDES
James A. Wheeler, R.R. #2, Box 147A, Dwight, Ill. 60420
Filed Jul. 7, 1994, Ser. No. 25,649
The portion of the term of this patent subsequent to Sep. 26, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—475



364,292
SHELVING UNIT
Glendon R. Good, 2000 Second St., Berkeley, Calif. 94710
Filed Oct. 20, 1994, Ser. No. 29,955
Term of patent 14 years
U.S. Cl. D6—479



364,293
TABLE
John Hutton, New York, N.Y., assignor to Donghia Furniture, New York, N.Y.
Filed Jun. 1, 1994, Ser. No. 23,779
Term of patent 14 years
U.S. Cl. D6—486

364,294

DOOR FOR CABINET

Keith E. Brightbill, Wooster; Rick Branham, Mansfield; Brian J. Conaway, Wooster; Frank Copen, Barberton; Richard E. Corney, Uniontown; Robert Frindt, Willoughby; Albert T. Kobilarcik, Wooster, and Stacy L. Wolff, Akron, all of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio

Filed Aug. 31, 1994, Ser. No. 27,850

Term of patent 14 years

U.S. Cl. D6—492

364,295

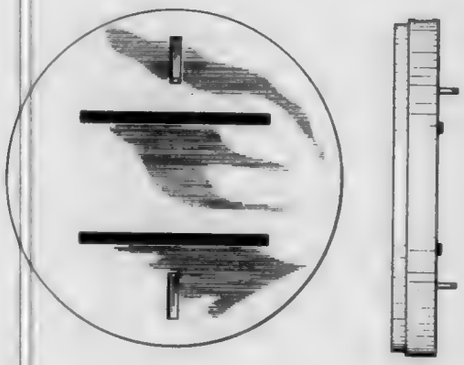
BASE FOR AN INFANT SEAT

Sidney E. Cooper, 230 Water St., Weldon, Ill. 61882

Filed Apr. 25, 1994, Ser. No. 21,803

Term of patent 14 years

U.S. Cl. D6—495



364,296

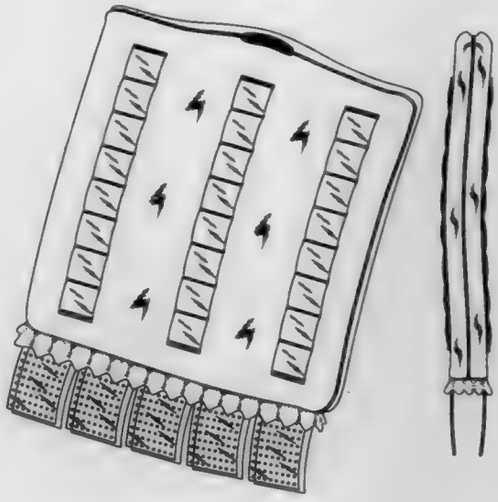
HANGABLE ORGANIZER FOR BOWS, EARRINGS, HAIR CLIPS AND SIMILAR ACCESSORIES

Idolina Eldridge, R.R. 2 Box 370, Bishop, Tex. 78343

Filed Mar. 29, 1994, Ser. No. 20,580

Term of patent 14 years

U.S. Cl. D6—513



364,297

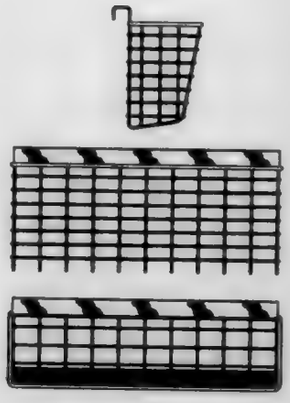
EYE GLASS HOLDER

Benjamin S. Daniel, 1053 W. Columbia Ave., Chicago, Ill. 60626

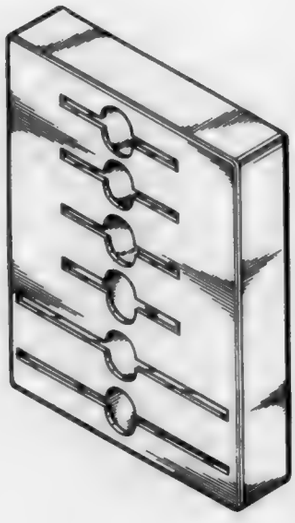
Filed May 16, 1994, Ser. No. 22,994

Term of patent 14 years

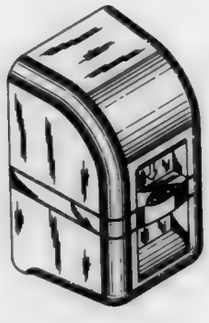
U.S. Cl. D6—513



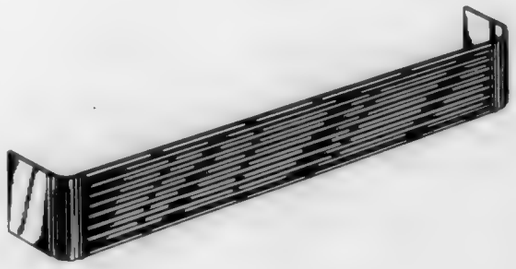
364,298
DISPENSING CABINET
Malcolm R. Phifer, 604 Dixon Dr., Raleigh, N.C. 27609
Filed Oct. 18, 1994, Ser. No. 29,822
Term of patent 14 years
U.S. Cl. D6—515



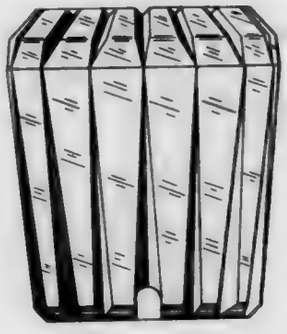
364,299
SOAP DISPENSER
Jacob Lax, 1013 E. 26th St., Brooklyn, N.Y. 11210
Filed Nov. 10, 1994, Ser. No. 30,866
Term of patent 14 years
U.S. Cl. D6—545



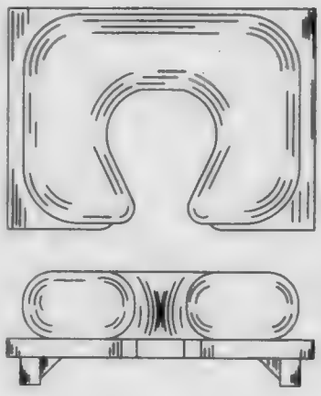
364,300
VALENCE FOR VERTICAL BLINDS
Harout Ohanesian, Northridge, Calif., assignor to U.S. Polymers, Inc., Commerce, Calif.
Filed Apr. 29, 1994, Ser. No. 22,200
Term of patent 14 years
U.S. Cl. D6—579



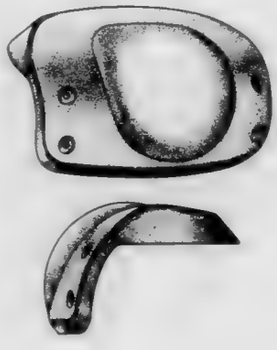
364,301
TASSEL CROWN
Albert N. Drake, Pensacola, Fla., assignor to National Awards, Inc., Jackson, Mich.
Filed Feb. 18, 1994, Ser. No. 19,006
Term of patent 14 years
U.S. Cl. D6—581



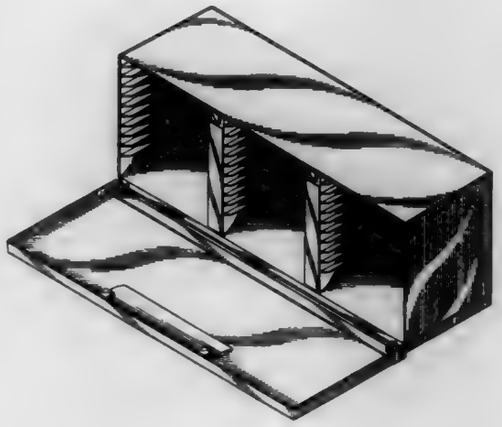
364,302
COMBINED INFLATABLE BEACH PILLOW AND SUPPORT TRAY THEREFOR
Robert W. Cloud, 3531 Barry Ave., Los Angeles, Calif. 90066
Filed Nov. 5, 1993, Ser. No. 14,947
Term of patent 14 years
U.S. Cl. D6—601



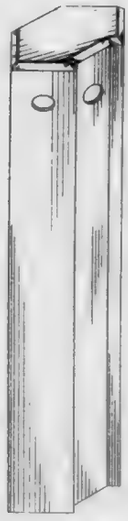
364,303
SUPPORT PILLOW FOR USE WITH BATHING TUBS INCLUDING SPAS, POOLS, AND WHIRLPOOLS
Christopher Larsen, Vista, Calif., assignor to Watkins Manufacturing Corporation, Vista, Calif.
Continuation of Ser. No. 321,747, Oct. 12, 1994. This application Nov. 9, 1994, Ser. No. 30,812
Term of patent 14 years
U.S. Cl. D6—601



364,304
COMPACT DISC STORAGE CONTAINER
James T. Weisburn, Massillon, and Christopher G. Gallagher, Akron, both of Ohio, assignors to Alpha Enterprises, Inc., North Canton, Ohio
Filed Jan. 11, 1993, Ser. No. 3,604
Term of patent 14 years
U.S. Cl. D6—632



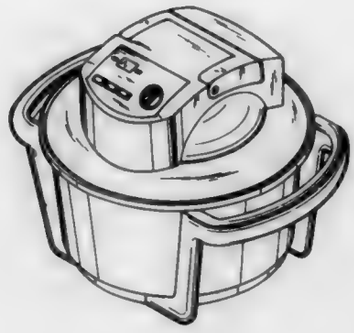
364,305
DEVICE FOR DISPENSING BEVERAGES
Jan N. Rasmussen, Ølstykke, Denmark, assignor to Carlsberg A/S, Copenhagen V, Denmark
Division of Ser. No. 502,451, Mar. 30, 1990. This application Nov. 16, 1992, Ser. No. 1,567
Claims priority, application Denmark, Nov. 3, 1989, MA 1337 1989
Term of patent 14 years
U.S. Cl. D7—300



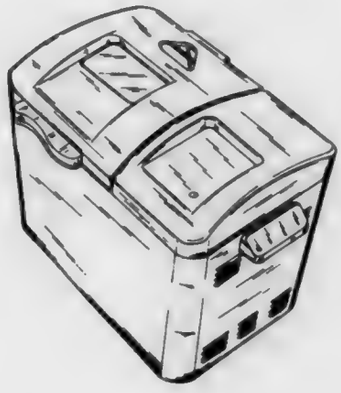
364,306
ELECTRIC ESPRESSO MACHINE
Günter Storsberg, Adolfstrasse 15, 5650 Solingen 1, Germany
Filed Dec. 27, 1993, Ser. No. 16,767
Claims priority, application France, Jun. 24, 1993, 933.323
Term of patent 14 years
U.S. Cl. D7—309

364,307
COFFEE MAKER
Kwei T. Chang, No. 14, Lane 54, Luong Chuan St., Panchiao City, Taipei Hsien, Taiwan, Prov. of China
Filed Jun. 15, 1994, Ser. No. 24,503
Term of patent 14 years
U.S. Cl. D7—322

364,308
CYCLONE COOKER
Kwei T. Chang, No. 14, Lane 54, Luong Chuan St., Panchiao, Taipei Hsien, Taiwan, Prov. of China
Filed Jan. 28, 1993, Ser. No. 4,207
Term of patent 14 years
U.S. Cl. D7—350



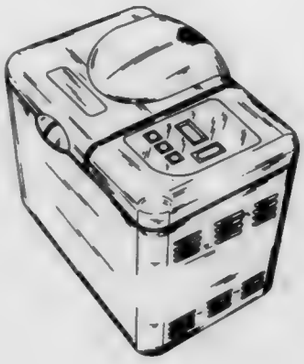
364,309
BREADMAKER
William C. Cesaroni, Glenview; Shawn Barrett, Grayslake, and Steven Cozzolino, Chicago, all of Ill., assignors to The West Bend Company, West Bend, Wis.
Filed Aug. 15, 1994, Ser. No. 27,168
Term of patent 14 years
U.S. Cl. D7—350



364,310
BREADMAKER

William C. Cesaroni, Glenview; Shawn Barrett, Grayslake, and Steven Cozzolino, Chicago, all of Ill., assignors to The West Bend Company, West Bend, Wis.

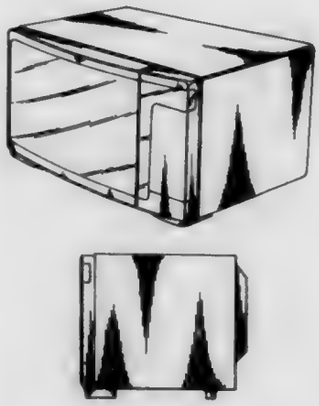
Filed Aug. 26, 1994, Ser. No. 27,667
Term of patent 14 years
U.S. Cl. D7—350



364,311
MICROWAVE OVEN

Byung-Soo Kim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

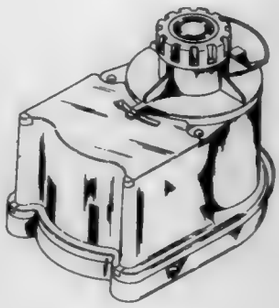
Filed Dec. 2, 1993, Ser. No. 15,897
Claims priority, application Rep. of Korea, Aug. 4, 1993, 15754-93
Term of patent 14 years
U.S. Cl. D7—351



364,312
PASTA MAKING MACHINE

Shih-Wang Lai, No. 654, Ta-Ya Rd., Lai-Tzu Li, North District, Taichung City, Taiwan, Prov. of China

Filed Aug. 22, 1994, Ser. No. 27,464
Term of patent 14 years
U.S. Cl. D7—376



364,313
BARBECUE LIGHTER

Marc Zemel, Old Bethpage, N.Y., assignor to Mr. Bar-B-Q-, Inc., Old Bethpage, N.Y.

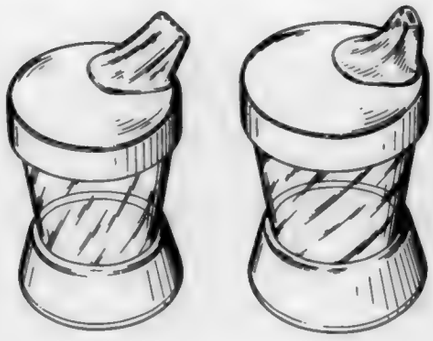
Filed Sep. 21, 1994, Ser. No. 28,747
Term of patent 14 years
U.S. Cl. D7—416

364,314

DRINKING CUP FOR CHILDREN

David C. Humphrey, and Frances A. Coletta, both of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Filed Sep. 28, 1993, Ser. No. 13,628
Term of patent 14 years
U.S. Cl. D7—510

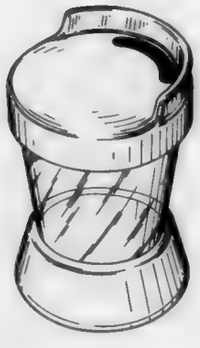


364,315

DRINKING CUP FOR CHILDREN

David C. Humphrey, and Frances A. Coletta, both of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Division of Ser. No. 13,628, Sep. 28, 1993. This application Jan. 12, 1995, Ser. No. 33,433
Term of patent 14 years
U.S. Cl. D7—510

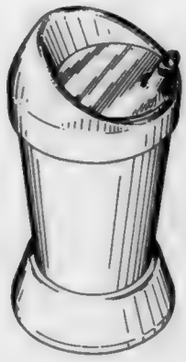


364,316

DRINKING CUP FOR CHILDREN

David C. Humphrey, and Frances A. Coletta, both of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Division of Ser. No. 13,628, Sep. 28, 1993. This application Jan. 12, 1995, Ser. No. 33,435
Term of patent 14 years
U.S. Cl. D7—510



364,317

DRINKING CUP FOR CHILDREN

David C. Humphrey, and Frances A. Coletta, both of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Division of Ser. No. 13,628, Sep. 28, 1993. This application Jan. 12, 1995, Ser. No. 33,434
Term of patent 14 years
U.S. Cl. D7—511

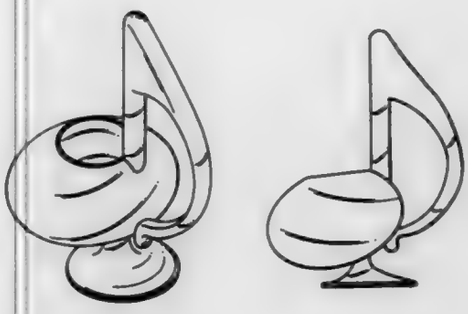
364,318
BEVERAGE GLASS

Ming-Kuan Chih, No. 28, Lane 126, Yuan-Huan E. Rd., Fengyuan City, Taichung Hsien, Taiwan, Prov. of China

Filed Aug. 24, 1994, Ser. No. 28,273

Term of patent 14 years

U.S. Cl. D7—515



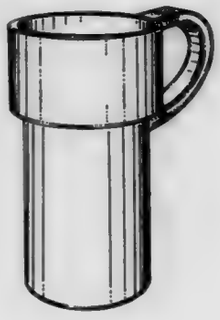
364,319
BEVERAGE MUG

Thomas J. Schaeppi, 8601 Upland North, Maple Grove, Minn. 55311

Continuation-in-part of Ser. No. 123,866, Sep. 20, 1993, Pat. No. 5,344,040, which is a continuation-in-part of Ser. No. 991,993, Dec. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 895,480, Jun. 9, 1992, Pat. No. 343,991, which is a continuation-in-part of Ser. No. 822,566, Jan. 16, 1992, Pat. No. Des. 339,029. This application May 20, 1994, Ser. No. 23,261

Term of patent 14 years

U.S. Cl. D7—536



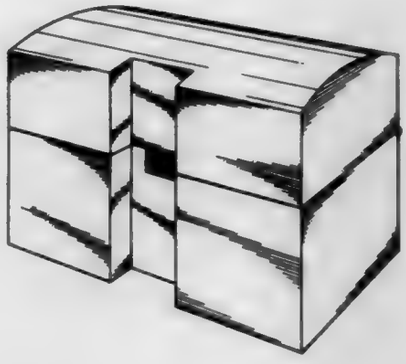
364,320
LOCKING LUNCH BOX

Edward E. Sipe, R.D. #2, Box 447 Orchard Rd., New Wilmington, Del. 16142

Filed Sep. 27, 1994, Ser. No. 29,035

Term of patent 14 years

U.S. Cl. D7—629



364,321
FOOD CUTTER

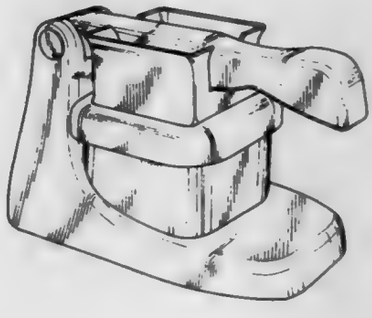
Lui C. Ping, and Tang L. Kwong, both of Hong Kong, Hong Kong, assignors to Keysun Industrial Company Limited, Hong Kong, Hong Kong

Filed Jul. 25, 1994, Ser. No. 26,293

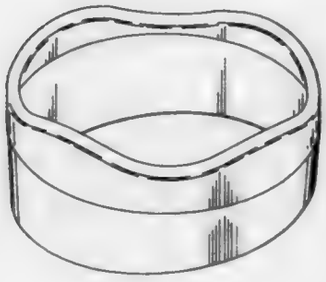
Claims priority, application United Kingdom, Feb. 21, 1994, 2037249

Term of patent 14 years

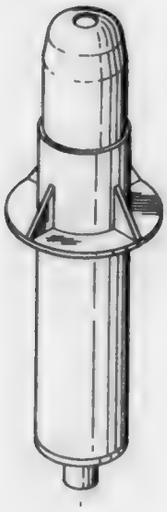
U.S. Cl. D7—673



364,322
PLANT WATERING RING
Stephen J. Breacain, 1568 Alyssa Pl., Manteca, Calif. 95337
Filed Jun. 20, 1994, Ser. No. 24,718
Term of patent 14 years
U.S. Cl. D8—1

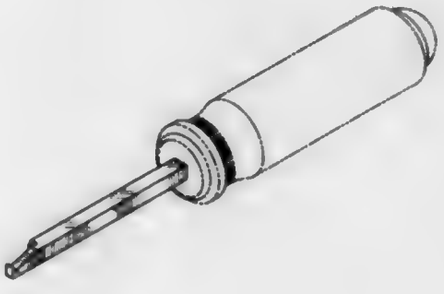


364,323
LIGHT BULB BASE EXTRACTOR
Alan L. Zapo, Markham, and Roger G. Brown, Willowdale, both of, Canada, assignors to Socket Butler Inc., Concord, Canada
Filed Jun. 7, 1994, Ser. No. 24,073
Claims priority, application Hague Agreement, Apr. 8, 1994, 1994-0675
Term of patent 14 years
U.S. Cl. D8—14



364,324
TABLE MODEL CORKSCREW WITH CUTTING WHEELS
Richard Entwistle, London, England, assignor to Le Creuset S.A., Fresnoy-le-Grand, France
Filed Mar. 25, 1994, Ser. No. 20,409
Claims priority, application United Kingdom, Sep. 27, 1993, 2034188
The portion of the term of this patent subsequent to May 30, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D8—42

364,325
SHANK AND BLADE PORTION OF A STAPLE REMOVER
Richard J. Jetter, 1887 Ridgeway Dr., Clearwater, Fla. 34615
Filed Aug. 19, 1994, Ser. No. 27,365
Term of patent 14 years
U.S. Cl. D8—48



364,326

CHAIN SAW

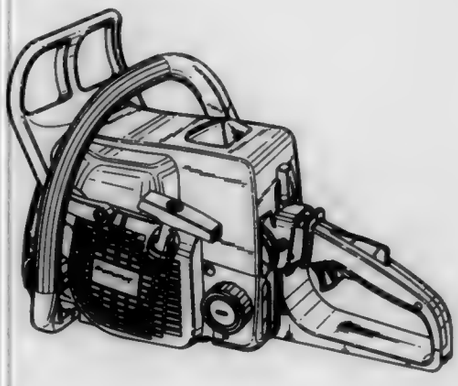
Georg Lohse, Waiblingen; Karl Förderer, Schwaikheim; Klaus Höppner, Marbach, and Michael P. G. Tinius, Elchingen, all of, Germany, assignors to Andreas Stihl, Waiblingen, Germany

Filed Aug. 10, 1994, Ser. No. 27,011

Claims priority, application Germany, Feb. 12, 1994, M9401412.4

Term of patent 14 years

U.S. Cl. D8—65



364,327

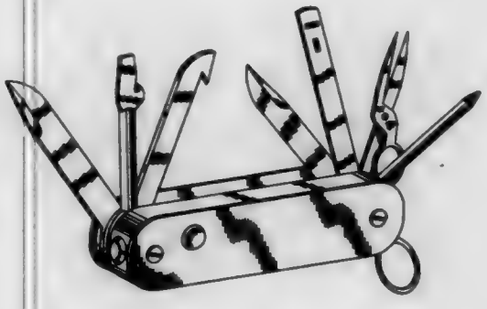
UTILITY POCKETKNIFE

William Graham, P.O. Box 53, Tazewell, Va. 24651

Filed Aug. 29, 1994, Ser. No. 27,694

Term of patent 14 years

U.S. Cl. D8—105



364,328

HINGE WING COVER

Frances G. H. Ainscough, McHenry, Ill., assignor to Newell Operating Company, Freeport, Ill.

Filed Aug. 3, 1994, Ser. No. 25,228

Term of patent 14 years

U.S. Cl. D8—323

364,329

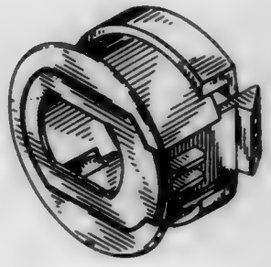
SLAM LATCH DESIGN

Lynn B. Ziemer, Ridley Park, and Robert D. Alyanakian, West Chester, both of Pa., assignors to Southco, Inc., Concordville, Pa.

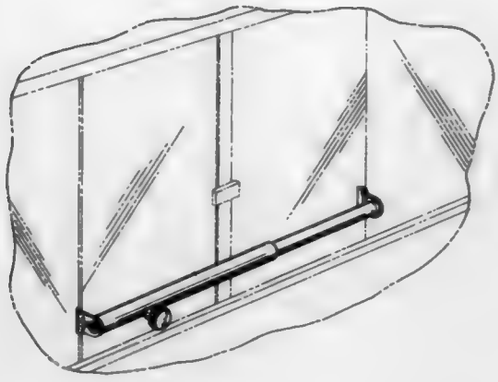
Continuation of Ser. No. 21,404, Apr. 15, 1994, Pat. No. Des. 357,396, which is a continuation of Ser. No. 11,013, Jul. 23, 1993, abandoned. This application Sep. 29, 1994, Ser. No. 29,092

Term of patent 14 years

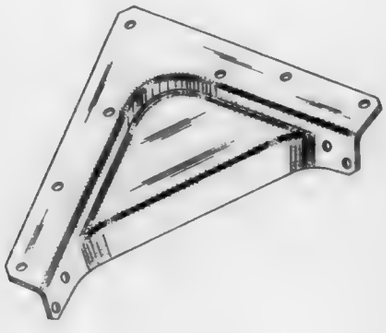
U.S. Cl. D8—331



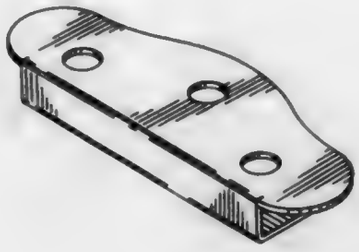
364,330
SLIDING PANELS SECURITY DEVICE
Al Virzi, Troy, Mich., assignor to G&D Communications Corporation, Bloomfield Hills, Mich.
Filed Apr. 14, 1994, Ser. No. 20,180
Term of patent 14 years
U.S. Cl. D8—341



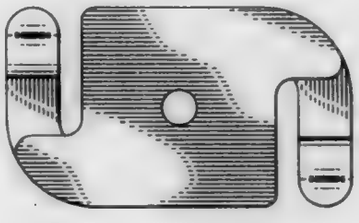
364,331
STRUCTURAL CONNECTOR
William F. Leek, Anaheim, Calif., assignor to Simpson Strong-Tie Company, Inc., Pleasanton, Calif.
Filed Aug. 18, 1993, Ser. No. 11,960
Term of patent 14 years
U.S. Cl. D8—354



364,332
ELECTRICAL GROUND BRACKET
Isaac Sachs, 283 Newton, Dollard-des-Ormeaux, Quebec, Canada
Filed Apr. 25, 1994, Ser. No. 21,896
Term of patent 14 years
U.S. Cl. D8—354



364,333
LIGHT SUPPORT BRACKET
Stephen L. Fillipp, and Peter A. Brown, both of Lubbock, Tex., assignors to Gary Products Group, Inc., Lubbock, Tex.
Filed Sep. 12, 1994, Ser. No. 28,335
Term of patent 14 years
U.S. Cl. D8—354



364,334

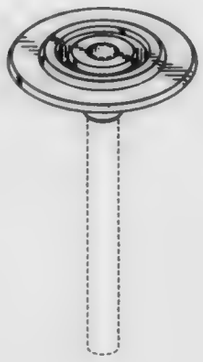
GROUND SLEEVE FOR SUPPORTING A POLE

Lloyd L. Sandstrom, 1692 W. Paiute Rd., Bloomington, Utah 84770; Todd L. Sandstrom, 80 North Main, North Salt Lake, Utah 84054, and Robert L Sandberg, 628 Sir Michael Dr., Salt Lake City, Utah 84116

Filed Oct. 11, 1994, Ser. No. 29,546

Term of patent 14 years

U.S. Cl. D8—354



364,335

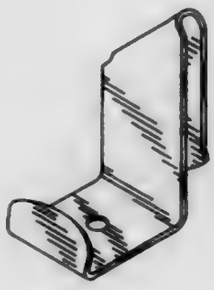
FENCE HOOK

Larry D. Mesna, 52118 Munsacker Way; Gregory C. Mesna, and Wendy L. Mesna, both of P.O. Box 2344, all of Running Springs, Calif. 92382

Filed Aug. 30, 1993, Ser. No. 12,392

Term of patent 14 years

U.S. Cl. D8—367



364,336

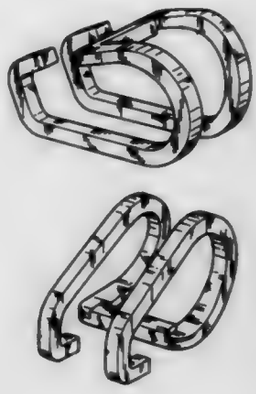
SPRING CLIP

Richard R. Calusinski, Vista, Australia, assignor to Everts & Van Der Weijden Exploitatie Maatschappij Ewem B.V., The Hague, Netherlands

Filed Oct. 5, 1994, Ser. No. 30,075

Term of patent 14 years

U.S. Cl. D8—371



364,337

FASTENER CLIP

Charles L. Deschenes, North Attleboro; Terence J. Jones, Bolton, both of Mass., and William J. Cooper, Woonsocket, R.I., assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Sep. 19, 1994, Ser. No. 28,648

Term of patent 14 years

U.S. Cl. D8—382

364,338

SURFACE MOUNT SNOW GUARD

Roger M. Cline, Bluemont, Va., assignor to Real-Tool, Inc., Purcellville, Va.

Filed Sep. 23, 1994, Ser. No. 28,610

Term of patent 14 years

U.S. Cl. D8—499

364,339

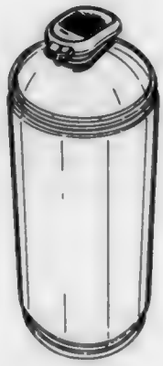
AEROSOL DISPENSER

Jill M. Shurtleff, South Boston, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Sep. 22, 1994, Ser. No. 28,816

Term of patent 14 years

U.S. Cl. D9—300



364,340

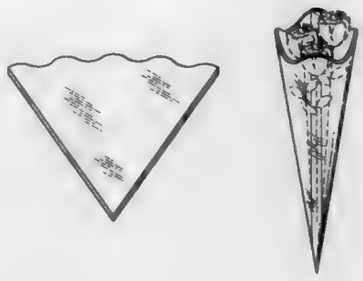
FLORAL WRAPPING MATERIAL

Donald E. Weder; Joseph G. Straeter, both of Highland; William F. Straeter, and Lisa A. Straeter, both of Breese, all of Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 795, Oct. 22, 1992, Pat. No. Des. 356,028. This application Feb. 22, 1995, Ser. No. 35,167

Term of patent 14 years

U.S. Cl. D9—305



364,341

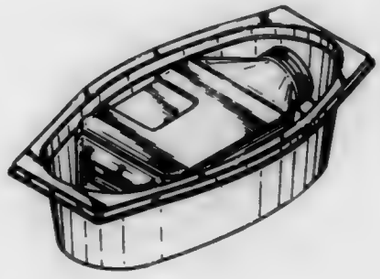
COMBINED BOTTLE AND BOWL PACKAGE

Duane M. Regenscheid, Austin, Minn.; Grover J. Manderfield, Jr., Elk Grove Village, Ill.; Luther A. Gross, Churubusco, and John Fricke, South Whitley, both of Ind., assignors to Hormel Foods Corporation, Austin, Minn.

Filed Mar. 16, 1994, Ser. No. 20,071

Term of patent 14 years

U.S. Cl. D9—337



364,342

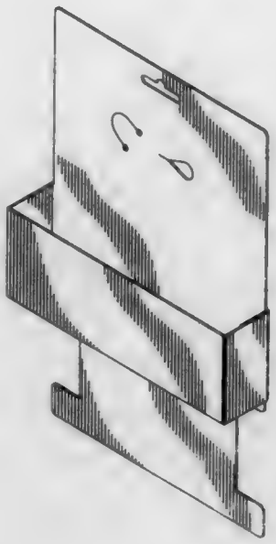
BOW PACKAGE

Edward Ruff, Boca Raton, Fla., assignor to Santa's Best, Northfield, Ill.

Filed Aug. 5, 1993, Ser. No. 11,428

Term of patent 14 years

U.S. Cl. D9—415



364,343

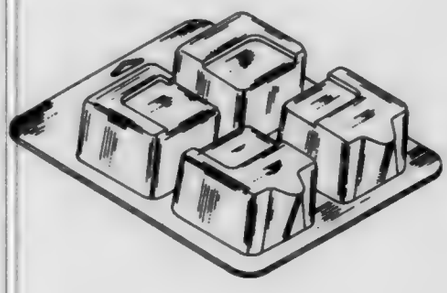
FOOD PACKAGE

Frank C. Mello, Columbus, Miss., assignor to Sara Lee Corporation, Winston-Salem, N.C.

Filed Nov. 30, 1994, Ser. No. 31,536

Term of patent 14 years

U.S. Cl. D9—415



364,344

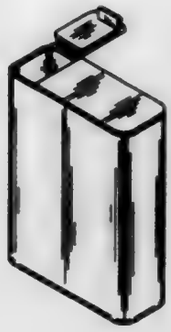
SPLIT LID CONTAINER

Howard G. Shaw, 90 Montecito Rd., San Rafael, Calif. 94901

Filed Jun. 29, 1994, Ser. No. 25,296

Term of patent 14 years

U.S. Cl. D9—421



364,345

BOX

Ted Prins, Amsterdam, Netherlands, assignor to Dutch Cocoa & Chocolate Company B.V., Haarlem, Netherlands

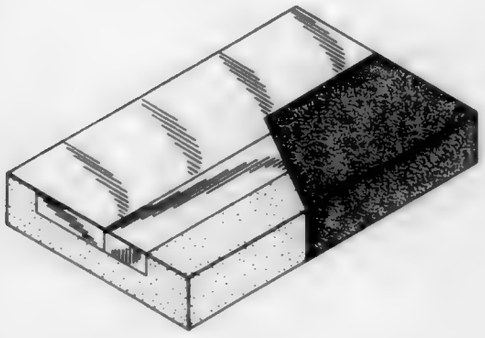
Filed Jun. 10, 1994, Ser. No. 24,268

Claims priority, application Benelux TM/Des. Off., Dec. 10, 1993, 24213-00

Term of patent 14 years

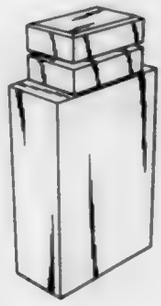
U.S. Cl. D9—430

364,346
WRAPPING FOR AUDIO CASSETTE TAPE BOX
Masato Yamada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 8, 1994, Ser. No. 31,894
Term of patent 14 years
U.S. Cl. D9—432

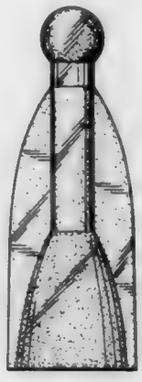


364,347
BOTTLE
Mark E. Sillince, Bedfordshire, United Kingdom, and Erwin A. Rosens, Alphen A/D Rign, Netherlands, assignors to Whitbread plc, London, United Kingdom, and Heineken Technical Services, Amsterdam, Netherlands
Filed Jan. 6, 1995, Ser. No. 33,208
Claims priority, application United Kingdom, Jul. 7, 1994, 2040175
Term of patent 14 years
U.S. Cl. D9—500

364,348
COMBINED PERFUME BOTTLE AND STOPPER
Giovanni Sgariboldi, Monza, Italy, assignor to Euroitalia S.r.l., Monza, Italy
Filed Feb. 18, 1993, Ser. No. 4,988
Claims priority, application Italy, Jan. 22, 1992, MI9200703
Term of patent 14 years
U.S. Cl. D9—544



364,349
COMBINED CLOSURE AND SIDEWALLS FOR A PERFUME BOTTLE
Tamotsu Yagi, San Francisco, Calif., assignor to Benetton Group S.p.A., Ponzano-Veneto, Italy
Filed Jan. 24, 1994, Ser. No. 17,848
Claims priority, application Italy, Jul. 23, 1993, MI930000416
Term of patent 14 years
U.S. Cl. D9—549



364,350

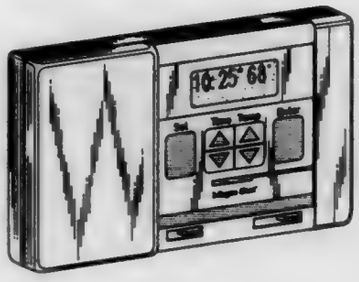
THERMOSTAT HOUSING

Ralph Pasquarette, Jordan, and Alfred J. Gaskell, Hopkins, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 29, 1993, Ser. No. 19,321

Term of patent 14 years

U.S. Cl. D10—50



364,351

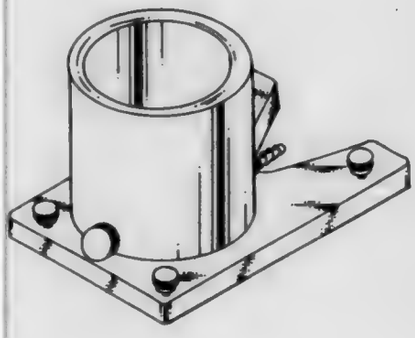
COLLAR HOUSING FOR A ROTOR-STATOR ADAPTOR FOR SENSITIVE ROTATING VISCOMETERS

John L. Van Meter; Kevin J. Wolfe; Gregory C. Miiller, and Theodore W. Selby, all of Midland, Mich., assignors to Tannas Co., Midland, Mich.

Continuation-in-part of Ser. No. 308,918, Sep. 20, 1994. This application Nov. 8, 1994, Ser. No. 30,792

Term of patent 14 years

U.S. Cl. D10—80



364,352

WATCH FACE

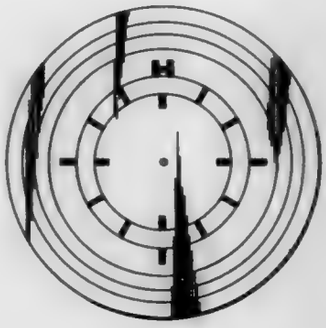
Jean-Louis Dumas, Paris, France, assignor to La Montre Hermes, Bienne, Switzerland

Filed Jul. 7, 1994, Ser. No. 25,652

Claims priority, application WIPO, Jan. 10, 1994, DM/028.347

Term of patent 14 years

U.S. Cl. D10—126



364,353

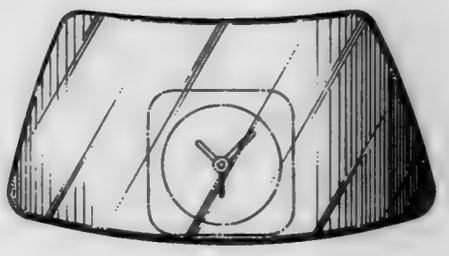
CLOCK STAND

Edward F. Staib, 123 Avenida Pelayo, #D, San Clemente, Calif. 92672-4640

Filed Oct. 4, 1993, Ser. No. 13,862

Term of patent 14 years

U.S. Cl. D10—128



364,354

BASKETBALL NOVELTY CLOCK

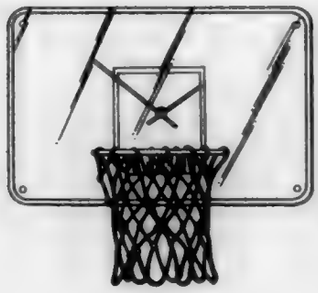
Brendon G. Nunes, 467 Westney Road S., Unit 3, Ajax, Ontario, Canada

Continuation-in-part of Ser. No. 936,540, Aug. 31, 1992, Pat. No. Des. 354,231. This application Nov. 1, 1994, Ser. No. 30,110

The portion of the term of this patent subsequent to Mar. 15, 2008, has been disclaimed.

Term of patent 14 years

U.S. Cl. D10—6



364,355

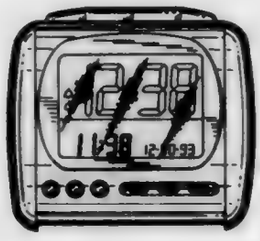
TRAVEL CLOCK

Cheng F. W. George, Hong Kong, Hong Kong, assignor to Tomor Electronics Ltd., Quarry Bay, Hong Kong

Filed Oct. 13, 1994, Ser. No. 29,700

Term of patent 14 years

U.S. Cl. D10—18



364,356

WALL MOUNTED CLOCK

Shan-Ker Moore, Taichung Hsien, Taiwan, Prov. of China, assignor to Centre Clock Industry Co., Ltd., Taichung Hsien, Taiwan, Prov. of China

Filed Jan. 4, 1995, Ser. No. 33,050

Term of patent 14 years

U.S. Cl. D10—29

364,357

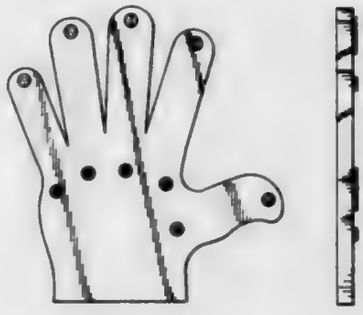
NOVELTY HAND

Thomas D. Ledgerwood, II, 408 W. Main, Norman, Okla. 73069

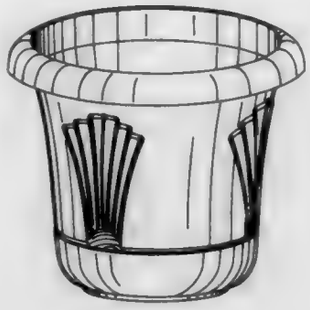
Filed Nov. 25, 1994, Ser. No. 31,389

Term of patent 14 years

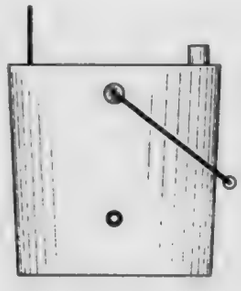
U.S. Cl. D10—33



364,358
PLANTER
Jeffrey D. Bransky, Clarendon Hills, and Kenneth L. Sanderson, Elgin, both of Ill., assignors to Duraco Products, Inc., Streamwood, Ill.
Filed Nov. 8, 1993, Ser. No. 15,022
Term of patent 14 years
U.S. Cl. D11—152

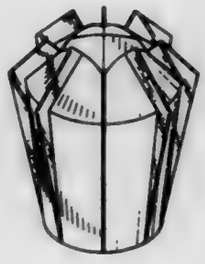


364,359
SELF-WATERING PLANT CONTAINER
Donald C. Johnson, P.O. Box 21, Farmville, N.C. 27828
Filed Dec. 21, 1993, Ser. No. 16,631
Term of patent 14 years
U.S. Cl. D11—152

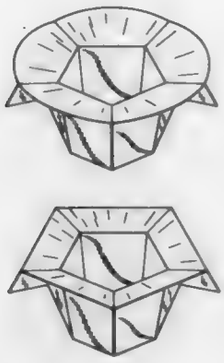


364,360
INSECT FIGURINE
Leal Smith, 4931 E. 40th, Indianapolis, Ind. 46226
Division of Ser. No. 275,740, Nov. 23, 1988, Pat. No. Des. 319,418, which is a division of Ser. No. 143,152, Jan. 13, 1988, Pat. No. Des. 299,321, which is a division of Ser. No. 4,696, Jan. 20, 1987, Pat. No. Des. 295,616, which is a division of Ser. No. 684,362, Dec. 20, 1984, Pat. No. Des. 289,270. This application Jul. 8, 1991, Ser. No. 726,556
Term of patent 14 years
U.S. Cl. D11—158

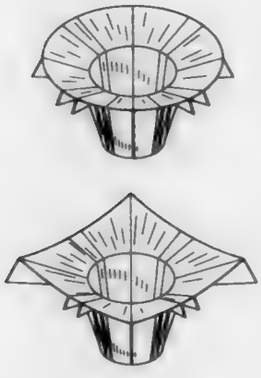
364,361
FLOWER POT COVER WITH FINS
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, Pat. No. Des. 348,634, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989. This application Sep. 29, 1992, Ser. No. 954,061
The portion of the term of this patent subsequent to Sep. 19, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



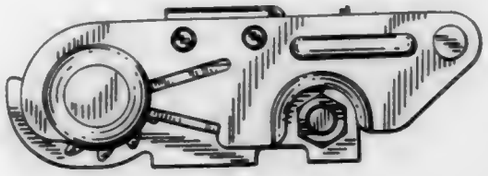
364,362
FLOWER POT COVER
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, Pat. No. Des. 348,634, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, abandoned, and Ser. No. 411,245, Sep. 22, 1989, abandoned.
This application Oct. 20, 1992, Ser. No. 670
Term of patent 14 years
U.S. Cl. D11—164



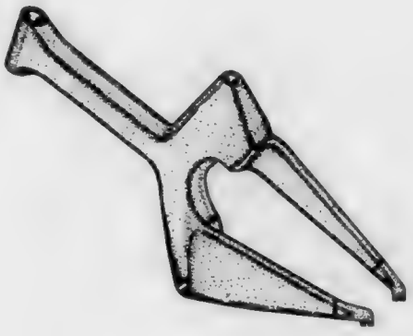
364,363
FLOWER POT COVER
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, Pat. No. Des. 348,634, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. D. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989. This application Nov. 9, 1992, Ser. No. 1,279
Term of patent 14 years
U.S. Cl. D11—164



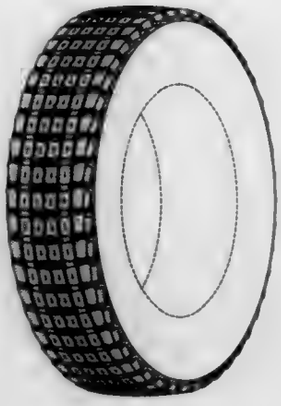
364,364
BUCKLE FOR CARGO STRAPS
Kazuhide Takimoto, Tokyo, Japan, assignor to Takigen Manufacturing Co. Ltd., Tokyo, Japan
Filed Jun. 24, 1994, Ser. No. 24,984
Term of patent 14 years
U.S. Cl. D11—216



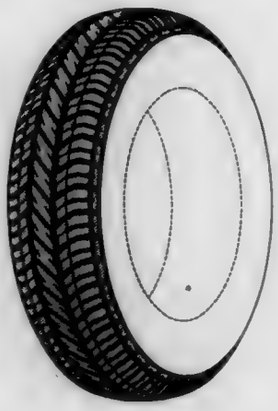
364,365
BICYCLE FRAME
Chin-I Lin, Tainan, and Gou-Don Chu, Hsinchu, both of, Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Taiwan, Prov. of China
Filed May 6, 1994, Ser. No. 22,502
Term of patent 14 years
U.S. Cl. D12—111



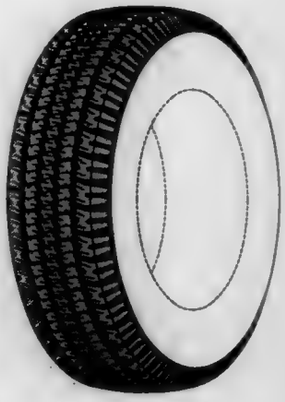
364,366
TIRE TREAD
Richard Harden, Jr., Tallmadge, and Daniel E. Schuster, North Royalton, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jun. 20, 1994, Ser. No. 24,716
Term of patent 14 years
U.S. Cl. D12—146



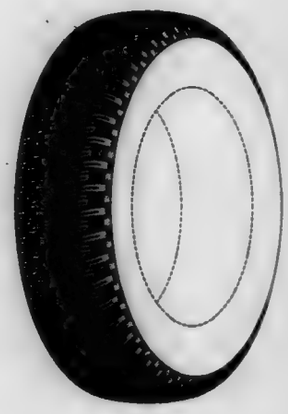
364,367
TIRE TREAD
Alain Alphonse Z. S. Klepper, Bastogne, Belgium, and Bruno P. Maitre, Useldange, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jul. 27, 1994, Ser. No. 26,424
Term of patent 14 years
U.S. Cl. D12—146



364,368
TIRE TREAD
Alex Van Der Meer, Schieren, Luxembourg, and Claude Lardo, Walzing, Belgium, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 1, 1994, Ser. No. 26,533
Term of patent 14 years
U.S. Cl. D12—146

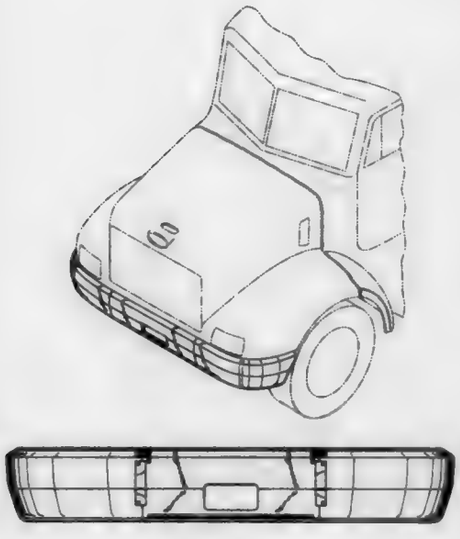


364,369
TIRE TREAD
Maurice Graas, Reichlange, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 4, 1994, Ser. No. 26,751
Term of patent 14 years
U.S. Cl. D12—146



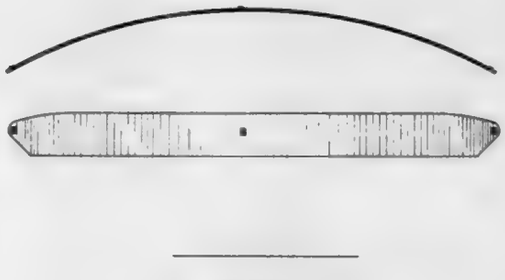
364,370
TIRE TREAD
Andrew F. Weimer, Akron; Randall R. Brayer, and Beale A. Robinson, both of North Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 4, 1994, Ser. No. 26,753
Term of patent 14 years
U.S. Cl. D12—147

364,371
TRUCK BUMPER
Robert A. Ray, Highland Village, Tex., and Ronaldo S. Natividad, San Jose, Calif., assignors to Paccar Inc., Bellevue, Wash.
Filed Sep. 16, 1994, Ser. No. 28,502
Term of patent 14 years
U.S. Cl. D12—169



364,372
STEERING WHEEL COVER
Rony Shroitman, Tel Aviv, Israel, assignor to Drivetime Marketing Corp., New York, N.Y.
Filed Sep. 7, 1994, Ser. No. 28,125
Term of patent 14 years
U.S. Cl. D12—177

364,373
HEADLINER CLIP FOR VEHICLE INTERIORS
Kurt E. Warner, P.O. Box 853, Candler, N.C. 28715
Filed Dec. 30, 1993, Ser. No. 16,975
Term of patent 14 years
U.S. Cl. D12—223



364,374
ATV ROD CARRIER
Larry F. Elliott, 345 S. 9th, Lander, Wyo. 82520
Filed May 20, 1994, Ser. No. 23,243
Term of patent 14 years
U.S. Cl. D12—423

364,375

SMALL ELECTRIC MOTOR

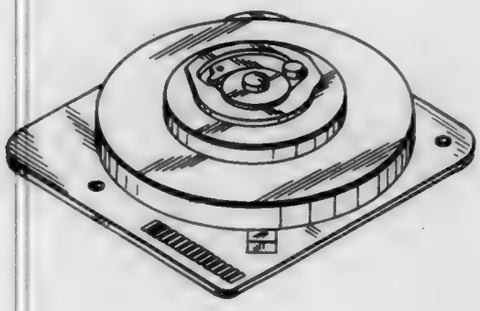
Hiroshi Sakashita; Norihide Yoshida, and Katsuyoshi Miyasaka, all of Nagano, Japan, assignors to Sankyo Seiki Mfg. Co., Ltd., Nagano, Japan

Filed Jan. 3, 1994, Ser. No. 17,075

Claims priority, application Japan, Jul. 7, 1993, 05-20797; Jul. 7, 1993, 05-20798

Term of patent 14 years

U.S. Cl. D13—112



364,376

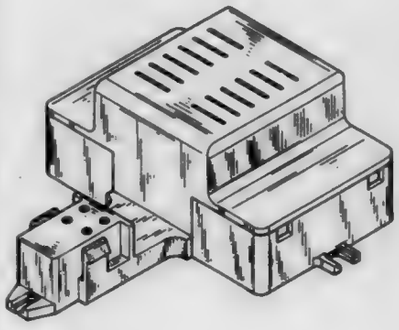
STARTER FOR A LAMP

Mei-Mo Lin, No. 34, Lane 114, Yuantung S. Rd., Tantze Hsiang, Taichung Hsien, Taiwan, Prov. of China

Filed Sep. 23, 1994, Ser. No. 28,832

Term of patent 14 years

U.S. Cl. D13—117



364,377

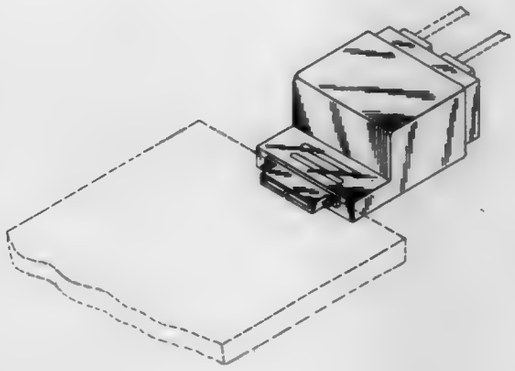
PERIPHERAL CONNECTOR

Greg Johnson, New Brighton, and David A. Weinzierl, Mounds View, both of Minn., assignors to Multi-Tech Systems, Inc., Mounds View, Minn.

Filed Oct. 13, 1994, Ser. No. 30,278

Term of patent 14 years

U.S. Cl. D13—146



364,378

ELECTRICAL CONNECTOR

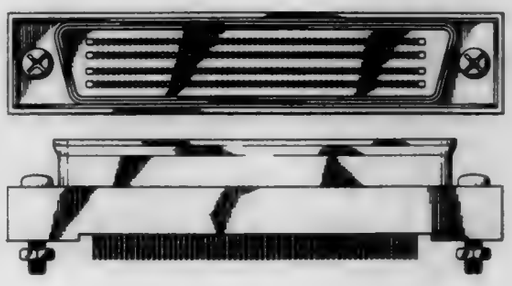
Masaru Nakamura, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1995, Ser. No. 35,585

Claims priority, application Japan, Sep. 21, 1994, 6-28409

Term of patent 14 years

U.S. Cl. D13—147



364,379

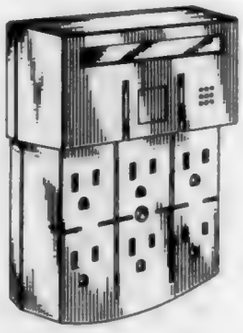
SURGE PROTECTOR

Lonnie C. Pogue, and William J. McKnight, both of San Diego, Calif., assignors to Proxima Corporation, San Diego, Calif.

Filed Jan. 21, 1994, Ser. No. 17,686

Term of patent 14 years

U.S. Cl. D13—160



364,380

SENSOR

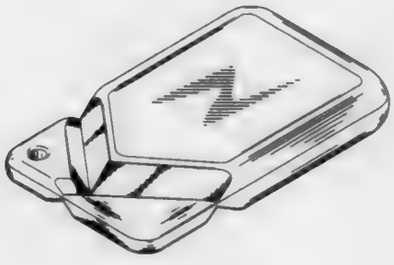
Peter R. Cunningham, 32-34 Sir William Drive, East Tamaki, Auckland, New Zealand

Filed Nov. 5, 1993, Ser. No. 14,977

Claims priority, application New Zealand, May 5, 1993, 25191

Term of patent 14 years

U.S. Cl. D13—162



364,381

TAB FOR A SENSOR

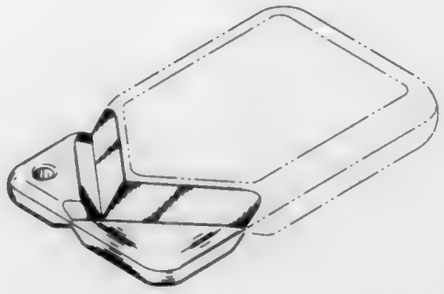
Peter R. Cunningham, 32-34 Sir William Drive,, East Tamaki, Auckland, New Zealand

Filed Nov. 5, 1993, Ser. No. 14,978

Claims priority, application New Zealand, May 5, 1993, 25192

Term of patent 14 years

U.S. Cl. D13—162



364,382

PROCESS CONTROL PANEL

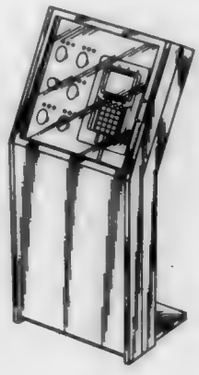
Kazuharu Yamamoto, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 15, 1994, Ser. No. 31,238

Claims priority, application Japan, Jun. 2, 1994, 6-16120

Term of patent 14 years

U.S. Cl. D13—163

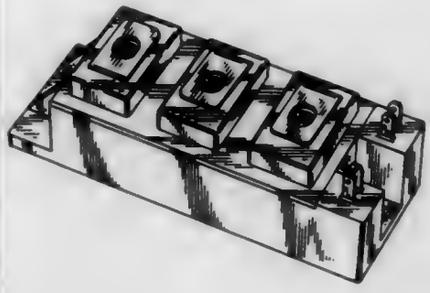


364,383

SEMI-CONDUCTOR ELEMENT WITH TERMINAL CASING

Toshifusa Yamada; Hiroshi Hikita; Takao Nagasawa, and Tomio Shimizu, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Sep. 16, 1994, Ser. No. 28,484
Claims priority, application Japan, May 11, 1994, 6-13277
Term of patent 14 years
U.S. Cl. D13—182

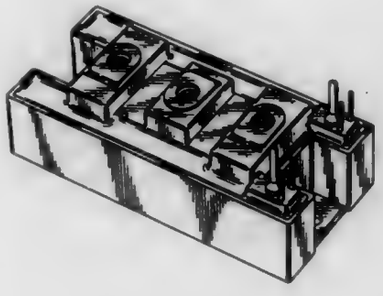


364,384

SEMI-CONDUCTOR ELEMENT WITH TERMINAL CASING

Tomio Shimizu; Akira Nakahira; Shinichi Kobayashi, and Katsumi Yamada, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Sep. 16, 1994, Ser. No. 28,486
Claims priority, application Japan, May 23, 1994, 6-14733
Term of patent 14 years
U.S. Cl. D13—182

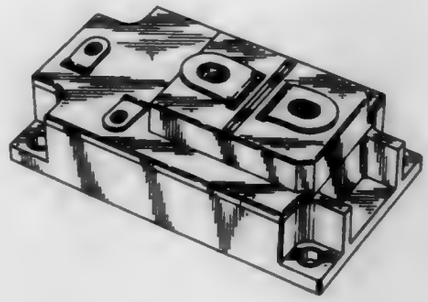


364,385

SEMI-CONDUCTOR ELEMENT WITH TERMINAL CASING

Tomio Shimizu; Akira Nakahira; Rikihiro Maruyama; Toshifusa Yamada, and Takao Nagasawa, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Sep. 16, 1994, Ser. No. 28,487
Claims priority, application Japan, May 11, 1994, 6-13276
Term of patent 14 years
U.S. Cl. D13—182

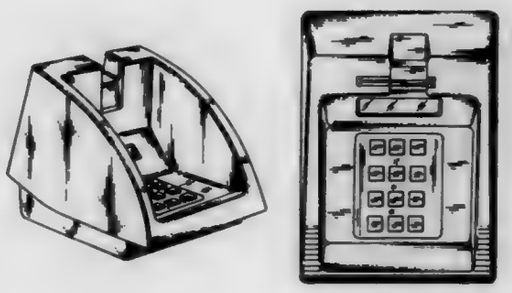


364,386

CUSTOMER IDENTIFICATION TERMINAL

Larry Bramlett, Lake Forest; Charles T. Inatomi, Los Angeles; Robert R. Propp, Corona Del Mar, and Warren Tan, Thousand Oaks, all of Calif., assignors to Transaction Technology, Inc., Santa Monica, Calif.

Filed Jul. 21, 1994, Ser. No. 26,162
Term of patent 14 years
U.S. Cl. D14—105



364,387

PORTABLE PERSONAL COMPUTER

Taneaki Chiba; Mari Goudo; Akira Sakai, and Kenichirou Matsushita, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 28,155

Claims priority, application Japan, Mar. 29, 1994, 6-8568

Term of patent 14 years

U.S. Cl. D14—106

364,388

IMAGE INPUT DEVICE

Kazuhiko Miyahara, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1994, Ser. No. 27,504

Claims priority, application Japan, Mar. 2, 1994, 6-5330

Term of patent 14 years

U.S. Cl. D14—107

364,389

IMAGE EDITING DEVICE

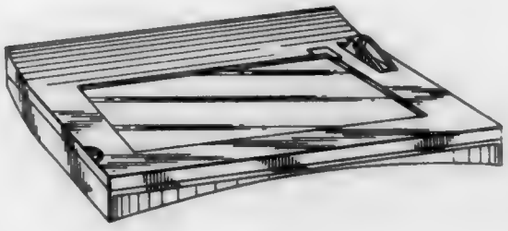
Hisakazu Shimizu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1994, Ser. No. 25,243

Claims priority, application Japan, Dec. 29, 1993, 5-40037

Term of patent 14 years

U.S. Cl. D14—100



364,390

HAND HELD TRANSLATOR

Paul J. Shreeve, and Marjorie Shreeve, both of 290 12th Ave., Holbrook, Ariz. 86025

Filed Jul. 27, 1994, Ser. No. 26,762

Term of patent 14 years

U.S. Cl. D14—100

364,391

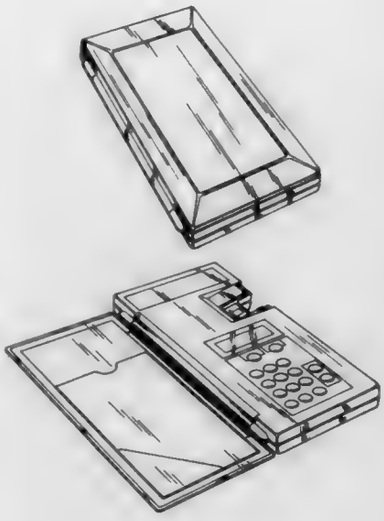
PORTABLE TRANSACTION TERMINAL

Brian R. Drugge, Los Gatos, Calif., assignor to Verifone Inc., Redwood City, Calif.

Filed Oct. 31, 1994, Ser. No. 30,476

Term of patent 14 years

U.S. Cl. D14—100



364,392

MONITOR FOR COMPUTERS

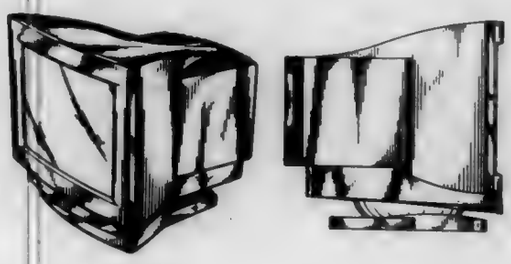
Jochen Backs, San Francisco, Calif., assignor to Samsung Electronics Co. Ltd, Kung-Do, Rep. of Korea

Filed Jul. 7, 1994, Ser. No. 25,629

Claims priority, application Rep. of Korea, Jan. 7, 1994, 1994-240

Term of patent 14 years

U.S. Cl. D14—113



364,393

MONITOR FOR COMPUTERS

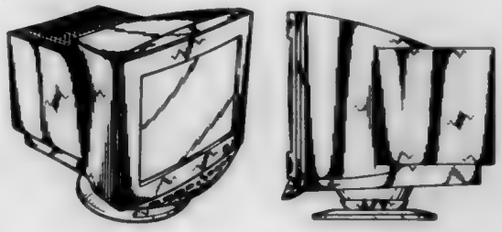
Jochen Backs, San Francisco, Calif., assignor to Samsung Electronics Co. Ltd., Kung-Do, Rep. of Korea

Filed Jul. 7, 1994, Ser. No. 25,632

Claims priority, application Rep. of Korea, Jan. 7, 1994, 1994-239

Term of patent 14 years

U.S. Cl. D14—113



364,394

MONITOR FOR COMPUTERS

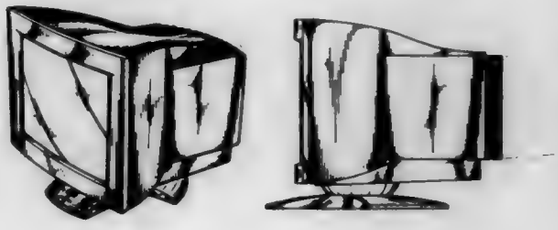
Jochen Backs, San Francisco, Calif., assignor to Samsung Electronics Co. Ltd., Kung-Do, Rep. of Korea

Filed Jul. 7, 1994, Ser. No. 25,644

Claims priority, application Rep. of Korea, Jan. 7, 1994, 1994-241

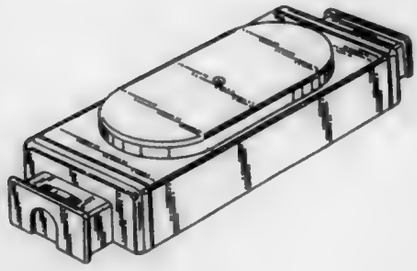
Term of patent 14 years

U.S. Cl. D14—113

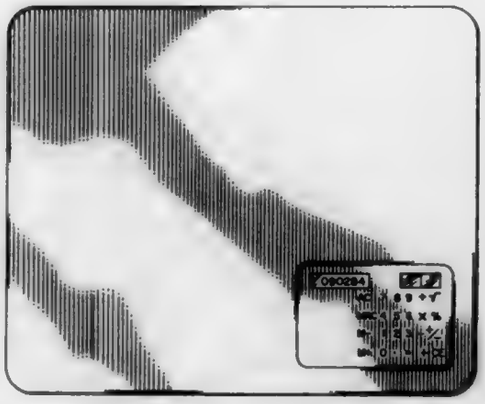


364,395
DISPLAY FACE OF A LIQUID CRYSTAL DISPLAY MODULE
Shinichi Uratani, Osaka, and Junichi Sasaki, Nara, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Dec. 2, 1994, Ser. No. 32,118
Claims priority, application Japan, Jun. 30, 1994, 6-19506
Term of patent 14 years
U.S. Cl. D14—113

364,396
DATA MODULE FOR MODULAR WIRING SYSTEM
Rado Starec, Tullamarine; Antonino Schiavello, Templestowe, and James G. Cowhey, Bulleen, all of, Australia, assignors to Light On Pty Ltd, Tullamarine, Australia
Filed Feb. 18, 1994, Ser. No. 18,958
Claims priority, application Australia, Aug. 19, 1993, 2555/93
Term of patent 14 years
U.S. Cl. D14—114



364,397
COMBINED COMPUTER MOUSE PAD AND CALCULATOR
Mark A. Bedol, P.O. Box 2847, Rancho Cucamonga, Calif. 91729-2847
Filed Mar. 18, 1994, Ser. No. 20,090
Term of patent 14 years
U.S. Cl. D14—114



364,398
ADAPTER SLEEVE FOR A PCMCIA DEVICE
Lawrence Lam, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.
Filed Aug. 19, 1994, Ser. No. 27,337
Term of patent 14 years
U.S. Cl. D14—114

364,399

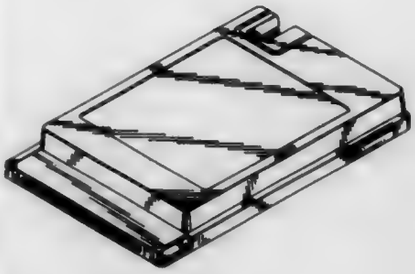
MODEM CONNECTOR

Jacky Long, Taipei, Taiwan, Prov. of China, assignor to Quanta Computer Inc., Taipei, Taiwan, Prov. of China

Filed Sep. 7, 1994, Ser. No. 28,096

Term of patent 14 years

U.S. Cl. D14—114



364,400

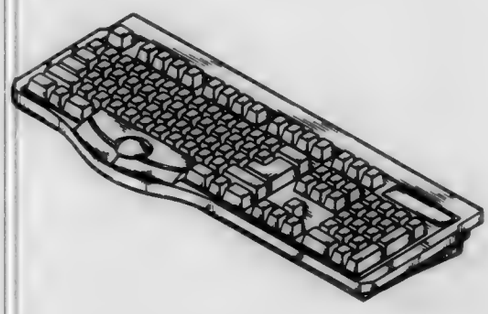
KEYBOARD

Wen-Cheng Chen, Taipei, Taiwan, Prov. of China, assignor to Focus Electronic Co., Ltd., Taipei, Taiwan, Prov. of China

Filed Oct. 3, 1994, Ser. No. 28,615

Term of patent 14 years

U.S. Cl. D14—115



364,401

VIDEOCASSETTE

John A. Bailey, Woodbury; Glenn A. Bloomer, Maplewood; Gregory H. Johnson, Oakdale, all of Minn.; Mark J. Cleako, Hilliard, and Donald J. Staufenberg, Dublin, both of Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1994, Ser. No. 20,899

Term of patent 14 years

U.S. Cl. D14—121

364,402

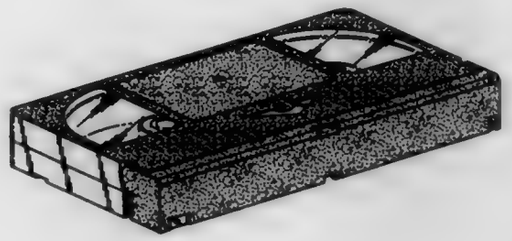
VIDEOCASSETTE

John A. Bailey, Woodbury; Glenn A. Bloomer, Maplewood; Gregory H. Johnson, Oakdale, all of Minn.; Mark J. Cleako, Hilliard, and Donald J. Staufenberg, Dublin, both of Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1994, Ser. No. 20,913

Term of patent 14 years

U.S. Cl. D14—121



364,403

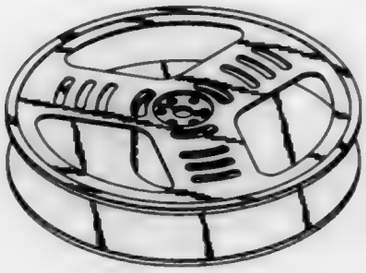
TAPE REEL FOR A VIDEOCASSETTE

John A. Bailey, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1994, Ser. No. 20,919

Term of patent 14 years

U.S. Cl. D14—122



364,404

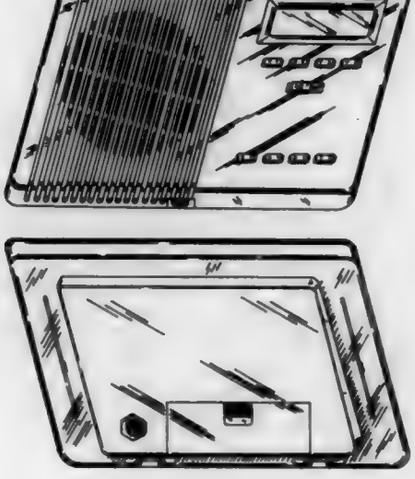
SOUND CONDITIONER

David A. Theisen, Hampstead, N.C., assignor to Marpac Corporation, Wilmington, N.C.

Filed Aug. 8, 1994, Ser. No. 26,872

Term of patent 14 years

U.S. Cl. D14—160



364,405

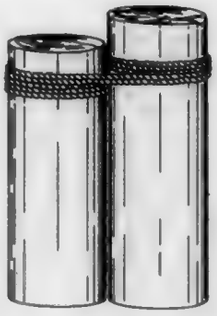
AUDIO SPEAKER

Barry S. Goldfarb, Deland, and Theron Skees, Longwood, both of Fla., assignors to BSG Laboratories, Inc., Deland, Fla.

Filed Aug. 1, 1994, Ser. No. 26,541

Term of patent 14 years

U.S. Cl. D14—207



364,406

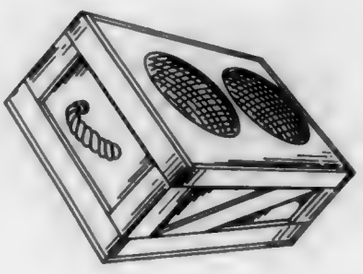
AUDIO SPEAKER

Barry S. Goldfarb, Deland, and Theron Skees, Longwood, both of Fla., assignors to BSG Laboratories, Inc., Deland, Fla.

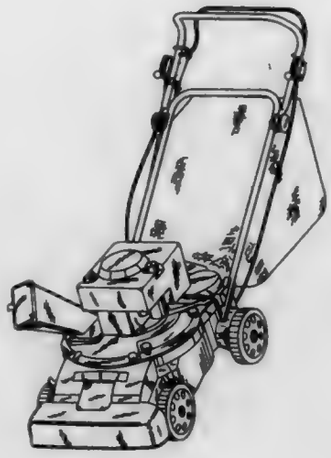
Filed Aug. 1, 1994, Ser. No. 26,603

Term of patent 14 years

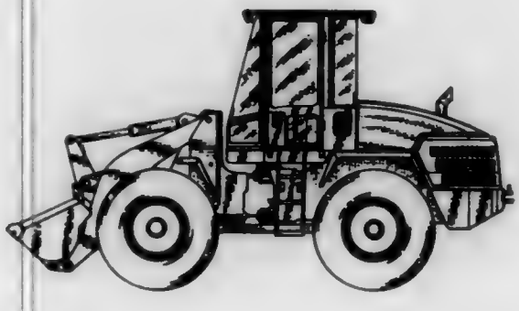
U.S. Cl. D14—215



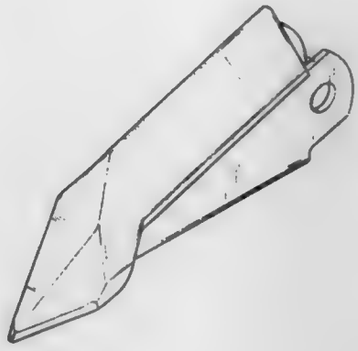
364,407
CHIPPER/SHREDDER VACUUM APPARATUS
Alfred J. Bold, Waterford; Kevin J. Connolly, Ballston Lake; Steven E. Kodesch, Schenectady; Irving Lobdell, Averill Park; Bruce E. Roberts, Waterford, and Carmen M. Satalino, Johnsonville, all of N.Y., assignors to Garden Way Incorporated, Troy, N.Y.
Filed Jun. 1, 1995, Ser. No. 23,820
Term of patent 14 years
U.S. Cl. D15—10



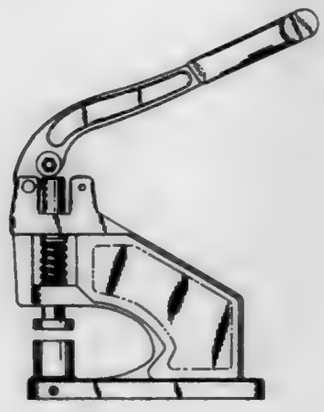
364,408
WHEEL LOADER VEHICLE
Gary C. Bryant, Chillicothe, Ill.; Alan A. Davidovich, Garner, N.C.; Thomas L. Howard, Garner, N.C.; David G. Kupper, Knightdale, N.C.; Sydney K. Scott, Wilson, N.C.; David G. Surridge, Knightdale, N.C., and Mark W. Vannette, Fuquay-Varina, N.C., assignors to Caterpillar Inc., Peoria, Ill.
Filed Apr. 8, 1994, Ser. No. 21,104
Term of patent 14 years
U.S. Cl. D15—25



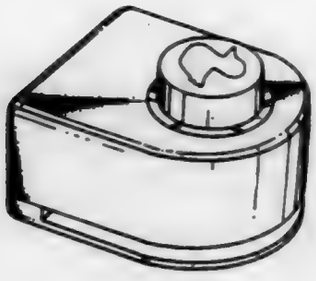
364,409
EARTHWORKING TOOL POINT
Richard L. Peterson, LeSueur; James A. Johnson, Cologne, and Vincent J. Tomlonovic, North Mankato, all of Minn., assignors to Hinlker Company, Mankato, Minn.
Filed Oct. 26, 1994, Ser. No. 30,303
Term of patent 14 years
U.S. Cl. D15—29



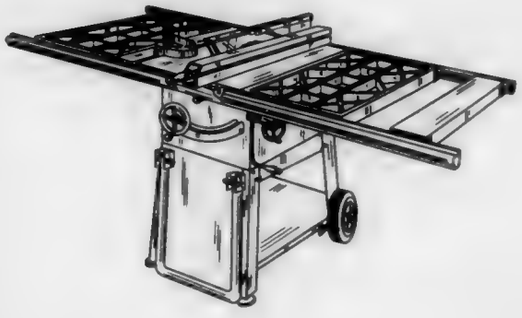
364,410
FASTENER APPLYING PRESS
Frederick G. Schriever, Grosse Pointe Shores, Mich., assignor to Snap Fast Industries, Detroit, Mich.
Continuation-in-part of Ser. No. 839,449, Feb. 21, 1992, abandoned, which is a continuation-in-part of Ser. No. 792,082, Nov. 8, 1991, abandoned. This application Aug. 9, 1993, Ser. No. 11,536
Term of patent 14 years
U.S. Cl. D15—123



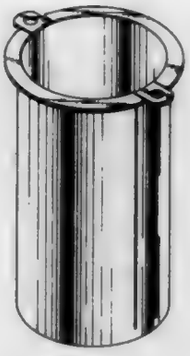
364,411
TOY PUNCH
Shun-Yi Wang, 11-2 No. 7, Section 3, Shin Sheng North Road, Taipei, Taiwan, Prov. of China
Filed Dec. 19, 1994, Ser. No. 32,408
Term of patent 14 years
U.S. Cl. D15—128



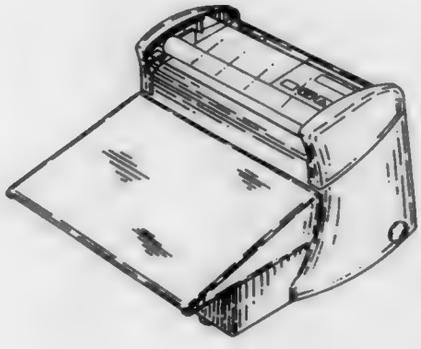
364,412
TABLE SAW
James E. Hilliard, Markham; William A. Lane, Brooklin; John W. Bartlett, Pickering; John W. LaBallister, Markham, all of, Canada, and Frederick B. Jedlicka, Jerseyville, Ill., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Jun. 16, 1994, Ser. No. 24,567
Term of patent 14 years
U.S. Cl. D15—133



364,413
CONCRETE TEST PIECE FORMING MOLD
Ryohei Ishida, Tokyo; Eiji Ueno, Utsunomiya, and Hitoshi Terashima, Yokohama, all of, Japan, assignors to NIFCO Inc., Yokohama, Japan
Filed Jan. 4, 1995, Ser. No. 33,078
Claims priority, application Japan, Jul. 6, 1994, 6-19841
Term of patent 14 years
U.S. Cl. D15—136



364,414
SEALING DEVICE FOR PACKING
Yasuo Yashimoto, Toyonaka, Japan, assignor to Fuji Impulse Co., Ltd., Japan
Filed Dec. 22, 1994, Ser. No. 32,611
Claims priority, application Japan, Aug. 5, 1994, 6-23889
Term of patent 14 years
U.S. Cl. D15—145



364,415

SEALING MACHINE FOR PACKAGING

Hsin F. Hsieh, No. 110, Ho Hsien Road, Tin Lee Village, Hsien Shi Hsiang, Changhua Hsien, Taiwan, Prov. of China

Filed Jul. 29, 1994, Ser. No. 26,515

Term of patent 14 years

U.S. Cl. D15—146

364,416

VIDEO PROJECTOR

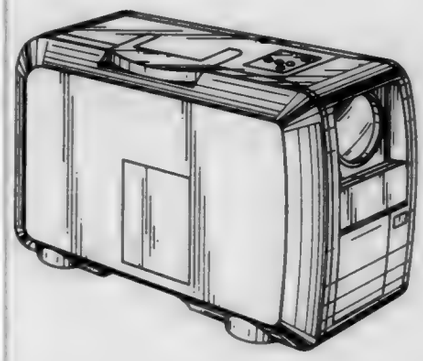
Taisuke Saeki; Harumi Sakamoto, and Kiyomi Usui, all of Tochigi, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 6, 1995, Ser. No. 35,761

Claims priority, application Japan, Sep. 6, 1994, 6-27109

Term of patent 14 years

U.S. Cl. D16—231



364,417

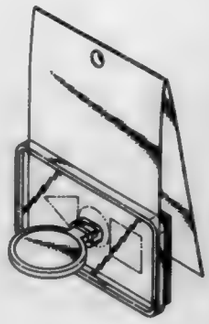
COMBINED RUBBER STAMP AND DISPLAY CARD

Jeffrey M. Winston, 658 W. Shore Dr., Anacortes, Wash. 98221

Filed Jun. 3, 1994, Ser. No. 23,937

Term of patent 14 years

U.S. Cl. D18—15



364,418

TONER CARTRIDGE

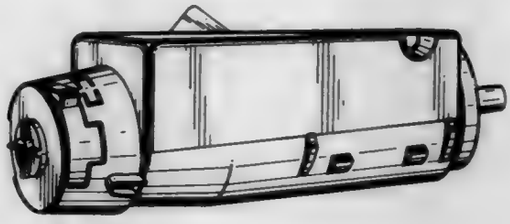
Hideaki Hagiwara, Nara, and Takashi Shietani, Osaka, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 8, 1994, Ser. No. 32,139

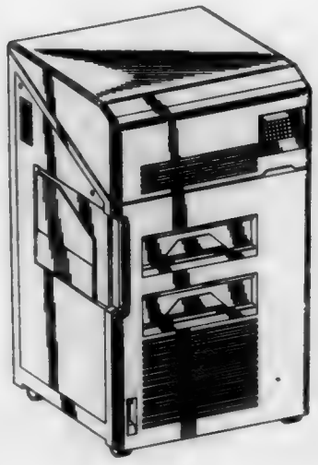
Claims priority, application Japan, Jun. 8, 1994, 6-16956

Term of patent 14 years

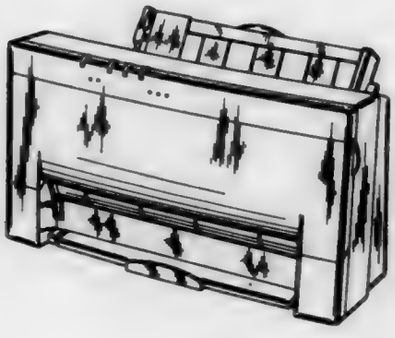
U.S. Cl. D18—43



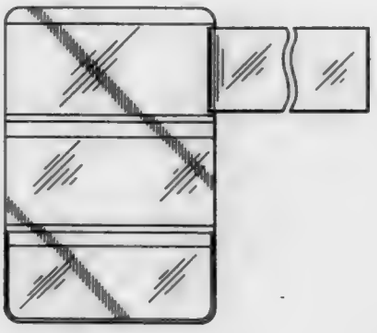
364,419
THERMAL LASER PRINTER
John B. Morse, Boston; Paul F. Neely, Quincy, and George D. Whiteside, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed Oct. 21, 1994, Ser. No. 30,166
Term of patent 14 years
U.S. Cl. D18—53



364,420
PRINTER FOR ELECTRONIC COMPUTER
Shosaku Kawashima, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 28, 1994, Ser. No. 20,555
Claims priority, application Japan, Sep. 29, 1993, 5-29392
Term of patent 14 years
U.S. Cl. D18—54

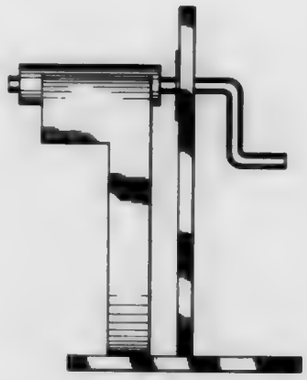


364,421
COMBINED CHECKBOOK AND INFORMATION REGISTER
Blaine Harris, Bountiful, Utah, assignor to Chequemate International, Inc., Salt Lake City, Utah
Continuation-in-part of Ser. No. 939,643, Sep. 8, 1992, Pat. No. Des. 353,835. This application Feb. 24, 1994, Ser. No. 19,136
Term of patent 14 years
U.S. Cl. D19—26



364,422
PLURAL-NIBBED WRITING INSTRUMENT
James D. Diresta, Woodmere, N.Y., assignor to Rapid Mounting & Finishing Co., Chicago, Ill.
Filed Nov. 23, 1994, Ser. No. 31,369
Term of patent 14 years
U.S. Cl. D19—36

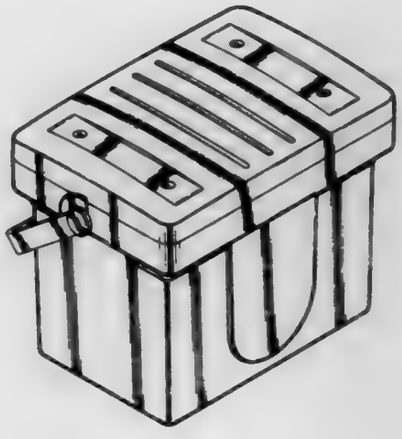
364,423
PEN
David A. Edgerley, and Ming K. Leung, both of London, England, assignors to The Gillette Company, Boston, Mass.
Filed Apr. 29, 1994, Ser. No. 22,108
Term of patent 14 years
U.S. Cl. D19—51



364,424
WRITING INSTRUMENT
Kazuhisa Shimizu, Tokyo, Japan, assignor to Pentel Kabushiki Kaisha, Japan
Filed Dec. 14, 1994, Ser. No. 32,209
Claims priority, application Japan, Jun. 14, 1994, 6-17471
Term of patent 14 years
U.S. Cl. D19—51

364,425
EDUCATIONAL DISPLAY UNIT
Allen B. Mage, P.O. Box 42801, Los Angeles, Calif. 90042
Filed May 15, 1991, Ser. No. 701,957
Term of patent 14 years
U.S. Cl. D19—59

364,426
FILE BOX
Tom Bucaccio, Grant, Fla., assignor to Rubbermaid Office Products Inc., Maryville, Tenn.
Filed Mar. 20, 1995, Ser. No. 36,378
Term of patent 14 years
U.S. Cl. D19—75

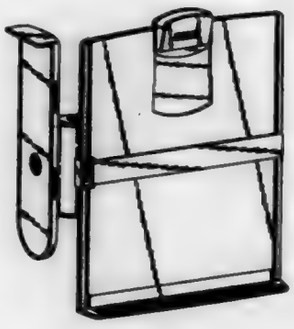


364,427

ADJUSTABLE PAPER HOLDER

Kenneth J. Kirchhoff, Gem Lake, Minn., and Lawrence J. Fenske, Oregon Township Dane County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 18, 1994, Ser. No. 29,884
Term of patent 14 years
U.S. Cl. D19—88

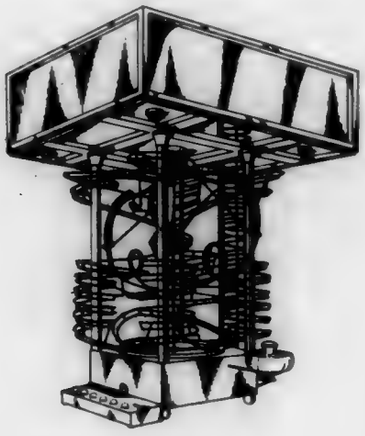


364,428

GAMING MACHINE

Erich Caron, 623 Dorsey Rd., Bel Air, Md. 21014

Filed Dec. 27, 1994, Ser. No. 32,720
Term of patent 14 years
U.S. Cl. D21—12



364,429

SPORTS TRADING CARD SORTER

Laren F. Crawford, 3318 Viewpoint Dr., Medford, Oreg. 97504

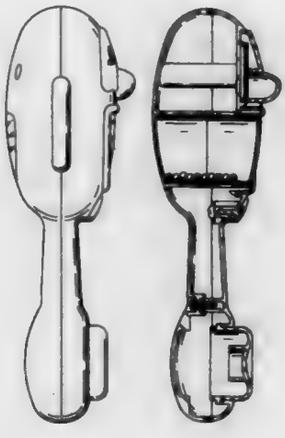
Filed Feb. 8, 1994, Ser. No. 18,492
Term of patent 14 years
U.S. Cl. D21—54

364,430

TOY MARACAS

Moriya Kino, Yokohama, Japan, assignor to Royal Co., Ltd., Japan

Filed Dec. 22, 1994, Ser. No. 32,659
Term of patent 14 years
U.S. Cl. D21—65

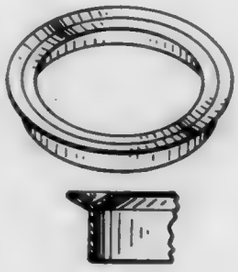


364,431

RING TOY

Pamela Diecidue, 74 Georgetown Pl., Hyde Park, Mass. 02136, and Elizabeth Bonanno, 6 Oakdale Rd., Canton, Mass. 02021

Filed Mar. 25, 1994, Ser. No. 20,459
Term of patent 14 years
U.S. Cl. D21—82



364,432

RACQUETBALL RACQUET

John B. Cudlip, 3651 Haven Ave., Menlo Park, Calif. 95025

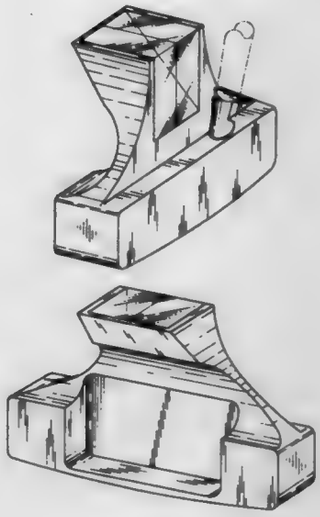
Filed Jul. 22, 1994, Ser. No. 26,252
Term of patent 14 years
U.S. Cl. D21—212

364,433

GOLF PUTTER HEAD

Edward Chiuminatta, 16405 Everett, and Alan R. Chiuminatta, 16862 Mariposa Ave., both of Riverside, Calif. 92504

Filed Oct. 26, 1993, Ser. No. 14,586
Term of patent 14 years
U.S. Cl. D21—219

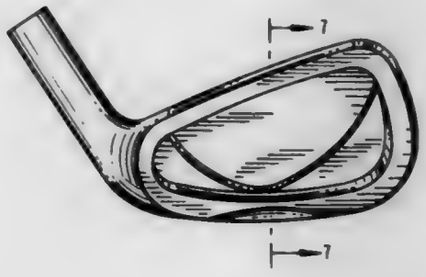


364,434

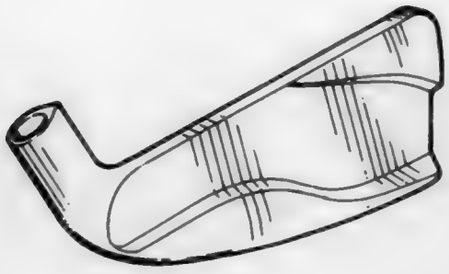
GOLF CLUB HEAD

Ronnie F. McGraw, Glen Allen, and Donald S. Rahrig, Richmond, both of Va., assignors to Ben Hogan Company, Richmond, Va.

Filed Sep. 20, 1994, Ser. No. 28,663
Term of patent 14 years
U.S. Cl. D21—220



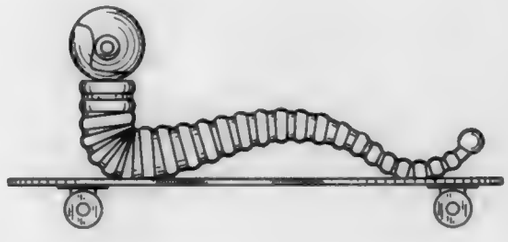
364,435
GOLF CLUB HEAD
Donald C. Wood, Carlsbad, Calif., assignor to Plop Golf Company, Carlsbad, Calif.
Filed Oct. 14, 1994, Ser. No. 29,730
Term of patent 14 years
U.S. Cl. D21—220



364,436
ADJUSTABLE LENGTH SHAFT FOR A GOLF PUTTER
Robert K. Thomas, 69 Rockland St., Malone, N.Y. 12953
Filed May 13, 1994, Ser. No. 23,039
Term of patent 14 years
U.S. Cl. D21—221

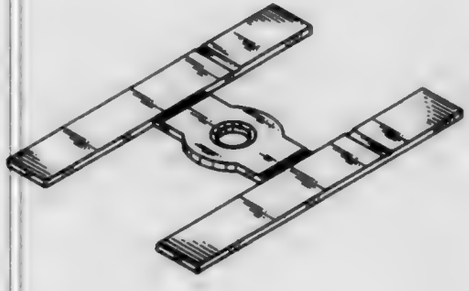
364,437
TOE STOP FOR IN-LINE SKATE
Michael K. Pratt, Ware, Mass., assignor to Seneca Sports, Inc., Milford, Mass.
Filed Jan. 10, 1994, Ser. No. 17,316
Term of patent 14 years
U.S. Cl. D21—226

364,438
SIMULATIVE TOY SKATEBOARD
Dorothy M. Carlisle, and Kenneth D. Cason, both of 7311 Chambers Creek Rd. W, Sunrise Ter. Space 1, Tacoma, Wash. 98467
Filed Oct. 4, 1993, Ser. No. 13,814
Term of patent 14 years
U.S. Cl. D21—227

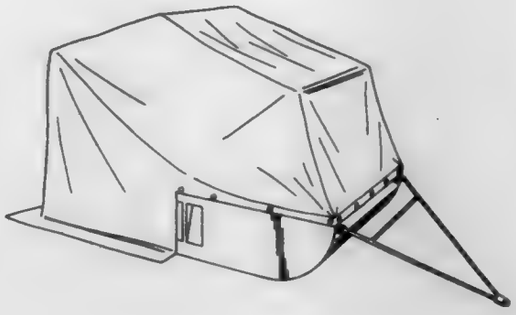


364,439
GOLFER'S TOOL
Dianna Ragusin, 21420 Norman Shores Dr., Davidson, N.C. 28036
Filed Nov. 23, 1994, Ser. No. 31,342
Term of patent 14 years
U.S. Cl. D21—234

364,440
GOLD PUTTING AID
Harry Balestrieri, Plantation, Fla., assignor to M. R. Carretta Co., Inc., Allamuchy, N.J.
Filed Dec. 23, 1994, Ser. No. 33,218
Term of patent 14 years
U.S. Cl. D21—234

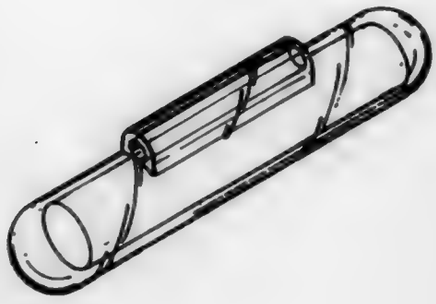


364,441
ICE FISHING TENT
Merrill A. Milden, 1-930-84 St., Edmonton, Alberta, Canada
Filed Aug. 15, 1994, Ser. No. 27,164
Claims priority, application Canada, Feb. 24, 1994, 1994-0377
Term of patent 14 years
U.S. Cl. D21—253



364,442
GAS TUBE FOR SEMI-AUTOMATIC FIREARM
Phillip C. Martel, 43551 Applewood, Canton, Mich. 48188, assignor to Phillip C. Martel, Canton, Mich.
Filed Jan. 20, 1995, Ser. No. 33,837
Term of patent 14 years
U.S. Cl. D22—108

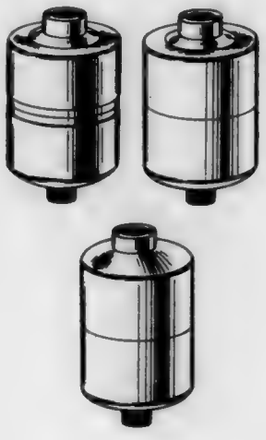
364,443
FISHING RATTLER
Larry A. Rasmusson, Andover, Minn., assignor to Oxboro Medical International, Inc., Ham Lake, Minn.
Filed Jun. 3, 1993, Ser. No. 9,095
Term of patent 14 years
U.S. Cl. D22—126



364,444
FISHING LURE
Stephen DeCosta, 626 Grinnell St., Fall River, Mass. 02721
Filed Apr. 8, 1994, Ser. No. 21,108
Term of patent 14 years
U.S. Cl. D22—129

364,445
FLY LINE LOOP WITH LINE WEIGHT INDICATOR
Rudi Heger, Hauptstr. 4, 83 309, Siegsdorf, Germany
Filed Sep. 20, 1993, Ser. No. 13,135
Term of patent 14 years
U.S. Cl. D22—134

364,446
SHOWER FILTER HOUSING
Frederick A. Farley, c/o Sprite Industries, 2512-A E. Fener Ave., Fullerton, Calif. 92631
Continuation-in-part of Ser. No. 796,433, Nov. 21, 1991, Pat. No. 5,300,224. This application Jun. 29, 1993, Ser. No. 10,863
Term of patent 14 years
U.S. Cl. D23—209



364,447

SPRAYER HANDLE

King-Yuan Wang, Changhua Hsien, Taiwan, Prov. of China, assignor to Yuan Mei Corp., Changhua Hsien, Taiwan, Prov. of China

Filed Nov. 22, 1994, Ser. No. 31,258

Term of patent 14 years

U.S. Cl. D23—223

364,448

FAUCET

Wen-Mu Wang, No. 32, Lane 266, Fu Te I Rd., Hsi Tze Chen, Taipei Hsien, Taiwan, Prov. of China

Filed Jan. 13, 1995, Ser. No. 33,526

Term of patent 14 years

U.S. Cl. D23—238

364,449

WELDING OUTLET

James P. Ellenberger, 17107 Rustington Dr., Spring, Tex. 77379

Filed Sep. 28, 1994, Ser. No. 29,061

Term of patent 14 years

U.S. Cl. D23—262

364,450

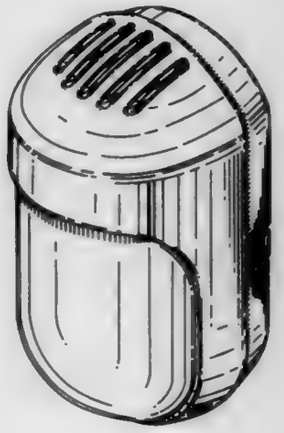
WALL MOUNTED DEODORANT DISPENSER

Thomas Kearnes, Richfield, Ohio, assignor to The Tranzonic Companies, Pepper Pike, Ohio

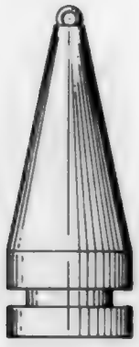
Filed Oct. 17, 1994, Ser. No. 29,784

Term of patent 14 years

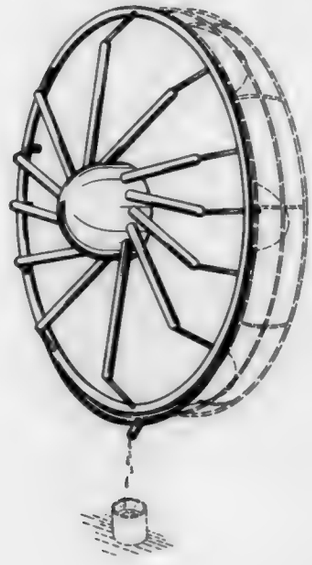
U.S. Cl. D23—366



364,451
AIR FRESHNER
Warner Rosenschein, New Hamberg, N.Y., assignor to Cedalux, Inc., Millbrook, N.Y.
Filed May 11, 1994, Ser. No. 22,715
Term of patent 14 years
U.S. Cl. D23—368



364,452
AIR COOLING UNIT TO BE MOUNTED ON THE FRONT OF AN ELECTRIC FAN
James R. Wiggins, P.O. Box 894, Bellmawr, N.J. 08099
Filed May 16, 1994, Ser. No. 22,979
Term of patent 14 years
U.S. Cl. D23—386



364,453
SOFTGEL CAPSULE
Gregory A. Schurig, Clearwater, and David G. Williams, Palm Harbor, both of Fla., assignors to R. P. Scherer Corporation, Troy, Mich.
Filed Jun. 30, 1994, Ser. No. 25,416
Term of patent 14 years
U.S. Cl. D24—104

364,454
SOFTGEL CAPSULE
Gregory A. Schurig, Clearwater, Fla., assignor to R. P. Scherer Corporation, Troy, Mich.
Filed Sep. 19, 1994, Ser. No. 28,643
Term of patent 14 years
U.S. Cl. D24—104

364,455

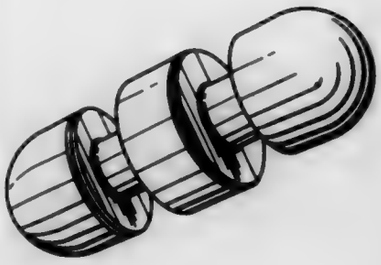
EAR PLUG

W. Barry Krause, Spotsylvania, Va., assignor to Ward Barry Krause, Spotsylvania, Va.

Filed Jul. 21, 1994, Ser. No. 26,202

Term of patent 14 years

U.S. Cl. D24—106



364,456

ASPIRATOR TIP

Albert Solnit, 250 N. Robertson Blvd., Suite 401, Beverly Hills, Calif. 90211, and Robert Goldstein, 2222 Avenue of the Stars, Suite 805, Los Angeles, Calif. 90067

Filed May 20, 1994, Ser. No. 23,229

Term of patent 14 years

U.S. Cl. D24—112

364,457

INTUBATION END CAP

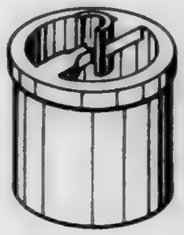
Douglas R. Mongeon, Orange, Calif., assignor to Coast Medical, Inc., Orange, Calif.

Filed Jul. 30, 1993, Ser. No. 11,246

The portion of the term of this patent subsequent to Dec. 7, 2007, has been disclaimed.

Term of patent 14 years

U.S. Cl. D24—127



364,458

SPECIMEN CUP HOLDER

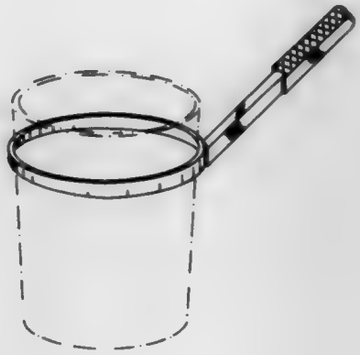
Timothy B. Jones, 2517 E. Sweetbriar, Edmond, Okla. 73034; Robert D. Jones, and Lori D. Jones, both of 2233 Hickory Dr., Ardmore, Okla. 73401

Filed Dec. 17, 1993, Ser. No. 16,716

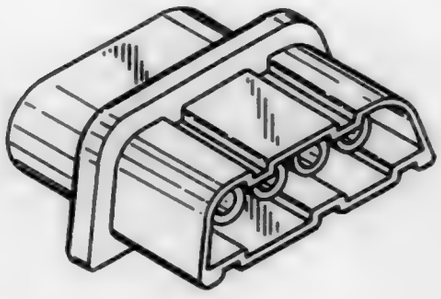
The portion of the term of this patent subsequent to Apr. 27, 2007, has been disclaimed.

Term of patent 14 years

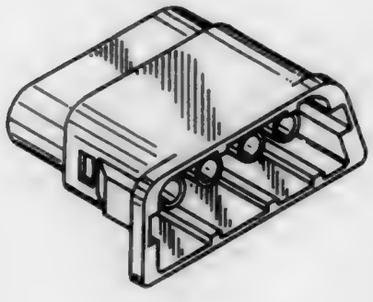
U.S. Cl. D24—128



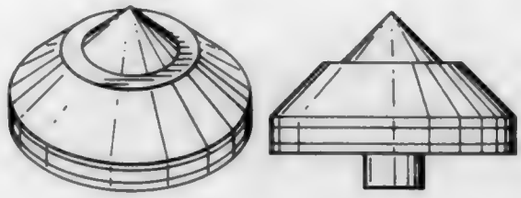
364,459
CONNECTOR FOR APPLYING COMPRESSIVE PRESSURE TO THE LEG
John F. Dye, Bridgewater, Mass., assignor to The Kendall Company, Mansfield, Mass.
Filed Apr. 26, 1994, Ser. No. 21,919
The portion of the term of this patent subsequent to Apr. 25, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—129



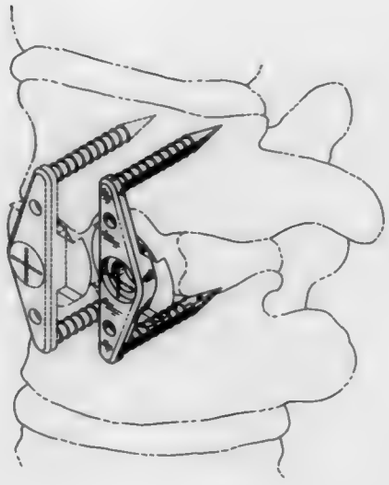
364,460
CONNECTOR FOR APPLYING COMPRESSIVE PRESSURE TO THE LEG
John F. Dye, Bridgewater, Mass., assignor to The Kendall Company, Mansfield, Mass.
Filed Apr. 26, 1994, Ser. No. 21,924
The portion of the term of this patent subsequent to Nov. 7, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—129



364,461
ASPIRATING PLUNGER FOR POWER INJECTOR CARTRIDGES
Richard T. Liebert, Ballston Spa, N.Y., and Neil H. Brown, Royersford, Pa., assignors to Sterling Winthrop, Inc., New York, N.Y.
Filed Jul. 21, 1993, Ser. No. 12,603
Term of patent 14 years
U.S. Cl. D24—130



364,462
SPINAL FIXATION STAPLE
Gary K. Michelson, 438 Sherman Canal, Venice, Calif. 90291
Filed Mar. 28, 1994, Ser. No. 20,624
Term of patent 14 years
U.S. Cl. D24—145



364,463

ORTHOPEDIC SURGICAL INSTRUMENT

James F. Pitzen, Maplewood; Jeffrey D. Smith, Marine on St. Croix, both of Minn.; Charles E. Alexson, River Falls, and Lawrence Fenske, Madison, both of Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 10, 1994, Ser. No. 24,241

Term of patent 14 years

U.S. Cl. D24—146

364,464

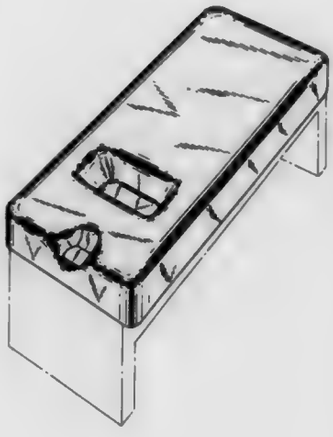
COMBINED MASSAGE AND TREATMENT CUSHION

Salvatore Gigante, Spring Valley, N.Y., and Olympia Gigante, Old Tappan, N.J.

Filed May 10, 1994, Ser. No. 22,681

Term of patent 14 years

U.S. Cl. D24—183



364,465

DEVICE FOR ACCUMULATION, AMPLIFICATION AND LOCAL DIRECTION OF POSITIVE COSMIC ENERGY

Branislav Stojanovic, Dragoslava Stojanovica 6, 21000 Novi Sad, Yugoslavia

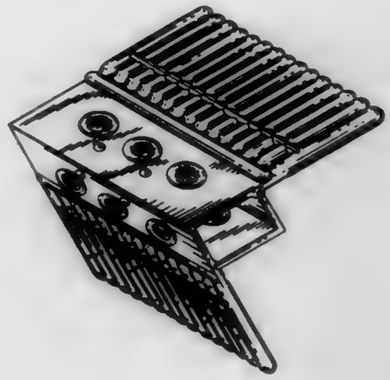
Continuation-in-part of Ser. No. 710,653, Jun. 5, 1991, abandoned. This application Jul. 28, 1993, Ser. No. 11,179

Claims priority, application Yugoslavia, Jun. 8, 1990, 1128/90

The portion of the term of this patent subsequent to Jan. 21, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D24—209



364,466

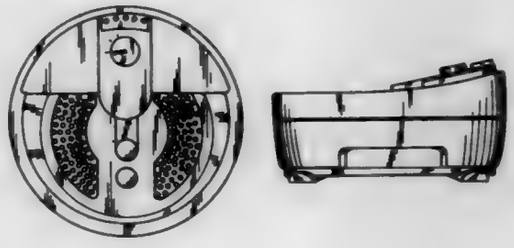
FOOTBATH TUB

Jürgen Assmann, Essen; Dietmar Walta, and Andre Kunzendorf, both of Velbert, all of, Germany, assignors to WIK Elektro-Hausgeräte Vertriebs GmbH & Co. Produktions, Essen, Germany

Filed Oct. 28, 1994, Ser. No. 30,378

Term of patent 14 years

U.S. Cl. D24—213



364,467

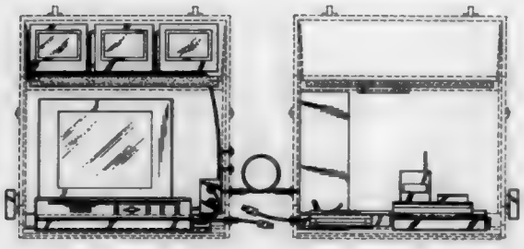
PORTABLE LABORATORY ANALYZER

Reed B. Johnson, Cumming, Ga., assignor to Usability Systems, Inc., Alpharetta, Ga.

Filed Jul. 18, 1994, Ser. No. 26,061

Term of patent 14 years

U.S. Cl. D24—231



364,468

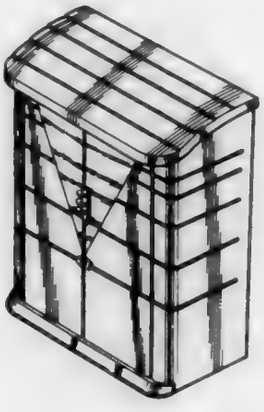
UTILITY SHED

Wade A. F. Maple, 3763 Landmark Dr., Sherrills Ford, N.C. 28673, assignor to Rubbermaid Specialty Products Inc., Wooster, Ohio

Filed Apr. 19, 1994, Ser. No. 21,495

Term of patent 14 years

U.S. Cl. D25—16



364,469

SKYLIGHT

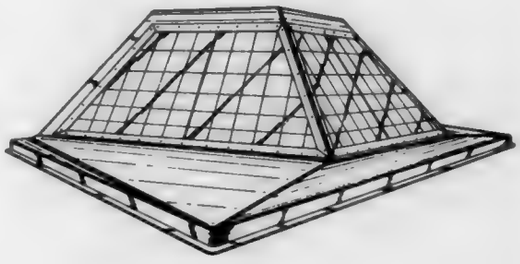
David A. Eljadi, St. Paul; Loren Abraham, White Bear Lake; Dawn DeKeyser, Minneapolis, and Thomas A. Hansen, Stillwater, all of Minn., assignors to Andersen Corporation, Bayport, Minn.

Continuation of Ser. No. 8,972, May 28, 1993, abandoned.

This application Oct. 13, 1994, Ser. No. 29,701

Term of patent 14 years

U.S. Cl. D25—52



364,470

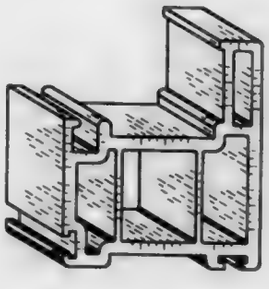
WINDOW COMPONENT EXTRUSION

Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Dec. 15, 1994, Ser. No. 32,287

Term of patent 14 years

U.S. Cl. D25—124



364,471

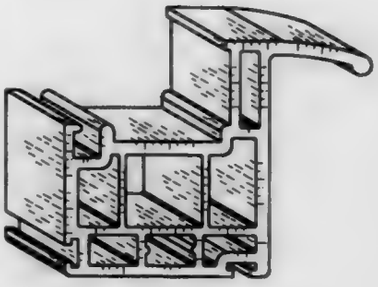
WINDOW COMPONENT EXTRUSION

Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Dec. 15, 1994, Ser. No. 32,236

Term of patent 14 years

U.S. Cl. D25—124



364,472

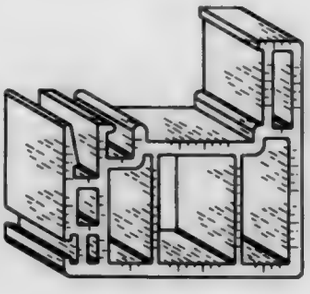
WINDOW COMPONENT EXTRUSION

Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Dec. 15, 1994, Ser. No. 32,288

Term of patent 14 years

U.S. Cl. D25—124



364,473

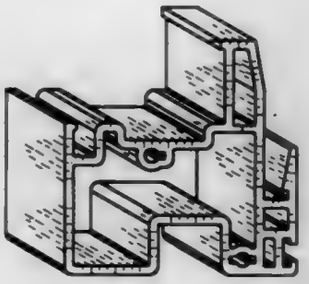
WINDOW COMPONENT EXTRUSION

Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Dec. 15, 1994, Ser. No. 32,289

Term of patent 14 years

U.S. Cl. D25—124



364,474

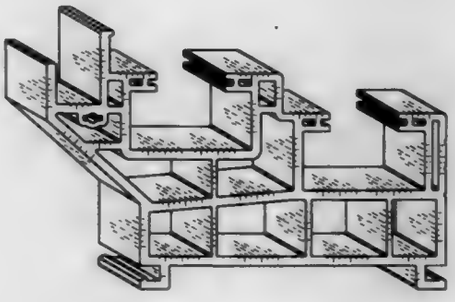
WINDOW COMPONENT EXTRUSION

Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.

Filed Dec. 15, 1994, Ser. No. 32,285

Term of patent 14 years

U.S. Cl. D25—125



364,475

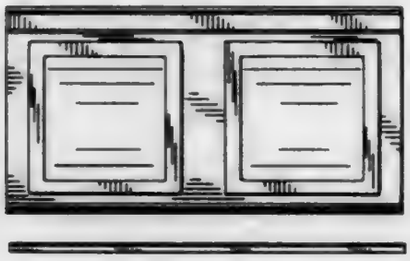
DECORATOR WALL PANEL

Robert L. Burbury, Elgin, Ill., and Phillip P. Nuccio, Benton Harbor, Mich., assignors to Optima Imaging, Inc., Wheeling, Ill.

Filed Mar. 13, 1992, Ser. No. 851,354

Term of patent 14 years

U.S. Cl. D25—138



364,476

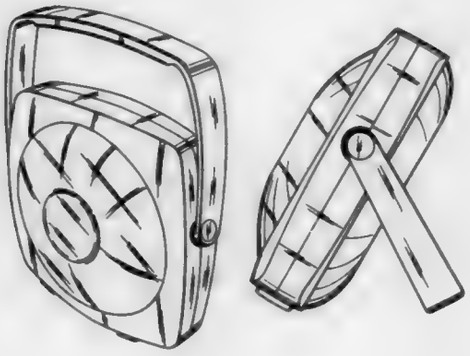
LOW PROFILE FLASHLIGHT/SPOTLIGHT

Tor H. Pettersen, Rancho Palos Verdes, Calif., assignor to Diamond Light Industries, Costa Mesa, Calif.

Filed Feb. 3, 1994, Ser. No. 18,316

Term of patent 14 years

U.S. Cl. D26—50



364,477

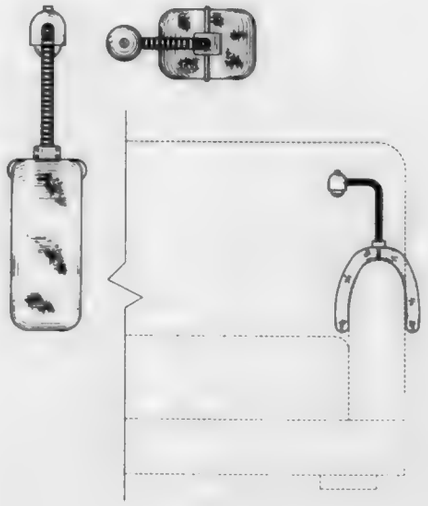
SANDBAG LAMP

Charles S. Ryder, 34 Baughman Ct., Battle Creek, Mich. 49017

Filed Sep. 8, 1994, Ser. No. 28,179

Term of patent 14 years

U.S. Cl. D26—60



364,478

FLUORESCENT LIGHTING FIXTURE

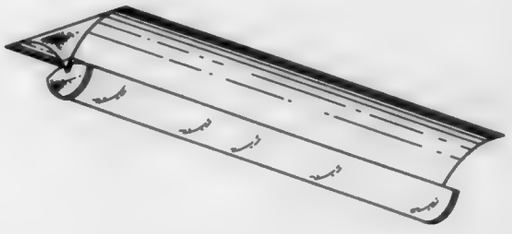
Karin Pesau, Vienna, Austria, assignor to Zumtobel Licht GmbH, Dornbirn, Austria

Filed Apr. 16, 1993, Ser. No. 7,240

Claims priority, application Germany, Jan. 20, 1992, M9207581.1

Term of patent 14 years

U.S. Cl. D26—76



364,479

WALL SCONCE LIGHT FIXTURE

David Gilbert, Jonesboro, Ark., assignor to Don Gilbert Industries, Inc., Jonesboro, Ark.

Filed Jun. 30, 1994, Ser. No. 25,363

Term of patent 14 years

U.S. Cl. D26—85

364,480

CIGARETTE HOLDER WITH VARIABLE AIR VENTS

Peter Warren, Sr., R.D. 1 Box 769, Jermyn, Pa. 18433

Filed Jul. 11, 1994, Ser. No. 25,723

Term of patent 14 years

U.S. Cl. D27—183

364,481

COMBINED APPLICATOR AND DISPENSER FOR OIL AND LOTION

Alan R. Lambert, Rte. 3 Box 425C, Mooresville, N.C. 28115

Filed Dec. 17, 1993, Ser. No. 16,566

Term of patent 14 years

U.S. Cl. D28—7

364,482

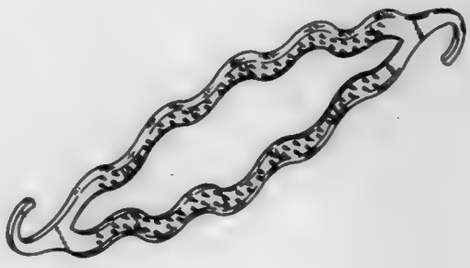
HAIR STYLER

Shih-Ming Hsu, P.O. Box 82-144, Taipei, Taiwan, Prov. of China

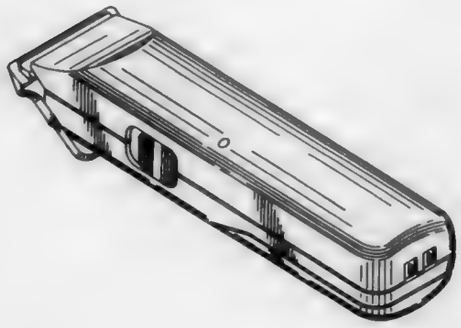
Filed Oct. 27, 1994, Ser. No. 30,363

Term of patent 14 years

U.S. Cl. D28—10

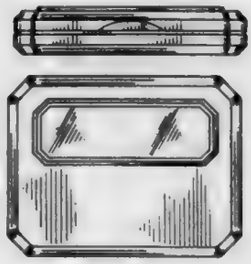


364,483
HAIR CLIPPER
Andrew Elston, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.
Filed Nov. 5, 1993, Ser. No. 15,079
Term of patent 14 years
U.S. Cl. D28—53



364,484
TOOL FOR REMOVING NAIL POLISH
Susan Stewart, 375 Newport, #2, Long Beach, Calif. 90814, and Mary Halliburton, 5002 Adenmoor, Lakewood, Calif. 90713
Filed May 4, 1994, Ser. No. 22,358
Term of patent 14 years
U.S. Cl. D28—57

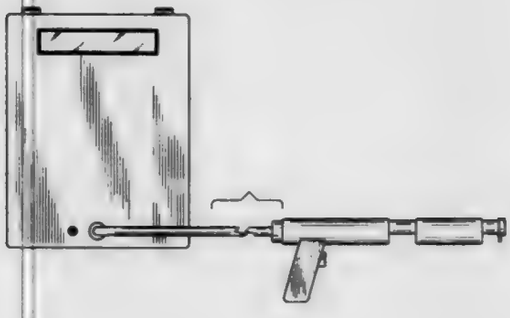
364,485
BLUSH COMPACT
Ellen Gavin, Atlantic Highlands, N.J., assignor to L'Oreal SA, France
Filed Aug. 1, 1994, Ser. No. 26,604
Term of patent 14 years
U.S. Cl. D28—78



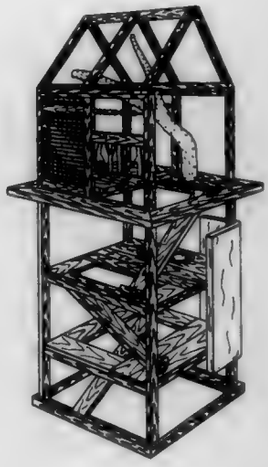
364,486
LIPSTICK CASE
Chin-Hwang Tsai, Hsinchu, Taiwan, Prov. of China, assignor to Ming Hwang Ind. Co., Ltd., Taiwan, Prov. of China
Filed May 12, 1994, Ser. No. 22,803
Term of patent 14 years
U.S. Cl. D28—88

364,487
LINER FOR SAFETY HELMET
John Tutton, North Gower; Todd Arnold, Cascades; Edmund A. Fournier, Orleans, all of, Canada, and Terrance A. Smith, Los Angeles, Calif., assignors to Safe Cycle Limited a British Virgin Island Corp., Grand Cayman, Cayman Islands
Filed Apr. 15, 1994, Ser. No. 21,385
Term of patent 14 years
U.S. Cl. D29—122

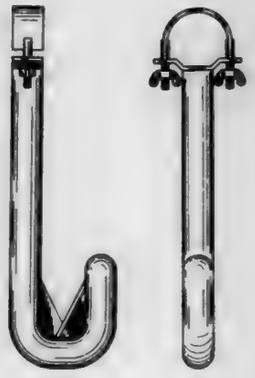
364,488
PORTABLE FIRE EXTINGUISHER
Jarrod A. Nasin, 39 Pond Rd., Franklin, Conn. 06254
Filed Jun. 27, 1994, Ser. No. 25,105
Term of patent 14 years
U.S. Cl. D29—129



364,489
COMBINED SHELTER AND PLAYHOUSE FOR CATS
Princess Cook, 25011 Bell Mountain Dr., San Antonio, Tex. 78255
Filed Sep. 28, 1994, Ser. No. 29,042
Term of patent 14 years
U.S. Cl. D30—108



364,490
TAIL TRIMMER
Darwin J. Zentner, Box 206, Cedar Rapids, Nebr. 68627
Filed Feb. 16, 1994, Ser. No. 18,772
Term of patent 14 years
U.S. Cl. D30—158



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21th DAY OF NOVEMBER, 1995

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A - Tech Corporation: *See*—
Laughlin, Darren R., 5,469,053, Cl. 324-207.180.

A/S Grorud Jernvarefabrik: *See*—
Fries, Bror; and Nakamoto, Yusho, 5,468,061, Cl. 312-258.000.

A/S Lundbeck Export Division Ltd.: *See*—
Skov, Per Stahl; and Bjarno, Ole-Christian, 5,468,650, Cl. 436-527.000.

Aagaard, Paul: *See*—
McFall, Michael; and Aagaard, Paul, 5,468,205, Cl. 482-129.000.

AAR Corp.: *See*—
O'Hara, Robert J.; and Knowlton, Christopher M., 5,467,500, Cl. 15-320.000.

Aaronson, Stuart A.: *See*—
LaRochelle, William J.; Pierce, Jacalyn; Jensen, Roy A.; and Aaronson, Stuart A., 5,468,468, Cl. 424-1.490.

Aaslyng, Dorrit A.: *See*—
Outrup, Helle; Aaslyng, Dorrit A.; Dambmann, Claus; and Patkar, Shamkant A., 5,468,416, Cl. 252-174.120.

Aatresh, Deepak J.; Nakanishi, Tosaku; and Mathews, Gregory S., to Intel Corporation. Central processing unit address pipelining. 5,469,544, Cl. 395-290.000.

Abata, Jeffrey D.: *See*—
Metrick, Joseph; and Abata, Jeffrey D., 5,468,792, Cl. 524-108.000.

ABB Management AG: *See*—
Frey, Heinz; Prochazka, Kamil; and Suter, Franz, 5,467,683, Cl. 91-442.000.

ABB Research Ltd.: *See*—
Haamann, Jurgen; Knopfli, Alfred; Sattelmayer, Thomas; and Tresch, Rudolf, 5,467,815, Cl. 165-109.100.

Abb Vetco Gray Inc.: *See*—
Galle, Gary L.; and Adamek, Frank C., 5,468,023, Cl. 285-24.000.

Abbas, Gregory L.; Vertatschitsch, Edward J.; de La Chapelle, Michael; and Porter, Charles R., to Boeing Company, The. Temperature sensing optical system, 5,467,942, Cl. 244-75.00R.

Abbott Laboratories: *See*—
Klein, Larry L.; and Maring, Clarence J., 5,468,769, Cl. 514-449.000.
Mattingly, Phillip G.; and Bennett, Larry G., 5,468,646, Cl. 436-501.000.
Shah, Dinesh O.; Chandra, Tarun; and Klosterman, Kurt, 5,468,649, Cl. 436-518.000.

Abdallah, Mohammad A. F. F. Digital circuit for the evaluation of mathematical expressions. 5,469,376, Cl. 364-735.000.

Abdelkader, Hatem: *See*—
Reitz, Paul; and Abdelkader, Hatem, 5,469,455, Cl. 372-20.000.

Abe, Kazuo; Ishihara, Masashi; Ikeuchi, Hitoshi; Sugano, Shinsuke; Okuda, Toshiharu; Sakakibara, Shigemi; Shimizu, Hidetoshi; and Ichiba, Yasuaki, to Toyota Jidosha Kabushiki Kaisha. Disc brake assembly. 5,467,846, Cl. 188-73.370.

Abe, Satoshi: *See*—
Yamaguchi, Eiji; Uragami, Yuji; Yokozuka, Hideharu; Uekusa, Kikoo; Yamaguchi, Toshio; Abe, Satoshi; Kamo, Tetsuro; and Suzuki, Takao, 5,468,709, Cl. 502-210.000.

Abe, Shinya: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Abe, Toshiaki; and Wakabayashi, Nobukatsu, to Fujitsu Limited. Post-delivery support system for private branch exchanges. 5,469,498, Cl. 379-127.000.

Abele, Dorotea: *See*—
McGill, James K., III; Abele, Dorotea; Colman, Lonnie L.; Gonsalves, Manuel; and Saxena, Sanjeev, 5,469,573, Cl. 395-700.000.

Abraham, Loren: *See*—
DeKeyser, Dawn; Abraham, Loren; and Eljadi, David A., 5,467,564, Cl. 52-173.300.

Abrams, Richard; Edwards, Russell J.; Ebel, James A.; and Keene, Darren S., to Johnson & Johnson Vision Products, Inc. Ophthalmic lens package. 5,467,868, Cl. 206-5.100.

Access Radiology Corp.: *See*—
Pinsky, Howard; Sheldon, Scott S.; Christakis, Nicholas A.; and Schmertzler, Michael, 5,469,353, Cl. 364-413.010.

Accumulata Verwaltungsgesellschaft GmbH: *See*—
Schlamp, Hans, 5,467,892, Cl. 221-7.000.

Accumulatorenfabrik Sonnenschein GmbH: *See*—
Holland, Gunther K.; and Kügler, Wolfgang, 5,468,575, Cl. 429-56.000.

Acker, William P.; Hahn, Robert T.; Mach, Thomas J.; and Sung, Rodney L., to Texaco Inc. Thermal stability additives for jet fuels. 5,468,262, Cl. 44-348.000.

ACO Severin Ahlmann GmbH & Co., KG: *See*—
Sauerwein, Heinrich; Arm, Wolfgang; and Witt, Jan, 5,468,096, Cl. 405-36.000.

Acrodyne Industries, Inc.: *See*—
Hulick, Timothy P.; and Brookes, Julian L., 5,469,127, Cl. 332-149.000.

ACS Wireless, Inc.: *See*—
Gattey, Phillip A.; and Jensen, Wolfgang W., 5,469,505, Cl. 379-430.000.

Actel Corporation: *See*—
Eltoukhy, Abdelshafy A., 5,469,396, Cl. 365-210.000.

Acushnet Company: *See*—
Chou, Arthur C. P.; and Aoyama, Steven, 5,467,538, Cl. 33-508.000.

Acutus Industries: *See*—
Grove, John A., 5,467,810, Cl. 164-418.000.

Adamek, Frank C.: *See*—
Galle, Gary L.; and Adamek, Frank C., 5,468,023, Cl. 285-24.000.

Adams, Charles T.: *See*—
Seamans, James D.; Adams, Charles T.; Dominguez, Wendy B.; and Chen, Andrew A.-J., 5,468,372, Cl. 208-216.00R.

Adams, Daniel J.; Amjad, Zahid; Lemma, Solomon; and Long, Carl J., II, to B. F. Goodrich Company, The. Polycarboxylic acid thickeners, emulsifiers, and suspending aids having improved wettability characteristics. 5,468,797, Cl. 524-379.000.

Adams, Robert J., to RJA Associates. Method for treating coal. 5,468,265, Cl. 44-505.000.

Adamson, Ronald B.; Lutz, Daniel R.; and Armijo, Joseph S., to General Electric Company. Method of preparing fuel cladding having an alloyed zirconium barrier layer. 5,469,481, Cl. 376-416.000.

Adelson, Alexander M.: *See*—
Swartz, Jerome; Shepard, Howard M.; Barkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward; and Adelson, Alexander M., 5,468,949, Cl. 235-472.000.

Adeza Biomedical Corporation: *See*—
Senyei, Andrew E.; and Casal, David C., 5,468,619, Cl. 435-7.940.

Adinolfe, Joseph P.: *See*—
Adinolfe, Nicholas; and Adinolfe, Joseph P., 5,468,025, Cl. 285-114.000.

Adinolfe, Nicholas; and Adinolfe, Joseph P. Sewer line vent clamp assembly. 5,468,025, Cl. 285-114.000.

Adir et Compagnie: *See*—
de Nanteuil, Guillaume; Vincent, Michel; Lila, Christine; Bonnet, Jacqueline; and Fradin, Armel, 5,468,761, Cl. 514-374.000.

Advanced Composites, Inc.: *See*—
Philpot, Randall J.; Olsen, Douglas G.; Ventrello, Sandra C.; Welsh, Eric R.; and Buckmiller, Daniel K., 5,468,329, Cl. 156-429.000.

Advanced Micro Devices, Inc.: *See*—
Agrawal, Om P.; Wright, Michael J.; and Shea, Ju, 5,469,368, Cl. 364-489.000.
Gupta, Subhash; and Chen, Susan H., 5,468,339, Cl. 216-67.000.
Ho, Kenneth, 5,469,097, Cl. 327-170.000.
Hsu, James, 5,468,981, Cl. 257-316.000.
Runaldue, Thomas J., 5,469,437, Cl. 370-85.300.
Sharpe-Geisler, Bradley A., 5,469,088, Cl. 327-51.000.

Advanced Milliwave Laboratories, Inc.: *See*—
Saxena, Vinod K., 5,469,114, Cl. 330-107.000.

Advanced Surgical, Inc.: *See*—
Buelna, Terry, 5,468,251, Cl. 606-223.000.

Advanced Technology Incubator, Inc.: *See*—
Yaniv, Zvi, 5,469,187, Cl. 345-98.000.

Aerojet General Corporation: *See*—
Malik, Aslam A.; Archibald, Thomas G.; Carlson, Roland P.; and Manser, Gerald E., 5,468,841, Cl. 528-408.000.

Aeromatics Automotive, Inc.: *See*—
Knez, Marijan, 5,467,848, Cl. 188-73.450.

AeroTrans: *See*—
Ashton, Larry J.; Allman, Michael G.; and Ta-Ala, Benko, 5,467,889, Cl. 220-562.000.

AFA Products, Inc.: *See*—
Maas, Wilhelmus J. J.; and Hurkmans, Petrus L. W., 5,467,900, Cl. 222-341.000.

Agahdel, Fariborz: *See*—
Roebuck, Randal D.; Agahdel, Fariborz; and Rizzo, Salvatore P., 5,468,157, Cl. 439-264.000.

Agency of Industrial Science and Technology: *See*—

Kanayama, Toshihiko, 5,469,323, Cl. 361-225.000.
AGFA-GAVAERT, N.V.: *See*—
Vanmaele, Luc J., 5,468,870, Cl. 548-370.100.
Agfa-Gevaert N. V.: *See*—
Boeve, Gerard; and Verbeke, Gentil, 5,469,205, Cl. 347-263.000.
Janssens, Wilhelmus; and Vanmaele, Luc, 5,468,258, Cl. 8-471.000.
A'Gramkow A/S: *See*—
Cording, Louis B.; Knudsen, Hans B.; and Gramkow, Asger, 5,467,608, Cl. 62-195.000.
Agrawal, Om P.; Wright, Michael J.; and Shen, Ju, to Advanced Micro Devices, Inc. Array of configurable logic blocks each including a first lookup table output coupled to selectively replace an output of second lookup with an alternate function output. 5,469,368, Cl. 364-489.000.
Ahluwalia, Gurpreet S.; Shander, Douglas; and Henry, James P. Reduction of hair growth. 5,468,476, Cl. 424-73.000.
Ahn, Byung C., to Goldstar Co., Ltd. Signal line structure for a TFT-LCD and method for fabricating the same. 5,467,882, Cl. 216-23.000.
Ahn, Mi-Ran: *See*—
Park, Chan-Min, 5,468,215, Cl. 601-23.000.
Ahold Retail Services AG: *See*—
Oosterveen, Leendert; Lombaers, Jacobus H. M.; and Dorsman, Johannes, 5,468,942, Cl. 235-383.000.
Aichi Steel Works, Ltd.: *See*—
Honkura, Yoshinobu; Toki, Hiroyuki; and Usami, Toyokatsu, 5,468,522, Cl. 427-597.000.
Air Products and Chemicals, Inc.: *See*—
Roth, Timothy J.; and Welliver, William R., 5,468,276, Cl. 71-15.000.
Aircraft Gear Corporation: *See*—
Vandenberg, Douglas; Philpott, Michael L.; Green, Phillip A.; Eastman, Scott A.; and Carlini, Sean M., 5,469,482, Cl. 377-3.000.
Aisin AW Co., Ltd.: *See*—
Otake, Shinichi, 5,469,032, Cl. 318-439.000.
Aizawa, Eiji: *See*—
Amano, Yasuyuki; Ikeda, Takeshi; Aizawa, Eiji; and Saito, Takanori, 5,468,535, Cl. 428-40.000.
Akanuma, Hiroshi: *See*—
Yabuuchi, Masahiko; Akanuma, Hiroshi; Masuda, Minoru; Katoh, Kazuo; Nakamura, Tsuneo; Tajima, Shigeru; Hashiba, Masashi; Hayami, Hiroshi; Takezawa, Tomoko; and Hirayama, Masachika, 5,468,380, Cl. 210-198.200.
Akashi, Sueo: *See*—
Nakajima, Takeshi; Hashimoto, Ichiro; Saitou, Tomoyuki; Ohira, Fusanori; Akashi, Sueo; Sone, Nobukatu; and Nii, Katsutoshi, 5,469,008, Cl. 310-90.500.
Akikawa, Kazuhiro: *See*—
Tsujimoto, Nohiro; Hongyo, Kenichi; Baba, Yoshisuke; Suzuki, Michinori; and Akikawa, Kazuhiro, 5,468,822, Cl. 526-340.100.
Akino, Toshiro: *See*—
Seri, Kenji; Sanai, Kazuko; Negishi, Shigenori; and Akino, Toshiro, 5,468,734, Cl. 514-23.000.
Akiyama, Hisashi; and Miyoshi, Shuji, to Sharp Kabushiki Kaisha. Method for forming an orientation film including coupling an organic compound to a silane coupling agent in a magnetic or electrical field. 5,468,519, Cl. 427-532.000.
Akiyama, Masatsugu: *See*—
Kanekawa, Nobuyasu; Ihara, Hirokazu; Akiyama, Masatsugu; Kawabata, Kiyoshi; Yamanaka, Hisayoshi; and Okishima, Tetsuya, 5,468,992, Cl. 257-676.000.
Aktiebolaget Astra: *See*—
Federsel, Hans-Jügen; Hö, Thomas; Rämsby, Sten I.; and Ström, Peter H. E., 5,468,876, Cl. 548-535.000.
Akutagawa, Hitoshi: *See*—
Kameda, Osamu; Akutagawa, Hitoshi; Okita, Junichi; and Hirose, Ichiro, 5,467,668, Cl. 74-606.00R.
Akzo N.V.: *See*—
Lijten, Franciscus A. T.; and Meerman, Johannes J., 5,468,555, Cl. 428-365.000.
Alaron Corporation: *See*—
Mencarelli, Ron; and Sasko, Jeffry P., 5,467,704, Cl. 100-131.000.
Alavie, Tino: *See*—
Measures, Raymond M.; Alavie, Tino; Melle, Serge M.; Coroy, Trent; Mason, Beck; Karr, Shawn E.; and Liu, Kexing, 5,469,265, Cl. 356-419.000.
Albert, Bernhard: *See*—
Loerzer, Thomas; Telser, Thomas; Zwez, Thomas; and Albert, Bernhard, 5,468,596, Cl. 430-306.000.
Albert, Eckehard, to Witels Apparate-Maschinen Albert GmbH & Co. KG. Straightening apparatus for tubular material, wire and cable. 5,467,629, Cl. 72-164.000.
Albinus, Eberhard: *See*—
Reiners, Ulrich; Krallmann, Anton; Albinus, Eberhard; and Böhner, Jürgen, 5,468,563, Cl. 428-515.000.
Albizzati, Enrico: *See*—
Morini, Giampiero; Albizzati, Enrico; Giannini, Umberto; Scordamaglia, Raimondo; and Barino, Luisa, 5,468,704, Cl. 502-115.000.
Albon, Richard; and Hastie, Neil, to Plessey Semiconductors Limited. Content addressable memory having match line transistors connected in series and coupled to current sensing circuit. 5,469,378, Cl. 365-49.000.
Albrecht, Alan R.: *See*—
Thaler, Patricia A.; Kadambi, Jayant; Spratt, Michael; Albrecht, Alan R.; and Goody, Steven H., 5,469,439, Cl. 370-94.300.
Albrigo, Julian; Ricker, Edward D.; and Colarusso, Louis J., to Erico International Corporation. Reinforcing bar splice and system fo forming precast concrete members and structures. 5,468,524, Cl. 428-34.100.
Alcatel Cit: *See*—
Guerin, Jean-Pierre; Robin, Jean-Francois; and Roudot, Francois, 5,469,430, Cl. 370-37.000.
Alcatel, N.V.: *See*—
De Groote, Jan L. B.; Vandewege, Jan A. O.; Allaert, Joost; and Van Parys, Hans A. G., 5,469,464, Cl. 375-317.000.
Alderdice, Marc: *See*—
Gawin, Frank H.; Byck, Robert; Alderdice, Marc; and Schwimmer, Jeffrey, 5,468,749, Cl. 514-252.000.
Alexander, Brian S.: *See*—
Davis, James A.; Kane, Edward G.; Alexander, Brian S.; and Barham, William F., 5,468,550, Cl. 428-327.000.
Alexander, Edward R.; Goldman, Ron; Li, Yajun; Bard, Simon; Strat, Askold; Katz, Joseph; and Metlitsky, Boris, to Symbol Technologies, Inc. Miniature high speed scan element mounted on a personal computer interface card. 5,468,952, Cl. 235-492.000.
Alfano, Robert R.; Pradhan, Asima; Tang, Guichen C.; Wang, Leming; Budansky, Yury; and Das, Bidyut B. Method for determining if tissue is malignant as opposed to non-malignant using time-resolved fluorescence spectroscopy. 5,467,767, Cl. 128-665.000.
Alfred University: *See*—
Stangle, Gregory C.; Venkatachari, Koththavasal R.; Ostrander, Steven P.; and Schulze, Walter A., 5,468,427, Cl. 264-3.400.
Allaert, Joost: *See*—
De Groote, Jan L. B.; Vandewege, Jan A. O.; Allaert, Joost; and Van Parys, Hans A. G., 5,469,464, Cl. 375-317.000.
Allegro Microsystems, Inc.: *See*—
Peppiette, Roger; and Bilotti, Alberto, 5,469,095, Cl. 327-110.000.
Allen, Ethan: *See*—
Marshall, Dorothea; and Allen, Ethan, 5,469,297, Cl. 359-617.000.
Allen, Lawrence H.; and Lapointe, Christine L., to Pulp and Paper Research Institute of Canada. Centrifugal cleaning of pulp and paper process liquids. 5,468,396, Cl. 210-787.000.
Allen, Paul G.; and Whitten, Arthur T. Method and apparatus for increasing the functionality of computer system pointing devices by simultaneous actuation of buttons thereon. 5,469,192, Cl. 345-157.000.
Allen, Ross R.; Lam, Si-Ty; McClelland, Paul H.; and Hanson, Eric G., to Hewlett-Packard Company. Wide inkjet printhead. 5,469,199, Cl. 347-42.000.
Allen, Scott I.; Foye, Duane F.; and Ferguson, Michael, to Dow Chemical Company, The. Multilayer barrier film for ostomy applications. 5,468,526, Cl. 428-35.400.
Allen, William C.; and Maurizi, Michael G., to Allen, William C. Method for repairing tears and incisions in soft tissue. 5,467,786, Cl. 128-898.000.
Allergan, Inc.: *See*—
Chandraratna, Roshantha A. S., 5,468,879, Cl. 549-23.000.
Garst, Michael E.; Burk, Robert M.; Chan, Ming F.; and Roof, Michael B., 5,468,778, Cl. 514-573.000.
Allied Signal Inc.: *See*—
Grasso, Mark S., 5,469,258, Cl. 356-350.000.
AlliedSignal Inc.: *See*—
Gilchrist, Raymond T.; and McCoy, Kevin, 5,467,529, Cl. 29-890.128.
Hulsing, Rand H., II, 5,469,052, Cl. 324-174.000.
Leung, Roger Y.; Stranford, Gerald T.; and Gonczy, Stephen T., 5,468,318, Cl. 156-89.000.
Okpara, Nnawuihe; and Henry, Chester L., 5,468,125, Cl. 416-97.00R.
Allman, Michael G.: *See*—
Ashton, Larry J.; Allman, Michael G.; and Ta-Ala, Benko, 5,467,889, Cl. 220-562.000.
Alm, Roger R.: *See*—
Muggli, Imelda A.; and Alm, Roger R., 5,468,812, Cl. 525-293.000.
Alpha 1 Biomedicals: *See*—
Chretien, Paul B.; and Mutchnick, Milton G., 5,468,729, Cl. 514-12.000.
Alps Electric Co., Ltd.: *See*—
Nagai, Takuya, 5,468,060, Cl. 312-223.200.
Altchuler, Steven I., to Mayo Foundation for Medical Education & Research. Process for determining drug taper schedules. 5,468,222, Cl. 604-49.000.
Alten Gerätebau GmbH: *See*—
Borchardt, Horst, 5,467,563, Cl. 52-173.200.
Alten, Kurt. Support plates for bridges and ramps. 5,467,493, Cl. 14-69.500.
Alteon Inc.: *See*—
France, Dennis S.; Cerami, Anthony; Ulrich, Peter C.; Norton, Laura A.; and Neer, David L., 5,468,777, Cl. 514-562.000.
Althaus, Wolfgang, to Warner-Lambert Company. Wet razor. 5,467,530, Cl. 30-85.000.
Altonen, Gene M.; and Kerr, G. Scott, to Proctor Gamble Company, The. Interleaving dispenser for dispensing objects stacked within a package. 5,467,894, Cl. 221-71.000.
Alverio, John, to General Motors Corporation. Method of manufacture for rotary cutting tool. 5,467,670, Cl. 76-108.600.
Alvis, Brady A. Bilevel trailer with a lowerable upper deck. 5,468,115, Cl. 414-556.000.
Alvité, Joseph, to Robodyne Corporation. PC card assembly. 5,469,332, Cl. 361-737.000.
Alvord, Larry A.: *See*—
Nicolson, Paul C.; Seamons, Kenneth R.; Tsao, Fu-Pao; Alvord, Larry A.; and McCraw, Earl C., Jr., 5,468,448, Cl. 422-30.000.
Amano, Hiroyuki: *See*—

Sugimoto, Tadashi; Ohkawa, Shingo; Amano, Hiroyuki; and Murata, Norikazu, 5,468,960, Cl. 250-338.300.

Amano, Yasuyuki; Ikeda, Takeshi; Aizawa, Eiji; and Saito, Takanori, to Lintec Corporation. Label for a squeezable container and squeezable container bearing same. 5,468,535, Cl. 428-40.000.

Amano, Yoshinobu, to NEC Corporation. Floating point computing device for simplifying procedures accompanying addition or subtraction by detecting whether all of the bits of the digits of the mantissa are 0 or 1. 5,469,377, Cl. 364-748.000.

Amerace Corporation: *See*—
Luzzi, Glenn J., 5,467,515, Cl. 29-235.000.

Amergen, Inc.: *See*—
Sharma, Somesh D.; Clark, Brian R.; and Lerch, Bernard L., 5,468,481, Cl. 424-125.100.

American Colloid Company: *See*—
Nebergall, Robert S.; Taylor, Dennis R.; and Kucharz, Carolyn J., 5,468,701, Cl. 502-80.000.

American Cyanamid Company: *See*—
Barnes, Keith D.; Kamhi, Victor M.; and Diehl, Robert E., 5,468,877, Cl. 548-543.000.

American Home Products Corporation: *See*—
Argiriadi, Andrew A.; Blank, Robert G.; and Giamalva, David H., 5,468,502, Cl. 424-456.000.
Malamas, Michael S.; and Nelson, James A., 5,468,760, Cl. 514-374.000.
Malamas, Michael S.; and Gunawan, Iwan, 5,468,762, Cl. 514-376.000.
Sabb, Annmarie L.; and Stein, Reinhardt P., 5,468,875, Cl. 548-512.000.
Schiehser, Guy A.; Caufield, Craig E.; Senko, Nancie A.; and VonBurg, Gregory F., 5,468,774, Cl. 514-471.000.

American Medical Systems, Inc.: *See*—
Polyak, Mark, 5,468,213, Cl. 600-40.000.

American Metal Products Company: *See*—
Annestedt, James W., 5,468,026, Cl. 285-133.100.

American National Carbide Company: *See*—
Stroud, Donald S., 5,467,669, Cl. 76-108.200.

American Suessen Corporation: *See*—
Steiner, Erwin; and Mischker, Rolf, 5,467,513, Cl. 28-281.000.

American Tel-A-Systems, Inc.: *See*—
Morley, John F., Jr.; and Anderson, Kent D., 5,469,491, Cl. 379-88.000.

Ames, Sherry A. Hedge trimmer aid. 5,467,532, Cl. 33-334.000.

AMFAG S.r.l.: *See*—
Bosio, Orlando, 5,467,929, Cl. 239-428.500.

Amino, Yukio: *See*—
Hirota, Toshizumi; Kobayashi, Hitoshi; Nakagoshi, Yasunobu; and Amino, Yukio, 5,468,351, Cl. 202-234.000.

Amjad, Zahid: *See*—
Adams, Daniel J.; Amjad, Zahid; Lemma, Solomon; and Long, Carl J., II, 5,468,797, Cl. 524-379.000.

Ammermann, Eberhard: *See*—
Wenderoth, Bernd; Brand, Siegbert; Schuetz, Franz; Kuekenhoehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,468,717, Cl. 504-130.000.

Amspec Chemical Co., Inc.: *See*—
Wienckoski, Ronald J., 5,468,424, Cl. 252-609.000.

Analog Devices, Inc.: *See*—
Steyaert, Michel; Dehaene, Wim; Craninckx, Jan; Walsh, Mairtin; and Real, Peter, 5,469,113, Cl. 329-311.000.

Andcare, Inc.: *See*—
Wegner, Steven; Harpold, Michael A.; McCaffrey, Terence M.; Morris, Susan E.; Wojciechowski, Marek; Zhao, Junguo; Henkens, Robert W.; Naser, Najih; and O'Daly, John P., 5,468,366, Cl. 204-403.000.

Andersen Corporation: *See*—
DeKeyser, Dawn; Abraham, Loren; and Eijadi, David A., 5,467,564, Cl. 52-173.300.

Anderson, Kent D.: *See*—
Morley, John F., Jr.; and Anderson, Kent D., 5,469,491, Cl. 379-88.000.

Anderson, Neal R.; Erickson, Bart J.; and Leung, Keith, to Motorola, Inc. Method for clock calibration in a position determination system. 5,469,409, Cl. 368-10.000.

Anderson, Stuart J., to Commonwealth of Australia, c/o The Secretary, Department of Defence, The. Oceanographic and meteorological data. 5,469,168, Cl. 342-26.000.

Andon, Mark B., to Procter & Gamble Company, The. Concentrated bioavailable calcium source. 5,468,506, Cl. 426-74.000.

Andrea, Martin. Electric induction furnace. 5,469,461, Cl. 373-156.000.

Angelo, Anthony: *See*—
Williams, William M.; Angelo, Anthony; and Westbrook, Gregory L., 5,469,072, Cl. 324-754.000.

Angevaare, Petrus A.; and Gary, Richard G. Purine class compounds in detergent compositions. 5,468,410, Cl. 252-95.000.

Anich, Ann T.; and Sierakowski, Michael J., to Minnesota Mining and Manufacturing Company. Mist suppressant for solvent extraction metal electrowinning. 5,468,353, Cl. 204-105.00R.

Annestedt, James W., to American Metal Products Company. Spacer clip for chimney. 5,468,026, Cl. 285-133.100.

Ansite, William K.; and Pennell, David N., to Gentex Corporation. Valve for a pressure breathing system which accomplishes the Valsalva maneuver. 5,467,766, Cl. 128-205.240.

Anthony, Thomas R.; and Fleischer, James F., to General Electric Company. Apparatus for annealing diamond water jet mixing tubes. 5,468,934, Cl. 219-390.000.

Anthony, Vivienne M.: *See*—
Buckley, Alan J.; Huchings, Michael G.; Ferguson, Ian; Beautement, Kevin; Clough, John M.; Crowley, Patrick J.; Godfrey, Christopher R. A.; deFraine, Paul J.; Anthony, Vivienne M.; and Heaney, Stephen P., 5,468,857, Cl. 544-298.000.

Antonelli, Joseph A.; and Scopazzi, Christopher, to Du Pont de Nemours, E. I., and Company. Dual stabilized microparticles. 5,468,801, Cl. 524-504.000.

Antony, Paul; Falter, Wolfgang; Kiessig, Andreas; and Berg, Matthias, to Perrot Bremsen GmbH. Disc brake. 5,467,847, Cl. 188-73.390.

Anzai, Kenji: *See*—
Tani, Tomofune; Murai, Ichiro; and Anzai, Kenji, 5,468,979, Cl. 257-304.000.

Aoki, Takuya; Shimasaki, Yuichi; Matsumoto, Seiji; Hatcho, Seiji; Oketani, Toshikazu; Miyashita, Yukio; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust gas-purifying system for internal combustion engines. 5,467,594, Cl. 60-276.000.

Aoki, Yasushi: *See*—
Horita, Satomi; Aoki, Yasushi; Wakana, Masahiro; Okamoto, Hiroshi; Chiba, Kiyohiko; and Daikoku, Shizue, 5,469,081, Cl. 326-81.000.

Aoshima, Taku; Noami, Tsuneo; Soga, Hiroh; Sumikawa, Takeshi; Furuya, Nobumasa; and Edure, Tadakazu, to Fuji Xerox Co., Ltd. Development method and apparatus and multicolor image forming apparatus using these. 5,469,245, Cl. 355-251.000.

Aota, Ikuhiro: *See*—
Ishiwata, Tadashi; Ogata, Tetsuo; and Aota, Ikuhiro, 5,467,974, Cl. 271-220.000.

Aoyama, Steven: *See*—
Chou, Arthur C. P.; and Aoyama, Steven, 5,467,538, Cl. 33-508.000.

Aphton Corp.: *See*—
Gevas, Philip C.; Grimes, Stephen; Karr, Stephen L.; Michaeli, Dov; and Scibienski, Robert, 5,468,494, Cl. 424-195.110.

Apple Computer, Inc.: *See*—
August, Mark P., 5,468,920, Cl. 174-267.000.
Clark, Michael B.; and Venolia, Daniel S., 5,469,194, Cl. 345-173.000.
Krein, William T.; Hochsprung, Ronald R.; and Kelly, James D., 5,469,435, Cl. 370-85.200.
Masterson, Anthony, 5,469,190, Cl. 345-155.000.
Powers, John R., III; Palmer, James E.; Coleman, Patricia J.; Herman, Jeffrey A.; and Cochran, Eli, 5,469,540, Cl. 395-158.000.

Applied Biosystems, Inc.: *See*—
Menchen, Steven M.; Winnik, Mitchell A.; and Johnson, Ben F., 5,468,365, Cl. 204-299.00R.

Applied Materials, Inc.: *See*—
Lei, Lawrence C.; and Leung, Cissy, 5,468,298, Cl. 118-728.000.
Lowrance, Robert B., 5,469,035, Cl. 318-568.100.

Applied Power Inc.: *See*—
Yu, Xudong, 5,467,596, Cl. 60-415.000.

Arai, Norihisa: *See*—
Hoshino, Chiaki; and Arai, Norihisa, 5,469,397, Cl. 365-210.000.

Arai, Toru: *See*—
Nishio, Hisashi; Arai, Toru; Nishizuka, Masaru; and Makitani, Atsushi, 5,469,350, Cl. 363-55.000.

Arai, Yoichiro: *See*—
Honda, Shinkichi; Torii, Kenji; Arai, Yoichiro; Kasai, Masaji; Kato, Hiromasa; Iida, Takao; Takahashi, Tomoya; Yokoo, Yoshiharu; Kamiya, Toshikazu; and Tamaoki, Tatsuya, 5,468,474, Cl. 424-70.100.

Archambeault, John T.; Gasmovic, David J.; and Mizuno, Morio, to McLaughlin Manufacturing Company, Inc. Wireless remote boring apparatus guidance system. 5,469,155, Cl. 340-853.400.

Archibald, Thomas G.: *See*—
Malik, Aslam A.; Archibald, Thomas G.; Carlson, Roland P.; and Manser, Gerald E., 5,468,841, Cl. 528-408.000.

ARCO Chemical Technology, L.P.: *See*—
Jubin, John C., Jr., 5,468,885, Cl. 549-531.000.

Ardes, Wilhelm, to Ing. Walter Hengst GmbH & Co. KG. Filter assembly and preassembled drain valve unit therefor. 5,468,386, Cl. 210-248.000.

Area Lighting Research, Inc.: *See*—
Duve, George; and Gieger, Jeffrey S., 5,469,347, Cl. 362-245.000.

Areaux, Larry D., to Premelt Pump, Inc. Molten metal conveying means and method of conveying molten metal from one place to another in a metal-melting furnace with simultaneous degassing of the melt. 5,468,280, Cl. 75-708.000.

Ares Holding 89 N.V.: *See*—
Cacabelos, Ramón, 5,468,726, Cl. 514-2.000.

Argiriadi, Andrew A.; Blank, Robert G.; and Giamalva, David H., to American Home Products Corporation. Ibuprofen enhancing solvent system. 5,468,502, Cl. 424-456.000.

Arimatsu, Yohei: *See*—
Nakamura, Kosei; Hayashi, Yoshiyuki; Kimijima, Masami; and Arimatsu, Yohei, 5,467,521, Cl. 29-598.000.

Arimoto, Satoshi; Hayafuji, Norjo; Deguchi, Mikio; and Hamamoto, Satoshi, to Mitsubishi Denki Kabushiki Kaisha. Method of producing a semiconductor structure including a recrystallized film. 5,467,731, Cl. 117-43.000.

Arimoto, Shinobu: *See*—
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,469,266, Cl. 358-298.000.

Arisato, Akira; and Yonezawa, Keitaro, to Kabushiki Kaisha Kosmek. Clamping apparatus. 5,468,136, Cl. 425-192.00R.
Arisawa, Shigeru: *See*—
Fujita, Masahiro; and Arisawa, Shigeru, 5,469,512, Cl. 382-118.000.
Arison, Byron H.: *See*—
Gagliardi, Magda M.; Chen, Shieh-Shung T.; Arison, Byron H.; Garrity, George M.; Huang, Leeyuan; MacConnell, John G.; and White, Raymond F., 5,468,771, Cl. 514-452.000.
Aritome, Seiichi: *See*—
Endoh, Tetsuo; Shirota, Riichiro; Ohuchi, Kazunori; Kirisawa, Ryouhei; Aritome, Seiichi; Tanaka, Tomoharu; and Tanaka, Yoshiyuki, 5,469,444, Cl. 371-215.000.
Arm, Wolfgang: *See*—
Sauerwein, Heinrich; Arm, Wolfgang; and Witt, Jan, 5,468,096, Cl. 405-36.000.
Armijo, Joseph S.: *See*—
Adamson, Ronald B.; Lutz, Daniel R.; and Armijo, Joseph S., 5,469,481, Cl. 376-416.000.
Armington, Steven E.; and Silvis, John E., to Ranpak Corp. Downsized cushioning dunnage conversion machine and packaging systems employing the same. 5,468,208, Cl. 493-352.000.
Armstrong, Lawrence E.: *See*—
Hurtubise, Diane M.; Arnold, Perry K.; Kudla, David P.; and Armstrong, Lawrence E., 5,467,971, Cl. 267-220.000.
Arnold, Kevin E.; and Baylis, Keith. Inserting linings into pipes. 5,468,091, Cl. 405-154.000.
Arnold, Perry K.: *See*—
Hurtubise, Diane M.; Arnold, Perry K.; Kudla, David P.; and Armstrong, Lawrence E., 5,467,971, Cl. 267-220.000.
Aronowitz, Sheldon; Ku, Yen-Hui J.; and Ho, Yu-Lam, to LSI Logic Corporation. Control and modification of dopant distribution and activation in polysilicon. 5,468,974, Cl. 257-51.000.
Arthur, Richard L.; Bowman, Timothy S.; and Harmon, J. David, to Walker Systems, Inc. Floor box for in-floor service distribution systems. 5,468,908, Cl. 174-48.000.
Aruga, Tomoe; Yokouchi, Hideya; and Fujimori, Kazuyoshi, to Seiko Epson Corporation. Floppy disk drive device. 5,469,421, Cl. 369-75.100.
Arvanitopoulos, Labros D.: *See*—
Greuel, Michael P.; Arvanitopoulos, Labros D.; and Harwood, H. James, 5,468,785, Cl. 522-63.000.
Arvedi, Giovanni; Gosio, Giovanni; Siegers, Ulrich; Manini, Luciano; Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Thurm, Hans-Günther; and Lüdorff, Harald, to Mannesmann Aktiengesellschaft. Liquid-cooled ingot mold for the continuous casting of steel billets in the form of slabs. 5,467,809, Cl. 164-418.000.
Asaga, Hiroyuki: *See*—
Hayakawa, Tetsuo; Inoue, Tokuji; and Asaga, Hiroyuki, 5,468,810, Cl. 525-244.000.
Asahi Glass Company Ltd.: *See*—
Osawa, Ryoko; Maekawa, Takashige; Momii, Tatsuo; and Kamata, Satoshi, 5,468,904, Cl. 568-333.000.
Yugami, Hiroshi; Yamada, Minoru; Oda, Noriyuki; and Endo, Yasuhiko, 5,468,282, Cl. 95-8.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Nomura, Hiroshi, 5,469,300, Cl. 359-700.000.
Asai, Naoki; Morozumi, Choji; Ito, Yoshikazu; Ito, Kiyoshi; and Koyabu, Akira, to Seiko Epson Corporation. Printer color ink ribbon positioning control. 5,468,078, Cl. 400-215.000.
Asai, Nobutoshi; Iwamura, Takashi; and Tamura, Shin-Ichiro, to Sony Corporation. Optical recording medium. 5,468,593, Cl. 430-273.000.
Asakawa, Satoshi: *See*—
Hatakeyama, Atsushi; Fujisawa, Hiromichi; Kato, Kanji; Kawaguchi, Hisamitsu; Minegishi, Naoki; Tada, Katsumi; and Asakawa, Satoshi, 5,469,354, Cl. 364-419.190.
Asama, Kiichi; and Ashibe, Hiroo, to Sankyo Seiki Mfg. Co., Ltd. Brushless motor. 5,469,005, Cl. 310-68.00B.
Asano, Osamu: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.
Asea Brown Boveri Ltd.: *See*—
Litenas, Michael; and Schuler, Roland, 5,468,916, Cl. 174-127.000.
Ashby, Earl T. Open end ratchet wrench. 5,467,672, Cl. 81-58.200.
Ashibe, Hiroo: *See*—
Asama, Kiichi; and Ashibe, Hiroo, 5,469,005, Cl. 310-68.00B.
Ashton, Larry J.; Allman, Michael G.; and Ta-Ala, Benko, to AeroTrans. Nestable elastic fuel tank and method for making same. 5,467,889, Cl. 220-562.000.
Ashworth, Uriel G.: *See*—
Johnson, Gregory E.; Ashworth, Uriel G.; and Salerno, Mark, 5,468,216, Cl. 601-24.000.
Asmund S. Laerdal A/S: *See*—
Egelandsdal, Einar; Garth, Geoffrey C.; Hamilton, John; Johnson, David; Laerdal, Tore; and Patterson, Charles A., 5,468,151, Cl. 434-265.000.
Aspect Telecommunications Corporation: *See*—
Butensky, Michael J.; Gibbs, Richard A.; Collins, Kevin T.; Yang, Yih-Nan; Johnson, Eric M.; and Grafft, Chris A., 5,469,503, Cl. 379-265.000.
Aszalos, Adorjan; Weaver, James L.; and Pine, P. Scott, to United States of America, Health and Human Services. Methods of using azo dyes and their derivatives. 5,468,469, Cl. 514-150.000.
AT&T Corp.: *See*—
Cunningham, John E.; Goossen, Keith W.; Jan, William Y.; and Walker, James A., 5,468,689, Cl. 437-241.000.
Donnelly, Vincent M., Jr.; and McCaulley, James A., 5,467,732, Cl. 117-86.000.
Frye, Robert C.; Harry, Thomas R.; Lory, Earl R.; and Rietman, Edward A., 5,467,883, Cl. 216-60.000.
Harvey, William J., 5,467,607, Cl. 62-186.000.
Lee, Kuo-Hua; Lin, Horng-dar; Yan, Ran-Hong; and Yu, Chen-Hua D., 5,468,669, Cl. 437-51.000.
Neuhoff, David L.; Pappas, Thrasyvoulos N.; and Seshadri, Nambirajan, 5,469,268, Cl. 358-298.000.
Palaszewski, Stephen J., 5,469,328, Cl. 361-690.000.
Post, Irving G., 5,469,119, Cl. 331-117.00R.
Vella-Coleiro, George P., 5,469,467, Cl. 375-358.000.
AT&T Global Information Solutions Company: *See*—
Bullinger, Philip W.; and McManus, Michael J., 5,469,082, Cl. 326-81.000.
At&T IPM Corp.: *See*—
Baumert, Robert J.; and Joh, Clarence C., 5,469,438, Cl. 370-85.110.
Haas, Zygmunt, 5,469,284, Cl. 359-139.000.
Shahid, Muhammed A., 5,468,338, Cl. 216-90.000.
Atherton, Kenneth W.; Grogan, Kevin P.; Balch, Richard A.; and Plis, Mark J., to General Electric Company. Method of serially processing binary characters asynchronously received by an electrical energy meter. 5,469,153, Cl. 340-870.280.
Atlas Fluid Controls Inc.: *See*—
Sallas, John J., 5,467,800, Cl. 137-625.650.
Atochem: *See*—
Berthe, Marie-Christine; Caubere, Paul; and Fort, Yves, 5,468,856, Cl. 544-219.000.
Atoma International Inc.: *See*—
Powell, Fred D.; Phelan, Raymond J.; McCormack, James; Budansew, Peter; Demoe, Larry; and Poschun, Alex, 5,468,434, Cl. 264-46.800.
Atomic Energy of Canada Limited: *See*—
Miller, Alistair I.; and Spagnolo, Dino A., 5,468,462, Cl. 423-580.200.
Atsumi, Kiminori: *See*—
Sakuma, Shuji; and Atsumi, Kiminori, 5,468,489, Cl. 424-49.000.
Attfield, Stephen F.; and Sambatakakis, Andreas, to Howmedica International, Inc. Surgical apparatus for use in joint replacement surgery. 5,468,244, Cl. 606-90.000.
Audiovox Corporation: *See*—
Lavelle, Patrick M.; DiCroce, John; and Malone, Thomas C., 5,469,151, Cl. 340-825.360.
August, Mark P., to Apple Computer, Inc. Printed circuit board having raised conductor pads. 5,468,920, Cl. 174-267.000.
AuraVision Corporation: *See*—
Kimura, Scott A., 5,469,223, Cl. 348-581.000.
Aust, Steven D.; Barr, David P.; Grover, Thomas A.; Shah, Manish M.; and Chung, Namhyun, to Utah State University Foundation. Compounds and methods for generating oxygen and free radicals used in general oxidation and reduction reactions. 5,468,628, Cl. 435-168.000.
Austin, Craig R.: *See*—
Rodriquez, Peter A.; and Austin, Craig R., 5,467,937, Cl. 242-526.200.
Australian National University, The: *See*—
Luther–Davies, Barry; and Xiaoping, Yang, 5,469,525, Cl. 385-122.000.
Automated Healthcare, Inc.: *See*—
McDonald, Sean C.; Hertz, Ellen J.; Smith, James A.; and Toto, Gregory, 5,468,110, Cl. 414-273.000.
Avani, Michael A.; and Potter, Daniel R., to Nike, Inc. Shoe with adjustable closure system. 5,467,537, Cl. 36-50.100.
Avery Dennison Corporation: *See*—
Kline, Brant D., 5,468,085, Cl. 402-79.000.
Avionic Displays Corporation: *See*—
Dunn, William R., 5,467,533, Cl. 33-348.000.
Aydin, Oral; Portugall, Michael; Neutzner, Josef; and Maechtle, Walter, to BASF Aktiengesellschaft. Aqueous polymer dispersion having a broad particle size distribution. 5,468,799, Cl. 524-457.000.
Ayuzawa, Nobuo: *See*—
Ishizawa, Kenki; Ayuzawa, Nobuo; Shiranita, Akira; and Takai, Masamichi, 5,468,696, Cl. 501-98.000.
Ayyildiz, Metin: *See*—
Dohrmann, Wolfgang; and Ayyildiz, Metin, 5,468,033, Cl. 293-133.000.
Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A.: *See*—
Zanini, Gianpietro; Vesentini, Renzo; and Corniani, Carlo, 5,467,527, Cl. 29-773.000.
Azuma, Seiichiro: *See*—
Nishizawa, Hirotaka; Azuma, Seiichiro; Ootoshi, Kazuaki; Miyama, Masataka; Kawata, Shuji; Kasahara, Osamu; and Suzuki, Sinichi, 5,468,989, Cl. 257-517.000.
B. F. Goodrich Company, The: *See*—
Adams, Daniel J.; Amjad, Zahid; Lemma, Solomon; and Long, Carl J., II, 5,468,797, Cl. 524-379.000.
Goodall, Brian L.; Benedikt, George M.; McIntosh, Lester H., III; and Barnes, Dennis A., 5,468,819, Cl. 526-171.000.

Baba, Yasushi: *See*—
Fujita, Shuji; Baba, Yasushi; Itoh, Hitoshi; and Satoma, Shiro, 5,467,725, Cl. 112-162.000.

Baba, Yoshisuke: *See*—
Tsujimoto, Nohiro; Hongyo, Kenichi; Baba, Yoshisuke; Suzuki, Michinori; and Akikawa, Kazuhiro, 5,468,822, Cl. 526-340.100.

Babcock, John W. Segmental, anchored, vertical precast retaining wall system. 5,468,098, Cl. 405-262.000.

Babour, Kamal; Belani, Ashok K.; and Pilla, Jacques, to Schlumberger Technology Corporation. Methods and apparatus for long term monitoring of reservoirs. 5,467,823, Cl. 166-250.010.

Bachand, David P.; and McNamara, Gerald P., to IPEC Advanced Systems, Inc. Recyclable abrasive blasting system. 5,468,174, Cl. 451-75.000.

Bachy, André; Fraisse, Laurent; Keane, Peter; Mendes, Etienne; Vernieres, Jean-Claude; and Simiand, Jacques, to Elf Sanofi. Heterocycle-coupled substituted pyrrolo[3,2-c]pyridin-2-carboxylic acids. 5,468,750, Cl. 514-255.000.

Bacon, Edward R.; Daum, Sol J.; Estep, Kimberly G.; Josef, Kurt A.; Douty, Brent D.; and Illig, Carl R., to Sterling Winthrop, Inc. Compositions of iodophenyl sulfonates for X-ray visualization of the gastrointestinal tract. 5,468,466, Cl. 424-9.450.

Bader, Mansour S. Precipitation and separation of salts, scale salts, and norm contaminant salts from saline waters and saline solutions. 5,468,394, Cl. 210-729.000.

Badyal, Rajeev; and Linn, Scott, to Hewlett-Packard Corporation. Static current testing apparatus and method for current steering logic (CSL). 5,469,076, Cl. 326-16.000.

Bae, Sang M., to Hyundai Electronics Industries Co., Ltd. Photomask having patterns to reduce power of a stepper. 5,468,577, Cl. 430-5.000.

BAeSEMA Ltd.: *See*—
Morgan, Peter C.; Hart, Alan D.; and Morgans, Philip D., 5,468,446, Cl. 419-64.000.

Bagnall, Arthur: *See*—
Bardsley, Harold B.; and Bagnall, Arthur, 5,467,724, Cl. 112-80.700.

Bahjat, Zuhair S.: *See*—
Powell, Bruce A.; Stanley, Jannah; Kupersmith, Bertram F.; Sahara, Masanori; Simcik, Paul; and Bahjat, Zuhair S., 5,467,844, Cl. 187-387.000.

Bahng, Sam-yong; and Kim, Suk-ki, to Samsung Electronics Co., Ltd. Floating detection circuit. 5,469,086, Cl. 327-18.000.

Bai, Zhi-ping: *See*—
Okabayashi, Minahiro; and Bai, Zhi-ping, 5,468,738, Cl. 514-63.000.

Bailey, David S.; Mura, Albert J., Jr.; and Eiff, Shari L., to Eastman Kodak Company. Hydrogen bond accepting groups on thermal solvents for image separation systems. 5,468,587, Cl. 430-203.000.

Bailey, William H.; Byers, Lonnie L.; Holley, Robert G.; Lamie, James M.; Sparks, Robert M.; West, Mike L.; and Storey, Richard P., to Nuclear Fuel Services, Inc. Air quality monitoring system and process. 5,468,968, Cl. 250-435.000.

Baker, Charles L., Jr.; Chu, Cynthia T.; Mazzone, Dominick N.; and Page, Nancy M., to Mobil Oil Corporation. Lubricant hydrocracking process. 5,468,368, Cl. 208-58.000.

Baker, George D.; and Henry, V. Russell, to Liquid Air Corporation. Refill-preventing valve for non-refillable containers. 5,467,798, Cl. 137-614.200.

Baker Hughes Incorporated: *See*—
Grimes, Robert E.; Scott, Danny E.; and Pessier, Rudolf C. O., 5,467,836, Cl. 175-401.000.
Meyer, Wallace H., Jr., 5,469,062, Cl. 324-338.000.

Baker, Jay D.: *See*—
Reddy, Prathap A.; Baker, Jay D.; and Kneisel, Larry L., 5,469,329, Cl. 361-704.000.

Bakhtiari, Sasan: *See*—
Gopalsami, Nachappa; Bakhtiari, Sasan; Raptis, Apostolos C.; and Dieckman, Stephen L., 5,468,964, Cl. 250-393.000.

Balakrishnan, Balu, to Power Integrations, Inc. Plastic quad-packaged switched-mode integrated circuit with integrated transformer windings and mouldings for transformer core pieces. 5,469,334, Cl. 361-782.000.

Balaschak, Edward J.; Scott, Curtis E.; and Sakoske, George E., to General Electric Company. Means for supporting and sealing the lead structure of a lamp and method for making such lamp. 5,468,168, Cl. 445-26.000.

Balch, Richard A.: *See*—
Atherton, Kenneth W.; Grogan, Kevin P.; Balch, Richard A.; and Plis, Mark J., 5,469,153, Cl. 340-870.280.

Baldwin, Joseph C.: *See*—
Shofner, Frederick M.; Chu, Youe-T; Baldwin, Joseph C.; Galyon, Michael E.; Kacenas, Benjamin M.; and Williams, Gordon F., 5,469,253, Cl. 356-238.000.

Bales, Daniel A.; and Hartman, Mark L., to United Technologies Corporation. Method of making a tubular thermal structure. 5,467,528, Cl. 29-890.010.

Ban, Cozy, to Mitsubishi Denki Kabushiki Kaisha. Apparatus for manufacturing ultrapure water. 5,468,350, Cl. 202-176.000.

Banks, Bernard J.; Dutton, Christopher J.; and Goudie, Alexander C., to Pfizer Inc. Benzimidazole anthelmintic agents. 5,468,765, Cl. 514-395.000.

Bantien, Frank: *See*—
Reihlen, Eckart; Marek, Jiri; Bantien, Frank; Findler, Guenther; Offenberg, Michael; Kleinhans, Josef; Konzelmann, Uwe; and Ziegenbein, Botho, 5,467,649, Cl. 73-204.260.

Bar Ilan University: *See*—
Yehuda, Shlomo, 5,468,776, Cl. 514-560.000.

Baranowska-Kortylewicz, Janina, to Board of Regents University of Nebraska. Synthesis of 5-radiohalo-2'-deoxyuridine. 5,468,853, Cl. 536-28.550.

Barat, Didier: *See*—
Simon, Jean-Michel; and Barat, Didier, 5,468,055, Cl. 301-6.910.

Barber, Harold P.; and Lee, Clyde. Method and apparatus for seismic exploration. 5,469,404, Cl. 367-23.000.

Barboza, Steven D.; Seeley, William P.; and Shucosky, Anthony C., to Memtec America Corporation. Gas backwash of pleated filters. 5,468,397, Cl. 210-798.000.

Bard, Simon: *See*—
Alexander, Edward R.; Goldman, Ron; Li, Yajun; Bard, Simon; Strat, Askold; Katz, Joseph; and Metlitsky, Boris, 5,468,952, Cl. 235-492.000.

Bardsley, Harold B.; and Bagnall, Arthur, to Spencer Wright Industries, Inc. Yarn jerker and threader guide for tufting machines. 5,467,724, Cl. 112-80.700.

Barens, Ivor. Variable-speed gear mechanism. 5,467,660, Cl. 74-351.000.

Barham, William F.: *See*—
Davis, James A.; Kane, Edward G.; Alexander, Brian S.; and Barham, William F., 5,468,550, Cl. 428-327.000.

Barino, Luisa: *See*—
Morini, Giampiero; Albizzati, Enrico; Giannini, Umberto; Scordamaglia, Raimondo; and Barino, Luisa, 5,468,704, Cl. 502-115.000.

Barkan, Edward: *See*—
Swartz, Jerome; Shepard, Howard M.; Barkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward; and Adelson, Alexander M., 5,468,949, Cl. 235-472.000.

Barkan, Eric F.: *See*—
Swartz, Jerome; Shepard, Howard M.; Barkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward; and Adelson, Alexander M., 5,468,949, Cl. 235-472.000.

Barker, Susan; Chu, I-Hsi; Fedun, Oresta N.; and Tyndorf, Tadeusz A., to Becton, Dickinson and Company. Cell culture insert. 5,468,638, Cl. 435-304.100.

Barmag AG: *See*—
Binner, Tobias; and Schafer, Klaus, 5,469,149, Cl. 34-677.000.

Barnard, Michael A.: *See*—
Beugelsdyk, Anthony F.; and Barnard, Michael A., 5,467,583, Cl. 56-10.800.

Barnes, Dennis A.: *See*—
Goodall, Brian L.; Benedikt, George M.; McIntosh, Lester H., III; and Barnes, Dennis A., 5,468,819, Cl. 526-171.000.

Barnes, Keith D.; Kamhi, Victor M.; and Diehl, Robert E., to American Cyanamid Company. Haloalkylthio, -sulfinyl and -sulfonyl arylpyrrole insecticidal and acaricidal agents. 5,468,877, Cl. 548-543.000.

Barnes, Michael W.: *See*—
Taylor, Robert D.; Deppert, Thomas M.; and Barnes, Michael W., 5,467,715, Cl. 102-289.000.

Barnett, Michael L.; and Brader, Larry G. Method and apparatus for monitoring water flow in a marine engine cooling water system and a bilge water pumping system. 5,467,643, Cl. 73-116.000.

Barr, David P.: *See*—
Aust, Steven D.; Barr, David P.; Grover, Thomas A.; Shah, Manish M.; and Chung, Namhyun, 5,468,628, Cl. 435-168.000.

Barrett, Alan J.; Buttle, David J.; and Rich, Daniel H., to Boots Company PLC, The. Pharmaceutical composition of purified chymopapain. 5,468,480, Cl. 424-94.650.

Bartochevichi, Y. E.: *See*—
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburobe, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.

Barton, James C.; Lueschow, Kevin J.; and Stratton, Ken L., to Caterpillar Inc. Automatic lift and tip coordination control system and method of using same. 5,467,829, Cl. 172-4.500.

Bartzick, Gerd; Naydowski, Reinhard; and Werk, Jürgen, to Fried. Krupp AG Hoesch-Krupp. Article strapping arrangement with a synchronous motors connected to a frequency converter. 5,467,701, Cl. 100-4.000.

Barwin, David A.: *See*—
Hennessee, Robert P.; Flaishans, Gary B.; Rudzewicz, Robert G.; and Barwin, David A., 5,467,605, Cl. 62-133.000.

BASF Aktiengesellschaft: *See*—
Aydin, Oral; Portugall, Michael; Neutzner, Josef; and Maechtle, Walter, 5,468,799, Cl. 524-457.000.
Ebel, Klaus; Schroeder, Juergen; Groening, Carsten; Dockner, Toni; and Merkle, Hans R., 5,468,871, Cl. 548-373.100.
Götz, Walter; and Gottschalk, Axel. 5,468,530, Cl. 428-36.400.
Grafen, Paul; Kiefer, Hans; and Jaedicke, Hagen, 5,468,883, Cl. 549-411.000.
Wenderoth, Bernd; Brand, Siegbert; Schuetz, Franz; Kuekenhoehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,468,717, Cl. 504-130.000.

BASF Corporation: *See*—
Fishback, Thomas L.; and Lee, Thomas B., 5,468,420, Cl. 252-182.240.
Lisa, Rudolph E.; Kilbride, Terence K.; and Jager, Karl-Friedrich, 5,468,720, Cl. 504-236.000.

BASF Lacke + Farben AG: *See*—
Loerzer, Thomas; Telser, Thomas; Zwez, Thomas; and Albert, Bernhard, 5,468,596, Cl. 430-306.000.

Bashirzadeh, Ramin. Method of using informational playing cards. 5,467,997, Cl. 273-302.000.
Basile, Pauline R. Doll including recorded message means. 5,468,172, Cl. 446-299.000.
Bass, Michael, to University of Central Florida. Surfaced detection system for airports. 5,469,371, Cl. 364-550.000.
Bastien, Ernest J. Diffuser for hair dryer. 5,467,540, Cl. 34-97.000.
Bates, Donald C., to Southern California Edison. Pressure sealed chain. 5,468,376, Cl. 210-160.000.
Battelle Memorial Institute: *See*—
Linehan, John C.; Yonker, Clement R.; Zemanian, Thomas S.; and Franz, James A., 5,469,061, Cl. 324-321.000.
Battles, Amy: *See*—
Linder, Benjamin; Lee, Don; Battles, Amy; and Thomas, Bradley S., 5,468,022, Cl. 283-072.000.
Baudou, Joël; and Vitte, Vincent, to Sextant Avionique. Support system for at least one visor on a helmet. 5,467,480, Cl. 2-6.500.
Bauer, William, Jr.; Quiros, Nelson I.; and Upmacis, Rita K. Process for purifying α,β-unsaturated esters. 5,468,899, Cl. 560-218.000.
Bauman, Thomas G.: *See*—
Rowlands, Kenneth C.; and Bauman, Thomas G., 5,467,549, Cl. 42-42.030.
Baumann, Hans-Martin; and Müller, Rolf, to Papst Licensing GmbH. Frequency monitoring device. 5,469,148, Cl. 340-658.000.
Baumert, Robert J.; and Joh, Clarence C., to At&T IPM Corp. Method of transmitting signals in an extendible local area network. 5,469,438, Cl. 370-85.110.
Baumfolder Corporation: *See*—
Kinson, Robert D., Jr., 5,467,677, Cl. 83-155.000.
Baxter-Lowe, Lee A.; and Gorski, Jack A., to Blood Center Research Foundation, Inc., The. Method for HLA typing. 5,468,611, Cl. 435-6.000.
Bayer AG: *See*—
Boehmke, Günther; and Schmitz, Gerd, 5,468,838, Cl. 528-363.000.
Bayer Aktiengesellschaft: *See*—
Bütje, Kai; and Kischkewitz, Jürgen, 5,468,463, Cl. 423-612.000.
Gebauer, Herbert; Gupta, Pramod; and König, Christian, 5,468,783, Cl. 521-159.000.
Hassenrück, Karin; and Wild, Peter, 5,468,848, Cl. 534-759.000.
Petersen, Uwe; Himmler, Thomas; Schenke, Thomas; Krebs, Andreas; Grobe, Klaus; Bremm, Klaus-Dieter; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 5,468,742, Cl. 514-187.000.
Petersen, Uwe; Grobe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 5,468,861, Cl. 546-156.000.
Probst, Joachim; Novotny, Fritz; Träubel, Harro; and Heiliger, Ludger, 5,468,257, Cl. 8-436.000.
Schmalstieg, Lutz; Kremer, Wolfgang; Brahm, Martin; Probst, Joachim; and Kubitza, Werner, 5,468,804, Cl. 524-591.000.
Schohe-Loop, Rudolf; Heine, Hans-Georg; Junge, Bodo; Glaser, Thomas; De Vry, Jean M. V.; Dompert, Wolfgang; and Sommermeyer, Henning, 5,468,882, Cl. 549-407.000.
Schrader, Lutz; Jakob, Hans-Dieter; Müller, Hanns-Peter; and Niggemann, Johann, 5,468,832, Cl. 528-53.000.
Schwindt, Jürgen; Hentschel, Karl-Heinz; and Schmalstieg, Lutz, 5,468,833, Cl. 528-67.000.
Bayer Corporation: *See*—
Benezra, Jeffrey; and Malin, Michael J., 5,468,640, Cl. 436-66.000.
Hatch, Robert P.; and Radtke, Marilyn J., 5,468,641, Cl. 436-97.000.
Hurley, Michael F.; Lau, Clifford J.; and Lee, Bin, 5,468,432, Cl. 264-45.300.
Bayer, Heiner; Lehner, Barbara; and Rogalli, Michael, to Siemens Aktiengesellschaft. Radiation-curable reaction resin system. 5,468,786, Cl. 522-170.000.
Baylis, Keith: *See*—
Arnold, Kevin E.; and Baylis, Keith, 5,468,091, Cl. 405-154.000.
Bayraktaroglu, Burhan, to Texas Instruments Incorporated. Method of making multilayer base heterojunction device having one of base layer as a diffusion barrier between base-emitter junction. 5,468,658, Cl. 437-31.000.
Bazzaz, Paul, to U.S. Philips Corporation. Device for recursive processing of a video signal, comprising a plurality of branches. 5,469,214, Cl. 348-416.000.
Beales, Jonathan T., to International Paper Company. Paperboard box with locking tab. 5,467,916, Cl. 229-195.000.
Beard Industries, Inc.: *See*—
Lentz, Thomas D., 5,467,535, Cl. 34-168.000.
Beaubien, Pierre: *See*—
Goulet, Richard; Forest, Claude; Landry, Michel; Beaubien, Pierre; Finkelstein, Michael; and Vaidya, Vivek V., 5,467,928, Cl. 239-404.000.
Beautement, Kevin: *See*—
Buckley, Alan J.; Huchings, Michael G.; Ferguson, Ian; Beautement, Kevin; Clough, John M.; Crowley, Patrick J.; Godfrey, Christopher R. A.; deFraine, Paul J.; Anthony, Vivienne M.; and Heaney, Stephen P., 5,468,857, Cl. 544-298.000.
Becher, Mark; and Charron, Kenneth R., to Charron Sports Services, Inc. Drive unit for movement of telescopic seating system. 5,467,840, Cl. 180-251.000.
Beck, John W. Portable pitching mound. 5,467,977, Cl. 273-25.000.
Beck, Niels J.; Pena, James A.; Roach, Alan R.; and Johnston, Bevan H., to Servojet Electronic Systems, Ltd. Accumulator fuel injection system. 5,467,754, Cl. 123-467.000.
Becker, James A.; Fritsch, Ronald J.; Holland, Richard J.; and Klobuchar, Robert F., to Eaton Corporation. Handle lock for reciprocally movable operator handle. 5,467,622, Cl. 70-203.000.
Becktel, David C.; Newman, Harry B.; and Moldenhauer, Phillip E., to Caterpillar Inc. Apparatus for extruding a viscous material. 5,468,137, Cl. 425-381.000.
Becton, Dickinson and Company: *See*—
Barker, Susan; Chu, I-Hsi; Fedun, Oresta N.; and Tyndorf, Tadeusz A., 5,468,638, Cl. 435-304.100.
Williams, Joel L.; Burkett, Susan L.; and McGuire, Shel, 5,468,520, Cl. 427-560.000.
Bee, Edward C.: *See*—
Smith, Douglas S.; and Bee, Edward C., 5,469,104, Cl. 327-491.000.
Beglin, Thomas W., to International Business Machines Corporation. Prioritizing pending read requests in an automated storage library. 5,469,560, Cl. 395-439.000.
Begum, Syeda R.; and Symons, Robert S., to Litton Systems, Inc. Extended interaction output circuit using modified disk-loaded waveguide. 5,469,022, Cl. 315-5.390.
Behrens, Klaus F. A.: *See*—
Metz-Stavenhagen, Peter; and Behrens, Klaus F. A., 5,468,241, Cl. 606-61.000.
Behringer, Mark R. Christmas tree clamping stand. 5,467,959, Cl. 248-523.000.
Beight, Douglas W.: *See*—
Flynn, Gary A.; and Beight, Douglas W., 5,468,745, Cl. 514-214.000.
Belani, Ashok K.: *See*—
Babour, Kamal; Belani, Ashok K.; and Pilla, Jacques, 5,467,823, Cl. 166-250.010.
Belden, Tighe M.: *See*—
Dretzka, Philip C.; Belden, Tighe M.; Reshanov, Eugene N.; and Samuelson, Bruce E., 5,468,332, Cl. 156-527.000.
Belfort, Georges: *See*—
Crivello, James V.; Belfort, Georges; and Yamagishi, Hideyuki, 5,468,390, Cl. 210-490.000.
Bell Atlantic Network Services, Inc.: *See*—
Emery, Mark J.; Tucker, Brenda N.; and Schwartz, Laurie D., 5,469,496, Cl. 379-58.000.
Bell Communications Research, Inc.: *See*—
McAuley, Anthony J., 5,469,433, Cl. 370-60.000.
Bell, David, to Eclipse Blinds Limited. Blind or curtain suspension system. 5,467,808, Cl. 160-168.100.
Bellsouth Corporation: *See*—
Beyersmith, Stacy C., 5,467,955, Cl. 248-219.300.
Belmont, Brian V.: *See*—
Tucker, Brian B.; and Belmont, Brian V., 5,469,554, Cl. 395-420.000.
Beloit Technologies, Inc.: *See*—
Blackledge, James; Salvai, Nazzareno; and Turner, James A., 5,468,348, Cl. 162-132.000.
Dodd, John, 5,467,931, Cl. 241-261.200.
Belvac Production Machinery, Inc.: *See*—
Bowlin, Geoffrey R.; Schill, Joseph G.; and Henzel, Alexander A., 5,467,628, Cl. 72-126.000.
Benalikhodja, Karim, to IMAJE. Sealed piston pump. 5,468,128, Cl. 417-413.100.
Benedikt, George M.: *See*—
Goodall, Brian L.; Benedikt, George M.; McIntosh, Lester H., III; and Barnes, Dennis A., 5,468,819, Cl. 526-171.000.
Benezra, Jeffrey; and Malin, Michael J., to Bayer Corporation. Cyanide-free hemoglobin reagent. 5,468,640, Cl. 436-66.000.
Bennett, Clyde T.: *See*—
Dowell, Floyd E.; Sheppard, Harry T.; Dettore, Lawrence A.; and Bennett, Clyde T., 5,467,700, Cl. 99-570.000.
Bennett, Larry G.: *See*—
Mattingly, Phillip G.; and Bennett, Larry G., 5,468,646, Cl. 436-501.000.
Bennett, Tommy L. Remotely activated location identifying arrow attachment. 5,468,000, Cl. 273-416.000.
Bensalem, Azzedine; Deevi, Sarojini; Deevi, Seetharama C.; and Schleich, Donald M., to Philip Morris Incorporated. Method for making a carbonaceous heat source containing metal oxide. 5,468,266, Cl. 44-542.000.
Bentley-Harris Manufacturing Company, The: *See*—
Lusen, Leonard; and Ebersole, Tammy S., 5,467,802, Cl. 139-384.00R.
Benton, Robert L.: *See*—
Lange, David A.; Benton, Robert L.; Welling, William E.; and Muggleston, Peter R., 5,467,662, Cl. 74-459.000.
Berg, Matthias: *See*—
Antony, Paul; Falter, Wolfgang; Kiessig, Andreas; and Berg, Matthias, 5,467,847, Cl. 188-73.390.
Bergelson, Michael N.; and Naydenov, Nartzis, to Paceart Associates, L.P. Cardiac patient remote monitoring using multiple tone frequencies from central station to control functions of local instrument at patient's home. 5,467,773, Cl. 128-709.000.
Bergman, Adam S.; and Drew, Douglas A., to Sensormatic Electronics Corporation. Electronic article surveillance system having enhanced tag deactivation capacity. 5,469,142, Cl. 340-572.000.
Bergman, Scott I.: *See*—
Hensler, Scott E.; Bergman, Scott I.; and Costello, Mike P., 5,469,133, Cl. 340-407.100.

Bergstrom, Debora F.; Burns, Gary T.; and Giwa-Agbomeirele, Patricia A., to Dow Corning Corporation. In-situ reinforced silicone elastomer using resin precursor. 5,468,829, Cl. 528-18.000.

Berkhan, Ernst; and Muth, Hubert, to Desaga GmbH. Method for mixing liquid media having different specific weights. 5,468,067, Cl. 366-208.000.

Berlin, Kenneth D.; Garrison, Gregory L.; Sangiah, Subbiah; Clarke, Cyril R.; Chen, Chun-Lin; Lazzara, Ralph; Scherlag, Benjamin J.; Patterson, Eugene S.; and Burrows, George E., to Board of Regents of Oklahoma State University Physical Sciences, The. N-alkyl and n-acyl derivatives of 3,7-diazabicyclo-[3.3.1]nonanes and selected salts thereof as multi-class antiarrhythmic agents. 5,468,858, Cl. 546-18.000.

Bermas, Edward M., to Harrison-Clifton Inc. Refrigerator freshener. 5,468,447, Cl. 422-5.000.

Bernardon, Jean-Michel: *See*—
Shroot, Braham; Bernardon, Jean-Michel; and Pilgrim, William R., 5,468,897, Cl. 560-18.000.

Berner, Bret: *See*—
Kydonieus, Agis; Shah, Kishore R.; and Berner, Bret, 5,468,501, Cl. 424-443.000.

Berney, Jean-Claude, to Eta Sa Fabriques d'Ebauches. Watch with date dial. 5,469,410, Cl. 368-28.000.

Bernhardt, Bruno, to leg Industrie-Engineering GmbH. Method of circulating ground water in ground regions with a fall of ground water level. 5,468,097, Cl. 405-52.000.

Berson, William; and Zemlok, Kenneth C., to Pitney Bowes Inc. Apparatus for verifying an identification card and identifying a person by means of a biometric characteristic. 5,469,506, Cl. 380-23.000.

Berthe, Marie-Christine; Caubere, Paul; and Fort, Yves, to Atochem. Triazines substituted with thioalkylmethacrylate groups. 5,468,856, Cl. 544-219.000.

Bertin, Claude L.; DiMaria, Donelli J.; Miyakawa, Makoto; and Sakaue, Yoshinori, to International Business Machines Corporation. Method of fabricating three-dimensional direct-write EEPROM arrays. 5,468,663, Cl. 437-43.000.

Bertrand, Dominique: *See*—
Gatto, Jean-Marie; and Bertrand, Dominique, 5,468,943, Cl. 235-454.000.

Beru Ruprecht GmbH & Co. KG: *See*—
Eller, Martin, 5,468,933, Cl. 219-270.000.

Best, Kenneth E.: *See*—
Nolte, Douglas A.; Vetter, Gregory J.; Best, Kenneth E.; and Krampotich, Dennis J., 5,467,503, Cl. 16-115.000.

Betz Laboratories, Inc.: *See*—
Clavin, J. Steven; Peters, Bradley J.; and Schrandt, Henry M., 5,468,377, Cl. 210-167.000.
Rodzewich, Edward A., 5,468,412, Cl. 252-106.000.
Whitekettle, Wilson K.; Petrille, Joseph C.; and Werner, Michael W., 5,468,739, Cl. 514-75.000.

Betz PaperChem, Inc.: *See*—
Zidovec, Davor F.; Fisher, Alexander D., deceased, 5,468,393, Cl. 210-697.000.

Beuch, Donald: *See*—
Reichert, Ronald E.; and Beuch, Donald, 5,468,116, Cl. 414-607.000.

Beugelsdyk, Anthony F.; and Barnard, Michael A., to Wescon Products Company. Dual actuator control assembly and method of dual action control assembly utilization. 5,467,583, Cl. 56-10.800.

Beveridge, Gregory J., to U S West Advanced Technologies, Inc. Method and apparatus for delivering secured telephone service in hybrid coaxial cable network. 5,469,495, Cl. 379-56.000.

Beyersmith, Stacy C., to Bellsouth Corporation. Antenna mounting platform for a monopole tower. 5,467,955, Cl. 248-219.300.

Bezek, John D., to International Business Machines Corporation. Algorithm for the implementation of Ziv-Lempel data compression using content addressable memory. 5,469,161, Cl. 341-51.000.

Bezwada, Rao S.; and Scopelianos, Angelo G., to Ethicon, Inc. Elastomeric medical device. 5,468,253, Cl. 606-230.000.

BF Goodrich FlightSystem, Inc.: *See*—
Schleder, William E.; and Eggleston, Albert D., 5,469,172, Cl. 342-174.000.

Bhattacharya, Dipankar: *See*—
Ghosh, Subir K.; and Bhattacharya, Dipankar, 5,469,555, Cl. 395-460.000.

Bianca, Joseph D.: *See*—
Bozzuto, Carl R.; Bianca, Joseph D.; and Siddall, Walter F., 5,467,591, Cl. 60-39.020.

Biavasco, Raffaella; Kirk, Mark; and Giribone, Giovanni, to Minnesota Mining and Manufacturing Company. Silver halide photographic material with reduced fog and improved residual stain. 5,468,599, Cl. 430-512.000.

Bicking, Robert E., to Honeywell Inc. Position sensor with two magnetically sensitive devices and two target tracks which are sensed in combination with each other to provide a synthesized signal. 5,469,054, Cl. 324-207.200.

Biegler, Robert M., to Minnesota Mining and Manufacturing Company. Filter for a photothermographic developer. 5,469,238, Cl. 354-300.000.

Biehle, Edward J., IV: *See*—
Paraschac, Joseph F.; and Biehle, Edward J., IV, 5,468,250, Cl. 606-205.000.

Bielli, Cristina: *See*—
Farooq, Amjad; Mehreteab, Ammanuel; Broze, Guy; and Bielli, Cristina, 5,468,398, Cl. 252-88.000.

BigToys, Inc.: *See*—
Keeler, Russell L.; and Underbrink, John M., 5,468,199, Cl. 482-35.000.

Billiar, Timothy R.; Nussler, Andreas K.; Geller, David A.; and Simmons, Richard L., to Commonwealth System of Higher Education, University of Pittsburg of the. cDNA clone for human inducible nitric oxide synthase and process for preparing same. 5,468,630, Cl. 435-189.000.

Billings, Ronald F.: *See*—
Dickens, Joseph C.; Billings, Ronald F.; and Payne, Thomas L., 5,468,770, Cl. 514-450.000.

Bilotti, Alberto: *See*—
Peppiette, Roger; and Bilotti, Alberto, 5,469,095, Cl. 327-110.000.

Bimbot, Frédéric; and Mathan, Luc, to France Telecom Etablissement Autonome de Droit Public. Process for measuring the resemblance between sound samples and apparatus for performing this process. 5,469,529, Cl. 395-2.550.

Binner, Tobias; and Schafer, Klaus, to Barmag AG. Method and apparatus for producing a wound package of an endless thermoplastic material. 5,469,149, Cl. 34-677.000.

Biogal Gyógyszergyár RT: *See*—
Szalóki, Erzsébet; Kristóf, Ilona; Pál, Veronika; and Szabó, Eva, 5,468,492, Cl. 424-195.100.

Biological Monitoring, Inc.: *See*—
Gradzki, Pawel; Kaynor, Mark; and Gruber, David, 5,469,144, Cl. 340-603.000.

BioNumerik Pharmaceuticals, Inc.: *See*—
Hausheer, Frederick H.; and Haridas, Kochat, 5,468,754, Cl. 514-283.000.

Biostar, Inc.: *See*—
Bogart, Gregory R.; Moddel, Garret R.; Maul, Diana M.; and Ener, Jeffrey B., 5,468,606, Cl. 435-5.000.

Bircann, Raul A.; and Palmer, Dwight O., to General Motors Corporation. Actuator for an exhaust gas recirculation valve. 5,467,962, Cl. 251-129.150.

Birchler, Mark A.; Jasper, Steven C.; and Wilson, Timothy J., to Motorola, Inc. Method and apparatus for mitigating distortion effects in the determination of signal usability. 5,469,465, Cl. 375-346.000.

Birkmeyer, William J.: *See*—
Wilt, Truman F.; Carney, Joseph M.; Thomas, Stephen J.; Claar, James A.; and Birkmeyer, William J., 5,468,802, Cl. 524-539.000.

Bishop, Gary, to British Aerospace Public Limited Company. Surveillance system. 5,468,963, Cl. 250-372.000.

Bito, Shiro: *See*—
Tsuruta, Minoru; Suzuta, Toshihiko; Nakada, Akio; Kuramoto, Seiji; Hibino, Hiroki; Bito, Shiro; and Mukaizawa, Akito, 5,467,911, Cl. 227-175.000.

Bjarklev, Anders O.; and Rasmussen, Thomas P., to Lycom A/S. Method of amplifying an optical signal, an optical amplifier for performing the method, and use of such an optical amplifier as a source of light. 5,469,292, Cl. 359-341.000.

Bjarno, Ole-Christian: *See*—
Skov, Per Stahl; and Bjarno, Ole-Christian, 5,468,650, Cl. 436-527.000.

Bjordahl, James: *See*—
Slocum, Richard T.; Bjordahl, James; Louie, Danny; and Rasmussen, Donald, 5,469,310, Cl. 360-92.000.

Black, Peter J.: *See*—
Peterzell, Paul E.; Wilson, Nathaniel B.; and Black, Peter J., 5,469,115, Cl. 330-129.000.

Black River Manufacturing, Inc.: *See*—
Wehner, Timothy D., 5,467,664, Cl. 74-523.000.

Blackledge, James; Salvai, Nazzareno; and Turner, James A., to Beloit Technologies, Inc. Multi-ply web former and method. 5,468,348, Cl. 162-132.000.

Blaha, David L. Automatic call distribution with intersubnetwork customer information transfer system and method. 5,469,504, Cl. 379-265.000.

Blair, Thomas H.; and Lebby, Michael S., to Motorola, Inc. Fused optical layer and method of making. 5,468,582, Cl. 430-54.000.

Blake, Carl D.; and Harrar, Karl E., to Boeckeler Instruments, Inc. Extended communication cable for a light pen or the like. 5,468,921, Cl. 178-18.000.

Blake, James N.; Sanders, Glen A.; and Strandjord, Lee K., to Honeywell Inc. Fiber optic gyroscope output noise reducer. 5,469,257, Cl. 356-350.000.

Blake, Larry W., to Iovision, Inc. Intraocular lens injector. 5,468,246, Cl. 606-107.000.

Blanco GmbH & Co. KG: *See*—
Keller, Dieter; and Mück, Manfred, 5,467,695, Cl. 99-422.000.

Blank, Arthur M., to ImageWare Software, Inc. Image editing system including masking capability. 5,469,536, Cl. 395-131.000.

Blank, Robert G.: *See*—
Argiriadi, Andrew A.; Blank, Robert G.; and Giamalva, David H., 5,468,502, Cl. 424-456.000.

Bläse, Meinhard; and Mika, Helmut, to TRW Repa GmbH. Belt pretensioner with a pyrotechnic gas generator. 5,468,019, Cl. 280-805.000.

Blau, Reed J.: *See*—
Highsmith, Thomas K.; Hajik, Robert M.; Wardle, Robert B.; Lund, Gary K.; and Blau, Reed J., 5,468,866, Cl. 548-251.000.

Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; DeJean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre. Steroid/thyroid hormone receptor-related gene, which is inappropriately expressed in human heptocellular carcinoma, and which is a retinoic acid receptor. 5,468,617, Cl. 435-7.800.

Blend, Theodore: *See*—
Coe, Robert P.; and Blend, Theodore, 5,468,581, Cl. 430-22.000.

Blew, Douglas J.; and Carlson, Bruce J., to CommScope, Inc. Composite fiber optic and electrical cable and associated fabrication method. 5,469,523, Cl. 385-101.000.

Blind, Henry F.; Campagne, Anthony J.; Czekaj, James L.; Difiore, Nicholas L.; Geddes, Earl R.; Krochmal, Andrew C.; and Senyk, Myron L., to Ford Motor Company. Arbitration adjustment for acoustic reproduction systems. 5,469,510, Cl. 381-55.000.

Blinstrub, Robert M. Collapsible material handling container. 5,467,885, Cl. 220-6.000.

Blitz U.S.A., Inc.: *See*—
Chrisco, Larry L., 5,467,735, Cl. 119-51.500.

Bloker, Raymond E., to Cypress Semiconductor Corp. BiCMOS output driver. 5,469,084, Cl. 326-110.000.

Blood Center Research Foundation, Inc., The: *See*—
Baxter-Lowe, Lee A.; and Gorski, Jack A., 5,468,611, Cl. 435-6.000.

Blose, Thomas L.; Britten, David L.; Humphreys, Kevin J.; and Kaiser, Trent M. V., to Ipaco Enterprises Inc. Pipe coupling. 5,468,029, Cl. 285-328.000.

Blouin, Bernadette D. Method of cleaning an interior cavity of a container and a scrapper. 5,467,499, Cl. 15-236.050.

Blume, Peter; and Stehr, Roger, to MAAG Pump Systems AG. Method for cooling the shaft of a gear pump rotor, a gear pump rotor, and a gear pump comprising such a rotor. 5,468,131, Cl. 418-94.000.

Board of Governers of Wayne State University, The: *See*—
Chretien, Paul B.; and Mutchnick, Milton G., 5,468,729, Cl. 514-12.000.

Board of Regents Acting for and on Behalf of The University of Michigan, The: *See*—
Moyne, James R., 5,469,361, Cl. 364-468.000.

Board of Regents of Oklahoma State University Physical Sciences, The: *See*—
Bertin, Kenneth D.; Garrison, Gregory L.; Sangiah, Subbiah; Clarke, Cyril R.; Chen, Chun-Lin; Lazzara, Ralph; Scherlag, Benjamin J.; Patterson, Eugene S.; and Burrows, George E., 5,468,858, Cl. 546-18.000.

Board of Regents, The University of Texas System: *See*—
Hubbell, Jeffrey A.; Hill-West, Jennifer L.; and Dunn, Randall C., 5,468,505, Cl. 424-484.000.
Phillips, William T.; Schwartz, Joyce G.; and Green, Gary M., 5,468,727, Cl. 514-12.000.
Thompson, E. Brad; and Nazareth, Lynne V., 5,468,624, Cl. 435-69.100.

Board of Regents University of Nebraska: *See*—
Baranowska-Kortylewicz, Janina, 5,468,853, Cl. 536-28.550.

Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, The: *See*—
Cincotta, Anthony H.; and Meier, Albert H., 5,468,755, Cl. 514-288.000.

Boardman, Larry D.; Melancon, Kurt C.; Chau, Trang D.; and Erickson, John J., to Minnesota Mining and Manufacturing. Low coefficient of friction silicone release formulations incorporating higher alkenyl-functional silicone gums. 5,468,815, Cl. 525-478.000.

BOC Group, Inc., The: *See*—
McPherson, Mary C.; and Hozbor, Maria A., 5,468,560, Cl. 428-413.000.
Tamhankar, Satish S.; and Ramachandran, Ramakrishnan, 5,468,459, Cl. 423-240.00S.

BOC Group plc, The: *See*—
Watson, Richard W., 5,468,458, Cl. 423-222.000.

Bocci, Paul M.: *See*—
House, Robert W.; Bocci, Paul M.; and Edkins, James G., 5,469,472, Cl. 375-211.000.

Boeckeler Instruments, Inc.: *See*—
Blake, Carl D.; and Harrar, Karl E., 5,468,921, Cl. 178-18.000.

Boehmke, Günther; and Schmitz, Gerd, to Bayer AG. Process for the preparation of polysuccinimide, polyaspartic acid and their salts. 5,468,838, Cl. 528-363.000.

Boehringer Ingelheim Italia S.p.A.: *See*—
Cereda, Enzo; Ezhaya, Antoine; Turconi, Marco; Dubini, Enrica; and Maffione, Grazia, 5,468,758, Cl. 514-304.000.

Boeing Company, The: *See*—
Abbas, Gregory L.; Vertatschitsch, Edward J.; de La Chapelle, Michael; and Porter, Charles R., 5,467,942, Cl. 244-75.00R.
Chee, Wan T., 5,467,941, Cl. 244-54.000.
Dull, Dennis L., 5,468,409, Cl. 252-79.200.
Sanders, Daniel G., 5,467,626, Cl. 72-60.000.

Boek, Heather; Borrelli, Nicholas F.; and Hares, George F., to Corning Incorporated. Non-browning cathode ray tube glasses. 5,468,692, Cl. 501-64.000.

Boesten, Wilhelmus H. J.; and Broxterman, Quirinus B., to DSM N.V. Process for the preparation of optically active methionine amide. 5,468,901, Cl. 564-198.000.

Boeve, Gerard; and Verbeke, Gentil, to Agfa-Gevaert N. V. Image scanning apparatus. 5,469,205, Cl. 347-263.000.

Bogart, Gregory R.; Moddel, Garret R.; Maul, Diana M.; and Etter, Jeffrey B., to Biostar, Inc. Devices for detection of an analyte based upon light interference. 5,468,606, Cl. 435-5.000.

Boguslavski, Igor: *See*—
Solinov, Vladimir; and Boguslavski, Igor, 5,468,559, Cl. 428-410.000.

Bohland, John F., Jr.: *See*—
Calabrese, Gary S.; Calvert, Jeffrey M.; Chen, Mu-San; Dressick, Walter J.; Dulcey, Charles S.; Georger, Jacque H., Jr.; and Bohland, John F., Jr., 5,468,597, Cl. 430-315.000.

Böhner, Jürgen: *See*—
Reiners, Ulrich; Krallmann, Anton; Albinus, Eberhard; and Böhner, Jürgen, 5,468,563, Cl. 428-515.000.

Boland, Bernhard; and Hilfinger, Peter, to Braun Aktiengesellschaft. Brush for an electrically powered toothbrush. 5,467,495, Cl. 15-28.000.

Bolton, Theodore S.; and Stopyra, Stephen, to Carrier Corporation. Low profile room air conditioner indoor section construction. 5,467,610, Cl. 62-262.000.

Bolton, Theodore S.; and Michaels, John H., to Carrier Corporation. Seal for refrigerant tubing through air conditioner partition. 5,467,615, Cl. 62-498.000.

Bolton, Theodore S.; and Stopyra, Stephen, to Carrier Corporation. Snap-on air deflectors for air conditioner. 5,468,186, Cl. 454-202.000.

Boman, Bertho, to Golf Scoring Systems Unlimited, Inc. System and method for measuring distance between two objects on a golf course. 5,469,175, Cl. 342-357.000.

Bongardt, Frank: *See*—
Klein, Johann; Bongardt, Frank; and Schmid, Karl-Heinz, 5,468,405, Cl. 252-56.00R.
Schmid, Karl-Heinz; Bongardt, Frank; and Wuest, Reinhold, 5,468,406, Cl. 252-56.00S.

Boninsegni, Christian; and Geike, Hans-Georg, to H. Huck GmbH & Co. KG. Lipstick with replaceable waxstick case unit. 5,468,084, Cl. 401-78.000.

Bonnet, Jacqueline: *See*—
de Nanteuil, Guillaume; Vincent, Michel; Lila, Christine; Bonnet, Jacqueline; and Fradin, Armel, 5,468,761, Cl. 514-374.000.

Booda Products, Inc.: *See*—
O'Rourke, Anthony, 5,467,741, Cl. 119-710.000.

Boots Company PLC, The: *See*—
Barrett, Alan J.; Buttle, David J.; and Rich, Daniel H., 5,468,480, Cl. 424-94.650.

Borchardt, Horst, to Alten Gerättebau GmbH. Deformable sealing device for a gap between the edge of a wall opening and the back wall of a vehicle docking at the wall opening. 5,467,563, Cl. 52-173.200.

Borealis Holding A/S: *See*—
Koskinen, Jukka; and Garoff, Thomas, 5,468,698, Cl. 502-9.000.

Borg-Warner Automotive, Inc.: *See*—
Robbins, Francis B., 5,468,192, Cl. 474-28.000.

Boriani, Silvano; and Gamberini, Antonio, to G.D Societa' Per Azioni. Method and device for laterally joining product wrappings. 5,467,579, Cl. 53-477.000.

Borkowski, Rudolph: *See*—
Sandler, Sheldon; Crandall, Alan; Schwarzkopf, Daniel; Johnson, Gilbert; and Borkowski, Rudolph, 5,469,176, Cl. 342-375.000.

Born, Maurice: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; and Marchand, Pierre, 5,468,399, Cl. 252-18.000.

Borodychuk, Karen K.: *See*—
Newman, Thomas H.; and Borodychuk, Karen K., 5,468,818, Cl. 526-170.000.

Borowiak, Hervé: *See*—
LaGrange, Alain; and Borowiak, Hervé, 5,468,472, Cl. 424-62.000.

Borrelli, Nicholas F.: *See*—
Boek, Heather; Borrelli, Nicholas F.; and Hares, George F., 5,468,692, Cl. 501-64.000.

Borszyński, Wacław. Assembly for wet cleaning of combustion gases derived from combustion processes, especially the combustion of coal, coke and fuel oil. 5,468,270, Cl. 55-228.000.

Boschert, Jeff D. Apparatus for simulating a tide pool in an aquarium. 5,467,739, Cl. 119-247.000.

Bose Corporation: *See*—
Hanba, Michio, 5,468,922, Cl. 181-150.000.

Bose, Frank: *See*—
Patrick, Roger; Schoenborn, Philippe; Franklin, Mark; and Bose, Frank, 5,468,296, Cl. 118-723.0MP.

Bosio, Orlando, to AMFAG S.r.l. Aerator for liquids. 5,467,929, Cl. 239-428.500.

Bosse, Charles F.; and Kowligi, Rajagopal R., to IMPRA, Inc. Apparatus for stretching polymer films. 5,468,138, Cl. 425-383.000.

Boston, David R.: *See*—
Morrison, Eric D.; Boston, David R.; Hedrick, Steven T.; Kausch, William L.; Larson, Wayne K.; and Fung, Simon S., 5,468,498, Cl. 524-408.000.

Boual, Roland, to Giat Industries. Telescoped-type munition. 5,467,716, Cl. 102-434.000.

Bouboutou, Romaine; Dereu, Norbert; Evers, Michel; Gueguen, Jean-Christophe; James, Claude; Poujade, Christèle; Reisdorf, Daniel; Ribeill, Yves; and Soler, Françoise, to Rhone-Poulenc Rorer S.A. Lupane derivatives, their preparation and the pharmaceutical compositions which contain them. 5,468,888, Cl. 554-58.000.

Boucher, Didier: *See*—
Scarpitta, Alain A.; Boucher, Didier; and Grosso, Gilles, 5,469,406, Cl. 367-171.000.

Bourdelaise, Robert A.: *See*—
Conway, Harry E.; and Bourdelaise, Robert A., 5,469,331, Cl. 361-716.000.

Bourgeois, Jean-Marie, to SGS-Thomson Microelectronics, S.A. Pulse-controlled converter and electric motor controller. 5,469,041, Cl. 318-810.000.

Bowden's Automated Products, Inc.: *See*—
Winter, Robert A., 5,469,063, Cl. 324-508.000.

Bower, Lawrence J.; Delo, Ronald R.; and VanZeeland, Gerald D., to Newell Operating Company. Method and apparatus of manufacturing a paint roller. 5,468,207, Cl. 493-297.000.

Bowlin, Geoffrey R.; Schill, Joseph G.; and Henzel, Alexander A., to Belvac Production Machinery, Inc. Can bottom reprofiler. 5,467,628, Cl. 72-126.000.

Bowman, Timothy; Domigan, Charles N.; Hadfield, Robert W.; Harmon, J. David; and Sheridan, James E., to Walker Systems, Inc. Method and apparatus for improved activation of services in an office building floor. 5,467,565, Cl. 52-220.100.

Bowman, Timothy S.: *See*—
Arthur, Richard L.; Bowman, Timothy S.; and Harmon, J. David, 5,468,908, Cl. 174-48.000.

Boyd, Victoria L.; Bozzini, MeriLisa; and Loudon, G. Marc, to Perkin-Elmer. Acetic anhydride activation for C-terminal protein sequencing. 5,468,843, Cl. 530-345.000.

Boyles, George K. Line trimmer stabilizer. 5,467,584, Cl. 56-12.700.

Bozzini, MeriLisa: *See*—
Boyd, Victoria L.; Bozzini, MeriLisa; and Loudon, G. Marc, 5,468,843, Cl. 530-345.000.

Bozzuto, Carl R.; Bianca, Joseph D.; and Siddall, Walter F., to Combustion Engineering, Inc. Gas turbine combined cycle system. 5,467,591, Cl. 60-39.020.

BP Chemicals (Additives) Limited: *See*—
Carlisle, William D., 5,468,404, Cl. 252-51.50R.
Cooley, Neil A.; and Kirk, Adrian P., 5,468,708, Cl. 502-162.000.

Brabor S.r.l.: *See*—
Brambilla, Romano, 5,468,442, Cl. 264-519.000.

Bracco International B.V.: *See*—
Tweedle, Michael F.; Strauss, Harry W.; and Nunn, Adrian D., 5,468,467, Cl. 424-9.361.

Braddick, Britt O., to TIW Corporation. Retrievable whipstock and method of use orientable. 5,467,819, Cl. 166-117.600.

Braden, Michael; Downes, Sandra; Patel, Mangala P.; and Davy, Kenneth W. M. Biomaterials for tissue repair. 5,468,787, Cl. 523-113.000.

Brader, Larry G.: *See*—
Barnett, Michael L.; and Brader, Larry G., 5,467,643, Cl. 73-116.000.

Brady, Mark J.; and Cerny, Darin G., to Minnesota Mining and Manufacturing Company. Method and apparatus for calibrating three-dimensional space for machine vision applications. 5,467,634, Cl. 73-1.00D.

Braet, Johan: *See*—
Bruggeman, Aimé; and Braet, Johan, 5,468,347, Cl. 159-47.300.

Brahm, Martin: *See*—
Schmalstieg, Lutz; Kremer, Wolfgang; Brahm, Martin; Probst, Joachim; and Kubitza, Werner, 5,468,804, Cl. 524-591.000.

Braithwaite, Paul C.: *See*—
Lund, Gary K.; and Braithwaite, Paul C., 5,467,714, Cl. 102-284.000.
Wallace, Ingvar A., II; Braithwaite, Paul C.; and Neidert, Jamie B., 5,468,313, Cl. 149-53.000.

Brambilla, Romano, to Brabor S.r.l. Apparatus and process for gauging and controlling extruded profiled elements. 5,468,442, Cl. 264-519.000.

Brammann, Dierk. Means for fastening artificial teeth. 5,468,150, Cl. 433-173.000.

Brand New Technology Limited: *See*—
Lee, Man H., 5,467,927, Cl. 239-383.000.

Brand, Nigel: *See*—
Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; DeJean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, 5,468,617, Cl. 435-7.800.

Brand, Siegbert: *See*—
Wenderoth, Bernd; Brand, Siegbert; Schuetz, Franz; Kuckenboehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,468,717, Cl. 504-130.000.

Brandner, James M.; Manulik, Robert J.; Meyer, Arthur J., III; and Schreiter, Mark E. Polling-type digital communications system having pseudo-balanced mode. 5,469,436, Cl. 370-85.200.

Brändström, Paul; and Nord, Runo, to Paul & Martha Brandstrom AB. Auxiliary device for sealing cans for beverages. 5,467,888, Cl. 220-319.000.

Brandt, Everett G.; Christensen, M. Kathryn; and Sahm, W. Charles, to Caterpillar Inc. Noise suppression enclosure for an engine. 5,467,747, Cl. 123-198.00E.

Branofilter GmbH: *See*—
Schmierer, Uwe, 5,468,272, Cl. 55-367.000.

Branson Ultrasonics Corporation: *See*—
Lotz, Wilfried; and Lovett, Donald C., 5,468,336, Cl. 156-580.200.
Mainolfi, Sylvio J.; Patry, Gerald F.; and Pensiero, Henry A., 5,468,335, Cl. 156-580.200.

Brant, William A.: *See*—
Hohenstein, Gerald L.; Nielson, Michael E.; Tang, Tin S.; Carmichael, Richard D.; and Brant, William A., 5,469,566, Cl. 395-182.040.

Brasz, Joost J., to Carrier Corporation. Two phase flow turbine. 5,467,613, Cl. 62-402.000.

Braun Aktiengesellschaft: *See*—
Boland, Bernhard; and Hilfinger, Peter, 5,467,495, Cl. 15-28.000.

Braun, Hans; Weinecke, Ulf; Maute, Kurt; and Strauss, Wolfgang, to Mercedes-Benz AG. Method of controlling engine output torque. 5,467,750, Cl. 123-350.000.

Braun, Hans-Jürgen, to Wella Aktiengesellschaft. Substitute 4-{4'-{bis-(B-hydroxyethyl)amino{phenylazo{-benzenesulfonic acid amides and hair dye compositions containing same. 5,468,256, Cl. 8-405.000.

Braun, William R.: *See*—
Hyman, Nelson L.; Braun, William R.; Garner, James C.; Larson, Lawrence R.; and Tuner, Sheleen M., 5,467,814, Cl. 165-41.000.

Braza, Joseph F.; and Larson, John A., to Torrington Company, The. Surface treated cast iron bearing element. 5,468,308, Cl. 148-321.000.

Bregoli, Lawrance J.; and Pearson, Mark L., to International Fuel Cells Corporation. Electrolyte paste for molten carbonate fuel cells. 5,468,573, Cl. 429-16.000.

Breivik, Kare; Smedal, Arne; and Syvertsen, Kare, to Den Norske Stats Oljeselskap A.S. System for rotatably mounting a vessel to a loading buoy. 5,468,166, Cl. 441-5.000.

Bremm, Klaus-Dieter: *See*—
Petersen, Uwe; Himmler, Thomas; Schenke, Thomas; Krebs, Andreas; Grobe, Klaus; Bremm, Klaus-Dieter; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 5,468,742, Cl. 514-187.000.

Bretz, Karl H.: *See*—
Derleth, Helmut; and Bretz, Karl H., 5,468,558, Cl. 428-402.000.

Brewer Company, The: *See*—
Hamilton, Steven D., 5,467,776, Cl. 128-730.000.

Brewer, William C.: *See*—
Daniel, Edward A.; Couchot, Norman J.; Keller, Daniel L.; and Brewer, William C., 5,467,705, Cl. 100-214.000.

Brick, Mary C.: *See*—
Miller, David D.; Brick, Mary C.; and Nair, Mridula, 5,468,598, Cl. 430-372.000.

Bridgestone Corporation: *See*—
Siegenthaler, Karl J., 5,468,319, Cl. 156-123.000.

Bridgestone/Firestone, Inc.: *See*—
Davis, James A.; Kane, Edward G.; Alexander, Brian S.; and Barham, William F., 5,468,550, Cl. 428-327.000.
Hoffman, Keith E.; Elliott, Robert F.; and Mickler, David J., 5,468,140, Cl. 425-389.000.

Briese, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Fouquet, Christophe J. A.; and Lowe, Coy S., to Schlumberger Industries, Inc. System checking and troubleshooting package for an electronic metering device. 5,469,049, Cl. 324-76.770.

Briggs, Karen A.: *See*—
McMurtrey, Kevin D., Sr.; Rossi, Arthur M.; Cichon, Robert J., Jr.; Briggs, Karen A.; and Ely, Jonathan C., 5,469,037, Cl. 318-626.000.

Brindle, Edward E.; Czudak, John C.; and Mensing, David B., to Xerox Corporation. Method for translating image processing data. 5,469,534, Cl. 395-114.000.

Brinkley, Paul: *See*—
Peterson, John P.; and Brinkley, Paul, 5,467,914, Cl. 228-102.000.

Briscoe, Stuart M.: *See*—
Williams, David; Briscoe, Stuart M.; and Melbourne, Keith, 5,467,641, Cl. 73-49.700.

Bristol-Myers Squibb Company: *See*—
Cipollina, Joseph A.; Matson, Ronald J.; and Sloan, Charles P., 5,468,767, Cl. 514-414.000.
Cipollina, Joseph A.; Gylys, Jonas A.; Matson, Ronald J.; and Sloan, Charles P., 5,468,768, Cl. 514-415.000.
Lam, Kin S.; Schroeder, Daniel R.; Mattei, Jacqueline; Forenza, Salvatore; and Matson, James A., 5,468,849, Cl. 536-18.500.

British Aerospace PLC: *See*—
Morgan, Peter C.; Hart, Alan D.; and Morgans, Philip D., 5,468,446, Cl. 419-64.000.

British Aerospace Public Limited Company: *See*—
Bishop, Gary, 5,468,963, Cl. 250-372.000.
Simpson, Hugo R.; and Campbell, Eric R., 5,469,549, Cl. 395-200.080.

British Broadcasting Corporation: *See*—
Chambers, John P., 5,469,207, Cl. 348-9.000.

British Technology Group Limited: *See*—
Stephenson, George R.; and Creaser, Colin S., 5,468,644, Cl. 436-163.000.

British Telecommunications: *See*—
Wade, Christopher A., 5,469,440, Cl. 370-110.100.

British Telecommunications public limited company: *See*—
Proud, Nicholas W.; and Freeman, Robert A., 5,467,968, Cl. 254-134.400.

Britten, David L.: *See*—
Blose, Thomas L.; Britten, David L.; Humphreys, Kevin J.; and Kaiser, Trent M. V., 5,468,029, Cl. 285-328.000.

Brodsky, William L.; and Herard, James D., to International Business Machines Corporation. Portable external flexible cable and package using same. 5,468,159, Cl. 439-501.000.

Brodsky, William L.; Herard, James D.; Macek, Thomas G.; Sharp, Timothy L.; and Shovlowsky, George J., to International Business Machines Corporation. Circuitized structure including flexible circuit with elastomeric member bonded thereto. 5,468,917, Cl. 174-255.000.

Brogmus, George E.: *See*—
Teare, Peter R.; Murphy, Patrice L.; and Brogmus, George E., 5,467,656, Cl. 73-862.541.

Brolund, Theodore F.; and Paquet, Eugene H., to W. A. Whitney Co. Apparatus for adjusting the stand-off height of a plasma arc torch or the like. 5,468,929, Cl. 219-121.560.

Brombach, Hansjoerg. Bending weir. 5,468,090, Cl. 405-94.000.

Brookes, Julian L.: *See*—
Hulick, Timothy P.; and Brookes, Julian L., 5,469,127, Cl. 332-149.000.

Brooks, Herbert B., to Hughes Missile Systems Company. Action calibration for firing upon a fast target. 5,467,682, Cl. 89-41.220.

Broschard, John L., III, to Whitaker Corporation, The. Mounting bracket for an electrical connector. 5,468,160, Cl. 439-567.000.

Broskow, James A.; and Marco, Leslie S., to Illinois Tool Works Inc. Wrapper, carrier, and handle assembly and package comprising same and containers. 5,467,870, Cl. 206-162.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Iwao, Naoto; and Yamada, Shoji, 5,469,289, Cl. 359-200.000.

Brown, David L.: *See*—
Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; Brown, David L.; and Holzwarth, Henry A., 5,468,252, Cl. 606-228.000.

Brown, Gary G.; Ghorashi, Hamid M.; and Shaffer, Donald E., to Du Pont de Nemours, E. I., and Company. Protective garments comprising an outer shell fabric of woven aramid fibers which elongate when exposed to a flame. 5,468,537, Cl. 428-101.000.

Brown, Gary L.: *See*—
Krishnamurthy, Suresh; McCormick, Robert A.; Cone, Kenneth F.; Brown, Gary L.; and Bryant, Ronald W., 5,469,188, Cl. 345-117.000.

Brown, Robert L.; Holodnak, John D.; McBride, Gene; and Mosley, Demmie L., to Drilling Measurements, Inc. Wireline swivel and method of use. 5,468,153, Cl. 439-13.000.

Brown, Ronny W. Ski and ski pole transport strap system. 5,468,036, Cl. 294-147.000.

Browne, Robert L.: *See*—
Goor, Dan; Harnisch, Robert P.; Browne, Robert L.; and Long, Stephen T., 5,468,047, Cl. 297-250.100.

Browning, David: *See*—
Scott, Michael; Browning, David; and Holt, Michael, 5,469,398, Cl. 365-221.000.

Broxterman, Quirinus B.: *See*—
Boesten, Wilhelmus H. J.; and Broxterman, Quirinus B., 5,468,901, Cl. 564-198.000.

Broze, Guy: *See*—
Farooq, Amjad; Mehreteab, Ammanuel; Broze, Guy; and Bielli, Cristina, 5,468,398, Cl. 252-88.000.

Bruce, Robert S.; and Hall, Christopher W. G., to Pilkington Aerospace Limited. Glass treatment. 5,468,346, Cl. 216-34.000.

Brück, Rolf, to Emitec Gesellschaft fuer Emissionstechnologie mbH. Honeycomb body with an internal structure that is retained in a frame and a method of producing the same. 5,468,455, Cl. 422-180.000.

Bruderer AG: *See*—
Summerauer, Ingomar J. K.; and Hellwig, Waldemar, 5,468,931, Cl. 219-121.630.

Bruggeman, Aimé; and Braet, Johan, to Studiecentrum Voor Kernenergie. Method for separating boric acid. 5,468,347, Cl. 159-47.300.

Brügging, Wilhelm: *See*—
Homann, Walter K.; Große-Puppendahl, Thomas; and Brügging, Wilhelm, 5,468,441, Cl. 264-331.210.

Bruker Analytische Messtechnik GmbH: *See*—
Müller, Wolfgang, 5,469,123, Cl. 335-301.000.

Bruker Franzen Analytik GmbH: *See*—
Franzen, Jochen, 5,468,957, Cl. 250-282.000.
Franzen, Jochen; and Wang, Yang, 5,468,958, Cl. 250-292.000.

Brun, Milivoj K.: *See*—
Miller, Steven A.; Mourer, David P.; and Brun, Milivoj K., 5,468,133, Cl. 425-7.000.

Brunemann, George A., Jr.; and Reismiller, Paul R., to General Electric Company. Apparatus for selecting a valid signal from a plurality of redundant measured and modelled sensor signals. 5,469,447, Cl. 371-36.000.

Bryant, Ronald W.: *See*—
Krishnamurthy, Suresh; McCormick, Robert A.; Cone, Kenneth F.; Brown, Gary L.; and Bryant, Ronald W., 5,469,188, Cl. 345-117.000.

BTL Fellows Company, LLC: *See*—
Lepselter, Martin P., 5,469,021, Cl. 313-582.000.

Buccicone, Dana F.; and Tempas, Jeffrey F., to Kohler Co. Mixing valve. 5,467,799, Cl. 137-625.410.

Buchanan, Jerry E., to Jebco Packaging Systems, Inc. Container. 5,468,206, Cl. 493-189.000.

Buchmeyer, Theodoor A.: *See*—
van Liempt, Martinus J. C.; and Buchmeyer, Theodoor A., 5,468,321, Cl. 156-159.000.

Buckalew, Robert D.; and Neitzke, Michael E. Escalator defective roller detector. 5,467,658, Cl. 73-865.900.

Buckley, Alan J.; Huchings, Michael G.; Ferguson, Ian; Beautement, Kevin; Clough, John M.; Crowley, Patrick J.; Godfrey, Christopher R. A.; deFraine, Paul J.; Anthony, Vivienne M.; and Heaney, Stephen P., to Imperial Chemical Industries PLC. Fungicides. 5,468,857, Cl. 544-298.000.

Buckley, James H., Jr., to Valeo Climate Control Corporation. Heat exchanger. 5,467,818, Cl. 165-178.000.

Buckley, Maura T.: *See*—
Weingarten, Jon; Kosann, Rod; Wallace, Jerry E.; Wilson, Olin E.; and Buckley, Maura T., 5,467,512, Cl. 28-100.000.

Buckmiller, Daniel K.: *See*—
Philpot, Randall J.; Olsen, Douglas G.; Ventrello, Sandra C.; Welsh, Eric R.; and Buckmiller, Daniel K., 5,468,329, Cl. 156-429.000.

Budansew, Peter: *See*—
Powell, Fred D.; Phelan, Raymond J.; McCormack, James; Budansew, Peter; Demoe, Larry; and Poschun, Alex, 5,468,434, Cl. 264-46.800.

Budansky, Yury: *See*—
Alfano, Robert R.; Pradhan, Asima; Tang, Guichen C.; Wang, Leming; Budansky, Yury; and Das, Bidyut B., 5,467,767, Cl. 128-665.000.

Buelna, Terry, to Advanced Surgical, Inc. Surgical suturing device. 5,468,251, Cl. 606-223.000.

Buescher, Alfred J.; and DeLuca, Frank, to Buescher, Alfred J. Unit injector optimized for reduced exhaust emissions. 5,467,924, Cl. 239-88.000.

Buffkin, Michael G.: *See*—
Perkins, James E.; and Buffkin, Michael G., 5,467,987, Cl. 273-175.000.

Building Materials Corporation of America: *See*—
Sieling, Frederick W., 5,467,568, Cl. 52-518.000.

Bullinger, Philip W.; and McManus, Michael J., to AT&T Global Information Solutions Company; and Hyundai Electronics America. Peripheral component interfacing system with bus voltage/logic supply comparison means. 5,469,082, Cl. 326-81.000.

Bunnell, Mitchell, to Lynx Real-Time Systems, Inc. Operating system architecture using multiple priority light weight kernel task based interrupt handling. 5,469,571, Cl. 395-700.000.

Burbury, Robert L.; and Nuccio, Phillip P., to Optima Imaging, Inc. Systems for operating X-ray equipment. 5,469,492, Cl. 378-197.000.

Burian Gesellschaft m.b.H. & Co. KG: *See*—
Potuznik, Walter; and Himmel, Josef, 5,467,923, Cl. 239-8.000.

Burk, Robert M.: *See*—
Garst, Michael E.; Burk, Robert M.; Chan, Ming F.; and Roof, Michael B., 5,468,778, Cl. 514-573.000.

Burke, David H.: *See*—
Giobbi, John J.; and Burke, David H., 5,469,193, Cl. 345-158.000.

Burke, Douglas. Dual polarizing reflection filter three dimensional image creation and display system. 5,469,295, Cl. 359-478.000.

Burkett, Susan L.: *See*—
Williams, Joel L.; Burkett, Susan L.; and McGuire, Shel, 5,468,520, Cl. 427-560.000.

Burlington Industries, Inc.: *See*—
Weingarten, Jon; Kosann, Rod; Wallace, Jerry E.; Wilson, Olin E.; and Buckley, Maura T., 5,467,512, Cl. 28-100.000.

Burndy Corporation: *See*—
Yip, Maxwell K.; Suffredini, Nino R.; Sidor, Ronald P.; and White, Robert C., 5,468,154, Cl. 439-79.000.

Burns, Gary T.: *See*—
Bergstrom, Debora F.; Burns, Gary T.; and Giwa-Agbomeirele, Patricia A., 5,468,829, Cl. 528-18.000.

Burns, James E.: *See*—
David, Morgan W. A.; and Burns, James E., 5,469,226, Cl. 348-699.000.

Burns, Mark: *See*—
Lein, Maureen M.; Eisfeiler, Richard C.; Poliquin, Alfred T.; Burns, Mark; and Russell, John T., 5,468,518, Cl. 427-421.000.

Burrows, George E.: *See*—
Berlin, Kenneth D.; Garrison, Gregory L.; Sangiah, Subbiah; Clarke, Cyril R.; Chen, Chun-Lin; Lazzara, Ralph; Scherlag, Benjamin J.; Patterson, Eugene S.; and Burrows, George E., 5,468,858, Cl. 546-10.000.

Burrus, Philip H., IV: *See*—
White, Walter, IV; and Burrus, Philip H., IV, 5,467,991, Cl. 273-186.300.

Burton, David L.: *See*—
Ochs, Dennis E.; Burton, David L.; Groh, John F.; and Smith, David E., 5,467,774, Cl. 128-711.000.

Burval, Jan; and Chan, Jimmy H., to ICI Americas Inc. Liquid, phytoactive compositions and method for their preparation. 5,468,718, Cl. 504-206.000.

Butensky, Michael J.; Gibbs, Richard A.; Collins, Kevin T.; Yang, Yih-Nan; Johnson, Eric M.; and Grafft, Chris A., to Aspect Telecommunications Corporation. Method for resynchronizing secondary database and primary database with preservation of functionality of an automatic call distribution system. 5,469,503, Cl. 379-265.000.

Bütje, Kai; and Kischkewitz, Jürgen, to Bayer Aktiengesellschaft. Process for the preparation of very pure titanium dioxide. 5,468,463, Cl. 423-612.000.

Buttery, Roger A.: *See*—
Cook, Nigel J. D.; Weight, Kenneth R.; Gutman, Richard G.; Buttery, Roger A.; and Grimes, Michael, 5,468,382, Cl. 210-232.000.

Buttle, David J.: *See*—
Barrett, Alan J.; Buttle, David J.; and Rich, Daniel H., 5,468,480, Cl. 424-94.650.

Byck, Robert: *See*—
Gawin, Frank H.; Byck, Robert; Alderdice, Marc; and Schwimmer, Jeffrey, 5,468,749, Cl. 514-252.000.

Byers, Lonnie L.: *See*—
Bailey, William H.; Byers, Lonnie L.; Holley, Robert G.; Lamie, James M.; Sparks, Robert M.; West, Mike L.; and Storey, Richard P., 5,468,968, Cl. 250-435.000.

Byrd, Richard H., Jr. U-lock with strength enhancing header extensions. 5,467,620, Cl. 70-38.00A.

C.N.R.S. Paris: *See*—
Mir, Lluis, 5,468,223, Cl. 604-51.000.

C.O.G.I.A. Societe Anonyme: *See*—
Carron, Didier; Deblay, Philippe; and Desage, Robert, 5,468,395, Cl. 210-774.000.

Cacabelos, Ramón, to Ares Holding 89 N.V. Treatment of neuropsychiatric disorders. 5,468,726, Cl. 514-2.000.

Cacheris, William P.: *See*—

Deutsch, Edward A.; Deutsch, Karen F.; Cacheris, William P.; Ralston, William H.; White, David H.; Nosco, Dennis L.; Wolfangel, Robert G.; Wilking, Janet B.; Meeh, Linda; and Woulfe, Steven R., 5,468,465, Cl. 424-9.400.

Calabrese, Gary S.; Calvert, Jeffrey M.; Chen, Mu-San; Dressick, Walter J.; Dulcey, Charles S.; Georger, Jacque H., Jr.; and Bohland, John F., Jr., to Shipley Company, L.L.C. Selective metallization process. 5,468,597, Cl. 430-315.000.

Calam & Associates, Inc.: *See*—
Calam, Henry D.; and Schaeffer, Hans A., 5,468,482, Cl. 424-195.100.

Calam, Henry D.; and Schaeffer, Hans A., to Calam & Associates, Inc. Palatable orally administered liquid medicaments for relief of discomfort and flavoring combinations therefor. 5,468,482, Cl. 424-195.100.

Calhoun, Cornelia. Method of promoting in vitro homologous recombination transfection in mammalian cells using the RecA protein. 5,468,629, Cl. 435-172.300.

Callahan, Matthew G.: *See*—
Callahan, Thomas F.; and Callahan, Matthew G., 5,467,775, Cl. 128-715.000.

Callahan, Thomas F.; and Callahan, Matthew G., to University Research Engineers & Associates. Modular auscultation sensor and telemetry system. 5,467,775, Cl. 128-715.000.

Callisen, Ryan A.; Chandler, Gregory T.; and Grieff, Thomas W., to Compaq Computer Corp. Disk array controller having internal protocol for sending address/transfer count information during first/second load cycles and transferring data after receiving an acknowldgement. 5,469,548, Cl. 395-441.000.

Calvert, Jeffrey M.: *See*—
Calabrese, Gary S.; Calvert, Jeffrey M.; Chen, Mu-San; Dressick, Walter J.; Dulcey, Charles S.; Georger, Jacque H., Jr.; and Bohland, John F., Jr., 5,468,597, Cl. 430-315.000.

Cambridge Patent Developments Limited: *See*—
Self, Colin H., 5,468,651, Cl. 436-548.000.

Camp, Calvin C.; Kaveney, Jack R.; Garman, Ronald H.; Vanderburg, Raymond M.; and Kingsinger, Malcolm H., to Caterpillar Inc. Window assembly. 5,467,560, Cl. 49-413.000.

Campagne, Anthony J.: *See*—
Blind, Henry F.; Campagne, Anthony J.; Czekaj, James L.; Difiore, Nicholas L.; Geddes, Earl R.; Krochmal, Andrew C.; and Senyk, Myron I., 5,469,510, Cl. 381-55.000.

Campbell, Charles E.: *See*—
Hellmuth, Thomas; Campbell, Charles E.; and Wei, Jay, 5,469,261, Cl. 356-361.000.

Campbell, Eric R.: *See*—
Simpson, Hugo R.; and Campbell, Eric R., 5,469,549, Cl. 395-200.080.

Canadian Liquid Air Ltd. - Air Liquide Canada Ltee: *See*—
Goulet, Richard; Forest, Claude; Landry, Michel; Beaubien, Pierre; Finkelstein, Michael; and Vaidya, Viwek V., 5,467,928, Cl. 239-404.000.

Canarslan, Necip S.: *See*—
Sekhar, Jainagesh A.; Subramanian, V.; and Canarslan, Necip S., 5,468,690, Cl. 501-1.000.

Cane, Michael R.; and Day, Robert C. L., to Esselte Dymo N.V. Tape cutting apparatus. 5,468,081, Cl. 400-621.000.

Canetti, Ran; and Herzberg, Amir, to International Business Machines Corporation. Secure communication and computation in an insecure environment. 5,469,507, Cl. 380-30.000.

Cannon, Raymond J. C.: *See*—
Payne, Jewel M.; Cannon, Raymond J. C.; Schnepf, H. Ernest; and Schwab, George E., 5,468,636, Cl. 435-252.300.

Canon Kabushiki Kaisha: *See*—
Furukawa, Tatsuo, 5,468,954, Cl. 250-208.100.
Go, Shintetsu; Kashizaki, Yoshio; Suzuki, Koichi; Sato, Kazuma; and Shimada, Akira, 5,468,584, Cl. 430-65.000.
Hasegawa, Takayuki; and Fujioka, Hidehiko, 5,467,637, Cl. 73-24.010.
Hiramatsu, Soichi, 5,469,197, Cl. 347-16.000.
Hosoya, Hideki, 5,469,546, Cl. 395-182.060.
Iida, Ichiro; Ogino, Yoshitaka; and Nakajima, Hideo, 5,469,419, Cl. 369-58.000.
Inoue, Shunsuke; Hoshi, Junichi; and Watanabe, Takanori, 5,468,344, Cl. 156-657.100.
Kansi, Masahiro; Fujioka, Yasushi; Yoshino, Takehito; and Hori, Tadashi, 5,468,521, Cl. 427-575.000.
Kashiwazaki, Masami; and Nagata, Satoshi, 5,469,373, Cl. 364-550.000.
Katakura, Kazunori; Okada, Shinjiro; and Inaba, Yutaka, 5,469,281, Cl. 359-56.000.
Kawamura, Yoshiaki, 5,469,514, Cl. 382-297.000.
Koike, Shoji; and Yamamoto, Tomoya, 5,468,553, Cl. 428-224.000.
Konishi, Kazuki, 5,469,234, Cl. 351-212.000.
Korenaga, Nobushige; and Iwamoto, Kazunori, 5,467,720, Cl. 108-20.000.
Kurumida, Tsuneaki, 5,469,513, Cl. 382-203.000.
Miyake, Akira; Fukuda, Yasuaki; and Maehara, Hiroshi, 5,469,489, Cl. 378-35.000.
Noguchi, Kazuhiro; Ogino, Shigeru; and Kobayashi, Takashi, 5,469,210, Cl. 348-208.000.
Ogata, Takao; and Menjo, Takeshi, 5,469,244, Cl. 355-246.000.
Otsuka, Kuniaki, 5,469,501, Cl. 379-201.000.
Sakaegi, Yuji; and Ohara, Eiji, 5,469,218, Cl. 348-455.000.
Terai, Haruhiko, 5,469,200, Cl. 347-63.000.
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,469,266, Cl. 358-298.000.

Cantey, Jimmy: *See*—
Liu, Nen-chin; Lian, Ming-Ren; and Cantey, Jimmy, 5,469,140, Cl. 340-551.000.

Cantwell, Cathleen A.; Hodges, Roland L.; McGilvray, Derek; Queener, Stephen W.; Swartling, James R.; and Zock, Joseph M., to Eli Lilly and Company. Recombinant DNA compounds and expression vectors encoding para-nitrobenzyl esterase activity from bacillus. 5,468,632, Cl. 435-197.000.

Capuso, Dennis L.: *See*—
Waterson, Bruce P.; Caputo, Dennis L.; and McLaughlin, William R., 5,468,291, Cl. 106-697.000.

Cardiac Pacemakers, Inc.: *See*—
Hahn, Stephen J.; and Swanson, David K., 5,468,254, Cl. 607-5.000.

Carey, Richard A.; Moses, Marlon M.; and Daley, Wayne D. R., to Georgia Tech Research Corporation. Poultry environmental control systems and methods. 5,467,922, Cl. 236-94.000.

Carl, Dan; Dobuzinsky, David M.; Nguyen, Son V.; and Nguyen, Tue, to International Business Machines Corporation. Method of making TA_2O_5 thin film by low temperature ozone plasma annealing (oxidation). 5,468,687, Cl. 437-235.000.

Carl Strutz & Co., Inc.: *See*—
McCoy, Gary W.; Zwigart, John M.; and Tweedy, Mark R., 5,467,864, Cl. 198-409.000.

Carl Zeiss, Inc.: *See*—
Hellmuth, Thomas; Campbell, Charles E.; and Wei, Jay, 5,469,261, Cl. 356-361.000.

Carletti, Ollivier, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "Snecma". Sectorized tubular structure subject to implosion. 5,467,592, Cl. 60-261.000.

Carlin, Jerry F.; Koon, James E.; Parker, Paul D.; and Thompson, Warren L., to Eaton Corporation. Hydraulic cylinder and biased wear ring assembly for use therein. 5,467,689, Cl. 92-172.000.

Carlini, Sean M.: *See*—
Vandenberg, Douglas; Philpott, Michael L.; Green, Phillip A.; Eastman, Scott A.; and Carlini, Sean M., 5,469,482, Cl. 377-3.000.

Carlisle, William D., to BP Chemicals (Additives) Limited. Lubricating oil additives, their preparation and use. 5,468,404, Cl. 252-51.50R.

Carlson, Bruce J.: *See*—
Blew, Douglas J.; and Carlson, Bruce J., 5,469,523, Cl. 385-101.000.

Carlson, Harold L.: *See*—
Soucie, Wayne L.; Champ, Larry B.; Tayon, Jeffrey E.; Carlson, Harold L.; Marek, Steven W.; and Koenig, Peter C., 5,467,666, Cl. 74-575.000.

Carlson, Roland P.: *See*—
Malik, Aslam A.; Archibald, Thomas G.; Carlson, Roland P.; and Manser, Gerald E., 5,468,841, Cl. 528-408.000.

Carlston, Richard L.: *See*—
Finsterwal, Robert N.; Carlston, Richard L.; Schlueter, Edward L., Jr.; and Sharf, Lucille M., 5,468,834, Cl. 528-76.000.

Carman, Anthony K.; and Pontbriand, Duane J., to ITT Corporation. Quick connector. 5,468,024, Cl. 285-81.000.

Carmichael, Richard D.: *See*—
Hohenstein, Gerald L.; Nielson, Michael E.; Tang, Tin S.; Carmichael, Richard D.; and Brant, William A., 5,469,566, Cl. 395-182.040.

Carney, Joseph M.: *See*—
Wilt, Truman F.; Carney, Joseph M.; Thomas, Stephen J.; Claar, James A.; and Birkmeyer, William J., 5,468,802, Cl. 524-539.000.

Carobus, Richard: *See*—
Good, Robert; and Carobus, Richard, 5,467,989, Cl. 273-167.00R.

Carpenter, Robert H.: *See*—
McAnalley, Bill H.; Carpenter, Robert H.; and McDaniel, Harley R., 5,468,737, Cl. 514-54.000.

Carpenter, Thom D.; and Heimann, Lee R., to CBD, Inc. Barricade light with light emitting diode. 5,469,157, Cl. 340-908.100.

Carrier Corporation: *See*—
Bolton, Theodore S.; and Stopyra, Stephen, 5,467,610, Cl. 62-262.000.
Bolton, Theodore S.; and Michaels, John H., 5,467,615, Cl. 62-498.000.
Bolton, Theodore S.; and Stopyra, Stephen, 5,468,186, Cl. 454-202.000.
Brasz, Joost J., 5,467,613, Cl. 62-402.000.
Shreeve, William O.; Werbowsky, Laurie L.; and Essig, Thomas W., 5,467,921, Cl. 236-78.00R.

Carrington Laboratories, Inc.: *See*—
McAnalley, Bill H.; Carpenter, Robert H.; and McDaniel, Harley R., 5,468,737, Cl. 514-54.000.

Carroll, Alan F.; and Hang, Kenneth W., to Du Pont de Nemours, E. I., and Company. Lead-free thick film paste composition. 5,468,695, Cl. 501-79.000.

Carron, Didier; Deblay, Philippe; and Desage, Robert, to C.O.G.I.A. Societe Anonyme. Process and apparatus for demineralizing water. 5,468,395, Cl. 210-774.000.

Carson, Gary: *See*—
Sjogren, Axel; Carson, Gary; Estergreen, Steven; Taga, Timothy; and Stewart, Rodger, 5,468,449, Cl. 422-46.000.

Casagrande, Cesare; Montanari, Stefania; and Santangelo, Francesco, to Zambon Group S.p.A. Compounds active on the cardiovascular system. 5,468,746, Cl. 514-235.500.

Casal, David C.: *See*—

Senyei, Andrew E.; and Casal, David C., 5,468,619, Cl. 435-7.940.
Casartelli, Gabriele, to E.D.C. Sarl. Crash-helmet for cyclists and sportspeople in general. 5,467,485, Cl. 2-421.000.
Case Corporation: *See*—
Panoushek, Dale W.; and Kraning, Calvin J., 5,467,582, Cl. 56-10.20R.
Casey, Jon A.; Divakaruni, Renuka S.; Natarajan, Govindarajan; Reddy, Srinivasa S. N.; and Sammet, Manfred, to International Business Machines Corporation. Ceramic via composition, multilayer ceramic circuit containing same, and process for using same. 5,468,445, Cl. 419-19.000.
Cass, Joanie E. Ant-free pet dishes. 5,467,738, Cl. 119-61.000.
Cassarly, William J.; Davenport, John M.; and Hansler, Richard L., to General Electric Company. Multiple port high brightness centralized lighting system. 5,469,337, Cl. 362-32.000.
Castellanos, Frederic; Cavezzan, Jacques; Fouassier, Jean-Pierre; and Priou, Christian, to Rhone-Poulenc Chimie. Onium borates/borates of organometallic complexes and cationic initiation of polymerization therewith. 5,468,902, Cl. 568-6.000.
Castenmiller, Wilhelmus A. M.: *See*—
Verschuren, Jozephus J.; Castenmiller, Wilhelmus A. M.; van Amerongen, Ivo A.; and van Der Meijs, Loillbrord C., 5,468,512, Cl. 426-658.000.
Cataldo, Stephen A.: *See*—
Ripley, Thomas L., Sr.; and Cataldo, Stephen A., 5,467,555, Cl. 47-66.000.
Catalytica, Inc.: *See*—
Gruber, John M., 5,468,873, Cl. 548-486.000.
Caterpillar Inc.: *See*—
Barton, James C.; Lueschow, Kevin J.; and Stratton, Ken L., 5,467,829, Cl. 172-4.500.
Becktel, David C.; Newman, Harry B.; and Moldenhauer, Phillip E., 5,468,137, Cl. 425-381.000.
Brandt, Everett G.; Christensen, M. Kathryn; and Sahm, W. Charles, 5,467,747, Cl. 123-198.00E.
Camp, Calvin C.; Kaveney, Jack R.; Garman, Ronald H.; Vanderburg, Raymond M.; and Kingsinger, Malcolm H., 5,467,560, Cl. 49-413.000.
Creger, Todd D.; Mitchell, Randall M.; Stahl, Alan L.; and Talbott, James R., 5,467,854, Cl. 192-87.180.
Greer, Robert D.; Henderson, Daniel E.; Hoseini, Javad; Rytter, Noel J.; and Simmons, Gerald P., 5,467,541, Cl. 37-348.000.
Hawkins, Mark R.; and Peterson, Joel L., 5,469,356, Cl. 364-424.020.
Kelley, Kurtis C., 5,468,290, Cl. 106-635.000.
Lukich, Michael S., 5,468,126, Cl. 417-53.000.
Singer, Stephen M., 5,468,835, Cl. 528-76.000.
Trowbridge, Jon D., 5,467,663, Cl. 74-481.000.
Walling, Dennis R., 5,468,030, Cl. 285-364.000.
Catt, Michael; Coley, John; and Davis, Paul J., to Unilever Patent Holdings B.V. Monitoring method. 5,467,778, Cl. 128-738.000.
Caubere, Paul: *See*—
Berthe, Marie-Christine; Caubere, Paul; and Fort, Yves, 5,468,856, Cl. 544-219.000.
Caufield, Craig E.: *See*—
Schiehser, Guy A.; Caufield, Craig E.; Senko, Nancie A.; and VonBurg, Gregory F., 5,468,774, Cl. 514-471.000.
Cavezzan, Jacques: *See*—
Castellanos, Frederic; Cavezzan, Jacques; Fouassier, Jean-Pierre; and Priou, Christian, 5,468,902, Cl. 568-6.000.
Cayama S.p.A.: *See*—
Francioni, Renzo, 5,467,580, Cl. 53-550.000.
CBD, Inc.: *See*—
Carpenter, Thom D.; and Heimann, Lee R., 5,469,157, Cl. 340-908.100.
Cchen, Cchung-Pao. Air permeable cushion. 5,467,489, Cl. 5-475.000.
Cecchin, Giuliano: *See*—
Ghisellini, Renato; Cecchin, Giuliano; and Malucelli, Decio, 5,468,809, Cl. 525-240.000.
Celgene Corporation: *See*—
Raju, Muppala S.; and Khetani, Vikram, 5,468,865, Cl. 548-229.000.
Celik, Richard J. Turkey tote. 5,467,907, Cl. 224-103.000.
Celwave: *See*—
Yarsunas, George D., 5,469,181, Cl. 343-815.000.
CEM Corporation: *See*—
Thomas, James E., 5,468,135, Cl. 425-85.000.
Central Glass Company, Limited: *See*—
Takematsu, Tetsu; Komata, Takeo; Kume, Takashi; Suzuki, Kiyoshi; Kawamura, Matsue; Shirakawa, Yumiko; and Mori, Kaoru, 5,468,719, Cl. 504-224.000.
Central Japan Railway Company: *See*—
Kubota, Kiyoto; Takeuchi, Hiroto; and Kato, Shinichiro, 5,467,945, Cl. 246-26.000.
Central Research Institute of Electric Power Industry: *See*—
Yamamoto, Kiyoshi; Sugii, Nobuyuki; Kubo, Koichi; Ichikawa, Michiharu; and Yamauchi, Hisao, 5,468,806, Cl. 505-238.000.
Centre International de Recherches Dermatologiques Galderma (Cird Galderma): *See*—
Shroot, Braham; Bernardon, Jean-Michel; and Pilgrim, William R., 5,468,897, Cl. 560-18.000.
Centre Stephanois De Recherches Mecaniques Hydromecanique et Frottement: *See*—
Tourneux, Daniel; Mariatte, René; and Dajoux, Bernard, 5,468,071, Cl. 384-276.000.
Cephalon, Inc.: *See*—
Glicksman, Marcie A.; Rotella, David P.; Neff, Nicola; and Murakata, Chikara, 5,468,872, Cl. 548-416.000.
Cerami, Anthony: *See*—
France, Dennis S.; Cerami, Anthony; Ulrich, Peter C.; Norton, Laura A.; and Neer, David L., 5,468,777, Cl. 514-562.000.
Cereda, Enzo; Ezhaya, Antoine; Turconi, Marco; Dubini, Enrica; and Maffione, Grazia, to Boehringer Ingelheim Italia S.p.A. Crystalline forms of endo-2,3-dihydro-N-(8-methyl)-8-azabicyclo[3.2.1]oct-3-yl)-2-oxo-1H-benzimidazole-1-carboxamides. 5,468,758, Cl. 514-304.000.
Cerny, Darin G.: *See*—
Brady, Mark J.; and Cerny, Darin G., 5,467,634, Cl. 73-1.00D.
Cerrina, Franco: *See*—
Waldo, Whitson G., III; Chen, Gong; and Cerrina, Franco, 5,469,263, Cl. 356-401.000.
Cezzar, Ruknet. Reversible computer apparatus and methods of constructing and utilizing same. 5,469,550, Cl. 395-375.000.
Chaffee, Frank, to Orbitron Division of Greenbriar Products, Inc. Antenna drive assembly. 5,469,182, Cl. 343-882.000.
Chaki, Yasuyuki; Shimpuku, Yoshihide; and Ino, Hiroyuki, to Sony Corporation. Data modulation method. 5,469,162, Cl. 341-58.000.
Chambers, John P., to British Broadcasting Corporation. Method of labelling a broadcast signal including transmitting a sequence of program labels. 5,469,207, Cl. 348-9.000.
Chambon, Pierre: *See*—
Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; DeJean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, 5,468,617, Cl. 435-7.800.
Champ, Larry B.: *See*—
Soucie, Wayne L.; Champ, Larry B.; Thyon, Jeffrey E.; Carlson, Harold L.; Marek, Steven W.; and Koenig, Peter C., 5,467,666, Cl. 74-575.000.
Chan, Benson; Chapin, Fletcher L.; Fiacco, Vincent M.; Mankus, John R.; and Pokrzywa, Robert S., to International Business Machines Corporation. Electronic package assembly and connector for use therewith. 5,468,996, Cl. 257-723.000.
Chan, Daniel S. H.; Leong, Kin; and Phang, Jacob C. H., to National University of Singapore. Double reflection cathodoluminescence detector with extremely high discrimination against backscattered electrons. 5,468,967, Cl. 250-397.000.
Chan, Jimmy H.: *See*—
Burval, Jan; and Chan, Jimmy H., 5,468,718, Cl. 504-206.000.
Chan, Kenneth K.; and Srigritsanapol, Aeumporn, to Ohio State University. Liposomes containing the salt of phosphoramide mustard and related compounds. 5,468,499, Cl. 424-450.000.
Chan, Ming F.: *See*—
Garst, Michael E.; Burk, Robert M.; Chan, Ming F.; and Roof, Michael B., 5,468,778, Cl. 514-573.000.
Chan, Wan K.: *See*—
Huang, Fu-Chih; Chan, Wan K.; Sutherland, Charles A.; and Galemmo, Robert A., Jr., 5,468,898, Cl. 560-41.000.
Chandler, Gregory T.: *See*—
Callison, Ryan A.; Chandler, Gregory T.; and Grieff, Thomas W., 5,469,548, Cl. 395-441.000.
Chandler, Howard M., to SmithKline Diagnostics, Inc. Interrupted-flow assay device. 5,468,648, Cl. 436-518.000.
Chandler, Janice. Peritoneal dialysis catheter support belt. 5,468,229, Cl. 604-179.000.
Chandra, Tarun: *See*—
Shah, Dinesh O.; Chandra, Tarun; and Klostermann, Kurt, 5,468,649, Cl. 436-518.000.
Chandrasena, Roshantha A. S., to Allergan, Inc. Disubstituted acetylenes bearing heterobicyclic groups and heteroaromatic or phenyl groups having retinoid like activity. 5,468,879, Cl. 549-23.000.
Chang, Christopher T.-M.; and White, William A., to Texas Instruments Incorporated. Digital chirp synthesizer. 5,469,479, Cl. 375-377.000.
Chang, Daniel T.; and Wolfsthal, Yaron, to International Business Machines Corporation. Method and system for interfacing interpreted applications with compiled procedures using signature files. 5,469,574, Cl. 395-700.000.
Chang, David B.; Vali, Victor; and Shih, I-Fu, to Hughes Aircraft Company. Optical waveguide image transmission system and method. 5,469,519, Cl. 385-33.000.
Chang, Mike F.: *See*—
Hsiieh, Pwu-Iuan; Kwan, Sze-Hon; Chang, Mike F.; Ho, Yueh-Se; Van Der Linde, Jan; and Owyang, King, 5,468,982, Cl. 257-331.000.
Chang, On-Kok. Method and apparatus for measuring resistivity of geometrically undefined materials. 5,469,069, Cl. 324-693.000.
Chao, Sidney C.; Stanford, Thomas B.; Purer, Edna M.; and Wilkerson, Angela Y., to Hughes Aircraft Company. Dry-cleaning of garments using liquid carbon dioxide under agitation as cleaning medium. 5,467,492, Cl. 8-159.000.
Chapin, Fletcher L.: *See*—
Chan, Benson; Chapin, Fletcher L.; Fiacco, Vincent M.; Mankus, John R.; and Pokrzywa, Robert S., 5,468,996, Cl. 257-723.000.
Chapman, John E. Valve system. 5,467,965, Cl. 251-160.000.
Chapman, Richard A., to Texas Instruments Incorporated. Using a change in doping of poly gate to permit placing both high voltage and low voltage transistors on the same chip. 5,468,666, Cl. 437-44.000.
Charpentier, Alain Y. P., to Matra MHS of France. Device for monitoring the boron content of borophosphosilicate. 5,468,642, Cl. 436-114.000.
Charron, Kenneth R.: *See*—

Becher, Mark; and Charron, Kenneth R., 5,467,840, Cl. 180-251.000.
Charron Sports Services, Inc.: *See*—
Becher, Mark; and Charron, Kenneth R., 5,467,840, Cl. 180-251.000.
Chatham, William P.: *See*—
Ward, James J.; and Chatham, William P., 5,468,793, Cl. 524-159.000.
Chau, Trang D.: *See*—
Boardman, Larry D.; Melancon, Kurt C.; Chau, Trang D.; and Erickson, John J., 5,468,815, Cl. 525-478.000.
CheckPoint Fluidic Systems International Ltd.: *See*—
Elliott, Andrew C.; and Guccione, Ray A., 5,468,127, Cl. 417-53.000.
Chee, Wan T., to Boeing Company, The. Pylon and engine installation for ultra-high by-pass turbo-fan engines. 5,467,941, Cl. 244-54.000.
Cheetham, Rex: *See*—
Clough, John M.; Godfrey, Christopher R. A.; Streeting, Ian T.; and Cheetham, Rex, 5,468,747, Cl. 514-239.500.
Chem-Trend, Incorporated: *See*—
Lum, Andrew F.; Uribe, Juan M.; Hogan, John M.; Persinger, Richard A.; Miller, James F.; and Navaratnam, Ramesh A., 5,468,401, Cl. 252-22.000.
Chen, Andrew A.-J.: *See*—
Seamans, James D.; Adams, Charles T.; Dominguez, Wendy B.; and Chen, Andrew A.-J., 5,468,372, Cl. 208-216.00R.
Chen, Archer C. C. Golf wooden club head. 5,467,983, Cl. 273-78.000.
Chen, Chun-Lin: *See*—
Berlin, Kenneth D.; Garrison, Gregory L.; Sangiah, Subbiah; Clarke, Cyril R.; Chen, Chun-Lin; Lazzara, Ralph; Scherlag, Benjamin J.; Patterson, Eugene S.; and Burrows, George E., 5,468,858, Cl. 546-18.000.
Chen, David K.: *See*—
Thompson, David A.; Rajagopalan, Venkatesh; Wright, Kurt W.; Sterba, John J.; Paulus, William J.; Paulus, Nancy J.; McCauley, Kathryn M.; and Chen, David K., 5,467,636, Cl. 73-23.310.
Chen, Franklin M. C.; and Druecke, Frank G., to Kimberly-Clark Corporation. Creeping chemical composition and method of use. 5,468,796, Cl. 524-377.000.
Chen, Gong: *See*—
Waldo, Whitson G., III; Chen, Gong; and Cerrina, Franco, 5,469,263, Cl. 356-401.000.
Chen, Guey-Shin. Portable electric fan. 5,468,124, Cl. 416-63.000.
Chen, Lee; Podlesnik, Dragan; and Sekiguchi, Akihisa, to International Business Machines Corporation. Neutral beam apparatus for in-situ production of reactants and kinetic energy transfer. 5,468,955, Cl. 250-251.000.
Chen, Mu-San: *See*—
Calabrese, Gary S.; Calvert, Jeffrey M.; Chen, Mu-San; Dressick, Walter J.; Dulcey, Charles S.; Georger, Jacque H., Jr.; and Bohland, John F., Jr., 5,468,597, Cl. 430-315.000.
Chen, Shieh-Shung T.: *See*—
Gagliardi, Magda M.; Chen, Shieh-Shung T.; Arison, Byron H.; Garrity, George M.; Huang, Leeyuan; MacConnell, John G.; and White, Raymond F., 5,468,771, Cl. 514-452.000.
Chen, Susan: *See*—
Gupta, Subhash; Chen, Susan; and Hui, Angela, 5,468,340, Cl. 216-67.000.
Chen, Susan H.: *See*—
Gupta, Subhash; and Chen, Susan H., 5,468,339, Cl. 216-67.000.
Cheng, Kuangti T.; Murthy, Ashok; Saldanha-Singh, Jeanne M.; and Sharma, Pramod K., to Lexmark International, Inc. Toned member cleaning by electrified roller. 5,469,247, Cl. 355-296.000.
Cheng, Samuel, to Manufacturing Technology Resources Inc. Portable computer with supporting legs. 5,469,327, Cl. 361-680.000.
Cherng, Jing-Yih; and Klang, James K., to GNB Battery Technologies Inc. Method for optimizing the charging of lead-acid batteries and an interactive charger. 5,469,043, Cl. 320-31.000.
Chesar, David M. Instrument hand grip. 5,468,083, Cl. 401-6.000.
Chew, James P.; and Hamilton, Robert E., to Union Switch & Signal Inc. Method and apparatus for determining the operating speed of a rail vehicle. 5,467,654, Cl. 73-514.390.
Chiahuan Spring Co., Ltd.: *See*—
Yang, A-Tso, 5,467,504, Cl. 16-342.000.
Chiba, Kiyohiko: *See*—
Horita, Satomi; Aoki, Yasushi; Wakana, Masahiro; Okamoto, Hiroshi; Chiba, Kiyohiko; and Daikoku, Shizue, 5,469,081, Cl. 326-81.000.
Chicopee: *See*—
Helmstetter, Thomas J., 5,467,862, Cl. 198-347.100.
Chien, Jui-Lung, to Jina Manufacturer Thai Co., Ltd. Foldable chair. 5,468,043, Cl. 297-153.000.
Chien, Tzeng L. Light-strip apparatus. 5,469,342, Cl. 362-84.000.
Children's Medical Center Corporation: *See*—
Corn, Stephen B., 5,468,230, Cl. 604-110.000.
Chimoto, Isamu: *See*—
Shiozaki, Minoru; Yasuda, Mikio; Chimoto, Isamu; and Ishimoto, Kameki, 5,468,919, Cl. 174-261.000.
Chin, Albert K.; and Lunsford, John P., to Origin Medsystems, Inc. Endoscopic inflatable retraction devices for separating layers of tissue. 5,468,248, Cl. 606-192.000.
Chio, Christopher L.; and Huff, Rita M., to Upjohn Company, The. Binding assay employing a synthetic gene for D4 dopamine receptors. 5,468,615, Cl. 435-7.200.
Chiodo, Daniel J. Anchor device. 5,467,569, Cl. 52-713.000.
Chisso Corporation: *See*—
Matsui, Shuichi; Goto, Yasuyuki; Onji, Yuichi; and Fujita, Atsuko, 5,468,421, Cl. 252-299.630.
Zenno, Shubei; Inouye, Satoshi; Kanoh, Hiromasa; and Saigo, Kaoru, 5,468,631, Cl. 435-189.000.
Chiu, Kwok-F, to National Semiconductor Corporation. Circuit for generating a process variation insensitive reference bias current. 5,469,111, Cl. 327-538.000.
Cho, Chih-Chen, to Texas Instruments Incorporated. Etching and patterning an amorphous copolymer made from tetrafluoroethylene and 2,2-bis(trifluoromethyl)-4,5-difluoro-1,3-dioxole (TFE AF). 5,468,561, Cl. 428-421.000.
Cho, Jin H.: *See*—
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,468,896, Cl. 558-233.000.
Cho, Sung-Hee; and Lee, Hyong-Gon, to Samsung Electronics Co., Ltd. Nonvolatile memory device including multi-ECC circuit. 5,469,450, Cl. 371-40.400.
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., to Dongkook Pharmaceutical Co., Ltd.; and Kwon, Ki Beom. *S. lavendofoliae* DKRS cell culture producing anti-tumor aclacinomycins A, B, Y and aglycones. 5,468,637, Cl. 435-252.350.
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., to Lucky Ltd. Dithiocarbazate compounds. 5,468,896, Cl. 558-233.000.
Choi, Ki Y.: *See*—
Kwon, Oh K.; Choi, Ung S.; Choi, Ki Y.; Mishkin, N. K.; and Jung, Yoon M., 5,468,529, Cl. 428-36.100.
Choi, Ung S.: *See*—
Kwon, Oh K.; Choi, Ung S.; Choi, Ki Y.; Mishkin, N. K.; and Jung, Yoon M., 5,468,529, Cl. 428-36.100.
Chorey, Edward A., to Cincinnati Milacron Inc. Dynamic braking for electric motors in a plastics processing machine. 5,469,031, Cl. 318-375.000.
Chou, Arthur C. P.; and Aoyama, Steven, to Acushnet Company. Method and apparatus of determining golfer's effective putter loft. 5,467,538, Cl. 33-508.000.
Chou, Ching-Ho. Printing machine with a printing unit adapted to receive various plate cylinders. 5,467,712, Cl. 101-219.000.
Chou, Wu-Chang. Multiple-effect water treatment apparatus. 5,468,373, Cl. 210-94.000.
Choy, Clement K.: *See*—
Garabedian, Aram, Jr.; Mills, Scott C.; Sibert, William P.; Choy, Clement K.; and Rebelo do Couto, Fernando J., 5,468,423, Cl. 252-546.000.
Chretien, Paul B.; and Mutchnick, Milton G., to Alpha 1 Biomedicals; and Board of Governers of Wayne State University, The. Method for treatment of autoimmune hepatitis. 5,468,729, Cl. 514-12.000.
Chrisco, Larry L., to Blitz U.S.A., Inc. Automatic pet feeder. 5,467,735, Cl. 119-51.500.
Christakis, Nicholas A.: *See*—
Pinsky, Howard; Sheldon, Scott S.; Christakis, Nicholas A.; and Schmertzler, Michael, 5,469,353, Cl. 364-413.010.
Christensen, Bent; and Mogensen, Frits, to Danish Crown Inc. A/S. Low calorie meat products. 5,468,510, Cl. 426-574.000.
Christensen, M. Kathryn: *See*—
Brandt, Everett G.; Christensen, M. Kathryn; and Sahm, W. Charles, 5,467,747, Cl. 123-198.00E.
Christensen, Stephen M., to Reinforced Earth Company, The. Spring biased apparatus for maintaining precast panels in a stable removable position in a vertical slot. 5,467,567, Cl. 52-459.000.
Christopher Robin Knights: *See*—
McIvor-Dean, Alan; and Groom, Murree, 5,467,723, Cl. 111-123.000.
Chrysler Corporation: *See*—
Hennessee, Robert P.; Flaishans, Gary B.; Rudzewicz, Robert G.; and Barwin, David A., 5,467,605, Cl. 62-133.000.
Holbrook, Gerald L.; Leising, Maurice B.; and Kwapis, David L., 5,468,198, Cl. 477-143.000.
Nuñez, Eduardo; and Johnson, Michael J., 5,467,520, Cl. 29-564.600.
Redman, Forrest C.; Heimbecher, John O.; Etnyre, Edwin L.; Shavrnoch, James J.; and Ferranti, Paul A., 5,468,018, Cl. 280-788.000.
Vincent, Michael T.; Gutermuth, Terry R.; Lawrie, Robert E.; Moote, Richard K.; Simonich, Mark A.; and Tamm, James R., 5,467,593, Cl. 60-274.000.
Chu, Cynthia T.: *See*—
Baker, Charles L., Jr.; Chu, Cynthia T.; Mazzone, Dominick N.; and Page, Nancy M., 5,468,368, Cl. 208-58.000.
Chu, David C., to Hewlett-Packard Company. System for highly repeatable clock parameter recovery from data modulated signals. 5,469,466, Cl. 375-354.000.
Chu, I-Hsi: *See*—
Barker, Susan; Chu, I-Hsi; Fedun, Oresta N.; and Tyndorf, Tadeusz A., 5,468,638, Cl. 435-304.100.
Chu, Youe-T: *See*—
Shofner, Frederick M.; Chu, Youe-T; Baldwin, Joseph C.; Galyon, Michael E.; Kacenas, Benjamin M.; and Williams, Gordon F., 5,469,253, Cl. 356-238.000.
Chun, Se-Ki, to Orion Electric Co., Ltd. P-F connector structure for a cathode-ray tube. 5,469,016, Cl. 313-402.000.
Chung, Hyun-jong; Yim, Sang-chul; Ku, Bon-chul; Gueu, Ho-young; and Kim, Duk-han, to Yukong Limited. Fuel composition containing alkylphenyl poly(oxyalkylene) polyamine acid ester. 5,468,263, Cl. 44-39.00L.

Chung, Kenneth T.: *See*—
Zecchino, Julius R.; Messin, Steven; Corcoran, Cathleen; and Chung, Kenneth T., 5,468,471, Cl. 424-59.000.

Chung, Namhyun: *See*—
Aust, Steven D.; Barr, David P.; Grover, Thomas A.; Shah, Manish M.; and Chung, Namhyun, 5,468,628, Cl. 435-168.000.

Chung, Siew L.: *See*—
Guénin, Eric P.; Trotzinka, Karen A.; Smith, Leslie C.; Warren, Craig B.; Munteanu, Marina A.; Chung, Siew L.; and Tan, Chee-Teck, 5,468,725, Cl. 512-2.000.

Church & Dwight Co., Inc.: *See*—
Joseph, Amy L.; Jones, Keith A.; Winston, Anthony E.; and Lajoie, M. Stephen, 5,468,715, Cl. 504-101.000.
Winston, Anthony E., 5,468,716, Cl. 504-101.000.

Ciba-Geigy Corporation: *See*—
Eckhardt, Claude, 5,468,884, Cl. 549-437.000.
Kristiansen, Odd; Zondler, Helmut; and Müller, Urs, 5,468,751, Cl. 514-256.000.
Nicolson, Paul C.; Seamons, Kenneth R.; Tsao, Fu-Pao; Alvord, Larry A.; and McCraw, Earl C., Jr., 5,468,448, Cl. 422-30.000.
Steinmann, Bettina; Wolf, Jean-Pierre; Schulthess, Adrian; and Hunziker, Max, 5,468,886, Cl. 549-549.000.
Zink, Rudolf, 5,468,855, Cl. 544-60.000.

Cichon, Robert J., Jr.: *See*—
McMurtrey, Kevin D., Sr.; Rossi, Arthur M.; Cichon, Robert J., Jr.; Briggs, Karen A.; and Ely, Jonathan C., 5,469,037, Cl. 318-626.000.

Cincinnati Milacron Inc.: *See*—
Chorey, Edward A., 5,469,031, Cl. 318-375.000.
Silvey, Jeff L., 5,469,038, Cl. 318-632.000.

Cincotta, Anthony H.; and Meier, Albert H., to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, The. Therapeutic process for the treatment of the pathologies of Type II diabetes. 5,468,755, Cl. 514-288.000.

Cipollina, Joseph A.; Mattson, Ronald J.; and Sloan, Charles P., to Bristol-Myers Squibb Company. Antidepressant 3-(aminocycloalkenyl)-indole-5-nitrile derivatives. 5,468,767, Cl. 514-414.000.

Cipollina, Joseph A.; Gylys, Jonas A.; Mattson, Ronald J.; and Sloan, Charles P., to Bristol-Myers Squibb Company. Antimigraine derivatives of indolylcycloalkanylamines. 5,468,768, Cl. 514-415.000.

Cirrus Diagnostics, Inc.: *See*—
Holt, Robert W.; and Palmieri, Thomas, 5,468,453, Cl. 422-100.000.

Citizen Watch Co., Ltd.: *See*—
Namekawa, Masatoshi; Ibuki, Yoshiteru; Iguchi, Norio; and Okuno, Masatoshi, 5,467,913, Cl. 228-41.000.

Claar, James A.: *See*—
Wilt, Truman F.; Carney, Joseph M.; Thomas, Stephen J.; Claar, James A.; and Birkmeyer, William J., 5,468,802, Cl. 524-539.000.

Clark, Andrew B.: *See*—
Gradon, Lewis; Clark, Andrew B.; and Seakins, Paul J., 5,468,961, Cl. 250-343.000.

Clark, Brian R.: *See*—
Sharma, Somesh D.; Clark, Brian R.; and Lerch, Bernard L., 5,468,481, Cl. 424-125.100.

Clark, Christopher S.: *See*—
Weber, David R.; and Clark, Christopher S., 5,468,165, Cl. 440-46.000.

Clark, Donna A.: *See*—
Nguyen, Tuan K.; Nguyen, Pha; Clark, Donna A.; and Marinelli, Robert A., 5,469,178, Cl. 343-702.000.

Clark, Michael B.; and Venolia, Daniel S., to Apple Computer, Inc. Apparatus and method for providing different input device orientations of a computer system. 5,469,194, Cl. 345-173.000.

Clark, Richard L.: *See*—
Navone, David; and Clark, Richard L., 5,469,509, Cl. 381-28.000.

Clark, Richard S. J.: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto; Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Clark, Russell L.: *See*—
Suman, Michael J.; Clark, Russell L.; and Ferrell, Richard M., 5,469,298, Cl. 359-630.000.

Clarke, Cyril R.: *See*—
Berlin, Kenneth D.; Garrison, Gregory L.; Sangiah, Subbiah; Clarke, Cyril R.; Chen, Chun-Lin; Lazzara, Ralph; Scherlag, Benjamin J.; Patterson, Eugene S.; and Burrows, George E., 5,468,858, Cl. 546-18.000.

Claude, Jean M.; and Evers, Gerardus H. M., to Societe Nouvelle Technigaz; and Soletanche Enterprise. Buried storage tank with a single fluid-tight vessel for the confinement of a liquefied gas for example and arrangement of such storage tanks. 5,468,089, Cl. 405-52.000.

Clavin, J. Steven; Peters, Bradley J.; and Schrandt, Henry M., to Betz Laboratories, Inc. Solid halogen feed system. 5,468,377, Cl. 210-167.000.

Clayton, Alan: *See*—
Liebman, Henry F.; Clayton, Alan; and Horneman, Walter A., 5,469,073, Cl. 324-757.000.

Clear Difference Co., The: *See*—
Good, Robert; and Carobus, Richard, 5,467,989, Cl. 273-167.00R.

Clemens, Clive; and Wain, Robert E., to Pirelli Tyres Limited. Seat back with adjustable support. 5,468,048, Cl. 297-284.400.

Clifton, Daniel B., to Harris Corporation. Resource access security system for controlling access to resources of a data processing system. 5,469,556, Cl. 395-490.000.

Clopton, Robert T., to Tekno, Inc. Chain for accumulating conveyor. 5,467,860, Cl. 198-779.000.

Clorox Company, The: *See*—
Garabedian, Aram, Jr.; Mills, Scott C.; Sibert, William P.; Choy, Clement K.; and Rebelo do Couto, Fernando J., 5,468,423, Cl. 252-546.000.

Clough, John M.; Godfrey, Christopher R. A.; Streeting, Ian T.; and Cheetham, Rex, to Zeneca Limited. Fungicidal compositions and methods of use employing pyrimidine derivatives. 5,468,747, Cl. 514-239.500.

Clough, John M.: *See*—
Buckley, Alan J.; Huchings, Michael G.; Ferguson, Ian; Beautement, Kevin; Clough, John M.; Crowley, Patrick J.; Godfrey, Christopher R. A.; deFraine, Paul J.; Anthony, Vivienne M.; and Heaney, Stephen P., 5,468,857, Cl. 544-298.000.

Cobe Laboratories, Inc.: *See*—
Sjogren, Axel; Carson, Gary; Estergreen, Steven; Taga, Timothy; and Stewart, Rodger, 5,468,449, Cl. 422-46.000.

Cocain, H. William: *See*—
Lenke, Gerd M.; and Cocain, H. William, 5,468,831, Cl. 528-44.000.

Cochran, Eli: *See*—
Powers, John R., III; Palmer, James E.; Coleman, Patricia J.; Herman, Jeffrey A.; and Cochran, Eli, 5,469,540, Cl. 395-158.000.

Coe, Robert P.; and Blend, Theodore, to Moore Business Forms, Inc. Verification latent image. 5,468,581, Cl. 430-22.000.

Cohen, Edward H.; and Landgraf, Bryan E., to Cytomed, Inc. 9804 gene and methods of use thereof. 5,468,612, Cl. 435-6.000.

Cohen, Simon S., to Massachusetts Institute of Technology. Method of making a three-terminal fuse. 5,468,680, Cl. 437-170.000.

Colarusso, Louis J.: *See*—
Albrigo, Julian; Ricker, Edward D.; and Colarusso, Louis J., 5,468,524, Cl. 428-34.100.

Cole, Lawrence: *See*—
Wile, Richard M.; and Cole, Lawrence, 5,467,572, Cl. 53-384.100.

Cole Parmer Instrument Company: *See*—
Sundén, Bengt; Forsström, Bo; Soderquist, Charles E.; and Storckman, Steven D., 5,468,129, Cl. 417-477.120.

Coleman, Patricia J.: *See*—
Powers, John R., III; Palmer, James E.; Coleman, Patricia J.; Herman, Jeffrey A.; and Cochran, Eli, 5,469,540, Cl. 395-158.000.

Coley, John: *See*—
Catt, Michael; Coley, John; and Davis, Paul J., 5,467,778, Cl. 128-738.000.

Colgate Palmolive Co.: *See*—
Dixit, Nagaraj S.; D'Ambrogio, Robert; Kenkare, Divaker; and Drapier, Julien, 5,468,411, Cl. 252-99.000.
Farooq, Amjad; Mehreteab, Ammanuel; Broze, Guy; and Bielli, Cristina, 5,468,398, Cl. 252-88.000.

Colin Corporation: *See*—
Narimatsu, Kiyoyuki; and Kawamura, Norio, 5,467,771, Cl. 128-672.000.

Collier, William R. Air circulation system for enclosed structures. 5,468,184, Cl. 454-186.000.

Collins, Kevin T.: *See*—
Butensky, Michael J.; Gibbs, Richard A.; Collins, Kevin T.; Yang, Yih-Nan; Johnson, Eric M.; and Grafft, Chris A., 5,469,503, Cl. 379-265.000.

Colman, Lonnie L.: *See*—
McGill, James K., III; Abele, Dorotea; Colman, Lonnie L.; Gonsalves, Manuel; and Saxena, Sanjeev, 5,469,573, Cl. 395-700.000.

Colsman & Co. GmbH: *See*—
Weber, Horst; and Normann, Alfred, 5,468,143, Cl. 431-243.000.

Colvin, Bryan J., Sr.; and Cook, Perry R., to Media Vision, Inc. Sound synthesis model incorporating sympathetic vibrations of strings. 5,468,906, Cl. 84-625.000.

Coman, Sorin, to Hoover Universal, Inc. Energy absorbing child seat. 5,468,044, Cl. 297-216.110.

Combustion Engineering, Inc.: *See*—
Bozzuto, Carl R.; Bianca, Joseph D.; and Siddall, Walter F., 5,467,591, Cl. 60-39.020.

Commonwealth of Australia, The: *See*—
Earl, George F.; and Ward, Bruce D., 5,469,171, Cl. 342-159.000.

Commonwealth of Australia, c/o The Secretary, Department of Defence, The: *See*—
Anderson, Stuart J., 5,469,168, Cl. 342-26.000.

Commonwealth System of Higher Education, University of Pittsburg of the: *See*—
Billiar, Timothy R.; Nussler, Andreas K.; Geller, David A.; and Simmons, Richard L., 5,468,630, Cl. 435-189.000.

CommScope, Inc.: *See*—
Blew, Douglas J.; and Carlson, Bruce J., 5,469,523, Cl. 385-101.000.

Compaq Computer Corp.: *See*—
Callison, Ryan A.; Chandler, Gregory T.; and Grieff, Thomas W., 5,469,548, Cl. 395-441.000.
Kluth, Michael R.; and Reents, Roberta M., 5,469,335, Cl. 361-800.000.
Tucker, Brian B.; and Belmont, Brian V., 5,469,554, Cl. 395-420.000.
Vanbuskirk, Michael R.; and Meinecke, Jon M., 5,469,545, Cl. 395-200.010.

Walker, Richard E.; and Nguyen, Hai N., 5,469,320, Cl. 361-33.000.
Compton, Ira. Fluid filled shaker pad for a tree shaking harvester. 5,467,588, Cl. 56-340.100.
Comte, Marie J. M., to Corning Incorporated. Lead-free glasses exhibiting characteristics of crystal. 5,468,693, Cl. 501-72.000.
Conder, Alan D.: *See*—
Seligmann, Daniel A.; Moss, William C.; Valk, Theodore C.; and Conder, Alan D., 5,469,442, Cl. 370-110.400.
Cone, Dale A.: *See*—
Lewis, Russell F.; Martin, Steven F.; Cone, Dale A.; and Josephson, Norman A., 5,469,511, Cl. 381-173.000.
Cone, Kenneth F.: *See*—
Krishnamurthy, Suresh; McCormick, Robert A.; Cone, Kenneth F.; Brown, Gary L.; and Bryant, Ronald W., 5,469,188, Cl. 345-117.000.
Conkle & Olesten: *See*—
Huber, S. Richard; and Counts, David F., 5,468,490, Cl. 424-78.030.
Conmed Corporation: *See*—
Gentelia, John S.; Eggan, Ronald E., Jr.; Williams, Frank R.; and Wheatley, William, 5,468,240, Cl. 606-42.000.
Consortio per la Ricerca Sulla Microelettronica Nel Mezzogiorno: *See*—
Frisina, Ferruccio; and Ferla, Giuseppe, 5,468,660, Cl. 437-31.000.
Conte, Francis Luca: *See*—
Farwell, Lawrence A., 5,467,777, Cl. 128-731.000.
Contico International, Inc.: *See*—
Foster, Donald D.; and Nelson, Philip L., 5,467,901, Cl. 222-376.000.
Continental Aktiengesellschaft: *See*—
Neddenriep, Thomas; and Frucht, Theodor, 5,467,807, Cl. 152-458.000.
Conway, Harry E.; and Bourdelaise, Robert A. Cooling system for modular power supply device. 5,469,331, Cl. 361-716.000.
Cook, Nigel J. D.; Weight, Kenneth R.; Gutman, Richard G.; Buttery, Roger A.; and Grimes, Michael, to Pall Corporation. Depth filter media. 5,468,382, Cl. 210-232.000.
Cook, Perry R.: *See*—
Colvin, Bryan J., Sr.; and Cook, Perry R., 5,468,906, Cl. 84-625.000.
Cookson, Christopher J.: *See*—
Ostrover, Lewis S.; Cookson, Christopher J.; and Lieberfarb, Warren N., 5,469,370, Cl. 364-514.00R.
Cooley, Neil A.; and Kirk, Adrian P., to BP Chemicals Limited. Group VIII metal catalyst composition. 5,468,708, Cl. 502-162.000.
Cooper, David E. Sleep awakening device for drivers of motor vehicles. 5,469,143, Cl. 340-575.000.
Copple, Charles M.: *See*—
Reid, Leonard F.; and Copple, Charles M., 5,468,104, Cl. 411-113.000.
Corcoran, Cathleen: *See*—
Zecchino, Julius R.; Messin, Steven; Corcoran, Cathleen; and Chung, Kenneth T., 5,468,471, Cl. 424-59.000.
Cordi, Alex A.; Handelmann, Gail E.; and Monahan, Joseph B., to G. D. Searle & Co. Use of a glycine B partial agonist for memory and learning enhancement or treatment of a cognitive disorder. 5,468,763, Cl. 514-380.000.
Cording, Louis B.; Knudsen, Hans B.; and Gramkow, Asger, to A'Gramkow A/S. Apparatus for collecting a volatile condensate and for separating non-condensible gas therefrom. 5,467,608, Cl. 62-195.000.
Corn, Stephen B., to Children's Medical Center Corporation. Anesthesia docking station. 5,468,230, Cl. 604-110.000.
Cornell Research Foundation, Inc.: *See*—
Shoemaker, Christine A.; and Whiffen, Gregory J., 5,468,088, Cl. 405-52.000.
Cornell, William L.: *See*—
Hicks, Gary W.; and Cornell, William L., 5,467,876, Cl. 209-170.000.
Corniani, Carlo: *See*—
Zanini, Gianpietro; Vesentini, Renzo; and Corniani, Carlo, 5,467,527, Cl. 29-773.000.
Corning Incorporated: *See*—
Boek, Heather; Borrelli, Nicholas F.; and Hares, George F., 5,468,692, Cl. 501-64.000.
Comte, Marie J. M., 5,468,693, Cl. 501-72.000.
Coroy, Trent: *See*—
Measures, Raymond M.; Alavie, Tino; Melle, Serge M.; Coroy, Trent; Mason, Beck; Karr, Shawn E.; and Liu, Kexing, 5,469,265, Cl. 356-419.000.
Corradini, Paolo: *See*—
Guerra, Gaetano; Corradini, Paolo; DeRosa, Claudio; Iuliano, Mauro; Oliva, Leone; and Petraccone, Vittorio, 5,468,823, Cl. 526-347.100.
Cortese, Carmelo A. Removal device for machines for checking, drying and pressing socks. 5,467,905, Cl. 223-112.000.
Costello, Mike P.: *See*—
Heasler, Scott E.; Bergman, Scott I.; and Costello, Mike P., 5,469,133, Cl. 340-407.100.
Coté, Stephane. Floating fish stringer. 5,467,908, Cl. 224-103.000.
Cotton, Dave: *See*—
Efland, Taylor R.; Cotton, Dave; and Skelton, Dale J., 5,468,984, Cl. 257-356.000.
Couchot, Norman J.: *See*—
Daniel, Edward A.; Couchot, Norman J.; Keller, Daniel L.; and Brewer, William C., 5,467,705, Cl. 100-214.000.
Coude, Francois X.; Fournier, Jacqueline; and Guzzi, Umberto, to Sanofi. Use of a 1-(2-naphthylethyl)-4-(3-trifluoromethylphenyl)-1,2,3,6-tetrahydropyridine for the manufacture of a medicament for the treatment of cerebral and neuronal diseases. 5,468,753, Cl. 514-277.000.
Coulter Corporation: *See*—
Coulter, Wallace H.; Hollinger, John D.; Kortright, Kenneth H.; Russell, Thomas; Rodriguez, Carlos; and Paul, Ronald, 5,468,616, Cl. 435-7.200.
Coulter, Wallace H.; Hollinger, John D.; Kortright, Kenneth H.; Russell, Thomas; Rodriguez, Carlos; and Paul, Ronald, to Coulter Corporation. Method and apparatus for rapid mixing of small volumes for enhancing biological reactions. 5,468,616, Cl. 435-7.200.
Counts, David F.: *See*—
Huber, S. Richard; and Counts, David F., 5,468,490, Cl. 424-78.030.
Coutts, Bruce; and Roe, Christopher A., to ITT Corporation. Seal between buffer tube and optical fiber. 5,469,521, Cl. 385-77.000.
Cox, John H. Portable sportsman furnace. 5,467,760, Cl. 126-208.000.
Cox, William D., to QuickLogic Corporation. Field programmable antifuse device and programming method therefor. 5,469,077, Cl. 326-38.000.
CPM: *See*—
Diekema, Jon M.; Steffler, Joseph B.; Van Baren, Jerald W.; and Sancimino, Vincent, 5,469,365, Cl. 364-483.000.
Crain, Jack A. System for lifting tubulars and equipment below the main deck of platforms. 5,467,833, Cl. 175-52.000.
Crandall, Alan: *See*—
Sandler, Sheldon; Crandall, Alan; Schwarzkopf, Daniel; Johnson, Gilbert; and Borkowski, Rudolph, 5,469,176, Cl. 342-375.000.
Craninckx, Jan: *See*—
Steyaert, Michel; Debaene, Wim; Craninckx, Jan; Walsh, Mairtin; and Real, Peter, 5,469,113, Cl. 329-311.000.
Crawford, William E., II. Self supporting sideless and waistless tanning brief. 5,467,482, Cl. 2-67.000.
Crawford, William W.: *See*—
DeMarsh, Peter L.; and Crawford, William W., 5,467,824, Cl. 166-297.000.
Creamery Hollow U.S.A., Inc.: *See*—
Fackrell, Robert N.; and Griffeth, Lorenzo P., 5,468,513, Cl. 426-663.000.
Creaser, Colin S.: *See*—
Stephenson, George R.; and Creaser, Colin S., 5,468,644, Cl. 436-163.000.
Cree, Robert E. Cooling and thickness control for extruded products. 5,468,134, Cl. 425-72.100.
Creger, Todd D.; Mitchell, Randall M.; Stahl, Alan L.; and Talbott, James R., to Caterpillar Inc. Method of controlling clutch-to-clutch shifts for a powershift transmission. 5,467,854, Cl. 192-87.180.
Crinion, Jonathan, to Teknion Furniture Systems. Counterline systems. 5,467,703, Cl. 108-50.000.
Crippen, Warren S. Porous fiberglass cast system for the setting of broken appendages. 5,468,219, Cl. 602-6.000.
Crivelli, Henry. Precast surface paving overlay comprising rubber crumbs and clay particles. 5,468,539, Cl. 428-141.000.
Crivello, James V.; Belfort, Georges; and Yamagishi, Hideyuki, to Rensselaer Polytechnic Institute. Low fouling ultrafiltration and microfiltration aryl polysulfone. 5,468,390, Cl. 210-490.000.
Crofts, John D.; Shurman, Rodney M.; and Wheeler, Gayle L., to Cummins Engine Company, Inc. Two-piece collet adjusting nut for a fuel injector solenoid valve. 5,467,963, Cl. 251-129.180.
Crook, David T.: *See*—
Kerschner, Ronald K.; Heumann, John M.; McDermid, John E.; Schlotzhauer, Ed. O.; and Crook, David T., 5,469,064, Cl. 324-537.000.
Crouch, Earl T., to General Electric Company. Method for production of a coated substrate with controlled surface characteristics. 5,468,542, Cl. 428-215.000.
Crowley, Patrick J.: *See*—
Buckley, Alan J.; Huchings, Michael G.; Ferguson, Ian; Beautement, Kevin; Clough, John M.; Crowley, Patrick J.; Godfrey, Christopher R. A.; deFraine, Paul J.; Anthony, Vivienne M.; and Heaney, Stephen P., 5,468,857, Cl. 544-298.000.
Cuchiaro, Joseph D.: *See*—
Paz de Araujo, Carlos A.; Scott, Michael C.; Cuchiaro, Joseph D.; and McMillan, Larry D., 5,468,679, Cl. 437-110.000.
Cummings, Larry D.; and Mittlefehldt, Kurt R., to General Motors Corporation. Two plate TXV block connector for automotive A/C system with common bolts and independently attachable sides. 5,467,611, Cl. 62-299.000.
Cummings, Russell E., II: *See*—
Oke, Timothy P.; Cummings, Russell E., II; and Gavrielov, Nachum M., 5,469,075, Cl. 324-763.000.
Cummins-Allison Corp.: *See*—
Geib, Joseph J., 5,468,182, Cl. 453-10.000.
Cummins Engine Company, Inc.: *See*—
Crofts, John D.; Shurman, Rodney M.; and Wheeler, Gayle L., 5,467,963, Cl. 251-129.180.
Cunningham, John E.; Goossen, Keith W.; Jan, William Y.; and Walker, James A., to AT&T Corp. Method for preparation of silicon nitride gallium diffusion barrier for use in molecular beam epitaxial growth of gallium arsenide. 5,468,689, Cl. 437-241.000.
Cuomo, Jerome J.; and Yehoda, Joseph E., to International Business Machines Corporation. Apparatus for polishing a diamond or carbon nitride film by reaction with oxygen transported to the film through a superionic conductor in contact with the film. 5,468,326, Cl. 156-345.000.
Cupido, Enrico: *See*—
Resca, Franco; and Cupido, Enrico, 5,467,909, Cl. 224-244.000.

Cupp, Carl J.; and Pfue, Ronald L., to Pachmayr Ltd. Gun sight mounting structure. 5,467,552, Cl. 42-100.000.

Curtis, Randall H.: *See*—
Schnaars, Daniel R.; and Curtis, Randall H., 5,468,528, Cl. 428-35.700.

Curtiss, Roy, III, to Washington University. Avirulent microbes and uses therefor. 5,468,485, Cl. 424-184.100.

Cushing, Vincent J. Open channel flowmeter. 5,467,650, Cl. 73-215.000.

Customs Ideas: *See*—
Diekema, Jon M.; Steffler, Joseph B.; Van Baren, Jerald W.; and Sancimino, Vincent, 5,469,365, Cl. 364-483.000.

Cymbalski, Robert S.: *See*—
Priddy, Dennis G.; and Cymbalski, Robert S., 5,468,953, Cl. 235-494.000.

Cypress Semiconductor Corp.: *See*—
Bloker, Raymond E., 5,469,084, Cl. 326-110.000.
Lacey, Timothy M., 5,469,384, Cl. 365-185.130.
Nulty, James E.; and Trammel, Pamela S., 5,468,342, Cl. 156-643.100.

Cytomed, Inc.: *See*—
Cohen, Edward H.; and Landgraf, Bryan E., 5,468,612, Cl. 435-6.000.

Czap, Al F. Composition containing a desired flavoring agent and medium chain triglycerides. 5,468,507, Cl. 426-99.000.

Czekaj, James L.: *See*—
Blind, Henry F.; Campagne, Anthony J.; Czekaj, James L.; Difiore, Nicholas L.; Geddes, Earl R.; Krochmal, Andrew C.; and Senyk, Myron I., 5,469,510, Cl. 381-55.000.

Czudak, John C.: *See*—
Brindle, Edward E.; Czudak, John C.; and Mensing, David B., 5,469,534, Cl. 395-114.000.

Czuhai, Brian S.: *See*—
Konrad, Julie A.; Freeland, Mark; and Czuhai, Brian S., 5,467,755, Cl. 123-674.000.

D.E.R. Investments Ltd.: *See*—
Kuechler, Irv, 5,467,761, Cl. 126-299.00D.

D. R. Weber, Inc.: *See*—
Weber, David R.; and Clark, Christopher S., 5,468,165, Cl. 440-46.000.

Daewoo Electronics Co., Ltd.: *See*—
Lim, Dae-Young, 5,469,302, Cl. 359-846.000.
Park, Yong-Gyu, 5,469,449, Cl. 371-40.100.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Oshima, Katsuyuki; Kutsukake, Masaki; Sato, Hideaki; and Sudo, Kenichiro, 5,468,714, Cl. 503-227.000.

Dai Nippon Printing Co., Ltd.: *See*—
Fujimura, Hideo; and Nakamura, Yoshinori, 5,468,713, Cl. 503-227.000.

Daicel Chemical Industries, Ltd.: *See*—
Okano, Yoshimichi; Kanno, Tatsuya; Yamato, Tsutomu; Oshino, Yasuhiro; Tanigawa, Michiyo; Kuwana, Takaaki; and Fukuda, Yutaka, 5,468,836, Cl. 528-204.000.

Daiden Kabushiki Kaisha: *See*—
Ito, Akira; and Kamohara, Hiroaki, 5,469,066, Cl. 324-551.000.

Daifuku Co., Ltd.: *See*—
Shibata, Satoru; and Murayama, Shigeto, 5,467,718, Cl. 104-284.000.
Takaoka, Shigekazu, 5,467,561, Cl. 52-30.000.

Daikin Industries, Ltd.: *See*—
Shigemori, Kazuhisa, 5,469,264, Cl. 356-417.000.

Daikoku, Shizue: *See*—
Horita, Satomi; Aoki, Yasushi; Wakana, Masahiro; Okamoto, Hiroshi; Chiba, Kiyohiko; and Daikoku, Shizue, 5,469,081, Cl. 326-81.000.

Dainihon Jochugiku Co., Ltd.: *See*—
Katsuda, Yoshio, 5,468,497, Cl. 424-405.000.

Dais Corporation: *See*—
Ehrenberg, Scott G.; Serpico, Joseph; Wnek, Gary E.; and Rider, Jeffrey N., 5,468,574, Cl. 429-33.000.

Daiwa Seiko, Inc.: *See*—
Miyazaki, Takeo, 5,467,933, Cl. 242-261.000.

Dajoux, Bernard: *See*—
Tourneux, Daniel; Mariatte, René; and Dajoux, Bernard, 5,468,071, Cl. 384-276.000.

Daley, Stephen T. A. K.: *See*—
Randles, Kenneth R.; Gott, Brian G.; and Daley, Stephen T. A. K., 5,468,903, Cl. 568-28.000.

Daley, Wayne D. R.: *See*—
Carey, Richard A.; Moses, Marlon M.; and Daley, Wayne D. R., 5,467,922, Cl. 236-94.000.

Da Lio, Joseph; Lanzavecchia, Laura; and Savini, Giuseppe, to Enichem Elastomeri S.r.l. Vulcanizable compositions based on modified acrylic rubbers. 5,468,817, Cl. 526-79.000.

D'Alise, James V. Dual function prosthetic locking device for endosseous dental implants. 5,468,149, Cl. 433-173.000.

Dalrymple, Thomas H.; and Harkey, Christopher C., to Trinity Industries, Inc. Method and apparatus for securing a tank to a tank car sill. 5,467,719, Cl. 105-362.000.

Dambmann, Claus: *See*—
Outtrup, Helle; Aaslyng, Dorrit A.; Dambmann, Claus; and Patkar, Shamkant A., 5,468,416, Cl. 252-174.120.

D'Ambrogio, Robert: *See*—
Dixit, Nagaraj S.; D'Ambrogio, Robert; Kenkare, Divaker; and Drapier, Julien, 5,468,411, Cl. 252-99.000.

Dammann, Martin: *See*—
Ibental, Achim; and Dammann, Martin, 5,469,217, Cl. 348-447.000.

Dana Corporation: *See*—
Loeffler, John M., 5,468,197, Cl. 477-99.000.
Olson, Darwin C., 5,468,028, Cl. 285-322.000.
Staab, Thomas E.; Shah, Kanu G.; Gallo, Paul E.; and Rakauskas, Paul V., 5,468,003, Cl. 277-235.00B.

Daniel, Edward A.; Couchot, Norman J.; Keller, Daniel L.; and Brewer, William C., to Minster Machine Company, The. Oil control system for a press. 5,467,705, Cl. 100-214.000.

Daniels, William J.: *See*—
Musil, Edward C.; and Daniels, William J., 5,467,867, Cl. 198-844.200.

Danielson, Arvin D.; and Durbin, Dennis A., to Norand Corporation. Pocket size data capture unit with processor and shell modules. 5,468,947, Cl. 235-472.000.

Danish Crown Inc. A/S: *See*—
Christensen, Bent; and Mogensen, Frits, 5,468,510, Cl. 426-574.000.

Daoudal, Bertrand: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; and Marchand, Pierre, 5,468,399, Cl. 252-18.000.

Dart Engineering AG: *See*—
Ekman, Thure, 5,467,964, Cl. 251-149.600.

Dart Industries Inc.: *See*—
Laib, Douglas M., 5,467,699, Cl. 99-495.000.

Das, Bidyut B.: *See*—
Alfano, Robert R.; Pradhan, Asima; Tang, Guichen C.; Wang, Leming; Budansky, Yury; and Das, Bidyut B., 5,467,767, Cl. 128-665.000.

Dassault Electronique: *See*—
Nicole, Pierre, 5,469,286, Cl. 359-163.000.

Dauerer, Norman J.; and Kelley, Edward E., to International Business Machines Corporation. Front end for file access controller. 5,469,576, Cl. 395-186.000.

Daum, Keith E., to National Semiconductor Corp. Structures for preventing reverse engineering of integrated circuits. 5,468,990, Cl. 257-632.000.

Daum, Sol J.: *See*—
Bacon, Edward R.; Daum, Sol J.; Estep, Kimberly G.; Josef, Kurt A.; Douty, Brent D.; and Illig, Carl R., 5,468,466, Cl. 424-9.450.

Davenport, John M.: *See*—
Cassarly, William J.; Davenport, John M.; and Hansler, Richard L., 5,469,337, Cl. 362-32.000.

David, John M. Tree stand rangefinder and method of using the same. 5,467,531, Cl. 33-284.000.

David, Lennie F.; and Roberts, Peter J. Electrolytic chlorination. 5,468,360, Cl. 204-228.000.

David, Morgan W. A.; and Burns, James E., to Sony United Kingdom Limited. Video signal processing to derive motion vectors representing motion between successive fields or frames. 5,469,226, Cl. 348-699.000.

Davidson Textron Inc.: *See*—
Lein, Maureen M.; Eisfeller, Richard C.; Poliquin, Alfred T.; Burns, Mark; and Russell, John T., 5,468,518, Cl. 427-421.000.

Davis, Harold A., to Willknight, Inc. One-piece folding auger for bulk material tender. 5,468,113, Cl. 414-523.000.

Davis, James A.; Kane, Edward G.; Alexander, Brian S.; and Barham, William F., to Bridgestone/Firestone, Inc. EPDM roofing membrane with improved burn resistivity. 5,468,550, Cl. 428-327.000.

Davis, Mark W.: *See*—
Stein, Judith; and Davis, Mark W., 5,468,794, Cl. 524-188.000.

Davis, Paul J.: *See*—
Catt, Michael; Coley, John; and Davis, Paul J., 5,467,778, Cl. 128-738.000.

Davy, Kenneth W. M.: *See*—
Braden, Michael; Downes, Sandra; Patel, Mangala P.; and Davy, Kenneth W. M., 5,468,787, Cl. 523-113.000.

Dawes, Timothy D.: *See*—
Harris, Albert K. M.; Kirk, Gregory L.; Owicki, John C.; Dawes, Timothy D.; and Kuo, Richard C., 5,468,605, Cl. 435-4.000.

Dawson, Peter J. Adjustable concrete rod. 5,468,095, Cl. 404-118.000.

Day, Robert C. L.: *See*—
Cane, Michael R.; and Day, Robert C. L., 5,468,081, Cl. 400-621.000.

Day, Stanley J. Universal coupling. 5,468,188, Cl. 464-60.000.

Dea, David, to Intel Corporation. Dequantization using decrements and multiply. 5,469,208, Cl. 348-27.000.

Dean, William J.; and Gilles, Theodore C., to Lennox Industries Inc. Air conditioning system with thermal energy storage and load leveling capacity. 5,467,812, Cl. 165-2.000.

Deblay, Philippe: *See*—
Carron, Didier; Deblay, Philippe; and Desage, Robert, 5,468,395, Cl. 210-774.000.

de Buzzaccarini, Francesco; Farwick, Timothy J.; and Zhen, Yeuqian, to Procter & Gamble Company, The. Stable, aqueous laundry detergent composition having improved softening properties. 5,468,413, Cl. 252-117.000.

Deckert, Curtis K.: *See*—
Urshan, Sydney; Deckert, Curtis K.; and Gonzales, Oscar, 5,468,944, Cl. 235-454.000.

de Costa, Brian R.: *See*—
McCabe, R. Tyler; and de Costa, Brian R., 5,468,854, Cl. 540-498.000.

Deevi, Sarojini: *See*—
Bensalem, Azzedine; Deevi, Sarojini; Deevi, Seetharama C.; and Schleich, Donald M., 5,468,266, Cl. 44-542.000.

Deevi, Seetharama C.; Hajaligol, Mohammad R.; Lieberman, Pamela D.; Nichols, Walter A.; and Watkins, Michael L., to Philip Morris Incorporated. Heater having a multiple-layer ceramic substrate and method of fabrication. 5,468,936, Cl. 219-553.000.

Deevi, Seetharama C.: *See*—
Bensalem, Azzedine; Deevi, Sarojini; Deevi, Seetharama C.; and Schleich, Donald M., 5,468,266, Cl. 44-542.000.
DeField, Norman. Key chain note holder with transparent housing. 5,467,871, Cl. 206-232.000.
dePraine, Paul J.: *See*—
Buckley, Alan J.; Huchings, Michael G.; Ferguson, Ian; Beautement, Kevin; Clough, John M.; Crowley, Patrick J.; Godfrey, Christopher R. A.; dePraine, Paul J.; Anthony, Vivienne M.; and Heaney, Stephen P., 5,468,857, Cl. 544-298.000.
DeGeorge, Rick E. Pallet slat salvaging apparatus. 5,467,516, Cl. 29-239.000.
De Groote, Jan L. B.; Vandewege, Jan A. O.; Allaert, Joost; and Van Parys, Hans A. G., to Alcatel, N.V. Transmission system for transmitting signals in a burst mode. 5,469,464, Cl. 375-317.000.
Deguchi, Mikio: *See*—
Arimoto, Satoshi; Hayafuji, Norio; Deguchi, Mikio; and Hamamoto, Satoshi, 5,467,731, Cl. 117-43.000.
Dehaene, Wim: *See*—
Steyaert, Michel; Dehaene, Wim; Craninckx, Jan; Walsh, Mairtin; and Real, Peter, 5,469,113, Cl. 329-311.000.
Dehdashti, Dolores A.: *See*—
Griffin, Edmond I.; and Dehdashti, Dolores A., 5,468,234, Cl. 604-290.000.
Deibler, Elizabeth A.: *See*—
Everhart, Dennis; Deibler, Elizabeth A.; and Taylor, Julie R., 5,468,236, Cl. 604-361.000.
DeJean, Anne: *See*—
Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; DeJean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, 5,468,617, Cl. 435-7.800.
DeKeyser, Dawn; Abraham, Loren; and Eljadi, David A., to Andersen Corporation. Daylight collection and distribution system. 5,467,564, Cl. 52-173.300.
de Kock, Cornelis, to Koni, B.V. Twin-pipe shock absorber. 5,467,852, Cl. 188-322.140.
de La Chapelle, Michael: *See*—
Abbas, Gregory L.; Vertatschitsch, Edward J.; de La Chapelle, Michael; and Porter, Charles R., 5,467,942, Cl. 244-75.00R.
de la Torre Barreiro, Jose L. Magnetic conditioners for treating liquids. 5,468,378, Cl. 210-192.000.
Delco Electronics Corporation: *See*—
Madaen, Wayne A., 5,469,026, Cl. 315-169.400.
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; and Marchand, Pierre, to Institut Francais du Petrole. Colloidal products containing sulfur and/or phosphorus and/or boron, their preparation and their utilization as additives for lubricants. 5,468,399, Cl. 252-18.000.
Delfyett, Peter J., Jr., to University of Central Florida. Mode locked laser diode in a high power solid state regenerative amplifier and mount mechanism. 5,469,454, Cl. 372-18.000.
Dell USA, L.P.: *See*—
Parks, Terry J.; and Register, David S., 5,469,559, Cl. 395-433.000.
del Mar Segura Salvador, Maria; and Segura Salvador, Silvia B. Braking system for bobbin-holder supports. 5,467,934, Cl. 242-421.400.
Delo, Ronald R.: *See*—
Bower, Lawrence J.; Delo, Ronald R.; and VanZeeland, Gerald D., 5,468,207, Cl. 493-297.000.
Deloux, Laurent: *See*—
Srebnik, Morris; Zheng, Bin; and Deloux, Laurent, 5,468,889, Cl. 556-7.000.
Delphia, John B.: *See*—
Hall, Jack K.; and Delphia, John B., 5,468,050, Cl. 297-344.100.
Delserro, Robert J. Manual golf cart. 5,468,006, Cl. 280-202.000.
DeLuca, Frank: *See*—
Buescher, Alfred J.; and DeLuca, Frank, 5,467,924, Cl. 239-88.000.
DeMarsh, Peter L.; and Crawford, William W., to Senior Engineering Company. Apparatus for and a method of severing multiple casing strings using explosives. 5,467,824, Cl. 166-297.000.
Demissy, Daniel, to GEC Alsthom T & D, Inc. Female contact, in particular for a high tension section switch. 5,468,164, Cl. 439-843.000.
Demoe, Larry: *See*—
Powell, Fred D.; Phelan, Raymond J.; McCormack, James; Budansew, Peter; Demoe, Larry; and Poschun, Alex, 5,468,434, Cl. 264-46.800.
Demura, Tatsuhiko, to Kabushiki Kaisha Toshiba. Decoding system having parallel-processing capability therein. 5,469,273, Cl. 358-426.000.
Den Norske Stats Oljeselskap A.S.: *See*—
Breivik, Kare; Smedal, Arne; and Syvertsen, Kare, 5,468,166, Cl. 441-5.000.
de Nanteuil, Guillaume; Vincent, Michel; Lila, Christine; Bonnet, Jacqueline; and Fradin, Armel, to Adir et Compagnie. 4-methyl-5-substituted-1,3-oxazoles having anti-inflammatory activity. 5,468,761, Cl. 514-374.000.
Dence, Carmen S.: *See*—
Shefer, Ruth E.; Klinkowstein, Robert E.; Hughey, Barbara J.; Welch, Michael J.; and Dence, Carmen S., 5,468,355, Cl. 204-157.200.
Denissen, Adrianus J. M.; and Zwaans, Bernardus A. M. Encoding/decoding circuit, and digital video system comprising the circuit. 5,469,448, Cl. 371-37.400.
Dennis, Stephen V., to Microsoft Corporation. Resource-oriented printer system and method of operation. 5,469,533, Cl. 395-114.000.
De Poorter, Johannes A.: *See*—
Van De Pas, Hermanus A.; Tijburg, Rudolf P.; and De Poorter, Johannes A., 5,468,683, Cl. 437-209.000.
Deppert, Thomas M.: *See*—
Taylor, Robert D.; Deppert, Thomas M.; and Barnes, Michael W., 5,467,715, Cl. 102-289.000.
Dereu, Norbert: *See*—
Bouboutou, Romaine; Dereu, Norbert; Evers, Michel; Gueguen, Jean-Christophe; James, Claude; Poujade, Christèle; Reisdorf, Daniel; Ribeill, Yves; and Soler, Françoise, 5,468,888, Cl. 554-58.000.
de Riese-Meyer, Loert; and Zauns-Huber, Rudolf, to Henkel Kommanditgesellschaft auf Aktien. Process for the production of an aluminum triformate solution containing alkali metal and/or alkaline earth metal, highly concentrated aluminum triformate solutions containing alkali and/or alkaline earth metal, and their use. 5,468,892, Cl. 556-171.000.
Derksen, Klaus, to Firma Carl Freudenberg. Closure for an injection bottle. 5,467,878, Cl. 215-253.000.
Derleth, Helmut; and Bretz, Karl H., to Solvay Catalysts GmbH. Process for preparing fracture-resistant sol/gel particles. 5,468,558, Cl. 428-402.000.
Dermenzhi, Evgeniy: *See*—
Evseev, Yury; Rachinsky, Lubomir; Tetervova, Natalia; Seleninov, Kazimir; Dermenzhi, Evgeniy; Nasekan, Olga; Druyanova, Eva; and Ribak, Roman, 5,468,976, Cl. 257-177.000.
DeRosa, Claudio: *See*—
Guerra, Gaetano; Corradini, Paolo; DeRosa, Claudio; Iuliano, Mauro; Oliva, Leone; and Petraccone, Vittorio, 5,468,823, Cl. 526-347.100.
DeRosa, Thomas F.; Studzinski, William M.; Russo, Joseph M.; Kaufman, Benjamin J.; and Hahn, Robert T., to Texaco Inc. Non-metallic anti-knock fuel additive. 5,468,264, Cl. 44-426.000.
Desaga GmbH: *See*—
Berkhan, Ernst; and Muth, Hubert, 5,468,067, Cl. 366-208.000.
Desage, Robert: *See*—
Carron, Didier; Deblay, Philippe; and Desage, Robert, 5,468,395, Cl. 210-774.000.
deSolms, S. Jane; Giuliani, Elizabeth A.; and Graham, Samuel L., to Merck & Co., Inc. Inhibitors of farnesyl-protein transferase. 5,468,733, Cl. 514-19.000.
Dettmering, Todd J.: *See*—
Graushar, William T.; Geres, John C.; and Dettmering, Todd J., 5,467,973, Cl. 270-1.100.
Dettore, Lawrence A.: *See*—
Dowell, Floyd E.; Sheppard, Harry T.; Dettore, Lawrence A.; and Bennett, Clyde T., 5,467,700, Cl. 99-570.000.
Deutsch, Edward A.; Deutsch, Karen F.; Cacheris, William P.; Ralston, William H.; White, David H.; Nosco, Dennis L.; Wolfangel, Robert G.; Wilking, Janet B.; Meeh, Linda; and Woulfe, Steven R., to Mallinckrodt Medical, Inc. Treated apatite particles for x-ray diagnostic imaging. 5,468,465, Cl. 424-9.400.
Deutsch, Karen F.: *See*—
Deutsch, Edward A.; Deutsch, Karen F.; Cacheris, William P.; Ralston, William H.; White, David H.; Nosco, Dennis L.; Wolfangel, Robert G.; Wilking, Janet B.; Meeh, Linda; and Woulfe, Steven R., 5,468,465, Cl. 424-9.400.
Deutsche Aerospace Airbus GmbH: *See*—
Trey, Heiko; Grabow, Thomas; and Steinbrink, Eckhard, 5,469,147, Cl. 340-625.000.
Deutsche Thomson-Brandt GmbH: *See*—
Rothermel, Albrecht; Gleim, Günter; and Rothermel, Karin, 5,469,089, Cl. 327-56.000.
DeVault, Robert C., to Martin Marietta Energy Systems, Inc. Dual-circuit, multiple-effect refrigeration system and method. 5,467,614, Cl. 62-476.000.
Devine, Maryann: *See*—
Romanelli, Michael G.; Watts, Raymond F.; and Devine, Maryann, 5,468,403, Cl. 252-47.500.
Devlin, Thomas E.: *See*—
Keegan, Joseph P.; and Devlin, Thomas E., 5,467,498, Cl. 15-236.050.
De Vry, Jean M. V.: *See*—
Schohe-Loop, Rudolf; Heine, Hans-Georg; Junge, Bodo; Glaser, Thomas; De Vry, Jean M. V.; Dompert, Wolfgang; and Sommermeyer, Henning, 5,468,882, Cl. 549-407.000.
Dial Corp., The: *See*—
Gupta, Shyam K., 5,468,887, Cl. 554-169.000.
Diamond Light Industries: *See*—
Petersen, Tor H.; Scherbarth, John F.; and Hobbs, Bobby L., 5,469,345, Cl. 362-188.000.
Diaz, Carlos H.; Duvvury, Charvaka; and Kang, Sung-Mo, to Texas Instruments Incorporated. Method of placing source contacts for efficient ESD/EOS protection in grounded substrate MOS integrated circuit. 5,468,667, Cl. 437-50.000.
Dickakian, Ghazi, to Exxon Chemical Patents Inc. Antifoulant for inorganic fouling. 5,468,367, Cl. 208-48.0AA.
Dickens, Joseph C.; Billings, Ronald F.; and Payne, Thomas L., to United States of America, Agriculture; and Texas A&M University System. Green leaf volatiles as inhibitors of bark beetle aggregation pheromones. 5,468,770, Cl. 514-450.000.
DiCroce, John: *See*—
Lavelle, Patrick M.; DiCroce, John; and Malone, Thomas C., 5,469,151, Cl. 340-825.360.
Dieckman, Stephen L.: *See*—
Gopalsami, Nachappa; Bakhtiari, Sasan; Raptis, Apostolos C.; and Dieckman, Stephen L., 5,468,964, Cl. 250-393.000.

Diehl GmbH & Co.: *See*—
Steuer, Raimar, 5,467,940, Cl. 244-3.110.
Diehl, Robert E.: *See*—
Barnes, Keith D.; Kamhi, Victor M.; and Diehl, Robert E., 5,468,877, Cl. 548-543.000.
Diekema, Jon M.; Steffler, Joseph B.; Van Baren, Jerald W.; and Sancimino, Vincent, to Customs Ideas; and CPM. Power monitor unit. 5,469,365, Cl. 364-483.000.
Diels, Gaston S. M.: *See*—
Janssens, Frans E.; Diels, Gaston S. M.; and Leenaerts, Joseph E., 5,468,743, Cl. 514-214.000.
Diemer, Gordon J., to John Henry Company, The. Apparatus for tagging plants. 5,467,524, Cl. 29-701.000.
Difiore, Nicholas L.: *See*—
Blind, Henry F.; Campagne, Anthony J.; Czekaj, James L.; Difiore, Nicholas L.; Geddes, Earl R.; Krochmal, Andrew C.; and Senyk, Myron L, 5,469,510, Cl. 381-55.000.
Digital Equipment Corporation: *See*—
Pawlowski, Chester W., 5,469,547, Cl. 395-285.000.
Polich, Herman; Nicholson, James; and Emlich, Larry, 5,469,463, Cl. 395-182.180.
Saether, Christian D., 5,469,562, Cl. 395-182.180.
Sites, Richard L.; and Witek, Richard T., 5,469,551, Cl. 395-375.000.
Di Lella, Daniel: *See*—
Rose-Pehrsson, Susan L.; Di Lella, Daniel; and Grate, Jay W., 5,469,369, Cl. 364-497.000.
DiMaria, Donelli J.: *See*—
Bertin, Claude L.; DiMaria, Donelli J.; Miyakawa, Makoto; and Sakaue, Yoshinori, 5,468,663, Cl. 437-43.000.
Distelrath, Winfried: *See*—
Esch, Hans-Joachim; Distelrath, Winfried; and Trieb, Kurt, 5,467,843, Cl. 184-6.500.
Divakaruni, Renuka S.: *See*—
Casey, Jon A.; Divakaruni, Renuka S.; Natarajan, Govindarajan; Reddy, Srinivasa S. N.; and Sammet, Manfred, 5,468,445, Cl. 419-19.000.
Dixit, Nagaraj S.; D'Ambrogio, Robert; Kenkare, Divaker; and Drapier, Julien, to Colgate Palmolive Co. Powdered automatic dishwashing composition containing enzymes. 5,468,411, Cl. 252-99.000.
Do, Tien-Dung: *See*—
Wuidart, Sylvie; and Do, Tien-Dung, 5,469,100, Cl. 327-262.000.
Dobelbower, M. Christian: *See*—
Garnett, Robert W.; and Dobelbower, M. Christian, 5,468,965, Cl. 250-396.0ML.
Dobuzinsky, David M.: *See*—
Carl, Dan; Dobuzinsky, David M.; Nguyen, Son V.; and Nguyen, Tue, 5,468,687, Cl. 437-235.000.
Dockner, Toni: *See*—
Ebel, Klaus; Schroeder, Juergen; Groening, Carsten; Dockner, Toni; and Merkle, Hans R., 5,468,871, Cl. 548-373.100.
Dodd, John, to Beloit Technologies, Inc. Long life refiner disc. 5,467,931, Cl. 241-261.200.
Dodge, Jeffrey A.; and Sato, Masahiko, to Eli Lilly and Company. Methods for inhibiting bone loss and cartilage degradation using wortmannin and its analogs. 5,468,773, Cl. 514-453.000.
Doehler, Peter. Circuit arrangement for the busy indication of track sections of a model railway. 5,467,946, Cl. 246-122.00A.
Dohrmann, Wolfgang; and Ayyildiz, Metin, to Fichtel & Sachs AG. Impact absorbing bumper mount and method of making. 5,468,033, Cl. 293-133.000.
Doles, Joseph E.; and Hadick, Robert J., to LaserMike, Inc. Fiber optic flaw detector and identification system. 5,469,252, Cl. 356-73.100.
Doliton, Michael: *See*—
Gunday, Erhan H.; Doliton, Michael; Foung, Paul; and Lee, John R., 5,469,209, Cl. 348-96.000.
Dolling, Ulf H.; McCauley, James A.; and Varsolona, Richard J., to Merck & Co., Inc. New finasteride processes. 5,468,860, Cl. 546-77.000.
Domigan, Charles N.: *See*—
Bowman, Timothy; Domigan, Charles N.; Hadfield, Robert W.; Harmon, J. David; and Sheridan, James E., 5,467,565, Cl. 52-220.100.
Dominguez, Wendy B.: *See*—
Seamans, James D.; Adams, Charles T.; Dominguez, Wendy B.; and Chen, Andrew A.-J., 5,468,372, Cl. 208-216.00R.
Dompert, Wolfgang: *See*—
Schohe-Loop, Rudolf; Heine, Hans-Georg; Junge, Bodo; Glaser, Thomas; De Vry, Jean M. V.; Dompert, Wolfgang; and Sommermeyer, Henning, 5,468,882, Cl. 549-407.000.
Domracheva, A. G.: *See*—
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.
Donato, Frank: *See*—
Perry, Brian; and Donato, Frank, 5,468,433, Cl. 264-46.400.
Donegan, Michael W.; Nuchols, Richard P.; Webber, James L.; and Mc Cann, Jerry A., to General Motors Corporation. Simplified air bag module. 5,468,011, Cl. 280-728.200.
Dongkook Pharmaceutical Co., Ltd.: *See*—
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.
Donnelly, Vincent M., Jr.; and McCaulley, James A., to AT&T Corp. Device processing involving an optical interferometric thermometry. 5,467,732, Cl. 117-86.000.
Donohue, Charles W., to Meridian Oil Inc. Cathodic protection measurement apparatus. 5,469,048, Cl. 324-71.100.
Doose, Karen A. Pet collar. 5,467,743, Cl. 119-864.000.
Dorfman, Leonid P.; Scheithauer, Michael J.; Houck, David L.; and Kopatz, Nelson E., to Osram Sylvania Inc. Method of making tungsten-copper composite oxides. 5,468,457, Cl. 423-61.000.
Dornblaser, Norman E.: *See*—
Hooper, Steven C.; and Dornblaser, Norman E., 5,467,676, Cl. 83-24.000.
Dornier GmbH: *See*—
Eschner, Wolfgang; and Ludwig, Wolfgang, 5,469,056, Cl. 324-248.000.
Dorris, Stephen E.; Poeppel, Roger B.; Prorok, Barton C.; Lanagan, Michael T.; and Maroni, Victor A., to University of Chicago. Synthesis of highly phase pure BSCCO superconductors. 5,468,566, Cl. 428-552.000.
Dorsman, Johannes: *See*—
Oosterveen, Leendert; Lombaers, Jacobus H. M.; and Dorsman, Johannes, 5,468,942, Cl. 235-383.000.
Doucet, Louis J. Device including a diverting mechanism for changing the conveying direction of products in a folder. 5,467,976, Cl. 271-13.000.
Dougherty, James A.; and Wolf, Philip F., to ISP Investments Inc. Reactive diluent for radiation curing of film-forming polymers. 5,468,820, Cl. 526-264.000.
Douglas, Craig: *See*—
Pawlowicz, Andrew; Douglas, Craig; Tayebi, Amad; and Orroth, Stephen, 5,468,327, Cl. 156-393.000.
Douglas, George H.: *See*—
Gerlach, Brett C.; Lee, Patrick; McCormick, William B.; and Douglas, George H., 5,469,532, Cl. 395-102.000.
Douglas, Larry D.; and Hutchinson, Clarence W., Jr., to Syseca, Inc. Neural load disturbance analyzer. 5,469,528, Cl. 395-23.000.
Douine, Denis; and Durand, Gilles, to Muller BEM. Process and device for controlling the braking of four-wheel drive vehicles. 5,467,646, Cl. 73-126.000.
Douty, Brent D.: *See*—
Bacon, Edward R.; Daum, Sol J.; Estep, Kimberly G.; Josef, Kurt A.; Douty, Brent D.; and Illig, Carl R., 5,468,466, Cl. 424-9.450.
Dove, Donald C.; and Kent, Howard D. High speed power factor controller. 5,469,045, Cl. 323-211.000.
Dow Chemical Company, The: *See*—
Allen, Scott I.; Foye, Duane F.; and Ferguson, Michael, 5,468,526, Cl. 428-35.400.
Frazier, Kevin A.; Garces, Juan M.; and Lee, Guo-ahuh J., 5,468,407, Cl. 252-61.000.
Hsieh, Harry W., 5,468,317, Cl. 156-108.000.
Newman, Thomas H.; and Borodychuk, Karen K., 5,468,818, Cl. 526-170.000.
Suppes, Galen J.; and Friedli, Hans R., 5,468,839, Cl. 528-403.000.
Dow Corning Corporation: *See*—
Bergstrom, Debora F.; Burns, Gary T.; and Giwa-Agbomeirele, Patricia A., 5,468,829, Cl. 528-18.000.
Gentle, Theresa E.; and Lutz, Michael A., 5,468,826, Cl. 528-15.000.
LeGrow, Gary E., 5,468,417, Cl. 252-174.150.
Dow Corning Limited: *See*—
Hurford, Simon R.; and Parbhoo, Bhukandas, 5,468,816, Cl. 525-479.000.
Hurford, Simon R.; and Parbhoo, Bhukandas, 5,468,828, Cl. 528-15.000.
Dow Corning Toray Silicon Co., Ltd.: *See*—
Morita, Yoshitsugu, 5,468,827, Cl. 528-15.000.
Onishi, Masayuki, 5,468,805, Cl. 524-731.000.
Togashi, Atsushi; and Yamada, Takaeru, 5,468,824, Cl. 528-12.000.
Dow, Ronald N., to Elantec, Inc. Voltage controlled amplifier which reduces differential gain. 5,469,106, Cl. 330-254.000.
Dow, Thomas A.; Garrard, Kenneth P.; Moorefield, George M., II; and Taylor, Lauren W., to North Carolina State University. Apparatus and method for forming a workpiece surface into a non-rotationally symmetric shape. 5,467,675, Cl. 82-1.110.
Dowben, Peter A. Forming $B_{1-x}C_x$ semiconductor devices by chemical vapor deposition. 5,468,978, Cl. 257-258.000.
Dowell, Floyd E.; Sheppard, Harry T.; Dettore, Lawrence A.; and Bennett, Clyde T., to United States of America, Agriculture. Density separation sheller for peanut grade samples. 5,467,700, Cl. 99-570.000.
Downes, Sandra: *See*—
Braden, Michael; Downes, Sandra; Patel, Mangala P.; and Davy, Kenneth W. M., 5,468,787, Cl. 523-113.000.
Doyle, Michael T.: *See*—
Kovens, Steven A.; and Doyle, Michael T., 5,467,858, Cl. 194-350.000.
Dr. Ing. h.c.F. Porsche AG: *See*—
Esch, Hans-Joachim; Distelrath, Winfried; and Trieb, Kurt, 5,467,843, Cl. 184-6.500.
Dr. Karl Thomae GmbH: *See*—
Eberlein, Wolfgang; Engel, Wolfhard; Mihm, Gerhard; Rudolf, Klaus; and Engelhardt, Günther, 5,468,766, Cl. 514-403.000.
Drabenstadt, William W.; Fowler, Richard C.; Grinderslev, Soren; and Irlbeck, Robert D., to Whitaker Corporation, The. Chip socket testing apparatus with adjustable contact force. 5,469,074, Cl. 324-758.000.
Drake, Rodney: *See*—
Salt, Tom; and Drake, Rodney, 5,469,557, Cl. 395-425.000.

Drapier, Julien: *See*—
Dixit, Nagaraj S.; D'Ambrogio, Robert; Kenkare, Divaker; and Drapier, Julien, 5,468,411, Cl. 252-99.000.

Drescher, Bonnie J.; and Drescher, Scott M. Non-slip glove. 5,467,484, Cl. 2-161.800.

Drescher, Scott M.: *See*—
Drescher, Bonnie J.; and Drescher, Scott M., 5,467,484, Cl. 2-161.800.

Dressick, Walter J.: *See*—
Calabrese, Gary S.; Calvert, Jeffrey M.; Chen, Mu-San; Dressick, Walter J.; Dulcey, Charles S.; Georger, Jacque H., Jr.; and Bohland, John F., Jr., 5,468,597, Cl. 430-315.000.

Dretzka, Philip C.; Belden, Tighe M.; Reshanov, Eugene N.; and Samuelson, Bruce E., to Minnesota Mining And Manufacturing Company. Tape dispenser. 5,468,332, Cl. 156-527.000.

Drew, Douglas A.: *See*—
Bergman, Adam S.; and Drew, Douglas A., 5,469,142, Cl. 340-572.000.

Drilling Measurements, Inc.: *See*—
Brown, Robert L.; Holodnak, John D.; McBride, Gene; and Mosley, Demmie L., 5,468,153, Cl. 439-13.000.

Drnevich, Raymond F.: *See*—
Paolino, Gerald A.; Drnevich, Raymond F.; and Prosser, Neil M., 5,467,601, Cl. 62-38.000.
Paolino, Gerald A.; and Drnevich, Raymond F., 5,467,602, Cl. 62-38.000.

Drogo de Iacovo, Rosario; Montagna, Roberto; and Sereno, Daniele, to SIP - Societa Italiana per l'Esercizio delle Telecomunicazioni p.A. Method of and device for coding speech signals with analysis-by-synthesis techniques. 5,469,527, Cl. 395-2.290.

Drtina, Gary J.: *See*—
Heilmann, Steven M.; Drtina, Gary J.; Eitzman, Philip D.; Haddad, Louis C.; Hyde, Frederick W.; Johnson, Todd W.; Rassmussen, Jerald K.; and Williams, Michael G., 5,468,847, Cl. 530-413.000.

Druecke, Frank G.: *See*—
Chen, Franklin M. C.; and Druecke, Frank G., 5,468,796, Cl. 524-377.000.

Drügh, Hans-Peter: *See*—
Hartmann, Hans H.; Drügh, Hans-Peter; and Reismann, Hans J., 5,468,146, Cl. 432-77.000.

Druyanova, Eva: *See*—
Evseev, Yury; Rachinsky, Lubomir; Tetervova, Natalia; Seleninov, Kazimir; Dermenzhi, Evgeniy; Nasekan, Olga; Druyanova, Eva; and Ribak, Roman, 5,468,976, Cl. 257-177.000.

DSM N.V.: *See*—
Boesten, Wilhelmus H. J.; and Broxterman, Quirinus B., 5,468,901, Cl. 564-198.000.

Du Pont de Nemours, E. I., and Company: *See*—
Antonelli, Joseph A.; and Scopazzi, Christopher, 5,468,801, Cl. 524-504.000.
Brown, Gary G.; Ghorashi, Hamid M.; and Shaffer, Donald E., 5,468,537, Cl. 428-101.000.
Carroll, Alan F.; and Hang, Kenneth W., 5,468,695, Cl. 501-79.000.
Howard, Edward G., Jr., 5,468,842, Cl. 528-481.000.
Moran, Edward F., Jr.; and McKinney, Ronald J., 5,468,900, Cl. 562-590.000.
Windley, William T., 5,468,554, Cl. 428-357.000.
Yuan, San C., 5,468,791, Cl. 524-108.000.

Dubini, Enrica: *See*—
Cereda, Enzo; Ezhaya, Antoine; Turconi, Marco; Dubini, Enrica; and Maffione, Grazia, 5,468,758, Cl. 514-304.000.

Ducheyne, Paul: *See*—
Marcolongo, Michele S.; Ducheyne, Paul; Ko, Frank; and LaCourse, William, 5,468,544, Cl. 428-224.000.

Dufty, Raymond J.; and Kaye, Ronald S. Rolling apparatus. 5,468,267, Cl. 47-1.010.

Dulcey, Charles S.: *See*—
Calabrese, Gary S.; Calvert, Jeffrey M.; Chen, Mu-San; Dressick, Walter J.; Dulcey, Charles S.; Georger, Jacque H., Jr.; and Bohland, John F., Jr., 5,468,597, Cl. 430-315.000.

Dull, Dennis L., to Boeing Company, The. Copper etchant useful for making fine-line copper elements. 5,468,409, Cl. 252-79.200.

Dumas, Richard H.: *See*—
Hani, Rahim; Dumas, Richard H.; Gavin, David F.; Harrison, Charles H.; Kennedy, Michael A.; Schiessl, Henry W.; McMahon, Robert E.; and Manke, Steven A., 5,468,864, Cl. 546-345.000.

Dumitru, David. Multipurpose forearm/wrist support for users of data input devices. 5,467,950, Cl. 248-118.100.

Dumoulin, Charles L., to General Electric Company. Method for the simultaneous detection of acceleration and velocity distribution in moving fluids. 5,469,059, Cl. 324-306.000.

Dunckley, James A.: *See*—
Morehouse, James H.; Furay, David M.; Volk, Steven B.; and Dunckley, James A., 5,469,314, Cl. 360-105.000.

Dunlop, Hugh: *See*—
Ledoux, Marc-Jacques; Guille, Jean-Louis; Pham Huu, Cuong; Dunlop, Hugh; and Prin, Marie, 5,468,370, Cl. 208-134.000.

Dunlop Limited: *See*—
Smith, Wilfred W., 5,467,595, Cl. 60-410.000.

Dunn, Randall C.: *See*—
Hubbell, Jeffrey A.; Hill-West, Jennifer L.; and Dunn, Randall C., 5,468,505, Cl. 424-484.000.

Dunn, William R., to Avionic Displays Corporation. Night vision inclinometer. 5,467,533, Cl. 33-348.000.

Dunnam, Curt. Feedback enhanced sensor, alternating magnetic field detector. 5,469,058, Cl. 324-258.000.

Dunne, Mike: *See*—
Keen, Harry J.; and Dunne, Mike, 5,469,262, Cl. 356-386.000.

Dupuis, David J.: *See*—
Kindler, David J.; and Dupuis, David J., 5,468,177, Cl. 451-364.000.

Dura Automotive Systems, Inc.: *See*—
Soucie, Wayne L.; Champ, Larry B.; Tayon, Jeffrey E.; Carlson, Harold L.; Marek, Steven W.; and Koenig, Peter C., 5,467,666, Cl. 74-575.000.

Dura Pharmaceuticals, Inc.: *See*—
Hahn, Gary S., 5,468,730, Cl. 514-17.000.

Durand, Gilles: *See*—
Douine, Denis; and Durand, Gilles, 5,467,646, Cl. 73-126.000.

Durante, Vincent A.: *See*—
Resasco, Daniel E.; Marcus, Bonita K.; Huang, Chen-Shi; and Durante, Vincent A., 5,468,710, Cl. 502-222.000.

Durbin, Dennis A.: *See*—
Danielson, Arvin D.; and Durbin, Dennis A., 5,468,947, Cl. 235-472.000.

Dutton, Christopher J.: *See*—
Banks, Bernard J.; Dutton, Christopher J.; and Goudie, Alexander C., 5,468,765, Cl. 514-395.000.

Duve, George; and Gieger, Jeffrey S., to Area Lighting Research, Inc. Retro-fit illuminated sign module and method. 5,469,347, Cl. 362-245.000.

Duvvury, Charvaka: *See*—
Diaz, Carlos H.; Duvvury, Charvaka; and Kang, Sung-Mo, 5,468,667, Cl. 437-50.000.

DVA Ltd.: *See*—
Karp, Richard M., 5,469,154, Cl. 340-825.800.

Dydyk, Michael, to Motorola, Inc. Impedance transforming three-port power divider/combiner using lumped elements. 5,469,129, Cl. 333-124.000.

Dynalaser Inc.: *See*—
Harkness, Scott, 5,467,992, Cl. 273-187.200.

E.D.C. Sarl: *See*—
Casartelli, Gabriele, 5,467,485, Cl. 2-421.000.

E. I. DuPont de Nemours and Company: *See*—
Zafiroglu, Dimitri P., 5,468,320, Cl. 156-148.000.

E M S: *See*—
Georges, Pierre, 5,467,939, Cl. 242-607.100.

E-Systems, Inc.: *See*—
Kunkel, Scott H.; and Peck, Wiley M., 5,467,526, Cl. 29-747.000.

Earl, George F.; and Ward, Bruce D., to Commonwealth of Australia, The. HF background noise measurement in HF environments. 5,469,171, Cl. 342-159.000.

Eastman Kodak Company: *See*—
Bailey, David S.; Mura, Albert J., Jr.; and Biff, Shari L., 5,468,587, Cl. 430-203.000.
Gruenbaum, William T.; Kung, Teh-Ming; and Young, Ralph H., 5,468,583, Cl. 430-58.000.
Hauschild, Edward, 5,469,203, Cl. 347-190.000.
Miller, David D.; Brick, Mary C.; and Nair, Mridula, 5,468,598, Cl. 430-372.000.
Oliver, James A., 5,468,946, Cl. 235-462.000.
Pearce, Glenn T.; and Henzel, Richard P., 5,468,591, Cl. 430-201.000.
Wen, Xin, 5,468,601, Cl. 430-567.000.
Young, David J., 5,467,659, Cl. 73-866.000.
Zengerle, Paul L.; Miller, David D.; Whitesides, Thomas H.; Rieger, John B.; Flow, Vincent J., III; and Isaac, Walter H., 5,468,604, Cl. 430-631.000.

Eastman, Scott A.: *See*—
Vandenberg, Douglas; Philpott, Michael L.; Green, Phillip A.; Eastman, Scott A.; and Carlini, Sean M., 5,469,482, Cl. 377-3.000.

Eaton Corporation: *See*—
Becker, James A.; Fritsch, Ronald J.; Holland, Richard J.; and Klobuchar, Robert F., 5,467,622, Cl. 70-203.000.
Carlin, Jerry F.; Koon, James E.; Parker, Paul D.; and Thompson, Warren L., 5,467,689, Cl. 92-172.000.
Skorupski, Jeffrey H.; and Gee, Thomas A., 5,467,645, Cl. 73-121.000.

Eatwell, Graham P., to Noise Cancellation Technologies, Inc. Control system using harmonic filters. 5,469,087, Cl. 327-40.000.

Eatz, Ralph A.: *See*—
Sinor, Lyle T.; Eatz, Ralph A.; Stone, Darryl L.; and Plapp, Fred V., 5,468,618, Cl. 435-7.210.

Ebata, Takashi; Matsumoto, Katsuya; Koseki, Koshi; Kawakami, Hiroshi; Matsushita, Hajime; Yoshikoshi, Hajime; and Okaniwa, Masakazu, to Japan Tobacco Inc.; and Yuji Gosei Kogyo Co., Ltd. Method of producing cis-whiskey lactone. 5,468,881, Cl. 549-295.000.

Ebel, James A.: *See*—
Abrams, Richard; Edwards, Russell J.; Ebel, James A.; and Keene, Darren S., 5,467,868, Cl. 206-5.100.

Ebel, Klaus; Schroeder, Juergen; Groeaing, Carsten; Dockner, Toni; and Merkle, Hans R., to BASF Aktiengesellschaft. Preparation of N-substituted pyrazoles. 5,468,871, Cl. 548-373.100.

Eberlein, Wolfgang; Engel, Wolfhard; Mihm, Gerhard; Rudolf, Klaus; and Engelhardt, Günther, to Dr. Karl Thomae GmbH. 1,5,6,7-tetrahydro-4H-indazol-4-ones. 5,468,766, Cl. 514-403.000.

Ebersole, Tammy S.: *See*—

Lusea, Leonard; and Ebersole, Tammy S., 5,467,802, Cl. 139-384.00R.
Eberts, Friedrich; and Pohl, Helmut, to KM-Kabelmetal AG. Method for manufacturing a plug-type chamber used in the cascade drawing of tubes, and device for implementing the method. 5,467,631, Cl. 72-283.000.
Ebina, Chinehito: *See*—
Hashimoto, Kazuhiko; Osaki, Haruyoshi; Ebina, Chinehito; Nagase, Kyoko; Moriuma, Hiroshi; and Uetani, Yasunori, 5,468,590, Cl. 430-191.000.
Ebisuno, Tadahiro: *See*—
Moriyama, Keiji; Ebisuno, Tadahiro; and Sugimoto, Kazushige, 5,467,994, Cl. 273-222.000.
Ebstein, Steven; Gonsalves, Robert A.; and Menelly, Richard A. Verification device for currency containing an embedded security thread. 5,468,971, Cl. 250-556.000.
Eckelt, Ulrich; and Timmerbeil, Karl-Ernst, to Windmöller & Hölscher. Process for applying an adhesive band having one adhesive side. 5,468,325, Cl. 156-259.000.
Eckhardt, Claude, to Ciba-Geigy Corporation. Liquid detergent compositions. 5,468,884, Cl. 549-437.000.
Eclipse Blinds Limited: *See*—
Bell, David, 5,467,808, Cl. 160-168.100.
Ecochem Aktiengesellschaft: *See*—
Zoppi, Gianni, 5,468,354, Cl. 204-213.000.
Edafiogho, Ivan O.: *See*—
Scott, Kenneth R.; Nicholson, Jesse M.; and Edafiogho, Ivan O., 5,468,775, Cl. 514-541.000.
Edgar, Albert D., to International Business Machines Corporation. Method and apparatus for grayscale adjustment. 5,469,275, Cl. 358-458.000.
Edkins, James G.: *See*—
House, Robert W.; Bocci, Paul M.; and Edkins, James G., 5,469,472, Cl. 375-211.000.
Edure, Tadakazu: *See*—
Aoshima, Taku; Noami, Truneo; Soga, Hiroh; Sumikawa, Takeshi; Furuya, Nobumasa; and Edure, Tadakazu, 5,469,245, Cl. 355-251.000.
Edwards, Charles L., Jr. Peanut cleaner. 5,468,187, Cl. 460-126.000.
Edwards, Russell J.: *See*—
Abrams, Richard; Edwards, Russell J.; Ebel, James A.; and Keene, Darren S., 5,467,868, Cl. 206-5.100.
Efland, Taylor R.; Cotton, Dave; and Skelton, Dale J., to Texas Instruments Incorporated. ESD protection structure using LDMOS diodes with thick copper interconnect. 5,468,984, Cl. 257-356.000.
Egelandsdal, Einar; Garth, Geoffrey C.; Hamilton, John; Johnson, David; Laerdal, Tore; and Patterson, Charles A., to Asmund S. Laerdal A/S. Dummy for practicing cardiopulmonary resuscitation (CPR) of a human being. 5,468,151, Cl. 434-265.000.
Egenolf, Bernhard, to Whitaker Corporation, The. Electrical terminal for use with short circuit spring contacts. 5,468,163, Cl. 439-839.000.
Eggan, Ronald E., Jr.: *See*—
Gentelia, John S.; Eggan, Ronald E., Jr.; Williams, Frank R.; and Wheatley, William, 5,468,240, Cl. 606-42.000.
Eggleston, Albert D.: *See*—
Schleder, William E.; and Eggleston, Albert D., 5,469,172, Cl. 342-174.000.
Egusa, Naoyuki: *See*—
Shinoda, Masahisa; Egusa, Naoyuki; Sato, Yasuyuki; and Koike, Manabu, 5,469,423, Cl. 369-112.000.
Ehrenberg, Scott G.; Serpico, Joseph; Wnek, Gary E.; and Rider, Jeffrey N., to Dais Corporation. Fuel cell incorporating novel ion-conducting membrane. 5,468,574, Cl. 429-33.000.
Ehsani, Mohammad R.: *See*—
Seadatmanesh, Hamid; and Ehsani, Mohammad R., 5,467,483, Cl. 2-161.700.
Eiff, Shari L.: *See*—
Bailey, David S.; Mura, Albert J., Jr.; and Eiff, Shari L., 5,468,587, Cl. 430-203.000.
Eijadi, David A.: *See*—
DeKeyser, Dawn; Abraham, Loren; and Eijadi, David A., 5,467,564, Cl. 52-173.300.
Eilers, Hergen: *See*—
Jacobsen, Stuart M.; Jaffe, Steven M.; Eilers, Hergen; and Jones, Michieal L., 5,469,018, Cl. 313-461.000.
Eisai Co., Ltd.: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Koniehi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.
Eisfeller, Richard C.: *See*—
Leia, Maureen M.; Eisfeller, Richard C.; Poliquin, Alfred T.; Burns, Mark; and Russell, John T., 5,468,518, Cl. 427-421.000.
Eitzman, Philip D.: *See*—
Heilmann, Steven M.; Drtina, Gary J.; Eitzman, Philip D.; Haddad, Louis C.; Hyde, Frederick W.; Johnson, Todd W.; Rassmussen, Jerald K.; and Williams, Michael G., 5,468,847, Cl. 530-413.000.
Ekdahl, Egon; Gurka, Jiri; Huber, Rupert; Kötritsch, Hubert; Kufe, Gottfried; Müllner, Johann; and Weninger, Helmut, to SKF GmbH. System and method for supporting a shaft or axle in a support component. 5,468,072, Cl. 384-448.000.
Ekiner, Okan M.; and Fleming, Gregory K., to L'Air Liquide S.A. Process of making multicomponent or asymmetric gas separation membranes. 5,468,430, Cl. 264-28.000.
Ekman, Thure, to Dart Engineering AG. Quick coupling component with pressure reduction member. 5,467,964, Cl. 251-149.600.
Elantec, Inc.: *See*—
Dow, Ronald N., 5,469,106, Cl. 330-254.000.
Smith, Douglas S.; and Bee, Edward C., 5,469,104, Cl. 327-491.000.
Electron Vision Corporation: *See*—
Livesay, William R., 5,468,595, Cl. 430-296.000.
Electronics and Telecommunications Research Institute: *See*—
Song, Seok-Ho; and Jung, Sang-Don, 5,469,518, Cl. 385-89.000.
Elf Sanofi: *See*—
Bachy, André; Fraisse, Laurent; Keane, Peter; Mendes, Etienne; Verniéres, Jean-Claude; and Simiand, Jacques, 5,468,750, Cl. 514-255.000.
Eli Lilly and Company: *See*—
Cantwell, Cathleen A.; Hodges, Roland L.; McGilvray, Derek; Queener, Stephen W.; Swartling, James R.; and Zock, Joseph M., 5,468,632, Cl. 435-197.000.
Dodge, Jeffrey A.; and Sato, Masahiko, 5,468,773, Cl. 514-453.000.
Jakubowski, Joseph A.; Palkowitz, Alan D.; and Sigmund, Sandra K., 5,468,757, Cl. 514-300.000.
Schadewald, Mary B.; and Vanevenhoven, Peter W., 5,468,735, Cl. 514-30.000.
Elie, François; and Rossin, Vincent, to Essilor International Cie Generale d'Optique. Eyeglass lens packaging. 5,467,869, Cl. 206-45.130.
Eller, Martin, to Beru Ruprecht GmbH & Co. KG. Rod flame glow plug having a CoFe alloy regulating coil and a housing having a fuel connection for a metering device. 5,468,933, Cl. 219-270.000.
Ellerson, James V.; Noreika, Richard J.; and Varcoe, Jack A., to International Business Machines Corporation. Electronic package assembly with protective encapsulant material on opposing sides not having conductive leads. 5,469,333, Cl. 361-779.000.
Elliott, Andrew C.; and Guccione, Ray A., to CheckPoint Fluidic Systems International Ltd. Pilot control valve having means for recovering exhaust fluids. 5,468,127, Cl. 417-53.000.
Elliott, Robert F.: *See*—
Hoffman, Keith E.; Elliott, Robert F.; and Mickler, David J., 5,468,140, Cl. 425-389.000.
Ellis, Matthew: *See*—
Smith, James A.; Ellis, Matthew; Saunders, Rowland F.; and Hall, Anne L., 5,467,770, Cl. 128-661.080.
Elmer, John W.; Teruya, Alan T.; and O'Brien, Dennis W., to University of California, Regents of the. System for tomographic determination of the power distribution in electron beams. 5,468,966, Cl. 250-397.000.
Elsner, Frederick H.: *See*—
Ohkawa, Tihiro; and Elsner, Frederick H., 5,468,358, Cl. 204-181.500.
Eltoukhy, Abdelshafy A., to Actel Corporation. Apparatus and method determining the resistance of antifuses in an array. 5,469,396, Cl. 365-210.000.
Ely, Jonathan C.: *See*—
McMurtrey, Kevin D., Sr.; Rossi, Arthur M.; Cichon, Robert J., Jr.; Briggs, Karen A.; and Ely, Jonathan C., 5,469,037, Cl. 318-626.000.
Embry, Donald: *See*—
Stillwagon, Woodrow C.; and Embry, Donald, 5,467,619, Cl. 70-34.000.
EMC Corporation: *See*—
Hohenstein, Gerald L.; Nielson, Michael E.; Tang, Tin S.; Carmichael, Richard D.; and Brant, William A., 5,469,566, Cl. 395-182.040.
Emery, Mark J.; Tucker, Brenda N.; and Schwartz, Laurie D., to Bell Atlantic Network Services, Inc. Personal communications service using wireline/wireless integration. 5,469,496, Cl. 379-58.000.
Emhart Inc.: *See*—
Marsh, David J.; and Schubring, Gary L., 5,467,507, Cl. 24-298.000.
Emitec Gesellschaft fuer Emissionstechnologie mbH: *See*—
Brück, Rolf, 5,468,455, Cl. 422-180.000.
Emlich, Larry: *See*—
Polich, Herman; Nicholson, James; and Emlich, Larry, 5,469,463, Cl. 395-182.180.
Emoto, Ikuo: *See*—
Tsurutani, Iwao; Manabe, Takafumi; and Emoto, Ikuo, 5,468,807, Cl. 525-240.000.
EMTEK Products, Inc.: *See*—
Sorensen, Birk C., 5,467,855, Cl. 193-5.000.
Enari, Hiroyuki: *See*—
Kumazawa, Satoru; and Enari, Hiroyuki, 5,468,869, Cl. 548-267.800.
Encore Computer Corporation: *See*—
McMurtrey, Kevin D., Sr.; Rossi, Arthur M.; Cichon, Robert J., Jr.; Briggs, Karen A.; and Ely, Jonathan C., 5,469,037, Cl. 318-626.000.
Endermann, Rainer: *See*—
Petersen, Uwe; Himmler, Thomas; Schenke, Thomas; Krebs, Andreas; Grohe, Klaus; Bremm, Klaus-Dieter; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 5,468,742, Cl. 514-187.000.
Enders, Stephan: *See*—
Heinrichs, Heinrich-Josef; Enders, Stephan; and Koch, Klaus, 5,468,042, Cl. 296-146.400.
Endo, Keiji: *See*—
Sasaki, Norio; Kudo, Sachio; Watanabe, Michi; Endo, Keiji; and Kawaguchi, Shinji, 5,468,721, Cl. 504-243.000.
Endo, Shoichi: *See*—
Ohtani, Teiichi; Endo, Shoichi; Shimada, Teruhisa; and Kuroyama, Yoshihiro, 5,468,564, Cl. 428-537.500.
Endo, Yasuhiko: *See*—

Yagami, Hiroshi; Yamada, Minoru; Oda, Noriyuki; and Endo, Yasuhiko, 5,468,282, Cl. 95-8.000.

Endoh, Takeshi; Imai, Tomoaki; and Hagiya, Mikio, to Hitachi Cable, Ltd. Detecting partial discharge using a detection coil and analysis of output signal and noise frequency spectrums. 5,469,067, Cl. 324-551.000.

Endoh, Tetsuo; Shirota, Riichiro; Ohuchi, Kazunori; Kirisawa, Ryouhei; Aritome, Seiichi; Tanaka, Tomoharu; and Tanaka, Yoshiyuki, to Kabushiki Kaisha Toshiba. Electrically erasable and programmable non-volatile memory system with write-verify controller using two reference levels. 5,469,444, Cl. 371-215.000.

Energy BioSystems Corporation: *See*—
Johnson, Steven W.; Monticello, Daniel J.; Gibbs, Phillip R.; and Kulpa, Charles F., 5,468,626, Cl. 435-130.000.

Eng, Robert C.; Galella, John W.; McCrary, Rex E.; McDonald, Mark G.; Stelzer, Eric H.; and Yentz, Frederick C., to International Business Machines Corporation. Providing alternate bus master with multiple cycles of bursting access to local bus in a dual bus system including a processor local bus and a device communications bus. 5,469,577, Cl. 395-290.000.

Engel, Wolfhard: *See*—
Eberlein, Wolfgang; Engel, Wolfhard; Mihm, Gerhard; Rudolf, Klaus; and Engelhardt, Günther, 5,468,766, Cl. 514-403.000.

Engelhardt, Günther: *See*—
Eberlein, Wolfgang; Engel, Wolfhard; Mihm, Gerhard; Rudolf, Klaus; and Engelhardt, Günther, 5,468,766, Cl. 514-403.000.

Engineered Resources, Inc.: *See*—
Scruggs, William M., 5,467,845, Cl. 188-65.200.

Enichem Elastomeri S.r.l.: *See*—
Da Lio, Joseph; Lanzavecchia, Laura; and Savini, Giuseppe, 5,468,817, Cl. 526-79.000.

Enkaku, Shigeyuki: *See*—
Kogure, Mitsuhiro; Nagashima, Shinichi; Wakabayashi, Kazuhisa; Enkaku, Shigeyuki; Shimayama, Hitoshi; Kimura, Minoru; Shimoyama, Shuji; and Yokoo, Tsugio, 5,467,632, Cl. 72-379.200.

EPI Packaging Technologies, Inc.: *See*—
Wile, Richard M.; and Cole, Lawrence, 5,467,572, Cl. 53-384.100.

Erhardt, Peter F.: *See*—
Proper, James M.; and Erhardt, Peter F., 5,468,586, Cl. 430-137.000.

Erickson, Bart J.: *See*—
Anderson, Neal R.; Erickson, Bart J.; and Leung, Keith, 5,469,409, Cl. 368-10.000.

Erickson, John J.: *See*—
Boardman, Larry D.; Melancon, Kurt C.; Chau, Trang D.; and Erickson, John J., 5,468,815, Cl. 525-478.000.

Erickson, Paul R.; and Schooler, Tim C., to LaserMaster Corporation. Ink supply line support system for a continuous ink refill system for disosable ink jet cartridges. 5,469,201, Cl. 347-85.000.

Erico International Corporation: *See*—
Albrigo, Julian; Ricker, Edward D.; and Colarusso, Louis J., 5,468,524, Cl. 428-34.100.

Erlich, Henry A.; Horn, Glenn; Saiki, Randall K.; and Mullis, Kary B., to Hoffmann-La Roche Inc. Process for detecting specific nucleotide variations and genetic polymorphisms present in nucleic acids. 5,468,613, Cl. 435-6.000.

Esaki, Takanobu: *See*—
Yamada, Kenichi; and Esaki, Takanobu, 5,467,623, Cl. 70-208.000.

Esch, Hans-Joachim; Distelrath, Winfried; and Trieb, Kurt, to Dr. Ing. h.c.F. Porsche AG. Arrangement for guiding lubricating oil in an internal-combustion engine. 5,467,843, Cl. 184-6.500.

Esch, Victor C.; and Valley, Kirsten L., to Indigo Medical, Incorporated. Fiberoptic delivery system and method of use. 5,469,524, Cl. 385-118.000.

Eschner, Wolfgang; and Ludwig, Wolfgang, to Dornier GmbH. Planar gradiometers arranged on non-parallel surfaces for determination of a gradient tensor of a magnetic field. 5,469,056, Cl. 324-248.000.

Esselte Dymo N.V.: *See*—
Cane, Michael R.; and Day, Robert C. L., 5,468,081, Cl. 400-621.000.

Essig, Thomas W.: *See*—
Shreeve, William O.; Werbowsky, Laurie L.; and Essig, Thomas W., 5,467,921, Cl. 236-78.00R.

Essilor International Cie Generale d'Optique: *See*—
Elie, François; and Rossin, Vincent, 5,467,869, Cl. 206-45.130.

Estee Lauder, Inc.: *See*—
Zecchino, Julius R.; Messin, Steven; Corcoran, Cathleen; and Chung, Kenneth T., 5,468,471, Cl. 424-59.000.

Estep, Kimberly G.: *See*—
Bacon, Edward R.; Daum, Sol J.; Estep, Kimberly G.; Josef, Kurt A.; Douty, Brent D.; and Illig, Carl R., 5,468,466, Cl. 424-9.450.

Estergreen, Steven: *See*—
Sjogren, Axel; Carson, Gary; Estergreen, Steven; Taga, Timothy; and Stewart, Rodger, 5,468,449, Cl. 422-46.000.

Eta Sa Fabriques d'Ebauches: *See*—
Berney, Jean-Claude, 5,469,410, Cl. 368-28.000.

Ethicon, Inc.: *See*—
Bezwada, Rao S.; and Scopelianos, Angelo G., 5,468,253, Cl. 606-230.000.
Mersch, Steven H., 5,468,238, Cl. 606-15.000.
Paraschac, Joseph F.; and Biehle, Edward J., IV, 5,468,250, Cl. 606-205.000.

Etnyre, Edwin L.: *See*—
Redman, Forrest C.; Heimbecher, John O.; Etnyre, Edwin L.; Shavrnoch, James J.; and Ferranti, Paul A., 5,468,018, Cl. 280-788.000.

Eto Denki Co.: *See*—
Eto, Tetsutaro, 5,469,036, Cl. 318-581.000.

Eto, Tetsutaro, to Eto Denki Co. Apparatus for feeding electricity to motor driving means of a movable body. 5,469,036, Cl. 318-581.000.

Etoh, Makoto; and Kawaguchi, Kiyoshi, to Toyo Seikan Kaisha, Ltd. Tamper-revealing screw-cap for a container. 5,467,880, Cl. 215-256.000.

Etter, Jeffrey B.: *See*—
Bogart, Gregory R.; Moddel, Garret R.; Maul, Diana M.; and Etter, Jeffrey B., 5,468,606, Cl. 435-5.000.

Evans, David A., to Evans Findings Co. Capacitor. 5,469,325, Cl. 361-526.000.

Evans Findings Co.: *See*—
Evans, David A., 5,469,325, Cl. 361-526.000.

Everette, David B., to W. R. Grace & Co.-Conn. Apparatus and process for positioning a fitment. 5,467,581, Cl. 53-133.200.

Everhart, Deanis; Deibler, Elizabeth A.; and Taylor, Julie R., to Kimberly-Clark Corporation. Disposable absorbent product incorporating chemically reactive substance. 5,468,236, Cl. 604-361.000.

Everhart, Rick J. Grease free skillet. 5,467,696, Cl. 99-425.000.

Evers, Gerardus H. M.: *See*—
Claude, Jean M.; and Evers, Gerardus H. M., 5,468,089, Cl. 405-52.000.

Evers, Michel: *See*—
Bouboutou, Romaine; Dereu, Norbert; Evers, Michel; Gueguen, Jean-Christophe; James, Claude; Poujade, Christèle; Reisdorf, Daniel; Ribeill, Yves; and Soler, Françoise, 5,468,888, Cl. 554-58.000.

Evseev, Yury; Rachinsky, Lubomir; Tetervova, Natalia; Seleninov, Kazimir; Dermenzhi, Evgeniy; Nasekan, Olga; Druyanova, Eva; and Ribak, Roman. Semi conductor rectifying module. 5,468,976, Cl. 257-177.000.

Exide Electronics Corporation: *See*—
Johnson, Robert W., Jr., 5,469,098, Cl. 327-190.000.

Exxon Chemical Patents Inc.: *See*—
Dickakian, Ghazi, 5,468,367, Cl. 208-48.0AA.
Jejelowo, Moses O., 5,468,702, Cl. 502-104.000.
McAlpin, James J.; Kuo, Jeffrey W. C.; and Hylton, Donald C., 5,468,440, Cl. 264-291.000.
Peacock, Andrew J., 5,468,808, Cl. 525-240.000.
Romanelli, Michael G.; Watts, Raymond F.; and Devine, Maryann, 5,468,403, Cl. 252-47.500.

Eyman, David; and Schmidlin, Thomas J., to TRI Industries, Inc. Collapsible folding stroller. 5,468,009, Cl. 280-650.000.

Ezhaya, Antoine: *See*—
Cereda, Enzo; Ezhaya, Antoine; Turconi, Marco; Dubini, Enrica; and Maffione, Grazia, 5,468,758, Cl. 514-304.000.

Ezoe, Toshihide: *See*—
Nii, Kazumi; Hoshimiya, Takashi; Katoh, Kazunobu; and Ezoe, Toshihide, 5,468,592, Cl. 430-264.000.

Faarup, Peter; Jakobsen, Palle; Jørgensen, Anker S.; and Klitgaard, Henrik. 9H-indeno[1,2-b]pyrazine derivatives. 5,468,748, Cl. 514-250.000.

Fackrell, Robert N.; and Griffeth, Lorenzo P., to Creamery Hollow U.S.A., Inc. Honey products. 5,468,513, Cl. 426-663.000.

Factor, Arnold: *See*—
Lewis, Larry N.; Medford, George F.; and Factor, Arnold, 5,468,789, Cl. 524-99.000.

Fairbanks Inc.: *See*—
Keen, Harry J.; and Dunne, Mike, 5,469,262, Cl. 356-386.000.

Falabella, Steven, to University of California, Regents of the. Magnetic-cusp, cathodic-arc source. 5,468,363, Cl. 204-298.410.

Falciglia, James W.; and Mauro, Anthony J., to Monogram Industries Inc. Armored cable. 5,468,914, Cl. 174-112.000.

Falter, Wolfgang: *See*—
Antony, Paul; Falter, Wolfgang; Kiessig, Andreas; and Berg, Matthias, 5,467,847, Cl. 188-73.390.

Fan, Robert J., to LiteCom, Inc. Optical fiber splice interconnection and usage method. 5,469,522, Cl. 385-98.000.

Fantone, Stephen D., to Mobi Corporation. Dual-path optical system. 5,469,293, Cl. 359-412.000.

Fanuc Ltd.: *See*—
Nakamura, Kosei; Hayashi, Yoshiyuki; Kimijima, Masami; and Arimatsu, Yohei, 5,467,521, Cl. 29-598.000.

Fanuc Ltd: *See*—
Yukutomo, Masashi; Isohata, Shigeru; and Yamazaki, Osamu, 5,469,352, Cl. 364-192.000.

Farago, Bela: *See*—
Kocsis, Menhard; and Farago, Bela, 5,468,970, Cl. 250-505.100.

Fargo, Richard N.; and Wurts, William A., to Otis Elevator Company. Method for reducing seal stiction in a fluid cylinder. 5,467,599, Cl. 60-478.000.

Farina, Pietro, to Sovema S.r.l. Lead grid spreading machine for making grid plates for electric accumulators. 5,467,805, Cl. 141-32.000.

Farivar, Mohammad; and Sioshansi, Piran, to Spire Corporation. Metallized polymeric implant with ion embedded coating. 5,468,562, Cl. 428-457.000.

Farooq, Amjad; Mehreteab, Ammanuel; Broze, Guy; and Bielli, Cristina, to Colgate-Palmolive Company. Liquid fabric softening composition. 5,468,398, Cl. 252-88.000.

Farr, Glyn P. R., to Lucas Industries public limited company. Hyudraulic anti-lock braking systems for vehicles. 5,468,059, Cl. 303-116.100.

Farrell, Monti. Oscillating piston engine for helicopters. 5,467,744, Cl. 123-18.00A.

Farwell, Lawrence A., to Conte, Francis Luca. Method for electroencephalographic information detection. 5,467,777, Cl. 128-731.000.

Farwick, Timothy J.: *See*—
de Buzzaccarini, Francesco; Farwick, Timothy J.; and Zhen, Yeuqian, 5,468,413, Cl. 252-117.000.

Fasano, Alessio; Levine, Myron M.; Nataro, James P.; and Noriega, Fernando, to University of Maryland at Baltimore. Isolated DNA molecule encoding ShET2 of *Shigella flexneri* 2a. 5,468,639, Cl. 435-320.100.

Fatigue Technology, Inc.: *See*—
Reid, Leonard F.; and Copple, Charles M., 5,468,104, Cl. 411-113.000.

Faun GmbH: *See*—
Krob, Adolf, 5,468,120, Cl. 414-695.000.

Faure, Serge; Gaillet, Alain; Lefebvre, Régis; and Reboulet, Claude, to Potain. Process for hybrid position/force control for a robot manipulator. 5,469,531, Cl. 395-86.000.

Federsel, Hans-Jürgen; Hö, Thomas; Rämsby, Sten I.; and Ström, Peter H. E., to Aktiebolaget Astra. Intermediates for the stereoconservative synthesis of 1-substituted (S)-and (R)-2-aminomethylpyrrolidines. 5,468,876, Cl. 548-311.000.

Fedun, Oresta N.: *See*—
Barker, Susan; Chu, I-Hsi; Fedun, Oresta N.; and Tyndorf, Tadeusz A., 5,468,638, Cl. 435-304.100.

Feeney, Edward K., to Liebert Corporation. Modular floor sub-structure for the operational support of computer systems. 5,467,609, Cl. 62-259.200.

Fehlner, James R.: *See*—
Zhang, Zhenyu; and Fehlner, James R., 5,468,699, Cl. 502-60.000.

Feng, Le-Jang. Tightening-up belt. 5,467,508, Cl. 24-68.0SK.

Ferguson, Ian: *See*—
Buckley, Alan J.; Huchings, Michael G.; Ferguson, Ian; Beautement, Kevin; Clough, John M.; Crowley, Patrick J.; Godfrey, Christopher R. A.; deFraine, Paul J.; Anthony, Vivienne M.; and Heaney, Stephen P., 5,468,857, Cl. 544-298.000.

Ferguson, Michael: *See*—
Allen, Scott I.; Foye, Duane F.; and Ferguson, Michael, 5,468,526, Cl. 428-35.400.

Ferla, Giuseppe: *See*—
Frisina, Ferruccio; and Ferla, Giuseppe, 5,468,660, Cl. 437-31.000.

Ferlin, William J., to Lincoln Brass Works, Inc. Sealed gas burner assembly. 5,468,145, Cl. 431-266.000.

Ferrando, William A., to United States of America, Navy. Lightweight zinc electrode. 5,468,570, Cl. 429-217.000.

Ferrant, Richard, to Thomson-CSF Semiconducteurs Specifiques. Frequency divider. 5,469,485, Cl. 377-107.000.

Ferranti, Paul A.: *See*—
Redman, Forrest C.; Heimbecher, John O.; Etnyre, Edwin L.; Shavrnoch, James J.; and Ferranti, Paul A., 5,468,018, Cl. 280-788.000.

Ferrari, Franco; and Migli, Carlo, to Ferrari, Franco. Quick removable fasteners in particular for furniture. 5,468,109, Cl. 411-553.000.

Ferrari, Lorenzo: *See*—
Stover, Harald D. H.; Li, Pei; Ferrari, Lorenzo; Shaver, Robert T.; and Vlaovic, Djordje, 5,468,814, Cl. 525-390.000.

Ferrell, Richard M.: *See*—
Suman, Michael J.; Clark, Russell L.; and Ferrell, Richard M., 5,469,298, Cl. 359-630.000.

Ferrier, Donald; and Yakobson, Eric, to MacDermid, Incorporated. Composition and method for selective plating. 5,468,515, Cl. 427-98.000.

Ferroni, Gianfranco: *See*—
Khouzam, Cesare; and Ferroni, Gianfranco, 5,468,422, Cl. 252-544.000.

Fiacco, Vincent M.: *See*—
Chan, Benson; Chapin, Fletcher L.; Fiacco, Vincent M.; Mankus, John R.; and Pokrzywa, Robert S., 5,468,996, Cl. 257-723.000.

Fichtel & Sachs AG: *See*—
Dohrmann, Wolfgang; and Ayyildiz, Metin, 5,468,033, Cl. 293-133.000.
Handke, Günter; Rossberg, Lars; and Zietsch, Andreas, 5,467,851, Cl. 188-299.000.

Fields, Stanley; and Song, Ok-Kyu, to Research Foundation of State University of New York, The. System to detect protein-protein interactions. 5,468,614, Cl. 435-6.000.

Fike Corporation: *See*—
Himrichs, James O., 5,467,886, Cl. 220-89.200.

Findler, Guenther: *See*—
Reihlen, Eckart; Marek, Jiri; Bantien, Frank; Findler, Guenther; Offenberg, Michael; Kleinhans, Josef; Konzelmann, Uwe; and Ziegenbein, Botho, 5,467,649, Cl. 73-204.260.

Fink, Steven R.; and Herman, Floyd J., to Sterman Enterprises, Inc. Multipositional inflatable auto decoy with automatic inflation means. 5,467,543, Cl. 40-538.000.

Finkelstein, Michael: *See*—
Goulet, Richard; Forest, Claude; Landry, Michel; Beaubien, Pierre; Finkelstein, Michael; and Vaidya, Viwek V., 5,467,928, Cl. 239-404.000.

Finnegan, Richard J. H. Double tiered storage trays for a drawer. 5,468,062, Cl. 312-301.000.

Finsterwal, Robert N.; Carlston, Richard L.; Schlueter, Edward L., Jr.; and Sharf, Lucille M., to Xerox Corporation. Sheet registration device. 5,468,834, Cl. 528-76.000.

Firma Carl Freudenberg: *See*—
Derksen, Klaus, 5,467,878, Cl. 215-253.000.
Saussner, Andreas; and Knapp, Stefan, 5,467,961, Cl. 251-129.150.

Firman, William F.: *See*—
Lucy, William D.; and Firman, William F., 5,467,728, Cl. 114-332.000.

Fischer, Jorg-Peter; and Mossner, Steffen, to Robert Bosch GmbH. Device for controlling an amount of exhaust gas returned to an aspirating line. 5,467,756, Cl. 123-569.000.

Fishback, Thomas L.; and Lee, Thomas B., to BASF Corporation. Polyol compositions and rigid polyisocyanate based foams containing 2-chloropropane and aliphatic hydrocarbon blowing agents. 5,468,420, Cl. 252-182.240.

Fisher, Alexander D., deceased (by Bennett Hodge-Fisher, legal representative): *See*—
Zidovec, Davor F.; Fisher, Alexander D., deceased, 5,468,393, Cl. 210-697.000.

Fisher & Paykel Limited: *See*—
Gradon, Lewis; Clark, Andrew B.; and Seakins, Paul J., 5,468,961, Cl. 250-343.000.

Fisher, Lawrence E.; Flippin, Lee A.; and Martin, Michael G., to Syntex (U.S.A.) Inc. Process for preparing1-butyl-2-{2'-(2H-tetrazol-5-yl)biphenyl-4-ylmethyl1-1H-indole-3-carboxylic acid. 5,468,867, Cl. 548-253.000.

Fisons PLC: *See*—
Molloy, James O.; and Pollard-Knight, Denise V., 5,468,620, Cl. 435-7.100.

Flachglas Intg Glasveredelungs GmbH: *See*—
Solinov, Vladimir; and Boguslavski, Igor, 5,468,559, Cl. 428-410.000.

Flaishans, Gary B.: *See*—
Hennessee, Robert P.; Flaishans, Gary B.; Rudzewicz, Robert G.; and Barwin, David A., 5,467,605, Cl. 62-133.000.

Flame-Spray Industries, Inc.: *See*—
Marantz, Daniel R.; and Kowalsky, Keith A., 5,468,295, Cl. 118-723.0DC.

Fleischer, James F.: *See*—
Anthony, Thomas R.; and Fleischer, James F., 5,468,934, Cl. 219-390.000.

Fleming, George R.; and Green, James R. Long wear life flame-retardant cotton blend fabrics. 5,468,545, Cl. 428-259.000.

Fleming, Gregory K.: *See*—
Ekiner, Okan M.; and Fleming, Gregory K., 5,468,430, Cl. 264-28.000.

Fletcher, Don C.: *See*—
Pierce, George C.; and Fletcher, Don C., 5,469,497, Cl. 379-115.000.

Flexible Steel Lacing Company: *See*—
Musil, Edward C.; and Daniels, William J., 5,467,867, Cl. 198-844.200.

Flinchbaugh, Bernadette M.; Paley, Harold R.; Knaub, John E.; Schmid, Christopher J.; and Melnyk, Adrian L., to Whitaker Corporation, The. Locking system for interconnection of daughter board and mother board assemblies. 5,468,156, Cl. 439-157.000.

Flint, Alan; Nguyen, Quy; and Jacobs, William G., to Seagate Technology, Inc. Disc loading and unloading assembly. 5,468,111, Cl. 414-416.000.

Flippin, Lee A.: *See*—
Fisher, Lawrence E.; Flippin, Lee A.; and Martin, Michael G., 5,468,867, Cl. 548-253.000.

Flow, Vincent J., III: *See*—
Zengerle, Paul L.; Miller, David D.; Whitesides, Thomas H.; Rieger, John B.; Flow, Vincent J., III; and Isaac, Walter H., 5,468,604, Cl. 430-631.000.

Flynn, Gary A.; and Beight, Douglas W., to Merrell Dow Pharmaceuticals Inc. Amino and nitro containing tricyclic compounds useful as inhibitors of ace. 5,468,745, Cl. 514-214.000.

FMC Corporation: *See*—
Halfon, Marc; Polsz, Craig A.; and Hoare, John H., 5,468,868, Cl. 548-263.200.
Wilcher, Stephen B., 5,468,391, Cl. 210-525.000.

Foley, Geoffrey M. T.: *See*—
Yu, Robert C. U.; Foley, Geoffrey M. T.; Herbert, William G.; Limburg, William W.; Mishra, Satchidanand; Post, Richard L.; and Von Hoene, Donald C., 5,469,242, Cl. 355-219.000.

Fölsch, Karl J.; Kaufmann, Marita; and Hartmann, Jürgen, to Roehm GmbH Chemische Fabrik. Binder which is crosslinkable at room temperature. 5,468,800, Cl. 524-458.000.

Ford Motor Company: *See*—
Blind, Henry F.; Campagne, Anthony J.; Czekaj, James L.; Difiore, Nicholas L.; Geddes, Earl R.; Krochmal, Andrew C.; and Senyk, Myron I., 5,469,510, Cl. 381-55.000.
Kemp, Christopher J., 5,469,164, Cl. 341-145.000.
Konrad, Julie A.; Freeland, Mark; and Czuhai, Brian S., 5,467,755, Cl. 123-674.000.
Masrur, Md A.; Xu, Xingyi; and Liang, Feng, 5,469,351, Cl. 363-56.000.
Reddy, Prathap A.; Baker, Jay D.; and Kneisel, Larry L., 5,469,329, Cl. 361-704.000.
Stockhausen, William F., 5,467,748, Cl. 123-198.00F.

Forenza, Salvatore: *See*—
Lam, Kin S.; Schroeder, Daniel R.; Mattei, Jacqueline; Forenza, Salvatore; and Matson, James A., 5,468,849, Cl. 536-18.500.

Forest, Claude: *See*—
Goulet, Richard; Forest, Claude; Landry, Michel; Beaubien, Pierre; Finkelstein, Michael; and Vaidya, Viwek V., 5,467,928, Cl. 239-404.000.

Forman, Mark L. Camera bicycle. 5,467,906, Cl. 224-39.000.

Forsström, Bo: *See*—
Sundén, Bengt; Forsström, Bo; Soderquist, Charles E.; and Storckman, Steven D., 5,468,129, Cl. 417-477.120.

Forster, Franz, to Linde Aktiengesellschaft. Hydromechanical transmission. 5,467,597, Cl. 60-442.000.

Fort, Jeffrey W.: *See*—
Smith, Jay, III; and Fort, Jeffrey W., 5,469,191, Cl. 345-157.000.

Fort Lock Corporation: *See*—

Myers, Gary L., 5,467,624, Cl. 70-455.000.
Fort, Yves: *See*—
Berthe, Marie-Christine; Caubere, Paul; and Fort, Yves, 5,468,856, Cl. 544-219.000.
Fortner, Larry L., to Graphic Communications, Inc. Self-erecting display stand that automatically dimensionalizes front panels. 5,467,547, Cl. 40-610.000.
Fortunak, Joseph; Kitteringham, John; Sisti, Nicholas; and Wood, Jeffery, to SmithKline Beecham Corporation. Process for asymmetric total synthesis of camptothecin analogues. 5,468,859, Cl. 546-48.000.
Foster, David J.; Garcia, Armando; and Pearson, Robert B., to International Business Machines Corporation. Serial diagnostic interface bus for multiprocessor systems. 5,469,542, Cl. 395-200.010.
Foster, Donald D.; and Nelson, Philip L., to Contico International, Inc. Trigger sprayer operable in upright, downturned & inverted positions. 5,467,901, Cl. 222-376.000.
Foster, George: *See*—
Rudell, Elliot; and Foster, George, 5,467,981, Cl. 273-65.0EF.
Fouassier, Jean-Pierre: *See*—
Castellanos, Frederic; Cavezzan, Jacques; Fouassier, Jean-Pierre; and Priou, Christian, 5,468,902, Cl. 568-6.000.
Foung, Paul: *See*—
Gunday, Erhan H.; Doliton, Michael; Foung, Paul; and Lee, John R., 5,469,209, Cl. 348-96.000.
Fountain, Edward. Grapple hanger mechanism. 5,468,035, Cl. 294-85.000.
Fouquet, Christophe J. A.: *See*—
Bridge, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Fouquet, Christophe J. A.; and Lowe, Coy S., 5,469,049, Cl. 324-76.770.
Fournier, Jacqueline: *See*—
Coude, Francois X.; Fournier, Jacqueline; and Guzzi, Umberto, 5,468,753, Cl. 514-277.000.
Fowler, Richard C.: *See*—
Drabenstadt, William W.; Fowler, Richard C.; Grindersley, Soren; and Irlbeck, Robert D., 5,469,074, Cl. 324-758.000.
Foye, Duane F.: *See*—
Allen, Scott I.; Foye, Duane F.; and Ferguson, Michael, 5,468,526, Cl. 428-35.400.
Fradin, Armel: *See*—
de Nanteuil, Guillaume; Vincent, Michel; Lila, Christine; Bonnet, Jacqueline; and Fradin, Armel, 5,468,761, Cl. 514-374.000.
Fraisse, Laurent: *See*—
Bachy, André; Fraisse, Laurent; Keane, Peter; Mendes, Etienne; Vernieres, Jean-Claude; and Simiand, Jacques, 5,468,750, Cl. 514-255.000.
Framatome Connectors International: *See*—
Leve, Ludger; and Sierokz, Jurgen, 5,468,911, Cl. 174-74.00R.
France, Dennis S.; Cerami, Anthony; Ulrich, Peter C.; Norton, Laura A.; and Neer, David L., to Rockefeller University, The ; and Alteon Inc. Method and agents for preventing and reversing the staining of teeth. 5,468,777, Cl. 514-562.000.
France Telecom Etablissement Autonome de Droit Public: *See*—
Bimbot, Frédéric; and Mathan, Luc, 5,469,529, Cl. 395-2.550.
Francioni, Renzo, to Cayanna S.p.A. Automatic packaging machine. 5,467,580, Cl. 53-550.000.
Frankenhauser, Georg; and Wedemann, Erhard, to Siemens Aktiengesellschaft. Electrical conductor with a longitudinal groove and slots perpendicular thereto and a method for producing the same. 5,468,907, Cl. 174-15.600.
Franklin, Mark: *See*—
Patrick, Roger; Schoenborn, Philippe; Franklin, Mark; and Bose, Frank, 5,468,296, Cl. 118-723.0MP.
Franz, James A.: *See*—
Linehan, John C.; Yonker, Clement R.; Zemanian, Thomas S.; and Franz, James A., 5,469,061, Cl. 324-321.000.
Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b. H.: *See*—
Theurer, Josef; and Wörgötter, Herbert, 5,467,717, Cl. 104-6.000.
Franzen, Jochen, to Bruker Franzen Analytik GmbH. Ejection of ions from ion traps by combined electrical dipole and quadrupole fields. 5,468,957, Cl. 250-282.000.
Franzen, Jochen; and Wang, Yang, to Bruker-Franzen Analytik GmbH. Quadrupole ion trap with switchable multipole fractions. 5,468,958, Cl. 250-292.000.
Frazier, Kevin A.; Garces, Juan M.; and Lee, Guo-shuh J., to Dow Chemical Company, The. Dialkylbenzene monosulfonate collectors useful in ore flotation. 5,468,407, Cl. 252-61.000.
Free-Flow Packaging Corporation: *See*—
Puss, Gunter G.; and Yampolsky, Vladimir, 5,468,556, Cl. 428-369.000.
Freeland, Mark: *See*—
Konrad, Julie A.; Freeland, Mark; and Czuhai, Brian S., 5,467,755, Cl. 123-674.000.
Freeman, Robert A.: *See*—
Proud, Nicholas W.; and Freeman, Robert A., 5,467,968, Cl. 254-134.400.
Freeman, William R. Treatment of conditions of abnormally increased intraocular pressure by administration of HPMPC and related phosphonylmethoxyalkylcytosines. 5,468,752, Cl. 514-272.000.
French, Erick M.; and French, James S., to Transfair Corporation. Hollow fiber membrane modules with transverse gas flow tailored for improved gas separation. 5,468,283, Cl. 95-45.000.
French, James S.: *See*—
French, Erick M.; and French, James S., 5,468,283, Cl. 95-45.000.
Frey, Heinz; Prochazka, Kamil; and Suter, Franz, to ABB Management AG. Actuating drive for a control valve. 5,467,683, Cl. 91-442.000.
Fried. Krupp AG Hoesch-Krupp: *See*—
Bartzick, Gerd; Naydowski, Reinhard; and Werk, Jürgen, 5,467,701, Cl. 100-4.000.
Friedli, Hans R.: *See*—
Suppes, Galen J.; and Friedli, Hans R., 5,468,839, Cl. 528-403.000.
Fries, Bror; and Nakamoto, Yusho, to A/S Grorud Jernvarefabrik. Cabinet body structure and articulated joint means for use with the structure. 5,468,061, Cl. 312-258.000.
Prisina, Ferruccio; and Ferla, Giuseppe, to Consorzio per la Ricerca Sulla Microelettronica Nel Mezzogiorno; and SGS-Thomson Microelectronics S.r.l. Process for manufacturing an integrated bipolar power device and a fast diode. 5,468,660, Cl. 437-31.000.
Fritsch, Ronald J.: *See*—
Becker, James A.; Fritsch, Ronald J.; Holland, Richard J.; and Klobuchar, Robert F., 5,467,622, Cl. 70-203.000.
Frucht, Theodor: *See*—
Neddenriep, Thomas; and Frucht, Theodor, 5,467,807, Cl. 152-458.000.
Frush, Charles L., to University Corporation for Atmospheric Research. Receiver for bistatic doppler radar network. 5,469,169, Cl. 342-26.000.
Fry, Arthur L.: *See*—
Huss, Charles P.; Fry, Arthur L.; and Leseman, Steven R., 5,468,523, Cl. 428-5.000.
Frye, Robert C.; Harry, Thomas R.; Lory, Earl R.; and Rietman, Edward A., to AT&T Corp. Active neural network control of wafer attributes in a plasma etch process. 5,467,883, Cl. 216-60.000.
Fucili, Giona: *See*—
Nessi, Maurizio; and Fucili, Giona, 5,469,096, Cl. 327-112.000.
Fuhs, Ronald E.; Hammond, William A., Jr.; Nation, George W.; Rogers, Steven L.; and Willis, John C., to International Business Machines Corporation. Retry filter and circulating echo method and apparatus. 5,469,446, Cl. 371-33.000.
Fuji Electric Co., Ltd.: *See*—
Ohishi, Mitsuru; Nakagawa, Wataru; and Uno, Masahiro, 5,468,962, Cl. 250-343.000.
Shigekane, Hisao, 5,469,103, Cl. 327-478.000.
Fuji Oil Co., Ltd.: *See*—
Hattori, Mitsuo; Furuta, Hitoshi; Takahashi, Taro; and Maeda, Hirokazu, 5,468,287, Cl. 106-217.000.
Fuji Photo Film Co., Ltd.: *See*—
Katsuma, Nobuo, 5,469,068, Cl. 324-678.000.
Nii, Kazumi; Hoshimiya, Takashi; Katoh, Kazunobu; and Ezoe, Toshihide, 5,468,592, Cl. 430-264.000.
Suzuki, Tamotsu; Totsuka, Mikio; Niitsu, Chiyomi; and Shinozaki, Fumiaki, 5,468,594, Cl. 430-294.000.
Takahashi, Yutaka; and Shidara, Shinichi, 5,469,241, Cl. 355-64.000.
Watanabe, Toshiyuki; and Takizawa, Hiroo, 5,468,600, Cl. 430-546.000.
Fuji Xerox Co., Ltd.: *See*—
Aoshima, Taku; Noami, Tsuneo; Soga, Hiroh; Sumikawa, Takeshi; Furuya, Nobumasa; and Edure, Tadakazu, 5,469,245, Cl. 355-251.000.
Sunaga, Takayuki; Kato, Akihiko; Sakamoto, Takashi; and Miyata, Hideaki, 5,469,246, Cl. 355-251.000.
Fujie, Hirotoshi: *See*—
Urano, Fumiyoshi; Fujie, Hirotoshi; Oono, Keiji; and Negishi, Takaaki, 5,468,589, Cl. 430-170.000.
Fujihara, Toshiaki: *See*—
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.
Fujii, Hidehiko, to Shimadzu Corporation. Base sequencing apparatus. 5,468,364, Cl. 204-299.00R.
Fujiki, Akira; and Kano, Makoto, to Nissan Motor Co., Ltd. High temperature abrasion resistant copper alloy. 5,468,310, Cl. 148-435.000.
Fujiki, Hiroshi: *See*—
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.
Fujimori, Kazuyoshi: *See*—
Aruga, Tomoe; Yokouchi, Hideya; and Fujimori, Kazuyoshi, 5,469,421, Cl. 369-75.100.
Fujimoto, Masahisa; Nishio, Koji; and Saito, Toshihiko, to Sanyo Electric Co., Ltd. Secondary battery. 5,468,571, Cl. 429-217.000.
Fujimura, Hideo; and Nakamura, Yoshinori, to Dai Nippon Printing Co., Ltd. Thermal transfer recording medium and method for thermal transfer recording. 5,468,713, Cl. 503-227.000.
Fujioka, Hidehiko: *See*—
Hasegawa, Takayuki; and Fujioka, Hidehiko, 5,467,637, Cl. 73-24.010.
Fujioka, Yasushi: *See*—
Kanai, Masahiro; Fujioka, Yasushi; Yoshino, Takehito; and Hori, Tadashi, 5,468,521, Cl. 427-575.000.
Fujisawa, Hiromichi: *See*—
Hatakeyama, Atsushi; Fujisawa, Hiromichi; Kato, Kanji; Kawaguchi, Hisamitsu; Minegishi, Naoki; Tada, Katsumi; and Asakawa, Satoshi, 5,469,354, Cl. 364-419.190.
Fujisawa, Misuzu: *See*—

Yamada, Akiya; Wato, Takahiko; Uchida, Naoki; Fujisawa, Misuzu; Takama, Shigeyuki; and Inamoto, Yukiko, 5,468,503, Cl. 424-461.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Matsuo, Masaaki; Hagiwara, Daijiro; and Miyake, Hiroshi, 5,468,731, Cl. 514-18.000.

Fujisawa, Yoshikazu; Narishige, Takeshi; and Miyazaki, Yuzuru, to Honda Giken Kogyo Kabushiki Kaisha. Slide member. 5,468,567, Cl. 428-645.000.

Fujita, Atsuko: *See*—
Matsui, Shuichi; Goto, Yasuyuki; Onji, Yuichi; and Fujita, Atsuko, 5,468,421, Cl. 252-299.630.

Fujita, Goro; and Tobita, Minoru. Optical information recording or reproducing apparatus with asymmetry compensation. 5,469,415, Cl. 369-48.000.

Fujita, Goro; and Tobita, Minoru, to Sony Corporation. Multi-value recorded data detecting method. 5,469,420, Cl. 369-59.000.

Fujita, Masahiro; and Arisawa, Shigeru, to Sony Corporation. Pattern recognition device. 5,469,512, Cl. 382-118.000.

Fujita, Shuji; Baba, Yasushi; Itoh, Hitoshi; and Satoma, Shiro, to Juki Corporation. Thread spreading apparatus for use in overlock sewing machine. 5,467,725, Cl. 112-162.000.

Fujitsu Limited: *See*—
Abe, Toshiaki; and Wakabayashi, Nobukatsu, 5,469,498, Cl. 379-127.000.
Ishioka, Yuzuru, 5,469,282, Cl. 359-110.000.
Kajita, Tatsuya, 5,468,664, Cl. 437-43.000.
Kumakura, Sinsuke; Yamazaki, Hirokazu; Watanabe, Hisayoshi; and Kasa, Yasushi, 5,469,394, Cl. 365-201.000.
Matsumoto, Takashi, 5,469,502, Cl. 379-230.000.
Motokado, Tomoko; Motokado, Shinichiro; and Ohtomo, Mutsumi, 5,468,077, Cl. 400-76.000.
Okamura, Eiji, 5,469,414, Cl. 369-32.000.
Onaka, Hiroshi; and Miyata, Hideyuki, 5,469,288, Cl. 359-189.000.
Sato, Kazumi, 5,469,427, Cl. 370-16.000.
Sugama, Akio; Suzuki, Hiroaki; and Kojima, Naomi, 5,468,408, Cl. 252-62.200.
Tsuzuki, Kouichi, 5,469,355, Cl. 364-419.190.
Yamazaki, Hirokazu, 5,469,381, Cl. 365-185.010.

Fujiwara, Shigeru; Takahashi, Masashi; and Ishida, Haruhiko, to Kabushiki Kaisha Toshiba. Image forming apparatus having means for applying a common transfer bias voltage to first and second transfer rollers. 5,469,248, Cl. 355-326.00R.

Fukazawa, Makoto, to Mitsumi Electric Co., Ltd. Method capable of judging validity or invalidity of a status of switching elements in a keyboard switch device. 5,469,159, Cl. 341-22.000.

Fukazawa, Toshio: *See*—
Nagata, Yuji; Fukazawa, Toshio; Wada, Kumiko; and Tosaki, Yoshihiro, 5,469,317, Cl. 360-113.000.

Fukuda, Mituo: *See*—
Mishina, Haruo; Wada, Masafumi; Fukuda, Mituo; Itagaki, Masato; and Yamama, Shinya, 5,467,912, Cl. 228-10.000.

Fukuda, Nobutoshi: *See*—
Yamada, Tomoyasu; and Fukuda, Nobutoshi, 5,469,307, Cl. 360-69.000.

Fukuda, Yasuaki: *See*—
Miyake, Akira; Fukuda, Yasuaki; and Maehara, Hiroshi, 5,469,489, Cl. 378-35.000.

Fukuda, Yoshimori: *See*—
Suehiro, Toshiyuki; Teraoka, Shinichi; Ishimaru, Eiichiro; Fukuda, Yoshimori; and Inoue, Shuichi, 5,467,811, Cl. 164-476.000.

Fukuda, Yutaka: *See*—
Okano, Yoshimichi; Kanno, Tatsuya; Yamato, Tsutomu; Oshino, Yasuhiro; Tanigawa, Michiyo; Kuwana, Takaaki; and Fukuda, Yutaka, 5,468,836, Cl. 528-204.000.

Fukui, Tamami: *See*—
Matsumoto, Katsuru; Hirayama, Nobuhiro; Kawasaki, Shoji; Uchiyama, Kenji; Uramoto, Katsuo; and Fukui, Tamami, 5,468,585, Cl. 430-110.000.

Fukumori, Noriyuki: *See*—
Uchihashi, Kiyoaki; Nishimura, Hiroshi; and Fukumori, Noriyuki, 5,469,027, Cl. 315-224.000.

Fukumura, Takeo: *See*—
Matsubara, Kousuke; and Fukumura, Takeo, 5,469,136, Cl. 340-445.000.

Fukunaga, Hidetoshi: *See*—
Sasaki, Masahiko; Tsuchiya, Yasutoshi; and Fukunaga, Hidetoshi, 5,467,606, Cl. 62-160.000.

Fuknoka, Masayoshi: *See*—
Iwami, Hiroyuki; Fukuoka, Masayoshi; and Kanayama, Hiroyuki, 5,468,141, Cl. 425-542.000.

Fukushima, Jukichi, to Yoshida Kogyo K.K. Hook-and-eye fastener. 5,467,509, Cl. 24-689.000.

Fukushima, Shigeru: *See*—
Ohashi, Tetsuo; Tada, Jun; Fukushima, Shigeru; Ozaki, Hiroko; Nishimura, Naoyuki; Shirasaki, Yoshinari; and Yamagata, Koichi, 5,468,852, Cl. 536-24.330.

Fukushima, Toyoaki: *See*—
Nakagawa, Kazuya; and Fukushima, Toyoaki, 5,467,635, Cl. 73-23.350.

Fung, Man K., to TDM Pty Ltd. Ticket dispensing machine. 5,467,895, Cl. 221-259.000.

Fung, Simon S.: *See*—
Morrison, Eric D.; Boston, David R.; Hedrick, Steven T.; Kausch, William L.; Larson, Wayne K.; and Fung, Simon S., 5,468,498, Cl. 424-401.000.
Whitcomb, William C.; Insley, Thomas L; and Fung, Simon S., 5,468,536, Cl. 428-98.000.

Funkunaga, Toshikazu, to Shiraimatsu Shinyaku Kabushiki Kaisha; and Itochu Fine Chemical Corporation. Food product containing antimicrobial composition prepared by dry distillation of bamboo. 5,468,493, Cl. 424-195.100.

Furay, David M.: *See*—
Morehouse, James H.; Furay, David M.; Volk, Steven B.; and Dunckley, James A., 5,469,314, Cl. 360-105.000.

Furukawa Electric Co., Ltd., The: *See*—
Yamamoto, Kiyoshi; Sugii, Nobuyuki; Kubo, Koichi; Ichikawa, Michiharu; and Yamauchi, Hisao, 5,468,806, Cl. 505-238.000.

Furukawa, Nobohiro: *See*—
Takee, Masao; Kimoto, Mamoru; Tikano, Yoshito; Mizitaki, Husago; Mastuura, Yoshinori; Nishio, Koji; and Furukawa, Nobohiro, 5,468,260, Cl. 29-623.500.

Furukawa, Tatsuo, to Canon Kabushiki Kaisha. Photo-electric converter having variable accumulation time. 5,468,954, Cl. 250-208.100.

Furuta, Hitoshi: *See*—
Hattori, Mitsuo; Furuta, Hitoshi; Takahashi, Taro; and Maeda, Hirokazu, 5,468,287, Cl. 106-217.000.

Furuya, Nobumasa: *See*—
Aoshima, Taku; Noami, Tsuneo; Soga, Hiroh; Sumikawa, Takeshi; Furuya, Nobumasa; and Edure, Tadakazu, 5,469,245, Cl. 355-251.000.

Fuss, Gunter G.; and Yampolsky, Vladimir, to Free-Flow Packaging Corporation. Shaped loose-fill packaging particle and method for making the same. 5,468,556, Cl. 428-369.000.

G. D. Searle & Co.: *See*—
Cordi, Alex A.; Handelmann, Gail E.; and Monahan, Joseph B., 5,468,763, Cl. 514-380.000.

G.D Societa' Per Azioni: *See*—
Boriani, Silvano; and Gamberini, Antonio, 5,467,579, Cl. 53-477.000.
Minarelli, Alessandro; Venturi, Giuseppe; and Osti, Roberto, 5,467,872, Cl. 206-256.000.

GA International, Inc.: *See*—
Goor, Dan; Harnisch, Robert P.; Browne, Robert L.; and Long, Stephen T., 5,468,047, Cl. 297-250.100.

Gaertner, Frank H.: *See*—
Thompson, Mark; and Gaertner, Frank H., 5,468,483, Cl. 424-93.461.

Gaffal, Peter: *See*—
Obermeier, Josef; Müller-Boysen, Ulrich; Keusch, Siegfried; and Gaffal, Peter, 5,467,835, Cl. 175-209.000.

Gagen Batterie AG: *See*—
Rühling, Klaus, 5,469,042, Cl. 320-17.000.

Gagliardi, Magda M.; Chen, Shieh-Shung T.; Arison, Byron H.; Garrity, George M.; Huang, Leeyuan; MacConnell, John G.; and White, Raymond F., to Merck & Co., Inc. Cholesterol lowering compound. 5,468,771, Cl. 514-452.000.

Gagnon, Maurice. Brushwood clearing machine capable of cutting and recuperating the cut brushwood material. 5,467,585, Cl. 56-14.300.

Gaillet, Alain: *See*—
Faure, Serge; Gaillet, Alain; Lefebvre, Régis; and Reboulet, Claude, 5,469,531, Cl. 395-86.000.

Galella, John W.: *See*—
Eng, Robert C.; Galella, John W.; McCrary, Rex E.; McDonald, Mark G.; Stelzer, Eric H.; and Yeatz, Frederick C., 5,469,577, Cl. 395-290.000.

Galemmo, Robert A., Jr.: *See*—
Huang, Fu-Chih; Chan, Wan K.; Sutherland, Charles A.; and Galemmo, Robert A., Jr., 5,468,898, Cl. 560-41.000.

Gallagher, Kevin P.: *See*—
Loftus, James E.; and Gallagher, Kevin P., 5,468,546, Cl. 428-280.000.

Galle, Gary L.; and Adamek, Frank C., to Abb Vetco Gray Inc. Subsea flow line connector. 5,468,023, Cl. 285-24.000.

Gallo, Paul E.: *See*—
Staab, Thomas E.; Shah, Kanu G.; Gallo, Paul E.; and Rakauskas, Paul V., 5,468,003, Cl. 277-235.00B.

Galyon, Michael E.: *See*—
Shofner, Frederick M.; Chu, Youe-T; Baldwin, Joseph C.; Galyon, Michael E.; Kacenas, Benjamin M.; and Williams, Gordon F., 5,469,253, Cl. 356-238.000.

Gamberini, Antonio: *See*—
Boriani, Silvano; and Gamberini, Antonio, 5,467,579, Cl. 53-477.000.

Gamow, Rustem I., to Hyperbaric Mountain Technologies, Inc. Hypobaric sleeping chamber. 5,467,764, Cl. 128-202.120.

Gap Technologies, Inc.: *See*—
Plesko, George A., 5,469,291, Cl. 359-224.000.

Garabedian, Aram, Jr.; Mills, Scott C.; Sibert, William P.; Choy, Clement K.; and Rebelo do Couto, Fernando J., to Clorox Company, The. Reduced residue hard surface cleaner. 5,468,423, Cl. 252-546.000.

Garcera, Daniel; Toujas, Edouard; and Gillot, Jacques, to Societe Anonyme Dite Societe des Ceramiques Techniques. Module for filtering, separating, purifying gases or liquids, or for catalytic conversion. 5,468,384, Cl. 210-232.000.

Garces, Juan M.: *See*—
Frazier, Kevin A.; Garces, Juan M.; and Lee, Guo-shuh J., 5,468,407, Cl. 252-61.000.

Garcia, Armando: *See*—

Foster, David J.; Garcia, Armando; and Pearson, Robert B., 5,469,542, Cl. 395-200.010.

Garcia, Graham A.: *See*—
Walker, Howard W.; and Garcia, Graham A., 5,468,674, Cl. 437-62.000.

Garcia, Mario C.; Lund, Kristofer T.; and Park, William H., to Prevent Products Inc. Lower extremity phlebo pump. 5,468,217, Cl. 601-32.000.

Garman, Ronald H.: *See*—
Camp, Calvin C.; Kaveney, Jack R.; Garman, Ronald H.; Vanderburg, Raymond M.; and Kingsinger, Malcolm H., 5,467,560, Cl. 49-413.000.

Garner, James C.: *See*—
Hyman, Nelson L.; Braun, William R.; Garner, James C.; Larson, Lawrence R.; and Tuner, Sheleen M., 5,467,814, Cl. 165-41.000.

Garnett, Robert W.; and Dobelbower, M. Christian, to University of California, Office of Technology Transfer, The Regents of the. Circular, confined distribution for charged particle beams. 5,468,965, Cl. 250-396.0ML.

Garoff, Thomas: *See*—
Koskinen, Jukka; and Garoff, Thomas, 5,468,698, Cl. 502-9.000.

Garrard, Kenneth P.: *See*—
Dow, Thomas A.; Garrard, Kenneth P.; Moorefield, George M., II; and Taylor, Lauren W., 5,467,675, Cl. 82-1.110.

Garrett, Ronald R.; and Topcik, Dennis S. Safety systems for abating the theft of vehicles. 5,469,134, Cl. 340-426.000.

Garrett, Scott M., to Motorola, Inc. Bi-level current limiting circuit and battery using same. 5,469,002, Cl. 307-150.000.

Garrison, Gregory L.: *See*—
Berlin, Kenneth D.; Garrison, Gregory L.; Sangiah, Subbiah; Clarke, Cyril R.; Chen, Chun-Lin; Lazzara, Ralph; Scherlag, Benjamin J.; Patterson, Eugene S.; and Burrows, George E., 5,468,858, Cl. 546-18.000.

Garrity, George M.: *See*—
Gagliardi, Magda M.; Chen, Shieh-Shung T.; Arison, Byron H.; Garrity, George M.; Huang, Leeyuan; MacConnell, John G.; and White, Raymond F., 5,468,771, Cl. 514-452.000.

Garst, Michael E.; Burk, Robert M.; Chan, Ming F.; and Roof, Michael B., to Allergan, Inc. Method of lowering intraocular pressure by administering a pharmaceutical composition containing 7-(5-substituted cyclopentyl) and 7-(5-substituted-cyclopentenyl) 5-heptenoic acids and derivatives. 5,468,778, Cl. 514-573.000.

Garth, Geoffrey C.: *See*—
Egelandsdal, Einar; Garth, Geoffrey C.; Hamilton, John; Johnson, David; Laerdal, Tore; and Patterson, Charles A., 5,468,151, Cl. 434-265.000.

Gary, Richard G.: *See*—
Angevaare, Petrus A.; and Gary, Richard G., 5,468,410, Cl. 252-95.000.

Gasmovic, David J.: *See*—
Archambeault, John T.; Gasmovic, David J.; and Mizuno, Morio, 5,469,155, Cl. 340-853.400.

Gat, Eran. High-speed digital communications network. 5,469,432, Cl. 370-60.000.

Gates, Douglas M.: *See*—
Macioch, Michael T.; Gates, Douglas M.; and Leary, Timothy M., 5,468,588, Cl. 430-229.000.

Gatfield, Ian; and Sand, Theodor, to Haarmann & Reimer GmbH. Process of preparing butyric acid or 2- or 3-methylbutyric acid by oxidizing the corresponding butanols with gluconobacter roseus IAM 1841 or IFO 3990. 5,468,627, Cl. 435-141.000.

Gattey, Phillip A.; and Jensen, Wolfgang W., to ACS Wireless, Inc. Communications headset having a ball joint-mounted receiver assembly. 5,469,505, Cl. 379-430.000.

Gatto, Jean-Marie; and Bertrand, Dominique, to International Des Jeux. Device for analyzing information media with an elastically mounted image sensor. 5,468,943, Cl. 235-454.000.

Gauger, Derek K., to ITT Corporation. Vehicle power seat adjuster with self-aligning drive nut. 5,467,957, Cl. 248-429.000.

Gavin, David F.: *See*—
Hani, Rahim; Dumas, Richard H.; Gavin, David F.; Harrison, Charles H.; Kennedy, Michael A.; Schiessl, Henry W.; McMahon, Robert E.; and Manke, Steven A., 5,468,864, Cl. 546-345.000.

Gavin, Patrick M.: *See*—
Lin, David C. K.; and Gavin, Patrick M., 5,468,275, Cl. 65-497.000.

Gavrielov, Nachum M.: *See*—
Oke, Timothy P.; Cummings, Russell E., II; and Gavrielov, Nachum M., 5,469,075, Cl. 324-763.000.

Gawin, Frank H.; Byck, Robert; Alderdice, Marc; and Schwimmer, Jeffrey. Method for treatment of substance addiction. 5,468,749, Cl. 514-252.000.

Gebauer, Herbert; Gupta, Pramod; and König, Christian, to Bayer Aktiengesellschaft. Modified aromatic polyisocyanates and their use for the production of rigid foamed materials. 5,468,783, Cl. 521-159.000.

Gebert, Rowan D. Intravenous cannula connector. 5,468,228, Cl. 604-174.000.

Gebr. Happich GmbH: *See*—
Viertel, Lothar; and Welter, Patrick, 5,468,041, Cl. 296-97.900.

GEC Alsthom T & D, Inc.: *See*—
Demissy, Daniel, 5,468,164, Cl. 439-843.000.

Geddes, Earl R.: *See*—
Blind, Henry F.; Campagne, Anthony J.; Czekaj, James L.; Difiore, Nicholas L.; Geddes, Earl R.; Krochmal, Andrew C.; and Senyk, Myron I., 5,469,510, Cl. 381-55.000.

Gedeon, Andras, to Minco AB. Device for indicating the presence of carbon dioxide in a patient's exhaled air. 5,468,451, Cl. 422-58.000.

Gee, James M., to Sandia Corporation. Method of making a back contacted solar cell. 5,468,652, Cl. 437-2.000.

Gee, Thomas A.: *See*—
Skorupski, Jeffrey H.; and Gee, Thomas A., 5,467,645, Cl. 73-121.000.

Geib, Joseph J., to Cummins-Allison Corp. Disc-type coin sorter with adjustable targeting inserts. 5,468,182, Cl. 453-10.000.

Geike, Hans-Georg: *See*—
Boninsegni, Christian; and Geike, Hans-Georg, 5,468,084, Cl. 401-78.000.

Geller, David A.: *See*—
Billiar, Timothy R.; Nussler, Andreas K.; Geller, David A.; and Simmons, Richard L., 5,468,630, Cl. 435-189.000.

GenCorp Inc.: *See*—
Kildune, Joseph S., 5,467,708, Cl. 101-32.000.
Lenke, Gerd M.; and Cocain, H. William, 5,468,831, Cl. 528-44.000.

General Atomics: *See*—
Ohkawa, Tihiro; and Elsner, Frederick H., 5,468,358, Cl. 204-181.500.

General DataComm, Inc.: *See*—
Kurdzo, James P.; and Katze, Alan B., Jr., 5,469,434, Cl. 370-67.000.

General Electric Company: *See*—
Adamson, Ronald B.; Lutz, Daniel R.; and Armijo, Joseph S., 5,469,481, Cl. 376-416.000.
Anthony, Thomas R.; and Fleischer, James F., 5,468,934, Cl. 219-390.000.
Atherton, Kenneth W.; Grogan, Kevin P.; Balch, Richard A.; and Plis, Mark J., 5,469,153, Cl. 340-870.280.
Balaschak, Edward J.; Scott, Curtis E.; and Sakoske, George E., 5,468,168, Cl. 445-26.000.
Brunemann, George A., Jr.; and Reismiller, Paul R., 5,469,447, Cl. 371-36.000.
Cassarly, William J.; Davenport, John M.; and Hansler, Richard L., 5,469,337, Cl. 362-32.000.
Crouch, Earl T., 5,468,542, Cl. 428-215.000.
Dumoulin, Charles L., 5,469,059, Cl. 324-306.000.
Hall, Walter L., 5,468,437, Cl. 264-119.000.
Hu, Hui; Pelc, Norbert J.; and Pfoh, Armin H., 5,469,486, Cl. 378-4.000.
Hu, Hui, 5,469,487, Cl. 378-9.000.
Kulich, Donald M., 5,468,788, Cl. 523-335.000.
Lewis, Larry N.; Medford, George F.; and Factor, Arnold, 5,468,789, Cl. 524-99.000.
Mahood, James A., 5,468,895, Cl. 558-71.000.
Makarenko, Peter; Harris, Stacy E.; and Martin, Robert R., 5,468,331, Cl. 156-494.000.
Miller, Steven A.; Mourer, David P.; and Brun, Milivoj K., 5,468,133, Cl. 425-7.000.
Seaman, Burton J., 5,467,523, Cl. 29-622.000.
Smith, James A.; Ellis, Matthew; Saunders, Rowland F.; and Hall, Anne L., 5,467,770, Cl. 128-661.080.
Smith, Lowell S.; and Lewandowski, Robert S., 5,467,779, Cl. 128-660.100.
Stein, Judith; and Davis, Mark W., 5,468,794, Cl. 524-188.000.

General Motors Corporation: *See*—
Alverio, John, 5,467,670, Cl. 76-108.600.
Bircann, Raul A.; and Palmer, Dwight O., 5,467,962, Cl. 251-129.150.
Cummings, Larry D.; and Mittlefehldt, Kurt R., 5,467,611, Cl. 62-299.000.
Donegan, Michael W.; Nuchols, Richard P.; Webber, James L.; and Mc Cann, Jerry A., 5,468,011, Cl. 280-728.200.
Gimbel, Hans-Peter; Trutter, Walter P.; and Specht, Martin, 5,468,014, Cl. 280-735.000.
Hurtubise, Diane M.; Arnold, Perry K.; Kudla, David P.; and Armstrong, Lawrence E., 5,467,971, Cl. 267-220.000.
Ratu, John J.; Jones, Alvin K.; and Maddox, Charles K., 5,467,970, Cl. 267-220.000.
Seetharaman, Viswanath; and Reuter, David F., 5,467,797, Cl. 137-599.000.
Thompson, David A.; Rajagopalan, Venkatesh; Wright, Kurt W.; Sterba, John J.; Paulus, William J.; Paulus, Nancy J.; McCauley, Kathryn M.; and Chen, David K., 5,467,636, Cl. 73-23.310.

Gentelia, John S.; Eggan, Ronald E., Jr.; Williams, Frank R.; and Wheatley, William, to Conmed Corporation. Manual control device for laparoscopic instrument. 5,468,240, Cl. 606-42.000.

Gentex Corporation: *See*—
Ansite, William K.; and Pennell, David N., 5,467,766, Cl. 128-205.240.

Gentle, Theresa E.; and Lutz, Michael A., to Dow Corning Corporation. Adhesion promoting additives and curable organosiloxane compositions containing same. 5,468,826, Cl. 528-15.000.

Geo-Centers, Inc.: *See*—
Sandler, Sheldon; Crandall, Alan; Schwarzkopf, Daniel; Johnson, Gilbert; and Borkowski, Rudolph, 5,469,176, Cl. 342-375.000.

Georger, Jacque H., Jr.: *See*—
Calabrese, Gary S.; Calvert, Jeffrey M.; Chen, Mu-San; Dressick, Walter J.; Dulcey, Charles S.; Georger, Jacque H., Jr.; and Bohland, John F., Jr., 5,468,597, Cl. 430-315.000.

Georges, Pierre, to E M S. Collapsible drum. 5,467,939, Cl. 242-607.100.

Georgia Tech Research Corporation: *See*—
Carey, Richard A.; Moses, Marlon M.; and Daley, Wayne D. R., 5,467,922, Cl. 236-94.000.
Kohl, Paul A.; and Vogt, Kirkland W., 5,468,688, Cl. 437-237.000.

Geres, John C.: *See*—

Graushar, William T.; Geres, John C.; and Dettmering, Todd J., 5,467,973, Cl. 270-1.100.

Gerhard, Albert: *See*—
Meiwes, Johannes; Gerhard, Albert; and Hammer, Uwe, 5,467,749, Cl. 123-339.270.

Gerlach, Brett C.; Lee, Patrick; McCormick, William B.; and Douglas, George H., to Microsoft Corporation. System and method for font wrapping printer data. 5,469,532, Cl. 395-102.000.

Gevas, Philip C.; Grimes, Stephen; Karr, Stephen L.; Michaeli, Dov; and Scibienski, Robert, to Aphton Corp. Immunogenic compositions against human gastrin 17. 5,468,494, Cl. 424-195.110.

Geysen, Hendrik M. Switching device with a plurality of switches responsive to an input signal level. 5,469,000, Cl. 307-39.000.

Ghazarian, John, to Sellman, George. Optical motion sensor and method for operating same. 5,469,141, Cl. 340-566.000.

Ghazarossian, Vartan: *See*—
Skold, Carl N.; Shanafelt, Armen B.; Ghazarossian, Vartan; and Ullman, Edwin F., 5,468,647, Cl. 436-514.000.

Ghisellini, Renato; Cecchin, Giuliano; and Malucelli, Decio, to Montell North America Inc. Polyolefin compositions having good transparency and impact resistance. 5,468,809, Cl. 525-240.000.

Ghorashi, Hamid M.: *See*—
Brown, Gary G.; Ghorashi, Hamid M.; and Shaffer, Donald E., 5,468,537, Cl. 428-101.000.

Ghosh, Subir K.; and Bhattacharya, Dipankar, to OPTi, Inc. Adaptive write-back method and apparatus wherein the cache system operates in a combination of write-back and write-through modes for a cache-based microprocessor system. 5,469,555, Cl. 395-460.000.

Giamalva, David H.: *See*—
Argiriadi, Andrew A.; Blank, Robert G.; and Giamalva, David H., 5,468,502, Cl. 424-456.000.

Giamei, Anthony F.; and Thompson, Earl R., to United Technologies Corporation. Directionally solidified eutectic reinforcing fibers and fiber reinforced composites containing the fibers. 5,468,548, Cl. 428-294.000.

Giani, Carlo: *See*—
Meiwes, Johannes; Wullbrandt, Dieter; and Giani, Carlo, 5,468,625, Cl. 435-71.100.

Giannini, Umberto: *See*—
Morini, Giampiero; Albizzati, Enrico; Giannini, Umberto; Scordamaglia, Raimondo; and Barino, Luisa, 5,468,704, Cl. 502-115.000.

Giat Industries: *See*—
Boual, Roland, 5,467,716, Cl. 102-434.000.

Gibbs, Phillip R.: *See*—
Johnson, Steven W.; Monticello, Daniel J.; Gibbs, Phillip R.; and Kulpa, Charles F., 5,468,626, Cl. 435-130.000.

Gibbs, Richard A.: *See*—
Butensky, Michael J.; Gibbs, Richard A.; Collins, Kevin T.; Yang, Yih-Nan; Johnson, Eric M.; and Grafft, Chris A., 5,469,503, Cl. 379-265.000.

Gieger, Jeffrey S.: *See*—
Duve, George; and Gieger, Jeffrey S., 5,469,347, Cl. 362-245.000.

Gilchrist, Raymond T.; and McCoy, Kevin, to AlliedSignal Inc. Pneumatic check valve and method for making a pneumatic check valve. 5,467,529, Cl. 29-890.128.

Gill, Hardayal S., to International Business Machines Corporation. Method of manufacturing an MR read head which eliminates lead-to-shield shorts at the ABS of the MR read head. 5,467,881, Cl. 216-22.000.

Gill, Manzur: *See*—
McElroy, Dave J.; Gill, Manzur; and Shah, Pradeep L., 5,469,383, Cl. 365-185.010.

Gille, Lennart A., to TRW Inc. Dual air bag system for occupant restraint. 5,468,013, Cl. 280-729.000.

Gilles, Theodore C.: *See*—
Dean, William J.; and Gilles, Theodore C., 5,467,812, Cl. 165-2.000.

Gillespie, Duncan S. Apparatus for retaining cooling pipes for an ice rink. 5,467,948, Cl. 248-68.100.

Gillingham, Peter B., to Mosaid Technologies Incorporated. Column redundancy scheme for DRAM using normal and redundant column decoders programmed with defective array address and defective column address. 5,469,401, Cl. 365-230.060.

Gillooly, Gregory T. Water temperature control device. 5,467,967, Cl. 251-288.000.

Gillot, Jacques: *See*—
Garcera, Daniel; Toujas, Edouard; and Gillot, Jacques, 5,468,384, Cl. 210-232.000.

Gimbel, Hans-Peter; Trutter, Walter P.; and Specht, Martin, to General Motors Corporation. Motor vehicle seat with child's safety seat attachment. 5,468,014, Cl. 280-735.000.

Giobbi, John J.; and Burke, David H., to Prelude Technology Corp. Cordless pointing apparatus. 5,469,193, Cl. 345-158.000.

Giribone, Giovanni: *See*—
Biavasco, Raffaella; Kirk, Mark; and Giribone, Giovanni, 5,468,599, Cl. 430-512.000.

Giuliani, Elizabeth A.: *See*—
deSolms, S. Jane; Giuliani, Elizabeth A.; and Graham, Samuel L., 5,468,733, Cl. 514-19.000.

Givens, James A. Life raft utility tether. 5,468,167, Cl. 441-40.000.

Giwa-Agbomeirele, Patricia A.: *See*—
Bergstrom, Debora F.; Burns, Gary T.; and Giwa-Agbomeirele, Patricia A., 5,468,829, Cl. 528-18.000.

Glaser, Thomas: *See*—
Schohe-Loop, Rudolf; Heine, Hans-Georg; Junge, Bodo; Glaser, Thomas; De Vry, Jean M. V.; Dompert, Wolfgang; and Sommermeyer, Henning, 5,468,882, Cl. 549-407.000.

Glatfelter, Troy; and Lycette, Mark, to United Solar Systems Corporation. Large area, through-hole, parallel-connected photovoltaic device. 5,468,988, Cl. 257-431.000.

Gleim, Günter: *See*—
Rothermel, Albrecht; Gleim, Günter; and Rothermel, Karin, 5,469,089, Cl. 327-56.000.

Glicksman, Marcie A.; Rotella, David P.; Neff, Nicola; and Murakata, Chikara, to Cephalon, Inc.; and Kyowa Hakko Kogyo Co., Ltd. K-252a functional derivatives potentiate neurotrophin-3 for the treatment of neurological disorders. 5,468,872, Cl. 548-416.000.

Glider, Joseph S.; Powers, David T.; and Idleman, Thomas E., to MTI Technology Corporation. Data corrections applicable to redundant arrays of independent disks. 5,469,453, Cl. 371-68.100.

Glover, Michael W. Controlled access collection container. 5,467,918, Cl. 232-43.100.

GNB Battery Technologies Inc.: *See*—
Cherng, Jing-Yih; and Klang, James K., 5,469,043, Cl. 320-31.000.

Go, Shintetsu; Kashizaki, Yoshio; Suzuki, Koichi; Sato, Kazuma; and Shimada, Akira, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member having intermediate layer containing fine powder particles of tin oxide containing phosphorous and apparatus employing same. 5,468,584, Cl. 430-65.000.

Goddard, Norman H.; and Schaefer, Peter, to Sartorius AG. Filter module with degassing feature. 5,468,388, Cl. 210-321.750.

Godec, Maksimilijan; Larson, John A.; and Waskiewicz, Walter P., to Torrington Company, The. Bearing assembly. 5,468,074, Cl. 384-495.000.

Godfrey, Christopher R. A.: *See*—
Buckley, Alan J.; Huchings, Michael G.; Ferguson, Ian; Beautement, Kevin; Clough, John M.; Crowley, Patrick J.; Godfrey, Christopher R. A.; dePraine, Paul J.; Anthony, Vivienne M.; and Heaney, Stephen P., 5,468,857, Cl. 544-298.000.
Clough, John M.; Godfrey, Christopher R. A.; Streeting, Ian T.; and Cheetham, Rex, 5,468,747, Cl. 514-239.500.

Godfrey, Edith: *See*—
Godfrey, Ernest; and Godfrey, Edith, 5,468,534, Cl. 428-40.000.

Godfrey, Ernest; and Godfrey, Edith. Attachable dinner napkin. 5,468,534, Cl. 428-40.000.

Godo Shusei Co., Ltd.: *See*—
Seri, Kenji; Sanai, Kazuko; Negishi, Shigenori; and Akino, Toshiro, 5,468,734, Cl. 514-23.000.

Godsey, James H.; Jacox, James L.; Keller, Robert F.; and Legare, Richard J., to Hercules Incorporated. Binder system for crosslinked double base propellant. 5,468,311, Cl. 149-19.400.

Godvin, Gerard B.; and Kolb, Charles F., Jr. Pile mooring device for boats. 5,467,727, Cl. 114-230.000.

Goetz, George W., to TRW Vehicle Safety Systems Inc. Apparatus for inflating an inflatable vehicle occupant restraint. 5,468,015, Cl. 280-737.000.

Golby, John A.; Padgett, Miles J.; and Woodall, Stephen P., to International Business Machines Corporation. Inspection interferometer with scanning autofocus, and phase angle control features. 5,469,259, Cl. 356-351.000.

Gold, Peter. Windshield wiper deicing windshield and method of constructing same. 5,467,522, Cl. 29-611.000.

Golden, John; and Golden, Phillip. Cold-cathode X-ray emitter and tube therefor. 5,469,490, Cl. 378-122.000.

Golden Key Futura, Inc.: *See*—
Troncoso, Vincent F., 5,467,759, Cl. 124-44.500.

Golden, Phillip: *See*—
Golden, John; and Golden, Phillip, 5,469,490, Cl. 378-122.000.

Goldman, Ron: *See*—
Alexander, Edward R.; Goldman, Ron; Li, Yajun; Bard, Simon; Strat, Askold; Katz, Joseph; and Metlitsky, Boris, 5,468,952, Cl. 235-492.000.

Goldstar Co., Ltd.: *See*—
Ahn, Byung C., 5,467,882, Cl. 216-23.000.
Her, Chung H., 5,469,224, Cl. 348-589.000.
Hong, Sung H., 5,469,225, Cl. 348-625.000.
Kang, Hyung J., 5,468,940, Cl. 219-746.000.
Lee, Choon, 5,469,212, Cl. 348-392.000.

Goldstar Electron Co., Ltd.: *See*—
Jun, Young K., 5,468,677, Cl. 437-70.000.
Kim, Tae-hoon, 5,469,387, Cl. 365-189.090.
Lee, Chang-Jae; and Hwang, Hyunsang, 5,468,665, Cl. 437-44.000.
Seo, Jung Y., 5,469,322, Cl. 361-220.000.

Golf Scoring Systems Unlimited, Inc.: *See*—
Boman, Bertho, 5,469,175, Cl. 342-357.000.

Gonczy, Stephen T.: *See*—
Leung, Roger Y.; Stranford, Gerald T.; and Gonczy, Stephen T., 5,468,318, Cl. 156-89.000.

Gong, Kai F.: *See*—
Graham, Marcus L.; MacDonald, John F.; Gong, Kai F.; and Keay, Kathleen D., 5,469,374, Cl. 364-516.000.

Gonsalves, Manuel: *See*—
McGill, James K., III; Abele, Dorotea; Colman, Lonnie L.; Gonsalves, Manuel; and Saxena, Sanjeev, 5,469,573, Cl. 395-700.000.

Gonsalves, Robert A.: *See*—
Ebstein, Steven; Gonsalves, Robert A.; and Menelly, Richard A., 5,468,971, Cl. 250-556.000.

Gonzales, Oscar: *See*—
Urshan, Sydney; Deckert, Curtis K.; and Gonzales, Oscar, 5,468,944, Cl. 235-454.000.

Good, Robert; and Carobus, Richard, to Clear Difference Co., The. Golf club head with acrylic club body and method for manufacturing same. 5,467,989, Cl. 273-167.00R.

Goodall, Brian L.; Benedikt, George M.; McIntosh, Lester H., III; and Barnes, Dennis A., to B.F. Goodrich Company, The. Process for making polymers containing a norbornene repeating unit by addition polymerization using an organo (nickel or palladium) complex. 5,468,819, Cl. 526-171.000.

Goody, Steven H.: *See*—
Thaler, Patricia A.; Kadambi, Jayant; Spratt, Michael; Albrecht, Alan R.; and Goody, Steven H., 5,469,439, Cl. 370-94.300.

Goodyear Tire & Rubber Company, The: *See*—
Parker, Dane K.; Musleve, Richard T.; and Hirst, Robert C., 5,468,893, Cl. 556-427.000.

Goonng Chyii Industrial Co., Ltd.: *See*—
Yang, Ching S., 5,468,005, Cl. 280-40.000.

Goor, Dan; Harnisch, Robert P.; Browne, Robert L.; and Long, Stephen T., to GA International, Inc. Child safety seat. 5,468,047, Cl. 297-250.100.

Goossen, Keith W.: *See*—
Cunningham, John E.; Goossen, Keith W.; Jan, William Y.; and Walker, James A., 5,468,689, Cl. 437-241.000.

Gopalsami, Nachappa; Bakhtiari, Sasan; Raptis, Apostolos C.; and Dieckman, Stephen L., to University of Chicago, The. Millimeter wave sensor for monitoring effluents. 5,468,964, Cl. 250-393.000.

Gorablenkow, Jorg: *See*—
Lorenz, Dieter; and Gorablenkow, Jorg, 5,469,050, Cl. 324-126.000.

Gorski, Jack A.: *See*—
Baxter-Lowe, Lee A.; and Gorski, Jack A., 5,468,611, Cl. 435-6.000.

Gosch, Richard H., to Motorola, Inc. Vertically movable table. 5,467,721, Cl. 108-146.000.

Gosio, Giovanni: *See*—
Arvedi, Giovanni; Gosio, Giovanni; Siegers, Ulrich; Manini, Luciano; Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Thurm, Hans-Günther; and Lüdorff, Harald, 5,467,809, Cl. 164-418.000.

Goto, Yasuyuki: *See*—
Matsui, Shuichi; Goto, Yasuyuki; Onji, Yuichi; and Fujita, Atsuko, 5,468,421, Cl. 252-299.630.

Gotoh, Toshihiro: *See*—
Sugano, Toshihiko; and Gotoh, Toshihiro, 5,468,781, Cl. 521-60.000.

Gotou, Makoto: *See*—
Sakakibara, Yoshio; Gotou, Makoto; and Isaka, Haruo, 5,469,304, Cl. 360-13.000.

Gott, Brian G.: *See*—
Randles, Kenneth R.; Gott, Brian G.; and Daley, Stephen T. A. K., 5,468,903, Cl. 568-28.000.

Gottschalk, Axel: *See*—
Götz, Walter; and Gottschalk, Axel, 5,468,530, Cl. 428-36.400.

Götz, Walter; and Gottschalk, Axel, to BASF Aktiengesellschaft. PPE/PA molding materials for the production of moldings by means of blow molding, profile extrusion and pipe extrusion. 5,468,530, Cl. 428-36.400.

Goudie, Alexander C.: *See*—
Banks, Bernard J.; Dutton, Christopher J.; and Goudie, Alexander C., 5,468,765, Cl. 514-395.000.

Goulet, Richard; Forest, Claude; Landry, Michel; Beaubien, Pierre; Finkelstein, Michael; and Vaidya, Viwek V., to Canadian Liquid Air Ltd. - Air Liquide Canada Ltee. Oxy-fuel cutting tip having gas outlet passages. 5,467,928, Cl. 239-404.000.

Goya, Shigeru. Metal connector for construction. 5,468,086, Cl. 403-260.000.

Grabow, Thomas: *See*—
Trey, Heiko; Grabow, Thomas; and Steinbrink, Eckhard, 5,469,147, Cl. 340-628.000.

Gradecki, Raymond J.: *See*—
Sorensen, Gerald R.; and Gradecki, Raymond J., 5,467,903, Cl. 222-455.000.

Gradon, Lewis; Clark, Andrew B.; and Seakins, Paul J., to Fisher & Paykel Limited. Infrared gas analyser and humidity sensor. 5,468,961, Cl. 250-343.000.

Gradzki, Pawel; Kaynor, Mark; and Gruber, David, to Biological Monitoring, Inc. Method and apparatus using threshold techniques for generating an alarm in a bio-sensor. 5,469,144, Cl. 340-603.000.

Graf + Cie AG Kratzen- Und Maschinenfabrik: *See*—
Graf, Ralph, 5,467,505, Cl. 19-114.000.

Graf, Ralph, to Graf + Cie AG Kratzen- Und Maschinenfabrik. Card clothing for a carding machine. 5,467,505, Cl. 19-114.000.

Grafen, Paul; Kiefer, Hans; and Jaedicke, Hagen, to BASF Aktiengesellschaft. Preparation of vitamin E. 5,468,883, Cl. 549-411.000.

Grafft, Chris A.: *See*—
Butensky, Michael J.; Gibbs, Richard A.; Collins, Kevin T.; Yang, Yih-Nan; Johnson, Eric M.; and Grafft, Chris A., 5,469,503, Cl. 379-265.000.

Graham, Edgar E. Prism pod. 5,469,301, Cl. 359-831.000.

Graham, Marcus L.; MacDonald, John F.; Gong, Kai F.; and Keay, Kathleen D., to United States of America, Navy. Automatic data segmentation module for target motion analysis applications. 5,469,374, Cl. 364-516.000.

Graham, Samuel L.: *See*—
deSolms, S. Jane; Giuliani, Elizabeth A.; and Graham, Samuel L., 5,468,733, Cl. 514-19.000.

Gramkow, Asger: *See*—
Cording, Louis B.; Knudsen, Hans B.; and Gramkow, Asger, 5,467,608, Cl. 62-195.000.

Graphic Communications, Inc.: *See*—
Fortner, Larry L., 5,467,547, Cl. 40-610.000.

Grasso, Mark S., to Allied Signal Inc. Ring laser gyroscope with tilting mirrors. 5,469,258, Cl. 356-350.000.

Grate, Jay W.: *See*—
Rose-Pehrsson, Susan L.; Di Lella, Daniel; and Grate, Jay W., 5,469,369, Cl. 364-497.000.

Graushar, William T.; Geres, John C.; and Dettmering, Todd J., to Quad/Tech, Inc. Apparatus and method for addressing variable thickness signatures. 5,467,973, Cl. 270-1.100.

Gravino, Marc C., to Trilby, Ltd. Lockable closure for a fuel tank filler pipe. 5,467,621, Cl. 70-171.000.

Green, Augustus H., Jr.: *See*—
Polge, Robert J.; and Green, Augustus H., Jr., 5,469,167, Cl. 342-25.000.

Green, Charles J.: *See*—
Morris, John M.; and Green, Charles J., 5,467,960, Cl. 251-30.010.

Green, Edward A. Strippable fiberglass insulated conductor. 5,468,915, Cl. 174-124.00R.

Green, Gary M.: *See*—
Phillips, William T.; Schwartz, Joyce G.; and Green, Gary M., 5,468,727, Cl. 514-12.000.

Green, James R.: *See*—
Fleming, George R.; and Green, James R., 5,468,545, Cl. 428-259.000.

Green, Lloyd G.: *See*—
Kirsch, Thomas A.; and Green, Lloyd G., 5,468,017, Cl. 280-741.000.

Green, Phillip A.: *See*—
Vandenberg, Douglas; Philpott, Michael L.; Green, Phillip A.; Eastman, Scott A.; and Carlini, Sean M., 5,469,482, Cl. 377-3.000.

Green, Timothy M., to Public Safety Equipment, Inc. Light bar with reflector assembly. 5,469,341, Cl. 362-83.300.

Greenbaum, Steven S. Multi-purpose protective eye shield. 5,469,229, Cl. 351-44.000.

Greene, Gary L.; and Spector, George. Adjustable drywall corner tool. 5,467,497, Cl. 15-235.800.

GreenTech, L.L.C.: *See*—
Ripley, Thomas L., Sr.; and Cataldo, Stephen A., 5,467,555, Cl. 47-66.000.

Greenwald, Roger J.: *See*—
Sauer, Jude S.; Oravecz, Michael G.; Greenwald, Roger J.; and Kobilansky, Alexander L., 5,467,762, Cl. 600-114.000.

Greer, Robert D.; Henderson, Daniel E.; Hosseini, Javad; Rytter, Noel J.; and Simmons, Gerald P., to Caterpillar Inc. Electronic implement control. 5,467,541, Cl. 37-348.000.

Greer, Stuart E., to Motorola, Inc. Method for forming a temporary attachment between a semiconductor die and a substrate using a metal paste comprising spherical modules. 5,468,655, Cl. 437-8.000.

Greer, Thomas W., to Reliable Corporation of America, The. Multiple bingo game apparatus. 5,467,996, Cl. 273-269.000.

Greuel, Michael P.; Arvanitopoulos, Labros D.; and Harwood, H. James, to University of Akron. Cobaloxime photoinitiated free radical polymerizations. 5,468,785, Cl. 522-63.000.

Grieff, Thomas W.: *See*—
Callison, Ryan A.; Chandler, Gregory T.; and Grieff, Thomas W., 5,469,548, Cl. 395-441.000.

Griffeth, Lorenzo P.: *See*—
Fackrell, Robert N.; and Griffeth, Lorenzo P., 5,468,513, Cl. 426-663.000.

Griffin, Edmond I.; and Dehdashti, Dolores A., to Griffin, Edmond I. Apparatus and method for shower Puva treatment. 5,468,234, Cl. 604-290.000.

Griffith, John D. Bedding anchor. 5,467,491, Cl. 5-658.000.

Grimes, Michael: *See*—
Cook, Nigel J. D.; Weight, Kenneth R.; Gutman, Richard G.; Buttery, Roger A.; and Grimes, Michael, 5,468,382, Cl. 210-232.000.

Grimes, Robert E.; Scott, Danny E.; and Pessier, Rudolf C. O., to Baker Hughes Incorporated. Fixed cutter bit with shear cutting gage. 5,467,836, Cl. 175-401.000.

Grimes, Stephen: *See*—
Gevas, Philip C.; Grimes, Stephen; Karr, Stephen L.; Michaeli, Dov; and Scibienski, Robert, 5,468,494, Cl. 424-195.110.

Grinderslev, Soren: *See*—
Drabenstadt, William W.; Fowler, Richard C.; Grinderslev, Soren; and Irlbeck, Robert D., 5,469,074, Cl. 324-758.000.

Grobe, Klaus: *See*—
Petersen, Uwe; Grobe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 5,468,861, Cl. 546-156.000.

Groβe-Puppendahl, Thomas: *See*—
Homann, Walter K.; Groβe-Puppendahl, Thomas; and Brügging, Wilhelm, 5,468,441, Cl. 264-331.210.

Groening, Carsten: *See*—
Ebel, Klaus; Schroeder, Juergen; Groening, Carsten; Dockner, Toni; and Merkle, Hans R., 5,468,871, Cl. 548-373.100.

Grogan, Kevin P.: *See*—
Atherton, Kenneth W.; Grogan, Kevin P.; Balch, Richard A.; and Plis, Mark J., 5,469,153, Cl. 340-870.280.

Groh, John F.: *See*—
Ochs, Dennis E.; Burton, David L.; Groh, John F.; and Smith, David E., 5,467,774, Cl. 128-711.000.

Grohe, Klaus: *See*—

Petersen, Uwe; Himmler, Thomas; Schenke, Thomas; Krebs, Andreas; Grohe, Klaus; Bremm, Klaus-Dieter; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 5,468,742, Cl. 514-187.000.

Groom, Murree: *See*—
McIvor-Dean, Alan; and Groom, Murree, 5,467,723, Cl. 111-123.000.

Grosso, Gilles: *See*—
Scarpitta, Alain A.; Boucher, Didier; and Grosso, Gilles, 5,469,406, Cl. 367-171.000.

Grove, John A., to Acutus Industries. Continuous metal casting mold. 5,467,810, Cl. 164-418.000.

Grover, Thomas A.: *See*—
Aust, Steven D.; Barr, David P.; Grover, Thomas A.; Shah, Manish M.; and Chung, Namhyun, 5,468,628, Cl. 435-168.000.

Grove-Rasmussen, Svend, to Rockwool International A/S. Process and apparatus for making mineral wool fibres. 5,468,274, Cl. 65-469.000.

Grubaugh, James: *See*—
Riedel, John; and Grubaugh, James, 5,468,070, Cl. 384-127.000.

Grube, Gary W.; and Markison, Timothy W., to Motorola, Inc. Method for detecting unauthorized modification of a communication or broadcast unit. 5,469,569, Cl. 395-600.000.

Gruber, David: *See*—
Gradzki, Pawel; Kaynor, Mark; and Gruber, David, 5,469,144, Cl. 340-603.000.

Gruber, John M., to Catalytica, Inc. Process for preparing amide n-carboxamides. 5,468,873, Cl. 548-486.000.

Gruber, Stefan: *See*—
Schönberger, Eduard; Gruber, Stefan; Kasowski, Hermann; and Schmidt, Heinz, 5,468,909, Cl. 174-16.100.

Gruenbaum, William T.; Kung, Teh-Ming; and Young, Ralph H., to Eastman Kodak Company. Cyclic bis-dicarboximide electron transport compounds for electrophotography. 5,468,583, Cl. 430-58.000.

Grunstad, Jerome A.: *See*—
Peterson, Francis C.; Grunstad, Jerome A.; and Wildgen, Leo F., 5,468,037, Cl. 296-57.100.

GT Development Corporation: *See*—
Morris, John M.; and Green, Charles J., 5,467,960, Cl. 251-30.010.

Gu, Jun: *See*—
Puri, Rochir; and Gu, Jun, 5,469,367, Cl. 364-489.000.

Guccione, Ray A.: *See*—
Elliott, Andrew C.; and Guccione, Ray A., 5,468,127, Cl. 417-53.000.

Guder, Harald, to Minnesota Mining and Manufacturing Company. Method for priming wet or dry road surfaces. 5,468,795, Cl. 524-361.000.

Gueguen, Jean-Christophe: *See*—
Bouboutou, Romaine; Dereu, Norbert; Evers, Michel; Gueguen, Jean-Christophe; James, Claude; Poujade, Christèle; Reisdorf, Daniel; Ribeill, Yves; and Soler, Françoise, 5,468,888, Cl. 554-58.000.

Guen, Ho-young: *See*—
Chung, Hyun-jong; Yim, Sang-chul; Ku, Bon-chul; Guen, Ho-young; and Kim, Duk-han, 5,468,263, Cl. 44-39.00L.

Guénin, Eric P.; Trotzinka, Karen A.; Smith, Leslie C.; Warren, Craig B.; Munteanu, Marina A.; Chung, Siew L.; and Tan, Chee-Teck, to International Flvos & Pragnaces Inc. Alcohol free perfume. 5,468,725, Cl. 512-2.000.

Guenther, Dolores: *See*—
Guenther, Torbett B., 5,467,486, Cl. 4-578.100.

Guenther, Torbett B., to Guenther, Torbett B.; and Guenther, Dolores. Foldable shower/tub seat. 5,467,486, Cl. 4-578.100.

Guerin, Jean-Pierre; Robin, Jean-Francois; and Roudot, Francois, to Alcatel Cit. Method and devices for simultaneous transmission of two heterochronous binary signals on the same transmission medium. 5,469,430, Cl. 370-37.000.

Guerra, Gaetano; Corradini, Paolo; DeRosa, Claudio; Iuliano, Mauro; Oliva, Leone; and Petraccone, Vittorio, to Montecatini Tecnologie S.p.A. Semicrystalline manufactured articles made of syndiotactic poly-p-methylstyrene (s-PpMS). 5,468,823, Cl. 526-347.100.

Guest, John D. Tube couplings. 5,468,027, Cl. 285-319.000.

Guille, Jean-Louis: *See*—
Ledoux, Marc-Jacques; Guille, Jean-Louis; Pham Hou, Cuong; Dunlop, Hugh; and Prin, Marie, 5,468,370, Cl. 208-134.000.

Guimier, Michel; and Paris, Philippe M., to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation "Snecma". System for ventilating the turbine disks and stator of a turbo jet engine. 5,468,123, Cl. 415-178.000.

Gunawan, Iwan: *See*—
Malamas, Michael S.; and Gunawan, Iwan, 5,468,762, Cl. 514-376.000.

Gunday, Erhan H.; Doliton, Michael; Foung, Paul; and Lee, John R., to Sony Electronics, Inc. Apparatus for generating video signals representing a photographic image previously recorded in a frame on a photographic film-type medium. 5,469,209, Cl. 348-96.000.

Guo, Fang-Merng: *See*—
Wun, Jeffrey; Shia, Ting; and Guo, Fang-Merng, 5,469,303, Cl. 359-[illegible]96.000.

Gupta, Pramod: *See*—
Gebauer, Herbert; Gupta, Pramod; and König, Christian, 5,468,783, Cl. 521-159.000.

Gupta, Shyam K., to Dial Corp., The. Production of fatty acid methyl esters and soaps therefrom. 5,468,887, Cl. 554-169.000.

Gupta, Subhash; and Chen, Susan H., to Advanced Micro Devices, Inc. Plasma etch process. 5,468,339, Cl. 216-67.000.

Gupta, Subhash; Chen, Susan; and Hui, Angela. Highly selective high aspect ratio oxide etch method and products made by the process. 5,468,340, Cl. 216-67.000.

Gurka, Jiri: *See*—
Ekdahl, Egon; Gurka, Jiri; Huber, Rupert; Köttritsch, Hubert; Kufe, Gottfried; Müllner, Johann; and Weninger, Helmut, 5,468,072, Cl. 354-448.000.

Gurler, Yener. Device for attaching to and detecting wetness in diapers. 5,469,146, Cl. 340-605.000.

Gut, Max B., to Royale Consultants Ltd. Method and equipment for bidirectional data transmission (full-duplex). 5,469,285, Cl. 359-152.000.

Gutermuth, Terry R.: *See*—
Vincent, Michael T.; Gutermuth, Terry R.; Lawrie, Robert E.; Moote, Richard K.; Simonich, Mark A.; and Tamm, James R., 5,467,593, Cl. 60-274.000.

Gutman, Richard G.: *See*—
Cook, Nigel J. D.; Weight, Kenneth R.; Gutman, Richard G.; Buttery, Roger A.; and Grimes, Michael, 5,468,382, Cl. 210-232.000.

Guzzi, Umberto: *See*—
Coude, Francois X.; Fournier, Jacqueline; and Guzzi, Umberto, 5,468,753, Cl. 514-277.000.

Gwinn, Kimberly D.: *See*—
Reddick, Bradford B.; Gwinn, Kimberly D.; and Oliver, Jack W., 5,468,486, Cl. 424-194.100.

Gylys, Jonas A.: *See*—
Cipollina, Joseph A.; Gylys, Jonas A.; Mattson, Ronald J.; and Sloan, Charles P., 5,468,768, Cl. 514-415.000.

Gyugyi, Laszlo; and Nelson, Robert J., to Westinghouse Electric Corporation. Transmission line power flow controller with unequal advancement and retardation of transmission angle. 5,469,044, Cl. 323-207.000.

H. Huck GmbH & Co. KG: *See*—
Boninsegni, Christian; and Geike, Hans-Georg, 5,468,084, Cl. 401-78.000.

H. Stroll GmbH & Co.: *See*—
Loquet, Rüdiger; and Kimmich, Ulrich, 5,467,616, Cl. 66-60.00R.

Haarmann & Reimer GmbH: *See*—
Gatfield, Ian; and Sand, Theodor, 5,468,627, Cl. 435-141.000.

Haas, Zygmunt, to AT&T IPM Corp. Optical packet switch. 5,469,284, Cl. 359-139.000.

Habegger, Oskar, to Maschinenfabrik Sulzer Burckhardt AG. Piston compressor. 5,467,687, Cl. 92-165.00R.

Habing, Theodore G., to Pacific Fitness Corporation. Multi-hip exerciser. 5,468,202, Cl. 482-100.000.

Hachiya, Seio; Shinoda, Ken-ichi; and Higo, Yuichi, to Nisshin Steel Co., Ltd. Lubricant for use in hot rolling of stainless steel. 5,468,402, Cl. 252-25.000.

Haddad, Louis C.: *See*—
Heilmann, Steven M.; Drtina, Gary J.; Eitzman, Philip D.; Haddad, Louis C.; Hyde, Frederick W.; Johnson, Todd W.; Rassmussen, Jerald K.; and Williams, Michael G., 5,468,847, Cl. 530-413.000.

Hadfield, Robert W.: *See*—
Bowman, Timothy; Domigan, Charles N.; Hadfield, Robert W.; Harmon, J. David; and Sheridan, James E., 5,467,565, Cl. 52-220.100.

Hadick, Robert J.: *See*—
Doles, Joseph E.; and Hadick, Robert J., 5,469,252, Cl. 356-73.100.

Hadimioglu, Babur B.; Lim, Martin G.; Stearns, Richard G.; and Quate, Calvin F., to Xerox Corporation. Apparatus and method for moving a substrate. 5,467,975, Cl. 271-267.000.

Hafizi, Madjid; Stanchina, William E.; and Hooper, William W., to Hughes Aircraft Company. Reduction of base-collector junction parasitic capacitance of heterojunction bipolar transistors. 5,468,659, Cl. 437-31.000.

Hagiwara, Daijiro: *See*—
Matsuo, Masaaki; Hagiwara, Daijiro; and Miyake, Hiroshi, 5,468,731, Cl. 514-18.000.

Hagiwara, Teruhiko. Quantitative analysis combining high performance liquid chromatograph and mass spectrometer. 5,468,452, Cl. 422-70.000.

Hagiya, Mikio: *See*—
Endoh, Takeshi; Imai, Tomoaki; and Hagiya, Mikio, 5,469,067, Cl. 324-551.000.

Hahn, Gary S., to Dura Pharmaceuticals, Inc. Methods for the treatment of non-IgE-mediated diseases. 5,468,730, Cl. 514-17.000.

Hahn, Horst, to Multimatic Corporation. Reducing the concentration of solvent vapors in drycleaning machines. 5,467,539, Cl. 34-77.000.

Hahn, Inc.: *See*—
Hahn, Kent S., 5,468,183, Cl. 454-136.000.

Hahn, Kent S., to Hahn, Inc. Clean air operator enclosure. 5,468,183, Cl. 454-136.000.

Hahn, Robert T.: *See*—
Acker, William P.; Hahn, Robert T.; Mach, Thomas J.; and Sung, Rodney L., 5,468,262, Cl. 44-348.000.
DeRosa, Thomas F.; Studzinski, William M.; Russo, Joseph M.; Kaufman, Benjamin J.; and Hahn, Robert T., 5,468,264, Cl. 44-426.000.

Hahn, Stephen J.; and Swanson, David K., to Cardiac Pacemakers, Inc. Method and apparatus for defibrillation using a multiphasic truncated exponential waveform. 5,468,254, Cl. 607-5.000.

Hahn, Ulf: *See*—
Roosmann, Karl-Heinz; and Hahn, Ulf, 5,467,713, Cl. 102-233.000.

Haines, D. Mark, to University of Massachusetts Lowell Research Foundation. Composite spread spectrum signal including modulator demodulator. 5,469,469, Cl. 375-201.000.

Hajaligol, Mohammad R.: *See*—
Deevi, Seetharama C.; Hajaligol, Mohammad R.; Lieberman, Pamela D.; Nichols, Walter A.; and Watkins, Michael L., 5,468,936, Cl. 219-553.000.

Hajik, Robert M.: *See*—
Highsmith, Thomas K.; Hajik, Robert M.; Wardle, Robert B.; Lund, Gary K.; and Blau, Reed J., 5,468,866, Cl. 548-251.000.

HaL Computer Systems, Inc.: *See*—
Saxena, Nirmal, 5,469,443, Cl. 371-21.300.

Halfon, Marc; Polsz, Craig A.; and Hoare, John H., to FMC Corporation. Process for the selective chlorination of 4,5-dihydro-1-phenyl-1H-1,2,4-triazol-5-one. 5,468,868, Cl. 548-263.200.

Hall, Anne L.: *See*—
Smith, James A.; Ellis, Matthew; Saunders, Rowland F.; and Hall, Anne L., 5,467,770, Cl. 128-661.080.

Hall, Christopher W. G.: *See*—
Bruce, Robert S.; and Hall, Christopher W. G., 5,468,346, Cl. 216-34.000.

Hall, David B.; and Lam, Leo K., to Litton Systems, Inc. Multipole magnetic geometry for a ring laser gyroscope. 5,469,256, Cl. 356-350.000.

Hall, Jack K.; and Delphia, John B., to Hoover Universal, Inc. Vehicle seat assembly with unitary frame structure. 5,468,050, Cl. 297-344.100.

Hall, Walter L., to General Electric Company. Process for producing stabilized non-woven thermoplastic composites. 5,468,437, Cl. 264-119.000.

Haller, William R.: *See*—
McBrearty, Raymond A.; and Haller, William R., 5,469,372, Cl. 364-550.000.

Halpern, Alan A. Femoral superior neck remodelling means and method. 5,468,243, Cl. 606-80.000.

Hamabe, Takeshi: *See*—
Kawanishi, Umeo; Hirayama, Nobuhisa; Hamabe, Takeshi; and Takagi, Toru, 5,469,128, Cl. 333-22.00R.

Hamada, Masaharu: *See*—
Itoh, Junichi; Sato, Yuta; Matsuzaki, Minoru; Hamada, Masaharu; and Imai, Yuji, 5,469,237, Cl. 354-106.000.

Hamade, Kei: *See*—
Yamauchi, Tadaaki; Hamade, Kei; and Morooka, Yoshikazu, 5,469,402, Cl. 365-230.080.

Hamamoto, Satoshi: *See*—
Arimoto, Satoshi; Hayafuji, Norio; Deguchi, Mikio; and Hamamoto, Satoshi, 5,467,731, Cl. 117-43.000.

Hamann, Theodora L.: *See*—
Misker, Jan S.; Hamann, Theodora L.; and Rozendaal, Leendert T., 5,469,227, Cl. 348-702.000.

Hamilton, John: *See*—
Egelandsdal, Einar; Garth, Geoffrey C.; Hamilton, John; Johnson, David; Laerdal, Tore; and Patterson, Charles A., 5,468,151, Cl. 434-265.000.

Hamilton, Robert E.: *See*—
Chew, James P.; and Hamilton, Robert E., 5,467,654, Cl. 73-514.390.

Hamilton, Steven D., to Brewer Company, The. Air sampling device and method for sampling exhaled air. 5,467,776, Cl. 128-730.000.

Hammer, Uwe: *See*—
Meiwes, Johannes; Gerhard, Albert; and Hammer, Uwe, 5,467,749, Cl. 123-339.270.

Hammerbacher, Milfred D., to Texas Instruments Incorporated. Output-increasing, protective cover for a solar cell. 5,468,304, Cl. 136-246.000.

Hammond, William A., Jr.: *See*—
Puhs, Ronald E.; Hammond, William A., Jr.; Nation, George W.; Rogers, Steven L.; and Willis, John C., 5,469,446, Cl. 371-33.000.

Hammonds, Carl L. Apparatus and method for injecting dry particulate material in a fluid flow line. 5,468,066, Cl. 366-139.000.

Hamoda, Keiji; Yoshida, Ritsuo; Iijima, Toshihiko; Yamamoto, Chiemi; and Kubo, Akihiko, to Kabushiki Kaisha Toshiba. Management apparatus for a plurality of cassettes. 5,469,308, Cl. 360-71.000.

Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., to Han, Young Bok; and Korean Association of Creation Research. Extracted substance having anti-HIV activity. 5,468,487, Cl. 424-195.100.

Han, Young Bok: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.

Hanba, Michio, to Bose Corporation. Supported vehicle electroacoustical transducing. 5,468,922, Cl. 181-150.000.

Hancock, Albert G., Jr., to Texas Incinerator Co., TX. Contaminant solidifying and stabilizing apparatus and process. 5,468,435, Cl. 264-109.000.

Handelmann, Gail E.: *See*—
Cordi, Alex A.; Handelmann, Gail E.; and Monahan, Joseph B., 5,468,763, Cl. 514-380.000.

Handke, Günter; Rossberg, Lars; and Zietsch, Andreas, to Fichtel & Sachs AG. Shock absorber with a check valve module and a check valve module for a shock absorber. 5,467,851, Cl. 188-299.000.

Hang, Kenneth W.: *See*—
Carroll, Alan F.; and Hang, Kenneth W., 5,468,695, Cl. 501-79.000.

Hani, Rahim; Dumas, Richard H.; Gavin, David F.; Harrison, Charles H.; Kennedy, Michael A.; Schiessl, Henry W.; McMahon, Robert E.; and Manke, Steven A., to Olin Corporation. Process for preparing 2,6-dichloropyridine. 5,468,864, Cl. 546-345.000.

Hanschen, Thomas P.; Krueger, Dennis L.; and Karp, Gregory P., to Minnesota Mining and Manufacturing Company. Spatially modified elastic laminates. 5,468,428, Cl. 264-483.000.

Hansler, Richard L.: *See*—
Cassarly, William J.; Davenport, John M.; and Hansler, Richard L., 5,469,337, Cl. 362-32.000.

Hanson, Christopher D.; and Meurer, Charles L., to Meurer Research, Inc. Submerged fixed-film biological waste treatment method and system. 5,468,392, Cl. 210-615.000.

Hanson, Eric G.: *See*—
Allen, Ross R.; Lam, Si-Ty; McClelland, Paul H.; and Hanson, Eric G., 5,469,199, Cl. 347-42.000.

Hanson, George E., to Norand Corporation. Chromatic ranging method and apparatus for reading optically readable information over a substantial range of distances. 5,468,950, Cl. 235-472.000.

Hara, Masaaki, to Sony Corporation. Digital signal reproducing method and apparatus. 5,469,306, Cl. 360-65.000.

Hara, Yuji; Ito, Satoru; and Toya, Tatsuro, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Resin molded type semiconductor device having a conductor film. 5,468,998, Cl. 257-775.000.

Harada, Keizo; and Itozaki, Hideo, to Sumitomo Electric Industries, Ltd. Stacked Josephson junction device composed of oxide superconductor material. 5,468,973, Cl. 257-33.000.

Harada, Koukichi: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Harada, Masana, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing an insulated gate bipolar transistor. 5,468,654, Cl. 437-6.000.

Harada, Yoshihisa: *See*—
Nakagomi, Hirofumi; Harada, Yoshihisa; and Umezawa, Shigeki, 5,467,849, Cl. 188-77.00W.

Haraguchi, Yoshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device including redundancy circuit for remedying defect in memory portion. 5,469,391, Cl. 365-200.000.

Hardie, William: *See*—
McGregor, Gordon L.; Minor, Raymond B.; Hardie, William; and Kennedy, Michael, 5,468,314, Cl. 156-56.000.

Hares, George F.: *See*—
Boek, Heather; Borrelli, Nicholas F.; and Hares, George F., 5,468,692, Cl. 501-64.000.

Haridas, Kochat: *See*—
Hausheer, Frederick H.; and Haridas, Kochat, 5,468,754, Cl. 514-283.000.

Harima, Takayuki, to Kabushiki Kaisha Toshiba. Semiconductor device. 5,468,985, Cl. 257-385.000.

Harkey, Christopher C.: *See*—
Dalrymple, Thomas H.; and Harkey, Christopher C., 5,467,719, Cl. 105-362.000.

Harkness, Scott, to Dynalaser Inc. Golf swing training method. 5,467,992, Cl. 273-187.200.

Harmon, Frank C., Jr.: *See*—
Zguris, George C.; and Harmon, Frank C., Jr., 5,468,572, Cl. 429-247.000.

Harmon, J. David: *See*—
Arthur, Richard L.; Bowman, Timothy S.; and Harmon, J. David, 5,468,908, Cl. 174-48.000.
Bowman, Timothy; Domigan, Charles N.; Hadfield, Robert W.; Harmon, J. David; and Sheridan, James E., 5,467,565, Cl. 52-220.100.

Harmon, John P.: *See*—
Okazaki, Sandra Y.; and Harmon, John P., 5,469,196, Cl. 347-8.000.

Harnisch, Robert P.: *See*—
Goor, Dan; Harnisch, Robert P.; Browne, Robert L.; and Long, Stephen T., 5,468,047, Cl. 297-250.100.

Harpold, Michael A.: *See*—
Wegner, Steven; Harpold, Michael A.; McCaffrey, Terence M.; Morris, Susan E.; Wojciechowski, Marek; Zhao, Junguo; Henkens, Robert W.; Naser, Najih; and O'Daly, John P., 5,468,366, Cl. 204-403.000.

Harrar, Karl E.: *See*—
Blake, Carl D.; and Harrar, Karl E., 5,468,921, Cl. 178-18.000.

Harris, Albert K. M.; Kirk, Gregory L.; Owicki, John C.; Dawes, Timothy D.; and Kuo, Richard C., to Molecular Devices Corp. Transverse flow plungers for microphysiometers. 5,468,605, Cl. 435-4.000.

Harris Corporation: *See*—
Clifton, Daniel B., 5,469,556, Cl. 395-490.000.
Neilson, John M. S.; Wheatley, Carl F., Jr.; Jones, Frederick P.; and Temple, Victor A. K., 5,468,668, Cl. 437-51.000.

Harris, Stacy E.: *See*—
Makarenko, Peter; Harris, Stacy E.; and Martin, Robert R., 5,468,331, Cl. 156-494.000.

Harrison, Charles H.: *See*—
Hani, Rahim; Dumas, Richard H.; Gavin, David F.; Harrison, Charles H.; Kennedy, Michael A.; Schiessl, Henry W.; McMahon, Robert E.; and Manke, Steven A., 5,468,864, Cl. 546-345.000.

Harrison-Clifton Inc.: *See*—
Bermas, Edward M., 5,468,447, Cl. 422-5.000.

Harry, Thomas R.: *See*—
Frye, Robert C.; Harry, Thomas R.; Lory, Earl R.; and Rietman, Edward A., 5,467,883, Cl. 216-60.000.

Hart, Alan D.: *See*—

Morgan, Peter C.; Hart, Alan D.; and Morgans, Philip D., 5,468,446, Cl. 419-64.000.

Hart, David, to Ontario Crippled Children's Centre. Orthotic walker. 5,467,793, Cl. 135-67.000.

Hartman, Mark L.: *See*—
Bales, Daniel A.; and Hartman, Mark L., 5,467,528, Cl. 29-890.010.

Hartmann, Hans H.; Drügh, Hans-Peter; and Reismann, Hans J., to SMS Schloemann-Siemag AG. Billet live roller feed bed upstream of cooling beds. 5,468,146, Cl. 432-77.000.

Hartmann, Jürgen: *See*—
Fölsch, Karl J.; Kaufmann, Marita; and Hartmann, Jürgen, 5,468,800, Cl. 524-458.000.

Hartzell, Jonathan. Sock tagging device and method. 5,467,510, Cl. 24-706.900.

Harvey, William J., to AT&T Corp. Air conditioning control system. 5,467,607, Cl. 62-186.000.

Harward, Mark G., to Texas Instruments Incorporated. Programmable logic device routing architecture. 5,469,078, Cl. 326-41.000.

Harwood, H. James: *See*—
Greuel, Michael P.; Arvanitopoulos, Labros D.; and Harwood, H. James, 5,468,785, Cl. 522-63.000.

Hasegawa, Haruhiro: *See*—
Nishino, Toshikazu; Hasegawa, Haruhiro; and Kawabe, Ushio, 5,468,723, Cl. 505-330.000.

Hasegawa, Hiroshi: *See*—
Okada, Ken'ichi; Takagi, Masahiro; Hasegawa, Hiroshi; and Iwamura, Ryoji, 5,468,315, Cl. 156-64.000.

Hasegawa, Jun: *See*—
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 5,469,239, Cl. 354-402.000.

Hasegawa, Takayuki; and Fujioka, Hidehiko, to Canon Kabushiki Kaisha. Method of measuring gas purity information, chamber unit and exposure unit using the method and a device production method. 5,467,637, Cl. 73-24.010.

Hashiba, Masashi: *See*—
Yabuuchi, Masahiko; Akazuma, Hiroshi; Masuda, Minoru; Katoh, Kazuo; Nakamura, Tsuneo; Tajima, Shigeru; Hashiba, Masashi; Hayami, Hiroshi; Takezawa, Tomoko; and Hirayama, Masachika, 5,468,380, Cl. 210-198.200.

Hashimoto, Ichiro: *See*—
Nakajima, Takeshi; Hashimoto, Ichiro; Saitou, Tomoyuki; Ohira, Fusanori; Akashi, Sueo; Sone, Nobukatu; and Nii, Katsutoshi, 5,469,008, Cl. 310-90.500.

Hashimoto, Kazuhiko; Osaki, Haruyoshi; Ebina, Chinchito; Nagase, Kyoko; Moriuma, Hiroshi; and Uetani, Yasunori, to Sumitomo Chemical Company, Limited. Positive resist composition. 5,468,590, Cl. 430-191.000.

Hashimoto, Koji: *See*—
Shibata, Tsuyoshi; Hashimoto, Koji; and Hieda, Katsuhiko, 5,468,576, Cl. 430-5.000.

Hashimoto, Shigeo: *See*—
Yoshino, Hitoshi; and Hashimoto, Shigeo, 5,467,769, Cl. 128-653.200.

Hashimoto, Shin: *See*—
Hirase, Junji; and Hashimoto, Shin, 5,468,983, Cl. 257-344.000.

Haskell, Ora. Poultry vaccinator. 5,468,227, Cl. 604-156.000.

Hassenrück, Karin; and Wild, Peter, to Bayer Aktiengesellschaft. Basic azo dyestuffs of the 3-cyano-2,4,6-triamino pyridine series. 5,468,848, Cl. 534-759.000.

Hastie, Neil: *See*—
Albon, Richard; and Hastie, Neil, 5,469,378, Cl. 365-49.000.

Hatakeyama, Atsushi; Fujisawa, Hiromichi; Kato, Kanji; Kawaguchi, Hisamitsu; Minegishi, Naoki; Tada, Katsumi; and Asakawa, Satoshi, to Hitachi, Ltd. Document data processing method and apparatus for document retrieval. 5,469,354, Cl. 364-419.190.

Hatano, Kouichi: *See*—
Yamashita, Hiroyuki; Kondo, Hiroyuki; Hatano, Kouichi; Nakano, Katsunori; Toyoda, Kouji; and Senzaki, Takashi, 5,468,516, Cl. 427-180.000.

Hatano, Masami: *See*—
Suzuki, Junji; Hatano, Masami; and Imaizumi, Shinichi, 5,468,905, Cl. 565.346.000.

Hatch Associates Ltd.: *See*—
McCaffrey, Felim, 5,468,190, Cl. 472-82.000.

Hatch, Robert P.; and Radtke, Marilyn J., to Bayer Corporation. Device for validating urobilinogen test devices. 5,468,641, Cl. 436-97.000.

Hatcho, Seiji: *See*—
Aoki, Takuya; Shimasaki, Yuichi; Matsumoto, Seiji; Hatcho, Seiji; Oketani, Toshikazu; Miyashita, Yukio; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,467,594, Cl. 60-276.000.

Hattori, Mitsuo; Furuta, Hitoshi; Takahashi, Taro; and Maeda, Hirokazu, to Fuji Oil Co., Ltd. Water color. 5,468,287, Cl. 106-217.000.

Haumann, Jurgen; Knopfli, Alfred; Sattelmayer, Thomas; and Treach, Rudolf, to ABB Research Ltd. Apparatus for impingement cooling. 5,467,815, Cl. 165-109.100.

Hawchild, Edward, to Eastman Kodak Company. Parasitic resistance compensation for a thermal print head. 5,469,203, Cl. 347-190.000.

Hawsheer, Frederick H.; and Haridas, Kochat, to BioNumerik Pharmaceuticals, Inc. 11,7 substituted camptothecin derivatives and formulations of 11,7 substituted camptothecin derivatives and methods for uses thereof. 5,468,754, Cl. 514-283.000.

Haut, Paul R.; and Schuster, William, to Haut, Paul R. Time settable flashing light. 5,469,346, Cl. 362-205.000.

Havemann, Robert H., to Texas Instruments Incorporated. Method of making thin film transistor and a silicide local interconnect. 5,468,662, Cl. 437-40.000.

Hawkins, Mark R.; and Peterson, Joel L., to Caterpillar Inc. System for controlling a vehicle to selectively allow operation in either an autonomous mode or a manual mode. 5,469,356, Cl. 364-424.020.

Hayafuji, Norio: *See*—
Arimoto, Satoshi; Hayafuji, Norio; Deguchi, Mikio; and Hamamoto, Satoshi, 5,467,731, Cl. 117-43.000.

Hayakawa, Tetsuo; Inoue, Tokuji; and Asaga, Hiroyuki, to Ube Industries, Ltd. Process for producing a propylene block copolymer. 5,468,810, Cl. 525-244.000.

Hayami, Hiroshi: *See*—
Yabuuchi, Masahiko; Akazuma, Hiroshi; Masuda, Minoru; Katoh, Kazuo; Nakamura, Tsuneo; Tajima, Shigeru; Hashiba, Masashi; Hayami, Hiroshi; Takezawa, Tomoko; and Hirayama, Masachika, 5,468,380, Cl. 210-198.200.

Hayashi, Keiichiro, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Power transmission for mechanical press. 5,468,194, Cl. 477-3.000.

Hayashi, Yoshiyuki: *See*—
Nakamura, Kosei; Hayashi, Yoshiyuki; Kimijima, Masami; and Arimatsu, Yohei, 5,467,521, Cl. 29-598.000.

Heaney, Stephen P.: *See*—
Buckley, Alan J.; Huchings, Michael G.; Ferguson, Ian; Beautement, Kevin; Clough, John M.; Crowley, Patrick J.; Godfrey, Christopher R. A.; deFraine, Paul J.; Anthony, Vivienne M.; and Heaney, Stephen P., 5,468,857, Cl. 544-298.000.

Hebert, John J.: *See*—
Hebert, Robert J.; and Hebert, John J., 5,468,032, Cl. 292-343.000.

Hebert, Robert J.; and Hebert, John J. Door stop assembly. 5,468,032, Cl. 292-343.000.

Hecht, Michael R. Low deck trailer. 5,468,008, Cl. 280-638.000.

Heckler, Chris, to PepsiCo, Inc. Manifold and valve block assembly. 5,467,790, Cl. 134-66.000.

Hedrick, Steven T.: *See*—
Morrison, Eric D.; Boston, David R.; Hedrick, Steven T.; Kausch, William L.; Larson, Wayne K.; and Fung, Simon S., 5,468,498, Cl. 424-408.000.

Heidelberger Druckmaschinen AG: *See*—
Wirz, Arno, 5,467,710, Cl. 101-177.000.

Heiliger, Ludger: *See*—
Probst, Joachim; Novotny, Fritz; Träubel, Harro; and Heiliger, Ludger, 5,468,257, Cl. 8-436.000.

Heilmann, Steven M.; Drtina, Gary J.; Eitzman, Philip D.; Haddad, Louis C.; Hyde, Frederick W.; Johnson, Todd W.; Rassmussen, Jerald K.; and Williams, Michael G., to Minnesota Mining and Manufacturing Company. Method of isolating and purifying a biomacromolecule. 5,468,847, Cl. 530-413.000.

Heimann, Lee R.: *See*—
Carpenter, Thom D.; and Heimann, Lee R., 5,469,157, Cl. 340-908.100.

Heimbecher, John O.: *See*—
Redman, Forrest C.; Heimbecher, John O.; Etnyre, Edwin L.; Shavrnoch, James J.; and Ferranti, Paul A., 5,468,018, Cl. 280-788.000.

Heine, Hans-Georg: *See*—
Schohe-Loop, Rudolf; Heine, Hans-Georg; Junge, Bodo; Glaser, Thomas; De Vry, Jean M. V.; Dompert, Wolfgang; and Sommermeyer, Henning, 5,468,882, Cl. 549-407.000.

Heinrichs, Heinrich-Josef; Enders, Stephan; and Koch, Klaus, to Stabilus GmbH. Compartment confining construction with an opening, a closure unit for the opening and a positioning unit for the closure unit. 5,468,042, Cl. 296-146.400.

Heitsch, Holger; Linz, Wolfgang; Wagner, Adalbert; and Kleemann, Heinz-Werner, to Hoechst Aktiengesellschaft. Angiotensin II receptor antagonists for the treatment of disturbances in cardiac rhythm. 5,468,764, Cl. 514-382.000.

Heizmann, Prieder, to Robert Bosch GmbH. Illumination device for vehicles. 5,469,340, Cl. 362-66.000.

Heki, Hideaki: *See*—
Kato, Hiroaki; Heki, Hideaki; Komura, Shirou; and Okamura, Emiko, 5,467,791, Cl. 134-166.00C.

Helling, Wilhelm, to Helling, Wilhelm. Method for preparing moldable mixtures of incompatible plastics. 5,468,431, Cl. 264-37.000.

Hellings, Deborah. Non-toxic, edible, and biodegradable sheet and method of making the same. 5,467,998, Cl. 273-363.000.

Hellmuth, Thomas; Campbell, Charles E.; and Wei, Jay, to Carl Zeiss, Inc. Measurement of lens characteristics. 5,469,261, Cl. 356-361.000.

Hellwig, Waldemar: *See*—
Summerauer, Ingomar J. K.; and Hellwig, Waldemar, 5,468,931, Cl. 219-121.630.

Helmes, Ludger: *See*—
Sauer, Ralf; Kraut-Reinkober, Stefan; Helmes, Ludger; and Hoyer, Werner, 5,468,271, Cl. 55-357.000.

Helmstetter, Thomas J., to Chicopee. Apparatus for interfacing indexing and continuous motion machines and method of utilizing apparatus. 5,467,862, Cl. 198-347.100.

Henderson, Daniel E.: *See*—
Greer, Robert D.; Henderson, Daniel E.; Hosseini, Javad; Rytter, Noel J.; and Simmons, Gerald P., 5,467,541, Cl. 37-348.000.

Henderson, Watson R.; Paurus, Floyd G.; and Szerlip, Stanley R., to Storage Technology Corporation. Integrated decoupling capacitive core for a printed circuit board and method of making same. 5,469,324, Cl. 361-301.200.
Hendriks, Ivo G., to Teepak, Inc. Machine for making a package of food casing strands. 5,467,576, Cl. 53-437.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
de Riese-Meyer, Loert; and Zauns-Huber, Rudolf, 5,468,892, Cl. 556-171.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Klein, Johann; Bongardt, Frank; and Schmid, Karl-Heinz, 5,468,405, Cl. 252-56.00R.
Schmid, Karl-Heinz; Bongardt, Frank; and Wuest, Reinhold, 5,468,406, Cl. 252-56.00S.
Zauns-Huber, Rudolf; Ruscheinsky, Emil; and Wolter, Fredi, 5,468,255, Cl. 8-94.220.
Henkens, Robert W.: *See*—
Wegner, Steven; Harpold, Michael A.; McCaffrey, Terence M.; Morris, Susan E.; Wojciechowski, Marek; Zhao, Junguo; Henkens, Robert W.; Naser, Najih; and O'Daly, John P., 5,468,366, Cl. 204-403.000.
Henmi, Toru, to NEC Corporation. Error detection and correction of a semiconductor memory device. 5,469,451, Cl. 371-40.400.
Hennessee, Robert P.; Flaishans, Gary B.; Rudzewicz, Robert G.; and Barwin, David A., to Chrysler Corporation. System for preventing fogging in climate control system. 5,467,605, Cl. 62-133.000.
Henry, Chester L.: *See*—
Okpara, Nnawuihe; and Henry, Chester L., 5,468,125, Cl. 416-97.00R.
Henry, James P.: *See*—
Ahluwalia, Gurpreet S.; Shander, Douglas; and Henry, James P., 5,468,476, Cl. 424-73.000.
Henry, V. Russell: *See*—
Baker, George D.; and Henry, V. Russell, 5,467,798, Cl. 137-614.200.
Hensler, Scott E.; Bergman, Scott I.; and Costello, Mike P. Telephone pager alarm enhancement and method therefor. 5,469,133, Cl. 340-407.100.
Hentschel, Karl-Heinz: *See*—
Schwindt, Jürgen; Hentschel, Karl-Heinz; and Schmalstieg, Lutz, 5,468,833, Cl. 528-67.000.
Henwood, William D., to Nicklaus Golf Equipment Company, L.C. Golf club head. 5,467,988, Cl. 273-167.00A.
Henzel, Alexander A.: *See*—
Bowlin, Geoffrey R.; Schill, Joseph G.; and Henzel, Alexander A., 5,467,628, Cl. 72-126.000.
Henzel, Richard P.: *See*—
Pearce, Glenn T.; and Henzel, Richard P., 5,468,591, Cl. 430-201.000.
Her, Chung H., to Goldstar Co., Ltd. Recording signal selection method for video titling. 5,469,224, Cl. 348-589.000.
Herard, James D.: *See*—
Brodsky, William L.; and Herard, James D., 5,468,159, Cl. 439-501.000.
Brodsky, William L.; Herard, James D.; Macek, Thomas G.; Sharp, Timothy L.; and Shovlowsky, George J., 5,468,917, Cl. 174-255.000.
Herberg, Frank: *See*—
Kühn, Heinrich; Herberg, Frank; and Jaculi, Dieter, 5,468,568, Cl. 428-245.000.
Herbert, William G.: *See*—
Yu, Robert C. U.; Foley, Geoffrey M. T.; Herbert, William G.; Limburg, William W.; Mishra, Satchidanand; Post, Richard I.; and Von Hoene, Donald C., 5,469,242, Cl. 355-219.000.
Herbski, Margarete: *See*—
Herget, Gerhard; Herbski, Margarete; and Osterried, Karl, 5,468,289, Cl. 106-415.000.
Hercon Laboratories Corporation: *See*—
Kydonieus, Agis; Shah, Kishore R.; and Berner, Bret, 5,468,501, Cl. 424-443.000.
Hercules Incorporated: *See*—
Godsey, James H.; Jacox, James L.; Keller, Robert F.; and Legare, Richard J., 5,468,311, Cl. 149-19.400.
Herget, Gerhard; Herbski, Margarete; and Osterried, Karl, to Merck Patent Gesellschaft Mit Beschrankter Haftung. Surface-modified pigments. 5,468,289, Cl. 106-415.000.
Herman, Floyd J.: *See*—
Fink, Steven R.; and Herman, Floyd J., 5,467,543, Cl. 40-538.000.
Herman, Jeffrey A.: *See*—
Powers, John R., III; Palmer, James E.; Coleman, Patricia J.; Herman, Jeffrey A.; and Cochran, Eli, 5,469,540, Cl. 395-158.000.
Herman, Richard S.: *See*—
Ramer, John; and Herman, Richard S., 5,467,536, Cl. 36-28.000.
Hermes, Matthew E.: *See*—
Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; Brown, David L.; and Holzwarth, Henry A., 5,468,252, Cl. 606-228.000.
Hermo, Eduardo M., to Sega, S.A. Switching and control system with four video game boards. 5,468,001, Cl. 273-434.000.
Herr, Boone D. Sheet roll dispenser. 5,467,956, Cl. 248-309.200.
Herrick, Bradley R., to Massachusetts Institute of Technology. Flexible large screen display having multiple light emitting elements sandwiched between crossed electrodes. 5,469,020, Cl. 313-511.000.
Herrmann, Klaus; and Krauss, Guenther, to Siemens Aktiengesellschaft. Therapy apparatus for treatment with acoustic waves. 5,468,214, Cl. 601-2.000.
Hertz, Ellen J.: *See*—
McDonald, Sean C.; Hertz, Ellen J.; Smith, James A.; and Toto, Gregory, 5,468,110, Cl. 414-273.000.
Herzberg, Amir: *See*—
Canetti, Ran; and Herzberg, Amir, 5,469,507, Cl. 380-30.000.
Herzig, Christian; and Scheiding, Silke, to Wacker-Chemie GmbH. Iodonium salts and process for the preparation thereof. 5,468,890, Cl. 556-12.000.
Hesdahl, Piet B.; and Klik, Cornelis M., to U.S. Philips Corporation. Digital telephone communication system including an exchange and a service station connected thereto for supplying programming information to user stations by way of the B channels of the system. 5,469,441, Cl. 370-110.100.
Hess, H. Frederick, III: *See*—
Hess, H. Frederick, Jr.; and Hess, H. Frederick, III. 5,468,361, Cl. 204-252.000.
Hess, H. Frederick, Jr.; and Hess, H. Frederick, III, to UFS Corporation. Membrane guard for a membrane electrode cell. 5,468,361, Cl. 204-252.000.
Heumann, John M.: *See*—
Kerschner, Ronald K.; Heumann, John M.; McDermid, John E.; Schlotzhauer, Ed. O.; and Crook, David T., 5,469,064, Cl. 324-537.000.
Hewlett-Packard Company: *See*—
Allen, Ross R.; Lam, Si-Ty; McClelland, Paul H.; and Hanson, Eric G., 5,469,199, Cl. 347-42.000.
Chu, David C., 5,469,466, Cl. 375-354.000.
Kadonaga, Anne P., 5,469,198, Cl. 347-41.000.
Kerschner, Ronald K.; Heumann, John M.; McDermid, John E.; Schlotzhauer, Ed. O.; and Crook, David T., 5,469,064, Cl. 324-537.000.
Okazaki, Sandra Y.; and Harmon, John P., 5,469,196, Cl. 347-8.000.
Pendse, Rajendra D., 5,468,994, Cl. 257-693.000.
Thaler, Patricia A.; Kadambi, Jayant; Spratt, Michael; Albrecht, Alan R.; and Goody, Steven H., 5,469,439, Cl. 370-94.300.
Hewlett-Packard Corporation: *See*—
Badyal, Rajeev; and Linn, Scott, 5,469,076, Cl. 326-16.000.
Ochs, Dennis E.; Burton, David L.; Groh, John F.; and Smith, David E., 5,467,774, Cl. 128-711.000.
Heymann, Daniel H.: *See*—
Kantor, Ellis; and Heymann, Daniel H., 5,468,170, Cl. 446-23.000.
Hibi, Kenji, to Kabushiki Kaisha Toshiba. Personal computer for disabling resume mode upon replacement of HDD. 5,469,565, Cl. 395-181.000.
Hibi, Yasuo: *See*—
Sugito, Katsuhiko; and Hibi, Yasuo, 5,467,517, Cl. 29-407.000.
Hibino, Hiroki: *See*—
Tsuruta, Minoru; Suzuta, Toshihiko; Nakada, Akio; Kuramoto, Seiji; Hibino, Hiroki; Bito, Shiro; and Mukaizawa, Akito, 5,467,911, Cl. 227-175.000.
Hickerson, Scott J. Loading device for pick-up trucks. 5,468,114, Cl. 414-537.000.
Hicks, Gary W.; and Cornell, William L., to United States of America, Interior. Method and apparatus for concentration of minerals by froth flotation. 5,467,876, Cl. 209-170.000.
Hieda, Katsuhiko: *See*—
Shibata, Tsuyoshi; Hashimoto, Koji; and Hieda, Katsuhiko, 5,468,576, Cl. 430-5.000.
Higgins, Leo M., III, to Motorola, Inc. Semiconductor device having compliant columnar electrical connections. 5,468,995, Cl. 257-697.000.
Higginson, Norman. Golf training apparatus. 5,467,993, Cl. 273-191.00A.
Highland Supply Corporation: *See*—
Weder, Donald E.; Straeter, Joseph G.; and Straeter, William F., 5,467,573, Cl. 53-397.000.
Weder, Donald E.; and Straeter, Joseph G., 5,467,575, Cl. 53-399.000.
Highsmith, Thomas K.; Hajik, Robert M.; Wardle, Robert B.; Lund, Gary K.; and Blau, Reed J., to Thiokol Corporation. Methods for synthesizing and processing bis-(1(2)H-tetrazol-5-yl)-amine. 5,468,866, Cl. 548-251.000.
Higo, Yuichi: *See*—
Hachiya, Seio; Shinoda, Ken-ichi; and Higo, Yuichi, 5,468,402, Cl. 252-25.000.
Hilfinger, Peter: *See*—
Boland, Bernhard; and Hilfinger, Peter, 5,467,495, Cl. 15-28.000.
Hilgers, Kevin B.: *See*—
Kane, Robert C.; and Hilgers, Kevin B., 5,468,169, Cl. 445-50.000.
Hill-West, Jennifer L.: *See*—
Hubbell, Jeffrey A.; Hill-West, Jennifer L.; and Dunn, Randall C., 5,468,505, Cl. 424-484.000.
Hilti Aktiengesellschaft: *See*—
Obermeier, Josef; Müller-Boysen, Ulrich; Keusch, Siegfried; and Gaffal, Peter, 5,467,835, Cl. 175-209.000.
Udert, Karl E.; and Winkler, Walter, 5,468,176, Cl. 451-359.000.
Himmel, Josef: *See*—
Potuznik, Walter; and Himmel, Josef, 5,467,923, Cl. 239-8.000.
Himmler, Thomas: *See*—
Petersen, Uwe; Himmler, Thomas; Schenke, Thomas; Krebs, Andreas; Grohe, Klaus; Bremm, Klaus-Dieter; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 5,468,742, Cl. 514-187.000.
Hinrichs, James O., to Fike Corporation. Low burst pressure, multiple domed, scored rupture disc. 5,467,886, Cl. 220-89.200.
Hipeaux, Jean-Claude: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; and Marchand, Pierre, 5,468,399, Cl. 252-18.000.
Hirai, Takayuki: *See*—

Murai, Masaru; Hirai, Takayuki; Hyoi, Isao; Maeda, Yoshimi; and Suzuki, Seiichi, 5,469,230, Cl. 351-52.000.
Hiraide, Shuzo: *See*—
Yoshimori, Hiroyuki; Watanabe, Hitoshi; Paz De Araujo, Carlos A.; Hiraide, Shuzo; Mihara, Takashi; and McMillan, Larry D., 5,468,684, Cl. 437-228.000.
Hiramatsu, Soichi, to Canon Kabushiki Kaisha. Recording apparatus for controlling conveyance speed of recording medium in accordance with a type of recording data to be recorded. 5,469,197, Cl. 347-16.000.
Hirano, Takahisa; Takai, Masanori; and Taniguchi, Mitsuhiro, to Kabushiki Kaisha Tec. Print gap adjusting device. 5,468,076, Cl. 400-59.000.
Hirao, Toru; Sato, Hideki; and Kanbe, Toshio, to Tsubakimoto Chain Co. Sorting system having horizontal transfer apparatus. 5,467,863, Cl. 198-360.000.
Hirase, Junji; and Hashimoto, Shin, to Matsushita Electric Industrial Co., Ltd. Semiconductor device and method of manufacturing the same. 5,468,983, Cl. 257-344.000.
Hirayama, Hiroshi: *See*—
Igarashi, Shinya; Hirayama, Hiroshi; Kobayashi, Chihiro; Tsutsui, Mitsukuni; and Kato, Yukio, 5,467,648, Cl. 73-202.500.
Hirayama, Masachika: *See*—
Yabuuchi, Masahiko; Akanuma, Hiroshi; Masuda, Minoru; Katoh, Kazuo; Nakamura, Tsuneo; Tajima, Shigeru; Hashiba, Masashi; Hayami, Hiroshi; Takezawa, Tomoko; and Hirayama, Masachika, 5,468,380, Cl. 210-198.200.
Hirayama, Nobuhiro: *See*—
Matsumoto, Katsuru; Hirayama, Nobuhiro; Kawasaki, Shoji; Uchiyama, Kenji; Uramoto, Katsuo; and Fukui, Tamami, 5,468,585, Cl. 430-110.000.
Hirayama, Nobuhisa: *See*—
Kawanishi, Umeo; Hirayama, Nobuhisa; Hamabe, Takeshi; and Takagi, Toru, 5,469,128, Cl. 333-22.00R.
Hirose, Ichiro: *See*—
Kameda, Osamu; Akutagawa, Hitoshi; Okita, Junichi; and Hirose, Ichiro, 5,467,668, Cl. 74-606.00R.
Hirota, Toshizumi; Kobayashi, Hitoshi; Nakagoshi, Yasunobu; and Amino, Yukio, to Mitsubishi Corporation; Mitsubishi Gas Chemical Company, Inc.; and Nihon Polytech Co., Ltd. Apparatus for recovering fresh water and apparatus for concentrating liquid. 5,468,351, Cl. 202-234.000.
Hirsch, Hans-Ludwig: *See*—
Pohl, Ludwig; Poetsch, Fike; Schumann, Herbert; Weiss, Karin; Thiele, Karl-Heinz; and Hirsch, Hans-Ludwig, 5,468,707, Cl. 502-153.000.
Hirst, Robert C.: *See*—
Parker, Dane K.; Musleve, Richard T.; and Hirst, Robert C., 5,468,893, Cl. 556-427.000.
Hisakado, Yuji: *See*—
Satoh, Isao; Takagi, Yuji; and Hisakado, Yuji, 5,469,418, Cl. 369-54.000.
Hitachi Automotive Eng. Co.: *See*—
Murao, Yoshinori; Nagano, Masami; and Hosowari, Shigenori, 5,467,752, Cl. 123-414.000.
Hitachi Automotive Engineering Co., Ltd.: *See*—
Igarashi, Shinya; Hirayama, Hiroshi; Kobayashi, Chihiro; Tsutsui, Mitsukuni; and Kato, Yukio, 5,467,648, Cl. 73-202.500.
Hitachi Cable, Ltd.: *See*—
Endoh, Takeshi; Imai, Tomoaki; and Hagiya, Mikio, 5,469,067, Cl. 324-551.000.
Hitachi Construction Machinery, Ltd.: *See*—
Hosaka, Sumio; Kikugawa, Atsushi; Honda, Yukio; Koyanagi, Hajime; and Nagasawa, Kiyosi, 5,467,642, Cl. 73-105.000.
Hitachi, Ltd.: *See*—
Hara, Yuji; Ito, Satoru; and Toya, Tatsuro, 5,468,998, Cl. 257-775.000.
Hatakeyama, Atsushi; Fujisawa, Hiromichi; Kato, Kanji; Kawaguchi, Hisamitsu; Minegishi, Naoki; Tada, Katsumi; and Asakawa, Satoshi, 5,469,354, Cl. 364-419.190.
Hosaka, Sumio; Kikugawa, Atsushi; Honda, Yukio; Koyanagi, Hajime; and Nagasawa, Kiyosi, 5,467,642, Cl. 73-105.000.
Igarashi, Shinya; Hirayama, Hiroshi; Kobayashi, Chihiro; Tsutsui, Mitsukuni; and Kato, Yukio, 5,467,648, Cl. 73-202.500.
Itoh, Hiroyuki; Todokoro, Hideo; Sohda, Yasunari; and Nakayama, Yoshinori, 5,468,969, Cl. 250-492.230.
Kanamaru, Hisanobu, 5,467,707, Cl. 100-292.000.
Kanekawa, Nobuyasu; Ibara, Hirokazu; Akiyama, Masatsugu; Kawabata, Kiyoshi; Yamanaka, Hisayoshi; and Okishima, Tetsuya, 5,468,992, Cl. 257-676.000.
Kogure, Makoto, 5,469,156, Cl. 340-870.380.
Minowa, Toshimichi; Nishimura, Yutaka; Kawashima, Ken'ichi; Kuroiwa, Hiroshi; and Ibamoto, Masahiko, 5,468,196, Cl. 477-62.000.
Moriyama, Norio; and Sugiura, Noboru, 5,467,758, Cl. 123-617.000.
Murao, Yoshinori; Nagano, Masami; and Hosowari, Shigenori, 5,467,752, Cl. 123-414.000.
Nakajima, Takeshi; Hashimoto, Ichiro; Saitou, Tomoyuki; Ohira, Fusanori; Akashi, Sueo; Sone, Nobukatu; and Nii, Katsutoshi, 5,469,008, Cl. 310-90.500.
Nishida, Hiroshi; Nakagoshi, Kazuo; Kai, Kenjiro; and Onoyama, Katsumoto, 5,469,311, Cl. 360-97.020.
Nishino, Toshikazu; Hasegawa, Haruhiro; and Kawabe, Ushio, 5,468,723, Cl. 505-330.000.
Nishizawa, Hirotaka; Azuma, Seiichiro; Ootoshi, Kazuaki; Miyama, Masataka; Kawata, Shuji; Kasahara, Osamu; and Suzuki, Sinichi, 5,468,989, Cl. 257-517.000.
Noguchi, Yasuhiro; Kuwahara, Hiroshi; Yasuda, Isao; and Takei, Kazuo, 5,469,189, Cl. 345-118.000.
Okada, Ken'ichi; Takagi, Masahiro; Hasegawa, Hiroshi; and Iwamura, Ryoji, 5,468,315, Cl. 156-64.000.
Sasaki, Toshio; and Tanaka, Toshihiro, 5,469,390, Cl. 365-200.000.
Takeda, Hidekazu; Kaku, Nobuyuki; and Ogiro, Kenji, 5,469,319, Cl. 360-132.000.
Waku, Shinichi; Ide, Kazumasa; Koharagi, Haruo; Takahashi, Miyoshi; Miyakawa, Kado; and Yagi, Yasuomi, 5,469,009, Cl. 310-214.000.
Yamamoto, Kiyoshi; Sugii, Nobuyuki; Kubo, Koichi; Ichikawa, Michiharu; and Yamauchi, Hisao, 5,468,886, Cl. 505-238.000.
Yasuda, Kenji; Takata, Yoshinori; Tsuruta, Harumi; Ohnuma, Sadabumi; and Miura, Junkichi, 5,468,379, Cl. 210-198.200.
Hitachi Medical Corporation: *See*—
Yoshino, Hitoshi; and Hashimoto, Shigeo, 5,467,769, Cl. 128-653.200.
Hitachi Metals, Ltd.: *See*—
Nakahara, Yuichi; and Kojo, Katsuhiko, 5,468,278, Cl. 75-236.000.
Hitachi Microcomputer Engineering Ltd.: *See*—
Hara, Yuji; Ito, Satoru; and Toya, Tatsuro, 5,468,998, Cl. 257-775.000.
Hitachi Software Engineering Co., Ltd.: *See*—
Usuda, Yutaka, 5,469,539, Cl. 395-155.000.
Hitachi Techno Engineering Co., Ltd.: *See*—
Mishina, Haruo; Wada, Masafumi; Fukuda, Mituo; Itagaki, Masato; and Yamama, Shinya, 5,467,912, Cl. 228-10.000.
Hitachi VLSI Engineering Corp.: *See*—
Nishizawa, Hirotaka; Azuma, Seiichiro; Ootoshi, Kazuaki; Miyama, Masataka; Kawata, Shuji; Kasahara, Osamu; and Suzuki, Sinichi, 5,468,989, Cl. 257-517.000.
Ho, Chia-Tie; McMullen, Carl W.; and Sawka, Raymond M., to Minnesota Mining and Manufacturing Company. Multilayer graphic article with color layer. 5,468,532, Cl. 428-40.000.
Ho, Kenneth, to Advanced Micro Devices, Inc. Translator circuit with symmetrical switching delays. 5,469,097, Cl. 327-170.000.
Hö, Thomas: *See*—
Federsel, Hans-Jürgen; Hö, Thomas; Rämsby, Sten I.; and Ström, Peter H. E., 5,468,876, Cl. 548-535.000.
Ho, Ying-Kuon. Movable animal house. 5,467,734, Cl. 119-19.000.
Ho, Yueh-Se: *See*—
Hshieh, Fwu-Iuan; Kwan, Sze-Hon; Chang, Mike F.; Ho, Yueh-Se; Van Der Linde, Jan; and Owyang, King, 5,468,982, Cl. 257-331.000.
Ho, Yu-Lam: *See*—
Aronowitz, Sheldon; Ku, Yen-Hui J.; and Ho, Yu-Lam, 5,468,974, Cl. 257-51.000.
Hoare, John H.: *See*—
Halfon, Marc; Polsz, Craig A.; and Hoare, John H., 5,468,868, Cl. 548-263.200.
Hobbs, Bobby L.: *See*—
Pettersen, Tor H.; Scherbarth, John F.; and Hobbs, Bobby L., 5,469,345, Cl. 362-188.000.
Hocek, Adam S.: *See*—
Wendorf, James W.; Hocek, Adam S.; and Singh, Kenneth S., 5,469,431, Cl. 370-50.000.
Hochsprung, Ronald R.: *See*—
Krein, William T.; Hochsprung, Ronald R.; and Kelly, James D., 5,469,435, Cl. 370-85.200.
Hodge-Fisher, Bennett, legal representative: *See*—
Zidovec, Davor F.; Fisher, Alexander D., deceased, 5,468,393, Cl. 210-697.000.
Hodgen, Gary D., to Medical College of Hampton Road, The. Hormone replacement therapy. 5,468,736, Cl. 514-179.000.
Hodges, Robert S.; Irvin, Randall T.; Paranchych, William; Sokol, Pamela A.; and Woods, Donald E., to S.P.I. Synthetic Peptides Incorporated. Method of prevention of pseudomonas infection. 5,468,484, Cl. 424-141.100.
Hodges, Roland L.: *See*—
Cantwell, Cathleen A.; Hodges, Roland L.; McGilvray, Derek; Queener, Stephen W.; Swartling, James R.; and Zock, Joseph M., 5,468,632, Cl. 435-197.000.
Hoechst Aktiengesellschaft: *See*—
Heitsch, Holger; Linz, Wolfgang; Wagner, Adalbert; and Kleemann, Heinz-Werner, 5,468,764, Cl. 514-382.000.
Jäger, Gerhard; and Millauer, Hans, 5,468,352, Cl. 204-59.00F.
Kühn, Heinrich; Herberg, Frank; and Jaculi, Dieter, 5,468,568, Cl. 428-245.000.
Meiwes, Johannes; Wullbrandt, Dieter; and Giani, Carlo, 5,468,625, Cl. 435-71.100.
Peiffer, Herbert; Murschall, Ursula; and Schloegl, Gunter, 5,468,527, Cl. 428-35.700.
Pfirmann, Ralf; and Papenfuhs, Theodor, 5,468,863, Cl. 546-345.000.
Hoffman, Henry R.: *See*—
Watson, Gene, 5,467,830, Cl. 172-378.000.
Hoffman, Keith E.; Elliott, Robert F.; and Mickler, David J., to Bridgestone/Firestone, Inc. Tapered airsleeve curing press. 5,468,140, Cl. 425-389.000.
Hoffman, Kurtis J.: *See*—
Smith, Kevin E.; and Hoffman, Kurtis J., 5,467,627, Cl. 72-121.000.
Hoffman, Ned, to Sports-Mitt International. Weighted exercise glove having webbed fingers. 5,468,200, Cl. 482-55.000.
Hoffman, Wesley P.: *See*—
Upadhya, Kamleshwar; and Hoffman, Wesley P., 5,468,357, Cl. 204-173.000.
Hoffmann-La Roche Inc.: *See*—

Erlich, Henry A.; Horn, Glenn; Saiki, Randall K.; and Mullis, Kary B., 5,468,613, Cl. 435-6.000.
Hofmann Maschinenbau GmbH: *See*—
Lulay, Eugen, 5,467,653, Cl. 73-469.000.
Schepp, Michael, 5,467,647, Cl. 73-146.000.
Hofmann Werkstatt-Technik GmbH: *See*—
Rothamel, Karl, 5,469,040, Cl. 318-785.000.
Hogan, John M.: *See*—
Lam, Andrew F.; Uribe, Juan M.; Hogan, John M.; Persinger, Richard A.; Miller, James F.; and Navaratnam, Ramesh A., 5,468,401, Cl. 252-22.000.
Hohenstein, Gerald L.; Nielson, Michael E.; Tang, Tin S.; Carmichael, Richard D.; and Brant, William A., to EMC Corporation. Flexible parity generation circuit for intermittently generating a parity for a plurality of data channels in a redundant array of storage units. 5,469,566, Cl. 395-182.040.
Hohl, Guenther: *See*—
Megerle, Friedrich; Hohl, Guenther; Ludewig, Erich; and Kaes, Guenter, 5,468,057, Cl. 303-87.000.
Holbrook, Gerald L.; Leising, Maurice B.; and Kwapis, David L., to Chrysler Corporation. Method of controlling coastdown and coastdown/tip-in in an automatic transmission. 5,468,198, Cl. 477-143.000.
Holland, Gunther K.; and Kügler, Wolfgang, to Accumulatorenfabrik Sonnenschein GmbH. Maintenance-free high capacity lead battery or accumulator. 5,468,575, Cl. 429-56.000.
Holland, Phillip R. Prefabricated modular closet unit. 5,467,562, Cl. 52-79.100.
Holland, Richard J.: *See*—
Becker, James A.; Fritsch, Ronald J.; Holland, Richard J.; and Klobuchar, Robert F., 5,467,622, Cl. 70-203.000.
Holley, Robert G.: *See*—
Bailey, William H.; Byers, Lonnie L.; Holley, Robert G.; Lamie, James M.; Sparks, Robert M.; West, Mike L.; and Storey, Richard P., 5,468,968, Cl. 250-435.000.
Hollinger, John D.: *See*—
Coulter, Wallace H.; Hollinger, John D.; Kortright, Kenneth H.; Russell, Thomas; Rodriguez, Carlos; and Paul, Ronald, 5,468,616, Cl. 435-7.200.
Hollingsworth & Vose Company: *See*—
Zguris, George C.; and Harmon, Frank C., Jr., 5,468,572, Cl. 429-247.000.
Hollis, Thomas J. System for determining the appropriate state of a flow control valve and controlling its state. 5,467,745, Cl. 123-41.100.
Hollister Incorporated: *See*—
La Gro, Phillip A., 5,468,235, Cl. 604-333.000.
Hollub, Peter C.: *See*—
Waelput, Erik F. M.; Hollub, Peter C.; and Lentini, Joseph D., 5,467,746, Cl. 123-196.00A.
Holmberg, Per A., to Telefonaktiebolaget LM Ericsson. Method and arrangement for minimizing skew. 5,469,477, Cl. 375-356.000.
Holmes, Richard B., to Rockwell International Corporation. Passive optical wind profilometer. 5,469,250, Cl. 356-28.000.
Holmgren, Bertil, to MW Trading APS. Lock mechanism. 5,468,031, Cl. 292-81.000.
Holodnak, John D.: *See*—
Brown, Robert L.; Holodnak, John D.; McBride, Gene; and Mosley, Demmie L., 5,468,153, Cl. 439-13.000.
Hols, Lyle W. No drip pour spout. 5,467,896, Cl. 222-83.000.
Holt, Michael: *See*—
Scott, Michael; Browning, David; and Holt, Michael, 5,469,398, Cl. 365-221.000.
Holt, Robert W.; and Palmieri, Thomas, to Cirrus Diagnostics, Inc. Low carryover pipette probe. 5,468,453, Cl. 422-100.000.
Holthoff, Helmut, to Kocks Technik GmbH & Co. Arrangement for adjusting of three rollers or guiding rolls which together form a caliber opening. 5,467,625, Cl. 72-35.000.
Holzwarth, Henry A.: *See*—
Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; Brown, David L.; and Holzwarth, Henry A., 5,468,252, Cl. 606-228.000.
Homann, Walter K.; Große-Puppendahl, Thomas; and Brügging, Wilhelm, to Huels Aktiengesellschaft. Process for preparing high-molecular weight polyesters. 5,468,441, Cl. 264-331.210.
Homma, Tetsuya, to NEC Corporation. Method of manufacturing semiconductor device using the abrasive. 5,468,682, Cl. 437-195.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Aoki, Takuya; Shimasaki, Yuichi; Matsumoto, Seiji; Hatcho, Seiji; Oketani, Toshikazu; Miyashita, Yukio; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,467,594, Cl. 60-276.000.
Fujisawa, Yoshikazu; Narishige, Takeshi; and Miyazaki, Yuzuru, 5,468,567, Cl. 428-645.000.
Miyazaki, Katsuo; Maeda, Takahide; Ogawa, Takeshi; Kakui, Sonoko; Ikeda, Satoshi; and Yamane, Yoshiki, 5,468,517, Cl. 427-322.000.
Yamaguchi, Tadashi; Nosaki, Katsutoshi; Inoue, Akihisa; and Masumoto, Tsuyoshi, 5,468,697, Cl. 501-98.000.
Yoshio, Oka, 5,467,839, Cl. 180-233.000.
Honda, Shinkichi; Torii, Kenji; Arai, Yoichiro; Kasai, Masaji; Kato, Hiromasa; Iida, Takao; Takahashi, Tomoya; Yokoo, Yoshiharu; Kamiya, Toshikazu; and Tamaoki, Tatsuya, to Kyowa Hakko Kogyo Co., Ltd. N-acylglutamine derivatives and cosmetic compositions. 5,468,474, Cl. 424-70.100.
Honda, Yukio: *See*—
Hosaka, Sumio; Kikugawa, Atsushi; Honda, Yukio; Koyanagi, Hajime; and Nagasawa, Kiyosi, 5,467,642, Cl. 73-105.000.
Honeywell Inc.: *See*—
Bicking, Robert E., 5,469,054, Cl. 324-207.200.
Blake, James N.; Sanders, Glen A.; and Strandjord, Lee K., 5,469,257, Cl. 356-350.000.
Lengyel, J. Michael; and Robinder, Ronald C., 5,468,064, Cl. 359-63.000.
Mueller, Douglas L.; and Sumcad, Gustavo L., 5,469,055, Cl. 324-207.210.
Porter, Richard B., 5,467,920, Cl. 236-68.00B.
Sitte, Hans J., 5,469,150, Cl. 340-825.070.
Hong, Eun K.: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.
Hong, Gary: *See*—
Yang, Ming-Tzong; Hsue, Chen-Chiu; and Hong, Gary, 5,468,980, Cl. 257-306.000.
Hong, Gilbert H. Spin-on and peel polymer film method of data recording duplication and micro-structure fabrication. 5,468,324, Cl. 156-247.000.
Hong, Sung H., to Goldstar Co., Ltd. Apparatus and method for enhancing transient edge of video signal. 5,469,225, Cl. 348-625.000.
Hongyo, Kenichi: *See*—
Tsujimoto, Nohiro; Hongyo, Kenichi; Baba, Yoshisuke; Suzaki, Michinori; and Akikawa, Kazuhiro, 5,468,822, Cl. 526-340.100.
Honkura, Yoshinobu; Toki, Hiroyuki; and Usami, Toyokatsu, to Aichi Steel Works, Ltd. Method of manufacturing a composite magnetic component. 5,468,522, Cl. 427-597.000.
Hooper, Steven C.; and Dornblaser, Norman E., to Lamb-Grays Harbor Co. Automatic roll wrapper removing apparatus and method. 5,467,676, Cl. 83-24.000.
Hooper, William W.: *See*—
Hafizi, Madjid; Stanchina, William E.; and Hooper, William W., 5,468,659, Cl. 437-31.000.
Hoover Universal, Inc.: *See*—
Coman, Sorin, 5,468,044, Cl. 297-216.110.
Hall, Jack K.; and Delphia, John B., 5,468,050, Cl. 297-344.100.
Weber, James L., 5,468,045, Cl. 297-216.110.
Weber, James L.; and Sabo, Dianna L., 5,468,046, Cl. 297-238.000.
Hori, Jiro. Pressurized writing instrument with stirring weight. 5,468,082, Cl. 401-4.000.
Hori, Nobuaki, to Toyo Seikan Kaisha, Ltd. Liquid foam-discharging, squeezable vessel. 5,467,898, Cl. 222-190.000.
Hori, Tadashi: *See*—
Kanai, Masahiro; Fujioka, Yasushi; Yoshino, Takehito; and Hori, Tadashi, 5,468,521, Cl. 427-575.000.
Horiba, Ltd.: *See*—
Tomita, Katsuhiko, 5,468,514, Cl. 427-77.000.
Horita, Satomi; Aoki, Yasushi; Wakana, Masahiro; Okamoto, Hiroshi; Chiba, Kiyohiko; and Daikoku, Shizue, to NEC Corporation. Circuit for interconnecting integrated semiconductor circuits. 5,469,081, Cl. 326-81.000.
Horn, Glenn: *See*—
Erlich, Henry A.; Horn, Glenn; Saiki, Randall K.; and Mullis, Kary B., 5,468,613, Cl. 435-6.000.
Horneman, Walter A.: *See*—
Liebman, Henry F.; Clayton, Alan; and Horneman, Walter A., 5,469,073, Cl. 324-757.000.
Hosaka, Hidehiro: *See*—
Suda, Shin; and Hosaka, Hidehiro, 5,467,768, Cl. 128-640.000.
Hosaka, Sumio; Kikugawa, Atsushi; Honda, Yukio; Koyanagi, Hajime; and Nagasawa, Kiyosi, to Hitachi, Ltd.; and Hitachi Construction Machinery, Ltd. Scanning probe microscope and method of control error correction. 5,467,642, Cl. 73-105.000.
Hosaka, Tohru: *See*—
Takahashi, Nobukazu; Hosaka, Tohru; Minami, Koji; Konishi, Yuichiro; Kohara, Teiji; and Natsuume, Tadao, 5,468,803, Cl. 524-553.000.
Hoshi, Junichi: *See*—
Inoue, Shunsuke; Hoshi, Junichi; and Watanabe, Takanori, 5,468,344, Cl. 156-657.100.
Hoshimiya, Takashi: *See*—
Nii, Kazumi; Hoshimiya, Takashi; Katoh, Kazunobu; and Ezoe, Toshihide, 5,468,592, Cl. 430-264.000.
Hoshino, Chiaki; and Arai, Norihisa, to Kabushiki Kaisha Toshiba. Semiconductor memory device with a reference potential generator. 5,469,397, Cl. 365-210.000.
Hoshino, Mitsuo; Tsutsumi, Yuka; Shimada, Mitsuhiro; Masuda, Takashi; Morimiya, Yuji; Ide, Yoshihiro; Kawaguchi, Takashi; and Nogo, Yuichiro, to Sony Corporation. Unified compact video camera and VCR. 5,469,271, Cl. 358-335.000.
Hosoda, Yasushi; Shiota, Toshiaki; Suzuki, Nobukazu; Ikeda, Satoshi; Odawa, Taketosi; Kimura, Koichi; and Yamamoto, Hisataka, to Nippon Paint Co., Ltd.; and Sumitomo Metal Industries, Ltd. Anticorrosive primer composition. 5,468,461, Cl. 523-435.000.
Hosowari, Shigenori: *See*—
Murao, Yoshinori; Nagano, Masami; and Hosowari, Shigenori, 5,467,752, Cl. 123-414.000.
Hosoya, Hideki, to Canon Kabushiki Kaisha. Method for retrying recording information into a next logical block by sending sense data including address information to host computer and responding to command therefrom. 5,469,546, Cl. 395-182.060.

Hosseini, Javad: *See*—
Greer, Robert D.; Henderson, Daniel E.; Hosseini, Javad; Rytter, Noel J.; and Simmons, Gerald P., 5,467,541, Cl. 37-348.000.
Hotchkiss, Wesley E., III. Method of tint mixing and delivery. 5,468,068, Cl. 366-348.000.
Hotta, Yoshihiko: *See*—
Suzuki, Akira; Hotta, Yoshihiko; and Uemura, Hiroyuki, 5,468,711, Cl. 503-201.000.
Houck, David L.: *See*—
Dorfman, Leonid P.; Scheithauer, Michael J.; Houck, David L.; and Kopatz, Nelson E., 5,468,457, Cl. 423-61.000.
Hough, B. Ann: *See*—
Hussey, Geary W., 5,467,890, Cl. 220-571.000.
House, Robert W.; Bocci, Paul M.; and Edkins, James G. Message substitution in a digital communication system. 5,469,472, Cl. 375-211.000.
Houston, Theodore W., to Texas Instruments Incorporated. On chip capacitor based power spike detection. 5,469,065, Cl. 324-537.000.
Howard, Edward G., Jr., to Du Pont de Nemours, E. I., and Company. Annealed linear high density polyethylene and preparation thereof. 5,468,842, Cl. 528-481.000.
Howard University: *See*—
Scott, Kenneth R.; Nicholson, Jesse M.; and Edafiogho, Ivan O., 5,468,775, Cl. 514-541.000.
Howmedica GmbH: *See*—
Metz-Stavenhagen, Peter; and Behrens, Klaus F. A., 5,468,241, Cl. 606-61.000.
Howmedica International, Inc.: *See*—
Attfield, Stephen F.; and Sambatakakis, Andreas, 5,468,244, Cl. 606-90.000.
Hoyer, Werner: *See*—
Sauer, Ralf; Kraut-Reinkober, Stefan; Helmes, Ludger; and Hoyer, Werner, 5,468,271, Cl. 55-357.000.
Hozbor, Maria A.: *See*—
McPherson, Mary C.; and Hozbor, Maria A., 5,468,560, Cl. 428-413.000.
Hshieh, Fwu-Iuan; Kwan, Sze-Hon; Chang, Mike F.; Ho, Yueh-Se; Van Der Linde, Jan; and Owyang, King, to Siliconix Incorporated. Trenched DMOS transistor with channel block at cell trench corners. 5,468,982, Cl. 257-331.000.
Hsieh, Harry W., to Dow Chemical Company, The. Method of bonding a urethane adhesive to non-porous substrates. 5,468,317, Cl. 156-108.000.
Hsu, Chen-Chung, to United Microelectronics Corporation. Thin film delamination test chip. 5,468,541, Cl. 428-210.000.
Hsu, James, to Advanced Micro Devices, Inc. Self-aligned buried channel/junction stacked gate flash memory cell. 5,468,981, Cl. 257-316.000.
Hsu, Jemin C., to Rohm and Haas Company. Synergistic microbicidal combinations containing 4,5-dichloro-2-octyl-3-isothiazolone and certain commercial biocides. 5,468,759, Cl. 514-372.000.
Hsu, Sheng T., to Sharp Microelectronics Technology, Inc.; and Sharp Kabushiki Kaisha. Nitridation of SIMOX buried oxide. 5,468,657, Cl. 437-24.000.
Hsue, Chen-Chiu: *See*—
Yang, Ming-Tzong; Hsue, Chen-Chiu; and Hong, Gary, 5,468,980, Cl. 257-306.000.
Hu, Hui; Pelc, Norbert J.; and Pfoh, Armin H., to General Electric Company. Projection domain reconstruction method for helical scanning computed tomography apparatus with multi-column detector array employing overlapping beams. 5,469,486, Cl. 378-4.000.
Hu, Hui, to General Electric Company. CT system with twin fan beam helical scan. 5,469,487, Cl. 378-9.000.
Huang, Chen-Shi: *See*—
Resasco, Daniel E.; Marcus, Bonita K.; Huang, Chen-Shi; and Durante, Vincent A., 5,468,710, Cl. 502-222.000.
Huang, Chien-Hsing. Simple frame for encasing the glass pieces of eye glasses. 5,469,231, Cl. 351-92.000.
Huang, Fu-Chih; Chan, Wan K.; Sutherland, Charles A.; and Galemmo, Robert A., Jr., to Rhone-Poulenc Rorer Pharmaceuticals Inc. Substituted naphthylene compounds exhibiting selective leukotriene B_4 antagonist activity. 5,468,898, Cl. 560-41.000.
Huang, Hao, to SL Montevideo Technology, Inc. Virtual hall-effect signal generating for a brushless sensorless electrical rotary machine. 5,469,033, Cl. 318-439.000.
Huang, Leeyuan: *See*—
Gagliardi, Magda M.; Chen, Shieh-Shung T.; Arison, Byron H.; Garrity, George M.; Huang, Leeyuan; MacConnell, John G.; and White, Raymond F., 5,468,771, Cl. 514-452.000.
Huang, Y. H., to Lu Kuang Incorporation. Adjustable highchair. 5,468,051, Cl. 297-344.180.
Huang, Yi-Fa, to Michelle Hsiu-Feng Wang. Hydraulic exerciser with reciprocating hydraulic cylinder pair. 5,468,204, Cl. 482-112.000.
Huang, Yuan-Hsin. Adjustable, shock-absorbing bicycle handlebar mounting hardware. 5,467,665, Cl. 74-551.200.
Hubbell, Jeffrey A.; Hill-West, Jennifer L.; and Dunn, Randall C., to Board of Regents, The University of Texas System. Local delivery of fibrinolysis enhancing agents. 5,468,505, Cl. 424-484.000.
Huber, Rupert: *See*—
Ekdahl, Egon; Gurka, Jiri; Huber, Rupert; Köttritsch, Hubert; Kufe, Gottfried; Müllner, Johann; and Weninger, Helmut, 5,468,072, Cl. 384-448.000.
Huber, S. Richard; and Counts, David F., to Conkle & Olesten. Lipidic furans useful for skin therapeutics. 5,468,490, Cl. 424-78.030.
Hubl, Werner, to Norgren Martonair GmbH. Rodless pneumatic cylinder having a pair of driven elements. 5,467,685, Cl. 92-88.000.
Huchings, Michael G.: *See*—
Buckley, Alan J.; Huchings, Michael G.; Ferguson, Ian; Beautement, Kevin; Clough, John M.; Crowley, Patrick J.; Godfrey, Christopher R. A.; deFraine, Paul J.; Anthony, Vivienne M.; and Heaney, Stephen P., 5,468,857, Cl. 544-298.000.
Huebel, Michael; and Reymann, Klaus, to Robert Bosch GmbH. Peripheral pump, particularly for feeding fuel to an internal combustion engine from a fuel tank of a motor vehicle. 5,468,119, Cl. 415-55.100.
Huebner, Jerold R. Boat locking apparatus. 5,467,617, Cl. 70-18.000.
Huels Aktiengesellschaft: *See*—
Homann, Walter K.; Große-Puppendahl, Thomas; and Brügging, Wilhelm, 5,468,441, Cl. 264-331.210.
Rauleder, Hartwig; Standke, Burkhard; Kötzsch, Hans-Joachim; and Schork, Reinhold, 5,468,705, Cl. 502-151.000.
Rauleder, Hartwig; Standke, Burkhard; Kötzsch, Hans-Joachim; and Schork, Reinhold, 5,468,706, Cl. 502-151.000.
Huff, Rita M.: *See*—
Chio, Christopher L.; and Huff, Rita M., 5,468,615, Cl. 435-7.200.
Huggett, George R.; and McDonald, William M., to Intermec Corporation. Method and apparatus for locating and decoding a postnet forwarding bar code in a field of postnet bar codes. 5,468,945, Cl. 235-462.000.
Hughes Aircraft Company: *See*—
Chang, David B.; Vali, Victor; and Shih, I-Fu, 5,469,519, Cl. 385-33.000.
Chao, Sidney C.; Stanford, Thomas B.; Purer, Edna M.; and Wilkerson, Angela Y., 5,467,492, Cl. 8-159.000.
Hafizi, Madjid; Stanchina, William E.; and Hooper, William W., 5,468,659, Cl. 437-31.000.
Johnston, Paul A., 5,468,155, Cl. 439-98.000.
Milroy, William W., 5,469,165, Cl. 342-13.000.
Yepp, Ronald J., 5,469,101, Cl. 327-361.000.
Hughes Missile Systems Company: *See*—
Brooks, Herbert B., 5,467,682, Cl. 89-41.220.
Upadhya, Kamleshwar; and Hoffman, Wesley P., 5,468,357, Cl. 204-173.000.
Hughes, W. James; McCabe, James W.; and Marks, Owen L., Jr., to Maverick Tool Company. Method and apparatus for short radius drilling of curved boreholes. 5,467,834, Cl. 175-61.000.
Hughey, Barbara J.: *See*—
Shefer, Ruth E.; Klinkowstein, Robert E.; Hughey, Barbara J.; Welch, Michael J.; and Dence, Carmen S., 5,468,355, Cl. 204-157.200.
Hughey, Bradley W.; Pisau, Lucretiu; and Millea, Liviu. Apparatus and methods for measuring and detecting variations in the value of a capacitor. 5,469,364, Cl. 364-482.000.
Hugo Neu & Sons Inc.: *See*—
Waterson, Bruce P.; Caputo, Dennis L.; and McLaughlin, William R., 5,468,291, Cl. 106-697.000.
Hui, Angela: *See*—
Gupta, Subhash; Chen, Susan; and Hui, Angela, 5,468,340, Cl. 216-67.000.
Hulden, Fritiof. Coupling assembly and actuating mechanism therefor. 5,467,542, Cl. 37-468.000.
Hulick, Timothy P.; and Brookes, Julian L., to Acrodyne Industries, Inc. Amplification apparatus and method including modulator component. 5,469,127, Cl. 332-149.000.
Hulsing, Rand H., II, to AlliedSignal Inc. Velocity sensor which senses differential velocity by sensing changes in magnetic flux. 5,469,052, Cl. 324-174.000.
Humphreys, Kevin J.: *See*—
Blose, Thomas L.; Britten, David L.; Humphreys, Kevin J.; and Kaiser, Trent M. V., 5,468,029, Cl. 285-328.000.
Hunt, William M.; and Sansone, Ronald P., to Pitney Bowes Inc. Dispatching method and apparatus for monitoring scheduled mail. 5,469,362, Cl. 364-478.000.
Hunziker, Hugo. Disposable chafing dish. 5,467,697, Cl. 99-449.000.
Hunziker, Max: *See*—
Steinmann, Bettina; Wolf, Jean-Pierre; Schultheiss, Adrian; and Hunziker, Max, 5,468,886, Cl. 549-549.000.
Hurford, Simon R.; and Parbhoo, Bhukandas, to Dow Corning Limited. Silicone release compositions. 5,468,816, Cl. 525-479.000.
Hurford, Simon R.; and Parbhoo, Bhukandas, to Dow Corning Limited. Silicone release composition. 5,468,828, Cl. 528-15.000.
Hurkmans, Petrus L. W.: *See*—
Maas, Wilhelmus J. J.; and Hurkmans, Petrus L. W., 5,467,900, Cl. 222-341.000.
Hurley, Michael F.; Lau, Clifford J.; and Lee, Bin, to Bayer Corporation. Process for the preparation of filled urethane-based reinforced moldings. 5,468,432, Cl. 264-45.300.
Hurtubise, Diane M.; Arnold, Perry K.; Kudla, David P.; and Armstrong, Lawrence E., to General Motors Corporation. Strut assembly with integral bearing and spring seat. 5,467,971, Cl. 267-220.000.
Huss, Charles P.; Fry, Arthur L.; and Leseman, Steven R., to Minnesota Mining and Manufacturing Company. Method and apparatus for forming prefabricated self-forming self-adhering pull bow and pull bow formed thereby. 5,468,523, Cl. 428-5.000.
Hussey, Geary W., to Hough, B. Ann. Container for collecting leaking hydrocarbons. 5,467,890, Cl. 220-571.000.
Hutchins, William L. Furling line tension control for roller-reefing drum. 5,467,726, Cl. 114-218.000.

Hutchinson: *See*—
Simon, Jean-Michel; and Barat, Didier, 5,468,055, Cl. 301-6.910.
Hutchinson, Clarence W., Jr.: *See*—
Douglas, Larry D.; and Hutchinson, Clarence W., Jr., 5,469,528, Cl. 395-23.000.
Huyser, Richard F.: *See*—
Matthai, John T.; and Huyser, Richard F., 5,468,247, Cl. 606-178.000.
Hwang, Hyunsang: *See*—
Lee, Chang-Jae; and Hwang, Hyunsang, 5,468,665, Cl. 437-44.000.
Hyde, Frederick W.: *See*—
Heilmann, Steven M.; Drtina, Gary J.; Eitzman, Philip D.; Haddad, Louis C.; Hyde, Frederick W.; Johnson, Todd W.; Rasmussen, Jerald K.; and Williams, Michael G., 5,468,847, Cl. 530-413.000.
Hyder, Charles C.: *See*—
Briese, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Pouquet, Christophe J. A.; and Lowe, Coy S., 5,469,049, Cl. 324-76.770.
Hydronic Components, Inc.: *See*—
Pettinaroli, Giuseppe; and Sherman, John C., 5,467,796, Cl. 137-238.000.
Hylton, Donald C.: *See*—
McAlpin, James J.; Kuo, Jeffrey W. C.; and Hylton, Donald C., 5,468,440, Cl. 264-291.000.
Hyman, Nelson L.; Braun, William R.; Garner, James C.; Larson, Lawrence R.; and Tuner, Sheleen M., to United States of America, Navy. Graphite/epoxy heat sink/mounting for common pressure vessel. 5,467,814, Cl. 165-41.000.
Hyoguchi, Takao; and Kawashima, Katsuhiro, to Nippon Steel Corporation. Method for measuring properties of cold rolled thin steel sheet and apparatus therefor. 5,467,655, Cl. 73-579.000.
Hyoi, Isao: *See*—
Murai, Masaru; Hirai, Takayuki; Hyoi, Isao; Maeda, Yoshimi; and Susuki, Seiichi, 5,469,230, Cl. 351-52.000.
Hyperbaric Mountain Technologies, Inc.: *See*—
Gamow, Rustem I., 5,467,764, Cl. 128-202.120.
Hyundai Electronics America: *See*—
Bullinger, Philip W.; and McManus, Michael J., 5,469,082, Cl. 326-81.000.
Hyundai Electronics Industries Co., Ltd.: *See*—
Bae, Sang M., 5,468,577, Cl. 430-5.000.
Kim, Beom S.; Lee, Jin H.; and Koo, Kyoung B., 5,469,228, Cl. 348-715.000.
Ryou, Eui K., 5,468,670, Cl. 437-52.000.
Ryou, Eui K., 5,468,671, Cl. 437-52.000.
Ibamoto, Masahiko: *See*—
Minowa, Toshimichi; Nishimura, Yutaka; Kawashima, Ken'ichi; Kuroiwa, Hiroshi; and Ibamoto, Masahiko, 5,468,196, Cl. 477-62.000.
Ibental, Achim; and Dammann, Martin, to U.S. Philips Corporation. Arrangement for doubling the field frequency of a picture signal. 5,469,217, Cl. 348-447.000.
Ibuki, Yoshiteru: *See*—
Namekawa, Masatoshi; Ibuki, Yoshiteru; Iguchi, Norio; and Okuno, Masatoshi, 5,467,913, Cl. 228-41.000.
Ichiba, Yasuaki: *See*—
Abe, Kazuo; Ishihara, Masashi; Ikeuchi, Hitoshi; Sugano, Shinsuke; Okuda, Toshiharu; Sakakibara, Shigemi; Shimizu, Hidetoshi; and Ichiba, Yasuaki, 5,467,846, Cl. 188-73.370.
Ichihashi, Takao: *See*—
Saitoh, Yasushi; Matsumoto, Masashi; Ichihashi, Takao; and Yamada, Shuji, 5,469,243, Cl. 355-225.000.
Ichikawa, Michiharu: *See*—
Yamamoto, Kiyoshi; Sugii, Nobuyuki; Kubo, Koichi; Ichikawa, Michiharu; and Yamauchi, Hisao, 5,468,806, Cl. 505-238.000.
Ichikawa, Takanori; Kuwaki, Tomoaki; Matsuki, Shigeru; and Tachibana, Katsumi, to Kirin-Amgen Inc. Monoclonal antibodies and method for the determination of human G-CSF. 5,468,846, Cl. 530-388.230.
Ichimura, Masami, to Sunreeve Company Limited. Eyeglasses with spring temples. 5,469,232, Cl. 351-111.000.
ICI Americas Inc.: *See*—
Burval, Jan; and Chan, Jimmy H., 5,468,718, Cl. 504-206.000.
Ide, Kazumasa: *See*—
Wakui, Shinichi; Ide, Kazumasa; Kobaragi, Haruo; Takahashi, Miyoshi; Miyakawa, Kado; and Yagi, Yasuomi, 5,469,009, Cl. 310-214.000.
Ide, Yoshihiro: *See*—
Hoshino, Mitsuo; Tsutsumi, Yuka; Shimada, Mitsuhiro; Masuda, Takashi; Morimiya, Yuji; Ide, Yoshihiro; Kawaguchi, Takashi; and Nogo, Yuichiro, 5,469,271, Cl. 358-335.000.
Ide, Yuji: *See*—
Sato, Toshiro; Tanaka, Tomoharu; Mizoguchi, Tetsuhiko; and Ide, Yuji, 5,469,399, Cl. 365-226.000.
Idemitsu Kosan Co., Ltd.: *See*—
Nasuno, Ichiro; Shibata, Mitsuru; Sakamoto, Masashi; and Koike, Kazuyoshi, 5,468,878, Cl. 549-23.000.
Shibata, Mitsuru; Sakamoto, Masashi; Koike, Kazuyoshi; and Nasuno, Ichiro, 5,468,722, Cl. 504-282.000.
Idleman, Dennis D.; Rawlins, Douglas C.; and Sood, Virendra M., to Solar Turbines Incorporated. Injector having low tip temperature. 5,467,926, Cl. 239-132.500.
Idleman, Thomas E.: *See*—
Glider, Joseph S.; Powers, David T.; and Idleman, Thomas E., 5,469,453, Cl. 371-68.100.
Ieg Industrie-Engineering GmbH: *See*—
Bernhardt, Bruno, 5,468,097, Cl. 405-52.000.
Igarashi, Minoru: *See*—
Inoue, Yoshio; Sekiguchi, Susumu; and Igarashi, Minoru, 5,468,830, Cl. 526-76.000.
Igarashi, Shinya; Hirayama, Hiroshi; Kobayashi, Chihiro; Tsutsui, Mitsukuni; and Kato, Yukio, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Air flow rate measuring device. 5,467,648, Cl. 73-202.500.
Igarashi, Yusuke: *See*—
Takahashi, Ryoichi; Okawa, Katsumi; and Igarashi, Yusuke, 5,469,131, Cl. 338-306.000.
Iguchi, Masao: *See*—
Yamada, Kiyohiro; Iguchi, Masao; Shimizu, Izuru; and Watanabe, Yasushi, 5,468,130, Cl. 418-55.200.
Iguchi, Norio: *See*—
Namekawa, Masatoshi; Ibuki, Yoshiteru; Iguchi, Norio; and Okuno, Masatoshi, 5,467,913, Cl. 228-41.000.
Ihara, Hirokazu: *See*—
Kanekawa, Nobuyasu; Ihara, Hirokazu; Akiyama, Masatsugu; Kawabata, Kiyoshi; Yamanaka, Hisayoshi; and Okishima, Tetsuya, 5,468,992, Cl. 257-676.000.
Ihara, Makoto, to Sharp Kabushiki Kaisha. Semiconductor memory. 5,469,392, Cl. 365-205.000.
Ihara, Yasuhiro; Yamashita, Mitsuhiro; and Ueyama, Yoshiki, to Matsushita Electric Industrial Co., Ltd. Vehicle position detecting apparatus. 5,469,360, Cl. 364-449.000.
Iida, Ichiro; Ogino, Yoshitaka; and Nakajima, Hideo, to Canon Kabushiki Kaisha. Information processing apparatus with recording medium discharging mechanism for preventing change or loss of information of recording medium by temperature increase of the apparatus. 5,469,419, Cl. 369-58.000.
Iida, Takao: *See*—
Honda, Shinkichi; Torii, Kenji; Arai, Yoichiro; Kasai, Masaji; Kato, Hiromasa; Iida, Takao; Takahashi, Tomoya; Yokoo, Yoshiharu; Kamiya, Toshikazu; and Tamaoki, Tatsuya, 5,468,474, Cl. 424-70.100.
Iijima, Toshihiko: *See*—
Hamoda, Keiji; Yoshida, Ritsuo; Iijima, Toshihiko; Yamamoto, Chiemi; and Kubo, Akihiko, 5,469,308, Cl. 360-71.000.
Iio, Masaya, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory. 5,469,380, Cl. 365-154.000.
Iiyama, Katsuhiko; and Uchida, Naoki, to Koito Manufacturing Co., Ltd. Rectangular reflector capable of avoiding secondary reflection by side walls. 5,469,339, Cl. 362-61.000.
Ikeda, Satoshi: *See*—
Hosoda, Yasushi; Shiota, Toshiaki; Suzuki, Nobukazu; Ikeda, Satoshi; Odawa, Taketosi; Kimura, Koichi; and Yamamoto, Hisataka, 5,468,461, Cl. 523-435.000.
Miyazaki, Katsuo; Maeda, Takahide; Ogawa, Takeshi; Kakui, Sonoko; Ikeda, Satoshi; and Yamane, Yoshiki, 5,468,517, Cl. 427-322.000.
Ikeda, Takeshi: *See*—
Amano, Yasuyuki; Ikeda, Takeshi; Aizawa, Eiji; and Saito, Takanori, 5,468,535, Cl. 428-40.000.
Ikeda, Yoshinori: *See*—
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,469,266, Cl. 358-298.000.
Ikegami, Makoto: *See*—
Murakoshi, Keiji; Nebashi, Mitsuhiko; Ikegami, Makoto; and Otsuki, Noboru, 5,468,079, Cl. 400-521.000.
Ikeuchi, Hitoshi: *See*—
Abe, Kazuo; Ishihara, Masashi; Ikeuchi, Hitoshi; Sugano, Shinsuke; Okuda, Toshiharu; Sakakibara, Shigemi; Shimizu, Hidetoshi; and Ichiba, Yasuaki, 5,467,846, Cl. 188-73.370.
Illig, Carl R.: *See*—
Bacon, Edward R.; Daum, Sol J.; Estep, Kimberly G.; Josef, Kurt A.; Douty, Brent D.; and Illig, Carl R., 5,468,466, Cl. 424-9.450.
Illinois Tool Works Inc.: *See*—
Broskow, James A.; and Marco, Leslie S., 5,467,870, Cl. 206-162.000.
Sullivan, Kathleen A.; and Peek, Brian R., 5,468,108, Cl. 411-510.000.
ImageWare Software, Inc.: *See*—
Blank, Arthur M., 5,469,536, Cl. 395-131.000.
Imai, Ryuji; and Kanbe, Rokuro, to NGK Spark Plug Co., Ltd. Integrated circuit package having a multilayered wiring portion formed on an insulating substrate. 5,468,997, Cl. 257-734.000.
Imai, Tomoaki: *See*—
Endoh, Takeshi; Imai, Tomoaki; and Hagiya, Mikio, 5,469,067, Cl. 324-551.000.
Imai, Yuji: *See*—
Itoh, Junichi; Sato, Yuta; Matsuzaki, Minoru; Hamada, Masaharu; and Imai, Yuji, 5,469,237, Cl. 354-106.000.
Imaizumi, Shinichi: *See*—
Suzuki, Junji; Hatano, Masami; and Imaizumi, Shinichi, 5,468,905, Cl. 568-346.000.
IMAJE: *See*—
Benalikhodja, Karim, 5,468,128, Cl. 417-413.100.
Immucor, Inc.: *See*—
Sinor, Lyle T.; Eatz, Ralph A.; Stone, Darryl L.; and Plapp, Fred V., 5,468,618, Cl. 435-7.210.
Immunomatrix, Inc.: *See*—

Richards, Karen L., 5,468,622, Cl. 435-28.000.

Imperial Chemical Industries PLC: *See*—
Buckley, Alan J.; Huchings, Michael G.; Ferguson, Ian; Beautement, Kevin; Clough, John M.; Crowley, Patrick J.; Godfrey, Christopher R. A.; deFraine, Paul J.; Anthony, Vivienne M.; and Heaney, Stephen P., 5,468,857, Cl. 544-298.000.

IMPRA, Inc.: *See*—
Bosse, Charles F.; and Kowligi, Rajagopal R., 5,468,138, Cl. 425-383.000.

Inaba, Yutaka: *See*—
Katakura, Kazunori; Okada, Shinjiro; and Inaba, Yutaka, 5,469,281, Cl. 359-56.000.

Inamoto, Yukiko: *See*—
Yamada, Akiya; Wato, Takahiko; Uchida, Naoki; Fujisawa, Misuzu; Takama, Shigeyuki; and Inamoto, Yukiko, 5,468,503, Cl. 424-461.000.

Inazawa, Shinji: *See*—
Nishio, Masanobu; Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,468,557, Cl. 428-384.000.

Indigo Medical, Incorporated: *See*—
Esch, Victor C.; and Valley, Kirsten L., 5,469,524, Cl. 385-118.000.

Industrial Technology Research Institute: *See*—
Liao, Tsuoe-Hsiang, 5,469,110, Cl. 327-536.000.

Ing. Walter Hengst GmbH & Co. KG: *See*—
Ardes, Wilhelm, 5,468,386, Cl. 210-248.000.

Innova Products, Inc.: *See*—
Mullen, Patricia, 5,468,473, Cl. 424-66.000.

Ino, Hiroyuki: *See*—
Chaki, Yasuyuki; Shimpuku, Yoshihide; and Ino, Hiroyuki, 5,469,162, Cl. 341-58.000.

Inoue, Akihisa: *See*—
Yamaguchi, Tadashi; Nosaki, Katsutoshi; Inoue, Akihisa; and Masumoto, Tsuyoshi, 5,468,697, Cl. 501-98.000.

Inoue, Hideo; and Sugita, Mitsuru, to Mitsubishi Denki Kabushiki Kaisha. Timer with a compensation value to increment or decrement a count value of a counter. 5,469,483, Cl. 377-20.000.

Inoue, Naoto; and Yamaguchi, Kiyotaka, to Mitsumi Electric Co., Ltd. Magnetic head device with a cleaning mechanism. 5,469,318, Cl. 360-128.000.

Inoue, Noboru. Charged coalescer type oil-water separating apparatus. 5,468,385, Cl. 210-243.000.

Inoue, Shuichi: *See*—
Suehiro, Toshiyuki; Teraoka, Shinichi; Ishimaru, Eiichiro; Fukuda, Yoshimori; and Inoue, Shuichi, 5,467,811, Cl. 164-476.000.

Inoue, Shunsuke; Hoshi, Junichi; and Watanabe, Takanori, to Canon Kabushiki Kaisha. Method for manufacturing semiconductor devices. 5,468,344, Cl. 156-657.100.

Inoue, Tokuji: *See*—
Hayakawa, Tetsuo; Inoue, Tokuji; and Asaga, Hiroyuki, 5,468,810, Cl. 525-244.000.

Inoue, Yoshio; Sekiguchi, Susumu; and Igarashi, Minoru, to Shin-Etsu Chemical Co. Ltd. Process for preparing organopolysiloxane gum. 5,468,830, Cl. 528-26.000.

Inouye, Satoshi: *See*—
Zenno, Shuhei; Inouye, Satoshi; Kanoh, Hiromasa; and Saigo, Kaoru, 5,468,631, Cl. 435-189.000.

Inrad: *See*—
Zhang, Zhenyu; and Fehlner, James R., 5,468,699, Cl. 502-60.000.

Insertec Systems, Inc.: *See*—
Martin, Luther W.; and Smith, Richard L., 5,467,795, Cl. 137-15.000.

Insley, Thomas L.: *See*—
Whitcomb, William C.; Insley, Thomas L; and Fung, Simon S., 5,468,536, Cl. 428-98.000.

Institut Francais du Petrole: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; and Marchand, Pierre, 5,468,399, Cl. 252-18.000.

Institut Max Von Laue - Paul Langevin: *See*—
Kocsis, Menhard; and Farago, Bela, 5,468,970, Cl. 250-505.100.

Intégral Peripherals, Inc.: *See*—
Morehouse, James H.; Furay, David M.; Volk, Steven B.; and Dunckley, James A., 5,469,314, Cl. 360-105.000.

Intel Corporation: *See*—
Astresh, Deepak J.; Nakanishi, Tosaku; and Mathews, Gregory S., 5,469,544, Cl. 395-290.000.
Dea, David, 5,469,208, Cl. 348-27.000.
Sprague, David L., 5,469,222, Cl. 348-580.000.

Interdigital Technology Corporation: *See*—
Schilling, Donald L., 5,469,468, Cl. 375-200.000.

Intermec Corporation: *See*—
Huggett, George R.; and McDonald, William M., 5,468,945, Cl. 235-462.000.

International Beauty Design, Inc.: *See*—
Mast, Rolf; and Powers, Dulce M., 5,467,787, Cl. 132-73.000.

International Business Machines Corporation: *See*—
Beglin, Thomas W., 5,469,560, Cl. 395-439.000.
Bertin, Claude L.; DiMaria, Donelli J.; Miyakawa, Makoto; and Sakaue, Yoshinori, 5,468,663, Cl. 437-43.000.
Bezek, John D., 5,469,161, Cl. 341-51.000.
Brodsky, William L.; and Herard, James D., 5,468,159, Cl. 439-501.000.
Brodsky, William L.; Herard, James D.; Macek, Thomas G.; Sharp, Timothy L.; and Shovlowsky, George J., 5,468,917, Cl. 174-255.000.
Canetti, Ran; and Herzberg, Amir, 5,469,507, Cl. 380-30.000.
Carl, Dan; Dobuzinsky, David M.; Nguyen, Son V.; and Nguyen, Tue, 5,468,687, Cl. 437-235.000.
Casey, Jon A.; Divakaruni, Renuka S.; Natarajan, Govindarajan; Reddy, Srinivasa S. N.; and Sammet, Manfred, 5,468,445, Cl. 419-19.000.
Chan, Benson; Chapin, Fletcher L.; Fiacco, Vincent M.; Mankus, John R.; and Pokrzywa, Robert S., 5,468,996, Cl. 257-723.000.
Chang, Daniel T.; and Wolfsthal, Yaron, 5,469,574, Cl. 395-700.000.
Chen, Lee; Podlesnik, Dragan; and Sekiguchi, Akihisa, 5,468,955, Cl. 250-251.000.
Cuomo, Jerome J.; and Yehoda, Joseph E., 5,468,326, Cl. 156-345.000.
Dauerer, Norman J.; and Kelley, Edward E., 5,469,576, Cl. 395-186.000.
Edgar, Albert D., 5,469,275, Cl. 358-458.000.
Ellerson, James V.; Noreika, Richard J.; and Varcoe, Jack A., 5,469,333, Cl. 361-779.000.
Eng, Robert C.; Galella, John W.; McCrary, Rex E.; McDonald, Mark G.; Stelzer, Eric H.; and Yentz, Frederick C., 5,469,577, Cl. 395-290.000.
Foster, David J.; Garcia, Armando; and Pearson, Robert B., 5,469,542, Cl. 395-200.010.
Fuhs, Ronald E.; Hammond, William A., Jr.; Nation, George W.; Rogers, Steven L.; and Willis, John C., 5,469,446, Cl. 371-33.000.
Gill, Hardayal S., 5,467,881, Cl. 216-22.000.
Golby, John A.; Padgett, Miles J.; and Woodall, Stephen P., 5,469,259, Cl. 356-351.000.
Jackson, Frederick S.; and Leaver, David, 5,469,029, Cl. 315-408.000.
Kingman, John A.; Larky, Steven P.; and Vanover, Michael T., 5,469,541, Cl. 395-158.000.
Madduri, Hari H., 5,469,575, Cl. 395-200.030.
Papathomas, Konstantinos I., 5,468,790, Cl. 524-100.000.
Schiefer, Klaus B.; and Swami, Arun N., 5,469,568, Cl. 395-600.000.
Yarmchuk, Edward J., 5,469,051, Cl. 324-158.100.

International Data Matrix, Inc.: *See*—
Priddy, Dennis G.; and Cymbalski, Robert S., 5,468,953, Cl. 235-494.000.

International Des Jeux: *See*—
Gatto, Jean-Marie; and Bertrand, Dominique, 5,468,943, Cl. 235-454.000.

International Flvos & Fragrances Inc.: *See*—
Guénin, Eric P.; Trotzinka, Karen A.; Smith, Leslie C.; Warren, Craig B.; Munteanu, Marina A.; Chung, Siew L.; and Tan, Chee-Teck, 5,468,725, Cl. 512-2.000.

International Food Processing Incorporated: *See*—
Monclin, Jean-Pierre, 5,468,300, Cl. 127-43.000.
Monclin, Jean-Pierre, 5,468,301, Cl. 127-43.000.

International Fuel Cells Corporation: *See*—
Bregoli, Lawrance J.; and Pearson, Mark L., 5,468,573, Cl. 429-16.000.

International Paper Company: *See*—
Beales, Jonathan T., 5,467,916, Cl. 229-195.000.

International Superconductivity Technology Center: *See*—
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.
Yamamoto, Kiyoshi; Sugii, Nobuyuki; Kubo, Koichi; Ichikawa, Michiharu; and Yamauchi, Hisao, 5,468,806, Cl. 505-238.000.

International Technical Illustration Co., Ltd.: *See*—
Seki, Nobuhiro, 5,469,537, Cl. 395-133.000.

Intot, Ltd.: *See*—
Pevzner, Lev K.; Lakhovskiy, Mikhail Y.; and Oborin, Boris S., 5,468,273, Cl. 55-523.000.

Inushima, Takashi; and Vaitkus, Rimantas, to Semiconductor Energy Laboratory Co., Ltd. Electronic device utilizing a material capable of storing information which is readable by illumination. 5,469,424, Cl. 369-120.000.

Inventive Services, Inc.: *See*—
Yelvington, Richard D., 5,468,928, Cl. 219-68.000.

Invest Tech AG: *See*—
Lipinski, Reinhard, 5,467,686, Cl. 92-88.000.

Iovision, Inc.: *See*—
Blake, Larry W., 5,468,246, Cl. 606-107.000.

Iowa State University Research Foundation, Inc.: *See*—
Vallier, Jeffrey J., 5,469,508, Cl. 381-63.000.
Van Fossen, Larry, 5,468,122, Cl. 414-786.000.

IPEC Advanced Systems, Inc.: *See*—
Bachand, David P.; and McNamara, Gerald P., 5,468,174, Cl. 451-75.000.

Ipsco Enterprises Inc.: *See*—
Blose, Thomas L.; Britten, David L.; Humphreys, Kevin J.; and Kaiser, Trent M. V., 5,468,029, Cl. 285-328.000.

Irie, Katsumi: *See*—
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.

Irie, Masahiro: *See*—
Sugai, Fumio; and Irie, Masahiro, 5,468,874, Cl. 548-454.000.

Irlbeck, Robert D.: *See*—
Drabenstadt, William W.; Fowler, Richard C.; Grindershev, Soren; and Irlbeck, Robert D., 5,469,074, Cl. 324-758.000.

Irvin, Randall T.: *See—*
Hodges, Robert S.; Irvin, Randall T.; Paranchych, William; Sokol, Pamela A.; and Woods, Donald E., 5,468,484, Cl. 424-141.100.
Irwin, Guy L. Conveyor belt with textured edge. 5,467,865, Cl. 198-778.000.
Isaac, Walter H.: *See—*
Zengerle, Paul L.; Miller, David D.; Whitesides, Thomas H.; Rieger, John B.; Flow, Vincent J., III; and Isaac, Walter H., 5,468,604, Cl. 430-631.000.
Isaka, Haruo: *See—*
Sakakibara, Yoshio; Gotou, Makoto; and Isaka, Haruo, 5,469,304, Cl. 360-13.000.
Ishida, Haruhiko: *See—*
Fujiwara, Shigeru; Takahashi, Masashi; and Ishida, Haruhiko, 5,469,248, Cl. 355-326.00R.
Ishida, Takeshi; Koyama, Kenji; Kasama, Hiroshi; Nishiumi, Kenji; and Nakajima, Kenji, to Kabushiki Kaisha Nippon Conlux. Coin processing apparatus. 5,468,181, Cl. 453-3.000.
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, to Minolta Camera Kabushiki Kaisha. Image sensing system. 5,469,239, Cl. 354-402.000.
Ishihara, Masashi: *See—*
Abe, Kazuo; Ishihara, Masashi; Ikeuchi, Hitoshi; Sugano, Shinsuke; Okuda, Toshiharu; Sakakibara, Shigemi; Shimizu, Hidetoshi; and Ichiba, Yasuaki, 5,467,846, Cl. 188-73.370.
Ishihara, Susumu: *See—*
Suzuki, Yoshihisa; Sugawara, Youichi; Ishihara, Susumu; and Katoh, Ikuo, 5,469,012, Cl. 310-348.000.
Ishii, Katsumi; and Takikawa, Masao, to Tokyo Electron Limited; and Tokyo Electron Tohoku Limited. Wafer container and wafer aligning apparatus. 5,468,112, Cl. 414-416.000.
Ishikawa, Ko, to Sony Corporation. Molded tape cassette. 5,468,065, Cl. 360-132.000.
Ishikawa, Wataru: *See—*
Watanabe, Takashi; and Ishikawa, Wataru, 5,469,312, Cl. 360-103.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Hayashi, Keiichiro, 5,468,194, Cl. 477-3.000.
Kato, Kanji, 5,468,426, Cl. 261-153.000.
Ishimaru, Eiichiro: *See—*
Suehiro, Toshiyuki; Teraoka, Shinichi; Ishimaru, Eiichiro; Fukuda, Yoshimori; and Inoue, Shuichi, 5,467,811, Cl. 164-476.000.
Ishimoto, Kameki: *See—*
Shiozaki, Minoru; Yasuda, Mikio; Chimoto, Isamu; and Ishimoto, Kameki, 5,468,919, Cl. 174-261.000.
Ishioka, Yuzuru, to Fujitsu Limited. Power supply system for optical network unit of a fiber in the loop. 5,469,282, Cl. 359-110.000.
Ishiwata, Tadashi; Ogata, Tetsuo; and Aota, Ikuhiro, to NEC Corporation. Paper sheet stacking mechanism for mail sorting system. 5,467,974, Cl. 271-220.000.
Ishizawa, Kenki; Ayuzawa, Nobuo; Shiranita, Akira; and Taksi, Masamichi, to Shinagawa Refractories Co., Ltd. Highly corrosion resistant α-sialon-like sintered body and process for preparation thereof. 5,468,696, Cl. 501-98.000.
Isohata, Shigeru: *See—*
Yukutomo, Masashi; Isohata, Shigeru; and Yamazaki, Osamu, 5,469,352, Cl. 364-192.000.
Isosport Verbundbauteile Gesellschaft m.b.H.: *See—*
Schamesberger, Robert, 5,468,543, Cl. 428-220.000.
Isozaki, Shin; Kikugawa, Shozo; and Iwata, Eiji, to Konica Corporation. Supporting device for a magnetic head which records/reproduces information from a magnetic layer of a photographic film. 5,469,313, Cl. 360-104.000.
ISP Investments Inc.: *See—*
Dougherty, James A.; and Wolf, Philip F., 5,468,820, Cl. 526-264.000.
Isuzu Motors Limited: *See—*
Yamamoto, Naotaka; and Oohori, Noriko, 5,468,779, Cl. 521-46.500.
Itagaki, Masato: *See—*
Mishina, Haruo; Wada, Masafumi; Fukuda, Mituo; Itagaki, Masato; and Yamama, Shinya, 5,467,912, Cl. 228-10.000.
Itakura, Tetsuro, to Kabushiki Kaisha Toshiba. Electronic circuit including means for reflecting signal current and feed forward means for compensating operational speed thereof. 5,469,092, Cl. 327-103.000.
Ito, Akira; and Kamohara, Hiroaki, to Daiden Kabushiki Kaisha. Method and apparatus for measuring deterioration of power cable insulation. 5,469,066, Cl. 324-551.000.
Ito, Kiyoshi: *See—*
Asai, Naoki; Morozumi, Choji; Ito, Yoshikazu; Ito, Kiyoshi; and Koyabu, Akira, 5,468,078, Cl. 400-215.000.
Ito, Osamu: *See—*
Kubota, Shizuo; Ito, Osamu; and Miyamoto, Hiroyuki, 5,468,780, Cl. 521-48.500.
Ito, Satoru: *See—*
Hara, Yuji; Ito, Satoru; and Toya, Tatsuro, 5,468,998, Cl. 257-775.000.
Ito, Yoshikazu: *See—*
Asai, Naoki; Morozumi, Choji; Ito, Yoshikazu; Ito, Kiyoshi; and Koyabu, Akira, 5,468,078, Cl. 400-215.000.
Itochu Fine Chemical Corporation: *See—*
Funkunaga, Toshikazu, 5,468,493, Cl. 424-195.100.
Itoh, Hiroyuki; Todokoro, Hideo; Sohda, Yasunari; and Nakayama, Yoshinori, to Hitachi, Ltd. Method and apparatus for electron beam lithography. 5,468,969, Cl. 250-492.230.
Itoh, Hitoshi: *See—*
Fujita, Shuji; Baba, Yasushi; Itoh, Hitoshi; and Satoma, Shiro, 5,467,725, Cl. 112-162.000.
Itoh, Junichi; Sato, Yuta; Matsuzaki, Minoru; Hamada, Masaharu; and Imai, Yuji, to Olympus Optical Co., Ltd. Data printing apparatus. 5,469,237, Cl. 354-106.000.
Itoh, Junji: *See—*
Itoh, Shigeo; Watanabe, Teruo; Miyamori, Makoto; Nishimura, Norio; Itoh, Junji; and Kanemaru, Seigo, 5,469,014, Cl. 313-308.000.
Itoh, Shigeo; Watanabe, Teruo; Miyamori, Makoto; Nishimura, Norio; Itoh, Junji; and Kanemaru, Seigo. Field emission element. 5,469,014, Cl. 313-308.000.
Itozaki, Hideo: *See—*
Harada, Keizo; and Itozaki, Hideo, 5,468,973, Cl. 257-33.000.
ITT Corporation: *See—*
Carman, Anthony K.; and Pontbriand, Duane J., 5,468,024, Cl. 285-81.000.
Coutts, Bruce; and Roe, Christopher A., 5,469,521, Cl. 385-77.000.
Gauger, Derek K., 5,467,957, Cl. 248-429.000.
Iuliano, Mauro: *See—*
Guerra, Gaetano; Corradini, Paolo; DeRosa, Claudio; Iuliano, Mauro; Oliva, Leone; and Petraccone, Vittorio, 5,468,823, Cl. 526-347.100.
Iwahori, Masayuki. Gas lighter. 5,468,144, Cl. 431-254.000.
Iwaki, Tsutomu: *See—*
Seri, Hajime; Yamamura, Yasuharu; Tsuji, Yoichiro; Moriwaki, Yoshio; and Iwaki, Tsutomu, 5,468,309, Cl. 148-421.000.
Iwakuni, Mikio, to Uniden Corporation. Laser light receiving device with improved noise discrimination. 5,469,287, Cl. 359-189.000.
Iwami, Hiroyuki; Fukuoka, Masayoshi; and Kanayama, Hiroyuki, to Taiyo Manufacturing Works Co., Ltd. Mold for injection molding of thermoplastic resin. 5,468,141, Cl. 425-542.000.
Iwamoto, Kazunori: *See—*
Korenaga, Nobushige; and Iwamoto, Kazunori, 5,467,720, Cl. 108-20.000.
Iwamoto, Minekazu. Ceiling insert. 5,468,105, Cl. 411-433.000.
Iwamura, Ryoji: *See—*
Okada, Ken'ichi; Takagi, Masahiro; Hasegawa, Hiroshi; and Iwamura, Ryoji, 5,468,315, Cl. 156-64.000.
Iwamura, Takashi: *See—*
Asai, Nobutoshi; Iwamura, Takashi; and Tamura, Shin-Ichiro, 5,468,593, Cl. 430-273.000.
Iwao, Naoto; and Yamada, Shoji, to Brother Kogyo Kabushiki Kaisha. Light scanning device. 5,469,289, Cl. 359-200.000.
Iwasa, Naruhito: *See—*
Nakamura, Shuji; Iwasa, Naruhito; and Senoh, Masayuki, 5,468,678, Cl. 437-107.000.
Iwasaki, Keisuke; and Takahama, Kengo, to Sharp Kabushiki Kaisha. Image processing apparatus for combining differently corrected images. 5,469,274, Cl. 358-450.000.
Iwata, Eiji: *See—*
Isozaki, Shin; Kikugawa, Shozo; and Iwata, Eiji, 5,469,313, Cl. 360-104.000.
Izukawa, Tsukuru: *See—*
Tsutsui, Tomoki; Izukawa, Tsukuru; Obkubo, Kazuhiko; and Sakaki, Yoshitsugu, 5,468,840, Cl. 528-408.000.
Izzi, Louis J.: *See—*
Yung, Henry T.; Izzi, Louis J.; and Kresik, William R., 5,469,195, Cl. 345-199.000.
J. M. Voith GmbH: *See—*
Schiel, Christian, 5,468,349, Cl. 162-358.300.
Jachim, Frank M. Electric vehicle solenoid motor. 5,469,004, Cl. 310-24.000.
Jachimowicz, Karen E.: *See—*
Lebby, Michael S.; and Jachimowicz, Karen E., 5,469,185, Cl. 345-8.000.
Jackson, Frederick S.; and Leaver, David, to International Business Machines Corporation. Deflection apparatus for raster scanned CRT displays. 5,469,029, Cl. 315-408.000.
Jacob, Heinz J., to U.S. Philips Corporation. Method of generating a pattern in the surface of a workpiece. 5,468,932, Cl. 219-121.690.
Jacobs, William G.: *See—*
Flint, Alan; Nguyen, Quy; and Jacobs, William G., 5,468,111, Cl. 414-416.000.
Jacobsen, Stuart M.; Jaffe, Steven M.; Eilers, Hergen; and Jones, Michieal L., to University of Georgia Research Foundation, Inc. Resonant microcavity display. 5,469,018, Cl. 313-461.000.
Jacox, James L.: *See—*
Godsey, James H.; Jacox, James L.; Keller, Robert F.; and Legare, Richard J., 5,468,311, Cl. 149-19.400.
Jaculi, Dieter: *See—*
Kühn, Heinrich; Herberg, Frank; and Jaculi, Dieter, 5,468,568, Cl. 428-245.000.
Jaedicke, Hagen: *See—*
Grafen, Paul; Kiefer, Hans; and Jaedicke, Hagen, 5,468,883, Cl. 549-411.000.
Jaffe, Steven M.: *See—*
Jacobsen, Stuart M.; Jaffe, Steven M.; Eilers, Hergen; and Jones, Michieal L., 5,469,018, Cl. 313-461.000.
Jäger, Gerhard; and Millauer, Hans, to Hoechst Aktiengesellschaft. Process for preparing perfluoropolyethers. 5,468,352, Cl. 204-59.00F.
Jager, Karl-Friedrich: *See—*
Lisa, Rudolph E.; Kilbride, Terence K.; and Jager, Karl-Friedrich, 5,468,720, Cl. 504-236.000.

Jakob, Hans-Dieter: *See—*
Schrader, Lutz; Jakob, Hans-Dieter; Müller, Hanns-Peter; and Niggemann, Johann, 5,468,832, Cl. 528-53.000.

Jakobsen, Palle: *See—*
Faarup, Peter; Jakobsen, Palle; Jørgensen, Anker S.; and Klitgaard, Henrik, 5,468,748, Cl. 514-250.000.

Jakubowski, Joseph A.; Palkowitz, Alan D.; and Sigmund, Sandra K., to Eli Lilly and Company. 6-azaindole thromboxane synthase inhibitors. 5,468,757, Cl. 514-300.000.

Jalcos Holdings Inc.: *See—*
O'Coin, Bernard J., 5,468,316, Cl. 156-64.000.

Jamco Corporation: *See—*
Umeda, Katsuhiko, 5,467,943, Cl. 244-129.300.

James, Claude: *See—*
Bouboutou, Romaine; Dereu, Norbert; Evers, Michel; Gueguen, Jean-Christophe; James, Claude; Poujade, Christèle; Reisdorf, Daniel; Ribeill, Yves; and Soler, Françoise, 5,468,888, Cl. 554-58.000.

James River Paper Company, Inc.: *See—*
Moody, John R., 5,467,935, Cl. 242-422.400.
Moody, John R., 5,467,936, Cl. 242-525.700.

James, Ruth A.: *See—*
Lucast, Donald H.; Moore, Cheryl L.; and James, Ruth A., 5,468,821, Cl. 526-264.000.

Jan, William Y.: *See—*
Cunningham, John E.; Goossen, Keith W.; Jan, William Y.; and Walker, James A., 5,468,689, Cl. 437-241.000.

Jang, In-Sik, to Samsung Electronics Co., Ltd. Multi-layered liquid crystal display panel with auxiliary supports for reinforcement of injection holes. 5,469,280, Cl. 359-53.000.

Janssen Pharmaceutica N.V.: *See—*
Janssens, Frans E.; Diels, Gaston S. M.; and Leenaerts, Joseph E., 5,468,743, Cl. 514-214.000.

Janssens, Frans E.; Diels, Gaston S. M.; and Leenaerts, Joseph E., to Janssen Pharmaceutica N.V. Imidazo[2,1-b]benzazepine derivatives, compositions and method of use. 5,468,743, Cl. 514-214.000.

Janssens, Wilhelmus; and Vanmaele, Luc, to Agfa-Gevaert N.V. Thermal dye transfer methods utilizing heterocyclic hydrazono dyes. 5,468,258, Cl. 8-471.000.

Japan Gore-Tex, Inc.: *See—*
Kikukawa, Hiroyasu; and Kato, Hiroshi, 5,468,531, Cl. 428-36.500.

Japan Tobacco Inc.: *See—*
Ebata, Takashi; Matsumoto, Katsuya; Koseki, Koshi; Kawakami, Hiroshi; Matsushita, Hajime; Yoshikoshi, Hajime; and Okaniwa, Masakazu, 5,468,881, Cl. 549-295.000.

Jarema, Chester P., to Specialty Environmental Technologies, Inc. Paint stripper composition. 5,468,415, Cl. 252-171.000.

Jarvis, Alan R.: *See—*
Tank, Klaus; Jarvis, Alan R.; and Stewart, Aulette, 5,468,268, Cl. 51-293.000.

Jarvis, Eugene; and Pribyl, Eric L., to Midway Manufacturing Company. Three-dimensional, texture mapping display system. 5,469,535, Cl. 395-130.000.

Jarvis, Jack D. Float means. 5,467,496, Cl. 15-235.800.

Jasper, Steven C.: *See—*
Birchler, Mark A.; Jasper, Steven C.; and Wilson, Timothy J., 5,469,465, Cl. 375-346.000.

Jebco Packaging Systems, Inc.: *See—*
Buchanan, Jerry E., 5,468,206, Cl. 493-189.000.

Jejelowo, Moses O., to Exxon Chemical Patents Inc. Method for making a catalyst system. 5,468,702, Cl. 502-104.000.

Jensen, Harold A., to MHB Industries Corp. Method for encapsulating articles in wicketed bags. 5,467,578, Cl. 53-469.000.

Jensen, Roy A.: *See—*
LaRochelle, William J.; Pierce, Jacalyn; Jensen, Roy A.; and Aaronson, Stuart A., 5,468,468, Cl. 424-1.490.

Jensen, Wolfgang W.: *See—*
Gatley, Phillip A.; and Jensen, Wolfgang W., 5,469,505, Cl. 379-430.000.

Jeong, Hyeon J.: *See—*
Lee, Joon K.; and Jeong, Hyeon J., 5,468,991, Cl. 257-666.000.

Jhung, In B.: *See—*
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,468,896, Cl. 558-233.000.

Jina Manufacturer Thai Co., Ltd.: *See—*
Chien, Jui-Lung, 5,468 043, Cl. 297-153.000.

Jo, Sung J.: *See—*
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,468,896, Cl. 558-233.000.

Joh, Clarence C.: *See—*
Baumert, Robert J.; and Joh, Clarence C., 5,469,438, Cl. 370-85.110.

John Crane Inc.: *See—*
Wasser, James R., 5,468,002, Cl. 277-65.000.

John Henry Company, The: *See—*
Diemer, Gordon J., 5,467,524, Cl. 29-701.000.

Johnson & Johnson Vision Products, Inc.: *See—*
Abrams, Richard; Edwards, Russell J.; Ebel, James A.; and Keene, Darren S., 5,467,868, Cl. 206-5.100.

Johnson, Ben F.: *See—*
Menchen, Steven M.; Winnik, Mitchell A.; and Johnson, Ben F., 5,468,365, Cl. 204-299.00R.

Johnson, Chris: *See—*
Mobley, J. Phil; Zhang, Chaoying; Soli, Sigfried D.; Johnson, Chris; and O'Connell, Drew, 5,467,784, Cl. 128-867.000.

Johnson, David: *See—*
Egelandsdal, Einar; Garth, Geoffrey C.; Hamilton, John; Johnson, David; Laerdal, Tore; and Patterson, Charles A., 5,468,151, Cl. 434-265.000.

Johnson, Eric M.: *See—*
Butensky, Michael J.; Gibbs, Richard A.; Collins, Kevin T.; Yang, Yih-Nan; Johnson, Eric M.; and Grafft, Chris A., 5,469,503, Cl. 379-265.000.

Johnson, Gilbert: *See—*
Sandler, Sheldon; Crandall, Alan; Schwarzkopf, Daniel; Johnson, Gilbert; and Borkowski, Rudolph, 5,469,176, Cl. 342-375.000.

Johnson, Gregory E.; Ashworth, Uriel G.; and Salerno, Mark, to Physicians Consulting Incorporated. Kinetic rehabilitation device employing controlled passive motion. 5,468,216, Cl. 601-24.000.

Johnson, Lonnie. Wet diaper detector. 5,469,145, Cl. 340-604.000.

Johnson, Marion K. Hand truck apparatus. 5,468,010, Cl. 280-652.000.

Johnson, Michael J.: *See—*
Nuñez, Eduardo; and Johnson, Michael J., 5,467,520, Cl. 29-564.600.

Johnson, Milton J.; and Roney, Jeffrey T., to Matsushita Applicane Corporation. Height adjusting system for upright vacuum cleaner. 5,467,502, Cl. 15-339.000.

Johnson, M. Kristina: *See—*
Sharp, D. Gary; and Johnson, M. Kristina, 5,469,279, Cl. 359-53.000.

Johnson, Phillip W., to Mayo Foundation for Medical Education and Research. Universal penetration test apparatus and method. 5,467,639, Cl. 73-38.000.

Johnson, Robert W., Jr., to Exide Electronics Corporation. Isolated gate drive. 5,469,098, Cl. 327-190.000.

Johnson, Steven W.; Monticello, Daniel J.; Gibbs, Phillip R.; and Kulpa, Charles F., to Energy BioSystems Corporation; and University of Notre Dame. Method for separating a sulfur compound from carbonaceous materials. 5,468,626, Cl. 435-130.000.

Johnson, Todd W.: *See—*
Heilmann, Steven M.; Drtina, Gary J.; Eitzman, Philip D.; Haddad, Louis C.; Hyde, Frederick W.; Johnson, Todd W.; Rassmussen, Jerald K.; and Williams, Michael G., 5,468,847, Cl. 530-413.000.

Johnston, Bevan H.: *See—*
Beck, Niels J.; Pena, James A.; Roach, Alan R.; and Johnston, Bevan H., 5,467,754, Cl. 123-467.000.

Johnston, Gary L. Manually operated uplift apparatus. 5,468,049, Cl. 297-339.000.

Johnston, Paul A., to Hughes Aircraft Company. Connector accessory for shield termination. 5,468,155, Cl. 439-98.000.

Jones, Alvin K.: *See—*
Ratu, John J.; Jones, Alvin K.; and Maddox, Charles K., 5,467,970, Cl. 267-220.000.

Jones, Darryl L. Objectional air skelly game. 5,467,985, Cl. 273-126.00R.

Jones, Edgar W. Window construction and method of making the same. 5,467,557, Cl. 49-171.000.

Jones, Frederick P.: *See—*
Neilson, John M. S.; Wheatley, Carl F., Jr.; Jones, Frederick P.; and Temple, Victor A. K., 5,468,668, Cl. 437-51.000.

Jones, Greg; and Wyatt, Daryn. Apparatus and method for constructing a spray in place structure. 5,468,293, Cl. 118-308.000.

Jones, Keith A.: *See—*
Joseph, Amy L.; Jones, Keith A.; Winston, Anthony E.; and Lajoie, M. Stephen, 5,468,715, Cl. 504-101.000.

Jones, Michieal L.: *See—*
Jacobsen, Stuart M.; Jaffe, Steven M.; Eilers, Hergen; and Jones, Michieal L., 5,469,018, Cl. 313-461.000.

Jones, William B. Poly bag printer for packaging machine. 5,468,080, Cl. 400-618.000.

Jordan, Holger; and Richartz, Sigurd, to Nordischer Maschinenbau Rud. Baader GmbH & Co KG. Apparatus for removing the skin from the bodies of slaughtered poultry. 5,468,180, Cl. 452-127.000.

Jørgensen, Anker S.: *See—*
Faarup, Peter; Jakobsen, Palle; Jørgensen, Anker S.; and Klitgaard, Henrik, 5,468,748, Cl. 514-250.000.

Josef, Kurt A.: *See—*
Bacon, Edward R.; Daum, Sol J.; Estep, Kimberly G.; Josef, Kurt A.; Douty, Brent D.; and Illig, Carl R., 5,468,466, Cl. 424-9.450.

Joseph, Amy L.; Jones, Keith A.; Winston, Anthony E.; and Lajoie, M. Stephen, to Church & Dwight Co., Inc. Blended fungicide compositions. 5,468,715, Cl. 504-101.000.

Josephson, Norman A.: *See—*
Lewis, Russell F.; Martin, Steven F.; Cone, Dale A.; and Josephson, Norman A., 5,469,511, Cl. 381-173.000.

Jubin, John C., Jr., to ARCO Chemical Technology, L.P. Epoxidizer oxygen recovery. 5,468,885, Cl. 549-531.000.

Juki Corporation: *See—*
Fujita, Shuji; Baba, Yasushi; Itoh, Hitoshi; and Satoma, Shiro, 5,467,725, Cl. 112-162.000.
Sato, Koki, 5,467,577, Cl. 53-468.000.

Jun, Young K., to Goldstar Electron Co., Ltd. Isolation structure of semiconductor device and method for forming the same. 5,468,677, Cl. 437-70.000.

Jung, Sang-Don: *See—*
Song, Seok-Ho; and Jung, Sang-Don, 5,469,518, Cl. 385-09.000.

Jung, Yoon M.: *See—*

Kwon, Oh K.; Choi, Ung S.; Choi, Ki Y.; Mishkin, N. K.; and Jung, Yoon M., 5,468,529, Cl. 428-36.100.

Junge, Bodo: *See*—
Schohe-Loop, Rudolf; Heine, Hans-Georg; Junge, Bodo; Glaser, Thomas; De Vry, Jean M. V.; Dompert, Wolfgang; and Sommermeyer, Henning, 5,468,882, Cl. 549-407.000.

Junkers, John K. Fluid-operated torque tool. 5,467,671, Cl. 81-57.440.

Junya, Tempaku, to Samsung Electronics Co., Ltd. Data storage device with enhanced data security. 5,469,564, Cl. 395-188.010.

Kabushiki Kaisha Ace Denken: *See*—
Takemoto, Takatoshi, 5,467,857, Cl. 194-206.000.

Kabushiki Kaisha Hara Shokki Seisakusho: *See*—
Nishikawa, Shinjirou, 5,467,506, Cl. 19-223.000.

Kabushiki Kaisha Hayashibara: *See*—
Mandai, Takahiko; Yoneyama, Masaru; and Sakai, Shuzo, 5,468,850, Cl. 536-18.500.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Uchida, Hiroyuki; Yoshikawa, Kazuo; and Nishi, Seiji, 5,468,305, Cl. 148-120.000.
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Maruyama, Jun; and Yamashita, Koji, 5,467,688, Cl. 91-441.000.

Kabushiki Kaisha Kosmek: *See*—
Arisato, Akira; and Yonezawa, Keitaro, 5,468,136, Cl. 425-192.00R.

Kabushiki Kaisha Nippon Conlux: *See*—
Ishida, Takeshi; Koyama, Kenji; Kasama, Hiroshi; Nishiumi, Kenji; and Nakajima, Kenji, 5,468,181, Cl. 453-3.000.

Kabushiki Kaisha Shinkawa: *See*—
Terakado, Yoshimitsu, 5,468,927, Cl. 219-56.210.

Kabushiki Kaisha Tec: *See*—
Hirano, Takahisa; Takai, Masanori; and Taniguchi, Mitsuhiro, 5,468,076, Cl. 400-59.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Ohno, Kouichi; Miyatake, Hideki; and Yoshida, Yutaka, 5,469,296, Cl. 359-603.000.

Kabushiki Kaisha Topcon: *See*—
Katsuragi, Kenjiro, 5,469,233, Cl. 351-205.000.

Kabushiki Kaisha Toshiba: *See*—
Demura, Tatsuhiko, 5,469,273, Cl. 358-426.000.
Endoh, Tetsuo; Shirota, Riichiro; Ohuchi, Kazunori; Kirisawa, Ryouhei; Aritome, Seiichi; Tanaka, Tomoharu; and Tanaka, Yoshiyuki, 5,469,444, Cl. 371-215.000.
Fujiwara, Shigeru; Takahashi, Masashi; and Ishida, Haruhiko, 5,469,248, Cl. 355-326.00R.
Hamada, Keiji; Yoshida, Ritsuo; Iijima, Toshihiko; Yamamoto, Chiemi; and Kubo, Akihiko, 5,469,308, Cl. 360-71.000.
Harima, Takayuki, 5,468,985, Cl. 257-385.000.
Hibi, Kenji, 5,469,565, Cl. 395-181.000.
Hoshino, Chiaki; and Arai, Norihisa, 5,469,397, Cl. 365-210.000.
Itakura, Tetsuro, 5,469,092, Cl. 327-103.000.
Kato, Hiroaki; Heki, Hideaki; Komura, Shirou; and Okamura, Emiko, 5,467,791, Cl. 134-166.00C.
Obata, Yosimori, 5,469,071, Cl. 324-713.000.
Ono, Masahiko, 5,469,488, Cl. 378-15.000.
Sasaki, Kazuhito, 5,468,941, Cl. 235-379.000.
Sasaki, Masahiko; Tsuchiya, Yasutoshi; and Fukunaga, Hidetoshi, 5,467,606, Cl. 62-160.000.
Sato, Toshiro; Tanaka, Tomoharu; Mizoguchi, Tetsuhiko; and Ide, Yuji, 5,469,399, Cl. 365-226.000.
Shibata, Tsuyoshi; Hashimoto, Koji; and Hieda, Katsuhiko, 5,468,576, Cl. 430-5.000.
Tanoue, Koki; Yokota, Tsuneshi; and Yoshimaru, Tomohisa, 5,469,417, Cl. 369-50.000.
Yamamoto, Kiyoshi; Sugii, Nobuyuki; Kubo, Koichi; Ichikawa, Michiharu; and Yamauchi, Hisao, 5,468,806, Cl. 505-238.000.
Yamanashi, Mitsuhiro, 5,468,986, Cl. 257-389.000.
Yamano, Satoshi, 5,469,400, Cl. 365-230.010.
Yamazaki, Masahiko; Shibata, Yutaka; Natori, Kozi; Yahata, Mitsuru; and Nambu, Kyojiro, 5,469,429, Cl. 378-19.000.
Yoshimura, Atsushi; Shibata, Hiroshi; Takahashi, Fumio; and Tsurushima, Kuniaki, 5,467,803, Cl. 140-105.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Yamada, Kiyohiro; Iguchi, Masao; Shimizu, Izuru; and Watanabe, Yasushi, 5,468,130, Cl. 418-55.200.

Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo: *See*—
Ueno, Ryuji; and Oda, Tomio, 5,468,880, Cl. 549-263.000.

Kabushiki Kaisha Universal: *See*—
Okada, Kazuo, 5,467,856, Cl. 194-202.000.

Kacenas, Benjamin M.: *See*—
Shofner, Frederick M.; Chu, Youe-T; Baldwin, Joseph C.; Galyon, Michael E.; Kacenas, Benjamin M.; and Williams, Gordon F., 5,469,253, Cl. 356-238.000.

Kadambi, Jayant: *See*—
Thaler, Patricia A.; Kadambi, Jayant; Spratt, Michael; Albrecht, Alan R.; and Goody, Steven H., 5,469,439, Cl. 370-94.300.

Kado, Hiroyuki: *See*—
Tohda, Takao; Kado, Hiroyuki; and Yamamoto, Shinichi, 5,468,959, Cl. 250-306.000.

Kadonaga, Anne P., to Hewlett-Packard Company. Multiple pass printing for achieving increased print resolution. 5,469,198, Cl. 347-41.000.

Kaes, Guenter: *See*—
Megerle, Friedrich; Hohl, Guenther; Ludewig, Erich; and Kaes, Guenter, 5,468,057, Cl. 303-87.000.

Kagawa, Hitoshi, to Mitsubishi Denki Kabushiki Kaisha. Magneto-optic recording system and associated controllable heat source. 5,469,413, Cl. 369-13.000.

Kahlman, Josephus A. H. M.; and Rijckaert, Albert M. A., to U.S. Philips Corporation. Receiving arrangement including a variable equalizer which variable equalizer is controlled on the basis of one or more signal portions produced by the variable equalizer. 5,469,462, Cl. 375-232.000.

Kai, Kenjiro: *See*—
Nishida, Hiroshi; Nakagoshi, Kazuo; Kai, Kenjiro; and Onoyama, Katsumoto, 5,469,311, Cl. 360-97.020.

Kaigawa, Hiroyuki, to Rohm Co., Ltd. Method for manufacturing a device separation region for semiconductor device. 5,468,675, Cl. 437-69.000.

Kaiser, Trent M. V.: *See*—
Blose, Thomas L.; Britten, David L.; Humphreys, Kevin J.; and Kaiser, Trent M. V., 5,468,029, Cl. 285-328.000.

Kajita, Tatsuya, to Fujitsu Limited. Method of making semiconductor device with alignment marks. 5,468,664, Cl. 437-43.000.

Kajiyama, Yoshio: *See*—
Tokura, Nobuyuki; Kajiyama, Yoshio; Tatsuno, Hideo; and Nakashima, Takashi, 5,469,428, Cl. 370-161.000.

Kakascik, Tim, to Wheeling Pittsburgh Steel Corporation. Method and device for core sampling steel. 5,467,657, Cl. 73-864.440.

Kaku, Nobuyuki: *See*—
Takeda, Hidekazu; Kaku, Nobuyuki; and Ogiro, Kenji, 5,469,319, Cl. 360-132.000.

Kakui, Sonoko: *See*—
Miyazaki, Katsuo; Maeda, Takahide; Ogawa, Takeshi; Kakui, Sonoko; Ikeda, Satoshi; and Yamane, Yoshiki, 5,468,517, Cl. 427-322.000.

Kalocsai, Guy I. Z., to Skylab International Limited. Reversible transformation of hydrocarbons. 5,468,261, Cl. 44-268.000.

Kamada, Kenji; Sasaki, Keiji; Kitamura, Noboru; and Masuhara, Hiroshi. Method and apparatus for spectrometric measurement of particulate surfaces. 5,469,255, Cl. 356-300.000.

Kamata, Satoshi: *See*—
Osawa, Ryoko; Maekawa, Takashige; Momii, Tatsuo; and Kamata, Satoshi, 5,468,904, Cl. 568-333.000.

Kamaya, Naoki: *See*—
Maruichi, Takanori; Kamaya, Naoki; and Yamauchi, Toshiyuki, 5,469,211, Cl. 348-211.000.

Kameda, Osamu; Akutagawa, Hitoshi; Okita, Junichi; and Hirose, Ichiro, to Mazda Motor Corporation. Powertrain for an automotive vehicle. 5,467,668, Cl. 74-606.00R.

Kamhi, Victor M.: *See*—
Barnes, Keith D.; Kamhi, Victor M.; and Diebl, Robert E., 5,468,877, Cl. 548-543.000.

Kamiya, Toshikazu: *See*—
Honda, Shinkichi; Torii, Kenji; Arai, Yoichiro; Kasai, Masaji; Kato, Hiromasa; Iida, Takao; Takahashi, Tomoya; Yokoo, Yoshiharu; Kamiya, Toshikazu; and Tamaoki, Tatsuya, 5,468,474, Cl. 424-70.100.

Kamo, Tetsuro: *See*—
Yamaguchi, Eiji; Uragami, Yuji; Yokozuka, Hideharu; Uekusa, Kikoo; Yamaguchi, Toshio; Abe, Satoshi; Kamo, Tetsuro; and Suzuki, Takao, 5,468,709, Cl. 502-210.000.

Kamohara, Hiroaki: *See*—
Ito, Akira; and Kamohara, Hiroaki, 5,469,066, Cl. 324-551.000.

Kanai, Masahiro; Fujioka, Yasushi; Yoshino, Takehito; and Hori, Tadashi, to Canon Kabushiki Kaisha. Method for forming a photoelectric deposited film. 5,468,521, Cl. 427-575.000.

Kanamaru, Hisanobu, to Hitachi, Ltd. Revolving cam-type press. 5,467,707, Cl. 100-292.000.

Kanayama, Hiroyuki: *See*—
Iwami, Hiroyuki; Fukuoka, Masayoshi; and Kanayama, Hiroyuki, 5,468,141, Cl. 425-542.000.

Kanayama, Toshihiko, to Agency of Industrial Science and Technology. Method and apparatus for trapping charged particles. 5,469,323, Cl. 361-225.000.

Kanbe, Rokuro: *See*—
Imai, Ryuji; and Kanbe, Rokuro, 5,468,997, Cl. 257-734.000.

Kanbe, Toshio: *See*—
Hirao, Toru; Sato, Hideki; and Kanbe, Toshio, 5,467,863, Cl. 198-360.000.

Kane, Edward G.: *See*—
Davis, James A.; Kane, Edward G.; Alexander, Brian S.; and Barham, William F., 5,468,550, Cl. 428-327.000.

Kane, Mark J.: *See*—
Pyszczek, Michael F.; Takeuchi, Esther S.; and Kane, Mark J., 5,468,569, Cl. 429-94.000.

Kane, Robert C.; and Hilgers, Kevin B., to Motorola. Field emission device employing a sequential emitter electrode formation method. 5,468,169, Cl. 445-50.000.

Kaneda, Kazuo; and Ushiro, Masayuki, to Nissan Texsys Co., Ltd. Warp yarn leveling motion incorporated with a loom stop timing judging device. 5,467,801, Cl. 139-1.00E.

Kanekawa, Nobuyasu; Ihara, Hirokazu; Akiyama, Masatsugu; Kawabata, Kiyoshi; Yamanaka, Hisayoshi; and Okishima, Tetsuya, to Hitachi, Ltd. Electronic circuit package including plural bare chips mounted on a single wiring substrate. 5,468,992, Cl. 257-676.000.

Kaneko, Akira; Kanno, Toru; and Morishita, Keiko, to Matsushita Electric Industrial Co., Ltd. Functional vacuum microelectronic field-emission device. 5,469,015, Cl. 313-309.000.

Kanemaru, Seigo: *See*—
Itoh, Shigeo; Watanabe, Teruo; Miyamori, Makoto; Nishimura, Norio; Itoh, Junji; and Kanemaru, Seigo, 5,469,014, Cl. 313-308.000.

Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, to Sharp Kabushiki Kaisha. Fault tolerant active matrix display device. 5,469,025, Cl. 315-169.300.

Kanerva, Ronald, to Shop Industrial 510851 Ontario Ltd., The. Towing hitch. 5,468,007, Cl. 280-499.000.

Kanetake, Yasuo, to Rohm Co., Ltd. Solid electrolytic capacitor. 5,469,326, Cl. 361-534.000.

Kang, Hyung J., to Goldstar Co., Ltd. Microwave oven for simultaneously cooking two dishes of food. 5,468,940, Cl. 219-746.000.

Kang, Michael, to United States of America, Energy. Large discharge-volume, silent discharge spark plug. 5,469,013, Cl. 313-138.000.

Kang, Sung-Mo: *See*—
Diaz, Carlos H.; Duvvury, Charvaka; and Kang, Sung-Mo, 5,468,667, Cl. 437-50.000.

Kanno, Tatsuya: *See*—
Okano, Yoshimichi; Kanno, Tatsuya; Yamato, Tsutomu; Oshino, Yasuhiro; Tanigawa, Michiyo; Kuwana, Takaaki; and Fukuda, Yutaka, 5,468,836, Cl. 528-204.000.

Kanno, Toru: *See*—
Kaneko, Akira; Kanno, Toru; and Morishita, Keiko, 5,469,015, Cl. 313-309.000.

Kanno, Toshiaki; Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, to Yazaki Corporation. Conductive member for electric circuit and electric circuit body, and method for fabricating them. 5,468,918, Cl. 174-256.000.

Kano, Ai: *See*—
Shaku, Masao; Ohkura, Sayuri; Kuroda, Hideo; Kano, Ai; and Nakabayashi, Nobuo, 5,468,475, Cl. 424-70.160.

Kano, Makoto: *See*—
Fujiki, Akira; and Kano, Makoto, 5,468,310, Cl. 148-435.000.

Kanoh, Hiromasa: *See*—
Zenno, Shuhei; Inouye, Satoshi; Kanoh, Hiromasa; and Saigo, Kaoru, 5,468,631, Cl. 435-189.000.

Kant-ly Ltd.: *See*—
Naim, Moshe, 5,468,100, Cl. 409-234.000.

Kantor, Ellis; and Heymann, Daniel H. Collector's model disintegrator pistol (CMDF). 5,468,170, Cl. 446-23.000.

Kao Corporation: *See*—
Yamashita, Hiroyuki; Kondo, Hiroyuki; Hatano, Kouichi; Nakano, Katsunori; Toyoda, Kouji; and Senzaki, Takashi, 5,468,516, Cl. 427-180.000.

Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; Brown, David L.; and Holzwarth, Henry A., to United States Surgical Corporation. Packaged synthetic absorbable surgical elements. 5,468,252, Cl. 606-228.000.

Karabatsos, Chris; and Smith, Gary W. Heat sink header assembly. 5,469,330, Cl. 361-704.000.

Karampurwala, Hashain: *See*—
Yang, Dian; and Karampurwala, Hashain, 5,469,366, Cl. 364-489.000.

Karp, Gregory P.: *See*—
Hanschen, Thomas P.; Krueger, Dennis L.; and Karp, Gregory P., 5,468,428, Cl. 264-483.000.

Karp, Richard M., to DVA Ltd. Multiconnection switching networks. 5,469,154, Cl. 340-825.800.

Karr, Shawn E.: *See*—
Measures, Raymond M.; Alavie, Tino; Melle, Serge M.; Coroy, Trent; Mason, Beck; Karr, Shawn E.; and Liu, Kexing, 5,469,265, Cl. 356-419.000.

Karr, Stephen L.: *See*—
Gevas, Philip C.; Grimes, Stephen; Karr, Stephen L.; Michaeli, Dov; and Scibienski, Robert, 5,468,494, Cl. 424-195.110.

Kasa, Yasushi: *See*—
Kumakura, Sinsuke; Yamazaki, Hirokazu; Watanabe, Hisayoshi; and Kasa, Yasushi, 5,469,394, Cl. 365-201.000.

Kasahara, Osamu: *See*—
Nishizawa, Hirotaka; Azuma, Seiichiro; Ootoshi, Kazuaki; Miyama, Masataka; Kawata, Shuji; Kasahara, Osamu; and Suzuki, Sinichi, 5,468,989, Cl. 257-517.000.

Kasai, Masaji: *See*—
Honda, Shinkichi; Torii, Kenji; Arai, Yoichiro; Kasai, Masaji; Kato, Hiromasa; Iida, Takao; Takahashi, Tomoya; Yokoo, Yoshiharu; Kamiya, Toshikazu; and Tamaoki, Tatsuya, 5,468,474, Cl. 424-70.100.

Kasama, Hiroshi: *See*—
Ishida, Takeshi; Koyama, Kenji; Kasama, Hiroshi; Nishiumi, Kenji; and Nakajima, Kenji, 5,468,181, Cl. 453-3.000.

Kashiwabara, Masuo, to Unisia Jecs Corporation. Apparatus and method for control of a vehicle fitted with an automatic continuously variable transmission. 5,468,195, Cl. 477-46.000.

Kashiwazaki, Masami; and Nagata, Satoshi, to Canon Kabushiki Kaisha. Printing apparatus and method that discriminates which analyzer should analyze information. 5,469,373, Cl. 364-550.000.

Kashizaki, Yoshio: *See*—
Go, Shintetsu; Kashizaki, Yoshio; Suzuki, Koichi; Sato, Kazuma; and Shimada, Akira, 5,468,584, Cl. 430-65.000.

Kasica, James J.: *See*—
Wai-Chiu, Chung; and Kasica, James J., 5,468,286, Cl. 106-210.000.

Kasowski, Hermann: *See*—
Schönberger, Eduard; Gruber, Stefan; Kasowski, Hermann; and Schmidt, Heinz, 5,468,909, Cl. 174-16.100.

Kastenhofer, Gerhard, to Schneider (Europe) A.G. Blister packaging with spring means therein. 5,467,873, Cl. 206-363.000.

Katakura, Kazunori; Okada, Shinjiro; and Inaba, Yutaka, to Canon Kabushiki Kaisha. Driving method for liquid crystal device which is not affected by a threshold characteristic change. 5,469,281, Cl. 359-56.000.

Katayama, Kouichi: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Katayama, Mikio: *See*—
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.

Katayama, Satoshi: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Kato, Akihiko: *See*—
Sunaga, Takayuki; Kato, Akihiko; Sakamoto, Takashi; and Miyata, Hideaki, 5,469,246, Cl. 355-251.000.

Kato, Bunkichi: *See*—
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Sato, Makoto; Oowaki, Hiroyuki; Kato, Bunkichi; and Takahashi, Haruo, 5,468,728, Cl. 514-12.000.

Kato, Heizaburo, to Sankyo Seisakusho Co. Mechanical pressing machine. 5,467,633, Cl. 72-452.000.

Kato, Heizaburo, to Sankyo Seisakusho Co. Mechanical pressing machine with dynamic balancing device. 5,467,706, Cl. 100-282.000.

Kato, Hiroaki; Heki, Hideaki; Komura, Shirou; and Okamura, Emiko, to Kabushiki Kaisha Toshiba. Ultrasonic cleaning method and device therefor. 5,467,791, Cl. 134-166.00C.

Kato, Hiroaki: *See*—
Aoki, Takuya; Shimasaki, Yuichi; Matsumoto, Seiji; Hatcho, Seiji; Oketani, Toshikazu; Miyashita, Yukio; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,467,594, Cl. 60-276.000.
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.

Kato, Hiromasa: *See*—
Honda, Shinkichi; Torii, Kenji; Arai, Yoichiro; Kasai, Masaji; Kato, Hiromasa; Iida, Takao; Takahashi, Tomoya; Yokoo, Yoshiharu; Kamiya, Toshikazu; and Tamaoki, Tatsuya, 5,468,474, Cl. 424-70.100.

Kato, Hiroshi: *See*—
Kikukawa, Hiroyasu; and Kato, Hiroshi, 5,468,531, Cl. 428-36.500.

Kato, Kanji, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Process for cooling water and cooling tower. 5,468,426, Cl. 261-153.000.

Kato, Kanji: *See*—
Hatakeyama, Atsushi; Fujisawa, Hiromichi; Kato, Kanji; Kawaguchi, Hisamitsu; Minegishi, Naoki; Tada, Katsumi; and Asakawa, Satoshi, 5,469,354, Cl. 364-419.190.

Kato, Katsuhito: *See*—
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,469,266, Cl. 358-298.000.

Kato, Kazuyuki. Condom. 5,467,781, Cl. 128-844.000.

Kato, Masaru: *See*—
Minato, Toshihiro; Kato, Masaru; and Yasuda, Kenji, 5,468,712, Cl. 503-227.000.

Kato, Shinichiro: *See*—
Kubota, Kiyoto; Takeuchi, Hiroto; and Kato, Shinichiro, 5,467,945, Cl. 246-26.000.

Kato, Yukio: *See*—
Igarashi, Shinya; Hirayama, Hiroshi; Kobayashi, Chihiro; Tsutsui, Mitsukuni; and Kato, Yukio, 5,467,648, Cl. 73-202.500.

Katoh, Ikuo: *See*—

Suzuki, Yoshihisa; Sugawara, Yuuichi; Ishihara, Susumu; and Katoh, Ikuo, 5,469,012, Cl. 310-348.000.

Katoh, Kazunobu: *See*—
Nii, Kazumi; Hoshimiya, Takashi; Katoh, Kazunobu; and Ezoe, Toshihide, 5,468,592, Cl. 430-264.000.

Katoh, Kazuo: *See*—
Yabuuchi, Masahiko; Akanuma, Hiroshi; Masuda, Minoru; Katoh, Kazuo; Nakamura, Tsuneo; Tajima, Shigeru; Hashiba, Masashi; Hayami, Hiroshi; Takezawa, Tomoko; and Hirayama, Masachika, 5,468,380, Cl. 210-198.200.

Katsuda, Yoshio, to Dainihon Jochugiku Co., Ltd. Fuming, hot-vaporizing insecticide for killing flies, and method for killing flies with the same. 5,468,497, Cl. 424-405.000.

Katsuma, Nobuo, to Fuji Photo Film Co., Ltd. Thermal printer and device and method for measuring resistance of thermal head of thermal printer. 5,469,068, Cl. 324-678.000.

Katsumata, Makoto: *See*—
Kanno, Toshiaki; Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, 5,468,918, Cl. 174-256.000.

Katsuragi, Kenjiro, to Kabushiki Kaisha Topcon. Ophthalmologic instrumeat. 5,469,233, Cl. 351-205.000.

Katz, Joseph: *See*—
Alexander, Edward R.; Goldman, Ron; Li, Yajun; Bard, Simon; Strat, Askold; Katz, Joseph; and Metlitsky, Boris, 5,468,952, Cl. 235-492.000.

Katze, Alan B., Jr.: *See*—
Kurdzo, James P.; and Katze, Alan B., Jr., 5,469,434, Cl. 370-67.000.

Kaufman, Benjamin J.: *See*—
DeRosa, Thomas F.; Studzinski, William M.; Russo, Joseph M.; Kaufman, Benjamin J.; and Hahn, Robert T., 5,468,264, Cl. 44-426.000.

Kaufmann, Marita: *See*—
Fölsch, Karl J.; Kaufmann, Marita; and Hartmann, Jürgen, 5,468,800, Cl. 524-458.000.

Kausch, William L.: *See*—
Morrison, Eric D.; Boston, David R.; Hedrick, Steven T.; Kausch, William L.; Larson, Wayne K.; and Fung, Simon S., 5,468,498, Cl. 524-408.000.

Kavehrad, Mohsen; and Yun, Gang, to University of Ottawa. Optical interconnection device. 5,469,277, Cl. 359-15.000.

Kaveney, Jack R.: *See*—
Camp, Calvin C.; Kaveney, Jack R.; Garman, Ronald H.; Vanderburg, Raymond M.; and Kingsinger, Malcolm H., 5,467,560, Cl. 49-413.000.

Kawabata, Kiyoshi: *See*—
Kanekawa, Nobuyasu; Ihara, Hirokazu; Akiyama, Masatsugu; Kawabata, Kiyoshi; Yamanaka, Hisayoshi; and Otkishima, Tetsuya, 5,468,992, Cl. 257-676.000.

Kawabe, Ushio: *See*—
Nishino, Toshikazu; Hasegawa, Haruhiro; and Kawabe, Ushio, 5,468,723, Cl. 505-330.000.

Kawaguchi, Akio: *See*—
Yanagihara, Hiromichi; Sato, Yasuo; and Kawaguchi, Akio, 5,467,757, Cl. 123-305.000.

Kawaguchi, Hisamitsu: *See*—
Hatakeyama, Atsushi; Fujisawa, Hiromichi; Kato, Kanji; Kawaguchi, Hisamitsu; Minegishi, Naoki; Tada, Katsumi; and Asakawa, Satoshi, 5,469,354, Cl. 364-419.190.

Kawaguchi, Kiyoshi: *See*—
Etoh, Makoto; and Kawaguchi, Kiyoshi, 5,467,880, Cl. 215-256.000.

Kawaguchi, Shinji: *See*—
Sasaki, Norio; Kudo, Sachio; Watanabe, Michi; Endo, Keiji; and Kawaguchi, Shinji, 5,468,721, Cl. 504-243.000.

Kawaguchi, Takashi: *See*—
Hoshino, Mitsuo; Tsutsumi, Yuka; Shimada, Mitsuhiro; Masuda, Takashi; Morimiya, Yuji; Ide, Yoshihiro; Kawaguchi, Takashi; and Nogo, Yuichiro, 5,469,271, Cl. 358-335.000.

Kawahara, Tetsuya: *See*—
Okano, Kazuo; Miyazawa, Shubei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Kawakami, Hiroshi: *See*—
Ebata, Takashi; Matsumoto, Katsuya; Koseki, Koshi; Kawakami, Hiroshi; Matsushita, Hajime; Yoshikoshi, Hajime; and Okaniwa, Masakazu, 5,468,881, Cl. 549-295.000.

Kawamoto, Hiedaki, to NEC Corporation. Method of cleaning an etching chamber of a dry etching system. 5,468,686, Cl. 437-229.000.

Kawamura, Makoto: *See*—
Tsuyama, Toshiaki; Onaka, Toru; Nobumoto, Kazutoshi; and Kawamura, Makoto, 5,469,359, Cl. 364-426.030.

Kawamura, Matsue: *See*—
Takematsu, Tetsu; Komata, Takeo; Kume, Takashi; Suzuki, Kiyoshi; Kawamura, Matsue; Shirakawa, Yumiko; and Mori, Kaoru, 5,468,719, Cl. 504-224.000.

Kawamura, Norio: *See*—
Narimatsu, Kiyoyuki; and Kawamura, Norio, 5,467,771, Cl. 128-672.000.

Kawamura, Yoshiaki, to Canon Kabushiki Kaisha. Outputting apparatus. 5,469,514, Cl. 382-297.000.

Kawanishi, Toshio: *See*—
Matsushiro, Aizo, 5,468,479, Cl. 424-93.440.

Kawanishi, Umeo; Hirayama, Nobuhisa; Hamabe, Takeshi; and Takagi, Toru, to Nissan Motor Co., Ltd.; and Nippon Valqua Industries, Ltd. Circuit elements for microwave and millimeter-wave bands and method of producing same. 5,469,128, Cl. 333-22.00R.

Kawasaki, Shoji: *See*—
Matsumoto, Katsuru; Hirayama, Nobuhiro; Kawasaki, Shoji; Uchiyama, Kenji; Uramoto, Katsuo; and Fukui, Tamami, 5,468,585, Cl. 430-110.000.

Kawashima, Hirofumi, to Seiko Electronic Components Ltd. Method of adjusting frequency of NS-GT cut quartz resonator. 5,469,010, Cl. 310-312.000.

Kawashima, Katsuhiro: *See*—
Hyoguchi, Takao; and Kawashima, Katsuhiro, 5,467,655, Cl. 73-579.000.

Kawashima, Ken'ichi: *See*—
Minowa, Toshimichi; Nishimura, Yutaka; Kawashima, Ken'ichi; Kuroiwa, Hiroshi; and Ibamoto, Masahiko, 5,468,196, Cl. 477-62.000.

Kawata, Shuji: *See*—
Nishizawa, Hirotaka; Azuma, Seiichiro; Ootoshi, Kazuaki; Miyama, Masataka; Kawata, Shuji; Kasahara, Osamu; and Suzuki, Simichi, 5,468,989, Cl. 257-517.000.

Kayahara, Kenji; and Shimada, Shunsuke, to Kyokado Engineering Co., Ltd. Grouting liquid for injection into a ground. 5,468,292, Cl. 106-789.000.

Kaye, Ronald S.: *See*—
Dufty, Raymond J.; and Kaye, Ronald S., 5,468,267, Cl. 47-1.010.

Kaynor, Mark: *See*—
Gradzki, Pawel; Kaynor, Mark; and Gruber, David, 5,469,144, Cl. 340-603.000.

Kean, Thomas A., to Xilinx, Inc. Hierarchically connectable configurable cellular array. 5,469,003, Cl. 326-39.000.

Keane, Peter: *See*—
Bachy, André; Fraisse, Laurent; Keane, Peter; Mendes, Etienne; Vernieres, Jean-Claude; and Simiand, Jacques, 5,468,750, Cl. 514-255.000.

Keay, Kathleen D.: *See*—
Graham, Marcus L.; MacDonald, John F.; Gong, Kai F.; and Keay, Kathleen D., 5,469,374, Cl. 364-516.000.

Keegan, Joseph P.; and Devlin, Thomas E. Self-sharpening scraping tool. 5,467,498, Cl. 15-236.050.

Keeler, Russell L.; and Underbrink, John M., to BigToys, Inc. Sliding-handgrip amusement apparatus. 5,468,199, Cl. 482-35.000.

Keen, Harry J.; and Dunne, Mike, to Fairbanks Inc. Dimension-measuring apparatus. 5,469,262, Cl. 356-386.000.

Keene, Darren S.: *See*—
Abrams, Richard; Edwards, Russell J.; Ebel, James A.; and Keene, Darren S., 5,467,868, Cl. 206-5.100.

Keller, Daniel L.: *See*—
Daniel, Edward A.; Couchot, Norman J.; Keller, Daniel L.; and Brewer, William C., 5,467,705, Cl. 100-214.000.

Keller, Dieter; and Mück, Manfred, to Blanco GmbH & Co. KG. Device for preparing foods. 5,467,695, Cl. 99-422.000.

Keller, Niklaus, to Sulzer-Escher Wyss AG. Double-acting pusher centrifuge. 5,468,389, Cl. 210-360.200.

Keller, Robert F.: *See*—
Godsey, James H.; Jacox, James L.; Keller, Robert F.; and Legare, Richard J., 5,468,311, Cl. 149-19.400.

Kelley, Edward E.: *See*—
Dauerer, Norman J.; and Kelley, Edward E., 5,469,576, Cl. 395-186.000.

Kelley, Kurtis C., to Caterpillar Inc. Ceramic adhesive. 5,468,290, Cl. 106-615.000.

Kelley, Mark D.: *See*—
Stanley, Thomas R.; and Kelley, Mark D., 5,468,179, Cl. 452-37.000.

Kelly, James D.: *See*—
Krein, William T.; Hochsprung, Ronald R.; and Kelly, James D., 5,469,435, Cl. 370-85.200.

Kelsey-Hayes Company: *See*—
Linkner, Herbert L., Jr., 5,468,058, Cl. 303-115.200.

Kemmochi, Kazuhisa: *See*—
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,469,266, Cl. 358-298.000.

Kemp, Christopher J., to Ford Motor Company. Circuit and method for digital to analog signal conversion. 5,469,164, Cl. 341-145.000.

Kenkare, Divaker: *See*—
Dixit, Nagaraj S.; D'Ambrogio, Robert; Kenkare, Divaker; and Drapier, Julien, 5,468,411, Cl. 252-99.000.

Kennametal Inc.: *See*—
Miller, Thomas R.; and Sheirer, Daniel C., 5,467,837, Cl. 175-420.100.

Kennedy, Michael: *See*—
McGregor, Gordon L.; Minor, Raymond B.; Hardie, William; and Kennedy, Michael, 5,468,314, Cl. 156-56.000.

Kennedy, Michael A.: *See*—
Hani, Rahim; Dumas, Richard H.; Gavia, David F.; Harrison, Charles H.; Kennedy, Michael A.; Schiessl, Henry W.; McMahon, Robert E.; and Manke, Steven A., 5,468,864, Cl. 546-345.000.

Keunerknecht, Steven. Ceramic core for investment casting and method for preparation of the same. 5,468,285, Cl. 106-38.300.

Kenny, John: *See*—
Uenaka, Akimitsu; Toyoda, Yuji; Tsutsui, Koichi; and Kenny, John, 5,468,813, Cl. 525-385.000.

Kent, Howard D.: *See*—
Dove, Donald C.; and Kent, Howard D., 5,469,045, Cl. 323-211.000.

Kenyoshi, Kaoru, to NEC Corporation. Telephone call saving system and method for an integrated service digital network. 5,469,493, Cl. 379-9.000.

Kerfoot, Charles S.: *See*—
O' Donnell, Patricia A.; Kerfoot, Charles S.; and Springer, Joseph J., 5,469,124, Cl. 336-61.000.

Kerfoot, Derek G. E., to Sherritt Gordon Limited. Process for the separation of cobalt from nickel. 5,468,281, Cl. 75-710.000.

Kerr, G. Scott: *See*—
Ahonen, Gene M.; and Kerr, G. Scott, 5,467,894, Cl. 221-71.000.

Kerschner, Ronald K.; Heumann, John M.; McDermid, John E.; Schlotzhauer, Ed. O.; and Crook, David T., to Hewlett-Packard Company. Electrical assembly testing using robotic positioning of probes. 5,469,064, Cl. 324-537.000.

Kerz, Lado, to Linotype-Hell AG. Method for generating and storing digitized density thresholds for rastering a half tone original image. 5,469,516, Cl. 382-254.000.

Keusch, Siegfried: *See*—
Obermeier, Josef; Müller-Boysen, Ulrich; Keusch, Siegfried; and Gaffal, Peter, 5,467,835, Cl. 175-209.000.

Khatibi, Janis M. Snap fastener and method of installing removable trim. 5,467,571, Cl. 52-718.040.

Khetani, Vikram: *See*—
Raju, Muppala S.; and Khetani, Vikram, 5,468,865, Cl. 548-229.000.

Khouzam, Cesare; and Ferroni, Gianfranco, to Silvani Antincedi. Composition for use in washing and cleansing vulcanization molds. 5,468,422, Cl. 252-544.000.

Kiefer, Hans: *See*—
Grafen, Paul; Kiefer, Hans; and Jaedicke, Hagen, 5,468,883, Cl. 549-411.000.

Kiessig, Andreas: *See*—
Antony, Paul; Falter, Wolfgang; Kiessig, Andreas; and Berg, Matthias, 5,467,847, Cl. 188-73.390.

Kikuchi, Horishi. Parametrically amplifying traveling-wave antenna. 5,469,179, Cl. 343-731.000.

Kikugawa, Atsushi: *See*—
Hosaka, Sumio; Kikugawa, Atsushi; Honda, Yukio; Koyanagi, Hajime; and Nagasawa, Kiyosi, 5,467,642, Cl. 73-105.000.

Kikugawa, Shozo: *See*—
Isozaki, Shin; Kikugawa, Shozo; and Iwata, Eiji, 5,469,313, Cl. 360-104.000.

Kikukawa, Hiroyasu; and Kato, Hiroshi, to Japan Gore-Tex, Inc. Elastic fixing roll. 5,468,531, Cl. 428-36.500.

Kilbride, Terence K.: *See*—
Lisa, Rudolph E.; Kilbride, Terence K.; and Jager, Karl-Friedrich, 5,468,720, Cl. 504-236.000.

Kildune, Joseph S., to GenCorp Inc. Direct applied embossing casting method. 5,467,708, Cl. 101-32.000.

Kim, Beom S.; Lee, Jin H.; and Koo, Kyoung B., to Hyundai Electronics Industries Co., Ltd. Memory address and display control apparatus for high definition television. 5,469,228, Cl. 348-715.000.

Kim, Choon W.: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.

Kim, Chun T., to Samsung Electronics Co., Ltd. Compact sterilizing deodorizing and freshness-preserving apparatus for use in a refrigerator. 5,468,454, Cl. 422-121.000.

Kim, Chun-Sik; Yoon, Young-Rok; and Kim, Seong-keun, to Kumho & Co., Inc. Tire molder shoulder bladder. 5,468,328, Cl. 156-401.000.

Kim, Duk-han: *See*—
Chung, Hyun-jong; Yim, Sang-chul; Ku, Bon-chul; Gueu, Ho-young; and Kim, Duk-han, 5,468,263, Cl. 44-39.00L.

Kim, Hae R.: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.

Kim, Hak R.: *See*—
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.

Kim, Jae C. Auxiliary brake for automobile. 5,468,056, Cl. 303-87.000.

Kim, Jeong H.: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.

Kim, Jong B.: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.

Kim, Jong-Kab: *See*—
Park, Youn-Won; and Kim, Jong-Kab, 5,469,480, Cl. 376-299.000.

Kim, Jong-woo, to Samsung Electronics Co., Ltd. Printing without margins. 5,469,204, Cl. 347-218.000.

Kim, Kyung R.: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.

Kim, Kyung T.: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.

Kim, Myung K.: *See*—
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.

Kim, Seong-keun: *See*—
Kim, Chun-Sik; Yoon, Young-Rok; and Kim, Seong-keun, 5,468,328, Cl. 156-401.000.

Kim, Suk-ki: *See*—
Bahng, Sam-yong; and Kim, Suk-ki, 5,469,086, Cl. 327-18.000.

Kim, Tae S.: *See*—
Yuan, Han-Tzong; Plumton, Donald L.; Kim, Tae S.; and Yang, Jau-Yuann, 5,468,661, Cl. 437-40.000.

Kim, Tae-hoon, to Goldstar Electron Co., Ltd. Circuit for clamping enable clock in a semiconductor memory device. 5,469,387, Cl. 365-189.090.

Kim, Wan S.: *See*—
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.

Kimberly-Clark Corporation: *See*—
Chen, Franklin M. C.; and Druecke, Frank G., 5,468,796, Cl. 524-377.000.
Everhart, Dennis; Deibler, Elizabeth A.; and Taylor, Julie R., 5,468,236, Cl. 604-361.000.

Kimijima, Masami: *See*—
Nakamura, Kosei; Hayashi, Yoshiyuki; Kimijima, Masami; and Arimatsu, Yohei, 5,467,521, Cl. 29-598.000.

Kimmich, Ulrich: *See*—
Loquet, Rüdiger; and Kimmich, Ulrich, 5,467,616, Cl. 66-60.00R.

Kimoto, Mamoru: *See*—
Takee, Masao; Kimoto, Mamoru; Tikano, Yoshito; Mizitaki, Husago; Mastuura, Yoshinori; Nishio, Koji; and Furukawa, Nobohiro, 5,468,260, Cl. 29-623.500.

Kimura, Koichi: *See*—
Hosoda, Yasushi; Shiota, Toshiaki; Suzuki, Nobukazu; Ikeda, Satoshi; Odawa, Taketosi; Kimura, Koichi; and Yamamoto, Hisataka, 5,468,461, Cl. 523-435.000.

Kimura, Minoru: *See*—
Kogure, Mitsuhiro; Nagashima, Shinichi; Wakabayashi, Kazuhita; Enkaku, Shigeyuki; Shimayama, Hitoshi; Kimura, Minoru; Shimoyama, Shuji; and Yokoo, Tsugio, 5,467,632, Cl. 72-379.200.

Kimura, Scott A., to AuraVision Corporation. Shared line buffer architecture for a video processing circuit. 5,469,223, Cl. 348-581.000.

Kimura, Yoshio, to Lucky Corporation Co., Ltd. Hair curler and method of manufacturing the same. 5,467,788, Cl. 132-255.000.

Kindler, David J.; and Dupuis, David J., to Quantum Corporation. Lapping fixture for disk sliders. 5,468,177, Cl. 451-364.000.

Kingman, John A.; Larky, Steven P.; and Vanover, Michael T., to International Business Machines Corporation. Window specific control of overlay planes in a graphics display system. 5,469,541, Cl. 395-158.000.

Kingsinger, Malcolm H.: *See*—
Camp, Calvin C.; Kaveney, Jack R.; Garman, Ronald H.; Vanderburg, Raymond M.; and Kingsinger, Malcolm H., 5,467,560, Cl. 49-413.000.

Kinson, Robert D., *Jr.*, to Baumfolder Corporation. Cutting apparatus. 5,467,677, Cl. 83-155.000.

Kioka, Mamoru; and Yashiki, Tsuneo, to Mitsui Petrochemical Industries, Ltd. Titanium catalyst component for ethylene polymerization, ethylene polymerization catalyst, and process for ethylene polymerization using the same. 5,468,703, Cl. 502-108.000.

Kipp, Winfried: *See*—
Newman, Charles L.; and Kipp, Winfried, 5,468,231, Cl. 604-180.000.

Kirby, Ronald K.; and Watson, James W. Method of making a high-definition printed circuit. 5,468,345, Cl. 216-51.000.

Kirchhoff, Hans-Gerd: *See*—
Puester, Harald; and Kirchhoff, Hans-Gerd, 5,469,083, Cl. 326-93.000.

Kirin-Amgen Inc.: *See*—
Ichikawa, Takanori; Kuwaki, Tomoaki; Matsuki, Shigeru; and Tachibana, Katsumi, 5,468,846, Cl. 530-388.230.

Kirisawa, Ryouhei: *See*—
Endoh, Tetsuo; Shirota, Riichiro; Ohuchi, Kazunori; Kirisawa, Ryouhei; Aritome, Seiichi; Tanaka, Tomoharu; and Tanaka, Yoshiyuki, 5,469,444, Cl. 371-215.000.

Kirk, Adrian P.: *See*—
Cooley, Neil A.; and Kirk, Adrian P., 5,468,708, Cl. 502-162.000.

Kirk, Gregory L.: *See*—
Harris, Albert K. M.; Kirk, Gregory L.; Owicki, John C.; Dawes, Timothy D.; and Kuo, Richard C., 5,468,605, Cl. 435-4.000.

Kirk, Mark: *See*—
Biavasco, Raffaella; Kirk, Mark; and Giribone, Giovanni, 5,468,599, Cl. 430-512.000.

Kirollos, Kirollos S.; Mihaylov, Gueorgui M.; Lockerby, Kevin L.; and Stobnicki, Roman A. Method for real-time colorimetric measurement of exposure to airborne pollutants. 5,468,645, Cl. 436-164.000.

Kirsch, Thomas A.; and Green, Lloyd G., to TRW Inc. Auto ignition package for an air bag inflator. 5,468,017, Cl. 280-741.000.

Kirshner, Mark F., to Litton Systems, Inc. Capacitive stub for enhancing efficiency and bandwidth in a klystron. 5,469,023, Cl. 315-5.390.

Kirshner, Mark F.; and Symons, Robert S., to Litton Systems, Inc. Leaky wall filter for use in extended interaction klystron. 5,469,024, Cl. 315-5.390.

Kirtland, Ralph. Continuous feed, low pressure process for manufacturing thermoplastic posts. 5,468,436, Cl. 264-112.000.

Kischkewitz, Jürgen: *See*—
Bötje, Kai; and Kischkewitz, Jürgen, 5,468,463, Cl. 423-612.000.

Kishimoto, Junichi: *See*—
Kobari, Hirokazu; and Kishimoto, Junichi, 5,468,016, Cl. 280-741.000.

Kiso, Koichi: *See*—
Yamaguchi, Ryuichi; Kiso, Koichi; Tazuke, Kiyoshi; Machida, Hideaki; Mihirogi, Katsuhiro; and Takamatsu, Yukichi, 5,468,894, Cl. 556-477.000.

Kitabatake, Osamu, to NEC Corporation. Quantization bit number allocation by first selecting a subband signal having a maximum of signal to mask ratios in an input signal. 5,469,474, Cl. 375-243.000.

Kitamura, Noboru: *See*—
Kanada, Kenji; Sasaki, Keiji; Kitamura, Noboru; and Masuhara, Hiroshi, 5,469,255, Cl. 356-300.000.

Kitamura, Shigeto: *See*—
Suzuki, Fumio; Kuroda, Takeshi; Kitamura, Shigeto; and Ohmori, Kenji, 5,468,756, Cl. 514-293.000.

Kitano, Toshiaki, to Mitsubishi Denki Kabushiki Kaisha. Etching solution and etching method for semiconductors and method for evaluating GaAs surface. 5,468,343, Cl. 156-656.100.

Kitko, Frederick A.; and Kitko, Frederick R. Rotary device for removing paint from a surface. 5,468,178, Cl. 451-548.000.

Kitko, Frederick R.: *See*—
Kitko, Frederick A.; and Kitko, Frederick R., 5,468,178, Cl. 451-548.000.

Kitteringham, John: *See*—
Fortunak, Joseph; Kitteringham, John; Sisti, Nicholas; and Wood, Jeffery, 5,468,859, Cl. 546-48.000.

Kitzhaber, Jeremy T. Ambidextrous golf driving net. 5,467,990, Cl. 273-181.00F.

Kiyohara, Tokuzo: *See*—
Suzuki, Masato; and Kiyohara, Tokuzo, 5,469,552, Cl. 395-375.000.

Klang, James K.: *See*—
Cherng, Jing-Yih; and Klang, James K., 5,469,043, Cl. 320-31.000.

Kleemann, Heinz-Werner: *See*—
Heitsch, Holger; Linz, Wolfgang; Wagner, Adalbert; and Kleemann, Heinz-Werner, 5,468,764, Cl. 514-382.000.

Klein, Johann; Bongardt, Frank; and Schmid, Karl-Heinz, to Henkel Kommanditgesellschaft auf Aktien. Use of partially dehydrated castor oils as lubricants. 5,468,405, Cl. 252-56.00R.

Klein, Larry L.; and Maring, Clarence J., to Abbott Laboratories. Paclitaxel derivatives. 5,468,769, Cl. 514-449.000.

Kleinhans, Josef: *See*—
Reihlen, Eckart; Marek, Jiri; Bantien, Frank; Findler, Guenther; Offenberg, Michael; Kleinhans, Josef; Konzelmann, Uwe; and Ziegenbein, Botho, 5,467,649, Cl. 73-204.260.

Kleyn Die Engravers, Inc.: *See*—
Kleyn, Hendrik, 5,468,923, Cl. 181-282.000.

Kleyn, Hendrik, to Kleyn Die Engravers, Inc. Molded muffler. 5,468,923, Cl. 181-282.000.

Kligman, Albert M. Methods of preventing and reducing the size of *Striae distensae* lesions. 5,468,495, Cl. 424-401.000.

Klik, Cornelis M.: *See*—
Hesdahl, Piet B.; and Klik, Cornelis M., 5,469,441, Cl. 370-110.100.

Kline, Brant D., to Avery Dennison Corporation. User-customizable index divider sheet set and table of contents sheet assembly. 5,468,085, Cl. 402-79.000.

Klinkowstein, Robert E.: *See*—
Shefer, Ruth E.; Klinkowstein, Robert E.; Hughey, Barbara J.; Welch, Michael J.; and Dence, Carmen S., 5,468,355, Cl. 204-157.200.

Klitgaard, Henrik: *See*—
Faarup, Peter; Jakobsen, Palle; Jørgensen, Anker S.; and Klitgaard, Henrik, 5,468,748, Cl. 514-250.000.

Klobuchar, Robert F.: *See*—
Becker, James A.; Fritsch, Ronald J.; Holland, Richard J.; and Klobuchar, Robert F., 5,467,622, Cl. 70-203.000.

Klosterman, Kurt: *See*—
Shah, Dinesh O.; Chandra, Tarun; and Klosterman, Kurt, 5,468,649, Cl. 436-518.000.

Kluth, Michael R.; and Reents, Roberta M., to Compaq Computer Corporation. Power distribution connector apparatus for back-to-back sandwiched circuit boards. 5,469,335, Cl. 361-800.000.

KM-Kabelmetal AG: *See*—
Eberts, Friedrich; and Pohl, Helmut, 5,467,631, Cl. 72-283.000.

Knapp, James H.; and Nelson, Keith E., to Motorola, Inc. Semiconductor device package and method of making. 5,468,910, Cl. 174-52.200.

Knapp, Stefan: *See*—
Sausner, Andreas; and Knapp, Stefan, 5,467,961, Cl. 251-129.150.

Knaub, John E.: *See*—
Flinchbaugh, Bernadette M.; Paley, Harold R.; Knaub, John E.; Schmid, Christopher J.; and Melnyk, Adrian L., 5,468,156, Cl. 439-157.000.

Kneisel, Larry L.: *See*—
Reddy, Prathap A.; Baker, Jay D.; and Kneisel, Larry L., 5,469,329, Cl. 361-704.000.

Knez, Marijan, to Aeromatics Automotive, Inc. Slider assembly for automotive brake caliper. 5,467,848, Cl. 188-73.450.

Knoll, Meinhard. Miniaturized sensor component for measuring concentrations of substances in liquids, and method of manufacturing such a component. 5,468,374, Cl. 210-96.200.

Knopfli, Alfred: *See*—
Haumann, Jurgen; Knopfli, Alfred; Sattelmayer, Thomas; and Treach, Rudolf, 5,467,815, Cl. 165-109.100.

Knowles, Carl H.; Rockstein, George B.; Wilz, David M.; and Naylor, Charles A., to Metrologic Instruments, Inc. Automatic hand-supportable code symbol scanning device with improved laser beam pointing efficiency. 5,468,951, Cl. 235-472.000.

Knowlton, Christopher M.: *See*—
O'Hara, Robert J.; and Knowlton, Christopher M., 5,467,500, Cl. 15-320.000.

Knudsen, Hans B.: *See*—
Cording, Louis B.; Knudsen, Hans B.; and Granskow, Anger, 5,467,608, Cl. 62-195.000.

Ko, Frank: *See*—
Marcolongo, Michele S.; Ducheyne, Paul; Ko, Frank; and LaCourse, William, 5,468,544, Cl. 428-224.000.

Ko, Joseph Y. Door block alarm. 5,469,139, Cl. 340-545.000.

Kobari, Hirokazu; and Kishimoto, Junichi, to Nippon Koki Co., Ltd. Gas generating agent pack of air bag inflation gas generator. 5,468,016, Cl. 280-741.000.

Kobayashi, Chihiro: *See*—
Igarashi, Shinya; Hirayama, Hiroshi; Kobayashi, Chihiro; Tsutsui, Mitsukuni; and Kato, Yukio, 5,467,648, Cl. 73-202.500.

Kobayashi, Hiroshi: *See*—
Kubota, Yukio; Sasaki, Takayuki; Takahashi, Takao; and Kobayashi, Hiroshi, 5,469,272, Cl. 358-335.000.

Kobayashi, Hitoshi: *See*—
Hirota, Toshizumi; Kobayashi, Hitoshi; Nakagoshi, Yasunobu; and Amino, Yukio, 5,468,351, Cl. 202-234.000.

Kobayashi, Noriyuki: *See*—
Yazaki, Takao; Noro, Masataka; Matsui, Takashi; Kobayashi, Noriyuki; Sano, Hironari; and Yamamoto, Koji, 5,468,444, Cl. 264-566.000.

Kobayashi, Osamu; and Yoshida, Takashi, to Otis Elevator Company. Rope jack device for a shuttle. 5,467,969, Cl. 254-251.000.

Kobayashi, Takashi: *See*—
Noguchi, Kazuhiro; Ogino, Shigeru; and Kobayashi, Takashi, 5,469,210, Cl. 348-208.000.

Kobayashi, Tatsuya: *See*—
Matsui, Masaaki; Shimizu, Toshifumi; and Kobayashi, Tatsuya, 5,468,210, Cl. 600-10.000.

Kober, Jeffrey F.; and Nelson, Victor A., to Prime Composites, Inc. Rail car plug door. 5,467,558, Cl. 49-220.000.

Kobilansky, Alexander I.: *See*—
Sauer, Jude S.; Oravecz, Michael G.; Greenwald, Roger J.; and Kobilansky, Alexander I., 5,467,762, Cl. 600-114.000.

Koch, Klaus: *See*—
Heinrichs, Heinrich-Josef; Enders, Stephan; and Koch, Klaus, 5,468,042, Cl. 296-146.400.

Kocks Technik GmbH & Co.: *See*—
Holthoff, Helmut, 5,467,625, Cl. 72-35.000.

Kocsis, Menhard; and Parago, Bela, to Institut Max Von Laue - Paul Langevin. Device for collimating beams of a radiation. 5,468,970, Cl. 250-505.100.

Koenck, Steven E.; Miller, Phillip; and Schultz, Darald R., to Norand Corporation. Hand-held data terminal and communicator. 5,468,948, Cl. 235-472.000.

Koenig, Peter C.: *See*—
Soucie, Wayne L.; Champ, Larry B.; Tayon, Jeffrey E.; Carlson, Harold L.; Marek, Steven W.; and Koenig, Peter C., 5,467,666, Cl. 74-575.000.

Koga, Toshio; and Okajima, Masayuki, to NEC Corporation. Time-varying image signal coding/decoding system. 5,469,213, Cl. 348-401.000.

Kogure, Makoto, to Hitachi, Ltd. Field sensor communication system. 5,469,156, Cl. 340-870.380.

Kogure, Mitsuhiro; Nagashima, Shinichi; Wakabayashi, Kazuhisa; Enkaku, Shigeyuki; Shimayama, Hitoshi; Kimura, Minoru; Shimoyama, Shuji; and Yokoo, Tsugio, to Mitsuba Electric Mfg. Co., Ltd. Method for fabricating a contact assembly of a magnetic switch. 5,467,632, Cl. 72-379.200.

Kohara, Teiji: *See*—
Takahashi, Nobukazu; Hosaka, Tohru; Minami, Koji; Konishi, Yuichiro; Kohara, Teiji; and Natsuume, Tadao, 5,468,803, Cl. 524-553.000.

Koharagi, Haruo: *See*—
Wakui, Shinichi; Ide, Kazumasa; Koharagi, Haruo; Takahashi, Miyoshi; Miyakawa, Kado; and Yagi, Yasuomi, 5,469,009, Cl. 310-214.000.

Kohl, Paul A.; and Vogt, Kirkland W., to Georgia Tech Research Corporation. Process for the low temperature creation of nitride films on semiconductors. 5,468,688, Cl. 437-237.000.

Kohler Co.: *See*—
Buccicone, Dana F.; and Tempas, Jeffrey F., 5,467,799, Cl. 137-625.410.

Kohno, Masaki, to Mitsubishi Denki Kabushiki Kaisha. Microwave amplifier. 5,469,107, Cl. 330-277.000.

Koike, Kazuyoshi: *See*—
Nasuno, Ichiro; Shibata, Mitsuru; Sakamoto, Masashi; and Koike, Kazuyoshi, 5,468,878, Cl. 549-23.000.
Shibata, Mitsuru; Sakamoto, Masashi; Koike, Kazuyoshi; and Nasuno, Ichiro, 5,468,722, Cl. 504-282.000.

Koike, Manabu: *See*—
Shinoda, Masahisa; Egusa, Naoyuki; Sato, Yasuyuki; and Koike, Manabu, 5,469,423, Cl. 369-112.000.

Koike, Shoji; and Yamamoto, Tomoya, to Canon Kabushiki Kaisha. Cloth suitable for textile printing and ink-jet textile printing method. 5,468,553, Cl. 428-224.000.

Koito Manufacturing Co., Ltd.: *See*—
Iiyama, Katsuhiko; and Uchida, Naoki, 5,469,339, Cl. 362-61.000.

Kojima, Junichi: *See*—
Naitou, Kiyotaka; and Kojima, Junichi, 5,468,924, Cl. 200-6.00A.

Kojima, Naomi: *See*—
Sugama, Akio; Suzuki, Hiroaki; and Kojima, Naomi, 5,468,408, Cl. 252-62.200.

Kojima, Ryo; Sato, Yoshiro; and Nagasawa, Takeshi, to Nitto Boseki Co., Ltd. Method of quantitative assay for 1,5-anhydroglucitol. 5,468,621, Cl. 435-25.000.

Kojo, Katsuhiko: *See*—
Nakahara, Yuichi; and Kojo, Katsuhiko, 5,468,278, Cl. 75-236.000.

Kolb, Charles F., Jr.: *See*—
Godvin, Gerard B.; and Kolb, Charles F., Jr., 5,467,727, Cl. 114-230.000.

Kolm, Roger R.: *See*—
Sheth, Paresh J.; and Kolm, Roger R., 5,468,259, Cl. 8-497.000.

Koluvek, Roland H., to Rosemount Analytical Inc. Circuit for measuring source resistance of a sensor. 5,469,070, Cl. 324-713.000.

Komata, Takeo: *See*—
Takematsu, Tetsu; Komata, Takeo; Kume, Takashi; Suzuki, Kiyoshi; Kawamura, Matsue; Shirakawa, Yumiko; and Mori, Kaoru, 5,468,719, Cl. 504-224.000.

Komatsuda, Takashi: *See*—
Aoki, Takuya; Shimasaki, Yuichi; Matsumoto, Seiji; Hatcho, Seiji; Oketani, Toshikazu; Miyashita, Yukio; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,467,594, Cl. 60-276.000.

Komiya, Koji; Takezono, Tetsuya; Yabe, Noritsugu; and Matsui, Hisao, to Nippon Oil Co., Ltd. In vitro method for stimulating cell growth by culturing cells in a serum-free culture medium comprising human lysozyme. 5,468,635, Cl. 435-240.210.

Komori Corporation: *See*—
Maejima, Kazuhiro, 5,467,711, Cl. 101-216.000.

Komura, Shirou: *See*—
Kato, Hiroaki; Heki, Hideaki; Komura, Shirou; and Okamura, Emiko, 5,467,791, Cl. 134-166.00C.

Komuro, Toshio: *See*—
Kuwabara, Shinichi; and Komuro, Toshio, 5,469,395, Cl. 365-207.000.

Konaga, Tomomi: *See*—
Taguchi, Tomoyuki; Kuribayashi, Hideyuki; Tanaka, Jun; Konaga, Tomomi; and Morigami, Yoshihiro, 5,468,694, Cl. 501-77.000.

Kondo, Akio: *See*—
Ohnuki, Yukio; Kurosawa, Satoshi; and Kondo, Akio, 5,468,552, Cl. 428-336.000.

Kondo, Hiroyuki: *See*—
Yamashita, Hiroyuki; Kondo, Hiroyuki; Hatano, Kouichi; Nakano, Katsunori; Toyoda, Kouji; and Senzaki, Takashi, 5,468,516, Cl. 427-[illegible].

Kondo, Naofumi: *See*—
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.

Kondo, Tetsujiro: *See*—
Takahashi, Kenji; and Kondo, Tetsujiro, 5,469,216, Cl. 348-441.000.

Koni, B.V.: *See*—
de Kock, Cornelis, 5,467,852, Cl. 188-322.140.

Konica Corporation: *See*—
Isozaki, Shin; Kikugawa, Shozo; and Iwata, Eiji, 5,469,313, Cl. 360-104.000.
Takahashi, Shigeaki, 5,468,602, Cl. 430-569.000.

König, Christian: *See*—
Gebauer, Herbert; Gupta, Pramod; and König, Christian, 5,468,783, Cl. 521-159.000.

Konishi, Akio; Sakai, Yoshitomo; Saito, Yoshiyuki; and Yoshio, Hideaki, to Matsushita Electric Industrial Co., Ltd. Magnetic recording/reproducing apparatus with stoppers for loading boats. 5,469,309, Cl. 360-85.000.

Konishi, Kazuki, to Canon Kabushiki Kaisha. Method of detecting eye component information for determining sight axis direction, and sight axis direction detection apparatus. 5,469,234, Cl. 351-212.000.

Konishi, Yasuhiro, to Mitsubishi Denki Kabushiki Kaisha. Power-on reset signal generator and operating method thereof. 5,469,099, Cl. 327-198.000.

Konishi, Yuichiro: *See*—
Takahashi, Nobukazu; Hosaka, Tohru; Minami, Koji; Konishi, Yuichiro; Kohara, Teiji; and Natsuume, Tadao, 5,468,803, Cl. 524-553.000.

Konomura, Yutaka, to Olympus Optical Co., Ltd. Method and apparatus for measuring three-dimensional position of a pipe from image of the pipe in an endoscopic observation system. 5,469,254, Cl. 356-241.000.

Konrad, Julie A.; Freeland, Mark; and Czuhai, Brian S., to Ford Motor Company. Method and system for controlling flexible fuel vehicle fueling. 5,467,755, Cl. 123-674.000.

Konzelmann, Uwe: *See*—
Reihlen, Eckart; Marek, Jiri; Bantien, Frank; Findler, Guenther; Offenberg, Michael; Kleinhans, Josef; Konzelmann, Uwe; and Ziegenbein, Botho, 5,467,649, Cl. 73-204.260.

Koo, Kyoung B.: *See*—
Kim, Beom S.; Lee, Jin H.; and Koo, Kyoung B., 5,469,228, Cl. 348-715.000.

Koon, James E.: *See*—
Carlin, Jerry F.; Koon, James E.; Parker, Paul D.; and Thompson, Warren L., 5,467,689, Cl. 92-172.000.

Kop-Coat, Inc.: *See*—
Sturm, Jeffrey C., 5,468,284, Cl. 106-2.000.

Kopatz, Nelson E.: *See*—
Dorfman, Leonid P.; Scheithauer, Michael J.; Houck, David L.; and Kopatz, Nelson E., 5,468,457, Cl. 423-61.000.

Kopel, Larry L. Apparatus for pulling arrows from surfaces in which they are embedded. 5,468,034, Cl. 294-1.100.

Korea Institute of Nuclear Safety: *See*—
Park, Youn-Won; and Kim, Jong-Kab, 5,469,480, Cl. 376-299.000.

Korea Institute of Science and Technology: *See*—
Kwon, Oh K.; Choi, Ung S.; Choi, Ki Y.; Mishkin, N. K.; and Jung, Yoon M., 5,468,529, Cl. 428-36.100.

Korean Association of Creation Research: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.

Korenaga, Nobushige; and Iwamoto, Kazunori, to Canon Kabushiki Kaisha. Support device. 5,467,720, Cl. 108-20.000.

Koriyama, Hiroshi, to NEC Corporation. Actuator for magnetic disks and having a VCM support with a recess. 5,469,316, Cl. 360-106.000.

Koriyama, Shin-ichi: *See*—
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.

Kortright, Kenneth H.: *See*—
Coulter, Wallace H.; Hollinger, John D.; Kortright, Kenneth H.; Russell, Thomas; Rodriguez, Carlos; and Paul, Ronald, 5,468,616, Cl. 435-7.200.

Kosaka, Tokihiro; Ogino, Shinichi; and Maekawa, Yasunori, to Toa Medical Electronics Co., Ltd. Apparatus for detecting fluorescence of particles in a fluid and analyzing the particles. 5,469,251, Cl. 356-73.000.

Kosaka, Tokihiro, to Toa Medical Electronics Co., Ltd. Device for identifying the type of particle detected by a particle detecting device. 5,469,375, Cl. 364-555.000.

Kosann, Rod: *See*—
Weingarten, Jon; Kosann, Rod; Wallace, Jerry E.; Wilson, Olin E.; and Buckley, Maura T., 5,467,512, Cl. 28-100.000.

Koseki, Koshi: *See*—
Ebata, Takashi; Matsumoto, Katsuya; Koseki, Koshi; Kawakami, Hiroshi; Matsushita, Hajime; Yoshikoshi, Hajime; and Okaniwa, Masakazu, 5,468,881, Cl. 549-295.000.

Koshizuka, Naoki: *See*—
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.

Koskinen, Jukka; and Garoff, Thomas, to Borealis Holding A/S. Method for the preparation of a particulate carrier for a polymerization catalyst. 5,468,698, Cl. 502-9.000.

Kotsakis, Ted. Support for decorative light string on a building. 5,469,344, Cl. 362-145.000.

Köttritsch, Hubert: *See*—
Ekdahl, Egon; Gurka, Jiri; Huber, Rupert; Köttritsch, Hubert; Kufe, Gottfried; Müllner, Johann; and Weninger, Helmut, 5,468,072, Cl. 384-448.000.

Kötzsch, Hans-Joachim: *See*—
Rauleder, Hartwig; Standke, Burkhard; Kötzsch, Hans-Joachim; and Schork, Reinhold, 5,468,705, Cl. 502-151.000.
Rauleder, Hartwig; Standke, Burkhard; Kötzsch, Hans-Joachim; and Schork, Reinhold, 5,468,706, Cl. 502-151.000.

Kouno, Hiroyuki: *See*—
Kumamoto, Toshio; Miki, Takahiro; and Kouno, Hiroyuki, 5,469,047, Cl. 323-312.000.

Kovalak, Judson L., Jr., to SignComp, Inc. Tensioned fabric sign. 5,467,546, Cl. 40-603.000.

Kovaletz, Mark P. Fixture apparatus for elevated lines. 5,467,730, Cl. 116-209.000.

Kovens, Steven A.; and Doyle, Michael T., to Parkway Machine Corporation. Coin box insert for bulk vending machines. 5,467,858, Cl. 194-350.000.

Kowalsky, Keith A.: *See*—
Marantz, Daniel R.; and Kowalsky, Keith A., 5,468,295, Cl. 118-723.0DC.

Kowligi, Rajagopal R.: *See*—
Bosse, Charles F.; and Kowligi, Rajagopal R., 5,468,138, Cl. 425-383.000.

Koyabu, Akira: *See*—
Asai, Naoki; Morozumi, Choji; Ito, Yoshikazu; Ito, Kiyoshi; and Koyabu, Akira, 5,468,078, Cl. 400-215.000.

Koyama, Kenji: *See*—

Ishida, Takeshi; Koyama, Kenji; Kasama, Hiroshi; Nishiumi, Kenji; and Nakajima, Kenji, 5,468,181, Cl. 453-3.000.
Koyanagi, Hajime: *See*—
Hosaka, Sumio; Kikugawa, Atsushi; Honda, Yukio; Koyanagi, Hajime; and Nagasawa, Kiyosi, 5,467,642, Cl. 73-105.000.
Koyo Seiko Co., Ltd.: *See*—
Nishimoto, Mitsuhiko, 5,469,357, Cl. 364-424.050.
Koziol, Walter, to Modern Home Products Corp. Cooking grid. 5,467,691, Cl. 99-340.000.
Koziol, Walter, to Modern Home Products Corp. Gas light control apparatus. 5,468,142, Cl. 431-18.000.
Kraft Foods, Inc.: *See*—
Weaver, Edmund A., 5,467,887, Cl. 220-212.000.
Kraft Jacobs Suchard: *See*—
Schlup, Raphael; and Lioutas, Theodore S., 5,468,509, Cl. 426-548.000.
Krallmann, Anton: *See*—
Reiners, Ulrich; Krallmann, Anton; Albinus, Eberhard; and Böhner, Jürgen, 5,468,563, Cl. 428-515.000.
Krampotich, Dennis J.: *See*—
Nolte, Douglas A.; Vetter, Gregory J.; Best, Kenneth E.; and Krampotich, Dennis J., 5,467,503, Cl. 16-115.000.
Kraning, Calvin J.: *See*—
Panoushek, Dale W.; and Kraning, Calvin J., 5,467,582, Cl. 56-10.20R.
Kranz, Jurgen, to Metzeler Automotive Profiles GmbH. Process for manufacturing finite extruded profiles. 5,468,439, Cl. 264-145.000.
Krauss, Guenther: *See*—
Herrmann, Klaus; and Krauss, Guenther, 5,468,214, Cl. 601-2.000.
Kraut-Reinkober, Stefan: *See*—
Sauer, Ralf; Kraut-Reinkober, Stefan; Helmes, Ludger; and Hoyer, Werner, 5,468,271, Cl. 55-357.000.
Krebs, Andreas: *See*—
Petersen, Uwe; Himmler, Thomas; Schenke, Thomas; Krebs, Andreas; Grobe, Klaus; Bremm, Klaus-Dieter; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 5,468,742, Cl. 514-187.000.
Krein, William T.; Hochsprung, Ronald R.; and Kelly, James D., to Apple Computer, Inc. Bus deadlock avoidance during master split-transactions. 5,469,435, Cl. 370-85.200.
Kremer, Wolfgang: *See*—
Schmalstieg, Lutz; Kremer, Wolfgang; Brahm, Martin; Probst, Joachim; and Kubitza, Werner, 5,468,804, Cl. 524-591.000.
Krenik, William R.: *See*—
Yung, Henry T.; Izzi, Louis J.; and Krenik, William R., 5,469,195, Cl. 345-199.000.
Kress-Elektrik GmbH & Co. Elektromotorenfabrik: *See*—
Kress, Willy, 5,468,294, Cl. 118-668.000.
Kress, Willy, to Kress-Elektrik GmbH & Co. Elektromotorenfabrik. Apparatus for impregnation of an object with curable resin. 5,468,294, Cl. 118-668.000.
Krichever, Mark J.: *See*—
Swartz, Jerome; Shepard, Howard M.; Barkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward; and Adelson, Alexander M., 5,468,949, Cl. 235-472.000.
Kriesel, Marshall S., to Science Incorporated. Fluid delivery apparatus having a stored energy source. 5,468,226, Cl. 604-132.000.
Krishnamurthy, Suresh; McCormick, Robert A.; Cone, Kenneth F.; Brown, Gary L.; and Bryant, Ronald W., to Tektronix, Inc. Pre-analysis of video signals obtained from digital images. 5,469,188, Cl. 345-117.000.
Kristiansen, Odd; Zondler, Helmut; and Müller, Urs, to Ciba-Geigy Corporation. Aminopyrimidine derivatives as microbicides, insecticides and acaricides. 5,468,751, Cl. 514-256.000.
Kristóf, Ilona: *See*—
Szalóki, Erzsébet; Kristóf, Ilona; Pál, Veronika; and Szabó, Eva, 5,468,492, Cl. 424-195.100.
Krob, Adolf, to Faun GmbH. Multiple-purpose utility vehicle. 5,468,120, Cl. 414-695.000.
Krochmal, Andrew C.: *See*—
Blind, Henry F.; Campagne, Anthony J.; Czekaj, James L.; Difiore, Nicholas L.; Geddes, Earl R.; Krochmal, Andrew C.; and Senyk, Myron I., 5,469,510, Cl. 381-55.000.
Krueger, Dennis L.: *See*—
Hanschen, Thomas P.; Krueger, Dennis L.; and Karp, Gregory P., 5,468,428, Cl. 264-483.000.
Kruger, Robert L.: *See*—
Vanderpan, Timothy P.; and Kruger, Robert L., 5,468,094, Cl. 404-75.000.
Krumal, Frank K. Escape window frame assembly. 5,467,841, Cl. 182-70.000.
Kruse, Albert L., to Modern Muzzleloading, Inc. Nipple for muzzle-loading firearm. 5,467,551, Cl. 42-83.000.
Krust, Andree: *See*—
Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; DeJean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, 5,468,617, Cl. 435-7.800.
Ku, Bon-chul: *See*—
Chung, Hyun-jong; Yim, Sang-chul; Ku, Bon-chul; Guen, Ho-young; and Kim, Duk-han, 5,468,263, Cl. 44-39.00L.
Ku, Fei-Lung. Lining strip cutting machine. 5,467,514, Cl. 29-2.190.
Ku, Yen-Hui J.: *See*—
Aronowitz, Sheldon; Ku, Yen-Hui J.; and Ho, Yu-Lam, 5,468,974, Cl. 257-51.000.
Kub, Thomas J., to Minnesota Mining and Manufacturing Company. Photothermographic and thermographic elements for use in automated equipment. 5,468,603, Cl. 430-619.000.
Kuberasampath, Thangavel: *See*—
Oppermann, Hermann; Ozkaynak, Engin; Kuberasampath, Thangavel; and Rueger, David C., 5,468,845, Cl. 530-387.900.
Kubitza, Werner: *See*—
Schmalstieg, Lutz; Kremer, Wolfgang; Brahm, Martin; Probst, Joachim; and Kubitza, Werner, 5,468,804, Cl. 524-591.000.
Kubo, Akihiko: *See*—
Hamoda, Keiji; Yoshida, Ritsuo; Iijima, Toshihiko; Yamamoto, Chiemi; and Kubo, Akihiko, 5,469,308, Cl. 360-71.000.
Kubo, Koichi: *See*—
Yamamoto, Kiyoshi; Sugii, Nobuyuki; Kubo, Koichi; Ichikawa, Michiharu; and Yamauchi, Hisao, 5,468,806, Cl. 505-238.000.
Kubo, Yoshihiro, to Morito Kabushiki Gaisha. Shoelace fastening device. 5,467,511, Cl. 24-712.900.
Kubota, Kiyoto; Takeuchi, Hiroto; and Kato, Shinichiro, to Central Japan Railway Company. Apparatus for improved block control of train operation. 5,467,945, Cl. 246-26.000.
Kubota, Shizuo; Ito, Osamu; and Miyamoto, Hiroyuki, to Miyaso Chemical Co. Method of recycling unsaturated polyester resin waste. 5,468,780, Cl. 521-48.500.
Kubota, Yukio; Sasaki, Takayuki; Takahashi, Takao; and Kobayashi, Hiroshi, to Sony Corporation. Digital signal recording and/or reproducing apparatus. 5,469,272, Cl. 358-335.000.
Kucharz, Carolyn J.: *See*—
Nebergall, Robert S.; Taylor, Dennis R.; and Kucharz, Carolyn J., 5,468,701, Cl. 502-80.000.
Kudla, David P.: *See*—
Hurtubise, Diane M.; Arnold, Perry K.; Kudla, David P.; and Armstrong, Lawrence E., 5,467,971, Cl. 267-220.000.
Kudo, Sachio: *See*—
Sasaki, Norio; Kudo, Sachio; Watanabe, Michi; Endo, Keiji; and Kawaguchi, Shinji, 5,468,721, Cl. 504-243.000.
Kuechler, Irv, to D.E.R. Investments Ltd. Apparatus and method for removing fumes from the space above a cooking appliance. 5,467,761, Cl. 126-299.00D.
Kuekenhoehner, Thomas: *See*—
Wenderoth, Bernd; Brand, Siegbert; Schuetz, Franz; Kuekenhoehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,468,717, Cl. 504-130.000.
Kügler, Wolfgang: *See*—
Holland, Gunther K.; and Kügler, Wolfgang, 5,468,575, Cl. 429-56.000.
Kühn, Heinrich; Herberg, Frank; and Jaculi, Dieter, to Hoechst Aktiengesellschaft. Printing roller with a sleeve of thermally wound fiber-reinforced thermoplastics and a plasma-sprayed coating of copper or copper alloy. 5,468,568, Cl. 428-245.000.
Kulich, Donald M., to General Electric Company. Agglomeration of latices by organic acid - anhydride mixtures. 5,468,788, Cl. 523-335.000.
Kulicke & Soffa Investments, Inc.: *See*—
Safabakhsh, Ali R., 5,469,011, Cl. 310-325.000.
Kulpa, Charles F.: *See*—
Johnson, Steven W.; Monticello, Daniel J.; Gibbs, Phillip R.; and Kulpa, Charles F., 5,468,626, Cl. 435-130.000.
Kulpa, Gregory A.: *See*—
Swartz, Allan J.; and Kulpa, Gregory A., 5,467,566, Cl. 52-235.000.
Kumada, Kouji, to Sharp Kabushiki Kaisha. Vertical synchronizing circuit. 5,469,220, Cl. 348-529.000.
Kumagai, Masato, to Unisia Jecs Corporation. Throttle valve control system. 5,467,751, Cl. 123-399.000.
Kumakura, Sinsuke; Yamazaki, Hirokazu; Watanabe, Hisayoshi; and Kasa, Yasushi, to Fujitsu Limited. Nonvolatile semiconductor memory device having a status register and test method for the same. 5,469,394, Cl. 365-201.000.
Kumamoto, Toshio; Miki, Takahiro; and Kouno, Hiroyuki, to Mitsubishi Denki Kabushiki Kaisha. Transistor circuit. 5,469,047, Cl. 323-312.000.
Kumar, Kanta; Kumar, Ramesh C.; and Mitra, Smarajit, to Minnesota Mining and Manufacturing Company. Vinyl-silicone polymers in cosmetics and personal care products. 5,468,477, Cl. 424-78.170.
Kumar, Ramesh C.: *See*—
Kumar, Kanta; Kumar, Ramesh C.; and Mitra, Smarajit, 5,468,477, Cl. 424-78.170.
Kumazawa, Satoru; and Enari, Hiroyuki, to Kureha Kagaku Kogyo K.K. Process for production of (azolylmethyl)-(biphenylmethyl)cyclopentanol derivatives. 5,468,869, Cl. 548-267.800.
Kume, Takashi: *See*—
Takematsu, Tetsu; Komata, Takeo; Kume, Takashi; Suzuki, Kiyoshi; Kawamura, Matsue; Shirakawa, Yumiko; and Mori, Kaoru, 5,468,719, Cl. 504-224.000.
Kumho & Co., Inc.: *See*—
Kim, Chun-Sik; Yoon, Young-Rok; and Kim, Seong-keun, 5,468,328, Cl. 156-401.000.
Kung, Teh-Ming: *See*—
Gruenbaum, William T.; Kung, Teh-Ming; and Young, Ralph H., 5,468,583, Cl. 430-58.000.
Kunkel, Scott H.; and Peck, Wiley M., to E-Systems, Inc. Tool for wafer alignment and insertion. 5,467,526, Cl. 29-747.000.
Kuo, Jeffrey W. C.: *See*—
McAlpin, James J.; Kuo, Jeffrey W. C.; and Hylton, Donald C., 5,468,440, Cl. 264-291.000.

Kuo, Richard C.: *See*—
Harris, Albert K. M.; Kirk, Gregory L.; Owicki, John C.; Dawes, Timothy D.; and Kuo, Richard C., 5,468,605, Cl. 435-4.000.

Kupersmith, Bertram F.: *See*—
Powell, Bruce A.; Stanley, Jannah; Kupersmith, Bertram F.; Sahara, Masanori; Simcik, Paul; and Bahjat, Zuhair S., 5,467,844, Cl. 187-387.000.

Kupferschmidt, Albert; and Wiedel, John, to L&P Property Management Company. Wire twister-cutter assembly. 5,467,804, Cl. 140-115.000.

Kuramoto, Seiji: *See*—
Tsuruta, Minoru; Suzuta, Toshihiko; Nakada, Akio; Kuramoto, Seiji; Hibino, Hiroki; Bito, Shiro; and Mukaizawa, Akito, 5,467,911, Cl. 227-175.000.

Kurano, Takatoshi: *See*—
Nishihara, Motoo; Kurano, Takatoshi; Yamanaka, Naoaki; and Sato, Youichi, 5,469,543, Cl. 395-200.060.

Kurdzo, James P.; and Katze, Alan B., Jr., to General DataComm, Inc. Distributed frame processing for time division multiplexing. 5,469,434, Cl. 370-67.000.

Kufe, Gottfried: *See*—
Ekdahl, Egon; Gurka, Jiri; Huber, Rupert; Kötritsch, Hubert; Kufe, Gottfried; Müllner, Johann; and Weninger, Helmut, 5,468,072, Cl. 384-448.000.

Kureha Kagaku Kogyo K.K.: *See*—
Kumazawa, Satoru; and Enari, Hiroyuki, 5,468,869, Cl. 548-267.800.

Kuribayashi, Hideyuki: *See*—
Taguchi, Tomoyuki; Kuribayashi, Hideyuki; Tanaka, Jun; Konaga, Tomomi; and Morigami, Yoshihiro, 5,468,694, Cl. 501-77.000.

Kuroda, Hideo: *See*—
Shaku, Masao; Ohkura, Sayuri; Kuroda, Hideo; Kano, Ai; and Nakabayashi, Nobuo, 5,468,475, Cl. 424-70.160.

Kuroda, Takeshi: *See*—
Suzuki, Fumio; Kuroda, Takeshi; Kitamura, Shigeto; and Ohmori, Kenji, 5,468,756, Cl. 514-293.000.

Kuroiwa, Hiroshi: *See*—
Minowa, Toshimichi; Nishimura, Yutaka; Kawashima, Ken'ichi; Kuroiwa, Hiroshi; and Ibamoto, Masahiko, 5,468,196, Cl. 477-67.000.

Kuroiwa, Kazuo. Naturally circulated thermal cycling system with environmentally powered engine. 5,467,600, Cl. 62-6.000.

Kurono, Masayasu: *See*—
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Sato, Makoto; Oowaki, Hiroyuki; Kato, Bunkichi; and Takahashi, Haruo, 5,468,728, Cl. 514-12.000.

Kurosaki, Makoto, to Yamaha Corporation. Snare drum stand. 5,467,680, Cl. 84-421.000.

Kurosawa, Satoshi: *See*—
Ohnuki, Yukio; Kurosawa, Satoshi; and Kondo, Akio, 5,468,552, Cl. 428-336.000.

Kuroyama, Yoshihiro: *See*—
Ohtani, Teiichi; Endo, Shoichi; Shimada, Teruhisa; and Kuroyama, Yoshihiro, 5,468,564, Cl. 428-537.500.

Kurumida, Tsuneaki, to Canon Kabushiki Kaisha. Method and apparatus for generating pattern. 5,469,513, Cl. 382-203.000.

Kusaka, Yosuke: *See*—
Uchiyama, Shigeyuki; Kusaka, Yosuke; and Yamano, Syozo, 5,469,240, Cl. 354-406.000.

Kutsukake, Masaki: *See*—
Oshima, Katsuyuki; Kutsukake, Masaki; Sato, Hideaki; and Sudo, Kenichiro, 5,468,714, Cl. 503-227.000.

Kuwabara, Shinichi; and Komuro, Toshio, to NEC Corporation. Dynamic random access memory device equipped with diferential amplifier for cell plate line. 5,469,395, Cl. 365-207.000.

Kuwahara, Hiroshi: *See*—
Noguchi, Yasuhiro; Kuwahara, Hiroshi; Yasuda, Isao; and Takei, Kazuo, 5,469,189, Cl. 345-118.000.

Kuwaki, Tomoaki: *See*—
Ichikawa, Takanori; Kuwaki, Tomoaki; Matsuki, Shigeru; and Tachibana, Katsumi, 5,468,846, Cl. 530-388.230.

Kuwana, Takaaki: *See*—
Okano, Yoshimichi; Kanno, Tatsuya; Yamato, Tsutomu; Oshino, Yasuhiro; Tanigawa, Michiyo; Kuwana, Takaaki; and Fukuda, Yutaka, 5,468,836, Cl. 528-204.000.

Kuzma, Petr: *See*—
Moro, Daniel G.; Ronel, Samuel H.; and Kuzma, Petr, 5,468,811, Cl. 525-263.000.

Kwan, Sze-Hon: *See*—
Hshieh, Fwu-Iuan; Kwan, Sze-Hon; Chang, Mike F.; Ho, Yueh-Se; Van Der Linde, Jan; and Owyang, King, 5,468,982, Cl. 257-331.000.

Kwapis, David L.: *See*—
Holbrook, Gerald L.; Leising, Maurice B.; and Kwapis, David L., 5,468,198, Cl. 477-143.000.

Kwik Paint Products: *See*—
Lipson, Ron B., 5,468,533, Cl. 428-40.000.

Kwon, Ki Beom: *See*—
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.

Kwon, Oh K.; Choi, Ung S.; Choi, Ki Y.; Mishkin, N. K.; and Jung, Yoon M., to Korea Institute of Science and Technology. Magnetic filter material comprising a self-bonding nonwoven fabric of continuous thermoplastic fibers and magnetic particulate within the fibers. 5,468,529, Cl. 428-36.100.

Kydonieus, Agis; Shah, Kishore R.; and Berner, Bret, to Hercon Laboratories Corporation. Article useful for administration of pharmacologically-active substances transdermally, orally or by means of implant. 5,468,501, Cl. 424-443.000.

Kyocera Corporation: *See*—
Taguchi, Tomoyuki; Kuribayashi, Hideyuki; Tanaka, Jun; Konaga, Tomomi; and Morigami, Yoshihiro, 5,468,694, Cl. 501-77.000.
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.

Kyokado Engineering Co., Ltd.: *See*—
Kayahara, Kenji; and Shimada, Shunsuke, 5,468,292, Cl. 106-789.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Glicksman, Marcie A.; Rotella, David P.; Neff, Nicola; and Murakata, Chikara, 5,468,872, Cl. 548-416.000.
Honda, Shinkichi; Torii, Kenji; Arai, Yoichiro; Kasai, Masaji; Kato, Hiromasa; Iida, Takao; Takahashi, Tomoya; Yokoo, Yoshiharu; Kamiya, Toshikazu; and Tamaoki, Tatsuya, 5,468,474, Cl. 424-70.100.
Suzuki, Fumio; Kuroda, Takeshi; Kitamura, Shigeto; and Ohmori, Kenji, 5,468,756, Cl. 514-293.000.

Kyung, Hong K.: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.

L&P Property Management Company: *See*—
Kupferschmidt, Albert; and Wiedel, John, 5,467,804, Cl. 140-115.000.

Laboratoires Glaxo S.A.: *See*—
Schaeffer, Alain E. E., 5,468,504, Cl. 424-466.000.

Lacey, Timothy M., to Cypress Semiconductor Corp. Decoding scheme for reliable multi bit hot electron programming. 5,469,384, Cl. 365-185.130.

LaCourse, William: *See*—
Marcolongo, Michele S.; Ducheyne, Paul; Ko, Frank; and LaCourse, William, 5,468,544, Cl. 428-224.000.

Laerdal, Tore: *See*—
Egelandsdal, Einar; Garth, Geoffrey C.; Hamilton, John; Johnson, David; Laerdal, Tore; and Patterson, Charles A., 5,468,151, Cl. 434-265.000.

LaGrange, Alain; and Borowiak, Hervé, to L'Oreal. Topical process for lightening the skin or treating pigmental blemishes using a composition containing 4-thioresorcin derivatives. 5,468,472, Cl. 424-62.000.

La Gro, Phillip A., to Hollister Incorporated. Ostomy pouch and filter assembly with successive flap vents. 5,468,235, Cl. 604-333.000.

Laib, Douglas M., to Dart Industries Inc. Garlic press. 5,467,699, Cl. 99-495.000.

L'Air Liquide S.A.: *See*—
Ekiner, Okan M.; and Fleming, Gregory K., 5,468,430, Cl. 264-28.000.

L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude: *See*—
Lehman, Jean-Yves; and Mirigay, Charles, 5,467,603, Cl. 62-50.200.

Lajoie, M. Stephen: *See*—
Joseph, Amy L.; Jones, Keith A.; Winston, Anthony E.; and Lajoie, M. Stephen, 5,468,715, Cl. 504-101.000.

Lakhani, Sunil: *See*—
Pine, Jerrold; Lakhani, Sunil; and Renteria, Stanley, 5,467,525, Cl. 29-743.000.

Lakhovskiy, Mikhail Y.: *See*—
Pevzner, Lev K.; Lakhovskiy, Mikhail Y.; and Oborin, Boris S., 5,468,273, Cl. 55-523.000.

Lallement, Jacques: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; and Marchand, Pierre, 5,468,399, Cl. 252-18.000.

Lam, Kin S.; Schroeder, Daniel R.; Mattei, Jacqueline; Forenza, Salvatore; and Matson, James A., to Bristol-Myers Squibb Company. Rebeccamycin analogs by tryptophan analogs feeding. 5,468,849, Cl. 536-18.500.

Lam, Leo K.: *See*—
Hall, David B.; and Lam, Leo K., 5,469,256, Cl. 356-350.000.

Lam, Peter A.-F. Transducer apparatus responsive to external perturbation. 5,469,132, Cl. 340-392.100.

Lam, Si-Ty: *See*—
Allen, Ross R.; Lam, Si-Ty; McClelland, Paul H.; and Hanson, Eric G., 5,469,199, Cl. 347-42.000.

Lamb-Grays Harbor Co.: *See*—
Hooper, Steven C.; and Dornblaser, Norman E., 5,467,676, Cl. 83-24.000.

Lambert, Victor S. Vegetable harvesting system. 5,467,589, Cl. 56-327.100.

Lamie, James M.: *See*—
Bailey, William H.; Byers, Lonnie L.; Holley, Robert G.; Lamie, James M.; Sparks, Robert M.; West, Mike L.; and Storey, Richard P., 5,468,968, Cl. 250-435.000.

Lanagan, Michael T.: *See*—
Dorris, Stephen E.; Poeppel, Roger B.; Prorok, Barton C.; Lanagan, Michael T.; and Maroni, Victor A., 5,468,566, Cl. 428-552.000.

Landers, Robert J.: *See*—

Mahant-Shetti, Shivaling S.; and Landers, Robert J., 5,469,079, Cl. 326-46.000.

Landgraf, Bryan E.: *See*—
Cohen, Edward H.; and Landgraf, Bryan E., 5,468,612, Cl. 435-6.000.

Landis, Henry J., II; and Landis, Russel J., to Sanford Corporation. Storage and dispensing canister for moist cloth. 5,467,893, Cl. 221-34.000.

Landis, Russel J.: *See*—
Landis, Henry J., II; and Landis, Russel J., 5,467,893, Cl. 221-34.000.

Landry, Michel: *See*—
Goulet, Richard; Forest, Claude; Landry, Michel; Beaubien, Pierre; Finkelstein, Michael; and Vaidya, Viwek V., 5,467,928, Cl. 239-408.000.

Lange, David A., to Thomson Saginaw Ball Screw Company, Inc. Ball nut and screw assembly with backdrive control. 5,467,661, Cl. 74-441.000.

Lange, David A.; Benton, Robert L.; Welling, William E.; and Mugglestone, Peter R., to Thomson Saginaw Ball Screw Company, Inc. Ball nut and screw assemby with enhanced radial load capacity. 5,467,662, Cl. 74-459.000.

Lanning, Leif. System for securing access to equipment connectable to a telephone communication channel. 5,469,499, Cl. 379-196.000.

Lanzavecchia, Laura: *See*—
Da Lio, Joseph; Lanzavecchia, Laura; and Savini, Giuseppe, 5,468,817, Cl. 526-79.000.

Lapointe, Christine L.: *See*—
Allen, Lawrence H.; and Lapointe, Christine L., 5,468,396, Cl. 210-787.000.

Larinoff, Michael W. Finned tubes for air-cooled steam condensers. 5,467,816, Cl. 165-151.000.

Larky, Steven P.: *See*—
Kingman, John A.; Larky, Steven P.; and Vanover, Michael T., 5,469,541, Cl. 395-158.000.

Larmie, Henry A., to Minnesota Mining and Manufacturing Company. Abrasive grain containing alumina and zirconia. 5,468,269, Cl. 51-307.000.

LaRochelle, William J.; Pierce, Jacalyn; Jensen, Roy A.; and Aaronson, Stuart A., to United States of America, Health and Human Services. Method for making a monoclonal antibody, monoclonal antibodies to α PDGFR and method of in vivo imaging. 5,468,468, Cl. 424-1.490.

Larson, John A.: *See*—
Braza, Joseph F.; and Larson, John A., 5,468,308, Cl. 148-321.000.
Godec, Maksimilijan; Larson, John A.; and Waskiewicz, Walter P., 5,468,074, Cl. 384-495.000.

Larson, Lawrence R.: *See*—
Hyman, Nelson L.; Braun, William R.; Garner, James C.; Larson, Lawrence R.; and Tuner, Sheleen M., 5,467,814, Cl. 165-41.000.

Larson, Wayne K.: *See*—
Morrison, Eric D.; Boston, David R.; Hedrick, Steven T.; Kausch, William L.; Larson, Wayne K.; and Fung, Simon S., 5,468,498, Cl. 524-408.000.

LaserMaster Corporation: *See*—
Erickson, Paul R.; and Schooler, Tim C., 5,469,201, Cl. 347-85.000.

LaserMike, Inc.: *See*—
Doles, Joseph E.; and Hadick, Robert J., 5,469,252, Cl. 356-73.100.

Lau, Clifford J.: *See*—
Hurley, Michael F.; Lau, Clifford J.; and Lee, Bin, 5,468,432, Cl. 264-45.300.

Laughlin, Darren R., to A - Tech Corporation. E/U core linear variable differential transformer for precise displacement measurement. 5,469,053, Cl. 324-207.180.

Lavelle, Patrick M.; DiCroce, John; and Malone, Thomas C., to Audiovox Corporation. Remote control car alarm system with wireless module interconnect. 5,469,151, Cl. 340-825.360.

Lawrie, Robert E.: *See*—
Vincent, Michael T.; Gutermuth, Terry R.; Lawrie, Robert E.; Moote, Richard K.; Simonich, Mark A.; and Tamm, James R., 5,467,593, Cl. 60-274.000.

Lawton, Rodney J., to Plessey Semiconductors Limited. Integrated oscillator circuits. 5,469,118, Cl. 331-113.00R.

Lazzara, Ralph: *See*—
Berlin, Kenneth D.; Garrison, Gregory L.; Sangiah, Subbiah; Clarke, Cyril R.; Chen, Chun-Lin; Lazzara, Ralph; Scherlag, Benjamin J.; Patterson, Eugene S.; and Burrows, George E., 5,468,858, Cl. 546-18.000.

Le, Duy-Loan T.: *See*—
Smith, Scott E.; Le, Duy-Loan T.; Stephens, Michael C., Jr.; and Nomura, Masayoshi, 5,469,385, Cl. 365-189.050.

Leary, Timothy M.: *See*—
Macioch, Michael T.; Gates, Douglas M.; and Leary, Timothy M., 5,468,588, Cl. 430-229.000.

Leaver, David: *See*—
Jackson, Frederick S.; and Leaver, David, 5,469,029, Cl. 315-408.000.

Lebby, Michael S.; and Jachimowicz, Karen E., to Motorola, Inc. Remote sensory unit and driver. 5,469,185, Cl. 345-8.000.

Lebby, Michael S.: *See*—
Blair, Thomas H.; and Lebby, Michael S., 5,468,582, Cl. 430-54.000.
Shieh, Chan-Long; Lebby, Michael S.; and Lungo, John, 5,468,656, Cl. 437-23.000.

Ledoux, Marc-Jacques; Guille, Jean-Louis; Pham Huu, Cuong; Dunlop, Hugh; and Prin, Marie, to Pechiney Recherche. Preparation of a catalyst from metal oxides by reduction and partial carburization by reaction gases. 5,468,370, Cl. 208-134.000.

Lee, Bin: *See*—
Hurley, Michael F.; Lau, Clifford J.; and Lee, Bin, 5,468,432, Cl. 264-45.300.

Lee, Chang-Jae; and Hwang, Hyunsang, to Goldstar Electron Co., Ltd. Process for making a semiconductor MOS transistor employing a temporary spacer. 5,468,665, Cl. 437-44.000.

Lee, Cheng-Liang: *See*—
Peng Hsieh, Shih-Fang; and Lee, Cheng-Liang, 5,468,040, Cl. 296-97.400.

Lee, Choon, to Goldstar Co., Ltd. Apparatus for compression-encoding and decoding video signals. 5,469,212, Cl. 348-392.000.

Lee, Clyde: *See*—
Barber, Harold P.; and Lee, Clyde, 5,469,404, Cl. 367-23.000.

Lee, Don: *See*—
Linder, Benjamin; Lee, Don; Battles, Amy; and Thomas, Bradley S., 5,468,022, Cl. 283-072.000.

Lee, Edward K. B., to Motorola, Inc. Communication device with zero-crossing demodulator. 5,469,112, Cl. 329-302.000.

Lee, Guo-shuh J.: *See*—
Frazier, Kevin A.; Garces, Juan M.; and Lee, Guo-shuh J., 5,468,407, Cl. 252-61.000.

Lee, Hyong-Gon: *See*—
Cho, Sung-Hee; and Lee, Hyong-Gon, 5,469,450, Cl. 371-40.400.

Lee, Jae C.: *See*—
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,468,896, Cl. 558-233.000.

Lee, Jin H.: *See*—
Kim, Beom S.; Lee, Jin H.; and Koo, Kyoung B., 5,469,228, Cl. 348-715.000.

Lee, John R.: *See*—
Gunday, Erhan H.; Doliton, Michael; Foung, Paul; and Lee, John R., 5,469,209, Cl. 348-96.000.

Lee, Johnny C., to National Semiconductor Corporation. Digital phase lock loop for jitter filtering and frequency offset compensation. 5,469,478, Cl. 375-376.000.

Lee, Joon K.; and Jeong, Hyeon J., to Samsung Electronics Co., Ltd. Lead frame having dummy leads. 5,468,991, Cl. 257-666.000.

Lee, Kuo-Hua; Lin, Horng-dar; Yan, Ran-Hong; and Yu, Chen-Hua D., to AT&T Corp. Integrated circuit fabrication. 5,468,669, Cl. 437-51.000.

Lee, Leonard G.; Lynn, John S.; McLean, Francis A.; Tucker, Edwin C.; and Sevack, Lloyd, to Lee Valley Tools, Ltd. Panel clamping apparatus. 5,467,972, Cl. 269-118.000.

Lee, Man H., to Brand New Technology Limited. Shower head with selectively usable vibrating and pulsating element. 5,467,927, Cl. 239-383.000.

Lee, Patrick: *See*—
Gerlach, Brett C.; Lee, Patrick; McCormick, William B.; and Douglas, George H., 5,469,532, Cl. 395-102.000.

Lee, Richard D. Bowfishing arrowhead. 5,467,553, Cl. 43-1.000.

Lee, Thomas B.: *See*—
Fishback, Thomas L.; and Lee, Thomas B., 5,468,420, Cl. 252-182.240.

Lee Valley Tools, Ltd.: *See*—
Lee, Leonard G.; Lynn, John S.; McLean, Francis A.; Tucker, Edwin C.; and Sevack, Lloyd, 5,467,972, Cl. 269-118.000.

Leech, Lawrence D., to Whitford Corporation. Basecoat for a coating system. 5,468,798, Cl. 524-440.000.

Leek, William F., to Simpson Strong-Tie Co., Inc. Tension tie. 5,467,570, Cl. 52-712.000.

Leenaerts, Joseph E.: *See*—
Janssens, Frans E.; Diels, Gaston S. M.; and Leenaerts, Joseph E., 5,468,743, Cl. 514-214.000.

Leeson, Plato J., to Yonco Corporation. Locking system with an identification mark for threaded fasteners. 5,468,103, Cl. 411-87.000.

Lefebvre, Régis: *See*—
Faure, Serge; Gaillet, Alain; Lefebvre, Régis; and Reboulet, Claude, 5,469,531, Cl. 395-86.000.

Lefevre Corporation: *See*—
Lefevre, Mark S., 5,467,930, Cl. 241-84.000.

Lefevre, Mark S., to Lefevre Corporation. Solid waste processing device. 5,467,930, Cl. 241-84.000.

Lefumeux, Alain: *See*—
Martin, Bernard; and Lefumeux, Alain, 5,468,312, Cl. 149-19.400.

Legare, Richard J.: *See*—
Godsey, James H.; Jacox, James L.; Keller, Robert F.; and Legare, Richard J., 5,468,311, Cl. 149-19.400.

LeGrow, Gary E., to Dow Corning Corporation. Silicone containing VOC complaint paint remover. 5,468,417, Cl. 252-174.150.

Lehman, Jean-Yves; and Mirigay, Charles, to L'Air Liquide, Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude. High-pressure gas supply installation. 5,467,603, Cl. 62-50.200.

Lehner, Barbara: *See*—
Bayer, Heiner; Lehner, Barbara; and Rogalli, Michael, 5,468,786, Cl. 522-170.000.

Lei, Lawrence C.; and Leung, Cissy, to Applied Materials, Inc. Bottom purge manifold for CVD tungsten process. 5,468,298, Cl. 118-728.000.

Leibinger Gmbh: *See*—
Reisberg, Erhard, 5,468,242, Cl. 606-69.000.

Lein, Maureen M.; Eisfeller, Richard C.; Poliquin, Alfred T.; Burns, Mark; and Russell, John T., to Davidson Textron Inc. Combined primer/basecoat island coating system. 5,468,518, Cl. 427-421.000.

Leising, Maurice B.: *See*—

Holbrook, Gerald L.; Leising, Maurice B.; and Kwapis, David L., 5,468,198, Cl. 477-143.000.
Le Menn, Jacques: *See*—
Le Roux, Gérard; and Le Menn, Jacques, 5,468,673, Cl. 437-60.000.
Lemke, Stuart H. Clamping hanger for food bags. 5,467,949, Cl. 248-95.000.
Lemma, Solomon: *See*—
Adams, Daniel J.; Amjad, Zahid; Lemma, Solomon; and Long, Carl J., II, 5,468,797, Cl. 524-379.000.
Lenart, Mary K. Educational children's clothing. 5,468,152, Cl. 434-429.000.
Lengyel, J. Michael; and Robinder, Ronald C., to Honeywell Inc. Night vision compatible color correction system. 5,468,064, Cl. 359-63.000.
Lenke, Gerd M.; and Cocain, H. William, to GenCorp Inc. One-package structural adhesive. 5,468,831, Cl. 528-44.000.
Lennox Industries Inc.: *See*—
Dean, William J.; and Gilles, Theodore C., 5,467,812, Cl. 165-2.000.
Lenoir, Pierre M. A.: *See*—
Panandiker, Rajan K.; Thoen, Christiaan A. J.; and Lenoir, Pierre M. A., 5,468,414, Cl. 252-135.000.
Lentini, Joseph D.: *See*—
Waelput, Erik F. M.; Hollub, Peter C.; and Lentini, Joseph D., 5,467,746, Cl. 123-196.00A.
Lentz, Thomas D., to Beard Industries, Inc. Moisture equalizer for a continuous flow grain dryer. 5,467,535, Cl. 34-168.000.
Leong, Kin: *See*—
Chan, Daniel S. H.; Leong, Kin; and Phang, Jacob C. H., 5,468,967, Cl. 250-397.000.
LePoire, Robert A., to Mitek Holdings, Inc. Apparatus for stacking wood roof trusses. 5,468,118, Cl. 414-788.900.
Lepselter, Martin P., to BTL Fellows Company, LLC; and Spectron Corporation of America, L.L.C. Gas discharge flat-panel display and method for making the same. 5,469,021, Cl. 313-582.000.
Lerch, Bernard L.: *See*—
Sharma, Somesh D.; Clark, Brian R.; and Lerch, Bernard L., 5,468,481, Cl. 424-125.100.
Le Roux, Gérard; and Le Menn, Jacques, to SGS-Thomson Microelectronics, S.A. Avalanche diode incorporated in a bipolar integrated circuit. 5,468,673, Cl. 437-60.000.
Leseman, Steven R.: *See*—
Huss, Charles P.; Fry, Arthur L.; and Leseman, Steven R., 5,468,523, Cl. 428-5.000.
L'Etat Francais represente par le Deleque General pour l'Armement: *See*—
Scarpitta, Alain A.; Boucher, Didier; and Grosso, Gilles, 5,469,406, Cl. 367-171.000.
Letort, Xavier, to SGS-Thomson Microelectronics, S.A. Wafer boat for supporting silicon wafers. 5,468,297, Cl. 118-728.000.
Leung, Cissy: *See*—
Lei, Lawrence C.; and Leung, Cissy, 5,468,298, Cl. 118-728.000.
Leung, Keith: *See*—
Anderson, Neal R.; Erickson, Bart J.; and Leung, Keith, 5,469,409, Cl. 368-10.000.
Leung, Roger Y.; Stranford, Gerald T.; and Gonczy, Stephen T., to Allied-Signal Inc. High flexural strength ceramic fiber reinforced silicon carboxide composite. 5,468,318, Cl. 156-89.000.
Leve, Ludger; and Sieroks, Jurgen, to Framatome Connectors International. Screening hull for electrical cable. 5,468,911, Cl. 174-74.00R.
Lever Brothers Company, Division of Conopco, Inc.: *See*—
Rabone, Kenneth L., 5,468,418, Cl. 252-174.250.
Levine, Myron M.: *See*—
Fasano, Alessio; Levine, Myron M.; Nataro, James P.; and Noriega, Fernando, 5,468,639, Cl. 435-320.100.
Levy, Paul S., to VLSI Technology, Inc. Multi-level vROM programming method and circuit. 5,469,379, Cl. 365-96.000.
Lewandowski, Robert S.: *See*—
Smith, Lowell S.; and Lewandowski, Robert S., 5,467,779, Cl. 128-660.100.
Lewis, Larry N.; Medford, George F.; and Factor, Arnold, to General Electric Company. Method for making radiation curable silicon containing polyacrylate hardcoat compositions and compositions made thereby. 5,468,789, Cl. 524-99.000.
Lewis, Russell F.; Martin, Steven F.; Cone, Dale A.; and Josephson, Norman A., to Texas Instruments Incorporated. Method and apparatus for presentation of on-line directional sound. 5,469,511, Cl. 381-173.000.
Lexmark International, Inc.: *See*—
Cheng, Kuangti T.; Murthy, Ashok; Saldanha-Singh, Jeanne M.; and Sharma, Pramod K., 5,469,247, Cl. 355-296.000.
Leybold Aktiengesellschaft: *See*—
Mahler, Peter; and Stang, Wolfgang, 5,468,362, Cl. 204-298.110.
Li, Pei: *See*—
Stover, Harald D. H.; Li, Pei; Ferrari, Lorenzo; Shaver, Robert T.; and Vlaovic, Djordje, 5,468,814, Cl. 525-390.000.
Li, Tzu-Li; Tung, I-Chung; and Yu, Duncan. Ultrasound-enhanced devolatilization of thermoplastic plastics. 5,468,429, Cl. 264-442.000.
Li, Yajun: *See*—
Alexander, Edward R.; Goldman, Ron; Li, Yajun; Bard, Simon; Strat, Askold; Katz, Joseph; and Metlitsky, Boris, 5,468,952, Cl. 235-492.000.
Lian, Ming-Ren: *See*—
Liu, Nen-chin; Lian, Ming-Ren; and Cantey, Jimmy, 5,469,140, Cl. 340-551.000.
Liang, Feng: *See*—
Masur, Md A.; Xu, Xingyi; and Liang, Feng, 5,469,351, Cl. 363-56.000.
Liao, Benson; and Wang, Taming, to Motorola, Inc. Circuit and method for filtering voltage spikes. 5,469,476, Cl. 375-350.000.
Liao, Truoe-Hsiang, to Industrial Technology Research Institute. Charge pumping circuit using non-overlapping clock control. 5,469,110, Cl. 327-536.000.
Liberman, Harold J., to United States of America, Army. Cannon launched reconnaissance vehicle. 5,467,681, Cl. 89-1.110.
Liberty Mutual Insurance Co.: *See*—
Teare, Peter R.; Murphy, Patrice L.; and Brogmus, George E., 5,467,656, Cl. 73-862.541.
Lieberfarb, Warren N.: *See*—
Ostrover, Lewis S.; Cookson, Christopher J.; and Lieberfarb, Warren N., 5,469,370, Cl. 364-514.00R.
Lieberman, Donald A.; and Nemec, John J., to Multichip Technology. Dynamically reconfigurable memory system with programmable controller and FIFO buffered data channels. 5,469,558, Cl. 395-285.000.
Lieberman, Pamela D.: *See*—
Deevi, Seetharama C.; Hajaligol, Mohammad R.; Lieberman, Pamela D.; Nichols, Walter A.; and Watkins, Michael L., 5,468,936, Cl. 219-553.000.
Liebert Corporation: *See*—
Feeney, Edward K., 5,467,609, Cl. 62-259.200.
Liebman, Henry F.; Clayton, Alan; and Horneman, Walter A., to Motorola, Inc. Method and apparatus for ultrasonically energizing pin seating in test fixture devices. 5,469,073, Cl. 324-757.000.
Lijten, Franciscus A. T.; and Meerman, Johannes J., to Akzo N.V. Yarn formed from core-sheath filaments and production thereof. 5,468,555, Cl. 428-365.000.
Lila, Christine: *See*—
de Nanteuil, Guillaume; Vincent, Michel; Lila, Christine; Bonnet, Jacqueline; and Fradin, Armel, 5,468,761, Cl. 514-374.000.
Lim, Dae-Young, to Daewoo Electronics Co., Ltd. Electrostrictive mirror actuator for use in optical projection system. 5,469,302, Cl. 359-846.000.
Lim, Martin G.: *See*—
Hadimioglu, Babur B.; Lim, Martin G.; Stearns, Richard G.; and Quate, Calvin F., 5,467,975, Cl. 271-267.000.
Limburg, William W.: *See*—
Yu, Robert C. U.; Foley, Geoffrey M. T.; Herbert, William G.; Limburg, William W.; Mishra, Satchidanand; Post, Richard L.; and Von Hoene, Donald C., 5,469,242, Cl. 355-219.000.
Lin, Bill: *See*—
Takahashi, Haruki; and Lin, Bill, 5,467,789, Cl. 134-56.00R.
Lin, Chun S.; Lin, Thomas; Lin, Jefferson; and Lin, Philip. Replaceable cutting blade for a lawn mower blade. 5,467,586, Cl. 56-17.500.
Lin, David C. K.; and Gavin, Patrick M., to Owens-Corning Fiberglas Technology, Inc. Apparatus having elongated orifices for centrifuging dual-component, curly, glass fibers. 5,468,275, Cl. 65-497.000.
Lin, Horng-dar: *See*—
Lee, Kuo-Hua; Lin, Horng-dar; Yan, Ran-Hong; and Yu, Chen-Hua D., 5,468,669, Cl. 437-51.000.
Lin, Jefferson: *See*—
Lin, Chun S.; Lin, Thomas; Lin, Jefferson; and Lin, Philip, 5,467,586, Cl. 56-17.500.
Lin, M. Linda, to Nalco Fuel Tech. Stabilization of calcium-based slurries for sox reduction by in-furnace injection. 5,468,460, Cl. 423-266.000.
Lin, Paul T.; and McShane, Michael B., to Motorola, Inc. Liquid encapsulated ball grid array semiconductor device with fine pitch wire bonding. 5,468,999, Cl. 257-784.000.
Lin, Philip: *See*—
Lin, Chun S.; Lin, Thomas; Lin, Jefferson; and Lin, Philip, 5,467,586, Cl. 56-17.500.
Lin, Qian. Halftone image formation using dither matrix generated based upon printed symbol models. 5,469,515, Cl. 382-237.000.
Lin, Thomas: *See*—
Lin, Chun S.; Lin, Thomas; Lin, Jefferson; and Lin, Philip, 5,467,586, Cl. 56-17.500.
Lin, Tien-Wang. Shutter window assembly. 5,467,556, Cl. 49-82.100.
Lincoln Brass Works, Inc.: *See*—
Ferlin, William J., 5,468,145, Cl. 431-266.000.
Linde Aktiengesellschaft: *See*—
Forster, Franz, 5,467,597, Cl. 60-442.000.
Linder, Benjamin; Lee, Don; Battles, Amy; and Thomas, Bradley S., to Massachusetts Institute of Technology. Sample tube identification flag. 5,468,022, Cl. 283-072.000.
Linehan, John C.; Yonker, Clement R.; Zemanian, Thomas S.; and Franz, James A., to Battelle Memorial Institute. Spectrometer capillary vessel and method of making same. 5,469,061, Cl. 324-321.000.
Linkner, Herbert L., Jr., to Kelsey-Hayes Company. Antilock system with proportional control and pressure memory. 5,468,058, Cl. 303-115.200.
Linn, Scott: *See*—
Badyal, Rajeev; and Linn, Scott, 5,469,076, Cl. 326-16.000.
Linotype-Hell AG: *See*—
Kerz, Ludo, 5,469,516, Cl. 382-254.000.
Lintec Corporation: *See*—
Amano, Yasuyuki; Ikeda, Takeshi; Aizawa, Eiji; and Saito, Takanori, 5,468,535, Cl. 428-40.000.
Linz, Wolfgang: *See*—
Heitsch, Holger; Linz, Wolfgang; Wagner, Adalbert; and Kleemann, Heinz-Werner, 5,468,764, Cl. 514-382.000.
Lioutas, Theodore S.: *See*—

Schlup, Raphael; and Lioutas, Theodore S., 5,468,509, Cl. 426-548.000.

Lipinski, Reinhard, to Invest Tech AG. Linear drive without a piston rod. 5,467,686, Cl. 92-88.000.

Lippens, Christiaan A. C.: *See*—
Nauktgeboren, Adrianus; and Lippens, Christiaan A. C., 5,467,702, Cl. 100-35.000.

Lipson, Ron B., to Kwik Paint Products. Masking material. 5,468,533, Cl. 428-40.000.

Liquid Air Corporation: *See*—
Baker, George D.; and Henry, V. Russell, 5,467,798, Cl. 137-614.200.

Liquid Carbonic Corporation: *See*—
Venetucci, Jim M., 5,467,612, Cl. 62-374.000.

Liquid Control Corporation: *See*—
Miller, Kenneth L., 5,467,899, Cl. 222-309.000.

Lira, Joseph R., to Nova Power Systems, Ltd. Wastewater pretreatment tank assembly. 5,468,375, Cl. 210-139.000.

Lisa, Rudolph E.; Kilbride, Terence K.; and Jager, Karl-Friedrich, to BASF Corporation. High concentrated, solid mepiquat chloride products and processes for making dry form solid mepiquat chloride powder and tablets. 5,468,720, Cl. 504-236.000.

LiteCom, Inc.: *See*—
Fan, Robert J., 5,469,522, Cl. 385-98.000.

Litenas, Michael; and Schuler, Roland, to Asea Brown Boveri Ltd. Means for fixing winding overhangs in electrical machines. 5,468,916, Cl. 174-127.000.

Litton Systems, Inc.: *See*—
Begum, Syeda R.; and Symons, Robert S., 5,469,022, Cl. 315-5.390.
Hall, David B.; and Lam, Leo K., 5,469,256, Cl. 356-350.000.
Kirshner, Mark F., 5,469,023, Cl. 315-5.390.
Kirshner, Mark F.; and Symons, Robert S., 5,469,024, Cl. 315-5.390.

Liu, Edison T., to University of North Carolina at Chapel Hill, The. Axl oncogene. 5,468,634, Cl. 435-240.200.

Liu, Kexing: *See*—
Measures, Raymond M.; Alavie, Tino; Melle, Serge M.; Coroy, Trent; Mason, Beck; Karr, Shawn E.; and Liu, Kexing, 5,469,265, Cl. 356-419.000.

Liu, Nen-chin; Liao, Ming-Ren; and Cantey, Jimmy, to Sensormatic Electronics Corporation. Transverse magnetic field annealed amorphous magnetomechanical elements for use in electronic article surveillance system and method of making same. 5,469,140, Cl. 340-551.000.

Livesay, William R., to Electron Vision Corporation. Method for three-dimensional control of solubility properties of resist layers. 5,468,595, Cl. 430-296.000.

Lobko, Irina P.: *See*—
Lobko, Mikhail A.; and Lobko, Irina P., 5,468,117, Cl. 414-786.000.

Lobko, Mikhail A.; and Lobko, Irina P. Heating of tank car walls for ejecting frozen or congealed cargo. 5,468,117, Cl. 414-786.000.

Lockerby, Kevin L.: *See*—
Kirollos, Kirollos S.; Mihaylov, Gueorgui M.; Lockerby, Kevin L.; and Stobnicki, Roman A., 5,468,645, Cl. 436-164.000.

Lockheed Sanders, Inc.: *See*—
Saunders, Roger L., 5,469,407, Cl. 367-173.000.

Loeffler, John M., to Dana Corporation. Shift rail position sensor for vehicle transmission. 5,468,197, Cl. 477-99.000.

Loerzer, Thomas; Telser, Thomas; Zwez, Thomas; and Albert, Bernhard, to BASF Lacke + Farben AG. Photosensitive recording element and production of a relief printing plate. 5,468,596, Cl. 430-306.000.

Loftus, James E.; and Gallagher, Kevin P., to Owens-Corning Fiberglas Technology, Inc. Method of making a highway reinforcement product. 5,468,546, Cl. 428-280.000.

Lombaers, Jacobus H. M.: *See*—
Oosterveen, Leendert; Lombaers, Jacobus H. M.; and Dorsman, Johannes, 5,468,942, Cl. 235-383.000.

Long, Carl J., II: *See*—
Adams, Daniel J.; Amjad, Zahid; Lemma, Solomon; and Long, Carl J., II, 5,468,797, Cl. 524-379.000.

Long, Stephen T.: *See*—
Gotor Dan; Harnisch, Robert P.; Browne, Robert L.; and Long, Stephen T., 5,468,047, Cl. 297-250.100.

Loquet, Rüdiger; and Kimmich, Ulrich, to H. Stroll GmbH & Co. Process for forming a yarn securing knot in a flat knitting machine. 5,467,616, Cl. 66-93.00R.

L'Oreal: *See*—
LaGrange, Alain; and Borowiak, Hervé, 5,468,472, Cl. 424-62.000.
Touzan, Philippe; Lukassen, Liliane; and Louvet, Nathalie, 5,468,496, Cl. 424-401.000.
Yquel, Jean-Pierre, 5,467,902, Cl. 222-402.100.

Lorenz, Dieter; and Gorablenkow, Jorg, to Siemens Aktiengesellschaft. High-voltage measurement device. 5,469,050, Cl. 324-126.000.

Lorenz, Gisela: *See*—
Wenderoth, Bernd; Brand, Siegbert; Schuetz, Franz; Kuekenhoehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,468,717, Cl. 504-130.000.

Lory, Earl R.: *See*—
Frye, Robert C.; Harry, Thomas R.; Lory, Earl R.; and Rietman, Edward A., 5,467,883, Cl. 216-60.000.

Lotz, Wilfried; and Lovett, Donald C., to Branson Ultrasonics Corporation. Flexural spring support for vibratory apparatus. 5,468,336, Cl. 156-580.200.

Loudon, G. Marc: *See*—
Boyd, Victoria L.; Bozzini, MeriLisa; and Loudon, G. Marc, 5,468,843, Cl. 530-345.000.

Louie, Danny: *See*—
Slocum, Richard T.; Bjordahl, James; Louie, Danny; and Rasmussen, Donald, 5,469,310, Cl. 360-92.000.

Louvet, Nathalie: *See*—
Touzan, Philippe; Lukassen, Liliane; and Louvet, Nathalie, 5,468,496, Cl. 424-401.000.

Lovett, Donald C.: *See*—
Lotz, Wilfried; and Lovett, Donald C., 5,468,336, Cl. 156-580.200.

Lowe, Coy S.: *See*—
Briese, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Fouquet, Christophe J. A.; and Lowe, Coy S., 5,469,049, Cl. 324-76.770.

Lowrance, Robert B., to Applied Materials, Inc. Two-axis magnetically coupled robot. 5,469,035, Cl. 318-568.100.

LSI Logic Corporation: *See*—
Aronowitz, Sheldon; Ku, Yen-Hui J.; and Ho, Yu-Lam, 5,468,974, Cl. 257-51.000.
Nguyen, Trung T.; and Zhao, Jin, 5,469,120, Cl. 331-177.00R.
Oke, Timothy P.; Cummings, Russell E., II; and Gavrielov, Nachum M., 5,469,075, Cl. 324-763.000.
Pasch, Nicholas F., 5,468,681, Cl. 437-183.000.
Patrick, Roger; Schoenborn, Philippe; Franklin, Mark; and Bose, Frank, 5,468,296, Cl. 118-723.0MP.
Yang, Dian; and Karampurwala, Hashain, 5,469,366, Cl. 364-489.000.

Lu Kuang Incorporation: *See*—
Huang, Y. H., 5,468,051, Cl. 297-344.180.

Lu, Shih-Lai, to Minnesota Mining and Manufacturing Company. Retroreflective article comprising a transparent base sheet and nacreous pigment coating, method for making such a base sheet, and method for making a forming master. 5,468,540, Cl. 428-156.000.

Lucas Industries public limited company: *See*—
Farr, Glyn P. R., 5,468,059, Cl. 303-116.100.
Willacy, Stephen J., 5,468,073, Cl. 384-477.000.
Williams, David; Briscoe, Stuart M.; and Melbourne, Keith, 5,467,641, Cl. 73-49.700.

Lucast, Donald H.; Moore, Cheryl L.; and James, Ruth A., to Minnesota Mining and Manufacturing Company. Crosslinked absorbent pressure sensitive adhesive and wound dressing. 5,468,821, Cl. 526-264.000.

Lucky Corporation Co., Ltd.: *See*—
Kimura, Yoshio, 5,467,788, Cl. 132-255.000.

Lucky Ltd.: *See*—
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,468,896, Cl. 558-233.000.

Lucy, William D.; and Firman, William F., to United States of America, Navy. Retractable bow diving plane for a submarine. 5,467,728, Cl. 114-332.000.

Ludewig, Erich: *See*—
Megerle, Friedrich; Hohl, Guenther; Ludewig, Erich; and Kaes, Guenter, 5,468,057, Cl. 303-87.000.

Lüdorff, Harald: *See*—
Arvedi, Giovanni; Gosio, Giovanni; Siegers, Ulrich; Manini, Luciano; Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Thurm, Hans-Günther; and Lüdorff, Harald, 5,467,809, Cl. 164-418.000.

Ludwig, Wolfgang: *See*—
Eschner, Wolfgang; and Ludwig, Wolfgang, 5,469,056, Cl. 324-248.000.

Luedke, Adam A.: *See*—
Olson, Scott B.; Polk, Louis F., III; and Luedke, Adam A., 5,468,004, Cl. 280-11.200.

Lueschow, Kevin J.: *See*—
Barton, James C.; Lueschow, Kevin J.; and Stratton, Ken L., 5,467,829, Cl. 172-4.500.

Lukassen, Liliane: *See*—
Touzan, Philippe; Lukassen, Liliane; and Louvet, Nathalie, 5,468,496, Cl. 424-401.000.

Lukich, Michael S., to Caterpillar Inc. Hydraulic power control system. 5,468,126, Cl. 417-53.000.

Lulay, Eugen, to Hofmann Maschinenbau GmbH. Apparatus for unbalance compensation of a grinding wheel. 5,467,653, Cl. 73-469.000.

Lum, Andrew F.; Uribe, Juan M.; Hogan, John M.; Persinger, Richard A.; Miller, James F.; and Navaratnam, Ramesh A., to Chem-Trend, Incorporated. Carrier-free metalworking lubricant and method of making and using same. 5,468,401, Cl. 252-22.000.

Lund, Gary K.; and Braithwaite, Paul C., to Thiokol Corporation. Enhanced performance, high reaction temperature explosive. 5,467,714, Cl. 102-284.000.

Lund, Gary K.: *See*—
Highsmith, Thomas K.; Hajik, Robert M.; Wardle, Robert B.; Lund, Gary K.; and Blau, Reed J., 5,468,866, Cl. 548-251.000.

Lund, Kristofer T.: *See*—
Garcia, Mario C.; Lund, Kristofer T.; and Park, William H., 5,468,217, Cl. 601-32.000.

Lungo, John: *See*—
Shieh, Chan-Long; Lebby, Michael S.; and Lungo, John, 5,468,656, Cl. 437-23.000.

Lunsford, John P.: *See*—
Chin, Albert K.; and Lunsford, John P., 5,468,248, Cl. 606-192.000.

Lusen, Leonard; and Ebersole, Tammy S., to Bentley-Harris Manufacturing Company, The. Woven sleeve with integral lacing cord. 5,467,802, Cl. 139-384.00R.

Luther–Davies, Barry; and Xiaoping, Yang, to Australian National University, The. Photonic devices using optical waveguides induced by dark spatial solitons. 5,469,525, Cl. 385-122.000.

Lutz, Daniel R.: *See*—
Adamson, Ronald B.; Lutz, Daniel R.; and Armijo, Joseph S., 5,469,481, Cl. 376-416.000.

Lutz, Michael A.: *See*—
Gentle, Theresa E.; and Lutz, Michael A., 5,468,826, Cl. 528-15.000.

Luukkala, Mauri, to Soundek Oy. Detector for indicating ice formation on the wing of an aircraft. 5,467,944, Cl. 244-134.00F.

Luzzi, Glenn J., to Amerace Corporation. Alternative cold shrink device. 5,467,515, Cl. 29-235.000.

Lycette, Mark: *See*—
Glatfelter, Troy; and Lycette, Mark, 5,468,988, Cl. 257-431.000.

Lycom A/S: *See*—
Bjarklev, Anders O.; and Rasmussen, Thomas P., 5,469,292, Cl. 359-341.000.

Lynn, John S.: *See*—
Lee, Leonard G.; Lynn, John S.; McLean, Francis A.; Tucker, Edwin C.; and Sevack, Lloyd, 5,467,972, Cl. 269-118.000.

Lynx Real-Time Systems, Inc.: *See*—
Bunnell, Mitchell, 5,469,571, Cl. 395-700.000.

MAAG Pump Systems AG: *See*—
Blume, Peter; and Stehr, Roger, 5,468,131, Cl. 418-94.000.

Maas, Wilhelmus J. J.; and Hurkmans, Petrus L. W., to AFA Products, Inc. Precompression valve for trigger sprayer. 5,467,900, Cl. 222-341.000.

MacConnell, John G.: *See*—
Gagliardi, Magda M.; Chen, Shieh-Shung T.; Arison, Byron H.; Garrity, George M.; Huang, Leeyuan; MacConnell, John G.; and White, Raymond F., 5,468,771, Cl. 514-452.000.

MacDermid, Incorporated: *See*—
Ferrier, Donald; and Yakobson, Eric, 5,468,515, Cl. 427-98.000.

MacDonald, Iain R., to Plessey Semiconductors Limited. Current mirror drive circuit with high breakdown voltage. 5,469,093, Cl. 327-108.000.

MacDonald, John F.: *See*—
Graham, Marcus L.; MacDonald, John F.; Gong, Kai F.; and Keay, Kathleen D., 5,469,374, Cl. 364-516.000.

Macek, Thomas G.: *See*—
Brodsky, William L.; Herard, James D.; Macek, Thomas G.; Sharp, Timothy L.; and Shovlowsky, George J., 5,468,917, Cl. 174-255.000.

Mach, Thomas J.: *See*—
Acker, William P.; Hahn, Robert T.; Mach, Thomas J.; and Sung, Rodney L., 5,468,262, Cl. 44-348.000.

Machelski, Russell J.: *See*—
Madsen, Timothy A.; and Machelski, Russell J., 5,469,305, Cl. 360-51.000.

Machida, Hideaki: *See*—
Yamaguchi, Ryuichi; Kiso, Koichi; Tazuke, Kiyoshi; Machida, Hideaki; Mihirogi, Katsuhiro; and Takamatsu, Yukichi, 5,468,894, Cl. 556-477.000.

Machida, Hirohisa, to Mitsubishi Denki Kabushiki Kaisha. Standard cells interconnection structure including a modified standard cell. 5,468,977, Cl. 257-208.000.

Machida, Yoshimasa: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Macioch, Michael T.; Gates, Douglas M.; and Leary, Timothy M., to Minnesota Mining and Manufacturing Company. Process for manufacturing diffusion transfer printing plates. 5,468,588, Cl. 430-229.000.

MacLean, John A., IV. Microwave cooking container with reflectors. 5,468,939, Cl. 219-727.000.

Madan, Sudhir K., to Texas Instruments Incorporated. Trench isolation structure and method for forming. 5,468,676, Cl. 437-70.000.

Maddox, Charles K.: *See*—
Ratu, John J.; Jones, Alvin K.; and Maddox, Charles K., 5,467,970, Cl. 267-220.000.

Madduri, Hari H., to International Business Machines Corporation. Determining a winner of a race in a data processing system. 5,469,575, Cl. 395-200.030.

Madsen, Timothy A.; and Machelski, Russell J., to Seagate Technology, Inc. AC timing asymmetry reduction circuit including summing DC offset voltage with timing signal. 5,469,305, Cl. 360-51.000.

Madsen, Wayne A., to Delco Electronics Corporation. Method and apparatus for VF tube power supply. 5,469,026, Cl. 315-169.400.

Maechtle, Walter: *See*—
Aydin, Oral; Portugall, Michael; Neutzner, Josef; and Maechtle, Walter, 5,468,799, Cl. 524-457.000.

Maeda, Hirokazu: *See*—
Hattori, Mitsuo; Furuta, Hitoshi; Takahashi, Taro; and Maeda, Hirokazu, 5,468,287, Cl. 106-217.000.

Maeda, Patrick Y., to Xerox Corporation. Two-element zoom lens for beam separation error correction. 5,469,290, Cl. 359-210.000.

Maeda, Takahide: *See*—
Miyazaki, Katsuo; Maeda, Takahide; Ogawa, Takeshi; Kakui, Sonoko; Ikeda, Satoshi; and Yamane, Yoshiki, 5,468,517, Cl. 427-322.000.

Maeda, Yoshimi: *See*—
Murai, Masaru; Hirai, Takayuki; Hyoi, Isao; Maeda, Yoshimi; and Susuki, Seiichi, 5,469,230, Cl. 351-52.000.

Maehara, Hiroshi: *See*—
Miyake, Akira; Fukada, Yasuaki; and Maehara, Hiroshi, 5,469,489, Cl. 378-35.000.

Maejima, Kazuhiro, to Komori Corporation. Plate exchange apparatus for printing press. 5,467,711, Cl. 101-216.000.

Maekawa, Takashige: *See*—
Osawa, Ryoko; Maekawa, Takashige; Momii, Tatsuo; and Kamata, Satoshi, 5,468,904, Cl. 568-333.000.

Maekawa, Yasunori: *See*—
Kosaka, Tokihiro; Ogino, Shinichi; and Maekawa, Yasunori, 5,469,251, Cl. 356-73.000.

Maffione, Grazia: *See*—
Cereda, Enzo; Ezbaya, Antoine; Turconi, Marco; Dubini, Enrica; and Maffione, Grazia, 5,468,758, Cl. 514-304.000.

Magnetic Bearing Technologies, Inc.: *See*—
Pinkerton, Joseph F., 5,469,006, Cl. 310-90.500.

Magyar, by Sheila, legal representative: *See*—
Magyar, Peter F., deceased, Jr; and Magyar, by Sheila, legal representative, 5,469,249, Cl. 356-4.070.

Magyar, Peter F., deceased, Jr; and Magyar, by Sheila, legal representative. Photosensitive probes. 5,469,249, Cl. 356-4.070.

Mahant-Shetti, Shivaling S.; and Landers, Robert J., to Texas Instruments Incorporated. Flip-flop for use in LSSD gate arrays. 5,469,079, Cl. 326-46.000.

Mahler, Peter; and Stang, Wolfgang, to Leybold Aktiengesellschaft. Apparatus for treating substrates in a vacuum chamber. 5,468,362, Cl. 204-298.110.

Mahood, James A., to General Electric Company. Amine stabilized amorphous phosphite. 5,468,895, Cl. 558-71.000.

Mainolfi, Sylvio J.; Patry, Gerald F.; and Pensiero, Henry A., to Branson Ultrasonics Corporation. Apparatus for producing carpeted panels. 5,468,335, Cl. 156-580.200.

Majid, Naveed: *See*—
Wong, Stephen L.; and Majid, Naveed, 5,469,046, Cl. 323-286.000.

Makarenko, Peter; Harris, Stacy E.; and Martin, Robert R., to General Electric Company. Apparatus for making a bonded laminated article bend portion. 5,468,331, Cl. 156-494.000.

Makitani, Atsushi: *See*—
Nishio, Hisashi; Arai, Toru; Nishizuka, Masaru; and Makitani, Atsushi, 5,469,350, Cl. 363-55.000.

Makram-Ebeid, Shérif, to U.S. Philips Corporation. Unsupervised training method for a neural net and a neural net classifier device. 5,469,530, Cl. 395-23.000.

Malamas, Michael S.; and Nelson, James A., to American Home Products Corporation. Aralkyl-N-hydroxyureas as inhibitors of 5-lipoxygenase and oxidation of low density lipoprotein. 5,468,760, Cl. 514-374.000.

Malamas, Michael S.; and Gunawan, Iwan, to American Home Products Corporation. Azolidinediones as antihyperglycemic agents. 5,468,762, Cl. 514-376.000.

Malik, Aslam A.; Archibald, Thomas G.; Carlson, Roland P.; and Manser, Gerald E., to Aerojet General Corporation. Polymerization of energetic, cyclic ether monomers using boron trifluoride tetrahydrofuranate. 5,468,841, Cl. 528-408.000.

Malin, Michael J.: *See*—
Benezra, Jeffrey; and Malin, Michael J., 5,468,640, Cl. 436-66.000.

Malizia, Mario. Supporting stand for a musical instrument keyboard. 5,467,953, Cl. 248-166.000.

Mallinckrodt Medical, Inc.: *See*—
Deutsch, Edward A.; Deutsch, Karen F.; Cacheris, William P.; Ralston, William H.; White, David H.; Nosco, Dennis L.; Wolfangel, Robert G.; Wilking, Janet B.; Meeh, Linda; and Woulfe, Steven R., 5,468,465, Cl. 424-9.400.

Malone, Thomas C.: *See*—
Lavelle, Patrick M.; DiCroce, John; and Malone, Thomas C., 5,469,151, Cl. 340-825.360.

Malucelli, Decio: *See*—
Ghisellini, Renato; Cecchin, Giuliano; and Malucelli, Decio, 5,468,809, Cl. 525-240.000.

MAN Roland Druckmaschinen AG: *See*—
Rohrhirsch, Ulrich; and Schmid, Georg, 5,468,209, Cl. 493-424.000.

Manabe, Takafumi: *See*—
Tsurutani, Iwao; Manabe, Takafumi; and Ernoto, Ikuo, 5,468,807, Cl. 525-240.000.

Manaka, Junji, to Ricoh Seiki Company, Ltd. Drive control apparatus for microsensor. 5,467,651, Cl. 73-23.210.

Mandai, Takahiko; Yoneyama, Masaru; and Sakai, Shuzo, to Kabushiki Kaisha Hayashibara; and Seibutsu Kagaku Kenkyujo. Process for preparing high 2-O-α-D-glucopyranosyl-L-ascorbic acid content product. 5,468,850, Cl. 536-18.500.

Manini, Luciano: *See*—
Arvedi, Giovanni; Gosio, Giovanni; Siegers, Ulrich; Manini, Luciano; Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Thurm, Hans-Günther; and Lüdorff, Harald, 5,467,809, Cl. 164-418.000.

Manke, Steven A.: *See*—
Hani, Rahim; Dumas, Richard H.; Gavin, David F.; Harrison, Charles H.; Kennedy, Michael A.; Schiessl, Henry W.; McMahon, Robert E.; and Manke, Steven A., 5,468,864, Cl. 546-345.000.

Mankus, John R.: *See*—

Chr., Benson; Chapin, Fletcher L.; Fiacco, Vincent M.; Markus, John R., and Pokrzywa, Robert S., 5,468,996, Cl. 257-723.000.

Mannesmann Aktiengesellschaft: *See*—
Arvedi, Giovanni; Gosio, Giovanni; Siegers, Ulrich; Manini, Luciano; Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Thurm, Hans-Günther; and Lüdorff, Harald, 5,467,809, Cl. 164-418.000.

Manser, Gerald E.: *See*—
Malik, Aslam A.; Archibald, Thomas G.; Carlson, Roland P.; and Manser, Gerald E., 5,468,841, Cl. 528-408.000.

Manufacturing Technology Resources Inc.: *See*—
Cheng, Samuel, 5,469,327, Cl. 361-680.000.

Manulik, Robert J.: *See*—
Brandner, James M.; Manulik, Robert J.; Meyer, Arthur J., III; and Schreiter, Mark E., 5,469,436, Cl. 370-85.200.

Marantz, Daniel R.; and Kowalsky, Keith A., to Flame-Spray Industries, Inc. Apparatus and method for thermal spray coating interior surfaces. 5,468,295, Cl. 118-723.0DC.

Marathon Oil Company: *See*—
Miller, Troy A., 5,467,826, Cl. 166-380.000.

Marchand, Pierre: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; and Marchand, Pierre, 5,468,399, Cl. 252-[illegible].000.

Marchio, Agnes: *See*—
Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; DeJean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, 5,468,617, Cl. 435-7.800.

Marco, Leslie S.: *See*—
Broskow, James A.; and Marco, Leslie S., 5,467,870, Cl. 206-162.000.

Marcolongo, Michele S.; Ducheyne, Paul; Ko, Frank; and LaCourse, William, to University of Pennsylvania, The Trustees of the. Composite materials using bone bioactive glass and ceramic fibers. 5,468,544, Cl. 428-224.000.

Marcus, Bonita K.: *See*—
Resasco, Daniel E.; Marcus, Bonita K.; Huang, Chen-Shi; and Durante, Vincent A., 5,468,710, Cl. 502-222.000.

Marek, Jiri: *See*—
Reiblen, Eckart; Marek, Jiri; Bantien, Frank; Findler, Guenther; Offenberg, Michael; Kleinhans, Josef; Konzelmann, Uwe; and Ziegenbein, Botho, 5,467,649, Cl. 73-204.260.

Marek, Steven W.: *See*—
Soucie, Wayne L.; Champ, Larry B.; Tayon, Jeffrey E.; Carlson, Harold L.; Marek, Steven W.; and Koenig, Peter C., 5,467,666, Cl. 74-575.000.

Mariani, Elio A., to United States of America, Army. Passive SAW-ID tags using a chirp transducer. 5,469,170, Cl. 342-51.000.

Mariatte, René: *See*—
Tourneux, Daniel; Mariatte, René; and Dajoux, Bernard, 5,468,071, Cl. 384-276.000.

Marinelli, Robert A.: *See*—
Nguyen, Tuan K.; Nguyen, Pha; Clark, Donna A.; and Marinelli, Robert A., 5,469,178, Cl. 343-702.000.

Maring, Clarence J.: *See*—
Klein, Larry L.; and Maring, Clarence J., 5,468,769, Cl. 514-449.000.

Marinus, Antonius A. M., to U.S. Philips Corporation. Power supply circuit and control circuit for use in a power supply circuit. 5,469,349, Cl. 363-21.000.

Markison, Timothy W.: *See*—
Grube, Gary W.; and Markison, Timothy W., 5,469,569, Cl. 395-600.000.

Marks, Owen L., Jr.: *See*—
Hughes, W. James; McCabe, James W.; and Marks, Owen L., Jr., 5,467,834, Cl. 175-61.000.

Maroni, Victor A.: *See*—
Dorris, Stephen E.; Poeppel, Roger B.; Prorok, Barton C.; Lanagan, Michael T.; and Maroni, Victor A., 5,468,566, Cl. 428-552.000.

Marsh, David J.; and Schubring, Gary L., to Emhart Inc. Polymer cable check strap. 5,467,507, Cl. 24-298.000.

Marshall, Dorothea; and Allen, Ethan. Kaleidoscope kit. 5,469,297, Cl. 359-617.000.

Martin, Bernard; and Lefumeux, Alain, to Societe Nationale des Poudres et Explosifs. Ignition-sensitive low-vulnerability propellent powder. 5,468,312, Cl. 149-19.400.

Martin Engineering Company: *See*—
Swinderman, R. Todd, 5,467,866, Cl. 198-841.000.

Martin, John R. Wrist support for a keyboard. 5,467,952, Cl. 248-118.100.

Martin, Luther W.; and Smith, Richard L., to Insertec Systems, Inc. Methods of sealing annular space between inner and outer gas mains for tie-overs. 5,467,795, Cl. 137-15.000.

Martin Marietta Energy Systems, Inc.: *See*—
DeVault, Robert C., 5,467,614, Cl. 62-476.000.

Martin, Michael G.: *See*—
Fisher, Lawrence E.; Flippin, Lee A.; and Martin, Michael G., 5,468,867, Cl. 548-253.000.

Martin, Robert R.: *See*—
Makarenko, Peter; Harris, Stacy E.; and Martin, Robert R., 5,468,331, Cl. 156-494.000.

Martin, Steven F.: *See*—
Lewis, Russell F.; Martin, Steven F.; Cone, Dale A.; and Josephson, Norman A., 5,469,511, Cl. 381-173.000.

Maruichi, Takanori; Kamaya, Naoki; and Yamauchi, Toshiyuki, to Sony Corporation. Video camera. 5,469,211, Cl. 348-211.000.

Marumoto, Hideji: *See*—
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.

Maruyama, Jun; and Yamashita, Koji, to Kabushiki Kaisha Komatsu Seisakusho. Operating valve device. 5,467,688, Cl. 91-441.000.

Maruyama, Yuichi: *See*—
Okada, Takekazu; Maruyama, Yuichi; and Sayanagi, Kazuya, 5,469,130, Cl. 333-246.000.

Maschinenfabrik Sulzer Burckhardt AG: *See*—
Habegger, Oskar, 5,467,687, Cl. 92-165.00R.

Mason, Beck: *See*—
Measures, Raymond M.; Alavie, Tino; Melle, Serge M.; Coroy, Trent; Mason, Beck; Karr, Shawn E.; and Liu, Kexing, 5,469,265, Cl. 356-419.000.

Masrur, Md A.; Xu, Xingyi; and Liang, Feng, to Ford Motor Company. Fault isolation in an induction motor control system. 5,469,351, Cl. 363-56.000.

Massachusetts Institute of Technology: *See*—
Cohen, Simon S., 5,468,680, Cl. 437-170.000.
Herrick, Bradley R., 5,469,020, Cl. 313-511.000.
Linder, Benjamin; Lee, Don; Battles, Amy; and Thomas, Bradley S., 5,468,022, Cl. 283-072.000.

Mast, Rolf; and Powers, Dulce M., to International Beauty Design, Inc. Serrated edge nail. 5,467,787, Cl. 132-73.000.

Masterson, Anthony, to Apple Computer, Inc. Apparatus for converting twenty-four bit color to fifteen bit color in a computer output display system. 5,469,190, Cl. 345-155.000.

Mastuura, Yoshinori: *See*—
Takee, Masao; Kimoto, Mamoru; Tikano, Yoshito; Mizitaki, Husago; Mastuura, Yoshinori; Nishio, Koji; and Furukawa, Nobohiro, 5,468,260, Cl. 29-623.500.

Masuda, Minoru: *See*—
Yabuuchi, Masahiko; Akanuma, Hiroshi; Masuda, Minoru; Katoh, Kazuo; Nakamura, Tsuneo; Tajima, Shigeru; Hashiba, Masashi; Hayami, Hiroshi; Takezawa, Tomoko; and Hirayama, Masachika, 5,468,380, Cl. 210-198.200.

Masuda, Takashi: *See*—
Hoshino, Mitsuo; Tsutsumi, Yuka; Shimada, Mitsuhiro; Masuda, Takashi; Morimiya, Yuji; Ide, Yoshihiro; Kawaguchi, Takashi; and Nogo, Yuichiro, 5,469,271, Cl. 358-335.000.

Masuhara, Hiroshi: *See*—
Kamada, Kenji; Sasaki, Keiji; Kitamura, Noboru; and Masuhara, Hiroshi, 5,469,255, Cl. 356-300.000.

Masumoto, Tsuyoshi: *See*—
Yamaguchi, Tadashi; Nosaki, Katsutoshi; Inoue, Akihisa; and Masumoto, Tsuyoshi, 5,468,697, Cl. 501-98.000.

Mathan, Luc: *See*—
Bimbot, Frédéric; and Mathan, Luc, 5,469,529, Cl. 395-2.550.

Mathews, Gregory S.: *See*—
Aatresh, Deepak J.; Nakanishi, Tosaku; and Mathews, Gregory S., 5,469,544, Cl. 395-290.000.

Mathsoft, Inc.: *See*—
Razdow, Allen M., 5,469,538, Cl. 395-140.000.

Matra MHS of France: *See*—
Charpentier, Alain Y. P., 5,468,642, Cl. 436-114.000.

Matson, James A.: *See*—
Lam, Kin S.; Schroeder, Daniel R.; Mattei, Jacqueline; Forenza, Salvatore; and Matson, James A., 5,468,849, Cl. 536-18.500.

Matsubara, Kousuke; and Fukumura, Takeo, to NHK Spring Co., Ltd. Tire inflation pressure monitoring apparatus. 5,469,136, Cl. 340-445.000.

Matsui, Fumio: *See*—
Tanaka, Satoru; Matsui, Fumio; and Murata, Yasushi, 5,469,186, Cl. 345-32.000.

Matsui, Hiroshi: *See*—
Shigemoto, Hideki; Matsui, Hiroshi; and Sugahara, Jun, 5,469,125, Cl. 338-162.000.

Matsui, Hisao: *See*—
Komiya, Koji; Takezono, Tetsuya; Yabe, Noritsugu; and Matsui, Hisao, 5,468,635, Cl. 435-240.210.

Matsui, Masaaki; Shimizu, Toshifumi; and Kobayashi, Tatsuya, to Tanaka Kikinzoku Kogyo K.K. Process of thermal treatment in tissue. 5,468,210, Cl. 600-10.000.

Matsui, Shuichi; Goto, Yasuyuki; Onji, Yuichi; and Fujita, Atsuko, to Chisso Corporation. Cyclohexane derivative and liquid crystal composition containing the same. 5,468,421, Cl. 252-299.630.

Matsui, Takashi: *See*—
Yazaki, Takao; Noro, Masataka; Matsui, Takashi; Kobayashi, Noriyuki; Sano, Hironari; and Yamamoto, Koji, 5,468,444, Cl. 264-566.000.

Matsuki, Shigeru: *See*—
Ichikawa, Takanori; Kuwaki, Tomoaki; Matsuki, Shigeru; and Tachibana, Katsumi, 5,468,846, Cl. 530-388.230.

Matsumoto, Katsuru; Hirayama, Nobuhiro; Kawasaki, Shoji; Uchiyama, Kenji; Uramoto, Katsuo; and Fukui, Tamami, to Mitsui Toatsu Chemicals, Incorporated. Resin composition for use in an electrophotographic toner. 5,468,585, Cl. 430-110.000.

Matsumoto, Katsuya: *See*—
Ebata, Takashi; Matsumoto, Katsuya; Koseki, Koshi; Kawakami, Hiroshi; Matsushita, Hajime; Yoshikoshi, Hajime; and Okaniwa, Masakazu, 5,468,881, Cl. 549-295.000.

Matsumoto, Masahito; and Usui, Nobuhiro, to Sumitomo Chemical Company, Limited. Instrument panel for automobile. 5,468,039, Cl. 296-70.000.

Matsumoto, Masashi: *See*—
Saitoh, Yasushi; Matsumoto, Masashi; Ichihashi, Takao; and Yamada, Shuji, 5,469,243, Cl. 355-225.000.

Matsumoto, Seiji: *See*—
Aoki, Takuya; Shimasaki, Yuichi; Matsumoto, Seiji; Hatcho, Seiji; Oketani, Toshikazu; Miyashita, Yukio; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,467,594, Cl. 60-276.000.

Matsumoto, Takashi, to Fujitsu Limited. Telecommunication system for selecting optimum transfer rate. 5,469,502, Cl. 379-230.000.

Matsuo, Masaaki; Hagiwara, Daijiro; and Miyake, Hiroshi, to Fujisawa Pharmaceutical Co., Ltd. Peptide compounds, a process for preparation thereof and pharmaceutical composition comprising the same. 5,468,731, Cl. 514-18.000.

Matsushima, Kiyomitsu; and Nagata, Katsuyuki, to Yoshida Kogyo K.K. Method for working terminal part of material for vertical suspension type surface treatment. 5,467,630, Cl. 72-254.000.

Matsushiro, Aizo, to Kawanishi, Toshio; and Tsutsumi, Kazusumi. Compositions containing lactic acid bacterium *Streptococcus salivarius*. *5,468,479, Cl. 424-93.440.*

Matsushita Applicase Corporation: *See*—
Johnson, Milton J.; and Roney, Jeffrey T., 5,467,502, Cl. 15-339.000.

Matsushita Electric Industrial Co.: *See*—
Nishizawa, Hiroshi, 5,469,425, Cl. 369-189.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Hirase, Junji; and Hashimoto, Shin, 5,468,983, Cl. 257-344.000.
Ihara, Yasuhiro; Yamashita, Mitsuhiro; and Ueyama, Yoshiki, 5,469,360, Cl. 364-449.000.
Kaneko, Akira; Kanno, Toru; and Morishita, Keiko, 5,469,015, Cl. 313-309.000.
Konishi, Akio; Sakai, Yoshitomo; Saito, Yoshiyuki; and Yoshio, Hideaki, 5,469,309, Cl. 360-85.000.
Nagata, Yuji; Fukazawa, Toshio; Wada, Kumiko; and Tosaki, Yoshihiro, 5,469,317, Cl. 360-113.000.
Nishikawa, Yukio; Tanaka, Kunio; and Yoshida, Yoshikazu, 5,468,930, Cl. 219-121.600.
Ogawa, Kazufumi, 5,468,551, Cl. 428-333.000.
Sakakibara, Yoshio; Gotou, Makoto; and Isaka, Haruo, 5,469,304, Cl. 360-13.000.
Satoh, Isao; Takagi, Yuji; and Hisakado, Yuji, 5,469,418, Cl. 369-54.000.
Seri, Hajime; Yamamura, Yasuharu; Tsuji, Yoichiro; Moriwaki, Yoshio; and Iwaki, Tsutomu, 5,468,309, Cl. 148-421.000.
Shigemoto, Hideki; Matsui, Hiroshi; and Sugahara, Jun, 5,469,125, Cl. 338-162.000.
Shiozaki, Minoru; Yasuda, Mikio; Chimoto, Isamu; and Ishimoto, Kameki, 5,468,919, Cl. 174-261.000.
Suzuki, Masato; and Kiyohara, Tokuzo, 5,469,552, Cl. 395-375.000.
Takahara, Hiroshi; and Ohmae, Hideki, 5,469,278, Cl. 359-51.000.
Takatsuji, Ayako; and Okada, Noritake, 5,469,183, Cl. 345-2.000.
Tohda, Takao; Kado, Hiroyuki; and Yamamoto, Shinichi, 5,468,959, Cl. 250-306.000.
Urano, Fumiyoshi; Fujie, Hirotoshi; Oono, Keiji; and Negishi, Takaaki, 5,468,589, Cl. 430-170.000.
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.

Matsushita Electric Industrial Co., Ltd.k: *See*—
Takahashi, Shinichi; Nakaimaki, Masayuki; and Yagi, Yukihiro, 5,469,091, Cl. 327-73.000.

Matsushita Electric Works, Ltd.: *See*—
Uchihashi, Kiyoaki; Nishimura, Hiroshi; and Fukumori, Noriyuki, 5,469,027, Cl. 315-224.000.

Matsushita, Hajime: *See*—
Ebata, Takashi; Matsumoto, Katsuya; Koseki, Koshi; Kawakami, Hiroshi; Matsushita, Hajime; Yoshikoshi, Hajime; and Okaniwa, Masakazu, 5,468,881, Cl. 549-295.000.

Matsuzaki, Minoru: *See*—
Itoh, Junichi; Sato, Yuta; Matsuzaki, Minoru; Hamada, Masaharu; and Imai, Yuji, 5,469,237, Cl. 354-106.000.

Mattei, Jacqueline: *See*—
Lam, Kin S.; Schroeder, Daniel R.; Mattei, Jacqueline; Forenza, Salvatore; and Matson, James A., 5,468,849, Cl. 536-18.500.

Mattes, Paul B., to Varo Inc. Night vision goggle mount. 5,467,479, Cl. 2-6.300.

Matthai, John T.; and Huyser, Richard F., to Stryker Corporation. Saw blade for powered medical handpiece. 5,468,247, Cl. 606-178.000.

Mattingly, Phillip G.; and Bennett, Larry G., to Abbott Laboratories. Chemiluminescent acridinium salts. 5,468,646, Cl. 436-501.000.

Mattson, Larry J., to Roberts Systems, Inc. Lift-up handle. 5,467,915, Cl. 229-117.240.

Mattson, Ronald J.: *See*—
Cipollina, Joseph A.; Mattson, Ronald J.; and Sloan, Charles P., 5,468,767, Cl. 514-414.000.
Cipollina, Joseph A.; Gylys, Jonas A.; Mattson, Ronald J.; and Sloan, Charles P., 5,468,768, Cl. 514-415.000.

Maturaporn, Thawatchai. Disposable face mask with multiple liquid resistant layers. 5,467,765, Cl. 128-206.190.

Maul, Diana M.: *See*—
Bogart, Gregory R.; Moddel, Garret R.; Maul, Diana M.; and Etter, Jeffrey B., 5,468,606, Cl. 435-5.000.

Maurizi, Michael G.: *See*—
Allen, William C.; and Maurizi, Michael G., 5,467,786, Cl. 128-898.000.

Mauro, Anthony J.: *See*—
Falciglia, James W.; and Mauro, Anthony J., 5,468,914, Cl. 174-112.000.

Maute, Kurt: *See*—
Braun, Hans; Weinocke, Ulf; Maute, Kurt; and Strauss, Wolfgang, 5,467,750, Cl. 123-350.000.

Maverick Tool Company: *See*—
Hughes, W. James; McCabe, James W.; and Marks, Owen L., Jr., 5,467,834, Cl. 175-61.000.

Mayo Foundation for Medical Education & Research: *See*—
Altchuler, Steven I., 5,468,222, Cl. 604-49.000.
Johnson, Phillip W., 5,467,639, Cl. 73-38.000.

Mazda Motor Corporation: *See*—
Kameda, Osamu; Akutagawa, Hitoshi; Okita, Junichi; and Hirose, Ichiro, 5,467,668, Cl. 74-606.00R.
Tsuyama, Toshiaki; Onaka, Toru; Nobumoto, Kazutoshi; and Kawamura, Makoto, 5,469,359, Cl. 364-426.030.

Mazzone, Dominick N.: *See*—
Baker, Charles L., Jr.; Chu, Cynthia T.; Mazzone, Dominick N.; and Page, Nancy M., 5,468,368, Cl. 208-58.000.

McAlpin, James J.; Kuo, Jeffrey W. C.; and Hylton, Donald C., to Exxon Chemical Patents Inc. Process of making oriented film or structure. 5,468,440, Cl. 264-291.000.

McAnalley, Bill H.; Carpenter, Robert H.; and McDaniel, Harley R., to Carrington Laboratories, Inc. Wound healing accelerated by systemic administration of polysaccharide from aloe. 5,468,737, Cl. 514-54.000.

McAuley, Anthony J., to Bell Communications Research, Inc. System for the parallel assembly of data transmissions in a broadband network. 5,469,433, Cl. 370-60.000.

McBrearty, Raymond A.; and Haller, William R., to McBrearty, Raymond A. Oxygen concentrator remote monitoring apparatus. 5,469,372, Cl. 364-550.000.

McBride, Gene: *See*—
Brown, Robert L.; Holodnak, John D.; McBride, Gene; and Mosley, Demmie L., 5,468,153, Cl. 439-13.000.

McCabe, James W.: *See*—
Hughes, W. James; McCabe, James W.; and Marks, Owen L., Jr., 5,467,834, Cl. 175-61.000.

McCabe, R. Tyler; and de Costa, Brian R., to Pharmaceutical Discovery Corporation. Characterization of specific drug receptors with fluorescent ligands. 5,468,854, Cl. 540-498.000.

McCaffrey, Felim, to Hatch Associates Ltd. Multi-purpose arena. 5,468,190, Cl. 472-82.000.

McCaffrey, Terence M.: *See*—
Wegner, Steven; Harpold, Michael A.; McCaffrey, Terence M.; Morris, Susan E.; Wojciechowski, Marek; Zhao, Junguo; Henkens, Robert W.; Naser, Najih; and O'Daly, John P., 5,468,366, Cl. 204-403.000.

Mc Cann, Jerry A.: *See*—
Donegan, Michael W.; Nuchols, Richard P.; Webber, James L.; and Mc Cann, Jerry A., 5,468,011, Cl. 280-728.200.

McCarty, William L., Jr. Therapeutic method for effecting translatory continuous passive motion of the temporomandibular joint. 5,467,785, Cl. 128-898.000.

McCauley, James A.: *See*—
Dolling, Ulf H.; McCauley, James A.; and Varsolona, Richard J., 5,468,860, Cl. 546-77.000.

McCauley, Kathryn M.: *See*—
Thompson, David A.; Rajagopalan, Venkatesh; Wright, Kurt W.; Sterba, John J.; Paulus, William J.; Paulus, Nancy J.; McCauley, Kathryn M.; and Chen, David K., 5,467,636, Cl. 73-23.310.

McCaulley, James A.: *See*—
Donnelly, Vincent M., Jr.; and McCaulley, James A., 5,467,732, Cl. 117-86.000.

McClear, Mark T.; and Wellheuser, Christopher, to Texas Instruments Incorporated. Transceiver circuit with transition detection. 5,469,473, Cl. 375-219.000.

McClelland, Paul H.: *See*—
Allen, Ross R.; Lam, Si-Ty; McClelland, Paul H.; and Hanson, Eric G., 5,469,199, Cl. 347-42.000.

McCorkle, John. Pulse transmitter for terminating reflected waves. 5,469,174, Cl. 342-203.000.

McCormack, James: *See*—
Powell, Fred D.; Phelan, Raymond J.; McCormack, James; Budansew, Peter; Demoe, Larry; and Poschun, Alex, 5,468,434, Cl. 264-46.800.

McCormick, Robert A.: *See*—
Krishnamurthy, Suresh; McCormick, Robert A.; Cone, Kenneth F.; Brown, Gary L.; and Bryant, Ronald W., 5,469,188, Cl. 345-117.000.

McCormick, William B.: *See*—
Gerlach, Brett C.; Lee, Patrick; McCormick, William B.; and Douglas, George H., 5,469,532, Cl. 395-102.000.

McCoy, Gary W.; Zwigart, John M.; and Tweedy, Mark R., to Carl Strutz & Co., Inc. Dual purpose apparatus to manipulate workpieces. 5,467,864, Cl. 198-409.000.

McCoy, Kevin: *See*—
Gilchrist, Raymond T.; and McCoy, Kevin, 5,467,529, Cl. 29-890.128.

McCrary, Rex E.: *See*—
Eng, Robert C.; Galella, John W.; McCrary, Rex E.; McDonald, Mark G.; Stelzer, Eric H.; and Yentz, Frederick C., 5,469,577, Cl. 395-290.000.

McCraw, Earl C., Jr.: *See*—

Nicolson, Paul C.; Seamons, Kenneth R.; Tao, Fu-Pao; Alvord, Larry A.; and McCraw, Earl C., Jr., 5,468,448, Cl. 422-30.000.

McDaniel, Harley R.: *See*—
McAnalley, Bill H.; Carpenter, Robert H.; and McDaniel, Harley R., 5,468,737, Cl. 514-54.000.

McDermid, John E.: *See*—
Kerschner, Ronald K.; Heumann, John M.; McDermid, John E.; Schlotzhauer, Ed. O.; and Crook, David T., 5,469,064, Cl. 324-537.000.

McDonald, Mark G.: *See*—
Eng, Robert C.; Galella, John W.; McCrary, Rex E.; McDonald, Mark G.; Stelzer, Eric H.; and Yentz, Frederick C., 5,469,577, Cl. 395-290.000.

McDonald, Sean C.; Hertz, Ellen J.; Smith, James A.; and Toto, Gregory, to Automated Healthcare, Inc. Automated system for selecting packages from a storage area. 5,468,110, Cl. 414-273.000.

McDonald, William M.: *See*—
Huggett, George R.; and McDonald, William M., 5,468,945, Cl. 235-462.000.

McElroy, Dave J.; Gill, Manzur; and Shah, Pradeep L., to Texas Instruments Incorporated. Memory cell array having continuous-strip field-oxide regions. 5,469,383, Cl. 365-185.010.

McFall, Michael; and Aagaard, Paul. Portable door mounted exercise apparatus. 5,468,205, Cl. 482-129.000.

McFarlane, Robert: *See*—
Strubbe, Hugo J.; and McFarlane, Robert, 5,469,206, Cl. 348-7.000.

McGill, James K., III; Abele, Dorotea; Colman, Lonnie L.; Gonsalves, Manuel; and Saxena, Sanjeev, to Sytron Corporation. Disk operating system backup and recovery system. 5,469,573, Cl. 395-700.000.

McGilvray, Derek: *See*—
Eastwell, Cathleen A.; Hodges, Roland L.; McGilvray, Derek; Queener, Stephen W.; Swartling, James R.; and Zock, Joseph M., 5,468,632, Cl. 435-197.000.

McGregor, Gordon L.; Minor, Raymond B.; Hardie, William; and Kennedy, Michael, to W. L. Gore & Associates, Inc. Process for making an electrical cable with expandable insulation. 5,468,314, Cl. 156-56.000.

McGuire, Shel: *See*—
Williams, Joel L.; Burkett, Susan L.; and McGuire, Shel, 5,468,520, Cl. 427-560.000.

McIntosh, Lester H., III: *See*—
Goodall, Brian L.; Benedikt, George M.; McIntosh, Lester H., III; and Barnes, Dennis A., 5,468,819, Cl. 526-171.000.

McIvor-Dean, Alan; and Groom, Murree, to Christopher Robin Knights. Combined cultivator and fluid injector system. 5,467,723, Cl. 111-123.000.

McKenzie, Thomas J. Fluid filter holder. 5,468,383, Cl. 210-232.000.

McKinney, Ronald J.: *See*—
Moran, Edward F., Jr.; and McKinney, Ronald J., 5,468,900, Cl. 562-590.000.

McLaughlin Manufacturing Company, Inc.: *See*—
Archambeault, John T.; Gasmovic, David J.; and Mizuno, Morio, 5,469,155, Cl. 340-853.400.

McLaughlin, William R.: *See*—
Waterson, Bruce P.; Caputo, Dennis L.; and McLaughlin, William R., 5,468,291, Cl. 106-697.000.

McLean, Francis A.: *See*—
Lee, Leonard G.; Lynn, John S.; McLean, Francis A.; Tucker, Edwin C.; and Sevack, Lloyd, 5,467,972, Cl. 269-118.000.

McLoughlin, John E. Modular fire truck. 5,467,827, Cl. 169-24.000.

McMahon, Michael J.; and Moran, Peter. Surgical instruments. 5,467,763, Cl. 600-201.000.

McMahon, Robert E.: *See*—
Hasi, Rahim; Dumas, Richard H.; Gavin, David F.; Harrison, Charles H.; Kennedy, Michael A.; Schiessl, Henry W.; McMahon, Robert E.; and Manke, Steven A., 5,468,864, Cl. 546-345.000.

McManus, Michael J.: *See*—
Bullinger, Philip W.; and McManus, Michael J., 5,469,082, Cl. 326-81.000.

McMillan, Larry D.: *See*—
Paz de Araujo, Carlos A.; Scott, Michael C.; Cuchiaro, Joseph D.; and McMillan, Larry D., 5,468,679, Cl. 437-110.000.
Yoshimori, Hiroyuki; Watanabe, Hitoshi; Paz De Araujo, Carlos A.; Hiraide, Shuzo; Mihara, Takashi; and McMillan, Larry D., 5,468,684, Cl. 437-228.000.

McMullen, Carl W.: *See*—
Ho, Chia-Tie; McMullen, Carl W.; and Sawka, Raymond M., 5,468,532, Cl. 428-40.000.

McMurtrey, Kevin D., Sr.; Rossi, Arthur M.; Cichon, Robert J., Jr.; Briggs, Karen A.; and Ely, Jonathan C., to Encore Computer Corporation. Linear accelerated device. 5,469,037, Cl. 318-626.000.

McNamara, Gerald P.: *See*—
Bachand, David P.; and McNamara, Gerald P., 5,468,174, Cl. 451-75.000.

McNeil, Kevin B., to Procter & Gamble Company, The. Apparatus and process for making a dual ply cellulosic fibrous laminate. 5,468,323, Cl. 156-209.000.

McNeil Lab, Inc.: *See*—
Raffa, Robert B.; and Vaught, Jeffrey L., 5,468,744, Cl. 514-282.000.

McPherson, Mary C.; and Hozbor, Maria A., to BOC Group, Inc., The. Product and process for polymeric article with improved surface. 5,468,560, Cl. 428-413.000.

McQueary, Timothy R.: *See*—
Rossback, Matthew A.; and McQueary, Timothy R., 5,468,464, Cl. 423-544.000.

McShane, Michael B.: *See*—
Lin, Paul T.; and McShane, Michael B., 5,468,999, Cl. 257-784.000.

MDT Corporation: *See*—
Young, Barry S., 5,467,951, Cl. 248-188.100.

Meade, Thomas E. Apparatus and method for the reduction of snoring. 5,467,783, Cl. 128-848.000.

Measures, Raymond M.; Alavie, Tino; Melle, Serge M.; Coroy, Trent; Mason, Beck; Karr, Shawn E.; and Liu, Kexing. Method and apparatus for an optoelectronic smart structure interface with wavelength demodulation of laser sensors. 5,469,265, Cl. 356-419.000.

Medford, George F.: *See*—
Lewis, Larry N.; Medford, George F.; and Factor, Arnold, 5,468,789, Cl. 524-99.000.

Media Vision, Inc.: *See*—
Colvin, Bryan J., Sr.; and Cook, Perry R., 5,468,906, Cl. 84-625.000.

Medical College of Hampton Road, The: *See*—
Hodgen, Gary D., 5,468,736, Cl. 514-179.000.

Meeh, Linda: *See*—
Deutsch, Edward A.; Deutsch, Karen F.; Cacheris, William P.; Ralston, William H.; White, David H.; Nosco, Dennis L.; Wolfangel, Robert G.; Wilking, Janet B.; Meeh, Linda; and Woulfe, Steven R., 5,468,465, Cl. 424-9.400.

Meerman, Johannes J.: *See*—
Lijten, Franciscus A. T.; and Meerman, Johannes J., 5,468,555, Cl. 428-365.000.

Megerle, Friedrich; Hohl, Guenther; Ludewig, Erich; and Kaes, Guenter, to Robert Bosch GmbH. Hydraulic vehicle brake system with a hydraulic unit for wheel slip control. 5,468,057, Cl. 303-87.000.

Mehan, Ashok, to Raychem Corporation. Fluoropolymer compositions. 5,468,782, Cl. 521-134.000.

Mehreteab, Ammanuel: *See*—
Farooq, Amjad; Mehreteab, Ammanuel; Broze, Guy; and Bielli, Cristina, 5,468,398, Cl. 252-88.000.

Meier, Albert H.: *See*—
Cincotta, Anthony H.; and Meier, Albert H., 5,468,755, Cl. 514-288.000.

Meiji Seika Kaisha, Ltd.: *See*—
Mochizuki, Keizo; and Minobe, Tomio, 5,467,694, Cl. 99-355.000.

Meinecke, Jon M.: *See*—
Vanbuskirk, Michael R.; and Meinecke, Jon M., 5,469,545, Cl. 395-200.010.

Meiwes, Johannes; Gerhard, Albert; and Hammer, Uwe, to Robert Bosch GmbH. Apparatus for governing the idling rpm of an internal combustion engine. 5,467,749, Cl. 123-339.270.

Meiwes, Johannes; Wullbrandt, Dieter; and Giani, Carlo, to Hoechst Aktiengesellschaft. α-L-Rhamnosidase for obtaining rhamnose, a process for its preparation and its use. 5,468,625, Cl. 435-71.100.

Melancon, Kurt C.: *See*—
Boardman, Larry D.; Melancon, Kurt C.; Chau, Trang D.; and Erickson, John J., 5,468,815, Cl. 525-478.000.

Melbourne, Keith: *See*—
Williams, David; Briscoe, Stuart M.; and Melbourne, Keith, 5,467,641, Cl. 73-49.700.

Melle, Serge M.: *See*—
Measures, Raymond M.; Alavie, Tino; Melle, Serge M.; Coroy, Trent; Mason, Beck; Karr, Shawn E.; and Liu, Kexing, 5,469,265, Cl. 356-419.000.

Melnyk, Adrian L.: *See*—
Flinchbaugh, Bernadette M.; Paley, Harold R.; Knaub, John E.; Schmid, Christopher J.; and Melnyk, Adrian L., 5,468,156, Cl. 439-157.000.

Meloy, John. Collapsible saw horse. 5,467,842, Cl. 182-153.000.

Memtec America Corporation: *See*—
Barboza, Steven D.; Seeley, William P.; and Shucosky, Anthony C., 5,468,397, Cl. 210-798.000.

Mencarelli, Albert E.; and Mencarelli, Richard A. Raking tool. 5,467,590, Cl. 56-400.170.

Mencarelli, Richard A.: *See*—
Mencarelli, Albert E.; and Mencarelli, Richard A., 5,467,590, Cl. 56-400.170.

Mencarelli, Ron; and Sasko, Jeffry P., to Alaron Corporation. Waste container reformer and method for reforming waste containers. 5,467,704, Cl. 100-131.000.

Menchen, Steven M.; Winnik, Mitchell A.; and Johnson, Ben F., to Applied Biosystems, Inc. Viscous electrophoresis polymer medium and method. 5,468,365, Cl. 204-299.008.

Mendes, Etienne: *See*—
Bachy, André; Praisse, Laurent; Keane, Peter; Mendes, Etienne; Vernieres, Jean-Claude; and Simiand, Jacques, 5,468,750, Cl. 514-255.000.

Menelly, Richard A.: *See*—
Ebstein, Steven; Gonsalves, Robert A.; and Menelly, Richard A., 5,468,971, Cl. 250-556.000.

Menjo, Takeshi: *See*—
Ogata, Takao; and Menjo, Takeshi, 5,469,244, Cl. 355-246.000.

Mensing, David B.: *See*—
Brindle, Edward E.; Czudak, John C.; and Mensing, David B., 5,469,534, Cl. 395-114.000.

Mentor Corporation: *See*—
Welch, Daniel P., 5,468,211, Cl. 600-38.000.

Menzel, Stanley W. O., to Rib Loc Australia Pty Ltd. Loop machine for helically winding strip. 5,468,322, Cl. 156-195.000.

Meratla, Zober M. Method and apparatus for removing pollutants from flue gas. 5,467,722, Cl. 110-345.000.

Mercedes-Benz AG: *See*—
Braun, Hans; Weinecke, Ulf; Maute, Kurt; and Strauss, Wolfgang, 5,467,750, Cl. 123-350.000.
Zaiser, Wolfgang; and Merkle, Hans, 5,467,667, Cl. 74-606.00R.

Merck & Co., Inc.: *See*—
Dolling, Ulf H.; McCauley, James A.; and Varsolona, Richard J., 5,468,860, Cl. 546-77.000.
Gagliardi, Magda M.; Chen, Shieh-Shung T.; Arison, Byron H.; Garrity, George M.; Huang, Leeyuan; MacConnell, John G.; and White, Raymond F., 5,468,771, Cl. 514-452.000.
deSolms, S. Jane; Giuliani, Elizabeth A.; and Graham, Samuel L., 5,468,733, Cl. 514-19.000.

Merck Patent Gesellschaft Mit Beschrankter Haftung: *See*—
Herget, Gerhard; Herbski, Margarete; and Osterried, Karl, 5,468,289, Cl. 106-415.000.
Pohl, Ludwig; Poetsch, Fike; Schumann, Herbert; Weiss, Karin; Thiele, Karl-Heinz; and Hirsch, Hans-Ludwig, 5,468,707, Cl. 502-153.000.

Meridian Oil Inc.: *See*—
Donohue, Charles W., 5,469,048, Cl. 324-71.100.

Merkle, Hans: *See*—
Zaiser, Wolfgang; and Merkle, Hans, 5,467,667, Cl. 74-606.00R.

Merkle, Hans R.: *See*—
Ebel, Klaus; Schroeder, Juergen; Groening, Carsten; Dockner, Toni; and Merkle, Hans R., 5,468,871, Cl. 548-373.100.

Merlin Gerin: *See*—
Payet-Burin, Jean-Luc, 5,469,121, Cl. 335-16.000.

Merrell Dow Pharmaceuticals Inc.: *See*—
Flynn, Gary A.; and Beight, Douglas W., 5,468,745, Cl. 514-214.000.

Merril, Carl R.: *See*—
Polymeropoulos, Mihael H.; and Merril, Carl R., 5,468,610, Cl. 435-6.000.

Mersch, Steven H., to Ethicon, Inc. Endoscopic laser instrument. 5,468,238, Cl. 606-15.000.

Mertens, Werner, to SMS Schloemann-Siemag Aktiengesellschaft. Method of and apparatus for continuously casting and rolling down thin slabs. 5,467,518, Cl. 29-527.700.

Messin, Steven: *See*—
Zecchino, Julius R.; Messin, Steven; Corcoran, Cathleen; and Chung, Kenneth T., 5,468,471, Cl. 424-59.000.

Messina, Anthony. Feeder bowl for a bird in a cage. 5,467,733, Cl. 119-18.000.

Metlitsky, Boris: *See*—
Alexander, Edward R.; Goldman, Ron; Li, Yajun; Bard, Simon; Strat, Askold; Katz, Joseph; and Metlitsky, Boris, 5,468,952, Cl. 235-492.000.
Swartz, Jerome; Shepard, Howard M.; Barkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward; and Adelson, Alexander M., 5,468,949, Cl. 235-472.000.

Metra Electronics Corporation: *See*—
Quilling, R. Spencer, II, 5,467,947, Cl. 248-27.100.

Metrick, Joseph; and Abata, Jeffrey D., to Montell North America Inc. Clarifying compositions, process for making and polyolefin compositions containing them. 5,468,792, Cl. 524-108.000.

Metrologic Instruments, Inc.: *See*—
Knowles, Carl H.; Rockstein, George B.; Wilz, David M.; and Naylor, Charles A., 5,468,951, Cl. 235-472.000.

Metzeler Automotive Profiles GmbH: *See*—
Kranz, Jurgen, 5,468,439, Cl. 264-145.000.

Metzger, Karl G.: *See*—
Petersen, Uwe; Himmler, Thomas; Schenke, Thomas; Krebs, Andreas; Grobe, Klaus; Bremm, Klaus-Dieter; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 5,468,742, Cl. 514-187.000.
Petersen, Uwe; Grobe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 5,468,861, Cl. 546-156.000.

Metz-Stavenhagen, Peter; and Behrens, Klaus F. A., to Howmedica GmbH. Support device for the human vertebral column. 5,468,241, Cl. 606-61.000.

Meurer, Charles L.: *See*—
Hanson, Christopher D.; and Meurer, Charles L., 5,468,392, Cl. 210-615.000.

Meurer Research, Inc.: *See*—
Hanson, Christopher D.; and Meurer, Charles L., 5,468,392, Cl. 210-615.000.

Meyer, Arthur J., III: *See*—
Brandner, James M.; Manulik, Robert J.; Meyer, Arthur J., III; and Schreiter, Mark E., 5,469,436, Cl. 370-85.200.

Meyer, Wallace H., Jr., to Baker Hughes, Inc. Multiple depths and frequencies for simultaneous inversion of electromagnetic borehole measurements. 5,469,062, Cl. 324-338.000.

Meyerand, Mary E. Time encoded magnetic resonance imaging. 5,469,060, Cl. 324-309.000.

MHB Industries Corp.: *See*—
Jensen, Harold A., 5,467,578, Cl. 53-469.000.

Michael, Richard D. Expanding vehicle for colorimetric diagnostic assays. 5,468,450, Cl. 422-56.000.

Michaeli, Dov: *See*—
Gevas, Philip C.; Grimes, Stephen; Karr, Stephen L.; Michaeli, Dov; and Scibienski, Robert, 5,468,494, Cl. 424-195.110.

Michaels, John H.: *See*—
Bolton, Theodore S.; and Michaels, John H., 5,467,615, Cl. 62-498.000.

Michelle Hsiu-Feng Wang: *See*—
Huang, Yi-Fa, 5,468,204, Cl. 482-112.000.

Michlin, Steven B. Lubricant and method for lubricating imaging machine components. 5,468,400, Cl. 252-21.000.

Mickler, David J.: *See*—
Hoffman, Keith E.; Elliott, Robert F.; and Mickler, David J., 5,468,140, Cl. 425-389.000.

Micro Denshi Co., Ltd.: *See*—
Mochizuki, Keizo; and Minobe, Tomio, 5,467,694, Cl. 99-355.000.

Microchip Technology Incorporated: *See*—
Salt, Tom; and Drake, Rodney, 5,469,557, Cl. 395-425.000.

Micrognosis, Inc.: *See*—
Mortensen, Keith Y., 5,469,219, Cl. 348-492.000.

Micron Semiconductor, Inc.: *See*—
Thomann, Mark R., 5,469,393, Cl. 365-201.000.

Micron Technology, Inc.: *See*—
Rolfson, J. Brett, 5,468,578, Cl. 430-5.000.

Microsoft Corporation: *See*—
Dennis, Stephen V., 5,469,533, Cl. 395-114.000.
Gerlach, Brett C.; Lee, Patrick; McCormick, William B.; and Douglas, George H., 5,469,532, Cl. 395-102.000.

Midway Manufacturing Company: *See*—
Jarvis, Eugene; and Pribyl, Eric L., 5,469,535, Cl. 395-130.000.

Migli, Carlo: *See*—
Ferrari, Franco; and Migli, Carlo, 5,468,109, Cl. 411-553.000.

Mihara, Takashi: *See*—
Yoshimori, Hiroyuki; Watanabe, Hitoshi; Paz De Araujo, Carlos A.; Hiraide, Shuzo; Mihara, Takashi; and McMillan, Larry D., 5,468,684, Cl. 437-228.000.

Mihaylov, Gueorgui M.: *See*—
Kirollos, Kirollos S.; Mihaylov, Gueorgui M.; Lockerby, Kevin L.; and Stobnicki, Roman A., 5,468,645, Cl. 436-164.000.

Mihirogi, Katsuhiro: *See*—
Yamaguchi, Ryuichi; Kiso, Koichi; Tazuke, Kiyoshi; Machida, Hideaki; Mihirogi, Katsuhiro; and Takamatsu, Yukichi, 5,468,894, Cl. 556-477.000.

Mihm, Gerhard: *See*—
Eberlein, Wolfgang; Engel, Wolfhard; Mihm, Gerhard; Rudolf, Klaus; and Engelhardt, Günther, 5,468,766, Cl. 514-403.000.

Mihm, Joseph J., to TRW Vehicle Safety Systems Inc. Air bag module. 5,468,012, Cl. 280-728.200.

Mika, Helmut: *See*—
Bläse, Meinhard; and Mika, Helmut, 5,468,019, Cl. 280-805.000.

Miki, Takahiro: *See*—
Kumamoto, Toshio; Miki, Takahiro; and Kouno, Hiroyuki, 5,469,047, Cl. 323-312.000.

Millauer, Hans: *See*—
Jäger, Gerhard; and Millauer, Hans, 5,468,352, Cl. 204-59.00F.

Millea, Liviu: *See*—
Hughey, Bradley W.; Pisau, Lucretiu; and Millea, Liviu, 5,469,364, Cl. 364-482.000.

Miller, Alistair I.; and Spagnolo, Dino A., to Atomic Energy of Canada Limited. Geographically distributed tritium extraction plant and process for producing detritiated heavy water using combined electrolysis and catalytic exchange processes. 5,468,462, Cl. 423-580.200.

Miller, David D.; Brick, Mary C.; and Nair, Mridula, to Eastman Kodak Company. Solid particle dispersions for imaging systems. 5,468,598, Cl. 430-372.000.

Miller, David D.: *See*—
Zengerle, Paul L.; Miller, David D.; Whitesides, Thomas H.; Rieger, John B.; Flow, Vincent J., III; and Isaac, Walter H., 5,468,604, Cl. 430-631.000.

Miller, James F.: *See*—
Lum, Andrew F.; Uribe, Juan M.; Hogan, John M.; Persinger, Richard A.; Miller, James F.; and Navaratnam, Ramesh A., 5,468,401, Cl. 252-22.000.

Miller, John A.; Velasquez Urey, Ruben E.; and Tate, Earl, Jr., to Minnesota Mining and Manufacturing Company. Pressure-sensitive adhesive and disposable diaper closure system. 5,468,237, Cl. 604-390.000.

Miller, Kenneth L., to Liquid Control Corporation. Dispensing device for flowable materials. 5,467,899, Cl. 222-309.000.

Miller, Mark A.; and Miller, Ronald H. More challenging backgammon type game. 5,467,995, Cl. 273-248.000.

Miller, Phillip: *See*—
Koenck, Steven E.; Miller, Phillip; and Schultz, Darald R., 5,468,948, Cl. 235-472.000.

Miller, Ronald H.: *See*—
Miller, Mark A.; and Miller, Ronald H., 5,467,995, Cl. 273-248.000.

Miller, Steven A.; Mourer, David P.; and Brun, Milivoj K., to General Electric Company. Gas shield for atomization with reduced heat flux. 5,468,133, Cl. 425-7.000.

Miller, Thomas R.; and Sheirer, Daniel C., to Kennametal Inc. Rotary drill bit having an insert with leading and trailing relief portions. 5,467,837, Cl. 175-420.100.

Miller, Troy A., to Marathon Oil Company. Oilfield tubing string integrally enclosing a fluid production or injection tube and a service line. 5,467,826, Cl. 166-380.000.

Mills, Scott C.: *See*—
Garabedian, Aram, Jr.; Mills, Scott C.; Sibert, William P.; Choy, Clement K.; and Rebelo do Couto, Fernando J., 5,468,423, Cl. 252-546.000.

Milroy, William W., to Hughes Aircraft Company. Radar and electronic warfare systems employing continuous transverse stub array antennas. 5,469,165, Cl. 342-13.000.

Minami, Koji: *See*—
Takahashi, Nobukazu; Hosaka, Tohru; Minami, Koji; Konishi, Yuichiro; Kohara, Teiji; and Natsuume, Tadao, 5,468,803, Cl. 524-553.000.

Minarelli, Alessandro; Venturi, Giuseppe; and Osti, Roberto, to G.D Societa'Per Azioni. Rigid hinged-lid packet for tobacco products, particularly cigarettes. 5,467,872, Cl. 206-256.000.

Minato, Toshihiro; Kato, Masaru; and Yasuda, Kenji, to Oji Paper Co., Ltd. Thermal transfer dye image-receiving sheet. 5,468,712, Cl. 503-227.000.

Minco AB: *See*—
Gedeon, Andras, 5,468,451, Cl. 422-58.000.

Minegishi, Naoki: *See*—
Hatakeyama, Atsushi; Fujisawa, Hiromichi; Kato, Kanji; Kawaguchi, Hisamitsu; Minegishi, Naoki; Tada, Katsumi; and Asakawa, Satoshi, 5,469,354, Cl. 364-419.190.

Minnesota Mining and Manufacturing: *See*—
Boardman, Larry D.; Melancon, Kurt C.; Chau, Trang D.; and Erickson, John J., 5,468,815, Cl. 525-478.000.

Minnesota Mining and Manufacturing Company: *See*—
Anich, Ann T.; and Sierakowski, Michael J., 5,468,353, Cl. 204-105.000.
Biavasco, Raffaella; Kirk, Mark; and Giribone, Giovanni, 5,468,599, Cl. 430-512.000.
Biegler, Robert M., 5,469,238, Cl. 354-300.000.
Brady, Mark J.; and Cerny, Darin G., 5,467,634, Cl. 73-1.00D.
Dretzka, Philip C.; Belden, Tighe M.; Reshanov, Eugene N.; and Samuelson, Bruce E., 5,468,332, Cl. 156-527.000.
Guder, Harald, 5,468,795, Cl. 524-361.000.
Hanschen, Thomas P.; Krueger, Dennis L.; and Karp, Gregory P., 5,468,428, Cl. 264-483.000.
Heilmann, Steven M.; Drtina, Gary J.; Eitzman, Philip D.; Haddad, Louis C.; Hyde, Frederick W.; Johnson, Todd W.; Rassmussen, Jerald K.; and Williams, Michael G., 5,468,847, Cl. 530-413.000.
Ho, Chia-Tie; McMullen, Carl W.; and Sawka, Raymond M., 5,468,532, Cl. 428-40.000.
Huss, Charles P.; Fry, Arthur L.; and Leseman, Steven R., 5,468,523, Cl. 428-5.000.
Kuh, Thomas J., 5,468,603, Cl. 430-619.000.
Kumar, Kanta; Kumar, Ramesh C.; and Mitra, Smarajit, 5,468,477, Cl. 424-78.170.
Larmie, Henry A., 5,468,269, Cl. 51-307.000.
Lu, Shih-Lai, 5,468,540, Cl. 428-156.000.
Lucast, Donald H.; Moore, Cheryl L.; and James, Ruth A., 5,468,821, Cl. 526-264.000.
Macioch, Michael T.; Gates, Douglas M.; and Leary, Timothy M., 5,468,588, Cl. 430-229.000.
Miller, John A.; Velasquez Urey, Ruben E.; and Tate, Earl, Jr., 5,468,237, Cl. 604-390.000.
Morrison, Eric D.; Boston, David R.; Hedrick, Steven T.; Kausch, William L.; Larson, Wayne K.; and Pung, Simon S., 5,468,498, Cl. 524-406.000.
Muggli, Imelda A.; and Alm, Roger R., 5,468,812, Cl. 525-293.000.
Newman, Charles L.; and Kipp, Winfried, 5,468,231, Cl. 604-180.000.
Whitcomb, William C.; Insley, Thomas L; and Pung, Simon S., 5,468,536, Cl. 428-98.000.

Minobe, Tomio: *See*—
Mochizuki, Keizo; and Minobe, Tomio, 5,467,694, Cl. 99-355.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 5,469,239, Cl. 354-402.000.

Minor, Raymond B.: *See*—
McGregor, Gordon L.; Minor, Raymond B.; Hardie, William; and Kennedy, Michael, 5,468,314, Cl. 156-56.000.

Minoura Co., Ltd.: *See*—
Minoura, Koji, 5,468,201, Cl. 482-61.000.

Minoura, Koji, to Minoura Co., Ltd. Loading apparatus for exercise device. 5,468,201, Cl. 482-61.000.

Minowa, Toshimichi; Nishimura, Yutaka; Kawashima, Ken'ichi; Kuroiwa, Hiroshi; and Ibamoto, Masahiko, to Hitachi, Ltd. Method and an apparatus for controlling a car equipped with an automatic transmission having a lockup clutch. 5,468,196, Cl. 477-62.000.

Minster Machine Company, The: *See*—
Daniel, Edward A.; Couchot, Norman J.; Keller, Daniel L.; and Brewer, William C., 5,467,705, Cl. 100-214.000.

Mir, Lluis, to C.N.R.S. Paris. Electrochemotherapy. 5,468,223, Cl. 604-51.000.

Mirigay, Charles: *See*—
Lehman, Jean-Yves; and Mirigay, Charles, 5,467,603, Cl. 62-50.200.

Mischker, Rolf: *See*—
Steiner, Erwin; and Mischker, Rolf, 5,467,513, Cl. 28-281.000.

Mishina, Haruo; Wada, Masafumi; Fukuda, Mituo; Itagaki, Masato; and Yamana, Shinya, to Hitachi Techno Engineering Co., Ltd. Reflow soldering apparatus for soldering electronic parts to circuit substrate. 5,467,912, Cl. 228-10.000.

Mishkin, N. K.: *See*—
Kwon, Oh K.; Choi, Ung S.; Choi, Ki Y.; Mishkin, N. K.; and Jung, Yoon M., 5,468,529, Cl. 428-36.100.

Mishra, Satchidanand: *See*—
Yu, Robert C. U.; Foley, Geoffrey M. T.; Herbert, William G.; Limburg, William W.; Mishra, Satchidanand; Post, Richard L.; and Von Hoene, Donald C., 5,469,242, Cl. 355-219.000.

Misker, Jan S.; Hamann, Theodora L.; and Rozendaal, Leendert T., to U.S. Philips Corporation. Video processing system featuring a choice between inter and intra field processing based on motion in chrominance signals. 5,469,227, Cl. 348-702.000.

Mita Industrial Co., Ltd.: *See*—
Saitoh, Yasushi; Matsumoto, Masashi; Ichihashi, Takao; and Yamada, Shuji, 5,469,243, Cl. 355-225.000.
Sugai, Fumio; and Irie, Masahiro, 5,468,874, Cl. 548-454.000.

Mitani, Takahiko: *See*—
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Sato, Makoto; Oowaki, Hiroyuki; Kato, Bunkichi; and Takahashi, Haruo, 5,468,728, Cl. 514-12.000.

Mitchell, Randall M.: *See*—
Creger, Todd D.; Mitchell, Randall M.; Stahl, Alan L.; and Talbott, James R., 5,467,854, Cl. 192-87.180.

Mitek Holdings, Inc.: *See*—
LePoire, Robert A., 5,468,118, Cl. 414-788.900.

Mitra, Smarajit: *See*—
Kumar, Kanta; Kumar, Ramesh C.; and Mitra, Smarajit, 5,468,477, Cl. 424-78.170.

Mitsuba Electric Mfg. Co., Ltd.: *See*—
Kogure, Mitsuhiro; Nagashima, Shinichi; Wakabayashi, Kazuhisa; Enkaku, Shigeyuki; Shimayama, Hitoshi; Kimura, Minoru; Shimoyama, Shuji; and Yokoo, Tsugio, 5,467,632, Cl. 72-379.200.

Mitsubishi Chemical Corporation: *See*—
Miyazawa, Chihiro; Orita, Souichi; and Tsuboi, Akio, 5,468,419, Cl. 252-182.120.
Yazaki, Takao; Noro, Masataka; Matsui, Takashi; Kobayashi, Noriyuki; Sano, Hironari; and Yamamoto, Koji, 5,468,444, Cl. 264-566.000.

Mitsubishi Corporation: *See*—
Hirota, Toshizumi; Kobayashi, Hitoshi; Nakagoshi, Yasunobu; and Amino, Yukio, 5,468,351, Cl. 202-234.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Arimoto, Satoshi; Hayafuji, Norio; Deguchi, Mikio; and Hamamoto, Satoshi, 5,467,731, Cl. 117-43.000.
Ban, Cozy, 5,468,350, Cl. 202-176.000.
Harada, Masana, 5,468,654, Cl. 437-6.000.
Haraguchi, Yoshiyuki, 5,469,391, Cl. 365-200.000.
Iio, Masaya, 5,469,380, Cl. 365-154.000.
Inoue, Hideo; and Sugita, Mitsuru, 5,469,483, Cl. 377-20.000.
Kagawa, Hitoshi, 5,469,413, Cl. 369-13.000.
Kitano, Toshiaki, 5,468,343, Cl. 156-656.100.
Kohno, Masaki, 5,469,107, Cl. 330-277.000.
Konishi, Yasuhiro, 5,469,099, Cl. 327-198.000.
Kumamoto, Toshio; Miki, Takahiro; and Koumo, Hiroyuki, 5,469,047, Cl. 323-312.000.
Machida, Hirohisa, 5,468,977, Cl. 257-208.000.
Miyatake, Hiroshi, 5,468,337, Cl. 216-24.000.
Nagai, Yutaka; and Shima, Akihiro, 5,469,457, Cl. 372-45.000.
Orisaka, Shinji; and Noda, Minoru, 5,468,685, Cl. 437-228.000.
Yamauchi, Tadaaki; Hamade, Kei; and Morooka, Yoshikazu, 5,469,402, Cl. 365-230.080.

Mitsubishi Gas Chemical Company, Inc.: *See*—
Hirota, Toshizumi; Kobayashi, Hitoshi; Nakagoshi, Yasunobu; and Amino, Yukio, 5,468,351, Cl. 202-234.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Toyama, Katsuhisa, 5,469,007, Cl. 310-90.500.

Mitsubishi Kenki Kabushiki Kaisha: *See*—
Shinoda, Masahisa; Egusa, Naoyuki; Sato, Yasuyuki; and Koike, Manabu, 5,469,423, Cl. 369-112.000.

Mitsubishi Materials Corporation: *See*—
Yamashiro, Akiyoshi, 5,468,279, Cl. 75-640.000.

Mitsubishi Metal Corporation: *See*—
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.

Mitsubishi Petrochemical Company Limited: *See*—
Sugano, Toshihiko; and Gotoh, Toshihiro, 5,468,781, Cl. 521-60.000.

Mitsubishi Petrochemical Co., Ltd.: *See*—
Sasaki, Norio; Kudo, Sachio; Watanabe, Michi; Endo, Keiji; and Kawaguchi, Shinji, 5,468,721, Cl. 504-243.000.

Mitsubishi Yuka Badische Company Limited: *See*—
Sugano, Toshihiko; and Gotoh, Toshihiro, 5,468,781, Cl. 521-60.000.

Mitsui Petrochemical Industries, Ltd.: *See*—
Kioka, Mamoru; and Yashiki, Tsuneo, 5,468,703, Cl. 502-108.000.

Mitsui Toatsu Chemicals, Incorporated: *See*—
Matsumoto, Katsuru; Hirayama, Nobuhiro; Kawasaki, Shoji; Uchiyama, Kenji; Uramoto, Katsuo; and Fukui, Tamami, 5,468,585, Cl. 430-110.000.
Tsutsui, Tomoki; Izukawa, Tsukuru; Ohkubo, Kazuhiko; and Sakaki, Yoshitsugu, 5,468,840, Cl. 528-408.000.

Mitsumi Electric Co., Ltd.: *See*—
Fukazawa, Makoto, 5,469,159, Cl. 341-22.000.
Inoue, Naoto; and Yamaguchi, Kiyotaka, 5,469,318, Cl. 360-128.000.

Mitsumoto, Kazuyori: *See*—

Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.

Mittlefehldt, Kurt R.: *See*—
Cummings, Larry D.; and Mittlefehldt, Kurt R., 5,467,611, Cl. 62-299.000.

Miura, Junkichi: *See*—
Yasuda, Kenji; Takata, Yoshinori; Tsuruta, Harumi; Ohnuma, Sadabumi; and Miura, Junkichi, 5,468,379, Cl. 210-198.200.

Miyakawa, Kado: *See*—
Wakui, Shinichi; Ide, Kazumasa; Koharagi, Haruo; Takahashi, Miyoshi; Miyakawa, Kado; and Yagi, Yasuomi, 5,469,009, Cl. 310-214.000.

Miyakawa, Makoto: *See*—
Bertin, Claude L.; DiMaria, Donelli J.; Miyakawa, Makoto; and Sakaue, Yoshinori, 5,468,663, Cl. 437-43.000.

Miyake, Akira; Fukuda, Yasuaki; and Maehara, Hiroshi, to Canon Kabushiki Kaisha. Production method of an x-ray mask structure, an x-ray mask structure produced thereby, and a device fabricated by using the x-ray mask structure. 5,469,489, Cl. 378-35.000.

Miyake, Hiroshi: *See*—
Matsuo, Masaaki; Hagiwara, Daijiro; and Miyake, Hiroshi, 5,468,731, Cl. 514-18.000.

Miyama, Masataka: *See*—
Nishizawa, Hirotaka; Azuma, Seiichiro; Ootoshi, Kazuaki; Miyama, Masataka; Kawata, Shuji; Kasahara, Osamu; and Suzuki, Sinichi, 5,468,989, Cl. 257-517.000.

Miyamori, Makoto: *See*—
Itoh, Shigeo; Watanabe, Teruo; Miyamori, Makoto; Nishimura, Norio; Itoh, Junji; and Kanemaru, Seigo, 5,469,014, Cl. 313-308.000.

Miyamoto, Hiroyuki: *See*—
Kubota, Shizuo; Ito, Osamu; and Miyamoto, Hiroyuki, 5,468,780, Cl. 521-48.500.

Miyamoto, Mitsuaki: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Miyashita, Yukio: *See*—
Aoki, Takuya; Shimasaki, Yuichi; Matsumoto, Seiji; Hatcho, Seiji; Oketani, Toshikazu; Miyashita, Yukio; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,467,594, Cl. 60-276.000.

Miyaso Chemical Co.: *See*—
Kubota, Shizuo; Ito, Osamu; and Miyamoto, Hiroyuki, 5,468,780, Cl. 521-48.500.

Miyata, Hideaki: *See*—
Sunaga, Takayuki; Kato, Akihiko; Sakamoto, Takashi; and Miyata, Hideaki, 5,469,246, Cl. 355-251.000.

Miyata, Hideyuki: *See*—
Onaka, Hiroshi; and Miyata, Hideyuki, 5,469,288, Cl. 359-189.000.

Miyatake, Hideki: *See*—
Ohno, Kouichi; Miyatake, Hideki; and Yoshida, Yutaka, 5,469,296, Cl. 359-603.000.

Miyatake, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Method of mending a defect in a phase shift pattern. 5,468,337, Cl. 216-24.000.

Miyatake, Takayuki: *See*—
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.

Miyazaki, Katsuo; Maeda, Takahide; Ogawa, Takeshi; Kakui, Sonoko; Ikeda, Satoshi; and Yamane, Yoshiki, to Nippon Paint Co., Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Method for treating shaped article made of polypropylene resin before coating. 5,468,517, Cl. 427-322.000.

Miyazaki, Takeo, to Daiwa Seiko, Inc. Clutch mechanism in a fishing reel. 5,467,933, Cl. 242-261.000.

Miyazaki, Yuzuru: *See*—
Fujisawa, Yoshikazu; Narishige, Takeshi; and Miyazaki, Yuzuru, 5,468,567, Cl. 428-645.000.

Miyazawa, Chihiro; Orita, Souichi; and Tsuboi, Akio, to Mitsubishi Chemical Corporation. Preparation of C_9 alcohol mixture and plasticizer. 5,468,419, Cl. 252-182.120.

Miyazawa, Shuhei: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Miyoshi, Shuji: *See*—
Akiyama, Hisashi; and Miyoshi, Shuji, 5,468,519, Cl. 427-532.000.

Miyoa Co., Ltd.: *See*—
Namekawa, Masatoshi; Ibuki, Yoshiteru; Iguchi, Norio; and Okuno, Masatoshi, 5,467,913, Cl. 228-41.000.

Mizitaki, Husago: *See*—
Takee, Masao; Kimoto, Mamoru; Tikano, Yoshito; Mizitaki, Husago; Masuura, Yoshinori; Nishio, Koji; and Furukawa, Nobohiro, 5,468,260, Cl. 29-623.500.

Mizoguchi, Tetsuhiko: *See*—
Sato, Toshiro; Tanaka, Tomoharu; Mizoguchi, Tetsuhiko; and Ide, Yuji, 5,469,399, Cl. 365-226.000.

Mizuno, Morio: *See*—
Archambeault, John T.; Gasmovic, David J.; and Mizuno, Morio, 5,469,155, Cl. 340-853.400.

Mizutani, Kazuhiko: *See*—
Takaoka, Atsushi; and Mizutani, Kazuhiko, 5,467,753, Cl. 123-418.000.

Mobi Corporation: *See*—
Fantone, Stephen D., 5,469,293, Cl. 359-412.000.

Mobil Oil Corporation: *See*—
Baker, Charles L., Jr.; Chu, Cynthia T.; Mazzone, Dominick N.; and Page, Nancy M., 5,468,368, Cl. 208-58.000.
Muldowney, Gregory P., 5,468,369, Cl. 208-113.000.

Mobley, J. Phil; Zhang, Chaoying; Soli, Sigfried D.; Johnson, Chris; and O'Connell, Drew. Pressure-regulating ear plug. 5,467,784, Cl. 128-867.000.

Mochida, Yoshinori: *See*—
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,469,266, Cl. 358-298.000.

Mochizuki, Keizo; and Minobe, Tomio, to Meiji Seika Kaisha, Ltd.; and Micro Denshi Co., Ltd. Apparatus for controlling water content of fried food using microwave heating. 5,467,694, Cl. 99-355.000.

Moddel, Garret R.: *See*—
Bogart, Gregory R.; Moddel, Garret R.; Maul, Diana M.; and Etter, Jeffrey B., 5,468,606, Cl. 435-5.000.

Modern Home Products Corp.: *See*—
Koziol, Walter, 5,467,691, Cl. 99-340.000.
Koziol, Walter, 5,468,142, Cl. 431-18.000.

Modern Muzzleloading, Inc.: *See*—
Kruse, Albert L., 5,467,551, Cl. 42-83.000.

Modernfold, Incorporated: *See*—
Owens, N. Douglas, 5,467,559, Cl. 49-321.000.

Moehling, Steven P.: *See*—
Rush, Tonya A.; Moehling, Steven P.; and Roback, Kenneth J., 5,469,177, Cl. 343-702.000.

Mogensen, Frits: *See*—
Christensen, Bent; and Mogensen, Frits, 5,468,510, Cl. 426-574.000.

Mohsen, Jafar. Enclosure for an electrical switch. 5,468,925, Cl. 200-43.220.

Moldenhauer, Phillip E.: *See*—
Becktel, David C.; Newman, Harry B.; and Moldenhauer, Phillip E., 5,468,137, Cl. 425-381.000.

Molecular Devices Corp.: *See*—
Harris, Albert K. M.; Kirk, Gregory L.; Owicki, John C.; Dawes, Timothy D.; and Kuo, Richard C., 5,468,605, Cl. 435-4.000.

Molloy, James O.; and Pollard-Knight, Denise V., to Fisons PLC. Methods and device for glycosylation analysis. 5,468,620, Cl. 435-7.100.

Momii, Tatsuo: *See*—
Osawa, Ryoko; Maekawa, Takashige; Momii, Tatsuo; and Kamata, Satoshi, 5,468,904, Cl. 568-333.000.

Monahan, Joseph B.: *See*—
Cordi, Alex A.; Handelmann, Gail E.; and Monahan, Joseph B., 5,468,763, Cl. 514-380.000.

Monahan, Russell E., to NTN Corporation. Variable effective diameter pulleys for variable speed transmission of power. 5,468,191, Cl. 474-8.000.

Monclin, Jean-Pierre, to International Food Processing Incorporated. Process for producing refined sugar directly from sugarcane. 5,468,300, Cl. 127-43.000.

Monclin, Jean-Pierre, to International Food Processing Incorporated. Process for producing refined sugar. 5,468,301, Cl. 127-43.000.

Monogram Industries Inc.: *See*—
Falciglia, James W.; and Mauro, Anthony J., 5,468,914, Cl. 174-112.000.

Monster Cable International, Ltd.: *See*—
Navone, David; and Clark, Richard L., 5,469,509, Cl. 381-28.000.

Montagna, Roberto: *See*—
Drogo de Iacovo, Rosario; Montagna, Roberto; and Sereno, Daniele, 5,469,527, Cl. 395-2.290.

Montain, Paul D.: *See*—
Rehbein, Gerald L.; and Montain, Paul D., 5,468,277, Cl. 71-24.000.

Montanari, Stefania: *See*—
Casagrande, Cesare; Montanari, Stefania; and Santangelo, Francesco, 5,468,746, Cl. 514-235.500.

Montecatini Tecnologie S.p.A.: *See*—
Guerra, Gaetano; Corradini, Paolo; DeRosa, Claudio; Iuliano, Mauro; Oliva, Leone; and Petraccone, Vittorio, 5,468,823, Cl. 526-347.100.

Montell North America Inc.: *See*—
Ghisellini, Renato; Cecchin, Giuliano; and Malucelli, Decio, 5,468,809, Cl. 525-240.000.
Metrick, Joseph; and Abata, Jeffrey D., 5,468,792, Cl. 524-108.000.
Morini, Giampiero; Albizzati, Enrico; Giannini, Umberto; Scordamaglia, Raimondo; and Barino, Luisa, 5,468,704, Cl. 502-115.000.

Monticello, Daniel J.: *See*—
Johnson, Steven W.; Monticello, Daniel J.; Gibbs, Phillip R.; and Kulpa, Charles F., 5,468,626, Cl. 435-130.000.

Moody, John R., to James River Paper Company, Inc. Apparatus for supporting a coreless paper roll and for impeding rotation of the roll during paper dispensing. 5,467,935, Cl. 242-422.400.

Moody, John R., to James River Paper Company, Inc. Apparatus and method for forming coreless paper roll products. 5,467,936, Cl. 242-525.700.

Moore Business Forms, Inc.: *See*—
Coe, Robert P.; and Blend, Theodore, 5,468,581, Cl. 430-22.000.

Moore, Cheryl L.: *See*—
Lucast, Donald H.; Moore, Cheryl L.; and James, Ruth A., 5,468,821, Cl. 526-264.000.

Moore, David N. Linerless closure and fitment assembly. 5,467,879, Cl. 215-253.000.

Moorefield, George M., II: *See*—
Dew, Thomas A.; Garrard, Kenneth P.; Moorefield, George M., II; and Taylor, Lauren W., 5,467,675, Cl. 82-1.110.

Moote, Richard K.: *See*—
Vincent, Michael T.; Gutermuth, Terry R.; Lawrie, Robert E.; Moote, Richard K.; Simonich, Mark A.; and Tamm, James R., 5,467,593, Cl. 60-274.000.

Moran, Edward F., Jr.; and McKinney, Ronald J., to Du Pont de Nemours, E. I., and Company. Conversion of nylon 6 and/or nylon 6,6 to adipic acid. 5,468,900, Cl. 562-590.000.

Moran, Peter: *See*—
McMahon, Michael J.; and Moran, Peter, 5,467,763, Cl. 600-201.000.

Morehouse, James H.; Furay, David M.; Volk, Steven B.; and Dunckley, James A., to Intégral Peripherals, Inc. Miniature disk drive with dynamic head loading. 5,469,314, Cl. 360-105.000.

Morey, William W.; and Wilson, Arnold L., to United Technologies Corporation. Compression-tuned fiber grating. 5,469,520, Cl. 385-37.000.

Morgan, Peter C.; Hart, Alan D.; and Morgans, Philip D., to British Aerospace PLC; and BAeSEMA Ltd. Pelletizing or granulating process. 5,468,446, Cl. 419-64.000.

Morgans, Philip D.: *See*—
Morgan, Peter C.; Hart, Alan D.; and Morgans, Philip D., 5,468,446, Cl. 419-64.000.

Mori, Kaoru: *See*—
Takematsu, Tetsu; Komata, Takeo; Kume, Takashi; Suzuki, Kiyoshi; Kawamura, Matsue; Shirakawa, Yumiko; and Mori, Kaoru, 5,468,719, Cl. 504-224.000.

Mori, Naoyuki, to NEC Corporation. Thin electroluminescent lamp and process for fabricating the same. 5,469,019, Cl. 313-509.000.

Morigami, Yoshihiro: *See*—
Taguchi, Tomoyuki; Kuribayashi, Hideyuki; Tanaka, Jun; Konaga, Tomomi; and Morigami, Yoshihiro, 5,468,694, Cl. 501-77.000.

Morimiya, Yuji: *See*—
Hoshino, Mitsuo; Tsutsumi, Yuka; Shimada, Mitsuhiro; Masuda, Takashi; Morimiya, Yuji; Ide, Yoshihiro; Kawaguchi, Takashi; and Nogo, Yuichiro, 5,469,271, Cl. 358-335.000.

Morini, Giampiero; Albizzati, Enrico; Giannini, Umberto; Scordamaglia, Raimondo; and Barino, Luisa, to Montell North America Inc. Components and catalysts for the polymerization of olefins. 5,468,704, Cl. 502-115.000.

Morishita, Keiko: *See*—
Kaneko, Akira; Kanno, Toru; and Morishita, Keiko, 5,469,015, Cl. 313-309.000.

Morita, Kazuya, to Sumitomo Electric Industries, Ltd. Apparatus for correcting the detected heading of a vehicle. 5,469,158, Cl. 340-988.000.

Morita, Shinya, to Sony Corporation. Method and control apparatus for self diagnosis. 5,469,563, Cl. 395-183.010.

Morita, Yoshitsugu, to Dow Corning Toray Silicon Co., Ltd. Epoxy-functional MQ organopolysiloxanes. 5,468,827, Cl. 528-15.000.

Morito Kabushiki Gaisha: *See*—
Kubo, Yoshihiro, 5,467,511, Cl. 24-712.900.

Moriuma, Hiroshi: *See*—
Hashimoto, Kazuhiko; Osaki, Haruyoshi; Ebina, Chinehito; Nagase, Kyoko; Moriuma, Hiroshi; and Uetani, Yasunori, 5,468,590, Cl. 430-191.000.

Moriwaki, Yoshio: *See*—
Seri, Hajime; Yamamura, Yasuharu; Tsuji, Yoichiro; Moriwaki, Yoshio; and Iwaki, Tsutomu, 5,468,309, Cl. 148-421.000.

Moriyama, Keiji; Ebisuno, Tadahiro; and Sugimoto, Kazushige, to Sumitomo Rubber Industries, Ltd. Golf ball. 5,467,994, Cl. 273-222.000.

Moriyama, Norio; and Sugiura, Noboru, to Hitachi, Ltd. Electronic distributing type ignition device. 5,467,758, Cl. 123-617.000.

Morley, John F., Jr.; and Anderson, Kent D., to American Tel-A-Systems, Inc. Telephone answering service with integrated voice and textual message storage. 5,469,491, Cl. 379-88.000.

Moro, Daniel G.; Ronel, Samuel H.; and Kuzma, Petr, to National Patent Development Corporation. Hydrophilic composite polymer articles formed from a settable paste comprising a mixture of hydrophilic polymer and unsaturated monomer. 5,468,811, Cl. 525-263.000.

Morooka, Yoshikazu: *See*—
Yamauchi, Tadaaki; Hamade, Kei; and Morooka, Yoshikazu, 5,469,402, Cl. 365-230.080.

Morozumi, Choji: *See*—
Asai, Naoki; Morozumi, Choji; Ito, Yoshikazu; Ito, Kiyoshi; and Koyabu, Akira, 5,468,078, Cl. 400-215.000.

Morris, John M.; and Green, Charles J., to GT Development Corporation. Two-way HVAC fluid control valve. 5,467,960, Cl. 251-30.010.

Morris, Susan E.: *See*—
Wegner, Steven; Harpold, Michael A.; McCaffrey, Terence M.; Morris, Susan E.; Wojciechowski, Marek; Zhao, Junguo; Henkens, Robert W.; Naser, Najih; and O'Daly, John P., 5,468,366, Cl. 204-403.000.

Morrison, Eric D.; Boston, David R.; Hedrick, Steven T.; Kausch, William L.; Larson, Wayne K.; and Fung, Simon S., to Minnesota Mining and Manufacturing Company. Sulfopolymer/vanadium oxide antistatic compositions. 5,468,498, Cl. 524-408.000.

Mortensen, Keith Y., to Micrognosis, Inc. RF-based high-bandwidth signal transmission method and apparatus. 5,469,219, Cl. 348-492.000.

Morton International, Inc.: *See*—
Taylor, Robert D.; Deppert, Thomas M.; and Barnes, Michael W., 5,467,715, Cl. 102-289.000.

Mosaid Technologies Incorporated: *See*—
Gillingham, Peter B., 5,469,401, Cl. 365-230.060.

Moses, Marlon M.: *See*—
Carey, Richard A.; Moses, Marlon M.; and Daley, Wayne D. R., 5,467,922, Cl. 236-94.000.

Mosley, Demmie L.: *See*—
Brown, Robert L.; Holodnak, John D.; McBride, Gene; and Mosley, Demmie L., 5,468,153, Cl. 439-13.000.

Moss, William C.: *See*—
Seligmann, Daniel A.; Moss, William C.; Valk, Theodore C.; and Conder, Alan D., 5,469,442, Cl. 370-110.400.

Mossner, Steffen: *See*—
Fischer, Jorg-Peter; and Mossner, Steffen, 5,467,756, Cl. 123-569.000.

Motokado, Shinichiro: *See*—
Motokado, Tomoko; Motokado, Shinichiro; and Ohtomo, Mutsumi, 5,468,077, Cl. 400-76.000.

Motokado, Tomoko; Motokado, Shinichiro; and Ohtomo, Mutsumi, to Fujitsu Limited. Method and apparatus for combining characters. 5,468,077, Cl. 400-76.000.

Motorola: *See*—
Kane, Robert C.; and Hilgers, Kevin B., 5,468,169, Cl. 445-50.000.
Shieh, Chan-Long; Lebby, Michael S.; and Lungo, John, 5,468,656, Cl. 437-23.000.

Motorola, Inc.: *See*—
Anderson, Neal R.; Erickson, Bart J.; and Leung, Keith, 5,469,409, Cl. 368-10.000.
Birchler, Mark A.; Jasper, Steven C.; and Wilson, Timothy J., 5,469,465, Cl. 375-346.000.
Blair, Thomas H.; and Lebby, Michael S., 5,468,582, Cl. 430-54.000.
Dydyk, Michael, 5,469,129, Cl. 333-124.000.
Garrett, Scott M., 5,469,002, Cl. 307-150.000.
Gosch, Richard H., 5,467,721, Cl. 108-146.000.
Greer, Stuart E., 5,468,655, Cl. 437-8.000.
Grube, Gary W.; and Markison, Timothy W., 5,469,569, Cl. 395-600.000.
Higgins, Leo M., III, 5,468,995, Cl. 257-697.000.
Knapp, James H.; and Nelson, Keith E., 5,468,910, Cl. 174-52.200.
Lebby, Michael S.; and Jachimowicz, Karen E., 5,469,185, Cl. 345-8.000.
Lee, Edward K. B., 5,469,112, Cl. 329-302.000.
Liao, Benson; and Wang, Taming, 5,469,476, Cl. 375-350.000.
Liebman, Henry F.; Clayton, Alan; and Horneman, Walter A., 5,469,073, Cl. 324-757.000.
Lin, Paul T.; and McShane, Michael B., 5,468,999, Cl. 257-784.000.
Nguyen, Tuan K.; Nguyen, Pha; Clark, Donna A.; and Marinelli, Robert A., 5,469,178, Cl. 343-702.000.
Pine, Jerrold; Lakhani, Sunil; and Renteria, Stanley, 5,467,525, Cl. 29-743.000.
Rush, Tonya A.; Moehling, Steven P.; and Roback, Kenneth J., 5,469,177, Cl. 343-702.000.
Waldo, Whitson G., III; Chen, Gong; and Cerrina, Franco, 5,469,263, Cl. 356-401.000.
Wiggenhorn, James T., 5,469,180, Cl. 343-744.000.
Williams, William M.; Angelo, Anthony; and Westbrook, Gregory L., 5,469,072, Cl. 324-754.000.

Mount, Wilbur S. Directly viewable speed display system. 5,469,184, Cl. 345-7.000.

Mourer, David P.: *See*—
Miller, Steven A.; Mourer, David P.; and Brun, Milivoj K., 5,468,133, Cl. 425-7.000.

Moyne, James R., to Board of Regents Acting for and on Behalf of The University of Michigan, The. Generic cell controlling method and apparatus for computer integrated manufacturing system. 5,469,361, Cl. 364-468.000.

MTI Technology Corporation: *See*—
Glider, Joseph S.; Powers, David T.; and Idleman, Thomas E., 5,469,453, Cl. 371-68.100.

Mück, Manfred: *See*—
Keller, Dieter; and Mück, Manfred, 5,467,695, Cl. 99-422.000.

Mueller, Douglas L.; and Sumcad, Gustavo L., to Honeywell Inc. Engine shaft with integrally formed complementary targets. 5,469,055, Cl. 324-207.210.

Mugglestone, Peter R.: *See*—
Lange, David A.; Benton, Robert L.; Welling, William E.; and Mugglestone, Peter R., 5,467,662, Cl. 74-459.000.

Muggli, Imelda A.; and Alm, Roger R., to Minnesota Mining and Manufacturing Company. Polymerizable fluorochemical surfactants. 5,468,812, Cl. 525-293.000.

Mukaizawa, Akito: *See*—

Tsuruta, Minoru; Suzuta, Toshihiko; Nakada, Akio; Kuramoto, Seiji; Hibino, Hiroki; Bito, Shiro; and Mukaizawa, Akito, 5,467,911, Cl. 227-175.000.

Muldowney, Gregory P., to Mobil Oil Corporation. FCC process with upflow and downflow reactor. 5,468,369, Cl. 208-113.000.

Mullen, Patricia, to Innova Products, Inc. Antiperspirant for hands and feet. 5,468,473, Cl. 424-66.000.

Muller BEM: *See*—
Douine, Denis; and Durand, Gilles, 5,467,646, Cl. 73-126.000.

Müller, Hanns-Peter: *See*—
Schrader, Lutz; Jakob, Hans-Dieter; Müller, Hanns-Peter; and Niggemann, Johann, 5,468,832, Cl. 528-53.000.

Müller, Ingo; and Schneider, Norbert, to U.S. Philips Corporation. Toothbrush. 5,467,494, Cl. 15-22.100.

Müller, Rolf: *See*—
Baumann, Hans-Martin; and Müller, Rolf, 5,469,148, Cl. 340-658.000.

Müller, Urs: *See*—
Kristiansen, Odd; Zondler, Helmut; and Müller, Urs, 5,468,751, Cl. 514-256.000.

Müller, Wolfgang, to Bruker Analytische Messtechnik GmbH. Ferromagnetic room shielding for the superconducting high field magnet of an NMR spectrometer. 5,469,123, Cl. 335-301.000.

Müller-Boysen, Ulrich: *See*—
Obermeier, Josef; Müller-Boysen, Ulrich; Keusch, Siegfried; and Gaffal, Peter, 5,467,835, Cl. 175-209.000.

Mullis, Kary B.: *See*—
Erlich, Henry A.; Horn, Glenn; Saiki, Randall K.; and Mullis, Kary B., 5,468,613, Cl. 435-6.000.

Müllner, Johann: *See*—
Ekdahl, Egon; Gurka, Jiri; Huber, Rupert; Köttritsch, Hubert; Kufe, Gottfried; Müllner, Johann; and Weninger, Helmut, 5,468,072, Cl. 384-448.000.

Multichip Technology: *See*—
Lieberman, Donald A.; and Nemec, John J., 5,469,558, Cl. 395-285.000.

Multimatic Corporation: *See*—
Hahn, Horst, 5,467,539, Cl. 34-77.000.

Mumbleau, Dean W. Passive safety mechanism for firearms. 5,467,550, Cl. 42-70.110.

Mun, Jeong J.: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.

Mundus, Friedhelm; and Voss, Hans-Ludwig, to Windmoeller & Hoelscher. Apparatus for sealing film webs of a thermoplastic synthetic material. 5,468,333, Cl. 156-537.000.

Munteanu, Marina A.: *See*—
Guénin, Eric P.; Trotzinka, Karen A.; Smith, Leslie C.; Warren, Craig B.; Munteanu, Marina A.; Chung, Siew L.; and Tan, Chee-Teck, 5,468,725, Cl. 512-2.000.

Mura, Albert J., Jr.: *See*—
Bailey, David S.; Mura, Albert J., Jr.; and Eiff, Shari L., 5,468,587, Cl. 430-203.000.

Murai Co., Ltd.: *See*—
Murai, Masaru; Hirai, Takayuki; Hyoi, Isao; Maeda, Yoshimi; and Susuki, Seiichi, 5,469,230, Cl. 351-52.000.

Murai, Ichiro: *See*—
Tani, Tomofune; Murai, Ichiro; and Anzai, Kenji, 5,468,979, Cl. 257-304.000.

Murai, Masaru; Hirai, Takayuki; Hyoi, Isao; Maeda, Yoshimi; and Susuki, Seiichi, to Murai Co., Ltd. Spectacles with decoration. 5,469,230, Cl. 351-52.000.

Murakata, Chikara: *See*—
Glicksman, Marcie A.; Rotella, David P.; Neff, Nicola; and Murakata, Chikara, 5,468,872, Cl. 548-416.000.

Murakoshi, Keiji; Nebashi, Mitsuhiko; Ikegami, Makoto; and Otsuki, Noboru, to Seiko Epson Corporation. Printer for printing on cards. 5,468,079, Cl. 400-521.000.

Muramoto, Kenzo: *See*—
Okano, Kazuo; Miyazawa, Shubei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Murao, Yoshinori; Nagano, Masami; and Hosowari, Shigenori, to Hitachi, Ltd.; and Hitachi Automotive Eng. Co. Method and apparatus for controlling the fuel injection/ignition timing of internal combustion engines, and a crank angle sensor using same. 5,467,752, Cl. 123-414.000.

Murata Mfg. Co., Ltd.: *See*—
Okada, Takekazu; Maruyama, Yuichi; and Sayanagi, Kazuya, 5,469,130, Cl. 333-246.000.

Murata, Norikazu: *See*—
Sugimoto, Tadashi; Ohkawa, Shingo; Amano, Hiroyuki; and Murata, Norikazu, 5,468,960, Cl. 250-338.300.

Murata, Yasushi: *See*—
Tanaka, Satoru; Matsui, Fumio; and Murata, Yasushi, 5,469,186, Cl. 345-32.000.

Murayama, Shigeto: *See*—
Shibata, Satoru; and Murayama, Shigeto, 5,467,718, Cl. 104-284.000.

Murphy, Patrice L.: *See*—
Teare, Peter R.; Murphy, Patrice L.; and Brogmus, George E., 5,467,656, Cl. 73-862.541.

Murschall, Ursula: *See*—
Peiffer, Herbert; Murschall, Ursula; and Schloegl, Gunter, 5,468,527, Cl. 428-35.700.

Murthy, Ashok: *See*—
Cheng, Kuangti T.; Murthy, Ashok; Saldanha-Singh, Jeanne M.; and Sharma, Pramod K., 5,469,247, Cl. 355-296.000.

Murtojarvi, Simo, to Nokia Mobile Phones Ltd. I/Q-modulator and I/Q-demodulator. 5,469,126, Cl. 332-105.000.

Musil, Edward C.; and Daniels, William J., to Flexible Steel Lacing Company. Splice assemblies for connecting belt ends. 5,467,867, Cl. 198-844.200.

Musleve, Richard T.: *See*—
Parker, Dane K.; Musleve, Richard T.; and Hirst, Robert C., 5,468,893, Cl. 556-427.000.

Mutchnick, Milton G.: *See*—
Chretien, Paul B.; and Mutchnick, Milton G., 5,468,729, Cl. 514-12.000.

Muth, Hubert: *See*—
Berkhan, Ernst; and Muth, Hubert, 5,468,067, Cl. 366-208.000.

Muth, Ross R.: *See*—
Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; Brown, David L.; and Holzwarth, Henry A., 5,468,252, Cl. 606-228.000.

Muto, Masanori, to Yazaki Corporation. Digital/analog indication unit. 5,469,137, Cl. 340-462.000.

MW Trading APS: *See*—
Holmgren, Bertil, 5,468,031, Cl. 292-81.000.

Mycogen Corporation: *See*—
Payne, Jewel M.; Cannon, Raymond J. C.; Schnepf, H. Ernest; and Schwab, George E., 5,468,636, Cl. 435-252.300.
Thompson, Mark; and Gaertner, Frank H., 5,468,483, Cl. 424-93.461.

Myers, Gary L., to Fort Lock Corporation. Dust shutter assembly for locks. 5,467,624, Cl. 70-455.000.

Naaktgeboren, Adrianus; and Lippens, Christiaan A. C., to New Holland North America, Inc. Baler stuffer mechanism and method. 5,467,702, Cl. 100-35.000.

Nabai, Hossein; and Rahbari, Homayoon. Biopsy wound closure device and method. 5,467,780, Cl. 128-754.000.

Nagae, Kouji: *See*—
Sekigami, Kunie; Nagae, Kouji; and Shimotani, Makoto, 5,467,604, Cl. 62-117.000.

Nagai, Takuya, to Alps Electric Co., Ltd. Recording and/or reproducing device provided with shutter. 5,468,060, Cl. 312-223.200.

Nagai, Yutaka; and Shima, Akihiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor laser with COD preventing disordered regions. 5,469,457, Cl. 372-45.000.

Nagano, Chikara, to Olympus Optical Co., Ltd. Objective lens system. 5,469,299, Cl. 359-661.000.

Nagano, Masami: *See*—
Murao, Yoshinori; Nagano, Masami; and Hosowari, Shigenori, 5,467,752, Cl. 123-414.000.

Naganuma, Masateru, to Seikagaku Kogyo Kabushiki Kaisha(Seikagaku Corporation). Syringe. 5,468,232, Cl. 604-200.000.

Nagasawa, Kiyosi: *See*—
Hosaka, Sumio; Kikugawa, Atsushi; Honda, Yukio; Koyanagi, Hajime; and Nagasawa, Kiyosi, 5,467,642, Cl. 73-105.000.

Nagasawa, Takeshi: *See*—
Kojima, Ryo; Sato, Yoshiro; and Nagasawa, Takeshi, 5,468,621, Cl. 435-25.000.

Nagase, Kyoko: *See*—
Hashimoto, Kazuhiko; Osaki, Haruyoshi; Ebina, Chinehito; Nagase, Kyoko; Moriuma, Hiroshi; and Uetani, Yasunori, 5,468,590, Cl. 430-191.000.

Nagase, Yukio: *See*—
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,469,266, Cl. 358-298.000.

Nagashima, Shinichi: *See*—
Kogure, Mitsuhiro; Nagashima, Shinichi; Wakabayashi, Kazuhisa; Enkaku, Shigeyuki; Shimayama, Hitoshi; Kimura, Minoru; Shimoyama, Shuji; and Yokoo, Tsugio, 5,467,632, Cl. 72-379.200.

Nagata, Katsuyuki: *See*—
Matsushima, Kiyomitsu; and Nagata, Katsuyuki, 5,467,630, Cl. 72-254.000.

Nagata, Satoshi: *See*—
Kashiwazaki, Masami; and Nagata, Satoshi, 5,469,373, Cl. 364-550.000.

Nagata, Yuji; Fukazawa, Toshio; Wada, Kumiko; and Tosaki, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Thin film magnetoresistive head for magnetic recording and reproducing apparatus. 5,469,317, Cl. 360-113.000.

Naim, Moshe, to Kant-ly Ltd. Adjustable gap two-member rotary tool. 5,468,100, Cl. 409-234.000.

Nair, Mridula: *See*—
Miller, David D.; Brick, Mary C.; and Nair, Mridula, 5,468,598, Cl. 430-372.000.

Naitou, Kiyotaka; and Kojima, Junichi, to Sumitomo Wiring Systems, Ltd. Joy stick support structure for multi-directional switch. 5,468,924, Cl. 200-6.00A.

Nakabayashi, Nobuo: *See*—
Shaku, Masao; Ohkura, Sayuri; Kuroda, Hideo; Kano, Ai; and Nakabayashi, Nobuo, 5,468,475, Cl. 424-70.160.

Nakada, Akio: *See*—
Tsuruta, Minoru; Suzuta, Toshihiko; Nakada, Akio; Kuramoto, Seiji; Hibino, Hiroki; Bito, Shiro; and Mukaizawa, Akito, 5,467,911, Cl. 227-175.000.

Nakagawa, Kazuya; and Fukushima, Toyoaki, to Shimadzu Corporation. Gas chromatograph. 5,467,635, Cl. 73-23.350.

Nakagawa, Wataru: *See*—
Ohishi, Mitsuru; Nakagawa, Wataru; and Uno, Masahiro, 5,468,962, Cl. 250-343.000.

Nakagomi, Hirofumi; Harada, Yoshihisa; and Umezawa, Shigeki, to NSK-Warner K.K. Brake band. 5,467,849, Cl. 188-77.00W.

Nakagoshi, Kazuo: *See*—
Nishida, Hiroshi; Nakagoshi, Kazuo; Kai, Kenjiro; and Onoyama, Katsumoto, 5,469,311, Cl. 360-97.020.

Nakagoshi, Yasunobu: *See*—
Hirota, Toshizumi; Kobayashi, Hitoshi; Nakagoshi, Yasunobu; and Amino, Yukio, 5,468,351, Cl. 202-234.000.

Nakahara, Yuichi; and Kojo, Katsuhiko, to Hitachi Metals, Ltd. Cermet alloy. 5,468,278, Cl. 75-236.000.

Nakaimuki, Masayuki: *See*—
Takahashi, Shinichi; Nakaimuki, Masayuki; and Yagi, Yukihiro, 5,469,091, Cl. 327-73.000.

Nakajima, Hideo: *See*—
Iida, Ichiro; Ogino, Yoshitaka; and Nakajima, Hideo, 5,469,419, Cl. 369-58.000.

Nakajima, Kenji: *See*—
Ishida, Takeshi; Koyama, Kenji; Kasama, Hiroshi; Nishiumi, Kenji; and Nakajima, Kenji, 5,468,181, Cl. 453-3.000.

Nakajima, Takeshi; Hashimoto, Ichiro; Saitou, Tomoyuki; Ohira, Fusanori; Akashi, Sueo; Sone, Nobukatu; and Nii, Katsutoshi, to Hitachi, Ltd. Motor with a bearing lubricated by magnetic fluid. 5,469,008, Cl. 310-90.500.

Nakamoto, Yusho: *See*—
Fries, Bror; and Nakamoto, Yusho, 5,468,061, Cl. 312-258.000.

Nakamura, Kosei; Hayashi, Yoshiyuki; Kimijima, Masami; and Arimatsu, Yohei, to Fanuc Ltd. Method of producing squirrel-cage rotor for induction motor. 5,467,521, Cl. 29-598.000.

Nakamura, Shuji; Iwasa, Naruhito; and Senoh, Masayuki, to Nichia Chemical Industries, Ltd. Method of manufacturing P-type compound semiconductor. 5,468,678, Cl. 437-107.000.

Nakamura, Tsuneo: *See*—
Yabuuchi, Masahiko; Akanuma, Hiroshi; Masuda, Minoru; Katoh, Kazuo; Nakamura, Tsuneo; Tajima, Shigeru; Hashiba, Masashi; Hayami, Hiroshi; Takezawa, Tomoko; and Hirayama, Masachika, 5,468,380, Cl. 210-198.200.

Nakamura, Yoshinori: *See*—
Fujimura, Hideo; and Nakamura, Yoshinori, 5,468,713, Cl. 503-227.000.

Nakanishi, Tosaku: *See*—
Aatresh, Deepak J.; Nakanishi, Tosaku; and Mathews, Gregory S., 5,469,544, Cl. 395-290.000.

Nakano, Katsunori: *See*—
Yamashita, Hiroyuki; Kondo, Hiroyuki; Hatano, Kouichi; Nakano, Katsunori; Toyoda, Kouji; and Senzaki, Takashi, 5,468,516, Cl. 427-190.000.

Nakashima, Takashi: *See*—
Tokura, Nobuyuki; Kajiyama, Yoshio; Tatsuno, Hideo; and Nakashima, Takashi, 5,469,428, Cl. 370-161.000.

Nakayama, Yoshinori: *See*—
Itoh, Hiroyuki; Todokoro, Hideo; Sohda, Yasunari; and Nakayama, Yoshinori, 5,468,969, Cl. 250-492.230.

Nakazawa, Kiyoshi: *See*—
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.

Nalco Fuel Tech: *See*—
Lin, M. Linda, 5,468,460, Cl. 423-266.000.

Nambu, Kyojiro: *See*—
Yamazaki, Masahiko; Shibata, Yutaka; Natori, Kozi; Yahata, Mitsuru; and Nambu, Kyojiro, 5,469,429, Cl. 378-19.000.

Nameche, Paul W. Paint masking kit for windows and method of using same. 5,468,538, Cl. 428-101.000.

Namekawa, Masatoshi; Ibuki, Yoshiteru; Iguchi, Norio; and Okuno, Masatoshi, to Citizen Watch Co., Ltd.; and Miyota Co., Ltd. Solder ball supply device. 5,467,913, Cl. 228-41.000.

Narahara, Tetsuya, to NEC Corporation. Transistor circuit for holding peak/bottom level of signal. 5,469,090, Cl. 327-58.000.

Narimatsu, Kiyoyuki; and Kawamura, Norio, to Colin Corporation. Pulse wave sensor. 5,467,771, Cl. 128-672.000.

Narishige, Takeshi: *See*—
Fujisawa, Yoshikazu; Narishige, Takeshi; and Miyazaki, Yuzuru, 5,468,567, Cl. 428-645.000.

Nasekan, Olga: *See*—
Evseev, Yury; Rachinsky, Lubomir; Tetervova, Natalia; Seleninov, Kazimir; Dermeazhi, Evgeniy; Nasekan, Olga; Druyanova, Eva; and Ribak, Roman, 5,468,976, Cl. 257-177.000.

Naser, Najih: *See*—
Wegner, Steven; Harpold, Michael A.; McCaffrey, Terence M.; Morris, Susan E.; Wojciechowski, Marek; Zhao, Junguo; Henkens, Robert W.; Naser, Najih; and O'Daly, John P., 5,468,366, Cl. 204-403.000.

Nashiki, Masayuki, to Okuma Corporation. Method and apparatus for controlling an electric motor with compensation or torque ripple. 5,469,215, Cl. 318-432.000.

Nasuno, Ichiro; Shibata, Mitsuru; Sakamoto, Masashi; and Koike, Kazuyoshi, to Idemitsu Kosan Co., Ltd. Cyclohexanedione derivatives. 5,468,878, Cl. 549-23.000.

Nasuno, Ichiro: *See*—
Shibata, Mitsuru; Sakamoto, Masashi; Koike, Kazuyoshi; and Nasuno, Ichiro, 5,468,722, Cl. 504-282.000.

Natarajan, Govindarajan: *See*—
Casey, Jon A.; Divakaruni, Renuka S.; Natarajan, Govindarajan; Reddy, Srinivasa S. N.; and Sammet, Manfred, 5,468,445, Cl. 419-19.000.

Nataro, James P.: *See*—
Fasano, Alessio; Levine, Myron M.; Nataro, James P.; and Noriega, Fernando, 5,468,639, Cl. 435-320.100.

Nation, George W.: *See*—
Fuhs, Ronald E.; Hammond, William A., Jr.; Nation, George W.; Rogers, Steven L.; and Willis, John C., 5,469,446, Cl. 371-33.000.

National Patent Development Corporation: *See*—
Moro, Daniel G.; Ronel, Samuel H.; and Kuzma, Petr, 5,468,811, Cl. 525-263.000.

National Semiconductor Corporation: *See*—
Chiu, Kwok-F, 5,469,111, Cl. 327-538.000.
Daum, Keith E., 5,468,990, Cl. 257-632.000.
Lee, Johnny C., 5,469,478, Cl. 375-376.000.

National Starch and Chemical Investment Holding Corporation: *See*—
Wai-Chiu, Chung; and Kasica, James J., 5,468,286, Cl. 106-210.000.

National University of Singapore: *See*—
Chan, Daniel S. H.; Leong, Kin; and Phang, Jacob C. H., 5,468,967, Cl. 250-397.000.

Natori, Kozi: *See*—
Yamazaki, Masahiko; Shibata, Yutaka; Natori, Kozi; Yahata, Mitsuru; and Nambu, Kyojiro, 5,469,429, Cl. 378-19.000.

Natsuume, Tadao: *See*—
Takahashi, Nobukazu; Hosaka, Tohru; Minami, Koji; Konishi, Yuichiro; Kohara, Teiji; and Natsuume, Tadao, 5,468,803, Cl. 524-553.000.

Navaratnam, Ramesh A.: *See*—
Lum, Andrew F.; Uribe, Juan M.; Hogan, John M.; Persinger, Richard A.; Miller, James F.; and Navaratnam, Ramesh A., 5,468,401, Cl. 252-22.000.

Navone, David; and Clark, Richard L., to Monster Cable International, Ltd. Car audio system with high signal output. 5,469,509, Cl. 381-28.000.

Naydenov, Nartzis: *See*—
Bergelson, Michael N.; and Naydenov, Nartzis, 5,467,773, Cl. 128-709.000.

Naydowski, Reinhard: *See*—
Bartzick, Gerd; Naydowski, Reinhard; and Werk, Jürgen, 5,467,701, Cl. 100-4.000.

Naylor, Charles A.: *See*—
Knowles, Carl H.; Rockstein, George B.; Wilz, David M.; and Naylor, Charles A., 5,468,951, Cl. 235-472.000.

Nazareth, Lynne V.: *See*—
Thompson, E. Brad; and Nazareth, Lynne V., 5,468,624, Cl. 435-69.100.

NCM International, Inc.: *See*—
Sorensen, Gerald R.; and Gradecki, Raymond J., 5,467,903, Cl. 222-455.000.

Nebashi, Mitsuhiko: *See*—
Murakoshi, Keiji; Nebashi, Mitsuhiko; Ikegami, Makoto; and Otsuki, Noboru, 5,468,079, Cl. 400-521.000.

Nebergall, Robert S.; Taylor, Dennis R.; and Kucharz, Carolyn J., to American Colloid Company. Process for regenerating spent acid-activated bentonite clays and smectite catalysts. 5,468,701, Cl. 502-80.000.

NEC Corporation: *See*—
Amano, Yoshinobu, 5,469,377, Cl. 364-748.000.
Henmi, Toru, 5,469,451, Cl. 371-40.400.
Homma, Tetsuya, 5,468,682, Cl. 437-195.000.
Horita, Satomi; Aoki, Yasushi; Wakana, Masahiro; Okamoto, Hiroshi; Chiba, Kiyohiko; and Daikoku, Shizue, 5,469,081, Cl. 326-81.000.
Ishiwata, Tadashi; Ogata, Tetsuo; and Aota, Ikuhiro, 5,467,974, Cl. 271-220.000.
Kawamoto, Hiedaki, 5,468,686, Cl. 437-229.000.
Kenyoshi, Kaoru, 5,469,493, Cl. 379-9.000.
Kitabatake, Osamu, 5,469,474, Cl. 375-243.000.
Koga, Toshio; and Okajima, Masayuki, 5,469,213, Cl. 348-401.000.
Koriyama, Hiroshi, 5,469,316, Cl. 360-106.000.
Kuwabara, Shinichi; and Komuro, Toshio, 5,469,395, Cl. 365-207.000.
Mori, Naoyuki, 5,469,019, Cl. 313-509.000.
Narahara, Tetsuya, 5,469,090, Cl. 327-58.000.
Nishihara, Motoo; Kurano, Takatoshi; Yamanaka, Naoaki; and Sato, Youichi, 5,469,543, Cl. 395-200.060.
Numai, Takahiro, 5,469,458, Cl. 372-45.000.
Obara, Takashi, 5,469,386, Cl. 365-189.070.
Ohta, Mutsumi, 5,469,517, Cl. 382-252.000.
Okada, Hidemi, 5,469,567, Cl. 395-600.000.
Okuda, Tetsuro; Yamada, Hirohito; and Torikai, Toshitaka, 5,469,459, Cl. 372-46.000.
Samukawa, Seiji, 5,468,341, Cl. 216-69.000.
Sanada, Yotaro, 5,469,315, Cl. 360-106.000.
Shibata, Tsugikazu, 5,469,570, Cl. 395-650.000.
Sohmuta, Mitoshi, 5,469,422, Cl. 369-100.000.
Yamada, Keizo, 5,468,972, Cl. 257-10.000.

Neddenriep, Thomas; and Frucht, Theodor, to Continental Aktiengesellschaft. Pneumatic vehicle tire with optimized recyclability. 5,467,807, Cl. 152-[illegible].

Neer, David L.: *See*—
France, Dennis S.; Cerami, Anthony; Ulrich, Peter C.; Norton, Laura A.; and Neer, David L., 5,468,777, Cl. 514-562.000.

Neff, Nicola: *See*—
Glicksman, Marcie A.; Rotella, David P.; Neff, Nicola; and Murakata, Chikara, 5,468,872, Cl. 548-416.000.

Negishi, Shigenori: *See*—
Seri, Kenji; Sanai, Kazuko; Negishi, Shigenori; and Akino, Toshiro, 5,468,734, Cl. 514-23.000.

Negishi, Takaaki: *See*—
Urano, Fumiyoshi; Fujie, Hirotoshi; Oono, Keiji; and Negishi, Takaaki, 5,468,589, Cl. 430-170.000.

Negoto, Hidenori: *See*—
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-[illegible].

Neidert, Jamie B.: *See*—
Wallace, Ingvar A., II; Braithwaite, Paul C.; and Neidert, Jamie B., 5,468,313, Cl. 149-53.000.

Neilson, John M. S.; Wheatley, Carl F., Jr.; Jones, Frederick P.; and Temple, Victor A. K., to Harris Corporation. Method of forming MOS-gated semiconductor devices having mesh geometry pattern. 5,468,668, Cl. 437-51.000.

Neitzke, Michael E.: *See*—
Buckalew, Robert D.; and Neitzke, Michael E., 5,467,658, Cl. 73-865.900.

Nelson, Gerald V.; Nongbri, Govanon; and Pratt, Roy E., to Texaco Inc. Catalyst for residual conversion demonstrating reduced toluene insolubles. 5,468,371, Cl. 208-216.0PP.

Nelson, James A.: *See*—
Malamas, Michael S.; and Nelson, James A., 5,468,760, Cl. 514-374.000.

Nelson, Keith E.: *See*—
Knapp, James H.; and Nelson, Keith E., 5,468,910, Cl. 174-52.200.

Nelson, Philip L.: *See*—
Foster, Donald D.; and Nelson, Philip L., 5,467,901, Cl. 222-376.000.

Nelson, Robert J.: *See*—
Gyugyi, Laszlo; and Nelson, Robert J., 5,469,044, Cl. 323-207.000.

Nelson, Victor A.: *See*—
Kober, Jeffrey F.; and Nelson, Victor A., 5,467,558, Cl. 49-220.000.

Nemec, John J.: *See*—
Lieberman, Donald A.; and Nemec, John J., 5,469,558, Cl. 395-285.000.

Nessi, Maurizio, to SGS-Thomson Microelectronics, S.r.l. Power transistor driver stage with optimally reduced turn-off delay. 5,469,094, Cl. 327-110.000.

Nessi, Maurizio; and Fucili, Giona, to SGS-Thomson Microelectronics, S.r.l. Power-transistor slew-rate controller employing only a single capacitor per half-bridge. 5,469,096, Cl. 327-112.000.

Neuhoff, David L.; Pappas, Thrasyvoulos N.; and Seshadri, Nambirajan, to AT&T Corp. Display model-based error criterion halftoning. 5,469,268, Cl. 358-298.000.

Neutzner, Josef: *See*—
Aydin, Oral; Portugall, Michael; Neutzner, Josef; and Maechtle, Walter, 5,468,799, Cl. 524-457.000.

New Holland North America, Inc.: *See*—
Naaktgeboren, Adrianus; and Lippens, Christiaan A. C., 5,467,702, Cl. 100-35.000.

New York University: *See*—
Seeman, Nadrian C.; and Zhang, Yuwen, 5,468,851, Cl. 536-22.100.

Newell Operating Company: *See*—
Bower, Lawrence J.; Delo, Ronald R.; and VanZeeland, Gerald D., 5,468,207, Cl. 493-297.000.

Newman, Charles L.; and Kipp, Winfried, to Minnesota Mining and Manufacturing Company. Refastenable tube and cable restraint for surgical use. 5,468,231, Cl. 604-180.000.

Newman, Harry B.: *See*—
Becktel, David C.; Newman, Harry B.; and Moldenhauer, Phillip E., 5,468,137, Cl. 425-381.000.

Newman, Thomas H.; and Borodychuk, Karen K., to Dow Chemical Company, The. Syndiotactic vinylaromatic polymerization process using low hydrogen partial pressures. 5,468,818, Cl. 526-170.000.

NGK Spark Plug Co., Ltd.: *See*—
Imai, Ryuji; and Kanbe, Rokuro, 5,468,997, Cl. 257-734.000.

Nguyen, Hai N.: *See*—
Walker, Richard E.; and Nguyen, Hai N., 5,469,320, Cl. 361-33.000.

Nguyen, Pha: *See*—
Nguyen, Tuan K.; Nguyen, Pha; Clark, Donna A.; and Marinelli, Robert A., 5,469,178, Cl. 343-702.000.

Nguyen, Quy: *See*—
Flint, Alan; Nguyen, Quy; and Jacobs, William G., 5,468,111, Cl. 414-416.000.

Nguyen, Son V.: *See*—
Carl, Dan; Dobuzinsky, David M.; Nguyen, Son V.; and Nguyen, Tue, 5,468,687, Cl. 437-235.000.

Nguyen, Trung T.; and Zhao, Jin, to LSI Logic Corporation. High performance voltage controlled oscillator. 5,469,120, Cl. 331-177.00R.

Nguyen, Tuan K.; Nguyen, Pha; Clark, Donna A.; and Marinelli, Robert A., to Motorola, Inc. Low profile antenna system for a cardlike communication receiver. 5,469,178, Cl. 343-702.000.

Nguyen, Tue: *See*—
Carl, Dan; Dobuzinsky, David M.; Nguyen, Son V.; and Nguyen, Tue, 5,468,687, Cl. 437-235.000.

NHK Spring Co., Ltd.: *See*—
Matsubara, Kousuke; and Fukumura, Takeo, 5,469,136, Cl. 340-445.000.

Nichia Chemical Industries, Ltd.: *See*—
Nakamura, Shuji; Iwasa, Naruhito; and Senoh, Masayuki, 5,468,678, Cl. 437-107.000.

Nichols, Walter A.: *See*—
Deevi, Seetharama C.; Hajaligol, Mohammad R.; Lieberman, Pamela D.; Nichols, Walter A.; and Watkins, Michael L., 5,468,936, Cl. 219-553.000.

Nicholson, James: *See*—
Polich, Herman; Nicholson, James; and Emlich, Larry, 5,469,463, Cl. 395-182.180.

Nicholson, Jesse M.: *See*—
Scott, Kenneth R.; Nicholson, Jesse M.; and Edafioghо, Ivan O., 5,468,775, Cl. 514-541.000.

Nicholson, Terence P., to Specialist Sealing Ltd. Seals. 5,467,966, Cl. 251-174.000.

Nicklaus Golf Equipment Company, L.C.: *See*—
Henwood, William D., 5,467,988, Cl. 273-167.00A.

Nicolaidis, Michael, to Sofia Koloni Ltd. Transparent testing of integrated circuits. 5,469,445, Cl. 371-22.300.

Nicole, Pierre, to Dassault Electronique. Optoelectronic installation for the interconnection of electronic modules and a corresponding optoelectric connector. 5,469,286, Cl. 359-163.000.

Nicolson, Paul C.; Seamons, Kenneth R.; Tsao, Fu-Pao; Alvord, Larry A.; and McCraw, Earl C., Jr., to Ciba-Geigy Corporation. Peroxide disinfection method and devices therefor. 5,468,448, Cl. 422-30.000.

Nielson, Michael E.: *See*—
Hohenstein, Gerald L.; Nielson, Michael E.; Tang, Tin S.; Carmichael, Richard D.; and Brant, William A., 5,469,566, Cl. 395-182.040.

Niggemann, Johann: *See*—
Schrader, Lutz; Jakob, Hans-Dieter; Müller, Hanns-Peter; and Niggemann, Johann, 5,468,832, Cl. 528-53.000.

Nihon Koden Corporation: *See*—
Suda, Shin; and Hosaka, Hidehiro, 5,467,768, Cl. 128-640.000.

Nihon Polytech Co., Ltd.: *See*—
Hirota, Toshizumi; Kobayashi, Hitoshi; Nakagoshi, Yasunobu; and Amino, Yukio, 5,468,351, Cl. 202-234.000.

Nii, Katsutoshi: *See*—
Nakajima, Takeshi; Hashimoto, Ichiro; Saitou, Tomoyuki; Ohira, Fusanori; Akashi, Sueo; Sone, Nobukatu; and Nii, Katsutoshi, 5,469,008, Cl. 310-90.500.

Nii, Kazumi; Hoshimiya, Takashi; Katoh, Kazunobu; and Ezoe, Toshihide, to Fuji Photo Film Co. Ltd. Silver halide photographic material. 5,468,592, Cl. 430-264.000.

Niitsu, Chiyomi: *See*—
Suzuki, Tamotsu; Totsuka, Mikio; Niitsu, Chiyomi; and Shinozaki, Fumiaki, 5,468,594, Cl. 430-294.000.

Nike, Inc.: *See*—
Aveni, Michael A.; and Potter, Daniel R., 5,467,537, Cl. 36-50.100.

Nikon Corporation: *See*—
Takagi, Shinichi; and Nishi, Kenji, 5,469,260, Cl. 356-358.000.
Uchiyama, Shigeyuki; Kusaka, Yosuke; and Yamano, Syozo, 5,469,240, Cl. 354-406.000.

Nilén, Bengt, to Viptop AB. Dishwasher wherein liquid is circulated with granules and separation device for separating granules from the liquid. 5,468,175, Cl. 451-87.000.

Nilssen, Ole K. Electronic ballast drawing sinusoidal line current. 5,469,028, Cl. 315-291.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Yabuuchi, Masahiko; Akanuma, Hiroshi; Masuda, Minoru; Katoh, Kazuo; Nakamura, Tsuneo; Tajima, Shigeru; Hashiba, Masashi; Hayami, Hiroshi; Takezawa, Tomoko; and Hirayama, Masachika, 5,468,380, Cl. 210-198.200.

Nippon Koki Co., Ltd.: *See*—
Kobari, Hirokazu; and Kishimoto, Junichi, 5,468,016, Cl. 280-741.000.

Nippon Oil Co., Ltd.: *See*—
Komiya, Koji; Takezono, Tetsuya; Yabe, Noritsugu; and Matsui, Hisao, 5,468,635, Cl. 435-240.210.

Nippon Paint Co., Ltd.: *See*—
Hosoda, Yasushi; Shiota, Toshiaki; Suzuki, Nobukazu; Ikeda, Satoshi; Odawa, Taketosi; Kimura, Koichi; and Yamamoto, Hisataka, 5,468,461, Cl. 523-435.000.
Miyazaki, Katsuo; Maeda, Takahide; Ogawa, Takeshi; Kakui, Sonoko; Ikeda, Satoshi; and Yamane, Yoshiki, 5,468,517, Cl. 427-322.000.
Uenaka, Akimitsu; Toyoda, Yuji; Tsutsui, Koichi; and Kenny, John, 5,468,813, Cl. 525-385.000.

Nippon Paper Industries Co., Ltd.: *See*—
Ohtani, Teiichi; Endo, Shoichi; Shimada, Teruhisa; and Kuroyama, Yoshihiro, 5,468,564, Cl. 428-537.500.

Nippon Soda Co., Ltd.: *See*—
Suzuki, Junji; Hatano, Masami; and Imaizumi, Shinichi, 5,468,905, Cl. 568-346.000.

Nippon Steel Corporation: *See*—

Hyoguchi, Takao; and Kawashima, Katsuhiro, 5,467,655, Cl. 73-579.000.
Suehiro, Toshiyuki; Teraoka, Shinichi; Ishimaru, Eiichiro; Fukuda, Yoshimori; and Inoue, Shuichi, 5,467,811, Cl. 164-476.000.
Tani, Tomofune; Murai, Ichiro; and Anzai, Kenji, 5,468,979, Cl. 257-104.000.

Nippon Telegraph and Telephone Corporation: *See*—
Tokura, Nobuyuki; Kajiyama, Yoshio; Tatsuno, Hideo; and Nakashima, Takashi, 5,469,428, Cl. 370-161.000.

Nippon Thompson Co., Ltd.: *See*—
Takei, Seiji; and Obara, Kouji, 5,469,030, Cl. 318-254.000.

Nippon Valqua Industries, Ltd.: *See*—
Kawanishi, Umeo; Hirayama, Nobuhisa; Hamabe, Takeshi; and Takagi, Toru, 5,469,128, Cl. 333-22.00R.

Nippon Zeon Co. Ltd.: *See*—
Takahashi, Nobukazu; Hosaka, Tohru; Minami, Koji; Konishi, Yuichiro; Kohara, Teiji; and Natsuume, Tadao, 5,468,803, Cl. 524-553.000.

Nippondenso Co., Ltd.: *See*—
Sugito, Katsuhiko; and Hibi, Yasuo, 5,467,517, Cl. 29-407.000.

Nishi, Kenji: *See*—
Takagi, Shinichi; and Nishi, Kenji, 5,469,260, Cl. 356-358.000.

Nishi, Seiji: *See*—
Uchida, Hiroyuki; Yoshikawa, Kazuo; and Nishi, Seiji, 5,468,305, Cl. 148-120.000.

Nishida, Hiroshi; Nakagoshi, Kazuo; Kai, Kenjiro; and Onoyama, Katsumoto, to Hitachi, Ltd. Vibration absorbing structure for a magnetic disk apparatus. 5,469,311, Cl. 360-97.020.

Nishihara, Motoo; Kurano, Takatoshi; Yamanaka, Naoaki; and Sato, Youichi, to NEC Corporation. Policing circuits arranged in matrix array for selectively transferring virtual path identifier (VPI) responsive to either VPI or service class identifier (SCI) threshold value. 5,469,543, Cl. 395-200.060.

Nishikawa, Shinjirou, to Kabushiki Kaisha Hara Shokki Seisakusho. Nipper apparatus for use in comber. 5,467,506, Cl. 19-223.000.

Nishikawa, Yukio; Tanaka, Kunio; and Yoshida, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Laser sputtering apparatus. 5,468,930, Cl. 219-121.600.

Nishimoto, Mitsuhiko, to Koyo Seiko Co., Ltd. Controlling apparatus for power steering. 5,469,357, Cl. 364-424.050.

Nishimura, Hiroshi: *See*—
Uchihashi, Kiyoaki; Nishimura, Hiroshi; and Fukumori, Noriyuki, 5,469,027, Cl. 315-224.000.

Nishimura, Naoyuki: *See*—
Ohashi, Tetsuo; Tada, Jun; Fukushima, Shigeru; Ozaki, Hiroko; Nishimura, Naoyuki; Shirasaki, Yoshinari; and Yamagata, Koichi, 5,468,852, Cl. 536-24.330.

Nishimura, Norio: *See*—
Itoh, Shigeo; Watanabe, Teruo; Miyamori, Makoto; Nishimura, Norio; Itoh, Junji; and Kanemaru, Seigo, 5,469,014, Cl. 313-308.000.

Nishimura, Yutaka: *See*—
Minowa, Toshimichi; Nishimura, Yutaka; Kawashima, Ken'ichi; Kuroiwa, Hiroshi; and Ibamoto, Masahiko, 5,468,196, Cl. 477-62.000.

Nishino, Toshikazu; Hasegawa, Haruhiro; and Kawabe, Ushio, to Hitachi, Ltd. Method for forming a superconducting weak link device. 5,468,723, Cl. 505-330.000.

Nishio, Hisashi; Arai, Toru; Nishizuka, Masaru; and Makitani, Atsushi, to Sansha Electric Manufacturing Co., Ltd. Voltage boosting power failure protected power supply device. 5,469,350, Cl. 363-55.000.

Nishio, Koji: *See*—
Fujimoto, Masahisa; Nishio, Koji; and Saito, Toshihiko, 5,468,571, Cl. 429-217.000.
Takee, Masao; Kimoto, Mamoru; Tikano, Yoshito; Mizitaki, Husago; Mastuura, Yoshinori; Nishio, Koji; and Furukawa, Nobohiro, 5,468,260, Cl. 29-623.500.

Nishio, Masanobu; Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, to Sumitomo Electric Industries, Ltd. Ceramic insulated electrical conductor wire and method for manufacturing such a wire. 5,468,557, Cl. 428-384.000.

Nishiumi, Kenji: *See*—
Ishida, Takeshi; Koyama, Kenji; Kasama, Hiroshi; Nishiumi, Kenji; and Nakajima, Kenji, 5,468,181, Cl. 453-3.000.

Nishizawa, Hiroshi, to Matsushita Electric Industrial Co. Method of manufacturing an index apparatus. 5,469,425, Cl. 369-189.000.

Nishizawa, Hirotaka; Azuma, Seiichiro; Ootoshi, Kazuaki; Miyama, Masataka; Kawata, Shuji; Kasahara, Osamu; and Suzuki, Sinichi, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Semiconductor integrated circuit device having an improved vertical bipolar transistor structure. 5,468,989, Cl. 257-517.000.

Nishizuka, Masaru: *See*—
Nishio, Hisashi; Arai, Toru; Nishizuka, Masaru; and Makitani, Atsushi, 5,469,350, Cl. 363-55.000.

Nissan Motor Co., Ltd.: *See*—
Fujiki, Akira; and Kano, Makoto, 5,468,310, Cl. 148-435.000.
Kawanishi, Umeo; Hirayama, Nobuhisa; Hamabe, Takeshi; and Takagi, Toru, 5,469,128, Cl. 333-22.00R.

Nissan Texsys Co., Ltd.: *See*—
Kaneda, Kazuo; and Ushiro, Masayuki, 5,467,801, Cl. 139-1.00E.

Nissei ASB Machine Co., Ltd.: *See*—
Takada, Minoru; Satoh, Kouichi; Yokobayashi, Kazuyuki; and Ogihara, Shuichi, 5,468,443, Cl. 264-537.000.

Nisshin Flour Milling Co., Ltd.: *See*—
Ohwaki, Tatsuya; and Sakai, Hiroshi, 5,468,623, Cl. 435-68.100.
Ohwaki, Tatsuya; and Sakai, Hiroshi, 5,468,633, Cl. 435-212.000.

Nisshin Steel Co., Ltd.: *See*—
Hachiya, Seio; Shinoda, Ken-ichi; and Higo, Yuichi, 5,468,402, Cl. 252-25.000.

Nitto Boseki Co., Ltd.: *See*—
Kojima, Ryo; Sato, Yoshiro; and Nagasawa, Takeshi, 5,468,621, Cl. 435-25.000.

Noami, Tsuneo: *See*—
Aoshima, Taku; Noami, Tsuneo; Soga, Hirob; Sumikawa, Takeshi; Furuya, Nobumasa; and Edure, Tadakazu, 5,469,245, Cl. 355-251.000.

Nobikoba, L. M.: *See*—
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.

Nobumoto, Kazutoshi: *See*—
Tsuyama, Toshiaki; Onaka, Toru; Nobumoto, Kazutoshi; and Kawamura, Makoto, 5,469,359, Cl. 364-426.030.

Noda, Minoru: *See*—
Orisaka, Shinji; and Noda, Minoru, 5,468,685, Cl. 437-228.000.

Nogo, Yuichiro: *See*—
Hoshino, Mitsuo; Tsutsumi, Yuka; Shimada, Mitsuhiro; Masuda, Takashi; Morimiya, Yuji; Ide, Yoshihiro; Kawaguchi, Takashi; and Nogo, Yuichiro, 5,469,271, Cl. 358-335.000.

Noguchi, Kazuhiro; Ogino, Shigeru; and Kobayashi, Takashi, to Canon Kabushiki Kaisha. Image pickup apparatus with control for output of non-vibrating images. 5,469,210, Cl. 348-208.000.

Noguchi, Yasuhiro; Kuwahara, Hiroshi; Yasuda, Isao; and Takei, Kazuo, to Hitachi, Ltd. Display apparatus and method with multi-window function. 5,469,189, Cl. 345-118.000.

Noise Cancellation Technologies, Inc.: *See*—
Eatwell, Graham P., 5,469,087, Cl. 327-40.000.

Nokia Mobile Phones Ltd.: *See*—
Murtojarvi, Simo, 5,469,126, Cl. 332-105.000.

Nolte, Douglas A.; Vetter, Gregory J.; Best, Kenneth E.; and Krampotich, Dennis J., to Truth Hardware Corporation. Handle and cover assembly for a window operator. 5,467,503, Cl. 16-115.000.

Nomura, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Zoom lens barrel. 5,469,300, Cl. 359-700.000.

Nomura, Masayoshi: *See*—
Smith, Scott E.; Le, Duy-Loan T.; Stephens, Michael C., Jr.; and Nomura, Masayoshi, 5,469,385, Cl. 365-189.050.

Nongbri, Govanon: *See*—
Nelson, Gerald V.; Nongbri, Govanon; and Pratt, Roy E., 5,468,371, Cl. 208-216.0PP.

Norand Corporation: *See*—
Danielson, Arvin D.; and Durbin, Dennis A., 5,468,947, Cl. 235-472.000.
Hanson, George E., 5,468,950, Cl. 235-472.000.
Koenck, Steven E.; Miller, Phillip; and Schultz, Darald R., 5,468,948, Cl. 235-472.000.

Nord, Runo: *See*—
Brändström, Paul; and Nord, Runo, 5,467,888, Cl. 220-319.000.

Nordischer Maschinenbau Rud. Baader GmbH & Co KG: *See*—
Jordan, Holger; and Richartz, Sigurd, 5,468,180, Cl. 452-127.000.

Noreika, Richard J.: *See*—
Ellerson, James V.; Noreika, Richard J.; and Varcoe, Jack A., 5,469,333, Cl. 361-779.000.

Norgren Martonair GmbH: *See*—
Hubl, Werner, 5,467,685, Cl. 92-88.000.

Noriega, Fernando: *See*—
Fasano, Alessio; Levine, Myron M.; Nataro, James P.; and Noriega, Fernando, 5,468,639, Cl. 435-320.100.

Norita, Toshio: *See*—
Ishida, Tokuji; Norita, Toshio; and Hasegawa, Jun, 5,469,239, Cl. 354-402.000.

Normann, Alfred: *See*—
Weber, Horst; and Normann, Alfred, 5,468,143, Cl. 431-243.000.

Noro, Masataka: *See*—
Yazaki, Takao; Noro, Masataka; Matsui, Takashi; Kobayashi, Noriyuki; Sano, Hironari; and Yamamoto, Koji, 5,468,444, Cl. 264-566.000.

North American Philips Corporation: *See*—
Wong, Stephen L.; and Majid, Naveed, 5,469,046, Cl. 323-286.000.

North Carolina State University: *See*—
Dow, Thomas A.; Garrard, Kenneth P.; Moorefield, George M., II; and Taylor, Lauren W., 5,467,675, Cl. 82-1.110.

Northern Telecom Limited: *See*—
Peterson, John P.; and Brinkley, Paul, 5,467,914, Cl. 228-102.000.

Norton, Laura A.: *See*—
France, Dennis S.; Cerami, Anthony; Ulrich, Peter C.; Norton, Laura A.; and Neer, David L., 5,468,777, Cl. 514-562.000.

Nosaki, Katsutoshi: *See*—
Yamaguchi, Tadashi; Nosaki, Katsutoshi; Inoue, Akihisa; and Masumoto, Tsuyoshi, 5,468,697, Cl. 501-98.000.

Nosco, Dennis L.: *See*—
Deutsch, Edward A.; Deutsch, Karen F.; Cacheris, William P.; Ralston, William H.; White, David H.; Nosco, Dennis L.; Wolfangel, Robert G.; Wilking, Janet B.; Meeh, Linda; and Woulfe, Steven R., 5,468,465, Cl. 424-9.400.

Nova Power Systems, Ltd.: *See*—
Lira, Joseph R., 5,468,375, Cl. 210-139.000.

Novo Nordisk A/S: *See*—
Outtrup, Helle; Aaslyng, Dorrit A.; Dambmann, Claus; and Patkar, Shamkant A., 5,468,416, Cl. 252-174.120.

Novotny, Fritz: *See*—
Probst, Joachim; Novotny, Fritz; Träubel, Harro; and Heiliger, Ludger, 5,468,257, Cl. 8-436.000.

NSK-Warner K.K.: *See*—
Nakagomi, Hirofumi; Harada, Yoshihisa; and Umezawa, Shigeki, 5,467,849, Cl. 188-77.00W.

NTN Corporation: *See*—
Monahan, Russell E., 5,468,191, Cl. 474-8.000.

Nuccio, Phillip P.: *See*—
Burbury, Robert L.; and Nuccio, Phillip P., 5,469,492, Cl. 378-197.000.

Nuchols, Richard P.: *See*—
Donegan, Michael W.; Nuchols, Richard P.; Webber, James L.; and Mc Cann, Jerry A., 5,468,011, Cl. 280-728.200.

Nuclear Fuel Services, Inc.: *See*—
Bailey, William H.; Byers, Lonnie L.; Holley, Robert G.; Lamie, James M.; Sparks, Robert M.; West, Mike L.; and Storey, Richard P., 5,468,968, Cl. 250-435.000.

Nulty, James E.; and Trammel, Pamela S., to Cypress Semiconductor Corp. Method of etching an oxide layer. 5,468,342, Cl. 156-643.100.

Numai, Takahiro, to NEC Corporation. Surface-emitting semiconductor device. 5,469,458, Cl. 372-45.000.

Nuñez, Eduardo; and Johnson, Michael J., to Chrysler Corporation. Apparatus for automatically feeding and assembling wires into a trough of a panel. 5,467,520, Cl. 29-564.600.

Nunez, Luis; and Vandergrift, George F., to University of Chicago, The. Batch extracting process using magneticparticle held solvents. 5,468,456, Cl. 423-10.000.

Nunn, Adrian D.: *See*—
Tweedle, Michael F.; Strauss, Harry W.; and Nunn, Adrian D., 5,468,467, Cl. 424-9.361.

Nussler, Andreas K.: *See*—
Billiar, Timothy R.; Nussler, Andreas K.; Geller, David A.; and Simmons, Richard L., 5,468,630, Cl. 435-189.000.

Nutter, Dale E. Gas-liquid contact apparatus including trays with vapor apertures in overlapping panel margins. 5,468,425, Cl. 261-114.300.

O.S. Designs, Inc.: *See*—
Olson, Scott B.; Polk, Louis F., III; and Luedke, Adam A., 5,468,004, Cl. 280-11.200.

Obaishi, Hiroshi: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Obara, Kouji: *See*—
Takei, Seiji; and Obara, Kouji, 5,469,030, Cl. 318-254.000.

Obara, Takashi, to NEC Corporation. Semiconductor integrated circuit device having low-power consumption signal input circuit responsive to high-speed small-amplitude input signal. 5,469,386, Cl. 365-189.070.

Obata, Yosimori, to Kabushiki Kaisha Toshiba. Resistor sensor input apparatus. 5,469,071, Cl. 324-713.000.

Obermeier, Josef; Müller-Boysen, Ulrich; Keusch, Siegfried; and Gaffal, Peter, to Hilti Aktiengesellschaft. Drilling or chiseling tool with suction apparatus. 5,467,835, Cl. 175-209.000.

Oborin, Boris S.: *See*—
Pevzner, Lev K.; Lakhovskiy, Mikhail Y.; and Oborin, Boris S., 5,468,273, Cl. 55-523.000.

O'Brien, Dennis W.: *See*—
Elmer, John W.; Teruya, Alan T.; and O'Brien, Dennis W., 5,468,966, Cl. 250-397.000.

Ochs, Dennis E.; Burton, David L.; Groh, John F.; and Smith, David E., to Hewlett-Packard Corporation. Method and system for precise time based presentation of recorded medical data. 5,467,774, Cl. 128-711.000.

O'Coin, Bernard J., to Jalcos Holdings Inc. Methods of manufacturing and installing elastomeric fills for use in pneumatic tire casings. 5,468,316, Cl. 156-64.000.

O'Connell, Drew: *See*—
Mobley, J. Phil; Zhang, Chaoying; Soli, Sigfried D.; Johnson, Chris; and O'Connell, Drew, 5,467,784, Cl. 128-867.000.

Oda, Kenzo, to Whitaker Corporation, The. Locking connector. 5,468,162, Cl. 439-752.000.

Oda, Noriyuki: *See*—
Yugami, Hiroshi; Yamada, Minoru; Oda, Noriyuki; and Endo, Yasuhiko, 5,468,282, Cl. 95-8.000.

Oda, Tomio: *See*—
Ueno, Ryuji; and Oda, Tomio, 5,468,880, Cl. 549-263.000.

O'Daly, John P.: *See*—
Wegner, Steven; Harpold, Michael A.; McCaffrey, Terence M.; Morris, Susan E.; Wojciechowski, Marek; Zhao, Junguo; Henkens, Robert W.; Naser, Najih; and O'Daly, John P., 5,468,366, Cl. 204-403.000.

Odawa, Taketosi: *See*—
Hosoda, Yasushi; Shiota, Toshiaki; Suzuki, Nobukazu; Ikeda, Satoshi; Odawa, Taketosi; Kimura, Koichi; and Yamamoto, Hisataka, 5,468,461, Cl. 523-435.000.

O' Donnell, Patricia A.; Kerfoot, Charles S.; and Springer, Joseph J., to Westinghouse Electric Corp. Heat dissipating transformer coil. 5,469,124, Cl. 336-61.000.

Offenberg, Michael: *See*—
Reihlen, Eckart; Marek, Jiri; Bantien, Frank; Findler, Guenther; Offenberg, Michael; Kleinhans, Josef; Konzelmann, Uwe; and Ziegenbein, Botho, 5,467,649, Cl. 73-204.260.

Ogata, Takao; and Menjo, Takeshi, to Canon Kabushiki Kaisha. Developing agent density control method of varying development bias in density control. 5,469,244, Cl. 355-246.000.

Ogata, Tetsuo: *See*—
Ishiwata, Tadashi; Ogata, Tetsuo; and Aota, Ikuhiro, 5,467,974, Cl. 271-220.000.

Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Functional laminated chemically adsorbed films. 5,468,551, Cl. 428-333.000.

Ogawa, Takeshi: *See*—
Miyazaki, Katsuo; Maeda, Takahide; Ogawa, Takeshi; Kakui, Sonoko; Ikeda, Satoshi; and Yamane, Yoshiki, 5,468,517, Cl. 427-322.000.

Ogihara, Shuichi: *See*—
Takada, Minoru; Satoh, Kouichi; Yokobayashi, Kazuyuki; and Ogihara, Shuichi, 5,468,443, Cl. 264-537.000.

Ogino, Shigeru: *See*—
Noguchi, Kazuhiro; Ogino, Shigeru; and Kobayashi, Takashi, 5,469,210, Cl. 348-208.000.

Ogino, Shinichi: *See*—
Kosaka, Tokihiro; Ogino, Shinichi; and Maekawa, Yasunori, 5,469,251, Cl. 356-73.000.

Ogino, Yoshitaka: *See*—
Iida, Ichiro; Ogino, Yoshitaka; and Nakajima, Hideo, 5,469,419, Cl. 369-58.000.

Ogiro, Kenji: *See*—
Takeda, Hidekazu; Kaku, Nobuyuki; and Ogiro, Kenji, 5,469,319, Cl. 360-132.000.

Ogura, Hiroaki: *See*—
Okada, Osamu; Ogura, Hiroaki; and Sogabe, Toshiaki, 5,468,565, Cl. 428-552.000.

Ohara, Eiji: *See*—
Sakaegi, Yuji; and Ohara, Eiji, 5,469,218, Cl. 348-455.000.

O'Hara, Robert J.; and Knowlton, Christopher M., to AAR Corp. Steering mechanism for a cleaning vehicle. 5,467,500, Cl. 15-320.000.

Ohashi, Tetsuo; Tada, Jun; Fukushima, Shigeru; Ozaki, Hiroko; Nishimura, Naoyuki; Shirasaki, Yoshinari; and Yamagata, Koichi, to Shimadzu Corporation. Oligonucleotides for detecting bacteria. 5,468,852, Cl. 536-24.330.

Ohio Mattress Co. Licensing & Components Group, The: *See*—
Wagner, Robert F., 5,467,488, Cl. 5-474.000.

Ohio State University: *See*—
Chan, Kenneth K.; and Srigritsanapol, Aeumporn, 5,468,499, Cl. 424-450.000.

Ohira, Fusanori: *See*—
Nakajima, Takeshi; Hashimoto, Ichiro; Saitou, Tomoyuki; Ohira, Fusanori; Akashi, Sueo; Sone, Nobukatu; and Nii, Katsutoshi, 5,469,008, Cl. 310-90.500.

Ohishi, Mitsuru; Nakagawa, Wataru; and Uno, Masahiro, to Fuji Electric Co., Ltd. Infrared gas analyzer. 5,468,962, Cl. 250-343.000.

Ohkawa, Shingo: *See*—
Sugimoto, Tadashi; Ohkawa, Shingo; Amano, Hiroyuki; and Murata, Norikazu, 5,468,960, Cl. 250-338.300.

Ohkawa, Tihiro; and Elsner, Frederick H., to General Atomics. Fabrication of fiber-reinforced composites. 5,468,358, Cl. 204-181.500.

Ohkubo, Kazuhiko: *See*—
Tsutsui, Tomoki; Izukawa, Tsukuru; Ohkubo, Kazuhiko; and Sakaki, Yoshitsugu, 5,468,840, Cl. 528-408.000.

Ohkura, Sayuri: *See*—
Shaku, Masao; Ohkura, Sayuri; Kuroda, Hideo; Kano, Ai; and Nakabayashi, Nobuo, 5,468,475, Cl. 424-70.160.

Ohmae, Hideki: *See*—
Takahara, Hiroshi; and Ohmae, Hideki, 5,469,278, Cl. 359-51.000.

Ohmi, Tadahiro: *See*—
Shibata, Tadashi; and Ohmi, Tadahiro, 5,469,085, Cl. 326-121.000.

Ohmori, Kenji: *See*—
Suzuki, Fumio; Kuroda, Takeshi; Kitamura, Shigeto; and Ohmori, Kenji, 5,468,756, Cl. 514-293.000.

Ohno, Kouichi; Miyatake, Hideki; and Yoshida, Yutaka, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Control device for antiglare mirror. 5,469,296, Cl. 359-603.000.

Ohnuki, Yukio; Kurosawa, Satoshi; and Kondo, Akio, to Tosoh Corporation. Magnetic recording medium comprising a magnetic film layer and a coating of purified perfluoropolyether lubricant. 5,468,552, Cl. 428-336.000.

Ohnuma, Sadabumi: *See*—
Yasuda, Kenji; Takata, Yoshinori; Tsuruta, Harumi; Ohnuma, Sadabumi; and Miura, Junkichi, 5,468,379, Cl. 210-198.200.

Ohsawa, Nobuhiko: *See*—
Sato, Yasushi; and Ohsawa, Nobuhiko, 5,469,484, Cl. 377-58.000.

Ohta, Mutsumi, to NEC Corporation. Motion compensation circuit. 5,469,517, Cl. 382-252.000.

Ohtani, Teiichi; Endo, Shoichi; Shimada, Teruhisa; and Kuroyama, Yoshihiro, to Nippon Paper Industries Co., Ltd. Transfer paper and method of manufacturing the same. 5,468,564, Cl. 428-537.500.

Ohtomo, Mutsumi: *See*—

Motokado, Tomoko; Motokado, Shinichiro; and Ohtomo, Mutsumi, 5,468,077, Cl. 400-76.000.

Ohuchi, Kazunori: *See*—
Endoh, Tetsuo; Shirota, Riichiro; Obuchi, Kazunori; Kirisawa, Ryouhei; Aritome, Seiichi; Tanaka, Tomoharu; and Tanaka, Yoshiyuki, 5,469,444, Cl. 371-215.000.

Ohwaki, Tatsuya; and Sakai, Hiroshi, to Nisshin Flour Milling Co., Ltd. Method of converting big endothelin-1 to endothelin-1 with human apolipoprotein B. 5,468,623, Cl. 435-68.100.

Ohwaki, Tatsuya; and Sakai, Hiroshi, to Nisshin Flour Milling Co., Ltd. Human endothelin converting enzyme obtained from blood or placenta. 5,468,633, Cl. 435-212.000.

Oji Paper Co., Ltd.: *See*—
Minato, Toshihiro; Kato, Masaru; and Yasuda, Kenji, 5,468,712, Cl. 503-227.000.

Okabayashi, Minahiro; and Bai, Zhi-ping, to Tokuyama Corporation. Fungicide and its use. 5,468,738, Cl. 514-63.000.

Okada, Hidemi, to NEC Corporation. System for secondary database data block buffering with block save generations and read/write access and with separate management. 5,469,567, Cl. 395-600.000.

Okada, Kazuo, to Kabushiki Kaisha Universal. Gaming machine and method of detecting fraud in the same. 5,467,856, Cl. 194-202.000.

Okada, Kin'ichi; Takagi, Masahiro; Hasegawa, Hiroshi; and Iwamura, Ryoji, to Hitachi, Ltd. Method of and apparatus for producing multilayer ceramic board. 5,468,315, Cl. 156-64.000.

Okada, Noritake: *See*—
Takatsuji, Ayako; and Okada, Noritake, 5,469,183, Cl. 345-2.000.

Okada, Osamu; Ogura, Hiroaki; and Sogabe, Toshiaki, to Toyo Tanso Co., Ltd. Method for producing composite material mainly composed of carbon and boron. 5,468,565, Cl. 428-552.000.

Okada, Shinjiro: *See*—
Katakura, Kazunori; Okada, Shinjiro; and Inaba, Yutaka, 5,469,281, Cl. 359-56.000.

Okada, Takekazu; Maruyama, Yuichi; and Sayanagi, Kazuya, to Murata Mfg. Co., Ltd. High frequency parallel strip line cable comprising connector part and connector provided on substrate for connecting with connector part thereof. 5,469,130, Cl. 333-246.000.

Okajima, Masayuki: *See*—
Kogi, Toshio; and Okajima, Masayuki, 5,469,213, Cl. 348-401.000.

Okamoto, Hiroshi: *See*—
Horita, Satomi; Aoki, Yasushi; Wakana, Masahiro; Okamoto, Hiroshi; Chiba, Kiyohiko; and Daikoku, Shizue, 5,469,081, Cl. 326-81.000.

Okamoto, Masaya: *See*—
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.

Okamura, Eiji, to Fujitsu Limited. Positioning control system. 5,469,414, Cl. 369-32.000.

Okamura, Emiko: *See*—
Kato, Hiroaki; Heki, Hideaki; Komura, Shirou; and Okamura, Emiko, 5,467,791, Cl. 134-166.00C.

Okaniwa, Masakazu: *See*—
Ebata, Takashi; Matsumoto, Katsuya; Koseki, Koshi; Kawakami, Hiroshi; Matsushita, Hajime; Yoshikoshi, Hajime; and Okaniwa, Masakazu, 5,468,881, Cl. 549-295.000.

Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, to Eisai Co., Ltd. 1,4-diazepine derivative and its pharmaceutical use. 5,468,740, Cl. 514-81.000.

Okano, Yoshimichi; Kanno, Tatsuya; Yamato, Tsutomu; Oshino, Yasuhiro; Tanigawa, Michiyo; Kuwana, Takaaki; and Fukuda, Yutaka, to Daicel Chemical Industries, Ltd. Process for the preparation of polycarbonate. 5,468,836, Cl. 528-204.000.

Okawa, Katsumi: *See*—
Takahashi, Ryoichi; Okawa, Katsumi; and Igarashi, Yusuke, 5,469,131, Cl. 338-306.000.

Okazaki, Sandra Y.; and Harmon, John P., to Hewlett-Packard Company. Print material variable support mechanism. 5,469,196, Cl. 347-8.000.

Oke, Timothy P.; Cummings, Russell E., II; and Gavrielov, Nachum M., to LSI Logic Corporation. Testable embedded microprocessor and method of testing same. 5,469,075, Cl. 324-763.000.

Oketani, Toshikazu: *See*—
Aoki, Takuya; Shimasaki, Yuichi; Matsumoto, Seiji; Hatcho, Seiji; Oketani, Toshikazu; Miyashita, Yukio; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,467,594, Cl. 60-276.000.

Okishima, Tetsuya: *See*—
Kanekawa, Nobuyasu; Ihara, Hirokazu; Akiyama, Masatsugu; Kawabata, Kiyoshi; Yamanaka, Hisayoshi; and Okishima, Tetsuya, 5,468,992, Cl. 257-676.000.

Okita, Junichi: *See*—
Kaneda, Osamu; Akutagawa, Hitoshi; Okita, Junichi; and Hirose, Ichiro, 5,467,668, Cl. 74-606.00R.

Okonkwo, Charles U. Weight lifting safety device. 5,468,203, Cl. 482-104.000.

Okpara, Nnawuihe; and Henry, Chester L., to AlliedSignal Inc. Turbine blade with improved heat transfer surface. 5,468,125, Cl. 416-97.00R.

Okuda, Tetsuro; Yamada, Hirohito; and Torikai, Toshitaka, to NEC Corporation. Laser diode element with excellent intermodulation distortion characteristic. 5,469,459, Cl. 372-46.000.

Okuda, Toshiharu: *See*—
Abe, Kazuo; Ishihara, Masashi; Ikeuchi, Hitoshi; Sugano, Shinsuke; Okuda, Toshiharu; Sakakibara, Shigemi; Shimizu, Hidetoshi; and Ichiba, Yasuaki, 5,467,846, Cl. 188-73.370.

Okuda, Toshio. Collapsible umbrella. 5,467,792, Cl. 135-25.300.

Okuma Corporation: *See*—
Nashiki, Masayuki, 5,469,215, Cl. 318-432.000.

Okuno, Masatoshi: *See*—
Namekawa, Masatoshi; Ibuki, Yoshiteru; Iguchi, Norio; and Okuno, Masatoshi, 5,467,913, Cl. 228-41.000.

Olin Corporation: *See*—
Hani, Rahim; Dumas, Richard H.; Gavin, David F.; Harrison, Charles H.; Kennedy, Michael A.; Schiessl, Henry W.; McMahon, Robert E.; and Manke, Steven A., 5,468,864, Cl. 546-345.000.

Oliva, Leone: *See*—
Guerra, Gaetano; Corradini, Paolo; DeRosa, Claudio; Iuliano, Mauro; Oliva, Leone; and Petraccone, Vittorio, 5,468,823, Cl. 526-347.100.

Oliver, Jack W.: *See*—
Reddick, Bradford B.; Gwinn, Kimberly D.; and Oliver, Jack W., 5,468,486, Cl. 424-194.100.

Oliver, James A., to Eastman Kodak Company. Method and apparatus for decoding multi-level bar codes or bi-level bar codes. 5,468,946, Cl. 235-462.000.

Olivo, Marco; and Pascucci, Luigi, to SGS-Thomson Microelectronics s.r.l. Semiconductor memory with memory matrix comprising redundancy cell columns associated with single matrix sectors. 5,469,389, Cl. 365-200.000.

Olsen, Douglas G.: *See*—
Philpot, Randall J.; Olsen, Douglas G.; Ventrello, Sandra C.; Welsh, Eric R.; and Buckmiller, Daniel K., 5,468,329, Cl. 156-429.000.

Olson, Darwin C., to Dana Corporation. Quick connect tube couplings. 5,468,028, Cl. 285-322.000.

Olson, Scott B.; Polk, Louis F., III; and Luedke, Adam A., to O.S. Designs, Inc. Anti-lock brake for in-line skate. 5,468,004, Cl. 280-11.200.

Olympus Optical Co., Ltd.: *See*—
Itoh, Junichi; Sato, Yuta; Matsuzaki, Minoru; Hamada, Masaharu; and Imai, Yuji, 5,469,237, Cl. 354-106.000.
Konomura, Yutaka, 5,469,254, Cl. 356-241.000.
Nagano, Chikara, 5,469,299, Cl. 359-661.000.
Tsuruta, Minoru; Suzuta, Toshihiko; Nakada, Akio; Kuramoto, Seiji; Hibino, Hiroki; Bito, Shiro; and Mukaizawa, Akito, 5,467,911, Cl. 227-175.000.
Yoshimori, Hiroyuki; Watanabe, Hitoshi; Paz De Araujo, Carlos A.; Hiraide, Shuzo; Mihara, Takashi; and McMillan, Larry D., 5,468,684, Cl. 437-228.000.

Onaka, Hiroshi; and Miyata, Hideyuki, to Fujitsu Limited. Optical filter, method of controlling transmission wavelength thereof, and optical receiver using the method. 5,469,288, Cl. 359-189.000.

Onaka, Toru: *See*—
Tsuyama, Toshiaki; Onaka, Toru; Nobumoto, Kazutoshi; and Kawamura, Makoto, 5,469,359, Cl. 364-426.030.

Onishi, Masayuki, to Dow Corning Toray Silicon Co., Ltd. Room-temperature-curable organopolysiloxane composition method for its preparation. 5,468,805, Cl. 524-731.000.

Onji, Yuichi: *See*—
Matsui, Shuichi; Goto, Yasuyuki; Onji, Yuichi; and Fujita, Atsuko, 5,468,421, Cl. 252-299.630.

Ono, Masahiko, to Kabushiki Kaisha Toshiba. X-ray CT scanner. 5,469,488, Cl. 378-15.000.

Onoyama, Katsumoto: *See*—
Nishida, Hiroshi; Nakagoshi, Kazuo; Kai, Kenjiro; and Onoyama, Katsumoto, 5,469,311, Cl. 360-97.020.

Ontario Crippled Children's Centre: *See*—
Hart, David, 5,467,793, Cl. 135-67.000.

Oohori, Noriko: *See*—
Yamamoto, Naotaka; and Oohori, Noriko, 5,468,779, Cl. 521-46.500.

Ooms, Guido. Automatic device for producing a cooled semi-liquid food product and cleaning device used thereby. 5,467,698, Cl. 99-455.000.

Oono, Keiji: *See*—
Urano, Fumiyoshi; Fujie, Hirotoshi; Oono, Keiji; and Negishi, Takaaki, 5,468,589, Cl. 430-170.000.

Oosterveen, Leendert; Lombaers, Jacobus H. M.; and Dorsman, Johannes, to Ahold Retail Services AG. Dispensing device for hand scanners accessible from two sides. 5,468,942, Cl. 235-383.000.

Ootoshi, Kazuaki: *See*—
Nishizawa, Hirotaka; Azuma, Seiichiro; Ootoshi, Kazuaki; Miyama, Masataka; Kawata, Shuji; Kasahara, Osamu; and Suzuki, Sinichi, 5,468,989, Cl. 257-517.000.

Oowaki, Hiroyuki: *See*—
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Sato, Makoto; Oowaki, Hiroyuki; Kato, Bunkichi; and Takahashi, Haruo, 5,468,728, Cl. 514-12.000.

Oppermann, Hermann; Ozkaynak, Engin; Kuberasampath, Thangavel; and Rueger, David C., to Stryker Corporation. Antibodies to osteogenic proteins. 5,468,845, Cl. 530-387.900.

Optex Co., Ltd.: *See*—
Sugimoto, Tadashi; Ohkawa, Shingo; Amano, Hiroyuki; and Murata, Norikazu, 5,468,960, Cl. 250-338.300.

OPTi, Inc.: *See*—

Ghosh, Subir K.; and Bhattacharya, Dipankar, 5,469,555, Cl. 395-460.000.

Optima Imaging, Inc.: *See*—
Burbury, Robert L.; and Nuccio, Phillip P., 5,469,492, Cl. 378-197.000.

Opto Power Corporation: *See*—
Rogers, Lesley; and Ung, Michael M., 5,469,456, Cl. 372-43.000.

Oravecz, Michael G.: *See*—
Sauer, Jude S.; Oravecz, Michael G.; Greenwald, Roger J.; and Kobilansky, Alexander I., 5,467,762, Cl. 600-114.000.

Orban, Jacques; and Richardson, Neil W., to Schlumberger Technology Corporation. Method for directionally drilling a borehole. 5,467,832, Cl. 175-45.000.

Orbitron Division of Greenbriar Products, Inc.: *See*—
Chaffee, Frank, 5,469,182, Cl. 343-882.000.

Origin Medsystems, Inc.: *See*—
Chin, Albert K.; and Lunsford, John P., 5,468,248, Cl. 606-192.000.

Orion Electric Co., Ltd.: *See*—
Chun, Se-Ki, 5,469,016, Cl. 313-402.000.

Orisaka, Shinji; and Noda, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Method for producing a semiconductor integrated circuit. 5,468,685, Cl. 437-228.000.

Orita, Souichi: *See*—
Miyazawa, Chihiro; Orita, Souichi; and Tsuboi, Akio, 5,468,419, Cl. 252-182.120.

O'Rourke, Anthony, to Booda Products, Inc. Dog chew toy for canine dental care and methods for making chew toy. 5,467,741, Cl. 119-710.000.

Orroth, Stephen: *See*—
Pawlowicz, Andrew; Douglas, Craig; Tayebi, Amad; and Orroth, Stephen, 5,468,327, Cl. 156-393.000.

Ortiz Perez, Luis R.; and Ramos, Alexis T., to Telular International, Inc. Self-diagnostic system for cellular-transceiver systems. 5,469,494, Cl. 375-27.000.

Osaki, Haruyoshi: *See*—
Hashimoto, Kazuhiko; Osaki, Haruyoshi; Ebina, Chinehito; Nagase, Kyoko; Moriuma, Hiroshi; and Uetani, Yasunori, 5,468,590, Cl. 430-191.000.

Osawa, Ryoko; Maekawa, Takashige; Momii, Tatsuo; and Kamata, Satoshi, to Asahi Glass Company Ltd. Fluorine-containing benzophenone derivatives and use thereof. 5,468,904, Cl. 568-333.000.

Oshima, Katsuyuki; Kutsukake, Masaki; Sato, Hideaki; and Sudo, Kenichiro, to Dai Nippon Insatsu Kabushiki Kaisha. Heat transfer sheet. 5,468,714, Cl. 503-227.000.

Oshino, Yasuhiro: *See*—
Okano, Yoshimichi; Kanno, Tatsuya; Yamato, Tsutomu; Oshino, Yasuhiro; Tanigawa, Michiyo; Kuwana, Takaaki; and Fukuda, Yutaka, 5,468,836, Cl. 528-204.000.

Osram Sylvania Inc.: *See*—
Dorfman, Leonid P.; Scheithauer, Michael J.; Houck, David L.; and Kopatz, Nelson E., 5,468,457, Cl. 423-61.000.

Osterried, Karl: *See*—
Herget, Gerhard; Herbski, Margarete; and Osterried, Karl, 5,468,289, Cl. 106-415.000.

Osti, Roberto: *See*—
Minarelli, Alessandro; Venturi, Giuseppe; and Osti, Roberto, 5,467,872, Cl. 206-256.000.

Ostrander, Steven P.: *See*—
Stangle, Gregory C.; Venkatachari, Koththavasal R.; Ostrander, Steven P.; and Schulze, Walter A., 5,468,427, Cl. 264-3.400.

Ostrover, Lewis S.; Cookson, Christopher J.; and Lieberfarb, Warren N., to Time Warner Entertainment Co., L.P. System and method for controlling play of multiple audio tracks of a software carrier. 5,469,370, Cl. 364-514.00R.

Otake, Shinichi, to Aisin AW Co., Ltd. Electric motor control with malfunction detection. 5,469,032, Cl. 318-439.000.

Otis Elevator Company: *See*—
Fargo, Richard N.; and Wurts, William A., 5,467,599, Cl. 60-478.000.
Kobayashi, Osamu; and Yoshida, Takashi, 5,467,969, Cl. 254-251.000.
Powell, Bruce A.; Stanley, Jannah; Kupersmith, Bertram F.; Sahara, Masanori; Simcik, Paul; and Bahjat, Zuhair S., 5,467,844, Cl. 187-387.000.
Skalski, Clement A., 5,467,850, Cl. 188-165.000.

Otsu, Kumiko: *See*—
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.

Otsuka, Kuniaki, to Canon Kabushiki Kaisha. Communication exchange apparatus with switching of communication terminal information. 5,469,501, Cl. 379-201.000.

Otsuki, Noboru: *See*—
Murakoshi, Keiji; Nebashi, Mitsuhiko; Ikegami, Makoto; and Otsuki, Noboru, 5,468,079, Cl. 400-521.000.

Otto Bock Orthopaedische Industrie Besitz- und Verwaltungs-KG: *See*—
Stender, Adolf, 5,468,139, Cl. 425-383.000.

Outtrup, Helle; Aaslyng, Dorrit A.; Dambmann, Claus; and Patkar, Shamkant A., to Novo Nordisk A/S. Detergent enzymes. 5,468,416, Cl. 252-174.120.

Ovadia, Victor A. Carry card offer strip. 5,468,021, Cl. 283-56.000.

Owen, Jeffrey R., to Seiko Communications Holding N.V. Method and apparatus for accurate time maintenance and display. 5,469,411, Cl. 368-47.000.

Owens-Corning Fiberglas Technology, Inc.: *See*—
Lin, David C. K.; and Gavin, Patrick M., 5,468,275, Cl. 65-497.000.
Loftus, James E.; and Gallagher, Kevin P., 5,468,546, Cl. 428-280.000.

Owens, N. Douglas, to Modernfold, Incorporated. Electrically operated drop seal for pass doors in operable walls. 5,467,559, Cl. 49-321.000.

Owicki, John C.: *See*—
Harris, Albert K. M.; Kirk, Gregory L.; Owicki, John C.; Dawes, Timothy D.; and Kuo, Richard C., 5,468,605, Cl. 435-4.000.

Owyang, King: *See*—
Hshieh, Fwu-Iuan; Kwan, Sze-Hon; Chang, Mike F.; Ho, Yueh-Se; Van Der Linde, Jan; and Owyang, King, 5,468,982, Cl. 257-331.000.

Oxis International, Inc.: *See*—
Saifer, Mark; Somack, Ralph; and Williams, L. David, 5,468,478, Cl. 424-78.270.

Ozaki, Hiroko: *See*—
Ohashi, Tetsuo; Tada, Jun; Fukushima, Shigeru; Ozaki, Hiroko; Nishimura, Naoyuki; Shirasaki, Yoshinari; and Yamagata, Koichi, 5,468,852, Cl. 536-24.330.

Ozkaynak, Engin: *See*—
Oppermann, Hermann; Ozkaynak, Engin; Kuberasampath, Thangavel; and Rueger, David C., 5,468,845, Cl. 530-387.900.

Paceart Associates, L.P.: *See*—
Bergelson, Michael N.; and Naydenov, Nartzis, 5,467,773, Cl. 128-709.000.

Pachmayr Ltd.: *See*—
Cupp, Carl J.; and Plue, Ronald L., 5,467,552, Cl. 42-100.000.

Pacific Fitness Corporation: *See*—
Habing, Theodore G., 5,468,202, Cl. 482-100.000.

Padgett, Miles J.: *See*—
Golby, John A.; Padgett, Miles J.; and Woodall, Stephen P., 5,469,259, Cl. 356-351.000.

Page, Nancy M.: *See*—
Baker, Charles L., Jr.; Chu, Cynthia T.; Mazzone, Dominick N.; and Page, Nancy M., 5,468,368, Cl. 208-58.000.

Paivinen, John O., to Quicklogic Corporation. Method and apparatus for programming anti-fuse devices. 5,469,109, Cl. 327-525.000.

Pál, Veronika: *See*—
Szalóki, Erzsébet; Kristóf, Ilona; Pál, Veronika; and Szabó, Eva, 5,468,492, Cl. 424-195.100.

Palaszewski, Stephen J., to AT&T Corp. Electronics cabinet with reduced absorption of solar radiation. 5,469,328, Cl. 361-690.000.

Paley, Harold R.: *See*—
Flinchbaugh, Bernadette M.; Paley, Harold R.; Knaub, John E.; Schmid, Christopher J.; and Melnyk, Adrian L., 5,468,156, Cl. 439-157.000.

Palkowitz, Alan D.: *See*—
Jakubowski, Joseph A.; Palkowitz, Alan D.; and Sigmund, Sandra K., 5,468,757, Cl. 514-300.000.

Pall Corporation: *See*—
Cook, Nigel J. D.; Weight, Kenneth R.; Gutman, Richard G.; Buttery, Roger A.; and Grimes, Michael, 5,468,382, Cl. 210-232.000.

Palmer, Dwight O.: *See*—
Bircann, Raul A.; and Palmer, Dwight O., 5,467,962, Cl. 251-129.150.

Palmer, James E.: *See*—
Powers, John R., III; Palmer, James E.; Coleman, Patricia J.; Herman, Jeffrey A.; and Cochran, Eli, 5,469,540, Cl. 395-158.000.

Palmieri, Thomas: *See*—
Holt, Robert W.; and Palmieri, Thomas, 5,468,453, Cl. 422-100.000.

Paluch, Joseph J. Training device for baseball batting. 5,467,978, Cl. 273-26.00E.

Panandiker, Rajan K.; Thoen, Christiaan A. J.; and Lenoir, Pierre M. A. Built liquid detergents with boric-polyol complex to inhibit proteolytic enzyme. 5,468,414, Cl. 252-135.000.

Panichkina, T. B.: *See*—
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.

Panoushek, Dale W.; and Kraning, Calvin J., to Case Corporation. Cotton picker spindle moistening system. 5,467,582, Cl. 56-10.20R.

Paolino, Gerald A.; Drnevich, Raymond F.; and Prosser, Neil M., to Praxair Technology, Inc. Air boiling cryogenic rectification system with lower power requirements. 5,467,601, Cl. 62-38.000.

Paolino, Gerald A.; and Drnevich, Raymond F., to Praxair Technology, Inc. Air boiling cryogenic rectification system for producing elevated pressure oxygen. 5,467,602, Cl. 62-38.000.

Papathomas, Konstantinos I., to International Business Machines Corporation. Triazine polymer and use thereof. 5,468,790, Cl. 524-100.000.

Papenfuhs, Theodor: *See*—
Pfirmann, Ralf; and Papenfuhs, Theodor, 5,468,863, Cl. 546-345.000.

Pappas, Thrasyvoulos N.: *See*—
Neuhoff, David L.; Pappas, Thrasyvoulos N.; and Seshadri, Nambirajan, 5,469,268, Cl. 358-298.000.

Papst Licensing GmbH: *See*—
Baumann, Hans-Martin; and Müller, Rolf, 5,469,148, Cl. 340-658.000.

Paquet, Eugene H.: *See*—
Brolund, Theodore F.; and Paquet, Eugene H., 5,468,929, Cl. 219-121.560.

Paranchych, William: *See*—
Hodges, Robert S.; Irvin, Randall T.; Paranchych, William; Sokol, Pamela A.; and Woods, Donald E., 5,468,484, Cl. 424-141.100.

Paraschac, Joseph F.; and Biehle, Edward J., IV, to Ethicon, Inc. Endoscopic mechanism with friction maintaining handle. 5,468,250, Cl. 606-205.000.

Parbhoo, Bhukandas: *See*—
Hurford, Simon R.; and Parbhoo, Bhukandas, 5,468,816, Cl. 525-479.000.
Hurford, Simon R.; and Parbhoo, Bhukandas, 5,468,828, Cl. 528-15.000.

Paris, Philippe M.: *See*—
Guimier, Michel; and Paris, Philippe M., 5,468,123, Cl. 415-178.000.

Park, Chan-Jong, to Samsung Electronics Co., Ltd. Row redundancy circuit suitable for high density semiconductor memory devices. 5,469,388, Cl. 365-200.000.

Park, Chan-Min, to Ahn, Mi-Ran. Exercise unit for whole body. 5,468,215, Cl. 601-23.000.

Park, Heonchul: *See*—
Prasanna, Viktor K.; Wang, Cho-Li; and Park, Heonchul, 5,468,069, Cl. 382-253.000.

Park, Jin K.: *See*—
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.

Park, William H.: *See*—
Garcia, Mario C.; Lund, Kristofer T.; and Park, William H., 5,468,217, Cl. 601-32.000.

Park, Yong-Gyu, to Daewoo Electronics Co., Ltd. FIFO buffer system having an error detection and resetting unit. 5,469,449, Cl. 371-40.100.

Park, Youn-Won; and Kim, Jong-Kab, to Korea Institute of Nuclear Safety. Mid-loop operating method for nuclear power plant, and facility therefor. 5,469,480, Cl. 376-299.000.

Parker, Dane K.; Musleve, Richard T.; and Hirst, Robert C., to Goodyear Tire & Rubber Company, The. Preparation of sulfur-containing organosilicon compounds. 5,468,893, Cl. 556-427.000.

Parker, Paul D.: *See*—
Carlin, Jerry F.; Koon, James E.; Parker, Paul D.; and Thompson, Warren L., 5,467,689, Cl. 92-172.000.

Parks, Terry J.; and Register, David S., to Dell USA, L.P. Method and apparatus for refreshing a selected portion of a dynamic random access memory. 5,469,559, Cl. 395-433.000.

Parkway Machine Corporation: *See*—
Kovens, Steven A.; and Doyle, Michael T., 5,467,858, Cl. 194-350.000.

Parschat, Lothar: *See*—
Arvedi, Giovanni; Gosio, Giovanni; Siegers, Ulrich; Manini, Luciano; Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Thurm, Hans-Günther; and Lüdorff, Harald, 5,467,809, Cl. 164-418.000.

Pasch, Nicholas F., to LSI Logic Corporation. Process for interconnecting conductive substrates using an interposer having conductive plastic filled vias. 5,468,681, Cl. 437-183.000.

Pascucci, Luigi: *See*—
Olivo, Marco; and Pascucci, Luigi, 5,469,389, Cl. 365-200.000.

Patel, Mangala P.: *See*—
Braden, Michael; Downes, Sandra; Patel, Mangala P.; and Davy, Kenneth W. M., 5,468,787, Cl. 523-113.000.

Patkar, Shamkant A.: *See*—
Outtrup, Helle; Aaslyng, Dorrit A.; Dambmann, Claus; and Patkar, Shamkant A., 5,468,416, Cl. 252-174.120.

Patrick, Paul R., to Quantum Corporation. Event driven power reducing software state machine. 5,469,553, Cl. 395-750.000.

Patrick, Roger; Schoenborn, Philippe; Franklin, Mark; and Bose, Frank, to LSI Logic Corporation. Apparatus for igniting low pressure inductively coupled plasma. 5,468,296, Cl. 118-723.0MP.

Patriot Packaging Corporation: *See*—
Watts, Ridley, 5,468,525, Cl. 428-34.100.

Patry, Gerald F.: *See*—
Mainolfi, Sylvio J.; Patry, Gerald F.; and Pensiero, Henry A., 5,468,335, Cl. 156-580.200.

Patterson, Charles A.: *See*—
Egelandsdal, Einar; Garth, Geoffrey C.; Hamilton, John; Johnson, David; Laerdal, Tore; and Patterson, Charles A., 5,468,151, Cl. 434-265.000.

Patterson, Eugene S.: *See*—
Benin, Kenneth D.; Garrison, Gregory L.; Sangiah, Subbiah; Clarke, Cyril R.; Chen, Chun-Lin; Lazzara, Ralph; Scherlag, Benjamin J.; Patterson, Eugene S.; and Burrows, George E., 5,468,858, Cl. 546-18.000.

Paul & Martha Brandstrom AB: *See*—
Brändström, Paul; and Nord, Runo, 5,467,888, Cl. 220-319.000.

Paul, Ronald: *See*—
Coulter, Wallace H.; Hollinger, John D.; Kortright, Kenneth H.; Russell, Thomas; Rodriguez, Carlos; and Paul, Ronald, 5,468,616, Cl. 435-7.200.

Paulus, Nancy J.: *See*—
Thompson, David A.; Rajagopalan, Venkatesh; Wright, Kurt W.; Sterba, John J.; Paulus, William J.; Paulus, Nancy J.; McCauley, Kathryn M.; and Chen, David K., 5,467,636, Cl. 73-23.310.

Paulus, William J.: *See*—
Thompson, David A.; Rajagopalan, Venkatesh; Wright, Kurt W.; Sterba, John J.; Paulus, William J.; Paulus, Nancy J.; McCauley, Kathryn M.; and Chen, David K., 5,467,636, Cl. 73-23.310.

Paurus, Floyd G.: *See*—
Henderson, Watson R.; Paurus, Floyd G.; and Szerlip, Stanley R., 5,469,324, Cl. 361-301.200.

Pawliszyn, Janusz B., to Torres, Anthony R. Method of determining presence of an analyte by isoelectric focusing. 5,468,359, Cl. 204-183.200.

Pawlowicz, Andrew; Douglas, Craig; Tayebi, Amad; and Orroth, Stephen, to University of Massachusetts Lowell. Method and device for continuous formation of braid reinforced thermoplastic structural and flexible members. 5,468,327, Cl. 156-393.000.

Pawlowski, Chester W., to Digital Equipment Corporation. Asynchronous bus interface for generating individual handshake signal for each data transfer based on associated propagation delay within a transaction. 5,469,547, Cl. 395-285.000.

Payet-Burin, Jean-Luc, to Merlin Gerin. Multiple current-limiting circuit breaker with electrodynamic repulsion. 5,469,121, Cl. 335-16.000.

Payne, Jewel M.; Cannon, Raymond J. C.; Schnepf, H. Ernest; and Schwab, George E., to Mycogen Corporation. *Bacillus thuringiensis* for controlling pests in the family aphididae. 5,468,636, Cl. 435-252.300.

Payne, Thomas L.: *See*—
Dickens, Joseph C.; Billings, Ronald F.; and Payne, Thomas L., 5,468,770, Cl. 514-450.000.

Paz de Araujo, Carlos A.; Scott, Michael C.; Cuchiaro, Joseph D.; and McMillan, Larry D., to Symetrix Corporation. Process for fabricating materials for ferroelectric, high dielectric constant, and integrated circuit applications. 5,468,679, Cl. 437-110.000.

Paz De Araujo, Carlos A.: *See*—
Yoshimori, Hiroyuki; Watanabe, Hitoshi; Paz De Araujo, Carlos A.; Hiraide, Shuzo; Mihara, Takashi; and McMillan, Larry D., 5,468,684, Cl. 437-228.000.

Peacock, Andrew J., to Exxon Chemical Patents Inc. Reduction of flow marks in rubber modified polypropylene. 5,468,808, Cl. 525-240.000.

Pearce, Glenn T.; and Henzel, Richard P., to Eastman Kodak Company. Barrier layer for laser ablative imaging. 5,468,591, Cl. 430-201.000.

Pearson, Mark L.: *See*—
Bregoli, Lawrance J.; and Pearson, Mark L., 5,468,573, Cl. 429-16.000.

Pearson, Michael: *See*—
Udding, Anne C.; Van Leeuwen, Peter A.; and Pearson, Michael, 5,468,891, Cl. 556-61.000.

Pearson, Robert B.: *See*—
Foster, David J.; Garcia, Armando; and Pearson, Robert B., 5,469,542, Cl. 395-200.010.

Pechiney Recherche: *See*—
Ledoux, Marc-Jacques; Guille, Jean-Louis; Pham Huu, Cuong; Dunlop, Hugh; and Prin, Marie, 5,468,370, Cl. 208-134.000.

Peck, Wiley M.: *See*—
Kunkel, Scott H.; and Peck, Wiley M., 5,467,526, Cl. 29-747.000.

Peek, Brian R.: *See*—
Sullivan, Kathleen A.; and Peek, Brian R., 5,468,108, Cl. 411-510.000.

Peiffer, Herbert; Murschall, Ursula; and Schloegl, Gunter, to Hoechst Aktiengesellschaft. Transparent, non-heat-sealable, oriented, multilayer polyolefin film, process for the production thereof, and the use thereof. 5,468,527, Cl. 428-35.700.

Pelc, Norbert J.: *See*—
Hu, Hui; Pelc, Norbert J.; and Pfoh, Armin H., 5,469,486, Cl. 378-4.000.

Pelletier, Wendy. Children's activity case. 5,467,853, Cl. 190-11.000.

Pena, James A.: *See*—
Beck, Niels J.; Pena, James A.; Roach, Alan R.; and Johnston, Bevan H., 5,467,754, Cl. 123-467.000.

Pendse, Rajendra D., to Hewlett-Packard Company. High pin count package for semiconductor device. 5,468,994, Cl. 257-693.000.

Peng Hsieh, Shih-Fang; and Lee, Cheng-Liang. Power-operated automobile sunshade. 5,468,040, Cl. 296-97.400.

Pennell, David N.: *See*—
Ansite, William K.; and Pennell, David N., 5,467,766, Cl. 128-205.240.

Pennings, Engelbertus C. M.: *See*—
Van Roijen, Raymond; and Pennings, Engelbertus C. M., 5,469,460, Cl. 372-94.000.

Pensiero, Henry A.: *See*—
Mainolfi, Sylvio J.; Patry, Gerald F.; and Pensiero, Henry A., 5,468,335, Cl. 156-580.200.

Peppiette, Roger; and Bilotti, Alberto, to Allegro Microsystems, Inc. Bridge circuit for driving an inductive load with a shoot-through prevention circuit. 5,469,095, Cl. 327-110.000.

PepsiCo, Inc.: *See*—
Heckler, Chris, 5,467,790, Cl. 134-66.000.

Percival-Smith, Harry D., to Pilgrim Moorside Limited. Hydraulic tensioning device. 5,468,106, Cl. 411-434.000.

Perez, Manuel, III. Combination outdoor cooker and smoker. 5,467,692, Cl. 99-340.000.

Perkin-Elmer: *See*—
Boyd, Victoria L.; Bozzini, MeriLisa; and Loudon, G. Marc, 5,468,843, Cl. 530-345.000.

Perkins, James E.; and Buffkin, Michael G. Golf putters. 5,467,987, Cl. 273-175.000.

Perreaut, Jean M.; Roussel, Bruno F.; and Thibaudin, Didier, to Thomson Tubes & Displays, S.A. Permanent magnet focus unit with integral astigmatism corrector. 5,469,017, Cl. 313-431.000.

Perrier, Philippe: *See*—
Vinel, Paul; and Perrier, Philippe, 5,469,283, Cl. 359-118.000.

Perrot Bremsen GmbH: *See*—
Antony, Paul; Falter, Wolfgang; Kiessig, Andreas; and Berg, Matthias, 5,467,847, Cl. 188-73.390.

Perry, Brian; and Donato, Frank, to Woodbridge Foam Corporation. Process for manufacturing a padded element using a cover preforming mandrel. 5,468,433, Cl. 264-46.400.

Perry, Michael L., to Scheurer, Robert S. Beverage container insulator. 5,467,891, Cl. 220-739.000.

Persinger, Richard A.: *See*—
Lum, Andrew F.; Uribe, Juan M.; Hogan, John M.; Persinger, Richard A.; Miller, James F.; and Navaratnam, Ramesh A., 5,468,401, Cl. 252-22.000.

Pessier, Rudolf C. O.: *See*—
Grimes, Robert E.; Scott, Danny E.; and Pessier, Rudolf C. O., 5,467,836, Cl. 175-401.000.

Peters, Bradley J.: *See*—
Clavin, J. Steven; Peters, Bradley J.; and Schrandt, Henry M., 5,468,377, Cl. 210-167.000.

Petersen, Uwe; Himmler, Thomas; Schenke, Thomas; Krebs, Andreas; Grohe, Klaus; Bremm, Klaus-Dieter; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, to Bayer Aktiengesellschaft. 8-vinyl- and 9-ethinyl-quinolone-carboxylic acids. 5,468,742, Cl. 514-187.000.

Petersen, Uwe; Grobe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 8-chloro-1-cyclopropyl-6,7-difluoro-1,4-dihydro-4-oxo-3-quinolinecarboxylic acid and alkyl esters thereof. 5,468,861, Cl. 546-156.000.

Peterson, Francis C.; Grunstad, Jerome A.; and Wildgen, Leo F. Dual pivot pickup tailgate. 5,468,037, Cl. 296-57.100.

Peterson, Joel L.: *See*—
Hawkins, Mark R.; and Peterson, Joel L., 5,469,356, Cl. 364-424.020.

Peterson, John P.; and Brinkley, Paul, to Northern Telecom Limited. Method and apparatus for fluxing and soldering terminals on a printed circuit board. 5,467,914, Cl. 228-102.000.

Peterzell, Paul E.; Wilson, Nathaniel B.; and Black, Peter J., to QUALCOMM Incorporated. Method and apparatus for automatic gain control in a digital receiver. 5,469,115, Cl. 330-129.000.

Petkovich, Martin: *See*—
Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; DeJean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, 5,468,617, Cl. 435-7.800.

Petraccone, Vittorio: *See*—
Guerra, Gaetano; Corradini, Paolo; DeRosa, Claudio; Iuliano, Mauro; Oliva, Leone; and Petraccone, Vittorio, 5,468,823, Cl. 526-347.100.

Petrille, Joseph C.: *See*—
Whitekettle, Wilson K.; Petrille, Joseph C.; and Werner, Michael W., 5,468,739, Cl. 514-75.000.

Pettersen, Tor H.; Scherbarth, John F.; and Hobbs, Bobby L., to Diamond Light Industries. Low profile flashlight/spotlight. 5,469,345, Cl. 362-188.000.

Pettinaroli, Giuseppe; and Sherman, John C., to Hydronic Components, Inc. Ball valve with a strainer and integrated means for flushing the strainer. 5,467,796, Cl. 137-238.000.

Pevzner, Lev K.; Lakhovskiy, Mikhail Y.; and Oborin, Boris S., to Intot, Ltd. Stratal porous filter material. 5,468,273, Cl. 55-523.000.

Pfirmann, Ralf; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of substituted 2,3-difluoropyridines. 5,468,863, Cl. 546-345.000.

Pfizer Inc.: *See*—
Banks, Bernard J.; Dutton, Christopher J.; and Goudie, Alexander C., 5,468,765, Cl. 514-395.000.
Wester, Ronald T., 5,468,732, Cl. 514-19.000.

Pfoh, Armin H.: *See*—
Hu, Hui; Pelc, Norbert J.; and Pfoh, Armin H., 5,469,486, Cl. 378-4.000.

Pham Huu, Cuong: *See*—
Ledoux, Marc-Jacques; Guille, Jean-Louis; Pham Huu, Cuong; Dunlop, Hugh; and Prin, Marie, 5,468.370, Cl. 208-134.000.

Phang, Jacob C. H.: *See*—
Chan, Daniel S. H.; Leong, Kin; and Phang, Jacob C. H., 5,468,967, Cl. 250-397.000.

Pharmaceutical Discovery Corporation: *See*—
McCabe, R. Tyler; and de Costa, Brian R., 5,468,854, Cl. 540-498.000.

Pharmagenesis, Inc.: *See*—
Xu, Ren S.; and Wiedmann, Tien W., 5,468,772, Cl. 514-453.000.

Phelan, Raymond J.: *See*—
Powell, Fred D.; Phelan, Raymond J.; McCormack, James; Budansew, Peter; Demoe, Larry; and Poschun, Alex, 5,468,434, Cl. 264-46.800.

Philip Morris Incorporated: *See*—
Bensalem, Azzedine; Deevi, Sarojini; Deevi, Seetharama C.; and Schleich, Donald M., 5,468,266, Cl. 44-542.080.
Deevi, Seetharama C.; Hajaligol, Mohammad R.; Lieberman, Pamela D.; Nichols, Walter A.; and Watkins, Michael L., 5,468,936, Cl. 219-553.000.

Philipp, Matthias, to Robert Bosch GmbH. Method and device for recognizing the knocking of an internal-combustion engine. 5,467,638, Cl. 73-35.060.

Philippe, Pascal, to U.S. Philips Corporation. Voltage-controlled frequency oscillator. 5,469,117, Cl. 331-109.000.

Philips Electronics North America Corporation: *See*—
Strubbe, Hugo J.; and McFarlane, Robert, 5,469,206, Cl. 348-7.000.
Wendorf, James W.; Hocek, Adam S.; and Singh, Kenneth S., 5,469,431, Cl. 370-50.000.

Phillips, William T.; Schwartz, Joyce G.; and Green, Gary M., to Board of Regents, The University of Texas System. Methods of normalizing metabolic parameters in diabetics. 5,468,727, Cl. 514-12.000.

Philpot, Randall J.; Olsen, Douglas G.; Ventrello, Sandra C.; Welsh, Eric R.; and Buckmiller, Daniel K., to Advanced Composites, Inc. Universal pin strip and ring for filament winding. 5,468,329, Cl. 156-429.000.

Philpott, Michael L.: *See*—
Vandenberg, Douglas; Philpott, Michael L.; Green, Phillip A.; Eastman, Scott A.; and Carlini, Sean M., 5,469,482, Cl. 377-3.000.

Physicians Consulting Incorporated: *See*—
Johnson, Gregory E.; Ashworth, Uriel G.; and Salerno, Mark, 5,468,216, Cl. 601-24.000.

Pierce, George C.; and Fletcher, Don C., to Teledebit. Networked interactive call management subsystems with prevention of simultaneous use of a single account number. 5,469,497, Cl. 379-115.000.

Pierce, Jacalyn: *See*—
LaRochelle, William J.; Pierce, Jacalyn; Jensen, Roy A.; and Aaronson, Stuart A., 5,468,468, Cl. 424-1.490.

Pilgrim Moorside Limited: *See*—
Percival-Smith, Harry D., 5,468,106, Cl. 411-434.000.

Pilgrim, William R.: *See*—
Shroot, Braham; Bernardon, Jean-Michel; and Pilgrim, William R., 5,468,897, Cl. 560-18.000.

Pilkington Aerospace Limited: *See*—
Bruce, Robert S.; and Hall, Christopher W. G., 5,468,346, Cl. 216-34.000.

Pilla, Jacques: *See*—
Babour, Kamal; Belani, Ashok K.; and Pilla, Jacques, 5,467.823, Cl. 166-250.010.

Pine, Jerrold; Lakhani, Sunil; and Renteria, Stanley, to Motorola, Inc. Apparatus for picking and placing components using a morphing vacuum tip. 5,467,525, Cl. 29-743.000.

Pine, P. Scott: *See*—
Aszalos, Adorjan; Weaver, James L.; and Pine, P. Scott, 5,468,469, Cl. 514-150.000.

Pinkerton, Joseph F., to Magnetic Bearing Technologies, Inc. Lorentz force magnetic bearing utilizing closed conductive loops and selectively controlled electromagnets. 5,469,006, Cl. 310-90.500.

Pinsky, Howard; Sheldon, Scott S.; Christakis, Nicholas A.; and Schmertzler, Michael, to Access Radiology Corp. Radiological image interpretation apparatus and method. 5,469,353, Cl. 364-413.010.

Pioneer Electronic Corporation: *See*—
Tanaka, Satoru; Matsui, Fumio; and Murata, Yasushi, 5,469,186, Cl. 345-32.000.
Yamada, Tomoyasu; and Fukuda, Nobutoshi, 5,469,307, Cl. 360-69.000.

Pirelli Tyres Limited: *See*—
Clemens, Clive; and Wain, Robert E., 5,468,048, Cl. 297-284.400.

Pisau, Lucretiu: *See*—
Hughey, Bradley W.; Pisau, Lucretiu; and Millea, Liviu, 5,469,364, Cl. 364-482.000.

Pitney Bowes Inc.: *See*—
Berson, William; and Zemlok, Kenneth C., 5,469,506, Cl. 380-23.000.
Hunt, William M.; and Sansone, Ronald P., 5,469,362, Cl. 364-478.000.
Salomon, James A., 5,467,709, Cl. 101-93.000.

Plapp, Fred V.: *See*—
Sinor, Lyle T.; Eatz, Ralph A.; Stone, Darryl L.; and Plapp, Fred V., 5,468,618, Cl. 435-7.210.

Pleschiutschnigg, Fritz-Peter: *See*—
Arvedi, Giovanni; Gosio, Giovanni; Siegers, Ulrich; Manini, Luciano; Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Thurm, Hans-Günther; and Lüdorff, Harald, 5,467,809, Cl. 164-418.000.

Plesko, George A., to Gap Technologies, Inc. Gyrating programmable scanner. 5,469,291, Cl. 359-224.000.

Plessey Semiconductors Limited: *See*—
Albon, Richard; and Hastie, Neil, 5,469,378, Cl. 365-49.000.
Lawton, Rodney J., 5,469,118, Cl. 331-113.00R.
MacDonald, Iain R., 5,469,093, Cl. 327-108.000.

Plis, Mark J.: *See*—
Atherton, Kenneth W.; Grogan, Kevin P.; Balch, Richard A.; and Plis, Mark J., 5,469,153, Cl. 340-870.280.

Plue, Ronald L.: *See*—
Cupp, Carl J.; and Plue, Ronald L., 5,467,552, Cl. 42-100.000.

Plumton, Donald L.: *See*—
Yuan, Han-Tzong; Plumton, Donald L.; Kim, Tae S.; and Yang, Jau-Yuann, 5,468,661, Cl. 437-40.000.

Podlesnik, Dragan: *See*—
Chen, Lee; Podlesnik, Dragan; and Sekiguchi, Akihisa, 5,468,955, Cl. 250-251.000.

Poeppel, Roger B.: *See*—
Dorris, Stephen E.; Poeppel, Roger B.; Prorok, Barton C.; Lanagan, Michael T.; and Maroni, Victor A., 5,468,566, Cl. 428-552.000.

Poetsch, Fike: *See*—
Pohl, Ludwig; Poetsch, Fike; Schumann, Herbert; Weiss, Karin; Thiele, Karl-Heinz; and Hirsch, Hans-Ludwig, 5,468,707, Cl. 502-153.000.

Pohl, Helmut: *See*—
Eberts, Friedrich; and Pohl, Helmut, 5,467,631, Cl. 72-283.000.

Pohl, Ludwig; Poetsch, Fike; Schumann, Herbert; Weiss, Karin; Thiele, Karl-Heinz; and Hirsch, Hans-Ludwig, to Merck Patent Gesellschaft mit Beschrankter Haftung. Coordination catalyst systems. 5,468,707, Cl. 502-153.000.

Pokrzywa, Robert S.: *See*—
Chan, Benson; Chapin, Fletcher L.; Fiacco, Vincent M.; Mankus, John R.; and Pokrzywa, Robert S., 5,468,996, Cl. 257-723.000.

Pola Chemical Industries Inc.: *See*—

Shaku, Masao; Ohkura, Sayuri; Kuroda, Hideo; Kano, Ai; and Nakabayashi, Nobuo, 5,468,475, Cl. 424-70.160.

Polge, Robert J.; and Green, Augustus H., Jr., to United States of America, Army. Synthetic aperture radar for nonlinear trajectories using range relative doppler processing and invariant mapping. 5,469,167, Cl. 342-25.000.

Polich, Herman; Nicholson, James; and Emlich, Larry, to Digital Equipment Corporation. Expert system for identifying likely failure points in a digital data processing system. 5,469,463, Cl. 395-182.180.

Poliquin, Alfred T.: *See*—
Lein, Maureen M.; Eisfeller, Richard C.; Poliquin, Alfred T.; Burns, Mark; and Russell, John T., 5,468,518, Cl. 427-421.000.

Polk, Louis F., III: *See*—
Olson, Scott B.; Polk, Louis F., III; and Luedke, Adam A., 5,468,004, Cl. 280-11.200.

Pollard-Knight, Denise V.: *See*—
Molloy, James O.; and Pollard-Knight, Denise V., 5,468,620, Cl. 435-7.100.

Polsky, Steven E.: *See*—
Sattet, Sohail; and Polsky, Steven E., 5,469,500, Cl. 379-201.000.

Polsz, Craig A.: *See*—
Halfon, Marc; Polsz, Craig A.; and Hoare, John H., 5,468,868, Cl. 548-263.200.

Polyak, Mark, to American Medical Systems, Inc. Mechanical penile prosthesis. 5,468,213, Cl. 600-40.000.

Polymeropoulos, Mihael H.; and Merril, Carl R., to United States of America, Health and Human Services. Three highly informative microsatellite repeat polymorphic DNA markers. 5,468,610, Cl. 435-6.000.

Pontbriand, Duane J.: *See*—
Carman, Anthony K.; and Pontbriand, Duane J., 5,468,024, Cl. 285-81.000.

Porta Systems Corp.: *See*—
Rawlings, David L., 5,469,526, Cl. 385-135.000.

Porter, Charles R.: *See*—
Abbas, Gregory L.; Vertatschitsch, Edward J.; de La Chapelle, Michael; and Porter, Charles R., 5,467,942, Cl. 244-75.00R.

Porter, Richard B., to Honeywell Inc. Thermostat with adjustment for the cycling rate of the heating plant. 5,467,920, Cl. 236-68.00B.

Portugall, Michael: *See*—
Aydin, Oral; Portugall, Michael; Neutzner, Josef; and Maechtle, Walter, 5,468,799, Cl. 524-457.000.

Poschun, Alex: *See*—
Powell, Fred D.; Phelan, Raymond J.; McCormack, James; Budansew, Peter; Demoe, Larry; and Poschun, Alex, 5,468,434, Cl. 264-46.800.

Posit Plus: *See*—
Zheng, Yu, 5,467,794, Cl. 135-125.000.

Post, Irving G., to AT&T Corp. Linear voltage-controlled oscillator using fixed capacitors in lieu of varactors. 5,469,119, Cl. 331-117.00R.

Post, Richard L.: *See*—
Yu, Robert C. U.; Foley, Geoffrey M. T.; Herbert, William G.; Limburg, William W.; Mishra, Satchidanand; Post, Richard L.; and Von Hoene, Donald C., 5,469,242, Cl. 355-219.000.

Potain: *See*—
Faure, Serge; Gaillet, Alain; Lefebvre, Régis; and Reboulet, Claude, 5,469,531, Cl. 395-86.000.

Potter, Daniel R.: *See*—
Averi, Michael A.; and Potter, Daniel R., 5,467,537, Cl. 36-50.100

Potter, Richard. Envelope. 5,467,917, Cl. 229-301.000.

Potuznik, Walter; and Himmel, Josef, to Burian Gesellschaft m.b.H. & Co. KG. Method and device for the monolithic application of a thermal-insulation and/or fire-protection compound to a surface. 5,467,923, Cl. 239-8.000.

Poujade, Christèle: *See*—
Bouboutou, Romaine; Dereu, Norbert; Evers, Michel; Gueguen, Jean-Christophe; James, Claude; Poujade, Christèle; Reisdorf, Daniel; Ribeill, Yves; and Soler, Françoise, 5,468,888, Cl. 554-58.000.

Powell, Bruce A.; Stanley, Jannah; Kupersmith, Bertram F.; Sahara, Masanori; Simcik, Paul; and Bahjat, Zuhair S., to Otis Elevator Company. Assigning a hall call to a full elevator car. 5,467,844, Cl. 187-387.000.

Powell, Fred D.; Phelan, Raymond J.; McCormack, James; Budansew, Peter; Demoe, Larry; and Poschun, Alex, to Atoma International Inc. Provision of cover impermeability in mold in place seat component method. 5,468,434, Cl. 264-46.800.

Power Integrations, Inc.: *See*—
Balakrishnan, Balu, 5,469,334, Cl. 361-782.000.

Powers, David T.: *See*—
Glider, Joseph S.; Powers, David T.; and Idleman, Thomas E., 5,469,453, Cl. 371-68.100.

Powers, Dulce M.: *See*—
Mast, Rolf; and Powers, Dulce M., 5,467,787, Cl. 132-73.000.

Powers, John R., III; Palmer, James E.; Coleman, Patricia J.; Herman, Jeffrey A.; and Cochran, Eli, to Apple Computer, Inc. Method and apparatus for generating and displaying multiple simultaneously-active windows. 5,469,540, Cl. 395-158.000.

Powrie, William D.: *See*—
Wu, Chiu H.; and Powrie, William D., 5,468,508, Cl. 426-316.000.

PPG Industries, Inc.: *See*—
Wilt, Truman F.; Carney, Joseph M.; Thomas, Stephen J.; Claar, James A.; and Birkmeyer, William J., 5,468,802, Cl. 524-539.000.

Pradhan, Asima: *See*—
Alfano, Robert R.; Pradhan, Asima; Tang, Guichen C.; Wang, Leming; Budansky, Yury; and Das, Bidyut B., 5,467,767, Cl. 128-665.000.

Prasanna, Viktor K.; Wang, Cho-Li; and Park, Heonchul, to University of So. California. Single chip design for fast image compression. 5,468,069, Cl. 382-253.000.

Pratt, Roy E.: *See*—
Nelson, Gerald V.; Nongbri, Govanon; and Pratt, Roy E., 5,468,371, Cl. 208-216.0PP.

Praxair Technology, Inc.: *See*—
Paolino, Gerald A.; Drnevich, Raymond F.; and Prosser, Neil M., 5,467,601, Cl. 62-38.000.
Paolino, Gerald A.; and Drnevich, Raymond F., 5,467,602, Cl. 62-38.000.

Prelude Technology Corp.: *See*—
Giobbi, John J.; and Burke, David H., 5,469,193, Cl. 345-158.000.

Premelt Pump, Inc.: *See*—
Areaux, Larry D., 5,468,280, Cl. 75-708.000.

Prestele, Eugen. Grid plate for seeding down surfaces. 5,467,554, Cl. 47-1.010.

Prevent Products Inc.: *See*—
Garcia, Mario C.; Lund, Kristofer T.; and Park, William H., 5,468,217, Cl. 601-32.000.

Pribyl, Eric L.: *See*—
Jarvis, Eugene; and Pribyl, Eric L., 5,469,535, Cl. 395-130.000.

Priddy, Dennis G.; and Cymbalski, Robert S., to International Data Matrix, Inc. Dynamically variable machine readable binary code and method for reading and producing thereof. 5,468,953, Cl. 235-494.000.

Prime Composites, Inc.: *See*—
Kober, Jeffrey F.; and Nelson, Victor A., 5,467,558, Cl. 49-220.000.

Prin, Marie: *See*—
Ledoux, Marc-Jacques; Guille, Jean-Louis; Pham Huu, Cuong; Dunlop, Hugh; and Prin, Marie, 5,468,370, Cl. 208-134.000.

Prince Corporation: *See*—
Suman, Michael J.; Clark, Russell L.; and Ferrell, Richard M., 5,469,298, Cl. 359-630.000.

Priou, Christian: *See*—
Castellanos, Frederic; Cavezzan, Jacques; Fouassier, Jean-Pierre; and Priou, Christian, 5,468,902, Cl. 568-6.000.

Probst, Joachim; Novotny, Fritz; Träubel, Harro; and Heiliger, Ludger, to Bayer Aktiengesellschaft. Process for dying leather with pigments and cationic binders. 5,468,257, Cl. 8-436.000.

Probst, Joachim: *See*—
Schmalstieg, Lutz; Kremer, Wolfgang; Brahm, Martin; Probst, Joachim; and Kubitza, Werner, 5,468,804, Cl. 524-591.000.

Prochazka, Kamil: *See*—
Frey, Heinz; Prochazka, Kamil; and Suter, Franz, 5,467,683, Cl. 91-442.000.

Procter & Gamble Company, The: *See*—
Andon, Mark B., 5,468,506, Cl. 426-74.000.
McNeil, Kevin B., 5,468,323, Cl. 156-209.000.
de Buzzaccarini, Francesco; Farwick, Timothy J.; and Zhen, Yeuqian, 5,468,413, Cl. 252-117.000.

Proctor Gamble Company, The: *See*—
Altonen, Gene M.; and Kerr, G. Scott, 5,467,894, Cl. 221-71.000.

Proler International Corp.: *See*—
Waterson, Bruce P.; Caputo, Dennis L.; and McLaughlin, William R., 5,468,291, Cl. 106-697.000.

Proper, James M.; and Erhardt, Peter F., to Xerox Corporation. System for controlling the color of toner mixtures. 5,468,586, Cl. 430-137.000.

Prorok, Barton C.: *See*—
Dorris, Stephen E.; Poeppel, Roger B.; Prorok, Barton C.; Lanagan, Michael T.; and Maroni, Victor A., 5,468,566, Cl. 428-552.000.

Prosser, Neil M.: *See*—
Paolino, Gerald A.; Drnevich, Raymond F.; and Prosser, Neil M., 5,467,601, Cl. 62-38.000.

Protose Technologies Inc.: *See*—
Smith, Paul, 5,468,844, Cl. 530-366.000.

Proud, Nicholas W.; and Freeman, Robert A., to British Telecommunications public limited company. Transmission line installation. 5,467,968, Cl. 254-134.400.

Public Safety Equipment, Inc.: *See*—
Green, Timothy M., 5,469,341, Cl. 362-83.300.

Puester, Harald; and Kirchhoff, Hans-Gerd, to Siemens Aktiengesellschaft. Circuit configuration for synchronous clock generation of at least two clock signals. 5,469,083, Cl. 326-93.000.

Pulp and Paper Research Institute of Canada: *See*—
Allen, Lawrence H.; and Lapointe, Christine L., 5,468,396, Cl. 210-787.000.

Purer, Edna M.: *See*—
Chao, Sidney C.; Stanford, Thomas B.; Purer, Edna M.; and Wilkerson, Angela Y., 5,467,492, Cl. 8-159.000.

Puri, Ruchir; and Gu, Jun, to University Technologies International Inc. Methodology and apparatus for modular partitioning for the machine design of asynchronous circuits. 5,469,367, Cl. 364-489.000.

Puryear, John W. Line guide for fishing reels. 5,467,932, Cl. 242-236.000.

Putman, Carl, to Valeo. Torsion damper, in particular for a motor vehicle. 5,468,189, Cl. 464-68.000.

Pyszczek, Michael F.; Takeuchi, Esther S.; and Kane, Mark J., to Wilson Greatbatch Ltd. Use of standard uniform electrode components in cells of either high or low surface area design. 5,468,569, Cl. 429-94.000.

Quad/Tech, Inc.: *See*—

Graushar, William T.; Geres, John C.; and Dettmering, Todd J., 5,467,973, Cl. 270-1.100.
QUALCOMM Incorporated: *See*—
Peterzell, Paul E.; Wilson, Nathaniel B.; and Black, Peter J., 5,469,115, Cl. 330-129.000.
Wheatley, Charles E., III, 5,469,471, Cl. 375-205.000.
Zehavi, Ephraim, 5,469,452, Cl. 371-43.000.
Quantum Corporation: *See*—
Kindler, David J.; and Dupuis, David J., 5,468,177, Cl. 451-364.000.
Patrick, Paul R., 5,469,553, Cl. 395-750.000.
Quate, Calvin F.: *See*—
Hadimioglu, Babur B.; Lim, Martin G.; Stearns, Richard G.; and Quate, Calvin F., 5,467,975, Cl. 271-267.000.
Queener, Stephen W.: *See*—
Cantwell, Cathleen A.; Hodges, Roland L.; McGilvray, Derek; Queener, Stephen W.; Swartling, James R.; and Zock, Joseph M., 5,468,632, Cl. 435-197.000.
QuickLogic Corporation: *See*—
Cox, William D., 5,469,077, Cl. 326-38.000.
Paivinen, John O., 5,469,109, Cl. 327-525.000.
Quilling, R. Spencer, II, to Metra Electronics Corporation. Mounting kit for mounting one of several types of audio equipment in an automotive dashboard. 5,467,947, Cl. 248-27.100.
Quiros, Nelson I.: *See*—
Bauer, William, Jr.; Quiros, Nelson I.; and Upmacis, Rita K., 5,468,899, Cl. 560-218.000.
R-Made, Inc.: *See*—
Wiseman, Jay, 5,467,782, Cl. 128-845.000.
Rabone, Kenneth L., to Lever Brothers Company, Division of Conopco, Inc. Detergent composition containing mixture of hydratable and non-hydratable salts. 5,468,418, Cl. 252-174.250.
Rachinsky, Lubomir: *See*—
Evseev, Yury; Rachinsky, Lubomir; Tetervova, Natalia; Seleninov, Kazimir; Dermenzhi, Evgeniy; Nasekan, Olga; Druyanova, Eva; and Ribak, Roman, 5,468,976, Cl. 257-177.000.
Radtke, Marilyn J.: *See*—
Hatch, Robert P.; and Radtke, Marilyn J., 5,468,641, Cl. 436-97.000.
Raffa, Robert B.; and Vaught, Jeffrey L., to McNeil Lab, Inc. Composition comprising a tramadol material and any of codeine, oxycodone or hydrocodone and their use. 5,468,744, Cl. 514-282.000.
Rahbari, Homayoon: *See*—
Nabai, Hossein; and Rahbari, Homayoon, 5,467,780, Cl. 128-754.000.
Rajagopalan, Venkatesh: *See*—
Thompson, David A.; Rajagopalan, Venkatesh; Wright, Kurt W.; Sterba, John J.; Paulus, William J.; Paulus, Nancy J.; McCauley, Kathryn M.; and Chen, David K., 5,467,636, Cl. 73-23.310.
Raju, Muppala S.; and Khetani, Vikram, to Celgene Corporation. Stereopreferential synthesis of 3-(1-phenylprop-2-yl)-5-phenyloxazolidinones. 5,468,865, Cl. 548-229.000.
Rakauskas, Paul V.: *See*—
Staab, Thomas E.; Shah, Kanu G.; Gallo, Paul E.; and Rakauskas, Paul V., 5,468,003, Cl. 277-235.00B.
Ralston, William H.: *See*—
Deutsch, Edward A.; Deutsch, Karen F.; Cacheris, William P.; Ralston, William H.; White, David H.; Nosco, Dennis L.; Wolfangel, Robert G.; Wilking, Janet B.; Meeh, Linda; and Woulfe, Steven R., 5,468,465, Cl. 424-9.400.
Ramachandran, Ramakrishnan: *See*—
Tamhankar, Satish S.; and Ramachandran, Ramakrishnan, 5,468,459, Cl. 423-240.00S.
Ramer, John; and Herman, Richard S. Shoe construction. 5,467,536, Cl. 36-28.000.
Ramos, Alexis T.: *See*—
Ortiz Perez, Luis R.; and Ramos, Alexis T., 5,469,494, Cl. 375-27.000.
Rämsby, Sten I.: *See*—
Federsel, Hans-Jügen; Hö, Thomas; Rämsby, Sten I.; and Ström, Peter H. E., 5,468,876, Cl. 548-535.000.
Randles, Kenneth R.; Gott, Brian G.; and Daley, Stephen T. A. K., to Zeneca Limited. Regioselective sulfonylation reaction of substituted aromatic compounds. 5,468,903, Cl. 568-28.000.
Ranpak Corp.: *See*—
Armington, Steven E.; and Silvis, John E., 5,468,208, Cl. 493-352.000.
Raptis, Apostolos C.: *See*—
Gopalsami, Nachappa; Bakhtiari, Sasan; Raptis, Apostolos C.; and Dieckman, Stephen L., 5,468,964, Cl. 250-393.000.
Rasmussen, Donald: *See*—
Slocum, Richard T.; Bjordahl, James; Louie, Danny; and Rasmussen, Donald, 5,469,310, Cl. 360-92.000.
Rasmussen, Thomas P.: *See*—
Bjarklev, Anders O.; and Rasmussen, Thomas P., 5,469,292, Cl. 359-341.000.
Raspanti, Giuseppe, to 3V Inc. Benzofuran derivatives and the use thereof as stabilizers against UV radiations. 5,468,470, Cl. 424-59.000.
Rassmussen, Jerald K.: *See*—
Heilmann, Steven M.; Drtina, Gary J.; Eitzman, Philip D.; Haddad, Louis C.; Hyde, Frederick W.; Johnson, Todd W.; Rassmussen, Jerald K.; and Williams, Michael G., 5,468,847, Cl. 530-413.000.
Ratu, John J.; Jones, Alvin K.; and Maddox, Charles K., to General Motors Corporation. Vehicle suspension system with jounce bumper. 5,467,970, Cl. 267-220.000.
Rauleder, Hartwig; Standke, Burkhard; Kötzsch, Hans-Joachim; and Schork, Reinhold, to Huels Aktiengesellschaft. Storage-stable solution of carbonated magnesium methoxide in methanol and its use. 5,468,705, Cl. 502-151.000.
Rauleder, Hartwig; Standke, Burkhard; Kötzsch, Hans-Joachim; and Schork, Reinhold, to Huels Aktiengesellschaft. Storage-stable solution of a mixture of carbonated magnesium methoxide, carbonated magnesium ethoxide and their carbonated mixed alkoxide in a combination of methanol and ethanol and uses thereof. 5,468,706, Cl. 502-151.000.
Rawlings, David L., to Porta Systems Corp. Optical fiber support for printed circuit boards. 5,469,526, Cl. 385-135.000.
Rawlins, Douglas C.: *See*—
Idleman, Dennis D.; Rawlins, Douglas C.; and Sood, Virendra M., 5,467,926, Cl. 239-132.500.
Ray, William F.: *See*—
Stephenson, John M.; and Ray, William F., 5,469,039, Cl. 318-701.000.
Raychem Corporation: *See*—
Mehan, Ashok, 5,468,782, Cl. 521-134.000.
Raytheon Company: *See*—
Rosvold, Warren C., 5,468,672, Cl. 437-60.000.
Razdow, Allen M., to Mathsoft, Inc. Mathematical document editor and method performing live symbolic calculations for use with an electronic book. 5,469,538, Cl. 395-140.000.
Real, Peter: *See*—
Steyaert, Michel; Dehaene, Wim; Craninckx, Jan; Walsh, Mairtin; and Real, Peter, 5,469,113, Cl. 329-311.000.
Rebelo do Couto, Fernando J.: *See*—
Garabedian, Aram, Jr.; Mills, Scott C.; Sibert, William P.; Choy, Clement K.; and Rebelo do Couto, Fernando J., 5,468,423, Cl. 252-546.000.
Reboulet, Claude: *See*—
Faure, Serge; Gaillet, Alain; Lefebvre, Régis; and Reboulet, Claude, 5,469,531, Cl. 395-86.000.
Reddick, Bradford B.; Gwinn, Kimberly D.; and Oliver, Jack W., to University of Tennessee Research Corporation, The. Vaccine containing a protein alkaloid conjugate for the treatment of fescue toxicosis. 5,468,486, Cl. 424-194.100.
Reddy, Prathap A.; Baker, Jay D.; and Kneisel, Larry L., to Ford Motor Company. Printed circuit board with bi-metallic heat spreader. 5,469,329, Cl. 361-704.000.
Reddy, Srinivasa S. N.: *See*—
Casey, Jon A.; Divakaruni, Renuka S.; Natarajan, Govindarajan; Reddy, Srinivasa S. N.; and Sammet, Manfred, 5,468,445, Cl. 419-19.000.
Redman, David W. Spool having adjustable end plates. 5,467,938, Cl. 242-599.100.
Redman, Forrest C.; Heimbecher, John O.; Etnyre, Edwin L.; Shavrnoch, James J.; and Ferranti, Paul A., to Chrysler Corporation. Torque box assembly for a vehicle. 5,468,018, Cl. 280-788.000.
Redwine, Steve. Dog and cat trainer-exerciser. 5,467,740, Cl. 119-707.000.
Reents, Roberta M.: *See*—
Kluth, Michael R.; and Reents, Roberta M., 5,469,335, Cl. 361-800.000.
Regev, Zvi Y. Method to generate a continuous periodic signal from a short sample of the signal. 5,469,166, Cl. 342-14.000.
Register, David S.: *See*—
Parks, Terry J.; and Register, David S., 5,469,559, Cl. 395-433.000.
Rehbein, Gerald L.; and Montain, Paul D., to Rehbein, Inc. Coal combustion fly ash soil amendment. 5,468,277, Cl. 71-24.000.
Rehbein, Inc.: *See*—
Rehbein, Gerald L.; and Montain, Paul D., 5,468,277, Cl. 71-24.000.
Reichert, Ronald E.; and Beuch, Donald, to RTI Corporation. Manipulation and transport device for rolled materials. 5,468,116, Cl. 414-607.000.
Reid, Leonard F.; and Copple, Charles M., to Fatigue Technology, Inc. Wall nut assembly. 5,468,104, Cl. 411-113.000.
Reihlen, Eckart; Marek, Jiri; Bantien, Frank; Findler, Guenther; Offenberg, Michael; Kleinhans, Josef; Konzelmann, Uwe; and Ziegenbein, Botho, to Robert Bosch GmbH. Mass flow sensor having a measuring element arranged on a membrane retained on a monocrystalline silicon wafer. 5,467,649, Cl. 73-204.260.
Reiners, Ulrich; Krallmann, Anton; Albinus, Eberhard; and Böhner, Jürgen, to Wolff Walsrode Aktiengesellschaft. Reflection-reduced, bondable stretched film as window film for envelopes. 5,468,563, Cl. 428-515.000.
Reinforced Earth Company, The: *See*—
Christensen, Stephen M., 5,467,567, Cl. 52-459.000.
Reisberg, Erhard, to Leibinger Gmbh. Form-fitting mesh implant. 5,468,242, Cl. 606-69.000.
Reisdorf, Daniel: *See*—
Bouboutou, Romaine; Dereu, Norbert; Evers, Michel; Gueguen, Jean-Christophe; James, Claude; Poujade, Christèle; Reisdorf, Daniel; Ribeill, Yves; and Soler, Françoise, 5,468,888, Cl. 554-58.000.
Reismann, Hans J.: *See*—
Hartmann, Hans H.; Drügh, Hans-Peter; and Reismann, Hans J., 5,468,146, Cl. 432-77.000.
Reismiller, Paul R.: *See*—
Brunemann, George A., Jr.; and Reismiller, Paul R., 5,469,447, Cl. 371-36.000.
Reitz, Paul; and Abdelkader, Hatem, to Whitaker Corporation, The. Fiber optic ring laser. 5,469,455, Cl. 372-20.000.
Reliable Corporation of America, The: *See*—
Greer, Thomas W., 5,467,996, Cl. 273-269.000.
Rensselaer Polytechnic Institute: *See*—
Crivello, James V.; Belfort, Georges; and Yamagishi, Hideyuki, 5,468,390, Cl. 210-490.000.

Renteria, Stanley: *See—*
Pine, Jerrold; Lakhani, Sunil; and Renteria, Stanley, 5,467,525, Cl. 29-743.000.
Resasco, Daniel E.; Marcus, Bonita K.; Huang, Chen-Shi; and Durante, Vincent A., to Sun Company, Inc. (R&M). Compositions comprising sulfided nickel and alumina useful as dehydrogenation catalysts. 5,468,710, Cl. 502-222.000.
Resca, Franco; and Cupido, Enrico. Firearm holding device. 5,467,909, Cl. 224-244.000.
Research Corporation Technologies, Inc.: *See—*
Stover, Harald D. H.; Li, Pei; Ferrari, Lorenzo; Shaver, Robert T.; and Vlaovic, Djordje, 5,468,814, Cl. 525-390.000.
Research Foundation of State University of New York, The: *See—*
Fields, Stanley; and Song, Ok-Kyu, 5,468,614, Cl. 435-6.000.
Reshanov, Eugene N.: *See—*
Dretzka, Philip C.; Belden, Tighe M.; Reshanov, Eugene N.; and Samuelson, Bruce E., 5,468,332, Cl. 156-527.000.
Reuter, David F.: *See—*
Seetharaman, Viswanath; and Reuter, David F., 5,467,797, Cl. 137-599.000.
Revel, Michel; and Tiollais, Pierre, to Yeda Research & Development Co. Ltd. Production of interferon. 5,468,607, Cl. 435-6.000.
Revel, Michel; and Tiollais, Pierre, to Yeda Research & Development Co., Ltd. Production of interferon. 5,468,608, Cl. 435-91.110.
Revel, Michel; and Tiollais, Pierre, to Yeda Research & Development Co. Ltd. Production of interferon. 5,468,609, Cl. 530-351.000.
Rexene Corporation: *See—*
Tsurutani, Iwao; Manabe, Takafumi; and Emoto, Ikuo, 5,468,807, Cl. 525-240.000.
Reymann, Klaus: *See—*
Huebel, Michael; and Reymann, Klaus, 5,468,119, Cl. 415-55.100.
Reynolds Metals Company: *See—*
Thompson, Kurt P.; and Wiese, Jeffrey W., 5,468,053, Cl. 297-472.000.
Reynolds, Robert R. Wild squirrel feeder. 5,467,736, Cl. 119-52.200.
Rhee, Sang K.: *See—*
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.
Rhein Chemie Rheinau GmbH: *See—*
Steger, Lothar; Syrowatka, Horst; and Schütte, Walter, 5,468,288, Cl. 106-243.000.
Rheinmetall GmbH: *See—*
Roosmann, Karl-Heinz; and Hahn, Ulf, 5,467,713, Cl. 102-233.000.
Rhone-Poulenc Chimie: *See—*
Castellanos, Frederic; Cavezzan, Jacques; Fouassier, Jean-Pierre; and Priou, Christian, 5,468,902, Cl. 568-6.000.
Rhone-Poulenc Rorer Pharmaceuticals Inc.: *See—*
Huang, Fu-Chih; Chan, Wan K.; Sutherland, Charles A.; and Galemmo, Robert A., Jr., 5,468,898, Cl. 560-41.000.
Rhone-Poulenc Rorer S.A.: *See—*
Bouboutou, Romaine; Dereu, Norbert; Evers, Michel; Gueguen, Jean-Christophe; James, Claude; Poujade, Christèle; Reisdorf, Daniel; Ribeill, Yves; and Soler, Françoise, 5,468,888, Cl. 554-58.000.
Riano, Marcos D. Sulfur gun assembly with rapid service capability. 5,467,925, Cl. 239-132.300.
Rib Loc Australia Pty Ltd: *See—*
Menzel, Stanley W. O., 5,468,322, Cl. 156-195.000.
Ribak, Roman: *See—*
Evseev, Yury; Rachinsky, Lubomír; Tetervova, Natalia; Seleninov, Kazimir; Dermenzhi, Evgeniy; Nasekan, Olga; Druyanova, Eva; and Ribak, Roman, 5,468,976, Cl. 257-177.000.
Ribeill, Yves: *See—*
Bouboutou, Romaine; Dereu, Norbert; Evers, Michel; Gueguen, Jean-Christophe; James, Claude; Poujade, Christèle; Reisdorf, Daniel; Ribeill, Yves; and Soler, Françoise, 5,468,888, Cl. 554-58.000.
Rice, Susan F. Neck cradle. 5,467,490, Cl. 5-636.000.
Rich, Daniel H.: *See—*
Barrett, Alan J.; Buttle, David J.; and Rich, Daniel H., 5,468,480, Cl. 424-94.650.
Richards, Karen L., to Immunomatrix, Inc. Salt stabilization of antibody-enzyme conjugates heat-dried into paper. 5,468,622, Cl. 435-28.000.
Richards, Katy S. Apparatus and method for determining response parameters of a runner to a start signal. 5,467,652, Cl. 73-379.010.
Richardson, Neil W.: *See—*
Orban, Jacques; and Richardson, Neil W., 5,467,832, Cl. 175-45.000.
Richartz, Sigurd: *See—*
Jordan, Holger; and Richartz, Sigurd, 5,468,180, Cl. 452-127.000.
Ricker, Edward D.: *See—*
Albrigo, Julian; Ricker, Edward D.; and Colarusso, Louis J., 5,468,524, Cl. 428-34.100.
Ricks, Melvin D. Remotely controlled dental syringe. 5,468,148, Cl. 433-80.000.
Ricoh Company, Ltd.: *See—*
Suzuki, Akira; Hotta, Yoshihiko; and Uemura, Hiroyuki, 5,468,711, Cl. 503-201.000.
Takahashi, Satoshi, 5,469,470, Cl. 375-205.000.
Ricoh Seiki Company, Ltd.: *See—*
Manaka, Junji, 5,467,651, Cl. 73-23.210.
Rider, Jeffrey N.: *See—*
Ehrenberg, Scott G.; Serpico, Joseph; Wnek, Gary E.; and Rider, Jeffrey N., 5,468,574, Cl. 429-33.000.
Riedel, John; and Grubaugh, James, to Sears Manufacturing Company. Composite roller assembly. 5,468,070, Cl. 384-127.000.
Rieger, John B.: *See—*
Zengerle, Paul L.; Miller, David D.; Whitesides, Thomas H.; Rieger, John B.; Flow, Vincent J., III; and Isaac, Walter H., 5,468,604, Cl. 430-631.000.
Rietman, Edward A.: *See—*
Frye, Robert C.; Harry, Thomas R.; Lory, Earl R.; and Rietman, Edward A., 5,467,883, Cl. 216-60.000.
Rijckaert, Albert M. A.: *See—*
Kahlman, Josephus A. H. M.; and Rijckaert, Albert M. A., 5,469,462, Cl. 375-232.000.
Ripley, Thomas L., Sr.; and Cataldo, Stephen A., to GreenTech, L.L.C. Turfing systems for stadia. 5,467,555, Cl. 47-66.000.
Ritter, Daniel S.: *See—*
Ritter, Donald H.; and Ritter, Daniel S., 5,467,910, Cl. 224-499.000.
Ritter, Donald H.; and Ritter, Daniel S. Load carrying frame for vehicles. 5,467,910, Cl. 224-499.000.
Rivera-Gonzalez, Sonia: *See—*
Rodriguez-Flores, Manuel; and Rivera-Gonzalez, Sonia, 5,468,500, Cl. 424-441.000.
Rizzo, Salvatore P.: *See—*
Roebuck, Randal D.; Agahdel, Fariborz; and Rizzo, Salvatore P., 5,468,157, Cl. 439-264.000.
Roebuck, Randal D.; and Rizzo, Salvatore P., 5,468,158, Cl. 439-264.000.
RJA Associates: *See—*
Adams, Robert J., 5,468,265, Cl. 44-505.000.
Roach, Alan R.: *See—*
Beck, Niels J.; Pena, James A.; Roach, Alan R.; and Johnston, Bevan H., 5,467,754, Cl. 123-467.000.
Roback, Kenneth J.: *See—*
Rush, Tonya A.; Moehling, Steven P.; and Roback, Kenneth J., 5,469,177, Cl. 343-702.000.
Robbins, Francis B., to Borg-Warner Automotive, Inc. Adjustable pulley in a continuously variable transmission. 5,468,192, Cl. 474-28.000.
Robert Bosch GmbH: *See—*
Fischer, Jorg-Peter; and Mossner, Steffen, 5,467,756, Cl. 123-569.000.
Heizmann, Frieder, 5,469,340, Cl. 362-66.000.
Huebel, Michael; and Reymann, Klaus, 5,468,119, Cl. 415-55.100.
Megerle, Friedrich; Hohl, Guenther; Ludewig, Erich; and Kaes, Guenter, 5,468,057, Cl. 303-87.000.
Meiwes, Johannes; Gerhard, Albert; and Hammer, Uwe, 5,467,749, Cl. 123-339.270.
Philipp, Matthias, 5,467,638, Cl. 73-35.060.
Reihlen, Eckart; Marek, Jiri; Bantien, Frank; Findler, Guenther; Offenberg, Michael; Kleinhans, Josef; Konzelmann, Uwe; and Ziegenbein, Botho, 5,467,649, Cl. 73-204.260.
Roberts, Peter J.: *See—*
David, Lennie F.; and Roberts, Peter J., 5,468,360, Cl. 204-228.000.
Roberts Systems, Inc.: *See—*
Mattson, Larry J., 5,467,915, Cl. 229-117.240.
Robin, Jean-Francois: *See—*
Guerin, Jean-Pierre; Robin, Jean-Francois; and Roudot, Francois, 5,469,430, Cl. 370-37.000.
Robinder, Ronald C.: *See—*
Lengyel, J. Michael; and Robinder, Ronald C., 5,468,064, Cl. 359-63.000.
Robinson, Stephen E., to University of New Mexico. Method and apparatus for extending the dynamic range of DC-squid measurements using a flux tracking loop. 5,469,057, Cl. 324-248.000.
Robodyne Corporation: *See—*
Alvité, Joseph, 5,469,332, Cl. 361-737.000.
Rockefeller University, The: *See—*
France, Dennis S.; Cerami, Anthony; Ulrich, Peter C.; Norton, Laura A.; and Neer, David L., 5,468,777, Cl. 514-562.000.
Rockstein, George B.: *See—*
Knowles, Carl H.; Rockstein, George B.; Wilz, David M.; and Naylor, Charles A., 5,468,951, Cl. 235-472.000.
Rockwell International Corporation: *See—*
Holmes, Richard B., 5,469,250, Cl. 356-28.000.
Rockwool International A/S: *See—*
Grove-Rasmussen, Svend, 5,468,274, Cl. 65-469.000.
Rodriguez, Carlos: *See—*
Coulter, Wallace H.; Hollinger, John D.; Kortright, Kenneth H.; Russell, Thomas; Rodriguez, Carlos; and Paul, Ronald, 5,468,616, Cl. 435-7.200.
Rodriguez-Flores, Manuel; and Rivera-Gonzalez, Sonia, to University of Puerto Rico. Soursop flavor. 5,468,500, Cl. 424-441.000.
Rodriquez, Peter A.; and Austin, Craig R., to Sandar Industries, Inc. Track assembly for a cutting tape. 5,467,937, Cl. 242-526.200.
Rodzewich, Edward A., to Betz Laboratories, Inc. Low foaming aqueous cleaning and passivating treatment for metals. 5,468,412, Cl. 252-106.000.
Roe, Christopher A.: *See—*
Coutts, Bruce; and Roe, Christopher A., 5,469,521, Cl. 385-77.000.
Roebuck, Randal D.; Agahdel, Fariborz; and Rizzo, Salvatore P., to Texas Instruments Incorporated. Non-destructive interconnect system for semiconductor devices. 5,468,157, Cl. 439-264.000.

Roebuck, Randal D.; and Rizzo, Salvatore P., to Texas Instruments Incorporated. Non-destructive interconnect system for semiconductor devices. 5,468,158, Cl. 439-264.000.
Roehl, Franz: *See*—
Wenderoth, Bernd; Brand, Siegbert; Schuetz, Franz; Koekenhoehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,468,717, Cl. 504-130.000.
Roehm GmbH Chemische Fabrik: *See*—
Fölsch, Karl J.; Kaufmann, Marita; and Hartmann, Jürgen, 5,468,800, Cl. 524-458.000.
Roessel, Wolfgang, to Roessel/Cpt, Inc. Snorkel leas system. 5,469,236, Cl. 354-79.000.
Roessel/Cpt, Inc.: *See*—
Roessel, Wolfgang, 5,469,236, Cl. 354-79.000.
Rogalli, Michael: *See*—
Bayer, Heiner; Lehner, Barbara; and Rogalli, Michael, 5,468,786, Cl. 522-170.000.
Rogers, Lesley; and Ung, Michael M., to Opto Power Corporation. Laser device and method of manufacture using non-metalized fiber. 5,469,456, Cl. 372-43.000.
Rogers, Steven L.: *See*—
Fuhs, Ronald E.; Hammond, William A., Jr.; Nation, George W.; Rogers, Steven L.; and Willis, John C., 5,469,446, Cl. 371-33.000.
Rohm and Haas Company: *See*—
Hsu, Jemin C., 5,468,759, Cl. 514-372.000.
Rohm Co., Ltd.: *See*—
Kaigawa, Hiroyuki, 5,468,675, Cl. 437-69.000.
Kanetake, Yasuo, 5,469,326, Cl. 361-534.000.
Tani, Koji, 5,468,993, Cl. 257-676.000.
Rohrhiursch, Ulrich; and Schmid, Georg, to MAN Roland Druckmaschinen AG. Sealing for a folding blade shaft. 5,468,209, Cl. 493-424.000.
Rolfson, J. Brett, to Micron Technology, Inc. Method of making masks for phase shifting lithography to avoid phase conflicts. 5,468,578, Cl. 430-5.000.
Rolls-Royce plc: *See*—
Searle, John G., 5,468,334, Cl. 156-580.000.
Romanelli, Michael G.; Watts, Raymond F.; and Devine, Maryann, to Exxon Chemical Patents Inc. Phosphorus- and mono- or di-sulfide-containing additives for lubrication oils. 5,468,403, Cl. 252-47.500.
Ronel, Samuel H.: *See*—
Moro, Daniel G.; Ronel, Samuel H.; and Kuzma, Petr, 5,468,811, Cl. 525-263.000.
Roney, Jeffrey T.: *See*—
Johnson, Milton J.; and Roney, Jeffrey T., 5,467,502, Cl. 15-339.000.
Roof, Michael B.: *See*—
Garst, Michael E.; Burk, Robert M.; Chan, Ming F.; and Roof, Michael B., 5,468,778, Cl. 514-573.000.
Roosmann, Karl-Heinz; and Hahn, Ulf, to Rheinmetall GmbH. Ignition and safty device for a grenade projectile provided with a shaped charge insert. 5,467,713, Cl. 102-233.000.
Rosemount Analytical Inc.: *See*—
Koluvek, Roland H., 5,469,070, Cl. 324-713.000.
Rose-Pehrsson, Susan L.; Di Lella, Daniel; and Grate, Jay W., to United States of America, Navy. Smart sensor system and method using a surface acoustic wave vapor sensor array and pattern recognition for selective trace organic vapor detection. 5,469,369, Cl. 364-497.000.
Ross, Charles N. Protective barrier members for work areas. 5,467,548, Cl. 40-612.000.
Rossback, Matthew A.; and McQueary, Timothy R., to Teledyne Industries, Inc. Process for the preparation of metal hydrides. 5,468,464, Cl. 423-644.000.
Rossberg, Lars: *See*—
Handke, Günter; Rossberg, Lars; and Zietsch, Andreas, 5,467,851, Cl. 188-299.000.
Rossi, Arthur M.: *See*—
McMurtrey, Kevin D., Sr.; Rossi, Arthur M.; Cichon, Robert J., Jr.; Briggs, Karen A.; and Ely, Jonathan C., 5,469,037, Cl. 318-626.000.
Rossin, Vincent: *See*—
Elie, François; and Rossin, Vincent, 5,467,869, Cl. 206-45.130.
Rosvold, Warren C., to Raytheon Company. Thin film resistor and method of fabrication. 5,468,672, Cl. 437-60.000.
Rotella, David P.: *See*—
Glicksman, Marcie A.; Rotella, David P.; Neff, Nicola; and Murakata, Chikara, 5,468,872, Cl. 548-416.000.
Roth, Timothy J.; and Welliver, William R., to Air Products and Chemicals, Inc. Fertilizer chip and process for making same. 5,468,276, Cl. 71-15.000.
Rothamel, Karl, to Hofmann Werkstatt-Technik GmbH. Operating circuit including an oscillating circuit capacitor coupled to an auxiliary winding for an apparatus that measures the unbalance of a rotary member. 5,469,040, Cl. 318-785.000.
Rothermel, Albrecht; Gleim, Günter; and Rothermel, Karin, to Deutsche Thomson-Brandt GmbH. Circuit arrangement for regulating signals. 5,469,089, Cl. 327-56.000.
Rothermel, Karin: *See*—
Rothermel, Albrecht; Gleim, Günter; and Rothermel, Karin, 5,469,089, Cl. 327-56.000.
Roudot, Francois: *See*—
Guerin, Jean-Pierre; Robin, Jean-Francois; and Roudot, Francois, 5,469,430, Cl. 370-37.000.
Roussel, Bruno F.: *See*—
Perreaut, Jean M.; Roussel, Bruno F.; and Thibaudin, Didier, 5,469,017, Cl. 313-431.000.
Rowlands, Kenneth C.; and Bauman, Thomas G. Firearm automatic safety system. 5,467,549, Cl. 42-42.030.
Roy, Stephen. Microwave radiation insert exterminator. 5,468,938, Cl. 219-690.000.
Royale Consultants Ltd.: *See*—
Gut, Max B., 5,469,285, Cl. 359-152.000.
Rozendaal, Leendert T.: *See*—
Misker, Jan S.; Hamann, Theodora L.; and Rozendaal, Leendert T., 5,469,227, Cl. 348-702.000.
RTI Corporation: *See*—
Reichert, Ronald E.; and Beuch, Donald, 5,468,116, Cl. 414-607.000.
Rudell, Elliot; and Foster, George, to Rudell, Elliot. Football with tail appendage. 5,467,981, Cl. 273-65.0EF.
Rudolf, Klaus: *See*—
Eberlein, Wolfgang; Engel, Wolfhard; Mihm, Gerhard; Rudolf, Klaus; and Engelhardt, Günther, 5,468,766, Cl. 514-403.000.
Rudzewicz, Robert G.: *See*—
Hennessee, Robert P.; Flaishans, Gary B.; Rudzewicz, Robert G.; and Barwin, David A., 5,467,605, Cl. 62-133.000.
Rueger, David C.: *See*—
Oppermann, Hermann; Ozkaynak, Engin; Kuberasampath, Thangavel; and Rueger, David C., 5,468,845, Cl. 530-387.900.
Rühling, Klaus, to Gagen Batterie AG. Charging monitor for electrical accumulators. 5,469,042, Cl. 320-17.000.
Ruhnau, Gerhard, to WABCO Westinghouse Fahrzeugbremsen GmbH. Method for generating wheel acceleration control signals and wheel deceleration control signals. 5,469,358, Cl. 364-426.020.
Runaldue, Thomas J., to Advanced Micro Devices, Inc. Network chip with auto sensing and reconfiguration. 5,469,437, Cl. 370-85.300.
Ruozi, Aldo. Hydraulically powered stalk and root shredder. 5,467,828, Cl. 171-58.000.
Ruscheinsky, Emil: *See*—
Zauns-Huber, Rudolf; Ruscheinsky, Emil; and Wolter, Fredi, 5,468,255, Cl. 8-94.220.
Rush, Tonya A.; Moehling, Steven P.; and Roback, Kenneth J., to Motorola, Inc. Antenna assembly and method therefor. 5,469,177, Cl. 343-702.000.
Russell, John T.: *See*—
Lein, Maureen M.; Eisfeller, Richard C.; Poliquin, Alfred T.; Burns, Mark; and Russell, John T., 5,468,518, Cl. 427-421.000.
Russell, Thomas: *See*—
Coulter, Wallace H.; Hollinger, John D.; Kortright, Kenneth H.; Russell, Thomas; Rodriguez, Carlos; and Paul, Ronald, 5,468,616, Cl. 435-7.200.
Russo, Joseph M.: *See*—
DeRosa, Thomas F.; Studzinski, William M.; Russo, Joseph M.; Kaufman, Benjamin J.; and Hahn, Robert T., 5,468,264, Cl. 44-426.000.
Ryan, Lowell H.: *See*—
Ryan, Michael D.; and Ryan, Lowell H., 5,468,330, Cl. 156-443.000.
Ryan, Michael D.; and Ryan, Lowell H. Apparatus for manufacturing a disposable vacuum cleaner bag. 5,468,330, Cl. 156-443.000.
Ryou, Bui K., to Hyundai Electronics Industries Co., Ltd. Method for fabricating a semiconductor memory device having a stacked capacitor cell. 5,468,670, Cl. 437-52.000.
Ryou, Bui K., to Hyundai Electronics Industries, Co. Ltd. Method for fabricating stacked capacitor of semiconductor memory device. 5,468,671, Cl. 437-52.000.
Rytter, Noel J.: *See*—
Greer, Robert D.; Henderson, Daniel E.; Hosseini, Javad; Rytter, Noel J.; and Simmons, Gerald P., 5,467,541, Cl. 37-348.000.
S.P.I. Synthetic Peptides Incorporated: *See*—
Hodges, Robert S.; Irvin, Randall T.; Paranchych, William; Sokol, Pamela A.; and Woods, Donald E., 5,468,484, Cl. 424-141.100.
Sa, Jong S.: *See*—
Choi, Jong K.; Jhung, In B.; Lee, Jae C.; Sa, Jong S.; Jo, Sung J.; and Cho, Jin H., 5,468,896, Cl. 558-233.000.
Saadatmanesh, Hamid; and Ehsani, Mohammad R. Surgical glove with removal means protected from contamination. 5,467,483, Cl. 2-161.700.
Sabb, Annmarie L.; and Stein, Reinhardt P., to American Home Products Corporation. 1-azabicycloheptane derivatives. 5,468,875, Cl. 548-512.000.
Sabo, Dianna L.: *See*—
Weber, James L.; and Sabo, Dianna L., 5,468,046, Cl. 297-238.000.
Saburoba, L. A.: *See*—
Cho, Won T.; Kim, Wan S.; Kim, Myung K.; Park, Jin K.; Kim, Hak R.; Rhee, Sang K.; Domracheva, A. G.; Panichkina, T. B.; Saburoba, L. A.; Nobikoba, L. M.; and Bartochevichi, Y. E., 5,468,637, Cl. 435-252.350.
Saether, Christian D., to Digital Equipment Corporation. Durable atomic storage update manager. 5,469,562, Cl. 395-182.180.
Safabakhsh, Ali R., to Kulicke & Soffa Investments, Inc. Unibody ultrasonic transducer. 5,469,011, Cl. 310-325.000.
Sahara, Masanori: *See*—
Powell, Bruce A.; Stanley, Jannah; Kupersmith, Bertram F.; Sahara, Masanori; Simcik, Paul; and Bahjat, Zuhair S., 5,467,844, Cl. 187-387.000.
Sahlberg, Karl M., to Vibro Industries, Inc. Vibrator for transporting articles. 5,467,859, Cl. 198-750.700.
Sahm, W. Charles: *See*—
Brandt, Everett G.; Christensen, M. Kathryn; and Sahm, W. Charles, 5,467,747, Cl. 123-198.00E.

Saifer, Mark; Somack, Ralph; and Williams, L. David, to Oxis International, Inc. Conjugates of superoxide dismutage coupled to high molecular weight polyalkylene glycols. 5,468,478, Cl. 424-78.270.
Saigo, Kaoru: *See*—
Zenno, Shuhei; Inouye, Satoshi; Kanoh, Hiromasa; and Saigo, Kaoru, 5,468,631, Cl. 435-189.000.
Saiki, Randall K.: *See*—
Erlich, Henry A.; Horn, Glenn; Saiki, Randall K.; and Mullis, Kary B., 5,468,613, Cl. 435-6.000.
Saito, Akihisa: *See*—
Aoki, Takuya; Shimasaki, Yuichi; Matsumoto, Seiji; Hascho, Seiji; Oketani, Toshikazu; Miyashita, Yukio; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,467,594, Cl. 60-276.000.
Saito, Takanori: *See*—
Amano, Yasuyuki; Ikeda, Takeshi; Aizawa, Eiji; and Saito, Takanori, 5,468,535, Cl. 428-40.000.
Saito, Toshihiko: *See*—
Fujimoto, Masahisa; Nishio, Koji; and Saito, Toshihiko, 5,468,571, Cl. 429-217.000.
Saito, Yoshiyuki: *See*—
Komishi, Akio; Sakai, Yoshitomo; Saito, Yoshiyuki; and Yoshio, Hideaki, 5,469,309, Cl. 360-85.000.
Saitoh, Yasushi; Matsumoto, Masashi; Ichihashi, Takao; and Yamada, Shuji, to Mita Industrial Co., Ltd. Image forming apparatus having a function to charge at a low main charging voltage. 5,469,243, Cl. 355-225.000.
Saitou, Tomoyuki: *See*—
Nakajima, Takeshi; Hashimoto, Ichiro; Saitou, Tomoyuki; Ohira, Fusanori; Akashi, Sueo; Sone, Nobukatu; and Nii, Katsutoshi, 5,469,008, Cl. 310-90.500.
Sakaegi, Yuji; and Ohara, Eiji, to Canon Kabushiki Kaisha. Image signal processing device with conversion of sample frequency of digital color-difference data signals. 5,469,218, Cl. 348-455.000.
Sakai, Hiroshi: *See*—
Ohwaki, Tatsuya; and Sakai, Hiroshi, 5,468,623, Cl. 435-68.100.
Ohwaki, Tatsuya; and Sakai, Hiroshi, 5,468,633, Cl. 435-212.000.
Sakai, Shuzo: *See*—
Mandai, Takahiko; Yoneyama, Masaru; and Sakai, Shuzo, 5,468,850, Cl. 536-18.500.
Sakai, Yoshitomo: *See*—
Komishi, Akio; Sakai, Yoshitomo; Saito, Yoshiyuki; and Yoshio, Hideaki, 5,469,309, Cl. 360-85.000.
Sakaki, Yoshitsugu: *See*—
Tsutsui, Tomoki; Izukawa, Tsukuru; Ohkubo, Kazuhiko; and Sakaki, Yoshitsugu, 5,468,840, Cl. 528-408.000.
Sakakibara, Shigemi: *See*—
Abe, Kazuo; Ishihara, Masashi; Ikeuchi, Hitoshi; Sugano, Shinsuke; Okuda, Toshiharu; Sakakibara, Shigemi; Shimizu, Hidetoshi; and Ichiba, Yasuaki, 5,467,846, Cl. 188-73.370.
Sakakibara, Yoshio; Gotou, Makoto; and Isaka, Haruo, to Matsushita Electric Industrial Co., Ltd. Tape medium recording and/or reproducing apparatus capable of minimizing deviation of recording position. 5,469,304, Cl. 360-13.000.
Sakamoto, Masashi: *See*—
Nasuno, Ichiro; Shibata, Mitsuru; Sakamoto, Masashi; and Koike, Kazuyoshi, 5,468,878, Cl. 549-23.000.
Shibata, Mitsuru; Sakamoto, Masashi; Koike, Kazuyoshi; and Nasuno, Ichiro, 5,468,722, Cl. 504-282.000.
Sakamoto, Takashi: *See*—
Sunaga, Takayuki; Kato, Akihiko; Sakamoto, Takashi; and Miyata, Hideaki, 5,469,246, Cl. 355-251.000.
Sakaue, Yoshinori: *See*—
Berra, Claude L.; DiMaria, Donelli J.; Miyakawa, Makoto; and Sakaue, Yoshinori, 5,468,663, Cl. 437-43.000.
Sako, Yoichiro: *See*—
Yamagami, Tamotsu; Sako, Yoichiro; and Yamamoto, Masanobu, 5,469,416, Cl. 369-48.000.
Sakoske, George E.: *See*—
Balaschak, Edward J.; Scott, Curtis E.; and Sakoske, George E., 5,468,168, Cl. 445-26.000.
Sakuma, Shuji; and Atsumi, Kiminori, to Sangi Co., Ltd. Dentifrice containing antibacterial material. 5,468,489, Cl. 424-49.000.
Sakuma, Yoshimori: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.
Sakurai, Takeshi: *See*—
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.
Saldanha-Singh, Jeanne M.: *See*—
Cheng, Kuangti T.; Murthy, Ashok; Saldanha-Singh, Jeanne M.; and Sharma, Pramod K., 5,469,247, Cl. 355-296.000.
Salerno, Mark: *See*—
Johnson, Gregory E.; Ashworth, Uriel G.; and Salerno, Mark, 5,468,216, Cl. 601-24.000.
Saliga, Thomas V. Electronic tag with source certification capability. 5,469,363, Cl. 364-478.000.
Salinas, Joe E. Pipeline testing and leak locating apparatus and method. 5,467,640, Cl. 73-40.50R.
Sallas, John J., to Atlas Fluid Controls Inc. Low inertia servo valve. 5,467,800, Cl. 137-625.650.
Salomon, James A., to Pitney Bowes Inc. Mailing machine utilizing ink jet printer. 5,467,709, Cl. 101-93.000.
Salt, Tom; and Drake, Rodney, to Microchip Technology Incorporated. Code protection in microcontroller with EEPROM fuses. 5,469,557, Cl. 395-425.000.
Salter, Robert L.; and Sollinger, Hans-Peter. Procedure for drying a paper web and a drying part for a paper machine. 5,467,534, Cl. 34-117.000.
Salvai, Nazzareno: *See*—
Blackledge, James; Salvai, Nazzareno; and Turner, James A., 5,468,348, Cl. 162-132.000.
Sambatakakis, Andreas: *See*—
Attfield, Stephen F.; and Sambatakakis, Andreas, 5,468,244, Cl. 606-90.000.
Sammet, Manfred: *See*—
Casey, Jon A.; Divakaruni, Renuka S.; Natarajan, Govindarajan; Reddy, Srinivasa S. N.; and Sammet, Manfred, 5,468,445, Cl. 419-19.000.
Samsung Electro-Mechanics Co., Ltd.: *See*—
Yoon, In J., 5,469,122, Cl. 335-214.000.
Samsung Electronics Co., Ltd.: *See*—
Bahng, Sam-yong; and Kim, Suk-ki, 5,469,086, Cl. 327-18.000.
Cho, Sung-Hee; and Lee, Hyong-Gon, 5,469,450, Cl. 371-40.400.
Jang, In-Sik, 5,469,280, Cl. 359-53.000.
Junya, Tempaku, 5,469,564, Cl. 395-188.010.
Kim, Chun T., 5,468,454, Cl. 422-121.000.
Kim, Jong-woo, 5,469,204, Cl. 347-218.000.
Lee, Joon K.; and Jeong, Hyeon J., 5,468,991, Cl. 257-666.000.
Park, Chan-Jong, 5,469,388, Cl. 365-200.000.
Yun, Jong K., 5,469,269, Cl. 358-335.000.
Samuelson, Bruce E.: *See*—
Dretzka, Philip C.; Belden, Tighe M.; Reshanov, Eugene N.; and Samuelson, Bruce E., 5,468,332, Cl. 156-527.000.
Samukawa, Seiji, to NEC Corporation. Plasma-etching method and apparatus therefor. 5,468,341, Cl. 216-69.000.
Sanada, Yotaro, to NEC Corporation. Magnetic head positioner for a magnetic disk apparatus with low load torque. 5,469,315, Cl. 360-106.000.
Sanai, Kazuko: *See*—
Seri, Kenji; Sanai, Kazuko; Negishi, Shigenori; and Akino, Toshiro, 5,468,734, Cl. 514-23.000.
Sancimino, Vincent: *See*—
Diekema, Jon M.; Steffler, Joseph B.; Van Baren, Jerald W.; and Sancimino, Vincent, 5,469,365, Cl. 364-483.000.
Sand, Theodor: *See*—
Gatfield, Ian; and Sand, Theodor, 5,468,627, Cl. 435-141.000.
Sandar Industries, Inc.: *See*—
Rodriquez, Peter A.; and Austin, Craig R., 5,467,937, Cl. 242-526.200.
Sanders, Daniel G., to Boeing Company, The. Integral forming die system for superplastic metal forming. 5,467,626, Cl. 72-60.000.
Sanders, Glen A.: *See*—
Blake, James N.; Sanders, Glen A.; and Strandjord, Lee K., 5,469,257, Cl. 356-350.000.
Sandia Corporation: *See*—
Gee, James M., 5,468,652, Cl. 437-2.000.
Sandler, Sheldon; Crandall, Alan; Schwarzkopf, Daniel; Johnson, Gilbert; and Borkowski, Rudolph, to Geo-Centers, Inc. Focused array radar. 5,469,176, Cl. 342-375.000.
Sanford Corporation: *See*—
Landis, Henry J., II; and Landis, Russel J., 5,467,893, Cl. 221-34.000.
Sangi Co., Ltd.: *See*—
Sakuma, Shuji; and Atsumi, Kiminori, 5,468,489, Cl. 424-49.000.
Sangiah, Subbiah: *See*—
Berlin, Kenneth D.; Garrison, Gregory L.; Sangiah, Subbiah; Clarke, Cyril R.; Chen, Chun-Lin; Lazzara, Ralph; Scherlag, Benjamin J.; Patterson, Eugene S.; and Burrows, George E., 5,468,858, Cl. 546-18.000.
Sankyo Seiki Mfg. Co., Ltd.: *See*—
Asama, Kiichi; and Ashibe, Hiroo, 5,469,005, Cl. 310-68.00B.
Sankyo Seisakusho Co.: *See*—
Kato, Heizaburo, 5,467,633, Cl. 72-452.000.
Kato, Heizaburo, 5,467,706, Cl. 100-282.000.
Sano, Hironari: *See*—
Yazaki, Takao; Noro, Masataka; Matsui, Takashi; Kobayashi, Noriyuki; Sano, Hironari; and Yamamoto, Koji, 5,468,444, Cl. 264-566.000.
Sanofi: *See*—
Coude, Francois X.; Fournier, Jacqueline; and Guzzi, Umberto, 5,468,753, Cl. 514-277.000.
Sansha Electric Manufacturing Co., Ltd.: *See*—
Nishio, Hisashi; Arai, Toru; Nishizuka, Masaru; and Makitani, Atsushi, 5,469,350, Cl. 363-55.000.
Sansone, Ronald P.: *See*—
Hunt, William M.; and Sansone, Ronald P., 5,469,362, Cl. 364-478.000.
Santangelo, Francesco: *See*—
Casagrande, Cesare; Montanari, Stefania; and Santangelo, Francesco, 5,468,746, Cl. 514-235.500.
Sanwa Kagaku Kenkyusho Co., Ltd.: *See*—
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Sato, Makoto; Oowaki, Hiroyuki; Kato, Bunkichi; and Takahashi, Haruo, 5,468,728, Cl. 514-12.000.

Sanyo Electric Co., Ltd.: *See*—
Fujimoto, Masahisa; Nishio, Koji; and Saito, Toshihiko, 5,468,571, Cl. 429-217.000.
Sekigami, Kunie; Nagae, Kouji; and Shimotani, Makoto, 5,467,604, Cl. 62-117.000.
Takahashi, Ryoichi; Okawa, Katsumi; and Igarashi, Yusuke, 5,469,131, Cl. 338-306.000.
Takee, Masao; Kimoto, Mamoru; Tikano, Yoshito; Mizitaki, Husago; Mastuura, Yoshinori; Nishio, Koji; and Furukawa, Nobohiro, 5,468,260, Cl. 29-623.500.
Sartorius AG: *See*—
Goddard, Norman H.; and Schaefer, Peter, 5,468,388, Cl. 210-321.750.
Sasaki, Kazuhito, to Kabushiki Kaisha Toshiba. Money processing apparatus having timer means. 5,468,941, Cl. 235-379.000.
Sasaki, Keiji: *See*—
Kamada, Kenji; Sasaki, Keiji; Kitamura, Noboru; and Masuhara, Hiroshi, 5,469,255, Cl. 356-300.000.
Sasaki, Masahiko; Tsuchiya, Yasutoshi; and Fukunaga, Hidetoshi, to Kabushiki Kaisha Toshiba. Air conditioning apparatus capable of operating in cooling mode and heating mode. 5,467,606, Cl. 62-160.000.
Sasaki, Norio; Kudo, Sachio; Watanabe, Michi; Endo, Keiji; and Kawaguchi, Shinji, to Mitsubishi Petrochemical Co., Ltd. Phenoxymethylpyrimidine derivative and use thereof as herbicide. 5,468,721, Cl. 504-243.000.
Sasaki, Takayuki: *See*—
Kubota, Yukio; Sasaki, Takayuki; Takahashi, Takao; and Kobayashi, Hiroshi, 5,469,272, Cl. 358-335.000.
Sasaki, Toshio; and Tanaka, Toshihiro, to Hitachi, Ltd. Semiconductor memory system with the function of the replacement to the other chips. 5,469,390, Cl. 365-200.000.
Sasko, Jeffry P.: *See*—
Mencarelli, Ron; and Sasko, Jeffry P., 5,467,704, Cl. 100-131.000.
Sato, Hideaki: *See*—
Oshima, Katsuyuki; Kutsukake, Masaki; Sato, Hideaki; and Sudo, Kenichiro, 5,468,714, Cl. 503-227.000.
Sato, Hideki: *See*—
Hirao, Toru; Sato, Hideki; and Kanbe, Toshio, 5,467,863, Cl. 198-360.000.
Sato, Hiroshi, to Toyo Denso Kabushiki Kaisha. Switch device. 5,468,926, Cl. 200-558.000.
Sato, Kazuma: *See*—
Go, Shintetsu; Kashizaki, Yoshio; Suzuki, Koichi; Sato, Kazuma; and Shimada, Akira, 5,468,584, Cl. 430-65.000.
Sato, Kazumi, to Fujitsu Limited. Transmission line control system and interface unit therefor. 5,469,427, Cl. 370-16.000.
Sato, Koki, to Juki Corporation. Apparatus and method of enclosing and sealing enclosure. 5,467,577, Cl. 53-468.000.
Sato, Makoto: *See*—
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Sato, Makoto; Oowaki, Hiroyuki; Kato, Bunkichi; and Takahashi, Haruo, 5,468,728, Cl. 514-12.000.
Sato, Masahiko: *See*—
Dodge, Jeffrey A.; and Sato, Masahiko, 5,468,773, Cl. 514-453.000.
Sato, Shizuo. Multiple structure paper protector and the apparatus for its production. 5,467,875, Cl. 206-588.000.
Sato, Toshiro; Tanaka, Tomoharu; Mizoguchi, Tetsuhiko; and Ide, Yuji, to Kabushiki Kaisha Toshiba. Semiconductor memory, memory card, and method of driving power supply for EEPROM. 5,469,399, Cl. 365-226.000.
Sato, Yasuo: *See*—
Yanagihara, Hiromichi; Sato, Yasuo; and Kawaguchi, Akio, 5,467,757, Cl. 123-305.000.
Sato, Yasushi; and Ohsawa, Nobuhiko, to Sony Corporation. Image-sensing-system booster circuit for driving image sensor. 5,469,484, Cl. 377-58.000.
Sato, Yasuyuki: *See*—
Shinoda, Masahisa; Egusa, Naoyuki; Sato, Yasuyuki; and Koike, Manabu, 5,469,423, Cl. 369-112.000.
Sato, Yoshiro: *See*—
Kojima, Ryo; Sato, Yoshiro; and Nagasawa, Takeshi, 5,468,621, Cl. 435-25.000.
Sato, Youichi: *See*—
Nishihara, Motoo; Kurano, Takatoshi; Yamanaka, Naoaki; and Sato, Youichi, 5,469,543, Cl. 395-200.060.
Sato, Yuta: *See*—
Itoh, Junichi; Sato, Yuta; Matsuzaki, Minoru; Hamada, Masaharu; and Imai, Yuji, 5,469,237, Cl. 354-106.000.
Satoh, Isao; Takagi, Yuji; and Hisakado, Yuji, to Matsushita Electric Industrial Co., Ltd. Optical information write/read device and method for writing data. 5,469,418, Cl. 369-54.000.
Satoh, Kouichi: *See*—
Takada, Minoru; Satoh, Kouichi; Yokobayashi, Kazuyuki; and Ogihara, Shuichi, 5,468,443, Cl. 264-537.000.
Satoma, Shiro: *See*—
Fujita, Shuji; Baba, Yasushi; Itoh, Hitoshi; and Satoma, Shiro, 5,467,725, Cl. 112-162.000.
Sattelmayer, Thomas: *See*—
Haumann, Jurgen; Knopfli, Alfred; Sattelmayer, Thomas; and Tresch, Rudolf, 5,467,815, Cl. 165-109.100.
Satter, Sohail; and Polsky, Steven E., to Voiceplex Corporation. Method and apparatus for delivering calling services. 5,469,500, Cl. 379-201.000.
Sauer Inc.: *See*—
Welscher, William L., 5,467,598, Cl. 60-436.000.
Sauer, Jude S.; Oravecz, Michael G.; Greenwald, Roger J.; and Kobilansky, Alexander L., to United States Surgical Corporation. Optical trocar. 5,467,762, Cl. 600-114.000.
Sauer, Ralf; Kraut-Reinkober, Stefan; Helmes, Ludger; and Hoyer, Werner, to Vorwerk & Co. Interbolding GmbH. Dust filter bag for a vacuum cleaner. 5,468,271, Cl. 55-357.000.
Sauerwein, Heinrich; Arm, Wolfgang; and Witt, Jan, to ACO Severin Ahlmann GmbH & Co., KG. Means for securing a cover over a drainage channel. 5,468,096, Cl. 405-36.000.
Saunders, Eugene K. Clamp for conduit sections. 5,468,092, Cl. 403-385.000.
Saunders, Roger L., to Lockheed Sanders, Inc. Parachute array. 5,469,407, Cl. 367-173.000.
Saunders, Rowland F.: *See*—
Smith, James A.; Ellis, Matthew; Saunders, Rowland F.; and Hall, Anne L., 5,467,770, Cl. 128-661.080.
Sauri, Gregory M. Multiple configuration tailgate extender. 5,468,038, Cl. 296-57.100.
Sausner, Andreas; and Knapp, Stefan, to Firma Carl Freudenberg. Electromagnetically actuated valve. 5,467,961, Cl. 251-129.150.
Savage, Chester: *See*—
Stricklin, Douglas K.; and Savage, Chester, 5,467,806, Cl. 141-346.000.
Savini, Giuseppe: *See*—
Da Lio, Joseph; Lanzavecchia, Laura; and Savini, Giuseppe, 5,468,817, Cl. 526-79.000.
Sawada, Kazuo: *See*—
Nishio, Masanobu; Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,468,557, Cl. 428-384.000.
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Sato, Makoto; Oowaki, Hiroyuki; Kato, Bunkichi; and Takahashi, Haruo, to Sanwa Kagaku Kenkyusho Co., Ltd. Use of orally absorbable motilin preparations to enhance motility of digestive tract. 5,468,728, Cl. 514-12.000.
Sawka, Raymond M.: *See*—
Ho, Chia-Tie; McMullen, Carl W.; and Sawka, Raymond M., 5,468,532, Cl. 428-40.000.
Saxena, Nirmal, to HaL Computer Systems, Inc. Method and apparatus for testing random access memory. 5,469,443, Cl. 371-21.300.
Saxena, Sanjeev: *See*—
McGill, James K., III; Abele, Dorotea; Colman, Lonnie L.; Gonsalves, Manuel; and Saxena, Sanjeev, 5,469,573, Cl. 395-700.000.
Saxena, Vinod K., to Advanced Milliwave Laboratories, Inc. Loss less RF feedback for power amplifier linearizatioo. 5,469,114, Cl. 330-107.000.
Sayanagi, Kazuya: *See*—
Okada, Takekazu; Maruyama, Yuichi; and Sayanagi, Kazuya, 5,469,130, Cl. 333-246.000.
Scarpitta, Alain A.; Boucher, Didier; and Grosso, Gilles, to L'Etat Francais represente par le Deleque General pour l'Armement. Method of emitting very low frequency high power acoustic waves, and corresponding transducers therefor. 5,469,406, Cl. 367-171.000.
Schadewald, Mary B.; and Vanevenhoven, Peter W., to Eli Lilly and Company. Tylosin animal feed premix. 5,468,735, Cl. 514-30.000.
Schaefer, Peter: *See*—
Goddard, Norman H.; and Schaefer, Peter, 5,468,388, Cl. 210-321.750.
Schaeffer, Alain E. E., to Laboratoires Glaxo S.A. Effervescent pharmaceutical compositions. 5,468,504, Cl. 424-466.000.
Schaeffer, Hans A.: *See*—
Calam, Henry D.; and Schaeffer, Hans A., 5,468,482, Cl. 424-195.100.
Schafer, Klaus: *See*—
Binner, Tobias; and Schafer, Klaus, 5,469,149, Cl. 34-677.000.
Schaffer, Larry. Universal transmission tester. 5,467,644, Cl. 73-118.100.
Schaller, David A.: *See*—
Wheetley, Michael J.; and Schaller, David A., 5,468,099, Cl. 408-1.00R.
Schamesberger, Robert, to Isosport Verbundbauteile Gesellschaft m.b.H. Process for producing a ski coating strip made of ultra high molecular-weight polyethylene. 5,468,543, Cl. 428-220.000.
Scheiding, Silke: *See*—
Herzig, Christian; and Scheiding, Silke, 5,468,890, Cl. 556-12.000.
Scheithauer, Michael J.: *See*—
Dorfman, Leonid P.; Scheithauer, Michael J.; Houck, David L.; and Kopatz, Nelson E., 5,468,457, Cl. 423-61.000.
Schenke, Thomas: *See*—
Petersen, Uwe; Himmler, Thomas; Schenke, Thomas; Krebs, Andreas; Grohe, Klaus; Bremm, Klaus-Dieter; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 5,468,742, Cl. 514-187.000.
Schepp, Michael, to Hofmann Maschinenbau GmbH. Clamp assembly for testing and/or measuring unit activated upon inflation of a pneumatic tire. 5,467,647, Cl. 73-146.000.
Scherbarth, John F.: *See*—
Pettersen, Tor H.; Scherbarth, John F.; and Hobbs, Bobby L., 5,469,345, Cl. 362-188.000.
Scherlag, Benjamin J.: *See*—
Berlin, Kenneth D.; Garrison, Gregory L.; Sangiah, Subbiah; Clarke, Cyril R.; Chen, Chun-Lin; Lazzara, Ralph; Scherlag, Benjamin J.; Patterson, Eugene S.; and Burrows, George E., 5,468,858, Cl. 546-18.000.
Scheurer, Robert S.: *See*—
Perry, Michael L., 5,467,891, Cl. 220-739.000.
Schiefer, Klaus B.; and Swami, Arun N., to International Business Machines Corporation. Method for choosing largest selectivities among eligible predicates of join equivalence classes for query optimization. 5,469,568, Cl. 395-600.000.

Schichler, Guy A.; Caufield, Craig E.; Senko, Nancie A.; and VonBurg, Gregory F., to American Home Products Corporation. Tetronic, thiotetronic and tetramic acid derivatives as phospholipase A_2 inhibitors. 5,468,774, Cl. 514-471.000.

Schiel, Christian, to J. M. Voith GmbH. paper machine wire and pressing sections with impervious pressing belt. 5,468,349, Cl. 162-358.300.

Schiessl, Henry W.: *See*—
Hani, Rahim; Dumas, Richard H.; Gavin, David F.; Harrison, Charles H.; Kennedy, Michael A.; Schiessl, Henry W.; McMahon, Robert E.; and Manke, Steven A., 5,468,864, Cl. 546-345.000.

Schill, Joseph G.: *See*—
Bowlin, Geoffrey R.; Schill, Joseph G.; and Henzel, Alexander A., 5,467,628, Cl. 72-126.000.

Schilling, Donald L., to Interdigital Technology Corporation. Overlaying spread-spectrum satellite system and method. 5,469,468, Cl. 375-200.000.

Schlamp, Hans, to Accumulata Verwaltungsgesellschaft GmbH. Vending device. 5,467,892, Cl. 221-7.000.

Schlarb, John M.: *See*—
Briese, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Fouquet, Christophe J. A.; and Lowe, Coy S., 5,469,049, Cl. 324-76.770.

Schleder, William E.; and Eggleston, Albert D., to BF Goodrich FlightSystem, Inc. Calibration method and apparatus for receiving transponder reply signals. 5,469,172, Cl. 342-174.000.

Schleich, Donald M.: *See*—
Bensalem, Azzedine; Deevi, Sarojini; Deevi, Seetharama C.; and Schleich, Donald M., 5,468,266, Cl. 44-542.000.

Schloegl, Gunter: *See*—
Peiffer, Herbert; Murschall, Ursula; and Schloegl, Gunter, 5,468,527, Cl. 428-35.700.

Schlotzhauer, Ed. O.: *See*—
Kerschner, Ronald K.; Heumann, John M.; McDermid, John E.; Schlotzhauer, Ed. O.; and Crook, David T., 5,469,064, Cl. 324-537.000.

Schlueter, Edward L., Jr.: *See*—
Finsterwal, Robert N.; Carlston, Richard L.; Schlueter, Edward L., Jr.; and Sharf, Lucille M., 5,468,834, Cl. 528-76.000.

Schlumberger Industries, Inc.: *See*—
Briese, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Fouquet, Christophe J. A.; and Lowe, Coy S., 5,469,049, Cl. 324-76.770.

Schlumberger Technology Corporation: *See*—
Babour, Kamal; Belani, Ashok K.; and Pilla, Jacques, 5,467,823, Cl. 166-250.010.
Orban, Jacques; and Richardson, Neil W., 5,467,832, Cl. 175-45.000.

Schlup, Raphael; and Lioutas, Theodore S., to Kraft Jacobs Suchard. Process for producing water-containing milk chocolate. 5,468,509, Cl. 426-548.000.

Schmalstieg, Lutz; Kremer, Wolfgang; Brahm, Martin; Probst, Joachim; and Kubitza, Werner, to Bayer Aktiengesellschaft. Water-soluble or water-dispersible polyisocyanate composition, a process for its preparation and its use in coating compositions. 5,468,804, Cl. 524-591.000.

Schmalstieg, Lutz: *See*—
Schwindt, Jürgen; Hentschel, Karl-Heinz; and Schmalstieg, Lutz, 5,468,833, Cl. 528-67.080.

Schmertzler, Michael: *See*—
Pinsky, Howard; Sheldon, Scott S.; Christakis, Nicholas A.; and Schmertzler, Michael, 5,469,353, Cl. 364-413.010.

Schmid, Christopher J.: *See*—
Flinchbaugh, Bernadette M.; Paley, Harold R.; Knaub, John E.; Schmid, Christopher J.; and Melnyk, Adrian L., 5,468,156, Cl. 439-157.000.

Schmid, Georg: *See*—
Rohrhiursch, Ulrich; and Schmid, Georg, 5,468,209, Cl. 493-424.000.

Schmid, Karl-Heinz; Bongardt, Frank; and Wuest, Reinhold, to Henkel Kommanditgesellschaft auf Aktien. Mixtures of esters of highly branched carboxylic acids. 5,468,406, Cl. 252-56.00S.

Schmid, Karl-Heinz: *See*—
Klein, Johann; Bongardt, Frank; and Schmid, Karl-Heinz, 5,468,405, Cl. 252-56.00R.

Schmidlin, Thomas J.: *See*—
Eyman, David; and Schmidlin, Thomas J., 5,468,009, Cl. 280-650.000.

Schmidt, Bradley R. Discrete string damper for a guitar. 5,467,679, Cl. 84-312.00R.

Schmidt, Heinz: *See*—
Schönberger, Eduard; Gruber, Stefan; Kasowski, Hermann; and Schmidt, Heinz, 5,468,909, Cl. 174-16.100.

Schmierer, Uwe, to Branofilter GmbH. Filter bag for vacuum cleaners. 5,468,272, Cl. 55-367.000.

Schmitz, Gerd: *See*—
Boehmke, Günther; and Schmitz, Gerd, 5,468,838, Cl. 528-363.000.

Schnaars, Daniel R.; and Curtis, Randall H. Bulk bag with internal baffles. 5,468,528, Cl. 428-35.700.

Schneider (Europe) A.G.: *See*—
Kastenhofer, Gerhard, 5,467,873, Cl. 206-363.000.

Schneider, Norbert: *See*—
Müller, Ingo; and Schneider, Norbert, 5,467,494, Cl. 15-22.100.

Schnepf, H. Ernest: *See*—
Payne, Jewel M.; Cannon, Raymond J. C.; Schnepf, H. Ernest; and Schwab, George E., 5,468,636, Cl. 435-252.300.

Schoenborn, Philippe: *See*—
Patrick, Roger; Schoenborn, Philippe; Franklin, Mark; and Bose, Frank, 5,468,296, Cl. 118-723.0MP.

Schohe-Loop, Rudolf; Heine, Hans-Georg; Junge, Bodo; Glaser, Thomas; De Vry, Jean M. V.; Dompert, Wolfgang; and Sommermeyer, Henning, to Bayer Aktiengesellschaft. 2-aminomethyl-chromans. 5,468,882, Cl. 549-407.000.

Scholle Corporation: *See*—
Stricklin, Douglas K.; and Savage, Chester, 5,467,806, Cl. 141-346.000.

Schönberger, Eduard; Gruber, Stefan; Kasowski, Hermann; and Schmidt, Heinz, to Siemens Aktiensesellschaft. Insulating part with improved heat transfer element. 5,468,909, Cl. 174-16.100.

Schöner, Wolfgang. Implantable catheter made of high cold flow material. 5,468,221, Cl. 604-8.000.

Schooler, Tim C.: *See*—
Erickson, Paul R.; and Schooler, Tim C., 5,469,201, Cl. 347-85.000.

Schork, Reinhold: *See*—
Rauleder, Hartwig; Standke, Burkhard; Kötzsch, Hans-Joachim; and Schork, Reinhold, 5,468,705, Cl. 502-151.000.
Rauleder, Hartwig; Standke, Burkhard; Kötzsch, Hans-Joachim; and Schork, Reinhold, 5,468,706, Cl. 502-151.000.

Schrader, Lutz; Jakob, Hans-Dieter; Müller, Hanns-Peter; and Niggemann, Johann, to Bayer Aktiengesellschaft. Heat-curable reaction resin mixtures and the use thereof. 5,468,832, Cl. 528-53.000.

Schraga, Steven. Hypodermic dosage measuring device. 5,468,233, Cl. 604-207.000.

Schrandt, Henry M.: *See*—
Clavin, J. Steven; Peters, Bradley J.; and Schrandt, Henry M., 5,468,377, Cl. 210-167.000.

Schreiter, Mark E.: *See*—
Brandner, James M.; Manulik, Robert J.; Meyer, Arthur J., III; and Schreiter, Mark E., 5,469,436, Cl. 370-85.200.

Schriever, Matthias P. Non-chromated oxide coating for aluminum substrates. 5,468,307, Cl. 148-261.000.

Schroeder, Daniel R.: *See*—
Lam, Kin S.; Schroeder, Daniel R.; Mattei, Jacqueline; Forenza, Salvatore; and Matson, James A., 5,468,849, Cl. 536-18.500.

Schroeder, Juergen: *See*—
Ebel, Klaus; Schroeder, Juergen; Groening, Carsten; Dockner, Toni; and Merkle, Hans R., 5,468,871, Cl. 548-373.100.

Schubring, Gary L.: *See*—
Marsh, David J.; and Schubring, Gary L., 5,467,507, Cl. 24-298.000.

Schuetz, Franz: *See*—
Wenderoth, Bernd; Brand, Siegbert; Schuetz, Franz; Kuekenhoehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,468,717, Cl. 504-130.000.

Schuler, Roland: *See*—
Litenas, Michael; and Schuler, Roland, 5,468,916, Cl. 174-127.000.

Schulthess, Adrian: *See*—
Steinmann, Bettina; Wolf, Jean-Pierre; Schulthess, Adrian; and Hunziker, Max, 5,468,886, Cl. 549-549.000.

Schultz, Darald R.: *See*—
Koenck, Steven E.; Miller, Phillip; and Schultz, Darald R., 5,468,948, Cl. 235-472.000.

Schulze, Walter A.: *See*—
Stangle, Gregory C.; Venkatachari, Koththavasal R.; Ostrander, Steven P.; and Schulze, Walter A., 5,468,427, Cl. 264-3.400.

Schumann, Herbert: *See*—
Pohl, Ludwig; Poetsch, Fike; Schumann, Herbert; Weiss, Karin; Thiele, Karl-Heinz; and Hirsch, Hans-Ludwig, 5,468,707, Cl. 502-153.000.

Schuster, William: *See*—
Haut, Paul R.; and Schuster, William, 5,469,346, Cl. 362-205.000.

Schütte, Walter: *See*—
Steger, Lothar; Syrowatka, Horst; and Schütte, Walter, 5,468,288, Cl. 106-243.000.

Schutz, udo, to Schutz-Werke GmbH & Co. KG. Metal container for transport and storage of liquids. 5,467,884, Cl. 220-1.500.

Schutz-Werke GmbH & Co. KG: *See*—
Schutz, udo, 5,467,884, Cl. 220-1.500.

Schwab, George E.: *See*—
Payne, Jewel M.; Cannon, Raymond J. C.; Schnepf, H. Ernest; and Schwab, George E., 5,468,636, Cl. 435-252.300.

Schwald, Günther, to Sulzer Chemtech AG. Packing element for methods of exchange or conversion of materials designed as a heat-transfer element. 5,467,817, Cl. 165-167.000.

Schwartz, Joyce G.: *See*—
Phillips, William T.; Schwartz, Joyce G.; and Green, Gary M., 5,468,727, Cl. 514-12.000.

Schwartz, Laurie D.: *See*—
Emery, Mark J.; Tucker, Brenda N.; and Schwartz, Laurie D., 5,469,496, Cl. 379-58.000.

Schwarzkopf, Daniel: *See*—
Sandler, Sheldon; Crandall, Alan; Schwarzkopf, Daniel; Johnson, Gilbert; and Borkowski, Rudolph, 5,469,176, Cl. 342-375.000.

Schwimmer, Jeffrey: *See*—
Gawin, Frank H.; Byck, Robert; Alderdice, Marc; and Schwimmer, Jeffrey, 5,468,749, Cl. 514-252.000.

Schwindt, Jürgen; Hentschel, Karl-Heinz; and Schmalstieg, Lutz, to Bayer Aktiengesellschaft. Moisture curing, one-component coating compositions and their use for the production of coatings. 5,468,833, Cl. 528-67.000.

Scibienski, Robert: *See*—
Gevas, Philip C.; Grimes, Stephen; Karr, Stephen L.; Michaeli, Dov; and Scibienski, Robert, 5,468,494, Cl. 424-195.110.

Science Incorporated: *See*—

Kriesel, Marshall S., 5,468,226, Cl. 604-132.000.

Science Research Laboratory: *See*—
Shefer, Ruth E.; Klinkowstein, Robert E.; Hughey, Barbara J.; Welch, Michael J.; and Dence, Carmen S., 5,468,355, Cl. 204-157.200.

Scime, Danya. Auxiliary safety harness. 5,468,020, Cl. 280-808.000.

Scitex Digital Printing, Inc.: *See*—
Stephens, David J., 5,469,202, Cl. 347-90.000.

Scopazzi, Christopher: *See*—
Antonelli, Joseph A.; and Scopazzi, Christopher, 5,468,801, Cl. 524-504.000.

Scopelianos, Angelo G.: *See*—
Bezwada, Rao S.; and Scopelianos, Angelo G., 5,468,253, Cl. 606-230.000.

Scordamaglia, Raimondo: *See*—
Morini, Giampiero; Albizzati, Enrico; Giannini, Umberto; Scordamaglia, Raimondo; and Barino, Luisa, 5,468,704, Cl. 502-115.000.

Scott, Curtis E.: *See*—
Balaschak, Edward J.; Scott, Curtis E.; and Sakoske, George E., 5,468,168, Cl. 445-26.000.

Scott, Danny E.: *See*—
Grimes, Robert E.; Scott, Danny E.; and Pessier, Rudolf C. O., 5,467,836, Cl. 175-401.000.

Scott, Kenneth R.; Nicholson, Jesse M.; and Edafiogho, Ivan O., to Howard University. Enaminone esters. 5,468,775, Cl. 514-541.000.

Scott, Michael; Browning, David; and Holt, Michael, to Silicon Systems, Inc. Selectable width, brustable FIFO. 5,469,398, Cl. 365-221.000.

Scott, Michael C.: *See*—
Paz de Araujo, Carlos A.; Scott, Michael C.; Cuchiaro, Joseph D.; and McMillan, Larry D., 5,468,679, Cl. 437-110.000.

Scruggs, William M., to Engineered Resources, Inc. Rope braking device. 5,467,845, Cl. 188-65.200.

Seagate Technology, Inc.: *See*—
Flint, Alan; Nguyen, Quy; and Jacobs, William G., 5,468,111, Cl. 414-416.000.
Madsen, Timothy A.; and Machelski, Russell J., 5,469,305, Cl. 360-51.000.

Seakins, Paul J.: *See*—
Gradon, Lewis; Clark, Andrew B.; and Seakins, Paul J., 5,468,961, Cl. 250-343.000.

Seaman, Burton J., to General Electric Company. Method for assembling and calibrating a condition-responsive electric switch mechanism. 5,467,523, Cl. 29-622.000.

Seaman, Peter E.; and Stottlemyer, Thomas R., to United States of America, Navy. Electro-optical coaxial tow cable. 5,468,913, Cl. 174-102.00R.

Seamans, James D.; Adams, Charles T.; Dominguez, Wendy B.; and Chen, Andrew A.-J., to Shell Oil Company. Process of hydrotreating and/or hydrocracking hydrocarbon streams or tail gas treating sulfur-containing gas streams. 5,468,372, Cl. 208-216.00R.

Seamons, Kenneth R.: *See*—
Nicolson, Paul C.; Seamons, Kenneth R.; Tsao, Fu-Pao; Alvord, Larry A.; and McCraw, Earl C., Jr., 5,468,448, Cl. 422-30.000.

Searle, John G., to Rolls-Royce plc. Friction welding. 5,468,334, Cl. 156-580.000.

Sears Manufacturing Company: *See*—
Riedel, John; and Grubaugh, James, 5,468,070, Cl. 384-127.000.

Seeley, William P.: *See*—
Barboza, Steven D.; Seeley, William P.; and Shucosky, Anthony C., 5,468,397, Cl. 210-798.000.

Seeman, Nadrian C.; and Zhang, Yuwen, to New York University. Construction of geometrical objects from polynucleotides. 5,468,851, Cl. 536-22.100.

Seetharaman, Viswanath; and Reuter, David F., to General Motors Corporation. Two-position three-way solenoid valve. 5,467,797, Cl. 137-599.000.

Sega, S.A.: *See*—
Hermo, Eduardo M., 5,468,001, Cl. 273-434.000.

Segura Salvador, Silvia B.: *See*—
del Mar Segura Salvador, Maria; and Segura Salvador, Silvia B., 5,467,934, Cl. 2.42-421.400.

Seibutsu Kagaku Kenkyujo: *See*—
Mandai, Takahiko; Yoneyama, Masaru; and Sakai, Shuzo, 5,468,850, Cl. 536-18.500.

Seikagaku Kogyo Kabushiki Kaisha(Seikagaku Corporation): *See*—
Naganuma, Masateru, 5,468,232, Cl. 604-200.000.

Seiko Communications Holding N.V.: *See*—
Owen, Jeffrey R., 5,469,411, Cl. 368-47.000.

Seiko Electronic Components Ltd.: *See*—
Kawashima, Hirofumi, 5,469,010, Cl. 310-312.000.

Seiko Epson Corporation: *See*—
Aruga, Tomoe; Yokouchi, Hideya; and Fujimori, Kazuyoshi, 5,469,421, Cl. 369-75.100.
Asai, Naoki; Morozumi, Choji; Ito, Yoshikazu; Ito, Kiyoshi; and Koyabu, Akira, 5,468,078, Cl. 400-215.000.
Murakoshi, Keiji; Nebashi, Mitsuhiko; Ikegami, Makoto; and Otsuki, Noboru, 5,468,079, Cl. 400-521.000.
Shu, Joseph S., 5,469,276, Cl. 358-534.000.
Takeda, Koji, 5,469,561, Cl. 395-550.000.
Takeuchi, Kesatoshi, 5,469,221, Cl. 348-564.000.

Sekhar, Jainagesh A.; Subramanian, V.; and Canarslan, Necip S., to University of Cincinnati. Combustible slurry for joining metallic or ceramic surfaces or for coating metallic, ceramic and refractory surfaces. 5,468,690, Cl. 501-1.000.

Seki, Nobuhiro, to International Technical Illustration Co., Ltd. Method of tracing a drawing and apparatus for embodying the method. 5,469,537, Cl. 395-133.000.

Sekigami, Kunie; Nagae, Kouji; and Shimotani, Makoto, to Sanyo Electric Co., Ltd. Multiroom air conditioner and driving method therefor. 5,467,604, Cl. 62-117.000.

Sekiguchi, Akihisa: *See*—
Chen, Lee; Podlesnik, Dragan; and Sekiguchi, Akihisa, 5,468,955, Cl. 250-251.000.

Sekiguchi, Susumu: *See*—
Inoue, Yoshio; Sekiguchi, Susumu; and Igarashi, Minoru, 5,468,830, Cl. 528-26.000.

Seleninov, Kazimir: *See*—
Evseev, Yury; Rachinsky, Lubomir; Tetervova, Natalia; Seleninov, Kazimir; Dermenzhi, Evgeniy; Nasekaa, Olga; Druyanova, Eva; and Ribak, Roman, 5,468,976, Cl. 257-177.000.

Self, Colin H., to Cambridge Patent Developments Limited. Method for determining haptens, use of method and components useful in method. 5,468,651, Cl. 436-548.000.

Seligmann, Daniel A.; Moss, William C.; Valk, Theodore C.; and Conder, Alan D., to United States of America, Energy. Compact self-contained electrical-to-optical converter/transmitter. 5,469,442, Cl. 370-110.400.

Sellman, George: *See*—
Ghazarian, John, 5,469,141, Cl. 340-566.000.

Selvaggio, John J. Adjustable document holder stand. 5,467,958, Cl. 248-449.000.

Semiconductor Energy Laboratory Co., Ltd.: *See*—
Inushima, Takashi; and Vaitkus, Rimantas, 5,469,424, Cl. 369-120.000.
Yamazaki, Shunpei, 5,468,653, Cl. 437-4.000.
Yamazaki, Shunpei; Zhang, Hongyong; and Takamura, Yasuhiko, 5,468,987, Cl. 257-412.000.

Senior Engineering Company: *See*—
DeMarsh, Peter L.; and Crawford, William W., 5,467,824, Cl. 166-297.000.

Senko, Nancie A.: *See*—
Schiehser, Guy A.; Caufield, Craig E.; Senko, Nancie A.; and VonBurg, Gregory F., 5,468,774, Cl. 514-471.000.

Senoh, Masayuki: *See*—
Nakamura, Shuji; Iwasa, Naruhito; and Senoh, Masayuki, 5,468,678, Cl. 437-107.000.

Sensormatic Electronics Corporation: *See*—
Bergman, Adam S.; and Drew, Douglas A., 5,469,142, Cl. 340-572.000.
Liu, Nen-chin; Liao, Ming-Ren; and Cantey, Jimmy, 5,469,140, Cl. 340-551.000.

Seayei, Andrew E.; and Casal, David C., to Adeza Biomedical Corporation. Screening method for identifying women at increased risk for imminent delivery. 5,468,619, Cl. 435-7.940.

Senyk, Myron I.: *See*—
Blind, Henry F.; Campagne, Anthony J.; Czekaj, James L.; Difiore, Nicholas L.; Geddes, Earl R.; Krochmal, Andrew C.; and Senyk, Myron I., 5,469,510, Cl. 381-55.000.

Senzaki, Takashi: *See*—
Yamashita, Hiroyuki; Kondo, Hiroyuki; Hatano, Kouichi; Nakano, Katsunori; Toyoda, Kouji; and Senzaki, Takashi, 5,468,516, Cl. 427-180.000.

Seo, Jung Y., to Goldstar Electron Co., Ltd. Carbon brush for discharging static electricity. 5,469,322, Cl. 361-220.000.

Sepke, Arnold L., to White Consolidated Industries, Inc. Vacuum cleaner with illuminated belt view. 5,467,501, Cl. 15-324.000.

Sereno, Daniele: *See*—
Drogo de Iacovo, Rosario; Montagna, Roberto; and Sereno, Daniele, 5,469,527, Cl. 395-2.290.

Seri, Hajime; Yamamura, Yasuharu; Tsuji, Yoichiro; Moriwaki, Yoshio; and Iwaki, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Hydrogen storage alloy electrodes. 5,468,309, Cl. 148-421.000.

Seri, Kenji; Sanai, Kazuko; Negishi, Shigenori; and Akino, Toshiro, to Godo Shusei Co., Ltd. Prophylactic and remedial preparation for diseases attendant on hyperglycemia, and wholesome food. 5,468,734, Cl. 514-23.000

Serpico, Joseph: *See*—
Ehrenberg, Scott G.; Serpico, Joseph; Wnek, Gary E.; and Rider, Jeffrey N., 5,468,574, Cl. 429-33.000.

Servojet Electronic Systems, Ltd.: *See*—
Beck, Niels J.; Pena, James A.; Roach, Alan R.; and Johnston, Bevan H., 5,467,754, Cl. 123-467.000.

Seshadri, Nambirajan: *See*—
Neuhoff, David L.; Pappas, Thrasyvoulos N.; and Seshadri, Nambirajan, 5,469,268, Cl. 358-298.000.

Sevack, Lloyd: *See*—
Lee, Leonard G.; Lynn, John S.; McLean, Francis A.; Tucker, Edwin C.; and Sevack, Lloyd, 5,467,972, Cl. 269-118.000.

Sextant Avionique: *See*—
Baudou, Joël; and Vitte, Vincent, 5,467,480, Cl. 2-6.500.

SGS-Thomson Microelectronics, Inc.: *See*—
Slemmer, William C., 5,469,116, Cl. 331-74.000.

SGS-Thomson Microelectronics, S.A.: *See*—
Bourgeois, Jean-Marie, 5,469,041, Cl. 318-810.000.
Le Roux, Gérard; and Le Menn, Jacques, 5,468,673, Cl. 437-60.000.
Letort, Xavier, 5,468,297, Cl. 118-728.000.
Wuidart, Sylvie; and Do, Tien-Dung, 5,469,100, Cl. 327-262.000.
Yero, Emilio, 5,469,382, Cl. 365-185.200.

SGS-Thomson Microelectronics S.r.l.: *See*—

Frisina, Ferruccio; and Ferla, Giuseppe, 5,468,660, Cl. 437-31.000.
Nessi, Maurizio, 5,469,094, Cl. 327-110.000.
Nessi, Maurizio; and Fucili, Giona, 5,469,096, Cl. 327-112.000.
Olivo, Marco; and Pascucci, Luigi, 5,469,389, Cl. 365-200.000.

Shaffer, Donald E.: *See*—
Brown, Gary G.; Ghorashi, Hamid M.; and Shaffer, Donald E., 5,468,537, Cl. 428-101.000.

Shah, Dinesh O.; Chandra, Tarun; and Klosterman, Kurt, to Abbott Laboratories. Process for labeling acridinium to microparticles and application in an instrument. 5,468,649, Cl. 436-518.000.

Shah, Kanu G.: *See*—
Staib, Thomas E.; Shah, Kanu G.; Gallo, Paul E.; and Rakauskas, Paul V., 5,468,003, Cl. 277-235.00B.

Shah, Kishore R.: *See*—
Kydonieus, Agis; Shah, Kishore R.; and Berner, Bret, 5,468,501, Cl. 424-443.000.

Shah, Manish M.: *See*—
Aust, Steven D.; Barr, David P.; Grover, Thomas A.; Shah, Manish M.; and Chung, Namhyun, 5,468,628, Cl. 435-168.000.

Shah, Pradeep L.: *See*—
McElroy, Dave J.; Gill, Manzur; and Shah, Pradeep L., 5,469,383, Cl. 365-185.010.

Shahid, Muhammed A., to AT&T IPM Corp. Methods for selectively wet etching substrates. 5,468,338, Cl. 216-90.000.

Shaku, Masao; Ohkura, Sayuri; Kuroda, Hideo; Kano, Ai; and Nakabayashi, Nobuo, to Pola Chemical Industries Inc.; and Nakabayashi, Nobuo. Cosmetic composition with choline derivative. 5,468,475, Cl. 424-70.160.

Shanafelt, Armen B.: *See*—
Skold, Carl N.; Shanafelt, Armen B.; Ghazarossian, Vartan; and Ullman, Edwin F., 5,468,647, Cl. 436-514.000.

Shander, Douglas: *See*—
Ahluwalia, Gurpreet S.; Shander, Douglas; and Henry, James P., 5,468,476, Cl. 424-73.000.

Sharf, Lucille M.: *See*—
Finsterwal, Robert N.; Carlston, Richard L.; Schlueter, Edward L., Jr.; and Sharf, Lucille M., 5,468,834, Cl. 528-76.000.

Sharma, Pramod K.: *See*—
Cheng, Kuangti T.; Murthy, Ashok; Saldanha-Singh, Jeanne M.; and Sharma, Pramod K., 5,469,247, Cl. 355-296.000.

Sharma, Somesh D.; Clark, Brian R.; and Lerch, Bernard L., to Amergen, Inc. MHC class II-peptide conjugates useful in ameliorating autoimmunity. 5,468,481, Cl. 424-125.100.

Sharp, D. Gary; and Johnson, M. Kristina, to University of Colorado Foundation, Inc., The. Chiral smectic liquid crystal multipass optical filters including a variable retarder (and a variable isotropic spacer). 5,469,279, Cl. 359-53.000.

Sharp Kabushiki Kaisha: *See*—
Akiyama, Hisashi; and Miyoshi, Shuji, 5,468,519, Cl. 427-532.000.
Hsu, Sheng T., 5,468,657, Cl. 437-24.000.
Ihata, Makoto, 5,469,392, Cl. 365-205.000.
Iwasaki, Keisuke; and Takahama, Kengo, 5,469,274, Cl. 358-450.000
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.
Kunada, Kouji, 5,469,220, Cl. 348-529.000.

Sharp Microelectronics Technology, Inc.: *See*—
Hsu, Sheng T., 5,468,657, Cl. 437-24.000.

Sharp, Timothy L.: *See*—
Brodsky, William L.; Herard, James D.; Macek, Thomas G.; Sharp, Timothy L.; and Shovlowsky, George J., 5,468,917, Cl. 174-255.000.

Sharpe-Geisler, Bradley A., to Advanced Micro Devices, Inc. Cascade array cell partitioning for a sense amplifier of a programmable logic device. 5,469,088, Cl. 327-51.000.

Shaver, Robert T.: *See*—
Stover, Harald D. H.; Li, Pei; Ferrari, Lorenzo; Shaver, Robert T.; and Vlasovic, Djordje, 5,468,814, Cl. 525-390.000.

Shavrnoch, James J.: *See*—
Redman, Forrest C.; Heimbecher, John O.; Etnyre, Edwin L.; Shavrnoch, James J.; and Ferranti, Paul A., 5,468,018, Cl. 280-788.000.

Shaw Industries Limited: *See*—
Woo, Daniel M., 5,469,408, Cl. 367-182.000.

Shaw, Richard D. Reinforced ceramic tube. 5,467,904, Cl. 222-603.000.

Shefer, Ruth E.; Klinkowstein, Robert E.; Hughey, Barbara J.; Welch, Michael J.; and Dence, Carmen S., to Science Research Laboratory; and Washington University. Method for producing radioisotopes. 5,468,355, Cl. 204-157.200.

Sheirer, Daniel C.: *See*—
Miller, Thomas R.; and Sheirer, Daniel C., 5,467,837, Cl. 175-420.100.

Sheldon, Scott S.: *See*—
Pinsky, Howard; Sheldon, Scott S.; Christakis, Nicholas A.; and Schmertzler, Michael, 5,469,353, Cl. 364-413.010.

Shell Oil Company: *See*—
Seamans, James D.; Adams, Charles T.; Dominguez, Wendy B.; and Chen, Andrew A.-J., 5,468,372, Cl. 208-216.00R.
Udding, Anne C.; Van Leeuwen, Peter A.; and Pearson, Michael, 5,468,891, Cl. 556-61.000.

Shen, Ju: *See*—
Agrawal, Om P.; Wright, Michael J.; and Shen, Ju, 5,469,368, Cl. 364-489.000.

Shepard, Howard M.: *See*—
Swartz, Jerome; Shepard, Howard M.; Barkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward; and Adelson, Alexander M., 5,468,949, Cl. 235-472.000.

Sheppard, Harry T.: *See*—
Dowell, Floyd E.; Sheppard, Harry T.; Dettore, Lawrence A.; and Bennett, Clyde T., 5,467,700, Cl. 99-570.000.

Sher, Arieh. Rotary piston driving mechanism. 5,467,684, Cl. 92-31.000.

Sheridan, James E.: *See*—
Bowman, Timothy; Domigan, Charles N.; Hadfield, Robert W.; Harmon, J. David; and Sheridan, James E., 5,467,565, Cl. 52-220.100.

Sherman, John C.: *See*—
Pettinaroli, Giuseppe; and Sherman, John C., 5,467,796, Cl. 137-238.000.

Sherritt Gordon Limited: *See*—
Kerfoot, Derek G. E., 5,468,281, Cl. 75-710.000.

Sheth, Paresh J.; and Kolm, Roger R. Dyeable polyolefin compositions and dyeing polyolefin compositions. 5,468,259, Cl. 8-497.000.

Shia, Ting: *See*—
Wun, Jeffrey; Shia, Ting; and Guo, Fang-Merng, 5,469,303, Cl. 359-896.000.

Shibata, Hiroshi: *See*—
Yoshimura, Atsushi; Shibata, Hiroshi; Takahashi, Fumio; and Tsurushima, Kuniaki, 5,467,803, Cl. 140-105.000.

Shibata, Mitsuru; Sakamoto, Masashi; Koike, Kazuyoshi; and Nasuno, Ichiro, to Idemitsu Kosan Co., Ltd. Pyrazole derivatives. 5,468,722, Cl. 504-282.000.

Shibata, Mitsuru. *See*—
Nasuno, Ichiro; Shibata, Mitsuru; Sakamoto, Masashi; and Koike, Kazuyoshi, 5,468,878, Cl. 549-23.000.

Shibata, Satoru; and Murayama, Shigeto, to Daifuku Co., Ltd. Magnetic levitation transport system with non-contact inductive power supply and battery charging. 5,467,718, Cl. 104-284.000.

Shibata, Tadashi; and Ohmi, Tadahiro. Source follower using two pairs of NMOS and PMOS transistors. 5,469,085, Cl. 326-121.000.

Shibata, Tsugikazu, to NEC Corporation. System for examining statuses of tasks when one task is interrupted in data processing system. 5,469,570, Cl. 395-650.000.

Shibata, Tsuyoshi; Hashimoto, Koji; and Hieda, Katsuhiko, to Kabushiki Kaisha Toshiba. Method for manufacturing exposure mask. 5,468,576, Cl. 430-5.000.

Shibata, Yutaka: *See*—
Yamazaki, Masahiko; Shibata, Yutaka; Natori, Kozi; Yahata, Mitsuru; and Nambu, Kyojiro, 5,469,129, Cl. 378-19.000.

Shidara, Shinichi: *See*—
Takahashi, Yutaka; and Shidara, Shinichi, 5,469,241, Cl. 355-64.000.

Shieh, Chan-Long; Lebby, Michael S.; and Lungo, John, to Motorola. Method of making a VCSEL. 5,468,656, Cl. 437-23.000.

Shieh, Jin-Ren. Motorcycle disk brake lock. 5,467,618, Cl. 70-33.000.

Shigekane, Hisao, to Fuji Electric Co., Ltd. Diode circuit for high speed switching transistor. 5,469,103, Cl. 327-478.000.

Shigemori, Kazuhisa, to Daikin Industries, Ltd. Optical measurement apparatus. 5,469,264, Cl. 356-417.000.

Shigemoto, Hideki; Matsui, Hiroshi; and Sugahara, Jun, to Matsushita Electric Industrial Co., Ltd. Rotary electronic device. 5,469,125, Cl. 338-162.000.

Shih, I-Fu: *See*—
Chang, David B.; Vali, Victor; and Shih, I-Fu, 5,469,519, Cl. 385-33.000.

Shima, Akihiro: *See*—
Nagai, Yutaka; and Shima, Akihiro, 5,469,457, Cl. 372-45.000.

Shimada, Akira: *See*—
Go, Shintetsu; Kashizaki, Yoshio; Suzuki, Koichi; Sato, Kazuma; and Shimada, Akira, 5,468,584, Cl. 430-65.000.

Shimada, Mitsuhiro: *See*—
Hoshino, Mitsuo; Tsutsumi, Yuka; Shimada, Mitsuhiro; Masuda, Takashi; Morimiya, Yuji; Ide, Yoshihiro; Kawaguchi, Takashi; and Nogo, Yuichiro, 5,469,271, Cl. 358-335.000.

Shimada, Shunsuke: *See*—
Kayahara, Kenji; and Shimada, Shunsuke, 5,468,292, Cl. 106-789.000.

Shimada, Teruhisa: *See*—
Ohtani, Teiichi; Endo, Shoichi; Shimada, Teruhisa; and Kuroyama, Yoshihiro, 5,468,564, Cl. 428-537.500.

Shimadzu Corporation: *See*—
Fujii, Hidehiko, 5,468,364, Cl. 204-299.00R.
Nakagawa, Kazuya; and Fukushima, Toyoaki, 5,467,635, Cl. 73-23.350.
Ohashi, Tetsuo; Tada, Jun; Fukushima, Shigeru; Ozaki, Hiroko; Nishimura, Naoyuki; Shirasaki, Yoshinari; and Yamagata, Koichi, 5,468,852, Cl. 536-24.330.

Shimasaki, Yuichi: *See*—
Aoki, Takuya; Shimasaki, Yuichi; Matsumoto, Seiji; Hatcho, Seiji; Oketani, Toshikazu; Miyashita, Yukio; Saito, Akihisa; Komatsuda, Takashi; and Kato, Hiroaki, 5,467,594, Cl. 60-276.000.

Shimayama, Hitoshi: *See*—
Kogure, Mitsuhiro; Nagashima, Shinichi; Wakabayashi, Kazuhisa; Enkaku, Shigeyuki; Shimayama, Hitoshi; Kimura, Minoru; Shimoyama, Shuji; and Yokoo, Tsugio, 5,467,632, Cl. 72-379.200.

Shimizu, Hidetoshi: *See*—
Abe, Kazuo; Ishihara, Masashi; Ikeuchi, Hitoshi; Sugano, Shinsuke; Okuda, Toshiharu; Sakakibara, Shigemi; Shimizu, Hidetoshi; and Ichiba, Yasuaki, 5,467,846, Cl. 188-73.370.

Shimizu, Izuru: *See*—
Yamada, Kiyohiro; Iguchi, Masao; Shimizu, Izuru; and Watanabe, Yasushi, 5,468,130, Cl. 418-55.200.

Shimizu, Toshifumi: *See*—
Matsui, Masaaki; Shimizu, Toshifumi; and Kobayashi, Tatsuya, 5,468,210, Cl. 600-10.000.

Shimomura, Naoyuki: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Shimotani, Makoto: *See*—
Sekigami, Kunie; Nagae, Kouji; and Shimotani, Makoto, 5,467,604, Cl. 62-117.000.

Shimoyama, Shuji: *See*—
Kogure, Mitsuhiro; Nagashima, Shinichi; Wakabayashi, Kazuhisa; Enkaku, Shigeyuki; Shimayama, Hitoshi; Kimura, Minoru; Shimoyama, Shuji; and Yokoo, Tsugio, 5,467,632, Cl. 72-379.200.

Shimpuku, Yoshihide: *See*—
Chaki, Yasuyuki; Shimpuku, Yoshihide; and Ino, Hiroyuki, 5,469,162, Cl. 341-58.000.

Shin-Etsu Chemical Co. Ltd.: *See*—
Inoue, Yoshio; Sekiguchi, Susumu; and Igarashi, Minoru, 5,468,830, Cl. 528-26.000.
Takarada, Mitsuhiro; Yoshikawa, Yuji; and Yamamoto, Kenji, 5,468,825, Cl. 528-15.000.

Shin, Hyun G.: *See*—
Han, Young B.; Mun, Jeong J.; Kyung, Hong K.; Kim, Jong B.; Kim, Kyung T.; Kim, Hae R.; Kim, Jeong H.; Shin, Hyun G.; Kim, Kyung R.; Hong, Eun K.; and Kim, Choon W., 5,468,487, Cl. 424-195.100.

Shinagawa Refractories Co., Ltd.: *See*—
Ishizawa, Kenki; Ayuzawa, Nobuo; Shiranita, Akira; and Takai, Masamichi, 5,468,696, Cl. 501-98.000.

Shinoda, Ken-ichi: *See*—
Hachiya, Seio; Shinoda, Ken-ichi; and Higo, Yuichi, 5,468,402, Cl. 252-25.000.

Shinoda, Masahisa; Egusa, Naoyuki; Sato, Yasuyuki; and Koike, Manabu, to Mitsubishi Kenki Kabushiki Kaisha. Laser power control of an optical head with a plurality of beam sources. 5,469,423, Cl. 369-112.000.

Shinozaki, Fumiaki: *See*—
Suzuki, Tamotsu; Totsuka, Mikio; Niitsu, Chiyomi; and Shinozaki, Fumiaki, 5,468,594, Cl. 430-294.000.

Shiota, Toshiaki: *See*—
Hosoda, Yasushi; Shiota, Toshiaki; Suzuki, Nobukazu; Ikeda, Satoshi; Odawa, Taketoni; Kimura, Koichi; and Yamamoto, Hisataka, 5,468,461, Cl. 523-435.000.

Shiozaki, Minoru; Yasuda, Mikio; Chimoto, Isamu; and Ishimoto, Kameki, to Matsushita Electric Industrial Co., Ltd. Printed circuit board device with surface-mounted bar-like connectors. 5,468,919, Cl. 174-261.000.

Shipley Company, L.L.C.: *See*—
Calabrese, Gary S.; Calvert, Jeffrey M.; Chen, Mu-San; Dressick, Walter J.; Dulcey, Charles S.; Georger, Jacque H., Jr.; and Bohland, John F., Jr., 5,468,597, Cl. 430-315.000.

Shiraimatsu Shinyaku Kabushiki Kaisha: *See*—
Funkunaga, Toshikazu, 5,468,493, Cl. 424-195.100.

Shirakawa, Yumiko: *See*—
Takematsu, Tetsu; Komata, Takeo; Kume, Takashi; Suzuki, Kiyoshi; Kawamura, Matsue; Shirakawa, Yumiko; and Mori, Kaoru, 5,468,719, Cl. 504-224.000.

Shiranita, Akira: *See*—
Ishizawa, Kenki; Ayuzawa, Nobuo; Shiranita, Akira; and Takai, Masamichi, 5,468,696, Cl. 501-98.000.

Shirasaki, Yoshinari: *See*—
Ohashi, Tetsuo; Tada, Jun; Fukushima, Shigeru; Ozaki, Hiroko; Nishimura, Naoyuki; Shirasaki, Yoshinari; and Yamagata, Koichi, 5,468,852, Cl. 536-24.330.

Shirota, Riichiro: *See*—
Endoh, Tetsuo; Shirota, Riichiro; Ohuchi, Kazunori; Kirisawa, Ryouhei; Aritome, Seiichi; Tanaka, Tomoharu; and Tanaka, Yoshiyuki, 5,469,444, Cl. 371-215.000.

Shiu, Gerald K.: *See*—
Su, Syang Y.; and Shiu, Gerald K., 5,468,643, Cl. 436-161.000.

Shoda, Isao. Wood working machine and table translation apparatus for the same. 5,468,101, Cl. 409-202.000.

Shoemaker, Christine A.; and Whiffen, Gregory J., to Cornell Research Foundation, Inc. Feedback control of groundwater remediation. 5,468,088, Cl. 405-52.000.

Shofner, Frederick M.; Chu, Youe-T; Baldwin, Joseph C.; Galyon, Michael E.; Kacenas, Benjamin M.; and Williams, Gordon F., to Zellweger Uster, Inc. Apparatus and method for testing multiple characteristics of single textile sample with automatic feed. 5,469,253, Cl. 356-238.000.

Shooter, Ernest K. Device for controlling premature ejaculation. 5,468,212, Cl. 600-39.000.

Shop Industrial 510851 Ontario Ltd., The: *See*—
Kanerva, Ronald, 5,468,007, Cl. 280-499.000.

Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, to Yozan Inc. Capacitive coupled summing circuit with signed output. 5,469,102, Cl. 327-361.000.

Shovlowsky, George J.: *See*—
Brodsky, William L.; Herard, James D.; Macek, Thomas G.; Sharp, Timothy L.; and Shovlowsky, George J., 5,468,917, Cl. 174-255.000.

Shreeve, William O.; Werbowsky, Laurie L.; and Essig, Thomas W., to Carrier Corporation. Thermostat having short circuit protection. 5,467,921, Cl. 236-78.00R.

Shroot, Braham; Bernardon, Jean-Michel; and Pilgrim, William R., to Centre International de Recherches Dermatologiques Galderma (Cird Galderma). Bi-aromatic esters, a process for their preparation and their use in human or veterinary medicine and in cosmetic compositions. 5,468,897, Cl. 560-18.000.

Shu, Joseph S., to Seiko Epson Corporation. Method and apparatus for reducing artifacts in halftone images using gray balance correction. 5,469,276, Cl. 358-534.000.

Shucosky, Anthony C.: *See*—
Barboza, Steven D.; Seeley, William P.; and Shucosky, Anthony C., 5,468,397, Cl. 210-798.000.

Shurman, Rodney M.: *See*—
Crofts, John D.; Shurman, Rodney M.; and Wheeler, Gayle L., 5,467,963, Cl. 251-129.180.

Sibert, William P.: *See*—
Garabedian, Aram, Jr.; Mills, Scott C.; Sibert, William P.; Choy, Clement K.; and Rebelo do Couto, Fernando J., 5,468,423, Cl. 252-546.000.

Sicard, Pamela J. Portable multipurpose beach towel apparatus. 5,467,487, Cl. 5-419.000.

Siddall, Walter F.: *See*—
Bozzuto, Carl R.; Bianca, Joseph D.; and Siddall, Walter F., 5,467,591, Cl. 60-39.020.

Sidell, Richard S.: *See*—
Wilt, Donald R.; and Sidell, Richard S., 5,469,294, Cl. 359-436.000.

Sidor, Ronald P.: *See*—
Yip, Maxwell K.; Suffredini, Nino R.; Sidor, Ronald P.; and White, Robert C., 5,468,154, Cl. 439-79.000.

Sieber, Bobby G. Slotted face wellbore deviation assembly. 5,467,820, Cl. 166-117.600.

Sieber, Bobby G. Rectilinear tool for use with a slotted face wellbore deviation assembly. 5,467,821, Cl. 166-123.000.

Siegenthaler, Karl J., to Bridgestone Corporation. Method of switching component elements of road vehicle tires. 5,468,319, Cl. 156-123.000.

Siegers, Ulrich: *See*—
Arvedi, Giovanni; Gosio, Giovanni; Siegers, Ulrich; Manini, Luciano; Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Thurm, Hans-Günther; and Lüdorff, Harald, 5,467,809, Cl. 164-418.000.

Sieling, Frederick W., to Building Materials Corporation of America. Dimensional hip and ridge roofing panel. 5,467,568, Cl. 52-518.000.

Siemens Aktiengesellschaft: *See*—
Bayer, Heiner; Lehner, Barbara; and Rogalli, Michael, 5,468,786, Cl. 522-170.000.
Frankenhauser, Georg; and Wedemann, Erhard, 5,468,907, Cl. 174-15.600.
Herrmann, Klaus; and Krauss, Guenther, 5,468,214, Cl. 601-2.000.
Lorenz, Dieter; and Gorablenkow, Jorg, 5,469,050, Cl. 324-126.000.
Puester, Harald; and Kirchhoff, Hans-Gerd, 5,469,083, Cl. 326-93.000.

Siemens Aktiensesellschaft: *See*—
Schönberger, Eduard; Gruber, Stefan; Kasowski, Hermann; and Schmidt, Heinz, 5,468,909, Cl. 174-16.100.

Sierakowski, Michael J.: *See*—
Anich, Ann T.; and Sierakowski, Michael J., 5,468,353, Cl. 204-105.00R.

Sieroks, Jurgen: *See*—
Leve, Ludger; and Sieroks, Jurgen, 5,468,911, Cl. 174-74.00R.

Sigmund, Sandra K.: *See*—
Jakubowski, Joseph A.; Palkowitz, Alan D.; and Sigmund, Sandra K., 5,468,757, Cl. 514-300.000.

SignComp, Inc.: *See*—
Kovalak, Judson L., Jr., 5,467,546, Cl. 40-603.000.

Silicon Systems, Inc.: *See*—
Scott, Michael; Browning, David; and Holt, Michael, 5,469,398, Cl. 365-221.000.

Siliconix Incorporated: *See*—
Hshieh, Fwu-Iuan; Kwan, Sze-Hon; Chang, Mike F.; Ho, Yueh-Se; Van Der Linde, Jan; and Owyang, King, 5,468,982, Cl. 257-331.000.

Silvani Antincedi: *See*—
Khouzam, Cesare; and Ferroni, Gianfranco, 5,468,422, Cl. 252-544.000.

Silvey, Jeff L., to Cincinnati Milacron Inc. Method for compensating for efficient variations in an electric motor. 5,469,038, Cl. 318-632.000.

Silvis, John E.: *See*—
Armington, Steven E.; and Silvis, John E., 5,468,208, Cl. 493-352.000.

Simcik, Paul: *See*—
Powell, Bruce A.; Stanley, Jannah; Kupersmith, Bertram F.; Sahara, Masanori; Simcik, Paul; and Bahjat, Zuhair S., 5,467,844, Cl. 187-387.000.

Simiand, Jacques: *See*—
Bachy, André; Fraisse, Laurent; Keane, Peter; Mendes, Etienne; Vernieres, Jean-Claude; and Simiand, Jacques, 5,468,750, Cl. 514-255.000.

Simmonds Precision Engine Systems, Inc.: *See*—
Wright, James R., 5,468,161, Cl. 439-610.000.

Simmons, Gerald P.: *See*—
Greer, Robert D.; Henderson, Daniel E.; Hosseini, Javad; Rytter, Noel J.; and Simmons, Gerald P., 5,467,541, Cl. 37-348.000.

Simmons, Richard L.: *See*—

Billiar, Timothy R.; Nussler, Andreas K.; Geller, David A.; and Simmons, Richard L., 5,468,630, Cl. 435-189.000.

Simon, Jean-Michel; and Barat, Didier, to Hutchinson. Device for attenuating the rolling noise of vehicles. 5,468,055, Cl. 301-6.910.

Simonek, Laura M. Accessories organizer. 5,468,063, Cl. 312-334.280.

Simonich, Mark A.: *See*—
Vincent, Michael T.; Gutermuth, Terry R.; Lawrie, Robert E.; Moote, Richard K.; Simonich, Mark A.; and Tamm, James R., 5,467,593, Cl. 60-274.000.

Simpson, Hugo R.; and Campbell, Eric R., to British Aerospace Public Limited Company. Computer system having multiple asynchronous processors interconnected by shared memories and providing fully asynchronous communication therebetween. 5,469,549, Cl. 395-200.080.

Simpson Strong-Tie Co., Inc.: *See*—
Leek, William F., 5,467,570, Cl. 52-712.000.

Sims, Christopher A. Automobile steering wheel and turn signal indicator. 5,469,338, Cl. 362-61.000.

Singer, Stephen M., to Caterpillar Inc. Polyetherpolyurethane end caps for oil filters. 5,468,835, Cl. 528-76.000.

Singh, Kenneth S.: *See*—
Wendorf, James W.; Hocek, Adam S.; and Singh, Kenneth S., 5,469,431, Cl. 370-50.000.

Sinor, Lyle T.; Batz, Ralph A.; Stone, Darryl L.; and Plapp, Fred V., to Immucor, Inc. Article for performing immunological assays utilizing organic dyes to immobilize immunologically reactive components to a solid phase support and methods for producing and utilizing same. 5,468,618, Cl. 435-7.210.

Sioshansi, Piran: *See*—
Farivar, Mohammad; and Sioshansi, Piran, 5,468,562, Cl. 428-457.000.

SIP - Societa Italiana per l'Esercizio delle Telecomunicazioni p.A.: *See*—
Drogo de Iacovo, Rosario; Montagna, Roberto; and Sereno, Daniele, 5,469,527, Cl. 395-2.290.

Sisti, Nicholas: *See*—
Fortunak, Joseph; Kitteringham, John; Sisti, Nicholas; and Wood, Jeffery, 5,468,859, Cl. 546-48.000.

Sites, Richard L.; and Witek, Richard T., to Digital Equipment Corporation. Method and apparatus for eliminating branches using conditional move instructions. 5,469,551, Cl. 395-375.000.

Sitte, Hans J., to Honeywell Inc. Sensor actuator bus system. 5,469,150, Cl. 340-825.070.

Sjogren, Axel; Carson, Gary; Estergreen, Steven; Taga, Timothy; and Stewart, Rodger, to Cobe Laboratories, Inc. Exchanger and method for manufacturing the same. 5,468,449, Cl. 422-46.000.

Skalski, Clement A., to Otis Elevator Company. Permanent magnet, magnetodynamic safety brake for elevators and the like. 5,467,850, Cl. 188-165.000.

Skelton, Dale J.: *See*—
Efland, Taylor R.; Cotton, Dave; and Skelton, Dale J., 5,468,984, Cl. 257-356.000.

SKF GmbH: *See*—
Ekdahl, Egon; Gurka, Jiri; Huber, Rupert; Köttritsch, Hubert; Kufe, Gottfried; Müllner, Johann; and Weninger, Helmut, 5,468,072, Cl. 184-448.000.

Skold, Carl N.; Shanafelt, Armen B.; Ghazarossian, Vartan; and Ullman, Edwin F., to Syntex (U.S.A.) Inc. Method for immunochromatographic analysis. 5,468,647, Cl. 436-514.000.

Skorupski, Jeffrey H.; and Gee, Thomas A., to Eaton Corporation. Remote brake performance testing system/method. 5,467,645, Cl. 73-121.000.

Skov, Per Stahl; and Bjarno, Ole-Christian, to A/S Lundbeck Export Division Ltd. Class microfiber histamine assay device. 5,468,650, Cl. 436-527.000.

Skudera, William J., Jr., to United States of America, Army. Monitoring phase characteristics of BPSK and CW signals. 5,469,173, Cl. 342-202.000.

Skylab International Limited: *See*—
Kalocsai, Guy I. Z., 5,468,261, Cl. 44-268.000.

SL Montevideo Technology, Inc.: *See*—
Huang, Hao, 5,469,033, Cl. 318-439.000.

Slaughter, Ella M.: *See*—
Slaughter, John L.; and Slaughter, Ella M., 5,467,478, Cl. 2-1.000.

Slaughter, John L.; and Slaughter, Ella M. Handkerchief with finger securing loop. 5,467,478, Cl. 2-1.000.

Slemmer, William C., to SGS-Thomson Microelectronics, Inc. Clock generator circuit with low current frequency divider. 5,469,116, Cl. 331-74.000.

Sloan, Charles P.: *See*—
Cipollina, Joseph A.; Mattson, Ronald J.; and Sloan, Charles P., 5,468,767, Cl. 514-414.000.
Cipollina, Joseph A.; Gylys, Jonas A.; Mattson, Ronald J.; and Sloan, Charles P., 5,468,768, Cl. 514-415.000.

Slocum, Richard T.; Bjordahl, James; Louie, Danny; and Rasmussen, Donald, to WangDAT, Inc. Automated cassette loader. 5,469,310, Cl. 360-92.000.

Smedal, Arne: *See*—
Breivik, Kare; Smedal, Arne; and Syvertsen, Kare, 5,468,166, Cl. 441-5.000.

Smith, David E.: *See*—
Ochs, Dennis E.; Burton, David L.; Groh, John F.; and Smith, David E., 5,467,774, Cl. 128-711.000.

Smith, Douglas S.; and Bee, Edward C., to Elantec, Inc. Active folded cascode. 5,469,104, Cl. 327-491.000.

Smith, Gary W.: *See*—
Karabatsos, Chris; and Smith, Gary W., 5,469,330, Cl. 361-704.000.

Smith, James A.; Ellis, Matthew; Saunders, Rowland F.; and Hall, Anne L., to General Electric Company. Color adaptive frame averaging. 5,467,770, Cl. 128-661.080.

Smith, James A.: *See*—
McDonald, Sean C.; Hertz, Ellen J.; Smith, James A.; and Toto, Gregory, 5,468,110, Cl. 414-273.000.

Smith, Jay, III; and Fort, Jeffrey W. Cursor control system. 5,469,191, Cl. 345-157.000.

Smith, Kevin E.; and Hoffman, Kurtis J., to Wauseon Machine and Manufacturing, Inc. End finisher machine. 5,467,627, Cl. 72-121.000.

Smith, Leslie C.: *See*—
Guénin, Eric P.; Trotzinka, Karen A.; Smith, Leslie C.; Warren, Craig B.; Munteanu, Marina A.; Chung, Siew L.; and Tan, Chee-Teck, 5,468,725, Cl. 512-2.000.

Smith, Lowell S.; and Lewandowski, Robert S., to General Electric Company. Multiplanar probe for ultrasonic imaging. 5,467,779, Cl. 128-660.100.

Smith, Paul, to Protose Technologies Inc. Process for the membrane-filtering of protein solutions. 5,468,844, Cl. 530-366.000.

Smith, Richard L.: *See*—
Martin, Luther W.; and Smith, Richard L., 5,467,795, Cl. 137-15.000.

Smith, Scott E.; Le, Duy-Loan T.; Stephens, Michael C., Jr.; and Nomura, Masayoshi, to Texas Instruments Incorporated. Output buffer with boost from voltage supplies. 5,469,385, Cl. 365-189.050.

Smith, Thomas C. Baby bottle with recessed bottom for the removable receipt of a cold substance. 5,467,877, Cl. 215-11.100.

Smith, Wilfred W., to Dunlop Limited. Valve means. 5,467,595, Cl. 60-410.000.

SmithKline Beecham Corporation: *See*—
Fortunak, Joseph; Kitteringham, John; Sisti, Nicholas; and Wood, Jeffery, 5,468,859, Cl. 546-48.000.

SmithKline Diagnostics, Inc.: *See*—
Chandler, Howard M., 5,468,648, Cl. 436-518.000.

SMS Schloemann-Siemag AG: *See*—
Hartmann, Hans H.; Drügh, Hans-Peter; and Reismann, Hans J., 5,468,146, Cl. 432-77.000.

SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Mertens, Werner, 5,467,518, Cl. 29-527.700.

Snell (Hydro Design) Consultancy Limited: *See*—
Snell, Michael James; and Snell, Leonard Stanley, 5,468,132, Cl. 418-206.000.

Snell, Leonard Stanley: *See*—
Snell, Michael James; and Snell, Leonard Stanley, 5,468,132, Cl. 418-206.000.

Snell, Michael James; and Snell, Leonard Stanley, to Snell (Hydro Design) Consultancy Limited. Water turbines. 5,468,132, Cl. 418-206.000.

Societe Anontme Dite Alcatel Espace: *See*—
Vaillant, Bruno, 5,469,001, Cl. 307-113.000.

Societe Anonyme Dite Societe des Ceramiques Techniques: *See*—
Garcera, Daniel; Toujas, Edouard; and Gillot, Jacques, 5,468,384, Cl. 210-232.000.

Societe Anonyme Dite: Alcatel CIT: *See*—
Vinel, Paul; and Perrier, Philippe, 5,469,283, Cl. 359-118.000.

Societe Nationale des Poudres et Explosifs: *See*—
Martin, Bernard; and Lefumeux, Alain, 5,468,312, Cl. 149-19.400.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "Snecma": *See*—
Carletti, Ollivier, 5,467,592, Cl. 60-261.000.
Guimier, Michel; and Paris, Philippe M., 5,468,123, Cl. 415-178.000.

Societe Nouvelle Technigaz: *See*—
Claude, Jean M.; and Evers, Gerardus H. M., 5,468,089, Cl. 405-52.000.

Soderquist, Charles E.: *See*—
Sundén, Bengt; Forsström, Bo; Soderquist, Charles E.; and Storckman, Steven D., 5,468,129, Cl. 417-477.120.

Sofia Koloni Ltd.: *See*—
Nicolaidis, Michael, 5,469,445, Cl. 371-22.300.

Soga, Hiroh: *See*—
Aoshima, Taku; Noami, Tsuneo; Soga, Hiroh; Sumikawa, Takeshi; Furuya, Nobumasa; and Edure, Tadakazu, 5,469,245, Cl. 355-251.000.

Sogabe, Toshiaki: *See*—
Okada, Osamu; Ogura, Hiroaki; and Sogabe, Toshiaki, 5,468,565, Cl. 428-552.000.

Sohda, Yasunari: *See*—
Itoh, Hiroyuki; Todokoro, Hideo; Sohda, Yasunari; and Nakayama, Yoshinori, 5,468,969, Cl. 250-492.230.

Sohmuta, Mitoshi, to NEC Corporation. Writing and erasing information by varying the temperature of an optical recording medium. 5,469,422, Cl. 369-100.000.

Sokol, Pamela A.: *See*—
Hodges, Robert S.; Irvin, Randall T.; Paranchych, William; Sokol, Pamela A.; and Woods, Donald E., 5,468,484, Cl. 424-141.100.

Solar Turbines Incorporated: *See*—
Idleman, Dennis D.; Rawlins, Douglas C.; and Sood, Virendra M., 5,467,926, Cl. 239-132.500.

Soler, Françoise: *See*—
Bouboutou, Romaine; Dereu, Norbert; Evers, Michel; Gueguen, Jean-Christophe; James, Claude; Poujade, Christèle; Reisdorf, Daniel; Ribeill, Yves; and Soler, Françoise, 5,468,888, Cl. 554-58.000.

Soletanche Enterprise: *See*—
Claude, Jean M.; and Evers, Gerardus H. M., 5,468,089, Cl. 405-52.000.

Soli, Sigfried D.: *See*—

Mobley, J. Phil; Zhang, Chaoying; Soli, Sigfried D.; Johnson, Chris; and O'Connell, Drew, 5,467,784, Cl. 128-867.000.

Solinov, Vladimir; and Boguslavski, Igor, to Flachglas Intg Glasveredelungs GmbH. Impact resistant laminated windows and manufacture thereof. 5,468,559, Cl. 428-410.000.

Sollinger, Hans-Peter: *See*—
Salter, Robert L.; and Sollinger, Hans-Peter, 5,467,534, Cl. 34-117.000.

Solomon, Donald F. Storage tank and reverse osmosis system utilizing the same. 5,468,387, Cl. 210-257.200.

Solow, Joseph E., to WOLO Manufacturing Corporation. Vehicle security device and alarm. 5,469,135, Cl. 340-426.000.

Solvay (Société Anonyme): *See*—
Wautier, Henri, 5,468,837, Cl. 528-357.000.

Solvay Catalysts GmbH: *See*—
Derleth, Helmut; and Bretz, Karl H., 5,468,558, Cl. 428-402.000.

Somack, Ralph: *See*—
Saifer, Mark; Somack, Ralph; and Williams, L. David, 5,468,478, Cl. 424-78.270.

Sommermeyer, Henning: *See*—
Schohe-Loop, Rudolf; Heine, Hans-Georg; Junge, Bodo; Glaser, Thomas; De Vry, Jean M. V.; Dompert, Wolfgang; and Sommermeyer, Henning, 5,468,882, Cl. 549-407.000.

Son, Ilhun, to Sun Microsytems, Inc. Low-power, logic signal level converter. 5,469,080, Cl. 326-81.000.

Sone, Nobukatu: *See*—
Nakajima, Takeshi; Hashimoto, Ichiro; Saitou, Tomoyuki; Ohira, Fusanori; Akashi, Sueo; Sone, Nobukatu; and Nii, Katsutoshi, 5,469,008, Cl. 310-90.500.

Song, Ok-Kyu: *See*—
Fields, Stanley; and Song, Ok-Kyu, 5,468,614, Cl. 435-6.000.

Song, Seok-Ho; and Jung, Sang-Don, to Electronics and Telecommunications Research Institute. Back-board optical signal interconnection module using focusing grating coupler arrays. 5,469,518, Cl. 385-89.000.

Sony Corporation: *See*—
Asai, Nobutoshi; Iwamura, Takashi; and Tamura, Shin-Ichiro, 5,468,593, Cl. 430-273.000.
Chaki, Yasuyuki; Shimpuku, Yoshihide; and Ino, Hiroyuki, 5,469,162, Cl. 341-58.000.
Fujita, Goro; and Tobita, Minoru, 5,469,420, Cl. 369-59.000.
Fujita, Masahiro; and Arisawa, Shigeru, 5,469,512, Cl. 382-118.000.
Hara, Masaaki, 5,469,306, Cl. 360-65.000.
Hoshino, Mitsuo; Tsutsumi, Yuka; Shimada, Mitsuhiro; Masuda, Takashi; Morimiya, Yuji; Ide, Yoshihiro; Kawaguchi, Takashi; and Nogo, Yuichiro, 5,469,271, Cl. 358-335.000.
Ishikawa, Ko, 5,468,065, Cl. 360-132.000.
Kubota, Yukio; Sasaki, Takayuki; Takahashi, Takao; and Kobayashi, Hiroshi, 5,469,272, Cl. 358-335.000.
Maruchi, Takanori; Kamaya, Naoki; and Yamauchi, Toshiyuki, 5,469,211, Cl. 348-211.000.
Morita, Shinya, 5,469,563, Cl. 395-183.010.
Sato, Yasushi, and Ohsawa, Nobuhiko, 5,469,484, Cl. 377-58.000.
Takahashi, Kenji; and Kondo, Tetsujiro, 5,469,216, Cl. 348-441.000.
Tanaka, Yasushi, 5,468,580, Cl. 430-22.000.
Watanabe, Takashi; and Ishikawa, Wataru, 5,469,312, Cl. 360-103.000.
Yamagami, Tamotsu; Sako, Yoichiro; and Yamamoto, Masanobu, 5,469,416, Cl. 369-48.000.
Yamamoto, Hirotaka; and Tanaka, Tamiya, 5,469,152, Cl. 340-825.630.
Yamamoto, Tomoyuki, 5,469,270, Cl. 358-335.000.

Sony Electronics, Inc.: *See*—
Gunday, Erhan H.; Doliton, Michael; Foung, Paul; and Lee, John R., 5,469,209, Cl. 348-96.000.
Takahashi, Haruki; and Lin, Bill, 5,467,789, Cl. 134-56.00R.

Sony United Kingdom Limited: *See*—
David, Morgan W. A.; and Burns, James E., 5,469,226, Cl. 348-699.000.

Sood, Virendra M.: *See*—
Idleman, Dennis D.; Rawlins, Douglas C.; and Sood, Virendra M., 5,467,926, Cl. 239-132.500.

Sorensen, Birk C., to EMTEK Products, Inc. Ramp weight-reducing assembly. 5,467,855, Cl. 193-5.000.

Sorensen, Gerald R.; and Gradecki, Raymond J., to NCM International, Inc. Apparatus for dispensing measured amounts of granular product. 5,467,903, Cl. 222-455.000.

Sorenson, James L.: *See*—
Tanner, Howard M. C.; and Sorenson, James L., 5,468,239, Cl. 606-15.000.

Sorenson Laboratories, Inc.: *See*—
Tanner, Howard M. C.; and Sorenson, James L., 5,468,239, Cl. 606-15.000.

Soucie, Wayne L.; Champ, Larry B.; Tayon, Jeffrey E.; Carlson, Harold L.; Marek, Steven W.; and Koenig, Peter C., to Dura Automotive Systems, Inc. Non-jamming self-adjust pawl and ratchet mechanism. 5,467,666, Cl. 74-575.000.

Souda, Shigeru: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Soulard, Roger R., to Wang Laboratories, Inc. Non-radiating enclosure including a stack of closure plates having slats staggered about an aperture in a wall of the enclosure. 5,469,336, Cl. 361-818.000.

Soules, Richard F. Pivoting trailer assembly. 5,468,054, Cl. 298-19.00V.

Souma, Takahiro, to Terumo Kabushiki Kaisha. Automatic sphygmomanometer. 5,467,772, Cl. 128-680.000.

Soundek Oy: *See*—
Luukkala, Mauri, 5,467,944, Cl. 244-134.00F.

Souryal, Tarek O. Methods of color coding injectable medications. 5,468,224, Cl. 604-51.000.

Southern California Edison: *See*—
Bates, Donald C., 5,468,376, Cl. 210-160.000.

Sovema S.r.l.: *See*—
Farina, Pietro, 5,467,805, Cl. 141-32.000.

SpaceLabs Medical, Inc.: *See*—
Wekell, William O., 5,467,954, Cl. 248-201.000.

Spagnolo, Dino A.: *See*—
Miller, Alistair I.; and Spagnolo, Dino A., 5,468,462, Cl. 423-580.200

Sparks, Geoffrey S., to U.S. Philips Corporation. Transmitter and power amplifier therefor. 5,469,105, Cl. 330-129.000.

Sparks, Robert M.: *See*—
Bailey, William H.; Byers, Lonnie L.; Holley, Robert G.; Lamie, James M.; Sparks, Robert M.; West, Mike L.; and Storey, Richard P., 5,468,968, Cl. 250-435.000.

Specht, Martin: *See*—
Gimbel, Hans-Peter; Trutter, Walter P.; and Specht, Martin, 5,468,014, Cl. 280-735.000.

Specialist Sealing Ltd.: *See*—
Nicholson, Terence P., 5,467,966, Cl. 251-174.000.

Specialty Environmental Technologies, Inc.: *See*—
Parema, Chester P., 5,468,415, Cl. 252-171.000.

Speck, Glen J. Walking implement with associated lighting device. 5,469,343 Cl. 362-102.000.

Spector, George: *See*—
Greene, Gary L.; and Spector, George, 5,467,497, Cl. 15-235.800.

Spectron Corporation of America, L.L.C.: *See*—
Lepselter, Martin P., 5,469,021, Cl. 313-582.000.

Spektor, Michael B. Monotube differential pneumopercussive reversible self-propelled soil penetrating machine with stabilizers. 5,467,831, Cl. 175-19.000.

Spencer Wright Industries, Inc.: *See*—
Bardsley, Harold B.; and Bagnall, Arthur, 5,467,724, Cl. 112-80.700.

Spire Corporation: *See*—
Farivar, Mohammad; and Sioshansi, Piran, 5,468,562, Cl. 428-457.000.

Sports-Mitt International: *See*—
Hoffman, Ned, 5,468,200, Cl. 482-55.000.

Sprague, David L., to Intel Corporation. Non-linear pixel interpolator function for video and graphic processing. 5,469,222, Cl. 348-580.000

Spratt, Michael: *See*—
Thaler, Patricia A.; Kadambi, Jayant; Spratt, Michael; Albrecht, Alan R.; and Goody, Steven H., 5,469,439, Cl. 370-94.300.

Springer, Joseph J.: *See*—
O' Donnell, Patricia A.; Kerfoot, Charles S.; and Springer, Joseph J., 5,469,124, Cl. 336-61.000.

Srebnik, Morris; Zheng, Bin; and Deloux, Laurent, to University of Toledo The. Boryl zirconocene organic 1,1-dimetallic compounds. 5,468,889, Cl 556-7.000.

Srigritsanapol, Aeumporn: *See*—
Chan, Kenneth K.; and Srigritsanapol, Aeumporn, 5,468,499, Cl. 424-450.000.

Srivastava, Laxmi S. Glove with hand-coloring material. 5,467,481, Cl. 2-161.700.

Staab, Thomas E.; Shah, Kanu G.; Gallo, Paul E.; and Rakauskas, Paul V., to Dana Corporation. Reinforced core heavy duty gasket. 5,468,003, Cl. 277-235.00B.

Stabilus GmbH: *See*—
Heinrichs, Heinrich-Josef; Enders, Stephan; and Koch, Klaus, 5,468,042, Cl. 296-146.400.

Stahl, Alan L.: *See*—
Creger, Todd D.; Mitchell, Randall M.; Stahl, Alan L.; and Talbott, James R., 5,467,854, Cl. 192-87.180.

Stanchina, William E.: *See*—
Hafizi, Madjid; Stanchina, William E.; and Hooper, William W., 5,468,659, Cl. 437-31.000.

Standke, Burkhard: *See*—
Rauleder, Hartwig; Standke, Burkhard; Kötzsch, Hans-Joachim; and Schork, Reinhold, 5,468,705, Cl. 502-151.000.
Rauleder, Hartwig; Standke, Burkhard; Kötzsch, Hans-Joachim; and Schork, Reinhold, 5,468,706, Cl. 502-151.000.

Stanford, Thomas B.: *See*—
Chao, Sidney C.; Stanford, Thomas B.; Purer, Edna M.; and Wilkerson, Angela Y., 5,467,492, Cl. 8-159.000.

Stang, Wolfgang: *See*—
Mahler, Peter; and Stang, Wolfgang, 5,468,362, Cl. 204-298.110.

Stangle, Gregory C.; Venkatachari, Kothihavasal R.; Ostrander, Steven P.; and Schulze, Walter A., to Alfred University. Process for making ultra-fine ceramic particles. 5,468,427, Cl. 264-3.400.

Stanley, Jannah: *See*—
Powell, Bruce A.; Stanley, Jannah; Kupersmith, Bertram F.; Sahara, Masanori; Simcik, Paul; and Bahjat, Zuhair S., 5,467,844, Cl. 187-387.000.

Stanley, Thomas R.; and Kelley, Mark D., to Teepak, Inc. Apparatus and methods for preparing loaf shaped sausage products in slack filled food casings. 5,468,179, Cl. 452-37.000.

Star Lock Systems, Inc.: *See*—
Stillwagon, Woodrow C.; and Embry, Donald, 5,467,619, Cl. 70-34.000.

Stearns, Richard G.: *See*—
Hadimioglu, Babur B.; Lim, Martin G.; Stearns, Richard G.; and Quate, Calvin F., 5,467,975, Cl. 271-267.000.

Steffler, Joseph B.: *See*—
Diekema, Jon M.; Steffler, Joseph B.; Van Baren, Jerald W.; and Sancimino, Vincent, 5,469,365, Cl. 364-483.000.

Steger, Lothar; Syrowatka, Horst; and Schütte, Walter, to Rhein Chemie Rheinau GmbH. Masticating agent for rubber. 5,468,288, Cl. 106-243.000.

Stehr, Roger: *See*—
Blume, Peter; and Stehr, Roger, 5,468,131, Cl. 418-94.000.

Stein, Judith; and Davis, Mark W., to General Electric Company. Room temperature addition-curable silicone adhesive compositions and N-heterocyclic silane adhesion promoters. 5,468,794, Cl. 524-188.000.

Stein, Reinhardt P.: *See*—
Sabb, Annmarie L.; and Stein, Reinhardt P., 5,468,875, Cl. 548-512.000.

Steinbrink, Eckhard: *See*—
Trey, Heiko; Grabow, Thomas; and Steinbrink, Eckhard, 5,469,147, Cl. 340-628.000.

Steiner, Erwin; and Mischker, Rolf, to American Suessen Corporation. Method and apparatus for heat-setting carpet yarn using variable yarn laying mechanism. 5,467,513, Cl. 28-281.000.

Steinmann, Bettina; Wolf, Jean-Pierre; Schulthess, Adrian; and Hunziker, Max, to Ciba-Geigy Corporation. (Cyclo)aliphatic epoxy compounds. 5,468,886, Cl. 549-549.000.

Stelzer, Eric H.: *See*—
Eng, Robert C.; Galella, John W.; McCrary, Rex E.; McDonald, Mark G.; Stelzer, Eric H.; and Yentz, Frederick C., 5,469,577, Cl. 395-290.000.

Stendel, Adolf, to Otto Bock Orthopaedische Industrie Besitz- und Verwaltungs-KG. Heating enclosure with a thermoforming insert. 5,468,139, Cl. 425-383.000.

Stephens, David J., to Scitex Digital Printing, Inc. Continuous ink jet catcher with improved screen structure. 5,469,202, Cl. 347-90.000.

Stephens, Michael C., Jr.: *See*—
Smith, Scott E.; Le, Duy-Loan T.; Stephens, Michael C., Jr.; and Nomura, Masayoshi, 5,469,385, Cl. 365-189.050.

Stephenson, George R.; and Creaser, Colin S., to British Technology Group Limited. Spectroscopic investigation using organometallic compounds. 5,468,644, Cl. 436-163.000.

Stephenson, John M.; and Ray, William F., to Switched Reluctance Drives Limited. Control of switched reluctance machines. 5,469,039, Cl. 318-701.000.

Sterba, John J.: *See*—
Thompson, David A.; Rajagopalan, Venkatesh; Wright, Kurt W.; Sterba, John J.; Paulus, William J.; Paulus, Nancy J.; McCauley, Kathryn M.; and Chen, David K., 5,467,636, Cl. 73-23.310.

Sterling Winthrop, Inc.: *See*—
Bacon, Edward R.; Daum, Sol J.; Estep, Kimberly G.; Josef, Kurt A.; Douty, Brent D.; and Illig, Carl R., 5,468,466, Cl. 424-9.450.

Sterman Enterprises, Inc.: *See*—
Fink, Steven R.; and Herman, Floyd J., 5,467,543, Cl. 40-538.000.

Steuer, Raimar, to Diehl GmbH & Co. Artillery rocket. 5,467,940, Cl. 244-3,110.

Stewart, Aulette: *See*—
Tank, Klaus; Jarvis, Alan R.; and Stewart, Aulette, 5,468,268, Cl. 51-293.000.

Stewart, Rodger: *See*—
Sjogren, Axel; Carson, Gary; Estergreen, Steven; Taga, Timothy; and Stewart, Rodger, 5,468,449, Cl. 422-46.000.

Steyaert, Michel; Dehaene, Wim; Craninckx, Jan; Walsh, Mairtin; and Real, Peter, to Analog Devices, Inc. Rectifier and integrator circuit for disk drive servo system. 5,469,113, Cl. 329-311.000.

Stillwagon, Woodrow C.; and Embry, Donald, to Star Lock Systems, Inc. Post latching systems. 5,467,619, Cl. 70-34.000.

Stobnicki, Roman A.: *See*—
Kirollos, Kirollos S.; Mihaylov, Gueorgui M.; Lockerby, Kevin L.; and Stobnicki, Roman A., 5,468,645, Cl. 436-164.000.

Stockhausen, William F., to Ford Motor Company. Internal combustion engine with intake port throttling and exhaust camshaft phase shifting for cylinder deactivation. 5,467,748, Cl. 123-198.00F.

Stogner, Huey. Apparatus and method for positioning drill pipe in a mousehole. 5,468,121, Cl. 414-745.200.

Stojanovski, Stojan. Milling tool holder. 5,468,102, Cl. 409-234.000.

Stollenwerk, Josef A. Apparatus for automatically applying equalized pressure to a rotary cutting die. 5,467,678, Cl. 83-344.000.

Stone, Darryl L.: *See*—
Sinor, Lyle T.; Estz, Ralph A.; Stone, Darryl L.; and Plapp, Fred V., 5,468,618, Cl. 435-7.210.

Stopyra, Stephen: *See*—
Bolton, Theodore S.; and Stopyra, Stephen, 5,467,610, Cl. 62-262.000.
Bolton, Theodore S.; and Stopyra, Stephen, 5,468,186, Cl. 454-202.000.

Storage Technology Corporation: *See*—
Henderson, Watson R.; Paurus, Floyd G.; and Szerlip, Stanley R., 5,469,324, Cl. 361-301.200.

Storckman, Steven D.: *See*—
Snadén, Bengt; Forsström, Bo; Soderquist, Charles E.; and Storckman, Steven D., 5,468,129, Cl. 417-477.120.

Storey, Richard P.: *See*—
Bailey, William H.; Byers, Lonnie L.; Holley, Robert G.; Lamie, James M.; Sparks, Robert M.; West, Mike L.; and Storey, Richard P., 5,468,968, Cl. 250-435.000.

Stork Contiweb B.V.: *See*—
van Liempt, Martinus J. C.; and Buchmeyer, Theodoor A., 5,468,321, Cl. 156-159.000.

Stottlemyer, Thomas R.: *See*—
Seaman, Peter E.; and Stottlemyer, Thomas R., 5,468,913, Cl. 174-102.00R.

Stover, Harald D. H.; Li, Pei; Ferrari, Lorenzo; Shaver, Robert T.; and Vlaovic, Djordje, to Research Corporation Technologies, Inc. Polymers having oxidic functionality and derivatives thereof. 5,468,814, Cl. 525-390.000.

Straeter, Joseph G.: *See*—
Weder, Donald E.; Straeter, Joseph G.; and Straeter, William F., 5,467,573, Cl. 53-397.000.
Weder, Donald E.; and Straeter, Joseph G., 5,467,575, Cl. 53-399.000.

Straeter, William F.: *See*—
Weder, Donald E.; Straeter, Joseph G.; and Straeter, William F., 5,467,573, Cl. 53-397.000.

Strandjord, Lee K.: *See*—
Blake, James N.; Sanders, Glen A.; and Strandjord, Lee K., 5,469,257, Cl. 356-350.000.

Stranford, Gerald T.: *See*—
Leung, Roger Y.; Stranford, Gerald T.; and Gonczy, Stephen T., 5,468,318, Cl. 156-89.000.

Strat, Askold: *See*—
Alexander, Edward R.; Goldman, Ron; Li, Yajun; Bard, Simon; Strat, Askold; Katz, Joseph; and Metlitsky, Boris, 5,468,952, Cl. 235-492.000.

Stratton, Ken L.: *See*—
Barton, James C.; Lueschow, Kevin J.; and Stratton, Ken L., 5,467,829, Cl. 172-4.500.

Strauss, Harry W.: *See*—
Tweedle, Michael F.; Strauss, Harry W.; and Nunn, Adrian D., 5,468,467, Cl. 424-9.361.

Strauss, Wolfgang: *See*—
Braun, Hans; Weinecke, Ulf; Maute, Kurt; and Strauss, Wolfgang, 5,467,750, Cl. 123-350.000.

Streeting, Ian T.: *See*—
Clough, John M.; Godfrey, Christopher R. A.; Streeting, Ian T.; and Cheetham, Rex, 5,468,747, Cl. 514-239.500.

Stricklin, Douglas K.; and Savage, Chester, to Scholle Corporation. Two-part coupling structure having cooperating parts effecting fluid flow upon connection an mutual resealing upon disconnection. 5,467,806, Cl. 141-346.000.

Ström, Peter H. E.: *See*—
Federsel, Hans-Jügen; Hö, Thomas; Rämsby, Sten I.; and Ström, Peter H. E., 5,468,876, Cl. 548-535.000.

Stroud, Donald S., to American National Carbide Company. Cutting tool insert. 5,467,669, Cl. 76-108.200.

Strubbe, Hugo J.; and McFarlane, Robert, to Philips Electronics North America Corporation. System and method for automatically correlating user preferences with electronic shopping information. 5,469,206, Cl. 348-7.000.

Stryker Corporation: *See*—
Matthai, John T.; and Huyser, Richard F., 5,468,247, Cl. 606-178.000.
Oppermann, Hermann; Ozkaynak, Engin; Kuberasampath, Thangavel; and Rueger, David C., 5,468,845, Cl. 530-387.900.

Studiecentrum Voor Kernenergie: *See*—
Bruggeman, Aimé; and Braet, Johan, 5,468,347, Cl. 159-47.300.

Studzinski, William M.: *See*—
DeRosa, Thomas F.; Studzinski, William M.; Russo, Joseph M.; Kaufman, Benjamin J.; and Hahn, Robert T., 5,468,264, Cl. 44-426.000.

Stupak, Joseph J., Jr. Magnetizing device having variable charge storage network and voltage control. 5,469,321, Cl. 361-156.000.

Sturm, Jeffrey C., to Kop-Coat, Inc. Method of waterproof wood and associated composition. 5,468,284, Cl. 106-2.000.

Su, Syang Y.; and Shiu, Gerald K., to United States of America, Health and Human Services. Switching valve system for direct biological sample injection for LC analysis. 5,468,643, Cl. 436-161.000.

Subramanian, V.: *See*—
Sekhar, Jainagesh A.; Subramanian, V.; and Canarslan, Necip S., 5,468,690, Cl. 501-1.000.

Sucher, Benjamin M. Carpal tunnel bracelet. 5,468,220, Cl. 602-21.000.

Suda, Shin; and Hosaka, Hidehiro, to Nihon Koden Corporation. Multipurpose sensor. 5,467,768, Cl. 128-640.000.

Sudo, Kenichiro: *See*—
Oshima, Katsuyuki; Kutsukake, Masaki; Sato, Hideaki; and Sudo, Kenichiro, 5,468,714, Cl. 503-227.000.

Suehiro, Toshiyuki; Teraoka, Shinichi; Ishimaru, Eiichiro; Fukada, Yoshimori; and Inoue, Shuichi, to Nippon Steel Corporation. Thin cast strip of austenitic stainless steel and cold-rolled sheet in thin strip form and processes for producing said strip and sheet. 5,467,811, Cl. 164-476.000.

Suffredini, Nino R.: *See*—
Yip, Maxwell K.; Suffredini, Nino R.; Sidor, Ronald P.; and White, Robert C., 5,468,154, Cl. 439-79.000.

Sugahara, Jun: *See*—
Shigemoto, Hideki; Matsui, Hiroshi; and Sugahara, Jun, 5,469,125, Cl. 338-162.000.

Sugai, Fumio; and Irie, Masahiro, to Mita Industrial Co., Ltd. Benzothiophene/indole-substituted maleimide derivatives, photochromic material comprising said derivatives and optical recording material using the same material. 5,468,874, Cl. 548-454.000.

Sugama, Akio; Suzuki, Hiroaki; and Kojima, Naomi, to Fujitsu Limited. Electrolyte composition for screen printing and miniaturized oxygen electrode and production process thereof. 5,468,408, Cl. 252-62.200.

Sugano, Shinsuke: *See*—
Abe, Kazuo; Ishihara, Masashi; Ikeuchi, Hitoshi; Sugano, Shinsuke; Okuda, Toshiharu; Sakakibara, Shigemi; Shimizu, Hidetoshi; and Ichiba, Yasuaki, 5,467,846, Cl. 188-73.370.

Sugano, Toshihiko; and Gotoh, Toshihiro, to Mitsubishi Petrochemical Company Limited; and Mitsubishi Yuka Badische Company Limited. Polypropylene resin expanded particles. 5,468,781, Cl. 521-60.000.

Sugawara, Yuuichi: *See*—
Suzuki, Yoshihisa; Sugawara, Yuuichi; Ishihara, Susumu; and Katoh, Ikuo, 5,469,012, Cl. 310-348.000.

Sugii, Nobuyuki: *See*—
Yamamoto, Kiyoshi; Sugii, Nobuyuki; Kubo, Koichi; Ichikawa, Michiharu; and Yamauchi, Hisao, 5,468,806, Cl. 505-238.000.

Sugimoto, Kazushige: *See*—
Moriyama, Keiji; Ebisuno, Tadahiro; and Sugimoto, Kazushige, 5,467,994, Cl. 273-222.000.

Sugimoto, Tadashi; Ohkawa, Shingo; Amano, Hiroyuki; and Murata, Norikazu, to Optex Co., Ltd. Pyroelectric infrared detector. 5,468,960, Cl. 250-338.300.

Sugita, Mitsuru: *See*—
Inoue, Hideo; and Sugita, Mitsuru, 5,469,483, Cl. 377-20.000.

Sugito, Katsuhiko; and Hibi, Yasuo, to Nippondenso Co., Ltd. Method and system for fitting work-pieces. 5,467,517, Cl. 29-407.000.

Sugiura, Noboru: *See*—
Moriyama, Norio; and Sugiura, Noboru, 5,467,758, Cl. 123-617.000.

Sujeeth, Puthalath K., to Warner-Jenkinson Company. Synthesis of Solvent Yellow 33 (D & C Yellow 11) with excess phthalic anhydride acid as a solvent. 5,468,862, Cl. 546-173.000.

Sullivan, Kathleen A.; and Peek, Brian R., to Illinois Tool Works Inc. Spiral flex tree fastener. 5,468,108, Cl. 411-510.000.

Sulzer Chemtech AG: *See*—
Schwald, Günther, 5,467,817, Cl. 165-167.000.

Sulzer-Escher Wysse AG: *See*—
Keller, Niklaus, 5,468,389, Cl. 210-360.200.

Suman, Michael J.; Clark, Russell L.; and Ferrell, Richard M., to Prince Corporation. Reflective display at infinity. 5,469,298, Cl. 359-630.000.

Sumcad, Gustavo L.: *See*—
Mueller, Douglas L.; and Sumcad, Gustavo L., 5,469,055, Cl. 324-207.210.

Sumikawa, Takeshi: *See*—
Aoshima, Taku; Noami, Tsuneo; Soga, Hiroh; Sumikawa, Takeshi; Furuya, Nobumasa; and Edure, Tadakazu, 5,469,245, Cl. 355-251.000.

Sumitomo Chemical Company, Limited: *See*—
Hashimoto, Kazuhiko; Osaki, Haruyoshi; Ebina, Chinehito; Nagase, Kyoko; Moriuma, Hiroshi; and Uetani, Yasunori, 5,468,590, Cl. 430-191.000.
Matsumoto, Masahito; and Usui, Nobuhiro, 5,468,039, Cl. 296-70.000.

Sumitomo Electric Industries, Ltd.: *See*—
Harada, Keizo; and Itozaki, Hideo, 5,468,973, Cl. 257-33.000.
Morita, Kazuya, 5,469,158, Cl. 340-988.000.
Nishio, Masanobu; Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,468,557, Cl. 428-384.000.

Sumitomo Heavy Industries, Ltd.: *See*—
Yamaguchi, Katuyoshi, 5,468,193, Cl. 475-162.000.

Sumitomo Metal Industries, Ltd.: *See*—
Hosoda, Yasushi; Shiota, Toshiaki; Suzuki, Nobukazu; Ikeda, Satoshi; Odawa, Taketosi; Kimura, Koichi; and Yamamoto, Hisataka, 5,468,461, Cl. 523-435.000.

Sumitomo Metal Mining Co., Ltd.: *See*—
Yamaguchi, Eiji; Uragami, Yuji; Yokozuka, Hideharu; Uekusa, Kikoo; Yamaguchi, Toshio; Abe, Satoshi; Kamo, Tetsuro; and Suzuki, Takao, 5,468,709, Cl. 502-210.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Moriyama, Keiji; Ebisuno, Tadahiro; and Sugimoto, Kazushige, 5,467,994, Cl. 273-222.000.

Sumitomo Special Metals Co., Ltd.: *See*—
Yoshino, Hitoshi; and Hashimoto, Shigeo, 5,467,769, Cl. 128-653.200.

Sumitomo Wiring Systems, Ltd.: *See*—
Naitou, Kiyotaka; and Kojima, Junichi, 5,468,924, Cl. 200-6.00A.

Summerauer, Ingomar J. K.; and Hellwig, Waldemar, to Bruderer AG. Tool assembly for a punch press having a laser welding apparatus. 5,468,931, Cl. 219-121.630.

Sun Company, Inc. (R&M): *See*—
Resasco, Daniel E.; Marcus, Bonita K.; Huang, Chen-Shi; and Durante, Vincent A., 5,468,710, Cl. 502-222.000.

Sun Microsytems, Inc.: *See*—
Son, Ilhun, 5,469,080, Cl. 326-81.000.

Sunaga, Takayuki; Kato, Akihiko; Sakamoto, Takashi; and Miyata, Hideaki, to Fuji Xerox Co., Ltd. Developing apparatus using monocomponent developer. 5,469,246, Cl. 355-251.000.

Sundén, Bengt; Forsström, Bo; Soderquist, Charles E.; and Storckman, Steven D., to Cole Parmer Instrument Company. Peristaltic pump. 5,468,129, Cl. 417-477.120.

Sung, Rodney L.: *See*—
Acker, William P.; Hahn, Robert T.; Mach, Thomas J.; and Sung, Rodney L., 5,468,262, Cl. 44-348.000.

Sunreeve Company Limited: *See*—
Ichimura, Masami, 5,469,232, Cl. 351-111.000.

Suppes, Galen J.; and Friedli, Hans R., to Dow Chemical Company, The. Hydroxy-functional polyether finishing process. 5,468,839, Cl. 528-403.000.

Susuki, Seiichi: *See*—
Murai, Masaru; Hirai, Takayuki; Hyoi, Isao; Maeda, Yoshimi; and Susuki, Seiichi, 5,469,230, Cl. 351-52.000.

Suter, Franz: *See*—
Frey, Heinz; Prochazka, Kamil; and Suter, Franz, 5,467,683, Cl. 91-442.000.

Sutherland, Charles A.: *See*—
Huang, Fu-Chih; Chan, Wan K.; Sutherland, Charles A.; and Galemmo, Robert A., Jr., 5,468,898, Cl. 560-41.000.

Suzuki, Akira; Hotta, Yoshihiko; and Uemura, Hiroyuki, to Ricoh Company, Ltd. Information recording medium and printing method using the same. 5,468,711, Cl. 503-201.000.

Suzuki, Fumio; Kuroda, Takeshi; Kitamura, Shigeto; and Ohmori, Kenji, to Kyowa Hakko Kogyo Co., Ltd. Imidazonaphthyridine derivatives. 5,468,756, Cl. 514-293.000.

Suzuki, Hajime: *See*—
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,469,266, Cl. 358-298.000.

Suzuki, Hiroaki: *See*—
Sugama, Akio; Suzuki, Hiroaki; and Kojima, Naomi, 5,468,408, Cl. 252-62.200.

Suzuki, Junji; Hatano, Masami; and Imaizumi, Shinichi, to Nippon Soda Co., Ltd. Bicyclo[4,1,0]heptane-2,4-dion derivatives, its synthetic intermediates and process for the manufacture thereof. 5,468,905, Cl. 568-346.000.

Suzuki Kabushiki Kaisha: *See*—
Takaoka, Atsushi; and Mizutani, Kazuhiko, 5,467,753, Cl. 123-418.000.

Suzuki, Kiyoshi: *See*—
Takematsu, Tetsu; Komata, Takeo; Kume, Takashi; Suzuki, Kiyoshi; Kawamura, Matsue; Shirakawa, Yumiko; and Mori, Kaoru, 5,468,719, Cl. 504-224.000.

Suzuki, Koichi: *See*—
Go, Shintetsu; Kashizaki, Yoshio; Suzuki, Koichi; Sato, Kazuma; and Shimada, Akira, 5,468,584, Cl. 430-65.000.

Suzuki, Masato; and Kiyohara, Tokuzo, to Matsushita Electric Industrial Co., Ltd. Pipelined data processor having combined operand fetch and execution stage to reduce number of pipeline stages and penalty associated with branch instructions. 5,469,552, Cl. 395-375.000.

Suzuki, Michinori: *See*—
Tsujimoto, Nohiro; Hongyo, Kenichi; Baba, Yoshisuke; Suzuki, Michinori; and Akikawa, Kazuhiro, 5,468,822, Cl. 526-340.100.

Suzuki, Nobukazu: *See*—
Hosoda, Yasushi; Shiota, Toshiaki; Suzuki, Nobukazu; Ikeda, Satoshi; Odawa, Taketosi; Kimura, Koichi; and Yamamoto, Hisataka, 5,468,461, Cl. 523-435.000.

Suzuki, Nobuo: *See*—
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.

Suzuki, Sinichi: *See*—
Nishizawa, Hirotaka; Azuma, Seiichiro; Ootoshi, Kazuaki; Miyama, Masataka; Kawata, Shuji; Kasahara, Osamu; and Suzuki, Sinichi, 5,468,989, Cl. 257-517.000.

Suzuki, Takao: *See*—
Yamaguchi, Eiji; Uragami, Yuji; Yokozuka, Hideharu; Uekusa, Kikoo; Yamaguchi, Toshio; Abe, Satoshi; Kamo, Tetsuro; and Suzuki, Takao, 5,468,709, Cl. 502-210.000.

Suzuki, Tamotsu; Totsuka, Mikio; Niitsu, Chiyomi; and Shinozaki, Fumiaki, to Fuji Photo Film Co., Ltd. Image forming process. 5,468,594, Cl. 430-294.000.

Suzuki, Yoshihisa; Sugawara, Yuuichi; Ishihara, Susumu; and Katoh, Ikuo, to TDK Corporation. Electronic component. 5,469,012, Cl. 310-348.000.

Suzuta, Toshihiko: *See*—
Tsuruta, Minoru; Suzuta, Toshihiko; Nakada, Akio; Kuramoto, Seiji; Hibino, Hiroki; Bito, Shiro; and Mukaizawa, Akito, 5,467,911, Cl. 227-175.000.

Swami, Arun N.: *See*—
Schiefer, Klaus B.; and Swami, Arun N., 5,469,568, Cl. 395-600.000.

Swanson, David K.: *See*—
Hahn, Stephen J.; and Swanson, David K., 5,468,254, Cl. 607-5.000.

Swartling, James R.: *See*—
Cantwell, Cathleen A.; Hodges, Roland L.; McGilvray, Derek; Queener, Stephen W.; Swartling, James R.; and Zock, Joseph M., 5,468,632, Cl. 435-197.000.

Swartz, Allan J.; and Kulpa, Gregory A., to Swartz & Kulpa, Structural Design and Engineering. Curtain wall clip. 5,467,566, Cl. 52-235.000.

Swartz & Kulpa, Structural Design and Engineering: *See*—
Swartz, Allan J.; and Kulpa, Gregory A., 5,467,566, Cl. 52-235.000.

Swartz, Jerome; Shepard, Howard M.; Barkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward; and Adelson, Alexander M., to Symbol Technologies, Inc. Portable laser diode scanning head. 5,468,949, Cl. 235-472.000.

Swinderman, R. Todd, to Martin Engineering Company. Conveyor impact pillow. 5,467,866, Cl. 198-841.000.

Switched Reluctance Drives Limited: *See*—
Stephenson, John M.; and Ray, William F., 5,469,039, Cl. 318-701.000.

Symbol Technologies, Inc.: *See*—
Alexander, Edward R.; Goldman, Ron; Li, Yajun; Bard, Simon; Strat, Askold; Katz, Joseph; and Metlitsky, Boris, 5,468,952, Cl. 235-492.000.
Swartz, Jerome; Shepard, Howard M.; Barkan, Eric F.; Krichever, Mark J.; Metlitsky, Boris; Barkan, Edward; and Adelson, Alexander M., 5,468,949, Cl. 235-472.000.

Symetrix Corporation: *See*—
Paz de Araujo, Carlos A.; Scott, Michael C.; Cuchiaro, Joseph D.; and McMillan, Larry D., 5,468,679, Cl. 437-110.000.
Yoshimori, Hiroyuki; Watanabe, Hitoshi; Paz De Araujo, Carlos A.; Hiraide, Shuzo; Mihara, Takashi; and McMillan, Larry D., 5,468,684, Cl. 437-228.000.

Symons, Robert S.: *See*—
Begum, Syeda R.; and Symons, Robert S., 5,469,022, Cl. 315-5.390.
Kirshner, Mark F.; and Symons, Robert S., 5,469,024, Cl. 315-5.390.

Syntex (U.S.A.) Inc.: *See*—
Fisher, Lawrence E.; Flippin, Lee A.; and Martin, Michael G., 5,468,867, Cl. 548-253.000.
Skold, Carl N.; Shanafelt, Armen B.; Ghazarossian, Vartan; and Ullman, Edwin F., 5,468,647, Cl. 436-514.000.

Syrowatka, Horst: *See*—
Steger, Lothar; Syrowatka, Horst; and Schütte, Walter, 5,468,288, Cl. 106-243.000.

Syseca, Inc.: *See*—
Douglas, Larry D.; and Hutchinson, Clarence W., Jr., 5,469,528, Cl. 395-23.000.

Sytron Corporation: *See*—
McGill, James K., III; Abele, Dorotea; Colman, Lonnie L.; Gonsalves, Manuel; and Saxena, Sanjeev, 5,469,573, Cl. 395-700.000.

Syvertsen, Kare: *See*—
Breivik, Kare; Smedal, Arne; and Syvertsen, Kare, 5,468,166, Cl. 441-5.000.

Szabó, Eva: *See*—
Szalóki, Erzsébet; Kristóf, Ilona; Pál, Veronika; and Szabó, Eva, 5,468,492, Cl. 424-195.100.

Szalóki, Erzsébet; Kristóf, Ilona; Pál, Veronika; and Szabó, Eva, to Biogal Gyógyszergyár RT. Cosmetic composition. 5,468,492, Cl. 424-195.100.

Szerlip, Stanley R.: *See*—
Henderson, Watson R.; Paurus, Floyd G.; and Szerlip, Stanley R., 5,469,324, Cl. 361-301.200.

Ta-Ala, Benko: *See*—
Ashton, Larry J.; Allman, Michael G.; and Ta-Ala, Benko, 5,467,889, Cl. 220-562.000.

Tachibana, Katsumi: *See*—
Ichikawa, Takanori; Kuwaki, Tomoaki; Matsuki, Shigeru; and Tachibana, Katsumi, 5,468,846, Cl. 530-388.230.

Tada, Jun: *See*—
Ohashi, Tetsuo; Tada, Jun; Fukushima, Shigeru; Ozaki, Hiroko; Nishimura, Naoyuki; Shirasaki, Yoshinari; and Yamagata, Koichi, 5,468,852, Cl. 536-24.330.

Tada, Katsumi: *See*—
Hatakeyama, Atsushi; Fujisawa, Hiromichi; Kato, Kanji; Kawaguchi, Hisamitsu; Minegishi, Naoki; Tada, Katsumi; and Asakawa, Satoshi, 5,469,354, Cl. 364-419.190.

Taddiken, Albert H., to Texas Instruments Incorporated. Multiple resonant tunneling circuits for positive digit range-4 base-2 to binary conversion. 5,469,163, Cl. 341-83.000.

Taga, Timothy: *See*—
Sjogren, Axel; Carson, Gary; Estergreen, Steven; Taga, Timothy; and Stewart, Rodger, 5,468,449, Cl. 422-46.000.

Taguchi, Tomoyuki; Kuribayashi, Hideyuki; Tanaka, Jun; Konaga, Tomomi; and Morigami, Yoshihiro, to Yamamura Glass Co. Ltd.; and Kyocera Corporation. Composition for producing low temperature co-fired substrate. 5,468,694, Cl. 501-77.000.

Taiyo Manufacturing Works Co., Ltd.: *See*—
Iwami, Hiroyuki; Fukuoka, Masayoshi; and Kanayama, Hiroyuki, 5,468,141, Cl. 425-542.000.

Tajima, Shigeru: *See*—
Yabuuchi, Masahiko; Akanuma, Hiroshi; Masuda, Minoru; Katoh, Kazuo; Nakamura, Tsuneo; Tajima, Shigeru; Hashiba, Masashi; Hayami, Hiroshi; Takezawa, Tomoko; and Hirayama, Masachika, 5,468,380, Cl. 210-198.200.

Takada, Minoru; Satoh, Kouichi; Yokobayashi, Kazuyuki; and Ogihara, Shuichi, to Nissei ASB Machine Co., Ltd. Method and apparatus of injection stretch blow molding. 5,468,443, Cl. 264-537.000.

Takagi, Masahiro: *See*—
Okada, Ken'ichi; Takagi, Masahiro; Hasegawa, Hiroshi; and Iwamura, Ryoji, 5,468,315, Cl. 156-64.000.

Takagi, Shinichi; and Nishi, Kenji, to Nikon Corporation. Stage-position measuring apparatus. 5,469,260, Cl. 356-358.000.

Takagi, Toru: *See*—
Kawanishi, Umeo; Hirayama, Nobuhisa; Hamabe, Takeshi; and Takagi, Toru, 5,469,128, Cl. 333-22.00R.

Takagi, Yuji: *See*—
Satoh, Isao; Takagi, Yuji; and Hisakado, Yuji, 5,469,418, Cl. 369-54.000.

Takahama, Kengo: *See*—
Iwasaki, Keisuke; and Takahama, Kengo, 5,469,274, Cl. 358-450.000.

Takahara, Hiroshi; and Ohmae, Hideki, to Matsushita Electric Industrial Co., Ltd. Liquid crystal panel and viewfinder for video camera and projection display using liquid crystal panel. 5,469,278, Cl. 359-51.000.

Takahashi, Fumio: *See*—
Yoshimura, Atsushi; Shibata, Hiroshi; Takahashi, Fumio; and Tsurushima, Kuniaki, 5,467,803, Cl. 140-105.000.

Takahashi, Haruki; and Lin, Bill, to Sony Electronics Inc. System for removal of phosphor from CRT panels. 5,467,789, Cl. 134-56.00R.

Takahashi, Haruo: *See*—
Sawai, Kiichi; Kurono, Masayasu; Mitani, Takahiko; Sato, Makoto; Oowaki, Hiroyuki; Kato, Bunkichi; and Takahashi, Haruo, 5,468,728, Cl. 514-12.000.

Takahashi, Kenji; and Kondo, Tetsujiro, to Sony Corporation. Apparatus and method for processing a digital video signal to produce interpolated data. 5,469,216, Cl. 348-441.000.

Takahashi, Masashi: *See*—
Fujiwara, Shigeru; Takahashi, Masashi; and Ishida, Haruhiko, 5,469,248, Cl. 355-326.00R.

Takahashi, Miyoshi: *See*—
Wakui, Shinichi; Ide, Kazumasa; Kobaragi, Haruo; Takahashi, Miyoshi; Miyakawa, Kado; and Yagi, Yasuomi, 5,469,009, Cl. 310-214.000.

Takahashi, Nobukazu; Hosaka, Tohru; Minami, Koji; Konishi, Yuichiro; Kohara, Teiji; and Natsuume, Tadao, to Nippon Zeon Co. Ltd. Medical implement, polymer composition, and optical material. 5,468,803, Cl. 524-553.000.

Takahashi, Ryoichi; Okawa, Katsumi; and Igarashi, Yusuke, to Sanyo Electric Co., Ltd. Hybrid integrated circuit device. 5,469,131, Cl. 338-306.000.

Takahashi, Satoshi, to Ricoh Company Ltd. Spread spectrum communication system using two-predetermined-code pseudo-noise signals. 5,469,470, Cl. 375-205.000.

Takahashi, Shigeaki, to Konica Corporation. Method for producing silver halide photographic light-sensitive material. 5,468,602, Cl. 430-569.000.

Takahashi, Shinichi; Nakaimuki, Masayuki; and Yagi, Yukihiro, to Matsushita Electric Industrial Co., Ltd.k. Data slice circuit. 5,469,091, Cl. 327-73.000.

Takahashi, Takao: *See*—
Kubota, Yukio; Sasaki, Takayuki; Takahashi, Takao; and Kobayashi, Hiroshi, 5,469,272, Cl. 358-335.000.

Takahashi, Taro: *See*—
Hattori, Mitsuo; Furuta, Hitoshi; Takahashi, Taro; and Maeda, Hirokazu, 5,468,287, Cl. 106-217.000.

Takahashi, Tomoya: *See*—
Honda, Shinkichi; Torii, Kenji; Arai, Yoichiro; Kasai, Masaji; Kato, Hiromasa; Iida, Takao; Takahashi, Tomoya; Yokoo, Yoshiharu; Kamiya, Toshikazu; and Tamaoki, Tatsuya, 5,468,474, Cl. 424-70.100.

Takahashi, Yutaka; and Shidara, Shinichi, to Fuji Photo Film Co., Ltd. Microfilm camera. 5,469,241, Cl. 355-64.000.

Takai, Masamichi: *See*—
Ishizawa, Kenki; Ayuzawa, Nobuo; Shiranita, Akira; and Takai, Masamichi, 5,468,696, Cl. 501-98.000.

Takai, Masanori: *See*—
Hirano, Takahisa; Takai, Masanori; and Taniguchi, Mitsuhiro, 5,468,076, Cl. 400-59.000.

Takama, Shigeyuki: *See*—
Yamada, Akiya; Wato, Takahiko; Uchida, Naoki; Fujisawa, Misuzu; Takama, Shigeyuki; and Inamoto, Yukiko, 5,468,503, Cl. 424-461.000.

Takamatsu, Yukichi: *See*—
Yamaguchi, Ryuichi; Kiso, Koichi; Tazuke, Kiyoshi; Machida, Hideaki; Mihirogi, Katsuhiro; and Takamatsu, Yukichi, 5,468,894, Cl. 556-477.000.

Takamura, Yasuhiko: *See*—
Yamazaki, Shunpei; Zhang, Hongyong; and Takamura, Yasuhiko, 5,468,987, Cl. 257-412.000.

Takaoka, Atsushi; and Mizutani, Kazuhiko, to Suzuki Kabushiki Kaisha. Ignition timing control apparatus for internal combustion engine of vehicle. 5,467,753, Cl. 123-418.000.

Takaoka, Shigekazu, to Daifuku Co., Ltd. Automated high-raised parking system. 5,467,561, Cl. 52-30.000.

Takarada, Mitsuhiro; Yoshikawa, Yuji; and Yamamoto, Kenji, to Shin-Etsu Chemical Co., Ltd. Coating composition for carriers for use in electrophotography and carriers using the same. 5,468,825, Cl. 528-15.000.

Takata, Yoshinori: *See*—
Yasuda, Kenji; Takata, Yoshinori; Tsuruta, Harumi; Ohnuma, Sadabumi; and Miura, Junkichi, 5,468,379, Cl. 210-198.200.

Takatori, Sunao: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,469,102, Cl. 327-361.000.

Takatsuji, Ayako; and Okada, Noritake, to Matsushita Electric Industrial Co., Ltd. Synchronous display control apparatus. 5,469,183, Cl. 345-2.000.

Takeda, Hidekazu; Kaku, Nobuyuki; and Ogiro, Kenji, to Hitachi, Ltd. Magnetic tape cassette having tape edge regulating members. 5,469,319, Cl. 360-132.000.

Takeda, Koji, to Seiko Epson Corporation. Apparatus and method for controlling the running of a data processing apparatus. 5,469,561, Cl. 395-550.000.

Takee, Masao; Kimoto, Mamoru; Tikano, Yoshito; Mizitaki, Husago; Matsuura, Yoshinori; Nishio, Koji; and Furukawa, Nobohiro, to Sanyo Electric Co., Ltd. Hydrogen-absorbing alloy for negative electrode. 5,468,260, Cl. 29-623.500.

Takei, Kazuo: *See—*
Noguchi, Yasuhiro; Kuwahara, Hiroshi; Yasuda, Isao; and Takei, Kazuo, 5,469,189, Cl. 345-118.000.

Takei, Seiji; and Obara, Kouji, to Nippon Thompson Co., Ltd. Direct current motor drive apparatus. 5,469,030, Cl. 318-254.000.

Takematsu, Tetsu; Komata, Takeo; Kume, Takashi; Suzuki, Kiyoshi; Kawamura, Matsue; Shirakawa, Yumiko; and Mori, Kaoru, to Central Glass Company, Limited. N-acyl-n-phenyltetrahydrophthalamic acid derivatives, methods of producing same, and herbicides containing same as effective components. 5,468,719, Cl. 504-224.000.

Takemoto, Takatoshi, to Kabushiki Kaisha Ace Denken. Slot machine having unitary coin restoration system. 5,467,857, Cl. 194-206.000.

Takeuchi, Esther S.: *See—*
Pyszczek, Michael F.; Takeuchi, Esther S.; and Kane, Mark J., 5,468,569, Cl. 429-94.000.

Takeuchi, Hiroto: *See—*
Kubota, Kiyoto; Takeuchi, Hiroto; and Kato, Shinichiro, 5,467,945, Cl. 246-26.000.

Takeuchi, Kesatoshi, to Seiko Epson Corporation. Video multiplexing system for superimposition of scalable video data streams upon a background video data stream. 5,469,221, Cl. 348-564.000.

Takezawa, Tomoko: *See—*
Yabuuchi, Masahiko; Akanuma, Hiroshi; Masuda, Minoru; Katoh, Kazuo; Nakamura, Tsuneo; Tajima, Shigeru; Hashiba, Masashi; Hayami, Hiroshi; Takezawa, Tomoko; and Hirayama, Masachika, 5,468,380, Cl. 210-198.200.

Takezono, Tetsuya: *See—*
Komiya, Koji; Takezono, Tetsuya; Yabe, Noritsugu; and Matsui, Hisao, 5,468,635, Cl. 435-240.210.

Takigen Manufacturing Co. Ltd.: *See—*
Yamada, Kenichi; and Esaki, Takanobu, 5,467,623, Cl. 70-208.000.

Takikawa, Masao: *See—*
Ishii, Katsumi; and Takikawa, Masao, 5,468,112, Cl. 414-416.000.

Takizawa, Hiroo: *See—*
Watanabe, Toshiyuki; and Takizawa, Hiroo, 5,468,600, Cl. 430-546.000.

Talbott, James R.: *See—*
Creger, Todd D.; Mitchell, Randall M.; Stahl, Alan L.; and Talbott, James R., 5,467,854, Cl. 192-87.180.

Tamaoki, Tatsuya: *See—*
Honda, Shinkichi; Torii, Kenji; Arai, Yoichiro; Kasai, Masaji; Kato, Hiromasa; Iida, Takao; Takahashi, Tomoya; Yokoo, Yoshiharu; Kamiya, Toshikazu; and Tamaoki, Tatsuya, 5,468,474, Cl. 424-70.100.

Tamblyn, Robert T. Air conditioning system providing for individual work station control. 5,467,919, Cl. 236-49.300.

Tamhankar, Satish S.; and Ramachandran, Ramakrishnan, to BOC Group, Inc., The. Gas stream treatment method for removing per-fluorocarbons. 5,468,459, Cl. 423-240.00S.

Tamm, James R.: *See—*
Vincent, Michael T.; Gutermuth, Terry R.; Lawrie, Robert E.; Moote, Richard K.; Simonich, Mark A.; and Tamm, James R., 5,467,593, Cl. 60-274.000.

Tamura Kaken Corporation: *See—*
Yanagawa, Makoto; and Yamamoto, Hiroshi, 5,468,784, Cl. 522-31.000.

Tamura, Shin-Ichiro: *See—*
Asai, Nobutoshi; Iwamura, Takashi; and Tamura, Shin-Ichiro, 5,468,593, Cl. 430-273.000.

Tan, Chee-Teck: *See—*
Guénin, Eric P.; Trotzinka, Karen A.; Smith, Leslie C.; Warren, Craig B.; Munteanu, Marina A.; Chung, Siew L.; and Tan, Chee-Teck, 5,468,725, Cl. 512-2.000.

Tanaka, Jun: *See—*
Taguchi, Tomoyuki; Kuribayashi, Hideyuki; Tanaka, Jun; Konaga, Tomomi; and Morigami, Yoshihiro, 5,468,694, Cl. 501-77.000.

Tanaka Kikinzoku Kogyo K.K.: *See—*
Matsui, Masaaki; Shimizu, Toshifumi; and Kobayashi, Tatsuya, 5,468,210, Cl. 600-10.000.

Tanaka, Kunio: *See—*
Nishikawa, Yukio; Tanaka, Kunio; and Yoshida, Yoshikazu, 5,468,930, Cl. 219-121.600.

Tanaka, Satoru; Matsui, Fumio; and Murata, Yasushi, to Pioneer Electronic Corporation. Display device with face plate responsive to multiple wave length beams. 5,469,186, Cl. 345-32.000.

Tanaka, Shoji: *See—*
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.

Tanaka, Tamiya: *See—*
Yamamoto, Hirotaka; and Tanaka, Tamiya, 5,469,152, Cl. 340-825.630.

Tanaka, Tomoharu: *See—*
Endoh, Tetsuo; Shirota, Riichiro; Ohuchi, Kazunori; Kirisawa, Ryouhei; Aritome, Seiichi; Tanaka, Tomoharu; and Tanaka, Yoshiyuki, 5,469,444, Cl. 371-215.000.
Sato, Toshiro; Tanaka, Tomoharu; Mizoguchi, Tetsuhiko; and Ide, Yuji, 5,469,399, Cl. 365-226.000.

Tanaka, Toshihiro: *See—*
Sasaki, Toshio; and Tanaka, Toshihiro, 5,469,390, Cl. 365-200.000.

Tanaka, Yasushi, to Sony Corporation. Condition optimization method for measuring overlay accuracy of pattern. 5,468,580, Cl. 430-22.000.

Tanaka, Yoshiyuki: *See—*
Endoh, Tetsuo; Shirota, Riichiro; Ohuchi, Kazunori; Kirisawa, Ryouhei; Aritome, Seiichi; Tanaka, Tomoharu; and Tanaka, Yoshiyuki, 5,469,444, Cl. 371-215.000.

Tang, Guichen C.: *See—*
Alfano, Robert R.; Pradhan, Asima; Tang, Guichen C.; Wang, Leming; Budansky, Yury; and Das, Bidyut B., 5,467,767, Cl. 128-665.000.

Tang, Tin S.: *See—*
Hohenstein, Gerald L.; Nielson, Michael E.; Tang, Tin S.; Carmichael, Richard D.; and Brant, William A., 5,469,566, Cl. 395-182.040.

Tani, Koji, to Rohm Co., Ltd. Semiconductor device with polygonal shaped die pad. 5,468,993, Cl. 257-676.000.

Tani, Tomofune; Murai, Ichiro; and Anzai, Kenji, to Nippon Steel Corporation. Semiconductor device having trench type capacitors formed completely within an insulating layer. 5,468,979, Cl. 257-304.000.

Tanigawa, Michiyo: *See—*
Okano, Yoshimichi; Kanno, Tatsuya; Yamato, Tsutomu; Oshino, Yasuhiro; Tanigawa, Michiyo; Kuwana, Takaaki; and Fukuda, Yutaka, 5,468,836, Cl. 528-204.000.

Taniguchi, Mitsuhiro: *See—*
Hirano, Takahisa; Takai, Masanori; and Taniguchi, Mitsuhiro, 5,468,076, Cl. 400-59.000.

Tank, Klaus; Jarvis, Alan R.; and Stewart, Aulette. Method of making an abrasive compact. 5,468,268, Cl. 51-293.000.

Tannenbaum, Wesley. Detection method and apparatus. 5,469,405, Cl. 367-135.000.

Tanner, Howard M. C.; and Sorenson, James L., to Sorenson Laboratories, Inc. Apparatus and methods for using a circumferential light-emitting surgical laser probe. 5,468,239, Cl. 606-15.000.

Tanoue, Koki; Yokota, Tsuneshi; and Yoshimaru, Tomohisa, to Kabushiki Kaisha Toshiba. Information recording/reproducing apparatus for recording or reproducing data, and clock generating circuit inforporated therein. 5,469,417, Cl. 369-50.000.

Targan, Ronald G. Method for producing oat extract. 5,468,491, Cl. 424-195.100.

Tate, Earl, Jr.: *See—*
Miller, John A.; Velasquez Urey, Ruben E.; and Tate, Earl, Jr., 5,468,237, Cl. 604-390.000.

Tatsuno, Hideo: *See—*
Tokura, Nobuyuki; Kajiyama, Yoshio; Tatsuno, Hideo; and Nakashima, Takashi, 5,469,428, Cl. 370-161.000.

Tayebi, Amad: *See—*
Pawlowicz, Andrew; Douglas, Craig; Tayebi, Amad; and Orroth, Stephen, 5,468,327, Cl. 156-393.000.

Taylor, Dennis R.: *See—*
Nebergall, Robert S.; Taylor, Dennis R.; and Kucharz, Carolyn J., 5,468,701, Cl. 502-80.000.

Taylor, James M. Post compile optimizer for linkable object code. 5,469,572, Cl. 395-700.000.

Taylor, Julie R.: *See—*
Everhart, Dennis; Deibler, Elizabeth A.; and Taylor, Julie R., 5,468,236, Cl. 604-361.000.

Taylor, Lauren W.: *See—*
Dow, Thomas A.; Garrard, Kenneth P.; Moorefield, George M., II; and Taylor, Lauren W., 5,467,675, Cl. 82-1.110.

Taylor Made Golf Company, Inc.: *See—*
Veux, Jean-Luc; and Vincent, Benoit, 5,467,984, Cl. 273-81.00R.

Taylor, Robert D.; Deppert, Thomas M.; and Barnes, Michael W., to Morton International, Inc. Gas generant compositions. 5,467,715, Cl. 102-289.000.

Taylor, Roy. Portable puppet theater systems. 5,468,171, Cl. 446-82.000.

Tayon, Jeffrey E.: *See—*
Soucie, Wayne L.; Champ, Larry B.; Tayon, Jeffrey E.; Carlson, Harold L.; Marek, Steven W.; and Koenig, Peter C., 5,467,666, Cl. 74-575.000.

Tazuke, Kiyoshi: *See—*
Yamaguchi, Ryuichi; Kiso, Koichi; Tazuke, Kiyoshi; Machida, Hideaki; Mihirogi, Katsuhiro; and Takamatsu, Yukichi, 5,468,894, Cl. 556-477.000.

TDK Corporation: *See—*
Suzuki, Yoshihisa; Sugawara, Yuuichi; Ishihara, Susumu; and Katoh, Ikuo, 5,469,012, Cl. 310-348.000.

TDM Pty Ltd: *See—*
Fung, Man K., 5,467,895, Cl. 221-259.000.

Teare, Peter R.; Murphy, Patrice L.; and Brogmus, George E., to Liberty Mutual Insurance Co. Measuremeat system for hand tools. 5,467,656, Cl. 73-862.541.

Teepak, Inc.: *See—*
Hendriks, Ivo G., 5,467,576, Cl. 53-437.000.
Stanley, Thomas R.; and Kelley, Mark D., 5,468,179, Cl. 452-37.000.

Teikoku Seiyaku Kabushiki Kaisha: *See—*
Yamada, Akiya; Wato, Takahiko; Uchida, Naoki; Fujisawa, Misuzu; Takama, Shigeyuki; and Inamoto, Yukiko, 5,468,503, Cl. 424-461.000.

Teirstein, Paul S. Rapid exchange catheter. 5,468,225, Cl. 604-102.000.

Teisan Kabushiki Kaisha: *See—*
Yokogi, Kazuo, 5,468,937, Cl. 219-634.000.

Teknion Furniture Systems: *See—*
Crinion, Jonathan, 5,467,703, Cl. 108-50.000.

Tekno, Inc.: *See—*
Clopton, Robert T., 5,467,860, Cl. 198-779.000.

Tektronix, Inc.: *See—*

Krishnamurthy, Suresh; McCormick, Robert A.; Cone, Kenneth F.; Brown, Gary L.; and Bryant, Ronald W., 5,469,188, Cl. 345-117.000.
Teledebit: *See—*
Pierce, George C.; and Fletcher, Don C., 5,469,497, Cl. 379-115.000.
Teledyne Industries, Inc.: *See—*
Rossback, Matthew A.; and McQueary, Timothy R., 5,468,464, Cl. 423-644.000.
Telefonaktiebolaget LM Ericsson: *See—*
Holmberg, Per A., 5,469,477, Cl. 375-356.000.
Telser, Thomas: *See—*
Loerzer, Thomas; Telser, Thomas; Zwez, Thomas; and Albert, Bernhard, 5,468,596, Cl. 430-306.000.
Telular International, Inc.: *See—*
Ortiz Perez, Luis R.; and Ramos, Alexis T., 5,469,494, Cl. 375-27.000.
Tempas, Jeffrey F.: *See—*
Buccicone, Dana F.; and Tempas, Jeffrey F., 5,467,799, Cl. 137-625.410.
Temple, Victor A. K.: *See—*
Neilson, John M. S.; Wheatley, Carl F., Jr.; Jones, Frederick P.; and Temple, Victor A. K., 5,468,668, Cl. 437-51.000.
Terai, Haruhiko, to Canon Kabushiki Kaisha. Polycrystalline silicon substrate having a thermally-treated surface, and process of making the same. 5,469,200, Cl. 347-63.000.
Terakado, Yoshimitsu, to Kabushiki Kaisha Shinkawa. Wire bonding apparatus. 5,468,927, Cl. 219-56.210.
Teraoka, Shinichi: *See—*
Sachiro, Toshiyuki; Teraoka, Shinichi; Ishimaru, Eiichiro; Fukuda, Yoshimori; and Inoue, Shuichi, 5,467,811, Cl. 164-476.000.
Terumo Kabushiki Kaisha: *See—*
Souma, Takahiro, 5,467,772, Cl. 128-680.000.
Teruya, Alan T.: *See—*
Elmer, John W.; Teruya, Alan T.; and O'Brien, Dennis W., 5,468,966, Cl. 250-397.000.
Tetervova, Natalia: *See—*
Evseev, Yury; Rachinsky, Lubomir; Tetervova, Natalia; Seleninov, Kazimir; Dermenzhi, Evgeniy; Nasekan, Olga; Druyanova, Eva; and Ribak, Roman, 5,468,976, Cl. 257-177.000.
Texaco Inc.: *See—*
Acker, William P.; Hahn, Robert T.; Mach, Thomas J.; and Sung, Rodney L., 5,468,262, Cl. 44-348.000.
DeRosa, Thomas F.; Studzinski, William M.; Russo, Joseph M.; Kaufman, Benjamin J.; and Hahn, Robert T., 5,468,264, Cl. 44-426.000.
Nelson, Gerald V.; Nongbri, Govanon; and Pratt, Roy E., 5,468,371, Cl. 208-216.0PP.
Texas A&M University System: *See—*
Dickens, Joseph C.; Billings, Ronald F.; and Payne, Thomas L., 5,468,770, Cl. 514-450.000.
Texas Incinerator Co., TX: *See—*
Hancock, Albert G., Jr., 5,468,435, Cl. 264-109.000.
Texas Instruments Incorporated: *See—*
Bayraktaroglu, Burhan, 5,468,658, Cl. 437-31.000.
Chang, Christopher T.-M.; and White, William A., 5,469,479, Cl. 375-377.000.
Chapman, Richard A., 5,468,666, Cl. 437-44.000.
Cho, Chih-Chen, 5,468,561, Cl. 428-421.000.
Diaz, Carlos H.; Duvvury, Charvaka; and Kang, Sung-Mo, 5,468,667, Cl. 437-50.000.
Efland, Taylor R.; Cotton, Dave; and Skelton, Dale J., 5,468,984, Cl. 257-356.000.
Hammerbacher, Milfred D., 5,468,304, Cl. 136-246.000.
Harward, Mark G., 5,469,078, Cl. 326-41.000.
Havemann, Robert H., 5,468,662, Cl. 437-40.000.
Houston, Theodore W., 5,469,065, Cl. 324-537.000.
Lewis, Russell F.; Martin, Steven F.; Cone, Dale A.; and Josephson, Norman A., 5,469,511, Cl. 381-173.000.
Madan, Sudhir K., 5,468,676, Cl. 437-70.000.
Mahant-Shetti, Shivaling S.; and Landers, Robert J., 5,469,079, Cl. 326-46.000.
McClear, Mark T.; and Wellheuser, Christopher, 5,469,473, Cl. 375-219.000.
McElroy, Dave J.; Gill, Manzur; and Shah, Pradeep L., 5,469,383, Cl. 365-185.010.
Roebuck, Randal D.; Agahdel, Fariborz; and Rizzo, Salvatore P., 5,468,157, Cl. 439-264.000.
Roebuck, Randal D.; and Rizzo, Salvatore P., 5,468,158, Cl. 439-264.000.
Smith, Scott E.; Le, Duy-Loan T.; Stephens, Michael C., Jr.; and Nomura, Masayoshi, 5,469,385, Cl. 365-189.050.
Taddiken, Albert H., 5,469,163, Cl. 341-83.000.
Tserng, Hua Q., 5,469,108, Cl. 330-286.000.
Yuan, Han-Tzong; Plumton, Donald L.; Kim, Tae S.; and Yang, Jau-Yuann, 5,468,661, Cl. 437-40.000.
Yung, Henry T.; Izzi, Louis J.; and Krenik, William R., 5,469,195, Cl. 345-199.000.
Thaler, Patricia A.; Kadambi, Jayant; Spratt, Michael; Albrecht, Alan R.; and Goody, Steven H., to Hewlett Packard Company. Two priority fair distributed round robin protocol for a network having cascaded hubs. 5,469,439, Cl. 370-94.300.
Theurer, Josef; and Wörgötter, Herbert, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b. H. Work train for exchanging old ties for new ties. 5,467,717, Cl. 104-6.000.
Thibaudin, Didier: *See—*
Perreaut, Jean M.; Roussel, Bruno F.; and Thibaudin, Didier, 5,469,017, Cl. 313-431.000.
Thiele, Karl-Heinz: *See—*
Pohl, Ludwig; Poetsch, Fike; Schumann, Herbert; Weiss, Karin; Thiele, Karl-Heinz; and Hirsch, Hans-Ludwig, 5,468,707, Cl. 502-153.000.
Thietje, Jerry. Semiconductor wafer cleaning system. 5,468,302, Cl. 134-1.000.
Thiokol Corporation: *See—*
Highsmith, Thomas K.; Hajik, Robert M.; Wardle, Robert B.; Lund, Gary K.; and Blau, Reed J., 5,468,866, Cl. 548-251.000.
Lund, Gary K.; and Braithwaite, Paul C., 5,467,714, Cl. 102-284.000.
Wallace, Ingvar A., II; Braithwaite, Paul C.; and Neidert, Jamie B., 5,468,313, Cl. 149-53.000.
Thoen, Christiaan A. J.: *See—*
Panandiker, Rajan K.; Thoen, Christiaan A. J.; and Lenoir, Pierre M. A., 5,468,414, Cl. 252-135.000.
Thomann, Mark R., to Micron Semiconductor, Inc. Circuit and method for decreasing the cell margin during a test mode. 5,469,393, Cl. 365-201.000.
Thomas & Betts Corporation: *See—*
Yamada, Yoshio; and Yamakawa, Katumi, 5,467,729, Cl. 116-209.000.
Thomas, Bradley S.: *See—*
Linder, Benjamin; Lee, Don; Battles, Amy; and Thomas, Bradley S., 5,468,022, Cl. 283-072.000.
Thomas, Glenn C., Sr., to ZT Corporation. Rust, corrosion, and scale remover. 5,468,303, Cl. 134-3.000.
Thomas, James E., to CEM Corporation. Apparatus for manufacture of containers for materials being heated. 5,468,135, Cl. 425-85.000.
Thomas, John E.: *See—*
Tippins, George W.; and Thomas, John E., 5,467,519, Cl. 29-527.700.
Thomas, Stephen J.: *See—*
Wilt, Truman F.; Carney, Joseph M.; Thomas, Stephen J.; Claar, James A.; and Birkmeyer, William J., 5,468,802, Cl. 524-539.000.
Thompson, Daniel L.; and Thompson, W. Dale. Sunflower harvesting attachment for corn picker heads. 5,467,587, Cl. 56-98.000.
Thompson, David A.; Rajagopalan, Venkatesh; Wright, Kurt W.; Sterba, John J.; Paulus, William J.; Paulus, Nancy J.; McCauley, Kathryn M.; and Chen, David K., to General Motors Corporation. Flat plate sensor with a robust package design. 5,467,636, Cl. 73-23.310.
Thompson, Earl R.: *See—*
Giamei, Anthony F.; and Thompson, Earl R., 5,468,548, Cl. 428-294.000.
Thompson, E. Brad; and Nazareth, Lynne V., to Board of Regents, the University of Texas System. Cell lysis activity of a modified fragment of the glucocorticoid receptor. 5,468,624, Cl. 435-69.100.
Thompson, Kurt P.; and Wiese, Jeffrey W., to Reynolds Metals Company. Energy absorbing beam construction for use with vehicle seat belt restraining systems. 5,468,053, Cl. 297-472.000.
Thompson, Mark; and Gaertner, Frank H., to Mycogen Corporation. *Bacillus thuringiensis anti-giardia treatment. 5,468,483, Cl. 424-93.461.*
Thompson, Warren L.: *See—*
Carlin, Jerry F.; Koon, James E.; Parker, Paul D.; and Thompson, Warren L., 5,467,689, Cl. 92-172.000.
Thompson, W. Dale: *See—*
Thompson, Daniel L.; and Thompson, W. Dale, 5,467,587, Cl. 56-98.000.
Thomsen, John E. Stacking and carrying device. 5,467,574, Cl. 53-397.000.
Thomson-CSF Semiconducteurs Specifiques: *See—*
Ferrant, Richard, 5,469,485, Cl. 377-107.000.
Thomson Saginaw Ball Screw Company, Inc.: *See—*
Lange, David A., 5,467,661, Cl. 74-441.000.
Lange, David A.; Benton, Robert L.; Welling, William E.; and Mugglestone, Peter R., 5,467,662, Cl. 74-459.000.
Thomson Tubes & Displays, S.A.: *See—*
Perreaut, Jean M.; Roussel, Bruno F.; and Thibaudin, Didier, 5,469,017, Cl. 313-431.000.
Thorn, Brent. Combined torque limiting and marking wrench. 5,467,674, Cl. 81-468.000.
Thurm, Hans-Günther: *See—*
Arvedi, Giovanni; Gosio, Giovanni; Siegers, Ulrich; Manini, Luciano; Pleschiutschnigg, Fritz-Peter; Parschat, Lothar; Thurm, Hans-Günther; and Lüdorff, Harald, 5,467,809, Cl. 164-418.000.
Tijburg, Rudolf P.: *See—*
Van De Pas, Hermanus A.; Tijburg, Rudolf P.; and De Poorter, Johannes A., 5,468,683, Cl. 437-209.000.
Tikano, Yoshito: *See—*
Takee, Masao; Kimoto, Mamoru; Tikano, Yoshito; Mizitaki, Husago; Masuura, Yoshinori; Nishio, Koji; and Furukawa, Nobohiro, 5,468,260, Cl. 29-623.500.
Time Warner Entertainment Co., L.P.: *See—*
Ostrover, Lewis S.; Cookson, Christopher J.; and Lieberfarb, Warren N., 5,469,370, Cl. 364-514.00R.
Timmerbeil, Karl-Ernst: *See—*
Eckelt, Ulrich; and Timmerbeil, Karl-Ernst, 5,468,325, Cl. 156-259.000.
Tiollais, Pierre: *See—*
Blaudin De The, Hughes; Marchio, Agnes; Tiollais, Pierre; DeJean, Anne; Brand, Nigel; Petkovich, Martin; Krust, Andree; and Chambon, Pierre, 5,468,617, Cl. 435-7.800.
Revel, Michel; and Tiollais, Pierre, 5,468,607, Cl. 435-6.000.
Revel, Michel; and Tiollais, Pierre, 5,468,608, Cl. 435-91.110.
Revel, Michel; and Tiollais, Pierre, 5,468,609, Cl. 530-351.000.

Tippins, George W.; and Thomas, John E., to Tippins Incorporated. Intermediate thickness twin slab caster and inline hot strip and plate line. 5,467,519, Cl. 29-527.700.
Tippins Incorporated: *See*—
Tippins, George W.; and Thomas, John E., 5,467,519, Cl. 29-527.700.
TIW Corporation: *See*—
Braddick, Britt O., 5,467,819, Cl. 166-117.600.
Toa Medical Electronics Co., Ltd.: *See*—
Kosaka, Tokihiro; Ogino, Shinichi; and Maekawa, Yasunori, 5,469,251, Cl. 356-73.000.
Kosaka, Tokihiro, 5,469,375, Cl. 364-555.000.
Tobita, Minoru: *See*—
Fujita, Goro; and Tobita, Minoru, 5,469,415, Cl. 369-48.000.
Fujita, Goro; and Tobita, Minoru, 5,469,420, Cl. 369-59.000.
Todokoro, Hideo: *See*—
Itoh, Hiroyuki; Todokoro, Hideo; Sohda, Yasunari; and Nakayama, Yoshinori, 5,468,969, Cl. 250-492.230.
Togashi, Atsushi; and Yamada, Takateru, to Dow Corning Toray Silicon Co., Ltd. Silicone compositions for the formation of cured release coatings. 5,468,824, Cl. 528-12.000.
Tohda, Takao; Kado, Hiroyuki; and Yamamoto, Shinichi, to Matsushita Electric Industrial Co., Ltd. Scanning probe microscope and method for measuring surfaces by using this microscope. 5,468,959, Cl. 250-306.000.
Tokai Kogyo Kabushiki Kaisha: *See*—
Yada, Yukihiko, 5,468,438, Cl. 264-139.000.
Toki, Hiroyuki: *See*—
Honkura, Yoshinobu; Toki, Hiroyuki; and Usami, Toyokatsu, 5,468,522, Cl. 427-597.000.
Tokura, Nobuyuki; Kajiyama, Yoshio; Tatsuno, Hideo; and Nakashima, Takashi, to Nippon Telegraph and Telephone Corporation. Loop-back system in a dual ring network. 5,469,428, Cl. 370-161.000.
Tokuyama Corporation: *See*—
Okabayashi, Minahiro; and Bai, Zhi-ping, 5,468,738, Cl. 514-63.000.
Tokyo Electric Power Company, Incorporated, The: *See*—
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.
Tokyo Electron Limited: *See*—
Ishii, Katsumi; and Takikawa, Masao, 5,468,112, Cl. 414-416.000.
Tokyo Electron Tohoku Limited: *See*—
Ishii, Katsumi; and Takikawa, Masao, 5,468,112, Cl. 414-416.000.
Tomasello, Biagia: *See*—
Zappala, Paolo; and Tomasello, Biagia, 5,467,690, Cl. 99-302.00P.
Tomita, Katsuhiko, to Horiba, Ltd. Method of producing a pH-responsive membrane. 5,468,514, Cl. 427-77.000.
Topcik, Dennis S.: *See*—
Garrett, Ronald R.; and Topcik, Dennis S., 5,469,134, Cl. 340-426.000.
Torii, Kenji: *See*—
Honda, Shinkichi; Torii, Kenji; Arai, Yoichiro; Kasai, Masaji; Kato, Hiromasa; Iida, Takao; Takahashi, Tomoya; Yokoo, Yoshiharu; Kamiya, Toshikazu; and Tamaoki, Tatsuya, 5,468,474, Cl. 424-70.100.
Torikai, Toshitaka: *See*—
Okuda, Tetsuro; Yamada, Hirohito; and Torikai, Toshitaka, 5,469,459, Cl. 372-46.000.
Torres, Anthony R.: *See*—
Pawliszyn, Janusz B., 5,468,359, Cl. 204-183.200.
Torrington Company, The: *See*—
Braza, Joseph F.; and Larson, John A., 5,468,308, Cl. 148-321.000.
Godec, Maksimilijan; Larson, John A.; and Waskiewicz, Walter P., 5,468,074, Cl. 384-495.000.
Tosaki, Yoshihiro: *See*—
Nagata, Yuji; Fukazawa, Toshio; Wada, Kumiko; and Tosaki, Yoshihiro, 5,469,317, Cl. 360-113.000.
Tosoh Corporation: *See*—
Ohnuki, Yukio; Kurosawa, Satoshi; and Kondo, Akio, 5,468,552, Cl. 428-336.000.
Toto, Gregory: *See*—
McDonald, Sean C.; Hertz, Ellen J.; Smith, James A.; and Toto, Gregory, 5,468,110, Cl. 414-273.000.
Totsuka, Mikio: *See*—
Suzuki, Tamotsu; Totsuka, Mikio; Niitsu, Chiyomi; and Shinozaki, Fumiaki, 5,468,594, Cl. 430-294.000.
Toujas, Edouard: *See*—
Garcera, Daniel; Toujas, Edouard; and Gillot, Jacques, 5,468,384, Cl. 210-232.000.
Tourneux, Daniel; Mariatte, René; and Dujoux, Bernard, to Centre Stephanois De Recherches Mecaniques Hydromecanique et Frottement. Bearing shell for heavily loaded bearings with a rolled strip interference or force fit lining. 5,468,071, Cl. 384-276.000.
Touzan, Philippe; Lukassen, Liliane; and Louvet, Nathalie, to L'Oreal. Two-phase cosmetic or dermatological composition. 5,468,496, Cl. 424-401.000.
Toya, Tatsuro: *See*—
Hara, Yuji; Iio, Satoru; and Toya, Tatsuro, 5,468,998, Cl. 257-775.000.
Toyama, Katsuhisa, to Mitsubishi Jukogyo Kabushiki Kaisha. Magnetic bearing arrangement. 5,469,007, Cl. 310-90.500.
Toyo Denso Kabushiki Kaisha: *See*—
Sato, Hiroshi, 5,468,926, Cl. 200-558.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Etoh, Makoto; and Kawaguchi, Kiyoshi, 5,467,880, Cl. 215-256.000.
Hori, Nobuaki, 5,467,898, Cl. 222-190.000.
Toyo Tanso Co., Ltd.: *See*—
Okada, Osamu; Ogura, Hiroaki; and Sogabe, Toshiaki, 5,468,565, Cl. 428-552.000.
Toyoda, Kouji: *See*—
Yamashita, Hiroyuki; Kondo, Hiroyuki; Hatano, Kouichi; Nakano, Katsunori; Toyoda, Kouji; and Senzaki, Takashi, 5,468,516, Cl. 427-180.000.
Toyoda, Yuji: *See*—
Uenaka, Akimitsu; Toyoda, Yuji; Tsutsui, Koichi; and Kenny, John, 5,468,813, Cl. 525-385.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Abe, Kazuo; Ishihara, Masashi; Ikeuchi, Hitoshi; Sugano, Shinsuke; Okuda, Toshiharu; Sakakibara, Shigemi; Shimizu, Hidetoshi; and Ichiba, Yasuaki, 5,467,846, Cl. 188-73.370.
Yanagihara, Hiromichi; Sato, Yasuo; and Kawaguchi, Akio, 5,467,757, Cl. 123-305.000.
Trammel, Pamela S.: *See*—
Nulty, James E.; and Trammel, Pamela S., 5,468,342, Cl. 156-643.100.
Transfair Corporation: *See*—
French, Erick M.; and French, James S., 5,468,283, Cl. 95-45.000.
Träubel, Harro: *See*—
Probst, Joachim; Novotny, Fritz; Träubel, Harro; and Heiliger, Ludger, 5,468,257, Cl. 8-436.000.
Tresch, Rudolf: *See*—
Haumann, Jurgen; Knopfli, Alfred; Sattelmayer, Thomas; and Tresch, Rudolf, 5,467,815, Cl. 165-109.100.
Treuberg, Heinz D. Electric siga advertising element. 5,467,544, Cl. 40-564.000.
Trey, Heiko; Grabow, Thomas; and Steinbrink, Eckhard, to Deutsche Aerospace Airbus GmbH. Smoke detector device, especially for a space in an aircraft. 5,469,147, Cl. 340-628.000.
TRI Chemical Laboratory Inc.: *See*—
Yamaguchi, Ryuichi; Kiso, Koichi; Tazuke, Kiyoshi; Machida, Hideaki; Mihirogi, Katsuhiro; and Takamatsu, Yukichi, 5,468,894, Cl. 556-477.000.
TRI Industries, Inc.: *See*—
Eyman, David; and Schmidlin, Thomas J., 5,468,009, Cl. 280-650.000.
Trieb, Kurt: *See*—
Esch, Hans-Joachim; Distelrath, Winfried; and Trieb, Kurt, 5,467,843, Cl. 184-6.500.
Trilby, Ltd.: *See*—
Gravino, Marc C., 5,467,621, Cl. 70-171.000.
Trinity Industries, Inc.: *See*—
Dalrymple, Thomas H.; and Harkey, Christopher C., 5,467,719, Cl. 105-362.000.
Troncoso, Vincent F., to Golden Key Futura, Inc. Archery rest assembly. 5,467,759, Cl. 124-44.500.
Trotzinka, Karen A.: *See*—
Guénin, Eric P.; Trotzinka, Karen A.; Smith, Leslie C.; Warren, Craig B.; Munteanu, Marina A.; Chung, Siew L.; and Tan, Chee-Teck, 5,468,725, Cl. 512-2.000.
Trowbridge, Jon D., to Caterpillar Inc. Control cable for a vehicle system. 5,467,663, Cl. 74-481.000.
Truitt, Archie A. Air distribution system. 5,468,185, Cl. 454-198.000.
Truth Hardware Corporation: *See*—
Nolte, Douglas A.; Vetter, Gregory J.; Best, Kenneth E.; and Krampotich, Dennis J., 5,467,503, Cl. 16-115.000.
Trutter, Walter P.: *See*—
Gimbel, Hans-Peter; Trutter, Walter P.; and Specht, Martin, 5,468,014, Cl. 280-735.000.
TRW Inc.: *See*—
Gille, Lennart A., 5,468,013, Cl. 280-729.000.
Kirsch, Thomas A.; and Green, Lloyd G., 5,468,017, Cl. 280-741.000.
TRW Repa GmbH: *See*—
Bläse, Meinhard; and Mika, Helmut, 5,468,019, Cl. 280-805.000.
TRW Vehicle Safety Systems Inc.: *See*—
Goetz, George W., 5,468,015, Cl. 280-737.000.
Mihm, Joseph J., 5,468,012, Cl. 280-728.200.
Tsai, Charles S. Device comprising a flat susceptor rotating parallel to a reference surface about a shaft perpendicular to this surface. 5,468,299, Cl. 118-730.000.
Tsai, Hsin-Tan. Danger detector-type automatic control device. 5,469,138, Cl. 340-500.000.
Tsao, Fu-Pao: *See*—
Nicolson, Paul C.; Seamons, Kenneth R.; Tsao, Fu-Pao; Alvord, Larry A.; and McCraw, Earl C., Jr., 5,468,448, Cl. 422-30.000.
Tseng, Kuni. Tennis racket. 5,467,982, Cl. 273-73.00C.
Tserng, Hua Q., to Texas Instruments Incorporated. Reactively compensated power transistor circuits. 5,469,108, Cl. 330-286.000.
Tsubakimoto Chain Co.: *See*—
Hirao, Toru; Sato, Hideki; and Kanbe, Toshio, 5,467,863, Cl. 198-360.000.
Tsuboi, Akio: *See*—
Miyazawa, Chihiro; Orita, Souichi; and Tsuboi, Akio, 5,468,419, Cl. 252-182.120.
Tsuchiya, Yasutoshi: *See*—
Sasaki, Masahiko; Tsuchiya, Yasutoshi; and Fukunaga, Hidetoshi, 5,467,606, Cl. 62-160.000.
Tsuji, Yoichiro: *See*—

Seri, Hajime; Yamamura, Yasuharu; Tsuji, Yoichiro; Moriwaki, Yoshio; and Iwaki, Tsutomu, 5,468,309, Cl. 148-421.000.

Tsujimoto, Nohiro; Hongyo, Kenichi; Baba, Yoshisuke; Suzuki, Michinori; and Akikawa, Kazuhiro, to UBE Industries, Ltd. Polybutadiene composition and process for producing same. 5,468,822, Cl. 526-340.100.

Tsunoda, Hajime: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Tsurushima, Kuniaki: *See*—
Yoshimura, Atsushi; Shibata, Hiroshi; Takahashi, Fumio; and Tsurushima, Kuniaki, 5,467,803, Cl. 140-105.000.

Tsuruta, Harumi: *See*—
Yasuda, Kenji; Takata, Yoshinori; Tsuruta, Harumi; Ohnuma, Sadabumi; and Miura, Junkichi, 5,468,379, Cl. 210-198.200.

Tsuruta, Minoru; Suzuta, Toshihiko; Nakada, Akio; Kuramoto, Seiji; Hibino, Hiroki; Bito, Shiro; and Mukaizawa, Akito, to Olympus Optical Co., Ltd. Surgical device for stapling and fastening body tissues. 5,467,911, Cl. 227-175.000.

Tsurutani, Iwao; Manabe, Takafumi; and Emoto, Ikuo, to Ube Rexene Corporation; Ube Industries; and Rexene Corporation. Resin composition. 5,468,807, Cl. 525-240.000.

Tsutsui, Koichi: *See*—
Uenaka, Akimitsu; Toyoda, Yuji; Tsutsui, Koichi; and Keany, John, 5,468,813, Cl. 525-385.000.

Tsutsui, Mitsukuni: *See*—
Igarashi, Shinya; Hirayama, Hiroshi; Kobayashi, Chihiro; Tsutsui, Mitsukuni; and Kato, Yukio, 5,467,648, Cl. 73-202.500.

Tsutsui, Tomoki; Izukawa, Tsukuru; Ohkubo, Kazuhiko; and Sakaki, Yoshitsugu, to Mitsui Toatsu Chemicals, Inc. Preparation process of polyoxyalkylene polyols and process of alkylene oxide recovery. 5,468,840, Cl. 528-408.000.

Tsutsumi, Kazusumi: *See*—
Matsushiro, Aizo, 5,468,479, Cl. 424-93.440.

Tsutsumi, Yuka: *See*—
Hoshino, Mitsuo; Tsutsumi, Yuka; Shimada, Mitsuhiro; Masuda, Takashi; Morimiya, Yuji; Ide, Yoshihiro; Kawaguchi, Takashi; and Nogo, Yuichiro, 5,469,271, Cl. 358-335.000.

Tsuyama, Toshiaki; Onaka, Toru; Nobumoto, Kazutoshi; and Kawamura, Makoto, to Mazda Motor Corporation. Traction control device for vehicles. 5,469,359, Cl. 364-426.030.

Tsuzuki, Kouichi, to Fujitsu Limited. Near-synonym generating method. 5,469,355, Cl. 364-419.190.

Tucker, Brenda N.: *See*—
Emery, Mark J.; Tucker, Brenda N.; and Schwartz, Laurie D., 5,469,496, Cl. 379-58.000.

Tucker, Brian B.; and Belmont, Brian V., to Compaq Computer Corp. Detecting the presence of a device on a computer system bus by altering the bus termination. 5,469,554, Cl. 395-420.000.

Tucker, Edwin C.: *See*—
Lee, Leonard G.; Lynn, John S.; McLean, Francis A.; Tucker, Edwin C.; and Sevack, Lloyd, 5,467,972, Cl. 269-118.000.

Tuner, Sheleen M.: *See*—
Hyman, Nelson L.; Braun, William R.; Garner, James C.; Larson, Lawrence R.; and Tuner, Sheleen M., 5,467,814, Cl. 165-41.000.

Tung, I-Chung: *See*—
Li, Tzu-Li; Tung, I-Chung; and Yu, Duncan, 5,468,429, Cl. 264-442.000.

Tung, Pai-Feng. Means for fixing a gore to ribs of a large umbrella. 5,468,087, Cl. 403-294.000.

Turconi, Marco: *See*—
Cereda, Enzo; Ezhaya, Antoine; Turconi, Marco; Dubini, Enrica; and Maffione, Grazia, 5,468,758, Cl. 514-304.000.

Turner, James A.: *See*—
Blackledge, James; Salvai, Nazzareno; and Turner, James A., 5,468,348, Cl. 162-132.000.

Tweedie, Michael F.; Strauss, Harry W.; and Nunn, Adrian D., to Bracco International B.V. Methods for the in vivo measurement of the concentration of non-imaging nmr-detectable xenobiotic compounds. 5,468,467, Cl. 424-9.361.

Tweedy, Mark R.: *See*—
McCoy, Gary W.; Zwigart, John M.; and Tweedy, Mark R., 5,467,864, Cl. 198-409.000.

Tyndorf, Tadeusz A.: *See*—
Barker, Susan; Chu, I-Hsi; Fedun, Oresta N.; and Tyndorf, Tadeusz A., 5,468,638, Cl. 435-304.100.

U S West Advanced Technologies, Inc.: *See*—
Beveridge, Gregory J., 5,469,495, Cl. 379-56.000.

Ube Industries: *See*—
Tsurutani, Iwao; Manabe, Takafumi; and Emoto, Ikuo, 5,468,807, Cl. 525-240.000.

Ube Industries, Ltd.: *See*—
Hayakawa, Tetsuo; Inoue, Tokuji; and Asaga, Hiroyuki, 5,468,810, Cl. 525-244.000.
Tsujimoto, Nohiro; Hongyo, Kenichi; Baba, Yoshisuke; Suzuki, Michinori; and Akikawa, Kazuhiro, 5,468,822, Cl. 526-340.100.

Ube Rexene Corporation: *See*—
Tsurutani, Iwao; Manabe, Takafumi; and Emoto, Ikuo, 5,468,807, Cl. 525-240.000.

Uchida, Hiroyuki; Yoshikawa, Kazuo; and Nishi, Seiji, to Kabushiki Kaisha Kobe Seiko Sho. Method of lowering permeability of difficult-to-work Co alloy. 5,468,305, Cl. 148-120.000.

Uchida, Naoki: *See*—
Iiyama, Katsuhiko; and Uchida, Naoki, 5,469,339, Cl. 362-61.000.
Yamada, Akiya; Wato, Takahiko; Uchida, Naoki; Fujisawa, Misuzu; Takama, Shigeyuki; and Inamoto, Yukiko, 5,468,503, Cl. 424-661.000.

Uchihashi, Kiyoaki; Nishimura, Hiroshi; and Fukumori, Noriyuki, to Matsushita Electric Works, Ltd. Device for operating a high pressure gas discharge lamp. 5,469,027, Cl. 315-224.000.

Uchiyama, Kenji: *See*—
Matsumoto, Katsuru; Hirayama, Nobuhiro; Kawasaki, Shoji; Uchiyama, Kenji; Uramoto, Katsuo; and Fukui, Tamami, 5,468,585, Cl. 430-110.000.

Uchiyama, Shigeyuki; Kusaka, Yosuke; and Yamano, Syozo, to Nikon Corporation. Autofocus camera. 5,469,240, Cl. 354-406.000.

Udding, Anne C.; Van Leeuwen, Peter A.; and Pearson, Michael, to Shell Oil Company. Molybdenum-containing friction-reducing additives. 5,468,891, Cl. 556-61.000.

Udert, Karl E.; and Winkler, Walter, to Hilti Aktiengesellschaft. Disk-shaped tool bit for an angle grinder. 5,468,176, Cl. 451-359.000.

Uekusa, Kikoo: *See*—
Yamaguchi, Eiji; Uragami, Yuji; Yokozuka, Hideharu; Uekusa, Kikoo; Yamaguchi, Toshio; Abe, Satoshi; Kamo, Tetsuro; and Suzuki, Takao, 5,468,709, Cl. 502-210.000.

Uemura, Hiroyuki: *See*—
Suzuki, Akira; Hotta, Yoshihiko; and Uemura, Hiroyuki, 5,468,711, Cl. 503-201.000.

Uenaka, Akimitsu; Toyoda, Yuji; Tsutsui, Koichi; and Kenay, John, to Nippon Paint Co., Ltd. Powder coating. 5,468,813, Cl. 525-385.000.

Ueno, Ryuji; and Oda, Tomio, to Kabushiki Kaisha Ueno Seiyaku Oyo Kenkyujo. Method of producing α, β-unsaturated ketones. 5,468,880, Cl. 549-263.000.

Uetani, Yasunori: *See*—
Hashimoto, Kazuhiko; Osaki, Haruyoshi; Ebina, Chinehito; Nagase, Kyoko; Moriuma, Hiroshi; and Uetani, Yasunori, 5,468,590, Cl. 430-191.000.

Ueyama, Yoshiki: *See*—
Ihara, Yasuhiro; Yamashita, Mitsuhiro; and Ueyama, Yoshiki, 5,469,360, Cl. 364-449.000.

UFS Corporation: *See*—
Hess, H. Frederick, Jr.; and Hess, H. Frederick, III, 5,468,361, Cl. 204-252.000.

Uhm, Han S., to United States of America, Navy. Large scale purification of contaminated air. 5,468,356, Cl. 204-164.000.

Ullman, Edwin F.: *See*—
Skold, Carl N.; Shanafelt, Armen B.; Ghazarossian, Vartan; and Ullman, Edwin F., 5,468,647, Cl. 436-514.000.

Ulrich, Peter C.: *See*—
France, Dennis S.; Cerami, Anthony; Ulrich, Peter C.; Norton, Laura A.; and Neer, David L., 5,468,777, Cl. 514-562.000.

Umax Data Systems Inc.: *See*—
Wun, Jeffrey; Shia, Ting; and Guo, Pang-Merag, 5,469,303, Cl. 359-196.000.

Umeda, Katsuhiko, to Jamco Corporation. Window structure equipped on side walls of a cabin in the body of an airplane. 5,467,943, Cl. 244-129.300.

Umezawa, Shigeki: *See*—
Nakagomi, Hirofumi; Harada, Yoshihisa; and Umezawa, Shigeki, 5,467,849, Cl. 188-77.00W.

Underbrink, John M.: *See*—
Keeler, Russell L.; and Underbrink, John M., 5,468,199, Cl. 482-35.000.

Ung, Michael M.: *See*—
Rogers, Lesley; and Ung, Michael M., 5,469,456, Cl. 372-43.000.

Uniden Corporation: *See*—
Iwakuni, Mikio, 5,469,287, Cl. 359-189.000.

Unilever Patent Holdings B.V.: *See*—
Catt, Michael; Coley, John; and Davis, Paul J., 5,467,778, Cl. 128-738.000.

Union Switch & Signal Inc.: *See*—
Chew, James P.; and Hamilton, Robert E., 5,467,654, Cl. 73-514.390.

Unisia Jecs Corporation: *See*—
Kashiwabara, Masuo, 5,468,195, Cl. 477-46.000.
Kumagai, Masato, 5,467,751, Cl. 123-399.000.

United Microelectronics Corporation: *See*—
Hsu, Chen-Chung, 5,468,541, Cl. 428-210.000.
Yang, Ming-Tzong; Hsue, Chen-Chiu; and Hong, Gary, 5,468,980, Cl. 257-306.000.

United Solar Systems Corporation: *See*—
Glatfelter, Troy; and Lycette, Mark, 5,468,988, Cl. 257-431.000.

United States of America
Agriculture: *See*—
Dickens, Joseph C.; Billings, Ronald F.; and Payne, Thomas L., 5,468,770, Cl. 514-450.000.
Dowell, Floyd E.; Sheppard, Harry T.; Dettore, Lawrence A.; and Bennett, Clyde T., 5,467,700, Cl. 99-570.000.

Army: *See*—
Liberman, Harold J., 5,467,681, Cl. 89-1.110.
Mariani, Elio A., 5,469,170, Cl. 342-51.000.

Polge, Robert J.; and Green, Augustus H., Jr., 5,469,167, Cl. 342-25.000.
Skudera, William J., Jr., 5,469,173, Cl. 342-202.000.
Energy: *See—*
Kang, Michael, 5,469,013, Cl. 313-138.000.
Seligmann, Daniel A.; Moss, William C.; Valk, Theodore C.; and Conder, Alan D., 5,469,442, Cl. 370-110.400.
Health and Human Services: *See—*
Aszalos, Adorjan; Weaver, James L.; and Pine, P. Scott, 5,468,469, Cl. 514-150.000.
LaRochelle, William J.; Pierce, Jacalyn; Jensen, Roy A.; and Aaronson, Stuart A., 5,468,468, Cl. 424-1.490.
Polymeropoulos, Mihael H.; and Merril, Carl R., 5,468,610, Cl. 435-6.000.
Su, Syang Y.; and Shiu, Gerald K., 5,468,643, Cl. 436-161.000.
Interior: *See—*
Hicks, Gary W.; and Cornell, William L., 5,467,876, Cl. 209-170.000.
Navy: *See—*
Ferrando, William A., 5,468,570, Cl. 429-217.000.
Graham, Marcus L.; MacDonald, John F.; Gong, Kai F.; and Keay, Kathleen D., 5,469,374, Cl. 364-516.000.
Hyman, Nelson L.; Braun, William R.; Garner, James C.; Larson, Lawrence R.; and Tuner, Sheleen M., 5,467,814, Cl. 165-41.000.
Lucy, William D.; and Firman, William F., 5,467,728, Cl. 114-332.000.
Rose-Pehrsson, Susan L.; Di Lella, Daniel; and Grate, Jay W., 5,469,369, Cl. 364-497.000.
Seaman, Peter E.; and Stottlemyer, Thomas R., 5,468,913, Cl. 174-102.00R.
Uhm, Han S., 5,468,356, Cl. 204-164.000.
Walker, Howard W.; and Garcia, Graham A., 5,468,674, Cl. 437-62.000.
U.S. Philips Corporation: *See—*
Bazzaz, Paul, 5,469,214, Cl. 348-416.000.
Hesdahl, Piet R.; and Klik, Cornelis M., 5,469,441, Cl. 370-110.100.
Ibental, Achim; and Dammann, Martin, 5,469,217, Cl. 348-447.000.
Jacob, Heinz J., 5,468,932, Cl. 219-121.690.
Kahlman, Josephus A. H. M.; and Rijckaert, Albert M. A., 5,469,462, Cl 375-232.000.
Müller, Ingo; and Schneider, Norbert, 5,467,494, Cl. 15-22.100.
Makram-Ebeid, Shérif, 5,469,530, Cl. 395-23.000.
Marinus, Antonius A. M., 5,469,349, Cl. 363-21.000.
Misker, Jan S.; Hamann, Theodora L.; and Rozendaal, Leendert T., 5,469,227 Cl. 348-702.000.
Philippe, Pascal, 5,469,117, Cl. 331-109.000.
Sparks, Geoffrey S., 5,469,105, Cl. 330-129.000.
Valster, Adriaan, 5,468,975, Cl. 257-97.000.
Van De Pas, Hermanus A.; Tijburg, Rudolf P.; and De Poorter, Johannes A., 5,468,683, Cl. 437-209.000.
Van Roijen, Raymond; and Pennings, Engelbertus C. M., 5,469,460, Cl. 372-94.000.
Voorman, Johannes O., 5,469,475, Cl. 375-247.000.
United States Surgical Corporation: *See—*
Kaplan, Donald S.; Hermes, Matthew E.; Muth, Ross R.; Brown, David L.; and Holzwarth, Henry A., 5,468,252, Cl. 606-228.000.
Sauer, Jude S.; Oravecz, Michael G.; Greenwald, Roger J.; and Kobilansky, Alexander I., 5,467,762, Cl. 600-114.000.
United Technologies Corporation: *See—*
Bales, Daniel A.; and Hartman, Mark L., 5,467,528, Cl. 29-890.010.
Giamei, Anthony F.; and Thompson, Earl R., 5,468,548, Cl. 428-294.000.
Morey, William W.; and Wilson, Arnold L., 5,469,520, Cl. 385-37.000.
University Corporation for Atmospheric Research: *See—*
Frush, Charles L., 5,469,169, Cl. 342-26.000.
University of Akron: *See—*
Greuel, Michael P.; Arvanitopoulos, Labros D.; and Harwood, H. James, 5,468,785, Cl. 522-63.000.
University of British Columbia, The: *See—*
Wu, Chiu H.; and Powrie, William D., 5,468,508, Cl. 426-316.000.
University of California. Office of Technology Transfer, The Regents of the: *See—*
Garnett, Robert W.; and Dobelbower, M. Christian, 5,468,965, Cl. 250-396.0ML.
University of California, Regents of the: *See—*
Elmer, John W.; Teruya, Alan T.; and O'Brien, Dennis W., 5,468,966, Cl. 250-397.000.
Falabella, Steven, 5,468,363, Cl. 204-298.410.
University of California, The Regents of the: *See—*
Yen, Samuel S. C., 5,468,741, Cl. 514-179.000.
Zeidler, Gideon, 5,468,511, Cl. 426-614.000.
University of Central Florida: *See—*
Bass, Michael, 5,469,371, Cl. 364-550.000.
Delfyett, Peter J., Jr., 5,469,454, Cl. 372-18.000.
University of Chicago: *See—*
Dorris, Stephen E.; Poeppel, Roger B.; Prorok, Barton C.; Lanagan, Michael T.; and Maroni, Victor A., 5,468,566, Cl. 428-552.000.
Gopalsami, Nachappa; Bakhtiari, Sasan; Raptis, Apostolos C.; and Dieckman, Stephen L., 5,468,964, Cl. 250-393.000.
Nunez, Luis; and Vandergrift, George F., 5,468,456, Cl. 423-10.000.
University of Cincinnati: *See—*
Sekhar, Jainagesh A.; Subramanian, V.; and Canarslan, Necip S., 5,468,690, Cl. 501-1.000.
University of Colorado Foundation, Inc., The: *See—*
Sharp, D. Gary; and Johnson, M. Kristina, 5,469,279, Cl. 359-53.000.
University of Georgia Research Foundation, Inc.: *See—*
Jacobsen, Stuart M.; Jaffe, Steven M.; Eilers, Hergen; and Jones, Michieal L., 5,469,018, Cl. 313-461.000.
University of Illinois, The Board of Trustees of the: *See—*
Vandenberg, Douglas; Philpott, Michael L.; Green, Phillip A.; Eastman, Scott A.; and Carlini, Sean M., 5,469,482, Cl. 377-3.000.
University of Maryland at Baltimore: *See—*
Fasano, Alessio; Levine, Myron M.; Nataro, James P.; and Noriega, Fernando, 5,468,639, Cl. 435-320.100.
University of Massachusetts Lowell: *See—*
Pawlowicz, Andrew; Douglas, Craig; Tayebi, Amad; and Orroth, Stephen, 5,468,327, Cl. 156-393.000.
University of Massachusetts Lowell Research Foundation: *See—*
Haines, D. Mark, 5,469,469, Cl. 375-201.000.
University of New Mexico: *See—*
Robinson, Stephen E., 5,469,057, Cl. 324-248.000.
University of North Carolina at Chapel Hill, The: *See—*
Liu, Edison T., 5,468,634, Cl. 435-240.200.
University of Notre Dame: *See—*
Johnson, Steven W.; Monticello, Daniel J.; Gibbs, Phillip R.; and Kulpa, Charles F., 5,468,626, Cl. 435-130.000.
University of Ottawa: *See—*
Kavehrad, Mohsen; and Yun, Gang, 5,469,277, Cl. 359-15.000.
University of Pennsylvania, The Trustees of the: *See—*
Marcolongo, Michele S.; Ducheyne, Paul; Ko, Frank; and LaCourse, William, 5,468,544, Cl. 428-224.000.
University of Puerto Rico: *See—*
Rodriguez-Flores, Manuel; and Rivera-Gonzalez, Sonia, 5,468,500, Cl 424-441.000.
University of Rochester, The: *See—*
Wang, Shenge, 5,469,267, Cl. 358-298.000.
University of So. California: *See—*
Prasanna, Viktor K.; Wang, Cho-Li; and Park, Heonchul, 5,468,069, Cl. 382-253.000.
University of Tennessee Research Corporation, The: *See—*
Reddick, Bradford B.; Gwinn, Kimberly D.; and Oliver, Jack W., 5,468,486, Cl. 424-194.100.
University of Toledo, The: *See—*
Srebnik, Morris; Zheng, Bin; and Deloux, Laurent, 5,468,889, Cl. 556-7.000.
University of Washington, Board of Regents of the: *See—*
Young, Kenneth K.; and Wilkes, R. Jeffrey, 5,469,403, Cl. 367-6 000.
University Research Engineers & Associates: *See—*
Callahan, Thomas F.; and Callahan, Matthew G., 5,467,775, Cl. 128-715.000.
University Technologies International Inc.: *See—*
Puri, Ruchir; and Gu, Jun, 5,469,367, Cl. 364-489.000.
Uno, Masahiro: *See—*
Ohishi, Mitsuru; Nakagawa, Wataru; and Uno, Masahiro, 5,468,962, Cl. 250-343.000.
UOP: *See—*
Ward, John W., 5,468,700, Cl. 502-60.000.
Upadhya, Kamleshwar; and Hoffman, Wesley P., to Hughes Missile Systems Company. Densification of porous articles by plasma enhanced chemical vapor infiltration. 5,468,357, Cl. 204-173.000.
Upjohn Company, The: *See—*
Chio, Christopher L.; and Huff, Rita M., 5,468,615, Cl 435-7.200.
Upmacis, Rita K.: *See—*
Bauer, William, Jr.; Quiros, Nelson I.; and Upmacis, Rita K., 5,468,899 Cl. 560-218.000.
Uragami, Yuji: *See—*
Yamaguchi, Eiji; Uragami, Yuji; Yokozuka, Hideharu; Uekusa, Kikoo; Yamaguchi, Toshio; Abe, Satoshi; Kamo, Tetsuro; and Suzuki, Takao, 5,468,709, Cl. 502-210.000.
Uramoto, Katsuo: *See—*
Matsumoto, Katsuru; Hirayama, Nobuhiro; Kawasaki, Shoji; Uchiyama, Kenji; Uramoto, Katsuo; and Fukui, Tamami, 5,468,585, Cl. 430-110.000.
Urano, Fumiyoshi; Fujie, Hirotoshi; Oono, Keiji; and Negishi, Takaaki, to Wako Pure Chemical Industries, Ltd.; and Matsushita Electric Industrial Co., Ltd. Resist material and pattern formation process. 5,468,589, Cl. 430-170.000.
Uribe, Juan M.: *See—*
Lum, Andrew F.; Uribe, Juan M.; Hogan, John M.; Persinger, Richard A.; Miller, James F.; and Navaratnam, Ramesh A., 5,468,401, Cl. 252-22.000.
Urshan, Sydney; Deckert, Curtis K.; and Gonzales, Oscar. High-speed optical recording and playback apparatus capable of recording and retrieving digital data from an optical storage card. 5,468,944, Cl. 235-454.000.
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, to Canon Kabushiki Kaisha. Color image processing apparatus which uses different screen angles for different color components. 5,469,266, Cl. 358-298.000.
Usami, Toyokatsu: *See—*
Honkura, Yoshinobu; Toki, Hiroyuki; and Usami, Toyokatsu, 5,468,522, Cl. 427-597.000.

Ushijima, Hitoshi: *See*—
Kanno, Toshiaki; Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, 5,468,918, Cl. 174-256.000.

Ushiro, Masayuki: *See*—
Kaneda, Kazuo; and Ushiro, Masayuki, 5,467,801, Cl. 139-1.00E.

Usuda, Yutaka, to Hitachi Software Engineering Co., Ltd. Method for abstracting/detailing structuring elements of system specification information. 5,469,539, Cl. 395-155.000.

Usui, Nobuhiro: *See*—
Matsumoto, Masahito; and Usui, Nobuhiro, 5,468,039, Cl. 296-70.000.

Utah State University Foundation: *See*—
Aust, Steven D.; Barr, David P.; Grover, Thomas A.; Shah, Manish M.; and Chung, Namhyun, 5,468,628, Cl. 435-168.000.

Vaidya, Viwek V.: *See*—
Goulet, Richard; Forest, Claude; Landry, Michel; Beaubien, Pierre; Finkelstein, Michael; and Vaidya, Viwek V., 5,467,928, Cl. 239-404.000.

Vaillant, Bruno, to Societe Anontme Dite Alcatel Espace. Switch network. 5,469,001, Cl. 307-113.000.

Vaitkus, Rimantas: *See*—
Inushima, Takashi; and Vaitkus, Rimantas, 5,469,424, Cl. 369-120.000.

Valencic, David: *See*—
Valencic, Michael; and Valencic, David, 5,467,999, Cl. 273-402.000.

Valencic, Michael; and Valencic, David, to Valencic, Michael; and Valencic, David, Master archer target. 5,467,999, Cl. 273-402.000.

Valeo: *See*—
Putman, Carl, 5,468,189, Cl. 464-68.000.

Valeo Climate Control Corporation: *See*—
Beckley, James H., Jr., 5,467,818, Cl. 165-178.000.

Vali, Victor: *See*—
Chang, David B.; Vali, Victor; and Shih, I-Fu, 5,469,519, Cl. 385-33.000.

Valk, Theodore C.: *See*—
Seligmann, Daniel A.; Moss, William C.; Valk, Theodore C.; and Conder, Alan D., 5,469,442, Cl. 370-110.400.

Vallet, Aldon J. Apparatus and method for hanging coiled tubing in wells. 5,467,825, Cl. 166-379.000.

Valley, Kirsten L.: *See*—
Esch, Victor C.; and Valley, Kirsten L., 5,469,524, Cl. 385-118.000.

Vallier, Jeffrey J., to Iowa State University Research Foundation, Inc. Audio signal processor. 5,469,508, Cl. 381-63.000.

Valster, Adriaan, to U.S. Philips Corporation. Optoelectronic semiconductor device. 5,468,975, Cl. 257-97.000.

Van den Bergh Foods Company, Division of Conopco, Inc.: *See*—
Verschuren, Jozephus J.; Castenmiller, Wilhelmus A. M.; van Amerongen, Ivo A.; and van Der Meijs, Loillbrord C., 5,468,512, Cl. 426-658.000.

van Amerongen, Ivo A.: *See*—
Verschuren, Jozephus J.; Castenmiller, Wilhelmus A. M.; van Amerongen, Ivo A.; and van Der Meijs, Loillbrord C., 5,468,512, Cl. 426-658.000.

Van Baren, Jerald W.: *See*—
Diekema, Jon M.; Steffler, Joseph B.; Van Baren, Jerald W.; and Sancimino, Vincent, 5,469,365, Cl. 364-483.000.

Vanbuskirk, Michael R.; and Meinecke, Jon M., to Compaq Computer Corp. Expandable communication system with data flow control. 5,469,545, Cl. 395-200.010.

Vandenberg, Douglas; Philpott, Michael L.; Green, Phillip A.; Eastman, Scott A.; and Carlini, Sean M., to Aircraft Gear Corporation; and University of Illinois, The Board of Trustees of the. Spline counting mechanism. 5,469,482, Cl. 377-3.000.

Van den Berghe, René. Production of granular crackers. 5,467,693, Cl. 99-353.000.

Van De Pas, Hermanus A.; Tijburg, Rudolf P.; and De Poorter, Johannes A., to U.S. Philips Corporation. Method of manufacturing an optoelectronic semiconductor device having a single wire between non-parallel surfaces. 5,468,683, Cl. 437-209.000.

Vanderburg, Raymond M.: *See*—
Camp, Calvin C.; Kaveney, Jack R.; Garman, Ronald H.; Vanderburg, Raymond M.; and Kingsinger, Malcolm H., 5,467,560, Cl. 49-413.000.

Vandegrift, George F.: *See*—
Nunez, Luis; and Vandergrift, George F., 5,468,456, Cl. 423-10.000.

Van Der Linde, Jan: *See*—
Hshieh, Fwu-luan; Kwan, Sze-Hon; Chang, Mike F.; Ho, Yueh-Se; Van Der Linde, Jan; and Owyang, King, 5,468,982, Cl. 257-331.000.

van Der Meijs, Loillbrord C.: *See*—
Verschuren, Jozephus J.; Castenmiller, Wilhelmus A. M.; van Amerongen, Ivo A.; and van Der Meijs, Loillbrord C., 5,468,512, Cl. 426-658.000.

Vanderpan, Timothy P.; and Kruger, Robert L., to Kruger, Robert L. Machine which holds tools for cleaning and filling joints in pavement. 5,468,094, Cl. 404-75.000.

Vandewege, Jan A. O.: *See*—
De Groote, Jan L. B.; Vandewege, Jan A. O.; Allaert, Joost; and Van Parys, Hans A. G., 5,469,464, Cl. 375-317.000.

Vanevenhoven, Peter W.: *See*—
Schadewald, Mary B.; and Vanevenhoven, Peter W., 5,468,735, Cl. 514-30.000.

Van Fossen, Larry, to Iowa State University Research Foundation, Inc. Uniform mechanical wet grain unloading system. 5,468,122, Cl. 414-786.000.

Van Leeuwen, Peter A.: *See*—
Udding, Anne C.; Van Leeuwen, Peter A.; and Pearson, Michael, 5,468,891, Cl. 556-61.000.

van Liempt, Martinus J. C.; and Buchmeyer, Theodoor A., to Stork Contiweb B.V. Apparatus and method for joining two webs together. 5,468,321, Cl. 156-159.000.

Vanmaele, Luc: *See*—
Janssens, Wilhelmus; and Vanmaele, Luc, 5,468,258, Cl. 8-471.000.

Vanmaele, Luc J., to AGFA-GAVAERT, N.V. Dyes and dye-donor elements for use in thermal dye sublimation transfer. 5,468,870, Cl. 548-370.100.

Vanover, Michael T.: *See*—
Kingman, John A.; Larky, Steven P.; and Vanover, Michael T., 5,469,541, Cl. 395-158.000.

Van Parys, Hans A. G.: *See*—
De Groote, Jan L. B.; Vandewege, Jan A. O.; Allaert, Joost; and Van Parys, Hans A. G., 5,469,464, Cl. 375-317.000.

Van Roijen, Raymond; and Pennings, Engelbertus C. M., to U.S. Philips Corporation. Ring laser. 5,469,460, Cl. 372-94.000.

VanZeeland, Gerald D.: *See*—
Bower, Lawrence J.; Delo, Ronald R.; and VanZeeland, Gerald D., 5,468,207, Cl. 493-297.000.

Varcoe, Jack A.: *See*—
Ellerson, James V.; Noreika, Richard J.; and Varcoe, Jack A., 5,469,333, Cl. 361-779.000.

Vargas, Joseph H., III. Biomedical cement bonding enhancer. 5,468,245, Cl. 606-94.000.

Varo Inc.: *See*—
Mattes, Paul B., 5,467,479, Cl. 2-6.300.

Varsolona, Richard J.: *See*—
Dolling, Ulf H.; McCauley, James A.; and Varsolona, Richard J., 5,468,860, Cl. 546-77.000.

Vaughn, Steven. Sissy bar kit for post-manufacture installation on a motorcycle. 5,468,052, Cl. 297-352.000.

Vaught, Jeffrey L.: *See*—
Raffa, Robert B.; and Vaught, Jeffrey L., 5,468,744, Cl. 514-282.000.

Velasquez Urey, Ruben E.: *See*—
Miller, John A.; Velasquez Urey, Ruben E.; and Tate, Earl, Jr., 5,468,237, Cl. 604-390.000.

Vella-Coleiro, George P., to AT&T Corp. Method for synchronizing the reference frequency oscillator of a metallic-based microcell to a master oscillator. 5,469,467, Cl. 375-358.000.

Venetucci, Jim M., to Liquid Carbonic Corporation. Freezing system for fragible food products. 5,467,612, Cl. 62-374.000.

Venkatachari, Koththavasal R.: *See*—
Stangle, Gregory C.; Venkatachari, Koththavasal R.; Ostrander, Steven P.; and Schulze, Walter A., 5,468,427, Cl. 264-3.400.

Venolia, Daniel S.: *See*—
Clark, Michael B.; and Venolia, Daniel S., 5,469,194, Cl. 345-173.000.

Ventrello, Sandra C.: *See*—
Philpot, Randall J.; Olsen, Douglas G.; Ventrello, Sandra C.; Welsh, Eric R.; and Buckmiller, Daniel K., 5,468,329, Cl. 156-429.000.

Venturi, Giuseppe: *See*—
Minarelli, Alessandro; Venturi, Giuseppe; and Osti, Roberto, 5,467,872, Cl. 206-256.000.

Verbeke, Gentil: *See*—
Boeve, Gerard; and Verbeke, Gentil, 5,469,205, Cl. 347-263.000.

Vermaat, Huibrecht P., to Vermaat Technics B.V. Robot with suction cup attachment to steam generator partition. 5,467,813, Cl. 165-11.200.

Vermaat Technics B.V.: *See*—
Vermaat, Huibrecht P., 5,467,813, Cl. 165-11.200.

Vernieres, Jean-Claude: *See*—
Bachy, André; Fraisse, Laurent; Keane, Peter; Mendes, Etienne; Vernieres, Jean-Claude; and Simiand, Jacques, 5,468,750, Cl. 514-255.000.

Verschuren, Jozephus J.; Castenmiller, Wilhelmus A. M.; van Amerongen, Ivo A.; and van Der Meijs, Loillbrord C., to Van den Bergh Foods Company, Division of Conopco, Inc. Fat-replacing ingredient and method of making. 5,468,512, Cl. 426-658.000.

Vertatschitsch, Edward J.: *See*—
Abbas, Gregory L.; Vertatschitsch, Edward J.; de La Chapelle, Michael; and Porter, Charles R., 5,467,942, Cl. 244-75.00R.

Vesentini, Renzo: *See*—
Zanini, Gianpietro; Vesentini, Renzo; and Corniani, Carlo, 5,467,527, Cl. 29-773.000.

Vetter, Gregory J.: *See*—
Nolte, Douglas A.; Vetter, Gregory J.; Best, Kenneth E.; and Krampotich, Dennis J., 5,467,503, Cl. 16-115.000.

Veux, Jean-Luc; and Vincent, Benoit, to Taylor Made Golf Company, Inc. Balanced golf club. 5,467,984, Cl. 273-81.00R.

Vibro Industries, Inc.: *See*—
Sahlberg, Karl M., 5,467,859, Cl. 198-750.700.

Viertel, Lothar; and Welter, Patrick, to Gebr. Happich GmbH. Swivel bearing bracket for vehicle sun visors. 5,468,041, Cl. 296-97.900.

Vincent, Benoit: *See*—
Veux, Jean-Luc; and Vincent, Benoit, 5,467,984, Cl. 273-81.00R.

Vincent, Michael T.; Gutermuth, Terry R.; Lawrie, Robert E.; Moote, Richard K.; Simonich, Mark A.; and Tamm, James R., to Chrysler Corporation. Method of electronic fuel injection feedback control. 5,467,593, Cl. 60-274.000.

Vincent, Michel: *See*—
de Nanteuil, Guillaume; Vincent, Michel; Lila, Christine; Bonnet, Jacqueline; and Fradin, Armel, 5,468,761, Cl. 514-374.000.
Vinel, Paul; and Perrier, Philippe, to Societe Anonyme Dite: Alcatel CIT. Optical system for connecting customer premises networks to a switching center of a telecommunication network providing interactive and non-interactive services. 5,469,283, Cl. 359-118.000.
Viptop AB: *See*—
Nilén, Bengt, 5,468,175, Cl. 451-87.000.
Vitte, Vincent: *See*—
Baudou, Joël; and Vitte, Vincent, 5,467,480, Cl. 2-6.500.
Vlaovic, Djordje: *See*—
Stover, Harald D. H.; Li, Pei; Ferrari, Lorenzo; Shaver, Robert T.; and Vlaovic, Djordje, 5,468,814, Cl. 525-390.000.
VLSI Technology, Inc.: *See*—
Levy, Paul S., 5,469,379, Cl. 365-96.000.
Vogt, Kirkland W.: *See*—
Kohl, Paul A.; and Vogt, Kirkland W., 5,468,688, Cl. 437-237.000.
Voiceplex Corporation: *See*—
Satter, Sohail; and Polsky, Steven E., 5,469,500, Cl. 379-201.000.
Voigt Products, Incorporated: *See*—
Voigt, William L., 5,468,093, Cl. 404-6.000.
Voigt, William L., to Voigt Products, Incorporated. Resilient safety barrier. 5,468,093, Cl. 404-6.000.
Volk, Steven B.: *See*—
Morehouse, James H.; Furay, David M.; Volk, Steven B.; and Dunckley, James A., 5,469,314, Cl. 360-105.000.
VonBurg, Gregory F.: *See*—
Schiehser, Guy A.; Caufield, Craig E.; Senko, Nancie A.; and VonBurg, Gregory F., 5,468,774, Cl. 514-471.000.
Von Hoene, Donald C.: *See*—
Yu, Robert C. U.; Foley, Geoffrey M. T.; Herbert, William G.; Limburg, William W.; Mishra, Satchidanand; Post, Richard L.; and Von Hoene, Donald C., 5,469,242, Cl. 355-219.000.
Voorman, Johannes O., to U.S. Philips Corporation. Transmitter comprising an eletronic arrangement for generating a modulated carrier signal. 5,469,475, Cl. 375-247.000.
Vorwerk & Co. Interholding GmbH: *See*—
Sauer, Ralf; Kraut-Reinkober, Stefan; Helmes, Ludger; and Hoyer, Werner, 5,468,271, Cl. 55-357.000.
Voss, Hans-Ludwig: *See*—
Mundus, Friedhelm; and Voss, Hans-Ludwig, 5,468,333, Cl. 156-537.000.
Vought Aircraft Company: *See*—
Wheetley, Michael J.; and Schaller, David A., 5,468,099, Cl. 408-1.00R.
W. A. Whitney Co.: *See*—
Brolund, Theodore F.; and Paquet, Eugene H., 5,468,929, Cl. 219-121.560.
W. L. Gore & Associates, Inc.: *See*—
McGregor, Gordon L.; Minor, Raymond B.; Hardie, William; and Kennedy, Michael, 5,468,314, Cl. 156-56.000.
W. R. Grace & Co.-Conn.: *See*—
Everette, David B., 5,467,581, Cl. 53-133.200.
WABCO Westinghouse Fahrzeugbremsen GmbH: *See*—
Ruhnau, Gerhard, 5,469,358, Cl. 364-426.020.
Wacker-Chemie GmbH: *See*—
Herzig, Christian; and Scheiding, Silke, 5,468,890, Cl. 556-12.000.
Wada, Kumiko: *See*—
Nagata, Yuji; Fukazawa, Toshio; Wada, Kumiko; and Tosaki, Yoshihiro, 5,469,317, Cl. 360-113.000.
Wada, Masafumi: *See*—
Mishina, Haruo; Wada, Masafumi; Fukuda, Mituo; Itagaki, Masato; and Yamama, Shinya, 5,467,912, Cl. 228-10.000.
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, to International Superconductivity Technology Center; Matsushita Electric Industrial Co., Ltd.; Kyocera Corporation; Mitsubishi Metal Corporation; Tokyo Electric Power Company, Incorporated, The ; and Kabushiki Kaisha Kobe Seiko Sho. High temperature oxide superconductor. 5,468,724, Cl. 505-125.000.
Wade, Christopher A., to British Telecommunications. Communications network and method. 5,469,440, Cl. 370-110.100.
Waelput, Erik F. M.; Hollub, Peter C.; and Leatini, Joseph D. Adapters for flushing an internal combustion engine. 5,467,746, Cl. 123-196.00A.
Wagner, Adalbert: *See*—
Heitsch, Holger; Linz, Wolfgang; Wagner, Adalbert; and Kleemann, Heinz-Werner, 5,468,764, Cl. 514-382.000.
Wagner, Robert F., to Ohio Mattress Co. Licensing & Components Group, The. Border stabilizing member and method for making mattresses, cushions and the like using the same. 5,467,488, Cl. 5-474.000.
Wahi, Ashok L. Electrostatically charged nasal application product and method. 5,468,488, Cl. 424-78.030.
Wai-Chiu, Chung; and Kasica, James J., to National Starch and Chemical Investment Holding Corporation. Enzymatically debranched starches as tablet excipients. 5,468,286, Cl. 106-210.000.
Wain, Robert E.: *See*—
Clemens, Clive; and Wain, Robert E., 5,468,048, Cl. 297-284.400.
Wakabayashi, Kazuhisa: *See*—
Kogure, Mitsuhiro; Nagashima, Shinichi; Wakabayashi, Kazuhisa; Enkaku, Shigeyuki; Shimayama, Hitoshi; Kimura, Minoru; Shimoyama, Shuji; and Yokoo, Tsugio, 5,467,632, Cl. 72-379.200.
Wakabayashi, Nobukatsu: *See*—
Abe, Toshiaki; and Wakabayashi, Nobukatsu, 5,469,498, Cl. 379-127.000.
Wakai & Co., Ltd.: *See*—
Wakai, Takao, 5,468,107, Cl. 411-448.000.
Wakai, Takao, to Wakai & Co., Ltd. Split nail. 5,468,107, Cl. 411-448.000.
Wakana, Masahiro: *See*—
Horita, Satomi; Aoki, Yasushi; Wakana, Masahiro; Okamoto, Hiroshi; Chiba, Kiyohiko; and Daikoku, Shizue, 5,469,081, Cl. 326-81.000.
Wako Pure Chemical Industries, Ltd.: *See*—
Urano, Fumiyoshi; Fujie, Hirotoshi; Oono, Keiji; and Negishi, Takaaki, 5,468,589, Cl. 430-170.000.
Wakui, Shinichi; Ide, Kazumasa; Koharagi, Haruo; Takahashi, Miyoshi; Miyakawa, Kado; and Yagi, Yasuomi, to Hitachi, Ltd. Turbine generator. 5,469,009, Cl. 310-214.000.
Waldo, Whitson G., III; Chen, Gong; and Cerrina, Franco, to Motorola, Inc. Method for alignment in photolithographic processes. 5,469,263, Cl. 356-401.000.
Walker, Howard W.; and Garcia, Graham A., to United States of America, Navy. Method for forming low and high minority carrier lifetime layers in a single semiconductor structure. 5,468,674, Cl. 437-62.000.
Walker, James A.: *See*—
Cunningham, John E.; Goossen, Keith W.; Jan, William Y.; and Walker, James A., 5,468,689, Cl. 437-241.000.
Walker, Richard E.; and Nguyen, Hai N., to Compaq Computer Corp. Low power fan drive circuit for personal computers. 5,469,320, Cl. 361-33.000.
Walker Systems, Inc.: *See*—
Arthur, Richard L.; Bowman, Timothy S.; and Harmon, J. David, 5,468,908, Cl. 174-48.000.
Bowman, Timothy; Domigan, Charles N.; Hadfield, Robert W.; Harmon, J. David; and Sheridan, James E., 5,467,565, Cl. 52-220.100.
Wallace, Ingvar A., II; Braithwaite, Paul C.; and Neidert, Jamie B., to Thiokol Corporation. Plastisol explosive. 5,468,313, Cl. 149-53.000.
Wallace, Jerry E.: *See*—
Weingarten, Jon; Kosann, Rod; Wallace, Jerry E.; Wilson, Olin E.; and Buckley, Maura T., 5,467,512, Cl. 28-100.000.
Walling, Dennis R., to Caterpillar Inc. Tube clamp and coupling. 5,468,030, Cl. 285-364.000.
Walsh, Mairtin: *See*—
Steyaert, Michel; Dehaene, Wim; Craninckx, Jan; Walsh, Mairtin; and Real, Peter, 5,469,113, Cl. 329-311.000.
Wang, Ching-Hsiang. L-electric conventional roaster oven with whirlpool air circulation. 5,468,935, Cl. 219-400.000.
Wang, Cho-Li: *See*—
Prasanna, Viktor K.; Wang, Cho-Li; and Park, Heonchul, 5,468,069, Cl. 382-253.000.
Wang Laboratories, Inc.: *See*—
Soulard, Roger R., 5,469,336, Cl. 361-818.000.
Wang, Leming: *See*—
Alfano, Robert R.; Pradhan, Asima; Tang, Guichen C.; Wang, Leming; Budansky, Yury; and Das, Bidyut B., 5,467,767, Cl. 128-665.000.
Wang, Shenge, to University of Rochester, The. Halftone correction system. 5,469,267, Cl. 358-298.000.
Wang, Taming: *See*—
Liao, Benson; and Wang, Taming, 5,469,476, Cl. 375-350.000.
Wang, Yang: *See*—
Franzen, Jochen; and Wang, Yang, 5,468,958, Cl. 250-292.000.
Wang, Yu. High write speed erasable optical recording disk using active semiconductor devices at each pixel. 5,469,426, Cl. 369-275.200.
WangDAT, Inc.: *See*—
Slocum, Richard T.; Bjordahl, James; Louie, Danny; and Rasmussen, Donald, 5,469,310, Cl. 360-92.000.
Ward, Bruce D.: *See*—
Earl, George F.; and Ward, Bruce D., 5,469,171, Cl. 342-159.000.
Ward, James J.; and Chatham, William P., to Wico Corporation. Plastic compositions with antistatic properties. 5,468,793, Cl. 524-159.000.
Ward, James K. Forehead stimulator apparatus. 5,468,218, Cl. 601-144.000.
Ward, John W., to UOP. Hydrocarbon conversion catalyst for use in selectively making middle distillates. 5,468,700, Cl. 502-60.000.
Wardle, Robert B.: *See*—
Highsmith, Thomas K.; Hajik, Robert M.; Wardle, Robert B.; Lund, Gary K.; and Blau, Reed J., 5,468,866, Cl. 548-251.000.
Warner-Jenkinson Company: *See*—
Sujeeth, Puthalath K., 5,468,862, Cl. 546-173.000.
Warner-Lambert Company: *See*—
Althaus, Wolfgang, 5,467,530, Cl. 30-85.000.
Warren, Craig B.: *See*—
Guénin, Eric P.; Trotzinka, Karen A.; Smith, Leslie C.; Warren, Craig B.; Munteanu, Marina A.; Chung, Siew L.; and Tan, Chee-Teck, 5,468,725, Cl. 512-2.000.
Washington University: *See*—
Curtiss, Roy, III, 5,468,485, Cl. 424-184.100.
Shefer, Ruth E.; Klinkowstein, Robert E.; Hughey, Barbara J.; Welch, Michael J.; and Dence, Carmen S., 5,468,355, Cl. 204-157.200.
Waskiewicz, Walter P.: *See*—
Godec, Maksimilijan; Larson, John A.; and Waskiewicz, Walter P., 5,468,074, Cl. 384-495.000.
Wasser, James R., to John Crane Inc. Mechanical end face seal having an improved mating ring. 5,468,002, Cl. 277-65.000.
Watanabe, Hisayoshi: *See*—

Kamakura, Sinsuke; Yamazaki, Hirokazu; Watanabe, Hisayoshi; and Kasa, Yasushi, 5,469,394, Cl. 365-201.000.

Watanabe, Hitoshi: *See*—
Yoshimori, Hiroyuki; Watanabe, Hitoshi; Paz De Araujo, Carlos A.; Hiraide, Shuzo; Mihara, Takashi; and McMillan, Larry D., 5,468,684, Cl. 437-228.000.

Watanabe, Michi: *See*—
Sasaki, Norio; Kudo, Sachio; Watanabe, Michi; Endo, Keiji; and Kawaguchi, Shinji, 5,468,721, Cl. 504-243.000.

Watanabe, Takanori: *See*—
Inoue, Shunsuke; Hoshi, Junichi; and Watanabe, Takanori, 5,468,344, Cl. 156-657.100.

Watanabe, Takashi; and Ishikawa, Wataru, to Sony Corporation. Thin film magnetic head device having a core recess set to a predetermined spacing loss. 5,469,312, Cl. 360-103.000.

Watanabe, Teruo: *See*—
Itoh, Shigeo; Watanabe, Teruo; Miyamori, Makoto; Nishimura, Norio; Itoh, Junji; and Kanemaru, Seigo, 5,469,014, Cl. 313-308.000.

Watanabe, Toshiyuki; and Takizawa, Hiroo, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 5,468,600, Cl. 430-546.000.

Watanabe, Yasushi: *See*—
Yamada, Kiyohiro; Iguchi, Masao; Shimizu, Izuru; and Watanabe, Yasushi, 5,468,130, Cl. 418-55.200.

Waterson, Bruce P.; Caputo, Dennis L.; and McLaughlin, William R., to Hugo Neu & Sons Inc.; and Proler International Corp. Metal shredder residue-based landfill cover. 5,468,291, Cl. 106-697.000.

Watkins, Michael L.: *See*—
Deevi, Seetharama C.; Hajaligol, Mohammad R.; Lieberman, Pamela D.; Nichols, Walter A.; and Watkins, Michael L., 5,468,936, Cl. 219-553.000.

Wato, Takahiko: *See*—
Yamada, Akiya; Wato, Takahiko; Uchida, Naoki; Fujisawa, Misuzu; Takama, Shigeyuki; and Inamoto, Yukiko, 5,468,503, Cl. 424-461.000.

Watson, Gene, to Hoffman, Henry R. Weeding device. 5,467,830, Cl. 172-378.000.

Watson, James W.: *See*—
Kirby, Ronald K.; and Watson, James W., 5,468,345, Cl. 216-51.000.

Watson, Richard W., to BOC Group plc, The. Treatment of gas streams. 5,468,458, Cl. 423-222.000.

Watts, Raymond F.: *See*—
Romanelli, Michael G.; Watts, Raymond F.; and Devine, Maryann, 5,468,403, Cl. 252-47.500.

Watts, Ridley, to Patriot Packaging Corporation. Spiral coils suitable for cushioning use. 5,468,525, Cl. 428-34.100.

Wauseon Machine and Manufacturing, Inc.: *See*—
Smith, Kevin E.; and Hoffman, Kurtis J., 5,467,627, Cl. 72-121.000.

Wautier, Henri, to Solvay (Société Anonyme). Process for the manufacture of poly-epsilon-caprolactones and poly-epsilon-caprolactones which have high molecular masses obtainable by this process. 5,468,837, Cl. 528-357.000.

Weaver, Edmund A., to Kraft Foods, Inc. Expandable end closure for reclosable package. 5,467,887, Cl. 220-212.000.

Weaver, James L.: *See*—
Aszalos, Adorjan; Weaver, James L.; and Pine, P. Scott, 5,468,469, Cl. 514-150.000.

Webber, James L.: *See*—
Donegan, Michael W.; Nuchols, Richard P.; Webber, James L.; and Mc Cann, Jerry A., 5,468,011, Cl. 280-728.200.

Weber, David R.; and Clark, Christopher S., to D. R. Weber, Inc. Grass and debris exclusion plate for marine jet pumps. 5,468,165, Cl. 440-46.000.

Weber, Horst; and Normann, Alfred, to Colsman & Co. GmbH. Gas-fueled infrared heater. 5,468,143, Cl. 431-243.000.

Weber, James L., to Hoover Universal, Inc. Energy absorbing child seat. 5,468,045, Cl. 297-216.110.

Weber, James L.; and Sabo, Dianna L., to Hoover Universal, Inc. Seat belt mounting for integral child seat. 5,468,046, Cl. 297-238.000.

Wedemann, Erhard: *See*—
Frankenhauser, Georg; and Wedemann, Erhard, 5,468,907, Cl. 174-15.600.

Weder, Donald E.; Straeter, Joseph G.; and Straeter, William F., to Highland Supply Corporation. Method of using a wrapping material having a pull tab and pull indicia for wrapping a floral arrangement. 5,467,573, Cl. 53-397.000.

Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Method for wrapping a floral grouping with a sheet of material having a reinforcing member. 5,467,575, Cl. 53-399.000.

Weelink, J. M. W. Stable with feeding system. 5,467,737, Cl. 119-60.000.

Wegner, Steven; Harpold, Michael A.; McCaffrey, Terence M.; Morris, Susan E.; Wojciechowski, Marek; Zhao, Junguo; Henkens, Robert W.; Naser, Najih; and O'Daly, John P., to Andcare, Inc. Colloidal-gold electrosensor measuring device. 5,468,366, Cl. 204-403.000.

Wehner, Timothy D., to Black River Manufacturing, Inc. Noise abating vehicle transmission shift lever. 5,467,664, Cl. 74-523.000.

Wei, Jay: *See*—
Hellmuth, Thomas; Campbell, Charles E.; and Wei, Jay, 5,469,261, Cl. 356-361.000.

Weight, Kenneth R.: *See*—
Cook, Nigel J. D.; Weight, Kenneth R.; Gutman, Richard G.; Buttery, Roger A.; and Grimes, Michael, 5,468,382, Cl. 210-232.000.

Weiland, Kenneth E. Pneumatically projected ball table game. 5,467,986, Cl. 273-129.0AP.

Weinecke, Ulf: *See*—
Braun, Hans; Weinecke, Ulf; Maste, Kurt; and Strauss, Wolfgang, 5,467,750, Cl. 123-350.000.

Weingarten, Jon; Kosann, Rod; Wallace, Jerry E.; Wilson, Olin E.; and Buckley, Maura T., to Burlington Industries, Inc. Knitted fabric construction for an industrially launderable knitted garment. 5,467,512, Cl. 2[illegible]-100.000.

Weise, Edgar H., to Yperwatch S.A. Analog watch, more specifically a wrist watch. 5,469,412, Cl. 368-88.000.

Weisenstein, Larry. Golf club supporting device. 5,467,980, Cl. 273-32.00B.

Weiss, Karin: *See*—
Pohl, Ludwig; Poetsch, Fike; Schumann, Herbert; Weiss, Karin; Thiele, Karl-Heinz; and Hirsch, Hans-Ludwig, 5,468,707, Cl. 502-153.000.

Wekell, William O., to SpaceLabs Medical, Inc. Track mounting system for electronic devices. 5,467,954, Cl. 248-201.000.

Welch, Daniel P., to Mentor Corporation. Internal ring releasing device for a vacuum constriction system. 5,468,211, Cl. 600-38.000.

Welch, Michael J.: *See*—
Shefer, Ruth E.; Klinkowstein, Robert E.; Hughey, Barbara J.; Welch, Michael J.; and Dence, Carmen S., 5,468,355, Cl. 204-157.200.

Wella Aktiengesellschaft: *See*—
Braun, Hans-Jürgen, 5,468,256, Cl. 8-405.000.

Wellheuser, Christopher: *See*—
McClear, Mark T.; and Wellheuser, Christopher, 5,469,473, Cl. 375-219.000.

Welling, William E.: *See*—
Lange, David A.; Benton, Robert L.; Welling, William E.; and Muggiestone, Peter R., 5,467,662, Cl. 74-459.000.

Welliver, William R.: *See*—
Roth, Timothy J.; and Welliver, William R., 5,468,276, Cl. 71-15.000.

Welscher, William L., to Sauer Inc. Displacement override/brake control circuit. 5,467,598, Cl. 60-436.000.

Welsh, Eric R.: *See*—
Philpot, Randall J.; Olsen, Douglas G.; Ventrello, Sandra C.; Welsh, Eric R.; and Buckmiller, Daniel K., 5,468,329, Cl. 156-429.000.

Welter, Patrick: *See*—
Viertel, Lothar; and Welter, Patrick, 5,468,041, Cl. 296-97.900.

Wen, Xin, to Eastman Kodak Company. Deposition sensitized emulsions and processes for their preparation. 5,468,601, Cl. 430-567.000.

Wenderoth, Bernd; Brand, Siegbert; Schuetz, Franz; Kuekenhoehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, to BASF Aktiengesellschaft. Oxime ether derivatives, their preparation and fungicides containing these derivatives. 5,468,717, Cl. 504-130.000.

Wendorf, James W.; Hocek, Adam S.; and Singh, Kenneth S., to Philips Electronics North America Corp. Method of and apparatus for channel mapping with relative service identification. 5,469,431, Cl. 370-50.000.

Weninger, Helmut: *See*—
Ekdahl, Egon; Gurka, Jiri; Huber, Rupert; Köttritsch, Hubert; Kufe, Gottfried; Müllner, Johann; and Weninger, Helmut, 5,468,072, Cl. 384-448.000.

Werbowsky, Laurie L.: *See*—
Shreeve, William O.; Werbowsky, Laurie L.; and Essig, Thomas W., 5,467,921, Cl. 236-78.00R.

Werk, Jürgen: *See*—
Bartzick, Gerd; Naydowski, Reinhard; and Werk, Jürgen, 5,467,701, Cl. 100-4.000.

Werner, Michael W.: *See*—
Whitekettle, Wilson K.; Petrille, Joseph C.; and Werner, Michael W., 5,468,739, Cl. 514-75.000.

Wescon Products Company: *See*—
Beugelsdyk, Anthony F.; and Barnard, Michael A., 5,467,583, Cl. 56-10.800.

Weskamp, Robert. Conveyor with three plane locking system. 5,467,861, Cl. 198-345.300.

West, Mike L.: *See*—
Bailey, William H.; Byers, Lonnie L.; Holley, Robert G.; Lamie, James M.; Sparks, Robert M.; West, Mike L.; and Storey, Richard P., 5,468,968, Cl. 250-435.000.

Westbrook, Gregory L.: *See*—
Williams, William M.; Angelo, Anthony; and Westbrook, Gregory L., 5,469,072, Cl. 324-754.000.

Wester, Ronald T., to Pfizer Inc. Phosphorus containing renin inhibitors. 5,468,732, Cl. 514-19.000.

Westinghouse Electric Corporation: *See*—
Gyugyi, Laszlo; and Nelson, Robert J., 5,469,044, Cl. 323-207.000.
O' Donnell, Patricia A.; Kerfoot, Charles S.; and Springer, Joseph J., 5,469,124, Cl. 336-61.000.

Wheatley, Carl F., Jr.: *See*—
Neilson, John M. S.; Wheatley, Carl F., Jr.; Jones, Frederick P.; and Temple, Victor A. K., 5,468,668, Cl. 437-51.000.

Wheatley, Charles E., III, to QUALCOMM Incorporated. Method and apparatus for providing a communication link quality indication. 5,469,471, Cl. 375-205.000.

Wheatley, William: *See*—
Gentelia, John S.; Eggan, Ronald E., Jr.; Williams, Frank R.; and Wheatley, William, 5,468,240, Cl. 606-42.000.

Wheeler, Gayle L.: *See*—
Crofts, John D.; Shurman, Rodney M.; and Wheeler, Gayle L., 5,467,963, Cl. 251-129.180.

Wheeling Pittsburgh Steel Corporation: *See*—
Kakascik, Tim, 5,467,657, Cl. 73-864.440.
Wheetley, Michael J.; and Schaller, David A., to Vought Aircraft Company. Seam tracking drilling machine. 5,468,099, Cl. 408-1.00R.
Whiffen, Gregory J.: *See*—
Shoemaker, Christine A.; and Whiffen, Gregory J., 5,468,088, Cl. 405-52.000.
Whitaker Corporation, The: *See*—
Broschard, John L., III, 5,468,160, Cl. 439-567.000.
Drabenstadt, William W.; Fowler, Richard C.; Grinderslev, Soren; and Irlbeck, Robert D., 5,469,074, Cl. 324-758.000.
Egenolf, Bernhard, 5,468,163, Cl. 439-839.000.
Flinchbaugh, Bernadette M.; Paley, Harold R.; Knaub, John E.; Schmid, Christopher J.; and Melnyk, Adrian L., 5,468,156, Cl. 439-157.000.
Oda, Kenzo, 5,468,162, Cl. 439-752.000.
Reitz, Paul; and Abdelkader, Hatem, 5,469,455, Cl. 372-20.000.
Whitaker, Eugene. Ball lock socket holder. 5,467,874, Cl. 206-378.000.
Whitcomb, William C.; Insley, Thomas I.; and Fung, Simon S., to Minnesota Mining and Manufacturing Company. Sorbent articles. 5,468,536, Cl. 428-98.000.
White Consolidated Industries, Inc.: *See*—
Sepke, Arnold L., 5,467,501, Cl. 15-324.000.
White, David H.: *See*—
Deutsch, Edward A.; Deutsch, Karen F.; Cacheris, William P.; Ralston, William H.; White, David H.; Nosco, Dennis L.; Wolfangel, Robert G.; Wilking, Janet B.; Meeh, Linda; and Woulfe, Steven R., 5,468,465, Cl. 424-9.400.
White, Raymond F.: *See*—
Gagliardi, Magda M.; Chen, Shieh-Shung T.; Arison, Byron H.; Garrity, George M.; Huang, Leeyuan; MacConnell, John G.; and White, Raymond F., 5,468,771, Cl. 514-452.000.
White, Robert C.: *See*—
Yip, Maxwell K.; Suffredini, Nino R.; Sidor, Ronald P.; and White, Robert C., 5,468,154, Cl. 439-79.000.
White, Walter, IV; and Burrus, Philip H., IV. Detachable golf swing training device using two light beams. 5,467,991, Cl. 273-186.300.
White, William A.: *See*—
Chang, Christopher T.-M.; and White, William A., 5,469,479, Cl. 375-377.000.
Whitekettle, Wilson K.; Petrille, Joseph C.; and Werner, Michael W., to Betz Laboratories, Inc. Methods for controlling asiatic clams. 5,468,739, Cl. 514-75.000.
Whitesides, Thomas H.: *See*—
Zengerle, Paul L.; Miller, David D.; Whitesides, Thomas H.; Rieger, John B.; Flow, Vincent J., III; and Isaac, Walter H., 5,468,604, Cl. 430-631.000.
Whitford Corporation: *See*—
Leech, Lawrence D., 5,468,798, Cl. 524-440.000.
Whitten, Arthur T.: *See*—
Allen, Paul G.; and Whitten, Arthur T., 5,469,192, Cl. 345-157.000.
Wico Corporation: *See*—
Ward, James J.; and Chatham, William P., 5,468,793, Cl. 524-159.000.
Wiedel, John: *See*—
Kupferschmidt, Albert; and Wiedel, John, 5,467,804, Cl. 140-115.000.
Wiedmann, Tien W.: *See*—
Xu, Ren S.; and Wiedmann, Tien W., 5,468,772, Cl. 514-453.000.
Wienckoski, Ronald J., to Amspec Chemical Co., Inc. Liquid-like flame retardant additives for polymers. 5,468,424, Cl. 252-609.000.
Wiese, Jeffrey W.: *See*—
Thompson, Kurt P.; and Wiese, Jeffrey W., 5,468,053, Cl. 297-472.000.
Wiggenhorn, James T., to Motorola, Inc. Method and apparatus for tuning a loop antenna. 5,469,180, Cl. 343-744.000.
Wilcher, Stephen B., to FMC Corporation. Sludge flight support rail assembly. 5,468,391, Cl. 210-525.000.
Wild, Peter: *See*—
Hassenrück, Karin; and Wild, Peter, 5,468,848, Cl. 534-759.000.
Wildgen, Leo F.: *See*—
Peterson, Francis C.; Grunstad, Jerome A.; and Wildgen, Leo F., 5,468,037, Cl. 296-57.100.
Wile, Richard M.; and Cole, Lawrence, to EPI Packaging Technologies, Inc. Bagging system. 5,467,572, Cl. 53-384.100.
Wilkerson, Angela Y.: *See*—
Chao, Sidney C.; Stanford, Thomas B.; Purer, Edna M.; and Wilkerson, Angela Y., 5,467,492, Cl. 8-159.000.
Wilkes, R. Jeffrey: *See*—
Young, Kenneth K.; and Wilkes, R. Jeffrey, 5,469,403, Cl. 367-6.000.
Wilking, Janet B.: *See*—
Deutsch, Edward A.; Deutsch, Karen F.; Cacheris, William P.; Ralston, William H.; White, David H.; Nosco, Dennis L.; Wolfangel, Robert G.; Wilking, Janet B.; Meeh, Linda; and Woulfe, Steven R., 5,468,465, Cl. 424-9.400.
Willacy, Stephen J., to Lucas Industries Public Limited Company. Bearing arrangement. 5,468,073, Cl. 384-477.000.
Williams, David; Briscoe, Stuart M.; and Melbourne, Keith, to Lucas Industries Public Limited Company. Method of and apparatus for detecting fuel system leak. 5,467,641, Cl. 73-49.700.
Williams, David E. Resilient collapsible tube with device for preventing tube unrolling. 5,467,897, Cl. 222-107.000.
Williams, Frank R.: *See*—
Gentelia, John S.; Eggan, Ronald E., Jr.; Williams, Frank R.; and Wheatley, William, 5,468,240, Cl. 606-42.000.
Williams, Gordon F.: *See*—
Shofner, Frederick M.; Chu, Youe-T; Baldwin, Joseph C.; Galyon, Michael E.; Kacenas, Benjamin M.; and Williams, Gordon F., 5,469,253, Cl. 356-238.000.
Williams, Joel L.; Burkett, Susan L.; and McGuire, Shel, to Becton, Dickinson and Company. Process for barrier coating of plastic objects. 5,468,520, Cl. 427-560.000.
Williams, L. David: *See*—
Saifer, Mark; Somack, Ralph; and Williams, L. David, 5,468,478, Cl. 424-78.270.
Williams, Michael G.: *See*—
Heilmann, Steven M.; Drtina, Gary J.; Eitzman, Philip D.; Haddad, Louis C.; Hyde, Frederick W.; Johnson, Todd W.; Rassmussen, Jerald K.; and Williams, Michael G., 5,468,847, Cl. 530-413.000.
Williams, William M.; Angelo, Anthony; and Westbrook, Gregory L., to Motorola, Inc. Integrated circuit test system. 5,469,072, Cl. 324-754.000.
Williamson, Carlton R. Magnetic filter adapter. 5,468,381, Cl. 210-223.000.
Willis, John C.: *See*—
Fuhs, Ronald E.; Hammond, William A., Jr.; Nation, George W.; Rogers, Steven L.; and Willis, John C., 5,469,446, Cl. 371-33.000.
Willknight, Inc.: *See*—
Davis, Harold A., 5,468,113, Cl. 414-523.000.
Wilson, Arnold L.: *See*—
Morey, William W.; and Wilson, Arnold L., 5,469,520, Cl. 385-37.000.
Wilson Greatbatch Ltd.: *See*—
Pyszczek, Michael F.; Takeuchi, Esther S.; and Kane, Mark J., 5,468,569, Cl. 429-94.000.
Wilson, Nathaniel B.: *See*—
Peterzell, Paul E.; Wilson, Nathaniel B.; and Black, Peter J., 5,469,115, Cl. 330-129.000.
Wilson, Olin E.: *See*—
Weingarten, Jon; Kosann, Rod; Wallace, Jerry E.; Wilson, Olin E.; and Buckley, Maura T., 5,467,512, Cl. 28-100.000.
Wilson, Timothy J.: *See*—
Birchler, Mark A.; Jasper, Steven C.; and Wilson, Timothy J., 5,469,465, Cl. 375-346.000.
Wilt, Donald R.; and Sidell, Richard S., to XRL, Inc. Illumination system for OCR of indicia on a substrate. 5,469,294, Cl. 359-436.000.
Wilt, Truman F.; Carney, Joseph M.; Thomas, Stephen J.; Claar, James A.; and Birkmeyer, William J., to PPG Industries, Inc. Low volatile organic content automotive refinish coating composition. 5,468,802, Cl. 524-539.000.
Wilz, David M.: *See*—
Knowles, Carl H.; Rockstein, George B.; Wilz, David M.; and Naylor, Charles A., 5,468,951, Cl. 235-472.000.
Windley, William T., to Du Pont de Nemours, E. I., and Company. Dyed antistain nylon with cationic dye modifier. 5,468,554, Cl. 428-357.000.
Windmoeller & Hoelscher: *See*—
Mundus, Friedhelm; and Voss, Hans-Ludwig, 5,468,333, Cl. 156-537.000.
Windmöller & Hölscher: *See*—
Eckelt, Ulrich; and Timmerbeil, Karl-Ernst, 5,468,325, Cl. 156-259.000.
Winkler, Walter: *See*—
Udert, Karl E.; and Winkler, Walter, 5,468,176, Cl. 451-359.000.
Winnik, Mitchell A.: *See*—
Menchen, Steven M.; Winnik, Mitchell A.; and Johnson, Ben F., 5,468,365, Cl. 204-299.00R.
Winston, Anthony E., to Church & Dwight Co., Inc. Bicarbonate fungicide product with a combination of surfactant ingredients. 5,468,716, Cl. 504-101.000.
Winston, Anthony E.: *See*—
Joseph, Amy L.; Jones, Keith A.; Winston, Anthony E.; and Lajoie, M. Stephen, 5,468,715, Cl. 504-101.000.
Winter, Robert A., to Bowden's Automated Products, Inc. Method and apparatus for testing for a high voltage on the chassis of an electronic apparatus. 5,469,063, Cl. 324-508.000.
Winton, George R., III. Automatic deburring machine. 5,468,173, Cl. 451-59.000.
Wirz, Arno, to Heidelberger Druckmaschinen AG. Rotary printing press for two-sided printing of sheets. 5,467,710, Cl. 101-177.000.
Wiseman, Jay, to R-Made, Inc. Patient support device. 5,467,782, Cl. 128-845.000.
Witek, Richard T.: *See*—
Sites, Richard L.; and Witek, Richard T., 5,469,551, Cl. 395-375.000.
Witels Apparate-Maschinen Albert GmbH & Co. KG: *See*—
Albert, Eckehard, 5,467,629, Cl. 72-164.000.
Witt, Jan: *See*—
Sauerwein, Heinrich; Arm, Wolfgang; and Witt, Jan, 5,468,096, Cl. 405-36.000.
Wnek, Gary E.: *See*—
Ehrenberg, Scott G.; Serpico, Joseph; Wnek, Gary E.; and Rider, Jeffrey N., 5,468,574, Cl. 429-33.000.
Wojciechowski, Marek: *See*—
Wegner, Steven; Harpold, Michael A.; McCaffrey, Terence M.; Morris, Susan E.; Wojciechowski, Marek; Zhao, Junguo; Henkens, Robert W.; Naser, Najih; and O'Daly, John P., 5,468,366, Cl. 204-403.000.
Wolf, Jean-Pierre: *See*—
Steinmann, Bettina; Wolf, Jean-Pierre; Schultheiss, Adrian; and Hunziker, Max, 5,468,886, Cl. 549-549.000.
Wolf, Philip F.: *See*—
Dougherty, James A.; and Wolf, Philip F., 5,468,820, Cl. 526-264.000.
Wolfangel, Robert G.: *See*—

Deutsch, Edward A.; Deutsch, Karen F.; Cacheris, William P.; Ralston, William H.; White, David H.; Nosco, Dennis L.; Wolfangel, Robert G.; Wilking, Janet B.; Meeh, Linda; and Woulfe, Steven R., 5,468,465, Cl. 424-9.400.

Wolff Walsrode Aktiengesellschaft: *See*—
Reisers, Ulrich; Krallmann, Anton; Albinus, Eberhard; and Böhner, Jürgen, 5,468,563, Cl. 428-515.000.

Wolfsthal, Yaron: *See*—
Chang, Daniel T.; and Wolfsthal, Yaron, 5,469,574, Cl. 395-700.000.

WOLO Manufacturing Corporation: *See*—
Solow, Joseph E., 5,469,135, Cl. 340-426.000.

Wolter, Fredi: *See*—
Zauns-Huber, Rudolf; Ruscheinsky, Emil; and Wolter, Fredi, 5,468,255, Cl. 8-94.220.

Wong, Stephen L.; and Majid, Naveed, to North American Philips Corporation. Transformerless low voltage switching power supply. 5,469,046, Cl. 323-286.000.

Wong, Yin H. Support for a light tube and method of use. 5,469,348, Cl. 362-217.000.

Woo, Daniel M., to Shaw Industries Limited. High resolution geophone. 5,469,408, Cl. 367-182.000.

Wood, Jeffery: *See*—
Fortunak, Joseph; Kitteringham, John; Sisti, Nicholas; and Wood, Jeffery, 5,468,859, Cl. 546-48.000.

Woodall, Stephen P.: *See*—
Golby, John A.; Padgett, Miles J.; and Woodall, Stephen P., 5,469,259, Cl. 356-351.000.

Woodbridge Foam Corporation: *See*—
Perry, Brian; and Donato, Frank, 5,468,433, Cl. 264-46.400.

Woods, Donald E.: *See*—
Hodges, Robert S.; Irvin, Randall T.; Paranchych, William; Sokol, Pamela A.; and Woods, Donald E., 5,468,484, Cl. 424-141.100.

Wörgötter, Herbert: *See*—
Theurer, Josef; and Wörgötter, Herbert, 5,467,717, Cl. 104-6.000.

Woulfe, Steven R.: *See*—
Deutsch, Edward A.; Deutsch, Karen F.; Cacheris, William P.; Ralston, William H.; White, David H.; Nosco, Dennis L.; Wolfangel, Robert G.; Wilking, Janet B.; Meeh, Linda; and Woulfe, Steven R., 5,468,465, Cl. 424-9.400.

Wright, James R., to Simmonds Precision Engine Systems, Inc. Semipermanent electrical connector and backshell assembly. 5,468,161, Cl. 439-610.000.

Wright, Kurt W.: *See*—
Thompson, David A.; Rajagopalan, Venkatesh; Wright, Kurt W.; Sterba, John J.; Paulus, William J.; Paulus, Nancy J.; McCauley, Kathryn M.; and Chen, David K., 5,467,636, Cl. 73-23.310.

Wright, Michael J.: *See*—
Agrawal, Om P.; Wright, Michael J.; and Shen, Ju, 5,469,368, Cl. 364-489.000.

Wu, Chiu H.; and Powrie, William D., to University of British Columbia, The. Preservation of fresh fruit juices and fruit juice blends. 5,468,508, Cl. 426-316.000.

Wu, Donald P. H. Automatically deployable vehicle stabilization system. 5,467,838, Cl. 180-209.000.

Wuest, Reinhold: *See*—
Schmid, Karl-Heinz; Bongardt, Frank; and Wuest, Reinhold, 5,468,406, Cl. 252-56.00S.

Wuidart, Sylvie; and Do, Tien-Dung, to SGS Thomson Microelectronics, S.A. Circuit for the generation of a time-stabilized output pulse. 5,469,100, Cl. 327-262.000.

Wullbrandt, Dieter: *See*—
Meiwes, Johannes; Wullbrandt, Dieter; and Giani, Carlo, 5,468,625, Cl. 435-71.100.

Wun, Jeffrey; Shia, Ting; and Guo, Fang-Meng, to Umax Data Systems Inc. Brightness compensation for a lamp shade in an optical scanner. 5,469,303, Cl. 359-896.000.

Wurts, William A.: *See*—
Fargo, Richard N.; and Wurts, William A., 5,467,599, Cl. 60-478.000.

Wyatt, Daryn: *See*—
Jones, Greg; and Wyatt, Daryn, 5,468,293, Cl. 118-308.000.

Xerox Corporation: *See*—
Brindle, Edward E.; Czudak, John C.; and Mensing, David B., 5,469,534, Cl. 395-114.000.
Finsterwal, Robert N.; Carlston, Richard L.; Schlueter, Edward L., Jr.; and Sharf, Lucille M., 5,468,834, Cl. 528-76.000.
Hadimioglu, Babur B.; Lim, Martin G.; Stearns, Richard G.; and Quate, Calvin F., 5,467,975, Cl. 271-267.000.
Maeda, Patrick Y., 5,469,290, Cl. 359-210.000.
Proper, James M.; and Erhardt, Peter F., 5,468,586, Cl. 430-137.000.
Yu, Robert C. U.; Foley, Geoffrey M. T.; Herbert, William G.; Limburg, William W.; Mishra, Satchidanand; Post, Richard L.; and Von Hoene, Donald C., 5,469,242, Cl. 355-219.000.

Xiaoping, Yang: *See*—
Luther–Davies, Barry; and Xiaoping, Yang, 5,469,525, Cl. 385-122.000.

Xilinx, Inc.: *See*—
Kean, Thomas A., 5,469,003, Cl. 326-39.000.

XRL, Inc.: *See*—
Wilt, Donald R.; and Sidell, Richard S., 5,469,294, Cl. 359-436.000.

Xu, Ren S.; and Wiedmann, Tien W., to Pharmagenesis, Inc. Tripterinin compound and method. 5,468,772, Cl. 514-453.000.

Xu, Xingyi: *See*—
Masrur, Md A.; Xu, Xingyi; and Liang, Feng, 5,469,351, Cl. 363-56.000.

Yabe, Noritsugu: *See*—
Komiya, Koji; Takezono, Tetsuya; Yabe, Noritsugu; and Matsui, Hisao, 5,468,635, Cl. 435-240.210.

Yabuuchi, Masahiko; Akanuma, Hiroshi; Masuda, Minoru; Katoh, Kazuo; Nakamura, Tsuneo; Tajima, Shigeru; Hashiba, Masashi; Hayami, Hiroshi; Takezawa, Tomoko; and Hirayama, Masachika, to Nippon Kayaku Kabushiki Kaisha. Method for quantitatively measuring sugar-alcohol, column and kit therefor. 5,468,380, Cl. 210-198.200.

Yada, Yukihiko, to Tokai Kogyo Kabushiki Kaisha. Production method of molding strips. 5,468,438, Cl. 264-139.000.

Yagi, Yasuomi: *See*—
Waku, Shinichi; Ide, Kazumasa; Kobaragi, Haruo; Takahashi, Miyoshi; Miyakawa, Kado; and Yagi, Yasuomi, 5,469,009, Cl. 310-214.000.

Yagi, Yukihiro: *See*—
Takahashi, Shinichi; Naksimuki, Masayuki; and Yagi, Yukihiro, 5,469,091, Cl. 327-73.000.

Yahata, Mitsuru: *See*—
Yamazaki, Masahiko; Shibata, Yutaka; Natori, Kozi; Yahata, Mitsuru; and Nambu, Kyojiro, 5,469,429, Cl. 378-19.000.

Yakobson, Eric: *See*—
Perrier, Donald; and Yakobson, Eric, 5,468,515, Cl. 427-98.000.

Yamada, Akiya; Wato, Takahiko; Uchida, Naoki; Fujisawa, Misuzu; Takama, Shigeyuki; and Inamoto, Yukiko, to Teikoku Seiyaku Kabushiki Kaisha. Oral pharmaceutical preparation released at infragastrointestinal tract. 5,468,503, Cl. 424-461.000.

Yamada, Hirohito: *See*—
Okuda, Tetsuro; Yamada, Hirohito; and Torikai, Toshitaka, 5,469,459, Cl. 372-46.000.

Yamada, Keizo, to NEC Corporation. Vacuum device for controlling spatial position and path of electron. 5,468,972, Cl. 257-10.000.

Yamada, Kenichi; and Esaki, Takanobu, to Takigen Manufacturing Co. Ltd. Door locking handle assembly of pull-out and side-swinging lever-action type. 5,467,623, Cl. 70-208.000.

Yamada, Kiyohiro; Iguchi, Masao; Shimizu, Izuru; and Watanabe, Yasushi, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Costing structure for a movable member in a compressor. 5,468,130, Cl. 418-55.200.

Yamada, Kouichi: *See*—
Nishio, Masanobu; Sawada, Kazuo; Inazawa, Shinji; and Yamada, Kouichi, 5,468,557, Cl. 428-384.000.

Yamada, Kouji: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Yamada, Masanori: *See*—
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,469,266, Cl. 358-298.000.

Yamada, Minoru: *See*—
Yugami, Hiroshi; Yamada, Minoru; Oda, Noriyuki; and Endo, Yasuhiko, 5,468,282, Cl. 95-8.000.

Yamada, Shoji: *See*—
Iwao, Naoto; and Yamada, Shoji, 5,469,289, Cl. 359-200.000.

Yamada, Shuji: *See*—
Saitoh, Yasushi; Matsumoto, Masashi; Ichihashi, Takao; and Yamada, Shuji, 5,469,243, Cl. 355-225.000.

Yamada, Takateru: *See*—
Togashi, Atsushi; and Yamada, Takateru, 5,468,824, Cl. 528-12.000.

Yamada, Tomoyasu; and Fukuda, Nobutoshi, to Pioneer Electronic Corporation. Magnetic tape recording/playback apparatus for automatically detecting a desired program. 5,469,307, Cl. 360-69.000.

Yamada, Yoshio; and Yamakawa, Katumi, to Thomas & Betts Corporation. Buried marker. 5,467,729, Cl. 116-209.000.

Yamagami, Tamotsu; Sako, Yoichiro; and Yamamoto, Masanobu, to Sony Corporation. Apparatus for reproducing recorded data and selectively either of read-only or recorded synchronization information from a magneto-optical recording medium. 5,469,416, Cl. 369-48.000.

Yamagata, Koichi: *See*—
Ohashi, Tetsuo; Tada, Jun; Fukushima, Shigeru; Ozaki, Hiroko; Nishimura, Naoyuki; Shirasaki, Yoshinari; and Yamagata, Koichi, 5,468,852, Cl. 536-24.330.

Yamagishi, Hideyuki: *See*—
Crivello, James V.; Belfort, Georges; and Yamagishi, Hideyuki, 5,468,390, Cl. 210-490.000.

Yamaguchi, Eiji; Uragami, Yuji; Yokozuka, Hideharu; Uekusa, Kikoo; Yamaguchi, Toshio; Abe, Satoshi; Kamo, Tetsuro; and Suzuki, Takao, to Sumitomo Metal Mining Co., Ltd. Catalysts for hydrotreating hydrocarbon oils and method of preparing the same. 5,468,709, Cl. 502-210.000.

Yamaguchi, Katuyoshi, to Sumitomo Heavy Industries, Ltd. Inscribed planetary gear device having powder injection molded external gear. 5,468,193, Cl. 475-162.000.

Yamaguchi, Kiyotaka: *See*—
Inoue, Naoto; and Yamaguchi, Kiyotaka, 5,469,318, Cl. 360-128.000.

Yamaguchi, Ryuichi; Kiso, Koichi; Tazuke, Kiyoshi; Machida, Hideaki; Mihirogi, Katsuhiro; and Takamatsu, Yukichi, to TRI Chemical Laboratory Inc. Method of manufacturing $FSi(OR)_3$. 5,468,894, Cl. 556-477.000.

Yamaguchi, Tadashi; Nosaki, Katsutoshi; Inoue, Akihisa; and Masumoto, Tsuyoshi, to Yoshida Kogyo K.K.; Masumoto, Tsuyoshi; Inoue, Akihisa; and Honda Giken Kogyo Kabushiki Kaisha. Composite ultrafine particles of aluminum nitride and rare earth nitride, method for production and sintered article thereof. 5,468,697, Cl. 501-98.000.

Yamaguchi, Toshio: *See*—
Yamaguchi, Eiji; Uragami, Yuji; Yokozuka, Hideharu; Uekusa, Kikoo; Yamaguchi, Toshio; Abe, Satoshi; Kamo, Tetsuro; and Suzuki, Takao, 5,468,709, Cl. 502-210.000.

Yamaha Corporation: *See*—
Kurosaki, Makoto, 5,467,680, Cl. 84-421.000.

Yamakawa, Katumi: *See*—
Yamada, Yoshio; and Yamakawa, Katumi, 5,467,729, Cl. 116-209.000.

Yamama, Shinya: *See*—
Mishina, Haruo; Wada, Masafumi; Fukuda, Mituo; Itagaki, Masato; and Yamama, Shinya, 5,467,912, Cl. 228-10.000.

Yamamoto, Chiemi: *See*—
Hamoda, Keiji; Yoshida, Ritsuo; Iijima, Toshihiko; Yamamoto, Chiemi; and Kubo, Akihiko, 5,469,308, Cl. 360-71.000.

Yamamoto, Hiroshi: *See*—
Yanagawa, Makoto; and Yamamoto, Hiroshi, 5,468,784, Cl. 522-31.000.

Yamamoto, Hirotaka; and Tanaka, Tamiya, to Sony Corporation. Remote control device that transmits signals indicating termination of key pressing operations. 5,469,152, Cl. 340-825.630.

Yamamoto, Hisataka: *See*—
Hosoda, Yasushi; Shiota, Toshiaki; Suzuki, Nobukazu; Ikeda, Satoshi; Odawa, Taketosi; Kimura, Koichi; and Yamamoto, Hisataka, 5,468,461, Cl. 523-435.000.

Yamamoto, Kenji: *See*—
Takarada, Mitsuhiro; Yoshikawa, Yuji; and Yamamoto, Kenji, 5,468,825, Cl. 528-15.000.

Yamamoto, Kiyoshi; Sugii, Nobuyuki; Kubo, Koichi; Ichikawa, Michiharu; and Yamauchi, Hisao, to Furukawa Electric Co., Ltd., The ; Hitachi Ltd.; Kabushiki Kaisha Toshiba; Central Research Institute of Electric Power Industry; and International Superconductivity Technology Center. Method of manufacturing an oxide superconductor thin film. 5,468,806, Cl. 505-238.000.

Yamamoto, Koji: *See*—
Yazaki, Takao; Noro, Masataka; Matsui, Takashi; Kobayashi, Noriyuki; Sano, Hironari; and Yamamoto, Koji, 5,468,444, Cl. 264-566.000.

Yamamoto, Makoto: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,469,102, Cl. 327-361.000.

Yamamoto, Masanobu: *See*—
Yamagami, Tamotsu; Sako, Yoichiro; and Yamamoto, Masanobu, 5,469,416, Cl. 369-48.000.

Yamamoto, Naotaka; and Oohori, Noriko, to Isuzu Motors Limited. Method for recycling painted plastic materials. 5,468,779, Cl. 521-46.500.

Yamamoto, Shinichi: *See*—
Tohda, Takao; Kado, Hiroyuki; and Yamamoto, Shinichi, 5,468,959, Cl. 250-306.000.

Yamamoto, Tomoya: *See*—
Koike, Shoji; and Yamamoto, Tomoya, 5,468,553, Cl. 428-224.000.

Yamamoto, Tomoyuki, to Sony Corporation. Video editing apparatus. 5,469,270, Cl. 358-335.000.

Yamamura Glass Co. Ltd.: *See*—
Taguchi, Tomoyuki; Kuribayashi, Hideyuki; Tanaka, Jun; Konaga, Tomomi; and Morigami, Yoshihiro, 5,468,694, Cl. 501-77.000.

Yamamura, Yasuharu: *See*—
Seri, Hajime; Yamamura, Yasuharu; Tsuji, Yoichiro; Moriwaki, Yoshio; and Iwaki, Tsutomu, 5,468,309, Cl. 148-421.000.

Yamanaka, Hisayoshi: *See*—
Kanekawa, Nobuyasu; Ihara, Hirokazu; Akiyama, Masatsugu; Kawabata, Kiyoshi; Yamanaka, Hisayoshi; and Okishima, Tetsuya, 5,468,992, Cl. 257-676.000.

Yamanaka, Naoaki: *See*—
Nishihara, Motoo; Kurano, Takatoshi; Yamanaka, Naoaki; and Sato, Youichi, 5,469,543, Cl. 395-200.060.

Yamanashi, Hidenori: *See*—
Kanno, Toshiaki; Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, 5,468,918, Cl. 174-256.000.

Yamanashi, Mitsuhiro, to Kabushiki Kaisha Toshiba. Semiconductor static random access memory device with covered driver transistors. 5,468,986, Cl. 257-389.000.

Yamane, Yoshiki: *See*—
Miyazaki, Katsuo; Maeda, Takahide; Ogawa, Takeshi; Kakui, Sonoko; Ikeda, Satoshi; and Yamane, Yoshiki, 5,468,517, Cl. 427-322.000.

Yamano, Satoshi, to Kabushiki Kaisha Toshiba. Semiconductor memory device using serial pointer. 5,469,400, Cl. 365-230.010.

Yamano, Syozo: *See*—
Uchiyama, Shigeyuki; Kusaka, Yosuke; and Yamano, Syozo, 5,469,240, Cl. 354-406.000.

Yamashiro, Akiyoshi, to Mitsubishi Materials Corporation. Method for water-granulating calcium ferrite slag. 5,468,279, Cl. 75-640.000.

Yamashita, Hiroyuki; Kondo, Hiroyuki; Hatano, Kouichi; Nakano, Katsunori; Toyoda, Kouji; and Senzaki, Takashi, to Kao Corporation. Process for producing nonionic detergent granules. 5,468,516, Cl. 427-180.000.

Yamashita, Koji: *See*—
Maruyama, Jun; and Yamashita, Koji, 5,467,688, Cl. 91-441.000.

Yamashita, Mitsuhiro: *See*—
Ihara, Yasuhiro; Yamashita, Mitsuhiro; and Ueyama, Yoshiki, 5,469,360, Cl. 364-449.000.

Yamato, Tsutomu: *See*—
Okano, Yoshimichi; Kanno, Tatsuya; Yamato, Tsutomu; Oshino, Yasuhiro; Tanigawa, Michiyo; Kuwana, Takaaki; and Fukuda, Yutaka, 5,468,836, Cl. 528-204.000.

Yamatsu, Isao: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Yamauchi, Hisao: *See*—
Wada, Takahiro; Koriyama, Shin-ichi; Sakurai, Takeshi; Suzuki, Nobuo; Miyatake, Takayuki; Yamauchi, Hisao; Koshizuka, Naoki; and Tanaka, Shoji, 5,468,724, Cl. 505-125.000.
Yamamoto, Kiyoshi; Sugii, Nobuyuki; Kubo, Koichi; Ichikawa, Michiharu; and Yamauchi, Hisao, 5,468,806, Cl. 505-238.000.

Yamauchi, Tadaaki; Hamade, Kei; and Morooka, Yoshikazu, to Mitsubishi Denki Kabushiki Kaisha. Buffer circuit of a semiconductor memory device. 5,469,402, Cl. 365-230.080.

Yamauchi, Toshiyuki: *See*—
Maruichi, Takanori; Kamaya, Naoki; and Yamauchi, Toshiyuki, 5,469,211, Cl. 348-211.000.

Yamazaki, Hirokazu, to Fujitsu Limited. Semiconductor memory having non-volatile semiconductor memory cell. 5,469,381, Cl. 365-185.010.

Yamazaki, Hirokazu: *See*—
Kumakura, Sinsuke; Yamazaki, Hirokazu; Watanabe, Hisayoshi; and Kasa, Yasushi, 5,469,394, Cl. 365-201.000.

Yamazaki, Masahiko; Shibata, Yutaka; Natori, Kozi; Yahata, Mitsuru; and Nambu, Kyojiro, to Kabushiki Kaisha Toshiba. X-ray CT apparatus having focal spot position detection means for the X-ray tube and focal spot position adjusting means. 5,469,429, Cl. 378-19.000.

Yamazaki, Osamu: *See*—
Yukutomo, Masashi; Isohata, Shigeru; and Yamazaki, Osamu, 5,469,352, Cl. 364-192.000.

Yamazaki, Shunpei, to Semiconductor Energy Laboratory Co., Ltd. Photoelectric conversion device and method of making the same. 5,468,653, Cl. 437-4.000.

Yamazaki, Shunpei; Zhang, Hongyong; and Takamura, Yasuhiko, to Semiconductor Energy Laboratory Co., Ltd. Semiconductor device and method for forming the same. 5,468,987, Cl. 257-412.000.

Yampolsky, Vladimir: *See*—
Fuss, Gunter G.; and Yampolsky, Vladimir, 5,468,556, Cl. 428-369.000.

Yan, Ran-Hong: *See*—
Lee, Kuo-Hua; Lin, Horng-dar; Yan, Ran-Hong; and Yu, Chen-Hua D., 5,468,669, Cl. 437-51.000.

Yanagawa, Makoto; and Yamamoto, Hiroshi, to Tamura Kaken Corporation. Photopolymerizable resin composition. 5,468,784, Cl. 522-31.000.

Yanagihara, Hiromichi; Sato, Yasuo; and Kawaguchi, Akio, to Toyota Jidosha Kabushiki Kaisha. Compression-ignition type engine and combustion method of same. 5,467,757, Cl. 123-305.000.

Yang, A-Tso, to Chiahuan Spring Co., Ltd. Hinge for a portable computer. 5,467,504, Cl. 16-342.000.

Yang, Ching S., to Goonng Chyii Industrial Co., Ltd. Foldable cart. 5,468,005, Cl. 280-40.000.

Yang, Dian; and Karampurwala, Hashain, to LSI Logic Corporation. Method and apparatus for determining the performance of nets of an integrated circuit design on a semiconductor design automation system. 5,469,366, Cl. 364-489.000.

Yang, Jau-Yuann: *See*—
Yuan, Han-Tzong; Plumton, Donald L.; Kim, Tae S.; and Yang, Jau-Yuann, 5,468,661, Cl. 437-40.000.

Yang, Ming-Tzong; Hsue, Chen-Chiu; and Hong, Gary, to United Microelectronics Corporation. Buried bit line DRAM cell. 5,468,980, Cl. 257-306.000.

Yang, Suimin. Computer keyboard. 5,469,160, Cl. 341-22.000.

Yang, Weikang: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,469,102, Cl. 327-361.000.

Yang, Yih-Nan: *See*—
Butensky, Michael J.; Gibbs, Richard A.; Collins, Kevin T.; Yang, Yih-Nan; Johnson, Eric M.; and Graff, Chris A., 5,469,503, Cl. 379-265.000.

Yaniv, Zvi, to Advanced Technology Incubator, Inc. Large scale electronic display system. 5,469,187, Cl. 345-98.000.

Yano, Kozo: *See*—
Kanemori, Yuzuru; Katayama, Mikio; Nakazawa, Kiyoshi; Kondo, Naofumi; Okamoto, Masaya; Kato, Hiroaki; Yano, Kozo; Irie, Katsumi; Otsu, Kumiko; Fujiki, Hiroshi; Fujihara, Toshiaki; Marumoto, Hideji; Negoto, Hidenori; and Mitsumoto, Kazuyori, 5,469,025, Cl. 315-169.300.

Yao, Stephen C. Orthodontic wire. 5,468,147, Cl. 433-20.000.

Yarmchuk, Edward J., to International Business Machines Corp. Electrical defect detector for circuit lines. 5,469,051, Cl. 324-158.100.

Yarsunas, George D., to Celwave. Variable horizontal beamwidth antenna having hingeable side reflectors. 5,469,181, Cl. 343-815.000.

Yashiki, Tsuneo: *See*—
Kioka, Mamoru; and Yashiki, Tsuneo, 5,468,703, Cl. 502-108.000.

Yasuda, Isao: *See*—
Noguchi, Yasuhiro; Kuwahara, Hiroshi; Yasuda, Isao; and Takei, Kazuo, 5,469,189, Cl. 345-118.000.

Yasuda, Kenji; Takata, Yoshinori; Tsuruta, Harumi; Ohnuma, Sadaburni; and Miura, Junkichi, to Hitachi, Ltd. Solution for suppressing deterioration of a separation column for analyzing hemoglobins. 5,468,379, Cl. 210-198.200.

Yasuda, Kenji: *See*—
Minato, Toshihiro; Kato, Masaru; and Yasuda, Kenji, 5,468,712, Cl. 503-227.000.

Yasuda, Mikio: *See*—
Shiozaki, Minoru; Yasuda, Mikio; Chimoto, Isamu; and Ishimoto, Kameki, 5,468,919, Cl. 174-261.000.

Yazaki Corporation: *See*—
Kamo, Toshiaki; Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, 5,468,918, Cl. 174-256.000.
Muto, Masanori, 5,469,137, Cl. 340-462.000.

Yazaki, Takao; Noro, Masataka; Matsui, Takashi; Kobayashi, Noriyuki; Sano, Hironari; and Yamamoto, Koji, to Mitsubishi Chemical Corporation. Production of oriented thermoplastic films by blown-film extrusion. 5,468,444, Cl. 264-566.000.

Yeda Research & Development Co. Ltd.: *See*—
Revel, Michel; and Tiollais, Pierre, 5,468,607, Cl. 435-6.000.
Revel, Michel; and Tiollais, Pierre, 5,468,608, Cl. 435-91.110.
Revel, Michel; and Tiollais, Pierre, 5,468,609, Cl. 530-351.000.

Yehoda, Joseph E.: *See*—
Cucinio, Jerome J.; and Yehoda, Joseph E., 5,468,326, Cl. 156-345.000.

Yehuda, Shlomo, to Bar Ilan University. Physiologically active and nutritional composition. 5,468,776, Cl. 514-560.000.

Yelvington, Richard D., to Inventive Services, Inc. Portable apparatus for destroying syringe-type needles. 5,468,928, Cl. 219-68.000.

Yen, Samuel S. C., to University of California, The Regents of the. Use of low levels of mifepristone to treat leiomyomata. 5,468,741, Cl. 514-179.000.

Yentz, Frederick C.: *See*—
Eng, Robert C.; Galella, John W.; McCrary, Rex E.; McDonald, Mark G.; Stelzer, Eric H.; and Yentz, Frederick C., 5,469,577, Cl. 395-290.000.

Yepp, Ronald J., to Hughes Aircraft Company. Analog signal selection and summing circuit having multiplexing capability. 5,469,101, Cl. 327-361.000.

Yero, Emilio, to SGS-Thomson Microelectronics S.A. Device for detecting the contents of cells within a memory, especially an EPROM memory, method implemented with this device, and memory provided with this device. 5,469,382, Cl. 365-185.200.

Yim, Sang-chul: *See*—
Chung, Hyun-jong; Yim, Sang-chul; Ku, Bon-chul; Guen, Ho-young; and Kim, Duk-han, 5,468,263, Cl. 44-39.00L.

Yip, Maxwell K.; Suffredini, Nino R.; Sidor, Ronald P.; and White, Robert C., to Burndy Corporation. Multi-piece housing card edge connector with mounting arms. 5,468,154, Cl. 439-79.000.

Yokobayashi, Kazuyuki: *See*—
Takada, Minoru; Satoh, Kouichi; Yokobayashi, Kazuyuki; and Ogihara, Shuichi, 5,468,443, Cl. 264-537.000.

Yokogi, Kazuo, to Teisan Kabushiki Kaisha. Impurity removing system for the delivery of high purity gases. 5,468,937, Cl. 219-634.000.

Yokoo, Tsugio: *See*—
Kogure, Mitsuhiro; Nagashima, Shinichi; Wakabayashi, Kazuhisa; Enkaku, Shigeyuki; Shimayama, Hitoshi; Kimura, Minoru; Shimoyama, Shuji; and Yokoo, Tsugio, 5,467,632, Cl. 72-379.200.

Yokoo, Yoshiharu: *See*—
Hoeda, Shinkichi; Torii, Kenji; Arai, Yoichiro; Kasai, Masaji; Kato, Hironasa; Iida, Takao; Takahashi, Tomoya; Yokoo, Yoshiharu; Kamiya, Toshikazu; and Tamaoki, Tatsuya, 5,468,474, Cl. 424-70.100.

Yokota, Tsuneshi: *See*—
Tanoue, Koki; Yokota, Tsuneshi; and Yoshimaru, Tomohisa, 5,469,417, Cl. 369-50.000.

Yokouchi, Hideya: *See*—
Aruga, Tomoe; Yokouchi, Hideya; and Fujimori, Kazuyoshi, 5,469,421, Cl. 369-75.100.

Yokozuka, Hideharu: *See*—
Yamaguchi, Eiji; Uragami, Yuji; Yokozuka, Hideharu; Uekusa, Kikoo; Yamaguchi, Toshio; Abe, Satoshi; Kamo, Tetsuro; and Suzuki, Takao, 5,468,709, Cl. 502-210.000.

Yonco Corporation: *See*—
Leeson, Plato J., 5,468,103, Cl. 411-87.000.

Yoneyama, Masaru: *See*—
Mandai, Takahiko; Yoneyama, Masaru; and Sakai, Shuzo, 5,468,850, Cl. 536-18.500.

Yonezawa, Keitaro: *See*—
Arisato, Akira; and Yonezawa, Keitaro, 5,468,136, Cl. 425-192.00R.

Yonker, Clement R.: *See*—
Linehan, John C.; Yonker, Clement R.; Zemanian, Thomas S.; and Franz, James A., 5,469,061, Cl. 324-321.000.

Yoon, In J., to Samsung Electro-Mechanics Co., Ltd. Deflection yoke. 5,469,122, Cl. 335-214.000.

Yoon, Young-Rok: *See*—
Kim, Chun-Sik; Yoon, Young-Rok; and Kim, Seong-keun, 5,468,328, Cl. 156-401.000.

Yoshida Kogyo K.K.: *See*—
Fukushima, Jukichi, 5,467,509, Cl. 24-689.000.
Matsushima, Kiyomitsu; and Nagata, Katsuyuki, 5,467,630, Cl. 72-254.000.
Yamaguchi, Tadashi; Nosaki, Katsutoshi; Inoue, Akihisa; and Matsumoto, Tsuyoshi, 5,468,697, Cl. 501-98.000.

Yoshida, Ritsuo: *See*—
Hamoda, Keiji; Yoshida, Ritsuo; Iijima, Toshihiko; Yamamoto, Chiemi; and Kubo, Akihiko, 5,469,308, Cl. 360-71.000.

Yoshida, Takashi: *See*—
Kobayashi, Osamu; and Yoshida, Takashi, 5,467,969, Cl. 254-251.000.

Yoshida, Yoshikazu: *See*—
Nishikawa, Yukio; Tanaka, Kunio; and Yoshida, Yoshikazu, 5,468,930, Cl. 219-121.600.

Yoshida, Yutaka: *See*—
Ohno, Kouichi; Miyatake, Hideki; and Yoshida, Yutaka, 5,469,296, Cl. 359-603.000.

Yoshikawa, Kazuo: *See*—
Uchida, Hiroyuki; Yoshikawa, Kazuo; and Nishi, Seiji, 5,468,305, Cl. 148-120.000.

Yoshikawa, Yuji: *See*—
Takarada, Mitsuhiro; Yoshikawa, Yuji; and Yamamoto, Kenji, 5,468,825, Cl. 528-15.000.

Yoshikoshi, Hajime: *See*—
Ebata, Takashi; Matsumoto, Katsuya; Koseki, Koshi; Kawakami, Hiroshi; Matsushita, Hajime; Yoshikoshi, Hajime; and Okaniwa, Masakazu, 5,468,881, Cl. 549-295.000.

Yoshimaru, Tomohisa: *See*—
Tanoue, Koki; Yokota, Tsuneshi; and Yoshimaru, Tomohisa, 5,469,417, Cl. 369-50.000.

Yoshimori, Hiroyuki; Watanabe, Hitoshi; Paz De Araujo, Carlos A.; Hiraide, Shuzo; Mihara, Takashi; and McMillan, Larry D., to Symetrix Corporation; and Olympus Optical Co., Ltd. Integrated circuit with layered superlattice material and method of fabricating same. 5,468,684, Cl. 437-228.000.

Yoshimura, Atsushi; Shibata, Hiroshi; Takahashi, Fumio; and Tsurushima, Kuniaki, to Kabushiki Kaisha Toshiba. Outer lead bending apparatus for a semiconductor package device having a package and outer leads extending from the package. 5,467,803, Cl. 140-105.000.

Yoshimura, Hiroyuki: *See*—
Okano, Kazuo; Miyazawa, Shuhei; Clark, Richard S. J.; Abe, Shinya; Kawahara, Tetsuya; Shimomura, Naoyuki; Asano, Osamu; Yoshimura, Hiroyuki; Miyamoto, Mitsuaki; Sakuma, Yoshimori; Muramoto, Kenzo; Obaishi, Hiroshi; Harada, Koukichi; Tsunoda, Hajime; Katayama, Satoshi; Yamada, Kouji; Souda, Shigeru; Machida, Yoshimasa; Katayama, Kouichi; and Yamatsu, Isao, 5,468,740, Cl. 514-81.000.

Yoshino, Hitoshi; and Hashimoto, Shigeo, to Hitachi Medical Corporation; and Sumitomo Special Metals Co., Ltd. Magnetic field generating apparatus. 5,467,769, Cl. 128-653.200.

Yoshino, Takehito: *See*—
Kanai, Masahiro; Fujioka, Yasushi; Yoshino, Takehito; and Hori, Tadashi, 5,468,521, Cl. 427-575.000.

Yoshio, Hideaki: *See*—
Konishi, Akio; Sakai, Yoshitomo; Saito, Yoshiyuki; and Yoshio, Hideaki, 5,469,309, Cl. 360-85.000.

Yoshio, Oka, to Honda Giken Kogyo Kabushiki Kaisha. All terrain vehicle. 5,467,839, Cl. 180-233.000.

Yoshizawa, Atsutomo: *See*—
Usami, Akihiro; Mochida, Yoshinori; Yoshizawa, Atsutomo; Ikeda, Yoshinori; Kemmochi, Kazuhisa; Nagase, Yukio; Arimoto, Shinobu; Yamada, Masanori; Suzuki, Hajime; and Kato, Katsuhito, 5,469,266, Cl. 358-298.000.

Young, Barry S., to MDT Corporation. Baseplate configuration. 5,467,951, Cl. 248-188.100.

Young, David J., to Eastman Kodak Company. Powder tester. 5,467,659, Cl. 73-866.000.

Young, Kenneth K.; and Wilkes, R. Jeffrey, to University of Washington, Board of Regents of the. Digital sonar system. 5,469,403, Cl. 367-6.000.

Young, Ralph H.: *See*—
Gruenbaum, William T.; Kung, Teh-Ming; and Young, Ralph H., 5,468,583, Cl. 430-58.000.

Yozan Inc.: *See*—
Shou, Guoliang; Yang, Weikang; Takatori, Sunao; and Yamamoto, Makoto, 5,469,102, Cl. 327-361.000.

Yperwatch S.A.: *See*—
Weise, Edgar H., 5,469,412, Cl. 368-88.000.

Yquel, Jean-Pierre, to L'Oreal. Aerosol device for dispensing a composition with relatively high viscosity. 5,467,902, Cl. 222-402.100.

Yu, Chen-Hua D.: *See*—
Lee, Kuo-Hua; Lin, Horng-dar; Yan, Ran-Hong; and Yu, Chen-Hua D., 5,468,669, Cl. 437-51.000.

Yu, Duncan: *See*—
Li, Tzu-Li; Tung, I-Chung; and Yu, Duncan, 5,468,429, Cl. 264-442.000.

Yu, Robert C. U.; Foley, Geoffrey M. T.; Herbert, William G.; Limburg, William W.; Mishra, Satchidanand; Post, Richard L.; and Von Hoene, Donald C., to Xerox Corporation. Corona generating device having a heated shield. 5,469,242, Cl. 355-219.000.

Yu, Xudong, to Applied Power Inc. Unitary electro-hydraulic rotary actuator for automotive convertible top. 5,467,596, Cl. 60-415.000.

Yuan, Han-Tzong; Plumton, Donald L.; Kim, Tae S.; and Yang, Jau-Yuann, to Texas Instruments Incorporated. Method of making power VFET device. 5,468,661, Cl. 437-40.000.

Yuan, San C., to Du Pont de Nemours, E. I., and Company. Primers containing zircoaluminate coupling agents for improved adhesion. 5,468,791, Cl. 524-108.000.

Yugami, Hiroshi; Yamada, Minoru; Oda, Noriyuki; and Endo, Yasuhiko, to Asahi Glass Company Ltd. Method for operating a filtration apparatus for flue gas. 5,468,282, Cl. 95-8.000.

Yuji Gosei Kogyo Co., Ltd.: *See*—
Ebata, Takashi; Matsumoto, Katsuya; Koseki, Koshi; Kawakami, Hiroshi; Matsushita, Hajime; Yoshikoshi, Hajime; and Okaniwa, Masakazu, 5,468,881, Cl. 549-295.000.

Yukong Limited: *See*—
Chung, Hyun-jong; Yim, Sang-chul; Ku, Bon-chul; Guen, Ho-young; and Kim, Duk-han, 5,468,263, Cl. 44-39.00L.

Yukutomo, Masashi; Isohata, Shigeru; and Yamazaki, Osamu, to Fanuc Ltd. Operation history display device of numerical control apparatus. 5,469,352, Cl. 364-192.000.

Yun, Gang: *See*—
Kavehrad, Mohsen; and Yun, Gang, 5,469,277, Cl. 359-15.000.

Yun, Joeg K., to SamSung Electronics Co., Ltd. High speed optical information system and method. 5,469,269, Cl. 358-335.000.

Yung, Henry T.; Izzi, Louis J.; and Krenik, William R., to Texas Instruments Incorporated. Integrated circuit capacitors, buffers, systems and methods. 5,469,195, Cl. 345-199.000.

Zafiroglu, Dimitri P., to E. I. DuPont de Nemours and Company. Process for elastic nonwoven undergarment with a stitchbonded outer shell. 5,468,320, Cl. 156-148.000.

Zaiser, Wolfgang; and Merkle, Hans, to Mercedes-Benz AG. Epicyclic change-speed gearbox casing with a spiral partition wall. 5,467,667, Cl. 74-606.00R.

Zako, Wayne N. Material selective device. 5,469,235, Cl. 353-97.000.

Zalewski, Leon. Swivel assembly for multi-conductor cord. 5,468,912, Cl. 174-86.000.

Zambon Group S.p.A.: *See*—
Casagrande, Cesare; Montanari, Stefania; and Santangelo, Francesco, 5,468,746, Cl. 514-235.500.

Zanini, Gianpietro; Vesentini, Renzo; and Corniani, Carlo, to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A. Capping unit for automatically assembling pump-operated spray cap. 5,467,527, Cl. 29-773.000.

Zappala, Paolo; and Tomasello, Biagia. Machine for preparing a coffee infusion in particular for home use. 5,467,690, Cl. 99-302.00P.

Zarate, Rene A. Baseball batting practice device. 5,467,979, Cl. 273-26.00R.

Zauns-Huber, Rudolf; Ruscheinsky, Emil; and Wolter, Fredi, to Henkel Kommanditgesellschaft auf Aktien. Use of nonionic organic dialkyl compounds for preventing fatty spew on leather. 5,468,255, Cl. 8-94.220.

Zauns-Huber, Rudolf: *See*—
de Riese-Meyer, Loert; and Zauns-Huber, Rudolf, 5,468,892, Cl. 556-171.000.

Zecchino, Julius R.; Messin, Steven; Corcoran, Cathleen; and Chung, Kenneth T., to Estee Lauder, Inc. Titanium dioxide dispersions, cosmetic compositions and methods for using same. 5,468,471, Cl. 424-59.000.

Zehavi, Ephraim, to Qualcomm Incorporated. Viterbi decoder bit efficient chainback memory method and decoder incorporating same. 5,469,452, Cl. 371-43.000.

Zeidler, Gideon, to University of California, The Regents of the. Method for removal of cholesterol and fat from liquid egg yolk with recovery of free cholesterol as a by-product. 5,468,511, Cl. 426-614.000.

Zeiler, Hans-Joachim: *See*—
Petersen, Uwe; Himmler, Thomas; Schenke, Thomas; Krebs, Andreas; Grobe, Klaus; Bremm, Klaus-Dieter; Metzger, Karl G.; Endermann, Rainer; and Zeiler, Hans-Joachim, 5,468,742, Cl. 514-187.000.
Petersen, Uwe; Grobe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 5,468,861, Cl. 546-156.000.

Zellweger Uster, Inc.: *See*—
Shofner, Frederick M.; Chu, Youe-T; Baldwin, Joseph C.; Galyon, Michael E.; Kacenas, Benjamin M.; and Williams, Gordon F., 5,469,253, Cl. 356-238.000.

Zemanian, Thomas S.: *See*—
Linehan, John C.; Yonker, Clement R.; Zemanian, Thomas S.; and Pranz, James A., 5,469,061, Cl. 324-321.000.

Zemlok, Kenneth C.: *See*—
Berson, William; and Zemlok, Kenneth C., 5,469,506, Cl. 380-23.000.

Zeneca Limited: *See*—
Clough, John M.; Godfrey, Christopher R. A.; Streeting, Ian T.; and Cheetham, Rex, 5,468,747, Cl. 514-239.500.
Randles, Kenneth R.; Gott, Brian G.; and Daley, Stephen T. A. K., 5,468,903, Cl. 568-28.000.

Zengerle, Paul L.; Miller, David D.; Whitesides, Thomas H.; Rieger, John B.; Flow, Vincent J., III; and Isaac, Walter H., to Eastman Kodak Company. Photographic dispersion. 5,468,604, Cl. 430-631.000.

Zenno, Shuhei; Inouye, Satoshi; Kanoh, Hiromasa; and Saigo, Kaoru, to Chisso Corporation. Gene encoding enzyme having flavin reducing activity and nitroreductase activity. 5,468,631, Cl. 435-189.000.

Zguris, George C.; and Harmon, Frank C., Jr., to Hollingsworth & Vose Company. Pre-compressed glass fiber separators for batteries. 5,468,572, Cl. 429-247.000.

Zhang, Chaoying: *See*—
Mobley, J. Phil; Zhang, Chaoying; Soli, Sigfried D.; Johnson, Chris; and O'Connell, Drew, 5,467,784, Cl. 128-867.000.

Zhang, Hongyong: *See*—
Yamazaki, Shunpei; Zhang, Hongyong; and Takamura, Yasuhiko, 5,468,987, Cl. 257-412.000.

Zhang, Yuwen: *See*—
Seeman, Nadrian C.; and Zhang, Yuwen, 5,468,851, Cl. 536-22.100.

Zhang, Zhenyu; and Fehlner, James R., to Inrad. Molecular sieve - photoactive semiconductor membranes and reactions employing the membranes. 5,468,699, Cl. 502-60.000.

Zhao, Jin: *See*—
Nguyen, Trung T.; and Zhao, Jin, 5,469,120, Cl. 331-177.00R.

Zhao, Junguo: *See*—
Wegner, Steven; Harpold, Michael A.; McCaffrey, Terence M.; Morris, Susan E.; Wojciechowski, Marek; Zhao, Junguo; Henkens, Robert W.; Naser, Najih; and O'Daly, John P., 5,468,366, Cl. 204-403.000.

Zhen, Yeuqian: *See*—
de Buzzaccarini, Francesco; Farwick, Timothy J.; and Zhen, Yeuqian, 5,468,413, Cl. 252-117.000.

Zheng, Bin: *See*—
Srebnik, Morris; Zheng, Bin; and Deloux, Laurent, 5,468,889, Cl. 556-7.000.

Zheng, Yu, to Posit Plus. Collapsible shade structure. 5,467,794, Cl. 135-125.000.

Zidovec, Davor F.; Fisher, Alexander D., deceased (by Bennett Hodge-Fisher, legal representative), to Betz PaperChem, Inc. Methods of controlling scale formation in the presence of metal ions in aqueous systems. 5,468,393, Cl. 210-697.000.

Ziegenbein, Botho: *See*—
Reihlen, Eckart; Marek, Jiri; Bantien, Frank; Findler, Guenther; Offenberg, Michael; Kleinhans, Josef; Konzelmann, Uwe; and Ziegenbein, Botho, 5,467,649, Cl. 73-204.260.

Zietsch, Andreas: *See*—
Handke, Günter; Rossberg, Lars; and Zietsch, Andreas, 5,467,851, Cl. 133-299.000.

Zillner, Jospeh W. Assemblies to determine the state of cleanliness of dishes in a dishwasher. 5,467,545, Cl. 40-597.000.

Zink, Rudolf, to Ciba-Geigy Corporation. Bislactones. 5,468,855, Cl. 544-60.000.

Zock, Joseph M.: *See*—
Cantwell, Cathleen A.; Hodges, Roland L.; McGilvray, Derek; Queener, Stephen W.; Swartling, James R.; and Zock, Joseph M., 5,468,632, Cl. 435-197.000.

Zondler, Helmut: *See*—
Kristiansen, Odd; Zondler, Helmut; and Müller, Urs, 5,468,751, Cl. 514-256.000.

Zoppi, Gianni, to Ecochem Aktiengesellschaft. Process for heavy metal electrowinning. 5,468,354, Cl. 204-213.000.

ZT Corporation: *See*—
Thomas, Glenn C., Sr., 5,468,303, Cl. 134-3.000.

Zwaans, Bernardus A. M.: *See*—
Denissen, Adrianus J. M.; and Zwaans, Bernardus A. M., 5,469,448, Cl. 371-37.400.

Zwart, Klaas J. Pack-off tool. 5,467,822, Cl. 166-179.000.

Zwez, Thomas: *See*—
Loerzer, Thomas; Telser, Thomas; Zwez, Thomas; and Albert, Bernhard, 5,468,596, Cl. 430-306.000.

Zwigart, John M.: *See*—
McCoy, Gary W.; Zwigart, John M.; and Tweedy, Mark R., 5,467,864, Cl. 198-409.000.

3V Inc.: *See*—
Raspanti, Giuseppe, 5,468,470, Cl. 424-59.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21th DAY OF NOVEMBER, 1995

NOTE— Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

Anastassiou, Dimitris: *See*—
Wang, Feng M.; and Anastassiou, Dimitris, Re. 35,093, Cl. 348-413.000.

Atmel Corporation: *See*—
Wu, Tsung-Ching; and Chern, Geeng-Chuan, Re. 35,094, Cl. 437-43.000.

Bergloff, Dag; Scheucher, Peter; Schieg, Rudolf; and Stummer, Giselher, to Maschesinfabrik Andritz Actiengesellschaft. Pressure device and seal for filter belt machines. Re. 35,091, Cl. 210-401.000.

Brandt, Nils G. L.; and Senesan, Zeljka D., to Sandvik AB. Ceramic cutting tool reinforced by whiskers. Re. 35,090, Cl. 51-309.000.

Chern, Geeng-Chuan: *See*—
Wu, Tsung-Ching; and Chern, Geeng-Chuan, Re. 35,094, Cl. 437-43.000.

Hirata, Mayumi: *See*—
Taniguchi, Masao; Umezu, Kohei; Shirasaka, Tadashi; Inoue, Shinya; Shinpuku, Tetsuro; Mitsuka, Masayuki; and Hirata, Mayumi, Re. 35,096, Cl. 514-423.000.

Inoue, Shinya: *See*—
Taniguchi, Masao; Umezu, Kohei; Shirasaka, Tadashi; Inoue, Shinya; Shinpuku, Tetsuro; Mitsuka, Masayuki; and Hirata, Mayumi, Re. 35,096, Cl. 514-423.000.

Kojima, Masami, to Nippondenso Co., Ltd. Ignition coil assembly for internal combustion engines. Re. 35,092, Cl. 336-92.000.

Liotta, Lance A.: *See*—
Steeg, Patricia S.; Liotta, Lance A.; and Sobel, Mark E., Re. 35,097, Cl. 536-23.500.

Marion Laboratories, Inc.: *See*—
Zobrist, Ray H.; and Morrone, William R., Re. 35,095, Cl. 514-211.000.

Maschesinfabrik Andritz Actiengesellschaft: *See*—
Bergloff, Dag; Scheucher, Peter; Schieg, Rudolf; and Stummer, Giselher, Re. 35,091, Cl. 210-401.000.

Mitsubishi Chemical Corporation: *See*—
Taniguchi, Masao; Umezu, Kohei; Shirasaka, Tadashi; Inoue, Shinya; Shinpuku, Tetsuro; Mitsuka, Masayuki; and Hirata, Mayumi, Re. 35,096, Cl. 514-423.000.

Mitsuka, Masayuki: *See*—
Taniguchi, Masao; Umezu, Kohei; Shirasaka, Tadashi; Inoue, Shinya; Shinpuku, Tetsuro; Mitsuka, Masayuki; and Hirata, Mayumi, Re. 35,096, Cl. 514-423.000.

Morrone, William R.: *See*—
Zobrist, Ray H.; and Morrone, William R., Re. 35,095, Cl. 514-211.000.

Nippondenso Co., Ltd.: *See*—
Kojima, Masami, Re. 35,092, Cl. 336-92.000.

Sandvik AB: *See*—
Brandt, Nils G. L.; and Senesan, Zeljka D., Re. 35,090, Cl. 51-309.000.

Scheucher, Peter: *See*—
Bergloff, Dag; Scheucher, Peter; Schieg, Rudolf; and Stummer, Giselher, Re. 35,091, Cl. 210-401.000.

Schieg, Rudolf: *See*—
Bergloff, Dag; Scheucher, Peter; Schieg, Rudolf; and Stummer, Giselher, Re. 35,091, Cl. 210-401.000.

Senesan, Zeljka D.: *See*—
Brandt, Nils G. L.; and Senesan, Zeljka D., Re. 35,090, Cl. 51-309.000.

Shinpuku, Tetsuro: *See*—
Taniguchi, Masao; Umezu, Kohei; Shirasaka, Tadashi; Inoue, Shinya; Shinpuku, Tetsuro; Mitsuka, Masayuki; and Hirata, Mayumi, Re. 35,096, Cl. 514-423.000.

Shirasaka, Tadashi: *See*—
Taniguchi, Masao; Umezu, Kohei; Shirasaka, Tadashi; Inoue, Shinya; Shinpuku, Tetsuro; Mitsuka, Masayuki; and Hirata, Mayumi, Re. 35,096, Cl. 514-423.000.

Sobel, Mark E.: *See*—
Steeg, Patricia S.; Liotta, Lance A.; and Sobel, Mark E., Re. 35,097, Cl. 536-23.500.

Steeg, Patricia S.; Liotta, Lance A.; and Sobel, Mark E., to United States of America, Health and Human Services. Gene for diagnosing cancer metastatic potential. Re. 35,097, Cl. 536-23.500.

Stummer, Giselher: *See*—
Bergloff, Dag; Scheucher, Peter; Schieg, Rudolf; and Stummer, Giselher, Re. 35,091, Cl. 210-401.000.

Taniguchi, Masao; Umezu, Kohei; Shirasaka, Tadashi; Inoue, Shinya; Shinpuku, Tetsuro; Mitsuka, Masayuki; and Hirata, Mayumi, to Mitsubishi Chemical Corporation. Pyrrolecarboxylic acid derivatives. Re. 35,096, Cl. 514-423.000.

Trustees of Columbia University In the City of New York, The: *See*—
Wang, Feng M.; and Anastassiou, Dimitris, Re. 35,093, Cl. 348-413.000.

Umezu, Kohei: *See*—
Taniguchi, Masao; Umezu, Kohei; Shirasaka, Tadashi; Inoue, Shinya; Shinpuku, Tetsuro; Mitsuka, Masayuki; and Hirata, Mayumi, Re. 35,096, Cl. 514-423.000.

United States of America
Health and Human Services: *See*—
Steeg, Patricia S.; Liotta, Lance A.; and Sobel, Mark E., Re. 35,097, Cl. 536-23.500.

Wang, Feng M.; and Anastassiou, Dimitris, to Trustees of Columbia University In the City of New York, The. Systems and methods for coding even fields of interlaced video sequences. Re. 35,093, Cl. 348-413.000.

Wu, Tsung-Ching; and Chern, Geeng-Chuan, to Atmel Corporation. Fabrication process for programmable and erasable MOS memory device. Re. 35,094, Cl. 437-43.000.

Zobrist, Ray H.; and Morrone, William R., to Marion Laboratories, Inc. Benzothiazepine anti-seizure method. Re. 35,095, Cl. 514-211.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Brookfield, David A. Viscometer with a continuously variable electronic readout. B1 4,448,061, Cl. 73-54.330.

DH Technology, Inc.: *See*—
Jeanblanc, Ivan M.; Hutchison, Stephen E.; Virkus, Mark K.; and Johnsen, Ronald J., B1 5,115,493, Cl. 395-117.000.

Fitzgerald, Robert M.; and Gresens, Eugene O. Satellite antenna mounting apparatus with ballast means. B1 4,922,264, Cl. 343-878.000.

Gresens, Eugene O.: *See*—
Fitzgerald, Robert M.; and Gresens, Eugene O., B1 4,922,264, Cl. 343-878.000.

Hutchison, Stephen E.: *See*—
Jeanblanc, Ivan M.; Hutchison, Stephen E.; Virkus, Mark K.; and Johnsen, Ronald J., B1 5,115,493, Cl. 395-117.000.

Jeanblanc, Ivan M.; Hutchison, Stephen E.; Virkus, Mark K.; and Johnsen, Ronald J., to DH Technology, Inc. Continuous laser printer for printing over page boundaries. B1 5,115,493, Cl. 395-117.000.

Johnsen, Ronald J.: *See*—
Jeanblanc, Ivan M.; Hutchison, Stephen E.; Virkus, Mark K.; and Johnsen, Ronald J., B1 5,115,493, Cl. 395-117.000.

Kane, Robert C., to Motorola, Inc. Cold cathode field emission device with integral emitter ballasting. B1 5,142,184, Cl. 313-309.000.

Motorola, Inc.: *See*—
Kane, Robert C., B1 5,142,184, Cl. 313-309.000.

Powell, Robert M. Intraocular lens. B1 4,536,897, Cl. 623-6.000.

Virkus, Mark K.: *See*—
Jeanblanc, Ivan M.; Hutchison, Stephen E.; Virkus, Mark K.; and Johnsen, Ronald J., B1 5,115,493, Cl. 395-117.000.

LIST OF DESIGN PATENTEES

Abraham, Loren: *See*—
Eijadi, David A.; Abraham, Loren; DeKeyser, Dawn; and Hansen, Thomas A., 364,469, Cl. D25-52.000.

Aiascough, Frances G. H., to Newell Operating Company. Hinge wing cover. 364,328, Cl. D8-323.000.

Alcan Australia Limited: *See*—
Worral, Brian C., 364,277, Cl. D5-1.000.

Alexson, Charles E.: *See*—
Pitzen, James F.; Smith, Jeffrey D.; Alexson, Charles E.; and Fenske, Lawrence, 364,463, Cl. D24-146.000.

Alpha Enterprises, Inc.: *See*—
Weisburn, James T.; and Gallagher, Christopher G., 364,304, Cl. D6-632.000.

Alyanakian, Robert D.: *See*—
Ziemer, Lynn B.; and Alyanakian, Robert D., 364,329, Cl. D8-331.000.

Andersen Corporation: *See*—
Eijadi, David A.; Abraham, Loren; DeKeyser, Dawn; and Hansen, Thomas A., 364,469, Cl. D25-52.000.

Andersson, Björn, to Hagglunds Vehicle AB. Foldable chair for a combat vehicle. 364,282, Cl. D6-356.000.

Andreas Stihl: *See*—
Lohse, Georg; Förderer, Karl; Höppner, Klaus; and Tinius, Michael P. G., 364,326, Cl. D8-65.000.

Apple Computer, Inc.: *See*—
Lam, Lawrence, 364,398, Cl. D14-114.000.

Arnold, Todd: *See*—
Tutton, John; Arnold, Todd; Fournier, Edmund A.; and Smith, Terrance A., 364,487, Cl. D29-122.000.

Assmann, Jürgen; Walta, Dietmar; and Kunzendorf, Andre, to WIK Elektro-Hausgeräte Vertriebs GmbH & Co. Produktions. Footbath tub. 364,466, Cl. D24-213.000.

Avery Dennison Corporation: *See*—
Deschenes, Charles L.; Jones, Terence J.; and Cooper, William J., 364,337, Cl. D8-382.000.

Backs, Jochen, to Samsung Electronics Co. Ltd. Monitor for computers. 364,392, Cl. D14-113.000.

Backs, Jochen, to Samsung Electronics Co. Ltd. Monitor for computers. 364,393, Cl. D14-113.000.

Backs, Jochen, to Samsung Electronics Co. Ltd. Monitor for computers. 364,394, Cl. D14-113.000.

Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., to Minnesota Mining and Manufacturing Company. Videocassette. 364,401, Cl. D14-121.000.

Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., to Minnesota Mining and Manufacturing Company. Videocassette. 364,402, Cl. D14-121.000.

Bailey, John A., to Minnesota Mining and Manufacturing Company. Tape reel for a videocassette. 364,403, Cl. D14-122.000.

Balestrieri, Harry, to M. R. Carretta Co., Inc. Gold putting aid. 364,440, Cl. D21-234.000.

Barrett, Shawn: *See*—
Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, 364,309, Cl. D7-350.000.
Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, 364,310, Cl. D7-350.000.

Bartlett, John W.: *See*—
Hilliard, James E.; Lane, William A.; Bartlett, John W.; LaBallister, John W.; and Jedlicka, Frederick B., 364,412, Cl. D15-133.000.

Bedol, Mark A. Combined computer mouse pad and calculator. 364,397, Cl. D14-114.000.

Ben Hogan Company: *See*—
McGraw, Ronnie F.; and Rahrig, Donald S., 364,434, Cl. D21-220.000.

Benetton Group S.p.A.: *See*—
Yagi, Tamotsu, 364,349, Cl. D9-549.000.

Bird, David A.; and Haley, Vincent L., to Rubbermaid Incorporated. Brush handle. 364,276, Cl. D4-138.000.

Bloomer, Glenn A.: *See*—
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., 364,401, Cl. D14-121.000.
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., 364,402, Cl. D14-121.000.

Bold, Alfred J.; Connolly, Kevin J.; Kodesch, Steven E.; Lobdell, Irving; Roberts, Bruce E.; and Satalino, Carmen M., to Garden Way Incorporated. Chipper/shredder vacuum apparatus. 364,407, Cl. D15-10.000.

Bonanno, Elizabeth: *See*—
Diecidue, Pamela; and Bonanno, Elizabeth, 364,431, Cl. D21-82.000.

Bramlett, Larry; Inatomi, Charles T.; Propp, Robert R.; and Tan, Warren, to Transaction Technology, Inc. Customer identification terminal. 364,386, Cl. D14-105.000.

Branham, Rick: *See*—
Brightbill, Keith E.; Branham, Rick; Conaway, Brian J.; Copen, Frank; Corney, Richard E.; Frindt, Robert; Kobilarcik, Albert T.; and Wolff, Stacy L., 364,294, Cl. D6-492.000.

Bransky, Jeffrey D.; and Sanderson, Kenneth L., to Duraco Products, Inc. Planter. 364,358, Cl. D11-152.000.

Brayer, Randall R.: *See*—
Weimer, Andrew F.; Brayer, Randall R.; and Robinson, Beale A., 364,370, Cl. D12-147.000.

Breacain, Stephen J. Plant watering ring. 364,322, Cl. D8-1.000.

Brightbill, Keith, to Rubbermaid Incorporated. Basket. 364,272, Cl. D3-312.000.

Brightbill, Keith E.; Branham, Rick; Conaway, Brian J.; Copen, Frank; Corney, Richard E.; Frindt, Robert; Kobilarcik, Albert T.; and Wolff, Stacy L., to Rubbermaid Incorporated. Door for cabinet. 364,294, Cl. D6-492.000.

Brown, Dennis B.; and Robertson, Breon J. Flexible flask. 364,268, Cl. D3-202.000.

Brown, Neil H.: *See*—
Liebert, Richard T.; and Brown, Neil H., 364,461, Cl. D24-130.000.

Brown, Peter A.: *See*—
Filipp, Stephen L.; and Brown, Peter A., 364,333, Cl. D8-354.000.

Brown, Roger G.: *See*—
Zupo, Alan L.; and Brown, Roger G., 364,323, Cl. D8-14.000.

Bryant, Gary C.; Davidovich, Alan A.; Howard, Thomas L.; Kupper, David G.; Scott, Sydney K.; Surridge, David G.; and Vannette, Mark W., to Caterpillar Inc. Wheel loader vehicle. 364,408, Cl. D15-25.000.

BSG Laboratories, Inc.: *See*—
Goldfarb, Barry S.; and Skees, Theron, 364,405, Cl. D14-207.000.
Goldfarb, Barry S.; and Skees, Theron, 364,406, Cl. D14-215.000.

Bucaccio, Tom, to Rubbermaid Office Products Inc. File box. 364,426, Cl. D19-75.000.

Burbury, Robert L.; and Nuccio, Phillip P., to Optima Imaging, Inc. Decorator wall panel. 364,475, Cl. D25-138.000.

Calmeise, Randall W., to Rubbermaid Incorporated. Hardware container. 364,271, Cl. D3-282.000.

Calusinski, Richard R., to Everts & Van Der Weijden Exploitatie Maatschappij Ewem B.V. Spring clip. 364,336, Cl. D8-371.000.

Canon Kabushiki Kaisha: *See*—
Kawashima, Shosaku, 364,420, Cl. D18-54.000.
Miyahara, Kazuhiko, 364,388, Cl. D14-107.000.
Shimizu, Hisakazu, 364,389, Cl. D14-100.000.

Carlisle, Dorothy M.; and Cason, Kenneth D. Simulative toy skateboard. 364,438, Cl. D21-227.000.

Carlsberg A/S: *See*—
Rasmussen, Jan N., 364,305, Cl. D7-300.000.

Caron, Erich. Gaming machine. 364,428, Cl. D21-12.000.

Cason, Kenneth D.: *See*—
Carlisle, Dorothy M.; and Cason, Kenneth D., 364,438, Cl. D21-227.000.

Caterpillar Inc.: *See*—
Bryant, Gary C.; Davidovich, Alan A.; Howard, Thomas L.; Kupper, David G.; Scott, Sydney K.; Surridge, David G.; and Vannette, Mark W., 364,408, Cl. D15-25.000.

Cedalux, Inc.: *See*—
Rosenschein, Warner, 364,451, Cl. D23-368.000.

Centre Clock Industry Co., Ltd.: *See*—
Moore, Shan-Ker, 364,356, Cl. D10-29.000.

Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, to West Bend Company, The. Breadmaker. 364,309, Cl. D7-350.000.

Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, to West Bend Company, The. Breadmaker. 364,310, Cl. D7-350.000.

Chang, Kwei T. Coffee maker. 364,307, Cl. D7-322.000.

Chang, Kwei T. Cyclone cooker. 364,308, Cl. D7-350.000.

Chen, Wen-Cheng, to Focus Electronic Co., Ltd. Keyboard. 364,400, Cl. D14-115.000.

Chequemate International, Inc.: *See*—
Harris, Blaine, 364,421, Cl. D19-26.000.

Chiba, Taneaki; Goudo, Mari; Sakai, Akira; and Matsushita, Kenichirou, to NBC Corporation. Portable personal computer. 364,387, Cl. D14-106.000.

Chih, Ming-Kuan. Beverage glass. 364,318, Cl. D7-515.000.

Chiuminatta, Alan R.: *See*—
Chiuminatta, Edward; and Chiuminatta, Alan R., 364,433, Cl. D21-219.000.

Chiuminatta, Edward; and Chiuminatta, Alan R. Golf putter head. 364,433, Cl. D21-219.000.

Chu, Gou-Don: *See*—
Lin, Chin-I; and Chu, Gou-Don, 364,365, Cl. D12-111.000.

Cianciotto, Daniel, to Tie Teacher, Inc. Tie teacher. 364,261, Cl. D2-609.000.

Ciesko, Mark J.: *See*—
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., 364,401, Cl. D14-121.000.
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., 364,402, Cl. D14-121.000.

Cline, Roger M., to Real-Tool, Inc. Surface mount snow guard. 364,338, Cl. D8-499.000.

Cloud, Robert W. Combined inflatable beach pillow and support tray therefor. 364,302, Cl. D6-601.000.

Coast Medical, Inc.: *See*—
Mongeon, Douglas R., 364,457, Cl. D24-127.000.

Coletta, Frances A.: *See*—
Humphrey, David C.; and Coletta, Frances A., 364,314, Cl. D7-510.000.
Humphrey, David C.; and Coletta, Frances A., 364,315, Cl. D7-510.000.

Humphrey, David C.; and Coletta, Frances A., 364,316, Cl. D7-510.000.
Humphrey, David C.; and Coletta, Frances A., 364,317, Cl. D7-511.000.
Conaway, Brian J.: *See—*
Brightbill, Keith E.; Branham, Rick; Conaway, Brian J.; Copen, Frank; Corney, Richard E.; Frindt, Robert; Kobilarcik, Albert T.; and Wolff, Stacy L., 364,294, Cl. D6-492.000.
Connolly, Kevin J.: *See—*
Bold, Alfred J.; Connolly, Kevin J.; Kodesch, Steven E.; Lobdell, Irving; Roberts, Bruce E.; and Satalino, Carmen M., 364,407, Cl. D15-10.000.
Cook, Princess. Combined shelter and playhouse for cats. 364,489, Cl. D30-108.000.
Cooper, Sidney E. Base for an infant seat. 364,295, Cl. D6-495.000.
Cooper, William J.: *See—*
Deschenes, Charles L.; Jones, Terence J.; and Cooper, William J., 364,337, Cl. D8-382.000.
Copen, Frank: *See—*
Brightbill, Keith E.; Branham, Rick; Conaway, Brian J.; Copen, Frank; Corney, Richard E.; Frindt, Robert; Kobilarcik, Albert T.; and Wolff, Stacy L., 364,294, Cl. D6-492.000.
Corney, Richard E.: *See—*
Brightbill, Keith E.; Branham, Rick; Conaway, Brian J.; Copen, Frank; Corney, Richard E.; Frindt, Robert; Kobilarcik, Albert T.; and Wolff, Stacy L., 364,294, Cl. D6-492.000.
Cowhey, James G.: *See—*
Stasec, Rado; Schiavello, Antonino; and Cowhey, James G., 364,396, Cl. D14-114.000.
Cozzolino, Steven: *See—*
Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, 364,309, Cl. D7-350.000.
Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, 364,310, Cl. D7-350.000.
Crawford, Laren F. Sports trading card sorter. 364,429, Cl. D21-54.000.
Cudlip, John B. Racquetball racquet. 364,432, Cl. D21-212.000.
Cunningham, Peter R. Sensor. 364,380, Cl. D13-162.000.
Cunningham, Peter R. Tab for a sensor. 364,381, Cl. D13-162.000.
Daniel, Benjamin S. Eye glass holder. 364,297, Cl. D6-513.000.
Davidovich, Alan A.: *See—*
Bryant, Gary C.; Davidovich, Alan A.; Howard, Thomas L.; Kupper, David G.; Scott, Sydney K.; Surridge, David G.; and Vannette, Mark W., 364,408, Cl. D15-25.000.
Davis, Teena E.: *See—*
Poxleitner, Harold C.; and Davis, Teena E., 364,267, Cl. D3-8.000.
DeCosta, Stephen. Fishing lure. 364,444, Cl. D22-129.000.
DeKeyser, Dawn: *See—*
Eijadi, David A.; Abraham, Loren; DeKeyser, Dawn; and Hansen, Thomas A., 364,469, Cl. D25-52.000.
Denis, Elizabeth A.: *See—*
Kramer, Louise P.; Denis, Elizabeth A.; and Ye, Brian H., 364,288, Cl. D6-465.000.
Deschenes, Charles L.; Jones, Terence J.; and Cooper, William J., to Avery Dennison Corporation. Fastener clip. 364,337, Cl. D8-382.000.
Diamond Light Industries: *See—*
Pettersen, Tor H., 364,476, Cl. D26-50.000.
Diecidue, Pamela; and Bonanno, Elizabeth. Ring toy. 364,431, Cl. D21-82.000.
Diresta, James D., to Rapid Mounting & Finishing Co. Plural-nibbed writing instrument. 364,422, Cl. D19-36.000.
Don Gilbert Industries, Inc.: *See—*
Gilbert, David, 364,479, Cl. D26-85.000.
Donghia Furniture: *See—*
Hutton, John, 364,293, Cl. D6-486.000.
Drake, Albert N., to National Awards, Inc. Tassel crown. 364,301, Cl. D6-581.000.
Drivetime Marketing Corp.: *See—*
Shnoltman, Rony, 364,372, Cl. D12-177.000.
Drugge, Brian R., to Verifone Inc. Portable transaction terminal. 364,391, Cl. D14-100.000.
Dumas, Jean-Louis, to La Montre Hermes. Watch face. 364,352, Cl. D10-126.000.
Duraco Products, Inc.: *See—*
Bransky, Jeffrey D.; and Sanderson, Kenneth L., 364,358, Cl. D11-152.000.
Dutch Cocoa & Chocolate Company B.V.: *See—*
Prins, Ted, 364,345, Cl. D9-430.000.
Dye, John F., to Kendall Company, The. Connector for applying compressive pressure to the leg. 364,459, Cl. D24-129.000.
Dye, John F., to Kendall Company, The. Connector for applying compressive pressure to the leg. 364,460, Cl. D24-129.000.
Eason, Donald H., to Ultimate Support Systems, Inc. Bench. 364,281, Cl. D6-349.000.
Edgerley, David A.; and Leung, Ming K., to Gillette Company, The. Pen. 364,423, Cl. D19-51.000.
Eijadi, David A.; Abraham, Loren; DeKeyser, Dawn; and Hansen, Thomas A., to Andersen Corporation. Skylight. 364,469, Cl. D25-52.000.
Eldridge, Idolina. Hangable organizer for bows, earrings, hair clips and similar accessories. 364,296, Cl. D6-513.000.
Ellenberger, James P. Welding outlet. 364,449, Cl. D23-262.000.
Elliott, Larry F. ATV rod carrier. 364,374, Cl. D12-423.000.
Elston, Andrew, to Wahl Clipper Corporation. Hair clipper. 364,483, Cl. D28-53.000.
Emerson Electric Co.: *See—*
Hilliard, James E.; Lane, William A.; Bartlett, John W.; LaBallister, John W.; and Jedlicka, Frederick B., 364,412, Cl. D15-133.000.
Entwistle, Richard, to Le Creuset S.A. Table model corkscrew with cutting wheels. 364,324, Cl. D8-42.000.
Euroitalia S.r.l.: *See—*
Sgariboldi, Giovanni, 364,348, Cl. D9-544.000.
Everts & Van Der Weijden Exploitatie Maatschappij Ewem B.V.: *See—*
Calusinski, Richard R., 364,336, Cl. D8-371.000.
Farley, Frederick A. Shower filter housing. 364,446, Cl. D23-209.000.
Fenske, Lawrence: *See—*
Pitzen, James F.; Smith, Jeffrey D.; Alexson, Charles E.; and Fenske, Lawrence, 364,463, Cl. D24-146.000.
Fenske, Lawrence J.: *See—*
Kirchhoff, Kenneth J.; and Fenske, Lawrence J., 364,427, Cl. D19-[illegible].000.
Fillipp, Stephen L.; and Brown, Peter A., to Gary Products Group, Inc. Light support bracket. 364,333, Cl. D8-354.000.
Focus Electronic Co., Ltd.: *See—*
Chen, Wen-Cheng, 364,400, Cl. D14-115.000.
Förderer, Karl: *See—*
Lohse, Georg; Förderer, Karl; Höppner, Klaus; and Tinius, Michael P. G., 364,326, Cl. D8-65.000.
Fournier, Edmund A.: *See—*
Tutton, John; Arnold, Todd; Fournier, Edmund A.; and Smith, Terrance A., 364,487, Cl. D29-122.000.
Fricke, John: *See—*
Regenscheid, Duane M.; Manderfield, Grover J., Jr.; Gross, Luther A.; and Fricke, John, 364,341, Cl. D9-337.000.
Frindt, Robert: *See—*
Brightbill, Keith E.; Branham, Rick; Conaway, Brian J.; Copen, Frank; Corney, Richard E.; Frindt, Robert; Kobilarcik, Albert T.; and Wolff, Stacy L., 364,294, Cl. D6-492.000.
Fuji Electric Co., Ltd.: *See—*
Shimizu, Tomio; Nakahira, Akira; Kobayashi, Shinichi; and Yamada, Katsumi, 364,384, Cl. D13-182.000.
Shimizu, Tomio; Nakahira, Akira; Maruyama, Rikihiro; Yamada, Toshifusa; and Nagasawa, Takao, 364,385, Cl. D13-182.000.
Yamada, Toshifusa; Hikita, Hiroshi; Nagasawa, Takao; and Shimizu, Tomio, 364,383, Cl. D13-182.000.
Fuji Impulse Co., Ltd.: *See—*
Yashimoto, Yasuo, 364,414, Cl. D15-145.000.
G&D Communications Corporation: *See—*
Virzi, Al, 364,330, Cl. D8-341.000.
Gallagher, Christopher G.: *See—*
Weisburn, James T.; and Gallagher, Christopher G., 364,304, Cl. D6-632.000.
Garden Way Incorporated: *See—*
Bold, Alfred J.; Connolly, Kevin J.; Kodesch, Steven E.; Lobdell, Irving; Roberts, Bruce E.; and Satalino, Carmen M., 364,407, Cl. D15-10.000.
Gary Products Group, Inc.: *See—*
Fillipp, Stephen L.; and Brown, Peter A., 364,333, Cl. D8-354.000.
Gaskell, Alfred J.: *See—*
Pasquarette, Ralph; and Gaskell, Alfred J., 364,350, Cl. D10-50.000.
Gavin, Ellen, to L'Oreal SA. Blush compact. 364,485, Cl. D28-78.000.
George, Cheng F. W., to Tomor Electronics Ltd. Travel clock. 364,355, Cl. D10-18.000.
Gerber, André, to USM U. Schärer Söhne AG. Curved display shelf with transparent shelves and doors. 364,289, Cl. D6-470.000.
Gerber Products Company: *See—*
Humphrey, David C.; and Coletta, Frances A., 364,314, Cl. D7-510.000.
Humphrey, David C.; and Coletta, Frances A., 364,315, Cl. D7-510.000.
Humphrey, David C.; and Coletta, Frances A., 364,316, Cl. D7-510.000.
Humphrey, David C.; and Coletta, Frances A., 364,317, Cl. D7-511.000.
Gigante, Olympia: *See—*
Gigante, Salvatore; and Gigante, Olympia, 364,464, Cl. D24-183.000.
Gigante, Salvatore; and Gigante, Olympia. Combined massage and treatment cushion. 364,464, Cl. D24-183.000.
Gilbert, David, to Don Gilbert Industries, Inc. Wall sconce light fixture. 364,479, Cl. D26-85.000.
Gillette Company, The: *See—*
Edgerley, David A.; and Leung, Ming K., 364,423, Cl. D19-51.000.
Shurtleff, Jill M., 364,339, Cl. D9-300.000.
Goldfarb, Barry S.; and Skees, Theron, to BSG Laboratories, Inc. Audio speaker. 364,405, Cl. D14-207.000.
Goldfarb, Barry S.; and Skees, Theron, to BSG Laboratories, Inc. Audio speaker. 364,406, Cl. D14-215.000.
Goldstar Co., Ltd.: *See—*
Kim, Byung-Soo, 364,311, Cl. D7-351.000.
Goldstein, Robert: *See—*
Solnit, Albert; and Goldstein, Robert, 364,456, Cl. D24-112.000.
Gomez, Madeleine: *See—*
Magidson, Shirley; and Gomez, Madeleine, 364,262, Cl. D2-711.000.
Good, Glendon R. Shelving unit. 364,292, Cl. D6-479.000.
Goodyear Tire & Rubber Company, The: *See—*
Graas, Maurice, 364,369, Cl. D12-146.000.
Harden, Richard, Jr.; and Schuster, Daniel E., 364,366, Cl. D12-146.000.
Klepper, Alain Alphonse Z. S.; and Maitre, Bruno P., 364,367, Cl. D12-146.000.
Van Der Meer, Alex; and Lardo, Claude, 364,368, Cl. D12-146.000.

Weimer, Andrew F.; Brayer, Randall R.; and Robinson, Beale A., 364,370, Cl. D12-147.000.
Goss, Lorane C., Jr., to Mikron Industries, Inc. Window component extrusion. 364,470, Cl. D25-124.000.
Goss, Lorane C., Jr., to Mikron Industries, Inc. Window component extrusion. 364,471, Cl. D25-124.000.
Goss, Lorane C., Jr., to Mikron Industries, Inc. Window component extrusion. 364,472, Cl. D25-124.000.
Goss, Lorane C., Jr., to Mikron Industries, Inc. Window component extrusion. 364,473, Cl. D25-124.000.
Goss, Lorane C., Jr., to Mikron Industries, Inc. Window component extrusion. 364,474, Cl. D25-125.000.
Goudo, Mari: *See*—
Chiba, Taneaki; Goudo, Mari; Sakai, Akira; and Matsushita, Kenichirou, 364,387, Cl. D14-106.000.
Graas, Maurice, to Goodyear Tire & Rubber Company, The. Tire tread. 364,369, Cl. D12-146.000.
Graham, William. Utility pocketknife. 364,327, Cl. D8-105.000.
Gross, Luther A.: *See*—
Regenscheid, Duane M.; Manderfield, Grover J., Jr.; Gross, Luther A.; and Fricke, John, 364,341, Cl. D9-337.000.
Guyton, Donald R. Hanging picture frame. 364,278, Cl. D6-300.000.
Hagglunds Vehicle AB: *See*—
Andersson, Björn, 364,282, Cl. D6-356.000.
Hagiwara, Hideaki; and Shiotani, Takashi, to Sharp Kabushiki Kaisha. Toner cartridge. 364,418, Cl. D18-43.000.
Haley, Vincent L.: *See*—
Bird, David A.; and Haley, Vincent L., 364,276, Cl. D4-138.000.
Halliburton, Mary: *See*—
Stewart, Susan; and Halliburton, Mary, 364,484, Cl. D28-57.000.
Hansen, Thomas A.: *See*—
Eijadi, David A.; Abraham, Loren; DeKeyser, Dawn; and Hansen, Thomas A., 364,469, Cl. D25-52.000.
Harden, Richard, Jr.; and Schuster, Daniel E., to Goodyear Tire & Rubber Company, The. Tire tread. 364,366, Cl. D12-146.000.
Harris, Blaine, to Chequemate International, Inc. Combined checkbook and information register. 364,421, Cl. D19-26.000.
Heger, Rudi. Fly line loop with line weight indicator. 364,445, Cl. D22-134.000.
Heineken Technical Services: *See*—
Sillince, Mark E.; and Rosens, Erwin A., 364,347, Cl. D9-500.000.
Highland Supply Corporation: *See*—
Weder, Donald E.; and Straeter, Joseph G., 363,899, Cl. D11-164.000.
Weder, Donald E.; Straeter, Joseph G.; Straeter, William F.; and Straeter, Lisa A., 364,340, Cl. D9-305.000.
Weder, Donald E.; and Straeter, Joseph G., 364,361, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,362, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,363, Cl. D11-164.000.
Hikita, Hiroshi: *See*—
Yamada, Toshifusa; Hikita, Hiroshi; Nagasawa, Takao; and Shimizu, Tomio, 364,383, Cl. D13-182.000.
Hilliard, James E.; Lane, William A.; Bartlett, John W.; LaBallister, John W.; and Jedlicka, Frederick B., to Emerson Electric Co. Table saw. 364,412, Cl. D15-133.000.
Hiniker Company: *See*—
Peterson, Richard L.; Johnson, James A.; and Tomlonovic, Vincent J., 364,409, Cl. D15-29.000.
Hirose Electric Co., Ltd.: *See*—
Nakamura, Masaru, 364,378, Cl. D13-147.000.
Hoffman, Marvin A., to Sassi Hosiery Corp. Planar hosiery hanger. 364,279, Cl. D6-319.000.
Honeywell Inc.: *See*—
Pasquarette, Ralph; and Gaskell, Alfred J., 364,350, Cl. D10-50.000.
Höppner, Klaus: *See*—
Lohse, Georg; Förderer, Karl; Höppner, Klaus; and Tinius, Michael P. G., 364,326, Cl. D8-65.000.
Hormel Foods Corporation: *See*—
Regenscheid, Duane M.; Manderfield, Grover J., Jr.; Gross, Luther A.; and Fricke, John, 364,341, Cl. D9-337.000.
Howard, Thomas L.: *See*—
Bryant, Gary C.; Davidovich, Alan A.; Howard, Thomas L.; Kupper, David G.; Scott, Sydney K.; Surridge, David G.; and Vannette, Mark W., 364,408, Cl. D15-25.000.
Hsieh, Hsin F. Sealing machine for packaging. 364,415, Cl. D15-146.000.
Hsu, Shih-Ming. Hair styler. 364,482, Cl. D28-10.000.
Humphrey, David C.; and Coletta, Frances A., to Gerber Products Company. Drinking cup for children. 364,314, Cl. D7-510.000.
Humphrey, David C.; and Coletta, Frances A., to Gerber Products Company. Drinking cup for children. 364,315, Cl. D7-510.000.
Humphrey, David C.; and Coletta, Frances A., to Gerber Products Company. Drinking cup for children. 364,316, Cl. D7-510.000.
Humphrey, David C.; and Coletta, Frances A., to Gerber Products Company. Drinking cup for children. 364,317, Cl. D7-511.000.
Hutton, John, to Donghia Furniture. Table. 364,293, Cl. D6-486.000.
I.P.A.E. Societa Per Azioni: *See*—
Prosperio, Camillo, 364,284, Cl. D6-374.000.
Inatomi, Charles T.: *See*—
Bramlett, Larry; Inatomi, Charles T.; Propp, Robert R.; and Tan, Warren, 364,386, Cl. D14-105.000.
Industrial Technology Research Institute: *See*—
Lin, Chin-I; and Chu, Gou-Don, 364,365, Cl. D12-111.000.
Ishida, Ryohei; Ueno, Eiji; and Terashima, Hitoshi, to NIPCO Inc. Concrete test piece forming mold. 364,413, Cl. D15-136.000.
Jedlicka, Frederick B.: *See*—
Hilliard, James E.; Lane, William A.; Bartlett, John W.; LaBallister, John W.; and Jedlicka, Frederick B., 364,412, Cl. D15-133.000.
Jeter, Richard J. Shank and blade portion of a staple remover. 364,325, Cl. D8-48.000.
Johnson, Donald C. Self-watering plant container. 364,359, Cl. D11-152.000.
Johnson, Greg; and Weinzierl, David A., to Multi-Tech Systems, Inc. Peripheral connector. 364,377, Cl. D13-146.000.
Johnson, Gregory H.: *See*—
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Cieslo, Mark J.; and Staufenberg, Donald J., 364,401, Cl. D14-121.000.
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Cieslo, Mark J.; and Staufenberg, Donald J., 364,402, Cl. D14-121.000.
Johnson, James A.: *See*—
Peterson, Richard L.; Johnson, James A.; and Tomlonovic, Vincent J., 364,409, Cl. D15-29.000.
Johnson, Reed B., to Usability Systems, Inc. Portable laboratory analyzer. 364,467, Cl. D24-231.000.
Jones, Lori D.: *See*—
Jones, Timothy B.; Jones, Robert D.; and Jones, Lori D., 364,458, Cl. D24-128.000.
Jones, Robert D.: *See*—
Jones, Timothy B.; Jones, Robert D.; and Jones, Lori D., 364,458, Cl. D24-128.000.
Jones, Terence J.: *See*—
Deschenes, Charles L.; Jones, Terence J.; and Cooper, William J., 364,337, Cl. D8-382.000.
Jones, Timothy B.; Jones, Robert D.; and Jones, Lori D. Specimen cup holder. 364,458, Cl. D24-128.000.
Jurasinski, Jeff. Table. 364,287, Cl. D6-451.000.
Kabushiki Kaisha Toshiba: *See*—
Yamamoto, Kazuharu, 364,382, Cl. D13-163.000.
Kawashima, Shosaku, to Canon Kabushiki Kaisha. Printer for electronic computer. 364,420, Cl. D18-54.000.
Kearnes, Thomas, to Tranzonic Companies, The. Wall mounted deodorant dispenser. 364,450, Cl. D23-366.000.
Kellerman, Theodore J. Harness for a radio cassette player. 364,270, Cl. D3-218.000.
Kendall Company, The: *See*—
Dye, John F., 364,459, Cl. D24-129.000.
Dye, John F., 364,460, Cl. D24-129.000.
Keysun Industrial Company Limited: *See*—
Lui, Chee P.; and Tang, Ling K., 364,321, Cl. D7-673.000.
Kim, Byung-Soo, to Goldstar Co., Ltd. Microwave oven. 364,311, Cl. D7-351.000.
Kino, Moriya, to Royal Co., Ltd. Toy maracas. 364,430, Cl. D21-65.000.
Kirchhoff, Kenneth J.; and Fenske, Lawrence J., to Minnesota Mining and Manufacturing Company. Adjustable paper holder. 364,427, Cl. D19-44.000.
Klepper, Alain Alphonse Z. S.; and Maitre, Bruno P., to Goodyear Tire & Rubber Company, The. Tire tread. 364,367, Cl. D12-146.000.
Kline, Kimberly. Combined pants and suspenders. 364,263, Cl. D2-746.000.
Kobayashi, Shinichi: *See*—
Shimizu, Tomio; Nakahira, Akira; Kobayashi, Shinichi; and Yamada, Katsumi, 364,384, Cl. D13-182.000.
Kobilarcik, Albert T.: *See*—
Brightbill, Keith E.; Branham, Rick; Conaway, Brian J.; Copen, Frank; Corney, Richard E.; Prindt, Robert; Kobilarcik, Albert T.; and Wolff, Stacy L., 364,294, Cl. D6-492.000.
Kodesch, Steven E.: *See*—
Bold, Alfred J.; Connolly, Kevin J.; Kodesch, Steven E.; Lobdell, Irving; Roberts, Bruce E.; and Satalino, Carmen M., 364,407, Cl. D15-10.000.
Kramer, Louise P.; Denis, Elizabeth A.; and Ye, Brian H., to L & L Products, Inc. Combined bakers rack and organizer. 364,288, Cl. D6-465.000.
Krause, Ward Barry: *See*—
Krause, W. Barry, 364,455, Cl. D24-106.000.
Krause, W. Barry, to Krause, Ward Barry. Ear plug. 364,455, Cl. D24-106.000.
Kunzendorf, Andre: *See*—
Assmann, Jürgen; Walta, Dietmar; and Kunzendorf, Andre, 364,466, Cl. D24-213.000.
Kupper, David G.: *See*—
Bryant, Gary C.; Davidovich, Alan A.; Howard, Thomas L.; Kupper, David G.; Scott, Sydney K.; Surridge, David G.; and Vannette, Mark W., 364,408, Cl. D15-25.000.
L & L Products, Inc.: *See*—
Kramer, Louise P.; Denis, Elizabeth A.; and Ye, Brian H., 364,288, Cl. D6-465.000.
La Montre Hermes: *See*—
Dumas, Jean-Louis, 364,352, Cl. D10-126.000.
LaBallister, John W.: *See*—
Hilliard, James E.; Lane, William A.; Bartlett, John W.; LaBallister, John W.; and Jedlicka, Frederick B., 364,412, Cl. D15-133.000.
Lai, Shih-Wang. Pasta making machine. 364,312, Cl. D7-376.000.
Lam, Lawrence, to Apple Computer, Inc. Adapter sleeve for a PCMCIA device. 364,398, Cl. D14-114.000.
Lambert, Alan R. Combined applicator and dispenser for oil and lotion. 364,481, Cl. D28-7.000.

Lane, William A.: *See*—
Hilliard, James E.; Lane, William A.; Bartlett, John W.; LaBallister, John W.; and Jedlicka, Frederick B., 364,412, Cl. D15-133.000.
Lardo, Claude: *See*—
Van Der Meer, Alex; and Lardo, Claude, 364,368, Cl. D12-146.000.
Larsen, Christopher, to Watkins Manufacturing Corporation. Support pillow for use with bathing tubs including spas, pools, and whirlpools. 364,303, Cl. D6-601.000.
Lax, Jacob. Soap dispenser. 364,299, Cl. D6-545.000.
Le Creuset S.A.: *See*—
Entwistle, Richard, 364,324, Cl. D8-42.000.
Ledgerwood, Thomas D., II. Novelty hand. 364,357, Cl. D10-33.000.
Leek, William F., to Simpson Strong-Tie Company, Inc. Structural connector. 364,331, Cl. D8-354.000.
Leung, Ming K.: *See*—
Edgerley, David A.; and Leung, Ming K., 364,423, Cl. D19-51.000.
Lewis, Sally S. Sofa. 364,285, Cl. D6-381.000.
Lewkowicz, Martin, to Ranir/DCP Corporation. Brush. 364,275, Cl. D4-119.000.
Liebert, Richard T.; and Brown, Neil H., to Sterling Winthrop, Inc. Aspirating plunger for power injector cartridges. 364,461, Cl. D24-130.000.
Light On Pty Ltd: *See*—
Starec, Rado; Schiavello, Antonino; and Cowhey, James G., 364,396, Cl. D14-114.000.
Lin, Chin-I; and Chu, Gou-Don, to Industrial Technology Research Institute. Bicycle frame. 364,365, Cl. D12-111.000.
Lin, Mei-Mo. Starter for a lamp. 364,376, Cl. D13-117.000.
Loadholtz, Everett E. Ground inserted umbrella support. 364,286, Cl. D6-417.000.
Lobdell, Irving: *See*—
Bold, Alfred J.; Connolly, Kevin J.; Kodesch, Steven E.; Lobdell, Irving; Roberts, Bruce E.; and Satalino, Carmen M., 364,407, Cl. D15-10.000.
Lohse, Georg; Förderer, Karl; Höppner, Klaus; and Tinius, Michael P. G., to Andreas Stihl. Chain saw. 364,326, Cl. D8-65.000.
Long, Jacky, to Quanta Computer Inc. Modem connector. 364,399, Cl. D14-114.000.
L'Oreal SA: *See*—
Gavin, Ellen, 364,485, Cl. D28-78.000.
Lui, Chee P.; and Tang, Ling K., to Keysun Industrial Company Limited. Food cutter. 364,321, Cl. D7-673.000.
M. R. Carretta Co., Inc.: *See*—
Balestrieri, Harry, 364,440, Cl. D21-234.000.
Mage, Allen B. Educational display unit. 364,425, Cl. D19-59.000.
Magidson, Shirley; and Gomez, Madeleine, to Metric Products, Inc. Protective cup. 364,262, Cl. D2-711.000.
Maitre, Bruno P.: *See*—
Klepper, Alain Alphonse Z. S.; and Maitre, Bruno P., 364,367, Cl. D12-146.000.
Manderfield, Grover J., Jr.: *See*—
Regenscheid, Duane M.; Manderfield, Grover J., Jr.; Gross, Luther A.; and Fricke, John, 364,341, Cl. D9-337.000.
Maple, Wade A. F., to Rubbermaid Specialty Products Inc. Utility shed. 364,468, Cl. D25-16.000.
Marpac Corporation: *See*—
Theisen, David A., 364,404, Cl. D14-160.000.
Martel, Phillip C., to Martel, Phillip C. Gas tube for semi-automatic firearm. 364,442, Cl. D22-108.000.
Maruyama, Rikihiro: *See*—
Shimizu, Tomio; Nakahira, Akira; Maruyama, Rikihiro; Yamada, Toshifusa; and Nagasawa, Takao, 364,385, Cl. D13-182.000.
Matsushita, Kenichirou: *See*—
Chiba, Taneaki; Goudo, Mari; Sakai, Akira; and Matsushita, Kenichirou, 364,387, Cl. D14-106.000.
Maynard, Nancy E. Garment hanger. 364,280, Cl. D6-326.000.
McGraw, Ronnie F.; and Rahrig, Donald S., to Ben Hogan Company. Golf club head. 364,434, Cl. D21-220.000.
McKnight, William J.: *See*—
Pogue, Lonnie C.; and McKnight, William J., 364,379, Cl. D13-160.000.
Mello, Frank C., to Sara Lee Corporation. Food package. 364,343, Cl. D9-415.000.
Mesna, Gregory C.: *See*—
Mesna, Larry D.; Mesna, Gregory C.; and Mesna, Wendy L., 364,335, Cl. D8-367.000.
Mesna, Larry D.; Mesna, Gregory C.; and Mesna, Wendy L. Fence hook. 364,335, Cl. D8-367.000.
Mesna, Wendy L.: *See*—
Mesna, Larry D.; Mesna, Gregory C.; and Mesna, Wendy L., 364,335, Cl. D8-367.000.
Metric Products, Inc.: *See*—
Magidson, Shirley; and Gomez, Madeleine, 364,262, Cl. D2-711.000.
Michelson, Gary K. Spinal fixation staple. 364,462, Cl. D24-145.000.
Miiller, Gregory C.: *See*—
Van Meter, John L.; Wolfe, Kevin J.; Miiller, Gregory C.; and Selby, Theodore W., 364,351, Cl. D10-80.000.
Mikron Industries, Inc.: *See*—
Goss, Lorane C., Jr., 364,470, Cl. D25-124.000.
Goss, Lorane C., Jr., 364,471, Cl. D25-124.000.
Goss, Lorane C., Jr., 364,472, Cl. D25-124.000.
Goss, Lorane C., Jr., 364,473, Cl. D25-124.000.
Goss, Lorane C., Jr., 364,474, Cl. D25-125.000.
Mildon, Merrill A. Ice fishing tent. 364,441, Cl. D21-253.000.
Miller, Kenneth E., Jr. Universal frame for supporting duffle bags. 364,273, Cl. D3-318.000.
Ming Hwang Ind. Co., Ltd.: *See*—
Tsai, Chin-Hwang, 364,486, Cl. D28-88.000.
Minnesota Mining and Manufacturing Company: *See*—
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Cieslo, Mark J.; and Staufenberg, Donald J., 364,401, Cl. D14-121.000.
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Cieslo, Mark J.; and Staufenberg, Donald J., 364,402, Cl. D14-121.000.
Bailey, John A., 364,403, Cl. D14-122.000.
Kirchhoff, Kenneth J.; and Fenske, Lawrence J., 364,427, Cl. D19-55.000.
Pitzen, James F.; Smith, Jeffrey D.; Alexson, Charles E.; and Fenske, Lawrence, 364,463, Cl. D24-146.000.
Miyahara, Kazuhiko, to Canon Kabushiki Kaisha. Image input device. 364,388, Cl. D14-107.000.
Miyasaka, Katsuyoshi: *See*—
Sakashita, Hiroshi; Yoshida, Norihide; and Miyasaka, Katsuyoshi, 364,375, Cl. D13-112.000.
Mongeon, Douglas R., to Coast Medical, Inc. Intubation end cap. 364,457, Cl. D24-127.000.
Moore, Shan-Ker, to Centre Clock Industry Co., Ltd. Wall mounted clock. 364,356, Cl. D10-29.000.
Morse, John B.; Neely, Paul F.; and Whiteside, George D., to Polaroid Corporation. Thermal laser printer. 364,419, Cl. D18-53.000.
Mr. Bar-B-Q-, Inc.: *See*—
Zemel, Marc, 364,313, Cl. D7-416.000.
Multi-Tech Systems, Inc.: *See*—
Johnson, Greg; and Weinzierl, David A., 364,377, Cl. D13-146.000.
Murray, Cecilia, to Reebok International Ltd. Shoe sole. 364,265, Cl. D2-951.000.
Nagasawa, Takao: *See*—
Shimizu, Tomio; Nakahira, Akira; Maruyama, Rikihiro; Yamada, Toshifusa; and Nagasawa, Takao, 364,385, Cl. D13-182.000.
Yamada, Toshifusa; Hikita, Hiroshi; Nagasawa, Takao; and Shimizu, Tomio, 364,383, Cl. D13-182.000.
Nakahira, Akira: *See*—
Shimizu, Tomio; Nakahira, Akira; Kobayashi, Shinichi; and Yamada, Katsumi, 364,384, Cl. D13-182.000.
Shimizu, Tomio; Nakahira, Akira; Maruyama, Rikihiro; Yamada, Toshifusa; and Nagasawa, Takao, 364,385, Cl. D13-182.000.
Nakamura, Masaru, to Hirose Electric Co., Ltd. Electrical connector. 364,378, Cl. D13-147.000.
Nasin, Jarrod A. Portable fire extinguisher. 364,488, Cl. D29-129.000.
National Awards, Inc.: *See*—
Drake, Albert N., 364,301, Cl. D6-581.000.
Natividad, Ronaldo S.: *See*—
Ray, Robert A.; and Natividad, Ronaldo S., 364,371, Cl. D12-169.000.
NEC Corporation: *See*—
Chiba, Taneaki; Goudo, Mari; Sakai, Akira; and Matsushita, Kenichirou, 364,387, Cl. D14-106.000.
Neely, Paul F.: *See*—
Morse, John B.; Neely, Paul F.; and Whiteside, George D., 364,419, Cl. D18-53.000.
Newell Operating Company: *See*—
Ainscough, Frances G. H., 364,328, Cl. D8-323.000.
NIFCO Inc.: *See*—
Ishida, Ryohei; Ueno, Eiji; and Terashima, Hitoshi, 364,413, Cl. D15-136.000.
Nike, Inc.: *See*—
Orzeck, Toren P. B., 364,266, Cl. D2-969.000.
Nuccio, Phillip P.: *See*—
Burbury, Robert L.; and Nuccio, Phillip P., 364,475, Cl. D25-138.000.
Nunes, Brendon G. Basketball novelty clock. 364,354, Cl. D10-6.000.
Ohanesian, Harout, to U.S. Polymers, Inc. Valence for vertical blinds. 364,300, Cl. D6-579.000.
Optima Imaging, Inc.: *See*—
Burbury, Robert L.; and Nuccio, Phillip P., 364,475, Cl. D25-138.000.
Orzeck, Toren P. B., to Nike, Inc. Shoe upper. 364,266, Cl. D2-969.000.
Oxboro Medical International, Inc.: *See*—
Rasmusson, Larry A., 364,443, Cl. D22-126.000.
Paccar Inc.: *See*—
Ray, Robert A.; and Natividad, Ronaldo S., 364,371, Cl. D12-169.000.
Pasquarette, Ralph; and Gaskell, Alfred J., to Honeywell Inc. Thermostat housing. 364,350, Cl. D10-50.000.
Paul Zaidman Designs Limited: *See*—
Zaidman, Paul, 364,283, Cl. D6-365.000.
Pentel Kabushiki Kaisha: *See*—
Shimizu, Kazuhisa, 364,424, Cl. D19-51.000.
Pesau, Karin, to Zumtobel Licht GmbH. Fluorescent lighting fixture. 364,478, Cl. D26-76.000.
Peterson, Richard L.; Johnson, James A.; and Tomlonovic, Vincent J., to Hiniker Company. Earthworking tool point. 364,409, Cl. D15-29.000.
Pettersen, Tor H., to Diamond Light Industries. Low profile flashlight/spotlight. 364,476, Cl. D26-50.000.
Phifer, Malcolm R. Dispensing cabinet. 364,298, Cl. D6-515.000.
Pitzen, James F.; Smith, Jeffrey D.; Alexson, Charles E.; and Fenske, Lawrence, to Minnesota Mining and Manufacturing Company. Orthopedic surgical instrument. 364,463, Cl. D24-146.000.
Plop Golf Company: *See*—

Wood, Donald C., 364,435, Cl. D21-220.000.
Pogue, Lonnie C.; and McKnight, William J., to Proxima Corporation. Surge protector. 364,379, Cl. D13-160.000.
Polaroid Corporation: *See*—
Morse, John B.; Neely, Paul F.; and Whiteside, George D., 364,419, Cl. D18-53.000.
Poxleitner, Harold C.; and Davis, Teena E. Forearm crutch pads. 364,267, Cl. D3-8.000.
Pratt, Michael K., to Seneca Sports, Inc. Toe stop for in-line skate. 364,437, Cl. D21-226.000.
Prins, Ted, to Dutch Cocoa & Chocolate Company B.V. Box. 364,345, Cl. D9-430.000.
Propp, Robert R.: *See*—
Bramlett, Larry; Inatomi, Charles T.; Propp, Robert R.; and Tan, Warren, 364,386, Cl. D14-105.000.
Prosperio, Camillo, to I.P.A.E. Societa Per Azioni. Chair. 364,284, Cl. D6-374.000.
Proxima Corporation: *See*—
Pogue, Lonnie C.; and McKnight, William J., 364,379, Cl. D13-160.000.
Quanta Computer Inc.: *See*—
Long, Jacky, 364,399, Cl. D14-114.000.
R. P. Scherer Corporation: *See*—
Schurig, Gregory A.; and Williams, David G., 364,453, Cl. D24-104.000.
Schurig, Gregory A., 364,454, Cl. D24-104.000.
Ragusin, Dianna. Golfer's tool. 364,439, Cl. D21-234.000.
Rahrig, Donald S.: *See*—
McGraw, Ronnie F.; and Rahrig, Donald S., 364,434, Cl. D21-220.000.
Ranir/DCP Corporation: *See*—
Lewkowicz, Martin, 364,275, Cl. D4-119.000.
Rapid Mounting & Finishing Co.: *See*—
Diresta, James D., 364,422, Cl. D19-36.000.
Rasmussen, Jan N., to Carlsberg A/S. Device for dispensing beverages. 364,305, Cl. D7-300.000.
Rasmusson, Larry A., to Oxboro Medical International, Inc. Fishing rattler. 364,443, Cl. D22-126.000.
Ray, Robert A.; and Natividad, Ronaldo S., to Paccar Inc. Truck bumper. 364,371, Cl. D12-169.000.
Real-Tool, Inc.: *See*—
Cline, Roger M., 364,338, Cl. D8-499.000.
Reebok International Ltd.: *See*—
Murray, Cecilia, 364,265, Cl. D2-951.000.
Regenscheid, Duane M.; Manderfield, Grover J., Jr.; Gross, Luther A.; and Fricke, John, to Hormel Foods Corporation. Combined bottle and bowl package. 364,341, Cl. D9-337.000.
Roberts, Bruce E.: *See*—
Bold, Alfred J.; Connolly, Kevin J.; Kodesch, Steven E.; Lobdell, Irving; Roberts, Bruce E.; and Satalino, Carmen M., 364,407, Cl. D15-10.000.
Robertson, Breon J.: *See*—
Brown, Dennis B.; and Robertson, Breon J., 364,268, Cl. D3-202.000.
Robinson, Beale A.: *See*—
Weimer, Andrew F.; Brayer, Randall R.; and Robinson, Beale A., 364,370, Cl. D12-147.000.
Rosens, Erwin A.: *See*—
Sillince, Mark E.; and Rosens, Erwin A., 364,347, Cl. D9-500.000.
Rosenschein, Warner, to Cedalux, Inc. Air freshner. 364,451, Cl. D23-308.000.
Royal Co., Ltd.: *See*—
Kino, Moriya, 364,430, Cl. D21-65.000.
Rubbermaid Incorporated: *See*—
Bird, David A.; and Haley, Vincent L., 364,276, Cl. D4-138.000.
Brightbill, Keith, 364,272, Cl. D3-312.000.
Brightbill, Keith E.; Branham, Rick; Conaway, Brian J.; Copen, Frank; Corney, Richard E.; Frindt, Robert; Kobilarcik, Albert T.; and Wolff, Stacy L., 364,294, Cl. D6-492.000.
Calmeise, Randall W., 364,271, Cl. D3-282.000.
Rubbermaid Office Products Inc.: *See*—
Bucaccio, Tom, 364,426, Cl. D19-75.000.
Rubbermaid Specialty Products Inc.: *See*—
Maple, Wade A. F., 364,468, Cl. D25-16.000.
Ruff, Edward, to Santa's Best. Bow package. 364,342, Cl. D9-415.000.
Ryder, Charles S. Sandbag lamp. 364,477, Cl. D26-60.000.
Sabosky, Mark. Key ring holder with clip. 364,269, Cl. D3-207.000.
Sachs, Isaac. Electrical ground bracket. 364,332, Cl. D8-354.000.
Saeki, Taisuke; Sakamoto, Harumi; and Usui, Kiyomi, to Sharp Kabushiki Kaisha. Video projector. 364,416, Cl. D16-231.000.
Safe Cycle Limited a British Virgin Island Corp.: *See*—
Tutton, John; Arnold, Todd; Fournier, Edmund A.; and Smith, Terrance A., 364,487, Cl. D29-122.000.
Sakai, Akira: *See*—
Chiba, Taneaki; Goudo, Mari; Sakai, Akira; and Matsushita, Kenichirou, 364,387, Cl. D14-106.000.
Sakamoto, Harumi: *See*—
Saeki, Taisuke; Sakamoto, Harumi; and Usui, Kiyomi, 364,416, Cl. D16-231.000.
Sakashita, Hiroshi; Yoshida, Norihide; and Miyasaka, Katsuyoshi, to Sankyo Seiki Mfg. Co., Ltd. Small electric motor. 364,375, Cl. D13-112.000.
Samsung Electronics Co. Ltd: *See*—
Backs, Jochen, 364,392, Cl. D14-113.000.
Backs, Jochen, 364,393, Cl. D14-113.000.
Backs, Jochen, 364,394, Cl. D14-113.000.
Sandberg, Robert I.: *See*—
Sandstrom, Lloyd I.; Sandstrom, Todd L.; and Sandberg, Robert I., 364,334, Cl. D8-354.000.
Sanderson, Kenneth L.: *See*—
Bransky, Jeffrey D.; and Sanderson, Kenneth L., 364,358, Cl. D11-152.000.
Sandstrom, Lloyd I.; Sandstrom, Todd L.; and Sandberg, Robert I. Ground sleeve for supporting a pole. 364,334, Cl. D8-354.000.
Sandstrom, Todd L.: *See*—
Sandstrom, Lloyd I.; Sandstrom, Todd L.; and Sandberg, Robert I., 364,334, Cl. D8-354.000.
Sankyo Seiki Mfg. Co., Ltd.: *See*—
Sakashita, Hiroshi; Yoshida, Norihide; and Miyasaka, Katsuyoshi, 364,375, Cl. D13-112.000.
Santa's Best: *See*—
Ruff, Edward, 364,342, Cl. D9-415.000.
Sara Lee Corporation: *See*—
Mello, Frank C., 364,343, Cl. D9-415.000.
Sasaki, Junichi: *See*—
Uratani, Shinichi; and Sasaki, Junichi, 364,395, Cl. D14-113.000.
Sassi Hosiery Corp.: *See*—
Hoffman, Marvin A., 364,279, Cl. D6-319.000.
Satalino, Carmen M.: *See*—
Bold, Alfred J.; Connolly, Kevin J.; Kodesch, Steven E.; Lobdell, Irving; Roberts, Bruce E.; and Satalino, Carmen M., 364,407, Cl. D15-10.000.
Schaeppi, Thomas J. Beverage mug. 364,319, Cl. D7-536.000.
Schiavello, Antonino: *See*—
Starec, Rado; Schiavello, Antonino; and Cowhey, James G., 364,396, Cl. D14-114.000.
Schriever, Frederick G., to Snap Fast Industries. Fastener applying press. 364,410, Cl. D15-123.000.
Schurig, Gregory A.; and Williams, David G., to R. P. Scherer Corporation. Softgel capsule. 364,453, Cl. D24-104.000.
Schurig, Gregory A., to R. P. Scherer Corporation. Softgel capsule. 364,454, Cl. D24-104.000.
Schuster, Daniel E.: *See*—
Harden, Richard, Jr.; and Schuster, Daniel E., 364,366, Cl. D12-146.000.
Scott, Sydney K.: *See*—
Bryant, Gary C.; Davidovich, Alan A.; Howard, Thomas L.; Kupper, David G.; Scott, Sydney K.; Surridge, David G.; and Vannette, Mark W., 364,408, Cl. D15-25.000.
Selby, Theodore W.: *See*—
Van Meter, John L.; Wolfe, Kevin J.; Miiller, Gregory C.; and Selby, Theodore W., 364,351, Cl. D10-80.000.
Seneca Sports, Inc.: *See*—
Pratt, Michael K., 364,437, Cl. D21-226.000.
Sgariboldi, Giovanni, to Euroitalia S.r.l. Combined perfume bottle and stopper. 364,348, Cl. D9-544.000.
Sharp Kabushiki Kaisha: *See*—
Hagiwara, Hideaki; and Shiotani, Takashi, 364,418, Cl. D18-43.000.
Saeki, Taisuke; Sakamoto, Harumi; and Usui, Kiyomi, 364,416, Cl. D16-231.000.
Uratani, Shinichi; and Sasaki, Junichi, 364,395, Cl. D14-113.000.
Shaw, Howard G. Split lid container. 364,344, Cl. D9-421.000.
Sheer, Ronald. Toy hockey helmet. 364,264, Cl. D2-869.000.
Shimizu, Hisakazu, to Canon Kabushiki Kaisha. Image editing device. 364,389, Cl. D14-100.000.
Shimizu, Kazuhisa, to Pentel Kabushiki Kaisha. Writing instrument. 364,424, Cl. D19-51.000.
Shimizu, Tomio; Nakahira, Akira; Kobayashi, Shinichi; and Yamada, Katsumi, to Fuji Electric Co., Ltd. Semi-conductor element with terminal casing. 364,384, Cl. D13-182.000.
Shimizu, Tomio; Nakahira, Akira; Maruyama, Rikihiro; Yamada, Toshifusa; and Nagasawa, Takao, to Fuji Electric Co., Ltd. Semi-conductor element with terminal casing. 364,385, Cl. D13-182.000.
Shimizu, Tomio: *See*—
Yamada, Toshifusa; Hikita, Hiroshi; Nagasawa, Takao; and Shimizu, Tomio, 364,383, Cl. D13-182.000.
Shiotani, Takashi: *See*—
Hagiwara, Hideaki; and Shiotani, Takashi, 364,418, Cl. D18-43.000.
Shreeve, Marjorie: *See*—
Shreeve, Paul J.; and Shreeve, Marjorie, 364,390, Cl. D14-100.000.
Shreeve, Paul J.; and Shreeve, Marjorie. Hand held translator. 364,390, Cl. D14-100.000.
Shroitman, Rony, to Drivetime Marketing Corp. Steering wheel cover. 364,372, Cl. D12-177.000.
Shurtleff, Jill M., to Gillette Company, The. Aerosol dispenser. 364,339, Cl. D9-300.000.
Sillince, Mark E.; and Rosens, Erwin A., to Whitbread plc; and Heineken Technical Services. Bottle. 364,347, Cl. D9-500.000.
Simpson Strong-Tie Company, Inc.: *See*—
Leek, William F., 364,331, Cl. D8-354.000.
Sipe, Edward E. Locking lunch box. 364,320, Cl. D7-629.000.
Skees, Theron: *See*—
Goldfarb, Barry S.; and Skees, Theron, 364,405, Cl. D14-207.000.
Goldfarb, Barry S.; and Skees, Theron, 364,406, Cl. D14-215.000.
Smith, Jeffrey D.: *See*—
Pitzen, James F.; Smith, Jeffrey D.; Alexson, Charles E.; and Fenske, Lawrence, 364,463, Cl. D24-146.000.

Smith, Leal. Insect figurine. 364,360, Cl. D11-158.000.
Smith, Terrance A.: *See*—
Tutton, John; Arnold, Todd; Fournier, Edmund A.; and Smith, Terrance A., 364,487, Cl. D29-122.000.
Snap Fast Industries: *See*—
Schriever, Frederick G., 364,410, Cl. D15-123.000.
Socket Butler Inc.: *See*—
Zupo, Alan L.; and Brown, Roger G., 364,323, Cl. D8-14.000.
Solnit, Albert; and Goldstein, Robert. Aspirator tip. 364,456, Cl. D24-112.000.
Sony Corporation: *See*—
Yamada, Masato, 364,346, Cl. D9-432.000.
Southco, Inc.: *See*—
Ziemer, Lynn B.; and Alyanakian, Robert D., 364,329, Cl. D8-331.000.
Staib, Edward F. Clock stand. 364,353, Cl. D10-128.000.
Starec, Rado; Schiavello, Antonino; and Cowhey, James G., to Light On Pty Ltd. Data module for modular wiring system. 364,396, Cl. D14-114.000.
Staufenberg, Donald J.: *See*—
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., 364,401, Cl. D14-121.000.
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., 364,402, Cl. D14-121.000.
Sterling Winthrop, Inc.: *See*—
Liebert, Richard T.; and Brown, Neil H., 364,461, Cl. D24-130.000.
Stewart, Susan; and Halliburton, Mary. Tool for removing nail polish. 364,484, Cl. D28-57.000.
Stojanović, Branislav. Device for accumulation, amplification and local direction of positive cosmic energy. 364,465, Cl. D24-209.000.
Storsberg, Günter. Electric espresso machine. 364,306, Cl. D7-309.000.
Straeter, Joseph G.: *See*—
Weder, Donald E.; and Straeter, Joseph G., 363,899, Cl. D11-164.000.
Weder, Donald E.; Straeter, Joseph G.; Straeter, William F.; and Straeter, Lisa A., 364,340, Cl. D9-305.000.
Weder, Donald E.; and Straeter, Joseph G., 364,361, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,362, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,363, Cl. D11-164.000.
Straeter, Lisa A.: *See*—
Weder, Donald E.; Straeter, Joseph G.; Straeter, William F.; and Straeter, Lisa A., 364,340, Cl. D9-305.000.
Straeter, William F.: *See*—
Weder, Donald E.; Straeter, Joseph G.; Straeter, William F.; and Straeter, Lisa A., 364,340, Cl. D9-305.000.
Surridge, David G.: *See*—
Bryant, Gary C.; Davidovich, Alan A.; Howard, Thomas L.; Kupper, David G.; Scott, Sydney K.; Surridge, David G.; and Vannette, Mark W., 364,408, Cl. D15-25.000.
Takigen Manufacturing Co. Ltd.: *See*—
Takimoto, Kazuhide, 364,364, Cl. D11-216.000.
Takimoto, Kazuhide, to Takigen Manufacturing Co. Ltd. Buckle for cargo straps. 364,364, Cl. D11-216.000.
Tan, Warren: *See*—
Bramlett, Larry; Inatomi, Charles T.; Propp, Robert R.; and Tan, Warren, 364,386, Cl. D14-105.000.
Tang, Ling K.: *See*—
Lui, Chee P.; and Tang, Ling K., 364,321, Cl. D7-673.000.
Tannas Co.: *See*—
Van Meter, John L.; Wolfe, Kevin J.; Müller, Gregory C.; and Selby, Theodore W., 364,351, Cl. D10-80.000.
Terashima, Hitoshi: *See*—
Ishida, Ryohei; Ueno, Eiji; and Terashima, Hitoshi, 364,413, Cl. D15-136.000.
Theisen, David A., to Marpac Corporation. Sound conditioner. 364,404, Cl. D14-160.000.
Thomas, Robert K. Adjustable length shaft for a golf putter. 364,436, Cl. D21-221.000.
Tie Teacher, Inc.: *See*—
Cianciotto, Daniel, 364,261, Cl. D2-609.000.
Tinius, Michael P. G.: *See*—
Lohse, Georg; Förderer, Karl; Höppner, Klaus; and Tinius, Michael P. G., 364,326, Cl. D8-65.000.
Tomlonovic, Vincent J.: *See*—
Peterson, Richard L.; Johnson, James A.; and Tomlonovic, Vincent J., 364,409, Cl. D15-29.000.
Tomor Electronics Ltd.: *See*—
George, Cheng F. W., 364,355, Cl. D10-18.000.
Transaction Technology, Inc.: *See*—
Bramlett, Larry; Inatomi, Charles T.; Propp, Robert R.; and Tan, Warren, 364,386, Cl. D14-105.000.
Tranzonic Companies, The: *See*—
Kearnes, Thomas, 364,450, Cl. D23-366.000.
Tsai, Chin-Hwang, to Ming Hwang Ind. Co., Ltd. Lipstick case. 364,486, Cl. D28-88.000.
Tutton, John; Arnold, Todd; Fournier, Edmund A.; and Smith, Terrance A., to Safe Cycle Limited a British Virgin Island Corp. Liner for safety helmet. 364,487, Cl. D29-122.000.
Ueno, Eiji: *See*—
Ishida, Ryohei; Ueno, Eiji; and Terashima, Hitoshi, 364,413, Cl. D15-136.000.
Ultimate Support Systems, Inc.: *See*—
Eason, Donald H., 364,281, Cl. D6-349.000.
U.S. Polymers, Inc.: *See*—
Ohanesian, Harout, 364,300, Cl. D6-579.000.
Uratani, Shinichi; and Sasaki, Junichi, to Sharp Kabushiki Kaisha. Display face of a liquid crystal display module. 364,395, Cl. D14-113.000.
Usability Systems, Inc.: *See*—
Johnson, Reed B., 364,467, Cl. D24-231.000.
USM U. Schärer Söhne AG.: *See*—
Gerber, André, 364,289, Cl. D6-470.000.
Usui, Kiyomi: *See*—
Saeki, Taisuke; Sakamoto, Harumi; and Usui, Kiyomi, 364,416, Cl. D16-231.000.
Van Der Meer, Alex; and Lardo, Claude, to Goodyear Tire & Rubber Company, The. Tire tread. 364,368, Cl. D12-146.000.
Van Meter, John L.; Wolfe, Kevin J.; Müller, Gregory C.; and Selby, Theodore W., to Tannas Co. Collar housing for a rotor-stator adaptor for sensitive rotating viscometers. 364,351, Cl. D10-80.000.
Vannette, Mark W.: *See*—
Bryant, Gary C.; Davidovich, Alan A.; Howard, Thomas L.; Kupper, David G.; Scott, Sydney K.; Surridge, David G.; and Vannette, Mark W., 364,408, Cl. D15-25.000.
Vasquez, Julian. Combined toothbrush, toothpaste dispenser and cover. 364,274, Cl. D4-108.000.
Verifone Inc.: *See*—
Drugge, Brian R., 364,391, Cl. D14-100.000.
Virzi, Al, to G&D Communications Corporation. Sliding panels security device. 364,330, Cl. D8-341.000.
Wahl Clipper Corporation: *See*—
Elston, Andrew, 364,483, Cl. D28-53.000.
Walta, Dietmar: *See*—
Assmann, Jürgen; Walta, Dietmar; and Kunzendorf, Andre, 364,466, Cl. D24-213.000.
Wang, King-Yuan, to Yuan Mei Corp. Sprayer handle. 364,447, Cl. D23-223.000.
Wang, Shun-Yi. Toy punch. 364,411, Cl. D15-128.000.
Wang, Wen-Mu. Faucet. 364,448, Cl. D23-238.000.
Warner, Kurt E. Headliner clip for vehicle interiors. 364,373, Cl. D12-223.000.
Warren, Peter, Sr. Cigarette holder with variable air vents. 364,480, Cl. D27-183.000.
Watkins Manufacturing Corporation: *See*—
Larsen, Christopher, 364,303, Cl. D6-601.000.
Watts, Malcolm. Pull-out shelf assembly. 364,290, Cl. D6-474.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 363,899, Cl. D11-164.000.
Weder, Donald E.; Straeter, Joseph G.; Straeter, William F.; and Straeter, Lisa A., to Highland Supply Corporation. Floral wrapping material. 364,340, Cl. D9-305.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover with fins. 364,361, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,362, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,363, Cl. D11-164.000.
Weimer, Andrew F.; Brayer, Randall R.; and Robinson, Beale A., to Goodyear Tire & Rubber Company, The. Tire tread. 364,370, Cl. D12-147.000.
Weinzierl, David A.: *See*—
Johnson, Greg; and Weinzierl, David A., 364,377, Cl. D13-146.000.
Weisburn, James T.; and Gallagher, Christopher G., to Alpha Enterprises, Inc. Compact disc storage container. 364,304, Cl. D6-632.000.
West Bend Company, The: *See*—
Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, 364,309, Cl. D7-350.000.
Cesaroni, William C.; Barrett, Shawn; and Cozzolino, Steven, 364,310, Cl. D7-350.000.
Wheeler, James A. Organizer for TV/VCR remote control units and program listing guides. 364,291, Cl. D6-475.000.
Whitbread plc: *See*—
Sillince, Mark E.; and Rosens, Erwin A., 364,347, Cl. D9-500.000.
Whiteside, George D.: *See*—
Morse, John B.; Neely, Paul F.; and Whiteside, George D., 364,419, Cl. D18-53.000.
Wiggins, James R. Air cooling unit to be mounted on the front of an electric fan. 364,452, Cl. D23-386.000.
WIK Elektro-Hausgeräte Vertriebs GmbH & Co. Produktions: *See*—
Assmann, Jürgen; Walta, Dietmar; and Kunzendorf, Andre, 364,466, Cl. D24-213.000.
Williams, David G.: *See*—
Schurig, Gregory A.; and Williams, David G., 364,453, Cl. D24-104.000.
Winston, Jeffrey M. Combined rubber stamp and display card. 364,417, Cl. D18-15.000.
Wolfe, Kevin J.: *See*—
Van Meter, John L.; Wolfe, Kevin J.; Müller, Gregory C.; and Selby, Theodore W., 364,351, Cl. D10-80.000.
Wolff, Stacy L.: *See*—
Brightbill, Keith E.; Branham, Rick; Conaway, Brian J.; Copen, Frank; Corney, Richard E.; Prindt, Robert; Kobilarcik, Albert T.; and Wolff, Stacy L., 364,294, Cl. D6-492.000.
Wood, Donald C., to Plop Golf Company. Golf club head. 364,435, Cl. D21-220.000.
Worral, Brian C., to Alcan Australia Limited. Mesh panel. 364,277, Cl. D5-1.000.

Yagi, Tamotsu, to Benetton Group S.p.A. Combined closure and sidewalls for a perfume bottle. 364,349, Cl. D9-549.000.
Yamada, Katsumi: *See*—
Shimizu, Tomio; Nakahira, Akira; Kobayashi, Shinichi; and Yamada, Katsumi, 364,384, Cl. D13-182.000.
Yamada, Masato, to Sony Corporation. Wrapping for audio cassette tape box. 364,346, Cl. D9-432.000.
Yamada, Toshifusa; Hikita, Hiroshi; Nagasawa, Takao; and Shimizu, Tomio, to Fuji Electric Co., Ltd. Semi-conductor element with terminal casing. 364,383, Cl. D13-182.000.
Yamada, Toshifusa: *See*—
Shimizu, Tomio; Nakahira, Akira; Maruyama, Rikihiro; Yamada, Toshifusa; and Nagasawa, Takao, 364,385, Cl. D13-182.000.
Yamamoto, Kazuharu, to Kabushiki Kaisha Toshiba. Process control panel. 364,382, Cl. D13-163.000.
Yashimoto, Yasuo, to Fuji Impulse Co., Ltd. Sealing device for packing. 364,414, Cl. D15-145.000.
Ye, Brian H.: *See*—
Kramer, Louise P.; Denis, Elizabeth A.; and Ye, Brian H., 364,288, Cl. D6-465.000.
Yoshida, Norihide: *See*—
Sakashita, Hiroshi; Yoshida, Norihide; and Miyasaka, Katsuyoshi, 364,375, Cl. D13-112.000.
Yuan Mei Corp.: *See*—
Wang, King-Yuan, 364,447, Cl. D23-223.000.
Zaidman, Paul, to Paul Zaidman Designs Limited. Chair. 364,283, Cl. D6-363.000.
Zemel, Marc, to Mr. Bar-B-Q-, Inc. Barbecue lighter. 364,313, Cl. D7-416.000.
Zentner, Darwin J. Tail trimmer. 364,490, Cl. D30-158.000.
Ziemer, Lynn B.; and Alyanakian, Robert D., to Southco, Inc. Slam latch design. 364,329, Cl. D8-331.000.
Zumtobel Licht GmbH: *See*—
Pesau, Karin, 364,478, Cl. D26-76.000.
Zupo, Alan L.; and Brown, Roger G., to Socket Butler Inc. Light bulb base extractor. 364,323, Cl. D8-14.000.

LIST OF PLANT PATENTEES

Bear Creek Gardens, Inc.: *See*—
Christensen, Jack E., 9,376, Cl. Plt.-12.000.
Zary, Keith W., 9,374, Cl. Plt.-1.000.

Bennett, Cecilia L. D., deceased; and O'Brien, by Susan M., special administrator. Miniature rose plant named 'X-Rated'. 9,375, Cl. Plt.-7.100.

Christensen, Jack E., to Bear Creek Gardens, Inc: Hybrid tea rose plant named 'JACboy'. 9,376, Cl. Plt.-12.000.

Florfis, AG: *See*—
Schumann, Ingeborg, 9,381, Cl. Plt.-87.120.
Schumann, Ingeborg; and Utecht, Angelika, 9,382, Cl. Plt.-87.120.

Goldsmith Seeds, Inc.: *See*—
Hanes, Mitchell E., 9,383, Cl. Plt.-87.120.

Hammons, Bruce, to Plantation Tree Company. *Magnolia grandiflora* named 'Green Giant'. 9,377, Cl. Plt.-53.500.

Hanes, Mitchell E., to Goldsmith Seeds, Inc. Geranium named 'Americana Deep Rose'. 9,383, Cl. Plt.-87.120.

Iverson, Ronald C. Daylily plant named 'Pink Silk Ruffles'. 9,380, Cl. Plt.-87.400.

John Tooby & Co. Ltd.: *See*—
Tooby, Hubert J., 9,378, Cl. Plt.-67.200.

O'Brien, by Susan M., special administrator: *See*—
Bennett, Cecilia L. D., deceased; and O'Brien, by Susan M., special administrator, 9,375, Cl. Plt.-7.100.

Plantation Tree Company: *See*—
Hammons, Bruce, 9,377, Cl. Plt.-53.500.

Schumann, Ingeborg, to Florfis, AG. Geranium plant named Fisflori. 9,381, Cl. Plt.-87.120.

Schumann, Ingeborg; and Utecht, Angelika, to Florfis AG. Geranium plant named Fismoli. 9,382, Cl. Plt.-87.120.

Tooby, Hubert J., to John Tooby & Co. Ltd. Hebe 'Rosie'. 9,378, Cl. Plt.-67.200.

Utecht, Angelika: *See*—
Schumann, Ingeborg; and Utecht, Angelika, 9,382, Cl. Plt.-87.120.

VandenBerg, Cornelis P., to Yoder Brothers, Inc. Chrysanthemum plant named 'Yvette'. 9,379, Cl. Plt.-82.100.

Yoder Brothers, Inc.: *See*—
VandenBerg, Cornelis P., 9,379, Cl. Plt.-82.100.

Zary, Keith W., to Bear Creek Gardens, Inc. Shrub rose plant named 'JACwade'. 9,374, Cl. Plt.-1.000.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 21, 1995

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2

1 5,467,478
6.3 5,467,479
6.5 5,467,480
67 5,467,482
161.7 5,467,481
161.8 5,467,484
421 5,467,485
421.6 5,467,934

CLASS 4

578.1 5,467,486

CLASS 5

419 5,467,487
474 5,467,488
475 5,467,489
636 5,467,490
658 5,467,491

CLASS 8

94.22 5,468,255
159 5,467,492
405 5,468,256
436 5,468,257
471 5,468,258
497 5,468,259

CLASS 14

69.5 5,467,493

CLASS 15

22.1 5,467,494
28 5,467,495
235.8 5,467,496
236.05 5,467,498
320 5,467,500
328 5,467,501
339 5,467,502

CLASS 16

115 5,467,503
342 5,467,504

CLASS 19

118 5,467,505
229 5,467,506

CLASS 24

68.5 K 5,467,508
298 5,467,507
689 5,467,509
706.9 5,467,510
712.9 5,467,511

CLASS 28

100 5,467,512
281 5,467,513

CLASS 29

2.19 5,467,514
235 5,467,515
239 5,467,516
[illegible] 5,467,517
527.7 5,467,518
564.6 5,467,520
598 5,467,521
611 5,467,522
622 5,467,523
623.5 5,468,260
701 5,467,524
743 5,467,525
747 5,467,526
773 5,467,527
890.01 5,467,528
890.128 5,467,529

CLASS 30

85 5,467,530

CLASS 33

284 5,467,531
334 5,467,532
348 5,467,533
508 5,467,538

CLASS 34

77 5,467,539
97 5,467,540
117 5,467,534
168 5,467,535
677 5,469,149

CLASS 36

28 5,467,536
50.1 5,467,537

CLASS 37

348 5,467,541
468 5,467,542

CLASS 40

538 5,467,543
564 5,467,544
597 5,467,545
603 5,467,546
610 5,467,547
612 5,467,548

CLASS 42

42.03 5,467,549
70.11 5,467,550
83 5,467,551
100 5,467,552

CLASS 43

1 5,467,553

CLASS 44

39 L 5,468,263
268 5,468,261
348 5,468,262
426 5,468,264
505 5,468,265
542 5,468,266

CLASS 47

1.01 5,467,554
66 5,467,555

CLASS 49

82.1 5,467,556
171 5,467,557
220 5,467,558
321 5,467,559
413 5,467,560

CLASS 51

293 5,468,268
307 5,468,269
309 Re.35,090

CLASS 52

30 5,467,561
79.1 5,467,562
173.2 5,467,563
173.3 5,467,564
220.1 5,467,565
235 5,467,566
459 5,467,567
518 5,467,568
712 5,467,570
713 5,467,569
718.04 5,467,571

CLASS 53

133.2 5,467,581
384.1 5,467,572
397 5,467,573
399 5,467,575
437 5,467,576
468 5,467,577
469 5,467,578
477 5,467,579
550 5,467,580

CLASS 55

228 5,468,270
357 5,468,271
367 5,468,272
523 5,468,273

CLASS 56

10.2 R 5,467,582
10.8 5,467,583
12.7 5,467,584
14.3 5,467,585
17.5 5,467,586
98 5,467,587
327.1 5,467,589
340.1 5,467,588
400.17 5,467,590

CLASS 60

39.02 5,467,591
261 5,467,592
274 5,467,593
276 5,467,594
410 5,467,595
415 5,467,596
436 5,467,598
442 5,467,597
[illegible] 5,467,599

CLASS 62

6 5,467,600
[illegible] 5,467,601
50.2 5,467,603
117 5,467,604
133 5,467,605
160 5,467,606
[illegible] 5,467,607
195 5,467,608
259.2 5,467,609
262 5,467,610
[illegible] 5,467,611
374 5,467,612
402 5,467,613
476 5,467,614
498 5,467,615

CLASS 65

469 5,468,274
497 5,468,275

CLASS 66

60 R 5,467,616

CLASS 70

18 5,467,617
33 5,467,618
34 5,467,619
38 A 5,467,620
171 5,467,621
203 5,467,622
208 5,467,623
455 5,467,624

CLASS 71

15 5,468,276
24 5,468,277

CLASS 72

35 5,467,625
60 5,467,626
121 5,467,627
126 5,467,628
164 5,467,629
254 5,467,630
283 5,467,631
379.2 5,467,632
452 5,467,633

CLASS 73

1 D 5,467,634
23.21 5,467,651
23.31 5,467,636
23.350 5,467,635
24.01 5,467,637
35.06 5,467,638
38 5,467,639
40.5 R 5,467,640
49.7 5,467,641
54.33 4,448,061
[illegible] 5,467,642
116 5,467,643
118.1 5,467,644
121 5,467,645
126 5,467,646
[illegible] 5,467,647
202.5 5,467,648
204.26 5,467,649
215 5,467,650
379.01 5,467,652
[illegible] 5,467,653
514.39 5,467,654
579 5,467,655
862.541 5,467,656
[illegible] 5,467,657
865.9 5,467,658
866 5,467,659

CLASS 74

351 5,467,660
441 5,467,661
459 5,467,662
[illegible] 5,467,663
523 5,467,664
551.2 5,467,665
575 5,467,666
[illegible] 5,467,667

CLASS 75

236 5,468,278
640 5,468,279
708 5,468,280
710 5,468,281

CLASS 76

108.2 5,467,669
108.6 5,467,670

CLASS 81

57.44 5,467,671
58.2 5,467,672
468 5,467,674

CLASS 82

1.11 5,467,675

CLASS 83

24 5,467,676
155 5,467,677
344 5,467,678

CLASS 84

312 R 5,467,679
421 5,467,680
625 5,468,906

CLASS 89

1.11 5,467,681
41.22 5,467,682

CLASS 91

441 5,467,688
442 5,467,683

CLASS 92

31 5,467,684
88 5,467,685
165 R 5,467,687
172 5,467,689

CLASS 95

8 5,468,282
45 5,468,283

CLASS 99

302 P 5,467,690
340 5,467,691
353 5,467,693
355 5,467,694
422 5,467,695
425 5,467,696
449 5,467,697
455 5,467,698
495 5,467,699
570 5,467,700

CLASS 100

[illegible] 5,467,701
35 5,467,702
131 5,467,704
214 5,467,705
282 5,467,706
292 5,467,707

CLASS 101

32 5,467,708
93 5,467,709
177 5,467,710
216 5,467,711
219 5,467,712

CLASS 102

233 5,467,713
284 5,467,714
[illegible] 5,467,715
434 5,467,716

CLASS 104

[illegible] 5,467,717
[illegible] 5,467,718

CLASS 105

362 5,467,719

CLASS 106

2 5,468,284
38.3 5,468,285
210 5,468,286
217 5,468,287
243 5,468,288
415 5,468,289
635 5,468,290
[illegible] 5,468,291
[illegible] 5,468,292

CLASS 108

[illegible] 5,467,720
50 5,467,703
[illegible] 5,467,721

CLASS 110

345 5,467,722

CLASS 111

123 5,467,723

CLASS 112

80.7 5,467,724
162 5,467,725

CLASS 114

218 5,467,726
[illegible] 5,467,727
332 5,467,728

CLASS 116

209 5,467,729

CLASS 117

43 5,467,731
86 5,467,732

CLASS 118

308 5,468,293
668 5,468,294
723 DC 5,468,295
723 MP 5,468,296
728 5,468,297
730 5,468,299

CLASS 119

18 5,467,733
19 5,467,734
51.5 5,467,735
52.2 5,467,736
60 5,467,737
61 5,467,738
247 5,467,739
707 5,467,740
710 5,467,741
864 5,467,743

CLASS 123

18 A 5,467,744
41.1 5,467,745
196 A 5,467,746
198 E 5,467,747
198 F 5,467,748
305 5,467,757
339.27 5,467,749
350 5,467,750
399 5,467,751
414 5,467,752
418 5,467,753
467 5,467,754
569 5,467,756
617 5,467,758
674 5,467,755

CLASS 124

44.5 5,467,759

CLASS 126

208 5,467,760
299 D 5,467,761

CLASS 127

43 5,468,300

CLASS 128

202.12 5,467,764
205.24 5,467,766
206.19 5,467,765
640 5,467,768
653.2 5,467,769
660.1 5,467,779
661.08 5,467,770
665 5,467,767
672 5,467,771
680 5,467,772
709 5,467,773
711 5,467,774
715 5,467,775
730 5,467,776
731 5,467,777
[illegible] 5,467,778
754 5,467,780
[illegible] 5,467,781
[illegible] 5,467,782
[illegible] 5,467,783
[illegible] 5,467,784
898 5,467,785

CLASS 132

73 5,467,787
255 5,467,788

CLASS 134

1 5,468,302
3 5,468,303
56 R 5,467,789
66 5,467,790
166. C 5,467,791

CLASS 135

25.3 5,467,792
67 5,467,793
125 5,467,794

CLASS 136

246 5,468,304

CLASS 137

15 5,467,795
238 5,467,796
599 5,467,797
614.2 5,467,798
625.41 5,467,799
625.65 5,467,800

CLASS 139

1 E 5,467,801
384 R 5,467,802

CLASS 140

105 5,467,803
115 5,467,804

CLASS 141

32 5,467,805
346 5,467,806

CLASS 148

120 5,468,305
261 5,468,307
321 5,468,308
421 5,468,309
435 5,468,310

CLASS 149

19.4 5,468,311
53 5,468,313

CLASS 152

458 5,467,807

CLASS 156

[illegible] 5,468,314
[illegible] 5,468,315
[illegible] 5,468,318
[illegible] 5,468,317
123 5,468,319
[illegible] 5,468,320
[illegible] 5,468,321
195 5,468,322
209 5,468,323
247 5,468,324
259 5,468,325
345 5,468,326
393 5,468,327
[illegible] 5,468,328
[illegible] 5,468,329
443 5,468,330
[illegible] 5,468,331
527 5,468,332
537 5,468,333
[illegible] 5,468,334
580.2 5,468,335
643.1 5,468,342
656.1 5,468,343
657.1 5,468,344

CLASS 159

47.3 5,468,347

CLASS 160
168.1 5,467,808

CLASS 162
132 5,468,348
358.3 5,468,349

CLASS 164
418 5,467,809
476 5,467,811

CLASS 165
2 5,467,812
11.2 5,467,813
41 5,467,814
109.1 5,467,815
151 5,467,816
167 5,467,817
178 5,467,818

CLASS 166
117.6 5,467,819
123 5,467,821
179 5,467,822
250.01 5,467,823
297 5,467,824
379 5,467,825
380 5,467,826

CLASS 169
24 5,467,827

CLASS 171
58 5,467,828

CLASS 172
4.5 5,467,829
378 5,467,830

CLASS 174
15.6 5,468,907
16.1 5,468,909
48 5,468,908
52.2 5,468,910
74 R 5,468,911
86 5,468,912
102 R 5,468,913
112 5,468,914
124 R 5,468,915
127 5,468,916
255 5,468,917
256 5,468,918
261 5,468,919
267 5,468,920

CLASS 175
19 5,467,831
45 5,467,832
52 5,467,833
61 5,467,834
209 5,467,835
401 5,467,836
420.1 5,467,837

CLASS 178
18 5,468,921

CLASS 180
209 5,467,838
233 5,467,839
251 5,467,840

CLASS 181
150 5,468,922
282 5,468,923

CLASS 182
70 5,467,841
153 5,467,842

CLASS 184
6.5 5,467,843

CLASS 187
387 5,467,844

CLASS 188
65.2 5,467,845
73.37 5,467,846
73.39 5,467,847
73.45 5,467,848
77 W 5,467,849
165 5,467,850
299 5,467,851
322.14 5,467,852

CLASS 190
11 5,467,853

CLASS 192
87.18 5,467,854

CLASS 193
5 5,467,855

CLASS 194
202 5,467,856
206 5,467,857
350 5,467,858

CLASS 198
345.3 5,467,861
347.1 5,467,862
360 5,467,863
409 5,467,864
750.7 5,467,859
778 5,467,865
779 5,467,860
841 5,467,866
844.2 5,467,867

CLASS 200
6 A 5,468,924
43.22 5,468,925
558 5,468,926

CLASS 202
176 5,468,350
234 5,468,351

CLASS 204
59 F 5,468,352
105 R 5,468,353
157.2 5,468,355
164 5,468,356
173 5,468,357
181.5 5,468,358
183.2 5,468,359
213 5,468,354
228 5,468,360
252 5,468,361
298.11 5,468,362
298.41 5,468,363
299 R 5,468,364
403 5,468,366

CLASS 206
5.1 5,467,868
45.13 5,467,869
162 5,467,870
232 5,467,871
256 5,467,872
363 5,467,873
378 5,467,874
588 5,467,875

CLASS 208
48 AA 5,468,367
58 5,468,368
113 5,468,369
134 5,468,370
216 PP 5,468,371
216 R 5,468,372

CLASS 209
170 5,467,876

CLASS 210
94 5,468,373
96.2 5,468,374
139 5,468,375
160 5,468,376
167 5,468,377
192 5,468,378
198.2 5,468,379
223 5,468,381
232 5,468,382
243 5,468,385
248 5,468,386
257.2 5,468,387
321.75 5,468,388
360.2 5,468,389
401 Re.35,091
490 5,468,390
525 5,468,391
615 5,468,392
697 5,468,393
729 5,468,394
774 5,468,395
787 5,468,396
798 5,468,397

CLASS 215
11.1 5,467,877
253 5,467,878
256 5,467,880

CLASS 216
22 5,467,881
23 5,467,882
24 5,468,337
34 5,468,346
51 5,468,345
60 5,467,883
67 5,468,339
69 5,468,341
90 5,468,338

CLASS 219
56.21 5,468,927
68 5,468,928
121.56 5,468,929
121.6 5,468,930
121.63 5,468,931
121.69 5,468,932
270 5,468,933
390 5,468,934
400 5,468,935
553 5,468,936
634 5,468,937
690 5,468,938
727 5,468,939
746 5,468,940

CLASS 220
1.5 5,467,884
6 5,467,885
89.2 5,467,886
212 5,467,887
319 5,467,888
562 5,467,889
571 5,467,890
739 5,467,891

CLASS 221
7 5,467,892
34 5,467,893
71 5,467,894
259 5,467,895

CLASS 222
83 5,467,896
107 5,467,897
190 5,467,898
309 5,467,899
341 5,467,900
376 5,467,901
402.1 5,467,902
455 5,467,903
603 5,467,904

CLASS 223
112 5,467,905

CLASS 224
39 5,467,906
103 5,467,907
244 5,467,909
499 5,467,910

CLASS 227
175 5,467,911

CLASS 228
10 5,467,912
41 5,467,913
102 5,467,914

CLASS 229
117.24 5,467,915
195 5,467,916
301 5,467,917

CLASS 232
43.1 5,467,918

CLASS 235
379 5,468,941
383 5,468,942
454 5,468,943
462 5,468,945
472 5,468,947
492 5,468,952
494 5,468,953

CLASS 236
49.3 5,467,919
68 B 5,467,920
78 R 5,467,921
94 5,467,922

CLASS 239
8 5,467,923
88 5,467,924
132.3 5,467,925
132.5 5,467,926
383 5,467,927
404 5,467,928
428.5 5,467,929

CLASS 241
84 5,467,930
261.2 5,467,931

CLASS 242
236 5,467,932
261 5,467,933
422.4 5,467,935
525.7 5,467,936
526.2 5,467,937
599.1 5,467,938
607.1 5,467,939

CLASS 244
3.11 5,467,940
54 5,467,941
75 R 5,467,942
129.3 5,467,943
134 F 5,467,944

CLASS 246
26 5,467,945
122 A 5,467,946

CLASS 248
27.1 5,467,947
68.1 5,467,948
95 5,467,949
118.1 5,467,950
166 5,467,953
188.1 5,467,951
201 5,467,954
219.3 5,467,955
309.2 5,467,956
429 5,467,957
449 5,467,958
523 5,467,959

CLASS 250
208.1 5,468,954
251 5,468,955
282 5,468,957
292 5,468,958
306 5,468,959
338.3 5,468,960
343 5,468,961
372 5,468,963
393 5,468,964
396 ML 5,468,965
397 5,468,966
435 5,468,968
492.23 5,468,969
505.1 5,468,970
556 5,468,971

CLASS 251
30.01 5,467,960
129.15 5,467,961
129.18 5,467,963
149.6 5,467,964
160 5,467,965
174 5,467,966
288 5,467,967

CLASS 252
18 5,468,399
21 5,468,400
22 5,468,401
25 5,468,402
47.5 5,468,403
51.5 R 5,468,404
56 R 5,468,405
56 S 5,468,406
61 5,468,407
62.2 5,468,408
79.2 5,468,409
88 5,468,398
95 5,468,410
99 5,468,411
106 5,468,412
117 5,468,413
135 5,468,414
171 5,468,415
174.12 5,468,416
174.15 5,468,417
174.25 5,468,418
182.12 5,468,419
182.24 5,468,420
299.63 5,468,421
544 5,468,422
546 5,468,423
609 5,468,424

CLASS 254
134.4 5,467,968
251 5,467,969

CLASS 257
10 5,468,972
33 5,468,973
51 5,468,974
97 5,468,975
177 5,468,976
208 5,468,977
258 5,468,978
304 5,468,979
306 5,468,980
316 5,468,981
331 5,468,982
344 5,468,983
356 5,468,984
385 5,468,985
389 5,468,986
412 5,468,987
431 5,468,988
517 5,468,989
632 5,468,990
666 5,468,991
676 5,468,992
693 5,468,994
697 5,468,995
723 5,468,996
734 5,468,997
775 5,468,998
784 5,468,999

CLASS 261
114.3 5,468,425
153 5,468,426

CLASS 264
3.4 5,468,427
28 5,468,430
37 5,468,431
45.3 5,468,432
46.4 5,468,433
46.8 5,468,434
109 5,468,435
112 5,468,436
119 5,468,437
139 5,468,438
145 5,468,439
291 5,468,440
331.21 5,468,441
442 5,468,429
483 5,468,428
519 5,468,442
537 5,468,443
566 5,468,444

CLASS 267
220 5,467,970

CLASS 269
118 5,467,972

CLASS 270
1.1 5,467,973

CLASS 271
13 5,467,976
220 5,467,974
267 5,467,975

CLASS 273
25 5,467,977
26 E 5,467,978
26 R 5,467,979
32 B 5,467,980
65 EF 5,467,981
73 C 5,467,982
78 5,467,983
81 R 5,467,984
126 R 5,467,985
129 AP 5,467,986
167 A 5,467,988
167 R 5,467,989
175 5,467,987
181 F 5,467,990
186.3 5,467,991
187.2 5,467,992
191 A 5,467,993
222 5,467,994
248 5,467,995
269 5,467,996
302 5,467,997
363 5,467,998
402 5,467,999
416 5,468,000
434 5,468,001

CLASS 277
65 5,468,002
235 B 5,468,003

CLASS 280
11.2 5,468,004
40 5,468,005
202 5,468,006
499 5,468,007
638 5,468,008
650 5,468,009
652 5,468,010
728.2 5,468,011
729 5,468,013
735 5,468,014
737 5,468,015
741 5,468,016
788 5,468,018
805 5,468,019
808 5,468,020

CLASS 283
56 5,468,021
072 5,468,022

CLASS 285
24 5,468,023
81 5,468,024
114 5,468,025
133.1 5,468,026
319 5,468,027
322 5,468,028
328 5,458,029
364 5,468,030

CLASS 292
81 5,468,031
343 5,468,032

CLASS 293
133 5,468,033

CLASS 294
1.1 5,468,034
85 5,468,035
147 5,468,036

CLASS 296
57.1 5,468,037
70 5,468,039
97.4 5,468,040
97.9 5,468,041
146.4 5,468,042

CLASS 297
153 5,468,043
216.11 5,468,044
238 5,468,046
250.1 5,468,047
284.4 5,468,048
339 5,468,049
344.1 5,468,050
344.18 5,468,051
352 5,468,052
472 5,468,053

CLASS 298
19 V 5,468,054

CLASS 301
6.91 5,468,055

CLASS 303
87 5,468,056
115.2 5,468,058
116.1 5,468,059

CLASS 307
39 5,469,000
113 5,469,001
150 5,469,002

CLASS 310
24 5,469,004
68 B 5,469,005
90.5 5,469,006
214 5,469,009
312 5,469,010
325 5,469,011
348 5,469,012

CLASS 312
223.2 5,468,060
258 5,468,061
301 5,468,062
334.28 5,468,063

CLASS 313
138 5,469,013
308 5,469,014
309 5,469,015
5,142,184
402 5,469,016
431 5,469,017
461 5,469,018
509 5,469,019
511 5,469,020
582 5,469,021

CLASS 315
5.39 5,469,022
169.3 5,469,025
169.4 5,469,026
224 5,469,027
291 5,469,028
408 5,469,029

CLASS 318
254 5,469,030
375 5,469,031
432 5,469,215
439 5,469,032
568.1 5,469,035
581 5,469,036
626 5,469,037
632 5,469,038

5,469,039
5,469,040
5,469,041

CLASS 320

5,469,042
5,469,043

CLASS 323

5,469,044
5,469,045
5,469,046
5,469,047

CLASS 324

5,469,048
5,469,049
5,469,050
5,469,051
5,469,052
5,469,053
5,469,054
5,469,055
5,469,056
5,469,058
5,469,059
5,469,060
5,469,061
5,469,062
5,469,063
5,469,064
5,469,066
5,469,068
5,469,069
5,469,070
5,469,072
5,469,073
5,469,074
5,469,075

CLASS 326

5,469,076
5,469,077
5,469,003
5,469,078
5,469,079
5,469,080
5,469,083
5,469,084
5,469,085

CLASS 327

5,469,086
5,469,087
5,469,088
5,469,089
5,469,090
5,469,091
5,469,092
5,469,093
5,469,094
5,469,096
5,469,097
5,469,098
5,469,099
5,469,100
5,469,101
5,469,103
5,469,104
5,469,109
5,469,110
5,469,111

CLASS 329

5,469,112
5,469,113

CLASS 330

5,469,114
5,469,105
5,469,106
5,469,107
5,469,108

CLASS 331

5,469,116
5,469,117
5,469,118 R
5,469,119 R
5,469,120

CLASS 332

5,469,126
5,469,127

CLASS 333

5,469,128 R
5,469,129
5,469,130

CLASS 335

5,469,121
5,469,122

5,469,123

CLASS 336

5,469,124
Re.35,092

CLASS 338

5,469,125
5,469,131

CLASS 340

5,469,132
5,469,133
5,469,134
5,469,136
5,469,137
5,469,138
5,469,139
5,469,140
5,469,141
5,469,142
5,469,143
5,469,144
5,469,145
5,469,146
5,469,147
5,469,148
5,469,150
5,469,151
5,469,152
5,469,154
5,469,155
5,469,153
5,469,156
5,469,157
5,469,158

CLASS 341

5,469,159
5,469,161
5,469,162
5,469,163
5,469,164

CLASS 342

5,469,165
5,469,166
5,469,167
5,469,168
5,469,170
5,469,171
5,469,172
5,469,173
5,469,174
5,469,175
5,469,176

CLASS 343

5,469,177
5,469,179
5,469,180
5,469,181
4,922,264
5,469,182

CLASS 345

5,469,183
5,469,184
5,469,185
5,469,186
5,469,187
5,469,188
5,469,189
5,469,190
5,469,191
5,469,193
5,469,194
5,469,195

CLASS 347

5,469,196
5,469,197
5,469,198
5,469,199
5,469,200
5,469,201
5,469,202
5,469,203
5,469,204
5,469,205

CLASS 348

5,469,206
5,469,207
5,469,208
5,469,209
5,469,210
5,469,211
5,469,212
5,469,213
Re.35,093
5,469,214
5,469,216

5,469,217
5,469,218
5,469,219
5,469,220
5,469,221
5,469,222
5,469,223
5,469,224
5,469,225
5,469,226
5,469,227
5,469,228

CLASS 351

5,469,229
5,469,230
5,469,231
5,469,232
5,469,233
5,469,234

CLASS 353

5,469,235

CLASS 354

5,469,236
5,469,237
5,469,238
5,469,239
5,469,240

CLASS 355

5,469,241
5,469,242
5,469,243
5,469,244
5,469,245
5,469,247
326 R 5,469,248

CLASS 356

5,469,249
5,469,250
5,469,251
5,469,252
5,469,253
5,469,254
5,469,255
5,469,256
5,469,259
5,469,260
5,469,261
5,469,262
5,469,263
5,469,264
5,469,265

CLASS 358

5,469,266
5,469,269
5,469,273
5,469,274
5,469,275
5,469,276

CLASS 359

5,469,277
5,469,278
5,469,279
5,469,281
5,468,064
5,469,282
5,469,283
5,469,284
5,469,285
5,469,286
5,469,287
5,469,289
5,469,290
5,469,291
5,469,292
5,469,293
5,469,294
5,469,295
5,469,296
5,469,297
5,469,298
5,469,299
5,469,300
5,469,301
5,469,302
5,469,303

CLASS 360

5,469,304
5,469,305
5,469,306
5,469,307
5,469,308
5,469,309
5,469,310
5,469,311
5,469,312

5,469,313
5,469,314
5,469,315
5,469,317
5,469,318
5,468,065

CLASS 361

5,469,320
5,469,321
5,469,322
5,469,323
5,469,324
5,469,325
5,469,326
5,469,327
5,469,328
5,469,329
5,469,331
5,469,332
5,469,333
5,469,334
5,469,335
5,469,336

CLASS 362

5,469,337
5,469,338
5,469,340
5,469,341
5,469,342
5,469,343
5,469,344
5,469,345
5,469,346
5,469,348
5,469,347

CLASS 363

5,469,349
5,469,350
5,469,351

CLASS 364

5,469,352
5,469,353
5,469,354
5,469,356
5,469,357
5,469,358
5,469,359
5,469,360
5,469,361
5,469,362
5,469,364
5,469,365
5,469,366
5,469,369
5,469,370
5,469,374
5,469,371
5,469,375
5,469,376
5,469,377

CLASS 365

5,469,378
5,469,379
5,469,380
5,469,381
5,469,384
5,469,382
5,469,385
5,469,386
5,469,387
5,469,388
5,469,393
5,469,392
5,469,395
5,469,396
5,469,398
5,469,399
5,469,400
5,469,401
5,469,402

CLASS 366

5,468,066
5,468,067
5,468,068

CLASS 367

5,469,403
5,469,404
5,469,405
5,469,406
5,469,407
5,469,408

CLASS 368

5,469,409
5,469,410
5,469,411

5,469,412

CLASS 369

5,469,413
5,469,414
5,469,415
5,469,417
5,469,418
5,469,419
5,469,420
5,469,421
5,469,422
5,469,423
5,469,424
5,469,425
5,469,426

CLASS 370

5,469,427
5,469,430
5,469,431
5,469,432
5,469,434
5,469,438
5,469,435
5,469,437
5,469,439
5,469,440
5,469,442
5,469,428

CLASS 371

5,469,443
5,469,445
5,469,446
5,469,447
5,469,448
5,469,449
5,469,450
5,469,452
5,469,453
5,469,444

CLASS 372

5,469,454
5,469,455
5,469,456
5,469,457
5,469,459
5,469,460

CLASS 373

5,469,461

CLASS 375

5,469,494
5,469,468
5,469,469
5,469,470
5,469,472
5,469,473
5,469,462
5,469,474
5,469,475
5,469,464
5,469,465
5,469,476
5,469,466
5,469,477
5,469,467
5,469,478
5,469,479

CLASS 376

5,469,480
5,469,481

CLASS 377

5,469,482
5,469,483
5,469,484
5,469,485

CLASS 378

5,469,486
5,469,487
5,469,488
5,469,429
5,469,489
5,469,490
5,469,492

CLASS 379

5,469,493
5,469,495
5,469,496
5,469,491
5,469,497
5,469,498
5,469,499
5,469,500
5,469,502
5,469,503

5,469,505

CLASS 380

5,469,506
5,469,507

CLASS 381

5,469,509
5,469,510
5,469,508
5,469,511

CLASS 382

5,469,512
5,469,513
5,469,515
5,469,517
5,469,516
5,469,514

CLASS 384

5,468,070
5,468,071
5,468,072
5,468,073
5,468,074

CLASS 385

5,469,519
5,469,520
5,469,521
5,469,518
5,469,522
5,469,523
5,469,524
5,469,525
5,469,526

CLASS 395

5,469,527
5,469,529
5,469,528
5,469,531
5,469,532
5,469,533
5,115,493
5,469,535
5,469,536
5,469,537
5,469,538
5,469,539
5,469,540
5,469,565
5,469,566
5,469,546
5,469,463
5,469,563
5,469,576
5,469,564
5,469,542
5,469,575
5,469,543
5,469,549
5,469,547
5,469,544
5,469,550
5,469,554
5,469,557
5,469,559
5,469,560
5,469,548
5,469,555
5,469,556
5,469,561
5,469,567
5,469,570
5,469,571
5,469,553

CLASS 406

5,468,076
5,468,077
5,468,078
5,468,079
5,468,080
5,468,081

CLASS 401

5,468,082
5,468,083
5,468,084

CLASS 402

5,468,085

CLASS 403

5,468,086
5,468,087
5,468,092

CLASS 404

5,468,093

75 5,468,094
118 5,468,095

CLASS 405

36 5,468,096
52 5,468,088
94 5,468,090
154 5,468,091
262 5,468,098

CLASS 408

1 R 5,468,099

CLASS 409

202 5,468,101
234 5,468,100

CLASS 411

87 5,468,103
113 5,468,104
433 5,468,105
434 5,468,106
448 5,468,107
510 5,468,108
553 5,468,109

CLASS 414

273 5,468,110
416 5,468,111
523 5,468,113
537 5,468,114
556 5,468,115
607 5,468,116
695 5,468,120
745.2 5,468,121
786 5,468,117
788.9 5,468,118

CLASS 415

55.1 5,468,119
178 5,468,123

CLASS 416

63 5,468,124
97 R 5,468,125

CLASS 417

53 5,468,126
413.1 5,468,128
477.12 5,468,129

CLASS 418

55.2 5,468,130
94 5,468,131
206 5,468,132

CLASS 419

19 5,468,445
64 5,468,446

CLASS 422

5 5,468,447
30 5,468,448
46 5,468,449
56 5,468,450
58 5,468,451
70 5,468,452
100 5,468,453
121 5,468,454
180 5,468,455

CLASS 423

10 5,468,456
61 5,468,457
222 5,468,458
240.S 5,468,459
266 5,468,460
580.2 5,468,462
612 5,468,463
644 5,468,464

CLASS 424

1.49 5,468,468
9.361 5,468,467
9.4 5,468,465
9.45 5,468,466
49 5,468,469
59 5,468,470
62 5,468,472
66 5,468,473
70.1 5,468,474
70.16 5,468,475
73 5,468,476
78.03 5,468,488
78.17 5,468,477
78.27 5,468,478
93.44 5,468,479
93.461 5,468,483
94.65 5,468,480
125.1 5,468,481
141.1 5,468,484
184.1 5,468,485
194.1 5,468,486
[illegible] 5,468,487
195.11 5,468,494
[illegible] 5,468,495
405 5,468,497
[illegible] 5,468,500
[illegible] 5,468,501
450 5,468,499
456 5,468,502
[illegible] 5,468,503
466 5,468,504
[illegible] 5,468,505

CLASS 425

7 5,468,133
72.1 5,468,134
[illegible] 5,468,135
192 R 5,468,136
[illegible] 5,468,137
[illegible] 5,468,138
389 5,468,140
[illegible] 5,468,141

CLASS 426

74 5,468,506
99 5,468,507
316 [illegible]
[illegible] 5,468,509
574 5,468,510
[illegible] 5,468,511
[illegible] 5,468,512
663 5,468,513

CLASS 427

77 5,468,514
[illegible] 5,468,515
180 5,468,516
322 5,468,517
[illegible] 5,468,518
532 5,468,519
[illegible] 5,468,520
575 5,468,521
[illegible] 5,468,522

CLASS 428

5 5,468,523
34.1 5,468,524
35.4 5,468,526
35.7 5,468,527
36.1 5,468,529
36.4 5,468,530
36.5 5,468,531
[illegible] 5,468,532
[illegible] 5,468,536
101 5,468,537
141 5,468,539
156 5,468,540
210 5,468,541
215 5,468,542
[illegible] 5,468,543
224 5,468,544
245 [illegible]
[illegible] 5,468,545
280 5,468,546
[illegible] 5,468,548
327 5,468,550
333 5,468,551
336 5,468,552
357 5,468,554
[illegible] 5,468,555
[illegible] 5,468,556
384 5,468,557
[illegible] 5,468,558
410 5,468,559
413 5,468,560
421 5,468,561
457 5,468,562
515 5,468,563
537.5 5,468,564
552 5,468,565
[illegible] 5,468,567

CLASS 429

[illegible] 5,468,573
33 5,468,574
[illegible] 5,468,575
[illegible] 5,468,569
217 5,468,570
247 5,468,572

CLASS 430

[illegible] 5,468,576
[illegible] 5,468,580
54 5,468,582
[illegible] 5,468,583
65 5,468,584
110 5,468,585
137 5,468,586
170 5,468,589
191 5,468,590
[illegible] 5,468,591
[illegible] 5,468,587
229 [illegible]
[illegible] 5,468,592
273 5,468,593
294 5,468,594
296 5,468,595
306 5,468,596
315 5,468,597
372 5,468,598
512 5,468,599
546 5,468,600
567 5,468,601
569 5,468,602
619 5,468,603
631 5,468,604

CLASS 431

18 5,468,142
243 5,468,143
254 5,468,144
266 5,468,145

CLASS 432

77 5,468,146

CLASS 433

20 5,468,147
80 5,468,148
173 5,468,149

CLASS 434

265 5,468,151
429 5,468,152

CLASS 435

4 5,468,605
5 5,468,606
6 5,468,607
7.1 5,468,620
7.2 5,468,615
7.21 5,468,618
7.8 5,468,617
7.94 5,468,619
25 5,468,621
28 5,468,622
68.1 5,468,623
69.1 5,468,624
71.1 5,468,625
91.11 5,468,608
130 5,468,626
141 5,468,627
168 5,468,628
172.3 5,468,629
189 5,468,630
197 5,468,632
212 5,468,633
240.2 5,468,634
240.21 5,468,635
252.3 5,468,636
252.35 5,468,637
304.1 5,468,638
320.1 5,468,639

CLASS 436

66 5,468,640
97 5,468,641
114 5,468,642
161 5,468,643
163 5,468,644
164 5,468,645
501 5,468,646
514 5,468,647
518 5,468,648
527 5,468,650
548 5,468,651

CLASS 437

2 5,468,652
4 5,468,653
6 5,468,654
8 5,468,655
23 5,468,656
24 5,468,657
31 5,468,658
40 5,468,661
43 Re.35,094
5,468,663
44 5,468,665
50 5,468,667
51 5,468,668
52 5,468,670
60 5,468,672
62 5,468,674
69 5,468,675
70 5,468,676
107 5,468,678
110 5,468,679
170 5,468,680
183 5,468,681
195 5,468,682
209 5,468,683
228 5,468,684
229 5,468,686
235 5,468,687
237 5,468,688
241 5,468,689

CLASS 439

13 5,468,153
79 5,468,154
98 5,468,155
157 5,468,156
264 5,468,157
501 5,468,159
567 5,468,160
610 5,468,161
752 5,468,162
839 5,468,163
843 5,468,164

CLASS 440

[illegible] 5,468,165

CLASS 441

5 5,468,166
40 5,468,167

CLASS 445

[illegible] 5,468,168
50 5,468,169

CLASS 446

23 5,468,170
[illegible] 5,468,171
299 5,468,172

CLASS 451

59 5,468,173
75 5,468,174
87 5,468,175
359 5,468,176
364 5,468,177
548 5,468,178

CLASS 452

37 5,468,179
127 [illegible]

CLASS 453

3 5,468,181
10 5,468,182

CLASS 454

136 5,468,183
186 5,468,184
[illegible] 5,468,185
202 5,468,186

CLASS 460

126 5,468,187

CLASS 464

[illegible] 5,468,188
68 5,468,189

CLASS 472

82 5,468,190

CLASS 474

[illegible] 5,468,191
28 5,468,192

CLASS 475

162 5,468,193

CLASS 477

3 5,468,194
46 5,468,195
[illegible] 5,468,196
[illegible] 5,468,197
143 5,468,198

CLASS 482

35 5,468,199
55 5,468,200
[illegible] 5,468,201
[illegible] 5,468,202
[illegible] 5,468,203
112 5,468,204
129 5,468,205

CLASS 493

[illegible] 5,468,206
[illegible] 5,468,207
352 5,468,208
424 5,468,209

CLASS 501

1 5,468,690
[illegible] 5,468,692
72 5,468,693
77 5,468,694
[illegible] 5,468,695
[illegible] 5,468,696

CLASS 502

[illegible] [illegible]
[illegible] 5,468,699
80 5,468,701
[illegible] 5,468,702
108 [illegible]
115 5,468,704
151 5,468,705
153 5,468,707
[illegible] [illegible]
210 [illegible]
222 5,468,710

CLASS 503

[illegible] 5,468,711
227 5,468,712

CLASS 504

101 5,468,715
[illegible] 5,468,717
[illegible] 5,468,718
[illegible] 5,468,719
[illegible] 5,468,720
243 5,468,721
282 5,468,722

CLASS 505

125 5,468,724
[illegible] 5,468,806
[illegible] 5,468,723

CLASS 512

2 5,468,725

CLASS 514

2 5,468,726
12 5,468,727
17 5,468,730
[illegible] 5,468,731
[illegible] 5,468,732
23 5,468,734
[illegible] 5,468,735
[illegible] 5,468,737
[illegible] 5,468,738
75 5,468,739
[illegible] 5,468,740
150 5,468,469
[illegible] 5,468,736
187 5,468,742
211 Re.35,095
214 5,468,743
235.5 5,468,746
[illegible] 5,468,747
250 5,468,748
[illegible] 5,468,749
255 5,468,750
[illegible] 5,468,751
272 5,468,752
277 5,468,753
282 5,468,744
[illegible] 5,468,754
288 5,468,755
[illegible] 5,468,756
300 5,468,757
[illegible] 5,468,758
372 5,468,759
374 5,468,760
376 5,468,762
[illegible] 5,468,763
[illegible] 5,468,764
[illegible] 5,468,765
[illegible] 5,468,766
414 5,468,767
415 5,468,768
423 Re.35,096
[illegible] 5,468,769
[illegible] 5,468,770
452 5,468,771
453 5,468,772
471 5,468,774
541 5,468,775
[illegible] 5,468,776
[illegible] 5,468,777
573 5,468,778

CLASS 521

46.5 5,468,779
48.5 5,468,780
[illegible] 5,468,781
134 5,468,782
159 5,468,783

CLASS 522

31 5,468,784
[illegible] 5,468,785
[illegible] 5,468,786

CLASS 523

113 5,468,787
335 5,468,788
435 5,468,461

CLASS 524

[illegible] 5,468,789
[illegible] 5,468,790
[illegible] 5,468,791
[illegible] 5,468,793
188 5,468,794
361 5,468,795
377 5,468,796
379 5,468,797
408 5,468,498
440 5,468,798
457 5,468,799
458 5,468,800
504 5,468,801
539 5,468,802
553 5,468,803
591 5,468,804
731 5,468,805

CLASS 525

240 5,468,807
244 5,468,810
263 5,468,811
293 5,468,812
385 5,468,813
390 5,468,814
478 5,468,815
479 5,468,816

CLASS 526

79 5,468,817
170 5,468,818
171 5,468,819
264 5,468,820
340.1 5,468,822
347.1 5,468,823

CLASS 528

12 5,468,824
15 5,468,825
18 5,468,829
26 5,468,830
44 5,468,831
53 5,468,832
67 5,468,833
76 5,468,834
204 5,468,836
357 5,468,837
363 5,468,838
403 5,468,839
408 5,468,840
481 5,468,842

CLASS 530

345 5,468,843
351 5,468,609
366 5,468,844
387.9 5,468,845
388.23 5,468,846
413 5,468,847

CLASS 534

759 5,468,848

CLASS 536

18.5 5,468,849
22.1 5,468,851
23.5 Re.35,097
24.33 5,468,852
28.55 5,468,853

CLASS 540

498 5,468,854

CLASS 544

60 5,468,855
219 5,468,856
298 5,468,857

CLASS 546

18 5,468,858
48 5,468,859
77 5,468,860
156 5,468,861
173 5,468,862
345 5,468,863

CLASS 548

229 5,468,865
251 5,468,866
253 5,468,867
263.2 5,468,868
267.8 5,468,869
370.1 5,468,870
373.1 5,468,871
416 5,468,872
454 5,468,874
486 5,468,873
512 5,468,875
535 5,468,876
543 5,468,877

CLASS 549

23 5,468,878
263 5,468,880
295 5,468,881
407 5,468,882
411 5,468,883
437 5,468,884

531	5,468,885		CLASS 558		CLASS 568		CLASS 601		51	5,468,223		CLASS 606	
549	5,468,886	71	5,468,895	6	5,468,902	2	5,468,214	102	5,468,225	15	5,468,238
		233	5,468,896	28	5,468,903	23	5,468,215	110	5,468,230	42	5,468,240
	CLASS 554			333	5,468,904	24	5,468,216	132	5,468,226	61	5,468,241
58	5,468,888		CLASS 560	346	5,468,905	32	5,468,217	156	5,468,227	69	5,468,242
169	5,468,887	18	5,468,897			144	5,468,218	174	5,468,228	80	5,468,243
		41	5,468,898					179	5,468,229	90	5,468,244
	CLASS 556	218	5,468,899		CLASS 600		CLASS 602	180	5,468,231	94	5,468,245
7	5,468,889			10	5,468,210	6	5,468,219	200	5,468,232	107	5,468,246
12	5,468,890		CLASS 562	38	5,468,211	21	5,468,220	207	5,468,233	178	5,468,247
61	5,468,891	590	5,468,900	39	5,468,212			290	5,468,234	192	5,468,248
171	5,468,892			40	5,468,213		CLASS 604	333	5,468,235	205	5,468,250
427	5,468,893		CLASS 564	114	5,467,762	8	5,468,221	361	5,468,236	223	5,468,251
477	5,468,894	198	5,468,901	201	5,467,763	40	5,468,222	390	5,468,237	228	5,468,252
										230	5,468,253
											CLASS 607
										5	5,468,254
											CLASS 623
										6	4,536,897

CLASSIFICATION OF DESIGNS

D2	609	364,261		492	364,294		371	364,336		117	364,376	D19	35	364,421		128	364,458
	711	364,262		495	364,295		382	364,337		146	364,377		36	364,422		129	364,459
	746	364,263		513	364,296		409	364,338		147	364,378		51	364,423		130	364,461
	849	364,264		515	364,298	D9	300	364,339		160	364,379		59	364,425		145	364,462
	951	364,265		545	364,299		305	364,340		162	364,380		75	364,426		146	364,463
	959	364,266		579	364,300		337	364,341		163	364,382		88	364,427		153	364,464
D3	8	364,267		581	364,301		415	364,342		182	364,383	D21	12	364,428		209	364,465
	202	364,268		601	364,302		421	364,344	D14	100	364,389		34	364,429		213	364,466
	207	364,269		632	364,304		430	364,345		105	364,386		85	364,430		231	364,467
	218	364,270	D7	300	364,305		432	364,346		106	364,387		82	364,431	D25	16	364,468
	282	364,271		479	364,306		448	364,347		107	364,388		212	364,432		52	364,469
	312	364,272		322	364,307		544	364,348		113	364,392		219	364,433		124	364,470
	318	364,273		350	364,308		549	364,349		114	364,396		220	364,434		125	364,474
D4	108	364,274		351	364,311	D10	6	364,354		115	364,400		221	364,436		138	364,475
	119	364,275		376	364,312		11	364,355		121	364,401		226	364,437	D26	50	364,476
	138	364,276		416	364,313		29	364,356		122	364,403		227	364,438		60	364,477
D5	1	364,277		510	364,314		33	364,357		180	364,404		234	364,439		76	364,478
D6	300	364,278		511	364,317		58	364,350		207	364,405		253	364,441		81	364,479
	319	364,279		515	364,318		80	364,351		215	364,406	D22	108	364,442	D27	183	364,480
	326	364,280		536	364,319		126	364,352	D15	10	364,407		126	364,443	D28	7	364,481
	349	364,281		629	364,320		138	364,353		25	364,408		179	364,444		10	364,482
	356	364,282		673	364,321	D11	152	364,358		29	364,409		134	364,445		53	364,483
	365	364,283	D8	1	364,322		158	364,360		123	364,410	D23	209	364,446		57	364,484
	374	364,284		14	364,323		178	364,361		128	364,411		223	364,447		78	364,485
	381	364,285		42	364,324		216	364,364		133	364,412		230	364,448		88	364,486
	417	364,286		48	364,325	D12	111	364,365		136	364,413		262	364,449	D29	122	364,487
	451	364,287		65	364,326		138	364,366		145	364,414		305	364,450		129	364,488
	465	364,288		105	364,327		147	364,370		146	364,415		360	364,451	D30	108	364,489
	470	364,289		323	364,328		160	364,371	D16	231	364,416		386	364,452		118	364,490
	474	364,290		331	364,329		177	364,372	D18	15	364,417	D24	110	364,453			
	475	364,291		341	364,330		223	364,373		43	364,418		106	364,455			
	479	364,292		354	364,331		423	364,374		53	364,419		112	364,456			
	480	364,293		367	364,335	D13	112	364,375		54	364,420		127	364,457			

CLASSIFICATION OF PLANTS

Plt.	1	9,374	12	9,376	67.2	9,378	87.12	9,381
	7.1	9,375	53.5	9,377	82.1	9,379	87.4	9,380

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01	:	5,467,785		5,467,741		5,468,339		5,468,974		5,469,366	[illegible]
		5,467,918		5,467,743		5,468,340		5,468,981		5,469,368	5,469,164
		5,468,049		5,467,744		5,468,342		5,468,982		5,469,370	5,469,169
		5,468,545		5,467,746		5,468,357		5,468,990		5,469,384	5,469,279
		5,469,338		5,467,754		5,468,358		5,468,992		5,469,396	5,469,314
02	:	5,467,826		5,467,761		5,468,363		5,468,994		5,469,398	5,469,324
04	:	5,467,483		5,467,766		5,468,365		5,469,022		5,469,432	5,469,463
		5,467,529		5,467,784		5,468,376		5,469,023		5,469,435	5,469,495
		5,467,830		5,467,787		5,468,387		5,469,024		5,469,437	5,469,553
		5,468,017		5,467,789		5,468,401		5,469,035		5,469,439	5,469,566
		5,468,125		5,467,794		5,468,423		5,469,045		5,469,442	09 : 5,467,498
		5,468,138		5,467,806		5,468,478		5,469,069		5,469,443	5,467,512
		5,468,203		5,467,828		5,468,481		5,469,070		5,469,453	5,467,590
		5,468,220		5,467,839		5,468,483		5,469,075		5,469,456	5,467,591
		5,468,383		5,467,848		5,468,490		5,469,077		5,469,466	5,467,599
		5,468,656		5,467,855		5,468,511		5,469,080		5,469,471	5,467,617
		5,468,887		5,467,881		5,468,556		5,469,084		5,469,478	5,467,709
		5,468,910		5,467,896		5,468,560		5,469,088		5,469,481	5,467,844
		5,468,921		5,467,897		5,468,595		5,469,097		5,469,503	5,467,850
		5,469,072		5,467,917		5,468,605		5,469,101		5,469,505	5,468,021
		5,469,129		5,467,926		5,468,613		5,469,104		5,469,509	5,468,074
		5,469,133		5,467,935		5,468,619		5,469,106		5,469,515	5,468,154
		5,469,143		5,467,936		5,468,629		5,469,109		5,469,519	5,468,174
		5,469,185		5,467,975		5,468,636		5,469,111		5,469,521	5,468,227
		5,469,222		5,467,981		5,468,647		5,469,114		5,469,522	5,468,252
		5,469,379		5,468,013		5,468,659		5,469,115		5,469,536	[illegible]
		5,469,409		5,468,032		5,468,672		5,469,120		5,469,540	5,468,335
		5,469,557		5,468,064		5,468,674		5,469,132		5,469,544	5,468,447
		5,469,560		5,468,068		5,468,681		5,469,139		5,469,555	5,468,515
05	:	5,467,534		5,468,069		5,468,687		5,469,146		5,469,558	[illegible]
		5,468,036		5,468,085		5,468,700		5,469,154		5,469,568	5,468,732
06	:	Re.35,093		5,468,095		5,468,718		5,469,165		5,469,571	5,468,749
		Re.35,094		5,468,111		5,468,730		5,469,166		5,469,574	5,468,765
		5,467,491		5,468,147		5,468,741		5,469,190	08 :	5,467,500	5,468,767
		5,467,492		5,468,148		5,468,752		5,469,191		5,467,652	[illegible]
		5,467,538		5,468,151		5,468,772		5,469,194		5,467,759	5,468,849
		5,467,540		5,468,155		5,468,778		5,469,198		5,467,764	5,468,864
		5,467,545		5,468,200		5,468,782		5,469,199		5,467,931	5,468,912
		5,467,547		5,468,202		5,468,841		5,469,223		5,467,990	5,468,913
		5,467,552		5,468,205		5,468,843		5,469,250		5,468,047	5,469,219
		5,467,553		5,468,225		5,468,867		5,469,256		5,468,280	5,469,362
		5,467,566		5,468,246		5,468,873		5,469,261		5,468,283	5,469,434
		5,467,570		5,468,248		5,468,879		5,469,276		5,468,392	5,469,506
		5,467,588		5,468,251		5,468,906		5,469,290		5,468,449	5,469,520
		5,467,620		5,468,293		5,468,920		5,469,295		5,468,606	10 : 5,467,809
		5,467,682		5,468,296		5,468,925		5,469,310		5,468,679	5,468,320
		5,467,697		5,468,298		5,468,938		5,469,334		5,468,684	5,468,430
		5,467,730		5,468,299		5,468,944		5,469,343		5,469,064	5,468,537
		5,467,739		5,468,324		5,468,966		5,469,345		5,469,076	5,468,554

5,468,792
5,468,842
12 : 5,467,525
5,467,528
5,467,544
5,467,569
5,467,644
5,467,692
5,467,699
5,467,726
5,467,816
5,467,868
5,467,925
5,467,937
5,467,947
5,467,998
5,468,000
5,468,115
5,468,165
5,468,233
5,468,345
5,468,393
5,468,509
5,468,534
5,468,539
5,468,616
5,468,928
5,468,952
5,468,953
5,469,004
5,469,037
5,469,073
5,469,112
5,469,140
5,469,142
5,469,175
5,469,178
5,469,180
5,469,363
5,469,371
5,469,454
5,469,497
5,469,556
5,469,577
13 : 5,467,533
5,467,619
5,467,622
5,467,678
5,467,700
5,467,922
5,467,955
5,467,988
5,467,991
5,468,080
5,468,173
5,468,206
5,468,218
5,468,234
5,468,236
5,468,448
5,468,618
5,468,688
5,469,002
5,469,018
5,469,049
5,469,145
4,922,264
15 : 5,468,494
16 : 5,468,507
5,468,513
5,468,578
5,469,393
17 : 5,467,501
5,467,523
5,467,541
5,467,560
5,467,573
5,467,575
5,467,582
5,467,612
5,467,621
5,467,624
5,467,663
5,467,691
5,467,721
5,467,747
5,467,790
5,467,795
5,467,799
5,467,804
5,467,829
5,467,854
5,467,861
5,467,866
5,467,867
5,467,870
5,467,879
5,467,893
5,467,903
5,467,952
5,467,989
5,468,002
5,468,003

5,468,103
5,468,108
5,468,126
5,468,129
5,468,137
5,468,142
5,468,149
5,468,169
5,468,179
5,468,182
5,468,235
5,468,290
5,468,318
5,468,361
5,468,456
5,468,460
5,468,566
5,468,582
5,468,646
5,468,649
5,468,667
5,468,701
5,468,769
5,468,835
5,468,929
5,468,964
5,469,028
5,469,054
5,469,055
5,469,150
5,469,155
5,469,157
5,469,177
5,469,297
5,469,356
5,469,364
5,469,461
5,469,465
5,469,472
5,469,482
5,469,492
5,469,504
5,469,535
5,469,569
5,142,184
18 : 5,467,478
5,467,535
5,467,559
5,467,797
5,467,899
5,467,921
5,467,963
5,468,030
5,468,140
5,468,183
5,468,437
5,468,542
5,468,550
5,468,632
5,468,641
5,468,735
5,468,757
5,468,773
5,469,026
5,469,193
5,469,490
19 : 5,467,598
5,467,777
5,468,034
5,468,070
5,468,122
5,468,947
5,468,948
5,468,950
5,469,508
20 : Re.35,095
5,467,583
21 : 5,467,502
5,467,672
5,467,860
5,469,247
22 : 5,467,589
5,467,833
5,468,127
5,468,153
5,468,528
5,469,167
5,469,376
23 : 5,467,532
5,468,648
5,469,153
24 : Re.35,097
5,467,650
5,467,658
5,467,798
5,467,814
5,467,858
5,467,967
5,468,356
5,468,397
5,468,450
5,468,468
5,468,469

5,468,476
5,468,610
5,468,639
5,468,643
5,468,729
5,468,775
5,468,854
5,469,124
5,469,174
5,469,331
25 : 5,467,536
5,467,572
5,467,578
5,467,656
5,467,775
5,467,959
5,467,997
5,468,022
5,468,177
5,468,180
5,468,230
5,468,355
5,468,538
5,468,562
5,468,573
5,468,597
5,468,612
5,468,680
5,468,755
5,468,845
5,468,971
5,469,020
5,469,095
5,469,176
5,469,293
5,469,294
5,469,325
5,469,336
5,469,353
5,469,405
5,469,469
5,469,538
5,469,547
5,469,551
5,469,573
4,448,061
26 : 5,467,486
5,467,497
5,467,507
5,467,524
5,467,546
5,467,593
5,467,605
5,467,636
5,467,645
5,467,661
5,467,662
5,467,664
5,467,670
5,467,674
5,467,748
5,467,755
5,467,760
5,467,780
5,467,782
5,467,796
5,467,885
5,467,930
5,467,957
5,467,970
5,467,996
5,468,012
5,468,015
5,468,018
5,468,024
5,468,044
5,468,045
5,468,046
5,468,050
5,468,058
5,468,092
5,468,102
5,468,118
5,468,145
5,468,191
5,468,198
5,468,243
5,468,247
5,468,317
5,468,327
5,468,400
5,468,407
5,468,415
5,468,417
5,468,420
5,468,434
5,468,533
5,468,615
5,468,720
5,468,791
5,468,818
5,468,826
5,468,829

5,468,923
5,468,988
5,469,187
5,469,249
5,469,268
5,469,298
5,469,329
5,469,351
5,469,361
5,469,365
5,469,510
4,536,897
27 : 5,467,503
5,467,550
5,467,564
5,467,634
5,467,639
5,467,679
5,467,689
5,467,920
5,468,004
5,468,113
5,468,114
5,468,188
5,468,211
5,468,213
5,468,217
5,468,222
5,468,226
5,468,231
5,468,237
5,468,254
5,468,269
5,468,277
5,468,300
5,468,301
5,468,332
5,468,353
5,468,428
5,468,477
5,468,498
5,468,523
5,468,532
5,468,536
5,468,540
5,468,603
5,468,622
5,468,785
5,468,812
5,468,815
5,468,821
5,468,847
5,469,033
5,469,043
5,469,201
5,469,238
5,469,305
5,469,332
5,469,436
5,469,446
5,467,824
5,467,932
5,468,770
29 : 5,467,666
5,467,696
5,467,786
5,467,845
5,467,876
5,467,886
5,467,901
5,468,117
5,468,170
5,468,465
5,468,485
5,468,763
5,468,862
5,469,341
5,115,493
30 : 5,467,871
31 : 5,468,853
32 : 5,469,141
33 : 5,467,708
5,467,976
5,468,518
5,468,572
5,469,407
34 : 5,467,539
5,467,568
5,467,607
5,467,671
5,467,681
5,467,727
5,467,732
5,467,745
5,467,862
5,467,883
5,467,980
5,468,006
5,468,008
5,468,253
5,468,264
5,468,286
5,468,338

5,468,398
5,468,410
5,468,411
5,468,429
5,468,453
5,468,459
5,468,467
5,468,471
5,468,488
5,468,491
5,468,501
5,468,502
5,468,638
5,468,689
5,468,715
5,468,716
5,468,725
5,468,771
5,468,777
5,468,801
5,468,811
5,468,820
5,468,860
5,468,865
5,468,868
5,468,875
5,468,900
5,468,951
5,469,021
5,469,144
5,469,170
5,469,173
5,469,181
5,469,258
5,469,284
5,469,328
5,469,347
5,469,433
5,469,467
35 : 5,467,783
5,467,874
5,468,331
5,468,652
5,468,965
5,469,013
5,469,048
5,469,053
5,469,057
5,469,524
36 : 5,467,522
5,467,549
5,467,601
5,467,602
5,467,610
5,467,611
5,467,613
5,467,615
5,467,736
5,467,762
5,467,767
5,467,773
5,467,779
5,467,827
5,467,841
5,467,906
5,467,907
5,467,962
5,467,985
5,468,025
5,468,035
5,468,052
5,468,088
5,468,133
5,468,134
5,468,159
5,468,161
5,468,186
5,468,192
5,468,240
5,468,262
5,468,266
5,468,295
5,468,302
5,468,326
5,468,330
5,468,336
5,468,375
5,468,390
5,468,403
5,468,427
5,468,445
5,468,466
5,468,473
5,468,482
5,468,569
5,468,574
5,468,581
5,468,583
5,468,586
5,468,587
5,468,591
5,468,598
5,468,601

5,468,604
5,468,614
5,468,640
5,468,692
5,468,699
5,468,789
5,468,790
5,468,794
5,468,834
5,468,851
5,468,917
5,468,934
5,468,946
5,468,949
5,468,978
5,468,996
5,469,046
5,469,051
5,469,058
5,469,059
5,469,135
5,469,151
5,469,161
5,469,203
5,469,206
5,469,209
5,469,236
5,469,242
5,469,267
5,469,330
5,469,333
5,469,431
5,469,468
5,469,499
5,469,507
5,469,526
5,469,534
5,469,542
5,469,576
37 : 5,467,584
5,467,675
5,467,914
5,467,915
5,467,938
5,468,093
5,468,135
5,468,187
5,468,366
5,468,520
5,468,634
5,468,695
5,469,098
5,469,134
5,469,523
38 : 5,467,587
5,468,178
39 : 5,467,481
5,467,488
5,467,557
5,467,609
5,467,627
5,467,657
5,467,677
5,467,705
5,467,894
5,467,924
5,467,958
5,467,971
5,467,977
5,467,995
5,468,009
5,468,011
5,468,083
5,468,152
5,468,168
5,468,197
5,468,208
5,468,238
5,468,250
5,468,275
5,468,303
5,468,323
5,468,413
5,468,414
5,468,499
5,468,506
5,468,524
5,468,525
5,468,526
5,468,546
5,468,690
5,468,745
5,468,788
5,468,797
5,468,819
5,468,831
5,468,889
5,468,893
5,468,915
5,469,031
5,469,038
5,469,172
5,469,202

5,469,252
5,469,337
5,469,426
5,469,447
40 : 5,467,735
5,467,834
5,467,842
5,468,394
5,468,425
5,468,710
5,468,858
41 : 5,467,537
5,467,643
5,467,774
5,467,831
5,467,951
5,468,464
5,469,188
5,469,321
5,469,344
5,469,411
42 : 5,467,515
5,467,516
5,467,519
5,467,543
5,467,555
5,467,654
5,467,802
5,467,810
5,467,837
5,467,864
5,467,865
5,467,999
5,468,054
5,468,110
5,468,146
5,468,156
5,468,160
5,468,172
5,468,265
5,468,276
5,468,284
5,468,288
5,468,314
5,468,368
5,468,369
5,468,377
5,468,391

5,468,412
5,468,424
5,468,432
5,468,457
5,468,495
5,468,544
5,468,630
5,468,668
5,468,669
5,468,739
5,468,744
5,468,759
5,468,760
5,468,762
5,468,774
5,468,798
5,468,802
5,468,859
5,468,872
5,468,877
5,468,885
5,468,898
5,468,899
5,469,011
5,469,044
5,469,074
5,469,119
5,469,127
5,469,208
5,469,229
5,469,291
5,469,372
5,469,438
5,469,455
44 : 5,468,167
5,468,291
5,468,914
5,469,374
45 : 5,467,513
5,467,581
5,467,704
5,467,840
5,467,987
5,468,010
5,468,229
46 : 5,467,551
5,468,094

5,469,063
5,469,235
47 : 5,467,496
5,467,562
5,467,614
5,467,916
5,468,026
5,468,028
5,468,486
5,468,793
5,468,968
5,469,253
48 : 5,467,479
5,467,482
5,467,510
5,467,520
5,467,586
5,467,640
5,467,669
5,467,719
5,467,733
5,467,738
5,467,800
5,467,812
5,467,818
5,467,819
5,467,820
5,467,821
5,467,832
5,467,836
5,467,890
5,467,891
5,467,956
5,467,979
5,468,023
5,468,029
5,468,038
5,468,053
5,468,066
5,468,099
5,468,121
5,468,157
5,468,158
5,468,216
5,468,224
5,468,259
5,468,304
5,468,367

5,468,371
5,468,372
5,468,381
5,468,435
5,468,440
5,468,505
5,468,561
5,468,624
5,468,626
5,468,655
5,468,658
5,468,661
5,468,662
5,468,666
5,468,676
5,468,702
5,468,727
5,468,737
5,468,754
5,468,808
5,468,839
5,468,955
5,468,984
5,468,995
5,468,999
5,469,006
5,469,062
5,469,065
5,469,078
5,469,079
5,469,108
5,469,116
5,469,163
5,469,195
5,469,257
5,469,263
5,469,275
5,469,301
5,469,320
5,469,335
5,469,383
5,469,385
5,469,404
5,469,408
5,469,473
5,469,500
5,469,511

5,469,528
5,469,541
5,469,545
5,469,548
5,469,554
5,469,559
5,469,572
5,469,575
49 : 5,467,714
5,467,715
5,467,889
5,468,098
5,468,116
5,468,239
5,468,311
5,468,313
5,468,329
5,468,628
5,468,866
50 : 5,467,487
5,467,986
5,468,245
5,468,663
5,469,262
51 : 5,467,490
5,467,526
5,467,531
5,467,567
5,467,628
5,467,728
5,467,872
5,468,053
5,468,436
5,468,570
5,468,645
5,468,736
5,468,936
5,469,184
5,469,369
5,469,486
5,469,550
53 : 5,467,571
5,467,626
5,467,676
5,467,740
5,467,877
5,467,941
5,467,942

5,467,954
5,467,960
5,468,104
5,468,199
5,468,307
5,468,409
5,468,657
5,468,945
5,469,082
5,469,091
5,469,192
5,469,194
5,469,403
5,469,532
5,469,533
5,469,562
54 : 5,467,565
5,468,895
5,468,908
55 : 5,467,484
5,467,558
5,467,574
5,467,586
5,467,770
5,467,776
5,467,887
5,467,910
5,467,949
5,467,956
5,467,973
5,468,037
5,468,207
5,468,480
5,468,588
5,468,611
5,468,796
5,468,939
5,469,060
5,469,182
5,469,346
5,469,486
5,469,487
5,469,491

DESIGN PATENTS

04 : 364,390
05 : 364,479
06 : 364,262
364,299
364,280
364,283
364,292
364,300
364,302
364,303
364,322
364,331
364,335
364,344
364,349
364,353
364,379
364,386
364,391
364,392
364,393
364,394
364,397
364,398
364,425
364,432
364,433

364,435
364,446
364,456
364,457
364,462
364,476
364,484
364,487
08 : 364,281
09 : 364,488
10 : 364,320
12 : 364,286
364,287
364,301
364,325
364,342
364,405
364,406
364,426
364,440
364,453
364,454
13 : 364,467
16 : 364,287
17 : 364,291
364,295
364,297

364,309
364,310
364,328
364,340
364,358
364,361
364,362
364,383
364,408
364,412
364,475
364,483
18 : 364,360
24 : 364,428
25 : 364,265
364,337
364,339
364,419
364,431
364,437
364,444
364,459
364,460
26 : 364,314
364,315
364,316
364,317

364,330
364,351
364,410
364,442
364,477
27 : 364,288
364,319
364,341
364,350
364,377
364,411
364,412
364,403
364,409
364,427
364,443
364,463
364,469
28 : 364,343
31 : 364,490
34 : 364,275
364,452
364,485
36 : 364,261
364,264
364,370
364,279

364,293
364,299
364,313
364,407
364,422
364,436
364,451
364,461
364,464
364,470
364,473
364,474
364,480
364,359
364,373
364,404
364,439
364,468
364,481
364,271
364,272
364,273
364,276
364,278
364,294
364,304
364,366
364,370
364,450
364,357

41 : 364,266
364,429
42 : 364,329
364,470
364,471
364,472
364,473
364,474
364,480
48 : 364,274
364,296
364,333
364,371
364,449
364,489
49 : 364,268
364,334
364,421
364,263
364,277
364,358
364,434
364,455
53 : 364,417
364,438
56 : 364,374

PLANT PATENTS

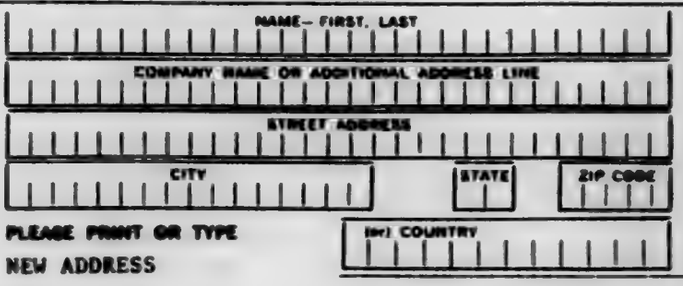
01 : 9,377
[illegible] : 9,374

9,375
9,376

9,379
9,383

51 : [illegible]

CHANGE OF ADDRESS FORM



PLEASE PRINT OR TYPE

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

Superintendent of Documents **Subscription** Order Form

Order Processing Code:
*** 5606**

❑ **YES,** enter _____ subscription(s) to **Official Gazette of the U.S. Patent and Trademark Office: Patents** (OG) for $549 per year ($686.25 foreign).

The total cost of my order is $_____. Price includes regular shipping and handling and is subject to change. International customers please add 25%.

Company or personal name (Please type or print)

Additional address/attention line

Street address

City, State, Zip code

Daytime phone including area code

Purchase order number (optional)

Charge your order. It's easy!

For privacy protection, check the box below:
❑ Do not make my name available to other mailers

Fax your orders (202) 512–2250

Check method of payment:
❑ Check payable to Superintendent of Documents
❑ GPO Deposit Account ☐☐☐☐☐☐☐–☐
❑ VISA ❑ MasterCard

Phone your orders (202) 512–1800

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐ (expiration date)

Thank you for your order!

Authorizing signature 4/95

Mail To: Superintendent of Documents
P.O. Box 371954, Pittsburgh, PA 15250–7954

Important: Please be sure to include this completed order form with your remittance.

Superintendent of Documents **Subscription** Order Form

Order Processing Code:
* 5606

❑ **YES,** enter _____ subscription(s) to **Official Gazette of the U.S. Patent and Trademark Office: Patents** (OG) for $549 per year ($686.25 foreign).

The total cost of my order is $_____. Price includes regular shipping and handling and is subject to change. International customers please add 25%.

Company or personal name (Please type or print)

Additional address/attention line

Street address

City, State, Zip code

Daytime phone including area code

Purchase order number (optional)

Charge your order. It's easy!

MasterCard

VISA

Fax your orders (202) 512–2250

For privacy protection, check the box below:
❑ Do not make my name available to other mailers

Check method of payment:
❑ Check payable to Superintendent of Documents
❑ GPO Deposit Account ☐☐☐☐☐☐☐ – ☐
❑ VISA ❑ MasterCard

Phone your orders (202) 512–1800

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐ (expiration date)

Thank you for your order!

Authorizing signature 4/95

Mail To: Superintendent of Documents
P.O. Box 371954, Pittsburgh, PA 15250–7954

Important: Please be sure to include this completed order form with your remittance.

Superintendent of Documents **Subscription** Order Form

Order Processing Code:
*** 5606**

❑ **YES,** enter _____ subscription(s) to **Official Gazette of the U.S. Patent and Trademark Office: Patents** (OG) for $549 per year ($686.25 foreign).

The total cost of my order is $_____. Price includes regular shipping and handling and is subject to change. International customers please add 25%.

Company or personal name (Please type or print)

Additional address/attention line

Street address

City, State, Zip code

Daytime phone including area code

Purchase order number (optional)

Charge your order. It's easy!

For privacy protection, check the box below:
❑ Do not make my name available to other mailers

Fax your orders (202) 512–2250

Check method of payment:
❑ Check payable to Superintendent of Documents
❑ GPO Deposit Account ☐☐☐☐☐☐☐–☐
❑ VISA ❑ MasterCard

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐ (expiration date)

Phone your orders (202) 512–1800

Thank you for your order!

Authorizing signature 4/95

Mail To: Superintendent of Documents
P.O. Box 371954, Pittsburgh, PA 15250–7954

Important: Please be sure to include this completed order form with your remittance.

Superintendent of Documents **Subscription** Order Form

Order Processing Code:
*** 5606**

❑ **YES,** enter _____ subscription(s) to **Official Gazette of the U.S. Patent and Trademark Office: Patents** (OG) for $549 per year ($686.25 foreign).

The total cost of my order is $_____. Price includes regular shipping and handling and is subject to change. International customers please add 25%.

Company or personal name (Please type or print)

Additional address/attention line

Street address

City, State, Zip code

Daytime phone including area code

Purchase order number (optional)

Charge your order. It's easy!

Fax your orders (202) 512–2250

Phone your orders (202) 512–1800

For privacy protection, check the box below:
❑ Do not make my name available to other mailers

Check method of payment:
❑ Check payable to Superintendent of Documents
❑ GPO Deposit Account ☐☐☐☐☐☐☐–☐
❑ VISA ❑ MasterCard

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐ (expiration date)

Thank you for your order!

Authorizing signature 4/95

Mail To: Superintendent of Documents
P.O. Box 371954, Pittsburgh, PA 15250–7954

Important: Please be sure to include this completed order form with your remittance.

Vol. 1180 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

November 28, 1995

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

November 28, 1995 Volume 1180 Number 4

CONTENTS

			Page
Patent and Trademark Office Notices			
Patent Cooperation Treaty (PCT) Information	1180	OG	109
Notice of Maintenance Fees Payable	1180	OG	109
Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee	1180	OG	110
Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 09/22/95	1180	OG	118
Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 09/29/95	1180	OG	118
Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 10/06/95	1180	OG	119
Reissue Applications Filed	1180	OG	119
Requests for Reexaminations Filed	1180	OG	120
Service by Publication	1180	OG	120
Registration To Practice	1180	OG	120
Adverse Decisions in Interference	1180	OG	120
Temporary Suspension of "At Cost" Services	1180	OG	121
Communications with the Patent and Trademark Office	1180	OG	122
Patent Certificates of Correction	1180	OG	126
Summary of Final Decisions Issued by the Trademark Trial and Appeal Board	1180	OG	127
Provisional Applications for Patent Meet Paris Convention Requirements as Foreign Priority Documents	1180	OG	131
Special Boxes for Mail	1180	OG	135
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1180	OG	137
Patent Examining Corps	1180	OG	139
Condition of Trademark Applications	1180	OG	140
Reexaminations			2135
Reissue Patents Granted (35,098)			2137
Plant Patents Granted (9,384)			2141
Patents Granted			
General and Mechanical (5,469,578)			2143
Chemical (5,470,355)			2415
Electrical (5,471,006)			2613
Design Patents Granted (364,491)			2851
Index of Patentees		PI	1
Indices of Reissue, Reexaminations, Design and Plant Patents		PI	97
Classification of			
Patents (Including Reissues and Reexaminations)		PI	105
Designs and Plants Applications		PI	109
Geographical Index of Residence of Inventors			
Patents (Including Reissues and Reexaminations)		PI	111
Designs and Plant Applications		PI	113
Change of Address Form		PI	115
Subscription Order Form		PI	117

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402, to whom all subscriptions should be made payable and all communications addressed. VISA or MasterCard may be used for telephone orders, (202)-512-1800.

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly. Stock No. 703-033-00000-8
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly. Stock No. 703-034-00000-4
PATENT AND TRADEMARK OFFICE NOTICES, issued weekly. Stock No. 703-035-00000-1
GENERAL INFORMATION concerning PATENTS. Stock No. 003-004-00661-7

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $3.00 each; PLANT PATENTS in color, $12.00 each; copies of TRADEMARKS at $3.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S.P.T.O.

For sale by the U.S. Government Printing Office
Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402–9328

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1178 O.G. 29, on September 12, 1995.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective June 20, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1174 O.G. 57, on May 9, 1995.

International fees were changed, effective on January 1, 1995, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1168 O.G. 99, on November 29, 1994.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective October 1, 1995, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	660.00
—Corresponding prior U.S. national application filed	430.00
—Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1722.00
International fees	
Basic fee	604.00
Basic Supplemental fee (for each page over 30)	12.00
Designation fee per country or region	
—For the first 10 national or regional offices designated	147.00
—For each designation in excess of 10 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
—Designation fee	147.00
—Confirmation fee	73.50
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	185.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—USPTO was ISA in PCT Chapter I	470.00
—Additional examination fee, per additional invention (payable only upon invitation)	140.00
—USPTO was not ISA in PCT Chapter I	710.00
—Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
—All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
—All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
—Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
—Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
—For each independent claim in excess of 3	39.00	78.00
—For each claim in excess of 20	11.00	22.00
—For each application containing a multiple dependent claim	125.00	250.00
—Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l)	65.00	130.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(l)	130.00	130.00

Sept. 11, 1995

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on November 24, 1992 for which maintenance fees due at 3 years

and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,165,110 through 5,167,035
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 22, 1988 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,782,476 through 4,787,098
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 20, 1984 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,483,019 through 4,484,358
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED September 20, 1995
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,543	06/876,680	11/10/87
(4,405,886)	(06/238,076)	(09/20/83)
Re. 33,284	07/126,907	07/31/90
(4,694,053)	(06/483,433)	(09/15/87)
Re. 33,562	06/777,540	04/02/91
(4,405,336)	(06/288,418)	(09/20/83)
4,404,693	06/221,255	09/20/83
4,404,703	06/373,710	09/20/83
4,404,704	06/325,694	09/20/83
4,404,709	06/271,246	09/20/83
4,404,710	06/268,326	09/20/83
4,404,712	06/315,725	09/20/83
4,404,718	06/245,121	09/20/83
4,404,724	06/242,121	09/20/83
4,404,727	06/237,750	09/20/83
4,404,735	06/263,280	09/20/83
4,404,741	06/309,907	09/20/83
4,404,745	06/238,600	09/20/83
4,404,747	06/287,917	09/20/83
4,404,749	06/290,685	09/20/83
4,404,755	06/296,021	09/20/83
4,404,759	06/296,772	09/20/83
4,404,774	06/299,162	09/20/83
4,404,776	06/226,755	09/20/83
4,404,778	06/254,130	09/20/83
4,404,784	06/320,186	09/20/83
4,404,791	06/285,722	09/20/83
4,404,792	06/349,541	09/20/83
4,404,794	06/230,945	09/20/83
4,404,802	06/302,102	09/20/83
4,404,804	06/223,165	09/20/83
4,404,807	06/334,846	09/20/83
4,404,813	06/255,672	09/20/83
4,404,814	06/316,695	09/20/83
4,404,815	06/323,799	09/20/83
4,404,825	06/263,036	09/20/83
4,404,827	06/282,255	09/20/83
4,404,836	06/327,802	09/20/83
4,404,841	06/344,518	09/20/83
4,404,843	06/284,756	09/20/83
4,404,851	06/266,792	09/20/83
4,404,860	06/228,525	09/20/83
4,404,865	06/347,469	09/20/83
4,404,870	06/274,786	09/20/83
4,404,874	06/232,781	09/20/83
4,404,877	06/309,975	09/20/83
4,404,905	06/395,141	09/20/83
4,404,907	06/260,687	09/20/83
4,404,908	06/390,276	09/20/83
4,404,913	06/309,244	09/20/83
4,404,917	06/276,377	09/20/83
4,404,918	06/301,730	09/20/83
4,404,926	06/309,577	09/20/83
4,404,928	06/356,548	09/20/83
4,404,932	06/392,697	09/20/83

Patent Number	Serial Number	Issue Date
4,404,933	06/297,994	09/20/83
4,404,936	06/225,658	09/20/83
4,404,938	06/322,234	09/20/83
4,404,941	06/241,721	09/20/83
4,404,950	06/347,382	09/20/83
4,404,954	06/228,717	09/20/83
4,404,962	06/347,709	09/20/83
4,404,978	06/356,773	09/20/83
4,404,985	06/309,741	09/20/83
4,405,004	06/293,430	09/20/83
4,405,006	06/334,657	09/20/83
4,405,016	06/278,359	09/20/83
4,405,017	06/308,688	09/20/83
4,405,023	06/350,834	09/20/83
4,405,024	06/293,631	09/20/83
4,405,039	06/290,058	09/20/83
4,405,046	06/438,318	09/20/83
4,405,047	06/285,318	09/20/83
4,405,053	06/258,191	09/20/83
4,405,054	06/358,094	09/20/83
4,405,055	06/217,815	09/20/83
4,405,056	06/378,985	09/20/83
4,405,058	06/234,452	09/20/83
4,405,063	06/239,173	09/20/83
4,405,068	06/277,229	09/20/83
4,405,074	06/297,867	09/20/83
4,405,075	06/262,170	09/20/83
4,405,080	06/440,689	09/20/83
4,405,082	06/288,845	09/20/83
4,405,083	06/359,899	09/20/83
4,405,085	06/257,621	09/20/83
4,405,089	06/425,431	09/20/83
4,405,093	06/287,820	09/20/83
4,405,094	06/250,318	09/20/83
4,405,096	06/253,507	09/20/83
4,405,105	06/250,931	09/20/83
4,405,112	06/367,108	09/20/83
4,405,124	06/331,784	09/20/83
4,405,125	06/301,719	09/20/83
4,405,130	06/256,706	09/20/83
4,405,137	06/437,563	09/20/83
4,405,143	06/303,393	09/20/83
4,405,144	06/369,917	09/20/83
4,405,145	06/279,013	09/20/83
4,405,147	06/275,504	09/20/83
4,405,151	06/243,920	09/20/83
4,405,155	06/273,049	09/20/83
4,405,173	06/263,135	09/20/83
4,405,176	06/243,819	09/20/83
4,405,180	06/358,298	09/20/83
4,405,185	06/332,843	09/20/83
4,405,188	06/251,580	09/20/83
4,405,189	06/292,565	09/20/83
4,405,194	06/310,669	09/20/83
4,405,198	06/295,989	09/20/83
4,405,199	06/233,532	09/20/83
4,405,207	06/224,348	09/20/83
4,405,215	06/318,001	09/20/83
4,405,228	06/273,471	09/20/83
4,405,230	06/267,940	09/20/83
4,405,232	06/298,830	09/20/83
4,405,234	06/289,813	09/20/83
4,405,237	06/231,636	09/20/83
4,405,245	06/286,483	09/20/83
4,405,251	06/339,872	09/20/83
4,405,252	06/349,581	09/20/83
4,405,253	06/237,166	09/20/83
4,405,257	06/227,105	09/20/83
4,405,268	06/220,979	09/20/83
4,405,271	06/285,099	09/20/83
4,405,274	06/343,080	09/20/83
4,405,291	06/456,366	09/20/83
4,405,296	06/427,900	09/20/83
4,405,299	06/286,500	09/20/83
4,405,300	06/238,976	09/20/83
4,405,305	06/235,185	09/20/83
4,405,308	06/334,029	09/20/83
4,405,310	06/315,383	09/20/83
4,405,319	06/303,348	09/20/83
4,405,321	06/352,805	09/20/83
4,405,324	06/295,768	09/20/83
4,405,331	06/371,218	09/20/83
4,405,333	06/423,606	09/20/83
4,405,334	06/424,053	09/20/83
4,405,335	06/424,054	09/20/83
4,405,342	06/351,679	09/20/83
4,405,361	06/455,180	09/20/83
4,405,363	06/367,796	09/20/83
4,405,371	06/279,191	09/20/83
4,405,377	06/347,661	09/20/83
4,405,378	06/306,262	09/20/83
4,405,381	06/296,637	09/20/83
4,405,382	06/406,218	09/20/83
4,405,387	06/402,230	09/20/83
4,405,389	06/435,699	09/20/83
4,405,394	06/341,618	09/20/83
4,405,399	06/307,271	09/20/83
4,405,406	06/386,826	09/20/83
4,405,408	06/346,056	09/20/83
4,405,413	06/379,833	09/20/83
4,405,414	06/328,135	09/20/83
4,405,426	06/369,612	09/20/83
4,405,430	06/243,557	09/20/83
4,405,431	06/285,335	09/20/83
4,405,437	06/338,259	09/20/83
4,405,438	06/336,262	09/20/83
4,405,439	06/243,484	09/20/83
4,405,440	06/443,369	09/20/83
4,405,441	06/429,780	09/20/83
4,405,445	06/295,335	09/20/83
4,405,447	06/358,074	09/20/83
4,405,448	06/364,060	09/20/83
4,405,449	06/373,593	09/20/83
4,405,450	06/300,632	09/20/83
4,405,451	06/313,160	09/20/83
4,405,455	06/337,522	09/20/83
4,405,457	06/319,141	09/20/83
4,405,459	06/344,680	09/20/83
4,405,464	06/297,634	09/20/83
4,405,467	06/288,410	09/20/83
4,405,468	06/243,032	09/20/83
4,405,472	06/443,773	09/20/83
4,405,473	06/443,774	09/20/83
4,405,475	06/443,776	09/20/83
4,405,477	06/443,780	09/20/83
4,405,484	06/291,073	09/20/83
4,405,486	06/380,164	09/20/83
4,405,489	06/225,389	09/20/83
4,405,490	06/249,253	09/20/83
4,405,496	06/450,945	09/20/83
4,405,502	06/281,828	09/20/83
4,405,504	06/281,839	09/20/83
4,405,513	06/388,853	09/20/83
4,405,519	06/353,861	09/20/83
4,405,520	06/353,864	09/20/83
4,405,521	06/353,868	09/20/83
4,405,523	06/361,398	09/20/83
4,405,525	06/413,578	09/20/83
4,405,527	06/397,652	09/20/83
4,405,529	06/420,170	09/20/83
4,405,530	06/321,505	09/20/83
4,405,532	06/307,405	09/20/83
4,405,533	06/385,437	09/20/83
4,405,535	06/316,004	09/20/83
4,405,537	06/260,418	09/20/83
4,405,545	06/342,847	09/20/83
4,405,549	06/283,070	09/20/83
4,405,550	06/255,028	09/20/83
4,405,552	06/264,494	09/20/83
4,405,574	06/307,827	09/20/83
4,405,577	06/321,103	09/20/83
4,405,581	06/339,901	09/20/83
4,405,584	06/344,987	09/20/83
4,405,588	06/333,256	09/20/83
4,405,589	06/439,436	09/20/83
4,405,594	06/304,131	09/20/83

Patent Number	Serial Number	Issue Date
4,405,595	06/339,697	09/20/83
4,405,602	06/305,629	09/20/83
4,405,606	06/260,144	09/20/83
4,405,609	06/443,791	09/20/83
4,405,611	06/331,989	09/20/83
4,405,612	06/267,579	09/20/83
4,405,615	06/330,472	09/20/83
4,405,617	06/230,675	09/20/83
4,405,624	06/326,877	09/20/83
4,405,630	06/398,532	09/20/83
4,405,631	06/410,155	09/20/83
4,405,633	06/353,307	09/20/83
4,405,636	06/296,164	09/20/83
4,405,645	06/249,666	09/20/83
4,405,647	06/273,361	09/20/83
4,405,652	06/341,363	09/20/83
4,405,653	06/287,858	09/20/83
4,405,654	06/371,995	09/20/83
4,405,655	06/371,093	09/20/83
4,405,662	06/423,407	09/20/83
4,405,663	06/363,069	09/20/83
4,405,664	06/334,600	09/20/83
4,405,676	06/263,048	09/20/83
4,405,677	06/306,125	09/20/83
4,405,683	06/240,911	09/20/83
4,405,684	06/441,469	09/20/83
4,405,694	06/333,093	09/20/83
4,405,695	06/273,086	09/20/83
4,405,704	06/382,047	09/20/83
4,405,705	06/286,825	09/20/83
4,405,708	06/355,977	09/20/83
4,405,711	06/298,812	09/20/83
4,405,715	06/290,804	09/20/83
4,405,716	06/371,087	09/20/83
4,405,718	06/284,556	09/20/83
4,405,719	06/268,050	09/20/83
4,405,727	06/296,032	09/20/83
4,405,728	06/339,563	09/20/83
4,405,730	06/390,879	09/20/83
4,405,731	06/339,012	09/20/83
4,405,733	06/289,594	09/20/83
4,405,734	06/414,812	09/20/83
4,405,736	06/271,888	09/20/83
4,405,737	06/346,424	09/20/83
4,405,739	06/322,225	09/20/83
4,405,741	06/420,569	09/20/83
4,405,745	06/422,786	09/20/83
4,405,749	06/385,165	09/20/83
4,405,753	06/345,286	09/20/83
4,405,754	06/339,251	09/20/83
4,405,760	06/334,910	09/20/83
4,405,763	06/349,219	09/20/83
4,405,767	06/391,067	09/20/83
4,405,768	06/422,780	09/20/83
4,405,781	06/238,055	09/20/83
4,405,786	06/353,863	09/20/83
4,405,792	06/300,046	09/20/83
4,405,794	06/332,290	09/20/83
4,405,798	06/248,183	09/20/83
4,405,799	06/291,740	09/20/83
4,405,806	06/370,009	09/20/83
4,405,809	06/327,606	09/20/83
4,405,810	06/388,060	09/20/83
4,405,811	06/339,881	09/20/83
4,405,817	06/258,979	09/20/83
4,405,819	06/374,212	09/20/83
4,405,820	06/354,389	09/20/83
4,405,821	06/291,749	09/20/83
4,405,822	06/316,580	09/20/83
4,405,825	06/316,893	09/20/83
4,405,828	06/363,848	09/20/83
4,405,838	06/273,400	09/20/83
4,405,841	06/401,075	09/20/83
4,405,842	06/314,956	09/20/83
4,405,847	06/330,808	09/20/83
4,405,852	06/248,724	09/20/83
4,405,854	06/389,985	09/20/83
4,405,855	06/224,526	09/20/83
4,405,858	06/276,373	09/20/83
4,405,863	06/312,557	09/20/83
4,405,865	06/296,549	09/20/83
4,405,866	06/310,290	09/20/83
4,405,869	06/412,178	09/20/83
4,405,876	06/250,275	09/20/83
4,405,883	06/287,985	09/20/83
4,405,887	06/310,362	09/20/83
4,405,891	06/282,497	09/20/83
4,405,894	06/313,265	09/20/83
4,405,895	06/272,489	09/20/83
4,405,900	06/252,483	09/20/83
4,405,902	06/256,364	09/20/83
4,405,903	06/248,659	09/20/83
4,405,907	06/314,848	09/20/83
4,405,911	06/304,904	09/20/83
4,405,920	06/221,849	09/20/83
4,405,925	06/246,693	09/20/83
4,405,929	06/277,999	09/20/83
4,405,931	06/348,143	09/20/83
4,405,935	06/227,679	09/20/83
4,405,936	06/288,231	09/20/83
4,405,949	06/360,741	09/20/83
4,405,951	06/217,304	09/20/83
4,405,956	06/256,334	09/20/83
4,405,962	06/300,961	09/20/83
4,405,964	06/363,184	09/20/83
4,405,968	06/377,587	09/20/83
4,405,972	06/356,083	09/20/83
4,405,975	06/316,158	09/20/83
4,405,988	06/241,472	09/20/83
4,405,993	06/221,880	09/20/83
4,406,003	06/284,868	09/20/83
4,406,005	06/219,547	09/20/83
4,406,019	06/322,107	09/20/83
4,406,020	06/288,229	09/20/83
4,692,950	06/796,987	09/15/87
4,692,954	06/902,579	09/15/87
4,692,957	06/839,204	09/15/87
4,692,965	06/912,988	09/15/87
4,692,966	06/895,005	09/15/87
4,692,969	06/901,515	09/15/87
4,692,971	06/924,765	09/15/87
4,692,972	06/766,926	09/15/87
4,692,974	06/798,828	09/15/87
4,692,977	06/877,538	09/15/87
4,692,979	06/771,630	09/15/87
4,692,984	06/918,623	09/15/87
4,692,988	06/897,804	09/15/87
4,692,989	06/881,115	09/15/87
4,692,990	06/739,741	09/15/87
4,692,995	06/822,028	09/15/87
4,692,998	06/693,477	09/15/87
4,693,000	06/796,595	09/15/87
4,693,001	06/901,306	09/15/87
4,693,002	06/913,566	09/15/87
4,693,003	06/908,079	09/15/87
4,693,008	06/731,317	09/15/87
4,693,011	06/888,684	09/15/87
4,693,012	06/755,685	09/15/87
4,693,013	06/876,379	09/15/87
4,693,014	06/910,787	09/15/87
4,693,015	06/769,388	09/15/87
4,693,018	06/831,304	09/15/87
4,693,020	06/883,383	09/15/87
4,693,025	06/894,392	09/15/87
4,693,038	06/848,728	09/15/87
4,693,042	06/920,751	09/15/87
4,693,045	06/760,380	09/15/87
4,693,051	06/930,540	09/15/87
4,693,052	06/942,645	09/15/87
4,693,057	06/934,251	09/15/87
4,693,058	06/887,559	09/15/87
4,693,063	06/897,329	09/15/87
4,693,064	06/938,694	09/15/87
4,693,065	06/826,815	09/15/87
4,693,066	06/866,059	09/15/87
4,693,073	06/866,741	09/15/87

Patent Number	Serial Number	Issue Date
4,693,078	06/807,435	09/15/87
4,693,079	06/928,019	09/15/87
4,693,080	06/777,366	09/15/87
4,693,082	06/818,459	09/15/87
4,693,087	06/844,583	09/15/87
4,693,089	06/844,545	09/15/87
4,693,091	06/864,354	09/15/87
4,693,092	06/775,256	09/15/87
4,693,097	06/271,978	09/15/87
4,693,102	06/795,175	09/15/87
4,693,104	06/721,172	09/15/87
4,693,105	06/699,041	09/15/87
4,693,109	06/836,045	09/15/87
4,693,110	06/741,869	09/15/87
4,693,112	06/873,386	09/15/87
4,693,117	06/775,804	09/15/87
4,693,118	06/856,007	09/15/87
4,693,119	06/819,947	09/15/87
4,693,120	06/877,485	09/15/87
4,693,122	06/830,226	09/15/87
4,693,125	06/785,579	09/15/87
4,693,141	07/004,241	09/15/87
4,693,143	06/820,155	09/15/87
4,693,146	06/946,585	09/15/87
4,693,147	06/810,599	09/15/87
4,693,148	06/876,833	09/15/87
4,693,156	06/761,859	09/15/87
4,693,159	06/739,363	09/15/87
4,693,161	06/852,536	09/15/87
4,693,167	06/715,322	09/15/87
4,693,168	06/916,537	09/15/87
4,693,171	06/785,874	09/15/87
4,693,172	06/807,473	09/15/87
4,693,176	06/839,366	09/15/87
4,693,182	06/755,862	09/15/87
4,693,183	06/808,123	09/15/87
4,693,196	06/810,648	09/15/87
4,693,197	06/868,794	09/15/87
4,693,199	06/804,342	09/15/87
4,693,203	06/693,590	09/15/87
4,693,206	06/861,521	09/15/87
4,693,214	06/877,937	09/15/87
4,693,219	06/598,943	09/15/87
4,693,225	06/835,109	09/15/87
4,693,233	06/847,927	09/15/87
4,693,235	06/800,381	09/15/87
4,693,236	06/834,515	09/15/87
4,693,238	06/772,246	09/15/87
4,693,239	06/820,037	09/15/87
4,693,243	06/844,110	09/15/87
4,693,246	06/720,505	09/15/87
4,693,251	06/804,160	09/15/87
4,693,252	06/821,347	09/15/87
4,693,253	06/246,528	09/15/87
4,693,255	06/726,015	09/15/87
4,693,257	06/862,263	09/15/87
4,693,262	06/836,527	09/15/87
4,693,264	06/873,989	09/15/87
4,693,265	06/864,363	09/15/87
4,693,267	06/846,286	09/15/87
4,693,274	06/863,001	09/15/87
4,693,276	06/906,067	09/15/87
4,693,281	06/778,696	09/15/87
4,693,285	06/907,384	09/15/87
4,693,287	06/887,807	09/15/87
4,693,288	06/918,158	09/15/87
4,693,289	06/769,160	09/15/87
4,693,291	06/816,640	09/15/87
4,693,295	06/881,031	09/15/87
4,693,296	06/795,837	09/15/87
4,693,298	06/939,325	09/15/87
4,693,299	06/871,005	09/15/87
4,693,300	06/892,851	09/15/87
4,693,302	06/797,734	09/15/87
4,693,304	06/866,876	09/15/87
4,693,306	06/834,211	09/15/87
4,693,308	06/810,635	09/15/87
4,693,310	06/939,985	09/15/87
4,693,315	06/904,694	09/15/87
4,693,321	06/799,070	09/15/87
4,693,323	06/830,201	09/15/87
4,693,331	06/855,146	09/15/87
4,693,332	06/767,508	09/15/87
4,693,343	06/744,055	09/15/87
4,693,348	06/856,765	09/15/87
4,693,351	06/877,138	09/15/87
4,693,354	06/822,987	09/15/87
4,693,358	06/835,943	09/15/87
4,693,363	06/791,448	09/15/87
4,693,364	06/910,502	09/15/87
4,693,374	06/801,145	09/15/87
4,693,381	06/801,356	09/15/87
4,693,382	06/892,858	09/15/87
4,693,383	06/722,621	09/15/87
4,693,387	06/872,829	09/15/87
4,693,388	06/874,442	09/15/87
4,693,389	06/823,905	09/15/87
4,693,392	06/907,483	09/15/87
4,693,398	06/275,728	09/15/87
4,693,401	06/759,638	09/15/87
4,693,405	06/699,379	09/15/87
4,693,406	06/850,052	09/15/87
4,693,410	06/809,059	09/15/87
4,693,421	06/851,349	09/15/87
4,693,423	06/832,598	09/15/87
4,693,424	06/889,259	09/15/87
4,693,429	06/798,071	09/15/87
4,693,430	06/912,765	09/15/87
4,693,436	06/898,154	09/15/87
4,693,443	06/703,293	09/15/87
4,693,445	06/892,121	09/15/87
4,693,446	06/778,321	09/15/87
4,693,447	06/908,003	09/15/87
4,693,450	06/871,706	09/15/87
4,693,453	06/864,544	09/15/87
4,693,464	06/800,384	09/15/87
4,693,471	06/768,519	09/15/87
4,693,472	06/705,335	09/15/87
4,693,473	06/796,893	09/15/87
4,693,476	06/873,097	09/15/87
4,693,479	06/858,570	09/15/87
4,693,482	06/777,613	09/15/87
4,693,483	06/692,700	09/15/87
4,693,484	06/848,919	09/15/87
4,693,488	06/775,121	09/15/87
4,693,493	06/921,251	09/15/87
4,693,495	06/817,979	09/15/87
4,693,500	06/908,965	09/15/87
4,693,506	06/860,078	09/15/87
4,693,511	06/904,417	09/15/87
4,693,513	07/006,775	09/15/87
4,693,520	06/831,503	09/15/87
4,693,523	06/939,233	09/15/87
4,693,525	06/831,986	09/15/87
4,693,537	06/882,530	09/15/87
4,693,540	06/588,807	09/15/87
4,693,544	06/558,507	09/15/87
4,693,545	06/646,723	09/15/87
4,693,546	06/831,902	09/15/87
4,693,547	06/831,910	09/15/87
4,693,552	06/520,152	09/15/87
4,693,553	06/705,634	09/15/87
4,693,556	06/741,144	09/15/87
4,693,558	06/713,684	09/15/87
4,693,561	06/812,603	09/15/87
4,693,562	06/805,787	09/15/87
4,693,565	06/856,822	09/15/87
4,693,567	06/524,036	09/15/87
4,693,570	06/857,733	09/15/87
4,693,575	06/855,175	09/15/87
4,693,600	06/922,797	09/15/87
4,693,601	06/861,017	09/15/87
4,693,606	06/784,258	09/15/87
4,693,607	06/862,126	09/15/87
4,693,610	06/804,634	09/15/87
4,693,611	06/760,121	09/15/87

Patent Number	Serial Number	Issue Date
4,693,613	06/824,743	09/15/87
4,693,614	06/861,110	09/15/87
4,693,617	06/885,080	09/15/87
4,693,619	06/790,502	09/15/87
4,693,620	06/771,888	09/15/87
4,693,622	06/807,896	09/15/87
4,693,626	06/920,255	09/15/87
4,693,638	06/854,504	09/15/87
4,693,639	06/878,160	09/15/87
4,693,640	06/893,568	09/15/87
4,693,645	06/880,274	09/15/87
4,693,646	06/829,923	09/15/87
4,693,653	06/834,273	09/15/87
4,693,657	06/846,199	09/15/87
4,693,658	06/746,127	09/15/87
4,693,659	06/743,530	09/15/87
4,693,661	06/910,267	09/15/87
4,693,665	06/598,519	09/15/87
4,693,666	06/892,890	09/15/87
4,693,668	06/865,358	09/15/87
4,693,669	06/717,652	09/15/87
4,693,670	06/824,281	09/15/87
4,693,671	06/901,891	09/15/87
4,693,673	06/647,393	09/15/87
4,693,675	06/819,529	09/15/87
4,693,678	06/819,039	09/15/87
4,693,688	06/885,065	09/15/87
4,693,689	06/846,468	09/15/87
4,693,690	06/837,958	09/15/87
4,693,691	06/759,407	09/15/87
4,693,693	06/783,357	09/15/87
4,693,695	06/846,055	09/15/87
4,693,697	06/804,416	09/15/87
4,693,700	06/883,147	09/15/87
4,693,702	06/892,262	09/15/87
4,693,704	06/824,316	09/15/87
4,693,719	06/701,771	09/15/87
4,693,732	07/016,229	09/15/87
4,693,739	06/746,118	09/15/87
4,693,742	06/563,346	09/15/87
4,693,743	06/863,606	09/15/87
4,693,744	06/858,760	09/15/87
4,693,755	06/871,454	09/15/87
4,693,756	06/749,004	09/15/87
4,693,763	06/945,892	09/15/87
4,693,764	06/909,362	09/15/87
4,693,768	06/765,913	09/15/87
4,693,784	06/851,480	09/15/87
4,693,785	06/779,443	09/15/87
4,693,786	06/751,279	09/15/87
4,693,790	06/805,297	09/15/87
4,693,793	06/905,398	09/15/87
4,693,796	06/792,629	09/15/87
4,693,803	06/716,655	09/15/87
4,693,809	06/839,319	09/15/87
4,693,817	06/743,332	09/15/87
4,693,822	06/703,355	09/15/87
4,693,826	06/830,037	09/15/87
4,693,834	06/857,914	09/15/87
4,693,835	06/767,746	09/15/87
4,693,836	06/856,406	09/15/87
4,693,837	06/937,769	09/15/87
4,693,844	06/801,098	09/15/87
4,693,846	06/861,171	09/15/87
4,693,847	06/931,552	09/15/87
4,693,848	06/847,196	09/15/87
4,693,853	06/879,326	09/15/87
4,693,854	06/915,695	09/15/87
4,693,855	06/906,289	09/15/87
4,693,856	06/725,952	09/15/87
4,693,857	06/716,212	09/15/87
4,693,862	06/626,846	09/15/87
4,693,864	06/804,874	09/15/87
4,693,870	06/746,122	09/15/87
4,693,874	06/715,168	09/15/87
4,693,878	06/919,017	09/15/87
4,693,881	06/755,840	09/15/87
4,693,886	06/725,840	09/15/87
4,693,887	06/606,794	09/15/87
4,693,890	06/879,426	09/15/87
4,693,894	06/819,440	09/15/87
4,693,897	06/846,834	09/15/87
4,693,899	06/736,800	09/15/87
4,693,901	06/807,524	09/15/87
4,693,903	06/588,127	09/15/87
4,693,904	06/576,175	09/15/87
4,693,905	06/746,608	09/15/87
4,693,908	06/766,623	09/15/87
4,693,909	06/843,306	09/15/87
4,693,910	06/724,319	09/15/87
4,693,911	06/846,739	09/15/87
4,693,912	06/706,495	09/15/87
4,693,914	06/859,952	09/15/87
4,693,933	06/547,338	09/15/87
4,693,938	06/927,995	09/15/87
4,693,941	06/762,874	09/15/87
4,693,942	06/816,834	09/15/87
4,693,946	06/838,484	09/15/87
4,693,947	06/854,363	09/15/87
4,693,952	06/736,705	09/15/87
4,693,955	06/712,731	09/15/87
4,693,957	06/711,786	09/15/87
4,693,966	06/474,618	09/15/87
4,693,968	06/643,281	09/15/87
4,693,969	06/607,025	09/15/87
4,693,970	06/747,497	09/15/87
4,693,983	06/937,063	09/15/87
4,693,984	06/925,452	09/15/87
4,693,992	06/769,066	09/15/87
4,693,995	06/701,695	09/15/87
4,693,996	06/812,876	09/15/87
4,694,000	06/679,000	09/15/87
4,694,001	06/674,710	09/15/87
4,694,004	06/746,510	09/15/87
4,694,006	06/711,583	09/15/87
4,694,007	06/865,055	09/15/87
4,694,008	06/765,766	09/15/87
4,694,010	06/766,838	09/15/87
4,694,013	06/910,942	09/15/87
4,694,017	06/610,574	09/15/87
4,694,019	06/765,539	09/15/87
4,694,020	06/921,718	09/15/87
4,694,022	06/946,345	09/15/87
4,694,023	06/710,768	09/15/87
4,694,028	06/859,670	09/15/87
4,694,032	06/795,778	09/15/87
4,694,036	06/507,174	09/15/87
4,694,038	06/920,628	09/15/87
4,694,041	06/896,661	09/15/87
4,694,042	06/696,790	09/15/87
4,694,043	06/835,333	09/15/87
4,694,048	06/854,274	09/15/87
4,694,050	06/787,593	09/15/87
4,694,060	06/860,038	09/15/87
4,694,061	06/657,870	09/15/87
4,694,065	06/815,648	09/15/87
4,694,066	06/822,092	09/15/87
4,694,067	06/755,586	09/15/87
4,694,071	06/619,155	09/15/87
4,694,072	06/634,881	09/15/87
4,694,075	06/820,018	09/15/87
4,694,077	06/902,625	09/15/87
4,694,081	06/778,817	09/15/87
4,694,082	06/778,818	09/15/87
4,694,087	06/910,116	09/15/87
4,694,088	06/807,037	09/15/87
4,694,090	06/679,455	09/15/87
4,694,096	06/823,230	09/15/87
4,694,101	06/844,958	09/15/87
4,694,104	06/406,755	09/15/87
4,694,108	06/891,838	09/15/87
4,694,110	06/861,414	09/15/87
4,694,111	06/883,675	09/15/87
4,694,113	06/870,462	09/15/87
4,694,117	06/858,173	09/15/87
4,694,122	06/835,978	09/15/87

Patent Number	Serial Number	Issue Date
4,694,129	06/868,367	09/15/87
4,694,131	06/738,968	09/15/87
4,694,135	06/883,934	09/15/87
4,694,139	06/802,762	09/15/87
4,694,144	06/755,729	09/15/87
4,694,145	06/701,907	09/15/87
4,694,151	06/745,777	09/15/87
4,694,155	06/757,881	09/15/87
4,694,161	06/794,528	09/15/87
4,694,166	06/738,419	09/15/87
4,694,168	06/706,013	09/15/87
4,694,169	06/783,530	09/15/87
4,694,173	06/785,725	09/15/87
4,694,174	06/782,516	09/15/87
4,694,177	06/793,860	09/15/87
4,694,179	06/866,893	09/15/87
4,694,181	06/882,391	09/15/87
4,694,187	06/818,466	09/15/87
4,694,193	06/847,108	09/15/87
4,694,213	06/933,485	09/15/87
4,694,215	06/771,986	09/15/87
4,694,218	06/817,867	09/15/87
4,694,221	06/886,385	09/15/87
4,694,230	06/838,748	09/15/87
4,694,233	06/902,659	09/15/87
4,694,236	06/705,665	09/15/87
4,694,237	06/883,062	09/15/87
4,694,243	06/868,224	09/15/87
4,694,248	06/574,773	09/15/87
4,694,252	06/824,784	09/15/87
4,694,260	06/823,862	09/15/87
4,694,264	06/836,776	09/15/87
4,694,269	06/638,876	09/15/87
4,694,271	06/850,675	09/15/87
4,694,273	06/790,827	09/15/87
4,694,279	06/920,123	09/15/87
4,694,282	06/716,694	09/15/87
4,694,284	06/851,830	09/15/87
4,694,287	06/658,049	09/15/87
4,694,289	06/634,156	09/15/87
4,694,291	06/826,648	09/15/87
4,694,293	06/776,689	09/15/87
4,694,294	06/753,595	09/15/87
4,694,297	06/703,236	09/15/87
4,694,299	06/722,542	09/15/87
4,694,301	06/812,528	09/15/87
4,694,303	06/824,925	09/15/87
4,694,304	06/896,090	09/15/87
4,694,318	06/678,226	09/15/87
4,694,319	06/612,668	09/15/87
4,694,323	06/849,834	09/15/87
4,694,334	06/813,011	09/15/87
4,694,338	06/856,622	09/15/87
4,694,340	06/864,783	09/15/87
4,694,342	06/858,337	09/15/87
4,694,347	06/868,715	09/15/87
4,694,355	06/776,231	09/15/87
4,694,356	06/776,236	09/15/87
4,694,357	06/726,409	09/15/87
4,694,358	06/792,148	09/15/87
4,694,363	06/795,770	09/15/87
4,694,364	06/719,998	09/15/87
4,694,365	06/806,671	09/15/87
4,694,368	06/817,621	09/15/87
4,694,372	06/744,297	09/15/87
4,694,373	06/827,440	09/15/87
4,694,375	06/360,264	09/15/87
4,694,383	06/907,581	09/15/87
4,694,385	06/890,593	09/15/87
4,694,387	07/001,610	09/15/87
4,694,388	06/892,602	09/15/87
4,694,389	06/878,938	09/15/87
4,694,390	06/750,617	09/15/87
4,694,394	06/786,376	09/15/87
4,694,398	06/654,323	09/15/87
4,694,416	06/705,290	09/15/87
4,694,419	06/658,025	09/15/87
4,694,431	06/779,013	09/15/87
4,694,438	06/729,508	09/15/87
4,694,449	06/751,418	09/15/87
4,694,454	06/759,954	09/15/87
4,694,462	06/808,863	09/15/87
4,694,465	06/833,599	09/15/87
4,694,474	06/875,554	09/15/87
4,694,483	06/869,408	09/15/87
4,694,486	06/580,827	09/15/87
4,694,492	06/670,471	09/15/87
4,694,494	06/610,565	09/15/87
5,048,126	07/415,658	09/17/91
5,048,129	07/627,457	09/17/91
5,048,130	07/553,638	09/17/91
5,048,131	07/587,212	09/17/91
5,048,134	07/511,682	09/17/91
5,048,138	07/600,561	09/17/91
5,048,140	07/653,368	09/17/91
5,048,142	07/509,303	09/17/91
5,048,149	07/372,437	09/17/91
5,048,155	07/405,537	09/17/91
5,048,166	07/505,573	09/17/91
5,048,167	07/321,917	09/17/91
5,048,172	07/486,891	09/17/91
5,048,179	07/480,013	09/17/91
5,048,184	07/611,840	09/17/91
5,048,185	07/574,761	09/17/91
5,048,186	07/670,476	09/17/91
5,048,187	07/595,181	09/17/91
5,048,189	07/489,516	09/17/91
5,048,190	07/170,904	09/17/91
5,048,193	07/372,431	09/17/91
5,048,199	07/605,450	09/17/91
5,048,200	07/540,063	09/17/91
5,048,208	07/420,754	09/17/91
5,048,209	07/444,137	09/17/91
5,048,212	07/560,572	09/17/91
5,048,214	07/660,782	09/17/91
5,048,218	07/585,018	09/17/91
5,048,220	07/585,016	09/17/91
5,048,221	07/460,358	09/17/91
5,048,224	07/522,265	09/17/91
5,048,228	07/376,027	09/17/91
5,048,230	07/320,099	09/17/91
5,048,231	07/561,469	09/17/91
5,048,235	07/271,721	09/17/91
5,048,237	07/516,124	09/17/91
5,048,238	07/550,987	09/17/91
5,048,240	07/533,336	09/17/91
5,048,241	07/475,224	09/17/91
5,048,243	07/258,359	09/17/91
5,048,245	07/594,952	09/17/91
5,048,251	07/484,279	09/17/91
5,048,252	07/596,097	09/17/91
5,048,254	07/429,856	09/17/91
5,048,258	07/414,116	09/17/91
5,048,259	07/601,349	09/17/91
5,048,260	07/422,929	09/17/91
5,048,263	07/466,273	09/17/91
5,048,265	07/482,361	09/17/91
5,048,271	07/593,233	09/17/91
5,048,272	07/439,437	09/17/91
5,048,276	07/610,123	09/17/91
5,048,279	07/476,593	09/17/91
5,048,282	07/413,308	09/17/91
5,048,293	07/454,387	09/17/91
5,048,297	07/493,474	09/17/91
5,048,298	07/377,564	09/17/91
5,048,299	07/539,237	09/17/91
5,048,301	07/539,330	09/17/91
5,048,302	07/477,592	09/17/91
5,048,303	07/553,046	09/17/91
5,048,307	07/369,299	09/17/91
5,048,310	07/560,352	09/17/91
5,048,314	07/525,232	09/17/91
5,048,323	07/231,313	09/17/91
5,048,333	07/597,972	09/17/91
5,048,338	07/544,834	09/17/91
5,048,343	07/516,898	09/17/91

Patent Number	Serial Number	Issue Date
5,048,347	07/578,823	09/17/91
5,048,348	07/478,898	09/17/91
5,048,360	07/561,144	09/17/91
5,048,375	07/598,814	09/17/91
5,048,376	07/475,969	09/17/91
5,048,380	07/481,189	09/17/91
5,048,381	07/503,771	09/17/91
5,048,408	07/506,843	09/17/91
5,048,413	07/501,604	09/17/91
5,048,414	07/515,702	09/17/91
5,048,417	07/518,938	09/17/91
5,048,423	07/570,833	09/17/91
5,048,428	07/544,583	09/17/91
5,048,432	07/634,402	09/17/91
5,048,436	07/505,554	09/17/91
5,048,437	07/372,378	09/17/91
5,048,438	07/439,468	09/17/91
5,048,442	07/468,074	09/17/91
5,048,446	07/357,480	09/17/91
5,048,452	07/468,874	09/17/91
5,048,456	07/502,524	09/17/91
5,048,461	07/559,671	09/17/91
5,048,463	07/598,468	09/17/91
5,048,469	07/626,619	09/17/91
5,048,472	07/562,881	09/17/91
5,048,480	07/493,968	09/17/91
5,048,496	07/554,911	09/17/91
5,048,498	07/565,552	09/17/91
5,048,501	07/329,192	09/17/91
5,048,506	07/635,010	09/17/91
5,048,508	07/566,580	09/17/91
5,048,517	07/467,643	09/17/91
5,048,522	07/837,606	09/17/91
5,048,541	07/562,829	09/17/91
5,048,551	07/544,267	09/17/91
5,048,555	07/415,343	09/17/91
5,048,556	07/536,797	09/17/91
5,048,562	07/529,185	09/17/91
5,048,566	07/586,480	09/17/91
5,048,568	07/539,953	09/17/91
5,048,570	06/854,359	09/17/91
5,048,573	07/419,889	09/17/91
5,048,574	07/508,249	09/17/91
5,048,579	07/547,951	09/17/91
5,048,584	07/452,934	09/17/91
5,048,585	07/441,463	09/17/91
5,048,586	07/473,602	09/17/91
5,048,587	07/267,878	09/17/91
5,048,590	07/565,760	09/17/91
5,048,591	07/467,912	09/17/91
5,048,596	07/639,078	09/17/91
5,048,604	07/610,055	09/17/91
5,048,608	07/410,859	09/17/91
5,048,609	07/627,294	09/17/91
5,048,614	07/551,028	09/17/91
5,048,615	07/476,530	09/17/91
5,048,617	07/507,849	09/17/91
5,048,620	07/390,619	09/17/91
5,048,624	07/628,302	09/17/91
5,048,627	07/375,629	09/17/91
5,048,630	07/506,053	09/17/91
5,048,632	07/423,358	09/17/91
5,048,637	07/498,531	09/17/91
5,048,639	07/565,478	09/17/91
5,048,646	07/424,744	09/17/91
5,048,661	07/500,444	09/17/91
5,048,666	07/318,107	09/17/91
5,048,668	07/610,448	09/17/91
5,048,669	07/492,610	09/17/91
5,048,673	07/534,687	09/17/91
5,048,684	07/473,558	09/17/91
5,048,691	07/492,466	09/17/91
5,048,696	07/575,917	09/17/91
5,048,697	07/309,480	09/17/91
5,048,701	07/568,975	09/17/91
5,048,702	07/486,792	09/17/91
5,048,704	07/260,464	09/17/91
5,048,710	07/468,183	09/17/91
5,048,712	07/421,373	09/17/91
5,048,714	07/523,582	09/17/91
5,048,716	07/037,834	09/17/91
5,048,720	07/583,292	09/17/91
5,048,721	07/437,735	09/17/91
5,048,726	07/525,924	09/17/91
5,048,728	07/412,911	09/17/91
5,048,730	07/521,389	09/17/91
5,048,736	07/544,233	09/17/91
5,048,738	06/936,383	09/17/91
5,048,742	07/537,581	09/17/91
5,048,756	07/492,624	09/17/91
5,048,757	07/334,326	09/17/91
5,048,758	07/598,012	09/17/91
5,048,759	07/478,692	09/17/91
5,048,761	07/493,171	09/17/91
5,048,766	07/529,081	09/17/91
5,048,776	07/469,147	09/17/91
5,048,780	07/491,326	09/17/91
5,048,781	07/515,061	09/17/91
5,048,785	07/581,046	09/17/91
5,048,787	07/507,152	09/17/91
5,048,796	07/581,918	09/17/91
5,048,799	07/418,958	09/17/91
5,048,801	07/379,579	09/17/91
5,048,805	07/558,626	09/17/91
5,048,806	07/548,753	09/17/91
5,048,808	07/577,073	09/17/91
5,048,809	07/343,447	09/17/91
5,048,81[illegible]	07/386,622	09/17/91
5,048,812	07/477,155	09/17/91
5,048,824	07/550,921	09/17/91
5,048,827	07/435,140	09/17/91
5,048,829	07/654,599	09/17/91
5,048,831	07/578,993	09/17/91
5,048,837	07/636,508	09/17/91
5,048,839	07/502,742	09/17/91
5,048,842	07/322,682	09/17/91
5,048,847	07/545,102	09/17/91
5,048,851	07/574,882	09/17/91
5,048,858	07/486,949	09/17/91
5,048,871	07/386,299	09/17/91
5,048,682	07/507,389	09/17/91
5,048,885	07/466,863	09/17/91
5,048,892	07/578,676	09/17/91
5,048,895	07/564,422	09/17/91
5,048,899	07/466,114	09/17/91
5,048,902	07/596,970	09/17/91
5,048,903	07/613,101	09/17/91
5,048,904	07/549,228	09/17/91
5,048,914	07/283,590	09/17/91
5,048,928	07/553,908	09/17/91
5,048,938	07/535,261	09/17/91
5,048,939	07/510,284	09/17/91
5,048,943	07/462,640	09/17/91
5,048,946	07/523,799	09/17/91
5,048,948	07/598,544	09/17/91
5,048,959	07/531,871	09/17/91
5,048,970	07/546,081	09/17/91
5,048,971	07/311,091	09/17/91
5,048,983	07/358,695	09/17/91
5,048,987	07/457,265	09/17/91
5,048,989	07/511,208	09/17/91
5,048,993	07/589,619	09/17/91
5,048,994	07/601,363	09/17/91
5,048,995	07/486,769	09/17/91
5,048,998	07/347,463	09/17/91
5,048,999	07/679,102	09/17/91
5,049,005	07/550,229	09/17/91
5,049,008	07/508,213	09/17/91
5,049,015	07/371,773	09/17/91
5,049,019	07/244,621	09/17/91
5,049,022	07/305,855	09/17/91
5,049,023	07/459,737	09/17/91
5,049,030	07/374,543	09/17/91
5,049,036	07/443,243	09/17/91
5,049,037	07/456,308	09/17/91
5,049,038	07/595,361	09/17/91

Patent Number	Serial Number	Issue Date
5,049,039	07/443,757	09/17/91
5,049,044	07/467,130	09/17/91
5,049,051	07/549,844	09/17/91
5,049,056	07/493,909	09/17/91
5,049,058	07/452,745	09/17/91
5,049,059	07/622,834	09/17/91
5,049,064	07/511,876	09/17/91
5,049,067	07/380,972	09/17/91
5,049,075	07/289,975	09/17/91
5,049,081	07/392,981	09/17/91
5,049,083	07/521,490	09/17/91
5,049,086	07/644,276	09/17/91
5,049,087	07/604,048	09/17/91
5,049,096	07/457,571	09/17/91
5,049,097	07/512,384	09/17/91
5,049,102	07/289,230	09/17/91
5,049,106	07/532,384	09/17/91
5,049,107	07/502,118	09/17/91
5,049,109	07/492,625	09/17/91
5,049,110	07/487,844	09/17/91
5,049,115	07/527,594	09/17/91
5,049,127	07/500,530	09/17/91
5,049,131	07/435,724	09/17/91
5,049,133	07/468,735	09/17/91
5,049,140	07/467,951	09/17/91
5,049,144	07/446,910	09/17/91
5,049,149	07/448,094	09/17/91
5,049,160	07/381,987	09/17/91
5,049,172	07/559,217	09/17/91
5,049,174	07/540,028	09/17/91
5,049,175	07/183,523	09/17/91
5,049,180	07/450,483	09/17/91
5,049,182	07/291,723	09/17/91
5,049,196	07/341,049	09/17/91
5,049,206	07/602,902	09/17/91
5,049,212	07/676,772	09/17/91
5,049,215	07/585,858	09/17/91
5,049,216	07/359,855	09/17/91
5,049,222	07/357,595	09/17/91
5,049,225	07/471,682	09/17/91
5,049,227	07/407,400	09/17/91
5,049,228	07/401,134	09/17/91
5,049,246	07/368,666	09/17/91
5,049,256	07/475,627	09/17/91
5,049,269	07/363,518	09/17/91
5,049,270	07/405,539	09/17/91
5,049,273	07/594,443	09/17/91
5,049,282	07/507,566	09/17/91
5,049,287	07/563,449	09/17/91
5,049,289	07/418,024	09/17/91
5,049,293	07/587,284	09/17/91
5,049,301	07/453,449	09/17/91
5,049,307	07/528,770	09/17/91
5,049,330	07/543,869	09/17/91
5,049,338	07/370,210	09/17/91
5,049,342	07/520,975	09/17/91
5,049,348	07/413,848	09/17/91
5,049,352	07/598,846	09/17/91
5,049,358	07/251,297	09/17/91
5,049,361	07/509,454	09/17/91
5,049,373	07/553,166	09/17/91
5,049,374	07/441,984	09/17/91
5,049,393	07/213,760	09/17/91
5,049,396	07/329,379	09/17/91
5,049,400	07/646,238	09/17/91
5,049,402	07/469,085	09/17/91
5,049,410	07/430,599	09/17/91
5,049,413	07/429,984	09/17/91
5,049,415	07/631,341	09/17/91
5,049,416	07/531,300	09/17/91
5,049,424	07/369,800	09/17/91
5,049,426	07/389,467	09/17/91
5,049,429	07/401,184	09/17/91
5,049,433	07/525,199	09/17/91
5,049,438	07/503,055	09/17/91
5,049,439	07/528,969	09/17/91
5,049,440	07/388,068	09/17/91
5,049,449	07/444,572	09/17/91
5,049,455	07/581,162	09/17/91
5,049,458	07/399,159	09/17/91
5,049,460	07/353,062	09/17/91
5,049,465	07/434,262	09/17/91
5,049,482	07/400,079	09/17/91
5,049,489	07/339,277	09/17/91
5,049,491	07/122,985	09/17/91
5,049,494	07/307,450	09/17/91
5,049,497	06/900,029	09/17/91
5,049,499	07/298,355	09/17/91
5,049,505	07/490,580	09/17/91
5,049,510	07/461,379	09/17/91
5,049,529	07/442,647	09/17/91
5,049,540	07/353,341	09/17/91
5,049,543	07/316,395	09/17/91
5,049,545	07/323,156	09/17/91
5,049,548	07/319,448	09/17/91
5,049,549	07/451,877	09/17/91
5,049,551	07/528,710	09/17/91
5,049,563	07/374,774	09/17/91
5,049,565	07/623,479	09/17/91
5,049,566	07/493,957	09/17/91
5,049,567	07/638,950	09/17/91
5,049,573	07/526,935	09/17/91
5,049,574	07/481,063	09/17/91
5,049,580	07/565,938	09/17/91
5,049,585	07/417,921	09/17/91
5,049,586	07/517,620	09/17/91
5,049,587	07/341,408	09/17/91
5,049,591	07/413,770	09/17/91
5,049,592	07/366,116	09/17/91
5,049,602	07/589,803	09/17/91
5,049,614	07/499,704	09/17/91
5,049,623	07/389,140	09/17/91
5,049,632	07/629,884	09/17/91
5,049,642	07/454,438	09/17/91
5,049,644	07/442,667	09/17/91
5,049,645	07/495,695	09/17/91
5,049,647	07/289,911	09/17/91
5,049,651	07/402,886	09/17/91
5,049,652	07/621,113	09/17/91
5,049,672	07/425,090	09/17/91
5,049,675	07/471,347	09/17/91
5,049,683	07/552,839	09/17/91
5,049,687	07/601,405	09/17/91
5,049,696	07/366,085	09/17/91
5,049,703	07/417,264	09/17/91
5,049,713	07/526,007	09/17/91
5,049,723	07/496,518	09/17/91
5,049,725	07/537,900	09/17/91
5,049,729	07/520,971	09/17/91
5,049,737	07/467,209	09/17/91
5,049,744	07/461,898	09/17/91
5,049,749	07/493,105	09/17/91
5,049,752	07/608,976	09/17/91
5,049,753	07/549,885	09/17/91
5,049,768	07/280,054	09/17/91
5,049,769	07/450,179	09/17/91
5,049,772	07/580,224	09/17/91
5,049,776	07/433,224	09/17/91
5,049,785	07/506,150	09/17/91
5,049,789	07/464,424	09/17/91
5,049,790	07/410,920	09/17/91
5,049,795	07/551,691	09/17/91
5,049,797	07/546,924	09/17/91
5,049,805	07/529,030	09/17/91
5,049,812	07/490,558	09/17/91
5,049,821	07/479,684	09/17/91
5,049,822	07/357,065	09/17/91
5,049,833	07/546,978	09/17/91
5,049,844	07/523,987	09/17/91
5,049,847	07/450,573	09/17/91
5,049,848	07/442,154	09/17/91
5,049,849	07/575,461	09/17/91
5,049,858	07/512,476	09/17/91
5,049,859	07/594,401	09/17/91
5,049,860	07/496,662	09/17/91
5,049,863	07/477,458	09/17/91

Patent Number	Serial Number	Issue Date
5,049,867	07/278,251	09/17/91
5,049,870	07/264,864	09/17/91
5,049,879	07/606,239	09/17/91
5,049,882	07/630,539	09/17/91
5,049,886	07/589,309	09/17/91
5,049,896	07/515,241	09/17/91
5,049,905	07/142,841	09/17/91
5,049,910	07/548,615	09/17/91
5,049,911	07/418,272	09/17/91
5,049,918	07/397,832	09/17/91
5,049,919	07/599,981	09/17/91
5,049,921	07/470,900	09/17/91
5,049,922	07/611,501	09/17/91
5,049,926	07/470,899	09/17/91
5,049,937	07/503,962	09/17/91
5,049,938	07/507,128	09/17/91
5,049,942	07/459,881	09/17/91
5,049,955	07/061,036	09/17/91
5,049,978	07/579,652	09/17/91
5,049,980	07/181,526	09/17/91
5,049,995	07/467,814	09/17/91
5,050,021	07/495,034	09/17/91
5,050,031	07/576,143	09/17/91
5,050,041	07/543,671	09/17/91
5,050,042	07/557,646	09/17/91
5,050,050	07/616,592	09/17/91
5,050,058	07/567,948	09/17/91
5,050,064	07/446,772	09/17/91
5,050,065	07/266,147	09/17/91
5,050,067	07/489,722	09/17/91
5,050,071	07/267,011	09/17/91
5,050,072	07/207,878	09/17/91
5,050,076	07/252,927	09/17/91
5,050,082	07/279,690	09/17/91
5,050,085	07/542,300	09/17/91
5,050,093	07/424,750	09/17/91
5,050,109	07/452,817	09/17/91
5,050,117	07/475,727	09/17/91
5,050,120	07/414,276	09/17/91
5,050,133	07/655,239	09/17/91
5,050,142	07/516,903	09/17/91
5,050,143	07/253,038	09/17/91
5,050,147	07/333,056	09/17/91
5,050,169	07/355,979	09/17/91
5,050,170	07/093,840	09/17/91
5,050,173	07/477,879	09/17/91
5,050,178	07/604,829	09/17/91
5,050,193	07/274,478	09/17/91
5,050,200	07/514,963	09/17/91
5,050,204	07/353,359	09/17/91
5,050,205	07/603,410	09/17/91
5,050,219	07/436,457	09/17/91
5,050,220	07/556,224	09/17/91
5,050,224	07/523,375	09/17/91

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 09/22/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,649,347	06/798,546	11/15/85	03/10/87	09/27/95
4,650,573	06/691,058	01/14/85	03/17/87	09/27/95
4,662,806	06/552,759	11/17/83	05/05/87	09/25/95
4,702,415	06/652,740	09/18/84	10/27/87	09/26/95
4,819,287	07/156,603	02/17/88	04/11/89	09/28/95
4,831,749	07/227,315	08/02/88	05/23/89	09/28/95
4,858,763	07/180,238	04/11/88	08/22/89	09/28/95
4,861,797	07/110,184	10/15/87	08/29/89	09/27/95
4,870,824	07/092,848	08/24/87	10/03/89	09/25/95
4,896,652	07/271,417	11/10/88	01/30/90	09/28/95
4,909,918	07/240,540	09/06/88	03/20/90	09/25/95
4,921,356	07/344,957	04/28/89	05/01/90	09/25/95
4,928,580	07/302,371	01/27/89	05/29/90	09/25/95
4,929,839	07/256,005	10/11/88	05/29/90	09/25/95
4,939,336	07/253,064	10/03/88	07/03/90	09/25/95
4,956,074	07/390,238	08/04/89	09/11/90	09/27/95
4,971,263	07/269,672	11/10/88	11/20/90	09/22/95
4,985,707	07/294,716	01/09/89	01/15/91	09/28/95
4,986,261	07/086,314	08/14/87	01/22/91	09/28/95
4,994,694	07/397,213	08/23/89	02/19/91	09/28/95
5,000,352	07/401,656	08/31/89	03/19/91	09/25/95
5,001,614	07/391,792	08/09/89	03/19/91	09/27/95
5,001,966	07/480,918	02/16/90	03/26/91	09/25/95
5,002,280	07/502,780	04/02/90	03/26/91	09/28/95
5,008,965	07/217,685	07/11/88	04/23/91	09/25/95
5,009,665	07/308,112	02/08/89	04/23/91	09/25/95
5,011,135	07/377,258	07/10/89	04/30/91	09/28/95
5,018,670	07/463,251	01/10/90	05/28/91	09/25/95
5,022,716	07/437,863	11/17/89	06/11/91	09/25/95

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 09/29/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,357,719	06/238,511	02/26/81	11/09/82	09/29/95
4,372,969	06/235,937	02/19/81	02/08/83	09/29/95
4,411,727	06/275,840	06/22/81	10/25/83	09/29/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,456,048	06/460,492	01/24/83	06/26/84	09/29/95
4,492,728	06/468,497	02/22/83	01/08/85	09/29/95
4,499,696	06/232,995	02/09/81	02/19/85	09/29/95
4,532,659	06/568,944	01/09/84	08/06/85	09/29/95
4,568,024	06/515,802	07/21/83	02/04/86	09/29/95
4,574,502	06/773,600	09/09/85	03/11/86	09/29/95
4,674,324	06/617,329	06/05/84	06/23/87	09/29/95
4,674,746	06/593,974	03/27/84	06/23/87	09/29/95
4,734,144	06/727,322	04/25/85	03/29/88	09/29/95
4,842,588	07/151,117	02/01/88	06/27/89	09/29/95
4,861,061	07/189,065	05/02/88	08/29/89	09/29/95
4,871,525	07/081,638	08/03/87	10/03/89	09/29/95
4,915,022	07/241,043	09/06/88	04/10/90	09/29/95
4,926,105	07/015,748	02/17/87	05/15/90	09/29/95
4,968,426	07/398,863	08/25/89	11/06/90	09/29/95
4,989,591	07/307,611	02/08/89	02/05/91	09/29/95
5,004,587	07/475,432	02/05/90	04/02/91	09/29/95
5,005,387	07/616,215	11/20/90	04/09/91	09/29/95
5,006,817	07/420,937	10/13/89	04/09/91	09/29/95
5,007,901	07/582,128	09/12/90	04/16/91	09/29/95
5,009,919	07/320,808	03/08/89	04/23/91	09/29/95
5,010,909	07/510,121	04/17/90	04/30/91	09/29/95
5,011,613	07/466,908	01/18/90	04/30/91	09/29/95
5,022,868	07/458,142	12/28/89	06/11/91	09/29/95
5,026,139	07/501,144	03/28/90	06/25/91	09/29/95
5,026,209	07/389,639	08/04/89	06/25/91	09/29/95
5,026,486	06/912,758	09/26/86	06/25/91	09/29/95
5,029,848	07/253,113	10/04/88	07/09/91	09/29/95
5,041,298	07/551,773	07/12/90	08/20/91	09/29/95
5,042,330	07/538,406	06/15/90	08/27/91	09/29/95

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 10/06/95

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,393,357	06/231,292	02/04/81	07/12/83	10/13/95
4,578,828	06/672,998	11/19/84	04/01/86	10/13/95
4,606,431	06/591,200	03/19/84	08/19/86	10/13/95
4,677,366	06/862,593	05/12/86	06/30/87	10/13/95
4,876,335	07/067,798	06/30/87	10/24/89	10/13/95
4,917,014	07/342,184	04/24/89	04/17/90	10/11/95
4,989,560	07/416,496	10/03/89	02/05/91	10/13/95
5,009,791	07/395,897	08/18/89	04/23/91	10/13/95

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,890,187, Re. S.N. 08/532,011, Sept. 21, 1995, Cl. 361, INTEGRATED CIRCUIT PROTECTED AGAINST ELECTROSTATIC DISCHARGES WITH VARIABLE PROTECTION THRESHOLD, Francois Tailliet, et. al., Owner of Record: *SGS-Thomson Microelectronics SA, Gentilly, France,* Attorney or Agent: Kenneth C. Hill, Ex. Gp.: 2104

4,894,408, Re. S.N. 08/533,278, Sept. 25, 1995, Cl. 524/425, THERMOPLASTIC OLEFIN COMPOSITIONS OF EPDM RUBBER AND ETHYLENE COPOLYMER RESIN, Donald R. Hazelton, et. al., Owner of Record: *Advanced Elastomer Systems L.P., Akron, Ohio,* Attorney or Agent: Dale H. Hoscheit, Ex. Gp.: 1501

4,992,850, Re. S.N. 08/534,176, Sept. 26, 1995, Cl. 257/230, DIRECTLY BONDED SIMM MODULE, Tim J. Corbett, et. al., Owner of Record: *Micron Technology Inc., Boise, Id.,* Attorney or Agent: Michael L. Lynch, Ex. Gp.: 2508

5,026,835, Re. S.N. 08/533,834, Sept. 26, 1995, Cl. 536, PYRIMIDINE 2'-METHYLIDENE NUCLEOSIDE COMPOUNDS, Tohru Ueda, et. al., Owner of Record: *Yamasa Shoyu Co., LTD., Choshi-Shi, Japan,* Attorney or Agent: Matthew Jacob, Ex. Gp.: 1803

5,042,103, Re. S.N. 08/532,415, Sept. 22, 1995, Cl. 14/71.3, MOVABLE LOADING BRIDGE HAVING AN INFLATABLE FLEXIBLE BODY, Johannes H. Megens, Owner of Record: *Kelley Corporation, Inc., Milwaukee, Wis.,* Attorney or Agent: Kevin P. Moran, Ex. Gp.: 3506

5,138,434, Re. S.N. 08/534,177, Sept. 26, 1995, Cl. 257/692, PACKAGING FOR SEMICONDUCTOR LOGIC DEVICES, Alan G. Wood, et. al., Owner of Record: *Micron Technology, Boise, Id.,* Attorney or Agent: Michael L. Lynch, Ex. Gp.: 2508

5,196,910, Re. S.N. 08/408,788, Mar. 23, 1995, Cl. 257/54, SEMICONDUCTOR MEMORY DEVICE WITH RECESSED ARRAY REGION, Noboru Moriuchi, et. al., Owner of Record: *Hitachi, LTD, Tokyo, Japan,* Attorney or Agent: Gregory E. Montone, Ex. Gp.: 2508

5,205,428, Re. S.N. 08/534,440, Sept. 27, 1995, Cl. 220/001.5, LARGER CUBIC VOLUME CARGO CONTAINER, Howard J. Yurgevich, et. al., Owner of Record: *Congress*

Financial Corporation, Chicago, Ill., Attorney or Agent: John S. Mortimer, Ex. Gp.: 3207

5,276,737, Re. S.N. 08/526,977, Sept. 12, 1995, Cl. 380/30, FAIR CRYPTOSYSTEMS AND METHODS OF USE, Silvio Micali, Owner of Record: *Inventor*, Attorney or Agent: Stuart T. F. Huang, Ex. Gp.: 2202

5,315,658, Re. S.N. 08/526,979, Sept. 12, 1995, Cl. 380/30, FAIR CRYPTOSYSTEMS AND METHODS OF USE, Silvio Micali, Owner of Record: *Inventor*, Attorney or Agent: Stuart T. F. Huang, Ex. Gp.: 2202

5,339,796, Re. S.N. 08/534,029, Sept. 26, 1995, Cl. 126/263, REUSABLE WARMERS OF THE TYPE EMPLOYING A SUPER-COOLED SOLUTION AND AN ACTIVATOR, Charles F. Manker, Owner of Record: *Prism Enterprises, Inc., San Antonio, Tex.*, Attorney or Agent: John Kilyk, Jr., Ex. Gp.: 3406

5,382,103, Re. S.N. 08/535,838, Sept. 29, 1995, Cl. 400/248, MULTIPLE COLOR INK RIBBON CASSETTE, Koichi Kimura, et. al., Owner of Record: *Seikosha Co., LTD, Tokyo, Japan*, Attorney or Agent: Joel E. Lutzker, Ex. Gp.: 3307

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,107,543, Reexam. No. 90/003,997, Oct. 19, 1995, Cl. 307/10.4, VEHICLE ANTITHEFT SYSTEM, Neil B. Kaplan, Owner of Record: *TSI Security Acquisition Corp., Deerfield Beach, Fla.*, Attorney or Agent: None, Ex. Gp.: 2109, Requester: Baker & McKenzie, Chicago. Ill.

4,725,934, Reexam. No. 90/003,998, Oct. 2, 1995, Cl. 362/298, GLARE CONTROL LAMP AND REFLECTOR ASSEMBLY AND METHOD FOR GLARE CONTROL, Myron K. Gordin, Owner of Record: *Musco Corp., Des Moines, Iowa*, Attorney or Agent: Edmund Sease, Zarley McKee Thomte Vorhees & Sease, Des Moines, Iowa, Ex. Gp.: 3406, Requester: Thomas N. Young, Young MacFarlane & Wood, Troy, Mich.

5,330,978, Reexam. No. 90/004,000, Oct. 18, 1995, Cl. 514/080, PHOSPHONIC ACID DERIVATIVES AND USE THEREOF, Mitsuhiro Wakimasu, et. al., Owner of Record: *Takeda Chemical Industries, Ltd., Osaka, Japan*, Attorney or Agent: David G. Colin, Dike Bronstein Roberts & Cushman, Boston, Mass., Ex. Gp.: 1205, Requester: James A. Poulos, III, Stevens Davis Miller & Mosher, Alexandria, Va.

5,331,305, Reexam. No. 90/003,999, Oct. 16, 1995, Cl. 338/322, CHIP NETWORK RESISTOR, Shigeru Kanbara, et. al., Owner of Record: *Rohm Co., Ltd., Kyoto-Shi, Japan*, Attorney or Agent: Francis J. Hone, Brumbaugh Graves Donohue & Raymond, New York, N.Y., Ex. Gp.: 2106, Requester: Owner

---

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

David C. Skinner, Arcadia, Calif., Reg. No. 1,592,412, for the mark "QUANTUM LEARNING", Canc. No. 23,761.

Insta-Tax, Inc., San Diego, Calif., Reg. No. 1,581,860, for the mark "FAX-TAX", Cancellation No. 23,849.

Baker, Moore, Richard & Price Entertainment Group, Los Angeles, Calif., Reg. No. 1,643,048 for the mark "A-K-A ROMEO (STYLIZED)", Canc. No. 23,644.

Fabulous Fakes of America, Hallandale, Fla., Reg. No. 1,052,666, for the mark "FABULOUS FAKES", Canc. No. 23,965.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office who have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before January 12, 1996.

Huppert, Michael S., 8212 Tall Timber Dr., Gainsville, Va. 22065
Meller, Michael V., 2107 Popkins Ln., Alexandria, Va. 22307
Schmickel, David B., 1325 Park Ave., Baltimore, Md. 21217
Whitfield, Michael A., 113 N. Granada St., Arlington, Va. 22203

November 1, 1995 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Adverse Decisions in Interference

In the designated interferences involving the following patents, final decisions have been rendered that the respective patentees are not entitled to patents containing the claims listed.

Patent No. 4,587,152, Peter Gleichenhagen, Ekkehard Behrend, Peter Jauchen, RESIDUELESSLY REDETACHABLE CONTACT-ADHESIVE SHEETLIKE STRUCTURES, Interference No. 101,660, final judgment adverse to the patentees rendered April 11, 1995, as to claims 1-9.

Patent No. 4,610,148, Samuel V. Shelton, SOLID ADSORBENT HEAT PUMP SYSTEM, Interference No. 102,998, final judgment adverse to the patentee rendered September 28, 1995, as to claims 1, 3-6, 8-12, 14-17.

Patent No. 4,623,461, Miles G. Hossom, Dinesh A. Jacob, TRANSVERSE FLOW DIAGNOSTIC DEVICE, Interference No. 102,696, final judgment adverse to the patentees rendered September 21, 1994, as to claims 1-41.

Patent No. 4,694,659, Samuel V. Shelton, DUAL BED HEAT PUMP, Interference No. 102,998, final judgment adverse to the patentee rendered September 28, 1995, as to claims 1, 3-6, 8-12 and 14-17.

Patent No. 4,783,478, Gordon Wootton, Gareth J. Sanger, TREATMENT OF EMESIS, NAUSEA AND VOMITING, Interference No. 102,666, final judgment adverse to the patentees rendered June 9, 1995 as to claims 1-9.

Patent No. 4,830,460, Tsvi Goldenberg, GUIDANCE SYSTEM AND METHOD FOR DELIVERY SYSTEM FOR HIGH-ENERGY PULSED ULTRAVIOLET LASER LIGHT, Interference No. 102,343, final judgment adverse to the patentee rendered March 31, 1994, as to claims 1-8 and 13-22.

Patent No. 4,851,444, Abraham Sunshine, Eugene M. Laska, ONSET-HASTENED/ENHANCED ANALGESIA, Interference No. 102,556, final judgment adverse to the patentees rendered July 10, 1995, as to claims 1-39.

Patent No. 4,889,615, Arthur A. Chin, Ivy D. Johnson, Charles T. Kresge, Michael S. Sarli, ADDITIVE FOR VANADIUM CAPTURE IN CATALYTIC CRACKING, Interference No. 102,931, final judgment adverse to the patentees rendered September 22, 1995, as to claims 1-20.

Patent No. 4,900,748, Arnold Brossi, Qian-Sheng Yu, John R. Hatack, Stanley I. Rapoport, CARBAMATES RELATED TO (—)—PHYSOSTIGMINE AS CHOLINERGIC AGENTS, Interferrence No. 103,282, final judgment adverse to the patentees rendered September 19, 1995, as to claims 1-13.

Patent No. 4,911,191, G. William Bain, APPARATUS FOR PROTECTING CEILING WORK AREA FROM DISPERSAL OF ASBESTOS FIBERS, Interference No. 103,305, final judgment adverse to the patentee rendered September 29, 1995, as to claims 1-20.

Patent No. 4,915,106, Charles C. Aulgur, David A. DiPasquale, Thomas K. McDonald, Alan E. Kidd, CREW OXYGEN MASK WITH PNEUMATIC COMFORT ADJUSTMENT, Interference No. 102,933, final judgment adverse to the patentees rendered September 28, 1995, as to claims 1-9.

Patent No. 5,013,134, Ronald T. Smith, GHOST-FREE AUTOMOTIVE HEAD UP DISPLAY EMPLOYING A WEDGED WINDSHIELD, Interference No. 103,070, final judgment adverse to the patentee rendered September 28, 1995, as to claims 1-16.

Patent No. 5,036,846, Charles C. Aulugur, David A. Dipasquale, Thomas K. McDonald, Alan E. Kidd, CREW OXYGEN MASK WITH PNEUMATIC ADJUSTMENT Interference No. 102,933, final judgment adverse to the patentees rendered September 28, 1995, as to claims 1-3.

Patent No. 5,088,511, G. William Bain, APPARATUS FOR PROTECTING CEILING WORK AREA FROM DISPERSAL OF ASBESTOS FIBERS, Interference No. 103,305, final judgment adverse to the patentee rendered September 29, 1995, as to claims 1-3.

Patent No. 5,107,552, Jean Lavalliere, Michel Dallaire, SWIMMING POOL COVER AND ROLL-UP DEVICE, Interference No. 103,178, final judgment adverse to the patentees rendered September 28, 1995, as to claims 1-6.

Patent No. 5,171,818, E. Lynn Wilson, SPRAYABLE ALIPHATIC POLYUREA-POLYURETHANE COATING COMPOSITIONS AND METHODS, Interference No. 103,532, final judgment adverse to the patentee rendered September 15, 1995, as to claims 1-33.

Patent No. 5,310,141, Masayuki Enomoto, Junya Takahashi, Tomoyuki Kusaba, Masayo Sugano, Rei Matsunaga, Masahiro Tamaki, ENZIMIDAZOLE DERIVATIVES, AGRICULTURAL AND HORTICULTURAL FUNGICIDES CONTAINING THE SAME AS AN ACTIVE INGREDIENT AND INTERMEDIATE COMPOUNDS THEREOF, Interference No. 103,542, final judgment adverse to the patentees rendered September 29, 1995, as to claims 1-10.

Correction

Patent No. 4,892,861, Siba P. Ray, LIQUID PHASE SINTERED SUPERCONDUCTING CERMET, Interference No. 102,743, final judgment adverse to the patentee rendered February 7, 1995, as to claims 1-10.

OLIVIA M. DUVALL, *Sup'v Legal Instruments Examiner*
Board of Patent Appeals & Interferences
(703) 308-9846

Temporary Suspension of "At Cost" Services for Orders for Certified Copies

Effective immediately, and until further notice, the Certification Division, Office of Public Records, will temporarily suspend accepting requests for "at cost" service for orders of certified copies of PTO documents except where the requester provides documentation that the copy is required for pending litigation.

The Certification Division's ability to provide "at cost" services is based upon the ready availability of source documents either on microform or via access to electronic images. Increased filings of both patent and trademark applications have resulted in more instances where requested documents are not yet available on film or electronic media to fill customer orders on an "at cost" basis efficiently and for a reasonable fee.

Orders for expedited service for certified copies of both patent and trademark applications-as-filed and trademark registrations will continue to be accepted. Customers will be advised within three working days if microform or electronic images are not available to fill their orders on an expedited basis, and the order will be filled as a request for regular service with an appropriate adjustment and/or credit for fees paid.

Customers are reminded that expedited service is provided on a "local basis" for those orders: (1) placed through the PTO's Public Service Windows located in the Patent Search Room and the Trademark Search Library; (2) hand-delivered to the Office of Public Records' (OPR) Service Counter in the North Tower building; (3) transmitted via fax directly to the Certification Division; or (4) received from an overnight delivery service at the OPR Service Counter. Requests for expedited service received through the US mail will be processed as regular orders.

In those cases where Certification Division cannot fill a customer order within 30 days of receipt due to unavailability of media or the source document itself, customers will be provided with a certified letter documenting their request and the Office's inability to fill the order as requested. These letters will be provided at no charge. The order itself will be closed and a full refund or credit made to the customer.

Customers placing orders for certified copies may use the following as guidelines for expected turnaround times from initial receipt of an order in PTO to mailing date from the Office:

Certified Product	*Days to Mail*
Patent Application-As-Filed, Expedited (microfiche available)	7
Patent Applications-As-Filed, Regular	17
Patent Related File Wrapper	25
Patent Copy	10
Trademark Application-As-Filed, Expedited (microfiche available)	7
Trademark Application-As-Filed, Regular	17
Trademark Related File Wrapper	25
Trademark Registration	10
Trademark Registration, Expedited	3

Delivery of any specific copy will vary based on the availability of microfilm products and/or file accessiblity. Customers are encouraged to fax orders for copies directly to Certification Division at (703) 308-9759 and to pay by PTO Deposit Account, MasterCard, or Visa to minimize processing time. Information on the status of pending orders may be obtained by calling (703) 308-9726 or 1 (800) 972-6382 (outside the Washington, D.C. Metro area).

November 2, 1995

WESLEY H. GEWEHR
Administrator for
Information Dissemination

Department of Commerce
Patent and Trademark Office
37 CFR Parts 1, 5 and 10
[Docket No. 951006247-5247-01]
RIN 0651-AA70

Communications with the Patent and Trademark Office

Agency: Patent and Trademark Office, Commerce.
Action: Notice of Proposed Rulemaking.
Summary: The Patent and Trademark Office (Office) is proposing to amend the rules of practice in patent and trademark cases to: (1) require that patent-related mail be addressed to the Assistant Commissioner for Patents; (2) require that most trademark-related mail be addressed to the Assistant Commissioner for Trademarks; (3) specify a separate address for mail related to disciplinary proceedings pending before the Administrative Law Judge or the Commissioner in the Office of the Solicitor; (4) provide a definition of "Federal holiday within the District of Columbia"; and (5) delete the requirement for a certificate for "Express Mail" in section 1.10 and incorporate requirements for the resubmission of misplaced correspondence which parallel section 1.8.
Dates: Comments must be received by January 2, 1996. No hearing will be held.
Addresses: Address written comments to Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513, marked to the attention of Lynne G. Beresford. In addition, written comments may also be sent by facsimile transmission to (703) 308-7220 with a confirmation copy mailed to the above address, or by electronic mail messages over the Internet to mail-rule@uspto.gov.

Written comments will be available for public inspection on [Insert date 75 days after date of publication in the FEDERAL REGISTER], in the Assistant Commissioner for Trademarks' suite on the 10th floor of the South Tower Building, 2900 Crystal Drive, Arlington, Virginia 22202-3513.
For Further Information Contact: Lawrence E. Anderson (for patent-related matters) by telephone at (703) 305-9285, by electronic mail at landerso@uspto.gov, or by mail to his attention addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231; or Lynne G. Beresford (for trademark-related matters) by telephone at (703) 308-8900, extension 44, or by mail marked to her attention and addressed to the Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513.
Supplementary Information: Addresses for correspondence with the Office are proposed to be changed to reflect the creation of a mailroom site at the South Tower Building for processing most trademark-related mail; to distinguish correspondence intended for organizations reporting to the Assistant Commissioner for Patents from other correspondence; and to add a separate mailing address in the Office of the Solicitor for disciplinary matters.

The proposed rulemaking entitled "Changes in Requirements for Addressing Trademark Applications and Trademark-Related Papers" (0651-AA73) has been merged with this notice of proposed rulemaking.

The Office will now have three separate general mailing addresses: (1) Assistant Commissioner for Patents for correspondence processed by organizations reporting to the Assistant Commissioner for Patents; (2) Assistant Commissioner for Trademarks for all trademark-related mail, except for trademark documents sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark documents which should be addressed to the Commissioner of Patents and Trademarks; and (3) Commissioner of Patents and Trademarks for all other correspondence. Notwithstanding the above, it is proposed that there will be separate mailing addresses in the Office of the Solicitor for certain disciplinary matters and cases involving pending litigation.

Those who correspond with the Office are requested to use separate envelopes directed to the different areas.

Because patent-related mail will be sent to the Assistant Commissioner for Patents, the requirement to designate patent application correspondence as "PATENT APPLICATION" is proposed to be deleted from section 1.5(a).

In addition, it is proposed that "Federal holiday within the District of Columbia" be defined as including Official closings.

It is further proposed that a "Certificate of Mailing by Express Mail" (currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper) no longer be required for correspondence actually received in the Office.

PATENT-RELATED MAIL

Section 1.1 is proposed to be amended to provide for correspondence which is processed by organizations reporting to the Assistant Commissioner for Patents to be addressed to the "Assistant Commissioner for Patents, Washington, D.C. 20231." The Office first announced the new address for patent-related mail in a notice (Change of Address for Patent Applications and Patent Related Papers) published in the *Official Gazette* at 1173 Off. Gaz. Pat. Office 13 (April 4, 1995).

This change will affect correspondence such as: patent applications, responses to notices of informality, requests for extension of time, notices of appeal to the Board of Patent Appeals and Interferences (the Board), briefs in support of an appeal to the Board, requests for oral hearing before the Board, extensions of term of patent, requests for reexamination, statutory disclaimers, certificates of correction, petitions to the Commissioner, submission of information disclosure statements, petitions to institute a public use proceeding, petitions to revive abandoned patent applications, and other correspondence related to patent applications and patents which is processed by organizations reporting to the Assistant Commissioner for Patents. When patent-related documents are filed with a certificate of mailing, pursuant to section 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Patents, Washington, D.C. 20231.

Unless otherwise specified, correspondence not processed by organizations reporting to the Assistant Commissioner for Patents, such as communications with the Board, patent services including patent copy sales, assignments, requests for lists of patents and SIRs in a subclass, requests for the status of maintenance fee payments, as well as patent practitioner enrollment matters including admission to examination, registration to practice, certificates of good standing, and financial service matters including establishing a deposit account should continue to be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of Office documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

Special Office mail boxes as currently listed in each issue of the Official Gazette should continue to be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Use of special box designations will facilitate the Office's timely and accurate identification and processing of the designated correspondence.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

TRADEMARK-RELATED MAIL

Most trademark-related mail should be sent directly to the Trademark Operation at: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513.

When trademark-related documents are filed with a certificate of mailing, pursuant to section 1.8, the certificate of mailing should be completed with the new address: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513. Use of the correct address will avoid processing delays. Trademark documents to be recorded with the Assignment Division, except those filed with new applications, should be addressed to: Box Assignment, Commissioner of Patents and Trademarks, Washington, D.C. 20231. Orders for certified and uncertified copies of trademark documents should be addressed to: Box 10, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

The Office announced the new address for trademark-related mail in a notice (Change of Address for Trademark Applications and Trademark Related Papers) published in the Federal Register at 59 FR 29275 (June 6, 1994) and in the Trademark Office Official Gazette at 1163 Off. Gaz. Trademark Office 80 (June 28, 1994) (republished in 1170 Off. Gaz. Pat. Office 303 (January 3, 1995)).

The Office will continue to maintain the special box designations and FEE/NO FEE indicators for trademark mail as currently listed in each issue of the Official Gazette. In addition to addressing trademark-related mail as set forth above, the boxes should also be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks.

Mail intended for the Trademark Trial and Appeal Board should be addressed to: Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513, including BOX TTAB/FEE or BOX TTAB/NO FEE, whichever is applicable.

HAND-CARRIED CORRESPONDENCE

All correspondence with the Office, except for communications relating to pending litigation as specified currently in section 1.1(g), may continue to be filed directly at the Attorney's Window located in Room 1B03 of Crystal Plaza Building 2, 2011 South Clark Place, Arlington, Virginia. Trademark-related papers may also be filed at the "walk-up" window located on the third floor of the South Tower Building, 2900 Crystal Drive, Arlington, Virginia.

FEDERAL HOLIDAYS WITHIN THE DISTRICT OF COLUMBIA

When the Patent and Trademark Office is officially closed for an entire day (for reasons due to weather or other causes), the Office will consider each such day a "Federal holiday within the District of Columbia" under 35 U.S.C. § 21. Any action or fee due on such a day may be taken, or fee paid, on the next succeeding business day the Office is open.

Legal holidays considered "Federal holidays within the District of Columbia" are New Year's Day (January 1), Martin Luther King, Jr.'s Birthday (third Monday in January), Presidential Inauguration Day, Washington's Birthday (third Monday in February), Memorial Day (last Monday in May), Independence Day (July 4), Labor Day (first Monday in September), Columbus Day (second Monday in October), Veterans Day (November 11), Thanksgiving Day (fourth Thursday in November) and Christmas Day (December 25). In the past, the Office has published notices concerning unscheduled closings. *See, e.g.*, "Closing of Patent and Trademark Office on Thursday, January 20, 1994 and Friday, February 11, 1994," 1161 Off. Gaz. Pat. Office 12 (April 5, 1994) (republished in 1170 Off. Gaz. Pat. Office 8 (January 3, 1995)) and "Filing of Papers During Unscheduled Closings of the Patent and Trademark Office," 1097 Off. Gaz. Pat. Office 53 (December 20, 1988) (republished in 1170 Off. Gaz. Pat. Office 8 (January 3, 1995)). The proposed rule change will further implement the existing policy.

EXPRESS MAIL PROVISIONS

Section 1.10 is proposed to be amended by deleting the requirement for a "Certificate of Mailing by Express Mail" to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) as the filing date of the paper. The title of section 1.10 is proposed to be revised and section 1.10 is also proposed to be amended to incorporate requirements for the resubmission of misplaced correspondence which parallel section 1.8.

Under the current rule, the filer is required to include a Certificate of Mailing by Express Mail, certifying the date of deposit as Express Mail. Some papers filed with the Office, although deposited as Express Mail with the U.S.P.S., have been denied the filing date of the date of deposit as Express Mail because the required Certificate of Mailing by Express Mail was omitted or deficient. The lost filing date for a significant number of these papers has resulted in the loss of substantive rights. For example, a trademark registration may be canceled if the required affidavit of continued use or excusable non-use is not filed by the end of the sixth year of registration. 15 U.S.C. § 1058.

In light of the problematic nature of the requirement for a Certificate of Mailing by Express Mail, inasmuch as the date of deposit has already been entered by a disinterested third party, the Office proposes to delete this requirement from section 1.10.

MISCELLANEOUS CHANGES

Miscellaneous changes are proposed to change the word "communications" to "correspondence" for purposes of consistency. Also, since the certificate of mailing by "Express Mail" will no longer be a requirement of the proposed rules, the provisions of Part 10 relating to misconduct are proposed to be amended to delete reference to this requirement.

DISCUSSION OF SPECIFIC RULES

If revised as proposed, the heading of section 1.1 will be changed to state that the section contains the addresses for correspondence to the Patent and Trademark Office.

Section 1.1 is proposed to be revised to set out all pertinent Office mailing addresses in paragraph (a) and in added paragraphs (a)(1), (a)(2), and (a)(3). It should be noted that the remaining paragraphs of section 1.1 contain directions for using box designations rather than addresses. Paragraph (a)(1) is proposed to be added to set out the new mailing address to which most patent-related documents should be sent. Paragraph (a)(2) is proposed to be added to set out the new mailing address to which most trademark-related documents should be sent. The Solicitor's mailing address, formerly set out in paragraph (g) of the section is moved to a new paragraph (a)(3). Paragraph 1.1(g) is proposed to be removed and reserved.

Sections 1.1 and 1.3 are proposed to be amended so that the word "communications" is changed to "correspondence."

Section 1.5(a) is proposed to be amended by removing the requirement of the words "PATENT APPLICATION" on letters concerning patent applications.

Section 1.8 (a) is proposed to be revised to state that papers and fees must be addressed as set out in section 1.1 (a). For the purposes of 1.8 (a) (1) (i) (A) , first class mail is interpreted as including "Express Mail" and "Priority Mail" deposited with the U.S.P.S.

Section 1.9 is proposed to be amended to add a definition of "Federal holiday within the District of Columbia" to include Federal holidays and days when the Patent and Trademark Office is officially closed for the entire day (for reasons due to adverse weather or other causes).

Section 1.10 is proposed to be revised to state that "Express Mail" must be addressed as set out in § 1.1(a). The title of section 1.10 is proposed to be revised to reflect this change. Further, for all correspondence *actually received* in the Office, the Office will consider the correspondence filed on the date shown by the "date in" notation on the "Express Mail" label unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia. Because of the reliance on the "date in" marked by the Postal Service, correspondence should be deposited directly with a person at the United States Postal Service, rather than in a drop box, to ensure that the person making the deposit receives a copy of the "Express Mail" label at the time of making the deposit to verify that the "date in" is accurately and clearly written by the Postal Service employee. Persons using an Express mail receptacle (such as a drop box) do so at the risk of not receiving an accurate and legible copy

of the Express mail label at the time of deposit from which the Office may determine the "Express mail" "date in," and, therefore, may not later argue that they should be entitled to the date on which they deposited the correspondence into a receptacle. Moreover, if the "date in" is found to be illegible or unclear, a person dealing directly with a Postal Service employee must take corrective action to ensure that a clear and accurate date is marked at the time of deposit. Persons choosing to use a receptacle (or the like) obviously do not oversee the marking by a Postal Service employee and thus may not later argue for the benefit of a section 1.10 filing date if the "date in" on the "Express Mail" label is improperly or not clearly marked. The determinative factor is when the Postal Service marks the "date in" and the mere deposit into a receptacle does not entitle one to an "Express Mail" "date in" under section 1.10.

Paragraph (b) of section 1.10 is proposed to be amended by deleting the requirement for a "Certificate of Mailing by Express Mail" currently necessary to obtain the benefit of the date of deposit with the United States Postal Service (U.S.P.S.) express mail service as the filing date of the paper.

Paragraph (c) of section 1.10 is proposed to be amended to set forth the requirements for the treatment of correspondence not received by the Office for which the "Express Mail" procedure was utilized. Correspondence not received by the Office will be considered filed in the Office on the date shown by the "date in" notation entered by the Postal Service if the party who forwards the correspondence:

(1) Places the number of the "Express Mail" mailing label on the correspondence prior to the original mailing by "Express Mail,"

(2) Informs the Office of the previous deposit of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence,

(3) Supplies an additional copy of the previously deposited correspondence showing the number of the "Express Mail" label thereon,

(4) Supplies a copy of the "Express Mail" label clearly displaying the "date in" entered by the United States Postal Service, and

(5) Includes a statement which establishes, to the satisfaction of the Commissioner, the previous deposit and that the copies of the correspondence and "Express Mail" label are true copies of the original correspondence and "Express Mail" label. Such statement must be on the basis of personal knowledge, whenever possible, and must be a verified statement if made by a person other than a practitioner as defined in section 10.1(r) of this chapter.

In addition, although the requirement for a certificate of express mail has been proposed to be eliminated from section 1.10, applicants are strongly encouraged to continue using the certificate of express mail, as well as the placement of the Express Mail label number in the upper right corner of the first page of each separate piece of correspondence and to retain a clearly marked Express Mail label, to facilitate complying with the requirements of paragraph (c) if the correspondence is not received in the Office or if reliance on the U.S.P.S. "date in" is not possible. Moreover, paragraph (d) is proposed to be added so that additional evidence may be required if the Office so determines.

Section 5.33 (entitled "Correspondence") is proposed to be amended to change the correspondence address to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

Section 10.23(c)(9) is proposed to be revised to reflect the proposed change to section 1.10 that the certificate of mailing by "Express Mail" is no longer a requirement of the rules.

OTHER CONSIDERATIONS

The proposed rule changes are in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* Information collection requirements are not affected by the change of address. This proposed rule has been determined to not be significant for the purposes of Executive Order 12866.

The Office has determined that this proposed rule change has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that the proposed rule changes would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The proposed rule change has no effect on patent fees.

These proposed rule changes contain collections of information subject to the requirements of the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*, which are currently approved by the Office of Management and Budget under Control No. 0651-0009 and 0651-0031. The public reporting burden for these collections of information for certificate of mailing is estimated to average six minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503. (ATTN: Paperwork Reduction Act Projects 0651-0009 and 0651-0031).

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Freedom of information, Inventions and patents, Reporting and record keeping requirements.

37 CFR PART 5

Classified information, Foreign relations, Inventions and patents.

37 CFR PART 10

Administrative Practice and procedure, Conflicts of interest, Courts, Inventions and patents, Lawyers.

For the reasons set forth in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6 and 15 U.S.C. 1123, 37 CFR Parts 1, 5 and 10 are proposed to be amended as follows:

PART 1--RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:
Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.1 is proposed to be amended by removing and reserving paragraph (g) and by revising the title and paragraph (a) to read as follows:

§ 1.1 Addresses for correspondence with the Patent and Trademark Office.

(a) Except for those documents identified in paragraphs (1), (2) and (3) of this section, all correspondence intended for the Patent and Trademark Office must be addressed to "Commissioner of Patents and Trademarks, Washington, D.C. 20231." When appropriate, correspondence should also be marked for the attention of a particular office or individual.

(1) *Patent correspondence.* All correspondence concerning patent matters processed by organizations reporting to the Assistant Commissioner for Patents should be addressed to "Assistant Commissioner for Patents, Washington, D.C. 20231."

(2) *Trademark correspondence.* All correspondence concerning trademark matters, except for trademark-related docu-

ments sent to the Assignment Division for recordation and requests for certified and uncertified copies of trademark application and registration documents, should be addressed to "Assistant Commissioner for Trademarks, 2900 Crystal Drive, Arlington, Virginia 22202-3513." This includes correspondence intended for the Trademark Trial and Appeal Board.

(3) *Office of Solicitor correspondence.*

(i) Correspondence relating to pending litigation required by court rule or order to be served on the Solicitor shall be hand-delivered to the Office of the Solicitor or shall be mailed to: Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215; or such other address as may be designated in writing in the litigation. See §§ 1.302(c) and 2.145(b)(3) for filing a notice of appeal to the U.S. Court of Appeals for the Federal Circuit.

(ii) Correspondence relating to disciplinary proceedings pending before an Administrative Law Judge or the Commissioner shall be mailed to: Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.

(iii) All other correspondence to the Office of the Solicitor shall be addressed to: Box 8, Commissioner of Patents and Trademarks, Washington, D.C. 20231.

(iv) Correspondence addressed to the wrong Post Office Box will not be filed elsewhere in the Patent and Trademark Office and might be returned.

*****

(g) [Reserved]

*****

3. Section 1.3 is proposed to be revised to read as follows:

§ 1.3 Business to be conducted with decorum and courtesy.

Applicants and their attorneys or agents are required to conduct their business with the Patent and Trademark Office with decorum and courtesy. Papers presented in violation of this requirement will be submitted to the Commissioner and will be returned by the Commissioner's direct order. Complaints against examiners and other employees must be made in correspondence separate from other papers.

4. Section 1.5(a) is proposed to be revised to read as follows:

§ 1.5 Identification of application, patent, or registration.

(a) No correspondence relating to an application should be filed prior to when notification of the application number is received from the Patent and Trademark Office. When a letter directed to the Patent and Trademark Office concerns a previously filed application for a patent, it must identify on the top page in a conspicuous location, the application number (consisting of the series code and the serial number; *e.g.*, 07/123,456), or the serial number and filing date assigned to that application by the Patent and Trademark Office, or the international application number of the international application. Any correspondence not containing such identification will be returned to the sender where a return address is available. The returned correspondence will be accompanied with a cover letter which will indicate to the sender that if the returned correspondence is resubmitted to the Patent and Trademark Office within two weeks of the mail date on the cover letter, the original date of receipt of the correspondence will be considered by the Patent and Trademark Office as the date of receipt of the correspondence. Applicants may use either the Certificate of Mailing or Transmission procedure under § 1.8 or the Express Mail procedure under § 1.10 for resubmissions of returned correspondence if they desire to have the benefit of the date of deposit in the United States Postal Service. If the returned correspondence is not resubmitted within the two-week period, the date of receipt of the resubmission will be considered to be the date of receipt of the correspondence. The two-week period to resubmit the returned correspondence will not be extended. If for some reason returned correspondence is resubmitted with proper identification later than two weeks after the return mailing by the Patent and Trademark Office, the resubmitted correspondence will be accepted but given its date of receipt. In addition to the application number, all letters directed to the Patent and Trademark Office concerning applications for patent should also state the name of the applicant, the title of the invention, the date of filing the same, and, if known, the group art unit or other unit within the Patent and Trademark Office responsible for considering the letter and the name of the examiner or other person to which it has been assigned.

5. Section 1.8(a)(1)(i)(A) is proposed to be revised to read as follows:

§ 1.8 Certificate of mailing or transmission.

(a) ***

(1) ***

(i) ***

(A) Addressed as set out in § 1.1(a) and deposited with the U.S. Postal Service with sufficient postage as first class mail; or

*****

6. Section 1.9 is proposed to be revised by adding a new paragraph (h) to read as follows:

§ 1.9 Definitions.

*****

(h) A "Federal holiday within the District of Columbia" as used in this chapter means any day, except Saturdays and Sundays, when the Patent and Trademark Office is officially closed for business.

7. Section 1.10 is proposed to be revised to read as follows:

§ 1.10 Filing of correspondence by "Express Mail."

(a) Any correspondence received by the Patent and Trademark Office utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service will be considered filed in the Office on the date shown by the "date in" notation entered by the United States Postal Service on the "Express Mail" label, unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia. See § 1.6(a). This procedure can be used to file any correspondence in the Office.

(b) Any correspondence filed by "Express Mail" must be addressed as set out in § 1.1(a) and should be deposited directly with the United States Postal Service to ensure that the person depositing the correspondence receives a copy of the "Express Mail" label at the time of deposit with the "date in" clearly marked thereon. Persons dealing indirectly with the United States Postal Service (such as by deposit in an Express Mail drop box) do so at the risk of not receiving their copy of the "Express Mail" label with the "date in" clearly marked.

(c) Any correspondence mailed to the Patent and Trademark Office utilizing the "Express Mail Post Office to Addressee" service of the United States Postal Service, but not received by the Office, will be considered filed in the Office on the date shown by the "date in" notation entered by the United States Postal Service on the "Express Mail" label, unless the "date in" is a Saturday, Sunday or Federal holiday within the District of Columbia (see § 1.6(a)), if the party who forwarded such correspondence:

(1) Places the number of the "Express Mail" mailing label on the correspondence prior to the original mailing by "Express Mail,"

(2) Informs the Office of the previous deposit of the correspondence promptly after becoming aware that the Office has no evidence of receipt of the correspondence,

(3) Supplies a copy of the previously deposited correspondence showing the number of the "Express Mail" label thereon,

(4) Supplies a copy of the "Express Mail" label clearly displaying the "date in" entered by the United States Postal Service, and

(5) Includes a statement which establishes, to the satisfaction of the Commissioner, to the previous deposit and that the

copies of the correspondence and "Express Mail" label are true copies of the original correspondence and "Express Mail" label. Such statement must be on the basis of personal knowledge, whenever possible, and must be a verified statement if made by a person other than a practitioner as defined in § 10.1(r) of this chapter.

(d) The Office may require additional evidence to determine if the correspondence was deposited as "Express Mail" with the United States Postal Service on the date in question.

Part 5 - SECRECY OF CERTAIN INVENTIONS AND LICENSES TO EXPORT AND FILE APPLICATIONS IN FOREIGN COUNTRIES

8. The authority citation for 37 CFR Part 5 continues to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418, 102 Stat. 1567; the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*, the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 et seq., and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

9. Section 5.33 is proposed to be revised to read as follows:

§ 5.33 Correspondence.

All correspondence in connection with this part, including petitions, should be addressed to "Assistant Commissioner for Patents (Attention: Licensing and Review), Washington, D.C. 20231."

Part 10 - REPRESENTATION OF OTHERS BEFORE THE PATENT AND TRADEMARK OFFICE

10. The authority citation for 37 CFR Part 10 continues to read as follows:
Authority: 5 U.S.C. 500; 15 U.S.C. 1123; 35 U.S.C. 6, 31, 32, 41.

11. Section 10.23(c)(9) is proposed to be revised to read as follows:

§ 10.23 Misconduct.

*****

(c) ***

*****

(9) Knowingly misusing a "Certificate of Mailing or Transmission" under § 1.8 of this chapter.

October 26, 1995

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

---

Certificate of Correction
For Week of November 28, 1995

B1 4,928,662	5,021,887	5,207,866	5,281,715
P. 09,127	5,026,835	5,219,101	5,285,470
Re. 35,004	5,073,094	5,220,396	5,287,978
D. 346,804	5,075,099	5,220,640	5,294,905
D. 351,758	5,090,442	5,224,335	5,298,661
D. 352,197	5,100,847	5,227,107	5,300,329
D. 361,297	5,113,519	5,234,955	5,304,882
D. 361,957	5,130,730	5,252,313	5,305,044
4,689,338	5,158,448	5,256,786	5,308,359
4,758,745	5,160,192	5,260,312	5,314,896
4,893,275	5,191,734	5,270,654	5,315,336
5,009,086	5,205,959	5,278,146	5,321,150
5,327,202	5,391,596	5,425,428	5,441,055
5,327,789	5,391,997	5,425,773	5,441,178
5,328,369	5,393,421	5,426,378	5,441,304
5,328,455	5,397,843	5,427,199	5,441,863
5,333,637	5,398,344	5,427,269	5,441,969
5,334,507	5,399,858	5,427,709	5,442,057
5,335,295	5,401,285	5,427,862	5,442,072
5,338,371	5,401,827	5,428,607	5,442,195
5,338,532	5,402,803	5,428,610	5,442,874
5,339,465	5,402,954	5,428,671	5,442,950
5,344,912	5,403,781	5,428,802	5,443,012
5,344,940	5,404,019	5,429,703	5,443,827
5,346,980	5,404,841	5,429,814	5,444,032
5,347,672	5,405,274	5,430,079	5,444,049
5,349,277	5,407,568	5,430,344	5,444,087
5,349,345	5,407,939	5,430,576	5,444,342
5,351,437	5,408,730	5,430,687	5,444,645
5,352,893	5,409,782	5,431,239	5,445,143
5,353,052	5,410,656	5,431,821	5,445,158
5,354,745	5,410,721	5,432,458	5,445,180
5,355,516	5,411,644	5,432,742	5,445,629
5,356,602	5,412,779	5,433,249	5,445,981
5,358,857	5,412,867	5,433,790	5,446,163
5,359,298	5,412,945	5,434,907	5,446,401
5,360,986	5,413,384	5,435,168	5,446,494
5,361,037	5,413,625	5,435,191	5,446,556
5,361,271	5,414,306	5,435,504	5,446,863
5,362,415	5,414,565	5,435,902	5,447,306
5,363,563	5,415,054	5,436,035	5,447,424
5,364,267	5,415,092	5,436,361	5,447,478
5,364,693	5,416,483	5,437,022	5,447,658
5,365,354	5,416,560	5,437,615	5,447,929
5,366,308	5,416,795	5,438,243	5,447,985
5,367,804	5,417,882	5,438,600	5,448,076
5,368,304	5,417,917	5,438,809	5,448,674
5,368,531	5,418,929	5,438,852	5,448,719
5,368,668	5,419,164	5,438,943	5,449,498
5,372,195	5,419,332	5,439,083	5,450,971
5,373,090	5,419,580	5,439,109	5,451,003
5,374,964	5,419,932	5,439,180	5,451,400
5,378,613	5,420,753	5,439,514	5,451,983
5,380,181	5,422,210	5,439,515	5,452,923
5,381,642	5,422,756	5,439,601	5,453,289
5,382,098	5,422,940	5,439,770	5,453,472
5,382,261	5,423,968	5,439,956	5,453,543
5,382,477	5,423,981	5,440,013	5,453,549
5,384,811	5,424,267	5,440,064	5,453,677
5,387,981	5,424,610	5,440,174	5,454,465
5,387,991	5,424,807	5,440,394	5,454,492
5,388,821	5,424,898	5,440,412	5,454,574
5,389,899	5,425,025	5,440,533	5,455,345
5,390,205	5,425,382	5,440,894	

Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

August 14-18, 1995

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
8-15	EX	74/337,765	P.I.P., Inc.	2(d)	Refusal Affirmed		"P.I.P." [courier services and delivery and freight transportation of goods, namely, personal property, general commodities and hazardous materials, by truck]	"PIP" (and design) [insuring packages against loss or damage during shipment by carriers]; "PIP PRINTING" (and design) [printing services]; et al.	No
8-15	EX	74/290,900	American Takii Inc.	whether the matter asserted for registration is a plant varietal name (generic term)	Refusal Reversed		"TAKII" [flower and vegetable seeds for horticultural and agricultural purposes]		No
8-15	EX	74/379,810	Industrial Electronic Engineers, Inc.	2(e)(1)	Refusal Affirmed		"MEETING METER" [apparatus for continuously calculating and displaying the elapsed time and accrued cost of meetings or conferences]		No
8-15	EX	74/324,477	Wood Carvers Supply, Inc.	genericness; whether applicant's mark has become distinctive under Sec. 2(f)	Refusal Affirmed [but only on the ground of lack of acquired distinctiveness under Sec. 2(1)]		"WOOD CARVERS SUPPLY, INC." (in stylized lettering) [mail order catalog services featuring wood carving supplies]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
8-15	EX	74/324,968	University Hospital, Inc.	2(d)	Refusal Affirmed		"ARTHRITIS LIFESTYLE ENRICHMENT NETWORK" [conducting courses in the field of arthritis treatment; operating a medical center specializing in the treatment of patients with arthritis; physical therapy]	"ARTHRITIS LIFESTYLE CENTERS" [providing arthritis treatment]	No
8-15	EX	74/255,471	Connie and John Bivens	2(e)(1); whether the stylized presentation (stylized lettering) of the mark is sufficiently distinctive to function as a mark even if the words are held merely descriptive of applicant's goods	Refusal Affirmed		"SPORT PINS" (in stylized lettering) [jewelry, namely, pins, earrings and medallions]		No
8-15	EX	73/632,697	Int'l. Telesis Communications	2(d)	Refusal Affirmed		"INTERNATIONAL TELESIS GROUP" [voice and data telecommunications consulting services]	"TELESIS" [telephone services]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
8-17	EX	74/396,007	Swing-Masters, Ltd.	2(d)	Refusal Affirmed		"SWINGMASTERS" [retail store services in the field of sports clothing, equipment, and accessories]	"SWINGMASTER" [golf clubs and covers for golf club heads, patented instructional mat and instructional video cassette tapes used to teach a golf swing]	No
8-17	EX	74/196,302	Wheat Technologies, Inc.	Section 6 disclaimer requirement (of wheat design)	Refusal Affirmed		WHEAT TECHNOLOGIES, INC." (and design) [modified and unmodified wheat starch and wheat gluten]		No
8-17	EX	74/369,231	Surgidev Corp.	2(e)(2)	Refusal Affirmed		"SURGICAL PRODUCTS OF AMERICA" [implantable ophthalmic devices, surgical viscous adducts, and surgical instruments]		No
8-18	EX	74/325,613	American Needle, Inc.	whether the matter asserted for registration functions as a trademark for applicant's goods or is, instead, mere ornamentation	Refusal Affirmed		a design within one of the curved triangular panels on a cap, the design consisting of tapered lettering (of, for example, a sports team name) declining in size from the base to the crown of the cap [caps]		No
8-18	EX	74/216,432	IPR Pharmaceuticals, Inc.	2(d)	Refusal Affirmed		"IPR" (and design) [medicine for human consumption in tablet form]	"IPR" (and design) [pharmaceutical and drug research]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
8-18	EX	74/343,080	Valley Recreation Products Inc.	whether the matter asserted for registration functions as a trademark for applicant's goods or is, instead, mere ornamentation	Refusal Affirmed		curved, vertically extending, silvery panel as the exterior of each of the four corners of a pool table [pool tables]		No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (R)=REQ. FOR RECONSIDERATION

Provisional Applications for Patent Meet Paris Convention Requirements as Foreign Priority Documents

In view of the recent question raised in the patent community regarding the adequacy of provisional patent applications filed under 35 USC 111(b) to serve as the basis for the right of priority provided by Article 4 of the Paris Convention for the Protection of Industrial Property, Commissioner Lehman decided to seek the advice of the World Intellectual Property Organization on that issue. Below is the resulting exchange of correspondence that should lay to rest any doubt that provisional patent applications are indeed sufficient for this purpose.

UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER
OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

NOV 17 1995

Dr. Arpad Bogsch
Director General
World Intellectual Property Organization
1211 Geneva 20
Switzerland

Dear Arpad,

Recently, a question arose regarding the adequacy of a provisional patent application, filed in accordance with section 111(b) of title 35, United State Code, to serve as the basis for the right of priority provided by Article 4 of the Paris Convention for the Protection of Industrial Property.

Although we are convinced that such an application is indeed sufficient for this purpose, we would be very interested in your opinion on this subject and request a reply at your earliest convenience.

Sincerely,

Bruce

Bruce A. Lehman
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

WORLD INTELLECTUAL PROPERTY ORGANIZATION

世界知识产权组织

ORGANIZACION MUNDIAL DE LA PROPIEDAD INTELECTUAL

ORGANISATION MONDIALE DE LA PROPRIÉTÉ INTELLECTUELLE

المنظمة العالمية للملكية الفكرية

ВСЕМИРНАЯ ОРГАНИЗАЦИЯ ИНТЕЛЛЕКТУАЛЬНОЙ СОБСТВЕННОСТИ

1970-1995 PCT WIPO-OMPI

-20
-33

November 20, 1995

Dear Bruce,

I thank you for your letter of November 17, 1995, asking for our views concerning the claiming of priority under Article 4 of the Paris Convention for the Protection of Industrial Property, in respect of provisional patent applications filed with the USPTO.

As you know, the International Bureau is not in a position to give an official interpretation of the provisions of the Paris Convention. However, we offer the following considerations which may be helpful in order to reply to the question raised by you.

According to Article 4A(1) of the Paris Convention, the basis for priority under that Convention is a duly filed application for a patent.

Article 4A(2) of the Paris Convention states, in particular, that "Any filing that is equivalent to a regular national filing under the domestic legislation of any country of the Union ... shall be recognized as giving rise to the right of priority." In the case under consideration, the "domestic legislation" is the legislation of the United States of America. Therefore, it is that legislation which determines whether a "regular national filing" exists, subject to compliance with Article 4A(3) of the Paris Convention.

/...

Mr. Bruce A. Lehman
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks
Patent and Trademark Office
Box 4
U.S. Department of Commerce
Washington, D.C. 20231
United States of America

34, chemin des Colombettes, 1211 GENÈVE 20 (SUISSE). ☎ (022) 730 91 11: Fac-similé (41-22) 733 54 28; Télex CH - 412 912: Télégr.: OMPI
Banque: Crédit Suisse, Genève, compte OMPI N° 48 7080-81 Chèques postaux: OMPI N° 12-5000-8, Genève

Mr. Bruce A. Lehman, Assistant Secretary of Commerce and Commissioner of Patents and Trademarks, Patent and Trademark Office, Washington, D.C. - November 20, 1995

Article 4A(3) of the Paris Convention states that "By a regular national filing is meant any filing that is adequate to establish the date on which the application was filed in the country concerned, ..." As section 111(b) of title 35, United States Code, establishes such a filing date with respect to provisional patent applications, this requirement of the Paris Convention appears to be satisfied. To conclude otherwise would put into question the ability of domestic legislation to prescribe the requirements which must be fulfilled for a filing to be adequate to establish a filing date.

Article 4A(3) of the Paris Convention also states that "any filing that is adequate to establish the date on which the application was filed" is a regular national filing "whatever may be the subsequent fate of the application." Thus the question of whether a filing is to be considered as a "regular national filing" does not appear to depend on whether or not that filing may itself lead to the grant of a patent. Moreover, it is to be noted that applications for patents are recognized as giving rise to a right of priority under the Paris Convention even if it is clear from the outset that no patent can be granted upon such an application, for example, where the invention concerned is excluded from patenting.

Sincerely yours,

A. Bogsch

Arpad Bogsch
Director General

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the specified type of document should be placed in an envelope addressed to one of these special boxes. If any documents other than the specified type identified for each special box are addressed to that box, they will be significantly delayed in reaching the appropriate area for which they are intended.

Please address mail as follows:

Box _____
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or material related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL–85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box M Fee	Correspondence related to a patent that is subject to the payment of a maintenance fee.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee-Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent application and associated papers and fees.
Box Pat. Ext.	Applications for patent term extension.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filings of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return postcard or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

Please address mail as follows:

Box _____
FEE (or "NO FEE")
Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOU's), and extension requests.
Box TTAB FEE	Oppositions, Cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections, and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

The following special box designations are applicable to both patent and trademark related mail, and the recommendations for "Special Boxes for Patent Mail" (above) should be followed for the types of mail listed below.
Please address mail as follows:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Assistant Commissioner for External Affairs and the Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation*; papers relating to pending litigation shall be mailed only to the Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Patent Clearinghouse	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Library, University of Michigan	(313) 764-5298
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-1450
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

State	*Name of Library*	*Telephone Contact*
	New York Public Library (The Research Libraries)	(212) 930-0917
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron: Summit County Public Library	Not Yet Operational
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	Not Yet Operational
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	Not Yet Operational
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy
J.O. THOMAS, JR., Deputy Assistant Commissioner for Patent Process Services

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	06/02/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1233	06/24/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	08/24/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	09/01/94
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	03/08/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	12/20/93
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	05/03/94
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	06/09/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	03/28/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	04/26/94
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	03/22/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	05/02/94
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	05/10/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	06/14/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	08/30/94
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	07/28/94
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	06/06/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

165-920 O.G.-95-2

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of October 1, 1995

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Sussman, Acting Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/23/95	05/25/95
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	07/03/95
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/26/95	08/21/95
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	04/06/95	08/14/95
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/23/95	05/01/95
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/14/95	07/03/95
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/01/95	07/24/95
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions– Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	05/15/95	06/17/95
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	06/30/95	05/30/95
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—John Walker, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	02/14/95	—0—
Renewals (All Classes)	07/25/95	—0—
Section 12(c) Publications (All Classes)	04/11/95	—0—

1. ** Assigned to all Law Office

2. Applicants with inquires concerning the status of their applications and a touch tone phone should call (703) 305–8747 through (703) 305-9752 from 6:30 a.m. to Midnight EST, Monday thru Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquires concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

NOVEMBER 28, 1995

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,098,622 (2739th)

EARTH-WORKING IMPLEMENT

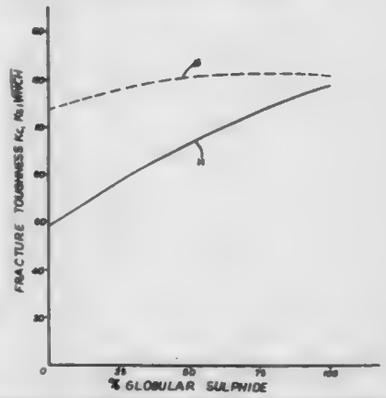
Theodore M. Clarke, Western Springs, and Gordon H. Walter, Darien, both of Ill., assignors to Case Corporation

Reexamination Request No. 90/003,292, Dec. 30, 1993.

Reexamination Certificate for Patent 4,098,622, issued Jul. 4, 1978, Ser. No. 686,616, May 14, 1976.

Int. Cl.[6] **C22C** *38/00*

U.S. Cl. 148—331



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** is confirmed.

1. A heat treated, straight rolled steel, earth-working implement disk having a carbon content of at least 0.65% and being substantially free of pearlitic microstructure, said disk having a sulphur content not exceeding a maximum of about 0.025%, a hardness in the range of approximately Rockwell "C" - 35 to 46, said disk containing a sulfide inclusion shape control agent selected from the group consisting of rare earth, Mischmetal and calcium containing additives, said shape control agent being present in an amount sufficient to render at least 40% of the retained sulfide inclusions globular in shape.

B1 4,756,651 (2740th)

Patent Not Issued For This Number

B1 4,791,708 (2741th)

ABRASION AND HYDROLYSIS RESISTANT JOINING MEANS FOR FABRIC SEAMS

H. Dana Smolens, Norristown, Pa., assignor to Asten Group, Inc., Devon, Pa.

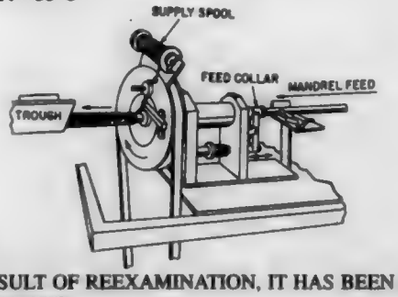
Reexamination Request No. 90/003,706, Jan. 20, 1995.

Reexamination Certificate for Patent 4,791,708, issued May 4, 1978, Ser. No. 874,640, Jun. 16, 1986.

Continuation of Ser. No. 582,784, Feb. 23, 1984, abandoned.

Int. Cl.[6] **F16G** *3/00*

U.S. Cl. 24—33 C



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–8** is confirmed.

1. Means for joining the ends of a flat woven heat sensitive industrial fabric into an endless papermaker's belt, said means comprising at least two fabric connecting elements, having a heat set temperature different from the heat set temperature of the interwoven threads of said flat woven industrial fabric and greater than 400° F., and a joining element, each of said connecting elements being a preformed and heat set coil of polyetheretherketone continuous filament having a preformed and heat set final height dimension which is not greater than the maximum thickness of the final finished papermaker's belt, whereby the connecting elements are secured to the respective ends of the flat woven fabric and are intermeshed to form a passage way for receiving the joining element therethrough and establishing the endless papermaker's belt, said connecting elements being heat set and preformed prior to use as a connecting element so as to avoid damage to said fabric from heat setting.

B1 4,952,936 (2742th)

MULTI-BAND RADAR DETECTOR HAVING PLURAL LOCAL OSCILLATORS

Glen Martinson, Oakville, Canada, assignor to B.E.L-Tronics Limited, Mississauga, Canada

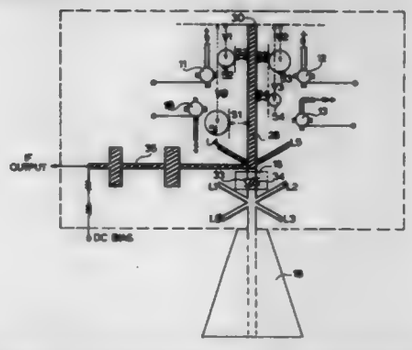
Reexamination Request No. 90/003,835, May 19, 1995.

Reexamination Certificate for Patent 4,952,936, issued Aug. 28, 1990, Ser. No. 242,533, Sep. 12, 1988.

Claims priority, application Canada, Dec. 23, 1987, 555193

Int. Cl.[6] **G01S** *7/285;* **H04B** *1/28;* **H01D** *7/10;* **H03B** *25/00*

U.S. Cl. 342—20



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1** and **3–5** is confirmed.

Claim **2** is determined to be patentable as amended.

Claims **6** and **7** dependent on an amended claim, are determined to be patentable.

2. A Multi-Band Radar detector comprising:

a broad band antenna;

a plurality of dielectric resonator local oscillators, each having an output at a respective [first] predetermined *fundamental* frequency;

a mixer having a radar signal input port, a local oscillator signal input port, and an intermediate frequency signal output port;

means to feed a signal from the antenna to the radar signal input port;

means to feed signals sequentially from *each of* said dielectric resonator local oscillators directly to said local oscillator signal input port of said mixer for mixing, each in its turn, with the signal from said antennas;

and means to feed an intermediate frequency signal from said intermediate frequency signal output port of said mixer to signal processing circuitry for actuating an alarm in response to detected radar;

wherein said means to feed signal sequentially from *each of* said dielectric resonator local oscillators directly to said local oscillator signal input port of said mixer comprises a feedline for said signals from said dielectric resonator local oscillators together with means to effect electromagnetic coupling between *each of* said dielectric resonator local oscillators, *at the respective predetermined fundamental frequency thereof,* and said feedline;

wherein said means for effecting electromagnetic coupling of *each of* said dielectric resonator local oscillators with said feedline comprises a dielectric resonator, and *said electromagnetic coupling* is achieved *at the respective predetermined fundamental frequency of each said dielectric resonator local oscillator* by [positioned] *positioning* each [said] *respective* dielectric resonator *at* a *respective* distance from said feedline so as to effect *said* electromagnetic coupling between each said dielectric resonator and said [mixer] *feedline*;

and wherein each dielectric resonator is positioned at a distance that is measured from the centre of the respective resonator to an [end] *open circuit point* of said feedline, which distance is equal to an odd number of quarter wave lengths of the *respective predetermined fundamental* frequency of each respective dielectric resonator, *so as to provide a short circuit for each respective dielectric resonator.*

B1 5,300,145 (2743th)

LOW AMYLOPECTIN STARCH

Virgil Fergason, Decatur, Ill.; Roger Jeffcoat, Bridgewater, N.J.; John E. Fannon, Somerville, N.J., and Teresa Capitani, Clark, N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

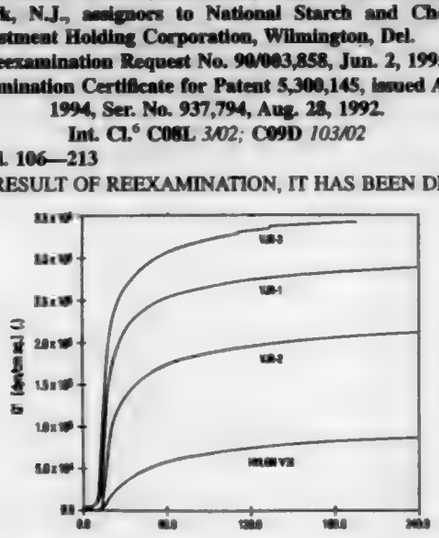
Reexamination Request No. 90/003,858, Jun. 2, 1995.

Reexamination Certificate for Patent 5,300,145, issued Apr. 5, 1994, Ser. No. 937,794, Aug. 28, 1992.

Int. Cl.[6] C08L *3/02*; **C09D** *103/02*

U.S. Cl. 106—213

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



The patentability of claims **1–20** is confirmed.

1. A substantially pure starch extracted from a plant source having an amylose extender genotype, the starch comprising less than **10%** amylopectin determined by butanol fractionation/exclusion chromatography measurement.

B1 5,317,787 (2744th)

CABLE TIE HAVING IMPROVED TAIL GRIPPING AND HOLDING FEATURE

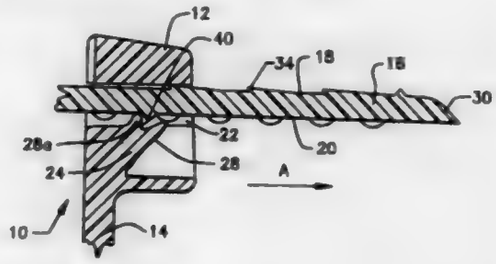
William A. Fortsch, Bernardsville, N.J., assignor to Thomas & Betts Corporation, Bridgewater, N.J.

Reexamination Request No. 90/003,641, Nov. 18, 1994.

Reexamination Certificate for Patent 5,317,787, issued Jun. 7, 1994, Ser. No. 955,558, Oct. 1, 1992.

Int. Cl.[6] B65D *63/00*

U.S. Cl. 24—16 PB



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **2** and **4** are cancelled.

Claims **3** and **5** are determined to be patentable as amended.

Claim **6**, dependent on an amended claim, is determined to be patentable.

New claims **7–12** are added and determined to be patentable.

3. A bundling tie for wrapping around an article comprising:

an elongate member having a head at one end, a tail at the other end and a central strap body therebetween;

said central strap body including teeth therealong;

said head including a passage therethrough for receipt of said tail and a locking barb extending into said passage for locking engagement with said teeth of said strap body;

said tail having an extending projection for engagement with said locking barb for releasably holding said tail in said head passage, *said tail including outwardly projecting tactile elements for enhancing manual gripping of the tail, said tactile elements being separate and distinct from said extending projection and of configuration and disposition on said tail to not engage said locking barb during receipt of said tail into said passage, said projection being configured to enable disengagement from said locking barb and withdrawal from said head upon application of a force to said tail in a direction opposite its insertion into said passage.*

REISSUES

NOVEMBER 28, 1995

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

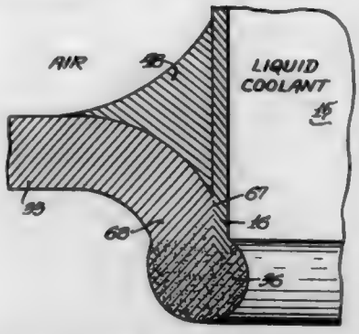
Re. 35,098
METHOD OF MAKING A HEAT EXCHANGER

Zalman P. Saperstein, Gurnee, Ill., assignor to Modine Manufacturing Co., Racine, Wis.

Original No. 4,377,024, dated Mar. 22, 1983, Ser. No. 250,111, Apr. 2, 1981. Continuation of Ser. No. 426,462, Oct. 20, 1989, abandoned, which is a continuation of Ser. No. 220,914, Jul. 19, 1988, abandoned, which is a continuation of Ser. No. 20,163, Feb. 26, 1987, abandoned, which is a continuation-in-part of Ser. No. 105,626, Dec. 20, 1979, abandoned. Application for reissue Aug. 17, 1990, Ser. No. 569,228

Int. Cl.[6] B23P *15/26;* **B23K** *31/02;* **F28F** *9/02*

U.S. Cl. 29—890.043 **22 Claims**



19. In making a radiator for a vehicle having a core of spaced tubes and interconnecting fins extending between liquid tanks, the method comprising:

(a) stacking a plurality of tubes in a plurality of spaced sets of fins arranged between each adjacent pair of tube sets to form a stack;

(b) arranging the tube sets so that the tubes have substantially coplanar ends projecting beyond the sides of the stack;

(c) applying a header plate having a plurality of holes to each side of the assembly having tube ends so that said tube ends extend through respective ones of said holes;

(d) welding said tube ends to the header plates with some or all of said welds being prone to defects;

(e) bonding the fins and tubes together;

(f) contacting the adjacent junction areas of the tube ends and header plates with a sealant having excellent capillary flow properties so that the sealant with its excellent capillary flow properties fills defects in the welds to provide a leak-tight structure; and

(g) attaching a tube enclosing liquid tank to each of said header plates in fluid tight relation.

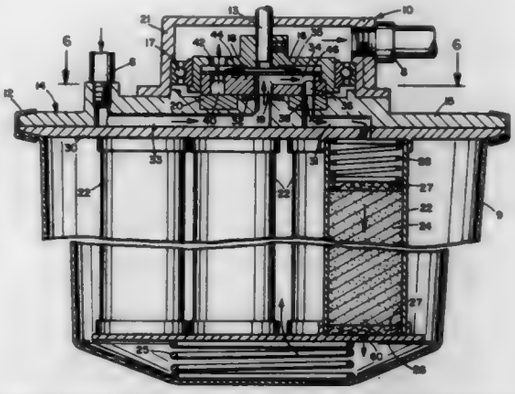
Re. 35,099
FLUID FRACTIONATOR

Charles C. Hill, Del Mar, Calif., assignor to SeQual Technologies, Inc., San Diego, Calif.

Original No. 5,112,367, dated May 12, 1992, Ser. No. 660,177, Feb. 25, 1991. Continuation of Ser. No. 438,786, Nov. 20, 1989, abandoned. Application for reissue Oct. 1, 1993, Ser. No. 131,761

Int. Cl.[6] B01D *53/04*

U.S. Cl. 95—98 **38 Claims**



14. In combination in a fluid fractionator,

first means for providing a plurality, more than two (2), of columns each including second means for passing a particular component of the fluid and for adsorbing other components of the fluid,

third means for providing the fluid under pressure to the columns in the plurality,

distributor means for sequentially selecting first successive ones of the columns in the plurality on a cyclic basis to receive the pressurized fluid for the passage of the particular component of the fluid through such columns and for the adorption of the other components of the fluid and for selecting second successive ones of the columns in the plurality on the cyclic basis to release the adsorbed fluid components from the columns after the passage of the particular component of the fluid through the columns,

there being third successive ones of the columns in the plurality other than the first and second successive ones of the columns in the plurality, and

fourth means for equalizing the pressures in the third successive ones of the columns in the plurality on the cyclic basis.

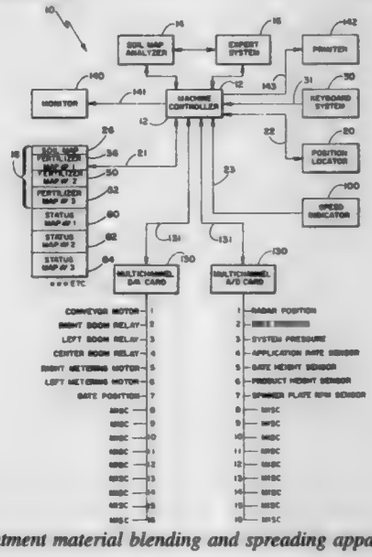
Re. 35,100
VARIABLE RATE APPLICATION SYSTEM

Robert J. Monson, St. Paul, and Norman A. Bauer, Watertown, both of Minn., assignors to Ag-Chem Equipment Co., Inc., Minnetonka, Minn.

Original No. 5,220,876, dated Jun. 22, 1993, Ser. No. 902,174, Jun. 22, 1992. Application for reissue Dec. 7, 1993, Ser. No. 163,007

Int. Cl.[6] A01C *15/00;21/00;23/00*

U.S. Cl. 111—130 **28 Claims**



12. Treatment material blending and spreading apparatus comprising:

(*a*) *a vehicle;*

(*b*) *a first product bin mounted on the vehicle for holding a first material to be applied to a field to be treated;*

(*c*) *dispensing means mounted on the vehicle operative in response to a first dispenser control signal for dispensing* the first material at a selected dispensing rate from the first product bin;

(*d*) *conveying and spreading means mounted on the vehicle for conveying the first material dispensing from the first bin via the dispensing means and spreading the first material over the ground, and*

(*e*) *control means operatively connected to the dispensing means for generating the first feeder control signal to control the rate of dispensation of the first material, the control means including;*

(*1*) *digital soil map means for storing a digital soil map indicating a distribution of different soil types in the field to be treated;*

(*2*) *first material map means for storing a first digital material map indicating a desired distribution of the first material in said field to be treated;*

(*3*) *first status map means independent of said first material map means for storing data representative of a first field characteristic;*

(*4*) *position locator means for indicating the position of the vehicle relative to said field as it moves about said field;*

(*f*) *speed indicator means for indicating the speed of said vehicle as it moves about said field; and*

(*g*) *first signal generating means responsive to said soil map means, said first material map means, said* independent first status map means, said position locator means and said speed indicator means for controlling the generation of said first dispenser control signal by correlating the position of the vehicle in the field to said soil map, said independent first status map and said first material map, and determining the type of soil the vehicle is currently over, the first field characteristic where the vehicle is over, the desired level of the first material, and the vehicle speed to provide that the first material can be applied at different rates to attain the desired distribution of the first material in the field according to the first material map means as the vehicle moves about the field.

Re. 35,101

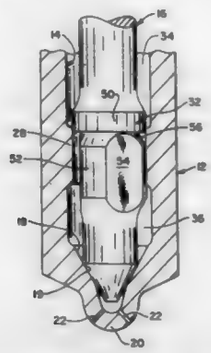
FUEL INJECTOR METHOD AND APPARATUS

William W. Kelly, Granby, Conn., assignor to Stanadyne Automotive Corp., Windsor, Conn.

Original No. 4,987,887, dated Jan. 19, 1991, Ser. No. 562,617, Aug. 3, 1990. Continuation-in-part of Ser. No. 500,714, Mar. 28, 1990, Pat. No. 5,020,500. Application for reissue Jan. 29, 1993, Ser. No. 11,407

Int. Cl.[6] **F02M** *41/00*

U.S. Cl. 123—467 **32 Claims**



19. A fuel injector comprising a nozzle body with an elongated valve bore, an annular valve seat and longitudinally spaced, coaxial, upper valve guide and lower outer valve ring above the valve seat; an elongated nozzle needle valve in the valve bore having longitudinally spaced, coaxial, upper guide and lower inner ring which cooperate with the valve guide and outer ring respectively of the nozzle body to provide axial movement of the needle valve within the valve bore between a lower closed position in engagement with the valve seat and an upper fully open position with a predetermined maximum lift; the nozzle body having hole means connected to the valve bore below the valve seat for injection of fuel; the nozzle body providing an upper fuel chamber surrounding the needle valve between the upper valve guide and outer ring and a lower fuel chamber surrounding the needle valve between the outer ring and valve seat; two stage valve closure spring means biasing the needle valve downwardly into engagement with the valve seat, including first stage spring means holding the needle valve in its closed position and biasing the needle valve downwardly as it is lifted upwardly from its closed to its fully open position and second stage spring means biasing the needle valve downwardly as it is lifted upwardly from a predetermined intermediate position with a predetermined intermediate lift to its fully open position; the upper guide of the needle valve having a diameter greater than both the inner ring and valve seat and the inner ring having a diameter greater than the valve seat to provide two differential areas for hydraulically opening the needle valve against the bias of the spring means; the upper fuel chamber being connected to receive periodic high pressure pulses of fuel for opening the needle valve against the bias of the spring means and for supplying fuel for fuel injection through the hole means; the outer rinq forming an outer metering ring with an internal, annular metering surface; the inner ring forming an inner metering ring with an external annular, metering surface; the inner metering ring, with the needle valve in its closed position, being received within the outer metering ring with a predetermined axial overlap greater than said predetermined intermediate lift and with a predetermined clearance between the inner and outer metering surfaces providing a metering passageway to regulate fuel flow between the upper and lower fuel chambers during predetermined opening movement of the needle valve from its closed position greater than said intermediate lift and to regulate the pressure in the lower fuel chamber durinq the last part of the closing movement of the needle valve.

Re. 35,102

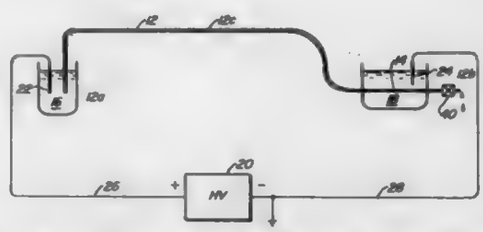
CAPILLARY ELECTROPHORETIC DEVICE EMPLOYING STRUCTURE PERMITTING ELECTRICAL CONTACT THROUGH IONIC MOVEMENT

Richard N. Zare, Stanford; Xiaohua Huang, Mountain View, and Raymond T. Huckaby, San Jose, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Original No. 4,908,116, dated Mar. 13, 1990, Ser. No. 359,512, Jun. 1, 1989. Continuation of Ser. No. 849,101, Mar. 6, 1992, abandoned. Application for reissue Nov. 8, 1993, Ser. No. 149,024

Int. Cl.[6] **G01N** *27/26;27/447*

U.S. Cl. 204—180.1 **32 Claims**



14. The method of claim **13**, wherein the collecting step causes relative motion between the outlet [end] and a surface and deposits the effluent onto the surface in order to record the effluent output as a function of time.

Re. 35,103

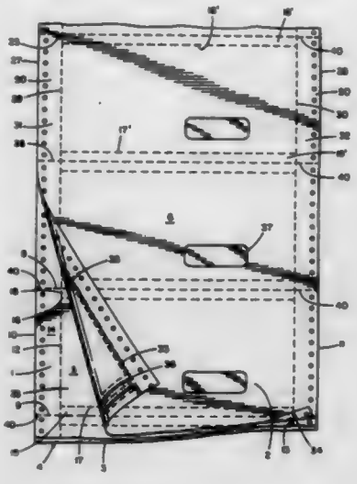
TWO-PART OR THREE-PART CONTINUOUS FORM

Edward G. Van Malderghem, Westminster, Md., and John C. Eder, Hacienda Heights, Calif., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Original No. 5,092,514, dated Mar. 3, 1992, Ser. No. 644,466, Jan. 18, 1991. Continuation-in-part of Ser. No. 452,002, Oct. 20, 1989, abandoned, and a continuation-in-part of Ser. No. 298,329, Jan. 13, 1989, abandoned, and a continuation-in-part of Ser. No. 158,022, Feb. 12, 1989, abandoned, and a continuation-in-part of Ser. No. 28,071, Mar. 18, 1987, abandoned, and a continuation-in-part of Ser. No. 556,925, Dec. 1, 1983, abandoned. Application for reissue Aug. 9, 1993, Ser. No. 104,457

Int. Cl.[6] B65D *27/10*

U.S. Cl. 229—69 **8 Claims**



5. An improved business form assembly kit, provided in an intermediate condition, comprising:

a message web having a series of spaced, transverse perforation lines, each message sheet having end edges along the transverse perforation lines, a marginal edges, a longitudinal dimension between the end edge along a longitudinal axis, and a transverse dimension between the marginal edges along a transevers axis, marginal lines of perforations along and spaced from the marginal edges of the message sheet extending fully between the end edges to define marginal strips, transverse, end lines of perforations extending along and spaced from the end edges between the marginal lines of perforations; and

an independent cover web having a series of spaced cover web transverse perforation lines and a plurality of cover sheets between the cover web transverse perforation lines, each cover sheet having cover sheet end edges along the cover web transverse perforation lines, cover sheet marginal edges, marginal lines of perforation extending along and spaced from said cover sheet marginal edges to define therewith cover sheet marginal strips, a longitudinal dimension between the cover sheet end edges equal to the longitudinal dimension of the message sheet, a transverse dimension between the cover sheet marginal edges equal to the transverse dimension of the message sheet and transverse perforation lines extending between the cover sheet marginal strips defining cover sheet end strips;

the cover sheet of suitable dimensions to be superimposed upon the message sheet and further having marginal lines of heat sealable adhesive along the cover sheet marginal strips extending substantially fully between the cover sheet end edges and being nearer the cover sheet marginal edges than the message sheet marginal lines of perforations are to the message sheet marginal edges, transverse, end lines of heat sealable adhesive along the cover sheet end strips extending substantially fully between the cover sheet marginal edges and being nearer the cover sheet end edges than the message sheet end lines of perforations are to the message sheet end edges, the marginal and end lines of heat sealable adhesive located so as to adhere the cover sheet to the message sheet in in final assembly thereof.

Re. 35,104

SUBRATE MULTI-MEDIA DATA TRANSMISSION SYSTEM

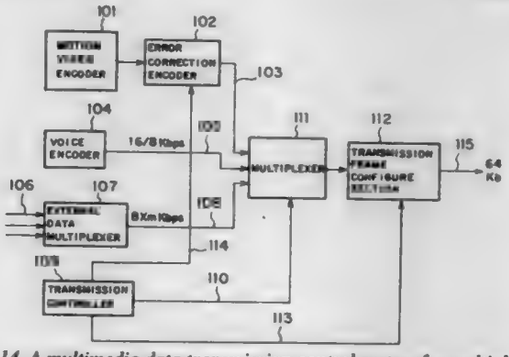
Tokumichi Murakami, and Koh Kamizawa, both of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Original No. 4,864,562, dated Sep. 5, 1989, Ser. No. 134,081, Dec. 17, 1987. Continuation of Ser. No. 751,779, Aug. 29, 1991, abandoned. Application for reissue Jan. 25, 1993, Ser. No. 8,834

Claims priority, application Japan, Dec. 18, 1986, 61-302580

Int. Cl.[6] H04J *3/22*

U.S. Cl. 370—84 **15 Claims**



14. A multimedia data transmission control system for multiplexing and transmitting various types of media data, including video data, audio data and external digital data, comprising:

transmission control means for allocating transmission frame bits, aligning transmission frame patterns, and setting transmission rates adaptively according to said various types of media data presented for transmission;

multiplexing means for multiplexing said various types of media data according to transmission frame bit allocation information from said transmission control means; and

transmission frame configuring means for configuring multiplexed data from said multiplexing means, and bit allocation and frame alignment pattern information from said transmission control means into transmission frames, and generating multiframes consisting of a plurality of transmission frames, for transmission over a transmission medium.

Re 35,105

Patent Not Issued For This Number

PLANT PATENTS

GRANTED NOVEMBER 28, 1995

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,384

CHRYSANTHEMUM PLANT NAMED 'EMPIRE VENTURA'

Janet S. Fuess, 22 Country Club Dr., New York Mills, N.Y. 13417-1456

Filed Oct. 19, 1994, Ser. No. 325,051

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—82.3 **1 Claim**

1. A new and distinct cultivar of Chrysanthemum plant named Empire Ventura, as illustrated and described.

9,385

POINSETTIA PLANT NAMED 'FISFLIRT'

Katharina Zerr, Simmern, Germany, assignor to Florfis AG, Binningen, Switzerland

Filed Oct. 24, 1994, Ser. No. 328,054

Claims priority, application Germany, Dec. 29, 1993, EUP 146

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—86.3 **1 Claim**

1. A new and distinct poinsettia plant named Fisflirt, as illustrated and described.

9,386

DAYLILY PLANT NAMED 'BURGUNDY LACE'

Ronald C. Iverson, Rte. 1, Box 326B, Orange, Va. 22960

Filed Dec. 12, 1994, Ser. No. 355,314

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.4 **1 Claim**

1. A new and distinct cultivar of daylily plant named Burgundy Lace, as illustrated and described.

9,387

DAYLILY PLANT NAMED 'X-2'

Ronald C. Iverson, Rte. 1, Box 326B, Orange, Va. 22960

Filed Dec. 12, 1994, Ser. No. 355,318

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.4 **1 Claim**

1. A new and distinct cultivar of daylily plant named X-2, as illustrated and described.

9,388

GERANIUM PLANT NAMED 'FISPLOSIVE'

Ingeborg Schumann, Albstadt, and Angelika Utecht, Montabaur, both of, Germany, assignors to Florfis AG, Binningen, Switzerland

Filed Dec. 21, 1994, Ser. No. 360,343

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—87.12 **1 Claim**

1. A new and distinct cultivar of geranium plant named Fisplosive, as illustrated and described.

PATENTS

GRANTED NOV. 28, 1995

ERRATA

For CLASS	See PATENT NO.
600–117	5,469,840
600–158	5,469,841
222–108	5,470,011
248–049	5,470,021
604–020	5,470,307
604–022	5,470,308
604–022	5,470,309
051–298	5,470,368
428–036	5,470,526
428–036	5,470,526
424–070	5,470,551
423–521	5,470,564
426–003	5,470,591
424–229	5,470,734
473–028	5,470,765
326–068	5,471,149
326–087	5,471,150
330–149	5,471,164
347–009	5,471,227
340–870	5,471,256
382–199	5,471,535
382–315	5,471,536
382–290	5,471,549
382–200	5,471,550
359–263	5,471,584
235–383	5,471,669
395–296	5,471,672
395–650	5,471,674
395–162	5,471,675
395–110	5,471,676
395–600	5,471,677

PATENTS

GRANTED NOVEMBER 28, 1995

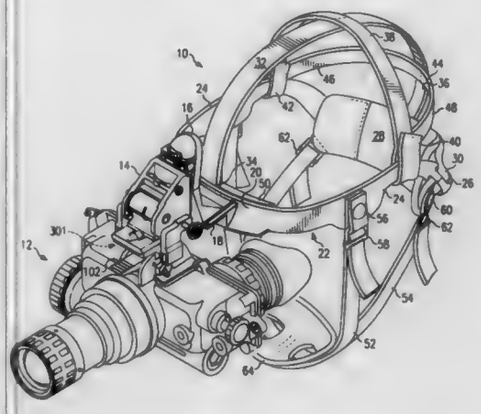
GENERAL AND MECHANICAL

5,469,578

NIGHT VISION GOGGLE HEADGEAR MOUNT

Paul B. Mattes, Garland, Tex., assignor to Varo, Inc., Garland, Tex.

Filed May 7, 1993, Ser. No. 58,955
Int. Cl.[6] A42B *1/24*; A61F *9/02*
U.S. Cl. 2—6.7 **17 Claims**



16. An apparatus for mounting night vision goggles to a user's cranium comprising:

a cranial frame positioned about the frontal tuber and temporal regions of the user's cranium when worn, and further comprising:

a base part; and

a first and a second temporal strip;

a pad placed about the region of the posterior pole of the skull when worn;

a crown strap having a first and a second end, the first end of the crown strap secured to the base part of the cranial frame and the second end secured to the pad, the crown strap positioned about the vertex of the user's skull when worn;

a radial strap having a first and second loop end, the first loop end coupled to the first temporal strip and the second loop end coupled to the second temporal strip, the radial strap positioned about the vertex of the user's skull when worn;

a posterior girth strap coupled to the first and second loop end of the radial strap, the posterior girth strap positioned about the posterior pole region of the skull and just above the pad when worn;

a chin strap rotatably attached to the cranial frame and positioned about the user's mandible when worn;

a lower girth strap coupled to the chin strap and the pad;

a mounting shelf secured to the base of the cranial frame;

a mounting block secured to the mounting shelf;

a goggle mount structure secured to the mounting block for receiving and holding the goggles, the goggle mount structure allowing the goggles to rotate between a line-of-sight position and a stowed position; and

a magnet means for activating the goggles when the goggles are in the line-of-sight position and deactivating the goggles when the goggles are in the stowed position, comprising:

a first magnet positioner secured to the goggle mounting structure;

a second magnet positioner secured to the goggle mounting structure;

the first magnet positioner and the second magnet positioner being mirror images of each other about a centerline of the goggle mounting structure;

a first magnet attached to the first magnet positioner with a magnetic north pole of the first magnet positioned at a upper most vertical portion of the first magnet; and

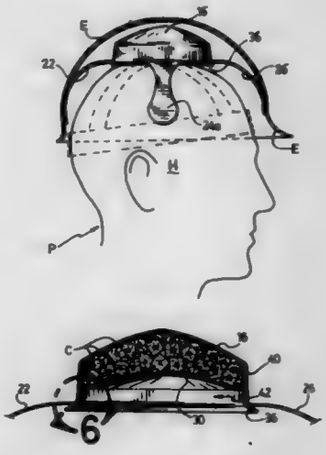
a second magnet attached to the second magnet positioner with a magnetic north pole of the second magnet positioned at a lowest vertical portion of the second magnet.

5,469,579

HEAD COOLING DEVICE

Ronaldo Tremblay, 48, rue St-Henri, Cap de la Madeleine, Québec, Canada, and Guy Tremblay, 227 rue Aubuchon, Cap de la Madeleine, Québec, Canada

Filed Jan. 24, 1994, Ser. No. 185,387
Claims priority, application United Kingdom, Jan. 27, 1993, 9301613; Mar. 30, 1993, 9306607
Int. Cl.[6] A42B *3/28*
U.S. Cl. 2—7 **6 Claims**



1. A head cooling device for mounting over a person's head, comprising:

(a) a housing member defining a main body enclosing a generally closed pocket for containing ice cubes therein, a mouth, at one end of said main body, and an intermediate flooring member, for supporting the ice cubes inside said pocket, said flooring member being offset into said pocket spacedly from said mouth, whereby in operation, said flooring member remains spaced at all times from the scalp of the head by a spacing gap;

(b) percolating means, including a number of spaced through-bores, made into said flooring member, for enabling water droplets from the melting ice cubes to escape in a discontinuous fashion from said pocket, freely through said flooring member and spacing gap and toward and against the person's scalp; and

(c) means for use with a headgear in releasably anchoring said housing member to said head in generally overhanging fashion;

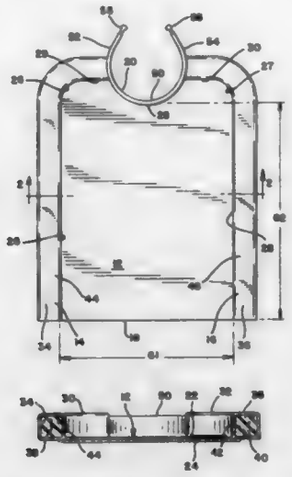
wherein said flooring member includes a main, generally domed-shaped portion oriented toward and into said pocket, and a peripheral annular step, destined to extend in operative. head covering condition within a generally horizontal plane; and said percolation means including a number of spaced through-bores, made into said peripheral step, whereby the slope of said domed-shape portion promotes circulation of melted water from the ice cubes toward said through-bores under gravity-borne forces.

5,469,580

SHAMPOO CAPE

Brigitte Sobol, 9 S. 336 Florence Ave., Downers Grove, Ill. 60516

Filed Nov. 7, 1994, Ser. No. 335,169
Int. Cl.[6] A41D *13/00*
U.S. Cl. 2—50 **4 Claims**



1. A hairdresser's cape comprising in combination:

a web of material having the pliability of a fabric, having a first end and a second end and opposing sides;

said opposing sides being substantially parallel to each other;

said second end having an arcuate indentation for being positioned against the neck of a person;

first and second semirigid elongate side members, each of said side members including a foam rubber insert, one of said side members extending along each of said opposing sides; and

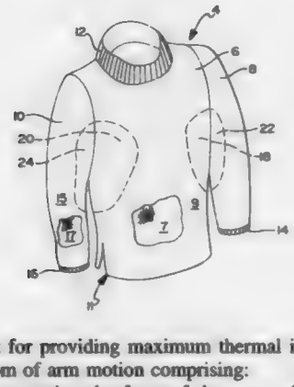
strap means for strapping said second end against a person's neck.

5,469,581

SPORTS GARMENT HAVING VARIABLE THICKNESS SECTIONS

David C. Uthoff, Wickenburg, Ariz., assignor to Corporate Concept Marketing, Northville, Mich.

Filed Mar. 10, 1994, Ser. No. 208,476
Int. Cl.[6] A41B *1/00*
U.S. Cl. 2—69 **5 Claims**



1. A garment for providing maximum thermal insulation while allowing freedom of arm motion comprising:

a front panel covering the front of the torso of a wearer, said front panel having a front outer layer and a front inner layer attached to said front outer layer;

a rear panel covering the back of the torso of a wearer, said back panel having a rear outer layer and a rear inner layer attached to said rear outer layer;

a tubular sleeve joined to said front panel and to said rear panel, said sleeve having a sleeve outer layer and a sleeve inner layer attached to said sleeve outer layer, said tubular sleeve forming an underarm area with said front panel and said rear panel;

an inner torso area extending horizontally from approximately said underarm area forward to approximately a midpoint of the wearer's ribcage and extending vertically from said tubular sleeve downward to approximately the bottom of the wearer's ribcage where said front inner layer and said rear inner layer is removed from said inner torso area;

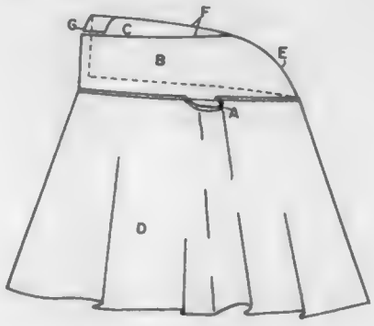
an inner arm area extending horizontally from approximately the midpoint of the front of said tubular sleeve rearward past said underarm area where said sleeve inner layer is removed from said inner arm area.

5,469,582

BREAST FEEDING COVER

Diane Livingston, 102 Bannister Avenue, Regina, Saskatchewan S4R 5K9, Canada

Filed Nov. 7, 1994, Ser. No. 336,226
Int. Cl.[6] A41D *1/00;1/20;1/22*
U.S. Cl. 2—104 **3 Claims**



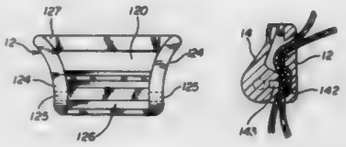
1. A cover for use by a nursing mother while breast feeding a baby comprising a yoke shaped and arranged to engage over one shoulder only of the mother and including strap means for engaging around the neck of the mother on a side of the neck opposite to the one shoulder, a skirt attached to a front edge of the yoke so as to depend therefrom so that in use the skirt is draped over the chest of the mother including the breast and over the baby, the yoke and skirt being reversible by turning inside out so that an inside surface of the fabric is moved to become an outside surface of the fabric and so that the cover when reversed can be used on an opposite shoulder of the mother, opening means between the skirt and the yoke defining a viewing window at a position above the breast, the opening means including a bottom edge of the yoke across a top of the opening means and an upper edge of the skirt across a bottom of the opening means, the upper edge of the skirt and the bottom edge of the yoke lying substantially in a common horizontal plane and a stiffening member supporting the upper edge of the skirt outwardly of the bottom edge of the yoke to a side of the skirt away from the chest of the mother so that the mother can see through the viewing window by looking downwardly while the breast and the baby remain covered from view by others in a generally horizontal direction, the stiffening member being reversible from said one side of the skirt by manually pushing through the opening means between the bottom edge of the yoke and the upper edge of the skirt to an opposite side of the skirt so as to project outwardly from the chest of the mother when the cover is reversed and used on the opposite shoulder of the mother.

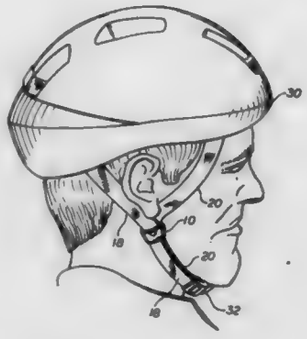
5,469,583

STRAP LOCK BUCKLE

Tom Akeley, Hermosa Beach, and Neil West, La Mirada, both of Calif., assignors to Bell Sports, Inc., Cerritos, Calif.

Filed Sep. 16, 1993, Ser. No. 122,748
Int. Cl.[6] A42B *3/02*
U.S. Cl. 2—421 **2 Claims**





2. A safety helmet comprising:

(a) a helmet for covering a portion of the head of a user thereof;

(b) at least two straps attached to said helmet and arranged to converge together at a selected point near an ear-lobe of the user; and

(c) a device for fastening said at least two straps together at said selected point, said device including:

(i) a base unit having an opening therein sized to receive said at least two straps, and a base portion and opposing internal side-walls between which is received said straps, said opposing internal side walls flaring outwardly from a centerline of said base portion to accommodate straps which diverge in use; and

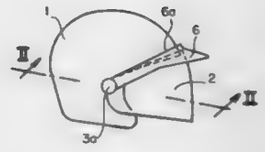
(ii) an arm rotatably mounted on said base unit, said arm having strap engagement means provided by a protuberance thereon, said arm being movable from a locked position to an open position, said arm in its locked position forcing the at least two straps into engagement with each other between said engagement means and said base unit, said arm being movable to an open position wherein said engagement means is rotated away from said straps so that said straps are free to move relative to each other and relative to said device.

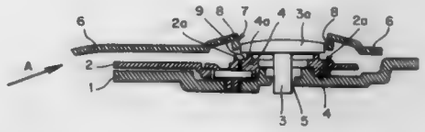
5,469,584

CRASH-HELMET FOR MOTORCYLISTS, CYCLISTS AND THE LIKE, PROVIDED WITH A SUNSHADE FRONT-PIECE OF RIGID MATERIAL

Gabriele Casartelli, Clamart, France, assignor to E.D.C. Sarl, Issy Les Moulineaux, France

Filed Apr. 12, 1994, Ser. No. 226,716
Claims priority, application European Pat. Off., Apr. 13, 1993, 93105997
Int. Cl.[6] A42B *3/04*
U.S. Cl. 2—422 **3 Claims**





1. Crash-helmet provided with a visor front-piece, comprising a cap body

said visor front-piece is made of rigid material and is stably jut-fixed to connection side pins on the cap body by cog means partly deformable and so sized as to permit the prompt detachment of the front-piece from said helmet pins,

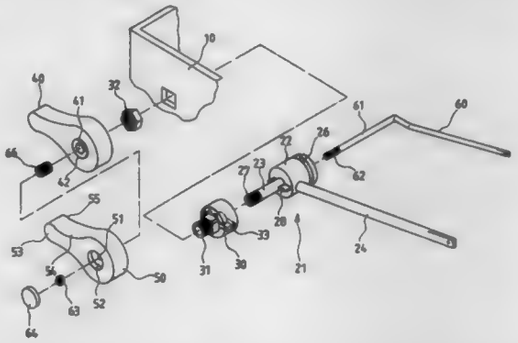
said cog means are constituted by a plurality of elements shaped as stepped-teeth, radially projecting towards the inside of two circular openings, each such opening being provided at the opposite ends of the front-piece, in such a way as to be arrangeable coaxially to one of said connection pins, the holding of said front-piece being obtained by the partial fitting of said stepped-teeth into an annular housing, defined, in correspondence of each connection pin, between the head of said pins and an annular body utilized for the rotatably holding of the liftable visor.

5,469,585

FLUSHING DEVICE OF TOILET

Yaw-Ching Shiue, 1F, 125-6, Sec. 1, San Min Rd., Taichung, Taiwan, Prov. of China

Filed Sep. 12, 1994, Ser. No. 304,124
Int. Cl.[6] E03D *1/14*
U.S. Cl. 4—326 **2 Claims**



1. A toilet flushing device comprising a water tank provided therein with a inlet tube, a float arm fastened at one end thereof with a top end of said inlet tube, an overflow tube, a first outlet tube having a predetermined height and a cap which is movably attached to a top end thereof, a second outlet tube having a predetermined height and a cap which is movably attached to a top end thereof, and a flushing mechanism;

wherein said flushing mechanism comprises:

a control member provided with a shaft to which a locating tube and a front control rod are fastened, said front control rod having a free end which is located over said top end of said second outlet tube and is fastened with said cap of said second outlet tube via a chain, said shaft provided in a top surface thereof with an L-shaped slot in communication with a hollow interior of said locating tube, said locating tube being provided with a threaded portion on a free end thereof, said locating tube further provided with two projections located at a junction between said shaft and said locating tube;

a locating sleeve disposed in said water tank such that a threaded outer end of said locating sleeve is located outside said water tank via a through hole of said water tank, said locating tube being fitted into said locating sleeve such that said two projections of said locating tube are received in two position-

limiting slots of said locating sleeve, said control member being held securely in place in said water tank by a fastening means engageable with said threaded outer end of said locating sleeve;

a first flush lever provided with a threaded through hole, a circular slot located at an outer end of said threaded through hole, a press portion located at one end thereof, an arcuate surface extending inwards from said press portion, and a raised surface located between said press portion and said arcuate surface;

a second flush lever provided with a threaded through hole engageable with said threaded portion of said locating tube, said second flush lever further provided with a flange located at an outer end of said threaded thorough hole; and

a rear control rod of a curved construction and having an outer segment provided with a threaded end and received in said L-shaped slot of said shaft, said hollow interior of said locating tube, said locating sleeve and said threaded through hole of said second flush lever such that said threaded end of said outer segment is fitted into a hushing which has a threaded outer surface engageable with said threaded through hole of said first flush lever, and that said threaded end of said outer segment is located in said circular slot of said first flush lever, and further that said threaded end of said outer segment is fastened securely with a fastening means which is covered with a cover dimensioned to fit into said circular slot of said first flush lever, said rear control rod further having an inner segment with a free end which is located over said top end if said first outlet tube and is fastened with said cap of said first outlet tube via a chain.

5,469,586

TOILET BOWL FLUSHING DEVICE

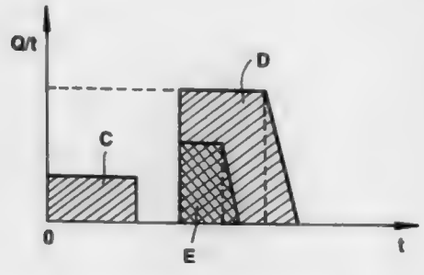
Osamu Tsutsui; Hisato Haraga; Atsuo Makita, and Hirofumi Takeuchi, all of Kanagawa, Japan, assignors to Toto Ltd., Fukuoka, Japan

Continuation-in-part of Ser. No. 621,469, Jan. 25, 1991, abandoned, which is a continuation of Ser. No. 317,929, Mar. 2, 1989, Pat. No. 4,989,277. This application Jul. 19, 1991, Ser. No. 732,815

Claims priority, application Japan, Mar. 2, 1988, 63-49993; May 13, 1988, 63-117460; May 27, 1988, 63-130949

Int. Cl.[6] E03D *5/10*

U.S. Cl. 4—4515 **4 Claims**



1. A toilet bowl flushing device comprising:

water supply means for supplying flushing water through a water supply pipe to a toilet bowl, said water supply means including flow rate control valve means having a valve disposed in said water supply pipe, for varying the rate of flow of flushing water supplied to the toilet bowl through control of an open condition of said valve;

an actuator for actuating said flow rate control valve means;

control means for controlling operation of said actuator;

said control means comprising a memory storing a predetermined flow rate pattern, said control means controlling .Operation of said actuator to vary said open condition of said valve stepwise with time in one flushing cycle according to said predetermined flow rate pattern stored in said memory so that the flushing water is supplied to the toilet bowl at a flow rate which varies stepwise with time;

said control means controls operation of said actuator according to the predetermined flow rate pattern stored in said memory so that flushing water is supplied to the toilet bowl at multiple different flow rates during said one flushing cycle;

said predetermined flow rate pattern is adapted to provide an optimum flushing effect based on a configuration of said toilet bowl; and

said memory stores a plurality of predetermined flow rate patterns, said control means comprising means for controlling operation of said actuator according to a selected one of the flow rate patterns stored in said memory.

5,469,587

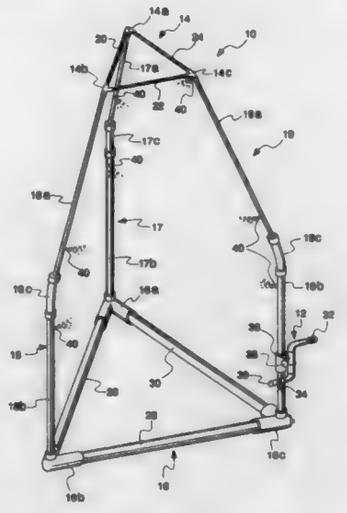
PORTABLE EMERGENCY DECONTAMINATION SHOWER

Rodney L. Demeny, Medinah, Ill., assignor to Fendall Company, Arlington Heights, Ill.

Filed Dec. 20, 1994, Ser. No. 359,573

Int. Cl.[6] A47K *3/23*

U.S. Cl. 4—599 **18 Claims**



1. A portable shower, comprising:

a fluid-conveying structure including

a base polygon section including a first plurality of flexible hoses connected by a first set of rigid hollow joints;

an upper polygon section including a second plurality of flexible hoses connected by a second set of rigid hollow joints; and

a plurality of hollow supporting posts connecting said first set of joints to said second set of joints, each of said supporting posts including at least one rigid pipe;

a spray nozzle mounted to said fluid-conveying structure; and

an entryway connected to said fluid-conveying structure and constructed and arranged for connection to a water source.

5,469,588

PATIENT TRANSFER ARRANGEMENT

Paul DiMatteo, and Paul C. DiMatteo, both of Dix Hills, N.Y., assignors to Nova Technologies, Inc., Hauppauge, N.Y.

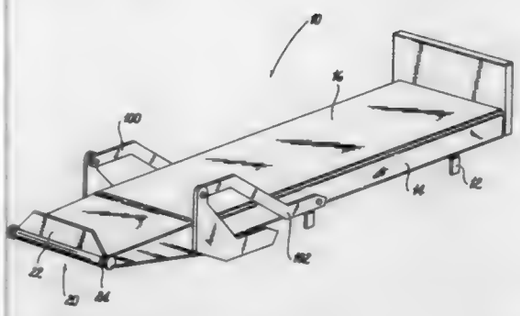
Continuation-in-part of Ser. No. 908,988, Jul. 6, 1992, Pat. No. 5,319,813. This application Jan. 18, 1994, Ser. No. 182,953

Int. Cl.[6] A61G *7/10*

U.S. Cl. 5—81.1 **33 Claims**

1. A bed comprising:

a) a frame;



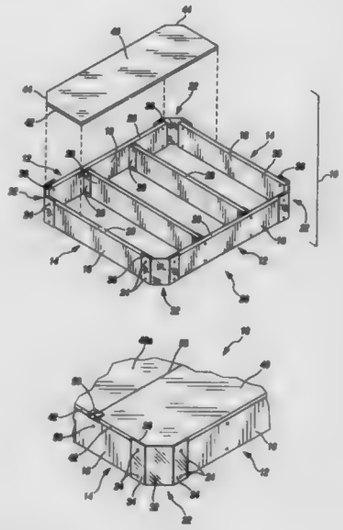
b) a mattress positioned on said frame;
c) a transport sheet extending across said mattress;
d) roller means for moving said transport sheet relative to said mattress; and
e) means operatively associated with said frame for progressively extending the transport sheet, to provide a patient supporting area beyond said mattress.

5,469,589

KNOCK DOWN FOUNDATION FOR A BED

C. Edward Steed, Alpharetta, and Wesley H. Brinkman, Dunwoody, both of Ga., assignors to Simmons Company, Atlanta, Ga.

Filed Mar. 2, 1995, Ser. No. 399,167
Int. Cl.[6] A47D *19/02*
U.S. Cl. 5—400 **10 Claims**



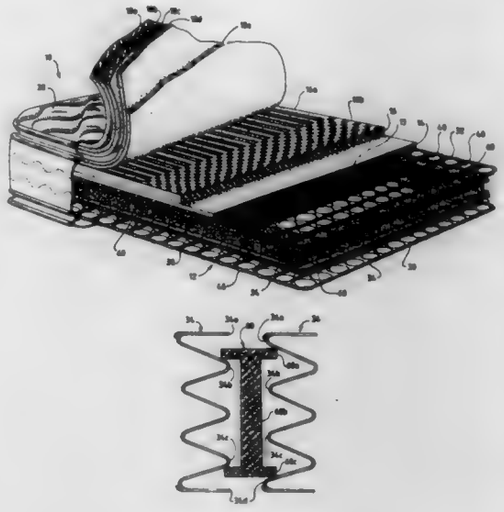
1. A bed foundation comprising:
a pair of parallel, spaced side rails each having opposed ends;
a pair of parallel, spaced cross rails each having opposed ends and extending between said side rails;
a corner brace connecting each end of a side rail to an end of a cross rail at a right angle thereby defining a box frame with edges of said side rails and cross rails facing upwardly and lying in a plane;
at least one joist extending between said rails at points intermediate the ends thereof and having an upwardly facing edge which is coplanar with the edges of the side rails and cross rails; and
first and second generally planar top panels, each panel dimensioned and configured to be positioned on and supported by the upwardly facing edges of a side rail, the cross rails and said joist, said top panels each having a peripheral edge of preselected thickness;
wherein said corner braces extend above the plane defined by the upwardly facing edges of the side rails and cross rails and cooperate with corners of said top panels to retain said top panels immovable on said frame.

5,469,590

MATTRESS WITH COMPRESSIBLE SUPPORT MEMBERS

LeRoy J. Simon, Kildeer, Ill., assignor to The Spring Air Company, Des Plaines, Ill.

Filed Mar. 4, 1994, Ser. No. 206,313
Int. Cl.[6] A47C *27/04*
U.S. Cl. 5—475 **34 Claims**



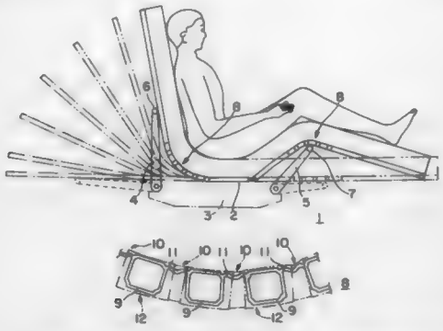
1. A mattress comprising:
a wire frame comprising first and second border wires spaced apart from each other by a predetermined distance, said first and second border wires defining first and second substantially parallel planes, respectively;
a plurality of spring coils provided between said first and second planes defined by said first and second border wires, said spring coils being arranged in a number of rows comprising at least a first row and a second row adjacent to said first row, each of said spring coils being formed of a helical wire member having a plurality of spaced-apart convolutions;
a compressible support member provided between said first and second planes defined by said first and second border wires, said support member being disposed between said first and second rows of said spring coils, said support member having an upper portion of a first width, a middle portion of a second width, and a lower portion of a third width, said upper portion of said support member being projected between a first two of said spaced-apart convolutions of one helical wire members and said lower portion of said support member being projected between a second two of said spaced-apart convolutions of said one helical wire member;
a mattress cover covering said wire frame, said spring coils, and said compressible support member; and
a layer of padding material disposed between said mattress cover and one of said first and second planes defined by said first and second border wires.

5,469,591

BOTTOM STRUCTURE FOR A BED

Katsuyoshi Nomura, Chiba, Japan, assignor to Paramount Bed Company Limited, Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 301,408
Claims priority, application Japan, Sep. 8, 1993, 5-223742
Int. Cl.[6] A61G 7/04
U.S. Cl. 5—613 25 Claims



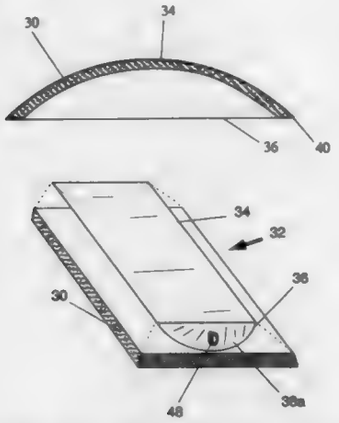
21. A bottom structure for a bed with a bending mechanism comprising guard rails which are provided longitudinally along a portion of a length of said bed, wherein said guard rails have a series of separate and adjacent end contacts, each end contact having an engaging means whereby said end contacts can be moved apart or together and remain separated.

5,469,592

GEOMETRICALLY EFFICIENT SELF-INFLATING SEAT CUSHION

Mark C. Johnson, 32 Galen Ct., Seekonk, Mass. 02771-1206

Continuation-in-part of Ser. No. 78,754, Jun. 16, 1993. This application Sep. 27, 1993, Ser. No. 126,552
Int. Cl.[6] A47C 27/08
U.S. Cl. 5—654 4 Claims



1. A substantially self-inflatable seat cushion comprising:

a substantially airtight hollow body(32) comprising a top section(34) and a base section(36) with one of said sections being planar and the other of said sections being arched, said sections being interconnected in airtight relation along a border, the airtight hollow hotly(32) comprising substantially flexible material so that the airtight hollow body(32) has a highly geometrically efficient single arching configuration, which means having a central vertical cross-section that has a highly geometrically efficient single arching shape(40), defined as a shape having a substantially curved portion, as a shape having a substantially straight portion closing the endpoints of the curved portion, and as a shape having a surface area greater than or equal to 2.25 times the surface area of a corresponding rectangle(42), where said corresponding rectangle(42) is the rectangle with equal perimeter and equal width, where width is defined as the geometrically efficient shape(40)'s biggest dimension;

a substantial hollow(31), which is a substantially homogeneous air fillable cavity inside the airtight hollow body(32);

a resilient structure member(30), that substantially contacts and lines the curved portion of the geometrically efficient arching shape(40) of the airtight hollow body(32), whereby said resilient structure member(30) substantially surrounds the hollow(31), said resilient structure member(30) defining a springy frame that substantially causes the cross-section of the airtight hollow body to have said highly geometrically efficient single arching shape(40) during inflating, whereby the airtight hollow body(32) has said highly geometrically efficient single arching configuration;

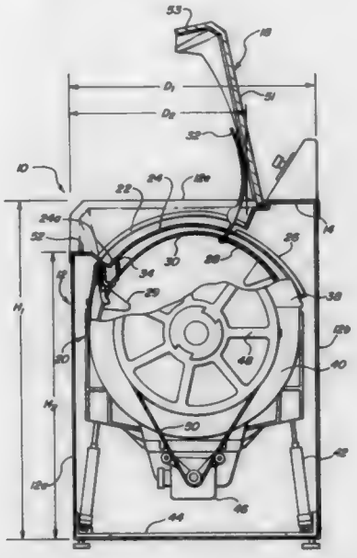
a valvular means(48) in communication with the interior of the airtight hollow body(32), to allow air to enter the airtight hollow body(32) during inflating, but to substantially prevent air from escaping the airtight hollow body(32) during use of the self-inflatable seat cushion.

5,469,593

BASKET POSITIONING SYSTEM FOR A TOP LOADING HORIZONTAL AXIS AUTOMATIC WASHER

Victor W. Cuthbert, Sodus Township; Joseph H. Zahrn, Jr., Berrien Springs, and Vonda K. Johnston, Ann Arbor, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed May 2, 1994, Ser. No. 236,822
Int. Cl.[6] D06F 39/08
U.S. Cl. 8—159 30 Claims



10. A method of positioning a rotatable basket within an automatic washer for loading and unloading clothes items into the basket, said basket having a horizontal axis and being disposed within an imperforate tub, said basket further being rotatably driven by a motor, said method comprising the steps of:

(1) slowly rotating said basket within said tub;

(2) actuating a holding arm, disposed adjacent said basket and having a holding end, to bias toward said rotating basket;

(3) engaging said basket with said holding end such that said basket is rotatably fixed;

(4) sensing said engagement of said basket with said holding end; and

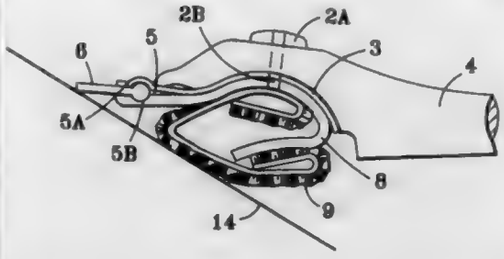
(5) deenergizing said motor.

5,469,594

CLEANING TOOL

Werner Nolte, Flurweg 2, D-55767 Nohen, Germany

Filed May 13, 1994, Ser. No. 242,194
Int. Cl.[6] A47L 1/06;1/15;13/12
U.S. Cl. 15—121 10 Claims



1. Cleaning tool for cleaning objects which are substantially smooth and flat comprising:

a basic body having a handle end to which is attachable a handle, a portion configured to matingly accept a clamping part and a holding device, and means for removeably attaching the clamping pan and the holding device;

a wiping element having two sides, each side adapted for cleaning; a scraper element;

the holding device removeably attached to the basic body, further configured for receiving and holding the wiping element, the wiping element configured to be assembleable onto the holding device in a manner to expose one of the two sides of the wiping element to an object to be cleaned when the cleaning tool is used;

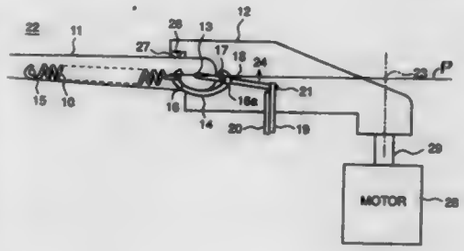
the clamping part removeably assembled, in combination with the holding device, onto the basic body portion, the clamping part comprising means for clamping the scraping element in a manner which situates the scraping element most distant from the handle, the wiping element situated between the handle and the scraping element wherein the holding device has a substantially U-shaped cross section comprising a bent segment and a clamp segment, the bottom of the U-shaped cross section is most proximate the handle end and further wherein the holding device receives the wiping element at an inner surface of the clamp segment of the holding device proximate the basic body and at an outer surface of the bent segment facing away from the basic body.

5,469,595

WINDSHIELD WIPER BLADE SLAPPER APPARATUS

Chester P. Darn, 4455 Corriander, Sterling Heights, Mich. 48314

Filed Jun. 21, 1994, Ser. No. 262,839
Int. Cl.[6] B60S 1/32;1/44
U.S. Cl. 15—250.19 15 Claims



1. A windshield wiper arm apparatus for lifting and slapping a windshield wiper blade against a vehicle windshield, said apparatus comprising:

a wiper base mounted for oscillation about a drive axis;

a wiper arm pivotally connected to said wiper base for movement about a pivot axis, said pivotal connection allowing said wiper arm to pivot away from and toward a given position;

an elongated lever having a first end pivoted to said wiper base and wiper arm at said pivot axis; and

a spring coupled to said arm and said lever for producing a tension vector between a first tension point on said wiper arm positioned perpendicularly further from said drive axis than said pivot axis, and a second tension point on said lever positioned perpendicularly closer to said drive axis than said pivot axis;

said lever being movable between a first lever position at which said tension vector is to one side of a plane which is substantially perpendicular to said drive axis and contains said pivot axis and a second lever position at which said tension vector is to an opposite side of said plane containing said pivot axis;

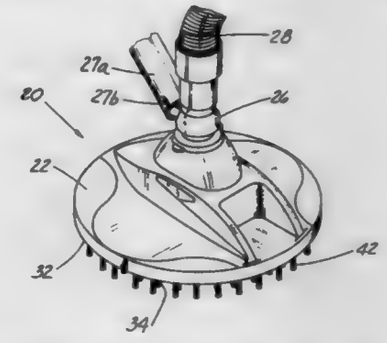
said wiper arm being pivoted away from said given position about said pivotal connection when said lever moves to said first lever position, and said wiper arm being pivoted toward said given position with a spring snapping action when said lever moves to said second lever position.

5,469,596

DUAL-USE AND MANUAL POOL CLEANING APPARATUS

Dieter J. Rief, Rohnert Park, and Herman E. Frentzel, Sausalito, both of Calif., assignors to Sta-Rite Industries, Inc., Delavan, Wis.

Filed Nov. 3, 1993, Ser. No. 147,822
Int. Cl.[6] E04H 4/16
U.S. Cl. 15—1.7 19 Claims



1. An automatic swimming pool cleaner of the type driven by water flow therethrough, comprising:

a housing forming a chamber open at its lower side and having a lower edge surrounding the chamber;

a hose connection device on the housing;

a handle attachment device on the housing;

a handle detachably secured to the handle attachment device;

a vibrator device secured to the housing to vibrate the head in response to water flow through the chamber;

main bristles secured with respect to the housing and projecting downwardly to terminate in main-bristle ends for supporting the pool cleaner on a surface to be cleaned, the main bristles inclined in a first direction such that vibration causes forward movement; and

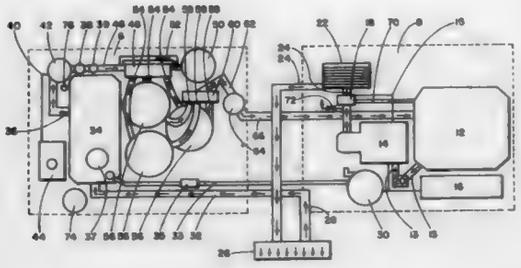
secondary bristles affixed along the lower edge and protecting downwardly to terminate in secondary-bristle ends positioned for engagement with the surface to be cleaned, the secondary bristles inclined in a second direction such that, upon contact thereof with the surface to be cleaned, vibration causes a turning away from the forward direction, and the secondary bristles positioned with respect to the common plane to at least periodically engage off-planar portions of the surface to be cleaned, to allow at least intermittent turning to occur;

whereby the pool cleaner can be used manually or automatically as desired.

5,469,597
CLOSED LOOP SURFACE CLEANING SYSTEM

Thomas A. Page, Houston, Tex., assignor to Hydrowash Recycling Systems, Inc., Houston, Tex.

Filed Nov. 4, 1993, Ser. No. 147,942
Int. Cl.[6] A47L *5/34*
U.S. Cl. 15—321 **19 Claims**



1. A closed-loop pressure cleaning system for cleaning a surface, comprising:

a portable base;

an uncontaminated fluid storage tank mounted on the portable base wherein the uncontaminated fluid storage tank includes a return port and a discharge port;

a high pressure fluid jetting pump mounted on the portable base and having an inlet and an outlet wherein the inlet is connected by a clean water line to the discharge port of the uncontaminated fluid storage tank;

a surface cleaning head including a means for jetting fluid against the surface to be cleaned mounted on the surface cleaning head, wherein the means for jetting fluid is connected to the outlet of the high pressure fluid jetting pump by a high pressure fluid line, and wherein the surface cleaning head further includes a means for suctioning any contaminants on the surface and any associated fluid, wherein the means for suctioning is mounted on the surface cleaning head;

a contaminated fluid storage tank mounted on the portable base including a top, an intake port and a discharge port wherein the intake port of the contaminated fluid storage tank is connected to the means for suctioning by a vacuum line;

a vacuum pump mounted on the portable base having a suction port connected through the top to an interior of the contaminated fluid storage tank by a vacuum suction line;

a contaminated fluid pump mounted on the portable base having an inlet and an outlet wherein the inlet is connected to the discharge port of the contaminated fluid storage tank by an input line; and

a filtration system for filtering a contaminated fluid including at least two filters mounted on the portable base wherein an upstream side of the filtration system is connected to the outlet of the contaminated fluid pump by a contaminated fluid pump discharge line and a downstream side of the filtration system is connected to the return port of the uncontaminated fluid storage tank by a clean fluid return line.

5,469,598
MOBILE SYSTEM CLEANING APPARATUS

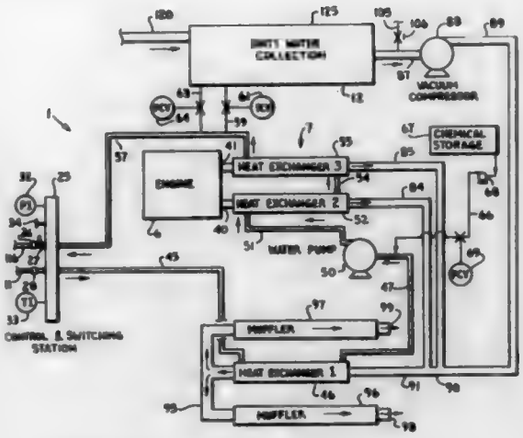
John K. Sales, P.O. Box 151 J, Lawson, Mo. 64062

Filed Jan. 26, 1994, Ser. No. 186,613
Int. Cl.[6] A47L *7/00*
U.S. Cl. 15—321 **7 Claims**

1. A cleaning apparatus for supplying a heated water fluid for cleaning; said apparatus comprising:

a) primary heat generating means;

b) a primary heat exchanger adapted to cooperate with water supply means so as to operably receive water therefrom and transferring heat produced in said heat generating means to the water received therein so as to produce the heated water fluid;



c) a cleaning assembly having a cleaning head flow connected to said primary heat exchanger and adapted to use said fluid for cleaning at a use site;

d) vacuum producing means flow connected to said head and selectively producing a vacuum at said head to withdraw reclaimed fluid from the use site;

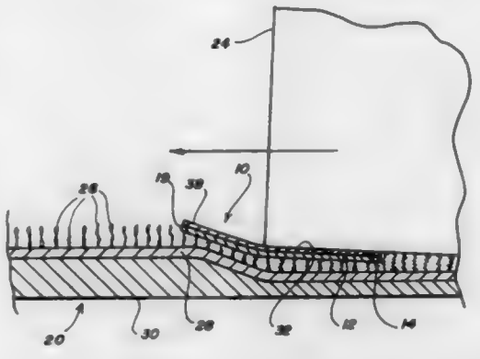
e) collection means for collecting dirty water within the reclaimed fluid;

f) a secondary heat exchanger flow connected to an exhaust of said vacuum producing means and receiving hot gases passed through and further heated by said vacuum producing means; said secondary heat exchanger also receiving and heating water to be heated prior to said primary heat exchanger with said vacuum producing means exhaust so as to preheat the water.

5,469,599
SLIDE

Roy A. Wurdack, P.O. Box 613, Warrenton, Mo. 63383

Filed Oct. 27, 1993, Ser. No. 143,836
Int. Cl.[6] A47B *91/06*
U.S. Cl. 16—42 R **4 Claims**



1. A slide to be partially inserted beneath a floor contact portion of a heavy structure to enable easy sliding, said slide comprising a flexible generally flat plate formed of ultra high molecular weight polyethylene having an abrasion resistance equal to or greater than 10 (USTM sand slurry method) and a non-slip pad formed of synthetic plastic material, said flat plate being about 0.05 inch to about 0.15 inch thick, having a diameter between about 4 inches and about 10 inches, and having an upper face and a lower face joined by a rim, said pad adhesively fixed to and generally covering the upper face of the plate whereby the rim of the slide not under the floor contact portion tends to bend upwardly to slide easily over the floor while the pad keeps the heavy structure from sliding off the slide.

5,469,600

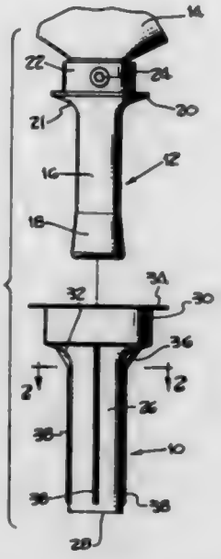
DISPOSABLE COVER FOR CONTOURED SURGICAL LIGHT HANDLE

Dan Sandel, Tarzana, Calif., assignor to Devon Industries, Inc., Chatsworth, Calif.

Continuation-in-part of Ser. No. 902,942, Jun. 23, 1992, abandoned. This application Dec. 13, 1993, Ser. No. 165,980

Int. Cl.[6] B25G *1/02*; F21L *15/12*

U.S. Cl. 16—111 R 22 Claims



1. A disposable cover for a handle of a surgical room light fixture which is normally positioned above an operating table and handled by surgical personnel during operations, said light fixture handle including a handle grip extending from a handle flange, said cover comprising:

a sterile, disposable, thin-walled, substantially impervious, flexible body including a hollow elongated grip portion, a closed longitudinal end and a cover flange, said elongated grip portion defining an outer circumferential surface and a longitudinal length and being adapted to be fitted over said light fixture handle; and

one or more elongated thin-walled expandable channels formed in said thin-walled flexible body and adapted to facilitate fitting said cover over said light fixture handle, said expandable channels extending radially outwardly of said outer circumference and along substantially more than half of the longitudinal length of said grip portion and defining an outer surface substantially parallel to said outer circumferential surface of said grip portion along substantially more than half of the longitudinal length of said grip portion.

9. A disposable cover for a handle of a surgical room light fixture which is normally positioned above an operating table and handled by surgical personnel during operations, said light fixture handle including a handle grip extending from a handle flange, said cover comprising:

a sterile, disposable, thin-walled, impervious, flexible body including a hollow elongated grip portion, a cover flange, said cover adapted to be fitted over said light fixture handle;

one or more elongated thin-walled expandable channels formed in said thin-walled flexible body and adapted to facilitate fitting said cover over said light fixture handle, said expandable channels extending substantially along a longitudinal length of said grip portion; and

a length of tape attached to said cover, said tape having a pressure sensitive adhesive applied thereto, and being adapted to be wrapped around said cover in order to secure said cover to said handle.

22. A disposable cover for a handle of a surgical room light fixture which is normally positioned above an operating table and handled by surgical personnel during operations, said light fixture handle having a configuration including a handle grip extending from a handle flange, said cover comprising:

a sterile, disposable, thin-walled, substantially impervious, flexible body including a hollow elongated grip portion having a bottom and a cover flange, said cover adapted to be fitted over said light fixture handle; and

an elongate channel, formed in said flexible body and having two circumferentially spaced channel portions extending along said grip portion and connected to one another by a lower channel portion extending along the bottom of said grip portion, for venting air trapped between said cover and said handle out of said cover during fitting of said cover over said handle.

5,469,601

GRIP COVER

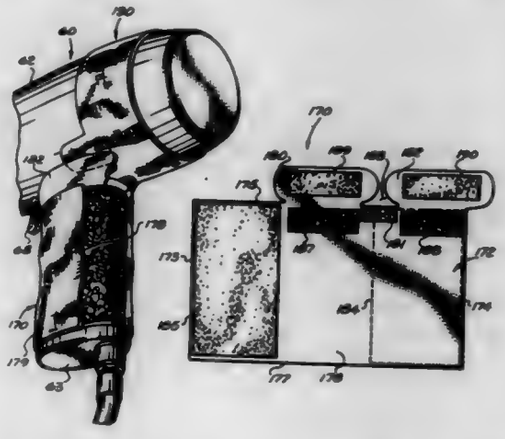
Linda J. Jackson, 965 N. 58th St., Mesa, Ariz. 85205

Continuation of Ser. No. 78,447, Jun. 16, 1993, Pat. No. 5,347,684, which is a continuation-in-part of Ser. No. 959,436, Oct. 13, 1992, abandoned. This application Jun. 23, 1994, Ser. No. 264,603

The portion of the term of this patent subsequent to Sep. 20, 2011, has been disclaimed.

Int. Cl.[6] A47J *45/10*

U.S. Cl. 16—111R 12 Claims



1. A grip cover removably covering a handle, said handle extending from a housing of an implement and having a free end, for protecting the hand of a user, said grip cover comprising:

a) a sheet of flexible material including

i. an inner surface received against and frictionally engaging the handle of said implement, and

ii. an outer surface for receiving the hand of said user thereagainst;

b) securement means for constrictively affixing said sheet about said handle with a selective predetermined compressive force; and

c) an extension, extending from an edge of said sheet so as to overlap said housing.

5,469,602

COLLAPSICLE HANDLE OF BAGGAGE

Ming-Teng Lin, Taichung Hsien, Taiwan, Prov. of China, assignor to Gallant Industries Co., Ltd., Taichung Hsien, Taiwan, Prov. of China

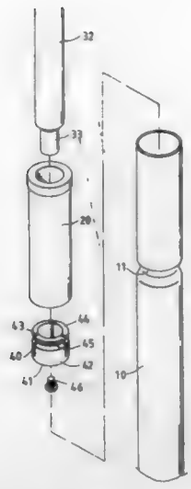
Filed Aug. 4, 1994, Ser. No. 284,987

Int. Cl.[6] B25G *1/04*

U.S. Cl. 16—115 6 Claims

1. A collapsible handle of baggage comprising:

two outer tubes fastened in a parallel manner to a baggage; and



a handle having a grip portion and two bar portions which extend in a parallel manner from both ends of said grip portion and which can be inserted into said two outer tubes;

wherein said two outer tubes have respectively an inner wall provided with a circular projection;

wherein said two bar portions are provided respectively at a bottom thereof with a retaining member having a round bottom and a tubular body which extends upwards from a periphery of said retaining member, said tubular body provided with a predetermined number of slits extending downwards from a top thereof, said tubular body further provided with at least two or more elastic arm portions, each of which is provided on an outer wall of a top thereof with a protuberance engageable securely with said projection of said outer tube.

5,469,603

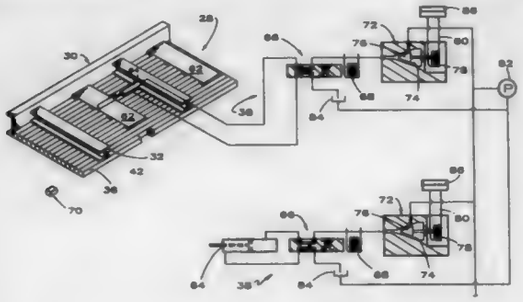
FIBER REDUCER RECIPROCATING CONVEYOR HAVING AN IMPROVED BEARING ASSEMBLY

Jimmy R. Stover, Walters, Okla., assignor to Western Steel, Inc., Corpus Christi, Tex.

Filed Nov. 26, 1993, Ser. No. 158,632

Int. Cl.[6] D01G *7/00*; B65G *25/04*

U.S. Cl. 19—80 R **15 Claims**



1. A fiber bundle reducer comprising

a feeder head for separating a fiber bundle into a multiplicity of clumps of fiber;

means for moving the fiber bundle relative to the feeder head including

a reciprocating conveyor having a frame providing a plurality of support members,

a plurality of elongate side-by-side slats and a planar bearing slidably supporting the slats on the support members for reciprocating movement and having at least one fastener slot opening into an edge of the bearing, the fastener slot defining a path of removal and installation movement of the bearing relative to the fastener; a removable fastener securing the bearing to the support member including a first member extending through the slot and through the support member; and means for holding the first member against rotation,

means for reciprocating the slats,

the slats being constantly in contact with the bearings; and

means for supporting a truck for movement onto the reciprocating conveyor for discharging a fiber bundle onto the slats.

5,469,604

RING FOR SWAGING AND METHOD OF FABRICATING IT

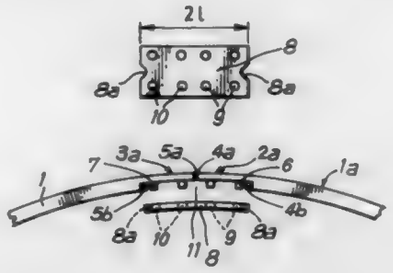
Lionel Calmettes, Romorantin Lanthenay; Pascal Detable, Gievres, and Michel Andre, Romorantin Lanthenay, all of, France, assignors to Etablissements Caillau, Issy Les Moulineaux, France

Filed Jan. 18, 1994, Ser. No. 182,938

Claims priority, application France, Feb. 1, 1993, 93 01053

Int. Cl.[6] F16L *33/207*

U.S. Cl. 24—20 CW **10 Claims**



1. A ring for swaging constituted by a length of rolled-up metal strip, the two ends of the strip being bonded together without causing significant increased thickness in the bond zone, wherein the ends of the length of strip are disposed substantially in contact with each other via their terminal edges, the thickness of each of said ends being close to half the thickness of the strip and their inside faces being offset outwardly relative to the inside surface of the ring so as to constitute a housing for a plate of thickness close to half the thickness of the strip, while a set of complementary studs and holes is provided on the ends of the strip and on the plate, said studs being riveted into the holes to secure the two ends of the strip.

5,469,605

SLIDE FASTENER

Mitsuo Horikawa, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

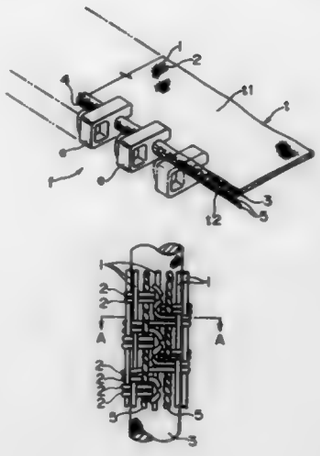
Filed Mar. 15, 1994, Ser. No. 213,084

Claims priority, application Japan, Mar. 16, 1993, 5-011496 U

Int. Cl.[6] A44B *19/02*

U.S. Cl. 24—403 **6 Claims**

1. A slide fastener having a fastener tape, a core cord weaved integrally in a longitudinal edge of one side of said fastener tape and metallic coupling elements disposed at regular intervals along the longitudinal edge of the fastener tape comprising plural electric conductors which are used as a part of warps of said fastener tape, at least two of said electric conductors having exposed portions which are shifted from one another in the longitudinal direction, so that said electric conductors are substantially continuously exposed along an outer edge of said core cord, being weaved in said fastener tape body.



5,469,606

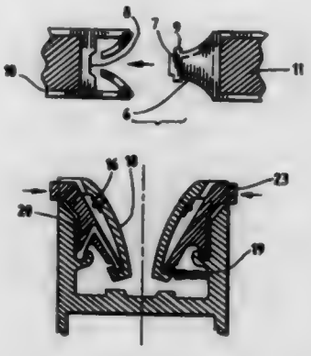
CLAMP MEANS FOR JOINING OBJECTS TOGETHER

Arne Hansen, P.O. Box 389 N-1301, Sandvika, Norway

Continuation-in-part of Ser. No. 962,599, Feb. 11, 1993, abandoned. This application Apr. 20, 1994, Ser. No. 230,296

Int. Cl.[6] A44B *17/00*

U.S. Cl. 24—662 13 Claims



1. A clamp means, preferably with a profile-shaped design, for joining together two objects in a fast and simple snap-on manner, comprising a male part and a female part provided respectively for each object, said female part comprising at least one springy, barb-like profile element attached along the upper edge of the female part, and in such a manner that for providing a retaining effect for the male part when the male part is inserted into the female part cavity, said profile element extending down into said cavity and being adapted to yield elastically sideways when the male part is inserted in the cavity and engages a profile element surface, and thereafter to be relaxed and return quickly to a less strained position when the tip of the male part has passed by the profile element, said male part tip having such dimensions that said tip is retained by the profile element due to a barb effect and against the cavity bottom due to an engagement effect, a further clamping effect also being obtained due to a pinch effect between the profile elements or between the single profile element and the opposite wall, said profile element being convexly curved when viewed in the insertion direction, that the lower edge of said profile element is located substantially closer to the cavity bottom than to the upper edge of the wall, a male part section behind said male part tip having a surface with a substantially complementary cross section shape in relation to said profile element surface when the profile element is in its less strained position, in order to obtain a firm and rigid engagement.

5,469,607

CLOTH HANGER CLIP

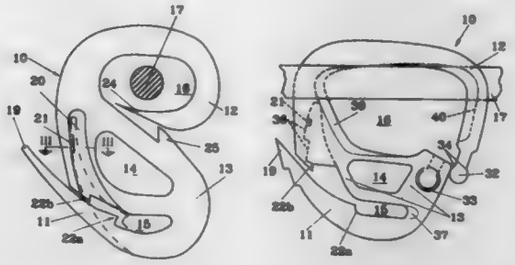
Göran Henningsson, and Hans Andersson, both of Kinna, Sweden, assignors to Ludvig Svensson International B.V., Hellevoetsluis, Netherlands

Continuation-in-part of Ser. No. 90,083, Aug. 4, 1993, abandoned. This application Nov. 7, 1994, Ser. No. 335,479

Claims priority, application Hague Agreement, Jan. 24, 1991, PCT/SE91/00050

Int. Cl.[6] A44B *13/00; A47H 1/00*

U.S. Cl. 24—716 7 Claims



1. A cloth hanger clip for holding a material, such as a curtain, screen or the like and for connecting it to a wire, said clip comprising:

an intermediate portion having a first and second end;

a first resilient hook formed at said first end of said intermediate portion;

a second resilient hook formed one at said second end of said intermediate portion;

said clip having a substantially S-shaped configuration with said first and second hooks in their open position, said first hook defining a material holding space and said second hook defining a wire holding space; and

a recess formed in said intermediate portion, said recess is formed on the intermediate portion from the side entrance into the material holding space;

said first hook being disposed to be received in said recess of said intermediate portion so that said first hook defines a closed oblong material holding space having parameters,

such that when said first hook is moved from an open position to a closed position a clamping effect is exerted on the material held therein.

5,469,608

MACHINE FOR TREATMENT OF FABRIC IN CORD FORM, WITH ROLLERS INCORPORATING ELECTRIC DRIVING MOTORS, FOR FULLING AND FOR OTHER OPERATIONS

Florenzo Biancalani, Florence, Italy, assignor to Officina Meccanica Biancalani & C. di Biancalani Florenzo & C. S.N.C., Florence, Italy

Filed Mar. 10, 1994, Ser. No. 209,193

Claims priority, application Italy, Mar. 12, 1993, F193A0047

Int. Cl.[6] D06C *17/02*

U.S. Cl. 26—19 6 Claims

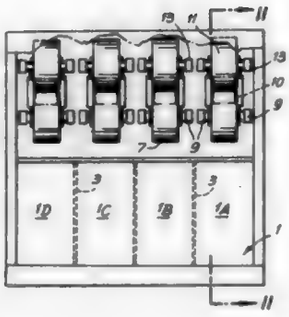
1. A machine for treating fabrics in cord form, comprising:

a treatment section;

two hollow rotating rollers provided at said treatment section for engaging fabric to be treated, the fabric passing between said rotating rollers;

an electric motor provided in each roller for driving a corresponding roller in rotation;

a roller mounting including a shaft beam, bearings mounted on said shaft beam, said motor including a stator fixed to said shaft beam and a rotor extending in an annular form around said stator, said rotor being formed fixed to a peripheral shell of said roller.



5,469,609

YARN TEXTURING APPARATUS

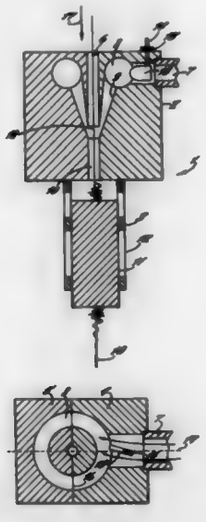
Horst Beifuss, Wermelskirchen, Germany, assignor to Barmag AG, Remscheid, Germany

Filed Jul. 15, 1994, Ser. No. 275,633

Claims priority, application Germany, Jul. 15, 1993, 43 23 664.2; Feb. 17, 1994, 44 04 975.7; Mar. 17, 1994, 44 09 038.2

Int. Cl.[6] D02G 1/16

U.S. Cl. 28—271 18 Claims



1. An apparatus for texturing an advancing yarn with a pressurized heating fluid and comprising:

a nozzle including a passageway through which the yarn is to advance at high speed from an inlet end to an outlet end of said passageway;

duct means for conducting a pressurized heating fluid into said passageway during operation of said apparatus, and including an annular duct surrounding said yarn passageway in said nozzle, a supply duct communicating with said annular duct, and a conical duct extending from said annular duct to said yarn passageway;

a perforated stuffer box disposed adjacent the outlet end of said yarn passageway for receiving and forming a compressed plug from the advancing yarn exiting from said passageway; and

means mounted in said supply duct for adjustably controlling the direction of flow of the heating fluid into said annular duct.

5,469,610

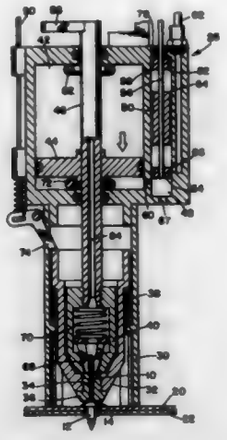
FASTENING TOOL AND FASTENER

Curtis C. Courian, 4428 Mistral Pl., and Kenneth J. Courian, 3536 Seaborn, both of San Diego, Calif. 92130

Continuation of Ser. No. 106,439, Aug. 16, 1993, abandoned. This application Jun. 28, 1994, Ser. No. 267,430

Int. Cl.[6] B21J 15/04

U.S. Cl. 29—243.521 16 Claims



1. A self-penetrating fastening apparatus for installing in a workpiece a fastener having a fastener stem, a point for piercing said workpiece, and a fastener body surrounding a portion of said fastener stem, comprising:

a nosepiece having an end for contacting said fastener and a hollow bore for receiving said fastener stem;

a pulling head axially movable with respect to said nosepiece having grip means for frictionally engaging said fastener stem and retaining said fastener stem; and

an actuator for applying an axial penetrating force to said nosepiece, said nosepiece carrying said point into contact with said workpiece for piercing said workpiece solely in response to said axial penetrating force, until said fastener body extends into said workpiece, said actuator adapted to drive said pulling head in an axial direction toward said workpiece for urging said grip means into frictional engagement with said fastener stem and for applying a pulling force to said grip means in a direction away from said workpiece while said nosepiece restrains said fastener body against movement relative to said workpiece.

5,469,611

TIP PROCESSING METHOD FOR JACKETED OPTICAL FIBERS

Koji Sasaki; Shizuka Yamaguchi; Tsuyoshi Fumeno, and Satoshi Fukuoka, all of Ichihara, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 54,796, Apr. 28, 1993, abandoned, which is a division of Ser. No. 866,795, Apr. 8, 1992, Pat. No. 5,253,412. This application Sep. 29, 1994, Ser. No. 315,197

Claims priority, application Japan, Apr. 12, 1991, 3-80153; Apr. 12, 1991, 3-80154; Apr. 12, 1991, 3-80155

Int. Cl.[6] B26F 3/00

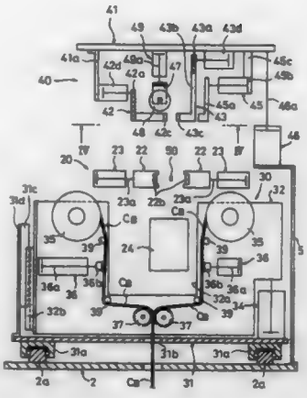
U.S. Cl. 29—426.2 7 Claims

1. A tip processing method for mechanically cleaning and processing a tip of a jacketed optical fiber, the tip processing method comprising the steps of:

mechanically holding a jacketed optical fiber in a specified position;

mechanically clamping a tip portion of the held jacketed optical fiber, and then peeling a jacket portion off of the held jacketed optical fiber by a desired length, thereby exposing only a portion of said optical fiber;

1



cleaning the exposed portion of the optical fiber which was exposed by the jacket peeling step; and

performing cut processing on the optical fiber to trim the cleaned optical fiber by

mechanically clamping the cleaned exposed portions of the optical fiber at two spaced apart points on said optical fiber;

cutting a notch in the exposed portion of the clamped optical fiber at a point between the two clamped points; and

pressing the exposed portion of the optical fiber at the notched point from a direction that orthogonally intersects with an axis extending along the optical fiber, for severing said optical fiber at said notch.

5,469,612

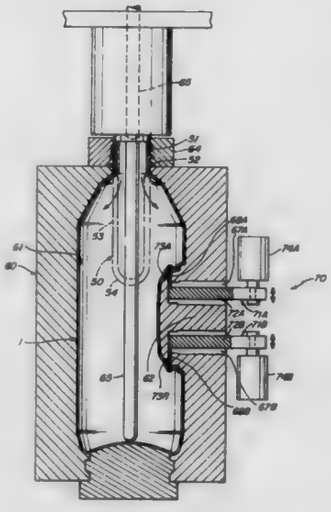
METHOD FOR FORMING A STRAIN-HARDENABLE PLASTIC CONTAINER

Wayne N. Collette, Merrimack, and Suppayan M. Krishnakumar, both of Nashua, N.H., assignors to Continental PET Technologies, Inc., Florence, Ky.

Filed Dec. 2, 1993, Ser. No. 160,963

Int. Cl.[6] **B29C** *49/08;* **B29D** *22/00;* **B65D** *23/10*

U.S. Cl. 29—453 **13 Claims**



1. A method of forming a strain-hardenable plastic container with handle comprising:

stretch blow molding a strain-oriented container from a preform in a cavity of a blow mold, the preform being made of a strain-hardenable thermoplastic material, the mold having at least one extendable projection forming a partial recess of a first depth in the container as the material is blow molded over the projection at a forming temperature above T_g of the thermoplastic material, the first depth of the partial recess being limited by strain hardening of the thermoplastic material during the stretch blow molding such that the partial recess has a depth-to-width ratio of up to about 2:1;

then mechanically extending the first depth of the partial recess to a greater second depth by extending the projection further into the recess to form a handle recess of the second depth and having a depth-to-width ratio of at least about 3:1;

mechanically retracting the extendable projection and removing the container with the handle recess from the blow mold; and

attaching a handle to the container by engaging an attachment member on the handle with the handle recess.

5,469,613

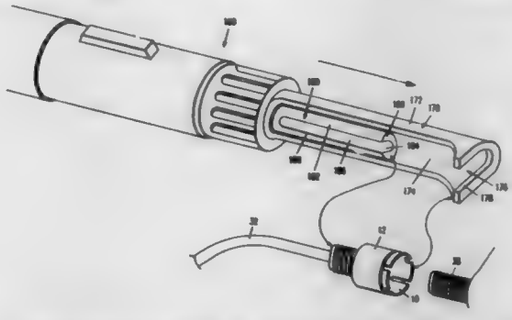
TOOL FOR CONNECTING A COAXIAL CABLE TERMINUS TO A CONNECTION JACK

Corey McMills, Los Altos, and John Mattis, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 912,106, Jul. 10, 1992, Pat. No. 5,297,972. This application Mar. 29, 1994, Ser. No. 219,064

Int. Cl.[6] **H01R** *43/22;43/26*

U.S. Cl. 29—751 **4 Claims**



1. A tool useful in a system for protectively connecting a coaxial cable terminus to a connection jack, wherein the connection jack comprises (1) an externally threaded body with a connection jack aperture, and (2) an internal electrical conductor disposed within, but insulated from, the body proximate to the connection jack aperture, and wherein the system comprises:

(I) an electrically conductive connection jack connector comprising a connection jack attachment moiety and a cable attachment moiety, the connection jack attachment moiety having a collet structure with a base, a base aperture and a plurality of flared fingers, and the cable attachment moiety having an open ended hollow cylinder which communicates with the collet base aperture, wherein the connection jack attachment moiety is attached snugly around the threaded body of the connection jack and the cable attachment moiety is attached to the coaxial cable terminus in such a way that the cable attachment moiety is in electrical contact with the concentric conductor and in such a way that the central conductor protrudes axially through the collet base aperture, through the connection jack aperture, and is in electrical contact with the internal electrical conductor;

(II) a hollow, open-ended swagging shell comprising a compression moiety and an externally threaded retraction moiety, the compression moiety being disposed tightly over the flared fingers of the connection jack connector thereby applying hoop stress to the flared fingers so as to urge the flared fingers into tight connection with the threaded body of the connection jack; and

(III) a hollow locking shroud having elongated side walls which define a locking shroud chamber with an open end, the locking shroud being disposed with respect to the connection jack in such a way that the side walls surround the connection jack, the connection jack connector and the swagging shell;

the tool comprising:

a. a body having a central axis;

b. a hollow, internally threaded retraction cylinder attached to the body, the retraction cylinder having an outside diameter dimensioned to allow the retraction cylinder to slide freely within the shroud chamber., having a length and an inside diameter dimensioned to threadably attach to the threads on the exterior of the swagging shell, and having a longitudinal axis which is coaxial with the central axis of the body; and

wherein the body and the retraction cylinder define a continuous external groove which encompasses the central axis of the body and the longitudinal axis of the retraction cylinder, the groove being dimensioned to allow the tool to freely slide along the exterior of a length of coaxial cable.

5,469,614

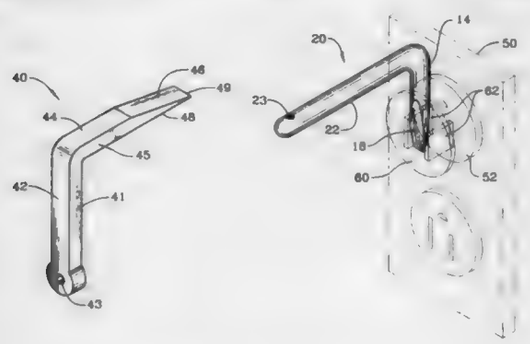
ELECTRICAL OUTLET COVER REMOVER

Debra Lyonnais, 4900 W. Leitner Dr., Coral Springs, Fla. 33067

Continuation of Ser. No. 12,069, Aug. 20, 1993. This application Apr. 29, 1994, Ser. No. 235,374

Int. Cl.[6] B23P *19/04*

U.S. Cl. 29—764 **13 Claims**



1. A tool for removing an electrical outlet safety cover having prongs from an electrical outlet, said tool comprising:

at least one elongated handle for holding said tool when removing the cover, said at least one handle having a first free end and a second upper end;

at least one elongated prying shank connected to and extending from said upper end of said handle, ending in a tapered end distal from said handle; and

an aperture formed in said free end of said handle for receiving a securing device.

5,469,615

METHOD FOR ELECTRICAL INTERCONNECTION OF METALLIC PATTERNS

Hideo Yamazaki, Sagamihara, Japan, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 5, 1994, Ser. No. 238,535

Int. Cl.[6] H05K *3/02*

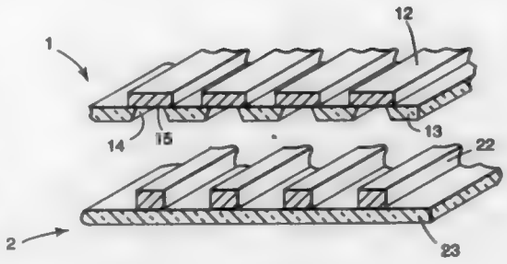
U.S. Cl. 29—846 **3 Claims**

1. A method for electrical interconnection of a first metallic pattern deposited on a dielectric film to a second metallic pattern, comprising the steps of:

forming on the opposite side to a side, of said dielectric film where the first metallic pattern is deposited, grooves so deep as to reach the first metallic pattern

preparing the second metallic pattern having such a thickness that it can be fitted into the grooves formed in said dielectric film and can be in contact with the first metallic pattern, and

fitting into said grooves formed in said dielectric film the second metallic pattern to join said metallic patterns to each other under pressure.



5,469,616

METHOD OF MANUFACTURING A SIDE RAIL OF A COMBINED OIL RING

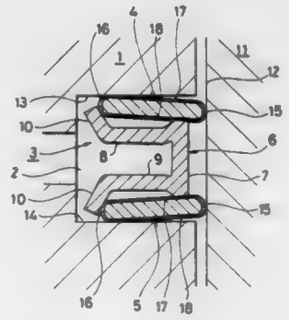
Satomichi Miyazaki; Akira Harayama; Nobuyuki Kazama, and Masao Ishida, all of Nagano, Japan, assignors to Teikoku Piston Ring Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 791,257, Nov. 13, 1991, abandoned. This application Jan. 31, 1994, Ser. No. 189,723

Claims priority, application Japan, Nov. 15, 1990, 2-309452; Jun. 10, 1991, 3-165012; Aug. 14, 1991, 3-228817

Int. Cl.[6] B23P *15/00*

U.S. Cl. 29—888.074 **2 Claims**



1. A method for manufacturing a side rail for use in a combined oil ring having a spacer-expander and two side rails, said method comprising the steps of:

coiling a strip of rail material having a thickness C/2 to form a coil;

providing a jig with an outer peripheral surface with a diameter x=(A+B)−C, wherein B=A'−A and A is the outer diameter of the coil after nitriding and A' is the outer diameter of the coil before nitriding;

setting said coil on the outer peripheral surface of said jig and clamping the coil so that adjacent surfaces are in contact with each other and only the outer peripheral surface of the coil is exposed;

applying an ion nitriding to the exposed outer peripheral surface of the coil; and then

cutting said coil into individual rails with a gap forming a pair of end surfaces.

5,469,617

FRICTION FORMING

Wayne M. Thomas; Edward D. Nicholas, both of Haverhill; Stephen B. Jones, Stapleford, all of, England; Roger H. Lilley, Comberton, United Kingdom; Christopher J. Dawes, Sawston, United Kingdom, and Richard E. Dolby, Burwell, United Kingdom, assignors to The Welding Institute, Cambridge, England

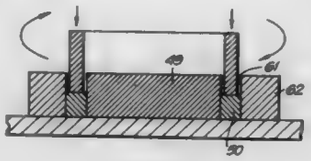
PCT No. PCT/GB92/01540, § 371 Date Mar. 2, 1994, § 102(e) Date Mar. 2, 1994, PCT Pub. No. WO93/04813, PCT Pub. Date Mar. 18, 1993

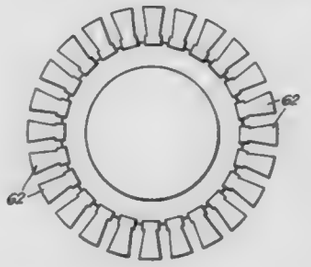
PCT Filed Aug. 21, 1992, Ser. No. 204,157

Claims priority, application United Kingdom, Sep. 5, 1991, 9119022

Int. Cl.[6] B23K *20/12*

U.S. Cl. 29—889.21 22 Claims





1. A method of forming a plug-like member, the method comprising placing a consumable member (4) in a bore (1) of a substrate (2), wherein said bore defines a wall around said consumable member, and wherein a clearance is left between said consumable member and said wall; causing relative movement between the consumable member (4) and the substrate (2) while urging them together to generate frictional heat and fully plasticising said consumable member across said bore in a plasticised region which progresses along the consumable member in a direction opposite to the urging direction; allowing the plasticised material (5) to solidify so as to form the plug like member having an outer surface conforming to the inner surface of at least part of the bore (1); and either leaving the plug-like member in situ or, following formation of the complete plug-like member, removing the substrate.

5,469,618

METHOD FOR MANUFACTURING HOLLOW AIRFOILS (TWO-PIECE CONCEPT)

Jeffrey LeMouds, Clifton Park; James E. McConnelee, Delanson, both of N.Y.; John R. Kelley, Cincinnati; Gene E. Wiggs, West Chester, both of Ohio, and Gary T. Martini, Milford, Mich., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 6, 1993, Ser. No. 162,212

The portion of the term of this patent subsequent to Sep. 14, 2010, has been disclaimed.

Int. Cl.[6] B23P *15/00*

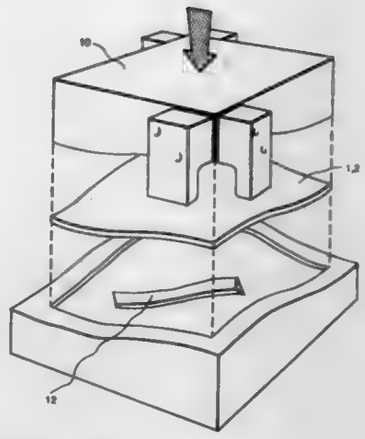
U.S. Cl. 29—889.72 19 Claims

1. A method of making hollow airfoils from two pieces comprising the steps of:

providing each of said two pieces with an initial camber and twist;

machining a series of raised ribs on the exterior sides of each of said two pieces;

joining said two pieces together into an assembly; and



applying internal pressure to said assembly so that said assembly superplastically deforms into a hollow airfoil.

5,469,619

TUBULAR CORE ASSEMBLY HAVING INSIDE-DIAMETER REDUCING END MEMBERS SECURED BY MECHANICAL INTERLOCKING MEMBER

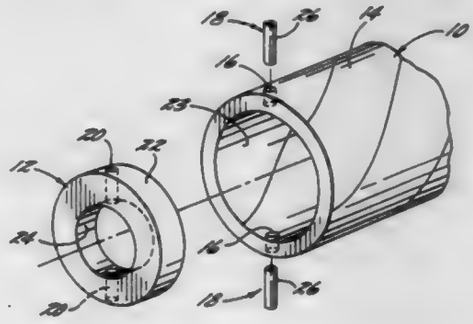
Lawrence E. Renck, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Division of Ser. No. 49,711, Apr. 20, 1993, Pat. No. 5,340,050.

This application Apr. 21, 1994, Ser. No. 230,606

Int. Cl.[6] B31D *5/00*

U.S. Cl. 29—895.2 8 Claims



1. The process for forming a tubular core assembly for a roll of paper or other sheet material comprising:

providing an elongate hollow cylindrical central core body member comprising a bodywall having opposed ends, a predetermined outside diameter and a predetermined inside diameter;

providing inside diameter-reducing annular core insert members, each having at least a portion of its outside diameter substantially the same as the inside diameter of said central core body member and each being inserted into one or said opposed ends of said central core body;

forming at least one aligned bore in a single operation for each of said cylindrical core body ends and the annular core insert member inserted therein;

providing at least two radially interlocking members having substantially the same outside diameter as the inside diameter of said aligned bores and inserting and securing one of said radially interlocking members in each of said aligned bores in said cylindrical core body end and the associated core insert member so that each core insert member is secured to the inside periphery of the associated end of the central core body in positive interlocking relationship.

5,469,620

METHOD OF ASSEMBLING A BEARING

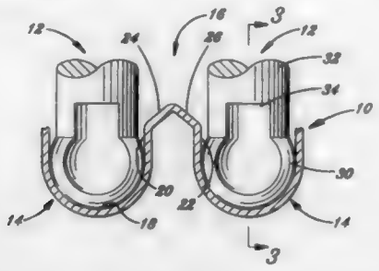
Gunter J. Zinken, Torrington, Conn., assignor to The Torrington Company, Torrington, Conn.

Continuation of Ser. No. 189,955, Jan. 31, 1994, Pat. No. 5,404,642. This application Dec. 19, 1994, Ser. No. 358,424

The portion of the term of this patent subsequent to Jan. 29, 2013, has been disclaimed.

Int. Cl.[5] B23P *15/00*

U.S. Cl. 29—898.064 **6 Claims**



1. A method of assembling a ball bearing assembly, the method comprising the steps of:

forming a one-piece metallic ball bearing cage having an initial configuration with ball pockets and bridge portions between the ball pockets, at least a portion of the bridge portions having a predetermined chordal length;

positioning bearing balls within an annulus between inner and outer bearing rings, the bearing balls being separated by an average chordal distance less than said predetermined chordal length; and

inserting the ball bearing cage into said annulus such that circumferential movement of the bearing balls allows the bridge portions of the ball bearing cage to pass between adjacent bearing balls as the bearing balls sequentially enter the ball pockets.

5,469,621

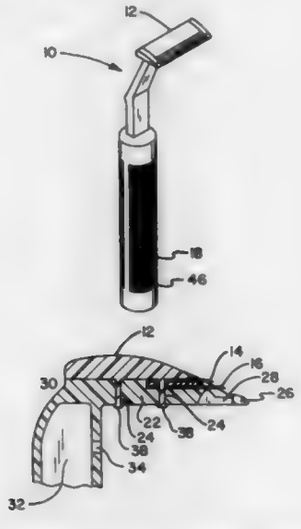
SEFETY RAZORS WITH A REDUCED SIZED HEAD AND BLADES

Mark A. Alsept, and Jerry D. Alsept, both of 3434 Wright Rd., Leslie, Mich. 49251

Filed Jan. 27, 1994, Ser. No. 187,147

Int. Cl.[6] B26B *21/06*

U.S. Cl. 30—50 **1 Claim**



1. A new and improved safety razor with a reduced sized head and blades comprising, in combination:

a head formed of a lower portion having a base plate with two sets of apertures extending therethrough and a forward end provided with a cleaning groove and rearward end formed with a downwardly extending recess, the recess having a hole therethrough, the head also including a cap with two sets of circular rivets extending downwardly therefrom, both sets of circular rivets being positioned through the apertures of the base plate and heat riveted therewith;

a pair of blades secured between the base plate and cap with the blades having cutting edges extending forwardly thereof over the cleaning groove, the blades having apertures for being received by only one set of the circular rivets for holding the blades in place, the head also including a spacer plate between the blades for dual blade shaving;

a handle having a gripping portion at its lower extent and a coupling portion at its upper extent, the coupling portion including a projection adapted to be positioned through the hole when the upper end of the handle is located within the recess;

the width of the head being about twenty-four millimeters from edge to edge; and

the width of the head being not greater than 30 percent of the length of the razor including handle and head.

5,469,622

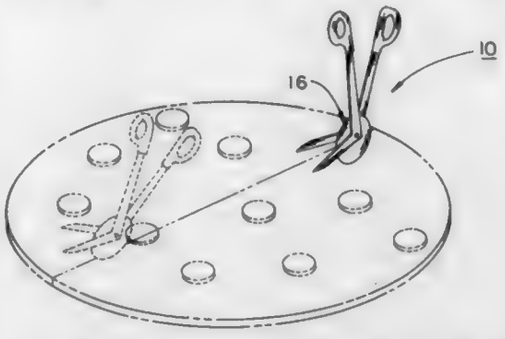
PIZZA CUTTING SCISSORS

John T. Gradoni, 39 Wertman La., Loudonville, N.Y. 12211

Filed Nov. 1, 1994, Ser. No. 332,853

Int. Cl.[6] B26B *11/00*

U.S. Cl. 30—146 **4 Claims**



1. A pair of new and improved pizza cutting scissors comprising, in combination:

a first scissor blade having a front segment and a rear segment, the front segment being fabricated of steel and formed in a long planar generally rectangular configuration, the front segment having a sharp inboard edge and a dull outboard edge, the rearward end of the front segment having a larger width than the frontward end thereof with a gradually decreasing width therebetween, the furthest extent of the frontward end being formed into a point, a handle fabricated of plastic being affixed to the rear segment and formed in a generally planar oval configuration with a large oval aperture extending therethrough, the rear segment having a screw aperture at its furthest frontward extent to permit coupling upon the furthest rearward extent of the front segment, the handle adapted to be held with user's fingers extending therethrough in an operative orientation;

a second scissor blade having a front segment and a rear segment, the front segment being fabricated of steel and formed in a long planar generally rectangular configuration, the front segment having a sharp inboard edge and a dull outboard edge, the rearward end of the front segment having a larger width than the frontward end thereof with a gradually decreasing width therebetween, the furthest extent of the frontward end being formed into a point, the rearward end including a slanted projection extending therefrom, the angle between the projection and the remainder of the front segment

measuring about one hundred and thirty five degrees, the rear segment being fabricated of plastic and formed in a generally planar circular configuration with a large circular aperture extending therethrough, the rear segment having a screw aperture at its furthest frontward extent to permit coupling upon the projection of the front segment, the rear segment adapted to be held with the user's thumb extending therethrough in the operative orientation;

a circular cutter formed in a thin planar generally circular configuration with a sharp outer edge, the center point of the cutter having a screw aperture extending therethrough, the cutter adapted to hold the topping of a pizza in place while being cut by the user; and

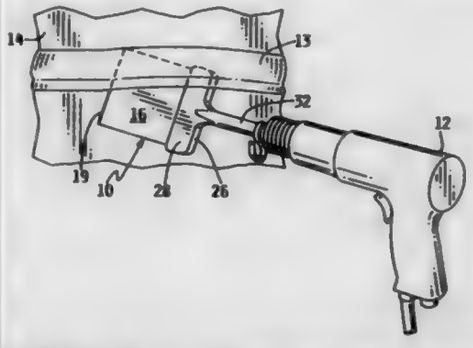
a wing nut and bolt, the bolt formed in a generally cylindrical configuration with a planar head and a plurality of external screw threads around the outboard portion of its shaft, the wing nut having two planar semi circular components with a semi spherical shaped component positioned therebetween, the semi spherical component including a plurality of internal screw threads, the bolt adapted to be positioned through the the screw apertures in the blades and cutter with the wing nut securely retaining the blades and cutter therebetween.

5,469,623

CUTTING TOOL AND METHOD FOR MANUFACTURE

David C. Roeker, Troy, Wis.; Edward L. Manor, Lakeland, and Shawn P. Crosby, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 29, 1994, Ser. No. 235,167
Int. Cl.[6] B26B *3/00*
U.S. Cl. 30—169 **24 Claims**



1. A cutting tool for use in a manually manipulated air hammer while the cutting tool is reciprocated by the air hammer and used to separate laminated materials, said cutting tool comprising:

a blade of thin resiliently flexible metal, said blade having opposite major surfaces, a first sharpened edge, and a driven edge opposite said sharpened edge, opposite side edges extending between said sharpened and driven edges, and an imaginary centerline midway between said side edges extending between said sharpened and driven edges; and

an adapter comprising

a blade holder portion comprising polymeric material around a portion of said blade adjacent said driven edge, said blade holder portion including a rear part abutting said driven edge and front parts extending from said rear part along portions of said major surfaces of said blade toward said sharpened edge;

means for retaining said portion of said blade adjacent said driven edge in said blade holder portion; and

an elongate shank portion having an axis, said shank portion having a rear end, a portion adjacent said rear end shaped for engagement by said air hammer, and a front end axially spaced from and opposite said rear end, said front end being attached to said blade holder portion with said axis of said shank portion generally in the same plane as the imaginary centerline of said blade, and said shank portion extending generally away from said sharpened edge from said front end toward said rear end;

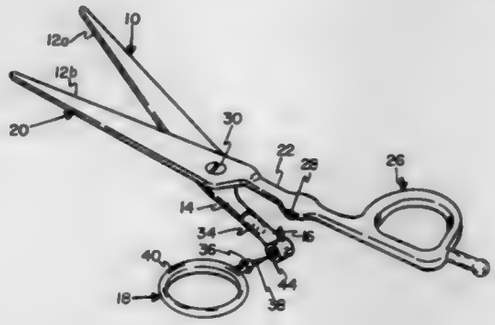
said polymeric material in said adapter providing an average specific gravity for said adapter that is less than about 1.84.

5,469,624

INTERCHANGEABLE THUMB RINGLETS FOR PIVOTED CUTTING AND GRASPING INSTRUMENTS

Billy H. Brenton, 245-B El Cerro Loop, Los Lunas, N.M. 87031, and James J. Stagnone, 2426 Vista Grande, NW., Albuquerque, N.M. 87120

Continuation-in-part of Ser. No. 907,107, Jun. 30, 1992, Pat. No. 5,301,430. This application Nov. 19, 1993, Ser. No. 155,007
The portion of the term of this patent subsequent to Jun. 30, 2009, has been disclaimed.
Int. Cl.[6] B26B *13/00*
U.S. Cl. 30—232 **6 Claims**



1. A pair of scissors having an interchangeable thumb ringlet, comprising in combination:

a. a first shank member having a handle portion and a cutting portion approximately separated by a first pivot location;

b. elongated handle extension means rigidly attached to the handle portion of said first shank member substantially near to the terminus thereof away from the first pivot location, said handle extension means having a tubular portion located at the end thereof opposite the position of attachment thereof to said first shank member and disposed substantially perpendicular to the long dimension thereof;

c. flexible thumb ring means having a ring-shaped portion and a generally cylindrical arm attached radially thereto, the arm having an enlarged deformable terminus and an arm extension located on said cylindrical arm thereof on the opposite side of said enlarged deformable terminus thereof from said ring-shaped portion, said arm extension being adapted for insertion into the tubular portion of said handle extension means; and

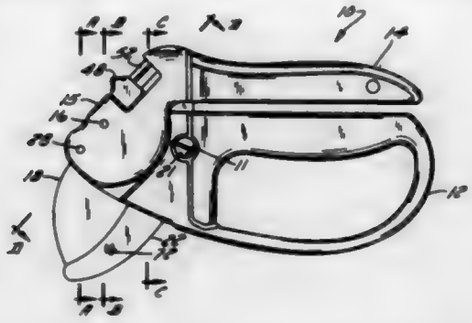
d. a second shank member having a handle portion, and a cutting portion approximately separated by a second pivot location, said second shank member being pivotably connected to said first shank member in the region of the first pivot location and the second pivot location in such a manner that the cutting portion of said first shank member and the cutting portion of said second shank member cooperate as opposing cutting portions of said pair of scissors; whereby the cylindrical arm of said thumb ring means, once inserted into the tubular portion of said handle extension means, forms said thumb ringlet, the enlarged terminus thereof and the ring-shaped portion preventing escape therefrom.

5,469,625

COMPOUND ACTION HAND PRUNER

Craig H. Melter, Baraboo, and Robert T. Schofield, Madison, both of Wis., assignors to Fiskars Inc., Madison, Wis.

Filed Aug. 11, 1994, Ser. No. 289,110
Int. Cl.[6] B26B *13/26*
U.S. Cl. 30—251 **5 Claims**



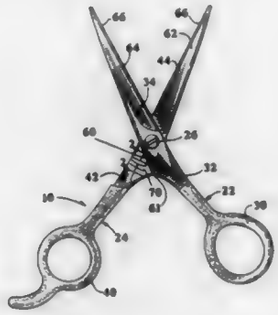
1. A hand pruner comprising a first handle having a first pivot section and a handle section, a second handle having a second pivot section and a second handle section, a first pin pivotally connecting said first pivot section to said second pivot section, a hook having one end pivotally connected to said second handle section, a bolt pivotally connecting said one end of said hook to said second handle section, a stationary cutting blade mounted in said second handle section and having one end secured to said bolt and the other end located in the path of travel of said hook and a pair of links connecting said hook to said first pivot section whereby the pivotal movement of said first handle with respect to said second handle will pull the hook into engagement with said stationary blade.

5,469,626

SCISSORS

David S. Vogel, and Donald E. Vogel, both of Columbus, Ohio, assignors to Vogel Brothers Corporation, Columbus, Ind.

Filed Apr. 23, 1993, Ser. No. 52,586
Int. Cl.[6] B26B *13/06*
U.S. Cl. 30—266 **5 Claims**



1. In a cutting tool comprising:
first and second cooperating metal members, with each of the first and second members having a first end, a second end and a longitudinal central axis extending between their first and second ends;
a first handle on the first end of the first member;
a second handle on the first end of the second member;
means for interconnecting the first and second members at a connection point disposed between their first ends and their second ends for permitting the first and second members to pivotally move, with respect to each other and about the connection point, between a closed position, where the second ends of the first and second members are adjacent to each other, and an open position, where the second ends of the first and second members are spaced from each other;
the first and second members each having a shank portion disposed adjacent to the connection point and between the connection point and their first ends, the shank portions each having an outside face, a leading edge that faces the leading edge of the other shank portion when the members are in their open position, and an inside face that has a planar, substantially flat surface, with the surfaces of the inside faces of the shank portions of the first and second members being substantially parallel to each other but being spaced from each other a predetermined distance and substantially overlying each other as the first and second members approach their closed positions and while the first and second members are in their closed positions;
the first and second members each including a blade portion disposed between their second ends and the connection point, with each of the blade portions having an inside face, an outside face and a cutting edge;
the improvement which comprises:
a bearing ramp disposed on the inside face of the shank portion of only the first member, the bearing ramp having a gradually inclining first end adjacent to the leading edge of the shank portion and a second end that extends away from the leading edge and toward the cutting edge of the first member, with the bearing ramp projecting above the inside face of the shank of the first member a height that gradually increases in a direction from the first end of the ramp to the second end, and with the bearing ramp having a minimum projecting height, between its ends, that is greater than said predetermined distance so that, as the first and second members approach their closed position, the inside face of the shank portion of the second member contacts the first end of the bearing ramp and gradually climbs upwardly along the bearing ramp towards its second end with only a single point of contact between this inside face and the bearing ramp thereby resulting in less friction therebetween and imparting a desirable, "Japanese feel" to the tool, and so that, as a result of the gradual climbing upwardly of the inside face of the shank portion of the second member along the bearing ramp, there is substantially point contact between the cutting edges of the first and second members as the first and second members move from their open position to their closed position.

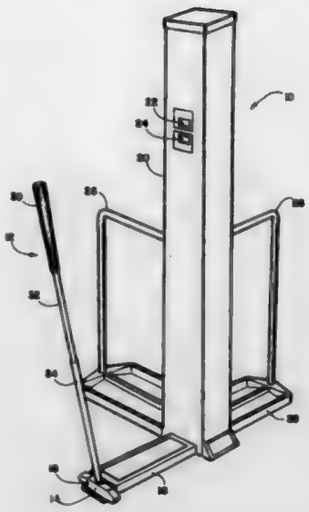
5,469,627

APPARATUS FOR FITTING A GOLF CLUB TO A PLAYER

Bradley J. Denny, San Marcos, and Richard H. Hannon, Oceanside, both of Calif., assignors to Plop Golf Company, Carlsbad, Calif.

Filed Dec. 12, 1994, Ser. No. 353,725
Int. Cl.[6] G01B *7/00*
U.S. Cl. 33—508 **18 Claims**

1. Apparatus for fitting the length of a golf club and the club head-to-shaft angle to an individual person, which comprises:
a fitting club having the overall configuration of a standard golf club with a shaft, grip and head;
said shaft including a first portion carrying said grip and a second portion connected to said head;
said first and second shaft portions relatively telescoping to vary the shaft length from grip to head;
said head mounted for pivoting about a pivot point at the connection of said shaft and head to vary the head-to-shaft angle;
means for determining the shaft length when said grip is held with the shaft telescoped to a selected length which comprises;
a generally "L" shaped electrically insulating panel;
a first leg of said panel extending into said second shaft portion and pivotable therewith;
a first series of spaced electrical contact areas along said first leg each representing a specific shaft length;



a first continuous electrical contact means along said first leg adjacent to said first series of spaced contacts;

a first movable connection contact secured to said second shaft portion formovement along said first series of contacts and said first continuous contact to connect therebetween;

electrical circuit means for generating a digital display corresponding to the one of said first spaced contacts engaged by said first movable connection contact to indicate the overall shaft length;

means for determining the head-to-shaft angle when said grip is held with said shaft at a selected angle to said head;

first display means for displaying indicia indicating the shaft length when said grip is held at a selected length and angular position;

second display means for displaying indicia indicating the head-to-shaft angle when said grip is held at a selected length and angular position;

whereby a person may hold the grip and assume a normal golf stance and said display means will display the actual shaft length and head-to-shaft angle so that the person can select a corresponding normal club.

5,469,628

APPARATUS FOR MEASURING THE DEFORMATION OF DAMAGED VEHICLES AND FOR RECONSTRUCTING CRIME SCENES

François Chartrand, 1009, Route 202, Godmanchester R.R. 4, Huntingdon, Québec, Canada, assignor to François Chartrand, Huntingdon, Canada

Continuation of Ser. No. 41,396, Mar. 31, 1993, abandoned. This application Jan. 20, 1995, Ser. No. 375,597

Int. Cl.[6] G01B *5/02*

U.S. Cl. 33—608 **7 Claims**

1. A deformation measuring apparatus for measuring on the site of an accident a three-dimensional deformation of the body of a damaged vehicle, comprising:

an elongated straight reference frame member to be installed in the proximity of the deformation of the damaged vehicle, with a known spatial relationship between said reference frame member and a non deformed part of said vehicle body, said reference frame member defining a first axis of a first three-dimensional coordinate system; and

a device for measuring distances between said reference frame member and the body of the damaged vehicle in the region of said three-dimensional deformation, by measuring distances along second and third axes of said first three-dimensional coordinate system; and

wherein said distance measuring device comprises:

a first elongated measuring member for measuring distances along said second axis of the first three-dimensional coordinate system;

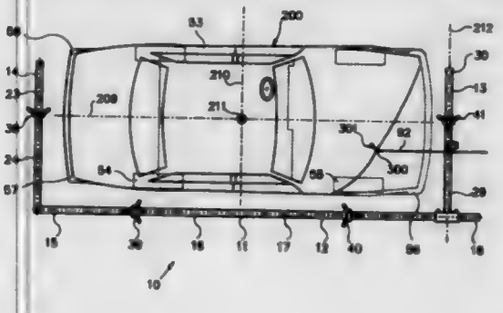
means for mounting said first elongated measuring member perpendicular to said reference frame member while enabling displacement of the first elongated measuring member along the reference frame member and rotation of said first elongated measuring member about said reference frame member;

means for measuring the position of said first elongated measuring member along said reference frame member;

a second elongated measuring member for measuring distances along said third axis of the first coordinate system;

means for mounting said second elongated measuring member perpendicular to both the first elongated measuring member and the reference frame member while enabling displacement of the second elongated measuring member along the first elongated measuring member and longitudinal sliding of the second elongated measuring member on said first elongated measuring member; and

a level means adapted for attachment to said first elongated measuring member for positioning said first elongated measuring member in a given angular position about said first axis by rotating said first elongated measuring member about the reference frame member prior to measuring distances between the reference frame member and the vehicle's body by means of the first and second elongated measuring members.



5,469,629

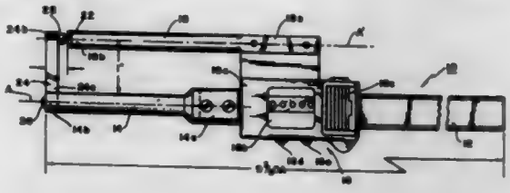
BRAKE ROTOR THICKNESS MEASUREMENT GAGE

Albert C. Rogler, North Scituate, R.I., assignor to Central Tools, Inc., Cranston, R.I.

Filed Jun. 2, 1994, Ser. No. 252,900

Int. Cl.[6] G01B *7/06*

U.S. Cl. 33—831 **17 Claims**



1. Gage for measuring the thickness of a vehicle wheel brake rotor without removing the wheel from the vehicle, wherein the rotor brake assembly is spaced from the wheel to form a predetermined space, the gage comprising an elongate bar defining a gage axis; an elongate support arm extending outwardly from one end of said bar along said gage axis and having a free end at a point remote from said bar; measurement and display module means slidably mounted on said bar for providing indications of relative movements of said module means on said bar; an elongate anvil arm one end of which is mounted on said module for sliding movements therewith, said elongate anvil arm being arranged along a measurement axis offset from and substantially parallel to said support arm and said bar; a first anvil mounted at the other end of said elongate anvil arm; a second anvil; support means on said support arm extending in the direction of said measurement axis

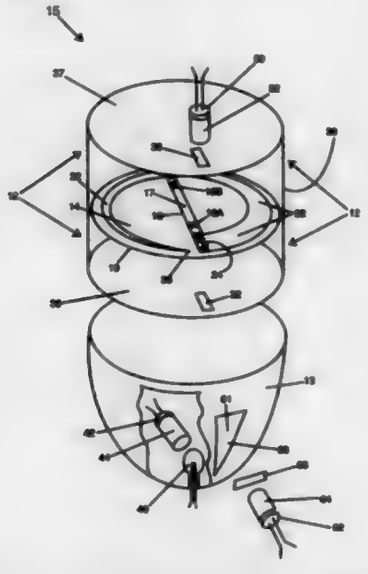
and having a support portion arranged on said measurement axis for supporting said second anvil along said measurement axis, said second anvil having a pointed end pointed in the direction of said first anvil, said support means having a dimension between said gage and measurement axes to permit passage through said predetermined space, whereby said second anvil can be inserted between the wheel and rotor and placed into contact with one side of the rotor without removing the wheel and the thickness of the rotor can be quickly and conveniently measured to determine wear at a plurality of rotor positions by placing said first anvil into contact with the other side of the rotor.

5,469,630

GIMBALLED COMPASS DEVICE

W. Stan Lewis, 709 Mar Vista Dr., Vista, Calif. 92083

Filed Aug. 30, 1994, Ser. No. 297,847
Int. Cl.[6] G01C *17/26;17/18*
U.S. Cl. 33—355 R **17 Claims**



1. A device for determining a directional orientation with respect to an external magnetic field and attitude orientation with respect to a horizon, said device comprising:

a housing, said housing being generally cylindrical and having a wall,

an emission housing, said emission housing being generally half spherical, said half spherical housing having a surface, a center and a radius,

said emission housing nested inside said housing, said emission housing connected to said housing by a gimbal means wherein said emission housing is freely tiltable in a first direction with respect to said housing,

said emission housing having an interior,

an emitting means having an emission, said emission having a first intensity, said emitting means located in said interior,

a first detection means, said first detection means located proximal to said emitting means,

a second detection means,

a chamber, said chamber located atop said emission housing,

a freely rotatable disk, said disk mounted in said chamber by a mounting means, said disk intermediate said emitting means and said second detection means, said disk having a magnet mounted thereon, said disk having a position relative to the external magnetic field,

said disk being generally circular, including a center and a circumference,

said disk including a slot, said slot proximal to the circumference and defining a first passage through said disk, said first passage having a first width, said first width varying linearly about the circumference,

said first passage permits a first portion of said emission to propagate therethrough, said first portion having a second intensity, said second intensity detected by said second detection means,

a third detection means,

said third detection means located on said wall,

said emission housing including a second slot, said second slot on said surface and defining a second passage through said emission housing,

said second slot having a second width, said second width varying linearly along said surface,

said second passage permits a second portion of said emission to propagate therethrough, said second portion having a third intensity, said third intensity detected by said third detection means,

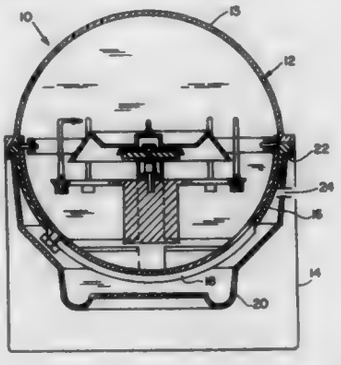
whereby said first detection means generates a first signal proportional to said first intensity, said second detection means generates a second signal proportional to said second intensity, and said third detection means generates a third signal proportional to said third intensity, said second signal proportional to said disk position, said third signal proportional to said emission housing tilt.

5,469,631

AIR BUBBLE FREE COMPASS AND METHOD OF MANUFACTURING SAME

James T. Burrill, Peabody, and William N. Anastos, Belmont, both of Mass., assignors to Rule Industries Inc., Burlington, Mass.

Filed Nov. 4, 1994, Ser. No. 334,569
Int. Cl.[6] G01C *17/08*
U.S. Cl. 33—364 **5 Claims**



1. A method of preventing air bubbles in a compass equipped with fluid expansion capability, the method comprising:

assembling a compass unit with fluid expansion means;

over filling said compass unit with fluid while expanding said fluid expansion means; and

sealing said compass unit while maintaining said fluid expansion means in its expanded state thereby exerting pressure on the fluid for preventing air bubbles in reduced pressure and/or reduced temperature conditions.

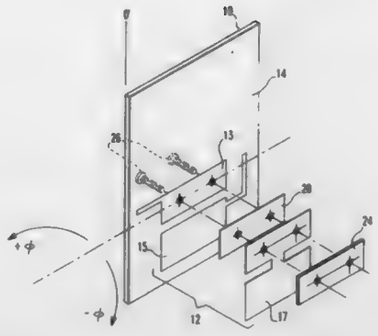
5,469,632

CAPACITIVE ANGLE SENSOR EMPLOYING A VERTICAL CANTILEVER BEAM

Robert A. Boenning, Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1994, Ser. No. 225,272
Int. Cl.[6] G01C *9/06*
U.S. Cl. 33—366 **6 Claims**

1. An angle sensor for determining the rotation angle of a device with respect to a reference axis, said angle sensor comprising:



a planar insulating substrate the plane of which defines the reference axis;

a first conductive film disposed on a first portion of the substrate to serve as a fixed capacitor plate;

a second conductive film disposed on a second portion of the substrate and spaced from and above the first conductive film;

a thin planar conductive spacer means aligned with and in overlaying conductive contact with the second conductive film;

a conductive cantilever member including a fixed portion which is aligned with and in overlaying fixed conductive contact with said conductive spacer means and said second conductive film disposed on the substrate, and a movable free end portion being aligned with but spaced from said first film to comprise a variable capacitor;

means for fixedly attaching said fixed portion of said conductive cantilever member to said planar conductive spacer means and thereby to said second conductive film, with said movable free end portion of said conductive cantilever member being movable to change the spacing between said movable free end portion and said first conductive film as the substrate rotates an angle ϕ about said reference axis;

means, electrically coupled to said first conductive film serving as the fixed capacitor plate and to said conductive cantilever member the movable free end portion of which comprises the variable capacitor, for measuring a change in charge on the variable capacitor as said substrate rotates about the reference axis, said measuring means including means for outputting a voltage proportional to the charge on the variable capacitor.

5,469,633

PLUMB BOB

Lawrence A. St. Peter, 521 Division St., Hubbell, Mich. 49934

Filed Apr. 22, 1994, Ser. No. 231,257

Int. Cl.[6] G01C *15/10*

U.S. Cl. 33—394 **4 Claims**

1. A plumb bob comprising, in combination,

an elongated body having a longitudinal axis, opposite ends on said longitudinal axis, a bore extending generally along said longitudinal axis, an upper end surface, and a cavity intermediate said opposite ends;

an elongated cord extending through one of said opposite ends into said bore;

a rotatable spool mounted in said cavity for rotation relative to said body, said spool being mounted in said cavity such that said spool is exposed in said cavity and projects outwardly from said body, and said spool being connected to said cord and having a length of said cord wound thereon, and

a locking mechanism positioned at said one end of said body adjacent said cord and selectively operable between a first position in engagement with said cord and a second position released from said cord,

said locking mechanism including a locking nut which is movable relative to said body between said first and second positions, said locking nut having therein a bore through which said cord extends, said bore of said locking nut terminating in an upper end surface which tapers inwardly and upwardly,

said locking mechanism further including a pair of cams disposed in said bore of said locking nut, said cams when so disposed abut said upper end surface of said body, said cams taper inwardly and upwardly and complement said inward and upward taper of said upper end surface of said bore of said locking nut, said cams define therebetween a space through which said cord extends, said cams are movable toward each other in response to movement of said locking nut from said second position to said first position.

5,469,634

DRAINING AND DRYING APPARATUS OF SEMICONDUCTOR MATERIALS

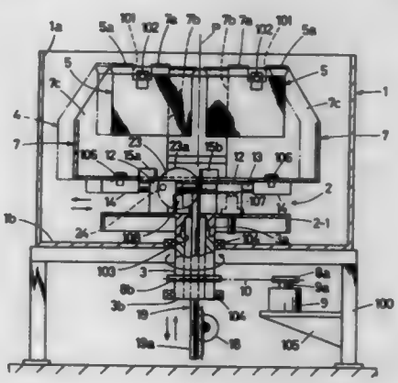
Tamotsu Mezaki, Chofu, Japan, assignor to Sugai Corporation, Higashi-Ossaka, Japan

Filed Oct. 25, 1993, Ser. No. 140,523

Claims priority, application Japan, Jan. 26, 1992, 4-287607

Int. Cl.[6] F26B *17/32*

U.S. Cl. 34—58 **10 Claims**



1. A draining and drying apparatus of semiconductor materials comprising:

rotor means disposed rotatably in a stationary rotor casing for holding semiconductor materials,

rotation main shaft means for supporting so as to rotate the rotor means at high speed, and

rotor horizontal moving means interposed between the rotation main shaft means and the rotor means so as to move and adjust the horizontal direction position of the rotor means with respect to the rotation main shaft means,

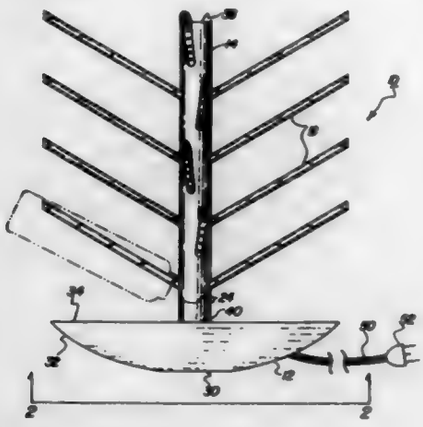
wherein said draining and drying apparatus is constituted so as to adjust the rotation balance depending on the holding state of the semiconductor materials.

5,469,635

BABY BOTTLE DRYERS FOR MULTIPLE BOTTLES

Daniel A. Lamontagne, and Jo-Ann Colantonio, both of 13 Hunter Dr., Ajax, Ontario, Canada

Filed Jan. 27, 1994, Ser. No. 187,202
Int. Cl.[6] F26B *25/00*
U.S. Cl. 34—104 3 Claims



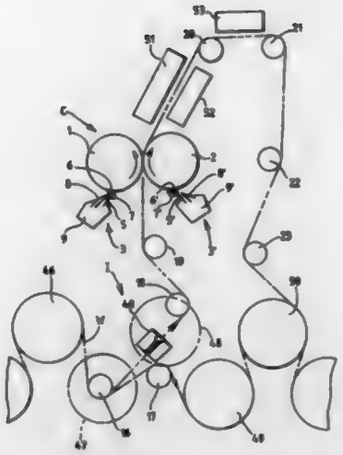
1. A baby bottle dryer comprising, in combination:
- a base plate formed in a dish-like configuration having a flat lower surface at the central extent and curved upwardly extending side walls;
- a central tube extending upwardly to an extended elevation above the periphery of the base;
- a plurality of spaced apertures formed in the tube, the apertures having cylindrical surfaces extending upwardly from the tubular member at an angle of about 30 degrees from the horizontal;
- a plurality of rods, each rod being hollow with an opened first end and closed second end and with a plurality of small holes located along their length thereof, the external diameter of the rods being such as to be removably positioned within the apertures of the tube and adapted to receive thereon a baby bottle to be dried;
- a fan located in a lower extent of the tube with means to couple the fan to a source of potential, the source of potential being a pair of batteries with a switch located on the exterior surface of the tube for coupling the batteries to the fan;
- ports in the tube adjacent to the fan for pulling air into the tube for use in drying baby bottles on the rods;
- a removable cap at the lower central extent of the base for providing access for changing the batteries;
- a supplemental base plate in a ring-like configuration for supporting nipples to be dried with attachment components for coupling to the base plate; and
- a plurality of dowels secured to the supplemental base plate for supporting nipple rings to be dried.

5,469,636

DEVICE FOR SELECTIVE TREATMENT OF MATERIAL WEBS

Anton Plomer, Heidenheim, Germany, assignor to J.M. Voith GmbH, Heidenheim, Germany

Filed Apr. 18, 1994, Ser. No. 229,173
Claims priority, application Germany, Apr. 27, 1993, 43 13 625.1
Int. Cl.[6] F26B *11/02*
U.S. Cl. 34—117 6 Claims



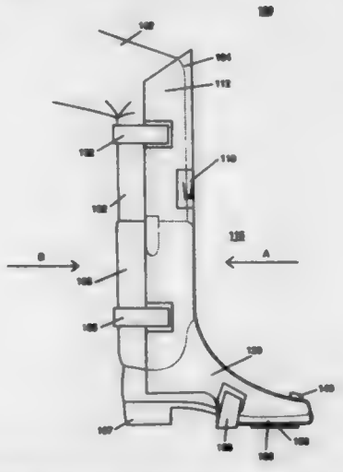
1. A device for treating material webs comprising first and second neighboring drying cylinders separated by an intermediate space, said intermediate space having a length equal to at most twice the diameter of at least one of the first and second cylinders, at least a first deflecting roll disposed in the intermediate space and in a path of a material web being conveyed through the device, and at least a second deflecting roll disposed below a coating device and above the intermediate space, said second deflecting roll being adapted to introduce a web of material upwardly into the coating device.

5,469,637

RAIN LEGGINGS

James R. Adam, 344 Camp Rd., Cocoa, Fla. 32927

Filed Jun. 6, 1994, Ser. No. 254,269
Int. Cl.[6] A43B *5/00*
U.S. Cl. 36—2 R 17 Claims



1. An adaptable lower leg and shoe protector for motorcycle and bicycle riders that is sleek, aerodynamic and water resistant comprising:
- a molded elongated flexible pant leg section that curves about a front area of a lower leg of a cycle rider, and a rear area of the lower leg being substantially uncovered, the pant leg section substantially covering the front of the lower leg from an ankle to a knee cap of the cycle rider; and
- a molded flexible shoe coupling section for fitting about a front tip portion and substantially covering an entire shoe of the cycle rider, the shoe coupling section having an opening to allow a heel of the shoe to be exposed, the shoe coupling section substantially covering from the front tip portion of the shoe over the shoe top to the ankle of the cycle rider, the shoe coupling section being connected to the leg section near the ankle of the cycle rider, wherein both the leg section and the shoe coupling section protect the front of the lower leg and the tip portion and shoe top of the cycle rider from splashing water; and

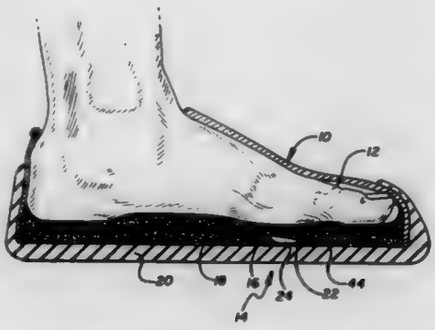
a raised molded pad located on a top area of the shoe coupling section, whereby the pad is positioned to contact a gear shift of the cycle.

5,469,638

FOREFOOT SPRING APPARATUS

Howard E. Crawford, III, Calabasas, Calif., assignor to Medical Materials Corporation, Camarillo, Calif.

Continuation of Ser. No. 27,313, Mar. 5, 1993, abandoned.
This application May 25, 1994, Ser. No. 248,955
Int. Cl.[6] A43B *13/18;13/28*
U.S. Cl. 36—28 **38 Claims**



1. In combination, footwear having a forefoot and including:
a midsole having opposite surfaces,
an insole disposed on one surface of the midsole in coupled relationship to the midsole,
an outsole disposed on the other surface of the midsole in coupled relationship to the midsole,
the midsole having a cavity across substantially the lateral width of the midsole at the position of the forefoot of the footwear, the cavity extending forwardly and downwardly in the midsole, and
a spring disposed in the cavity across substantially the lateral width of the cavity for receiving potential energy upon the disposition of the forefoot of the footwear on the ground and for releasing this potential energy upon the lifting of the forefoot of the footwear from the ground,
the midsole having flat surfaces,
the cavity being disposed at an acute angle relative to the flat surfaces of the midsole in a forwardly and downwardly facing direction from the top of the midsole, and
the spring being disposed in the cavity to provide a component of the potential energy in the forward direction and a component of the potential energy in the upward direction upon the disposition of the forefoot of the footwear on the ground,
the cavity and the spring being disposed relative to each other to provide an abutting relationship between the midsole and the spring in the forward and downward extension of the cavity when the forefoot of the footwear is on the ground and when the forefoot of the footwear is off the ground.

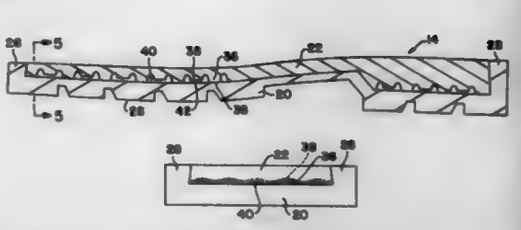
5,469,639

SHOE SOLE HAVING INSERT WITH GRADUATED CUSHIONING PROPERTIES

Raymond V. Sessa, 5123 Quail Crest Dr. SE., Grand Rapids, Mich. 49506

Filed Dec. 2, 1994, Ser. No. 349,499
Int. Cl.[6] A43B *13/18*
U.S. Cl. 36—28 **8 Claims**

1. A shoe sole comprising:
an outsole having lower and upper surfaces, with a recess being formed in the upper surface, the interior of the recess comprising a generally flat bottom surface; and



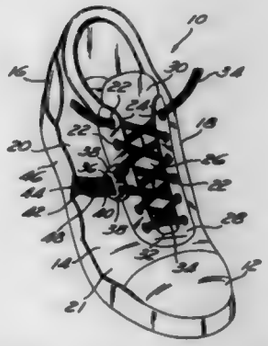
an insert formed of a resilient material that fits in the recess in the outsole, the insert having an insert bottom that rests on the bottom surface of the outsole recess, the insert bottom comprising a plurality of longitudinally spaced, downwardly extending, transverse ribs, the ribs being of at least two lengths so as to include longer and shorter ribs, the longer ribs alternating with the shorter ribs in a regular pattern along the longitudinal length of the insert, the longer ribs terminating in distal ends that rest on the bottom surface of the outsole recess, the shorter ribs terminating in distal ends that are raised above and spaced away from said bottom surface when the insert is in an uncompressed condition, the insert thus providing a variable cushioning rate for a user's foot, the longer ribs providing a first cushioning rate for initial compression of the insert, the shorter ribs providing supplemental cushioning when the longer ribs are compressed to the point where the shorter ribs engage the bottom surface, thus providing a stiffer second cushioning rate for further compression of the insert, the variable cushioning rates providing a soft feel on initial compression and a stronger resistance to compression upon further compression of the insert, at least some of the transverse ribs being formed with alternating portions of different lengths as the ribs extend from one side to the other side of the insert, the different length portions of the individual ribs providing a graduated cushioning rate for the individual ribs.

5,469,640

QUICK ADJUSTING SHOE LACING SYSTEM

Steven B. Nichols, Los Angeles, Calif., assignor to K-Swiss Inc., Chatsworth, Calif.

Continuation of Ser. No. 198,289, Feb. 18, 1994, abandoned.
This application Apr. 18, 1995, Ser. No. 425,213
Int. Cl.[6] A43B *11/00*
U.S. Cl. 36—50.1 **18 Claims**



1. A shoe with a quick adjusting shoe lacing system, the shoe having an upper with medial and lateral sides, a sole, and utilizing shoe laces which are cross-laced through a plurality of spaced apart eyelet means located on medial and lateral sides in a lacing area of the shoe, said quick adjustment shoe lacing system comprising:
a cinch member having a plurality of spaced apart eyelets at an upper region, said eyelets being spaced apart by approximately the same distance as are said adjacent eyelet means in the lacing area of the shoe, wherein said cinch member is placed adjacent said upper on a first side of the shoe comprising one of its medial and lateral sides, and said shoe laces are

laced through the eyelet means of said first side of the shoe and directly through said eyelets in said adjacent cinch member without first being laced through eyelets on the other second side of the medial and lateral side; and

a means positioned on said first side of the shoe to releasably retain and move said cinch member from a first upper position wherein its eyelets are generally aligned with at least some of said adjacent eyelet means, to at least one of several other lower positions where said cinch member is releasably retained, such that said cinch member will exert pulling force on said shoe laces of said shoe which are laced through said cinch member, and thereby selectively offer additional shoe lace tension, which tension can be placed on said shoe laces even after said laces are laced.

5,469,641

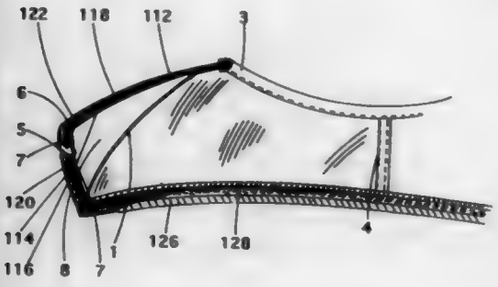
CUSTOM BALLET POINTE SHOE

Goran Subotic, 25 Willow St., Mystic, Conn. 06355

Filed Jan. 30, 1995, Ser. No. 380,556

Int. Cl.[6] A43B *7/14*

U.S. Cl. 36—93 **1 Claim**



1. A ballet pointe shoe comprising:

an upper of flexible material having a forefoot layer, an instep area, an opening for insertion of the foot, side seams, and a front portion having a flat front tip;

a sole having a shank;

a stretchable toe sock located in the front portion of the upper in direct contact with the wearer's foot, the toe sock attached to the upper along at least a portion of the perimeter of the opening for insertion of the foot, along the side seams, and along the shank creating a cavity between the forefoot layer of the upper and the toe sock, the toe sock and the forefoot layer of the upper each having a liquid impermeable surface facing the cavity;

the toe sock and the forefoot layer of the upper attached together such that the cavity is adjacent the front portion of the upper, extending from the flat front tip to the instep area of the upper and down to the shank, and such that when filled the cavity will surround only the front part of the foot from the front of the toes, on the top of the toes to the tops of the metatarsals, and along the sides of the toes;

an injection opening through the flat front tip of the upper penetrating into the cavity, the opening located in an upper comer of the flat front tip;

an injection tube located in the injection opening, the tube having a security membrane to prevent an injected filling product from escaping from the cavity through the tube.

5,469,642

MARCHING SHOES

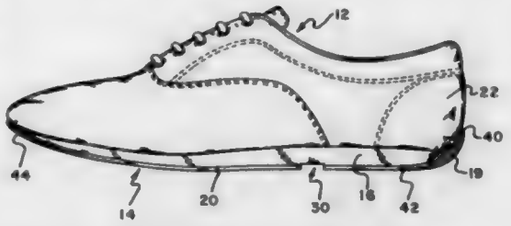
Jon Farbman, 344 Ocean Blvd., Atlantic Highlands, N.J. 07716

Continuation of Ser. No. 549,415, Jul. 6, 1990, abandoned, which is a division of Ser. No. 352,620, May 15, 1989, Pat. No. 4,939,853, which is a continuation of Ser. No. 139,653, Dec. 30, 1987, abandoned. This application Dec. 20, 1991, Ser. No. 810,567

The portion of the term of this patent subsequent to Jul. 10, 2007, has been disclaimed.

Int. Cl.[6] A43B *3/00;13/00*

U.S. Cl. 36—103 **1 Claim**



1. A formal dress marching shoe which comprises:

(a) a low-cut formal dress shoe upper portion which is formed of a strong, substantially inextensible dressy material compatible with a "formal dress uniform", having a close encircling foot enclosure including a counter section at the rear which overlies a heel receiving region, a mid-body rear quarter section, a front quarter section with a plurality of eyelets for receiving laces, and a toe-box front section;

(b) a midsole having a foot bearing surface and a bottom surface, said midsole being secured to said upper portion with a peripheral line of demarcation formed substantially therebetween and extending from the heel receiving region below the counter section at the rear forwardly to the toe-box section; and

(c) an elongated outer solepiece secured to and substantially covering said midsole bottom surface from the rear heel receiving region below the counter section forwardly to the toe-box section and with said solepiece extending upwardly about said midsole in a curving arcuate course from said heel-receiving region to about a portion of an outer surface of the counter section at the rear of said upper but wherein no portion of the forward end of said solepiece extends about any peripheral portion of the toe-box section of the upper; which thereby permits a wearer of said shoe to perform "corps style" and complex marching band maneuvers; said formal marching shoe including an indentation substantially in the outer solepiece extending across the width thereof transverse to the length of the shoe generally beneath a wearer's arch receiving region of the solepiece suitable to receive a "hold-down" strap.

5,469,643

SNOWSHOE

William E. Forrest, Denver, Colo., assignor to Mountain Safety Research, Seattle, Wash.

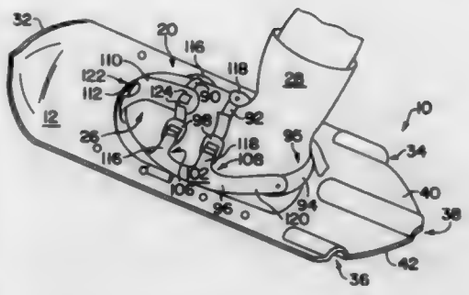
Filed Oct. 22, 1993, Ser. No. 141,853

Int. Cl.[6] A43B *5/04;* **A63C** *13/00*

U.S. Cl. 36—122 **10 Claims**

1. A snowshoe, comprising:

a) flotation means for providing a snow contact surface area, said flotation means having an upper surface and a lower surface, said lower surface including a tip portion adjacent a leading edge of said flotation means and a rear portion adjacent a rear edge of said flotation means, said lower surface of said flotation means having formed therein at least one recessed channel having a forward channel end located in said rear portion of said flotation means, said channel further having a narrow width in relation to a width of said flotation means and extending along said rear portion to said rear edge



of said flotation means, wherein, during forward travel, snow passes through said channel and exits said channel at said rear edge; and

b) binding means for use in attaching said snowshoe to said wearer's foot.

5,469,644

FOOTWEAR ACCESSORY

James W. Vidler, 141 Darby St., Newcastle, New South Wales 2300, Australia

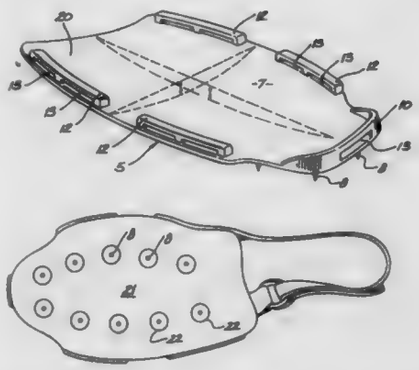
PCT No. PCT/AU93/00266, § 371 Date Oct. 28, 1993, § 102(e) Date Oct. 28, 1993, PCT Pub. No. WO93/25106, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 4, 1993, Ser. No. 129,178

Claims priority, application Australia, Jun. 9, 1992, PL2828

Int. Cl.[6] A43B *5/00;3/18*

U.S. Cl. 36—127 **18 Claims**



1. An accessory for attachment to the sole of a shoe having a continuous unstepped undersurface to allow the wearing of the shoe for the playing of golf, said accessory comprising:

a thin, flexible soleplate of an elastic plastic material having an upper surface and a lower surface, the soleplate being generally dish-shaped both longitudinally and transversely in its relaxed state with a concave upper surface, and being adapted to deflect resiliently to be generally flat when worn by the user; and

at least two curved rows of spikes protruding from the lower surface of the soleplate, each said row of spikes comprising five spikes, the rows being disposed along the length of the soleplate and being curved outwards, away from the center of the soleplate, said soleplate further comprising an axis point located between and generally midway along the length of the rows, the spikes being paired and each spike of each said pair being located such that a straight line drawn through a pair of spikes also passes through the axis point, each of the pair of spikes being equidistant from the axis point.

5,469,645

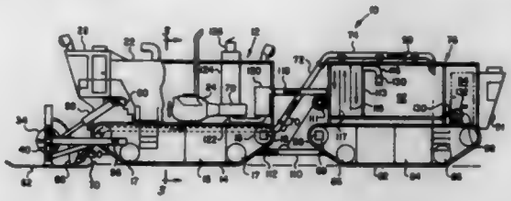
SYSTEM FOR RECOVERY OF OIL FROM SNOW AND ICE SURFACES

Lewis B. Aiken, Wasilla, Ak., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 18, 1994, Ser. No. 229,248

Int. Cl.[6] E01H *4/00;* **B01D** *57/00*

U.S. Cl. 37—291 **10 Claims**



1. A vehicle system for recovering oil and similar contaminants deposited on a snow or ice covered surface of the earth, comprising:

a. a tractor unit comprising:

i. a propulsion system for traversing the tractor unit over the surface; and

ii. spaced apart frames for supporting endless crawler tracks thereon, respectively, the frames comprising hollow boxes forming flotation chambers for buoyantly supporting the tractor unit in water;

b. a collection and transfer system mounted on the tractor unit for skimming the contaminant, including some snow or ice, off of the surface;

c. a storage and transport unit removably connected to the tractor unit, and including a storage tank for receiving the contaminant and a certain amount of snow and ice collected by the collection and transfer system; and

d. a conduit system removably connected to both the tractor unit and the storage and transport unit, for conducting a mixture of the contaminant and snow or ice collected by the collection and transfer system to the storage and transport unit.

5,469,646

FINE OPERATION MODE CHANGEOVER DEVICE FOR HYDRAULIC EXCAVATOR

Fujitoshi Takamura, Osaka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP92/01226, § 371 Date Mar. 24, 1994, § 102(e) Date Mar. 24, 1994, PCT Pub. No. WO93/06315, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 25, 1992, Ser. No. 211,251

Claims priority, application Japan, Sep. 27, 1991, 3-086381

Int. Cl.[6] G05D *1/04*

U.S. Cl. 37—382 **20 Claims**

1. Apparatus comprising:

a variable capacity type hydraulic pump;

an engine for driving said hydraulic pump;

a governor drive unit for controlling said engine;

an actuator to be driven by said hydraulic pump;

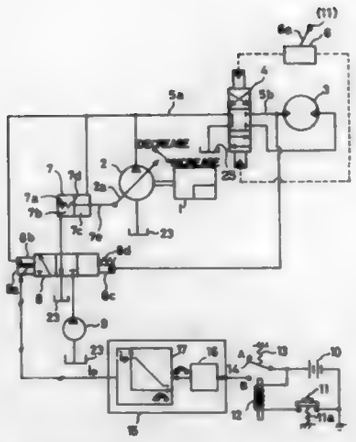
a conduit connected between said hydraulic pump and said actuator;

an operating valve provided in said conduit so that the pressure in said conduit upstream of said operating valve is an upstream pressure and the pressure in said conduit downstream of said operating valve is a downstream pressure;

a load sensing control unit for changing the capacity of said hydraulic pump, with said upstream pressure and said downstream pressure as pilot pressures to said load sensing control unit, in response to a change in the difference between said pilot pressures;

a pump capacity sensor for determining the capacity of said hydraulic pump;

a rotation rate sensor for determining the rate of rotation of said engine;



a hydraulic pressure sensor for determining said downstream pressure;

a fine operation mode changeover switch; and

a controller for receiving signals from said fine operation mode changeover switch, said pump capacity sensor, said rotation rate sensor, and said hydraulic pressure sensor; for calculating a pump capacity control signal responsive to signals from said fine operation mode changeover switch, said pump capacity sensor, and said hydraulic pressure sensor; for outputting said pump capacity control signal to said load sensing control unit for controlling the capacity of said hydraulic pump through said load sensing control unit; for calculating an engine control signal from signals from said fine operation mode changeover switch and said rotation rate sensor; and for outputting said engine control signal to said governor drive unit for operating said engine.

5,469,647

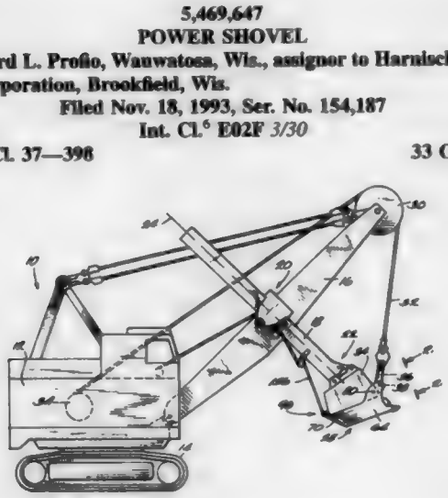
POWER SHOVEL

Richard L. Profio, Wauwatosa, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed Nov. 18, 1993, Ser. No. 154,187

Int. Cl.[6] E02F *3/30*

U.S. Cl. 37—398 **33 Claims**



1. A power shovel comprising

a frame,

a winch mounted on said frame,

a boom having a lower end mounted on said frame and having an upper end,

a sheave pivotally mounted on said boom adjacent said upper end of said boom,

a dipper handle mounted on said boom for pivotal movement relative thereto, said dipper handle being movable relative to a dumping position,

a dipper mounted on said dipper handle, said dipper including one section mounted on said dipper handle and an other section movable relative to said one section between closed and open conditions for respectively containing and dumping a load, and said dipper further including a latch mechanism for releasably securing said other dipper section in said closed condition, and

a hoist rope extending over said sheave, said rope having one end connected to said winch and an opposite end connected to said other dipper section such that, when said dipper handle is in said dumping position, said hoist rope exerts on said other dipper section a force moving said other dipper section relative to said one dipper section so as to change said other dipper section to said open condition when said latch mechanism is released, and such that said hoist rope moves said dipper handle relative to said boom in response to operation of said winch.

5,469,648

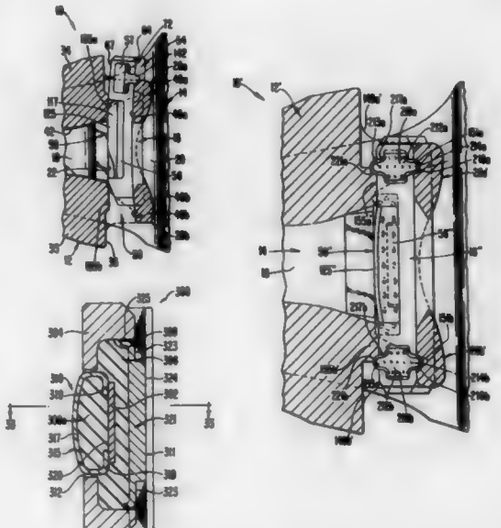
EXCAVATING TOOTH

Larren F. Jones, Aloha; Robert K. Emrich, Tigard, and Ian R. Bingham, Beaverton, all of Oreg., assignors to Esco Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 12,467, Feb. 2, 1993, abandoned. This application Aug. 16, 1994, Ser. No. 291,711

Int. Cl.[6] E02F *9/28*

U.S. Cl. 37—457 **40 Claims**



1. An excavating tooth comprising:

an adapter including a base adapted to be secured to excavating equipment and a forwardly extending nose, said adapter further including an opening;

a point including a front digging edge, a rearwardly opening socket receiving said adapter nose therein, a first opening in substantial alignment with said adapter opening, and a second opening proximate to said first opening; and

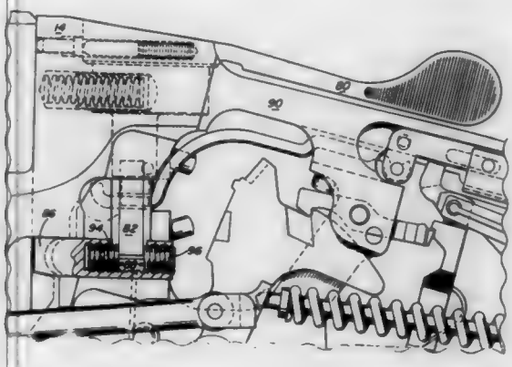
a pin received into said adapter opening and said first opening of said point to securely couple said point to said adapter, said pin including a rigid casing and a plurality of independently depressible protrusions, each of said protrusions including a working member attached to elastomeric material, one of said protrusions being resiliently engaged and pressed against a wall defining a portion of said adapter opening to tighten said connection of said point to said adapter, and one other of said protrusions being resiliently engaged within said second opening of said point to lock said pin to said point.

5,469,649

FIREARM TOP LEVER ADJUSTING SYSTEM

Kenneth C. Rowlands, Utica, and Thomas G. Bauman, Ilion, both of N.Y., assignors to Remington Arms Company, Inc., Wilmington, Del.

Filed Dec. 30, 1993, Ser. No. 175,852
Int. Cl.[6] F41A *3/58*
U.S. Cl. 42—43 **8 Claims**



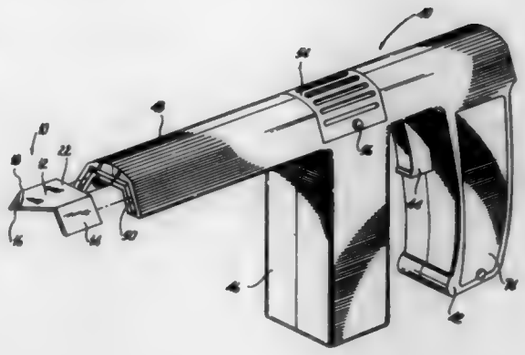
1. In a break open firearm having a frame attached to a stock, a barrel housing carrying at least one barrel and rotatable about a pivot on the frame at least one hammer pivotally mounted on the frame for movement from a cocked position to a position against the frame, a hammer spring urging the hammer forwardly, a firing pin aligned with each said hammer, trigger means operatively connected to actuate the hammer, a cocking rod mounted for reciprocation on the frame for acting on the hammer, and cam means for moving the cocking road rearward when the barrel housing is rotated about the frame, a fore-end housing and means for ejecting cartridges from the firearm, the improvement comprising a top lever pivotally mounted on the frame for opening the firearm, the top lever having an off-center cam projection which activates a locking bolt slideably positioned in the frame to engage a barrel assembly locking lug to move a locking bolt between locked and unlocked positions, the cam projection being positioned in an axial opening, and forward and rearward adjusting screws positioned to impinge on at least a portion of the cam projection to adjust the cam projection within the axial opening and the position of the top lever.

5,469,650

AERODYNAMIC PROJECTILE AND MEANS FOR PROPELLING SAME

John S. Singer, Bayberrie Dr., Westover Park, Stamford, Conn. 06902

Division of Ser. No. 122,702, Sep. 15, 1993. This application Jul. 20, 1994, Ser. No. 277,979
Int. Cl.[6] F41A *19/58;* **F42B** *5/16;5/18*
U.S. Cl. 42—84 **3 Claims**



1. A weapon for firing a small planar projectile having propellant carried on a rearward part of the projectile as an exposed mass, comprising a gun body, a firing chamber in said gun body, said firing chamber configured to receive the projectile, a lid assembly which is movable relative to said gun body, said lid assembly including a projectile stop that becomes part of said firing chamber when said lid is secured to said gun body whereby when a projectile is loaded into said firing chamber, it abuts against said stop and is held ready for firing, barrel means carried on said gun body with the internally disposed end of said barrel means being in communication with said firing chamber thereby to receive the projectile when the same is fired from such chamber, said barrel means having a form that is complementary to the external periphery of the projectile so as to guide and aim the same as it traverses therethrough, and means carried in said gun body for igniting the propellant whereby upon such ignition, the propellant explodes causing the projectile to exit said firing chamber and traverse said barrel means at high velocity.

5,469,651

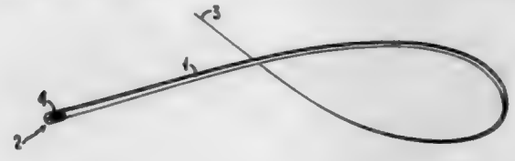
Patent Not Issued For This Number

5,469,652

FISHING LEADER AND CONNECTOR

Joseph Drosdak, 158 W. Coal St., Nesquehoning, Pa. 18240

Filed Apr. 19, 1994, Ser. No. 229,563
Int. Cl.[6] A01K *91/04*
U.S. Cl. 43—44.83 **5 Claims**



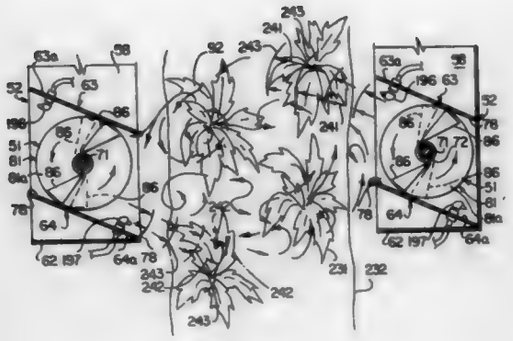
1. The combination of a fly line, a leader line and a connector, the connector having means formed in one end for attachment of an end of the fly line, and a female threaded socket formed in the other end for receiving a thread formed integrally on at least one end of the leader line.

5,469,653

APPARATUS AND METHOD FOR PEST CONTROL

Harry V. Roehrick, One Plaza Loma, Novato, Calif. 94947

Filed Apr. 28, 1994, Ser. No. 234,238
Int. Cl.[6] A01G 13/00
U.S. Cl. 47—1.7 24 Claims



1. In an apparatus for application of a liquid chemical treatment to plants in a field, a movable framework, first and second spaced-apart depending portions mounted upon the framework for providing a space extending longitudinally of the framework, first and second air displacement means carried by the first and second depending portions for creating first and second pulsed streams of air in directions at an angle to the longitudinal axis, the air displacement means being positioned on the depending portions so that the first and second pulsed streams of air are longitudinally offset from each other, and nozzles carried by the framework for introducing the chemical treatment into the pulsed streams of air produced by the air displacement means whereby the pulsed streams of air cause the plants to bend to and fro as the plant passes through the space so as to permit the chemical treatment to reach the underside of the plants.

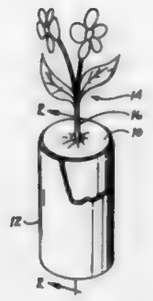
5,469,654

APPARATUS FOR PROVIDING A MOISTURE SEAL FOR A WET FOAM USED TO CONTAIN A STEM OF A FLOWER AND METHOD THEREFOR

Marcia C. Thompson, 3728 E. Medlock Dr., Phoenix, Ariz. 85018

Filed Feb. 15, 1994, Ser. No. 196,561
Int. Cl.[6] A01G 5/00; A47G 7/00
U.S. Cl. 47—41.12 2 Claims

1. Apparatus for maintaining a stem of a flower in a moist environment, comprising, in combination:



a water saturable foam; and

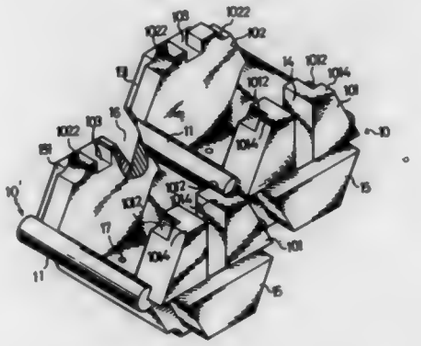
a impenetrable, imporous, flexible watertight sheath comprised of a rubber-type material that encases a portion of said foam, said sheath and said foam forming a structure having a substantially cylindrical shape, wherein said sheath further includes a peripheral lip portion which extends at least a minor distance over a top of said foam while leaving a substantial portion of said top of said foam exposed; and wherein said foam is tightly encased by said sheath on the sides and bottom thereof leaving no space therebetween.

5,469,655

SOIL GUARD WALL ASSEMBLY

Chin T. Lin, No. 15-3, Pei Ping Yi St., Taichung, Taiwan, Prov. of China

Filed Feb. 27, 1995, Ser. No. 394,599
Int. Cl.[6] A01G 9/02
U.S. Cl. 47—83 4 Claims



1. A soil guard wall assembly comprising a plurality of elongated soil guard wall modules (10) each having a hexagonal configuration in section and coupled together with each other to form said soil guard wall assembly (1) with a honeycomb shape, each of said elongated soil guard wall modules (10) including two bottom corner portions and comprising:

two longitudinal grooves (12) each defined in an underside of a corresponding one of said bottom corner portions of said elongated soil guard wall module (10);

two opposite wedged-shaped side portions each having a longitudinal post (11) laterally protruding outwardly therefrom, each of said longitudinal posts (11) including a first end and a second end;

a first side wall (**101**) of a hexagonal configuration formed on the first ends of said two longitudinal posts (**11**) and including two top corner portions, two first depressions (**1012**) each defined in an upperside of a corresponding one of said top corner portions of said first side wall (**101**), and an elongated slot (**14**) defined in said first side wall (**101**) between said two top corner portions thereof;

a second side wall (**102**) of a hexagonal configuration formed on the second ends of said two longitudinal posts (**11**) and including two top corner portions, two second depressions (**1022**) each defined in an upperside of a corresponding one of said top corner portions of said second side wall (**102**) and each aligning with a corresponding one of said first depressions (**1012**), and a cavity (**103**) defined in said second side wall (**102**) between said two top corner portions thereof; and

a concave opening (**13**) facing upwardly being defined in said elongated soil guard wall module (**10**) between said first and second side walls (**101**) and (**102**) and communicating with said elongated slot (**14**) and said cavity (**103**).

5,469,656

SAFETY DEVICE FOR AN ELECTRIC GLASS-WINDER OF A VEHICLE OF THE TYPE HAVING A CABLE SLIDABLE ALONG A GUIDE RAIL

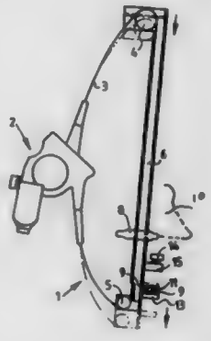
Achim R. Gier, Garches; Pascal Bonduel, Sully S/Loire; Robert J. Heckel, Cormeilles, and Enrico Fin, Paris, all of, France, assignors to Rockwell Body and Chassis Systems, France

Continuation of Ser. No. 80,667, Jun. 18, 1993, abandoned. This application Mar. 28, 1995, Ser. No. 411,409

Claims priority, application France, Jul. 10, 1992, 92 08621

Int. Cl.[6] E05F *15/02*

U.S. Cl. 49—28 **6 Claims**



1. In a safety device for an electric glass-winder mounted on a door panel having an electric motor fixedly attached to said door panel, a cable drivenly connected to said electric motor and drivingly connected to a window, said cable mounted so as to be slidable along a guide rail mounted on said door panel, a carriage carrying said window fixed to said cable, said safety device adapted to reverse the direction of rotation of said electric motor upon said window encountering a force of a first value opposing the travel of said window, the improvement comprising:

a) said guide rail movedly mounted on said door panel so as to be capable of being downwardly displaced in substantially vertical translation by said cable due to said force on said window exceeding said first value;

b) rail maintaining means for maintaining said guide rail in a given position so long as said force remains lower than said first value;

c) electromechanical means for detecting said force and displacing said guide rail in substantially vertical translation when said force exceeds said first value,

d) said electromechanical means causing reversal of the direction of rotation of said electric motor when said guide rail is displaced.

5,469,657

SECURITY-TRANSFER SYSTEMS

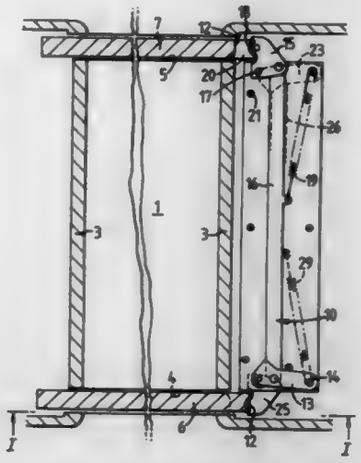
Roger C. Drew, 10 Elizabeth Close, Wendover Park, Aylesbury HP21 9XX, England

Filed Feb. 22, 1994, Ser. No. 199,671

Claims priority, application United Kingdom, Feb. 23, 1993, 9303626; Jan. 19, 1993, 9321553

Int. Cl.[6] E06B *7/00*

U.S. Cl. 49—68 **10 Claims**



1. A security system in which interlocking means is operative between two access doors to enable only one of the doors to be opened at any one time, each said door is a sliding door having a leading edge which leads in opening movement of the door, and said interlocking means comprises two mechanisms each of which includes:

(a) pivoted lever means for responding to movement of a respective one of the doors to turn upon opening movement of the respective door, and

(b) bolt means, coupled to the pivoted lever means, for responding to turning of the pivoted lever means to obstruct opening of the other door, the bolt means comprising a pivoted bolt that is pivoted for movement between a position in which it is clear of an opening path of said other door and a position in which it projects into that path to obstruct opening of said other door, said bolt means including means mounting the pivoted bolt for pivotal movement into the path of the leading edge of said other door.

5,469,658

LOUVRE SHUTTER DEVICE WITH VARIABLE SLATS

Michele Digianni, 32 Pennycross Court, and Norbert Marocco, 46 Pennycross Court, both of Woodbridge, Ontario, Canada

Filed Mar. 22, 1993, Ser. No. 35,036

Claims priority, application Canada, Mar. 20, 1992, 2063632

Int. Cl.[6] E05B *7/08*

U.S. Cl. 49—82.1 **13 Claims**

1. A louvre shutter, of a type having a rectangular framework, consisting of side frames and end frames, and slats extending from side to side of the side frames, and said louvre shutter comprising;

side frames, defining inner walls and outer walls, and side walls therebetween;

slats defining two ends;

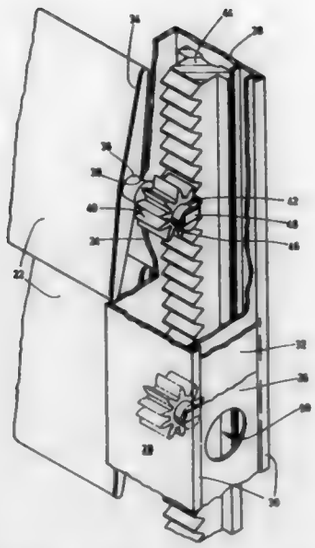
pivot means at each said end of said slats;

gear mounting portions defined said pivot means at one said end of each said slat;

opening means in respective said side frames;

gear means located in one of said side frames;

mounting recess means in said gear means for rotatably receiving respective said gear mounting portions of respective said pivot means and being dated to permit relative rotation



between respective said gear means and respective said pivot means during assembly;

fastening means securing respective said gear means and respective said gear mounting portions to one another in a non-rotatable relationship, thus preventing relative rotation between respective said gear means and respective said pivot means, whereby said gear means may be initially positioned in any desired rotational orientation relative to respective said slats and thereafter non-rotatably secured relative thereto to prevent further relative rotation, and,

rack means within said one of said side frames interconnecting said gear means, whereby movement of one of said slats, will be transmitted by said rack means and gear means to all of said slats, whereby all of said slats will pivot in unison with one another.

5,469,659

PET DOOR

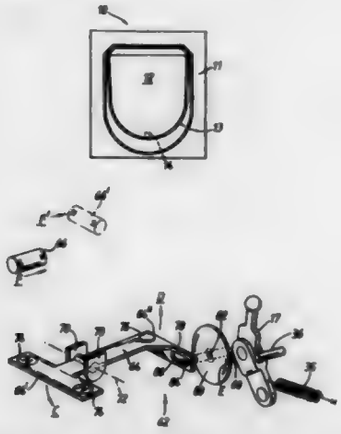
Alister P. Reid, London; John Kopec, Accrington, and Christopher Sumner, St. Helens, all of, England, assignors to Rellor Limited, England

Filed Dec. 7, 1993, Ser. No. 163,664

Claims priority, application United Kingdom, Dec. 11, 1992, 9225879

Int. Cl.[6] E05D *15/48*

U.S. Cl. 49—169 **20 Claims**



1. A pet door with a frame defining an access aperture and an aperture-closing flap pivotally mounted therein, wherein the pet door has latch means to bar said flap from opening in at least one direction and control means for disabling said latch means to permit said flap to open in said at least one direction, said latch means comprising a catch and a collapsible support operative normally to maintain said catch in a flap-barring position, said control means comprising magnetically-responsive actuating means cooperative with said latch means normally to prevent said support from collapsing, said magnetically-responsive actuating means having a magnet means and activatable when a magnetic key means is juxtaposed therewith, to allow said support to collapse and enable said catch to be moved from the flap-barring position to permit said flap to open in said at least one direction.

5,469,660

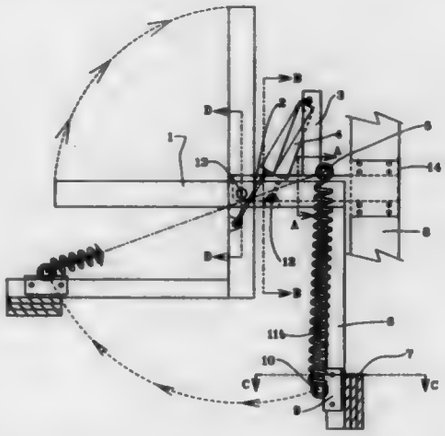
SELF-RESTORING RAILROAD HIGHWAY CROSSING GATE DEVICE

Harry L. Tamenne, 3811 Kentland Dr., Roanoke, Va. 24018

Filed Jan. 10, 1994, Ser. No. 179,343

Int. Cl.[6] E05D *15/52*

U.S. Cl. 479—192 **1 Claim**



1. In a railroad crossing gate arm having a counterweight and gate operating mechanism therefor wherein a self restoring gate arm system is displaced by a moving vehicle from its original position perpendicular to the movement of vehicular traffic and a means to restore said gate arm to its original position after being released by the vehicle, the improvement comprising a means to control the speed of return of said gate arm to its original position at a rate that would prevent damage or injury to following vehicular or pedestrian traffic within the area of return, and a means to automatically compensate for the imbalance created when said gate arm is displaced causing a shift in its center of gravity, where at a particular point of displacement, would cause the gate mechanism counterweight to lift the gate arm prematurely placing said gate arm in an abnormal position and possibly preventing the gate arm from returning to its original position.

5,469,661

SLIDING DOOR FOOT TREADLE

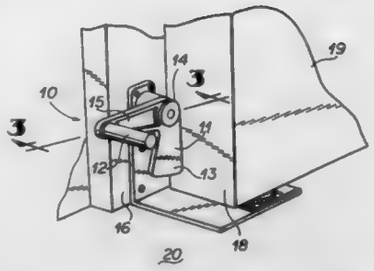
Burl Finkelstein, Shenandoah, and Thomas A. Thorsen, Moreland, both of Ga., assignors to Kason Industries, Inc., Shenandoah, Ga.

Filed Aug. 31, 1994, Ser. No. 298,677

Int. Cl.[6] E05F *11/00*

U.S. Cl. 49—276 **3 Claims**

1. A foot treadle for use in opening a sliding door of the type mounted for initial movement in three directional dimensions from its closed position, and with the foot treadle comprising, in combination:



a lever having an axis of rotation, a leg that depends generally downwardly from said axis, and an arm that extends generally laterally from said axis;

a pedal mounted to said arm distally from said axis of rotation; and

means for mounting said lever to a door jamb of a sliding door with said lever leg positioned closely adjacent a lower end of the door for pivotal movement about said lever axis of rotation in pushing and sliding engagement with the door lower end,

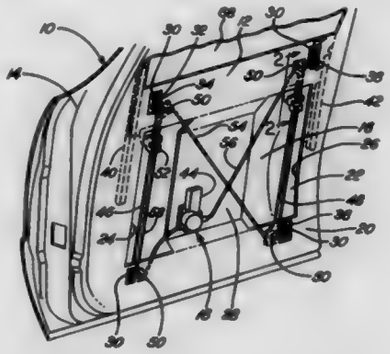
whereby upon a person stepping upon the pedal the lever leg applies a force laterally and upwardly against the door lower end thereby urging the door laterally and upwardly out of sealed engagement with the door jamb and floor as the door lower end slides outwardly from the door jamb in sliding contact with the lever leg.

5,469,662

VEHICLE DOOR CONSTRUCTION FACILITATING WINDOW REGULATOR INSTALLATION AND MOUNTING

Jay T. TenBrink, Goodrich; Maryanne R. Farkas, Bloomfield Hills; Robert J. Vendt, Macomb Township, and Waine T. Brock, Troy, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 3, 1994, Ser. No. 333,695
Int. Cl.[6] E05F *11/48*
U.S. Cl. 49—352 **7 Claims**



1. A vehicle door and window regulator combination comprising:

a dual lift window regulator having

an elongated first track with a pulley at an upper end of the track and a pulley at a lower end of the track and a threaded fastener with a fastener head extending from the track at each of the upper end and the lower end and having a first glider block slidably disposed thereon,

an elongated second track with a pulley at an upper end of the track and a pulley at a lower end of the track and a threaded fastener with a fastener head extending from the track at each of the upper end and the lower end and having a second glider block slidably disposed thereon,

a flex member extending over the pulleys of the elongated first and second tracks,

a winding mechanism disposed between the first track and the second track and engaging and operably displacing the flex member; and

a vehicle door to which the dual lift window regulator is mounted having

a door inner panel having two access openings in which the tracks are at least partially exposed and a recessed pan portion separating the openings to which the winding mechanism is mounted;

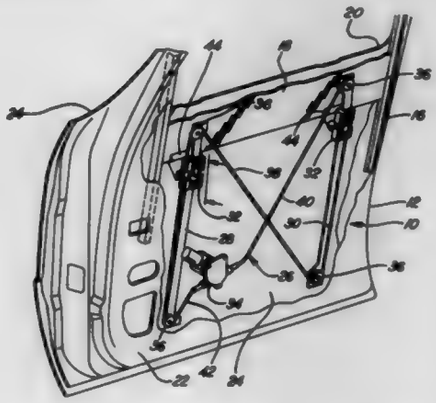
the door inner panel also defining four approximately keyhole shaped apertures receiving the threaded fasteners of the first and second elongated tracks and each having a large end sized to accommodate passage of the fastener head therethrough and a small end sized to prevent passage of the head therethrough positioned in a location above and below the openings separated by a distance equalling a distance between the fasteners in the track.

5,469,663

SNAP-IN ATTACHMENT OF WINDOW PANE LIFT PLATE TO WINDOW REGULATOR

Jay T. TenBrink, Goodrich, and Maryanne R. Farkas, Bloomfield Hills, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 4, 1994, Ser. No. 334,095
Int. Cl.[6] E05F *11/38*
U.S. Cl. 49—375 **12 Claims**



1. A glider block assembly for a motor vehicle window regulator, comprising:

a glider block defining an opening sized to receive a pin of a window lift plate extending from a surface of the plate and also defining a clip slot intersecting the opening; and

a spring clip disposed in the clip slot extending in part across the opening and defining in a first position an entry gap smaller than an engaging head of the pin and defining in a second position an expanded entry gap allowing the engaging head to pass therethrough in response to pressure of the head thereagainst when the pin is received by the block, snapping back behind the head, and thereby retaining the plate to the block.

5,469,664

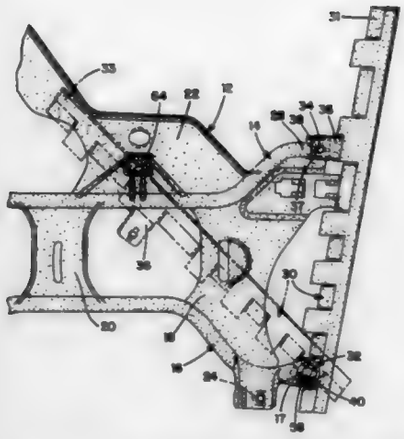
PIVOTING BELOW BELT GLASS RUN CHANNEL

Brian H. Staser, Troy; Danny W. Figlioli, Macomb Township, and Mark Manuel, Clinton Township, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1994, Ser. No. 337,707
Int. Cl.[6] E05D *15/16*
U.S. Cl. 49—452 **6 Claims**

1. A door module comprising:

a mounting panel;



a glass run channel pivotable between a first position and a second position;

a pivot joint connecting the glass run channel to the mounting panel with a key way including a ramp on the mounting panel which receives and mates with a key on the glass run channel; and

a leg on the glass run channel that engages a locator on the mounting panel in a snap fitting manner due to a bias applied to the glass run channel by the pivot joint.

5,469,665

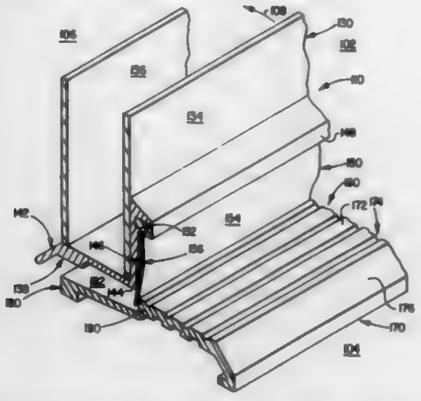
THRESHOLD SYSTEM

Lawrence Biebuyck, Garland, Tex., assignor to Butler Manufacturing Corporation, Kansas City, Mo.

Filed Oct. 21, 1993, Ser. No. 140,213

Int. Cl.[6] E06B *1/70*

U.S. Cl. 49—470 **67 Claims**



1. An improved threshold system for sealing an inside area of a building from an outside area thereof, of the type wherein a threshold plate is disposed beneath a door, wherein the improvement comprises:

a seal flap depending from a lower area of said door, said seal flap having a first surface facing said inside area, a second surface facing said outside area and a bottom;

a deflector shield disposed on a lower area of said door facing said outside area, said deflector shield being located for deflecting moisture and air away from said threshold system;

said threshold plate having a raised inner section connected by an upstanding lid to a recessed outer section, said upstanding lip being located for engaging said first surface of said seal flap, thereby sealing said outside area from said inside area; and

wherein said seal flap and said upstanding lip are located for an engagement which allows sufficient space between the bottom of said seal flap and a top surface of said recessed outer section, and sufficient overlap between said seal flap and said upstanding lip, so that the squareness of said door can be adjusted without loss of sealing contact between said seal flap and said upstanding lip.

5,469,666

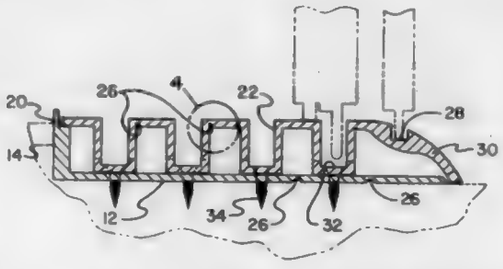
WALKABLE SECURE PATIO DOOR THRESHOLD

William P. Lewis, Jr., 3229 Harbor View, Tampa, Fla. 33611

Filed Sep. 13, 1994, Ser. No. 304,926

Int. Cl.[6] E06B *1/70*

U.S. Cl. 49—471 **6 Claims**



1. A new and improved walkable secure patio door threshold for providing a patio door sill that is comfortable to the feet, can be walked upon, and is as theft proof as possible comprising, in combination:

a lower extrusion having a lower surface and a vertical extension, the lower surface having a plurality of apertures vertically therethrough, the vertical extension having a lower end and an upper end, the lower end integral with one end of the lower surface of the lower extrusion;

an upper extrusion having a plurality of guide grooves and a plurality of break grooves, the guide grooves having a vertical configuration and having a flat surface positioned between each guide groove, a first flat surface removably positioned upon the upper end of the vertical extension of the lower extrusion, each of the guide grooves functioning to receive a sliding door, each of the flat surfaces functioning to separate each sliding door adapted to be positioned within the guide grooves, a sliding groove positioned adjacent the guide grooves, the sliding groove functioning to accommodate a screen door with rollers, a convoluted end portion formed adjacent the sliding groove, a plurality of countersunk apertures formed within the plurality of guide grooves, the countersunk apertures aligned with the plurality of apertures formed in the lower surface of the lower extrusion for securement thereon by a fastening means;

a plurality of non-skid surfaces secured to the flat surfaces of the upper extrusion;

a plurality of drainage apertures formed in the plurality of guide grooves and the convoluted end of the upper extrusion; and

a plurality of snap-on covers designed for removable positionment within the plurality of guide grooves of the upper extrusion.

5,469,667

SEALING PROFILE FOR DOORS OF MOTOR VEHICLES

Robert Le Marrec, Bezons, France, assignor to Etablissements Mesnel, Nanterre, France

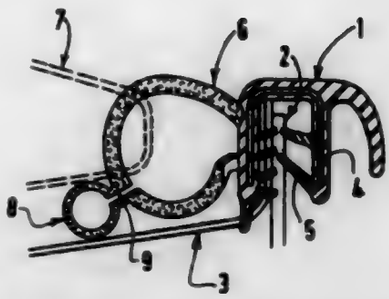
Filed May 31, 1994, Ser. No. 250,819

Claims priority, application France, Jun. 4, 1993, 93 06728

Int. Cl.[6] E06B *7/16*

U.S. Cl. 49—477.1 **3 Claims**

1. A door joint for automobile doors comprising a fixing element covering a projecting part of a door-frame and first and second tubular elements made of an elastically deformable material the



first tubular element adjoining the second tubular element and said fixing element, said tubular elements adapted to be interposed between said door frame and an associated door in its closed position in order to ensure the tightness of the assembly, said door joint further comprising a communicating section between said first and second tubular elements configured at least as one orifice or a continuous passage so that the compression of the first tubular element between the door and the door-frame results in said first tubular element's deformation and in an inflation of the second tubular element between said door and said door-frame.

5,469,668

VEHICLE DOOR

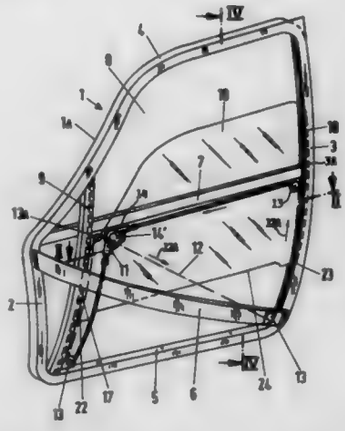
Gunther Helm, Obertshausen, and Bruno Kroll, Radevormwald, both of, Germany, assignors to YMOS Aktiengesellschaft Industrieprodukte, Obertshausen, Germany

Filed Mar. 1, 1994, Ser. No. 204,075

Claims priority, application Germany, Mar. 1, 1993, 43 06 290.3

Int. Cl.[6] B60J 5/04

U.S. Cl. 49—502 **20 Claims**



1. A vehicle door having a frame structure forming a load supporting door frame module (**1**), comprising at least one forward frame section (**2**), at least one rear frame section (**3**), and an upper frame section (**1A**, **4**) interconnecting said forward and rear frame sections, a window (**10**), a window lifting and lowering mechanism (**11**, **41**, **51**), and a window guide including a rear guide section (**3A**) integrated in said rear frame section (**3**), said window guide of said door frame module further comprising a forward window guide member (**9**) integrated in said door frame module (**1**) to form a structural unit with said door frame module (**1**), said forward window guide member (**9**) extending at least along a full window opening and closing stroke, said forward window guide member (**9**) comprising a hollow section (**25**, **26**), and wherein each of said guide section (**3A**) and said guide member (**9**) comprise a respective guide chamber (**16**, **15** or **57**), said guide chambers having laterally open sides facing each other for holding and guiding said window (**10**).

5,469,669

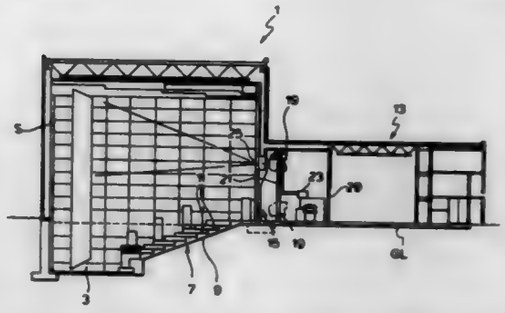
THEATER DESIGN

Lloyd Alter, 38 Thome Crescent, Toronto, Ontario, Canada

Filed Aug. 9, 1993, Ser. No. 103,547

Int. Cl.[6] E04H 3/22

U.S. Cl. 52—8 **2 Claims**



1. A permanently fixed theater construction comprising a ground level lobby and a projection screen which are at opposite ends of said construction, a seating region on a support floor in a pit excavated below ground level, said support floor being angled downwardly from said lobby towards said projection room into said pit, an entrance to and an exit from said seating region, both said entrance and said exit being through said lobby at the ground level, a projection room containing a projector in said lobby, a projection window out of said projection room facing said projection screen, said projector being movable from a first position at the ground level for maintenance and set up roof said projector to a second position elevated from the ground level to said projection window for operation of said projector, and a lift which moves said projector between said first and second positions, said projector when in said second position projecting large format film onto said projection screen.

5,469,670

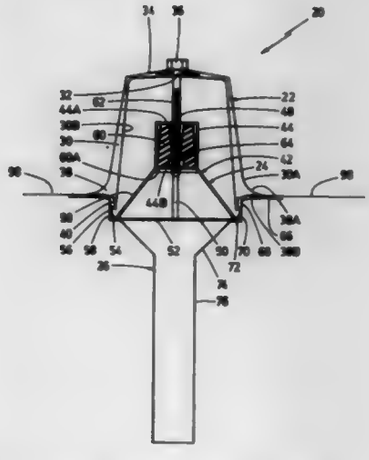
ROOF DRAIN

Kunibert Thaler, 32/33 Maplewood Dr., RR #1, Parry Sound, Ontario P2A 2W7, Canada

Filed Jul. 22, 1993, Ser. No. 95,021

Int. Cl.[6] B04D 13/00; B03F 5/06

U.S. Cl. 52—12 **25 Claims**



1. A roof drain for use with a leader, comprising:

a strainer;

a drainage sleeve;

fastening means for securing the strainer to the drainage sleeve so that water can drain through the strainer and the drainage sleeve into the leader; and

a compression/tension unit including resilient means for providing continuous tension between the strainer and the drainage sleeve, and a frame that supports and retains the resilient means, the frame including:

a rim for mounting the frame to the drainage sleeve;

a tension holder that retains the resilient means; and

radial struts that extend downwardly from the tension holder to connect the tension holder to the rim;

wherein the strainer and the drainage sleeve form a substantially watertight seal with each other.

5,469,671

ROOF PERIMETER COMPOSITE SECURING ELEMENT AND METHOD OF INSTALLING

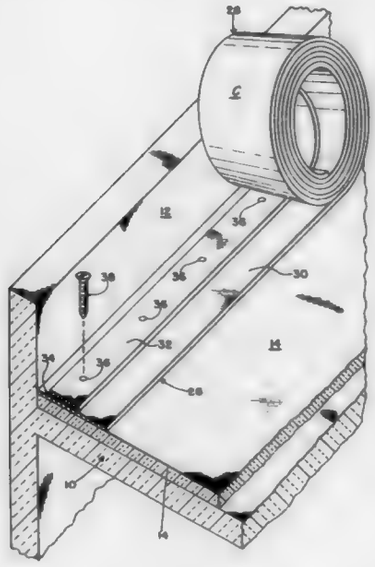
Juergen O. Rathgeber, Arlington Heights; Frederick A. Kish, Lockport; Syed R. Hasan, and Craig A. Hindman, both of Palatine, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Continuation of Ser. No. 831,412, Feb. 5, 1992, Pat. No. 5,309,685. This application Mar. 9, 1994, Ser. No. 208,247

The portion of the term of this patent subsequent to May 10, 2011, has been disclaimed.

Int. Cl.[6] E04D *1/36*

U.S. Cl. 52—58 **16 Claims**



1. A composite roof securement element, comprising:

a flexible membrane of elastomeric material having a first surface thereof for engagement with a roof substrate; and

a flexible batten strip inseparably bonded to a second surface of said flexible membrane so as to extend substantially parallel to and atop said flexible membrane;

said flexible membrane and said flexible batten strip bonded thereto being conjointly flexible so as to permit said flexible membrane and said flexible batten strip bonded thereto to be formed into a coil whereby said coil may be conveniently handled, readily pre-positioned upon said roof substrate, and unrolled into position upon said roof substrate at which said unrolled composite roof element lies flat upon said roof substrate for securement to said roof substrate by fasteners driven through said flexible batten strip and said flexible membrane and into said roof substrate.

5,469,672

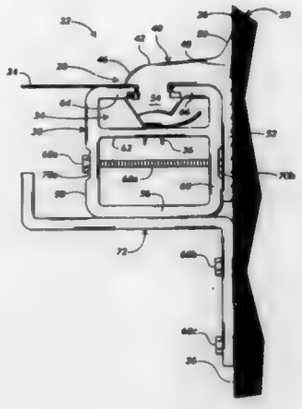
AWNING FLASH STRIP

Larry M. Fisher, 2316 Piedmont Ridge Ct., Marietta, Ga. 30062

Filed Mar. 1, 1994, Ser. No. 204,000

Int. Cl.[6] E04B *1/34*

U.S. Cl. 52—74 **22 Claims**



1. A flexible, water-impervious sealing strip for forming a seal between a frame member of an awning assembly and a building structure to which the awning assembly is attached, the sealing strip comprising:

an elongated central body including a top, a bottom, a rear end, and a front end opposite from said rear end;

a first protrusion extending upwardly and rearwardly from said rear end for engaging the building structure to which the awning assembly is attached; and

a second protrusion depending from said bottom of said central body for being retained by the awning assembly, wherein said second protrusion is a tab member constructed and arranged to be retained by a frame member of the awning assembly, and wherein said tab member includes,

a neck extending from said bottom of said central body at a position intermediate of said rear end and said front end of said central body, and

a cross-member attached to and extending transverse to said neck at a position distal from said central body, wherein said cross-member extends farther toward said front end and said rear end of said central body than does said neck.

5,469,673

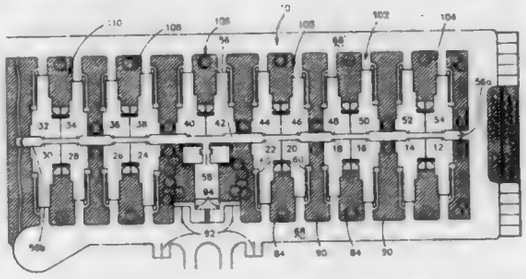
INTEGRATED RESIDENTIAL DWELLING UNITS

Dennis L. Raynor, 101 W. Mission, Bellevue, Nebr. 68005, and Dennis J. Hoth, 8420 W. Dodge Rd., Suite 207, Omaha, Nebr. 68114

Filed Apr. 6, 1994, Ser. No. 223,777

Int. Cl.[6] E04H *1/00*

U.S. Cl. 52—79.7 **10 Claims**



1. A system of integrated residential dwelling units, comprising:

first and second dwelling units, each having a forward side facing first and second generally parallel streets, respectively,

and each dwelling unit including an opposite rearward side, and opposing side walls;

said first and second dwelling units located with their forward sides facing in generally opposite directions and their rearward sides adjacent one another;

an enclosed passageway connecting the rearward sides of said first and second dwelling units, said passageway having at least one entryway from a exterior of said passageway, said entryway located externally of said dwelling units;

each said dwelling unit including a rearward entry in said rearward side accessing said passageway, and a separate forward entry accessing the street in front of the dwelling unit

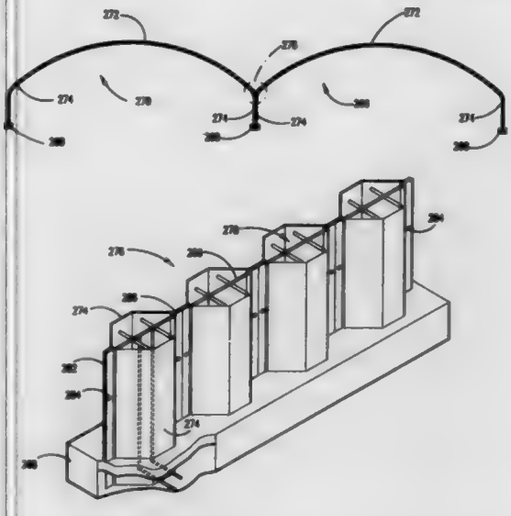
said first and second dwelling units forming a first pair of dwelling units.

5,469,674

ARCHED ROOF VERTICAL WALL SELF SUPPORTING METAL BUILDING CONSTRUCTIONS

Frederick Morello, Johnston, Pa., assignor to M.I.C. Industries, Inc., Reston, Va.

Continuation of Ser. No. 40,009, Mar. 30, 1993, which is a division of Ser. No. 872,005, Apr. 22, 1992, Pat. No. 5,249,445.
This application Nov. 21, 1994, Ser. No. 345,322
Int. Cl.[6] E04B *1/32*; E04C *2/32*
U.S. Cl. 52—86 **5 Claims**



1. A metal building erectable on site, the building having first and second adjacent units each of which has a roof structure and two vertical walls, the building comprising:

a first plurality of metal panels formed to a desired cross section of generally U-shape and having edges, the panels being assembled side-by-side and connected together by seams formed in adjoining edges of adjacent panels;

each of said panels having a portion thereof which is curved to form the roof structure of one of said building unit, and each panel having two ends and a portion at both ends thereof which is straight to form the vertical walls of said one building unit; and

a second plurality of metal panels seamed together side-by-side with each of said second plurality of panels having a cross section of generally U-shape and two ends each including a straight portion such that each of the second plurality of panels are shaped substantially the same as each of the first plurality of panels, the first and second pluralities of seamed together panels being assembled in back-to-back relationship with the seams located at one of the two straight end portions of the first plurality of panels in contact with the seams located at one of the two straight end portions of the second plurality of panels;

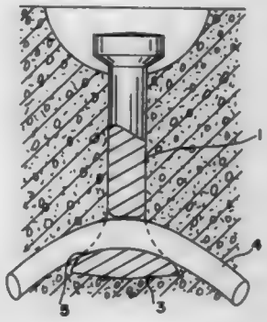
wherein the back-to-back assembled straight end portions of the respective pluralities of U-shape panels form a hollow core which forms a common vertical wall that defines one vertical wall of the first of said adjacent building units and one vertical wall of the second of said adjacent building units.

5,469,675

ANCHORING PIECE, IN PARTICULAR FOR CONCRETE

Marcel Arteon, 16, rue Cino del Duca, FR-92200 Neuilly sur Seine, France

Continuation of Ser. No. 487,976, Mar. 7, 1990, abandoned.
This application Feb. 12, 1993, Ser. No. 17,969
Claims priority, application France, Jul. 11, 1988, 88 09386
Int. Cl.[6] E04G *21/14*
U.S. Cl. 52—125.5 **7 Claims**



1. An anchoring piece for hardenable material, the piece comprising:

a cylindrical head for remaining outside the material, said head forming a widened part of the anchor shank thereby providing a means to be grasped;

a solid shank having an axis of symmetry;

a base having an upper surface wider than the cross section of the shank, wherein the head, the shank and the base are unitary and formed from one piece of material; and,

at least one continuous curved ramp having a substantially circular radius formed on said upper surface of the base, said ramp being shaped to define a contacting surface for receiving a reinforcing bar contacting and supported by said contacting surface, said ramp being flared downward and outward at opposing ends, the diameter and curvature of the ramp being substantially equal to the diameter and curvature of the reinforcing bar and wherein the anchoring piece is disposed directly within and contacts the hardenable material whereby relative displacement of the anchoring piece and said reinforcing bar are prohibited to prevent cracking of said hardenable material.

5,469,676

MOTOR-VEHICLE PARKING SYSTEM

Alfred Colsman, Eurasburg, Germany, assignor to Round Pals AG, Rotkreuz, Switzerland

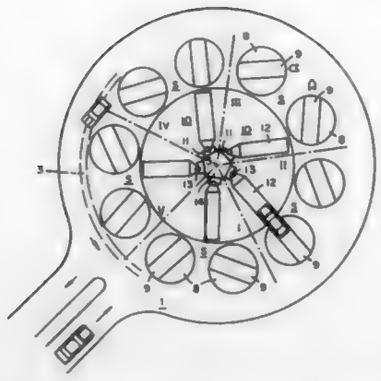
Filed Dec. 22, 1993, Ser. No. 171,465
Claims priority, application Switzerland, Dec. 29, 1992, 03 983/92
Int. Cl.[6] E04H *6/42*
U.S. Cl. 52—174 **20 Claims**

1. Installation for parking of a motor vehicle, comprising

a drive-in and drive-out level,

a plurality of parking levels vertically spaced separate from the drive-in and drive-out level,

at least one parking unit (S, S') at the drive-in and drive-out level having at least one drive-in and drive-out position (**9**, **17**, **18**) for the vehicle,



each said drive-in and drive-out position having turntable means for turning the vehicle in situ in relation to the drive-in and drive-out position,

a ground plan of said parking unit having a form of a sector of a circle,

a plurality of parking spaces (**4**) on said parking levels (**2**) separate from the parking unit (S, S'), said parking spaces aligned side by side radially on an arc of a circle,

at least one automatically controlled mechanical car lift means (**10**, **10'**) for vertical and horizontal transport of the vehicle between the drive-in and drive-out position (**9**, **17**, **18**) and the parking spaces (**4**),

the car lift means (**10**, **10'**) having a vertical guide (**11**) located adjacent to an apex of, and within the sector of the parking unit,

each said parking unit (S, S') being served by one of said car lift means (**10**, **10'**)

said car lift means further having vehicle platform means (**12**, **12'**) cantilevered from said vertical guide for pivoting laterally across an angle within the sector of the parking unit associated and aligned with said turntable means and respectively retrieving the vehicle from a drive-in position of said drive-in and drive-out position and depositing the vehicle on one of said parking spaces at one of said parking levers and thereafter respectively retrieving the vehicle from said parking space of said parking levels and depositing the vehicle on the drive-out position of said drive-in and drive-out position,

wherein an operator can respectively leave or retrieve the vehicle on the drive-in position of the drive-in and drive-out position, or the drive-out position of the drive-in and drive-out position and,

said car lift means will thereafter move the vehicle between the drive-in position or the drive-out position and the parking spaces.

5,469,677

STRESSING ANCHORAGE FOR AT LEAST ONE TENSION ELEMENT RUNNING INSIDE AN ENCASING TUBE AND METHOD OF PRODUCING THE STRESSING ANCHORAGE

Kurt Lüthi, Gwatt, Switzerland, assignor to VSL International AG, Switzerland

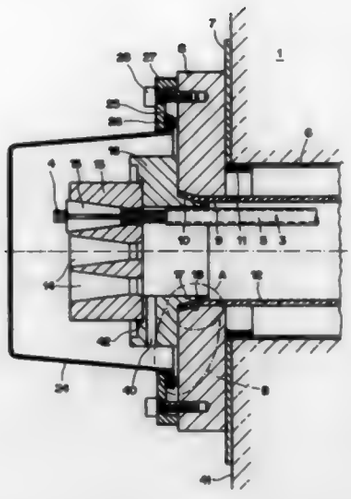
Filed Jan. 11, 1994, Ser. No. 180,144

Claims priority, application European Pat. Off., Jan. 11, 1993, 93810009

Int. Cl.[6] **E04C** *3/10*

U.S. Cl. 52—223.13 **20 Claims**

1. Stressing anchorage for at least one tension element running inside an encasing tube having first and second ends, with a bearing plate supported against a part of a building structure, said bearing plate having a continuous opening, with a trumpet having an inner and an outer end, the inner end essentially joining said first end of the encasing tube and being connected to it and the outer end extending at least into said continuous opening of said bearing plate, with an anchor head having at least one continuous



bore, wherein said at least one tension element is anchored with a wedge in said at least one continuous bore of said anchor head, said anchor head being supported against the bearing plate through an annular transition piece, with at least one area of said continuous opening of said bearing plate turned toward the anchor head having a cone opening toward the anchor head, and the outer end of the trumpet projecting into said at least area of said continuous opening, wherein said transition piece comprises a projection leading into said continuous opening, with the surface area of said projection forming a truncated cone, and the surface area of said truncated cone running essentially parallel to the surface area of said cone opening, and wherein said outer end area of said trumpet is pressed upon said cone opening of said bearing plate by means of the truncated cone of the projection, said outer end being held in an annular gap between said truncated cone and said cone opening.

5,469,678

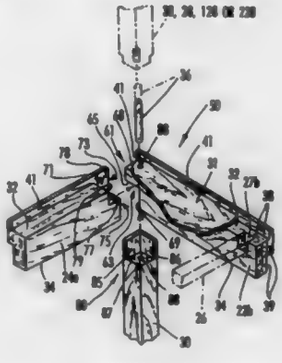
METHOD FOR CONSTRUCTING A FRAME STRUCTURE WITH LOAD-BEARING JOINTS

Edward Zamerovsky, 12 Geranium Rd., Levittown, Pa. 19057

Continuation of Ser. No. 539,124, Jun. 18, 1990, abandoned. This application Jan. 12, 1994, Ser. No. 180,480

Int. Cl.[6] **F04B** *5/14;* **F16B** *1/00*

U.S. Cl. 52—263 **11 Claims**



4. A junction of frame members for supporting a load comprising:

a) a first horizontal member, the first horizontal member having an inner section and an outer section, the inner and outer sections both having generally rectangular cross-sections, the inner and outer sections being adjacent to each other and generally parallel to each other and mutually offset to define a downwardly extending lower portion of the inner section and

an upwardly extending upper portion of the outer section, the inner section having an upper portion,

b) a second horizontal member, the second horizontal member having an inner section and an outer section, the inner and outer sections both having generally rectangular cross-sections, the inner and outer sections being adjacent to each other and generally parallel to each other and mutually offset to define a downwardly extending lower portion of the inner section and an upwardly extending upper portion of the outer section, the inner section having an upper portion,

c) the first horizontal member having an end in which there is a cut-out in the lower portion of the inner section of said first horizontal member, such that the upper portion of the inner section of the first horizontal member extends longitudinally beyond the lower portion of the inner section, and the outer section extends longitudinally beyond the upper portion of the inner section,

d) the second horizontal member having an end in which there is a cut-out in the upper portion of the inner section of said second horizontal member, the cut-out having a longitudinal extent, and wherein the outer section extends along the longitudinal extent of the cut-out,

wherein the first and second horizontal members are matingly engaged at said ends, and

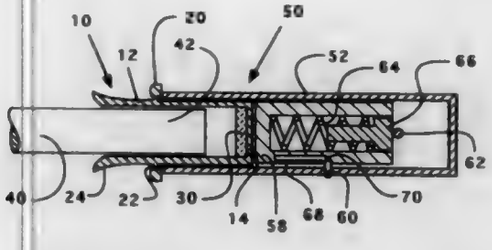
wherein the first and second horizontal members sit on a post member.

5,469,679

PROTECTIVE COVER WITH LOCKING COLLAR AND INSTALLATION TOOL

Christopher J. Burkard, Austin, and Norman G. Manley, Leander, both of Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 16, 1994, Ser. No. 307,326
Int. Cl.[6] B65D *59/06*
U.S. Cl. 52—301 **17 Claims**



1. An article for covering an end of a metal bar comprising,

a hollow tube having an inner surface, an outer surface and opposite ends, the first of said opposite ends being an open end, the second of said opposite ends is a closed end having internal and external faces wherein said internal face of said closed end and said inner surface of said hollow tube

define the internal volume of an open-ended tubular enclosure,

said hollow tube having at least one longitudinal slit adjacent said open end, in a wall of said hollow tube,

a quantity of sealant inside said open-ended hollow tube, and

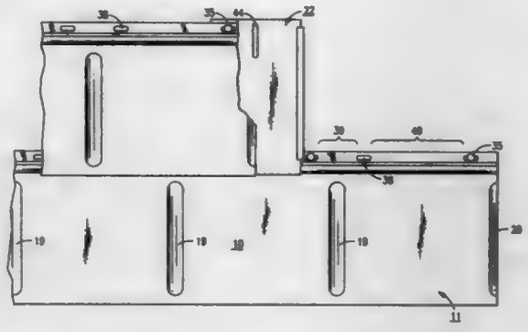
locking means for securing said hollow tube over a said end of a metal bar inserted in said tubular enclosure toward said internal face of said closed end.

5,469,680

METAL ROOFING SYSTEM

David L. Hunt, Westernville, N.Y., assignor to Revere Copper Products, Inc., Rome, N.Y.

Filed Mar. 18, 1994, Ser. No. 210,379
Int. Cl.[6] F04D *1/00*
U.S. Cl. 52—520 **8 Claims**



1. A metal roofing system comprising

a plurality of overlapping horizontal courses of metal shingles secured to a roofing substructure, with said shingles being rectangular in shape having a long horizontal dimension defined by a top securement border and a lower locking flange and two short vertical edge each said course being formed from a horizontal row of metal shingles that abut each other on their short vertical edges and overlap and interlock with other metal shingles in a course disposed directly therebelow, said shingles further containing a plurality of fastener guides appropriately spaced along the securement border at a top of said shingles,

a joint pan positioned below abutting metal shingles within each said course, said joint pan providing a water-tight and weatherproof joint, and

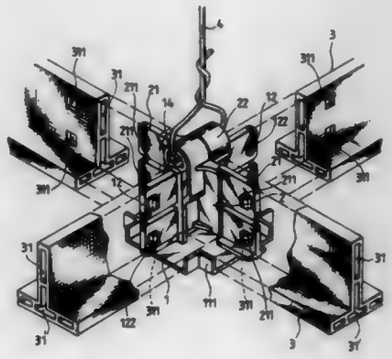
a deformation at a top of each joint pan, said deformation functioning go jointly with said fastener guides to indicate proper placement for a short edge of a metal shingle.

5,469,681

VINYL CEILING GRID STRUCTURE

Ming-Hsin Wu, 20, Lane 92, Shing E11 Street, Tao Yuan City, Tao Yuan County, Taiwan, Prov. of China

Filed Mar. 9, 1994, Ser. No. 207,685
Int. Cl.[6] E04B *9/24*
U.S. Cl. 52—656.9 **10 Claims**



1. A vinyl ceiling grid structure comprising:

a first connecting member for connecting at least two partitioning boards, the first connecting members having a generally

planar base with opposite sides and a plurality of first insert-to-fit plates located in a plane extending generally perpendicular to the base, the first insert-to-fit plates having distal ends extending towards opposite sides of the base, and a convex pipe section on an upper portion of the insert-to-fit plates extending in the plane of the first insert-to-fit plates.

5,469,682

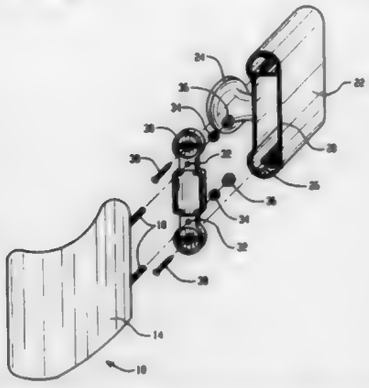
SOLID END CAP/CORNER UNIT FOR WALL PROTECTION SYSTEM

Thomas G. Knight, Muncy, Pa., assignor to RJF International, Fairlawn, Ohio

Continuation of Ser. No. 152,247, Nov. 12, 1993, abandoned, which is a continuation of Ser. No. 893,985, Jun. 5, 1992, abandoned. This application Sep. 20, 1994, Ser. No. 309,965

Int. Cl.[6] E04F *19/02*

U.S. Cl. 52—718.01 **21 Claims**



1. An end cap/corner unit for a wall protection system, said wall protection system comprising at least one elongated, hollow main segment formed from a frame, at least one mounting bracket for mounting the frame to a wall and an impact-absorbing cushion on said frame, said main segment also defining at least one main segment end face for attaching the frame thereof to another segment of said wall protection system, said end cap/corner unit comprising

a substantially solid body portion formed from a resilient, deformable, impact-absorbing material such that said body portion is capable of absorbing energy on impact with an object but retaining its shape after such impact,

said end cap/corner unit defining unit end faces, said body portion being located between said unit end faces,

at least one of said unit end faces being adapted for attachment to the frame of said main segment at the main segment end face thereof,

the only means in said end cap/corner unit capable of attaching said unit to the other segments in said wall protection system or to said wall being defined in said unit end faces, whereby said end cap/corner unit when secured in place in said wall protection system is mounted only by means of said unit end faces.

5,469,683

THERMALLY INSULATING COMPOSITE FRAME MEMBER WITH SNAP-IN THERMAL ISOLATOR

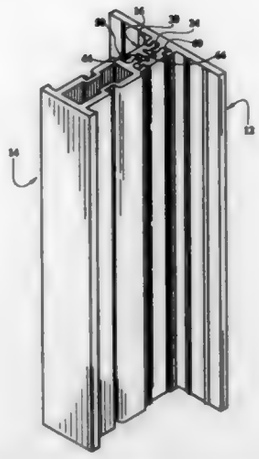
Gregory B. McKenna, Cumming, and Fred A. Grunewald, Roswell, both of Ga., assignors to Kawneer Company, Inc., Norcross, Ga.

Filed Feb. 9, 1994, Ser. No. 194,068

Int. Cl.[6] E04C *2/40*

U.S. Cl. 52—730.3 **15 Claims**

1. A thermally insulating composite frame member for windows, doors, curtainwalls, storefront flaming systems, and the like, comprising:



an elongated inner frame member, said inner frame member having a first flange on an outwardly facing portion thereof;

an elongated outer frame member disposed in parallel, spaced-apart relation to said inner frame member, said outer frame member having a second flange on an inwardly facing portion thereof;

a structural thermal isolator, said isolator having a first pair of resilient, spaced apart legs projecting rearward from said isolator and configured to engage said first flange, and said isolator having a second pair of resilient, spaced-apart legs projecting forward from said isolator and configured to engage said second flange;

said first and second pairs of resilient legs of said isolator being engaged with said first and second flanges on said frame members to structurally interconnect said frame members;

said inner frame member further comprising a pair of forward projecting arms disposed one on either side of said first flange, said forward projecting arms being crimped toward said first flange to capture said first pair of resilient legs of said isolator; and

said outer frame member further comprising a pair of rearward projecting arms disposed one on either side of said second flange, said rearward projecting arms being crimped toward said second flange to capture said second pair of resilient legs of said isolator.

5,469,684

CONCRETE BUILDING FRAME CONSTRUCTION METHOD

James W. Franklin, 1611 Francisca Rd. NW., Albuquerque, N.M. 87107

Filed Aug. 10, 1993, Ser. No. 104,679

Int. Cl.[6] E04B *1/00*

U.S. Cl. 52—745.13 **22 Claims**

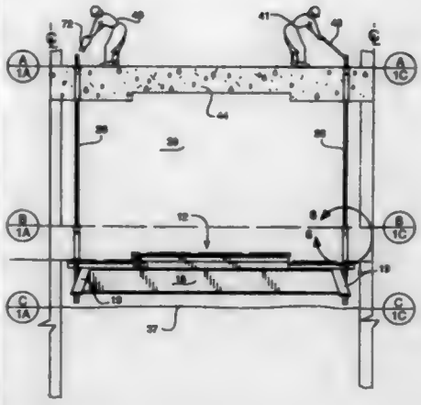
20. In a method of making a plurality of generally horizontal structural concrete diaphragm slabs for a multi-level building structure, the steps comprising:

(a) providing for said building structure, a generally vertical structural column frame network made up of spaced vertical columns that are substantially free of one another;

(b) structurally connecting spaced vertical columns together by constructing a structural concrete diaphragm slab with deck form assemblies;

(c) thereafter lowering said deck form assemblies from the first slab after it is constructed, to a position for the formation of the next lower structural diaphragm slab;

(d) supporting said deck form assemblies for the formation of said next lower slab from said first slab, including supporting an attachment with said first diaphragm slab when it is constructed to transmit to said first slab, the loads expected during the formation of said next lower structural diaphragm slab;



(e) said step of lowering including rotating a threaded rod which is attached to one of said form assemblies and threadably engaged within said embedded attachment; and

(f) repeating the steps labeled (b), (c), (d) and (e) for each pair of vertically adjacent structural concrete slabs to construct a plurality of succeeding structural diaphragm slabs.

5,469,685

FURNITURE EDGE CONSTRUCTION

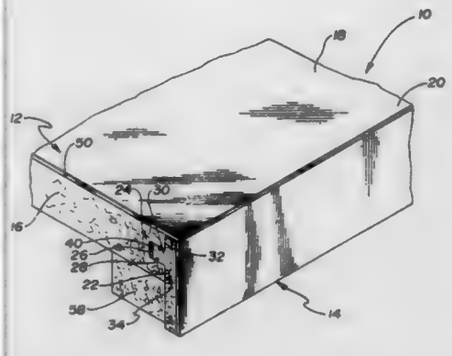
Thomas J. Nelson, Fridley, Minn., assignor to Ralph Wilson Plastics Company, Temple, Tex.

Division of Ser. No. 758,709, Sep. 6, 1991, Pat. No. 5,157,891, which is a continuation of Ser. No. 536,427, Jun. 11, 1990, abandoned, which is a division of Ser. No. 104,737, Oct. 1, 1987, Pat. No. 4,996,817, which is a continuation-in-part of Ser. No. 33,310, Mar. 31, 1987, abandoned. This application May 26, 1992, Ser. No. 889,115

The portion of the term of this patent subsequent to Oct. 27, 2009, has been disclaimed.

Int. Cl.[6] E04C *2/38*

U.S. Cl. 52—782.2 **51 Claims**



1. A molding member for concealing support decking exposed along an edge of a furniture panel or the like having decorative surfacing bonded to support decking and having support decking exposed along at least one edge thereof comprising:

a forward surface;

a rear surface; and

a rib projecting from said rear surface separating said rear surface into an upper rear surface and a lower rear surface; wherein said upper rear surface has a channel cut therein, adjacent said rid, for providing space for excess glue applied along the intersection of said rib and said upper rear surface to collect.

5,469,686

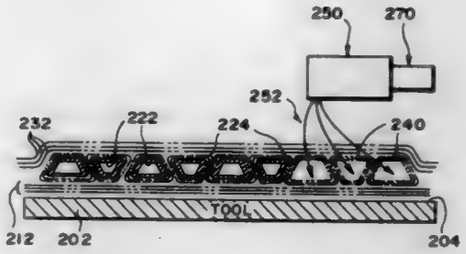
COMPOSITE STRUCTURAL TRUSS ELEMENT

Kenneth L. Pyklet, Owasso, Okla., assignor to Rockwell International Corp., Seal Beach, Calif.

Filed Sep. 27, 1993, Ser. No. 127,826

Int. Cl.[6] E04C *2/34*

U.S. Cl. 52—793.11 **14 Claims**



1. A structurally reinforced panel member, comprising:

a first layer of cured composite material,

a plurality of discrete, elongated, tubular sections of cured composite material disposed side-by-side atop said layer,

a second layer of cured composite material disposed atop said plurality of tubular sections,

said first and second layer and said tubular sections of cured composite material being integrally formed as a unitary structure.

5,469,687

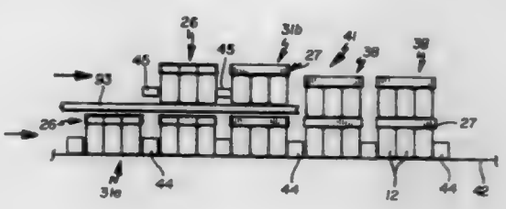
APPARATUS FOR FORMING STACKED ARTICLE GROUPS UTILIZING CLIP-TYPE CARRIERS

Allen L. Olson, Crosby, Minn., assignor to Riverwood International Corporation, Denver, Colo.

Filed Nov. 19, 1993, Ser. No. 155,433

Int. Cl.[6] B65B *27/04;35/50;61/14*

U.S. Cl. 53—48.1 **20 Claims**



1. An apparatus for assembling stacked article group carriers, comprising:

a) an article grouping and clip-type carrier application assembly, said assembly having at least one input and first and second output lines, and comprising:

i) two pairs of longitudinally oriented generally spatially parallel screw structures, each pair being separated a predetermined distance and disposed above one said conveyance path, said pairs of screw structures generating two metered, linear streams of article groups;

ii) a conveyor assembly constructed and arranged to receive said streams of article groups from said screw structures and longitudinally translate said groups in a pair of side by side, downstream conveyance paths;

iii) an overhead transfer mechanism constructed and arranged above each said conveyor assembly to deposit a clip-type carrier onto a top surface of at least one said article group traveling thereon; and

iv) means to bring said clip-type carrier into mating engagement with said top surface of at least one said article group;

b) a first conveyor disposed to receive and transport first article groups having clip-type carriers attached thereto from said first output line, said first article groups being transported at a first vertical level;

c) a second conveyor disposed to receive and transport second article groups having clip-type carriers attached thereto from said second output line, said second article groups being transported at a second vertical level which is above said first vertical level; and

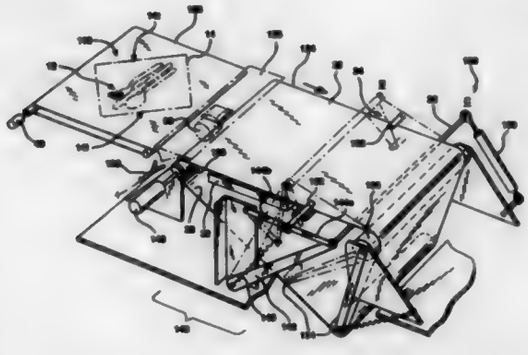
d) means to merge said second article groups over the top surface of said first article groups.

5,469,688

METHOD FOR WRAPPING SILVERWARE IN A NAPKIN

Michael D. Dunbar, 873 Neil Ave., Columbus, Ohio 43215, and Vincent J. Vohnout, Columbus, Ohio, assignors to Michael D. Dunbar, Columbus, Ohio

Filed Jul. 26, 1993, Ser. No. 97,847
Int. Cl.[6] B65B *51/06;11/00*
U.S. Cl. 53—419 **7 Claims**



1. A method for automatically wrapping a plurality of differently shaped, substantially rigid utensils with a napkin into a non-airtight bundle, said napkin having one surface including first and second side portions and a central portion therebetween, said method comprising the steps of:

positioning a plurality of differently shaped, substantially rigid utensils and at least one napkin in a receiving area wherein said step of positioning includes positioning said utensils in at least one of said portions of said napkins;

manipulating said at least one napkin and said plurality of utensils with an automatic wrapping mechanism, wherein said step of manipulating automatically includes:

generally surrounding said plurality of utensils with said at least one napkin wherein said step of generally surrounding includes automatically folding at least part of one of said portions over said utensils so as to be positioned opposite to and in contact with a part of another of said portions;

forming a variably shaped, non-airtight bundle of substantially rigid utensils of different shapes, said bundle including an open central structure retained by said at least one napkin;

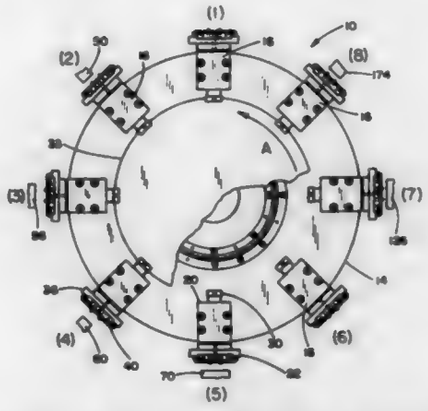
whereby said utensils are prepared for use generally surrounded by at least one napkin.

5,469,689

MACHINE FOR THE AUTOMATED PACKAGING OF NEEDLES AND ATTACHED SUTURES AND METHOD OF UTILIZING THE PACKAGING MACHINE

David Demarest, Parsippany; Robert B. Duncan, Bridgewater; Martin Sobel, Flemington, all of N.J.; Timothy P. Lenihan, Morrisville, Pa., and William Rattan, Cerritos, Calif., assignors to Ethicon, Inc., Somerville, N.J.

Division of Ser. No. 181,626, Jan. 13, 1994. This application Feb. 8, 1995, Ser. No. 385,342
Int. Cl.[6] B65B *63/04*
U.S. Cl. 53—430 **44 Claims**



1. A method for the automated packaging of needles having attached sutures to form suture packages, including automatically winding said sutures into a peripheral channel of a tray and attaching a cover to said tray so as to constitute said suture package, including advancing in indexed motions said tray while being supported on a tool next to a plurality of sequential spaced workstations stationarily arranged along the path of advancing movement of said tool nest; said method comprising the steps of:

(a) mounting an empty said tray at a first said workstation on a support surface of said tool nest;

(b) inserting a plurality of needles and attached sutures into said tray at a second workstation such that said needles are fastened in said tray in a predetermined array and said attached sutures include portions depending downwardly and outwardly from said tray;

(c) gathering said depending suture portions at a third workstation into a bundled strand and imparting axial tension thereto; rotating said support surface and mounted tray about an axis extending normal to the plane of said support surface and tray; and operatively in conjunction with gathering said suture, winding said bundled strand of depending suture portions into said peripheral tray channel;

(d) applying a cover to said tray at a fourth workstation to form said suture package containing said needles and attached wound sutures; and imparting pressure to said cover to form latching structure in said cover fastening said cover to said tray and concurrently severing a portion of the cover to form a label which is permanently attached to said tray;

(e) disengaging said completed suture package at a fifth workstation from said support surface on said tool nest.

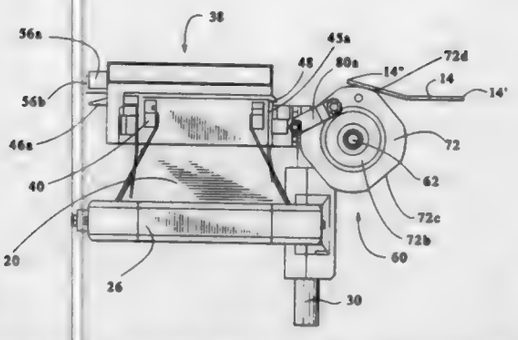
5,469,690

CAM MECHANISM FOR BENDING CARTON BLANKS FED FROM THE MAGAZINE OF A PACKAGING MACHINE

Joakim Nordell, 1512 Seville Ct. 2A, Wheeling, Ill. 60090

Filed Sep. 28, 1994, Ser. No. 315,406
Int. Cl.[6] B65B *43/24;43/44*
U.S. Cl. 53—458 **5 Claims**

1. An apparatus for bending carton blanks fed from the magazine of a packaging machine, each of the carton blanks having a



gripped portion held by the packaging machine and a bendable portion extending from the gripped portion, the apparatus comprising:

(a) a rotatable shaft mounted on said packaging machine, said shaft having a longitudinal axis;

(b) at least one cam member mounted on said shaft, said at least one cam member having a plurality of longitudinally extending side walls and apex portions interconnecting said side walls; and

(c) means for rotating said shaft about its longitudinal axis such that said side walls are adjacent the gripped portions of the carton blanks and said apex portions radially displace the bendable portions of the carton blanks as the carton blanks are fed from the magazine.

5,469,691

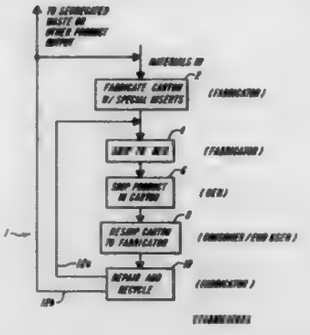
PROCESS FOR RECYCLING A SHIPPING CONTAINER

Michael J. Grey, Richboro, Pa., and William H. Shaw, Manchester, Mass., assignors to Resource America, Inc., Southampton, Pa.

Continuation of Ser. No. 906,000, Jun. 26, 1992, abandoned, which is a continuation of Ser. No. 719,026, Jun. 21, 1991, abandoned, which is a division of Ser. No. 427,812, Oct. 26, 1989, abandoned. This application Jun. 2, 1993, Ser. No. 71,595

Int. Cl.[6] **B65B** *23/00;61/02;* **B65D** *85/42*

U.S. Cl. 53—472 **11 Claims**



1. A process for recycling a shipping container comprising:

(a) providing to a product provider a shipping container and insert material for placement within the shipping container to provide a protective support for a product placed within the shipping container, the shipping container comprising a wood-pulp based material and the insert material comprising a polyolefin foam which is recyclable and designed to withstand multiple transits in normal shipping,

(b) shipping to a customer the shipping container having therein the product and the insert material;

(c) providing the customer with printed directions for returning the shipping container and the insert material to a fabricator via a parcel service,

(d) at the fabricator, inspecting and refurbishing or replacing the shipping container and the insert material, and causing whatever is replaced to be recycled; and

(e) repeating steps (b), (c), and (d) during a useful lifetime of the shipping container and the insert material.

5,469,692

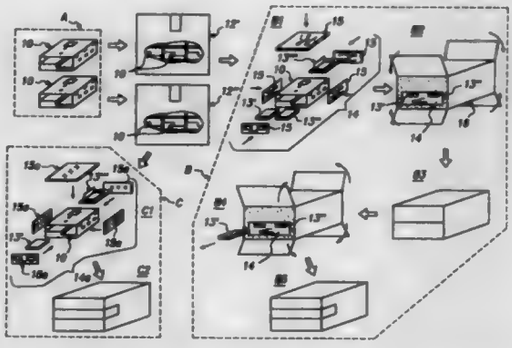
METHODS FOR CONFIGURING, PACKAGING AND RECONFIGURING PERSONAL COMPUTERS

Eric Xanthopoulos, Santa Clara, Calif., assignor to Apple Computer, Inc., Sunnyvale, Calif.

Filed Jul. 8, 1994, Ser. No. 271,959

Int. Cl.[6] **B65B** *17/00;55/20*

U.S. Cl. 53—474 **13 Claims**



9. A method of handling a personal computer, comprising the steps of:

A) assembling a plurality of housings at a first site;

B) shipping said plurality of housings in a common container to a second site remote from said first site;

C) installing electrical components into said housing at said second site;

D) packaging said personal computers into individual shipping containers at said second site, each shipping container having an openable end wall;

E) reconfiguring at least some of said packaged personal computers by removing at least one of said horizontally installed electrical components through a vertical side of said housing and horizontally through said vertical end wall of said individual container while said personal computer remains disposed in said individual container;

F) closing said end wall of said individual container; and

G) shipping said individual container and said reconfigured personal computer contained therein.

5,469,693

BALE BAGGING APPARATUS

Gerald Brodrecht, R.R. #1, Thorsby, Alberta, Canada

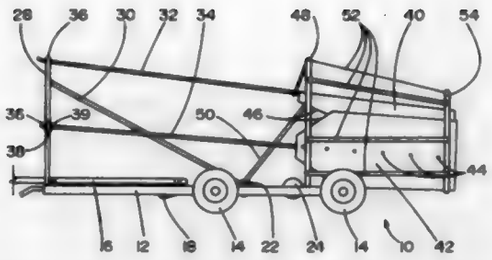
Continuation of Ser. No. 124,078, Sep. 21, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 395,659

Int. Cl.[6] **B65B** *43/42*

U.S. Cl. 53—567 **12 Claims**

1. A bale bagging apparatus for bagging end to end a plurality of preformed, round bales having a common nominal bale circumference, the apparatus comprising:

a collapsible, annular tunnel having an inlet end and an outlet end, through which tunnel the bales are passed in sequence in a direction of bale movement from the inlet end to the outlet end, said tunnel comprising a plurality of panels arranged side-by-side in an overlapping, annular array and panel mounting means mounting each of the panels for substantially independent movement towards and away from bales passing through the tunnel;



whereby when a shirred tube of plastic film surround the tunnel, the tube having an unstretched circumference substantially the same as the nominal bale circumference, the tube causes the tunnel to conform closely to the bales in size and shape as the bales pass through the tunnel; and

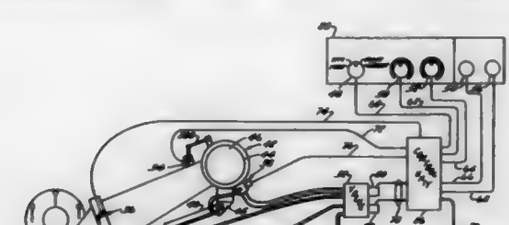
a tube retainer comprising a flexible hoop surrounding the tunnel adjacent the outlet end thereof, the retainer having a fixed circumference greater than the unstretched circumference of the tube and independent of the circumference of the tunnel adjacent the outlet end thereof, whereby the tube is stretched over the tube retainer as it is drawn off the tunnel onto a bale passing therethrough.

5,469,694

AGRICULTURAL VEHICLE INCLUDING A SYSTEM FOR AUTOMATICALLY MOVING AN IMPLEMENT TO A PREDETERMINED OPERATING POSITION

Dale W. Panousheck, Orion, Ill., and Jeffrey S. Illender, Valley City, N. Dak., assignors to Case Corporation, Racine, Wis.

Filed Jun. 24, 1994, Ser. No. 265,644
Int. Cl.[6] A01D *34/86;47/00*
U.S. Cl. 56—10.2 E **20 Claims**



9. In an agricultural vehicle including a positioner assembly for moving an implement relative to the vehicle, a control system comprising:

a position transducer coupled to the implement to produce position signals representative of the actual location of the implement;

an operator switch configured to produce a first direction signal in response to a first activation motion of the switch produced by an operator;

a control circuit including a digital processor coupled to a memory, the control circuit being coupled to the position transducer and the operator switch, the processor including;

a storage circuit coupled to the memory to store first digital data in the memory representative of position signals produced by the position transducer when the actual location of the implement is at the desired operating location of the implement, and

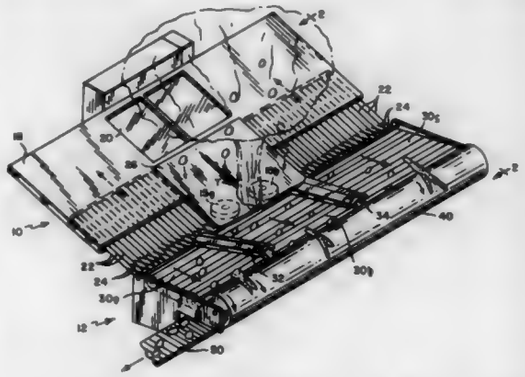
a position control circuit coupled to the memory to control the positioner assembly to move the implement to the desired operating location at a speed related to the distance between the desired operating location of the implement and the actual location of the implement in response to first direction signals occurring during a first momentary time period, the first digital data stored in memory, and the position signals, wherein the position control circuit controls the positioner assembly to move the implement at a substantially constant speed during the extended time period in response to first direction signals occurring during a first extended time period corresponding to the duration of the first activation motion and longer in duration than the momentary time period.

5,469,695

TREE-SHAKING AND HARVESTING APPARATUS

Eitan Zehavi, Kiriat Tivon, and David Chiel, Afula Ilit, both of, Israel

Filed Dec. 9, 1993, Ser. No. 165,028
Int. Cl.[6] A01D *46/26*
U.S. Cl. 56—340.1 **13 Claims**



1. An apparatus for harvesting fruit or nuts from a tree, the apparatus comprising:

a. a first movable unit comprising at least one series of projecting rods that are spaced sufficiently close to one another to retain the harvest;

b. a second movable unit comprising:

1) a tilted planar member;

2) means for shaking a tree; and

3) projecting from the tilted planar member, at least one series of rods that are spaced sufficiently close to one another to retain the harvest, and are of sufficient length to interlace with the rods projecting from the first unit during operation;

c. means for conveying the harvest from one of said series of rods to a repository, at least the other of said series of rods being tiltable so as to guide falling harvest toward the conveying means.

5,469,696

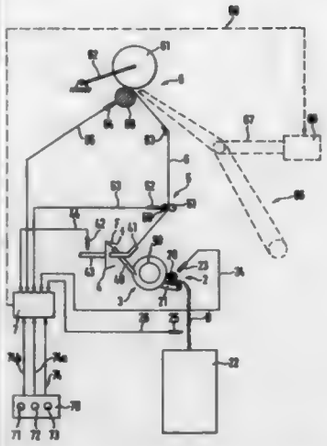
PROCESS AND DEVICE TO DETERMINE THE DIAMETER OF A BOBBIN AT A SPINNING STATION OF A SPINNING MACHINE

Hoeber Gerhard, Ingolstadt, Germany, assignor to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Continuation of Ser. No. 64,136, May 21, 1993, abandoned.
This application Nov. 28, 1994, Ser. No. 345,552
Claims priority, application WIPO, Jan. 29, 1992, 92/0466
Int. Cl.[6] D01H *13/24*
U.S. Cl. 57—264 **21 Claims**

1. A process for acting upon and determining the diameter of a bobbin of wound yarn formed at a spinning station of a spinning machine, comprising the steps of:

feeding a fiber sliver of known thickness at a given speed to a spinning element at the spinning station for being spun into yarn, drawing off the spun yarn at a given draw-off speed, and winding the yarn onto a bobbin at a winding speed synchronized with the draw-off speed;



empirically determining a yarn length corresponding to a given bobbin diameter for predetermined conditions of yarn thickness and winding tension of the spinning station;

determining actual sliver thickness, sliver feeding speed, and yarn draw-off speed and calculating yarn thickness from the product of sliver thickness and the ratio of sliver feeding speed and yarn draw-off speed;

determining winding speed and calculating winding tension from the ratio of winding speed and yarn draw-off speed;

comparing the calculated winding tension and yarn thickness with the predetermined yarn thickness and winding tension used to empirically determine the yarn length corresponding to a given bobbin diameter and computing a correction factor based upon any differences therebetween, and with the correction factor computing actual yarn length and corresponding actual bobbin diameter

conveying the actual bobbin diameter to a travelling service unit; and

after receipt of the actual bobbin diameter, performing one of bobbin replacement and yarn piecing at the spinning station with the travelling service unit.

5,469,697

STUD LINK CHAIN

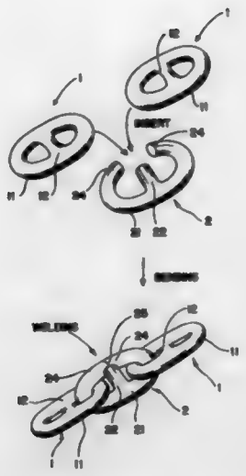
Katsuhiko Kuroki, Himeji, Japan, assignor to Kuroki Chain Mfg., Co., Ltd., Hyogo, Japan

Filed Sep. 7, 1993, Ser. No. 116,692
Int. Cl.[6] B21L *3/00*; F16G *15/02*
U.S. Cl. 59—35.1 **16 Claims**

1. A method for producing a stud link chain which comprises the following steps:

(a) die forging a pair of closed links, each closed link being integrally formed and including two link parts separated by a stud part, each closed link having two short sides and two long sides, the short sides each being elliptically-shaped in cross section with the major diameter of the ellipse lying in the same plane as a center-line of the stud part, and the minor diameter of the ellipse generally corresponding to an average diameter of the link;

(b) die forging an open link in which two link parts separated by a stud part are integrally formed, each open link having an opening part formed between open end portions of said two link parts and sufficient to insert a link part of one of the closed links made in step (a), each open link having two short sides and two long sides, the long sides being elliptically-shaped in cross section with the minor diameter of the ellipse lying in the same plane as a center-line of the stud part, and the short sides being elliptically-shaped in cross section with the major diameter of the ellipse lying in the same plane as said center-line of the stud part, the minor diameter of the short sides generally corresponding to an average diameter of the link, and the major diameter of the long sides generally corresponding to the average diameter of the link;



(c) assembling each of the closed links into the opening part of the open link so as to lie on opposite sides of the stud part to thereby form a chain portion;

(d) bending each link part of the open link shut to that the open end portions of the link parts abut one another to thereby form abutting end portions;

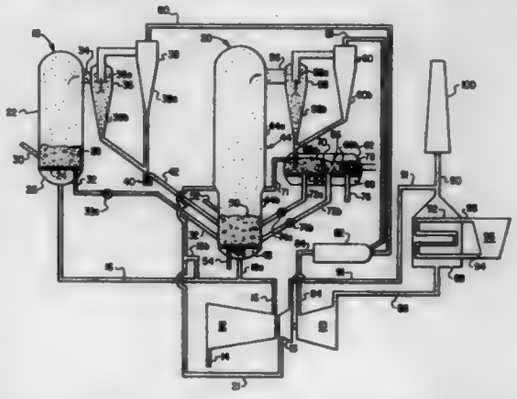
(e) welding the abutting end portions together.

5,469,698

PRESSURIZED CIRCULATING FLUIDIZED BED REACTOR COMBINED CYCLE POWER GENERATION SYSTEM

Juan A. Garcia-Mallol, Morristown, N.J., assignor to Foster Wheeler USA Corporation, Clinton, N.J.

Filed Aug. 25, 1994, Ser. No. 295,565
Int. Cl.[6] F02C *6/00*
U.S. Cl. 60—39.02 **11 Claims**



1. A method of generating power using a combined cycle system comprising the following steps:

producing fuel gas having solid fuel particles entrained therein;

separating said fuel gas from said solid fuel particles;

burning said solid fuel particles with air in a reactor to produce flue gases having solid particles entrained therein;

separating said flue gases from said latter solid particles;

passing said latter solid particles to a heat exchanger for cooling a portion of said latter solid particles;

passing said cooled portion of said particles and the remaining portion of said particles from said heat exchanger back to said reactor, the ratio of said cooled portion of said particles to

said remaining portion of said particles being adjustable to control the temperature of said reactor;

combusting said fuel gas in the presence of said flue gases in a combustor to produce gaseous products of combustion;

passing said gaseous products of combustion from said combustor to a gas turbine to drive said turbine and generate electrical energy;

utilizing heat from the exhaust gases from said turbine to produce steam; and

passing said steam to a steam turbine to drive said steam turbine and produce electrical energy.

5,469,699

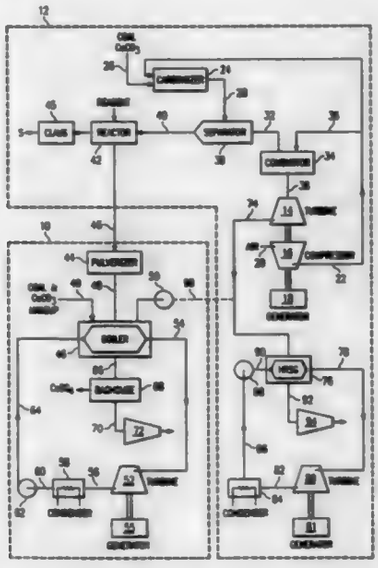
METHOD AND APPARATUS FOR GENERATING ELECTRICAL ENERGY UTILIZING A BOILER AND A GAS TURBINE POWERED BY A CARBONIZER

Ernest L. Daman, Mountainside, N.J., assignor to Foster Wheeler Development Corporation, Livingston, N.J.

Filed Oct. 14, 1994, Ser. No. 320,881

Int. Cl.[6] F02C *3/28*

U.S. Cl. 60—39.02 **12 Claims**



1. Apparatus for generating energy, said apparatus comprising:

means for carbonizing fuel in the presence of limestone to generate fuel gas and char including limestone containing sulfur generated during said carbonizing,

a separator for receiving said fuel gas and char from said carbonizing means and for separating said char from said fuel gas,

a gas turbine,

means for passing said fuel gas to said gas turbine for driving same,

means operatively connected to said gas turbine for generating electrical energy;

a reactor,

means for passing said char to said reactor for removing said sulfur from said limestone,

a boiler,

means for passing said char from said reactor to said boiler for powering said boiler, and,

means operatively connected to said boiler for generating electrical energy.

5,469,700

TURBINE ENGINE CONTROL SYSTEM

Nicholas C. Corbett, Solihull, and Norman P. Lines, Warwickshire, both of, England, assignors to Rolls-Royce plc, London, England

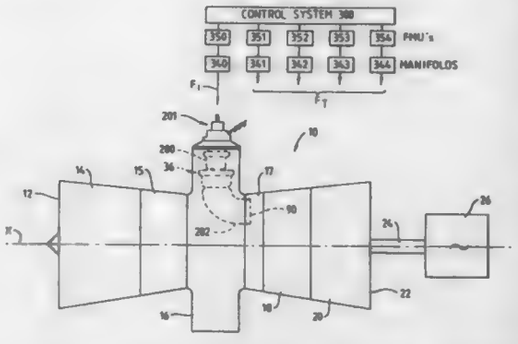
PCT No. PCT/GB92/01982, § 371 Date Jul. 7, 1994, § 102(e) Date Jul. 7, 1994, PCT Pub. No. WO93/09339, PCT Pub. Date May 13, 1993

PCT Filed Oct. 29, 1992, Ser. No. 211,493

Claims priority, application United Kingdom, Jan. 29, 1991, 9122965

Int. Cl.[6] F02C *9/28*

U.S. Cl. 60—39.06 **10 Claims**



1. A method of scheduling fuel flow to a plurality of combustion stages in a combustion turbine engine, comprising the steps of putting a plurality of engine fuel flow governors in parallel with each other, letting the governor which outputs the lowest fuel demand signal be the one which schedules the total fuel flow to the engine, defining predetermined temperature limits for the combustion process in each stage of combustion, and individually scheduling fuel flows to the plurality of combustion stages to achieve the lowest fuel flows consistent with the predetermined temperature limits for the corresponding stages of combustion, wherein a primary combustion stage is operated sequentially in a diffusion flame first combustion mode and in a lean burn second combustion mode and a secondary combustion stage and any further combustion stages are operated in a lean burn combustion mode.

5,469,701

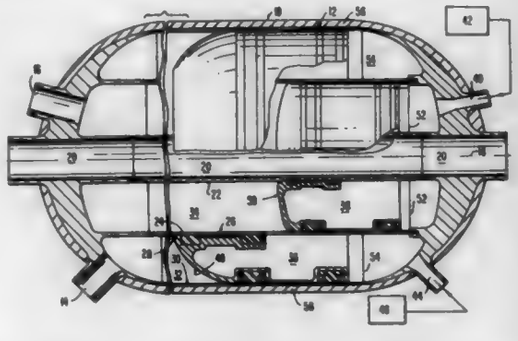
FLUID STORAGE AND EXPULSION SYSTEM

Kirk Sneddon, Sayville, N.Y., and Harold Brandmaier, Harrington Park, N.J., assignors to Arde, Inc., Norwood, N.J.

Filed Sep. 10, 1993, Ser. No. 119,356

Int. Cl.[6] F02K *9/44*

U.S. Cl. 60—259 **9 Claims**



1. A fluid storage and expulsion system comprising:

a rigid tank defining first and second openings, said rigid tank having an inner wall and defining a longitudinal axis;

a first piston guide positioned concentrically within said rigid tank and extending along said longitudinal axis, said first piston guide having an outer wall;

a second piston guide positioned concentrically between said rigid tank and said first piston guide and extending along said longitudinal axis, said second piston guide having an inner wall and an outer wall and defining a concentric outer annular space between the inner wall of said rigid tank and the outer wall of said second piston guide and an inner annular space between the inner wall of said second piston guide and the outer wall of said first piston guide, said outer annular space communicating with said first opening and said inner annular space communicating with said second opening;

an inner piston slidable in said inner annular space for expelling fluid therein through said second opening; and

an outer piston slidable in said outer annular space independently of said inner piston for expelling fluid in said outer annular space through said first opening.

5,469,702

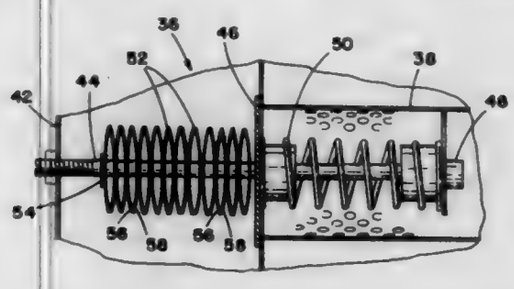
METHOD AND APPARATUS FOR FILTERING ENGINE EXHAUST

Daniel L. Tuma, Minneapolis, Minn.; Jacques V. Van Peteghem, Brugge, and Olivier H. Ronneau, Chapelle-Lez-Herlaimont, both of, Belgium, assignors to Donaldson Company, Inc., Minneapolis, Minn.

Continuation of Ser. No. 923,232, Jul. 31, 1992, abandoned. This application Dec. 27, 1994, Ser. No. 364,506

Int. Cl.[6] F01N *3/02*

U.S. Cl. 60—311 **16 Claims**



1. A filter apparatus for exhaust gases from an engine, comprising:

exhaust cooling means for cooling the exhaust gases after the gases leave the engine; and,

filtering means for filtering the cooled exhaust gases; and,

temperature override means, wherein the temperature override means comprises a temperature sensitive valve, wherein the valve includes a plurality of axially-aligned bi-metal discs deflecting axially as the temperature increases, and a plate mounted to a deflected end disc, thereby moving the plate axially between an open and closed position.

5,469,703

DEVICE FOR CONTROLLING A HYDRAULIC MOTOR

Lars P. Ericsson, Dalajöfors, and Bo Nilstam, Borås, both of, Sweden, assignors to VOAC Hydraulics Boras AB, Boras, Sweden

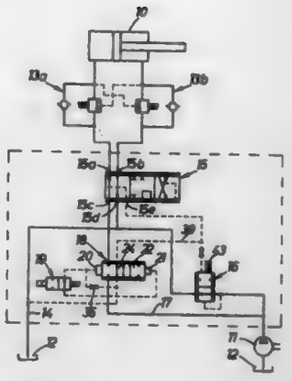
Filed Jun. 10, 1994, Ser. No. 258,082

Claims priority, application Sweden, Jun. 11, 1993, 9302031

Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—399 **9 Claims**

1. Device for controlling the operation of a hydraulic motor (**10**), comprising a directional valve (**15**) communicating with a pressure fluid pump (**11, 50**) via a feed passage (**17**) and provided with load sensing pressure communicating means (**15e**) connected to a pressure activated pressure adjusting means (**16; 51**) for varying the



fluid pressure within said feed passage ((**17**) in relation to the load sensing pressure, and a safety valve means (**18, 19**) located in said feed passage (**17**) upstream of said directional valve (**15**) and arranged to be activated separately from said directional valve (**15**) to prevent hydraulic fluid under pressure from reaching said directional valve (**15**) in an emergency, wherein said safety valve means (**18, 19**) comprises a shut-off valve (**18**) located in said feed passage (**17**) and shiftable between a normally open position and a closed fluid flow blocking position, said shut-off valve (**18**) comprises a load sensing pressure passage (**39**) which is connected to said load sensing pressure communicating means (**15e**), and a pressure discharge passage (**14**), said load sensing pressure passage (**39**) is connected to said pressure discharge passage (**14**) via said shut-off valve (**18**) as the latter is shifted from said open position to said closed position so as to depressurize said pressure adjusting means (**16; 51**) and hence substantially reduce the fluid pressure in said feed passage (**17**).

5,469,784

HYDRAULIC DRIVE APPARATUS COMPRISING A CYLINDER

Otmar Kramer, Lohr/Main, Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Germany

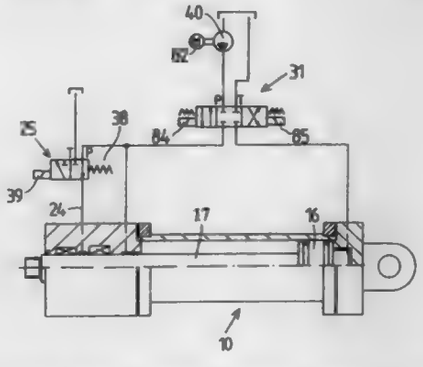
PCT No. PCT/EP93/00583, § 371 Date Nov. 18, 1993, § 102(e) Date Nov. 18, 1993, PCT Pub. No. WO93/19301, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 13, 1993, Ser. No. 150,062

Claims priority, application Germany, Mar. 20, 1992, 42 08 980.8

Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—455 **22 Claims**



1. A hydraulic drive apparatus having a cylinder (**10**) which comprises:

a piston (**16**) movably mounted in a working chamber, a piston rod (**17**) extending outwardly through a cylinder head (**11**),

a wear resistant primary seal (**19**) and a leakage free secondary seal (**20**), both said seals acting between the cylinder head

(11) and the piston rod (17), wherein the primary seal (19) is arranged closer to the working chamber than the secondary seal (20), and

a leakage oil conduit (24) between said primary seal (19) and said secondary seal (20), wherein said leakage oil conduit (24) is subjectable to a load holding pressure existing in a piston rod side pressure chamber (21) of the cylinder (10) by switching a valve (25; 31).

5,469,705

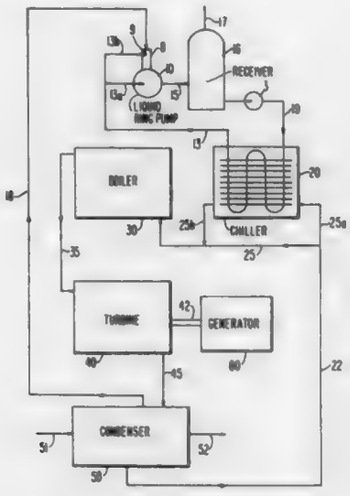
HEAT RECOVERY IN A LIQUID RING PUMP SEAL LIQUID CHILLER SYSTEM

John K. Glenn, Jr., Huntington, Conn., assignor to The Nash Engineering Company, Trumbull, Conn.

Filed Aug. 22, 1994, Ser. No. 293,835

Int. Cl.[6] F28B *7/00*

U.S. Cl. 60—693 **8 Claims**



1. A power plant comprising:

a boiler for heating a fluid in order to form a gaseous phase of said fluid;

a power generator for generating electrical power from said gaseous phase, said power generator having a first conduit for conveying said gaseous phase from said boiler to said power generator;

a condenser for partly condensing said gaseous phase to a liquid phase of said fluid after said gaseous phase has passed through said power generator, said condenser having a second conduit for conveying said gaseous phase from said power generator to said condenser;

a liquid ring pump for evacuating uncondensed gaseous phase from said condenser at a predetermined rate through a third conduit connected between said liquid ring pump and said condenser;

a chiller for cooling seal liquid discharged from said liquid ring pump, said chiller having a fourth conduit for conveying said seal liquid discharged from said liquid ring pump to said chiller, and a fifth conduit for conveying said seal liquid from said chiller to said liquid ring pump for re-use in said liquid ring pump after said seal liquid has been cooled by said chiller;

a sixth conduit for conveying a predetermined portion of said liquid phase from said condenser to said chiller so that said predetermined portion of said liquid phase is heated by heat generated during the operation of said chiller; and

a seventh conduit for conveying said predetermined portion of said liquid phase from said chiller to said boiler after said predetermined portion of said liquid phase has been heated by said chiller, said predetermined portion of said liquid phase being re-used in said boiler by being further heated in order to generate electrical power.

5,469,706

LIQUID FUEL ATOMIZING UNIT FOR MINIATURE JET ENGINE

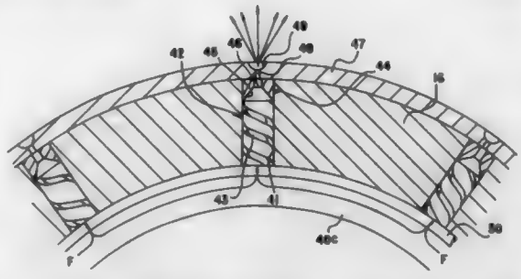
Hiroshi Hoya, Tokyo, Japan, assignor to Sophia Precision Corp., Tokyo, Japan

Filed Nov. 9, 1994, Ser. No. 338,192

Claims priority, application Japan, Nov. 10, 1993, 5-281189

Int. Cl.[6] F02C *7/22*

U.S. Cl. 60—739 **3 Claims**



1. A liquid fuel atomizing unit for a miniature jet engine, comprising: a ring-shaped liquid fuel feeding passage; plural holes extending radially from said liquid fuel feeding passage at equal spaced intervals; each of said radial holes having a revolution lead fitting extending radially from each said radial hole and provided with a spiral groove; a fuel lead fitting having a truncated cone shaped hole extending radially outward from each said fitting with the enlarged base of said cone shaped hole in contact with the outer radial end of said lead fitting and a straight hole extending radially outwardly from the truncated end of each of said cone shaped holes and a ring shaped outer fixing ring abutting the outer ends of said fuel lead fittings, said ring shaped outer fixing ring having a plurality of equally space radially extending spray holes in axial alignment with said straight holes in said fuel lead fitting, each of said radial extending holes in said ring shaped outer fixing ring having a hemispherical recess extending axially from said radial extending holes for atomizing fuel discharged through said fuel lead fittings into said spray holes in said outer fixing ring.

5,469,707

APPARATUS FOR, AND METHOD OF, PROVIDING AN ATMOSPHERE OF PREDETERMINED HUMIDITY

Fali M. Dadachanji, Marlow, Great Britain, assignor to Protimeter PLC, United Kingdom

PCT No. PCT/GB92/00910, § 371 Date Nov. 5, 1993, § 102(e) Date Nov. 5, 1993, PCT Pub. No. WO92/21080, PCT Pub. Date Nov. 26, 1992

PCT Filed May 20, 1992, Ser. No. 140,196

Claims priority, application United Kingdom, May 22, 1991, 9111065

Int. Cl.[6] F25B *21/02;* **F25D** *17/06*

U.S. Cl. 62—3.3 **7 Claims**

1. An apparatus for providing an atmosphere of predetermined humidity, comprising:

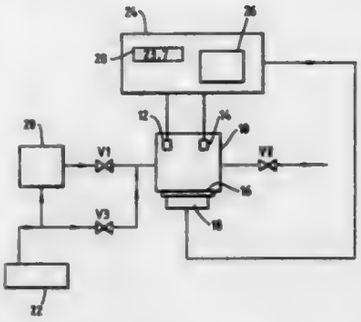
a chamber for containing the atmosphere;

means for supplying dry air and moist air to said chamber;

means for drawing air from said chamber;

control means for controlling the amounts of dry air and moist air supplied to the chamber to afford a course adjustment of humidity;

fine control means including moisture removal means for removing moisture from the atmosphere in said chamber, said moisture removal means including a cooled surface within said chamber upon which condensation of moisture from said



atmosphere can take place to remove such moisture from said atmosphere, and means for controlling the temperature of said surface to control moisture removal by said moisture removal means;

a control facility controlling said dry and moist air supplying means, and said means for drawing air from the chamber, and/or controlling said moisture removal means; and

humidity sensing means with said chamber providing an output signal to said control facility.

5,469,708

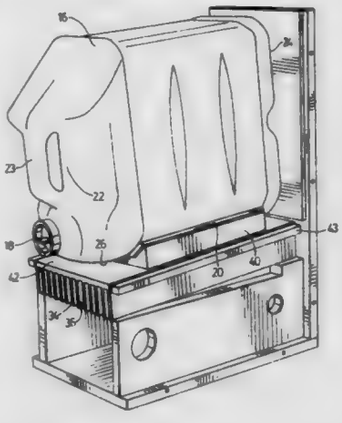
WATER COOLER

Howard R. Harrison, 1302 Martley Drive, and Jeffrey R. Brown, 1309 Martley Drive, both of Mississauga, Ontario, Canada

Filed Sep. 23, 1994, Ser. No. 311,240

Int. Cl.[6] F25B *21/02*

U.S. Cl. 62—3.64 **11 Claims**



1. A counter-top cooler for liquid containers having an operable outlet for liquid, the outlet being positioned such that, when the container is oriented for dispensing liquid with the outlet open, liquid in the container flows out to substantially empty the container, the cooler comprising:

a thermally conductive support having an upper seat surface which is angled at a front edge about 5 degrees to the horizontal and shaped for intimate contact with at least a substantial part of a bottom surface of the container;

thermo electric cooling means connected to a lower surface of the seat to remove heat from the seat;

a heat sink for dispersion of heat removed from the seat;

insulating screen means to screen an underpart of the set for the heat sink;

a reservoir being located at the front edge of the thermally conductive seat for run off of condensation

a fan located to direct air flow to evaporate liquid in said reservoir in the heat sink to disperse heat therefrom.

5,469,709

REGENERATOR FOR VUILLEUMIER HEAT PUMP

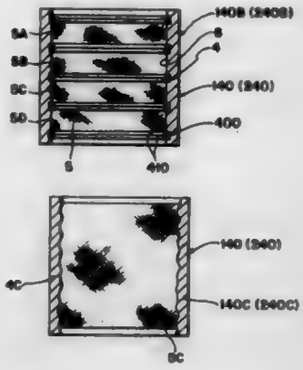
Byung M. Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Mar. 16, 1994, Ser. No. 213,703

Claims priority, application Rep. of Korea, Jun. 18, 1993, 1993-10814

Int. Cl.[6] F25B *9/14*

U.S. Cl. 62—6 **8 Claims**



1. In a Vuilleumier heat pump including fluid chambers interconnected by a conduit in which a regenerator is mounted, the conduit conducting fluid from one chamber to another and longitudinally through the regenerator so that heat is exchanged between the fluid and the regenerator, the improvement wherein the regenerator comprises a body having an internal surface contacted by the fluid flowing longitudinally through the regenerator for guiding the fluid flow, a porous heat absorbing/emitting structure housed within the body, and a flow interrupting structure provided laterally between the heat absorbing/emitting structure and the internal surface for inhibiting the leakage of fluid between the heat absorbing/emitting structure and the internal surface, wherein the flow interrupting structure comprises circumferential grooves formed in the internal surface, and ring devices mounted in respective ones of the grooves, an inner periphery of each ring device projecting laterally inwardly beyond the inner surface and contacting the porous heat absorbing/emitting structure to cause the fluid to flow laterally inwardly along the ring devices and into the porous heat absorbing/emitting structure.

5,469,710

CRYOGENIC RECTIFICATION SYSTEM WITH ENHANCED ARGON RECOVERY

Henry E. Howard, Grand Island; Neil M. Prosser, East Amherst, and Mark J. Roberts, North Tonawanda, all of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Oct. 26, 1994, Ser. No. 329,386

Int. Cl.[6] F25J *3/04*

U.S. Cl. 62—22 **8 Claims**

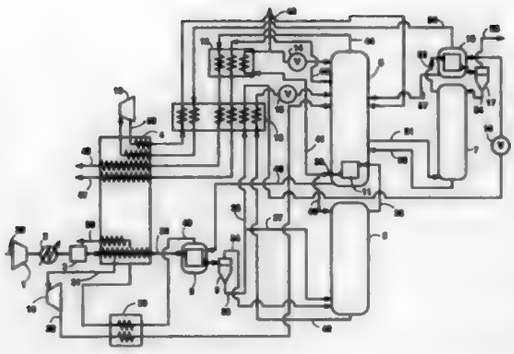
1. A method for the cryogenic rectification of feed air employing a higher pressure column, a lower pressure column, and an argon column, comprising:

(A) passing feed air into the higher pressure column and separating feed air within the higher pressure column by cryogenic rectification into nitrogen-enriched fluid and oxygen-enriched fluid;

(B) passing argon-containing fluid into the lower pressure column;

(C) passing argon-containing fluid from the lower pressure column into the argon column and separating argon-containing fluid by cryogenic rectification within the argon column into argon-richer vapor and oxygen-richer liquid;

(D) at least partially condensing argon-richer vapor by indirect heat exchange with vaporizing elevated pressure liquid having



a pressure which exceeds that of the lower pressure column to produce elevated pressure vapor;

(E) turboexpanding elevated pressure vapor to generate refrigeration;

(F) passing resulting turboexpanded vapor into the lower pressure column; and

(G) recovering argon-richer fluid as argon product.

5,469,711

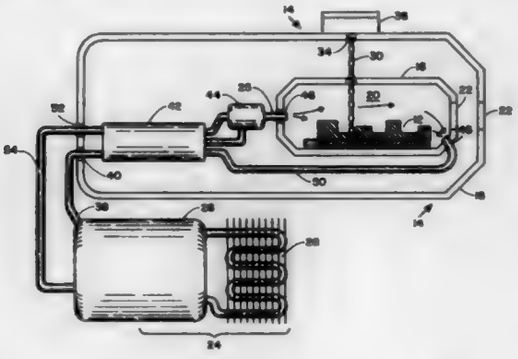
CRYOGENIC PACKAGING FOR UNIFORM COOLING

Joseph R. McCoy, Frankfort, N.Y., assignor to Infrared Components Corporation, Utica, N.Y.

Filed Apr. 15, 1994, Ser. No. 228,215

Int. Cl.[6] F25B *19/00*

U.S. Cl. 62—51.1 **5 Claims**



1. A cryogenic packaging for even cryogenic cooling of an operating electronic device, comprising:

a cryogenic vessel having a sealed chamber for containing an operating electronic device, said cryogenic vessel thermally isolating said sealed chamber from an outside environment;

signal carder means penetrating said cryogenic vessel and said sealed chamber for carrying electrical signals between an operating electronic device contained in said sealed chamber and a connector disposed outside said cryogenic vessel;

a cryogen generator including an inlet port for receiving a cryogenic gas; an outlet port for discharging said cryogenic gas; and heat discharge means for removing heat from the cryogenic gas so that the discharged gas is at a desired cryogenic temperature;

first conduit means coupling said cryogenic gas discharged from said outlet port through said heat discharge means into said sealed chamber; and

second conduit means for carrying said cryogenic gas from said sealed chamber through said heat discharge means to said inlet port so that an operating electronic device contained therein is continually bathed in said cryogenic gas at said cryogenic temperature so that temperature gradients along the operating electronic device contained therein are avoided.

5,469,712

DEVICE FOR DEHYDRATING AND/OR EMBEDDING SAMPLES

Hellmuth Sitte, Seefeld in Tirol, Austria; Klaus Neumann, Bexbach-Saar, Germany; Ludwig Edelmann; Helmut Haessig, both of Homburg-Saar, Germany; Anton Lang, Vienna, and Heinrich Kleber, Wien/Streberadorf, both of, Austria, assignors to Leica AG, Vienna, Austria

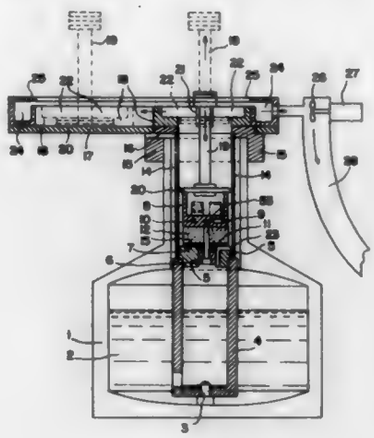
PCT No. PCT/EP93/02408, § 371 Date May 31, 1994, § 102(e) Date May 31, 1994

PCT Filed Sep. 6, 1993, Ser. No. 232,152

Claims priority, application Austria, Sep. 8, 1992, 1787/92

Int. Cl.[6] F25B *19/00*

U.S. Cl. 62—51.1 **17 Claims**



1. A device for dehydrating and/or embedding samples, comprising:

a sample container and a Dewar vessel, the sample container being removably inserted in the Dewar vessel, and the Dewar vessel containing liquid nitrogen, wherein

a stationary metallic cooling surface is disposed within and fixedly connected to the Dewar vessel and is cooled by the liquid nitrogen in the Dewar vessel, and

the sample container that is removably inserted in the Dewar vessel has a contact surface that is complementary to the cooling surface and contacts the stationary cooling surface when the sample container is inserted in the Dewar vessel to provide heat exchange between the stationary cooling surface and the contact surface,

the device being capable of accepting sample containers for either dewatering or freeze drying a sample and thereafter polymerization embedding of the sample.

5,469,713

LUBRICATION OF REFRIGERANT COMPRESSOR BEARINGS

Frank Wardle, Bodegraven; Bo Jacobson, Zeist; Henk Dolfsma, Tull en 'T Waal, all of, Netherlands, and Arthur Butterworth, La Crosse, Wis., assignors to SKF USA, Inc., King of Prussia, Pa.

Filed Jan. 21, 1994, Ser. No. 184,861

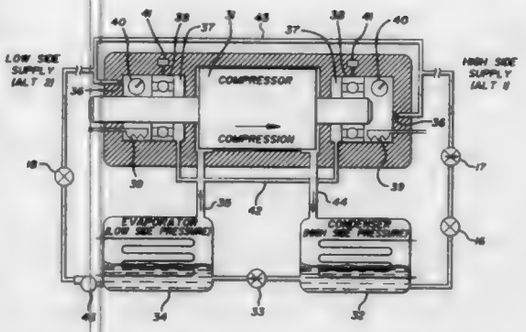
Int. Cl.[6] F25B *43/02*

U.S. Cl. 62—84 **7 Claims**

1. A method for lubricating a bearing in a refrigerant device, comprising the steps of:

providing a refrigerant flow path with said beating being disposed in a portion of said flow path;

circulating a liquid refrigerant in said portion of said flow path, said liquid refrigerant containing a lubricant therein which is miscible with said liquid refrigerant, said lubricant ranging from about 0.5% to about 5.0% by weight of the weight of said liquid refrigerant; and



vaporizing at least a portion of said liquid refrigerant proximate said bearing solely by bearing friction heat to deposit said lubricant on said bearing to produce a concentration of lubrication in said liquid refrigerant of at least 75% lubricant, based on the total weight of liquid deposited on said bearing.

5,469,714

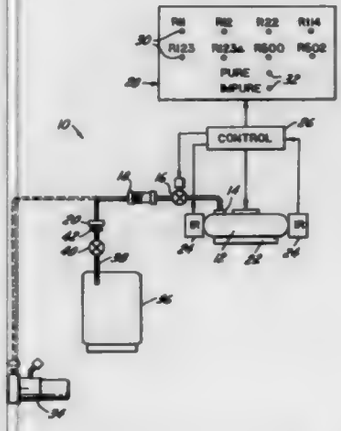
METHOD AND APPARATUS FOR ANALYZING REFRIGERANT PROPERTIES

Kenneth W. Manz, Paulding, and Sandra Snyder, Bryan, both of Ohio, assignors to SPX Corporation, Muskegon, Mich.

Division of Ser. No. 160,224, Dec. 2, 1993, Pat. No. 5,371,019. This application Sep. 30, 1994, Ser. No. 315,596

Int. Cl.[6] F25B *49/00*

U.S. Cl. 62—125 **5 Claims**



1. A refrigerant handling system that includes a compressor having an inlet, input means for connecting said compressor inlet to a source of refrigerant, and means coupled to said input means for analyzing and indicating refrigerant composition, purity or both composition and purity prior to passage of the refrigerant to said compressor comprising:

a refrigerant sample vessel,

means for connection to said vessel to evacuate said vessel,

means for selectively connecting said vessel to a vapor port at the refrigerant source so that reduced pressure in said vessel draws refrigerant in vapor phase into said vessel,

means coupled to said vessel for reducing temperature of said vessel and thereby condensing refrigerant within said vessel, and

means operatively coupled to said vessel for measuring and indicating composition, purity or both composition and purity of liquid phase refrigerant in said vessel.

5,469,715

DEFROST CYCLE CONTROLLER

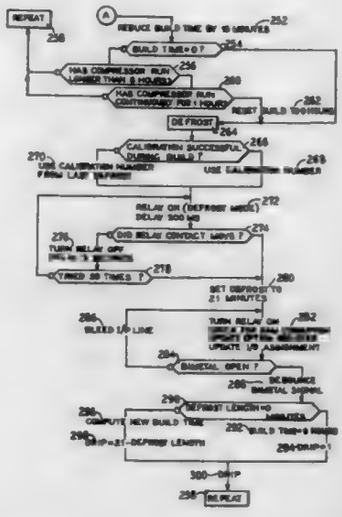
Donald E. Janke, Bentow Township, Berrien County, Mich.; Joseph M. Szynal, Laporte, and Ronald W. Guess, Scott Township, Vanderburgh County, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Continuation of Ser. No. 978,275, Nov. 18, 1992, Pat. No. 5,363,669. This application Sep. 26, 1994, Ser. No. 311,455

The portion of the term of this patent subsequent to Nov. 15, 2011, has been disclaimed.

Int. Cl.[6] F25D *21/00*

U.S. Cl. 62—155 **6 Claims**



1. A defrost cycle controller for a freezer system including a compressor whose operation is actuated by a thermostatic switch and a defrost heater whose operation is actuated by a bimetal switch, comprising:

a relay operatively connected to mutually exclusively couple the compressor and the defrost heater to a power supply;

a first signal line providing a first signal indicative of the operating status of the compressor;

a second signal line providing a second signal indicative of the operating status of the defrost heater;

a microprocessor operatively coupled to the first and second signal lines and to the relay to control energization of the relay and to select coupling of the compressor and the defrost heater to the power supply, the microprocessor being programmed to sense the first and second signals and vary the length of time intervals during which the compressor and defrost heater are coupled to the power supply, the microprocessor being programmed to couple the defrost heater to the power supply after a preselected continuous compressor run period.

5,469,716

SCROLL COMPRESSOR WITH LIQUID INJECTION

Mark Bass, Sidney, Ohio, and Alexander P. Rafalovich, Indianapolis, Ind., assignors to Copeland Corporation, Sidney, Ohio

Filed May 3, 1994, Ser. No. 237,449

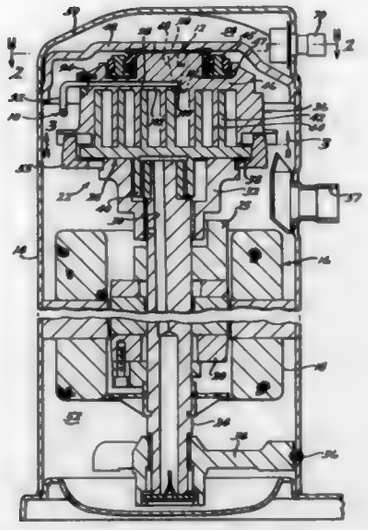
Int. Cl.[6] F25B *31/00*; **F04C** *18/04;29/04*

U.S. Cl. 62—505 **21 Claims**

1. A scroll-type compressor for handling a working fluid, comprising:

first and second scroll members having intermeshed spiral wraps;

a drive mechanism for causing said scroll members to engage in cyclical relative orbiting motion, said spiral wraps forming successive enclosed spaces which move during normal operation from a radially outer position where said working fluid is



at a suction pressure to a radially inner central position where said working fluid is at a higher central pressure;

a discharge diffuser disposed near said central position and having a diverging sidewall for discharging said working fluid from said enclosed spaces, said discharge diffuser having no discharge value and being adapted to reduce the pressure within an innermost enclosed space to allow for the injection of a liquid into said innermost enclosed space; and

a liquid injection circuit for injecting said liquid into said innermost enclosed space to reduce the temperature of said working fluid, said liquid injection circuit including an injection passage extending from a liquid refrigerant supply member to an injection port formed in one of said scroll members, said injection port being disposed proximate to said diffuser such that said injection port is in communication with said discharge diffuser during a portion of said cyclical relative orbiting motion of said scroll members.

5,469,717

METHOD FOR KNITTING A CROSSING PATTERN AND AN APPARATUS FOR KNITTING A CROSSING PATTERN IN FLAT KNITTING MACHINE

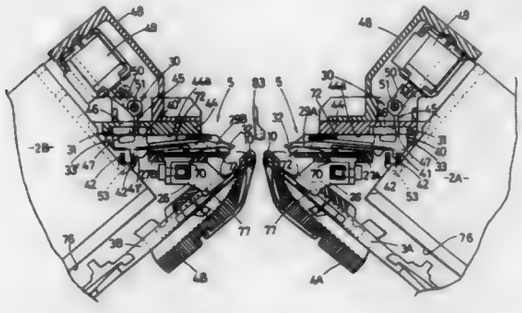
Takekazu Shibuta; Toshinori Nakamori, and Ikuhito Hirai, all of Wakayama, Japan, assignors to Shima Seiki Mfg., Ltd., Wakayama, Japan

Filed Dec. 20, 1993, Ser. No. 169,138

Claims priority, application Japan, Dec. 22, 1992, 4-342629

Int. Cl.[6] D04B *7/00*

U.S. Cl. 66—69 **3 Claims**



1. A knitting apparatus for knitting a crossing pattern texture on a flat knitting machine, comprising:

a pair of front and rear needle beds, each of said front and rear needle beds having as plurality of needle groves parallel and equally spaced along a length of said needle beds, each of said needle grooves having a needle therein;

needle cams for selectively advancing and retracting said needles in said needle grooves transverse of said needle beds for forming knit stitches on said needles in yarn fed to said needles as said needles are advanced and retracted;

a transferring jack bed supported by a support part above each of said needle beds;

transfer jacks each movable transverse of said jack beds in jack grooves parallel along a length of said jack beds;

a transferring cam for moving each of said transfer jacks in said jack groove forward and backward in said jack grooves by acting on jack butts on each of said transfer jacks, said transferring cam having a cam groove, a lift cam protruding into said cam groove for retracting said transferring jacks in said jack grooves, and means for moving said lift cams into and out of said cam groove of said transferring cam, wherein each of said transferring jacks is retracted in said jack groove or remains forward depending on said lift cam position being in or out of said cam groove of said transfer cam.

5,469,718

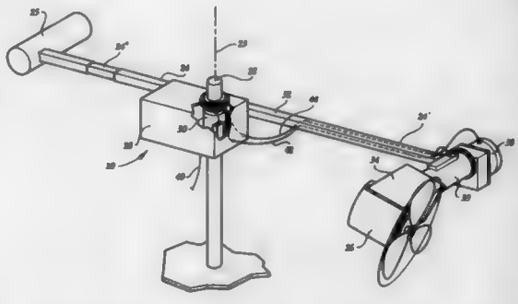
DEBRIS CLEANING APPARATUS FOR CIRCULAR KNITTING MACHINES AND LIKE TEXTILE MACHINES

Alan Gutschmit, Troy, N.C., assignor to Alandale Industries, Inc., Troy, N.C.

Filed Oct. 13, 1994, Ser. No. 323,034

Int. Cl.[6] D04B *35/32*

U.S. Cl. 66—168 **37 Claims**



1. Apparatus for cleaning debris from, and preventing settlement of debris on, a textile machine, comprising means defining a central axis of rotational movement, a blower for producing a moving airstream, means for mounting said blower to said central axis defining means at a radially outward spacing from said central axis, means for moving said blower relative to said mounting means to direct said moving airstream in a defined path of cleaning movement, repetitively over the course of normal cleaning operation and means for moving said mounting means rotatably about said central axis at alternatingly increasing and decreasing rotational speeds repetitively over the course of normal cleaning operation.

5,469,719

FULL AUTOMATIC WASHING MACHINE

Tooru Imai, Tajimi; Satoru Matsumoto, Seto; Kiyoshi Okazaki, Seto, and Yuji Nagata, Seto, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 28, 1994, Ser. No. 219,794

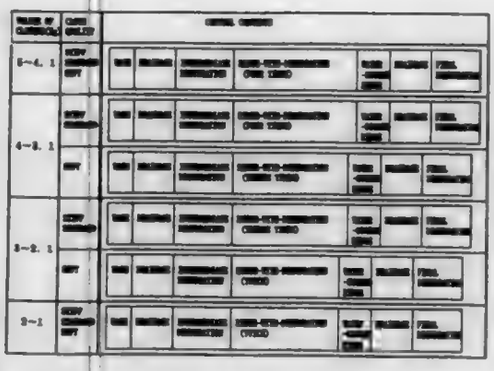
Claims priority, application Japan, Mar. 26, 1993, 5-068207; May 26, 1993, 5-124128

Int. Cl.[6] D06F *33/02*

U.S. Cl. 68—12.04 **17 Claims**

17. A full automatic washing machine, comprising:

an outer tub;



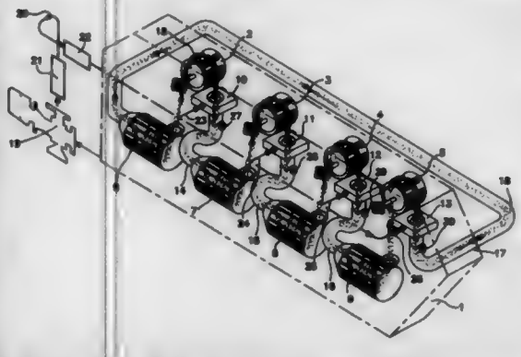
a rotatable tub rotatably mounted in the outer tub;
an agitator rotatably mounted in the rotatable tub;
an electric motor for driving the rotatable tub and the agitator;
rinse control means for controlling either a stored-water rinse mode wherein clothes accommodated in the rotatable tub are rinsed with water being stored in the rotatable tub or a rinse-with-dehydration mode wherein the clothes are rinsed and dehydrated with the water being supplied into the rotatable tub; and
operation mode selecting means for automatically selecting either the stored-water rinse mode or the rinse-with-dehydration mode on the basis of data on the status of the clothes, which data is obtained during execution of a wash step and includes a volume, a degree of soiling or a cloth quality of the clothes.

5,469,720

MACHINE FOR DYEING FABRICS WOUND UP INTO ENDLESS FABRIC LOOPS

Roberto Paggi, Milan, Italy, assignor to Paggi S.r.l., Italy

Filed Jun. 29, 1994, Ser. No. 268,248
Claims priority, application Italy, Jul. 8, 1993, MI93A1474
Int. Cl.[6] D06B *3/28*
U.S. Cl. 68—13 R **9 Claims**



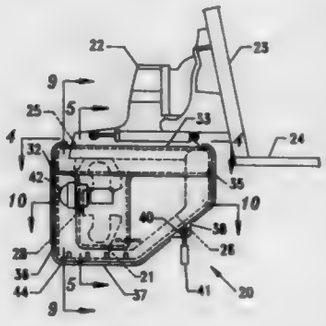
1. In a machine for dyeing fabrics wound into endless fabric loops, including a dyebath tank containing dyebath liquor, a plurality of overflow or jet devices arranged in a series in said tank, a like plurality of reels associated with said devices for feeding a fabric loop successively through the devices in said series thereof, a pump for circulating dyebath liquor from said tank through said devices, and a microprocessor control unit for driving one of said reels at a predetermined speed, and the remainder of said reels at speeds determined by signals generated during the passage of said fabric loop through said devices, the improvement comprising means for monitoring the rate at which the fabric loop to be dyed passes through each of said devices, said monitoring means including a plurality of signal generating elements equal in number to said devices, said signal generating elements being secured to said fabric loop at equispaced intervals therealong for travel therewith through said devices, and a signal sensor mounted on each of said devices to sense and relay a signal to said microprocessor control unit each time one of said signal generating elements passes one of said sensors, the relayed signals being operative to cause said microprocessor control unit to synchronize the speed of rotation of said other reels with the speed of rotation of said one reel, so that it will take the same interval of time for each section of the fabric loop between an adjacent pair of said signal generating elements to pass through each of said devices.

5,469,721

BOAT PROPELLER CASE AND LOCK

Stephen K. Pyle, 3026 Dixie Hwy., Waterford, Mich. 48328

Filed Mar. 25, 1994, Ser. No. 217,558
Int. Cl.[6] B63H *5/16*
U.S. Cl. 70—14 **10 Claims**



1. In an apparatus for reducing damage to and deterring theft of a boat propeller, comprising: a case for substantially enclosing a boat propeller and a portion of a drive unit to which said propeller is connected, said drive unit attached to a boat and including a horizontal stabilizer fin and a vertical rudder below said stabilizer fin, said case being divided approximately into symmetrically opposite members comprising a first member and a second member, said members having horizontal upper walls for supporting said case in an elevated position on said drive unit and being pivotally connected along a vertical axis for opening and closing said case to completely enclose said propeller and said stabilizer fin and rudder of said drive unit; a means for pivotally connecting said members; and a lock for selectively locking and unlocking said case members to prevent a theft of said propeller.

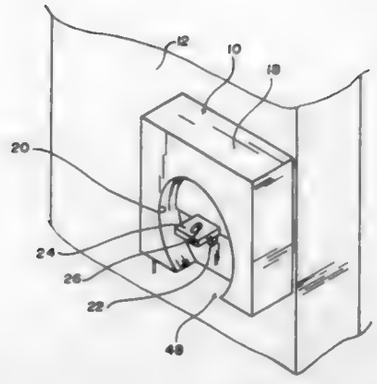
5,469,722

HASP FOR A CYLINDER LOCK

Robert J. Ellefsen, 4519 E. Wonderlake Dr., Wonderlake, Ill. 60097

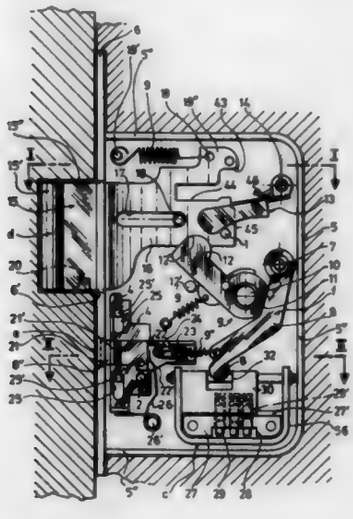
Filed Jun. 24, 1993, Ser. No. 83,034
Int. Cl.[6] E05B *65/48;67/36*
U.S. Cl. 70—56 **21 Claims**

1. A hasp for a round cylinder lock, the hasp comprising a steel reinforced plate, the steel reinforced plate having a truncated circular indentation on a front side thereof for encapsulating an outer diameter of a round cylinder lock, said truncated circular indentation having a depth generally equivalent to an axial thickness of the round cylinder lock, said truncated circular indentation having a hasp hole, the hasp hole being positioned within the truncated circular indentation for receiving a locking pin that extends from a round cylinder lock, said locking pin being fixed to the round cylinder lock even when the round cylinder lock is in an unlocked position, said hasp hole being sized slightly larger than an outer circumference of the locking pin, a plate lug supported on the steel reinforced plate and projecting axially outwardly of the truncated circular indentation for telescoping engagement internally of the round cylinder lock, the plate lug having a plate lug hole extending generally at right angles to the plate lug, the plate



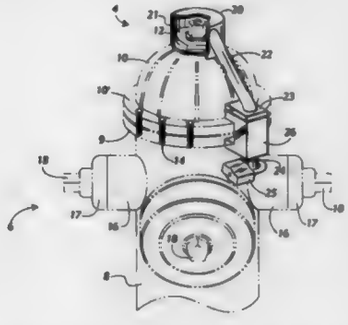
lug hole being positioned for receiving a sliding tubular lock shaft carried on the round cylinder lock, said plate lug being extendible into the round cylinder lock for receipt of the sliding tubular lock shaft within the plate lug hole, thereby enabling the plate lug and the hasp to be secured in locked assembly with the round cylinder lock.

5,469,723
SAFETY LOCKS
Noel Litwin, and Abraham I. Scherz, both of Leiva 4875, Buenos Aires, Argentina
Continuation-in-part of Ser. No. 732,216, Jul. 19, 1991, abandoned. This application Nov. 25, 1992, Ser. No. 982,691
Claims priority, application Argentina, Jul. 25, 1990, 317458
Int. Cl.[6] E05B *63/08;55/02*
U.S. Cl. 70—107 **17 Claims**



1. A lock comprising:
a housing having an indoor side and an outdoor side;
an axis passing through said housing from said indoor side to said outdoor side;
a main bolt having a bolt portion and a latch portion, said main bolt being displaceable into and out of said housing;
a double acting actuating mechanism coupled to said main bolt by said axis, said axis having a first pin to actuate said actuating mechanism and a second pin to actuate said actuating mechanism, said first pin and said second pin displacing said main bolt into and out of said housing;
locking means for preventing displacement of said main bolt;
a combination hub being disposed in said housing, said combination hub releasing said locking means when a combination key is introduced into said combination hub;
means for limiting the displacement of said main bolt upon movement out of said housing such that only said latch portion is exposed out of said housing, said combination hub comprises a fixed base and a movable base displaceably mounted on said fixed base, said fixed base being provided with a plurality of perforations which pass through said fixed base and which perforations end in a key housing, said fixed base being provided with a double group of perforations, each group of perforations coinciding with said movable base perforations, said fixed base perforations housing through-pins of different heights and said movable base perforations housing drive pins, said drive pins being pressed by springs against said fixed base, a flat bit key comprising depressions to compensate for the height of said bolt pins such that when said key is inserted in said key housing, an internal end of said each of bolt pins of said fixed base are at substantially the same level allowing for displacement of said movable base with respect to said fixed base.

5,469,724
FIRE HYDRANT LOCKING DEVICE
Jerry K. Pollard, 15 Surrey Trail, Rome, Ga. 30161
Filed Jan. 12, 1994, Ser. No. 180,680
Int. Cl.[6] F16K *35/00*
U.S. Cl. 70—178 **19 Claims**



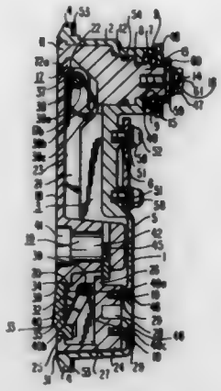
1. A locking device for a fire hydrant, the fire hydrant including an upright generally cylindrical barrel having a mounting flange at its upper end, a domed bonnet having a mounting flange fastened to the mounting flange of the barrel, and an operating nut protruding through the bonnet for operating a valve in the fire hydrant to permit water to charge the hydrant, comprising:
a cap for placement over the protruding portion of the operating nut and enclosing the operating nut;
at least one arm connected at one of its ends to said cap, said arm being sized and shaped to extend from said cap, when placed over the operating nut, downwardly and about the dome of the hydrant toward the barrel and passing downwardly beyond the mounting flange of the barrel;
bracket means sized and shaped to removably receive said arm, said bracket means being adapted to be fastened to the mounting flange of the barrel, wherein a longitudinal passage is defined within said bracket means and passes therethrough, said passage being adapted to receive said arm therein;
a generally horizontal tamper shield disposed on said arm, said tamper shield being sized and shaped to be received on said bracket means; and
means for locking said arm to said bracket means so that said cap, said bracket means, and the bonnet of the fire hydrant cannot be removed from the fire hydrant when said locking means is locked.

5,469,725

DOOR LOCKING HANDLE ASSEMBLY OF PULL-OUT AND SIDE-SWINGING LEVER-ACTION TYPE

Kenichi Yamada, Tokyo, Japan, assignor to Takigen Manufacturing Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1994, Ser. No. 197,068
Claims priority, application Japan, Mar. 16, 1993, 5-081289
Int. Cl.[6] E05B 13/10
U.S. Cl. 70—208 4 Claims



1. A door locking handle assembly of a pull-out and side-swinging lever-action type, comprising:

a casing (1) for fixedly mounting on a door (55);

a locking shaft (11) rotatably mounted in a cylindrical portion (2) of a base-end portion of said casing (1) in an insertion manner, said locking shaft (11) being non-axially slidable in said cylindrical portion (2) and having its rear-end portion fixed to a catch plate (36);

a retractable handle (18) which folds into a front concave portion (3) of said casing (1), and has its base-end portion pivoted to a front-end portion of said locking shaft (11) through a first cross pivot (37), said handle (18) being provided with a lock-receiving portion (19) and an engaging projection (20) in its front-end portion;

a biasing spring (38) for swingably biasing said handle (18) in its projecting direction on said first cross pivot (37), said biasing spring (38) being mounted between said locking shaft (11) and said handle (18);

a button casing (24) which is fixedly mounted in a front-end portion of said front concave portion (3) of said casing (1), and provided with an engaging projection (25) in its front-end portion side and another engaging projection (26) in an intermediate portion of its base-end portion side;

a push button (30) pivoted to a front-end portion of said button casing (24) through a second Cross pivot (39), said push button (30) being provided with an engaging-hook portion (31) in its front-end portion;

a position-keeping spring (40) which is interposed between said button casing (24) and said push button (30), and resiliently forces said push button (30) to swing on said second cross pivot (39) so as to have said engaging-hook portion (31) of said push button (30) engaged with said engaging projection (25) of said button casing (24);

a lock unit (41) fixedly embedded in said lock-receiving portion (19) of said front-end portion of said handle (18); and

a lock plate (45) which is interlocked with a rotor (42) of said lock unit (41) so as to move back and forth as said rotor (42) rotates;

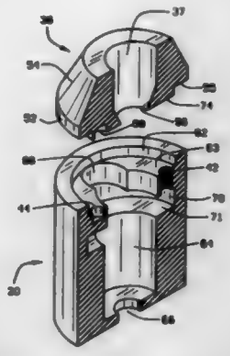
wherein said engaging projection (20) of said front-end portion of said handle (18) engages with a rear surface (32) of a base-end portion side of said push button (30), so that the handle (18) is held in its retracted position, and said lock plate (45) engages with said another engaging projection (26) of said button casing (24) to have said handle (18) locked up.

5,469,726

NUT LOCKING APPARATUS

Robert E. Rushing, and Linda L. Rushing, both of 908 Elliott, Alton, Ill. 62002

Filed Jun. 10, 1994, Ser. No. 257,712
Int. Cl.[6] F16B 71/00
U.S. Cl. 70—232 15 Claims



1. A lock assembly for preventing access to a nut threadably secured onto a bolt, the locking assembly comprising:

a cylindrical body having a first end and a second end;

a chamber within said body, said chamber sized to receive the nut and allow tightening of the nut onto the bolt;

a bolt aperture in said first end, said bolt aperture in communication with said chamber, said bolt aperture having a diameter less than a smallest diameter of the nut;

a counterbore in said second end, said counterbore in communication with said chamber and defining a seating surface;

an annular channel disposed between said counterbore and said chamber, said annular channel coaxial with said counterbore;

a lever disposed in said annular channel and limitedly rotatable therein, said lever having a threaded bore;

a cap having a bore therethrough and a boss on one end, said boss adapted to be received in said counterbore; and

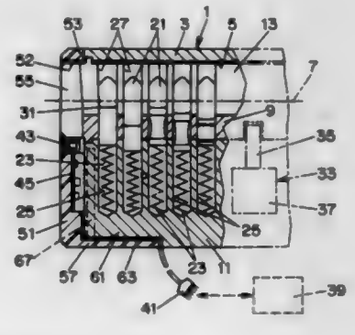
a lug having a threaded stud on a first end and adapted to be received through said bore, said threaded stud received in said threaded lever bore whereby a tightening of said lug causes said cap to be secured onto said body sealing said chamber.

5,469,727

ELECTRONIC LOCK CYLINDER

Karl-Heinz Spahn, Ostbevern; Helmut Aswegen, Drensteinfurt, and Franz Schwerdt, Telgte, all of, Germany, assignors to Aug.Winkhaus GmbH & Co. KG, Telgte, Germany

Filed Mar. 8, 1993, Ser. No. 27,664
Claims priority, application Germany, Mar. 6, 1992, 42 07 161.5
Int. Cl.[6] E05B 49/00
U.S. Cl. 70—278 11 Claims



1. A lock cylinder comprising

a profile housing of a profile lock cylinder, the housing including a cylinder section having a bore for a cylinder core and a root section projecting radially from the cylinder section and having an axial front face,

at least one cylinder core disposed rotatably in the bore of the housing and having a keyway extending in the direction of a cylinder axis for insertion of a key and a plurality of tumblers mechanically controllable by the key,

a detachable mounting on the housing and having a portion covering at least the axial front face of the root section and having an opening coaxial with the bore and receiving an extension of the cylinder core projecting from the bore, the extension being a cap separate from the cylinder core and being received on a projection on the front end of the cylinder core,

a first information transmitter/receiver element disposed in the vicinity of the keyway which upon insertion of the key into the keyway is capable of being coupled with a second transmitter/receiver element of an electronic control circuit of the key for transmission of coding information,

an electronic control circuit of the lock connected to the first transmitter/receiver element which, as a function of transmitted coding information, transmits a control signal representing a lock status, the electronic control circuit of the lock including a circuit chip,

the circuit chip of the electronic control circuit of the lock, and

the first information transmitter/receiver element, and the mounting forming a structural unit that is removably attached to the housing.

5,469,728

SHAPED GROOVE COUNTERMATRIX FOR ROTARY GROOVE PULLEY MATRIX AND COUNTERMATRIX BENDING HEAD PIPE BENDING MACHINES

Alessandro Caporusso, and Mario Caporusso, both of Via Pantanelle, 21, Piedimonte San Germano, Frosinone, Italy

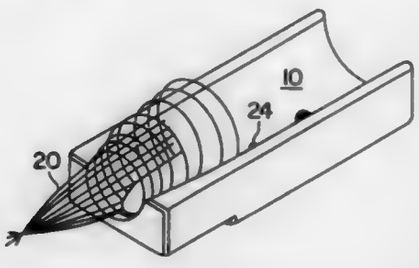
Division of Ser. No. 29,063, Mar. 10, 1993, Pat. No. 5,345,802. This application Sep. 12, 1994, Ser. No. 304,705

Claims priority, application Italy, Mar. 12, 1992, RM92U0064

The portion of the term of this patent subsequent to Sep. 13, 2011, has been disclaimed.

Int. Cl.[6] B21D 7/04

U.S. Cl. 72—154 **5 Claims**



1. A countermatrix for a pipe bending machine, the countermatrix comprising an elongated body having an elongated groove therein, the elongated body having a longitudinal axis, and the groove having arcuate cross sections in planes parallel to each other and perpendicular to said axis that decrease in radius of curvature toward one end of said elongated body.

5,469,729

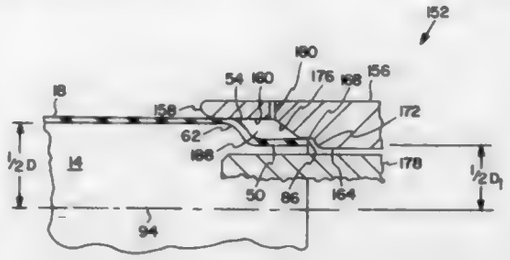
METHOD AND APPARATUS FOR PERFORMING MULTIPLE NECKING OPERATIONS ON A CONTAINER BODY

Milton S. Hager, Westminster, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Nov. 23, 1993, Ser. No. 157,827

Int. Cl.[6] B21D 41/04

U.S. Cl. 72—379.4 **21 Claims**



1. A method for performing multiple necking operations on an upper and open end of a sidewall of a container body having an initial diameter, comprising the steps of:

forming a first neck portion having a first neck diameter less than the initial diameter on the upper end of the container body with a first necking assembly, said forming a first neck portion step comprising exerting a radially inwardly directed force on the upper end of the container body;

forming a second neck portion having a second neck diameter less than the first neck diameter on at least a mesial portion of the first neck portion with a second necking assembly, said forming a second neck portion step comprising exerting a radially inwardly directed force on the at least a mesial portion of the first neck portion;

capturing a fluid in a substantially enclosed area defined by an exterior portion of a portion of the sidewall of the container body and at least part of said second necking assembly disposed radially outwardly from said container body during at least a portion of said forming a second neck portion step, said capturing step comprising causing a potential for exerting a radially inwardly directed hydraulic force on portions of the container body which are radially and mechanically unsupported and which define a portion of said enclosed space; and

venting the enclosed area during said forming a second neck portion step to reduce an amount of said hydraulic force and a potential for undesired deformation of the portions of the container body which are radially and mechanically unsupported and which define a portion of said enclosed space.

5,469,730

PIPE BENDING MACHINE

Norman L. Heaman, 11 Meadow Crescent, Edmonton, Alberta, Canada

Filed Oct. 13, 1994, Ser. No. 322,144

Int. Cl.[6] B21D 9/08

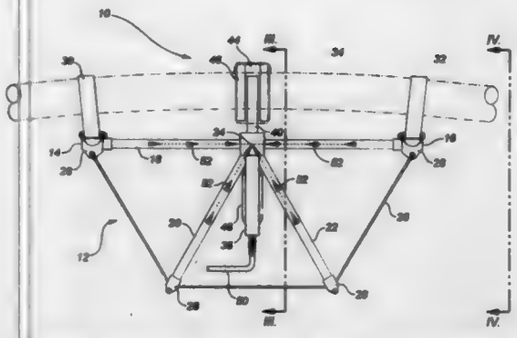
U.S. Cl. 72—389 **6 Claims**

1. A pipe bending machine, comprising:

a cord and lattice support structure having a first end, a second end, an interior lattice framework and an exterior connecting cord which connects the periphery of the interior lattice framework;

pipe securing means secured to the support structure adjacent each of the first end and the second end; and

pressure exerting means secured to the support structure intermediate the first end and the second end, the pressure exerting means having a pressure member movable in relation to the support structure thereby exerting a bending force upon a pipe held by the pipe securing means, the bending force placing the interior lattice framework in compression and the connecting cord in tension, the forces of compression and tension



being off-setting thereby enabling the support structure to withstand the bending force.

5,469,731

APPARATUS AND METHOD FOR A GAS QUANTITY SETTING SYSTEM

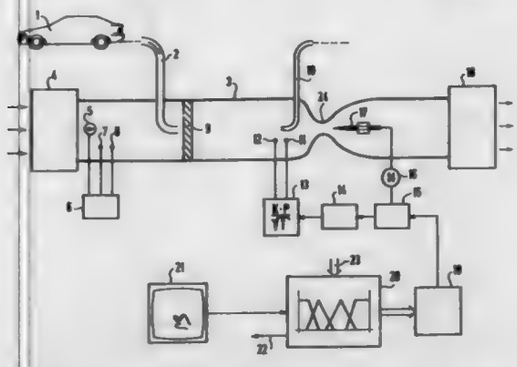
Hans-Josef Decker, Ronnenberg, and Klaus-Peter Schwarz, Burgdorf, both of, Germany, assignors to Siemens Aktiengesellschaft, München, Germany

Filed Nov. 2, 1993, Ser. No. 145,938

Claims priority, application Germany, Nov. 2, 1992, 42 37 009.4; European Pat. Off., Jul. 15, 1993, 93111433

Int. Cl.[6] G01M *15/00*; G01N *1/22*

U.S. Cl. 73—23.31 **18 Claims**



1. An apparatus for a gas quantity setting system in which a mixture of dilution air and exhaust gas is sampled for analysis, the apparatus comprising:

a cross-sectionally variable, venturi nozzle, the venturi nozzle defining an axis; and

an axially adjustable, conical, nozzle needle,

wherein a position of the nozzle needle in the venturi nozzle is adjusted based on a temperature, a pressure and measured values of a mass rate of flow meter, such that a dilution ratio of the exhaust gas has a predetermined constant value despite fluctuations in quantities of exhaust gas fed to the apparatus.

5,469,732

METHOD AND DEVICE FOR GAS ANALYSIS

Gunter Voss, Much, Germany, assignor to Auditec GmbH, Germany

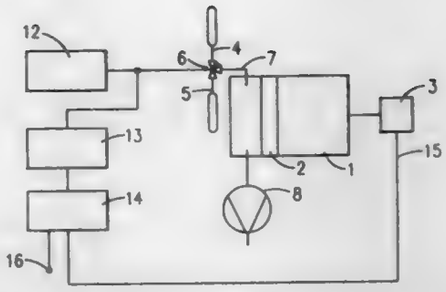
Filed May 6, 1994, Ser. No. 239,140

Claims priority, application Germany, May 15, 1993, 43 16 196.0

Int. Cl.[6] G01N *7/10*

U.S. Cl. 73—31.04 **17 Claims**

1. Method of analysis of gasses and gas mixtures where a gas which is to be analyzed is linked via a molecular diffusion path to a measurement chamber in which a pressure sensor registers pressure changes, wherein the pressure of gas (1) is modulated and wherein the pressure sensor (3) registers pressure changes according to their amplitude and time, which arise due to the different diffusion times of different gas components.



5,469,733

CANTILEVER FOR ATOMIC FORCE MICROSCOPE AND METHOD OF MANUFACTURING THE CANTILEVER

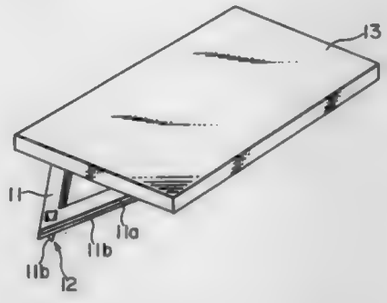
Takao Yasue, and Tadashi Nishioka, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1994, Ser. No. 194,169

Claims priority, application Japan, Feb. 16, 1993, 5-026841

Int. Cl.[6] G01B *5/28*; H01J *37/26*

U.S. Cl. 73—105 **9 Claims**



1. A cantilever for an atomic force microscope comprising:

a pointed probe, and

a cantilever body supporting said pointed probe and deflecting in response to an atomic force between said pointed probe and a sample, said pointed probe including a resist film and a silicon nitride film.

5,469,734

SCANNING APPARATUS LINEARIZATION AND CALIBRATION SYSTEM

Marc R. Schuman, San Francisco, Calif., assignor to Topometrix, Santa Clara, Calif.

Continuation of Ser. No. 979,762, Nov. 20, 1992, abandoned. This application Dec. 15, 1994, Ser. No. 357,133

Int. Cl.[6] H01J *37/00*

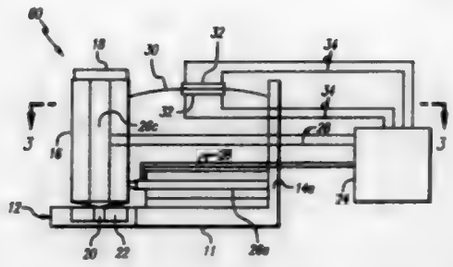
U.S. Cl. 73—105 **32 Claims**

1. A system for linearization and calibration of an electromechanical scanning apparatus, said system comprising:

fixed mounting means;

scanning means mounted for displacement in two dimensions relative to said fixed mounting means;

control means for generating a command signal for a desired displacement of said scanning means;



electromechanical actuator means electrically connected to said control means and mounted to said fixed mounting means for displacing said scanning means in said two dimensions of displacement relative to said fixed mounting means in response to said command signal;

deflecting means mounted between said scanning means and said fixed mounting means adapted to undergo deflection in response to displacement of said scanning means;

means attached to said deflecting means for measuring said deflection of said deflecting means and for generating an output deflection signal indicative of an amount of deflection of said deflecting means; and

means for determining an actual displacement of said scanning means in two dimensions of displacement based upon said output deflection signal.

5,469,735

SELF-DIAGNOSING APPARATUS AND METHOD FOR DETERMINING OCCURENCE OF FAILURE IN INNER CYLINDER PRESSURE RESPONSIVE SENSOR APPLICABLE TO ENGINE COMBUSTION DETECTING/CONTROLLING SYSTEM

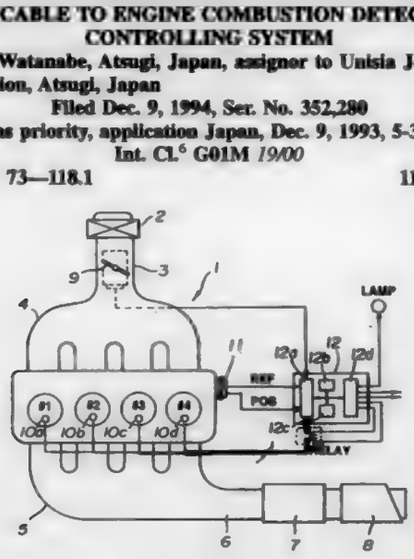
Satoru Watanabe, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Dec. 9, 1994, Ser. No. 352,280

Claims priority, application Japan, Dec. 9, 1993, 5-309412

Int. Cl.[6] G01M *19/00*

U.S. Cl. 73—118.1 **11 Claims**



1. A self-diagnosing apparatus for determining whether a failure in any one of inner cylinder pressure responsive sensors occurs, said inner cylinder pressure responsive sensors being disposed on respective engine cylinders so as to detect pressures within the respective engine cylinders for the respective engine cylinders and output inner cylinder pressure responsive signals indicative thereof, said diagnostic apparatus comprising:

a) means for integrating one of said inner cylinder pressure responsive signals which corresponds to one of said engine cylinders for a predetermined integral interval, said integrating means integrating any other of said inner cylinder pressure responsive signals for each predetermined integral interval which corresponds to any other of the engine cylinders so as to derive the individual integrated values for all of the engine cylinders;

b) means for calculating a first average value on the basis of at least presently and previously derived integrated values for every one of the engine cylinders;

c) means for calculating a second average value on the basis of the presently derived integrated value for any one of the engine cylinders and previously derived second average value for all of the engine cylinders;

d) means for establishing a predetermined relationship for each corresponding one of the engine cylinders between the first average value derived for the corresponding one of the engine cylinders and the second average value derived for all of the engine cylinders and comparing the established predetermined relationship with a predetermined threshold value;

e) means for determining an occurrence of failure in any one of the inner cylinder pressure responsive sensors which corresponds to the corresponding one of the engine cylinders for which the compared first average value is derived when the established predetermined relationship is equal to or larger than the predetermined threshold value; and

f) means for outputting a warning signal when said determining means determines the occurrence of failure in any one of the inner cylinder pressure sensors.

5,469,736

APPARATUS AND METHOD FOR MEASURING A BOREHOLE

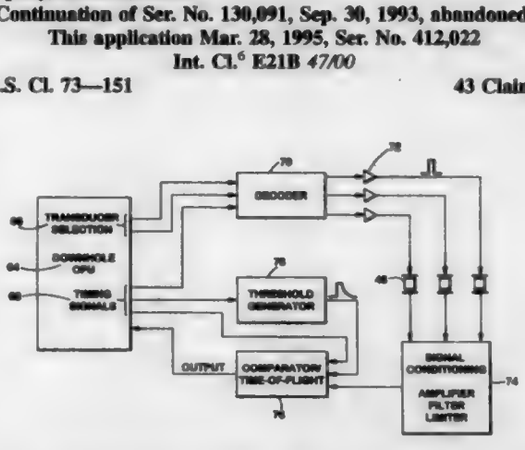
Gordon Moake, Houston, Tex., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 130,091, Sep. 30, 1993, abandoned.

This application Mar. 28, 1995, Ser. No. 412,022

Int. Cl.[6] E21B *47/00*

U.S. Cl. 73—151 **43 Claims**



1. An apparatus for determining dimensions of a borehole during a drilling operation, comprising:

a drill bit;

a logging tool coupled to said drill bit;

at least three distance determining sensors circumferentially spaced relative to said logging tool, each of said sensors adapted for generating an output signal in response to an input pulse and generating an output pulse in response to an input signal; and

control circuitry in communication with said sensors, said control circuitry comprising:

signal conditioning circuitry receiving said output pulse, and amplifying and filtering said output pulse to generate a filtered signal;

a threshold generator generating a threshold signal whose magnitude decays exponentially with elapsed time; and

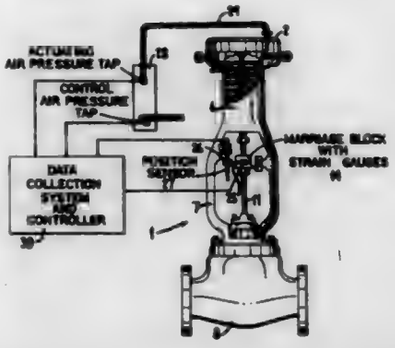
a comparator receiving said threshold signal and said filtered signal, comparing the magnitude of said threshold signal with a magnitude of said filtered signal, and generating a time-of-flight signal representative of an elapsed time between transmission of said output signal and receipt of said input signal by one of said sensors in response to filtered signals having a magnitude greater than the magnitude of said threshold signal.

5,469,737

METHOD AND APPARATUS FOR MEASURING THE AXIAL LOAD AND POSITION OF A VALVE STEM

Christopher P. Smith, and Paul G. Anderson, both of Acworth, Ga., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 20, 1993, Ser. No. 169,256
Int. Cl.[6] G01M *19/00*; F16K *37/00*; G01L *5/00*
U.S. Cl. 73—168 15 Claims



1. A method for measuring and monitoring the axial load on a valve stem, the method comprising the steps of connecting one end of the valve stem to one end of a valve actuator drive shaft with a marriage block connecting member capable of generating an electrical signal representative of the axial load or thrust on the valve stem, generating electrical signals representative of the axial load or thrust on the valve stem, and converting said electrical signals to an output indicative of the actual axial load or thrust on the valve stem.

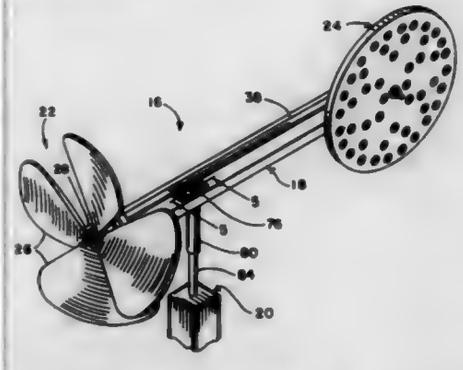
7. Apparatus for measuring and monitoring the axial load on a valve stem, the apparatus comprising a marriage block connecting member connecting one end of the valve stem with one end of a valve actuator drive shaft, said marriage block connecting member capable of generating an electrical signal representative of the axial load or thrust on the valve stem.

5,469,738

WIND SPEED INDICATOR

David L. Hendrickson, 7490 N. Navajo Rd., Fox Point, Wis. 53217

Filed Jun. 14, 1994, Ser. No. 259,473
Int. Cl.[6] G01F *1/00*
U.S. Cl. 73—170.07 19 Claims



1. A wind speed indicator, comprising:
a rotatable member rotatably driven by the wind; and
spaced, individual wind speed indicia on the rotatable member for blending into a virtual ring, wherein the spaced individual wind speed indicia comprises at least two bands of indicia, the indicia in a first one of the bands being spaced differently than the indicia in a second one of the bands, wherein the blending of the indicia in each band into a virtual ring indicates that wind speed exceeds a predetermined threshold.

5,469,739

ON-LINE FISHING DEPTH INDICATOR WITH ENCAPSULATED COMPONENTS

Michael P. McGuire, Ripon, Wis., assignor to Bait Data, Inc., Ripon, Wis.

Division of Ser. No. 38,412, Mar. 29, 1993, abandoned. This application Jul. 12, 1994, Ser. No. 274,864
The portion of the term of this patent subsequent to Oct. 4, 2011, has been disclaimed.
Int. Cl.[6] G01F *23/14*
U.S. Cl. 73—301 12 Claims

1. An on line, trollable fishing depth indicator for monitoring the water depth of a trollable fishing bait when both the depth indicator and the bait are secured to and trolled by a fishing line, the fishing depth indicator of the type including an elongate body having an outer peripheral wall, opposite closed ends and a hollow interior cavity, through ports in the body and in communication with the cavity, means for securing the body to a fishing line in combination with a fishing bait for trolling the body through the water with the fishing bait, and a pressure sensor in the cavity and in communication with the ports for reading the water pressure in the ports and producing in response thereto a usable output signal indicating the water depth of the transducer, the trollable fishing depth indicator further comprising:

a. electronic means housed in the cavity and in communication with the pressure sensor and adapted for producing an electronic signal in response to the usable output signal;

b. a visual readout device housed in the cavity and adapted for receiving the electronic signal and producing therefrom a visual readout indicating the depth corresponding to the pressure sensed by the sensor; and

c. an insulating material enveloping the electronic means and the visual readout device and sealing same in the cavity.

5,469,740

INTERACTIVE VIDEO TESTING AND TRAINING SYSTEM

Barry J. French, Bay Village; Kevin R. Ferguson, Broadview Heights; Holley A. McDonald, III, Cleveland, all of Ohio; Andrew B. Glass, Dix Hills, N.Y.; Timothy Mohanalingh, and Gregory Borges, both of Cleveland Heights, Ohio, assignors to Impulse Technology, Inc., Bay Village, Ohio

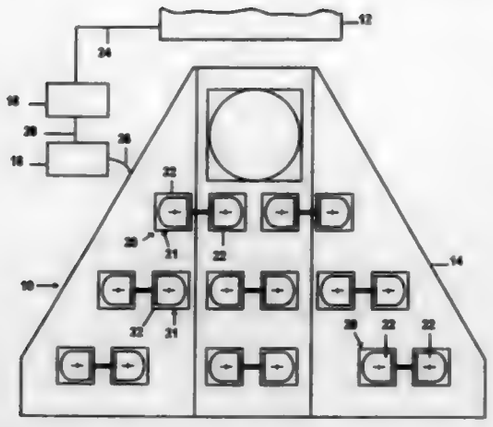
Continuation-in-part of Ser. No. 388,157, Jul. 14, 1989, Pat. No. 5,099,782, and a continuation-in-part of Ser. No. 801,877, Dec. 3, 1991. This application Dec. 2, 1992, Ser. No. 984,337
Int. Cl.[6] A61B *5/22*
U.S. Cl. 73—379.04 26 Claims

20. A reaction movement sequence system for directing and assessing leg movement performance of a subject, comprising:

a. a plurality of intercept positions geometrically oriented and arrayed to provide predetermined relationships reachable by movements of the subject;

b. display means for graphically representing said intercept positions;

c. first means operatively associated with said display means for presenting on said display means a visual cue of a designated target intercept position graphically corresponding to one of



said plurality of intercept positions different from the current intercept position of the subject;

d. analog sensor means operatively associated with said designated target position providing a signal in accordance with movement thereon;

e. timing means for receiving said signal from said sensor means and determining the time interval from said subject reaching an intercept position until reaching a predetermined stability thereon;

f. second means for initiating another visual cue at said designated intercept position and prescribing a course of subject movement therefrom; and

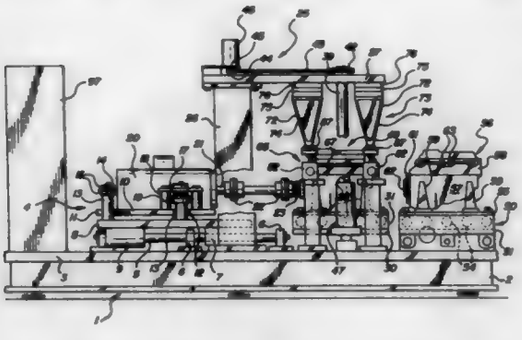
g. means associated with said timing means for graphically displaying information on said display means related to said time interval.

5,469,741

APPARATUS AND METHODS FOR DETECTING IMBALANCE

George Scourtes, Clearwater, Fla., and John P. Gagneur, Westland, Mich., assignors to Lucas Automation & Control Engineering, Inc., Reston, Va.

Filed Jun. 18, 1993, Ser. No. 79,459
Int. Cl.[6] G01M *7/06; 1/16*
U.S. Cl. 73—462 **46 Claims**



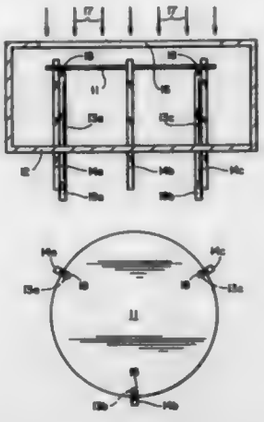
1. Apparatus for testing for imbalance a workpiece having at least one rotatable element, said apparatus comprising means for positioning said workpiece in a test position; means for rotating said element while said workpiece is in said station and at a speed sufficient to cause a moving, unbalanced mass to exert a force on said workpiece tending to move said workpiece relative to said position; restraining means acting on said workpiece during rotation of said element for preventing virtually any movement thereof in all directions from said position; and force sensing means acting on said workpiece for sensing force applied on said workpiece by said moving unbalanced mass.

5,469,742

ACOUSTIC TEMPERATURE AND FILM THICKNESS MONITOR AND METHOD

Yong J. Lee, 2600 E. Renner Rd., Apt. 285, Richardson, Tex. 75082; Butrus T. Khuri-Yakub, 4151 Donald Dr., Palo Alto, Calif. 94306, and Krishna C. Saraswat, 12356 Parker Ranch Rd., Saratoga, Calif. 95070

Filed Mar. 9, 1993, Ser. No. 28,331
Int. Cl.[6] G01N *29/18*
U.S. Cl. 73—597 **17 Claims**



1. The method of measuring a characteristic of a semiconductor wafer during processing which comprises the steps of

launching an acoustic wave in the wafer at one location so that the acoustic wave propagates through the wafer,

measuring the elapsed time required for the acoustic wave to travel between two spaced locations on the wafer, and

converting said elapsed time to a measure of said characteristic between said two locations;

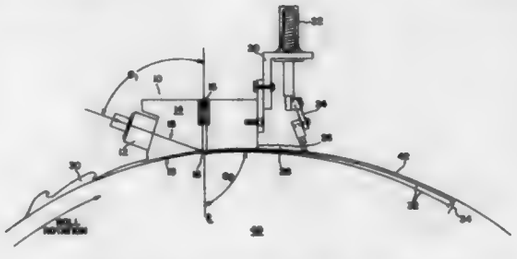
wherein the elapsed time is measured between a number of spaced locations and wherein said elapsed times are converted into a profile of the characteristic of said wafer.

5,469,743

DYNAMIC SURFACE WAVE ROLL INSPECTION DEVICE

Roger H. Zorn, 84 Crescent Blvd. Ext., Coraopolis, Pa. 15108

Filed Jun. 24, 1993, Ser. No. 82,043
Int. Cl.[6] G01N *29/04*
U.S. Cl. 73—627 **9 Claims**



1. An apparatus for dynamically inspecting rolling mill rolls for surface defects by rotating the rolls and by using ultrasonic waves, the apparatus comprising:

a housing having an arcuate bottom surface adapted to the contour of a roll surface to be inspected when placed adjacent the roll surface;

an ultrasonic angle beam transducer positioned within the housing to generate an ultrasonic shear wave substantially circumferentially in the roll surface;

means for wiping the roll surface downstream of the wave generator for cleaning liquid from the roll surface, said liquid

being present to facilitate transmission of the ultrasonic wave into the roll surface; and

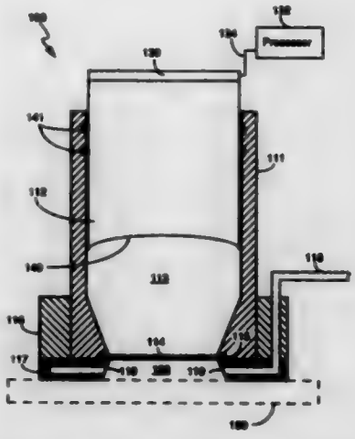
means for sensing a pulse echo reflection from within the wiped roll surface upon detection of a roll surface defect.

5,469,744

APPARATUS FOR ACOUSTICALLY INSPECTING A WORKPIECE

Thadd C. Patton, and David K. Hsu, both of Ames, Iowa, assignors to Iowa State University Research Foundation Inc., Ames, Iowa

Filed Jun. 16, 1994, Ser. No. 260,557
Int. Cl.[6] G01N *29/28*; G01H *11/00*
U.S. Cl. 73—644 **12 Claims**



1. An apparatus for acoustically inspecting a workpiece, comprising:

a tubular member;

a membrane sealed to one end of said tubular member;

an acoustic transducer assembly including a rod mounted in said tubular member, one end of said rod defining with said tubular member a first chamber and the other end of said rod acoustically coupled to a transducer;

an annular adapter attached to said tubular member, said adapter adapted to contact the workpiece and space said membrane from the workpiece to form a second chamber.

5,469,745

SYSTEM FOR DETERMINING FOVM SENSOR BEAT FREQUENCY

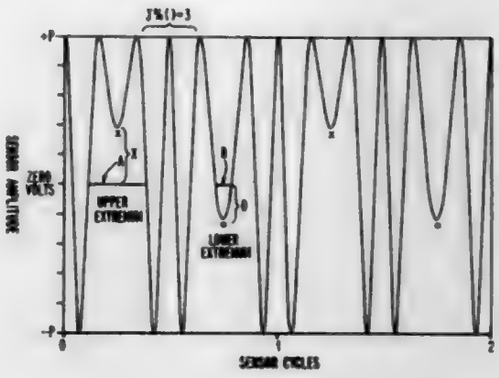
Michael Twerdochlib, Oviedo, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 1, 1993, Ser. No. 69,495
Int. Cl.[6] G01N *29/00*
U.S. Cl. 73—660 **18 Claims**

13. In a method for calibrating a vibration sensor comprising the steps of obtaining a vibration signal from the vibration sensor, the vibration signal corresponding to vibration of equipment to which the sensor is attached; extracting a beat frequency vibration signal having a beat frequency from the vibration signal; computing a resonant frequency of the vibration sensor in dependence upon the beat frequency; and calibrating the vibration sensor in dependence upon the resonant frequency; an improved method for obtaining said beat frequency vibration signal, comprising the steps of:

(a) generating a vibration signal indicative of a vibrational frequency and amplitude of the equipment; and

(b) obtaining a beat frequency from the vibration signal by storing and processing time interval data representing the time intervals between zero crossings of the vibration signal.

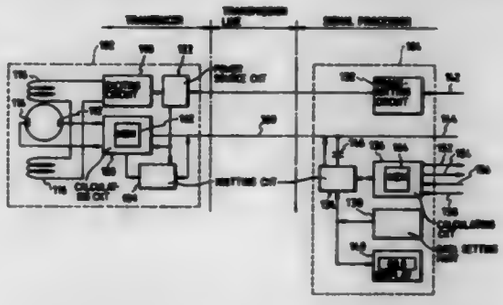


5,469,746

ELECTROMAGNETIC FLOW METER

Masao Fukunaga; Yutaka Sakurai, both of Katsuta; Kouji Saito, Mito, and Tamio Ishihara, Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1994, Ser. No. 215,339
Claims priority, application Japan, Mar. 30, 1993, 5-071462
Int. Cl.[6] G01F *1/00*
U.S. Cl. 73—861.12 **28 Claims**



1. An electromagnetic flow meter generating signals proportional to flow rate of fluid having a conduit inside which the fluid flows, a magnetic circuit for generating the magnetic field at right angles to the longitudinal direction of the fluid flow and a pair of electrodes provided at right angles to the flow directions of the fluid flow and to the direction of the magnetic field, said electromagnetic flow meter comprising:

a signal processor provided separately from a transducer; and

a signal transmission line connecting said signal processor and the transducer;

said transducer including said conduit, an exciting circuit, said pair of electrodes, a memory, an amplifying and calculating circuit, and a transmitting circuit, said transducer having a transmitter transmitting analog constant current signals proportional to flow rate through said signal transmission line and for executing digital transmission between said transducer and said signal processor.

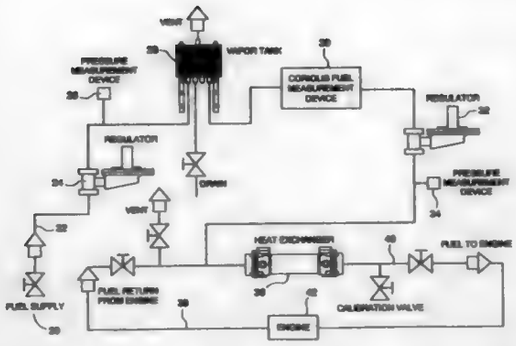
5,469,747

SYSTEM AND METHOD OF USING CORIOLIS MASS FLOW RATE METER

Lonnie E. Carlisle, Canton, and Chester M. Pesmark, Brighton, both of Mich., assignors to Detroit Diesel Corporation, Detroit, Mich.

Filed Jan. 21, 1994, Ser. No. 184,659
Int. Cl.[6] G01F *1/78*
U.S. Cl. 73—861.37 **7 Claims**

1. A method of measuring fluid flow using a Coriolis mass flow rate meter which comprises a vibrating U-shaped tube which twists



an amount proportional to the mass flow rate of the fluid therethrough according to Newton's Second Law of Motion, the meter having an inlet and an outlet, comprising:

flowing a fluid through the meter;

maintaining the pressure at the outlet of the meter above zero p.s.i.g.; and

minimizing the change in pressure from the inlet to the outlet of the meter.

5,469,748

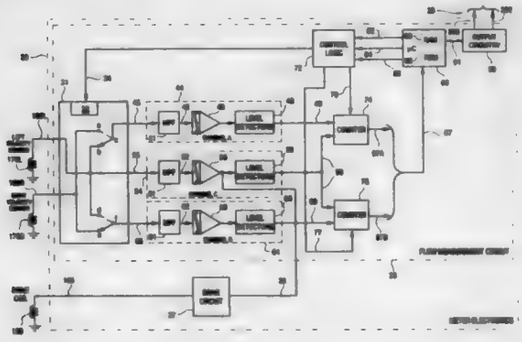
NOISE REDUCTION FILTER SYSTEM FOR A CORIOLIS FLOWMETER

Paul Z. Kalotay, Lafayette, Colo., assignor to Micro Motion, Inc., Boulder, Colo.

Filed Jul. 20, 1994, Ser. No. 278,547

Int. Cl.[6] G01F *1/68*

U.S. Cl. 73—861.38 **11 Claims**



6. Signal processing apparatus for determining the phase difference between two received input signals; said signal processing apparatus comprising:

a first channel and a second channel and a third channel;

a multi-pole filter having a phase shift in each of said first and second and third channels connected to extend signals received on an input of each of said first and second and third channels to an output of each of said first and second and third channels;

means for applying a first one of said input signals to an input of said first channel;

means for connecting an input of said second channel to said input of said first channel for the reception of said first one input signal during an nth time interval;

means effective during said nth time interval for deriving a first correction factor representing the phase difference between output signals generated by said first and second channels in response to the application of said first input signal to said inputs of said first and second channels;

means effective during an nth +1 time interval for disconnecting said input of said second channel from said input of said first channel and applying said second input signal to said input of said second channel;

means effective during said nth +1 time interval for measuring the phase difference between output signals of said first and second channels; and

means for deriving a corrected phase difference between said first and second input signals during said nth +1 time interval by combining said first correction factor with said measured phase difference between said output signals of said first and second channels;

means effective during an nth −1 time interval for connecting an input of said third channel to said input of said first channel for the reception of said first input signal by said inputs of both said first and third channels;

means effective during said nth −1 time interval for generating a second correction factor representing the phase difference between output signals of said first and third channels; and

means effective during said nth time interval when said input of second channel is connected to said input of said first channel for connecting said input of said third channel to said second input signal;

means effective during said nth time interval for measuring the phase difference between output signals of said first and third channels; and

means responsive to said measurement of said phase difference between said output signals of said first and third channels during said nth time interval for combining said second correction factor with said measured phase difference between output signals of said first and third channels to derive a corrected phase difference between said first and second input signals.

5,469,749

MULTIPLE-FUNCTION FLUID MEASURING AND TRANSMITTING APPARATUS

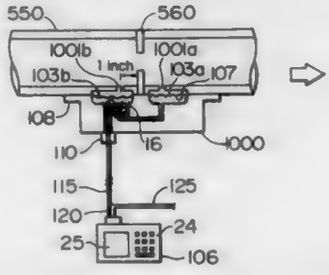
Satoshi Shimada; Seiichi Ugai, both of Hitachi; Tomoyuki Tobita, Katsuta, and Yoshimi Yamamoto, Naka, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 948,262, Sep. 21, 1992, abandoned. This application Mar. 28, 1995, Ser. No. 411,922

Claims priority, application Japan, Sep. 20, 1991, 3-241871

Int. Cl.[6] G01F *1/38*; G01L *7/08*

U.S. Cl. 73—861.47 **29 Claims**



1. A multiple-function fluid measuring and transmitting apparatus comprising:

a conduit for flowing a fluid under measurement;

a pressure receiving portion provided in said conduit;

a seal diaphragm provided to seal said pressure receiving portion at an inner wall portion of said conduit;

a pressure receiving chamber storing a pressure/temperature communicating fluid;

a differential pressure detecting portion fixed to said conduit and having a differential pressure sensor in contact with said pressure/temperature communicating fluid at a location of said seal diaphragm for detecting a differential pressure condition of said fluid under measurement;

a temperature sensor provided at a position in contact with said pressure/temperature communicating fluid at a location of said seal diaphragm for detecting a temperature condition of said fluid under measurement;

a sensor signal output means for outputting a sensor signal from said differential pressure sensor and said temperature sensor, and;

a calculating means for receiving said sensor signal from said sensor signal output means, for performing compensation using a compensation data stored in a storing means and outputting a measurement signal for indicating a condition of said fluid under measurement.

5,469,750

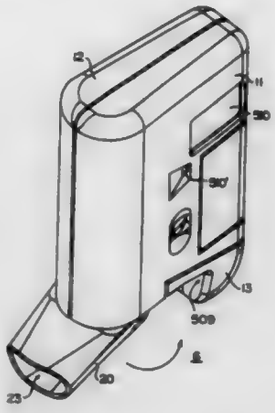
METHOD AND APPARATUS FOR SENSING FLOW IN TWO DIRECTIONS AND AUTOMATIC CALIBRATION THEREOF

Peter M. Lloyd, Oakland; Carl Ritson, San Jose; Eric T. Johansson, Dublin, and Reid M. Rubsamen, Berkeley, all of Calif., assignors to Aradigm Corporation, Hayward, Calif.

Continuation-in-part of Ser. No. 664,758, Mar. 5, 1991, Pat. No. 5,404,871. This application Jan. 29, 1993, Ser. No. 10,772

Int. Cl.[6] G01F *25/00; 1/42*

U.S. Cl. 73—861.61 **5 Claims**



1. A method of calibrating the output of a transducer in a flow path through which a medication is delivered from a hand-held metered dose inhaler, said transducer for sensing flow rates of human breath during inhalation and exhalation through a portion of a flow path in said inhaler, said flow rates having two non-linear flow characteristics and being in opposite directions therethrough over different ranges of flow, said flow path portion providing flow rate measurements representative of flow paths of the entire system, said method comprising:

(a) mounting a hand-held metered dose inhaler on a fixture terminating in a disposable cassette drug cassette;

(b) providing a flow controller having a controllable calibrated flow rate;

(c) selecting a first direction of flow simulating air flow during inhalation through the flow path and assigning a first plurality of data points defining a first flow rate range for the first direction, each of said first plurality of data points having a known flow rate;

(d) passing air at a first known flow rate into the flow path in a first direction and monitoring the signal output by the transducer in response to the first known flow rate;

(e) repeating step (d) for each other known flow rate in the first plurality of data points;

(f) deriving a first calibration array correlating the sensed transducer output with the corresponding known flow rate for each of the first plurality of data points;

(g) selecting a second direction of flow simulating flow rates during exhalation through the flow path and assigning a second plurality of data points defining a second flow rate range for the second direction, each of said second plurality of data points having a known flow rate;

(h) passing air at a second known flow rate into the flow path in the second direction and monitoring the signal output by the transducer in response to the second known flow rate;

(i) repeating step (h) for each other known flow rate in the second plurality of data points;

(j) deriving a second calibration array correlating the sensed transducer output with the known flow rate for each of the second plurality of data points;

(k) providing the first and second calibration arrays for determining the sensed flow in the first and second directions corresponding to inhalation and exhalation respectively;

(l) downloading the derived first and second calibration arrays into a memory device associated with the flow sensor;

(m) calculating a check sum for the downloaded first and second calibration arrays for determining whether or not the downloaded arrays are corrupted;

(n) testing the downloaded memory with one or more known flow rates to verify accuracy of the downloading step (l);

wherein steps (f) and (j) each further comprises processing the sensed transducer signals and correlated flow rates for each of the plurality of data points to identify outlying data points;

wherein the processing step further comprises repeating step (d) or (b) for each known flow rate identified as an outlying data point and thereafter further processing the sensed transducer signals and correlated known flow rates for each of the plurality of data points to identify any remaining outlying data points;

wherein steps (c) and (g) further comprise selecting the first and second pluralities of data points for human breath flow wherein the difference between the first and second ranges is selected from between a ratio of 2:5 to 1:100; and

wherein selecting the first plurality of data points further comprises selecting a plurality of data points over a range of from 0 to 200 liters per minute corresponding to breath inhalation.

5,469,751

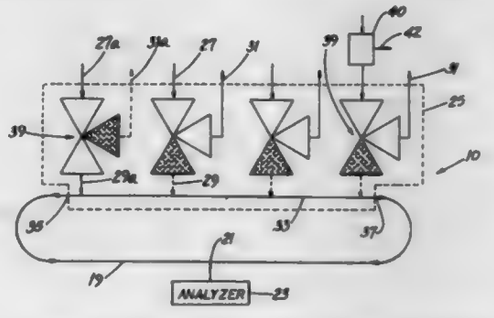
MANIFOLDED SAMPLING VALVE ASSEMBLY

Bruce W. Weiss, Whitefish Bay, and Eugene R. Rommelfaenger, Neosho, both of Wis., assignors to Sentry Equipment Corp., Oconomowoc, Wis.

Filed May 25, 1994, Ser. No. 248,662

Int. Cl.[6] F16K *11/22;* **G01N** *1/10*

U.S. Cl. 73—863.33 **17 Claims**



1. In a valve assembly for controlling flow of fluid and having a valve block with (a) at least two inlet passages, and (b) an outlet passage and wherein the assembly has two flow control valves, each for connecting a separate one of said inlet passages to the outlet passage, the improvement wherein:

each valve has a primary valving surface;

each of the two inlet passages is selectively placed in flow communication with the outlet passage by positioning a said primary valving surface; and

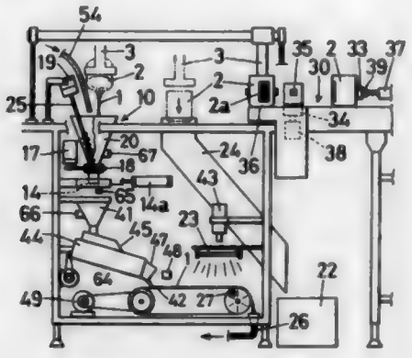
when a said primary valving surface is positioned to place an inlet passage in flow communication with the outlet passage, the outlet passage carries fluid bi-directionally.

5,469,752

APPARATUS FOR AUTOMATICALLY INSPECTING POWDERY PRODUCTS FOR THE PRESENCE OF FOREIGN SUBSTANCES

Hajime Kitamura, Ichihara; Masaru Takeuchi; Hideo Yoshikoshi, both of Hasaki; Mikio Kitai, Mito; Takashi Chino, Iruma; Yuji Nogami, Kawaguchi; Hajime Yashiro, Sagara, and Keisuke Kato, Kawasaki, all of, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan

Filed Dec. 16, 1993, Ser. No. 167,029
Claims priority, application Japan, Dec. 28, 1992, 4-349561
Int. Cl.[6] G01N *21/29;33/44*
U.S. Cl. 73—866 7 Claims



1. An apparatus for automatically inspecting a powdery material for presence of foreign substances, comprising:

a static charge eliminator for eliminating electrostatic charges generated on a powdery sample supplied to the apparatus, said static charge eliminator comprising a funnel having a shutter, a first rotary drive unit means for rotating the funnel, a first knocker for tapping said funnel, an agitator for agitating the powdery sample in said funnel, said agitator comprising a screw-agitator which has a rotation axis approximately parallel to an inclined inner wall of the funnel and a second rotary drive unit means for rotating the screw-agitator in a direction opposite to a rotation direction of the funnel, and a source for supplying static-charge eliminator liquid to the powdery sample in said funnel;

a hopper for receiving and storing the powdery sample from said static charge eliminator, said hopper including a second knocker for tapping the hopper;

a conveyor for conveying the powdery sample from the hopper;

a spreader for spreading the powdery sample over the conveyor in the form of a layer having a uniform thickness; and

a video camera for photographing, over a predetermined visual field, the powdery sample on the conveyor.

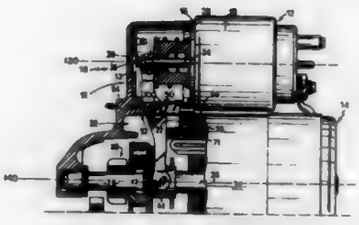
5,469,753

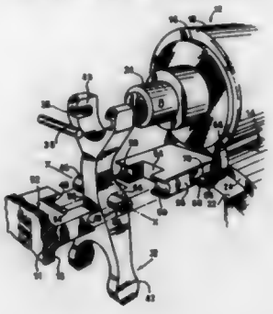
STARTER UNIT FOR A MOTOR VEHICLE ENGINE

Gilles Vadin-Michaud, Villeurbanne, and Thierry Florentin, Villefontaine, both of, France, assignors to Valeo Equipments Electriques Moteur, Creteil, France

Filed Dec. 22, 1993, Ser. No. 172,425
Claims priority, application France, Dec. 23, 1992, 9215634
Int. Cl.[6] F02N *15/06*
U.S. Cl. 74—7 A 9 Claims

1. For an internal combustion engine a starter unit comprising: a starter frame; an electric motor defining a first axis and carried by the starter frame; an electromagnetic actuator defining a second axis parallel to said first axis and carried by the starter frame, said motor having a shaft rotatable on said first axis and having a free end the actuator having an output member on said second axis and having a free end, and a casing including at least one starter nose enveloping said free ends of the motor shaft and actuator output member; and a pinion carried on the motor shaft, the starer unit further including: an actuating lever having a first end and a second





end, said first end of the actuating lever being coupled to the output member of said actuator, said second end of the actuating lever being coupled with a pinion; and a pivot mounting the actuating lever in the starter frame and defining a pivot axis for the actuating lever substantially perpendicular to said first and second axes, whereby the actuating lever controls axial displacements of the pinion, wherein the actuating lever includes a pivot shaft defining two ends thereof, said pivot comprising said pivot shaft and a two-part bearing cooperating with the latter, the two-part bearing comprising a first bearing part connoted to the starter nose and a second bearing part complementary to the first bearing part, the starter trait further including a member connected to one casing of the motor and the actuator, with said second bearing part being formed in said member, wherein the starter nose has an inner face, said first bearing part comprising a cylindrical half bearing projecting integrally from said inner face, and further having two said first half bearings, the starter nose having an integral plate element projecting from its inner face in a plane substantially at fight angles to a plane containing said first and second axes and having an end defining the two first half bearings.

5,469,754

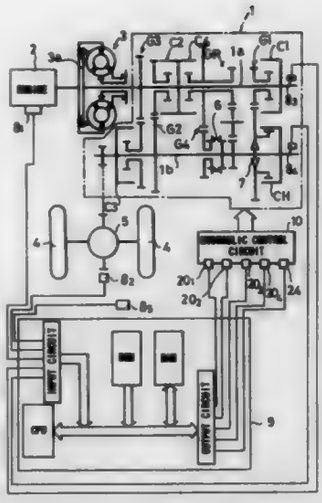
CONTROL APPARATUS FOR HYDRAULICALLY OPERATED VEHICULAR TRANSMISSION

Takafumi Sakai; Hideki Wakamatsu; Yoshihiro Tsuboi, and Masaya Kawauchi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1994, Ser. No. 282,599
Claims priority, application Japan, Sep. 1, 1993, 5-217499
Int. Cl.[6] F16H *59/20;61/04*
U.S. Cl. 74—336 R 3 Claims

1. A control apparatus for a hydraulically operated vehicular transmission having a hydraulic engaging element for a low-speed transmission train so as to establish the low-speed transmission train in cooperation with a one-way clutch, and a hydraulic engaging element for a high-speed transmission train, said apparatus having a shift valve for controlling supply and discharge of hydraulic oil to and from the hydraulic engaging element for the high-speed transmission train such that the high-speed transmission train can be established by hydraulic oil supply via said shift valve in a condition in which the hydraulic oil is kept supplied to the hydraulic engaging element for the low-speed transmission train, said apparatus comprising:

hydraulic oil pressure control means which can control to increase or reduce a supply pressure of the hydraulic oil to the hydraulic engaging element for the high-speed transmission train; and



speed change control means so arranged and constructed that, at a time of speed changing from the high-speed transmission train to the low-speed transmission train, said shift valve is maintained at an initial stage in a condition in which the hydraulic oil is supplied to the hydraulic engaging element for the high-speed transmission train, that the supply pressure of the hydraulic oil is reduced in this condition until the hydraulic engaging element for the high-speed transmission train gives rise to a slip, that the supply pressure of the hydraulic oil is maintained in the condition of reduced pressure until said one-way clutch is engaged, and that thereafter said shift valve is changed over to a condition in which the hydraulic oil is discharged from the hydraulic engaging element for the high-speed transmission train.

5,469,755

MULTI-SPEED BICYCLE HUB AND AN OPERATING MECHANISM THEREOF

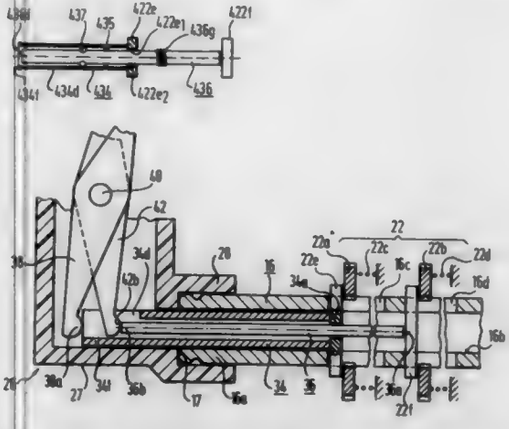
Werner Steuer, Schweinfurt, Germany, and Eduard Bergles, Österreichisch, Austria, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed May 19, 1993, Ser. No. 63,930

Claims priority, application Germany, May 21, 1992, 42 16 826.0

Int. Cl.[6] F16H *3/02*

U.S. Cl. 74—371 **47 Claims**



1. A multi-speed bicycle hub with an operating mechanism, the multi-speed bicycle hub having a hub shaft with a hub shaft axis, a hub sleeve being rotatably mounted on said hub shaft about said hub shaft axis, gear means being accommodated within said hub sleeve, at least one driving wheel being in driving connection with an input member of said gear means, at least one output member of said gear means being in driving connection with said hub sleeve, said hub shaft having an axially extending hub shaft bore open towards a hub shaft end, said hub shaft bore accommodating at least two speed change control members extending along said hub shaft bore and being in control connection with said gear means, said hub shaft end being provided with fastening means adapted for fastening engagement with counter-fastening means of said operating mechanism, said operating Mechanism comprising respective mover units operationally, engageable with respective mover side end portions of respective speed change control members, when said operating mechanism is fastened to said hub shaft end,

a first speed change control member engaging a first internal control member of said gear means more remote from said hub shaft end, a second speed change control member engaging a second internal control member of said gear means nearer to said hub shaft and, said first speed change control member passing through passage means across said second internal control member, said first speed change control member being provided with non-return means maneuverable through said passage means in an axial direction of introduction of said first speed change control member from said hub shaft end toward said first internal control member said first and said second speed change control member being provided with respective locking means preventing withdrawal of said second speed change control member out of said hub shaft bore in an axial direction opposite to said axial direction of introduction.

5,469,756

FLEXIBLE ROBOT ARM

Wendelin Feiten, Neubiberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

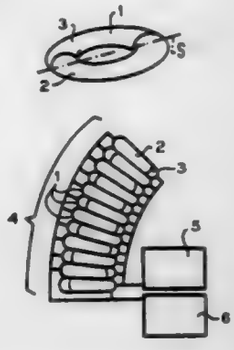
PCT No. PCT/DE92/00798, § 371 Date Apr. 8, 1994, § 102(e) Date Apr. 8, 1994, PCT Pub. No. WO93/06974, PCT Pub. Date Apr. 15, 1993

PCT Filed Sep. 18, 1994, Ser. No. 211,581

Claims priority, application Germany, Jan. 10, 1991, 41 33 605.4

Int. Cl.[6] B25J *18/06*

U.S. Cl. 74—490.05 **7 Claims**



1. A flexible robot arm apparatus, comprising:

a plurality of trunk elements joined on top of each other along an axis to form a trunk, each element being divided, by at least one cutting plane in said axis of said trunk, into segments which can be expanded or compressed independently of one another in the longitudinal direction of said trunk;

means for controlling said expansion or compression, said control means separated from said arm;

means for supplying power to said arm apparatus, said power supply means separated from said arm; and said trunk elements being oriented in a mutually reversed array in said longitudinal direction of said trunk with respect to said axis so

that a tip of said trunk can be comprehensively maneuvered by said separate expansion and compression of various said trunk element segments.

5,469,757

APPARATUS FOR THE LIMITATION OF THE WIPING ANGLE OF A WINDSCREEN WIPER UNIT

Harro Buhl, Kirchheim, and Hans-Peter Rienhardt, Neckarsulm, both of, Germany, assignors to Alfred Teves GmbH, Germany

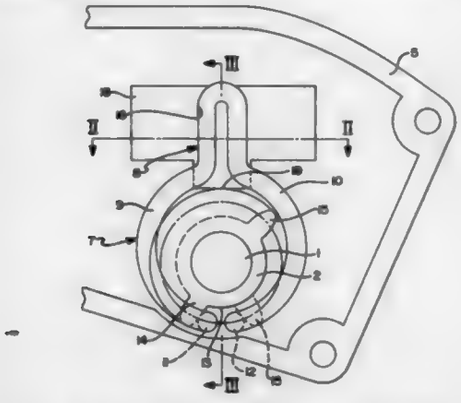
PCT No. PCT/EP92/02818, § 371 Date Aug. 27, 1994, § 102(e) Date Aug. 27, 1994, PCT Pub. No. WO93/12958, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 5, 1992, Ser. No. 108,592

Claims priority, application Germany, Dec. 28, 1991, 41 43 159.6

Int. Cl.[6] B60S *1/16*; F16H *57/00*; F16F *1/04*

U.S. Cl. 74—526 11 Claims



1. An apparatus for the limitation of the wiping angle of a windshield wiper unit for a vehicle, the wiper unit having a wiper spindle drivable to move to-and-fro, the apparatus comprising: a part-pinion lying substantially in a plane and having at least two teeth each projecting radially outwardly from said part-pinion; housing means for anchorage; a spring element having at least one springy arm, the spring element being anchored to said housing means, the at least one spring arm being elastically swingable in a plane generally parallel to the pinion plane, said springy arm having a free end projecting at an angle from said pinion plane, the springy arm being reciprocatingly engaged by said teeth to limit travel of said teeth on said part-pinion.

5,469,758

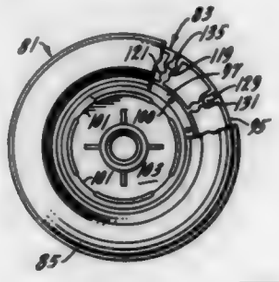
KNOB WITH SOFT PLASTIC COVER

Robert K. Howie, Jr., Decatur, Ill., assignor to The Grigoleit Company, Decatur, Ill.

Filed Nov. 3, 1993, Ser. No. 146,946

Int. Cl.[6] G05G *1/10*

U.S. Cl. 74—553 8 Claims



1. A composite knob including:

an elongated, cylindrical, inner core made of a relatively stiff plastic and having a partial outer covering of a soft, resilient plastic molded to said inner core,

said inner core having an inner hub, an outer circumferential wall encircling said inner hub, and radially extending ribs connecting said outer circumferential wall and said inner hub,

said outer circumferential wall having an outer surface and an inner surface,

each of said ribs having an axial length and a rear axial surface,

anchoring cavities for said outer covering formed in said ribs radially inwardly of said outer circumferential wall, and

said anchoring cavities communicating with said outer surface of said outer circumferential wall through narrow passages formed in said wall to receive plugs of said soft, resilient plastic of said outer covering to anchor said outer covering to said core.

5,469,759

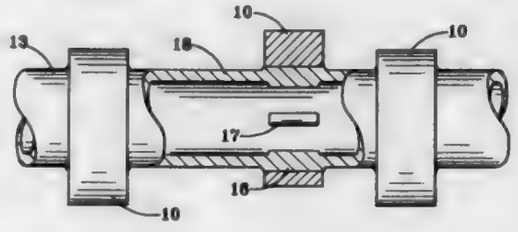
CAMSHAFT AND METHOD OF MAKING A CAMSHAFT

Louis V. Orsini, Jr., Kensington, Conn., assignor to The Torrington Company, Torrington, Conn.

Division of Ser. No. 180,743, Jan. 12, 1994, Pat. No. 5,428,894, which is a continuation-in-part of Ser. No. 912,432, Jul. 13, 1992, Pat. No. 5,280,675. This application Dec. 5, 1994, Ser. No. 349,287

Int. Cl.[6] F16H *21/40*

U.S. Cl. 74—567 3 Claims



1. A camshaft comprising:

a hollow tube (13) having a plurality of axially alternately spaced reduced diameter areas (16) and thinner wall areas (18), each reduced diameter area (16) having a plurality of circumferentially alternately spaced apart thicker wall segments (17) and thinner wall segments (19), the tube wall thickness of each thicker wall segment (17) being greater than the tube wall thickness of an axially adjacent thinner wall area (18), the tube wall thickness of each thicker wall segment (17) being greater than the tube wall thickness of a circumferentially adjacent thinner wall segment (19), the thicker wall segments (17) projecting radially inward towards a centerline of the hollow tube (13); and

a plurality of axially spaced cams (10) mounted about the hollow tube (13), each cam (10) having an axial opening and being positioned about one of the reduced diameter areas (16).

5,469,760

CLUTCH WEAR-COMPENSATING COMPOUND FLYWHEEL ASSEMBLY

Takenori Kamio, Neyagawa, Japan, assignor to Kabushi Kaisha Daikin Seisakusho, Osaka, Japan

Division of Ser. No. 96,846, Jul. 22, 1993, Pat. No. 5,349,882. This application Jun. 10, 1994, Ser. No. 257,879

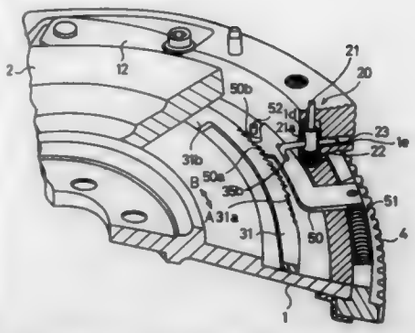
Claims priority, application Japan, Jul. 23, 1992, 4-196649

Int. Cl.[6] G05G *1/00*; F16D *13/54*

U.S. Cl. 74—572 10 Claims

1. A clutch wear-compensating compound flywheel assembly, comprising:

a first flywheel;



a ring gear peripherally connected to said first flywheel so as to rotate through a predetermined angle relative to said first flywheel;

a second flywheel connected to said first flywheel for unitary rotation and limited axial displacement relative to said first flywheel and bearing a friction facing against which a clutch disc is pressed;

a clutch wear-gauging mechanism provided in an end surface of said first flywheel facing said clutch disc, for gauging wear of said clutch disc;

an adjusting mechanism for inducing said second flywheel to move axially toward said clutch disc utilizing a cranking torque as transmitted by said ring gear, in cooperative response to said clutch wear-gauging mechanism, said adjusting mechanism including:

wedging members contacting to drive said second flywheel toward said clutch disc;

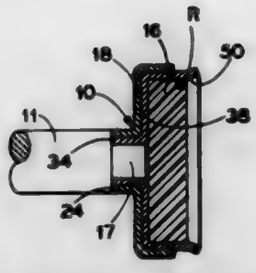
an engager arm in linkage with said clutch wear-gauging mechanism, one end of said engager arm being pivotally coupled to said ring gear and the other end of said engager arm selectively engaging one of said wedging members for wedging one of said wedging members against the other utilizing said cranking torque transmitted by said ring gear to move said second flywheel axially toward said clutch disc.

5,469,761

PUSH ROD BUTTON AND METHOD OF MAKING SAME

Charles E. Lane, 1335 Luther La., Unit C-7, Bldg. #33, Arlington Heights, Ill. 60004, assignee to Charles E. Lane, Arlington Heights, Ill.

Filed Sep. 7, 1994, Ser. No. 302,056
Int. Cl.[6] B60T 13/52
U.S. Cl. 74—579 R **10 Claims**



1. A push rod assembly for a power train of an automotive braking system comprising in combination,

an elongated cylindrical push rod of a first selected diameter and having a portion at one end thereof of a second selected diameter which is a reduced diameter relative to said first selected diameter,

a push rod button sub-assembly press fit on said reduced diameter portion at said one end of said push rod in firm assembly therewith,

said button sub-assembly comprising:

first and second parts consisting of strip stock of less than fifty thousandths inch thickness (0.050") drawn by stamping to form cup-shaped work piece articles having respectively,

each said cup-shaped work piece article having a bottom wall with an outer circumferentially extending peripheral wall extending longitudinally in one axial direction, and with an inner circumferentially extending peripheral wall of smaller diameter extending coaxially longitudinally in an opposite axial direction,

said first and said second parts being nested together in interfitting press fit subassembly with one another and being sized and shaped so that said conjoined outer peripheral walls and said bottom walls form a reaction disc recess, and

said conjoined inner peripheral walls form a recess for receiving and seating said reduced diameter portion at said one end of said push rod,

whereby a completed push rod assembly is formed for use in the power train of said automotive braking system.

5,469,762

DEVICE FOR STRIPPING ELECTRIC CONDUCTORS AND/OR WIRES

Franz Krampe, Bergstrasse 5,, D-49387 Ascheberg-Herbern, Germany

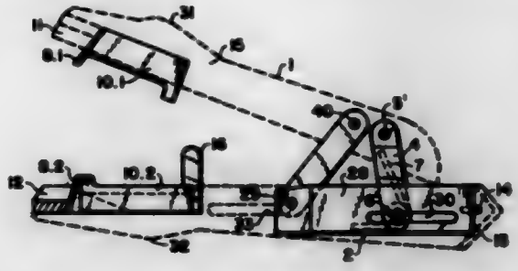
PCT No. PCT/EP93/01695, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO94/01906, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 1, 1993, Ser. No. 204,158

Claims priority, application Germany, Jul. 2, 1992, 42 21 900.5

Int. Cl.[6] H02G 1/12

U.S. Cl. 81—9.43 **18 Claims**



1. In a device for stripping insulation from wires, said device comprising two legs designed as stripping tools, each leg having at one end at least one swivel pin about which the respective leg can pivot, and having in the area of its other end, at least one cutting tool element; the improvement comprising an intermediate element pivotally connected at spaced points thereof to said swivel pins of said two legs, thereby forming a double hinge, such that when both legs, with their respective cutting tool parts, are held as forceps and are pressed against each other, they slide in contrary motion against each other and their respective cutting tool elements are forced away from each other to strip insulation from a wire.

5,469,763

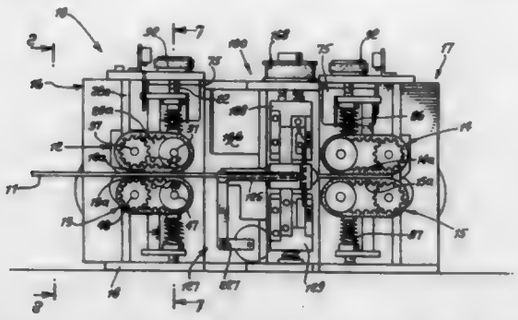
WIRE AND CABLE PROCESSING SYSTEM

Jack L. Hoffa, Brea, Calif., assignor to Eubanks Engineering Company, Monrovia, Calif.

Continuation-in-part of Ser. No. 22,981, Feb. 25, 1993, Pat. No. 5,375,485, which is a continuation-in-part of Ser. No. 857,972, Mar. 26, 1992, Pat. No. 5,293,683, which is a continuation-in-part of Ser. No. 659,557, Feb. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 611,057, Nov. 9, 1990, Pat. No. 5,146,673. This application Nov. 8, 1993, Ser. No. 148,568

Int. Cl.[6] H02G 1/12

U.S. Cl. 81—9.51 56 Claims



1. In wire processing apparatus wherein wire is moved endwise along a travel path, the combination comprising:

a) a primary wire processing blade pair including first and second blades at opposite sides of the wire travel path,

b) a secondary wire processing blade pair including third and fourth blades at opposite sides of the wire travel path,

c) drive means,

d) and means operatively connected between said drive means and said blade pairs, and operatively intercoupling the first and third blades, and also operatively intercoupling the second and fourth blades, and responsive to operation of the drive means to cause the first blade to be displaced toward said path as the third blade is displaced away from said path, and to cause the second blade to be displaced toward said path as the fourth blade is displaced away from said path,

e) and belts extending along said travel path for engaging and advancing the wire therealong.

5,469,764

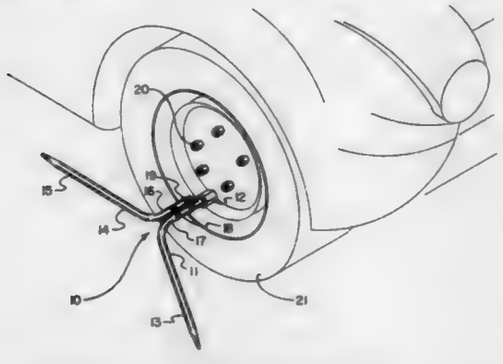
DUAL HANDLE LUG WRENCH

Richard A. Lang, P.O. Box 268, Abita Springs, La. 70420

Filed Mar. 21, 1994, Ser. No. 215,097

Int. Cl.[6] B25B 23/16

U.S. Cl. 81—177.2 2 Claims



1. A dual handle lug wrench comprising:

a lug wrench having a socket, a first straight section extending colinearly from the socket, and a first handle projecting from the first straight section, the first straight section and socket including a first longitudinal axis directed therethrough, with the first handle projecting from the first straight section at an oblique angle relative to the first longitudinal axis thereof, the first handle having a first handle longitudinal axis directed therethrough;

a second element including a second straight section positioned in a parallel and abutting relationship relative to the first straight section of the lug wrench, the second element further including a second handle extending from the second straight section, the second straight section including a second longitudinal axis directed therethrough, with the second handle projecting from the second straight section at an oblique angle relative to the second longitudinal axis thereof, the second straight section being shaped so as to define a notch extending longitudinally along an exterior surface thereof and from a lower end thereof a predetermined distance along the exterior surface of the second straight section, the first straight section being of a first length, and the second straight section being of a second length, wherein the first length is substantially greater than the second length, the second handle having a second handle longitudinal axis directed therethrough;

a first collar positioned about both straight sections of the lug wrench and the second element so as to selectively rotatably couple the straight sections together, the first collar being selectively tightenable about the straight sections;

a second collar positioned about the first straight section and slidably positionable over the second straight section, the second collar being selectively tightenable about the straight sections, the second collar including a stud projecting inwardly therefrom, wherein the second handle can be rotated into adjacency relative to the first handle such that both of the handle longitudinal axis are substantially parallel for storage, and further wherein the second handle can be rotated so as to extend in a diametrically opposed direction relative to the first handle, with the second collar being slidably positionable onto the second straight section such that the stud of the second collar extends into the notch of the second straight section, wherein the collars can be tightened to lock the handles relative to one another.

5,469,765

SELF-LOCKING HAND TOOLS

Michael J. Franklin, A9 Monte Carlo Villas, 25 Castle Peak Rd., Tuen Mun, Hong Kong

PCT No. PCT/GB92/01392, § 371 Date Dec. 23, 1993, § 102(e) Date Dec. 23, 1993, PCT Pub. No. WO93/01915, PCT Pub. Date Feb. 4, 1993

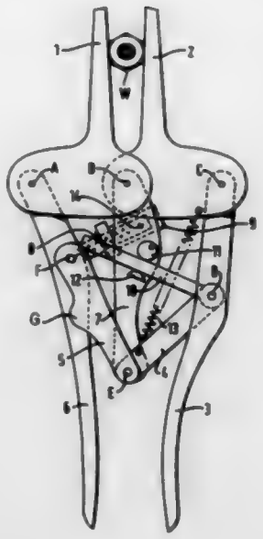
PCT Filed Jul. 27, 1992, Ser. No. 167,802

Claims priority, application United Kingdom, Jul. 25, 1991, 9116134

Int. Cl.[6] B25B 7/12

U.S. Cl. 81—324 13 Claims

1. A self-locking hand tool including two pivotally interconnected jaws which may be moved together or apart to embrace a workpiece, hand grips pivotally connected to each jaw, an articulated linkage pivotally interconnecting the hand grips and the jaws whereby a force applied between the hand grips causes the jaws to be forced together and an over-centre locking means operatively coupled with the hand grips and the articulated linkage and associated with a spring member whereby on application of a predetermined force to the hand grips, the over-centre lock is caused to be tripped into a position retaining the hand grips and the jaws in a fixed position.

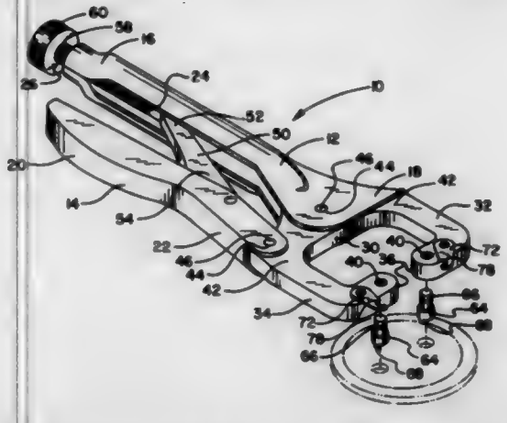


5,469,766

ADJUSTABLE SPANNER WRENCH

Joseph M. Hodges, 891 Bennett Rd., Quincy, Mich. 49082

Filed Sep. 28, 1994, Ser. No. 314,891
Int. Cl.[6] B25B 7/02;7/12
U.S. Cl. 81—367 **5 Claims**



1. A new and improved adjustable spanner wrench comprising, in combination:

a pair of handle halves, the handle halves including a first handle half having an inboard end and an outboard end, the second handle half having an inboard end and an outboard end, the first handle half being provided with an interior channel along its length and an internally threaded axial aperture at its inboard jaws in the form of two C-shaped arms, the C-shaped arms each having an outboard extent with an aperture therethrough for receiving a grooved pin, each C-shaped arm having an inboard extent with an aperture and an associated rivet coupling the outboard ends of the handle halves to the inboard extents of the arms;

an adjustment link having a first end received in the recess of the first handle half and a second end pivotally secured to the second handle half whereby movement of the first end of the adjustment link will vary the position of the outboard end of the second handle half and one of the C-shaped arms with respect to the other C-shaped arm;

an adjustment bolt with a threaded exterior surface threadedly received axially in the threaded aperture of the first handle half with an adjustment knob exterior of the first handle half adjacent to the inboard end, the adjustment nut having an outboard end operatively coupled to the first end of the adjustment link to vary its position within the first handle half;

a pin positionable in each aperture of the outboard extent of each arm, each pin having a groove at one end and a flat axial projection at its other end; and

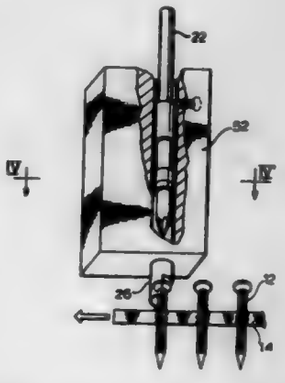
a pivotable clip having a free end and a pivot end pivotally secured to each outboard C-shaped arm and a semicircular recess at its free end, the semicircular recess adapted to be moved in position concentric with its associated aperture for contacting the groove of the pin received in an aperture.

5,469,767

SCREWDRIVING APPARATUS FOR USE IN DRIVING SCREWS JOINED TOGETHER IN A STRIP

G. Lyle Habermehl, 7528 Hickory Hills Ct., Whites Creek, Tenn. 37189

Continuation-in-part of Ser. No. 18,897, Feb. 17, 1993, Pat. No. 5,337,635. This application Feb. 17, 1994, Ser. No. 198,129
The portion of the term of this patent subsequent to Aug. 16, 2011, has been disclaimed.
Int. Cl.[6] B25B 23/06
U.S. Cl. 81—434 **20 Claims**



1. An apparatus for driving with a power driver, fasteners such as screws or the like which are joined together in a strip comprising:

housing means;

elongate drive shaft means for operative connection to a power driver for rotation thereby, the drive shaft means defining a longitudinal axis;

slide body means coupled to the housing means for displacement parallel to the axis of the drive shaft means between an extended position and a retracted position;

spring means biasing said body means forwardly relative to the housing means parallel the axis to the extended position;

guide channel means for said fastener strip extending through said body means;

the body means including guide tube means coaxially about the axis of the drive shaft means adapted to receive correspondingly sized screws when advanced therein via the guide channel means and to locate the screws axially in alignment with said drive shaft means for engagement in driving of the screws from the guide tube means by the drive shaft means;

the guide tube means removable from the body means for replacement with other guide tube means adapted to receive the same or different corresponding sized screws,

a forward portion of the guide tube means comprises a cylindrical screw guideway of an inner diameter marginally greater than a diameter of a head of the correspondingly sized screw,

the guide tube means having a screw locating sidewall about the screw guideway to engage the head of a screw and coaxially locate the screw in alignment with the drive shaft means,

the guide channel means opens radially into the screw guideway via a screw access opening in the screw locating sidewall and

exits radially from the guideway via a screw strip exit opening in the screw locating sidewall on a side of the guideway opposite the screw access opening.

5,469,768

MACHINING HEAD FOR A WATER JET CUTTING MACHINE AND AIMING DEVICE INTENDED TO EQUIP SUCH HEAD

Charles E. Schumacher, Grand'rue 52, CH-2075 Wavre, Switzerland

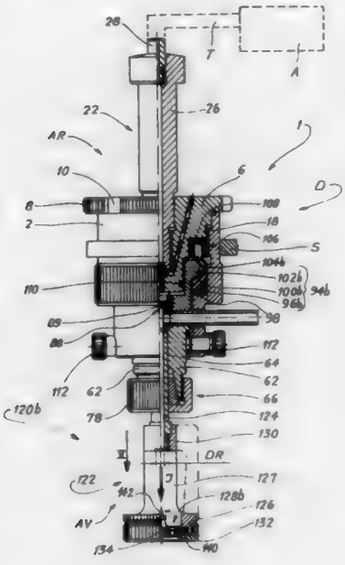
PCT No. PCT/CH93/00138, § 371 Date Jan. 27, 1994, § 102(e) Date Jan. 27, 1994, PCT Pub. No. WO92/24277, PCT Pub. Date Sep. 9, 1993

PCT Filed May 27, 1993, Ser. No. 182,029

Claims priority, application France, Jun. 1, 1992, 92 06695

Int. Cl.[6] B24C *5/04*

U.S. Cl. 83—177 28 Claims



1. Machining head for a water jet cutting machine, including:

a casing (**2**) adapted to be fixedly mounted on the cutting machine (D),

admission means (**28**) adapted to be coupled to a feed source (A) of water under pressure,

an acceleration nozzle (**22**) fixed to the casing (**2**) and connected to the admission means (**28**), said nozzle (**22**) being intended to form a jet (J) of water at high velocity, suitable to effect cutting of a material,

a cutting pipe (**60**) arranged to receive the water jet (J) emitted by the acceleration nozzle (**22**), and

a pipe carrier (**62**) maintaining the cutting pipe (**60**) in position relative to the casing (**2**),

regulating means (**120***a*, **120***b*, **112**, **94***a*, **94***b*) which permit regulation of the position of the pipe carrier (**62**) relative to the casing (**2**) in order to adjust the orientation of the cutting pipe (**60**) in a manner coaxial to the jet (J) emitted by the nozzle (**22**),

characterized in that said regulating means comprise an aiming device **120***a*, **120***b*) including a target (**128***a*, **128***b*) mounted to a support (**122**) arranged so as to be able to be mounted in said pipe carrier (**62**).

5,469,769

SOUNDBOARD FOR MUSICAL INSTRUMENTS

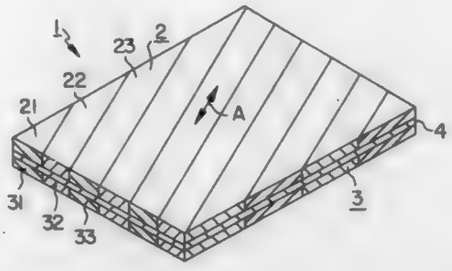
Shuichi Sawada; Katsuhiko Imagawa, and Yoshihiko Murase, all of Shizuoka, Japan, assignors to Yamaha Corporation, Shizuoka, Japan

Continuation-in-part of Ser. No. 43,048, Apr. 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 647,982, Sep. 6, 1984, abandoned. This application Jun. 26, 1989, Ser. No. 371,601

The portion of the term of this patent subsequent to Nov. 28, 2008, has been disclaimed.

Int. Cl.[6] G10C *3/06*

U.S. Cl. 84—193 12 Claims



1. An improved soundboard for musical instruments comprising fore and rear plates, and

a core interposed between and bonded to said fore and rear plates and made of a material with a shearing elastic modulus greater than that of said fore and rear plates and with a shearing loss tangent that is less than that of said fore and rear plates, said shearing elastic modulus of said material for said core being less than 3.0×10 dyne/cm.

5,469,770

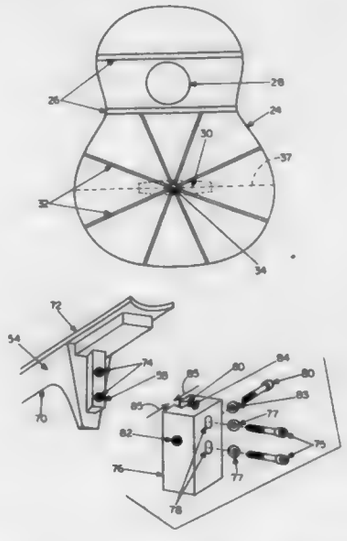
DISTRIBUTED LOAD SOUNDBOARD SYSTEM

Ben D. Taylor, 450 First Avenue, NW., Carmel, Ind. 46032

Filed Sep. 9, 1994, Ser. No. 303,423

Int. Cl.[6] G10D *3/00*

U.S. Cl. 84—291 28 Claims



1. A soundboard apparatus for a stringed musical instrument, the apparatus comprising:

a soundboard formed to include a soundhole;

an acoustic stop coupled to the soundboard to define an active portion of the soundboard on an opposite side of the acoustic stop from the soundhole;

a bridge coupled to the active portion of the soundboard for securing a plurality of strings to the soundboard;

a plurality of braces coupled to the active portion of the soundboard, the plurality of braces being configured to intersect at a point located directly below the bridge to strengthen the soundboard adjacent the bridge; and

a cap coupled to and overlapping a portion of each of the plurality of braces to reinforce the braces.

20. An adjustable locking apparatus for securing a neck to a body of a stringed musical instrument, the apparatus comprising:

a first track member located on the neck;

a second track member located on the body, the second track member being formed to slidably engage the first track member to align the neck in a selected position relative to the body; and

a fastener for holding the first and second track members in the selected position to secure the neck relative to the body without gluing the first and second track members together when the fastener is tightened, the position of the neck relative to the body being adjustable when the fastener is loosened to permit the first track member to slide relative to the second track member.

5,469,771

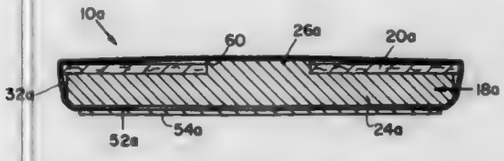
PAD FOR CLOSING A TONE HOLE IN A MUSICAL INSTRUMENT

Steven A. Wasser, Wellesley, Mass., assignor to Verne Q. Powell Flutes, Waltham, Mass.

Filed Jun. 28, 1994, Ser. No. 267,458

Int. Cl.[6] G10D *7/08*

U.S. Cl. 84—385 P **8 Claims**



1. A pad to be mounted in a cup for closing a tone hole in a musical instrument, comprising:

a rigid back plate having a generally planar base and a central raised collar;

a compliant cushion disposed on said back plate and around said collar and extending laterally approximately to the edge of said back plate; said cushion having a first surface engaged with said back plate and a second, opposite surface;

a membrane stretched tautly over said cushion and collar; and

said collar rises axially above the second surface of said cushion and contacts said membrane for increasing the tension on said membrane.

5,469,772

LINEARLY RECIPROCATING KEYBOARD KEY INCORPORATING TWO GUIDE PINS

Paul B. Vandervoort, 2875 Idlewild Dr., #19, Reno, Nev. 89509

Filed Apr. 1, 1993, Ser. No. 40,209

Int. Cl.[6] G10C *3/12*

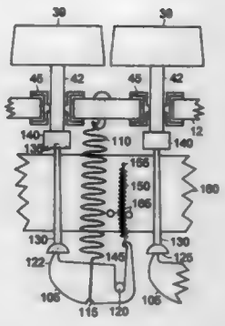
U.S. Cl. 84—436 **15 Claims**

1. In a keyboard for a finger-operated device,

a key, a front guide pin, a rear guide pin, a frame member, said guide pins extending downward directly from the underside of said key,

the improvement comprising,

an upper front bushing, a lower front bushing, and a rear bushing, wherein,



said bushings are incorporated in said frame member, said front guide pin mates with said front bushings and said rear guide pin mates with said rear bushing.

5,469,773

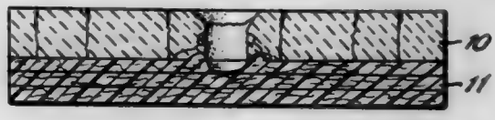
LIGHT WEIGHT ARMOR

Aram Tarpinian, Waltham, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 23, 1965, Ser. No. 490,779

Int. Cl.[6] F41H *5/04*

U.S. Cl. 89—36.02 **3 Claims**



1. Ceramic armor comprising a composite with an area density of 11.8 pounds per square foot consisting of a hot pressed facing having a composition of 92% magnesium oxide and 8% glass adapted to crack on impact of a projectile to spread and reduce the impact force per unit area, said facing being bonded to a laminated plastic back-up plate to absorb the reduced excess energy due to the wider distribution of the impact force on the facing and to thereby provide complete ballistic protection against caliber 0.30 armor piercing projectile at muzzle velocity.

5,469,774

PNEUMATIC ACTUATING DRIVE

Rüdiger Kaspers, Tönisvorst, Germany, assignor to Arca Regler GmbH, Tonisvorst, Germany

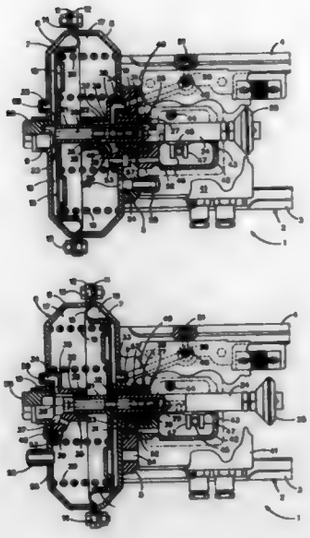
Filed Jan. 21, 1994, Ser. No. 183,821

Claims priority, application Germany, Jan. 20, 1993, 93 00 685.3

Int. Cl.[6] F01B *29/04*

U.S. Cl. 91—54 **13 Claims**

1. Pneumatic actuating drive (**1**, **62**) for final control elements having a drive housing (**6**) and a drive component (**15**) movable therein, to which drive component (**15**) is releasably attached a drive element (**24**) that exits from the drive housing (**6**) and can be moved together with the drive component (**15**) and which divides the drive housing (**6**) into a pressure chamber (**16**) and a reset chamber (**17**) with a reset element (**19**, **20**) that acts on the drive component (**15**), and with a position controller (**41**) whose output (**48**) merges into an internal air supply duct (**49**), whereby the drive housing (**6**) can be reversibly installed in such a manner that, in a first installation position the reset chamber (**17**), and in a second installation position, the pressure chamber (**16**) adjoins the position controller (**41**), and whereby furthermore the drive element (**24**) includes an air duct (**30**) that merges on a side of the drive component (**15**) facing away from the position controller (**41**) into the chamber located there, characterized in that the reset chamber



(17) includes a first connection aperture (34) which for the first installation position is connected to the air supply duct (49) and for the second installation position is closed, that a transfer connection (35, 62) is a separate component set into the reset chamber (17), said transfer connection connecting in the first installation position the first connection aperture (34) to the air duct (30), and that the pressure chamber (16) has a second connection aperture (33) which for the second installation position can be connected to the air supply duct (49) and for the first installation position can be closed.

5,469,775

LINEAR DRIVE WITH A BUFFER DEVICE

Kurt Stoll, Esslingen; Dieter Waldmann, Ebersbach, and Thomas Feyrer, Esslingen, all of, Germany, assignors to Festo KG, Esslingen, Germany

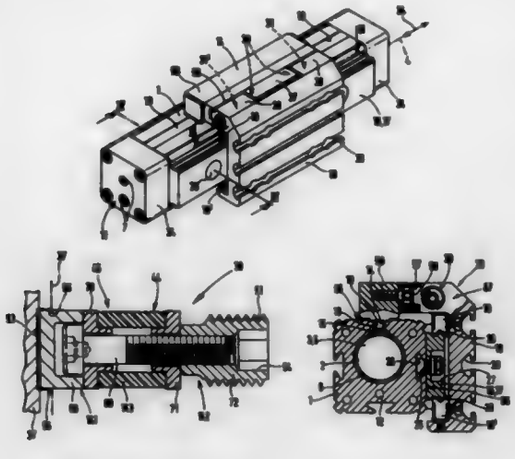
PCT No. PCT/EP92/01848, § 371 Date May 13, 1994, § 102(e) Date May 13, 1994, PCT Pub. No. WO93/10360, PCT Pub. Date May 27, 1993

PCT Filed Aug. 13, 1992, Ser. No. 240,645

Claims priority, application Germany, Nov. 16, 1991, 41 37 789.3

Int. Cl.[6] F01B 29/00

U.S. Cl. 92—88 **17 Claims**



1. A linear drive comprising:

a housing, said housing being provided with a longitudinal slot;

a longitudinally moveable drive element mounted in said housing;

a first longitudinal guide element mounted outside of said housing;

a second guide element which is guided movably in a longitudinal direction on said first guide element and which is adapted to receive a load to be moved;

a lug extending through said longitudinal slot forming a movement unit with said drive element and said second guide element, said movement unit having a longitudinal direction of movement; and

a buffer unit effective in said direction of movement of said movement unit, said buffer unit cooperating with said second guide element, said buffer unit being interposed in connection between said drive element and said second guide element subsequent to said lug.

5,469,776

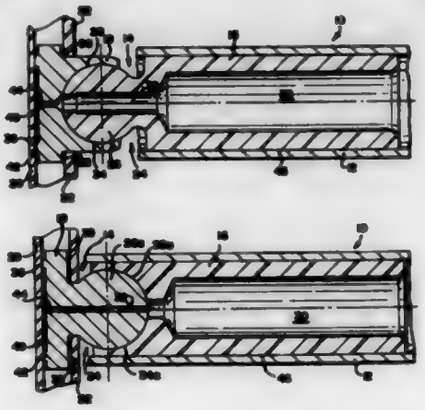
HYDRAULIC PUMPING DEVICE

Lars Martensen, Soenderborg; Ove T. Hansen, Nordborg; Henry M. Moeller, Soenderborg, and Hardy Jepsen, Nordborg, all of, Denmark, assignors to Danfoss A/S, Denmark

Filed Jul. 13, 1994, Ser. No. 274,246

Int. Cl.[6] F01B 11/02; F16J 10/00;9/00

U.S. Cl. 92—170.1 **16 Claims**



1. A hydraulic pumping device for use with virtually lubricant free fluid comprising:

a metal cylinder;

a piston and slider shoe unit, said unit comprising a plastic piston and a metal slider shoe operatively connected to said plastic piston, said plastic piston slidable within said metal cylinder;

a plastic control surface, said plastic control surface engaging said metal slider shoe whereby said plastic piston is reciprocated in said metal cylinder upon movement of said plastic control surface; and

a plastic support for securing said metal slider shoe in engagement with said plastic control surface, said plastic support engaging said metal slider shoe.

12. A hydraulic pumping device for use with virtually lubricant free fluid comprising:

a plastic cylinder;

a metal piston and plastic slider shoe unit, said unit comprising a metal piston and a plastic slider shoe operatively connected to said metal piston, said metal piston slidable within said plastic cylinder;

a metal control surface, said metal control surface engaging said plastic

slider shoe whereby said metal piston is reciprocated in said plastic cylinder upon movement of said metal control surface; and

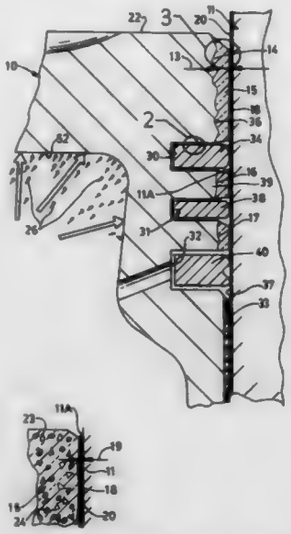
a metal support for securing said plastic slider shoe in engagement with said metal control surface, said metal support engaging said plastic slider shoe.

5,469,777

PISTON ASSEMBLY HAVING ABRADABLE COATING

V. Durga N. Rao, Bloomfield Township, and James R. Clarke, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 5, 1994, Ser. No. 270,950
Int. Cl.[6] F16J 1/04
U.S. Cl. 92—223 11 Claims



1. A piston assembly operable within a fluid bathed straight cylindrical cylinder wall said piston having a crown exposed to pressurized fluid, comprising:

(a) a piston body having at least one annular straight cylindrical land, adjacent the piston crown, adapted to be in close-fitting complementary relationship to said cylinder wall;

(b) an abradable coating tenaciously adhered to said at least one land effective to create and sustain substantially zero clearance along the whole of said at least one land with said fluid bathed cylinder wall; and

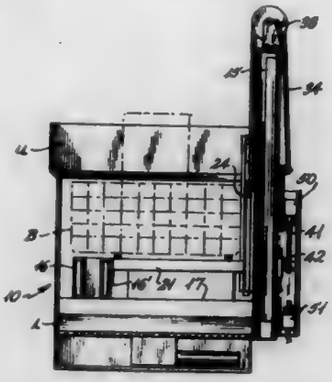
(c) a heat sink in the form of heat conductors in said coating to conduct heat from said lands to said fluid bathed cylinder wall.

5,469,778

FRYER BASKET LIFT

Malcolm J. Prudhomme, Rte. 3, Box 310, Arnaudville, La. 70512

Filed Nov. 1, 1994, Ser. No. 334,319
Int. Cl.[6] A47J 37/12
U.S. Cl. 99—336 13 Claims



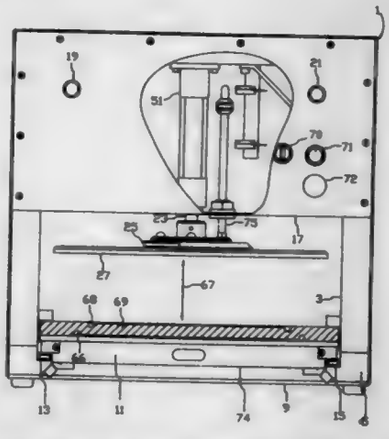
1. An apparatus for raising and lowering a cooking basket into a deep-fat fryer, wherein the fryer includes a tub having a bottom wall and side walls, each side wall having an upper edge, the apparatus comprising, a basket support and a lift means, said basket support being connected to said lift means, said lift means including a moveable bracket, at least one guide element for guiding said moveable bracket vertically within the tub of the fryer, said guide element including a pair of opposing generally "U" shaped track elements, said moveable bracket including a plate having outer edge portions receivable within said opposing track elements, a timed lift mechanism, means for connecting said moveable bracket to said timed lift mechanism, said lift mechanism including motor means for selectively raising and lowering said moveable bracket and said basket support relative to the fryer tub when the basket support is positioned therein, means for deactivating said motor means when said moveable bracket is in a first position wherein said basket support is lowered into the tub of the fryer and for deactivating said motor means when said moveable bracket is in a second position when said basket support is elevated with respect to said first position, and said means for connecting said moveable bracket to said timed lift mechanism including a cable having a first end connected to said moveable bracket and a second end connected to said timed lift mechanism.

5,469,779

AUTOMATIC PIZZA DOUGH PRESS DEVICE WITH INTERCHANGEABLE MOLDS

John A. Amore, Phillipsburg, N.J., and Pasquale Balsamo, Allentown, Pa., assignors to Balsamore Corp., Phillipsburg, N.J.

Continuation-in-part of Ser. No. 207,084, Mar. 8, 1994, abandoned. This application Oct. 6, 1994, Ser. No. 319,438
Int. Cl.[6] A47J 37/00;37/01;37/06
U.S. Cl. 99—349 20 Claims



1. An automatic pizza dough press device for forming uncooked pizza pie from fresh dough, said device comprises:

a. a main housing frame;

b. a base tray slideably mounted within said frame such that said tray slides out of said frame for accessibility;

c. an upper encasement on said frame;

d. a motor;

e. a pump coupled to said motor for creating hydraulic pressure;

f. a hydraulic cylinder mounted to said encasement;

g. a piston housed within said cylinder and hydraulically connected to said pump, said piston being capable of upward and downward movement, said piston being biased in an upward direction such that said piston returns to an upward position when at rest, said piston being in a downward position when compressing dough;

h. a hydraulic control valve hydraulically connected to said pump for controlling said upward and downward movement of said piston;

i. a top press mold connected to said piston, said top press mold having a pizza dough-forming underside plate and containing

a heating unit, said heating unit being capable of heating a portion of said underside plate to a temperature of about 100° F. to about 150° F.; and

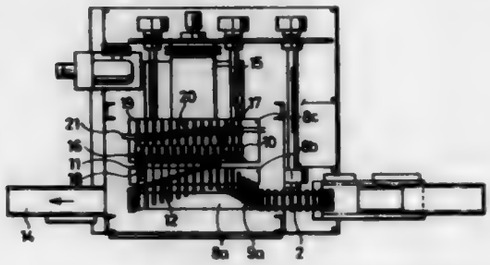
j. controls for controlling the upward and downward movement of said piston, said controls comprising at least two separate, disparate controls connected to said motor, said two separate, disparate controls being operated substantially simultaneously to effect control over said motor, said two separate, disparate controls being located sufficiently apart such that a single hand cannot operate both controls simultaneously thereby necessitating two hands to operate both controls simultaneously.

5,469,780

APPARATUS FOR FILLING EDIBLE ROD-SHAPED HOLLOW BODIES WITH CHOCOLATE

Mitsuo Yamaguchi; Kenjiro Ohge, and Makoto Nagasawa, all of Sakado, Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Sep. 27, 1994, Ser. No. 312,794
Claims priority, application Japan, Jan. 1, 1993, 5-246745
Int. Cl.[6] A21C *9/00; 9/06*
U.S. Cl. 99—450.7 **6 Claims**



1. An apparatus for filling edible, rod-shaped hollow bodies with chocolate comprising:

a feeding unit (1) for conveying said edible, rod-shaped hollow bodies (A); a transport roller (2) positioned close to said feeding unit: a first transfer roller (5) positioned close to said transport roller; a chocolate filling roller (8) positioned close to said first transport roller; a second transfer roller (13) positioned close to said chocolate filling roller; and a discharging unit (14) positioned close to said second transfer roller for receiving and conveying edible, rod-shaped hollow bodies filled with chocolate from said chocolate filling roller via said second transfer roller,

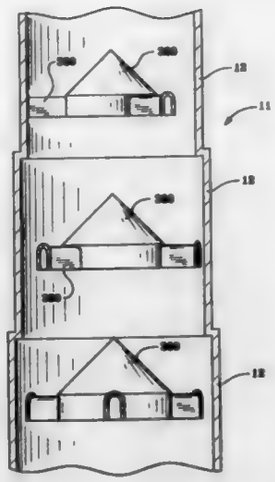
each of said transport roller, first transfer roller, chocolate filling roller and second transfer roller having same recesses (4) made at same regular intervals on its circumference for receiving said edible, rod-shaped hollow bodies, and being adapted to rotate at one and same circumference speed.

5,469,781

STEAM INJECTION DEVICE FOR A VERTICAL STEAM CONDITIONER

Kelsey C. Thom, Jr., Cedar Falls, Iowa, assignor to Roskamp Champion, Waterloo, Iowa

Division of Ser. No. 61,291, May 14, 1993. This application Jun. 13, 1994, Ser. No. 259,082
Int. Cl.[6] A23N *17/00*
U.S. Cl. 99—516 **8 Claims**



8. In a vertical chamber for conditioning downflowing feed grains and other particulate materials with upflowing steam, the improvement in combination with said chamber for conditioning, comprising:

at least one hollow module means, at the vertical centerline of said vertical chamber, for uniformly distributing steam outwardly from said vertical centerline; and hollow module means having an imperforate top and at least one hollow leg means, extending outwardly from said hollow module means, for supporting said hollow module means; said at least one hollow leg means being connected to a steam port in a sidewall of said vertical chamber for conducting steam from said sidewall to said hollow module means;

a steam manifold for receiving steam from a steam source and for distributing said steam to said steam port in said sidewall of said chamber; and

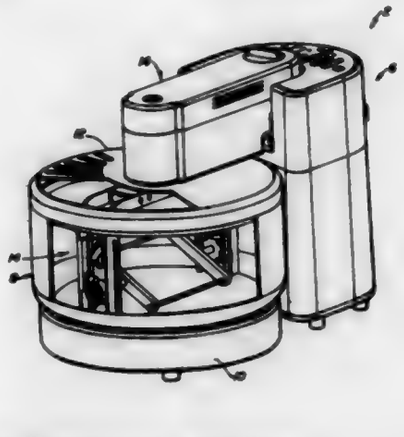
means for stepwise progressively increasing cross-sectional flow area, between said hollow module means and said sidewall of said vertical chamber, from the top to the bottom of said vertical chamber.

5,469,782

FOOD FLIPPING ASSEMBLY

Don M. Wong, 2296 Bunker Hill Dr., San Mateo, Calif. 94402

Filed Jan. 13, 1995, Ser. No. 372,203
Int. Cl.[6] A47J *27/00*
U.S. Cl. 99—644 **12 Claims**



1. A food flipping assembly comprising:

a frame having a cam-carrying structure and a movable carrier support;

a carrier support lifting assembly operably coupling the cam-carrying structure and the carrier support for moving the carrier support between a first elevation and a second elevation;

a food carrier rotatably mounted to the carrier support for rotation about an axis and for movement with the carrier

support between the first elevation and a first rotary orientation and the second elevation; and

a food carrier rotator assembly including:

a food carrier rotator mounted to the food carrier and including drive elements; and

rotator cam surfaces carried by the cam-carrying structure and located to engage the drive elements as the food carrier moves from an intermediate elevation intermediate the first and second elevations to the second elevation thereby rotating the food carrier about the axis to an intermediate rotary orientation substantially more than 90° from a first rotary orientation;

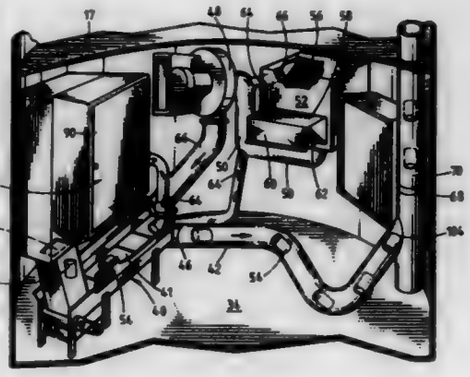
whereby upon movement of the food carrier from the second elevation to the first elevation, the food carrier is rotated to a second rotary orientation about 180° from the first rotary orientation by contact with a support surface thereby completing the flipping of any food carried by the food carrier.

5,469,783

COLLECTOR FOR EMPTY USED RECYCLABLE BEVERAGE CANS

Gene Fry, Austin, Tex., assignor to Eugene L. Fry, San Antonio, Tex.

Filed Mar. 4, 1994, Ser. No. 206,513
Int. Cl.[6] B30B *9/32*
U.S. Cl. 100—49 **21 Claims**



1. A collector for recyclable metal beverage cans, comprising;

a. a cylindrical enclosure having an interior area, the cylindrical enclosure including a floor;

b. an opening into the interior area of the enclosure for inserting beverage cans, including non-ferrous cans and magnetically permeable cans, and trash and lightweight trash;

c. conveying means in the interior area of the enclosure, the conveying means comprising an endless belt with a first end of the conveying means located below the opening to receive inserted cans, a part of said conveying means associated with a magnet to form a magnetized end of the conveyor for holding only magnetically permeable cans onto the belt and depositing magnetically permeable cans onto the floor of the cylindrical enclosure;

d. a can crusher in the interior area of the enclosure;

e. a pneumatic transporter in the interior area of the enclosure for transporting non-ferrous cans from the conveying means to the crusher, the transporter comprising a high velocity air conduit sized to carry non-ferrous cans and trash, the transporter located just beyond the magnetized end of the conveying means;

f. a vacuum conduit above the conveyor and between the first end and the magnetized end of the conveyor for sucking up lightweight trash from the belt;

g. means in the interior area of said enclosure for receiving and storing crushed cans from the crusher; and

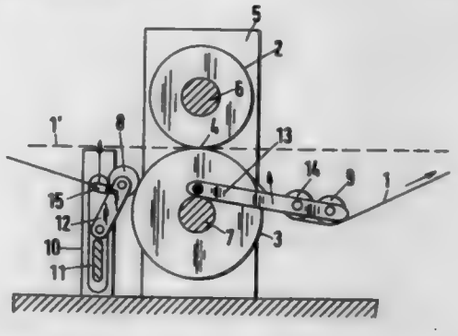
h. an air flow control valve in the pneumatic transporter to accelerate the flow of air in the transporter.

5,469,784

CALENDER ASSEMBLY INCLUDING AN ADDITIONAL ROLL DISPLACED INTO THE PATH OF THE WEB OF MATERIAL

Harald Hess, Grünkraut, Germany, assignor to Sulzer-Escher Wyss GmbH, Ravensburg, Germany

Filed Apr. 26, 1994, Ser. No. 233,457
Claims priority, application Germany, Apr. 29, 1993, 9306448 U
Int. Cl.[6] B30B *3/04*; D21G *1/00*
U.S. Cl. 100—93 RP **7 Claims**



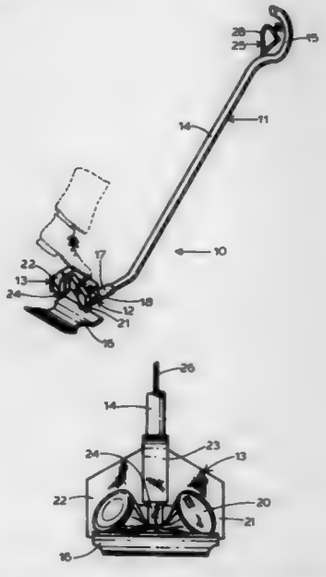
1. Calender assembly for treating a web of material in a nip formed by a pair of press rolls, at least one roll being heated, comprising upstream of the nip, in the direction of travel of the web of material, at least one additional roll which can be displaced into the path of the web of material in such a way that the angle of wrap of the web of material on the heated press roll increases, said at least one additional roll be pressed against the heated press roll by a device with a force that is substantially less than a force applied in the nip by the pair of press rolls.

5,469,785

COMBINATION CAN CRUSHING AND RETRIEVING DEVICE

William L. Goings, 853 Weedel La., Arnold, Mo. 63010

Filed Apr. 13, 1995, Ser. No. 421,517
Int. Cl.[6] B30B *7/00;9/32*
U.S. Cl. 100—137 **5 Claims**



1. A can crushing and retrieving device comprising, a contoured can positioning base member including a contoured can receiving portion, a movable jaw member pivotally secured to said base

member, said movable jaw member having a pair of oppositely disposed guide arms extending therefrom, a can crushing block positioned between said guide arms on said movable jaw, a handle support means extending from said base member, a cable secured to and extending from said movable jaw to a cable handle in said handle support means.

5,469,786

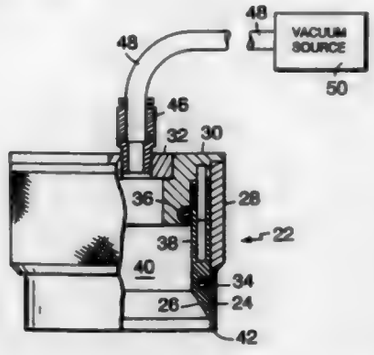
ENCLOSED INK CUP WITH IMPROVED SEAL

Kenneth R. Harris, Byfield, Mass., assignor to Imtran Industries, Inc., Newburyport, Mass.

Filed Oct. 25, 1994, Ser. No. 328,452

Int. Cl.[6] B41F *17/00*

U.S. Cl. 101—163 **8 Claims**



1. An enclosed ink cup for a pad-type printing machine comprising

a hollow structure defining a reservoir region that is closed around the sides and top and is open only at the bottom of said reservoir region, said structure having a lower edge for sealably contacting an engraved printing plate so as to contain ink within said structure over said plate, and

a vacuum port in said structure communicating with the top of said region for applying a vacuum to said region above said ink to promote sealable contact between said lower edge and said plate.

5,469,787

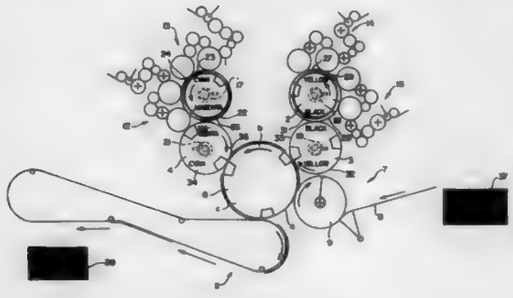
MULTI-COLOR PRINTING PRESS

Michael R. Turner, Renton, and Leslie L. Miller, Redmond, both of Wash., assignors to Heath Custom Press, Inc., Renton, Wash.

Filed Mar. 15, 1994, Ser. No. 213,673

Int. Cl.[6] B41M *1/14*

U.S. Cl. 101—211 **18 Claims**



16. A method of printing multiple designs on a single sheet comprising the steps of;

repeatedly applying a plurality of color designs from multiple segments on a single rotary plate cylinder onto a corresponding number of blanket segments of equal length on a rotary blanket cylinder of equal diameter,

transferring said color designs from each said blanket segment onto successive sheets held by segments of a rotating impression cylinder,

the number of segments on said impression cylinder being equal to the number of segments on said blanket cylinder multiplied by a whole number, plus one additional segment, and

carrying each said sheet on the surface of said impression cylinder for a number of revolutions thereof equal to the number of segments on the blanket cylinder,

whereby successive sheets carried by the impression cylinder will be printed with successive color designs from said blanket cylinder.

5,469,788

PAPER TRAIN INLET IN A LONGITUDINAL FOLD GATE

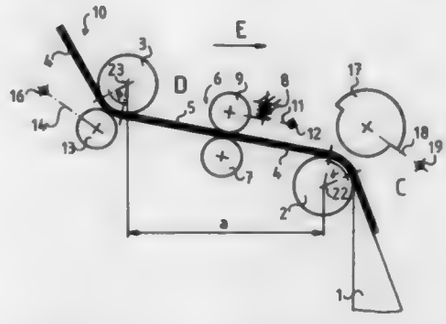
Horst B. Michalik, Höchberg, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed Jun. 15, 1994, Ser. No. 260,731

Claims priority, application Germany, Jun. 15, 1993, 43 19 806.6

Int. Cl.[6] B41F *13/56*

U.S. Cl. 101—227 **11 Claims**



1. A paper train inlet in a longitudinal fold gate in a track of a paper web train of a web-fed rotary printing press, said paper train inlet comprising:

a first driven paper guide cylinder positioned adjacent to, and before, in a direction of paper web travel, a longitudinal fold gate and engageable with a surface of a paper web train;

a second driven paper guide cylinder positioned remote from, and before, in a direction of paper web travel, the longitudinal fold gate and engageable with a surface of the paper web train, said first and second paper guide cylinders being spaced from each other along said direction of paper web travel at a distance "a" and acting on the paper web train; and

at least a first traction cylinder group engageable with the paper web train and positioned between said first and second paper guide cylinders, the paper web train partially wrapping around said first paper guide cylinder at a first wrap angle α and partially wrapping around said second paper guide cylinder at a second wrap angle β.

5,469,789

PRINTING SHEET MAKING AND PRINTING APPARATUS

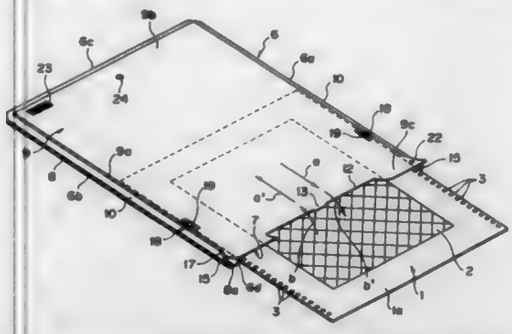
Hideki Haijima, and Shinji Okuda, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 291,043, Aug. 22, 1994. This application Mar. 10, 1995, Ser. No. 402,186

Claims priority, application Japan, Aug. 24, 1993, 5-229589; Jan. 15, 1993, 5-280732

Int. Cl.[6] B41F 27/06

U.S. Cl. 101—477 9 Claims



1. A printing sheet jacket into which an engraved or unengraved resin printing sheet is inserted, substantially rectangular in shape and of baglike form having three sides closed and a printing sheet removal/insertion opening formed at the fourth side through which printing sheet removal/insertion opening the printing sheet is automatically transferred between a cylinder of an engraving apparatus or a printing apparatus and the inside of the jacket by a printing sheet transfer mechanism of the engraving apparatus or of the printing apparatus said jacket having at least one feed opening permitting the printing sheet transfer mechanism to feed the printing sheet through the removal/insertion opening.

5,469,790

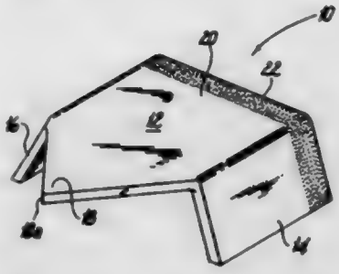
AERODYNAMIC PROJECTILE AND MEANS FOR PROPELLING SAME

John S. Singer, Bayberrie Dr., Westover Park, Stamford, Conn. 06902

Filed Sep. 15, 1993, Ser. No. 122,702

Int. Cl.[6] F42B 5/18

U.S. Cl. 102—431 3 Claims



1. A projectile for a firearm comprising a thin planar member of aerodynamic configuration and having a central body part that, in plan view, is generally symmetric about a central longitudinal axis, a pair of opposed fins integrally formed with said central body part in angulated configuration with respect to said central body part and in spaced disposition about the central longitudinal axis such that the disposition of said fins affords aerodynamic stability to the projectile when the same is in flight, said central body part, in plan view, having a leading edge and a trailing edge, ignitable propellant means applied directly to the trailing edge of said central body part such that when said propellant means is heated rapidly, the same ignites driving the projectile from the firearm at high velocity.

5,469,791

MOBILE MACHINE FOR PREPARING RAILS FOR WELDING

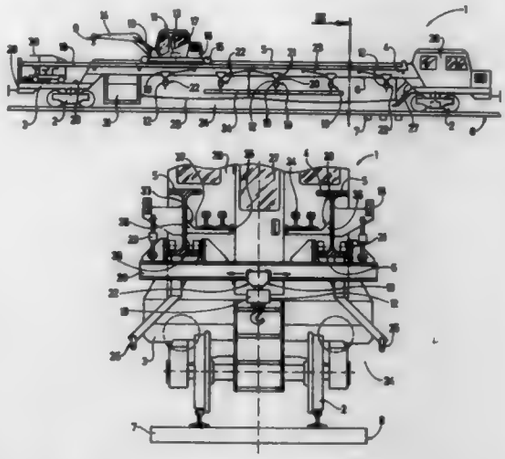
Josef Theurer, Vienna, and Herbert Wörgötter, Gallneukirchen, both of, Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft, Vienna, Austria

Filed Sep. 8, 1994, Ser. No. 303,087

Claims priority, application Austria, Sep. 17, 1993, A1889/93

Int. Cl.[6] E01B 27/00

U.S. Cl. 104—5 10 Claims



1. A mobile machine for preparing rails for welding, which comprises

(a) an elongated bridge-like machine frame extending in a longitudinal direction, the machine frame having

(1) an upwardly recessed frame portion extending between opposite ends of the machine frame and defining a work space, and being comprised of

(2) two carrier beams extending parallel to each other in the longitudinal direction and being transversely spaced from each other,

(b) undercarriages supporting the opposite machine frame ends,

(c) rail lifting means mounted on the machine frame for displacement in the longitudinal direction,

(d) drive means for vertically adjusting the rail lifting means,

(e) means for supporting rails on the machine frame,

(f) an operator's cab mounted at one of the machine frame ends,

(g) access steps leading from the cab to the work space between the carrier beams for enabling an operator to reach the work space from the cab and to leave the work space through the cab, and

(h) a boundary means extending in the longitudinal direction below each carrier beam for securing the work space within the gage.

5,469,792

RAILBORNE VEHICLE HAVING ARTICULATED BEAM CONNECTION SYSTEM BETWEEN CARRIAGES

Leopold Lenk, Vienna, Austria, assignor to SGP Verkehrstechnik Gesellschaft m.b.h., Wien, Australia

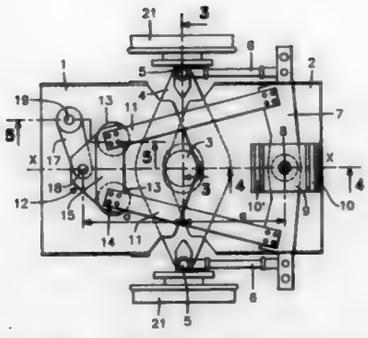
Filed Dec. 2, 1993, Ser. No. 161,303

Claims priority, application Austria, Sep. 6, 1993, 1120/93

Int. Cl.[6] B61D 17/00

U.S. Cl. 105—4.1 25 Claims

1. Railborne vehicle composed of at least two carriages having adjoining ends, forming a carriage consist, the adjoining ends of successive carriages comprising projecting mutually opposing bottom plates forming the passage between the two carriages, there being provided between the two carriages a bogey, wherein the bogey has mutually opposing driven loose wheels and wherein the adjoining ends of the two bottom plates are interconnected in



semimounted fashion and pivotal about the vertical axis of an interposed spherical joint, the said two adjoining ends are interconnected by at least one connecting beam which at its one end, by way of a first guide rod is connected to the bottom plate of one of the two successive carriages by means of a resilient mounting and with its opposite end to both arms of a transverse double-armed beam of the other carriage and which in its longitudinal center is pivotally mounted about a vertical axis to the bottom plate of the said other carriage and by way of its two arms is connected to the loose wheels via second guide rods.

5,469,793

TILTABLE LOAD SUPPORTING PLATFORMS

Richard A. Lindsay, Eye, United Kingdom, assignor to Vinten Group plc, United Kingdom

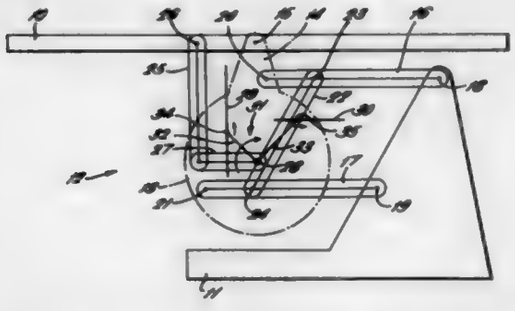
PCT No. PCT/GB91/02120, § 371 Date May 26, 1993, § 102(e) Date May 26, 1993, PCT Pub. No. WO92/09846, PCT Pub. Date Jun. 11, 1992

PCT Filed Nov. 29, 1991, Ser. No. 66,070

Claims priority, application United Kingdom, Nov. 29, 1990, 9026094

Int. Cl.[6] A47F *5/12*

U.S. Cl. 108—2 **18 Claims**



1. A counter-balanced tiltable platform for receiving and supporting a load having a base, means to mount the platform on the base for tilting about a horizontal axis in either direction from a normal horizontal position, means arranged with said platform to locate a load on the platform with its centre of gravity over the horizontal axis when the platform is in said normal position and means mounted on the base to raise the platform in response to tilting of the platform in either direction from said normal position to maintain the centre of gravity of the loaded platform in a constant horizontal plane and thereby to counter-balance the loaded platform, the means to mount the tiltable platform on the base comprising an intermediate support mounted on the base to rise and fall with respect to the base and pivot means for mounting the platform on the intermediate support to tilt about said horizontal axis, said means for raising the platform in relation to the base in response to tilting of the platform in either direction from said normal position comprising means acting through and connected with the intermediate support to raise the support and thereby the platform in response to tilting of the platform in either direction from said normal position; wherein the improvement comprises providing the means for raising the platform with respect to the base in response to tilting of the platform from said normal position to maintain the centre of gravity of a load on the platform in a constant horizontal plane with a lever of adjustable mechanical advantage connected to said base and said platform to cater for loads of different centres of gravity about the platform.

5,469,794

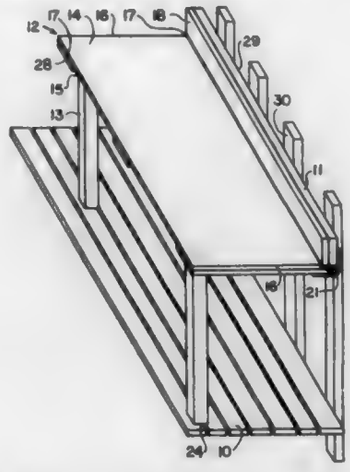
RAIL MOUNTED TABLE ROTATABLE ABOUT A LONGITUDINAL EDGE

Richard Laderoute, and Lynn Sasser, both of 266 St Michaels Cir., Odenton, Md. 21113

Filed Apr. 1, 1994, Ser. No. 222,079

Int. Cl.[6] A47B *5/00*

U.S. Cl. 108—48 **15 Claims**



1. A table intended for mounting upon a substantially vertical rigid structure further intended to possess a substantially horizontal utility position and a substantially vertical storage position, said table comprising:

a table top, a rail, a longitudinal rotatable attachment between said table top and said rail and two legs each comprising a rigid extension possessing two opposed ends;

said table top comprising a rigid structure possessing a longitudinal length and a lateral width, one substantially planar top surface and one substantially planar bottom surface further possessing at least one longitudinal edge proximate said longitudinal rotatable attachment;

said rail comprising a rigid member possessing at least one substantially planar face possessing a length and width, said length exceeding in dimension said width, said longitudinal rotatable attachment being longitudinally affixed to said planar surface;

each said leg possessing a lateral rotatable attachment to a portion of said table top distal said one longitudinal edge and proximate one said end of the leg, the other said end of each said leg being distal said lateral rotatable attachment, each said leg further possessing a length of a dimension at least as great as the dimension of said lateral width of said table top, said lateral rotatable attachment further maintaining each of said two legs in substantially perpendicular disposition with respect to said table top bottom surface;

each said lateral rotatable attachment comprising a locking hinge comprising a first member and a second member, a cylinder and a spring loaded locking bar, said first member possessing two substantially parallel flat sides each possessing an arcuate edge bounded by two notches encompassing ninety degrees, said locking bar being attached to said second member and biased by a spring into one of said two notches upon each side of said first member, said first and second members being rotatably attached by said cylinder which is disposed perpen-

dicular to both said sides of said first member at the center of the arc defining said arcuate edge;

each said lateral rotatable attachment enabling each said leg to be rotated with respect to said substantially planar bottom surface of said table top through a full arc of ninety degrees bounded by a perpendicular disposition between said leg and said substantially planar bottom surface and a substantially flush, substantially parallel disposition between said leg and said substantially planar bottom surface;

said longitudinal rotatable attachment enabling said table top to be rotated with respect to said substantially planar surface of said rail through a full arc of ninety degrees bounded by a perpendicular disposition between said substantially planar top surface and said substantially planar surface of said rail and a substantially parallel disposition between said substantially planar bottom surface and said substantially planar surface of said rail;

said table thereby possessing the capability of being mounted to a substantially vertical rigid structure by attachment of said rail to the same and disposed in a substantially horizontal position such that said longitudinal rotatable attachment is disposed at a distance from a floor substantially equivalent to the length of each said leg and said table top may be supported in a substantially horizontal position by said longitudinal rotatable attachment and said two legs disposed substantially perpendicular to said substantially planar bottom surface;

said table further possessing the capability of being disposed in said substantially vertical storage position wherein each said leg is disposed substantially flush with and parallel to said substantially planar bottom surface which is disposed substantially parallel to said planar surface of said rail thereby minimizing the floor space occupied by said table in said storage position.

5,469,795

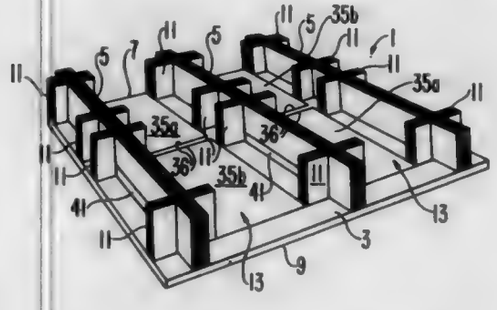
PALLET CONSTRUCTED OF SHEET MATERIAL

Stephen E. Moorman, Bowling Green, Ohio, assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Division of Ser. No. 772,661, Oct. 7, 1991, Pat. No. 5,337,679. This application Feb. 17, 1994, Ser. No. 197,826

Int. Cl.[6] B65D *19/00*

U.S. Cl. 108—51.3 **11 Claims**



1. A pallet for storing and transporting material thereon, comprising:

two first sheet members which cooperate to form an upper deck top layer and a first set of spaced runners depending from said upper deck and extending in a first direction; and

two second sheet members which cooperate to form at least one upper deck lower layer and a second set of spaced runners depending from said upper deck and extending in a second direction perpendicular to said first direction.

5,469,796

MULTI-LAYER PANELS FOR MODULAR VAULT STRUCTURE

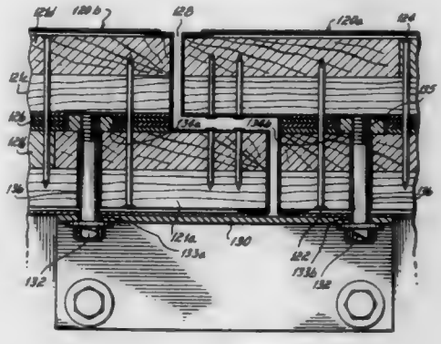
Donald E. Koenig, Hamilton, Ohio, assignor to Mosler, Inc., Hamilton, Ohio

Continuation-in-part of Ser. No. 899,749, Jun. 17, 1992, Pat. No. 5,257,583. This application Mar. 2, 1993, Ser. No. 24,939

The portion of the term of this patent subsequent to Nov. 2, 2010, has been disclaimed.

Int. Cl.[6] E04B *2/02*

U.S. Cl. 109—49.5 **18 Claims**



1. A multi-layered panel for a vault structure having upper and lower spaced horizontal edges, spaced right and left vertical side edges and opposing inner and outer spaced parallel major face surfaces comprising:

a first layer generally coextensive with a major face surface of the panel;

a second layer disposed parallel to said first layer and generally coextensive with a major face surface of the panel;

a first plurality of nails extending through one major face surface and into at least one of said panel layers, and a second plurality of nails extending through the other major face surface and into at least the other of said panel layers, the nails of the first and second plurality of nails extending into the panel layers angled non-perpendicularly to the planes of the major face surfaces to create opposing first and second grids of angled nails within the panel layers, the first grid being offset from the second grid such that the nails of the first grid extend into panel gaps between adjacent nails of the second grid and the nails of the second grid extend into panel gaps between adjacent nails of the first grid to reduce the effective size of the gaps in the panel between the nails over generally the entire panel; and

an anchoring structure between said first layer and said second panel layer, openings formed in at least one of said panel layers proximate said structure, said anchoring structure positioned proximate at least one of said panel edges and configured for receiving securing members so that when a batten is placed over the opposing edges of adjacent panels to hold together the panels joined to form a vault structure, securing members may be inserted through openings in the batten and through said openings in the at least one panel layer and received by the anchoring structure to provide a strengthened seam between adjacent vault panels;

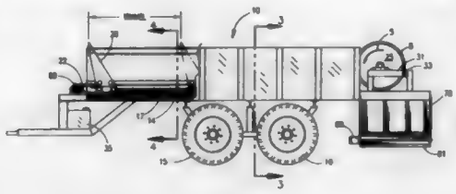
whereby the penetration resistance of the seam is enhanced because the securing members are secured by the anchoring structure and are not held only by the panel layers.

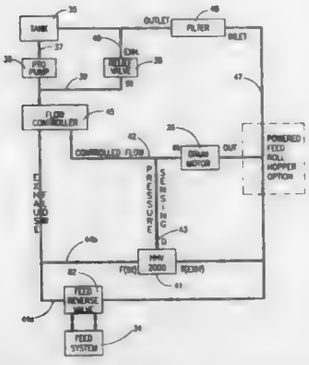
5,469,797

SUGAR CANE PLANTER

David C. Hearne, Jr., 120 Bois De Chene Dr., Opelousas, La. 70570

Filed Feb. 7, 1994, Ser. No. 192,740
Int. Cl.[6] A01C *11/00*
U.S. Cl. 111—200 14 Claims





1. A multi-row sugar cane planter comprising:

a) a chassis;

b) an undercarriage for moving said chassis along a cane field furrow;

c) said chassis further including a bed means for containing cane stalks in at least two columns in a semi-vertical position for planting;

d) a hydraulically driven, distribution means for transferring said cane stalks from said containment means to at least three consecutive rows in a cane field including one directly below said chassis;

f) a pressure compensated hydraulically driven feed conveyor means for advancing said cane stalks, along said means for containing cane stalks, toward said distribution means; and

g) a hydraulic control means for damping out high pressure spikes resulting from hesitation of said distribution means and automatically compensating by adjusting speed of said feed conveyor means relative to said hydraulically driven distribution means.

5,469,798

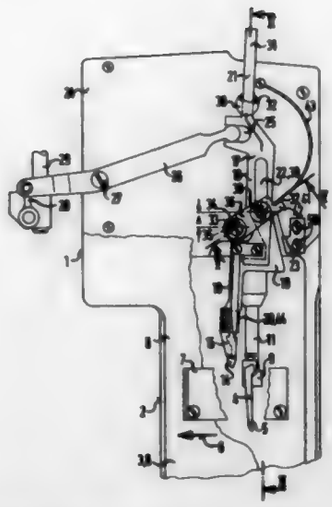
THREAD CUTTING DEVICE AND METHOD FOR A CHAIN STITCH SEWING MACHINE

Hermann Gauch, Möglingen, Germany, assignor to Union Special GmbH, Hemmingen, Germany

Filed Jul. 13, 1994, Ser. No. 274,545
Claims priority, application Germany, Jul. 14, 1993, 43 23 494.1
Int. Cl.[6] D05B *65/00*
U.S. Cl. 112—298 17 Claims

1. A thread cutting device for a chain-stitch sewing machine, having a cylindrical arm with a workpiece support and a looper which is displaceable at right angles to the feed direction of the workpiece and is pivotable in the feed direction of the workpiece for the purpose of receiving loops, comprising:

a) a drive member, having a distal end and a proximal end, attached to a movable, guided thread catcher, wherein the thread catcher is disposed between the looper and the workpiece support at the distal end of the drive member, and the thread catcher cooperates with a knife and a thread clamp;



b) the drive member is coupled by a collar stud to a carrier upon which the knife and the thread clamp are mounted, the drive member being movable between a thread catching position and an inoperative position, wherein the drive member, during part of its movement, positively moves the carrier toward the looper;

c) the drive member has a plurality of guides with which it cooperates in such a way that the thread catcher is moved towards the catching position parallel to the looper and beyond the knife and from there back into the inoperative position;

d) the carrier, and the knife mounted thereto, is restrained in its movement toward the looper by a stop that is mounted to the sewing machine;

e) a first guide from the plurality of guides is fixed relative to the arm, wherein the first guide displaceably receives the proximal end of the drive member;

f) a second guide from the plurality of guides comprises a guide link, wherein one end of the guide link pivots about a point fixed relative to the arm;

g) an opposite end of the guide link carries the collar stud which is operatively connected to the drive member to allow the drive member to move in a substantially linear manner about the collar stud, the collar stud moving along an arcuate path as the guide link pivots; and

h) the collar stud is operatively connected to the carrier in such a way that, as the drive member moves the thread catcher toward the catching position, the transition from the pivoting movement of the guide link into the substantially linear movement of the drive member is effected substantially tangentially to the arcuate path of the collar stud on the guide link.

5,469,799

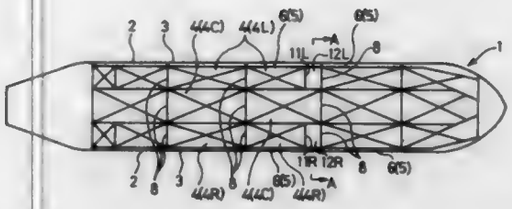
LIQUID CARGO TRANSPORT SHIP HAVING DOUBLE-HULL STRUCTURE

Kiyoshi Iwai, Kashihara; Kimio Kondo, Nara; Yoshiaki Sezaki, Osaka; Masatoshi Fukata, Otsu; Eiji Hashimoto, Ibaraki, and Toshio Yoshioka, Kawachinagano, all of, Japan, assignors to Hitachi Zosen Corporation, Osaka, Japan

Continuation of Ser. No. 216,713, Mar. 23, 1994, abandoned.
This application Apr. 21, 1995, Ser. No. 428,356
Claims priority, application Japan, Apr. 6, 1993, 5-078425
Int. Cl.[6] B63B *1/00*
U.S. Cl. 114—74 A 4 Claims

1. A liquid cargo transport ship comprising:

a double-hull structure having bottom and alongside domains surrounding a plurality of cargo tanks for loading liquid cargo, wherein said bottom and alongside domains of said transport ship respectively consist of double-hull structure



comprising a side plating and an internal hull plating; wherein a space domain formed between said side plating and said internal hull plating is utilized for a plurality of proper ballast tanks; and

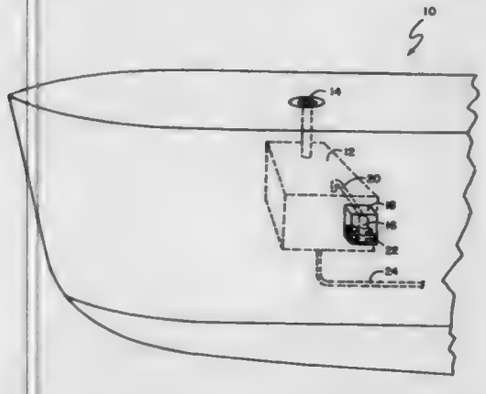
a plurality of tanks solely being available for ballasting purpose, wherein said plurality of tanks are provided at least partly in the domain of space inside of the plurality of cargo tanks disposed in the center domain of said hull structure along the fore-and-aft direction, at least one of said plurality of tanks solely being available for ballasting purpose and at least one of said plurality of proper ballast tanks being mutually interconnected with each other to form a single ballast tank.

5,469,800

NAUTICAL FUEL OVERFLOW PROTECTION DEVICE AND METHOD

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Filed Aug. 19, 1994, Ser. No. 292,850
Int. Cl.[6] B63B *25/08*
U.S. Cl. 114—74 R **18 Claims**



1. A device for use when filling the internal fuel tank of a boat having an air outlet vent in fluid communication with said fuel tank, said air outlet vent exiting from a side of said boat's hull, said device comprising:

means disposed in proximity to said air outlet vent to collect any fuel exiting said air outlet vent wherein said means include:

a container having a front side having a surface, a rear side, a left side, a right side, a top, and a bottom, said container having an aperture defined in said rear side;

means to adhere said device to said hull with said air outlet vent as through said aperture to be disposed within said container for the collection of said fuel exiting said air outlet vent; and

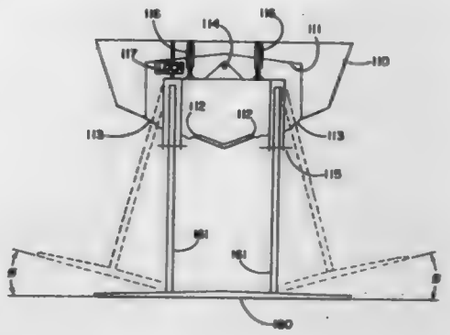
means disposed within said container to absorb said fuel exiting said air outlet vent.

5,469,801

ADVANCED MARINE VEHICLES FOR OPERATION AT HIGH SPEED IN OR ABOVE ROUGH WATER

Peter R. Payne, Severna Park, Md., assignor to Dynafoils, Inc., Severna Park, Md.

Continuation-in-part of Ser. No. 810,869, Dec. 20, 1991, Pat. No. 5,311,832. This application May 19, 1993, Ser. No. 63,782
Int. Cl.[6] B63B *1/30*
U.S. Cl. 114—282 **62 Claims**



43. A method of operating a hydrofoil craft comprising:

supporting a moving hull above a water surface by a first totally submerged foil and a second totally submerged foil disposed in close proximity to one another beneath the water surface when the speed of the hull is in a first speed range; and

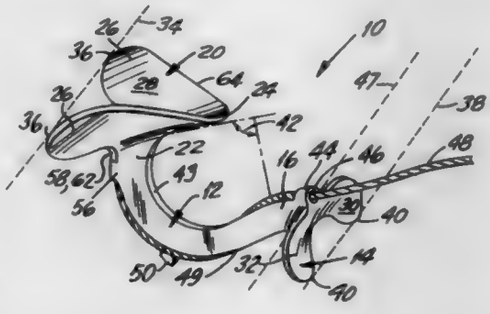
raising the first foil with respect to the second foil to above the water surface by pivoting a support arm for the first foil about an axis extending in a transverse direction of the hull and supporting the hull with the second foil when the speed is in a second speed range higher than the first speed range.

5,469,802

BOAT ANCHOR

Dragomir Ivicevic, 575 Main St., Ste. 1514, New York, N.Y. 10044

Filed Jun. 22, 1994, Ser. No. 263,788
Int. Cl.[6] B63B *21/32*
U.S. Cl. 114—301 **34 Claims**



1. A boat anchor for holding on all sea beds, comprising:

a shank of extended length;

ears extending transversely from said shank, said ears including a pair of ear lobes extending respectively from opposite sides of said shank;

plow flukes extending transversely from said shank, said flukes including a pair of fluke lobes extending respectively from opposite sides of said shank, said flukes and said ears being spaced apart along said shank length, said shank length including a fixed bend between said ears and said flukes;

attachment means on said anchor for connection to a rode.

5,469,803

INDIVIDUAL UNDERWATER PROPULSION DEVICE

Jean-Pierre Gallo, Figeac, France, assignor to Fem-Aero, Figeac, France

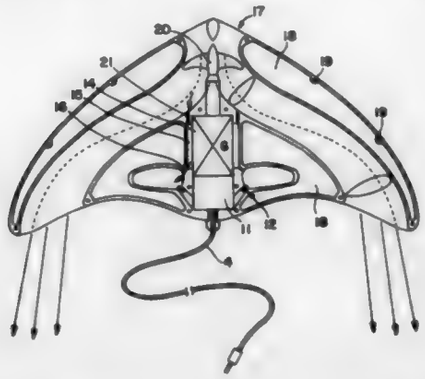
PCT No. PCT/FR93/00474, § 371 Date Nov. 21, 1994, § 102(e) Date Nov. 21, 1994, PCT Pub. No. WO93/23119, PCT Pub. Date Nov. 25, 1993

PCT Filed May 17, 1993, Ser. No. 341,590

Claims priority, application France, May 19, 1992, 92 06344

Int. Cl.[6] B63C *11/46*

U.S. Cl. 114—315 12 Claims



1. Electric propulsion device for underwater diving, comprising a body extending in the direction of a longitudinal axis from a forward end to a rearward end, said body including a hydrodynamic propulsion system for propelling said device underwater, said body lying in a displacement plane and having an inlet opening at said forward end defining a first fluid flow path, and two divergent fluid flow paths each of which extends from said first fluid flow path to said rearward end at respective lateral positions in relation to said longitudinal axis in said displacement plane, such that in use, a diver extends in the direction of said longitudinal axis in said displacement plane, and each divergent fluid flow path flows in the direction of said longitudinal axis on either side of said diver, and in said displacement plane.

5,469,804

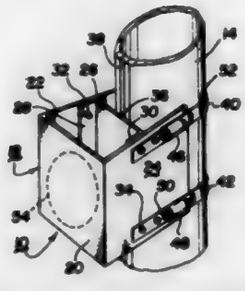
INSTRUMENT MOUNTING APPARATUS FOR SAILBOATS

William D. Bracken, 4 Canyon Ridge, Rockwall, Tex. 75087

Filed Sep. 14, 1994, Ser. No. 306,122

Int. Cl.[6] B63B *17/00*

U.S. Cl. 114—343 9 Claims



1. A mounting apparatus for mounting instruments onto the mast of a sailboat, said mounting apparatus comprising:

a substantially U-shaped frame adapted for lateral mounting onto said mast, said frame having a front wall and a pair of side walls extending from said front wall to distal ends defining an intervening gap therebetween in which to receive said mast;

placement means on said frame for effecting a placement interfit between said frame and a formation on said mast; said placement means comprising a recess defined in an exposed surface of one of said mast or said frame and a protuberance projecting outward from an exposed surface of the other of said mast or said frame for receipt inward of said recess;

a bulkhead secured transversely extending between said sidewalls at a predetermined distance behind said front wall so as cooperable with said front wall to define an intervening instrument cavity for receiving at least a rear portion of an instrument to be mounted through an opening in the front wall of said frame; and

mounting means to secure said frame onto said mast.

5,469,805

HIGH VISIBILITY VALVE POSITION INDICATOR

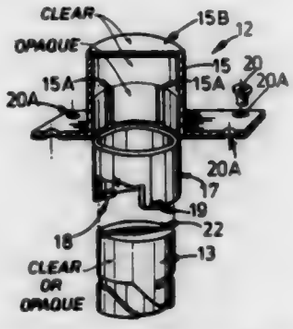
Stephen Gibbs, Glasgow, Scotland, assignor to Keystone International Holdings Corp., Houston, Tex.

Filed Jan. 7, 1994, Ser. No. 178,755

Claims priority, application United Kingdom, Aug. 22, 1992, 9217917; European Pat. Off., Aug. 2, 1993, 9330691

Int. Cl.[6] F16K *37/00*; G01O *5/00*; G09F *11/02*

U.S. Cl. 116—284 18 Claims



1. A high visibility indicator adapted to be attached to a rotary actuator having a rotatable shaft and a housing, said indicator comprising an inner cylindrical member, an outer cylindrical member and a sleeve member interposed between said inner and outer cylindrical members and drivingly connected to each of said inner and outer cylindrical members between first and second terminal positions, the inner cylindrical member being adapted for connection to said shaft of said actuator, the outer cylindrical member being adapted to be secured to said housing of said actuator, said driving connections arranged such that rotational motion of the inner cylindrical member results in axial motion of said sleeve member, the outer cylindrical member being opaque for a first half of its axial extent and being transparent for a second half of its axial extent, said sleeve member being a different color from the first half of the axial extent of the outer cylindrical member, and said inner cylindrical member being surfaced such that said indicator displays a first color-coded arrangement when said sleeve member is at said first terminal position and a second color-coded arrangement when said sleeve member is at said second terminal position.

5,469,806

METHOD FOR EPITAXIAL GROWTH OF SEMICONDUCTOR CRYSTAL BY USING HALOGENIDE

Yuji Mochizuki; Yoshie Chiba; Toshikazu Takada, and Akira Usui, all of Tokyo, Japan, assignors to NEC Corporation, Japan

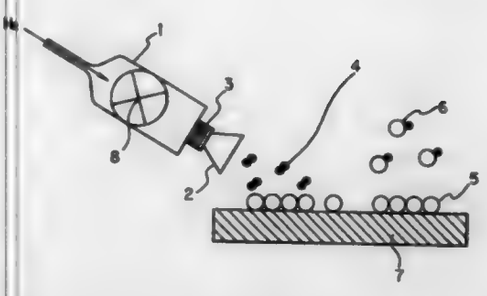
Filed Aug. 20, 1993, Ser. No. 110,116

Claims priority, application Japan, Aug. 21, 1992, 4-222772

Int. Cl.[6] C30B *25/14*

U.S. Cl. 117—97 2 Claims

1. A method for epitaxial growth of a semiconductor crystal by using halogenide, said method comprising the steps of:



exciting H_2 molecules into vibration and supplying said vibrationally-excited H_2 molecules onto a surface of a semiconductor crystal substrate under epitaxial growth, said epitaxial growth being carried out by using halogenide, so that Cl atoms are left on said surface of said semiconductor crystals;

removing said Cl atoms on said surface of said semiconductor substrate in accordance with formation of HCl molecules between said vibration-excited H_2 molecules and said Cl atoms;

said halogenide being selected from a group consisting of GaCl and $SiCl_2$, and

said epitaxial growth being carried out at a temperature of 200° C.

5,469,807

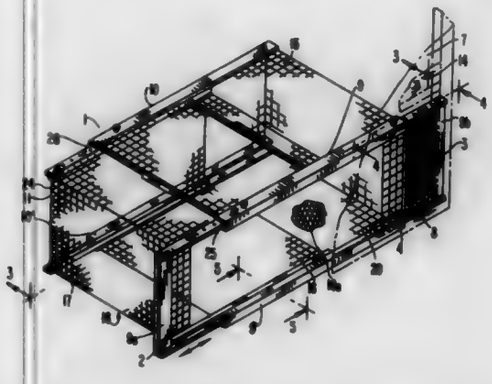
EXPANDABLE WINDOW PET BIN

Alicia Kormaczenka, 333 Beach 32nd St., Far Rockaway, N.Y. 11691

Filed Mar. 3, 1994, Ser. No. 205,589

Int. Cl.[6] A01K *1/02*

U.S. Cl. 119—19 **8 Claims**



1. A window pet enclosure comprising in combination: a window frame having a sill, said frame having a pair of vertically aligned channels in each side of the window frame, a bin container having a top roof, a bottom floor opposite said top roof, a plurality of vertical walls, an expandable, slidable bin extension portion on one side of said bin container, means for mounting said bin container to said window frame, said means for mounting said bin container being a pair of openable, slidable panels, said slidable panels being movably connectable to said bin container, each of said openable slidable panels slidable within the respective vertical channels of said window frame, said bin container further having an opening in a front wall of said plurality of vertical walls of said bin container, and means for closing said opening.

5,469,808

ANIMAL STALL

Michael J. Street, Bedford, and Toby T. F. Mottram, Somerset, both of, England, assignors to British Technology Group Ltd., London, England

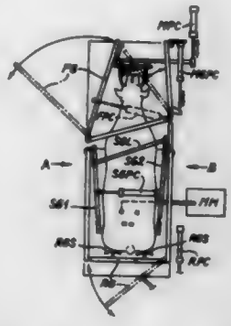
PCT No. PCT/GB91/01831, § 371 Date May 26, 1993, § 102(e) Date May 26, 1993, PCT Pub. No. WO92/06588, PCT Pub. Date Apr. 30, 1992

PCT Filed Oct. 18, 1991, Ser. No. 66,145

Claims priority, application United Kingdom, Jan. 19, 1990, 9022804

Int. Cl.[6] A01K *1/12*

U.S. Cl. 119—27 **7 Claims**



2. A closeable animal stall for milking including:

a closeable entry;

fixed floor means in the floor of the stall, said fixed means comprising a rear entry floor part and a forward floor part of the stall, said forward floor part being fixed higher than said rear entry floor part;

a movable manger; and

manger moving means for moving the manger forwardly as the animal enters the stall through said closeable entry to cause the animal to move forwardly and put its front feet on said higher forward floor part and for moving the manger rearwardly after the animal has its front feet on said higher forward floor part and the closeable entry is closed to cause the animal to move rearwardly into a predetermined position adjacent said closeable entry with its front feet still on said higher forward floor part;

the forward and rear entry floor parts being dimensioned such that when the animal is presented for milking it is positioned at a rear of the stall and encouraged to raise its fore-part with respect to its rear part and thereby increase an angle between the rear legs and an underside body of the animal, thereby improving milking access to an udder and teats of the animal;

whereby the animal is in an arched position for improving accommodation to automatic milking apparatus by improved access to the udder and teats.

5,469,809

NON DUSTING CLUMPING ANIMAL LITTER

Douglas Coleman, Macon, Miss., assignor to Super Dry Industries, Inc., Shaqualak, Miss.

Filed Jul. 15, 1994, Ser. No. 275,803

Int. Cl.[6] A01K *29/00*

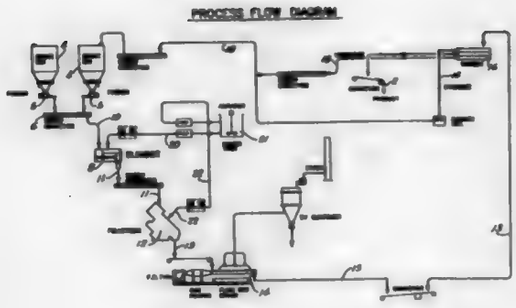
U.S. Cl. 119—173 **9 Claims**

1. A cat litter comprising:

a mixture comprising opal clay and sodium bentonite;

said mixture being pelletized into substantially round pellets;

said pellets being between a six (6) mesh and thirty (30) mesh in size.

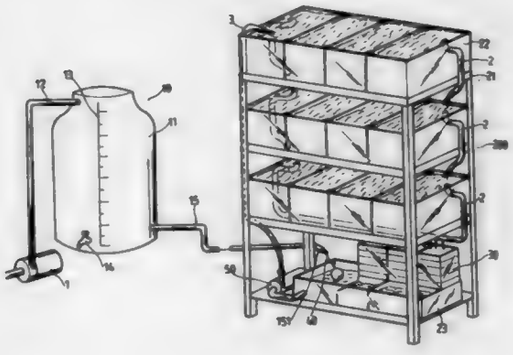


5,469,810

RAISING CONTROL APPARATUS FOR LIVING FISH AND WATER PLANTS

Ming-Tsung Chiang, No. 4, Lane 543, Chung Cheng Rd., Yuan Lin Chen, Changhua Hsien, Taiwan, Prov. of China

Filed May 4, 1994, Ser. No. 237,839
Int. Cl.[6] A01K *63/04*
U.S. Cl. 119—248 **4 Claims**



1. A raising control apparatus for living fish and water plants comprising:

a plurality of aquarium assemblies each including a frame having four partitions, a water quality stabilizing trough fitted in a lowest one of said partitions, three tanks each fitted in one of the remaining partitions, a pump having an inlet connected via a first pipe with said water quality stabilizing trough and an outlet connected via a second pipe with an uppermost one of said tanks which is in turn connected via a third pipe with an intermediate one of said tanks, a horizontally disposed dripping pipe connected between lower ends of said second and third pipes and having a plurality of perforations, a first downwardly depending pipe connected with an end of said dripping pipe, a second downwardly depending pipe connected with another end of said dripping pipe, a tank at an upper one of said partitions being connected with another tank at a lower one of said partitions by a tube, said water quality stabilizing trough being divided into a water collecting chamber under an outlet of said first downwardly depending pipe, a plurality of purifying chambers under an outlet of said second downwardly depending pipe, and a filtering chamber on which are piled up a plurality of additional filtering containers located under the perforations of said dripping pipe; and

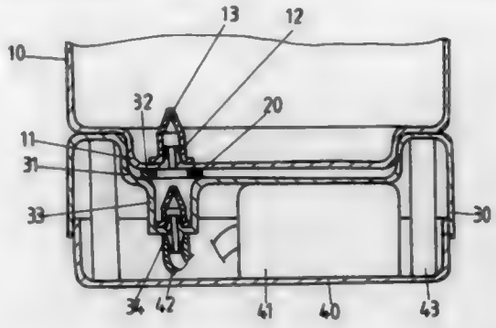
a water supply device having a reservoir connected with the water collecting chamber of said water quality stabilizing trough via a float ball valve.

5,469,811

AQUARIUM HAVING LEAK-PROOF BUBBLING PORT

Yu-An Lin, No.13, Wen-Ming Lane, Erhlin Chen, Changhua Hsien, Taiwan, Prov. of China

Filed May 25, 1994, Ser. No. 248,683
Int. Cl.[6] A01K *63/00*
U.S. Cl. 119—263 **2 Claims**



1. An improved leak-proof aquarium comprising:

a) a base disc having an air pump with an air conduit extending therefrom;

b) a base cover located on the base disc, the base cover having a recessed connection slot, a mounting hole formed in the recessed connection slot, and a connector having a first bubbling port connected to the air conduit;

c) a water tank having an insertion member in the recessed connection slot so as to mount the water tank on the base cover, the water tank having a second bubbling port;

d) an elastic seat located between the water tank and the base cover around the second bubbling port;

e) a first check valve connected to the second bubbling port so as to allow air to pass into the tank and prevent water in the tank from passing through the second bubbling port; and,

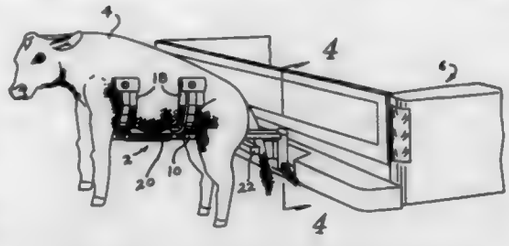
f) a second check valve connected to the first bubbling port so as to allow air to pass through the first bubbling port and prevent water from the water tank from passing through the first bubbling port.

5,469,812

CALF CARRIER

Geoffrey R. Burks, P.O. Box 215, Stratton, Nebr. 69043-0215

Continuation of Ser. No. 88,923, Jul. 6, 1993, Pat. No. 5,289,801. This application Feb. 24, 1994, Ser. No. 201,257
Int. Cl.[6] A61D *3/00*
U.S. Cl. 119—728 **1 Claim**



1. A mobile animal suspension assembly comprising,

a cantilevered rigid base member having inner and outer ends,

a rigid cross bar attached perpendicularly to the base member proximate the inner end of the base member,

inner and outer generally "U" shaped support members, each having a central apex and a pair of opposing divergent sides which have spaced apart free ends, and where each of the support members are attached at their respective apexes to the rigid base member and where the support members are spaced apart so as to provide support for an animal's body behind its

front legs and in front of its hind legs respectively, and where the inner support member is spaced from the cross bar a distance sufficient to accommodate the hind legs of the supported animal bar and the said inner support member,

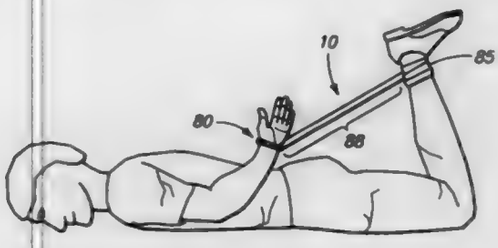
a tubular member depending from the inner end of the cantilevered base member and adapted to embrace a correspondingly sized projection attached to a mobile platform.

5,469,813

PRISONER RESTRAINT

Kevin H. Peden, 6005 W. Excell Ave., Spokane, Wash. 99208

Filed Nov. 5, 1993, Ser. No. 147,490
Int. Cl.[6] E05B *75/00*
U.S. Cl. 119—770 **3 Claims**



1. A method for restraining a prisoner, comprising:

selecting a prisoner restraint having a tether with a first loop formed at a first end and a detachable connection near an opposing second end of the tether;

forming a noose by doubling the tether through the first loop;

installing the noose over the leg of the prisoner;

encircling the tether about the prisoner's legs to provide circumscribing chords which extend laterally between the prisoner's legs to restrain action of the legs;

encincturing the tether about the circumscribing chords between the prisoner's legs to cinch the chords together;

extending the second end of the tether up the prisoner;

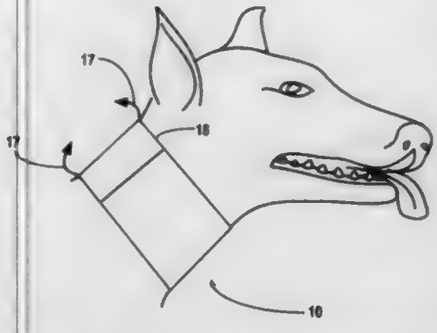
securing the second end of the tether to manacles installed on the prisoner's arms.

5,469,814

SMALL ANIMAL RECOVERY COLLAR

Deirdre L. Moy, and Kelly A. Moy, both of 125 Galewood Cir., San Francisco, Calif. 94131

Filed Jul. 8, 1994, Ser. No. 273,370
The portion of the term of this patent subsequent to May 3, 2011, has been disclaimed.
Int. Cl.[6] A01K *15/04*
U.S. Cl. 119—815 **7 Claims**



1. A protective collar worn by a household pet or other animal, said collar comprising a sheet of hard, flexible material, said sheet being formed into a tubular shape around the neck of said animal, said collar having a width such that the collar extends between the animal's mandible and the animal's scapula in the region of the shoulder joint.

5,469,815

METHOD OF LOADING LIVE POULTRY

Lawrence L. Stross, P.O. Box 7578, Station M, Edmonton, Alberta, Canada

Filed Jan. 18, 1995, Ser. No. 373,989
Int. Cl.[6] A01K *29/00*
U.S. Cl. 119—846 **1 Claim**

1. A method of loading live poultry, comprising the steps of:

firstly, providing a transport vehicle having a plurality of empty poultry crates, a trailer having a two tiered trailer mounted conveyor, and a plurality of interconnectable two tiered conveyor sections, the trailer mounted conveyor and the conveyor sections both having a top tier and a bottom tier;

secondly, deploying the trailer mounted conveyor so that a first end extends into the freight compartment of the transport vehicle, and deploying the two tiered conveyor sections so that they extend from a second end of the trailer mounted conveyor into an enclosure containing live poultry;

thirdly, sending poultry crates continuously along the trailer mounted conveyor and the conveyor sections from the freight compartment of the transport vehicle to the enclosure on one of the top tier and bottom tier; and

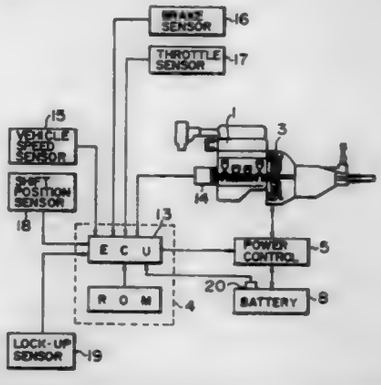
fourthly, loading the live poultry into the poultry crates at the enclosure and sending the poultry crates containing live poultry continuously along the conveyor sections from the enclosure to the freight compartment of the transport vehicle on the other of the top tier and bottom tier.

5,469,816

CONTROL MECHANISM FOR AN ELECTRIC GENERATOR MOTOR IN AN INTERNAL COMBUSTION ENGINE

Takaji Murakawa, Kariya; Toyoji Yagi, Anjo, and Hiroshi Tashiro, Nagoya, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 1, 1994, Ser. No. 299,278
Claims priority, application Japan, Sep. 2, 1993, 5-218701
Int. Cl.[6] F02B *63/00*
U.S. Cl. 123—2 **7 Claims**



1. A controller for a vehicle motor .generator which functions as an electric motor and as an electric generator charging an electrical storage device, said controller comprising:

travel energy detection means for detecting a vehicle speed during vehicle travel;

present capacity determining means for determining a present capacity remaining in said electrical storage device; and

control means for selectively operating said motor generator as an electric generator and as an electric motor based on said detected vehicle speed and said determined present capacity;

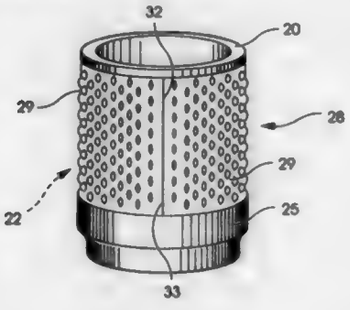
wherein said control means is further for calculating an amount of electric power required by said electrical storage device, and for operating said motor generator as an electric generator based on said calculated amount.

5,469,817

TURBULATOR FOR A LINER COOLING JACKET

Kevin L. Hoag, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Sep. 1, 1994, Ser. No. 299,540
Int. Cl.[6] F02F *1/14*
U.S. Cl. 123—41.79 **6 Claims**



1. In combination:

a cylinder block having a substantially cylindrical bore therein;

a cylinder liner constructed and arranged with a cooling jacket relief portion and positioned in said substantially cylindrical bore such that said relief portion is enclosed thereby defining a cooling jacket space;

a tubulator panel coiled around said cylinder liner and positioned in said cooling jacket space, said turbulator panel being constructed from a unitary sheet of metal and integrally formed with a repeating pattern of flow-through corrugations so as to create turbulence in the flow of a cooling liquid which circulates through said cooling jacket space;

wherein the repeating pattern of flow-through corrugations includes a first portion wherein the corrugations protrude radially outwardly from said turbulator panel in a first direction and a second portion wherein the corrugations protrude radially outwardly from said turbulator panel in a second direction, wherein said second direction is opposite to said first direction; and

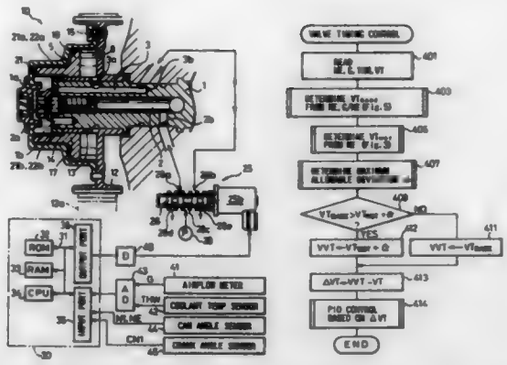
wherein said first portion of corrugations includes a plurality of rows of corrugations which rows are arranged side-by-side and extend in a circumferential direction.

5,469,818

VARIABLE VALVE TIMING CONTROL DEVICE FOR AN ENGINE

Mamoru Yoshioka, Susono; Haruyuki Obata, Toyota; Ken Tanoue, Okazaki; Yoshihiro Iwashita, Shizuoka; Toshimi Kashiwagura, Susono; Makoto Suzuki, Mishima; Hiroki Ichinose, Fujinomiya, and Hironori Okamizu, Shizuoka, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 13, 1995, Ser. No. 403,093
Claims priority, application Japan, Mar. 15, 1994, 6-044178
Int. Cl.[6] F01L *1/34;13/00*
U.S. Cl. 123—90.15 **9 Claims**



1. A variable valve timing control device, for an engine, for controlling the valve timing of the engine, in accordance with an operating condition thereof, comprising:

an engine speed detecting means for detecting the rotating speed of the engine;

an engine load detecting means for detecting the load on the engine;

an optimum-full-load valve-timing calculating means for calculating the optimum valve timing of the engine when the engine is operated at a full load with the engine speed detected by said engine speed detecting means;

a valve timing setting means for determining a setting value of the valve timing of the engine based on the engine speed detected by said engine speed detecting means and the engine load detected by said engine load detecting means, in such a manner that an amount of the deviation of said setting value of the valve timing from said optimum full load valve timing does not exceed a predetermined limiting value; and,

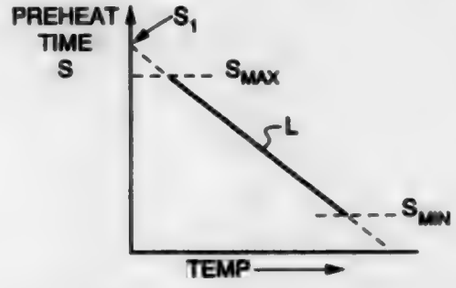
a valve timing adjusting means for adjusting the valve timing of the engine to said setting value determined by said valve timing setting means.

5,469,819

ADAPTIVE ENGINE PREHEAT

John G. Berger, Landisville, and Dale A. Ashcroft, New Holland, both of Pa., assignors to Ford New Holland, Inc., New Holland, Pa.

Filed Nov. 25, 1994, Ser. No. 348,911
Int. Cl.[6] F02N *17/02*
U.S. Cl. 123—179.6 **4 Claims**



1. A preheat system for a diesel engine, said preheat system comprising:

temperature sensor means for sensing the temperature of said engine and producing an output signal representing said temperature;

an ignition switch;

heater means for heating said engine;

a programmable microprocessor, said programmable microprocessor including means for sampling said output signal when said ignition switch is turned on, calculating means for calculating a value representing an interval of time that said heater means must be energized to raise the temperature of said engine from the temperature represented by said sampled output signal to a desired temperature for starting said engine, and means responsive to said calculated value for energizing said heater means for said interval of time;

said programmable microprocessor including a non-volatile memory in which is stored a parameter value S_{MAX} represent-

ing a maximum interval of time said heater means may be continuously energized and a parameter M defining a relationship between time of heating and change in temperature of the engine during the time of heating, said calculating means being responsive to said parameter M and said sampled output signal for calculating said calculated value; and,

said calculating means including means for comparing said value calculated from M and the sampled output signal with the parameter value S_{MAX} and means for using the parameter value S_{MAX} for energizing said heater means when S_{MAX} is smaller than the value calculated from M and the sampled output signal.

5,469,820

AUXILIARY POWER UNIT FOR A HYBRID ELECTRICAL VEHICLE

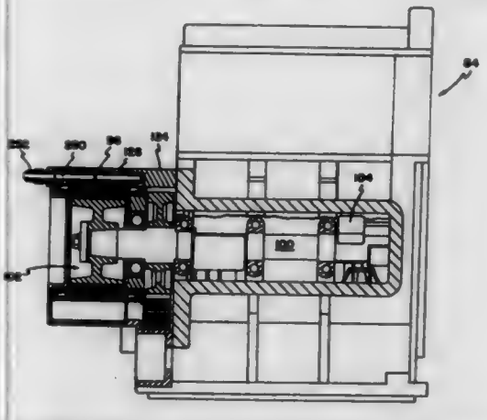
Stanley E. Data, Ramsey; Robert P. Koziara, Lake Elmo; Mark S. Lent, Brooklyn Park; Patrick A. O'Gorman, Brooklyn Center; Thomas K. Rose, Plymouth; Eugene G. Shanks, Blaine, and Daniel A. Norrick, Anoka, all of Minn., assignors to Onan Corporation, Minneapolis, Minn.

Continuation of Ser. No. 93,536, Jul. 15, 1993, abandoned.

This application Jan. 20, 1995, Ser. No. 376,043

Int. Cl.[6] F02B *75/06*

U.S. Cl. 123—192.2 **3 Claims**



1. An auxiliary power unit for a hybrid electric vehicle, comprising:

a combustion engine driving a crankshaft;

a balance shaft interconnected to the crankshaft by gear means for causing the balance shaft to rotate in a direction opposite to that of the crankshaft;

an alternator/starter mounted on an end of the balance shaft; and

wherein a net angular momentum of the auxiliary power unit is zero.

5,469,821

CYLINDER BLOCK AND METHOD OF MAKING THE SAME

Rolf Gosch, Lahnau, Germany, assignor to EB Brühl Aluminiumtechnik GmbH, Brühl, Germany

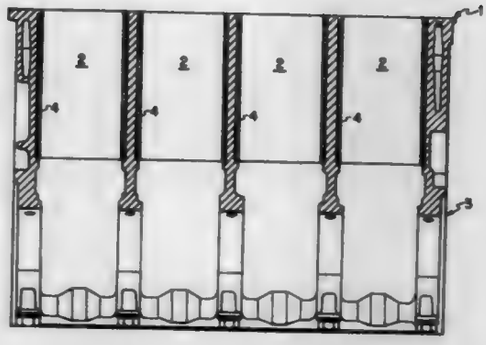
Filed Dec. 30, 1993, Ser. No. 176,838

Claims priority, application Germany, Dec. 30, 1992, 42 44 502.7

Int. Cl.[6] F02F *7/00*; C22C *21/02*; F16M *1/021*; F16J *10/04*

U.S. Cl. 123—193.2 **26 Claims**

1. A cylinder block for an engine, having a cylinder; and a separately made liner for said cylinder, the material of said liner being composed at least in part of a hypoeutectic aluminum-containing material having silicon carbide particles dispersed therein; wherein said block is composed at least in part of a hypoeutectic aluminum-containing substance.



5,469,822

OIL PAN FOR COMBUSTION MACHINES AND METHOD OF MAKING THE OIL PAN

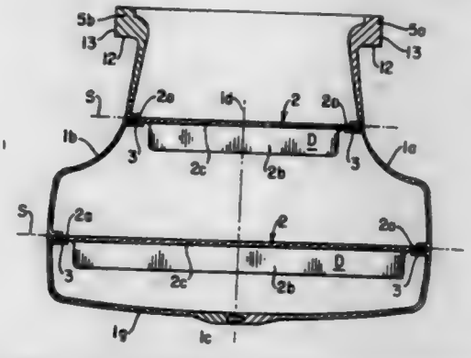
Klaus Mechsner, Neuwied, Germany, assignor to VAW Aluminium AG, Bonn, Germany

Filed Sep. 15, 1994, Ser. No. 306,646

Claims priority, application Germany, Jan. 13, 1993, 43 34 858.3

Int. Cl.[6] F02F *7/00*

U.S. Cl. 123—195 C **28 Claims**



1. An oil pan for combustion machines, comprising wall means defining an oil chamber; and partitioning means in said chamber including a first partition having first means for supporting said partition on said wall means and second means for deflecting oil in said chamber, said first means defining a support plane for said partition, and said second means defining at least one oil deflecting plane which is substantially normal to said support plane, said partitioning means further including a second partition similar to said first partition, and said partitions being arranged one above the other.

5,469,823

SENSOR ARRANGEMENT FOR RAPID CYLINDER DETECTION IN A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Karl Ott, Markgroeningen; Klaus Walter, and Joachim Strate, both of Bietigheim-Bissingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE94/00298, § 371 Date Dec. 15, 1994, § 102(e) Date Dec. 15, 1994, PCT Pub. No. WO94/23192, PCT Pub. Date Oct. 13, 1994

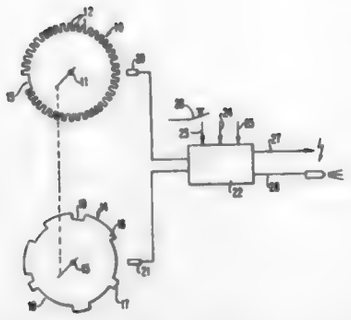
PCT Filed Mar. 18, 1994, Ser. No. 347,433

Claims priority, application Germany, Mar. 31, 1993, 43 10 468.6

Int. Cl.[6] F02P *5/00*

U.S. Cl. 123—414 **16 Claims**

1. A sensor arrangement for cylinder detection in a multi-cylinder internal combustion engine, comprising a sensor disc



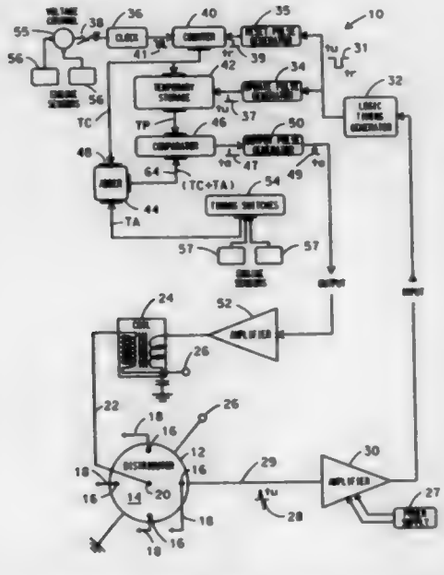
driveable by a crankshaft and having a multiplicity of angular marks and at least one distinguishable reference mark which is assigned to a fixed crankshaft angle; a sensor disc driveable by a camshaft and having a number of angular marks corresponding to a number of cylinders and having different lengths and different intermediate spaces; stationary detectors assigned to said sensor discs and, as a function of said marks passing by, outputting output signals with low phases and high phases; a control device evaluating said output signals so as to count the number of crankshaft pulses between a front edge and a rear edge of a camshaft sensor signal and to conclude an angular position of the camshaft from thusly obtained count values, said control device distinguishing identical angular marks with low phases and high phases of identical size by means of an additional detection of said reference mark so as to provide an unambiguous cylinder assignment within a segment with an extremely small number of different angular marks.

5,469,824

ELECTRONIC SYSTEM FOR CONTROLLING TIMING SIGNALS IN AN INTERNAL COMBUSTION ENGINE

Juan M. Fontenla, Louisville, Colo., assignor to Garci, Inc., Huntsville, Ala.

Filed Mar. 7, 1994, Ser. No. 206,329
Int. Cl.[6] F02P *5/15*
U.S. Cl. 123—416 **20 Claims**



15. An electronic ignition timing control system for electrical connection between the ignition distributor and the spark ignitor of an automotive engine wherein said distributor provides a train of electrical distributor pulses during operation of said automotive engine, said system comprising:

means for amplifying said distributor pulses;

a logic timing generator for reception of each of said amplified pulses and in response thereto, for delivery of a pulse which includes an instantly generated update signal and a time delayed reset signal;

an update pulse generator for reception of said update signal and for providing an update pulse in response thereto;

a reset pulse generator for reception of said reset signal and for providing a reset pulse in response thereto;

an analog voltage controlled clock for providing time marking signals;

a binary counter for reception of said time marking signals, for reception of said reset pulse and for providing elapsed timing signals in response to reception of said reset pulse;

a temporary storage means for reception of said elapsed timing signals, for reception of said update pulse and for providing a previous time signal in response to reception of said update pulse, said previous time signal reflecting the time between reception by said binary counter of said reset pulse and the time of reception by said temporary storage of said update pulse;

a timing switching means for providing selected timing control signals in a format compatible with the timing signals provided by said counter;

an adder means for reception of said timing control signals, for reception of said elapsed timing signals and for adding one to the other so as to provide progressing target time signals;

a comparator for reception of said previous time signal, for the reception of said progressing target time signals, for comparison of said accumulating target time signals to said previous time, and for producing a time controlled output pulse when said accumulating target time signals become equal to said previous time;

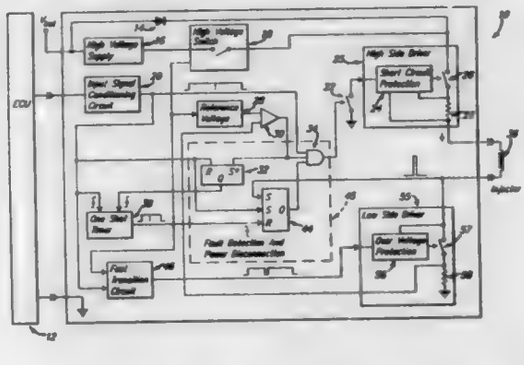
an output pulse generator means for reception of said time controlled output pulse and for producing in response thereto a conditioned output pulse suitable for use by the spark ignitor of said automotive engine.

5,469,825

FUEL INJECTOR FAILURE DETECTION CIRCUIT

Pawel J. Golab, Birmingham, and Anson Lee, St. Clair, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Sep. 19, 1994, Ser. No. 308,226
Int. Cl.[6] F02D *41/22;41/30;* **H01H** *47/32*
U.S. Cl. 123—479 **15 Claims**



1. An injector failure detection circuit including at least one injector having a high side and a low side terminal, the circuit comprising:

a one shot timer for transmitting a constant voltage state signal output when the injector reaches a set current threshold at a start of an injector current peak time duration;

a voltage sense comparator for transmitting a low voltage state signal output when the low side terminal of the injector produces a fly-back voltage pulse;

means for monitoring current of the injector during a rise time duration and the peak time duration, the current monitoring means in communication with the one shot timer;

means for disconnecting all electrical power supplied to the at least one injector if the injector current fails to reach a peak level during the rise time duration or the fly-back voltage pulse fails to occur at the end of the peak time duration, the disconnection means in communication with the one shot timer and the voltage sense comparator; and

means for monitoring the fly-back voltage pulse produced by the low side terminal of the injector, the fly-back voltage monitoring means in communication with the injector.

5,469,826

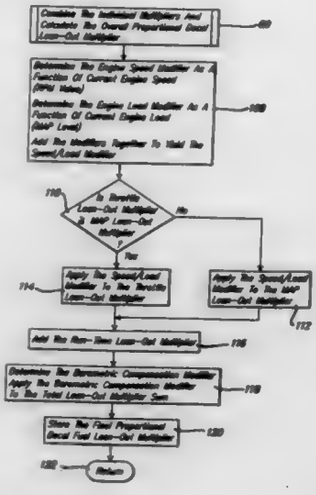
METHOD OF LOAD AND SPEED MODIFYING ON FUEL LEAN-OUT FOR INTERNAL COMBUSTION ENGINES

Christopher P. Thomas, Rochester Hills; Gregory T. Weber, Commerce Twp., and Glen E. Tallarek, Grosse Pointe Woods, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 4, 1994, Ser. No. 238,122

Int. Cl.[6] F02D *41/12*

U.S. Cl. 123—488 **6 Claims**



1. A method of load and speed modifying on declaration fuel lean-out for an internal combustion engine, said method comprising the steps of:

determining if conditions are right for executing said method and continuing said method if the conditions are right;

sensing a speed of the engine;

determining an engine speed modifier as a function of current sensed engine speed;

sensing a manifold absolute pressure (MAP) of an intake manifold of the engine;

determining an engine load modifier as a function of current sensed MAP;

adding the determined engine speed modifier and engine load modifier together to yield a speed/load modifier; and

applying the speed/load modifier value to a fuel pulsewidth value of fuel injectors for the engine and reducing the amount of fuel injected into the engine by the fuel injectors.

5,469,827

METHOD AND APPARATUS FOR CONTROL OF THE START-UP AIR-FUEL RATIO OF AN INTERNAL COMBUSTION ENGINE

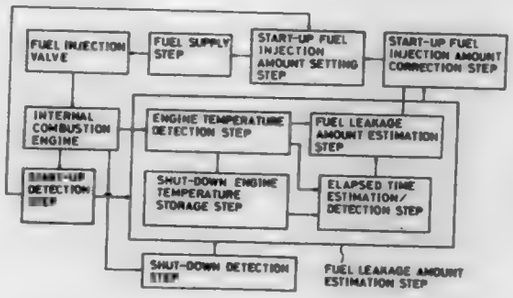
Naoki Tomisawa, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Feb. 1, 1994, Ser. No. 189,745

Claims priority, application Japan, Feb. 2, 1993, 5-015666

Int. Cl.[6] F02M *51/00*

U.S. Cl. 123—491 **22 Claims**



1. A method for controlling a start-up air/fuel ratio of an internal combustion engine, comprising:

detecting an engine start-up;

setting a start-up fuel injection amount of a fuel injection valve installed in an engine intake system;

supplying fuel to said engine from said fuel injection valve in an amount set by said start-up fuel injection amount setting step;

detecting shut-down of the engine;

estimating an amount of fuel leaked from said fuel injection valve into the engine intake system during the period from engine shut-down until restart;

correcting, on the basis of the leakage amount estimated by said fuel leakage amount estimating step, the start-up fuel injection amount set by said start-up fuel injection amount setting step; and

supplying fuel to said engine from said fuel injection valve in an amount corrected by said correcting step.

5,469,828

FUEL INJECTION DEVICE ACCORDING TO THE SOLID-STATE ENERGY STORAGE PRINCIPLE FOR INTERNAL COMBUSTION ENGINES

Wolfgang Heimberg, Ebersberg; Wolfram Hellmich, Munich; Franz Kogl, Kaufbeuren, all of, Germany, and Paul Maiatinszky, Bulle, Switzerland, assignors to Ficht GmbH, Kirschseeoan, Germany

PCT No. PCT/EO93/00495, § 371 Date Sep. 2, 1994, § 102(e) Date Sep. 2, 1994, PCT Pub. No. WO93/18297, PCT Pub. Date Sep. 16, 1993

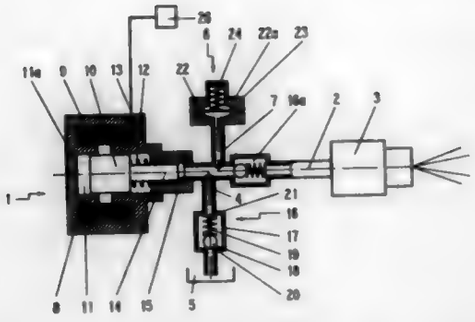
PCT Filed Mar. 4, 1993, Ser. No. 295,811

Claims priority, application Germany, Mar. 4, 1992, 42 06 817.7

Int. Cl.[6] F02M *51/04;63/06*

U.S. Cl. 123—497 **75 Claims**

1. Fuel injection device operating according to the solid-state energy storage principle, whereby a piston element carried in a pump cylinder of an electromagnetically driven reciprocating pump displaces the fuel to be injected in the pump area before the injection during a virtually resistanceless acceleration phase during which the piston element stores kinetic energy, and the displacement is suddenly stopped with means interrupting the displacement, so that a pressure impulse is produced in the fuel contained in a sealed pressure chamber due to the fact that the stored kinetic energy of the piston element is directly transferred to the fuel in the pressure chamber and whereby the pressure impulse is used for the injection of fuel by an injection device, characterized by the fact that the means for interrupting the displacement and producing the



pressure impulse are arranged outside the leading contact area between the piston element and the piston cylinder of the reciprocating pump.

5,469,829

ARRANGEMENT FOR SUPPLYING INTERNAL COMBUSTION ENGINE WITH FUEL FROM SUPPLY CONTAINER

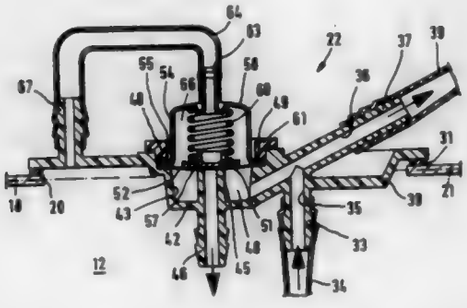
Stephan Kleppner, Bretten; Kurt Frank, Schorndorf, and Jan Mutschler, Oberstdorf, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 3, 1995, Ser. No. 367,695

Claims priority, application Germany, Jan. 26, 1994, 44 02 224.7

Int. Cl.[6] F02M 37/04

U.S. Cl. 123—514 11 Claims



1. An arrangement for supplying an internal combustion engine with fuel, comprising a supply container with an opening; a feed pump insertable into said supply container through said opening; a closure part closing said opening and provided with a pressure regulator having a pressure chamber with a connection to a pressure side of said feed pump to an internal combustion engine and to an unloading chamber, said pressure regulator having a spring-loaded closing member controlling the connection with the unloading chamber and cooperating with a seat so that after exceeding of a predetermined pressure in said pressure chamber the connection of said pressure chamber to said unloading chamber is released, said closure part being composed of a synthetic plastic material and having a flange-like base body which closes said opening, said base body being provided with a depression and a pipe which is formed of one piece with said base body and extends into said depression to form the connection of said pressure chamber with said unloading chamber; an elastically deformable diaphragm which covers said depression for forming said pressure chamber and acts as a closing member cooperating with an end of said pipe as the seat; and a separate holding element mounted on said base body so that said diaphragm is clamped between said base body and said holding element.

5,469,830

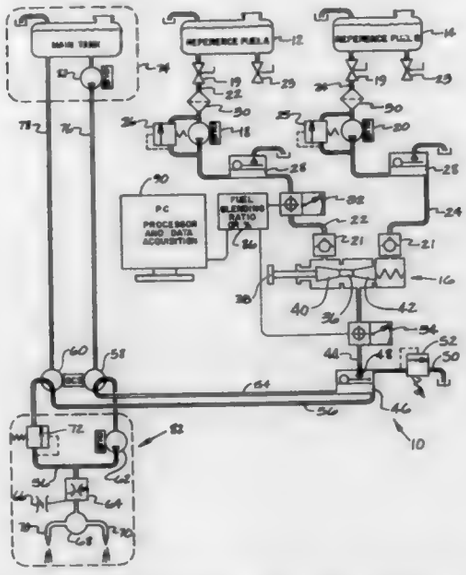
FUEL BLENDING SYSTEM METHOD AND APPARATUS

Cesar Gonzalez, Wichita, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Feb. 24, 1995, Ser. No. 394,415

Int. Cl.[6] F02M 37/04

U.S. Cl. 123—515 9 Claims



1. An on-board fuel blending system of two reference fuels A and B of known octane ratings for a piston engine comprising:

first and second fuel tanks with discharge lines each containing respective test fuels A and B;

a constant pressure pump having a discharge line connected to the discharge line of each tank for supplying a constant pressure of both fuel A and fuel B;

an adjustable blending valve with two entry ports and one exit port, each entry port connected to the discharge line of the respective pumps of fuels A and B, the blending valve includes a spool means which as it moves, increases the portion of one reference fuel as it decreases the portion of the other fuel to vary the octane rating of the blended-flow from the exit port;

a first flow meter in the flow path of one of the constant pressure pumps;

a second flow meter in the flow path of the blended flow flowing from the blending valve;

a float controlled needle valve positioned in the mixed fuel flow path which limits the mixed fuel flow to that which the engine is burning; and

integral processing means which senses the flow from both said flow meters to compute the percent of each test fuel A and B in the blend and the octane rating of the blended stream.

5,469,831

FUEL SUPPLY CONTROL SYSTEM FOR AN AUTOMOTIVE ENGINE

Tatsuhiko Takahashi, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1994, Ser. No. 339,194

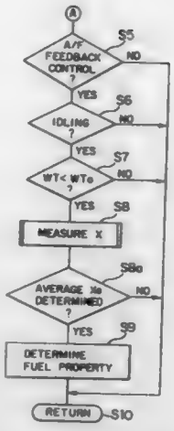
Claims priority, application Japan, Nov. 12, 1993, 5-283376

Int. Cl.[6] F02D 41/16

U.S. Cl. 123—680 6 Claims

1. A fuel supply control system for an internal combustion engine, comprising:

fuel supply means for supplying a fuel to said internal combustion engine;



air/fuel ratio sensor means for detecting an air/fuel ratio of a mixture of air and fuel supplied to said internal combustion engine; and

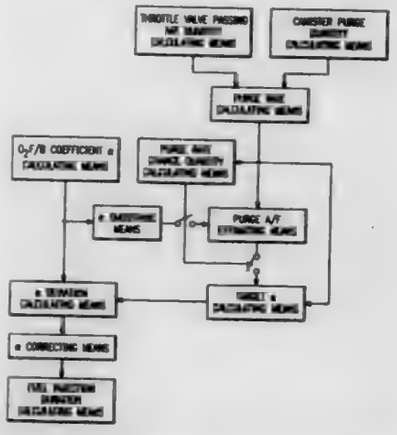
fuel supply control means, having all input coupled to said air/fuel ratio sensor means, for controlling said fuel supply means to adjust said air/fuel ratio to a theoretical ratio using a feedback control method based on an output of said air/fuel ratio sensor means; wherein said fuel supply control means includes: feedback correction factor calculation means for calculating a feedback correction factor from a deviation of said air/fuel ratio detected by said air/fuel ratio sensor means from said theoretical ratio; amplitude measurement means for determining an amplitude of said feedback correction factor; and fuel property judgment means for determining a property of said fuel on the basis of said amplitude of said feedback correction factor; said fuel supply control means controlling said fuel supply means in accordance with said property of said fuel determined by said fuel property judgment means.

5,469,832

CANISTER PURGE CONTROL METHOD AND APPARATUS FOR INTERNAL COMBUSTION ENGINE

Mamoru Nemoto, 2477-3, Aza Kashima-Yazu, Ohaza Takaba, Katsuka-Shi, Ibaraki-ken, Japan

Filed Sep. 20, 1994, Ser. No. 308,925
Claims priority, application Japan, Sep. 20, 1993, 5-232781
Int. Cl.[6] F02M *33/02*
U.S. Cl. 123—682 **15 Claims**



1. An engine air/fuel mixture control method comprising:

temporarily recovering a fuel vapor generated in a fuel tank to fuel vapor recovering means,

purging said recovered fuel vapor to said engine during operation of said engine with a purge air quantity (Qevp) being controlled at purge ratio (Kevp) proportional to an air quantity (Qtvo) supplied to said engine, and

feedback controlling an air-fuel ratio in the engine intake by a feedback control quantity (α);

said method comprising the steps of:

determining a purge air-fuel ratio (AFevp), in response to a first purge ratio (Kevp1) and a feedback control quantity (α) of said air-fuel ratio; and

determining a target air-fuel ratio feedback control quantity according to said estimated purge air-fuel ratio (AFevp) and a second ratio (Kevp2); and

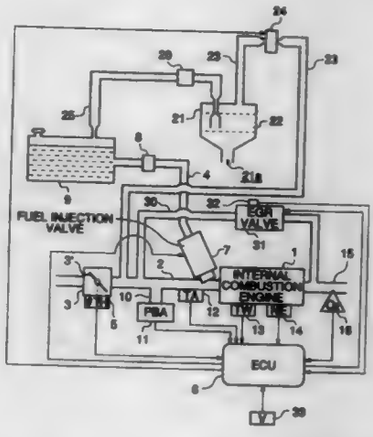
changing said feedback control quantity (α) of said air-fuel ratio according to said calculated target air-fuel ratio feedback control quantity when Kevp1 and Kevp2 are unequal.

5,469,833

CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Fumio Hara; Akira Fujimura; Yoshihisa Hara, and Masahiro Sakanushi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1994, Ser. No. 187,469
Claims priority, application Japan, Feb. 1, 1993, 5-036094
Int. Cl.[6] F02M *25/08*
U.S. Cl. 123—698 **5 Claims**



1. In a control system for an internal combustion engine having an intake passage, a fuel tank, a canister for adsorbing evaporative fuel generated from said fuel tank, a purging passage connecting said canister and said intake passage for allowing said evaporative fuel to be purged therethrough into said intake passage, said control system including a purge control valve arranged in said purging passage for controlling a flow rate of said evaporative fuel purged through said purging passage into said intake passage, fuel injection valves for controlling an amount of fuel to be supplied to said engine by injection, operating condition-detecting means for detecting operating conditions of said engine, evaporative fuel concentration-dependent correction coefficient-setting means for setting an evaporative fuel concentration-dependent correction coefficient dependent on concentration of said evaporative fuel purged into said intake passage, purging flow rate-controlling means for controlling said purge control valve depending on said operating conditions of said engine, and fuel injection amount-controlling means for controlling said fuel injection valves based on said operating conditions of said engine detected by said operating condition-detecting means and said evaporative fuel concentration-dependent correction coefficient,

the improvement comprising:

purging region-setting means for setting a purge control valve-enabling region in which said purge control valve is made operative, and a purge control valve-disabling region in which said purge control valve is made inoperative, based on said operating conditions of said engine, and

evaporative fuel concentration-dependent correction coefficient-holing means for holding said evaporative fuel concentration-dependent correction coefficient to a predetermined value for a predetermined time period after said engine has shifted from said purge control valve-disabling region to said purge control valve-enabling region.

5,469,834

ARCHERY BOW WITH TILTING AND TRANSLATING GRIP

Ronald Higgins, and Allan F. Smith, both of Tucson, Ariz., assignors to Precision Shooting Equipment, Inc., Tucson, Ariz.

Filed Sep. 12, 1994, Ser. No. 304,152
Int. Cl.[6] F41B 5/14
U.S. Cl. 124—88 **9 Claims**

1. An archery bow having a translating, tilting grip, said bow comprising:
a handle having a predetermined thickness;
a grip having a first side and a contoured back;
a pair of threaded inserts in said handle;
a pair of slots in said first side, wherein said slots are elongated in different directions;
a pair of screws passing through said slots and engaging said threaded inserts for securing said grip to said handle;
wherein said inserts are movable from side to side in said handle for translating said grip and wherein said screws can move within said slots for changing the tilt of said grip relative to said handle.

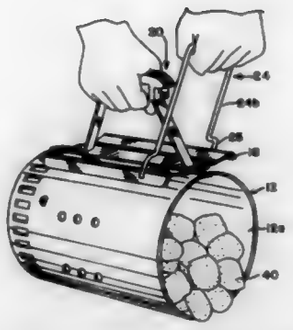
5,469,835

CHARCOAL IGNITER

James C. Stephen, Arlington Heights; Erich J. Schlosser, Barrington, and Ewald Sieg, Palatine, all of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.

Filed Jul. 29, 1994, Ser. No. 282,872
Int. Cl.[6] A47J 37/00
U.S. Cl. 126—25 B **21 Claims**

1. A charcoal briquette igniting apparatus comprising:
a housing having an interior and an exterior, an internal, annular channel therein and opposed openings at each end thereof;
a charcoal support member permanently connected to said housing within said channel;
a heat shield connected to said exterior of said housing;



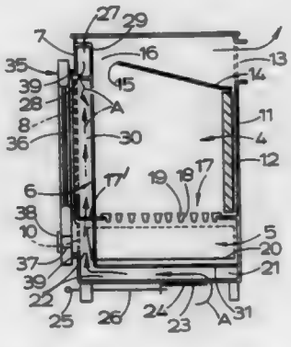
a stationary first handle connected to either said heat shield or said exterior of said housing and having a first gripping portion oriented parallel to the longitudinal central axis of said housing; and,
a second handle pivotally connected to either said heat shield or said exterior of said housing and having a second gripping portion angularly oriented relative to said first gripping portion of said first handle and adapted to permit a user to grip said stationary first gripping portion of said first handle with one hand, grip said second gripping portion of said second handle with the other hand, and control the angular orientation of said housing using both handles simultaneously.

5,469,836

SOLID FUEL HEATING APPLIANCE

Jonathan Greenall, More Works, Squilver Hill, Bishops Castle, England

PCT No. PCT/GB92/00268, § 371 Date Sep. 24, 1993, § 102(e) Date Sep. 24, 1993, PCT Pub. No. WO92/14972, PCT Pub. Date Sep. 3, 1992
PCT Filed Feb. 14, 1992, Ser. No. 104,058
Claims priority, application United Kingdom, Feb. 14, 1991, 9103161
Int. Cl.[6] F24C 1/14
U.S. Cl. 126—77 **5 Claims**



1. A multi-fuel stove comprising:
a housing;
a firebox;
a door having a transparent window;
an ash chamber having a lower wall; a grate;
preheating means provided beneath said ash chamber;
a front wall of said housing;
airwash means;
an updraught air supply;
wherein said housing contains said firebox and said ash chamber, and has a door aperture;
said firebox is provided above said ash chamber, with said grate disposed therebetween;
said door is provided in register with said door aperture;

and wherein said preheating means comprises a chamber, or passageway, provided below said ash chamber, said chamber or passageway being defined in part by said lower wall and communicating with said airwash means, said airwash means comprising a first conduit provided on said front wall of said housing and extending along one side of said door aperture, a second conduit provided on said front wall of said housing and extending along the other side of said door aperture, and a third conduit in communication with said first and second conduits and extending across the top of said door aperture, said first and second conduits both being in communication with said chamber or passageway;

said updraught air supply supplying updraught air to said ash chamber below said grate, said updraught air rising through said grate in use, said updraught air supply having an updraught air supply control to control the air supplied to said ash chamber by said updraught air supply, and wherein said preheating means has a preheated air supply control which controls air provided to said preheating chamber or passage, said preheated air supply control and said updraught air supply being independently controllable;

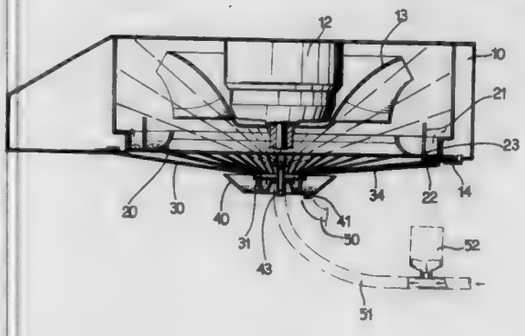
and wherein said airwash means is adapted to provide preheated air to the inside surface of said door.

5,469,837

SMOKE EXHAUSTER HAVING CLEANING DEVICE

Chao-Cheng Chiang, and Chi-Shyong Chiang, both of P.O. Box 63-151, Taichung, Taiwan, Prov. of China

Filed Dec. 27, 1994, Ser. No. 363,923
Int. Cl.[6] F24C *15/20*
U.S. Cl. 126—299 D **5 Claims**



1. A smoke exhauster comprising:

a housing including an opening formed therein,

an annular tray engaged in said opening for collecting fluid and including a first drain hole formed therein for draining said fluid,

a grill engaged below said annular tray and engaged in said opening, said grill including a center portion and including a passage extended radially therein, said passage including a first end located below said first drain hole of said annular tray for receiving said fluid and including a second end extended toward said center portion thereof for guiding said fluid to said center portion,

means for securing said grill to said housing and for retaining said annular tray in said opening,

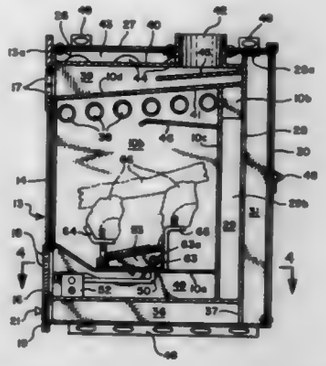
a container secured to said center portion of said grill for collecting fluid from said passage, said container including a center portion having a tube provided therein, said tube including an upper end extended toward said opening of said housing and including a lower end for supplying water into said housing for cleaning said housing.

5,469,838

GAS FIREPLACE CAPABLE OF BEING INSTALLED WITHOUT MASONRY WORK

Lynn C. Broadbent, 1590 N. Fort Canyon, and Craig L. Broadbent, 1520 N. Fort Canyon, both of Alpine, Utah 84004

Continuation of Ser. No. 965,902, Oct. 23, 1992, Pat. No. 5,329,915. This application Jul. 19, 1994, Ser. No. 276,916
Int. Cl.[6] F24B *1/188*
U.S. Cl. 126—524 **2 Claims**



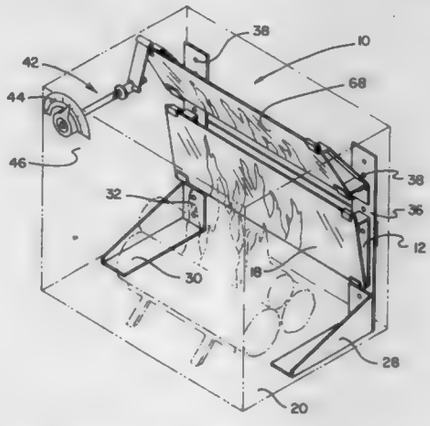
1. A gas fireplace apparatus capable of being installed without masonry work, comprising a firebox enclosing a gas fireplace burner and provided with bottom, top, opposite side, front, and back walls and with a window in the front wall for viewing a fire burning in the fireplace; interconnecting, air circulating chambers laterally of, back of, and below said firebox, with inflow means for air to be heated and outflow means for the heated air; a series of spaced air flow conduits extending between and providing air flow communication between the laterally placed air circulating chambers, said series of spaced air flow conduits extending through said firebox from front to back thereof below but adjacent to the top wall of the firebox; and air inflow openings opening into said flue chamber.

5,469,839

APPARATUS FOR ENHANCING THE VISUAL EFFECTS OF A FIRE AND FOR INCREASING ITS HEAT UTILIZATION

Anthony S. Kasulis, and Clara J. Kasulis, both of 9149 Mills Ave., Whittier, Calif. 90603

Filed Nov. 15, 1994, Ser. No. 339,796
Int. Cl.[6] F24B *1/195*
U.S. Cl. 126—552 **4 Claims**



1. A new and improved apparatus for enhancing the visual effects of a fire and for increasing its heat utilization comprising, in combination:

intermediate brackets having rear parts and front parts for removably supporting a mirror in an orientation offset from the vertical within a fireplace behind the fire, the rear parts including outwardly projecting fingers near an upper end and a lower end and a mirror coupled to the front part and formed of a reflective surface selected from the class of temperature resistance reflectors including glass mirrors and polished stainless steel;

upper brackets having rear parts and front parts removably supporting a mirror in an orientation offset from the vertical within a fireplace behind the fire, the rear parts including outwardly projecting fingers near an upper end and a lower end and a mirror coupled to the front part and formed of a reflective surface selected from the class of temperature resistance reflectors including glass mirrors and polished stainless steel;

lower reflective components having lower horizontal sheets positionable on a floor of a fireplace, back vertical walls with rearwardly and downwardly projecting fingers near an upper extent and a lower extent of each sheet and a vertical side wall coupled to side edges of the back vertical walls and lower horizontal walls and with a diagonal upper surface thereof, the lower reflective member being formed from a reflective metal selected from the class of reflective metals including polished copper, brass and stainless steel;

vertical plates being secured to a rear wall of a fireplace adjacent opposite lateral edges thereof, the vertical plates having vertically aligned apertures for receiving the fingers of the intermediate, lower and upper components for removable securement therebetween; and

an adjustment mechanism having a dial on the exterior face of a fireplace, a lag screw coupled with respect thereto and an axially reciprocable collar adapted to move in a longitudinal direction toward and away from the exterior face of the fireplace and with a linkage member coupled thereto for operatively coupling with the upper support member whereby rotation of the dial in one direction and another will vary the angular disposition of the upper support and a mirror supported therein.

5,469,840

ELECTROMOTIVE WARPING TYPE ENDOSCOPE WITH VELOCITY CONTROL

Yoshiyuki Tanii; Motokazu Nakamura, both of Hachioji; Yoshikatsu Nagayama, Sagamihara; Katsuaki Morita, Hachioji; Hiroki Hibino, Hachioji, and Akira Suzuki, Hachioji, all of, Japan, assignors to Olympus Optical, Ltd., Tokyo, Japan

Continuation of Ser. No. 880,065, May 7, 1992, abandoned. This application May 10, 1994, Ser. No. 242,052

Claims priority, application Japan, Dec. 10, 1991, 3-325950; Jan. 31, 1992, 4-016681; Feb. 7, 1992, 4-022897

Int. Cl.[6] A61B *1/005*

U.S. Cl. 600—117 **2 Claims**

1. An electromotive warping type endoscope apparatus comprising:

an insertion portion capable of being inserted into a subject to be inspected and including a warp-enabled portion;

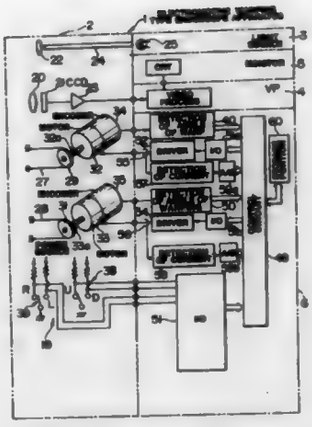
a warping mechanism for warping said warp-enabled portion;

driving means connected to said warping mechanism for driving said warping mechanism;.

quantity of warp instruction means for instructing said driving means to warp said warp-enabled portion wherein said instruction includes the direction of warp;

detecting means for detecting a state of said insertion portion; and

warping velocity control means for supplying a control signal for automatically controlling the warping velocity, including at least one of warping speed and warping direction, of said warp-enabled portion to said driving means according to the state of said insertion portion detected by said detecting means,



wherein said control signal consists of one of a deceleration control, a stoppage control, and a control of moving in a direction which is different from the warping direction instructed by said quantity of warp instruction means,

wherein said control signal is formed according to the state of said insertion portion with priority given over said instruction output by said quantity of warp instruction means,

wherein said detecting means includes electric quantity detecting means for detecting an electric quantity to be supplied to said driving means, and

wherein said detecting means further includes time detecting means for detecting a time in which the electric quantity detected by said electric quantity detecting means is larger than a predetermined value; and

said warping velocity control means controls the warping velocity whenever the time detected by said time detecting means is longer than a predetermined time.

5,469,841

ENDOSCOPE APPARATUS PROVIDED WITH LIQUID REMOVING MECHANISM FOR THE ELECTRIC CONNECTOR

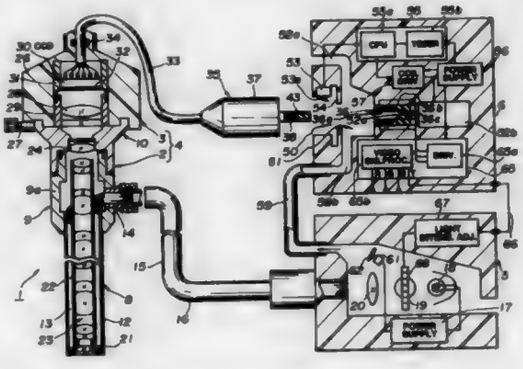
Kazunari Kobayashi; Kenji Omachi; Yutaka Tatsuno, all of Hachioji; Masahiro Hagihara, Shirakawa; Atsuki Kidawara, Tachikawa; Tadayoshi Hara, and Nobuyoshi Yazawa, both of Hachioji, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 27, 1993, Ser. No. 141,731

Claims priority, application Japan, Jan. 29, 1992, 4-291745; Feb. 24, 1993, 5-035807; Feb. 24, 1993, 5-035808

Int. Cl.[6] A61B *1/06*

U.S. Cl. 600—158 **34 Claims**



1. An endoscope apparatus comprising:

an endoscope including:

an inserting section capable of being inserted into an organism,

illuminating-light means for projecting an illuminating light from an illuminating window which is provided at a forward end of said inserting section,

observation means disposed within said inserting section for forming an image of a subject, said observation means including an electrical device for producing electrical image signals; and

an electrical connector provided with a plurality of electrical contacts which are electrically connected to said electrical device,

wherein said electrical device is electrically connected to said electrical connector through a signal cable; and

liquid removing means provided within said electrical connector for removing liquid from said plurality of electrical contacts of said electrical connector.

5,469,842

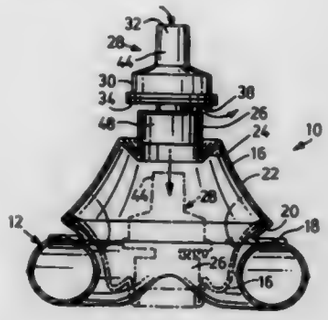
CPR FACE MASK

Stephen Flynn, 255,Chartwell Road, Oakville, Ontario, Canada

Filed Jul. 11, 1994, Ser. No. 272,460

Int. Cl.[6] A61M *16/00*

U.S. Cl. 128—203.11 **3 Claims**



1. A CPR face mask comprising:

a substantially toroidal face engaging part positionable on the face of a patient to surround at least the mouth of the patient,

a flexible generally conical part having a lower end extending around and secured to an upper surface of the face engaging part, and an upper end with an aperture through which a CPR giving person can blow air which passes downwardly through the conical part and the toroidal part into the patient's mouth,

the flexible generally conical part having a relatively short outwardly extending substantially horizontal portion at the lower end extending around and secured to the upper surface of the face engaging part, a relatively short portion extending upwardly and outwardly from an inner edge of the substantially horizontal portion, a relatively high frusto-conical portion extending upwardly and inwardly from an upper edge of the upwardly and outwardly inclined portion, a relatively short portion extending inwardly and downwardly from an upper edge of the frusto-conical portion and a central cylindrical portion extending upwardly from an inner edge of the inwardly and downwardly extending portion and providing said aperture,

whereby the mask can be positioned in a collapsed configuration for storage by downward movement of the central cylindrical portion to cause the frusto-conical portion to fold downwardly and extend into the toroidal face engaging part and can be returned to a ready-to-use configuration by an upward pull on the central cylindrical portion.

5,469,843

INHALATION DEVICE

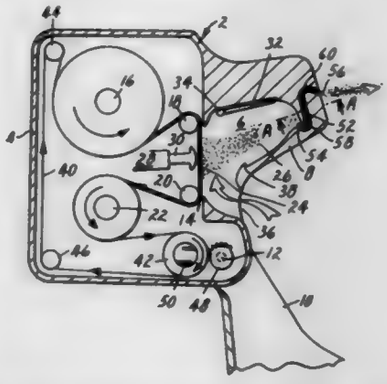
Peter D. Hodson, Trowell, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/US92/09585, § 371 Date May 4, 1994, § 102(e) Date May 4, 1994, PCT Pub. No. WO93/09832, PCT Pub. Date May 27, 1993

PCT Filed Nov. 6, 1992, Ser. No. 240,675

Int. Cl.[6] A61M *15/00*

U.S. Cl. 128—203.15 **12 Claims**



1. A dry powder inhaler for dispensing powdered medicament, comprising a housing defining a chamber for receiving a dose of powdered medicament, one or more air inlets, and a patient port adapted for insertion into the mouth or nasal passage of the patient, said housing being constructed and arranged to provide an air passage extending from the air inlet(s) through the chamber to the patient port so that patient inhalation at the patient port generates an airstream through the inhaler which entrains particles of medicament from the chamber for inhalation by the patient, the air passage being provided with one or more deagglomeration channels between the chamber and patient port through which the airstream with entrained medicament must pass, each channel having a substantially constant cross-sectional profile with a cross-sectional area no greater than 40 mm^2, a first opening communicating with the chamber, a second opening communicating with the patient port, and adjacent said first opening a first bend of 35° to 200° and adjacent said second opening a second bend of 35° to 200°, wherein the minimum radius of curvature of the center of each of the first and second bends is no greater than 10 mm, said first and second bends being of opposite-handedness so as to form an S shape.

5,469,844

MEDICAL MONITOR

Dietrich Rogler, Horb, Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 767,240, Sep. 27, 1991, abandoned. This application Mar. 28, 1994, Ser. No. 219,411

Claims priority, application European Pat. Off., Jan. 26, 1990, 90120519

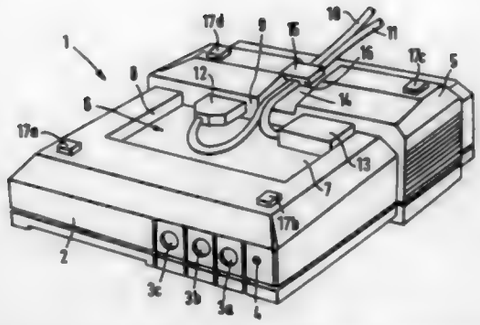
Int. Cl.[6] B65D *85/00*

U.S. Cl. 128—630 **18 Claims**

1. A casing for an instrument, comprising:

a front panel characterized by a first normal vector, said first normal vector being defined as a vector oriented in a direction which is normal to a surface of said front panel;

a bottom side, attached to said front panel, comprising a recess, said recess comprising at least three lateral walls at least one of which is substantially parallel to and located opposite said front panel, wherein an outside surface of said at least one of said lateral walls is characterized by a second normal vector that is defined as a vector oriented in a direction which is normal to said outside surface, said second normal vector being oriented in substantially the same direction as said first



normal vector of the front panel, and said at least one of said lateral walls comprises at least one cable connector;

means for hanging the casing substantially vertically such that said first and second normal vectors are oriented substantially in a downward direction; and

a shoulder extending around said casing in a direction parallel to said front panel and including a side wall a part of which adjoins said recess and forms said at least one of said lateral walls.

5,469,845

DISPOSABLE PULSE OXIMETER SENSOR

Russell DeLonzor, Union City, and Lee Middleman, Portola Valley, both of Calif., assignors to Nellcor Incorporated, Pleasanton, Calif.

Continuation-in-part of Ser. No. 838,565, Feb. 19, 1992, Pat. No. 5,246,003, which is a continuation-in-part of Ser. No. 751,405, Aug. 28, 1991, abandoned. This application Sep. 13, 1993, Ser. No. 120,267

The portion of the term of this patent subsequent to Sep. 21, 2010, has been disclaimed.

Int. Cl.[6] A61B *05/00*

U.S. Cl. 128—633 **22 Claims**

1. A non-invasive, electrooptical sensor for removable attachment to the skin of a patient, comprising:

a flexible substrate;

a light emitter mounted on one of a first and second portion of the substrate;

a light detector mounted on one of said first and second portions of the substrate; and

said second portion of the substrate being folded over to cover said first portion of the substrate, said second portion of the substrate at least partially covering the first portion of the substrate and being electrically connected thereto, with said substrate allowing light to reach said light emitter and the light detector.

5,469,846

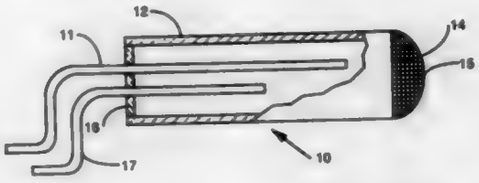
IMPLANTABLE NON-ENZYMATIC ELECTROCHEMICAL GLUCOSE SENSOR

Shahed U. M. Khan, Pittsburgh, Pa., assignor to Duquesne University of the Holy Ghost, Pittsburgh, Pa.

Division of Ser. No. 962,667, Oct. 19, 1992, Pat. No. 5,387,327. This application Sep. 27, 1994, Ser. No. 312,891

Int. Cl.[6] A61B *5/05*

U.S. Cl. 128—635 **12 Claims**



1. A method of detecting changes in blood glucose levels, comprising:

providing an implantable non-enzymatic blood glucose detector having a non-reactive semiconductor measurement electrode energized by a battery means and disposed within a sleeve member having an opening permitting glucose molecules to pass therethrough to said measurement electrode, but resisting the passage therethrough of molecules of predetermined greater size;

connecting said measurement electrode to a monitoring means for monitoring a current density at said measurement electrode in response to glucose molecule oxidation or glucose molecule reduction reactions at said measurement electrode:

continuously passing blood through said sleeve opening to said measurement electrode;

continuously monitoring said current density by said monitoring means; and

translating changes in current density detected by said monitoring means to changes in blood glucose levels.

5,469,847

RADIOGRAPHIC MULTI-MODALITY SKIN MARKERS

Simion J. Zinreich; Eva S. Zinreich, both of Owings Mill, Md., and Rex O. Bare, Lake Forest, Calif., assignors to IZI Corporation, Owings Mills, Md.

Continuation of Ser. No. 942,508, Sep. 9, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 204,882

Int. Cl.[6] A61B *5/055;6/03*

U.S. Cl. 128—653.1 **6 Claims**

1. A radiographic surface marker comprising

a casing comprising inner side walls, outer side walls, and top walls, said inner, outer, and top walls defining a first chamber and a second chamber,

said first chamber holding dense material visible to multiple radiographic imaging methods,

a first membrane attached to said casing forming a bottom wall and sealing the dense material into said first chamber,

a second membrane attached to said casing sealing said second chamber and enabling later injection of material into said

second chamber without said later injected material contacting said dense material, and

a disk attached to at least one of said first membrane and said second membrane for providing a needle stopping surface.

5,469,848

TONOMETER

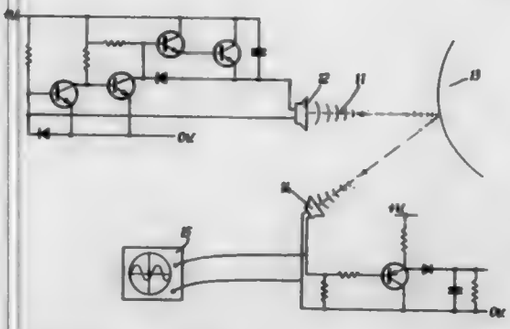
Paul Toleman, 6 Denesway, Sale Manchester, United Kingdom

Filed Jul. 8, 1994, Ser. No. 256,169

Claims priority, application United Kingdom, Jun. 11, 1992, 9200642; May 18, 1992, 9210584; Jul. 14, 1992, 9214888

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—660.02 **6 Claims**



1. A tonometer for measuring the Intra-ocular pressure of an eye comprising an emitter for emitting a primary signal towards the cornea of the eye, a receiver for receiving the primary signal on being reflected from the cornea, the amplitude of the primary signal being altered on reflection from the cornea, the changes to the amplitude of the primary signal depending on the rigidity of the cornea, and a monitoring device for monitoring the peak-to-peak amplitude of the reflected primary signal received by the receiver, wherein the emitter and/or receiver is movable relative to the eye while the monitoring device is operating, the monitoring device comprising means for taking and/or storing a measurement when the distance between the eye and the receiver is such that substantially the largest peak-to-peak amplitude of the primary reflected signal is received, the measurement being calibrated to provide the Intra-ocular pressure of the eye.

5,469,849

ULTRASOUND DIAGNOSIS APPARATUS

Hiroshi Sasaki, and Hiroyuki Tsujino, both of Tochigi, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 14, 1994, Ser. No. 260,364

Claims priority, application Japan, Jun. 14, 1993, 5-141863

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—660.07 **26 Claims**

1. An ultrasound diagnosis apparatus for obtaining ultrasound images of a patient, comprising;

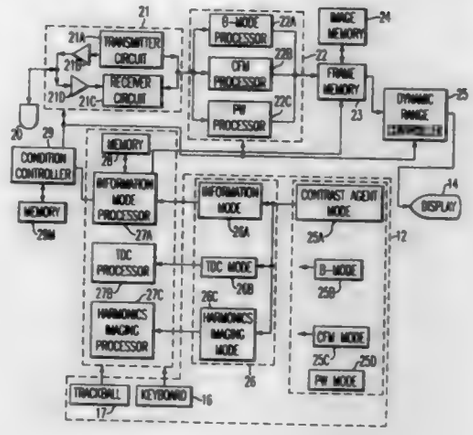
transmission-reception means for transmitting ultrasound signals and receiving echo signals;

image processing means for processing an ultrasound image according to the echo signals;

setting means for setting data related to a contrast agent;

first memory means for storing data the data being set by the setting means; and

display means for displaying the ultrasound image and the data on a screen.



5,469,850

ULTRASONIC DIAGNOSTIC SYSTEM

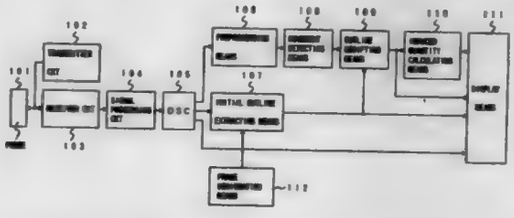
Miyuki Iizuka, and Akira Shiba, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 16, 1995, Ser. No. 405,237

Claims priority, application Japan, May 27, 1994, 6-115030; Nov. 30, 1994, 6-297071; Feb. 7, 1995, 7-019378

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—660.07 **41 Claims**



1. An ultrasonic diagnostic system wherein ultrasonic waves reflected within a subject are received, whereby image data corresponding to each point inside a tomographic surface spreading within the subject is obtained, comprising:

gradient arithmetic means for evaluating gradients of the image data on a plurality of points within the tomographic surface;

scalar quantity arithmetic means for evaluating scalar quantities each corresponding to an associated one of said gradients on the plurality of points within the tomographic surface;

maximal point arithmetic means for evaluating a plurality of maximal points within the tomographic surface so that said scalar quantities assume each a maximal value; and

outline extracting means for determining an outline of a predetermined tissue within the subject on the basis of said plurality of maximal points.

5,469,851

TIME MULTIPLEXED DIGITAL ULTRASOUND BEAMFORMER

David Lipschutz, Lexington, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 9, 1994, Ser. No. 287,689

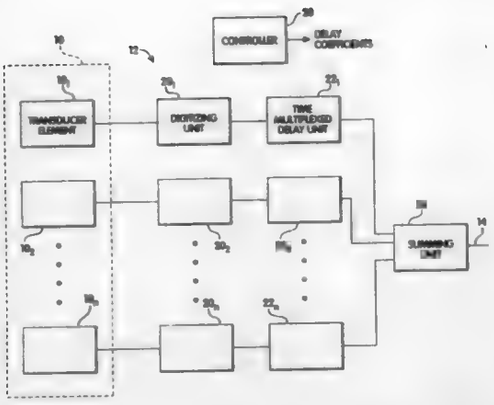
Int. Cl.[6] A61B *8/00*; G01N *29/00*

U.S. Cl. 128—661.01 **22 Claims**

1. An ultrasound beamformer for processing received signals from an ultrasound transducer array, comprising:

a plurality of processing channels, each receiving a signal from an element of the transducer array and comprising:

digitizing means for converting the received signal to digital samples at a sampling rate f; and



time multiplexed delay means responsive to delay coefficients for delaying said digital samples by time multiplexed delays to produce a stream of delayed, time multiplexed digital samples for forming two or more receive beams, said time multiplexed delay means comprising delay means for delaying said digital samples by selected delays that are quantized in increments equal to the sampling period 1/f, said delay means comprising memory means for storing said digital samples, means for writing said digital samples into said memory means, and time multiplexed read means for reading said digital samples from said memory means at locations corresponding to said time multiplexed delays, said read means comprising a read counter for each receive beam being processed, each read counter including means for addressing a location in said memory means corresponding to a desired delay, and multiplexer means for applying the output of a selected read counter to said memory means in response to an interleave control signal representative of a receive beam being processed during each clock cycle;

summing means for summing said delayed, time multiplexed digital samples to form a stream of time multiplexed output samples that is representative of said two or more receive beams; and

a coefficient generator for supplying said delay coefficients to the time multiplexed delay means in each of said processing channels.

5,469,852

ULTRASOUND DIAGNOSIS APPARATUS AND PROBE THEREFOR

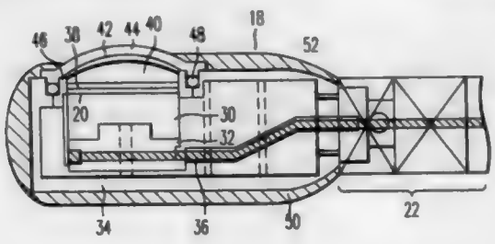
Hisashi Nakamura; Yasutaka Nagai, and Susumu Hiki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 11, 1994, Ser. No. 209,215

Claims priority, application Japan, Mar. 12, 1993, 5-052403; Mar. 12, 1993, 5-052405; Mar. 12, 1993, 5-052689; Mar. 18, 1993, 5-058884

Int. Cl.[6] A61B 8/12

U.S. Cl. 128—662.06 **55 Claims**



1. An ultrasound probe for insertion into a body cavity of a patient to obtain ultrasound images of the patient, comprising:

an insertion portion having a flexible tubular body;

a hollow housing provided at one end of the insertion portion;

a transducer mounted in said housing, said transducer having a flat surface and being rotatable about an axis perpendicular to said flat surface; and

a mark visible from the exterior of the housing for indicating a direction of the transducer provided on a surface of the rotation portion.

5,469,853

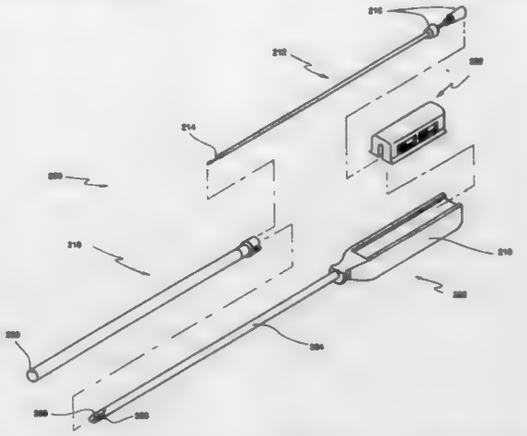
BENDABLE ULTRASONIC PROBE AND SHEATH FOR USE THEREWITH

Wing K. Law, Denver; Joseph V. Ranalletta; Clyde G. Oakley, both of Englewood; Stephen J. Douglas, Parker, and Dennis R. Dieta, Littleton, all of Colo., assignors to Tetrad Corporation, Englewood, Colo.

Continuation-in-part of Ser. No. 228,507, Apr. 15, 1994, which is a continuation-in-part of Ser. No. 989,515, Dec. 11, 1992, Pat. No. 5,335,663. This application Jun. 22, 1994, Ser. No. 264,016

Int. Cl.[6] A61B 8/12

U.S. Cl. 128—662.06 **28 Claims**



1. A surgical medical apparatus that facilitates conveyance into a patient's body of substantially nonbendable surgical tools to the vicinity of an ultrasonic device on a bendably movable carrier, the apparatus comprising:

a handle portion designed to remain outside of a patient's body and which may be grasped by a surgeon to manipulate the apparatus during use;

a carrier attached to said handle portion and longitudinally extending away from said handle portion, said carrier designed for insertion into the patient's body during a surgical operation;

an ultrasonic device attached to said carrier and designed for insertion into and use inside of the patient's body, said ultrasonic device being capable of transmitting an ultrasonic signal into tissue within the patient's body and/or receiving an ultrasonic signal from tissue within the patient's body that is located within a field of view of said ultrasonic device and generating an electrical signal representative of said ultrasonic signal that can be manipulated to produce an image of said tissue; and

a therapy channel extending longitudinally with said carrier and providing a passageway with a defined shape and through which surgical tools can be conveyed from outside of the patient's body to inside of the patient's body during a surgical operation, wherein said therapy channel has an exit port through which a surgical tool can exit into a patient's body during a surgical operation;

wherein said carrier has a bendable portion that can be bent relative to said handle so as to effect repositioning of said ultrasonic device within the patient's body, wherein said

defined shape of said passageway through said therapy channel is substantially unaffected by bending of said bendable portion of said carrier so that bendable and substantially nonbendable tools can be conveyed through said therapy channel, and wherein said handle portion is located closer to said exit port than said handle portion is located to said bendable portion of said carrier.

5,469,854

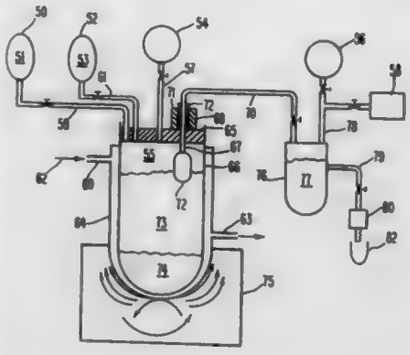
METHODS OF PREPARING GAS-FILLED LIPOSOMES

Evan C. Unger; Thomas A. Fritz; Terry Matsunaga; VaradaRajan Ramaswami; David Yellowhair, and Guanli Wu, all of Tucson, Ariz., assignors to ImaR$_x$ Pharmaceutical Corp., Tucson, Ariz.

Continuation-in-part of Ser. No. 717,084, Jun. 18, 1991, Pat. No. 5,228,446, and Ser. No. 716,899, Jun. 19, 1991, abandoned, each , Jun. 19, 0which is a continuation-in-part of Ser. No. 569,828, Aug. 20, 1990, Pat. No. 5,088,499, which is a continuation-in-part of Ser. No. 455,707, Dec. 22, 1989, abandoned. This application Jun. 11, 1993, Ser. No. 76,239

Int. Cl.^{6} A61B *8/00*; A61K *9/66*

U.S. Cl. 128—662.02 **19 Claims**



1. A method for preparing gas-filled lipid microspheres comprising shaking an aqueous solution comprising a lipid in the presence of a gas at a temperature below the gel state to liquid crystalline state phase transition temperature of the lipid.

5,469,855

CONTINUOUS TEMPERATURE MONITOR

Francesco Pompei; Janus Ternullo, both of Boston, and William W. Malecki, Newton Corner, all of Mass., assignors to Exergen Corporation, Watertown, Mass.

Continuation of Ser. No. 60,486, May 11, 1993, abandoned, which is a continuation of Ser. No. 666,744, Mar. 8, 1991, abandoned. This application Jul. 28, 1994, Ser. No. 281,766

The portion of the term of this patent subsequent to Jul. 5, 2011, has been disclaimed.

Int. Cl.^{6} A61B *5/00*

U.S. Cl. 128—664 **15 Claims**

1. A tympanic temperature monitor comprising:

a radiation detector mounted to view a tympanic membrane for monitoring temperature;

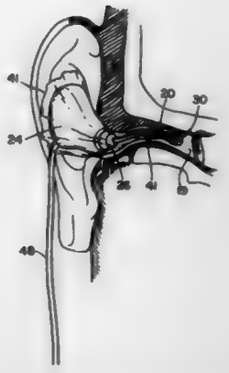
a plug structure shaped to fit in and remain in an ear concha region; and

a flexible extension connecting the radiation detector with the plug structure, the extension having a center axis along its length which bends upon insertion into the ear canal so as to conform to contours of the ear canal such that the ear canal substantially retains its natural shape along its full length;

wherein the radiation detector comprises:

a rigid structure of high thermal conductivity material;

a thermopile mounted to a film suspended across an opening in the rigid structure of high thermal conductivity material;



a window mounted on the rigid structure over one end of the opening in the rigid structure; and

a temperature sensor for sensing the cold junction temperature of the thermopile mounted on the rigid structure in close thermal contact with a junction of the thermopile.

5,469,856

METHOD AND DEVICE FOR FILTERING OUT BASELINE FLUCTUATIONS FROM AN ELECTROCARDIOGRAM

Lena Lundstrom; Peter Karlsson, both of Stockholm, and Thomas Ohlsson, Vallingby, all of, Sweden, assignors to Siemens Aktiengesellschaft, Munich, Germany

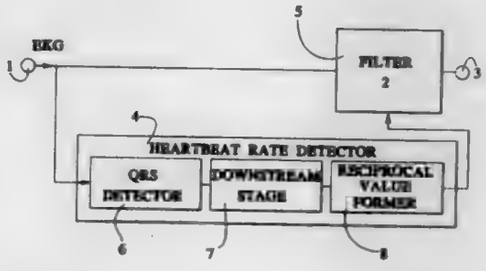
PCT No. PCT/EP92/00473, § 371 Date Dec. 22, 1993, § 102(e) Date Dec. 22, 1993, PCT Pub. No. WO92/15242, PCT Pub. Date Sep. 17, 1992

PCT Filed Mar. 4, 1992, Ser. No. 117,069

Claims priority, application Germany, Mar. 4, 1991, 41 06 856.4

Int. Cl.^{6} A61B *5/04*

U.S. Cl. 128—696 **5 Claims**



1. A method for filtering out baseline fluctuations from an electrocardiogram, comprising the steps of:

determining a current heartbeat rate from said electrocardiogram by subjecting said electrocardiogram to a frequency analysis;

filtering said electrocardiogram in a filter having a lower cut off frequency; and

altering said lower cut off frequency of said filter, by increasing said lower cut off frequency in the presence of an increasing heartbeat rate and decreasing said lower cut off frequency in the presence of a decreasing heartbeat rate.

5,469,857

APPARATUS FOR MEASURING ELECTRICAL ACTIVITY IN THE HEART WITH GRAPHICAL DISPLAY OF ELECTRODE CONTACT WITH TISSUE

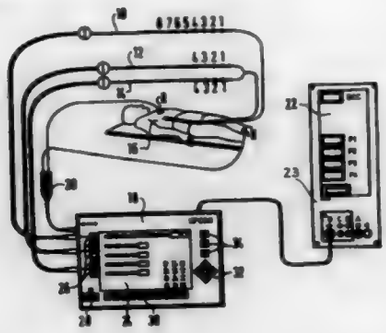
Estan Laurent, Vikbolandet, and Monica Magnusson, Lidingoe, both of, Sweden, assignors to Siemens Elema AB, Solna, Sweden

Filed Feb. 18, 1994, Ser. No. 198,587

Claims priority, application Sweden, Mar. 12, 1993, 9300825

Int. Cl.[6] A61B 5/04

U.S. Cl. 128—710 **8 Claims**



1. A medical apparatus comprising:

a plurality of electrodes, each electrode having a plurality of poles, at least some of said poles being introducible into patient for contact with the heart of said patient;

an input amplifier unit having a plurality of inputs to which said poles of said plurality of electrodes are respectively connected;

sensing means in said input amplifier unit for sensing an impedance across the inputs of said input amplifier unit after connection of said electrodes thereto for identifying poles which are in contact with the heart; and

display means connected to said input amplifier unit for graphically indicating which of said poles are connected to said input amplifier unit and which of said poles are in contact with said heart.

5,469,858

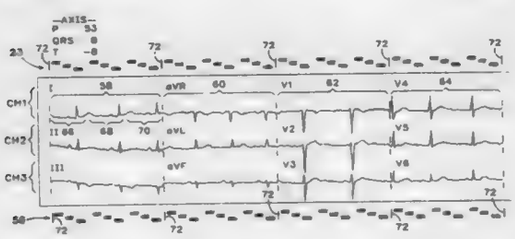
ECG P-QRS-T ONSET/OFFSET ANNOTATION METHOD AND APPARATUS

Jeffrey C. Osborne, McMinnville, Oreg., assignor to Hewlett-Packard Corporation, Palo Alto, Calif.

Filed Mar. 15, 1994, Ser. No. 213,890

Int. Cl.[6] A61B 5/0402

U.S. Cl. 128—710 **21 Claims**



1. A method for displaying a temporal relationship between various waves in an electrocardiogram, comprising:

detecting a beginning of a first wave from a first ECG channel;

detecting a beginning of a second wave from a second ECG channel;

generating a first graphic identifier corresponding to the beginning of the first wave;

generating a second graphic identifier corresponding to the beginning of the second wave; and

displaying the first and second graphic identifiers in a third channel and spacing the graphic identifiers at relative distances from each other proportional to the amount of time that has passed between the beginning of the first and second waves.

5,469,859

NON-INVASIVE METHOD AND DEVICE FOR COLLECTING MEASUREMENTS REPRESENTING BODY ACTIVITY AND DETERMINING CARDIORESPIRATORY PARAMETERS OF THE HUMAN BODY BASED UPON THE MEASUREMENTS COLLECTED

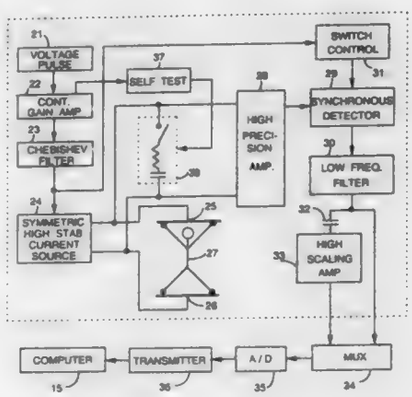
Alexander Tsoglin, Beer Yakov, and Yafim Frinerman, Bat-Yam, both of, Israel, assignors to N.I. Medical Ltd., Tel-Aviv, Iceland

Filed Jun. 24, 1993, Ser. No. 82,606

Claims priority, application Israel, Jun. 24, 1992, 102300

Int. Cl.[6] A61B 5/085

U.S. Cl. 128—723 **25 Claims**



1. A non-invasive method for determining of the main cardiorespiratory parameters of a human body, comprising the steps of:

attaching electrodes to the body in a manner so as to enable the measuring of integral bioimpedance measurements of the total body of a patient;

transmitting a high stability amplitude alternating current through said electrodes and into said body;

obtaining an integral impedance curve of said body from the connected electrodes upon transmission of the high stability amplitude alternating current;

transmitting the integral impedance curve to a measuring device;

converting the impedance curve to a working signal;

transmitting the working signal to a computer;

simultaneously and automatically separating an active component from said integral impedance;

calculating cardiorespiratory parameters; and

applying the computerized calculation of the cardiorespiratory parameters of said body from the active component of said integral bioimpedance, using empiric formulae applicable, to integral bioimpedance measurements;

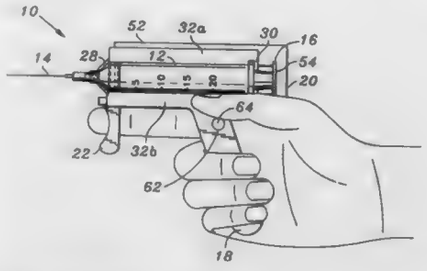
the computerized calculation being based on the bioimpedance measurements measured during a respiration cycle.

5,469,860

FINE NEEDLE ASPIRATION CYTOLOGY DEVICE SYRINGE HOLDER

Stephen A. De Santis, 23802 Inverness Pl., Laguna Niguel, Calif. 92677

Continuation-in-part of Ser. No. 225,594, Apr. 11, 1994. This application Oct. 27, 1994, Ser. No. 331,283
Int. Cl.[6] A61B *17/00*
U.S. Cl. 128—765 17 Claims



1. A manually operated aspirating device used in combination with a conventional needle and syringe with plunger comprising:

a) a body into which the syringe is received via the side thereof, said body having at least one collar formed thereon for attaching said syringe to said body;

b) a slide slidably attachable to said body, said slide having a slot formed thereon for releasably engaging said plunger, said slide being so attachable to said body such that when said syringe is attached to said body, said slide may selectively position said plunger relative said syringe;

c) a hand grip formed to said body distal of the proximal end of the syringe;

d) said slide comprises a generally U-shaped member having a closed end and a pair of generally parallel arms, said slot for releasably engaging said plunger being formed at the closed end of said generally U-shape;

e) said body includes first and second channels formed therein for slidably engaging a respective one of said pair of arms.

f) a trigger member depending downwardly from a lowermost one of said pair of arms of said generally U-shaped member, said trigger member being so attachable to said generally U-shaped member that when said generally U-shaped member is slidably attached to said body and handgrip, a generally gun-like structure is formed, said trigger providing means for allowing a user to actuate said slide relative said body; and

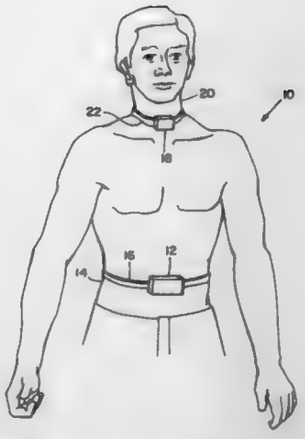
g) wherein during use the hand of the user is placed in a forward position wherein the index finger of a user's hand is oriented toward the target tissue and is positioned from 1 inch to 4 inches proximal the tip of said needle.

5,469,861

POSTURE MONITOR

Mark F. Piscopo, 59 Macintosh Rd., Bedford, N.H. 03110; Bruce E. Stetson, and Nancy E. Stetson, both of Goffstown, N.H., assignors to Mark F. Piscopo, Bedford, N.H.

Continuation of Ser. No. 956,117, Oct. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 870,064, Apr. 17, 1992, abandoned. This application Sep. 2, 1994, Ser. No. 300,594
Int. Cl.[6] A61B *5/103*
U.S. Cl. 128—781 18 Claims



1. A posture monitoring system comprising:

a first unit generating a first ultrasonic signal;

a first mounting member for locating said first unit in substantially fixed relation to a first position on a user's body;

a second unit, the first unit transmitting the first ultrasonic signal toward the second unit and the second unit returning a second ultrasonic signal to the first unit in response to the first ultrasonic signal; a second mounting member for locating said second unit in substantially fixed relation to a second position on the user's body at a distance from the first unit;

a sensor in the first unit that senses the second ultrasonic signal to determine the distance between the first unit and the second unit;

an alarm circuit in the first unit coupled to the sensor and having an alarm to communicate to the user a posture characteristic related to the distance between the first unit and the second unit: and

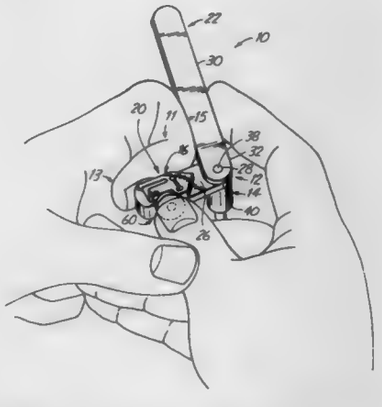
a recorder circuit in the first unit storing posture data related to the distance between the first unit and second unit.

5,469,862

RANGE OF MOTION ANALYSIS SYSTEM

Nebojsa Kovacevic, Plymouth, Minn., assignor to N.K. Biotechnical Engineering Company, Minneapolis, Minn.

Continuation of Ser. No. 971,413, Nov. 19, 1992, abandoned. This application Apr. 21, 1994, Ser. No. 232,000
Int. Cl.[6] A61B *5/103*
U.S. Cl. 128—782 32 Claims



5. An assembly for measuring angular displacement of a body joint formed between a first body portion and a connected second body portion of a subject, the apparatus comprising:

a support linkage comprising a first link pivotally joined to a second link for relative angular displacement therebetween about a pivot axis, the first link having a portion at a selected distance from the pivot axis to receive a force applied to the portion to develop a moment on the first body portion, the first link adapted to be retained for movement with the first body portion and the second link adapted to be retained for movement with the second body portion;

means for changing the selected distance of the portion from the pivot axis for adjusting the moment applied;

angular sensing means joined to the support linkage for sensing angular displacement of the second link relative to the first link and providing a representative indication of angular displacement therebetween;

force sensing means joined to the support linkage for sensing a force applied to the portion of the first link and providing a representative indication of the force applied; and

storing means for storing a selected representative indication of angular displacement, and for storing a selected representative indication of the force applied.

5,469,863

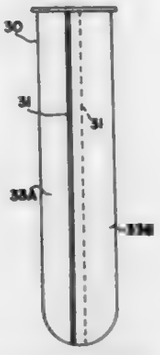
POLYURETHANE CONDOM OF WELDED POLYURETHANE FILM

Tilak M. Shah, Cary, N.C., assignor to Polygenex International, Inc., Cary, N.C.

Filed Aug. 11, 1993, Ser. No. 104,666

Int. Cl.[6] B32B *31/00*

U.S. Cl. 128—844 **8 Claims**



1. A polyurethane condom comprising:

A. An elongated tubular structure having one open base end and one closed distal end, said structure being formed of two generally flat sheets of a polyurethane elastomer film having a thickness of from about 0.5 to 5 mils;

B. A continuous radio frequency weld joining said two sheets along the periphery thereof starting at said open base end and extending axially to the distal end, extending around the periphery of said distal end, and axially from said distal end to said open base end, said weld having an elongated generally U shape, leaving said open end unwelded, such that the facing surfaces of said sheets define the interior of said condom;

C. Said radiofrequency weld having a width of two to ten times the thickness of said polyurethane film and a bond strength substantially the same as the unwelded film.

5,469,864

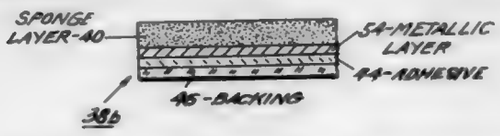
LASER SHIELD

Solomon Rosenblatt, Montclair, N.J., assignor to Merocel Corporation, Mystic, Conn.

Continuation of Ser. No. 32,476, Mar. 16, 1993, abandoned, which is a continuation of Ser. No. 259,790, Oct. 19, 1988, abandoned. This application Feb. 21, 1995, Ser. No. 391,637

Int. Cl.[6] A61F *5/37;13/00;* **A61B** *19/00;* **A61M** *16/00*

U.S. Cl. 128—849 **52 Claims**



29. A laser shield for an endotracheal tube comprising a first end and a second end, and a balloon cuff intermediate said first and second ends, said laser shield comprising:

an elongated hydrophilic surgical sponge layer comprising polyvinyl acetal foam, sized and shaped to be placed upon and thereby substantially cover the second end of said tube;

an elongated metal foil layer at least partially overlying said sponge layer and sized and shaped to be placed upon and thereby substantially cover said second end, said metal foil layer being corrugated so as to increase its flexibility, stretchability, and laser-beam diffusivity; and

means for securing said layers to said endotracheal tube.

5,469,865

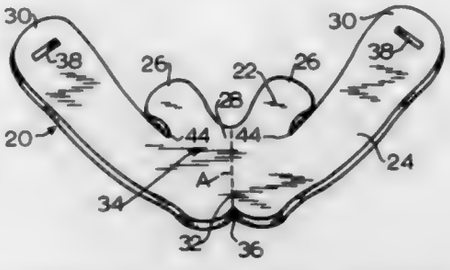
MOUTHGUARD HAVING AN EXTRA-ORAL PORTION AND AN INTRA-ORAL PORTION

Sue A. F. Minneman, 6250-202 St. Regis Cir., Raleigh, N.C. 27606

Filed Jun. 2, 1994, Ser. No. 253,099

Int. Cl.[6] A61C *5/14;5/00*

U.S. Cl. 128—859 **8 Claims**



1. A mouthguard for a patient, comprising a single planar piece of compressible flexible material, said piece comprising an intra-oral portion and an extra-oral portion, said intra-oral portion comprising two intra-oral curved arms and the extra-oral portion comprising two extra-oral curved arms which extend in mirror image on either side of a line in the center of said extra-oral portion, said extra-oral arms being longer than said intra-oral arms, said extra-oral portion having a W-shaped outer edge with a central indentation between said extra-oral curved arms to allow flexibility of the mouthguard, wherein said extra-oral portion is generally curved around and parallel to said intra-oral portion, wherein each said intra-oral curved arm is of a size enabling said intra-oral curved arms to fit in the mouth of said patient, and each said intra-oral arm is separated from the extra-oral portion by a side indentation, wherein said intra-oral curved arms together form a U-shaped intra-oral portion having the side indentations along the outer edge of said U-shaped intra-oral portion, for placement of said intra-oral portion between said patient's upper and lower teeth, wherein when said mouthguard is placed in the mouth of the patient each side indentation receives a corner of the mouth and the extra-oral arms extend along the cheeks of the patient on each side of the patient's face.

5,469,866

PACKAGING FOR A CONSUMER PRODUCT

Loren S. Adell, and Michael Adell, both of 200 Adell Blvd., Sunnyvale, Tex. 75182

Division of Ser. No. 427,823, Oct. 26, 1989, Pat. No. 5,063,940. This application Sep. 6, 1991, Ser. No. 756,038

The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.

Int. Cl.[6] A61F *5/00*

U.S. Cl. 128—860 **15 Claims**

1. A packaged product comprising a transparent enclosure ensealing a product, said enclosure having a peripheral margin, a carrier having cut-outs that are symmetrical about a line of folding by which a flap of the carrier joins with a central portion of the carrier, said enclosure fitting into said cut-outs such that said

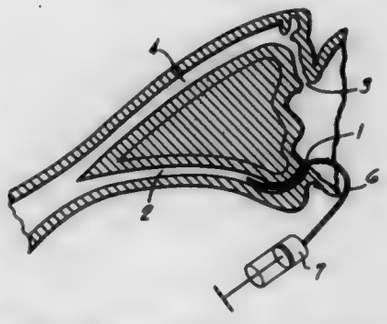
peripheral margin of the enclosure is sandwiched between said flap and said central portion of the carrier when said flap is folded onto said central portion of the carrier about said line of folding, wherein said carrier further includes a second flap that joins to said carrier about a further line of folding that is spaced from, but parallel to, the carrier's first-mentioned line of folding, said second flap being folded back onto the same side of the carrier as the first flap.

5,469,867

CAST-IN PLACE THERMOPLASTIC CHANNEL OCCLUDER

Edward E. Schmitt, Palo Alto, Calif., assignor to Landec Corporation, Menlo Park, Calif.

Filed Sep. 2, 1992, Ser. No. 939,110
Int. Cl.[6] A61B *19/00*
U.S. Cl. 128—898 **44 Claims**



1. A method of occluding a channel in a living mammal, said channel having a maximum temperature Y_L in the living mammal, the method comprising

(1) providing a thermoplastic, biocompatible, non-immunogenic occluding composition which

(a) is non-flowable at T_L,

(b) becomes flowable when heated to a temperature which does not damage the channel, and

(c) comprises a thermoplastic polymer;

(2) heating the composition to a temperature at which it is flowable;

(3) placing the heated composition in the channel while the composition is flowable and is at a temperature which does not damage the channel; and

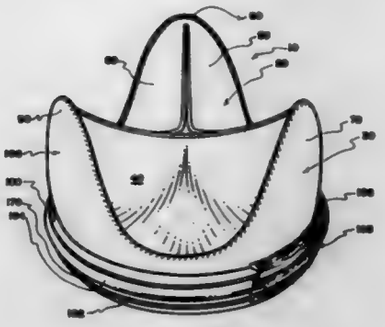
(4) allowing the composition to cool and become a thermoplastic non-flowable occluder in the channel; said non-flowable occluder being removable from the channel by a process which comprises heating the occluder to a temperature above T_L at which the composition is flowable and which does not damage the channel.

5,469,868

METHOD OF MAKING AN ARTIFICIAL HEART VALVE STENT

Vincent A. Reger, Portland, Oreg., assignor to Reger Medical Inc., Portland, Oreg.

Continuation of Ser. No. 84,663, Jun. 28, 1993, abandoned, which is a continuation of Ser. No. 834,416, Feb. 12, 1992, Pat. No. 5,258,023. This application Aug. 4, 1994, Ser. No. 286,162
Int. Cl.[6] A61B *19/00*; A61F *2/24*
U.S. Cl. 128—898 **3 Claims**



1. A method for making a stent for a prosthetic heart valve comprising the steps of:

forming a hollow cylindrical frame comprising raised stanchions and a base for support of a leaflet heart valve;

inserting cylindrically shaped covering into the interior of the hollow cylindrical frame such that each end of the covering extends beyond the stanchions and base of the cylindrical frame;

folding the covering about the cylindrical frame, thereby substantially enveloping the cylindrical frame;

outwardly everting each end of the covering to form at least two sewing rings;

trimming the covering which is disposed between the stanchions such that a pocket is formed about each stanchion;

sewing the trimmed covering to totally enclose each stanchion;

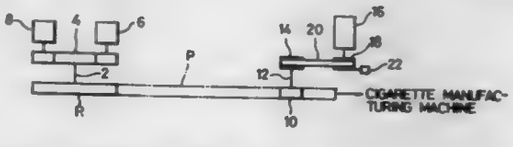
sewing each sewing ring along the line of outward eversion to the cylindrical framed and inserted portion of the covering.

5,469,869

WEB DELIVERY APPARATUS FOR A CIGARETTE MANUFACTURING MACHINE AND A DELIVERY METHOD THEREFOR

Takehiro Suzuki; Shigemitsu Inomata, both of Tokyo, and Mikio Komori, Horifune, all of, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Jan. 21, 1994, Ser. No. 183,768
Claims priority, application Japan, Jan. 22, 1993, 5-009079
Int. Cl.[6] A24C *5/18;5/20*
U.S. Cl. 131—60 **17 Claims**



1. An apparatus for supplying a cigarette manufacturing machine with a web to be used for the manufacture of cigarettes in a manner

such that the web is delivered from a freely rotatable web roll as a pulling roller rotates, comprising:

braking means for applying a braking force to the rotation of the web roll, said braking means being capable of adjusting the braking force;

detecting means for detecting the diameter of the web roll; and

control means for controlling the braking force applied to the web roll by said braking means, in accordance with operation modes corresponding to the operating conditions of the cigarette manufacturing machine and the diameter of the web roll detected by said detecting means, wherein the operation modes include a running mode in which the web is delivered from the web roll at constant speed, a stopping mode during which the web delivery is stopped following the running mode, and a suspension mode in which the web delivery is in suspension, the running mode includes a high-speed mode in which the web is delivered from the web roll at high speed and a low-speed mode in which the web is delivered from the web roll at low speed, said control means includes;

braking force reduction patterns determined individually for the operation modes in accordance with the diameter of the web roll,

setting means for setting the braking force of said braking means in accordance with the reduction pattern for the current operation mode and the detected diameter of the web roll,

braking force reduction patterns corresponding to the high- and low-speed modes, the reduction patterns for the running mode and the suspension mode have characteristics, individually, such that the braking force of said braking means is reduced by stages as the diameter of the web roll decreases; and the reduction pattern for the high-speed mode provides a smaller braking force to be set than the one provided by the reduction pattern for the low-speed mode when the diameter of the web roll is larger than a predetermined value.

5,469,870

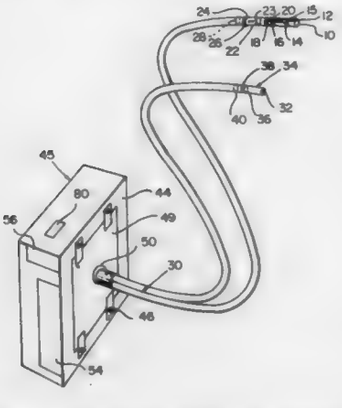
SECONDARY SMOKE FILTRATION DEVICE

Murray P. Meador, 104 Ryburn Ct., Old Hickory, Tenn. 37138

Continuation of Ser. No. 960,924, Oct. 13, 1992, abandoned. This application Feb. 18, 1994, Ser. No. 198,380

Int. Cl.[6] A24F *13/06*

U.S. Cl. 131—187 **10 Claims**



1. A secondary smoke filtration device for containing and filtering smoke associated with the use of a smoking product, comprising

(a) first container means for receiving and retaining a smoking product, said first container means having an opening at one end through which an inhalation end of the smoking product protrudes for inhalation by a user, said first container means completely enclosing a burning end of the smoking product to capture secondary smoke emanating from the burning end;

(b) second container means separate and distinct from said first container means for receiving secondary smoke exhaled by the user, said second container means having a generally cylindrical configuration and being adapted for insertion between the user's lips in contiguous relation therewith to prevent exhaled smoke from entering the environment;

(c) a first flexible tube connected with said first container means for receiving secondary smoke from the smoking product;

(d) a second flexible tube separate and distinct from said first flexible tube and connected with said second container means for receiving secondary smoke from the user; and

(e) filter means connecting with said first and second flexible tubes, said filter means including

(1) at least one filter member for removing contaminants from the secondary smoke; and

(2) blower means for drawing secondary smoke from said first and second flexible tubes through said filter member and for dispersing filtered smoke to the environment.

5,469,871

CIGARETTE AND METHOD OF MAKING SAME

Vernon B. Barnes; Donald R. Wilkinson, both of Clemmons; Lloyd H. Hancock, Walnut Cove, all of N.C.; Erwin Oesterling, Glinde, Germany; Siegfried Schlisio, Geesthacht, Germany, and Werner Hinz, Lauenburg, Germany, assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of Ser. No. 947,021, Sep. 17, 1992, abandoned. This application Jul. 16, 1993, Ser. No. 89,502

Int. Cl.[6] A24C *5/00*

U.S. Cl. 131—194 **24 Claims**

1. A method of continuously manufacturing cigarettes comprising steps of:

(a) continuously providing an insulated fuel element;

(b) continuously providing a substrate tube section;

(c) continuously combining said insulated fuel element and substrate tube section with an overwrap material to form a fuel-substrate section;

(d) continuously providing a roll of tobacco cut filler;

(e) continuously providing a plug of tobacco containing paper;

(f) continuously combining the tobacco roll and the tobacco containing paper plug with an overwrap to form a tobacco section;

(g) continuously aligning the fuel substrate section and the tobacco section so that the substrate tube assembly is aligned and abuts the tobacco paper plug and combining said sections with an overwrap to form a tobacco fuel unit;

(h) continuously providing a filter element; and

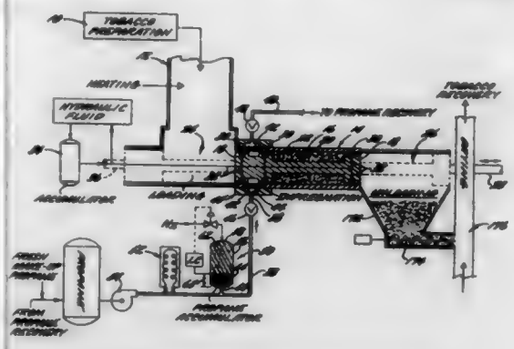
(i) continuously combining the filter element with the tobacco fuel unit to form a filter cigarette.

5,469,872

TOBACCO EXPANSION PROCESSES AND APPARATUS

Hoyt S. Beard; Lucas J. Conrad; J. Edward Crook; James E. Lovette, all of Winston-Salem; Robert C. Johnson, Advance; Donald A. Newton, Winston-Salem, all of N.C., and Hamid Neshan, Houston, Tex., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Dec. 6, 1993, Ser. No. 163,049
Int. Cl.[6] A24B *3/18*
U.S. Cl. 131—291 20 Claims



1. A process for the expansion of tobacco comprising:

placing a tobacco charge having a pre-expansion moisture content of greater than about 13 percent by weight in an impregnation chamber;

impregnating said tobacco in said impregnation chamber with an expansion agent;

removing said impregnated tobacco from said impregnation chamber and subjecting the impregnated tobacco to conditions sufficient to expand the tobacco and provide expanded tobacco having moisture content of greater than 13 percent; and

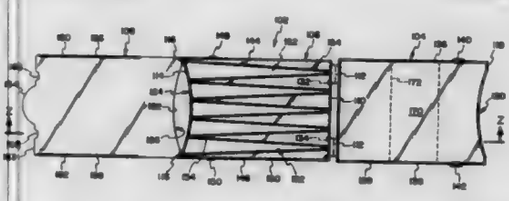
drying the expanded tobacco to a post-expansion moisture content of less than about 13 percent by weight and substantially maintaining the amount of expansion resulting from exposing the impregnated tobacco to expansion conditions.

5,469,873

DEVICE FOR PRODUCING STREAKS IN HAIR

Rouven Guth, Moorhof 6, D-31816 Liebenau, Germany

Filed Mar. 15, 1994, Ser. No. 213,020
Claims priority, application Germany, Mar. 18, 1993, 93 04 005.9; Jan. 23, 1993, 43 36 186.2
Int. Cl.[6] A45D *19/18;40/30*
U.S. Cl. 132—270 18 Claims



1. A device for hair streaking using a streaking dye, comprising:

a) a base plate, said base plate being configured for being placed against a user's head, and said base plate supporting a hair passee when in use;

b) an intermediate plate disposed adjacent said base plate, said intermediate plate being placeable against a user's head, and including a perforation pattern configured for receiving a streaking dye therethrough;

c) a film hinge disposed between and hingedly connecting said intermediate plate and said base plate;

d) a cover plate disposed adjacent said intermediate plate;

e) a further film hinge disposed between and hingedly connecting said cover plate and said intermediate plate; and,

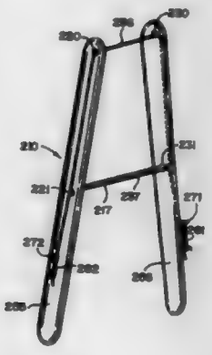
f) said base plate, said intermediate plate, and said cover plate being collapsible together in a zig-zag manner into a collapsed state.

5,469,874

APPARATUS AND METHOD FOR PREFORMING DENTAL FLOSSING

Stuart L. Meyer, Chicago, Ill.; Eric S. Meyer, Gaithersburg, Md.; David M. Meyer, Palo Alto, Calif., and Jonathan I. Meyer, Shake-Heights, Ohio, assignors to Televideo Consultants, Inc., Evanston, Ill.

Filed Feb. 24, 1994, Ser. No. 201,344
Int. Cl.[6] A61C *15/00*
U.S. Cl. 132—323 8 Claims



1. An apparatus for dental flossing comprising:

a) first and second elongated flossing handles;

b) a length of dental floss having opposite ends;

c) each of said flossing handles having one aperture adjacent a corresponding free end and said opposite ends of said length of dental floss passing through said one apertures to create a working segment of floss between said free ends;

d) each of said flossing handles also having at least one other aperture spaced a predetermined distance from a corresponding one aperture;

e) said opposite ends of said length of dental floss passing through one of said other apertures in each of said handles so as to form a virtual loop including a control segment of floss which is between said handles at said predetermined distance from said one apertures in said handles;

f) each of said flossing handles also having a handle extension which elongates the corresponding handle opposite said other apertures from said working segment of floss; and

g) an anchoring mechanism on each of said extensions;

h) said opposite ends of said length of floss each being anchored by an anchoring mechanism.

5,469,875

FLUID LEVEL CONTROL SYSTEM FOR A CONTINUOUS CHEMICAL TREATMENT DEVICE

Kenneth W. Rodarmer, Schoolcraft, and Louis W. Money, Kalamazoo, both of Mich., assignors to Delrod Sales Corporation, Kalamazoo, Mich.

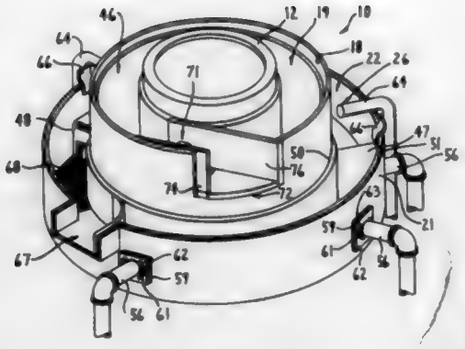
Filed Jun. 3, 1994, Ser. No. 253,674
Int. Cl.[6] B08B *3/10*
U.S. Cl. 134—63 23 Claims

1. A device for surface treating of parts, comprising:

a base frame;

an elongated channel having a bottom wall, a pair of spaced upstanding sidewalls on opposite sides of said bottom wall sealingly connected to said bottom wall;

a first end wall at a first end of said channel sealingly connected to said bottom wall and said pair of sidewalls;



a second end wall defining a dam at a second end of said channel remote from said first end, said dam including an inclined ramp extending from the bottom wall to a top of the dam, said inclined ramp being sealingly connected to said bottom wall and said pair of sidewalls;

drive means for vibrating the channel to cause parts to travel from said first end wall toward said dam and up said inclined ramp;

a fluid delivery means for spraying a treatment solution toward at least one of said bottom wall and said inclined ramp; and

a fluid outlet means for draining the treatment solution introduced into said channel by said fluid delivery means from said channel, said fluid outlet means opening into said channel solely through said first end wall.

5,469,876

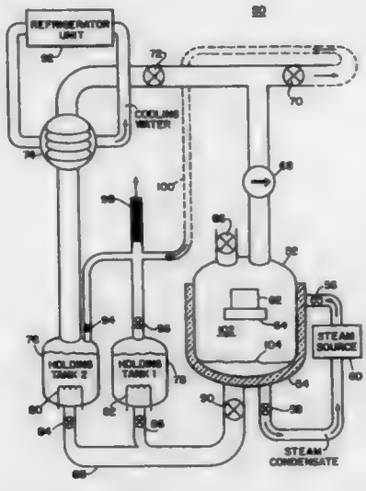
CLEANING METHOD AND SYSTEM

Donald J. Gray, 9 McGraw Ct., East Greenwich, R.I. 02818, and Peter T. E. Gebhard, 335 Valley St., Providence, R.I. 02903

Division of Ser. No. 787,935, Nov. 5, 1991, Pat. No. 5,240,507. This application Apr. 26, 1993, Ser. No. 53,161

Int. Cl.[6] B08B *3/10*

U.S. Cl. 134—105 **7 Claims**



1. A closed circuit solvent cleaning system comprising:

a solvent supply containing solvent;

a chamber sealable with respect to the atmosphere and in sealable communication with said solvent supply for holding an object to be cleaned in an airless environment;

means for subjecting said chamber to a negative gauge pressure to remove air and other non-condensible gases;

means for introducing solvent from said solvent supply into said chamber once it is subject to a negative gauge pressure while maintaining said airless environment in said chamber for cleaning the object; and

means for recovering solvent from said chamber and the object including means for preventing the emission of solvent or vapor containing solvent into the atmosphere.

5,469,877

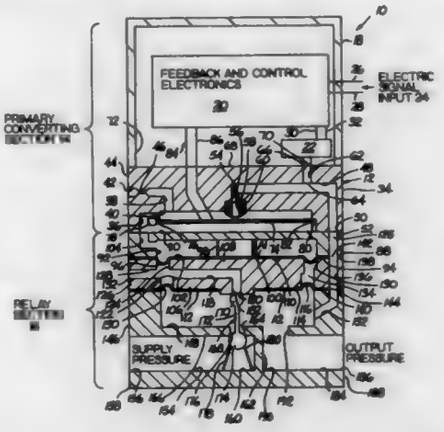
ELECTRIC TO PNEUMATIC TRANSDUCER

Andy R. Askew, Winston-Salem, N.C., assignor to Fairchild Industrial Products Company, Winston-Salem, N.C.

Filed Aug. 4, 1993, Ser. No. 101,745

Int. Cl.[6] G05D *16/20*

U.S. Cl. 137—85 **6 Claims**



1. An electric to pneumatic transducer comprising a transducer housing with a supply pressure aperture, an output pressure aperture, an exhaust valve aperture and an associated exhaust valve member, a pair of diaphragms associated with said exhaust valve member, said diaphragms having different effective operational areas with one having a larger effective operational area than the other with the ratio of the effective operational areas of said diaphragms being between the limits set forth below:

$$.5>R>.0$$

where:

R=Area ratio of the effective areas of diaphragms A1 and A2=$A1/A2$

A1=Effective area of the larger diaphragm

A2=Effective area of the smaller diaphragm,

and electronic feedback and control means located within said transducer housing for controlling the pressure in said output pressure aperture comprising a fluid valve nozzle for passing fluid and electronic valve means for controlling the passing of fluid from said fluid valve nozzle comprising an electrically deformable valve member, said electrically deformable valve member and said fluid valve nozzle being located to permit fluid to pass through said fluid valve nozzle and exert fluid pressure on the diaphragm having a larger effective operational area when said electrically deformable valve member is electrically deformed away from said fluid valve nozzle.

5,469,878

COILED TUBING CONCENTRIC GAS LIFT VALVE ASSEMBLY

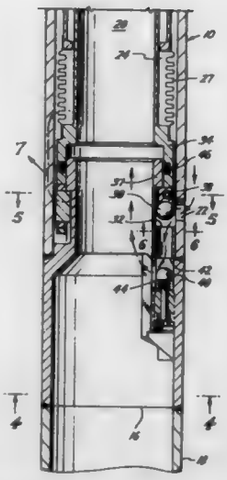
Ronald E. Pringle, Houston, Tex., assignor to Camco International Inc., Houston, Tex.

Filed Sep. 3, 1993, Ser. No. 115,623

Int. Cl.[6] F04F *1/08*

U.S. Cl. 137—155 **12 Claims**

12. A flexible spoolable coiled gas lift valve connected in a coiled tubing having a bore comprising,



a longitudinally flexible gas lift valve having a circular housing have first and second ends connected in a coiled tubing, said housing including an outside diameter substantially equal to the outside diameter of the coiled tubing, and an inside diameter substantially equal to the inside diameter of the coiled tubing, and said housing having an axial bore therethrough in coaxial communication with the bore of the coiled tubing for allowing the passage of well tools through the gas lift valve,

said housing having at least one port between the first and second ends extending between the inside and outside of the housing,

said housing including a movable valve element and a valve seat, said valve element controlled by a gas containing compartment, said valve seat and said valve element being positioned within the inside diameter of the housing, and

said valve element is laterally supported and guided by the inside diameter of the housing.

5,469,879

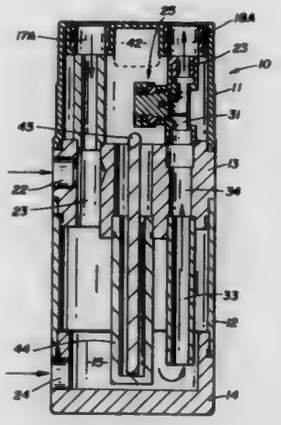
CONDENSATE TRAP AND DRAIN FOR SYSTEMS UNDER PRESSURE

John Rasmussen, 8433 South Ave., Youngstown, Ohio 44514

Filed May 23, 1994, Ser. No. 247,879

Int. Cl.[6] F16T *1/20*

U.S. Cl. 137—187 **6 Claims**



1. A condensate trap and drain system for use with systems under pressure comprises, an upper cylinder housing and a lower cylinder housing, a top cap threadably secured therebetween, a bottom cap threadably secured to said lower cylinder housing, a condensate collection reservoir therebetween, means for connecting said reservoir to said system, a purge outlet from said reservoir, a purge valve normally closing said purge outlet, sensing means within said collection reservoir in said lower cylinder housing comprising, a sensor tube projecting into said collection reservoir, a single probe encased within said sensor tube, said probe and said lower cylinder housing defining a variable capacitor within said condensate collection reservoir, said variable capacitor being responsive to changes in level of liquid condensate within said chamber, a control unit integrated into said upper cylinder housing said control unit comprising a sensing surrogate indicating level of condensation within said condensing reservoir by changes in impediment of said variable capacitor within, a purge valve in communication with said condensate reservoir, means for connecting said sensing means with said purge valve whereby opening and closing said purge valve responsive to condensate level changes within said condensate reservoir.

5,469,880

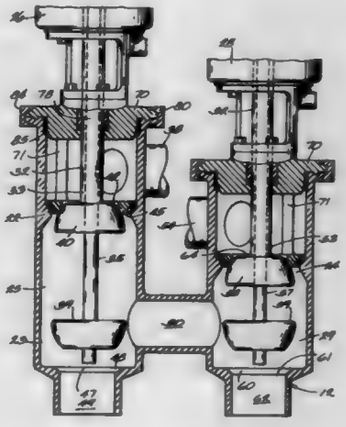
MANIFOLD VALVE ASSEMBLIES WITH CLEANING SOLUTION SUPPLY

Robert D. Zimmerly, Kenosha, Wis., assignor to Tetra Laval Holdings & Finance, S.C., Pully, Switzerland

Filed Dec. 16, 1994, Ser. No. 357,464

Int. Cl.[6] F16K *11/20*

U.S. Cl. 137—240 **4 Claims**



1. A manifold valve assembly, comprising:

a plurality of supply conduits each supplying a different fluid,

a plurality of distribution conduits for distribution of said fluids to a plurality of destinations,

a plurality of valve assemblies each including a pair of generally vertical valve cylinders each cylinder having an upper valve and a lower valve actuated by a pair of actuator rods that are coaxial with each other, the rods being independently actuatable by independently controlled actuators, one valve cylinder of each of said pairs having an inlet port connected to a supply conduit and the other valve cylinder of each of said pairs being connected to a distribution conduit, the valve cylinders of each pair being connected to each other by a crossover conduit near the lower ends of said cylinders, one of the bottom ports of each pair being connected to a drain, thereby forming a leak detector while the other bottom port of each pair is connected to a line supplying a cleaning fluid.

5,469,881

VALVE ASSEMBLIES

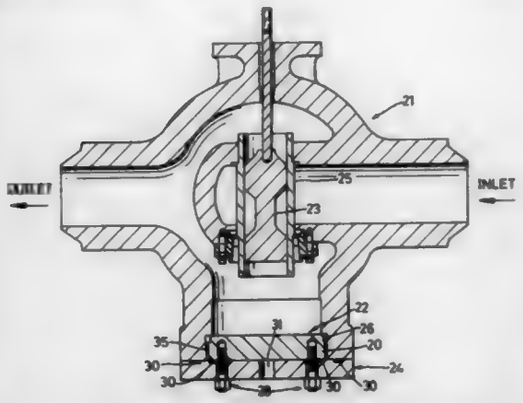
Chan B. Phan, Irvine, Calif., and Michael Walsh, Cypress, Tex., assignors to Control Components Inc., Rancho Santa Margarita, Calif.

Filed Jun. 3, 1994, Ser. No. 253,700

Claims priority, application United Kingdom, Jun. 4, 1993, 9311629

Int. Cl.[6] B65D 45/10

U.S. Cl. 137—315 7 Claims



1. A breech block flange assembly for blocking a breech opening in a valve assembly, the assembly breech block flange comprising:

a block to be secured in the breech opening to effectively close the breech opening,

a flange extending along a surface of said block and a surface of said valve assembly adjacent said opening and being secured to the block through fastening means, and

gasket structure disposed between the block and the flange constructed and arranged to seal the junction between the block and the breech opening to prevent the escape of fluid therethrough, the fastening means securing only the flange to the block such that walls of the valve assembly about the breech opening are free of any fasteners.

5,469,882

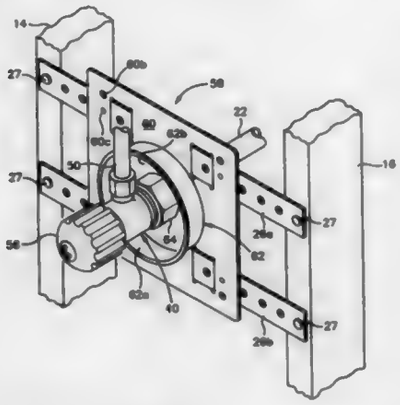
PARTIALLY RECESSED VALVE FIXTURE FOR CONNECTION TO FAUCETS AND COMMODES

Duane R. Condon, 2330 Raymond Ave., Ramona, Calif. 92065

Filed Dec. 14, 1994, Ser. No. 355,555

Int. Cl.[6] F16L 5/00

U.S. Cl. 137—360 12 Claims



1. A valve fixture, comprising:

a generally planar mounting plate formed to slidingly receive at least one mounting strap for supporting the plate between two adjacent wall studs;

a mounting dish overlying a first side of the mounting plate;

a valve having a threaded shank;

a hollow cylindrical adapter having a female threaded forward end screwed over the shank of the valve and a male threaded rearward end that extends through a hole in a base of the dish and a hole in an intermediate region of the mounting plate; and

a nut screwed over the rearward end of the adapter to squeeze the base of the dish and the mounting plate between an outer shoulder of the forward end of the adapter and the nut.

5,469,883

FLOW MODULATION DEVICE HAVING AN ELASTICALLY DEFORMABLE DISK-LIKE FLAP

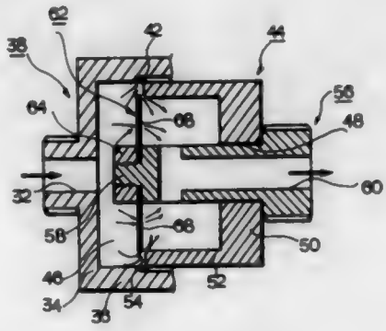
Seung H. Lee, Seoul, Rep. of Korea, assignor to Daewoo Heavy Industries Ltd., Incheon, Rep. of Korea

Filed Nov. 22, 1994, Ser. No. 345,753

Claims priority, application Rep. of Korea, Nov. 22, 1993, 93-24589

Int. Cl.[6] G05D 7/01

U.S. Cl. 137—513.3 11 Claims



1. A flow modulation device for restricting fluid flow exhausted from a first, actuator-sided conduit toward a second, reservoir-sided conduit to an acceptable rate in the event of sudden pressure drop within the second conduit, which comprises:

a body including a first end wall and a first cylindrical side wall extending from the end wall toward the second conduit, the first end wall having an inlet port coupled to the first conduit;

a socket fluid-tightly connected to the body to define a fluid chamber therebetween, the socket including a second end wall and a second cylindrical side wall extending from the second end wall into the first cylindrical side wall, the second side wall having at its distal end an abutment seat spaced apart from the first end wall, the second end wall having an axial aperture;

a nipple sealingly fitted through the axial aperture of the socket to protrude into the fluid chamber, the nipple having an outlet port through which the fluid chamber is in communication with the second conduit; and

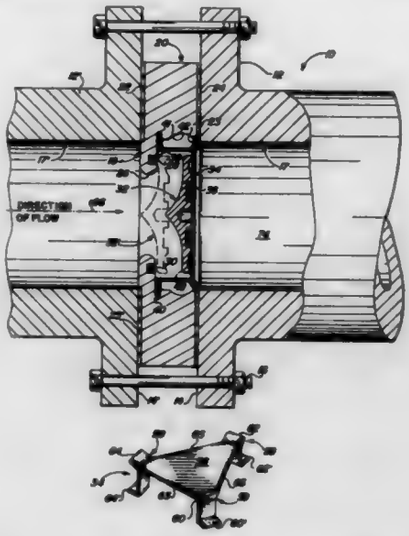
an elastically deformable disk-like flap detachably mounted to an internal free end of the nipple, the disk-like flap having at least one orifice and a peripheral edge of generally circular shape, the peripheral edge lying adjacent to the abutment seat of the socket so that it can normally remain out of contact with the abutment seat to leave an annular fluid leakage gap therebetween and, in the event of sudden pressure drop within the second conduit, come into contact with the abutment seat to eliminate the fluid leakage gap.

5,469,884

CHECK VALVE FOR METER RUN

Ronn G. Madrid, Midland, Tex., assignor to Durabla Pump Components, Inc., Odessa, Tex.

Filed May 20, 1994, Ser. No. 247,204
Int. Cl.[6] F16K *15/02*
U.S. Cl. 137—515.7 11 Claims



1. A check valve for preventing back flow of fluid through a fluid conduit, comprising;

a main body having opposed parallel upstream and downstream faces; said main body having an annular passageway through which flow can occur therethrough, means mounting said main body respective to a fluid conduit to enable flow to occur therethrough; said annular passageway includes a throat forming an inlet thereinto, a working chamber, and an outlet; said throat is of relatively small diameter and forms an entrance into said annular passageway at said upstream face, where the passageway enlarges into said working chamber which forms a circumferentially extending lip upstream thereof; said lip having opposed walls with an outer wall thereof coinciding with said upstream face and said opposed wall being arranged parallel to said outer wall; said opposed wall enlarges radially into a slot having an outside diameter greater than the diameter of said working chamber;

a valve element having a diameter greater than said throat, an annular seat formed on said lip downstream of said throat and within said annular passageway for receiving said valve element in seated relationship thereon, and thereby prevent back flow of fluid through said passageway;

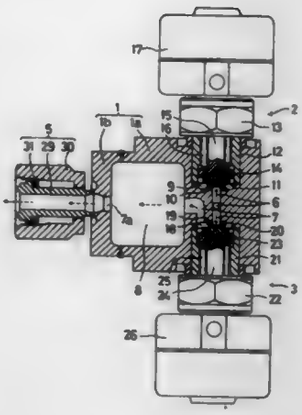
a valve cage by which said valve element is mounted for axial movement within said working chamber, said valve cage having legs releasably received within said slot whereby said valve element is moved toward and away from said seat in response to pressure differential thereacross such that said valve element can move from an open to a closed position to engage said seat to prevent back flow through said check valve.

5,469,885

BLOCK VALVE WITH TANK CHAMBER

Ryutaro Nishimura, Osaka, Japan, assignor to Masako Kiyohara, Kumamoto, Japan

Filed Oct. 21, 1994, Ser. No. 326,852
Claims priority, application Japan, Jan. 27, 1993, 5-268690
Int. Cl.[6] F16K *11/10*
U.S. Cl. 137—568 12 Claims



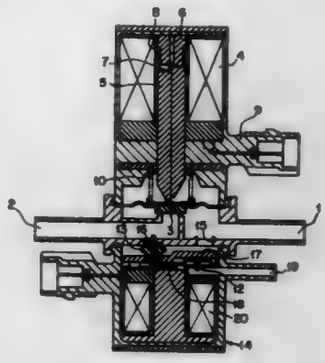
1. A block valve comprising a valve body having formed therein a tank chamber in which a vacuum is maintained, a gas feed passage having a gas feed inlet and a gas feed outlet, a branch passage having a portion connecting said gas feed passage to said tank chamber and a branch outlet extending from said tank chamber to a side of said valve body, a first valve mounted on said valve body for selectively opening and closing said gas feed passage at a point downstream of where said branch passage connects with said gas feed passage, and a second valve mounted on said valve body for selectively opening and closing said branch passage at a point between said tank chamber and where said branch passage connects with said gas feed passage, said vacuum being such that when said first valve is closed and said second valve is opened, gas in said gas feed passage and said branch passage upstream of the first and second valves is sucked into said tank chamber.

5,469,886

SOLENOID VALVE

Tamotsu Noya, Ibaraki, Japan, assignor to Kyosan Denki Co., Ltd., Tokyo, Japan

Division of Ser. No. 246,359, May 19, 1994, Pat. No. 5,419,367. This application Mar. 9, 1995, Ser. No. 401,164
Claims priority, application Japan, May 21, 1993, 5-141315
Int. Cl.[6] F02M *33/00*
U.S. Cl. 137—599 3 Claims



1. A solenoid valve comprising:

a solenoid valve for adjusting pressure between first and second connecting passages;

a bypass passage provided between said first and second connecting passages;

a one way valve provided between said bypass passage and a third connecting passage;

a closing valve provided between said bypass passage and said second connecting passage; and

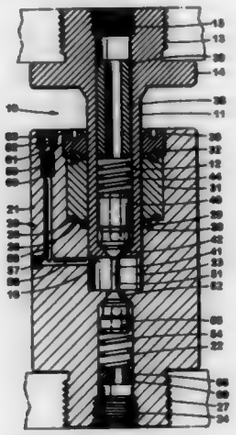
a second solenoid valve which is integrated with said solenoid valve for controlling to selectively open or close said closing valve and said one way valve.

5,469,887

HYDRAULIC COUPLING WITH PRESSURE EQUALIZING VALVE

Robert E. Smith, III, Stafford, Tex., assignor to National Coupling Inc., Stafford, Tex.

Filed Mar. 28, 1995, Ser. No. 411,943
Int. Cl.[6] F16L *37/28*
U.S. Cl. 137—614.04 **16 Claims**



1. A hydraulic coupling comprising:
(a) a female member having an internal bore and a slidable valve inserted therein for controlling fluid flow through the female member bore;
(b) a male member insertable into the female member bore and having an internal bore and a slidable valve inserted therein for controlling fluid flow through the male member bore;
(c) at least one seal configured to form a fluid-tight seal between the female member bore and the male member; and
(d) a pressure-equalizing passage extending between the female member bore and an external surface of the female member, and a valve in the passage biased to the closed position and openable in response to pressure at the external surface of the female member exceeding the bias force of the valve and internal pressure in the female member bore.

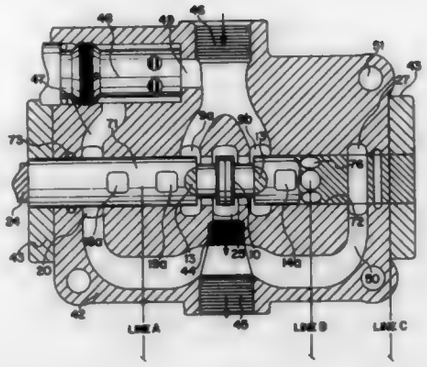
5,469,888

CONTROL VALVE

Graeme J. McAlister, Belgrave, Australia, assignor to Sapico Establishment, Vaduz, Liechtenstein

Continuation of Ser. No. 70,406, Jun. 10, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 338,822
Claims priority, application Australia, Dec. 12, 1990, PK3868
Int. Cl.[6] F15B *13/06*
U.S. Cl. 137—625.17 **22 Claims**

1. A manual control valve for controlling flow of pressurized fluid to and from at least two end users of said pressurized fluid, said valve comprising:
a valve body, said valve body having a main bore and at least two fluid flow passage means each leading from respective first port means opening into said main bore and adapted at an outer end for connection to a respective said end user of pressurized fluid;
a distribution spool located within said main bore, said distribution spool being movable within said main bore by manipulation by an operator external to said valve body, said distribution spool including internal distribution passage means



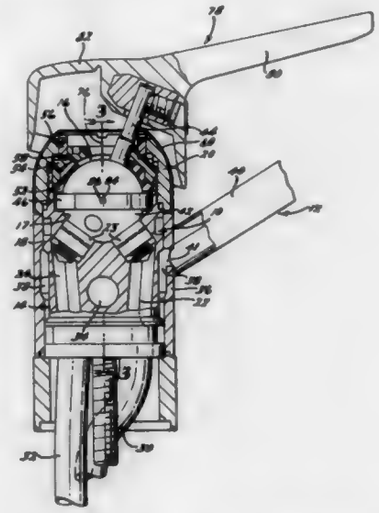
having a spool inlet means, for connection to a supply of pressurized fluid and having second port means located at an outer surface of said distribution spool that are cooperable with said first port means in selected positions of said distribution spool within said main bore, at least one of said first and second port means providing a substantially rectangular flow area, said distribution spool being rotationally movable into separate rotational positions, a first one of said rotational positions being such that pressurized fluid is directed from said internal distribution passage means into a respective one of said at least two fluid flow passage means, and in a second one of said rotational positions pressurized fluid is directed simultaneously into two adjacent said fluid flow passage means.

5,469,889

MIXING VALVE WITH A COLLARED BALL VALVE

Tage D. Tang, Vejle, Denmark, assignor to Masco Corporation, Taylor, Mich.

PCT No. PCT/US92/07939, § 371 Date Aug. 25, 1994, § 102(e) Date Aug. 25, 1994, PCT Pub. No. WO93/18325, PCT Pub. Date Sep. 16, 1993
PCT Filed Sep. 22, 1992, Ser. No. 295,639
Claims priority, application Denmark, Mar. 12, 1992, 333/92
Int. Cl.[6] F16K *11/076;51/00*
U.S. Cl. 137—625.41 **44 Claims**



20. In a ball valve for a faucet mixer valve, said ball valve characterized by;
a substantially spherical shaped valve surface;
a plurality of openings in said valve surface and in fluid communication with each other;

a first projection extending from said valve surface for driving said ball valve when mounted in a valve body; and

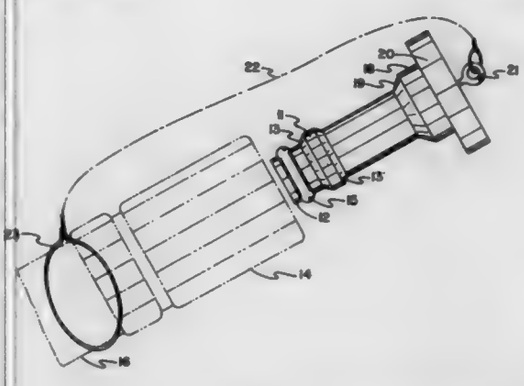
a circular collar bearing mounted about said ball valve surface for pivotable motion about an axis substantially perpendicular to said first projection.

5,469,890

HOSE MOBILE PLUG

James R. Carpentier, 1512 Walnut Dr., Alamogordo, N.M. 88310

Filed Oct. 27, 1994, Ser. No. 329,986
Int. Cl.[6] F16L *55/11*
U.S. Cl. 138—89 **1 Claim**



1. A new and improved hose mobile plug combined with a reel-mounted hose for prevention of fluid drainage from a stored hose comprising in combination:

a generally cylindrical plug formed of a rigid material being a solid structure having an upper end and a lower end;

a first annular projection being spaced from the lower end and having a pair of lead-in tapered edges being circumferentially positioned around the projection in parallel planes, the first annular projection capable of a slidable fit within a quick disconnect fitting of a reel-mounted hose, the quick disconnect fitting having an interior diameter and an outer end;

a retaining portion adjacent the lower end of the plug and spaced from the first annular projection, the retaining portion having seated therein an elastomeric ring;

an end cap having an exterior end integral with the upper end of the plug, the exterior end having a threaded aperture therein, the end cap having an enlarged diameter greater than the interior diameter of the quick disconnect;

a second annular projection being adjacent the end cap and having a lead-in tapered edge being circumferentially positioned around the projection and spaced from the end cap, the second annular projection having a size larger than the first annular projection and smaller than the end cap, the second annular projection further being capable of snugingly engaging the outer end of the quick disconnect fitting; and

a securing cable having a small looped portion at one end and an annular clamp at another end, the small looped portion having been coupled to a threaded eye-bolt, the annular clamp being capable of being positioned around the hose adjacent the quick disconnect fitting, the eye-bolt capable of coupling with the threaded aperture of the end cap, the securing cable having a length for allowing the plug to be positioned within the quick disconnect fitting of the hose while the cable hangs adjacent the plug in the fitting when the eye-bolt being secured within the end cap and the clamp being secured around the hose.

5,469,891

METHOD FOR RELINING UNDERGROUND PIPELINES

Arne Lund, and Lennart Agren, both of Boras, Sweden, assignors to Uponor Innovation AB, Fristad, Sweden

PCT No. PCT/SE92/00471, § 371 Date Apr. 18, 1994, § 102(e) Date Apr. 18, 1994, PCT Pub. No. WO93/00548, PCT Pub. Date Jan. 7, 1993
PCT Filed Jun. 25, 1992, Ser. No. 170,303
Claims priority, application Sweden, Jun. 25, 1991, 9101948
Int. Cl.[6] B29C *53/08;63/34*
U.S. Cl. 138—98 **2 Claims**

1. A method of restoring an underground pipeline, comprising the steps of:

providing a flexible folded pipe of PVC material which by an addition of polymer thermoplastic elastomers has a glass transition temperature ranging from 45° to 75° C., a ratio (Emod, T=20°)/(Emod, T=75°) > 20;

inserting said flexible pipe, without pre-heating, into the pipeline to position the pipe therein;

supplying a heat transferring fluid under low pressure to an interior of the pipe after insertion of said pipe;

increasing temperature of said pipe by heat transfer from said fluid to expand the pipe from a folded shape to engage the pipe with an inside surface of said pipeline; and

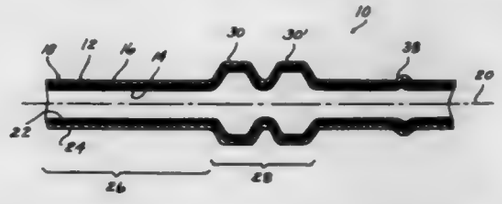
leaving the pipe as a liner in said pipeline.

5,469,892

CORRUGATED POLYMERIC TUBING HAVING AT LEAST THREE LAYERS WITH AT LEAST TWO RESPECTIVE LAYERS COMPOSED OF POLYMERIC MATERIALS DISSIMILAR TO ONE ANOTHER

David L. Noone, Marsberg, Germany, and Frank L. Mitchell, Rochester, Mich., assignors to ITT Automotive, Inc., Auburn Hills, Mich.

Continuation-in-part of Ser. No. 868,754, Apr. 14, 1992, and Ser. No. 962,496, Oct. 16, 1992. This application Apr. 14, 1994, Ser. No. 227,511
Int. Cl.[6] F16L *11/04*
U.S. Cl. 138—121 **26 Claims**



1. A multi-layer tubing suitable for use on motor vehicles comprising a cylindrical wall having an outer surface, and an inner surface essentially parallel to the outer surface, the inner surface defining an essentially cylindrical interior, said essentially cylindrical interior extending longitudinally through the tubing coaxial to a longitudinal axis, the cylindrical wall itself comprising:

a first region having an essentially uniform cross-sectional diameter in which the cylindrical wall has a flat longitudinal cross-section, the cylindrical wall oriented essentially parallel to the coaxial longitudinal axis; and

a second region in which the cylindrical wall has at least one convolution having a cross-sectional diameter which varies positionally depending on longitudinal location in the second region, the convolution having cross-sectional diameter different from the essentially uniform cross-sectional diameter of the first region, the cylindrical wall of the multi-layer tubing further comprising:

a thick flexible outer layer having an inner and an outer face, the outer layer consisting essentially of an extrudable melt-processible thermoplastic selected from the group consisting of twelve-carbon block polyamides, eleven-carbon block polyamides, six-carbon block polyamides, thermoplastic elastomers, and mixtures thereof;

a thin intermediate bonding layer homogeneously bonded to the inner face of the thick outer layer, the bonding layer consisting essentially of an extrudable melt-processible thermoplastic resistant to permeation by short-chain hydrocarbons, the thin intermediate bonding layer consisting of a thermoplastic which is chemically dissimilar to the extrudable thermoplastic employed in the thick outer layer and is capable of sufficiently permanent laminar adhesion to the inner face of the thick outer layer;

an interior layer composed of an extrudable melt-processible thermoplastic homogeneously bonded to the intermediate bonding layer, the extrudable melt-processible thermoplastic of the interior layer being capable of sufficiently permanent laminar adhesion to the intermediate bonding layer, the extrudable melt-processible thermoplastic material of the interior layer selected from the group consisting of twelve-carbon block polyamides, eleven-carbon block polyamides, six-carbon block polyamides, and mixtures thereof, the inner layer having a thickness less than the thickness of the outer layer; and

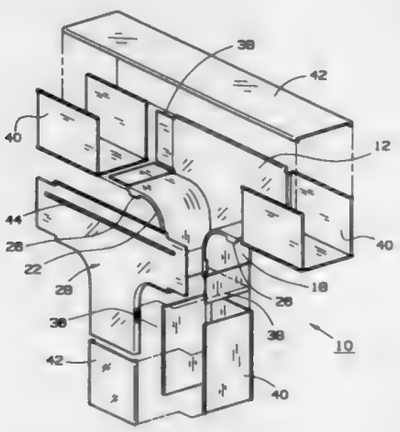
wherein thicknesses of each respective layer remains essentially constant throughout the convolution in the second region.

5,469,893

TAB AND SLOT FIBER OPTIC FITTING

Jack E. Caveney, Hinsdale, and Robert Nicoli, Glenwood, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Dec. 21, 1993, Ser. No. 172,519
Int. Cl.[6] F16L *9/22*
U.S. Cl. 138—162 **12 Claims**



1. A fitting for joining a plurality of duct sections of a cable duct network comprising:

a base member including a floor section;

a plurality of sidewalls perpendicularly disposed and extending from an interior face of the floor section to a marginal edge at a distal end of the sidewall;

a plurality of narrow tabs formed on the marginal edges of the sidewalls and disposed so as to extend perpendicularly away from a distal end of an exterior surface of the sidewalls;

a cover member, engageable with the base member, having a lid section and including flange portions extending perpendicularly from an interior face of the lid section; and

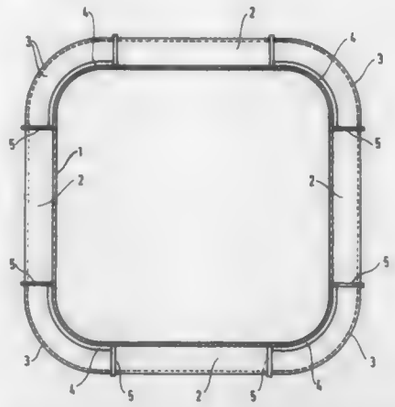
a plurality of slots formed in the flange portions disposed for engagement with corresponding tabs of the base member.

5,469,894

METAL DUCT SUBJECTED TO STEEP TEMPERATURE GRADIENTS

Liberto Gandia, Blevilliers, and Frédéric Rouget, Valdoie, both of, France, assignors to European Gas Turbines SA, Paris, France

Filed Oct. 25, 1993, Ser. No. 140,393
Claims priority, application France, Jan. 26, 1992, 92 12723
Int. Cl.[6] F16L *9/04*
U.S. Cl. 138—172 **6 Claims**



1. A metal duct subjected to steep temperature gradients comprising:

a sheet metal tube substantially rectangular in cross-section with four flat sides and four rounded corners; and

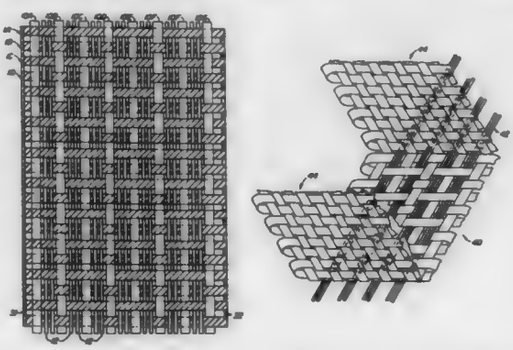
outer stiffeners disposed in separate discrete planes substantially perpendicular to a longitudinal axis of said tube, said outer stiffeners comprising four rectilinear first members, each of said first members being welded along a respective one of said four flat sides, and four second members, each of said second members being mounted between adjacent ends of said first members around a respective one of the rounded corners and spaced a predetermined distance from the rounded corners so as not to contact the rounded corners.

5,469,895

SMART SKIN ARRAY WOVEN FIBER OPTIC RIBBON AND ARRAYS AND PACKAGING THEREOF

Patricia Wiener, La Honda, Calif., assignor to Page Automated Telecommunications Systems, Inc., Palo Alto, Calif.

Continuation of Ser. No. 998,234, Dec. 30, 1992, abandoned, which is a division of Ser. No. 671,582, Mar. 19, 1991, Pat. No. 5,256,468. This application May 3, 1994, Ser. No. 237,426
Int. Cl.[6] D03D *15/00*
U.S. Cl. 139—420 R **7 Claims**



1. A method of fabricating a woven structure containing optical fibers, comprising:

positioning first strands of a first material in a warp direction, the first strands forming channels between adjacent strands;

positioning optical fibers in the warp direction in the channels formed by the first strands, the optical fibers being positioned in zero warp and having diameters less than the first strands; and

weaving second strands of a second material around the first strands thereby forming the woven structure in which the optical fibers are supported;

wherein the optical fibers are supported substantially straight and parallel by the woven structure so as to facilitate transmission of light through the optical fibers.

5,469,896

ROTATABLE CUTTING DEVICE FOR WEFT THREADS

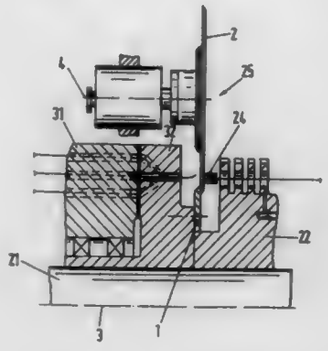
Marcel Christe, Rüti, and Urs Schaich, Eschenbach, both of, Switzerland, assignors to Sulzer Rueti AG, Rueti, Switzerland

Filed May 9, 1994, Ser. No. 238,297

Claims priority, application European Pat. Off., May 21, 1993, 93810376

Int. Cl.[6] D03D *49/70;47/36*

U.S. Cl. 139—450 **12 Claims**



1. A device for cutting weft threads for a loom having a driven member which rotates about a first axis comprising a positionally stable first cutting member adapted to be secured to the driven member of the loom for rotation therewith; a second cutting member; a shaft on which the second cutting member is rotatably mounted, the shaft having a second axis which is parallel to the first axis; a support for nonrotatably mounting the shaft, permitting relative movements of the shaft in an axial direction and positioning the second cutting member so that a portion thereof overlaps a portion of the first cutting member; and a spring biasing the shaft and therewith the second cutting member in an axial direction into engagement with the first cutting member so that rotation of the first cutting member in a first direction frictionally imparts rotation to the second cutting member in a second, opposite direction.

5,469,897

APPARATUS FOR FILLING GREASE GUNS

Oren Haytner, and Avi Haytner, both of 1 Kaplan Street, Petach Tikva, Israel

Filed Aug. 25, 1994, Ser. No. 296,103

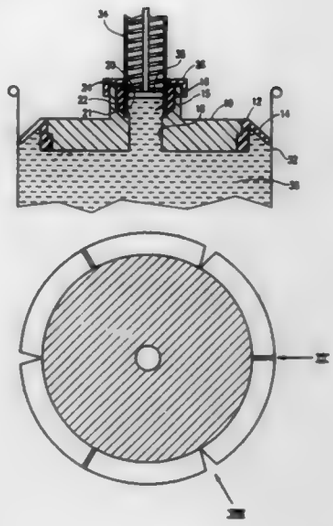
Claims priority, application Israel, Aug. 27, 1993, 106825

Int. Cl.[6] F16N *37/02*

U.S. Cl. 141—27 **10 Claims**

1. Apparatus for filling grease guns comprising:

a top member sealingly and slidably engageable with the interior of a grease container along the periphery of the top member, the top member including a socket for sealingly and removably receiving a grease gun body, whereby drawing of grease into the grease gun by rearward movement of a piston in the grease gun body provides suction which causes the top member to move inwardly in the grease container and grease to be forced into the grease gun body,



the top member including a flexibly inclined peripheral seal having multiple generally radially extending slits formed therein.

5,469,898

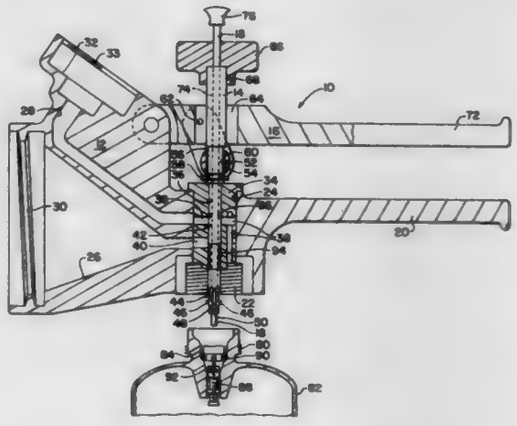
GAS TANK EVACUATOR

Michael C. Campbell, 1400 N. Woodhouse Rd., Virginia Beach, Va. 23454

Division of Ser. No. 213,499, Mar. 16, 1994, Pat. No. 5,421,380. This application Feb. 1, 1995, Ser. No. 382,407

Int. Cl.[6] B65B *31/04*

U.S. Cl. 141—65 **2 Claims**



1. A method for preparing a gas tank for disposal comprising the steps of:

inserting a valve-engaging end of an elongated valve-removal rod into a mouth of an attachment neck of the gas tank, said valve-engaging end of said valve-removal rod including a barb for engaging a sealing O-ring in the mouth and an axially-extending, downwardly-directed groove for engaging a valve threadably mounted in said mouth; and

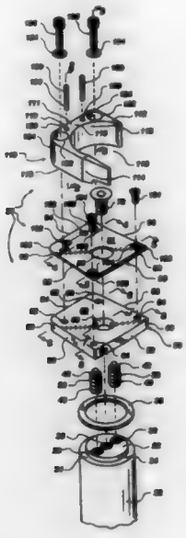
rotating said valve-removal rod to unscrew said threadingly engaged valve and withdrawing said valve-removal rod from said mouth with said barb engaging said O-ring to thereby remove said O-ring from said mouth.

5,469,899

STABILIZATION OF CANS WITH A SMALLER FOOTPRINT ON A CAN ELEVATING PLATFORM OF AUTOMATIC BEVERAGE FILLING MACHINERY

Terry E. Nish, Salt Lake City, Utah, assignor to Servi-Tech Inc., Salt Lake City, Utah

Filed Jan. 31, 1994, Ser. No. 189,956
Int. Cl.[6] B67C *3/26;3/34*
U.S. Cl. 141—275 6 Claims



2. An automatic beverage filling machine comprising a lift mechanism for a container having a diametrally reduced footprint comprising:

a reciprocable piston rod comprising a distal end comprising at least two fastener-receiving sites;

a platform comprising an underside, an upper surface comprising a central container footprint-receiving area, and fastener-receiving sites, at least two of said platform fastener-receiving sites being aligned with two of said piston rod fastener-receiving sites;

at least two fasteners extending between pairs of said aligned fastener-receiving sites thereby non-rotatably releasibly connecting the distal end of the piston rod to the underside of the platform generally in direct vertical relation;

a separate flat wear plate comprising a top surface and a bottom surface which is contiguously superimposed in direct vertical relation upon the upper surface of the platform, the wear plate further comprising a plurality of apertures through which fasteners pass, no more than one platform-to-piston rod fastener accommodating aperture being centrally located within the footprint receiving area;

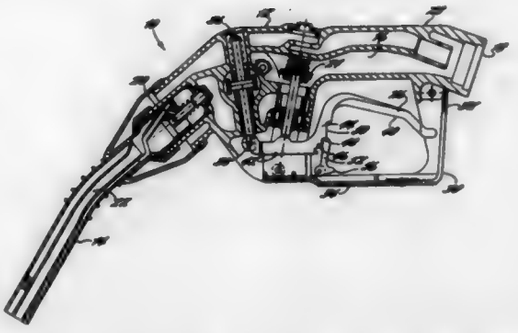
a container-centering stirrup comprising fastener-receiving sites through which fasteners pass non-rotatably connecting the stirrup to the platform in eccentric vertical relation so that a lower surface of the stirrup contiguously engages the top surface of the wear plate outside the footprint-receiving area.

5,469,900

FUEL DISPENSING NOZZLE HAVING HOLD-OPEN CLIP WITH LOCKOUT MECHANISM

F. Bruce Weeks, Apex, and John L. Johnson, Raleigh, both of N.C., assignors to EMCO Wheaton, Inc., Morrisville, N.C.

Filed May 31, 1995, Ser. No. 456,121
Int. Cl.[6] B65B *1/04;3/04*
U.S. Cl. 141—392 7 Claims



1. A fuel dispensing nozzle comprising:

(a) a main body portion having a fuel passageway extending from an ingress end of the main body portion to an egress end thereof, the ingress end of said main body portion being adapted to be connected to a hose for delivering fuel from a pump to said nozzle;

(b) a spout carried by the egress end of said main body portion and extending outwardly therefrom, said spout including a fuel dispensing passageway extending therethrough and being communicatively connected to said fuel passageway in said main body portion for dispensing fuel into a vehicle fuel tank;

(c) main valve means mounted in said main body portion for controlling the flow of fuel through said fuel passageway in said main body portion;

(d) a manually operable lever extending from said main body portion and operatively connected with said main valve means, said lever having a first position for opening said main valve means to allow flow of fuel through said fuel passageway in said main body and a second position wherein said main valve means is closed to prevent flow of fuel through said fuel passageway;

(e) a lever guard extending below said lever;

(f) a hold-open clip pivotally mounted to one of said lever and said lever guard for movement between operative and inoperative positions,

the other of said lever and said lever guard having a notch operatively associated with said hold-open clip for engagement with said hold-open clip upon pivotal movement of said hold-open clip to said operative position of said hold-open clip to thereby retain said lever in said first position of said lever when said hold-open clip is in said operative position; and,

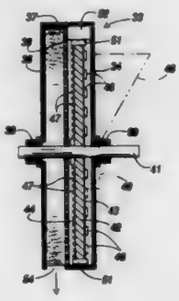
(g) lockout means for preventing operative engagement of said hold-open clip with said notch, wherein said lockout means is a lockout member adapted to be mounted to cover said notch to prevent engagement of said hold-open clip with said notch.

5,469,901

DOUBLE ACTION DISC HOG WITH CHIP SIZING GRATE

Dana Leguin, Rte. 4, Box 280, Summerville, Ga. 30747

Filed Mar. 7, 1994, Ser. No. 206,713
Int. Cl.[6] B27C *1/00*
U.S. Cl. 144—163 33 Claims



23. A disc hog for reducing timbers to wood shards of a predetermined maximum size, said disc hog comprising:

a housing having a front wall and a rear wall joined by a substantially circular ring shaped side wall to form a substantially disc shaped interior cavity of said housing;

a disc having a front surface and a rear surface and being disposed in said interior cavity of said housing, said disc being mounted on a drive shaft for rotation of said disc about its central axis;

said front wall of said housing being disposed in spaced substantially parallel relationship to said front surface of said disc and said rear wall of said housing being disposed in spaced substantially parallel relationship to said rear surface of said disc;

means for driving said shaft to cause said disc to rotate within said interior cavity of said housing;

a feeder opening formed is said front wall of said housing through which timbers can be introduced into said housing and presented to the front surface of said rotating disc;

a first plurality of first pulverizing means protruding outwardly from said front surface of said disc with said first pulverizing means being arrayed to impact a timber fed through said feeder opening, said first pulverizing means being configured to cut, shred, or tear the timber into wood chips and shards;

a plurality of second pulverizing means protruding outwardly from said rear surface of said disc with said second pulverizing means being arrayed to impact wood shards in their vicinity and reduce the shards to chips and shards of a smaller size;

means for transferring wood shards from the vicinity of said front surface of said disc to the vicinity of said rear surface of said disc for further processing; and

means for expelling wood shards from the vicinity of said rear surface of said disc when the shards are reduced to a predetermined maximum size.

5,469,902

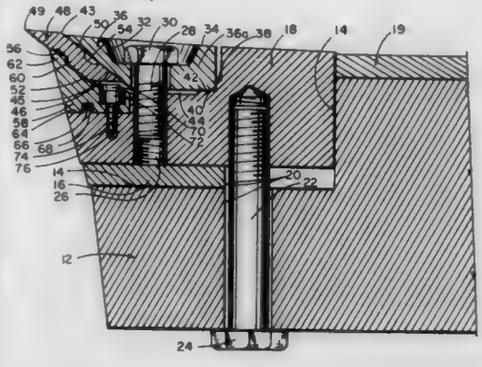
CHIPPER KNIFE AND KNIFE HOLDER ASSEMBLY

Gary A. Sharp, Clearwater, Fla., and Jan-Erik Jonsson, Atlanta, Ga., assignors to American Knife, Inc., Appleton, Wis.

Continuation-in-part of Ser. No. 119,310, Sep. 13, 1993, abandoned. This application Jun. 27, 1994, Ser. No. 265,771

Int. Cl.[6] B27G *13/00*; B27C *1/00*

U.S. Cl. 144—241 **13 Claims**



1. A chipper knife, comprising:

a body having a parallelogram shape;

said body having a first clamping surface of predetermined width, a second clamping surface of predetermined width, a pair of side walls, a leading surface, and a trailing surface;

a first cutting edge formed by a predetermined acute angle between said leading wall and said second clamping surface;

a second cutting edge formed by a predetermined acute angle between said trailing wall and said first clamping surface;

a first transverse groove formed in said first clamping surface;

said first transverse groove having a predetermined depth and having a flat bottom parallel to said first clamping surface;

a second transverse groove formed in said second clamping surface;

said second transverse groove having a flat bottom parallel to said second clamping surface and said second transverse groove having a depth substantially equal to the predetermined depth of said first transverse groove;

said knife having bilateral symmetry about a longitudinal axis of symmetry; and

said knife having bilateral symmetry about a transverse axis of symmetry.

5,469,903

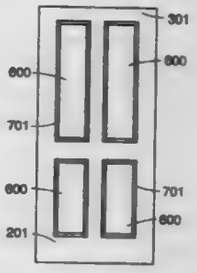
METHOD OF MAKING SIMULATED SOLID WOOD SLABS AND RESULTING SOLID WOOD SLAB

Kenneth Stanley, 138 Monmouth Rd., Spotswood, N.J. 08884

Continuation of Ser. No. 52,149, Apr. 23, 1993, Pat. No. 5,355,654. This application Oct. 7, 1994, Ser. No. 320,173

Int. Cl.[6] B27F *7/00*; B27D *1/00*; E06B *3/70*

U.S. Cl. 144—345 **4 Claims**



4. In a hollow core door having a wood rectangular frame, a first thin sheet of wood on a first side thereof, and a second thin sheet of wood on a second side thereof, said first and second sheets being of the same shape and size as said frame, a method of simulating a solid wood door, said method comprising the steps of:

cutting at least one opening through both sheets of wood;

forming said at least one artificial panel from sheet portions removed from said opening into which said artificial panel is to be inserted by mounting said sheet portions on wood, said at least one artificial panel being of a different thickness than said hollow core door;

attaching each of said at least one artificial panels within each of said at least one openings.

5,469,904

APPARATUS AND PROCEDURE FOR CUTTING SQUARE TIMBER

Veijo Kontiainen, Selkiöntie 5, FI-76100 Pieksämäki, Finland

PCT No. PCT/FI92/00279, § 371 Date Apr. 20, 1994, § 102(e) Date Apr. 20, 1994, PCT Pub. No. WO93/08002, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 19, 1992, Ser. No. 211,933

Claims priority, application Finland, Jan. 23, 1991, 91500

Int. Cl.[6] B27B *1/00*; B27C *9/00*

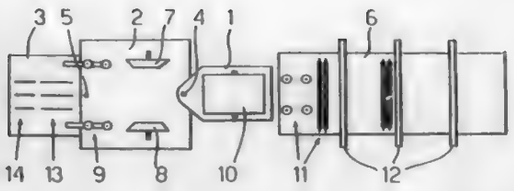
U.S. Cl. 144—370 **11 Claims**

1. An apparatus for sawing a timber into a plurality of boards, said timber having a longitudinal axis and having a generally square cross-sectional shape in a plane lying generally normal to the longitudinal axis, said timber being curved along said longitudinal axis, said apparatus comprising:

a frame;

a feed table (6) on which the timber to be sawed is placed;

a feed mechanism (1) for receiving the timber from said feed table and feeding said timber in a direction generally parallel to its longitudinal axis;



a chipper (2) coupled to said feed mechanism by a first pivot means (4) by which the feed mechanism and chipper can move relative to each other, said first pivot means having a rotational axis oriented normal to the feeding direction for said timber, said chipper receiving said timber from said feed mechanism and removing curved portions from said timber as the timber passes through said chipper;

sawing means (3) mounted on said frame of said apparatus, said sawing means being said coupled to said chipper by a second pivot means (5) by which said chipper can move relative to said sawing means, said second pivot means having a rotational axis oriented normal to the feeding direction for said timber, said sawing means receiving the timber from said chipper and sawing the timber into boards as said timber passes through said sawing means; and

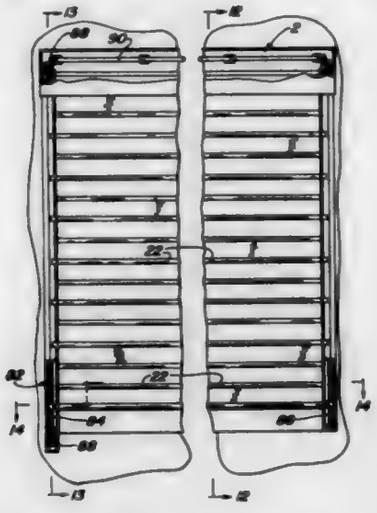
control means for moving said feed mechanism and said chipper relative to each other about said first pivot means and for moving said chipper relative to said sawing means about said second pivot means in accordance with the curvature of said timber as said timber moves through said apparatus.

5,469,905

SECURITY AND HURRICANE SHUTTER

Roy L. McKinney, Coconut Grove, and Abraham Wien, Miami, both of Fla., assignors to Fold-A-Shield, Coral Gables, Fla.

Filed Sep. 7, 1993, Ser. No. 117,827
Int. Cl.[6] E05D *15/26*
U.S. Cl. 160—35 **23 Claims**



1. A security/hurricane shutter attached to a part of a structure comprising:

(a) a plurality of horizontally disposed blades, each of said blades being rectangular in shape and having a first and second longitudinal edge and a first and second end;

(b) means for pivotably connecting each of said first longitudinal edges to a respective second longitudinal edge of a first adjoining blade and each of said second longitudinal edges to a respective first longitudinal edge of a second adjoining blade, in accordion fashion;

(c) means for adjusting the strength of said shutter to withstand impact from external forces by varying the angle between the plane of each of said plurality of blades and the plane of each of said adjoining blades;

(d) means for raising and lowering said shutter to cover and uncover said part of said structure from a fully raised position to a fully lowered position and from a fully lowered position to a fully raised position;

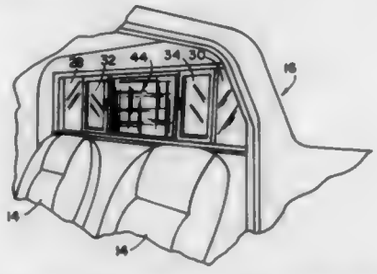
(e) means for enclosing said blades when said shutter is in the raised position.

5,469,906

SCREEN FOR REAR WINDOWS OF VEHICLES

Thomas C. Cason, 74 Fourth St., Lowell, Mass. 01850

Filed Dec. 20, 1993, Ser. No. 170,066
Int. Cl.[6] E06B *3/32*
U.S. Cl. 160—105 **12 Claims**



1. In a rear window assembly for a vehicle, said rear window assembly having spaced, horizontal, counterfacing channels for holding a horizontally displaceable closure therebetween such that the closure is displaceable between open and closed positions, the improvement of a screen assembly for filling the space vacated when the closure is displaced to an open position, said screen assembly comprising an open frame with horizontal side means for engaging the channels and a screen attached to said open frame, one of said horizontal side means including resilient means for changing the effective separation of said horizontal side means between a normally extended condition and a compressed condition, said horizontal side means seating in the channels in the extended condition thereby to support said screen assembly between said channels, said horizontal side means in the compressed condition enabling the removal of said screen assembly from the window assembly.

5,469,907

Patent Not Issued For This Number

5,469,908

CAP FOR INVESTMENT MOLDS FOR PRECISION CASTING

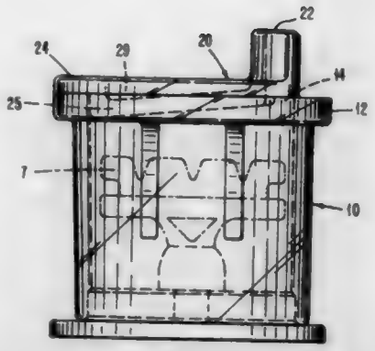
James Chmel, Fav Claire, Wis., and Robert P. Berger, Encino, Calif., assignors to Belle de St. Claire, Chatsworth, Calif.

Filed Mar. 15, 1994, Ser. No. 213,163
Int. Cl.[6] A61C *13/20;* **B22C** *7/02;21/00*
U.S. Cl. 164—376 **19 Claims**

1. A cap for a vessel which receives an investment material, the vessel having a wall, an open top and an inner edge at the open top, the cap comprising:

a platform having a contoured edge and having an underside, the cap being removably engageable with the open top of the vessel;

a portion on the underside of the platform frictionally engageable with at least a portion of the inner edge of the vessel;



the contoured edge of the platform and the inner edge of the vessel defining an opening for receiving the investment material when the platform is placed over the open top; and

a lip on the platform at the contoured edge for channeling the investment material to the opening.

18. A combination vessel and cap for receiving an investment material for precision lost wax casting, comprising:

a vessel having a side wall, an open top and an inner edge at the open top, the vessel having a bottom and a sprue forming structure connected to the bottom and extending to a volume of the vessel;

a cap for partially closing the open top of the vessel, particularly when the vessel is in a horizontal position for receiving investment material into the vessel, the cap comprising a platform having means for retaining the platform to the open top, the platform having a recess at one edge forming an opening into the open top; and

a lip around the recess for channeling investment material poured onto the lip into the opening.

5,469,909

COOLING DRUM FOR A CONTINUOUS CASTING SYSTEM AND METHOD FOR MANUFACTURING THE SAME

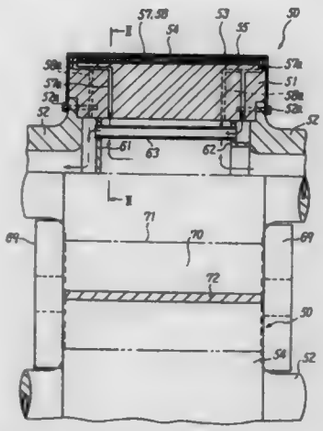
Kunimasa Sasaki; Youichi Wakiyama; Takahiro Matsumoto; Kisaburo Tanaka, and Keiichi Yamamoto, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1994, Ser. No. 257,746

Claims priority, application Japan, Dec. 22, 1992, 4-342410

Int. Cl.[6] B22D *11/06*

U.S. Cl. 164—428 **4 Claims**



1. A cooling drum for a continuous casting system in which molten metal is cooled and solidified by means of a rotating cooling drum or drums; comprising a three-layer structure consisting of a cylindrical rigid member, a cylindrical cooling member fitted around an outer circumferential surface of said rigid member and having its inner circumferential surface metallurgically bonded to said outer circumferential surface, and a heat-resistance member formed by electro-deposition, plating on an outer circumferential surface of said cooling member, and provided with cooling holes drilled in said cooling member as distributed over its entire circumference and extending in the axial direction of said cooling drum, and coolant passageways connecting the opposite axial end portions of said respective cooling holes with an inner circumferential surface of said rigid member.

5,469,910

PROCESS FOR THE CONTINUOUS CASTING OF METAL, IN PARTICULAR OF STEEL INTO BLOOM AND BILLET CROSS-SECTIONS

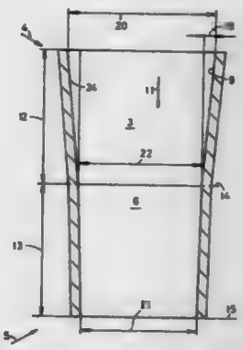
Franciszek Kawa, Adliswil; Adrian Stilli, Bülach, and Adalbert Roehrig, Thalwil, all of, Switzerland, assignors to Concast Standard AG, Zürich, Switzerland

Filed Sep. 2, 1994, Ser. No. 304,772

Claims priority, application Switzerland, Mar. 5, 1992, 690/92

Int. Cl.[6] B22D *11/00*

U.S. Cl. 164—459 **16 Claims**



1. A continuous casting method, comprising the steps of admitting molten metal into a casting passage to establish a bath of said molten metal in said passage, wherein a cross-section of an inlet is larger than that of an outlet, said bath having a variable level; cooling said molten metal in said passage, the cooling step including at least partially solidifying said molten metal to form a continuously cast strand having a plurality of bulges which are distributed substantially uniformly circumferentially of said strand; conveying said strand through said passage; deforming said bulges in said passage by a variable amount during the conveying step; and regulating said amount as a function of at least one of a set of casting parameters including the composition of said molten metal, the speed at which said strand is conveyed through said passage, the superheat of said molten metal, the coefficient of friction of said strand in said passage, and the force with which said strand is conveyed through said passage, the regulating step comprising adjusting said level.

5,469,911

METHOD FOR IMPROVING SURFACE QUALITY OF ELECTROMAGNETICALLY CAST ALUMINUM ALLOYS AND PRODUCTS THEREFROM

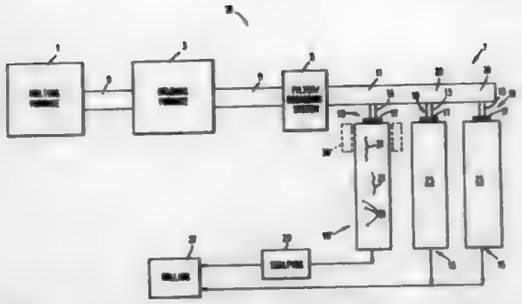
Gary B. Parker, Moulton, Ala., assignor to Reynolds Metals Company, Richmond, Va.

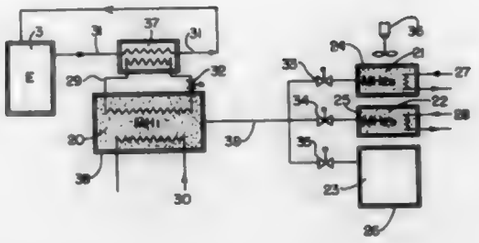
Filed Apr. 12, 1994, Ser. No. 226,727

Int. Cl.[6] B22D *11/00;27/02*

U.S. Cl. 164—467 **12 Claims**

1. In a method of producing an AA5000 series aluminum alloy product comprising feeding a molten AA5000 series aluminum alloy to an ingot mold having an ingot head, electromagnetically





casting the AA5000 series aluminum alloy using electromagnetic forces to confine the molten aluminum within said ingot mold, solidifying the molten aluminum to form an aluminum alloy ingot, and working said ingot to produce a product, the improvement comprising adding an effective amount of calcium to said molten aluminum alloy prior to said ingot head so that the ingot has at least an ingot side surface quality sufficiently free of surface imperfections such that said aluminum alloy ingot can be reduced in size by working without surface conditioning of said ingot side surfaces between said casting and said working steps.

5,469,912

PROCESS FOR PRODUCING ALUMINUM ALLOY SHEET PRODUCT

Donald C. McAuliffe, Golden, Colo., assignor to Golden Aluminum Company, Golden, Colo.

Filed Feb. 22, 1993, Ser. No. 20,677
Int. Cl.[6] B22D *11/12*; C22F *1/047*
U.S. Cl. 164—476 **16 Claims**

1. A process for producing an aluminum alloy sheet, comprising the steps of:

(a) forming an aluminum alloy melt comprising from about 4.7 percent to about 5.4 percent magnesium and from about 0.2 percent to about 0.5 percent manganese;

(b) casting said aluminum alloy melt in a block casting apparatus to form a cast strip;

(c) hot rolling said cast strip to reduce the thickness of said cast strip by at least about 65 percent and form a hot rolled strip;

(d) annealing said hot rolled strip at a temperature of from about 720° F. to about 730° F. to form an annealed strip;

(e) cold rolling said annealed strip to further reduce said thickness and form a cold rolled strip;

(f) annealing said cold rolled strip at a temperature of from about 700° F. to about 800° F. to form a second annealed strip; and

(g) cold rolling said second annealed strip to further reduce said thickness.

5,469,913

VEHICLE USING HYDROGEN ABSORBING ALLOYS

Takaharu Gamou, Fujiidera; Noboru Taniguchi, Osaka; Junji Niikura, Hirakata; Kazuhito Hatoh, Daito; Eiichi Yasumoto, Katano, and Kinichi Adachi, Takarazuka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 13, 1993, Ser. No. 166,505
Claims priority, application Japan, Dec. 18, 1992, 4-338420
Int. Cl.[6] F25B *17/12*
U.S. Cl. 165—104.12 **10 Claims**

1. A vehicle using hydrogen absorbing alloys, comprising:

a plurality of hydrogen absorbing alloy storing vessels for independently storing a plurality of hydrogen absorbing alloys with a different hydrogen equilibrium decomposition pressure,

a connecting means for passing hydrogen to and fro among said plurality of hydrogen absorbing alloy storing vessels, and

a heating means for heating a low pressure hydrogen absorbing alloy which has the lowest hydrogen equilibrium decomposition pressure among said plurality of hydrogen absorbing alloys, using combustion heat of fuel of an internal combustion engine or an external combustion engine of said vehicle as a heat source,

wherein, when said heating means heats said low pressure hydrogen absorbing alloy so that hydrogen is desorbed from said low pressure hydrogen absorbing alloy and then is absorbed by a high pressure hydrogen absorbing alloy of said plurality of hydrogen absorbing alloys, said high pressure hydrogen absorbing alloy having a hydrogen equilibrium decomposition pressure higher than that of said low pressure hydrogen absorbing alloy, exothermic heat generated by absorption of hydrogen by said high pressure hydrogen absorbing alloy is utilized for heating the air in a passenger compartment or a component of said vehicle;

when hydrogen is desorbed from said high pressure hydrogen absorbing alloy, endothermic heat generated by desorption of hydrogen from said high pressure hydrogen absorbing alloy is utilized for cooling the air in said passenger compartment or said component of said vehicle;

when hydrogen is desorbed from said high pressure hydrogen absorbing alloy and then is absorbed by said low pressure hydrogen absorbing alloy, exothermic heat generated by absorption of hydrogen by said low pressure hydrogen absorbing alloy is utilized for heating the air in said passenger compartment or said component of said vehicle; and

said connecting means includes a hydrogen gas storing vessel and hydrogen flow adjusting valves, and said hydrogen gas storing vessel is arranged in parallel to at least one of said plurality of hydrogen absorbing alloy storing vessels.

2. A vehicle using hydrogen absorbing alloys, comprising:

at least three hydrogen absorbing alloy storing vessels for independently storing at least three hydrogen absorbing alloys with a different hydrogen equilibrium decomposition pressure,

a connecting means for passing hydrogen to and fro among said at least three hydrogen absorbing alloy storing vessels, said connecting means includes hydrogen flow adjusting valves, and

a heating means for heating a low pressure hydrogen absorbing alloy which has the lowest hydrogen equilibrium decomposition pressure among said at least three hydrogen absorbing alloys, using combustion heat of fuel of an internal combustion engine or an external combustion engine of said vehicle as a heat source,

wherein, when said heating means heats said low pressure hydrogen absorbing alloy so that hydrogen is desorbed from said low pressure hydrogen absorbing alloy and then is absorbed by a high pressure hydrogen absorbing alloy of said at least three hydrogen absorbing alloys, said high pressure hydrogen absorbing alloy having a hydrogen equilibrium decomposition pressure higher than that of said low pressure hydrogen absorbing alloy, exothermic heat generated by absorption of hydrogen by said high pressure hydrogen absorbing alloy is utilized for heating the air in a passenger compartment or a component of said vehicle;

when hydrogen is desorbed from said high pressure hydrogen absorbing alloy, endothermic heat generated by desorption of hydrogen from said high pressure hydrogen absorbing alloy is

utilized for cooling the air in said passenger compartment or said component of said vehicle; and

when hydrogen is desorbed from said high pressure hydrogen absorbing alloy and then is absorbed by said low pressure hydrogen absorbing alloy, exothermic heat generated by absorption of hydrogen by said low pressure hydrogen absorbing alloy is utilized for heating the air in said passenger compartment or said component of said vehicle.

5,469,914

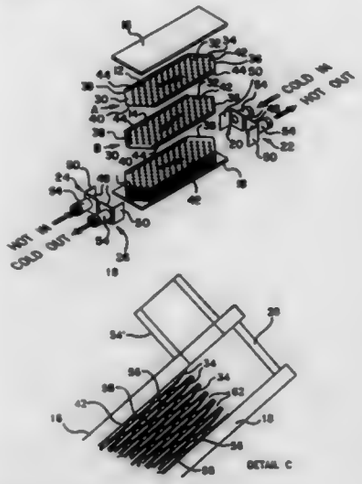
ALL-WELDED PLATE HEAT EXCHANGER

Roger C. Davison, and Achint P. Mathur, both of Wichita Falls, Tex., assignors to Tranter, Inc., Augusta, Ga.

Filed Jun. 14, 1993, Ser. No. 76,110

Int. Cl.[6] F28D *9/02*; F28F *3/08*

U.S. Cl. 165—166 **6 Claims**



1. A plate heat exchanger comprising:

a plurality of first plates and a plurality of second plates with said first plates interleaved with said second plates in an alternating stacked parallel relationship and with spaces between the plates,

first fluid passages for a first fluid in alternate spaces and second fluid passages for a second fluid in the remaining spaces,

said plates having parallel first and second side edges with the first side edges of the plates sealed together in superimposed registration and the second side edges of the plates sealed together in superimposed registration,

said plates having first and second ends with said first ends of said plates provided with first and second end edge portions intersecting to form a V and disposed respectively in superimposed registration and said second ends of said plates provided with first and second end edge portions intersecting to form a V and disposed respectively in superimposed registration, the V at each end of each said plate having an apex on the longitudinal centerline thereof,

said first and second end edge portions at one end of said first plates being diagonally opposed to said first and second end edge portions respectively at the other end thereof, said first and second end edge portions at one end of said second plates being diagonally opposed to said first and second end edge portions respectively at the other end thereof,

the diagonally opposed first end edge portions at opposite ends of said first plates being inclined away from the plane of said first plates and sealed to said second plates to block said second passages, and provide enlarged first fluid inlets and outlets for said first passages which results in lowering of pressure drop,

the diagonally opposed second end edge portions at opposite ends of said second plates being inclined away from the plane of said second plates and sealed to said first plates to block said first passages, and provide enlarged second fluid inlets and outlets for said second passages which results in lowering of pressure drop,

a top panel,

a bottom panel,

said stack of plates being sandwiched between said top and bottom panels,

said panels being generally rectangular having four corners and having side edges registering with the side edges of said plates and end edges registering with the apices of the V at the ends of said plates,

four end caps cooperating with said top and bottom panels and said plates to form four separate manifolds for fluid entering and exiting said first fluid passages through said first fluid inlets and outlets thereof and for fluid entering and exiting said second fluid passages through said second fluid inlets and outlets thereof,

said four end caps being located between said panels and at the four corners respectively of said panels and each being generally L-shaped having side legs which extend along the side edges of said top and bottom panels in contact therewith from one of said corners to and in contact with the side edges of said plates and end legs extending along the end edges of said top and bottom panels in contact therewith from one of said corners to and in contact with the apices of the V at the ends of said plates, whereby said end caps and panels provide a rectangular enclosure for said plates,

and fittings for the flow of fluid into and out of said respective manifolds.

5,469,915

PANEL HEAT EXCHANGER FORMED FROM TUBES AND SHEETS

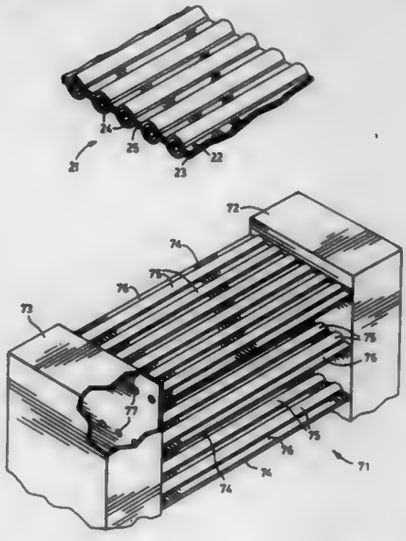
Anthony J. Cesaroni, 9 Heathmore Ct., Unionville, Ontario, Canada, assignor to Anthony J. Cesaroni, Unionville, Canada

Filed May 19, 1993, Ser. No. 70,721

Claims priority, application United Kingdom, May 29, 1992, 9211413

Int. Cl.[6] F28F *1/32;3/00*

U.S. Cl. 165—171 **7 Claims**



1. A panel heat exchanger consisting essentially at least two panels in a laminar stacked relationship, each panel comprising a plurality of parallel tubes in a spaced apart side-by-side relationship, said tubes being located between two plastic sheets that envelope and conform to the shape of the tubes so as to maintain said tubes in the side-by-side relationship, said sheets being bonded together between said tubes; wherein the distance mea-

sured from the inner surface of a tube to the outer surface of one of the plastic sheets enveloping said tube is less than 0.7 mm; and

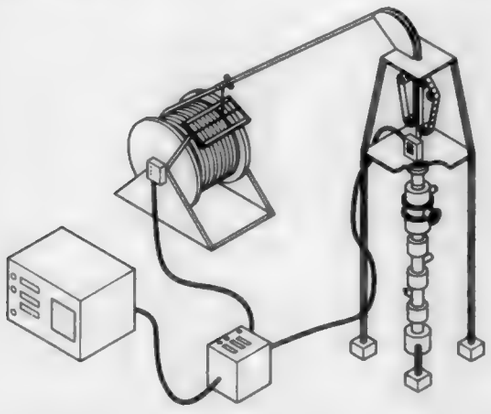
each of said plurality of tubes being bonded at opposing ends thereof to inlet and outlet manifolds such that one end of each of said plurality of tubes is in fluid flow communication with an inlet manifold and the other end of each of said plurality of tubes is in fluid flow communication with an outlet manifold; the inlet manifolds and outlet manifolds of each of the panels being aligned and sealed together in a fluid tight manner so as to provide inlets and outlets for the panel heat exchanger, respectively.

5,469,916

SYSTEM FOR DEPTH MEASUREMENT IN A WELLBORE USING COMPOSITE COILED TUBING

Alex Sas-Jaworsky, Houston, and Jerry G. Williams, Ponca City, both of Tex., assignors to Conoco Inc., Ponca City, Okla.

Filed Mar. 17, 1994, Ser. No. 214,720
Int. Cl.[6] E21B *47/04;47/09*
U.S. Cl. 166—64 **17 Claims**



1. A system for determining the position and depth of downhole equipment in a wellbore including an elongate spoolable composite coiled tubing for running said downhole equipment into said wellbore comprising:

a composite coiled tubing string having multiple adjacent layers of fibers arranged in a generally cylindrical shape, wherein each layer has a plurality of fibers arranged in at least one predetermined orientation to form a composite coiled tubing string having sufficient strength to be pushed into and pulled and out of the borehole;

a plurality of detectable indicia overlaying at least one of said layers of fibers and integral to said composite coiled tubing string and spaced apart along the length of said composite coiled tubing string;

a resin uniformly distributed throughout all the fiber layers and consolidated to form a matrix for fixing all the multiple layers of fibers and the detectable indicia together in their predetermined orientation;

means for detecting the presence of said indicia in said composite coiled tubing string as the tubing is raised and lowered in the wellbore;

means for determining said composite coiled tubing behavior in relation to load; and

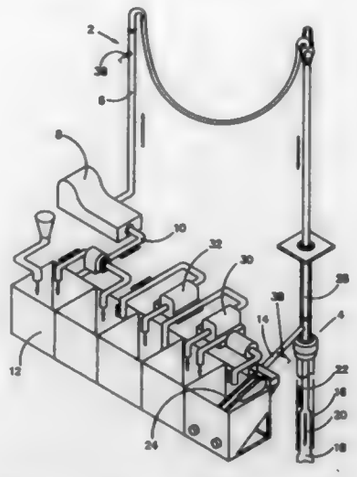
means for spooling and unspooling said composite coiled tubing string and said downhole equipment from the surface into and out of the wellbore.

5,469,917

USE OF CAPILLARY-MEMBRANE SAMPLING DEVICE TO MONITOR OIL-DRILLING MUDS

Duane K. Wolcott, 3406 Morning Glory Dr., Baton Rouge, La. 70808

Filed Dec. 14, 1994, Ser. No. 355,493
Int. Cl.[6] E21B *47/00*
U.S. Cl. 166—250.01 **7 Claims**



1. A method for monitoring oil-drilling mud, which comprises the steps of:

(a) providing a device comprising a support member, a capillary membrane permeable to hydrocarbons, and flights on the surface of the support member within which the capillary member is supported;

(b) disposing the device in a stream returning mud from a drill hole to the surface of an oil well;

(c) passing a stream of inert gas through the capillary membrane, thereby entraining hydrocarbon vapors in the gas stream; and

(d) inputting the gas stream containing the entrained hydrocarbon vapors to an analytical instrument capable of identifying and quantitatively determining the concentrations of the hydrocarbons.

5,469,918

POSITIVE DISPLACEMENT DEVICE TO IMPROVE PLACEMENT OF CEMENT PLUGS

John P. Haberman, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Sep. 16, 1994, Ser. No. 307,131
Int. Cl.[6] E21B *33/13*
U.S. Cl. 166—291 **4 Claims**

1. A method for improved placement of cement plugs in wellbores comprising the steps of:

providing a bridge plug having a bridge plug retainer means removably mounted thereon;

providing movable cement slurry containment means containing a cement slurry;

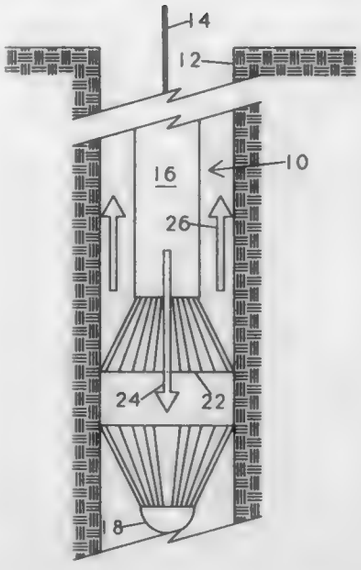
providing releasable sealing means temporarily holding said bridge plug to said cement slurry containment means;

positioning said bridge plug at a depth below where placement of a cement plug is intended in the wellbore;

releasing said bridge plug retainer means;

releasing said sealing means between said bridge plug and said cement slurry containment means; and

withdrawing said cement slurry containment means and said released sealing means upwardly and creating a piston-like action between said released sealing means and the wall of the wellbore to positively displace fluid in the wellbore as cement



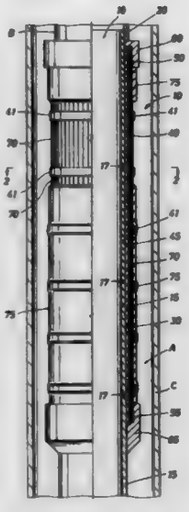
slurry flows downwardly from said cement slurry containment means against said bridge plug.

5,469,919

PROGRAMMED SHAPE INFLATABLE PACKER DEVICE AND METHOD

James V. Carisella, P.O. Box 10498, New Orleans, La. 70181

Filed Dec. 30, 1993, Ser. No. 175,974
Int. Cl.[6] E21B 33/127
U.S. Cl. 166—387 2 Claims



1. An inflatable packer device for use in a subterranean well bore having a wall and carryable into said well bore on a conduit, said inflatable packer device being inflatable by pressured fluid communicated to the packer from a source of pressured fluid, said inflatable packer device comprising:

(a) a body having means on its upper end for selective engagement to said conduit, said body further having an exterior surface;

(b) an inflatable elastomeric bladder concentrically disposed around said body, said bladder having an interior, the bladder further having a first bladder end and a second bladder end, the bladder further being selectively movable between deflated and inflated positions, the bladder further having a largest circumference and a smallest circumference at any given time;

(c) first securing means engageable with one of said bladder ends for sealably securing said bladder end to said body;

(d) second securing means engageable with the other of said bladder ends for sealably securing said other bladder end to said body, at least one of said first and second securing means enabling at least one of said bladder ends to slidably move relative to said body during inflation of said bladder;

(e) fluid transmission means for communicating said pressured fluid between the source of pressured fluid and the interior of bladder to move the bladder between each of deflated and inflated positions, whereby the inflatable packer device may be moved into one of sealing and unsealing relationship with said wall of said well bore; and

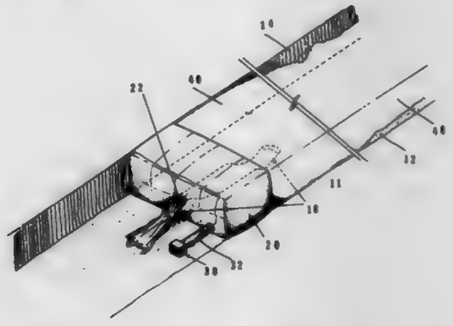
(f) a series of shape-controlling means disposed along the length of said bladder for causing substantially uniform, axial inflation of said bladder whereby the ratio of the largest circumference of the bladder to the smallest circumference of the bladder during inflation is reduced and prevented from exceeding a pre-determined maximum ratio, wherein said series of shape-controlling means comprise a plurality of circumferential limiters concentrically disposed around the exterior of said bladder, said limiters having a circumference larger than the circumference of said bladder in its uninflated position but less than the circumference of the well bore, wherein said limiters will break at a pre-determined tensile force caused by the inflation of said bladder after the entire bladder has been inflated to at least the circumference of said limiters.

5,469,920

INFLATABLE PARTITION FOR FIGHTING MINE FIRES

Ronald S. Conti, and Charles P. Lazzara, both of Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 8, 1993, Ser. No. 148,310
Int. Cl.[6] A62C 3/02
U.S. Cl. 169—48 5 Claims



1. A portable air-inflatable seal for isolating a fire in an underground passageway for passage of high expansion foam at a pressure generated by a foam generator from one side of the seal to another side of the seal, said seal comprising:

an air-inflatable rectangular bag fabricated of water- and heat-resistant material having an aperture for passage of the high expansion foam from one side of the bag to another side of the bag, said aperture comprising a cylindrical, collapsible fabric-lined passageway;

means for inflating the bag with air at a pressure for sealing the underground passageway and for collapsing the aperture closed; and

a collapsible feed tube passing through the aperture for conducting the high expansion foam from the foam generator through the seal when the foam pressure is greater than the air pressure;

wherein said air pressure collapses both the aperture closed and the feed tube closed when the foam is not being generated.

5,469,921

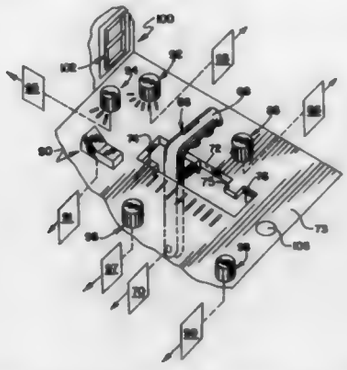
HITCH ASSEMBLY CONTROL SYSTEM

Abraham Orbech, Naperville; Dale W. Panoushek, Lemont, and William L. Schubert, Downers Grove, all of Ill., assignors to Case Corporation, Racine, Wis.

Continuation of Ser. No. 118,450, Sep. 8, 1993, Pat. No. 5,421,416. This application Feb. 13, 1995, Ser. No. 388,153

Int. Cl.[6] A01B *63/112*

U.S. Cl. 172—4 **11 Claims**



1. A control system for controlling elevation of a hitch assembly adapted to be coupled to an implement, the hitch assembly including an actuator for moving the hitch assembly through a range of positions between an extreme lower position and an extreme upper position in response to control signals, the control system comprising:

a first sensor assembly for sensing a draft force;

a second sensor assembly for sensing the actual position of the hitch assembly;

a central processing unit coupled to the first and second sensor assemblies for the determination of first and second error values and the generation of control signals based upon the error values, the first error value representing the difference between the sensed draft force value and a reference draft force value and the second error value representing the difference between the sensed position value and a reference position value; and

means for setting by an operator of limits for the first and second error values.

5,469,922

SOIL AERATOR

Scott W. Bjorge, 404 Adams Ave., Owatonna, Minn. 55060

Filed Aug. 23, 1993, Ser. No. 110,215

Int. Cl.[6] A01B *45/02*

U.S. Cl. 172—22 **15 Claims**

1. A soil aerator for pulling behind a vehicle comprising:

a frame;

a hitch connected to mid frame;

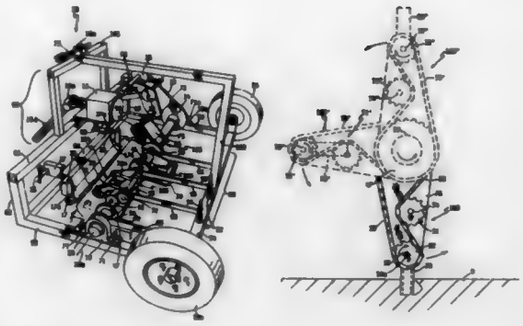
a drive shaft rotatably mounted on said frame;

drive means for rotating said drive shaft;

a plurality of aeration members located on said drive shaft, each of said plurality of members having a first end with a housing journaled around said drive shaft, each of said plurality of members having a second end having a further shaft rotatably mounted therein;

a first sprocket wheel mounted on said further shaft for rotating said further shaft;

a soil aeration tube mounted on said further shaft, said soil aeration tube rotatable with said further shaft;



a second sprocket wheel, said second sprocket wheel journaled around said drive shaft;

a timing bar connected to mid second sprocket wheel for setting an angle of entrance for the soil aeration tube, said timing bar restraining said second sprocket wheel from rotation thereabout by said frame;

a drive chain connected to said first sprocket wheel and said second sprocket wheel so that rotation of said member with said shaft causes the first sprocket wheel to rotate said aeration tube causing the aeration robe to periodically penetrate the soil.

5,469,923

DEVICE FOR EXTRACTING A PLANT FROM THE GROUND

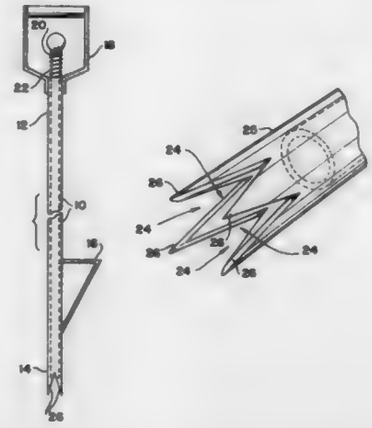
Alexis W. Visser, Sunninghill, South Africa, assignor to Desmond Kleineibst, Transvaal, South Africa

Filed Dec. 30, 1993, Ser. No. 175,574

Claims priority, application South Africa, Dec. 30, 1992, 92/10090; Jun. 24, 1993, 93/4537

Int. Cl.[6] A01B *45/02;* **A01C** *11/02*

U.S. Cl. 172—22 **6 Claims**



1. A device for extracting a plant from the ground, comprising:

at least two opposed prongs, each prong tapering operatively downwardly, the tapered prongs being shaped and configured with respect to one another to, in use, pierce the ground and grip a plug of earth in which the plant is located between the tapered prongs; and

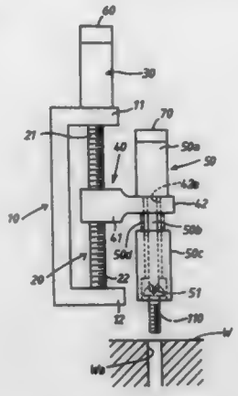
handle means for moving the tapered prongs relative to the ground;

wherein the tapered prongs are defined by a rigid tube which is substantially .square in cross-section and has an inverted "V"-shaped cut-out formed in each side of the tube at an end thereof thereby defining a tapered prong at each corner of the tube.

5,469,924
SCREW TIGHTENING APPARATUS

Junichiro Kanamori, and Masafumi Matsumura, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 13, 1994, Ser. No. 181,079
Claims priority, application Japan, Jan. 13, 1993, 5-004037; Jan. 13, 1993, 5-004051
Int. Cl.[6] B23Q 5/00; E21C 5/00
U.S. Cl. 173—176 **5 Claims**



1. A screw tightening apparatus of the type including an electric screwdriver the bit shaft of which is arranged to carry a male screw engaged therewith to be threaded into a mounting hole of a workpiece and a drive mechanism arranged to move the screwdriver toward and away from the mounting hole of the workpiece and to apply a thrust force to the bit shaft of the screwdriver,

wherein an electric control system for the screw tightening apparatus comprises:

first control means for controlling operation of the screwdriver and drive mechanism in such a manner that the bit shaft is driven at a low speed and applied with a small thrust force at an initial stage during which the male screw is located to be brought into engagement with the mounting hole of the workpiece;

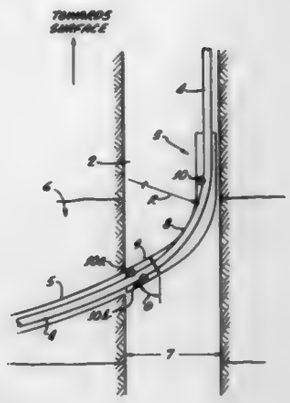
second control means for controlling operation of the screwdriver and drive mechanism in such a manner that the bit shaft is driven at a higher speed than that at the initial stage and applied with a larger thrust force than that at the initial stage at an interim stage during which the male screw is threaded into the mounting hole of the workpiece; and

third control means for controlling operation of the screwdriver and drive mechanism in such a manner that the bit shaft is driven at a lower speed than that at the initial stage and applied with a larger thrust force than that at the interim stage at a final stage during which the male screw is tightened and seated on the workpiece.

5,469,925
DOWNHOLE TUBE TURNING TOOL

Mark D. Mueller, and John C. McClellan, both of Bakersfield, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 6, 1993, Ser. No. 132,477
Int. Cl.[6] E21B 7/08
U.S. Cl. 175—61 **23 Claims**



13. A process for drilling an underground well having at least one lateral cavity portion outwardly extending from a substantially cylindrical borehole portion which penetrates an underground formation, said process using coilable tubing having a nominal outside diameter and comprising the steps of:

rotatively drilling said borehole portion having a nominal inside diameter less than about 12 times the nominal outside diameter of said tubing;

inserting a rigid bent pipe assembly into said borehole;

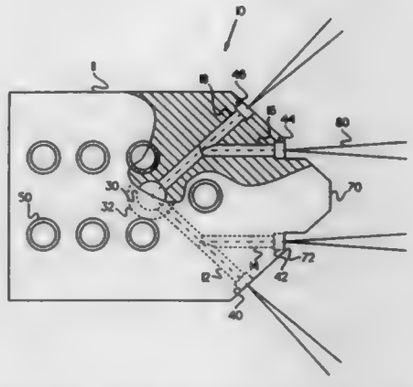
fixing an underground location of said rigid bent pipe assembly within said borehole; and

running said coilable tubing through said rigid bent pipe assembly in said fixed location so as to deform a portion of said tubing in a direction having a component radially outward from said borehole portion and then straightening the portion of said tubing, said running step being in the absence of steps to pressurize said tubing to greater than 341 atmospheres and in the absence of a tubing deforming step using an articulated tube bending device.

5,469,926
DIRECTIONAL BORING DRILL BIT BLADE

Willie J. Lessard, Forest Lake, Minn., assignor to Ber-mac, Inc., Lino Lakes, Minn.

Filed Apr. 22, 1994, Ser. No. 231,237
Int. Cl.[6] E21B 10/60
U.S. Cl. 175—424 **17 Claims**



1. A directional boring drill bit blade for mounting onto a boring tool wherein the boring tool provides fluid, wherein the directional boring drill bit blade comprises:

(a) a directional earth boring drill bit blade body including a forward blade end having a substantially rectangular cross section and having a cutting edge; and

(b) at least one fluid conduit through said directional earth boring drill bit blade body, said at least one fluid conduit having one end at the cutting edge and providing fluid for steering the boring tool.

5,469,927

CUTTING ELEMENTS FOR ROTARY DRILL BITS

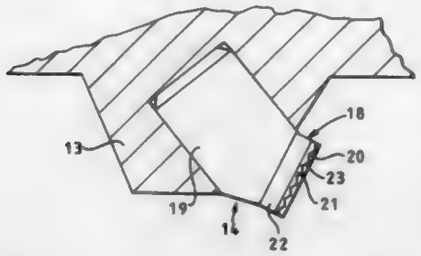
Nigel D. Griffin, Whitminster, England, assignor to Camco International Inc., Houston, Tex.

Filed Dec. 7, 1993, Ser. No. 163,344

Claims priority, application United Kingdom, Dec. 10, 1992, 9225779

Int. Cl.[6] E21B 10/46

U.S. Cl. 175—432 12 Claims



1. A preform cutting element comprising a thin cutting table of superhard material, a substrate of material which is less hard than the superhard material, and at least one transition layer between the cutting table and substrate, the cutting table, transition layer and substrate having been bonded together in a high pressure temperature press, the transition layer varying in thickness across the cutting element in a manner to provide a plurality of projections on the transition layer which project into the material of the cutting table and provide a configured non-planar interface between the cutting table and the transition layer.

5,469,928

ASSISTED STEERING SYSTEM FOR NON-TRACKBOUND VECHILE

Uwe Adler, Schweinfurt; Hans-Jürgen Drexl, Schonungen/Mgb.; Dieter Lutz, Schweinfurt; Franz Nagler, Ottendorf; Martin Ochs; Stefan Schiebold, both of Schweinfurt; Hans-Jpachim Schmidt-Brücken, Goldersheim; Wolfgang Thieler, Haßfurt; Michael Wagner, Niederwerrn; Holger Westendorf, Hambach; Rainer Wychnanek, Madenhausen, and Manfred Röder, Schwebheim, all of, Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Germany

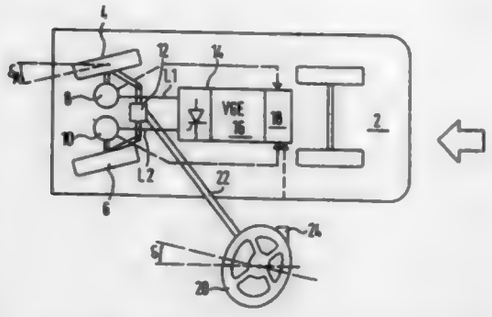
PCT No. PCT/DE92/00859, § 371 Date Jun. 20, 1994, § 102(e) Date Jun. 20, 1994, PCT Pub. No. WO93/08063, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 6, 1992, Ser. No. 211,847

Claims priority, application Germany, Jan. 6, 1991, 41 34 240.2

Int. Cl.[6] B62D 11/04

U.S. Cl. 180—6.28 6 Claims



1. A vehicle comprising:

at least two pairs of wheels having a left and right wheel, at least one of said pairs of wheels being coupled to a steering wheel manipulable into a steering angle for turning the vehicle:

a plurality of electric drive motors, each respective drive motor being operable to independently drive a corresponding one of said wheels such that during a turn one of said drive motors is associated with an inner wheel and another of said drive motors is associated with an outer wheel; and

steering assisted means for controlling said drive motors in accordance with steering wheel angle, said steering assisting means operating the drive motor associated with the outer wheel at a higher torque than the drive motor associated with the inner wheel to achieve a percentage wheel speed differential between said inner and outer wheels, wherein said drive motors are adjusted at lower vehicle speeds to achieve percentage wheel speed differentials in accordance with a predetermined linear relationship between steering wheel angle and percentage wheel speed differential and at higher vehicle speeds to achieve percentage wheel speed differentials which are increasingly smaller with increasing speed.

5,469,929

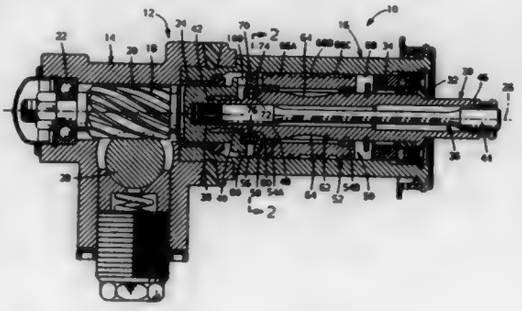
MOTOR VEHICLE POWER STEERING GEAR

Tony M. Dadak, Birch Run, and John L. Roberts, Frankenmuth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 3, 1995, Ser. No. 415,805

Int. Cl.[6] B62D 5/083

U.S. Cl. 180—149 4 Claims



1. A power steering gear for a motor vehicle including

a tubular spool shaft connected to a manual steering wheel of said motor vehicle for rotation therewith about a centerline of said steering gear,

a pinion head connected to a steered wheel of said motor vehicle and rotatable independently of said spool shaft about said centerline of said steering gear, and

a torsion bar inside said spool shaft having a first end rigidly connected to said pinion head and a second end rigidly connected to said spool shaft biasing said spool shaft to an on-center position relative to said pinion head,

characterized in that said steering gear includes a preload centering apparatus comprising:

a drive pin means rigidly connected to said spool shaft,

a C-shaped spring disposed around said spool shaft having a first resilient jaw and a second resilient jaw cooperating in clamping said drive pin means therebetween with a resilient preload on said drive pin means, and

an abutment means on said pinion head resiliently clamped between said first and said second jaws of said C-shaped spring with said resilient preload in said on-center relative position of said spool shaft including a first radial cantilever spring bearing against said first jaw and a second radial cantilever spring bearing against said second jaw and a radial reinforcement between said first and said second jaws separated from each by a span dimension calculated to limit flexure of said first and said second cantilever springs by engagement thereof-on said reinforcement during angular excursions of said spool shaft from said relative on-center position,

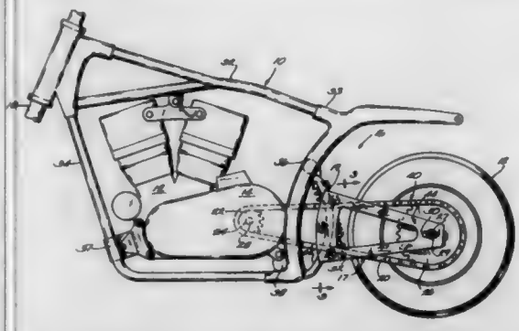
each of said first and said second radial cantilever springs flexing upon an engagement with the corresponding one of said first and said second jaws of said C-shaped spring during forced oscillation of said pinion head through said on-center relative position of said spool shaft for cushioning said engagement and minimizing audible noise attributable to said engagement.

5,469,930

MOTORCYCLE REAR WHEEL SUSPENSION

Paul C. Wiers, Milwaukee, Wis., assignor to Harley-Davidson, Inc., Milwaukee, Wis.

Filed Jun. 17, 1994, Ser. No. 261,683
Int. Cl.[6] B62K *25/04*; **B62D** *61/02*
U.S. Cl. 180—227 **17 Claims**



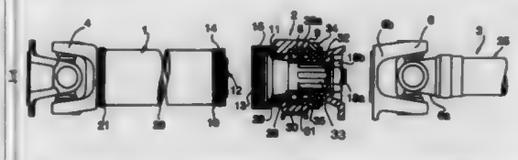
1. The combination of, a motorcycle frame, an engine and a transmission mounted on the frame, a rear wheel suspension mounted on the frame and including rear wheel support means for rotatably supporting a rear wheel, a rear wheel mounted on said rear wheel support means for rotation about a first rotation axis, first sprocket means mounted on the wheel for rotation about the first rotation axis, second sprocket means coupled to said transmission for rotation about a second rotation axis, belt means coupling said first and second sprocket means, mounting means mounted on said frame for supporting said rear wheel support means for movement in an arcuate path displaced from said second rotation axis and having a center of curvature coincident with said second rotation axis so that the distance between said first and second rotation axes remains substantially constant as said mounting means moves in said arcuate path during operation of said motorcycle, said rear wheel support means being wholly positioned on said mounting means in a spaced. apart relation from said first rotation axis.

5,469,931

PROPELLER SHAFT ARRANGEMENT

Yutaka Kawata, Ebina; Yoichi Ebe, Tokyo; Harumichi Hino, and Hidenobu Kawai, both of Shizuoka, all of, Japan, assignors to Jidosha Buhin Kogyo Co., Ltd., Kanagwa, Japan

Filed Nov. 29, 1993, Ser. No. 159,091
Claims priority, application Japan, Nov. 30, 1992, 4-320730
Int. Cl.[6] B60K *17/22;17/24*; **F16D** *1/033*
U.S. Cl. 180—379 **13 Claims**



1. A propeller shaft arrangement connecting a transmission with a differential gear of a vehicle, comprising:

a first propeller shaft segment connected to the transmission, the first propeller shaft segment being made of aluminum material;

a second propeller shaft segment connected to the differential gear, the second propeller shaft segment being made of aluminum material;

a shaft made of steel and drivingly connected between the first propeller shaft segment and the second propeller shaft segment; and

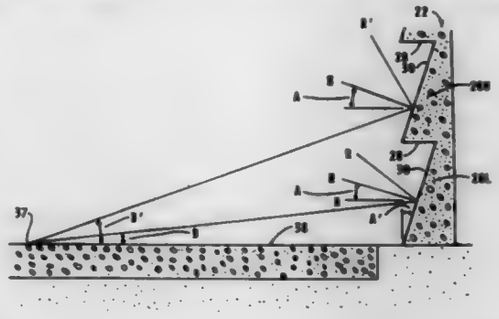
ball bearing means mounted on a vehicle frame for rotatably supporting the steel shaft.

5,469,932

SOUND BARRIER WITH OBLIQUE SURFACES

Edward P. McNair, 59 Chimney Ridge Dr., Morristown, N.J. 07960

Filed Jun. 9, 1994, Ser. No. 257,367
Int. Cl.[6] E04H *17/00*
U.S. Cl. 181—210 **14 Claims**



1. A sound barrier installed alongside a highway, said highway having a road surface, said barrier comprised of at least one partition and a means for supporting said partition, said partition being comprised of:

(a) at least one generally vertical imperforate wall;

(b) a plurality of wedge shaped protrusions, said wedge shaped protrusions, at least in part, covering a side of said wall, said side fronting said road surface;

(c) each said wedge shaped protrusion having at least one face inclined to a vertical;

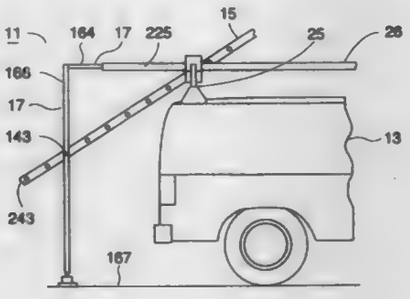
(d) a plurality of said faces positioned so that a normal from each said face forms an angle above a horizontal, said faces being in the path of sound rays originating from said surface.

5,469,933

VEHICLE MOUNTED LADDER

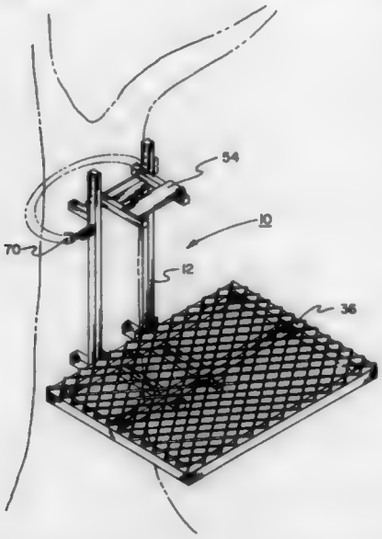
John Thomason, P.O. Box 1641, 600 E. Sandy Lake Rd., Ste. 120, Coppell, Tex. 75019

Filed Sep. 1, 1994, Ser. No. 299,747
Int. Cl.[6] E06C *5/00*
U.S. Cl. 182—127 **16 Claims**



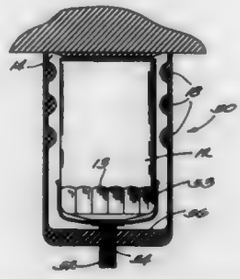
1. A vehicle mounted ladder apparatus, comprising:
mounting brackets adapted to be secured to a roof of a vehicle;
two elongated tubes mounted in said mounting brackets extending parallel to each other to be located lengthwise along the roof of the vehicle;
two elongated supports, each support being removably located in a respective elongated tube, each support having front and rear sections that are pivotally coupled together;
a ladder to be removably mounted on said mounting brackets between said elongated supports, said ladder having an engaging end and a portion spaced from said engaging end, pivotally coupled to said rear sections of said supports, said supports and ladder cooperatively having a storage position and an operating position, where said supports and said ladder slidably extend between said storage position and said operating position;
in said storage position said supports are located substantially within said elongated tubes with said front and rear sections extending in said tubes, and said ladder is located on said mounting brackets extending lengthwise over the roof of the vehicle;
in said operating position said supports are located substantially out of said elongated tubes rearward of said vehicle, said rear section of each support extending from its respective tube rearward of said vehicle, said rear section of each support extending transverse to its respective front section and having a support end supported by the ground spaced rearward of the vehicle to allow said ladder to be located upwardly with said engaging end supported against a structure of interest.

5,469,934
FULLY-ADJUSTABLE TREE STAND
Calvin L. Pherigo, 712 E. 10th St., N. Newton, Iowa 50208-2204
Filed Sep. 29, 1994, Ser. No. 315,871
Int. Cl.[6] A01M *31/02*
U.S. Cl. 182—187 **1 Claim**



1. A new and improved fully-adjustable tree stand for adjustably attaching to the trunk of a tree to support a hunter comprising, in combination:
a rectangular bracket having two vertically extending support bars, each of the two support bars having a first end and a second end, four horizontally extending legs secured to a back portion of the rectangular bracket downward of the each first end and to a back portion of each second end, each first end having a plurality of apertures formed through a side portion thereof, the plurality of apertures of each first end aligning with the other, a metal securement clasp secured to the side portion of each of the two support bars downward of the plurality of apertures thereof, an upper horizontal support bar secured to the two vertically extending support bars downward of the plurality of apertures, an upwardly vertical extension secured to a midpoint of the upper horizontal support bar, each second end having an aperture formed through a side portion thereof, a lower horizontal support bar secured to each second end of the two vertically extending support bars downward of the aperture, the lower horizontal support bar having a downwardly vertical extension secured to a midpoint thereof;
a large lower platform having an upper surface and a lower surface, the upper surface having mesh surface theresecured, a support bracket secured to the lower surface, the support bracket having two end portions extending outwardly therefrom, the two end portions having an aperture formed therethrough, the support bracket having a lower plate secured to a lower surface thereof, the lower plate having an adjustment means theresecured, the aperture formed through the two end portions corresponding with the aperture formed in each second end of the rectangular bracket, a metal rod with locking pin coupling the large lower platform to the rectangular bracket through the corresponding apertures thereof, the adjustment means corresponding with the downwardly vertical extension, the adjustment means serving to compensate for the angle at which trees lean;
a small upper platform having an upper surface and a lower surface, a support bracket secured to the lower portion, the support bracket having two end portions extending outwardly therefrom, the end portions having an aperture formed therethrough, the support bracket having a lower plate secured to a lower surface thereof, the lower plate having an adjustment means theresecured, the aperture formed through the two end portions corresponding with two of the aligning plurality of apertures formed in each first end of the rectangular bracket, a metal rod with locking pin adjustably coupling the small upper platform to the rectangular bracket through the corresponding apertures thereof, the adjustment means corresponding with the upwardly vertical extension;
a chain having two end portions, the chain serving to wrap around the tree with the two end portions secured to the metal securement clasps secured to the side portion of each of the two support bars of the rectangular bracket.

5,469,935
OIL FILTER REMOVAL AID
Monte P. Hewuse, Box 62, 2085 Highway 80, Babcock, Wis. 54413
Filed Sep. 1, 1994, Ser. No. 299,455
Int. Cl.[6] F16C *3/14*
U.S. Cl. 184—1.5 **5 Claims**



1. A device for preventing leakage and spillage of fluids from a canister type oil filter during removal thereof from an engine comprising an annular elastomeric sleeve having an upper end and a lower end,
said upper end having an opening adapted to fit over the exterior of an oil filter,
the lower end of said sleeve having an opening of lesser diameter than that of the upper end, and having smooth contours said opening in the lower end of said sleeve being of a

diameter adapted to fit tightly over a stem of a socket type filter removal wrench, said wrench having an axially oriented stem and an angular socket, adapted to matingly engage an angular end of said canister type filter, said socket being attached to said stem,

a plurality of protrusions extending inwardly from the inner surface of said shape positioned circumferentially around said shape and located between the upper and lower ends thereof.

5,469,936

SUPPORT DEVICE FOR AN ITEM OF RETRACTABLE STREET FURNITURE HAVING ELECTRICAL ACTUATION

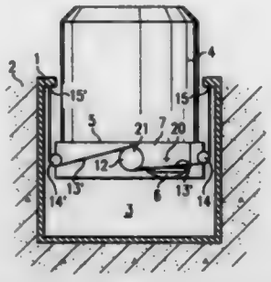
Olivier Lauga, Lôhlssemant de Condol, 8A800 Grazac; Nicolas Revol, 39 rue de Joscou, 75008 Paris, and Lionel Murou, 6 Place de Belo, Jassongy 74140, all of, France

Filed Jun. 3, 1994, Ser. No. 253,852

Claims priority, application France, Jun. 4, 1993, 93 06720

Int. Cl.[6] B66F 7/02

U.S. Cl. 187—205 **7 Claims**



1. A device for supporting an item of retractable street furniture having electrical actuation, the device being of the type comprising:

a stationary box installed in the ground;

moving equipment housed in the box and including a top support plate for supporting the item of street furniture, said equipment being movable between a high position in which said item of street furniture emerges from the box above the level of the ground, and a low position in which the item of street furniture is retracted into the box so that a top portion thereof does not project above ground level;

an electrical motor and gear box unit; and

a transmission for converting a rotary motion of the motor and gear box unit into translation motion of the moving equipment between its high position and its low position;

wherein the motor and gear box unit and the transmission form a reversible assembly so that in the absence of power being fed to the motor and in the absence of braking or locking being applied from outside said assembly, the moving equipment moves back on its own to its low position under gravity.

5,469,937

TRACTION SHEAVE ELEVATOR WITH DRIVE MACHINE BELOW

Harri Hakala, Hyvinkää, and Esko Aulanko, Kerava, both of, Finland, assignors to Kone Oy, Helsinki, Finland

Filed Jun. 23, 1994, Ser. No. 264,340

Claims priority, application Finland, Jun. 28, 1993, 932975

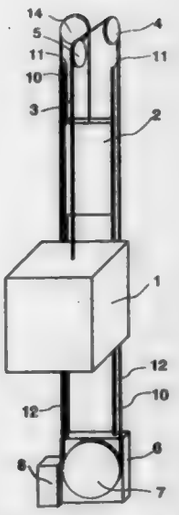
Int. Cl.[6] B66B 11/04

U.S. Cl. 187—266 **16 Claims**

1. A traction sheave elevator with drive machine below, comprising:

an elevator car moving along elevator guide rails in an elevator shaft;

a counterweight moving along counterweight guide rails, the counterweight being movable along a counterweight path;



a set of hoisting ropes on which the elevator car and the counterweight are suspended; and

a drive machine unit located in a bottom part of the elevator shaft, the drive machine unit comprising a traction sheave and means for driving the traction sheave, the traction sheave engaging the hoisting ropes, the drive machine unit being placed below the counterweight path, the drive machine unit in a thicknesswise direction of the counterweight being placed substantially inside a shaft space extension required by the counterweight on the path thereof including a safety distance for the counterweight.

5,469,938

GUIDE ARRANGEMENT FOR ELEVATORS

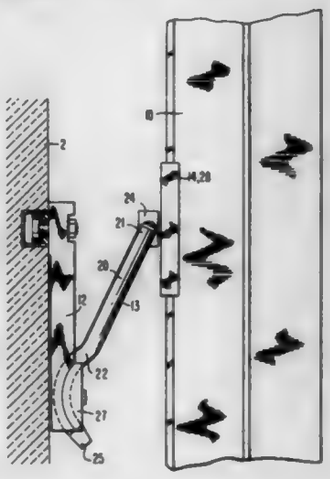
Joachim Biewald, Winnenden/Degenhof; Volker Scheub, Waiblingen; Helge Holler, Pforzheim; Karl Fenkl, Stuttgart; Stefan Hugel, Schwaikheim; Martin Grosser, Böblingen; Peter Schneider, Ditzingen; Wolfgang Barth, Bietigheim-Bissingen; Hermann Moll, Weissach im Tal, and Horst Pollmann, Weil der Stadt, all of, Germany, assignors to C. Haushahn GmbH & Co., Stuttgart, Germany

Filed Feb. 2, 1994, Ser. No. 190,879

Claims priority, application Germany, Feb. 15, 1993, 9302119 U

Int. Cl.[6] B66B 7/02

U.S. Cl. 187—408 **19 Claims**



1. A guide arrangement for elevators, particularly for vertical elevators, the guide arrangement being arranged in a shaft having a

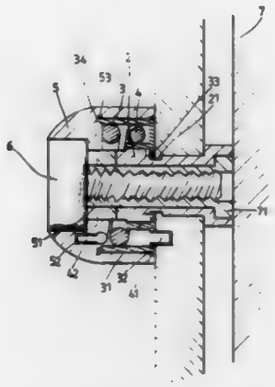
shaft wall, the guide arrangement comprising a self-contained inherently stiff rail frame, the rail frame comprising at least two parallel guide rails which are rigidly connected to each other, further comprising fastening members for connecting the rail frame to the shaft wall, wherein the fastening members comprise springs.

5,469,939

ELASTIC SEAT OF BICYCLE BRAKE DEVICE

The-Min Chen, P.O. Box 1750, Taichung, Taiwan, Prov. of China

Filed Sep. 13, 1994, Ser. No. 305,383
Int. Cl.[6] B62L *3/00*
U.S. Cl. 188—24.21 **2 Claims**



1. An elastic seat of a bicycle brake device comprising:

a shaft sleeve rotatably mounted on a brake seat fastened at one end thereof with a fork of a bicycle, said shaft sleeve further fastened with a brake arm;

a bushing provided with a locating hole and an axial hole dimensioned to receive therein said shaft sleeve;

a torsion spring disposed in said bushing such that said torsion spring is fitted over said shaft sleeve, and that one end of said torsion spring is located in said locating hole of said bushing;

an adjustment cap fitted over said bushing and provided with an axial hole and a locating hole in which another end of said torsion spring is located; and

a fastening means engageable with a threaded hole of said brake seat for fastening together said adjustment cap, torsion spring, said bushing and said shaft sleeve on said brake seat;

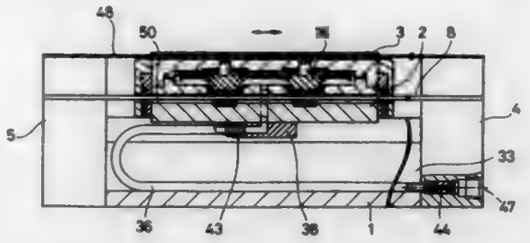
wherein said shaft sleeve is provided with a retaining slot; wherein said axial hole of said bushing has one end which is provided with a retaining projection engageable with said retaining slot of said shaft sleeve for holding said bushing and said shaft sleeve together securely; wherein said axial hole of said bushing has another end which is provided with a protruded ring; and wherein said adjustment cap is provided therein with a retaining recess corresponding in location to and engageable with said protruded ring of said axial hole of said bushings for holding said bushing and said adjustment cap together securely.

5,469,940

RODLESS CYLINDER UNIT WITH BRAKE

Hitoshi Yamamoto; Kunihisa Kaneko; Masayuki Watanabe, and Akio Kami, all of Yawara, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed Jan. 22, 1993, Ser. No. 7,596
Claims priority, application Japan, Jan. 23, 1992, 4-006553 U; Sep. 3, 1992, 4-067541 U
Int. Cl.[6] F01B *29/00*
U.S. Cl. 188—67 **7 Claims**



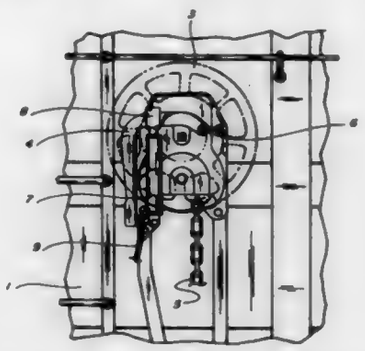
1. A rodless cylinder unit comprising an elongated cylinder tube having a first end and a second end, a table slidably supported by the cylinder tube for longitudinal movement, at least one brake band extending longitudinally of the cylinder tube and affixed adjacent the ends of the cylinder tube, pneumatic brake means carried by the table and operable to selectively engage the brake band and disengage from the brake band, the brake means being operable by air pressure supplied through a flexible air supply tube and including a diaphragm unit carrying a brake shoe for selective engagement with the brake band and defining with a portion of the table a pressure chamber, a passage in the table communicating with the pressure chamber, the air supply tube having an outlet end connected to the passage and an inlet end connected to the first end of the cylinder tube, and an elongated first slit in the cylinder tube, the first slit being open along its length at an external wall of the cylinder tube, the first slit receiving the air supply tube and the air supply tube being formed with a U-shaped loop portion of variable extent, depending on the position of the table on the cylinder tube, the loop portion being received in a portion of the first slit remote from the inlet end of the air supply tube.

5,469,941

AUTOMATIC HANDBRAKE RELEASE SYSTEM FOR A RAILROAD CAR

Robert L. Horvath, O'Fallon, Ill., assignor to James T. Williamson, Alton, Ill.

Filed Feb. 7, 1994, Ser. No. 192,349
Int. Cl.[6] F16D *65/14*
U.S. Cl. 188—107 **3 Claims**



1. An add-on device adapted to automatically release the manual handbrake of a railroad car when pressure in the main air pressure line of a train reaches a certain level, said handbrake being released by the upward movement of a manual releasing lever, comprising:

(a) a piston having a body and an upwardly extendable piston rod, said piston adapted to be attached near said manual handbrake wherein the top of said piston rod is in mechanical contact with the manual releasing lever during operation of the piston;

(b) a piston air pressure line connecting the main air pressure line of said train to said piston;

(c) a pressure sensitive valve means located in said piston air pressure line between said main pressure line and said piston, wherein said valve means automatically opens when the air pressure in said main pressure line exceeds a set PSI level;

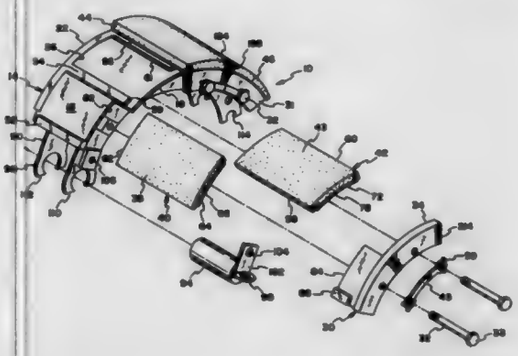
whereby the manual handbrake of a railroad car is automatically released by the upward extension of said piston rod, when the pressure in the main air pressure line of a train reaches a certain level.

5,469,942

ARCUATE BRAKE SYSTEM WITH FASTENER-FREE REPLACEABLE BRAKE LINING

Walter E. Krumm, Sr., 3201 N.E. 9th St., Ocala, Fla. 34470-6426

Filed Aug. 26, 1994, Ser. No. 296,409
Int. Cl.[6] F16D *69/00*
U.S. Cl. 188—250 G **19 Claims**



1. An arcuate brake lining apparatus for use with an arcuate brake drum, comprising:

a) a brake shoe table, said brake shoe table having an inner edge and an outer edge;

b) an outer lip disposed on said outer edge of said brake shoe table;

c) a gripper detachably attached to said brake shoe table;

d) an inner lip disposed on said gripper;

e) at least one brake lining segment, said at least one brake lining segment having a braking surface configured for engaging an arcuate brake drum, said at least one brake lining segment having an inner edge and an outer edge, said inner edge being configured for engaging said inner lip of said gripper, and said outer edge being configured for engaging said outer lip of said brake shoe table; and

f) a window defined in said brake shoe table, said window being configured for allowing said at least one brake lining segment to pass therethrough.

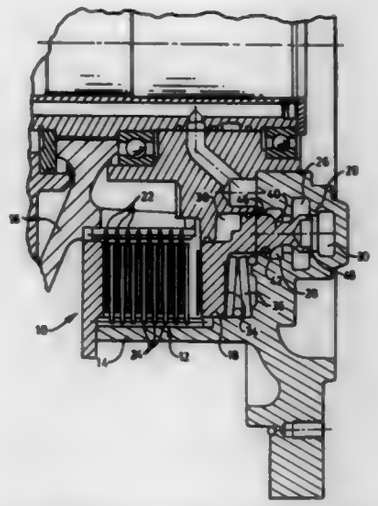
5,469,943

BRAKE ASSEMBLY HAVING A DUMP VALVE

John H. Hill, Edelstein; Randall L. Mooberry, and Daniel J. Schartman, both of East Peoria, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Apr. 28, 1995, Ser. No. 432,699
Int. Cl.[6] F16D *65/813*
U.S. Cl. 188—264 F **10 Claims**

1. A brake assembly, comprising:



a multiple disc brake pack having a plurality of rotatable brake discs and a plurality of co-operating non-rotatable brake discs;

a non-rotatable housing defining a fluid supply passage and a fluid dump passage, said non-rotatable brake discs being connected to said non-rotatable housing;

a rotatable housing, said rotatable brake discs being connected to said rotatable housing;

a brake piston, contained within said non-rotatable housing and being adapted to move between a first position wherein said non-rotatable discs are in contact with said rotatable discs and a second position wherein said rotatable discs are spaced from said non-rotatable discs; and

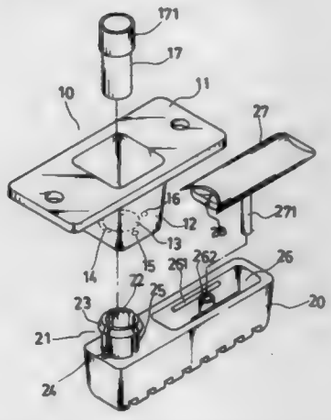
a dump valve mechanism including a spool valve in contact with said brake piston, said spool valve being adapted to move between a first position wherein fluid communication between said fluid supply passage and said fluid dump passage is closed, and a second position wherein fluid communication between said fluid supply passage and said fluid dump passage is open, said valve mechanism moving in the same direction as said piston during movement between said first and second positions of said valve mechanism and said piston.

5,469,944

SWIVEL FOOT FOR TRAVEL BAGS

King-Sheng Wang, No. 569, Ching Kuo Road, Ta Chia Chien, Taichung Hsien, Taiwan, Prov. of China

Filed Jul. 27, 1994, Ser. No. 280,662
Int. Cl.[6] A45C *3/00;13/00*
U.S. Cl. 190—18 R **4 Claims**



1. A swivel foot for a travel bag comprising:

a) a mounting block for attachment to the bottom of a travel bag, the mounting block including means for attachment to the travel bag, a downwardly extending receptacle, a circular plug hole formed at an extended end of the receptacle, an arcuate locating groove formed in the end of the receptacle and extending partially around an outer periphery of the plug hole, and a first locating recess and a second locating recess formed in the end of the receptacle and spaced at an angle of 90 degrees around the outer periphery of the plug hole;

b) an elongate swivel block including a hollow split plug tube extending upwardly from one end thereof, and a locating strip and a raised portion provided on the block adjacent the bottom of the split plug tube; and

c) means for engaging the split plug tube within the plug hole of the mounting block to dispose the locating strip the locating groove and permit the raised portion to be selectively engageable within either the first or the second locating recess when the swivel block is disposed in either of two positions offset from each other by 90 degrees.

5,469,945

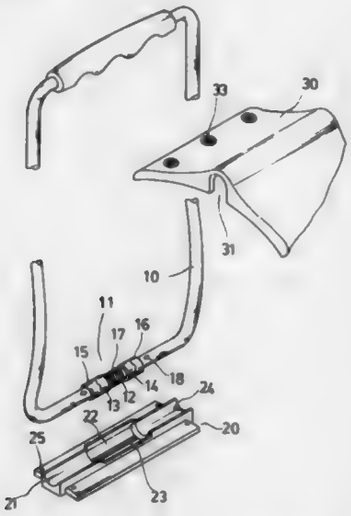
FOLDAWAY LUGGAGE PULL HANDLE

Yueh-Chy Jserng, 26-21, Hsi-Shih Chuang, Chang-Hua City, Taiwan, Prov. of China

Filed Jul. 27, 1994, Ser. No. 280,669

Int. Cl.[6] A45C *13/26*

U.S. Cl. 190—115 **3 Claims**



1. A pull handle mounted to an article of luggage comprising:

a) a mounting plate including means for attachment to an article of luggage, the mounting plate further including a pair of longitudinally aligned shallow open chambers and a deep open chamber positioned between the shallow open chambers, the deep open chamber having a longitudinal groove extending along the middle thereof;

b) a locating plate including means for bridging over the mounting plate, the locating plate further including a pair of shallow open chambers corresponding to the pair of shallow open chambers of the mounting plate and a deep open chamber corresponding to the deep open chamber of the mounting plate;

c) a pivot joint disposed within the corresponding deep open chambers of the mounting and locating plates, the pivot joint including a polygonal shaft, a pair of outer knobs including means for mounting on the shaft for rotation therewith, a pair of inner knobs including means for slidably mounting on the shaft between the outer knobs and including means engagable with the longitudinal groove of the mounting plate for preventing the inner knobs from rotating relative to the shaft, each inner knob and each outer knob including a corresponding serrated portion defined by tooth crests and tooth roots disposed for contact between the inner and outer knobs, means biasing the inner knobs outwardly along the shaft to dispose the corresponding serrated portions of the inner and outer knobs into engagement with each other; and

d) a rectangular-shaped handle including a pair of opposed tubular ends, the tubular ends being secured within opposite ends of the polygonal shaft by securing means and disposed within the corresponding shallow open chambers of the mounting and locating plates, whereby when the handle is turned relative to the pivot joint, the polygonal shaft and outer knobs are caused to rotate relative to the inner knobs such that corresponding tooth crests engage and cause the inner knobs to be urged inwardly against the biasing means and permit the corresponding serrated portions of the inner and outer knobs to be selectively repositioned with the tooth crests engaging corresponding tooth roots for maintaining the handle at a desired angle relative to the article of luggage.

5,469,946

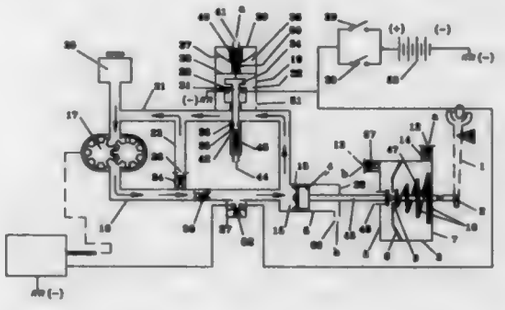
CLUTCH ACTUATION SYSTEM

Phuong H. Nguyen, 14752 Hunter La., Midway, Calif. 92655

Filed Feb. 1, 1994, Ser. No. 189,717

Int. Cl.[6] B60K *41/28*

U.S. Cl. 192—3.58 **9 Claims**



6. A control system for controlling a clutch of a motor vehicle having a manually operated transmission and further having an electric power source, comprising:

a vacuum booster means attached to a motor vehicle clutch fork and attached to a piston having a seal in a hydraulic actuator;

the hydraulic actuator with an actuated end having an actuator vacuum port connected to a vacuum source and a hydraulic end connected to a pressure line and a relief line with a safe valve line connected between the pressure line and the relief line;

the pressure line connected to a fluid pump and having a pressure check valve intermediate the safe valve line and the hydraulic end;

a limit switch with a limit switch spring in the pressure line;

the relief line and the fluid pump connected to a fluid reservoir with the relief line having a gradual pressure relief valve intermediate the safe valve line and the hydraulic end;

a safe check valve with a safe check valve spring in the safe check line;

a driver unit to power the fluid pump;

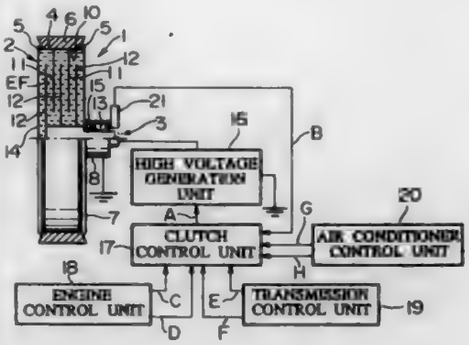
an electric source electrically connected to a brake pedal switch and a gear shift handle switch in parallel which are connected to a solenoid and the limit switch which limit switch is electrically connected to the driver unit.

5,469,947

FLUID CLUTCH DEVICE

Hidenobu Anzai, Iwaki; Moritaka Gotoh, Chiba, and Youichi Hisada, Iwaki, all of, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Aug. 27, 1993, Ser. No. 112,323
Claims priority, application Japan, Sep. 20, 1992, 4-258651; Sep. 28, 1992, 4-258650
Int. Cl.[6] F16D 27/00
U.S. Cl. 192—21.5 13 Claims



1. A fluid clutch device in a vehicle having a vehicular engine and an accessory equipment, with the fluid clutch device controlling transmission of motive power of the vehicular engine to the accessory equipment, said clutch device comprising:

(a) first and second members arranged for relative rotation about a common axis, said first member being constructed to be operated by said vehicular engine while said second member is constructed to operate said accessory equipment;

(b) a hermetically sealed clutch casing for accommodating said first and second members therein, said clutch casing containing an electroviscous fluid therein;

(c) a source of high voltage potential provided for applying a voltage to said electroviscous fluid to change viscosity of the electroviscous fluid to vary coupling force between said first and second members;

(d) means for generating a signal regarding driving of the accessory equipment; and

(e) a clutch control unit electrically connected to said source of high voltage potential and said accessory signal-generating means for regulating the voltage applied to said electroviscous fluid based on said accessory signal generated from said accessory signal-generating means to vary a driving power to be transmitted to said accessory equipment and wherein said accessory signal-generating means includes means for generating a signal representative of an actual driving speed of the accessory equipment and means for generating a signal representative of a target driving speed of the accessory equipment, and wherein said clutch control unit is constructed to:

determine whether the vehicle is in an acceleration stage, constant-speed stage or deceleration stage using signals from a vehicle drive signal-generating means, said vehicle drive signal-generating means including an engine motion signal-generating means and a transmission state signal-generating means;

obtain a reference driving speed of the accessory equipment based on the accessory signal generated from said accessory signal-generating means;

obtain a target driving speed of the accessory equipment by correcting said reference driving speed according to vehicle stage; and

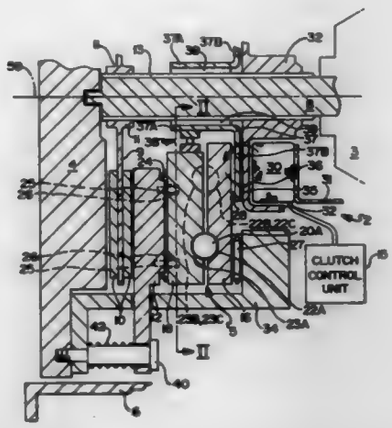
regulate the voltage to be applied to the electroviscous fluid so that the actual driving speed obtained from said actual driving speed signal-generating means matches the target driving speed obtained from said target driving speed signal-generating means.

5,469,948

CLUTCH BALL RAMP ACTUATOR WITH COAST LOCK

Gregory J. Organek, Dearborn; David M. Preston, Clarkston, and David A. Janson, Plymouth, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jan. 31, 1994, Ser. No. 189,342
Int. Cl.[6] F16D 13/04; 43/20
U.S. Cl. 192—35 13 Claims



1. A ball ramp mechanism for coupling two rotating elements comprising:

an input element driven by a prime mover and rotating about an axis of rotation;

an output element having an axis of rotation coaxial with said axis of rotation of said input element for rotating an output device;

a ball ramp actuator for generating an axial movement comprising; an annular control ring magnetically coupled to said output element and rotating therewith, said control ring having at least two circumferential control ramps formed in a first face of said control ring, said control ramps varying in axial depth, an equivalent number of rolling elements one occupying each of said ramps, an activation ring having an axis of rotation along said axis of rotation of said control ring, said activation ring having at least two activation ramps substantially identical in number, shape and radial position to said control ramps in said control ring where said activation ramps at least partially oppose said control ramps and where each of said rolling elements is trapped between said activation ramp and a respective at least partially opposed control ramp, said control ring axially and rotationally movably disposed relative to said activation ring;

coupling means for rotatably joining said input element to said output element where said coupling means varies the degree of rotational coupling between said input element and said output element according to the axial position of said control ring relative to said activation ring;

a locking ring nonrotatably attached to said output member;

a control support element disposed between said control ring and said locking ring, said control support element rotatably supported by said output element;

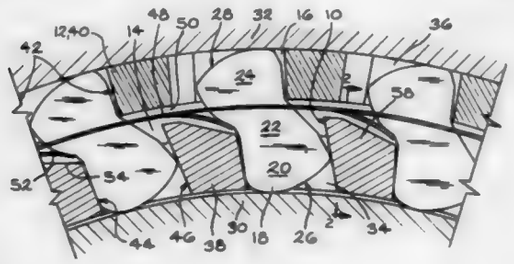
a coil for creating a magnetic field said locking ring and said control ring and said control support element thereby magnetically joining said control ring to said output element, said coil being electrically energized by a clutch control unit where said activation ring rotates with said input element and said control ring rotates with said output element according to said control means;

clutch means for preventing said activation ring from rotating relative to said control ring in a direction deactivating said ball ramp actuator when said coil is energized, said clutch means attached to said control support and to said activation ring.

5,469,949
SPRAG CLUTCH WITH ONE CAGE RING

Hermann Leitz, Heidelberg, Germany, assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Continuation of Ser. No. 854,635, Jul. 6, 1992, abandoned.
This application Apr. 20, 1994, Ser. No. 230,071
Claims priority, application European Pat. Off., Nov. 9, 1990, 90121441
Int. Cl.[6] F16D 41/07
U.S. Cl. 192—45.1 **5 Claims**



1. A one-way sprag clutch having a double cage between inner and outer races comprising:

a plurality of sprags spaced at specific intervals in a circumferential direction between the inner and outer races;

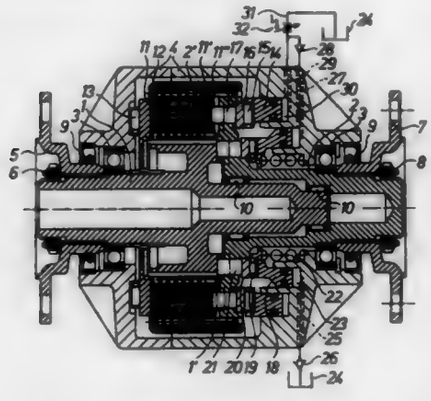
the double cage including an inner cage ring of a first plastic material radially retaining inner portions of the sprags, the remaining outer portions of the sprags extending radially outward from the inner cage ring; and

an outer cage ring of a reinforced plastic material radially retaining the outer portions of the sprags, said reinforced plastic material being substantially harder than the first plastic of the inner cage ring.

5,469,950
DEVICE FOR TRANSMITTING TORQUE BETWEEN TWO ROTATABLE SHAFTS

Bo Lundström, Glumslöv, and Lars Severinsson, Hishult, both of, Sweden, assignors to Ipumatic AB, Sweden

Filed Mar. 8, 1994, Ser. No. 207,156
Claims priority, application Sweden, Mar. 15, 1993, 9300838
Int. Cl.[6] F16D 25/02
U.S. Cl. 192—85 **8 Claims**



1. A device for transmitting torque between two rotatable, coaxial shaft members (1, 2) in a stationary housing (4), the device containing a number of alternate clutch discs (11, 12) connected to the two shaft members and engageable to counteract differential rotational speed between the shaft members, at least one hydraulic clutch piston (14) to engage the clutch discs, and a hydraulic pump arrangement (1', 18–21, 11", 14–17; 1', 18–21, 14–17, 33–38), driven by the speed differential between the two shaft members to create a hydraulic pressure on the clutch piston,

characterized in that the hydraulic pump arrangement (1', 18–21, 11', 14–17; 1', 18–21, 14–17, 33–38) is mounted on the stationary housing and includes

a supply piston (18) and the clutch piston (14), both axially movable in the housing (4) coaxially with the shaft members (1, 2),

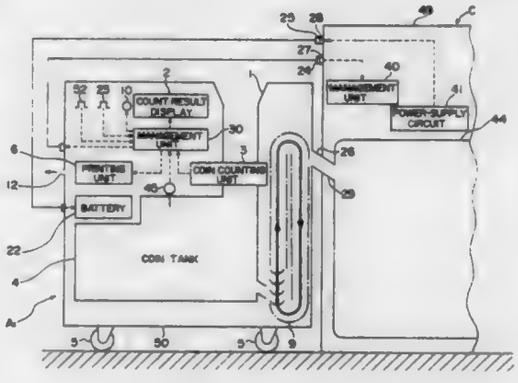
piston actuating members (17, 21) rotatable with one of the shaft members (2) and engaging the other of the shaft members (1) via cams (1', 11"; 1', 33'), which are angularly offset in relation to each other, so as to impart to the pistons a reciprocating movement at a differential rotational speed between the shaft members, and

a hydraulic line system (25, 27, 29, 31) connecting a cylinder (23) at the supply piston (18) on one hand with a tank (24) via a check valve (26) and on the other hand—via a line (27) with a check valve (28)—with an outlet line (31) and connecting a cylinder (30) at the clutch piston (14) with the outlet line.

5,469,951
COIN COUNTER FOR SLOT MACHINES AND A GAME PARLOR HAVING THE COIN COUNTER THEREIN

Takatoshi Takemoto, and Kazunari Kawashima, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ace Denken, Japan

Filed Mar. 29, 1994, Ser. No. 219,372
Int. Cl.[6] G07F 7/04; 17/34
U.S. Cl. 194—206 **14 Claims**



1. A game parlor comprising:

a plurality of slot machines mounted on a floor of the game parlor, said slot machines being operated by players by inserting coins therein;

rails provided adjacent the slot machines on said floor;

a coin counter for slot machines comprising,

a main body having a coin slot in which said coins are inserted, a coin counting means for counting the number of coins inserted in the coin slot, a coin tank for storing coins counted by the coin counting means, and a count result outputting means for outputting the result of the coin counting made by the coin counting means,

wheels provided under the main body for moving said main body, and

an engaging unit which engages said rails so as to move the coin counter along said rails.

5,469,952

COIN DISCRIMINATION APPARATUS

John Kershaw, Oldham, and Lesley Hutton, Rochdale, both of, England, assignors to Coin Controls Limited, Lancashire, England

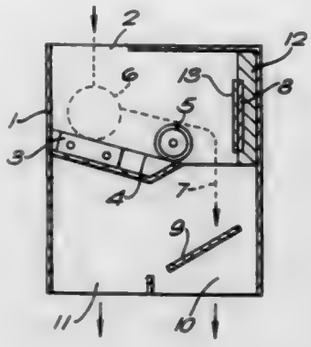
PCT No. PCT/GB92/00791, § 371 Date Apr. 28, 1994, § 102(e) Date Apr. 28, 1994, PCT Pub. No. WO93/06569, PCT Pub. Date Apr. 1, 1993

PCT Filed Apr. 30, 1992, Ser. No. 211,154

Claims priority, application United Kingdom, Sep. 24, 1991, 9120315

Int. Cl.[6] G07D *5/04;5/08*

U.S. Cl. 194—317 **13 Claims**



1. Coin discrimination apparatus comprising:

means defining a path for coin under test;

a surface to be impacted by coins that pass along path;

sensor means for providing an electrical output signal in response to impact of a coin with the surface;

means for defining a predetermined duration following impact of the coin with the sensor means;

maximum peak detecting means for detecting the peak maximum amplitude of the output signal that occurs within said predetermined duration following impact;

minimum peak detecting means for detecting the peak minimum amplitude of the output signal that occurs within said predetermined duration following impact; and

means for determining coin acceptability in dependence upon the detected values of the peak maximum and minimum amplitudes.

5,469,953

TRANSPORT MECHANISM FOR IC HANDLERS

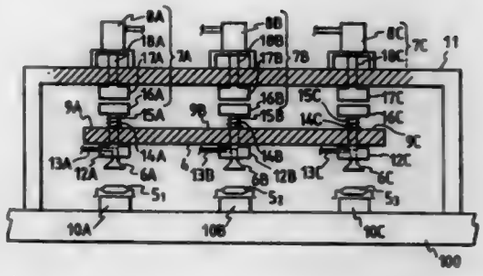
Noriyuki Igarashi, Gyoda, and Keiichi Fukumoto, Kitamoto, both of, Japan, assignors to Advantest Corporation, Tokyo, Japan

Filed Feb. 16, 1994, Ser. No. 197,190

Claims priority, application Japan, Feb. 17, 1993, 5-010643 U

Int. Cl.[6] B65G *47/00*

U.S. Cl. 198—345.2 **2 Claims**



face of said base plate, said rotary shaft passing through a center of the predetermined circle;

vertically slidable shafts having respective upper and lower ends and respectively provided in said transport stations;

a contact-in stage for feeding the devices under test, a test stage for testing the devices and a contact-out stage for taking out tested devices, said contact-in, test and contact-out stages being arranged on said base plate below said contact arm means at the same equiangular intervals as those of said transport stations and about said rotary shaft of said contact arm means on a perimeter of another circle having the same diameter as that of the predetermined circle;

air chuck means provided at each of said transport stations, for selectively holding by suction and releasing the devices under test, said air chuck means being mounted to the respective lower ends of said vertically slidable shafts;

a support table fixedly mounted on said base plate and extending over said contact arm means;

air chuck driving mechanism means fixed to said support table at positions thereof above said contact-in, test and contact-out stages, respectively, for selectively moving said air chuck means up and down by pressing down respective upper ends of said air chuck means and releasing pressure applied to the upper ends of said air chuck means when corresponding ones of said transport stations are held above said contact-in, test and contact-out stages, said air chuck driving mechanism means including respective vertically movable driving shafts having respective lower ends, each of said vertically movable driving shafts pressing down the respective upper end of a corresponding one of said vertically sliding shafts with the respective lower end of said corresponding vertically movable driving shaft to lower said corresponding air chuck means when ones of said transport stations lie above said contact-in, test and contact-out stages, respectively;

a rotary joint mounted on said support table, for rotatably supporting the rotary shaft of said contact arm means through an opening made in said support table, said rotary joint comprising:

a second rotary shaft having at least three through holes with one ends of which are open to an outer peripheral surface of said second rotary shaft at different positions in an axial direction thereof and the other ends of which are open to a lower end surface of said second rotary shaft at different positions,

a cylinder to receive therein said second rotary shaft, and

a plurality of O rings, interposed between said second rotary shaft and said cylinder, for forming at least three airtightly isolated annular chambers between the outer peripheral surface of said second rotary shaft and an inner peripheral surface of said cylinder, said annular chambers being disposed in the axial direction of said second rotary shaft, each of said annular chambers communicating with one of said one ends of said through holes; and

coupling means for coupling said secondary rotary shaft to the rotary shaft of said contact arm means.

5,469,954

CONVEYING APPARATUS WITH PRODUCT REORIENTATION CAPABILITY

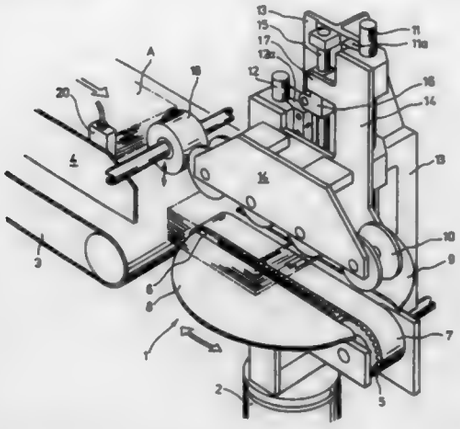
Horst Rathert, Stiftsalle, and Reimar Staudinger, Vorlaender, both of, Germany, assignors to Kolbus GmbH & Co. KG, Rahden, Germany

Filed Mar. 17, 1994, Ser. No. 214,371

Claims priority, application Germany, Mar. 18, 1993, 43 08 601.2

Int. Cl.[6] B65G 47/24

U.S. Cl. 198—412 21 Claims



1. Apparatus for transferring unsymmetrical products from a feed conveyor to a receiver, the products having oppositely disposed first and second sides, said apparatus comprising:

frame means rotatable about an axis;

variable speed linear conveyor means supported from said frame means, said conveyor means being in alignment with the conveying path of the feed conveyor at a first angular position of said frame means, said conveyor means engaging a first side of a product to be transferred and supporting the engaged product;

means mounted on said frame means for engaging the side of a product disposed opposite to the side supported on said conveyor means, said engagement means engaging the product as it is being transferred; and

means for controlling said conveyor means and the rotation of said frame means such that the linear component of the motion of a product supported on said conveyor means and contracted by said engaging means is simultaneous with rotation of said frame means and will be fully arrested when the center of gravity of the product is approximately in registration with said axis of rotation of said frame means when said frame means has been rotated through an angle of approximately 90°, said controlling means further causing a reversal of said linear conveyor means to thereby permit the product to be delivered to the receiver after said frame means has been rotated through an angle of 180°.

5,469,955

DEPOSITING APPARATUS FOR LAUNDRY

Jacob Van Rumpt, Ad Vught, Netherlands, assignor to AMKO International B.V., Kerkdriel, Netherlands

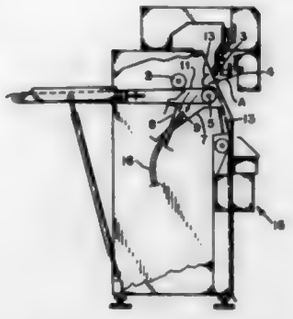
Filed Apr. 4, 1994, Ser. No. 222,667

Claims priority, application Netherlands, Apr. 7, 1993, 9300607

Int. Cl.[6] B65G 17/46

U.S. Cl. 198—689.1 17 Claims

1. Depositing apparatus for depositing a piece of laundry (13), after spreading or stretching thereof, on an endless conveyor belt (11), which can supply the deposited piece of laundry to an apparatus placed downstream of it, wherein the conveyor belt comprises a number of air passage openings, and suction means



are provided below the upper surface of the conveyor belt, for sucking in air through the upper surface of the conveyor belt, to suck the piece of laundry against the conveyor belt, said suction means comprising at least one chamber-like space having an open upper side and a discharge side, at least two facing sides of the chamber-like space defining a venturi.

5,469,956

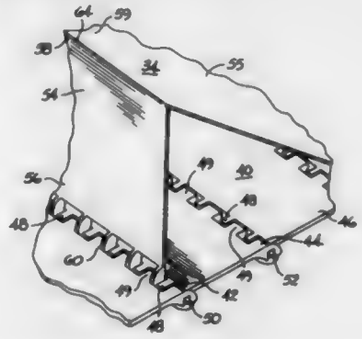
MODULAR CONVEYOR BELT AND FLIGHT MEMBERS THEREFOR

Christopher G. Greve, Covington, and Robert S. Lapeyre, New Orleans, both of La., assignors to The Laitram Corporation, Harahan, La.

Filed Jan. 20, 1995, Ser. No. 375,960

Int. Cl.[6] B65G 15/44

U.S. Cl. 198—699.1 32 Claims



1. A modular conveyor belt suitable for conveying product in a direction of travel, comprising:

a plurality of belt modules, each module having a first end and an opposite second end spaced from the first end in the direction of travel, a conveying surface disposed on one side of the module between the first and second ends and extending transversely across the width of the module, and a first set of hinge elements transversely spaced along the first end of the module and a second set of hinge elements transversely spaced along the second end, each of the hinge elements of each of the sets circumscribing an aperture aligned with the apertures of the other hinge elements of the same set, the belt modules connected end-to-end in rows with the first set of hinge elements along one row interleaved with the second set of hinge elements of an adjacent :row to form an endless conveyor belt having an outer conveying surface;

a plurality of pivot rods journalled in the aligned apertures of interleaved sets of hinge elements to form a hinged joint between adjacent rows of belt modules; and

a flight member extending outwardly from the outer conveying surface of the belt and including:

a first panel having a first end and an opposite second end and having first attachment means disposed at the first end for attaching the first panel at a first row of belt modules,

a second panel having a first end and an opposite second end and having second attachment means disposed at the first end for attaching the second panel at a second row of belt modules, and

hinge means hingedly joining the; second end of the first panel to the second end of the second panel.

5,469,957

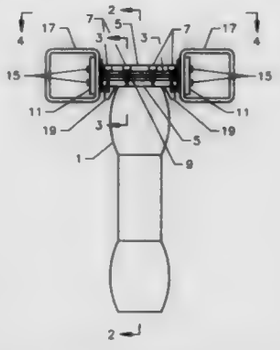
BUCKET CONVEYOR CHAIN

Timothy H. Seymour, 9544 Moran St., Biloxi, Miss. 39532

Filed Oct. 3, 1994, Ser. No. 316,934

Int. Cl.[6] B65G *17/36*

U.S. Cl. 198—711 **7 Claims**



1. An improved conveyor chain comprising an endless band mounted upon a plurality of wheels, said improvement comprising:

a series of metal plates, the ends of said plates adjoining one another to form said endless band,

said plates having one or more holes at each end,

a series of paired bars, said paired bars having matching holes,

wherein the ends of adjoining said plates are interposed between said pair of bars,

a fastener,

said fastener passing through said matching holes in said pair of bars and the holes in the ends of said plates providing a means for connecting the adjoining ends of said plates together to form said endless band,

wherein said paired bars are positioned so that one of said paired bars is interposed between said endless band and the outer periphery of said wheels,

wherein adjacent bars of said series of paired bars are spaced in close proximity of one another thereby preventing the said series of metal plates from contacting the outer periphery of said wheels.

5,469,958

CONVEYOR DRIVE SPOCKET

David R. Gruettner, Mequon, and Robert J. Gladczak, Waukesha, both of Wis., assignors to UCC Corporation, New Berlin, Wis.

Continuation of Ser. No. 283,893, Aug. 3, 1994, abandoned, which is a continuation of Ser. No. 153,203, Nov. 16, 1993, abandoned. This application Feb. 28, 1995, Ser. No. 395,643

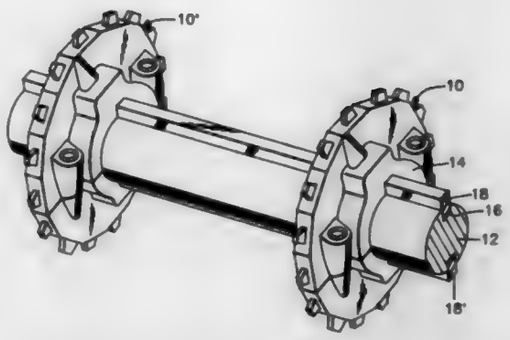
Int. Cl.[6] B65G *23/06*

U.S. Cl. 198—834 **15 Claims**

1. A conveyor sprocket mountable on and axially movable relative to a substantially cylindrical keyed drive shaft, said conveyor sprocket comprising:

a central hub formed of a molded thermoplastic material and having a central aperture for receiving therethrough the keyed shaft and a key which is longer than the length of the aperture for receiving said key; and

an insert formed of a material more rigid than said thermoplastic material and located with said central hub, said insert being



positioned and dimensioned to engage the key of the keyed shaft to receive the rotational driving forces transmitted through the key and distribute the driving forces to said central hub when said conveyor sprocket is mounted on the keyed shaft; wherein said conveyor sprocket is laterally unencumbered on the keyed shaft and key to accommodate changes in width of a conveyor belt, by the conveyor sprocket moving along the keyed shaft during operation.

5,469,959

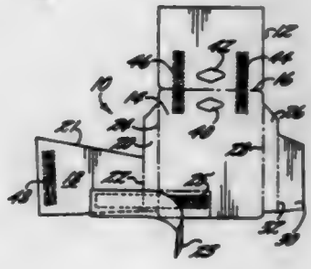
HOSIERY DISPLAY PACKAGE

Raymond J. E. Gummer, Grafton, Wis., assignor to Wigwam Mills, Inc., Sheboygan, Wis.

Filed May 24, 1994, Ser. No. 248,395

Int. Cl.[6] B65D *85/18*

U.S. Cl. 206—299 **14 Claims**



1. A display package for supporting a pair of hosiery for display on a point-of-purchase hanger rack made from a blank comprising:

a hanger support member for supporting said package on said display rack; and

a hosiery support band integrally formed with said hanger support member for encircling and retaining said hosiery therein, said hosiery support band including a front panel of predetermined width, a rear panel having an upper edge, said rear panel being substantially the same width as the front panel, and a pair of side panels of predetermined width connecting opposite side edges of said front and rear panels to maintain said front and rear panels in parallel spaced apart relationship; and

a pressure sensitive adhesive applied to the interior of about one-half of the whole portion of said front panel, said rear panel and a connecting side panel of said hosiery support band, said adhesive having a release strip attached thereto.

5,469,960

GOLF BAG

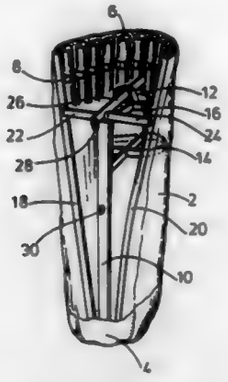
Robert M. Yuill, Aberdeen, Scotland, assignor to James Richard Ingleby, United Kingdom

Continuation of Ser. No. 39,024, Mar. 25, 1993, abandoned. This application Jul. 20, 1994, Ser. No. 277,940

Claims priority, application United Kingdom, Sep. 28, 1990, 9021285

Int. Cl.[6] A63B 55/00;55/06

U.S. Cl. 206—315.3 15 Claims



11. A golf bag for carrying golf clubs which comprises

a generally tubular bag member having a base and a side wall extending therefrom, the side wall being divided longitudinally along a front thereof, so as to provide a pair of opposed sidewall edges, a respective edge member being provided along each sidewall edge, each edge member being substantially rigid and having a respective upper end and lower end, each of said pair of edge members being mounted at its lower end to the base at respective first and second mounting points in a manner whereby the pair of edge members are pivotally mounted to allow pivotal movement relative to one another such as to open the sidewall of the bag member, the first and second mounting points being spaced apart from each other;

opening means operatively connected to the substantially rigid sidewall edge members for moving apart the upper ends of the edge members, such that the bag member is opened out at its upper end in a fan-like manner, and a carrying strap attached at one end to said opening means, whereby picking up the bag by the strap operates the opening means to close the bag; and

a series of individual golf club retaining means arranged in locations around the inner circumference of the sidewall, each said individual golf club retaining means being adapted to receive a single golf club, such that opening of the sidewall by operation of the opening means presents the clubs in a fan-like serial manner.

5,469,961

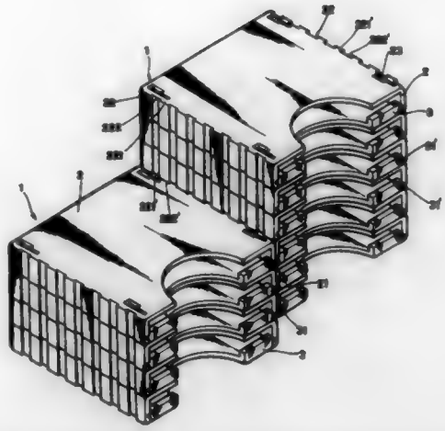
COMBINED MINIDISC BOX

Chun Y. Chang, 3 Floor-1, No. 65, Sec. 3, Roosevelt Rd., Taipei, Taiwan, Prov. of China

Filed Aug. 15, 1994, Ser. No. 290,138

Int. Cl.[6] B65D 85/30;83/57

U.S. Cl. 206—312 1 Claim



1. A combined minidisc box comprising:

an upper case comprising: two tuner sides having grooves, two outer sides having continuous interval dovetails and dovetail slots, the dovetails and dovetail slots of one side being faced to each dovetail slot and dovetail, respectively, of the other side, and four fitting holes each comprising a front part, a first fixing plate and a second fixing plate;

a lower case comprising: two outer sides having flanges which can be slid into said grooves of said upper case to connect said lower case with said upper case, four fitting posts, each defined by a concave part and a rear part, located on the bottom of said lower case which are situated opposite to the fitting holes of the upper case;

the combined minidisc box characterized in that:

said two continuous interval dovetails and dovetail slots of said combined minidisc box are able to be fitted respectively with the continuous interval dovetail slots and dovetails of the other like structured combined minidisc boxed;

furthermore said fitting posts of said lower case can be inserted into the front part of said fitting holes, defined by said first fixing plate, of the upper case of other like structured combined minidisc boxes, and said fitting posts are further able to be pushed into the rear part of said fitting holes, defined by said second fixing plate, so as to make said concave part of each of said fitting posts fit with said first fixing plate of each of said fixing holes, meanwhile said rear part of each of said fitting posts being stopped by means of said second fixing plate;

therefore, a plurality of said combined minidisc boxes can be connected with each other on their top, bottom, left side and right sides.

5,469,962

PACKING MATERIALS FOR ELECTROLYTIC CAPACITORS

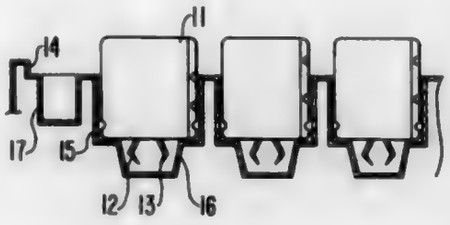
Toshiyuki Kitagawa; Hideharu Nagai; Junkichi Kawamura, and Hitoshi Mizuguchi, all of Kyoto, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 969,357, Oct. 30, 1992. This application Jun. 24, 1994, Ser. No. 265,638

Claims priority, application Japan, Nov. 8, 1991, 3-29771

Int. Cl.[6] B65D 73/02;85/42

U.S. Cl. 206—723 25 Claims



3. Capacitor packing materials comprising a container tray including a plurality of container hollows for containing capacitors formed therein, and terminal protecting sections formed under bottoms of said container hollows for holding anode and cathode lead terminals of said capacitors and restricting the rotational movement of said lead terminals, said terminal protecting sections having a length extending from a top surface to a bottom surface

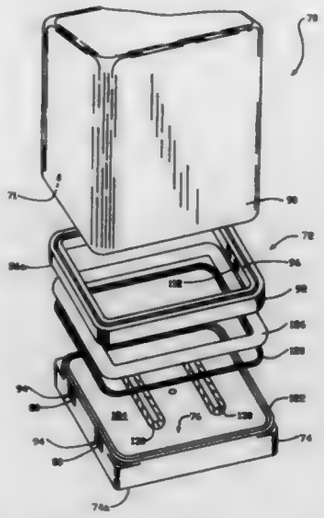
and including two recesses extending along the length of the terminal protecting sections.

5,469,963

SEALABLE TRANSPORTABLE CONTAINER HAVING IMPROVED LINER

Anthony C. Bonora, Menlo Park; Frederick T. Rosenquist, Redwood City; Sudhir Jain, Milpitas, Calif., and Mark R. Davis, Campbell, all of Calif., assignors to Asyst Technologies, Inc., Milpitas, Calif.

Filed Apr. 8, 1992, Ser. No. 865,297
Int. Cl.[6] B65D *85/30*
U.S. Cl. 206—709 **25 Claims**



1. A sealable, transportable container for an article, comprising:
a pod having an interior region and a sealing surface;
a pod door having an interior surface and an exterior surface, said pod door including an electrical conductor extending from the interior surface to the exterior surface;
an electrically conductive liner provided on said interior surface of said pod door adapted to remove electric charge from the article said liner connected to said conductor;
a gasket provided on said pod door;
a membrane overlying and attached to said electrically conductive liner and having an opening which exposes a portion of said conductive liner, a portion of said membrane overlying said gasket, said sealing surface of said pod adapted to mate with said portion of said membrane and compress said gasket to provide a seal; and
a latch for securing said pod door to said pod.

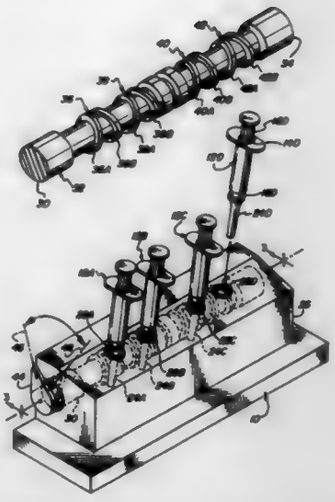
5,469,964

MULTIPLE SYRINGE UNSHEATHING AND RESHEATHING DEVICE

Eddy R. Bailey, 2115 US Rte. 11, Parish, N.Y. 13131

Continuation-in-part of Ser. No. 219,481, Mar. 29, 1994, abandoned. This application Dec. 2, 1994, Ser. No. 349,043
Int. Cl.[6] B65D *83/10*
U.S. Cl. 206—364 **10 Claims**

1. A needle sheath gripping device for use with a syringe having a needle and a removable sheath covering the needle, the sheath having a predetermined cross sectional dimension, the device comprising:
a housing having at least one sheath retaining bore for removably housing a sheath; and



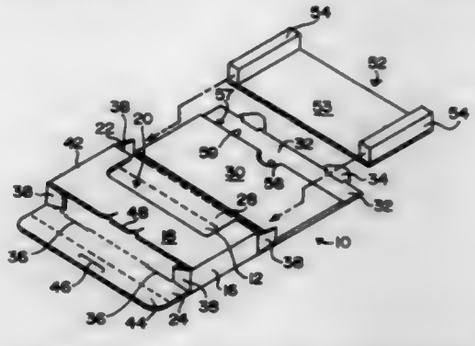
a rotatable shaft extending through the housing, the shaft comprising a first end and a second end, and at least one pair of opposed locking members extending at least partially about the shaft and located so as to straddle a sheath placed in the sheath retaining bore, at least one of the locking members being angled with respect to the other such that the distance therebetween is less than the cross sectional dimension of the sheath at a first rotational position and greater than the cross sectional dimension of the sheath at a second rotational position,
wherein when a sheath is inserted into the bore in the housing and is positioned between a pair of opposed locking members, rotation of the shaft moves the opposed locking members between the first position and second position so as to either grip or release the sheath.

5,469,965

VIDEO CASSETTE MAILERS

Gary E. Stearns, 36W418 Huntley Rd., Dundee, Ill. 60118

Continuation of Ser. No. 727,490, Jul. 9, 1991, abandoned. This application Oct. 18, 1993, Ser. No. 138,286
Int. Cl.[6] B65D *85/672*
U.S. Cl. 206—387.1 **33 Claims**



1. In combination with a video cassette, a video cassette mailer for protecting the video cassette received therein from damage during mailing thereof, the video cassette having a particular set of dimensions and the mailer comprising:
a box including at least a rectangular back panel having two short opposite ends and two longer ends, a side panel extending from each shorter end thereof, a front panel extending from one of said side panels, a top panel and a bottom panel each of which extend from one longer end of said back panel and a depending cover panel engaged to and extending from

said top panel and which folds Over said front panel and is engaged in said folded over position by tabs thereon which are received in slits provided at a juncture of said back panel and said bottom panel and having at least one dimension thereof greater than a corresponding dimension the video cassette and having an undercut area along one end edge of one panel thereof, and

an isolator element slidably and snugly received within said box and snugly engaging the video cassette in a manner to isolate a plurality of surfaces of the cassette from contact with the box, in cushioning manner.

5,469,966

INFLATABLE PACKAGE WITH VALVE

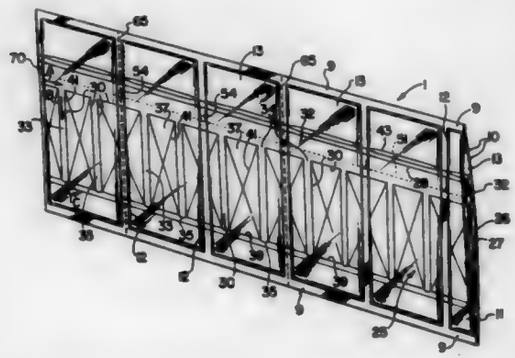
Geoffrey Boyer, 9 Foursome Crescent, Toronto, Ontario, Canada

Continuation-in-part of Ser. No. 907,657, Jul. 2, 1992, abandoned. This application Mar. 2, 1994, Ser. No. 204,093

Claims priority, application Canada, Jul. 5, 1991, 2046418

Int. Cl.[6] B65D *81/02;30/26*

U.S. Cl. 206—522 **19 Claims**



1. An inflatable package comprising:

outer pliable walls of indefinite length, said walls being joined along their opposed longitudinal edges and along spaced apart seams extending transversely between said longitudinal edges thereby defining a plurality of chambers of predetermined width between said outer walls; and

valve means disposed in longitudinal alignment between said outer walls for permitting the ingress of pressurized fluid into said chambers, said valve means comprising opposed layers of pliable film sealed together to define therebetween a primary fluid duct extending continuously along the length of said valve means, and a plurality of spaced apart flow channels intersecting said primary duct at an angle to extend transversely from said primary duct, a respective at least one of said flow channels placing said primary duct in fluid communication with the interior of respective ones of said chambers, said primary duct and flow channels being collapsible into a substantially flattened sealed condition when the ingress of pressurized fluid terminates to prevent the egress of said fluid from said chambers;

the orthogonal distance between centres of adjacent flow channels being equal and sufficiently less than the width of respective ones of said chambers so that each of said chambers is placed in fluid communication with said primary duct via at least one of said flow channels without need of registration of said flow channels relative to said chambers.

5,469,967

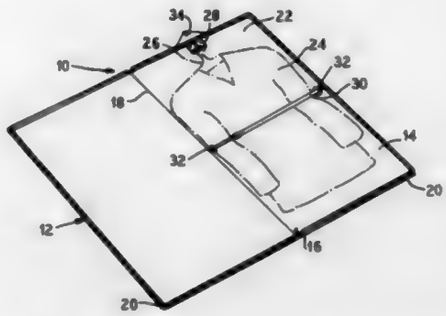
METHOD FOR CONVERTING A BAG BETWEEN TWO FUNCTIONAL CARRYING MODES

Charles A. Boorady, 2600 N. Hampden Ct., 2F, Chicago, Ill. 60614, assignor to Charles A. Boorady, New York, N.Y.

Continuation of Ser. No. 103,793, Aug. 10, 1993. This application Nov. 16, 1994, Ser. No. 341,067

Int. Cl.[6] A45C *3/00;7/00;13/10;9/00*

U.S. Cl. 206—527 **4 Claims**



1. A method for transporting and carrying garments and for converting a garment bag to a duffle-type bag, the garment bag having at least one interior compartment for carrying a first set of articles of clothing in a first carrying mode and the duffle-type bag having an interior compartment for carrying a second set of articles of clothing in a second carrying mode, the method comprising the steps of:

providing the garment bag having a first side and a second side secured by a first closure forming the at least one interior compartment wherein the second side includes a midpoint and the first side includes a second closure wherein the second closure encompasses an area defining a substantial portion of the first side when in an unsecured position and further wherein the second closure is spaced from a periphery of the first side, the garment bag having a means for supporting a hanging garment capable of suspending the hanging garment in the interior compartment of the garment bag only when used in the first carrying mode;

placing the garment bag on the first side such that the second side faces up;

folding a portion of each end of the garment bag toward the midpoint of the second side;

folding the garment bag at the midpoint of the second side; and

securing the second closure on the first side wherein the second side forms an interior wall of an interior compartment of the duffle-type bag and at least a portion of the first side forms an exterior wall of the interior compartment of the duffle-type bag wherein the interior compartment of the duffle-type bag is capable of carrying the articles of clothing in the second carrying mode only when the at least one compartment of the garment bag is not carrying the articles of clothing in the first carrying mode.

5,469,968

PEEL-PEEL-PUSH CHILDPROOF PACKAGING STRUCTURE

Gene C. Matthews, Powhatan, and Mary C. Speight, Amelia, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

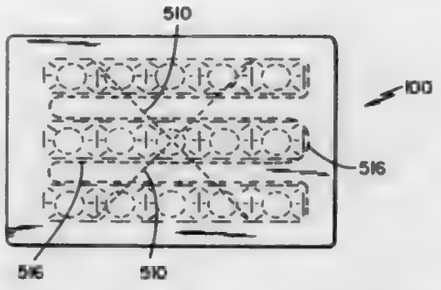
Filed Sep. 22, 1994, Ser. No. 310,516

Int. Cl.[6] B65D *83/02*

U.S. Cl. 206—532 **22 Claims**

1. A childproof package, comprising:

a containment element formed to have a flange portion and a recessed portion, said recessed portion being shaped and sized to accommodate an item therein; and



a multilayer covering attached to the flange portion at least around the recessed portion so as to sealingly retain an item therein,

said multilayer covering comprising in sequence from the flange portion:

(i) a first adhesive layer,

(ii) a frangible first film.

(iii) a second adhesive layer,

(iv) a second film containing a plurality of perforations in a first pattern,

(V) a third adhesive layer, and

(vi) a third film containing a plurality of perforations in a second pattern.

20. A method of retaining an item in a container in a childproof manner, comprising the steps of:

providing a container having a flange portion surrounding a recess for containing an item of medication;

heat sealing to the flange portion a frangible metal foil;

peelably adhering to the metal foil a first childproof film of plastic material provided with a plurality of perforations in a first pattern; and

peelably adhering to the first childproof film a second childproof film of plastic material provided with a plurality of apertures in a second pattern,

whereby a young child attempting to bite into the multilayer covering will be frustrated by its physical resistance to biting, whereas older children and adults are enabled to remove the childproof films sequentially at physical weaknesses generated by the perforations and apertures.

5,469,969

SELF-OPENING PLASTIC BAG PACK SYSTEM

Frank F. J. Huang, Irvine, Calif., assignor to Durabag, Inc., a California corporation, Tustin, Calif.

Continuation of Ser. No. 932,333, Aug. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 904,446, Jun. 25, 1992, abandoned. This application Mar. 1, 1994, Ser. No. 206,191

Int. Cl.[6] B65D *33/14*

U.S. Cl. 206—554 **21 Claims**

1. A pack of self-opening bags for use with bagging racks which are adapted to support said pack of self-opening bags in a generally vertical orientation, comprising:

a plurality of bags, each of said bags having opposed front and rear walls with outer surfaces, said outer surfaces being surface treated and aligned in a stack, said opposed walls being closed at a bottom edge and at least partially openable at a top region to define a mouth region, a central tab portion being located on said opposed walls of each of said bags in said mouth region of said bags, said central tab portion having a top edge and side edges, said central tab portion having a tearing cut extending thereacross, except for uncut portions near said side edges of said central tab portion, said tearing cuts being formed through said stack of bags and following a non-straight path, said walls of said pack of bags being held together by frangible bonds adjacent the sides of said tearing cut passing through said central tab portions, wherein said tearing cut is about 10 percent or greater in length than the straight line distance between its endpoints, and is generally downwardly directed relative to said pack of bags carried on the bagging rack so as to allow a portion of the suspended bag pack below said tearing cut to sag downwardly to relieve stress on the frangible bonds formed along the tearing cut, such that when a frontmost lying bag of the pack of bags carried on the bagging rack is removed from the pack of bags, the pulling force applied to remove the frontmost lying bag will be first concentrated on said uncut portions adjacent said tearing cut so that the uncut areas are torn through before the frangible bonds bonding the rear wall of the frontmost lying bag to the front wall of the immediately rearwardly lying bag are broken, so that each successive frontwardly lying bag will pull open the immediately rearwardly lying bag in the bag pack, said central tab portions in said stack being affixed together above said tearing cut to form said pack of self-opening bags.

5,469,970

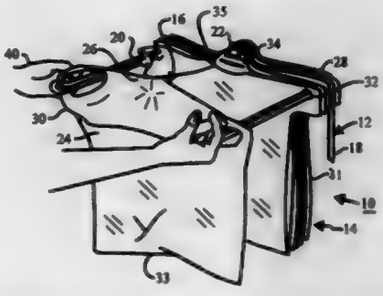
EASY OPEN STACKABLE HANDLE BAGS

Nam T. Li, 1808 S. Olive Ave., Alhambra, Calif. 91803

Filed Jun. 3, 1994, Ser. No. 254,072

Int. Cl.[6] B65D *27/10*

U.S. Cl. 206—554 **20 Claims**



1. A bag pack of stackable handle bags suitable for suspension by laterally spaced support arms of a bag rack, the bag pack comprising:

(a) a plurality of aligned, stackable handle bags, each handle bag having (i) a front wall having a longitudinal axis, (ii) a rear wall having a longitudinal axis, the rear wall joined opposite to the front wall defining an enclosure having an open top, opposed sides and a bottom, (iii) a pair of laterally spaced handles integral with the front and rear walls extending upwardly from the open top, each handle having a handle aperture extending therethrough for receiving a support rod, and (iv) a releasable center mount attached to the front and rear walls of each stackable handle bag on the longitudinal axis of the front and rear walls for receiving a center hook on the bag rack, the center mount releasably supporting each respective handle bag; and

(b) an area of releasable adhesive positioned at an offset area located (i) between the rear wall of each handle bag and the front wall of each subsequent handle bag in the bag pack, (ii) intermediate the longitudinal axis of the front and rear walls and only one of the opposed sides of the bags, and (iii) closer

to the open top than the bottom so that when each handle bag is removed from the bag rack by its handles and during the release of the center mount of the front wall of each subsequent bag from the bag rack, the front wall of each subsequent bag is pulled only from the offset area;

wherein the force required to release the releasable adhesive is greater than the force required to release the center mount when the front wall is pulled from the offset area;

wherein when each handle bag is removed from the bag rack by its handles and after the center mount is released the front wall of each subsequent bag, the force required to release the area of adhesive is less than the force required to continue to pull the subsequent bag by its front wall.

5,469,971

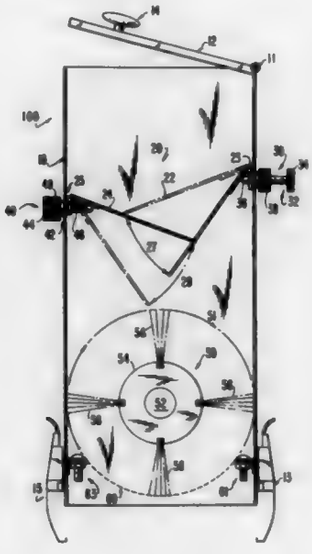
METHOD AND APPARATUS FOR DEAGGLOMERATING POWDER

John B. Chilton, Manhasset, N.Y.; Peter H. Gevaras, Bordentown; Paul C. Herb, Lawrenceville, both of N.J., and Thomas W. Wellen, Newtown, Pa., assignors to Estee Lauder Inc., New York, N.Y.

Filed Feb. 26, 1992, Ser. No. 841,567

Int. Cl.[6] B07B *1/06;* **B28B** *17/02*

U.S. Cl. 209—235 **26 Claims**



1. An apparatus for deagglomerating powder comprising:

a housing having an opening for depositing powder into said apparatus;

a sieve means mounted in said housing beneath said opening;

at least one sweeping means mounted in said housing above said sieve means, said sweeping means being constructed and arranged so that it is movable within close proximity to the top of said sieve means;

means for moving said sweeping means so as to cause said sweeping means to sweep said powder through said sieve means and deagglomerate said powder; and

first and second adjustable baffle means for regulating the flow of said powder to said sieve means, said first and second baffle means being mounted to said housing above said sweeping means such that said first and second baffle means do not contact said sweeping means, wherein the angle of each of said baffle means is separately adjustable with respect to the other baffle means so as to be capable of forming a plurality of flow paths for said powder through said apparatus, from which a desired flow path is selected.

5,469,972

SCREENING APPARATUS AND METHOD FOR SCREENING MIXED MATERIALS

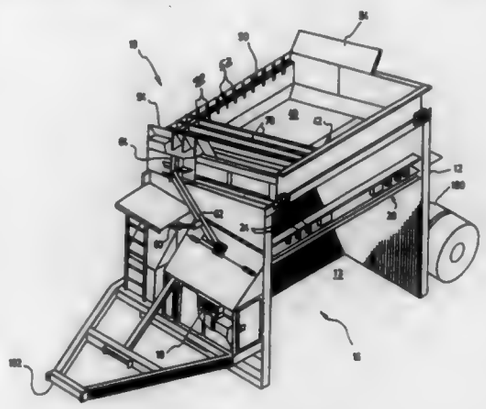
Jean-Guy St-Pierre, and André Godbout, both of Plessisville, Canada, assignors to les Équipements Vibrotech Inc., Plessisville, Canada

Filed Jul. 15, 1994, Ser. No. 276,108

Claims priority, application Canada, Aug. 31, 1993, 2105232

Int. Cl.[6] B07B *1/46;13/16*

U.S. Cl. 209—245 **12 Claims**



1. A screening apparatus for separating mixed material into coarse materials and finer materials, said screening apparatus comprising:

a frame having a lower section for resting on a surface, and an upper section;

a vibrating screen unit comprising a first material separating screen sloping downward with respect to said surface from an upper edge toward a lower edge, said first material separating screen being supported by said frame between said lower and upper sections;

shaking means for shaking said vibrating screen unit;

a bucket for receiving the mixed materials, said bucket being located in the upper section of said frame and comprising a bottom opening located over said first material separating screen adjacent the upper edge thereof;

an upright wall movable along the bottom of said bucket for pushing the mixed materials along the bottom of said bucket and into said bottom opening; and

means for moving said wall across said bucket at a predetermined speed;

whereby said first material separating screen is fed with the mixed materials as said wall pushes the mixed materials at the predetermined speed along the bottom of said bucket into said bottom opening.

5,469,973

SORTING OPTICALLY DIFFERENT SOLID MASSES

Hubert J. Booth; Paul H. Steagall, III, and Michael W. Wright, all of Florence, S.C., assignors to Wellman, Inc., Johnsonville, S.C.

Continuation of Ser. No. 156,353, Nov. 22, 1993, abandoned, which is a continuation of Ser. No. 669,043, Mar. 14, 1991, abandoned. This application Aug. 4, 1994, Ser. No. 286,382

Int. Cl.[6] B07C *5/342*

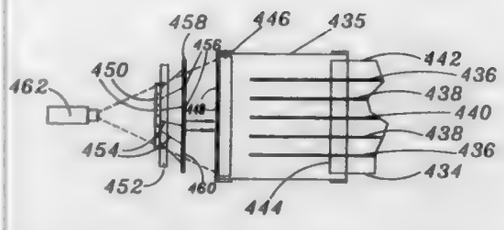
U.S. Cl. 209—580 **32 Claims**

1. Apparatus for separating plastic masses with differing optical transmissive properties comprising:

conveyor means for presenting continuously moving masses;

means for transmitting light through said moving masses; and

means responsive to light transmitted through said moving masses to remove predetermined ones thereof, said light responsive means comprising a line scan camera;



said conveyor means being positioned for continuously presenting said moving masses to said light transmitting means and said light responsive means for transmittal of light therethrough.

5,469,974

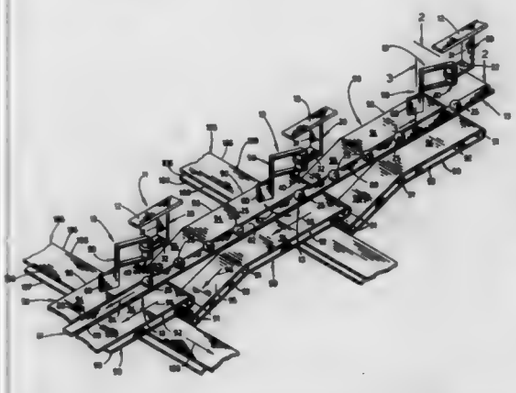
METHOD AND APPARATUS FOR SELECTIVELY DIRECTING WORK OBJECTS

James C. Hagan, Stockton, Calif., assignor to Hagan Electronics International, Stockton, Calif.

Continuation of Ser. No. 665,479, Mar. 6, 1991, abandoned. This application Nov. 18, 1993, Ser. No. 154,606

Int. Cl.[6] B07C *9/00*

U.S. Cl. 209—652 **3 Claims**



2. An apparatus for selectively directing work objects comprising a conveyor operable to transport a plurality of work objects thereon successively through a work station; means for detecting predetermined characteristics of said work objects as they are transported on the conveyor through said work station; and means operably connected to said detecting means in said work station operable to divert each work object passing through the work station, having said predetermined characteristics, from the conveyor in a first direction of movement and subsequently to divert the next successive work object so detected in a second direction of movement and wherein said second direction of movement is substantially opposite to the direction of said first direction of movement, said diverting means includes a diverting member mounted above said conveyor for movement in said first and second directions of movement without movement in a return direction after movement in either of said first or second directions of movement and said diverting means further includes a solenoid, mounted above the work object transport conveyor, a drive shaft having a pair of oppositely extending drive end portions and said drive shaft selectively driven in opposite directions and said diverting member is borne by a diverting assembly mounted on the drive shaft of the solenoid and the detecting means is operably connected in actuating relation to said solenoid for movement of the diverting member in said first and second directions of movement.

5,469,975

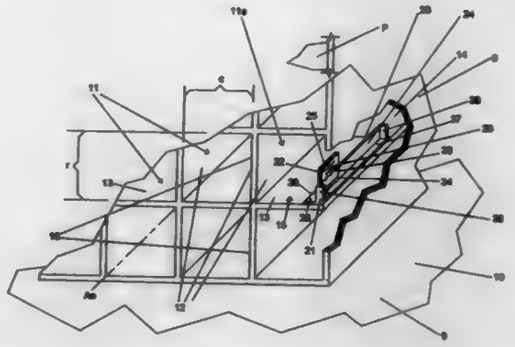
MOUNT FOR USE WITH A POSTAL SORTING TRAY

Aleksander Fajnsztajn, P.O. Box 6684, San Rafael, Calif. 94903

Filed Dec. 27, 1993, Ser. No. 173,202

Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—10 **9 Claims**



1. A mount for use with a status bar used within a mail sorting tray, said sorting tray including a series of longitudinally slots normalized to a given geographical area or street region, each of said slots being associated with a given address within such geographical area or street region, said status bar comprising a transversely directed leg and a longitudinal directed leg and being color coded to indicate a change in status of at least one addressee associated with a given slot, said mount to be attached to said transversely directed leg of said bar and comprising a first U-shaped member having a pair of coextensive side walls and an end wall defining a tear-drop shaped cavity having a bulbous portion adjacent to said end wall and a declining apex remote from said common end wall, said declining apex being outwardly biasable to permit entry therethrough for the purpose of releasable attachment of at least a card having written indicia about an addressee thereon, said mount including a planar member having a first segment having a broad surface in contact with one of said side walls and a second segment intragally formed within and cantilevered with respect to said first segment, said second segment of said planar member including a stepped bulbous section for attachment to said transversely directed leg of said bar along at least two separate surfaces for rigidizing attachment therebetween.

5,469,976

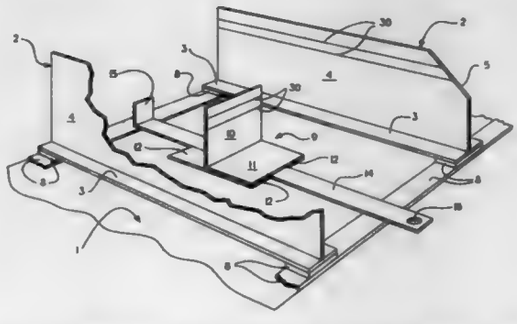
SHELF ALLOCATION AND MANAGEMENT SYSTEM

James R. Burchell, 318 New York Ave., Clairton, Pa. 15025

Filed Apr. 30, 1993, Ser. No. 55,679

Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—59.3 **4 Claims**



1. A shelf allocation management system for allocating shelf space among rows of products and for moving the rows of products towards the front of the shelf, said shelf allocation and management system comprising:

(a) at least two adjacent side rail assemblies positioned on the shelf extending from the front of the shelf to the back of the shelf, each said side rail assembly including a generally flat base rail and a rigid divider attached to and extending upwardly from said base rail, wherein at least one row of product may be positioned between said adjacent side rail assemblies, each side rail assembly being removably attached at appropriate positions on the shelf so as to facilitate adjustment of the distance between the said side rail assemblies to accommodate products of varying dimensions;

(b) an unbiased backstop assembly positioned between said dividers of said adjacent side rail assemblies, said backstop assembly moveable between the front and back of the shelf and adapted to engage and advance at least one row of products which may be positioned between said dividers of said adjacent side rail assemblies towards the front of the shelf; said backstop assembly to include a channel adapted to slideably receive a puller member; and

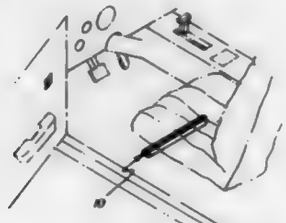
(c) a rigid puller member positioned between said dividers of said adjacent side rail assemblies and associated with said backstop assembly, said puller member adapted to be manually moved towards the front and the back of the shelf to move said backstop assembly towards the front of the shelf, said puller member extending through the channel in the backstop assembly such that when said puller member is advanced towards the front of the shelf it simultaneously advances the backstop assembly towards the front of the shelf, but such that the puller member, when pushed towards the back of the shelf, does not disturb the position of the backstop assembly and leaves the backstop assembly in contact with at least one row of product.

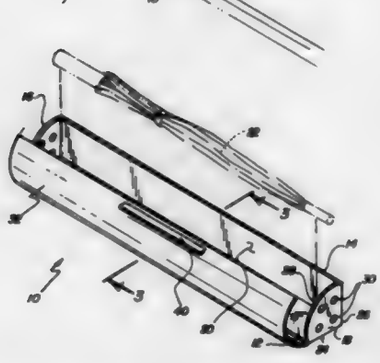
5,469,977

UMBRELLA HOLDER

Matney R. Tipton, 5100 Rolling Oak La., Charlotte, N.C. 28227

Filed Jul. 29, 1994, Ser. No. 282,320
Int. Cl.[6] A47F *7/00*
U.S. Cl. 211—62 **7 Claims**





1. A new umbrella holder comprising:

a substantially rectangularly shaped bottom wall;

a substantially rectangularly shaped side wall fixedly secured at an edge thereof to an inner edge of said bottom wall, with said bottom wall and said side wall each having a pair of lateral outboard edges;

a pair of spaced end walls mounted to said outboard edges of said bottom wall and said side wall such that said end walls are substantially orthogonally oriented relative to both said bottom wall and said side wall so as to define an interior cavity operable to receive an umbrella therewithin, said end walls being substantially identical in configuration and each including a flat bottom edge orthogonally oriented relative to a flat side edge, with an arcuate edge extending between said bottom and side edges so as to define a substantially quarter-round shape, with said flat bottom edge being coupled to said outboard edge of said bottom wall, and said flat side edge being coupled to said outboard edge of said side wall, with said arcuate edge having a radius of curvature substantially equal to a height of said side wall, and each of said end walls further having at least one ventilation aperture permitting a cross-flow of air through said holder; and,

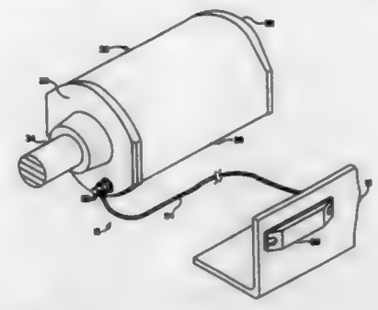
an arcuate cover pivotally mounted to an outer edge of said bottom wall, said arcuate cover having a substantially quarter-round shape defined by said radius of curvature of said end walls.

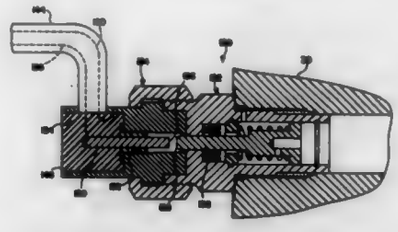
5,469,978

CONDITION INDICATING SYSTEM FOR RAILWAY CAR CUSHIONING UNIT

Kevin Bankos, York, and Douglas J. Bingler, Camp Hill, both of Pa., assignors to Keystone Railway Equipment Company, Inc., Mechanicsburg, Pa.

Filed Jul. 12, 1994, Ser. No. 273,727
Int. Cl.[6] G01L *19/00*
U.S. Cl. 213—223 **9 Claims**





1. A railway car cushioning system comprising,

A) a hydraulic—pneumatic cushioning device for cushioning a railway car, said device comprising a cushioning device body having an interior chamber, a device piston in the chamber, a piston rod connected to the device piston and extending outwardly of the cushioning device body, and hydraulic fluid and a pressurized gas in the chamber;

B) a pressure indicator mounted on said cushioning device body and located in communication with pressurized hydraulic fluid in the chamber, the pressure indicator including an indicator body, a movable member disposed in the indicator body including an exposed actuator pin and an indicator piston, a first switch contact on the actuator pin, a spring biasing the movable member toward the interior chamber, a seal between the movable member and indicator body, a first attachment member on the indicator body adjacent to the exposed actuator pin, a first electrical contact surface on the indicator body, the pressure indicator including a first electrical circuit path extending from the first electrical contact surface to the first switch contact; and

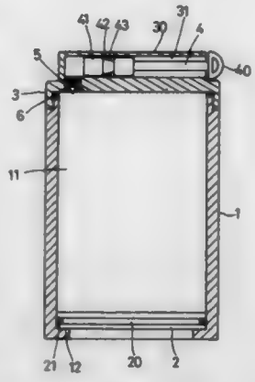
C) a signal unit including a signal unit body, first and second terminals, a contact member, a second switch contact on the contact member, an insulator between the contact member the signal unit body, a second electrical contact surface on the signal unit body, a second electrical circuit path extending through the signal unit between a first terminal and the second electrical contact surface, and a third electrical circuit path extending through the signal unit from a second terminal to the second switch contact, a second attachment member on the signal unit body complimentarily engagable and disengagable with the first attachment member to mount the signal unit on the pressure indicator with the first and second electrical contact surfaces engaging each other and the second switch contact adjacent to the first switch contact such that movement of the movable member outwardly of the hydraulic—pneumatic cushioning device by pressurized hydraulic fluid moves the first switch contact into engagement with the second switch contact to form a closed electrical connection between said terminals.

5,469,979

ADJUSTABLE SEALED CAN

Wen-Nen Chiou, 1-25, Gun Cao, Gun Nan Trueng, An-Tin Hsiang, Tainan Shien, Taiwan, Prov. of China

Filed Oct. 21, 1994, Ser. No. 326,845
Int. Cl.[6] B65B *31/04*; B65D *21/08*
U.S. Cl. 215—228 **5 Claims**



1. An adjustable sealed can comprising:

a can body having an upper opening, a bottom opening, a hollow interior, and an inwardly extending annular bottom wall defining the bottom opening;

a movable bottom plate sized to fit laterally in the hollow interior of said can body, the plate including a circumferential groove for an annular gasket to fit therein;

a cap for closing the upper opening of said an body, the cap having an elongated block on top, said block having a longitudinal hollow pumping chamber, said longitudinal hollow chamber arranged transversely across the top of said cap, and a valve hole at an inner end of said pumping chamber;

a pumping rod fitting closely in said pumping chamber of said elongated block of said cap, the rod having a grip at an outer end, and an inner end portion provided with an annular groove for receiving an annular gasket;

an air valve fitting vertically in said valve hole of said elongated block of aid cap, the air valve including a cylindrical valve base, a stopper and a spring, said valve base having a center through hole with a cone-shaped lower opening, said stopper fitting in said through hole and elastically maintained therein by said spring;

an anti-leak gasket fitting around an inner upper wall of said cap; and

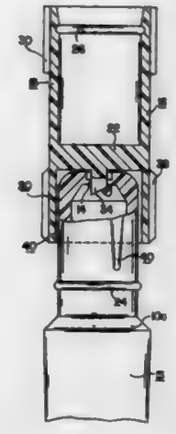
said movable bottom plate being movable upwardly from said annular bottom wall of said can body to force air in said can body to flow out through said air valve into said pumping chamber in said block of said cap, and said pumping rod in said pumping chamber being reciprocable to pump the air out from said pumping chamber to establish a substantially vacuum condition in the can body for keeping food stored therein fresh for a long time.

5,469,980

CHILD RESISTANT CONTAINER CLOSURE ASSEMBLY

John R. O'Meara, Jamesburg; David R. Cistone, Millville, both of N.J., and Louis Travalent, Jr., Lee's Summit, Mo., assignors to Wheaton Holding, Inc., Wilmington, Del.

Filed Jan. 26, 1994, Ser. No. 188,596
Int. Cl.[6] B65D *51/22*
U.S. Cl. 215—228 **12 Claims**



1. A container-closure assembly comprising a container having a nozzle portion with a puncturable diaphragm defining a discharge opening and a closure including a piercing portion of generally cup-like form positionable over the nozzle and having a piercing element recessed in the piercing portion of the closure of a predetermined axial length less than the diameter of the piercing portion; and

a plurality of axially extending circumferentially spaced ribs on the exterior surface of the nozzle portion and a plurality of circumferentially spaced grooves on the interior wall of the piercing portion to provide interengaging guide means when applying the piercing portion over the nozzle portion to pierce the diaphragm, the number of the circumferentially spaced grooves on the interior wall of the piercing portion being twice the number of ribs on the exterior surface of the nozzle portion spaced relative to one another so that the ribs on the exterior surface of the nozzle portion engage with selective ones of the grooves in the piercing portion when applying the piercing portion over the nozzle portion of the container.

5,469,981

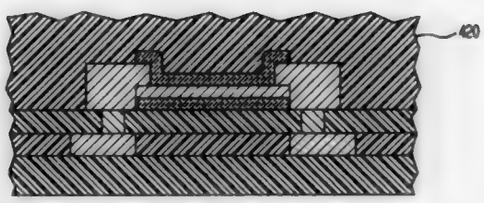
ELECTRICALLY BLOWABLE FUSE STRUCTURE MANUFACTURING FOR ORGANIC INSULATORS

Kris V. Srikrishnan, Wappingers Falls; James F. White, Newburgh, both of N.Y., and Jer-Ming Yang, Changhua City, Taiwan, Prov. of China, assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 192,760, Feb. 7, 1994, Pat. No. 5,389,814, which is a continuation of Ser. No. 23,278, Feb. 26, 1993, abandoned. This application Oct. 14, 1994, Ser. No. 323,196
Int. Cl.[6] H01B *13/00*
U.S. Cl. 216—13 **8 Claims**

1. A method of manufacturing a reliable fuse structure in contact with an organic insulator, comprising the steps of:

providing a substrate with a surface containing electrical contact areas in a first insulating organic layer,



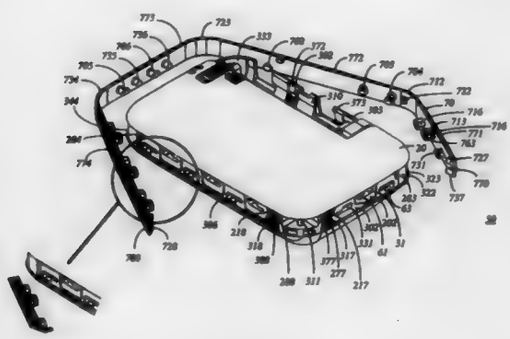
depositing a layer of first heat shield material,
depositing a layer of fusing material,
patterning said layers of heat shield and fusing material, thereby creating a fuse element and a heat shield member,
forming and patterning a plurality of conductors such that the ends of said fuse element are electrically contacted by a pair of said conductors,
depositing and patterning a second heat shield member over said fuse element, so as to substantially cover the fuse element, and
coating the entire surface of said substrate including said fuse element and said conductors with a second organic insulating layer.

5,469,982

FOUR-SIDED HOUSING LATCH

Ryszard J. Gordecki, and Kian T. Tan, both of Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 23, 1994, Ser. No. 294,297
Int. Cl.[6] B65D *6/24*
U.S. Cl. 220—4.02 **8 Claims**



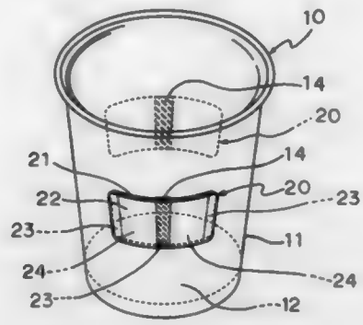
1. A double-housing retainer assembly comprising:
a pair of interlocked housings having a recessed border and mating cavities in the recessed border: and
a peripheral resilient latching band for fastening to the mating cavities around the recessed border, wherein the band comprises an open-ended trapezium housing latch comprising:
a first, shortest, side having a first free end;
a second, longest, side;
a first-to-second rounded corner connecting the first and second sides;
a third, next to shortest, side;
a second-to-third rounded corner connecting the second and third sides;
a fourth, next to longest, side having a second free end;
a third-to-fourth rounded corner connecting the third and fourth sides; and
an opposed pair of locking members disposed at the first and second free ends for securing the latch around the recessed border of the housings.

5,469,983

HEAT INSULATING CONTAINER AND CONTAINER HOLDING MEMBER

Masaya Yawata, Moriyama, Japan, assignor to Sado Yawata, and Masaki Kato, both of Shiga, Japan

Filed Dec. 13, 1994, Ser. No. 357,214
Claims priority, application Japan, Jun. 19, 1993, 5-187708
Int. Cl.[6] B65D *25/34*
U.S. Cl. 220—412 **9 Claims**



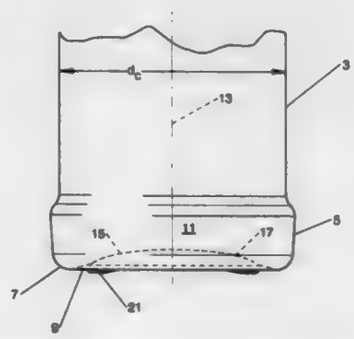
1. A heat insulating container comprising:
a container body; and
a laminated body in which base materials which differ in heat shrinkage percentages are laminated,
said base materials in the laminated body being bonded to each other by bonded portions spaced apart from each other,
the base material having a high heat shrinkage percentage in the laminated body being mounted with it directed toward an outer surface of the container body.

5,469,984

CONTAINER OF THERMOPLASTIC MATERIAL FOR CONTAINING LIQUIDS

Petros Kalkanis, Napplion, Greece, assignor to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US92/07871, § 371 Date Jul. 22, 1994, § 102(e) Date Jul. 22, 1994
PCT Filed Sep. 17, 1992, Ser. No. 211,188
Claims priority, application European Pat. Off., Sep. 27, 1991, 91202524
Int. Cl.[6] B65D *6/38*
U.S. Cl. 220—606 **7 Claims**



1. Container of thermoplastic material for containing liquids, the container having a side wall and a base connected to the side wall, the base generally extending transverse to the side wall, the base comprising:
a curved section connected to the sidewall,
a ring-shaped section connected to the curved section, the ring-shaped section having an inclination with respect to a plane perpendicular to a longitudinal axis of the container and

a central dome-shaped section connected to the curved section, wherein

the central dome-shaped section has in the plane of a cross-section perpendicular to the base, the plane comprising a central, longitudinal axis of the container, a dimension that is larger than 60% of a dimension, d_c, of the container along the cross section, both dimensions being measured in a direction perpendicular to the central, longitudinal axis, the central dome-shaped section comprising a lateral wall of radius of curvature r_1 such that $0.03\ d_c<r_1<0.22\ d_c$ and a cap of radius of curvature r_2 such that $0.3\ d_c<r_2<1.6\ d_c$.

5,469,985

STAINLESS STEEL CONTAINER WITH DEFORMATION PROTECTING DEVICE

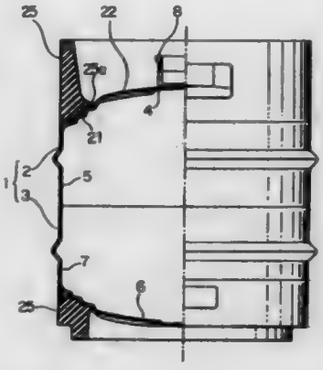
Kazuo Furuichi, Yokohama, and Tatsuya Gomi, Tokyo, both of, Japan, assignors to Fujitechno Ltd., Tokyo, and Suntory Limited, Osaka, both of, Japan

Filed Mar. 7, 1994, Ser. No. 206,187

Claims priority, application Japan, Mar. 12, 1993, 5-052504; Mar. 19, 1993, 5-060588; Apr. 6, 1993, 5-079585; Jun. 23, 1993, 5-151789; Jan. 20, 1994, 6-004523; Jan. 28, 1994, 6-008327; Jan. 31, 1994, 6-009596; Feb. 14, 1994, 6-017607

Int. Cl.[6] B65D *25/24*

U.S. Cl. 220—632 **13 Claims**



1. A metal container for storing liquid therein, comprising:

a cylindrical container body made of a metal plate, and having a cylindrical girth portion and upper and lower end walls at longitudinal ends of the girth portion,

a hardened region formed on at least one of the upper and lower end walls to harden the same for preventing deformation of the end wall, said hardened region including at least one annular stepped portion provided in a middle of the end wall to form an inner portion and an outer portion relative to the stepped portion, and a plurality of radial ribs formed in the inner portion and extending radially outwardly from a center portion thereof said inner portion being located axially outwardly relative to the outer portion along a longitudinal axis of the cylindrical girth portions, said annular stepped portion having an inclined surface and

a rubber protector fixed onto the end wall with the hardened region and extending from an end of the girth portion to the inclined surface of the end wall with the hardened region, said rubber protector preventing deformation of the end wall.

5,469,986

FRUIT BOX

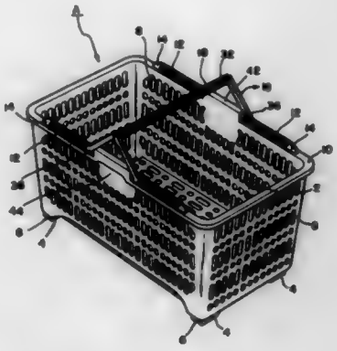
Keun H. Jang, 473, Jungsan-Dong, Kyungnan, Kyungbuk, Rep. of Korea

Filed Sep. 28, 1994, Ser. No. 314,002

Claims priority, application Rep. of Korea, Jan. 16, 1993, 93-21301 U

Int. Cl.[6] B65D *25/28*

U.S. Cl. 220—762 **4 Claims**



1. A box comprising:

a containing enclosure formed to be wider at an open end thereof and narrower at a closed end thereof;

a pair of grooves formed on opposing transverse ends of the closed end of said enclosure, said pair of grooves being parallel to each other;

an edge frame formed at a peripheral edge of the open end of said enclosure;

a pair of supporting frames formed on opposing longitudinal surfaces of said edge frame, each of said pair of supporting frames having an elongate hole formed therein;

a pair of handles pivotally and slidably mounted at a connection end thereof within the elongate holes of said pair of supporting frames, said pair of handles including a gripping portion opposite the connection end thereof;

a reinforcing member formed within the gripping portion of each of said pair of handles;

at least one hooking projection piece formed on the gripping portion of a first one of said pair of handles; and

at least one resilient piece formed on the gripping portion of a second one of said pair of handles for receiving said at least one hooking projection piece in a snap-fit manner;

wherein the pair of handles are independently slidable within the elongate holes at the connection ends thereof for enabling a first position of horizontal mating with said edge frame and a second position of joining the pair of handles together by a snap-fit connection.

5,469,987

CONTAINER WITH BAG DISPENSER

Bryan K. Honkawa, Venice, Calif., assignor to Roll International Corporation, Los Angeles, Calif.

Filed Mar. 16, 1994, Ser. No. 214,948

Int. Cl.[6] G07F *11/02*

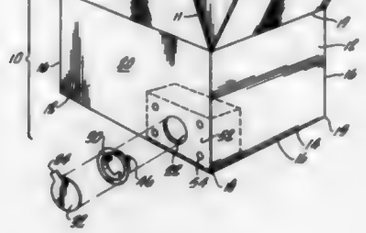
U.S. Cl. 221—96 **20 Claims**

1. A container with a bag dispenser comprising:

a first box comprising a bottom, four walls and a top forming a first interior space wherein at least one of said four walls contains a first opening for dispensing bags therethrough;

a second box comprising four walls, a top and a bottom forming a second interior space, wherein at least one of said four walls, said top or said bottom contains a second opening for dispensing bags therethrough; and

a means for attaching said second box to said first box within said first interior space such that said first opening and said second opening are aligned.

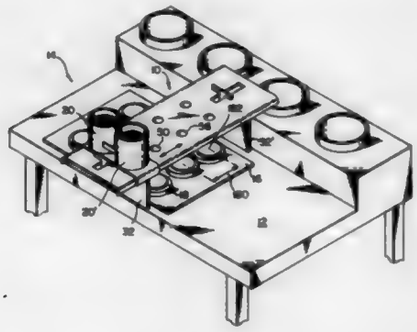


5,469,988

APPARATUS FOR DISPENSING PARTICULATE CONDIMENTS

Douglas X. Huang, 420 Maynard Ave. South #318, Seattle, Wash. 98104

Filed May 4, 1994, Ser. No. 237,643
Int. Cl.[6] G01F *11/00*
U.S. Cl. 222—1 23 Claims



1. A device for dispersing particulate condiments comprising:
a transfer plate having all aliquoting reservoir, the reservoir having a transfer opening;
a condiment hopper assembly mounted for translation on the transfer plate and including a condiment hopper having a bottom opening registrable with the transfer opening; and
moveable valve means automatically responsive to the position of the hopper assembly with respect to the transfer opening for controlling the dispensing of condiments from the reservoir.

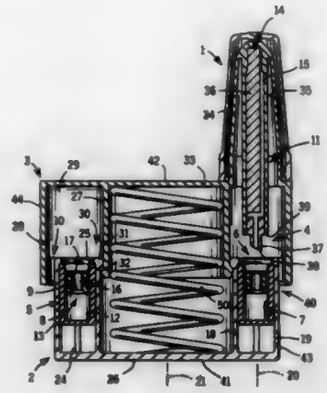
20. A method for dispensing particulate condiments comprising the steps of:
loading particulate condiments into a hopper translatably mounted above a transfer plate, the plate defining a reservoir having a transfer opening registrable with a bottom opening of the hopper;
translating the hopper with respect to the plate so that the bottom opening successively passes into, then out of, register with a transfer opening;
automatically closing a dispensing aperture of the reservoir while the bottom opening is at least partially in register with the transfer opening: and
automatically opening the dispensing aperture while the bottom opening is entirely out of register with the transfer opening, whereby a pre-determined aliquot of condiments is dispensed from the reservoir.

5,469,989

DISPENSER FOR POSITIVELY DISCHARGING A MEDIUM THROUGH A PLURALITY OF MOTIONS

Lothar Graf, Rielasingen-Worblingen, and Karl-Heinz Fuchs, Radolfzell, both of, Germany, assignors to Ing. Erich Pfeiffer GmbH & Co. KG, Radolfzell, Germany

Continuation of Ser. No. 958,367, Mar. 1, 1993, abandoned.
This application Oct. 7, 1994, Ser. No. 320,794
Claims priority, application Germany, Jul. 4, 1990, 40 21 263.7
Int. Cl.[6] B65D *88/54*
U.S. Cl. 222—82 41 Claims



1. A dispenser for positively discharging a medium through an outlet (14), said dispenser (1) comprising:
a discharge unit (6,6a) for expelling the medium in the form of a first charge volume unit as a function of a discharge actuation that induces a discharge operation during at least one discharge cycle, said discharge unit (6, 6a) including a discharge piston (9, 9a) traversed by an outlet duct (15, 15a), said outlet duct (15, 15a) connecting to said outlet (14, 14a);
a first dispenser section (2,2a) and a second dispenser section (3,3a) reciprocally displaceable in a first operating motion defining a first motion direction, at least one of said first and second dispenser sections (2,3) being displaceable in a second operating motion significantly diverging from said first operating motion;
medium reservoir means in said first dispenser section for containing a plurality of charge volume units including a first charge volume unit and a second charge volume unit; and
means for discharging said first charge volume unit through said first operating motion and for successively discharging a second charge volume unit after reciprocally displacing said first and second dispenser sections (2, 3) in said second operating motion, wherein prior to discharge, at least one of the first and second charge volume units is substantially sealingly enclosed.

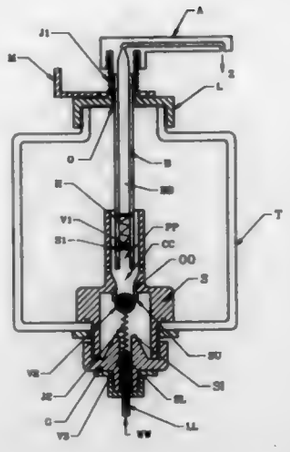
5,469,990

SELF CLEANING LIQUID SOAP DISPENSER

Josef Wodeslavsky, #5 Peter Lynas Ct., Tenafly, N.J. 07670

Filed Jul. 29, 1994, Ser. No. 282,318
Int. Cl.[6] B67D *5/42*
U.S. Cl. 222—148 10 Claims

1. A self cleaning liquid soap dispenser comprising;
a tank for storing soap, said tank comprising an opening at the top for refilling the tank with soap, and an opening at the bottom which is adapted to a pressurized water line, said tank further comprising a plug adapted to the top;
a plunger having a bore therethrough, said bore terminating in a nozzle protruding from said plug and out of said container, for ejecting soap from said container when the plunger is depressed;



a piston means having a bore therethrough mounted on said plunger, the plunger and piston having a continuous passage therethrough designed to permit flow of fluid, said passage having a first valve means for providing selective communication from the tank to the user;

a cylinder body means having a bore therethrough, said cylinder body means is mounted in the tank for slidingly receiving the piston means such that when the plunger is not pressed soap in the tank fills the cylinder body means and when the plunger is in a first depressed position soap is spat out from the cylinder body means into said passage via the first valve means, the soap being ejected to the user;

a second valve means mounted in the cylinder body for providing selective communication between the water line and the cylinder body means such that when the plunger is not pressed, the second valve means remains closed so that no water enters into said passage, further, when said plunger is depressed to a second depressed position, the plunger will push said second valve means to open position so that water from the water line will continuously enter into the cylinder body means, pushing the soap in the plunger out to the user as the water is continuously rinsing the piston, the cylinder the passage, and the first and second valve means.

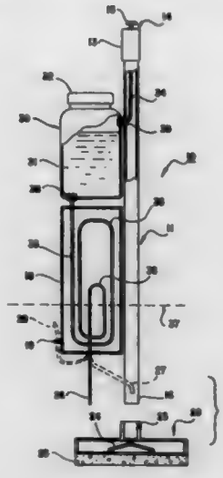
5,469,991

DEVICE FOR PORTIONING A LIQUID SUBSTANCE

Eino Hämäläinen, Iso-Heikkiläntie 5, SF-20200 Turku, Finland

Filed Feb. 16, 1995, Ser. No. 389,967

U.S. Cl. 222—188 **2 Claims**



1. A device for portioning a liquid substance comprising:

an airtight container for holding and discharging said liquid substance, said container comprising a top portion and a bottom portion, said top portion being provided with a means for adding said liquid substance to the container and said bottom portion being provided with an opening for discharging said liquid substance from the bottom of the container, and said container being provided with an opening for allowing air to enter the container;

an air duct provided with a valve for introducing air into said container, said air duct being connected to the opening in the top portion of said container; and

a tube for discharging said liquid substance by gravity from below the bottom of said container, said tube having first and second ends, said first end being connected to the opening in the bottom portion of said container, said second end being located below said first end, and said tube being formed into at least two closed loops between said first and second ends to form an air/hydraulic lock for preventing air from flowing through said tube into said container.

5,469,992

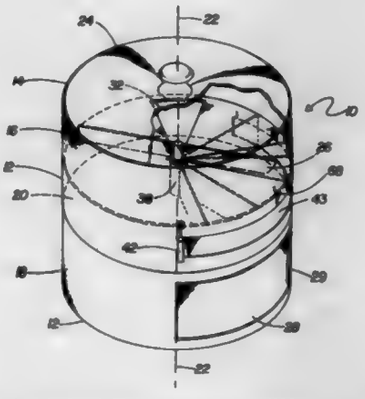
MULTI-COMPARTMENTED DEVICE FOR DISPENSING EXACT QUANTITIES OF DRY MATERIAL

Johnny L. Jenkins, 3767 Hardee Dr., Kennesaw, Ga. 30144

Filed Jan. 3, 1994, Ser. No. 176,533

Int. Cl.[6] G01F *11/10*

U.S. Cl. 222—362 **19 Claims**



1. A canister device enabling loose dry material to be dispensed in selected quantities as substantially exact fractions of a cup, said device comprising a housing having upper, mid and lower sections, with said upper section having a refill opening for receiving dry material to be selectively dispensed, a multi-compartmented member operatively disposed in said mid section, said multi-compartmented member being rotatable in said mid section about a substantially vertically-disposed axis toward and away from a reference location, the compartments of said member being of a specific, uniform configuration and spaced symmetrically about the substantially vertical axis, said member being disposed between upper and lower generally planar partitions, an aperture of approximately the same configuration as the compartments of said rotatable member located in each of said partitions, but with one aperture located in an offset relationship with respect to the other, said upper partition being contiguous to said upper section in which dry material is contained, with such dry material dropping from said upper section of said housing under the influence of gravity through such aperture in the upper partition into one or more of the compartments of said member as such member is rotated about its axis away from said reference location, one or more of the compartments of said member being filled with dry material, with the number of compartments filled in a given instance being determined by the extent of rotation of said member away from said reference location, with the material in said compartments thereafter dropping downward through the aperture in

said lower partition into receiving means during rotation of said member back to said reference location, to achieve a dispensing of dry material into said lower section as a selected fraction of a cup measurement, a portion of said lower section serving as a support for said receiving means as well as forming a support stand for said canister device.

5,469,993

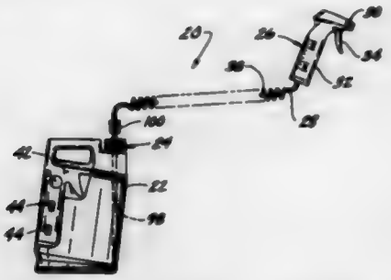
DISPENSING SYSTEM

Barry W. Hauf, St. Louis, Mo.; Stephen K. Jones, Stratford; Joseph E. Johnson, Jr., Noank, both of Conn., and Roger L. Paquin, Alpharetta, Ga., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 2, 1993, Ser. No. 161,781

Int. Cl.[6] B67D *3/00*

U.S. Cl. 222—383.3 **43 Claims**



1. A dispensing system comprising a container for containing a liquid to be dispensed, said container having a top and opposing side walls, a sprayer comprising a spray head and a handle connected to the spray head, flexible tubing having an inlet end adapted to communicate with the interior of the container and an outlet end connectable to the sprayer for conveying liquid from the container to the sprayer, a recess in one of said opposing side walls of the container sized and shaped for receiving the handle of the sprayer, and means for attaching the sprayer to the container with the sprayer in said recess in a position wherein the spray head of the sprayer is generally adjacent the top of the container to minimize leakage of liquid from the container through the sprayer, the sprayer being detachable from the container for dispensing liquid from the container.

5,469,994

APPARATUS AND METHOD FOR DOSING A PARTICULATE PHASE PRESENT IN A GAS/PARTICLE FLOW FROM A FLUIDIZED BED

Lothar Reh, Zumikon; Marc Tesch, Forch; Beat Häni, Zuzwil, and Arthur Ruf, Schwerzenbach, all of, Switzerland, assignors to Bühler AG, Uzwil, Switzerland

Filed Sep. 9, 1992, Ser. No. 942,673

Claims priority, application Switzerland, Sep. 9, 1991, 02641/91

Int. Cl.[6] C10J *3/50*

U.S. Cl. 222—630 **56 Claims**

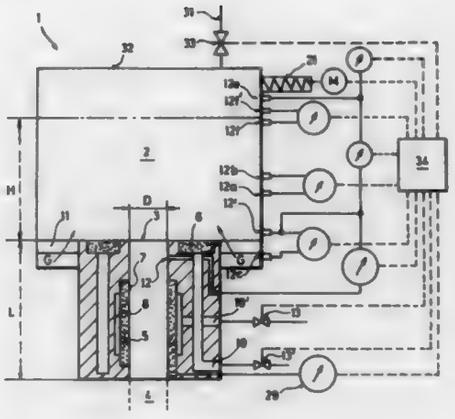
1. A dosing apparatus for dosing a particulate phase within a free-flowing two phase flow, consisting of a gas phase and a particulate phase, said two phase flow leaving a fluidized bed of a fluidizing apparatus with a fluidizing bottom through at least one outlet orifice of said fluidizing apparatus, said fluidized bed having a vertical bed height and a horizontal bed cross section, said dosing apparatus comprising:

at least one discharge pipe connected to said at least one outlet orifice, said at least one discharge pipe having an inner discharge cross section, a discharge diameter and a discharge direction leading away from said at least one outlet orifice;

controlling means adjacent to said at least one outlet orifice for controlling a constant mass flow of said particulate phase through said at least one discharge pipe and for controlling the homogeneity of said two phase flow, said controlling means comprising nozzle means for injecting gas into said two phase flow; and

pneumatic gas supply means for supplying said nozzle means with gas; and

wherein said nozzle means comprises at least one injection device for injecting gas into said fluidized bed.



5,469,995

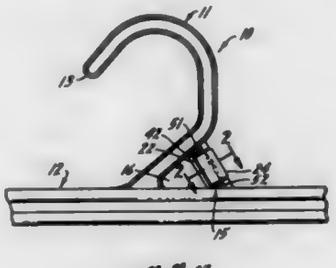
GARMENT HANGER SIZING SYSTEM

Robert Bredeweg; Russell O. Blanchard; Donald F. Morgan, all of Zeeland, and Edward J. Dooley, Holland, all of Mich., assignors to Batts, Inc., Zeeland, Mich.

Continuation-in-part of Ser. No. 57,139, May 5, 1993, abandoned. This application Apr. 29, 1994, Ser. No. 235,209

Int. Cl.[6] A47G *25/14*

U.S. Cl. 223—85 **10 Claims**



8. In combination with a garment hanger having garment support means and hang means,

size indicator means carried by said garment hanger, said size indicator means including

a base member extending away from said garment hanger,

a seat member disposed at a distal end of the base member,

a portion of the seat member which is adjacent the base member having a greater thickness than a thickness defined by a distal end of the seat member,

a size indicator tab construed and arranged to assemble to the seat member,

said size indicator tab having a generally U-shaped configuration which includes a bight portion and a pair of side walls which extend in generally the same direction from the bight portion of the tab,

said bight portion, when the tab is assembled to the seat member, being disposed at the distal end of the seat member,

a distal free end of each side wall having an end portion which projects inwardly toward the base member when the tab is assembled to the seat member,

an open distance between said inwardly projecting end portions of each of said side walls which projects toward the base member being less than the thickness of the seat member adjacent the base member

to thereby resist separation of the tab from the seat member,

no portion of the side walls between the bight portion and the end portions of the side walls which extend inward towards the base member being in separation restraining engagement with the seat member.

5,469,996

THREADING DEVICE

Paul Hürlimann, Baden, Switzerland, assignor to Tavaro, S.A., Geneva, Switzerland

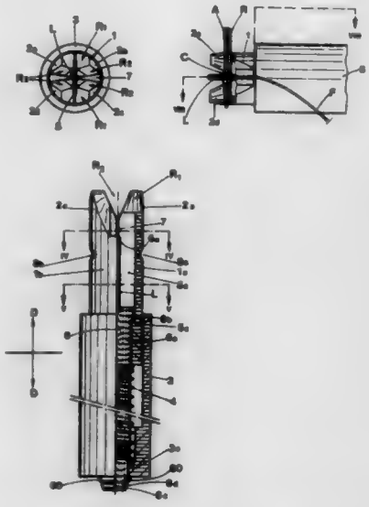
PCT No. PCT/CH93/00058, § 371 Date Nov. 9, 1993, § 102(e) Date Nov. 9, 1993, PCT Pub. No. WO93/18220, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 8, 1993, Ser. No. 146,017

Claims priority, application Switzerland, Mar. 9, 1992, 00743/92

Int. Cl.[6] D05B *87/02*

U.S. Cl. 223—99 **3 Claims**



1. A device for threading a sewing needle, comprising:

a body having an axial passage opening at a first end thereof;

a movable member carrying a blade having a thread gripping member adjacent a tip thereof, said movable member being displaceable in said passage between a first extreme position, in which said blade is withdrawn into the passage, and a second position in which said blade at least partly protrudes from said body;

a pusher member integral with said movable member and slidably mounted on a second end of said body, opposite said first end thereof;

at least one resilient member for biasing said movable member into said first extreme position, said first end of the body having first and second orthogonal front grooves having a profile converging towards said passage, said first groove being coplanar with said axial passage of the body and the distance between said opening and the bottom of said second groove being less than the distance between said passage and the bottom of said first groove; and

a narrow slit for receiving a thread therein, connecting the bottom of said second groove and said opening of said axial passage, said slit having transversely converging walls defining a central restricted zone where a pinching action is exerted on said thread for frictionally retaining said thread.

5,469,997

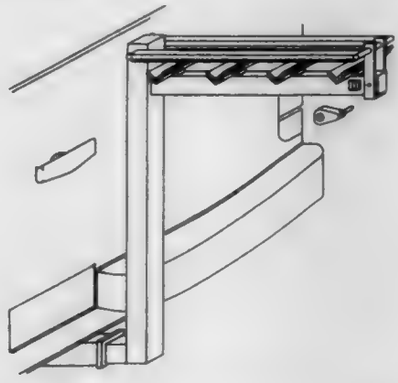
MULTI-BICYCLE REAR MOUNTING BICYCLE RACK

David C. Carlson, 5 La Villita Cr. NE., Albuquerque, N.M. 87112

Filed Sep. 13, 1994, Ser. No. 305,077

Int. Cl.[6] B60R *9/00;11/00*

U.S. Cl. 224—521 **6 Claims**



1. A bicycle carrier frame comprising:

a. a carrier frame adapted to hold multiple bicycles including means for attaching said frame to an automobile;

b. said frame including a vertical support member and a horizontal support member cantilevered from said vertical support member, a plurality of carrying brackets spaced on horizontal support member each adapted to receive a bicycle tubular frame member;

c. each bracket including a means for adjusting the size thereof relative to a diameter of the bicycle tubular frame member to be held;

d. a locking arm having a pair of parallel side elements, a first of said end elements pivotally mounted to said vertical support frame member whereby said locking arm rotates to overlie said carrying brackets for clamping said bicycle tubular frame members to said brackets, and said opposite end element having means for securing said locking arm to said horizontal support frame member.

5,469,998

SPARE TIRE CARRIER FOR A TOW HITCH

Donn S. Van Dusen, Loma Rica, and Douglas P. Gibbs, Yuba City, both of Calif., assignors to Mascotech Accessories, Inc., Sacramento, Calif.

Continuation of Ser. No. 144,760, Oct. 28, 1993, abandoned. This application Jan. 17, 1995, Ser. No. 373,486

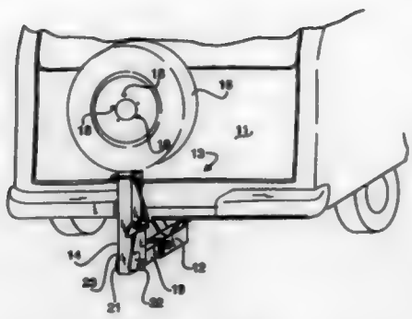
Int. Cl.[6] B62D *43/02*

U.S. Cl. 224—506 **21 Claims**

1. In a spare tire carrier having tire mount structure to project from a vehicle having a hitch receiver, for movement between a position for transportation of a tire and an inactive position, the improvement comprising the combination of:

(a) an elongated arm connected to and projecting from said tire mount structure; and

(b) a bracket for interacting with said arm as said tire mount structure moves with said arm between said transportation position and said inactive position, said bracket having a



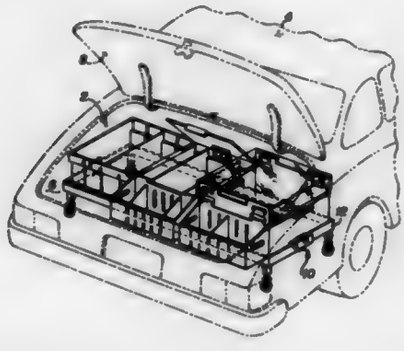
cinch to maintain said arm with said tire mount structure selectively in said transportation position, said cinch having a latch for holding said arm when said tire mount structure is in said transportation position and a lever for manipulating said latch to release said arm and said tire mount structure from said transportation position, said arm including a bearing surface having an over-center location thereon, said lever being rotatable about an axis adjacent said arm, said lever further including a protuberance rotatable about an axis between a release position in which said protuberance is on one side of said over-center location on said bearing surface when said lever releases said latch and a locked position in which said protuberance is on the other side of said over-center location at which said protuberance engages said bearing surface, thereby holding said elongated arm and said tire mount structure in said transportation position.

5,469,999

MODULAR STORAGE AND ORGANIZING SYSTEM FOR VEHICLES

George Phirippidis, 5815 Commerce Dr., Fremont, Calif. 94555

Filed Jul. 29, 1993, Ser. No. 99,063
Int. Cl.[6] B60R 7/00
U.S. Cl. 224—542 **8 Claims**



1. An improved universal modular storage system for vehicles of the type having a plurality of adjacently disposed generally box-shaped storage units including at least one main storage unit and at least one auxiliary storage unit, each of said units having a plurality of upstanding panel walls including a front panel, a rear panel and a pair of spaced apart side panels disposedly connected between said front and rear panels and wherein at least one of said panel walls includes means for engaging a panel wall of an adjacently disposed storage unit, wherein the improvement comprises:

a) at least one panel wall engaging means having means for restraining relative movement between adjacently disposed storage units, said engaging means including

i) a semi-circular flange having at least one slot, formed therethrough said flange being formed along the entire length of a first top edge of one of said panel walls and said slot being formed partially along said length;

ii) said semi-circular flange having a cavity on a bottom side thereof sized for receivingly engaging a second top peripheral edge of a panel wall of an adjacently disposed storage unit; and

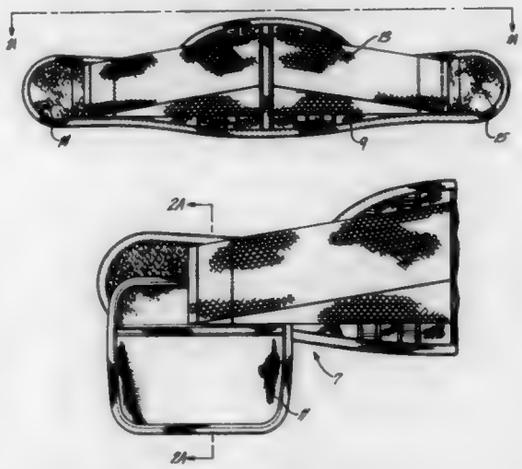
iii) said second top peripheral edge of said panel wall of said adjacently disposed storage unit includes a tab member extending therefrom sized for snug fit insertion within said slot when said semi-circular flange is receivingly engaged over said second top edge.

5,470,000

SUPPORT, CARRIER BELT SYSTEM

Jose C. Muñoz, Pico Rivera, Calif., assignor to McGuire Nicholas Company, Inc., Commerce, Calif.

Filed Apr. 20, 1994, Ser. No. 230,078
Int. Cl.[6] A45F 5/00
U.S. Cl. 224—224 **16 Claims**



1. A support, carrier belt system comprising:

a) a support belt, comprising opposed end segments with first fasteners for adjustably connecting the segments to each other, the belt having a pair of tightening straps therein, each tightening strap having one end attached to the support belt and an opposed free end, each tightening strap having on its free end a second fastener for adjustably connecting the tightening strap to a respective one of the first fasteners; and

b) at least one carrier device comprising a body portion having a front face and a rear face, the front face having a third fastener for removable connection to the second fasteners and the rear face having a fourth fastener for removable connection to the first fasteners so that the support device can be attached to one of the support belt end segments and one of the tightening straps so that the support belt can be adjusted without disengaging the carrier device from the support belt.

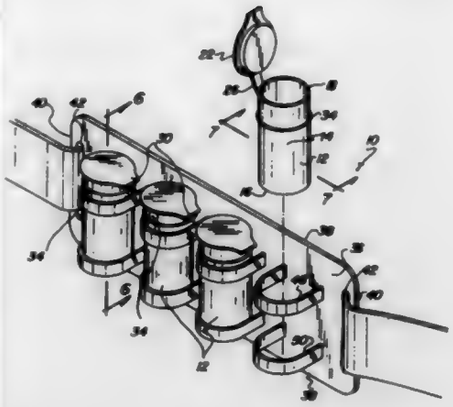
5,470,001

JARS FOR CARRYING FISHERMAN'S BAIT AND SUPPORT MEMBER FOR THE JARS

Larry L. Konchan, 1614 Christopher St., Johnstown, Pa. 15905

Filed May 5, 1994, Ser. No. 238,656
Int. Cl.[6] A45F 5/00
U.S. Cl. 224—253 **1 Claim**

1. An assembly for carrying fisherman's bait comprising, in combination:



a plurality of jars, each jar being molded of a plastic material in a cylindrical configuration with a cylindrical side wall, an integral bottom wall, an open upper end and a removable imperforate cap in connection with said upper end, with a strap coupling one edge of each cap with an adjacent section of an associated side wall of said jars, each cap having a forwardly extending flap extending beyond its associated side wall on the side of the lid remote from the strap, each side wall having an outstanding annular rib adjacent to the upper end of the side wall; and

a flexible member having long parallel horizontal side edges and short parallel vertical end edges, the member being imperforate except for two vertical elongated apertures, one of said apertures located adjacent to one of the end edges and the other of said apertures located adjacent the other of said end edges wherein both of said apertures being adapted for the passage of a belt of a user for coupling the member to the user, a plurality of separate top and bottom strips in vertically aligned pairs at spaced locations along the length of the member between the end edges, the top and bottom strips being of a common size to allow the passage of the lower end of one of the jars downwardly through the top strip to the bottom strip of each pair of said strips with the annular rib adjacent to and abutting an upper surface of the respective top strip.

5,470,002

FOOD CONTAINER SELF-LEVELING DEVICE

Richard DiStefano, 1798 Norm Pl., Seaford, N.Y. 11783, and Alfred DiStefano, 8010 NW. 101st Ave., Tamarac, Fla. 33321

Continuation-in-part of Ser. No. 992,792, Dec. 18, 1992, abandoned. This application Sep. 12, 1994, Ser. No. 304,251

Int. Cl.[6] B60R *7/00*

U.S. Cl. 224—275 **17 Claims**

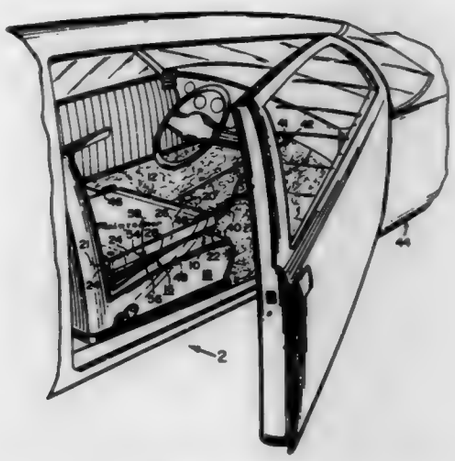
1. The combination of a self-leveling perishable product container and a vehicle with a seat and a seat belt restraint device which comprises:

an insulated carrying case having a hinged top cover, a bottom wall and a front, rear, and side upstanding walls for totally enclosing a perishable product therein;

automatic dynamic leveling means integral with said carrying case, for maintaining said carrying case from in an artificial level position in spite of the presence of horizontal driving accelerations generated by said vehicle when said case is placed on said vehicle seat;

retaining means attached to said hinged top cover for attaching said seat belt around said carrying case so as to positively prevent the horizontal driving accelerations from displacing said case from said seat; and

vibration isolation means incorporated in said leveling means for diminishing vertical ride vibrations generated by said vehicle; wherein



the perishable item within said carrying case is both prevented from sliding and spilling, and protected from ride vibrations while being transported in said vehicle.

5,470,003

ADJUSTABLE CROSS RAIL FOR A VEHICLE ARTICLE CARRIER

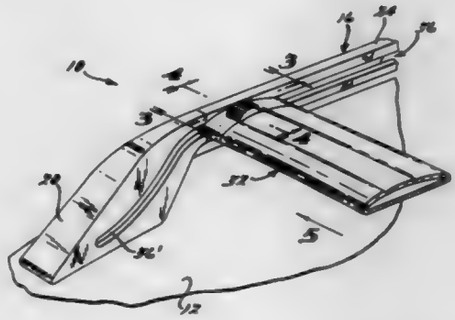
John S. Cucheran, Lake Orion, Mich., assignor to JAC Products, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 966,260, Oct. 26, 1992, Pat. No. 5,273,195. This application Dec. 1, 1993, Ser. No. 160,952

The portion of the term of this patent subsequent to Dec. 28, 2010, has been disclaimed.

Int. Cl.[6] B60R *9/00*

U.S. Cl. 224—316 **10 Claims**



1. A vehicle article carrier comprising:

a pair of laterally spaced apart side rail members positioned generally parallel to one another and extending longitudinally along an outer body surface of a vehicle;

a cross bar extending transversely between said side rail members for supporting articles above said outer body surface; and

a channel associated with at least one of said side rail members for adjustably supporting said cross bar for slidable movement along said side rail members along a first plane and for slidable movement between said first plane and a second plane spaced vertically apart from said first plane, such that when said cross bar is positioned in said second plane said cross bar is disposed in close proximate relation to said outer body surface of said vehicle, and when said cross bar is moved slidably from said second plane into said first plane said cross bar is disposed in a position spaced vertically above said second plane, and therefore above said outer body surface of said vehicle.

5,470,004

SEPARATING APPARATUS FOR A PUNCHED SHEET

Ryohachi Mineki, Tokyo, Japan, assignor to Takayoshi Mineki, Tokyo, Japan

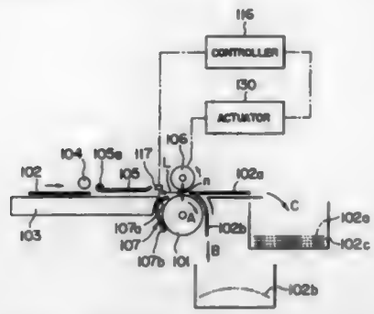
Filed Oct. 8, 1993, Ser. No. 134,303

Claims priority, application Japan, Jan. 14, 1992, 4-276256; Sep. 1, 1993, 5-217465

The portion of the term of this patent subsequent to Jun. 15, 2010, has been disclaimed.

Int. Cl.[6] B26F *3/02*

U.S. Cl. 225—99 **20 Claims**



16. A separating apparatus for a punched sheet having a portion surrounded by cuts comprising:

a feed roller for feeding the punched sheet;

a rotation support plate disposed at one side of the feed roller;

a pair of separate press rollers journaled on the rotation support plate at an angular spacing of 180 degrees from each other;

a connector for rotating the press rollers and the feed roller at the same surface speed;

a pair of separation helping devices supported on the rotation support plate at an angular spacing of 180 degrees to help in separation of the portion surrounded by the cuts from the punched sheet in cooperation with the press rollers; and

an actuator connected to the rotation support plate to rotate the rotation support plate so as to move the pair of press rollers and the pair of separation helping devices along a circumferential surface of the feed roller at the same speed as that of the punched sheet.

5,470,005

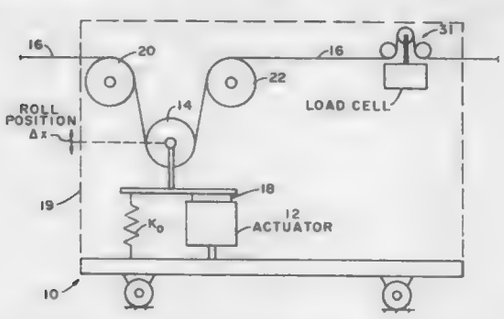
METHOD OF SHEET PROCESSING USING A TENSION EXCITER

Eugene O. King, Monroeville, and G. Alfred Teasley, Ross Township, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 904,482, Jun. 25, 1992, abandoned. This application Jun. 8, 1994, Ser. No. 255,422

Int. Cl.[6] B65H *16/00*

U.S. Cl. 226—1 **1 Claim**



1. A method of processing sheet metal having a certain modulus in a process using apparatus having a natural frequency and rotating components that have certain inertias, with tension changes in the sheet material propagating upstream and/or downstream from the location of the occurrence of the tension changes, the sheet metal having a mass flow balance as it travels through the process, the method comprising:

momentarily upsetting the mass flow balance of the sheet metal by means that introduces tension changes in the sheet metal at a location at which the metal is otherwise unsupported in its travel through the apparatus and process to determine the existence of any amplification of tension change occurring through the relationship of the mass flow of the sheet metal to sheet tension,

the means for introducing tension changes having a known spring rate,

describing said tension changes as a function of time and frequency,

relating tension changes occurring in an upstream or downstream location of the process to another upstream or downstream location, and

including as operating parameters of the relationship between mass flow and tension (1) the sheet metal modulus, (2) the inertia of the rotating components, (3) the spring rate of the means employed to introduce tension changes in the sheet metal, and (4) the natural frequency of the apparatus,

measuring the forces at which the tension changes in the sheet metal are momentarily introduced with a sensor that provides signals representing said forces,

measuring tension changes in the sheet metal with a second sensor that provides signals containing a plurality of frequencies representing a plurality of sheet tension changes propagating upstream and/or downstream from the location at which the tension changes are introduced,

analyzing the signals from said sensors to determine the influence of the above-named parameters on the relationship between mass flow and tension, and

using such determination to identify one or more of the rotating components of the apparatus contributing to tension changes.

5,470,006

SURGICAL FASTENING APPARATUS WITH LOCKING MECHANISM

Daniel P. Rodak, Milford, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 704,050, May 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 622,856, Dec. 6, 1990, abandoned. This application Aug. 11, 1992, Ser. No. 928,700

Int. Cl.[6] A61B *17/02*

U.S. Cl. 227—176 **28 Claims**

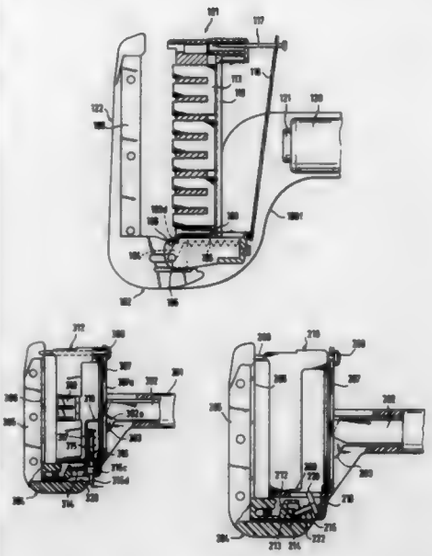
1. A surgical fastener applying apparatus which comprises:

a) a cartridge for holding a plurality of surgical fasteners;

b) means responsive to application of a fastener driving force for substantially simultaneously ejecting surgical fasteners from said cartridge;

c) approximation blocking means for blocking approximation of said cartridge from a proximal position to a distal position; and

d) a locking member supported within said cartridge, said locking member mounted for movement in response to application of said fastener driving force into engagement with said approximation blocking means only after fastener driving force into engagement with said approximation blocking means only after said surgical fasteners have been ejected from said cartridge to prevent reapproximation of the cartridge, said locking member including a generally cylindrical shaft portion.

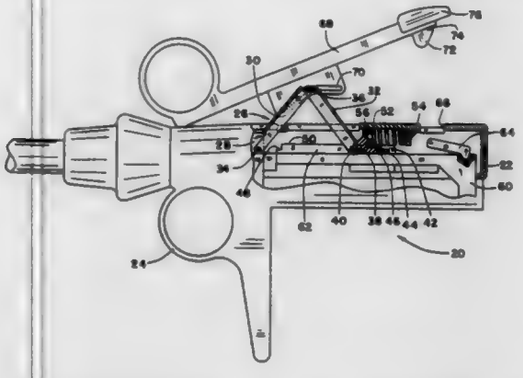


5,470,007

LAPAROSCOPIC STAPLER WITH OVERLOAD SENSOR AND INTERLOCK

Alan K. Plyley; Claude A. Vidal, both of Santa Barbara, and Roger Lagerquist, Isla Vista, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 2, 1994, Ser. No. 237,004
Int. Cl.[6] A61B *17/068*
U.S. Cl. 227—175 10 Claims



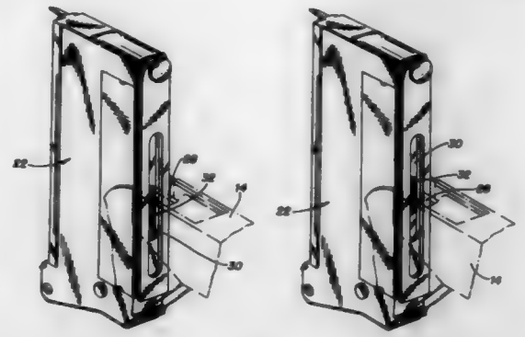
1. An improved endoscopic stapler apparatus having jaws which close together to approximate the tissues to be stapled and a linkage operable to close the jaws, the improvement comprising a portion of the linkage being movable, in response to a load between the jaws, out of its normal operating position so that normal operation of the linkage is interrupted, and a spring resiliently biasing the movable portion of the linkage to its normal operating position and holding the movable portion of the linkage in its normal operating position as the linkage closes the jaws on no more than a predetermined appropriate amount of tissue, but allowing the movable portion of the linkage to move from its normal operating position as the linkage closes the jaws on more than the predetermined appropriate amount of tissue so that normal operation of the linkage is interrupted.

5,470,008

APPARATUS FOR APPLYING SURGICAL FASTENERS

Daniel P. Rodak, Milford, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Dec. 20, 1993, Ser. No. 170,556
Int. Cl.[6] A61B *17/072*
U.S. Cl. 227—176 3 Claims



1. A surgical stapler comprising:

a frame having a longitudinal axis and a cartridge receiving portion;

an anvil portion positioned at a distal end of said frame;

a cartridge containing a plurality of fasteners, a plurality of fastener drivers and a fastener driving plate positioned proximally of said fastener drivers, said cartridge mountable in said cartridge receiving portion;

means for moving said cartridge between a proximal first position and a distal second position closer to said anvil portion;

means for substantially simultaneously firing said fasteners from said cartridge in a direction substantially parallel to said longitudinal axis, said firing means including a firing shaft and said fastener driving plate;

a slidable plate positioned in said cartridge proximally of said fastener drivers and substantially perpendicular to said longitudinal axis, said slidable plate being spring biased towards said firing shaft;

an elongated aperture formed in said slidable plate and dimensioned and configured to allow passage of said firing shaft therethrough to fire said fasteners; and

a retaining pin extending from said slidable plate for reception in an opening in said fastener driving plate, said slidable plate being movable from a first position wherein said retaining pin is positioned in said opening to a second position wherein said retaining pin is released from said opening, said slidable plate movable to said second position after distal movement of said firing shaft and said driving plate to fire said fasteners and retraction of said firing shaft, wherein in said second position at least a portion of said elongated aperture of said slidable plate is out of alignment with said firing shaft such that passage of said firing shaft is prevented by said slidable plate.

5,470,009

SURGICAL FASTENING APPARATUS WITH LOCKING MECHANISM

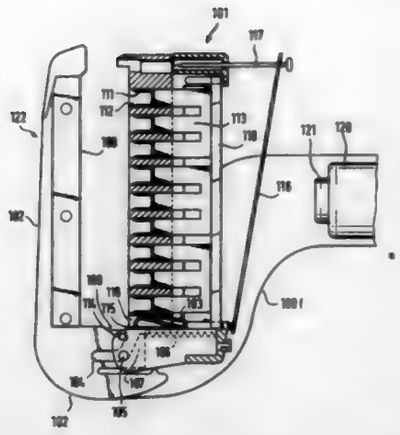
Daniel Rodak, Milford, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 936,884, Aug. 27, 1992, abandoned, which is a continuation of Ser. No. 622,856, Dec. 6, 1990, abandoned. This application Jul. 5, 1994, Ser. No. 270,396
Int. Cl.[6] A61B *17/072*
U.S. Cl. 227—176 54 Claims

1. An apparatus for applying a plurality of surgical fasteners to body tissue, which comprises:

a) a cartridge containing a plurality of fasteners;

b) fastener receiving means positioned opposite said cartridge for receiving said fasteners;



c) means for approximating said cartridge toward said fastener receiving means to a fastener firing position to grip body tissue therebetween; and

d) means operatively associated with said cartridge for preventing approximation of said cartridge toward said fastener firing position only when said cartridge is spent and while said spent cartridge is loaded in said apparatus.

5,470,010

MULTIPLE FIRE ENDOSCOPIC STAPLING MECHANISM

Robert G. Rothfuss, Bellevue, Ky.; Livyn O. Okorocha, Cincinnati, Ohio; Gregory D. Bishop, Hamilton, Ohio; Narinderjit S. Sambi, Maineville, Ohio; James J. Bedi, Cincinnati, Ohio; Salvatore Privitera, Sharonville, Ohio, and Michael Sherrill, Cincinnati, Ohio, assignors to Ethicon, Inc., Somerville, N.J.

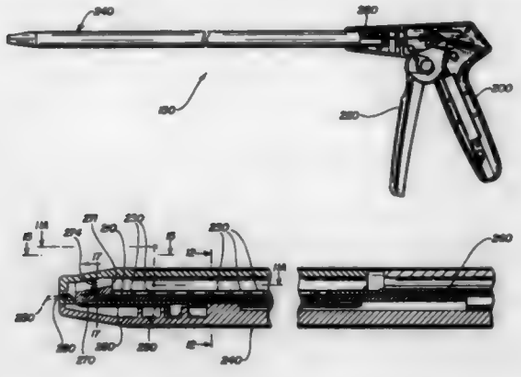
Continuation of Ser. No. 178,209, Jan. 6, 1994, abandoned, which is a continuation of Ser. No. 11,069, Jan. 29, 1993, Pat. No. 5,333,772, which is a continuation of Ser. No. 759,014, Sep. 12, 1991, Pat. No. 5,246,156, which is a continuation-in-part of Ser. No. 680,661, Apr. 4, 1991, Pat. No. 5,174,487.

This application Feb. 13, 1995, Ser. No. 388,117

The portion of the term of this patent subsequent to Dec. 29, 2009, has been disclaimed.

Int. Cl.[6] A61B *17/068*

U.S. Cl. 227—177 **6 Claims**



1. In combination:

a) an endoscopic staple mechanism comprising:

an elongated tubular shaft comprising an endoscopic section capable of emplacement within a cylindrical trocar tube during endoscopic surgery, said shaft formed as a cylinder and having a hollow interior and containing proximal and distal ends, and said shaft formed from a rigid construction;

an actuating mechanism attached to said shaft at said shaft proximal end;

a stack of staples arranged in a cartridge for sequential firing of a distalmost of said staples, said stack placed at the distal end of said shaft;

a firing mechanism including an anvil for forming staples, said anvil placed distal to said cartridge and said firing mechanism actuable by said actuating mechanism operating through said shaft; and

a transfer mechanism placed near the distalmost of said staples arranged in said cartridge, said transfer mechanism capable of transferring the distalmost of said staples to said firing mechanism, such that said actuating mechanism may cause said firing mechanism to form said staples; and

b) a cylindrical trocar tube into which is placed said staple mechanism, during endoscopic surgery.

5,470,011

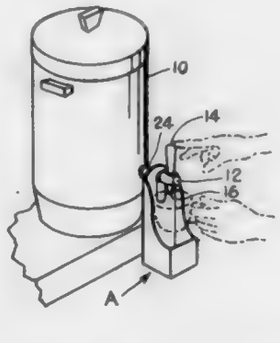
BEVERAGE DISPENSING URN AND DRIP COLLECTOR DEVICE

Anita E. Jordan, 403 Centre Blvd., Greenville, S.C. 29605-5803

Filed May 2, 1994, Ser. No. 235,913

Int. Cl.[6] B67D *1/16*

U.S. Cl. 222—108 **13 Claims**



10. A drip collection device for use with a beverage dispenser of the type having a spigot with a spigot actuator for manual operation of the spigot to control the flow of beverage, wherein said device comprises:

an elongated rear retaining member;

an elongated vertical spigot slot formed in said rear retaining member having an upper slot end and a lower slot end, and a vertical slot height defined between said upper and lower slot end sufficiently dimensioned to receive said spigot through said slot so that said retaining member may receive and move vertically relative to said spigot for engagement of said upper slot end and spigot for attachment of said retaining member to said spigot;

a drip collection reservoir carried by a lower unitarily formed portion of said rear retaining member positioned directly below said spigot outlet for collecting drips from said spigot outlet; and

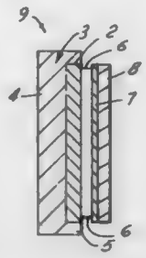
a spigot reservoir height defined between said spigot outlet and an upper edge of said collection reservoir which is generally greater than the height of a beverage cup so that said beverage cup may be conveniently placed in a beverage dispensing position.

5,470,012

METHOD FOR FORMING SURFACES OF CONTINUOUS CASTING MOLDS

Vonne D. Linse, Columbus, Ohio, and Bruce D. Horn, Johnstown, Pa., assignors to Acutus Industries, Inc., Waterford, Mich.

Filed Apr. 25, 1994, Ser. No. 232,798
Int. Cl.[6] B23K *20/08*
U.S. Cl. 228—107 17 Claims



1. A method of applying a metal or metal alloy coating to the surfaces of a continuous casting mold, comprising the steps of:

providing at least one section of a continuous casting mold, said one section having a planar surface to be cladded and a back surface having a plurality of open coolant channels;

positioning a cladding material adjacent said planar surface of said section, said cladding material including a metal or metal alloy which is bondable to said surface;

placing an explosive charge adjacent said cladding material such that said cladding material is disposed between said explosive charge and said planar surface; and

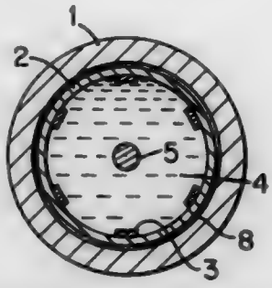
detonating said explosive charge such that said cladding material is bonded to said planar surface by the action of said explosion.

5,470,013

METHOD OF CLADDING TUBES

Ingemar Persson, Gyttorp, Sweden, assignor to Exploweld AB, Storfors, Sweden

PCT No. PCT/SE93/00136, § 371 Date Aug. 19, 1994, § 102(e) Date Aug. 19, 1994, PCT Pub. No. WO93/16836, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 19, 1993, Ser. No. 290,839
Claims priority, application Sweden, Feb. 21, 1992, 9200534; Apr. 8, 1992, 9201121; Jan. 20, 1993, 9300154
Int. Cl.[6] B23K *20/08*
U.S. Cl. 228—108 22 Claims



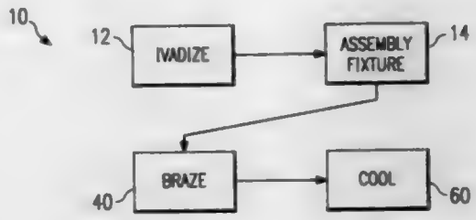
1. A method of cladding a metal outer tube (1) with a metal inner tube (2), comprising: placing a number of explosive charges (3) in a mutually spaced-apart arrangement within the inner tube (2), essentially in contact with and adjacent the inner surface of said inner tube; filling the inner tube with a pressure-transmitting medium (4); and detonating all explosive charges (3) simultaneously, so as to obtain a local metallurgical bond (6) at the regions of said explosive charges and so as to cause the inner tube (2) to expand into abutment with the outer tube (1).

5,470,014

BRAZING OF ALUMINUM-BERYLLIUM ALLOY

Ross E. Pritchard, Mississauga, Canada, and Ronald J. Laub, Naperville, Ill., assignors to Aluminum Design Corporation, Brookfield, Ill.

Filed Sep. 2, 1994, Ser. No. 300,276
Int. Cl.[6] B23K *1/20*
U.S. Cl. 228—208 9 Claims



1. A process for brazing aluminum-beryllium alloy parts, comprising the steps of:

providing a plurality of metal parts including aluminum in their composition, said plurality including at least a first metal part which includes beryllium in its composition and a second metal part;

performing an ion vapor deposition of aluminum on at least the first metal part; and

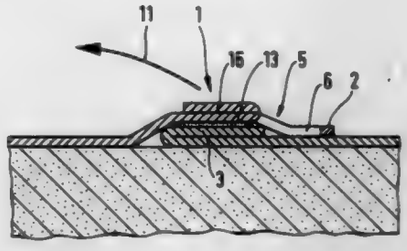
brazing the parts together using a brazing alloy.

5,470,015

TUBULAR POUCH WITH OPENING AID

Wilfried Jud, St. Pölten, Austria, assignor to Teich Aktiengesellschaft, Obergrafendorf, Austria

Continuation of Ser. No. 50,276, May 13, 1993, abandoned.
This application Apr. 7, 1995, Ser. No. 418,888
Claims priority, application Austria, Sep. 13, 1991, 1835/91
Int. Cl.[6] B65D *65/10;65/14;65/32*
U.S. Cl. 229—87.05 10 Claims



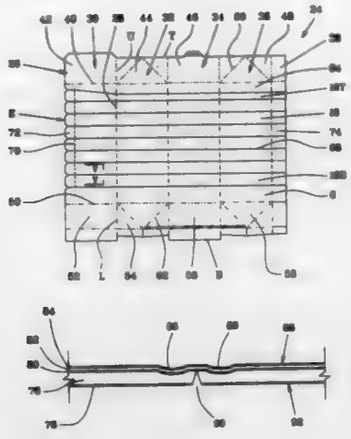
1. A tubular pouch for piece goods comprising a wrap formed by a planar, foldable wrapping material of which two edge strips are joined together in a junction area by a sealing means with one of said edge strips overlying the other of said edge strips and defining an outer surface of said wrap, a junction-free zone being present in said one of said edge strips, said junction-free zone being provided with a U-shaped perforation forming the beginning of a strip-shaped tear-open strip, said U-shaped perforation including a base and two legs with the legs pointing toward the junction area, at least one portion of said U-shaped perforation being located outside of the junction area and a segment of said one of the edge strips, that is enclosed along three sides by said U-shaped perforation and is located within said junction-free zone, is externally folded onto the outer surface of said wrap atop said junction area.

5,470,016

REDUCIBLE VOLUME CONTAINERS

Tommy B. G. Ljungström, 532 Cherbourg Ct. South, Buffalo Grove, Ill. 60089, and David Anchor, 407 S. Sunnyside, Itasca, Ill. 60143

Filed Apr. 15, 1994, Ser. No. 228,408
Int. Cl.[6] B65D *5/54*
U.S. Cl. 229—101.1 **20 Claims**



1. A package comprising:

a package wall having an interior surface and an exterior surface; and

at least one tear strip formed in the package wall, the tear strip being defined by a pair of generally parallel frangible tear lines;

wherein each tear line includes a pair of generally parallel creases formed on the interior surface of the package wall, and a linear cut formed in the exterior of the package wall, with the linear cut disposed in an area between the parallel creases and having a depth extending only partly through the thickness of the package wall.

5,470,017

Patent Not Issued For This Number

5,470,018

THERMOSTATICALLY CONTROLLED GAS HEATER

Ronald G. Smith, Bowling Green, Ky., assignor to DESA International, Inc., Bowling Green, Ky.

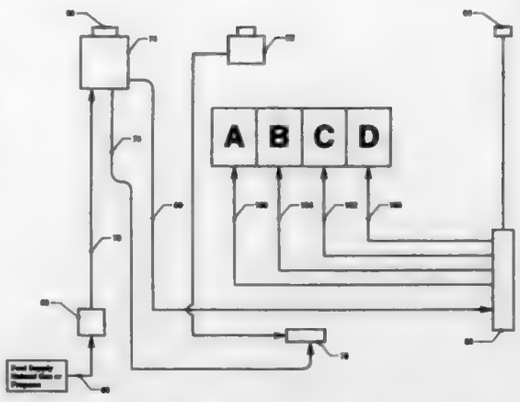
Continuation of Ser. No. 111,219, Aug. 24, 1993, abandoned. This application Dec. 30, 1994, Ser. No. 367,680
Int. Cl.[6] F23Q *9/08;* **F24H** *3/00*
U.S. Cl. 236—15 A **7 Claims**

1. A gas heater comprising:

(a) at least four independently operable heating elements with each heating element adjoining at least one other heating element;

(b) manually operable control means connected to each of said heating elements for activating a preselected number of said heating elements, said number being selected from any natural number ranging from one through the total number of heating elements in said plurality;

(c) thermostatically operable valve means connected to said manually operable control means and serving as the sole means for supplying gas to said preselected number of said heating elements as determined by operation of said manually operable control means, whereby said preselected number of heating elements may be modulated between off and a desired heat setting; and



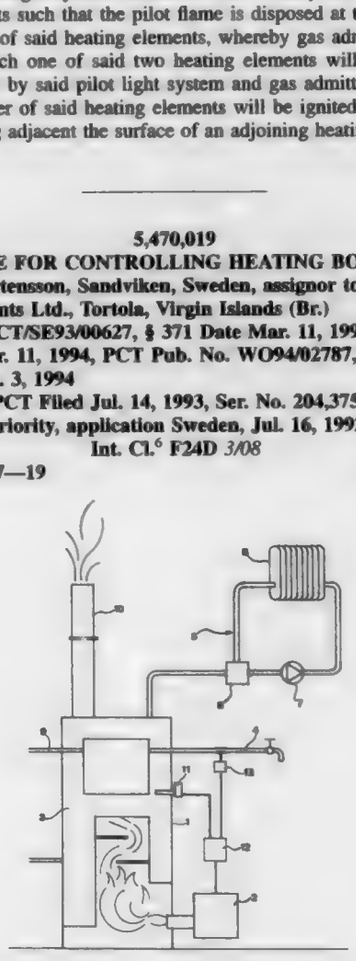
(d) a pilot light system mounted in the vicinity of said heating elements such that the pilot flame is disposed at the juncture of two of said heating elements, whereby gas admitted adjacent each one of said two heating elements will be ignited directly by said pilot light system and gas admitted adjacent the other of said heating elements will be ignited by the gas burning adjacent the surface of an adjoining heating element.

5,470,019

DEVICE FOR CONTROLLING HEATING BOILERS

Göran Mårtensson, Sandviken, Sweden, assignor to Riverlake Investments Ltd., Tortola, Virgin Islands (Br.)

PCT No. PCT/SE93/00627, § 371 Date Mar. 11, 1994, § 102(e) Date Mar. 11, 1994, PCT Pub. No. WO94/02787, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 14, 1993, Ser. No. 204,375
Claims priority, application Sweden, Jul. 16, 1992, 9202181
Int. Cl.[6] F24D *3/08*
U.S. Cl. 237—19 **21 Claims**



1. A device for controlling a boiler in a heating plant wherein the boiler has means for heating a heat carrying medium present in the boiler and circulating out thereof in the heating plant as well as means adapted to detect the temperature of the heat carrying medium present in the boiler and send signals to the heating means to start and stop the heating of the medium when a first lower temperature level is reached and a second higher temperature level is reached, respectively by the medium in the boiler, said device comprising delay means having

a first time measuring member arranged to measure a time signal representing the time between the temperature of the heat carrying medium reaching the second higher temperature level and the temperature of the heat carrying medium reaching the first lower temperature level following thereupon, and

processor means for determining a delay time signal as a function of the time signal and to generate as a function of the delay time signal, a start signal for starting said heating means at a time delayed from when the first temperature, level is reached by the medium.

5,470,020

COMBINATION TURBOJET ENGINE NOZZLE AND THRUST REVERSER

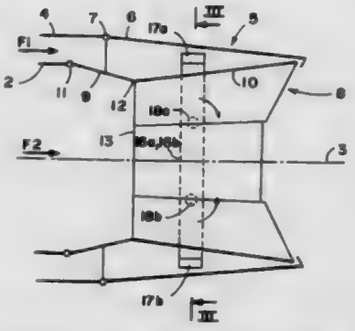
Pascal N. Brossier, Lieusaint; Jean-Marie N. Pincemin, Crosne, and Pascal Wurniesky, Savigny le Tempe, all of, France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.), Paris, France

Filed Oct. 6, 1994, Ser. No. 319,043

Claims priority, application France, Jan. 6, 1993, 93 11898

Int. Cl.[6] B64C *15/00*

U.S. Cl. 239—265.33 **10 Claims**



1. A combination converging-diverging exhaust nozzle and thrust reverser for an aircraft turbojet engine having a hot gas exhaust duct with a first downstream end and having a central axis, and a cowling support structure generally coaxial with and spaced from the hot gas exhaust duct, the cowling support structure having a second downstream end, the combination comprising:

a) a generally annular array of cold flaps extending from the second downstream end of the cowling support structure, the array of cold flaps movable between a forward thrust position wherein an upstream edge of the array of cold flaps is adjacent to the second downstream end of the cowling support structure and a reverse thrust position wherein the upstream edge of the array of cold flaps is displaced away from the second downstream edge of the cowling support structure;

b) a generally annular array of first hot flaps having a first edge pivotally attached to the first downstream edge of the hot gas exhaust duct and a second edge; and,

c) a generally annular array of second hot flaps having a third edge, the array of second hot flaps movable between a forward thrust position wherein the third edge is in contact with the second edge of the array of first hot flaps and a reverse thrust position wherein the third edge is displaced away from the second edge of the array of first hot flaps wherein the array of second hot flaps redirects the hot gases emanating from the hot gas exhaust duct so as to produce a reverse thrust effect.

5,470,021

CABLE SUPPORT APPARATUS AND METHOD

James Q. Looney, Fountain Inn, S.C., assignor to MPHusky Corporation, Greenville, S.C.

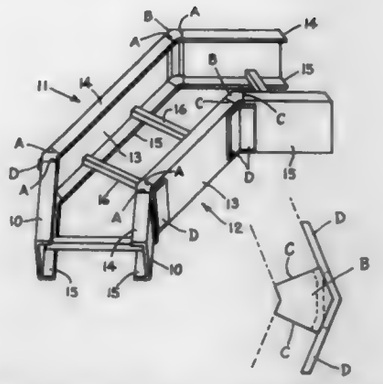
Filed Nov. 5, 1993, Ser. No. 147,561

Int. Cl.[6] F16L *3/00*

U.S. Cl. 248—49 **7 Claims**

2. A splice plate for use in a cable support apparatus having:

a plurality of straight channel shaped structural sections each having a web and first and second longitudinal flanges;



a transverse terminus at ends of said structural sections at substantially a 90° angle relative thereto; and

said structural sections being positioned in end to end relation and arranged in pairs defining first and second sides, with said first and second flanges of each structural section facing inwardly;

transverse cable supports extending horizontally between said pair of structural sections, said structural sections and said transverse cable supports forming a trough for containing cable extending longitudinally therein, said splice plates being positioned between each of said structural sections where a change of direction at a predetermined angle is to take place, said splice plates being employed in complementary pairs where said change of direction is to take place, with a first splice plate positioned between adjoining structural sections on said first side and a second splice plate positioned between adjoining structural sections on said second side of said cable support apparatus and comprising:

a one-piece section having;

a corner member having a web and first and second spaced apart flanges defining a generally channel-shaped section, said first and second flanges of said corner member presenting sides converging to an apex and having an included angle equal to said predetermined angle, said flange sides and said web each having a distal edge abutting said transverse terminus of said adjoining structural sections in end to end relation and forming a flush relationship with said adjoining structural sections' first and second flanges and web, respectively; and

an angle member carried by said corner member at a complementary angle to said web of said adjoining structural sections in closely adjacent overlying relation to said web of said adjoining structural sections for attachment thereto;

wherein mitering of said adjoining structural sections is unnecessary when assembling said cable support apparatus.

5,470,022

SHARPS DISPOSAL SYSTEM

Glenn A. Wright, Huntington Beach; Philip F. Fritz, Ontario, and Tuan Q. Nguyen, Anaheim, all of Calif., assignors to Glenn Albert Wright, Huntington Beach, Calif.

Continuation of Ser. No. 143,491, Oct. 25, 1993, Pat. No. 5,354,000, which is a continuation of Ser. No. 876,314, May 5, 1992, abandoned. This application Oct. 4, 1994, Ser. No. 317,855

The portion of the term of this patent subsequent to Oct. 11, 2011, has been disclaimed.

Int. Cl.[6] B02C *4/32*

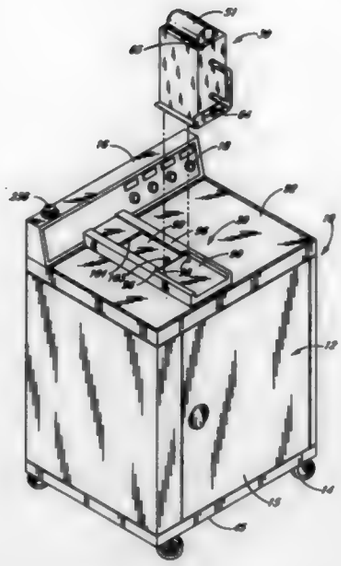
U.S. Cl. 241—33 **21 Claims**

1. A disposal system for processing and sterilizing medical waste including medical sharps, said system comprising:

a container having an exit opening;

a disposal unit having an opening for receiving material from the container by way of said exit opening, said disposal unit comprising:

a disposer for processing medical waste into small particles;



a reservoir containing sterilant;

a disposable waste receptacle disposed apart from said reservoir, said waste receptacle comprising an influent portion through which said sterilant enters said receptacle, an effluent port through which said sterilant exits said receptacle, a container portion that holds said small particles from said disposer, said container portion being constructed of a fluid impermeable material, and a filter positioned between said container portion and said effluent port; and

a sterilant recirculation system that circulates said sterilant between said reservoir, disposer and waste receptacle; and

an engagement structure on the disposal unit for engaging said container and placing said exit opening in communication with said disposal unit opening.

5,470,023

CRUSHING APPARATUS FOR WASTE MATERIAL

Raimund Falkner, Roppen, Austria, assignor to Agria-Werke GmbH, Möckmühl, Australia

PCT No. PCT/AT92/00166, § 371 Date Jun. 1, 1994, § 102(e) Date Jun. 1, 1994, PCT Pub. No. WO93/11873, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 11, 1992, Ser. No. 244,577

Claims priority, application Germany, Dec. 12, 1991, 9115433 U

Int. Cl.[6] B02C *4/08*

U.S. Cl. 241—85 **37 Claims**

1. A crushing apparatus for crushing waste material, said apparatus comprising:

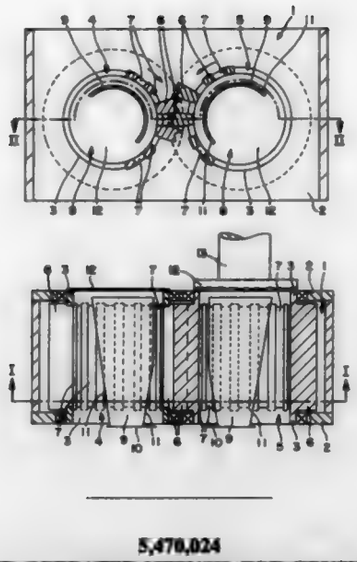
a housing having a filling opening;

a hollow rotary crushing drum within said housing, said crushing drum having a drum cavity and at least one open end, and said crushing drum being provided with peripheral cutting bars spaced apart by entry slots open into said drum cavity;

a drive to rotate said crushing drum; and

a counterpart cutting tool cooperating with said cutting bars of said crushing drum, so that waste material is crushed when passing through between said crushing drum and said counterpart cutting tool, and wherein said slots form additional passages for non-crushed or only partially crushed waste material to pass into said drum cavity;

wherein said housing forms an open space below said crushing drum and said counterpart cutting tool allowing waste material that is crushed when passing through between said crushing drum and said counterpart cutting tool to fall therethrough.



5,470,024

HAND-OPERATED UTENSIL FOR CRUSHING GRANULAR FOODS

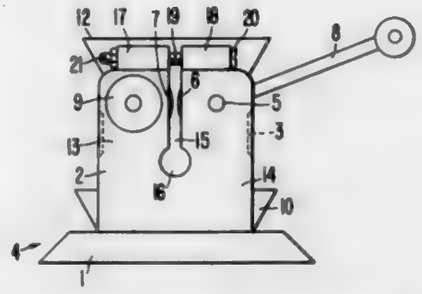
Hans Desaga, Am Gänsberg 13, D-64658 Fürth, Germany

Filed Mar. 31, 1994, Ser. No. 220,503

Claims priority, application Germany, Mar. 31, 1993, 9304855 U

Int. Cl.[6] B02C *4/32*

U.S. Cl. 241—234 **14 Claims**



1. A utensil for crushing granular foods comprising:

at least two crushing rolls mounted in side plates, at least the side plates being made from plastic, the side plates having side plate legs separated by a slot, each side plate leg having a roll mounted thereon and the side plate legs being braced against one another to reduce a width of the slot with each of the side plates being constructed in one piece and disposed on a frame.

5,470,025

METHOD AND APPARATUS FOR MONITORING AND CONTROLLING AN ARMATURE WINDING MACHINE INCLUDING MISSED TANG DETECTION

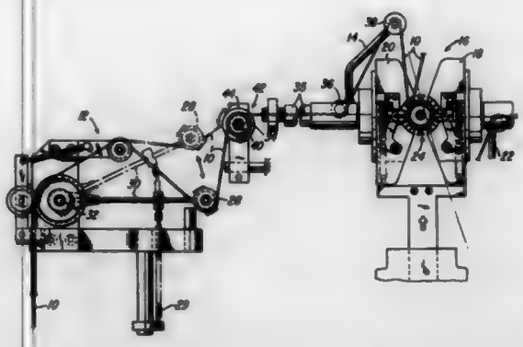
Alvin C. Banner, Kettering, and Mark T. Heaton, Springfield, both of Ohio, assignors to Globe Products Inc., Huber Heights, Ohio

Continuation of Ser. No. 773,335, Oct. 7, 1991, abandoned. This application Jun. 6, 1994, Ser. No. 254,480

Int. Cl.[6] H01B *11/04*; H02K *15/04*

U.S. Cl. 242—7.03 **22 Claims**

1. A method for monitoring the operation of a cyclical machine which utilizes wire in the winding of electric motor components and interrupting the operation of the machine in the event of faulty winding operation, said machine having a winding member that pulls wire from a source of wire under tension over a guide pulley during some intervals of operation and permits the wire to become



slack during other intervals of operation, the wire being pulled from said winding member by operation of a slack take-up mechanism when the wire becomes slack, said method comprising the steps of:

sensing increments of rotation of said guide pulley in a first direction as wire is being drawn from said source;

sensing increments of rotation of said guide pulley in a reverse direction when operation of said winding member results in a slack wire condition;

computing an algebraic sum of the increments of rotation of said guide pulley both in said first and in said reverse direction which is equal to the difference between the increments of rotation of said guide pulley in said first direction and the increments of rotation of said guide pulley in said reverse direction;

determining whether said algebraic sum is within a predetermined tolerance limit of a predetermined algebraic sum of increments of rotation of said guide pulley for a given cyclical portion of machine operation; and

interrupting operation of the machine if said algebraic sum is outside of said tolerance limit.

5,470,026

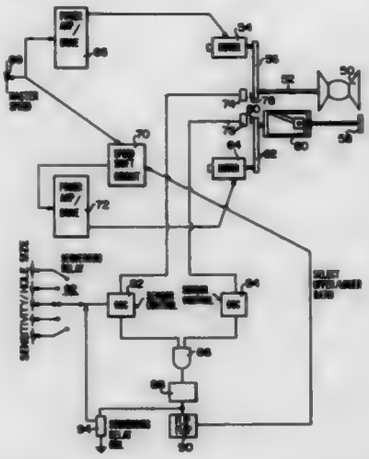
UNIFORM WIDTH PAYOUT HOLE

Frank W. Kotzur, Carmel, N.Y., assignor to Windings, Inc., Patterson, N.Y.

Filed Oct. 1, 1993, Ser. No. 130,547

Int. Cl.[6] B65H *67/044; 18/28*

U.S. Cl. 242—18 R **16 Claims**



1. Apparatus for winding filamentary material, comprising:

a mandrel rotatable about a spindle axis of rotation and a traverse reciprocating at a fixed distance with respect to said spindle axis to wind said filamentary material in a figure 8 coil configuration with a payout hole extending radially from the inner to the outer wind of said coil;

means for controlling the rotation of said mandrel about said spindle axis of rotation; and

means for controlling the reciprocating movement of said traverse with respect to the rotation of said mandrel to wind said filamentary material on said mandrel in said coil of a figure 8 configuration to form said radial payout hole having a substantially constant diameter.

5,470,027

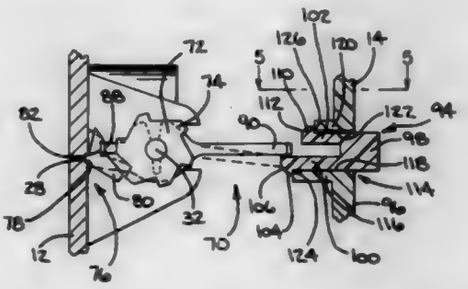
ANTIREVERSE ASSEMBLY FOR A FISHING REEL

Lorens G. Hlava, Clinton, Mo., and Thomas A. Pulliam, Broken Arrow, Okla., assignors to Zebco Corporation, Tulsa, Okla.

Filed Aug. 6, 1991, Ser. No. 741,967

Int. Cl.[6] A01K *89/027*

U.S. Cl. 242—247 **9 Claims**



1. An improved antireverse mechanism in a fishing reel having a line-carrying spool mounted to a deckplate, a crank shaft that is rotatable about a first axis and means for directing line onto the spool as an incident of the crank shaft rotating about said first axis in a first direction, the spool, deckplate and crank shaft being at least partially contained within a housing having an outer surface, the improvement comprising:

an elongate slot in the housing;

antireverse means selectively placable in a) an on position for preventing rotation of the crank shaft about said first axis opposite to said first direction and b) an off position for allowing the crank shaft to rotate about said first axis opposite to the first direction;

an actuator switch for placing the antireverse means selectively in its on and off positions; and

means for snap fit engagement between the housing and the actuator switch,

said snap fit engagement means including first and second parallel shanks extending from the actuator switch and into the elongate slot, the first and second shanks each having oppositely extending transverse flanges, the transverse flanges being configured to engage an inner surface of the housing, the shanks having a width dimension parallel to the length of the slot sufficient so that the actuator switch cannot be rotated in the slot and can only be moved by translation within the slot.

5,470,028

LIGHTWEIGHT VIDEO CASSETTE CARTRIDGE

Kermit T. Krantz, and Charles R. Jones, Jr., both of Leawood, Kans., assignors to V-Lite Corporation, Leawood, Kans.

Division of Ser. No. 1,670, Jan. 7, 1993, Pat. No. 5,398,881.

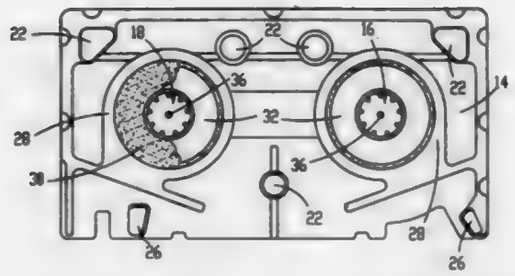
This application Oct. 11, 1994, Ser. No. 321,257

The portion of the term of this patent subsequent to Mar. 21, 2012, has been disclaimed.

Int. Cl.[6] G11B *23/087*

U.S. Cl. 242—343.2 **2 Claims**

1. A lightweight video cassette cartridge comprising:



a shell consisting of a top panel and a bottom panel which mate to form said video cassette cartridge shell, said bottom panel including a plurality of upwardly extending integrally molded ridges, said ridges defining circular reel wells;

a supply reel and a take-up reel rotatably mounted within said circular reel wells, said reels each including a flange;

means for inhibiting the rotation of said reels within said circular reel wells when not in use, said means being integrally formed on said circular wells and said reel flanges, said means including a textured surface presenting an irregular pattern integrally molded on said circular wells and said reel flanges.

5,470,029

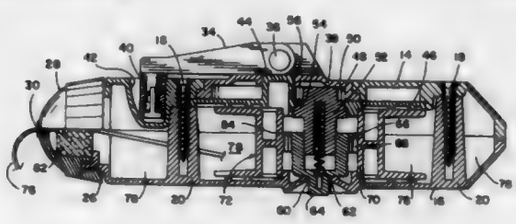
QUICK REWIND CHALK LINE REEL

Jean G. Dufour, Quebec, Canada, assignor to Johnson Level & Tool Mfg. Co., Inc., Mequon, Wis.

Filed Aug. 10, 1994, Ser. No. 288,397

Int. Cl.[6] **B65H** *75/40;* **B44D** *3/38*

U.S. Cl. 242—394 **10 Claims**



1. A line reel comprising;

a housing having a top, a bottom and an aperture formed therein;

a spool rotatably mounted in said housing and carrying a line extensible and retractable through said apertures;

a crank and crown gear assembly rotatably disposed on said housing;

a pinion disposed in said housing in meshed engagement with said crank and crown gear assembly for rotation therewith;

a release button slidably mounted on said pinion and keyed thereto for rotation therewith, said release button being movable into and out of meshed engagement with said spool; and

biasing means disposed between said pinion and said release button for selectively allowing locking and unlocking of said spool for rotation without movement of said crank and crown gear assembly.

5,470,030

FABRIC TAKE-UP FRAME FOR A TEXTILE FABRIC PRODUCING MACHINE

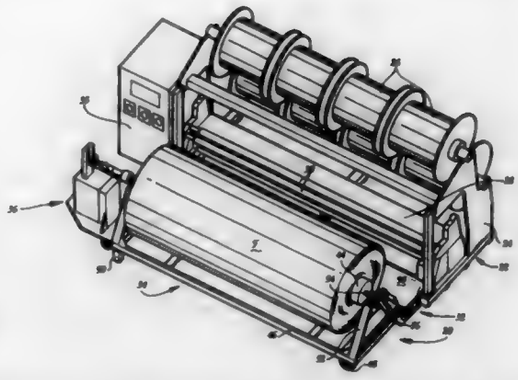
Arne Nielsen, Oak Ridge; Majid Moghaddassi; Boris Vishnepolsky, both of Greensboro, and Keith Smith, High Point, all of N.C., assignors to Guilford Mills, Inc., Greensboro, N.C.

Filed Dec. 17, 1993, Ser. No. 169,702

Int. Cl.[6] **B65H** *18/10;23/10*

U.S. Cl. 242—533.8 **7 Claims**

1. In combination with a textile fabric producing machine, a fabric take-up apparatus comprising a fabric take-up frame, a



fabric take-up roll supported on the frame for winding of fabric thereabout, means for variably driving rotation of the take-up roll, means for monitoring tension in the fabric between the fabric producing machine and the take-up frame, and means operatively associated with the tension monitoring means for controlling the driving means to maintain tension in the fabric according to a predetermined tension program as the fabric is wound on the take-up roll, wherein the tension monitoring means comprises a take-off roll adjacent the fabric producing machine for peripherally contacting the fabric and means associated with the take-off roll for detecting deflections of the take-off roll resulting from fabric tension fluctuations, and an applying means is arranged for peripherally applying the fabric to the take-up roll at a peripheral location thereon facing the take-off roll for reducing the distance of fabric travel between the take-off and take-up rolls, the take-up frame being separable from and movable independently of the fabric producing machine for transporting a fabric after a take-up operation to a subsequent processing station without rewinding of the fabric.

5,470,031

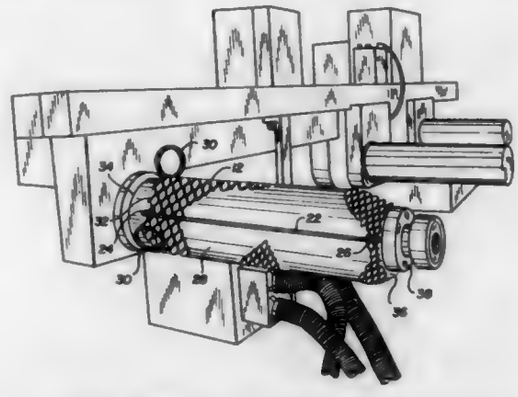
REUSABLE WASTE MATRIX SLEEVE

Kevin Gagnon, 194 Jackson Rd., Richland, N.Y. 13144

Filed Jan. 10, 1994, Ser. No. 179,061

Int. Cl.[6] **B65H** *75/20*

U.S. Cl. 242—571 **5 Claims**



1. A reusable, flexible sleeve for removably mounting upon a drive spindle in concentric, covering relation thereto, said sleeve being rotatable by and with said spindle whereby said sleeve is adapted to receive and roll a web of waste material thereon upon rotation of said spindle and said sleeve, said sleeve comprising a length of flexible mesh material joined along opposite side edges thereof to form said sleeve with first and second, opposite, open ends, said sleeve being freely movable between a fully expanded, maximum diameter condition and collapsed, minimal diameter condition, said maximum diameter being slightly larger than the

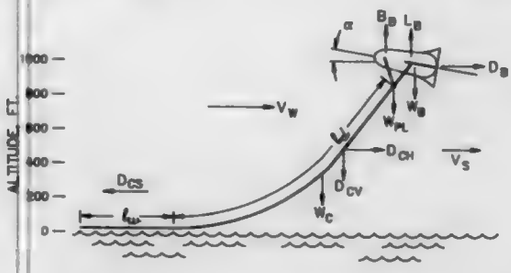
diameter of said spindle, said sleeve assuming said fully expanded condition upon mounting said sleeve to said drive spindle in concentric, covering relation thereto, said mesh material being formed from longitudinally interconnected, individual wire coils, said opposite edges of said mesh material are placed in removable, meshing engagement, and further comprising a rigid, elongated rod longitudinally extending through and securing said opposite side edges together.

5,470,032

AIRBORNE MONITORING SYSTEM AND METHOD

Joseph B. Williams, Jr., 153 Shewell Ave., Doylestown, Pa. 18901, and Marvin B. Sullivan, 814 Boca Ciega Isle, St. Pete Beach, Fla. 33706

Filed Apr. 18, 1994, Ser. No. 229,465
Int. Cl.[6] B64B *1/44*
U.S. Cl. 244—1 TD **18 Claims**



1. An airborne monitoring system for tracking and observing meteorological conditions in the lower atmospheric boundary layer over a body of water, comprising, in combination:

a lifting body;

module means for sensing and transmitting the conditions to, and receiving commands from, a remote station;

bridle means for suspending said module means below said lifting body; and

a tether having one end attached to said bridle means and a lower portion at the other end deployable on the surface of the water, said tether being dimensioned to maintain said lifting body at a substantially constant altitude h under a variable wind speed.

5,470,033

METHOD FOR CONTROLLING A CARRIER WHICH IS USED TO CARRY A FLIGHT VEHICLE

Yeong-Shyeong Tsai, and Wang-Jr Li, both of No. 141, Fu Hsing Rd., Lu Chou Hsiang, Taipei Hsien, Taiwan, Prov. of China

Filed Jul. 28, 1994, Ser. No. 281,918
Int. Cl.[6] B64I *1/00*
U.S. Cl. 244—110 E **3 Claims**

1. A method for controlling a carrier (**10**) which is used to carry flight vehicle (**90**), said method comprising:

(a) providing a carrier (**10**) and a control system (**20**) mounted on a lower side thereof, said carrier (**10**) being limited to slides on a track (**40**) along a longitudinal direction thereof, said track (**40**) being substantially I-shaped in section and defining two recesses therein and having a vertical wall (**401**), a plurality pairs of L-shaped fork members (**14**) being mounted on a underside of said control system (**20**), a pair of first wheels (**141**) pivotally engaged with each of said pairs of fork members (**14**) to roll in each of said recesses of said I-shaped track (**40**) and a pair of second wheels (**142**) pivotally engaged with each of said pairs Of fork members (**14**) and abutting against said vertical wall (**401**) of said track (**40**);

(b) sending a signal to flight vehicle (**90**) by said control system (**20**) to decrease an instantaneous velocity thereof for landing and sending a signal to said flight vehicle (**90**) to adjust the flight direction thereof along a longitudinal direction of said substantially I-shaped track (**40**);

(c) sensing a flight direction of said flight vehicle (**90**) and instantaneous velocities thereof by said control system (**20**); and

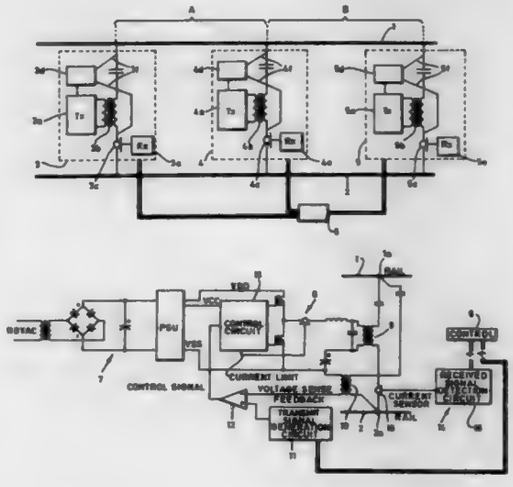
(d) accelerating said carrier (**10**) by said control systems (**20**) to catch up with said flight vehicle (**90**) at a location therebeneath and adjusting the velocity of said carrier (**10**) to match with that of said flight vehicle (**90**) such that said flight vehicle (**90**) is able to smoothly land so as to be supported on a top surface of said carrier (**10**).

5,470,034

RAILWAY TRACK CIRCUITS

Malcolm Reeves, Chippenham, United Kingdom, assignor to Westinghouse Brake & Signal Holding Ltd., United Kingdom

Filed Mar. 29, 1994, Ser. No. 219,217
Claims priority, application United Kingdom, May 20, 1993, 9310439
Int. Cl.[6] B61L *25/00*
U.S. Cl. 246—122 R **9 Claims**



1. A railway track circuit arrangement comprising:

a) first and second rails of a railway track;

b) a first track circuit comprising:

i) a first transmitter, for transmitting signals into said rails at one end of said first track circuit; and

ii) a first receiver, for receiving signals from said rails at an opposite end of said first track circuit; and

c) a second track circuit adjacent said first track circuit and comprising:

i) a second transmitter, for transmitting signals into said rails at an end of said second track circuit adjacent said opposite end of said first track circuit; and

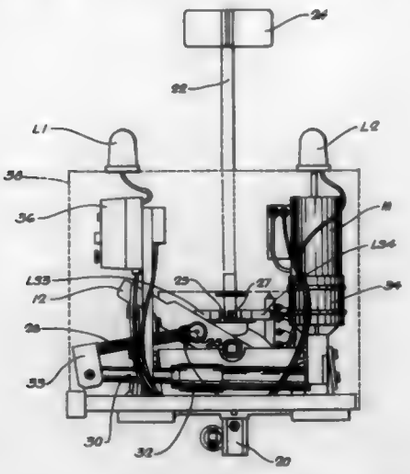
ii) a second receiver, for receiving signals from said rails at an opposite end of said second track circuit; wherein:

d) said second transmitter comprises part of termination apparatus for the first and second track circuits, said termination apparatus preventing the passage of signals between said first and second track circuits as well as providing said second transmitter as an active element of said second track circuit.

5,470,035
ELECTRICAL SWITCH STAND

Isaac Sargis, Morton Grove, Ill., assignor to National Trackwork, Inc., Itasca, Ill.

Continuation-in-part of Ser. No. 268,478, Jun. 30, 1994, which is a continuation of Ser. No. 926,063, Aug. 5, 1992, abandoned. This application Aug. 30, 1994, Ser. No. 298,102
Int. Cl.[6] B61L *5/06*
U.S. Cl. 246—221 **17 Claims**

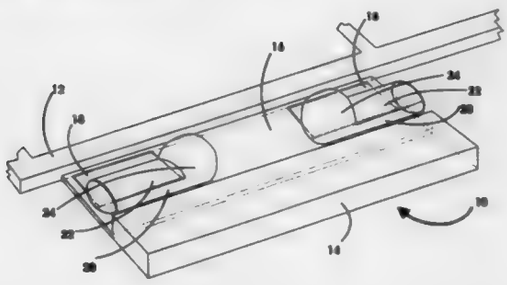


1. An electrical railroad switch stand for moving switching rails of a railroad track comprising:
(a) switch means for switching rails of a railroad track;
(b) handle means for actuating said switch means, said handle means movable from a first position to a second position;
(c) actuator means coupled to said handle means; said actuator means including an actuator rod and housing means for receiving said actuator rod, said actuator rod movable between an extended position and a retracted position with respect to said housing means, said actuator rod controlling the position of said handle means;
(d) motor means including a motor shaft coupled to said actuator means for moving said actuator rod between said extended position and said retracted position, said motor shaft rotatable in a first direction of rotation and a second direction of rotation;
(e) means for controlling the direction of rotation of said motor shaft; and
(f) brake means for physically preventing rotation of said motor.

5,470,036
WRIST/HAND SUPPORT FOR KEYBOARDS

Huy D. Vu, 1059 Sandalwood La., Milpitas, Calif. 95035, and Hoa M. Tran, 2810A Monterey Rd., San Jose, Calif. 95111

Filed Apr. 5, 1994, Ser. No. 222,823
Int. Cl.[6] B43L *15/00*
U.S. Cl. 248—118.5 **6 Claims**

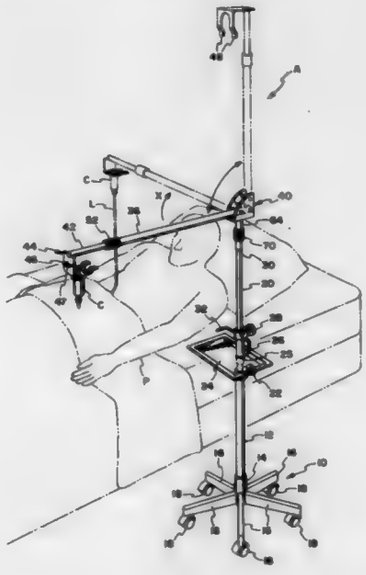


1. A support device for a keyboard operator comprising:
a base adapted to be placed on a work surface; mounting pads removably attached to the base;
hand support elements shaped to conform to the contour of a human hand, the hand support elements being removably attached via the mounting pads to the base of said support device, the lower surface of the base having a high friction coefficient so as to avoid slippage on the work surface,
the attachment of the mounting pads to the base being accomplished by fastening means such that the keyboard operator is able to alter the position of the mounting pads on the base by simply lifting the mounting pad off of the base, and repositioning the pad at a desired position, said fastening means for the mounting pads is also constructed so that a front portion of the pad is permitted to freely lift off of the base while other portions of the pad remain attached to the base, allowing the hand support to roll forward as the keyboard operator reaches for distant keys on a keyboard.

5,470,037
APPARATUS FOR SELF-ADMINISTERING FLUIDS IN PATIENTS, CHILDREN AND PERSONS OF LIMITED CAPABILITIES

Rodney L. Willis, 692 Shrewsbury Rd., Leitchfield, Ky. 42754

Filed Aug. 20, 1993, Ser. No. 109,544
Int. Cl.[6] F16L *3/00*
U.S. Cl. 248—125.9 **14 Claims**



1. An apparatus for self-administering fluids in patients, children and persons of limited capabilities comprising:
a) a base;
b) a first generally cylindrical elongate support extending generally upwardly from said base;
c) a second generally cylindrical elongate support extending generally upwardly from said first support;
d) said second support being pivotable relative to said first support to assume first and second positions;
e) said second support and said first support extend generally in a common direction in said first position;
f) said second support extends generally perpendicular to said first support;
g) means for freely rotating said second support a plurality of successive revolutions about said first support when said second support assumes said second position;

h) means for adjusting the length of said second support relative to said first support in a horizontal direction;

i) means for adjusting the length of said first support; and

j) means for selectively locking said second support in said first and second positions.

5,470,038

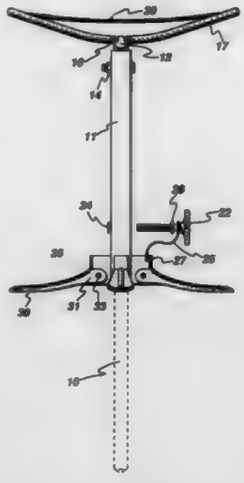
SELF-STABILIZING SEAT SUPPORT

R. John Clark, 221 Strathmore Dr., Syracuse, N.Y. 13207

Filed Aug. 17, 1993, Ser. No. 108,054

Int. Cl.[5] A45F *3/44*

U.S. Cl. 248—156 **11 Claims**



1. A self stabilizing seat support comprising:

(a) an elongate, rigid, tubular, main shaft member having a hollow interior and being of sufficient length when vertically oriented to support a seated human;

(b) a plurality of elongate oblong stabilizer foot members;

(c) a plurality of stabilizer foot attachment means for pivotally connecting each of said elongate oblong stabilizer foot members to a lower end of said elongate rigid tubular main shaft member whereby the hollow interior of the main shaft member is not obstructed by said stabilizer foot attachment means;

(d) an elongate rigid stabilizer shaft member adapted for ground insertion which is of predetermined length and cross sectional size whereby said stabilizer shaft member can slide within and extend beyond the lower end of the hollow interior of the main shaft member;

(e) means for adjustably connecting said elongate rigid stabilizer shaft member to said elongate rigid tubular main shaft member whereby the stabilizer shaft member can be held in any of a plurality of positions relative to the main shaft member.

5,470,039

FOLDABLE INFANT SEAT CRADLE AND SUPPORT STAND

Jeff H. Hilger, Stillwater, Minn., assignor to Koala Corporation, St. Paul, Minn.

Filed May 17, 1994, Ser. No. 243,806

Int. Cl.[6] F16M *11/20*

U.S. Cl. 248—164 **9 Claims**

1. A foldable cradle for supporting an infant seat comprising:

(a) a first U-shaped member having a first cross-member with a first leg depending from one end thereof and a second leg depending from an opposite end thereof;

(b) a second U-shaped member having a second cross-member with a first leg depending from one end thereof and a second leg depending from an opposite end thereof;

(c) said first leg of said second U-shaped member pivotally connected to said first leg of said first U-shaped member at an intermediate point on each leg, and said second leg of said second U-shaped member pivotally connected to said second leg of said first U-shaped member at an intermediate point on each leg, said U-shaped members forming a frame wherein, when the frame is in an open position, said first cross-member is generally parallel and spaced a horizontal distance from said second cross-member;

(d) means for supporting an infant seat, said means including a flexible member attached at one end to said first cross-member and attached at an opposite end to said second cross-member, said flexible member including a pair of generally vertical side panels defining a width thereof, wherein said infant seat is securely supported by said flexible member in combination with said side walls; and

(e) a safety strap, said strap secured at the respective ends thereof to each of said intermediate points on said pivotally connected legs, said strap, in use, extending over the top of said flexible member so that said infant seat is secured in a fixed position.

5,470,040

APPARATUS FOR A COMPUTER POINTING DEVICE

Gopal C. Bhagat, and James M. Webster, both of Houston, Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 924,850, Aug. 4, 1992, abandoned. This application Feb. 22, 1994, Ser. No. 200,066

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—222.4 **15 Claims**

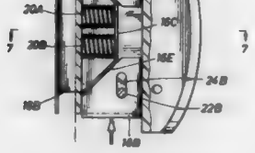
1. Apparatus for releasably attaching a pointing device to a computer, said apparatus comprising

an attachment housing having an elongated clamping side, said clamping side having a longitudinal axis,

a passage having an axis and extending through said housing, said passage axis being substantially parallel to said clamping side longitudinal axis,

a clamp mounted with said housing, said clamp movable relative to said housing clamping side between a home position and an extended position for clamping said housing to the computer, and

a pair of buttons positioned in said passage and engaging said clamp means, said buttons movable in said passage for moving said clamp means from said home position to said extended position.

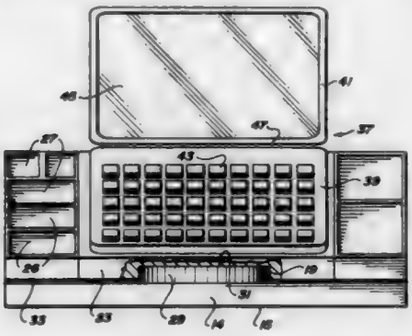


5,470,041

WORKSTATION FOR LAPTOP-TYPE COMPUTER

James L. Cucinotta, 2079 Centerport Rd., Mohrsville, Pa. 19541

Filed Feb. 2, 1994, Ser. No. 191,021
Int. Cl.[6] A47B *91/00;95/00*
U.S. Cl. 248—349 17 Claims



1. A work-top surface support stand for a laptop-type computer comprising:

(a) a lower section forming a base adapted for placement and support upon a flat working surface

(b) an upper section forming a laptop computer support means adapted for at least partially rotatable engagement with said base,

(c) said support means having a substantially flat horizontally disposed bottom surface adapted for rotational movement relative to an adjacent substantially flat horizontally disposed top surface of said base,

(d) said base and laptop computer support being rotatably engaged with each other by a rotatable broadbase engagement means allowing relative rotational movement between said base and support means while providing lateral stability to said support means,

(e) the top surface of the support means being inclined at an angle of between fifteen to thirty-five degrees with respect to horizontal and being sufficiently extended to underlie substantially an entire under surface of an average laptop computer, and

(f) said rotatable engagement means being arranged and constructed to allow relative rotatable movement, when an average weight laptop computer is supported by the support means, between the support means and base through rotation of an extension of one member of said rotatable engagement means within a receiving depression in a second member of said rotatable engagement means upon the application of an off-center force to the support means preferentially to causing the base to slide upon the working surface upon which it is supported, but not to allow relative rotation between the base and the support means under the impetus of environmental or use related vibration or forces applied to the laptop computer or the support means and

(g) wherein the relatively rotatable engagement means comprises a projecting extension extending between the base and the support means and received into an extension receiving depression, said projecting extension and extension receiving depression both having a width at least several times their respective height and depth and

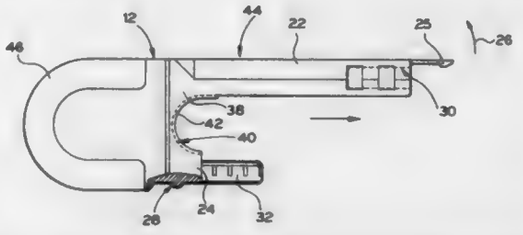
(h) wherein the height of the projecting extension means is at least slightly different from the depth of the extension receiving depression such that the weight of the support means and any computer thereupon is effectively transferred to the base at points sufficiently laterally spaced to provide lateral stability to the support means at all achievable rotational positions of the support means with the base.

5,470,042

SUPPORTING DEVICE FOR A MACHINE

Ralf-Peter Fietz, Paderborn-Elsen, and Franz Knoop, Büren-Steinhausen, both of, Germany, assignors to Siemens Nixdorf Informationssysteme Aktiengesellschaft, Paderborn, Germany

PCT No. PCT/EP92/00365, § 371 Date Aug. 19, 1993, § 102(e) Date Aug. 19, 1993, PCT Pub. No. WO92/14963, PCT Pub. Date Sep. 3, 1992
PCT Filed Feb. 21, 1992, Ser. No. 107,756
Claims priority, application Germany, Feb. 22, 1991, 41 05 691.4
Int. Cl.[6] F16M *1/00*
U.S. Cl. 248—678 8 Claims



1. A supporting device in combination with a machine standing on a floor surface of a floor,

the machine having a standing foot arrangement on a bottom side thereof, the standing foot arrangement having standing feet;

said supporting device comprising at least one supporting element, which is adjustable between a non-operating position and an operating position in which the supporting element protrudes outwards from the standing foot arrangement over a lateral contour of the machine;

the supporting element having a holding section, which reaches, in the operating position, beneath the machine and is detachably connected to an assigned standing foot of the machine, and having a supporting bracket disposed thereon, which protrudes over the lateral contour of the machine;

the holding section being configured as a substantially U-shaped bow having two arms which bear laterally against the standing foot;

the holding section having, in a direction perpendicular to the floor surface, stop faces, interacting with counter-faces of the standing foot, for fixing the holding section to the standing foot; and

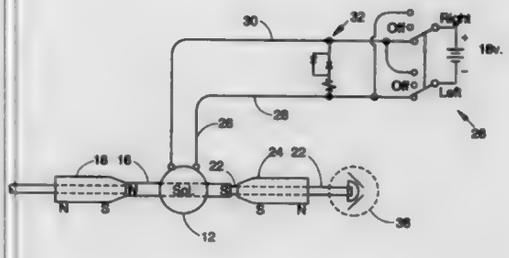
one arm of the two arms of the supporting element having an elastic snap hook and the other arm of the two arms of the supporting element having a latch recess for elastic snap hook reception.

5,470,043

MAGNETIC LATCHING SOLENOID

Donna J. Marts; John G. Richardson; Richard K. Albano, and John L. Morrison, Jr., all of Idaho Falls, Id., assignors to Lockheed Idaho Technologies Company, Idaho Falls, Id.

Filed May 26, 1994, Ser. No. 250,208
Int. Cl.[6] F16K *31/08*
U.S. Cl. 251—65 **9 Claims**



1. A D.C. magnetic latching solenoid comprising:
a) an electric coil;
b) a movable iron armature within the coil, said armature having a longitudinal axis and first and second ends;
c) first and second non-magnetic actuator rods attached respectively to the first and second ends of the armature on said longitudinal axis thereof, said rods passing through an aperture in first and second fixed magnets located proximate to the first and second ends of the armature, said magnets each having a like polarity adjacent the armature; and
d) a coil polarity reversing means connecting to the electric coil, wherein applying a voltage of a first polarity moves the armature in linear motion along the longitudinal axis to a first position and applying a reverse polarity voltage moves the armature in linear motion along the longitudinal axis to a second opposite position, and the armature is then retained in either position by one or the other of said magnets after the voltage is removed.

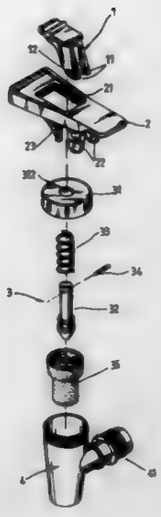
5,470,044

SAFETY FAUCET

James Chi, No. 17, Chung-Hsing Rd., Tu-Cheng; Taipei Hsien, Taiwan, Prov. of China

Filed Oct. 11, 1994, Ser. No. 320,226
Int. Cl.[6] F16K *35/02;31/60*
U.S. Cl. 251—98 **3 Claims**

1. A safety faucet comprising:
a) a handle having an opening adjacent an end thereof, a pair of downwardly extending lugs and a pair of downwardly extending stop blocks disposed adjacent the lugs;
b) a sliding block mounted through the opening of the handle, the sliding block including a plurality of downwardly projecting plates extending through the opening of the handle, the projecting plates having teeth means for retaining the sliding block to the handle and permitting independent movement of the block relative to the handle;
c) a valve device including a cap having a center hole formed therethrough, a valve stem having a top end and a bottom end, the top end being inserted through the center hole of the cap and pivotally connected to the lugs of the handle, a water stopper covering the bottom end, and a spring means mounted around the valve stem;



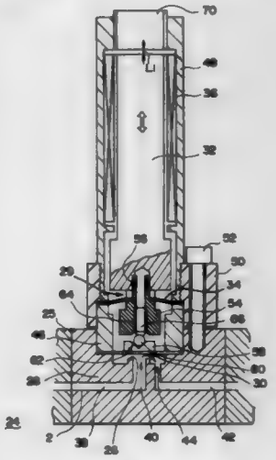
d) a three-way casing including a horizontal portion for connection to a water supply source and a vertical portion secured to the cap of the valve device; and
e) wherein when only the handle is pressed downwardly, the stop locks engage the periphery of the cap to prevent lifting of the valve stem, and when the sliding block is held against sliding movement within said handle opening both the sliding block and handle are held together and simultaneously pressed downwardly, the projecting plates engage the lugs and the top of the cap to function as levers with fulcrum points on the cap for lifting the valve stem and place the valve device in an open position.

5,470,045

SOLENOID-ACTUATED DIAPHRAGM VALVE WITH BIASED DISC SPRING

Yoichiro Kazama, Kumagaya, and Tomihisa Oyama, Fukaya, both of, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Aug. 1, 1994, Ser. No. 283,751
Claims priority, application Japan, Aug. 2, 1993, 5-209868
Int. Cl.[6] F16K *31/02;7/14*
U.S. Cl. 251—129.15 **11 Claims**



1. A valve apparatus comprising:
a valve body having a fluid inlet port, a fluid outlet port and a valve seat separating said inlet and outlet ports;
a flexible diaphragm positioned in an unflexed condition to face, and be spaced from, said valve seat, said diaphragm having a periphery fixed relative to said valve body;

a loading means provided at the opposite side of the diaphragm from the valve seat for causing flexing displacement of the diaphragm toward said valve seat,

wherein said loading means includes a thin plate annularly continuous disc having a center and an outer periphery, and fastened around the outer periphery relative to said valve body;

a valve stem operatively connected to the center of said thin plate disc; and

an electromagnetic actuator operatively connected to said valve stem for selectively Urging said disc counter to said loading means, whereby said diaphragm can flex away from said valve seat.

5,470,046

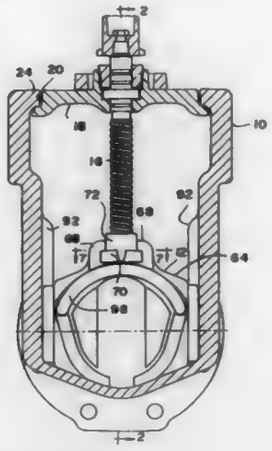
GATE VALVE STRUCTURE

Donald F. Mack, Lovington; Timothy M. Logman, Monticello; Gary L. Bouc, Decatur, all of Ill., and Larry W. Greenlee, Chattanooga, Tenn., assignors to Mueller Company, Decatur, Ill.

Filed Jan. 5, 1993, Ser. No. 997,702

Int. Cl.[6] F16K *3/314*

U.S. Cl. 251—329 **25 Claims**



1. A flow control device comprising:

a housing having a longitudinal axis and, at one portion, a through passage, a valve member mounted for movement in said housing relative to said passage to control flow through said passage,

said housing having, at another portion, an opening receiving operating means for effecting movement of said valve member,

said housing having, adjacent said opening, an internal lip which surrounds said longitudinal axis and an internal sealing surface adjacent said lip also surrounding said longitudinal axis and extending at an angle relative to said longitudinal axis,

closing means for said opening, said closing means having a first peripheral surface for engaging said internal lip and a second peripheral portion supporting a resiliently compressible sealing member so as to sealingly engage said internal sealing surface when said closing means is positioned to close said opening; and wherein said closing means has aperture means for receiving and supporting said operating means for rotation relative to said aperture means about said longitudinal axis when installed in said opening, said closing means including a shoulder portion extending at least partially about said aperture means and extending from adjacent said first peripheral surface through and beyond said opening of said housing, when said closing means is positioned to close said opening, said shoulder portion having a peripheral external surface provided with spaced apart, radially projecting lug members, said closing means including a retaining ring having spaced apart radially inwardly projecting lug members, each for engaging a said lug member of said shoulder portion upon relative rotation between said retaining ring and said shoulder portion to thereby restrain axial movement of said closing means toward said opening.

5,470,047

ELECTRICAL FLAME SENSOR FOR USE IN A GAS CUTTING APPARATUS

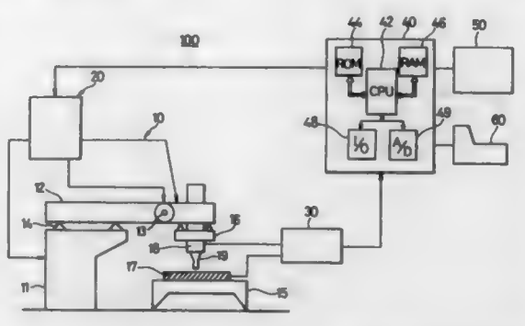
Yoon-Sub Shin, Incheon; Se-Yeob Chang, Seoul; Sang-Jin Lee, Incheon, and Jae-Kon Kim, Seoul, all of, Rep. of Korea, assignors to Daewood Heavy Industries Co., Ltd., Incheon, Rep. of Korea

Filed Jun. 23, 1994, Ser. No. 265,341

Claims priority, application Rep. of Korea, Jun. 23, 1993, 93-11530; Jun. 23, 1993, 93-11531; Jun. 23, 1993, 93-11532; Jun. 23, 1993, 93-11533

Int. Cl.[6] B23K *7/10*

U.S. Cl. 266—76 **8 Claims**



1. A gas cutting apparatus for cutting a workpiece in accordance with a predetermined contour, having a torch and a torch drive means, wherein the torch has a fuel gas supply channel for supplying a fuel gas, a first oxygen channel for supplying a stream of oxygen in order to produce a preheating flame for preheating the workpiece, and a second oxygen channel for supplying another stream of oxygen to produce a cutting flame for cutting the workpiece, which comprises:

a flame sensing means for generating a first and a second current sense signals representative of the amount of electric signals flowing through the preheating and the cutting flames, respectively, formed between the torch and the workpiece;

means responsive to the first current sense signal for generating a first control signal representative of the completion of the preheating; and

a control means responsive to the first control signal and the second current sense signal for generating a second control signal for use in operating the torch drive means.

5,470,048

SLIDING NOZZLE PLATE-METAL FRAME FIXING STRUCTURE

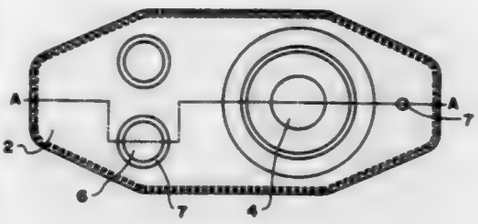
Toshimitsu Taira; Masao Ohnuma; Hisao Hanada; Teruo Aoki, and Tetsuro Kuhara, all of Fukuoka, Japan, assignors to Krosaki Corporation, Fukubka, Japan

Filed Aug. 29, 1994, Ser. No. 298,441

Int. Cl.[6] B22D *41/22*

U.S. Cl. 266—236 **3 Claims**

1. In a structure comprising a sliding nozzle plate attached to a molten metal vessel and a metal frame to which the sliding nozzle plate is attached, and wherein said sliding nozzle plate is formed of a refractory material having a sliding surface, a non-sliding surface opposite to the sliding surface, and side surfaces, and is surrounded by a metal case with the exception of the sliding surface, and at



least a molten metal passage hole extending vertically through the plate, said metal case surrounding said plate being provided with a projection or a plurality of projections on the non-sliding surface of said plate and said metal frame is provided with a plurality of concave portions corresponding to said projection or projections, respectively, so that each of said projections fits in each of said concave portions leaving a clearance in the range of between 0.1 and 1.0 mm in the sliding direction of said plate.

5,470,049

BEARING FOR A SPRING STRUT OF A MOTOR VEHICLE

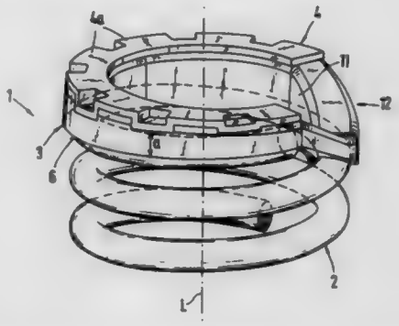
Hans J. Wöhler, Stuttgart, and Francesco Germano, Sachsenheim, both of, Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany

Filed Mar. 25, 1993, Ser. No. 36,892

Claims priority, application Germany, Apr. 3, 1992, 42 11 176.5

Int. Cl.[6] F16F 1/12

U.S. Cl. 267—172 **18 Claims**



1. A bearing assembly for supporting a coil spring comprising:

a wedge shaped elastic support with continuously increasing axial thickness over its circumferential direction corresponding to the pitch of said coil spring, said elastic support being engageable with said coil spring, and;

a rigid wedge shaped distance element disposed on top of and mating with the elastic support and having a continuously increasing axial thickness corresponding to the pitch of said coil spring;

wherein said elastic support and said distance element include mating spring supporting surface sections such that the top of the bearing assembly results in a flat supporting surface perpendicular to a longitudinal axis of the coil spring and said bearing assembly provides substantially uniform elasticity in a longitudinal axial direction over the circumference of the coil spring.

5,470,050

SHEET STACKING APPARATUS

Hideyuki Anma, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

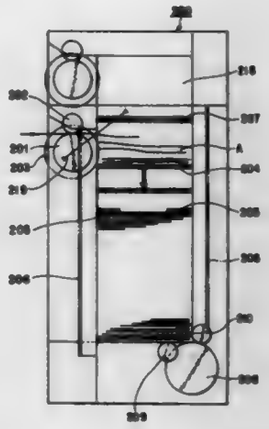
Division of Ser. No. 921,753, Jul. 30, 1992, Pat. No. 5,314,177.

This application Apr. 1, 1994, Ser. No. 221,773

Claims priority, application Japan, Jul. 31, 1991, 3-192212

Int. Cl.[6] B65H 5/22

U.S. Cl. 271—3.03 **5 Claims**



1. A sheet stacking apparatus comprising:

means, having a sheet loading port and a sheet discharge port, for stacking a plurality sheets between the sheet loading port and the sheet discharge port;

means for individually picking up each sheet from the plurality of sheets and for supplying each of the picked up sheets to the sheet discharge port, thereby permitting each of the picked up sheets to be discharged by the discharge port;

means for conveying each of the discharged sheets to the sheet loading port, thereby permitting each of the discharged sheets to be newly loaded through the loading port;

means for counting the conveyed sheets;

means, disposed inside the stacking means, for separating the plurality of sheets from the newly loaded sheets, and for stacking the newly loaded sheets upon the separating means;

first detection means for detecting a position of an upper surface of the newly loaded sheets;

means for moving the separation means in a stacking direction in accordance with the detection results of the first detection means, thereby maintaining the upper surface in a predetermined position; and

second detection means, located proximate to the sheet discharge port, for detecting whether one of the plurality of sheets remains between the sheet loading port and the sheet discharge port, and for outputting a signal for stopping the pickup means and the counting means when the sheet detecting means detects that none of the plurality of sheets remains between the sheet loading port and the sheet discharge port.

5,470,051

AUTOMATIC DOCUMENT FEEDER

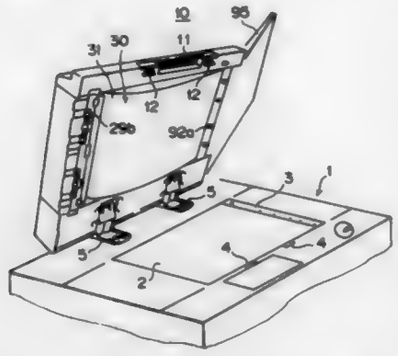
Yuusuke Morigami; Hirokazu Matsuo; Hirofumi Tanahashi, all of Toyohashi; Yoshihito Hirano, Toyokawa; Hiroyasu Nagato, Toyokawa, and Takuma Ishikawa, Toyokawa, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 951,841, Sep. 28, 1992, Pat. No. 5,292,113. This application Dec. 3, 1993, Ser. No. 160,946

Claims priority, application Japan, Sep. 30, 1991, 3-252421; Sep. 30, 1991, 3-252422; Sep. 30, 1991, 3-252423; Sep. 30, 1991, 3-252424; Sep. 30, 1991, 3-252425

Int. Cl.[6] B65H *5/22*

U.S. Cl. 271—7 **10 Claims**



1. An automatic document feeder for feeding a document onto a platen glass of an image forming apparatus and discharging the document therefrom, the automatic document feeder comprising:

a first frame which is pivoted on the image forming apparatus;

a conveyer belt which is an endless belt laid between a driving roller and a driven roller, the conveyer belt rotating with rotation of the driving roller and conveying a document on the platen glass;

a second frame for holding the driving roller and the driven roller;

a connecting member for connecting the second frame with the first frame such that the second frame is movable from and to the first frame within a specified range; and

an urging member for urging the second frame in a direction toward the first frame.

5,470,052

OVERLAPPED TRANSFER-PREVENTING MECHANISM

Yoshiyuki Asakawa; Kazuyoshi Yamamura; Toshinori Muraoka, and Masaru Hatano, all of c/o Mita Industrial Co., Ltd., 2-28, 1-chome, Tamatsukuri, Chuo-ku, Osaka, Japan

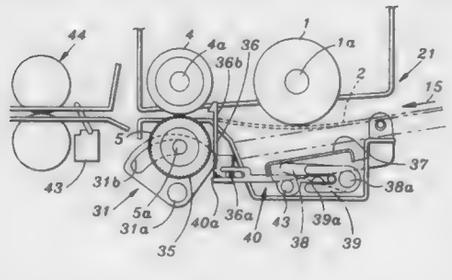
Division of Ser. No. 67,441, May 25, 1993, Pat. No. 5,351,945. This application Aug. 8, 1994, Ser. No. 287,242

Claims priority, application Japan, May 30, 1992, 4-163470; Dec. 12, 1992, 4-352991; Dec. 12, 1992, 4-352992

Int. Cl.[6] B65H *3/06*

U.S. Cl. 271—118 **2 Claims**

1. An overlapped transfer-preventing mechanism provided in an image-forming apparatus, in which a paper-carrying plate with the papers carried thereon is moved between an upper paper-supplying position and a lower non-paper-supplying position, comprising an upper rotably driven separating roll and a lower separating roll offset from said upper separating roll and supported so that an interval between both separating rolls may be regulated by the up or down position of the lower separating roll, a pivot integrated with the lower separating roll being provided with a gear, a ratchet movable up and down engaging said gear, and a cam mounted on a pivot integrated with a raising member which is adopted to raise said paper-carrying plate up to said upper paper-supplying position during a raising operation of said raising member, the cam being interlocked with said ratchet through an interlocking member to rotate the lower separating roll in the direction opposite to a paper-supplying direction by the raising operation of said raising member regardless of the up and down position of the lower separating roll.



5,470,053

DEVICE FOR COLLECTING SHEET-LIKE NOTES AND FOR DISPENSING A BUNDLE OF NOTES

Hermann Kohlhage, Paderborn; Günter Baltz, and Wolfgang Malke, both of Berlin, all of, Germany, assignors to Siemens Nixdorf Informationssysteme Aktiengesellschaft, Paderborn, Germany

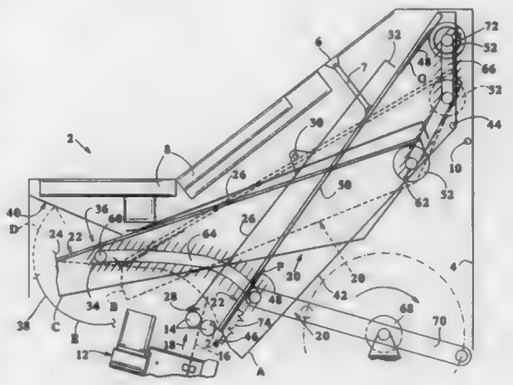
PCT No. PCT/EP91/02346, § 371 Date Jul. 30, 1993, § 102(e) Date Jul. 30, 1993, PCT Pub. No. WO92/10813, PCT Pub. Date Jun. 25, 1992

PCT Filed Dec. 6, 1991, Ser. No. 74,830

Claims priority, application European Pat. Off., Dec. 7, 1990, 90123599

Int. Cl.[6] B65H *31/04*

U.S. Cl. 271—213 **10 Claims**



1. A device for collecting successively supplied sheet-like note and for dispensing a collected bundle of said sheet-like notes at a dispensing station of a dispensing machine, comprising:

a collecting cartridge pivotably mounted in a machine housing such that it can be swivelled between an inclined collecting position, at an end of a note conveyor, and an at least approximately horizontal dispensing position, said collecting cartridge having a bottom and at least one side wall, bounding a lower side of said collecting cartridge, and said side wall forming in a collecting position a lower limitation of said bottom against which said sheet-like notes accumulate when received from said note conveyor, said collecting cartridge being disposed in such a way that, when in said at least approximately horizontal dispensing position of said collecting cartridge, that said at least one side wall faces a side from which said sheet-like notes are removed, wherein in said inclined collecting position, said collecting cartridge is above said note conveyor, which conveys said sheet-like notes essentially vertically upward into said collecting cartridge at said lower side of said collecting cartridge.

5,470,054

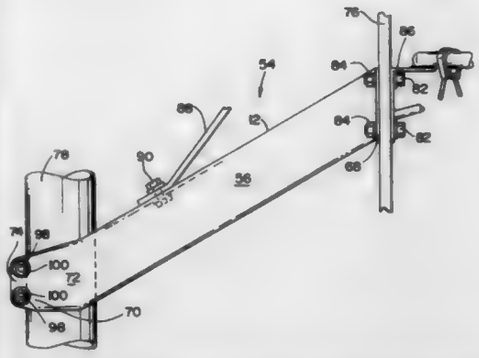
ONE-PIECE EXTENSION ARM

Joseph K. Bohrman, Eagle, Wis., assignor to Huffy Corporation, Waukesha, Wis.

Continuation of Ser. No. 69,287, May 28, 1993, abandoned. This application Feb. 13, 1995, Ser. No. 387,358

Int. Cl.[6] A63B *63/08*

U.S. Cl. 273—1.5 R **20 Claims**



1. Basketball goal apparatus including a backboard for supporting a rim, a support pole having an outer periphery, and a one-piece extension arm formed of a unitary material for connecting the backboard to a support pole, said one-piece extension arm comprising:

a central web;

a pair of spaced legs depending from and formed integrally with said web portion;

at least one forward projection having means for connecting the arm to the backboard, said forward projection depending from and formed integrally with said unitary material; and

a first rearward projection for connecting the arm to the support pole, said rearward projection depending from and formed integrally with one of said legs, and being shaped to correspond to at least a portion of the outer periphery of the support pole and yieldable to cooperate with the other of said legs to clamp the extension arm to the support pole.

5,470,055

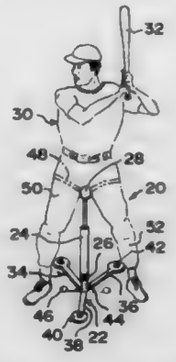
BASEBALL AND GOLF HITTER'S TRAINING DEVICE

Gregory A. Ritchie, c/o M. Siegel, 974 East 18th St., Brooklyn, N.Y. 11230

Filed Jun. 23, 1994, Ser. No. 264,698

Int. Cl.[6] A63B *69/00*

U.S. Cl. 273—26 R **6 Claims**



1. A ball hitter's training device comprising:

a) a base assembly;

b) a height adjustable stanchion having one of it's ends attached to said base assembly;

c) a spring relative to said attached intermediate the ends of said stanchion for permitting pivoting a portion of said stanchion base assembly;

d) an adjustable saddle suitable for a hitters; and

e) a ball joint rotatively securing said adjustable seat to the other said stanchion permitting said adjustable seat to rotate while steadying a hitter astride said stanchion and sitting on said seat, so as to help the hitter to perform a proper weight shift through the executing of a pre-swing stage and a swing stage for hitting a base with a base bat.

5,470,056

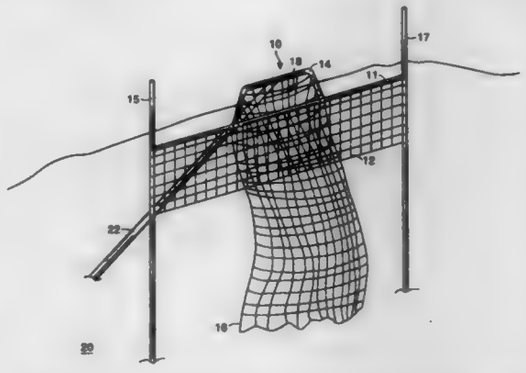
APPARATUS FOR IMPEDING THE MOVEMENT OF A BALL

Christopher F. Dennesen, 147 E. Lothrop St., Beverly, Mass. 01915

Filed Sep. 8, 1994, Ser. No. 303,079

Int. Cl.[6] A63B *61/00*

U.S. Cl. 273—29 B **18 Claims**



1. Apparatus in combination with a raised volleyball net to block a moving ball, comprising:

a supporting structure coupled to, and disposed substantially above, the top of the volleyball net such that a target space is defined by the supporting structure and the top of the volleyball net;

a blocking device coupled to the supporting structure and spanning substantially all of the target space for blocking the moving ball by substantially impeding the movement of the ball when the moving ball passes through the target space, the blocking device having at least a portion thereof free of the supporting structure such that a portion of the blocking device hangs down freely from the supporting structure and overlaps with at least a portion of the volleyball net; and

a stabilizing structure coupled to the supporting structure for stabilizing the supporting structure in relation to the volleyball net.

5,470,057

PADDLE GAME

Robert E. Bodford, Jr., Winston-Salem, N.C., assignor to Paddle Games Unlimited, Inc., Winston-Salem, N.C.

Filed Feb. 2, 1995, Ser. No. 382,967

Int. Cl.[6] A63B *67/04*

U.S. Cl. 273—30 **49 Claims**

1. A paddle game comprising:

an elongate deflector adapted for resting on a table top, said deflector having a generally triangular configuration in cross section and having two substantially opposing angular playing surfaces which extend toward each other in intersecting planes to define an apex, and said deflector being of such a length as to extend across at least a major portion of the width of a table top; and

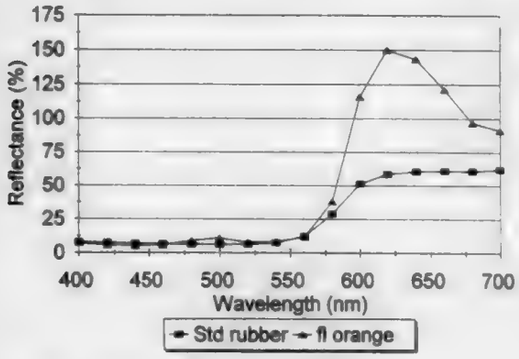
a game board removably positioned on and cooperating with said deflector, said game board extending generally vertically above said apex of said deflector, and said game board having means defining a target associated therewith.

5,470,058

HIGH VISIBILITY INFLATED GAME BALL

Michael J. Sullivan, Chicopee, and R. Dennis Nesbitt, Westfield, both of Mass., assignors to Lisco, Inc., Tampa, Fla.

Filed Sep. 30, 1994, Ser. No. 316,699
Int. Cl.[6] A63B *41/02;41/10*
U.S. Cl. 273—65 B **23 Claims**



1. A high visibility game ball, comprising:
a central inflated portion, and
a cover formed over said central inflated portion, said cover including a plurality of panels at least one of which comprises a peroxide cured synthetic rubber and a tinting agent for enhancing the visibility of the ball, a portion of said ball which includes said at least one panel having a reflectance of at least 75% in a part of the visible spectrum.

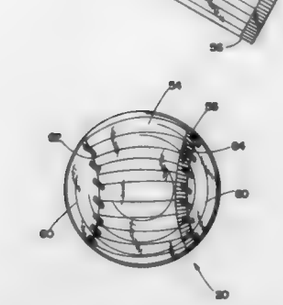
5,470,059

SOFT SPHERICAL PLAYING BALL AND METHOD OF MAKING SAME

Gerald A. Largent, 20573 Belvidere Ave., Fairview Park, Ohio 44126

Filed Jan. 18, 1995, Ser. No. 374,129
Int. Cl.[6] A63B *37/02;37/12*
U.S. Cl. 273—60 B **9 Claims**

1. A soft playing ball consisting of two flexible tubular socks rolled together to form a spherical ball the playing ball comprising:
a first sock rolled into a cylindrical core, the cylindrical core rolled within a second sock having a toe end and an opposite open ribbed end providing an opening to the interior of the second sock, the cylindrical core having circular ends linearly aligned with the toe end and ribbed end of the second sock,



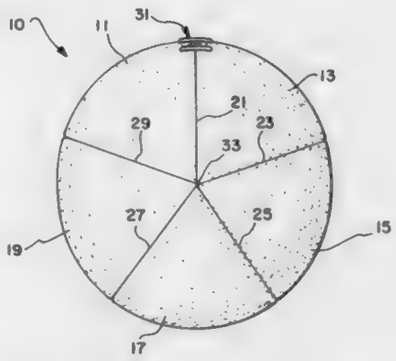
the first sock rolled end over end from the toe end of the second sock to the ribbed end of the second sock to form a spherical core, the ribbed end of the second sock opened and stretched backwards over the spherical core to enclose the spherical core, where the ribbed end is reverse folded to leave an exposed portion of the spherical core defined by a first seam, and the ribbed end partially enclosing the spherical core and leaving the opposite end of the spherical core exposed and defined by a second seam.

5,470,060

FOOTBALL WITH ODD NUMBER OF PANELS

H. Jay Spiegel, Alexandria, Va., assignor to Premium Products, Inc., Alexandria, Va.

Filed Nov. 4, 1994, Ser. No. 334,067
Int. Cl.[6] A63B *41/08*
U.S. Cl. 273—65 E **11 Claims**



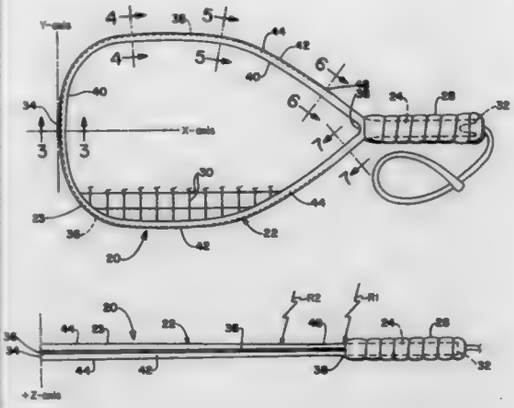
1. An oblate spheroidal football, comprising:
a) a body including an odd number of panels connected together;
b) at least one seam interconnecting two adjacent panels and carrying laces;
c) one of said panels having a first external surface diametrically opposite said laces, said first external surface being devoid of a seam, said one of said panels having reinforcing means overlying a second internal surface of said one of said panels aligned with said first surface, said first surface encompassing a "sweet spot" of said football;
d) said football having dimensions of length, long circumference and short circumference of an American football proportional to those commonly used in official games played by American high schools, colleges and professional teams.

5,470,061

RACQUETBALL RACQUET HAVING INCREASED STIFFNESS AT TIP

Todd B. Colburn, San Diego, and John F. Lorentzen, El Cajon, both of Calif., assignors to Ektelon, San Diego, Calif.

Filed Jun. 28, 1994, Ser. No. 267,448
Int. Cl.[6] A63B *49/02*
U.S. Cl. 273—73 C **5 Claims**



1. A racquetball racquet comprising a frame having a head portion connected to a handle portion, said head portion forming a head and said handle portion forming a handle, said racquet having a handle end, a throat, and a tip;

the frame having a side profile which is formed by oppositely tapered first and second arcs having first and second radii of curvature and intersecting at a point of intersection which is between said throat and a mid-section of said head;

said frame having a maximum frame height at said tip and a minimum frame height at said point of intersection;

said first arc having a first radius of curvature and extending from the tip to the point of minimum frame height, the second arc having a second radius of curvature and extending from the point of minimum frame height to a second point at or below the throat;

said first radius of curvature being about 20 to about 50 times the length of the racquet, said second radius of curvature being from about one to about three times the length of the racquet, and said first radius of curvature being from about 10 to about 20 times the second radius of curvature.

5,470,062

TENNIS RACKET

Masanori Takatsuka, Shizuoka, Japan, assignor to Yamaha Corporation, Japan

Filed Dec. 9, 1994, Ser. No. 352,600
Claims priority, application Japan, Dec. 10, 1993, 5-340932
Int. Cl.[6] A63B *49/04*
U.S. Cl. 273—73 R **9 Claims**

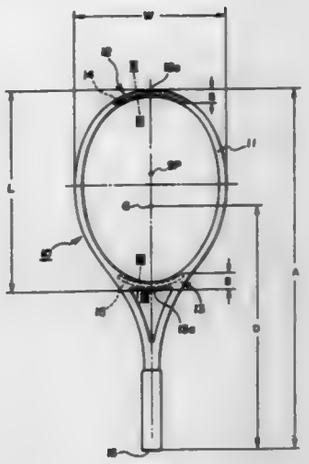
1. A tennis racket comprising

a substantially oval frame including a frame top and a yoke,

a first balance adjuster arranged at said frame top and made of a first material having a first specific gravity larger than that of said frame, and

a second balance adjuster arranged at said yoke and made of a second material having a second specific gravity larger than that of said frame,

the mass of said second balance adjuster being 1.5 to 2.9 times larger than that of said first balance adjuster.



5,470,063

ADJUSTABLE GOLF CLUB PUTTER

Dale P. Fisher, 21072 Marino La., Huntington Beach, Calif. 92646

Filed Sep. 26, 1994, Ser. No. 312,533
Int. Cl.[6] A63B *53/02*
U.S. Cl. 273—80.1 **4 Claims**

1. An adjustable golf club putter comprising:

a full-length straight shaft having a grip at a first end and a first adjustment gear at a second end;

a putter head having a ball striking face and having a hosel terminating in a second adjustment gear;

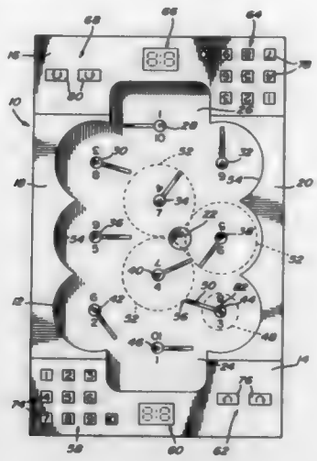
said first and second adjustment gears each having a central aperture and a plurality of contiguous radial teeth on an opposed annular face for firm engagement of said gears; and

a bolt for selectively securing said gears to one another and for releasing said gears from one another to swivel said shaft relative to said putter head in a plane parallel to said ball striking face.

5,470,064
GAME APPARATUS

Francis Landry, R.R. 1, 390 boul. Ste-Anne Est, Ste-Anne-des-Monts, Québec, Canada

Filed Jan. 13, 1995, Ser. No. 372,155
Int. Cl.[6] A63F 7/06
U.S. Cl. 273—85 A 14 Claims

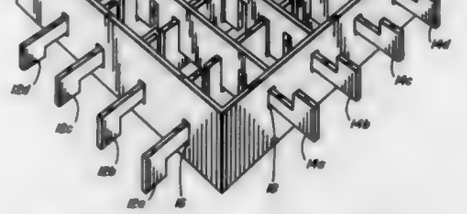


1. An action game apparatus comprising:
a game board having a playing surface for supporting a playing piece for movement thereon, said game board comprising:
a peripheral railing delimiting said playing surface;
said playing surface being generally rectangular, having opposite ends and comprising:
a goal mouth located at each said opposite end of said playing surface;
a plurality of playing figures for striking and propelling said playing piece on said playing surface, said playing figures being pivotally mounted, essentially orthogonal to said playing surface, said playing figures being mounted at predetermined locations on said playing surface;
bidirectional pivotal motion generating means connected to each said playing figure for selective pivotal movement thereof;
said apparatus further comprising:
first and second input means capable of being actuated by a first and a second player respectively, said first and second input means having a plurality of keys adapted to allow said first and second players to sequentially control any one of said plurality of playing figures, each said input means being connected to said bidirectional pivotal motion generating means for selectively actuating the pivotal motion generating means associated with a selected playing figure and for selectively controlling the direction of pivotal movement of said bidirectional rotational motion generating means.

5,470,065
SLIDER PUZZLE

Robert Hilchie, 2-323A Avondale Ave., Ottawa, Ontario, K1Z 7G7, Canada

Continuation of Ser. No. 88,921, Jul. 7, 1993, abandoned. This application Aug. 19, 1994, Ser. No. 293,686
Int. Cl.[6] A63F 9/08
U.S. Cl. 273—155 22 Claims

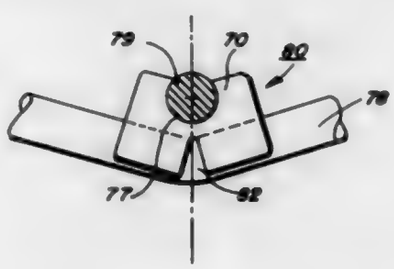


1. A puzzle comprising:
a plurality of permanently intersecting puzzle members, each puzzle member confined for longitudinal movement between opposed end positions, each puzzle member having one or more possible longitudinal positions, each puzzle member having a plurality of gate means, the gate means defining permissable longitudinal movement of each associated intersecting puzzle member in each of the one or more possible longitudinal positions of said puzzle member, the gate means being arranged so as to require a predetermined sequence of movements of said puzzle members in order to position all of said puzzle members in a solved configuration; and,
a housing for permanently interconnecting the puzzle members and to define the end stop positions, the housing also to confine each puzzle member to movement between the opposed end stop positions.

5,470,066
STRING FIXER IN SPORTS RACKET

Tsai C. Soong, 1839 Jackson Rd., Penfield, N.Y. 14526

Continuation-in-part of Ser. No. 191,027, Feb. 2, 1994, abandoned, which is a continuation-in-part of Ser. No. 91,656, Jul. 15, 1993, abandoned. This application May 17, 1994, Ser. No. 243,776
Int. Cl.[6] A63B 51/10
U.S. Cl. 273—73 D 1 Claim



1. In a sports racket having a frame with a midplane passing the neutral plane of the cross section of the frame, and a string network having interwoven string systems whose midplanes coincides with the midplane of the frame, wherein strings of one system which are approximately parallel among themselves are meshing with the strings of at least one other system in large oblique angles at respective string joints where strings in one system cross over strings of another system, interwoven with each other at the string joint, the improvement comprising a string fixer installed in at least one of the string joints, pressed in between the two interwoven strings, holding the two strings in place, said string fixer including holding means arranged to exert clamping compressive force to hold the strings from slipping in the direction of their respective axes, said holding means being formed with a slot for holding a string on either side of the midplane of the string fixer, said holding means having further means for reducing the bending rigidity of the string fixer and thereby effecting bending thereof by the interwoven strings and thereby increasing the clamping force for holding the strings from slipping in the direction of their respective axes as aforesaid, and wherein said further means is a cut through the thickness of said string fixer, at least one on either side thereof

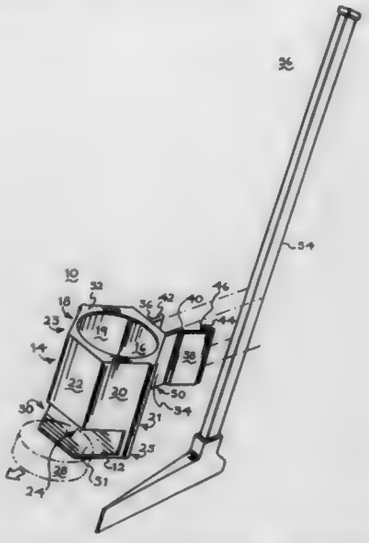
which reduces the bending rigidity of said string fixer making it easier for bending by the interwoven strings.

5,470,067

DETACHABLE PUCK DISPENSING APPARATUS AND METHOD FOR HOCKEY STICK

James D. Diresta, Woodmere, N.Y., assignor to Rapid Mounting & Finishing Co, Chicago, Ill.

Filed Jan. 27, 1995, Ser. No. 379,170
Int. Cl.[6] A63B 71/02
U.S. Cl. 273—57.2 **29 Claims**



1. A sports practice device for use with a player held projectile propelling device and at least one projectile, comprising:

a dispenser having a chamber means for retaining the at least one projectile, the chamber means having a base for supporting the at least one projectile and an aperture for ejecting the at least one projectile; and

a mounting means attached to the dispenser, the mounting means adapted to be detachably coupled to the player held projectile propelling device.

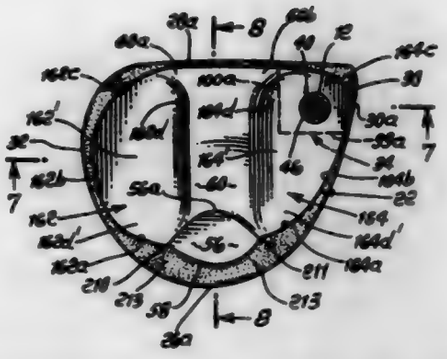
5,470,068

GOLF PUTTER WITH DISHED BOTTOM SURFACES

Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Continuation-in-part of Ser. No. 819,940, Jan. 13, 1992, Pat. No. Des. 343,434, Ser. No. 6,184, Mar. 19, 1993, Pat. No. Des. 352,984, Ser. No. 16,772, Jan. 6, 1994, and Ser. No. 29,553, Mar. 11, 1993, Pat. No. 5,301,945, which is a continuation of Ser. No. 819,379, Jan. 15, 1992, Pat. No. 5,240,252, which is a continuation-in-part of Ser. No. 791,322, Nov. 14, 1991, Pat. No. 5,180,166, which is a continuation of Ser. No. 595,963, Oct. 16, 1990, Pat. No. 5,067,715. This application Jan. 18, 1994, Ser. No. 182,423
The portion of the term of this patent subsequent to Aug. 31, 2010, has been disclaimed.
Int. Cl.[6] A63B 53/04
U.S. Cl. 273—167 A **18 Claims**

1. A golf putter head comprising a body having toe and heel portions, a front wall defining a ball-striking face, and top and bottom walls, said bottom wall characterized as having a medial ridge, and as forming two dished shallow recesses, one recess between the ridge and the heel portion, and the other recess between the ridge and the toe portion, said recesses everywhere



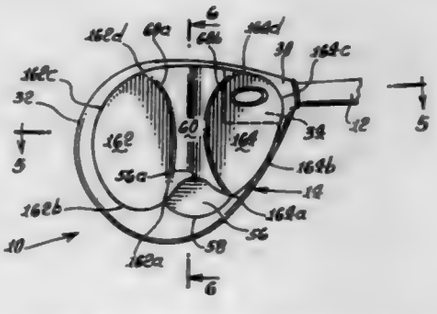
spaced rearwardly from said front wall, the one recess having an arcuate peripheral edge generally convex in a toe to heel direction toward said heel portion, and the other recess having an arcuate peripheral edge generally convex toward the toe portion, said recesses being located in substantially mirror imaged positions with respect to a forwardly extending vertical plane bisecting said ridge, said ridge being downwardly convex rearwardly of said front wall to form opposite sides having forward extents diverging in a direction toward said front wall and rearward extents diverging in a rearward direction; said forward and rearward extents being at substantially the same elevation.

5,470,069

HOLLOW, METALLIC GOLF CLUB HEAD WITH RELIEVED SOLE AND DENDRITIC STRUCTURE

Glenn H. Schmidt, Malibu, and Richard C. Helmstetter, Carlsbad, both of Calif., assignors to Callaway Golf Company, Carlsbad, Calif.

Continuation of Ser. No. 29,553, Mar. 11, 1993, Pat. No. 5,301,945, which is a continuation of Ser. No. 819,379, Jan. 15, 1992, Pat. No. 5,240,252, which is a continuation-in-part of Ser. No. 791,322, Nov. 14, 1991, Pat. No. 5,180,166, which is a continuation of Ser. No. 595,963, Oct. 16, 1990, Pat. No. 5,067,715. This application Apr. 12, 1994, Ser. No. 229,508
The portion of the term of this patent subsequent to Apr. 12, 2011, has been disclaimed.
Int. Cl.[6] A63B 53/04
U.S. Cl. 273—167 A **6 Claims**



1. A golf club head having a shell defining top, bottom, front, rear, toe, and heel walls, and a shell interior, and wherein:

a) the bottom wall has upwardly dished wall extent,

b) said upwardly dished wall extent defining downward facing surface means inclined forwardly and upwardly relative to the head swing path as the bottom wall engages the turf, so that the turf moving relatively rearwardly engages said inclined surface means,

c) and including a first group of narrow, metallic, shock wave distributing dendrites extending from said front wall generally rearwardly adjacent the underside of the shell top wall and integral therewith, said dendrites projecting toward said upwardly dished wall extent,

d) said bottom wall also having a downwardly facing medial ridge spaced below certain of the first group of dendrites, said ridge having rearwardly elongated length at substantially the same elevation and being downwardly convex in a toe to heel direction along said length thereof to define ridge side walls merging with said dished wall extent.

5,470,070

T-SHAPED GOLF PUTTER

Christopher J. Bendo, 12203 Roxbury, Tecumseh, Ontario, Canada

Filed Nov. 4, 1994, Ser. No. 334,133
Int. Cl.[6] A63B *53/04*
U.S. Cl. 273—167 R **7 Claims**

1. A golf club having a head and a shaft connected to the head, comprising:

said head being formed in a generally T-shape including a narrow, normally horizontally arranged stem portion forming an elongated head body portion having a forward end forming a normally vertically arranged impact face, and with the body portion having an upper surface, a lower surface, and opposite side surfaces, said side surfaces being tapered away from the forward end;

said T-shape head including a pair of narrow, elongated, oppositely extending arm portions which extend laterally and horizontally from the opposite side surfaces of the stem and said arm portions include a forward surface co-planar with said impact face and are narrow and include a tapered rear face and angled slightly upward, and said tapered rear faces are continuous with said tapered opposite side surfaces such that an arc is defined by each side surface and continuous rear surface;

the free end of each of said arms terminate in an integral enlargement which provides a weight on the opposite-sides of and spaced from said body portion, said enlargements being located above a transverse plane extending through a central, longitudinal axis of said head body portion;

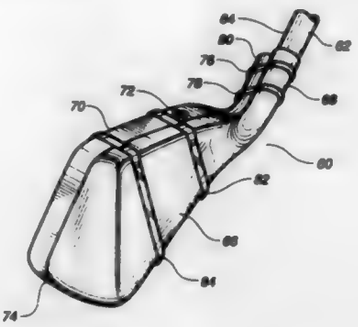
said shaft extending upwardly from the upper surface of said body portion and being connected to the body portion near, but spaced a short distance rearwardly, of the impact face of said body portion.

5,470,071

GOLF SWING TRAINING DEVICE

Kevin Hsu, and Chun S. Lin, both of 11610 Inwood, Houston, Tex. 77077

Filed Sep. 16, 1994, Ser. No. 307,078
Int. Cl.[6] A63B *69/36*
U.S. Cl. 273—186.4 **17 Claims**



1. A golf swing training device comprising:

a shaft; and

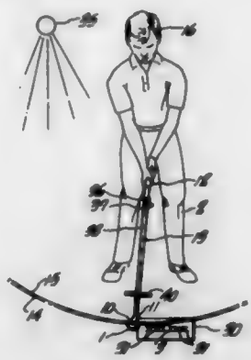
a club head connected to an end of said shaft, said club head having a liquid-receiving chamber, said chamber having an inlet and an outlet orifice, said outlet orifice of a sufficient size to release a liquid during a swing of said, shaft, said chamber being secured to said club head with a plurality of band members, said club head having a hosel connected to said shaft, at least one of said band members extending around said chamber and said hosel, said club head having a driving surface thereon, at least one of said band members extending around said driving chamber and said driving surface of said club head.

5,470,072

GOLF PRACTICE DEVICE

Tom Cunningham, 1802 Crenshaw Blvd., Los Angeles, Calif. 90019

Continuation of Ser. No. 846,899, Mar. 6, 1992, abandoned. This application Aug. 18, 1994, Ser. No. 292,587
Int. Cl.[6] A63B *69/36*
U.S. Cl. 273—186.3 **7 Claims**



1. A golf practice device comprising

a shaft;

a plurality of bright light sources having visually distinguishable colors, said light sources coupled to said shaft and positioned such that when said shaft is grasped by a person and swung as a golf club, said light sources are sufficiently bright to leave an after-image in the eyes of said person, and can be viewed by said person as tracing out distinct color patterns which visually distinguish a square swing from a non-square swing.

5,470,073

GOLF INSTRUCTIONAL DEVICE

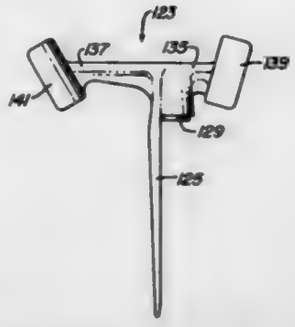
Jose C. Vasquez, 2508 Torrey Pines, Fort Worth, Tex. 76109

Continuation-in-part of Ser. No. 27,400, Mar. 8, 1993, Pat. No. 5,320,354, which is a division of Ser. No. 862,880, Apr. 3, 1992, Pat. No. 5,203,568. This application May 11, 1993, Ser. No. 60,320

The portion of the term of this patent subsequent to Apr. 20, 2010, has been disclaimed.

Int. Cl.[6] **A63B** *69/36*

U.S. Cl. 273—187.2 **9 Claims**



1. A golf instructional device for use with a conventional golf club and grip to teach and reinforce the touch and feel of strokes that establish accurate paths of golf balls around the greens, comprising:

a support member adapted to be held against and parallel to the grip of the club for use by a practicing golfer;

a cap formed integrally with the support member;

a linking means having a pair of generally opposite ends extending generally traversely from, and integrally formed with, the cap; and

a first and second arm pad formed integrally with each of the opposite ends of the linking means to position each of the practicing golfer's arms in an unalterable position.

5,470,074

GOLF PRACTICE TEE APPARATUS HAVING SELECTIVELY ADJUSTABLE INCLINATION FOR SIMULATING UNEVEN LIES AND METHOD FOR USE OF SAME

Dennis B. Hotchkiss, 306 Mesa Ave., Newbury Park, Calif. 91320, and Thomas G. Council, 459 Deerhurst Ave., Camarillo, Calif. 93012

Filed Jul. 18, 1994, Ser. No. 276,589

Int. Cl.[6] **A63B** *69/36*

U.S. Cl. 273—195 B **24 Claims**

1. A mechanical golf practice tee apparatus, comprising:

a base member;

a platform member adapted for a golfer to stand on while practicing a golf swing;

a swivel member for supporting said platform member above said base member, said swivel member allowing said platform member to be adjusted both in the amount of angle of said platform member with respect to said base member and in the relative orientation of said angle of said platform member with respect to said base member;

a plurality of hydraulic cylinders for positioning said platform member with respect to said base member, each of said hydraulic cylinders having a pair of hydraulic fluid connections thereto, each of said hydraulic cylinders being continuously moveable between a retracted position and an extended position when hydraulic fluid is allowed to flow freely into and out of said pair of hydraulic fluid connections, each of said hydraulic cylinders being fixed in position and immovable when hydraulic fluid is not allowed to flow freely into and out of said pair of hydraulic fluid connections;

a substantially fixed volume of hydraulic fluid;

fluid conduit means directly interconnecting all of said hydraulic cylinders; and

a control valve for alternately, selectively allowing or preventing said hydraulic fluid from flowing directly between said hydraulic cylinders and into and out of each of said pairs of hydraulic fluid connections.

5,470,075

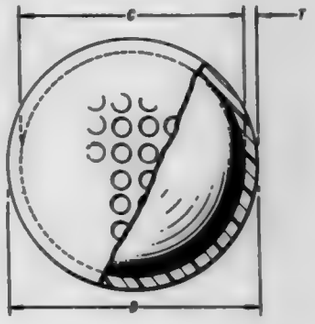
GOLF BALL

R. Dennis Nesbitt, Westfield, and Michael J. Sullivan, Chicopee, both of Mass., assignors to Lisco, Inc., Tampa, Fla.

Continuation-in-part of Ser. No. 171,956, Dec. 22, 1993. This application Nov. 15, 1994, Ser. No. 340,891

Int. Cl.[6] **A63B** *37/06;37/12*

U.S. Cl. 273—220 **5 Claims**



1. A golf ball of improved playing characteristics comprising

a ball having a core and cover, a mean outside diameter from 1.70 to 1.80 inches, and a weight no greater than 1.62 ounces;

said cover having a Shore D hardness of 63 or lower; and

said ball having a coefficient of restitution of at least 0.77.

5,470,076

GOLF BALL

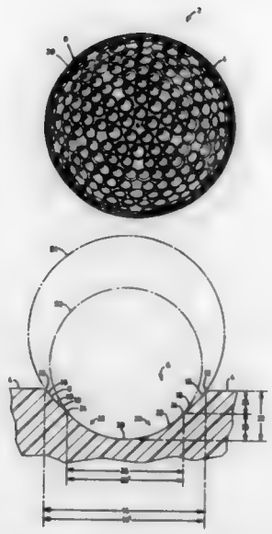
Lauro C. Cadorniga, Piedmont, S.C., assignor to Dunlop Slazenger Corporation, Greenville, S.C.

Filed Feb. 17, 1993, Ser. No. 18,744

Int. Cl.[6] **A63B** *37/14*

U.S. Cl. 273—232 **11 Claims**

1. A golf ball having a plurality of dimples therein, each of said dimples comprising a major dimple portion comprising a first recess formed in a surface of said ball, a major dimple wall defining said major dimple portion, major dimple side edges formed by intersection of said major dimple wall and said surface, said major dimple portion having a major dimple largest span from one of said major dimple side edges to another of said major



dimple side edges, and a minor dimple portion comprising a second recess formed in said major dimple wall, a minor dimple wall defining said minor dimple portion, said golf ball characterized by minor dimple side edges formed by intersection of said major dimple wall and said minor dimple wall, said major dimple wall and said minor dimple wall each comprising a single non-partitioned contiguous wall, said minor dimple portion having a minor dimple largest span from one of said minor dimple side edges to another of said minor dimple side edges, parallel to said major dimple span and smaller than said major dimple span, said major and minor dimple portions of each of said dimples being of similar configuration in planform and in centerline section and being similarly oriented, such that said first recess and said second recess are formed complementary to portions of first and second similar geometrical configurations of unequal size, with said minor dimple portion being substantially centered in said major dimple portion and interrupting said major dimple portion wall.

5,470,077

GOLF BOARD GAME APPARATUS

Wilfred G. Brewster, Mount Helena, and Michael D. Forrester, Greenmount, both of, Australia, assignors to Golf Games International (Australia) Pty Ltd., West Perth, Australia

PCT No. PCT/AU89/00463, § 371 Date Oct. 28, 1991, § 102(e) Date Oct. 28, 1991, PCT Pub. No. WO90/00443, PCT Pub. Date May 3, 1990

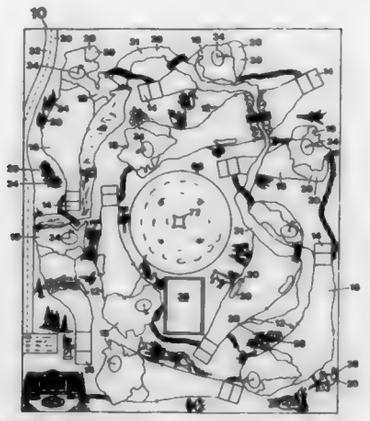
PCT Filed Oct. 26, 1989, Ser. No. 684,906

Claims priority, application Australia, Jan. 26, 1988, PJ1155

Int. Cl.[6] A63F *3/00*

U.S. Cl. 273—245 **13 Claims**

1. A golf board game apparatus a board marked out into a plurality of golf holes; each of the golf holes comprising a tee area, a fairway area, an obstruction area and a green area having a pin; a plurality of distinct place markers at each golf hole comprising a set of place markers representing the results of a tee stroke, and at least one set of place markers representing the result of at least one stroke subsequent to the tee stroke, each golf hole having first card means having an indication of place markers to which a golf ball travels as a result of the tee stroke, and also having an indication of the nature of the next stroke to be played, each golf hole further having at least second card means having an indication of the results of a subsequent stroke including at least two possible results on each second card means and any of an indication of the place marker to which a golf ball travels as a result of a subsequent stroke and an indication of the nature of the next stroke to be played wherein, the card means of each golf hole contains information unique to that golf hole so that conditions of play vary from golf hole to hole; and means for fortuitously determining the result



Side 1. Holes 1–9.

of the tee stroke and all subsequent strokes for each hole by indicating which result of the respective card means is to be referred to.

5,470,078

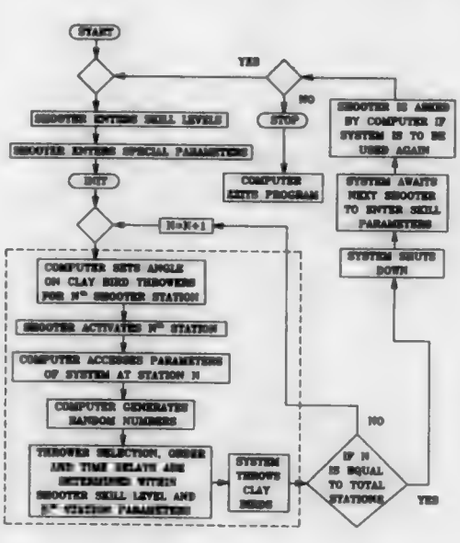
COMPUTER CONTROLLED TARGET SHOOTING SYSTEM

Tye M. Conlan, 610 Anderson Rd., Davis, Calif. 95616-3511

Filed Nov. 26, 1993, Ser. No. 157,472

Int. Cl.[6] A63B *63/00*

U.S. Cl. 273—317 **22 Claims**



1. A target system for a shooter, comprising:

a microprocessor, including means for a shooter to input data thereto;

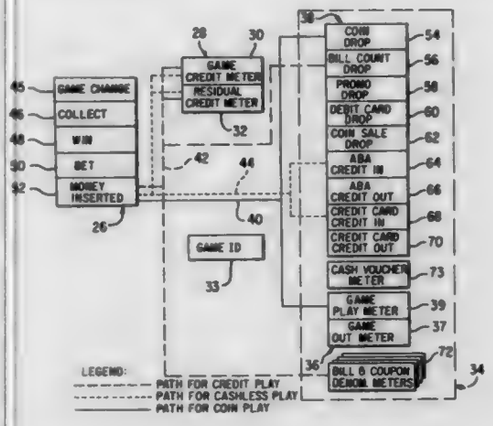
means to establish a predetermined shooting path for a shooter to move along, said shooting path having a plurality of shooter stations and means to sense the shooter along said shooting path and to input the shooter station sensed to said microprocessor; and

a plurality of target throwers connected to said microprocessor and disposed on both sides of said predetermined shooting path, said target throwers randomly directing targets for the shooter in response to output from said microprocessor based upon input from the shooter and the sensed shooter station of the shooter.

5,470,079
GAME MACHINE ACCOUNTING AND MONITORING SYSTEM

Michael M. LeStrange, Brigantine, N.J.; William H. Watson, Reno, and Richard C. Raven, deceased, late of Reno, both of Nev., assignors to Bally Gaming International, Inc., Las Vegas, Nev.

Filed Jun. 16, 1994, Ser. No. 260,587
Int. Cl.[6] G06F *15/28*; A63F *9/24*
U.S. Cl. 273—138 A **46 Claims**



1. An accounting and data collection system for a gaming machine adapted to accept game credit purchases and wagers from a player using one or more forms of monetary value, to generate game winnings or losses in response thereto and to dispense available game credit collected by the player in one or more forms of monetary value, comprising:

means for storing the amount of residual game credit purchased corresponding to credit purchased which has not yet been risked by the player;

means for tracing game activity within said gaming machine including the total wagers accepted and the total winnings paid to the players of said gaming machine; and

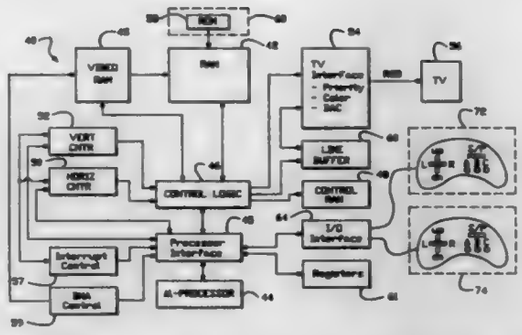
event processing means for sensing gaming machine events including the amount and form of game credit purchase and the amount of a wager by the player and having means for updating said residual credit storing means when game credit is purchased, when a wager is placed and when credit is collected by the player and incrementing Said game activity tracing means by the amount of credit collected in excess of the amount of residual credit available to the player.

5,470,080
MULTI-PLAYER VIDEO GAME APPARATUS WITH SINGLE SCREEN MODE AND SPLIT SCREEN MODE

Yuji Naka, Mountain View, and Masanobu Yamamoto, Forest City, both of Calif., assignors to Sega of America, Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 979,577, Nov. 20, 1992, abandoned. This application Nov. 18, 1993, Ser. No. 154,802
Int. Cl.[6] A63F *9/22*
U.S. Cl. 273—437 **14 Claims**

1. A method for controlling the display of game character movement in a video game for use in a video game system which uses a video display screen; wherein the video game system includes a graphics controller with digital memory; a first user input device and a second user input device; wherein movement of a first game character is responsive to the first user input device and movement of a second game character is responsive to the second user input device; wherein the video game involves the game characters traversing a playfield which is displayed as a series of video screens, the method comprising the steps of:



displaying a first playfield screen in an upper portion of the display screen using an interlace video screen rendering technique;

displaying a second playfield screen in a lower portion of the display screen using an interlace video screen rendering technique;

wherein said steps of displaying the first playfield screen and displaying the second playfield screen include,

first, rendering an even frame of the first playfield screen during a first screen trace;

second, rendering an even frame of the second playfield screen during the first screen trace;

third, rendering an odd frame of the first playfield screen during a second screen trace; and

fourth, rendering an odd frame of the second playfield screen during the second screen trace;

providing game character movement commands to the first user input device in order to control the movement of the first game character through the playfield;

displaying movements of the first character within the first playfield screen in response to the commands provided to the first user input device;

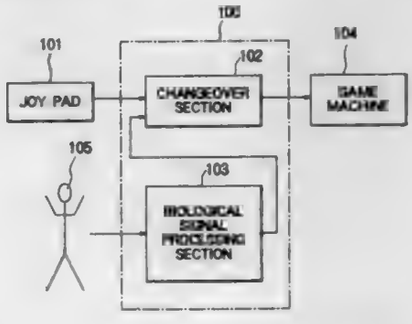
providing game character movement commands to the second user input device in order to control the movement of the second game character through the playfield; and

displaying movements of the second character within the second playfield screen in response to the commands provided to the second user input device.

5,470,081
CONTROL-SIGNAL INPUT DEVICE FOR COMPUTER GAME MACHINES

Toshiyuki Sato; George Sakamoto, both of Tokyo; Morikuni Takigawa, Kagoshima, and Hirotoki Kawasaki, Tokyo, all of, Japan, assignors to DFC Co. Ltd., Tokyo, Japan

Filed Jun. 28, 1993, Ser. No. 84,283
Claims priority, application Japan, Jun. 30, 1992, 4-172393
Int. Cl.[6] A63F *9/24*
U.S. Cl. 273—438 **7 Claims**



1. A control-signal input device for computer game machines for inputting control signals to a computer game machine constructed

so that peculiar operations are performed in accordance with a plurality of game control signals, comprising

means for extracting biological signals,

means for obtaining signal components of each of a plurality of frequency components in said extracted biological signals, and obtaining the state of said biological signals by performing a predetermined computational processing for said signal components, and

means for supplying control signals that substitute for said game control signals in accordance with the state of said obtained biological signals;

said biological signals are brain waves, and the state of biological signals is obtained based on the ratio of the intensity of alpha-rhythm signal components, beta-rhythm signal components, or theta-rhythm signal components to the intensity of the entire signal components of each of a plurality of obtained frequency components.

5,470,082

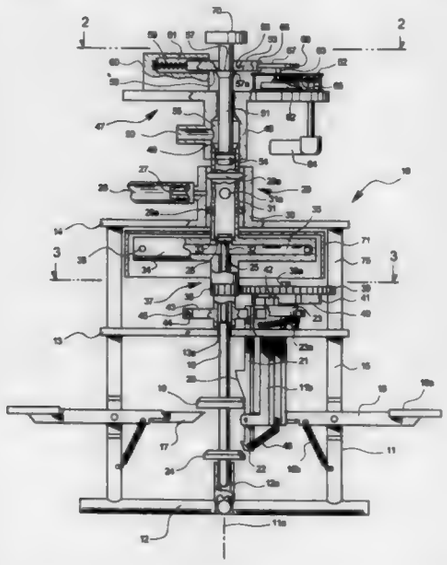
GAME APPARATUS

Richard A. Clayton, 10200 Hillview Ave., Chatsworth, Calif. 91311

Filed Jul. 7, 1993, Ser. No. 88,981

Int. Cl.[6] A63F *9/00*

U.S. Cl. 273—445 **28 Claims**



1. A game apparatus comprising movable discharge means for projecting fluid from said game apparatus toward a plurality of player positions about said game apparatus;

means for supplying fluid to said discharge means for projection therefrom;

propulsion means for imparting motion to said discharge means;

motion control means for selectively stopping motion of said discharge means for alignment within discrete boundaries corresponding to said player positions whereby said discharge means may be selectively aimed at said player positions;

said propulsion means adapted to automatically impart motion to said discharge means when said discharge means is not aligned within the boundaries of a selected player position.

5,470,083

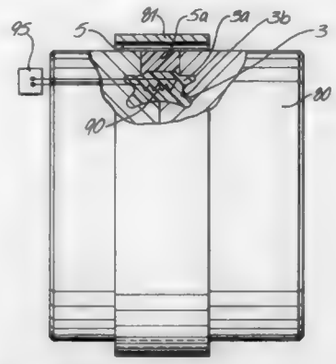
SEAL ASSEMBLY WITH A HARD SEAL LAYER ACTUATED THROUGH A SILICONE LAYER

Erkki Rinne, Espoo, Finland, assignor to Unicraft Oy, Helsinki, Finland

Continuation of Ser. No. 23,888, Feb. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 761,741, Sep. 16, 1991, abandoned. This application Sep. 6, 1994, Ser. No. 301,312

Int. Cl.[6] F16J *15/06*

U.S. Cl. 277—3 **5 Claims**



1. A seal assembly comprising:

a body portion;

a groove formed in a surface of the body portion and having inner and outer portions, wherein the outer portion includes first side walls and the inner portion includes second side walls, and a bottom wall;

a seal member disposed in the outer portion of the groove and in slidable engagement with the first side walls for sealing a gap between the surface of the body portion and a cooperating surface of an element to be sealed;

an inflatable tube in the inner portion of the groove and filed with a pressurizing medium;

an elastomeric medium surrounding the inflatable tube disposed in the inner portion of the groove, the elastomeric medium being of a softer material than the seal member; and

a pressurizing element for releasably applying pressure to the pressurizing medium, wherein the pressurizing means comprises a temperature-controlled heater.

5,470,084

HAND DRILL, IN PARTICULAR HAMMER DRILL

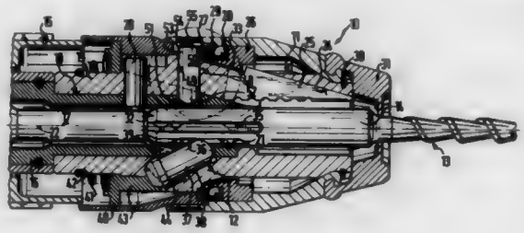
Wilbert Reibetanz; Otto Baumann; Rolf Mueller, all of Leinfelden-Echterdingen, and Bernd Ruckh, Waldenbuch, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 7, 1994, Ser. No. 335,151

Claims priority, application Germany, Dec. 16, 1993, 42 43 013.9

Int. Cl.[6] B23B *31/04*; B25D *17/08*

U.S. Cl. 279—19.3 **10 Claims**



1. A hand drill, in particular a hammer drill, comprising a combination tool holder provided with a first tool receptacle with clamping jaws displaceable relative to a base body and adjustable

by a rotatable adjusting ring to different diameters of tool shafts, and a second separate tool receptacle for tools with a groove shaft and provided with means for at least one driving and locking as well as with a central receiving opening for a groove shaft tool; and an arresting device having a blocking slider which is arranged displaceably in said base body and non-rotatably connected with said base body in a circumferential direction, said blocking slider being movable between a first end position in which a radially inwardly directed end of said blocking slider engages in said central receiving opening and is provided with teeth such that when a groove shaft tool is inserted in said receiving opening said teeth in another end position of said blocking slider non-rotatably engage with counter teeth connected with said adjusting ring.

5,470,085

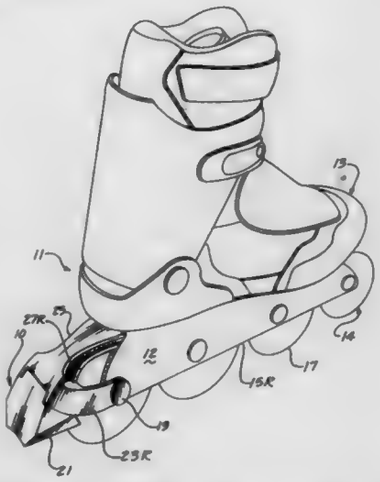
BRAKING APPARATUS FOR IN-LINE ROLLER SKATES

Antonin A. Melbock, Cleveland, Ohio, and John E. Svensson, Seattle, Wash., assignors to K-2 Corporation, Vashon, Wash.

Continuation-in-part of Ser. No. 94,576, Jul. 19, 1993, Ser. No. 100,745, Aug. 2, 1993, and Ser. No. 120,629, Sep. 13, 1993. This application Jan. 26, 1994, Ser. No. 188,961

Int. Cl.[6] A63C *17/14*

U.S. Cl. 280—11.2 **8 Claims**



1. A braking system adapted for use on in-line roller skate having an upper shoe, and a lower frame that includes a plurality of wheels rotatable in a common, longitudinally extending plane, said plurality of wheels being attached to said lower frame by a plurality of axles and having a forwardmost wheel and rearwardmost wheel, said braking system comprising:

(a) a substantially rigid brake housing adapted for attachment to a rear portion of said lower frame at least at three points, said brake housing including:

(i) a pair of plates adapted for attaching said brake housing to the lower frame, said plates being spaced apart but substantially parallel to each other, a forwardmost portion of each plate when mounted on the in-line roller skate, including an aperture of inserting a fastener therethrough for securing said plates to the lower frame at two of said at least three point; and

(ii) an arm coupled between the pair of plates and extending forwardly of the housing when mounted ion the in-line roller skate, said arm being adapted for attaching said brake housing to the lower frame at least at one point that is offset from the points at which the pair of plates are attached to the lower frame; and

(b) a brake pad attached to a bottom portion of said brake housing said pad having an upper portion with other side walls engaging inner surfaces of said pair of plates and support ridges engaging lower surfaces of said pair of plates said brake pad being secured in place using grooves formed in one of the outer side walls of said upper portion of the brake pad and the inner surfaces of the pair of plates that engage ridges formed in the other of the outer side walls of said upper portion of the brake pad and the inner surfaces of the pair of plates, and a fastener that is generally aligned with the grooves and ridges, said fastener being used to secure the brake pad to the brake housing, said brake pad having a braking surface for contacting a riding surface, said grooves and ridges extending in a direction transverse to said braking surface and at an angle to said support ridge to counter shear forces involved in braking.

5,470,086

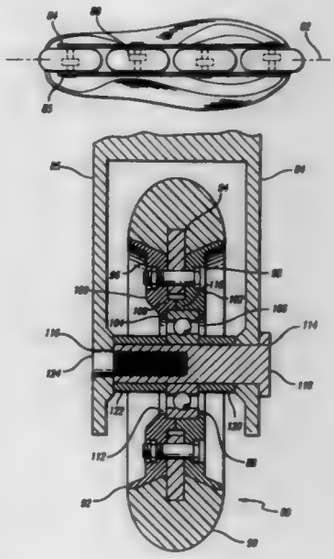
IN-LINE ROLLER SKATE ASSEMBLY

Tom Peterson, and Neal Piper, both of Huntington Beach, Calif., assignors to The Hyper Corporation, Huntington Beach, Calif.

Filed Jan. 28, 1994, Ser. No. 188,235

Int. Cl.[6] A63C *17/06;17/22*

U.S. Cl. 280—11.22 **20 Claims**



20. An in-line roller skate comprising:

a pair of longitudinal mounting rails spaced laterally apart equidistant on opposite sides of a longitudinal center plane to form therebetween a wheel receiving track and having a plurality of axle receiving holes spaced longitudinally thereabout;

a plurality of wheels spaced longitudinally apart in said track, each including a pair of hubs oppositely oriented and configured with a single bearing gland offset to a lateral side of said central plane, the bearing glands of alternate ones of said wheels being offset equidistant to the opposite sides of said longitudinal center plane;

axle bolts for receipt in said axle receiving holes for mounting the respective said wheels therefrom; and

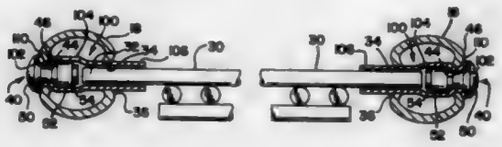
a single bearing assembly in each respective gland for supporting said rails from the each respective wheel so that, when loaded, the alternate ones of said bearings is loaded at alternate opposite sides of said longitudinal center plane.

5,470,087

SHOPPING CART HAVING GATE HINGED TO HANDLE

Tommy D. Mainard, and James F. Reinbold, both of Wagoner, Okla., assignors to UNR Industries, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 171,237, Dec. 21, 1993, Pat. No. 5,397,140. This application Jan. 20, 1995, Ser. No. 375,604
Int. Cl.[6] B62B *11/00*
U.S. Cl. 280—33.992 6 Claims



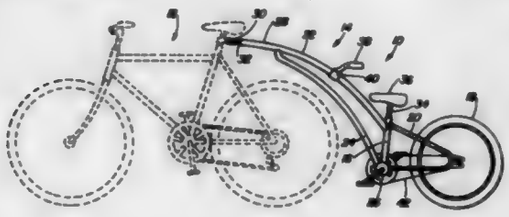
1. A shopping cart comprising an undercarriage, a handle having two tubular portions extending generally upwardly from the undercarriage, and a basket mounted to the undercarriage and to the handle, the basket having a gate and a hinge wire extending along an upper edge of the gate, each such tubular handle portion having an inwardly opening aperture and an outwardly opening aperture, the inwardly and outwardly opening apertures being aligned substantially with one another at the tubular portions of the handle, two tubular sleeves being fixed to the handle, each tubular sleeve extending through the inwardly opening aperture of an associated one of the tubular portions of the handle, the hinge wire defining a hinge axis and having two end portions, each end portion extending into an associated one of the tubular sleeves with sufficient clearance to enable the hinge wire to turn within the tubular sleeves, two retaining structures being fixed to the handle, each retaining structure extending inwardly through the outwardly opening aperture of an associated one of the tubular portions of the handle, into an associated one of the tubular sleeves, the retaining structures being spaced axially so as to permit but limit axial movement of the hinge wire relative to the tubular sleeves, the tubular portions of the handle, and the retaining structures.

5,470,088

BICYCLE TRAILER HITCH ASSEMBLY AND BICYCLE TRAILER INCORPORATING SAME

Delbert J. Adams, 286 Meadowcrest Rd., Kingston, Ontario, Canada

Filed Dec. 7, 1993, Ser. No. 162,330
Int. Cl.[6] B62K *27/12*; B60D *1/14*
U.S. Cl. 280—204 17 Claims



1. A bicycle trailer comprising a frame having at its one end a hitch assembly for connecting the bicycle trailer to a towing bicycle and at its other end a ground-engagable wheel, the hitch assembly comprising;

a clamp for clamping non-rotatably to a seat supporting part of the towing bicycle;

a universal coupling comprising a first part having bifurcations and a second part having bifurcations, the first part and second part being connected together by a central pivot block, the pivot block having one end portion extending between the bifurcations of the first part, its other end portion extending between the bifurcations of the second part, a first hole through said one end portion and a second hole through said other end portion, a first pivot pin extending through aligned holes in the bifurcations of the first part and said first hole to provide a first pivot axis and a second pivot pin extending through aligned holes in the bifurcations of the second part and said second hole to provide a second pivot axis, the first part being attached non-rotatably to the clamp and pivoting about said first pivot axis relative to the block, the second part being attached non-rotatably to the trailer frame and pivoting relative to the block about said second pivot axis, the first pivot axis and second pivot axis being perpendicular to each other and permitting pivoting of the trailer, in use, about generally vertical and horizontal axes, respectively, the first and second pivot axes being spaced apart with the first pivot axis disposed between the clamp and the second pivot axis; and

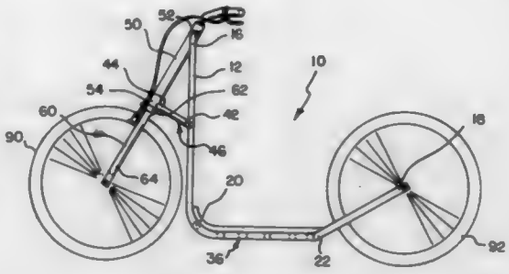
releasable fastening means releasably attaching the clamp to the universal coupling.

5,470,089

SCOOTER

Damaras E. Whitson, 1150 Luxton St., Seaside, Calif. 93955, and Birdie Bogdanovich, 3240 Wright St., Selma, Calif. 933662

Filed Dec. 27, 1993, Ser. No. 172,913
Int. Cl.[6] B62M *1/00*
U.S. Cl. 280—87.041 1 Claim



1. A frame for a vehicle with wheels, the vehicle having a height and a length, the frame having two rigid and spaced rods, each rod having a front end, a rear end, a first intermediate rod portion defined between the front end and the rear end, and a second intermediate rod portion defined between the first intermediate rod portion and the rear end, with the front ends of the rods, rear ends of the rods, first intermediate rod portions of the rods, and second intermediate rod portions of the rods being planarly offset and aligned, the rods extending downwardly from the front ends to the first intermediate rod portions forming a front frame support member, the rods extending horizontally from the intermediate rod portions to the second intermediate rod portions, and the rods extending upwardly from the second intermediate rod portions to the rear ends forming a back fork having two spaced prongs; a plurality of spaced links perpendicularly coupled between the rods from the first to the second intermediate rod portions to define a rear frame support member; a rigid plate coupled to the rear frame support member to define a platform; two rigid and spaced yoke support rods, each yoke support rod having a first end and a second end, with the first ends of the yoke support rods and the second ends of the yoke support rods being planarly offset and aligned, each yoke support rod having a first end and a second end with the first ends of the yoke support rods coupled to the front frame support member and extending upwardly and inwardly to define a yoke support; and a rigid yoke having an upper end and a lower end, the upper end connected to the front frame support member, the lower end connected to the second ends of the yoke support;

a front fork including a stem and two prongs extending downwardly therefrom, the stem disposed within the yoke;

a steering column having a upper end and a lower end, the lower end coupled to the stem of the front fork within the yoke;

handlebars coupled to the upper end of the steering column so that the front fork can be directionally pivoted in relation to the frame;

a front wheel mounted between the prongs of the front fork for rotation, wherein the ratio of the vehicle length to the wheel diameter is between about 2 to 1 and 3 to 1;

a back wheel mounted between the prongs of the back fork for rotation, wherein the ratio of the vehicle length to wheel diameter is between about 2 to 1 and 3 to 1;

the diameter of the wheels constituting the majority of the height of the frame and vehicle; and

a handbrake coupled to the handlebars and the front fork for applying a braking force to the front wheel.

5,470,090

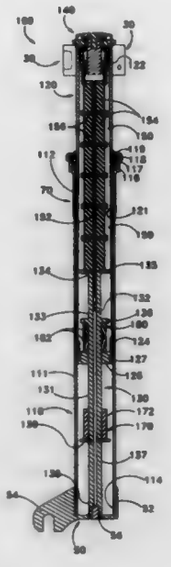
PRECISION SUSPENSION FORK FOR BICYLCES

Gerald M. Stewart, Camarillo, Calif., and E. Douglas Bradbury, Colorado Springs, Colo., assignors to Manitou Mountain Bikes, Inc., Colorado Springs, Colo.

Filed Sep. 7, 1993, Ser. No. 116,683

Int. Cl.[6] B62K *25/08*

U.S. Cl. 280—276 **39 Claims**



1. A suspension fork for mounting to a front wheel axle of a bicycle, comprising:

a. a steerer having an upper end and a lower end;

b. a crown having a body with a central bore and two opposite end bores, said lower end of said steerer being press fit into the central bore of the crown;

c. two parallel fork legs each having an upper end extending through a respective one of said end bores of said crown and secured to said crown, and a lower end attached to said front wheel axle, each fork leg further having a telescoping suspension system with an upper leg and a lower leg slidably engaged to each other;

d. a brake arch having a cross-portion with a rim brake cable receiver and two leg-portions;

e. a brake flange coupled to each one of said two fork legs for mounting one of said two legs of said brake arch and a rim brake post in a spaced apart relationship;

f. said telescoping suspension system comprising an outer tube which is said lower leg, the outer tube having an elongated hollow tubular body with an upper end and a lower end, the upper end being press fit with said brake flange, and the lower end being said lower end of said telescoping suspension system;

g. said telescoping suspension system further comprising an inner tube which is said upper leg, the inner tube having an elongated hollow tubular body with an upper end and a lower end, the body having a sidewall with reduced thickness tapered from the upper end toward the lower end, the upper end being said upper end of said telescoping suspension system, and the inner tube slidably engaged to said outer tube with the lower end of the inner tube sliding inside said outer tube;

h. said telescoping suspension system further comprising a compression rod, the compression rod having an elongated body with an internal bore, the body having an upper portion with an upper end and a lower portion with a lower end, the compression rod further having an integral compression flange positioned at the upper end, an integral rebound flange positioned at the upper portion and spaced apart from the upper end of the compression rod, and a detachable positive stop clip attached at the lower portion and spaced apart from the lower end of the compression rod, the compression rod slidably engaged to said inner tube with the upper portion of the compression rod sliding inside said inner tube, and the lower end of the compression rod coupled to said lower end of said outer tube;

i. an adjuster assembly having a cap mounted on said upper end of said inner tube, a spool slidably engaged with said cap, an adjuster screw threadedly engaged with the spool, a knob accessible from outside of said upper end of said inner tube for rotating the adjuster screw to drive the spool, and an elastomer adapter attached to the spool;

j. a compression elastomer assembly having an elastomer rod, the elastomer rod having an upper end secured to said elastomer adapter of said adjuster assembly and a lower end received by said internal bore of said compression rod, the compression elastomer assembly further having a multiplicity of compression elastomers placed on the elastomer rod in series and partitioned by a multiplicity of elastomer washers, and positioned inside said inner tube between said elastomer adapter of said adjuster assembly and said compression flange of said compression rod to provide an easy fine-tuning of a preload on said compression elastomers by turning said knob of said adjuster assembly, and also to provide a compressive damping force when said outer and inner tubes are compressed from a balanced condition;

k. a rebound elastomer assembly having at least two rebound elastomers placed on said compression rod and positioned inside said inner tube and between said rebound flange and said lower end of said inner tube to provide a rebound damping force when said outer and inner tubes are extended from said balanced condition;

l. a second stage elastomer assembly having at least one positive stop elastomer placed on said compression rod and positioned outside said inner tube and between said lower end of said inner tube and said positive stop clip to provide a secondary compressive damping force when said inner tube travels into said outer tube excessively; and

m. means for converting said suspension fork from a standard travel configuration to a long travel configuration, including one of said at least two rebound elastomers, which can be removed from said compression rod, and an additional compression elastomer, which can be added to said compression elastomer assembly, so that said inner and outer tubes can balance at an extended position to increase a compressive travel distance of said inner tube;

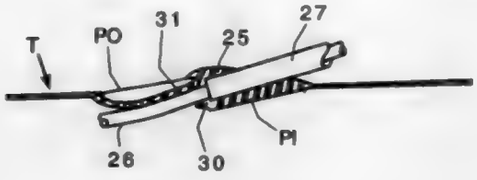
n. whereby said suspension fork provides not only compressive but also rebound damping, and positive stop damping, and further provides fine-tuning ability of said preload, and easy conversion between said standard and long travel configurations.

5,470,091

CABLE GUIDE FOR BICYCLE FRAMES AND METHOD FOR INCREASING FRAME STRENGTH

Darrell Voss; Gary Klein, both of Chehalis; Sean O'Connor, Rochester, all of Wash., and Lonney Pauls, Estacada, Oreg., assignors to Klein Bicycle Corporation, Chehalis, Wash.

Filed Jul. 31, 1992, Ser. No. 922,610
Int. Cl.[6] B62K *19/30*
U.S. Cl. 280—281.1 **14 Claims**



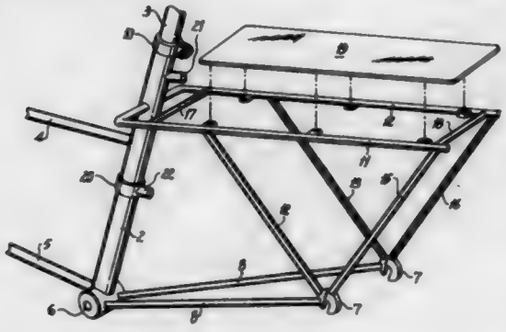
1. In a bicycle frame having a top tube, a head tube and a down tube, said top and down tubes having tube walls with one or more entry and exit apertures for internally routed control cables; the improvement including one or more dimples at each said entry and exit aperture, respectively, each dimple having an end wall forming a bulkhead and wherein said cable entry/exit apertures are formed in said end walls, respectively, said dimples being integral in said tube wall without welding and brazing to provide access points for routing of cables through said tube wall.

5,470,092

BICYCLE FRAME

Paul Fardy, 3067 Xavier Ct., Oceanside, N.Y. 11572

Continuation-in-part of Ser. No. 272,569, Jul. 11, 1994. This application Apr. 19, 1995, Ser. No. 424,888
Int. Cl.[6] B62J *7/04*; **B62K** *19/46*
U.S. Cl. 280—288 **2 Claims**



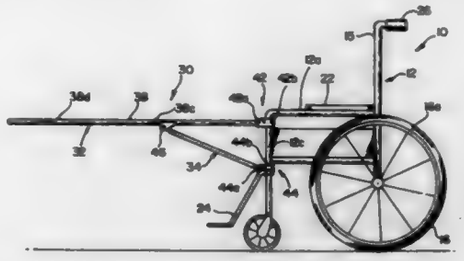
1. A one unit bicycle frame for a bicycle having two wheels in line, with a front steerable wheel, and having a head tube, top tube, down tube, seat tube, and a seat post for supporting a seat, and chain tubes with rear wheel lugs: said one unit bicycle frame having a horizontal rectangular structurally integral member located over the rear wheel and generally parallel to the ground, and having a front cross tube, a rear cross tube, and left and right longitudinal side members, the left and right side members having curved extensions curving inwardly and connected to the seat tube at a generally right angle to a longitudinal axis of the bicycle frame, with said longitudinal side members being spaced by, and connected together by said front and rear cross tubes at right angles to the longitudinal side members, and said rectangular member having a gusset plate installed on its top, secured with a fastener through holes on the periphery of the gusset plate into tabs provided with holes, said tabs located on the longitudinal side members, and said rectangular member being supported from underneath in a position parallel to the ground by left and right first downward tubes connected respectively to the front underside of the left and right longitudinal side members at a position rearward of the curved extensions and left and right second-downward tubes connected respectively to the rear underside of the left and right longitudinal side members, with the first and second downward tubes terminating at and connecting to respective left and right rear wheel lugs.

5,470,093

AUXILIARY WHEELCHAIR ATTACHMENT FOR PULLING A WHEELCHAIR

Charles M. Kiser, Marysville, Wash., assignor to Lovella V. Torp, Missoula, Mont.

Filed Oct. 11, 1994, Ser. No. 320,648
Int. Cl.[6] A61G *5/10*
U.S. Cl. 280—304.1 **22 Claims**



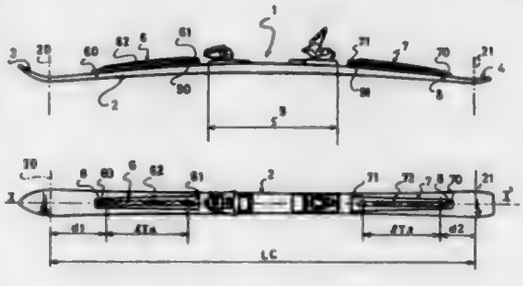
1. A wheelchair attachment which comprises frame means providing an enclosed frame having an end and two sides extendable from said end toward a wheelchair, the frame sides each comprising multiple elongated frame segments connectable axially of one another, the frame means further comprising interlockinq joint means detachably joining adjacent frame segments together; frame mounting means for detachably mounting said frame means to a wheelchair with said frame means projecting outwardly of the wheelchair; and frame support means connected to said frame means and detachably mountable to a wheelchair for positioning said frame means in a desired plane projecting outwardly of a wheelchair.

5,470,094

SKI EQUIPPED WITH VARIABLE LENGTH ELASTIC TRANSMITTERS ON EITHER SIDE OF THE BINDING ZONE

Philippe Commier, Annecy; Axel Phelipon, Alby sur Cheran, and Jacques Le Masson, Cran Gevrier, all of, France, assignors to Salomon S.A., Metz-Tessy, France

Filed Aug. 16, 1994, Ser. No. 291,020
Claims priority, application France, Aug. 20, 1993, 93 10209
The portion of the term of this patent subsequent to Nov. 7, 2012, has been disclaimed.
Int. Cl.[6] A63C *5/07*
U.S. Cl. 280—602 **11 Claims**



1. A ski comprising:

an elongate beam having a central arched portion of a predeterminate length (LC) between a forward contact line and a rear contact line, an upwardly turned front portion comprising a shovel and a less turned up rear portion comprising a tail, said central portion comprising a binding mounting zone corresponding to a standardized zone,

two transmitters located in said central portion and each on either side of said binding mounting zone; one of the ends of each transmitter being connected to the beam by a complete connection; the other end of each transmitter being connected to the beam by a partial connection means, free in translation along a longitudinal direction, the partial connection comprising one of an elastic and viscous element that resists the longitudinal displacement of said transmitter; a portion of a length (l_{T1}, l_{T2}) of each transmitter between the two connections being left free at least in translation with respect to the beam; the ratio of the free length (l_{T1}) of a front transmitter over the free length (l_{T2}) of a rear transmitter being comprised between 1.5 and 2.5, and the ratio ($l_{T1}+l_{T2}$) over a ski length (LC) being, comprised between 0.15 and 0.25.

5,470,095

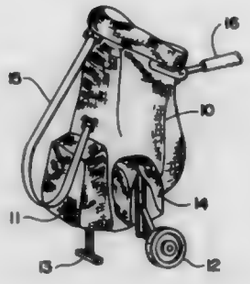
TRANSPORTABLE GOLF BAG

James E. Bridges, 110 River North Ct., Atlanta, Ga. 30328

Filed Jul. 20, 1994, Ser. No. 278,176

Int. Cl.[6] B62B *1/12*

U.S. Cl. 280—646 **5 Claims**



1. A transportable golf club holder for carrying golf clubs comprising:

a semi-rigid bag having a pair of closable pockets attached to lower ends of the bag on opposed sides thereof; and

a pair of retractable wheel assemblies, each wheel assembly being movable between an extended position in which a support wheel is in ground engagement and a stored position in which the wheel assembly is fully received within a respective one of the pair of closable pockets, each wheel assembly including a substantially vertical track secured within a respective pocket, upper and lower slide members movably secured to the track, an upper strut having an upper end pivotally secured to the upper slide member and a lower end pivotally secured to a wheel axle, the support wheel being rotatably mounted on the axle, a collapsible lower strut, the lower strut having outer ends pivotally connected to the lower end of the upper strut and the lower slide member respectively, means for releasably locking the collapsible lower strut in an extended position, and upper and lower locking means for selectively locking the upper slide member to the track at predetermined positions corresponding to the stored and extended positions respectively of the wheel assembly.

5,470,096

WHEELED VEHICLE SUSPENSION

Bobby G. Baxter, Warrenton, Mo., assignor to The Binkley Company, Warrenton, Mo.

Continuation of Ser. No. 217,796, Mar. 25, 1994, abandoned. This application Jan. 23, 1995, Ser. No. 376,287

Int. Cl.[6] B60G *11/02*

U.S. Cl. 280—712 **18 Claims**

1. An air-ride suspension for a vehicle having a bottom, sides and forward and rearward ends, said suspension comprising:

a pair of hangers, one adjacent each side of the vehicle, extending down below the bottom of the vehicle coplanar in a vertical transverse plane of the vehicle, each of said hangers comprising a pair of side members with a space therebetween and an upper and lower member spanning said space defining an opening,

a pair of leaf springs, one adjacent each side of the vehicle below the bottom of the vehicle, each spring extending longitudinally with respect to the vehicle and having one end constituting its forward end extending through the opening in a respective hanger;

a pair of elongate plates, one on top of each leaf spring, each of said elongate plates having a width generally corresponding to the width of each leaf spring, and being of such length and so disposed on the respective leaf spring as to overlie a portion of the length of the spring with the side edges of the elongate plate generally coplanar with the side edges of the respective spring;

an axle extending transversely of the vehicle below the bottom of the vehicle having end portions extending below the leaf springs and below forward end portions of said elongate plates:

means for fastening each end portion of the axle to the bottom of the respective leaf spring and fastening said forward end portion of each of said elongate plates on top of the respective leaf spring;

a cross-beam extending transversely of the vehicle below the bottom of the vehicle spanning the leaf springs having end portions bearing on the said elongate plates adjacent the rearward ends of said elongate plates and secured to said elongate plates;

means for fastening the rearward ends of the elongate plates on top of the leaf springs adjacent the end portions of the cross-beam;

a pair of air cushions, one adjacent each side of the vehicle below the bottom of the vehicle, interposed between the cross-beam and the bottom of the vehicle,

said cross-beam having secured thereon adjacent the ends thereof a pair of plates, one adjacent each end of the cross-beam, each constituting a bottom plate for the respective air cushion;

a pair of plates, one adjacent each side of the vehicle and carried by the vehicle below the bottom of the vehicle, each constituting a top plate for the respective air cushion;

a pair of torque arms, one adjacent each side of the vehicle, each extending longitudinally with respect to the vehicle and having a forward end and a rearward end, and each extending at its forward end into the space between the side members of a respective forward hanger and pivoted at its forward end therein for swinging movement about a first horizontal axis transverse to the vehicle below the said lower member of the hanger and pivotally connected at its rearward end to the axle for swinging movement about a second horizontal axis parallel to the first; and

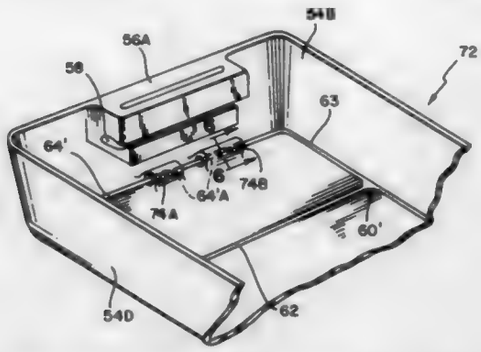
means for limiting transverse displacement of said leaf springs and up and down movement of said leaf springs.

5,470,097

CLOSURE FOR AIR BAG INSTALLATION

Wael S. Elqadah, North Ogden, and Bradley D. Harris, Farmington, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Sep. 3, 1993, Ser. No. 116,942
Int. Cl.[6] B60R 21/16
U.S. Cl. 280—728.3 20 Claims



1. A closure element for an air bag deployment opening of an inflatable restraint system adapted to be integrated into a vehicle with the system including a housing for accommodating a collapsed inflatable air bag, said closure element comprising:

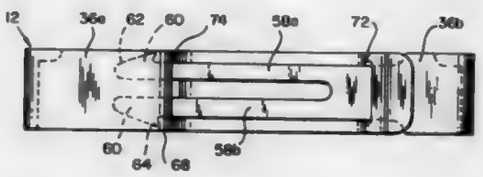
a mounting portion securable to the housing and a face portion and having therein a tear way adapted to tear to define at least one air bag release door with said closure element having at least one integral retention bridge joining said door with said mounting portion across and parallel at least a portion of said tear way, said retention bridge looping over said tear way to form an arc so as to keep said retention bridge out of the path of said tear way thereby preventing tearing of the retention bridge during deployment of the air bag.

5,470,098

SLIDING CUSHION RETAINER WITH SELF-LOCKING DEVICE

Attila Szigethy, Rocky River, Ohio; Brian C. Jenkins, Roy, Utah, and Marc D. Folsom, Mitaka, Japan, assignors to Morton International, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 78,377, Jun. 17, 1993, abandoned. This application Apr. 20, 1994, Ser. No. 225,846
Int. Cl.[6] B60R 21/16
U.S. Cl. 280—728.2 3 Claims



1. An air bag subassembly for installation of an automotive air bag cushion, which has a gas inlet opening, to an air bag cushion canister comprising:

an air bag cushion having a first portion, which is disposed opposite an occupant of the vehicle, a second portion attached to said first portion, said second portion terminating in a third portion defining a gas inlet opening in said air bag cushion for receiving a gas from said gas generator;

an air bag cushion canister having an inside and an outside, including a wall having an inner and an outer surface, said wall defining a cavity for said gas generator with at least part of said air bag cushion in a folded condition, said wall further defining an opening to said cavity in said container; and

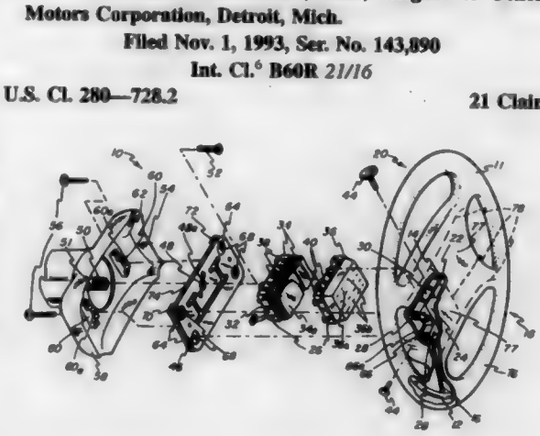
an air bag cushion retainer ring comprising a pair of first sides and a pair of second sides attached to the first sides, said second sides comprising a first section having a first end, a second end, a first aperture and a second aperture in spaced relation from said first aperture wherein said first section between said first aperture and said second aperture is offset from a plane formed by the ends of the first section and a second section shaped in the form of resiliently deformable spring elements comprising spaced members with engagement means attached to the ends thereof, said second section slidably engaged with said second side first section such that when said resiliently deformable spring elements are inserted through said first aperture and said second aperture of said first section said resiliently deformable spring elements compress allowing said engagement means to pass through said apertures permitting said engagement means to engage with said second aperture and to form a spring loaded self locking device thereby preventing the second side second section from passing back through the second aperture; wherein said first sides of said retainer ring are attached to said air bag cushion adjacent said gas inlet opening while said retainer ring second sides are slidably engaged and said retainer ring first sides are attached to said air bag cushion canister wall adjacent said canister opening and fixedly attaching said air bag cushion third portion to said canister.

5,470,099

ONE-PIECE STEERING WHEEL ASSEMBLY

Duane D. Williams, Beavercreek, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 1, 1993, Ser. No. 143,890
Int. Cl.[6] B60R 21/16
U.S. Cl. 280—728.2 21 Claims



1. A steering wheel for use with an air bag, comprising:

a steering wheel core comprising a center section, a rim section, and a plurality of spokes joining said center and rim sections to provide a driver's side and a mounting side, said center section comprising a receiving area which is capable of receiving an air bag;

a preselected material formed as an integral covering surface extending over said rim section, said center section and said spoke section; and

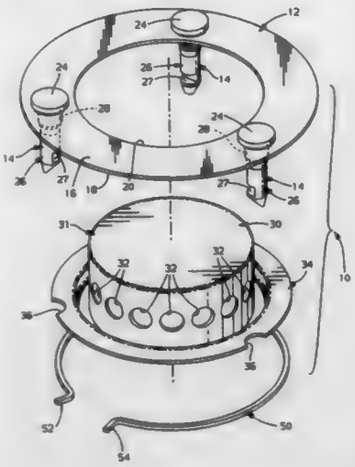
a fastener associated with said mounting side for fastening said center section onto a steering column.

5,470,100

AIR BAG MODULE INFLATOR RETAINER

John E. Gordon, Brookville, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 25, 1994, Ser. No. 295,589
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.2 **8 Claims**



1. In an air bag module including an inflator for discharging gas and a base plate including a plate opening, a mechanism for attaching the inflator to the base plate comprising:

a plurality of stud members mounted to the base plate and extending downwardly therefrom;

the inflator including an outwardly extending inflator flange underlying and engaging the base plate upon insertion of the inflator through the plate opening, the inflator flange adapted for receiving the stud members therethrough, each stud member including a radial slot opening subjacent the inflator flange when the inflator flange engages the base plate; and

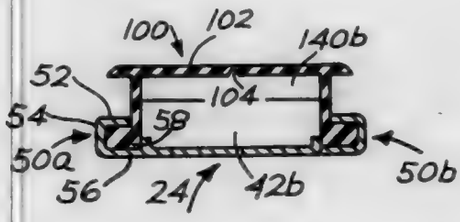
an inflator retainer being a discontinuous resilient ring which is radially deformable for positioning the retainer in radial alignment with the slots and being releasable to snap-fittedly engage with each of the slots such that the retainer is captured and held therein whereby the inflator flange is trapped between the retainer and the base plate such that the inflator is anchored to the base plate and held in position relative to the base plate when discharging gas.

5,470,101

DRIVER SIDE AIR BAG MODULE

Thomas A. Ennis, Clinton Twp., Mich., assignor to AlliedSignal Inc., Morristown, N.J.

Filed Dec. 20, 1993, Ser. No. 169,907
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.2 **6 Claims**



1. An air bag module (**10**) comprising:

a base plate (**24**), having first means for securing an air bag inflator thereto and opposingly situated open sided, tapered channels (**50***a*,*b*), generally extending across most of an adjacent side of the base plate, each channel having at least one open end (**61**);

a cover means (**100**) for protecting an air bag (**150**), the cover means includes a top (**102**) and side walls (**106***a*,*b*), each side wall includes tapered locating means (**114***a*,*b*) slidably receivable within the open end of and into each channel (**50***a*,*b*),

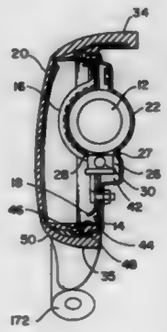
wherein the base plate, proximate the open end of each channel includes a first fold over tab means (**60**) for prohibiting the cover means from sliding out of the channels and when folded back permitting the cover to be removed.

5,470,102

AIR BAG MODULE WITH AN OFF-CENTER MOUNTED TUBULAR INFLATOR

Bradley W. Smith, South Ogden; Kirk Rasmussen, West Point, and John E. Allard, North Ogden, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Oct. 13, 1994, Ser. No. 322,818
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.2 **11 Claims**



1. A vehicle air bag module comprising,

a module housing including a flat bottom, a slotted section with a curved wall running the width thereof, and having an inflator diffuser opening lying in the plane of the bottom of the module housing and in a portion of said module housing slotted section at a position intermediate the ends thereof,

a folded inflatable cushion having a gas inlet rectangularly shaped opening with an inner periphery,

a retaining ring extending around the inner periphery of said gas inlet opening of said cushion, said retaining ring having slotted sections with curved walls that match and are disposed adjacent said slotted section of said module housing,

a tubular inflator comprising a cylindrical housing and a diffuser that projects laterally outwardly from said inflator at a position intermediate the ends thereof, said tubular inflator being disposed in said slotted section of said module housing with said diffuser extending through said inflator diffuser opening, and

a retaining bracket having a slotted section that matches and is disposed adjacent to and extends around the back side of said tubular inflator to hold said inflator in place thereagainst.

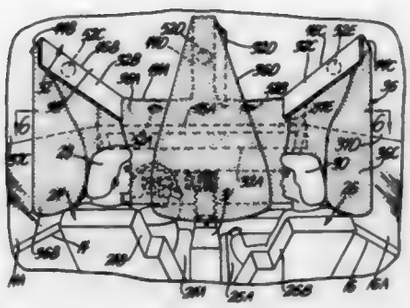
5,470,103

MOTOR VEHICLE HEAD IMPACT AIR BAG SYSTEM

Glenn M. Vaillancourt, Saco, Me., and Lee E. Gridley, Ossipee, N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Dec. 27, 1994, Ser. No. 364,638
Int. Cl.[6] B60R *21/08*
U.S. Cl. 280—730.1 **9 Claims**

1. An air bag system for a motor vehicle having a pair of adjacent seats and a ceiling located above said seats, said seats have a bottom and a back, said air bag system including a singular inflatable multisection air bag mounted in said ceiling for deploy-



ment vertically downward in a front and side and in between manner with respect to said seats, said air bag configured in an E-shape as viewed from overhead and in cross-section so as to form on inflation a singular air bag cushion that extends downward to at least about the level of the top of said seat backs along a front side of both of said seats and along an outer side of both of said seats and along an inner side of both said seats.

5,470,104

FLUID FUELED AIR BAG INFLATOR

Bradley W. Smith, Ogden, and Karl K. Rink, Liberty, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed May 31, 1994, Ser. No. 252,036
Int. Cl.[6] B60R *21/26*
U.S. Cl. 280—737 **43 Claims**

1. An apparatus for inflating an inflatable device, said apparatus comprising:

a pressurized first chamber wherein at least one fuel in the form of a fluid and at least one oxidant are burned to produce combustion products including hot combustion gas, said first chamber including at least one gas exit opening and having sealing means normally closing said gas exit opening, the combustion of said fluid fuel and said oxidant increasing the temperature and pressure within said first chamber, said first chamber sealing means adapted to open when a predetermined increase in pressure within said first chamber is realized,

whereby at least a portion of said hot combustion gas is expelled from said first chamber,

a second chamber containing a supply of pressurized stored gas, said second chamber in fluid communication with said first chamber upon the opening of said gas exit opening sealing means, said hot combustion gas expelled from said first chamber mixing with said pressurized stored gas to produce inflation gas, said second chamber including at least one gas exit port and having sealing means normally closing said gas exit port, the mixing of said hot combustion gas with said pressurized stored gas increasing the temperature and pressure within said second chamber, said second chamber sealing means adapted to open when a predetermined increase in pressure within said second chamber is realized after said hot combustion gas expelled from said first chamber mixes with said pressurized stored gas to produce said inflation gas,

whereby at least a portion of said inflation gas is expelled from said second chamber to inflate said device, and

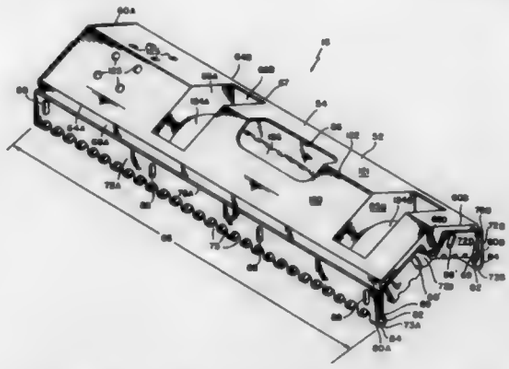
initiator means for initiating the burning of said at least one fluid fuel and said at least one oxidant.

5,470,105

DIFFUSER DEVICE AND INCORPORATION THEREOF IN AN INFLATABLE RESTRAINT SYSTEM

Larry D. Rose, Layton; Donald R. Lauritzen, Hyrum; Mike J. Ravenberg, Corinne; Mark A. Thompson; David J. Green, both of Brigham City, and Terry R. Davis, Layton, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Dec. 18, 1992, Ser. No. 993,277
Int. Cl.[6] B60R *21/28*
U.S. Cl. 280—740 **21 Claims**



1. In an air bag module assembly comprising an inflator that discharges gas from one end thereof, a diffuser device for an inflatable restraint system air bag module which includes an open-mouthed reaction canister housing having first and second side panels, an air bag inflator, and an air bag for the restraint of a vehicle occupant, the diffuser device comprising:

a face member portion having a longitudinal length with a peripheral edge defined thereabout;

an integrally formed side wall about at least a portion of said peripheral edge;

an Outer flange oppositely positioned and angularly disposed relative to at least a portion of said side wall; and

a channel portion, bridging said side wall and said oppositely positioned and angularly disposed outer flange, adapted to engage a thickened edge of the air bag,

the diffuser device also comprising gas flow directing means including a plurality of apertures in said face member portion permitting inflation gas to flow through said face member portion, with the longitudinal length of said face member portion being generally perpendicular to the direction of gas flow through said face member portion, said diffuser device forming a barrier between the inflator and both the air bag and vehicle occupant and a restricting tie between the first and second side panels of the reaction canister housing,

wherein said gas flow directing means results in uniform distribution of gas flow through said apertures along the longitudinal length of said face member portion.

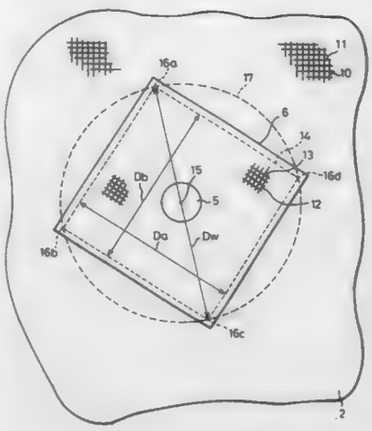
5,470,106

AIR BAG HAVING A HIGH BURST STRENGTH

Kunio Nishimura, Ibaraki; Hideo Nakagawa, Takatsuki, and Nobuo Takahashi, Ikoma, all of, Japan, assignors to Teijin Limited, Osaka, Japan

PCT No. PCT/JP93/01162, § 371 Date Apr. 7, 1994, § 102(e) Date Apr. 7, 1994, PCT Pub. No. WO94/04396, PCT Pub. Date Mar. 3, 1994
PCT Filed Aug. 19, 1993, Ser. No. 211,500
Claims priority, application Japan, Aug. 19, 1992, 4-241410
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—743.1 **9 Claims**

1. A beltless air bag with a high burst strength comprising a circular bottom cloth and a circular top cloth each formed from a woven fabric piece, having warp yarns and weft yarns superposed on each other and seam-joined to each other at a circumferential edge portion thereof, the circular bottom cloth having an inflation



connecting hole formed in a center portion thereof through which an inflator can be connected to the air bag and having a circumferential portion thereof surrounding the inflator-connecting hole reinforced with an apron having an inflator-connecting hole, said apron being made from a woven fabric piece seam-joined to the bottom cloth by circumferential seam lines wherein an outermost circumferential seam line on the apron is in a quadrilateral form selected from substantially regular square, rhombic and rectangular forms, said quadrilateral form having vertexes and having the same center point as that of the inflator-connecting hole; the outermost circumferential seam line having a pair of sides extending in parallel to each other and substantially parallel to the direction of the warp yarns or the weft yarns in the bottom cloth and satisfying the requirements that:

(1) when an imaginary circle having a diameter Dw is drawn around the same center point as that of the inflator-connecting hole on the apron in such a manner that at least one pair of vertexes of the outermost circumferential seam line, spaced at a largest diagonal distance from each other, is inscribed in the imaginary circle, a ratio of each of straight line distances Da and Db between one of the vertexes inscribed in the imaginary circle and each of two vertexes adjacent to said one of the vertexes to the diameter Dw of the imaginary circle is in a range of from 0.6:1 to 0.9:1; and

(2) a ratio of each of the distances Da and Db to a diameter De of the circular bottom cloth is 0.5:1 or less.

5,470,107

ENERGY ABSORBING STEERING COLUMN MOUNTING

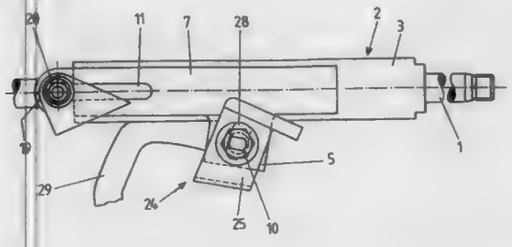
Herbert Müntener, Ruggell, and Michael Waiser, Schaan, both of, Liechtenstein, assignors to Etablissement Supervis, Vaduz, Liechtenstein

Filed Jul. 7, 1994, Ser. No. 271,596

Claims priority, application Germany, Jul. 7, 1993, 43 22 636.1

Int. Cl.[6] B62D *1/19*

U.S. Cl. 280—777 **16 Claims**



1. A safety steering system for a motor vehicle, comprising:

a steering shaft;

a steering column for receiving said steering shaft; and

means for securing said steering column to a motor vehicle body,

wherein said steering column includes axially extending elongate slots having each opposite end limiting edges and spaced substantially linear limiting edges extending between said opposite end limiting edges,

wherein the end limiting edge remote from a steering wheel side of said steering column has a circular shape defining a circular opening having a diameter, which is greater than a distance between said spaced substantially linear limiting edges,

wherein said securing means includes sleeve means located in said circular opening and having a diameter corresponding to the diameter of said circular opening, and a circular connecting element extending through said sleeve means, and

wherein a deformable element is located in said elongate slot, said deformable element having an elongate main portion and a segment formed integrally therewith and located at an end portion of said elongate main portion, said segment being adapted to be sheared off said main portion upon application outer forces thereto.

5,470,108

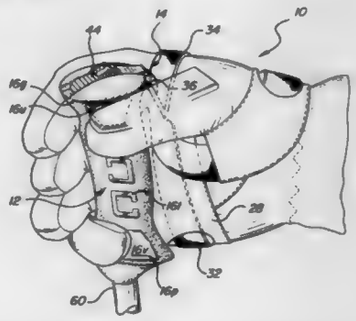
IMPROVED SKI POLE GRIP ASSEMBLY

David P. Goode, 1997 Long Lake Shore Dr., Bloomfield Hills, Mich. 48302, and Frank E. Vogel, 136 Walnut, Apt. 1, Rochester, Mich. 48307

Filed Oct. 5, 1992, Ser. No. 956,802

Int. Cl.[6] A63C *11/22*

U.S. Cl. 280—823 **8 Claims**



1. A ski pole assembly comprising a shaft and a grip adapted to be fitted on the upper end of the shaft characterized in that the grip includes an inner core member formed of a relatively hard low friction material and including a downwardly opening bore receiving the upper end of the shaft and allowing the shaft to be adjustably positioned in the bore to selectively vary the overall length of the ski pole, the lower end of the bore as it exits the core member is oversized with respect to the shaft diameter, and the grip further includes an outer sheath of soft, relatively high friction material surrounding the lower end of the core member and including an annular liner portion extending upwardly into said bore and having an inner diameter approximating the diameter of the shaft so that the liner tightly embraces the shaft as the shaft enters the bore.

5,470,109

ADJUSTABLE BOOK JACKET AND METHOD FOR MAKING SAME

Dennis Grande, 7 Bigham Trail, Park Ridge, N.J. 07656

Filed Jan. 12, 1995, Ser. No. 372,062

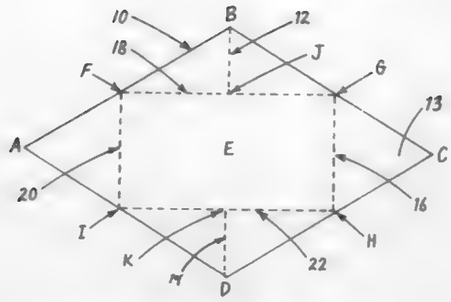
Int. Cl.[6] B42D *3/04*

U.S. Cl. 281—34 **16 Claims**

1. An adjustable book jacket, comprising:

(a) said jacket being fabricated in an elastic material;

(b) said jacket having a front panel and a back panel;



(c) said jacket being rectangular in shape, said rectangularly shaped jacket having a top and a bottom, and a left side and a right side, said rectangular shape being defined by a fold line around the periphery of said rectangular shape;

(d) said front panel having an open seam extending substantially the full latitudinal width of said front panel so as to form a left hand pocket and a right hand pocket for the placement therein of a left hand and right hand cover of a book;

(e) said left hand pocket having two seams stitched closed, a first one of said two left hand pocket seams being located between a beginning point on the top left hand corner of said rectangular shape stitched closed in a substantially diagonal direction to an end point on a first edge of said open seam, and a second one of said two left hand pocket seams being located between the bottom left hand corner of said rectangular shape stitched closed in a substantially diagonal direction to an end point on said first edge of said open seam;

said right hand pocket having two seams stitched closed, a first one of said right hand pocket seams being located between a beginning point on the top right hand corner of said rectangular shape stitched closed in a substantially diagonal direction to an end point on a second edge of said open seam, and a second one of said two right hand pocket seams being located between the bottom right hand corner of said rectangular shape stitched closed in a substantially diagonal direction to an end point on said second edge of said open seam, so that books having a spine and two covers, said combination of book spine and covers having the same or greater widths and lengths as said jacket can be covered by said jacket, said covers of said books being placed within and covered by said pockets within said jacket, said jacket covering the outer, exposed area of said covers and said spines of said books.

5,470,110

SAFETY SHIELD FOR FLANGE TYPE COUPLING

Lawrence R. Hupe, 4118 Chico Rd., Pascagoula, Miss. 39567

Filed Feb. 7, 1994, Ser. No. 192,459

Int. Cl.[6] F16L *55/17;55/00*

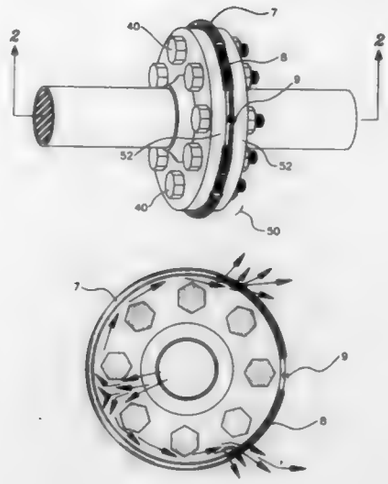
U.S. Cl. 285—13 **7 Claims**

1. An apparatus for protecting a worker against sudden discharge of a product from a flange coupling having a gap during opening, comprising:

an elongate flexible body having a cross-section adapted to fitting within the gap of a flanged pipe coupling;

the length of said body extending at least one half but less than all of the circumference of said flange gap;

means for securing said body within the flange gap of said pipe coupling.



5,470,111

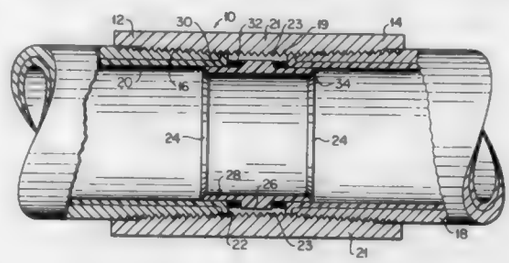
PLASTIC COATING THREAD AND COUPLING ASSEMBLY

John M. Nelson, and Ray D. Willis, both of Houston, Tex., assignors to Tuboscope Vetco International, Inc., Houston, Tex.

Filed Aug. 12, 1994, Ser. No. 288,805

Int. Cl.[6] F16L *15/04*

U.S. Cl. 285—55 **6 Claims**



1. A coupling assembly comprising an annular coupling having internal threads having a central portion having a plastic corrosion-resistant coating and opposed tubes having a continuous plastic, corrosion-resistant coating and having external threads inserted into said coupling with said internal threads, including said central portion thereof, and said external threads being in threaded engagement to produce a seal and a corrosion barrier at said central portion of said annular coupling, an annular gasket of rigid material mounted between and in sealing engagement with opposed ends of said tubes within said coupling, said gasket having a continuous radial portion extending between said opposed ends of said tubes and spaced apart from each said opposed ends of said tubes a distance sufficient to receive a plurality of O-rings mounted between each said tubing opposed ends and said continuous radial portion of said gasket and in sealing engagement with each said plurality of O-rings, a pair of opposed flanges extending from opposite sides of said continuous radial portion of said gasket and into sealing contact with an interior surface portion of said tubes extending from each said opposed end of said tubes.

5,470,112

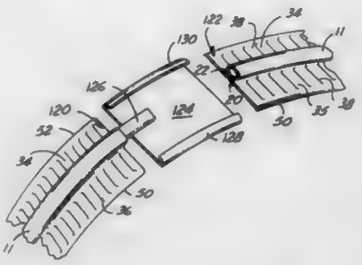
ADJUSTABLE COUPLING RING

Henry M. Keating, St. Clair Shores, Mich., assignor to Keating Koupling, Inc., Six Mile, S.C.

Filed Oct. 24, 1994, Ser. No. 328,022

Int. Cl.[6] F16L *35/00*

U.S. Cl. 285—24 **3 Claims**



1. A coupling ring for receiving and joining circular air ducts whose actual diameter may vary from the nominal diameter comprising:

an elongated strip of sheet metal folded upon itself and bent into cylindrical shape to provide oppositely extending cylindrical flanges and a channel-shaped annular rib encircling the flanges at their proximal edges and connecting them together;

axially outwardly opening grooves at opposite sides of the rib at the connection between the rib and flanges for receiving the ends of ducts into which the flanges are telescoped for connecting the ducts;

said strip having opposite juxtaposed ends and the diameter of the ring being expansible or contractable to vary the gap therebetween;

a tongue connected to the rib at said juxtaposed ends and extending therebetween to bridge the gap and hold the ends in alignment and slidable in respect of at least one such end;

a cleat in the form of a plate extending between said juxtaposed ends on the inside of the ring from the rib and bridging the gap between such ends;

and said cleat having lateral edges shaped to embrace the distal edges of the flanges to hold them in alignment while allowing slidable adjustment between such ends during variations in the gap between them.

5,470,113

CONNECTOR FOR PLASTIC TUBES

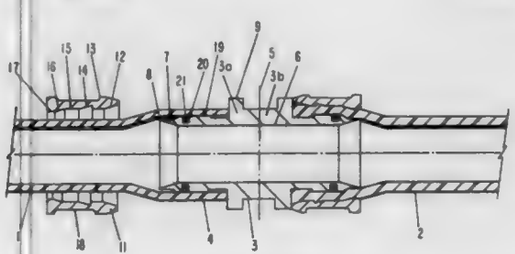
Dieter Schwalm, Bielefeld, and Rainer Neumann, Herten, both of, Germany, assignors to Vulkan Lokring GmbH, Herne, Germany

Filed May 13, 1994, Ser. No. 242,288

Claims priority, application Germany, May 13, 1993, 9307262 U

Int. Cl.[6] F16L *13/14*

U.S. Cl. 285—255 **7 Claims**



1. A connector for cylindrical plastic tubes, said connector comprising:

a metallic inner sleeve having an outer diameter that is greater than an inner diameter of the plastic tubes to be connected;

said inner sleeve having a free end and a securing flange positioned opposite said free end;

a metallic sliding sleeve for sliding onto a section of the plastic tube, the plastic tube having inserted therein said inner sleeve;

said inner sleeve having an outer surface with at least one circumferential rib of a substantially rectangular cross-section;

said sliding sleeve having a leading end and a rearward end in a direction of sliding onto said section;

said sliding sleeve having an inner surface that, beginning at said leading end and ending at said rearward end, has sequentially arranged thereat: a first conically narrowing zone, a second conically narrowing zone, a cylindrical zone, a third conically narrowing zone, and a cylindrical zone; and

wherein between said first and said second conically narrowing zone a transition zone is located, said transition zone being sawtooth-shaped in cross-section.

5,470,114

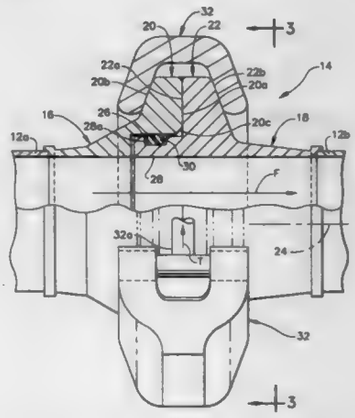
COUPLING ASSEMBLY

Michael A. Umney, Mason, Ohio; Steven A. Walters, Canton, Mich., and Christopher R. Koss, West Chester, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 14, 1994, Ser. No. 338,063

Int. Cl.[6] F16L *17/06*

U.S. Cl. 285—367 **10 Claims**



1. A gas turbine engine assembly for sealingly coupling adjoining ends of first and second fluid carrying tubes in a gas turbine engine comprising:

a first tubular fitting fixedly joinable at a proximal end to said first tube, and having a first annular mating flange at a distal end thereof;

said first mating flange including an annular first flat face on one side thereof extending radially outwardly to a perimeter of said first mating flange, and an annular first inclined face on an opposite side thereof, and a counterbore extending inwardly from said first flat face into said first fitting;

a second tubular fitting fixedly joinable at a proximal end to said second tube, and having a second annular mating flange at a distal end thereof;

said second mating flange including an annular second flat face on one side thereof extending radially outwardly to a perimeter of said second mating flange being complementary to said first flat face for facing said first flat face, an annular second inclined face on an opposite side thereof, and a pilot tube extending outwardly directly from said second flat face and being complementary to said counterbore for being disposed therein;

an annular elastomeric seal being disposable between said first and second fittings; and

a clamping band having a generally V-shaped cross section complementary in configuration with said first and second

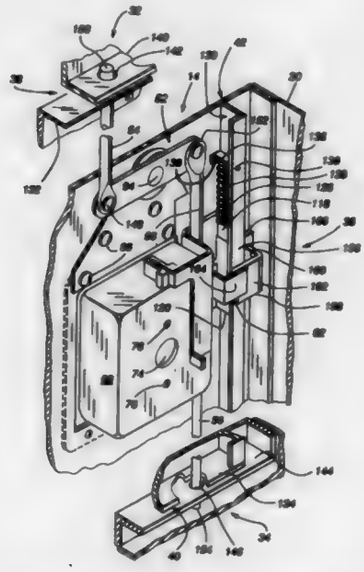
inclined faces when said first and second fittings are assembled together, and including an adjustable fastener for effecting hoop tension in said band for axially clamping together said first and second flanges by axially directed forces generated by tightening said band against said first and second inclined faces to effect a leak-proof coupling between said first and second fittings in said gas turbine engine, with a distal end of said pilot tube being spaced away from a bottom step of said counterbore to provide a clearance therebetween.

5,470,115

RECESSED THREE-POINT LATCHING MECHANISM AND METHOD FOR A STORAGE LOCKER

Robert D. W. Berg, and Eugene R. Dousten, both of La Junta, Colo., assignors to DeBourgh Manufacturing Company, La Junta, Colo.

Filed Feb. 10, 1994, Ser. No. 194,704
Int. Cl.[6] E05B *63/20*
U.S. Cl. 292—335 **25 Claims**



1. A latching mechanism for an enclosure having a generally box-like interior compartment and a hingedly attached door, said door having inner and outer surfaces and a periphery, said door periphery being surrounded by upper, lower and jamb portions of said enclosure, said door including an open-top recessed cup, said open-top of said cup terminating at said exterior surface of said door, and said cup having a wall surface that contains an aperture communicating with said interior compartment, said cup being displaced inwardly into said interior compartment from said interior surface of said door, said latching mechanism comprising:

a manually actuable bracket having an exposed portion extending through said aperture and disposed within said recessed cup, said exposed portion of said bracket presenting no protrusion beyond said outer surface of said door, said bracket having an unexposed portion that is contained within said interior compartment;

said bracket being manually actuatable by said exposed portion thereof and being movably retained adjacent to said interior surface of said door, said unexposed portion of said bracket including a center latch having a first latched position for engaging said center latch with said jamb portion, and having a second unlatched position for disengaging said center latch from said jamb portion;

a pivot bar pivotally secured about a substantially median point thereof and adjacent to said interior surface of said door, said pivot bar being coupled to said unexposed portion of said bracket for transforming a motion of said unexposed portion of said bracket that is induced by motion of said exposed portion of said bracket into a rotational motion of said pivot bar; and

at least two radially extending lock rods pivotally affixed at proximal ends thereof adjacent to opposite ends of said pivot bar for transforming said rotational motion of said pivot bar into a translational motion of said lock rods, said lock rods having a first locked position in conjunction with said first latched position of said center latch for engaging said upper and lower portions of said enclosure adjacent to distal ends of said lock rods, and having a second unlocked position in conjunction with said second unlatched position of said center latch for disengaging said distal ends of said lock rods from said upper and lower portions of said enclosure.

5,470,116

DEVICE FOR HOLDING PRESSURE-SENSITIVE ADHESIVE TAPE FOR ADHESIVELY GRIPPING ITEMS TO BE GRIPPED AND METHOD OF MANUFACTURE

Irvin S. DeWoskin, St. Louis, Mo., assignor to Barnhart Industries, Inc., Barnhart, Mo.

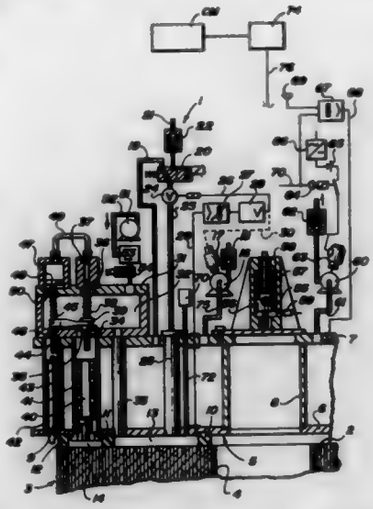
Filed Mar. 16, 1994, Ser. No. 214,807
Int. Cl.[6] B65H *3/20*
U.S. Cl. 294—1.1 **14 Claims**

1. A device for holding a length of pressure-sensitive adhesive tape for utilization of the tape adhesively to grip an item to be gripped, the tape being of the type comprising a backing strip and a pressure-sensitive adhesive on one face of the backing strip, said device comprising an elongate holder having a first free end, a second free end and opposite sides, with a base at the first end having opposite side edges, said holder being relatively thin between said opposite sides thereof at its said second end constituting said second end as a finger grip for being gripped by the fingers of the user, said side edges of said base of the holder being relatively widely spaced in relation to the sides of the holder at its said second free end, said holder being adapted for application thereto of a length of pressure-sensitive tape to have a base portion of the tape extending adhesive side out across the base of the holder and folded around said opposite side edges of the base to have side portions extending over the sides of the holder also with the adhesive side of the tape out, said holder further having a pair of flaps, one at each side thereof, each flap having an end joined to the holder adjacent its said second free end and extending over a respective side of the holder free of the respective side of the holder toward the respective side edge of the base of the holder, the flaps being free of the sides of the holder from their ends where they are joined to the holder to opposite ends thereof adjacent the side edges of the base and being free at said opposite ends so as to be capable of being swung out for the folding of the tape around the opposite side edges of the base to have the said side portions of the tape extend over the sides of the holder, and then being pressed down against said side portions of the tape for being adhesively secured to said side portions, said flaps being peelable away from said side portions of the tape for replacement of the tape, the holder with the tape thereon being adapted to be gripped by the fingers of the user at its said second end and moved to press the adhesive face of said base portion of the tape against an item to be gripped adhesively to grip said item.

5,470,117
VACUUM LIFTER AND METHOD

Adolf Schmidt, Duren, Germany, assignor to Bartholomy & Co., Duren, Germany

Continuation-in-part of Ser. No. 764,682, Sep. 25, 1991, abandoned. This application Aug. 5, 1993, Ser. No. 102,288
Claims priority, application Germany, Sep. 26, 1990, 90 13 525.3
Int. Cl.[6] B66C *1/02*
U.S. Cl. 294—64.1 20 Claims



1. A vacuum lifter to move loads having an adhesion surface, said lifter comprising at least one suction head with a plurality of annular seals projecting from a suction side thereof and where these seals form vacuum spaces and which are each connected to a vacuum source communicating through valve with an outer vacuum space, said valves being controlled by sensors detecting the span of the load,

characterized in that a compressed-air system (51, 52, 53) is in fluid communication with at least one of the vacuum spaces (13) and in that an automated control system is provided which sequentially turns on and off the compressed-air system (51, 52, 53) in order with a first opening of the valve to raise the pressure in at least one vacuum space to approximately atmospheric and to thereafter with a second opening of the valve create a positive pressure air cushion which separates the adhesion surface from the suction head.

5,470,118
SHEAR DEVICE FOR WELL SERVICE TOOLS

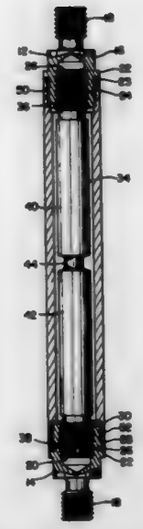
James E. Burton, 408 Elizabeth La., McCook, Nebr. 69001

Continuation-in-part of Ser. No. 984,987, Dec. 2, 1992, abandoned. This application Mar. 11, 1994, Ser. No. 212,599
Int. Cl.[6] E21B *31/12*
U.S. Cl. 294—86.18 11 Claims

1. In a well service tool assembly having a fishing tool or the like for suspension from a sandline or the like to be inserted into a subsurface well, the improvement comprising:

a shear device inserted between the sandline and the fishing tool, said shear device including coupling members at opposite ends thereof, each of said coupling members having a rod-engaging portion, said shear device including a shear rod and an outer elongated sleeve member interposed between said coupling members in surrounding relation to said shear rod, and

said shear rod having opposite ends affixed to corresponding ones of said rod-engaging portions, said shear rod including a weakened portion which is ruptureable under a predetermined tensile load to separate the fishing tool from the sandline, only an upper one of said coupling members including means



positively attaching said upper coupling member to said sleeve whereby said sleeve remains attached to said upper coupling member and separated from a lower one of said coupling members when said upper coupling member is retrieved from the well in the event of rupture of said shear rod.

5,470,119
FLEXIBLE REMOVABLE CARRYING HARNESS

Gerald D. Huf, 36 Jackson Ave., Meadville, Pa. 16335

Filed Oct. 24, 1994, Ser. No. 328,763
Int. Cl.[6] A45F *5/10;* B65D *63/18*
U.S. Cl. 294—157 8 Claims

1. A carrying harness for carrying a cleaning apparatus having casters disposed at the bottom thereof, comprising:

a handle member having first and second ends;

a first transverse member having first and second free ends, said first transverse member being attached to said first end of said handle member;

a second transverse member having first and second free ends, said second transverse member being attached to said second end of said handle member, each of said first free end of said first transverse member, said second free end of said first transverse member, said first free end of said second transverse member, and said second free end of said second transverse member being provided with a loop, said loops

being engageable with the casters of a cleaning apparatus, said carrying harness thereby being capable of supporting a cleaning apparatus without allowing any substantial tilting of the cleaning apparatus;

a first lateral support member having first and second ends, said first end of said first lateral support member being attached to said first transverse member between said first end of said handle member and said first free end of said first transverse member, said second end of said first lateral support member being attached to said second transverse member between said second end of said handle member and said first free end of said second transverse member; and

a second lateral support member having first and second ends, said first end of said second lateral support member being attached to said first transverse member between said first end of said handle member and said second free end of said first transverse member, said second end of said second lateral support member being attached to said second transverse member between said second end of said handle member and said second free end of said second transverse member.

5,470,120

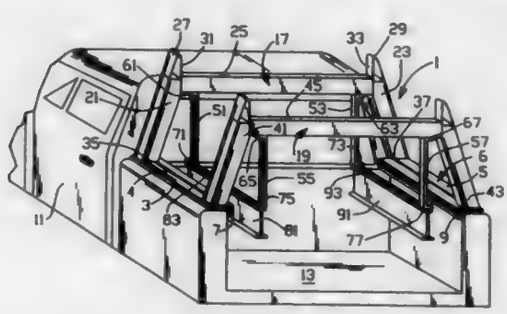
BASE RAIL FOR UTILITY RACK

David Christensen, 11 Moores Mill Rd., Pennington, N.J. 08534

Continuation-in-part of Ser. No. 908,979, Jul. 6, 1992, Pat. No. 5,238,280, which is a continuation-in-part of Ser. No. 762,575, Sep. 19, 1991, Pat. No. 5,137,320. This application Aug. 23, 1993, Ser. No. 110,388

Int. Cl.[6] B60R *9/00;* **B60P** *3/00*

U.S. Cl. 296—3 **5 Claims**



1. A base rail, for a utility rack, which comprises:

a unistructurally formed elongated member with an elongated length with a generally L-shaped cross section having two segments, one being a vertical first segment with an inner surface and an outer surface, said inner surface adapted to fit against an inside surface of a cargo bed wall, and the other being a horizontal second segment with an essentially planar top surface and a bottom surface, said bottom surface adapted to nest atop said cargo bed wall, said inner surface of said vertical first segment and said bottom surface of said horizontal second segment meeting at a 90 degree angle;

an elongated horizontal T-slot running along at least a portion of said elongated length of said horizontal second segment, with a T-slot opening facing upwardly away from said 90 degree angle;

at least a first totally enclosed hollow separate from said horizontal T-slot running along at least a portion of said elongated length of said horizontal segment separating said bottom surface from said top surface such that said horizontal T-slot opening is flush with said essentially planar top surface of said horizontal segment;

an elongated vertical T-slot running along at least a portion of said unistructurally formed elongated member with a T-slot opening facing away from said horizontal segment-and said 90 degree angle, sa,id vertical T-alot extending downwardly from said horizontal second segment and said vertical T-slot being separated from said vertical first segment.

5,470,121

SEAT SLIDING APPARATUS FOR VEHICLE AND A METHOD OF MAKING A SEAT SLIDING APPARATUS FOR A VEHICLE

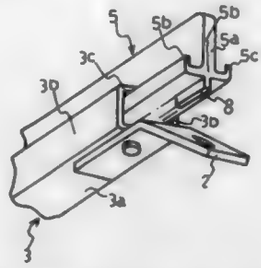
Sadao Ito, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 14,572, Feb. 5, 1993, abandoned. This application Aug. 10, 1994, Ser. No. 288,880

Claims priority, application Japan, Feb. 7, 1992, 4-022593

Int. Cl.[6] B60N *2/06*

U.S. Cl. 296—65.1 **8 Claims**



1. A vehicle seat sliding apparatus, comprising:

a lower rail attachable to a floor of a vehicle;

an elongated extruded upper rail for supporting a seat cushion, mounted for slidable movement along the lower rail, the upper rail being a unitary member and having a vertically extending main portion having a first length and a supporting portion extending substantially perpendicular to the main portion, the supporting portion having a bottom surface and first and second ends, and first and second vertically projecting segments extending from first and second portions of the bottom surface proximate the first and second ends, respectively, each vertically projecting segment extending along a second length of the bottom surface, the second length being less than the first length, and being substantially parallel with the main portion along its entire second length; and

roller means positioned between the lower rail and the bottom surface of the upper rail for assisting the slidable movement and for stopping the slidable movement upon engagement with either the first or second projecting segment.

5,470,122

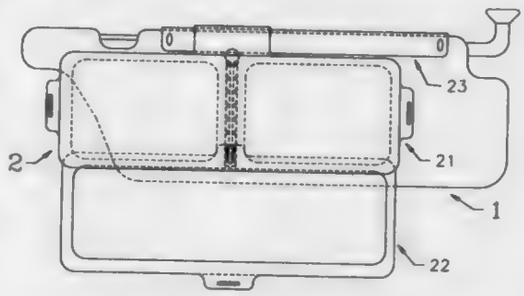
EXTENSION UNIT FOR SUN VISOR

Henry Feng, 1208 E. 24th St., Oakland, Calif. 94606

Filed Feb. 16, 1993, Ser. No. 17,774

Int. Cl.[6] B60J *3/02*

U.S. Cl. 296—97.6 **7 Claims**



1. A releasable extension unit which is attached to a sun visor of a motor vehicle to reduce glare more effectively and to use as a shading means on a front side window comprising: an elongate member of a generally C-shaped cross-section having a smooth exterior surface mounted on the upper edge of the sun visor and a first panel which has clamping means provided on one edge portion thereof for mating slidable engagement with said elongate member whereby said first panel can be adjusted in the horizontal

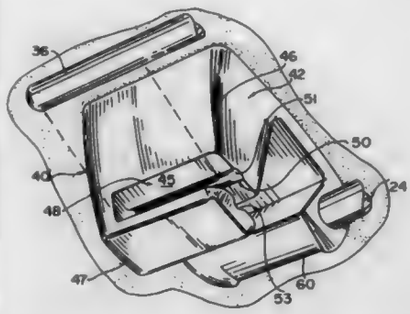
direction; said first panel having vertically extending slot means for connecting a second panel, said second panel having pin means for frictional engagement with said slot means, whereby said second panel can be vertically adjustably positioned relative to said first panel.

5,470,123

VISOR BRACKET

Ronald P. Snyder, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Feb. 10, 1995, Ser. No. 416,673
Int. Cl.[6] B60J 3/00
U.S. Cl. 296—97.9 **23 Claims**



1. A visor bracket for releasably receiving an end post of a visor comprising:

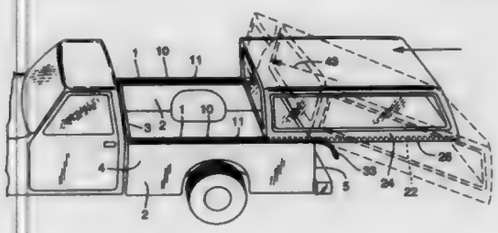
a body for mounting to a vehicle, said body including a leg extending downwardly and including a channel formed in a side of said leg for receiving an end post of a visor, said channel opening forwardly and rearwardly when said body is installed in a vehicle such that a visor end post can be inserted from either a forward or rearward direction in the vehicle.

5,470,124

RAIL STRUCTURE FOR CANOPY INSTALLATION ON A TRUCK BOX

Gregory R. Ernst, 15735 SE. Bartell Rd., Boring, Oreg. 97009

Filed Jun. 27, 1994, Ser. No. 265,955
Int. Cl.[6] B60P 7/02
U.S. Cl. 296—100 **10 Claims**



1. Rail structure for attaching a canopy to the side walls of a pickup truck box and comprising,

rails each for securement along the upper extremities of the truck box walls,

slides each for securement along the lower extremities of the canopy,

locking means interlocking said slides to said rails,

said rails each defining a channel with a laterally projecting undercut portion, and

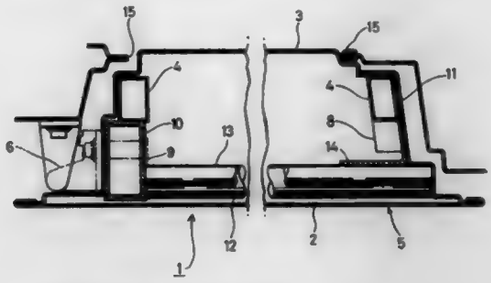
said slides each having a main body with a flangeless forward segment for downward placement into said channel and a rearward segment having a laterally directed flange thereon for lengthwise insertion into said undercut portion of the channel, said flange terminating at a point rearwardly offset from the forward end of said slide to facilitate initial engagement of said slides with said rails during installation of the canopy on the truck box side walls.

5,470,125

MOTOR VEHICLE DOOR WITH REINFORCING BEAMS

Shouji Yamazaki, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1994, Ser. No. 205,482
Claims priority, application Japan, Mar. 5, 1993, 5-044899
Int. Cl.[6] B60J 5/04
U.S. Cl. 296—146.6 **5 Claims**



1. A motor vehicle door, comprising:

a door body;

hinge means mounted on said door body for openably closing the door body over a door opening in a motor vehicle body;

a plurality of cross beams disposed in said door body and connected to said hinge means;

a vertical beam disposed in said door body between a front end of each said cross beam and a front end of said door body and having a rear vertical surface joined to each said cross beam at said front ends of each said cross beam, said vertical beam having a lower end portion positionable in laterally overlapping relationship to a corner of the door opening when the door opening is closed by said door body;

said door body including an inner panel and an outer panel joined to said inner panel and curved convexly outwardly, said vertical beam being curved convexly outwardly along said outer panel; and

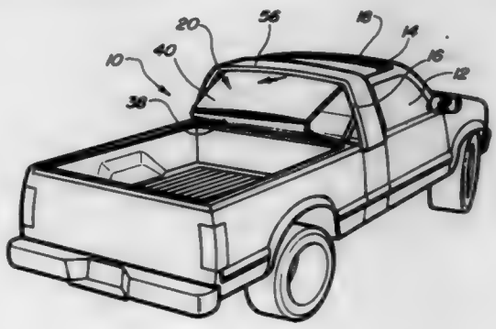
a lowermost one of said cross beams being the thickest of said plurality of cross beams.

5,470,126

RETRACTABLE HARDTOP VEHICLE ROOF

Charles P. Hines, Jr., Hamburg, Mich., assignor to MascoTech Automotive Systems Group, Inc., Auburn Hills, Mich.

Filed Nov. 3, 1993, Ser. No. 146,851
Int. Cl.[6] B60J 7/12
U.S. Cl. 296—219 **3 Claims**



1. A retractable hardtop roof for a vehicle having a passenger compartment, said passenger compartment being enclosed by a front windshield with a header, a top portion and a rear portion, said retractable hardtop roof comprising:

a guide frame mounted to said top and rear portion of said passenger compartment, said guide frame including a pair of spaced horizontal tracks along said top portion and a pair of spaced vertical tracks along said rear portion, said spaced horizontal and vertical tracks forming spaced continuous tracks along outboard sides of the passenger compartment;

a rigid back panel pivotably connected to said guide frame at the lower end of said spaced vertical tracks;

a rigid top panel pivotably connected to said back panel, said top panel having a front edge sealingly engageable with the header; and

drive means mounted to said top panel proximate said front edge, said drive means including at least two spaced drive wheels cooperatively engaging respective spaced tracks, said at least two spaced drive wheels selectively moving along respective spaced horizontal tracks and vertical tracks to selectively move said rigid panels between a closed position enclosing said passenger compartment and an open position exposing said passenger compartment, said front edge of said rigid top panel being maintained in substantially parallel alignment with the top portion of the passenger compartment as said spaced drive wheels move along said horizontal tracks such that said front edge travels along a plane formed by the top portion of the passenger compartment.

5,470,127

BABY TABLE CHAIR USABLE AS SHOULDER HARNESS

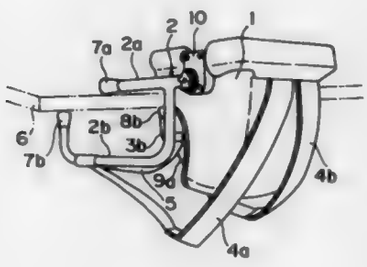
Kenzou Kasai, and Keiji Inoue, both of Osaka, Japan, assignors to Aprica Kasai Kabushikikaisha, Japan

Filed Dec. 9, 1993, Ser. No. 164,401

Claims priority, application Japan, Dec. 9, 1992, 4-084850 U

Int. Cl.[6] A47B *39/00*

U.S. Cl. 297—174 **5 Claims**



1. A baby table chair being usable as a shoulder harness, comprising:

a chair portion for seating a baby thereon;

an arm portion having an end being mounted on said chair portion for supporting said chair portion;

a shoulder belt having an end being mounted on said chair portion and another end being mounted on said arm portion;

an arm mounting portion for mounting said end of said arm portion on said chair portion, said arm mounting portion being capable of rotatably supporting said arm portion for implementing a state of positioning said arm portion in front of said chair portion for using said table chair as such by holding a table with said arm portion and a state of positioning said arm portion under said chair portion for using said table chair as a shoulder harness, as well as positioning and fixing said arm portion in positions for implementing said two states respectively;

there being a pair of said arm portions and a pair of said arm mounting portions respectively, each of said arm portions being formed by first and second arms respectively so that said first arms are positioned on said table and said second arms are positioned under said table in said state of said table chair being used as such; and

for each of said arm portions, said first and second arms thereof being in a fixed relationship with respect to each other whereby they move together as a unitary structure while said arm portion formed thereby is pivoted.

5,470,128

ARTICLE OF FURNITURE

Katrina A. Kerkham, Wentworth Falls, Australia, assignor to Sebel Furniture Limited, Bankstown, Australia

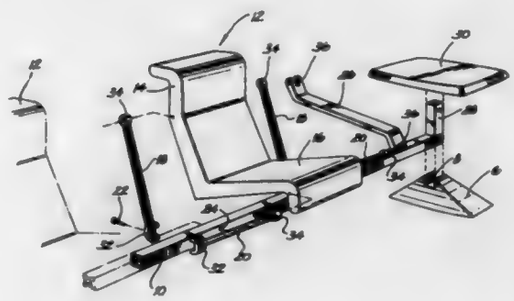
Continuation of Ser. No. 146,314, Nov. 2, 1993, abandoned.

This application Jan. 17, 1995, Ser. No. 373,507

Claims priority, application Australia, Nov. 2, 1992, PL5617

Int. Cl.[6] A47C *15/00*

U.S. Cl. 297—232 **20 Claims**



1. A modular seating arrangement configurable to realize any one of a number of desired seating configurations, said arrangement comprising, in combination, at least one spine of substantially uniform transverse cross-sectional shape and of predetermined length, at least a pair of supporting stands each of which has a rebated part of complementary shape to said cross-sectional shape of said at least one spine and which receives said at least one spine at spaced apart locations to support said at least one spine, a plurality of seat frames each having a seat and a backrest formed as a unitary structure, at least one elongate seat support for each said

seat, each said seat support having one end thereof shaped to engage with said at least one spine and the other end thereof shaped to be connected to an extremity of said seat distal from said at least one spine, and at least one elongate backrest support for each said backrest, each said backrest support having one end thereof shaped to engage with said at least one spine and the other end thereof shaped to be connected to an extremity of said backrest distal from said at least one spine, said seat support and said backrest support being separable and extending respectively forwardly and rearwardly of said at least one spine when connected to said at least one spine and said seat frame.

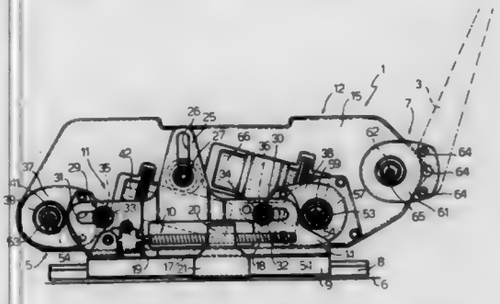
5,470,129

ADJUSTABLE VEHICLE SEAT

Ferruccio Ferrero, Savonera-Venaria, Italy, assignor to Ferrero Giulio, S.p.A., Turin, Italy

Filed Sep. 22, 1993, Ser. No. 125,413
Claims priority, application Italy, Sep. 25, 1992, TO92A0785
Int. Cl.[6] B60N 2/12
U.S. Cl. 297—330 **16 Claims**

1. An adjustable vehicle seat comprising a seat portion; a backrest connected for rotation to the seat portion; a frame supporting the seat portion; first adjusting means coupled to the frame for adjusting the position of the seat portion in relation to the vehicle; and second adjusting means coupled to the frame for adjusting the angular position of the backrest in relation to the seat portion; the first adjusting means comprising first guide means for attachment to the vehicle and for longitudinally guiding the frame and shift means coupled to the seat portion and first guide means for



vertically adjusting the position of the seat portion in relation to the first guide means in a lift direction; characterized by the frame comprising two spaced sides, each side comprising a bottom portion connected in sliding engagement to the first guide means, and a top portion connected to the seat portion; said shift means comprising, for each said side, a vertical guide and slide assembly, the guide and slide assembly being coupled to and interposed between said bottom and top portions, and first and second actuating devices each coupled to the top and bottom portions and to a corresponding slide assembly on a side for imparting to the top portion rocking movements relative to the bottom portion for vertically lifting the top portion relative to the bottom portion in said lift direction, said rocking movements being directed about respective spaced first and second axes perpendicular to said sides, each said actuating devices including means coupled to said top and bottom portions for simultaneous rotation about a different axis and translating relative to the bottom portion transversely the lift direction in response to said rotation to effect said rocking movements.

5,470,130

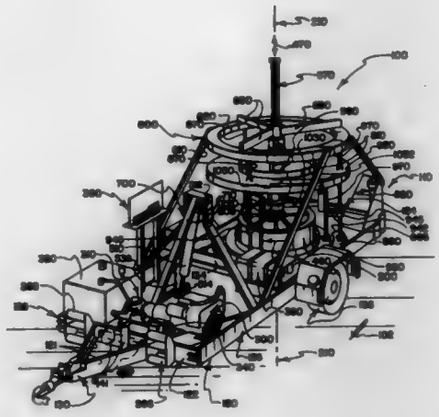
Patent Not Issued For This Number

5,470,131

METHODS AND APPARATUS FOR CUTTING CIRCULAR SLOTS IN PAVEMENT EXTENDING ABOUT MANHOLE CASTINGS

Brian J. Nolan, Chardon; Glenn L. Mahaffey, Elyria, and John M. Svoboda, Sr., Chardon, all of Ohio, assignors to Americore Technologies, Inc., Chardon, Ohio

Filed Jun. 21, 1994, Ser. No. 263,150
Int. Cl.[6] E01C 23/09
U.S. Cl. 299—41.1 **70 Claims**



62. A method of cutting at least one circular slot in traffic surface pavement extending about at least one pavement-embedded casting and the like, comprising the steps of:

a) providing core-cutting apparatus having:

i) a transport carriage including a frame having a front part, a rear part, a left part and a right part that all are rigidly connected;

ii) rotary cutter means for being rotated about a substantially vertically extending center axis to cut a circular slot at a desired location in pavement of a substantially horizontally extending traffic surface;

iii) cutter operating means connected to the frame and to the rotary cutter means for mounting the rotary cutter means on the frame, for raising the rotary cutter means relative to the transport carriage to a transport position wherein the rotary cutter means does not interfere with movement of the machine across the traffic surface, and for operating the rotary cutter means by rotating the rotary cutter means about the substantially vertically extending center axis while lowering the rotary cutter means relative to the transport carriage to bring the rotary cutter means into engagement with traffic surface pavement for cutting a circular slot therein; and,

iv) carriage support means, including:

A) at least five support members connected to the frame at spaced locations for supporting the frame above a traffic surface;

B) transport support means for causing a selected set of three of the five support members to cooperate to movably support the frame atop the traffic surface so that the machine can move from place to place; and,

C) operation support means for causing a different set of three of the five support members to cooperate to immovably support the frame atop the traffic surface at a

desired location so that the machine is held in place at said desired location when the rotary cutter means is being operated to cut a circular slot; and,

b) moving the apparatus across a traffic surface while the carriage is supported by the transport support means to position the rotary cutter means for cutting a circular slot at a desired location in pavement that defines the traffic surface;

c) transferring the support of the carriage of the apparatus from the transport support means to the operation support means to immovably support the frame of the apparatus atop the traffic surface at the desired location where a circular slot is to be cut in pavement that underlies the rotary cutter means; and,

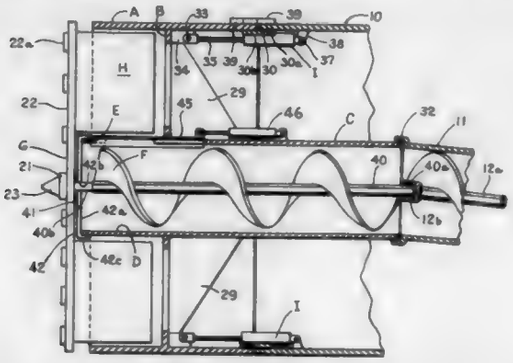
d) operating the rotary cutter means while the operation support means immovably supports the frame of the apparatus to cut a circular slot by lowering the rotary cutter means along the center axis to bring the rotary cutter means into engagement with the traffic surface while rotating the rotary cutter means about the center axis.

5,470,132

TUNNELLING HEAD AND METHOD

Dewight L. Cartwright, 147 Caversham Woods, Pittsford, N.Y. 14534

Filed Jul. 27, 1994, Ser. No. 280,937
Int. Cl.[6] E21D *9/08*
U.S. Cl. 299—56 **24 Claims**



19. The method of micro tunnelling including the steps of:

removing cuttings utilizing a cutting head mounted forwardly of a cylindrical housing;

providing a stationary bulkhead extending across said cylindrical housing;

discharging said cuttings into a stationary chamber mounted axially in said cylindrical housing forwardly of said stationary bulkhead; and

removing cuttings from said cylindrical housing and driving said cutting head utilizing an auger extending axially from said cylindrical housing rearwardly and thence through a casing carried in fixed relation to said housing.

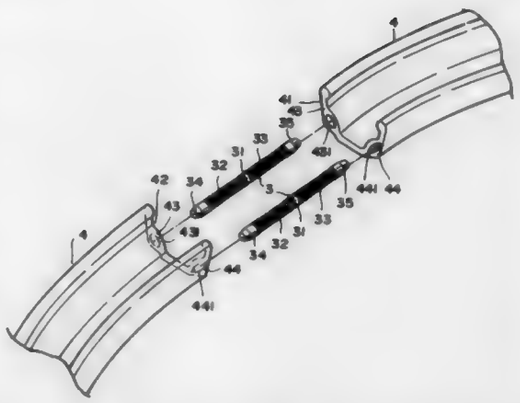
5,470,133

BICYCLE WHEEL RIM ASSEMBLY

Tse-Hsin Kuo, No. 5, Alley 16, Lane 33, Changshui Load, Changhua City, and Lieh-Jou Sheu, No. 130, Chung Shan Load,, Homei Town, Changhua Hsien, both of, Taiwan, Prov. of China

Filed Oct. 25, 1994, Ser. No. 328,821
Int. Cl.[6] B60B *21/00*
U.S. Cl. 301—95 **4 Claims**

1. A bicycle wheel rim assembly of the type including a circular rim body having two end portions secured together by at least one pin engaged within a pair of corresponding holes formed in the end portions, the improvement comprising:



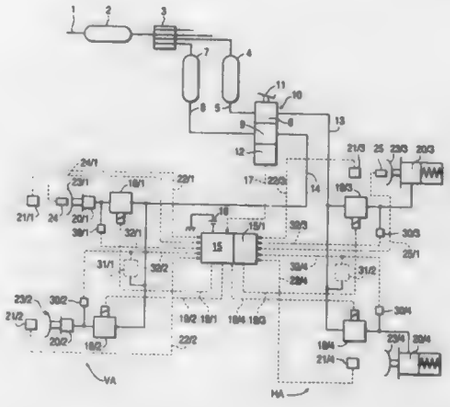
the pin including a center portion, two opposite ends, two opposite helical threads extending outwardly from the center portion toward the opposite ends for permitting the pin to rotate in one direction and threadedly engage within the corresponding holes of the end portions when the end portions are forced towards each other, thereby securing the end portions together and preventing their subsequent disengagement.

5,470,134

METHOD OF DETERMINING A WEAR-DEPENDENT BRAKING FORCE DISTRIBUTION

Bernhard Toepfer, Stuttgart; Michael Reiner, Fellbach, and Bodo Klein, Borsinghausen, all of, Germany, assignors to Mercedes-Benz AG, Germany

Filed Aug. 5, 1994, Ser. No. 286,231
Claims priority, application Germany, Aug. 5, 1993, 43 26 256.2
Int. Cl.[6] B60T *13/66*
U.S. Cl. 303—9.61 **17 Claims**



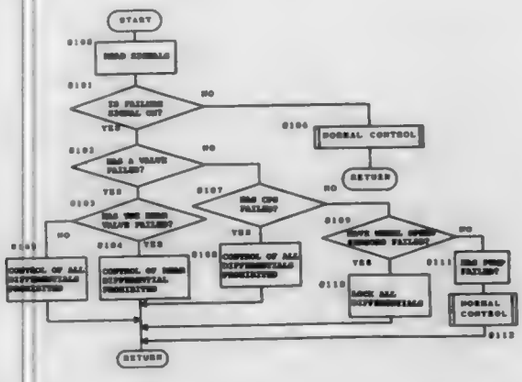
1. A method of determining a wear-dependent braking force distribution between braked wheels of a vehicle, comprising the steps of determining wear values of brake linings at a beginning of each journey, supplying signals representing the wear values to a computer, determining the wear-dependent braking force distribution in the computer device at the beginning of each journey such that a setting signal representing a lower braking force is supplied to vehicle brakes exhibiting a wear which is too large relative to other vehicle brakes and retaining the wear-dependent braking force distribution during each journey, storing previously measured individual wear values in a memory of the computer, and controlling braking operations during each journey to obtain the wear-dependent braking force distribution.

5,470,135

CONTROL DEVICE FOR AN AUTOMOTIVE VEHICLE HAVING AN ANTISKID BRAKE SYSTEM AND DIFFERENTIALS

Yuji Shitani, Hatsukaichi; Haruki Okazaki, and Seiji Miyamoto, both of Hiroshima, all of, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 17, 1994, Ser. No. 197,593
Claims priority, application Japan, Feb. 17, 1993, 5-027893; Dec. 21, 1993, 5-321895
Int. Cl.[6] B60K 17/35
U.S. Cl. 303—122.03 21 Claims



1. A control device for an automotive vehicle comprising:

an antiskid brake control device for controlling an antiskid brake device; and

a differential control device for controlling a differential limiting device;

wherein upon a failure of one component operatively associated with one of said antiskid brake control device or said differential control device, the other control device receives a signal indicating a failure from said antiskid brake control device or said differential control device, and then the other control device assumes control of the control device experiencing a failure in said one component, and wherein following receipt of the signal indicating a failure, the differential control device increases a differential limit from an amount previously set.

5,470,136

ANTI-SKID CONTROL SYSTEM

Kenji Tozu; Kenji Asano, and Hiroaki Kawai, all of Aichi Pref., Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

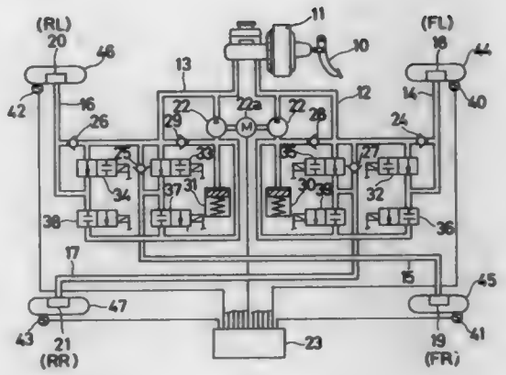
Continuation of Ser. No. 950,998, Sep. 25, 1992, abandoned. This application Dec. 14, 1994, Ser. No. 358,605
Claims priority, application Japan, Nov. 9, 1992, 3-246154
Int. Cl.[6] B60T 8/24
U.S. Cl. 303—147 6 Claims

1. An anti-skid control system for use in an automotive vehicle comprising:

brake detecting means for detecting a braking operation of the vehicle;

target slip rate calculating means for calculating a slip rate such that a deceleration of a vehicle-body becomes its maximum value and setting the resulting slip rate as a target slip rate; and

adjusting means for adjusting a real slip rate of a wheel so as to be in coincidence with the target slip rate further comprising real yaw rate detecting means for detecting a real yaw rate of the vehicle, a target yaw rate setting means for setting a target yaw rate of the vehicle, yaw rate deviation calculating means for calculating a yaw rate deviation between the real yaw rate and the target yaw rate, and a slip rate regulating means for regulating the slip rate on the basis of the yaw rate deviation.

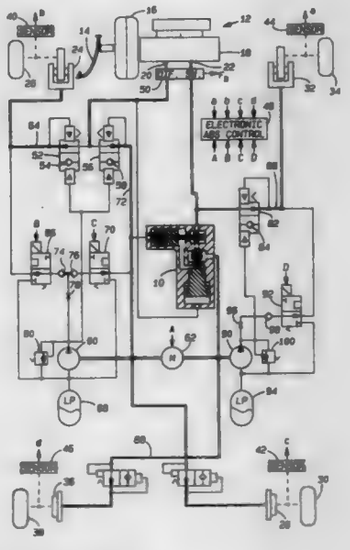


5,470,137

COPY VALVE FOR AN ANTI-LOCK BRAKE SYSTEM

Peter Every, Livonia; Gerald Sivulka, Ann Arbor, and Edward M. Fuller, Manchester, all of Mich., assignors to Kelsey-Hayes, Romulus, Mich.

Filed Aug. 16, 1994, Ser. No. 291,289
Int. Cl.[6] B60T 8/32
U.S. Cl. 303—188 10 Claims



1. A copy valve comprising:

a housing having four internal chambers;

a first input port provided through said housing for transmitting a first pressurized fluid received from a first external source to a first of said four internal chambers;

an output port provided through said housing for transmitting a second pressurized fluid from a second of said four internal chambers external to said housing;

a second input port provided through said housing for transmitting a third pressurized fluid received from a second external source to a third of said four internal chambers;

a third input port provided through said housing for transmitting a fourth pressurized fluid received from a third external source to a fourth of said four internal chambers; and

means responsive to the pressure of said first, second and third pressurized fluids being substantially equal for providing an unobstructed fluid path between said first chamber and said second chamber, said means further responsive to the pressure of said third pressurized fluid in said third chamber being less than the pressure of said first and fourth pressurized fluids for blocking said unobstructed path between said first and second chambers and reducing the pressure in said second chamber to

be substantially equal to the pressure in said third chamber, and further responsive to the pressure of said fourth pressurized fluid being less than the pressure of said first pressurized fluid, independent of the pressure of said third pressurized fluid to provide an unobstructed fluid path between said first and second chambers.

5,470,138

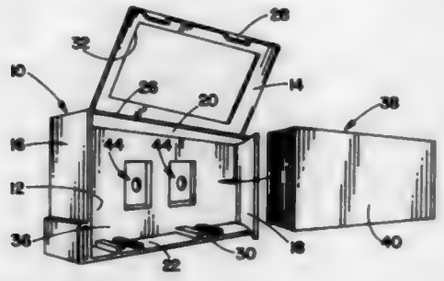
COUPON DISPLAY AND DISPENSER DEVICE

Daniel J. Kump, Mentor, Ohio, assignor to Fasteners for Retail, Inc., Cleveland, Ohio

Filed Oct. 5, 1993, Ser. No. 132,588

Int. Cl.[6] A47F 7/00

U.S. Cl. 312—34.4 **24 Claims**



1. A device for displaying and dispensing sheets of promotional material, comprising:

a frame comprising:

a rear wall and a front wall,

a pair of side walls, and

a top wall and a bottom wall, wherein said walls cooperate to define a sheet-receiving cavity;

a hinge construction for pivotally mounting said front wall from the remainder of said frame;

a securing means located on said rear wall for securing said frame to an associated support member; and,

a slot defined along one of said side walls for allowing the withdrawal of sheets from said cavity, wherein said one of said side walls comprises a curved extension which orients sheets withdrawn in a direction approximately normal to a plane of said front wall.

5,470,139

COMBINED DISPLAY CASE

Szu-Chang Hsiao, No. 8, Alley 2, Lane 106, Sec. 4, Patch Rd., Taipei, Taiwan, Prov. of China

Filed Jan. 24, 1994, Ser. No. 185,388

Int. Cl.[6] A47F 3/12; F16B 12/10

U.S. Cl. 312—140 **6 Claims**

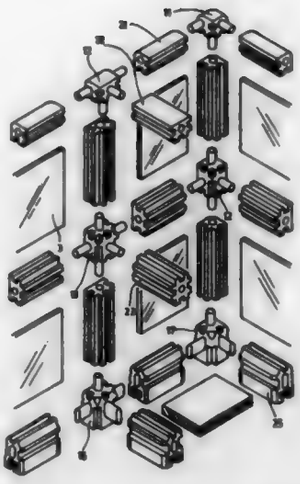
1. A display case assembly having at least one display case with a substantially parallelepiped configuration and comprising:

a) at least one base wall, at least figure side walls, and at least one top wall;

b) at least our base frame members, each base frame member having a first receiving groove extending along the length of the base frame member configured to receive an edge of the base wall and a second receiving groove extending along the length of the base frame member configured to receive an edge of a side wall, the base frame members having a first cross-sectional configuration;

c) at least four base corner members, each removably attached to two base frame members so as to form a base having a substantially parallelepiped configuration;

d) an upstanding frame member removably attached to and extending upwardly from each of the at least four base corner members, the upstanding frame members having a second crosssectional configuration different from the first cross-



sectional configuration, at least two third receiving grooves extending along the length and configured to receive edges of two side walls;

e) at least four top frame members, each having at least two fourth receiving grooves extending along the length configured to receive edges of the side walls and top wall, the top frame member having a third cross-sectional configuration different from the first cross-sectional configuration;

f) at least four corner members, each removably attached to an upstanding frame member and two top frame members; and,

g) pivot attaching means for pivotally attaching at least one side wall to adjoining upstanding frame members comprising hinge pins extending from the side wall so as to engage holes formed in-the adjoining upstanding frame members such that the pivot axis extends generally perpendicular to the third receiving grooves in the adjoining side members to which the hinge pins are attached.

5,470,140

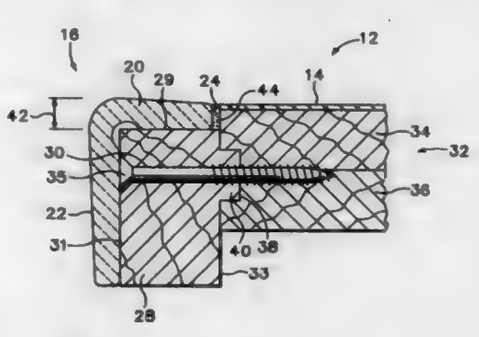
INTERLOCKING TILE EDGE FOR COUNTERTOPS

Craig Schagunn, 12012 NE. 14th, Vancouver, Wash. 98684

Filed Apr. 6, 1994, Ser. No. 223,687

Int. Cl.[6] A47B 96/18

U.S. Cl. 312—140.3 **16 Claims**



1. A modular countertop, comprising:

a base structure having a fixed top member with a front edge;

a flat sheet material having a top surface and a front edge aligned with the front edge of the top member, the sheet material attached to the top member of the base structure and formed of a first material which is essentially impervious to moisture penetration, impact and scratching;

supporting means for connecting to the base structure having a horizontally aligned top face and a vertically aligned side face;

multiple unitary preformed substantially "V-shaped" edge members connected to the supporting means and formed of a second material, each edge member including a horizontal top portion extending over the top face of the supporting means having a front face aligned with the front edges of the top member and the sheet material and a vertical side portion extending over the entire side face of the supporting means; and sealing means for sealing between the side faces of adjacent edge members and between the front face of each edge member and the front edge of the sheet material thereby forming a cohesive water impervious covering over the top member and around the front edge of said top member.

5,470,141

MODULAR FILING SYSTEM

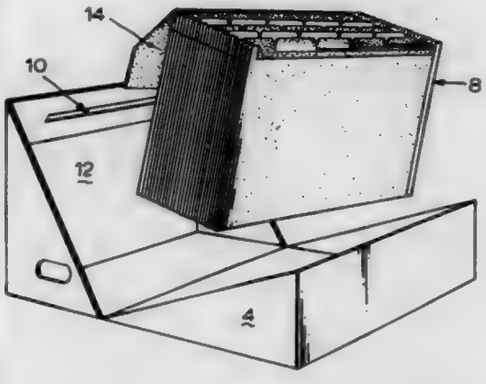
Paul R. Billingham, 22 Heathfield Ter., Chiswick, London W4 4JE, England

Continuation of Ser. No. 689,749, Nov. 7, 1991, abandoned. This application Sep. 1, 1993, Ser. No. 114,984

Claims priority, application United Kingdom, Nov. 23, 1988, 8827291; Nov. 30, 1988, 8827982; Dec. 21, 1988, 8829650

Int. Cl.[6] A45C *5/00*

U.S. Cl. 312—205 **4 Claims**



1. A box file in two flexibly connected parts, comprising first and second rectangular wall members flexibly connected together along a common side edge, wherein said first and second wall members are coplanar when the box file is opened on a flat surface;

a further wall member rigidly connected to each of said first and second wall members at an edge opposite to said common side edge and each said further wall member extending at right angles to a respective one of said first and second wall members so as to form a box when the two parts are closed together;

retaining means, carried internally of one of said box parts, and adapted to cooperate with an expanding file to be retained in said box;

whereby said expanding file can be extended out onto an inside surface of said second wall member, when said box is opened;

the box also having end walls each of which is divided along a diagonal line from a corner at an end of said common side edge, to an opposite corner, so as to facilitate access to an interior when the box is opened;

and further comprising catch means adapted to hold the box in its closed condition, said catch means comprising a first catch member, mounted at a free edge of one of said first and second wall members and including a projecting tongue, and a second cooperating catch member, which is channel shaped so as to fit onto a free edge of the said further wall member which is connected to the other of said first and second wall members, whereby said channel shaped member forms a detent for said tongue.

5,470,142

DISHWASHER

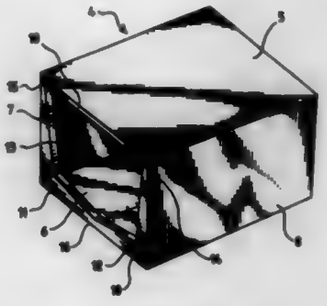
Adrian A. Sergeant; William H. Currie, both of Dunedin; Willem Ouwens, Outram; Philip J. Brace, Auckland; Robert W. Todd, Dunedin, and Hans-Joachim Schulz, Otago, all of, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Filed Dec. 18, 1992, Ser. No. 992,828

Claims priority, application New Zealand, Dec. 20, 1991, 241093

Int. Cl.[6] A47B *43/00*

U.S. Cl. 312—258 **2 Claims**



1. A cabinet for a household appliance including an open sided box compartment which is able to resist racking forces applied parallel to the open side comprising: four side walls and a back wall of thin sheet material joined along their edges to leave a substantially rectangular front opening defined by the front edges of the four side walls, and co-planar internally directed flanges on said four front edges, connection means connecting said flanges on three contiguous edges for rigidly joining two corners and for configuring as a tapered beam portal frame with moment resisting corners and the flange on the fourth edge forming a beam linking the flanges which form the extremities of the portal frame, and means between the flanges for forming the beam and portal frame respectively which provide no substantial resistance to bending moments.

5,470,143

SELF-LOCKING SNAP-ON SUSPENSION UNIT FOR FURNITURE CABINETS AND THE LIKE

John F. Gill, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Mar. 24, 1994, Ser. No. 217,256

Int. Cl.[6] A47B *88/16*

U.S. Cl. 312—334.4 **20 Claims**

1. A furniture cabinet, comprising:

a case having an interior portion with a plurality of horizontally oriented mounting slots positioned adjacent front and rear portions thereof;

a stop located on the interior portion of said case;

a roll-out support shaped to be slidably supported in the interior portion of said case for movement between extended and retracted positions;

at least one suspension unit slidably supporting said roll-out support in said case, and including:

an inner housing member connected with said roll-out support;

an outer housing member operably connected with said inner housing member for smooth longitudinal translation therebetween, and having at least two prongs spaced longitudinally apart to be closely received in said mounting slots adjacent the front and rear portions of said case, and being oriented in a first longitudinal direction to engage the interior portion of said case when said outer housing member is shifted longitudinally in the first direction to an engaged position;

a resiliently flexible lock arm connected with said outer housing member, and configured to assume a normally outwardly protruding position; said lock arm being laterally flexible into an inwardly retracted position, and oriented in a second longitudinal direction generally opposite said first longitudinal direction, such that when the prongs on said outer housing member are inserted into said mounting slots, said lock arm abuts said stop to resiliently shift the same into the retracted position, and when said outer housing member is shifted longitudinally into its engaged position in said case, said lock arm resiliently flexes back into its normally extended position against said stop to positively prevent inadvertent removal of said suspension unit from said case.

5,470,144

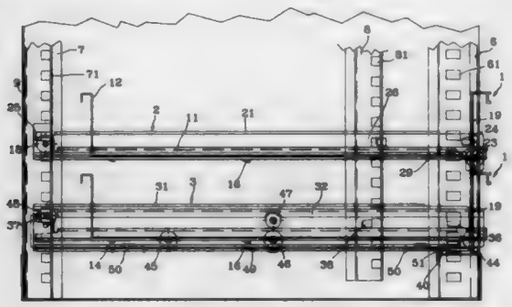
DRAWER WITH A RAIL STRUCTURE COMPATIBLE WITH A SINGLE RAIL OR MULTI-RAIL ASSEMBLY IN A CABINET

Cheng-Kan Wen, No. 35, Lane 304, Sec. 1, Chien Kao S. Rd., Taipei, Taiwan, Prov. of China

Filed Jan. 21, 1994, Ser. No. 184,694

Int. Cl.[6] A47B *88/10*

U.S. Cl. 312—334.13 **2 Claims**



1. A drawer structure compatible for use with a single rail or a multi-rail assembly, said drawer structure including a compatibility means to allow such compatibility, and said means comprising:

a pair of drawer rails affixed to a right and left side, respectively, of a drawer body, each of said drawer rails having a horizontal portion, said horizontal portion having a rail stop;

a detachable roller, which is detachably mounted in a rear end of said drawer when said drawer structure is used with a single rail assembly, said detachable roller is removed when said drawer structure is used with a multi-rail assembly;

wherein when said drawer structure is used with a single rail assembly, said compatibility means further comprises:

a pair of first fixed rails for receiving said horizontal portions of said pair of drawer rails, respectively, each of said first fixed rails having a first roller fixed at a front end thereof which, in cooperation with said detachable roller, allows said drawer body to move slidably, said first fixed rail further having a first stop lug, which, in cooperation with said rail stop, prevents said drawer body from being pulled completely out;

and when said drawer structure is used with a multi-rail assembly, said compatibility means further comprises:

a pair of second fixed rails and a pair of extension rails, said second fixed rails and said extension rails are structured such that said extension rails, which will receive said drawer rails, are received by said second fixed rails, respectively, and slidably movable therewithin;

each of said extension rails comprises a pair of generally vertically aligned pressing rollers for slidably receiving said horizontal portion of said drawer rail therebetween;

said extension rail further comprises a friction means provided by said pair of pressing rollers to cause said drawer body and said extension rails to move together within said second fixed rails up to a predetermined distance when said drawer body is being pulled out; extension roller means for allowing said extension rails to slidably move within said second fixed rails, and a second lug, which, in cooperation with a third lug provided on said second fixed rail, stops a movement of said extension rail and allows said drawer body to move relative to said extension rail.

5,470,145

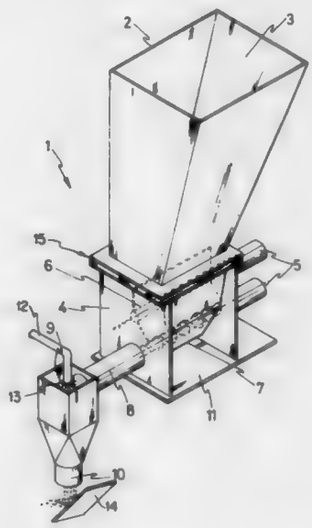
PROCESS AND APPARATUS FOR THE DISPERSION AND PROPORTIONING OF FIBERS USED IN THE BUILDING SECTOR IN GENERAL

Reyero Lopez, Madrid, Spain, assignor to Productos Bituminosos, S.A. (Probisa), Madrid, Spain

Filed Dec. 23, 1992, Ser. No. 995,368

Int. Cl.[6] B01F *13/00;15/02*

U.S. Cl. 366—13 **11 Claims**



1. An apparatus for dispersing and dosing fibers used in the building sector and for attaining a homogeneous dispersion of the fibers in a bituminous mix, comprising:

feeding means, having inclined side walls, to feed said fibers into the apparatus;

means for stirring to prevent said fibers from compacting and to achieve their homogenization, said means for stirring being arranged below said feeding means and receiving said fibers from said feeding means;

means for conveying dosed quantities of said fibers to be introduced into said mix, arranged adjacent said stirring means;

a housing enclosing said conveying and stirring means;

an air injection fiber dispersion system for homogeneously dispersing a plurality of bundles of fibers, said dispersion system receiving fibers from said means for conveying; and

means for driving tile means for stirring and means for conveying of the apparatus.

5,470,146

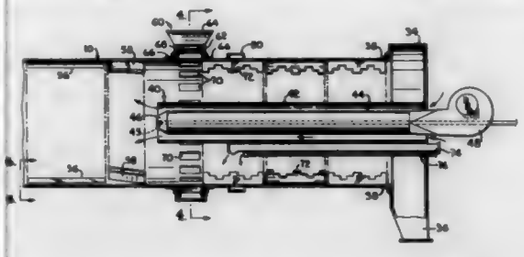
COUNTERCURRENT DRUM MIXER ASPHALT PLANT

Michael R. Hawkins, Prairie Village, Kans., assignor to Standard Havens, Inc., Cedar Rapids, Iowa

Continuation of Ser. No. 521,832, May 8, 1990, abandoned, which is a continuation of Ser. No. 158,853, Feb. 22, 1988, abandoned, which is a division of Ser. No. 879,996, Jun. 30, 1986, Pat. No. 4,787,938. This application Dec. 27, 1991, Ser. No. 815,591

Int. Cl.[6] **B28C** *5/46*

U.S. Cl. 366—25 **16 Claims**



1. Apparatus for manufacturing an asphaltic composition, comprising:

a single inclined cylindrical rotatable drum having an upper inlet end and a lower discharge end, and including means disposed about an inner wall of the drum for advancing aggregate materials for inclusion in the asphaltic composition to move in a generally longitudinal, downstream direction away from the upper inlet end and toward the lower discharge end in response to rotation of said drum, said means for advancing aggregate materials including first flighting means for creating a falling curtain of said aggregate materials in an upstream portion of the drum, second flighting means for mixing and stirring said aggregate materials disposed in a downstream portion of the drum adjacent to the lower discharge end, and third flighting means disposed downstream of said first flighting means and upstream of said second flighting means for confining said aggregate materials generally to the inner wall of the drum;

means for rotating said drum;

first housing means, disposed about and receiving the inlet end of the drum, for placing virgin aggregate material into said upper inlet end of said drum for movement in said downstream direction towards said lower discharge end, and for exhausting gases;

a burner head for a combustion source of hot gases mounted within said drum intermediate said upper inlet and lower discharge ends and disposed upstream of said second flighting means and downstream of said third flighting means to divide said drum into a heating zone upstream from said burner head and a mixing zone downstream from said burner head, the burner head disposed for gas discharge toward the upper inlet end and for directing a stream of hot gases from said burner head in a counterflow direction with respect to the downstream movement of said virgin aggregate material in said heating zone to flow out of the drum through the first housing means, and away from said mixing zone, whereby said mixing zone will be free from the presence of said hot gas stream;

means, extending into the drum to the burner head, for supplying fuel and forced combustion air to the burner head to maintain a burner flame longitudinally within the drum and within said heating zone having said third flighting means;

second housing means, disposed at the lower discharge end of the drum and receiving the lower discharge end of the drum, and including discharge means for directing an asphaltic composition from the drum and for discharging said asphaltic composition through said discharge means;

secondary air tube means, penetrating said second housing means and extending centrally into the drum to the burner head and receiving said fuel and forced combustion air supply means therein and forming with the drum an annulus, for establishing secondary, atmospheric air flow to said burner head within said air tube means through the drum from outside said drum and for isolating said secondary, atmospheric air flow from said mixing zone, the mixing zone occupying the annulus between said secondary air tube means and the drum; and

means for introducing liquid asphalt material into said mixing zone.

5,470,147

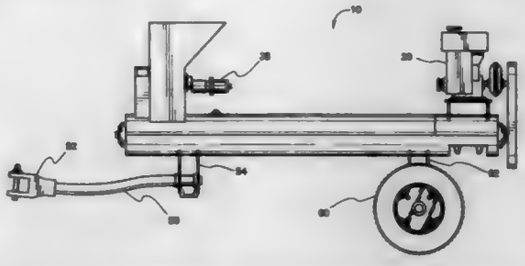
PORTABLE CONTINUAL MIXER

Donald L. Duckworth, 702 Columbia St. NE., Roanoke, Va. 24016

Filed Jul. 1, 1994, Ser. No. 269,530

Int. Cl.[6] **B28C** *7/14*; **B01F** *15/02*

U.S. Cl. 366—34 **5 Claims**



1. A portable continual mixer for mixing dry, granular or powdered material with a liquid, comprising:

a feed auger having a first motor driving said feed auger, said feed auger for feeding the powdered material; and

a mixing chamber comprising a housing and a mixing auger disposed within, said mixing auger disposed to receive powdered material from said feed auger, and further having

a second motor for driving said mixing auger, and

a blade having a first section having a continuous screw blade and a second section and a second section having paddles arranged at a pitch urging the powdered material and liquid to migrate in the same direction as urged by said first section, said mixer blade further having a third section disposed after said first section and said second section, said third section characterized by a second continuous screw blade having a pitch urging the powdered material and liquid to move in the same direction as urged by said first blade section.

5,470,148

PORTABLE CEMENT-MIXING APPARATUS HAVING UPPER AND LOWER NOTCHED PLATES AFFIXED TO A SHAFT

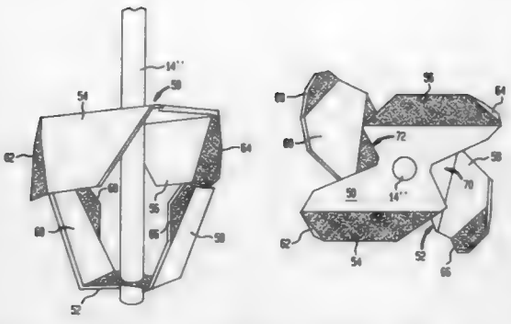
Richard H. Gorr, 448 Baldwin Place Rd., Mahopac, N.Y. 10541, and Gunther R. Siegel, Walsh Rd., Lagrangeville, N.Y. 12540

Filed Dec. 20, 1993, Ser. No. 170,011

Int. Cl.[6] **B28C** *5/08*

U.S. Cl. 366—64 **1 Claim**

1. Apparatus for mixing cement comprising an engine, a shaft having two ends, the engine being connected to the shaft at one end thereof for rotation of the shaft, a plurality of paddles arranged about the shaft near the other end of the shaft, said paddles extending outwardly from the shaft and comprising two notched plates affixed to the shaft, each of said notched plates having two ends one of said plates being an upper plate on said shaft and having vanes at each end of the plate bent toward the other lower plate at a bend line, the other lower plate having vanes at each end of the plate bent toward the upper plate at a bend line, each said vane having a trailing edge section bent with respect to each said vane for providing a pushing force and said vanes being arranged such that the ends of said vanes are disposed at a radial distance from the shaft which is substantially greater than a radial distance



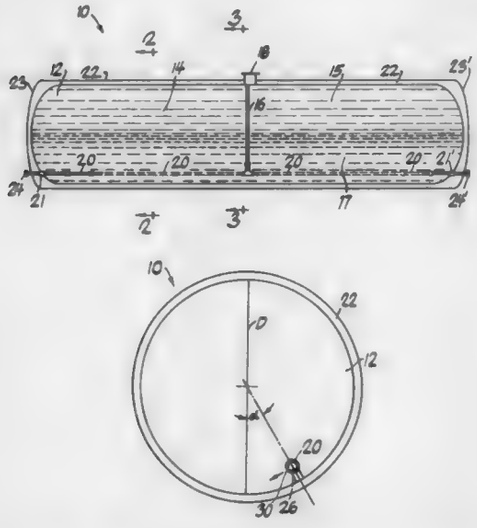
of the bend lines from the shaft thereby forming between the vanes and the shaft a substantially open volume to enable passage of coarse material and to channel flow around the shaft.

5,470,149

AIR SPARGER FOR AGITATING SOLID-LIQUID SUSPENSIONS

Joseph T. Witkowski, Baltimore, Md., and Steve D. Raffensperger, Sylvania, Ohio, assignors to Martin Marietta Magnesia Specialties Inc., Raleigh, N.C.

Filed Sep. 15, 1994, Ser. No. 305,319
Int. Cl.[6] B01F *13/02*
U.S. Cl. 366—101 **16 Claims**



1. A sparger system for mixing the contents of a substantially cylindrical container including a liquid, wherein when the container is in a reference position, a longitudinal axis of the container extends in a substantially horizontal direction so that a bottom center line of the container is located directly below the longitudinal axis, the system comprising:

an inner wall of the container defining a chamber for receiving the liquid;

a sparger pipe which extends substantially parallel to the longitudinal axis of the container with a centerline of the sparger pipe being separated from the inner wall of the container by a first distance and wherein the sparger pipe is displaced relative to the bottom center line so that a radius of the container passing through the sparger pipe is separated from a radius connecting the longitudinal axis and the bottom center line by a first angle, the first angle being between 9° and 12°;

a fluid passage having an opening which is above a maximum level of the liquid to be stored in the container, wherein the fluid passage is coupled to the sparger pipe; and

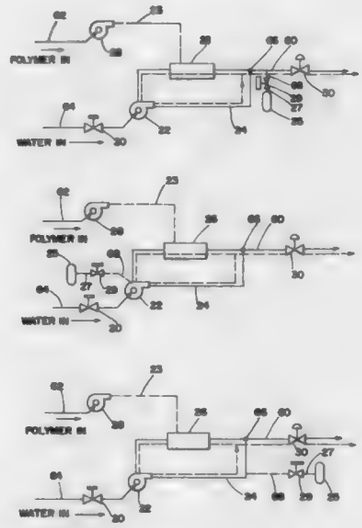
a plurality of orifices disposed substantially in a line along the sparger pipe, wherein the plurality of orifices are oriented so that when a pressurized gas is introduced into the sparger pipe, the gas leaves the orifices directed toward the bottom center line.

5,470,150

SYSTEM FOR MIXING AND ACTIVATING POLYMERS

Dennis G. Pardikes, 12811 S. 82nd Ct., Palos Park, Ill. 60464

Continuation of Ser. No. 572,411, Aug. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 540,910, Jun. 20, 1990, abandoned. This application Aug. 16, 1993, Ser. No. 107,345
Int. Cl.[6] B01F *15/04*
U.S. Cl. 366—137 **11 Claims**



1. A system for activating polymer comprising:

a pump having an input and output,

a source of polymer,

a means for coupling said source of polymer to said input of said pump means so as to create a polymer flow,

a source of solvent,

a means for coupling said source of solvent to said input of said pump means;

a means for imparting energy on and activating said polymer within said pump means,

a mixing manifold with a first input, an output and an agitator means for thoroughly mixing said polymer and said solvent to form a polymer solution and enhancing activation by mixing the polymer solution with activated polymer;

a means for connecting said first input of said mixing manifold and said output of said pump means;

a connection means between said mixing manifold output and said input of

said pump means;

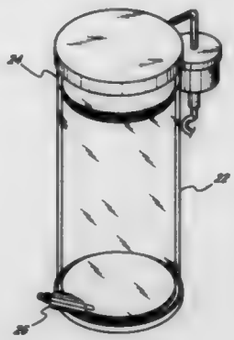
a system output distribution means;

a flow divider means located within said connecting means between said output of said pump means and said first input of said manifold, said flow divider means redirecting a first portion of said polymer flow to said first input of said manifold and directing a second portion of said polymer flow to said system output distribution means; and a means for injecting gas into said system.

5,470,151
MIXING APPARATUS

Ben J. Walthall, Santa Ana; Matthew V. Caple, Riverside, and Thomas J. Murphy, Mission Viejo, all of Calif., assignors to Irvine Scientific Sales Co.

Continuation of Ser. No. 721,826, Jun. 26, 1991, Pat. No. 5,326,165. This application Jun. 30, 1994, Ser. No. 268,502
The portion of the term of this patent subsequent to Jul. 5, 2011, has been disclaimed.
Int. Cl.[6] B01F *3/12*
U.S. Cl. 366—165.1 **7 Claims**



2. A mixing apparatus for mixing a concentrated material with an incoming fluid stream, comprising:

a housing having a substantially cylindrical first mixing chamber therein for containing concentrated material to be mixed;

a second mixing chamber in fluid communication with the first mixing chamber, for containing a second concentrated material to be mixed with the incoming fluid stream;

a filter in between the first and second mixing chambers, for permitting the passage of fluid therebetween but substantially preventing the passage of unmixed concentrated material;

an influent port in the housing for providing fluid communication between the first mixing chamber and a source of fluid; and

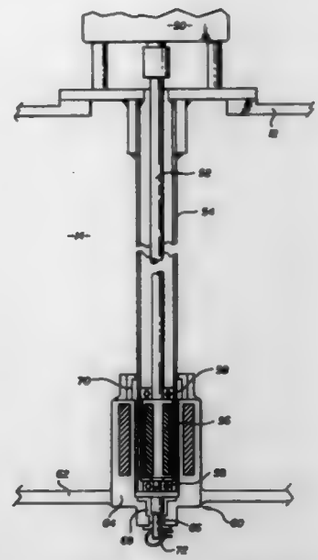
an effluent port in the housing and a sterilization unit downstream from and in fluid communication with said effluent port for sterilizing the concentrated material; wherein the only fluid permitted to enter the second mixing chamber is from the first mixing chamber;

wherein the influent port is positioned to direct incoming fluid along an axis which is generally tangential to the interior wall of the first mixing chamber thereby generating a rotational fluid velocity within the first mixing chamber upon introduction of the fluid under pressure.

5,470,152
RADIALLY MOUNTED MAGNETIC COUPLING

Robert L. Rains, Oxnard, Calif., assignor to General Signal Corporation, Stamford, Conn.

Continuation of Ser. No. 21,027, Feb. 23, 1993, abandoned. This application Nov. 29, 1994, Ser. No. 346,348
Int. Cl.[6] B01F *13/08*
U.S. Cl. 366—273 **10 Claims**



6. An agitator tank system, comprising:

a tank having an inner cavity, a top portion and a bottom portion;

a motor;

a drive shaft coupled to said motor and extending from said top portion of said tank toward said bottom portion of said tank, said drive shaft having a longitudinal axis and an unsupported end located within said tank opposite from said motor;

a drive magnet that is rotated by said drive shaft, said drive magnet being located at said unsupported end of said drive shaft and having a first coupling surface that is essentially parallel with said longitudinal axis of said drive shaft;

a driven magnet magnetically coupled to said drive magnet to rotate with said rotation of said drive magnet, said driven magnet having a second coupling surface that is essentially parallel with said first coupling surface of said drive magnet;

a drive housing attached to said tank and enclosing said drive magnet and said drive shaft, said drive housing being located between said drive magnet and said driven magnet;

a radial bearing that couples said drive shaft to said drive housing;

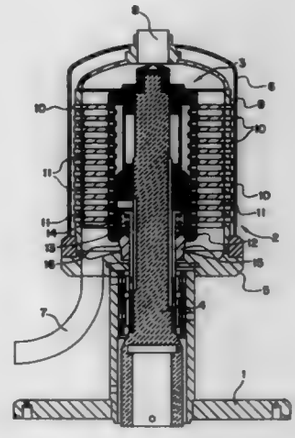
a thrust bearing that couples said drive shaft to said drive housing; and,

an impeller coupled to said driven magnet to rotate when said driven magnet is rotated.

5,470,153
MIXING DEVICE FOR AERATING AND MIXING PUMPABLE SEMI-LIQUID PRODUCTS

Emiel De Naeghel, Schoten, Belgium, assignor to Machines Collette, Wommelgem, Belgium

Filed Feb. 14, 1994, Ser. No. 195,022
Claims priority, application Belgium, Feb. 12, 1993, 09300135
Int. Cl.[6] B01F *7/16*
U.S. Cl. 366—303 **6 Claims**



1. A mixing device which aerates and mixes pumpable semi-liquid products comprising:

a frame;

a cylindrically-shaped mixing chamber means, having a circumference wall surface with no inlets or outlets, a bottom surface having an inlet, and atop surface having an outlet, said chamber means capable of being pressurized above atmospheric pressure so that products which are input to said chamber means through said inlet at a pressure which exceeds atmospheric pressure exit said chamber means through said outlet, said chamber means supported by said frame so that the axis of the cylinder shape is positioned substantially vertically when said mixing device is in operation, said mixing chamber means having fixed pins attached to an inner surface of said circumference wall of said mixing chamber means so as to extend radially toward the center axis of said chamber means;

a rotor axially arranged in said mixing chamber means and provided with radial pins which move between said fixed pins when said rotor is rotated, thereby,mixing said products introduced into the mixing chamber.

5,470,154

METHOD OF CLEANING THE REFLECTOR MIRROR IN AN OPTICAL DEW POINT METER AND AN OPTICAL DEW POINT METER EQUIPPED WITH A CLEANING DEVICE

Juinchi Nishizawa, Miyagi; Takahiko Kijima, Hyogo, both of, Japan; Edward F. Ezell, Warren, N.J., and Akira Makihara, Chiba, Japan, assignors to Osaka Sanso Kogyo Ltd., Japan

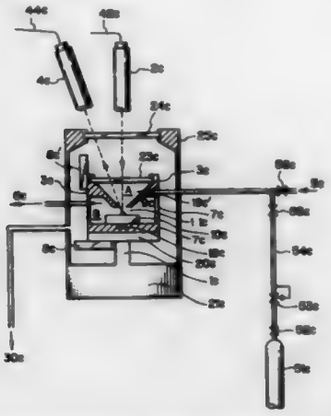
Continuation of Ser. No. 993,235, Dec. 17, 1992, abandoned.

This application Sep. 1, 1994, Ser. No. 299,883

Claims priority, application Japan, Apr. 18, 1991, 3-086900; Dec. 1, 1991, 3-357408

Int. Cl.[6] G01N *25/68;21/47;21/55;* **B08B** *5/00*

U.S. Cl. 374—141 **6 Claims**



1. In a method of cleaning a reflector mirror in an optical dew point meter that measures the dew point or frost point of a sample gas by a process including the steps of bringing the sample gas into contact with the reflector mirror whose temperature is variable, projecting condensed rays of light or laser light onto said reflector mirror, and detecting the change in the intensity of scattered light or reflected light on account of the dew or frost formed on said reflector mirror, characterized in that the cleaning steps of said method comprise the step of bringing CO_2 gas of five-nine grade purity, CO_2 gas or CO_2 containing gas, said CO_2 gas or CO_2 containing gas having been purified for removal of water, oils and particles, into contact with the reflector while the latter is in a cooled state, thereby condensing CO_2 on the surface of the reflector mirror, and the subsequent step of heating the reflector mirror to vaporize the CO_2.

4. An optical dew point meter equipped with a cleaning device, said meter comprising:

(i) a reflector mirror whose temperature is variable;

(ii) a gas inlet or a gas blowing nozzle for supplying a sample gas into a compartment including said reflector mirror in such a way that said sample gas will contact said reflector mirror;

(iii) a means for protecting condensed rays of light to that part of the reflector mirror where dew or frost is to form;

(iv) a means for detecting the change in the intensity of scattered light or reflected light due to the dew or frost formed on the reflector mirror;

(v) a means for sensing that the capability of detecting a normal change in the intensity of reflected light or scattered light has decreased on account of the fouling of the reflector mirror;

(vi) a means for causing CO_2 gas of five-nine grade purity, purified CO_2 or purified CO_2 containing gas to contact the reflector mirror either automatically or manually, said CO2 or CO2 containing gas having been preliminarily purified by removing water, oils and particles;

(vii) a means for detecting the temperature at which the change in the intensity of scattered light or reflected light occurs, and

(viii) means for controlling the temperature of said reflector mirror down to at least −78.5° C.

5,470,155

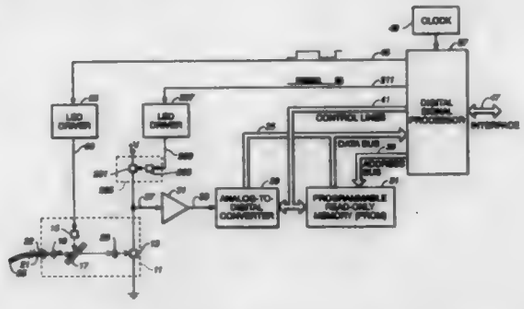
APPARATUS AND METHOD FOR MEASURING TEMPERATURES AT A PLURALITY OF LOCATIONS USING LUMINESCENT-TYPE TEMPERATURE SENSORS WHICH ARE EXCITED IN A TIME SEQUENCE

Earl M. Jensen, Sunnyvale, Calif., assignor to Luxtron Corporation, Santa Clara, Calif.

Filed Jun. 11, 1993, Ser. No. 75,743

Int. Cl.[6] G01K *11/20*

U.S. Cl. 374—161 **9 Claims**



1. A method of measuring a parameter with a plurality of fiberoptic sensors that individually contain a quantity of luminescent material characterized by emitting, in response to excitation radiation, luminescence radiation having a characteristic that varies as a function of said parameter, comprising the steps of:

individually communicating the luminescent radiation from the sensors onto respective photodetectors,

permanently connecting said photodetectors in parallel to an input of an analog amplifier,

alternately directing excitation radiation to said plurality of sensors, one of said plurality of sensors at a time, thereby to generate luminescence signals from said plurality of sensors in time sequence at the amplifier input, whereby the amplifier output carries a signal representing in time sequence said characteristic of the luminescence of the individual sensors,

processing the amplifier output signal in order to measure in time sequence said characteristic of the luminescence radiation of the individual sensor, and

determining from said measured characteristic of the individual sensors a value of the parameter being measured by the respective individual sensors.

9. A multi-sensor measuring system comprising:

a plurality of sensors containing luminescent material, each sensor being attached to one end of a different one of a plurality of optical fiber communication channels, said luminescent material being characterized by emitting, in response to excitation radiation, luminescence radiation that exhibits a rate of intensity decay that is related to the material's temperature,

a plurality of photodetectors, each of said plurality of photodetectors being optically coupled with another end of a unique one of said plurality of optical fiber communication channels, each of said plurality of photodetectors generating a separate electrical output that is related in value to an amount of luminescent radiation incident upon it from its associated luminescence material sensor,

an electrical signal amplifier having an input that permanently receives the electrical output of each of said plurality of photodetectors in parallel, said amplifier having an electrical signal output,

means optically coupled with said another end of each of said plurality of optical fiber communication channels for directing excitation radiation to at least any selected one of the plurality of luminescent material sensors at a time;

means connected with said excitation radiation directing means for causing said excitation radiation to be directed to each of the sensors in sequence, one sensor at a time, thereby to generate the electrical signal output of the amplifier that represents intensities of the luminescence radiation from the plurality of sensors in time sequence, and

means receiving the amplifier output signal for determining in time sequence the rate of intensity decay of the luminescence radiation from each of the plurality of sensors.

5,470,156

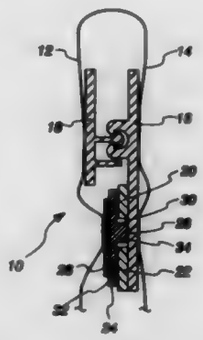
CLOSURE ARRANGEMENT HAVING A PEELABLE SEAL

Timothy J. May, Greenville, Wis., assignor to Reynolds Consumer Products, Inc., Appleton, Wis.

Filed Apr. 11, 1994, Ser. No. 225,864

Int. Cl.[6] B65D *33/16;33/25*

U.S. Cl. 383—210 **7 Claims**



1. A closure arrangement for a polymeric bag having first and second opposing films, comprising:

a first base strip having inner and outer surfaces, said outer surface of said first base strip being adapted for attachment to the first film of the polymeric bag;

a pair of heat-resistant stripe attached to said inner surface of said first base strip, said pair of heat-resistant strips being positioned generally parallel to each other and spaced from each other so as to form a gap therebetween; and

a T-shaped peelable strip including a top portion having opposing first and second surfaces and a stem portion extending perpendicular to said first surface of said top portion, said stem portion extending into said gap between said pair of heat-resistant strips and being attached to said inner surface of said first base strip, said top portion being positioned generally parallel to said pair of heat-resistant strips with said first surface of said top portion opposing said pair of heat-resistant strips.

5,470,157

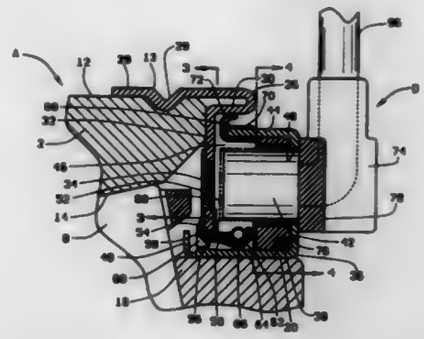
BEARING SEAL FOR SENSING ANGULAR VELOCITY

John D. Dougherty, Stark; Mark R Moldovan, both of Stark; Dennis L. Otto, Carroll, and Orestes J. Varonis, Stark, all of Ohio, assignors to The Timken Company, Canton, Ohio

Filed Mar. 29, 1994, Ser. No. 219,655

Int. Cl.[6] F16C *19/08;* **G01P** *3/44*

U.S. Cl. 384—448 **33 Claims**



1. In combination with an antifriction bearing which has an outer race that rotates around the bearing axis, an inner race that remains fixed with respect to the axis, and rolling elements arranged in a circular row between the outer and inner races, with each race having at one of its ends a mounting surface that is presented outwardly away from the axis, an improved seal for isolating the space between the two races from the environment at the exterior of the bearing, said seal comprising: an outer case fitted to the outer race at the mounting surface thereof and having a generally radially directed wall; an inner case fitted to the inner race on the mounting surface thereof and having a generally radially directed wall that is spaced from the radially directed wall of the outer case so that a chamber exists between the radial walls of the two cases; a first seal element carried by the outer case and establishing a first fluid barrier with the inner case, with the first barrier isolating the chamber from the interior of the bearing; a second seal element carried by the inner case and establishing a second fluid barrier with the outer case with the second barrier isolating the chamber from the environment at the exterior of the bearing; a sensor mounted on the inner seal case and having a head located in the chamber; the sensor being capable of producing a pulsating signal when excited; and means on the generally radial wall of the outer case for exciting the sensor when the outer race rotates, so that the sensor produces a signal, the frequency of which reflects the angular velocity.

5,470,158

SEAL FOR ROLLING BEARINGS

Daniel R. McLarty, Burlington, and Salvatore Acampora, Bristol, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Dec. 29, 1994, Ser. No. 366,355

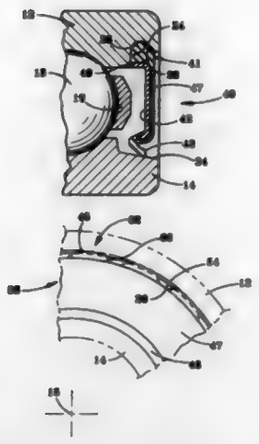
Int. Cl.[6] F16C *33/78*

U.S. Cl. 384—484 **12 Claims**

1. A seal element for a rolling element bearing having outer and inner bearing rings and a plurality of rolling elements within an annular space therebetween, one of the bearing rings having an annular sealing groove at an axial end of the bearing ring, the sealing groove having a curved bottom wall, substantially radially directed inner side wall and tapered outer side wall, the seal element comprising:

an annular ring of an elastomeric material, the annular ring having an outer periphery and an inner periphery;

a plurality of circumferentially periodic radially extending projections integrally formed in one of the outer periphery and the inner periphery of the annular ring, the projections being segments of a radially extending ridge;



said projections being configured to provide an interference fit in the radial direction with respect to the curved bottom wall and the tapered outer side wall of the sealing groove such that the sealing groove compresses the elastomeric material and thereby imparts an axial force on the seal element to effect a seal between the seal element and the inner side wall of the sealing groove to effect a seal.

5,470,159

CAGE GUIDE FOR ROLLING BEARINGS, IN PARTICULAR FOR AXIAL CYLINDRICAL ROLLER BEARINGS

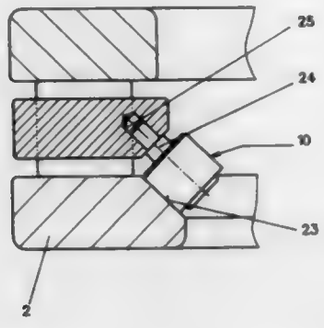
Reinhart Hillmann, Schweinfurt, Germany, assignor to SKF GmbH, Schweinfurt, Germany

Filed Aug. 4, 1993, Ser. No. 101,832

Claims priority, application Germany, Sep. 28, 1992, 42 32 433.5

Int. Cl.[6] F16C *33/46*

U.S. Cl. 384—623 **4 Claims**



1. In an axial rolling bearing including first and second bearing disks, a plurality of rolling members situated between said bearing disks, and a cage for maintaining said rolling members in spaced relationship to each other, the improvement of a radial guidance system for said cage comprising a plurality of bearing means, each mounted to said cage and engaging the first of said bearing disks, means for adjusting each of said bearing means in a radial direction for reducing friction between said cage and said bearing disk by said bearing means, and a plurality of axial guidance means for maintaining the cage axially spaced between and not contacting said bearing disks, each axial guidance means comprising a bearing element including inner and outer races and included rolling elements, and journal means coupling said bearing element to said cage, the journal situated with its axis oriented generally radially, and said outer race thereof engaging one of said bearing disks.

5,470,160

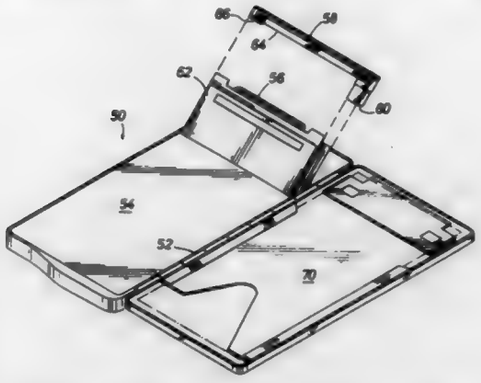
CHECK PREPARATION METHOD AND APPARATUS INCORPORATING CHECK SUM PROOF ENTRY

Linda Nowlin, 16007 Yorkminister, Spring, Tex. 77379

Filed Jan. 3, 1994, Ser. No. 176,727

Int. Cl.[6] B41J *5/00*

U.S. Cl. 400—105 **17 Claims**



1. A method of issuing a check by a depositor in a bank wherein check processing of the issued check is done by MICR readers without requiring further entry of data on the check after issuance by the depositor, the process comprising the steps of:

(a) printing a set of checks with MICR characters representing the bank number, depositor account number, and check number wherein the MICR characters are aligned along a designated line of the check to enable reading of the MICR characters during processing at the bank;

(b) issuing one check by printing thereon the data, payee and check sum in conformance with banking laws to create a valid check obligation to pay check sum on the check when negotiated by the user, wherein the check issuer determines the check sum, date and payee at any time or place;

(c) printing the check sum in MICR readable characters on the check at the time of issue with a depositor controlled, hand held portable printer wherein the MICR characters are also aligned with the MICR characters representing the bank number, depositor account numbers and check number to enable reading of the MICR characters during processing at the issuing bank so that the issuing bank processing is fully accomplished in MICR characters on the check when the check is presented for payment; and

(d) entering the depositor check sum to the depositor account stored in the printer.

5,470,161

Patent Not Issued For This Number

5,470,162

ERGONOMIC HAND-HELD IMPLEMENT

Burton S. Rubin, 200 E. 33rd St., Apt. 28-D, New York, N.Y. 10016

Continuation of Ser. No. 906,855, Jun. 30, 1992, abandoned. This application Feb. 8, 1994, Ser. No. 193,635

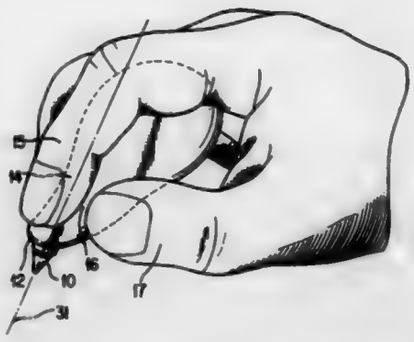
Int. Cl.[6] B43K *23/00;19/00*

U.S. Cl. 401—6 **4 Claims**

1. A hand-held implement, comprising:

a bottom portion from which a tool extends;

a forward surface extending upward from the bottom portion, having a smooth first concave contour, the forward surface being adapted to be engaged by and extend in a direction substantially parallel to the index finger of a user;

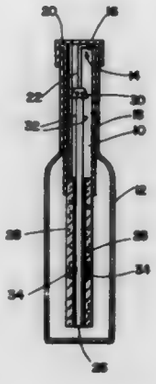


first and second opposed side surfaces extending upward from the bottom portion and rearward from the forward surface, said first and second side surfaces being provided with opposed smooth concave contours, the concave contour of one of the side surfaces being adapted to engage the thumb of a user, the concave contour of the other of the side surfaces being adapted to engage the side of a third finger of a user, the first concave contour and the concave contours of the side surface being adjacent the bottom portion, the forward and side surfaces being oriented so that in use the forward surface is substantially parallel to the user's index finger;

a rearward surface comprising a second concave contour, the concave contours of said first and second side surfaces extending between said first and second concave contours; and

a first convex contour smoothly joining said forward surface and said rearward surface, said second concave contour being smoothly joined to said first convex contour, the first convex contour being adapted to fit within the palm of a user, the forward surface, the first and second side surfaces and the first convex contour defining a bulbous upper portion above the concave contours of the side surfaces.

5,470,163
FOLDING LOTION APPLICATOR
Ernest Komala, 375 Wildberry La., Bartlett, Ill. 60103
Filed Jul. 29, 1994, Ser. No. 283,288
Int. Cl.[6] A45D *34/00*
U.S. Cl. 401—126 **7 Claims**



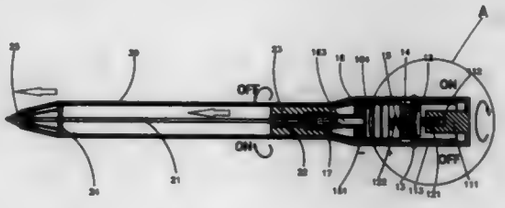
1. A collapsible applicator for spreading a fluid such as lotions and creams to a person's body, wherein the fluid is carried in a container having at least one opening, the improvement comprising:

a central frame member having grasping means at one end and fluid holding means at the other end for carrying said fluid;

a mechanism for folding and collapsing said fluid holding means into a generally parallel configuration relative to the central frame member to allow the applicator to be easily placed into said container to contact the fluid within the container and then be removed, unfolded and applied to a person's body to apply said fluid without the user's hands coming in contact with said fluid;

said fluid holding means including at least two elongated, porous, sponge like members with means extending outwardly from said central frame member when the applicator is unfolded to apply fluid.

5,470,164
PEN INCORPORATED WITH AND ILLUMINATOR
Chiag C. Chen, No. 14, Alley 1, Lane 46, Hsing Erh Rd., Taoyuan City, Taiwan, Prov. of China
Filed Mar. 8, 1995, Ser. No. 400,805
Int. Cl.[6] B43K *29/10*
U.S. Cl. 401—195 **1 Claim**



1. A pen comprising:

an insulative pen top, having a bottom chamber, an inside stem suspended within the bottom chamber, a screw hole on said inside stem, and two opposite ribs raised from said bottom chamber on the inside;

a metal contact member, having a screw rod at one end threaded into the screw hole on said inside stem of said pen top, and a contact rod at an opposite end, the contact rod of said metal contact member having an annular groove around the periphery;

a metal adapter, having a bottom coupling portion defining a bottom chamber, an upper coupling portion fitted into the bottom chamber of said pen top, an annular groove around an outside wall of said upper coupling portion, which receives the inside ribs of said pen top, and a longitudinal center through hole, through which the contact rod of said metal contact member passes;

an insulative cap mounted within the bottom chamber of said metal adapter, having a center through hole, through which the contact rod of said metal contact member passes;

a conical metal spring mounted within said insulative cap, having a top end fastened to the annular groove on the contact rod of said metal contact member;

a battery holder mounted within an upper barrel, having a battery chamber, which receives a battery set, and a bottom hole at the longitudinal center of said battery chamber;

a T-contact mounted within said battery chamber and stopped at said battery set against said conical metal spring, having a bottom tube extended out of the bottom hole on the battery chamber of said battery holder and an annular groove around the bottom tube;

a coil spring mounted around the bottom tube of said T-contact, having a top end fixed to the annular groove on the bottom tube of said T-contact;

an insulative sleeve mounted within the bottom tube of said T-contact;

a refill holder mounted within said upper barrel and connected to said insulative sleeve and stopped at said coil spring against said T-contact, having a bottom screw rod and a bottom mounting hole through the longitudinal center of the bottom screw rod;

a refill fitted into the bottom mounting hole on the bottom screw rod of said refill holder;

a lower barrel longitudinally connected to said upper barrel, having a tapered front end defining a front orifice;

a propelling control member mounted within said upper barrel around said refill holder, having a top screw hole, which receives the bottom screw rod of said refill holder;

a circuit board having a positive contact terminal around the border welded to said lower barrel on the inside and electrically connected to the positive terminal of said battery set, a center through hole, through which said refill passes, and a negative contact terminal made within the center through hole and disposed in contact with said refill; and

a lamp head electrically connected to said circuit board and extended out of the front orifice of said lower barrel, having a center through hole, through which said refill is moved in and out;

wherein said pen top can be turned relative to said adapter between the ON position to let the positive terminal of said battery set be connected to the contact rod of said metal contact member and said metal adapter through said metal conical spring and the OFF position to electrically disconnect the positive terminal of said battery set from the contact rod of said metal contact member and said metal adapter; said lamp head is turned on when said refill is propelled out of said lower barrel by said propelling control member by turning said upper barrel in one direction relative to said lower barrel when said pen top is turned to the ON position, or turned off when said refill is moved back inside said lower barrel by said propelling control member by turning said upper barrel in the reverse direction relative to said lower barrel.

5,470,165

RETAINING BUSHING FOR JOINING BEARING RINGS

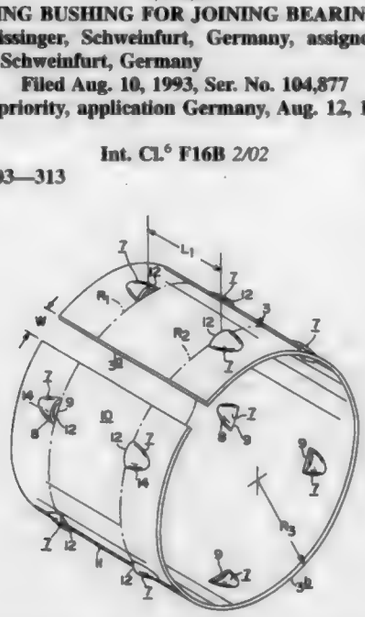
Ronald Bissinger, Schweinfurt, Germany, assignor to SKF GmbH, Schweinfurt, Germany

Filed Aug. 10, 1993, Ser. No. 104,877

Claims priority, application Germany, Aug. 12, 1992, 42 26 618.1

Int. Cl.[6] F16B *2/02*

U.S. Cl. 403—313 **6 Claims**



1. A retaining bushing for securing bearing rings, comprising:

a cylindrical retaining ring including an axial slot along its entire length;

said ring having circumferentially spaced, radially outwardly projecting retaining projections about its periphery arranged in two axially spaced rows, said projections having a surface which slopes relative to a radial plane forming an outer portion and an inner portion with an opening whereby the axial distance between the surfaces is greater at the outer portion of the projection than at the inner portion which is adjacent the ring; and

said retaining projections locking into radial grooves in the bearing rings to secure the bearing rings in abutting end to end relation.

5,470,166

SHAFTING CONNECTION

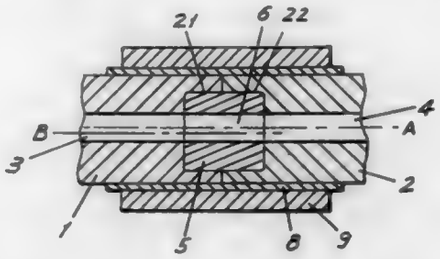
Staffan Sundberg, Hofors, Sweden; Vilaly E. Sergeev, and Vladimir G. Nesterov, both of Sankt Petersburg, U.S.S.R., assignors to Ovako Couplings AB, Sweden

Filed Nov. 17, 1993, Ser. No. 153,757

Claims priority, application Sweden, Dec. 29, 1992, 9203922

Int. Cl.[6] F16B *2/00*

U.S. Cl. 403—314 **16 Claims**



1. Shafting connection for connecting a first hollow cylindrical steel shaft to an aligned second hollow cylindrical steel shaft, said shafts having respective main bores and identical outer diameters at least in regions extending from their abutting ends., comprising a friction coupling including an inner sleeve with an inner cylindrical surface arranged for frictional contact with the outer surface of a terminal region of the shafts, said friction coupling being arranged to be fitted on the aligned shafts to cover both shafts near their abutting ends, each of said shafts in a region extending from their abutting ends having a second bore of same diameter for receiving an annular insert, said second bores being wider than the main shaft bores and being arranged with equal eccentricity in respect to the main shaft bores, said annular insert being an annular locking insert having substantial extension in both second bores and having an eccentrically arranged through bore having a bore diameter, the degree of eccentricity essentially corresponding to that of the eccentrically arranged bore in the respective shaft.

5,470,167

LOCKING DEVICE FOR PULL-OUT SUPPORTS

Hartmut Benckert, Filderstadt-Sielmingen, and Dieter Schillinger, Neuhausen, both of, Germany, assignors to Putzmeister-Werk Maschinenfabrik GmbH, Aichtal, Germany

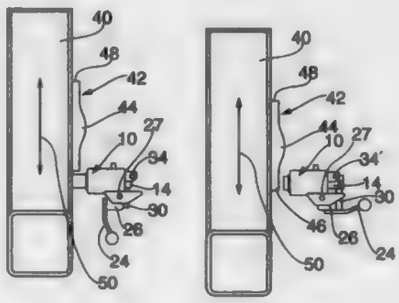
PCT No. PCT/EP93/00131, § 371 Date Jul. 7, 1994, § 102(e) Date Jul. 7, 1994, PCT Pub. No. WO93/19957, PCT Pub. Date Oct. 14, 1993

PCT Filed Jan. 21, 1993, Ser. No. 256,329

Claims priority, application Germany, Apr. 6, 1992, 42 11 493.4

Int. Cl.[6] B66C *5/00*; E05C *1/12*

U.S. Cl. 403—322 **14 Claims**



1. A locking device for a support member adapted for supporting a support frame, the support member being movable relative to the

support frame between a retracted transport position and an operating support position, the locking device for locking said support member at said positions comprising:

a guide sleeve connected to said support frame;

a locking bolt slidably mounted in said guide sleeve and moveable in a direction generally transverse to the direction of movement of the support member, said locking bolt being movable between a locking position, an unlocking position, and a release position; means biasing said locking bolt toward the locking position;

a driving element connected to said locking bolt;

an actuating member moveable relative to the sleeve between first and second end positions, the actuating member being engagable with said driving element such that said locking bolt is moved from the locking position to the unlocking position when the actuating member is moved from the first end position to the second end position; and

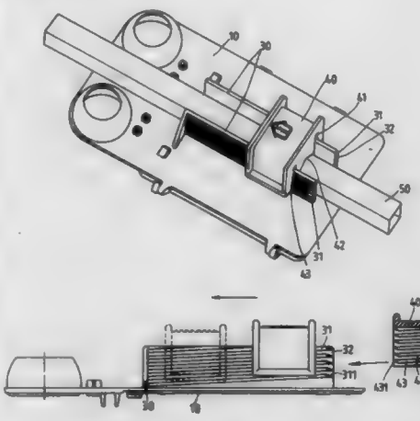
an engagement and guide member fixedly connected to the support member, said engagement and guide member including a locking surface engagable with the locking bolt in its locking position for locking said support member in the transport position and another locking surface engagable with the locking bolt in its locking position for locking said support member in the operating support position, the engagement and guide member also including a cam portion between the two locking surfaces, said cam portion being engagable with the locking bolt for displacing the locking bolt from the unlocking position to the release position, wherein the actuating member becomes disengaged from the driving element when the locking bolt is in its release position and to consequently move automatically from its second end position to its first end position.

5,470,168

DEVICE FOR SPEEDILY MOUNTING OBJECTS ON TUBES AND BARS

Gordon Liao, Taipei, Taiwan, Prov. of China, assignor to Union Sports Co., Ltd., Taipei, Taiwan, Prov. of China

Filed Jun. 22, 1993, Ser. No. 80,887
Int. Cl.[6] B25G *3/20*
U.S. Cl. 403—368 **3 Claims**



1. A device for mounting objects on tubes and bars comprising:

two elongate teeth plates being fixed upright and parallel to each other on an object, each elongate teeth plate having a plurality of longitudinal parallel teeth grooves defined by pairs of two adjacent teeth on an outer side of the teeth plate, the plurality of teeth grooves gradually sloping upward from a left end of the plates to a right end thereof,

an elongate elastic cushion placed between the two teeth plates on said object to contact the tubes and bars,

an engaging base having two parallel vertical slots, each opening to a bottom of the base so that the slots are adapted to receive said two elongate teeth plates, an inverted V-shaped bottom surface between the two slots, each slot having a plurality of parallel longitudinal teeth and teeth grooves defined by pairs of two adjacent teeth on an outer surface of said slot, the teeth gradually sloping in the same direction as the teeth on the teeth plates; wherein

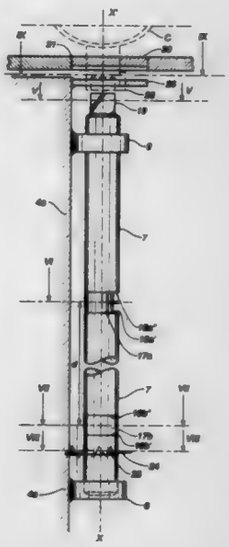
said teeth of the teeth plates engage the teeth of the engaging base so that the distance between the inverted V-shaped bottom surface of said engaging base and said object is reduced by moving said engaging base gradually toward the left end of said two teeth plates, thereby compressing said elastic cushion and fixing said tube and bars in place between said object and said engaging base.

5,470,169

DEVICE FOR LOCKING A SLIDING BODY, AND PARTICULARLY A RETRACTABLE ROAD BOUNDARY MARK

Yvan Verra, 75, rue Folard, F-84310 Morières, France

PCT No. PCT/FR92/00825, § 371 Date Mar. 2, 1994, § 102(e) Date Mar. 2, 1994, PCT Pub. No. WO93/05235, PCT Pub. Date Mar. 18, 1993
PCT Filed Aug. 27, 1992, Ser. No. 204,218
Claims priority, application France, Sep. 5, 1991, 91 11092
Int. Cl.[6] E01F *13/00*
U.S. Cl. 404—6 **8 Claims**



1. A device for locking a sliding body in at least two predetermined positions towards which the device may be urged by a control device acting on a locking body which extends parallel to a sliding axis of the sliding body and which rotates around its longitudinal axis but cannot move parallel thereto, the device comprising:

a plurality of transverse notches formed on the locking rod and whose number and mutual distance along said locking rod are respectively equal to a number and a mutual distance of said predetermined positions, said notches having a bottom which is convex and is linked with side surfaces of said locking rod, said notches being angularly spaced from each other about the axis of said locking rod when viewed from a lengthwise direction of the locking rod; and

a bolt means cooperative with said plurality of transverse notches and attached to said sliding body, said bolt means engaging said notches by a pressure of a spring such that the rotating of said locking rod around its axis brings the bolt to the predetermined angular positions where one of said transverse notches opens outwardly toward said bolt means.

5,470,170

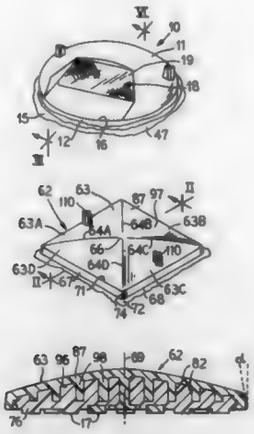
PAVEMENT MARKERS AND METHOD FOR MAKING

Henry Lindner, Elgin, Ill., assignor to Elgin Molded Plastics, Inc., Elgin, Ill.

Continuation-in-part of Ser. No. 978,907, Nov. 19, 1992, Pat. No. 5,354,143. This application Sep. 29, 1994, Ser. No. 315,323

Int. Cl.[6] E01F *9/00*

U.S. Cl. 404—9 **7 Claims**



1. A pavement marker comprising:

(A) a unitarily molded flattened base block having:

(1) a transversely extending central channel defined therethrough,

(2) a generally convex upper surface that has a plurality of troughs defined therein,

(3) a thickened side perimeter, and

(4) a generally planar bottom surface; and

(B) a unitarily molded cap structure that clads said base block, said cap structure having:

(1) a protrusion that fills said channel,

(2) a dish-configured portion which

(a) has a generally concave inner surface that extends over said upper surface and fills said troughs,

(b) has a generally convex outer surface, and

(3) a side portion that extends over said side perimeter;

said cap structure having been so molded in situ by flowing a thermoplastic resin through said central channel and over said upper surface and said side perimeter.

7. A method for making a pavement marker comprising the steps of:

(A) molding a unitary base block which has:

a central channel defined therethrough,

a generally convex upper surface that has a plurality of troughs defined therein,

a thickened side perimeter,

a generally planar bottom surface; and thereafter

(B) molding a unitary cap structure over said base block, said cap structure having:

a protrusion that fills said channel

a dish-configured portion which extends concavely over said upper surface, fills said troughs and joins said protrusion and which has a generally convex outer surface, and

a side portion that extends over said side perimeter.

5,470,171

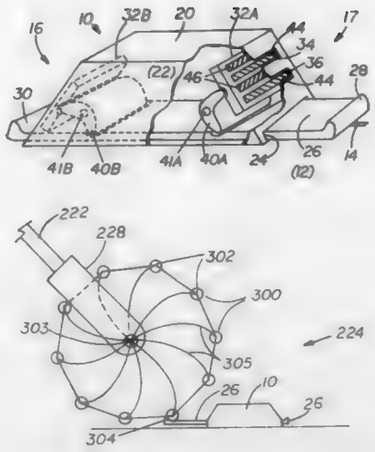
CONFIGURABLE HIGHWAY DIVIDER SYSTEM

Ling-yuan Tseng, 13772 Calle Tacuba, Saratoga, Calif. 95070

Filed Aug. 10, 1993, Ser. No. 104,881

Int. Cl.[6] E01F *9/087*

U.S. Cl. 404—13 **15 Claims**



1. A configurable highway divider system, comprising:

a plurality of markers, spaced apart on a road surface alongside a traffic lane, each marker having a first end which faces traffic travelling in one direction on said lane and a second end which faces traffic in the opposite direction, at least one of said ends including a visual indicator which a vehicle operator may observe to determine the proper direction of travel along said traffic lane; and

a vehicle-mountable indicator changing device, whereby a vehicle equipped with said indicator changing device may interact with said markers and change their indicators.

5,470,172

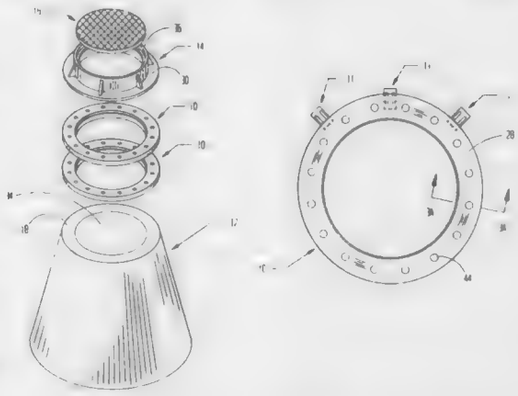
MANHOLE ADJUSTING EXTENSION RING SECTION

Dwight G. Wiedrich, N-2204 730th St., Hager City, Wis. 54014

Filed Jun. 6, 1994, Ser. No. 254,908

Int. Cl.[6] E02D *29/14*

U.S. Cl. 404—25 **36 Claims**



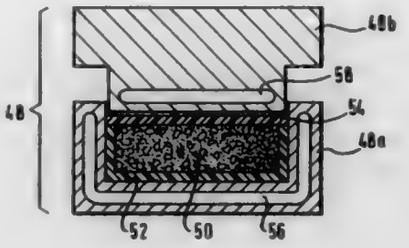
1. An extension for use in manhole construction which comprises:

a molded plastic member having a shape conforming to the manhole construction, and further having a first (outer) and second (inner) concentric, spaced-apart, walls interconnected by a plurality of webs extending from said first and second walls to create a corresponding plurality of pocket spaces, said second wall having an upper and a lower section laterally offset in opposite directions relative to a center section to define an upper and a lower shoulder extending from said center section.

5,470,173
PROCESS FOR PRODUCING A RAILROAD CROSSING MEANS

Peter Schmidt, Waldkraiburg, Germany, assignor to Gummiwerk Kraiburg Development GmbH, Waldkraiburg, Germany

Continuation of Ser. No. 938,135, Oct. 7, 1992, abandoned. This application Nov. 22, 1994, Ser. No. 343,788
Claims priority, application Germany, Apr. 10, 1990, 40 11 599.2
Int. Cl.[6] E01C 9/04
U.S. Cl. 404—32 26 Claims



1. A process for forming a molded member for a railroad track crossing, comprising:

providing a mold for forming the molded member, the mold having a bottom part and a top part, both of which are substantially impermeable to the materials from which the molded member is to be formed, the bottom part having a cavity with a top opening and the top part being receivable into the cavity through the top opening,

preparing a heated mixture comprising granular vulcanized scrap rubber and a binder comprising crude rubber and a vulcanizing agent;

preparing a molded-member precursor in the cavity of the bottom part of the mold, the molded-member precursor comprising as one part thereof the heated mixture and as a further part thereof at least one cohesive layer adjoining the heated mixture and interposed between the heated mixture and a surface of one of the mold parts, the cohesive layer comprising crude rubber and a vulcanizing agent and having a putty-like consistency;

inserting the top part of the mold into the cavity of the bottom part of the mold through the top opening and applying a force to the top part to apply pressure to the molded member precursor while maintaining the molded-member precursor at an elevated temperature to vulcanize the crude rubber, to bond the heated mixture, and to form a bond between the heated mixture and the cohesive layer, thereby forming the molded member from the molded-member precursor; and

allowing the molded member to cool.

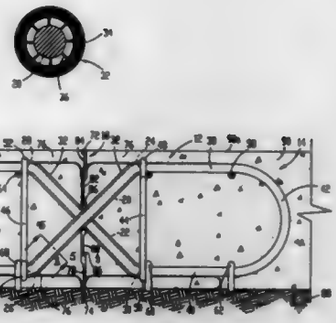
5,470,174
EXPANSION JOINT ASSEMBLY HAVING LOAD TRANSFER CAPACITY

Kuo-Kuang Hu; Philip G. Kirmser; Stuart E. Swartz, and Mustaque Hossain, all of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Continuation of Ser. No. 13,688, Feb. 4, 1993, Pat. No. 5,366,319. This application Oct. 26, 1994, Ser. No. 329,306
Int. Cl.[6] E01C 5/08
U.S. Cl. 404—52 4 Claims

4. An expansion assembly comprising:

a pair of separate, adjacent spaced apart concrete slabs having an elongated expansion joint therebetween; and



a pair of elongated load transfer bars each integrally formed and presenting a pair of opposed ends with elongated, integral segments extending from each of said ends in a direction away from the joint;

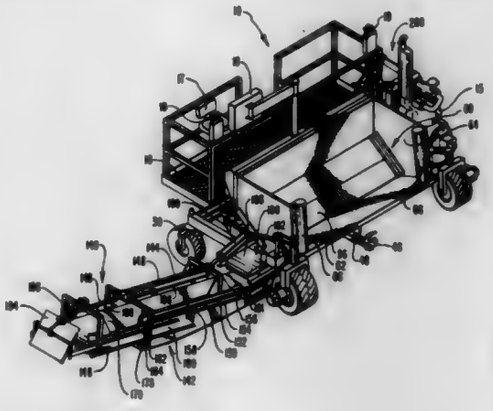
said bars being oriented obliquely relative to said joint to cooperatively present a general X-configuration of bars bridging said joint, with the opposed ends of each bar and said integral segment each being embedded in respective concrete slabs in material consisting essentially of concrete,

said load transfer bars being unconnected to each other in the region of said joint.

5,470,175
APPARATUS AND METHODS FOR EFFICIENT AND PRECISE PLACEMENT OF DISCRETE QUANTITIES OF MATERIALS ADJACENT TO THE APPARATUS

Darrell V. Jensen; Carl J. Hobbs, and M. Andrew Blight, all of Blackfoot, Id., assignors to Spudnik Equipment Company, Blackfoot, Id.

Filed May 16, 1994, Ser. No. 245,154
Int. Cl.[6] E01C 19/45
U.S. Cl. 404—72 57 Claims



1. An apparatus comprising:

a support frame;

an engine mounted on the support frame;

a hydraulic system for supplying power from the engine throughout the apparatus;

four wheels rotatably mounted on the support frame, two of said wheels being powered through the hydraulic system to advance the apparatus forward and to steer the apparatus;

a control system for operating the apparatus;

a hopper for receiving the material, the hopper being fixedly attached to and supported by the support frame, the hopper having a bottom;

means for metering discrete quantities of the material from the hopper and transferring the metered material while supporting the material in the hopper, the metering means being posi-

tioned at the bottom of the hopper and powered through the hydraulic system; and

means for transferring the metered material received from the metering means to a side of the apparatus, the transferring means being attached to the support frame, being perpendicular relative to the longitudinal axis of the apparatus and being powered through the hydraulic system, whereby the metered material is precisely placed adjacent to the apparatus.

5,470,176

SYSTEM AND METHOD FOR CONTROLLING EMISSIONS CREATED BY SPRAYING LIQUIDS FROM MOVING VEHICLES

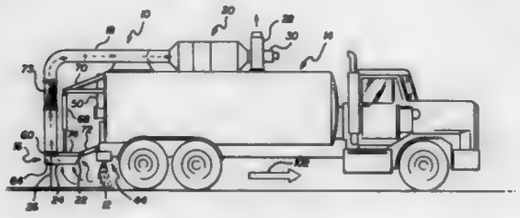
John Corcoran, Los Angeles; Ikbal A. Molvi, Hawthorne; Joseph W. Hower, Long Beach, and William A. Moseley, Redondo Beach, all of Calif., assignors to Manhole Adjusting Contractors Inc., Monterey Park, Calif.

Continuation-in-part of Ser. No. 163,937, Dec. 8, 1993, Pat. No. 5,342,143, which is a continuation of Ser. No. 748, Jan. 5, 1993, Pat. No. 5,297,893. This application May 19, 1994, Ser. No. 248,501

The portion of the term of this patent subsequent to Aug. 30, 2011, has been disclaimed.

Int. Cl.[6] **B01D** *45/00;* **E01C** *23/00*

U.S. Cl. 404—72 **39 Claims**



1. A system for controlling emissions created by spraying a heated liquid paving composition from at least one nozzle of a moving vehicle onto a pavement surface, comprising:

a vacuum hood positionable adjacent said at least one nozzle and having at least one inlet and at least one outlet;

a shroud structure associated with the vacuum hood to at least partially enclose an emissions collection region above the pavement surface;

a mechanism communicating with said at least one outlet to create a partial vacuum within the vacuum hood and draw air from the emissions collection region through said at least one inlet; and

apparatus for receiving said air and extracting emissions therefrom.

5,470,177

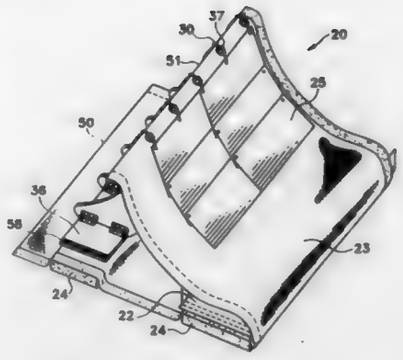
HYDRO WALL

Christopher T. Hughes, Box 8036, Bennett Ave., Milford, Pa. 18337

Filed Mar. 2, 1994, Ser. No. 204,768

Int. Cl.[6] **E02B** *7/00*

U.S. Cl. 405—115 **16 Claims**



1. A module for use in providing a barrier wall for containment of flood waters, said module comprising;

an elongated rectangular substantially flexible waterproof cover sheet, said cover sheet having a front end and a back end and containing means affixed to said cover sheet for sealing the module to the ground so as to prevent the flood waters from passing under said module; and

at least one ballast cell unit in the form of a rectangular trough of substantially flexible waterproof material, containing a plurality of ballast cells, for placement on the back end of said cover sheet, the front end of said cover sheet being capable of covering said ballast cell unit on the side facing said flood waters to enhance the water impervious character of the barrier wall.

5,470,178

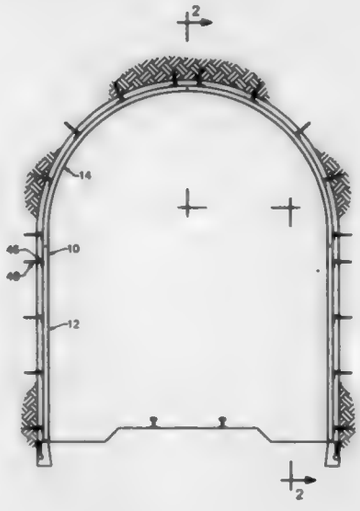
INSULATING TUNNEL LINER SYSTEM

Raymond L. Weholt, 3119 W. Commodore Way, #1A, Seattle, Wash. 98199

Filed Feb. 17, 1994, Ser. No. 197,937

Int. Cl.[6] **E21D** *11/00*

U.S. Cl. 405—152 **9 Claims**



1. An insulating panel system adapted to wet concrete lined tunnels, comprising:

a plurality of modular interlocking liner panels each having an inner substantially load bearing flexible metal skin, an outer substantially non-load bearing flexible plastic skin and a preformed flexible insulating core adhered to both the inner and outer skins so that the panels can be shaped to conform to an arcuate tunnel shape;

mounting means for mounting the panels in a spaced relationship from the concrete lined tunnel so as to form an air gap between the plastic outer skin and the tunnel wall; and,

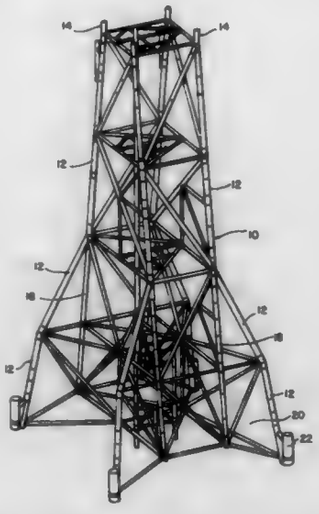
end section insulating means for at least partially closing end sections formed by the liner panels to insulate air in the air gap from air outside of the tunnel whereby the concrete lining is insulated from the outside air and destructive freeze and thaw cycles are avoided.

5,470,179

WIDENED-BASE STRUCTURE FOR SUPPORTING AN OFFSHORE PLATFORM

Vitor G. Maciel, Rio de Janeiro, Brazil, assignor to Petroleo Brasileiro S.A. - Petrobras, Rio de Janeiro, Brazil

Filed Sep. 15, 1993, Ser. No. 120,766
Claims priority, application Brazil, Sep. 16, 1992, 9203617
Int. Cl.[6] E02R *17/00*
U.S. Cl. 405—224 3 Claims



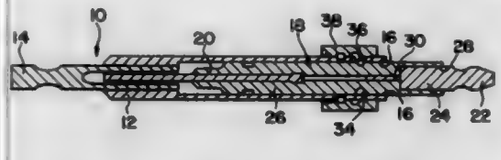
1. An offshore tower having a widened base structure for supporting an offshore platform comprising four main legs each having a first cross-sectional dimension disposed at corners of a rectangle with legs in each of two pairs of legs being disposed parallel to each other to define front and rear faces in an upper region of said tower with said front and rear faces angled inwardly toward each other in an upward direction, said main legs angling outwardly in an intermediate region and a lower region for resting on a seabed, four secondary legs each having a second cross-sectional dimension smaller than said first cross-sectional dimension connected to and extending downwardly from and in alignment with said main legs in said upper region said secondary legs extending downwardly through said intermediate and lower regions for engagement with said seabed, said main legs and said secondary legs in said intermediate and lower regions defining external lateral faces having a substantially dihedral configuration whereby operational and environmental loads are directly transmitted to said seabed through said main legs.

5,470,180

REVERSIBLE DRILL/DRIVER TOOL

Matthew B. Jore, 45000 Highway 93 S., Ronan, Mont. 59864

Filed May 2, 1994, Ser. No. 236,992
Int. Cl.[6] B23B *31/10*
U.S. Cl. 408—239 R 9 Claims



1. A reversible drill/driver tool for use with a powered drill having a chuck comprising:

a two-ended reversible tool assembly having an elongate holder body means for holding at one end thereof a removable bit for drilling a pilot hole and countersink, and for holding at the other end thereof a removable screwdriver bit for driving a screw;

an elongate hollow socket open at one end and having a drive shank attached at the other end to be received by the chuck of the powered drill; the hollow socket, sized to accept the two-ended reversible tool assembly within the interior thereof with one end of the reversible tool assembled exposed;

a driving means operatively connecting the tool assembly with the socket for rotating the two-ended reversible tool assembly with the socket;

the driving means comprising the open end of the hollow socket shaped to have a polygonal interior shape and the holder body shaped to have an elongate polygonal shaped portion intermediate the ends of the holder body for mating with the polygonal interior shape of the socket;

a releasable retaining means for releasably retaining the two-ended reversible tool assembly within the hollow socket, the releasable retaining means including a releasable ball detent means having cooperating components on the exterior of the holder and the interior of the socket;

a sleeve means located on and moveable along the hollow socket for operating the releasable retaining means from a position where the two-ended reversible tool assembly is held within the hollow socket to a position where the two-ended reversible tool assembly may be removed from the hollow socket;

said ball detent means comprising a circumferential groove in the elongate polygonal portion of the holder body, the hollow socket having a sidewall with a detent ball opening with which the circumferential groove is registerable, and a detent ball in the detent ball opening to project into the circumferential groove; and

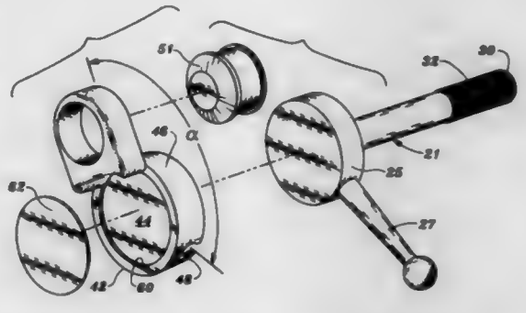
wherein the sleeve means includes means for manipulating the detent ball into and out of engagement with the circumferential groove.

5,470,181

SAFETY DEVICE FOR MACHINE TOOLS

Richard J. Garcia, 304 Plum Dr., Exeter, Calif. 93221

Filed Jan. 17, 1995, Ser. No. 373,574
Int. Cl.[6] B23C *9/00*; B23B *47/00*; B23Q *11/00*
U.S. Cl. 409—134 17 Claims



1. A safety tool for use in overcoming the effects of inertia on a locking device disposed on a machine tool to lock and unlock a longitudinally moveable machine element, wherein the locking device includes a bolt having a bolt head at one end thereof, and a radially outwardly extending lever movable between a locking and unlocking position of said locking device, said safety tool comprising in combination:

a cap, said cap being adapted to and fit upon the knob of the locking device, said cap having a disc portion, a side wall depending from said disc, and an opening defined by said disc and said side wail for encircling the lever of the locking device;

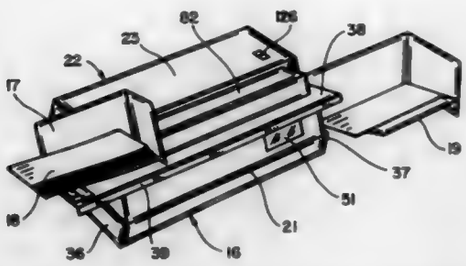
means defining a counterweight, said counterweight being connected to said cap in radial opposition to said opening in said side wall, said counterweight being positioned to overcome the effective mass of said lever so as to urge said lever toward an unlocked position.

5,470,182

ENVELOPE OPENING MACHINE

Edward A. Krupotich, Los Altos, and Burton J. Rosensweig, Foster City, both of Calif., assignors to Omation Corporation, Mountain View, Calif.

Filed Feb. 4, 1994, Ser. No. 192,002
Int. Cl.[6] B23C 3/00
U.S. Cl. 409—137 **19 Claims**



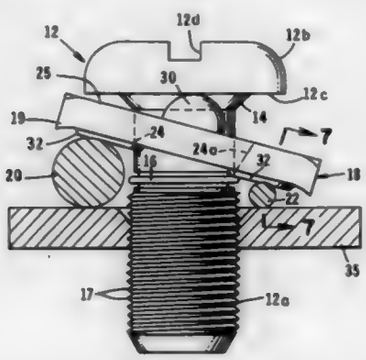
1. In machine for opening envelopes, a transport surface, a guide extending longitudinally of the transport surface and intersecting the surface to form a corner, a transport belt extending obliquely of the guide and projecting through an opening in the transport surface for conveying an envelope along the surface with one edge of the envelope in contact with the guide, and a rotatively driven milling cutter having radially facing teeth projecting through the corner for cutting away the edge portion of an envelope as it is conveyed past the cutter.

5,470,183

ELECTRICAL CONNECTION TERMINAL ASSEMBLY AND TILT WASHER

E. Grant Swick, 28 W. 629 Stearns Rd., Bartlett, Ill. 60103

Filed Nov. 22, 1993, Ser. No. 155,387
Int. Cl.[6] F16B 33/00; H01R 4/44;11/01
U.S. Cl. 411—368 **28 Claims**



1. A washer for use in connection with a screw having a shank portion having a longitudinal axis and a head portion, including an undersurface, said washer comprising:

(a) a body having a transverse center line, a longitudinal center line, a first surface and a second surface, said body having a centrally disposed aperture for receiving the shank of the screw and being pivotable generally about the longitudinal axis of the screw;

(b) screw head engaging means provided on said first surface substantially along said transverse center line for engaging the undersurface of the screw head upon tightening the screw; and

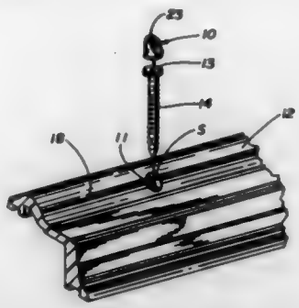
(c) gripping means provided on said second surface for gripping an article below said second surface, said gripping means being disposed on either side of said transverse center line of said body and being substantially coplanar.

5,470,184

SCREW HOLE PLUG

Charles W. Chandler, 245 Albright La., Gallatin, Tenn. 37066

Filed Jan. 14, 1994, Ser. No. 181,041
Int. Cl.[6] F16B 19/00; A47G 3/00
U.S. Cl. 411—377 **4 Claims**



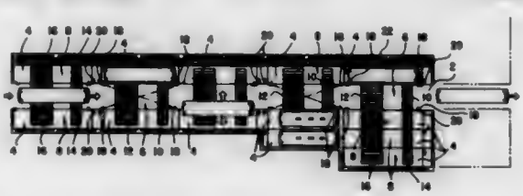
1. A screw hole plug for use in a counter sink defining a hole within a modified frame element assembly having a smooth contoured exposed surface, a fastener extending through said screw hole having a head located within said counter sink below said smooth contoured exposed surface, said screw hole plug comprised of a single molded monolithic element of resilient deformable material, the screw hole plug having a cylindrical side surface, a curvilinear top surface and a planar bottom surface with a beveled lower edge extending therefrom and intersecting said cylindrical side surface, flanges extending from said beveled lower edge, said flanges are co-planar with said bevel lower edge of said planar bottom surface and extend beyond said cylindrical side surface, said screw hole plug being located within said counter sink whereby said curvilinear top is generally flush with said smooth contoured exposed surface of said frame element.

5,470,185

PARKING GARAGE

Takahiro Tsubota, 7-8-5, Nakayama-Sakuradai, Takarazuka, Hyogo, and Hiroshi Kitajima, 1-10-8, Seihuuso, Toyonaka, Osaka, both of, Japan, assignors to Takenaka Corporation, Osaka; Takahiro Tsubota, Hyogo, and Hiroshi Kitajima, Osaka, all of, Japan

Continuation of Ser. No. 83,901, Jun. 28, 1993, abandoned.
This application Mar. 1, 1995, Ser. No. 396,059
Claims priority, application Japan, Jun. 30, 1992, 4-197692
Int. Cl.[6] E04H 6/34
U.S. Cl. 414—264 **17 Claims**



1. A parking garage comprising:

a self-running lane for vehicles to move therethrough by means of a motor in each of the vehicles, said self-running lane having an entrance or entering the garage, said entrance being located near a first end of said self-running lane, and an exit for exiting the garage, said exit being located near a second end of said self-running lane;

a plurality of individual parking zones arranged on a first side and a second side of said self-running lane; and

a plurality of first crossfeeder means for front wheels and a plurality of second crossfeeder means for rear wheels of the vehicles; at least one first crossfeeder means of said plurality of first crossfeeder means and at least one second crossfeeder means of said plurality of second crossfeeder means arranged

at each of the individual parking zones and extending into the self-running lane, respectively, for moving the vehicle to and from one of said parking zones and said self-running lane; said parking garage further comprising

an entrance gate arranged at a front of the entrance of said self-running lane;

safety sensors arranged at said entrance gate, said safety sensors for detecting the vehicle moving through said entrance gate;

alarm means arranged at each of said plurality of individual parking zones, said alarm means for signalling a presence of the vehicle moving from said each zones, and for signalling a presence of the vehicle entering said self-running lane from said entrance gate; and

means to light at least one of said alarm means when the vehicle approaches from said entrance gate and when the vehicle is taken out by said crossfeeder means.

5,470,186

SYSTEM FOR DISCHARGE OF BULK MATERIALS FROM VEHICLES

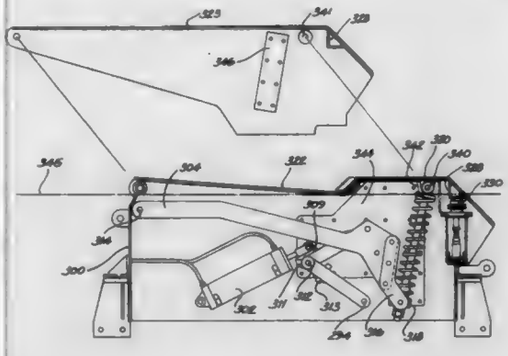
Alexander K. W. Kwok, Scarborough, Australia, assignor to ABB EPT Construction Pty. Limited, Sydney, Australia

Continuation of Ser. No. 117,440, Sep. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 894,021, Jun. 5, 1992, abandoned. This application Apr. 12, 1995, Ser. No. 421,461

Claims priority, application Australia, Jan. 15, 1991, PK8929

Int. Cl.[6] B61D *7/30*

U.S. Cl. 414—388 **15 Claims**



1. A system for a discharge of bulk materials from a vehicle, said vehicle having at least one storage compartment with at least one discharge opening and a door covering said at least one discharge opening, held shut by an over-center action of a door operating mechanism having an articulated linkage, said door operating mechanism further including a first lever means for opening said door, and a second lever means for closing said door, a first cam means cooperable with said first lever means to open said door and a second cam means cooperable with said second lever means for closing said door, said first cam means and said second cam means being separate from said vehicle and each having means for moving said respective cam means between a first inoperative position and a second operative position and vice versa, so that in said second position said first cam means or said second cam means is in a position for contacting said first lever means or said second lever means, respectively, as the case may be, so that relative movement of said vehicle and said respective cam means opens or closes said door, and in said first position is retracted and unable to contact said respective levers; and, trip means attached to said each of said means for moving respective said first cram means and said second cam means operative for returning respective said first cam means and said second cam means to, and lock in, said first position whenever movement of respective said first cam means and said second cam means under loading in a direction of said first position exceeds a predetermined value.

5,470,187

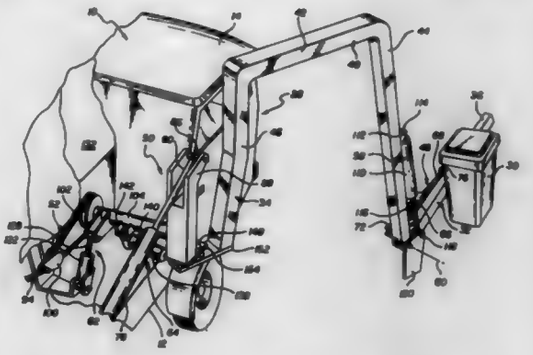
FRONT-SIDE LIFTING AND LOADING APPARATUS

Fred T. Smith, and Fred P. Smith, both of Alpine, Utah, assignors to Galion Solid Waste Equipment Co., Inc., Galion, Ohio

Filed Sep. 9, 1993, Ser. No. 118,564

Int. Cl.[6] B65F *3/02*

U.S. Cl. 414—408 **23 Claims**



15. A device for lifting and loading materials comprising:

a frame including a storage container having an inlet opening that is located above ground level;

a pick-up arm for engaging material at ground level for loading through the inlet opening of storage container;

a lift assembly for the pick-up arm including

a lift arm connected at one end portion to the frame and at another end portion to the pick-up arm; and

first actuating means for swinging the pick-up arm relative to the lift arm about an axis that is generally perpendicular to the ground to bring the pick-up arm into a close-in position along the section of the container where the inlet opening is located and a outreaching position spaced away from that section, said first actuating means including speed control means for automatically increasing the velocity of movement of the pick-up arm as it moves from the outreaching position toward the close-in position until a desired intermediate position is reached and for then automatically decreasing the velocity of movement of the pick-up arm as it moves from the intermediate position toward the close-in position.

5,470,188

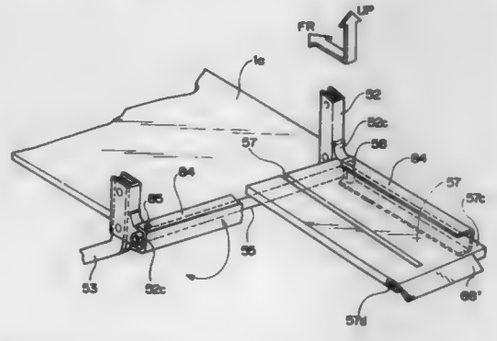
LIFT FOR LOADING AND UNLOADING A TRUCK

Hiroshi Ebato, Tokorozawa, Japan, assignor to EBAC Corporation, Tokorozawa, Japan

Filed Apr. 8, 1993, Ser. No. 44,153

Int. Cl.[6] B60P *1/26*

U.S. Cl. 414—545 **23 Claims**



1. A lift for loading and unloading a truck, having a rear end, sides, a chassis, and a loading chamber having a floor defining a plane, said lift comprising:

movable support posts mounted adjacent the rear-end and at each side of the truck;

drive means for moving said support posts in a direction substantially perpendicular to the plane;

a lift table having at least one slit therethrough substantially in registration with One of a chassis frame and a longitudinal joist, the at least one slit having a width slightly larger than a thickness of a web portion of the one of the chassis frame and longitudinal joist and extending from a front end of said lift table relative to a forward end of the truck toward a rear portion of said lift table so that said lift table is divided into a plurality of panels each integrally connected together only at the rear portion of said lift table; and

support means for supporting said lift table substantially parallel to the plane when said lift table is in a drawn out position, said support means comprising:

a connecting member connecting a lower end of each support post and supporting essentially the entire front end of said lift table; and

means for connecting a respective side of said lift table with a respective movable support post so that said movable support posts support both respective sides of said lift table.

5,470,189

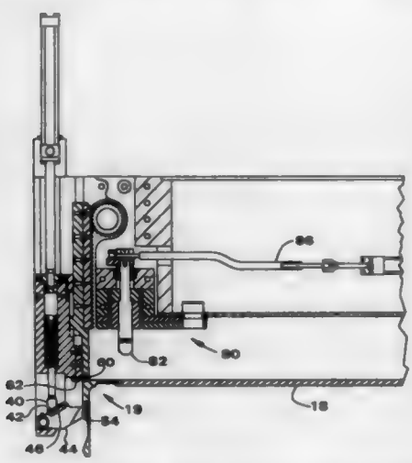
SIDE LATCH ASSEMBLY FOR LIFTING TRAILERS AND CONTAINERS

James A. Baumann, Orland Park; Joel G. Kuchcik, Crete, and John J. Lanigan, Sr., Orland Park, all of Ill., assignors to Mi-Jack Products, Inc., Hazel Crest, Ill.

Filed Apr. 19, 1994, Ser. No. 229,721

Int. Cl.[6] B66C *1/62*

U.S. Cl. 414—618 **9 Claims**



1. A side latch assembly for lifting a load carrying structure used for intermodal transportation comprising,

side fitting means for mounting at an upper side location on an external surface of said structure, said side fitting means including attachment receiving means thereon for at times engaging said side latch assembly,

horizontal beam means secured to a spreader apparatus for positioning over a top side of the load carrying structure in proximity to the location of said side fitting means mounted on the structure,

latch arm means secured to distal ends of said beam means for preselected vertical movement thereon,

adjusting means for positioning said latch arm means adjacent said side fitting means,

sensor means for contacting a top side of the side fitting means to position said latch arm means adjacent said side fitting means,

extension means for reciprocable movement within said latch arm means, and

adjustable gripping means secured to said extension means for at times engaging said attachment receiving means of the side fitting means in a vise-like interlocked connection therebetween,

whereby when said adjustable gripping means is connected with said attachment receiving means, said side latch assembly is operable to lift the structure.

5,470,190

LOADER VEHICLE

Joseph C. Bamford, Territet, Switzerland, and Frank Moeller, Milford, United Kingdom, assignors to Bamford Excavators, Limited, Staffordshire, United Kingdom

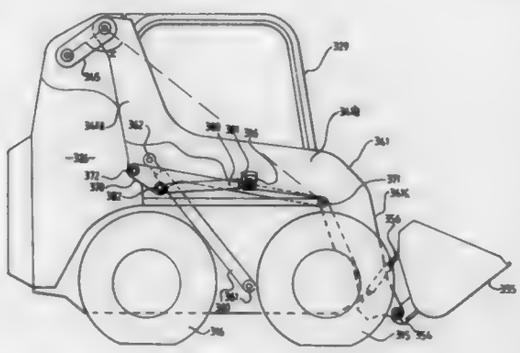
Continuation-in-part of Ser. No. 978,466, Nov. 19, 1992, Pat. No. 5,240,366, which is a continuation of Ser. No. 657,648, Feb. 19, 1991, abandoned. This application Jul. 14, 1993, Ser. No. 92,113

Claims priority, application United Kingdom, Feb. 21, 1990, 9003852; Feb. 21, 1990, 9003853; Feb. 21, 1990, 9003854; Feb. 21, 1990, 9003920; Jun. 8, 1993, 9311770

The portion of the term of this patent subsequent to Aug. 31, 2010, has been disclaimed.

Int. Cl.[6] E02F *3/34*

U.S. Cl. 414—686 **35 Claims**

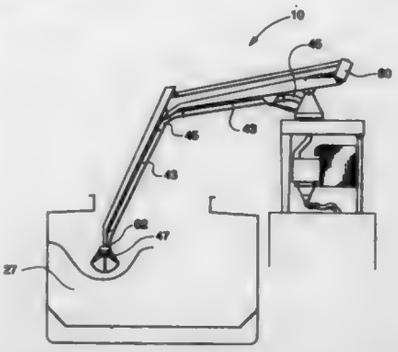


1. A loader vehicle comprising a body having a front end and a rear end and provided with ground engageable propulsion means, an operator's compartment and a boom assembly, said boom assembly, comprising a lift arm assembly and a pivot member which projects transversely from an inner end of the lift arm assembly on one side thereof and extends transversely across the body from said one side of the lift arm assembly and which is pivotally mounted on the body, adjacent the rear end thereof, for movement of the lift arm assembly between a raised position and a lowered position in which the lift arm assembly extends forwardly alongside the operator's compartment and means carrying a material handling implement at an outer end of the boom assembly so as to be disposed forward of the front end of the body, wherein the pivot member is pivotally mounted, for movement about a first axis, on a torsion member, which extends transversely across the body, by first pivotal mounting means disposed at positions which are spaced apart transversely of the torsion member and the torsion member is pivotally mounted on the body, for movement about a second axis which is parallel to the first axis and which extends transversely of the body, by second pivotal mounting means disposed at positions which are spaced apart transversely of the body.

5,470,191
MULTI PURPOSE UNLOADING ARM

Gerrit V. Aalst, Leiderdorp, Netherlands, assignor to Fuller Offshore Finance Corporation B.V., Koudekerk aan de Rijn, Netherlands

Filed Jul. 14, 1993, Ser. No. 91,506
Int. Cl.[6] B65G 67/60
U.S. Cl. 414—726 8 Claims



1. An articulated arm assembly for conveying a variety of material, either in a pneumatic or in a mechanical fashion, said arm assembly comprising:

a base structure and an arm structure, with the arm structure being comprised of, in combination, a frame and vacuum pneumatic tubing supported by said frame, said frame of said arm structure including a boom section pivotally connected to said base structure; a first jib section pivotally connected to said boom section; and a stinger section pivotally connected to said first jib section, wherein each of said frame and said pneumatic tubing has a first end located at the stinger section of the arm structure and a second end located near the base structure, wherein the stinger section is adaptable to interchangeably attach either (1) a suction nozzle which suction nozzle is attached to the first end of the pneumatic tubing in a manner enabling, when the arm is operating in a pneumatic mode, material to be conveyed through said nozzle toward the second end of said pneumatic tubing, or (2) a mechanical lifting device which is actuated to grasp and contain material to thereby enable material to be conveyed entirely mechanically by said arm assembly.

5,470,192
ARRANGEMENT FOR HANDLING CYLINDRICAL BODIES PROVIDED WITH CENTRAL HOLES

Mauri Parri, Vantaa, and Markku Heino, Espoo, both of, Finland, assignors to Nokia-Maillefer Holding S.A., Ecublens, Switzerland

Continuation of Ser. No. 971,230, Nov. 4, 1992, abandoned.
This application Jun. 9, 1994, Ser. No. 257,455
Claims priority, application Finland, Nov. 27, 1991, 915580
Int. Cl.[6] B65G 63/00
U.S. Cl. 414—741 4 Claims

1. Apparatus for handling a cable reel having central openings on opposite sides thereof, comprising:

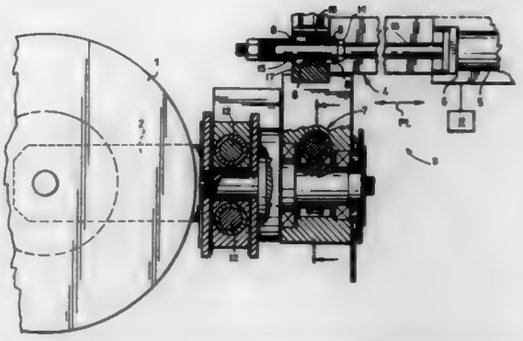
a support structure;

gripping arms carried by said support structure and having gripping pins configured for serf-centering with respect to the central openings upon engagement of the pins in the openings of the reel;

first means connected to said support structure for moving the gripping arms in horizontal and vertical directions;

second means carried by said first means for moving the gripping arms in a direction toward and away from the cable reel and including a linearly movable member and means for moving said linearly movable member in a linear direction;

third means carried by said linear movable member for movement with said linearly movable member and including a rotatable drive shaft mounting a drive gear, means for driving said drive gear and a rotatable second shaft having a driven gear in engagement with said drive gear and connected to said gripping arms for rotating said gripping arms in opposite rotary directions;



fourth means coupled to said second shaft for rotation therewith for moving the gripping arms toward each other such that said gripping pins are engageable in the central openings of the cable reel and for moving said gripping arms away from one another such that the gripping pins are disengaged from the central openings of the cable reel; and

an elastic structure carried by said support structure and cooperable between at least one of said support structure and said second means on the one had and said second means and said third means on the other hand to compensate for misalignment of said gripping pins and the central openings of the cable reel and enable self-centering accurate alignment thereof, said elastic structure including a mechanical spring, one of said linearly movable member and said rotatable drive shaft having an axis end a stop, said spring being disposed about one of said member and said drive shaft and engaged with said stop for enabling said one of said member and said drive shaft for resiliently yielding movement in an axial direction in response to deviations of relative positions of the cable reel and the gripping arms from positions with the gripping pins in accurate alignment with the central openings.

5,470,193
PALLET SUPPLY APPARATUS AND CONTROL METHOD THEREOF

Toshihiko Miura, and Yusaku Azuma, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 4, 1993, Ser. No. 71,003
Claims priority, application Japan, Jun. 8, 1992, 4-173909; Nov. 2, 1992, 4-294246; Mar. 26, 1993, 5-067206
Int. Cl.[6] B65G 1/18
U.S. Cl. 414—774 8 Claims

1. A pallet supply apparatus, comprising:

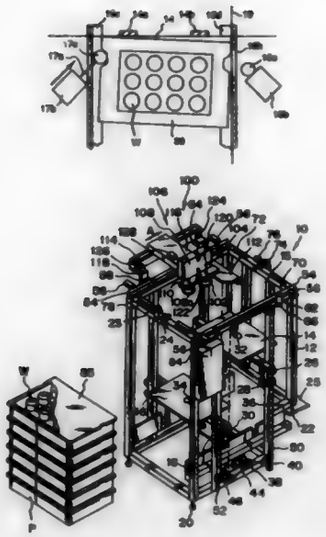
first pallet conveying means, including a first stage on which a stack of loaded pallets storing workpieces can be placed, for conveying the loaded pallets to an access position wherein an external robot apparatus can access an uppermost pallet in the stack;

second pallet conveying means, including a second stage on which a stack of empty pallets can be placed, for conveying the stack of empty pallets;

chucking means for chucking a cover of a pallet disposed at the uppermost position on either the first or second pallet conveying means;

moving means for moving said chucking means between a position above said first stage and a position above said second stage; and

locking means, arranged integrally with said chucking means and engaged with the pallet when said chucking means is moved to a lower end position, for moving the pallet from the position above said first stage to the position above said second stage upon operation of said moving means.



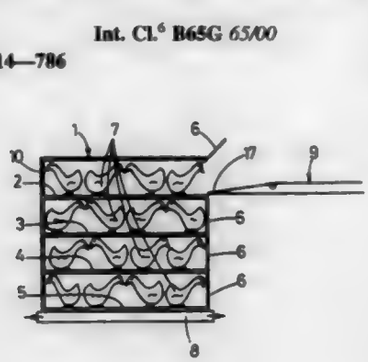
5,470,194

METHOD AND APPARATUS FOR UNLOADING A POULTRY TRANSPORT CONTAINER

Cornelis J. M. Zegers, Oostzaan, Netherlands, assignor to Machinefabriek Meyn B.V., Oostzaan, Netherlands

Continuation of Ser. No. 79,246, Jun. 17, 1993, abandoned.
This application Dec. 20, 1994, Ser. No. 359,437
Claims priority, application Netherlands, Jun. 23, 1992, 9201104

Int. Cl.[6] B65G 65/00
U.S. Cl. 414—786 8 Claims



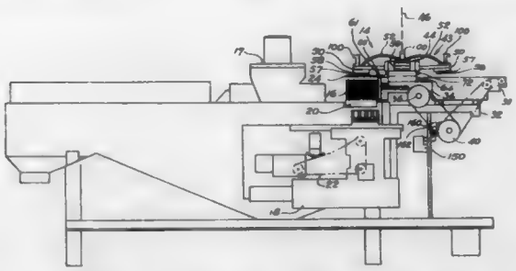
1. A method for unloading poultry from a poultry transport container, the poultry transport container including at least one loading tray with an openable unloading flap, said method comprising the steps of opening the unloading flap and moving an end of a discharge conveyor to just above the loading tray; gradually displacing at least one of said discharge conveyor and said loading tray in a longitudinal direction so that the end of said discharge conveyor moves within the loading tray and approaches a side of the loading tray opposite the unloading flap wherein poultry within the loading tray are gradually forced onto the discharge conveyor; and after the poultry has taken position on the discharge conveyor gradually displacing at least one of said discharge conveyor and said loading tray in a longitudinal direction so that the discharge conveyor is withdrawn from the loading tray, wherein the poultry on the discharge conveyor can be delivered to a first processing station by the discharge conveyor.

5,470,195

VACUUM TURRET

David L. Blank, Cedarburg; Roger O. Crill, Port Washington; Bruce A. Pusey, Milwaukee, and Kashyap H. Shah, Brookfield, all of Wis., assignors to Globe-Union, Inc., Milwaukee, Wis.

Filed Jan. 12, 1994, Ser. No. 180,847
Int. Cl.[6] B65G 59/04
U.S. Cl. 414—797 21 Claims



12. An apparatus for transferring battery electrode plates disposed in a stack, the apparatus being configured to move individual battery electrode plates between a first location and a second location, the apparatus comprising:

a turret assembly rotatably mounted about a central turret axis, the turret assembly including a center hub and a plurality of arms extending radially outward from the hub, each arm including a suction head having at least one contractible bellows configured for engagement with an uppermost electrode plate of the stack and for lifting of the uppermost electrode plate from the stack;

an indexing assembly connected to the turret assembly to rotate the turret assembly and sequentially move each arm from the first location to the second location; and

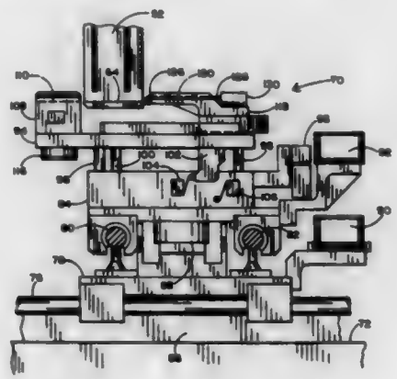
a pneumatic circuit configured for connection between a vacuum source and each contractible bellows to selectively provide a vacuum during a preselected portion of the rotation of each suction head from the first location to the second location, wherein the vacuum is sufficient to secure the individual plate to the suction head at the first location.

5,470,196

CARRIER HANDLING SYSTEM

Joon Park, Glendale, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 14, 1994, Ser. No. 323,297
Int. Cl.[6] B65G 59/06
U.S. Cl. 414—797.9 1 Claim



1. A carrier handling system comprising:

a substantially horizontal base;

a plurality of magazine tubes above said base for releasably retaining carriers which contain various electronic components;

a carriage movably mounted on said base for movement in a first direction, a linear motor connected between said base and said carriage for moving said carriage in said first direction;

a table mounted on said carriage for movement in a second direction, a linear motor connected between said carriage and said table for moving said table with respect to said carriage in said second direction;

a collector plate mounted on said table, a pusher finger movably mounted on said collector plate, wherein said finger has a chamfered upper surface so as to disengage more than one carrier from said pusher finger, for removing a carrier from a magazine tube and releasably retaining the removed carrier with respect to said collector plate so that said linear motors move said collector plate adjacent a selected magazine tube for removing a carrier therefrom and releasably retaining a carrier thereon, a saddle, said saddle having a movable stop pin for stopping a carrier in said saddle as the carrier is moved out of said selected magazine tube into said saddle,

wherein said collector plate is mounted on said table for motion in a third direction, said collector plate having a lowered position and a raised position along said third direction, means for removing and receiving a carrier being below said magazine tube when said collector plate is in its lowered position and being substantially in line with the carrier in the bottom of said selected magazine tube when said collector plate is in its raised position, and

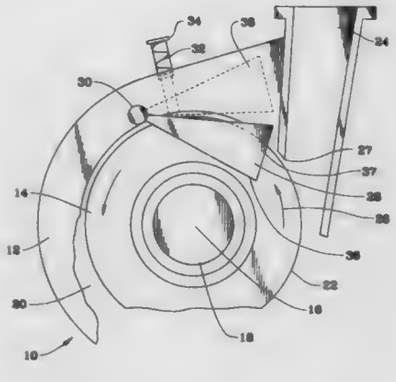
wherein said saddle is movable to an ejection position wherein a carrier is ejected from said saddle after removal of an electronic component from the carrier, said pusher finger having an ejector rod thereon and means to move said ejector rod so that when said stop pin on said saddle is retracted and said ejector rod is actuated, the carrier is discharged from said saddle.

5,470,197

TURBINE PUMP WITH BOUNDARY LAYER BLADE INSERTS

Robert S. Cafarelli, 467 Flag Branch Rd., Greeneville, Tenn. 37743

Filed Oct. 28, 1994, Ser. No. 331,017
Int. Cl.[6] F01D *1/36*
U.S. Cl. 415—90 **7 Claims**



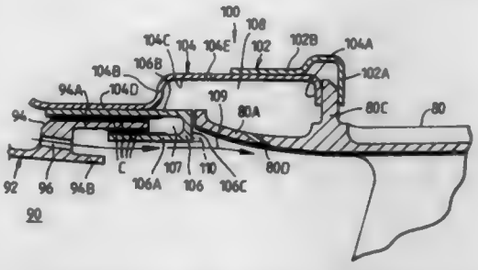
1. An improved turbine style pump having a casing with a centrally disposed inlet port and peripherally disposed outlet port having a plurality of spaced apart discs with a diameter between which a fluid may flow in natural spirals by reliance upon adhesive and viscous action of said discs when rotated by a motor means wherein the improvement comprises: a plurality of triangularly shaped blade inserts juxtapositioned between said spaced apart disc surfaces, said blade inserts including a frontal surface for directing fluid to said outlet port, and a compressible spring biasing said frontal surface of said blade inserts against fluid flow.

5,470,198

SEALING STRUCTURES FOR GAS TURBINE ENGINES

Ian W. R. Harrogate, Derby; David H. Taylor, Warwickshire; Arthur B. Griffin, Leicestershire, and David W. Tuson, Coventry, all of, England, assignors to Rolls-Royce plc, London, England

Division of Ser. No. 207,626, Mar. 9, 1994, Pat. No. 5,407,319. This application Aug. 31, 1994, Ser. No. 299,061
Claims priority, application United Kingdom, Mar. 11, 1993, 9305012
Int. Cl.[6] F01D *5/18*
U.S. Cl. 415—115 **14 Claims**



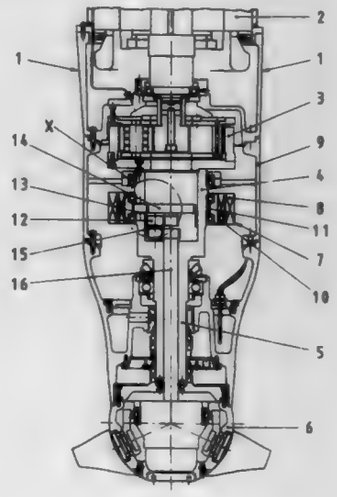
1. A seal assembly for sealing between a flow discharge nozzle means and an array of nozzle guide vane outer platforms located downstream of the nozzle means, the nozzle guide vane outer platforms having upstream portions extending towards the downstream end portion of the nozzle means, a downstream portion of the seal assembly comprising means for sealingly engaging a location member on the nozzle guide vane outer platforms and an upstream portion of the seal assembly comprising means for sealingly engaging the nozzle means and providing part of a boundary for a fluid air chamber means, the boundary of the chamber means having holes therein for metering a fluid flow into the chamber means to condition the upstream portions of the nozzle guide vane outer platforms.

5,470,199

ADJUSTMENT DEVICE FOR PROPELLER PUMPS

Horst Schäfer, Rhade, and Günter Schnaf, Bremen, both of, Germany, assignors to KSB Aktiengesellschaft, Frankenthal, Germany

Filed Feb. 23, 1994, Ser. No. 200,236
Claims priority, application Germany, Feb. 27, 1993, 43 06 141.9
Int. Cl.[6] F03B *3/06*
U.S. Cl. 415—129 **6 Claims**



1. An adjustment device for adjusting a pitch angle of at least one blade of a variable-pitch propeller of a turbo-engine comprising:

a shaft having a hollow range;

a gear transmission being disposed within said hollow flange;

a propeller being fastened on the shaft; and

an annular rotary member having a rotational axis is mounted on and is disposed radially outside of the hollow flange, the rotary member has an inner cylindrical surface facing the rotation axis that has a formation for transmitting torque, the formation is connected to said gear transmission so as to transmit force, and said rotary member being driven by a stator.

5,470,200

GUIDE VANES FOR AXIAL FANS

Vladimir Tupov, Moscow, Russian Federation; Patrick Nilsson, and Börje Nilsson, both of Växjö, Sweden, assignors to ABB Flakt Aktiebolag, Stockholm, Sweden

PCT No. PCT/SE92/00481, § 371 Date Mar. 17, 1994, § 102(e) Date Mar. 17, 1994, PCT Pub. No. WO93/01415, PCT Pub. Date Jan. 21, 1993

PCT Filed Jun. 26, 1992, Ser. No. 175,356

Claims priority, application Sweden, Jul. 9, 1991, 9102150

Int. Cl.[6] F01D *1/02*

U.S. Cl. 415—195 **11 Claims**

1. Guide vane arrangement of axial fans, the arrangement translating the rotational component of the gas flow velocity after passage through the impeller (1) into a substantially axial velocity, which comprises:

a ring (2) of guide vanes arranged downstream of the impeller and in spaced relationship therewith, wherein alternate guide vanes with an edge facing the impeller are axially displaced relative to remaining guide vanes and wherein alternate guide vanes are located a first axial distance from the fan and the remaining guide vanes are located at a second axial distance from the fan, and the guide vanes are non-uniformly distributed along a circumference of the ring.

5,470,201

MOLTEN METAL PUMP WITH VANED IMPELLER

Ronald E. Gilbert, Chardon; George S. Mordue, Ravenna, and Chris T. Vild, Cleveland Heights, all of Ohio, assignors to Metaullics Systems Co., L.P., Solon, Ohio

Continuation-in-part of Ser. No. 898,043, Jun. 12, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 312,327

Int. Cl.[6] F04D *7/06*

U.S. Cl. 415—200 **14 Claims**

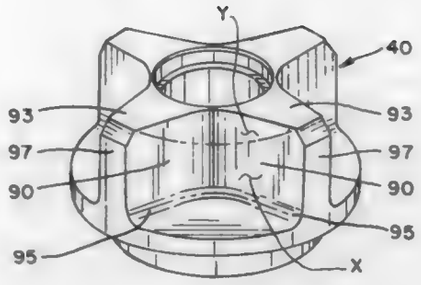
1. A molten metal pump comprising:

(a) a shaft having first and second ends;

(b) a means for rotating said shaft in communication with said first end of said shaft;

(c) an impeller in communication with said second end of said shaft;

(d) a volute housing said impeller, wherein said volute has a first opening through which molten metal can be drawn and a second opening through which molten metal can be discharged; and



(e) said impeller comprising an imperforate substantially circular base having a surface facing toward a first end of the shaft, and at least two imperforate vanes connected to and extending substantially perpendicular from said surface and extending radially from said shaft or a hub securing said shaft toward a peripheral portion of said base, said vanes being spaced circumferentially apart;

each vane defining a first edge, a second edge and a third edge;

said first edge being disposed on said base;

said second edge defining an inlet end;

said third edge being a radially outer edge;

said second edge of adjacent vanes defining an inlet area over their entire radial dimension and being generally planar;

said third edges of adjacent vanes defining an outlet area; and

said outlet area being greater than said inlet area.

5,470,202

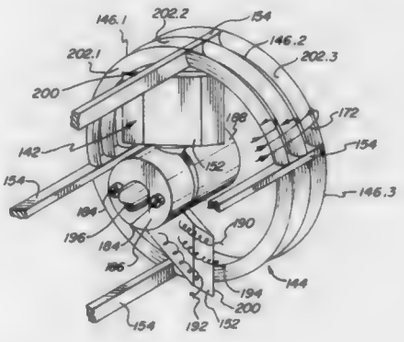
PROPULSIVE THRUST RING SYSTEM

Harold E. Lemont, 117 W. Church St., Seymour, Conn. 06483

Division of Ser. No. 711,622, Jun. 5, 1991, Pat. No. 5,292,088, which is a continuation-in-part of Ser. No. 419,137, Oct. 10, 1989, abandoned. This application Nov. 8, 1993, Ser. No. 148,992

Int. Cl.[6] F04D *19/02*

U.S. Cl. 415—211.1 **19 Claims**



1. A fan for moving air comprising:

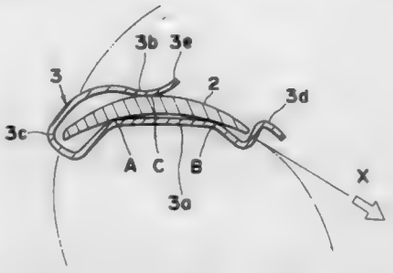
a motor, a propeller coupled to the motor to be driven by the motor into rotation about an axis, said propeller having a plurality of blades having an axial span along the axis;

a ringcage structure mounted around the propeller, said ringcage structure including a plurality of axially-spaced rings with an annular aperture between said rings, at least one of said rings being within the axial span of the propeller blades and another of said rings being located downstream of said one ring; said rings being so axially spaced from each other and being so selected to provide an air flow augmentation through said aperture from a conversion of propeller generated tip vortices so as to augment the air flow from the propeller.

5,470,203
BLOWER BLADE ASSEMBLY HAVING COUNTERBALANCERS

Masukazu Mori; Hiroyoshi Yamanaka; Norio Kubota, and Naoki Shimokawa, all of Shiga, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 31, 1994, Ser. No. 220,873
Claims priority, application Japan, Apr. 2, 1993, 5-076657
Int. Cl.[6] F04D 29/66
U.S. Cl. 416—144 6 Claims



1. A blower blade assembly which comprises:

a plurality of fan blades arranged in a circular row, each of said fan blades having first and second major surfaces opposite to each other; and

a respective one-piece counterbalancer mounted firmly on at least one of the fan blades, said one-piece counterbalancer contacting said major surfaces of said one of the fan blades only along three lines of contact,

said counterbalancer including a first arm contacting the first surface of the fan blade along only two of said lines of contact, a second arm contacting the second surface of the fan blade along only a third one of said lines contact, the third line of contact being located intermediate said two lines of contact with respect to a direction extending along said one of the fan blades between leading and trailing edges thereof, and an elastic connecting bridge connecting the first and second arms together, said elastic connecting bridge urging said first and said second arms toward one another in opposite directions, respectively, such that said one of the fan blades is clamped by said first and said second arms by forces exerted thereon by said counterbalancer only at three locations corresponding to said three lines of contact.

5,470,204
HYDRAULIC ADJUSTMENT DEVICE

Horst Schäfer, Rhade; Günter Schaaf, Bremen; Bernhard Scholz, Bremen, and Günter Beiss, Bremen, all of, Germany, assignors to KSB Aktiengesellschaft, Frankenthal, Germany

Filed Feb. 23, 1994, Ser. No. 200,238
Claims priority, application Germany, Feb. 27, 1993, 43 06 133.8
Int. Cl.[6] F04D 29/06
U.S. Cl. 416—157 R 11 Claims

1. An hydraulic actuation system for controlling the pitch angle of blades of a variable-pitch fluid propeller comprising:

a rotatable shaft:

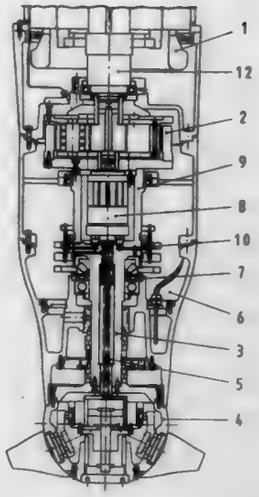
at least one variable-pitch blade being pivotally attached to said rotatable shaft, said at least one blade having a pitch angle and being pivotally rotated by an actuator;

at least one fluid passageway being located axially within said rotatable shaft for transmitting hydraulic fluid;

means for activating said actuator in response to hydraulic fluid pressure, said activating means being in fluid communication with said fluid passageway;

a sealed chamber disposed about said shaft, said sealed chamber being in fluid communication with said at least one fluid passageway;

an hydraulic pump being located within said sealed chamber; and

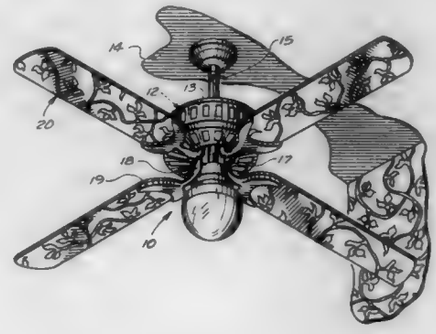


means for driving said hydraulic pump so that said hydraulic pump selectively forces hydraulic fluid through said at least one fluid passageway between said chamber and said activating means to control the pitch angle of said at least one blade.

5,470,205
DECORATIVE FAN BLADE

Dennis R. Conklin, Jr., 2005 E. University Dr., Phoenix, Ariz. 85034

Filed May 4, 1994, Ser. No. 238,218
Int. Cl.[6] F04D 29/38
U.S. Cl. 416—205 9 Claims



1. A decoratable fan blade removably mountable on a ceiling fan, said fan blade comprising:

a form having a base, a tip, and a major surface;

an adhesive layer on said major surface; and

a protective sheet removably covering said adhesive layer.

7. A fan blade removably mountable on substantially any ceiling fan, said fan blade comprising:

a form having a tip, a base, a first major surface and a second opposed major surface;

a plurality of openings formed through said form proximate said base; and

said plurality of openings positioned in three groupings, each

opening of said plurality of openings in each grouping cooperating with corresponding openings in each of said other groupings to define a plurality of opening configurations.

5,470,206

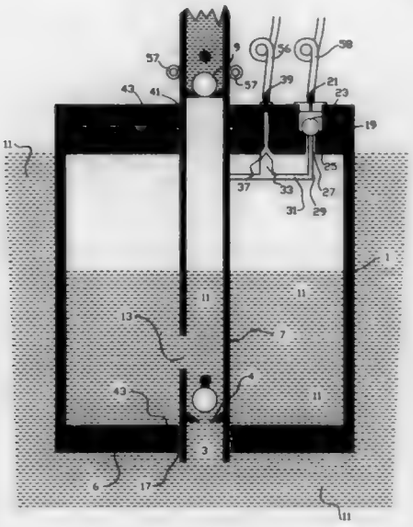
PNEUMATICALLY POWERED SUBMERSIBLE FLUIDS PUMP WITH CASING ACTIVATOR

Michael K. Breslin, 149 Shelley Dr., Mill Valley, Calif. 94941

Filed Oct. 19, 1994, Ser. No. 325,856

Int. Cl.[6] F04F *1/06*

U.S. Cl. 417—131 **28 Claims**



1. An apparatus for pumping fluids utilizing a compressed gas power source comprising:

an enclosed buoyant casing having (1) a top, a bottom, and at least one side for defining an interior volume for pumping fluids, (2) a positive buoyancy with respect to the fluids to be pumped when the interior volume is at least partially empty of fluids to be pumped, and (3) a negative buoyancy with respect to fluids to be pumped when the interior volume is at least partially flooded with fluids to be pumped;

means for mounting said enclosed buoyant casing for sliding sealed movement with respect to a discharge pipe between an upper position and a lower position;

an outlet to said discharge pipe located inside and below the top of said enclosed buoyant casing;

means for allowing fluid out said discharge pipe but not back in;

an inlet to said enclosed buoyant casing having means for allowing fluid into said enclosed buoyant casing but not out;

an air exhaust valve communicating proximate to an upper portion of said enclosed buoyant casing, said valve having an open position and a closed position;

a compressed air inlet valve communicating to said enclosed buoyant casing, said valve having a closed position and an open position; and

means for actuating said air exhaust valve and said compressed air inlet valve for opening said air exhaust valve and for closing said air inlet valve when said enclosed buoyant casing is in said upper position and for closing said air exhaust valve and opening said compressed air inlet valve when said enclosed buoyant casing is in said lower position.

5,470,207

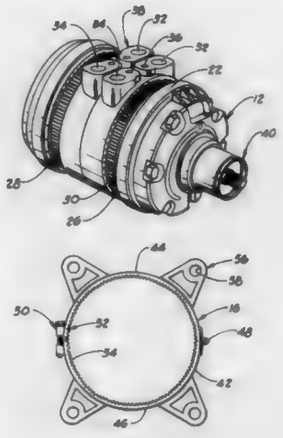
APPARATUS AND METHOD FOR PROVIDING UNIVERSAL AUTOMATIVE AIR CONDITIONING COMPRESSOR

Roy L. Shockey, Roanoke, and William W. McCulley, Keller, both of Tex., assignors to L & S Bearing Co., Oklahoma City, Okla.

Continuation of Ser. No. 97,211, Jul. 26, 1993, abandoned. This application Jun. 10, 1994, Ser. No. 258,897

Int. Cl.[6] F04B *39/12*

U.S. Cl. 417—313 **41 Claims**



1. A compressor apparatus for an automotive air conditioning system which comprises brackets in an engine compartment for supporting a compressor, the compressor apparatus comprising:

a casing containing a compressor compatible with the air conditioning system, wherein the casing has a first circumferential groove thereon;

a mounting assembly comprising a plurality of connecting members supported on at least a first collar, wherein the first collar is receivable in the first groove on the casing, and wherein the connecting members are adapted to connect the compressor apparatus to the brackets in the engine compartment of the automobile.

5,470,208

FLUID PUMP WITH MAGNETICALLY LEVITATED IMPELLER

Harold D. Kletschka, 1925 Noble Dr., Minneapolis, Minn. 55422

Continuation-in-part of Ser. No. 774,034, Oct. 7, 1991, Pat. No. 5,195,877, which is a continuation-in-part of Ser. No. 593,695, Oct. 5, 1990, Pat. No. 5,055,005. This application Dec. 16, 1992, Ser. No. 990,985

Int. Cl.[6] F04B *17/03;* **A61M** *1/10*

U.S. Cl. 417—356 **37 Claims**

1. A fluid pump comprising:

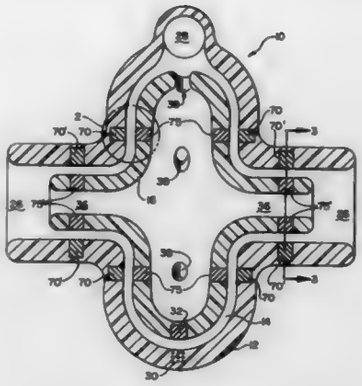
a housing defining a pumping chamber, a pumping chamber inlet port and a pumping chamber outlet port;

a rotatable impeller disposed in said pumping chamber for rotation about an axis;

a polarized electromagnetic means associated with said impeller and said housing for rotating said impeller about said axis;

a plurality of diamagnets fixed with respect to said impeller; and

a plurality of magnet means fixed with respect to said housing, disposed in magnetic communication with said plurality of diamagnets, and oriented generally axially and radially with said plurality of diamagnets to thereby stabilize said impeller in both the axial and radial directions by magnetic forces levitating said impeller.

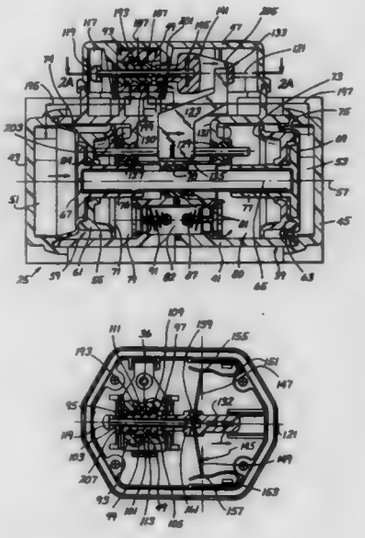


5,470,209

OFFSET RECIPROCABLE DEVICE

E. Dale Hartley, Malibu, and F. Scott Hartley, Camarillo, both of Calif., assignors to Shurflo Pump Manufacturing Co., Santa Ana, Calif.

Filed Oct. 13, 1993, Ser. No. 135,735
Int. Cl.[6] F04B *35/02*
U.S. Cl. 417—401 15 Claims



1. A reciprocable device, comprising:

a housing having a chamber therein;

a reciprocable member in the chamber and having first and second faces exposable to a driving fluid under pressure to reciprocate the reciprocable member in the chamber;

a valving system for controlling the supply and exhaust of the driving fluid under pressure to and from the first and second faces whereby the reciprocable member can be reciprocated in said chamber, said valving system being radially offset from said reciprocable member;

a mechanism for drivingly coupling the reciprocable member and the valving system so that the reciprocable member can actuate the valving system to switch between first and second states, said mechanism including an arm member drivingly coupled to said reciprocable member and to said valving system, said arm member being arranged generally radially between said reciprocable member and said valving system and being generally dog-leg shaped so that said reciprocable device may be more compactly packaged; and

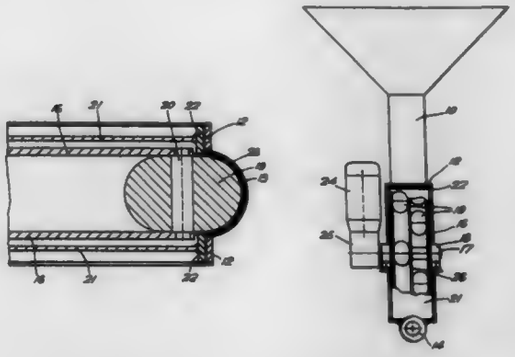
said first and second faces being outside faces, the reciprocable member including first and second inside faces and including an inside pickup mechanism driven by said inside faces for operating said valving system.

5,470,210

PRODUCT FILLING ASSEMBLY

Hans K. Larsen, Aestorp, Sweden, assignor to Nestec S.A., Vevey, Switzerland

Filed Dec. 15, 1993, Ser. No. 167,239
Claims priority, application European Pat. Off., Jan. 9, 1993, 93100237
Int. Cl.[6] F04B *43/08*
U.S. Cl. 417—477.7 9 Claims



1. A product filling assembly comprising:

a rotary member comprising:

at least two discs mounted on a first shaft for rotating the discs so that the first shaft extends through a central portion of each disc and so that the discs are spaced apart on the shaft;

a plurality of additional shafts which extend between and are mounted to the discs and a roller positioned on each additional shaft so that the rollers are freely rotatable on the additional shafts, wherein the additional shafts and the rollers are positioned and configured so that a circumferential portion of each roller extends beyond a circumference of the discs;

drive means for rotating the discs and for revolving the additional shafts and rollers;

a wall member positioned adjacent the rotary member having an interior wall surface which extends from a peripheral flanged wall edge and which is positioned and configured so that a channel is provided between the interior wall surface and the rotary member at a position between the discs for passage of the rollers and so that the flanged wall edge extends, with respect to a circumference of the rotary member, as an arc for a distance at least as great as a distance between two of the additional shafts which are positioned adjacent one to the other;

an elastic membrane which extends from the flanged wall edge across the channel to separate the rotary member from the channel;

two plates positioned to extend from the first shaft parallel one to the other and parallel to the discs and so that the two discs are positioned between the plates; and

wherein the discs, additional shafts, rollers, wall member and plates are configured and positioned so that the plates and wall member flanged edge secure the membrane, so that the rollers are positioned adjacent the membrane and so that upon rotation of the discs and revolution of the rollers, an adjacent pair of rollers stretch the membrane into contact with the interior wall to cause occlusions to form in the channel successively.

5,470,211
ROLLER PUMP

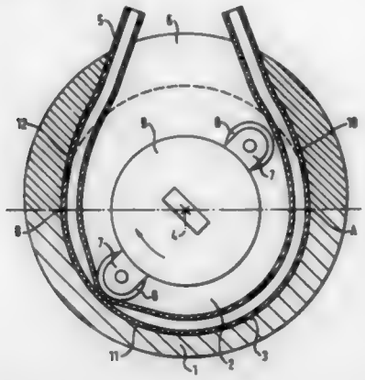
Erwin Knott, Poing, and Andreas Hahn, Sauerlach, both of, Germany, assignors to Stöckert Instrumente GmbH, Munich, Germany

Filed Aug. 11, 1994, Ser. No. 289,909

Claims priority, application Germany, Aug. 12, 1993, 43 27 152.9

Int. Cl.[6] F04B *43/08*

U.S. Cl. 417—477.9 **6 Claims**



1. Roller pump for medical technology, in particular for pumping blood in extracorporeal circulations, the roller pump having a stator with a cylindrical hollow space, the stator including a wall which is formed as a support wall for a pump tube laid along said wall about the central longitudinal axis of the hollow space, rollers rotatably supported on roller supports, the rollers being rollable in a circular path of motion along the tube and pressing said tube together upon rotation of the rotor, the support wall of the pump rotor having an opening defining an inlet region and an outlet region for the tube and in which regions said support wall deviates from the circular path of motion of the pump rollers at a differing curvature along the direction of said circular path of motion, wherein the support wall (**3**) in the inlet region (**10**) has a continuously increasing radius of curvature in the direction of motion of the pump rollers (**8**) and in the outlet region (**12**) has a continuously decreasing radius of curvature in the direction of motion of the rollers, said radii of curvature (C, D, E) being larger than the radius of curvature in the area of the opening between the inlet and outlet regions.

5,470,212
HUMIDITY CONTROL SYSTEM INCLUDING A PERISTALTIC PUMP AND INCUBATORS CONTAINING THE SAME

Francis H. Pearce, Stoneleigh, Hill Road, Sandford, Avon BS19 5RH, United Kingdom

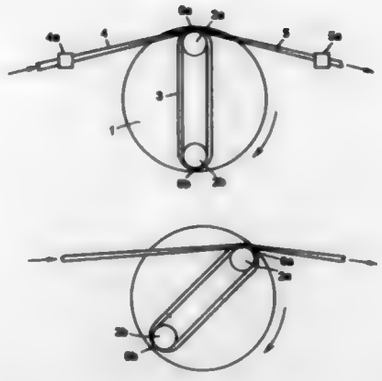
Filed May 5, 1994, Ser. No. 238,717

Claims priority, application United Kingdom, May 7, 1993, 9309427

Int. Cl.[6] F04B *43/08*

U.S. Cl. 417—477.13 **15 Claims**

1. A humidity control system for measuring and controlling the humidity of a controlled environment comprising a pump capable of supplying water when desired to the controlled environment and sensors capable of measuring the humidity in the controlled environment, the pump being a peristaltic pump which comprises a flexible tube for the passage of a fluid having an inlet and an outlet and a roller assembly comprising a number of rollers and a rotatable support, the rollers being mounted on and extending substantially perpendicularly outwardly from the rotatable support and the tube being stretched over the roller assembly so that it extends substantially perpendicularly to the rollers and through substantially 360° around the roller assembly and where the tube contacts a roller it is compressed against that roller, the arrangement being such that in use where the tube is compressed against a roller it is occluded and rotation of the roller assembly causes each roller to contact and thereby occlude successive parts of the tube forcing fluid contained in the tube and trapped between the occlusions to be moved along the tube from the inlet towards the outlet.



5,470,213
SCROLL TYPE COMPRESSOR HAVING A RING FOR COMPRESSIVE FORCE TRANSMISSION AND ORBIT DETERMINATION

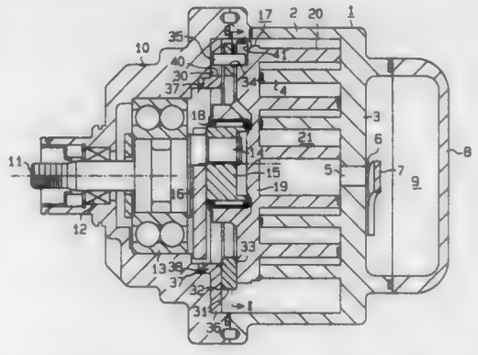
Masao Iguchi; Tetsuhiko Fukanuma; Tetsuya Yamaguchi, and Tetsuo Yoshida, both of Kariya, all of, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation-in-part of Ser. No. 128,827, Sep. 29, 1993. This application Apr. 13, 1994, Ser. No. 227,061

Claims priority, application Japan, Apr. 13, 1993, 5-018759 U

Int. Cl.[6] F04C *18/04*

U.S. Cl. 418—55.2 **10 Claims**



1. A scroll type compressor having a movable scroll eccentrically orbitable about a drive shaft in a housing for defining a compression chamber in cooperation with a fixed scroll disposed opposite the movable scroll, said compression chamber decreasing in size in accordance with the orbital movement of said movable scroll for compressing gas in the compression chamber, said housing and said movable scroll being made of aluminum, and said compressor further comprising:

a first ring orbitable with the movable scroll between the movable scroll and the housing for receiving compressive reaction force acting on the movable scroll parallel to the axis of the drive shaft;

a second ring engaged with the housing for receiving the compressive reaction force received by and acting on said first ring, said second ring being made of an iron-base metal;

a plurality of projections and corresponding recesses provided, respectively, on said second ring and said housing with said

projections inserted in the corresponding recesses to prevent said second ring from rotating relative to said housing;

force transmitting means on said first ring for transmitting said compressive reaction force from the movable scroll to the second ring; and

movement determining means disposed on said first ring for determining the orbit of the movable scroll, said movement determining means being separate from said force transmitting means.

5,470,214

LUBRICATING DEVICE FOR HORIZONTAL TYPE HERMETIC COMPRESSOR

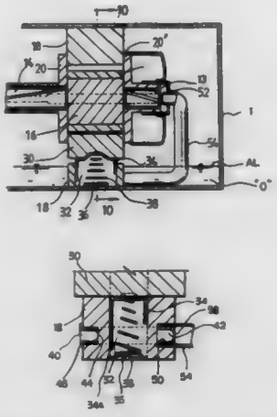
Chang J. Shin, Seoul, and Jong D. Moon, Kyungki-Do, both of, Rep. of Korea, assignors to Goldstar Co., Ltd., Rep. of Korea

Filed Dec. 14, 1993, Ser. No. 167,322

Claims priority, application Rep. of Korea, Dec. 17, 1992, 24713/1992; Dec. 31, 1992, 27116/1992

Int. Cl.[6] F04C *18/356;29/02*

U.S. Cl. 418—63 **3 Claims**



1. A lubricating device for a horizontal type hermetic compressor, said compressor being encased by a horizontal outer casing which is charged with lubrication oil in its lower section and includes a compression cylinder and a rotating shaft having an axial oil conduit therein and provided with an eccentric rotor positioned between a sub bearing and a main bearing, comprising:

a vane movably received in said compression cylinder in order to elastically vertically reciprocate in accordance with rotation of said eccentric rotor;

a vane slot provided in a lower section of said compression cylinder and movably receiving said vane;

a pumping chamber provided under said vane in said compression cylinder;

an oil inlet port provided in said compression cylinder at a position spaced apart from said vane slot by a predetermined distance, said inlet port having an inlet diode nozzle directed toward said pumping chamber;

an oil outlet port having an outlet diode nozzle directed towards the outside of said pumping chamber;

a spring cap including an extension part having a section corresponding to said oil inlet port for closing off the inlet port while said outlet port is opened for pumping, said extension part being longer than another section of said spring cap corresponding to said oil outlet port and movably provided in an upper section of said pumping chamber such that it vertically reciprocates in accordance with the reciprocation of said vane, thus to change an inner volume of said pumping chamber;

biasing means interposed between said spring cap for biasing said spring cap upwards; and

an oil feed pipe connected between said outlet diode nozzle of the oil outlet port and a lubricating adapter coupled to an end of said rotating shaft.

5,470,215

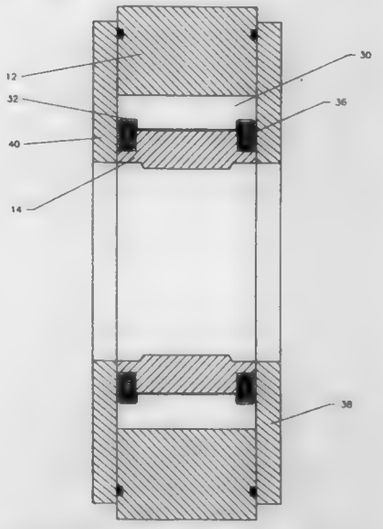
WEAR RESISTANT VANE-TYPE FLUID POWER CONVERTER

Stephen R. Stone, San Antonio, Tex., assignor to Rineer Hydraulics, Inc., San Antonio, Tex.

Filed Aug. 26, 1994, Ser. No. 296,626

Int. Cl.[6] F01C *1/344*

U.S. Cl. 418—266 **4 Claims**



1. A fluid power converter comprising:

a rotor rotatably displaced between first and second plates, the rotor having first and second ends in slidable contact with the first and second plates;

the rotor defining rotor vane slots, the rotor vane slots further defining spring pockets on the first and second ends of the rotor, each spring pocket having a bottom;

springs displaced within the spring pockets, the springs having first and second ends, the first ends of the springs in contact with the bottoms of the spring pockets;

buttons in communication with the second ends of the springs;

rotor vanes having outer edges defining notches exhibiting outer lips; the notches abutting on upper surface of each button; and

a stator, the stator defining an annular space between the stator and rotor.

5,470,216

FILM MANUFACTURING APPARATUS WITH BUBBLE CONTROLLING SENSOR

Masao Saito, Togane, and Hideo Yamanaka, Chiba, both of, Japan, assignors to Nippon Petrochmicals Company, Limited, Tokyo, Japan

Filed Apr. 5, 1994, Ser. No. 223,027

Claims priority, application Japan, Apr. 5, 1993, 5-078079

Int. Cl.[6] B29C *47/92*

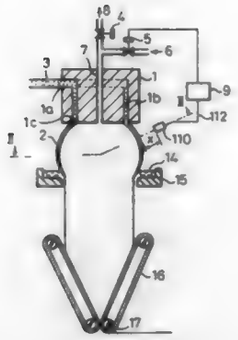
U.S. Cl. 425—72.1 **17 Claims**

1. A film manufacturing apparatus comprising:

a circular die having an axis, an inlet for a molten plastic, a lip-shaped circular outlet around the axis for extruding a molten plastic in an annular molten plastic form, and blowing means for blowing air into the annular molten plastic extruded from the lip-shaped circular outlet;

cooling means for cooling the annular molten plastic to form a tubular plastic film;

an ultrasonic sensor for detecting a distance between the surface of the annular molten plastic and the ultrasonic sensor by transmitting an ultrasonic wave toward the annular molten plastic at a place located between the die and the cooling means and receiving an ultrasonic wave reflected from the annular molten plastic; and



control means for controlling the blowing means in response to an output from the ultrasonic sensor.

5,470,217

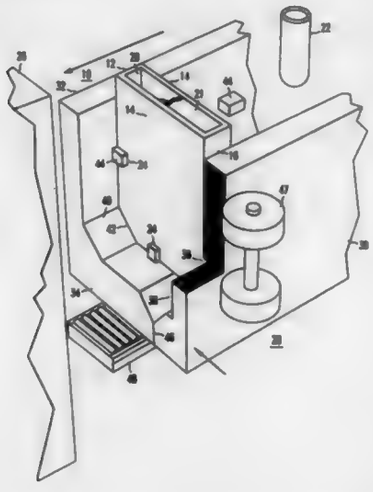
APPARATUS FOR FIXTURING MODULES

Peter F. Lilienthal, II, Princeton, N.J.; Ivan Pawlenko, Holland, Pa., and Ching-Ping Wong, Lawrenceville, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Division of Ser. No. 135,645, Oct. 14, 1993, Pat. No. 5,405,566. This application Oct. 31, 1994, Ser. No. 332,310

Int. Cl.[6] B29C *39/10*

U.S. Cl. 425—110 **6 Claims**



1. Apparatus for fixturing and sealing a module comprising a multi-sided body having an open end and at least one window through the body spaced from the open end comprising:

a channel configured of a pair of parallel, spaced-apart, longitudinally-running, generally elastic walls connected to each other by a bottom member such that at least one wall is effectively hinged to the bottom member for movement to and from the other wall, the walls having opposed faces, each with a topology conforming with the topology of a separate one of a pair of sides of the module body, to enable the module to be received between the walls of the channel; and

at least one protrusion extending out from a separate one of the walls and bottom for receipt in the window of the module to seal the window.

5,470,218

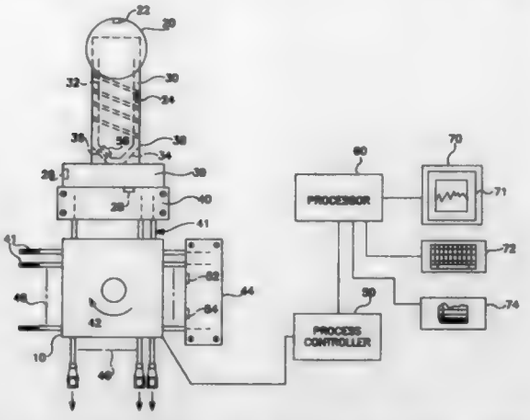
GRAPHICAL INTERFACE DRIVEN INJECTION BLOW MOLDING APPARATUS

Michael J. Hillman, Ocean City; Bruce E. Jacoby, Vineland, and Rui M. Barbosa, Millville, all of N.J., assignors to Wheaton Inc., Millville, N.J.

Filed Jul. 7, 1993, Ser. No. 88,427

Int. Cl.[6] B29C *45/77;45/78*

U.S. Cl. 425—144 **25 Claims**



1. In an injection blow molding apparatus including a plurality of injection blow molding machines, each machine having a plurality of work stations and a plurality of molds, said molds including injection molds and blow molds, wherein work pieces in each machine are first injection molded, then blown and removed at successive work stations, the improvement comprising:

a plurality of process controllers and a plurality of processors for operating said plurality of machines, each of said process controllers coupled to a respective machine and to a respective processor and operating in accordance with a respective set of processing parameters, each processing parameter in each respective set having a respective desired operating range;

a plurality of monitors, each of said monitors coupled to a respective processor, each of said monitors displaying a plurality of command buttons and icons and having a respective touch screen, each touch screen transmitting signals to said respective processor for adjusting said processing parameters;

a master processor coupled to each of said plurality of processors, said master processor having a monitor, wherein each respective processor transmits a respective set of signals to said master processor representing a respective set of processing parameters being used by the respective one of said process controllers which is coupled to said respective processor, and wherein said master processor includes:

main menu means for causing said master processor to display a plurality of command buttons, each button representing a respective machine, for selecting one of said machines for which a respective one of said sets of processing parameters is to be displayed by said master processor,

display means for displaying a plurality of icons, each icon representing a respectively different processing parameter from said selected machine, and for displaying, adjacent to each of said icons, the value of each respective processing parameter, and

alarm means for displaying an alarm message identifying whether any one of said processing parameters in said selected machine is operating outside its desired operating range,

wherein said master processor and each one of said plurality of processors are coupled to a network, and each one of said plurality of processors includes:

means for detecting an error condition which prevents said one processor from transmitting data to said master processor;

means for automatically disconnecting said one processor from said network in response to said error condition; and

means for automatically establishing a new connection between said processor and said network, whereby said error condition is corrected.

5,470,219

RUNNERLESS INJECTION MOLDING OF SYNTHETIC RESIN WITH A VALVE GATE

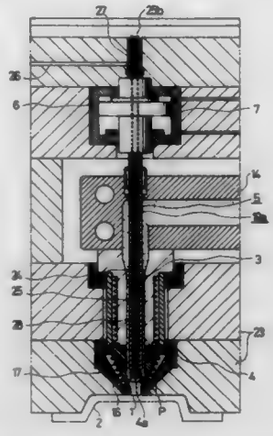
Kin-ichi Yokoyama, and Izumi Kato, both of Yonezawa, Japan, assignors to Seiki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 72,880, Jun. 3, 1993. This application Jul. 6, 1994, Ser. No. 271,271

Claims priority, application Japan, Jun. 15, 1992, 4-155163

Int. Cl.[6] B29C *45/78;45/72;45/23*

U.S. Cl. 425—144 **1 Claim**



1. A runnerless injection molding apparatus including a valve gate control system, said apparatus comprising:

a runner including a temperature maintaining means located on the outer periphery of said apparatus, said runner storing a molten synthetic resin and providing an injection passage therefor, said runner terminating in a cavity;

a gate in communication with said cavity;

a valve pin longitudinally disposed within said runner for opening and closing said gate;

a first forcible cooling means, whereby a cooling medium is supplied around the periphery of said gate for cooling intermittently said gate;

a second forcible cooling means, whereby a cooling medium is circulated within said valve pin for cooling intermittently the tip of said valve pin; and

an intermittent temperature control assembly for cooling and heating locally said gate, characterized in that a tip heater is provided around said gate and around the periphery of said cavity.

5,470,220

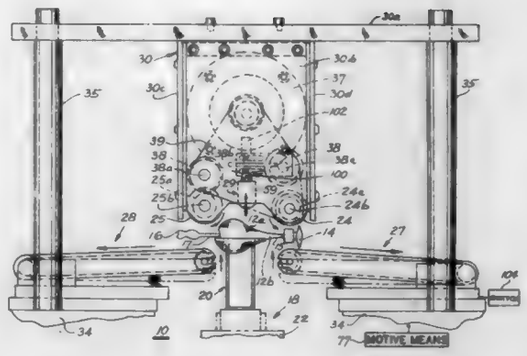
FLEXIBLE PART DEFLASHER

Michael M. Potes, Adrian; Edwin H. Lambarth, Onsted; Troy A. Frasher, Munith; Beth E. Edelstein, Ann Arbor; Lowell D. Kelley, Tecumseh, all of Mich., and Cynthia J. Lewis, Toledo, Ohio, assignors to Hoover Universal, Inc., Plymouth, Mich.

Filed Jun. 17, 1993, Ser. No. 79,434

Int. Cl.[6] B24B *9/00*

U.S. Cl. 425—216 **8 Claims**



1. Apparatus for removing flash from a molded article or part comprising:

pinch roller means including first and second pinch rollers each having a knurled outer gripping surface; said pinch rollers being located at opposing first and second ends of said part,

drive means for rotating said first and second pinch rollers in opposite directions;

part support means for supporting said part adjacent to said pinch rollers;

part holding means adapted to be moved into engagement with said part and cooperating with said part support means to hold said part firmly fixed in said part support means;

first conveyor means adapted to move a first portion of the flash at said first end of said part into engagement with said outer surface of said first pinch roller and second conveyor means adapted to move a second portion of the flash at said second end of said part into engagement with said outer surface of said second pinch roller;

motive means for moving said first and second conveyor means into engagement with said first and second portions of the flash at said first and second opposing ends of said part for pressing said first and second portions of the flash against said outer gripping surfaces of said first and second rotating pinch rollers while said part is held fixed in said part support means by said part holding means, to thereby prevent said part from moving relative to said pinch rollers when the flash is pressed against said pinch roller,

said first and second pinch rollers cooperating with said first and second conveyor means, respectively, to pull the flash from said part, and said first and second conveyor means being adapted to convey the flash removed from said part away from said part;

and said first and second pinch rollers being located above said part support means and said first and second conveyor means being located below said part support means.

5,470,221

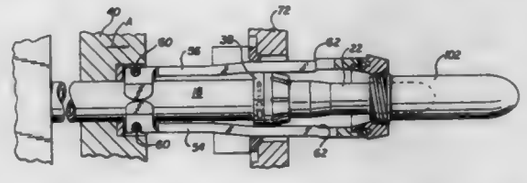
COMPACT CORE AND EJECTOR ASSEMBLY

William R. Gaiser, Spring Valley, Ohio, assignor to Broadway Companies, Inc., Dayton, Ohio

Filed Mar. 23, 1994, Ser. No. 217,200

Int. Cl.[6] B29C *45/44*

U.S. Cl. 425—556 **15 Claims**



1. A compact core and ejector assembly for use with an injection molding apparatus comprising:

elongate core means for a mold, said core means terminating in a male mold component and including a shoulder supporting a top plate of an associated support frame and;

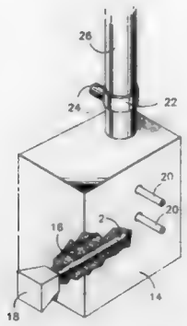
jaw means forming portion of a female mold component for gripping a preform molded on said core means.

5,470,222

HEATING UNIT WITH A HIGH EMISSIVITY, POROUS CERAMIC FLAME HOLDER

John E. Holowczak, South Windsor, and Martin F. Zabielski, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 21, 1993, Ser. No. 79,760
Int. Cl.[6] F23D *14/12*
U.S. Cl. 431—7 **18 Claims**



9. A method for burning a fuel, comprising the steps of:

(a) directing a fuel/air mixture through a flame holder having a plurality of randomly distributed pores, wherein the flame holder comprises at least about 50 wt % ceramic particles that have an emissivity of at least about 0.7,

(b) burning the fuel/air mixture to form a flame in proximity to the flame holder,

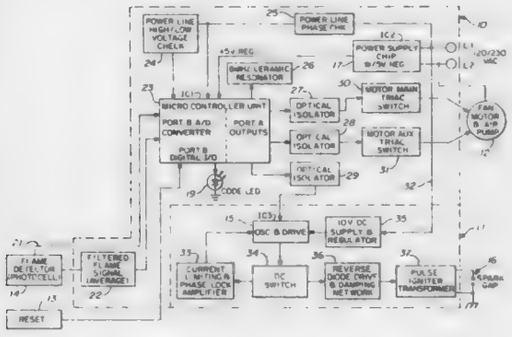
whereby the flame and flame holder interact to produce emissions of less than about 10 ng/J NO_x.

5,470,223

MICROPROCESSOR CONTROLLED FUEL AND IGNITION CONTROL FOR A FUEL BURNING DEVICE

Hugh W. McCoy, Bowling Green, Ky., assignor to Desa International, Inc., Bowling Green, Ky.

Filed Nov. 30, 1994, Ser. No. 347,560
Int. Cl.[6] F23Q *23/00*
U.S. Cl. 431—24 **16 Claims**



1. A microprocessor fuel and ignition control unit for a fuel burning device comprising:

an AC voltage source providing a positive one-half cycle and a negative one-half cycle;

a DC power supply coupled to said microprocessor and to said AC voltage source for operating only on the positive one-half cycle of the AC voltage to produce a regulated DC voltage for said control unit; and

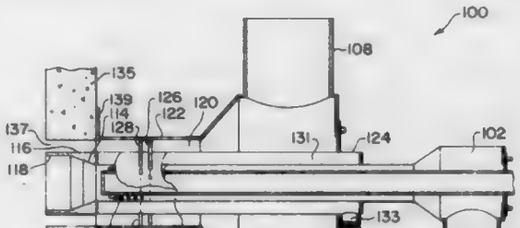
an ignitor circuit coupled to said microprocessor and said AC voltage source for using only the negative one-half cycle of said AC voltage to cause an ignition of said fuel so as to prevent any common mode electromagnetic interference generated by the ignitor from interfering with said DC power supply.

5,470,224

APPARATUS AND METHOD FOR REDUCING NO_X, CO AND HYDROCARBON EMISSIONS WHEN BURNING GASEOUS FUELS

Steven J. Bortz, Laguna Niguel, Calif., assignor to Radian Corporation, Austin, Tex.

Continuation-in-part of Ser. No. 92,979, Jul. 16, 1993, abandoned, and Ser. No. 188,586, Jan. 27, 1994, Pat. No. 5,407,347. This application Apr. 26, 1994, Ser. No. 233,358
Int. Cl.[6] F23C *5/08*
U.S. Cl. 431—182 **22 Claims**



1. A forced draft burner apparatus for burning a gaseous fuel while producing low levels of NO_x, CO and hydrocarbon emissions; comprising:

a cylindrical inner burner having a tubular wall;

a generally cylindrical body mounted inside the tubular wall of the inner burner;

an annular flow channel being defined between said body and the inner wall of said tubular section, said channel constituting a throat for oxidant gases, and having a downstream outlet for the inner burner;

means for supplying oxidant gases to said throat of the inner burner;

a divergent quarl for said inner burner having its smaller end connected to said outlet of said inner burner, and exiting into a combustion chamber;

a plurality of curved axial swirl vanes being mounted in said annular flow channel of the inner burner to impart swirl to said oxidant gases flowing downstream in said throat;

inner burner fuel gas injection means for the inner burner being provided in said annular channel proximate to said swirl vanes for injecting said gas into the flow of oxidant gases at a point upstream of said outlet end in a manner that results in uniform mixing of the fuel and oxidant upstream of the ignition point;

said fuel gas injection means for said inner burner comprising a plurality of spaced gas injectors each being defined by a gas injection hole and means to feed the gas thereto; the ratio of the number of gas injection holes to the transverse cross-sectional area of the annular flow channel of the inner burner being at least 200/ft^2;

an outer burner surrounding at least a portion of said inner burner and including a wall spaced from the outer wall of the inner burner to define an outer burner flow channel having a downstream outlet end for gases provided to said channel;

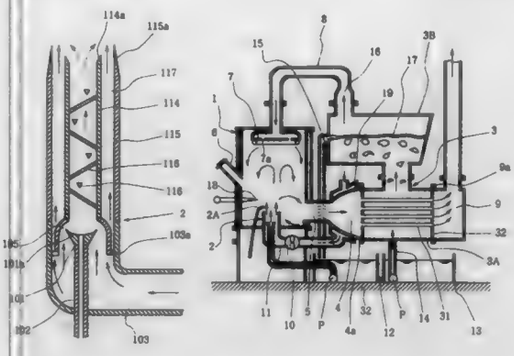
means for providing a flow of oxidant into the outer burner flow channel; and

outer burner fuel gas injection means for the outer burner being provided in said outer burner flow channel, upstream of the outer burner outlet end, comprising a plurality of spaced gas injectors, each being defined by a gas ejection hole and means to feed the gas thereto; the ratio of the number of gas injection holes to the transverse cross-sectional area of the flow channel of said outer burner being at least 200/ft^2.

5,470,225
ATOMIZING TYPE BURNER

Hideyoshi Fujiwara, Machida, and Naomi Ishikawa, Tokyo, both of, Japan, assignors to Create Ishikawa Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1993, Ser. No. 87,267
Claims priority, application Japan, Jul. 14, 1992, 4-208550
Int. Cl.[6] F23D *14/62*
U.S. Cl. 431—215 **8 Claims**

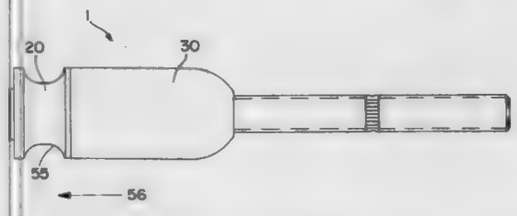


1. An atomizing type burner, comprising an air supply tube (**111**, **103**) for supplying air, a fuel supply tube (**102**) having an open end for supplying a fuel, a fuel atomizing nozzle (**101**) connected to the open end of the fuel supply tube (**102**) for atomizing the fuel, the fuel atomizing nozzle (**101**) being placed within the air supply tube (**11**, **103**), the air supply tube (**103**) having a double construction which includes an outer cylinder (**115**) and an inner cylinder (**114**) placed therein so as to form an air conduit (**117**) between the outer cylinder (**115**) and the inner cylinder (**114**) such that the air supplied in the air supply tube (**11**, **103**) can flow through the air conduit (**117**), the inner cylinder (**114**) having a passage formed therein through which the fuel atomized by the fuel atomizing nozzle (**101**) and the air supplied in the air supply tube (**11**, **103**) flow in combination, and wherein a static mixer (**116**) is formed within the inner cylinder (**114**).

5,470,226
COMBUSTION DEVICE

David S. Pearl, II, and Frank G. Smith, both of Fort Lauderdale, Fla., assignors to Uniweld Products, Inc., Fort Lauderdale, Fla.

Filed Jun. 29, 1994, Ser. No. 267,657
Int. Cl.[6] F23Q *3/00*
U.S. Cl. 431—255 **10 Claims**



1. A combustible device comprising:

combustible gas receiving means having a central axis, said combustible gas receiving means including a jet nozzle having an orifice for flow of said combustible gas;

combustion supporting gas receiving means;

mixing means along said central axis for combining said combustible gas and said combustion supporting gas;

torch tip means along said central axis and in gas-receiving communication with said mixing means;

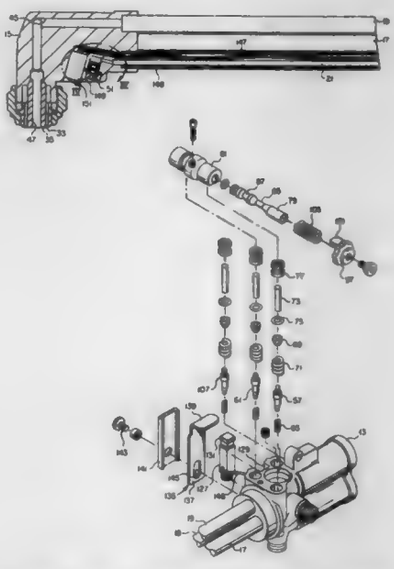
ignition means for igniting said combustible gas coupled to said combustion device and generating a flame said torch tip means; and

encapsulating means slidable along said central axis and comprising a mixer shell having a central bore for receiving said ignition means and said torch tip means, said encapsulating means encapsulating said ignition means and protecting the same from contamination.

5,470,227
PILOT IGNITER TORCH WITH CUTOFF PREHEAT VALVES

Carl W. Mims, Sanger, and Roger D. Zwicker, Arlington, both of Tex., assignors to Victor Equipment Company, Denton, Tex.

Division of Ser. No. 52,491, Apr. 23, 1993, Pat. No. 5,390,855.
This application Jun. 16, 1994, Ser. No. 260,956
Int. Cl.[6] F23D *14/32;14/42*
U.S. Cl. 431—255 **8 Claims**



1. In a cutting torch having a body having a preheat oxygen passage, a preheat fuel passage, and a cutting oxygen passage, the passages being connected by a plurality of conduits to a head having a tip, adjustable preheat oxygen valve means mounted to the body for delivering preheat oxygen through the preheat oxygen passage and one of the conduits to the head, adjustable preheat fuel valve means for delivery a gaseous fuel through the preheat fuel passage and one of the conduits to the head for mixing with the oxygen to create a preheat flame, and cutting oxygen valve means including a lever for supplying additional oxygen through the cutting oxygen passage and one of the conduits to the head for mixing with the preheat flame for cutting, an improved means for extinguishing the flame while retaining preset adjustment of the oxygen valve means and fuel valve means, comprising in combination:

a preheat oxygen cutoff valve means mounted in the preheat oxygen passage and a preheat fuel cutoff valve means mounted in the preheat fuel passage for linear movement between Open and closed positions to open and block flow through the preheat oxygen passage and preheat fuel passage, respectively;

actuator means for simultaneously moving the preheat oxygen cutoff valve means and the preheat fuel cutoff valve means between the open and closed positions and for retaining the preheat oxygen cutoff valve means and the preheat fuel cutoff valve means in the open and closed positions independently of any movement of the lever for the cutting oxygen valve means;

pilot valve passage means extending through the body and through one of the conduits to a pilot nozzle located adjacent the tip of the head for delivering pilot fuel;

pilot valve means in the pilot valve passage means and having a pilot plunger linearly movable between open and closed positions, opening and closing the pilot valve passage means;

an electrode mounted adjacent the pilot nozzle;

piezoelectric crystal means mounted adjacent the pilot valve means and connected to the electrode by a wire, the piezoelectric crystal having a linearly movable trigger for causing a spark at the electrode for igniting the pilot fuel to create a pilot flame for igniting oxygen and fuel flowing out the tip from the preheat oxygen and preheat fuel passages;

the trigger and the pilot plunger having parallel axes and being mounted side-by-side; and

ignition actuator means including an ignition actuator mounted adjacent the trigger and the pilot plunger for movement between an off position and an ignite position in which the pilot plunger is moved to the open position and the trigger is actuated.

5,470,228

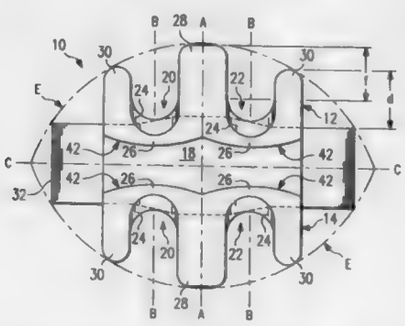
EDGEWISE ORTHODONTIC BRACKET

Steve A. Franseen, Denver, and Jeffrey A. Peterson, Aurora, both of Colo., assignors to RMO, Inc., Denver, Colo.

Filed May 12, 1993, Ser. No. 60,879

Int. Cl.[6] A61C *3/00*

U.S. Cl. 433—8 **27 Claims**



1. An edgewise orthodontic bracket comprising:

gingival and occlusal tie wings defining a labially opening archwire slot therebetween, each of the gingival and occlusal tie wings having a mesial/distal extent, said gingival wing comprising a gingivally-extending center leg and gingivally-extending mesial and distal wing tip portions, wherein said gingivally-extending center leg extends a greater distance from said archwire slot than each of said gingivally-extending mesial and distal wing tip portions, said occlusal wing comprising an occlusally-extending center leg and occlusally-extending mesial and distal wing tip portions, wherein said occlusally-extending center leg extends a greater distance from said archwire slot than each of said occlusally-extending mesial and distal wing tip portions;

a first set of gingival and occlusal notches, the gingival notch being disposed within the mesial/distal extent of said gingival tie wing and the occlusal notch being disposed within the mesial/distal extent of said occlusal tie wing; and

a second set of gingival and occlusal notches, the gingival notch being disposed within the mesial/distal extent of said gingival tie wing and the occlusal notch being disposed within the mesial/distal extent of said occlusal tie wing, said first set of notches being disposed on a mesial side of said bracket and said second set of notches being disposed on a distal side of said bracket.

5,470,229

Patent Not Issued For This Number

5,470,230

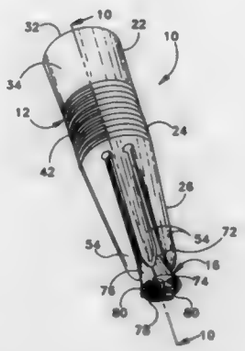
ANATOMICAL DENTAL IMPLANT WITH EXPANDABLE ROOT

Fereidoun Daftary, 50 N. La Gienega Blvd., No. 206, Beverly Hills, Calif. 90210, and Oded Bahat, 414 N. Camden Dr., Beverly Hills, Calif. 90210

Filed Sep. 30, 1994, Ser. No. 315,603

Int. Cl.[6] A61C *8/00*

U.S. Cl. 433—174 **20 Claims**



1. A dental implant assembly for supporting a dental component on a patient's jawbone, the dental implant assembly to be fitted into a hole which is drilled in the jawbone and has an interior sidewall and a bottom, the dental implant assembly comprising:

a. a generally cylindrical integral body member having a top section, a middle section and a bottom section;

b. said top section of said integral body member having a top end, an abrasive exterior surface for frictionally engaging with said interior sidewall of said jawbone hole, and an upward facing interior threaded bore for adopting said dental component;

c. said middle section of said integral body member having a threaded exterior surface for threadedly fastening to said interior sidewall of said jawbone hole, and a downward facing interior bore;

d. said bottom section of said integral body member having a hollow sleeve split into a multiplicity of longitudinally elongated segments each having a bottom end;

e. an elongated internal shaft member having a top end and a bottom end, and screw threads along a substantial portion of its length except the top end;

f. said top end of said internal shaft member press-fitted into said downward facing interior bore of said middle section of said integral body member for non-rotatably attaching said internal shaft member inside said split bottom section of said integral body member;

g. a frusto-conical shaped expander member having a small top end, a large bottom end, a beveled exterior surface, and a threaded interior bore extending from the top end to the bottom end for threadedly engaging with said bottom end of said internal shaft member;

h. said beveled surface of said expander member engaging with said bottom ends of said multiplicity of longitudinally elongated segments of said bottom section of said integral body member;

i. said bottom end of said expander member having means for anti-rotation engagement with said bottom of said jawbone hole; and

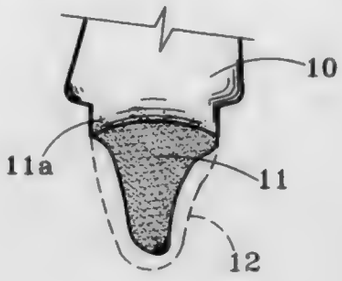
j. said top end of said top section of said integral body member having means adaptable to a driving tool for rotating said integral body member to install it into said jawbone hole, causing said internal shaft member also to rotate, which in turn causes said expander member to move upwardly on said internal shaft member, to thereby force said multiplicity of longitudinally elongated segments of said bottom section of said integral body member to expand outwardly against and tightly engage with said interior sidewall of said jawbone hole;

k. whereby said dental implant assembly can be securely installed into said patient's jawbone in a single step without any additional and separate step to operate said expander.

5,470,231
METHOD OF FORMING PORCELAIN TOOTH RESTORATIONS

Alvin L. Stern, P.O. Box 711333, Houston, Tex. 77271-1333

Filed Apr. 20, 1994, Ser. No. 230,508
Int. Cl.[6] A61C *5/08;5/10*
U.S. Cl. 433—223 **12 Claims**



1. A method of forming an all porcelain tooth restoration comprising the steps of:

preparing a negative impression of the tooth structure on which a tooth restoration is to be placed;

forming from said negative impression a positive replication of said tooth structure of a porcelain compatible refractory investment material;

coating the areas of said replication which are to receive restoration materials with a liquid preparation which substantially inhibits moisture absorption by said replication;

applying a slurry of powdered porcelain over said coated areas of said replication to form at least a portion of a tooth restoration;

curing said at least a portion of a tooth restoration by firing thereof; and

removing said tooth structure replication to leave said at least a portion of a tooth restoration for bonding to said tooth structure.

5,470,232
RECONFIGURABLE AIRCRAFT STICK CONTROL AND METHOD FOR CONNECTING AND REMOVING STICK CONTROL FROM AIRCRAFT SIMULATOR

Thomas M. Kelso, Great Mills; John K. Kotch, California; Damon J. Boyle, Leonardtown; David H. Meiser, Lexington Park; William P. Flaherty, Leonardtown, and Bernard W. Baird, Avenue, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

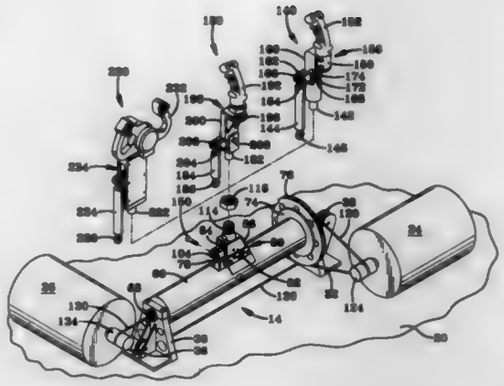
Filed Sep. 29, 1993, Ser. No. 129,729
Int. Cl.[6] G09B *9/28*
U.S. Cl. 434—45 **11 Claims**

1. An assembly having a generic base with mounting means to provide for interchangeability of stick controls of an aircraft simulator each having a particular connecting member, said assembly comprising:

a first member defining a first pitch axis;

means for mounting said first member for rotation about said first pitch axis, said mounting means comprising said generic base;

a second member defining a first roll axis, said second member being supported by said first member for movement with said first member about said pitch axis;



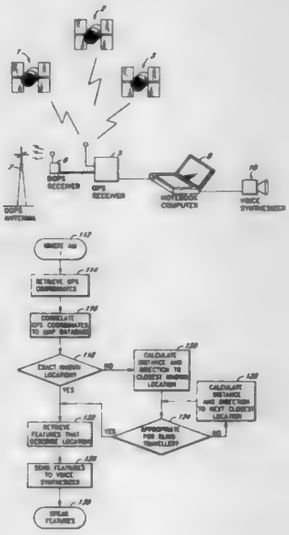
means connected to said first and second members for generating electrical signals that reflect the movement of said first and second members about their respective axes to thereby simulate the pitching and rolling of an aircraft; and

means for releasably supporting said particular connecting members of said stick controls, said releasable supporting means being mounted on said first member so that it can move said first member about said first pitch axis and so that it can move said second member about said first roll axis.

5,470,233
SYSTEM AND METHOD FOR TRACKING A PEDESTRIAN

James R. Fruchterman, Palo Alto; William C. Schwegler, San Jose; Bruce W. Merritt, Palo Alto, all of Calif., and Charles LaPierre, Ottawa, Canada, assignors to Arkenstone, Inc., Sunnyvale, Calif.

Filed Mar. 17, 1994, Ser. No. 210,239
Int. Cl.[6] G09B *21/00*
U.S. Cl. 434—112 **27 Claims**



1. A system for determining the geographic position of a blind pedestrian, comprising:

a global positioning system (GPS) receiver;

a computer receiving first coordinates from said GPS receiver representing the system's position;

instructions for accessing second coordinates representing locations in a region where said system is located to said computer, said instructions further accessing an associated feature list which contains specific features that describe said location

and a file created during use of said system relative to locations travelled by said blind pedestrian;

first instructions in said computer for defining plurality correlations between said first coordinates and said second coordinates;

second instructions in said computer for selecting one of said plurality correlations and its associated features that are appropriate for said blind pedestrian; and

a voice synthesizer linked to said computer for phonetically describing the selected correlation and its associated features and relative to said file so that said pedestrian can audibly determine his position relative to said location.

21. A method for tracking a handicapped pedestrian along a path, comprising:

receiving a first set of coordinates from a global positioning system (GPS) system corresponding to the location of said pedestrian travelling along a path;

determining from said coordinates whether the pedestrian has changed direction and storing said coordinates and features associated with said coordinates at the point of direction change in a history file;

storing said coordinates and said associated features to said history file whenever a predetermined period of time has passed, so that said history file contains a list of features associated with locations where the pedestrian changed direction as well as a list of features associated with locations taken at specific time intervals along the pedestrian's path; and

phonetically describing to said pedestrian his position relative to said location and said associated features.

5,470,234

CIRCULAR, PIECE-MATCHING MATH EDUCATIONAL AID

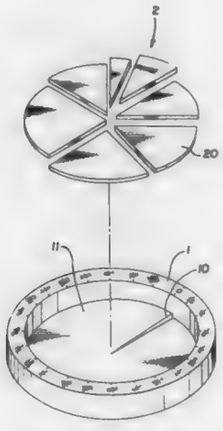
Louis Y. Sher, 504 Copper Ridge Dr., Richardson, Tex. 75080

Filed Jun. 16, 1994, Ser. No. 261,333

Claims priority, application Taiwan, Prov. of China, Jun. 16, 1993, 82208343

Int. Cl.[6] G09B *1/02*

U.S. Cl. 434—196 **5 Claims**



1. A math educational aid comprising in combination:

a circular helix support surface of approximately 360 degrees, going upward from a start position, forming an abutment at the start position; and

a plurality of segments forming at least one angle and capable of resting on the support surface with the point of the angle substantially near the center of the circle of the circular helix, wherein each segment is approximately as thick as the height of the abutment, and wherein if enough segments are placed in abutment to each other on the support surface beginning at the start position to exceed 360 degrees around the circular helix, then that portion of the plurality of segments beyond the 360 degrees, overlapping segments which began with the start position, will rest on the segments which are overlapped.

5,470,235

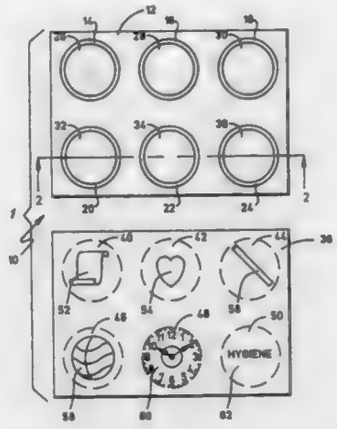
CHILD BEHAVIOR IMPROVEMENT SYSTEM

Stephen Papaleo, 4505 Van Dyke Ave., San Diego, Calif. 92116

Filed Jul. 5, 1994, Ser. No. 270,815

Int. Cl.[6] G09B *19/00*

U.S. Cl. 434—238 **19 Claims**



1. A behavior enhancement system comprising:

a support member having a plurality of receptacles;

means for defining a reward disposed in each of said receptacles;

cover means for covering each said receptacle, said cover means having means thereon identifying a desirable behavior, and said cover means being at least partially removable for providing access to said reward means.

5,470,236

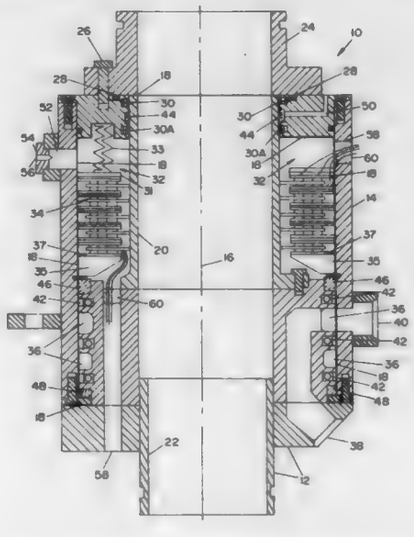
ROTATING JOINT FOR AERIAL LADDERS

Vernon J. Wissler, Conestoga, Pa., assignor to Amity Machine Corp., Alburtis, Pa.

Filed Feb. 22, 1994, Ser. No. 199,468

Int. Cl.[6] H01R *35/00*

U.S. Cl. 439—12 **5 Claims**



1. A rotating joint for water and electrical connections comprising:

a first assembly including a cylindrical water pipe with an inner wall and an outer wall;

a second assembly located concentric with and outside the outer wall of the cylindrical water pipe and capable of rotational motion relative to the first assembly, a portion of the second assembly being spaced from the outer wall of the first assembly to form an annular space around the first assembly;

at least two parallel annular planar surfaces within the annular space, attached to one of the assemblies, with each planar surface including at least two continuous circular conductive bands which are concentric to the cylindrical pipe;

connecting means attached to at least two of the conductive bands to provide an electrical current connection with the conductive bands;

at least two support structures located in different planes attached to the other assembly;

wiper contacts attached to the support structures and located so that each wiper contact rests upon a conductive band regardless of the rotational orientation between the first assembly and the second assembly; and

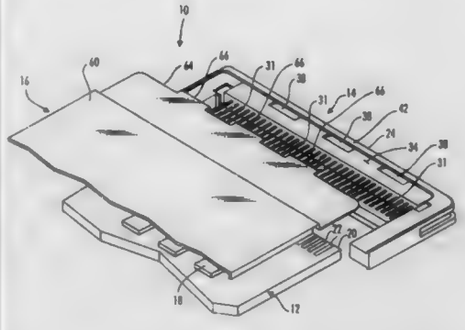
connecting means attached to at least two wiper contacts to provide an electrical current connection with the wiper contacts.

5,470,237

LATCH MECHANISM FOR JOINING THE COVER AND CONNECTOR OF A REMOVABLE MEMORY DEVICE

Roger W. Byczek, Lake in the Hills, Ill.; Randy Hendrich, Conneaut Lake, and John J. Ashman, Huntingdon, both of Pa., assignors to Elco Corporation, Huntingdon Park, Pa.

Filed Jun. 20, 1994, Ser. No. 262,997
Int. Cl.[6] H01R *13/00*
U.S. Cl. 439—76.1 **2 Claims**



1. A circuit device adapted to be removably connected to an electronic apparatus such as a computer, the circuit device comprising:

a cover including opposed upper and lower, substantially parallel cover panels, each of the panels having a forward edge including a plurality of forwardly projecting tabs;

a substrate disposed within the cover, the substrate carrying electronic circuit elements and including a forward edge having a plurality of contacts connected to the electronic circuit elements; and

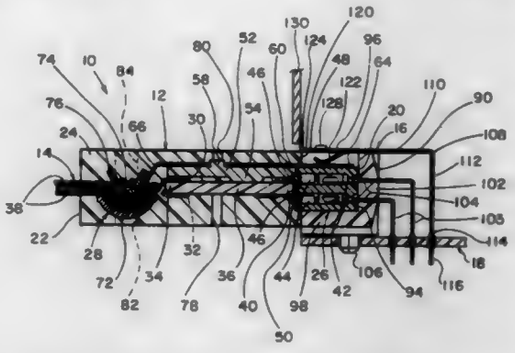
a connector disposed adjacent the forward edge of the substrate and having a plurality of contact members electrically coupled to the plurality of substrate contacts, the connector having opposed, parallel, upper and lower outer surfaces, each of the outer surfaces having a plurality of slots, each slot in the upper outer surface of the connector receiving one of the tabs along the forward edge of the upper cover panel and each slot in the lower outer surface of the connector block receiving one of the tabs along the forward edge of the lower cover panel.

5,470,238

SHIELDED RIBBON CABLE ELECTRICAL CONNECTOR ASSEMBLY AND METHOD

John D. Walden, Mechanicsburg, Pa., assignor to Intercon Systems, Inc., Harrisburg, Pa.

Filed Feb. 9, 1994, Ser. No. 193,795
Int. Cl.[6] H01R *13/58;13/652*
U.S. Cl. 439—98 **31 Claims**



1. A ribbon cable connector assembly comprising,

A) a ribbon cable having a plurality of conductors spaced across the width of the cable and a ground shield surrounding the cable; and

B) a connector on an end of the ribbon cable, the connector including a first face, a row of contact terminals at the first face for forming electrical connections with a row of contact members, electrical connection circuit paths joining the conductors in the ribbon cable to the contact terminals, a cable clamp including a first clamp bar extending across the width of one side of the cable with a first surface engaging the cable and a second clamp bar extending across the width of the other side of the cable across from the first bar with a second surface engaging the cable, the ends of the clamp bars extending beyond the edges of the ribbon cable and clamp members joining the ends of the clamp bars outwardly of the edges of the cable so that a section of the cable is clamped between the first and second surfaces of the bars, a ground member including a first contact end proximate the first face for forming an electrical connection with a ground contact and a second contact end at the cable clamp, the second end extending between the clamp bars so that clamp bars hold the second end in electrical connection against the cable ground shield, and an overmolded plastic body surrounding the end of the cable, the cable clamp, the electrical connection circuit paths and the ground member.

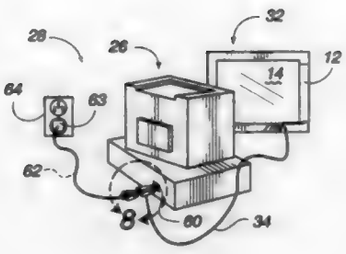
5,470,239

INTERNATIONAL ELECTRICAL GROUND CONNECTOR-ADAPTOR FOR COMPUTER MONITOR

James D. Rancourt, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Mar. 23, 1993, Ser. No. 35,446
Int. Cl.[6] H01R *4/66*
U.S. Cl. 439—105 **8 Claims**

1. A power connector comprising: an insulating body; electrically interconnected male and female external receptacles mounted in the insulating body, for connecting a first device to a power electrical outlet, each receptacle including a pair of power connectors and a ground connector, and the individual power and ground connectors of the male receptacle being permanently connected to associated power and ground connectors of the female receptacle; an external ground line adapted for connection to a second device separate from the power electrical outlet; means for connecting the external ground line to the electrically interconnected ground connector of the male and female external receptacles, thereby connecting the second device to a ground connection of the electrical outlet via the electrically interconnected ground connectors of the



male and female receptacles; and wherein the means for connecting the ground line to the ground connector comprises a socket housed in the body and a mating prong mounted on the ground line for removable insertion into the ground connector socket.

5,470,240

CARD EDGE CONNECTOR COMPRISING LEVERS FOR A CARD BOARD ON BOTH ENDS OF AN INSULATOR ROD

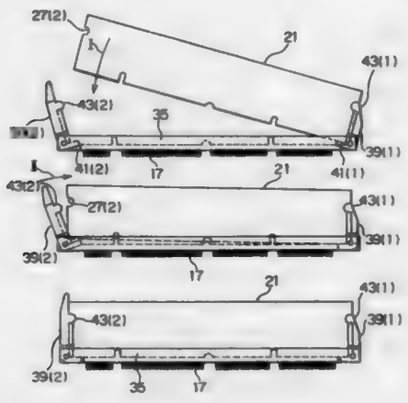
Keiichiro Suzuki, Tokyo, Japan, assignor to Japan Aviation Electronics Industry, Limited, Japan

Filed Jan. 10, 1994, Ser. No. 179,163

Claims priority, application Japan, May 27, 1993, 5-028045 U

Int. Cl.[6] H01R *13/00*

U.S. Cl. 439—157 **9 Claims**



1. A printed circuit card edge connector for use in combination with a printed circuit card board having a row of conductive connecting pads parallel to its bottom edge, said card edge connector including an insulator rod with an indent formed along its top surface and with a plurality of conductive contacts extending from a rod bottom edge of said insulator rod in a one-to-one correspondence with said connecting pads for making electric connections to said connecting pads when the card bottom edge of said card board is fitted in said indent to put said card board in mechanical contact with said insulator rod,

wherein said insulator rod comprises first and second levers pivoted at respective ends of said insulator rod for locking said card board into and for prying said bottom edge said card board out of said mechanical contact.

5,470,241

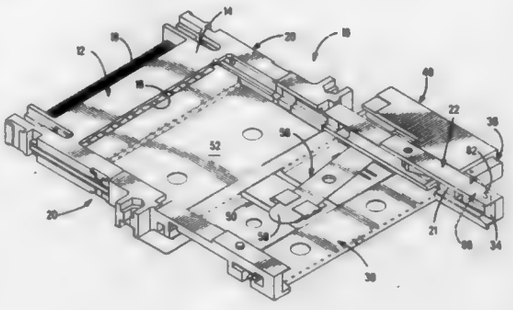
RETENTION MECHANISM FOR MEMORY CARDS

John W. Kaufman, Hershey; Robert H. Frantz, Newville, and John A. Root, Middletown, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 171,057, Dec. 21, 1993, abandoned. This application Jun. 14, 1994, Ser. No. 259,406

Int. Cl.[6] H01R *13/639*

U.S. Cl. 439—159 **14 Claims**



9. A card securing mechanism for retaining a card in a card reader and releasing same therefrom, comprising:

guide arms associated with opposite side edges of a card and mounted in the card reader and spaced apart so as to define a card-receiving channel aligned with an electrical connector traversing an inward end of the channel and said guide arms extending at least toward a card-engageable surface of a card ejection mechanism located at the inward end of the channel;

a push button slidably mounted within a housing along one of said guide arms at an entrance to said card-receiving channel, said push button being movable alongside said card and adapted to activate the card ejection mechanism upon being pushed into said housing;

a cam pivotally mounted to said one of said arms at the channel entrance proximate and beside said push button for a first portion thereof to be rotated into and out of the card-receiving channel, said cam having a notch in said first portion thereof dimensioned to receive and secure a corner of said card when said card is fully within said reader and said first portion of said cam is rotated into the channel;

a plate at least affixed to the card reader adjacent said cam and including a slot into a cam-adjacent surface thereof defining a path including a first path portion parallel to said card-receiving channel and a second path portion extending at an angle from an inner end of said first path portion toward said card-receiving channel, said plate being movable parallel to said card-receiving channel by said push button, and

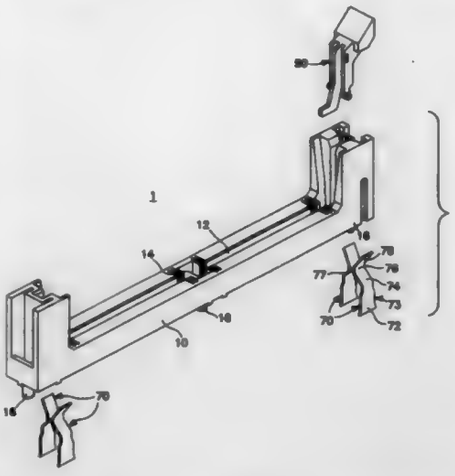
said cam further including a cam follower spaced from said pivot and extending into said path and adapted to follow said first path portion and said second path portion as said plate is moved in a first direction upon card insertion to rotate said cam into a card engaging position capturing said card corner, and upon ejection of said card from said card reader by depressing said push button, said plate is moved in an opposed second direction and said cam follower exits said second path portion and enters said first path portion thereby rotating said cam to a card releasing position as the said card is urged outwardly of the channel by the card ejection mechanism activated by said push button.

5,470,242

DUAL READOUT SOCKET CONNECTOR

Lee M. Cheng, Cupertino; Conrad Choy, San Francisco, and Danny Chau, Milpitas, all of Calif., assignors to Tongrand Limited, Hong Kong

Filed Apr. 20, 1994, Ser. No. 230,068
Int. Cl.[6] H01R *13/62*
U.S. Cl. 439—157 9 Claims



1. A socket for use with a daughter board inserted therein, comprising:

an elongated insulative housing having a central board slot extending in a lengthwise direction along said housing for receiving a bottom edge portion of said daughter board therein;

a plurality of contact slots side by side transversely arranged along said central board slot;

a plurality of contacts received within the corresponding contact slots, respectively;

a cavity positioned at one end of said housing, said cavity formed between an end wall and a retention wall;

an ejector pivotally positioned within said cavity; and

latch means positioned adjacent said retention wall and independently isolated from said ejector; wherein

each contact includes a horizontal base of which a pair of retaining barb sections extend upwardly from two opposite ends for retainable engagement within the corresponding contact slot, a tail extending downward from said base, an extending post extending atop one of the retaining barb sections, a generally S-shaped contact beam extends from the extending post through the contact slot and into the central board slot.

5,470,243

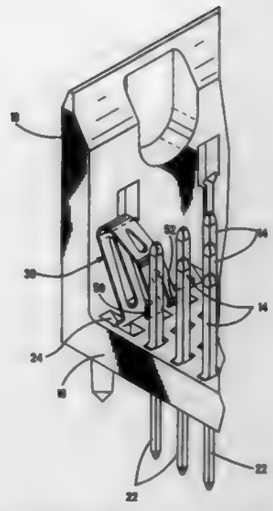
ELECTRICAL CONNECTOR WITH SNORTING SWITCH

Robert L. Bendorf, Millerstown, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Feb. 17, 1994, Ser. No. 198,798
Int. Cl.[6] H01R *29/00*
U.S. Cl. 439—188 15 Claims

1. In an electrical connector including an insulating housing having a base, at least one row of signal contacts extending upwardly from said base for mating engagement with contacts of a mating connector having a housing, said signal contacts extending through said base and terminating in leads for electrically connecting to another electrical component, a shorting switch comprising:

(a) a shank secured to said base of said connector housing and having an axis substantially parallel with the axes of said signal contacts;



(b) a first beam extending from said shank at an angle to said axis away from said signal contacts and terminating in a radiused end at least partially on one side of said axis;

(c) a second beam extending from said radiused end across said axis and terminating in a contact end positioned on the other side of said axis; and

(d) a turned edge on said contact end arranged so that when said connector and said mating connector are in mated engagement said turned edge is adjacent said shank and is further arranged to abuttingly engage said shank to prevent over stressing of said shorting switch during said mating,

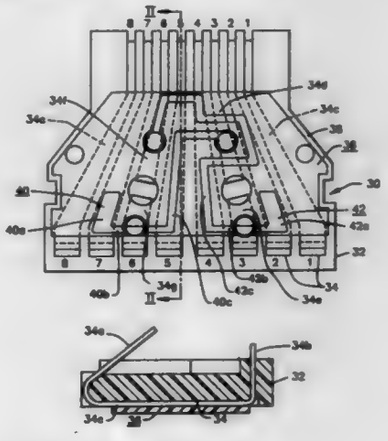
wherein said shorting switch is arranged so that when said connector and said mating connector are separated said contact end is in shorting engagement with at least two of said signal contacts and when said connector and said mating connector are mated said contact end is spaced from said signal contacts and from both of said connector housings.

5,470,244

ELECTRICAL CONNECTOR HAVING REDUCED CROSS-TALK

Gunsang Lim, Cordova; Richard D. Marowsky, Collierville, both of Tenn., and Ben Khoshnood, Parkland, Fla., assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Oct. 5, 1993, Ser. No. 132,015
Int. Cl.[6] H01R *21/22*
U.S. Cl. 439—189 17 Claims



1. An electrical connector comprising:

an insulative housing;

a plurality of elongate electrical contacts supported on said housing, said contacts being disposed in a mutually spaced side-by-side arrangement;

a dielectric substrate overlying said contacts;

a conductive trace supported by said dielectric substrate, said trace having an extent being disposed in spatial registry with a longitudinal portion of one of said contacts and being of configuration to define with said one contact and with the permeability and the dielectric constant of said dielectric substrate a predetermined mutual inductance and capacitance; and

a conductive element connecting said conductive trace to another one of said contacts.

5,470,245

ELECTRICAL CONNECTOR HAVING FLAT AND ELASTIC MULTI-CONTACT MEMBERS

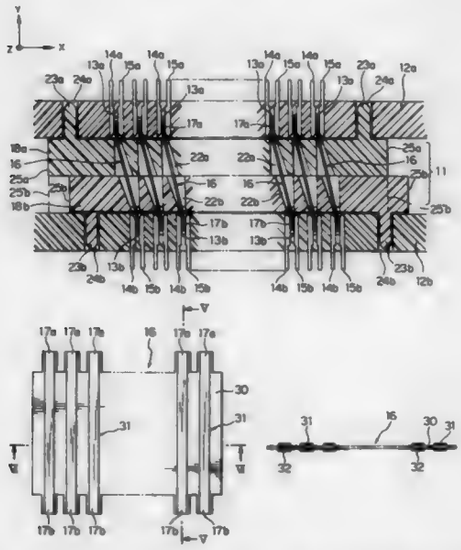
Yoshiaki Ichimura, Tokyo, Japan, assignor to Japan Aviation Electronics Industry, Limited, Japan

Filed Jul. 22, 1994, Ser. No. 278,839

Claims priority, application Japan, Jul. 23, 1993, 5-040442 U

Int. Cl.[6] H01R *9/09*

U.S. Cl. 439—259 **13 Claims**



1. An electrical connector for use in electrically connecting a pair of connection objects to each other, said connection objects being opposite to each other in a first direction and having a relative position changeable between a first and a second position in a second direction perpendicular to said first direction, each of said connection objects having a plurality of holes formed therein each extending in said first direction and having electroconductive contact means therein, said plurality of holes being arranged in a third direction perpendicular to said first direction and said second direction to form a row of holes, said connector comprising:

a flat and elastic multi-contact member comprising a flat insulator sheet generally extending in said first direction and a plurality of parallel conductive strips formed on said flat insulator sheet and extending in parallel with each other in said first direction, said multi-contact member having opposite end portions, each of the end portions being separated into a plurality of tab portions spaced from each other in said third direction and corresponding to said plurality of conductive strips, said a plurality of tabs being loosely fitted into said plurality of holes, respectively, in each of said connection objects when said relative position is said first position, each of said tabs being brought into press contact with said contact means in the corresponding one of said holes at two different points which are on opposite surfaces and spaced from each other in said first direction while the multi-contact member is being elastically bent when said relative position is said second position.

5,470,246

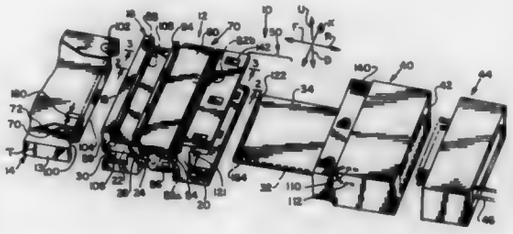
LOW PROFILE EDGE CONNECTOR

Rene A. Mosquera, Laguna Niguel, Calif., assignor to ITT Industries, New York, N.Y.

Filed Jul. 18, 1994, Ser. No. 276,727

Int. Cl.[6] H01R *13/62*

U.S. Cl. 439—260 **5 Claims**



1. An edge connector for connecting to a circuit board rear edge portion that is of predetermined thickness and that has a plurality of contact pads, comprising;

a housing having a rearward end portion and having upper and lower cantilevered beams with rear ends that are joined to said rearward end portion, with said beams forming a gap between them that includes a forward portion of a thickness to closely receive said circuit board rear edge portion;

a flat cable having front and rear ends and lying in said housing, said cable having a plurality of parallel conductors extending in said forward and rearward directions and having insulation joining said conductors together, with said front end of said cable lying at a location between said beams and having exposed conductor lower surfaces;

an actuator mounted on said housing and coupled to said upper and lower beams, said actuator being movable along said upper and lower beams from a release position wherein said actuator allows said beams to be vertically spaced by more than said predetermined thickness at said gap forward portion, to an actuated position at which said actuator presses said beams closer together to press said exposed conductor lower surfaces against said contact pads.

5,470,247

BURN-IN SOCKET APPARATUS

Masahiro Fuchigami, Gotenba, Japan, assignor to Texas Instruments Incorporated, Dallas, Tex.

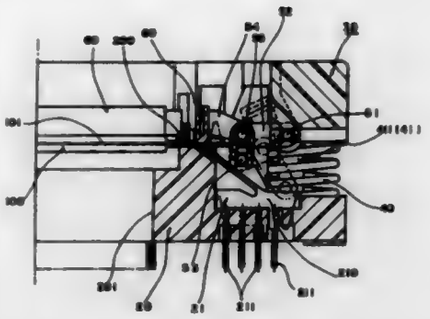
Filed Apr. 8, 1994, Ser. No. 225,484

Claims priority, application Japan, Apr. 24, 1993, 5-159918

Int. Cl.[6] H01R *13/15*

U.S. Cl. 439—264 **18 Claims**

1. A socket comprising a base member with a plurality of contact elements being mounted around an IC package receiving seat formed on the base member, the contact elements each having a main body and a movable contact arm extending therefrom, a cover member vertically movable toward and away from the base member from a position adjacent to the base member to a position removed from the base member at a fully extended return position, a spring biasing the cover member away from the base member, a latch member capable of moving the leads of an IC package received on the IC package receiving seat in the direction of engaging the movable contact arms of corresponding contact elements in dependence upon the movement of the cover member and a motion transfer mechanism which moves in dependence upon the movement of the cover member, the motion transfer mechanism coupled to the latch member to move the latch member toward and



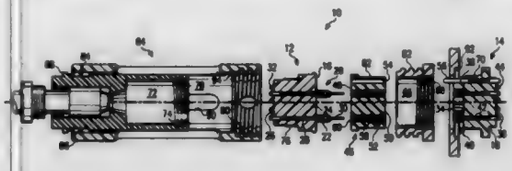
away from the contact arms, said movable contact arms of said contact elements only movable by movement action of said latch member moving said leads of the IC package.

5,470,248

FIELD REPAIRABLE ELECTRICAL CONNECTOR

Richard G. Wood, Magnolia, Tex., assignor to Tescorp Seismic Products, Inc., Houston, Tex.

Filed Apr. 11, 1994, Ser. No. 226,009
Int. Cl.[6] H01R *13/52*
U.S. Cl. 439—281 **15 Claims**



1. An electrical connector, comprising:

a male member having a body formed of a rigid, electrically nonconductive, thermoplastic material and a plurality of electrically conductive pins arranged in a predetermined pattern in said body, said body having a first face surface, a second face surface, and a plurality of sheaths extending outwardly from said first face surface, and each of said electrically conductive pins having a first portion completely encapsulated within the body and a respective one of said sheaths of said male member, a second portion extending outwardly from an outer end of the sheath respectively imbedding the first portion of said pins, and a third portion extending outwardly from the second face surface of the body of said male member, each of said third portions being connectable to an electrical wire conductor;

a female member having a body formed of a rigid, electrically nonconductive, thermoplastic material and a plurality of electrically conductive sockets arranged in said predetermined pattern in the body of said female member and adapted to receive the second portion of a respective one of the pins of said male member and maintain said respective pin in electrically conductive contact with the socket, said body of the female member having a first face surface, a second face surface, and a plurality of sheaths extending outwardly from said first face surface, and each of said electrically conductive sockets having a first portion completely encapsulated within the body and a respective one of the sheaths of said female member and a second portion extending outwardly from the second face surface of the body of said female member, said second portion of each of the sockets being connectable to an electrical wire conductor; and,

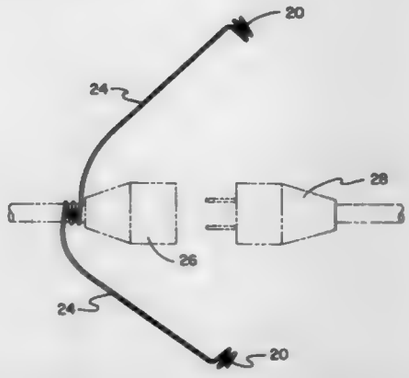
an elastomeric coupling member formed of a resiliently compressible, nonconductive material and having a first face surface abutable with the first face surface of said male member, a second face surface abutable with the first face surface of said female member, and a plurality of internally disposed passageways extending between said first and second face surfaces of the coupling member, said passageways being arranged in said predetermined pattern and having an internal wall shape adapted to receive and completely surround each of the sheaths of said male and said female members.

5,470,249

ELECTRICAL POWER CORD RETAINING CONNECTOR

Robert D. Manganello, 18 Crestview Dr., Dallas, Pa. 18612-9114

Filed Nov. 10, 1994, Ser. No. 337,113
Int. Cl.[6] H01R *13/62*
U.S. Cl. 439—369 **1 Claim**



1. An electrical cord retaining connector holding the male and female plug ends of two interconnected electrical power cords in a mated position for ensuring transfer of electrical power therethrough comprising:

an elongated piece of flexible metal wire coated with a plastic sheath, the elongated piece having free ends and an intermediate portion therebetween, the free ends each further having a first helical coil of two complete turns formed thereon, the intermediate portion further having a second helical coil of three complete turns and a pair of straight non-coiled segments extending outwardly with respect to the ends thereof to the first coils at the free ends, the elongated piece positionable in a generally linear decoupled configuration with the segments colinearly aligned and the first and second helical coils coaxially aligned, the elongated piece further positionable in a coupled configuration between two electrical power cords interconnected by the mated male and female plug ends with the second coil on the intermediate portion securable about one electrical power cord near the female plug end and the first coils at the free ends positionable in coaxial alignment about the other electrical power cord near the male plug end whereby the elongated piece ensures that the plug ends remain in their mated position.

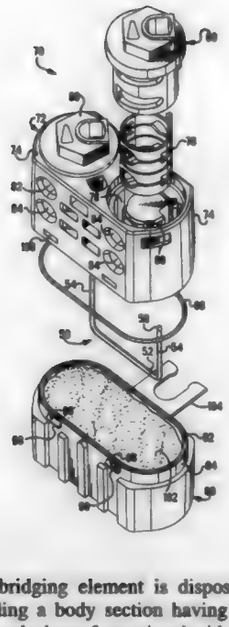
5,470,250

BRIDGING TERMINAL BLOCK

Kenneth C. Hawk, Clemmons, N.C.; Harry M. Capper, Harrisburg, and James W. Robertson, Oberlin, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed May 31, 1994, Ser. No. 251,074
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—409 **4 Claims**

1. A terminal block assembly for interconnecting respective conductors of insulated wires, the assembly being of the type having a housing member having at least two housing sections for respective terminals, and terminals disposed in respective terminal-receiving cavities of the terminal housing sections each having at least one conductor-receiving opening of the terminal housing sections for receipt of a respective at least one conductor thereinto for termination to a respective terminal, characterized in that:



a wire member bridging element is disposed in the housing member including a body section having respective contact sections at the ends thereof associated with each said terminal, said contact sections coextending from said body section and being adapted to be inserted into respective holes into a bottom surface of said housing member and received along grooves of a terminal-proximate internal surface of said terminal-receiving cavities of two of said at least two housing sections, each said groove having a depth less than a diameter of said contact section such that a portion of said contact section protrudes into a respective said terminal-receiving cavity to engage a surface of a respective said terminal for electrical engagement with said associated terminal upon full assembly of the terminal block assembly, thus commoning said terminals of said at least two housing sections; and

said housing member is adapted to contain said bridging element for said contact sections thereof to engage said terminals,

whereby all conductors inserted into apertures of the assembly become commoned upon termination to respective terminals upon actuation of the terminals.

5,470,251

CONNECTOR ENGAGEMENT DETECTING DEVICE

Minoru Sano, Hachioji, Japan, assignor to Molex Incorporated, Lisle, Ill.

Filed Sep. 2, 1994, Ser. No. 300,822

Claims priority, application Japan, Sep. 24, 1993, 5-261526

Int. Cl.[6] H01R *3/00*

U.S. Cl. 439—489 **5 Claims**

1. An electrical connector comprising,

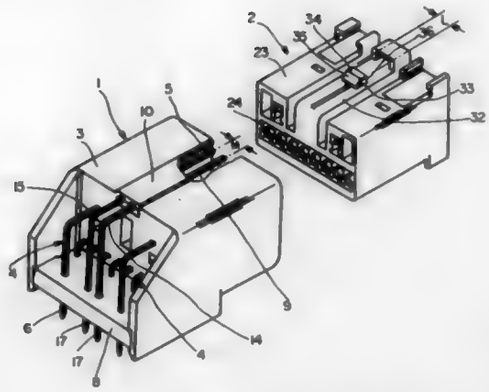
a pair of mating dielectric connector bodies,

a plurality of electrical terminals in one connector body adapted to engage a plurality of electrical contacts in the other connector body when the connector bodies are mated,

a resilient latching arm having a top and a bottom surface and including a locking projection at its free end on one connector body and a cooperating latching projection on the other connector body, the latching projection having a top surface and a latch surface substantially normal to the top surface for engaging the locking projection to lock the mated connector bodies together,

an electrical contact mounted to cover only on the top surface of the locking projection,

a pair of terminals having free ends mounted on an inner top side of the connector body having said latching projection with the free ends of the terminals located in a recess in the latching projection, whereby the terminals are bridged by the



electrical contact when the connector bodies are fully mated and the latching projection engages the locking projection.

5,470,252

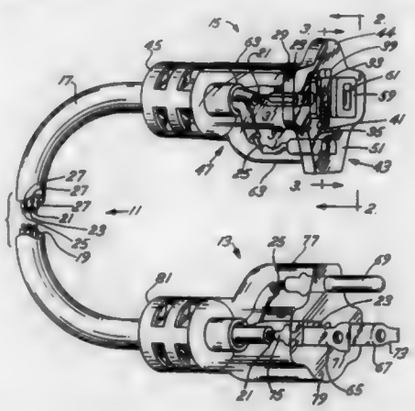
LIGHT-PERMEABLE EXTENSION CORD CONNECTOR

Philip E. Fladung, Carmel, Ind., assignor to Woods Industries, Inc., Carmel, Ind.

Continuation of Ser. No. 4,096, Jan. 13, 1993, Pat. No. 5,320,560, which is a continuation of Ser. No. 740,820, Aug. 6, 1991, abandoned. This application Jun. 13, 1994, Ser. No. 258,791

Int. Cl.[6] H01R *3/00*

U.S. Cl. 439—490 **23 Claims**



1. An electrical connector for use at one of the connection ends of an extension cord for mating with a conventional electrical connector device, comprising:

a plurality of electrical connection elements arranged relative to one another for mating with a conventional electrical connector device;

a plurality of wire conductors each electrically connected to separate one of said connection elements for developing a voltage drop across at least two of said elements;

visual indicating means including a voltage activated lamp for visually indicating by light from said lamp that power is available at said connection elements, said visual indicating means being electrically connected to said elements for activating said lamp to light when voltage is developed across said two elements;

a plug body molded entirely of a solid, light-permeable plastic and encapsulating said plurality of electrical connection elements and said visual indicating means, said plug body being molded for solidly encapsulating said lamp preventing any movement of said lamp relative to said plug body for protecting said lamp from mechanical shock;

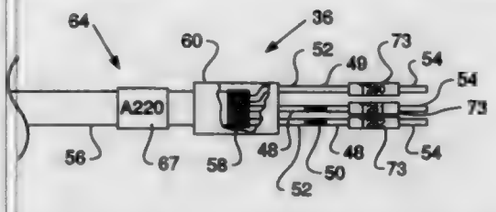
a plurality of grooves molded from said solid light-permeable plastic and into the outer surface of said plug body and each of said grooves having a peak, said grooves positioned at locations on said plug body such that light from said visual light source, even if directly occluded by encapsulated electrical connection elements or said extension cord, is diffracted to each line of sight around the entire body of the plug so that no single line of sight exists where said light cannot be viewed.

5,470,253

ENGINE WIRING SYSTEM

W. Peter Siems, West Lafayette, and Dale A. Philyaw, Westpoint, both of Ind., assignors to Caterpillar Inc., Peoria, Ill.

Filed Oct. 3, 1994, Ser. No. 316,972
Int. Cl.[6] H01R 3/00
U.S. Cl. 439—491 20 Claims



1. A wiring system for use with an engine or power module having a number of electrical systems, the wiring system comprising:

a first electrical device of an electrical system;

a second electrical device of said electrical system; and

an electrical connector connected between said first and said second electrical devices to define an electrical circuit, said electrical connector including first indicia identifying said electrical circuit;

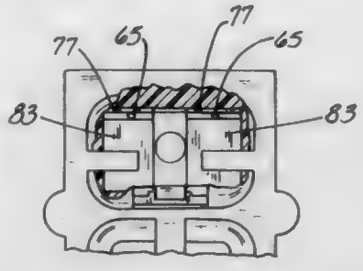
said first indicia including a first indicium corresponding to said electrical system, a second indicium corresponding to said first electrical device and a third indicium corresponding to said second electrical device.

5,470,254

TERMINAL BLOCK FOR SMALL APPLIANCES

Howard W. Kaney, West Bend, Wis., assignor to The West Bend Company, West Bend, Wis.

Division of Ser. No. 138,086, Oct. 20, 1993, Pat. No. 5,425,655. This application Nov. 21, 1994, Ser. No. 342,919
Int. Cl.[6] H01R 13/50;9/12
U.S. Cl. 439—439 15 Claims



1. In a terminal block having an insulating housing holding a plurality of electrically-conductive connectors, the improvement wherein:

at least a first connector is bifurcated to define a pair of wire-grasping structures;

the structures are separated by a tongue-like barrier;

the first connector includes first and second arms, each having a pair of spaced fingers; and,

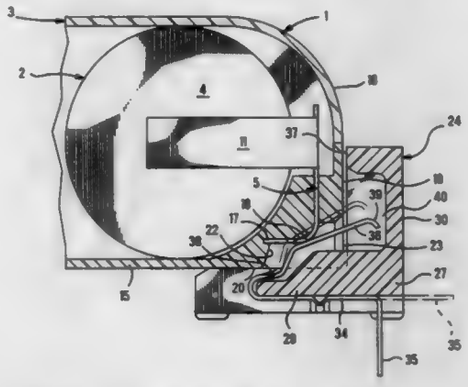
each finger of the first arm coacts with a finger of the second arm to provide one of said wire-grasping structures.

5,470,255

EXTENDED HEIGHT CONNECTOR FOR A BATTERY

Earl W. McCleerey, Mechanicsburg; Hurley C. Moll, Jr., Harrisburg; John M. Landis, Camp Hill, and George H. Douty, Mifflintown, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 35,817, Mar. 23, 1993, abandoned. This application Aug. 10, 1993, Ser. No. 105,987
Int. Cl.[6] H01R 3/00
U.S. Cl. 439—500 14 Claims



1. An electrical connector for a battery comprising:

multiple electrical battery terminals connected in electrical series with multiple cells of a battery,

a package containing the terminals and the cells,

contact surfaces of the terminals being accessible through recesses in an end of the package,

each of the contact surfaces having a height extending along said end and providing multiple points of connection along the height for electrical connection with an electrical contact of another, mating electrical connector,

each of the recesses having a height extending along said end and providing multiple locations along said height of the recess for receiving therein electrical contacts of another, mating electrical connector, and

opposed blades on each of the contacts comprising an electrical receptacle for electrical connection with an electrical contact of another, mating electrical connector, the contact surfaces extending along respective blades, and cross braces on the contacts bridging across respective recesses.

5,470,256

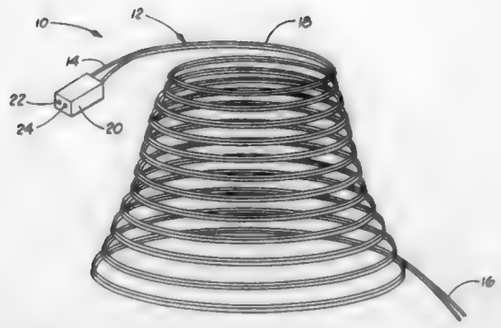
TWIN ELECTRICAL LEAD AND CONNECTOR ASSEMBLY

Kevin H. Waldock, Runaway Bay, Australia, assignor to Clipmate Corporation, Oklahoma City, Okla.

Continuation of Ser. No. 17,526, Feb. 16, 1993, abandoned. This application Sep. 21, 1994, Ser. No. 310,201
Int. Cl.[6] B65H 55/02
U.S. Cl. 439—501 16 Claims

1. A self dispensing leg wire and connector assembly for providing an electrical conductor between a charge of explosives at a blast site and a remote control site, the assembly consisting essentially of:

a selected length of leg wire, the leg wire comprising a pair of pliable electrical leads of equal length, wherein the length of the leg wire is selected to be about the same as the distance between the blast site and the control site, wherein the leg



wire has a first end and a second end and a coiled portion therebetween formed into a conical helix whereby both ends of the leg wire are accessible when the assembly is placed on its side on a surface, wherein the coiled portion is shape sustaining so that the assembly will retain its coiled configuration when placed on its side, and wherein the coiled portion is flexible so that, when placed on its side, the coil can be expanded by pulling on either end; and

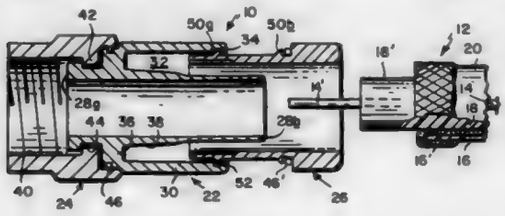
an electrical connector connected to the first end of the leg wire, the connector being characterized as capable of maintaining the two leads of the first end of the leg wire in non-conductive condition.

5,470,257

RADIAL COMPRESSION TYPE COAXIAL CABLE END CONNECTOR

Andrew Szegda, Canastota, N.Y., assignor to John Mezzalingua Assoc. Inc., Manlius, N.Y.

Filed Sep. 12, 1994, Ser. No. 304,562
Int. Cl.[6] H01R *17/04*
U.S. Cl. 439—578 **21 Claims**



1. An end connector for connecting a coaxial cable to a system component, said end connector comprising:

a connector body comprising a tubular inner post extending from a front end to a rear end, and including an outer collar surrounding and fixed relative to said inner post at a location disposed rearwardly of said front end, said outer collar cooperating in a radially spaced relationship with said inner post to define an annular chamber with a rear opening;

fastener means at the front end of said inner post for attaching said end connector to said system component;

a tubular locking member protruding axially into said annular chamber through said rear opening; and

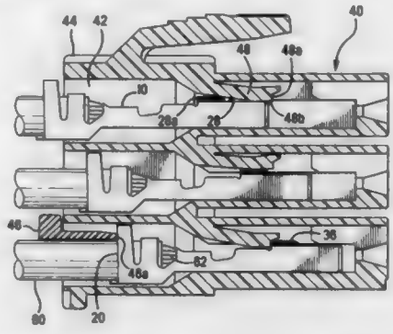
engagement means circumscribing the interior of said outer collar and the exterior of said locking member, said engagement means coacting in circular interengagement to inseparably couple said locking member to said connector body at a first position and to accommodate limited axial movement of said locking member relative to said connector body between said first position and a second position, said locking member coacting in a first radially spaced relationship with said inner post when in said first position to accommodate insertion of the rear end of said inner post into an end of said cable, with a central core portion of said cable being received in said inner post through said rear end and an outer annular portion of said cable being received in said annular chamber through said rear opening and between said locking member and said inner post, and said locking member coacting in a second radially spaced relationship with said inner post when in said second position to grip the outer annular portion of said cable therebetween.

5,470,258

ELECTRICAL CONNECTOR

Mitsuru Suzuki, Yokohama; Mikio Shindo, Hachioji, and Yoichi Kashiwa, Tokyo, all of, Japan, assignors to The Whitaker Corporation, Wilmington, Del.

Filed Dec. 22, 1993, Ser. No. 171,994
Claims priority, application Japan, Jan. 13, 1993, 5-019401; Jan. 29, 1993, 5-006061 U
Int. Cl.[6] H01R *13/40*
U.S. Cl. 439—595 **18 Claims**



1. An electrical connector assembly comprising:

an insulated housing member with a plurality of contact receiving cavities therein, at least one of said cavities includes a resilient arm which is formed on a wall of said at least one cavity,

an electrical contact for insertion into said at least one cavity, said contact having a general box shape with an upper wall portion, said upper wall portion having an upwardly extending projection for sliding engagement with said resilient arm and contact with an end surface of said resilient arm;

and a double lock member for retaining said contact in said housing;

whereby, when said contact is inserted into said at least one cavity said projection engages and deflects said resilient arm for an initial low insertion force, and as the contact is inserted further the insertion force increases as a portion of said resilient arm engages said cavity wall, and when said contact is fully inserted said projection contacts the end surface of said resilient arm thereby retaining said contact in said at least one cavity against separation forces.

5,470,259

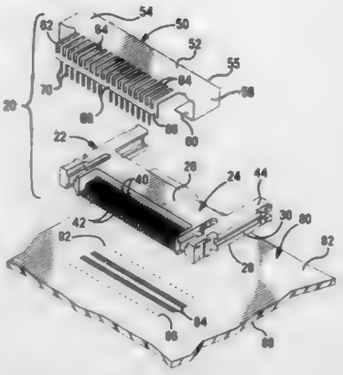
GROUNDING SHROUD FOR SURFACE MOUNTED ELECTRICAL CONNECTOR

John W. Kaufman, Hershey; John A. Root, Middletown, and James L. Schroeder, III, Palmyra, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Dec. 5, 1994, Ser. No. 350,202
Int. Cl.[6] H01R *13/648*
U.S. Cl. 439—607 **4 Claims**

1. A conductive ground shroud for use with an electrical connector having a housing and a plurality of electrical terminals with surface mountable contact sections extending outwardly thereof for electrically engaging circuitry on a circuit board, said connector being adapted to receive and electrically mate to an electrical device, said shroud comprising:

an electrically conductive plate-like body having first and second portions, said first portion being adapted to be disposed



on a board remote surface of said connector housing, said first portion including at least one first contact section adapted to engage a ground contact of the mating electrical device; and

said second portion being configured to extend over said surface mountable contact sections when said shroud is disposed on said housing, said second portion having at least one second contact section extending outwardly therefrom for engagement to ground circuitry of said circuit board;

said second portion further including at least one elongated aperture extending therethrough proximate said surface mountable contact sections;

whereby upon disposing said shroud on said connector housing and mounting said housing and shroud to said circuit board and soldering said surface mountable contact sections to corresponding circuit pads on said board, said at least one aperture permits sufficient heat generated by a board remote source during the soldering process to reach said contact pads to melt said solder thereby assuring electrical engagement of said terminals with said circuitry on said board.

5,470,260

SMART CARD CONNECTOR

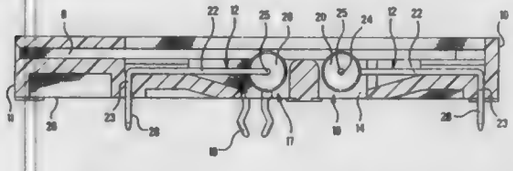
Rainer Schwan, Einhausen, and Rudi Krämer, Lautertal, both of, Germany, assignors to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 15, 1994, Ser. No. 213,418

Claims priority, application United Kingdom, Mar. 25, 1993, 9306177

Int. Cl.[6] H01R *23/70*

U.S. Cl. 439—630 **7 Claims**



1. An electrical connector for electrical connection between electrical circuit traces of a substrate card and electrical circuit traces of a printed circuit board, the electrical connector having a slot profiled for receiving the card therein, and contact members for interconnection to the traces of the printed circuit board, the electrical connector being characterized in that the contact members are electrically connected to contact roller members positioned proximate to said slot, whereby said contact roller members can roll along said printed circuit card during insertion thereof, into engagement with said traces on said printer circuit card, and where contact roller members are defined by resilient electrical contacting members having resilient arms and rotatable wheels, the wheels projecting into the slot when the card is not therein, the wheels rotatable over the card during insertion of the card into the slot, the wheels resiliently biased against the card circuit traces when the card is fully inserted into the slot.

5,470,261

PRESS-IN SPRING CONTACT CONNECTOR

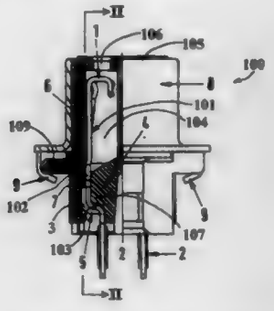
Georges Embo, Langemark; Tom Debrouwere, Wevelgem, and Werner Moyaert, Snellegem, all of, Belgium, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 30, 1994, Ser. No. 297,791

Claims priority, application Germany, Aug. 30, 1993, 43 29 151.1

Int. Cl.[6] H01R *13/436*

U.S. Cl. 439—752 **19 Claims**



1. A press-in connector configured to be mounted into bores of a printed circuit board, the connector comprising:

a plurality of contact springs, each said contact spring having a press-in part, a contact part, a fastening section, and an aperture closed on all sides thereof in the fastening section;

an inner insulator member having a plurality of nose members, the plurality of nose members corresponding to the plurality of contact springs; and

an outer insulator member configured to complimentarily engage the inner insulator member so that each contact spring is respectively arranged and secured in a corresponding chamber formed between the inner and outer insulator members;

wherein each fastening section is clamped between the inner and outer insulator members so that a region of each fastening section is parallel and offset in relation to the respective press-in part, and wherein each aperture respectively receives therein the respective nose member generally perpendicularly to the fastening section.

5,470,262

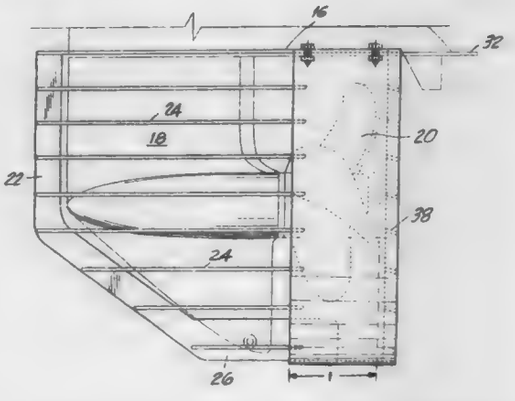
PROPELLER ENCLOSURE

Pedro Bustillo, Sr., Carolina, Puerto Rico, assignor to Bustillo Investment Corp., Santurce, Puerto Rico

Filed Jun. 1, 1994, Ser. No. 251,904

Int. Cl.[6] B63H *5/16*

U.S. Cl. 440—72 **3 Claims**



1. A boat motor enclosure to provide both protection from a propeller and protection to the propeller comprising:

a mounting bracket,

a fence portion extending down from and attached to said mounting bracket, said fence portion being dimensioned to encompass the skeg portion of an outboard motor, said fence portion having a set of spaced apart ribs to deflect large objects and to provide substantial open zones through which water can readily flow, said fence portion including at least one mounting rib attached to said mounting bracket,

a substantially U-shaped band portion extending down from and attached to said mounting bracket, said band portion extending around the majority of the circumference of the propeller blades, said band portion having a substantially U-shaped forward edge which is attached to the rear of said fence portion, said band portion having a substantially U-shaped rear edge defining a rear opening and a surface connecting said front and rear edges,

a cover mounted across said rear edge of said band portion, said cover having a plurality of spaced apart slats positioned over substantially all of the rear opening to prevent inadvertent contact between the propeller and objects and to allow passage of water therethrough and also angled to provide trim-tab like action to maintain the propeller under water,

said fence portion, said band portion and said cover defining a space within which the skeg and propeller of the boat motor are containable,

the surface of said band portion and the mounting plate providing substantially complete shielding of said propeller blades around the majority of the circumference of the propeller blades to improve motor.

5,470,263

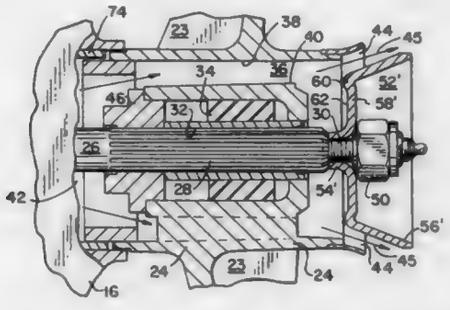
METHOD AND APPARATUS FOR IMPROVING REVERSE THRUST OF A MARINE DRIVE

John M. Griffiths, Fond du Lac, Wis.; David A. Gussert, Englewood, Fla., and Michael A. Karls, Hilbert, Wis., assignors to Brunswick Corporation, Lake Forest, Ill.

Filed Apr. 28, 1994, Ser. No. 234,397

Int. Cl.[6] B63H *21/28*

U.S. Cl. 440—75 **23 Claims**



1. A method of retrofitting a reversible marine drive to increase reverse thrust, the marine drive having a lower gearcase, a gearcase exhaust passage, a propeller shaft extending rearwardly from the gearcase and having a threaded rear end, a propeller hub drivingly mounted to the propeller shaft and having a first inner diameter portion in contact with the propeller shaft and a second inner diameter portion radially outward of the first inner diameter portion and a first outer diameter portion between the first and second inner diameter portions wherein the first outer diameter portion and the second inner diameter portion define a through-hub exhaust passage communicating with the gearcase exhaust passage and a rear underwater exhaust discharge opening being generally rearward in the propeller hub, a retaining nut threadedly engaging the threaded rear end of the propeller shaft, and a rear thrust washer disposed between the propeller hub and the retaining nut such that the propeller hub has limited fore and aft movement with respect to the propeller shaft, the method comprising replacing the rear thrust washer with a reverse thrust cup, the reverse thrust cup having at least first and second diameter portions, the first diameter portion being forward of the second diameter portion and having a diameter less than that of the first inner diameter portion of the propeller hub, and the second diameter portion being rearward of the second inner diameter portion of the propeller hub and having a diameter greater than that of the second inner diameter portion of the propeller hub, and wherein the propeller hub is allowed to slide on the propeller shaft from a forward position allowing exhaust to discharge out the rear underwater exhaust discharge opening to a rearward position allowing exhaust to discharge out a forward underwater exhaust discharge opening.

5,470,264

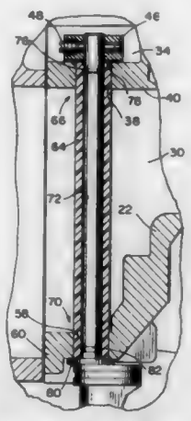
MARINE DRIVE SHIFT SHAFT MOUNTING SYSTEM

Edward C. Eick, Stillwater, Okla., assignor to Brunswick Corporation, Lake Forest, Ill.

Filed Nov. 15, 1994, Ser. No. 339,938

Int. Cl.[6] B63H *23/34*

U.S. Cl. 440—83 **6 Claims**



1. A shift shaft assembly for a marine drive system, comprising:

a housing including a passage defined by a bottom wall having a first bore extending therethrough, and a top wall having a second bore extending therethrough;

a shift shaft having a first end portion extending into the first bore in the bottom wall of the passage and a second end portion extending into the second bore in the top wall of the passage; and

an elongated, tubular sleeve having an inner surface defining a shift shaft receiving passage for receiving of the shift shaft therethrough, the sleeve extending through the passage and having a first end sealably mounted in the first bore about the first end portion of the shift shaft, and a second end sealably mounted in the second bore about the second end portion of the shift shaft.

5,470,265

MULTI-ELECTRON SOURCE, IMAGE-FORMING DEVICE USING MULTI-ELECTRON SOURCE, AND METHODS FOR PREPARING THEM

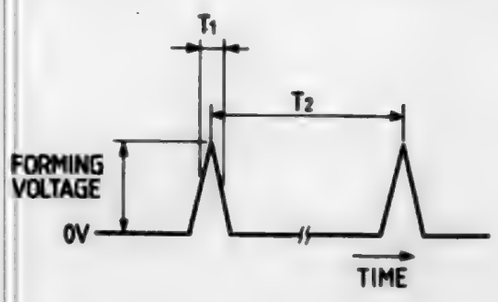
Ichiro Nomura, Atsugi; Yoshikazu Banno, Ebina; Tetsuya Kaneko, Yokohama; Toshihiko Takeda, Atsugi, and Kumi Iwai, Isehara, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1993, Ser. No. 10,302

Int. Cl.[6] H01J *9/02;1/30*

U.S. Cl. 445—24 **10 Claims**

1. A method for preparing a multi-electron source which comprises subjecting conductive films arranged between electrodes to a conduction treatment to form a plurality of electron emitting portions at a time, said conduction treatment being carried out by applying a pulse voltage between said electrodes.

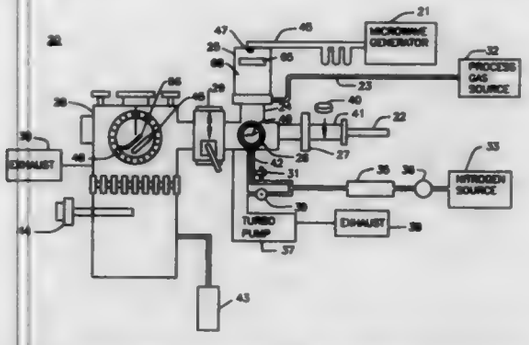


5,470,266

LOW TEMPERATURE PROCESS AND APPARATUS FOR CLEANING PHOTO-CATHODES

Donald H. Stanley, Bedford; Robert Peckman, Roanoke, and Weston K. Peregoy, Jr., Fredericksburg, all of Va., assignors to ITT Corporation, New York, N.Y.

Filed Jul. 6, 1994, Ser. No. 271,028
Int. Cl.[6] H01J 9/38;9/12
U.S. Cl. 445—59 28 Claims



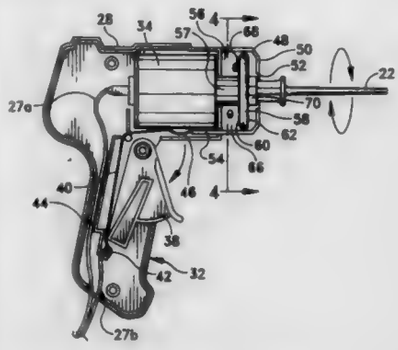
1. In a low temperature process for cleaning a photo-cathode having a Group III/V semiconductor surface with contaminants thereon, the improvement comprising applying plasma particles to said photo-cathode to remove said contaminants from said photo-cathode.

5,470,267

SPARK PRODUCING MECHANISM

Edward P. Busam, Mason, Ohio, assignor to Hasbro, Inc., Pawtucket, R.I.

Filed Feb. 10, 1995, Ser. No. 386,849
Int. Cl.[6] A63H 33/36
U.S. Cl. 446—22 5 Claims



1. A spark producing mechanism comprising

(a) a housing defining a substantially enclosed interior area, said housing including a transparent wall portion for viewing said interior area;

(b) an abrasive element in said housing having a rough abrasive surface thereon, said abrasive element being mounted in said housing and rotatable with respect to said housing for rotation about a predetermined axis and cooperating with said housing for defining an enclosed cavity therebetween;

(c) a flint element loosely captured in said cavity, said flint element being dimensioned to travel freely in said cavity such that said flint element can randomly contact and deflect off of said abrasive surface to randomly produce sparks during rotation of said abrasive element in said housing; and

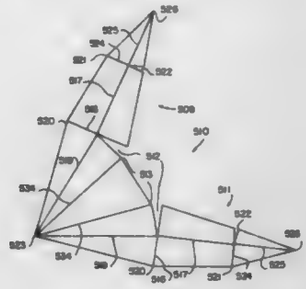
(d) means for rotating said abrasive element in said housing.

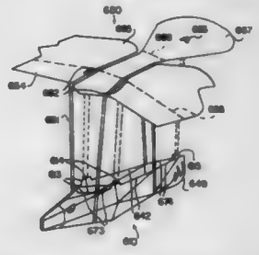
5,470,268

MODEL AIRPLANE OR TOY GLIDER

Madhava Dasa, P.O. Box 461, Kula, Hi. 96790-0461

Division of Ser. No. 179,231, Apr. 8, 1988, Pat. No. 4,957,465.
This application Sep. 17, 1990, Ser. No. 583,094
The portion of the term of this patent subsequent to Aug. 28, 2010, has been disclaimed.
Int. Cl.[6] A63H 27/01;27/18
U.S. Cl. 446—67 10 Claims





1. A model airplane or toy glider having a wing adapted to be assembled with a complex three dimensional folded fuselage constructed of of semi-rigid scoreable and foldable material, said fuselage having generally symmetrical left and right half portions joined along less than the length of said fuselage, said fuselage in unassembled unfolded condition being generally V-shaped, said folded fuselage being attached to said wing via elastic band.

5,470,269

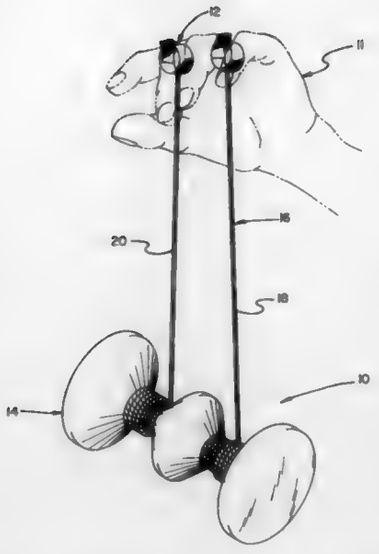
DUAL STRING YO-YO

Holly K. Ambroz, 2907 W. Cottage, Grand Island, Nebr. 68803

Filed Aug. 22, 1994, Ser. No. 293,892
Int. Cl.[6] A63H 1/30
U.S. Cl. 446—250 1 Claim

1. A new and improved dual string yo-yo toy for human entertainment comprising:

first and second string members attached to a body member, said body member having an axis of rotational symmetry wherein the body member comprises a cylinder having a first end portion of enlarged diameter, a first neck portion of smaller



diameter, a central disposed portion of enlarged diameter, a second neck portion of smaller diameter, and a second end portion of enlarged diameter, said first neck portion and said second neck portion comprise substantially solid cylindrical shapes and are susceptible to windingly disposing and recovering portions of two string members thereon, furthermore said first neck portion has a spirally formed channel producing a first threadlike string

engaging feature, and said second neck portion has a spirally formed channel producing a second threadlike string engaging feature wherein said first end second threadlike features exhibit mirror symmetry about a plane orthogonally disposed to the axis of rotational symmetry and passing through the center of the body member whereby said channels are capable of assisting the orderly winding and unwinding of the strings;

each of the string members having a free end, wherein said string members are affixed to said body member, and;

a first finger engagement means capable of attaching a human finger and said free end of the first string member;

a second finger engagement means capable of attaching a human finger and said free end of the first string member.

5,470,270

DOLL WITH BABY-HUGGING CAPABILITIES

Cecil H. Beamon, Jr., and Linda L. Beamon, both of 603 Stoneview Trail, Lilburn, Ga. 30247

Filed Nov. 23, 1994, Ser. No. 344,013

Int. Cl.[6] A63H *13/00*

U.S. Cl. 446—354 **3 Claims**

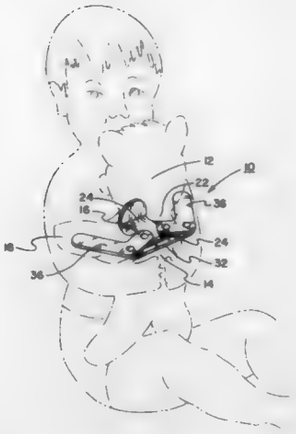
1. A new and improved doll with baby-hugging capabilities comprising, in combination:

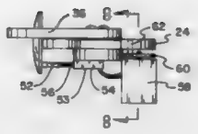
a doll having a main body portion with a chest and with arms extending outwardly therefrom;

a motion imparting mechanism within the doll comprising a horizontally-disposed central plate, the central plate having a rearward end and a forward end with an axially movable shield positionable in the chest area of the doll and adapted to be positioned adjacent the chest of a child playing with the doll;

a secondary plate positioned beneath the central plate, the secondary plate having a front surface and a rear surface being adapted to move toward and away from the shield upon the application of forces to the rear surface of the secondary plate;

a pair of similarly-shaped squeezer arms in an L-shaped configuration with short interior segments terminating at interior





ends with apertures thereadjacent and with long exterior segments and with central sections therebetween positioned in the arms of the doll;

first pivot pins securing the interior ends of the squeezer arms to the central plate adjacent to its rearward end for rotational movement of the squeezer arms with respect to the central plate, the apertures in the squeezer arms being elongated;

secondary pivot pins securing the central sections of the squeezer arms to the lower plate whereby when the lower plate is moved toward the shield, the long exterior segments of the arms will move inwardly about the first pivot pins; and

an electrical sensor within the main body portion with a reciprocable rod positioned between the shield and the electrical sensor and with a spring tending to urge the shield away from the electrical sensor, the electrical sensor being operated by the axial movement of the shield toward the electrical sensor to generate a signal to rotate a solenoid, the solenoid adapted to reciprocate the secondary plate toward and away from the shield to effect the rotational movement of the squeezer arms to effect a hug by the doll to the child with its chest against the chest of the doll and the shield when effecting a squeezing motion thereto.

5,470,271

FLEXIBLE BELT RECLAIMING

David R. Briggs, Rochester; Erwin E. Proseus, Marian; Frances Tracey, Pittsford; William G. Herbert, Williamson; Gary J. Bach, Bloomfield; Charles A. Hutchinson, Rochester; Alan L. Dudley, Ontario; Wayne F. Riker, Williamson; Willie McFadden, Jr., Penfield; Peter J. Schmitt, Ontario, and Henry T. Mastalski, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

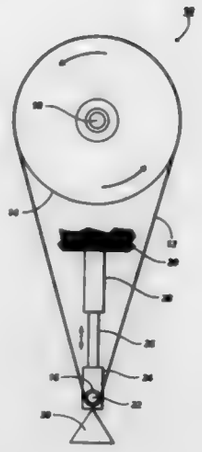
Continuation of Ser. No. 815,795, Jan. 2, 1992, abandoned.

This application Jun. 14, 1994, Ser. No. 259,364

Int. Cl.[6] B24B *27/033*

U.S. Cl. 451—55 **12 Claims**

1. A process for removing a photoconductive layer from a substrate comprising providing a flexible belt photoreceptor comprising a photoconductive layer on the outer surface of a flexible metal belt substrate, said photoconductive layer comprising a selenium composition selected from the group consisting of amorphous selenium and selenium alloy, heating said belt photoreceptor until said photoconductive layer forms blisters on said flexible metal belt substrate, transporting said substrate through an arcuate path having a small radius of curvature to apply stress to said photoconductive layer, and abrasively removing substantially all of said selenium composition remaining on said substrate.

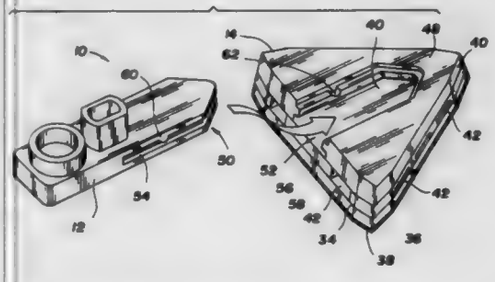


5,470,272

REMOVABLE WORKING TOOL ASSEMBLY

Naoki Kikuchi, Chandler, Ariz., and Nobuto Kai, Fuchu, Japan, assignors to Ryobi Motor Products Corp., Easley, S.C.

Filed Feb. 3, 1994, Ser. No. 191,515
Int. Cl.[6] B24B 23/00
U.S. Cl. 451—344 23 Claims



1. A removable working tool assembly to be used with a power driven tool having a drive shaft, the removable working tool assembly comprising:

a drive member which can be operably connected to the drive shaft of the power tool; and

a support member having a tool surface; and

one of the drive and support members defining a male connection mechanism and the other one of the drive and support members defining a female connection mechanism such that the male connection mechanism may operably engage the female connection mechanism without the need for tools or any other fastener elements, allowing the support member to be easily disconnected and reconnected to the drive member;

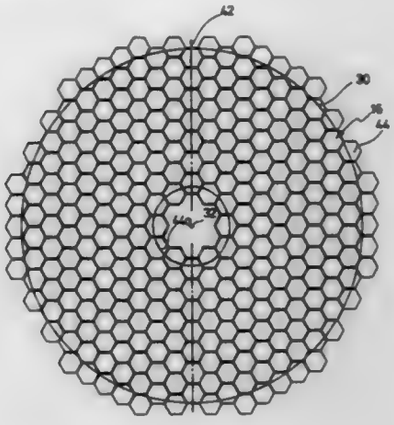
wherein one of the male and female connection mechanisms has a raised portion and the other one of the male and female connection mechanisms has a depression such that the raised portion and the depression engage when the male connection mechanism engages the female connection mechanism thereby preventing the male connection mechanism from being disengaged from the female connection mechanism during use.

5,470,273

GRINDING WHEEL FOR SURFACE CUTTING OF WORKPIECES

Udo Mertens, Halstenbek, Germany, assignor to Ernst Winter & Sohn (GmbH & Co.), Hamburg, Germany

Filed Nov. 29, 1993, Ser. No. 159,445
Claims priority, application Germany, Dec. 2, 1992, 42 40 476.2
Int. Cl.[6] B24D 7/06
U.S. Cl. 451—548 7 Claims



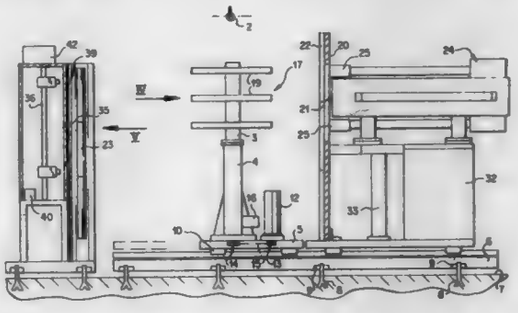
1. A grinding wheel having an axis and an inner and outer circumference, and a grinding surface extending in a plane perpendicular to the axis of said wheel for surface machining of workpieces, said wheel comprising a carrier body and an annular abrasive lining attached to said carrier body and defining said plane grinding surface, said abrasive lining comprising a plurality of individual separate hexagonal and equilateral grinding portions which have been attached one after the other to said carrier body such that, when attached, some sections of said individual grinding portions had projected radially and/or outwardly beyond said grinding wheel circumferences and said and/or radially outward projecting sections have been removed by machining whereby after machining, the grinding portions along the inner and/or outer circumferences are no longer complete equilateral hexagons.

5,470,274

DEVICE FOR CLASSIFYING CARCASSES OF LARGE CATTLE, CALVES, HOGS OR SHEEP

Rachid Kadi, Champigny Sur Marne; Jean Leclere, Creteil, and Janusz Plusa, Sucy En Brie, all of, France, assignors to Normaclass R.D., Paris, France

Filed Jun. 27, 1994, Ser. No. 265,802
Claims priority, application France, Jul. 9, 1993, 93 08727
Int. Cl.[6] A22C 17/00; B07C 5/342
U.S. Cl. 452—184 17 Claims



1. A device for classifying carcasses of large cattle, calves, hogs or sheep, comprising: a system, against which a side of meat

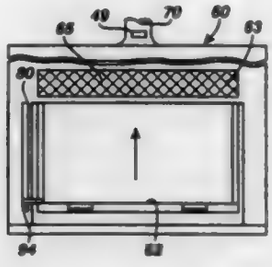
suspended from a conveyor of a slaughterhouse line bears, for orientating the side of meat about a hanging point of the meat; a system, located on one side of the conveyor, for recording images of the side of meat, a contrasting background situated facing the system for recording images, on the opposite side of the conveyor; a system for processing the images; and a control system, wherein the system against which each side of meat bears comprises a vertical post, the axis of which passes through the axis of a hook of the conveyor, the post being rotatably driven by a gear motor unit and associated with a mechanism for indexing the angular position of the post; the post having two series of bearing limit stops for the side of meat diametrically opposite each other, each limit stop including a support fixed to the post used for mounting a horizontal bar forming the limit stop.

5,470,275

METHOD AND APPARATUS FOR CONTROLLING FUME HOOD FACE VELOCITY USING VARIABLE BY-PASS RESISTANCE

Steven D. Jacob, Roselle; James J. Coogan, Des Plaines, and Stefan G. Petras, Lindenhurst, all of Ill., assignors to Landis & Gyr Powers, Inc., Buffalo Grove, Ill.

Filed Apr. 5, 1993, Ser. No. 42,824
Int. Cl.[6] B08B 15/02
U.S. Cl. 454—61 15 Claims



13. Apparatus for controlling a flow control means for controlling the air flow through a fume hood to maintain a predetermined average face velocity through an uncovered portion of a face opening of a fume hood of the type which has at least one moveable sash door adapted to cover the opening as the fume hood sash door is moved and having a by-pass opening with a grille means overlying the by-pass opening, the by-pass opening being adapted to be at least partially blocked responsive to movement of at least one of said sash doors, the fume hood being in communication with an exhaust duct for expelling air and fumes from the fume hood, said apparatus comprising:

means for generating signals indicative of the position of each sash door;

control means for determining the size of the uncovered face opening and the overall size of the unblocked by-pass opening responsive to said generated signals;

said control means modifying the overall size of said unblocked by-pass opening by a factor to compensate for the change in flow characteristic resulting from the presence of said grille means;

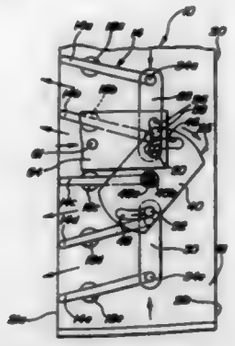
said control means generating a signal indicating the total effective opening size from said generated signals and from said modified size of said unblocked by-pass opening, and controlling said flow control means to provide the desired average face velocity utilizing said signal indicating said total effective opening size.

5,470,276

DIFFUSER AIR OUTLET

Joseph G. Burnell, Harrison Township, and Gary J. Clark, Troy, both of Mich., assignors to Aeroquip Corporation, Maumee, Ohio

Filed Sep. 21, 1993, Ser. No. 124,927
Int. Cl.[6] B60H 1/34
U.S. Cl. 454—155 14 Claims



1. A diffuser air outlet comprising:

a plurality or directional vanes journaled generally parallel to each other and oriented generally horizontally;

a plurality of moveable vane linkage arms connected to a predetermined number of said directional vanes in each of at least two distinct groups, said vane linkage arms having a plurality of apertures extending therethrough and said directional vanes having journal members protruding at each and therefrom with at least one of said journal members on each of said directional vanes received in said apertures for rotation therein;

rotatable means cooperating with said vane linkage arms for moving said at least two distinct groups between a focused position and a diffused position; and

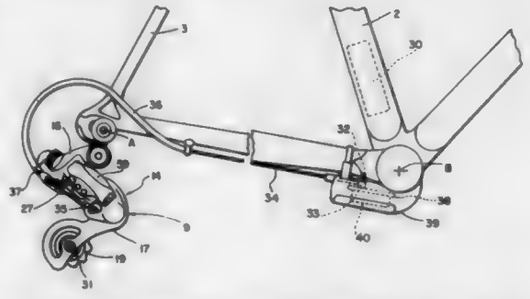
said rotatable means comprising at least one cam plate connected to one of said directional vanes and cooperating with each of said vane linkage arms.

5,470,277

POWER OPERATED GEAR CHANGE ASSEMBLY FOR BICYCLES

Antonio Romano, Padova, Italy, assignor to Campagnolo S.r.l., Vicenza, Italy

Filed Jun. 9, 1994, Ser. No. 257,148
Claims priority, application Italy, Jul. 8, 1993, T093A0503
Int. Cl.[6] F16H 9/00;59/00
U.S. Cl. 474—70 17 Claims



1. A power operated gear change assembly for bicycles, comprising an endless chain, a plurality of sprocket pinions arranged coaxially to one another, having different diameters and selectively engageable by said endless chain, a derailleur displaceable into a plurality of positions each corresponding to engagement of the chain with a respective sprocket pinion, a powered actuator for

performing displacement of the derailleur through said plurality of positions, manual control means for operating said actuator, detecting means for detecting displacement of the derailleur, and control means operatively associated to said detecting means and controlling operation of said actuator, wherein the powered actuator is a d.c. electric motor with associated power supply accumulator, and wherein:

the electric motor is directly fitted on the derailleur,

the detecting means comprise an electromechanical transducer device arranged in a remote position relative to the derailleur and having a movable member, and a transmission member interconnecting said movable member of the transducer device and the derailleur;

said accumulator is of rechargeable type and the gear change incorporates a dynamo-electric unit for recharging said accumulator,

the derailleur of the gear change comprises a stationary body intended to be fixed onto a bicycle frame, and a rocker arm movable body connected to the stationary body and carrying idle wheels for the chain, and

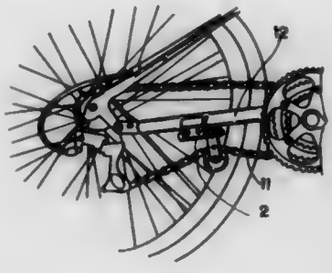
said dynamo-electric unit is incorporated within at least one of said idle wheels of the rocker-arm body.

5,470,278

ADJUSTABLE DEVICE FOR TENSIONING A BICYCLE DRIVE CHAIN

Tse-Min Chen, P.O. Box 1750, Taichung, Taiwan, Prov. of China

Filed Jan. 9, 1995, Ser. No. 370,416
Int. Cl.[6] F16H 7/12
U.S. Cl. 474—133 **2 Claims**



1. An adjustable device for pressing a bicycle drive chain comprising:

a fastening seat comprising two separated fastening pieces held together by a fastening bolt such that an upper pressing hole and a lower pressing hole are formed therebetween, said upper pressing hole being so dimensioned as to hold therein securely a side frame of a bicycle frame;

a shaft of a tubular construction and provided with a through hole, said shaft having one end which is held securely in said lower pressing hole of said fastening seat;

two support arms provided respectively with an upper through hole and a lower through hole;

an upper pivot and a lower pivot, said upper pivot being engageable with said through hole of said shaft and said upper through holes of said two support arms;

a pressing wheel having an axial hole provided therein with a bushing, said pressing wheel having respectively at both ends thereof a protecting flange, said pressing wheel mounted on said lower pivot engageable with said axial hole and said lower through holes of said two support arms such that said pressing wheel can be tilted so as to press effectively a bicycle drive chain; and

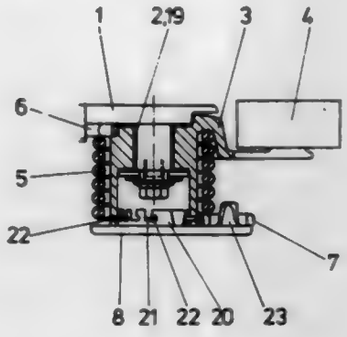
two rotary seats of a semicircular construction and provided respectively with an arcuate slot engageable with said upper pivot, said two rotary seats located respectively between said shaft and said two support arms.

5,470,279

PRESETTABLE BELT TENSION DEVICE

Manfred Brandenstein, Eussenheim; Wolfgang Friedrich, Schweinfurt; Roland Haas, Hofheim; Gerhard Herrmann, and Armin Olschewski, both of Schweinfurt, all of, Germany, assignors to SKF GmbH, Schweinfurt, Germany

Continuation of Ser. No. 698,400, May 10, 1991, abandoned.
This application Nov. 8, 1993, Ser. No. 149,131
Claims priority, application Germany, May 10, 1990, 40 15 028.3
Int. Cl.[6] F16H 7/08
U.S. Cl. 474—135 **8 Claims**



1. A belt tensioning device which is preadjustable after assembly in an auxiliary device, the device including a mounting element for attachment to an auxiliary device, a supporting member pivotally mounted on said mounting element, a tension roller rotatably carried by said supporting member, and a spring having a first end engaging and secured to and urging said supporting member to pivot relative to said mounting element the improvement of adjustment indicators on said supporting member and said mounting element respectively, means for pivoting said mounting element relative to the supporting element until said indicators coincide, an adjustment element for engaging said second end of the spring and tensioning said spring relative to said supporting element until a predetermined tension exists therebetween while said indicators coincide, and means for fixing said adjustment element to said mounting element, whereby subsequent pivoting of said adjusting element until said indicators coincide will automatically apply said predetermined tension to said spring.

5,470,280

BELT TENSIONER

Kazumasa Ayukawa, Yamatokoriyama, Japan, assignor to Unitta Company, Osaka, Japan

Filed Jul. 27, 1994, Ser. No. 281,103
Claims priority, application Japan, Mar. 18, 1994, 6-073822
Int. Cl.[6] F16H 7/12
U.S. Cl. 474—135 **21 Claims**

1. A belt tensioner comprising:

a stationary member;

a tensioner arm connected to said stationary member via a swing shaft and being swingable about said swing shaft with respect to said stationary member;

a belt engaging member for engaging a belt and rotatably arranged on said tensioner arm via a rotatable shaft, said belt engaging member being rotated by said belt;

a coiled spring coiled around said swing shaft, said coiled spring urging said tensioner arm rotationally around said swing shaft so that said belt engaging member tensions said belt;

a damping member arranged between said stationary member and said tensioner arm so that friction is produced between said stationary member and said damping member in order to damp a swinging motion of said tensioner arm when said tensioner arm swings; and

urging means for urging said damping member toward said stationary member swing shaft in a direction substantially perpendicular to a longitudinal axis of said swing shaft in order to produce said friction.

5,470,281

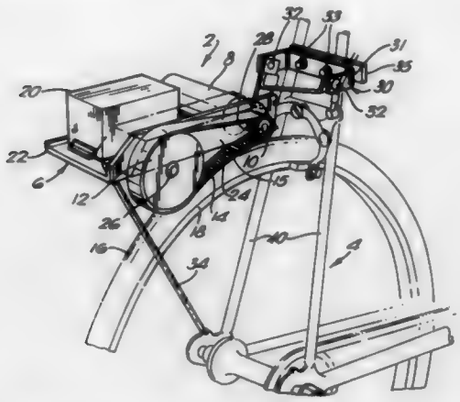
DRIVE APPARATUS FOR A CYCLE

Clive M. Sinclair, London, England, assignor to Sinclair Research Limited, London, England

Filed Sep. 8, 1994, Ser. No. 302,538

Int. Cl.[6] F16H *7/00*

U.S. Cl. 474—139 **10 Claims**



1. Drive apparatus for a cycle, which drive apparatus comprises a frame, a motor, a first pulley which is driven by the motor, a second pulley, and an endless belt which passes around the two pulleys and which is driven by the first pulley, the drive apparatus being such that during use the belt is in driving engagement with a tire of a wheel of the cycle, and the drive apparatus also being such that during use the first pulley does not engage the tire.

5,470,282

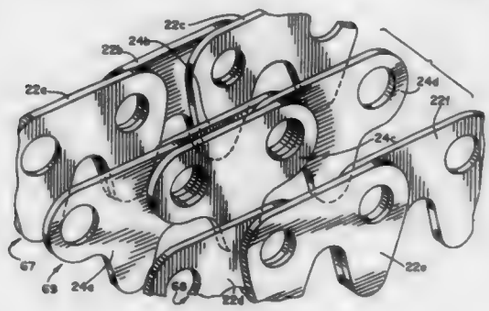
PHASED CHAIN ASSEMBLIES HAVING LINKS WITH A SINGLE TOE

Timothy J. Ledvina, Groton, and Philip J. Mott, Dryden, both of N.Y., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Division of Ser. No. 328,702, Oct. 25, 1994, Pat. No. 5,437,581, which is a division of Ser. No. 131,473, Oct. 4, 1993, Pat. No. 5,427,580, which is a continuation-in-part of Ser. No. 885,194, May 19, 1992, abandoned. This application Apr. 13, 1995, Ser. No. 423,384

Int. Cl.[6] F16H *7/06*

U.S. Cl. 474—156 **11 Claims**



1. A power transmission chain comprised of a plurality of interleaved sets of inverted tooth links, said inverted tooth links being adapted to contact the teeth of a sprocket, pivot means connecting adjacent sets of links, each link defining a pair of apertures for receiving said pivot means, said interleaved sets of links forming columns of links along the length of the chain, some of said columns of links including links having a pair of toes separated by a crotch, others of said columns of links including links having a single toe.

5,470,283

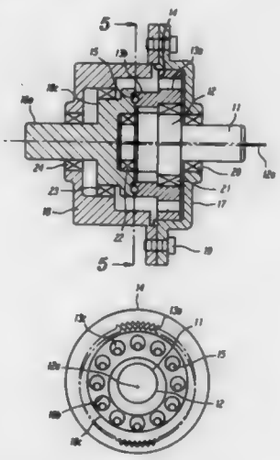
SPEED REDUCTION DEVICE

Yoshio Seidou, 101-13 Aokubo, Oshi Nagano-Ken, Japan

Filed Jan. 10, 1994, Ser. No. 179,561

Int. Cl.[6] F16H *1/28*

U.S. Cl. 475—162 **9 Claims**



8. A speed reduction device comprising

a housing;

an input shaft to rotate in the housing;

an eccentric shaft to rotate with the input shaft;

a ring gear outside of the eccentric shaft, concentric with the input shaft and fixed to the housing;

a gear wheel to rotate on the eccentric shaft and engaging the ring gear, the ring gear and the gear wheel having different numbers of teeth;

an output shaft to rotate in the housing coaxially with the input shaft;

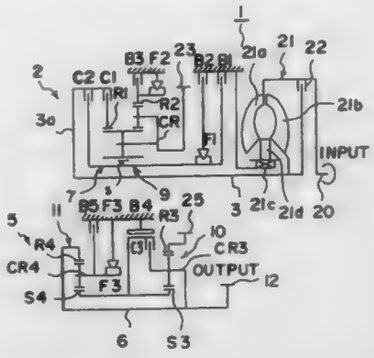
a dynamic coupling between the gear wheel and the output shaft to rotate the gear wheel and the output shaft at the same speed, including balls, a first surface on the gear wheel having first cavities in the first surface each with a constant radius of curvature substantially equal to the radius of the balls and a second surface on the output shaft facing the first surface and having second cavities in the second surface each with a surface being curved inwardly generated by a constant radius curve having a radius of curvature substantially equal to the radius of the balls and being rotated about an axis with the center of curvature of the constant radius curve at a distance from the axis equal to the eccentric radius of the eccentric shaft, the balls each being positioned in a first cavity and a second cavity, respectively.

5,470,284

AUTOMATIC TRANSMISSION

Takao Taniguchi, Okazaki; Kazumasa Tsukamoto, Toyota; Masahiro Hayabuchi, Anjo; Satoru Kasuya, Hekinan; Nobutada Sugiura, Nishio, and Masaaki Nishida, Anjo, all of, Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Jun. 30, 1994, Ser. No. 269,059
Claims priority, application Japan, Jun. 30, 1993, 5-187432
Int. Cl.[6] F16H 3/44
U.S. Cl. 475—204 6 Claims



1. An automatic transmission, providing five forward speeds and one reverse speed, comprising:

a casing;

first and second parallel transmission shafts rotatably mounted within said casing;

a fluid coupling for transmitting engine power to said first shaft and a housing for said fluid coupling joined to said casing to form an integral casing unit;

a main transmission mechanism mounted within said casing, coaxially with said fluid coupling on said first shaft, said main transmission mechanism providing three forward speeds and one reverse speed and including:

a planetary gear train coupled to said fluid coupling; and

an output unit connecting said planetary gear train and arranged between said planetary gear train and said fluid coupling;

an auxiliary transmission mechanism mounted within said casing on said second shaft, said auxiliary transmission mechanism providing three forward speeds and including:

a hollow output shaft mounted on said second shaft;

a band brake which is engaged at 2nd speed of said auxiliary transmission mechanism;

a multi-disc clutch which is engaged at 3rd speed of said auxiliary transmission mechanism and a first hydraulic servo for said multi-disc clutch including a first cylinder and a piston slidably mounted in said first cylinder, said multi-disc clutch and said first hydraulic servo being connected to said integral casing through said band brake, said band brake being arranged around the outer circumference of said first hydraulic servo;

a multi-disc brake which is engaged at 1st speed of said auxiliary transmission mechanism and a second hydraulic servo for said multi-disc brake including a second cylinder and a piston slidably mounted in said second cylinder;

a first planetary gear set comprising a first ring gear, connected to the output unit of said main transmission mechanism and serving as an input unit for said auxiliary transmission mechanism, a first carrier connected to said output shaft and a first sun gear engageable with said first carrier through said multi-disc clutch and said first hydraulic servo; and

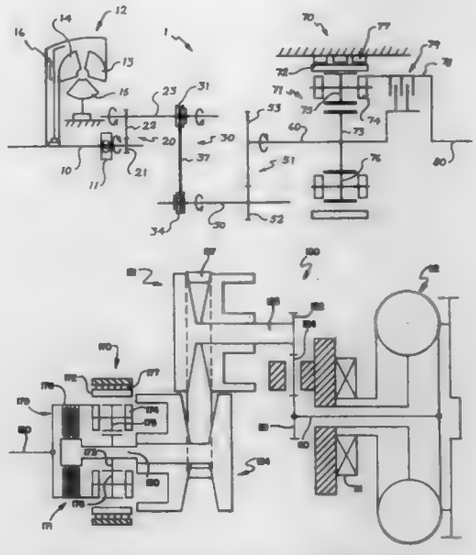
a second planetary gear set comprising a second ring gear connected to said output shaft, a second carrier engageable with said integral casing through said multi-disc clutch and a second sun gear connected to said first sun gear through said hydraulic servo for said multi-disc clutch.

5,470,285

COMPACT CONTINUOUSLY VARIABLE TRANSMISSION LAYOUT FOR REAR WHEEL DRIVE VEHICLES

Karl F. Schneider; Stanley K. Dembosky, both of Ithaca, N.Y.; Donn K. Fairbank, Naperville, Ill.; Romas B. Spokas, Ithaca, and Bradley L. Keeney, Groton, both of N.Y., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Jul. 20, 1993, Ser. No. 94,612
Int. Cl.[6] B60K 17/00; F16H 37/02
U.S. Cl. 475—210 15 Claims



1. A power transmission system to provide transmission of torque from a power input to a power output, comprising:

a. an input shaft disposed for operative connection to a power input;

b. an output shaft disposed for operative connection to a power output, the output shaft being substantially coaxial with the input shaft;

c. a first transfer gear assembly disposed for operative connection to the input shaft, the first transfer gear assembly being operatively connected to a first intermediate shaft;

d. a second transfer gear assembly disposed for operative connection to a second intermediate shaft, the second transfer gear assembly being operatively connected to a third intermediate shaft, the third intermediate shaft being substantially coaxial with and operatively connected to the output shaft; and

e. a continuously variable transmission assembly comprising a first adjustable pulley mounted to the first intermediate shaft, the first adjustable pulley comprising a first flange fixed to the first intermediate shaft and a second flange mounted to the first intermediate shaft for axial movement along the first intermediate shaft, a second pulley mounted to the second intermediate shaft and a belt interconnecting the first adjustable pulley and the second pulley.

5,470,286

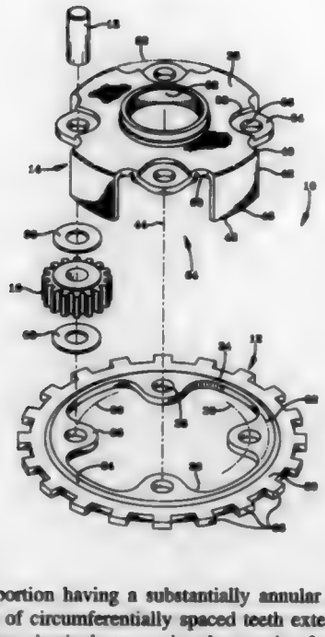
REACTION CARRIER ASSEMBLY HAVING ZERO RELATIVE PIN DEFLECTION

Changming Fan, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 29, 1994, Ser. No. 282,999
Int. Cl.[6] F16H 1/28
U.S. Cl. 475—331 12 Claims

1. A reaction carrier assembly for a planetary gear set having a central axis, said carrier assembly providing zero relative pin deflection for the planet gear support pins and comprising:

a base portion and a spider portion;



said base portion having a substantially annular flange with a plurality of circumferentially spaced teeth extending radially outwardly selectively to receive the reactive force;

said substantially annular flange also having first ears extending radially inwardly;

said first ears provided with a receiving bore;

said spider portion having a deck with a plurality of circumferentially spaced legs extending substantially parallel to said central axis;

a plurality of peripherally spaced second ears extending radially outwardly of said deck in alternating relation with said legs;

said second ears provided with a receiving bore;

said receiving bores in said first and second ears disposed in register with each other to receive a planet gear support pin therein.

5,470,287

COMMON TYPE ENGINE CONTROLLER FOR CONTROLLING AUTOMOTIVE ENGINE IN ACCORDANCE WITH THE TYPE OF TRANSMISSION

Takanori Fujimoto, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 16, 1994, Ser. No. 307,180

Claims priority, application Japan, Sep. 29, 1993, 5-243277

Int. Cl.[6] B60K *41/06;17/04;* **F02D** *41/06*

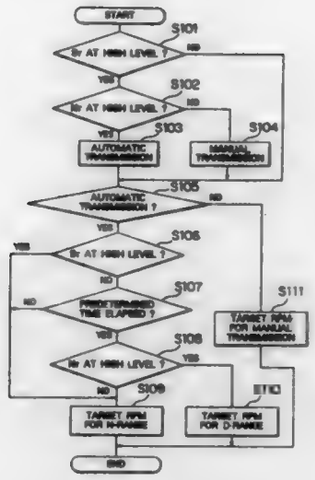
U.S. Cl. 477—99 **9 Claims**

1. A common type engine controller for controlling an engine of an automotive vehicle in accordance with a kind, automatic or manual, of a transmission associated with said engine, said engine controller comprising:

first signal generator means for generating a first signal which is at a first level when said engine is started, and is at a second level otherwise;

second signal generator means for generating a second signal which, in the case where said transmission associated with said engine is automatic, is at a first level when said engine is started, and which is continually at a second level in the case where said transmission associated with said engine is manual; and

first judgment means, coupled to said first and second signal generator means, for determining said kind of said transmission in response to said first and second signal, wherein, upon receiving said first level of said first signal, said first judgment means determines that the transmission is automatic if said second signal is at said first level; and that the transmission is manual if said second signal is at said second level.



5,470,288

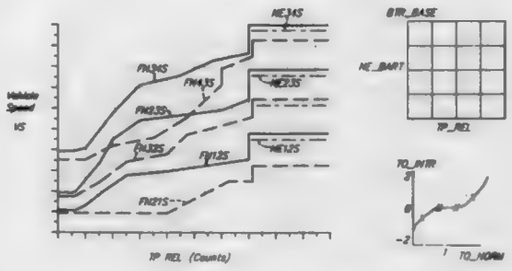
ENGINE TORQUE COMPENSATION SHIFT SCHEDULING OF AN AUTOMATIC TRANSMISSION FOR MOTOR VEHICLES

Bruce J. Palansky, Livonia; Thomas L. Greene, Plymouth, and Eileen A. Schock, Dexter, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 6, 1993, Ser. No. 132,417

Int. Cl.[6] B60K *41/06;* **F16H** *59/14*

U.S. Cl. 477—110 **21 Claims**



1. A system for controlling gear ratio changes in an automatic transmission having a torque converter bypass clutch for use in a motor vehicle, comprising:

an engine having a variable position throttle for controlling the engine;

means containing a gearshift schedule developed at reference engine output torque BTR BASE, the schedule defining conditions under which upshifts in gear ratio from a current gear ratio can occur, and means for determining the current magnitude of reference engine output torque BTR BASE;

means for calculating current engine output torque TQ NET;

means for determining current vehicle speed;

means for determining a vehicle speed adjustment to account for a difference between the current engine output torque and reference BTR BASE;

means for determining from the gearshift schedule a predetermined vehicle speed FNXXS above which an upshift from the current gear ratio can occur;

means for calculating engine torque compensation vehicle speed from said vehicle speed adjustment and said predetermined vehicle speed;

means for comparing current vehicle speed to the engine torque compensated vehicle speed; and

means for producing an upshift when said comparison indicates current vehicle speed exceeds said engine torque compensated vehicle speed.

5,470,289

METHOD FOR SMOOTHING OUT ACCELERATION JERKS OF A VEHICLE PROPELLED BY AN INTERNAL-COMBUSTION ENGINE

Olivier Ploch, Saint-Cere; Dominique Martineau, Plaisance-du-Touch, and Henri Dupont, Toulouse, all of, France, assignors to Siemens Automotive S.A., Toulouse-Cedex, France

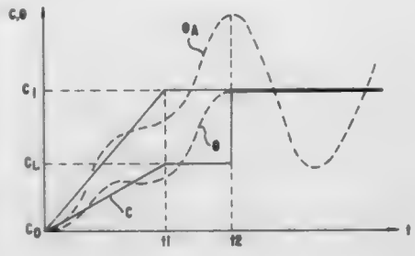
PCT No. PCT/EP92/01788, § 371 Date Feb. 7, 1994, § 102(e) Date Feb. 7, 1994, PCT Pub. No. WO93/03276, PCT Pub. Date Feb. 18, 1993

PCT Filed Aug. 6, 1992, Ser. No. 193,079

Claims priority, application France, Aug. 6, 1991, 91/10002

Int. Cl.[6] F02P *5/14;5/152*

U.S. Cl. 477—111 **10 Claims**



1. A method for smoothing out acceleration jerks of a motor vehicle propelled by an internal combustion engine and having a gearbox at an output side of the internal combustion engine, which comprises:

detecting an entry into an acceleration phase of the vehicle;

reducing an ignition advance angle of the engine to a predetermined value and maintaining the ignition advance at the predetermined value for a given time interval, wherein the given time interval is a function of a selected gear ratio of the gearbox at the output side of the engine; and

$$\Delta t = \frac{\pi - \phi}{\omega_0} - t_1$$

where:

$$\phi = \arccos\left(\frac{\sin \omega_0 t_1}{\sqrt{2(1 - \cos \omega_0 t_1)}} \right)$$

$$\omega_0 = \sqrt{\frac{A}{Br^2 + C}}$$

A, B and C are constants, and t_1 is a duration of an acceleration requested by a driver of the vehicle.

5,470,290

CHANGE GEAR CONTROL DEVICE USING ACCELERATION AND GEAR RATIO AS PARAMETERS FOR AUTOMATIC TRANSMISSION IN A MOTOR VEHICLE AND THE METHOD THEREFOR

Toshimichi Minowa, Naka; Hiroshi Kimura, Hitachi; Yoshiyuki Yhoshida, Yokohama; Yoshishige Ohyama, and Yutaka Nishimura, both of Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

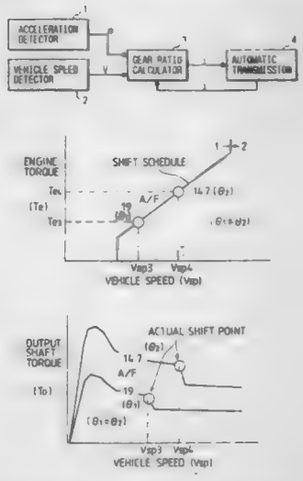
Continuation-in-part of Ser. No. 840,816, Feb. 25, 1992, Pat. No. 5,235,876. This application Aug. 17, 1993, Ser. No. 107,018

Claims priority, application Japan, Feb. 25, 1991, 3-50148

The portion of the term of this patent subsequent to Aug. 17, 2010, has been disclaimed.

Int. Cl.[6] F02D *43/00;* **B60K** *41/06*

U.S. Cl. 477—115 **11 Claims**



1. A change gear control device for an automatic transmission in a motor vehicle comprising:

a first detector for detecting an engine torque of the motor vehicle;

a second detector for detecting a vehicle speed of the motor vehicle; and

a processor for processing transmission gear ratios for the automatic transmission, wherein said processor reads the detected engine torque from said first detector and the detected vehicle speed from said second detector, determines a new transmission gear ratio based upon the engine torque and the vehicle speed, and outputs a signal representing the new transmission gear ratio to the automatic transmission.

5,470,291

DEVICE IN A TRAINING APPARATUS

Olli Pekkanen, Palomäenrinne 2-4, SF-02730 Espoo, Finland

Continuation of Ser. No. 257,576, Jun. 6, 1994, abandoned, which is a continuation of Ser. No. 867,682, Jul. 7, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,439

Claims priority, application Finland, Jan. 16, 1991, 900240

Int. Cl.[6] A63B *23/16*

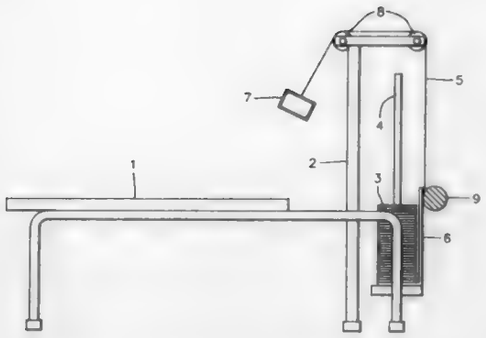
U.S. Cl. 482—49 **5 Claims**

1. An exercising apparatus adapted to be used in combination with a means for supporting said apparatus comprising:

a frame;

a support means which is positioned on and adapted to move linearly along said frame while carrying a resistive load;

a pulling device through which an operator works to move said supporting means for bodybuilding purposes, said pulling device including a filiform element having a gripping member at one end of the filiform element, a spool connected to said support means and onto which the filiform element is wound



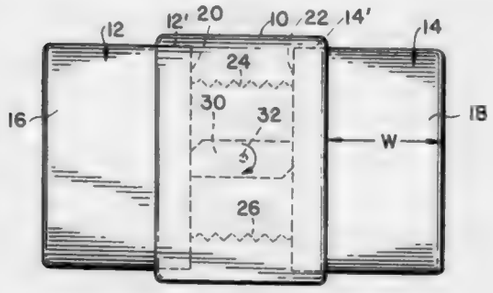
from its opposite end, said spool being driven by spring means to wind on the filiform element and which spool includes means for allowing the filiform element to be drawn out to a predetermined position and locked in said position thereby allowing variation of the exposed length of the filiform element which is withdrawn from the spool prior to commencing an exercise.

5,470,292

STEP AEROBIC EXERCISE DEVICE

Agnes Simon, 87-13 160th St., Jamaica, N.Y. 11432

Continuation of Ser. No. 23,340, Feb. 26, 1993, abandoned.
This application Jul. 21, 1994, Ser. No. 278,982
Int. Cl.[6] A63B *22/00*
U.S. Cl. 482—52 **17 Claims**



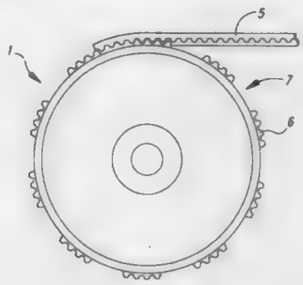
1. Exercise apparatus adapted to be mounted on a floor, comprising a platform, extensible members extendible from said platform, and adjusting means to control the extension of said extensible members from said platform, said members being extensible in opposite directions from said platform and having substantially coplanar supporting surfaces adapted for respectively receiving the feet of an exercising person, said platform having a supporting surface located at a selected fixed distance above the floor twice the height of said coplanar supporting surfaces, said members being at least partly accommodated within said platform, said means including an element interposed between said members to adjust the extension of said members in increments to different selectable extents, said coplanar supporting surfaces of said members, and said supporting surface of said platform forming steps.

5,470,293

TOOTHED-BELT, V-BELT, AND PULLEY ASSEMBLY, FOR TREADMILLS

Willi Schönenberger, Schönenberg, Switzerland, assignor to Woodway AG, Munich, Germany

Continuation of Ser. No. 152,177, Nov. 12, 1993, abandoned.
This application Dec. 29, 1994, Ser. No. 366,369
Claims priority, application Germany, Nov. 12, 1992, 42 38 252.1
Int. Cl.[6] A63B *22/02*
U.S. Cl. 482—54 **9 Claims**



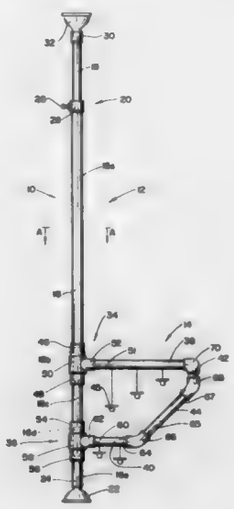
1. An assembly for treadmills, comprising at least one endless belt, which is provided with a plurality of tread lamellae and which is guided around two deflection pulleys arranged one behind the other, characterized in that at least one of said deflection pulleys comprises a sliding disk member and a toothed-disk member coaxially aligned and in juxtaposition, and that the belt comprises, in juxtaposition, a toothed belt area associated with the toothed-disk member of the deflection pulley and a V-belt area abutting on the sliding disk member of the deflection pulley, the main force for driving said belt being adapted to be transmitted via said sliding disk member and said V-belt area.

5,470,294

BABY WALKAROUND

Steven E. Ingram, Houma, La., assignor to T&M Toys, Inc., Houma, La.

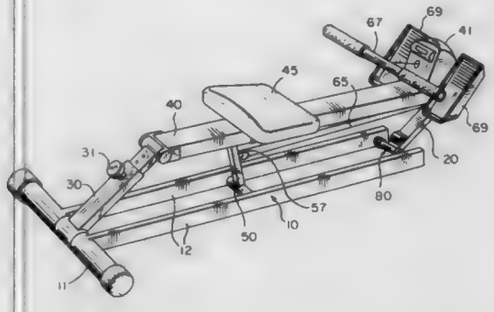
Filed Sep. 12, 1994, Ser. No. 304,290
Int. Cl.[6] A63B *3/00*
U.S. Cl. 482—66 **8 Claims**



1. A baby exercise device comprising:
an adjustable length pole assembly having a lower pole section, an upper pole section and a locking mechanism for selectively locking said first and second pole section in a fixed relationship with one another; and

a revolving bar assembly rotatably connected to said lower pole section by a first and second coupling assembly, said first coupling assembly having extending therefrom a first elongated horizontal member, said second coupling assembly having extending therefrom a second elongated horizontal member, said first and second horizontal members being oriented substantially in parallel and interconnected by a connecting assembly having a first portion extending diagonally to said first and second horizontal members and a second portion extending substantially perpendicular to said first and second horizontal members.

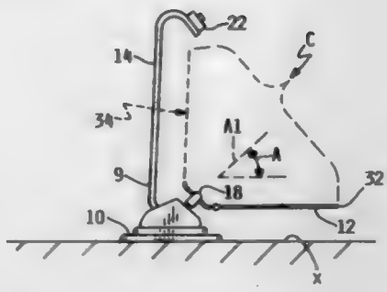
5,470,295
ROWING EXERCISE MACHINE
Chin-Liu Wang, No. 6, Lane 308, Shyue Shyh Road, Taichung, Taiwan, Prov. of China
Filed Mar. 7, 1995, Ser. No. 399,650
Int. Cl.[6] A63B *21/00*
U.S. Cl. 482—71 **7 Claims**



1. A rowing exercise machine comprising:
a base;
a first swinging member fastened pivotally at one end thereof with said base;
a second swinging member fastened pivotally at one end thereof with said base and having a length greater than or equal to a length of said first swinging member;
a seat tube fastened pivotally at one end thereof with said first swinging member and at another end thereof with said second swinging member;
a seat located securely on said seat tube;
a third swinging member fastened pivotally at one end thereof with said base such that said third swinging member is located between said first swinging member and said second swinging member which is shorter than said third swinging member;
a first pulley mounted on a predetermined position of said third swinging member;
a second pulley mounted on said seat tube such that said second pulley is adjacent to said first swinging member;
a pull cable fastened at one end thereof with said first swinging member and wound at another end thereof on said first pulley and said second pulley before said another end of said pull cable is extended toward said seat;
a hand grip fastened to said another end of said pull cable; and
two pedals mounted respectively on both sides of said seat tube such that said two pedals are adjacent to said first swinging member..

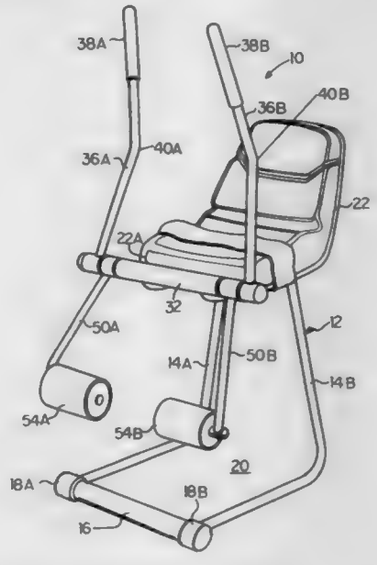
5,470,296
SPORT JUMP APPARATUS
David C. Welte, 4420 Highway 63 South, Rochester, Minn. 55904
Filed Jun. 14, 1994, Ser. No. 259,486
Int. Cl.[6] A63B *5/22*
U.S. Cl. 482—81 **15 Claims**

1. A jumping apparatus for an individual comprising:



a) a support base adapted for placement on a substantially horizontal floor surface,
b) a drive unit mounted on said support base, the drive unit comprised of a motor and a shaft connecting to and rotated by said motor, the shaft positioned at an oblique angle with respect to the floor surface;
c) an elongate rod for the individual to jump over, the rod connected to the shaft at an oblique angle with respect to said shaft, the rod having a lower substantially horizontal position with the rod extending outwardly beyond the base and an upwardly position with the rod substantially positioned above the base, whereby when the shaft rotates the rod moves between the substantially horizontal position and the upwardly position.

5,470,297
AEROBIC EXERCISE EQUIPMENT
John Park, 5 Paulding Ln., Crompond, N.Y. 10517
Filed Jun. 13, 1994, Ser. No. 259,243
Int. Cl.[6] A63B *21/045*
U.S. Cl. 482—127 **15 Claims**



1. Aerobic exercise equipment, comprising:
a frame body defining a base portion arranged to rest on a floor surface, and a seat portion including a seat over the base portion for supporting said seat at a certain height above the floor surface when said base portion rests on the floor surface, the seat having a forward edge;
shaft portion means fixed with respect to said frame body and aligned in the region of the forward edge of said seat, for defining a pivot axis;
a left arm exercise bar having an end pivoted on the shaft portion means at a left side of the forward edge of said seat for swinging movement about the pivot axis, and a right arm

exercise bar having an end pivoted on the shaft portion means at a right side of the forward edge of said seat for swinging movement about the pivot axis, the left and the right arm exercise bars having grip portions formed to be grasped by a person when seated on said seat to swing said bars about the pivot axis;

a left leg exercise bar having an end pivoted on the shaft portion means at a left side of the forward edge of said seat for swinging movement about the pivot axis, and a right leg exercise bar having an end pivoted on the shaft portion means at a right side of the forward edge of said seat for swinging movement about the pivot axis, the left and the right leg exercise bars having portions formed to engage a seated person's feet to swing the leg exercise bars about the pivot axis; and

spring action means associated with the arm and the leg exercise bars on said shaft portion means, for enabling the arm exercise bars to be swung in a forward direction relative to said seat against a force of the spring action means, and for enabling the leg exercise bars to be swung in an upward direction relative to the floor surface against a force of the spring action means, and the spring action means is constructed and arranged to enable the arm and the leg exercise bars to be swung independently of one another.

5,470,298

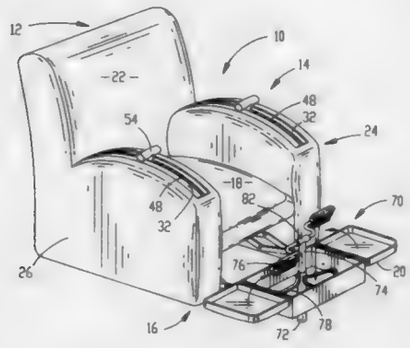
EXERCISE APPARATUS

James L. Curtis, Rte. 2, Box 31, Cameron, Mo. 64429

Filed Jun. 27, 1994, Ser. No. 267,861

Int. Cl.[6] A63B *21/04*

U.S. Cl. 482—130 **6 Claims**



1. An exercise apparatus comprising:

a chair including a base portion, a seat portion, a footrest portion, a backrest portion, and a pair of left and right armrest portions; and

an arm-exercising station including:

a support frame attached to said base portion,

an elongated exercise bar disposed within one of said armrest portions and including an inner elongated tubular pipe and an outer elongated tubular sleeve, the tubular pipe presenting upper and lower opposed ends, wherein said lower end is pivotally attached to said support frame so that said exercise bar is operable for selective pivotal movement within said armrest portion, said outer sleeve concentrically surrounding said inner pipe and being configured for relative axial telescopic movement, said tubular sleeve presenting an upper end including external threading, resistance means for resisting movement of said bar within said armrest portion, said resistance means including a piston/cylinder assembly including a fixed base portion attached to said support frame and a telescopically extending piston rod pivotally attached to said tubular pipe lower end, and

means for adjusting the resistance of said resistance means,

said exercise bar further including a handle member rotatably mounted about the upper ends of said inner pipe and said outer sleeve, said handle member presenting a base portion having internal threading for engaging the external threading of said outer sleeve, wherein rotation of said handle causes said outer sleeve to telescope upwardly from said inner pipe.

5,470,299

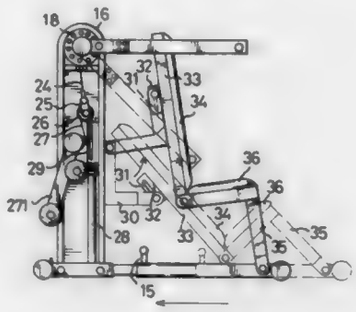
ADJUSTABLE BENCH DEVICE FOR EXERCISERS

Jonathan Yeh, No. 77-3, Nanshih Village, Linkou Hsiang, Taipei Hsien, Taiwan, Prov. of China

Filed Apr. 18, 1994, Ser. No. 228,961

Int. Cl.[6] A63B *21/00*

U.S. Cl. 482—142 **2 Claims**



1. An exerciser comprising:

first and second base sections having a longitudinal direction and being adjustable with each other along said longitudinal direction;

a frame extending upwardly from said first base section, a disc being pivotally mounted to said frame, a handle means being pivotably mounted to said disc to pivot therewith and a means for retaining said handle means in a desired angular position relative to said disc, and a resistance means operable by said handle means; and

an adjustable bench device comprising:

a substantially L-shaped first member having a first end pivotally mounted to said second base section and a second end;

a first mat mounted to said first member;

a second member having an end pivotally connected to said second end of said L-shaped first member and having an element mounted to a mediate section thereof; and

a second mat mounted to said second member;

a substantially L-shaped third member having a first end pivotally mounted to said frame and a second end pivotally connected to said element of said second member;

whereby the bench device may be adjusted to form a flat bench and a chair.

5,470,300

WEB REGISTRATION SYSTEM AND METHOD

Peter Terranova, Ridgewood, N.Y., assignor to Ro-An Industries Corporation, Middle Village, N.Y.

Filed Sep. 9, 1992, Ser. No. 942,628

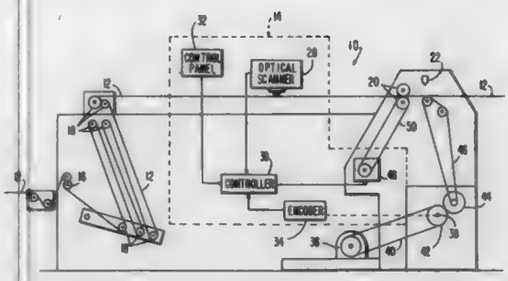
Int. Cl.[6] B31B *1/02*

U.S. Cl. 493—11 **32 Claims**

1. In a plastic bag making machine for making plastic bags from an elongate web of plastic material having a series of regularly spaced eyemarks printed thereon, the improvement comprising:

draw roll means for intermittently advancing the web over respective draw lengths;

optical scanner means for detecting the passage of an eyemark by a certain location at an initial part of an ongoing web index;



means for calculating a predetermined draw length D prior to upcoming web indexes, said means for calculating said predetermined draw length D calculating the same in accordance with the formula,

$$D=NL-K\cdot W,$$

where D is the predetermined draw length, NL is the nominal bag length equal to the distance between adjacent eyemarks, W is the length of a registration window in which an eyemark will normally be detected by said optical sensor means at said initial part of said ongoing web index, and K is a constant;

means for calculating during said ongoing web index an initial length E, if any, travelled by the web from the beginning of said ongoing web index to the detection of the passage of an eyemark; and

means for adjusting said predetermined draw length D of said ongoing web index based upon said initial length E.

5,470,301

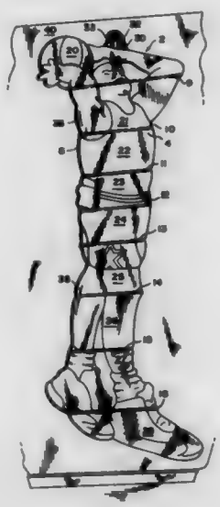
FOLDABLE LIFE SIZE POSTER AND METHOD FOR MAKING THE SAME

William F. Brunt, II, 631 2nd Ave. South, Nashville, Tenn. 37212

Filed Jan. 12, 1994, Ser. No. 180,293

Int. Cl.[6] B65H *45/12;45/28;* B31F *1/08*

U.S. Cl. 493—323 **3 Claims**



1. A method for making a life size poster of an action figure comprising the steps of:

(a) forming a life size multi-color pre-print on a web like sheet;

(b) forming a corrugated substrate including said multi-color pre-print having a longitudinally extending axis with the web like sheet forming one surface thereof;

(c) die cutting the corrugated sheet into the silhouette of a human action figure or the like; and forming a mounting support which extends from the life size figure for displaying the figure in an essentially fully extended format;

(d) providing a plurality of lateral fold lines transverse of the longitudinal axis;

(e) folding the life size poster along the fold lines to thereby provide a compact package; and

(f) embossing the surface of the corrugated substrate with the web like sheet thereon to further define a musculature of the human action figure and to give the poster a three-dimensional effect.

5,470,302

MEDICAL APPARATUS HAVING AN ADJUSTABLE APPARATUS PART FOR APPLICATION TO THE BODY SURFACE OF A PATIENT

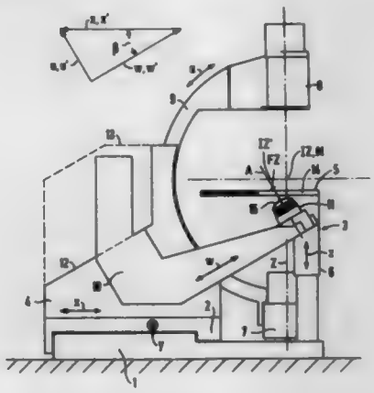
Guenther Krauss, Erlangen, and Klaus Herrmann, Nuernberg, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 30, 1994, Ser. No. 298,175

Claims priority, application Germany, Aug. 30, 1993, 43 29 167.8

Int. Cl.[6] A61B *17/22*

U.S. Cl. 601—2 **7 Claims**



1. A medical apparatus comprising:

an apparatus part adapted for application against the body surface of a patient; patient support means adapted for supporting said patient; and

means for adjusting said apparatus part at a first adjustment speed in a first direction and for simultaneously adjusting said patient support means at a second adjustment speed in a second direction with said first and second adjustment speeds in said first and second directions having a fixed constant relationship for causing said apparatus part and said patient support means to execute a motion relative to each other exclusively in a third direction for minimizing displacement of said patient upon the application of said apparatus part to said body surface of said patient.

5,470,303

MASSAGE DEVICE

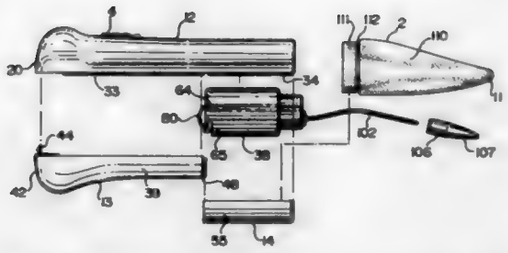
Cynthia D. Leonard, and Lawrence Gayne, both of North York, Canada, assignors to C. L. Femme Inc., North York

Filed Apr. 1, 1994, Ser. No. 221,665

Int. Cl.[6] A61H *1/00*

U.S. Cl. 601—84 **5 Claims**

1. A massage device comprising housing means for manual manipulation of the device, said housing means having an open front end and a closed rear end; drive means in said housing means; elongated shaft means including a straight inner end connected to said drive means and defining an axis of rotation parallel to the longitudinal axis of said housing means, an arcuate outer end



extending longitudinally out of said open end of the housing means, and a tip on said outer end of said shaft means which is eccentric with respect to said straight inner end, whereby, when said drive means is actuated, the tip of said shaft means moves in a circle around the axis of rotation, and the arcuate outer end travels through an arc defining an ellipsoid with a cone on the outer end thereof; elongated, flexible, resilient, tongue-shaped massage head means, said massage head means including an open rear end mounted in and closing said open front end of the housing means, a closed front end, and sleeve means defining an enclosure of a portion of the inner area of said head means, said sleeve means extending from the closed end substantially the entire length of said head means for snugly receiving said tip means, whereby said head means moves smoothly with said shaft means and damage to said head means during rotation of said shaft means is prevented.

5,470,304

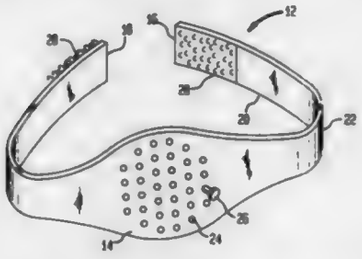
APPARATUS AND METHOD FOR PROVIDING PRESSURE POINT THERAPY

Anthony Decanto, 57 Ariel Ct., Neshanic, N.J. 08853

Continuation of Ser. No. 59,002, May 6, 1993, abandoned, which is a continuation of Ser. No. 870,890, Apr. 20, 1992, abandoned. This application Oct. 11, 1994, Ser. No. 320,563

Int. Cl.[6] A61H *7/00*

U.S. Cl. 601—134 **12 Claims**



1. Apparatus for providing pressure on a plurality of localized points in a user's lower back region corresponding to predetermined locations for pressure point therapy in said lower back region, comprising:

a belt for encircling the lower torso of the user, said belt having a rearward section thereon that faces the user's lower back region when worn by the user;

a two dimensional array of apertures arranged generally in a plurality of columns and rows on said rearward section, wherein the number of said apertures in certain of said columns is not the same as the number of said apertures in certain other columns and the number of said apertures in certain of said rows is not the same as the number of said apertures in certain other rows in order to conform to the muscles in the lower back region of a user, said array of apertures providing the user with a choice of predetermined locations on said rearward section corresponding in location to the localized points on the user's back; and

a plurality of rigid compression elements for providing independently adjustable point compression to a selected plurality of said localized points, each of said rigid point compression elements being a shaft of substantially constant diameter which is no greater than the diameter of said apertures, each of said shafts extends a predetermined distance through one of said apertures in said array, wherein each said rigid point compression element has an adjustable engagement means thereon for engaging said rearward section defining said array, whereby said adjustable engagement means enables said predetermined distance to be selectively altered to thereby independently adjust the pressure applied at each location.

5,470,305

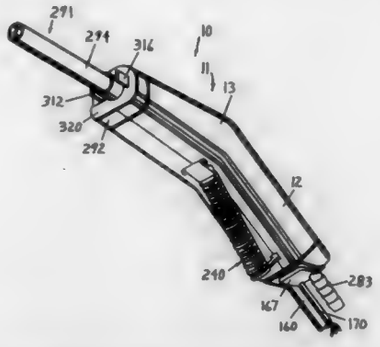
IRRIGATION HANDPIECE WITH BUILT IN PULSING PUMP

Jeffery D. Arnett, Kalamazoo; Nicholas V. Gately, Portage; David H. Grulke, Battle Creek; Ruth A. Hilsboe, Saline, and James L. Sertic, Kalamazoo, all of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Filed Apr. 19, 1993, Ser. No. 49,144

Int. Cl.[6] A61H *9/00*

U.S. Cl. 601—161 **9 Claims**



1. A pulsed irrigation surgical handpiece, comprising:

pulsed irrigation liquid outlet means for applying irrigation liquid pulses to a surgical site;

pump means reciprocatingly driveable for pumping pulses of irrigation liquid through said outlet means;

powered drive means comprising a hollow shell, motor means in said shell, and link means reciprocatingly driven by said motor means in said shell and having an output end extending reciprocatingly from said shell to operative engagement with said pump means for reciprocatingly driving said pump means;

handpiece housing means for relatively locating therein said pump means and drive means shell in relative operative relation, said handpiece housing means being elongate and bent and comprising a handle and a barrel open to and extending forward from the top of the handle at an angle thereto, said hollow shell extending along and within said handle, said pump means extending along and within said barrel, said pump means is located in said barrel, said shell having an upper end portion pivoted within said housing means on an axis transverse to the plane of said angle of said barrel to said handle.

5,470,306

MEDICAL BANDAGING ARTICLE AND PACKAGING SYSTEM

Walter D. Doubleday, Jupiter, Fla., assignor to Kirschner Medical Corporation, Timonium, Md.

Filed Feb. 23, 1994, Ser. No. 200,405

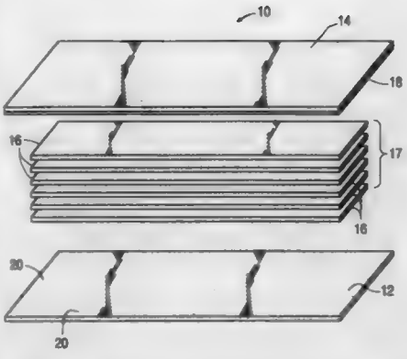
Int. Cl.[6] A61F *5/00*

U.S. Cl. 602—8 **14 Claims**

1. A medical bandaging article comprising:

a soft, resilient open cell foam padding layer;

a soft, flexible, water permeable fabric layer;



a flexible substrate smaller than said foam layer and said fabric layer, said substrate disposed between said foam layer and said fabric layer and impregnated or coated with a soft curable resin which hardens upon exposure to moisture to form a rigid structure; and

a heat fusing web interposed between said fabric layer and said foam layer along at least one side of said substrate, said web providing a resin seepage barrier;

wherein upon application of heat and pressure sufficient to activate said web, said foam layer and said fabric layer are fused together on at least said one side of said substrate said web providing a resin seepage barrier and encasing said substrate to maintain all components of said article in proper position.

5,470,307

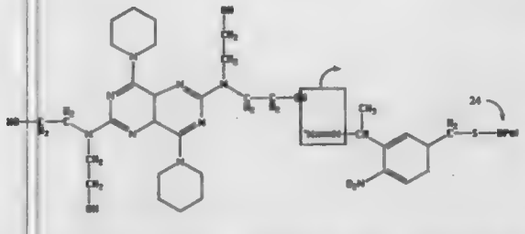
CATHETER SYSTEM FOR CONTROLLABLY RELEASING A THERAPEUTIC AGENT AT A REMOTE TISSUE SITE

Arnold W. Lindall, 1150 Nordic Ave. North, P.O. Box 187, Stillwater, Minn. 55082

Filed Mar. 16, 1994, Ser. No. 214,051

Int. Cl.[6] A61M *1/00*

U.S. Cl. 604—20 **24 Claims**



1. A catheter for applying a therapeutic agent to a tissue site by selectively releasing said therapeutic agent in response to light energy emanating from a source and conducted through at least a portion of said catheter, said catheter comprising:

a catheter body, said catheter body having a surface including a substrate layer; and

a linker layer, said linker layer being chemically bonded to said substrate layer with the therapeutic agent being chemically bonded to said linker layer, the therapeutic agent being selectively released from said substrate layer by a photolytic chemical reaction occurring in response to exposure to the light energy emanating from the source and conducted through the portion of the catheter.

5,470,308

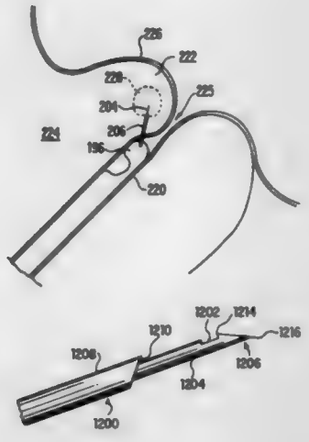
MEDICAL PROBE WITH BIOPSY STYLET

Stuart D. Edwards, Los Altos; Ronald G. Lax, Grassvalley; Hugh R. Sharkey, Redwood City, and Ingemar H. Lundquist, Pebble Beach, all of Calif., assignors to Vidamed, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 929,638, Aug. 12, 1992, abandoned, and Ser. No. 12,370, Feb. 2, 1993, Pat. No. 5,370,675, and Ser. No. 62,364, May 13, 1993, Pat. No. 5,435,805. This application Nov. 19, 1993, Ser. No. 155,975

Int. Cl.[6] A61B *17/39*

U.S. Cl. 604—22 **23 Claims**



1. A medical probe comprising a catheter having at least two stylet ports toward the distal end thereof, at least two flexible stylets disposed within the catheter and having sharp distal tips for puncturing tissue, means for advancing the stylets outward through the stylet ports and through intervening tissue to target tissue, means for energizing the stylets to apply ablating power to the target tissue, and means carried by the stylets for cutting and collecting a sample of the target tissue.

5,470,309

MEDICAL ABLATION APPARATUS UTILIZING A HEATED STYLET

Stuart D. Edwards, Los Altos; Ronald G. Lax, Grassvalley; Ingemar H. Lundquist, Pebble Beach, and Hugh R. Sharkey, Redwood City, all of Calif., assignors to Vidamed, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 929,638, Aug. 12, 1992, abandoned, Ser. No. 12,370, Feb. 2, 1993, Pat. No. 5,370,675, Ser. No. 62,364, May 13, 1993, and Ser. No. 61,647, May 13, 1993, Pat. No. 5,421,819. This application Jan. 12, 1994, Ser. No. 180,512

Int. Cl.[6] A61B *17/39*

U.S. Cl. 604—22 **5 Claims**

1. A method of medical treatment of a tissue mass, comprising the steps of:

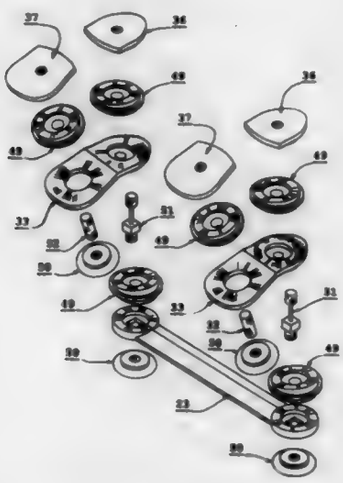
a) introducing a catheter to a zone adjacent to the tissue mass to be treated,

b) moving an electrically conductive flexible stylet from the catheter through a port in the catheter and through surrounding tissue into the tissue mass to be treated,

c) heating the stylet to a predetermined temperature by applying RF energy to the stylet at a first level high enough to heat body tissue to facilitate passage of the stylet through the surrounding tissue, and

d) further applying RF energy to the stylet at a second level high enough to kill living tissue in the mass to be treated but not high enough to immediately destroy that tissue.

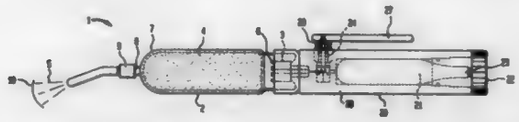
5,470,310
MODULAR NIGHT SPLINT
Brian L. Sutcliffe, c/o James E. Ogden, Block Box 7-47, Ephraim, Utah 84627
Division of Ser. No. 913,294, Jul. 14, 1992, Pat. No. 5,382,225. This application Feb. 15, 1994, Ser. No. 196,479
Int. Cl.[6] A61F 5/00
U.S. Cl. 602—24 13 Claims



1. In a modular orthopedic foot splint to which the shoes or feet of a patient are attached, and which comprises:
   a. a pair of foot plates to which the shoes or feet of the patient can be attached, and
   b. an elongated bar interconnecting the foot plates, an improvement comprising:
   c. means for enabling said foot plates to rotate and tilt with respect to said bars, and
   d. a pair of rotating wedges for rotating and tilting said foot plates in relation to said bar,

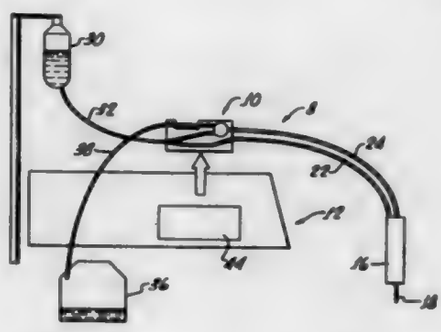
said pair of rotating wedges positioned in a generally stacked planar relationship with said pair of foot plates, wherein tilting and rotating of said foot plates can be accomplished by rotation of said wedge components, so that the patient's feet can be tilted to protect the patient's subtalar joint, and rotated to correct positional deformities.

5,470,311
MICROSPHERE DRUG APPLICATION DEVICE
Jean A. Setterstrom; Elliot Jacob, both of Silver Spring, and Walter K. Franz, Annapolis, all of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation-in-part of Ser. No. 493,597, Mar. 15, 1990, abandoned. This application May 24, 1994, Ser. No. 248,050
Int. Cl.[6] A61M 37/00
U.S. Cl. 604—24 4 Claims



1. An apparatus for dispensing microencapsulated medicinals which comprises
   a vial to contain the microencapsulated medicinal having an entrance end having a gas entrance opening and a nozzle end having an exit opening, each opening having attachment means, the nozzle end of the vial being substantially hemispherical, and
   a nebulizer unit comprising a gas chamber having an exit opening, a needle valve having an entrance opening and an exit opening having attachment means, means for activating the needle valve, and a vortex valve having an entrance opening and an exit opening having attachment means,
   assembled by attaching the exit opening of the nebulizer to the entrance end of the needle valve, the exit end of the needle valve to the entrance end of the vortex valve and the exit end of the vortex valve to the vial in a manner such that when the needle valve is opened gas from a gas source flows from the gas chamber through the vortex valve and into the vial to nebulize the contained microencapsulated medicinal and dispense it through the nozzle end of the vial.

5,470,312
IRRIGATION/ASPIRATION APPARATUS FOR SURGICAL PROCEDURES
Frank Zanger, Hayward; Edward R. Zaleski, Santa Ana, and Mark Cole, Trabuco Canyon, all of Calif., assignors to Allergan, Inc., Irvine, Calif.
Continuation-in-part of Ser. No. 893,119, Jun. 3, 1992, abandoned. This application Feb. 25, 1994, Ser. No. 201,567
Int. Cl.[6] A61M 1/00
U.S. Cl. 604—34 16 Claims



1. An irrigation/aspiration apparatus for use with surgical instrumentation requiring irrigation and aspiration of fluids and a peristaltic pump, the apparatus comprising:
   an aspiration tube;
   a housing comprising means for both supporting the aspiration tube and enabling access thereto for contact with a peristaltic pump head and for connecting said aspiration tube with an aspiration line of a surgical device;

means for connecting a supply line to both the aspiration line and an irrigation line of the surgical device;

means for enabling the regulation of irrigation fluid flow in said supply line into both said irrigation and aspiration lines of the surgical device; and

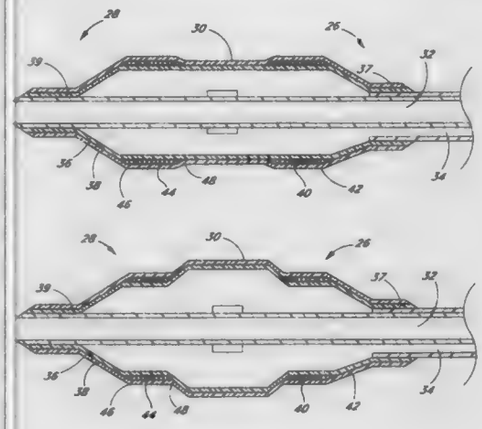
means, comprising a diaphragm, for both measuring fluid pressure in the aspiration line and for abruptly changing the pressure of the fluid in the aspiration line by movement of the diaphragm in response to the pressure measurement.

5,470,313

VARIABLE DIAMETER BALLOON DILATATION CATHETER

Michael Crocker, Mission Viejo, Calif.; John McB. Hodgson, Cleveland, Ohio, and Girma Kebede, Lake Forest, Calif., assignors to Cardiovascular Dynamics, Inc., Irvine, Calif.

Filed Feb. 24, 1994, Ser. No. 201,935
Int. Cl.[6] A61M *25/00*
U.S. Cl. 604—96 **13 Claims**



1. A balloon catheter, comprising:

an elongate, flexible, tubular body; and

an inflatable balloon on the tubular body, wherein a proximal segment, a central segment, and a distal segment of said balloon are inflatable to a first inflated diameter at a first inflation pressure, and where the material of said central segment expands to a second, greater inflated diameter at a second, greater inflation pressure, and said proximal and distal segments remain substantially at the first diameter at said second inflation pressure.

5,470,314

PERFUSION BALLOON CATHETER WITH DIFFERENTIAL COMPLIANCE

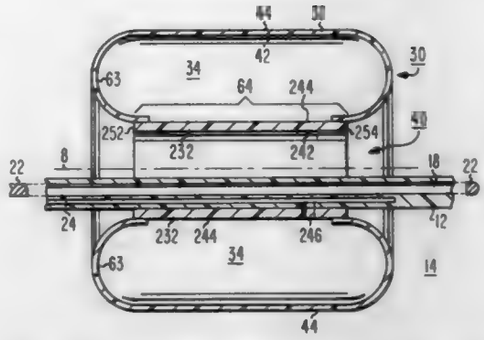
Paul Walinsky, 8910 Carlisle Rd., Wyndmoor, Pa. 19038

Filed Jul. 22, 1994, Ser. No. 279,061
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—96 **15 Claims**

1. A catheter, comprising:

an elongated portion defining proximal and distal ends and also defining at least one elongated lumen adapted for the flow of fluid therethrough, said elongated portion having a particular cross-sectional area at a particular location near said distal end;

balloon means coupled near said particular location near said distal end of said elongated portion, said balloon means defining a peripheral closure including a relatively elastic membrane portion and a less elastic portion of said balloon means, said peripheral closure defining an interior surface which is adjacent the interior of said balloon, and also defining an exterior surface which is adjacent the exterior of said balloon, said balloon being adapted for inflation within a vas and being configured, when so inflated within a vas, to define an open channel adjacent said exterior surface of said closure, said open channel extending from a distal portion of said balloon to a proximal portion of said balloon, and having a cross-sectional area greater than said particular cross-sectional area of said elongated portion of said catheter, said elongated portion of said catheter extending through said open channel, and being coupled to said peripheral closure on one side of said open channel, whereby body fluids may flow through that portion of said cross-sectional area of said channel which is not occupied by said elongated portion of said catheters, said less elastic portion of said balloon means extending completely about said open channel from said distal portion of said balloon to said proximal portion of said balloon, to thereby tend to prevent closure of said channel when said balloon is inflated; and



at least one path for the flow of balloon inflation fluid extending between said elongated lumen defined by said elongated portion and the interior of said balloon, whereby said balloon may be inflated and deflated from said proximal end of said elongated portion of said catheter.

5,470,315

OVER-THE-WIRE TYPE BALLOON CATHETER WITH PROXIMAL HYPOTUBE

Daniel O. Adams, Orono, Minn., assignor to SCIMED Life Systems, Inc., Maple Grove, Minn.

Filed Sep. 20, 1994, Ser. No. 309,240
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—96 **15 Claims**

1. A balloon dilation catheter system, comprising:

(i) a metallic tube having a proximal end, a distal end, and a proximal inflation lumen extending therethrough;

(ii) a polymer guide wire tube having a proximal end, a distal end, an exterior surface, and a guide wire lumen extending therethrough, the polymer guide wire tube extending exteriorly and parallel with the metallic tube, the proximal end of the polymer guide wire tube extending proximally to a point near the proximal end of the metallic tube, the distal end of

the polymer guide wire tube extending distally beyond the distal end of the metallic tube;

(iii) a core wire having a proximal end and a distal end, the proximal end of the core wire rigidly secured to the distal end of the metallic tube;

(iv) a distal polymer tube having a proximal end, a distal end, and a distal inflation lumen extending therethrough, the distal polymer tube extending exteriorly and parallel with the polymer guide wire tube, the proximal end of the distal polymer tube connected to the distal end of the proximal metallic tube, a portion of the distal polymer tube connected to a portion of the polymer guide wire tube, the distal inflation lumen fluidly communicating with the proximal inflation lumen;

(v) a balloon having a proximal end, a distal end, and a balloon inflation lumen extending therethrough, the proximal end of the balloon sealably connected to both the distal end of the distal polymer tube and a distal portion of the polymer guide wire tube, the distal end of the balloon sealably connected to the distal end of the polymer guide wire tube, the balloon inflation lumen fluidly communicating with the distal inflation lumen; and

(vi) a removable guide wire slidably disposed in and extending through the guide wire lumen of the polymer guide wire tube.

5,470,316

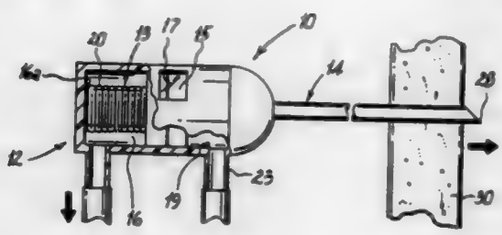
BODY TISSUE PENETRATING DEVICE HAVING A VACUUM INDICATOR

H. Jonathan Tovey, Milford, Conn., and Sidney D. Autry, Bellingham, Wash., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 116,789, Sep. 7, 1993, abandoned. This application Mar. 4, 1994, Ser. No. 206,686

Int. Cl.[6] A61M *1/00*

U.S. Cl. 604—118 **18 Claims**



1. Apparatus for penetrating body tissue, which comprises:

a shaft member having a pressure chamber positioned at a proximal end thereof and a free distal end adapted to penetrate body tissue, said pressure chamber being in gaseous communication with said free distal end; and

a pressure change indicator slidably mounted within the pressure chamber for sensing and indicating a pressure change adjacent said free distal end.

5,470,317

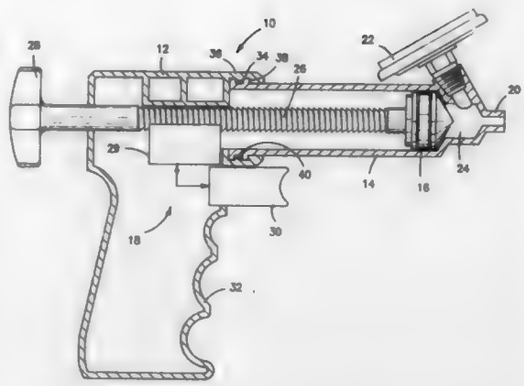
SWIVEL BARREL ASSEMBLY FOR INFLATION SYRINGE

John J. Cananzey, Charlestown, and Scot M. Lucey, Newbury, both of N.H., assignors to Design Standards Corporation, Charlestown, N.H.

Filed Aug. 2, 1994, Ser. No. 284,303

Int. Cl.[6] A61M *1/00*

U.S. Cl. 604—121 **14 Claims**



1. An inflation syringe assembly, comprising:

a housing having a barrel portion having a longitudinal axis and defining an interior space;

means for mounting said barrel portion to said housing for rotation of said barrel portion around said axis relative to said housing without longitudinal movement of said barrel portion along said axis relative to said housing;

a plunger disposed in said barrel portion; and

means associated with said housing for advancing said plunger in said barrel portion, wherein said barrel portion is rotatable relative to said housing without longitudinal movement of said barrel portion along said axis relative to said housing and said plunger.

5,470,318

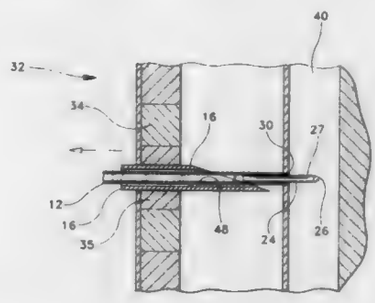
CATHETER/NEEDLE ASSEMBLY KIT AND METHOD FOR ADMINISTERING THERAPEUTIC AGENTS TO THE SUBARACHNOID SPACE

Richard L. Griffith, III, Schenectady, N.Y.; Joseph J. Gregg, Hasbrouck Heights, and George Yurkewych, Parsippany, both of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 11,056, Jan. 29, 1993, abandoned. This application Oct. 20, 1994, Ser. No. 326,569

Int. Cl.[6] A61M *5/178*

U.S. Cl. 604—161 **21 Claims**



1. A kit useful for introducing an injectable medicament into the subarachnoid space of a patient comprising:

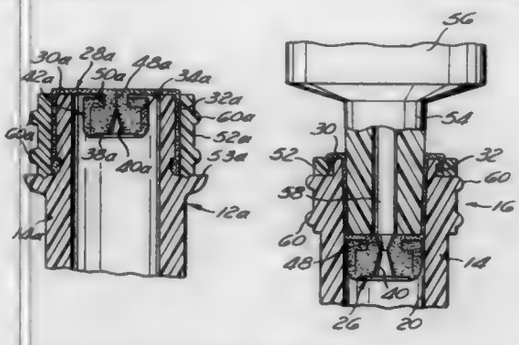
a device for gaining access to the subarachnoid space consisting essentially of an epidural needle having a distal tip and a bore therethrough and a catheter/needle assembly comprising an elongate flexible tube portion sized to fit within said bore of said epidural needle, said tube having a proximal end, a distal end and a hollow bore therethrough, and an elongate needle portion having a distal point and a passageway therethrough being fit within, fixedly attached to and fluidly sealing said hollow bore of said flexible tube, said point projecting distally a distance beyond said distal end of said flexible tube, said passageway of said needle portion fluidly communicative with said hollow bore of said tube, and said distal end of said tube forming a shoulder projecting radially outwardly at said needle portion for providing a resistance to penetration of said tube into the subarachnoid space.

5,470,319

NEEDLELESS INJECTION SITE

Bruno F. P. Mayer, Santa Ana, Calif., assignor to Critical Device Corporation, Brea, Calif.

Filed Jun. 20, 1994, Ser. No. 262,994
Int. Cl.[6] A61M *5/00;5/178*
U.S. Cl. 604—167 **31 Claims**



1. A needleless injection site, comprising:

a housing comprising:

a main body portion defining proximal and distal ends and a bore extending axially therethrough; and

a tubular side arm portion in fluid communication with said main body portion;

a reseal member attached to the proximal end of the main body portion and extending into said bore, said reseal member having an elastically openable and closable aperture formed therein and normally residing in a closed position wherein the aperture is in a closed configuration;

said reseal member being deformable such that the application of distally directed pressure thereto will cause the reseal member to distally advance within the bore to an open position wherein the aperture assumes an open configuration, and the removal of the distally directed pressure therefrom will cause the reseal member to resiliently return to the closed position wherein the aperture assumes the closed configuration.

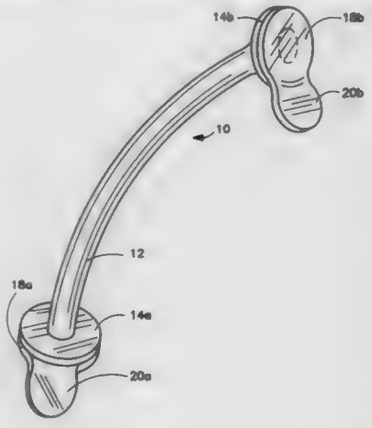
5,470,320

METHOD AND RELATED DEVICE FOR OBTAINING ACCESS TO A HOLLOW ORGAN

Jonathan Tiefenbrun, 62 Country Rd., Mamaronek, N.Y. 10543, and Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023

Filed Apr. 10, 1992, Ser. No. 866,760
Int. Cl.[6] 604N *264;280*
U.S. Cl. 604—174 **42 Claims**

1. A device for obtaining access to a hollow organ of a patient,



comprising:

a tubular member made of a nontoxic biocompatible material;

a flange also made of a nontoxic biocompatible material, said flange being connected to said tubular member at one end thereof; and

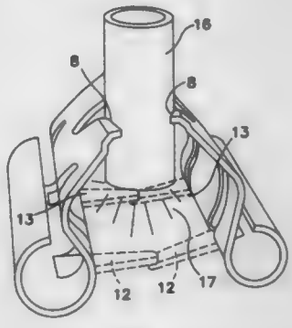
an elongate instrument inserted into said tubular member, said instrument being provided at a distal end with means for excising a section of an organ wall to which said flange is attached via said layer of adhesive.

5,470,321

DEVICE FOR ATTACHING A FLEXIBLE TUBE TO A PATIENT'S SKIN

Michel Ch. Forster, Le Puits, 26760 Beaumont-les-Valence; François H. Guillemin, Villers-les-Nancy, and Dominique H. Lignon, Vandoeuvre-les-Nancy, all of, France, assignors to Michel Ch. Forster, Beaumont-les-Valence, France

PCT No. PCT/FR93/00189, § 371 Date Oct. 14, 1994, § 102(e) Date Oct. 14, 1994, PCT Pub. No. WO93/16751, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 25, 1993, Ser. No. 318,761
Claims priority, application France, Feb. 28, 1992, 92 02345
Int. Cl.[6] A61M *25/02*
U.S. Cl. 604—174 **11 Claims**



1. A device for attaching a flexible tube to a pierceable material from which it protrudes, wherein it consists of a metal component capable of being converted, by bending it about a plane, from an "open" configuration before use to a "closed" configuration during use, said component exhibiting a cutout having an access which opens out on one of the edges of the component, said cutout being adapted to receive said tube in the vicinity of the point where it protrudes from said material, said bending plane being median with respect to said cutout and passing through said access, the component exhibiting first and second attachment means which are inactive when said component is in the open configuration and come into engagement with said tube and said pierceable material, respectively, when the component is converted, by bending, to the closed configuration.

5,470,322

REINFORCED MULTILUMEN CATHETER FOR AXIALLY VARYING STIFNESS

Michael J. Horzewski, and Nitin P. Matani, both of San Jose, Calif., assignors to Danforth Biomedical Inc., Santa Clara, Calif.

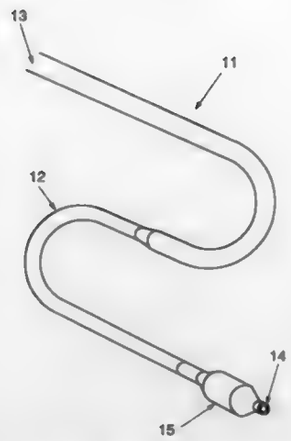
Filed Apr. 15, 1994, Ser. No. 227,954
Int. Cl.[6] A61M *25/00*
U.S. Cl. 604—280 **1 Claim**

1. A multilumen medical catheter for insertion into a body cavity through elongated and convoluted narrow passageways in the body, said medical catheter comprising:

a shaft having proximal and distal ends;

a functional element at said distal end of said shaft;

a plurality of lumens extending axially through said shaft;



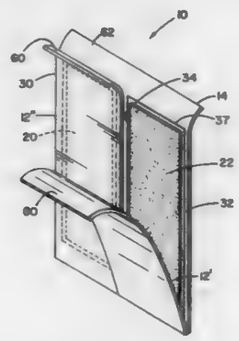
first and second hollow tubes of material substantially more rigid than said shaft and affixed thereto, said hollow tubes extending from said proximal end of said shaft to differing distances toward said distal end, thereby cumulatively imparting to said shaft a stiffness varying in stepwise manner, progressing from a maximum stiffness at the proximal end of said shaft top a minimum stiffness at the distal end of said shaft, said first hollow tube being disposed inside one of said lumens and said second hollow tube being disposed inside another of said lumens.

5,470,323

PACKAGING SYSTEM WITH IN-TANDEM APPLICATOR PADS FOR TOPICAL DRUG DELIVERY

James A. Smith, Chatham, Mass., and Betty J. Murphy, Upper Montclair, N.J., assignors to Creative Products Resource Associates, Ltd., North Caldwell, N.J.

Division of Ser. No. 986,597, Dec. 7, 1992, Pat. No. 5,242,433.
This application Aug. 11, 1993, Ser. No. 105,037
The portion of the term of this patent subsequent to May 23, 2012, has been disclaimed.
Int. Cl.[6] A61M *35/00*
U.S. Cl. 604—289 **37 Claims**



1. A dispensing and applicator system for applying a plurality of dermatological agents, comprising:

(a) a flexible, moisture impermeable support sheet;

(b) a plurality of applicator pads affixed in a separated array to the surface of said support sheet; each of said pads being impregnated with a composition comprising a different dermatological agent; and

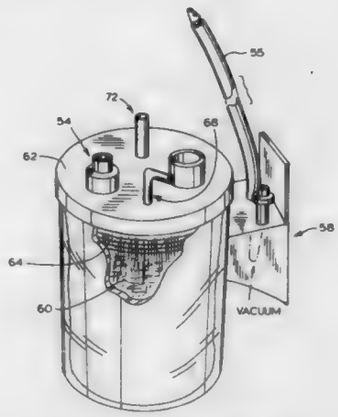
(c) a flexible, moisture-impermeable cover sheet having its peripheral surface releasably sealed to the opposed peripheral surface of the support sheet so as to form a compartment containing said pads and defined by a continuous seal, which seal is positioned inwardly from the edges of the sheets over a portion of the opposed peripheral surfaces, so as to form two opposed flanges, and wherein the cover sheet and the support sheet are also releasably sealed together between said pads to divide the compartment into a plurality of subcompartments, each containing one of said pads; the flanges being separable to at least partially release the cover sheet from the support sheet, so that said pads are exposed.

5,470,324

NON-REFLUXING SUCTION CANISTER SYSTEM AND COMPONENTS THEREFOR

Charles Cook, Whitehouse, Tex.; Mostafa Zomorodi, Palmdale, and Richard C. G. Dark, Rancho Cucomonga, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Jul. 1, 1993, Ser. No. 86,782
Int. Cl.[6] A61M *1/00*
U.S. Cl. 604—319 **31 Claims**



24. A device for collecting fluids, comprising:

a rigid canister, said canister having sidewalls and a bottom connected to said sidewalls to define a first cavity having a first top opening, said canister having a first vacuum port;

a flexible liner having a longitudinal length extending from an upper liner portion to a lower liner portion and comprising a substantially longitudinally nonexpandable sidewall portion that remains substantially unexpanded when the liner is filled with fluid and wherein the nonexpandable sidewall portion has a length, extending in the same direction as the liner length, which is less than the longitudinal length of the liner and which is substantially the same before and after the liner fills with fluid, said liner being shaped to generally conform to said first cavity to define a second cavity, said liner having a second top opening, said liner also having expansion means for allowing said liner to expand in a direction toward said top opening and having a length before the liner fills with fluid that is less than an expanded length after the liner fills with fluid;

a lid, said lid being sealed to said second top opening of said liner, and having clip means for releasable sealed engagement with said first top opening of said canister in a configuration to cause said liner to be disposed within said first cavity of said canister when said lid is releasably sealed to said first top opening of said canister, said lid having

a second vacuum port in fluid communication with said second cavity;

a fluid intake port;

collection means attached to said fluid intake port for collecting fluid from an outside source;

a first valve in fluid communication with said collection means to prevent fluid from flowing from said second cavity toward said collection means when said second cavity is filled with fluid;

a second valve in fluid communication with said second vacuum port which closes when said second cavity is filled with fluid;

suction means for temporarily connecting:

a first suction through said first vacuum port to said first cavity of said canister when said liner is placed in said first cavity;

to cause said lid to be pulled toward said first top opening of said canister to seal said lid against said first top opening, and

to subsequently pull said second cavity of said liner against said first cavity of said canister; and

a second suction through said second vacuum port in said lid to produce suction in said second cavity of said liner which produces suction through fluid inlet port to cause fluid from an outside source to be suctioned into said second cavity,

whereby when said second suction is disconnected and said first and second valves are closed, said expansion means will cause said second cavity to expand in a direction toward said second top opening to release said lid from said first top opening.

5,470,325

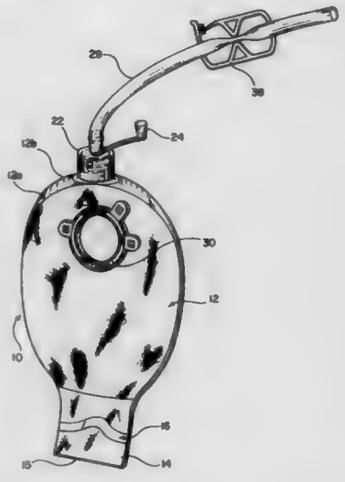
OSTOMY BAG WITH COMBINATION VENTING/CLEANING ASSEMBLY

Michael Fundock, R.D. #3, Box 256, Benton, Pa. 17814

Filed Feb. 28, 1992, Ser. No. 843,259

Int. Cl.[6] A61F *5/44*

U.S. Cl. 604—332 **17 Claims**



1. An ostomy bag having a tailpiece which terminates in a discharge opening at one end of the bag, a combination venting/cleaning assembly located at a second end of the bag and a mouth rim means located between the ends of the bag, wherein said venting/cleaning assembly comprises:

a hollow extension piece with a bore therethrough, said extension piece extending outward of the bag at a location above the mouth rim means;

a closure removably attached to the extension piece, including a hollow vent hose coupling with a bore therethrough, said vent hose coupling extending outwardly from the upper surface of said closure; and,

wherein the diameter of the bore in the extension piece is greater throughout its length than the diameter of the bore-in said vent hose coupling, thereby permitting a hose with a first inner diameter to connected with the vent hose coupling during venting, and a hose of a second, larger inner diameter to be connected with the extension piece during cleaning.

5,470,326

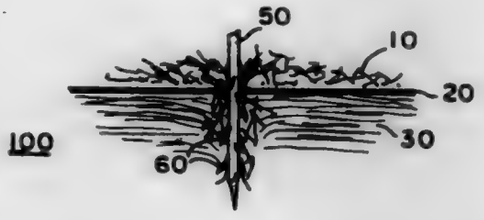
CLEAN DRY FACING NEEDLED COMPOSITE

Shmuel Dabi, Highland Park, and Kays Chinai, Burlington, both of N.J., assignors to McNeil-PPC, Inc., Milltown, N.J.

Continuation of Ser. No. 736,675, Jul. 26, 1991, abandoned. This application Apr. 12, 1994, Ser. No. 226,438

Int. Cl.[6] A61F *13/15;13/20*

U.S. Cl. 604—383 **23 Claims**



1. A facing material suitable for use in diapers and sanitary napkins, comprising: a fibrous top layer for engaging a body fluid; a generally opaque apertured middle layer that substantially hides body fluids contained below the middle layer; and a bottom layer having a capillary structure for drawing said body fluid from said fibrous top layer, at least a portion of said fibrous top layer extending downward through said middle layer for communicating with said bottom layer and for providing fluid transfer from said fibrous top layer into said bottom layer.

5,470,327

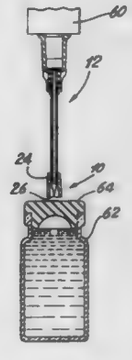
POINTED ADAPTER FOR BLUNT ENTRY DEVICE

R. Hayes Helgren, Mundelein, and David E. Kramer, Northbrook, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 84,666, Jun. 29, 1993, abandoned. This application Sep. 20, 1994, Ser. No. 308,870

Int. Cl.[6] A61M *37/00*

U.S. Cl. 604—411 **11 Claims**



1. A piercing member constructed and arranged for use with an associated blunt end of a hollow bore cannula to pierce an elastomeric closure, the piercing member comprising:

an annular collar having a generally cylindrical outside surface, a hollow rearward extending portion having a first inside diameter wall surface constructed and arranged for an interference fit around the blunt end of the cannula, and a hollow forward extending portion having a second inside diameter wall surface having an end constructed and arranged to abut the closure, the diameter of the first inside wall surface being less than the diameter of the second inside wall surface;

a detachable piercing element concentrically positioned within the second inside wall surface of the annular collar and having

a conical portion oriented axially forward within the forward portion of the collar and abase portion within the rearward portion of the collar; and

a frangible connection for detachably connecting the piercing element to the first inside wall surface.

5,470,328

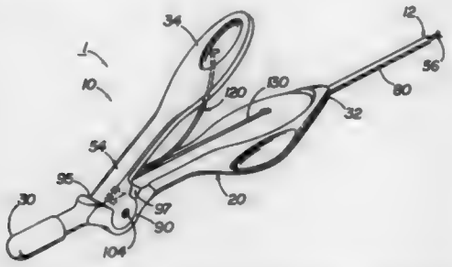
SURGICAL INSTRUMENT HANDLE AND ACTUATOR MEANS

Greg Furnish, Lawrenceville, and Michael Hipps, Roswell, both of Ga., assignors to Snowden-Pencer, Inc., Tucker, Ga.

Filed Jul. 21, 1994, Ser. No. 278,632

Int. Cl.[6] A61B *17/32*

U.S. Cl. 606—1 **18 Claims**



1. A hand-held surgical instrument comprising a handle attached to a tool having at least one articulated member thereon, the handle comprising:

a) an elongated base having a body portion, a top surface, opposite bottom surface, a first side and an opposite second side, a distal end a proximal end defining an inner portion;

b) an elongated lever having a first surface, an opposite second surface, a front end, a rear end and an actuator arm adjacent the rear end adapted to be projected into the inner portion of said base at a predetermined point;

c) means for connecting said actuator arm to said base at the predetermined point to allow said lever to pivot about a transverse axis at the predetermined point between a normally open position and a closed position, wherein said base and said lever are juxtaposed to each other along their length, with said lever extending forward from said connecting means toward the distal end of said base, such that the first surface of said lever is adjacent to the top surface of said body portion along a longitudinal axis thereof;

d) means connected to said lever for biasing said lever in the normally open position; and

e) an actuator rod pivotally connected at a fixed point on the actuator arm of said lever such that moving said lever from the normally open position to the closed position causes said fixed point on the actuator arm to be displaced toward the distal end of said base, thereby moving said actuator rod distally and causing movement of the articulated member.

5,470,329

OPERATION APPARATUS FOR CORRECTING AMETROPIA WITH LASER BEAM

Toshifumi Sumiya, Nukata, Japan, assignor to Nidek Co., Ltd., Japan

Filed Aug. 30, 1993, Ser. No. 113,063

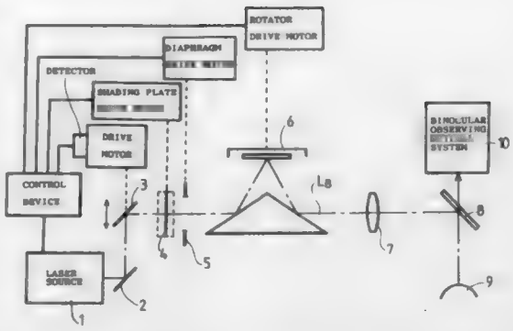
Claims priority, application Japan, Aug. 31, 1992, 4-257276

Int. Cl.[6] A61N *5/06;* **A61B** *17/36*

U.S. Cl. 606—4 **11 Claims**

1. An apparatus for use in ablating a cornea of an eye by a laser beam emitted from a laser source and passed along an optical path onto the cornea to correct ametropia of the eye, comprising:

a diaphragm with a variable diameter aperture disposed in the optical path along which the laser beam is passed onto the cornea;



a movable shading means disposed in the optical path for shading a central portion of the aperture of the diaphragm extending along a meridian diameter of the aperture and varying a width of the shaded area of the aperture when moved;

control means connected to the diaphragm and the shading means for controlling the aperture diameter and moving the shading means to vary the width of the shaded area and thereby form a laser beam image comprising two laser beam portions separated by the shaded area;

an image rotator disposed between the diaphragm and the cornea of the eye for rotating the resulting laser beam image about the optical path and on the cornea; and

means for controlling the image rotator to rotate the laser beam image on the cornea so that the depth of an area of the cornea ablated by the laser beam is substantially uniform in the laser beam rotating direction when the image rotator has rotated the laser beam image 360°;

whereby the cornea can be ablated more at its periphery than at its center so as to correct hypermetropia.

5,470,330

GUIDANCE AND DELIVERY SYSTEM FOR HIGH-ENERGY PULSED LASER LIGHT

Tsvi Goldenberg, Irvine; John Wardle, Mission Viejo, and William Anderson, Balboa Island, all of Calif., assignors to Advanced Interventional Systems, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 593,485, Oct. 3, 1990, Pat. No. 5,188,632, which is a continuation of Ser. No. 218,907, Jul. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 51,382, May 19, 1987, Pat. No. 4,830,460, which is a continuation-in-part of Ser. No. 860,241, May 6, 1986, Pat. No. 4,799,754, which is a continuation-in-part of Ser. No. 779,844, Sep. 25, 1985, Pat. No. 4,732,448, which is a continuation-in-part of Ser. No. 679,538, Dec. 7, 1984, Pat. No. 4,641,912. This application Feb. 19, 1991, Ser. No. 657,157

Int. Cl.[6] A61N *5/02*

U.S. Cl. 606—7 **26 Claims**

1. A deflectable catheter having a distal tip and a proximal end, comprising:

a fiber optic core extending from the distal tip of the catheter to the proximal end thereof;

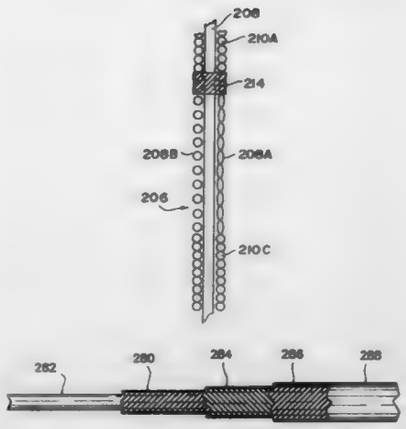
hollow means for encasing said core;

said hollow means including a deflecting region;

said core being fixed to said hollow means at a distal end of said deflecting region; and

control means mounted at proximal end of said core and said hollow means for applying a tension to said core so as to cause deflection of the deflecting region;

said fiber optic core being fixed to the distal tip of the catheter so as to permit laser energy to be emitted in a forward direction of the catheter.

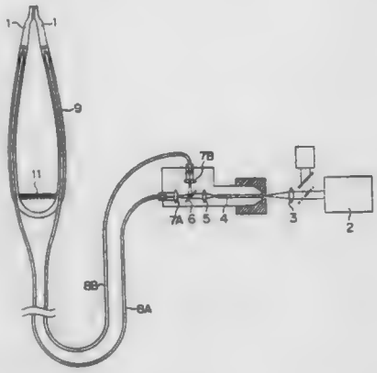


5,470,331

LASER LIGHT IRRADIATION APPARATUS FOR MEDICAL TREATMENT

Norio Daikuzono, Chiba, Japan, assignor to S.L.T. Japan Co., Ltd., Tokyo, Japan

Division of Ser. No. 761,892, Sep. 12, 1991, Pat. No. 5,328,488. This application Dec. 30, 1993, Ser. No. 176,372
Claims priority, application Japan, Mar. 31, 1990, 2-12347
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—16 14 Claims



1. A laser light irradiation system for use in a medical treatment, said system comprising:

a laser light generator;

transmission means for transmitting laser light from the generator;

a first probe having an axis, said first probe being formed of a laser light transmissive material for receiving laser light along the axis of the first probe from said transmission means and for emitting laser light from a light emitting surface of the first probe;

a second probe having an axis offset from the axis of said first probe, said second probe being formed of a laser light transmissive material for receiving laser light along the axis of the second probe from said transmission means and for emitting laser light from a light emitting surface of the second probe, the emitting surface of the first probe emitting at least some laser light toward the second probe, and the emitting surface of the second probe emitting at least some laser light toward the first probe;

a Y-shaped holder, wherein each laser light transmissive probe is fixed to one tip end of a flexible branch portion of the Y-shaped holder; and

a tubular sheath, wherein;

said Y-shaped holder is inserted into said tubular sheath so that each tip end of a flexible branch portion projects out from a distal end of the tubular sheath and a base portion of the Y-shaped holder projects from a proximal end of said tubular sheath, and

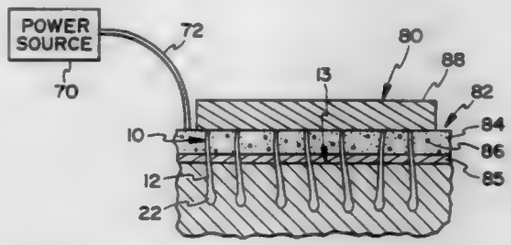
said holder can be moved back and forth along said tubular sheath to move the branch portions of the Y-shaped holder toward and away from each other, respectively, and thereby move the first probe and the second probe into and out of physical contact with each other during said medical treatment.

5,470,332

SYSTEM FOR PERMANENT REMOVAL OF MULTIPLE HAIRS

Thomas L. Mehl, Sr., Rte. 1, 1015 Highway 337, Old Bronson Rd., Newberry, Fla. 32669; George W. Harris, Jr., Melbourne, and Nardo Zaias, Miami Beach, both of Fla., assignors to Thomas L. Mehl, Sr., Newberry, Fla.

Continuation-in-part of Ser. No. 917,662, Jul. 20, 1992, abandoned, which is a continuation of Ser. No. 794,364, Nov. 13, 1991, abandoned, which is a continuation of Ser. No. 454,622, Dec. 21, 1989, abandoned, and a continuation-in-part of Ser. No. 66,261, May 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 929,750, Aug. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 707,828, May 30, 1991, abandoned. This application Dec. 30, 1993, Ser. No. 176,561
Int. Cl.[6] A61B *17/41*
U.S. Cl. 606—36 12 Claims



1. A hair removal system comprising:

a) a structural layer;

b) an electrically conductive adhesive layer disposed on said structural layer, said electrically conductive adhesive layer including:

i) an adhesive material, said adhesive material being sufficiently strong for adhering to and removing a plurality of treated hairs from skin; and

ii) a plurality of conductive particles disposed in said adhesive material; and

c) a non-conductive adhesive layer disposed on said conductive layer, and said non-conductive adhesive layer is configured to lay against skin, and to allow hair to project therethrough, and to protect a user's skin from shock and burns when in use.

5,470,333

SYSTEM FOR STABILIZING THE CERVICAL AND THE LUMBAR REGION OF THE SPINE

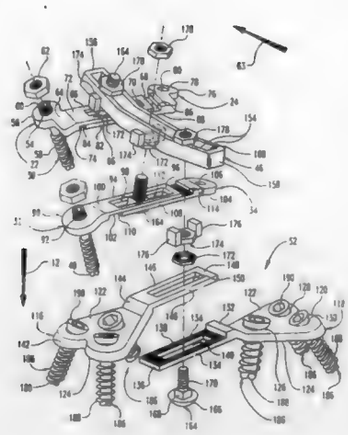
R. Charles Ray, Tacoma, Wash., assignor to Danek Medical, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 31,374, Mar. 11, 1993, abandoned. This application Jun. 10, 1993, Ser. No. 75,239
Int. Cl.[6] A61B *17/70*
U.S. Cl. 606—61 20 Claims

9. A system for stabilizing the spine comprising:

first and second transverse plates for securing to a first vertebra;

third and fourth transverse plates for securing to a second vertebra;



fifth and sixth transverse plates for securing to a third vertebra. said first, second, third, fourth, fifth, and sixth transverse plates each including at one end an eye plate that includes an eye for receiving a screw along a first axis, extending from the eye plate in a substantially medial direction is an intermediate plate, one end of the intermediate plate connected to the eye plate and another end of the intermediate plate connected to two substantially parallel spaced-apart fingers of substantially equal length extending in a medial direction substantially transverse to the first axis, said spaced-apart fingers including a posterior surface and an opposing anterior surface, the anterior surface of said spaced-apart fingers of said first, third, and fifth transverse plates being textured and the posterior surface of said spaced-apart fingers of said second, fourth, and sixth transverse plates being textured, wherein the anterior surface of said spaced-apart fingers of said first, third and fifth transverse plates face the posterior surface of said spaced-apart fingers of said second, fourth and sixth transverse plates, respectively;

longitudinal member including a superior end and an inferior end connected by spaced-apart members, said superior and inferior end and said spaced-apart member defining a slot in said longitudinal member;

a first fastener for securing the first and second transverse plates to one another and to the longitudinal member, the first fastener extending between the spaced-apart fingers of the first and second transverse plates and between the spaced-apart members of the longitudinal member when fastened;

a second fastener for securing the third and fourth transverse plates to one another and to the longitudinal member, the second fastener extending between the spaced-apart fingers of the third and fourth transverse plates and between the spaced-apart members of the longitudinal member when fastened; and

a third fastener for securing the fifth and sixth transverse plates to one another and to the longitudinal member, the third fastener extending between the spaced-apart fingers of the fifth and sixth transverse plates and between the spaced-apart members of the longitudinal member.

5,470,334

BIOABSORBABLE INTERFERENCE BONE FIXATION SCREW

Randall D. Ross, and Kevin J. Bassetti, both of Largo, Fla., assignors to Linvatec Corporation, Largo, Fla.

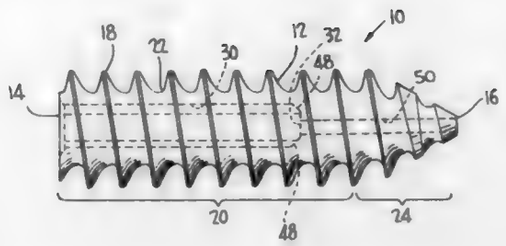
Continuation of Ser. No. 664,679, Mar. 5, 1991, abandoned. This application Jun. 22, 1992, Ser. No. 902,352

Int. Cl.[6] A61B *17/56*

U.S. Cl. 606—72 **31 Claims**

1. An interference bone fixation screw to be rotated by a driver comprising

a body having a proximal end, a distal end, a length between said proximal and distal ends and a longitudinal axis;



thread means for engaging bone disposed on said body from said proximal end to said distal end; and

drive recess means disposed in said proximal end of said body including a plurality of equally spaced lobe openings having force receiving surfaces in radial alignment with said longitudinal axis for receiving rotational forces from the driver, said force receiving surfaces extending longitudinally within said body along a substantial portion of said length,

said interference bone fixation screw being made of bioabsorbable material in its entirety.

5,470,335

METHOD FOR CARRYING OUT AN OSTEOTOMY PROCEDURE

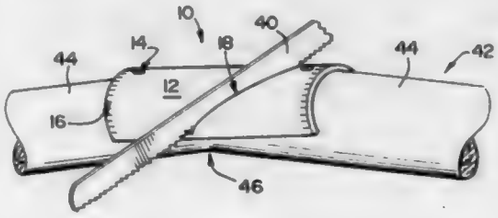
Guilluame T. Du Toit, Sandton, South Africa, assignor to Technology Finance Corporation (Proprietary) Limited, South Africa

Division of Ser. No. 59,639, May 10, 1993, Pat. No. 5,413,579. This application Apr. 13, 1995, Ser. No. 421,819

Claims priority, application South Africa, May 13, 1992, 92/3472

Int. Cl.[6] A61B *17/56*

U.S. Cl. 606—73 **8 Claims**



1. A method of carrying out an osteotomy procedure to reduce misalignment between portions of a long bone, the method comprising the steps of:

making an oblique cut through the bone at or adjacent the position where the misalignment portions intersect each other, to divide the bone into two fragments;

bolting the fragments loosely to each other to provide an axis about which the fragments can be rotated relative to each other to reduce the misalignment;

rotating the fragments relative to each other about said axis to reduce the misalignment; and

bolting the fragments tightly to each other so that the opposed cut ends of the fragments are clamped to each other.

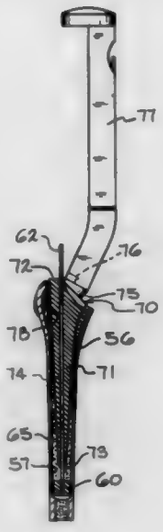
5,470,336
SYSTEM FOR PERFORMING HIP PROSTHESIS REVISION SURGERY

Robin S. M. Ling, 2 The Quadrant, Wonford Road, Exeter, EX2 4LE, England; W. E. Michael Mikhail, 4203 Shamley Green, Toledo, Ohio 43623; James J. Elting, Otsego Orthopaedics, One Associate Dr., Oneonta, N.Y. 13820; Graham A. Gie, 2 The Quadrant, Wonford Road, Exeter, EX2 4LE, England; Tom J. J. H. Slooff, c/o University Hospital, St. Radboud, Th. Craanenlaan 7, Postbus 9101, 6500 HB Nijmegen, Netherlands, and Jacques J. Vanderlinden, 4 Avenue d'Evian, 1006 Lausanne, Switzerland

Continuation of Ser. No. 939,054, Sep. 2, 1992, abandoned, which is a division of Ser. No. 735,524, Jul. 23, 1991, Pat. No. 5,192,283, which is a continuation-in-part of Ser. No. 565,149, Aug. 10, 1990, Pat. No. 5,047,035. This application Oct. 26, 1993, Ser. No. 143,272

Int. Cl.[6] A61F *2/28*

U.S. Cl. 606—105 3 Claims



1. Apparatus for use in preparing a femoral cavity to receive (1) bone graft material and (2) a femoral hip prosthesis of predetermined size and configuration comprising in combination:

(a) an elongate handle which is made of a material of suitable strength to transmit impacts made thereto;

(b) a guidewire;

(c) means for supporting said guidewire longitudinally in said cavity;

(d) a cannulated tamp having a stem extending from a proximal end having a relatively large cross-sectional size and tapering to a distal end having a relatively small cross-sectional size, said stem having (1) a size larger than and a configuration similar to said femoral hip prosthesis and (2) a passageway sized to slideably receive said guidewire, said passageway extending from said proximal end to said distal end; and

(e) means offset from said passageway extending from said proximal end for engagement by said handle, said proximal end and means for engagement being positioned to transmit impacts directed to said handle to said distal end, said tamp is made of a material having suitable strength to transmit impacts which compact crushed cancellous bone graft material to a desired density.

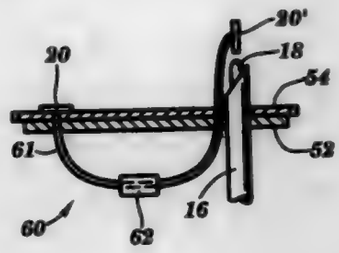
5,470,337
SURGICAL FASTENER

Gerald Moss, RD #1, West Sand Lake, N.Y. 12196

Continuation-in-part of Ser. No. 243,946, May 17, 1994. This application Aug. 16, 1994, Ser. No. 291,186

Int. Cl.[6] A61B *17/04*

U.S. Cl. 606—139 10 Claims



1. A surgical fastener including:

first and second opposing surgical fastener heads;

a filament portion attached to and extending between said first and second fastener heads;

a sleeve slidably displaceable along said filament portion; and

means, operatively attached to said sleeve, for releasably attaching said sleeve in a position such that substantially equal tension may be applied to each said surgical fastener head after insertion of each said surgical fastener head into a patient.

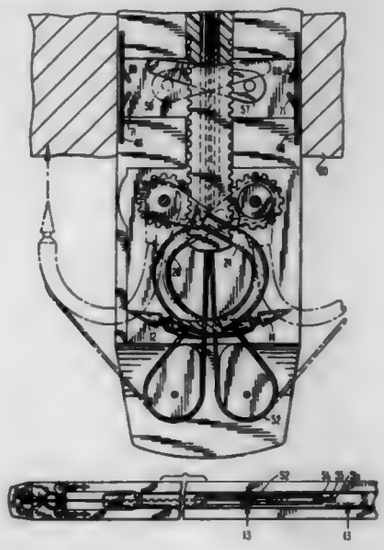
5,470,338
INSTRUMENT FOR CLOSING TROCAR PUNCTURE WOUNDS

Kenneth H. Whitfield, New Haven; Ian M. Scott, Ridgefield, and Michael Castro, Seymour, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 8, 1993, Ser. No. 134,144

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—144 28 Claims



1. A surgical instrument for applying sutures through body tissue, which comprises:

(a) an elongated body having a proximal end portion and a distal end portion;

(b) at least one needle carrier member operatively mounted in said distal end portion and movable between at least a retracted position and a deployed position;

(c) a needle having a tapered end and being releasably retained in said at least one needle carrier member such that when said at least one needle carrier member is in said retracted position said tapered end is prevented from contacting tissue;

(d) a predetermined length of suture material having one end affixed to said needle; and

(e) a suture material tensioning member movably disposed within said elongated body for maintaining said suture material in tension during movement of said at least one needle carrier member from said retracted position to said deployed position.

5,470,339

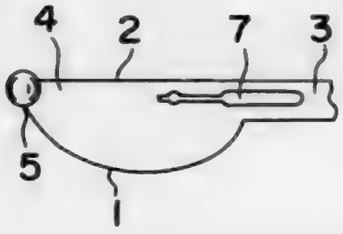
SURGICAL SCALPEL SAFETY BLADE

Andrew J. Lerrick, 232 N. Kings Hwy., #813, St. Louis, Mo. 63108

Continuation of Ser. No. 55,209, Apr. 29, 1993, abandoned. This application Sep. 21, 1994, Ser. No. 309,798

Int. Cl.[6] A61B *17/32*

U.S. Cl. 606—167 **8 Claims**



1. A surgical scalpel blade defined by a sharpened first edge adapted to cut by drawing along a surface to be incised, a second edge opposite said first edge, a proximal end portion at a proximal end of said first edge and a proximal end of said second edge being adapted to accept a scalpel handle, and a distal end portion at which a distal end of said first edge and a distal end of said second edge meet at a juncture,

a tip portion having a cross section greater than that of said blade being provided at said juncture, the greater cross section of said tip portion rendering said distal end of said first end incapable of cutting,

said first edge of said blade having a belly portion extending further from said second edge than said tip portion, whereby the drawing of said blade is substantially unimpaired by said tip portion, said second edge being straight, said first edge curving from said belly portion toward said first edge at said distal end portion.

5,470,340

COPOLYMERS OF (P-DIOXANONE/GLYCOLIDE AND/ OR LACTIDE) AND P-DIOXANONE

Rao S. Bezwada, Whitehouse Station, N.J.; Shalaby W. Shalaby, Anderson, S.C., and Donald F. Koelmel, Glen Gardener, N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Oct. 6, 1993, Ser. No. 132,595

Int. Cl.[6] A61B *17/04; C08G 63/08*

U.S. Cl. 606—231 **17 Claims**

6. An absorbable surgical filament prepared from a copolymer formed by reacting

a) 5 to 80 weight percent of a prepolymer of p-dioxanone and a monomer selected from the group consisting of lactide, glycolide and combinations thereof, which has a melting point of less than 120° C.;

b) with p-dioxanone to obtain a copolymer with an inherent viscosity in the range of from about 0.8 to about 3.0 dL/g in a 0.1 g/dL solution of hexafluoroisopropyl alcohol at 25° C.

5,470,341

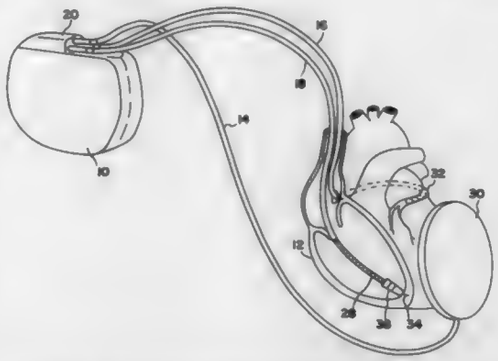
HIGH VOLTAGE SWITCH DRIVE FOR IMPLANTABLE CARDIOVERTER/DEFIBRILLATOR

Kevin P. Kuehn, Birchwood; Martin A. Rossing, Ramsey, and William C. Berg, Burnsville, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 10, 1993, Ser. No. 165,448

Int. Cl.[6] A61N *1/39*

U.S. Cl. 607—5 **11 Claims**



1. A medical device for electrical termination of an arrhythmic condition of a patient's heart of the type comprising:

a battery;

means for detection of an arrhythmic condition of a patient's heart;

a high voltage capacitor;

controller means responsive to detection of an arrhythmic condition of said patient's heart, for initiating charging of said capacitor and for providing a discharge control signal;

converter means, responsive to said controller means, for providing charging current from said battery to said capacitor; and

discharge circuit means for delivering voltage stored on said capacitor to said patient's heart in response to said discharge control signal, said discharge circuit means comprising:

high voltage switch means for connecting said capacitor to said patient's heart to discharge said capacitor through said patient's heart;

voltage regulating means coupled to said capacitor for sensing voltage stored on said capacitor and for generating a regulated voltage upon charging of said capacitor to a predetermined voltage;

drive circuit means powered by said regulated voltage and triggerable responsive to said discharge control signal for in turn triggering said high voltage switch means to discharge said capacitor; and

means for inhibiting transient high voltage signals generated during switching of said high voltage switch means from re-triggering said drive circuit means.

5,470,342

ADAPTIVE REFRACTORY PERIOD WITHIN IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR

Brian M. Mann, Beverly Hills, and James D. Causey, III, Simi Valley, both of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.

Filed Apr. 12, 1994, Ser. No. 226,787

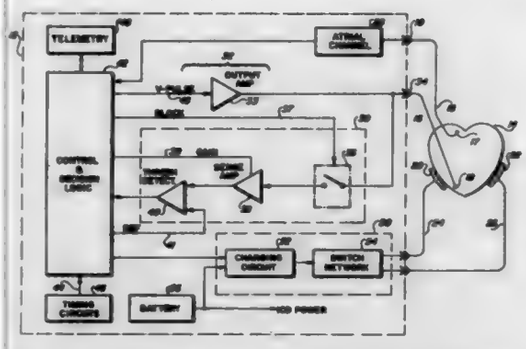
Int. Cl.[6] A61N *1/39*

U.S. Cl. 607—5 **22 Claims**

13. An implantable cardioverter-defibrillator (ICD) comprising:

sensing means for sensing intrinsic cardiac depolarization signals of a patient's heart;

stimulation means responsive to said sensing means for generating electrical stimulation pulses and delivering said pulses to the patient's heart in accordance with a prescribed stimulation regime;



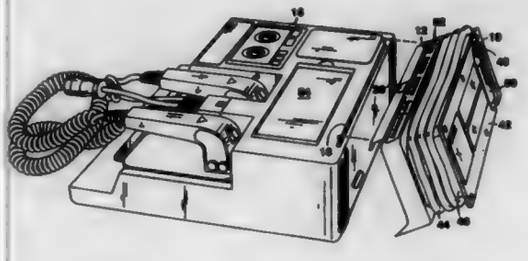
said sensing means including a refractory period that follows a depolarization of the patient's heart, said refractory period being divided into segments, with a different sensing option being activated at the conclusion of each segment to optimally sense a prescribed type of cardiac activity.

5,470,343

DETACHABLE POWER SUPPLY FOR SUPPLYING EXTERNAL POWER TO A PORTABLE DEFIBRILLATOR

Randall W. Fincke, Winchester; Michael L. Lopin, Newton, and Frederick W. Faller, Burlington, all of Mass., assignors to ZMD Corporation, Wilmington, Del.

Filed Jun. 10, 1994, Ser. No. 258,238
Int. Cl.[6] A61N *1/39*
U.S. Cl. 607—5 **34 Claims**



1. A detachable power supply for supplying power from an external power source to a portable defibrillator for charging a battery of the portable defibrillator and operating the portable defibrillator, comprising:

a housing shaped to attach to the portable defibrillator;

a latch connected to the housing for mechanically attaching the detachable power supply to the portable defibrillator so that the detachable power supply and the portable defibrillator form a portable, integral unit;

an electrical connector connected to the housing, the connector supplying power from the power supply to the portable defibrillator, the connector being located so that it engages a mating electrical connector on the portable defibrillator as the latch is engaged to connect the power supply to the defibrillator;

an external power connection for bringing power from outside of the housing of the power supply into the housing of the power supply;

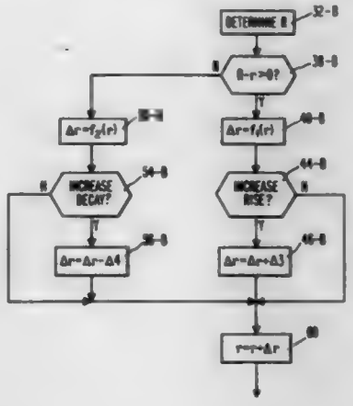
a power module installed within the housing, the power module having a power circuit that is operable to convert power from the external power source to a form useable by the portable defibrillator, the output of the power module being connected to the electrical connector to deliver power to the portable defibrillator in the form useable by the portable defibrillator.

5,470,344

RATE RESPONSIVE PACEMAKE WITH IMPROVED RATE CHANGE DYNAMICS AND PACING METHOD

Malcolm J. S. Begemann, Velp, Netherlands, assignor to Vitatron Medical, B.V., Dieren, Netherlands

Filed Oct. 6, 1993, Ser. No. 132,758
Int. Cl.[6] A61N *1/365*
U.S. Cl. 607—17 **11 Claims**



1. A rate responsive cardiac pacemaker, comprising a rate controllable pulse generator for generating stimulus pulses, sensor means for obtaining a sensor rate (R) which indicates desired pacing rate, and rate control means for developing a rate control signal for controlling said pulse generator to operate at a controlled pacing rate; and said rate control means further comprising:

first means for determining a difference between said sensor rate and said controlled pacing rate,

second means for determining a measure of time rate of change of said sensor rate, and

third means for adjusting said rate control signal as a function of said difference and said measure of time rate of change.

5,470,345

IMPLANTABLE MEDICAL DEVICE WITH MULTI-LAYERED CERAMIC ENCLOSURE

Beth A. Hassler, White Bear Lake, and Adrianus P. Donders, Andover, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

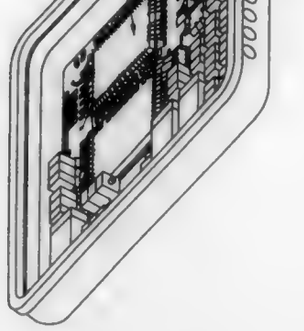
Filed Jun. 16, 1994, Ser. No. 260,866
Int. Cl.[6] A61N *1/375*
U.S. Cl. 607—36 **21 Claims**

1. A packaging arrangement for the outer packaging of an implantable medical device comprising:

at least a first multi-layered enclosure shell; and

at least a second multi-layered enclosure shell;

wherein said enclosure shells are joinable to sealably enclose components of said implantable medical device, and layers of said enclosure shells are adapted to conduct signals between implantable medical device components mounted on said shells.

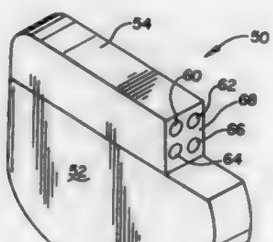


5,470,346

CONNECTOR PORTS FOR AN IMPLANTABLE DEFIBRILLATOR

Theodore P. Adams, Edina, Minn., assignor to Angeion Corporation, Plymouth, Minn.

Continuation of Ser. No. 853,052, Mar. 18, 1992, abandoned. This application Nov. 23, 1993, Ser. No. 156,984
Int. Cl.[6] A61N 1/39
U.S. Cl. 607—37 7 Claims



1. An implantable defibrillator for delivering a defibrillation countershock to at least three implantable defibrillator electrodes adapted for implantation within a human patient, the defibrillator comprising:

a. an implantable housing including circuit means for generating a truncated capacitive-discharge of greater than about 0.5 joules as the defibrillation countershock;

b. a connector block member in said housing having at least four terminal ports;

c. at least three of said terminal ports in said connector block member being defibrillator terminal ports electrically connected to said circuit means and each of said defibrillator terminal ports being electrically connected to a unique one of at least three implantable defibrillation electrodes;

d. at least one of said terminal ports being a sensing terminal port electrical connected to said circuit means and to an implantable sensing electrode; and

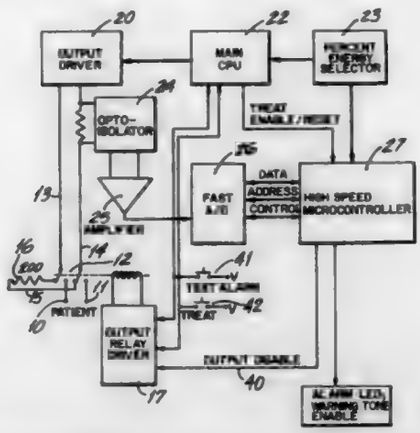
e. at least two of said defibrillator terminal ports having a same polarity, such that said implantable defibrillator does not require the use of an implantable junction box in order to deliver the countershock to said at least three defibrillator electrodes electrically connected to said defibrillator terminal ports.

5,470,347

SAFETY MONITOR CIRCUIT FOR AN ECT DEVICE AND METHOD

Conrad M. Swartz, Greenville, N.C., and Richard S. Abrams, Vernon Hills, Ill., assignors to Somatics, Inc., Lake Bluff, Ill.

Filed Dec. 13, 1994, Ser. No. 354,612
Int. Cl.[6] A61N 1/18
U.S. Cl. 607—45 17 Claims



1. An electroconvulsive therapy (ECT) system to apply an ECT dosage selected by an operator to a patient, the system comprising:

(a) electrodes adapted to be removably connected to the head of the patient;

(b) ECT dosage selection means to permit the operator to select the ECT dosage for the patient;

(c) an output driver means connected to the electrodes and to the ECT dosage selection means to generate the ECT dosage;

(d) a sampling circuit means to sample the ECT dosage;

(e) a switch means having open and closed positions connected between the output driver means and the electrodes;

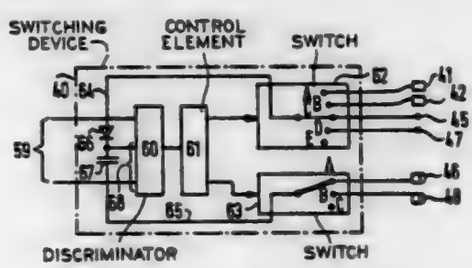
(f) a limit circuit means connected to the sampling circuit means and the switch means to generate a control signal to operate the switch means to the open position upon sensing an excess ECT dosage in excess of a predetermined amount greater than the ECT dosage selected for the patient.

5,470,348

DEVICE FOR STIMULATING LIVING TISSUE

Heinz Neubauer, Jaerfaella; Jakub Hirschberg, Taeby, and Hans Strandberg, Sundbyberg, all of, Sweden, assignors to Pacesetter AB, Solna, Sweden

Division of Ser. No. 111,198, Aug. 24, 1993, Pat. No. 5,423,873. This application Jan. 12, 1995, Ser. No. 371,824
Claims priority, application Sweden, Sep. 2, 1992, 9202521
Int. Cl.[6] A61N 1/32
U.S. Cl. 607—68 3 Claims



1. A device for stimulating living tissue comprising:

stimulation pulse generator means, having an output socket, for generating a stimulation signal having a polarity at said output socket;

electrode means having a plurality of stimulation signal delivery elements for transmitting said stimulation signal to different tissue sites;

control means, having a control means output connected to said output socket, for generating a control signal at said control means output, said control signal having a polarity opposite to the polarity of said stimulation signal and being superimposed on said stimulation signal at said output socket;

switching means, responsive to said stimulation control signal and having an input connected to said output socket which receives said stimulation signal with said stimulation control signal superimposed thereon and having outputs connected to said electrode means, for directing said stimulation signal to a selected tissue site, determined by said stimulation control signal, via at least one of said delivery elements;

discriminator means in said switching means for separating said stimulation control signal from said stimulation signal before directing said stimulation signal to said selected tissue site;

measurement sensor means for sensing a physiological activity and for generating a measurement sensor signal corresponding to said physical activity, said measurement sensor means being connectable to said output socket through said switching means;

measurement circuit means connected to said output socket for receiving said measurement sensor signal when said measurement sensor means is connected to said output socket and connected to said stimulation pulse generator means for causing said stimulation pulse generator means to modify said stimulation signal dependent on said physiological activity; and

said control means comprising means for generating a switching control signal for operating said switching means to establish a complete electrical path between said measurement sensor means and said measurement circuit means.

5,470,349

DEVICE FOR TREATING INFLAMMATORY SKIN CHANGES IN THE INITIAL STAGE, AND METHOD FOR USING SAME

Bernhard Kleditsch, Berlin, and Gabriel Khazaka, Köln, both of, Germany, assignors to Courage & Khazaka Electronic GmbH, Köln, Germany

PCT No. PCT/EP92/01361, § 371 Date Mar. 22, 1994, § 102(e) Date Mar. 22, 1994, PCT Pub. No. WO92/22349, PCT Pub. Date Dec. 23, 1992

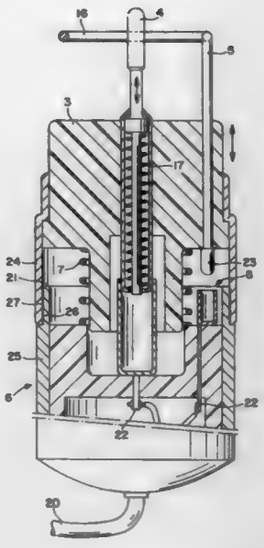
PCT Filed Jun. 16, 1992, Ser. No. 162,154

Claims priority, application Germany, Jun. 18, 1991, 41 20 517.0

Int. Cl.[6] A61N *1/20*

U.S. Cl. 607—75 **20 Claims**

1. A device for treating inflammatory skin changes in the initial stage, said device comprising a housing, with a direct-current source and a switch for interrupting the flow of said current fitted therein, and an electrode carrier on which are arranged an electrode and at least one counter-electrode, which electrode is connected electrically to one pole of the direct-current source, and which counter-electrode is electrically connected to the opposite pole of the direct-current source, said device characterized in that the electrode is pin-shaped and concentrically surrounded by the one or more counter-electrodes, the electrode carrier being mounted movably on a first spring in a cylindrical housing part, and electrode being mounted on a second spring inside the electrode carrier, the restoring force of which second spring is less than that of the first spring, the electrode and one or more counter-electrodes being in the operating state of the device, brought to bear on the area of skin which is to be treated.



5,470,350

SYSTEM FOR THE TREATMENT OF PATHOLOGICAL TISSUE HAVING A CATHETER WITH A PRESSURE SENSOR

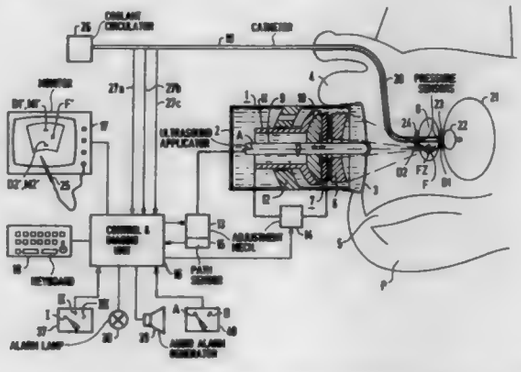
Gerhard Buchholtz, Erlangen, and Ulrich Schnetzle, Roettenbach, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 28, 1994, Ser. No. 218,582

Claims priority, application Germany, Apr. 2, 1993, 43 10 923.3

Int. Cl.[6] A61B *8/12*

U.S. Cl. 607—97 **17 Claims**



1. A therapy apparatus for treating pathological tissue with heating radiation comprising:

a source of heating radiation, said heating radiation having an active therapeutic region with a center;

a catheter introducible into the body of a patient to be treated with said heating radiation, said catheter having a distal end and a pressure sensor disposed approximately at said distal end, said pressure sensor generating output signals corresponding to a pressure sensed by said pressure sensor; and

ultrasound locating means for generating an ultrasound image of a region to be treated by said heating radiation, said ultrasound locating means including an ultrasound locating transducer which emits diagnostic ultrasound waves and an image-generating unit to which said output signals of said pressure sensor are supplied, said output signals arising due to charging of said pressure sensor with said diagnostic ultrasound waves, and said image-generating unit including means for identifying a position of said pressure sensor in said ultrasound image on the basis of said output signals, and for

mixing a mark into said ultrasound image identifying the position of said pressure sensor, and for mixing a further mark into said ultrasound image identifying a position of the center of said active therapeutic region.

5,470,351

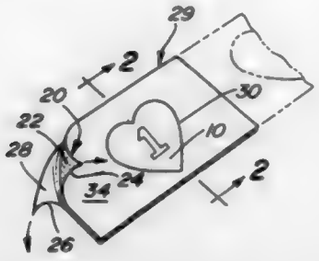
METHOD AND APPARATUS FOR CREATING TATTOOS

Jerry Ross, 7615 Fielding, Detroit, Mich. 48228, and Brian Sauvage, 2690 Golf Club Rd., Howell, Mich. 48843

Continuation of Ser. No. 113,999, Aug. 30, 1993, abandoned. This application Jul. 29, 1994, Ser. No. 283,208

Int. Cl.[6] A61N *5/00*

U.S. Cl. 607—95 **6 Claims**



1. A device for forming an ornamental design on a portion of a human body which has been exposed to tanning rays of a light source, said device comprising:

a flexible sheet member being adapted to block the tanning rays from the light source having a top surface and a bottom planar surface having an adhesive coating fully covering said bottom planar surface, said sheet member having means for forming a predetermined non-utilitarian ornamental shape, said means including a peripheral edge formed on said sheet member, said sheet member adapted for affixation to said portion of said human body whereby said shape is formed on said body after exposure to tanning rays from the light source;

a transfer sheet, having an adhesive coating on one side;

a backing sheet having a smooth surface to which said bottom planar surface of said sheet member and said adhesive coating of said one side of said transfer sheet are detachably mounted, said sheet member being sandwiched between said backing sheet and said transfer sheet, said bottom planar surface of said sheet member and said adhesive coating of said transfer sheet contacting said smooth surface of said backing sheet for easy removal of said backing sheet.

5,470,352

BALLOON ANGIOPLASTY DEVICE

Carey M. Rappaport, Newton, Mass., assignor to Northeastern University, Boston, Mass.

Filed Oct. 29, 1993, Ser. No. 145,878

Int. Cl.[6] A61B *17/36;* **A61N** *5/02;* **A61M** *25/10*

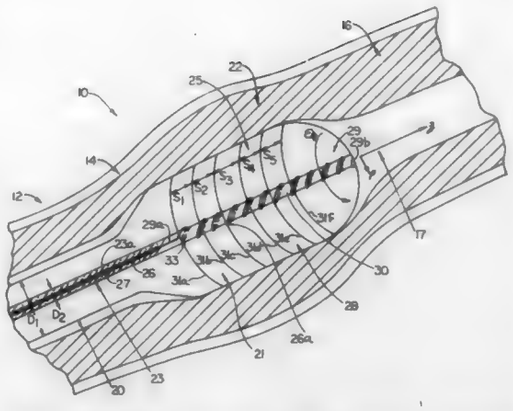
U.S. Cl. 607—101 **20 Claims**

1. A balloon angioplasty device for widening a path through which blood flows in an artery having plaque deposited on an inner wall thereof, the device having a catheter with a longitudinal axis and comprising:

an antenna for radiating an electric field having a component in a direction which is tangential to a boundary between said plaque and said inner wall of said artery;

a balloon coupled to the catheter, said balloon having first and second opposing surfaces, wherein said balloon is disposed about said antenna; and

a mode filter comprising at least one conductive strip disposed circumferentially around said balloon and concentrically about said longitudinal axis of said catheter for minimizing said electric field component radiated by said antenna in a



direction which is tangential to said boundary between the plaque and the artery wall on which the plaque is deposited.

5,470,353

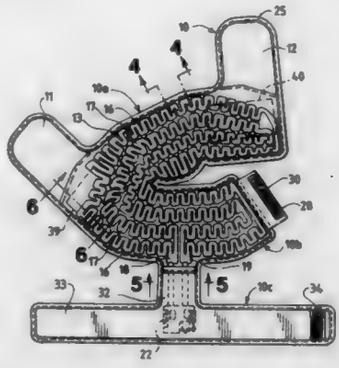
POST-OPERATIVE THERMAL BLANKET

Marvin E. Jensen, Mundelein, Ill., assignor to Hollister Incorporated, Libertyville, Ill.

Filed Oct. 20, 1993, Ser. No. 139,286

Int. Cl.[6] A61F *7/00*

U.S. Cl. 607—104 **13 Claims**



1. A thermal blanket for post-operative treatment of joint areas of the body, comprising a foldable bodyside panel composed of double layers of thermoplastic sheet material heat-sealed together to define therebetween at least one serpentine fluid-flow passage extending along a zigzag pathway from an inlet opening to an adjacent outlet opening; and a soft, foldable exterior panel extending along said bodyside panel in parallel relation therewith; said bodyside and exterior panels being coplanar and having peripheral edges secured together to form a unitary foldable blanket with an outline defining a pair of main blanket sections; said exterior panel having a soft loop-providing pile over substantially the entire exterior surface thereof; one of said main blanket sections being provided with an attachment patch having a bodyside-facing hook-providing fabric for releasable attachment of said loop-providing pile of said exterior surface of the other of said sections for maintaining said sections in partially overlapping interlocked relation when said blanket is wrapped about a joint area for thermal treatment thereof; said blanket including an integral T-shaped section having a central strap portion and an elongated transversely-extending limb-wrapping band portion; said T-shaped section having a soft loop-providing pile over substantially the entire exterior surface thereof; said band portion having a hook-providing bodyside-facing attachment patch at one end thereof for releasable attachment to the loop-providing pile of said band portion when the same is wrapped about a limb in close proximity to said joint area; said blanket also including parallel and flexible

inlet and outlet tubes extending along said strap portion; said inlet and outlet tubes each being connected at one end to said inlet and outlet openings, respectively, and at their opposite ends to a fluid coupling element.

5,470,354

FORCE SENSING APPARATUS AND METHOD FOR ORTHOPAEDIC JOINT RECONSTRUCTION

Troy W. Hershberger, Warsaw, Ind., and Robert E. Booth, Jr., Gladwyn, Pa., assignors to Biomet Inc., Warsaw, Ind.

Continuation of Ser. No. 790,176, Nov. 12, 1991, abandoned. This application Aug. 10, 1994, Ser. No. 288,545

Int. Cl.[6] **A61F** *2/38;2/30*

U.S. Cl. 623—20 **13 Claims**

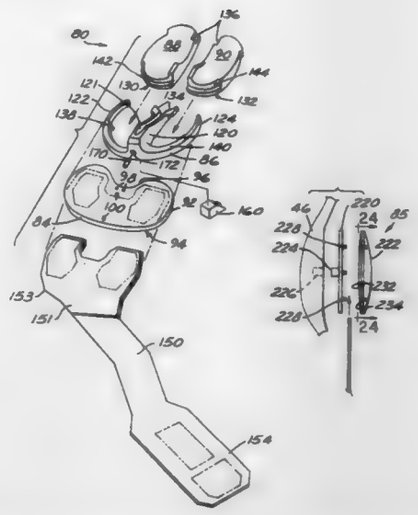
10. The method for assessing and determining proper alignment and placement of permanent implant components during joint reconstruction, comprising the steps of:

(1) affixing a first implant on one side of a joint;

(2) preparing a plateau on another side of the joint for receiving a second permanent implant;

(3) provisionally affixing a base to the plateau and interposing a bearing element between the first implant and the base such that the bearing element is rockable relative to the base in response to manipulation of the joint;

(4) provisionally interposing a force sensor between the base and the bearing element adapted to generate force signals when the bearing element rocks relative to the base;



(5) manipulating said joint through a desired range of flexion to cause the bearing element to rock relative to the base and generate a pattern of force magnitude and location signals indicative of joint alignment and contact areas;

(6) making adjustments to the joint as necessary to balance the forces and assure proper alignment and positioning of the implants in view of the pattern of force signals;

(7) removing the base, bearing element and force sensor from the plateau; and

(8) placing the second permanent implant on the plateau.

5,470,355

ORGANIC COMPOUNDS

Hans-Peter Baumann, Ettingen, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

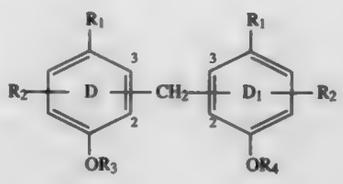
Continuation of Ser. No. 759,278, Sep. 13, 1991, abandoned, which is a continuation of Ser. No. 570,927, Aug. 21, 1990, abandoned, which is a continuation of Ser. No. 376,329, Jul. 6, 1989, abandoned, which is a continuation of Ser. No. 834,179, Feb. 26, 1986, abandoned, which is a continuation-in-part of Ser. No. 678,251, Dec. 5, 1984, abandoned. This application Feb. 3, 1994, Ser. No. 191,346

Claims priority, application Germany, Dec. 5, 1983, 33 43 949.4

Int. Cl.[6] C09B *67/40;* C07C *305/12*

U.S. Cl. 8—587 6 Claims

1. A compound of formula I



I

in which

each R_1, independently, is isooctyl, nonyl or dodecyl,

each R_2, independently, is hydrogen or $—SO_3R_6$,

R_3 is $-(A—O-)_mR_5$ where each A, independently, is $—C_2H_4—$, $—C_3H_6—$, $C_4H_8—$, and

the R_5 in R_3 is $—SO_3R_6$,

R_4 is hydrogen,

each R_6, independently, is hydrogen, an alkali metal, an equivalent of an alkaline earth metal, ammonium or substituted ammonium, and, m is 1, or a mixture thereof.

5,470,356

SULFUR DYE COMPOSITIONS AND THEIR PRODUCTION

Laszlo A. Meszaros, Rte. 1, Box 3110, Mt. Gilead, N.C. 27306

Continuation-in-part of Ser. No. 775,672, Oct. 11, 1991, abandoned. This application Oct. 2, 1992, Ser. No. 955,615

Int. Cl.[6] C09B *49/00*

U.S. Cl. 8—652 31 Claims

1. A process for producing a dye slurry which comprises the steps of

1) reducing a starting sulfur dye, which contains disulfide groups, in an amount of a non-sulfide reducing agent-containing aqueous reducing medium which is effective to reduce said disulfide groups and dissolve any solid particles of the dye and produce an aqueous solution of the reduced form of the dye which can be oxidized to form an aqueous slurry of precipitated solid particles of the dye which differ from particles obtainable by oxygenating an aqueous composition of the starting dye by virtue of a) being softer, b) being of more uniform particle size, c) being of smaller average particle size, d) containing less bound sulfur, e) containing less free sulfur or f) any combination of a)-e), and

2) oxidizing the solution obtained in step 1) to produce said slurry of precipitated solid particles of the dye.

5,470,357

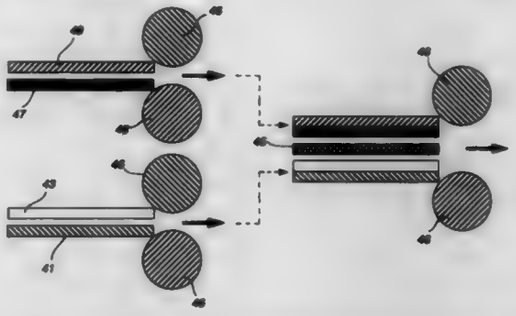
METHOD OF MAKING A LAMINATED LITHIUM-ION RECHARGEABLE BATTERY CELL

Caroline N. Schmutz, Eatontown; Frough K. Shokoohi, Fair Haven; Jean-Marie Tarascon, Martinsville, and Paul C. Warren, Far Hills, all of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Continuation-in-part of Ser. No. 160,018, Nov. 30, 1993, Pat. No. 5,460,904, which is a continuation-in-part of Ser. No. 110,262, Aug. 23, 1993, Pat. No. 5,418,091, which is a continuation-in-part of Ser. No. 26,904, Mar. 5, 1993, Pat. No. 5,296,318. This application Apr. 26, 1995, Ser. No. 428,970

Int. Cl.[6] H01M *6/00;6/18*

U.S. Cl. 29—623.5 8 Claims



1. A method of making a rechargeable battery structure which comprises arranging contiguously a positive current collector element, a positive electrode element, a separator element, a negative electrode element, and a negative current collector element characterized in that

a) each of said electrode and separator elements comprises a flexible, polymeric matrix film composition,

b) each of said collector elements comprises a flexible electrically-conductive foil which has been surface treated with a polymeric material compatible with the matrix composition of its contiguous electrode, and

c) said method further comprises bonding each said element to contiguous elements at its respective interfaces by the application of heat and pressure to form a unitary flexible laminate structure.

5,470,358

UNLEADED AVIATION GASOLINE

Roger G. Gaughan, Piscataway, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 59,437, May 4, 1993, abandoned. This application Apr. 19, 1994, Ser. No. 229,503

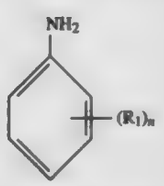
Int. Cl.[6] C10L *1/22*

U.S. Cl. 44—426 11 Claims

1. An unleaded aviation fuel composition having a motor octane number of at least about 98 for piston driven aircraft which comprises:

(1) unleaded aviation gasoline base fuel having a motor octane number of 90–93, and

(2) an amount of at least one aromatic amine effective to boost the motor octane number of the base fuel to at least about 98, said aromatic amine having the formula



(I)

wherein R_1 is C_1–C_{10} alkyl and n is an integer from 0 to 3 with the proviso that R_1 cannot occupy the 2- and 6- positions on the aromatic ring.

5,470,359

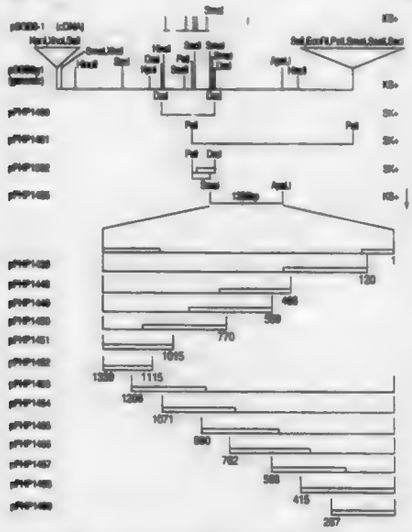
REGULATORY ELEMENT CONFERRING TAPETUM SPECIFICITY

Gary A. Huffman, Des Moines, Iowa, assignor to Pioneer Hi-Bred Internation, Inc., Des Moines, Iowa

Filed Apr. 21, 1994, Ser. No. 230,929

Int. Cl.[6] A01H *1/00;* **C12N** *15/00;15/05*

U.S. Cl. 47—58 **20 Claims**



1. An isolated DNA molecule comprising the nucleotide sequence of SEQ ID NO:1, wherein said DNA molecule is a tapetum-specific regulatory element.

5,470,360

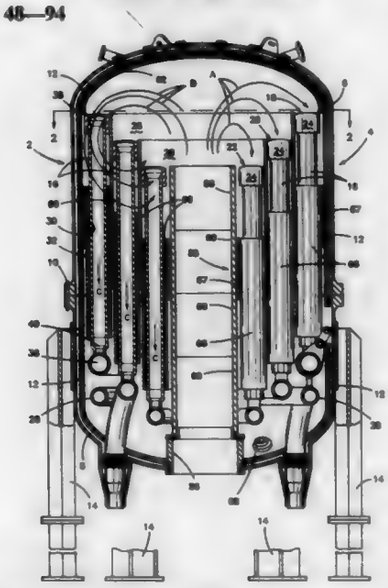
FUEL CELL POWER PLANT REFORMER BURNER GAS FLOW CONTROL SYSTEM

Richard A. Sederquist, Newington, Conn., assignor to International Fuel Cells Corporation, South Windsor, Conn.

Filed Mar. 10, 1994, Ser. No. 209,043

Int. Cl.[6] B01J *7/00;8/06*

U.S. Cl. 48—94 **2 Claims**



1. A catalytic reformer assembly for converting raw hydrocarbon fuel to a hydrogen-rich gaseous fuel for use in a fuel cell power plant, said reformer assembly comprising:

a) a housing having a cylindrical side wall, a first dome-shaped end wall, and a second end wall opposite said first wall;

b) a burner in said housing positioned coaxially with said housing side wall, said burner opening through said housing second wall and including a hot gas tube which extends toward said first wall of said housing;

c) a plurality of catalyst filled tubes disposed in said housing, each of said catalyst filled tubes having a first closed end directed toward the dome and an opposite second end, said catalyst filled tubes being arranged in a plurality of circular arrays each of which is concentric with said burner, said arrays being disposed in rings; and

d) annular baffles comprising vertically extending cylindrical walls, each extending upwardly toward the dome-shaped end wall and arranged concentric with said burner, and interposed between said rings of catalyst filled tubes, said baffles being operable to intercept hot burner gases deflected from said dome-shaped end wall toward said second end wall, and to direct said hot burner gases away from said hot gas tube, and distribute said hot gases evenly through said rings of catalyst tubes toward said second end wall.

5,470,361

PROCESS FOR WORKING UP MUNICIPAL PLASTIC WASTE MATERIALS BY GASIFICATION

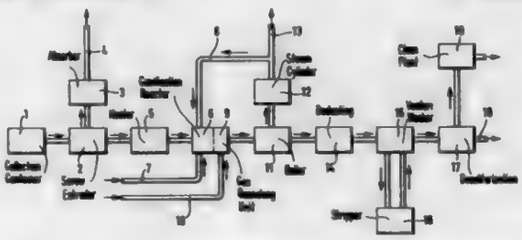
Adolf Linke; Werner Pohl; Karl Schmid, all of Essen, and Rolf Wetzel, Heiligenhaus, all of, Germany, assignors to Krupp Koppers GmbH, Essen, Germany

Filed Oct. 27, 1994, Ser. No. 331,364

Claims priority, application Germany, Jan. 27, 1993, 43 36 580.9

Int. Cl.[6] C10J *3/06;* **C10K** *1/02;1/06*

U.S. Cl. 48—197 R **11 Claims**



1. A process for gasifying municipal plastic waste material comprising the steps of:

a) compressing and heating a plurality of plastic waste material pieces of about 20 mm piece size in a screw extruder at a pressure of from 40 to 80 bar until at a temperature of from 230° to 300° C. to produce an HCl-containing gas and a heated and compressed plastic waste material containing less than 3000 mg of HCl per kg of said plastic waste materials pieces, said plastic waste material pieces being purified and freed of metallic components prior to said compressing and heating;

b) washing the HCl-containing gas produced during the compressing and heating step a) in a counterflow with water in an absorber to produce a hydrochloric acid solution;

c) further heating the heated and compressed plastic waste material containing less than 3000 mg of HCl per kg of said plastic waste materials pieces in a heating vessel until at a temperature of from 400° to 500° C. to form a plastic melt having a viscosity of less than 300 cSt;

d) gasifying the plastic melt formed in step c) in a gasification reactor at a pressure of 4 bar with oxygen in a flame reaction to form a crude gas in a gasification chamber having a central temperature of about 1600° C., a carbon content of the plastic melt being substantially converted to CO in the crude gas;

e) withdrawing said crude gas from said gasification reactor at a temperature of from 1300° to 1600° C. and directly cooling until at a temperature of said crude gas is from 700° to 900° C. by quenching;

f) after performing step e), further cooling said crude gas by indirect heat transfer in a heat exchanger producing steam until at a temperature of from 220° to 300° C.;

g) dry dedusting the crude gas cooled in step f) until said crude gas has a dust content of less than 20 mg/Nm^3 of the crude gas;

h) after the dry dedusting of step g), subsequently performing a water wash of said crude gas to remove gaseous impurities and residual dust from said crude gas; and

i) after performing the water wash of step h), desulfurizing the crude gas to form a purified gas.

5,470,362

METHOD FOR MAKING COATED ABRASIVE BELTS

Ian Gorsuch; Mark R. Ennis, and Robert M. Burgess, all of Kent, United Kingdom, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 78,484, Jun. 16, 1993, Pat. No. 5,341,609, which is a continuation of Ser. No. 826,811, Jan. 28, 1992, abandoned. This application May 26, 1994, Ser. No. 250,840

Claims priority, application United Kingdom, Jan. 30, 1991, 9102035

Int. Cl.^{6} B24D *11/06*

U.S. Cl. 51—295 **12 Claims**

1. A method of making a coated abrasive belt, said method comprising the steps of:

(a) providing an elongated strip of a flexible backing material having a major surface, complementary ends, a width, a length, at least one major surface, and having an abrasive layer attached to said major surface, said flexible backing material comprising at least one flexible support and a hot-melt adhesive layer, said hot-melt adhesive layer being parallel to said major surface of said flexible backing material and extending the length of said elongated strip;

(b) abutting said complementary ends to provide a belt;

(c) applying pressure and heat over an area of said abutting ends sufficient to cause said hot-melt adhesive to flow across said abutting complementary ends; and

(d) allowing said heated area to cool

to provide a coated abrasive belt, having a length, and a thickness, wherein said thickness is the same throughout its length, said coated abrasive belt having a width equal to said width of said elongated strip, and said hot-melt adhesive being continuous over said abutting complementary ends to provide a splice.

5,470,363

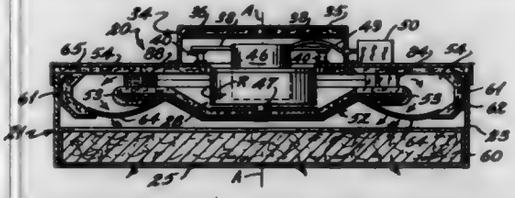
AIR BLOWER AND FILTER ASSEMBLIES

William J. Leader, and Dennis K. Smith, both of Albuquerque, N.M., assignors to Envirco Corporation, Albuquerque, N.M.

Filed Jan. 13, 1995, Ser. No. 373,941

Int. Cl.^{6} B01D *46/10*

U.S. Cl. 55—276 **23 Claims**



1. In an air purification apparatus including a housing having opposite sidewalls and opposite endwalls which define a first pair of diagonally oriented corners and a second pair of diagonally oriented corners, an upper and a lower portion, the housing defining an interior plenum chamber with an inlet opening in the upper portion of the housing and a discharge opening in the lower portion of the housing, a blower means mounted within the plenum chamber, means for rotating the blower means, a filter mounted between the blower means and the discharge, a first baffle having opposite sides and opposite ends mounted between the blower means and the filter means, the ends of the first baffle being spaced from the endwalls of the housing, and the blower means being operable to direct airflow along the sidewalls toward the second pair of diagonally oriented corners of the housing, the improvement comprising, a pair of first deflector means extending inwardly of the plenum chamber from each of the sidewalls of the housing adjacent to but spaced from the first pair of diagonally oriented corners, said first deflector means having a portion angled toward an adjacent endwall of the housing, and a second pair of air deflector means extending inwardly of the plenum chamber from each of the sidewalls adjacent to but spaced from the second pair of diagonally oriented corners, said second deflector means having a portion angled toward an adjacent endwall of the housing, whereby as air is directed generally radially outwardly with respect to the blower means, the air will be directed by said first and second deflector means away from said first and second pairs of diagonally oriented corners.

5,470,364

REGENERABLE DIESEL EXHAUST FILTER

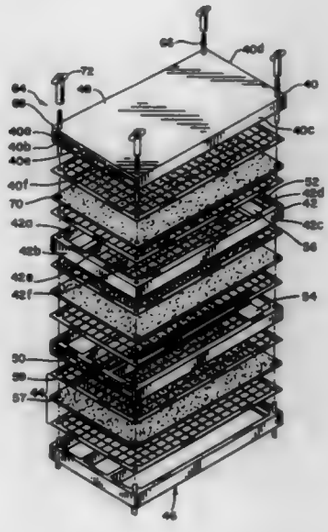
Joseph G. Adiletta, Thompson, Conn., assignor to Pall Corporation, East Hills, N.Y.

PCT No. PCT/US93/00022, § 371 Date Aug. 24, 1993, § 102(e) Date Aug. 24, 1993, PCT Pub. No. WO93/13848, PCT Pub. Date Jul. 22, 1993

Continuation-in-part of Ser. No. 817,595, Jan. 7, 1992, Pat. No. 5,228,891. This PCT application Jan. 7, 1993, Ser. No. 107,841

Int. Cl.^{6} B01D *46/00*

U.S. Cl. 55—484 **21 Claims**



1. An exhaust gas filter assembly for removing particulates from the exhaust gas of an engine, comprising, in combination,

a housing having an inlet pipe coupled to receive the exhaust gas from the engine and an outlet pipe coupled to vent exhaust gas to the atmosphere and defining an exhaust gas flow path through the housing and

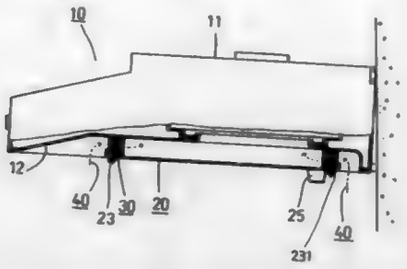
a filter arrangement disposed in the housing within the gas flow path, said filter arrangement including a plurality of inlet cells having first and second generally planar faces, a plurality of generally planar microporous filter elements, a plurality of outlet cells having first and second generally planar faces, said outlet cells being alternately arranged with at least one microporous filter element disposed between the second face of each inlet cell and adjacent the first face of a corresponding outlet cell, and wherein the inlet and outlet cells, and the microporous filter elements comprise materials that are resistant to high temperatures such that the filter arrangement may be regenerated by heat.

5,470,365

SMOKE EXHAUSTER

Sun-Sing Jang, 650, Yuan-Huan E. Rd., Fong-Yuan,, Taichung Hsien, Taiwan, Prov. of China

Filed Dec. 29, 1994, Ser. No. 366,307
Int. Cl.[6] B01D *35/02*
U.S. Cl. 55—510 **8 Claims**



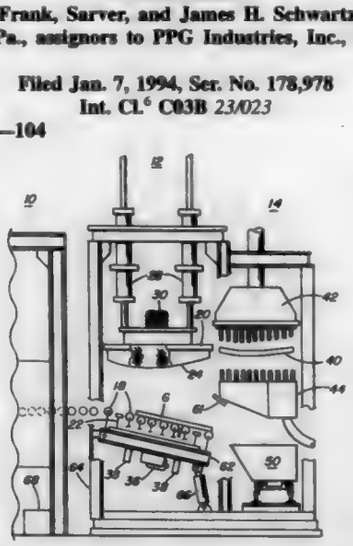
1. A smoke exhauster having a housing provided with a bottom board under which a base board is detachably fastened, said base board being greater in area than a fume admitting hole of said bottom board, said base board having a main plate portion provided peripherally with a stopping portion extending upwards for locating a filtration member of a rectangular framelike construction such that the periphery of said filtration member urges an inner side wall of said stopping portion of said base board, and that a top and a bottom of said filtration member are attached respectively to a bottom of said bottom board and a top of said base board.

5,470,366

METHOD AND APPARATUS FOR PROCESSING A GLASS SHEET

Robert G. Frank, Sarver, and James H. Schwartz, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 7, 1994, Ser. No. 178,978
Int. Cl.[6] C03B *23/023*
U.S. Cl. 65—104 **15 Claims**



1. In a method of heating, shaping and cooling heat softenable sheet material including the steps of moving a sheet in a first direction along a first generally horizontal plane through a furnace to heat said sheet to its heat softening temperature and into a shaping station, shaping said sheet including the steps of engaging said sheet with an upper vacuum surface, drawing a vacuum along said upper vacuum surface to secure said sheet thereagainst, moving a ring member from a first position between upper and lower quench plenums in a cooling station to a second position within said shaping station beneath said upper vacuum surface, along a second generally horizontal plane in a direction which is linearly aligned with said first direction, and terminating said vacuum along said upper vacuum surface to deposit said sheet on said ring member, and cooling said sheet including the step of moving said ring member from said second position within said shaping station along said second plane to said first position within said cooling station, the improvement comprising the steps of:

vertically offsetting said second plane relative to said first plane such that said first plane is beneath a portion of said lower quench plenum which is immediately adjacent said shaping station;

conveying said sheet within said shaping station along said first plane over a series of rolls supported on a frame positioned below said upper vacuum surface;

monitoring operation of said sheet moving, conveying, and shaping steps and in response to improper operation of said sheet moving, conveying, or shaping steps;

continuing said conveying step while pivoting said frame downward such that said sheet is conveyed through and exits said shaping station under said adjacent portion of said lower quench plenum without being shaped.

7. In an apparatus for heating, shaping and cooling heat softenable sheet material including a conveying means to move a sheet in a first direction along a first generally horizontal plane through a furnace to heat said sheet to its heat softening temperature and into a shaping station, an upper vacuum mold positioned within said shaping station, a ring member moveable between a first position within said shaping station beneath said upper vacuum mold to a second position between upper and lower quench plenums within a cooling station, along a second generally horizontal plane in a direction which is linearly aligned with said first direction, the improvement comprising:

a series of conveyor rolls supported on a frame positioned below said upper vacuum mold to convey said sheet along said first plane while within said shaping station; and

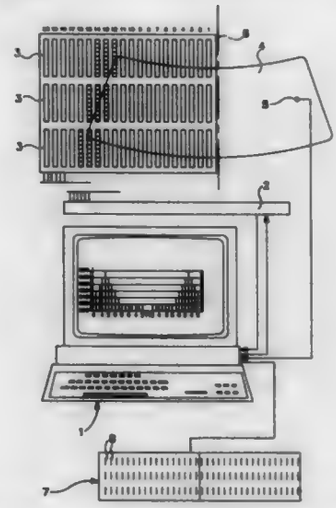
means to pivot said frame downward to lower a leading edge of said sheet while said sheet is conveyed through and exits said shaping station, wherein said first plane is vertically offset from said second plane such that said first plane is beneath a portion of said lower quench plenum which is immediately adjacent said shaping station.

5,470,367

HEATING APPARATUS FOR A GLASS-SHEET BENDING STATION

Tauno T. Salonen, and Erkki P. J. Yli-Vakkuri, both of Tampere, Finland, assignors to Tamglass Oy, Finland

Filed Nov. 21, 1991, Ser. No. 795,735
Int. Cl.[6] C03B *29/00;23/00*
U.S. Cl. 65—162 **10 Claims**



1. A heating apparatus for glass sheet bending station, comprising:

an array of heating elements including two or more heating element fields positioned successively in a longitudinal direction of said heating elements, said two or more heating

element fields being formed by heating elements positioned side by side such that the heating element fields are adapted to form a heat exchange area covering an area to be bent of a glass sheet, said heating elements being separately and independently controllable to be switched on and off;

a control mechanism including means for selectively switching individual heating elements on and off in successive heating element fields so as to form different heat exchange areas that each generally covers the area to be bent of the glass sheet and that each extends at a different angle relative to the longitudinal direction of the heating elements.

5,470,368

REDUCED VISCOSITY SLURRIES, ABRASIVE ARTICLES MADE THEREFROM, AND METHODS OF MAKING SAID ARTICLES

Scott R. Culler, Burnsville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 177,595, Jan. 5, 1994, Pat. No. 5,368,619.
This application Jun. 1, 1994, Ser. No. 251,906
Int. Cl.[6] B24D *3/24*
U.S. Cl. 51—298 **15 Claims**

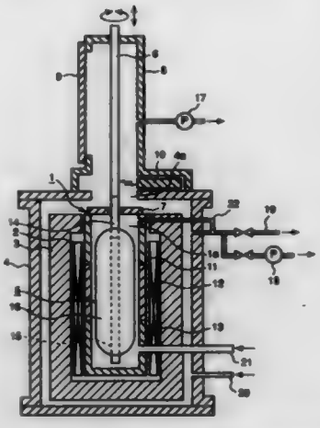
1. A slurry suitable for use in producing abrasive articles, the slurry consisting essentially of a polymerizable resin, abrasive particles, and modifying particles, wherein said modifying particles have a surface area of less than about 300 m^2/g and wherein said modifying particles are present in an amount sufficient to reduce the viscosity of said slurry.

5,470,369

PROCESS FOR CONSOLIDATION OF POROUS PREFORM FOR OPTICAL FIBER

Ichiro Tsuchiya; Toshio Danzuka, and Masumi Ito, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 990,256, Dec. 14, 1992, abandoned.
This application Feb. 16, 1994, Ser. No. 197,534
Claims priority, application Japan, Dec. 16, 1991, 3-332047
Int. Cl.[6] C03B *37/018*
U.S. Cl. 65—379 **16 Claims**



1. The process for the consolidation of a porous glass preform for an optical fiber comprising the steps of:

a first step of heating the preform under an increasing temperature in a vacuum furnace under a first pressure which is less than 5 kPa and supplying a first gas comprising a first inert gas to the vacuum furnace; and

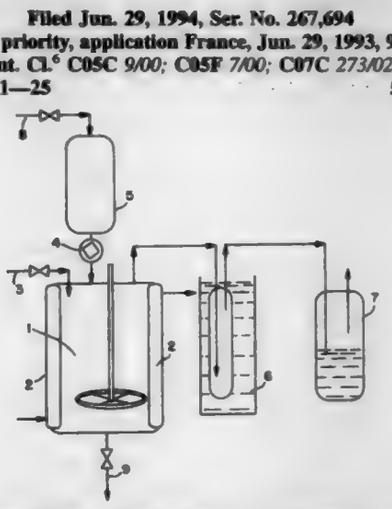
a second step of heating the preform under an increasing temperature in the vacuum furnace under a second pressure which is less than 5 kPa in which a second gas comprising a second inert gas is supplied to the vacuum furnace, the second inert gas being supplied at a flow rate less than the first inert gas, or under a vacuum in which substantially no gas is supplied to the vacuum furnace.

5,470,370

COMPLEX COMPOSITION RESULTING FROM THE ACTION OF UREA ON A SULFURIC SLUDGE OF PETROLEUM ORIGIN, PROCESS FOR THE PREPARATION THEREOF AND USE THEREOF AS A SOURCE OF FERTILIZING MATERIAL

Daniel Lonchamp, Tassin La Demi Lune, and Yvan Schwob, Cannes, both of, France, assignors to Institut Francais Du Petrole, Rueil Malmaison, and Transvalor, Paris, both of, France

Filed Jun. 29, 1994, Ser. No. 267,694
Claims priority, application France, Jun. 29, 1993, 93/08.044
Int. Cl.[6] C05C *9/00;* **C05F** *7/00;* **C07C** *273/02*
U.S. Cl. 71—25 **5 Claims**



1. A process for the preparation of a fertilizer composition comprising reacting at a temperature which is at most equal to 75° C. urea, a sulfuric sludge from an aliphatic alkylation reaction containing by weight 50 to 99% of sulfuric acid and 1 to 20% of organic residue and water, in an amount such that the molar ratio between the urea and the total acid contained in the sludge is from about 1:1 to about 4:1 and the molar ratio between the water and the total acid contained in the sludge is from about 1:1 to about 6:1, to form a liquid phase containing a sulfuric acid-urea complex and above the liquid phase a semi-solid hydrocarbon film; decanting the film from the solution obtained and recovering the fertilizer composition.

5,470,371

DISPERSION STRENGTHENED ALLOY CONTAINING IN-SITU-FORMED DISPERSOIDS AND ARTICLES AND METHODS OF MANUFACTURE

Ramgopal Darolia, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 12, 1992, Ser. No. 850,363
Int. Cl.[6] B22F *3/15;* **C22C** *19/05*
U.S. Cl. 75—229 **26 Claims**

14. A metal matrix composite material comprising a plurality of reinforcing fibers disposed in a predetermined arrangement within a matrix material comprised of a nickel-base superalloy comprising an equilibrium structure having at least three phases, a first phase defining a continuous matrix, a second phase in the form of a dispersion distributed throughout the matrix and a third phase in the form of a precipitate distributed substantially uniformly throughout the matrix, wherein manufacture of the superalloy includes the steps of:

producing a powder of the superalloy under nonequilibrium conditions so that the matrix is supersaturated with respect to elements of the second phase and elements of the third phase,

and substantially free of a dispersion of the second phase and a precipitate of the third phase;

developing in the matrix by a thermal treatment process the dispersion of the second phase, which is thenceforward substantially insoluble in the matrix; and

developing the precipitate of the third phase by a thermal treatment process.

5,470,372

SINTERED EXTREMELY FINE-GRAINED TITANIUM-BASED CARBONITRIDE ALLOY WITH IMPROVED TOUGHNESS AND/OR WEAR RESISTANCE

Gerold Weinl, Alvsjo, Sweden, assignor to Sandvik AB, Sandviken, Sweden

Filed Jun. 22, 1993, Ser. No. 79,604

Claims priority, application Sweden, Jun. 22, 1992, 9201928

Int. Cl.[6] C22C *29/04*; B22F *3/00*

U.S. Cl. 75—238 **4 Claims**

1. A sintered titanium-based carbonitride alloy for metal cutting containing hard constituents of carbonitrides based on Ti, Zr, Hf, V, Nb, Ta, Cr, Mo and/or W and 3–30% binder phase based on Co and/or Ni or their alloys, said carbonitride alloy containing coarse hard constituent grains essentially without core-rim structure with a mean grain size of 0.8–5 μm in a matrix of binder phase and fine-grained hard constituents with a mean grain size of the hard constituents of <1 μm, where said mean grain size of the coarse hard constituent grains is >1.5 times greater than the mean grain size for the grains in said matrix and the amount of coarse hard constituents is 10–50% by weight of said matrix, said matrix being made from a powder being prepared from an intermetallic prealloy disintegrated to <50 μm particle size and then carbonitrided in situ to extremely fine-grained hard constituents having a diameter <0.1 μm within the binder phase metals, said coarse hard constituent grains have been produced by carbonitriding of the metals or their oxides and are essentially equiaxial with a narrow grain size distribution.

5,470,373

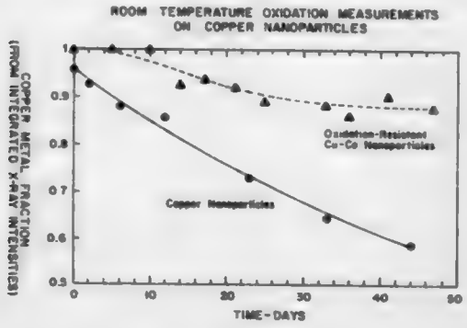
OXIDATION RESISTANT COPPER

Alan S. Edelstein, Alexandria, Va.; Forrest H. Kaatz, Appleton, Wis., and Vincent G. Harris, Beltsville, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 15, 1993, Ser. No. 151,693

Int. Cl.[6] C22C *9/06*

U.S. Cl. 75—255 **7 Claims**



5. An electrically conducting particulate metal product resistant to oxidation compared to unoxidized copper, with substantially each particle of said product comprising copper and at least one metal selected from the group consisting of cobalt, iron and mixtures thereof, wherein said copper and said at least one metal are in separate phases, wherein the atomic ratio of copper to said at least one metal is at least 1 in said product and wherein said particles have an average particle diameter in the range of 1–100 nm.

5,470,374

METHOD FOR PRODUCTION OF MAGNETIC METAL PARTICLES AND APPARATUS THEREFOR

Hiroyuki Nakamura; Yoshinori Hama; Shuhei Arikita, and Shingo Ikeshita, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

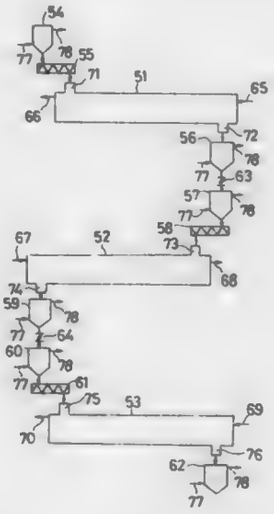
Filed Sep. 10, 1993, Ser. No. 118,659

Claims priority, application Japan, Sep. 10, 1992, 4-269751; Jan. 28, 1992, 4-313946

Int. Cl.[6] B22F *9/22*

U.S. Cl. 75—348 **11 Claims**

11. A method for producing magnetic metal particles, wherein



iron compound particles based on iron oxyhydroxide are thermally dehydrated with a non-reducing gas, then thermally reduced with a reducing gas, and further stabilized by a thermal gas-phase oxidation with an oxygen-containing gas, comprising the following steps (a)–(c):

(a) continuously supplying a granulated material of the iron compound particles based on iron oxyhydroxide, which have a weight-average size of 1 to 20 mm, onto a gas-passable belt installed in a gas flow reactor for the thermal dehydration; and continuously conducting the thermal dehydration with the non-reducing gas while conveying the granulated material so as to continuously yield a thermally dehydrated material;

(b) continuously supplying the thermally dehydrated material obtained in step (a) by providing a closed gas flow reactor wholly enclosing a gas-passable conveying belt onto which the dehydrated material is supplied for the thermal reduction; and continuously thermally reducing the dehydrated material using said reducing gas while conveying the dehydrated material so as to continuously yield a reduced material, such that within the reactor said granulated material is substantially prevented from exposure to an oxidizing environment; and

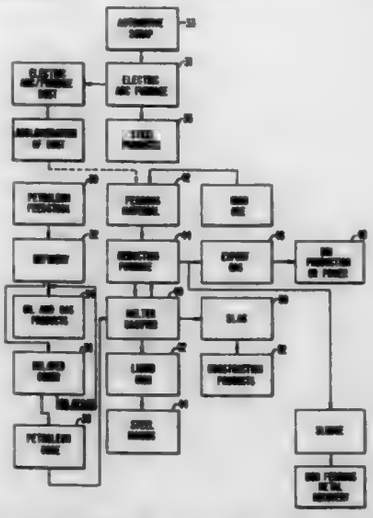
(c) continuously supplying the reduced material obtained in step (b) onto a gas-passable belt installed in a gas flow reactor for stabilization; and continuously stabilizing the material by the thermal gas-phase oxidation with the oxygen-containing gas while conveying the material.

5,470,375

METHOD OF PROCESSING WASTE MATERIAL CONTAINING NON FERROUS METAL OXIDES

Richard B. Greenwalt, Danville, Calif., assignor to Bechtel Group, Inc., San Francisco, Calif.

Continuation of Ser. No. 84,853, Jun. 30, 1993, Pat. No. 5,338,336. This application Feb. 14, 1994, Ser. No. 194,898
The portion of the term of this patent subsequent to Aug. 16, 2011, has been disclaimed.
Int. Cl.[6] C21B *13/14*
U.S. Cl. 75—505 4 Claims



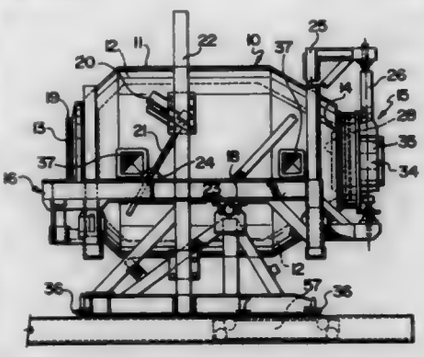
1. A method of treating electric arc furnace dust comprising the steps of charging a reduction furnace with agglomerates of electric arc furnace dust including the non-ferrous metals contained therein, passing a hot reduction gas through said agglomerates in said reduction furnace under reducing conditions and at a temperature sufficient to reduce said agglomerates to produce metallized iron and a top off gas containing vapors of said non-ferrous metals, removing said metallized iron and said top off gas from said reduction furnace while maintaining said top off gas under reducing conditions and condensing said vapors of said non-ferrous metals contained in said top off gas to produce concentrated non-ferrous metals.

5,470,376

RECOVERY OF NON-FERROUS METALS FROM DROSS

Ghyslain Dube, Chicoutimi; Marko Litalien, Laterriere; Roger Pelletier, and Zhou Wang, both of Jonquiere, all of, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Jul. 15, 1994, Ser. No. 275,799
Int. Cl.[6] C22B *7/04*
U.S. Cl. 75—672 11 Claims



1. A process of recovering a non-ferrous metal, having a melting point, from a dross containing the metal, comprising:

introducing into a rotary furnace said dross and a material comprising a fluoride salt which becomes substantially molten only at temperatures above the melting point of the metal;

heating the dross and said material to a maximum temperature above the melting point of the metal using a heating means that substantially maintains a non-oxidizing atmosphere in the furnace;

rotating the furnace in a manner selected from the group consisting of continuous rotation, intermittent rotation and reciprocating rotation until the dross reaches said maximum temperature;

removing the molten metal thereby separated from a solid dross residue; and

removing said solid dross residue from the furnace;

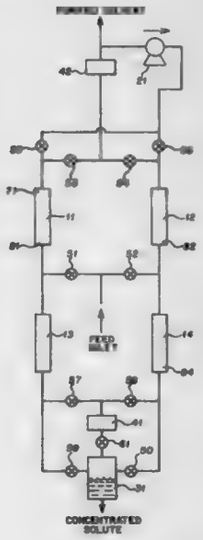
said material and said maximum temperature being chosen to avoid clumping of said dross or conversion of said dross to a paste as said dross and material are heated and rotated in said furnace.

5,470,377

SEPARATION OF SOLUTES IN GASEOUS SOLVENTS

David R. Whitlock, 138 Vassal La., Cambridge, Mass. 02138

Filed Mar. 8, 1993, Ser. No. 27,890
Int. Cl.[6] B01D *53/04*
U.S. Cl. 95—90 35 Claims



1. A process for separating at least one solute dissolved in a gaseous solvent, which is a supercritical fluid, from the gaseous solvent, the process comprising the steps of:

passing the gaseous solvent containing said solute, the gaseous solvent being at a first density, through a bed of sorbent in a first direction so as to sorb said solute from said solution onto said sorbent while producing purified gaseous solvent reduced in concentration of said solute;

acting upon a portion of the solvent depleted in said solute, so as to achieve a second density greater than the first density, whereby said portion of pure solvent has increased solvent capacity for said solute;

passing said portion of the solvent depleted in solute, at the second density greater than the first density and with increased solvent capacity, through said bed of sorbent in a direction counter to the first direction so as to desorb said solute from said sorbent producing a solution of said solute in said portion of solvent; and

recovering said portion of solvent at said second density containing said solute desorbed from said bed of sorbent and dissolved in said solvent to form a recovered portion of solvent.

5,470,378

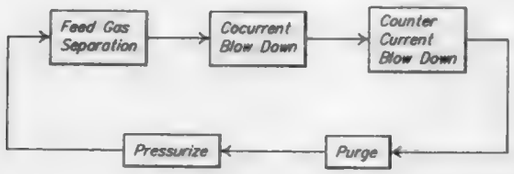
SYSTEM FOR SEPARATION OF OXYGEN FROM ARGON/OXYGEN MIXTURE

Alexander I. Kandybin, Toledo, Ohio; Richard A. Anderson, Katonah, N.Y., and Daniel L. Reichley, Toledo, Ohio, assignors to Arbor Research Corporation, Ann Arbor, Mich.

Continuation of Ser. No. 950,257, Sep. 22, 1992, abandoned. This application Dec. 27, 1993, Ser. No. 173,708

Int. Cl.[6] B01D *53/047*

U.S. Cl. 95—100 **14 Claims**



1. A process for removing argon from a feed gas stream comprising oxygen and argon to provide an oxygen-enriched gas stream, said process comprising:

a. providing said feed gas at a temperature between about −30° C. and about 100° C. and at an elevated pressure; and

b. passing said feed gas over an adsorbent bed comprising a Ag ion exchanged type X zeolite wherein at least about 80% of the available ion sites are occupied by Ag ions such that at least a portion of the argon in said feed gas is adsorbed by the adsorbent bed thereby leaving an oxygen-enriched gas stream.

5,470,379

MEMBRANE PLANT: AUTOMATIC CONTROL OF

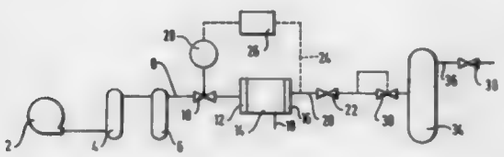
Michael E. Garrett, Woking, England, assignor to The BOC Group plc, Windlesham, England

Continuation of Ser. No. 873,500, Apr. 23, 1992, abandoned, which is a continuation of Ser. No. 551,582, Jul. 11, 1990, abandoned. This application Jan. 7, 1993, Ser. No. 1,946

Claims priority, application United Kingdom, Jul. 19, 1989, 8916510

Int. Cl.[6] B01D *53/22*

U.S. Cl. 96—4 **6 Claims**



1. Apparatus for separating a gas mixture comprising a vessel housing semi-permeable membranes effective to separate the mixture via permeation into a permeate gas and a non-permeate gas and having a single inlet for the gas mixture to be separated, a first outlet for product gas and a second outlet for a gas stream of different composition from that of the product gas, a first flow control valve for controlling the flow of all of the gas mixture to be separated to said inlet, control means for adjusting the position of said first flow control valve in response to analysis of the composition of the product gas, and a second flow control valve for controlling the flow of product gas from the first outlet, said second control valve capable of delivering product gas at a constant flow rate over a range of different pressures upstream thereof, additionally including a valve regulating the pressure upstream thereof downstream of the second control valve so as to make it possible to maintain in operating of the apparatus a constant pressure intermediate the second control valve and the pressure regulating valve.

5,470,380

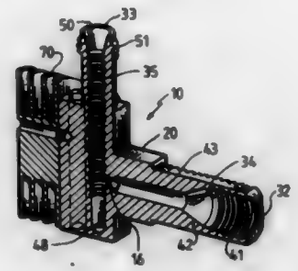
MANAGEMENT DEVICE FOR GAS CHROMATOGRAPHY SAMPLE CONCENTRATION

Kenneth K. Jiang, and Bernie B. Bernard, both of College Station, Tex., assignors to O. I. Corporation, College Station, Tex.

Division of Ser. No. 61,986, May 14, 1993, Pat. No. 5,358,557, which is a division of Ser. No. 848,395, Mar. 9, 1992, Pat. No. 5,250,093. This application Jul. 29, 1994, Ser. No. 282,171

Int. Cl.[6] B01D *15/08*

U.S. Cl. 96—102 **39 Claims**



1. An apparatus for removal of water from a sample being purged from a sparge vessel to a trap and desorbed from the trap to an analytical instrument for testing, comprising:

(a) a passage configured to provide a flow path for the sample between the sparge vessel, the trap and the analytical instrument; said passage being selectively connectable between the sparge vessel and the trap and between the trap and the analytical instrument;

(b) heating means for heating said passage to a first temperature sufficient to vaporize water in said passage when said passage is connected between the sparge vessel and the trap; and

(c) air cooling means for cooling said passage to a second temperature below said first temperature, but not below ambient, when said passage is connected between the trap and the analytical instrument.

5,470,381

ELECTROLESS GOLD PLATING SOLUTION

Masaru Kato; Yutaka Yazawa, and Shigetaka Hoshino, all of Soka, Japan, assignors to Kanto Kagaku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP92/01538, § 371 Date Jul. 22, 1994, § 102(e) Date Jul. 22, 1994, PCT Pub. No. WO94/12686, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 25, 1992, Ser. No. 256,369

Int. Cl.[6] C23C *18/44*

U.S. Cl. 106—1.23 **7 Claims**

1. An electroless gold plating solution comprising an aqueous solution which comprises: chloroauric (III) acid or a salt thereof or a sulfite or thiosulfate gold (I) complex salt as a gold source, an alkali metal or ammonium sulfite or thiosulfate, ascorbic acid or a salt thereof, a pH buffer, and a compound selected from the group consisting of 2-mercaptobenzothiazole, 6-ethoxy-2-mercaptobenzothiazole, 2-mercaptobenzimidazole, 2-mercaptobenzoxazole and salts thereof.

5,470,382

BIODEGRADABLE MOLDED ARTICLES

Sadamasa Andou, Minoo, Japan, assignor to Nissei Kabushiki Kaisha, Osaka, Japan

Filed Feb. 18, 1993, Ser. No. 18,988

Claims priority, application Japan, Feb. 19, 1992, 4-032215

Int. Cl.[6] C08L *89/04;91/00;99/00*

U.S. Cl. 106—124 **44 Claims**

11. A biodegradable molded article comprising:

residues resulting from processing soybeans to produce bean curd;

a binding agent; and

said residues and said binding agent being molded under pressure in a range of 0.5 to 500 kg/cm^2 at a temperature in a range of 30° to 300° C. for a time period in a range of 0.5 to 600 seconds.

17. The biodegradable molded article as set forth in claim 11, wherein the binding agent is a protein.

5,470,383

THICKENER COMBINATIONS FOR BUILDING PRODUCTS

Walter Schermann, Mainz; Dennis Miller, Kelkheim; Eckhard Hilgenfeldt, Wiesbaden, and Jozef Böhme-Kovac, Dexheim, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Jun. 21, 1994, Ser. No. 263,089

Claims priority, application Germany, Jun. 21, 1993, 43 20 508.9

Int. Cl.^{6} C08L *1/26;1/28;* C09D *101/26;101/28*

U.S. Cl. 106—170 **11 Claims**

1. A thickener composition for building products comprising:

a component I), comprising at least one nonionic cellulose ether soluble in water or aqueous surfactant solutions, wherein the cellulose ether is substituted by at least one hydrocarbon radical having from 8 to 36 carbon atoms, and

a component II), comprising from 0.05 to 10% by weight, based on the total weight of component I and component II, of one of the following surfactant components

a) at least one nonionic surfactant of the formula

$$R—A_n—OH$$

in which

R is C_8–C_{22}-alkyenyl, C_8–C_{22}-alkaryl or C_2–C_{12}-alkaryl,

A is the group OCH_2CH_2 or $OCH(CH_3)CH_2$, and

N is a number from 1 to 8,

b) at least one ethersulfate, ethersulfonate, ethercarboxylate, iseothionate, or mixtures thereof of the formula

$$R—\left[\begin{matrix}O\\ \|\\ C\end{matrix}\right]_p—(OCH_2CH_2)_q—Z \quad M$$

in which

R is C_8–C_{22}-alkyl, C_8–C_{22}-alkenyl or C_2–C_{12}-alkaryl,

Z is a group of the formula $OSO_3^{\ominus}$, $SO_3^{\ominus}$, or $OCO_2^{\ominus}$,

M is an alkali metal ion or triethanolammonium ion,

p is either 0 or 1, and

q is a number from 1 to 5,

c) at least one olefinsulfonate sodium salt, a primary or secondary alkanesulfonate, or a primary or secondary alkarylsulfonate,

d) at least one tauride, methyltauride, or mixtures thereof of the formula

$$R_1—\begin{matrix}O\\ \|\\ C\end{matrix}—\begin{matrix}N\\ |\\ R_2\end{matrix}—CH_2—CH_2—SO_3^- \quad M$$

in which

R_1 is C_8–C_{18}-alkyl or C_8–C_{18}-alkenyl,

R_2 is hydrogen or methyl, and

M is an alkali metal ion or triethanolammonium ion,

d) at least one cationic surfactant of the formula

$$R_3—\begin{matrix}CH_3\\ |\\ N^+\\ |\\ CH_3\end{matrix}—R_4 \quad X_1^-$$

in which

R_3 is C_8–C_{20}-alkyl,

R_4 is hydrogen, methyl, benzyl, or C_8–C_{20}-alkyl, and

X_1^- is a halide ion, acetate ion, lactate ion, or methylsulfate ion, or

e) at least one naphthalenesulfonic acid/formaldehyde condensation product.

5,470,384

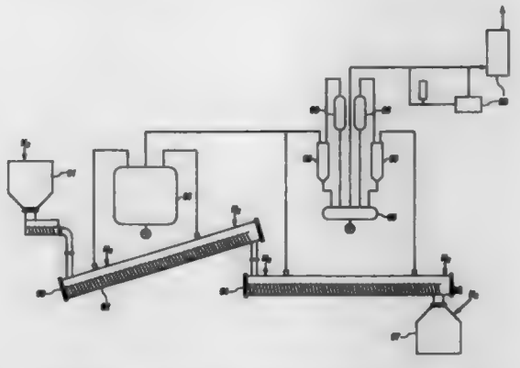
PROCESS FOR CO-RECYCLING TIRES AND OILS

Chang Y. Cha; Henry Plancher, both of Laramie, Wyo., and Lawrence S. Kraus, Elburn, Ill., assignors to Univ. of Wyoming, Laramie, Wyo., and Amoco Corp., Chicago, Ill.

Division of Ser. No. 140,378, Oct. 21, 1993, abandoned, which is a continuation of Ser. No. 117,387, Sep. 7, 1993, Pat. No. 5,389,691. This application Nov. 21, 1994, Ser. No. 342,517

Int. Cl.^{6} C09D *195/00*

U.S. Cl. 106—284.03 **15 Claims**



1. A bituminous binder composition of matter comprising:

blending asphalt;

carbonous residue, produced by the steps comprising: (1) digesting at a maximum temperature below about 750° F. waste tires using oil being selected from the group comprising residuum, new 600w cylinder oil, waste motor oil, trim gas oil, vacuum heavy bottoms, decanted oil, and combinations thereof; (2) mixing at least one additive, being selected from the group consisting of calcium carbonate, calcium hydroxide, calcium oxide, magnesium carbonate, magnesium oxide, magnesium hydroxide, dolomite, sodium carbonate, sodium hydroxide, potassium carbonate, potassium hydroxide, iron oxide, bauxite, red mud, and combinations thereof; (3) retorting at a maximum temperature below about 875° F. to remove light components while retaining said carbonous residue; and wherein said carbonous residue is within the range of about five to ten weight percent of said binder; and

at least one additional additive selected from the group comprising calcium oxide, calcium hydroxide, magnesium oxide, magnesium hydroxide, and combinations thereof, wherein all total additives are within the range of about up to about three weight percent of said binder.

5,470,385

WATER RESISTANT METAL PIGMENT PARTICLES

Craig B. Keemer, Fleetwood; William G. Jenkins, Plymouth; H. Taylor Lamborn, Reading, and Joseph B. Scheller, Orefield, all of Pa., assignors to Silberline Manufacturing Co., Ltd., Tamaqua, Pa.

PCT No. PCT/US92/11179, § 371 Date Jun. 27, 1994, § 102(e) Date Jun. 27, 1994, PCT Pub. No. WO93/13175, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 23, 1992, Ser. No. 256,184

Int. Cl.[6] C09C 1/62;1/64

U.S. Cl. 106—404 19 Claims

1. An aqueous coating composition comprising:

metal pigment paste which comprises metal pigment particles and a member selected from the group consisting of an organic phosphate, an organic phosphite and a pentavalent vanadium compound;

an alkyl or aryl compound having 1 to 20 carbon atoms or a halo or amino substituted alkyl or aryl compound having 1 to 20 carbon atoms and wherein said compound contains a nitro functional group and

an aqueous carrier.

5,470,386

LIQUID ADHESIVE APPLICATOR MEANS AND ASSOCIATED METHOD

Ira M. Harris, New York, N.Y., assignor to Daige, Inc., Albertson, N.Y.

Filed Jul. 7, 1993, Ser. No. 88,922

Int. Cl.[6] B05C 1/00

U.S. Cl. 118—244 17 Claims

1. A portable, hand-held adhesive applicator comprising a reservoir containing liquid adhesive, said liquid adhesive being maintained in said reservoir in an unheated liquid state at room temperature, a cylindrical, rotatable, coating roller in operative communication with said reservoir to receive liquid adhesive from the reservoir for application of a layer of uniform thickness of said adhesive onto a surface to be coated with the adhesive, a removable cover means for selectively enclosing or exposing the coating roller, and means to provide a substantially air-tight closure of the reservoir and coating roller with respect to ambient atmosphere for inhibiting drying of the liquid adhesive when the cover means encloses the coating roller and reservoir whereby the adhesive remains in liquid state in readiness for use, without external heating, to apply a uniformly thin layer of said adhesive onto the surface to be coated, said reservoir having an opening for refilling the reservoir with liquid adhesive, said refilling opening being remote from said coating roller, said reservoir having opposite ends, said coating roller being at one of said ends, said refilling opening including a filling spout at the other of said ends, said filling spout including a removable cap thereon, said cover means comprising a first cover at said one of said ends enclosing the coating roller and a second cover at said other of said ends enclosing said filling spouts and said removable cap, said first and second covers being respectively and independently separable from said reservoir, said reservoir including a portion exposed between said first and second covers and shaped for manual engagement in a hand-held operation of said unit.

5,470,387

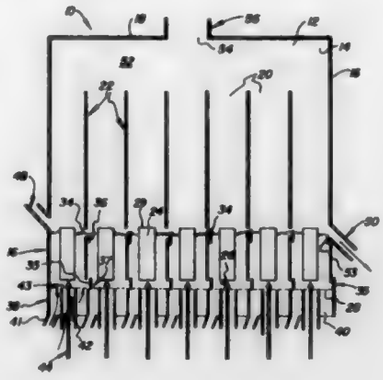
CONTINUOUS MULTICELL PROCESS AND APPARATUS FOR PARTICLE COATING INCLUDING PARTICLE RECIRCULATION

Erik Liborius, Ellicott City, Md., assignor to Niro A/S, Soeborg, Denmark

Filed Mar. 7, 1994, Ser. No. 206,174

Int. Cl.[6] B05B 17/00

U.S. Cl. 118—303 18 Claims



1. An apparatus for applying coatings to discrete particles comprising:

means defining a substantially closed chamber;

a plurality of partitions disposed on longitudinal spacing throughout said chamber dividing said chamber into a plurality of cells;

substantially vertically extending conduit means defined by a hollow duct disposed in each of said cells, said conduit means having open upper and lower ends spaced vertically from adjacent upper and lower surfaces of said chamber;

gas distribution means for supplying operating gas to the bottom of each cell and for directing it in vertical streams to the top thereof, said means including devices for directing a first gas flow through the interior of a said conduit means to develop a gas flow therein having a first velocity and a second flow of gas externally of said conduit means at a second velocity, which is less than that of said first gas flow;

means for supplying coating material in a diffused spray to the interior of said conduit means;

means for supplying discrete particles to be coated to a cell at one end of said chamber whereby said particles are entrained in operating gas for controlled circulation through said cell in an upward direction through the interior of said vertically extending conduit means in contact with the spray of coating material therein and in a downward direction in a subsidence zone exteriorly of said conduit means;

means for discharging coated product from a cell at the other end of said chamber;

means for discharging operating gas from an upper region of said chamber; and

means forming openings in each of said partitions for effecting the flow of particles into succeeding cells, whereby said particles are selectively recirculated a predetermined number of times through said conduit means for contact with said coating material.

5,470,388
DEVICE FOR THE VACUUM COATING OF MASS PRODUCED PRODUCTS

Klaus Goedicke; Christoph Metzner; Joerg Schmidt; Ullrich Heisig; Siegfried Schiller, and Jonathan Reschke, all of Dresden, Germany, assignors to Fraunhofer-Gesellschaft Zur Foederung der angewandten Porschung e.V., Munich, Germany

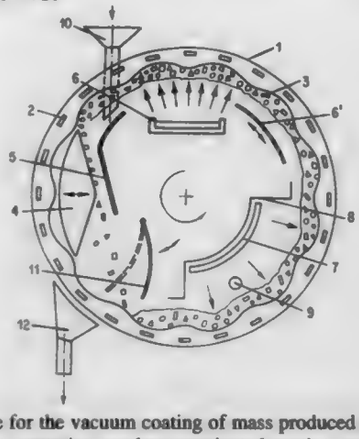
PCT No. PCT/DE93/00201, § 371 Date Nov. 23, 1994, § 102(e) Date Nov. 23, 1994, PCT Pub. No. WO93/19217, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 3, 1993, Ser. No. 307,663

Claims priority, application Germany, Mar. 23, 1992, 42 09 384.8

Int. Cl.[6] C23C *14/00*

U.S. Cl. 118—716 **15 Claims**



1. Device for the vacuum coating of mass produced products by evaporation, sputtering or plasma-activated coating, comprising:

a drum rotating constantly about its horizontal axis at such a speed that the parts located for coating purposes within said drum are held by centrifugal force on an inner wall of said drum, said drum having at least one coating device and at least one flow resistance, wherein a surface structure of the inner wall is geometrically constructed such that the parts to be coated are reliably fixed in the rotation direction of the drum and are movable with the drum;

a stripping device in said drum, the stripping device being adjustably spaced with respect to the inner wall of the drum, the stripping device being switchable off at programmable time intervals for the parts to be coated and having an abutting surface directed opposite to the rotation direction of the drum.

5,470,389
APPARATUS FOR FORMING DEPOSITED FILM

Shunichi Ishihara, Ebina; Junichi Hanna; Isamu Shimizu, both of Yokohama, and Masaaki Hirooka, Toride, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

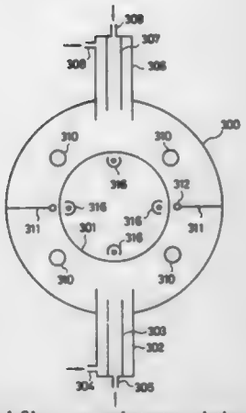
Division of Ser. No. 999,548, Dec. 31, 1992, Pat. No. 5,322,568, which is a continuation of Ser. No. 875,193, Apr. 16, 1992, abandoned, which is a continuation of Ser. No. 744,819, Aug. 12, 1991, abandoned, which is a continuation of Ser. No. 426,530, Oct. 24, 1989, abandoned, which is a continuation of Ser. No. 945,814, Dec. 24, 1986, abandoned. This application Mar. 15, 1994, Ser. No. 212,930

Claims priority, application Japan, Dec. 28, 1985, 60-298041; Jan. 15, 1986, 61-5951

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—719 **8 Claims**

1. An apparatus for forming multilayer deposited films by introducing a gaseous starting material for formation of a deposited film and a gaseous halogenic oxidizing agent having the property of oxidation action for said starting material into a reaction space to effect chemical contact therebetween to thereby form a plural number of precursors including a precursor in an excited state, and



forming a deposited film on a substrate existing in a film forming space spatially communicated with said reaction space with the use of at least one precursor of the precursors as the feeding source for the constituent element of the deposited film, said apparatus comprising rotatory driving means for rotating said substrate, at least a first gas releasing means connected to a means for supplying a mixture of at least a first gaseous starting material and a gaseous halogenic oxidizing agent, and at least a second gas releasing means connected to a means for supplying a mixture of a second gaseous starting material which is different from the first gaseous starting material and the gaseous halogenic oxidizing agent, wherein the first gas releasing means and the second gas releasing means are disposed at different positions in relation to the direction of rotation of the substrate in the reaction space.

5,470,390
MIXED GAS SUPPLY SYSTEM WITH A BACKUP SUPPLY SYSTEM

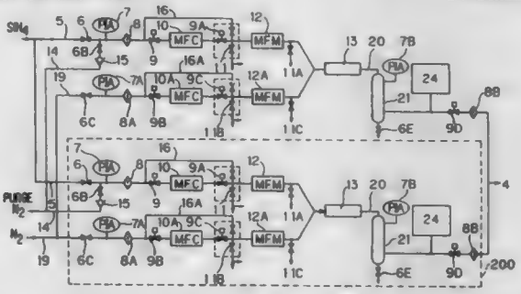
Yukinobu Nishikawa; Yoshinori Hashizume, and Takako Kimura, all of Tokyo, Japan, assignors to Teisan Kabushiki Kaisha, Tokyo, Japan, and L'Air Liquide Societe Anonyme Pour L'Etude et L'Exploitation Des Procedes Georges Claude, Paris Cedex, France

Filed May 2, 1994, Ser. No. 236,117

Claims priority, application Japan, May 7, 1993, 5-107029

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—719 **14 Claims**



1. A system for supplying gas mixtures for the manufacture of semiconductors, which comprises:

a) a first supply system, comprising:

i) a plurality of flow control means for automatically feeding a plurality of gases separately from separate sources to a plurality of gas conduit means fluidly connected thereto;

ii) a plurality of gas conduit means;

iii) mixing means fluidly connected to said plurality of said gas conduit means for mixing the plurality of gases flowing from the plurality of said gas conduit means for preparing a gas mixture; and

iv) buffer means for relieving the pressure energy of the gas mixture to, and in fluid connection with, a plurality of consumption means, at least one of which is a semiconductor manufacturing means; and

b) a second, or backup, supply system in fluid connection with and juxtaposed proximally to said first system, said second, or backup, supply system also being in fluid connection with said plurality of consumption means.

5,470,391

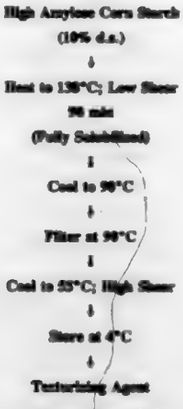
STARCH-BASED TEXTURIZING AGENT

Francis M. Mallee, Acton, and Eugene T. Finocchiaro, Boston, both of Mass., assignors to Opta Food Ingredients, Inc., Bedford, Mass.

Continuation-in-part of Ser. No. 900,899, Jun. 18, 1992, abandoned. This application Oct. 15, 1993, Ser. No. 138,541

Int. Cl.[6] C13K *1/06*; C13D *3/12*; C08B *30/00*

U.S. Cl. 127—38 **29 Claims**



1. A method for preparing a starch-based texturizing agent, comprising the steps of:

a) heating a slurry of high amylose starch in an acidic aqueous medium having a pH of from about 3.0 to about 4.7 under agitating conditions for a temperature, pressure and time sufficient to substantially disrupt starch granules, to produce a solubilized starch solution;

b) filtering the resultant solution to remove impurities; and

c) reducing the temperature of the resultant solution to a temperature and for a period of time sufficient for the starch to retrograde, wherein the starch is essentially devoid of starch granules.

5,470,392

SEMICONDUCTOR DEVICE PROCESSING METHOD

Yoshiaki Yamada; Junji Iwasaki, and Masashi Ohmori, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 970,471, Nov. 2, 1992, Pat. No. 5,383,482. This application Nov. 14, 1994, Ser. No. 340,350

Claims priority, application Japan, Jul. 30, 1992, 4-204068

Int. Cl.[6] G03D *5/04*

U.S. Cl. 134—2 **10 Claims**

1. A semiconductor processing method comprising the steps of:

transporting an incoming case containing semiconductor wafers to be processed to a first side of a semiconductor processing device;

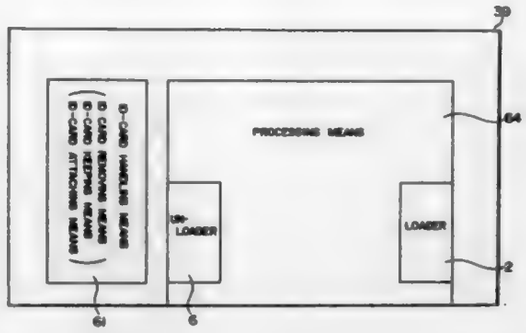
removing an ID card identifying the semiconductor wafers from the incoming case at the first side of the processing device and storing the ID card;

moving the incoming case from the first side to a second side of the processing devise spaced from the first side;

loading the semiconductor wafers from the incoming case into the processing device at the second side;

processing the semiconductor wafers in the processing device;

disposing an outgoing case for processed wafers at the first side of the processing device;



attaching the ID card to the outgoing case;

unloading the processed semiconductor wafers from the processing device into the outgoing case at the first side of the processing device; and

transporting the outgoing case away from the first side of the processing device.

5,470,393

SEMICONDUCTOR WAFER TREATING METHOD

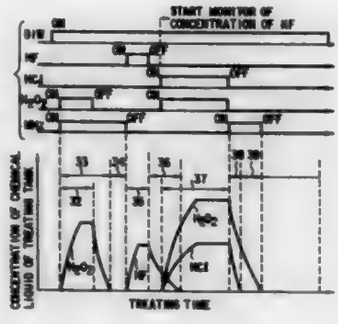
Yuji Fukazawa, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 8, 1994, Ser. No. 271,960

Claims priority, application Japan, Aug. 2, 1993, 5-191163

Int. Cl.[6] B08B *3/08*; *7/04*

U.S. Cl. 134—3 **15 Claims**



1. A method for treating a semiconductor wafer, comprising:

a first step of treating a surface of a semiconductor wafer with about a 0.2 weight % HF water solution, thereby removing an oxide film formed on the surface of said semiconductor wafer;

a second step, sequentially from said first step, of treating the surface of said semiconductor wafer with a mixture of between 0.1 ppm and 100 ppm HF water solution, a HCl water solution, and an oxidizing agent; and

a third step, sequentially from said second step, of treating the surface of said semiconductor wafer with a mixture of about a 0.5 weight % HCl water solution and about a 1 weight % concentration of an oxidizing agent.

5,470,394

METHOD AND APPARATUS FOR TREATING AND CLEANING PLATES BY MEANS OF A CENTRAL REACTOR

Georges L. Michel, Marseille, and Olivier M. Nathan, Gardanne, both of, France, assignors to Sapi Equipements S.A., France

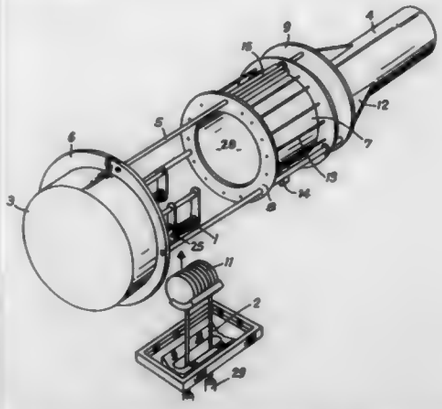
PCT No. PCT/FR92/00433, § 371 Date Jul. 29, 1992, § 102(e) Date Jul. 29, 1992, PCT Pub. No. WO92/21142, PCT Pub. Date Nov. 26, 1992

PCT Filed May 15, 1992, Ser. No. 916,120

Claims priority, application France, May 24, 1991, 91 06558

Int. Cl.[6] B08B *3/04*

U.S. Cl. 134—25.4 10 Claims



1. A method of treating regularly-shaped flat parts having no central opening, using a chamber having side walls, an end wall, an opening in a front plate facing said end wall, support means enabling a plurality of parts to be carried, means for injecting treatment fluids therein in order to completely immerse said Darts in said fluids, means for closing said chamber, and means for discharging said fluids, thereby enabling said parts to be treated by said fluids, and enabling said fluids subsequently to be discharged from said chamber, wherein:

said flat parts stored in a transport basket are brought beneath said chamber which is opened by moving the shell constituting the chamber away from its closure means;

said parts are transferred by any suitable means from the basket into the open volume of said chamber;

said parts are grasped by tilting two lateral combs that were previously moved apart, and which engage beneath said parts so as to constitute support means for them, and said transfer means is withdrawn;

said chamber is closed by moving said shell over said parts and their supporting combs until contact is made against the closure means, and the assembly is sealed; and

treatment is performed by injecting fluids into the chamber using said means for injecting treatment fluids so as to immerse said parts completely in said fluids, then at the end of the treatment, after the fluids have been discharged by said discharge means and after the chamber has been reopened, said parts are transferred back down into their transport basket.

5,470,395

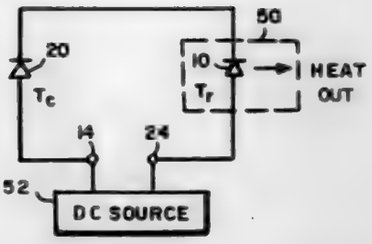
REVERSIBLE THERMOELECTRIC CONVERTER

Joseph C. Yater, 71 Autumn La., Lincoln, Mass. 01773; Jane A. Yater, 2H Sutton Dr., Matawan, N.J. 07747, and Joan E. Yater, 7205 Hart La. #3018, Austin, Tex. 78731

Division of Ser. No. 860,677, Mar. 30, 1992, Pat. No. 5,356,484. This application Jun. 30, 1994, Ser. No. 269,654

Int. Cl.[6] H01L *35/28*

U.S. Cl. 136—203 21 Claims



1. Apparatus for converting thermal energy from an external source to thermal energy at a higher temperature than the external source, comprising:

a first device comprising first and second regions wherein electric carriers are quantized in discrete energy levels, and a third region providing a potential barrier between said first and second regions, said first device receiving thermal energy from the external source and converting the thermal energy into electric voltage fluctuations;

a second device comprising first and second regions wherein electric carriers are quantized in discrete energy levels, and a third region providing a potential barrier between said first and second regions, said second device converting electric voltage fluctuations to thermal energy at a higher temperature than the temperature of the external source;

means for supplying to said first device a DC voltage sufficient to reverse a contact potential across said first device; and

means for electrically connecting said first device to said second device without a thermal barrier between them such that the electric voltage fluctuations generated by said first device in response to energy fluctuations from said external source are coupled to said second device and are converted by said second device to thermal energy at a higher temperature than the temperature of said external source.

5,470,396

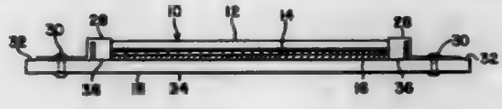
SOLAR CELL MODULE PACKAGE AND METHOD FOR ITS PREPARATION

John M. Mongon, Trenton, N.J.; Edward N. Twesme, Hatboro, and Peggy A. Weiss, Pennsburg, both of Pa., assignors to Amoco Corporation, Chicago, Ill.

Filed Apr. 12, 1994, Ser. No. 226,673

Int. Cl.[6] H01L *31/048;31/18*

U.S. Cl. 136—251 13 Claims



1. A solar cell module package comprising:

a light-transmissive glass support member;

at least one amorphous silicon solar cell comprising a member selected from the group consisting of amorphous silicon and amorphous silicon alloy, secured to said glass support member, said amorphous silicon solar cell comprising a p-type doped layer, an n-type doped layer, an intrinsic layer disposed between said p-type doped layer and said n-type doped layer, a tin oxide conductive layer positioned between said glass support member and said p-type doped layer, and a back contact layer positioned away from said n-type doped layer;

a protective composite layer positioned adjacent said back contact layer of said amorphous silicon solar cell, said protective composite layer comprising a polymeric material and asphalt, said polymeric material being selected from the group consisting of polymeric mesh, a polymeric web, and a polymeric sheet; and

a metal support member positioned adjacent said protective composite layer; and

said protective composite layer being disposed between said amorphous silicon solar cell and said metal support member.

5,470,397

PROCESS FOR MAKING PHOTOVOLTAIC DEVICES AND RESULTANT PRODUCT

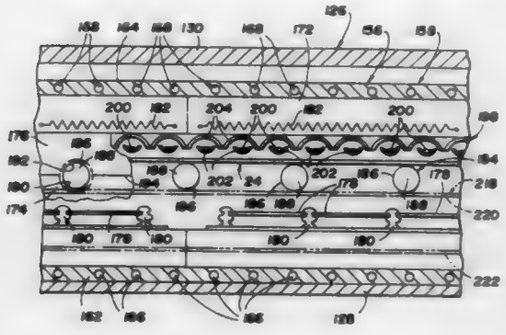
James B. Foote, Toledo; Steven A. F. Kaake, Perrysburg; Peter V. Meyers, Bowling Green, and James F. Nolan, Sylvania, all of Ohio, assignors to Solar Cells, Inc., Toledo, Ohio

Division of Ser. No. 66,348, May 24, 1993, Pat. No. 5,372,646, which is a division of Ser. No. 881,683, May 12, 1992, Pat. No. 5,248,349. This application Sep. 2, 1994, Ser. No. 300,406

The portion of the term of this patent subsequent to Sep. 28, 2010, has been disclaimed.

Int. Cl.[6] **H01L** *31/06;31/072;31/18;31/078*

U.S. Cl. 136—260 **23 Claims**



13. A photovoltaic device comprising: a sheet substrate which includes a planar glass sheet and has oppositely facing surfaces each of which has an area of at least 1000 $cm.^2$; a thin-film layer of cadmium telluride deposited on one of the surfaces of the substrate with a thickness in the range of about 1 to 5 microns and having crystals of a size in the range of about ½ to 5 microns; and the thin-film layer of cadmium telluride having a bond to the one surface of the substrate by deposition thereon while the glass sheet is oriented horizontally and heated within a contained environment that is heated and into which vapors of cadmium and tellurium are introduced for deposition as the layer of cadmium telluride on the one surface thereof which faces upwardly while the other surface thereof faces downwardly and is supported within the periphery thereof for horizontal conveyance while maintaining the planarity of the glass sheet.

5,470,398

DIELECTRIC THIN FILM AND METHOD OF MANUFACTURING SAME

Munehiro Shibuya, Katano; Masatoshi Kitagawa, Hirakata; Takeshi Kamada, Ikeda, and Takashi Hirao, Moriguchi, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

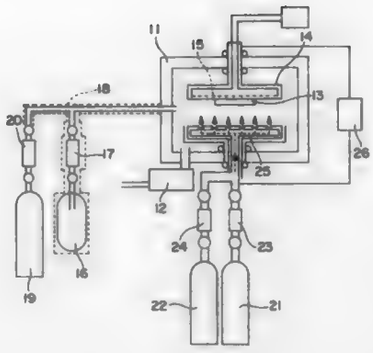
Filed Sep. 23, 1991, Ser. No. 763,674

Claims priority, application Japan, Sep. 25, 1990, 2-255791

Int. Cl.[6] **H01L** *21/312*

U.S. Cl. 148—33.3 **5 Claims**

1. A single dielectric film comprising oxides of titanium and silicon, said film having a high dielectric constant and a low leakage current resulting from a single step deposition by exposing a substrate to a plasma generated by simultaneously flowing titanium chloride, nitrogen, nitrous oxide and a monosilane into a vacuum chamber containing the substrate and means for creating said plasma.



5,470,399

PROCESS FOR MANUFACTURING MPP CORE FORMING POWDER, AND PROCESS FOR MANUFACTURING MPP CORE USING THE POWDER

Kwang W. Bae, Seoul, Rep. of Koren, assignor to Samsung Electro-Mechanics Co., Ltd., Kyongki, Rep. of Korea

Filed Jun. 24, 1994, Ser. No. 265,717

Claims priority, application Rep. of Korea, Jun. 30, 1993, 1993-12083

Int. Cl.[6] **H01F** *1/12*

U.S. Cl. 148—104 **24 Claims**

1. A process for manufacturing a powder for an MPP core (molypermalloy powder core), comprising the steps of:

melting an alloy composed of, in wt %, 1.6–4.0% of Mo, 78–83% of Ni, and the balance of Fe; and

manufacturing a powder by spraying a gas selected from the group consisting of N_2, He, Ne, At, Kr, Xe and Rn on a flow of the melt with a gas spraying pressure of 50–1200 psi and a gas spraying flow rate of 1–14 m^3/min.

5,470,400

RARE EARTH ANISOTROPIC MAGNETIC MATERIALS FOR POLYMER BONDED MAGNETS

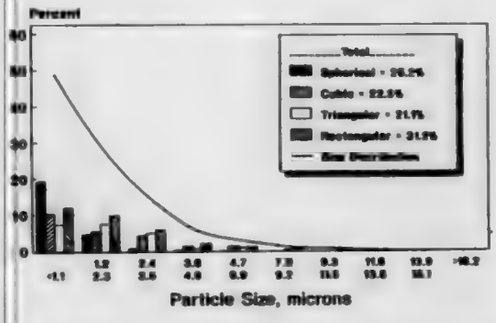
Yakov Bogatin, Richboro; Mark Robinson, West Lawn, both of Pa.; Frank S. Greenwald, Woodstock, and John Ormerod, Rockford, both of Ill., assignors to SPS Technologies, Inc., Jenkintown, Pa.

Division of Ser. No. 826,558, Jan. 27, 1992, which is a continuation-in-part of Ser. No. 535,460, Jun. 8, 1990, Pat. No. 5,122,203, which is a continuation-in-part of Ser. No. 365,622, Jun. 13, 1989, Pat. No. 5,114,502. This application May 31, 1994, Ser. No. 251,455

Int. Cl.[6] H01F *1/055*

U.S. Cl. 148—301 5 Claims

1. A polymer bonded, corrosion resistant, anisotropic permanent



magnet comprising a polymeric bonding agent interspersed with single crystal or polycrystalline particles, said particles being comprised of R_2Fe_{17} wherein R is a least one rare earth element selected from the group consisting of neodymium, praseodymium, lanthanum, cerium, terbium, dysprosium, holmium, erbium, europium, samarium, gadolinium, promethium, thulium, ytterbium, lutetium, yttrium, and scandium, said particles having a nitrogen surface concentration of from about 0.4 to about 26.8 atomic percent and a carbon surface concentration of from about 0.02 to about 15 atomic percent, said particles further having a higher concentration of nitrogen and carbon in the surface region than in the center of the particles, said magnet having a coercivity of at least 1,000 Oersteds.

5,470,401

METHOD OF MAKING BONDED OR SINTERED PERMANENT MAGNETS

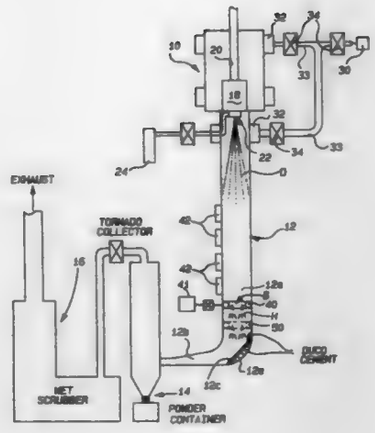
R. William McCallum; Kevin W. Dennis; Barbara K. Lograsso, and Iver E. Anderson, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Division of Ser. No. 593,943, Oct. 9, 1990, Pat. No. 5,240,513. This application Jul. 26, 1993, Ser. No. 97,442

Int. Cl.[6] H01F *1/057*

U.S. Cl. 148—302 8 Claims

1. An isotropic permanent magnet, comprising a binder and atomized generally spherical rare earth-transition metal alloy particles in the binder, said atomized particles having a carbon layer formed on individual atomized particles.



5,470,402

FERRITIC HEAT-RESISTANT CAST STEEL AND PROCESS FOR PRODUCING THE SAME

Kazuaki Nishino, Seto; Yoji Awano, Aichi; Hiroyuki Takamiya, Tajimi; Mitsufumi Ito, Nagoya; Masami Suzuki, Okazaki, and Yoshikazu Genma, Toyota, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

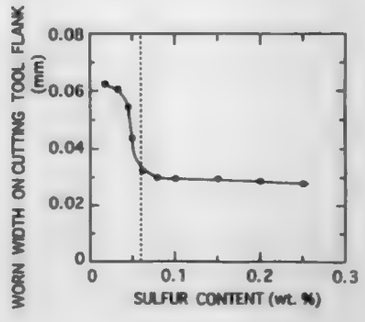
Filed Jul. 20, 1994, Ser. No. 275,749

Claims priority, application Japan, Jul. 20, 1993, 5-201014

Int. Cl.[6] C22C *38/60;38/24;* C21D *6/00*

U.S. Cl. 148—325 17 Claims

1. A ferritic heat-resistant cast steel, comprising:



C in an amount of from 0.15 to 0.38% by weight;

Si in an amount of from 0.5 to 2.0% by weight;

Mn in an amount of 1.0% by weight or less;

S in an amount of from 0.06 to 0.20% by weight;

Ni in an amount of 1.0% by weight or less;

Cr in an amount of from 13 to 20% by weight;

V in an amount of from 0.2 to 1.0% by weight;

at least one element selected from the group consisting of Nb in an amount of from 0.1 to 0.4% by weight, Mo in an amount of from 0.1 to 2.0% by weight, and W in an amount of from 0.2 to 4.0% by weight; and

the balance of Fe and inevitable impurities,

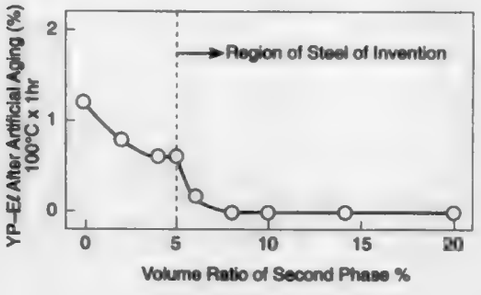
said S being dispersed as sulfides in said ferritic heat-resistant cast steel.

5,470,403

COLD ROLLED STEEL SHEET AND HOT DIP ZINC-COATED COLD ROLLED STEEL SHEET HAVING EXCELLENT BAKE HARDENABILITY, NON-AGING PROPERTIES AND FORMABILITY, AND PROCESS FOR PRODUCING SAME

Naoki Yoshinaga; Kohsaku Ushioda; Osamu Akisue, all of Futtsu, and Kunio Nishimura, Kitakyusyu, all of, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

PCT No. PCT/JP93/00846, § 371 Date Feb. 18, 1994, § 102(e) Date Feb. 18, 1994, PCT Pub. No. WO94/00615
PCT Filed Jun. 22, 1993, Ser. No. 196,098
Claims priority, application Japan, Jun. 22, 1992, 4-163083; Aug. 31, 1992, 4-232300
Int. Cl.[6] C21D *8/04;* C22C *38/06;38/04;* B32B *15/00*
U.S. Cl. 148—330 16 Claims



1. A cold rolled steel sheet excellent in paint bake hardenability, non-aging properties and formability, which consists essentially of, in terms of percentage by weight, from 0.0005 to 0.0070% of C, from 0.001 to 0.8% of Si, from 0.3 to 4.0% of Mn, from 0.003 to 0.15% of P, from 0.0005 to 0.015% of S, from 0.005 to 0.20% of Al, from 0.0003 to 0.0060% of N, less than 0.0030% by weight of B, said B satisfying the conditions B/N<1.5 and the balance Fe and unavoidable impurities, and which has a mixed structure comprising phases transformed at low temperature in an amount greater than 5% based on total volume and ferrite.

5,470,404

RARE EARTH METAL-NICKEL HYDROGEN OCCLUSIVE ALLOY INGOT

Kazuhiko Yamamoto, Kobe; Yuichi Miyake, Kasai; Chikara Okada, Kobe, and Nobuyuki Kitazume, Himeji, all of, Japan, assignors to Santoku Metal Industry Co., Ltd., Hyogo, Japan

Filed May 17, 1993, Ser. No. 63,895
Claims priority, application Japan, May 21, 1992, 4-128937
Int. Cl.[6] C22C *19/03;* H01M *4/38*
U.S. Cl. 148—426 5 Claims

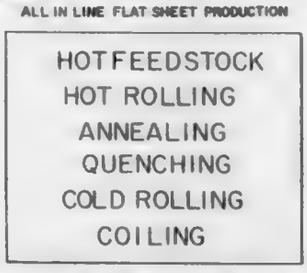
1. A rare earth metal-nickel hydrogen occlusive alloy ingot consisting essentially of a rare earth metal and nickel, the proportion of said rare earth metal to said nickel being between 35:65 and 30:70 by weight, said ingot including 90 vol % or more of crystals having a crystal grain size of 1 to 50 μm as measured along a short axis of said crystal and 1 to 100 μm as measured along a long axis of said crystal, and obtained by melting a rare earth metal-nickel alloy and uniformly solidifying the alloy melt to have a thickness of 0.1 to 20 mm under cooling conditions of a cooling rate of 10° to 1000° C./sec and a sub-cooling degree of 10° to 500° C.

5,470,405

METHOD OF MANUFACTURING CAN BODY SHEET

Gavin F. Wyatt-Mair, Lafayette, and Donald G. Harrington, Danville, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Pleasanton, Calif.

Continuation of Ser. No. 902,936, Jun. 23, 1992, abandoned. This application May 24, 1994, Ser. No. 248,555
Int. Cl.[6] C22F *1/04*
U.S. Cl. 148—551 30 Claims



1. A method for manufacturing of aluminum alloy can body sheet comprising the following steps in a continuous, in-line sequence:

(a) providing an aluminum alloy hot can body feedstock;

(b) hot rolling the feedstock to hot reduce its thickness;

(c) annealing and solution heat treating the hot reduced feedstock without intermediate cooling while maintaining the temperature of the reduced feedstock for a time and level sufficient to retain alloying elements in solution; and

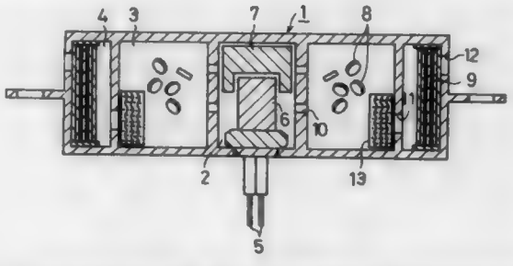
(d) rapidly quenching the heat treated feedstock to a temperature for cold rolling.

5,470,406

GAS GENERATOR COMPOSITION AND PROCESS FOR MANUFACTURING THE SAME

Koji Ochi; Kazuyuki Narita; Kazunori Matsuda, all of Aichi, and Nobukazu Asano, Handa, all of, Japan, assignors to NOF Corporation, Chiyoda, Japan

Filed Apr. 7, 1993, Ser. No. 44,281
Claims priority, application Japan, Apr. 10, 1992, 4-091245; Aug. 27, 1992, 4-228834; Dec. 28, 1992, 4-347836
Int. Cl.[6] C06B *35/00*
U.S. Cl. 149—35 10 Claims



1. A gas generator composition comprising sodium azide and an oxidizing agent as major components, and 2 to 8% by weight of magnesium aluminate.

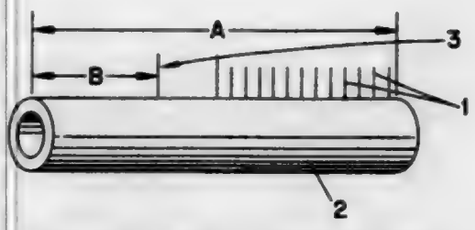
5,470,407

METHOD OF VARYING RATE OF DETONATION IN AN EXPLOSIVE COMPOSITION

George L. Griffith, Bethlehem, Pa., and Ricky T. Vance, Cordova, Ala., assignors to Nelson Brothers, Inc., Parrish, Ala.

Filed May 25, 1993, Ser. No. 66,650
Int. Cl.[6] D03D *23/00;43/00*
U.S. Cl. 149—109.6 12 Claims

1. A process of making an explosive composition, which comprises



(1) determining the desired rate of detonation, and

(2) formulating a water-in-oil explosive emulsion by combining a water immiscible organic fuel continuous phase, emulsified aqueous inorganic oxidizer salt solution discontinuous phase, emulsifier, and mixture of glass and plastic microspheres, with the mixture of glass and microspheres being adjusted to provide the desired rate of detonation.

5,470,408

USE OF CARBON FIBRILS TO ENHANCE BURN RATE OF PYROTECHNICS AND GAS GENERANTS

Daniel B. Nielson, and Dean M. Lester, both of Brigham City, Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed Oct. 22, 1993, Ser. No. 141,389

Int. Cl.[6] C06B *21/00*

U.S. Cl. 149—109.6 **16 Claims**

1. A method for enhancing the burn rate in an energetic composition selected from propellant and pyrotechnic energetic compositions comprising incorporating into said energetic composition an effective quantity of conductive carbon fibrils sufficient to increase the burn rate at least 20% upon burning said energetic composition, said carbon fibrils having substantially continuous layers of ordered carbon atoms having an outside diameter between about 3.5 and 75 nanometers which are catalytically grown and having a distinct inner core region, each of the carbon layers being disposed substantially concentrically about the inner core region, wherein the fibrils are substantially free of pyrolytically deposited thermal carbon.

5,470,409

PROCESS FOR MAKING FLUOROPOLYMER COMPOSITES

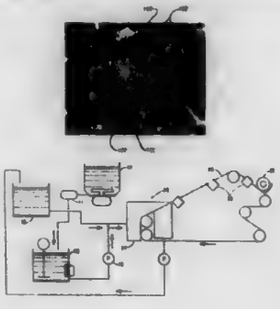
Clifford K. Deakyne, Wilmington, and Gregory P. Weeks, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 929,902, Aug. 17, 1992, which is a division of Ser. No. 821,567, Jan. 16, 1992, abandoned. This application Jul. 25, 1994, Ser. No. 279,384

Int. Cl.[6] D21F *11/02*; D21J *1/06*; B29C *59/02*

U.S. Cl. 156—62.4 **5 Claims**

1. A process for the production of a fluoropolymer-fiber compo-



ite comprising:

(a) preparing thin thermoplastic fluoropolymer flakes having an irregular periphery with an irregular microfibular structure extending therefrom by disc refining fluoropolymer pellets, said flakes having a Canadian Standard Freeness greater than 800, then co-dispersing said flakes with fibers in an aqueous solution to form a homogenous slurry;

(b) feeding the slurry to a screen in a layer;

(c) removing water from the layer; and

(d) drying the layer to form a thin self-supporting porous fluoropolymer-fiber planar preform layer.

5,470,410

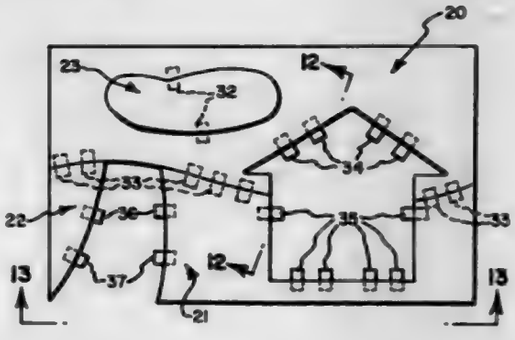
METHOD FOR PRODUCING A THREE-DIMENSIONAL WORK FROM A TWO-DIMENSIONAL WORK

Kent G. Keating, Amherst, and Joseph A. Drago, Williamsville, both of N.Y., assignors to Photo Sculptures, Inc., Amherst, N.Y.

Filed Mar. 31, 1994, Ser. No. 220,839

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—63 **16 Claims**



1. A method for producing a three-dimensional work from a single two-dimensional work, comprising the steps of:

providing a single two-dimensional work;

providing a rigid backer;

bonding said two-dimensional work to said rigid backer forming a work piece;

identification of shapes in said two-dimensional work to become sculpture pieces and background pieces;

providing a sculpture station having an oscillating cutting blade, said cutting blade having a circular cutting surface allowing said sculpture station to accurately and precisely cut a sculpture piece away from said work piece using a single uninterrupted cut;

cutting said work piece with said sculpture station into background pieces and sculpture pieces;

connecting at least two of said background pieces together forming a background;

providing spacers;

attaching said spacers to one or more of said background and said sculpture pieces, fixably positioning said sculpture pieces in relation to said background;

thereby forming a three-dimensional work composed of images in different layers from a single two-dimensional work.

5,470,411

METHOD FOR CONTINUOUS ASSEMBLY OF PATTERNED STRIPS AND INTEGRATED CIRCUIT MICROMODULE OBTAINED BY SAID METHOD

Jean-Pierre Gloton, Aix en Provence; Damien Laroche, Chateauneuf le Rouge; Joël Turin, Marseille, and Michel Fallah, Aubagne, all of, France, assignors to Gemplus Card International, Gemenos, France

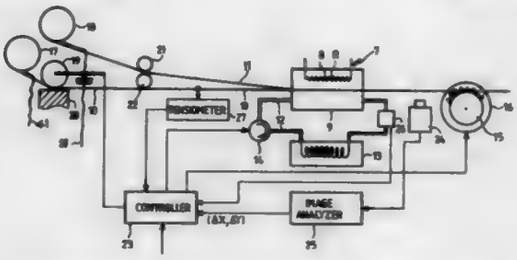
PCT No. PCT/FR92/00158, § 371 Date Oct. 25, 1993, § 102(e) Date Oct. 25, 1993, PCT Pub. No. WO92/15118, PCT Pub. Date Sep. 3, 1992

PCT Filed Feb. 18, 1992, Ser. No. 107,710

Claims priority, application France, Feb. 19, 1991, 91 01934

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—64 **22 Claims**



1. Method for the continuous assembly of patterned strips, one of which is a pre-slotted metal strip and the other a pre-perforated insulator strip, comprising providing each of the strips with reference marks, continuously unwinding the strips from respective feeder rollers, continuously transporting the strips through a bonding press under tension, sensing the locations of said reference marks, pressure bonding the first strip to the second strip through the bonding press, and, in response to said sensing step, juxtaposing the reference marks of each strip at the time of the bonding by at least one of (1) varying the tension applied to at least one of said strips so as to extend one strip with respect to the other, and (2) differentially heating each of the opposing strips to cause a relative shift, by expansion, of the two strips with respect to each other.

5,470,412

PROCESS FOR PRODUCING A CIRCUIT SUBSTRATE

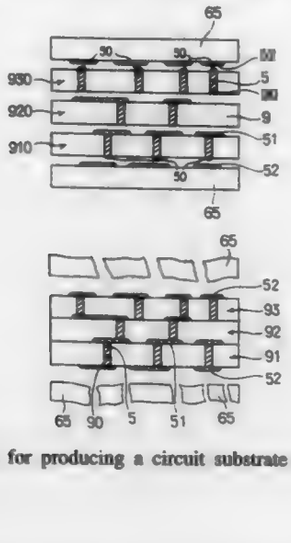
Junzo Fukuta; Masashi Fukaya, and Hideaki Araki, all of Yamaguchi, Japan, assignors to Sumitomo Metal Ceramics Inc., Yamaguchi, Japan

Filed Jul. 27, 1993, Ser. No. 97,120

Claims priority, application Japan, Jul. 30, 1992, 4-223190; Sep. 11, 1992, 4-269577

Int. Cl.[6] B32B *31/04;31/20;31/26;* **C04B** *33/32*

U.S. Cl. 156—89 **24 Claims**



1. A process for producing a circuit substrate comprising the steps of:

preparing at least one ceramic greensheet containing glass and which is sinterable at a low temperature for forming said circuit substrate, and at least one unsintered transfer sheet unsinterable at a sintering temperature of said ceramic greensheet;

printing a wiring pattern on said unsintered transfer sheet;

stacking said unsintered transfer sheet on said ceramic greensheet to form a laminated body and thermocompressing said laminated body to form a compressed body;

firing said compressed body at a sintering temperature of said ceramic greensheet to form a ceramic substrate without compressing said compressed body by a compressing means, thereby preparing a fired body by transferring said wiring pattern on said unsintered transfer sheet to said ceramic substrate; and

removing said unsintered transfer sheet from said fired body to prepare a circuit substrate.

5,470,413

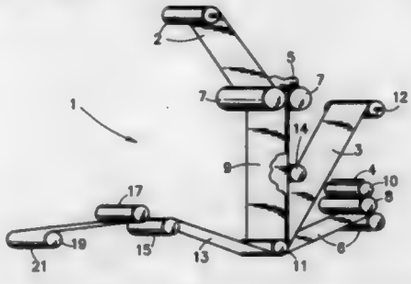
PROCESS OF MAKING A LIGHTING STRIKE COMPOSITE

Calvin P. Cedarleaf, Orinda, Calif., assignor to The Dexter Corporation, Pittsburg, Calif.

Division of Ser. No. 728,642, Jul. 11, 1991, Pat. No. 5,370,921,. This application Mar. 7, 1995, Ser. No. 400,870

Int. Cl.[6] B32B *33/00;31/26;29/02;5/00*

U.S. Cl. 156—90 **3 Claims**



1. A process of making a multilayered composite comprising the steps of:

(a) forming a highly-filled thermosettable resin film wherein the filler comprises a multimodal combination of filler particles,

(b) bonding said film to a carrier fabric sheet to form a supported filled resin surfacing film assembly,

(c) bonding said assembly to an adjacent metal screen or foil and at least one adhesively bonded prepreg, optionally containing a honeycomb structure, onto the carrier fabric side of the assembly to form said composite, and

(d) subjecting the composite to sufficient heat to cure the at least one prepreg, the optional honeycomb structure and the supported filled resin surfacing film assembly to form a cured composite structure.

5,470,414

METHOD OF MAKING FLAT STOCK HAVING A BEARING SURFACE AND THE FLAT STOCK MADE THEREBY

Bernard Harris, Northbrook, and Dennis E. Bozych, Downers Grove, both of Ill., assignors to Rexnord Corporation, Milwaukee, Wis.

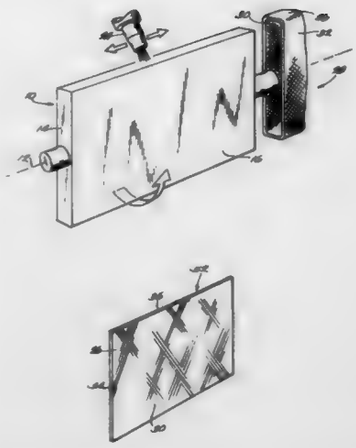
Continuation-in-part of Ser. No. 4,508, Jan. 14, 1993, abandoned. This application Oct. 4, 1993, Ser. No. 131,023

The portion of the term of this patent subsequent to Feb. 22, 2011, has been disclaimed.

Int. Cl.[6] B65H *81/00;* **F16C** *33/00*

U.S. Cl. 156—174 **7 Claims**

1. A method of making a filament wound flat stock bearing member that includes a matrix having a low friction bearing



surface of self-lubricating material integrally bonded thereto, said method comprising the steps of:

A. providing a support including a longitudinal extent and at least two flat surfaces, each of said flat surfaces having longitudinally extending edges interacting with edges of adjacent flat surfaces, and then placing a metallic reinforcement material upon one of said flat surfaces;

B. after step A, forming a low friction bearing surface by placing a self-lubricating material over said flat surfaces of said support and on said metallic reinforcement material;

C. forming a matrix upon said self-lubricating material by winding a filamentous material over said self-lubricating material under tension to cause said self-lubricating material to intimately conform to said metallic reinforcement material and continuing said winding until a desired matrix dimension is obtained having longitudinally extending edge regions at said interfacing edges of said flat surfaces;

D. applying a hardenable liquid bonding resin to interfuse between said filamentous material, said self-lubricating material and said metallic reinforcement material to form an unhardened tubular stock member wetted with resin;

E. hardening said resin to bond said materials together into a hardened stock member;

F. removing said hardened stock member from said support;

G. cutting said hardened stock member along said edge regions either before or after removal from said support to provide an unfinished filament wound flat stock sheet having an exposed finished bearing surface of said self-lubricating material; and

H. passing said unfinished flat stock sheet through a surface finishing machine to finish said unfinished surface and provide a finished flat stock of desired thickness.

5,470,415

BALLOON CONNECTION AND INFLATION LUMEN FOR ATHERECTOMY CATHETER

Roger W. Perkins, Fremont, and Gerri L. Chatelain, Pleasanton, both of Calif., assignors to Devices for Vascular Intervention, Inc., Redwood City, Calif.

Division of Ser. No. 845,124, Mar. 3, 1992, Pat. No. 5,222,966, which is a continuation-in-part of Ser. No. 486,675, Feb. 28, 1990, Pat. No. 5,092,873. This application Apr. 8, 1993, Ser. No. 45,480

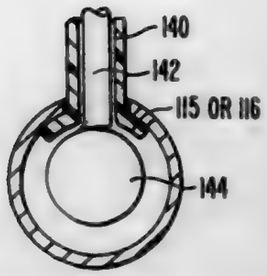
Int. Cl.[6] B29C *57/00;65/52;69/00*

U.S. Cl. 156—916 **5 Claims**

1. A method for joining an inflatable balloon to a cylindrical housing having an interior surface and an axial lumen, said method comprising:

inserting an end of a thermoplastic tube through an aperture in the housing;

positioning a rod through the thermoplastic tube so that an end of the rod is disposed in an interior of the housing;



inserting a heated mandrel axially into the housing through an open end of the housing;

contacting the heated mandrel against the end of the thermoplastic tube to form a saddle flange which conforms to the interior surface of the housing; wherein the rod maintains an open passage from the interior of the housing to the interior of the tube; and

forming the tube into a balloon.

5,470,416

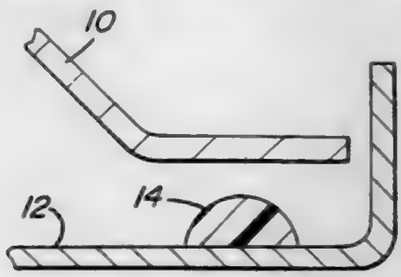
BONDING METHOD USING MIXTURE OF ADHESIVE AND NON-COMPRESSIBLE BEADS

James M. Herring, Jr., Rochester Hills, and Bruce N. Greve, Davisburg, both of Mich., assignors to The Budd Company, Troy, Mich.

Continuation of Ser. No. 869,649, Apr. 16, 1992, abandoned. This application Feb. 14, 1994, Ser. No. 195,746

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—196 **14 Claims**



1. A method of making an exterior body part comprising the steps of:

a) mixing a plurality of glass beads having a diameter of 0.003 to 0.030 inches with an adhesive to form a substantially uniform fluid mixture having a concentration of beads in the adhesive in the range of about 5–20% by weight of the mixture;

b) pumping the fluid mixture through pumping equipment having at least one valve to an applicator gun having a nozzle, the bead concentration being sufficiently low so as not to damage the pumping equipment;

c) forcing the fluid mixture from the nozzle of the applicator gun onto one surface of a first sheet metal member adjacent an edge thereof;

d) placing an edge portion of a second sheet metal member onto the surface of the first member, with the fluid mixture being sandwiched therebetween;

e) hemming an edge of the first member over the edge portion of the second member to form a joint by applying a pressure therebetween of 2,000–10,000 psi, the bead concentration and size being chosen such that the beads fail to read through to an exterior surface of the part while maintaining a space between the members to prevent excessive adhesive from being squeezed from the joint;

f) removing the hemming pressure, with the space between the members being essentially free of air gaps; and

g) thereafter, allowing the adhesive to cure.

3. A method for bonding an exterior body member to an inner member, said method comprising the steps of:

a) mixing a plurality of non-compressible beads with an adhesive to form a fluid mixture having a substantially uniform concentration of beads dispersed in the adhesive;

b) pumping the fluid mixture to dispensing equipment;

c) forcing the fluid mixture from the dispensing equipment and applying the mixture to at least one of the members;

d) pressing the members together, with the fluid mixture being sandwiched therebetween; and

e) said concentration of beads being at least about 5% by weight of the mixture and sufficiently high enough to prevent the adhesive from being squeezed from between the members, with the concentration of beads being less than about 20% and sufficiently low to provide a strong joint and prevent damage to said equipment.

14. A method of making an exterior automotive body part, said method comprising the steps of:

a) mixing a plurality of glass beads having a diameter of 0.003 to 0.030 inches with a first component of a two-part epoxy adhesive to form a first fluid mixture;

b) storing said first fluid mixture in a container;

c) storing a second component of the epoxy adhesive in a second container;

d) pumping the first component and second component of the adhesive from their respective containers to a metering device having a plurality of valves;

e) pumping preselected proportions of the first component and the second component of the adhesive to an applicator gun having an elongated mixing nozzle;

blending the first component and second component of the adhesive in the mixing nozzle to form a viscous fluid adhesive mixture having a concentration of beads in the mixture in the range of about 5–20% by weight of the mixture, the bead size and concentration being chosen so as not to damage the metering device and applicator gun while providing for a strong joint;

g) forcing the viscous fluid adhesive mixture from the nozzle and applying the mixture as a strip onto one surface of a first sheet metal member adjacent an edge thereof;

h) placing an edge of a second sheet metal member onto the surface of the first member, with the fluid adhesive mixture being sandwiched therebetween;

i) hemming an edge of the first member over the edge portion of the second member to form a joint by applying a pressure therebetween of 2,000–10,000 psi while the strip of the adhesive mixture is in a viscous state, said adhesive mixture spreading under the hemming pressure to fill the joint and minimize air gaps therein, the glass bead size and concentration in the fluid adhesive mixture being chosen such that the beads fail to read through to an exterior surface of the part while serving to maintain a space between the members to prevent excessive adhesive from being squeezed from the joint during hemming;

j) removing the hemming pressure, with the space between the members remaining essentially free of air gaps; and

k) thereafter, allowing the adhesive to cure to a solid state.

5,470,417

METHOD OF MAKING MULTI-LAYER FEMALE COMPONENT FOR REFASTENABLE FASTENING DEVICE

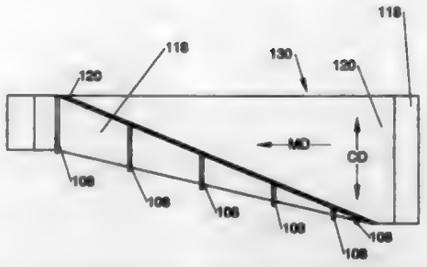
David J. K. Goulait, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 139,363, Oct. 19, 1993, which is a division of Ser. No. 703,426, May 20, 1991, abandoned. This application Oct. 11, 1994, Ser. No. 321,296

Int. Cl.[6] B32B *31/04;31/16;31/20;31/26*

U.S. Cl. 156—201 **8 Claims**

1. A method of making a multi-zone female component for a refastenable fastening device, said female component being capable of engaging a complementary hook fastening component



which has a base with individual hooks having blunt heads extending outward from said base, said method comprising the steps of:

(a) providing a first material comprised of at least one structural element, said first material being capable of providing a multiplicity of openings for said hooks so that a plurality of the hooks of the hook component may readily penetrate the thickness of said first material without forcibly piercing said first material;

(b) providing a second material comprised of at least one structural element, said second material being capable of providing a multiplicity of openings for said hooks so that a plurality of the hooks of the hook component may readily penetrate the thickness of said second material without forcibly piercing said second material;

(c) folding at least one of said first and second materials over on itself to form a folded structure; and

(d) securing said first and second materials together to form a multi-zone female component.

5,470,418

METHOD AND APPARATUS FOR PRODUCING LABELS

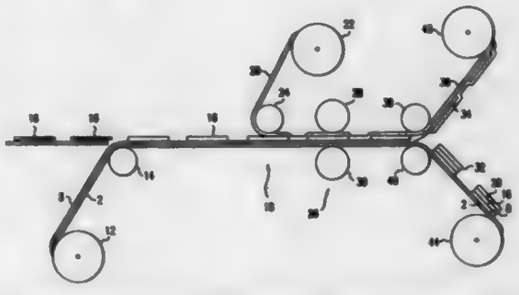
David J. Instance, Guinea Hall, Sellindge, Kent, United Kingdom

Continuation of Ser. No. 471,866, Jan. 29, 1990, abandoned, which is a continuation of Ser. No. 135,367, Dec. 21, 1987, abandoned. This application Jul. 26, 1994, Ser. No. 280,804

Claims priority, application United Kingdom, Dec. 22, 1986, 8630545

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—231 **7 Claims**



5. A method of producing a succession of self-adhesive labels on a length of release material, which method comprises the steps of:

(a) applying a layer of pressure-sensitive adhesive directly to a surface of a length of release material;

(b) applying a succession of individual labels directly to the layer of pressure-sensitive adhesive so as to adhere the labels to a release material;

(c) cutting through each of the labels and layer of pressure-sensitive adhesive as far as the release material thereby to form self-adhesive labels; and

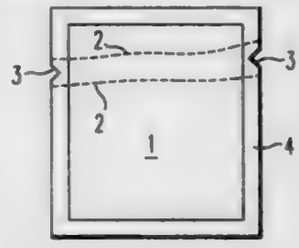
(d) removing waste portions of the applied labels and waste portions of the pressure-sensitive adhesive which surround the self-adhesive labels from the release material

wherein prior to removing step (d) the pressure-sensitive adhesive is in the form of a coherent film which can be pulled away from the release material without tearing.

5,470,419
EASILY TEARABLE FILM AND POUCH MADE THEREFROM

Hitoshi Sasaki; Yuikio Kobayashi, and Shyoji Igota, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 733,823, Jul. 22, 1991, abandoned. This application Dec. 21, 1993, Ser. No. 170,990
Claims priority, application Japan, Jul. 30, 1990, 2-201874
Int. Cl.[6] B29C 47/00
U.S. Cl. 156—244.12 2 Claims



1. A method for producing a tearable pouch comprising the steps of:

melt extruding a resin layer forming a coated film on a substrate film to form at least two laminate webs;

incorporating only two strings into the coated film of each of said laminate webs during said extruding step such that said strings are spaced from each other and parallel to each other, and do not fuse into the coated film of said laminate webs, for forming a thin wall portion in each of said at least two laminate webs, wherein the space between said parallel strings is between 2–10 mm;

adhering an aluminum foil—polyester film laminate to the substrate film by adhering the aluminum foil to the substrate film with polyurethane adhesive;

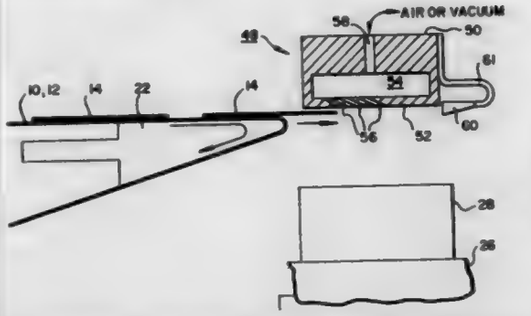
sealing said at least two laminate webs together to form said pouch so that the parallel strings of one web coincide and face the parallel strings of the other web, and the parallel strings extend along a widthwise direction of said pouch; and

forming a notch at an edge of said pouch and between said parallel strings to permit the pouch to be torn at said notch and along one of said parallel strings without pulling said parallel strings when an opening of the pouch is initiated.

5,470,420
APPARATUS FOR LABEL APPLICATION USING BERNOULLI EFFECT

Joseph E. Yokajty, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 31, 1992, Ser. No. 923,702
Int. Cl.[6] B65C 9/00
U.S. Cl. 156—566 38 Claims



1. Apparatus for acquiring and holding a thin, flexible, pressure sensitive label of the type having a first, display side and a second, adhesive side opposite said first, display side, said apparatus comprising:

a body having a support surface;

a plenum within said body;

a plurality of bores extending from said plenum through said support surface, said bores being angled with respect to said support surface and arranged in an array so that jets of gas issuing from said array will cause said label to be drawn toward and across said support surface when said label is presented to said support surface and said first, display side is brought into close proximity of said jets, thereby causing a zone of reduced gas pressure to be formed between said support surface and said first, display side and establishing a pressure differential across said label to hold said label on a film of gas flowing over said support surface;

means for directing a flow of gas into said plenum and through said angled bores;

means for presenting at least a portion of said label along a path of movement across said support surface; for permitting said jets to engage said first, display side and draw said label toward and across said support surface; and then for releasing said label to move with said film of gas across said support surface; and

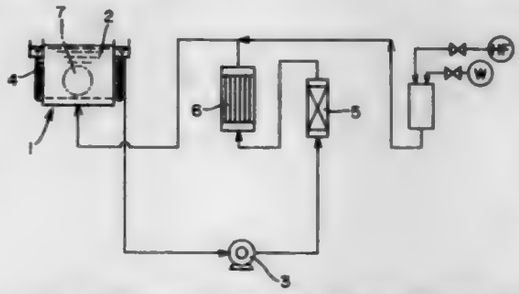
at least one stop abutment associated with said body for stopping movement of said label across said support surface and for holding said label on said film of gas in a position for accurate application to an article to be labeled,

at least a portion of said jets of gas issuing from said support surface at least partially toward said stop abutment to cause said label, after release by said means for presenting, to reposition from said path to said position for accurate application against said stop abutment while said label is held on said film of gas, all of said portion of said jets being covered by said label when said label is positioned against said stop abutment.

5,470,421
METHOD FOR PURIFICATION OF ETCHING SOLUTION

Akira Nakada, Yotsukaido; Akira Yoneya, Narashino; Noriyuki Kobayashi, Sodegaura; Mamoru Kateyamagi, Asaka; Tsutomu Kawashima, Koto, and Hiroshi Yoshida, Iwatsuki, all of, Japan, assignors to Nisso Engineering Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1994, Ser. No. 305,334
Claims priority, application Japan, Sep. 17, 1993, 5-253672
Int. Cl.[6] H01L 21/306
U.S. Cl. 156—642.1 9 Claims



1. A method for purifying an etching solution consisting of an aqueous phosphoric acid solution which has been used for etching of a silicon nitride film formed on a semiconductor wafer and contains silicon compounds resulting from the etching, said method comprising:

adding hydrogen fluoride in an amount of 6 moles or more per mole of said silicon compounds, in terms of silicon dioxide, and, if necessary, additional water, to an etching solution, said etching solution consisting of an aqueous phosphoric acid solution which has been used for etching of a silicon nitride film formed on a semiconductor wafer and contains silicon compounds resulting from the etching, and

heating the resulting solution to evaporate water in an amount more than a thousand times of the weight of silicon content to be removed and to remove fluorides of silicon as reaction products of the silicon compounds with hydrogen fluoride together with vaporized water.

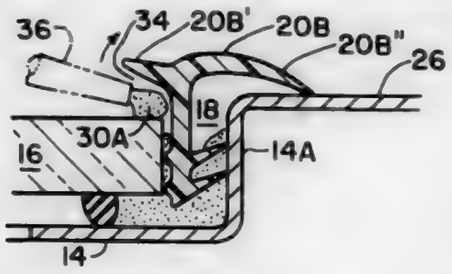
5,470,422

AUTO INSERT MOLDING AND METHOD OF INSTALLATION

Peter Gold, 389 Peninsula Blvd., Hempstead, N.Y. 11550

Filed Nov. 7, 1994, Ser. No. 334,574
Int. Cl.[6] B60J *1/00;10/02*
U.S. Cl. 156—108 1 Claim

1. An installation method for an insert auto windshield molding



of a type having a stem in depending relation from a crown in the installation of which said molding is inserted in a gap between a windshield seated in an auto windshield opening and a wall bounding said windshield opening so as to establish an attachment between said depending stem and in said gap a previous deposit of urethane having a curing time interval, and plural hold-down adhesive strips being strategically located circumferentially about said windshield in covering relation over said molding to prevent the inadvertent lifting thereof during said urethane curing time interval, a method of obviating using said hold-down adhesive strips during the insert installation of said molding comprising the steps of extruding from 70-durometer EPDM elastomeric construction material characterized by nominal resistance to shape change a molding in a configuration having a stem depending from a crown, seating an auto windshield of a selected size and shape in a conforming sized and shaped windshield opening, depositing urethane in a gap between a peripheral edge of said windshield and a wall bounding said auto windshield opening, inserting said molding into said gap so as to project said depending stem into said urethane and positioning said crown in covering relation over said gap, lifting said crown in overlying relation to said windshield from said gap-covering position into a clearance position, inserting beneath said lifted crown remaining in said clearance position due to said nominal resistance to shape change of said 70-durometer EPDM elastomeric construction material another deposit of urethane along said peripheral edge of said windshield, and urging said lifted crown in closing movement against said windshield, whereby said moved crown remains closed upon said windshield until said urethane cures to complete said molding installation without use of hold-down adhesive strips which heretofore inadvertently caused surface marring upon removal.

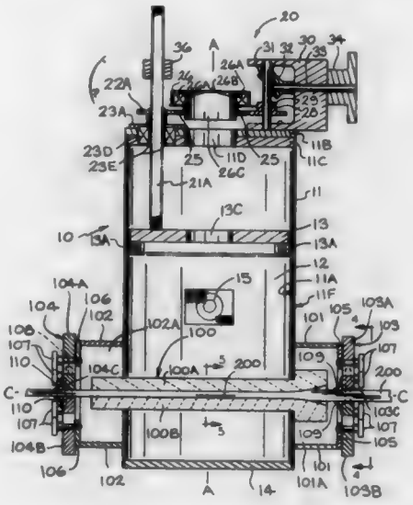
5,470,423

IMPROVED MICROWAVE PULTRUSION APPARATUS AND METHOD OF USE

Martin C. Hawley; Jianghua Wei; Valerie Adegbite, all of East Lansing, and Min Lin, Lansing, all of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Jan. 25, 1994, Ser. No. 186,462
Int. Cl.[6] B32B *31/28;5/10*
U.S. Cl. 156—166 15 Claims

1. In a microwave generating apparatus including a metallic



cavity defined by at least one wall which cavity is excited in one or more of its modes of resonance in the cavity around a central axis of the cavity including moveable plate means in the cavity mounted perpendicular to the central axis in the cavity and moveable along the central axis, moveable probe means connected to and extending inside the cavity for coupling the microwave to the cavity and control means for moving the probe means and plate means in order to select and control the mode of the electromagnetic wave in the cavity the improvement which comprises:

(a) a lossless pultrusion die with an opening along a longitudinal axis of the die and with a defined cross-section for a material to be treated with the microwaves mounted through the cavity with opposed ends which extend through and are mounted on opposed portions of the wall of the cavity;

(b) metallic extension having a proximal end away from the opposed ends of the pultrusion die and mounted on each of the opposed portions of the wall of the cavity so as to surround the material to be treated and extend away from the wall and having openings at a distal end of each of the housings;

(c) frame means mounted over each of the openings at the distal ends of the extensions, each having a window aligned along and with the longitudinal axis of the die wherein at least one of the frame means is split across the window into two portions which are relatively adjustable to increase or decrease a dimension of the window;

(d) and metallic finger means mounted around the windows of the frame means so as to surround the material to be treated on an outside surface of the cross-section of the material to be processed, wherein in use the microwave leakage at the windows is less than 10 mW/cm^2 at a frequency of 2.45 GHz.

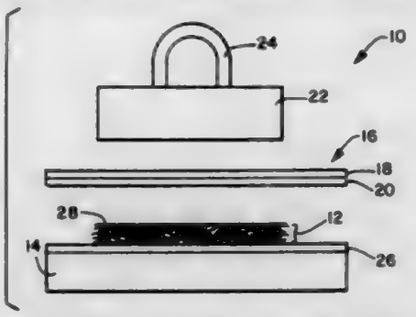
5,470,424

PROCESS FOR FORMING LIQUID IMPERMEABLE SHEET MATERIAL HAVING A FIBROUS SURFACE AND PRODUCTS FORMED THEREBY

Robert L. Isaac, Bethesda, Md.; Bernard Cohen, Berkeley Lake, and Lee K. Jameson, Roswell, both of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Nov. 30, 1993, Ser. No. 159,979
Int. Cl.[6] B32B *31/20;17/02;* B04H *1/58*
U.S. Cl. 156—253 33 Claims

1. A process for forming a liquid-impermeable, breathable sheet



having a fibrous surface, the process comprising the steps of:

forming a sheet having a first fibrous surface and a second fibrous surface;

subjecting the sheet to pressure and a z-gradient temperature differential sufficient to melt the fibers of the first surface and form the melt into a liquid impermeable, non-breathable skin without significantly altering the fibers of the second surface;

depositing fibers upon the skin while the skin is at least semi-molten to form a fibrous/skin/fibrous material; and

aperturing the liquid impermeable, non-breathable skin to make it breathable, while the skin remains liquid-impermeable.

20. A process for forming a liquid-impermeable, non-breathable sheet having a fibrous surface, the process comprising the steps of:

forming a sheet having a first fibrous surface and a second fibrous surface wherein, upon the sheet being subjected to a sufficient temperature, the fibers comprising the first fibrous surface are adapted to substantially completely melt prior to the fibers comprising the second fibrous surface significantly melting; and

subjecting the sheet to a sufficient pressure and temperature to melt the fibers of the first surface and form the melt into a liquid impermeable, non-breathable skin without significantly altering the fibers of the second surface.

5,470,425

MONOMER PREPARATIONS FOR THE CONSTRUCTION INDUSTRY

Karoly Dischö, Effretikon, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 167,256, Dec. 14, 1993, Pat. No. 5,387,644. This application Jan. 10, 1995, Ser. No. 370,744
Claims priority, application Germany, Dec. 15, 1992, 42 42 356.2
Int. Cl.[6] C09J *4/02;133/08;* B05D *1/00;* C08K *3/04*
U.S. Cl. 156—332 22 Claims

1. A method of forming a floor on a cementitious substrate comprising applying to said cementitious substrate a hardenable monomer composition comprising

(a) at least one cross-linkable acrylic monomer with a flash point above 50° C.;

(b) at least one material selected from the group consisting of

(i) 0.01 to 7% by weight of carbon black said weight based on the weight of the monomer, and

(ii) at least one polyfunctional polyester- or polyether-urethane/acrylate oligomer; and

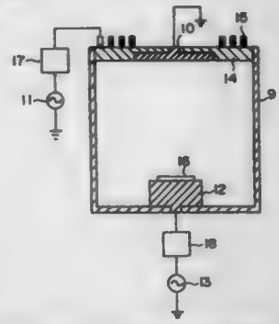
(c) from 0.01–1% by weight, based on the weight of the total composition, of at least one paraffin oil, said paraffin oil having a density which is lower than the density of the remainder of the composition.

5,470,426

PLASMA PROCESSING APPARATUS

Kazuyoshi Yoshida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 27, 1994, Ser. No. 330,375
Claims priority, application Japan, Jan. 29, 1993, 5-294657
Int. Cl.[6] B44C *1/22*
U.S. Cl. 156—345 4 Claims



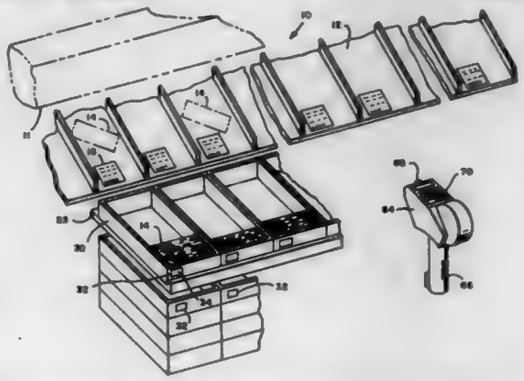
1. A plasma processing apparatus comprising a high-frequency electric field generating mechanism, having a pair of opposing electrodes arranged in a reaction vessel, for generating a high-frequency electric field between said electrodes, and a magnetic field generating mechanism constituted by a magnetic field generating coil arranged outside said reaction vessel to generate a magnetic field which does not spatially overlap the high-frequency electric field generated by said high-frequency electric field generating mechanism.

5,470,427

POSTAL AUTOMATED LABELING SYSTEM

Dennis A. Mikel, Vandelia, and Richard H. Rosen, Dayton, both of Ohio, assignors to Pitney Bowes Inc., Stamford, Conn.

Continuation of Ser. No. 963,013, Oct. 19, 1992, abandoned, which is a continuation of Ser. No. 641,985, Jan. 16, 1991, abandoned. This application Dec. 29, 1993, Ser. No. 181,476
Int. Cl.[6] B65C *9/18*
U.S. Cl. 156—387 3 Claims



1. Apparatus for producing tags to identify mail received within a bin of a mail distribution sort plan controlled sorting machine for placement into mail receiving trays and sacks, comprising:

an electronic hand held labeler having a processor having a program and a data base containing a plurality of mail distribution sort plans stored in the memory thereof that corresponds to the sort plan of the sorting machine, a keyboard and a printer having unprinted postal tags in communication with

said processor whereby upon a mail distribution sort plan being selected and bin data being entered through said keyboard, said processor will cause said printer to print a postal tag with information based upon said selected sort plan and bin data or multiple tags with information based upon said selected sort plan and bin data.

5,470,428

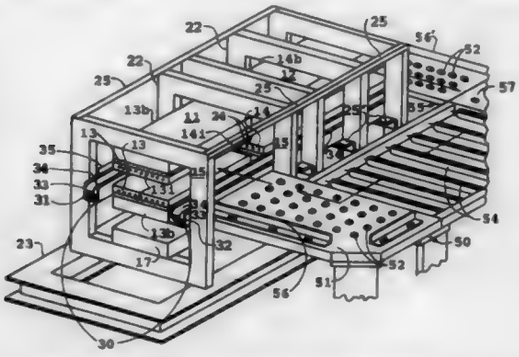
FLOW-THROUGH LINEAR TRANSFER SYSTEM FOR MAKING CREDIT CARDS AND THE LIKE, FROM SYNTHETIC RESINOUS SHEETS

William J. Sanko, Fairview, Pa., assignor to Alfred D. Lobo Co., L.P.A., Cleveland, Ohio

Filed Jun. 24, 1993, Ser. No. 81,639

Int. Cl.[6] B30B *15/34*

U.S. Cl. 156—498 **12 Claims**



1. In combination, a laminating machine having first and second daylight openings for producing a laminate of plural cards each carrying data on at least one core sheet of flexible core stock of uniformly thick thermobondable synthetic resinous material less than about 1.25 mm (50 mils) thick, having an upper and a lower surface to each of which is thermally and/or adhesively bonded an overlay of uniformly thin thermobondable synthetic resinous material less than about 0.25 mm (10 mils) thick, and having lengthwise and widthwise dimensions essentially the same as those of said core sheet, with a carrier for use in presenting an assembly of laminar sheets to a platen press comprising, a platen heating press, to heat and essentially concurrently press, a laminar assembly or 'set' in said carrier, said heating press having a single daylight opening provided by an upper fixedly mounted heating platen and a lower reciprocable heating platen;

a platen cooling press, to cool and essentially concurrently press said laminar assembly or set in said carrier, at a pressure the same as said heating press, or different, said cooling press having a single daylight opening provided by an upper fixedly mounted cooling platen and a lower reciprocable cooling platen, said cooling press being separated from and proximately disposed behind said heating press;

said first and second daylight openings being coaxially disposed in a longitudinal direction, along the longitudinal x-axis, along which said carrier travels in a linear processing path determined by successive first and second paths, with stops of chosen identical duration in each said first and second daylight openings, with travel in said first path, to and out of said first opening, and travel in said second path, to and out of said second opening being coplanar and in the same lateral plane;

carrier-loading conveyor means for transferring successive carriers, one at a time, by feeding them into said first opening;

laterally spaced apart endless loop edge-conveyor means drivingly engaged to transfer each carrier in a unidirectional processing path along the longitudinal x-axis direction only, while opposed lateral edges of said carrier rest upon parallel members of said edge-conveyor means transversely spaced apart along the y-axis, orthogonal to said x-axis, said members of said edge-conveyor means lying in substantially said same lateral plane;

means for stopping said edge-conveyor means so as to index each carrier directly vertically above each said lower platen, simultaneously;

means for operating said heating and cooling presses concurrently, to compress each said laminar assembly or set in said carrier in each said press, at a predetermined temperature and pressure, essentially simultaneously, at predetermined intervals;

means for operating said edge-conveyor means, to convey a heated and compressed laiminar assembly or set to a location directly above said lower cooling platen, and simultaneously to convey a cooled carrier onto a discharge station;

means for locating said lower heating and cooling platens of said heating and cooling presses, to index each substantially coplanarly in said lateral plane after each of said presses is opened, so as to lower each carrier from each lower platen onto said conveyor means;

means for actuating operation of said edge-conveyor means after said presses are opened to discharge a book from said cooling press;

said carrier comprising: a base plate and a cover plate between which said laminar assembly or set is compressibly held.

5,470,429

SURFACE-TREATING APPARATUS FOR CAN BODY BLANKS

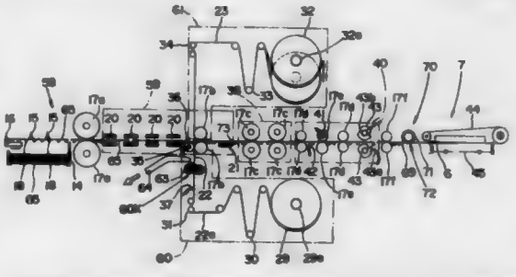
Tsutomu Shinomiya; Shunzo Miyazaki; Yasuyuki Tanaka; Shinichi Tsukada, and Michiya Tamura, all of Iwatsuki, Japan, assignors to Hokkai Can Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1992, Ser. No. 921,691

Claims priority, application Japan, Jul. 31, 1991, 3-191986; Aug. 9, 1991, 3-200826; May 25, 1992, 4-132643; Jun. 2, 1992, 4-141604

Int. Cl.[6] B32B *27/36*

U.S. Cl. 156—510 **29 Claims**



1. A surface-treating apparatus for producing can body blanks, comprising:

original sheet-cutting means for cutting an original sheet into a plurality of can body blank materials each having a predetermined width and being further dividable into a plurality of blanks for a plurality of can bodies;

a conveying path for conveying the can body blank materials obtained by the cutting means by separately holding the can body blank materials between a plurality of pairs of feed rolls;

material-feeding means for intermittently feeding the can body blank materials to the conveying path;

heating means provided along the conveying path for heating the can body blank materials which are conveyed in a row in a conveying direction along the conveying path;

a continuous biaxially-stretched polyester film on which a print pattern corresponding to a blank for a single can body and an identification mark have been printed successively at predetermined intervals, the film having a width shorter than said predetermined width of said can body blank materials;

first film-feeding means provided on one side of the can body blank materials for feeding said biaxially-stretched polyester film to one side of the can body blank materials along the conveying direction of the can body blank materials, said first film-feeding means comprising feed rollers having predetermined widths and disposed with respect to said conveying

path such that said biaxially-stretched polyester film is fed to a predetermined position on said one side of said can body blank materials wherein side edges of said can body blank materials extend beyond both side edges of said biaxially-stretched polyester film;

first press-bonding means for successively press-bonding under heat the biaxially-stretched polyester film fed by the first film-feeding means to said one side of the can body blank materials heated by the heating means at said predetermined position according to a traveling position thereof, and the first press-bonding means moreover coupling the can body blank materials forming a row in the conveying direction in a continuous form by the biaxially-stretched polyester film while defining metal-exposed areas, the metal-exposed areas being used as welding parts of the blank for a single can body and being disposed at edge portions of the can body blank materials along said both side edges of the biaxially-stretched polyester film;

a continuous plain polyester film having a width shorter than said predetermined width of said can body blank materials;

second film-feeding means provided on another side of the can body blank materials for feeding said plain polyester film to the other side of the can body blank materials along the conveying direction of the can body blank materials, said second film-feeding means comprising feed rollers having predetermined widths and disposed with respect to said conveying path such that said plain polyester film is fed to a predetermined position on said other side of said can body blank materials wherein side edges of said can body blank materials extend beyond both side edges of said plain polyester film;

second press-bonding means for successively press-bonding under heat the plain polyester film fed by the second film-feeding means to the other side of the can body blank materials heated by the heating means of said predetermined position according to a traveling position thereof, and the second press-bonding means moreover coupling the can body blank materials forming a row in the conveying direction in a continuous form by the plain polyester film while defining metal-exposed areas, the metal-exposed areas being used as welding parts of the blank for a single can body and being at edge portions of the can body blank materials along said both side edges of the plain polyester film;

blank material-cutting means arranged on a downstream side of the first and second press-bonding means along the conveying path for cutting a continuous sheet of the blank materials along a width direction thereof at a space area between the adjacent print patterns when the identification marks printer on the biaxially-stretched polyester film on the blank materials are detected, thereby obtaining surface-treated can body blank materials;

driving-out means for driving the surface-treated can body blank materials out of the conveying path; and

dividing means for dividing each of the surface treated can body blank materials driven out of the conveying path according to the individual print patterns, thereby obtaining a plurality of blanks for a plurality of can bodies.

5,470,430

MASKING APPARATUS

Tommy D. Lewis, P.O. Box 2966, Santa Cruz, Calif. 95063, and Keith V. Leisses, 435 Park Dr., Ben Lomond, Calif. 95005

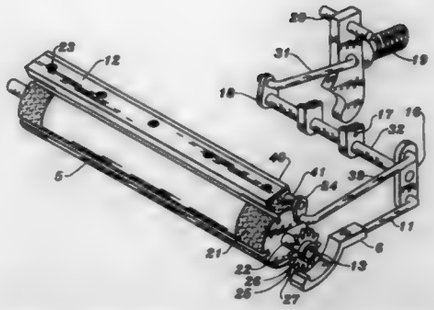
Filed Nov. 7, 1994, Ser. No. 335,470

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—577 **5 Claims**

1. An improved taping apparatus of the type in which a frame holds a roll holder rotatably carried by said frame for supporting a roll of tape and paper, wherein the improvement, comprises:

cutting means for cutting said tape without removing said apparatus from a work surface; said cutting means being operably mounted on said frame; said cutting means including an



elongated cutting element operably linked to a control assembly by a cutter pivot element;

handle assembly means allowing for both right and left handed operation of said taping apparatus; said handle assembly means including a centrally positioned handle operably mounted on said frame; said handle assembly means being positioned adjacent to a trigger element, said trigger element being operably linked to said control assembly;

dispensing means for dispensing said tape and paper, said dispensing means allowing for dispensing tape and paper from either one or two rolls of tape simultaneously; said tape dispensing means being operably secured to said frame and including a rotatable tape holding element and a rotatable paper holding element mounted on the frame; and

safety means for shielding said cutting means allowing for safe and efficient cutting of said tape; said safety means being operably secured to said elongated cutting element and to said control assembly.

5,470,431

STACK TYPE EVAPORATOR

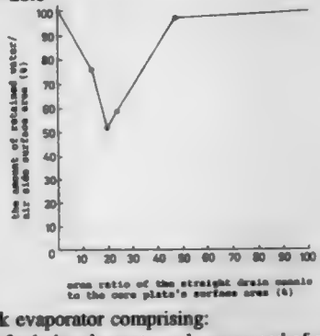
Nobuyuki Okuda, and Masayoshi Kojima, both of Oyamashi, Japan, assignors to Showa Aluminum Corp., Osaka, Japan

Continuation-in-part of Ser. No. 901,077, Jun. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 759,644, Sep. 12, 1991, Pat. No. 5,152,337, which is a continuation of Ser. No. 569,569, Aug. 20, 1990, abandoned. This application Sep. 17, 1993, Ser. No. 123,856

Claims priority, application Japan, Apr. 3, 1992, 4-082467; May 22, 1992, 4-131153

Int. Cl.[6] B01D *1/00;* **F28F** *21/00*

U.S. Cl. 159—28.6 **12 Claims**



1. In a stack evaporator comprising:

a plurality of tubular elements each composed of a pair of facing core plates which are adjoined one to another at their peripheries so as to define a coolant path therebetween;

a plurality of fins each interposed between the two adjacent tubular elements which are stacked side by side in a direction of their thickness;

upper and lower header portions respectively formed at an upper and lower ends of each tubular element, with the header portions being connected to the other corresponding header portions so as to unite the tubular elements to form the evaporator wherein except for the header portions of the tubular elements located at predetermined positions of evapo-

rator, the other tubular elements adjacent to each other have their header portions in fluid communication with one another through coolant flowing openings formed through summits of said header portions, wherein the walls of header portions at the predetermined positions of the first mentioned tubular elements function as partitions, which divide the tubular elements to form groups thereof, and which partitions thereby cause the coolant entering the evaporator through a coolant inlet pipe to advance in a meandering manner making turns at every boundary between the groups, before leaving the evaporator through a coolant outlet pipe; wherein the improvement comprises

a plurality of straight drainage canals for condensed water, the drainage canals being formed on the outer surface of the core plates forming each tubular element so as to extend vertically in parallel with one another from the upper header portion towards the lower header portion;

a hydrophilic resin coating covering the outer surfaces of the tubular elements and the fins;

the hydrophilic resin coating being applied by immersing said outer surfaces in a solution containing a polyvinyl alcohol resin as its main component, polyamide and/or polyvinyl pyrrolidone resins as its hydrophilic agent blended with the main component, a film hardener having a concentration sufficient to produce a hardened coating but not so great as to react with hydrophilic atom groups in the hydrophilic resin molecules and thereby fail to enhance the hydrophilic property, and a surfactant to stabilize said resin solution so that it will not become bubbly; the thickness of said hydrophilic resin coating falling in a range of from about 0.2 to about 1.5 μm;

a width of each straight drainage canal covered with the hydrophilic resin coating being included in a range of from about 0.5 to about 3 mm, the width being defined as a distance between surfaces of the resin coating covering an open mouth of the canal; a depth of straight drainage canals falling within a range of from about 0.5 to about 2.5 mm, the depth being defined as a distance between a portion of the resin coating covering a flat portions and another portion of the resin coating covering a bottom of each drainage canal; and

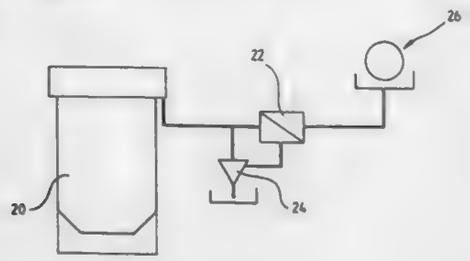
a surface area ratio falling within a range of from about 5 to about 40%, the surface area ratio being a ratio of a total area of the open mouths to an overall surface area of each core plate, and the overall surface not including expanded end regions of the core plate but inclusive of flat portions and the straight canals thereof, whereby the combination of said parallel drainage canals and said coating in said stack type evaporator results in substantially lower odor and retained water as compared to a coated scattered rib evaporator.

5,470,432

METHOD AND ARRANGEMENT FOR THE TREATMENT OF A FIBER SUSPENSION

Olavi Pikka, and Hannu Rönkönharju, both of Karhula, Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Jun. 8, 1993, Ser. No. 73,793
Claims priority, application Finland, Jun. 8, 1992, 922635
Int. Cl.[6] D21C 9/08
U.S. Cl. 162—55 **5 Claims**



1. A method of treating pulp in a bleaching stage and a postscreening stage including the removal of impurities from the pulp in said postscreening stage at a screening consistency, said method consisting essentially of the steps of:

diluting pulp from said bleaching stage to said screening consistency,

screening the pulp in at least one pressure screen to generate an accept fraction and a reject fraction;

supplying said accept fraction to a subsequent treatment including one of a washing stage, a thickening stage, a drying stage and a bleaching stage at the supply consistency of said stage without a separate thickening stage;

diluting said reject fraction to a consistency suitable for vortex cleaners;

introducing said diluted reject fraction into a vortex cleaning plant; and,

introducing accepts from the vortex cleaning plant to said subsequent treatment.

5,470,433

PROCESS FOR THE DELIGNIFICATION OF CELLULOSE FIBER RAW MATERIALS USING ALCOHOL AND ALKALI

Karl-Heinz Brodersen, Lipperheidestrasse 28; Gerhard Dahlmann, Flossmannstrasse 13, both of 8000 Munich 60, and Heinrich Leopold, Rottmannstrasse 3, 8000 Munich 2, all of, Germany

Continuation of Ser. No. 830,587, Feb. 6, 1992, abandoned.
This application Nov. 1, 1994, Ser. No. 332,039
Claims priority, application Germany, Feb. 6, 1991, 41 03 572.0
Int. Cl.[6] D21C 3/20;3/02
U.S. Cl. 162—77 **32 Claims**

1. A process for the delignification of fibrous material comprising:

heating a mixture of alcohol and water,

contacting the fibrous material with impregnation liquor at a temperature in the range of 100°–160° C. in an impregnation stage comprising the addition of said heated mixture of alcohol and water,

impregnating the fibrous material in the impregnation stage until a phase equilibrium is attained between the impregnation liquor and the liquid contained in the fibrous material,

heating an aqueous mixture of alkali and alcohol,

contacting the fibrous material with delignifying liquor in a single delignification stage comprising the addition of said heated aqueous mixture of alkali and alcohol,

wherein the concentration of alcohol in the delignification stage is lower than the concentration of alcohol in the impregnation stage, and

the pH in the delignification stage is in the range pH 9–12;

decreasing uniformly the concentration of alcohol contained in the fibrous material during the delignification stage, and

steadily increasing the concentration of the alkali in the fibrous material during the initial delignification stage, and then decreasing the concentration of alkali until a phase equilibrium is again reached between the liquid in the fibrous material and the delignification liquor.

5,470,434

DECAY-RESISTANT PAPER FOR THE MANUFACTURE OF A POT FOR RAISING AND TRANSPLANTING SEEDLINGS, AND THE PROCESS FOR PRODUCING THE SAME

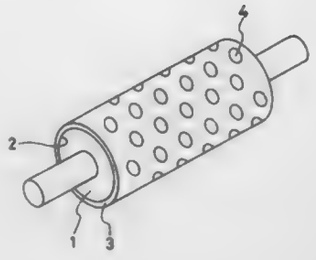
Hidekazu Terasawa; Masashi Tanimura, and Sumio Ito, all of Obihiro, Japan, assignors to Nihon Tensaiseito Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 22,171, Feb. 25, 1993, abandoned. This application Dec. 21, 1994, Ser. No. 361,153

Claims priority, application Japan, Mar. 27, 1992, 4-100335

Int. Cl.[6] D21H *25/06*

U.S. Cl. 162—117 **6 Claims**



1. A process for producing decay-resistant paper for the manufacture of a pot for raising and transplanting seedlings characterized by the formation of decayable portions in part of the decay-resistant area, which comprises the steps of:

impregnating the whole surface of paper with an aqueous solution containing an N-substituted derivative of urea having at least two reactive radicals (at least one kind of radicals among hydroxyl and methylol groups);

drying the impregnated paper; and,

thereafter simultaneously heating the paper at different temperatures with a heater having a discontinuous surface layer whereby a lower temperature at discontinuous portions of the surface layer of the heater causes no reaction with said urea derivative and a higher temperature at continuous portions of the surface layer of the heater causes a reaction with said urea derivative.

5,470,435

PROCESS FOR PREPARING WATER SOLUBLE POLYALUMINOSILICATES

John D. Rushmere, Wilmington, Del., and Robert H. Moffett, Landenberg, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 212,744, Mar. 14, 1994. This application Nov. 23, 1994, Ser. No. 347,232

Int. Cl.[6] D21H *3/78*

U.S. Cl. 162—181.6 **4 Claims**

1. A process for making paper comprising the steps of

(a) adding to an aqueous paper furnish containing pulp and optionally inorganic filler 0.01–1% by weight, based on the dry weight of the furnish, of a water soluble polyparticulate polyaluminosilicate microgel having a mole ratio of alumina:silica of between 1:10 and 1:1500 prepared by a process comprising the steps of

(i) acidifying an aqueous solution of an alkali metal silicate containing 0.1–6% by weight of SiO_2 to a pH of 2–10.5 by adding an aqueous acidic solution containing sufficient aluminum salt to provide said mole ratios; and

(ii) diluting the product of step (i) with water prior to gelation to a SiO_2 content of ≦2% by weight; and at least approximately 0.001% by weight based on the dry weight of the furnish of a water soluble cationic polymer; and

(b) forming and drying the product of step (a).

5,470,436

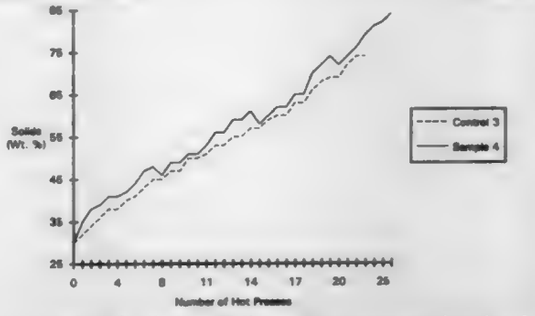
REWETTING OF PAPER PRODUCTS DURING DRYING

Dinkar G. Wagle, Monroe, and Raymond A. Volpe, Highland Mills, both of N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Nov. 9, 1994, Ser. No. 336,540

Int. Cl.[6] D21F *3/00;5/00;* **F26B** *13/18;13/14*

U.S. Cl. 162—207 **17 Claims**



1. A method for drying an elongate paper or paperboard web emerging from the press section of a papermaking machine as it traverses a dryer unit, which comprises continuously rewetting the web with an amount of water substantially uniformly across the width of the web during an initial web drying stage when the web has a solids content of no more than about 65 wt. %, wherein the amount of water added to the web ranges from about 0.5 wt. % to about 10 wt. % based on the total weight of the web including liquid and solids at each rewet step.

5,470,437

DIGESTER FOR COOKING PULP HAVING STAGGERED SCREENS

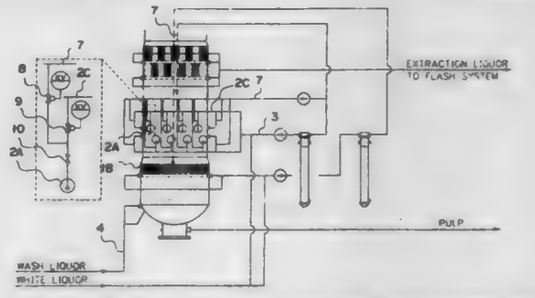
Finn Oulie; Ake Backlund, and Johanna Svanberg, all of Karlstad, Sweden, assignors to Kvaerner Pulping Technologies AB, Karlstad, Sweden

Filed Jul. 16, 1993, Ser. No. 92,420

Claims priority, application Sweden, Nov. 18, 1992, 9203462

Int. Cl.[6] D21C *7/12;7/14*

U.S. Cl. 162—237 **13 Claims**



1. A digester for continuous cooking under raised pressure and temperature of fiber material in said digester, said digester including a vessel having an interior surrounded by a wall where input of fiber material and cooking liquid takes place at the top of the digester, withdrawal of spent cooking liquor is carried out from at least one digester screening means located between the top and the bottom of the digester, and fiber material is fed out from the bottom of the digester, and at least one screening system is provided in the lower half of the digester, said at least one screening system comprising a plurality of separate screens each having a noncircular screen face of which the total area is less than 1 m^2 and which is attached to the digester wall with seal means to form a sealed volume from which liquid only can be supplied and withdrawn through each said screen face from said digester interior, said screening system including conduit means for providing an inlet and outlet for liquid, said conduit means penetrating the digester wall and communicating with said sealed volume of each said screen of said system, said screens of said system being

distributed about the inner surface of said digester vessel with each said screen including a said seal means forming a separate sealed volume and separate conduit means for each screen, said digester being vertically disposed in use and including a lower widened portion and said plurality of screens of said screen system being located in said lower widened portion, said plurality of screens comprising two rows each extending about said inner surface of said lower widened portion of said digester vessel, said screens in one of said rows being positioned in staggered relation to said screens of the other of said rows.

5,470,438

WIRE OR FELT FORMING SECTION WITH BREAST ROLLERS SUPPORTED BY HYDROSTATIC BEARINGS

Hans-Peter Sollinger, and Christian Schiel, both of Heidenheim, Germany, assignors to J. M. Voith GmbH, Germany

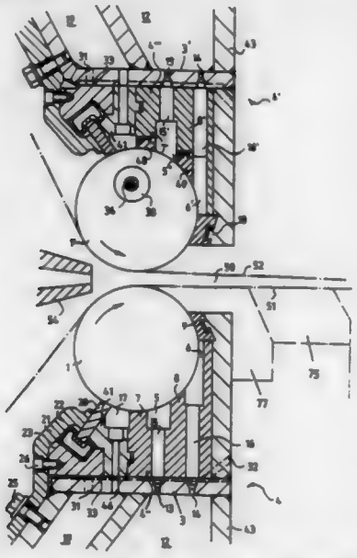
Continuation of Ser. No. 54,005, Apr. 26, 1993, abandoned, which is a continuation of Ser. No. 839,341, Feb. 20, 1992, Pat. No. 5,252,186. This application Aug. 10, 1994, Ser. No. 288,893

Claims priority, application Germany, Feb. 20, 1991, 41 05 215.3

The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.

Int. Cl.[6] D21F *1/36*

U.S. Cl. 162—273 **40 Claims**



1. A wire or felt guiding arrangement for a web of fiber pulp suspension, comprising:

a first and a second breast roller on respective opposite sides of a pulp suspension outlet from a headbox and defining a pulp gap between the rollers generally where the rollers are closest together;

a respective taut wire or felt passing under tension partially around each roller and through the pulp gap so that the headbox suspension outlet ejects suspension between the wires or felts toward the pulp gap;

means defining a respective hydrostatic bearing engaging an outer surface of each of the rollers and extending longitudinally in a cross-machine direction of the roller along the length of the roller for supporting each of the rollers against the tension exerted thereon by the respective wire or felt;

each roller being biased against the hydrostatic bearing by at least one of gravity and the respective wire or felt under tension, each roller being positioned along its entire length by the hydrostatic bearing and by one or both of the force of its own weight and the tension provided by the respective wire or felt, thereby providing a continuous hydrostatic roller support over the entire roller length;

each roller circumference forming a first arc disposed against the bearing substantially opposite a second arc of the circumference that the wire or felt engages.

5,470,439

END PORTION FLOW RATE REGULATING APPARATUS FOR A PAPER MACHINE HEADBOX

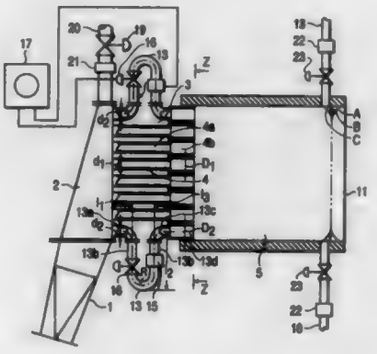
Tetsuo Makino; Keiichi Fujiki, both of Mihara, and Toshimi Tajima, Hiroshima, all of, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1993, Ser. No. 142,138

Claims priority, application Japan, Jan. 29, 1992, 4-312670; Jan. 14, 1993, 5-020824

Int. Cl.[6] D21F *1/06*

U.S. Cl. 162—216 **5 Claims**



5. A paper-making machine headbox comprising: a tapered header; a slice chamber; and an end portion flow rate regulating apparatus comprising a tube bank disposed between said tapered header and said slice chamber, and flow regulating means for regulating the flow of wet paper stock through the tube bank to said slice chamber, said tube bank including two sets of vertically aligned end tubes and an array of central tubes interposed between said sets of end tubes, each of said end tubes having a tubular portion including an inlet section adjacent said tapered header, a U-shaped take-out section projecting to the outside of the tube bank and extending contiguously from said inlet section, and an outlet section extending contiguously from said take-out section toward a respective side of said slice chamber, the inner diameter of the take-out section of the tubular portion of each of said end tubes being larger than the inner diameter of each of said central tubes.

5,470,440

METHOD FOR INHIBITING VINYL AROMATIC MONOMER POLYMERIZATION

Graciela B. Arhancet, Katy, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Apr. 19, 1994, Ser. No. 230,032

Int. Cl.[6] B01D *3/34*

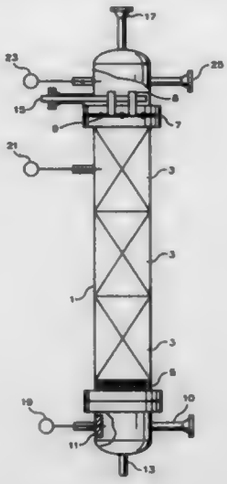
U.S. Cl. 203—9 **9 Claims**

1. A method for inhibiting the polymerization of vinyl aromatic monomers during their distillation comprising adding to said monomers an effective polymerization inhibiting amount of a combination of 2,6-di-tert-butyl-4-methylphenol and at least one substituted benzoquinonediimide compound.

5,470,441
PACKED COLUMN VAPORIZER AND VAPORIZING PROCESS

Ronald E. Brown, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 7, 1994, Ser. No. 207,435
Int. Cl.[6] B01D *3/14;47/16*
U.S. Cl. 203—49 20 Claims



6. A process for vaporizing a volatile liquid substance which comprises:

(1) providing an apparatus comprising (a) a packed column containing a bed of substantially inert, solid particles; (b) a gas inlet port being located below said bed of inert solid particles; (c) a liquid feed tube having a plurality of downwardly-directed holes, said tube being located above said bed of solid particles; (d) a feed distributor comprising a plate, a plurality of orifices extending through said plate and a plurality of open riser tubes mounted on said plate, said plate being located between the top of said packed column and said liquid feed tube; and (e) a gas outlet port being located above said feed tube:

(2) introducing a hot entrainer gas through said gas inlet port;

(3) establishing an upward flow of said hot entrainer gas in said packed column;

(4) introducing a volatile liquid through said liquid feed tube and forcing said volatile liquid to flow through said multiple downward-directed holes onto said distributor plate;

(5) forcing said volatile liquid to flow through said orifices into said packed column;

(6) vaporizing said volatile liquid and forming a gaseous mixture of said hot entrainer gas and of vaporized liquid in said packed column; and

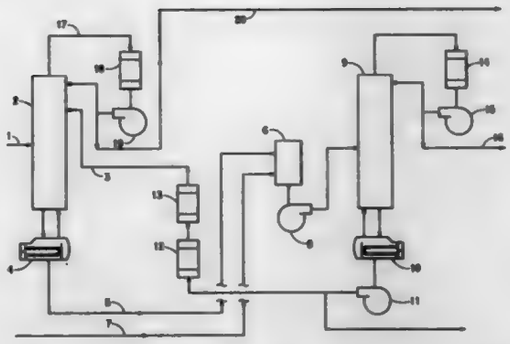
(7) forcing said gaseous mixture to flow upward through said plurality of open riser tubes and to exit through said gas outlet port.

5,470,442
SEPARATING AND REMOVING IMPURITIES FROM TETRAFLUOROETHANES BY USING EXTRACTIVE DISTILLATION

Barry A. Mahler, Glen Mills, Pa., and Ralph N. Miller, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 11, 1994, Ser. No. 212,439
Int. Cl.[6] B01D *3/40*
U.S. Cl. 203—56 15 Claims

1. A process for purifying tetrafluoroethane isomers in a first mixture comprising 1,1,2,2-tetrafluoroethane, 1,1,1,2-tetrafluoroethane and fluorocarbon impurities, the process comprising the steps of:



adding at least one extractive agent comprised of at least one alcohol to the first mixture in order to form a second mixture:

separating at least one fluorocarbon impurity from the tetrafluoroethane isomers in the second mixture by extractively distilling the second mixture in an extractive distillation zone,

thereby optionally forming a third mixture comprising the extractive agent and fluorocarbon impurities and separating the extractive agent from the third mixture, and;

recovering at least one tetrafluoroethane isomer.

5,470,443
SEPARATION OF ISOPROPANOL FROM 2-BUTANONE BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Jan. 10, 1995, Ser. No. 370,624
Int. Cl.[6] B01D *3/40;* C07C *31/10;45/83*
U.S. Cl. 203—57 2 Claims

1. A method for recovering isopropanol from a mixture of isopropanol and 2-butanone which comprises distilling a mixture of isopropanol and 2-butanone in the presence of about one part by weight of an extractive agent per part of isopropanol—2-butanone mixture, recovering the isopropanol as overhead product and obtaining the 2-butanone and the extractive agent as bottoms product, wherein said extractive agent consists of one material selected from the group consisting of butyliamine, triethyl amine, cyclohexyl amine, 2-nitrotoluene, nitrobenzene, ethyl acetoacetate, methyl acetoacetate, 2-hydroxy acetophenone, 5-methyl-2-hexanone, 2,4-pentanedione, propiophenone, nitromethane, nitroethane, 1-nitropropane, 2-nitropropane, butyronitrile and ethylene carbonate.

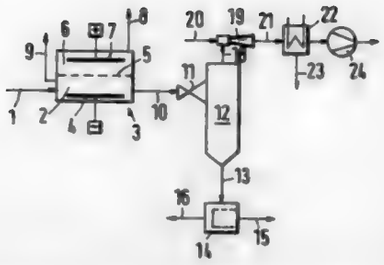
5,470,444
PROCESS FOR PREPARING LOW IRON AMMONIUM ALUM

Ingo F. Litzenberger, Frankfurt am Main; Günter Roller, Bad Homburg, and Dieter Stein, Wiesbaden, all of, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Germany

Filed Feb. 8, 1995, Ser. No. 386,811
Claims priority, application Germany, Feb. 17, 1994, 44 04 952.8
Int. Cl.[6] C25B *1/00*
U.S. Cl. 204—93 7 Claims

1. A process for preparing ammonium alum with reduced iron content from an aqueous ammonium alum solution which contains Fe^{3+} ions, which comprises the steps of:

(a) passing the aqueous ammonium alum solution containing Fe^{3+} and having a pH not in excess of 5 through at least one electrolytic cell containing an anode and a cathode, and an external power source to generate a current and conducting the current through the electrolytic cell to electrolytically reduce at least half of the Fe^{3+} ions to Fe^{2+} ions;



(b) subjecting the aqueous ammonium alum solution electrolytically reduced during step (a) to cooling and crystallization to form a liquid phase suspension containing crystalline ammonium alum and containing Fe^{2+} ions in the liquid phase; and

(c) separating the liquid phase from the crystallized ammonium alum.

5,470,445

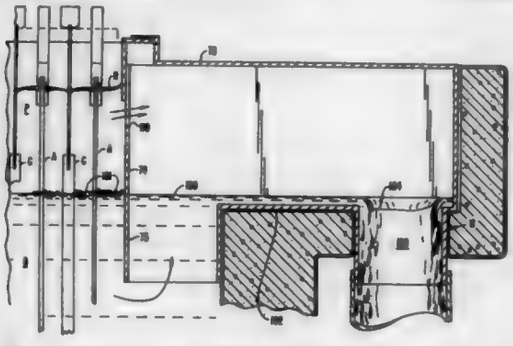
ELECTRODE CAP WITH INTEGRAL TANK COVER FOR ACID MIST COLLECTION

James A. Murray, Walnut Creek; Michael R. Nees, Clayton; William P. Imrie, Layfayette; Christopher C. Rayner, Alamo; Chris L. Pfalzgraff, Concord; Robert K. Bates, San Ramon, all of Calif.; Valmer H. Ness, Highlands Ranch, Colo., and Terrance J. Cox, San Francisco, Calif., assignors to Bechtel Group, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 978,945, Nov. 29, 1992, abandoned. This application Apr. 12, 1994, Ser. No. 226,785

Int. Cl.[6] C25C *7/06*

U.S. Cl. 204—105 R **58 Claims**



53. A method for evacuating aerosol acid mist from a tank having electroplating solution within the tank and having electroplating occurring between anode and cathode electrodes having electrical connections for producing plated metal and gas rising to the surface of the bath in the tank, the gas rising in the tank causing gas and mist aerosols over the surface of the tank, the method comprising the steps of:

placing a cover over the electrodes, the cover including a multi-element cover system applied below the electrical connections and above the surface of the electrolyte bath including a plurality of flexible electrode caps fastened to at least one side of the electrodes and spanning to adjacent electrodes to form a continuous, substantially air tight cover over the solution;

covering the circulating electroplating solution from the electrodes to the sides of the tank above the surface of the circulating electroplating solution for forming a substantially air tight seal;

providing the tank with at least an outflow for circulating electroplating solution through the tank;

providing the tank with a weir at the outflow;

out flowing fluid from the tank over the weir; and,

drawing gas and mist aerosol over the weir below the cover and above the surface of the electrolyte for causing the gas and mist to exit the tank and be drawn over the weir to avoid the formation of crystals adjacent the weir.

5,470,446

PROCESS FOR THE PRODUCTION OF SILICON NITRIDE

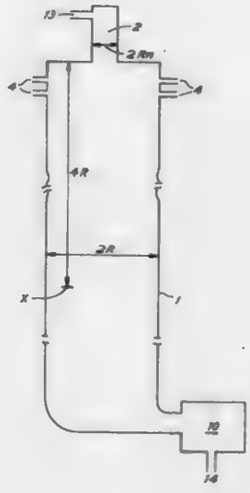
Timothy A. Jennett; Patrick D. Harmsworth; Dave Martin, and Anthony W. Ellison, all of Cleveland, England, assignors to Tioxide Specialties Limited, London, England

Filed Mar. 24, 1994, Ser. No. 217,053

Claims priority, application United Kingdom, Apr. 1, 1993, 9306802

Int. Cl.[6] C01B *21/06*

U.S. Cl. 204—177 **16 Claims**



9. A process for the production of substantially crystalline silicon nitride comprising generating an electric plasma by the discharge of direct current electricity between a pair of electrodes in a stream of non-oxidizing gas, introducing said plasma through an inlet nozzle into a reactor and mixing said plasma with a mixture of ammonia and a silicone halide, thereby heating said mixture of ammonia and silicon halide and forming substantially crystalline silicon nitride having a density as determined by pycnometry greater than 3.10 g cm^{-3} and collecting said silicon nitride, wherein said electricity is sufficient to transfer energy to said non-oxidizing gas at a rate of at least 30 kilowatts per mole of silicon halide per minute and at least 25 kilowatts and wherein said reactor is constructed and operated to induce circulation of gaseous material within the reactor such that a recirculation ratio (RR) is defined by the formula

$$RR = \frac{0.425\, M_n \cdot R}{M \cdot R_n}\left[\frac{D}{D_n}\right]^{1/2} - 0.425$$

wherein

M_n=mass flow of gas stream through the inlet nozzle,

R=internal radius of the reactor into which said gas stream flows,

M=mass flow of gases in the reactor at a distance 4R downstream from the inlet nozzle,

R_n=radius of inlet nozzle

D_n=density of gas stream passing through the inlet nozzle,

D=density of gases in reactor at a distance 4R downstream from the inlet nozzle

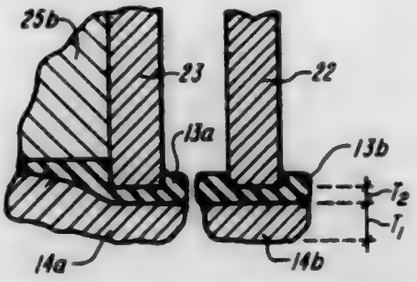
and the recirculation ratio is greater than 2.5.

5,470,447

METHOD FOR APPLYING A PROTECTIVE COATING ON A MAGNETIC RECORDING HEAD

Nader Mahvan, Cupertino; Atef H. Eltoukhy, Saratoga, and Edward F. Teng, Sunnyvale, all of Calif., assignors to Stor-Media, Inc., Santa Clara, Calif.

Continuation of Ser. No. 932,335, Aug. 19, 1992, abandoned. This application Sep. 29, 1994, Ser. No. 315,892
Int. Cl.[6] C23C *14/34*
U.S. Cl. 204—192.16 3 Claims



1. A method for applying a protective, electrically conductive coating to magnetic heads for reading and/or writing magnetic media data without substantially degrading a non-conductive zone between spaced head segments, said method comprising:

depositing, by sputter coating, an electrically insulating layer upon portions of a magnetic head to be coated with said protective, electrically conductive coating;

said sputter coating of said electrically insulating layer including subjecting of spaced surfaces of said spaced head segments to said depositing; and

depositing, by sputter coating, an electrically conductive, protective layer upon said electrically insulating layer deposited on said portions of said magnetic head;

said electrically insulating layer providing and enhancing adhesive bonding of said electrically conductive, protective layer to said magnetic head;

said magnetic head being supported on a slider;

said electrically insulating layer being applied to each of said slider and said spaced head segments;

said depositing of said electrically insulating layer being operable to concurrently prevent short-circuiting between said spaced head segments and insulatingly coat head segment supporting portions of said slider; and

said depositing of said electrically insulating layer being concurrently operable to

prevent degradation of electrical characteristics of said magnetic head

by said electrically conductive coating,

enhance adhesion of said electrically conductive coating to said magnetic head, and

enhance wear resistance of said magnetic head.

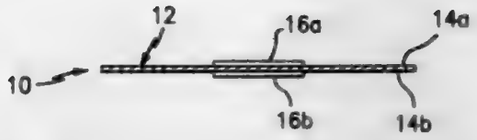
5,470,448

HIGH PERFORMANCE ELECTROLYTIC CELL ELECTRODE/MEMBRANE STRUCTURES AND A PROCESS FOR PREPARING SUCH ELECTRODE STRUCTURES

Trent M. Molter, and Kurt M. Critz, both of Enfield, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 28, 1994, Ser. No. 188,487
Int. Cl.[6] C25B *11/20*
U.S. Cl. 204—252 16 Claims

9. An improved electrolysis cell, having an anode and a cathode and utilizing at least one improved ionomer assisted electrode structure, comprising an ion exchange membrane having a first surface and a catalyst ionomer layer bonded to said first surface of said membrane, wherein said improvement consists essentially of a hydrated ion exchange membrane having a first surface and a



second surface and a first and optionally, a second pre-formed catalyst ionomer layer consisting essentially of hydrated and swollen ionomer solids bonded to discrete unsupported catalyst particles, wherein said first and said second catalyst ionomer layers each have a catalyst loading of at least 0.10 mg/cm^2, wherein said first catalyst ionomer layer is pressed and bonded to said first surface of said hydrated ion exchange membrane, and optionally, wherein said second catalyst ionomer layer is pressed and bonded to said second surface of said membrane.

5,470,449

MICROPOROUS ASBESTOS-FREE DIAPHRAGMS/ CATHODES FOR ELECTROLYTIC CELLS

Jean Bachot, Bourg la Reine, and Pascal Stutzmann, Paris, both of, France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Continuation of Ser. No. 948,456, Sep. 21, 1992, abandoned, which is a continuation of Ser. No. 565,385, Aug. 10, 1990, abandoned. This application Jul. 14, 1994, Ser. No. 274,150
Claims priority, application France, Aug. 10, 1989, 89 10938
Int. Cl.[6] C25B *13/08;9/00*
U.S. Cl. 204—252 38 Claims

1. A microporous diaphragm which comprises a sintered, fluoropolymer microconsolidated asbestos-free microporous fibrous sheet material, said sheet material comprising from 3% to 35% by weight of a fluoropolymer binder comprising a homopolymer or a copolymer derived at least partly from olefinic monomers completely substituted by fluorine atoms or completely substituted by a combination of fluorine atoms and of at least one of chlorine, bromine or iodine atoms per monomer, from 0% to 50% by weight of a gel of an oxohydroxide of at least one metal of Groups IVA, IVB, VB and VIB of the Periodic Table or of the lanthanide or actinide series thereof, and from 20% to 95% by weight of a mixture of polytetrafluoroethylene fibers and inorganic fibers, said inorganic fibers constituting from 1% to 80% by weight of such mixture and said inorganic fibers comprising titanate fibers, optionally in admixture with carbon or graphite fibers, or admixture thereof, wherein said diaphragm is non-conductive.

5,470,450

EDGE PROTECTOR FOR ELECTROLYTIC ELECTRODE, AND SPREADER BAR

Hiroshi Tanaka, and Yasuo Masuda, both of Tokyo, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 49,984, Apr. 20, 1993, Pat. No. 5,368,714. This application Aug. 26, 1994, Ser. No. 296,510
Claims priority, application Japan, Apr. 20, 1992, 4-099939; Apr. 20, 1992, 4-099940; Apr. 20, 1992, 4-099941; Apr. 20, 1992, 4-099942
The portion of the term of this patent subsequent to Nov. 29, 2011, has been disclaimed.
Int. Cl.[6] C25C *7/08*
U.S. Cl. 204—279 10 Claims

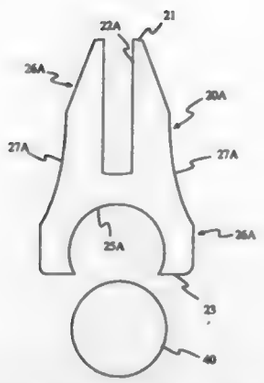
1. An edge protector for an electrolysis electrode comprising:

an inner jaw disposed in a longitudinal direction of said edge protector at a first end;

an outer jaw disposed in a longitudinal direction of said edge protector at a second end;

a first surface extending along a first side of said edge protector;

a second surface extending along a second side of said edge protector;



said first and second surfaces converging toward each other in a direction from said outer jaw toward said inner jaw, to reduce an amount of material in locations between said first and second surfaces sufficiently to reduce thermal stresses in said locations;

said first end further comprising opposing top and bottom portions of said inner jaw, wherein each said top and said bottom portion is angled upward from said first to said second surface;

said angle from said first surface of said edge protector to said second surface being an angle which is less than about twenty degrees from the center portion of the edge protector outward, formed at each said opposing top and bottom portion of said inner jaw, at a first end of said edge protector;

said angled first end of said edge protector effective for preventing unintended sharpening of said first end during electrolysis, and;

said edge protector is capable of ready removable detachment from said electrolysis electrode.

5,470,451

SPUTTERING APPARATUS

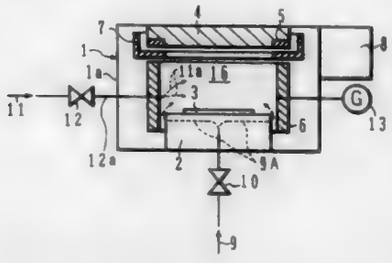
Masahiko Kobayashi, and Nobuyuki Takahashi, both of Fuchu, Japan, assignors to Anelva Corporation, Tokyo, Japan

Filed May 25, 1994, Ser. No. 249,271

Claims priority, application Japan, Jun. 8, 1993, 5-164127

Int. Cl.[6] C23C *14/34;14/52;14/54*

U.S. Cl. 204—298.03 **5 Claims**



1. A sputtering apparatus including a process chamber in which transfer of a substrate and formation of a thin film on the substrate are performed in a face-up manner, said sputtering apparatus comprising:

a substrate holder for supporting the substrate horizontally with the processing surface thereof made to face upward and opposite a target;

a means for generating a plasma discharge in a plasma discharge space in front of said substrate;

a cylindrical shield member for substantially tightly enclosing the plasma discharge space;

a process gas inlet means having at least one gas outlet opening formed in an inner surface of said cylindrical shield member; and

a pressure gauge having a sensor portion positioned in an opening formed in the inner surface of said cylindrical shield member.

5,470,452

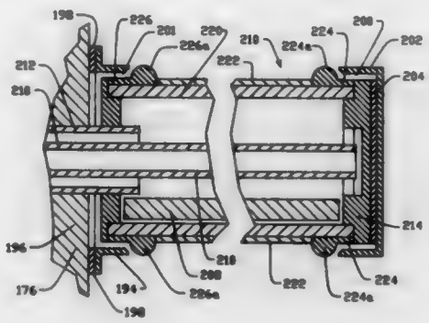
SHIELDING FOR ARC SUPPRESSION IN ROTATING MAGNETRON SPUTTERING SYSTEMS

Eric R. Dickey, and Erik J. Bjornard, both of Northfield, Minn., assignors to Viratec Thin Films, Inc., Faribault, Minn.

Continuation of Ser. No. 16,492, Feb. 10, 1993, abandoned, which is a continuation of Ser. No. 823,026, Jan. 15, 1992, abandoned, which is a continuation of Ser. No. 565,921, Aug. 10, 1990, abandoned. This application Nov. 29, 1993, Ser. No. 158,729

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—298.21 **20 Claims**



1. A rotating cylindrical magnetron sputtering apparatus for D.C. reactive sputtering a film of silicon dioxide on a substrate using a gas discharge, comprising:

an evacuable coating chamber;

a cathode including an elongated cylindrical tubular member having a layer of silicon at the surface thereof and having a magnet array defining a sputtering zone extending along the length of said tubular member and circumferentially along a relatively narrow region thereof, said sputtering zone defining an erosion zone about said tubular member and along the length thereof;

means for rotatably supporting said tubular member in said coating chamber;

means for transporting the substrate past the sputtering zone; and

means for suppressing arcing due to a dielectric breakdown of an insulating layer deposited on at least one of a dark-space shield, support structure or end portion of the cathode, including a collar formed of a material selected from a group consisting of scandium, titanium, vanadium, chromium, manganese, iron, cobalt, nickel, zirconium, molybdenum, hafnium, tantalum, tungsten, rhodium, platinum, and iridium, said collar disposed around at least one end of said tubular member and said collar having a first end outside said erosion zone and a second end extending into the erosion zone a distance sufficient that said collar material may be sputtered, said collar material having a sputtering rate less than that of silicon and a melting point greater than silicon, said sputtered collar material forming a compound having electrical insulating properties less than that of silicon dioxide to reduce the voltage drop across said insulating layer and thereby suppress arcing in said coating chamber, wherein a contiguous surface of said tubular member, extending over a majority of said erosion zone, is substantially free of said collar material, whereby said silicon dioxide film is substantially free of said collar material at least in an area between the edges of said substrate.

5,470,453

REFERENCE ELECTRODE WITH ION BARRIER FOR ELECTROCHEMICAL MEASURING SYSTEMS

Andre Nipkow, and Eric Bakker, both of Zurich, Switzerland, assignors to Mettler-Toledo AG, Switzerland

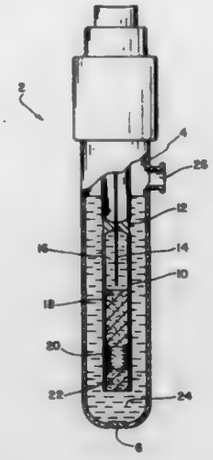
PCT No. PCT/CH92/00095, § 371 Date Jun. 28, 1993, § 102(e) Date Jun. 28, 1993, PCT Pub. No. WO92/21960, PCT Pub. Date Dec. 10, 1992

PCT Filed May 15, 1992, Ser. No. 971,870

Claims priority, application Switzerland, May 29, 1991, 1588/91

Int. Cl.[6] G01N *27/30*

U.S. Cl. 204—435 8 Claims



1. In a reference electrode for electrochemical measuring systems, including an electrode shaft equipped with a diaphragm and containing a reference electrolyte, an interior tube received within said electrode shaft with a silver wire therein and an ion barrier between said silver wire and said diaphragm, a portion of said reference electrolyte being in contact with said silver wire and said ion barrier, said portion of reference electrolyte containing silver ions, said ion barrier blocking said silver ions by forming a redox system therewith to precipitate said silver ions as silver metal and thereby preventing said silver ions from migrating to said diaphragm.

5,470,454

PROCESS FOR THE PREPARATION OF LUBRICATING BASE OILS

Pierre Grandvallet; Daniel G. P. Allais, and Pierre E. J. G. Dejaifve, all of Grand Couronne, France, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 2, 1993, Ser. No. 71,434

Claims priority, application European Pat. Off., Jul. 17, 1992, 92402069

Int. Cl.[6] C10G *45/00;71/00*

U.S. Cl. 208—144 18 Claims

1. A process for the preparation of a lubricating base oil, comprising treating a hydrocarbonaceous product with hydrogen, under hydrogenation conditions at an elevated temperature and pressure and in the presence of a catalyst, which hydrocarbonaceous product has been prepared by contacting hydrocarbons, having a viscosity index of at least 140, and/or derivatives thereof with an active hydrogen-containing system by a process which comprises generating a hydrogen-containing plasma and allowing contact of the hydrocarbons and/or derivatives thereof in liquid form with the plasma-generated system and recovering the hydrocarbonaceous product, and wherein a lubricating base oil having a substantially unchanged viscosity index from said hydrocarbonaceous product is recovered from said treating with hydrogen in the presence of a catalyst.

5,470,455

PROCESS FOR CONVERTING ACID SLUDGE TO INTERMEDIATE SLUDGE AND SOFT AND/OR HARD ASPHALT

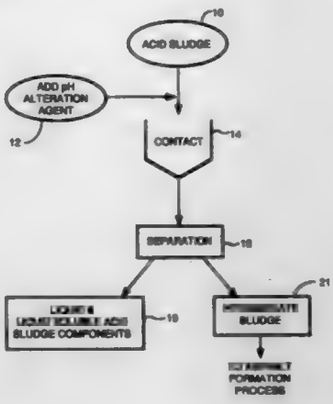
Benjamin S. Santos, 38735 Huntington Cir., Fremont, Calif. 94536

Continuation-in-part of Ser. No. 879,642, May 7, 1992, Pat. No. 5,288,392. This application Feb. 17, 1994, Ser. No. 197,587

The portion of the term of this patent subsequent to Feb. 22, 2011, has been disclaimed.

Int. Cl.[6] C10G *17/02*

U.S. Cl. 208—4 19 Claims



1. A process for converting acid sludge to un-oxidized asphalt, comprising:

altering the pH of the acid sludge by adding a pH elevating agent to said acid sludge, said pH elevating agent having a pH ranging from 3–14, said volume and pH of said pH elevating agent being sufficient to raise the pH of said acid sludge to from approximately 3 to approximately 7 such that the acid sludge does not become sandy and un-meltable at temperatures from room temperature up to approximately 275 degrees centigrade, thereby creating an intermediate mixture comprising a layer of liquid and a layer of intermediate sludge having a pH in the range from 3–7, and;

separating said liquid layer from said layer of intermediate sludge; and

heating said intermediate sludge to a temperature sufficient to evaporate the water content of said intermediate sludge and holding said intermediate sludge at an elevated temperature above the boiling point of water for a time sufficient to evaporate substantially all the water content of said intermediate sludge thereby converting the intermediate sludge to a soft, un-oxidized asphalt.

5,470,456

PROCESS FOR REMOVING CARBONYL-SULFIDE FROM LIQUID HYDROCARBON FEEDSTOCKS

Guy L. G. Debras, Les-Bons-Villers; Georges E. M. J. De Clippeleir, Sint Pieters Leeuw, and Raymond M. Cahen, Brussels, all of, Belgium, assignors to Fina Research, S.A., Feluy, Belgium

Continuation-in-part of Ser. No. 248,532, Sep. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 103,239, Sep. 30, 1987, Pat. No. 4,830,735, which is a continuation-in-part of Ser. No. 753,211, Jul. 9, 1985, abandoned. This application Jun. 1, 1993, Ser. No. 71,435

Int. Cl.[6] C10G *29/16*

U.S. Cl. 208—244 17 Claims

1. A process for removing carbonyl-sulfide from a hydrocarbon feedstock comprising:

(a) passing said hydrocarbon feedstock containing carbonyl sulfide as a contaminant over an absorbent material comprising

nickel deposited on a support material, said nickel being present in said absorbent material as being both nickel oxide and metallic nickel;

(b) selectively absorbing carbonyl sulfide from said feedstock on to said absorbent material by an amount sufficient to reduce the carbonyl sulfide content of said hydrocarbon stream to a concentration no greater than 50 ppb; and

(c) recovering a hydrocarbon stream of reduced carbonyl sulfide from said absorbent material;

wherein said absorbent material is in finely divided form.

5,470,457

STABILIZATION OF HYDROCARBONS BY THE ADDITION OF HYDRAZINE

Joseph E. Bares; Byron G. Johnson, both of Bartlesville, Okla., and Frederick J. Cornforth, Sweeny, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 17, 1994, Ser. No. 261,595

Int. Cl.[6] C10G *9/16*

U.S. Cl. 208—255 **5 Claims**

1. A process for retarding the formation of colored materials and gummy deposits in a hydrocarbon fluid containing at least one heteroaromatic comprising:

blending an antioxidant additive and a hydrazine additive selected from the group consisting of the hydrazine family with said hydrocarbon fluid.

5,470,458

METHOD FOR THE RECOVERY OF BLACK OIL RESIDUES

Ian Ripley, 75 The Willows Marton, Middlesborough, Cleveland, United Kingdom, and Anthony H. Needham, 50 Thames Avenue, Guisbrough, Cleveland, United Kingdom

Continuation of Ser. No. 464,866, Jan. 16, 1990, abandoned. This application Nov. 16, 1992, Ser. No. 976,724

Claims priority, application United Kingdom, Feb. 1, 1989, 8902116

Int. Cl.[6] C10G *70/04*

U.S. Cl. 208—370 **24 Claims**

1. A process for the mobilization and removal of black oil residue from an enclosed storage tank comprising the steps of:

a) introducing a heating medium into the black oil residue at a velocity and temperature effective to create a localized turbulent mixture of mobilized black oil residue and heating medium and an adjacent area of mobilized black oil residue;

b) removing the mobilized black oil residue from the adjacent area and from the tank by localized negative pressure located at the portion of the residue which has become mobilized;

c) heating the removed mobilized black oil residue to a temperature in the range of between about 50° C. to about 200° C.;

d) feeding the heated black oil residue to a filtration means to remove coarse particulate matter therefrom; and

e) passing the filtered, heated black oil residue to process separation whereby substantially all solid sediments and any residual heating medium contained in the filtered black oil residue are removed thereby producing an oil suitable for further refining or blending.

5,470,459

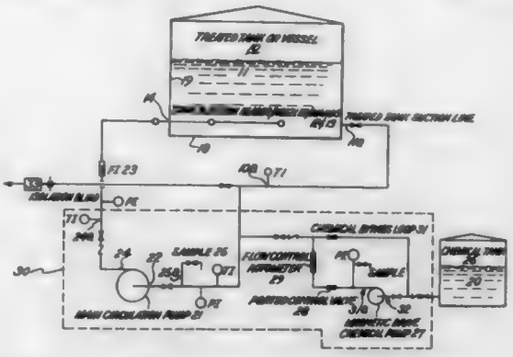
APPARATUS AND PROCESS FOR TREATMENT OF LIQUIDS

James W. Barrington, Downey; Randy W. Masters, Walnut Creek, and Mark D. Denny, Benicia, all of Calif., assignors to Rust Industrial Services Inc., La Porte, Tex.

Division of Ser. No. 151,270, Nov. 12, 1993, Pat. No. 5,425,880, which is a continuation-in-part of Ser. No. 937,367, Aug. 28, 1992, Pat. No. 5,300,232. This application Jan. 25, 1995, Ser. No. 377,655

Int. Cl.[6] C02F *1/76*; B01F *5/04*;*15/02*

U.S. Cl. 210—149 **12 Claims**



1. An apparatus for the treatment of liquids, comprising:

at least one rigid injection wand inserted through a single opening in a wall of a tank, said tank having a bottom and containing a liquid containing sulfides to be treated, wherein said injection wand is connected to a joint outside of the tank that allows for the angle between the injection wand and the tank bottom or the angle between the injection wand and the wall of the tank to be altered incrementally and in a controlled manner, and at least one location on said injection wand whereby a treating solution can be injected into the tank to promote reaction mixing between the injected treating solution and the liquid containing sulfides being treated.

5,470,460

APPARATUS FOR THE PURIFICATION OF CYANIDE-CONTAINING WASTE WATER

Nikolay V. Pertsov, Moscow; Zoya R. Ulberg; Vladimir E. Vember, both of Kiev; Valentina I. Podolskaya, Kiev; Boris S. Kogan, and Eduard K. Burenkov, both of Moscow, all of, Russian Federation, assignors to 958075 Ontario Inc., Toronto, Canada

PCT No. PCT/CA93/00077, § 371 Date Nov. 28, 1994, § 102(e) Date Nov. 28, 1994, PCT Pub. No. WO93/16962, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 24, 1993, Ser. No. 290,944

Claims priority, application Russian Federation, Feb. 25, 1992, 5036319

Int. Cl.[6] C02F *3/02*

U.S. Cl. 210—151 **11 Claims**

1. A two-stage apparatus for cleaning of waste water containing suspended solids and cyanide in a dissolved state, comprising:

a first stage comprising a bioreactor, having:

(i) at least one cultivator means (27) for cultivating micro-organisms;

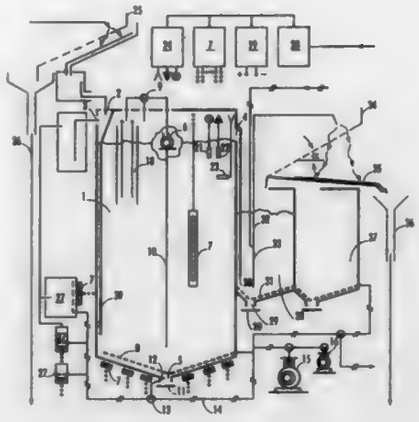
(ii) reservoir means (1) for receiving and treating a mixture of said waste water and micro-organisms having a downwardly converging conical base;

(iii) oxygenating means (8) for supplying oxygen to said mixture in a region proximate said conical base;

(iv) temperature regulating means (7) for maintaining said mixture at a constant temperature;

(v) stirring means for stirring said mixture; and

a second stage for receiving contents of said bioreactor, comprising:



(i) a sorption chamber (**28**) in communication with an outlet **4** from said reservoir means **1**, having a substantially downwardly-converging conical base, for containing an ion-exchange resin, activated carbon, charcoal, coke, or other sorption material mixed in suspension with said mixture;

(ii) oxygenating means (**31**) for supplying oxygen to contents of said sorption chamber;

(iii) stirring means for stirring the contents of said sorption chamber;

(iv) straining means (**34**) for separating said suspended sorption material from the waste water after treatment in said sorption chamber; and

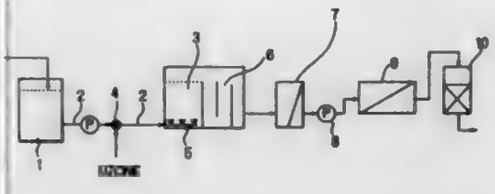
(v) conduit means (**33**) to transport said contents of said sorption chamber to said straining means (**34**) and the sorption material separated therefrom.

5,470,461

APPARATUS FOR PRODUCING PURE WATER

Cozy Ban; Motonori Yanagi; Takaaki Fukumoto, all of Itami; Toshiki Manabe, Toda; Hiroshi Yanome, Toda, and Kazuhiko Kawada, Toda, all of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Japan Organo Co., Ltd, both of Tokyo, Japan

Filed Oct. 1, 1992, Ser. No. 955,143
Claims priority, application Japan, Jan. 4, 1991, 3-257291
Int. Cl.[6] C02F *9/00*
U.S. Cl. 210—188 **15 Claims**



1. An apparatus for producing pure water comprising:

means for ionizing non-ionic silica which is contained in water comprising a vessel for allowing the water to pass therethrough and stay therein for predetermined lengths of time, a means for dissolving ozone in the water in this vessel, a means for irradiating the water in which ozone has been dissolved with ultraviolet rays, and a means for separating gases from liquids located between the means for dissolving ozone and the means for irradiating water; and

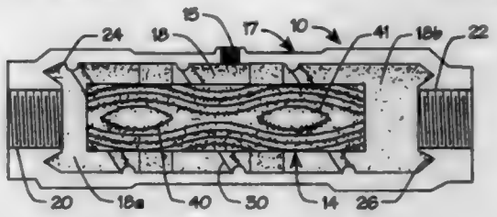
means for fixing ionized silica in the water to a solid electrolyte by ion exchange.

5,470,462

APPARATUS FOR PREVENTING SCALE FORMATION IN WATER SYSTEMS

Raymond G. Gauger, 2130-4 S. Ritchey St., Santa Ana, Calif. 92705

Filed Nov. 5, 1992, Ser. No. 967,731
Int. Cl.[6] B01D *15/00*
U.S. Cl. 210—198.1 **31 Claims**



1. An apparatus for preventing scale formation in systems wherein a fluid is conducted through a fluid delivery system, the combination comprising:

a housing configured for connection in fluid flow with said system and having an inner chamber with a generally cylindrical surface and an entrance end opening and an exit end opening, diameters of said openings being less than the diameter of said inner chamber;

flow control rib means formed on said inner surface;

a longitudinally extending unitary imperforate generally metallic member having a turbulence creating surface and diameter less than the diameter of said inner chamber and greater than the diameter of said openings;

means for supporting said unitary member in said chamber in coaxial alignment with said inner surface and spaced from said entrance and exit openings; and

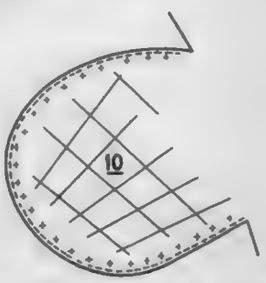
fluid feedback means formed within said chamber adjacent at least one of said exit opening or said entrance opening for causing water flowing through said conduit to at least partially reverse itself for causing greater turbulence than that caused by said rib means and the surface of said unitary member to thereby prevent the formation of scale in the fluid delivery system.

5,470,463

PASSIVATED POROUS SUPPORTS AND METHODS FOR THE PREPARATION AND USE OF SAME

Pierre Girot, Paris, and Egisto Boschetti, Croissy Sur Sei, both of, France, assignors to Sepracor Inc., Marlborough, Mass.

Continuation-in-part of Ser. No. 901,326, Jun. 19, 1992, abandoned. This application Jul. 13, 1993, Ser. No. 90,968
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—198.2 **38 Claims**



1. A passivated chromatographic media comprising (i) a porous mineral oxide substrate matrix having interior and exterior surfaces and innate groups that render said substrate matrix susceptible to undesirable non-specific interaction with biological molecules, and (ii) a three-dimensional, pore-filling gel network derived from polymerization of a main monomer, a neutralizing monomer different from said main monomer and having one or more polar and/or cationic functional group(s) and one or more reactive functional group(s), and a crosslinking agent, wherein said monomers

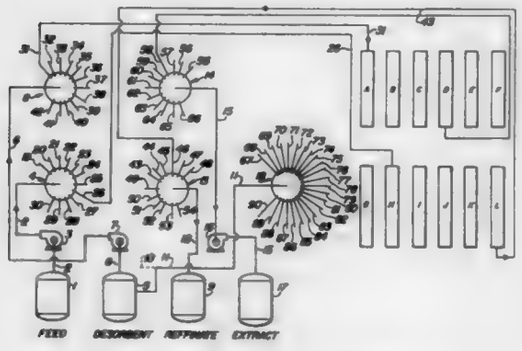
and said crosslinking agent have first been allowed to come into intimate contact with said surfaces of said substrate matrix before said polymerization to form said gel network, wherein said polar and/or cationic functional groups of said neutralizing monomer are substantially adjacent to and interact with said innate groups of said substrate matrix, and said reactive functional groups of said neutralizing monomer when polymerized are covalently linked to said main monomers, and wherein said gel network has become associated with said surfaces of said porous substrate matrix by means of non-covalent interactions between said innate groups of said substrate matrix and said neutralizing monomer, and said gel network extends into and throughout the porous volume of said substrate matrix to substantially fill said porous volume, and wherein said innate groups of said substrate matrix have become deactivated, resulting in the substantial elimination of said undesirable non-specific interaction.

5,470,464

SMALL SCALE SIMULATED MOVING BED SEPARATION APPARATUS AND PROCESS

James W. Priegnitz, Elgin, Ill., assignor to UOP, Des Plaines, Ill.

Filed Apr. 6, 1994, Ser. No. 223,785
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—198.2 **10 Claims**



1. A continuous chromatographic separation apparatus which comprises:

(a) a plurality of adsorbent chambers, with each chamber having an inlet and an outlet and being loaded with a quantity of a solid adsorbent;

(b) a first rotary valve means being connected via a first set of conduits to the inlet and outlet of each adsorbent chamber, with the first rotary valve means providing a set serial interconnection of the plurality of adsorbent chambers;

(c) a means to prevent the flow of fluid through the conduits linking the first rotary valve means to two selected sequential chambers;

(d) second and third rotary valve means which are connected via a second set of conduits to the inlet of the adsorbent chambers;

(e) fourth and fifth rotary valve means which are connected via a third set of conduits to the outlet of the adsorbent chambers;

(f) flow control devices adapted to regulate the rate of flow of fluid through the second, third, and fourth rotary valves;

(g) fluid storage devices for a feed mixture and a desorbent compound operatively connected to the second and third rotary valve means for charging a feed stream and a desorbent stream to different adsorbent chambers via said second set of conduits; and,

(h) fluid storage devices for an extract stream and a raffinate stream operatively connected to the fourth and fifth rotary valve means for collecting an extract stream and a raffinate stream delivered to said fourth and fifth rotary valve means via said third set of conduits.

5,470,465

VORTEX SYSTEM FOR SEPARATING PARTICLES FROM A LIQUID STREAM

Michael Maung, and Jack Moorehead, both of San Diego, Calif., assignors to Automatic Control Technology Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 188,092, Jan. 28, 1994, Pat. No. 5,451,318. This application Jun. 6, 1994, Ser. No. 254,397
Int. Cl.[6] B03D *1/74*
U.S. Cl. 210—205 **54 Claims**

1. A vortex system for separating particles from a liquid stream which comprises:

an elongated, generally cylindrical chamber;

means at one end of said chamber for tangentially introducing a particle-bearing liquid into said chamber so that a vortex flow is established;

an axial impeller at one end of said chamber for reinforcing said vortex flow;

a plurality of injection jets along and through the outer wall of said chamber for introducing a fluid comprising a gas thereinto;

first effluent means at one end of said chamber for removing gas and light, fine and buoyant particles from the axial region of said chamber;

second effluent means at the end of said chamber opposite said one end for removing liquid and heavy particles from the outer region of said chamber;

third effluent means at the end of chamber opposite said one end for removing cleaned liquid from the annular region between said axial region and said outer region.

5,470,466

METHOD AND APPARATUS FOR REMOVING FERROUS PARTICLES FROM COOLANT FLUID DURING MACHINING

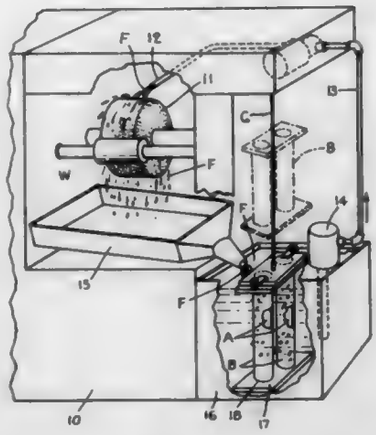
William R. Schaaf, 210 Middle Brook Rd., Greer, S.C. 29651

Continuation-in-part of Ser. No. 34,937, Mar. 17, 1993, abandoned. This application Apr. 20, 1994, Ser. No. 230,220
Int. Cl.[6] B01D *35/06;* **B03C** *1/02*
U.S. Cl. 210—222 **5 Claims**

3. Apparatus for removing fine ferrous particles suspended in an aqueous coolant fluid used to facilitate the machining away of particles from a workpiece comprising:

a plurality of elongated substantially horizontally aligned upright bar magnets carried in fixed spaced relation to each other;

a plurality of elongated plastic non-metallic cover members having imperforate sides and end members on one end and being open on the other end to receive said bar magnets respectively in closely fitting relation therein;



a transverse frame member constructed of non-magnetic material bridging said cover members adjacent said open ends and fixed to said cover members;

said transverse frame member having openings so as not to interfere with insertion of the bar magnets into the open ends of said cover members;

a liquid sealing member extending about each of said open ends of said cover members;

an end closure member carrying said liquid sealing member;

a transverse reinforcing element of non-magnetic material fixed to said covers affording rigidity and strength thereto; and

non-magnetic means sealing said covers at ends opposite said end closure member against entry of coolant fluid;

whereby said cover members and the magnets contained therein are sealed against entry of coolant fluid when the apparatus is suspended therein, and whereby said transverse frame member skims away said ferrous particles avoiding their adherence to said bar magnets when the magnets are withdrawn from the cover members.

5,470,467

OIL SPILL CONTAINMENT AND RECOVERY SYSTEM

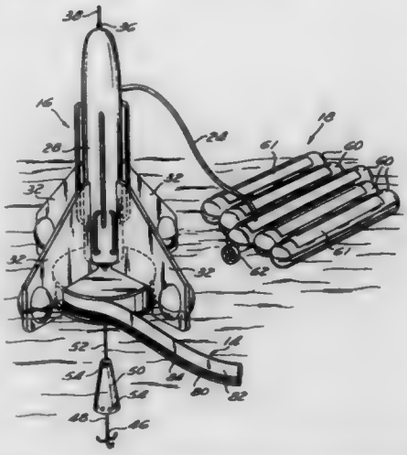
Wyman T. Soule, 12 Maynes Ave., Albany, N.Y. 12203

Continuation of Ser. No. 919,778, Jul. 23, 1992, Pat. No. 5,328,607. This application Apr. 15, 1994, Ser. No. 228,292

The portion of the term of this patent subsequent to Jul. 12, 2011, has been disclaimed.

Int. Cl.[6] F02B *15/04*

U.S. Cl. 210—242.3 **6 Claims**



1. An oil containment and recovery system for confining and collecting oil spills, the oil containment and recovery system comprising:

(a) a buoyant barrier and conduit, said buoyant barrier and conduit comprising;

i) an elongate inflatable buoyant member;

ii) an elongate suction conduit connected to a means for producing suction depending downwardly from said buoyant member, said suction conduit having a plurality of apertures formed therein for receiving oil directly into said suction conduit; and

iii) weight means formed upon said suction conduit to maintain said suction conduit in a position generally inferior to said buoyant member;

(b) a pump in fluid communication with said suction conduit for effecting oil flow therethrough; and

(c) an elongate housing having buoyant fins extending therefrom, said pump being disposed within said housing, and said buoyant barrier and conduit being stowable proximate said housing.

5,470,468

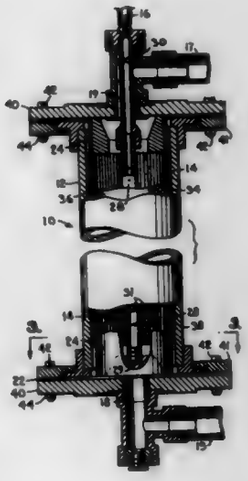
SPIRAL FILTRATION MODULE HAVING BYPASS PREVENTION FLANGE

David M. Colby, Medford, Mass., assignor to Koch Membrane Systems, Inc., Wilmington, Mass.

Filed Oct. 12, 1993, Ser. No. 134,062

Int. Cl.[6] B01D *27/08*

U.S. Cl. 210—321.6 **6 Claims**



1. A device for use in filtration of a liquid feed stream, the device comprising:

a housing including means for receiving the feed stream at one end thereof;

a filtration cartridge for separating the feed stream into concentrate and permeate,

the cartridge being disposed within the housing in spaced relationship to the housing to accommodate the selective removal of the cartridge from the housing, the spaced relationship presenting an essentially annular space;

means for preventing the feed stream from entering the annular space between the cartridge and the housing, the prevention means including a pair of flexible seals positioned on opposed ends of the cartridge, each seal comprising a gasket and a sleeve extending perpendicularly therefrom;

means for encapsulating the cartridge and the seals positioned thereon;

means coupled with the housing for accommodating withdrawal of permeate; and

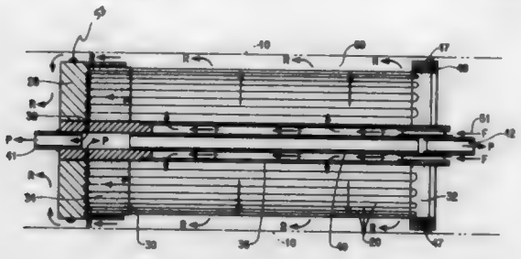
means coupled with the housing for discharging the concentrate therefrom.

5,470,469

HOLLOW FIBER CARTRIDGE

Thomas J. Eckman, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 16, 1994, Ser. No. 305,948
Int. Cl.[6] B01D 63/00
U.S. Cl. 210—321.8 7 Claims



1. A hollow fiber membrane separation apparatus comprising a pressure vessel having one or more slide-in, replaceable hollow fiber membrane cartridges disposed longitudinally therein,

(A) each said cartridge comprising a bundle of hollow fibers longitudinally aligned with said cartridge having at least one end of said bundle mounted in a tubesheet, said hollow fibers having selective permeability to fluid; an elongated feed member through which fluid to be treated can flow radially into and through the hollow fiber bundle; an elongated discharge member concentrically housed inside said elongated feed member; end caps mounted to the ends of said bundle wherein the facing ends of the tubesheet(s) and the adjacent end cap define a permeate collection space which is in fluid communication with (i) the open ends of the hollow fibers and (ii) said elongated discharge member; one or more of said end caps having a feed fluid port; wherein the feed member has a lip seal at said end cap; wherein the end caps are mounted over the ends of the bundle with epoxy; and

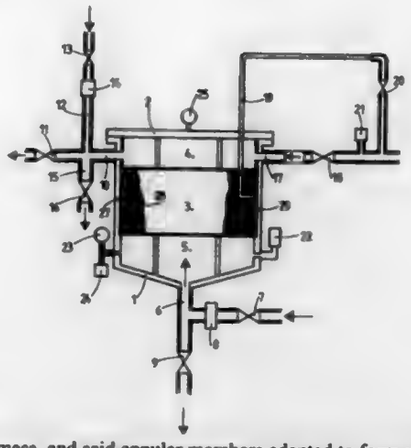
(B) wherein the cartridges are disposed within the pressure vessel so as to form a first space between the outside of each bundle and the inner wall of the pressure vessel; a first opening at an end of the pressure vessel and offset from its center, which is in communication with the elongated feed member through which the fluid to be treated is fed; a second opening or openings at an end of the pressure container and concentric therewith, in fluid communication with the open end of hollow fibers through which the permeate is discharged; and a third opening at an end of the pressure vessel, opposite said end through which fluid to be treated is fed, and offset from the center, through which the residue fluid is discharged.

5,470,470

LIQUID FILTER FIBER MODULE DISPOSED IN AN INFLATABLE BELT

Jean-Claude Leyat, Sion, Switzerland, assignor to Leyat Fils Marketing SA, Sion, Switzerland

Filed Sep. 30, 1993, Ser. No. 122,538
Claims priority, application Switzerland, Feb. 10, 1992, 352/91
Int. Cl.[6] B01D 39/06
U.S. Cl. 210—350 5 Claims



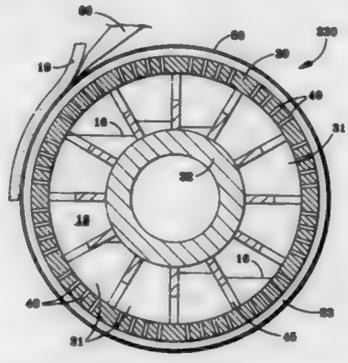
1. A filtering module for a liquid comprising a filtering mass formed by individual elongated fibers having each a diameter or transverse section of about 3 to 40 microns, said fibers being disposed axially so as to run substantially parallel to one another and maintained together by radial compression in a cylindrical casing, said filtering mass having a density of about 10,000 to 100,000 fibers/cm^2 and being surrounded by an inflatable belt arranged between said mass and said cylindrical casing and usable for modifying said density, and annular members disposed inside the cylindrical casing respectively above and below said inflatable belt, said inflatable belt being of a height lesser than that of the filtering mass, and said annular members adapted to form with said inflatable belt an interchangeable cartridge produced as a single part.

5,470,471

ANTI-REWET DECK FOR PRESS ROLLS

Oscar Luthi, Nashua; Antoine Abdulmassih, Hudson, both of N.H., and Frank J. Merchel, III, Salem, Mass., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed May 14, 1993, Ser. No. 62,092
Int. Cl.[6] B01D 33/00; D21F 3/08
U.S. Cl. 210—386 8 Claims



1. A deck for a liquid extraction press roll for processing fibrous materials, comprising:

a rotatable hollow cylindrical roll shell having drainage holes located in circumferential grooves in an outer surface of said roll shell;

an axial core for rotatably driving said roll shell, said core having mounted thereon longitudinal support ribs which support the roll shell and which define drainage compartments bounded by said axial core, said support ribs, and said roll shell; said support ribs further having cross-over ports which permit flow of liquid between said drainage compartments, each drainage compartment being bounded by two support ribs, said roll shell and said axial core, said axial core being rotated in a predetermined direction whereby one of said two support ribs is a leading support rib and the other of said two support ribs is a trailing support rib;

perforated filter plates mounted upon said roll shell, said filter plates permitting passage of liquid therethrough into the circumferential grooves, through the drainage holes, and into the drainage compartments while retaining fibrous material upon an outer surface of said filter plates; and

means for minimizing reflux of liquid from said drainage compartments, which have rotated to positions above a nip formed between said deck and a deck of a coacting liquid extraction press roll, back into said fibrous material on the outer surface

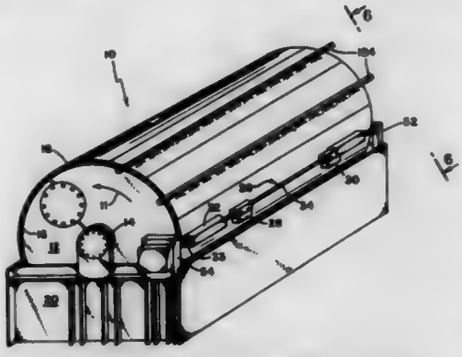
of said filter plates, the means for minimizing reflux of liquid limiting the flow of liquid through the drainage holes into and out of a drainage compartment to an area proximate the leading support rib.

5,470,472

ROTARY DRUM FILTER WITH RECIPROCATING NOZZLE MEANS

David P. Baird, Cumming, and Richard L. Reiter, Alpharetta, both of Ga., assignors to Dorr-Oliver Incorporated, Milford, Conn.

Filed May 16, 1994, Ser. No. 243,170
Int. Cl.[6] B01D *33/06*
U.S. Cl. 210—391 **10 Claims**



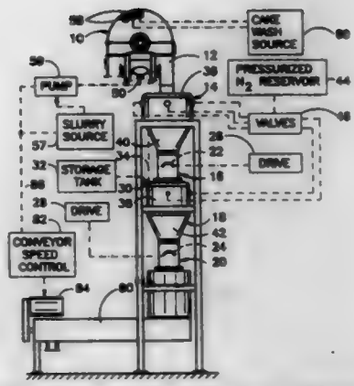
1. A rotary drum filter assembly comprising:
a filter drum having a peripheral filter surface covered with a filter medium and a hollow interior, said drum being mounted on a shaft for rotation about a substantially horizontal axis, said drum ascending on one side of said axis in a direction of rotation and said drum descending on the other side of said axis in the direction of rotation;
a nozzle positioned on said ascending side of said drum for directing a liquid jet toward said peripheral filter surface at an angle between about 0 degrees and 45 degrees of a vertical plane tangential to said peripheral filter surface, the angle being measured from the vertical plane in a direction opposite the direction of rotation, said liquid jet being directed against a precoat layer and an outer layer of sludge on said peripheral filter surface so as to disperse a strip of the layers in a manner such that substantially all of the sludge which comprises the strip of the layers remains on the drum;
a shower head positioned past said nozzle in the direction of rotation of said drum; and
a scraper positioned on the descending side of said drum for scraping accumulated sludge from said peripheral filter surface.

5,470,473

ROTARY VACUUM FILTRATION DRUM WITH VALVED HOPPER CAKE TREATMENT MEANS

David B. Park, Middleboro, Mass., and Michael F. Crawley, Maryville, Tenn., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Feb. 17, 1994, Ser. No. 197,965
Int. Cl.[6] B01D *33/06*
U.S. Cl. 210—402 **10 Claims**



1. An assembly for recovering crystals from a slurry, comprising:
a filtration unit including a rotatably mounted cylindrical filter, said filtration unit having a slurry input for receiving slurry under pressure, said filtration unit having an outlet for discharging crystalline material separated from said slurry by the filtration unit;
a first hopper connected to said outlet;
a first valve unit connected to said hopper at a downstream side thereof;
a second hopper connected to said first valve unit downstream thereof; and
a second valve unit connected to said second hopper at a downstream side thereof;
each of said valve units including a rotatably mounted dome shaped valve member,
further comprising pressure equalization means connected to said first hopper and said second hopper for substantially equalizing pressure in said first hopper and said second hopper prior to an opening of said first valve unit.

5,470,474

PROCESS FOR CLEANING HOLLOW FIBERS

Wolfgang Ansorge, Essen; Ralf Hornscheidt, Velbert; Andreas Jungheim, Solingen, and Klaus Müller, Wuppertal, all of, Germany, assignors to Akzo Nobel NV, Arnhem, Netherlands

Filed Mar. 25, 1994, Ser. No. 217,631
Claims priority, application Germany, Mar. 25, 1993, 43 09 734.0
Int. Cl.[6] B01D *69/08*
U.S. Cl. 210—500.23 **12 Claims**

12. A hollow fiber or hollow fiber membrane, wherein said hollow fiber or hollow fiber membrane has a residual content of lumen filler of less than 500 ppm, said lumen filler comprising isopropyl myristate, wherein said hollow fiber or hollow fiber membrane is produced by a process comprising removing the lumen filler, undesired auxiliary processing agents, or both from a finished hollow fiber or finished hollow fiber membrane by extracting the finished hollow fiber or finished hollow fiber membrane with a supercritical gas.

5,470,475

CLARIFIER

William H. Boyle, Milwaukee, Wis., assignor to Envirex, Inc., Waukesha, Wis.

Filed Aug. 20, 1993, Ser. No. 110,305
Int. Cl.[6] C02F *1/40*
U.S. Cl. 210—519 **9 Claims**

1. A clarifier for separating suspended solids from waste water to provide clarified water, said clarifier comprising
a rectangular tank for containing waste water to be separated, the tank including upper and lower regions, a bottom, endwalls and parallel spaced apart first and second sidewalls, and each of the sidewalls having upper and lower sidewall portions;
a first influent passage including an aperture for introducing waste water into the tank, the first influent passage extending along at least a portion of the sidewall upper portion of the first sidewall;
a first effluent passage for removing clarified water from the tank, the first effluent passage being adjacent to and extending

in parallel side by side relation to the first influent passage and including a weir having a weir upper edge over which clarified water flows from the upper region of the tank; and

a skirt baffle mounted in the tank and extending along the first sidewall to define a space between the first sidewall and the baffle, and wherein the aperture of the influent passage is located to admit waste water into the space.

5,470,476

METHOD FOR THE TREATMENT OF ANIMAL WASTE

Leandro Taboga, Via L. Nievo, 14, I-33010 Coloredo di Monte Albano, Italy

PCT No. PCT/IT92/00030, § 371 Date Jul. 27, 1993, § 102(e) Date Jul. 27, 1993, PCT Pub. No. WO92/16461, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 14, 1992, Ser. No. 113,321

Claims priority, application Italy, Mar. 14, 1991, UD91A0034

Int. Cl.[6] C02F *1/68*

U.S. Cl. 210—615 **10 Claims**

1. A method for animal waste treatment comprising introducing formaldehyde and ferrous sulphate into the animal waste wherein said formaldehyde and ferrous sulphate are incorporated in ion exchange resins which are contained in solid, floating, biodegradable blocks.

5,470,477

PARTS WASHER

Albert M. Farnsworth, Chandler, Ariz., assignor to Farnsworth Family Trust, Gilbert, Ariz.

Filed Nov. 13, 1992, Ser. No. 976,435

Int. Cl.[6] B01D *11/04*

U.S. Cl. 210—634 **23 Claims**

1. A parts washer having a washing fluid for washing parts and a filtering fluid of greater density than the washing fluid for filtering contaminants and debris from the washing fluid as the washing fluid percolates upwardly through the filtering fluid, said parts washer comprising in combination:

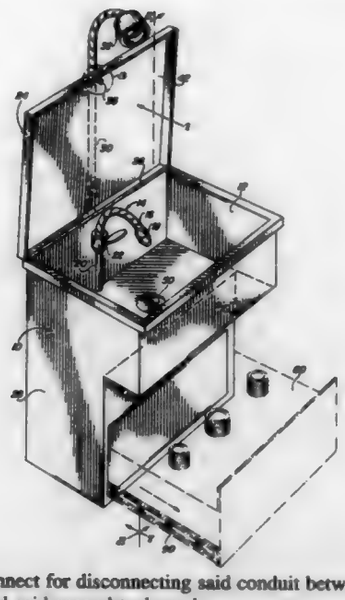
a) a basin for washing the parts with the washing fluid;

b) a drain extending downwardly from said basin for conveying the washing fluid and any entrained contaminants and debris washed from the parts, said drain including an outlet;

c) a first tank disposed below said basin and in fluid communication with said outlet to receive the washing fluid and any entrained contaminants and debris and for housing the filtering fluid to filter the washing fluid with the filtering fluid and to guide any contaminants and debris filtered and segregated from the washing fluid into a conduit;

d) a second tank disposed below said first tank and in fluid communication with said first tank through the conduit for receiving and containing the segregated contaminants and debris and some of the filtering fluid;

e) a pump for pumping the washing fluid from said first tank to said basin;



f) a disconnect for disconnecting said conduit between said first tank and said second tank; and

g) a detachment device for removing said second tank containing the contaminants and the debris and any filtering fluid for subsequent disposal of the contaminants, debris and filtering fluid.

5,470,478

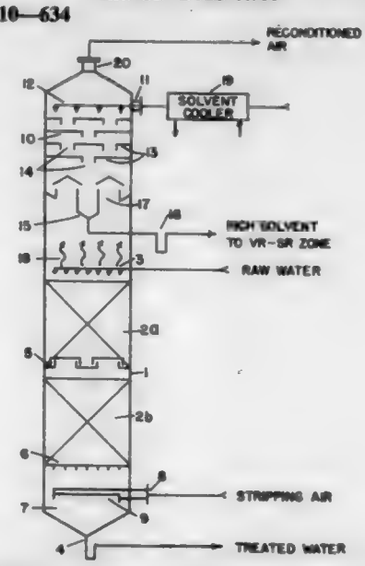
APPARATUS AND METHOD FOR STRIPPING AND ABSORPTION OF VOLATILE MATERIALS

Max Leva, 1 Hodgson Ave., Pittsburgh, Pa. 15205

Continuation-in-part of Ser. No. 78,914, Jun. 21, 1993, abandoned. This application Jul. 8, 1994, Ser. No. 272,122

Int. Cl.[6] B01D *11/00*

U.S. Cl. 210—634 **27 Claims**



1. A method of removing a volatile material from a liquid using a vertical tower structure containing a stripping zone, comprising feeding liquid containing the volatile material to the top of said stripping zone, introducing an inert gas to the base of said stripping zone to remove the bulk of said volatile material from said liquid feed, the tower containing an absorption zone into the base of which said inert gas carrying volatile material is caused to flow, said absorption zone being irrigated at the top with a solvent by which the bulk of said volatile material is removed from said inert gas without said solvent combining chemically with the volatile

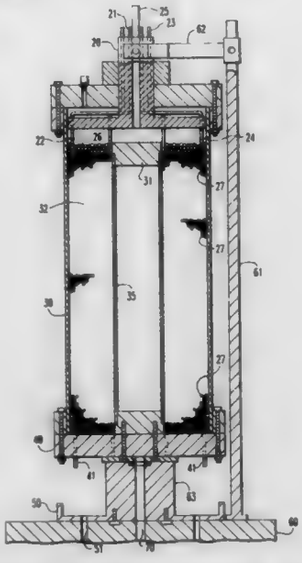
material or with any of its components in order to preclude any follow-up chemical processing, for substantial recovery and substantial restoration of the solvent to is original condition, removing the cleaned inert gas from the top of said absorption zone, and removing said solvent which now carries the bulk of said volatile material from the base of said absorption zone through a trap and/or pumping means.

5,470,479

CONTINUOUS, STEADY-STATE, CHROMATOGRAPHIC SEPARATION OF GADOLINIUM ISOTOPES

Thomas S. Snyder, Oakmont; Steven H. Peterson, and Umesh P. Nayak, both of Murrysville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 23, 1994, Ser. No. 264,806
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—635 **16 Claims**



12. A continuous, steady-state, gadolinium isotope separation method, comprising the steps of:

(a) loading a stationary phase into a circumferential annular space of a continuous annular chromatograph having an effective column height sufficient to resolve each of said gadolinium isotopes into a distinct product fraction having a sufficient purity, the stationary phase comprising an ion exchange resin having a monodisperse particle distribution of substantially spherical resin beads;

(b) preparing an aqueous feed solution of gadolinium ions from a mixture of gadolinium isotopes;

(c) preparing an eluant solution capable of displacing gadolinium ions from said ion exchange resin;

(d) rotating said annular space of said continuous annular chromatograph;

(e) feeding said feed solution containing gadolinium ions into the top of said annular space so that the feed solution penetrates no more than about 5% of the effective column height of the stationary phase before elution is initiated;

(f) feeding said eluant solution into the top of said annular space to cause each of the gadolinium isotopes in said feed solution to pass down the annular space at different speeds;

(g) collecting a separate product fraction at separate product ports at the bottom of said continuous annular chromatograph, said product fractions corresponding to each of the high thermal cross-section gadolinium isotopes present in the feed solution after elution of all of the gadolinium isotopes present in the feed solution

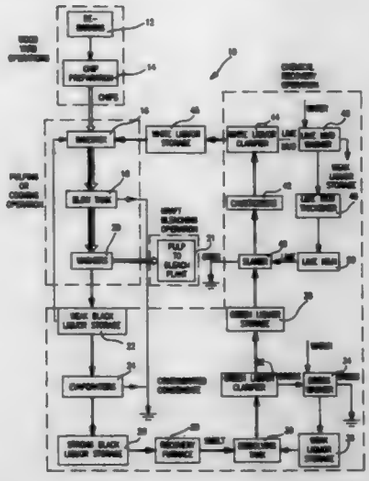
(e) continuously repeating steps (e) to (g) to produce commercially useful quantities of the high thermal neutron cross-section gadolinium isotopes.

5,470,480

PROCESS FOR TREATING WASTE WATER EFFLUENT

John M. Gray, Roswell, and David C. Lovetro, Marietta, both of Ga., assignors to EKA Nobel, Inc., Marietta, Ga.

Continuation-in-part of Ser. No. 239,568, May 9, 1994, abandoned. This application Jun. 17, 1994, Ser. No. 261,707
Int. Cl.[6] C02F *1/48*
U.S. Cl. 210—632 **22 Claims**



1. A method for decreasing the contaminant burden in pulp and paper mill effluent comprising the steps of:

(a) providing a waste water effluent containing a first level of organic contaminants;

(b) determining the amount of organic contaminants in said effluent by measuring at least one of chemical oxygen demand, total organic carbon, color, absorbable organic halogens, or biological oxygen demand;

(c) adding hydrogen peroxide to the effluent in an amount sufficient to reduce the amount of organic contaminants to a second level lower than said first level;

(d) adding peroxidase enzyme to the effluent in a catalytically effective amount for increasing the activity of said hydrogen peroxide;

(e) irradiating the effluent from step (d) with at least about 780 watt minutes of ultraviolet radiation to promote the formation of hydroxyl radicals from the added hydrogen peroxide;

(f) oxidizing a sufficient portion of the organic contaminants with the hydroxyl radicals formed in steps (d) and (e) to reduce the level of said contaminants to said second level.

5,470,481

METHOD AND APPARATUS FOR RECOVERING WASH WATER FROM PULP AND PAPER MILL EFFLUENT

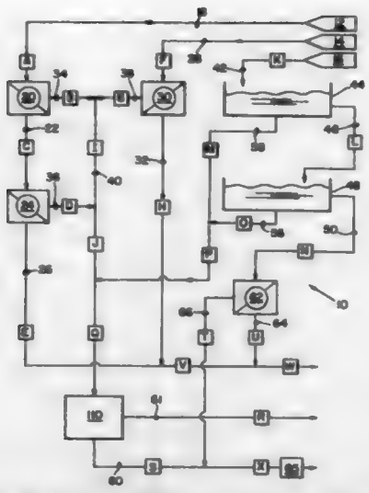
Michael Modell, Cambridge, Mass.; Edward G. Hauptmann, West Vancouver, and Stuart A. Gairns, Burnaby, both of, Canada, assignors to Modell Environmental Corporation, Waltham, Mass.

Filed Oct. 13, 1993, Ser. No. 135,913
Int. Cl.[6] B01D *61/00*
U.S. Cl. 210—652 **20 Claims**

1. A method for recovering wash water from effluent generated by a pulp and paper mill, comprising the steps of:

a) filtering at least a portion of the effluent to form a filtrate stream and an organic solids feed stream;

b) exposing the organic solids feed stream to a temperature and a pressure which are supercritical for water to cause a substantial portion of an organic solids component of said feed stream to oxidize and to form a product stream that, when cooled, includes a gaseous component, an inorganic solids component, and a liquid wash water component; and



c) separating the wash water component from the gaseous and inorganic solids components, thereby recovering the wash water.

5,470,482

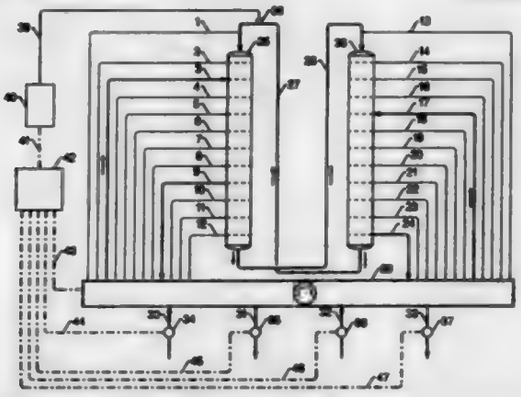
CONTROL PROCESS FOR SIMULATED MOVING BED PARA-XYLENE SEPARATION

Randall E. Holt, Elgin, Ill., assignor to UOP, Des Plaines, Ill.

Filed Dec. 27, 1993, Ser. No. 174,652

Int. Cl.[6] B01D *15/02*

U.S. Cl. 210—662 **8 Claims**



1. A process of continuously controlling the value of a characteristic in the separation of para-xylene from a stream whose composition contains at least the components consisting of para-xylene, ortho-xylene, meta-xylene, and ethylbenzene, and recovering a para-xylene product stream, said characteristic selected from the group consisting of the purity of the para-xylene product stream, the recovery of the para-xylene in the product stream, and the combination thereof; the separation using a simulated moving bed, having multiple input and output streams each with individual flow rates, a step time, multiple valve positions, and the components in a pumparound or pusharound stream, where the initial value of and characteristic is V_I, and the final value of the characteristic is to be within $\pm\delta$ of a target value V_T, said process comprising:

a. determining by on-line or in-line sampling the current concentrations of at least para-xylene, ortho-xylene, meta-xylene, and ethylbenzene, in said pumparound or pusharound stream at a minimum of three valve positions within one valve cycle;

b. determining, from the aggregate of the current concentrations within one valve cycle, a current value of the characteristic;

c. adjusting the step time and flow rates according to an algorithm, said algorithm relating a change in the current value of the characteristic to changes in the step time and the flow rates to afford a new concentration of at least one of the components and an associated new value of the characteristic, V_N, where $|V_T-V_N| \leq |V_T-V_I|$; and

d. repeating steps (a)through (c) until $|V_T-V_N| \leq \delta$.

5,470,483

DEVICE AND METHOD FOR CONTROLLING THE BALANCE OF FLUIDS IN AN EXTRACORPOREAL BLOOD CIRCUIT

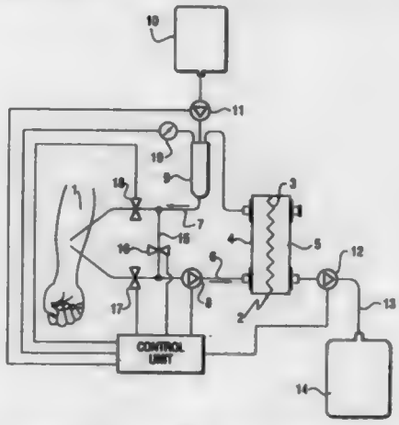
Bernard Bene, Irigny, and Nicolas Goux, Craponne, both of, France, assignors to Hospal Industrie, France

Filed Mar. 21, 1994, Ser. No. 215,701

Claims priority, application France, Mar. 22, 1993, 93 03468

Int. Cl.[6] B01D *61/00;61/18;61/22;61/32*

U.S. Cl. 210—741 **12 Claims**



10. A method for controlling liquid injection and withdrawal from an extracorporeal blood circuit connected to a vascular system of a patient so that equal quantities of liquid are injected and withdrawn from the circuit, the method comprising the steps of:

isolating a recirculation loop from the patient, the loop including a blood inlet line, a blood treatment device, a blood outlet line, and a bypass line connecting the blood inlet line to the blood outlet line;

circulating blood through the loop;

monitoring the pressure in the loop over a period of time; and

modifying one of an injection rate of liquid into the loop and a withdrawal rate of liquid from the loop in order to obtain a substantially constant pressure when a nonconstant pressure is detected over a period of time during the step of monitoring.

5,470,484

METHOD AND APPARATUS FOR CONTROLLING THE FEED OF WATER TREATMENT CHEMICALS USING A VOLTAMMETRIC SENSOR

Thomas E. McNeel, Memphis, Tenn., assignor to Buckman Laboratories International, Inc., Memphis, Tenn.

Filed Jan. 13, 1994, Ser. No. 181,254

Int. Cl.[6] B01D *21/30*

U.S. Cl. 210—746 **20 Claims**

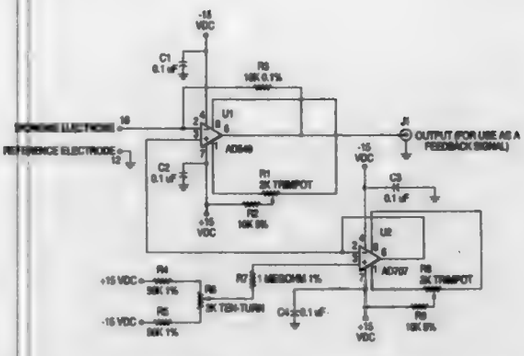
1. A method for controlling the chemical treatment of a solution comprising the steps of:

(a) feeding a treatment chemical into the solution to obtain a mixture of the treatment chemical and the solution;

(b) applying an external voltage across a reference electrode and a working electrode of a voltammetric sensor while the electrodes are immersed in and contact the mixture;

(c) measuring a current that flows through the working electrode;

(d) converting the measured current into a feedback signal which is indicative of a concentration of a substance in the mixture; and



(e) using the feedback signal to control a rate of feeding the treatment chemical in step (a).

5,470,485

ELECTROSTATICALLY-EFFECTIVE AIR FILTER MATERIAL

Karl-Heinz Morweiser, Birkenau; Klaus Veeser, Weinheim, and Harald Stini, Birkenau, all of, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Mar. 1, 1995, Ser. No. 397,510

Claims priority, application Germany, Mar. 5, 1994, 44 07 344.5

Int. Cl.[6] B01D *17/06;24/00*

U.S. Cl. 210—748 **16 Claims**

1. An electrostatically effective air filter material, consisting of a blend of:

type (I) polyolefin fibers that are two-component polypropylene/polyethylene fibers of the core/jacket or side-by-side type; and

type (II) halogen-free polyacrylonitrile fibers,

wherein the filter material is geometrically stable and wherein the fibers are free of lubricants and antistatic agents.

5,470,486

CONVERSION OF WATER-SOLUBLE INORGANIC SULFIDE COMPOUNDS IN AN AQUEOUS STREAM

Ralph D. Gillespie, Elgin, Ill., assignor to UOP, Des Plaines, Ill.

Filed Jun. 20, 1994, Ser. No. 262,708

Int. Cl.[6] C02F *1/76*

U.S. Cl. 210—758 **7 Claims**

1. A method for treating an aqueous stream having a pH greater than about 12 and comprising a water-soluble, inorganic sulfide compound which method comprises the steps of:

(a) contacting said aqueous stream and oxygen in a thermal, non-catalytic conversion zone to convert said inorganic sulfide compound to sulfate and thiosulfate;

(b) contacting the aqueous effluent from said thermal conversion zone and oxygen at a pH greater than about 12 and an oxygen to sulfur molar ratio greater than about 4 with a metallic phthalocyanine oxidizing catalyst supported on activated carbon to provide a high conversion of said thiosulfate in an amount greater than about 90 weight percent to sulfate; and

(c) recovering a substantially sulfide-free aqueous stream.

5,470,487

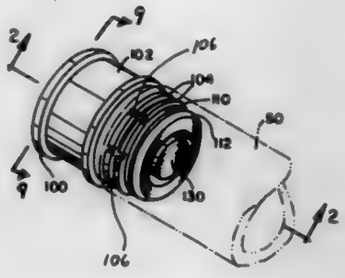
METHODS AND APPARATUS FOR FORMING AN INTEGRAL HIGH PRESSURE SEAL USING MECHANICAL ACUTATION

Louis T. Staats, III, Lincoln University, Pa.; James A. Bristow, Elkton, Md.; Anil P. F. Noronha, West Chester, Pa., and Gregory E. Murphy, Erial, N.J., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 999,413, Dec. 17, 1992, abandoned, which is a division of Ser. No. 825,450, Jan. 22, 1992, Pat. No. 5,193,703, which is a continuation of Ser. No. 487,655, Mar. 2, 1990, abandoned. This application May 4, 1994, Ser. No. 238,187

Int. Cl.[6] B01D *35/02*

U.S. Cl. 210—767 **12 Claims**



12. A method of filtering particulate from a fluid stream comprising:

(a) providing a sample vessel comprising means for engaging a seal and to be transferred to an extraction instrument;

(b) forming a nominal seal between said sample vessel and a cap applied to a first end of the sample vessel;

(c) applying a compressive force to said nominal seal by urging a force-applying member against the vessel wherein the vessel resists the force-applying member;

(d) directing said fluid stream into said sample vessel; and

(e) forming a nominal seal at another end of said vessel using a cap comprising a filter element.

5,470,488

METHOD FOR PROCESSING SEPARATE CONTAINERS OF BIOLOGICAL FLUID

Vlado I. Matkovich, Glen Cove; Thomas J. Bormann, Melville; Thomas C. Gsell, and Frank R. Pascale, both of Glen Cove, all of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Continuation of Ser. No. 107,033, Aug. 17, 1993, Pat. No. 5,364,526, which is a continuation of Ser. No. 795,480, Nov. 21, 1991, abandoned. This application Jul. 14, 1994, Ser. No. 274,782

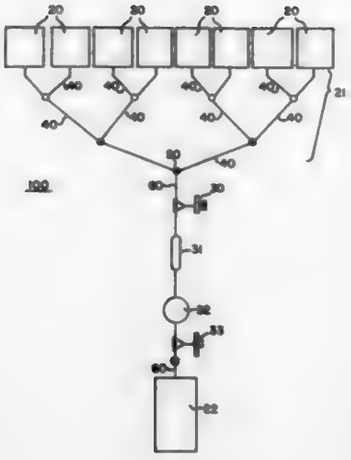
Int. Cl.[6] B01D *37/00*

U.S. Cl. 210—767 **17 Claims**

11. A method for processing biological fluid comprising:

introducing gas through a downstream gas inlet and through a pooling assembly into a plurality of upstream source containers of biological fluid while preventing the flow of gas from the gas inlet into a receiving container, wherein the gas inlet is interposed between the plurality of upstream source containers and the receiving container, and wherein the pooling assembly is interposed between the gas inlet and the plurality of upstream source containers; and

passing biological fluid from the plurality of upstream source containers through the pooling assembly and a leucocyte depletion assembly to the receiving container.



5,470,489

METHOD AND INLET DEVICE FOR CHARGING SHALLOW GRIT CHAMBERS OR SETTLING TANKS

Anton Felder, Schlotthauerstrasse 5, D-8000 Munich, and Franz Valentin, Arcisstrasse 21, D-8000 Munich 2, both of, Germany

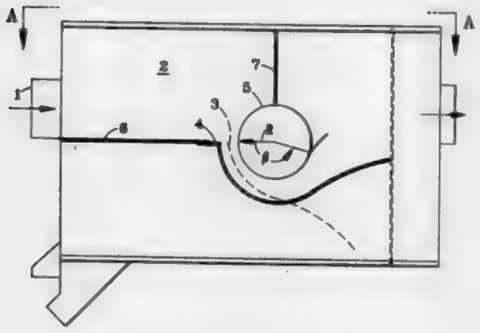
PCT No. PCT/EP93/00349, § 371 Date Nov. 17, 1993, § 102(e) Date Nov. 17, 1993, PCT Pub. No. WO93/20918, PCT Pub. Date Oct. 28, 1993

PCT Filed Feb. 12, 1993, Ser. No. 142,318

Claims priority, application Germany, Apr. 15, 1992, 42 12 631.2

Int. Cl.[6] B01D *21/26;21/24;21/02*

U.S. Cl. 210—788 20 Claims



1. A method of charging shallow grit chambers with waste water from a feed utilizing the Coanda effect, comprising the steps of:

introducing said waste water into an inlet chamber in a flow direction directed substantially horizontally and orthogonal to direction of gravitational forces, said gravitational forces being vertical and downwardly directed;

pressuring said waste water from said inlet chamber through an outlet gap downwardly directed;

contacting said waste water flowing from said outlet gap with a curved deflection surface thereby deflecting, using the Coanda effect, said waste water from said downwardly directed flow direction to, at least a substantially horizontally directed flow direction away from said inlet chamber for each said grit chamber, said waste water having mineral constituents being separated thereby from said waste water when in use with said grit chamber.

5,470,490

ADJUSTABLE VEHICLE-CARRYING FRAME

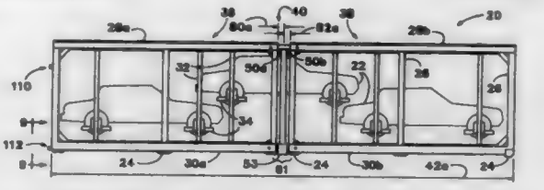
Peter Gearin, Portland, and Everett A. Leech, Oregon City, both of Oreg., assignors to G & G Intellectual Properties, Inc., Portland, Oreg.

Continuation of Ser. No. 871,288, Apr. 20, 1992, Pat. No. 5,417,332, which is a continuation-in-part of Ser. No. 720,893, Jun. 25, 1991, Pat. No. 5,105,951, which is a continuation of Ser. No. 500,476, Mar. 28, 1990, Pat. No. 5,040,938, which is a continuation of Ser. No. 261,504, Oct. 24, 1988, Pat. No. 4,963,067, which is a continuation-in-part of Ser. No. 943,688, Dec. 18, 1986, Pat. No. 4,797,049. This application May 3, 1995, Ser. No. 433,629

The portion of the term of this patent subsequent to May 3, 2015, has been disclaimed.

Int. Cl.[6] A47F *7/00*

U.S. Cl. 211—13 38 Claims



1. A system for loading and transporting wheeled vehicles comprising:

(a) an elongate rectangular enclosure comprising a closed top, bottom, and surrounding wall having longitudinally-oriented parallel sides and an openable end;

(b) an elongate three-dimensional frame having transversely-spaced longitudinally-oriented upright sides and having first respective front and rear vehicle wheel support members capable of supporting at least a first vehicle upon said frame in an elevated condition and second respective front and rear vehicle wheel support members capable of supporting a second vehicle upon said frame at a level below said first vehicle, said frame being matingly insertable longitudinally into said enclosure through said openable end while said first and second vehicles are supported upon said frame by said wheel support members; and

(c) at least said first respective front and rear vehicle wheel support members being adjustable vertically with respect to each other so as to position the respective front and rear wheels of said first vehicle at variable elevations relative to each other.

5,470,491

PROCESS FOR PRODUCING A THIN-FILM MAGNETIC HEAD HAVING AN INSULATION FORMED OF A LADDER-TYPE SILICONE RESIN

Satoshi Kodama, and Hiroshi Adachi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

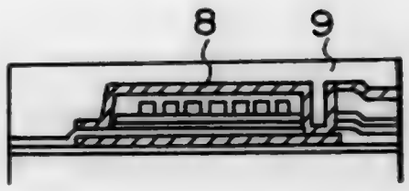
Continuation of Ser. No. 298,109, Aug. 15, 1994, abandoned, which is a division of Ser. No. 53,196, Apr. 28, 1993, abandoned. This application Mar. 8, 1995, Ser. No. 400,478

Claims priority, application Japan, Jul. 3, 1992, 4-176893; Jul. 9, 1992, 4-182316

Int. Cl.[6] B44C *1/22*

U.S. Cl. 216—22 12 Claims

1. A process for producing a thin-film magnetic head, said head comprising a substrate, a lower thin-film magnetic core formed on said substrate, a thin-film gap formed on said lower magnetic core, an insulation layer formed on said gap that electrically insulates said coil and said magnetic cores, said insulation layer being formed of an organic silicon resin with a ladder structure that is chiefly composed of silicon, oxygen and carbon, a thin-film conductor coil formed on said insulation layer, and an upper thin-film magnetic core formed on said coil, said process comprising the step of forming on said thin-film gap a protective sacrificial layer having a different etching property than said thin-film gap, thereby



preventing the etching of said thin-film gap so as to facilitate the control of its thickness.

5,470,492

DRYER-ACTIVATED FABRIC CONDITIONING ARTICLES WITH SOFT POLYESTER SUBSTRATE

Stephen L. Childs, Cincinnati; Alvin M. Robertson, West Chester; Alessandro Corona, III, Maineville, and Karl J. Russ, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 120,145, Sep. 10, 1993, abandoned. This application Jan. 4, 1995, Ser. No. 368,694

Int. Cl.[6] D06M *23/02;* **B05D** *1/26*

U.S. Cl. 252—8.6 **14 Claims**

1. A dryer-activated fabric conditioning article comprising:

(A) at least about 5% of fabric conditioning composition comprising fabric conditioning active; and

(B) a polyester non-woven fabric substrate prepared from a polyester fiber having a denier of from about 2 to about 6, said substrate having a basis weight of from about 0.52 oz/yd^2 to about 0.58 oz/yd^2, a thickness of from about 0.16 mm to about 0.22 mm, and jet side and belt side fuzz grades of from about 1.8 to about 2.9 to provide a polyester substrate having improved feel characteristics as compared to conventional substrates of this type, after said article is used in said automatic clothes dryer and after said fabric conditioning composition has been substantially completely removed from said substrate.

5,470,493

PROCESS FOR SOFTENING FABRICS BY CONTACTING THEM WITH A THIODIGLYCOL DERIVATIVE

Peter Daute, Essen; Ingo Wegener, Duesseldorf; Alfred Meffert, Monheim, and Faize Berger, Duesseldorf, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldort, Germany

PCT No. PCT/EP93/00323, § 371 Date Oct. 18, 1994, § 102(e) Date Oct. 18, 1994, PCT Pub. No. WO93/16989, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 10, 1993, Ser. No. 290,880

Claims priority, application Germany, Feb. 19, 1992, 42 04 885.0

Int. Cl.[6] C07C *317/18;* **C11D** *3/00*

U.S. Cl. 252—8.7 **8 Claims**

1. The process of softening fabrics comprising contacting said fabrics with a fabric softening composition comprising a thiodiglycol derivative corresponding to formula I

$$R^1—O—(C_2H_4O)_x—(C_2H_4—SO_z—C_2H_4—O)_w—(C_2H_4—O)_y—R^2 \quad (I)$$

wherein R^1 and R^2 are the same or different and represent linear or branched alkyl or alkenyl groups containing 6 to 30 carbon atoms or hydrogen, x+y equals 0 to 20, w is 1 to 5, and z is 1 or 2.

5,470,494

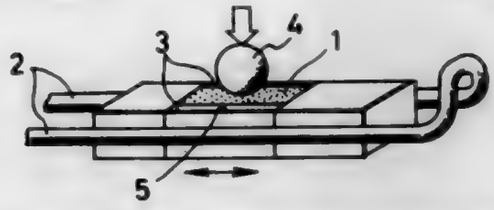
OXIDE TYPE SOLID LUBRICANT

Kazunori Umeda, Tsukuba, Japan, assignor to Agency of Industrial Science & Technology, and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Sep. 7, 1994, Ser. No. 301,564

Int. Cl.[6] C10M *103/06*

U.S. Cl. 252—12 **4 Claims**



1. A solid oxide lubricant formed of a powder of heated composite ceramic material resulting from heating a mixture of $BaZrO_3$ powder and Cr_2O_3 powder, with a Cr_2O_3 content, prior to said heating, in the range of about 10% to about 50% by weight.

3. An oxide type solid lubricant formed of a powder of heated composite ceramic material resulting from heating a mixture of $CaZrO_3$ and Cr_2O_3 powders having a Cr_2O_3 content in the range of 10 to 50% by weight.

5,470,495

COLLOIDAL PRODUCTS CONTAINING CALCIUM AND/OR MAGNESIUM, AS WELL AS BORON AND/OR PHOSPHORUS AND/OR SULFUR, THEIR PREPARATION AND THEIR UTILIZATION AS ADDITIVES FOR LUBRICANTS

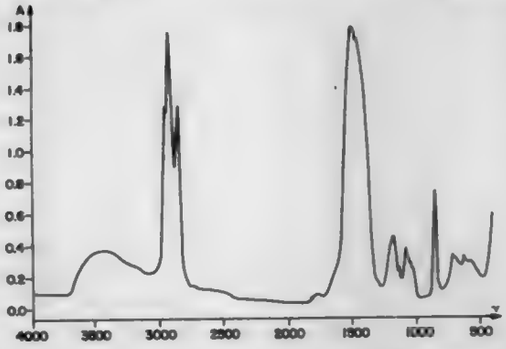
Bruno Delfort, Paris; Bertrand Daoudal, Pontigny; Jacques Lallement, Aubervilliers; Maurice Born, Nanterre; Jean-Claude Hipeaux, Colombes; Pierre Marchand, Orgeval; Francoise Dixmier, Sceaux, and Monique Prigent, Saint Germain En Laye, all of, France, assignors to Institut Francais Du Petrole, Rueil Malmaison, France

Filed Nov. 18, 1993, Ser. No. 155,509

Claims priority, application France, Nov. 18, 1992, 92 13934

Int. Cl.[6] C10M *135/10;159/12*

U.S. Cl. 252—18 **28 Claims**



1. A modified colloidal product obtained by a method comprising:

step (a) providing an original colloidal product having a basicity reserve and containing at least one alkaline-earth metal carbonate in micelle form, said original colloidal product having been reacted with at least one compound selected from the group consisting of alkylsulphonic and alkylarylsulphonic acids, salts thereof and long chain aliphatic carboxylic acids and salts thereof in such a way as to modify a proportion of the basicity reserve of the original colloidal product of not more than 70% and

step (b) completely neutralizing the residual basicity reserve of said colloidal product from step (a) with at least one acid containing at least one element selected from the group con-

sisting of boron, phosphorus and sulphur so as to obtain a new micelle devoid of carbonate without affecting the colloidal stability of the resultant product.

5,470,496

WORKING FLUID CONTAINING CHLOROTETRAFLUOROETHANE

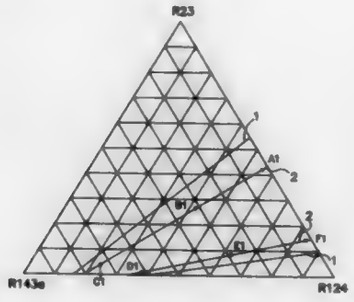
Yuji Yoshida, Itami; Masami Funakura, Hirakata; Kazuo Nakatani, Kadoma, and Minoru Tagashira, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 909,673, Jul. 7, 1992, abandoned. This application May 23, 1994, Ser. No. 247,400

Claims priority, application Japan, Jul. 12, 1991, 3-172370; Jan. 28, 1991, 3-281042

Int. Cl.[6] C09K *5/04*

U.S. Cl. 252—67 **8 Claims**



1. A working fluid consisting of 17 to 90% by weight of chlorotetrafluoroethane, 1 to 85% by weight of 1,1,1-trifluoroethane, and one fluorinated hydrocarbon having a boiling point not higher than −40° C. under atmospheric pressure, selected from the group consisting of 1 to 55% by weight of trifluoromethane, 1 to 65% by weight of difluoromethane and 1 to 85% by weight of pentafluoroethane, which working fluid has a composition in a range between phase equilibrium lines in a triangular coordinate which are obtained when 0° C. is specified as a temperature and the same vapor pressure as that of chlorodifluoromethane at 0° C. is specified as a vapor pressure or a range between phase equilibrium lines in a triangular coordinate which are obtained when 50° C. is specified as a temperature and the same vapor pressure as that of chlorodifluoromethane at 50° C. is specified as a vapor pressure.

5,470,497

REFRIGERATION WORKING FLUID COMPOSITIONS CONTAINING TRIFLUOROETHANE AND NEOPENTYL GLYCOL OR TRIMETHYLOLPROPANE ESTERS OF C_7 AND C_9 ACIDS

Richard H. Schlosberg; Carolyn B. Duncan, and Martin A. Krevalis, Jr., all of Baton Rouge, La., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Continuation of Ser. No. 992,412, Dec. 17, 1992, abandoned. This application Dec. 28, 1994, Ser. No. 365,187

Int. Cl.[6] C09K *5/04;* **C10M** *105/38*

U.S. Cl. 252—68 **4 Claims**

1. A refrigeration working fluid comprising about 5–55 parts by weight of a synthetic ester lubricant and 95–45 parts by weight of 1,1,1-trifluoroethane refrigerant, the ester being either (a) neopentylglycol esterified with 3,5,5-trimethylhexanoic acid or (b) trimethylol propane esterified with a mixture of about 12.8 wt. % methylhexanoic acid, 22.2 wt. % n-heptanoic acid and 65% 3,5,5-trimethylhexanoic acid, the working fluid having miscibility value of −20° C. or less.

5,470,498

POLYMERIC SALTS AS DISPERSED PARTICLES IN ELECTRORHEOLOGICAL FLUIDS

Joseph W. Plalet, Euclid; Kasturi Lal, Willoughby, and Charles P. Bryant, Euclid, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 878,797, May 5, 1992, Pat. No. 5,336,423. This application May 3, 1994, Ser. No. 237,515

Int. Cl.[6] C10M *169/04;171/00*

U.S. Cl. 252—76 **29 Claims**

1. An electrorheological fluid comprising (a) a hydrophobic liquid phase which comprises a liquid which is stable up to 120° C., said liquid being an oil selected from the group consisting of silicone oils, vegetable oils, and synthetic esters; and (b) particles of a polymer dispersed therein, said polymer comprising an alkenyl substituted aromatic comonomer, a maleic acid comonomer or derivative thereof, and 0 to about 20 mole percent of at least one third comonomer, wherein the polymer contains acid functionality which is at least partly in the form of a salt.

5,470,499

THICKENED AQUEOUS ABRASIVE CLEANSER WITH IMPROVED RINSABILITY

Clement K. Choy, Alamo; Brian P. Argo, Tracy; Kevin J. Brodbeck, Pleasanton, and Lynn M. Hearn, Livermore, all of Calif., assignors to The Clorox Company, Oakland, Calif.

Filed Sep. 23, 1993, Ser. No. 125,949

Int. Cl.[6] C11D *7/22*

U.S. Cl. 252—99 **16 Claims**

1. A thickened liquid abrasive cleanser with enhanced phase and viscosity stability comprising, in aqueous solution:

(a) a cross-linked polyacrylate having a molecular weight of 80,000–7,000,000 g/mole and a pH of a 2% solution at 21° C. of between 1.8 and 5;

(b) at least one nonionic surfactant;

(c) a pH adjusting agent for maintaining the pH at least above a pKa of the nonionic surfactant;

(d) a calcium carbonate abrasive; and

wherein the resulting composition is shear-thinning and has an ionic strength of less than about 5M.

5,470,500

COMPOSITION FOR CLEANING AND WATERPROOFING A SUBSTRATE AND INHIBITING THE BUILD-UP OF STATIC ELECTRICITY ON SAID SUBSTRATE

David A. Lupyan, Chagrin Falls, and Bryan I. Sokol, Westlake, both of Ohio, assignors to Blue Coral, Inc., Cleveland, Ohio

Filed Jan. 10, 1994, Ser. No. 179,435

Int. Cl.[6] C11D *3/26;1/835;* **C09K** *3/16*

U.S. Cl. 252—174.15 **9 Claims**

1. A composition for cleaning and waterproofing a substrate and inhibiting the build up of static electricity on said substrate, said composition comprising:

water;

about 0.1% to about 40% by weight of at least one nonionic surfactant represented by the formula

$$R^1O—(R^2O)_n—H \quad (I)$$

wherein in Formula I, R^1 is a hydrocarbon group of 8 to about 100 carbon atoms, R^2 is an alkylene group of 1 to about 4 carbon atoms, and n is a number in the range of 4 to about 40;

about 0.01% to about 30% by weight of at least one amphoteric surfactant;

about 0.01% to about 10% by weight of at least one organofunctional silane represented by the formula

$$R^1_{4-n}SiX_n \quad (III)$$

wherein in Formula III, R^1 is a functionally-substituted hydrocarbon group, the functional substituent of said functionally-substituted hydrocarbon group being amino, hydroxy, halo, mercapto, alkoxy, acyl, or epoxy; X is a hydrolyzable group; and n is 1, 2 or 3; and

about 1% to about 15% by weight of at least one alkoxylated alcohol represented by the formula

$$HO—R^1—OR^2 \quad (V)$$

wherein in Formula V, R^1 is an alkylene group of 1 to about 8 carbon atoms, and R^2 is a hydrocarbon group of 1 to about 6 carbon atoms.

5,470,501

PROCESSABILITY OF HYDROCARBON BLOWN, POLYISOCYANATE BASED FOAMS THROUGH USE OF A COMPATIBILIZING AGENT

Thomas L. Fishback, Gibraltar, and Thomas B. Lee, Southgate, both of Mich., assignors to BASF Corporation, Mt. Olive, N.J.

Filed May 8, 1995, Ser. No. 436,691

Int. Cl.[6] C08K *3/00;18/06*

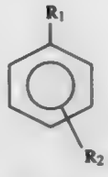
U.S. Cl. 252—182.28 **12 Claims**

1. A polyol solution comprising:

a) a polyol having polyester linkages;

b) a blowing agent comprising an aliphatic or cycloaliphatic C_4–C_7 hydrocarbon;

c) a reacted or unreacted compatibilizer represented by the following formula:



wherein R^1 is OH, NH_2, COOH, or oxyalkylated addition products thereof; and

R^2 is a C_6–C_{24} aliphatic, branched or unbranched, hydrocarbon group.

5,470,502

FLUORESCENT PIGMENTS

Erwin Hahn, Heidelberg; Werner Ostertag, Gruenstadt, and Guenther Seybold, Neuhofen, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 999,733, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 845,799, Mar. 9, 1992, abandoned, which is a continuation of Ser. No. 595,853, Oct. 11, 1990, abandoned. This application Feb. 8, 1994, Ser. No. 193,874

Claims priority, application Germany, Jan. 11, 1989, 39 33 933.3

Int. Cl.[6] C09K *11/02*

U.S. Cl. 252—301.35 **3 Claims**

1. A fluorescent pigment having a mean particle size of from 8 to 16 μm, said fluorescent pigment comprising

an apolar polymer matrix selected from the group consisting of polymethylmethacrylate, polystyrene, polybutadiene-modified polystyrene, polycarbonate, polyvinylchloride and polyamide, and one or more apolar fluorescent perylene dyes of the formula I

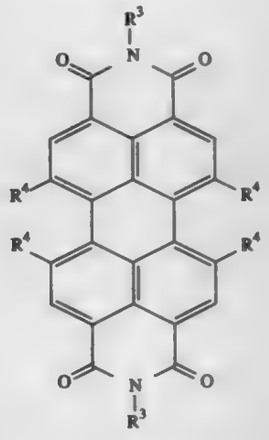
(I)

where

R^1 is hydrogen or cyano and

R^2 is C_1–C_{11}-alkyl

or of the formula II



(II)

where

R^3 is a C_5–C_{20} alkyl or is phenyl which is monosubstituted or polysubstituted by C_1–C_{13}-alkyl or C_1–C_{13}-alkoxy, and

R^4 is hydrogen, chlorine, phenoxy or halogen-, C_1–C_4-alkyl- or C_1–C_4-alkoxy-substituted phenoxy

said fluorescent dyes being present in said pigment in an amount of from 1 to 38% by weight, based on said polymer matrix.

5,470,503

GRANULAR RARE EARTH PHOSPHATES HAVING CHARACTERISTIC MORPHOLOGY

Jean-Jacques Braconnier, Lagord, France, assignor to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Jul. 29, 1993, Ser. No. 98,818

Claims priority, application France, Jul. 29, 1992, 92 09356

Int. Cl.[6] C09K *11/83;* **C01B** *25/37;25/45*

U.S. Cl. 252—301.4 P **29 Claims**

1. Monodisperse particulates of a rare earth phosphate having the formula $LnPO_4$ in which Ln is at least one rare earth, the average particle size of which is within a range from 1 to 10 microns and having a dispersion index of less than 0.5.

5,470,504

SILOXANE POLYMER COMPOSITIONS

Arthur J. Klehn, and Mark H. Eskridge, both of Seattle, Wash., assignors to Bardahl Manufacturing Corporation, Seattle, Wash.

Filed Jan. 21, 1994, Ser. No. 181,750
Int. Cl.[6] C10M *127/02;155/02*
U.S. Cl. 252—49.6 **25 Claims**

1. A composition, comprising:
a low viscosity siloxane polymer in an amount ranging from 1% to 40% by volume;
a surface bonding enhancer in an amount ranging from 0.1% to 15% by volume;
a lower alkyl alcohol in an amount ranging from 5% to 80% by volume; and
a citrus extract in an amount ranging from 20% to 50% by volume, wherein the citrus extract comprises d-limonene.

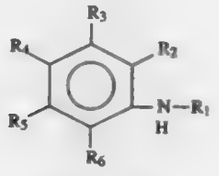
5,470,505

ELECTRICALLY CONDUCTIVE POLYANILINE

Paul Smith; Alan J. Heeger, both of Santa Barbara; Yong Cao, Goleta; Jin-Chih Chiang, Goleta, and Alejandro Andreatta, Goleta, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Division of Ser. No. 264,602, Oct. 31, 1988, Pat. No. 5,196,144. This application Feb. 25, 1993, Ser. No. 23,877
Int. Cl.[6] H01B *1/12;* **H01M** *4/60*
U.S. Cl. 252—500 **23 Claims**

11. A solid polyblend composition comprising:
i) an acid-soluble crystalline polyaniline, said polyaniline being comprised of monomer units, said monomer units in any of their oxidation states which allow for the composition to be electrically conductive, said monomer units having the structure:



wherein R_1 is H or alkyl, and R_2–R_6 are, independently, H, alkyl, aralkyl, alkaryl, hydroxy, alkyloxy, halogen or nitro; or a salt of said monomer; and
ii) an amount of a second polymer selected from the group consisting of polymers which are soluble in strong acids.

5,470,506

HEAT-GENERATING COMPOSITION

Yoshinori Tanigami, Nishinomiya; Takahiro Tabata, Takatsuki; Hidekazu Hashima, Ashiya, and Akio Konishi, Kakogawa, all of, Japan, assignors to Yamamura Glass Co., Ltd., Nishinomiya, Japan

Continuation-in-part of Ser. No. 457,402, Dec. 27, 1989, abandoned, and Ser. No. 38,136, Mar. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 740,325, Aug. 5, 1991, abandoned. This application Mar. 23, 1994, Ser. No. 216,615
Claims priority, application Japan, Dec. 31, 1988, 63-33550; Dec. 5, 1989, 1-317205; Aug. 5, 1990, 2-207188
Int. Cl.[6] H01B *1/14;* **C04B** *14/00;* **C03C** *3/064;3/068*
U.S. Cl. 252—518 **14 Claims**

1. A heat-generating composition comprising:
an electrically conductive powder;
and a crystallizable glass frit wherein the weight ratio of said electrically conductive powder to said crystallizable glass frit is from about 30:70 to about 95:5; and

said crystallizable glass frit, which is essentially crystallized during sintering, has the following ingredients:

$M^{II}O$	= about 25 to about 45 weight percent
B_2O_3	= about 20 to about 60 weight percent
$M_2^{III}O_3$	= about 1 to about 5 weight percent
$M_2^{I}O$	= about 0 to about 5 weight percent
SiO_2	= about 2 to about 10 weight percent
Al_2O_3	= about 2 to about 10 weight percent
Bi_2O_3	= about 0 to about 10 weight percent
Nuclear-forming agent	= about 0 to about 20 weight percent

M^{I} is one or more alkali metals selected from the group consisting of Li, Na, K, Rb, and Cs;
M^{II} is one or more alkaline-earth metals selected from the group consisting of Mg, Ca, Sr, and Ba;
M^{III} is one or more elements selected from the group consisting of scandium, yttrium, and lanthanide;
a lanthanide is an element from the periodic table of elements in the range of from lanthanum (La) to lutetium (Lu);
the nuclear-forming agent is one or more agents selected from the group consisting of TiO_2, ZrO_2, P_2O_5, SnO_2, ZnO, MoO_3, Ta_2O_5, Nb_2O_5, and As_2O_3.

5,470,507

DYE TRANSFER INHIBITING COMPOSITIONS COMPRISING POLYMERIC DISPERSING AGENTS

Abdennaceur Fredj, Brussel; James P. Johnston, Overijse, and Christiaan A. J. Thoen, Haasdonk, all of, Belgium, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed Jan. 17, 1995, Ser. No. 373,257
Claims priority, application European Pat. Off., Jul. 15, 1992, 92202168; Nov. 6, 1992, 92870181; Apr. 26, 1993, 93201198; Jun. 9, 1993, 93870109
The portion of the term of this patent subsequent to Oct. 17, 2012, has been disclaimed.
Int. Cl.[6] C11D *3/37;1/00*
U.S. Cl. 252—542 **9 Claims**

1. A dye transfer inhibiting detergent composition comprising
a) poly(4-vinylpyridine-N-oxide) having a ratio of amine to amine N-oxide of from about 2:3 to about 1:10000; and
b) a dispersing effective amount of a polymeric dispersing agent selected from the group consisting of polymeric polycarboxylate, polyethylene glycol, alkoxylated polyamine, polymers of glutamic acid, polyaminoacids, and mixtures thereof.

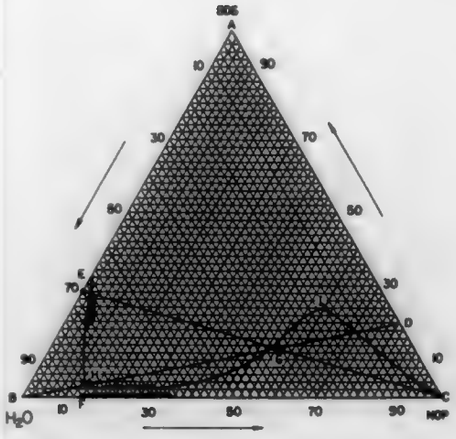
5,470,508

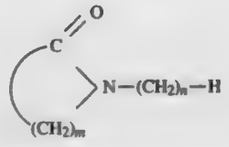
AQUEOUS OIL REMOVAL COMPOSITION CONTAINING HIGHER-ALKYL PYRROLIDONE

Kolazi S. Narayanan, Palisades Park; Ratan K. Chaudhuri, Butler; Robert B. Login, Oakland, and Frank Fusiak, Bayonne, all of N.J., assignors to ISP Investments Inc., Wilmington, Del.

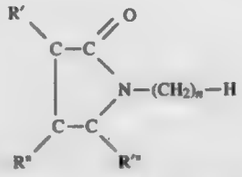
Continuation-in-part of Ser. No. 826,328, Jan. 24, 1992, abandoned. This application Feb. 14, 1994, Ser. No. 195,128
Int. Cl.[6] C11D *1/83;3/28;* **C23G** *5/036*
U.S. Cl. 252—542 **8 Claims**

1. A concentrate of an aqueous homogeneous cleaning composition for removing oil or grease from a hard surface consisting essentially of 20–70% by weight C_6–C_{20} alkyl substituted cyclic lactam, 5–20% anionic surfactant and 15–55% water, the lactam to surfactant ratio being 5–0.1 to 5–3.0, wherein the C_6–C_{20} alkyl substituted lactam is selected from the following:





Where m=3, 4, 5 and n=6–20 or a pyrrolidone of the formula



wherein n=6–20, and R', R", and R'" are H, lower alkyl, alkoxyl, cycloalkyl, or aralkyl.

5,470,509

LOW PH GRANULAR DETERGENT COMPOSITION HAVING IMPROVED BIODEGRADABILITY AND CLEANING PERFORMANCE

Eugene J. Pancheri, Montgomery, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 92,048, Jul. 15, 1993, abandoned. This application Sep. 26, 1994, Ser. No. 313,654

Int. Cl.[6] C11D *3/386*

U.S. Cl. 252—544 **6 Claims**

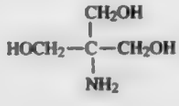
1. A granular detergent composition consisting essentially of:

(a) from about 5% to about 50% by weight of a detergent surfactant selected from the group consisting of anionic, nonionic, zwitterionic, ampholytic, cationic and mixtures thereof;

(b) from about 5% to about 50% by weight of a non-phosphorous detergent builder selected from the group consisting of aluminosilicate ion exchange material, crystalline layered sodium silicate and sodium citrate;

(c) from about 0.1% to about 2.5% of an enzyme component selected from the group consisting of proteases, amylases, lipases, cellulases and mixtures thereof; and

(d) from about 0.25% to about 5% of tris(hydroxymethyl)aminomethane having the formula



wherein said composition has a pH of from about 8.0 to about 9.0 and is substantially free of phosphates, bleaching agents and polyacrylates.

5,470,510

DISPERSING AGENT

Alan D. Willey, Sandyford, and Robin G. Hall, Cardworth, both of, Great Britain, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US92/08050, § 371 Date Mar. 23, 1994, § 102(e) Date Mar. 23, 1994, PCT Pub. No. WO93/06202, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 21, 1992, Ser. No. 211,189

Claims priority, application United Kingdom, Sep. 27, 1991, 9120653

Int. Cl.[6] C11D *3/26;7/32*

U.S. Cl. 252—546 **3 Claims**

I. 1. A cleaning composition comprising (a) from about 0.1 to 15% by weight of a block copolymer comprising biodegradable polyethylene glycol and poly (1-glutamic acid); and (b) a detersive surfactant.

5,470,511

VAPORIZER OVERFILL SAFETY DEVICE

John R. Laybourne, Wantage, and Justin Mott, Didcot, both of, United Kingdom, assignors to Biease Medical Equipment Limited, Chesham, United Kingdom

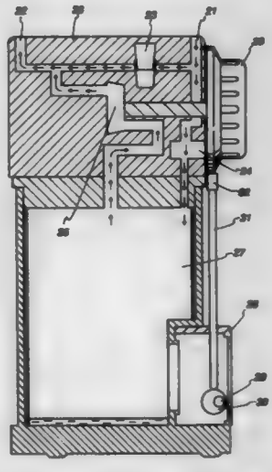
Filed Jun. 14, 1994, Ser. No. 259,610

Claims priority, application United Kingdom, Jun. 14, 1993, 9312250

Int. Cl.[6] B01F *3/04*

U.S. Cl. 261—55 **12 Claims**

II.



1. A vaporizer comprising gas inlet and outlet ports, gas inlet and outlet control means, one or more liquid reservoir chambers, at least one gas passage, at least one gas vaporization zone, a liquid filler body including filler control means wherein there is communication between the gas inlet control means, gas outlet control means and filler control means such that

i) when one or both of the gas inlet control means and gas outlet control means allows gas to flow into and/or out of the liquid reservoir chamber the filler control means will not allow liquid to pass either to or from the liquid reservoir chamber through the filler body, and

ii) when one or both of the gas inlet control means and gas outlet control means allows gas to flow into and/or out of the liquid reservoir chamber the filler means cannot be moved to a position such that liquid could pass either to or from the liquid reservoir chamber through the filler body.

5,470,512

PROCESS FOR PRODUCING MICROCAPSULES

Minoru Noji; Akira Kunugise, both of Takasaki, and Yumiko Imai, Maebashi, all of, Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 820,607, Jan. 21, 1992, abandoned. This application Sep. 13, 1993, Ser. No. 120,654

Claims priority, application Japan, May 24, 1990, 2-132685; Dec. 13, 1990, 2-410135

Int. Cl.[6] B01J *13/10;* A01N *25/28;* A61K *9/50*

U.S. Cl. 264—4.1 8 Claims

1. A process for producing microcapsules which consists essentially of

adding a substance to be encapsulated to a dispersion (hydrosol) of fine colloidal particles in which water is used as dispersion medium, said fine colloidal particles having ζ-potentials on their surfaces,

dispersing said dispersion in an oil medium to form an emulsion, and

adding a coagulating effective amount of an electrolyte to said emulsion so as to sufficiently neutralize said ζ-potentials and thereby cause coagulation of the fine colloidal particles in said emulsion.

5,470,513

CONTROLLING SCREW SPEED TO INJECTION COMPRESSION MOLDING MACHINE

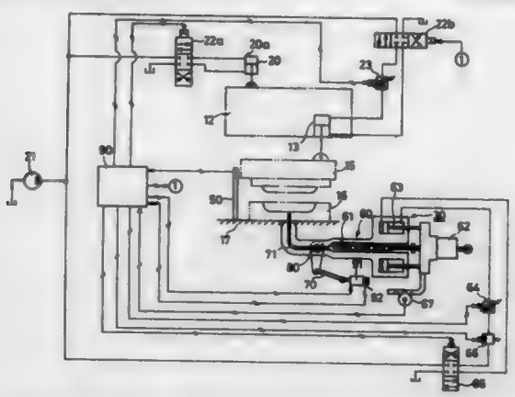
Makoto Nogawa, and Satoshi Fujimoto, both of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP91/00738, § 371 Date Nov. 29, 1993, § 102(e) Date Nov. 29, 1993, PCT Pub. No. WO92/21504, PCT Pub. Date Dec. 10, 1992

PCT Filed May 31, 1991, Ser. No. 142,458

Int. Cl.[6] B29C *45/70;45/77*

U.S. Cl. 264—40.1 12 Claims



1. In a method for molding in an injection compression molding machine, comprising:

positioning first and second molds in a slightly opened condition with a space between said first and second molds,

feeding molten resin into said space between said first mold and said second mold in said slightly opened condition by stroking a screw of an injection unit to inject molten resin through a gate into said space,

compressing the thus fed molten resin between said first and second molds, and

cooling the thus compressed resin; the improvement comprising the combination of the steps of:

detecting when said first mold is moved to a specified open position;

starting injection of molten resin into said space by stroking said screw at an advancing speed to advance said screw when said mold is detected at said specified open position;

detecting when said screw has advanced to a specified position in front of a predetermined stop position;

reducing the advancing speed of said screw to a lower specified value when the advance of said screw is detected at said specified position, in order to thereby reduce the feed rate of molten resin into said space before the injection of a specified amount of molten resin into said space is completed, and to feed molten resin at the thus reduced rate during the time between the screw reaching said specified position and the screw reaching said predetermined stop position;

detecting when said screw has advanced further from said specified position to said predetermined stop position;

starting the stopping of the advance of said screw when the advance of said screw is detected at said predetermined stop position;

starting the closing of said gate when the advance of said screw reaches said predetermined stop position; and

pressurizing said molten resin until the closing of said gate is completed.

5,470,514

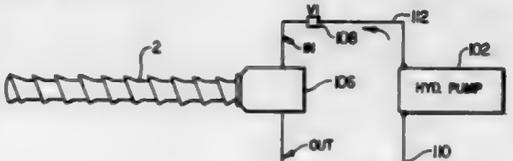
INJECTION MOLDING METHOD FOR A SHOT OF DETERMINED MASS

Robert F. Dray, 5204 Quail Creek Dr., McKinney, Tex. 75070

Continuation-in-part of Ser. No. 805,019, Dec. 11, 1991, Pat. No. 5,258,158, which is a continuation-in-part of Ser. No. 699,277, May 13, 1991, Pat. No. 5,151,282. This application Aug. 31, 1993, Ser. No. 114,685

Int. Cl.[6] B29C *45/52*

U.S. Cl. 264—40.4 9 Claims



1. A method of injection molding using a screw in a barrel comprising:

(a) conveying a predetermined volume of material into an accumulation area downstream of a non-return valve within a barrel by rotating said screw causing the screw to translate rearward;

(b) stopping the rearward travel to of the screw at a first position;

(c) increasing the pressure of said material within the accumulation area by continuing to rotate said screw after the rearward travel has stopped until a predetermined pressure is achieved in said accumulation area; and

(d) substantially purging said accumulation area.

5,470,515

ROTATIONAL MOLDING PROCESS FOR INSULATING PIPES

Wolfgang Grimm, Leverkusen; Norbert Eisen, and Hans-Dieter Ruprecht, both of Köln, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP92/01183, § 371 Date Dec. 3, 1993, § 102(e) Date Dec. 3, 1993, PCT Pub. No. WO92/21910, PCT Pub. Date Dec. 10, 1992

PCT Filed May 26, 1992, Ser. No. 157,063

Claims priority, application Germany, Jun. 5, 1991, 41 18 361.2

Int. Cl.[6] B29C *44/20;44/32*

U.S. Cl. 264—45.7 10 Claims

1. A process for insulating a pipe comprising:

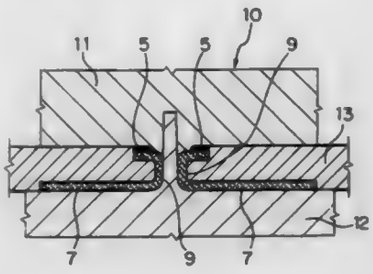
i) applying at least one insulating layer to said pipe by rotational molding, wherein the insulating layer is a rigid polyurethane foam-forming liquid reaction mixture comprising:
a) a mixture of diphenyl methane diisocyanate and polyphenyl polymethylene polyisocyanates,
b) a polyol component bearing on average at least isocyanate-reactive hydrogen atoms and containing
1) a polyether containing at least two hydroxyl groups and having a molecular weight of from 300 to 700,
2) an aliphatic, cycloaliphatic or aromatic polyamine having a molecular weight of from 32 to 1000 as crosslinking agent, and
3) a blowing agent,
ii) allowing said reaction mixture to foam to reach its insulating thickness,
iii) applying at least one solid polyurethane-forming liquid reaction mixture to said insulating layer by rotational molding, said solid polyurethane-forming reaction mixture containing no blowing agent, and comprising:
a) an NCO-terminated prepolymer having an NCO content of from 5 to 20% by weight and being prepared by reacting:
1) 4,4'-diphenyl methane diisocyanate with
2) polyethers containing 2 to 4 OH groups and having molecular weights of from 1000 to 6000,
b) a polyol component containing:
1) a polyether containing 2 to 4 isocyanate-reactive hydrogen atoms and having a molecular weight of from 1000 to 6000, and
2) 5 to 35% by weight of an aromatic diamine having a molecular weight of from 122 to 400.

5,470,516

METHOD OF MOLDING A SEPARABLE BOTTOM STOP ASSEMBLY ON A CONCEALED SLIDE FASTENER

Tsutomu Fudaki, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Feb. 16, 1994, Ser. No. 197,328
Claims priority, application Japan, Feb. 26, 1993, 5-038582
Int. Cl.[6] B29D *5/00*
U.S. Cl. 264—135 **3 Claims**



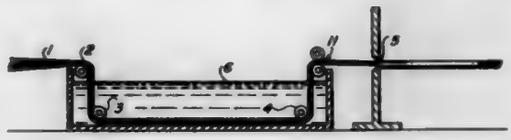
1. A method of molding a separable bottom stop assembly on a concealed slide fastener, comprising the steps of:
(a) removing fastener elements from a selected number of portions of said concealed slide fastener chain to form space portions;
(b) impregnating molten synthetic resin in fastener tapes at areas around said space portions;
(c) turning over confronting tape edge portions of fastener stringers of a concealed slide fastener chain longitudinally to have a U-shaped cross section and heat setting said tape edge portions;
(d) cutting said tapes across said space portions;
(e) injection molding a second pin member of said separable bottom stop assembly on the edge portion of one tape and a box member of said separable bottom stop assembly on the edge portion of the other tape at each of said space portions, contiguously to said fastener elements, said box member including a first pin member and a box.

5,470,517

METHOD OF PULTRUSION

Ed Conley, 7119 E. Shea, #109-224, Scottsdale, Ariz. 85254

Filed Dec. 9, 1994, Ser. No. 353,447
Int. Cl.[6] B29B *15/14*; B29C *43/36*
U.S. Cl. 264—137 **16 Claims**



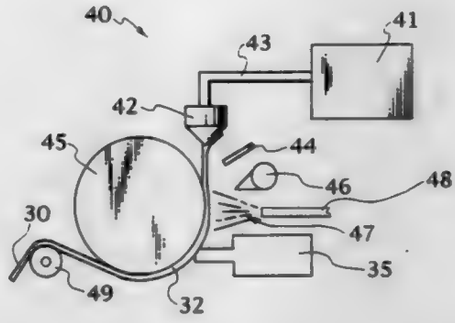
1. A method of molding reinforced synthetic resinous bodies comprising the steps of
(a) supplying a plurality of fibers;
(b) saturating said fibers with a resin;
(c) supplying a flexible mold to receive said saturated fibers;
(d) introducing said saturated fibers into said flexible mold;
(e) manipulating said flexible mold into a desired shape or form;
(f) allowing said resin to cure; and
(g) removing said flexible mold.

5,470,518

PROCESS AND APPARATUS FOR CONTROLLING THE GAP WIDTH OF A RECLOSABLE CLOSURE PROFILE FOR A THERMOPLASTIC CONTAINER

Brian C. Dais, and Jose Porchia, both of Midland, Mich., assignors to DowBrands L.P., Indianapolis, Ind.

Division of Ser. No. 926,985, Aug. 7, 1992, Pat. No. 5,363,540.
This application Feb. 8, 1994, Ser. No. 193,333
Int. Cl.[6] B29C *47/90*
U.S. Cl. 264—145 **23 Claims**



1. An apparatus for maintaining the gap between arm portions of a female profile member at a certain width for a reclosable plastic container and capable of cutting a base portion of the female profile member comprising extrusion means for forming the female profile member, a rigid separator gapping means located downstream from said extrusion means adapted to be placed between the arm portions of the female profile while cooling for maintaining the arm portions separated and apart, said gapping means including a leading edge capable of cutting the base portion of the female profile member anywhere between said arm portions whereby the gap of the female profile is maintained at a consistent width upon cooling.

21. A process for preparing closure elements for plastic webs comprising:
extruding closure elements including a male profile and a female profile having a base portion and arm portions with a gap therebetween;
attaching said profiles in a formable condition to a plastic web;
gapping said female profile in said formable condition; and
cutting the base portion of the female profile.

5,470,519

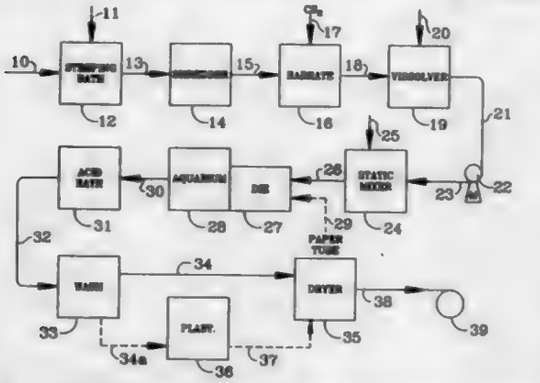
METHOD OF MANUFACTURING A CELLULOSIC ARTICLE CONTAINING AN OLEFINIC OXIDE POLYMER

John Markulin, Oak Lawn, Ill., assignor to Viskase Corporation, Chicago, Ill.

Division of Ser. No. 15,751, Feb. 10, 1993, Pat. No. 5,358,765, which is a continuation-in-part of Ser. No. 846,455, Mar. 4, 1992, abandoned. This application Jul. 26, 1994, Ser. No. 280,744

Int. Cl.[6] **B29K** *1/00;* **B65D** *85/72;* **B29C** *47/00*

U.S. Cl. 264—193 **12 Claims**



1. A method of manufacturing an olefin oxide polymer containing cellulosic article comprising:

(a) adding at least 0.5 percent by weight of an olefinic oxide polymer having a molecular weight of at least 70,000 to viscose;

(b) extruding, coagulating and regenerating the olefin oxide polymer containing viscose of step (a) into an article.

5,470,520

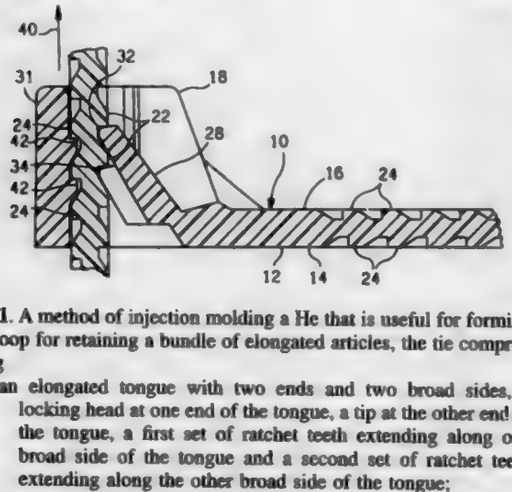
METHOD OF INJECTION MOLDING CABLE TIES

Soren C. Sorensen, 412 Marview Dr., Solana Beach, Calif. 92075, and Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif. 92067

Division of Ser. No. 10,538, Jan. 28, 1993, Pat. No. 5,389,330. This application Aug. 24, 1994, Ser. No. 295,251

Int. Cl.[6] **B65D** *63/00*

U.S. Cl. 264—297.2 **7 Claims**



1. A method of injection molding a He that is useful for forming a loop for retaining a bundle of elongated articles, the tie comprising

an elongated tongue with two ends and two broad sides, a locking head at one end of the tongue, a tip at the other end of the tongue, a first set of ratchet teeth extending along one broad side of the tongue and a second set of ratchet teeth extending along the other broad side of the tongue;

wherein the locking head has sides defining an opening for receiving the tip of the tongue to form said loop, including a movable pawl that is hinged at one side of said opening and with an abutment surface on the opposite side of said opening from the pawl;

wherein the pawl has at least one pawl tooth disposed for engaging the first set of ratchet teeth when the tip of the tongue has been inserted through said opening with the second set of ratchet teeth facing the abutment surface, wherein the pawl, when the at least one pawl tooth is so engaged, is movable toward the abutment surface In response to pressure applied to the tongue in a direction opposite to the direction of said insertion in order to force the second set of ratchet teeth against the abutment surface; and

at least one stationary tooth disposed on the abutment surface and having an apex for engaging the second set of ratchet teeth when the second set of ratchet teeth is forced against the abutment surface to thereby in combination with the at least one pawl tooth hold the tongue in the locking head when pressure is applied to the tongue in the direction opposite to the direction of said insertion,

the method comprising the steps of

(a) providing a mold by combining mold parts to define a mold cavity for forming the tie;

(b) injecting molding material into the mold cavity to form the tie;

(c) solidifying the injected molding material to solidify the tie;

(d) separating the mold parts to open the mold; and

(e) ejecting the solidified tie from the opened mold;

wherein step (a) comprises providing a first mold part defining a portion of the mold cavity that forms the first set of ratchet teeth on the one broad side of the tongue and a second mold part that defines a portion of the mold cavity that forms the second set of ratchet teeth on the other broad side of the tongue, wherein the second mold part includes a core that defines at least a portion of the mold cavity that forms the opening in the locking head, and wherein the first mold part is combined with the core of the second mold part at an interior parting surface that is remote from the portion of the mold cavity that forms the apex of the at least one stationary tooth; and

wherein steps (d) and (e) comprise ejecting the solidified tie from the opened mold without separating the mold parts at the portion of the mold cavity that forms the at least one stationary tooth apex.

5,470,521

METHOD FOR THE THERMAL DENSIFICATION OF THERMOPLASTIC ARTICLES

Richard A. Wenzel, Pittsford; Lewis E. Sable, Rochester; Charles M. Krutchen, Pittsford, and Phillip A. Williams, Naples, all of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 991,725, Dec. 15, 1992, abandoned, which is a continuation of Ser. No. 775,621, Oct. 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 476,087, Feb. 7, 1990, abandoned, and a continuation-in-part of Ser. No. 698,245, May 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 381,929, Jul. 19, 1989, abandoned. This application Mar. 17, 1994, Ser. No. 210,268

Int. Cl.[6] **B29C** *35/02*

U.S. Cl. 264—321 **11 Claims**

1. A process for the thermal densification of post-consumer food contaminated thermoplastic waste for the recycling thereof, consisting essentially of the steps of:

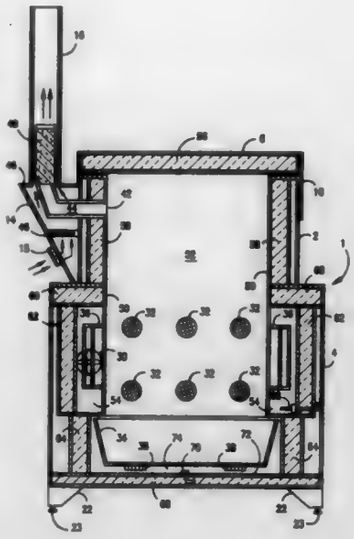
(a) introducing post-consumer food contaminated thermoplastic waste into a chamber;

(b) heating the thermoplastic waste introduced into the chamber in step (a) with a heating system which includes a forced-air heating system adapted to produce a stream of heated air of a temperature effective for thermal densification of the thermoplastic waste;

(c) increasing the bulk density of the thermoplastic waste;

(d) exhausting the chamber;

(e) producing a block of thermoplastic material of increased bulk density;



wherein said stream of heated air renders any food remains present in or on the thermoplastic waste substantially bacterially inert.

5,470,522

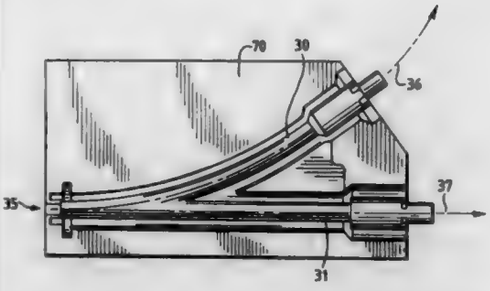
METHOD OF MOLDING Y-ADAPTER WITH A SIDEPORT RADIUS

Scott P. Thome, 535 Aberdeen Dr., Waite Park, Minn. 56387, and Thomas J. Holman, 2622 Idaho Ave. S., St. Louis Park, Minn. 55426

Division of Ser. No. 935,856, Aug. 26, 1992, Pat. No. 5,352,215. This application Jul. 12, 1994, Ser. No. 273,811

Int. Cl.[6] B29C *45/36;45/44*

U.S. Cl. 264—328.1 **3 Claims**



1. A method of molding the main body for a Y-adapter that has a straight passageway extending from one extremity to the other and an arcuate branch passageway that smoothly merges into the straight passageway including the step of:

(a) providing a mold for the main body that includes means for supporting a straight core pin and an arcuate core pin, said straight and arcuate core pins each include corresponding mold shut off surfaces that interface with each other such that a single, smooth passageway is formed in the main body and such that after the main body has been molded the proximal and distal ends of the straight and arcuate core pins are accessible from outside of the molded main body,

(b) placing the straight and arcuate core pins in the mold prior to injecting the material, from which the main body is to be formed, into the mold;

(c) injecting the material from which the main body is to be formed into the mold; and

(d) exerting force on the straight and arcuate cores causing them to slide out of the molded main body.

5,470,523

PROCESS OF MOLDING PRODUCTS BY RIM

Bernhard Jansen, Cologne; Jürgen Grönen, Overath, and Hanns P. Müller, Odenthal-Hoeffe, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 58,969, May 4, 1993, abandoned. This application Sep. 12, 1994, Ser. No. 304,058

Claims priority, application Germany, May 14, 1992, 42 15 875.3

Int. Cl.[6] B29C *45/00*

U.S. Cl. 264—328.6 **5 Claims**

1. In a process for the production of molded plastic parts by a reaction injection molding technique comprising reacting a reaction mixture of

a) a polyisocyanate and

b) a polyfunctional isocyanate-reactive component comprising

i) polyether polyols or aminopolyethers having molecular weights of from 1800 to 12,000,

ii) low molecular weight compounds selected from the group consisting of polyhydric alcohols, polyamines, and mixtures thereof, and

iii) auxiliary substances and additives, in a mold, allowing the mixture to react, and removing the part from the mold, the improvement wherein said reaction mixture contains a substance comprising one or more organic compounds which contain epoxide groups and which are subjected to heat treatment at 30° to 150° C. in the presence of an alkylating agent.

5,470,524

METHOD FOR MANUFACTURING A BLADE RING FOR DRUM-SHAPED ROTORS OF TURBOMACHINERY

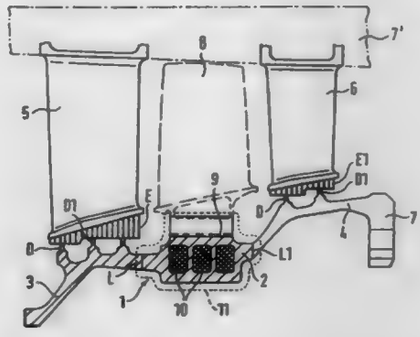
Wolfgang Krueger, Reichertshausen, and William Wei, Munich, both of, Germany, assignors to MTU Motoren- Und Turbinen-Union Muenchen GmbH, Munich, Germany

Filed Jun. 14, 1994, Ser. No. 260,383

Claims priority, application Germany, Jun. 15, 1993, 43 19 727.2

Int. Cl.[6] B22F *7/04*

U.S. Cl. 419—5 **15 Claims**



1. A method for manufacturing a blade ring on a rotor, having a rotor axis, of a turbo-engine, the method comprising the steps of:

firmly bonding fiber rings into a metallic material of the blade ring for absorbing stresses caused by the rotational speed and the centrifugal force of the turbo-engine, said fiber rings being arranged coaxially with respect to the rotor axis, the fiber rings being present as finished products, in which case fibers of said fiber rings are firmly bonded into a metal matrix to form said fiber rings;

manufacturing the blade ring of a metal powder as said metallic material using hot isostatic pressing (HIP);

diffusion bonding a metallic material partner of the metal matrix and of the metal powder for the blade ring during said hot isostatic pressing;

using a ring capsule, coordinated with a basic shape of the blade ring, for performing the HIP-process;

arranging the fiber rings in said ring capsule at a mutual distance and surrounded on all sides by the metal powder filled into the ring capsule; and

finishing the blade ring blank produced by the HIP-process to a specified size.

5,470,525

REMOVAL OF BINDER FROM TA PRODUCTS

Terrance B. Tripp, Westboro, and Malcolm Shaw, Medfield, both of Mass., assignors to H. C. Starck, Inc., Newton, Mass.

Filed Jul. 1, 1994, Ser. No. 269,580

Int. Cl.[6] B22F *1/00*

U.S. Cl. 419—36 **13 Claims**

1. Process of recovery of binder-pressed tantalum pellets with 0.1–3.0 w/o of a carbonaceous binder comprising the step of contacting the pellets at temperatures of 50°–200° F. with aqueous leach liquor and leaching sufficiently to remove at least 95% by weight of binder-source carbon content thereof while maintaining oxygen content of the pellet substantially constant, the said reduction of carbon content being achieved without heating for distillation/decomposition of binder.

5,470,526

DEGRADABLE MULTILAYERED STRUCTURES

Debra L. Wilfong, Lake Elmo; Denise R. Rutherford, and Richard J. Rolando, both of Oakdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

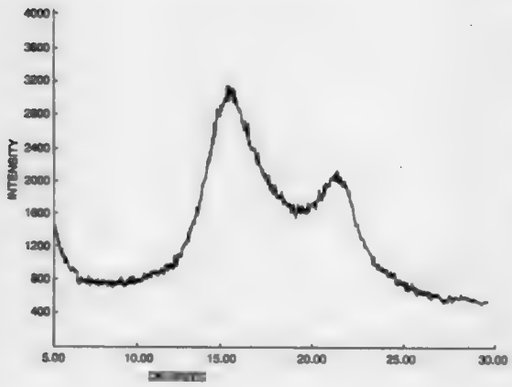
PCT No. PCT/US92/10718, § 371 Date Aug. 18, 1993, § 102(e) Date Aug. 18, 1993

Continuation-in-part of Ser. No. 806,769, Dec. 12, 1991, Pat. No. 5,216,043. This PCT application Dec. 4, 1992, Ser. No. 104,147

The portion of the term of this patent subsequent to Jun. 1, 2010, has been disclaimed.

Int. Cl.[6] B32B *27/32*; B29C *47/88*; C08K *5/56*

U.S. Cl. 428—36.6 **55 Claims**



1. A degradable multilayered structure comprising:

(a) a first layer of a polyolefin polymer containing a pro-degradant system comprising from about 5 ppm to about 2000 ppm of a transition metal in the form of a salt; and

(b) a second layer of a polyolefin polymer contacting the first layer of the multilayered structure; wherein the polyolefin polymer of the first layer, the second layer, or the first and second layers comprises a quenched mesophase propylene-based material, wherein said multilayered structure is radiation-resistant.

5,470,527

TI-W SPUTTERING TARGET AND METHOD FOR MANUFACTURING SAME

Takashi Yamanobe; Michio Satou; Takashi Ishigami, all of Kanagawa; Minoru Obata, Tokyo; Mituo Kawai, Kanagawa; Noriaki Yagi, Kanagawa; Toshihiro Maki, Kanagawa, and Shigeru Ando, Kanagawa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Division of Ser. No. 49,409, Apr. 20, 1993, abandoned. This application Sep. 12, 1994, Ser. No. 302,996

Claims priority, application Japan, Apr. 21, 1992, 4-101427

Int. Cl.[6] B22F *3/10*

U.S. Cl. 419—53 **14 Claims**

1. A method of manufacturing a sputtering target consisting essentially of a matrix of Ti-W phase, segregated portions of Ti having a diameter of 50 μm or less distributed in said matrix, segregated portions of W having a diameter of 20 μm or less distributed in said matrix, and 1 ppm or less Al, the method comprising the steps of:

mixing high purity W powder, at least one kind of high purity Ti powder, and high purity TiH_2 powder to produce a mixed powder;

placing said mixed powder in a mold with a partition plate disposed between said mold and said mixed powder, and reducing impurities in said mixed powder by heating said mold under a high vacuum; and

heating the mixed powder in the range of 1200° C. to 1600° C. under vacuum and under high applied pressure to induce diffusion of Ti and to densify the mixed powder.

5,470,528

LOW DECARBURIZATION SPRING STEEL

Hiroharu Motomura, Minamikawachi; Soichi Takasaki, Okegawa, and Kenji Kinoshita, Kamagaya, all of, Japan, assignors to Mitsubishi Steel Mfg. Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1994, Ser. No. 281,240

Claims priority, application Japan, Apr. 4, 1994, 6-066016

Int. Cl.[6] C22C *38/60*

U.S. Cl. 420—84 **4 Claims**

1. A low decarburization spring steel consisting essentially of, in weight percentages, 0.40 to 0.75% C, 0.15 to 2.50% Si, 0.30 to 1.20% Mn, 0.005 to 0.100% Al, 0.02 to 0.100% Se and the balance consisting of Fe and inevitable impurities.

5,470,529

HIGH TENSILE STRENGTH STEEL SHEET HAVING IMPROVED FORMABILITY

Shigeki Nomura, Ibaraki; Nozomi Komatsubara, Nishinomiya; Naomitsu Mizui, Amagasaki; Kazutoshi Kunishige, Kawanishi, and Tomoki Fukagawa, Amagasaki, all of, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 8, 1994, Ser. No. 207,098

Int. Cl.[6] C22C *38/06*

U.S. Cl. 420—103 **45 Claims**

1. A high tensile strength steel sheet having improved ductility and hole expandability, which consists essentially, on a weight basis, of:

C: 0.05–0.3%, Si: less than 1.0%, Mn: 0.05–4%,

Al: greater than 0.10% and not greater than 2.0% wherein

$$.5 \leqq Si(\%)+Al(\%) \leqq .0,$$

Cu: 0–2.0%, Ni: 0–1.0% and $Ni(\%) \geqq Cu(\%)/3$,

Cr: 0–5.0%, Ca: 0–0.01%, Zr: 0–0.10%,

rare earth metal (REM): 0–0.10%, Nb: 0–0.10%,

Ti: 0–0.10%, V: 0–0.20%,

and a balance of Fe and inevitable impurities with N being limited to 0.01% or less, the steel sheet having a structure which comprises at least 5% by volume of retained austenite.

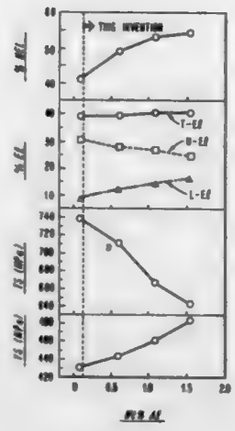


FIG. 4A

5,470,530

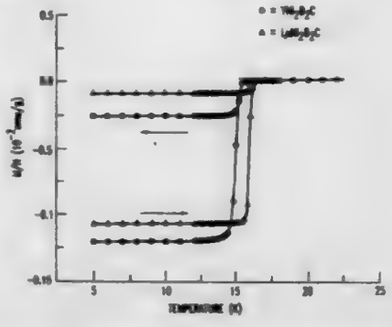
ARTICLE COMPRISING AN INTERMETALLIC SUPERCONDUCTOR MATERIAL

Robert J. Cava, Bridgewater, and Theo Siegrist, Neshanic Station, both of N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.

Continuation-in-part of Ser. No. 165,143, Dec. 10, 1993, which is a continuation-in-part of Ser. No. 143,419, Oct. 26, 1993, Pat. No. 5,413,755. This application Jan. 5, 1994, Ser. No. 177,837

Int. Cl.[6] C22C *5/04;19/03;28/00;30/00*

U.S. Cl. 420—416 **6 Claims**



3. An article comprising a quantity of material that exhibits superconductivity,

CHARACTERIZED In THAT

the material is a material of over-all composition $Ln_aNi_bB_cC_d$, where Ln is selected from the group consisting of Y and the rare earths (atomic number 57–71), and where $0.75 \leq a \leq 1.25$, $1.50 \leq b \leq 2.50$, $1.50 \leq c \leq 2.50$, and $0.75 \leq d \leq 1.25$.

5,470,531

EXCHANGER AND METHOD FOR MANUFACTURING THE SAME

Axel Sjogren, Littleton; Gary Carson, Golden; Steve Estergreen, Wheat Ridge; Timothy Taga, Broomfield, and Rodger Stewart, Lafayette, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Nov. 3, 1992, Ser. No. 970,781

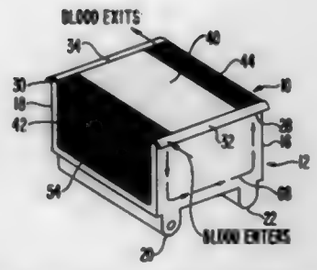
Int. Cl.[6] B01D *61/00;* **A61M** *1/14*

U.S. Cl. 422—46 **12 Claims**

1. An exchanger, comprising:

a casing having walls defining a cavity, the walls including distal edges;

a quantity of sheet material having first and second ends covering the distal edges of the walls; and



a cover extending over the cavity and sandwiching the first and second ends of the sheet material between the cover and the edges of the walls, the cover being melted into the sheet material and the distal edges of the walls.

5,470,532

COMPOSITE REACTIVE ARTICLES FOR THE DETERMINATION OF CYANIDE

Donald F. Hagen, Woodbury; Louis C. Haddad, St. Paul; Robert E. Perkins, Oakdale, and Craig G. Markell, White Bear Township, Ramsey County, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 2,198, Jan. 8, 1993, Pat. No. 5,443,641. This application Apr. 6, 1994, Ser. No. 223,737

Int. Cl.[6] G01N *31/00*

U.S. Cl. 422—57 **22 Claims**

1. A reactive support comprising immobilized finely divided gold in isolated areas on at least one of particulate and fiber as substrate, said substrate being an inert, porous, substrate having a diameter in the range of 0.1 to 200 micrometers with an aspect ratio of 1 to 1,000,000, said immobilized gold being present in the range of 0.05 to 10 weight percent of said reactive support and said isolated areas of gold having a size in the range of 0.1 to 100 nm.

5,470,533

TEST STRIP SUPPLY APPARATUS AND ANALYZER USING SAME

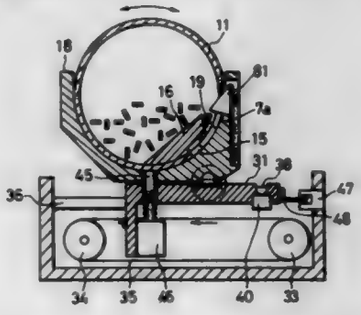
Isao Shindo, 2714, Tsuda, Katsuta-shi, Ibaraki-ken; Shigeo Mutou, 982, Ochiaicho, Hitachiohta-shi, Ibaraki-ken; Takao Terayama, 56-100, Sakaecho 1-chome, Ushiku-shi, Ibaraki-ken; Manao Okayama, 7-8, Nagayama 1-chome, Ryugasaki-shi, Ibaraki-ken, and Susumu Kai, Hitachi-wing 407, 11-1, Aobacho, Katsuta-shi, Ibaraki-ken, all of, Japan

Filed Nov. 9, 1993, Ser. No. 149,084

Claims priority, application Japan, Nov. 11, 1992, 4-300791

Int. Cl.[6] G01N *35/00;35/10*

U.S. Cl. 422—63 **10 Claims**



1. A test strip supply apparatus comprising a container for containing elongate test strips each having reaction layers impregnated with reagents, said container having a penetration slot through which said test strips are to be successively delivered out Of said container, a guide member including an extended portion

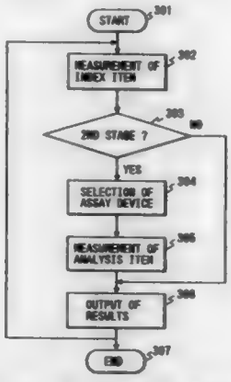
which extends over said penetration slot of said container and guiding said test strip in said container toward said penetration slot, and a pushing device for pushing said test strip into said guide member with relative movement between said container and said pushing device; wherein said pushing device approaches the guide member in said container when said guide member moves in a first direction, and said pushing device goes away from said guide member when said guide member moves in a second direction opposite of said first direction.

5,470,534

ANALYTICAL SYSTEM USEFUL IN DIAGNOSIS OF THE CONDITION OF A DISEASE

Kyoko Imai; Kazumichi Imai, both of Katsuta, and Yasushi Nomura, Mito, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 2, 1994, Ser. No. 236,134
Claims priority, application Japan, May 10, 1993, 5-108107
Int. Cl.[6] G01N *35/02*
U.S. Cl. 422—67 **9 Claims**



1. An analytical system for analyzing a biological sample which is gathered from a patient once, the system comprising:

means for storing an index analysis item of the biological sample to be measured in a first measurement stage, an assay item of the biological sample to be optionally measured in a second measurement stage following said first measurement stage, and a check level;

means for measuring the index analysis item of the biological sample in the first measurement stage;

determining means for determining whether to measure the assay item of the biological sample in the second measurement stage, which is different from the index analysis item of the first measurement stage, on the basis of a comparison of data of the measured index analysis item with the check level;

means for measuring the assay item of the biological sample in the second measurement stage responsive to said determining means determining that the assay item should be measured; and

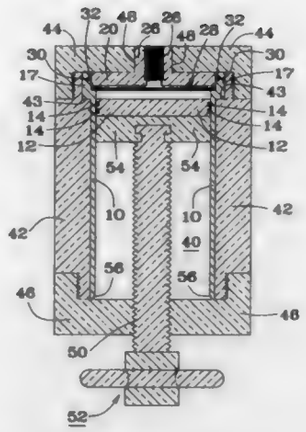
means for outputting data of the measured assay item.

5,470,535

UNIVERSAL ZERO-HEADSPACE EXTRACTOR VESSEL

Carl Ray, and J. Scott Coulter, both of Elko, Nev., assignors to Xcel Industrial Group, Inc., Elko, Nev.

Continuation of Ser. No. 875,242, Apr. 28, 1992, abandoned. This application Mar. 9, 1994, Ser. No. 208,790
Int. Cl.[6] B01L *11/00*
U.S. Cl. 422—101 **19 Claims**



1. A pressurizable zero-headspace extractor vessel useful in preparing multiphase sample mixtures for constituent analysis, said constituents potentially including heavy metals and volatile organics and said sample mixtures comprising solid-phase material and liquid-phase material, said liquid-phase material including an extraction liquid, wherein said extractor vessel is agitatable to effect thorough mixing of said sample mixture and comprises:

a) a cylinder;

b) a pressurizable sample chamber for said multiphase sample mixtures, within said cylinder, said sample chamber being pressurizable to a working pressure of at least 50 psig;

c) a discharge port for egress of liquids from said sample chamber;

d) a piston movable in said cylinder to pressurize said sample chamber and drive fluids out of said discharge port;

e) piston-driving means to urge said piston to move in said cylinder;

f) solids-retaining filtration means to retain solid-phase material within said sample chamber as fluids are driven out;

g) liner members defining said pressurizable sample chamber, said liner members having wettable surfaces in said sample chamber, said wettable surfaces constituting the surfaces contacted by said sample mixtures during normal use of said vessel, said liner members and wettable surfaces being formed of a fluorinated polymer selected from the group consisting of fluorinated polymers and copolymers of alkylenes and alkoxylenes and fluorinated polymers and copolymers of chlorinated alkylenes and alkoxylenes;

h) structural support members defining said cylinder backing and supporting said liner members to sustain said substantial working pressure in said sample chamber, said structural support member being formed of a lightweight structural material selected from the group consisting of polypropylene, high-density polyethylene, poly vinyl chloride, and copolymers of any one of these polymers; and

i) sealing means between said liner members, said sealing means being operative to seal said fluorinated polymer liner members to retain said working pressure of at least 50 psig;

whereby samples can be admixed and agitated with an extraction liquid in said sample chamber, under said working pressure, and said admixed extraction liquid can be discharged from said vessel for testing, while said sample mixtures contact only said wettable surfaces of said extractor vessel, said wettable surfaces being formed of said fluorinated polymer material.

5,470,536

CUVETTE MATRIX

Kari Järvimäki, Espoo, Finland, assignor to Labsystems Oy, Helsinki, Finland

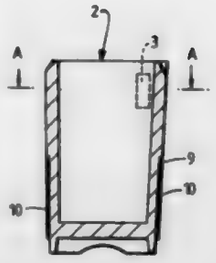
Filed Oct. 25, 1993, Ser. No. 140,491
Claims priority, application Finland, Nov. 11, 1992, 925117
Int. Cl.[6] B01L *3/00*
U.S. Cl. 422—102 **17 Claims**

6. In combination:

(1) a stand having an array of holes for supporting cuvettes; and

(2) a cuvette matrix, comprising:

a plurality of cuvettes capable of being placed within said stand both when connected together and individually;



connections formed between adjacent cuvettes which interconnect said plurality of cuvettes together in at least one row;

said at least one row extending along a longitudinal axis connecting centers of said cuvettes;

each of said cuvettes in said at least one row of cuvettes having a width, said width extending along an axis which is generally perpendicular to said longitudinal axis and through a center of said cuvette, said cuvette having a first outermost point on said perpendicular axis and a second outermost point on said perpendicular axis at opposite sides of said width;

said connections being disconnectable such that it is possible to detach one cuvette from said at least one row so as to be placed in said stand;

at least one holder member on the outer surface of each cuvette;

said at least one holder member being located at an angle offset from the longitudinal axis of the at least one row of cuvettes and being located substantially between said longitudinal axis and either of said first and second outermost points of said widths of the cuvettes, said at least one holder member on the outer surface of each cuvette being at a location such that (1) when said at least one row of cuvettes is still interconnected, said at least one holder member of each cuvette is at said angle from the longitudinal axis and is substantially away from fixing contact with said stand and such that (2) when one of said cuvettes of said at least one row of cuvettes is detached and placed within one of said holes with said at least one holder member also within said one of said holes, said one detached cuvette can be rotated such that said at least one holder member is in fixing contact with a wall of said stand.

5,470,537

SUPPORTING STAND FOR CONICAL-BOTTOM LIMITED-VOLUME VIAL

Barney Siegel, Lawrenceville, Ga., assignor to National Scientific Company, Lawrenceville, Ga.

Filed Aug. 25, 1993, Ser. No. 112,692
Int. Cl.[6] B01L *9/00*
U.S. Cl. 422—104 **10 Claims**

1. A combination limited-volume vial and base stand comprising:

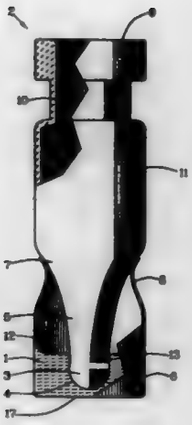
an elongated rigid vial having a proximal end and a distal end, the distal end having a tapered conical configuration of a predetermined minimum cross-sectional diameter,

the distal end terminating in a truncated spherical tip, the spherical tip having a cross-sectional diameter greater than the minimum cross-sectional diameter of the distal end,

a base made of resilient material to receive the spherical tip of the vial, the base having a flat external bottom and an upper platform surface defining a predetermined thickness therebetween,

the base having an upstanding cylindrical wall extending from the bottom defining a substantially hollow interior cavity to accept the distal end of the vial,

the upper platform surface of the base defining a tip receptacle cavity within the upper platform surface to receive the vial tip centrally therein, and



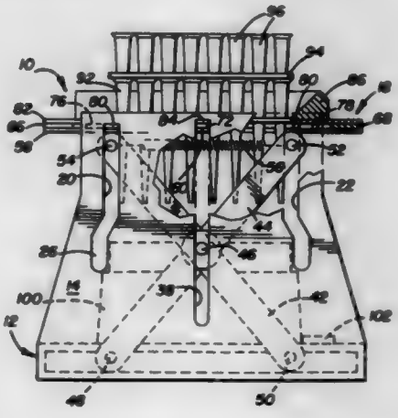
the tip receptacle cavity being of a corresponding size and shape to that of the vial tip to receive the vial tip in a snap fit relationship to maintain the vial and base together as a separable unitary structure.

5,470,538

PIPETTE TIP RACK LOADER

Peter M. Lind, Yountville, Calif., assignor to LABCON, North America, San Rafael, Calif.

Filed Jun. 3, 1994, Ser. No. 253,977
Int. Cl.[6] B01L *3/02*; B65D *85/00*
U.S. Cl. 422—104 **17 Claims**



1. A loading device for placing a plurality of pipette tips positioned in a flat into an upstanding pipette tip rack, the loading device comprising:

a rectangular base assembly;

a pair of side plates affixed at opposite ends of the base assembly to extend upwardly therefrom;

a platform assembly positioned between said pair of side plates and movably associated with said pair of side plates so that said platform may move from a first position distal of said base to a second position proximate of said base;

parallel motion means for maintaining said platform assembly in a parallel relation with said base assembly while the platform assembly moves from said first position to said second position;

said platform assembly including release means for retaining a flat on said platform assembly while said platform assembly is distal of said base and for releasing said flat at a predetermined position while said platform moves toward said second position proximate said base.

5,470,539
CONTINUOUS POLYMERIZATION METHOD AND APPARATUS

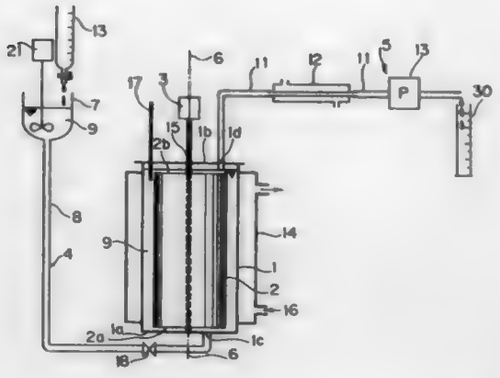
Tsuyoshi Imamura, Kyoto; Katsumi Mizuguchi, Ibaraki; Yasuhiro Shibai, Suita; Keizou Ishii, Ashiya; Shinichi Ishikura, and Koichi Saito, both of Kyoto, all of, Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 158,924, Nov. 29, 1993, Pat. No. 5,340,891, which is a continuation of Ser. No. 831,570, Feb. 5, 1992, abandoned. This application Mar. 30, 1994, Ser. No. 221,392

Claims priority, application Japan, Feb. 5, 1991, 3-14581; Jan. 22, 1991, 3-274355

Int. Cl.[6] C08F *2/00*; B01F *3/00*

U.S. Cl. 422—136 **6 Claims**



1. An apparatus for continuous polymerization, comprising:

a reaction vessel main body having an inner surface of cylindrical shape, wherein a center axis of said main body is oriented in a direction crossing a horizontal plane;

an inner cylinder configured for rotation about said center axis, which has an outer face which defines a coaxial double cylinder with the inner face of said main body and, wherein said inner cylinder has a closed upper end face and a closed lower end face and a value (b/R_1) is in a range of from 0.4 to 0.8, wherein R_1 is a radius of said inner cylinder and said b is a difference between a radius of said inner cylinder and a radius of said inner surface of said main body;

a rotating means to rotate the inner cylinder round said axis at an angular velocity (ω), wherein said angular velocity (ω) fulfills the mathematical limitation of the following formula:

$$Ta=(\omega\times R_1\times(b/\upsilon))\times(b/R_1)^{1/2} \text{ and}$$

$$Ta_{c,r}<Ta<,000,$$

wherein υ is a dynamic viscosity of a material solution for polymerization;

Ta includes a value specifying conditions for producing Taylor vortices in a rotating fluid and $Ta_{c,r}$ is a lowest limiting value for producing Taylor vortices in a homogenous system;

an inlet to supply said material solution for polymerization, said inlet being arranged, on one of the upper and lower end faces of said main body, at a position corresponding to one of the upper and lower end faces of said inner cylinder;

an outlet to take out a reaction mixture of said polymerization, said outlet being arranged, on an outer of the upper and lower end faces of said main body, at a position corresponding to the other of the upper and lower end faces of said inner cylinder;

a supplying means to continuously supply said material solution through said inlet into said main body; and

means for continuously taking out said reaction mixture through said outlet.

5,470,540
APPARATUS AND PROCESS FOR INTRODUCING A SUSPENSION INTO A REACTOR

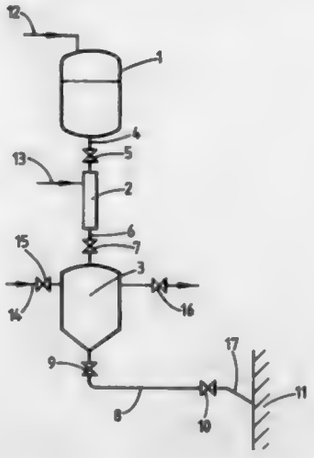
Robert Pes, Sausset les Pins, France, assignor to BP Chemicals Limited, London, England

Continuation of Ser. No. 190,730, Jan. 31, 1994, abandoned, which is a continuation of Ser. No. 799,390, Nov. 27, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 459,286

Claims priority, application France, Dec. 14, 1990, 90 16184

Int. Cl.[6] B01J *8/08*

U.S. Cl. 422—145 **11 Claims**



7. A process for introducing a predetermined volume of suspension contained in a storage vessel maintained at a pressure P1, into a reactor maintained at a higher pressure P2, comprising the following steps:

(a) providing a storage vessel maintained at a pressure P1, an intermediate vessel, a feed vessel, and a reactor maintained at a higher pressure P2,

(b) transferring by gravity the predetermined volume of suspension from the storage vessel to the intermediate vessel by opening and closing a valve in the conduit connecting the storage vessel and the intermediate vessel,

(c) transferring by gravity the volume of suspension to the feed vessel by opening and closing a valve in a conduit connecting the intermediate vessel and the feed vessel,

(d) introducing a gas into the feed vessel by means of a gas feed conduit to obtain a pressure P3 which is greater than P2 and such that the difference P3–P2 is sufficient to introduce the volume of suspension into the reactor,

(e) transferring the suspension to the reactor by a rapid opening and closing of a valve in a conduit connecting the feed vessel and the reactor, the pressure P4 in the feed vessel after completion of the transfer and after the closing of the valve still being greater than P2.

5,470,541
APPARATUS AND PROCESS FOR THE PREPARATION OF HYDROGEN CYANIDE

Theodore A. Koch; Karl R. Krause, and Mehrdad Mehdizadeh, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 28, 1993, Ser. No. 174,525

Int. Cl.[6] B01J *19/08*

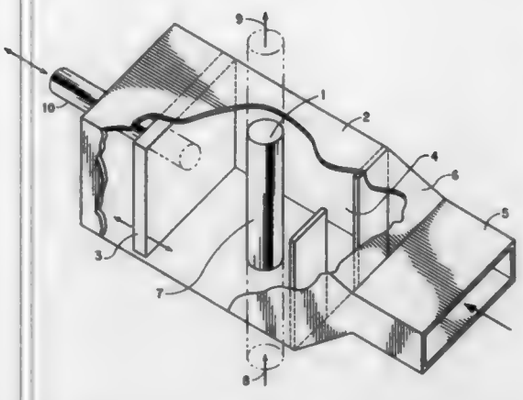
U.S. Cl. 422—186 **7 Claims**

1. A product generator comprising:

a microwave power source;

a waveguide coupled to said power source for transmitting microwave radiation therethrough; said waveguide having a flared section;

a resonant cavity attached to the flared section of said waveguide, said resonant cavity having a movable wall opposite the side of the cavity to which the waveguide is attached



for tuning the resonant cavity and for focusing microwave radiation on a tubular reactor;

a tubular reactor extending through said resonant cavity intermediate between the side of the cavity to which the waveguide is attached and the movable wall, in a direction parallel to the movable wall, said tubular reactor having inlet means for introducing gas and outlet means for removing product, the portion of the tubular reactor inside the resonant cavity being adapted to contain a catalyst.

5,470,542

CATALYZING FIXED BED REACTOR

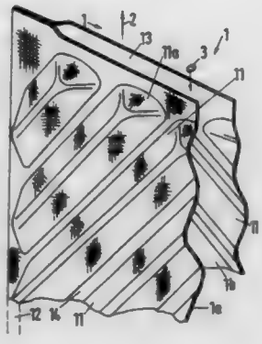
Jean P. Stringaro, Winterthur, Switzerland, assignor to Sulzer Chemtech AG, Winterthur, Switzerland

Filed Jun. 23, 1994, Ser. No. 265,586

Claims priority, application European Pat. Off., Jun. 30, 1993, 93810463

Int. Cl.[6] B01J *8/02;8/04*

U.S. Cl. 422—211 **13 Claims**



8. A packing element for a catalyzing fixed bed reactor for at least one fluid medium, the packing element comprising first and second opposing fluid medium permeable sheets each having a periphery, a plurality of unidirectional, parallel trough-shaped corrugations of a substantially constant cross-section in each sheet having closed ends and bulging away from the opposing sheet to define an interior space between the sheets, the corrugations of the first sheet being angularly inclined relative to the corrugations of the second sheet so that the corrugations intersect each other and define a plurality of contact points where the first and second sheets contact each other, and means securing the first and second sheets to each other at at least one of the contact points so that a catalyst material can be placed into the interior space between the sheets for use of the sheet in the reactor.

5,470,543

ULTRA-HIGH PURITY NITROGEN GENERATOR

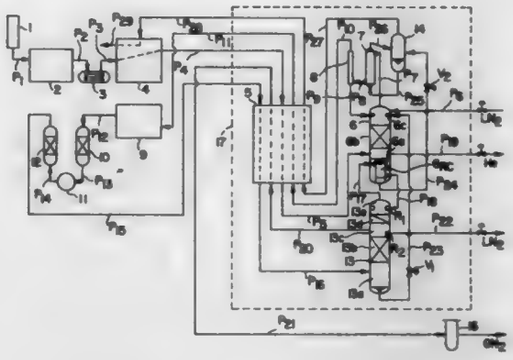
Takashi Nagamura; Takao Yamamoto, and Shinji Tomita, all of Hyogo, Japan, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Division of Ser. No. 124,072, Sep. 21, 1993. This application Oct. 19, 1994, Ser. No. 325,503

Claims priority, application Japan, Sep. 22, 1992, 4-276830

Int. Cl.[6] B01J *8/02;* **F25J** *3/02;3/04*

U.S. Cl. 422—211 **5 Claims**



1. An ultra-high purity nitrogen generator, which comprises:

a carbon dioxide eliminator-drier for removing, from feed air, carbon dioxide, moisture and catalyst poisons;

a primary rectification column for roughly rectifying the feed air passed through the carbon dioxide eliminator-drier, thereby obtaining raw nitrogen gas that is the nitrogen gas containing oxygen, from which the catalyst poisons for the oxidation catalyst have been further removed;

a compressor for increasing the pressure of the raw nitrogen gas obtained from the primary rectification column and raising the temperature thereof;

an oxidation column for converting carbon monoxide in the compressed raw nitrogen gas to carbon dioxide and hydrogen also contained therein to water; and an adsorption column for cooling down the carbon dioxide and water formed through oxidation, and removing them by adsorption, thereby obtaining feed raw nitrogen gas;

a secondary rectification column for rectifying the feed raw nitrogen gas, thereby obtaining an ultra-high purity nitrogen gas product or an ultra-high purity liquid nitrogen product;

a heat exchanger for exchanging heat among the feed air to be introduced to the primary rectification column, the raw nitrogen gas obtained from the primary rectification column, the feed raw nitrogen gas to be introduced to the secondary rectification column and the ultra-high purity nitrogen gas product;

a cold box surrounding the heat exchanger and the primary and secondary rectification columns; and

means for removing heat from any of the equipment in the cold box.

5,470,544

SYSTEM FOR STEAM-REFORMING OF LIQUID OR SLURRY FEED MATERIAL

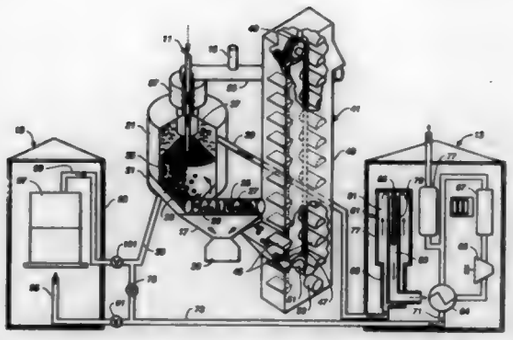
Terry R. Galloway, San Leandro, Calif., assignor to Synthetica Technologies, Inc., Richmond, Calif.

Continuation of Ser. No. 27,706, Mar. 8, 1993, abandoned. This application Apr. 1, 1994, Ser. No. 221,989

Int. Cl.[6] A61L *2/06*

U.S. Cl. 422—213 **6 Claims**

1. Apparatus for processing liquid or slurry feed material to derive output products of an altered character, comprising:



means defining a heat exposure region having a predetermined length, said exposure region defining means including a heated gas input opening and a gas output opening and an inlet and an outlet;

means for directing a bed comprising a plurality of independently movable surface presenting bodies through said heat exposure region;

means for circulating a heated gas stream through said bed in said heat exposure region from said heated gas input opening to said gas output opening in a direction substantially counter to the direction of movement of said bed;

means for introducing a feed material to said bed for movement therewith through said exposure region for reaction with the heated gas stream circulating through said bed to derive output products of an altered character;

a steam-reforming detoxification reactor; and,

means for circulating the gas stream from said gas output opening to said steam-reforming detoxification reactor to react organic components in the gas stream with steam and for circulating the effluent from said reactor to said heated gas input opening.

5,470,545

CORRIN MEDIATED DEGRADATION OF ORGANIC NITROGEN COMPOUNDS

Trevor S. Marks, Salisbury, and Andrew Maule, Amesbury, both of, Great Britain, assignors to The Public Health Laboratory Service Board in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

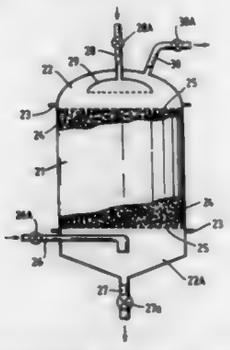
PCT No. PCT/GB90/00715, § 371 Date Nov. 5, 1991, § 102(e) Date Nov. 5, 1991, PCT Pub. No. WO90/13336, PCT Pub. Date Nov. 15, 1990

PCT Filed May 9, 1990, Ser. No. 773,938

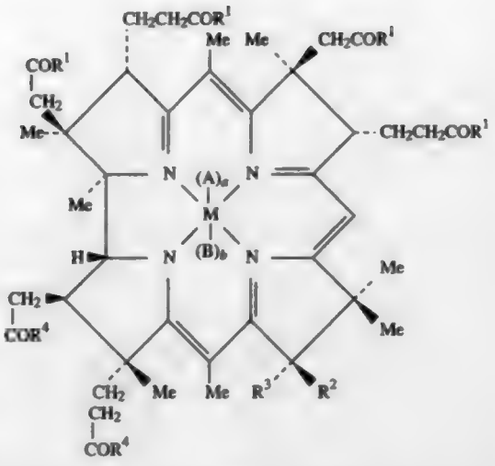
Claims priority, application United Kingdom, May 10, 1989, 8910760

Int. Cl.[6] A61L 2/20

U.S. Cl. 422—292 **15 Claims**



1. A method of chemically reducing an organic nitrogen compound wherein the compound is reacted in an aqueous medium with a reducing agent in the presence of a complex of a corrin containing a metal-centered ring system of the formula:



in which R^1 is selected from NH_2 and OH; R^2 is selected from H, CH_2CH_2COOH and $CH_2CH_2CONH_2$; R^3 is selected from H, CH_2CH_2COOH and $CH_2CH_2CONH_2$; and R^4 is selected from $NHCH_2CH(OH)CH_3$, OH and NH_2 or the ring is that of cyanocobalamin; M is an ion or atom of a metal selected from group 2, 5, 6, 7, 8, 9, 10, 11 or 12 of the periodic table, A and B are the same or different co-ordinating ligands, and a and b are independently 0 or 1.

5,470,546

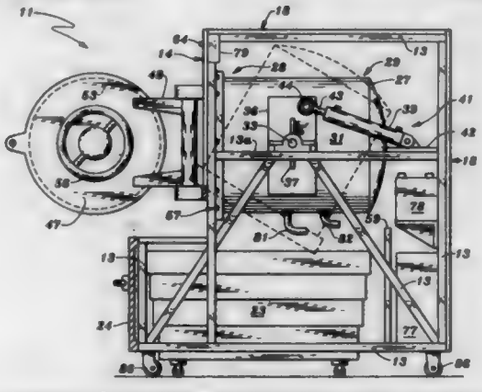
APPARATUS FOR STORING AND STERILIZING BIO-HAZARDOUS WASTE

John L. Hall, 8444 Julie Lynne Cir., Tracy, Calif. 95376

Filed Jun. 24, 1994, Ser. No. 264,988

Int. Cl.[6] A61L 2/06

U.S. Cl. 422—292 **14 Claims**



1. Apparatus for sterilizing bio-hazardous waste materials comprising:

a housing having an upper region bounded in part by a front face of said housing which front face has an upper access opening for enabling entry of waste materials that are to be sterilized, said housing having a lower region and a lower access opening thereat constructed and arranged for enabling entry of a removable sterilized waste receiver into said lower region of said housing and withdrawal of said waste receiver therefrom;

an unsterilized waste receptacle disposed in said upper region of said housing and which has an open end and a closed end, said receptacle being pivotable about a horizontal pivot axis which extends in parallel relationship with said front face of said housing and in parallel relationship with said upper access opening, said receptacle being pivotable about said axis between a first orientation at which said open end is in register with said upper access opening of said housing and an

upended orientation at which said open end is below said closed end and at least partially faces said lower region of said housing;

a closure disposed at said front face of said housing and being coupled thereto and means for enabling movement of said closure between an open position at which unsterilized waste materials may be inserted into said receptacle through said upper access opening when said receptacle is at said first orientation and a closed position at which said closure seats at said open end of said receptacle and closes said receptacle; and

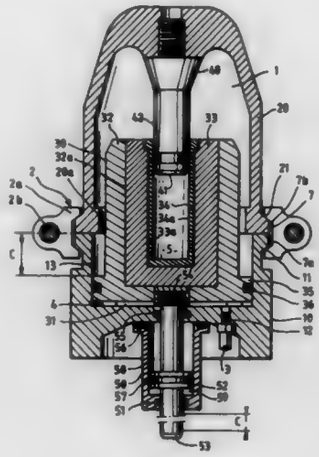
means for sterilizing waste materials while said waste materials are within said receptacle.

5,470,547

DEVICE FOR STERILIZING PRODUCTS AT HIGH PRESSURE

Bernard Lhenry, Le Creusot, France, assignor to Framatome, Courbevoie, France

Filed May 6, 1994, Ser. No. 238,867
Claims priority, application France, May 7, 1993, 93 05526
Int. Cl.[6] A61L 2/00
U.S. Cl. 422—295 **11 Claims**



1. Device for the sterilization of a product at high pressure, comprising, in combination,

(a) a sealed vessel including a bottom wall having an opening for connection to means for feeding fluid under pressure;

(b) a cover;

(c) a fixing means for assembling and fixing said cover to said bottom wall;

(d) a slidable piston having a first active surface on a bottom wall of said slidable piston, and adjacent said bottom wall, said slidable piston being mounted in a sealed manner in said vessel to be slidable in said vessel under the effect of pressure exerted by said fluid on said active surface of said slidable piston;

(e) a sterilization pressure treatment chamber provided in said slidable piston for receiving a product to be sterilized; and

(f) a fixed piston connected to said cover and adapted to penetrate said sterilization pressure treatment chamber when said slidable piston is moved for the purpose of compressing said product to be sterilized, said fixed piston having a free end defining a second active surface, a ratio between areas of said first and second active surfaces being approximately 1:20;

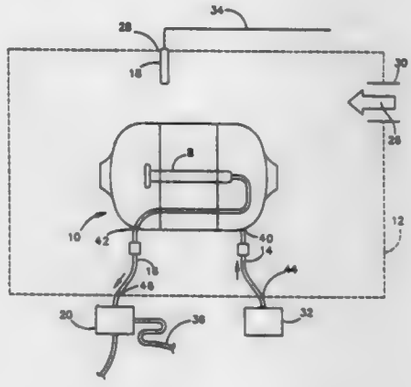
(g) wherein said slidable piston comprises at least two sleeves and a protective inner sheath, said at least two sleeves and said inner sheath being concentric and interconnected.

5,470,548

SYSTEM FOR STERILIZATION OF OBJECTS

H. William Hillebrenner, Apex, N.C., assignor to American Sterilizer Company, Erie, Pa.

Division of Ser. No. 57,755, May 7, 1993, Pat. No. 5,364,590.
This application Aug. 15, 1994, Ser. No. 290,567
Int. Cl.[6] A61L 2/20
U.S. Cl. 422—295 **1 Claim**



1. A system for sterilizing an object comprising:

a hollow cassette for receiving the object;

input and output ports in the cassette for receiving and exhausting air and sterilant vapor;

carrier means for transporting air and sterilant vapor into and out of the cassette through the input and output ports;

a cabinet for containing the hollow cassette having a first input and a first output ports coupled to the carrier means for providing air and sterilant vapor to the input and output ports of the cassette;

a second input and a second output ports, mounted on the interior surfaces of the cabinet for receiving and exhausting air and sterilant vapor;

a first temperature sensing device extended into the interior of the cabinet for sensing as a first temperature, the temperature of the internal cabinet environment outside of the cassette when the cassette is inserted within the cabinet;

a second temperature sensing device, located downstream from the cassette, and coupled to the carrier means for transporting air and sterilant vapor out of the cassette for sensing as a second temperature the temperature of gas exiting the cassette such that the first and second temperatures can be maintained so as to prevent condensation of moisture on the walls of the cassette and on the object therein.

5,470,549

METHOD OF MAKING TUNGSTEN-COPPER COMPOSITE OXIDES

Leonid P. Dorfman, Athens; Michael J. Scheithauer, Ulster; David L. Houck, Towanda, and Nelson E. Kopatz, Sayre, all of Pa., assignors to Osram Sylvania Inc., Danvers, Mass.

Filed Dec. 22, 1994, Ser. No. 361,415
Int. Cl.[6] C01G 41/00;3/00
U.S. Cl. 423—61 **12 Claims**

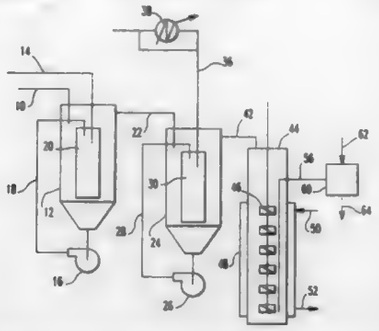
1. A method of making a tungsten-copper composite oxide, comprising the steps of blending an amount of an ammonium tungstate and an amount of an oxide or hydroxide of copper without milling to form an unmilled mixture, dehydrating the unmilled mixture, and then firing the unmilled mixture at a temperature and for a time sufficient to form the tungsten-copper composite oxide.

5,470,550

ZIRCONIUM SULFATE PRECIPITATION

Donald O. Voit, Ogden, Utah, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1993, Ser. No. 175,842
Int. Cl.[6] C01G *25/00*
U.S. Cl. 423—81 **5 Claims**



1. A method of precipitating zirconium sulfate from an aqueous zirconium oxychloride solution containing aluminum comprising the steps of:

(a) adding an aqueous ammonium hydroxide solution having a concentration of at least about 14 wt. % to an aqueous zirconium oxychloride solution containing from about 1000 to about 3000 parts aluminum per million parts zirconium and from about 0.5M to about 2M zirconium, and having an acidity greater than about 1.5N total acid per M zirconium, to form an acid adjusted solution having an acidity of between about 0.6N and about 1.2N total acid/M zirconium,

(b) mixing the acid adjusted solution at a temperature of at least about 60° C. for about 15 to 60 minutes,

(c) adding a precipitation agent selected from the group consisting of ammonium sulfate and sulfuric acid to the acid adjusted solution of step (b) in an amount sufficient to provide a sulfur/zirconium molar ratio of from about 0.6 to about 0.9 to precipitate zirconium sulfate and form a zirconium sulfate containing solution at a temperature between about 90° C. and the boiling point of the zirconium sulfate containing solution,

(d) filtering the zirconium sulfate containing solution to recover zirconium sulfate having less than 400 parts aluminum per million parts zirconium.

5,470,551

USE IN COSMETICS OR IN TOPICAL APPLICATION OF AN AQUEOUS DISPERSION BASED ON ORGANOPOLYSILOXANES AND ON A CROSS-LINKED ACRYLAMIDE/NEUTRALIZED 2-ACRYLAMIDO-2-METHYLPROPANESULFONIC ACID COPOLYMER

Claude Dubief, Le Chesnay, and Daniele Cauwet, Paris, both of, France, assignors to L'Oreal, Paris, France

PCT No. PCT/FR92/00866, § 371 Date May 17, 1993, § 102(e) Date May 17, 1993, PCT Pub. No. WO93/05762, PCT Pub. Date Apr. 1, 1993
PCT Filed Sep. 15, 1992, Ser. No. 64,144
Claims priority, application France, Sep. 17, 1991, 9111439
Int. Cl.[6] A61K *31/78;31/785;7/075*
U.S. Cl. 424—70.12 **21 Claims**

1. An aqueous dispersion for use in cosmetics or in topical application comprising, in a cosmetically or physiologically acceptable aqueous medium, at least one organopolysiloxane and one crosslinked acrylamide neutralized 2-acrylamido-2-methylpropanesulfonic acid copolymer, the organopolysiloxane is selected from the group consisting of

(i) cyclic silicons containing 3 to 7 silicon atoms or cyclocopolymers of dimethylsiloxane/methylalkylsiloxane type;

(ii) linear silicons having 2 to 9 silicon atoms and having a viscosity less than or equal to 5.10^{-6} m^2/s at 25° C.;

(iii) polyalkylsiloxane;

(iv) polyarylsiloxane;

(v) polyalkylarylsiloxane;

(vi) silicon gums;

(vii) silicon resins;

(viii) organomodified polysiloxanes and their mixtures,

the organopolysiloxane is present in proportions of between 0.5 and 50% by weight with respect to the total weight of the dispersion and the copolymer is present in proportions of between 0.05 and 10% by weight with respect to the total weight of the dispersion, with the proviso that the organopolysiloxane is not chosen from linear polydimethylsiloxanes with a viscosity of less than 10^{-1} m^2/s, the copolymer is obtained by copolymerization of 70 to 55 mol % of acrylamide and 30 to 45 mol % of sodium 2-acrylamido 2-methylpropanesulfonate in the presence of 10^{-4} to 4.10^{-4} mol of crosslinking agents per mol of mixture of the two monomers.

5,470,552

NICKEL EXTRACTION PROCESS

Gary A. Kordosky, and Stephen M. Olafson, both of Tucson, Ariz., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation of Ser. No. 559,458, Jul. 24, 1990, abandoned, which is a continuation of Ser. No. 206,535, Jun. 14, 1988, abandoned. This application Oct. 25, 1993, Ser. No. 142,883
Int. Cl.[6] B01D *11/00;* **C22B** *23/00*
U.S. Cl. 423—139 **10 Claims**

1. A process for recovering nickel from aqueous ammoniacal solutions containing nickel values, with improved selectivity over any Co and Zn values also contained in said ammoniacal solution, which solution contains NH_3 in an amount less than about 40 g/l NH_3 comprising:

(a) contacting said aqueous ammoniacal solution containing the nickel values with an organic solution comprising a water immiscible organic solvent containing dissolved from about 2% about 75% by weight of a water insoluble extractant consisting of a 5-alkyl-2-hydroxyacetophenone oxime in which the alkyl group contains from about 7 to about 12 carbon atoms and an equilibrium modifier in an amount of up to about 35 volume percent in the organic solution selected from the group consisting of a C_6 to C_{20} aliphatic alcohol, a C_6 to C_{20} alkyl phenol, 2,2,4-trimethyl-1,3-pentane diol diisobutyrate and tri-2-ethylhexyl phosphate, said organic solvent, the oxime and the equilibrium modifier forming a water immiscible organic phase, whereby nickel values are extracted from said aqueous ammoniacal solution into said organic phase, thereby providing a nickel pregnant organic phase and a nickel barren aqueous phase;

(b) separating said aqueous phase from said organic phase;

(c) contacting said nickel pregnant organic phase containing the equilibrium modifier with a concentrated stripping solution containing greater than about 100 g/l NH_3 and saturated with carbon dioxide, whereby said nickel values are stripped from the organic phase into said aqueous ammonia stripping solution;

(d) separating said aqueous stripping solution from the water immiscible organic phase; and

(e) recovering said nickel values from said aqueous strip solution.

5,470,553

METHOD FOR SEPARATING COBALT, NICKEL, AND ALUMINUM IONS IN SULFURIC ACID AQUEOUS SOLUTIONS AND THE EXTRACTANT COMPOSITIONS USED THEREIN

Hsin Hao-Chung; Tei-Chih Cheau, and Shang-Lin Tsai, all of Hsinchu, Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

Filed Dec. 7, 1993, Ser. No. 163,481
Int. Cl.[6] B01D 11/00; C22B 23/00;21/00
U.S. Cl. 423—139 5 Claims

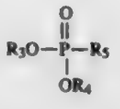
1. A method for separating aluminum, cobalt, and nickel ions contained in a sulfuric acid aqueous solution comprising the steps of:

contacting a first water-immiscible organic solution containing a first extractant dissolved therein with said sulfuric acid aqueous solution so as to obtain a Co-containing first organic phase and a first raffinate aqueous phase;

separating said Co-containing first organic phase from said first raffinate aqueous phase;

contacting a second water-immiscible organic solution containing said first extractant and a second extractant dissolved therein with said first raffinate aqueous phase for a period of time sufficient to selectively extract said Ni ions into said second water-immiscible organic solution so as to obtain a Ni-containing second organic phase and a second raffinate aqueous phase;

separating said Ni-containing second organic phase from said second raffinate aqueous phase; wherein said first extractant is bis(2,4,4-trimethyl pentyl) dithiophosphinic acid; and said second extractant is trialkyl phosphonate having a formula as follows:



where

R_3, R_4, R_5 are C_3 to C_{18} alkyl radicals;

further wherein said second water-immiscible organic solution contains a combined concentration of said first extractant and said second extractant of 1–80 vol %, with a volume ratio between said first extractant and said second extractant from 1:10 to 1:1.

5,470,554

BENEFICATION OF SALINE MINERALS

Roland Schmidt, Lakewood, and Dale L. Denham, Jr., Louisville, both of Colo., assignors to Environmental Projects, Inc., Casper, Wyo.

Filed May 25, 1993, Ser. No. 66,871
Int. Cl.[6] C22B 26/00; B03C 1/30;7/00
U.S. Cl. 423—206.2 22 Claims

1. A process for recovering trona from an ore containing trona and impurities, comprising the steps of:

(a) reducing a particle size of said ore to less than about 6 mesh;

(b) sizing the ore into size fractions, wherein ore having a particle size between about 6 mesh and about 100 mesh is sized into at least three size fractions;

(c) separating a first portion of impurities comprising shortite from each of said fractions by subjecting each fraction to a density separation method selected from the group consisting of air tabling and dry jigging to produce recovered trona;

(d) electrostatically separating a second portion of impurities from each of said fractions to produce recovered trona; and

(e) magnetically separating a third portion of impurities from each of said fractions to produce recovered trona.

5,470,555

PROCESS FOR PURIFICATION OF GASEOUS ORGANOMETALLIC COMPOUND

Takashi Shimada; Keiichi Iwata, and Masako Yasuda, all of Hiratsuka, Japan, assignors to Japan Pionics Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 904,166, Jun. 25, 1992, abandoned. This application Feb. 23, 1994, Ser. No. 202,701
Claims priority, application Japan, Jul. 17, 1991, 3-268121; Jul. 17, 1991, 3-268122
Int. Cl.[6] B01D 53/46; C07F 19/00; C23C 16/16;16/18
U.S. Cl. 423—219 14 Claims

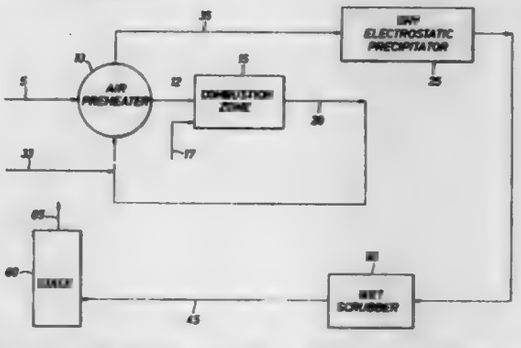
1. A process for purifying a gaseous organometallic compound containing impurities comprising removing oxygen contained therein as an impurity by bringing the gaseous organometallic compound which is at least one compound selected from the group consisting of dimethylzinc, diethylzinc, dimethylcadmium, diethylcadmium, dimethylmercury, trimethylaluminum, triethylaluminum, diisobutylaluminum hydride, trimethoxyaluminum, dimethylaluminum monochloride, trimethylgallium, triethylgallium, triethoxygallium, trimethylindium, triethylindium, dimethylgold acetylacetonato, bishexafluoro acetylacetonato copper, biscyclopentadienylmagnesium, tetramethyltin, trimethyl arsenic, trimethylphosphorous, dimethylselenium, diethylselenium, dimethyltellurium and pentacarbonyliron into contact with a catalyst consisting essentially of (i) a component selected from the group consisting of metallic copper, copper oxide activated by reduction with hydrogen, metallic nickel and nickel oxide activated by reduction with hydrogen, and (ii) a carrier on which the metallic component is supported, said component being in an amount of 20 to 95% by weight expressed in terms of metallic copper or metallic nickel, based on the total amount of the metallic component and the carrier, said catalyst having a specific surface area as measured by the BET method of 30 to 250 m^2/g and said catalyst being activated under reducing conditions by hydrogen.

5,470,556

METHOD FOR REDUCTION OF SULFUR TRIOXIDE IN FLUE GASES

Norman C. Samish, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1993, Ser. No. 171,954
Int. Cl.[6] B03C 3/013;3/017; B01D 53/50;53/75
U.S. Cl. 423—243.08 13 Claims



1. A method for reduction of sulfur trioxide in flue gases consisting essentially of

(a) combusting air and petroleum coke in a combustion zone thereby producing a particulates, sulfur trioxide, and sulfur dioxide-containing combustion product gas;

(b) admixing ash particulates from coke-fired furnaces on which sulfur trioxide will condense with said combustion product gas from step (a), thereby producing a first mixture;

(c) passing said first mixture from step (b) to an air preheater for cooling said first mixture to a temperature from above 212° F. to below 400° F. and heating said air for combustion with said petroleum coke, wherein said sulfur trioxide in said first mixture condenses, thereby forming a condensate on said

particulates, thereby producing a second mixture containing combustion product gas containing condensate on particulates and sulfur dioxide;

(d) passing said second mixture from step (c) to a dry electrostatic precipitator for removal of a sufficient portion of said particulates to produce a combustion product gas substantially free of particulates; and recovering said combustion product gas substantially free of particulates;

(e) passing said second mixture from step (d) to a wet scrubber for removal of substantially all of said sulfur dioxide, thereby producing a combustion product gas substantially free of sulfur dioxide, sulfur trioxide, and particulates; and

(f) passing said combustion product gas substantially free of sulfur dioxide, sulfur trioxide, and particulates from step (e) to a stack for release to the atmosphere.

5,470,557

ZEOLITES

Bryan W. Garney, Reading, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

PCT No. PCT/GB91/00781, § 371 Date Sep. 15, 1992, § 102(e) Date Sep. 15, 1992, PCT Pub. No. WO91/17955, PCT Pub. Date Nov. 28, 1991

PCT Filed May 17, 1991, Ser. No. 934,484

Claims priority, application United Kingdom, May 18, 1990, 9011151

Int. Cl.[6] C01B *5/02;6/34;33/26*

U.S. Cl. 423—249 **17 Claims**

1. Analcime crystals having their largest dimension greater than 106 microns and including a fraction of crystals of largest dimension between 106 and 180 microns, wherein a fraction of largest dimension between 106 and 125 microns when containing T_2O and placed in water, has a half-life of exchange of the T_2O with the water of about 167 years.

12. A method for immobilization of a water material selected from the group consisting of water (H_2O), deuterium oxide (D_2O), tritium oxide (T_2O), or mixtures thereof, which method comprises absorbing said water material into Analcime crystals having their largest dimension in excess of 106 microns and including a fraction of Analcime crystals of largest dimension between 106 and 125 microns, or into a body wherein the Analcime crystals having their largest dimension in excess of 106 microns and including a fraction of Analcime crystals of largest dimension between 106 and 125 microns are embedded in a water-porous binder matrix, wherein the Analcime crystals of largest dimension between 106 and 125 microns, when containing T_2O and placed in water, have a half-life of exchange of the T_2O with the water of about 167 years.

5,470,558

PROCESS FOR PRODUCING PITCH-BASED CARBON FIBERS SUPERIOR IN COMPRESSION CHARACTERISTICS

Hiroaki Takashima, Ohta; Osamu Kato, and Tsutomu Kihara, both of Yokohama, all of, Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 882,693, May 14, 1992, abandoned. This application May 13, 1994, Ser. No. 245,859

Claims priority, application Japan, May 16, 1991, 3-206596

Int. Cl.[6] D01F *9/145*

U.S. Cl. 423—447.6 **10 Claims**

1. A process for producing a carbon fiber, which process comprising mixing a polycyclic aromatic compound and a hydrogen donating compound at a mole ratio of the latter to the former in the range of 0.1 and 10, polymerizing the resulting mixture at a temperature of 50° to 400° C. in the presence of a Lewis acid as catalyst, then removing the catalyst, thereafter heat-treating the resulting polymer to obtain a pitch containing 5–40% of anisotropic spheres of 5–60 μm, having a total amount of aliphatic hydrogen of 25–50% and an amount of aliphatic hydrogen bonded to aliphatic carbons spaced two or more carbon atoms from aromatic rings of 5–25% and containing not more than 30% of oriented carbon based on the total amount of aromatic carbon, then spinning said pitch, then making the resulting pitch fiber infusible and subjecting the pitch fiber thus rendered infusible to a carbonization treatment.

5,470,559

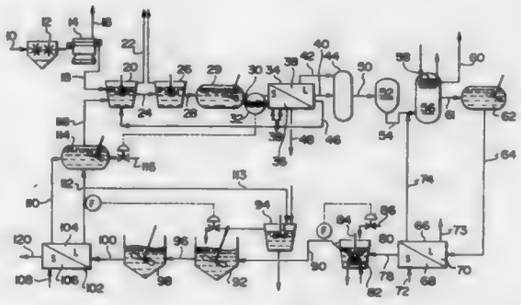
RECYCLING OF SPENT POT LININGS

Robert J. Grolman, Chicoutimi; George C. Holywell, Kingston; Frank M. Kimmerle, Jonquiere, and Gilles R. Turcotte, Chicoutimi, all of, Canada, assignors to Alcan International Limited, Montreal, Canada

Filed Feb. 26, 1993, Ser. No. 23,954

Int. Cl.[6] C01F *7/02;* **C01D** *3/02*

U.S. Cl. 423—489 **10 Claims**



1. A process of recycling spent potlining material containing carbon values contaminated with fluoride, sodium, aluminum and cyanide values and for enabling said carbon, sodium, fluoride and aluminum values to be recovered in a usable form, which process comprises:

reducing an average particle size of the spent potlining material to smaller than 28 Tyler mesh to form a powder;

without having destroyed the cyanide values by heating the powder, treating the powder with an aqueous sodium hydroxide solution containing about 10 to 60 g/L of sodium hydroxide at a temperature in the range of between 60° and 90° C. to form a solution containing fluoride, aluminate and said cyanide values, and a residual solid containing said carbon values;

removing the solution from the residual solid;

adjusting the content of NaOH in the solution within a range of about 10 to 60 g/L of NaOH, if said content differs from said range, to produce a solution suitable for destruction of said cyanide values;

heating said solution suitable for destruction of said cyanide values to a temperature in the range of about 160° to 220° C. at a pressure in the range of about 150 to 350 p.s.i. for a time of between about ½ and 3 hours to destroy said cyanide values in said solution and to produce a cyanide-free solution;

evaporating water from said cyanide-free solution to cause fluoride compounds in said solution to crystallize therefrom, thus producing fluoride crystals containing said fluoride values from said potlining and a sodium aluminate-containing solution containing said sodium and aluminum values from said potlining; and

separating said fluoride crystals from said sodium aluminate-containing solution.

5,470,560

METHOD FOR EVALUATING IMMUNOGENICITY

David W. Martin, Jr., San Francisco, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 947,890, Sep. 18, 1992, abandoned, which is a continuation of Ser. No. 692,806, Apr. 25, 1991, abandoned, which is a continuation of Ser. No. 4,988, Jan. 20, 1987, abandoned. This application Feb. 4, 1994, Ser. No. 192,316

Int. Cl.[6] A61K *49/00;39/00;* C12N *15/00*

U.S. Cl. 424—9.2 9 Claims

1. A method for determining the immunogenicity of a potentially immunogenic polypeptide in a mouse which comprises:

(a) providing a transgenic mouse whose somatic and germ cells contain a DNA sequence encoding a heterologous polypeptide, said DNA sequences having been introduced into said mouse or an ancestor of said mouse during an embryonic stage and said DNA sequence being transcribed and continuously expressed under the control of a promoter, whereby said mouse becomes immunologically tolerant to said heterologous polypeptide as a result of the expression of said DNA sequence;

(b) administering to said mouse of step (a) said potentially immunogenic polypeptide, wherein the potentially immunogenic polypeptide is a variant of said heterologous polypeptide; and

(c) determining the presence of antibodies specific for said potentially immunogenic polypeptide using radioimmunoassays or ELISA systems as an indication of the immunogenicity of said potentially immunogenic polypeptide.

5,470,561

MOUTHWASH COMPOSITIONS

Jan Klugkist, Spital, and Charles A. Saxton, Gayton, both of, Great Britain, assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Continuation of Ser. No. 988,533, Dec. 10, 1992, abandoned. This application May 26, 1994, Ser. No. 249,580

Claims priority, application United Kingdom, Dec. 11, 1991, 9126306

Int. Cl.[6] A61K *7/16*

U.S. Cl. 424—49 8 Claims

1. An aqueous mouthwash composition comprising from 100–4000 ppm, expressed as zinc ions, of a zinc salt and from 0.01–2% by weight of 2',4,4'-trichloro-2-hydroxy diphenyl ether as antiplaque system, from 5–30% by weight of a humectant system which comprises sorbitol, and a surfactant system, wherein the surfactant system comprises from 0.5–3% by weight of the composition of a nonionic surface-active agent of the ethyleneoxide/propylene oxide block copolymer type $H-(O-CH_2-CH_2)_a-(O-CH(CH_3)\ CH_2)-(O-CH_2CH_2)_a-OH$ in which a and b are integers, greater than 0, said nonionic agent having an approximate molecular weight of about 4,000 to about 15,000 and having an HLB-value of between 27 and 30.5, and a anionic surface-active agent selected from the group consisting of alkalimetal C_8-C_{18} alkylsulphates, alkalimetal C_8-C_{18} alkylbenzene sulphonates, and mixtures thereof, the weight ratio of the nonionic surface-active agent to the anionic surface-active agent ranging from 4 to 35, the amount of water in the composition being at least 60% by weight of the composition, said mouthwash having both clarity and an effective plaque growth inhibition value.

5,470,562

COSMETIC PIGMENT COATING AND METHOD OF APPLICATION IN NAIL POLISH

Adel A. Khamis, Belleville, N.J., assignor to Tevco, Inc., South Plainsfield, N.J.

Continuation of Ser. No. 901,524, Jun. 19, 1992, abandoned, which is a division of Ser. No. 689,379, Apr. 22, 1991, Pat. No. 5,133,966, which is a continuation-in-part of Ser. No. 501,677, Mar. 29, 1990, abandoned. This application Mar. 4, 1994, Ser. No. 206,248

Int. Cl.[6] A61K *7/043;* B23B *27/00*

U.S. Cl. 424—61 15 Claims

1. A method of preparing a coated pigment material to improve the suspensibility of said pigment material in a nail enamel suspension, said nail enamel suspension having improved stability as a result of said pretreatment, said method comprising pre-treating pigment material, prior to grinding, in the following steps:

a) forming a coating mix by mixing uncoated pigment material with from 0.25 to 20 weight % based on said pigment material of a hydrophobic pigment coating mixture and with from one-third to ten times the weight of said pigment material of an organic hydrophobic pigment paste solvent, said hydrophobic pigment coating mixture comprising:

i) one part of a hydrophobic carboxylic acid having from 3 to 18 carbon atoms;

ii) from 0.1 to 10 parts by weight of a non-toxic carboxylic acid metal salt also having from 3 to 18 carbon atoms; and

iii) from 0.5 to 10.0 parts based on the combined weight of said acid and said acid salt of a pigment-coating carrier resin; and

b) aging said coating mix for from about 5 to about 30 hours, being time sufficient to coat said pigment material with said hydrophobic pigment coating mixture and provide good stability of a nail enamel suspension incorporating said coated pigment material.

5,470,563

ALLEVIATING SKIN IRRITATION RESULTING FROM APPLYING TACKY TAPES

Hiroshi Tanaka; Toshiaki Kobayashi; Tomiyuki Nanba; Masaaki Ishiwatari; Toshio Yoneyama; Kimio Ohno; Takashi Matsumoto; Tetsuya Kanbe; Takashi Isa, and Yoshiyuki Ogusu, all of Yokohama, Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

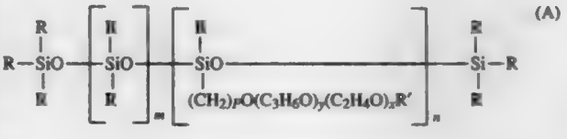
Continuation of Ser. No. 107,128, Oct. 9, 1987, abandoned. This application Nov. 28, 1989, Ser. No. 442,376

Claims priority, application Japan, Nov. 6, 1986, 61-264725; Nov. 6, 1986, 61-264726; Nov. 7, 1986, 61-265307; Feb. 4, 1987, 62-24380

Int. Cl.[6] A61K *7/032;7/135;7/155;9/70;47/34;* A61L *15/58;15/26;* C08J *11/08*

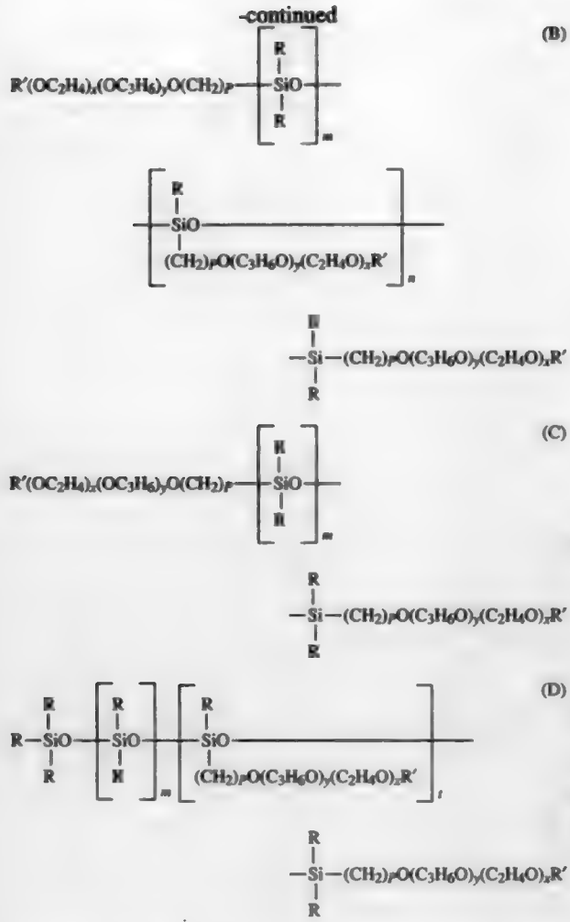
U.S. Cl. 424—448 4 Claims

1. In the application to the skin of a tacky tape or sheet with attendant skin irritation, the method of alleviating such skin irritation which comprises employing as said tacky tape or sheet one comprising a tacky layer having incorporated therein a skin irritation alleviation agent consisting essentially of 0.1 to 90% by weight of a polyoxyalkylene-modified organopolysiloxane having an average molecular weight of 3000 or more and having the formula (A), (B), (C), or (D):



(A)

-continued



wherein R is an alkyl group having 1 to 3 carbon atoms or phenyl, R' is hydrogen or an alkyl group having 1 to 12 carbon atoms, p is an integer of 1 to 5, m is an integer of 5 to 100, n and x are each an integer of 1 to 50, and t and y are each an integer of 0 to 50.

5,470,564

METHOD FOR PRODUCING CARO'S ACID

James L. Manganaro, Princeton; Martin E. Sacks, East Windsor, both of N.J., and James Carmichael, Buffalo, N.Y., assignors to FMC Corporation, Philadelphia, Pa.

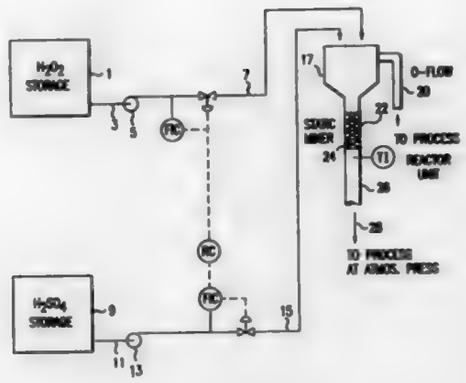
Continuation-in-part of Ser. No. 283,348, Aug. 1, 1994. This application Dec. 8, 1994, Ser. No. 351,987

The portion of the term of this patent subsequent to Aug. 8, 2012, has been disclaimed.

Int. Cl.[6] C01B *17/98*

U.S. Cl. 423—521 **12 Claims**

1. A process for producing Caro's acid by reacting sulfuric acid having a concentration of at least about 85% by weight and hydrogen peroxide having a concentration of at least about 50% by weight, wherein the hydrogen peroxide is introduced through a first feed line and the sulfuric acid is introduced through a second feed line into a funneling zone open to the atmosphere, the first feed line and second feed line having air gaps between their ends and the funneling zone, passing said hydrogen peroxide and sulfuric acid by gravity flow from said funneling zone into one end of a reaction zone that has been sized to permit a pressure drop therein which is at least 8 times the theoretical pressure drop for liquids flowing through such reaction zone and removing a mixture containing Caro's acid from an exit end of the reaction zone.



5,470,565

COMPOSITION FOR STRENGTHENING ACID RESISTANCY OF TEETH

Fumiko Hayakawa, Otsu; Takashi Ando, Kusatsu; Takahide Kimura, Otsu, and Yukihiko Hara, Fujieda, all of, Japan, assignors to Mitsui Norin Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1994, Ser. No. 216,174

Claims priority, application Japan, Apr. 19, 1993, 5-114217

Int. Cl.[6] A61K *7/16;7/18;7/26*

U.S. Cl. 424—52 **16 Claims**

1. A composition in the form of a toothpaste, a tooth powder or a mouthwash for strengthening acid resistancy of teeth consisting essentially of at least one tea polyphenol, a fluoride and an aluminum salt selected from the group consisting of aluminum nitrate, aluminum sulfate and aluminum lactate.

5,470,566

SOLID ORAL ANTICARIOGENIC COMPOSITION

Claude E. Lützen, Vejle, Denmark, assignor to Fertin Laboratories A/S (Dansk Tyggegummi Fabrik A/S), Dandyvej

Continuation of Ser. No. 27,936, Mar. 8, 1993, abandoned, which is a continuation of Ser. No. 799,869, Nov. 27, 1991, abandoned, which is a continuation of Ser. No. 445,903, Dec. 4, 1989, abandoned, which is a continuation of Ser. No. 396, Jan. 5, 1987, abandoned. This application Mar. 9, 1995, Ser. No. 402,774

Claims priority, application Denmark, May 10, 1985, 2092/85

Int. Cl.[6] A61K *7/16;7/22*

U.S. Cl. 424—54 **2 Claims**

1. A solid, oral, anticariogenic, chewable piece of chewing gum comprising:

a chewing gum base made from at least one substance selected from the group consisting of natural or synthetic gum bases of the families Sapotaceae, Apocynaceae, Moraceae, Euphorbiaceae, natural rubber, butadiene-styrene rubber, isobutylene-isoprene copolymer, paraffin, petroleum wax, polyethylene, polyisobutylene and polyvinyl acetate;

taste enhancers selected from the group consisting of peppermint, wintergreen, eucalyptus, spearmint, fruit flavors, sorbitol, xylitol, Lycasin®, glycerol, aspartame, saccharine, and cyclamate as well as mixtures thereof; and

urea for neutralizing acid in dental plaque subsequent to eating or drinking, said urea being present in an amount in the range of 5–30 mg per said piece of chewing gum.

5,470,567

SYNERGISTIC SKIN DEPIGMENTATION COMPOSITION

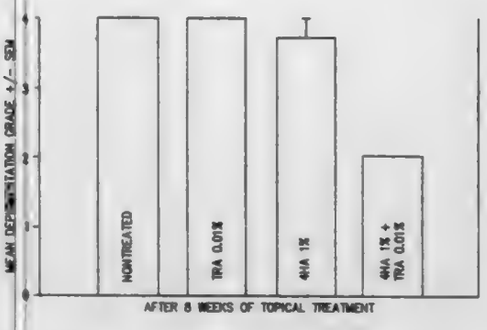
Xina Nair, E. Amherst, and Kenneth M. Tramposch, Williamsville, both of N.Y., assignors to Bristol Myers Squibb Company, New York, N.Y.

Continuation of Ser. No. 812,600, Dec. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 554,904, Jul. 24, 1990, Pat. No. 5,194,247, which is a continuation-in-part of Ser. No. 397,921, Aug. 24, 1989, abandoned. This application Oct. 25, 1993, Ser. No. 141,503

The portion of the term of this patent subsequent to Mar. 16, 2020, has been disclaimed.

Int. Cl.[6] A61K *31/07*

U.S. Cl. 424—59 8 Claims



1. A synergistic composition for skin depigmentation free of corticosteroid comprising:

(a) 4-hydroxyanisole in an amount from about 0.1% to about 2% by weight;

(b) a retinoid selected from the group consisting of all-trans retinoic acid in an amount from about 0.001% to about 0.1% by weight, (N-acetyl-4-aminophenyl) retinoate in an amount from about 0.001% to about 0.01%, and 11-cis, 13-cis-12 -hydroxymethyl retinoic acid δ-lactone in an amount from about 0.001% to about 0.1% by weight; and

(c) a dermatologically acceptable carrier.

5,470,568

METHODS AND COMPOSITIONS OF A POLYMER (POLOXAMER) FOR CELL REPAIR

Raphael C. Lee, Chicago, Ill., assignor to Arch Development Corporation, Chicago, Ill.

Filed Feb. 13, 1992, Ser. No. 835,271

Int. Cl.[6] A61K *9/06;9/12;31/77*

U.S. Cl. 424—78.02 40 Claims

1. A method of reducing animal tissue damage due to radiation comprising treating tissue with a composition consisting essentially of an amount of a surface active copolymer, selected from the group consisting of poloxamer, meroxapol, poloxamine and a polyol of trimethylolpropane and polyoxyethylene, that is effective to reduce radiation damage to said tissue by stabilizing cellular membranes or reducing membrane permeability, the surface active copolymer having a molecular weight of between about 2,000 and about 20,000 Daltons and from about 45% to 95% hydrophobic groups by weight of the copolymer; a high energy phosphate compound; and a pharmaceutically acceptable carrier, wherein said composition is administered either before, during or after the tissue's exposure to a radiation source.

5,470,569

RECOMBINANT COLONY STIMULATING FACTOR-1

Ernest S. Kawasaki, Richmond; Martha B. Ladner, Oakland; Janelle N. Van Arsdell, Richmond; Alice M. Wang, Lafayette; Peter Ralph, Orinda; Mazie Y. Coyne, Danville, all of Calif., and Mary K. Warren, Rockville, Md., assignors to Cetus Oncology Corporation, Emeryville, Calif.

Continuation of Ser. No. 794,822, Nov. 18, 1991, abandoned, which is a continuation of Ser. No. 358,394, May 26, 1989, abandoned, which is a division of Ser. No. 157,094, Feb. 9, 1988, Pat. No. 4,847,201, which is a continuation-in-part of Ser. No. 821,068, Jan. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 756,814, Jul. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 744,924, Jun. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 728,834, Apr. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 698,359, Feb. 5, 1985, abandoned. This application Mar. 14, 1994, Ser. No. 212,300

Int. Cl.[6] A61K *38/19;* C07K *14/535*

U.S. Cl. 424—85.1 8 Claims

1. A purified, homogeneous, recombinant, non-glycosylated human CSF-1 protein preparation that is substantially free from other human proteins, wherein said protein, in its active form, is capable of stimulating the formation of primarily macrophage colonies in a standard in vitro CSF-1 assay consisting of the amino acid sequence set out in FIGS. 5-1 and 5-2 from position 1 to position 158.

2. A purified, homogeneous, recombinant human CSF-1 protein preparation in accordance with claim 1, wherein the protein has the amino acid sequence set out in FIGS. 5-1 and 5-2 from position 1 to position 150.

5,470,570

MAMMALIAN PRIMATE ERYTHROCYTE BOUND HETEROPOLYMERIZED MONOCLONAL ANTIBODIES AND METHODS OF USE THEREOF

Ronald P. Taylor, Charlottesville; William M. Sutherland, Earlysville; Craig Reist, Charlottesville; Eleanor L. Wright, Earlysville; Donna Webb, and Ronald Labuguen, both of Charlottesville, all of Va., assignors to University of Virginia Patent Foundation, Charlottesville, Va.

Continuation of Ser. No. 592,801, Oct. 4, 1990, abandoned. This application Dec. 6, 1993, Ser. No. 161,812

Int. Cl.[6] A61K *35/18;39/395;39/40;39/42*

U.S. Cl. 424—93.73 7 Claims

1. A primate erythrocyte bound to a first monoclonal antibody at a CR1 receptor site for which said first monoclonal antibody is specific, said monoclonal antibody being cross-linked to a second monoclonal antibody specific for an antigen present in the primate circulatory system, said antigen being selected from the group consisting of virus, a microorganism and a protein, said primate erythrocyte bearing said first monoclonal antibody cross-linked to said second monoclonal antibody being effective for clearance of said antigen, in vivo, from said circulatory system.

5,470,571

METHOD OF TREATING HUMAN EGF RECEPTOR-EXPRESSING GLIOMAS USING RADIOLABELED EGF RECEPTOR-SPECIFIC MAB 425

Meenhard Herlyn, Wynnwood, and Ulrich Rodeck, Philadelphia, both of Pa., assignors to The Wistar Institute, Philadelphia, Pa.

Continuation of Ser. No. 149,100, Jan. 27, 1988, abandoned. This application Apr. 24, 1990, Ser. No. 513,668

Int. Cl.[6] A61K *51/10;39/395;* C07K *16/30*

U.S. Cl. 424—1.49 1 Claim

1. A method of treating a human patient having an EGF-receptor-expressing glioma, comprising:

administering MAb 425, which is produced by the cell line deposited at the American Type Culture Collection as Accession No. HB 9629, to the patient, wherein MAb 425 is radiolabelled.

5,470,572

NON-INFECTIOUS SIMIAN IMMUNODEFICIENCY VIRUS PARTICLES PRODUCED BY CELL LINE CRL 11393

Edmundo Kraiselburd, Santurce, Puerto Rico, assignor to University of Puerto Rico, San Juan, Puerto Rico

Filed Jul. 16, 1993, Ser. No. 93,336

Int. Cl.[6] A61K *39/21;* **C12N** *7/00;5/10;* **C07K** *14/155*

U.S. Cl. 424—208.1 **15 Claims**

1. Non-infectious SIV viral particles produced by the cell line having ATCC accession number CRL 11393.

5,470,573

IMMUNOGENS COMPRISING THE NON-LYTIC MEMBRANE SPANNING DOMAIN OF BACTERIOPHAGES MS2 OR PHIX174

Werner Lubitz, and Michael P. Szostak, both of Munich, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

PCT No. PCT/EP91/00306, § 371 Date Sep. 30, 1992, § 102(e) Date Sep. 30, 1992, PCT Pub. No. WO91/13155, PCT Pub. Date Sep. 5, 1991

PCT Filed Feb. 19, 1991, Ser. No. 924,028

Int. Cl.[6] A61K *39/02;39/108;* **C07K** *14/195;14;245*

U.S. Cl. 424—200.1 **8 Claims**

1. Immunogen comprising a non-lytic fusion protein bound to a portion of a gram negative bacterial cell membrane, wherein said fusion protein comprises:

(i) one hydrophobic, non-lytically active protein domain capable of integration into a gram negative bacterial cell membrane wherein said hydrophobic, non-lytically active protein domain is selected from the group consisting of: (a) amino acids 1 to 54 of protein E of phage Phix174, and (b) amino acids 21 to 75 of protein L of phage MS2, and

(ii) a protein foreign to a gram negative bacteria in which said fusion protein is expressed.

5,470,574

ACTIVE PRINCIPLE ISOLATED FROM SHARK TISSUE

Takuo Kosuge; Kuniro Tsuji; Hitoshi Ishida, and Yoshiki Kosuge, all of Shizuoka, Japan, assignors to J. W. Broadbent Nominees Pty. Ltd., Melbourne, Australia

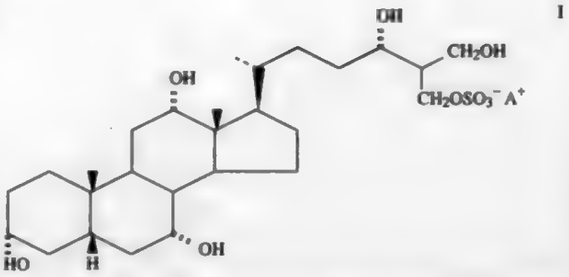
Continuation of Ser. No. 818,470, Jan. 6, 1992, abandoned, which is a continuation of Ser. No. 622,013, Jan. 14, 1991, abandoned, which is a division of Ser. No. 328,040, Mar. 29, 1989, Pat. No. 5,026,883. This application Dec. 20, 1993, Ser. No. 169,761

Claims priority, application Australia, Aug. 21, 1986, PH7614

Int. Cl.[6] A61K *7/00;35/60*

U.S. Cl. 424—401 **10 Claims**

1. A composition for the treatment of the skin consisting essentially of, as active ingredient, a compound of the general formula I,



I

wherein A is a cation selected from the group consisting of sodium, potassium, calcium, ammonium or an organic amine, together with a lotion or cream base carrier for topical application.

5,470,575

Patent Not Issued For This Number

5,470,576

PROCESS FOR PREPARING THE ALGINATE-CONTAINING WOUND DRESSING

Harish A. Patel, Norfolk, Mass., assignor to The Kendall Company, Mansfield, Mass.

Division of Ser. No. 894,966, Jun. 8, 1992, abandoned. This application Oct. 4, 1993, Ser. No. 130,814

Int. Cl.[6] A61L *15/00*

U.S. Cl. 424—445 **4 Claims**

1. A process for preparing a wound dressing containing calcium alginate consisting of the steps of impregnating an absorbent fabric with an aqueous solution of sodium alginate; thereafter introducing the sodium alginate-impregnated fabric into an aqueous solution of calcium chloride to convert the sodium alginate to calcium alginate; washing the calcium alginate-containing fabric with deionized water; drying the calcium alginate-containing fabric; and thereafter mechanically softening the fabric to provide a soft, highly pliant wound dressing.

3. A process for preparing an alginate-containing wound dressing comprising the steps of:

coating a mixture of sodium and calcium alginate with ethyl alcohol to prevent the alginate from gelling immediately on contact with water;

thereafter adding deionized or distilled water to the ethyl alcohol-coated alginate mixture to form an alginate solution;

impregnating a woven or nonwoven fabric with the alginate solution;

drying the fabric impregnated with the mixture of sodium and calcium alginate; and thereafter

mechanically softening the fabric to provide a soft, pliant wound dressing.

5,470,577

STIMULATION OF TANNING BY DNA FRAGMENTS OR SINGLE-STRANDED DNA

Barbara A. Gilchrest, Brookline; Mina Yaar, Sharon, and Mark Eller, Boston, all of Mass., assignors to Trustees of Boston University, Boston, Mass.

Filed Jul. 7, 1993, Ser. No. 88,251

Int. Cl.[6] A61K *37/22;9/50*

U.S. Cl. 424—450 **8 Claims**

1. A method of increasing pigmentation in mammalian epidermal cells, comprising applying to the epidermal cells DNA fragments selected from the group consisting of: single-stranded DNA fragments, double-stranded DNA fragments, a mixture of single-

and double-stranded DNA fragments, and deoxynucleotides, in a sufficient quantity and under conditions appropriate for the DNA fragments or deoxynucleotides to enter into or interact with the epidermal cells and stimulate enhanced melanin production in melanocytes.

5,470,578

ANTIRHEUMATIC COMPOSITION

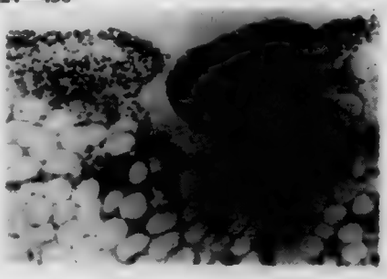
Shigehisa Aoki; Shinichi Iwasaki, both of Aichi; Nobuo Sugiura, Gifu; Sakaru Suzuki, and Koji Kimata, both of Aichi, all of, Japan, assignors to Seikagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1993, Ser. No. 98,936

Claims priority, application Japan, Jul. 30, 1992, 4-203558

Int. Cl.[6] A61K *37/22;9/48;31/715;* **C07H** *5/06*

U.S. Cl. 424—450 **9 Claims**



1. A method of treating rheumatism which comprises administering to mammals suffering from rheumatism a composition comprising between 0.1 to 80% lipid-bound glycosaminoglycan (gag) or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable carrier, wherein said composition is administered in a dose of 0.1 to 2,000 mg/adult once a day or within several weeks.

5,470,579

XANTHINES, OPTIONALLY INCORPORATED IN LIPOSOMES, FOR PROMOTING SKIN OR HAIR PIGMENTATION

Frédéric Bonte, Courbevoie; Marc Dumas, Colombes; Alain Meybeck, Courbevoie, and Christian Marechal, Paris, all of, France, assignors to LVMH, Recherche, Colombes Cedex, France

Continuation of Ser. No. 859,734, May 27, 1992, abandoned. This application Apr. 22, 1994, Ser. No. 231,881

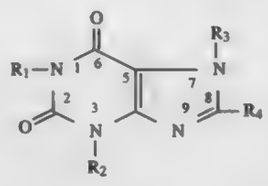
Claims priority, application France, Nov. 28, 1989, 89 15653

Int. Cl.[6] A61K *9/127;7/42*

U.S. Cl. 424—450 **43 Claims**

1. A method of treating the skin or hair for promoting pigmentation, said method comprising applying to said skin or hair to be pigmented, in an amount effective to producing pigmentation, at least one xanthine component incorporated in liposomes or in hydrated lipidic lamellar phases,

(a) where in the xanthine has the formula (I) below:

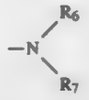


in which:

R_1 and R_2 are identical or different and are each a hydrogen atom, a linear or branched alkyl radical having from 1 to 8 carbon atoms or a cyclo alkyl radical having from 3 to 8 carbons atoms, an alkenyl radical with a linear or branched chain having from 2 to 5 carbon atoms, an alkynyl radical having from 2 to 3 carbon atoms or an aralkyl radical having from 7 to 12 carbon atoms, said alkyl, alkenyl and aralkyl radicals being unsubstituted or substituted by one or more halogen atoms or by one or more groups—OR_5 in which R_5 is a hydrogen atom or an alkyl radical having from 1 to 6 carbon atoms,

R_3 is a hydrogen atom, an alkyl radical having from 1 to 4 carbon atoms or a benzyl radical, said alkyl radical being unsubstituted or substituted by heterocyclic radical morpholin-4-yl piperidin-1-yl radical or by one or more halogen atoms or hydroxyl groups, and

R_4 is a hydrogen or halogen atom, a linear or branched alkyl radical having 1 to 6 carbon atoms a cycloalkyl radical having 3–6 carbon atoms, radical being unsubstituted or substituted by one or more halogen atoms hydroxyl, methoxy, carbomethoxy or amino groups, or, R_4 is the group:



in which R_6 and R_7 independently are a hydrogen atom or an alkyl radical having from 1 to 6 carbon atoms, or, R_6 and R_7 form together with said nitrogen atom, a piperidin-1-yl, said alkyl radicals being unsubstituted or substituted by one or more halogen atoms or hydroxyl, methoxy., carbomethoxy or amino groups, or

(b) a pharmaceutically or cosmetically acceptable salt of said xanthine of formula (I).

5,470,580

DIRECTLY-COMPRESSIBLE NAPROXEN OR NAPROXEN SODIUM COMPOSITIONS

Roy Kuramoto, Redwood City; Zakauddin T. Chowhan, Sunnyvale; Ranal O. Pendleton, Palo Alto, all of Calif., and Hafez Hafezzadeh, Boulder, Colo., assignors to Syntex Pharmaceuticals International Limited, Palo Alto, Calif.

Division of Ser. No. 878,145, May 4, 1992, Pat. No. 5,358,717, which is a continuation-in-part of Ser. No. 759,783, Aug. 27, 1991, abandoned, which is a continuation of Ser. No. 455,109, Dec. 22, 1989, abandoned. This application Jul. 6, 1994, Ser. No. 271,339

Int. Cl.[5] A61K *9/16;9/20*

U.S. Cl. 424—464 **45 Claims**

1. A directly-compressible naproxen composition consisting essentially of 90 to 97% spray-dried naproxen, 0.5 to 1.5% free moisture content, 1 to 6% binder, 1 to 6% disintegrating agent, and 0.1 to 2.0% lubricant.

5,470,581

AQUEOUS MALTODEXTRIN AND CELLULOSIC POLYMER FILM COATINGS

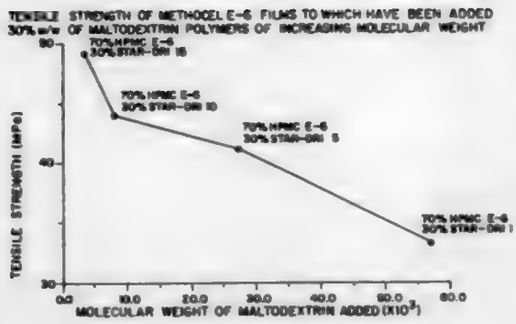
Susan M. Grillo, Quakertown; Rita M. Steffenino, Green Lane; Diane C. Kunkle, and Kathleen Saraceni, both of Lansdale, all of Pa., assignors to Berwind Pharmaceutical Services, Inc., West Point, Pa.

Continuation of Ser. No. 504,677, Apr. 4, 1990, abandoned. This application Dec. 15, 1992, Ser. No. 991,477

Int. Cl.[6] A61K *9/36*

U.S. Cl. 424—479 **62 Claims**

1. A method of coating substrates from the group consisting of pharmaceutical tablets, food and confectionery forms, and agricultural seeds, with a protective film comprising the steps of mixing a film former, the film former including a film forming amount of cellulosic polymer and a film forming amount of maltodextrin, and a plasticizer into water to form an aqueous coating suspension, the cellulosic polymer being in a range of greater than 5% to about



90% by weight of the non-water ingredients of the aqueous coating suspension, the maltodextrin being in a range of about 5% to about 78.5% by weight of the non-water ingredients of the aqueous coating suspension, and the plasticizer being in a range of about 2.5% to about 20% by weight of the non-water ingredients of the aqueous coating suspension, applying an effective amount of said coating suspension onto said substrates to form a film coating of the film former on said substrates, and drying the film coating on said substrates.

5,470,582

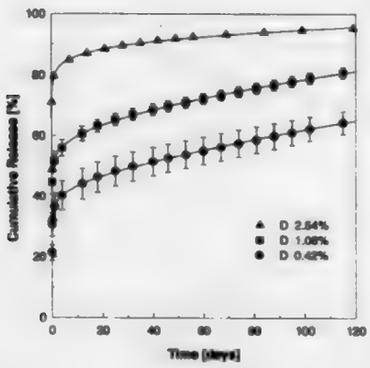
CONTROLLED DELIVERY OF PHARMACEUTICALS FROM PREFORMED POROUS POLYMERIC MICROPARTICLES

Andreas Supersaxo, Basel, Switzerland, and Jim H. Kou, Palo Alto, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 832,527, Feb. 7, 1992, abandoned. This application Feb. 5, 1993, Ser. No. 18,850

Int. Cl.[6] A61K *9/52*

U.S. Cl. 424—489 **15 Claims**



1. A controlled release pharmaceutical composition comprising a physiologically active agent dispersed in preformed porous polymeric microparticles, said polymeric microparticles selected from the group consisting of polyesters, polyamides. polyanhydrides and polyacrylates, wherein said agent is present in an amount from about 0.0001% to about 2% weight, each of said porous microparticles having a plurality of preformed pores into which active agent is loaded and from which active agent is released to the environment of use, said composition being capable of delivering physiologically effective amounts of active agent for at least about thirty days.

5,470,583

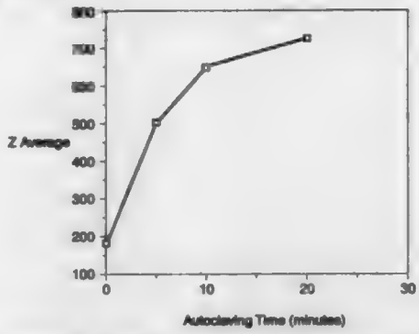
METHOD OF PREPARING NANOPARTICLE COMPOSITIONS CONTAINING CHARGED PHOSPHOLIPIDS TO REDUCE AGGREGATION

George C. Na, Fort Washington, and Natarajan Rajagopalan, Phoenixville, both of Pa., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 989,281, Dec. 11, 1992, Pat. No. 5,336,507. This application May 10, 1994, Ser. No. 240,309

Int. Cl.[6] A61K *9/14*

U.S. Cl. 424—489 **10 Claims**



1. A method of making a sterilized composition comprised of nanoparticles which do not agglomerate during sterilization, wherein the nanoparticles are comprised of a therapeutic or diagnostic agent having 0.1 to 90% by weight of said nanoparticles of a non-ionic surfactant as a surface modifier adsorbed on the surface of said therapeutic or diagnostic agent, said nanoparticles having from 0.005 to 20% by weight of said composition of a charged phospholipid as a cloud point modifier on the surface of said nanoparticles, said method comprised of contacting said nanoparticles having said non-ionic surfactant adsorbed thereon with a solution of the cloud point modifier and said sterilization is performed by stream heat autoclaving.

5,470,584

DILTIAZEM FORMULATION

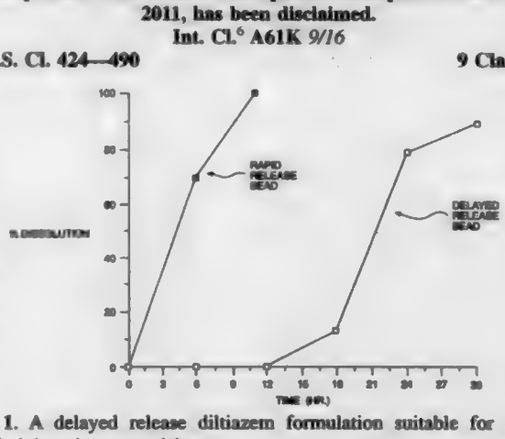
Dennis L. Hendrickson, Overland Park, Kans.; Dan C. Dimmitt, Belton; Mark S. Williams, Kansas City, both of Mo.; Paul F. Skultety, Leawood, Kans., and Michael J. Baltezor, Lees Summit, Mo., assignors to Carderm Capital L.P., Thalwil, Switzerland

Continuation of Ser. No. 164,062, Dec. 8, 1993, Pat. No. 5,439,689, which is a continuation of Ser. No. 58,534, May 6, 1993, Pat. No. 5,286,497, which is a continuation of Ser. No. 872,572, Apr. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 702,567, May 20, 1991, abandoned. This application Feb. 27, 1995, Ser. No. 394,573

The portion of the term of this patent subsequent to Feb. 15, 2011, has been disclaimed.

Int. Cl.[6] A61K *9/16*

U.S. Cl. 424—490 **9 Claims**



1. A delayed release diltiazem formulation suitable for oral administration comprising:

a) a central core containing an effective amount of diltiazem or a pharmaceutically acceptable salt thereof, optionally in association with pharmaceutically acceptable excipients, and;

b) a sufficient quantity of a suitable polymeric coating material which substantially envelops said diltiazem core so that said diltiazem bead exhibits the following in-vitro dissolution profile when measured in a type 2 dissolution apparatus (paddle), according to U.S. Pharmacopoeia XXII, at 37 ° C. in 0.1NHCl at 100 rpm:

a) from 0–15% of total diltiazem is released after 12 hours in said apparatus;

b) from 0–45% of total diltiazem is released after 18 hours of measurement in said apparatus, and;

c) not less than 45% of total diltiazem is released after 24 hours of measurement in said apparatus.

5,470,585

MEDICINAL SUBSTANCE FOR TOPICAL APPLICATION

Thomas Gilchrist, Ayr, Scotland, assignor to Giltech Limited, Scotland

Continuation of Ser. No. 121,411, Sep. 15, 1993, abandoned, which is a continuation of Ser. No. 688,546, Jun. 10, 1991, abandoned. This application Apr. 12, 1995, Ser. No. 421,005

Claims priority, application United Kingdom, Jan. 27, 1989, 8901846; Feb. 8, 1989, 8902785; Mar. 2, 1989, 8904806

Int. Cl.[6] A01N *59/16;59/26;* **A61F** *13/00*

U.S. Cl. 424—604 **7 Claims**

1. A medicinal substance capable of retarding bacterial growth at a surface of a body comprising a water-soluble glass comprising phosphorus pentoxide as a glass-forming substance, said glass containing silver orthophosphate and means to maintain the substance in contact with a surface of a body.

5,470,586

ANTIFOULING COATING AND METHOD FOR USING SAME

Donald J. Gerhart, Hillsborough, N.C., assignor to Duke University, Durham, N.C.

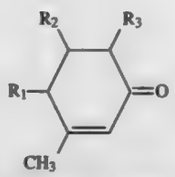
Division of Ser. No. 961,159, Oct. 15, 1992, Pat. No. 5,334,389. This application Apr. 11, 1994, Ser. No. 226,287

Int. Cl.[6] A01N *59/00;59/16;59/20;59/24;35/06;* **B63B** *59/04*

U.S. Cl. 424—609 **12 Claims**

8. A method of combatting the attachment of barnacles to an article having an underwater surface comprising;

(a) coating the underwater surface with a composition containing a compound of Formula I:



(I)

wherein R_1, R_2 and R_3 are each independently hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, halogen, or hydroxyl groups, in an amount effective to control the attachment of barnacles to said surface; and then

(b) contacting said barnacles with a compound of Formula I.

5,470,587

COMPOSITION AND METHOD FOR TREATMENT OF PATULOUS EUSTACHIAN TUBE SYNDROME AND ATROPHIC RHINITIS

Joseph R. Di Bartolomeo, 2420 Castillo St., Santa Barbara, Calif. 03105-4346

PCT No. PCT/US91/09264, § 371 Date May 23, 1994, § 102(e) Date May 23, 1994, PCT Pub. No. WO92/19103, PCT Pub. Date Nov. 12, 1992

Continuation-in-part of Ser. No. 692,486, Apr. 29, 1991, abandoned. This PCT application Dec. 10, 1991, Ser. No. 140,072

Int. Cl.[6] A61K *33/14*

U.S. Cl. 424—661 **17 Claims**

1. A method of treating patulous Eustachian tube syndrome, comprising applying to a person's nasal mucosa a solution comprised of hydrochloric acid, a pharmaceutically acceptable mild topical anaesthetic selected from the group consisting of benzyl alcohol and chlorobutanol, and a pharmaceutically acceptable liquid carrier in therapeutically effective amounts to treat patulous Eustachian tube syndrome.

5,470,588

METHOD OF INCREASING VAGINAL LUBRICATION

Susann R. Reilly, 300 Commercial St., Apt. #412, Boston, Mass. 02109

Continuation-in-part of Ser. No. 862,454, Apr. 2, 1992, Pat. No. 5,231,423. This application Dec. 20, 1993, Ser. No. 170,151

The portion of the term of this patent subsequent to Jan. 25, 2011, has been disclaimed.

Int. Cl.[6] A61K *33/36*

U.S. Cl. 424—667 **4 Claims**

1. A method of increasing vaginal lubrication in an adult human female in need of said treatment, said treatment consisting essentially of increasing the amount of transudate present in the vagina, comprising orally administering to the female an effective amount of hydriodic acid syrup.

5,470,589

HARDENING AGENT FOR AFFECTED TISSUES OF THE DIGESTIVE SYSTEM

Zhao-Qi Shi, Peking, China, assignor to Traditional Chinese Medicine Research Laboratory, Inc., Matsuyama, Japan

Continuation of Ser. No. 690,762, Apr. 24, 1991, Pat. No. 5,252,344. This application Jul. 7, 1993, Ser. No. 86,853

Claims priority, application Japan, Apr. 25, 1990, 2109787; Apr. 19, 1991, 3115319

Int. Cl.[6] A61K *33/06;31/70;47/12;35/78*

U.S. Cl. 424—698 **4 Claims**

1. An injectable preparation for hardening the tissue of digestive organs comprising a tissue-hardening effective amount of tannic acid and potassium aluminium sulfate as well as a stabilizing agent extracted from crude drugs of plants selected from the group consisting of *Zingberis rhizoma, Mori folium,* Schinsandrae cortex, Carthami sage, thyme, marjoram, oregano, clove, ginger, nutmeg, mace, turmeric, cinnamon, pepper and combinations thereof.

5,470,590

REUSABLE DIE SHAPE FOR THE MANUFACTURE OF MOLDED CUSHIONS

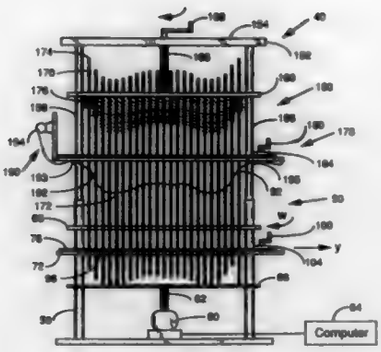
Clifford E. Brubaker, Pittsburgh; David M. Brienza, Allison Park, both of Pa., and Michael J. Brienza, Easton, Conn., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Jan. 31, 1994, Ser. No. 189,490

Int. Cl.[6] B28B *7/02*

U.S. Cl. 425—2 **37 Claims**

1. An apparatus for forming a contoured article, comprising:



first means for forming a negative surface profile of a contoured surface, said first means including a plurality of first rods;

second means for forming a positive surface profile of the contoured surface, wherein said second means comprises a plurality of second rods, each of said second rods having a first end and a deformable member in contact with each of the first ends, each of said plurality of said first rods adapted to be positioned in contact with an opposed deformable member of said second means forming said positive surface profile of the contoured surface, said plurality of first rods thereby defining said negative surface profile;

locking means located adjacent each of said second rods, said locking means adapted to fix the position of each of said second rods, thereby defining said positive surface profile of the contoured surface; and

means for developing contoured surface profile data and establishing said positive surface profile of the contoured surface by activating and deactivating said locking means adapted to fix the position of each of said second rods.

5,470,591

SWEETENING SYRUP BASED ON MALTITOL AND CONFECTIONERY USING THIS SYRUP

Guillaume Ribadeau-Dumas, Lambersart; Catherine Founche, Sailly Labourse, and Michel Serpelloni, Beuvry les Bethune, all of, France, assignors to Roquette Freres, France

Filed Feb. 16, 1994, Ser. No. 197,476

Claims priority, application France, Feb. 16, 1993, 93 01738; Feb. 18, 1993, 93 01864

Int. Cl.[6] A23G *3/00;3/30*

U.S. Cl. 426—3 **16 Claims**

1. In a process of manufacturing a maltitol based confectionery, the improvement comprising adding an agent for controlling propagation of crystallization of maltitol, said agent consisting of molecules having a molecular weight greater than about 1,300 daltons, said molecules being selected from the group consisting of:

linear or branched hydrogenated polysaccharides obtained from native or modified starch,

non hydrogenated or hydrogenated polysaccharides obtained from hydrolysis of dextrin,

non hydrogenated polyglucoses or hydrogenated polyglucoses.

5,470,592

APPARATUS FOR GENERATING CLAMPING FORCE IN INJECTION MOLDING MACHINES

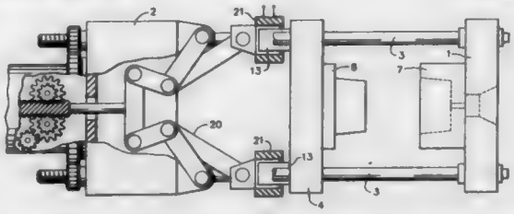
Reinhard Steger, Freiburg, Germany, assignor to Ferromatik Milacron Maschinenbau GmbH, Malterdingen, Germany

Filed Oct. 7, 1994, Ser. No. 319,705

Claims priority, application Germany, Jan. 27, 1993, 43 36 572.8

Int. Cl.[6] B29C *45/64*

U.S. Cl. 425—3 **8 Claims**



1. Apparatus for generating clamping force in an injection molding machine having a stationary platen, a moving platen, an injection molding die mounted between the stationary platen and moving platen, and a traversing mechanism connected to the moving platen for opening and closing of the injection molding die, characterized in that the traversing mechanism is lockable by a locking device when the injection molding die is closed, and at least one element consisting of a positively magnetostrictive material is provided between the traversing mechanism and one of the platens, each element being enclosed by a magnetic coil that generates an alternating magnetic field.

5,470,593

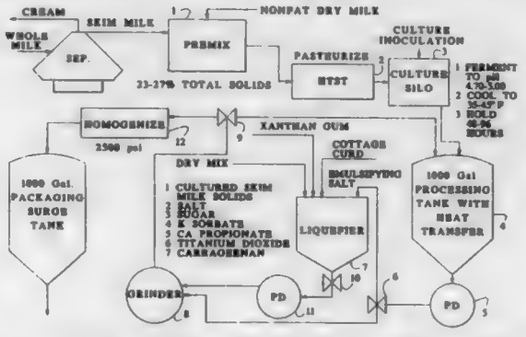
PROCESS FOR THE MANUFACTURE OF A FAT FREE CREAM CHEESE PRODUCT

John H. Mellinger; C. Gordon Brown, both of St. Louis, and Montgomery A. Bohanan, Grover, all of Mo., assignors to Raskas Foods Inc., Clayton, Mo.

Filed Feb. 22, 1994, Ser. No. 199,622

Int. Cl.[6] A23C *19/076*

U.S. Cl. 426—36 **19 Claims**



1. A process for making a cultured fat-free cream cheese product comprising the steps of:

(a) inoculating a pasteurized mixture comprising non-fat milk, said pasteurized mixture having a solid matter content ranging between about 23% wt. and about 27% wt., with a dairy starter culture so as to form an inoculated mixture;

(b) fermenting said inoculated mixture at a temperature ranging between about 68° F. and about 110° F. so as to obtain a fermented mixture having a pH ranging between about 4.7 and about 5.0;

(c) cooling said fermented mixture to a temperature ranging between about 35° F. and about 45° F. and allowing said fermented mixture to sit at said temperature for a period ranging between about 48 and about 96 hours so as to produce a flavor-rich precheese base;

(d) introducing a predetermined amount of said precheese base into a processing tank (4), said processing tank (4) being

connected to a liquefier tank (7) in a recirculation loop comprising a processing tank (4), positive displacement pump (5), valve (6), liquefier tank (7), valve (10), positive displacement pump (11), grinding pump (8), and valve (9);

(e) adding dry cottage cheese curd in an amount ranging between about 30% wt. and about 70% wt. and an emulsifying salt in an amount ranging between about 0.25% wt. and about 2.0% wt. into said liquefier tank (7) while recirculating said precheese base in said recirculating loop for a period ranging between about 3 and about 15 minutes and a temperature ranging between about 40° F. and about 80° F. so as to form a blended mixture;

(f) allowing the blended mixture to sit quiescently at said temperature for a period ranging between about 15 minutes and about 60 minutes;

(g) heating the blended mixture of step (f) to a temperature ranging between about 140° F. and about 180° F.;

(h) adding a stabilizing hydrocolloid in an amount ranging between about 0.2% wt. and about 2.0% wt. into said liquefier tank (7) while recirculating step (g) mixture in said recirculating loop for a period ranging between about 4 and about 12 minutes so as to form a stabilized mixture;

(i) heating the stabilized mixture to a temperature ranging between about 165° F. and about 190° F.;

(j) adding cultured skim milk solids, salt, sugar, food preservative, texturizing agent, and stabilizing hydrocolloid into liquefier (7) while recirculating said mixture of step (i) in said recirculation loop at said third predetermined temperature so as to form a final mixture; and

(k) homogenizing, packaging, and cooling said final mixture by passing said final mixture through a homogenization path (4), (5), (6), (8), (9), and (12) so as to produce said fat-free cream cheese product.

5,470,594

PAPER POUCH FOR FOOD PRODUCTS

André Di Mino, Woodcliff Lake, N.J., assignor to ADM Tronics Unlimited, Inc., Northvale, N.J.

Continuation-in-part of Ser. No. 906,431, Jun. 30, 1992, Pat. No. 5,332,586. This application May 31, 1994, Ser. No. 250,925

Int. Cl.[6] **B32B** *27/10;27/30;* **B65D** *85/72*

U.S. Cl. 426—87 **8 Claims**

1. A recyclable pouch for packaging a food product comprising two superposed plies each formed by at least one sheet of paper, each ply having an inner face coated with a layer of a water-based acrylic polymer having a low glass transition temperature, and an outer face coated with a water-based acrylic polymer having a relatively high glass transition temperature, the layers on the inner faces of the plies being in abutting relationship, said superposed plies being sealed together in a predetermined sealing pattern by heat and pressure applied thereto which brings about fusion of the inner layer but does not affect the outer layers, said sealing pattern defining an expandable interior pocket for accommodating the food product, whereby said pouch because it is composed of paper and water-based acrylic polymers is recyclable in a paper recycling facility.

5,470,595

METHOD AND SYSTEM FOR PROCESSING CHEESE

Gabriele M. Kopp, Munich; Erich Laudenbach, Starnberg, and Ahmet Anbarci, Unterhaching, all of, Germany, assignors to Kraft General Foods R&D, Inc., Rye Brook, N.Y.

Filed Feb. 22, 1994, Ser. No. 200,120

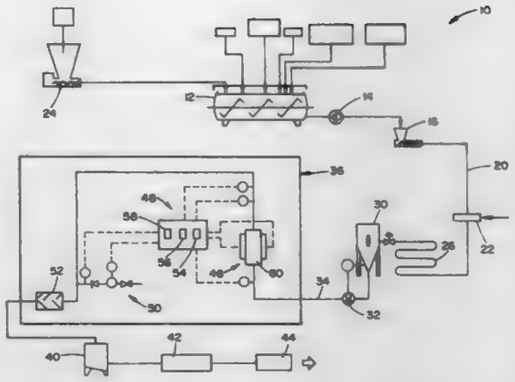
Int. Cl.[6] **A23C** *19/00;* **G01N** *22/00*

U.S. Cl. 426—231 **29 Claims**

1. A method for processing cheese, comprising:

blending cheese with additional ingredients to form a blended cheese material;

cooking the blended cheese material;



cooling the blended cheese material;

measuring a moisture content of the blended cheese material;

generating a signal representing said moisture content; and

adjusting said moisture content, in response to said signal, to a preset level;

wherein the measuring step includes the steps of

i) continuously conducting the blended cheese material through a conduit, and

ii) continuously measuring the moisture content of the blended cheese material passing through the conduit;

the generating step includes the step of continuously generating a moisture content signal representing the moisture content of the blended cheese material passing through the conduit; and

the adjusting step includes the steps of

i) generating an adjustment signal representing the difference between the moisture content of the blended cheese material and a desired moisture content level, and

ii) using the adjustment signal to adjust the moisture content of the blended cheese material to the desired moisture content level.

5,470,596

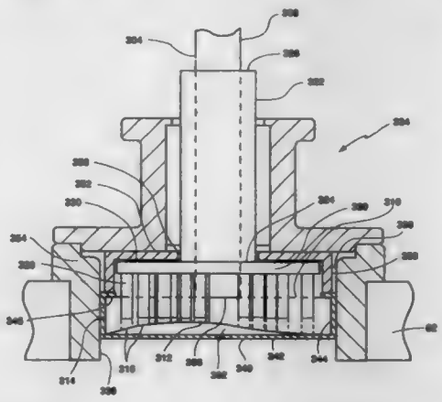
FOOD PRODUCT FORMING APPARATUS AND METHOD

James E. Jones, Golden, Colo., assignor to PRC, Englewood, Colo.

Continuation-in-part of Ser. No. 884,646, May 15, 1992, Pat. No. 5,250,314. This application Sep. 1, 1993, Ser. No. 114,960

Int. Cl.[6] **A23P** *1/00;* **A22C** *7/00*

U.S. Cl. 426—512 **21 Claims**



14. A method for forming a three-dimensional food product having upper and lower surfaces utilizing a mold and a membrane, wherein at least a portion of a mold face of said mold has a three-dimensional contour and at least a portion of said membrane is positioned over said mold face, said method comprising the steps of:

directing a flow of a raw food material toward said mold face;

substantially conforming said membrane to said contour of said mold face with said directing step to form at least a portion of the upper surface of the food product with a three-dimensional contour;

ejecting the food product from said mold using at least said membrane; and

generating a three-dimensional contour on at least a portion of the lower surface of the food product using said ejecting step.

5,470,597

ULTRA-HIGH TEMPERATURE PASTEURIZATION OF MEAT PRODUCTS

Von T. Mendenhall, Logan, Utah, assignor to Utah State University, N. Logan, Utah

Continuation-in-part of Ser. No. 131,321, Oct. 4, 1993, Pat. No. 5,366,746, which is a continuation-in-part of Ser. No. 944,792, Sep. 14, 1992, abandoned, which is a continuation of Ser. No. 573,358, Aug. 27, 1990, abandoned. This application Sep. 30, 1994, Ser. No. 316,033

Int. Cl.[6] A23L *3/00*; B65B *55/00*

U.S. Cl. 426—521 **17 Claims**

1. A method of producing pasteurized raw meat and accelerating the aging process thereof, wherein said meat can be stored for extended periods at refrigerated temperatures, comprising the steps of:

(a) treating a whole-muscle meat at ultra-high temperature of between about 900° and 1200° C. for a time sufficient to denature surface proteins, without burning, to a depth of not more than about 2 mm;

(b) aseptically packaging the ultra-high temperature treated meat in an inert atmosphere;

(c) placing the packaged meat in an incubator and aging at a temperature in the range of about 39° C. to about 47° C. for about 12 to 24 hours; and

(d) storing the packaged meat under refrigeration.

5,470,598

BETA-PRIME STABLE LOW-SATURATE, LOW TRANS, ALL PURPOSE SHORTENING

Timothy A. Scavone, Maineville, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 23, 1994, Ser. No. 216,393

Int. Cl.[6] A23D *9/00*

U.S. Cl. 426—607 **20 Claims**

1. A non-fluid, low saturate, low trans, beta-prime stable, plastic shortening comprising from about 6% to about 25% by volume, of an inert gas and from about 60% to about 94% by volume of a fat phase consisting essentially of:

(a) from about 74% to about 90% of a base oil having from 0% to about 10% trans fatty acid isomers, and less than 16% saturated C_4–C_{26} fatty acids;

(b) from about 10% to about 20% of a beta-prime hardstock consisting essentially of: at least 65% of PSP and PSS wherein PSP is 2-stearoyl 1,3-dipalmitin glyceride and PSS is 1-palmitoyl 2,3-distearin glyceride, and wherein the ratio of PSP:PSS is at least 0.8 to 1.0 and from 0 to 30% other triglycerides or synthetic fats and from 0 to 5% monoglycerides or diglycerides;

wherein said plastic shortening has an after shear viscosity greater than 72.6 Pas.

5,470,599

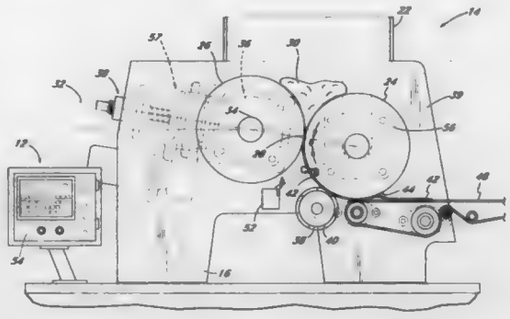
METHOD OF CONTROLLING MASA SHEET THICKNESS PRODUCED BY TORTILLA SHEETER

Thomas A. Ruhe, Fullerton, Calif., assignor to J.C. Ford Company, La Habra, Calif.

Filed Mar. 11, 1994, Ser. No. 213,241

Int. Cl.[6] A23P *1/00*

U.S. Cl. 426—231 **11 Claims**



1. A method for automatically and continuously controlling the thickness of a comestible product sheet produced by passing a comestible product between at least one pair of sheeting rollers, wherein the thickness of the comestible product sheet is substantially equal to a pinch point gap defined between opposing surface of the pair of sheeting rollers, said method comprising the steps of:

measuring the thickness of the produced comestible product sheet at a location where the produced comestible product sheet covers at least a portion of one of the sheeting rollers;

generating a first signal indicative of the thickness;

comparing the thickness indicated by said first signal to a preset thickness;

generating a second signal in response to the comparison between said thickness indicated by said first signal and said preset thickness; and

moving the sheeting rollers relative to each other in response to said second signal to change the size of the pinch point gap.

5,470,600

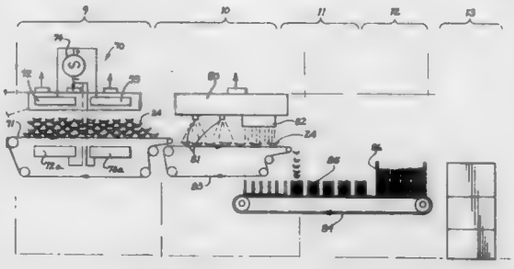
METHOD OF MAKING FAT FREE POTATO CHIPS

Joey Petelle; Karen D. Stoesz, both of Scottsdale, and Lisa R. Williams, Chandler, all of Ariz., assignors to Auburn Farms, Inc., Sacramento, Calif.

Filed Dec. 16, 1993, Ser. No. 168,640

Int. Cl.[6] A23L *1/00*; H05B *6/00*

U.S. Cl. 426—237 **21 Claims**



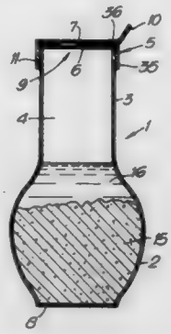
1. In a continuous process for making a cooked foodstuff without using any cooking oil including initial cooking moist food slices wherein the improvement comprises:

final cooking the food slices in a dielectric heater by subjecting the slices to long wavelength radio frequency electromagnetic waves having a predetermined wavelength sufficient to create an even controlled heating environment to heat the food slices until a predetermined final moisture content is reached.

5,470,601
CONTAINER FOR PREPARING AND USING ALCOHOLIC EXTRACTS

James P. Robertson, "Heath Hill", Hillside Road, Stromness, Orkney, KW16 3BS, United Kingdom

Continuation of Ser. No. 598,876, Oct. 19, 1990, abandoned. This application Jan. 13, 1992, Ser. No. 819,654
Claims priority, application United Kingdom, Jan. 19, 1989, 8923613
Int. Cl.[6] A23F 5/00; B65D 85/00
U.S. Cl. 426—429 17 Claims

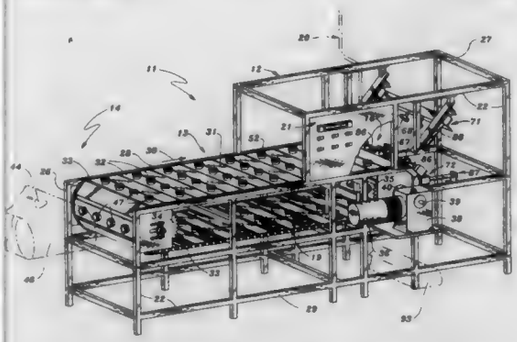


1. A method of providing an alcoholic extract for use in food or drink, comprising:
providing a resiliently squeezable plastics container having an outlet;
charging particulate extractable solids into said container;
charging alcoholic liquor into said container to wet the particulate solids;
securing a filter across the container outlet, said filter having a pore size smaller than said particulate solids;
closing the filter outlet with a closure seal to seal the alcoholic liquor and particulate solids inside the container; and
allowing the particulate solids to soak in the alcoholic liquor over a period of time, to form an alcoholic extract thereof sealed in the resiliently squeezable container.

5,470,602
BROCCOLI HEAD TRIMMING APPARATUS AND METHOD

Christopher R. Cecil, Merced, Calif., assignor to David J. Moore, Jacksonville, Oreg.

Filed Nov. 25, 1994, Ser. No. 345,036
Int. Cl.[6] A23P 1/00; A23N 15/00
U.S. Cl. 426—481 5 Claims

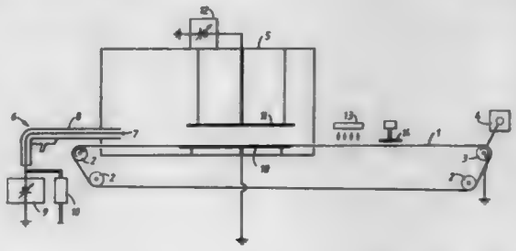


1. A method of trimming broccoli heads having a stalk and fleurettes, said method comprising the steps of:
a. providing an inflatable collar capable of securely gripping the base of the stalk;
b. inserting the base of the stalk into the collar so that the fleurettes are exposed;
c. positioning the collar so that the exposed fleurettes are located at a predetermined point;
d. providing an arcuate guillotine blade pivotally mounted on an axis bisecting the stalk when the exposed fleurettes are located at the predetermined point.
e. rotating the guillotine blade through a predetermined angle such that the fleurettes are severed from the stalk; and,
f. removing the stalk from the collar.

5,470,603
ELECTROSTATIC COATING OF SUBSTRATES OF MEDICINAL PRODUCTS

John N. Staniforth, and Martin P. Grosvenor, both of Bath, England, assignors to Hoechst UK Limited, Hounslow, United Kingdom

PCT No. PCT/GB92/00323, § 371 Date Oct. 19, 1992, § 102(e) Date Oct. 19, 1992, PCT Pub. No. WO92/14451
PCT Filed Feb. 21, 1992, Ser. No. 937,870
Claims priority, application United Kingdom, Feb. 22, 1991, 9103711
Int. Cl.[6] A61K 9/28; B05B 5/08
U.S. Cl. 427—2.14 24 Claims



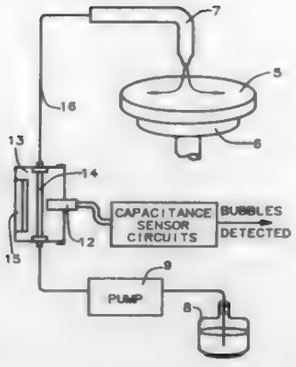
1. A method of coating cores of pharmaceutical tablets with a dry powder, said method comprising the steps of:
feeding cores of pharmaceutical tablets onto a conveyor;
supplying dry powder to a region through which said cores are to be conveyed on said conveyor;
conveying the cores through said region with said cores supported by said conveyor and with said cores maintained at a different electric potential from that of said dry powder, whereby said dry powder is attracted to exposed surfaces of the cores to form partially coated cores having powder coatings thereon, and melting said dry powder coatings of the partially coated cores to convert the dry powder into fused film coatings secured to the cores, thereby forming partially coated cores.

5,470,604
APPARATUS AND METHOD FOR SPREADING RESIST ON A WAFER AND DETECTING BUBBLES IN THE RESIST

Soon E. Neoh, Singapore, Singapore, assignor to Chartered Semiconductor Manufacturing Pte LTD, Singapore, Singapore

Continuation of Ser. No. 44,164, Apr. 8, 1993, abandoned. This application Jul. 5, 1994, Ser. No. 267,757
Int. Cl.[6] B05D 1/00; B05C 11/00; G01N 7/00
U.S. Cl. 427—8 6 Claims

1. In an apparatus for spreading a resist on a semiconductor wafer including a supply of a resist having a predetermined dielectric constant, a nozzle for applying the resist to the wafer, and a tube made of dielectric material carrying the resist from the supply to the nozzle, and a bubble detector for bubbles in the resist flowing in the tube, wherein the improvement comprises said bubble detector comprising,
a capacitance sensor having electrode means for establishing an electric field in a subject to be tested and having a circuit for signaling the dielectric constant of the subject, and means mounting the capacitance sensor on one side of the tube and



near the tube to sense the dielectric constant of the combination of the tube, the resist in the tube, and any bubbles in the resist,

and a metal backing plate located near the tube on the side of the tube opposite the capacitance sensor, the backing plate of a thickness to form an electrical ground for the capacitance sensor.

5. A method for spreading a resist coating evenly on a wafer, wherein the resist coating is adversely affected by bubbles in the resist, the method comprising the following steps,

providing a resist station including a resist nozzle and a means for holding the wafer to receive resist from the nozzle,

providing a resist supply and creating a flow of the resist from the resist supply through a resist delivery line to the nozzle, the resist being subject to bubble formation that may interfere with the resist coating,

monitoring the flow of the resist through the delivery line with a capacitance sensor located on one side of the delivery line and a conductive plate of a thickness to form an electrical ground for the capacitance sensor located near the capacitance sensor and on the side of the delivery line opposite the sensor,

and stopping the spreading of the resist on the wafer if bubbles in the delivery line are detected during said monitoring step.

5,470,605

UNIVERSAL ADHESION PROMOTING COMPOSITION FOR PLASTICS REPAIR, KIT INCLUDING SAME, AND METHOD OF USE

Richard H. Lundeen, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 74,962, Jun. 10, 1993. This application May 9, 1994, Ser. No. 239,697

Int. Cl.[6] B32B *35/00;* **B05D** *3/02*

U.S. Cl. 427—11 **4 Claims**

1. A method of repairing a first plastic surface with a second plastic material, said method comprising a sequence of steps of:

(a) applying to said first plastic surface a priming composition comprising:

(1) a first composition comprising a first organic material having a plurality of epoxy-functional groups, said first organic material combined with a first organic solvent in a sufficient amount of said first organic solvent to dissolve or disperse said first organic material, the first organic solvent comprising the combination of:

(i) a hydrocarbon having from 4 to 10 carbon atoms;

(ii) an alcohol having from 3 to 10 carbon atoms; and

(iii) an ester having from 3 to 10 carbon atoms,

with a proviso that said first organic material is soluble in said combination of (i), (ii) and (iii); and

(2) a second composition comprising a second organic material comprising a major portion of a mercaptan-terminated polymer having a plurality of mercaptan-functional groups and a minor portion of an amine-functional material having a plurality of amine-functional groups, said second organic material combined with a second organic solvent in a sufficient amount of said second organic solvent to dissolve or disperse said second organic material in said second organic solvent, said second organic solvent comprising the combination of:

(i') a hydrocarbon having from 4 to 10 carbon atoms;

(ii') an alcohol having from 3 to 10 carbon atoms; and

(iii') a ketone having from 3 to 10 carbon atoms,

with a proviso that said second organic material is soluble in said combination of (i'), (ii'), and (iii'), said second organic material and said first organic material present in an equivalent weight ratio ranging from about 4:1 to about 1:6;

(b) scrubbing into said first plastic surface said priming composition with a nonwoven article while said first and second organic solvents wet and penetrate but are not substantially retained by said first plastic surface;

(c) allowing said first plastic surface to stand for a duration of time sufficient to facilitate substantially complete evaporation of said first and second organic solvents;

(d) allowing said first organic material and said second organic material to substantially react to form an epoxy resin;

(e) applying to said first plastic surface after step (d), a curable plastic mixture;

(f) allowing said curable plastic mixture to cure to form a cured plastic mixture; and

(g) abrading said cured plastic mixture and said first plastic surface after step (f) with an abrasive article, thus forming a featheredge boundary between said first plastic surface and said cured plastic mixture.

5,470,606

METHOD OF MANUFACTURING AN ANTISTATIC COATING ON A SUBSTRATE, IN PARTICULAR, A CATHODE RAY TUBE, COMPRISING LATEX PARTICLES OF A POLYPYRROLE COMPOUND IN A SILICON DIOXIDE MATRIX

Johannes De Boer, Venlo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 947,664, Aug. 18, 1992, Pat. No. 5,412,279. This application Jun. 17, 1994, Ser. No. 261,545

Int. Cl.[6] B05D *5/06*

U.S. Cl. 427—64 **8 Claims**

1. A method of manufacturing an antistatic coating on a substrate, characterized in that latex particles of a polypyrrole compound are dispersed in an aqueous solution of a hydrolyzed alkoxysilane compound, after which the dispersion is provided on the substrate and the hydrolyzed alkoxysilane compound is converted to silicon dioxide by means of a treatment at an elevated temperature and for a period of time effective to form a silicon dioxide matrix comprising polypyrrole latex on said substrate.

5,470,607

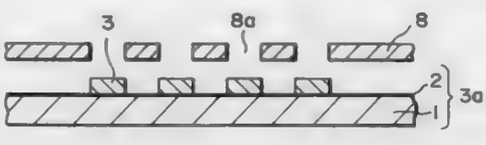
HEAT-SEALABLE CONNECTOR AND METHOD FOR THE PREPARATION THEREOF

Satoshi Odashima, and Kazuyoshi Yoshida, both of Saitama, Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Division of Ser. No. 105,731, Aug. 11, 1993. This application Nov. 18, 1994, Ser. No. 342,223

Int. Cl.[6] B05D *3/00;5/00*

U.S. Cl. 427—96 **2 Claims**



1. A method for the preparation of a heat-sealable connector which comprises the steps of:

(A) coating at least a part of a substrate with a solvent-containing coating composition of a solvent-absorptive material followed by drying to form a solvent-absorptive layer;

(B) forming lines of a solvent-containing electroconductive paste substantially in parallel to each other by screen printing on the solvent-absorptive layer whereby the solvent in the paste is absorbed; and

(C) coating at least a part of each of the electroconductive lines with a heat-sealable anisotropically electroconductive adhesive composition.

5,470,608

SURFACE COATING AGENT AND SURFACE COATING METHOD FOR ELASTIC MOLDING DIE

Akinori Watanabe, Shibuya; Itaru Horiguchi; Atsushi Sato, both of Ryugasaki; Hiroshige Kohno, Arakawa; Kenji Ikeda, Arakawa, and Yujiro Iwasaki, Arakawa, all of, Japan, assignors to Okamoto Industries, Inc., and Asahi Denka Kogyo Kabushikikaisya, both of Tokyo, Japan

Filed Jun. 13, 1994, Ser. No. 258,818

Claims priority, application Japan, Jun. 16, 1993, 5-144680

Int. Cl.[6] B05D *3/10;1/36;* **B32B** *27/40*

U.S. Cl. 427—133 **12 Claims**

1. A surface coating method for an elastic molding die comprising the steps of:

coating a primer on a surface of an elastic molding die to form a primed surface, said primer being selected from the group consisting of: a reaction product of a hydroxyl-terminated polydiene and a polyisocyanate, a mixture of an elastomer and a polyurethane, a cyanoacrylate compound, and an epoxy compound; and

coating said primed surface with a polyurethane surface coating agent by applying a solution of a polyurethane surface coating agent to said primed surface and then drying said applied solution, said polyurethane surface coating agent having been obtained by reacting a polyol with an aromatic polyisocyanate.

5,470,609

REPAIR OF PLASTIC SUBSTRATES UTILIZING POWDER COATING COMPOSITIONS

Burr L. Leach, Marion, and David Hawkins, Van Buren, both of Ind., assignors to GenCorp Inc., Fairlawn, Ohio

Filed Dec. 7, 1992, Ser. No. 987,507

Int. Cl.[6] B32B *35/00*

U.S. Cl. 427—140 **18 Claims**

1. A process for repairing a surface defect in a plastic article molded in a mold cavity, comprising:

applying a thermosettable powder coating composition to an area of a plastic article, which area includes a surface defect,

curing the applied powder coating composition through the application of heat,

and removing excess cured powder coating composition from said area to which said powder coating composition was applied and cured to conform said area to the shape of the mold cavity used to form the molded plastic article.

5,470,610

Patent Not Issued For This Number

5,470,611

METHOD FOR FORMING AN OXIDE FILM OF A SEMICONDUCTOR

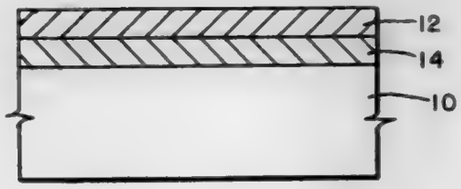
Chang-jip Yang, and Jun-gyo Jung, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Continuation of Ser. No. 134,847, Oct. 12, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 338,816

Claims priority, application Rep. of Korea, Jan. 12, 1992, 92-18695

Int. Cl.[6] C23C *16/40*

U.S. Cl. 427—255.4 **4 Claims**



1. A method for manufacturing a compound oxide film of a semiconductor device, comprising the steps of:

(a) forming a first oxide film on a semiconductor substrate using a low pressure chemical vapor deposition; and

(b) forming a second oxide film to a thickness between about 50 Å and about 200 Å between said substrate and said first oxide film using a wet oxidation process.

5,470,612

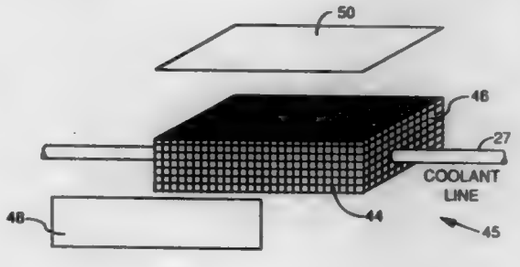
AEROGEL MESH GETTER

Steven P. Hotaling, Liverpool, N.Y., and Deidra A. Dykeman, Kent, Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 981,923, Nov. 12, 1992, Pat. No. 5,308,533, which is a continuation-in-part of Ser. No. 800,817, Nov. 29, 1991, abandoned. This application May 27, 1994, Ser. No. 251,819

Int. Cl.[6] B05D *3/12*

U.S. Cl. 427—377 **6 Claims**



4. A method for preparing a light-weight getter which collects contaminants comprising, contacting a solution of tetraethoxysilane (TEOS) or tetramethoxysilane (TMOS) with a metal mesh matrix, subjecting the solution to hydrolysis and condensation in the presence of a catalyst to form a gel coated on said matrix and extracting solvent from said gel to obtain a dry aerogel covering to form a getter having mesh wire covered with low-density (1–900 mg/cc) silica aerogel.

5,470,613

COMPOSITION AND METHOD OF FORMING A BLACK NO-RINSE CONVERSION COATING ON METAL SURFACES

Edward A. Rodzewich, Flourtown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 32,079, Mar. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 823,216, Jan. 21, 1992, abandoned. This application Jan. 27, 1994, Ser. No. 186,962

Int. Cl.[6] B05D *3/10*

U.S. Cl. 427—388.1 **4 Claims**

1. A method of forming a black conversion coating on surfaces of aluminum and its alloys comprising:

coating the surface with a coating solution having a pH below 7 consisting essentially of

a. from about 0.01 to about 0.20% hexavalent chromium;

b. from about 2.0 to about 10% acrylic/itaconic modified styrene butyl acrylate polymer resin (as solid);

c. from about 0.5 to about 3.0% carbon black pigment;

d. from about 0.2 to about 1.0% fluoacid;

e. a thickening agent selected from the group consisting of guar gum and xanthan gum and drying said coating on said surface without rinsing; and optionally

f. a non-ionic dispersant and/or a slow evaporating coalescent.

5,470,614

TREATMENT OF WOOD AND OTHER LIGNOCELLULOSIC MATERIALS WITH IODATES

George C. Chen, and Roger M. Rowell, both of Madison, Wis., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 205,008, Mar. 2, 1994, abandoned. This application Apr. 6, 1995, Ser. No. 418,909

Int. Cl.[6] B05D *5/00;7/06*

U.S. Cl. 427—440 **9 Claims**

1. A method of treating lignocellulosic material which comprises the following steps:

a. soaking of said lignocellulosic material with an IO_3^- solution;

b. removal of said lignocellulosic material from said IO_3^- solution; and

c. drying said lignocellulosic material, wherein the material is resistant to fungi.

5,470,615

BONDING AND COATING METHODS AND APPARATUS FOR TH COILS OF DYNAMO-ELECTRIC MACHINE PARTS

Federico Sbalchiero, and Marco Carboncini, both of Florence, Italy, assignors to Axis USA, Inc., Tampa, Fla.

Filed Mar. 11, 1994, Ser. No. 209,873

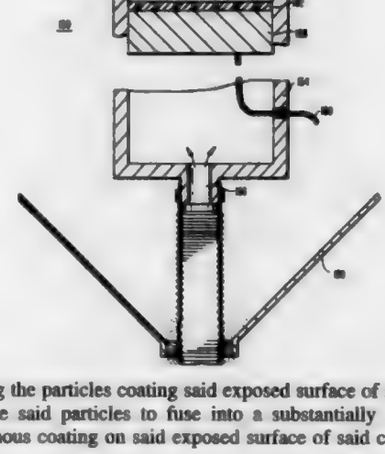
Int. Cl.[6] B05D *3/02;* **B05B** *5/025*

U.S. Cl. 427—459 **18 Claims**

1. The method of coating a coil of wire formed on a ferromagnetic core of a dynamo-electric machine part, said coil being formed on said core so that part of the surface of said coil is exposed and so that part of the surface of said core is also exposed, said method comprising the steps of:

exposing said dynamo-electric machine part to electrostatically charged resinous powder particles;

applying different first and second electrical potentials to said coil and said core, respectively, said first electrical potential being selected relative to the electrostatic charge on said particles so that said particles are electrostatically attracted to and coat said exposed surface of said coil, and said second electrical potential being selected relative to the electrostatic charge on said particles to substantially avoid electrostatic retention of said particles on said exposed surface of said core; and



treating the particles coating said exposed surface of said coil to cause said particles to fuse into a substantially continuous resinous coating on said exposed surface of said coil.

5,470,616

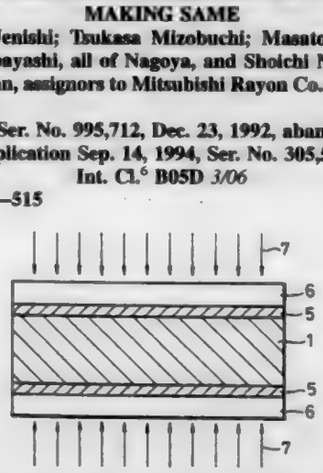
COATED SHAPED ARTICLES AND METHOD OF MAKING SAME

Masamoto Uenishi; Tsukasa Mizobuchi; Masatoshi Takesue; Yukio Kobayashi, all of Nagoya, and Shoichi Nagai, Tokyo, all of, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 995,712, Dec. 23, 1992, abandoned. This application Sep. 14, 1994, Ser. No. 305,553

Int. Cl.[6] B05D *3/06*

U.S. Cl. 427—515 **5 Claims**



1. A method of making abrasion-resistant shaped articles which comprises the steps of (a) providing a shaped article having a surface formed of a polymer having structural units derived from a multi-functional monomer containing two or more (meth)acryloyloxy groups in the molecule, (b) irradiating the surface of the polymer with ultraviolet light having a wavelength of 300 nm or less, (c) subjecting the irradiated surface to an alkali treatment, (d) coating the irradiated and alkali-treated surface with a coating composition consisting essentially of a silica polycondensate obtained by mixing (I) colloidal silica and (II) at least one hydrolyzable silicon compound selected from the group consisting of compounds of the following formulas (A) to (F)

$$SiR^1_aR^2_b(OR^3)_c \quad (A)$$

$$SiR^4_dR^5_e(OR^6)_f \quad (B)$$

$$SiR^7_gR^8_h(OR^9)_i \quad (C)$$

$$SiR^{10}_jR^{11}_k(OR^{12})_l \quad (D)$$

$$SiR^{13}_{m}R^{14}(OR^{15})_{o} \quad (E)$$

and

$$SiR^{16}_{p}R^{17}_{q}(OR)^{18})_{r} \quad (F)$$

wherein R^1, R^2, R^3, R^5, R^6, R^8, R^9, R^{11}, R^{12}, R^{14}, R^{15}, R^{17} and R^{18} in formulas (A) to (F) are hydrocarbon radicals of 1 to 15 carbon atoms or hydrocarbon radicals of 1 to 15 carbon atoms having an ether linkage or an ester linkage; R^4 in formula (B) is a hydrocarbon radical of 2 to 15 carbon atoms having an epoxy group; R^7 in formula (C) is a hydrocarbon radical of 1 to 15 carbon atoms having an amino group, R^{10} in formula (D) is a hydrocarbon radical of 1 to 15 carbon atoms having a mercapto group; R^{13} in formula (E) is a hydrocarbon radical of 2 to 15 carbon atoms having a vinyl group; R^{16} in formula (F) is a hydrocarbon radical of 3 to 15 carbon atoms having a (meth)acryloyloxy group; where a, b, d, e, g, h, j, k, m, n, p and q are whole numbers of 0 to 3, c is equal to (4-a-b), f is equal to (4-d-e), i is equal to (4-g-h), l is equal to (4-j-k), o is equal to (4-m-n), and r is equal to (4-p-q);

in such a molar ratio that the average number of hydrolyzable groups calculated from the following equation (1) is within the range of 2.30 to 3.85,

average number of hydrolyzable groups

$$\text{average number of hydrolyzable groups} = \frac{4[I]+c[A]+f[B]+i[C]+l[D]+o[E]+r[F]}{[I]+[A]+[B]+[C]+[D]+[E]+[F]} \quad (1)$$

where [A] to [F] are the number of moles of the hydrolyzable silicon compounds of the formulas (A) to (F), respectively, present in the reaction mixture, [I] is the number of moles of the colloidal silica present in the reaction mixture, and c, f, i, l, o and r are the same whole numbers as defined above for the formulas (A) to (F);

and then subjecting them to cohydrolysis and polycondensation, and (e) curing the coating composition.

5,470,617

PROCESS FOR MODIFYING THE SURFACES OF THE MOLDED MATERIALS MADE OF FLUORINE RESINS

Masanobu Nishii, Kyoto; Yuichi Shimizu, Osaka; Shunichi Kuwanishi, Osaka; Shunichi Sugimoto, Osaka; Masao Endo, Nishinomiya, and Tomohiro Nagase, Osaka, all of, Japan, assignors to Kurashishiki Boseki Kabushiki Kaisha, Kurashiki, Japan

Filed Oct. 14, 1994, Ser. No. 322,484

Claims priority, application Japan, Jan. 15, 1993, 5-258087

Int. Cl.[6] B05D *3/06*

U.S. Cl. 427—521 **7 Claims**

1. A process for modifying the surfaces of the molded materials made of fluorine resins comprising irradiating an ultraviolet laser beam on said surfaces in the presence of an ultraviolet-absorbing compound and a fluorosurfactant, wherein the fluorosurfactant is present in a concentration that permits uniform coating of the ultraviolet-absorbing compound on the surfaces of the molded material.

5,470,618

METHOD OF MAKING ZINC-BASED TRANSPARENT CONDUCTIVE FILM

Fumio Ohara, Nukata; Tadashi Hattori, Okazaki; Nobuei Ito, Okazaki; Yutaka Hattori, Okazaki, and Masumi Arai, Okazaki, all of, Japan, assignors to Nippon Soken, Inc., Japan

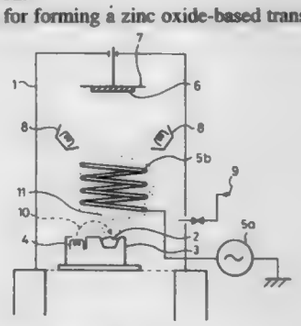
Continuation of Ser. No. 908,917, Jul. 2, 1992, abandoned, which is a continuation of Ser. No. 729,882, Jul. 11, 1991, abandoned, which is a division of Ser. No. 410,631, Sep. 21, 1989, abandoned. This application Jul. 14, 1994, Ser. No. 274,149

Claims priority, application Japan, Sep. 22, 1988, 63-238343; Jun. 29, 1989, 1-167276

Int. Cl.[6] C23C *14/08*

U.S. Cl. 427—529 **7 Claims**

1. A process for forming a zinc oxide-based transparent conductive film, comprising the steps of:



arranging a substrate on which the zinc oxide-based film is to be deposited, and an evaporation source substantially composed of zinc oxide containing one of indium oxide and gallium oxide in a vacuum chamber;

evacuating the vacuum chamber;

evaporating the source to produce evaporated particles;

activating the evaporated particles by a plasma excited by a radio frequency power in the range of 20 W to 100 W; and

depositing by ion plating the activated evaporated particles onto the substrate by heating the substrate to at least 50° C. to form a transparent zinc oxide-based film doped with one of indium and gallium, the resistivity of which is controlled to be not more than 5×10^{-4} Ω.cm by the radio frequency power.

5,470,619

METHOD OF THE PRODUCTION OF POLYCRYSTALLINE SILICON THIN FILMS

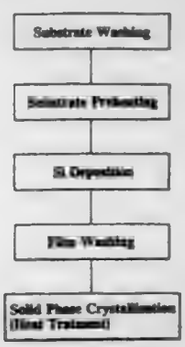
Byung T. Ahn; Dae G. Moon, and Jeong N. Lee, all of Seoul, Rep. of Korea, assignors to Korea Advanced Institute of Science and Technology, Taejon, Rep. of Korea

Filed Jul. 29, 1994, Ser. No. 282,643

Claims priority, application Rep. of Korea, Sep. 7, 1993, 93-17870

Int. Cl.[6] B05D *3/06*; C23C *16/24*

U.S. Cl. 427—578 **5 Claims**



1. In a method of producing a polycrystalline silicon thin film having a grain size of about 60–300 μm comprising depositing an

amorphous silicon thin film onto a substrate and subjecting the resulting as-deposited amorphous silicon thin film to heat treatment, the improvement which comprises carrying out said heat treatment at a temperature between 450° and 550° C. under a vacuum pressure ranging from 10^{-3} to 1 torr, and placing the substrate on which said amorphous silicon thin film is deposited on a copper or brass susceptor in a heating furnace.

5,470,620

RIBBON ASSEMBLY FORMING CURVED SEGMENT FOR MAKING A BOW OR RUFFLE

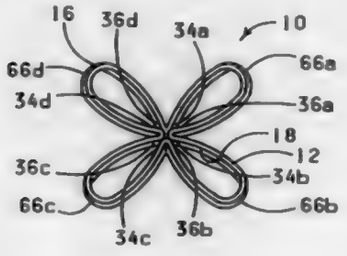
Donald E. Weder, Highland, Ill., assignor to Highland Supply Corporation, Highland, Ill.

Continuation of Ser. No. 286,853, Aug. 5, 1994, Pat. No. 5,411,774, which is a continuation of Ser. No. 101,210, Aug. 3, 1993, Pat. No. 5,387,446. This application Feb. 6, 1995, Ser. No. 384,496

The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—4 **7 Claims**



1. A ribbon assembly comprising:

a strip of material having a first end, a second end, an upper surface, a lower surface and a strip width extending between a first strip side and a second strip side, the strip of material being divided into a plurality of strip segments with one of the strip segments defining the first end of the strip of material and a second strip segment defining the second end of the strip of material and at least one strip segment disposed therebetween, each strip segment having a first segment end and a second segment end with the second segment end of each strip segment being disposed substantially adjacent the first segment end of the adjacent strip segment;

a resilient member having a first end, a second end, a stretched condition and an unstretched condition, the first end of the resilient member connected to the strip segment defining the first end of the strip of material in close proximity to the second segment end thereof and the second end of the resilient member connected to the strip segment defining the second end of the strip of material, the strip of material being extendable in about a straight line in the stretched condition of the resilient member and the resilient member pulling the first segment end toward the second segment end of each strip segment to form each strip segment into a curved segment while maintaining the strip segment defining the first end of the strip material in an extended position, wherein the strip segments of the strip of material defining curved segments extend along curved paths and define a bow or ruffle when the resilient member is in the unstretched condition.

5,470,621

FRAME-SUPPORTED PELLICLE FOR DUSTPROOF PROTECTION OF PHOTOMASK

Meguru Kashida; Toru Shirasaki; Yuichi Hamada; Yoshihiko Nagata; Sakae Kawaguchi, and Yoshihiro Kubota, all of Gunma, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1994, Ser. No. 271,037

Claims priority, application Japan, Jul. 28, 1993, 5-185929

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—14 **5 Claims**

1. A frame-supported pellicle for dustproof protection of photomask which is an integral body comprising:

(a) a frame made from a rigid material and provided on the whole surface with a layer of a coating composition formed by the coating method of electrodeposition in an aqueous coating composition; and

(b) a transparent film of a plastic resin spread over and adhesively bonded to one of the end surfaces of the frame in a drumhead-like slack-free fashion.

5,470,622

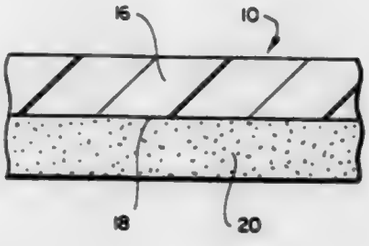
ENCLOSING A SUBSTRATE WITH A HEAT-RECOVERABLE ARTICLE

James A. Rinde, Fremont, and Richard M. Rowe, Los Gatos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 843,753, Feb. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 609,682, Nov. 6, 1990, abandoned. This application Sep. 19, 1994, Ser. No. 308,864

Int. Cl.[6] B65B *53/02*; B32B *31/06*

U.S. Cl. 428—34.9 **18 Claims**



1. A method of enclosing a substrate comprising:

(a) positioning a heat recoverable article around the substrate;

(b) positioning a flexible layer of a thermosetting adhesive composition between the heat recoverable article and the substrate to be enclosed, said adhesive composition

(i) comprising a blend of (1) about 25 to about 45 parts by weight of the adhesive composition of an essentially amorphous thermoplastic resin selected from the group consisting Of polysulfones, polyethersulfones, polystyrene, polyphenylene oxide, amorphous polyamides, phenoxy resins, amorphous polyimides, polyetherimides, polyetherimide/silicone block copolymers, polyurethanes, polycarbonates, and acrylic resins such as polymethyl methacrylate, styrene/acrylonitrile and styrene block copolymers, and (2) about 75 to about 55 parts by weight of the adhesive composition of an uncured thermosetting resin, and

(ii) being such that it will remain substantially uncured for at least about one year at 25° C.; and

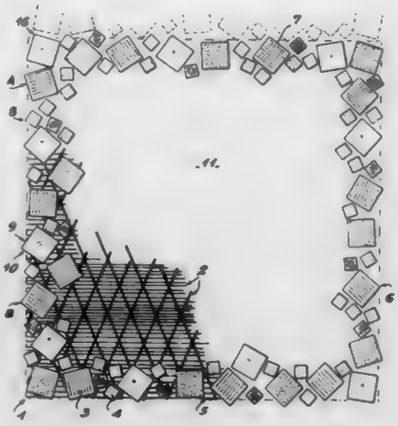
(c) heating the article and adhesive to cause the article to recover toward the substrate and the adhesive to cure, thereby enclosing the substrate.

5,470,623

DECORATIVE PANEL HAVING ADHESIVELY SET AND ARBITRARILY POSITIONED POLYGONAL MOSAIC ELEMENTS

Jacques Lucas, Briare, France, assignor to Emaux de Briare Technologies, S.A., Briare, France

Filed Dec. 2, 1992, Ser. No. 984,503
Claims priority, application France, Dec. 11, 1991, 91 15378
Int. Cl.[6] B44C *1/28*
U.S. Cl. 428—47 3 Claims



1. A tile mosaic panel comprising:

a mesh base for mounting tiles and having longitudinal and transverse edges thereon;

polygonal tiles mounted in coplanar relation on the base and in non-orthogonal relation to the edges;

a number of the tiles located inwardly of the edges being arranged arbitrarily on the mesh base; and

a number of the tiles disposed along each edge arranged in a respective repeating pattern and partially overhanging a corresponding edge to form a jagged edge that meshes with an abutting jagged edge of an adjacently situated panel so as to conceal joint therebetween.

5,470,624

OSTOMY FILM

Aurelio Oreglia, Como, and Paolo Vietto, Legnano, both of, Italy, assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Division of Ser. No. 363,565, Dec. 22, 1924, which is a continuation of Ser. No. 951,034, Sep. 24, 1992, abandoned, which is a continuation of Ser. No. 626,368, Dec. 12, 1990, abandoned. This application Apr. 11, 1995, Ser. No. 419,786
Claims priority, application United Kingdom, Dec. 13, 1989, 8928221
Int. Cl.[6] B29D *23/00;* B32B *27/36;* D04H *1/58*
U.S. Cl. 428—36.1 15 Claims

1. A container formed from a sheet material which comprises a nonwoven plastics film and, bonded thereto without an adhesive, a gas and odor barrier film, said barrier film comprising, in the following order:

a contact layer in contact with said non-woven film and having a high affinity for the material of said non-woven film;

a gas barrier layer; and

a sealing layer.

5,470,625

STRAND-OF-BEADS WOUND PACKING PRODUCT

James J. Perrault, Brooklyn Center, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 21, 1993, Ser. No. 171,316
Int. Cl.[6] B32B *3/16;* C08G *75/20;* B65D *81/24;* A61B *19/02*
U.S. Cl. 428—48 10 Claims

1. A wound packing product comprised of a pliable liquid permeable material enclosing an absorptive component in a continuous elongate series of individual discrete segments arranged in an elongate savage-like linked configuration.

5,470,626

OPTICAL RECORDING LAYERS CONTAINING SULFUR

James C. Fleming, Webster; Gerald R. Lange, and Donald R. Preuss, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 21, 1995, Ser. No. 393,142
Int. Cl.[6] B32B *3/00*
U.S. Cl. 428—64.8 8 Claims

1. An optical recording element comprising, in the following order, a transparent substrate bearing an optical recording layer containing a phthalocyanine dye and a gold reflective layer characterized in that the recording layer comprises sufficient sulfur to prevent defects in the gold reflective layer.

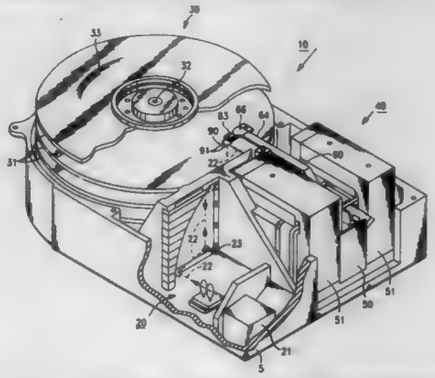
5,470,627

DOUBLE-SIDED OPTICAL MEDIA FOR A DISK STORAGE DEVICE

Neville K. Lee, Sherborn, and Kwan Y. Tan, Boston, both of Mass., assignors to Quantum Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 847,526, Mar. 6, 1992, Pat. No. 5,202,880. This application Feb. 22, 1993, Ser. No. 20,515
Int. Cl.[6] B32B *3/00*
U.S. Cl. 428—64.4 14 Claims

1. An optical disk for use with a lightbeam and an air-bearing



low-flying head of a rotary disk device for storing information comprising:

a substrate having a microscopic relief formed on a side surface 4 thereof to provide a pre-formatted structure for storing information;

a thin-film reflective layer applied on said side surface to reflect an incident lightbeam used for reading information: and

a transparent thin-film protective layer applied on said reflective layer, the asperity of the surface of said protective layer being generally not greater than 60% of the predetermined fly height

of the air-bearing low-flying head, and the composition of said protective layer having stiction sufficiently weak to allow the head to fly over the disk at said predetermined height during operation of the disk in a rotary disk device.

5,470,628

OPTICAL RECORDING MEDIUM

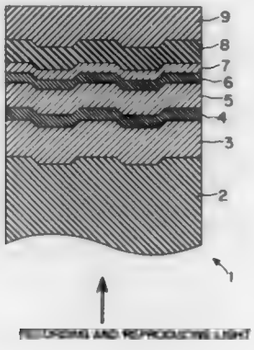
Junji Tominaga; Susumu Haratani; Tokuhiko Handa, and Ryo Inaba, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 14, 1994, Ser. No. 340,340

Claims priority, application Japan, Dec. 13, 1993, 5-341818

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—64.4 **20 Claims**



1. An optical recording medium comprising a mask layer, an intermediate dielectric layer, a recording layer, and a reflective layer on a transparent substrate in the described order, wherein

said recording layer contains a recording material which changes its crystallographic structure upon exposure to recording light for recording information, and

said mask layer contains a mask material which increases its light transmittance when melted, and said mask layer has a complex refractive index (n_0–ik_0), of which the real part n_0 has a drop of up to 1.0 and the imaginary part k_0 has a drop of 0.25 to 1.0 when the mask material becomes amorphous or microcrystalline.

5,470,629

METHOD AND APPARATUS FOR MAKING A PILE ARTICLE AND THE PRODUCTS THEREOF

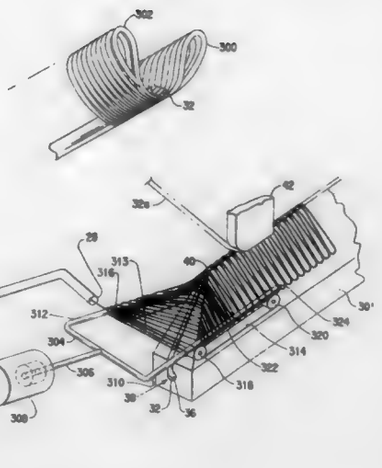
Ahmed M. Mokhtar, Laquey, Mo.; Peter Popper, and William C. Walker, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 296,264, Aug. 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 17,162, Feb. 22, 1993. This application Oct. 28, 1994, Ser. No. 331,074

Int. Cl.[6] B32B *3/16;5/08;* **D05C** *15/00*

U.S. Cl. 428—85 **11 Claims**

1. An elongated pile article comprising a plurality of bundles of filaments attached to an elongated support strand wherein each bundle is in the form of a pair of loops, with one of the pair bonded on each side of the strand.



5,470,630

METHOD OF PREPARING A BITUMEN-BACKED FLOOR COVERING

Andrew Thompson, Belfast, Northern Ireland, assignor to Interface, Inc., LaGrange, Ga.

Division of Ser. No. 191,802, Feb. 3, 1994, Pat. No. 5,366,779, which is a continuation-in-part of Ser. No. 930,608, Sep. 29, 1992, abandoned. This application Jul. 29, 1994, Ser. No. 283,031

Claims priority, application United Kingdom, Apr. 10, 1990, 9008166

Int. Cl.[6] C08L *95/00*

U.S. Cl. 428—95 **18 Claims**

1. A method of preparing a floor covering having a bitumen composition backing layer, the floor covering having a fibrous face surface and a back surface, the bitumen backing composition being bonded to the back surface, which method comprises:

a) heating a straight run bitumen to a temperature of about 180° C. to 200° C.;

b) adding a mixture consisting essentially of low density polyethylene and high density polyethylene, the low density polyethylene in greater concentration than the high density polyethylene, to the heated, straight run bitumen to form an admixture;

c) mixing the admixture to provide a homogenous dispersion with the straight run bitumen as a dispersed phase in a continuous phase of the polyethylene to provide a bitumen composition having a softening point of about 110° C. to 128° C. and a penetration value of about 10 dmm to 15 dmm;

d) heating the bitumen composition to a temperature of 160° C. to 180° C. at a coating application station;

e) applying at the coating application station the heated bitumen composition as the backing layer to the back surface of a fibrous face floor surface covering to bond to the back surface; and

f) recovering a floor covering having the bitumen composition as the backing layer with an exterior back surface.

5,470,631

FLAT ORIENTED STRAND BOARD-FIBERBOARD COMPOSITE STRUCTURE AND METHOD OF MAKING THE SAME

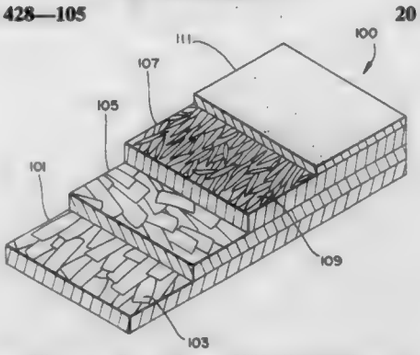
Craig R. Lindquist, Cordele, Ga.; John T. Clarke; Peter P. S. Chin, both of St. Charles, Ill.; Michael J. MacDonald, Batavia, and J. Peter Walsh, St. Charles, both of Ill., assignors to Masonite Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 670,681, Mar. 20, 1991, abandoned, which is a continuation-in-part of Ser. No. 503,573, Apr. 3, 1990, abandoned. This application Apr. 23, 1993, Ser. No. 52,375

The portion of the term of this patent subsequent to May 20, 2008, has been disclaimed.

Int. Cl.[6] B32B *5/12*

U.S. Cl. 428—105 20 Claims



1. A non-warping oriented strand board-fiberboard composite structure comprising a multi-layer oriented strand baseboard having a plurality of wood strand layers, including a central layer formed from wood strands oriented generally in a random or cross-machine direction sandwiched between two adjacent layers formed from wood strands oriented in a direction generally perpendicular to said central layer; and a wood fiber overlay layer bonded to one of the strand board layers, wherein the thickness of the central strand board layer comprises about 25% to about 35% of the total thickness of the central and adjacent strand board layers and the strand board layer adjacent to the central layer that is not in contact with the fiberboard overlay is about 25% to about 35% thicker than the strand board layer in contact with the fiberboard overlay.

5,470,632

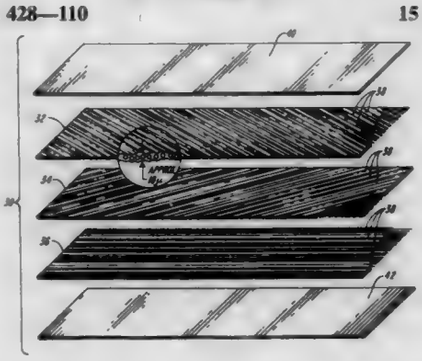
COMPOSITE MATERIAL FOR FABRICATION OF SAILS AND OTHER ARTICLES

Heiner Meldner, Burlingame, Calif., and Roland J. Downs, Mesa, Ariz., assignors to America[3] Foundation, West Palm Beach, Fla.

Division of Ser. No. 978,095, Nov. 17, 1992, Pat. No. 5,333,568. This application Jul. 18, 1994, Ser. No. 276,541

Int. Cl.[6] B32B *5/12*

U.S. Cl. 428—110 15 Claims



1. A material for use as a flexible foldable sheet having improved shear strength comprising:

a laminate including reinforcing elements therein, said reinforcing elements including at least two unidirectional tapes, each having extruded monofilaments therein, all of such monofilaments lying in a predetermined direction within the tape, said tapes being placed one atop the other within the laminate in a crossed fashion, with the monofilaments of one tape being at an angle to the monofilaments of an adjacent tape.

5,470,633

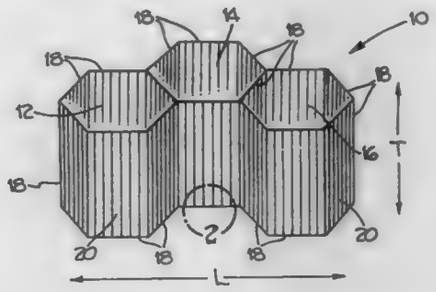
HIGH THERMAL CONDUCTIVITY NON-METALLIC HONEYCOMB WITH OPTIMUM PITCH FIBER ANGLE

Stephen C. Darfler, Castro Valley, Calif., assignor to Hexcel Corporation, Pleasanton, Calif.

Filed Oct. 14, 1993, Ser. No. 136,958

Int. Cl.[6] B32B *3/12*

U.S. Cl. 428—116 9 Claims



1. A high thermal conductivity non-metallic honeycomb structure comprising:

a plurality of interconnected walls which define a plurality of interconnected honeycomb cells having a lengthwise direction which extends transversely relative to said walls and a thickness direction which extends parallel relative to said walls, said cell walls comprising:

a first low thermal conductivity structural layer comprising a plurality of non-metallic fibers having low thermal conductivity;

a second low thermal conductivity structural layer comprising a plurality of non-metallic fibers having low thermal conductivity; and

a thermally conductive layer sandwiched between said first and second structural layers, said thermally conductive layer comprising a plurality of non-metallic fibers having high thermal conductivity to provide directionally controlled heat conductance through said honeycomb structure.

5,470,634

COVER FOR AIR-BAG INSTALLATION

Dan Persson, and Jonas Malmenstam, both of Alingsas, Sweden, assignors to Autoliv Development AB, Vargarda, Sweden

Filed Jan. 11, 1993, Ser. No. 2,387

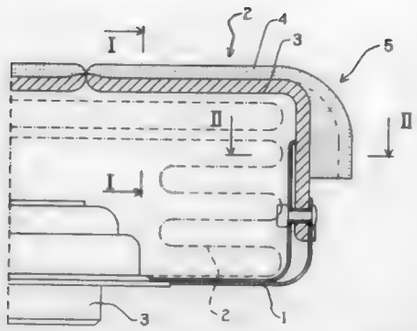
Claims priority, application United Kingdom, Jan. 23, 1992, 9201406

Int. Cl.[6] B60R *21/16*

U.S. Cl. 428—120 7 Claims

1. A cover for an inflatable air-bag installation, the cover comprising:

a base layer of polymer material, the base layer having a first thickness in first and second regions of the base layer, the first region of the base layer being in a center area of the base layer and the second region of the base layer being in a side area of the base layer, the first thickness being substantially constant, and the base layer having a plurality of evenly spaced flanges in the second region of the base layer, each flange of the base layer having a thickness which is substan-



tially equal to the first thickness each of said flanges extending outwardly from the base layer; and

an outer layer of polymer material superimposed on the base layer, the outer layer having a second thickness in first and second regions of the outer layer, the first region of the outer layer being in a center area of the outer layer and the second region of the outer layer being in a side area of the outer layer, the second thickness being substantially constant, the first and second regions of the outer layer corresponding to the first and second regions of the base layer, respectively, and the outer layer having a plurality of evenly spaced flanges in the second region of the outer layer each of said flanges extending outwardly from the outer layer, the flanges of the outer layer being complementary to the flanges of the base layer and each flange of the outer layer having a thickness which is substantially equal to the second thickness,

the flanges of the base layer and the outer layer being inter-digitated in the second region of the base and outer layers, leaving no air space between the inter-digitated flanges,

a thickness of the cover being substantially equal to the first thickness plus the second thickness in the first regions of the superimposed base and outer layers, and a thickness of the cover being substantially equal to the first thickness plus the second thickness plus a length of the complementary inter-digitated flanges in the second regions of the base and outer layers.

5,470,635

BLADE MEMBER HAVING A FLAT-SURFACE SIDE AND AN ANGLED-SURFACE SIDE

Hiroyuki Shirai, Tokyo; Kazumi Sekine, Kawasaki; Tadayuki Tsuda, Kawasaki; Isao Ikemoto, Kawasaki; Kazushi Watanabe, Yokohama; Yoshikazu Sasago, Tokyo; Takeo Shoji; Shinya Noda, both of Yokohama; Kazunori Kobayashi, Kawasaki, and Hiroyuki Adachi, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1993, Ser. No. 45,362

Claims priority, application Japan, Apr. 16, 1992, 4-121131; Jun. 30, 1992, 4-194660; Jul. 24, 1992, 4-217423; Jan. 28, 1993, 5-31175; Apr. 12, 1993, 5-84679

Int. Cl.[6] G03G *21/00*

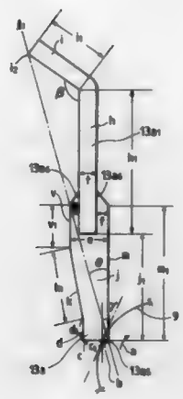
U.S. Cl. 428—131 **31 Claims**

1. A blade member, mountable onto an electrophotographic image forming apparatus, for removing residual matter from an electrophotographic photosensitive member, comprising:

an elastic blade, one side surface of which is flat in a longitudinal direction thereof and the other side surface of which has a vertical portion perpendicular to an end surface of said elastic blade, and an inclined portion inclined with respect to said vertical portion, said inclined portion having a larger thickness than said vertical portion; and

a support member for supporting said elastic blade;

wherein a thickness (f) of a portion of said elastic blade which is engaged by said support member at a side of said one side surface is greater than a thickness (g) of a portion of said elastic blade which is engaged by said support member at a side of said other side surface.



5,470,636

MAGNETIC RECORDING MEDIUM AND METHOD OF PRODUCING IT

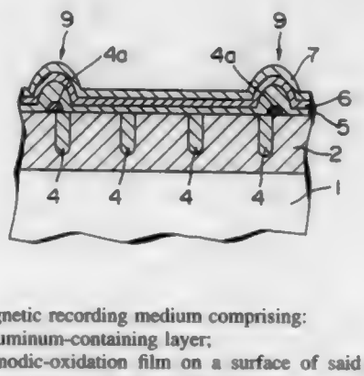
Yukio Wakui; Yoshiki Nishitani, and Kenichi Miyazawa, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Mar. 13, 1992, Ser. No. 851,041

Claims priority, application Japan, Mar. 15, 1991, 3-077018; Jul. 19, 1991, 3-204762; Feb. 24, 1992, 4-072894

Int. Cl.[6] G11B *5/66;* **B32B** *3/10;* **B05D** *5/12;* **C25D** *5/00*

U.S. Cl. 428—141 **48 Claims**



1. A magnetic recording medium comprising:

(a) an aluminum-containing layer;

(b) an anodic-oxidation film on a surface of said layer, said anodic-oxidation film having defined therein a plurality of cell-pores in each of which a filler material is deposited;

(c) a plurality of cores comprising a product of a reaction between a reagent selected from the group consisting of

(i) a solution comprising fluorine,

(ii) a solution comprising an acid but not comprising fluorine,

(iii) a solution comprising a base but not comprising fluorine,

(iv) a solution comprising a strong-acid salt but not comprising fluorine, and

(v) a gas comprising fluorine and at least one of said anodic-oxidation film and said filler material, said reaction product being a substance different from said filler material and from the substance used to form said aluminum-containing layer, said cores being formed on a surface of said anodic-oxide film in the vicinity of a portion of said plurality of cell-pores, wherein the height of said cores is less than 300 Å, the diameter of said cores is less than about 0.7 μm, and the number of said cores is smaller than the number of said cell-pores;

(d) a metal bed film deposited on said anodic-oxidation film; and

(e) a magnetic film deposited on said metal bed film, said magnetic film having a plurality of surface irregularities produced by said plurality of cores, wherein the surface density of said surface irregularities ranges from 10^2 to 10^7 per square millimeter.

5,470,637

POLYESTER COMPOSITION AND BIAXIALLY ORIENTED POLYESTER FILM CONTAINING THE SAME

Jun Sakamoto; Minoru Yoshida; Masatoshi Aoyama, all of Mishima; Masaru Suzuki, Ito; Yukari Nakamori, Shiga; Iwao Okazaki, and Koichi Abe, both of Kyoto, all of, Japan, assignors to Toray Industries, Inc., Japan

PCT No. PCT/JP92/01605, § 371 Date Nov. 23, 1992, § 102(e) Date Nov. 23, 1992, PCT Pub. No. WO93/12177, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 9, 1992, Ser. No. 98,306

Claims priority, application Japan, Dec. 9, 1991, 3-324745; Dec. 13, 1991, 3-330172; Dec. 26, 1991, 3-343814; Dec. 26, 1991, 3-343818; May 21, 1992, 4-128918

Int. Cl.[6] B32B *27/06;* C08K *3/18*

U.S. Cl. 428—143 8 Claims

1. A biaxially oriented polyester film consisting essentially of a polyester composition comprising a thermoplastic polyester (A) and zirconium oxide particles (B) having monoclinic and/or tetragonal crystal structure.

5,470,638

Patent Not Issued For This Number

5,470,639

ELASTIC NONWOVEN WEBS AND METHOD OF MAKING SAME

Scott L. Gessner, Encinitas, Calif.; David D. Newkirk, Greer, S.C.; Michael M. Thomason, Simpsonville, S.C., and James O. Reeder, Greenville, S.C., assignors to Fiberweb North America, Inc., Simpsonville, S.C.

Filed Feb. 3, 1992, Ser. No. 829,923

Int. Cl.[6] A61F *13/46;* B32B *5/04;5/26;31/08;* D04H *3/16*

U.S. Cl. 428—152 55 Claims

1. A spunbonded fabric comprising a web of bonded elastomeric thermoplastic substantially continuous filaments, said spunbonded fabric having a root mean square average recoverable elongation of at least about 75% based on machine direction and cross direction recoverable elongation values of the fabric after 30% elongation of the fabric and one pull, said fabric having been prepared by a spunbonding process conducted at a rate of less than about 1,200 meters per minute.

5,470,640

HIGH LOFT AND HIGH STRENGTH NONWOVEN FABRIC

James P. Modrak, Conyers, Ga., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 938,574, Aug. 31, 1992, Pat. No. 5,288,348, which is a continuation of Ser. No. 628,061, Dec. 14, 1990, abandoned. This application Nov. 24, 1993, Ser. No. 156,747

Int. Cl.[6] B32B *5/24;7/04*

U.S. Cl. 428—171 43 Claims

1. A high loft nonwoven material comprising, in combination:

(A) a facing component defining a water-permeable body-contacting surface comprised of at least one lightly bonded web of staple thermoplastic fiber or filament;

(B) a base component defining an external surface of said nonwoven and comprised of at least one web of short thermoplastic staple fiber or filament favoring arrangement in general cross- or transverse-direction relative to the machine direction of said lightly bonded facing component; and

(C) up to about 2 perforated and/or fibrillated films arranged intermediate said facing component and said base component, and through bonded to said facing component or to said based component;

wherein the base component is bonded to the facing component by bonding having a substantially greater bonding density than said lightly bonded facing component effected through the base component and into the facing component.

5,470,641

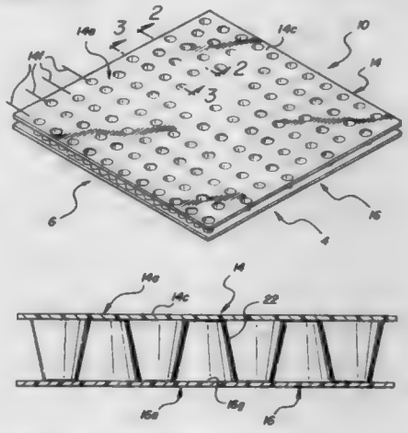
PANEL STRUCTURE

Lyle H. Shuert, 70 Kingsley Manor Dr., Bloomfield Hills, Mich. 48304

Continuation-in-part of Ser. No. 993,762, Dec. 18, 1992, Pat. No. 5,401,347. This application Dec. 14, 1993, Ser. No. 166,730

Int. Cl.[6] B32B *3/12;3/30;* B65D *19/32*

U.S. Cl. 428—178 17 Claims



1. A panel structure comprising:

a first plastic sheet having a planar main body portion and a plurality of spaced downwardly extending hollow bosses opening in the upper face of the first sheet and each including an annular side wall and a lower end;

a second plastic sheet having a planar main body portion and a plurality of spaced upwardly extending hollow bosses opening in the lower face of the second sheet and each including an annular side wall and an upper end;

the lower end of each downwardly extending boss being fused to the upper face of the main body portion of the second sheet between adjacent upwardly extending bosses and the upper end of each upwardly extending boss being fused to the lower face of the main body portion of the first sheet between adjacent downwardly extending bosses; and

the annular side walls of at least some of said downwardly extending bosses being fused to the annular side walls of upwardly extending bosses of the second sheet.

5,470,642

PAINT SAVER PAD

Donald S. Egigian, 2421 Almira Ave., Fullerton, Calif. 92631

Filed Sep. 27, 1993, Ser. No. 127,273

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—192 7 Claims

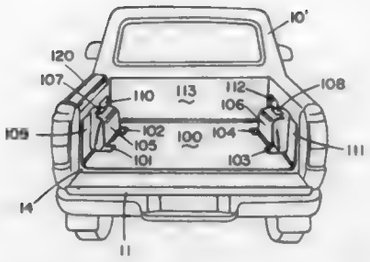
1. A protective device for use with a vehicle which is adapted to utilize a bedliner, comprising,

a pad of resilient, hydrophobic, non-abrasive material,

said pad configured to conform generally to the portion of the vehicle in which the bedliner is utilized,

said pad is generally rectilinear in configuration,

said pad includes at least one segment which extends outwardly therefrom, and



adhesive strip adapted to retain said pad in position in said vehicle.

5,470,643

POLYMER THICK FILM RESISTOR COMPOSITIONS

Jay R. Dorfman, Durham, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 944,996, Sep. 15, 1992, abandoned. This application Jun. 15, 1994, Ser. No. 260,503

Int. Cl.[6] B32B *5/16;* **C08K** *3/08*

U.S. Cl. 428—206 **12 Claims**

1. A polymer thick film resistor composition consisting essentially of:

(1) finely divided conductive metal particles having a surface area of 0.3 to 3.0 m^2/g,

(2) finely divided material non-metallic particles having a surface area greater than 100 m^2/g, said particles (a) being chemically inert and (b) having a conductivity substantially less than the conductive metal, and

(3) a thermoplastic phenoxy resin dissolved in an organic solvent having a volatility rating according to ASTM Test D 3539-87 greater than 10,000 seconds to 90% evaporation, wherein the composition is substantially cured within 2.5 minutes by heating to a temperature of 135° C., and the volume ratio of non-metallic particulate material to phenoxy resin is at least 3.5, and the weight ratio of solvent to phenoxy resin is 3:1 to 5:1.

5,470,644

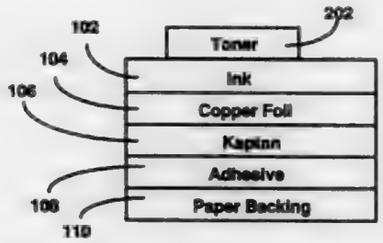
APPARATUS AND METHOD FOR FABRICATION OF PRINTED CIRCUIT BOARDS

David Durant, 6298 Drake St., Palm Beach Gardens, Fla. 33418

Filed Apr. 21, 1994, Ser. No. 230,748

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—209 **6 Claims**



1. A laminated sheet for printing circuit board land patterns with a single toner melt, comprising:

an electrically conductive layer having a lower surface and an upper surface;

a nonconductive substrate having a lower surface and an upper surface, the upper surface of the nonconductive substrate attached to the lower surface of the electrically conductive layer; and

a layer of toner retaining material, said toner retaining material capable of retaining toner directly deposited via laser printing and substantially covering the upper surface of the electrically conductive layer.

5,470,645

MAGNETIC RECORDING MEDIUM HAVING TWO MAGNETIC LAYERS COMPRISING MAGNETIC POWDER AND BINDER

Toshihiko Oguchi; Hajime Takeuchi, and Minori Murano, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, and Konica Corporation, Tokyo, both of, Japan

Continuation of Ser. No. 885,745, May 19, 1992, abandoned. This application Nov. 24, 1993, Ser. No. 156,972

Claims priority, application Japan, May 20, 1991, 3-114440

Int. Cl.[6] G11B *5/00*

U.S. Cl. 428—212 **6 Claims**

1. A magnetic recording medium comprising:

a non-magnetic base material;

a lower magnetic layer disposed on said non-magnetic base material and containing a magnetic powder and a resin binder; and

an upper magnetic layer with a thickness of 0.05 to 0.5 μm disposed on said lower magnetic layer and containing a magnetic powder, an abrasive material and a resin binder comprising a curing agent of polyisocyanate and a polyurethane resin binder having at least one polar group selected from the group consisting of —SO_3M and —OSO_3M, where M is hydrogen or an alkali metal atom, and an amount of said resin binder contained in said upper magnetic layer being in the range of 2 to 12 parts by weight for a magnetic powder of 100 parts by weight,

wherein a weight average molecular weight of said polyurethane resin binder is in the range of 1,000 to 20,000, an amount of said polar group of said polyurethane resin binder is in the range of 0.01 to 4.0 m mol/g, an amount of said abrasive material contained in said upper layer is in the range of 3 to 10 parts by weight for a magnetic powder of 100 parts by weight, and a median diameter of said abrasive material is in the range of 0.05 to 0.3 μm.

5,470,646

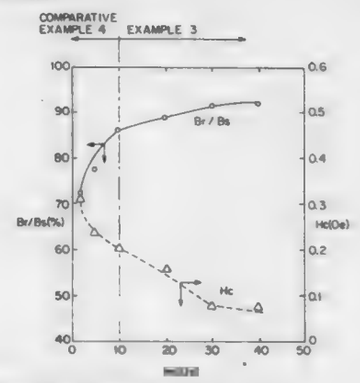
MAGNETIC CORE AND METHOD OF MANUFACTURING CORE

Masami Okamura; Takao Sawa; Yoshiyuki Yamauchi, and Takao Kusada, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 897,129, Jun. 11, 1992, abandoned. This application Apr. 4, 1994, Ser. No. 221,979

Int. Cl.[6] H01F *3/00*

U.S. Cl. 428—216 **32 Claims**



1. A magnetic core comprising,

a wound ferroalloy amorphous film defined by

$(Fe_{1-x}T_x)_{100-y}X_y$

wherein

T is at least one element selected from Co and Ni

X is at least one element selected from Si, B, P, C and Ge

$0<x\leqq 0.4$

$14\leqq y\leqq 21$; and

a polymer insulating film wound with the ferroalloy amorphous film;

wherein the value of the direct current coercive force of the magnetic core is 0.2 Oe or less, and the total value of residual magnetic flux density and saturated magnetic flux density is 27 KG or more.

5,470,647

PREPREGS COMPRISING A FIBROUS BASE WITH A FIRST COATING OF C-STAGE THERMOSETTING RESIN AND AN OUTER SECOND COATING OF B-STAGE THERMOSETTING RESIN AND A METHOD OF MAKING THE SAME

Bela Zimics, Tobelbad, and Willibald Orthofer, Wundschuh, both of, Austria, assignors to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft, Austria

PCT No. PCT/AT93/00082, § 371 Date Jan. 5, 1994, § 102(e) Date Jan. 5, 1994, PCT Pub. No. WO93/23461, PCT Pub. Date Nov. 25, 1993

PCT Filed May 13, 1993, Ser. No. 170,277

Claims priority, application Austria, May 15, 1992, 990/92

Int. Cl.[6] B32B *31/08;7/00;* **B05D** *5/12;1/36*

U.S. Cl. 428—229 **14 Claims**

1. A compressible prepreg based on flat substrates comprising webs or fabrics of organic or inorganic fiber impregnated with thermosetting synthetic resins comprising epoxy resins or polyester resins, said prepreg comprising a first layer of said synthetic resin in the C stage directly deposited on the substrate and a second layer of said synthetic resin in the B stage directly deposited on the first layer of synthetic resin.

5,470,648

COMPOSITE FABRICS OF NONWOVEN NYLON LAYERS AND FIBERGLASS SCRIM

Paul S. Pearlman, Thornton, Pa., and Vijayendra Kumar, New Castle, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 10, 1994, Ser. No. 258,120

Int. Cl.[6] B32B *5/12*

U.S. Cl. 428—247 **7 Claims**

1. A composite fabric, comprising:

a) a first layer of a nonwoven fabric comprising entangled, non-bonded nylon filaments;

b) a second layer of fiberglass scrim comprising an array of intersecting continuous multifilament glass strands; and

c) a third layer of a nonwoven fabric comprising entangled, non-bonded nylon filaments, wherein each layer of nonwoven fabric is adhesively attached to the layer of fiberglass scrim at a contact surface along said fabrics and scrim in such a manner that individual nylon filaments within the first and third layers of nonwoven fabric are mobile between the strands in the scrim.

5,470,649

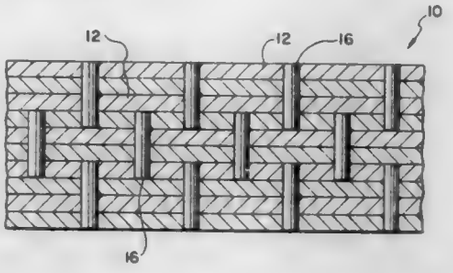
COMPOSITE WITH THROUGH THE THICKNESS REINFORCEMENT

Gary L. Farley, Yorktown, Va., assignor to The United States of America as represented by the Adminstrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 24, 1994, Ser. No. 265,361

Int. Cl.[6] B32B *17/02;17/04*

U.S. Cl. 428—303 **2 Claims**



2. A composite material having a predetermined finished thickness, comprising:

(a) a stack of reinforced laminae bonded together in a matrix; and

(b) a plurality of rods, said rods having diameters ranging from about 1 micron to about 2 mm, having a length substantially less than said finished thickness, but several times as long as the thickness of each lamina, said rods being arranged substantially perpendicular to the laminae and distributed substantially evenly throughout the composite material.

5,470,650

MAGNETIC RECORDING MEDIA

August Lehner, Roedersheim-Gronau; Norbert Schneider, Altrip; Hermann Roller, Ludwigshafen; Werner Balz, Limburgerhof; Werner Lenz, Bad Duerkheim, and Albert Kohl, Laumersheim, all of, Germany, assignors to Basi Magnetics GmbH, Mannheim, Germany

Filed Aug. 17, 1993, Ser. No. 107,052

Claims priority, application Germany, Aug. 22, 1992, 42 27 870.8

Int. Cl.[6] B32B *5/16;9/04;* **G11B** *5/66;* **B05D** *5/12*

U.S. Cl. 428—323 **1 Claim**

1. A magnetic recording medium obtained by preparing a dispersion of anisotropic magnetic material in a solution of a polymeric binder in an organic solvent, applying the dispersion as a layer to a nonmagnetizable substrate, then orienting the anisotropic magnetic material in a magnetic field and solidifying the applied magnetic layer, wherein a finely micronized, spherical particles of polyethylene or polypropylene having a particle diameter of less than 30 micrometers which are insoluble in the solvent used and have a melting point of more than 90° C. are present in the magnetic layer in an amount of from 0.1 to 8% by weight in combination with from 0.1 to 1.5% by weight of highly viscous polysiloxane having a viscosity of from 10,000 to 500,000 mPa.s, the percentages in each case being based on the amount of magnetic material.

5,470,651

MANDREL FOR USE IN NICKEL VAPOR DEPOSITION PROCESSES AND NICKEL MOLDS MADE THEREFORM

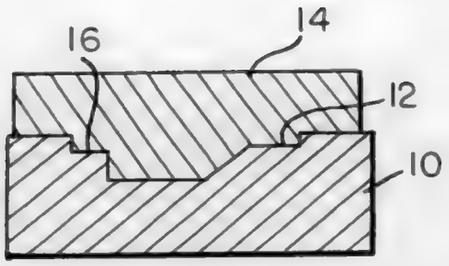
Miroslav Milinkovic, Islington; Tony P. Mathews, Toronto, and Kenneth C. Davy, Brampton, all of, Canada, assignors to Mirotech, Inc., Weston, Canada

Filed Aug. 24, 1992, Ser. No. 933,660

Int. Cl.[6] B32B *18/00*

U.S. Cl. 428—325 **8 Claims**

1. A mandrel for use in the manufacture of a nickel shell by the vapor deposition of nickel from gaseous nickel carbonyl, said



mandrel comprising a body formed of a composite material which is compatible with the vapor deposition of a removable nickel shell comprising a matrix and a filler and having essentially the same coefficient of thermal expansion as nickel, said coefficient of thermal expansion being between 10×10^{-6} mm/mm/° C. to 16×10^{-6} mm/mm/° C. and said matrix comprising a ceramic material or an organic polymeric material selected from the group consisting of bismaleimide resins, epoxy resins, phenolic resins, polyester resins, polyamide resins, vinylester resins and mixtures thereof, said composite material also including a surface coating which is acceptable to receive said deposited nickel and so formed as to provide said nickel shell with a well-defined complementary surface, said surface coating being different from the matrix, non-adherent to said nickel shell and being selected from the group consisting of bismaleimide resin, epoxy resin, polyester, polyimide, polyamide, phenolics and vinyl esters.

5,470,652

SUPPORT SHEET FOR PHOTOGRAPHIC PRINTING PAPER AND PROCESS FOR PRODUCING THE SHEET

Takaharu Miura, Chiba; Hiroyuki Nemoto, Ichikawa; Masataka Ito, Urawa; Masafumi Kobayashi, Tokyo, and Chieko Tanaka, Ichikawa, all of, Japan, assignors to Oji Paper Co., Ltd, Tokyo, Japan

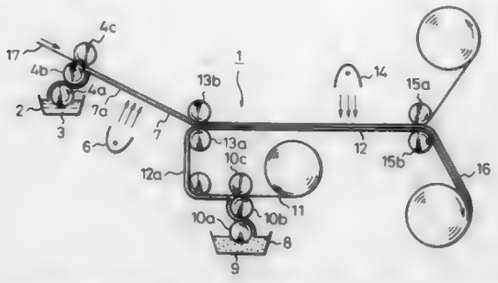
PCT No. PCT/JP92/01278, § 371 Date Jun. 2, 1993, § 102(e) Date Jun. 2, 1993, PCT Pub. No. WO93/07533, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 2, 1992, Ser. No. 66,120

Claims priority, application Japan, Jan. 3, 1991, 3-256445; May 25, 1992, 4-132730; Jul. 29, 1992, 4-202521; Sep. 1, 1992, 4-233725; Sep. 30, 1992, 4-262093

Int. Cl.[6] **B32B** *29/00;* **G03C** *1/86;* **B05D** *3/06*

U.S. Cl. 428—328 **36 Claims**



1. A support sheet for photographic printing paper, comprising:

a substrate paper sheet comprising a natural pulp as a principal component;

a front surface composite resin coating layer formed on a surface of the substrate paper sheet and comprising

a laminate structure comprising at least one inner cured resin layer comprised of, as a principal component, an unsaturated organic compound curable by electron beam irradiation,

and an outermost cured resin layer comprised of, as a principal component, an unsaturated organic compound curable by an electron beam irradiation laminated on the inner cured resin layer; said outermost cured resin layer having a higher density of crosslinking than that of the inner cured resin layer

and a back surface resin coating layer formed on the opposite surface of the substrate paper sheet and comprising, as a principal component, at least one film-forming synthetic resin.

5,470,653

DISPOSABLE MOP HEADS

Travis W. Honeycutt, Gainesville; Baosheng Lee, Duluth, both of Ga., and James R. Shreffler, Weaverville, N.C., assignors to Isolyser Company, Inc., Norcross, Ga.

Filed Aug. 5, 1994, Ser. No. 286,811

Int. Cl.[6] **D02G** *3/00*

U.S. Cl. 428—357 **12 Claims**

1. A mop head comprising a bundle of fibers bound together to create said mop head fabric, said fibers comprising polyvinyl alcohol which is water soluble at temperatures only above approximately 93° C., said polyvinyl alcohol fibers being produced by a process of dope extrusion and then treated with heat and stretching, the degree of crystallinity and the degree of orientation for the heated and stretched polyvinyl alcohol fibers are approximately 0.70 and 0.52, respectively, and wherein the water content of the polyvinyl alcohol fiber is kept at a value between approximately 1.5 to 15.0% (wt.), said polyvinyl alcohol having a degree of polymerization between approximately 1300 to 1500 being produced from greater than 99% saponified polyvinyl acetate.

5,470,654

Patent Not Issued For This Number

5,470,655

POLYTETRAFLUOROETHYLENE FILAMENTARY MATERIAL

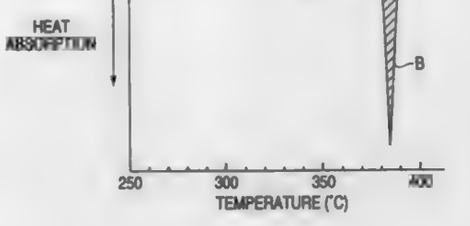
Kengo Hirai, Okayama, Japan, assignor to Japan Gore-Tex, Inc., Japan

Filed Sep. 15, 1994, Ser. No. 307,863

Claims priority, application Japan, Sep. 16, 1993, 5-253828

Int. Cl.[6] **D02G** *3/00*

U.S. Cl. 428—364 **7 Claims**



1. A polytetrafluoroethylene fiber,

said fiber, when analyzed by differential scanning calorimetry over a temperature range of 30° to 450° at a heating rate of 10° C./minute, exhibiting a first endothermic peak in the temperature range 325° to 350° C. and a second endothermic peak in the temperature range 370° to 390° C.;

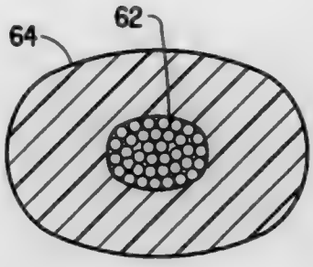
a melt energy ratio of the second peak to that of the first peak being equal to or greater than 2.

5,470,656

MOISTURE-STABLE FLEXIBLE STRUCTURAL ADHESIVE STRAND

Jeffrey L. Kennard, Hockessin; George K. Kodokian; Peter Popper, both of Wilmington, and Kalika R. Samant, Seaford, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 5, 1994, Ser. No. 270,861
Int. Cl.[6] D02G *3/00*
U.S. Cl. 428—370 5 Claims



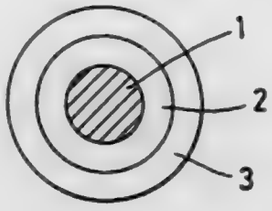
1. A moisture-stable, flexible, structural adhesive strand comprising: a core consisting essentially of continuous moisture-insensitive reinforcing filaments, said core having a periphery and an interior portion; and a sheath of a moisture-sensitive, thermoplastic resin, said sheath surrounding said core and adhered to the periphery of said core so that reinforcing filaments at the interior portion of said core are movable relative to said sheath, said strand having a cross-sectional area ratio of reinforcing filaments to moisture-sensitive thermoplastic resin in the range of about 0.04 to less than 0.30 whereby said strand has a change in length response from maximum expansion to maximum shrinkage of less than 2.0%, relative to a starting length measured at 20° C., 50% RH, due to changes in temperature and humidity over a relative humidity range of 0–100% and a temperature range from 5° C. to 40° C.

5,470,657

HEAT-RESISTANT, HIGH-VOLTAGE LEAD WIRE FOR DIRECT CURRENT

Hiroshi Hayami, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 930,597, Oct. 2, 1992, abandoned. This application Jul. 28, 1994, Ser. No. 281,531
Claims priority, application Japan, Apr. 26, 1991, 3-125376
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—373 3 Claims



1. An insulated high-voltage lead wire for direct current in which an insulating layer is formed over the conductor, said insulating layer comprising a polyolefin based resin composition, said polyolefin resin composition being a flame-retardant resin composition comprising a resin mixture (A) of 40 to 80% by weight a polyethylene, of which a crystalline component of the polyethylene has a melting point between about 125° C. to 131° C., and an ethylene-α-olefin copolymer, and a multi-functionalized monomer (B) having an unsaturated carbon-carbon bond moiety in its molecule as an indispensable component and wherein said insulating layer is irradiated by ionizing radiation.

5,470,658

GLASS FIBERS FOR REINFORCING ORGANIC MATRICES

Jean-Philippe Gasca, Saint-Jean De La Porte, and Gerard Tardy, Grenoble, both of, France, assignors to Vetrotex France, Chambery, France

Filed Jul. 22, 1994, Ser. No. 278,957
Claims priority, application France, Jul. 22, 1993, 93 09050
Int. Cl.[6] B32B *9/00;25/20*
U.S. Cl. 428—391 15 Claims

1. Glass fibers for reinforcing thermoplastic materials, said fibers being coated with a sizing composition comprising:

(1) an aqueous emulsion containing at least one polyolefin having grafted thereon at least one acid or anhydride which is neutralized by at least one alcoholamine, said at least one polyolefin being present in an amount of between 1 and 10% by weight of said composition;

(2) 0.1–2% by weight of at least one aminosilane coupling agent; and

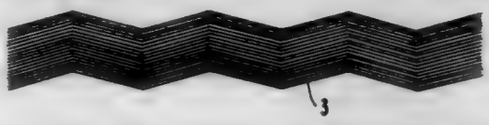
(3) 0.1–2% by weight of at least one primary, secondary, or tertiary aliphatic monoamine stabilizing agent which is miscible with water and which has a pK_b value lower than the pK_b value of the amine group of the coupling agent, plus 1, wherein the solids content of the composition is between 1 and 15%.

5,470,659

HOLLOW FIBERS

Rudolf Baumgart; Manfred Martin, both of Wuppertal; Lothar Löw, Elsenfeld, and Gunter Scheven, Erlenbach, all of, Germany, assignors to Akzo NV, Arnheim, Netherlands

Continuation of Ser. No. 617,273, Nov. 16, 1990, abandoned, which is a continuation of Ser. No. 275,591, Nov. 14, 1988, abandoned, which is a continuation of Ser. No. 938,726, Dec. 5, 1986, abandoned, which is a division of Ser. No. 571,519, Jan. 17, 1984, Pat. No. 4,681,720. This application Feb. 12, 1993, Ser. No. 17,980
Claims priority, application Germany, Jan. 17, 1983, 33 01 268.7
Int. Cl.[6] D02G *3/00;* B01D *39/18;39/02*
U.S. Cl. 428—398 4 Claims



1. A bundle of 1000, permanently undulated, closed-end hollow fibres made of regenerated cellulose having an amplitude of about 1 mm, an outer diameter of about 216 microns and a wavelength of about 20 mm to produce a pressure loss of about 26 mm Hg during a flowthrough of water having a temperature of 37° C. at a rate of 2.4 liters per hour in a longitudinal direction of the fibres when the bundle has a length of 250 mm and is arranged in a pipe of inner diameter of 14 mm.

5,470,660

IRON OXIDE PARTICLES AND PROCESS FOR PRODUCING THE SAME

Hiromitsu Misawa, Hatsukaichi; Kazuo Fujioka; Koso Aoki, both of Hiroshima; Eiichi Kurita, Yokohama; Yoji Okano, Hiroshima, and Minoru Kozawa, Higashihiroshima, all of, Japan, assignors to Toda Kogyo Corporation, Hiroshima, Japan

Filed Oct. 5, 1993, Ser. No. 131,668
Claims priority, application Japan, Jan. 6, 1992, 4-292265; Jan. 15, 1992, 4-304689; Jan. 15, 1992, 4-304691; Jan. 15, 1992, 4-304790
Int. Cl.[6] B32B *15/02*
U.S. Cl. 428—403 9 Claims

1. Iron oxide particles comprising:

100 parts by weight of iron oxide particles having an area-average particle diameter of 0.1 μm≦d_3≦ 1.0 μm, an area shape factor of 1.0≦ϕ_s≦2.0 and a BET specific surface area represented by the formula (1):

$$6/(\rho \cdot d_3) \times \phi_s \quad (1)$$

wherein ρ represents the specific gravity of said iron oxide particles, d_3 represents the area-average particle diameter and ϕ_s represents the area shape factor, and

0.25 to 10 parts by weight, calculated as an oxide, of the fine particles of an oxide, a hydroxide, a hydroxide oxide, a hydrous oxide and a mixture thereof of an element selected from the group consisting of Al, Si, Zr and Ti, which fine particles are adhered to the surfaces of said iron oxide particles,

the increment of said BET specific surface area of said iron oxide particles being 1 to 6 m^2/g, and the increment of said BET specific surface area with respect to the amount of said fine particles being not less than 0.35.

5,470,661

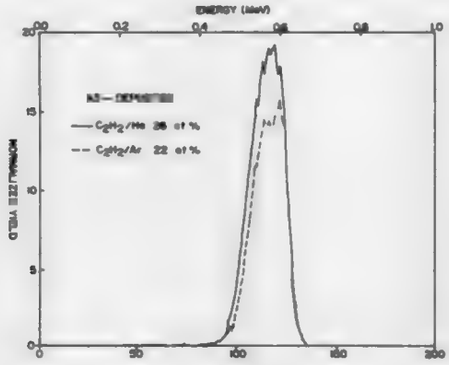
DIAMOND-LIKE CARBON FILMS FROM A HYDROCARBON HELIUM PLASMA

Fredric D. Bailey, Golden, Colo.; Douglas A. Buchanan, Cortlandt Manor, N.Y.; Alessandro C. Callegari; Howard M. Clearfield, both of Yorktown Heights, N.Y.; Fuad E. Doany, Katonah, N.Y.; Donis G. Flagello, Ridgefield, Conn.; Harold J. Hovel, Katonah, N.Y.; Douglas C. Latulipe, Jr., Danbury, Conn.; Naftali E. Lustig, Croton-on-Hudson, N.Y.; Andrew T. S. Pomerene, New Fairfield, Conn.; Sampath Purushothaman, Yorktown Heights, N.Y.; Christopher M. Scherpereel, Poughquag, N.Y.; David E. Seeger, Congers, N.Y., and Jane M. Shaw, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 7, 1993, Ser. No. 1,374

Int. Cl.[6] B24B *3/02*

U.S. Cl. 428—408 **7 Claims**



1. A coated substrate produced by depositing a diamond-like carbon film onto a substrate by plasma-enhanced chemical vapor deposition which comprises the steps of (a) admixing a hydrocarbon gas and helium to provide a gas mixture; (b) providing a plasma chamber containing a substrate; and (c) introducing said gas mixture into said plasma chamber wherein a diamond-like carbon film is disposited on said substrate, said diamond-like carbon film having an optical density in the range from about 1 to about 3 at a wavelength of from about 200 nm to about 365 nm and is thermally stable at temperatures of about 590° C.

5,470,662

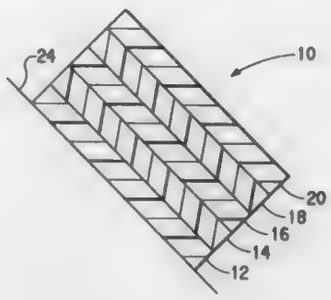
RECORDING FILMS WITH A HIGH REFRACTIVE INDEX MODULATION

Andrew M. Weber, and Aleksander Beresniewicz, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 146,816, Nov. 4, 1993, abandoned. This application Oct. 25, 1994, Ser. No. 328,935

Int. Cl.[6] B32B *17/10;27/08;27/30;* **G03C** *1/675*

U.S. Cl. 428—421 **13 Claims**



6. A laminated structure comprising, in order:

(a) a first ply;

(b) a photopolymerizable film imaged to contain a refractive index image, said film comprising, by weight, 25 to 90% binder, 5 to 60% monomer, and 0.1 to 10% photoinitiator system, said binder comprising a copolymer having the formula

$$(M)_w(VAc)_x(VOH)_y(CTFE)_z$$

wherein M is a fluoromonomer, VAc is vinyl acetate, VOH is vinyl alcohol, CTFE is a chlorofluoromonomer; w, x, y, and z are weight percents and w is 5 to 22%, x is 50 to 75%, y is 3 to 8%, and z is 15 to 30%; with the proviso that said copolymer contains about 3 to 35% fluorine by weight;

(c) and a second ply.

5,470,663

MELTBLOWING OF ETHYLENE AND FLUORINATED ETHYLENE COPOLYMERS

Larry C. Wadsworth, and Ahamad Y. Khan, both of Knoxville, Tenn., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Division of Ser. No. 142,240, Oct. 25, 1993, Pat. No. 5,401,458. This application Jan. 6, 1995, Ser. No. 369,824

Int. Cl.[6] B32B *27/00*

U.S. Cl. 428—421 **6 Claims**

1. The meltblown web comprising a copolymer of ethylene and a fluorocarbon having the following properties:

a) an average fiber size of less than 3.2 um;

b) an MD breaking load of greater than 400 g/in; and

c) a CD breaking load of greater than 1000 g/in;

wherein the copolymer is ethylene-chlorotrifluoroethylene (ECTFE); wherein said ECTFE has an ethylene content in the range of from about 30 to about 70 weight percent, a melting point of 240° C., a melt index in the range of from about 100 to about 1500 dg/10 min, a molecular weight in the range of from about 80,000 to about 120,000, and a T_g about 80° C.

5,470,664

HARD ANODIC COATING FOR MAGNESIUM ALLOYS

Duane E. Bartak, Cedar Falls, Iowa; Brian E. Lemieux, E. Grand Forks, Minn., and Earl R. Woolsey, Grand Forks, N. Dak., assignors to Technology Applications Group, Grand Forks, N. Dak.

Continuation-in-part of Ser. No. 136,494, Oct. 14, 1993, abandoned, which is a continuation of Ser. No. 869,427, Apr. 16, 1992, abandoned, which is a continuation of Ser. No. 661,503, Feb. 26, 1991, abandoned. This application Jul. 6, 1994, Ser. No. 271,052

Int. Cl.[6] B32B *15/04*

U.S. Cl. 428—472.1 4 Claims

1. A magnesium-containing article offering improved corrosion and abrasion resistance, the article comprising a magnesium-containing substrate coated with a first layer containing a continuum of magnesium fluoride, magnesium oxide, magnesium oxofluoride and silicon oxide.

5,470,665

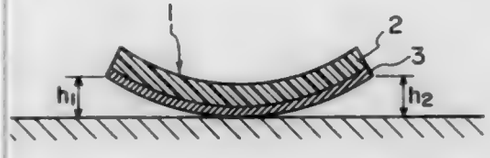
BIAXIALLY ORIENTED UNIDIRECTIONALLY LONG POLYETHYLENE-2, 6-NAPHTHALENEDICARBOXYLATE FILM

Hisashi Hamano; Masahiro Hosoi; Ieyasu Kobayshi, and Yasuhiro Saeki, all of Sagamihara, Japan, assignors to Teijin, Ltd., Osaka, Japan

Continuation of Ser. No. 16,259, Feb. 11, 1993, abandoned. This application Mar. 30, 1995, Ser. No. 414,137

Int. Cl.[6] B32B *27/06;27/36*

U.S. Cl. 428—480 16 Claims



1. A biaxially oriented, unidirectionally long polyethylene-2,6-naphthalenedicarboxylate film useful as a substrate for a magnetic recording video tape, said film having a first surface and a second surface, wherein the film has the following characteristic properties:

(A) the Young's Modulus in the longitudinal direction and the Young's modulus in the transverse direction are each at least 600 kg/mm^2, and the Young's modulus in the longitudinal direction is greater than the Young's modulus in the transverse direction,

(B) the heat shrinkage factor in the transverse direction when the film has been treated under no load at 105° C. for 30 minutes is at least 1%,

(C) the surface roughness, Ra, of the first surface of the film is up to 5 nm, said first surface being a surface to be coated with a metal layer by vapor deposition and,

(D) the heat shrinkage factor in the longitudinal direction when the film has been treated under no load at 105° C. for 30 minutes is up to 1%.

5,470,666

ALUMINUM BASE ALLOY BEARING HAVING SUPERIOR FATIGUE RESISTANCE

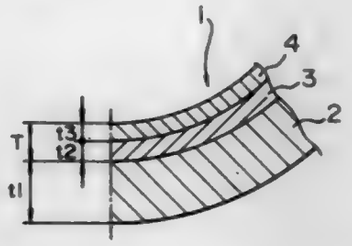
Tadashi Tanaka; Masaaki Sakamoto, and Yoshiaki Sato, all of Nagoya, Japan, assignors to Daido Metal Company, Ltd., Nagoya, Japan

Filed Dec. 5, 1994, Ser. No. 353,271

Claims priority, application Japan, Dec. 27, 1993, 5-332187

Int. Cl.[6] F16C *33/12*

U.S. Cl. 428—653 4 Claims



1. An aluminum base alloy bearing having a superior fatigue resistance, comprising a back metal layer, an intermediate bonding layer bonded onto the back metal layer, and an aluminum base bearing alloy layer bonded onto the intermediate bonding layer, the hardness of said intermediate bonding layer being in the range of 25 to 60 in terms of Vickers hardness, the thickness of said intermediate bonding layer being 0.5 to 0.9 times in the sum of both the thickness of said intermediate bonding layer and the thickness of said aluminum base bearing alloy layer.

5,470,667

ARCHITECTURAL MATERIAL COATING

Jay F. Carey, II, Follansbee, W. Va., and Mehrooz Zamanzadeh, Pittsburgh, Pa., assignors to The Louis Berkman Company, Steubenville, Ohio

Continuation of Ser. No. 175,523, Dec. 30, 1993, Pat. No. 5,401,586, which is a continuation-in-part of Ser. No. 154,376, Nov. 17, 1993, abandoned, which is a continuation of Ser. No. 42,649, Apr. 5, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 338,386

The portion of the term of this patent subsequent to Mar. 28, 2012, has been disclaimed.

Int. Cl.[6] B32B *15/18*

U.S. Cl. 428—659 31 Claims

1. A metal strip unwound from a roll of strip and coated in a continuous hot dip process forming a coating with a highly corrosive-resistant, two phase tin-zinc colored metallic coating, said coating comprising at least 65 weight percent zinc, at least 15 weight percent tin and at least 0.01 weight percent metallic stabilizer wherein said stabilizer is a metal selected from the group consisting of bismuth, antimony and mixtures thereof.

5,470,668

METAL OXIDE FILMS ON METAL

Xin D. Wu, and Prabhat Tiwari, both of Los Alamos, N.M., assignors to The Regents of the University of Calif., Oakland, Calif.

Filed Mar. 31, 1994, Ser. No. 221,426

Int. Cl.[6] B32B *09/00*

U.S. Cl. 428—688 4 Claims

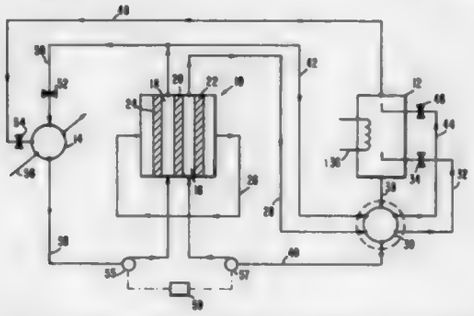
1. A heteroepitaxial oriented structure comprising a thin film of an epitaxial oriented conductive alkaline earth metal oxide selected from the group consisting of strontium ruthenium oxide, calcium ruthenium oxide, barium ruthenium oxide, lanthanum-strontium cobalt oxide or mixed alkaline earth ruthenium trioxides thereof, epitaxially oriented upon a thin film of a noble metal.

5,470,669

THERMOELECTROCHEMICAL SYSTEM AND METHOD

Frank A. Ludwig, Rancho Palos Verdes; Carl W. Townsend, and Bruce M. Eliash, both of Los Angeles, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 789,000, Oct. 18, 1985, abandoned. This application Mar. 27, 1989, Ser. No. 336,457
Int. Cl.[6] H01M *8/14;8/18;* C25D *17/00*
U.S. Cl. 429—17 22 Claims



1. A thermoelectrochemical system for generating an electrical current comprising:

a) an electrochemical cell having a cathode compartment and an anode compartment, said compartments having a common ion-permeable separation wall;

b) a cathode and an anode located within their respective compartments, said cathode and anode being connectable externally of said cell for generation of said electrical current;

c) a cathode solution comprising a concentrated aqueous solution of a chosen strong Bronsted acid located in said cathode compartment and in contact with said cathode wherein hydrogen ions are consumed at said cathode during generation of said electrical current and hydrogen gas and a first cell reaction product are generated;

d) an anode solution comprising a chosen relatively low melting molten salt solution located in said anode compartment and in contact with said anode wherein the anion of said salt reacts with hydrogen gas to thereby reduce the hydrogen ion concentration in said anode compartment and to form a second cell reaction product, and wherein the cation of said salt is capable of being decomposed by heat to produce hydrogen ions;

e) thermochemical regenerator means for thermally converting said first cell reaction product to said chosen acid and an intermediate regeneration product;

f) means for transferring said cathode solution containing said first cell reaction product from said cathode compartment to said thermochemical regenerator means;

g) cathode recycle means for transferring said chosen acid formed in said thermochemical regenerator means to said cathode compartment to replenish said chosen acid consumed during generation of said electrical current;

h) means for combining said second cell reaction product from said anode compartment with said intermediate regeneration product from said thermochemical regenerator means to thereby form said molten salt solution;

i) means for removing heat resulting from said combining in step "h";

j) means for transferring said intermediate regeneration product produced in said thermochemical regenerator means to said means for combining;

k) means for transferring anode solution containing said second cell reaction product to said means for combining; and

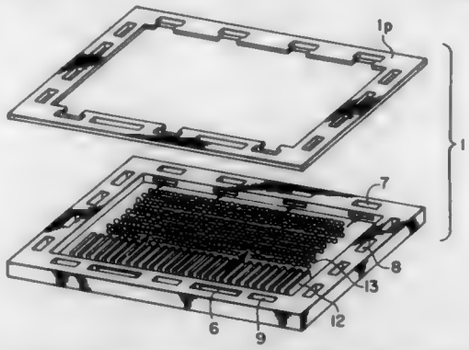
l) anode recycle means for transferring said molten salt formed in said means for combining to said anode compartment to replenish said molten salt consumed during generation of said electrical current.

5,470,670

FUEL CELL

Eiichi Yasumoto, Katano; Junji Niikura, Hirakata; Kazuhito Hatoh, Daito, and Takaharu Gamo, Fujiidera, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 24, 1994, Ser. No. 201,030
Claims priority, application Japan, Mar. 1, 1993, 5-039623
Int. Cl.[6] H01M *8/06*
U.S. Cl. 429—20 14 Claims



1. A fuel cell comprising a cell body having at least one cell element mainly composed of a fuel electrode and an oxidant electrode and an electrolyte board interposed between said fuel electrode and said oxidant electrode, and a plate-type reformer incorporated adjacent to said cell body, said reformer having a zone for preheating fuel gas and a reforming zone in which a reforming catalyst is located, said preheating zone being located upstream of said reforming zone in a direction in which said fuel gas flows, and including fins for radiating heat transmitted from said fuel cell so as to preheat said fuel gas.

5,470,671

ELECTROCHEMICAL FUEL CELL EMPLOYING AMBIENT AIR AS THE OXIDANT AND COOLANT

Nicholas J. Fletcher; Gordon J. Lamont, both of Vancouver; Vesna Basura, Burnaby; Henry H. Voss, West Vancouver, and David P. Wilkinson, North Vancouver, all of, Canada, assignors to Ballard Power Systems Inc., North Vancouver, Canada

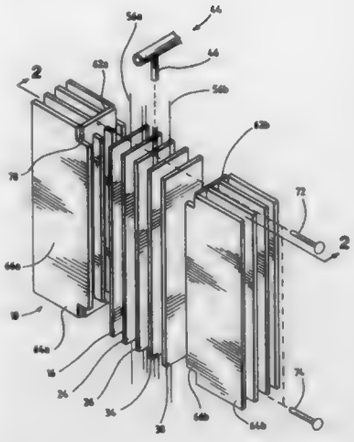
Filed Dec. 22, 1993, Ser. No. 171,732
Int. Cl.[6] H01M *8/02*
U.S. Cl. 429—26 30 Claims

1. An electrochemical fuel cell assembly comprising:

a membrane electrode assembly comprising a porous electrically conductive anode, a porous electrically conductive cathode having a surface thereof exposed to ambient air, and an ion exchange membrane interposed between said anode and said cathode;

sealant means for forming a gas-impermeable barrier around said anode;

fuel delivery means for supplying a gaseous fuel stream to said anode;



electrical connection means for providing an electrical connection to said anode and to said cathode;

a thermally conductive plate having a plurality of first thermally conductive members extending from a major surface thereof, said first members contacting portions of said exposed cathode surface, adjacent ones of said first members cooperating with said plate and said exposed cathode surface to form at least one air conducting channel;

whereby at least a portion of the heat generated exothermically in said membrane electrode assembly is dissipated to the atmosphere through said first members.

5,470,672

FUEL CELLS AND PROCESS FOR THE PRODUCTION OF THE ANODE

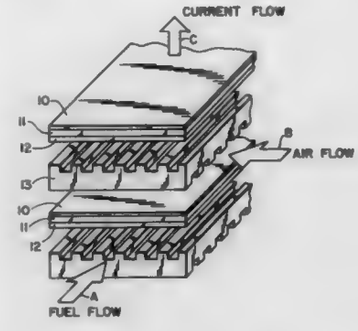
Aristides Naoumidis, Jülich, Germany, assignor to Forschungszentrum Julich GmbH, Jülich, Germany

Filed Nov. 25, 1994, Ser. No. 344,956

Claims priority, application Germany, Nov. 27, 1993, 43 40 486.3

Int. Cl.[6] H01M *4/86*

U.S. Cl. 429—40 **17 Claims**



1. In an anode for a fuel cell with a solid oxide (SOFC) or a molten carbonate salt electrolyte (MCFC), the improvement wherein said anode consists essentially of a solid mixture of tungsten carbide and an ion-conducting oxide.

5,470,673

ELECTROCHROMIC AND ELECTROCATALYTIC MATERIAL

Alfred C. C. Tseung; Pei K. Shen, and Jade Syed-Bokhari, all of Essex, United Kingdom, assignors to University of Essex, Colchester, United Kingdom

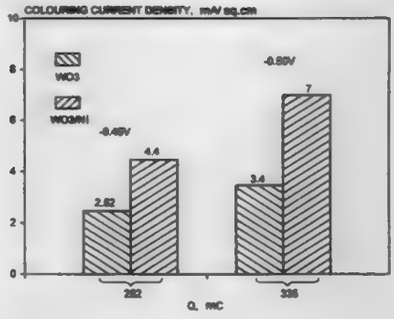
PCT No. PCT/GB92/00364, § 371 Date Nov. 12, 1993, § 102(e) Date Nov. 12, 1993, PCT Pub. No. WO92/16027, PCT Pub. Date Sep. 17, 1992

PCT Filed Feb. 28, 1992, Ser. No. 108,646

Claims priority, application United Kingdom, Mar. 1, 1991, 9104377

Int. Cl.[6] H01M *8/00;* **B05D** *1/18*

U.S. Cl. 429—44 **29 Claims**



1. An electrochemical or reductive co-deposition process, which comprises; forming a solution of ions comprising at least one metal (a) of a hydrogen bronze and ions comprising at least one metal (b) from Group VIII of the periodic table, and causing electrochemical deposition from the solution onto a cathodic substrate, or causing co-precipitation by incorporating a chemical reducing agent into the solution.

5,470,674

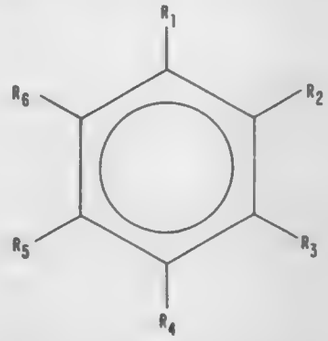
ELECTROLYTE SALTS FOR POWER SOURCES

Narayan Doddapaneni, 10516 Royal Birkdale, NE., and David Ingersoll, 5824 Mimosa Pl., NE., both of Albuquerque, N.M. 87111

Continuation-in-part of Ser. No. 153,416, Nov. 15, 1993, Pat. No. 5,378,550. This application Nov. 17, 1994, Ser. No. 341,494

Int. Cl.[6] H01M *6/16;6/18*

U.S. Cl. 429—50 **12 Claims**



1. A power source comprising: a solid polymer and an electrolyte salt comprising a parent phenyl ring with bonds outside said parent phenyl ring to R_1, R_2, R_3, R_4, R_5, and R_6, where R_1, R_2, R_3, R_4, R_5, and R_6 each comprise a member selected from the group consisting of H, SO_3X, R'H, $R'SO_3X$, PO_3X, and $R'PO_3X$, where X comprises a cation and R' comprises an aliphatic chain, an aromatic ring system, or a combination of an aliphatic chain and an aromatic ring system.

5,470,675
ELECTROCHEMICAL CELL COMPRISING A HYDRIDE-FORMING INTERMETALLIC COMPOUND

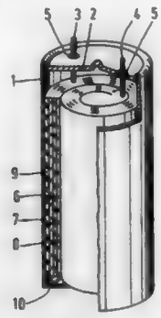
Robert E. F. Einerhand; Gerardus J. M. Lippits; Johannes L. C. Daams, and Petrus H. L. Notten, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 731,673, Jul. 17, 1991, abandoned. This application Mar. 18, 1993, Ser. No. 33,948

Claims priority, application Netherlands, Jul. 24, 1990, 9001677

Int. Cl.[6] H01M *4/04*

U.S. Cl. 429—101 **8 Claims**



1. A method of manufacturing an electrochemically active material comprising an intermetallic compound having the $CaCu_5$-structure which compound forms a hydride with hydrogen and which compound comprises a metastable phase having a composition of the formula AB_m, wherein m exceeds 5.1, A is Mischmetall or at least one element selected from the group consisting of Y, Ti, Hf, Zr, Ca, Th, La and the other rare earth metals, the overall atomic quantity of the elements Y, Ti, Mb and Zr being less than 40% of A and B is at least one element selected from the group consisting of Ni, Co, Cu, Pd, Fe, Mn and Si, said method comprising mixing and melting the quantities of the components A and B required for a melt of said compound, cooling the resultant melt first to a homogeneity region in which the composition of the formula AB_m is located and then cooling said melt rapidly at a rate such that a phase of the composition of the formula AB_m that is metastable at room temperature is formed.

5,470,676
LEAD-ACID STORAGE BATTERY CONTAINING POCKET-TYPE ELECTRODE ASSEMBLY

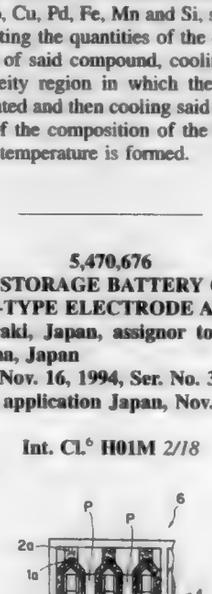
Kenji Nakano, Iwaki, Japan, assignor to Furukawa Denchi Kabushiki Kaisha, Japan

Filed Nov. 16, 1994, Ser. No. 341,152

Claims priority, application Japan, Nov. 30, 1993, 5-068909 U

Int. Cl.[6] H01M *2/18*

U.S. Cl. 429—139 **12 Claims**



1. An electrode assembly for a lead-acid storage battery comprising a synthetic resin-made separator with side edge portions and a glass mat with side edge portions, wherein the glass mat is wider than the synthetic resin-made separator, and wherein the separator and the glass mat are stacked one upon another and folded so that the separator is positioned within the glass mat, the side edge portions of the separator overlap, and the side edge portions of the glass mat overlap each other and extend beyond the side edge portions of the separator, with the side edge portions of the separator and the side edge portions of the glass mat respectively being at least individually seal-bonded to each other.

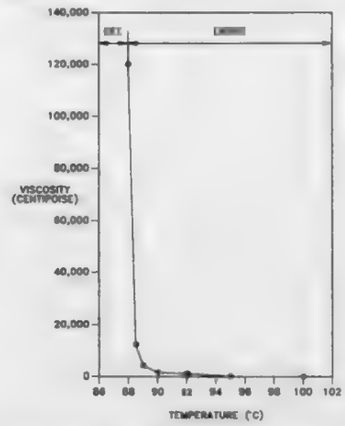
5,470,677
ELECTROLYTE GEL

Joel L. Williams, Cary; Tal M. Nahir, Raleigh, both of N.C., and Yong-Jian Qiu, Myrtle Beach, S.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Filed Nov. 17, 1993, Ser. No. 153,509

Int. Cl.[6] H01M *6/18*

U.S. Cl. 429—190 **5 Claims**



1. An electrochemical cell comprising a negative electrode, a positive electrode and a thermally reversible conducting electrolyte gel there-between, said gel comprising an organic solvent, an electrolyte soluble in said organic solvent and a gelling agent selected from the group consisting of dibenzylsorbitol, dibenzylidene sorbitol, 4,4'-dimethyl dibenzylidene sorbitol, 4,4'-dichlorodibenzylidene sorbitol, and 4,4'-bis(methylthio)dibenzylidene sorbitol.

5,470,678
LITHIUM CELL WITH A CATHODE COMPRISING A COPPER COMPOUND OXIDE

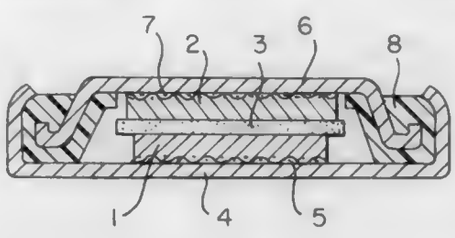
Hideaki Yumiba, Suita; Kazunobu Matsumoto, Mishima, and Akira Kawakami, Takatsuki, all of, Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Aug. 12, 1993, Ser. No. 105,169

Claims priority, application Japan, Aug. 19, 1992, 4-244280

Int. Cl.[6] H01M *6/16;4/58*

U.S. Cl. 429—194 **3 Claims**



1. A lithium cell comprising a negative electrode comprising lithium or a lithium containing material, an electrolytic solution based on an organic solvent, and a positive electrode active material comprising a copper compound oxide, having an atomic ratio

of at least 1 of a number of lithium atoms (Li) which react with one molecule of said copper compound oxide during discharge of said lithium cell to a number of oxygen atoms (O) contained in one molecule of said copper compound oxide, which ratio is expressed as Li/O, wherein said copper compound oxide comprises copper, tellurium and oxygen.

5,470,679

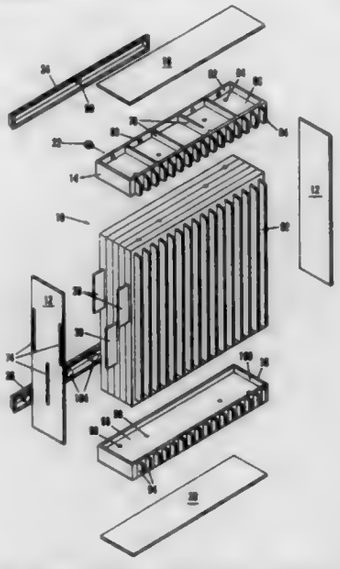
METHOD OF ASSEMBLING A BIPOLAR LEAD-ACID BATTERY AND THE RESULTING BIPOLAR BATTERY

David L. Lund, Minneapolis; William H. Kump, West St. Paul, and Donald W. Groff, Eagan, all of Minn., assignors to GNB Battery Technologies Inc., Mendota Heights, Minn.

Division of Ser. No. 71,298, Jun. 2, 1993. This application May 20, 1994, Ser. No. 246,730

Int. Cl.[6] H01M *4/14*

U.S. Cl. 429—210 **16 Claims**



1. A bipolar lead-acid battery having a desired voltage and capacity which comprises a set of end frames each having a solid exterior surface, top, bottom and side surfaces and an interior surface comprising a peripheral border defining a central open area sized to accommodate a first conductive metal substrate, said first conductive metal substrate being embedded in each of said end frames and positioned in said central open area, a first layer of positive or negative active material adhered to each of said first conductive metal substrates, a series of other frames having top, bottom and side surfaces and a peripheral border defining a central open area sized to accommodate a second conductive metal substrate, said second conductive metal substrate embedded in each of said other frames and positioned in the central open area, a second layer of either positive or negative active material adhered to each surface of each of said second conductive metal substrates embedded in said other frames, said end frames and said other frames being juxtaposed adjacent one another and comprising an electrochemical component unit having top, side and bottom surfaces corresponding to the respective top, side and bottom surfaces of said frames with the exterior surfaces of the end frames comprising the end surfaces of the electrochemical component unit and the peripheral surfaces of adjacent frames forming peripheral surfaces therebetween, the frames in the unit being assembled so as to have each layer of positive active material in said first and second layers adjacent a negative active material layer in said first and second layers, a separator positioned between adjacent positive and negative active material layers from said first and second layers, an electrolyte fill/vent hole in the top and bottom surfaces of said unit in communication with a separator, a panel sealed to the side surfaces of said electrochemical component unit, an electrolyte fill/vent box comprising a base divided into compartments equal in number to the number of separators and having electrolyte fill/vent holes in alignment with the holes in the top surface of said electrochemical component unit, a front panel having a series of apertures, one aperture communicating with each compartment and an open top, the base of said electrolyte fill/vent box being sealed to the top surface of the electrochemical component unit and an electrolyte fill/vent box cover being sealed thereto to close the open top, a vacuum box comprising a base divided into compartments equal in number to the number of separators having holes aligning with the holes in the bottom surface of the electrochemical component unit, a front panel having a series of apertures, one aperture communicating with each compartment and an open top, the base of said vacuum box being sealed to the bottom surface of the unit via the base, a manifold cover for the electrolyte fill/vent box sealed to the front panel of said electrolyte fill/vent box and a vacuum box cover being sealed thereto to close the open top, a vacuum box manifold cover having closures for blocking off the front panel vacuum box apertures and sealed to the vacuum box so that said closures block off the front panel vacuum box apertures, and electrolyte being positioned between adjacent active material layers of positive and negative active material.

5,470,680

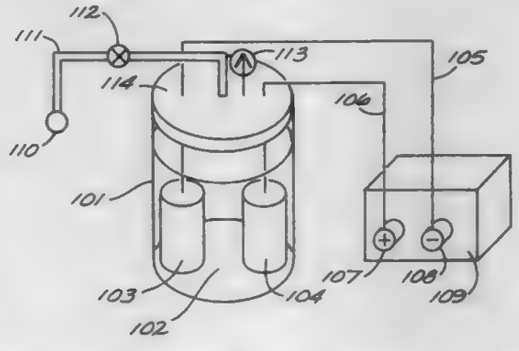
ELECTROCHEMICAL FULLERENE SYSTEM

Raouf O. Loutfy, and James C. Withers, both of Tucson, Ariz., assignors to Materials and Electrochemical Research Corp., Tucson, Ariz.

Filed Mar. 19, 1993, Ser. No. 34,354

Int. Cl.[6] H01M *4/58*

U.S. Cl. 429—218 **88 Claims**



29. A battery comprising a body of a proton donor electrolyte, first and second electrodes in effective contact with said electrolyte, said first electrode consisting essentially of a fullerene in contact with at least one conductive material, and conductive terminal means for deriving an electric current from said battery.

5,470,681

PHASE SHIFT MASK USING LIQUID PHASE OXIDE DEPOSITION

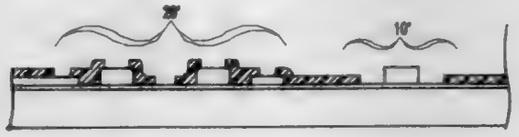
Timothy A. Brunner, Ridgefield, Conn.; Derek B. Dove, Mt. Kisco, and Louis L. Hsu, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1993, Ser. No. 173,394

Int. Cl.[6] G03F *9/00*

U.S. Cl. 430—5 **18 Claims**

1. A method of forming a lithographic exposure mask including



the steps of

applying a pattern of material having openings therein to a substrate which is transparent to at least one form of lithographic exposure radiation, and

selectively depositing silica in said openings to a first thickness from a supersaturated solution of silica in hydrofluorosilicic acid.

5,470,682

ELECTROPHOTOGRAPHIC PHOTORECEPTOR CONTAINING GRANULAR TRIGONAL SELENIUM

Seiji Ashiya; Takahiro Suzuki, and Masanori Murase, all of Minami-ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1993, Ser. No. 10,858

Claims priority, application Japan, Feb. 5, 1992, 4-047756

Int. Cl.[6] G03G *5/082*

U.S. Cl. 430—84 **4 Claims**

1. An electrophotographic photoreceptor comprising a photosensitive layer containing granular trigonal selenium which has a mean particle diameter of 0.01 μm to not more than 5 μm and which has absorption peaks in the X-ray diffraction spectrum using CuKα characteristic X-rays at Bragg angles (20°±0.2°) of 23.5°, 29.7°, 41.4° and 45.4° produced by the method comprising the reductive deposition of selenium with aqueous hydrogen peroxide by controlling the molar ratio of Se/H_2O_2 in the range of 1.5 to 2.0, controlling the addition rate of said aqueous hydrogen peroxide; and controlling the solution temperature in the range of 35°–60° C.

5,470,683

PHOTOSENSITIVE MICROCAPSULE TONER

Kouji Innishi, Okazaki, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

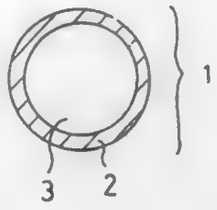
Filed Jul. 11, 1994, Ser. No. 272,427

Claims priority, application Japan, Jul. 28, 1993, 5-186110

Int. Cl.[6] G03G *9/09;9/093*

U.S. Cl. 430—106 **14 Claims**

1. Photosensitive microcapsule toner comprising; an outer shell; and a photocurable composition as a core, said photocurable composition comprising at least one radical polymerizable unsaturated group-containing compound, at least one metal arena compound as a polymerization initiator, at least one spectral sensitizing dye that is a squarylium dye, and at least one color material, wherein said



photosensitive microcapsule toner is curable by visible light.

5,470,684

Patent Not Issued For This Number

5,470,685

TONER FOR DEVELOPING ELECTROSTATIC IMAGES

Shuji Sugawara, Neyagawa; Kazuaki Sukata, Yawata, and Shun-ichiro Yamanaka, Hirakata, all of, Japan, assignors to Orient Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 29, 1994, Ser. No. 219,614

Claims priority, application Japan, Mar. 31, 1993, 5-098521

Int. Cl.[6] G03G *9/097*

U.S. Cl. 430—110 **24 Claims**

1. A positively chargeable toner for developing electrostatic images which contains at least one complex salt compound, as a charge control agent, obtained by treating a compound represented by the following formula I with an alkali metal salt, alkaline earth metal salt, alkali metal hydroxide, alkaline earth metal hydroxide, ammonium salt or pyridinium salt:

$$A^1—X—[(—L—X—)_m—(—Ar—X—)_n]—A^2 \quad I$$

wherein

(—L—X—) represents an oxyalkylene group or a thioalkylene group,

(—Ar—X—) represents an oxyarylene group or a thioarylene group,

$[(—L—X—)_m—(—Ar—X—)_n]$ represents a combination of m units of (— L—X—) and n units of (—Ar—X—) bound in a given order,

m and n independently represent an integer of 0 or more, and when n is 0, m is 3 or more, and when m is 0, n is 1 or more,

X represents —O— or —S—,

L represents an alkylene group having 1 to 4 carbon atoms which is branched or not branched or a cycloalkylene group,

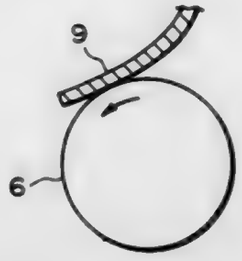
Ar represents a monocyclic or polycyclic arylene group which has or does not have a substituent, or a $—(CH_2)_a—Ax—(CH_2)_a—$ group wherein a represents an integer from 1 to 4 and Ax represents a monocyclic or polycyclic arylene group which has or does not have a substituent, and

A^1 and A^2 independently represent hydrogen, an alkyl group, a cycloalkyl group, a monocyclic or polycyclic aryl group which has or does not have a substituent, an aralkyl group or a residue of a nitrogen-containing heterocyclic compound having an —OH group or an —SH group.

5,470,686
IMAGE FORMING APPARATUS

Hiroyuki Suematsu; Hisayuki Ochi; Manabu Ohno, and Tetsuhito Kuwashima, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 7,826, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 558,438, Jul. 27, 1990, abandoned. This application Jun. 2, 1994, Ser. No. 253,209
Claims priority, application Japan, Jul. 28, 1989, 1-194024
Int. Cl.[6] G03G *9/00*
U.S. Cl. 430—111 **97 Claims**



1. An image forming apparatus, comprising: an image-bearing member for bearing a latent image, and a developing apparatus for developing the latent image, the developing apparatus comprising:

a developer container for containing a developer, wherein the developer comprises a magnetic toner comprising a binder resin composition and a magnetic material having a bulk density of 0.35 g/ml or higher, said magnetic material being contained in a proportion of 10–70 wt. % of the magnetic toner, said binder resin composition containing 10–70 wt. % of a THF (tetrahydrofuran)-insoluble component and the remainder of a THF-soluble component including a component with a molecular weight of 10000 or below on a GPC (gel permeation chromatography) chromatogram of the THF-soluble component constituting 10–50 wt. % of the binder resin;

a developer-carrying member for carrying and conveying the developer contained in the developer container to a developing zone opposite the image-bearing member, the developer-carrying member comprising a developing sleeve enclosing a magnet; and

an elastic blade which flexibly presses against the developer-carrying member to regulate the developer carried and conveyed on the developer-carrying member to a prescribed thickness to form a thin developer layer on the developer-carrying member.

5,470,687
PROCESS FOR PRODUCING TONER PARTICLES USING FREE SPACE FORMED IN A POLYMERIC MEDIUM

Shinya Mayama, Yamato; Takeshi Ikeda; Yoshinobu Baba, both of Yokohama, and Naoya Ogata, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1994, Ser. No. 233,324
Claims priority, application Japan, Apr. 28, 1993, 5-123153
Int. Cl.[6] G03G *9/00*
U.S. Cl. 430—137 **7 Claims**

1. A process for producing toner particles, comprising the steps of:

dispersing a monomer composition containing at least a colorant, a charge control agent, or a mixture thereof, and a polymerizable monomer, in free space formed in a polymeric medium comprising a polymer having a weight average molecular weight from 3,000 to 150,000 dissolved in a solvent;

polymerizing the monomer composition dispersed in said free space to obtain toner particles; and

removing said toner particles from said polymeric medium,

wherein the toner particles have a number average particle diameter from 0.5 μm to 5.0 μm, and contain particles with a diameter of 6.0 μm or larger in a proportion of not more than 5% by number.

5,470,688
HEAT DEVELOPMENT OF ELEMENTS CONTAINING METHINE-DYE RELEASING COUPLERS

John Texter, Rochester; Thomas R. Welter, Webster; David T. Southby, and Jared B. Mooberry, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 27, 1994, Ser. No. 250,146
Int. Cl.[6] G03C *8/12;8/10;8/40*
U.S. Cl. 430—203 **26 Claims**

1. A heat-developable photographic color diffusion transfer element comprising a dimensionally stable support and one or more layers comprising radiation sensitive silver halide, an organic silver salt oxidizing agent, a reducing agent, a methine-dye releasing compound, and a binder, wherein said methine-dye is heat diffusible in said element, and wherein said methine-dye releasing compound is of the structure

Cp—L—M (I)

where

Cp is a coupler radical substituted in the coupling position with a divalent linking group, L;

M is a methine-dye radical exhibiting selective absorption in the visible spectrum; and where the bond connecting M to L does not terminate in an oxygen atom; and where the —L—M group couples off upon reaction of said coupler radical with the oxidation product of a primary amine developing agent, and where said methine-dye radical M is released from said —L—M group subsequent to the coupling off of said —L—M group.

5,470,689
POLYMERISABLE COMPOSITIONS CONTAINING TETRAACRYLATES

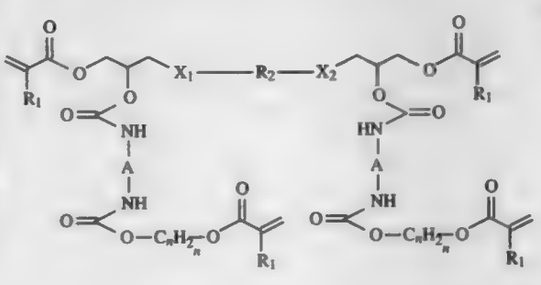
Jean-Pierre Wolf, Courtaman; Adrian Schulthess, Tentlingen; Bettina Steinmann, Praroman, and Max Hunziker, Dädingen, all of, Switzerland, assignors to Ciba-Geigy AG, Ardsley, N.Y.

Filed Feb. 24, 1994, Ser. No. 200,982
Claims priority, application Switzerland, Mar. 5, 1993, 681/93
Int. Cl.[6] G03C *5/00*
U.S. Cl. 430—269 **9 Claims**

1. A photopolymerisable composition for use in a stereolithographic process comprising

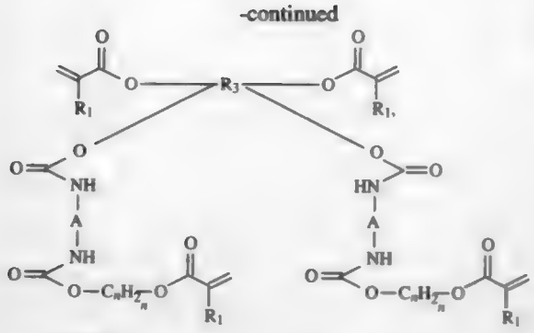
(a) 5 to 75% by weight of a tetraacrylate of formula I or II

(I)



-continued

(II)



wherein

R_1 is a hydrogen atom or methyl,

X_1 and X_2 are each independently of the other —O— or —CO—O—,

R_2 is a divalent aliphatic, cycloaliphatic or aromatic radical of a diglycidyl compound that contains no more glycidyl ether or ester groups,

A is a divalent aliphatic, cycloaliphatic or aromatic radical of a diisocyanate compound that contains no more isocyanate groups,

n is an integer from 1 to 8, and

R_3 is a tetravalent cycloaliphatic radical of a diepoxide compound that contains no more 1,2-epoxide groups at the cycloaliphatic ring,

(b) 25 to 95% by weight of at least one liquid radically polymerisable compound that differs from component a), the amount of components (a) and (b) together being 100% by weight and

(c) 0.1 to 10% by weight of a radical photoinitiator.

5,470,690

OPTICAL INFORMATION STORAGE ON A BACTERIORHODOPSIN - CONTAINING FILM

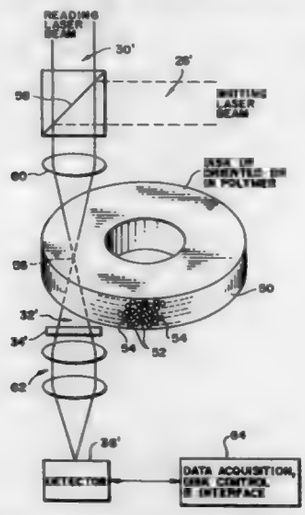
Aaron Lewis, Jerusalem, Israel; Zhongping Chen, Syracuse, N.Y., and Hiroyuki Takei, Hatoyama, Japan, assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 983,166, Nov. 30, 1992, Pat. No. 5,346,789, which is a continuation-in-part of Ser. No. 801,576, Dec. 6, 1991, abandoned. This application Jun. 9, 1994, Ser. No. 257,540

Int. Cl.[6] G11B *7/00;7/26*

U.S. Cl. 430—269 **7 Claims**

1. A method of optically storing information on a bacteriorhodopsin (BR)- containing film, comprising:



dissolving polyvinyl alcohol (PVA) in a buffer to form a polymer solution;

dissolving in a buffer a BR material incorporating a structure having a first optical state and capable of responding to light of a first spectral range to change structure to an intermediate material having a second optical state capable of responding to light of a second spectral range to change back to the first structure to thereby form a BR solution which is optically switchable between first and second states;

adjusting the pH of said BR solution to produce a high pH BR solution;

mixing said PVA solution and said high pH BR solution to form a BR-PVA solution;

forming a film from said BR-PVA solution;

drying said film;

directing onto said film light of a first spectral range representing optical information to be stored to thereby expose a selected portion of the BR material to switch the selected BR material from its first to its second state to thereby store in said film an optical image representing optical information to be stored, the stored image comprising said intermediate material having altered absorption spectra at a second spectral range.

5,470,691

OPTICAL INFORMATION MEDIUM

Yuji Arai; Takanobu Matumoto; Yuaki Shin, and Takashi Ishiguro, all of Tokyo, Japan, assignors to Taiyo Yuden, Co., Ltd., Tokyo, Japan

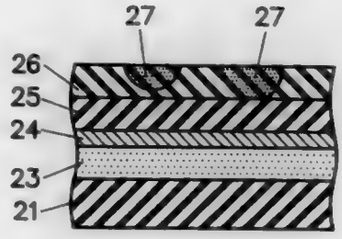
Filed Apr. 5, 1994, Ser. No. 223,465

Claims priority, application Japan, Apr. 10, 1993, 5-107617; Apr. 24, 1993, 5-120996; Apr. 24, 1993, 5-120999

Int. Cl.[6] G11B *7/24*

U.S. Cl. 430—273 **15 Claims**

1. An optical information medium comprising a plate-shaped,



optically transparent substrate, a resin protective layer formed above a first side of the substrate and an intermediate layer formed between the protective layer and the optically transparent substrate, which is capable of reproducing optically readable information by means of laser beam,

characterized in that an aqueous printing ink-fixable, hydrophilic resin film made of a radiation energy curable resin is formed on the resin protective layer.

5,470,692

INTEGRATED OPTIC COMPONENTS

Martinus B. J. Diemeer, Zoetermeer; Winfried H. G. Horsthuis, Dieren, both of, Netherlands; Alaster McDonach, and John M. Copeland, both of Glasgow, Scotland, assignors to Akzo Nobel N.V., and Kouinklijke P.T.T., both of, Netherlands

Division of Ser. No. 405,147, Sep. 7, 1989, Pat. No. 5,142,605. This application Apr. 29, 1992, Ser. No. 875,430

Claims priority, application United Kingdom, Sep. 8, 1988, 8821119; Mar. 23, 1989, 8906818

Int. Cl.[6] G03C 5/00

U.S. Cl. 430—290 7 Claims

1. A method of manufacturing an integrated optic component comprising:

providing a substrate carrying on at least one side thereof a thin layer of polymeric material capable of being made electro-optic, wherein said polymeric material is a material having an aliphatic or aromatic backbone with bonded sidegroups exhibiting hyperpolarizability; and

electively exposing portions of said polymeric material to irradiation with wavelengths within the electronic absorption bands of the sidegroups to induce into said polymeric material a predetermined refractive index pattern.

5,470,693

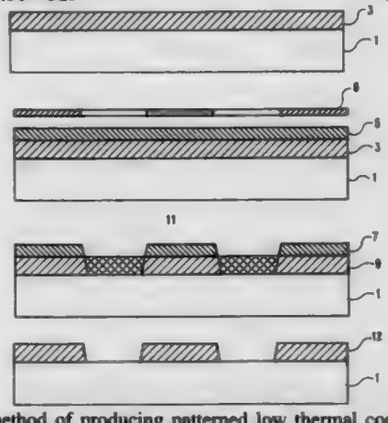
METHOD OF FORMING PATTERNED POLYIMIDE FILMS

Krishna G. Sachdev, Hopewell Junction; Joel R. Whitaker, Port Ewen, and Umar M. Ahmad, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 18, 1992, Ser. No. 837,505

Int. Cl.[6] G03F 7/26

U.S. Cl. 430—315 23 Claims



1. A method of producing patterned low thermal coefficient of expansion polyimide films, comprising the steps of:

applying a polyamic acid precursor layer onto a substrate wherein said polyamic acid precursor in said layer is capable of imidizing to form a polyimide which has a thermal coefficient of expansion approximately equal to said substrate and is selected from the group consisting of 3,3',4,4'-biphenyltetracarboxylic dianhydride-p-phenylenediamine, 3,3,4,4'-biphenyltetracarboxylic dianhydride-benzidine, pyromellitic dianhydride-p-phenylenediamine, pyromellitic dianhydride-benzidine, and 3,3'4,4'-benzophenone tetracarboxylic acid dianhydride-p-phenylenediamine;

partially baking said polyamic acid precursor layer to a point where a significant amount of casting solvent in said polyamic acid precursor layer has been removed but wherein said polyamic acid precursor layer is still subject to development;

applying a positive photoresist on said polyamic acid precursor layer;

imagewise exposing said positive photoresist to radiation through a mask;

developing said positive photoresist with a first developer which is more active for said positive photoresist than for said polyamic acid precursor layer to yield a structure comprised of a patterned photoresist, a polyamic acid precursor layer and a substrate, said step of developing is performed under conditions where said polyamic acid precursor layer is not etched with said first developer, said first developer being an aqueous developer;

immersing said substrate in a second developer which is more active for said polyamic acid precursor layer than for said positive photoresist, said second developer being an aqueous developer;

removing polyamic acid precursor material exposed to said second developer to produce a patterned polyamic acid precursor layer; and

curing said patterned polyamic acid precursor layer to yield a patterned polyimide which has a low thermal coefficient of expansion.

5,470,694

OPTICAL MEMORY ELEMENT & MANUFACTUKING METHOD THEREOF

Kenji Ohta, Nara; Junji Hirokane, Tenri; Akira Takahashi; Tetsuya Inui, both of Nara; Shohichi Katoh, Yamatokoriyama, and Toshihisa Deguchi, Nara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 821,850, Jan. 14, 1992, abandoned, which is a continuation of Ser. No. 392,027, Aug. 10, 1989, abandoned, which is a division of Ser. No. 229,753, Aug. 8, 1988, Pat. No. 4,925,776, which is a continuation of Ser. No. 901,132, Aug. 28, 1986, abandoned. This application Jun. 10, 1993, Ser. No. 74,272

Claims priority, application Japan, Aug. 30, 1985, 60-192937; Sep. 19, 1985, 60-207864; Sep. 26, 1985, 60-215909

The portion of the term of this patent subsequent to May 15, 2007, has been disclaimed.

Int. Cl.[6] G03C 5/16

U.S. Cl. 430—321 5 Claims

1. A method for manufacturing an optical memory element having a disc substrate formed of glass, circular guide tracks and circular address tracks for storing information, said method comprising the steps of:

applying a photo resist film onto a disc substrate formed of glass;

placing a photo mask plate having a mask pattern of circular guide tracks and circular address tracks on said photo resist film, wherein said photo mask plate has a diameter larger than said disc substrate, and wherein said photo mask plate includes a mask groove formed therein at a position facing the peripheral portion of the disc substrate so as to receive any risen portion of improper thickness of said photo resist film, wherein alignment between said photo mask plate and said disc substrate is improved;

irradiating the photo resist film applied to the disc substrate with ultraviolet rays through the photo mask plate having the mask pattern of circular guide tracks and circular address tracks to transcribe said mask pattern onto the photo resist film;

developing the photo resist film having said mask pattern to form a patterned photo resist film;

etching the disc substrate covered with said patterned photo resist film to form the pattern of circular guide tracks and circular address tracks onto said disc substrate;

removing the patterned photo resist film;

and

disposing a recording medium layer on said patterned disc substrate so as to form said optical memory element;

wherein a mask material of said photo mask plate is Ni, Ti or Ta, and the thickness of said photo resist film is in the range of 100 nm to 500 nm, and

wherein said disc substrate includes a center hole formed therein and said photo mask plate includes a position reference marker formed thereon so that when said photo mask plate is

placed on said photo resist film said reference marker is positioned so as to properly align said photo mask plate over said disc substrate.

4. A method for manufacturing an optical memory element having a disc substrate formed of glass, circular guide tracks and circular address tracks for storing information, said method comprising the steps of:

applying a photo resist film onto a disc substrate formed of glass;

placing a photo mask plate having a mask pattern of circular guide tracks and circular address tracks on said photo resist film, wherein said photo mask plate has a diameter larger than said disc substrate, and wherein said photo mask plate includes a central portion at a concentric center of said photo mask plate and a peripheral portion at an outer periphery thereof, such that the peripheral portion has a thickness thinner than the central portion thereof so as to receive any risen portion of improper thickness of said photo resist film opposing the outer periphery of said photo mask plate, wherein alignment between said photo mask plate and said disc substrate is improved;

irradiating the photo resist film applied to the disc substrate with ultraviolet rays through the photo mask plate having the mask pattern of circular guide tracks and circular address tracks to transcribe said mask pattern onto the photo resist film;

developing the photo resist film having said mask pattern to form a patterned photo resist film;

etching the disc substrate covered with said patterned photo resist film to form the pattern of circular guide tracks and circular address tracks onto said disc substrate;

removing the patterned photo resist film;

and

disposing a recording medium layer on said patterned disc substrate so as to form said optical memory element;

wherein a mask material of said photo mask plate is Ni, Ti or Ta, and the thickness of said photo resist film is in the range of 100 nm to 500 nm, and

wherein said disc substrate includes a center hole formed therein and said photo mask plate includes a position reference marker formed thereon so that when said photo mask plate is placed on said photo resist film said reference marker is positioned so as to properly align said photo mask plate over said disc substrate.

5. A method for manufacturing an optical memory element having a disc substrate formed of glass, circular guide tracks and circular address tracks for storing information, said method comprising the steps of:

removing a peripheral portion from a disc substrate formed of glass to form thereon an inner inclined edge portion and an outer inclined edge portion, the inner inclined edge portion being adjacent to and declining from a plane of the disc substrate where the circular guide tracks and circular address tracks are to be formed, and the outer inclined edge portion further declining from the inner inclined edge portion;

applying a photo resist film onto the disc substrate;

placing a photo mask plate having a mask pattern of circular guide tracks and circular address tracks on said photo resist film, wherein said inner inclined edge portion of the disc substrate receives any rise in the photo resist film so that alignment between said photo mask plate and said disc substrate is improved;

irradiating the photo resist film applied to the disc substrate with ultraviolet rays through the photo mask plate having the mask pattern of circular guide tracks and circular address tracks to transcribe said mask pattern onto the photo resist film;

developing the photo resist film having said mask pattern to form a patterned photo resist film;

etching the disc substrate covered with said patterned photo resist film to form the pattern of circular guide tracks and circular address tracks onto said disc substrate;

removing the patterned photo resist film;

and

disposing a recording medium layer on said patterned disc substrate so as to form said optical memory element,

wherein a mask material of said photo mask plate is Ni, Ti or Ta, and the thickness of said photo resist film is in the range of 100 nm to 500 nm, and

wherein said disc substrate includes a center hole formed therein and said photo mask plate includes a position reference marker formed thereon so that when said photo mask plate is placed on said photo resist film said reference marker is positioned so as to properly align said photo mask plate over said disc substrate.

5,470,695

SOLID PARTICLE DISPERSIONS OF FILTER DYES FOR PHOTOGRAPHIC ELEMENTS

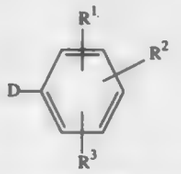
Donald R. Diehl, and Glenn M. Brown, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 733,907, Jul. 22, 1991, abandoned. This application Aug. 12, 1994, Ser. No. 289,993

Int. Cl.[6] **G03C** *1/06;1/815;1/825*

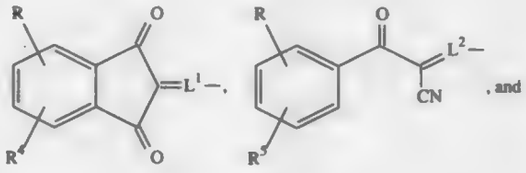
U.S. Cl. 430—522 **26 Claims**

14. A photographic element comprising a support having thereon a radiation-sensitive layer and a hydrophilic layer coated at a pH of 6 or less, which is the same as or different from the radiation-sensitive layer, comprising a hydrophilic binder and a filter dye, wherein the filter dye has the formula:

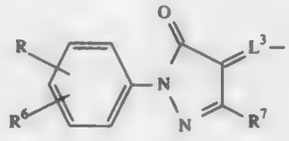


(I)

wherein: D is selected from the group consisting of



, and



wherein

R^1, R^2, and R^3 are each independently hydrogen, substituted or unsubstituted alkyl, or substituted or unsubstituted alkoxy, wherein the substituents on the alkyl or alkoxy are selected from halogen, alkoxy, ester groups, amido, acyl, alkylamino, carboxy and sulfonamido, at least one of R^1, R^2 and R^3 being substituted or unsubstituted alkoxy or two of R^1, R^2 and R^3 together consisting of —O—L—O— and forming a ring condensed with the phenyl ring to which they are attached wherein L is an alkylene linking group;

R^4, R^5, R^6, and R^7 are each independently hydrogen, substituted or unsubstituted alkyl, or substituted or unsubstituted aryl, wherein the substituents are selected from halogen, alkoxy, ester groups, amido, acyl, alkylamino, carboxy and sulfonamido;

R is a carboxy or sulfonamido substituent; and

L^1 through L^3 are each independently substituted or unsubstituted methine groups, wherein the substituents are selected from alkyl or aryl which are unsubstituted or substituted with substituents selected from halogen, alkoxy, ester groups, amido, acyl, alkylamino, carboxy and sulfonamido.

5,470,696

PHOTOGRAPHIC COLOR COUPLERS AND PHOTOGRAPHIC MATERIALS CONTAINING THEM

Hugh M. Williamson, Hanwell, United Kingdom, assignor to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/EP92/02293, § 371 Date Jun. 1, 1993, § 102(e) Date Jun. 1, 1993, PCT Pub. No. WO93/07534, PCT Pub. Date Apr. 15, 1993

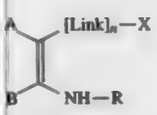
PCT Filed Oct. 2, 1992, Ser. No. 70,305

Claims priority, application United Kingdom, Jan. 30, 1991, 9121059

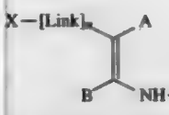
Int. Cl.[6] G03C *7/32;7/38*

U.S. Cl. 430—543 17 Claims

1. A photographic element comprising a support, at least one photosensitive silver halide layer and associated therewith a color coupler of the general formula (1) or (2):



(1)



(2)

wherein A and B represent the same or different electron-withdrawing groups,

X is H or a group which splits off from the carbon atom to which it is attached on coupling with oxidized color developer,

R is an alkyl, cycloalkyl, aryl or heterocyclic which may be substituted, —COR^1, —CSR^1, SOR^1, SO_2R^1, —$NHCOR^1$, —$CONHR^1$, —$COOR^1$, —$COSR^1$, —$NHSO_2R^1$ wherein R^1 is an alkyl, cycloalkyl, or aryl group any of which are optionally substituted,

and wherein two or more of B, R, and X optionally form part of a ring and A does not form part of a ring with B, R, or X,

Link is a linking group and

n is 0, 1 or 2.

5,470,697

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL

Hiroshi Kita; Hiroshi Ishidai, and Yutaka Kaneko, all of Hino, Japan, assignors to Konica Corporation, Japan

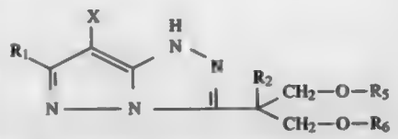
Filed Jun. 1, 1994, Ser. No. 252,268

Claims priority, application Japan, Jun. 30, 1993, 5-156373

Int. Cl.[6] G03C *7/38*

U.S. Cl. 430—558 1 Claim

1. A silver halide color photographic light sensitive material comprising a support and a light sensitive silver halide emulsion layer containing a magenta coupler wherein the magenta coupler is represented by a formula I-a,



I-a

wherein R_1 is a hydrogen atom or an alkyl group, R_2 represents a hydrogen atom or an alkyl group, R_5 and R_6 each represents a hydrogen atom or a sulfonyl, phosphonyl or acyl group, and X is a chlorine atom or a group represented by

wherein Z is atoms selected from a carbon oxygen, nitrogen, or sulfur atom to complete a 5- or 6 membered cycle with the nitrogen atom.

5,470,698

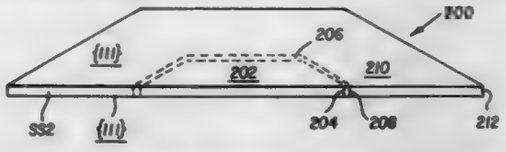
ULTRATHIN TABULAR GRAIN EMULSION

Xin Wen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 30, 1994, Ser. No. 268,362

Int. Cl.[6] G03C *1/035*

U.S. Cl. 430—567 7 Claims



1. A radiation-sensitive emulsion comprised of a dispersing medium and silver halide grains, greater than 90 percent of total grain projected area being accounted for by tabular grains having {111} major faces, exhibiting an average aspect ratio of greater than 8, and containing greater than 50 mole percent bromide and at least 0.5 mole percent iodide, based on total silver,

wherein said tabular grains have a mean thickness of less than 0.07 μm,

are capable of producing, when exposed to 325 nm electromagnetic radiation at 6° K., a stimulated fluorescent emission at 600 nm that is at least 2 percent of the maximum intensity of the stimulated fluorescent emission in the wavelength range of from 490 to 560 nm, and

are comprised of tabular grains each having a central region accounting for at least 5 percent of total silver forming the tabular grain, an annular region laterally surrounding said central region accounting for at least 0.5 and up to 10 percent of total silver forming the tabular grain and exhibiting a maximum iodide concentration, and a peripheral region laterally surrounding the annular region and accounting for greater than 25 percent of total silver forming the tabular grain.

5,470,699

HARDENING OF GELATIN-CONTAINING LAYERS

Anthony L. Beck; Julian M. Wallis; Martin D. Attwood, all of Harlow, and Stephen Newman, Bishops Stortford, all of, Great Britain, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

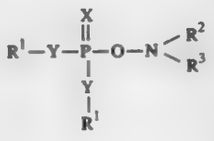
Filed Jul. 8, 1994, Ser. No. 272,097

Claims priority, application United Kingdom, Jul. 27, 1993, 9315468

Int. Cl.[6] G03C *1/30*

U.S. Cl. 430—621 21 Claims

1. A process for hardening gelatin comprising adding a compound of the formula



(1)

wherein:

X is a member selected from the group consisting of 0 and S or X is absent,

each Y independently is a member selected from the group consisting of O, S, and a bond between R^1 and P,

each R^1 independently represents an aliphatic group of up to 10 atoms or the two R^1 groups together represent the necessary atoms to complete a 5, 6, or 7-membered ring,

R^2 and R^3 are independently members of the group consisting of hydrogen, cyclic groups and acyclic groups or R2 and R3 together represent the atoms necessary to complete a heterocyclic ring, and reacting said compound with gelatin to crosslink said gelatin.

5,470,700

LIGHT-SENSITIVE SILVER HALIDE X-RAY PHOTOGRAPHIC MATERIAL CONTAINING A MIXTURE OF TABULAR GRAINS

Toshiyuki Marui, Tokyo, Japan, assignor to Konica Corporation, Japan

Continuation of Ser. No. 110,637, Aug. 23, 1993, abandoned, which is a continuation of Ser. No. 772,936, Oct. 8, 1991, abandoned. This application Oct. 17, 1994, Ser. No. 324,770

Claims priority, application Japan, Jan. 12, 1990, 2-274019

Int. Cl.[6] G03C *1/035;5/16*

U.S. Cl. 430—567 **9 Claims**

1. A light-sensitive silver halide X-ray photographic material comprising an emulsion containing a mixture of at least two kinds of tabular silver halide grains, containing tabular silver halide grains of 0.6 μm to 1.5 μm in an average grain size in a proportion of 70% to 95% and of 0.3 μm to 0.5 μm in a proportion of 5% to 30%; the aspect ratio of the tabular grains in said mixture is not less than 3;

and having sensitometric properties in which a gamma (γ1) formed by a straight line portion between two points 0.5 and 1.5 of optical density is 2.7 to 3.3 and a gamma (γ2) formed by a straight line portion between points 2.0 and 3.0 of optical density is 1.5 to 2.5 in the characteristic curve of a rectangular coordinate system having equal coordinate axis unit lengths for the optical density (D) and the amount of exposure (log E)

5,470,701

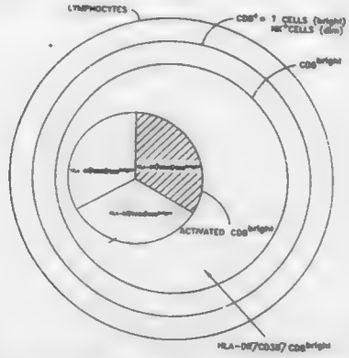
METHOD FOR DETERMINING FAVORABLE PROGNOSIS IN AN HIV POSITIVE SUBJECT USING HLA-DR$^+$/CD38$^-$ CD8^{BRIGHT} CELLS

Janis V. Giorgi, Woodland Hills, and Lance Hultin, West Hills, both of Calif., assignors to The Regents of the University of California, Los Angeles, Calif.

Filed Feb. 24, 1993, Ser. No. 22,971

Int. Cl.[6] G01N *33/569*

U.S. Cl. 435—5 **29 Claims**



1. A method for determining a favorable prognosis in an HIV positive subject which comprises quantitatively detecting an elevated level of HLA-DR$^+$/CD38$^-$/CD8^{bright} cells thereby determining a favorable prognosis in the HIV positive subject.

5,470,702

HIV-2 TRANSMEMBRANE GLYCOPROTEIN HOMODIMER (GP 80)

Ara G. Hovanessian, Montreuil; Marie-Anne Rey, Paris; Anne G. Laurent, Paris; Bernard Krust, Paris, and Luc Montagnier, Le Plessis-Robinson, all of, France, assignors to Institut Pasteur, France

Division of Ser. No. 356,459, May 25, 1989, Pat. No. 5,208,321, and a continuation-in-part of Ser. No. 204,346, Jun. 9, 1988, abandoned. This application Jan. 13, 1993, Ser. No. 2,756

Int. Cl.[6] C12Q *1/70*

U.S. Cl. 435—5 **3 Claims**

1. A method for determining the presence or absence of human immunodeficiency virus type-2 (HIV-2) in a sample, wherein the method comprises:

(A) providing a sample comprising cells suspected of being infected with HIV-2;

(B) lysing said cells in the sample to expose intracellular proteins;

(C) detecting the presence or absence of gp80 glycoprotein of HIV-2 in the sample by electrophoresis of said proteins; and

(D) detecting the presence or absence of gp80 glycoprotein by immunoassay of the proteins with antibodies that are immunologically reactive with gp80 glycoprotein of HIV-2.

5,470,703

METHOD FOR PEPTIDE C-TERMINAL FRAGMENT SEQUENCE ANALYSIS AND APPARATUS FOR COLLECTING PEPTIDE FRAGMENT

Kiyoshi Nokihara, and Rintaro Yamamoto, both of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Oct. 15, 1993, Ser. No. 136,761

Claims priority, application Japan, Jan. 21, 1992, 4-308197; Jan. 29, 1992, 4-291022

Int. Cl.[6] C12Q *1/00;* **C12N** *11/00;* **C12M** *1/40*

U.S. Cl. 435—4 **5 Claims**

1. A method for peptide C-terminal fragment sequence analysis comprising the steps of cleaving a peptide with Lys-C specific cleavage enzyme; reacting each resulting fragment with a solid support having a functional group capable of reacting with an α-amino group of each fragment and an ε-amino group of Lys to form a covalent bond therewith; cleaving a peptide bond between the α-amino acid residue of each fragment and an amino acid residue adjacent thereto by acid treatment to give a free C-terminal fragment having no ε-amino group; collecting the free C-terminal fragment on an amino group-derivatized polymer membrane or on amino group-derivatized glass fiber filter paper; immobilizing the collected C-terminal fragment on the polymer membrane or on the glass fiber filter paper; and subjecting the obtained immobilized product directly to amino acid sequence analysis.

5,470,704

HERPES SIMPLEX VIRUS TYPE 2-GLYCOPROTEIN G PROTEINS AND POLYPEPTIDES

Deborah L. Parkes, Oakland, and Stephen R. Coates, Orinda, both of Calif., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Continuation of Ser. No. 832,982, Feb. 10, 1992, abandoned, which is a continuation of Ser. No. 351,740, May 12, 1989, abandoned. This application Sep. 29, 1993, Ser. No. 129,021

Int. Cl.[6] C12Q *1/70*

U.S. Cl. 435—5 **6 Claims**

1. A method of testing human body fluids for the presence of HSV-2 type-specific antibodies which comprises contacting a com-

position containing a recombinantly produced nonglycosylated protein with a sample of a human body fluid and determining whether said nonglycosylated protein binds to HSV-2 antibodies in said sample, wherein said nonglycosylated protein is selected from the group consisting of an unique sequence HSV-2 gG protein which has the amino acid sequence from amino acid 16 to amino acid 462 as shown in FIG. 2; a fusion protein consisting of the unique sequence HSV-2 gG protein which has the amino acid sequence from amino acid 16 to amino acid 462 as shown in FIG. 2, attached to which at its carboxyl terminus is an alpha-peptide sequence of beta-galactosidase; and a fusion protein consisting of an unique sequence HSV-2 gG protein which has the amino acid sequence from amino acid 16 to amino acid 462 as shown in FIG. 2, attached to which at its carboxyl terminus is an alpha-peptide sequence of beta-galactosidase and at its amino terminus is a trpE leader amino acid sequence.

5,470,705

PROBE COMPOSITION CONTAINING A BINDING DOMAIN AND POLYMER CHAIN AND METHODS OF USE

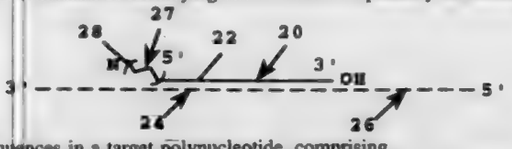
Paul D. Grossman, Burlingame; Steven Fung, Palo Alto; Steven M. Menchen, Fremont; Sam L. Woo, Redwood City, and Emily S. Winn-Deen, Foster City, all of Calif., assignors to Applied Biosystems, Inc., Foster City, Calif.

Continuation-in-part of Ser. No. 862,642, Apr. 3, 1992, abandoned. This application Apr. 7, 1992, Ser. No. 866,018

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **15 Claims**

1. A method of identifying one or more of a plurality of different



sequences in a target polynucleotide, comprising

adding to the target polynucleotide, a plurality of sequence-specific probes, each characterized by (a) an oligonucleotide binding polymer having a probe-specific sequence of subunits designed for base-specific binding of the binding polymer to one of the target sequences, under selected binding conditions, and (b) attached to the binding polymer, a polymer chain having a ratio of charge/translational frictional drag which is different from that of the binding polymer,

reacting the probes with the target polynucleotide under conditions favoring binding of the probes in a base-specific manner to the target polynucleotide,

treating the probes to selectively modify those probes which are bound to the target polynucleotide in a sequence-specific manner, to form modified, labeled probes characterized by (a) a distinctive ratio of charge/translational frictional drag, and (b) a detectable reporter label, and

fractionating the modified, labeled probe(s) by capillary electrophoresis in a non-sieving medium.

5,470,706

PROCESS FOR THE RESCUE OF DNA AND FOR DETECTING MUTATIONS IN MARKER GENES

Jan Vijg, Rotterdam, and Jan A. Gossen, Waddinxveen, both of, Netherlands, assignors to Nederlandse Organisatie voor toegepastwetenschappelijk onderzoek TNO, The Hague, Netherlands

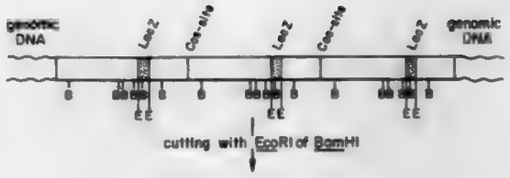
Continuation of Ser. No. 382,242, Jul. 19, 1989, abandoned. This application Jan. 29, 1993, Ser. No. 13,198

Claims priority, application Netherlands, Jul. 19, 1988, 8801826

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **20 Claims**

1. A process for the high efficiency rescue and cloning of a DNA fragment from genomic mammalian DNA comprising the steps of



preparing a vector containing the DNA fragment, followed by multiplying said vector containing said DNA fragment in a suitable bacterial host wherein said bacterial host is selected as being incapable of host restriction and further is selected as being capable of rescuing 900,000 copies of said fragment per 100 micrograms of genomic mammalian DNA when said 100 micrograms of genomic mammalian DNA derives from a mouse genome in which said fragment has a copy number of about 80 and said about 80 copies are present in a head-to-tail arrangement to effect rescue and cloning of said DNA fragment at an efficiency level defined as that efficiency of which a bacterial host, selected as being capable of rescuing 900,000 copies of said fragment per 100 micrograms of genomic mammalian DNA when said 100 micrograms of genomic mammalian DNA derives from a mouse genome in which said fragment has a copy number of about 80 and said about 80 copies are present in a head-to-tail arrangement, is capable.

5,470,707

HYDROGEN BOND LABELING AND BASE SEQUENCE DETERMINATION METHODS FOR DNA OR RNA

Yuji Sasaki, Kawagoe, and Yoshinori Harada, Hatoyama, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1993, Ser. No. 25,997

Claims priority, application Japan, Mar. 4, 1992, 4-046687

Int. Cl.[6] C12Q *1/68*; C07H *21/00*

U.S. Cl. 435—6 **17 Claims**

6. A method for determining a base sequence of a DNA or RNA molecule, comprising the steps of:

preparing first, second and third aqueous solutions containing identical double-stranded DNA or RNA molecules;

heating the first, second, and third aqueous solutions to denature the respective double-stranded DNA or RNA molecules so that each of the double strands dissociates into single strands having complementary nucleotide sequences;

adding at least one first, at least one second, and at least one third base-specific labeling molecule to the first, second, and third aqueous solutions, respectively;

cooling the first, second, and third aqueous solutions so that the respective base-specific labeling molecule added to each aqueous solution is hybridized to complementary bases on the single strands in the respective aqueous solution, to form a contour of each of the single strands defined respectively by said at least one first, at least one second, and at least one third base-specific labeling molecule;

further cooling the first, second, and third aqueous solutions so that each single strand, having the respective hybridized base-specific labeling molecule, is independently bound on a substrate; the contour of each of said independently bound strands, due to the respective hybridized base-specific labeling molecule, representing a base sequence thereof;

determining the labeled sequence of each of the independently bound single strands from the respective contours thereof; and

determining the base sequence of the identical double stranded parts of DNA or RNA from the step of determining the labeled sequence of each of the independently bound single strands.

5,470,708

PARTICLE-MEDIATED TRANSFORMATION OF MAMMALIAN UNATTACHED CELLS

Ning-Sun Yang, 7802 Ox Trail Way, Verona, Wis. 53593; William F. Swain, 4922 Marathon Dr., Madison, Wis. 53705; Joseph K. Burkholder, 917 Midland St., Madison, Wis. 53715, and Deborah L. Fuller, 6701 Park Edge Dr. Apt. D, Madison, Wis. 53719

Continuation of Ser. No. 777,768, Oct. 15, 1991, abandoned. This application Apr. 2, 1993, Ser. No. 61,430

Int. Cl.[6] C12Q *1/68;* **C12N** *15/90;5/16;5/22*

U.S. Cl. 435—6 **12 Claims**

1. A method of genetically transforming mammalian unattached cells, comprising the steps of:

(a) preparing copies of a nucleic acid construct which is expressed in mammalian cells;

(b) coating the copies of the nucleic acid construct onto biologically inert carrier particles;

(c) isolating mammalian unattached cells from a liquid suspension and placing them onto a porous support surface selected from the group consisting of paper and a polycarbonate membrane in such a manner that the cells retain sufficient moisture exposure to remain viable, the unattached mammalian cells selected from the group consisting of lymphocytes and bone marrow cells;

(d) accelerating the carrier particles produced in step (b) into the cells such that some of the particles lodge in the interior of at least some of the cells; and

(e) verifying the existence and expression of the nucleic acid construct in the treated cells.

5,470,709

GENE MAPPING BY HYBRIDISATION TO FREE CHROMATIN

Henry H. Q. Heng, Toronto, and Lap-Chee Tsui, Etobicoke, both of, Canada, assignors to HSC Research & Development Ltd. Partnership, Toronto, Canada

Filed Sep. 16, 1993, Ser. No. 122,141

Claims priority, application Canada, Sep. 16, 1992, 2078377-0

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **20 Claims**

1. A method for detecting and mapping DNA sequences from eukaryotic cells comprising:

(a) treating the cells to release free chromatin from the nuclei of the cells;

(b) contacting the released free chromatin with at least one detectable probe specific for the DNA sequences to be detected;

(c) detecting hybridization of the probe with the DNA sequences on the released free chromatin in order to detect the presence of the DNA sequences; and

(d) mapping the DNA sequences.

5,470,710

AUTOMATED HYBRIDIZATION/IMAGING DEVICE FOR FLUORESCENT MULTIPLEX DNA SEQUENCING

Robert B. Weiss; Alvin W. Kimball; Raymond F. Gesteland; F. Mark Ferguson, all of Salt Lake City; Diane M. Dunn, West Valley City; Leonard J. Di Sera, and Joshua L. Cherry, both of Salt Lake City, all of Utah, assignors to University of Utah, Salt Lake City, Utah

Filed Oct. 22, 1993, Ser. No. 141,234

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **10 Claims**

1. A method for enzyme-linked fluorescence detection of nucleic acid comprising the steps of:

(a) attaching the nucleic acid to be detected to a nylon membrane;

(b) contacting the nylon membrane with an oligonucleotide probe containing a binding moiety for binding alkaline phosphatase and which is able to hybridize specifically with a complementary sequence on the nucleic acid, thereby hybridizing said probe to said nucleic acid;

(c) contacting the probe with alkaline phosphatase, thereby binding the alkaline phosphatase to said binding moiety on the probe;

(d) contacting the alkaline phosphatase with BBTP so that the alkaline phosphatase converts the BBTP into a fluorescent product, wherein the fluorescent product interacts with the nylon membrane and is spatially localized thereon; and

(e) illuminating said fluorescent product with a beam of light capable of exciting fluorescence by said fluorescent product, thereby exciting fluorescence by said fluorescent product wherein said fluorescence produces a pattern that reflects the location of said nucleic acid on said membrane.

5,470,711

SALIVA ENHANCEMENT REAGENT FOR FELINE LEUKEMIA VIRUS ELISA

Eric S. Bean, Escondido; Cheryl Waldman, San Diego, and Ronald Sanders, Leucadia, all of Calif., assignors to Synbiotics Corporation, San Diego, Calif.

Continuation of Ser. No. 618,400, Nov. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 321,415, Mar. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 844,098, Mar. 26, 1986, Pat. No. 4,853,325. This application Dec. 16, 1992, Ser. No. 996,861

Int. Cl.[6] G01N *33/53;33/569*

U.S. Cl. 435—7.1 **6 Claims**

1. A method for detecting feline leukemia virus comprising obtaining a saliva sample from a cat with a dipstick and subjecting said sample to an ELISA assay involving anti-FeLV antibodies and an enzyme-antibody conjugate, wherein the improvement consists essentially of adding a saliva enhancement reagent to said conjugate prior to use in said method such that non-specific background color formation in said method is reduced, wherein said saliva enhancement reagent consists essentially of an aqueous solution containing from about 0.1% to about 2.0% by weight saponin and being from about 0.5 to about 2.0 molar in sodium chloride, said solution being buffered to a pH of from about 7.0 to about 8.0.

5,470,712

ANTIGENIC PROTEINS OF BORRELIA BURGDORFERI

Warren Simpson, 713 S. Second St., and T. G. Schwan, 601 S. 5th St., both of Hamilton, Mont. 59840

Continuation of Ser. No. 664,731, Mar. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 487,716, Mar. 5, 1990, abandoned. This application Feb. 19, 1993, Ser. No. 20,245

Int. Cl.[6] G01N *33/569*

U.S. Cl. 435—7.32 **17 Claims**

1. A bioassay for the diagnosis of Lyme borreliosis disease comprising the steps of:

i) coating a surface with purified antibodies raised against at least one recombinant non-flagellar *Borrelia burgdorferi* protein having a molecular weight of about 39 kD, wherein said protein is specifically immunoreactive with *Borrelia burgdorferi,* and is expressed from a *Borrelia burgdorferi* DNA fragment having SEQ. ID No 1, and forming a coated surface;

ii) contacting said coated surface with serum from a mammal suspected of having Lyme disease; and

iii) detecting the presence or absence of a complex formed between said antibodies and proteins present in said serum, the presence of the complex indicating a positive diagnosis of Lyme borreliosis.

5,470,713

METHOD AND ELEMENT FOR MEASURING ANALYTES IN BIOLOGICAL FLUIDS USING IMMOBILIZED BINDER-ANALYTE LABELED COMPLEX

A. Said El Shami, Agoura Hills, Calif.; Christopher W. Hand, Freeland, England; Susan A. Miller, Witney, England, and Robert A. Moore, Noke, England, assignors to Diagnostic Products Corporation, Los Angeles, Calif.

Continuation of Ser. No. 694,471, May 1, 1991, abandoned, which is a division of Ser. No. 344,179, Apr. 26, 1989. This application May 28, 1993, Ser. No. 68,931

Int. Cl.[6] G01N *33/543*

U.S. Cl. 435—7.72 16 Claims

1. A method for measuring analytes in biological fluids which comprises:

(1) covalently immobilizing a specific antibody binder to a given analyte on a solid phase support;

(2) saturating the binding sites on said specific antibody binder with a labeled analyte to the extent steric hinderance permits to form an immobilized specific antibody binder-analyte labeled complex;

(3) saturating remaining unoccupied binding sites on the immobilized specific antibody binder-analyte labeled complex with unlabeled analyte prior to contacting said complex with a biological specimen;

(4) contacting a sample of biological fluid to be analyzed for the presence of the given analyte with said immobilized complex, said sample of biological fluid as contacted with said immobilized complex being in an untreated form as obtained from the donor; and

(5) and allowing an analyte, if present in said sample, to compete with the labeled analyte bound to the immobilized binder for binding sites on said binder thus displacing a given amount of labeled analyte which is directly proportional to the amount of analyte present in the sample,

wherein the affinity of the analyte to the analyte's specific binder is at least about 10^7 l/mol and is higher than the affinity of the labeled analyte to the same binder and wherein the analyte has a molecular weight greater than 20 kD.

5,470,714

ONE-STEP FREE FATTY ACID DETERMINATION METHOD

Alan M. Kleinfeld, La Jolla, Calif., assignor to Lidak Pharmaceuticals, La Jolle, Calif.

Continuation-in-part of Ser. No. 827,057, Oct. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 624,125, Dec. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 449,972, Dec. 12, 1989, abandoned. This application Nov. 24, 1993, Ser. No. 157,965

Int. Cl.[6] G01N *33/533*

U.S. Cl. 435—7.8 3 Claims

1. A method for determining the concentration of unbound free fatty acid in aqueous solution comprising the steps of: mixing an aqueous solution suspected of containing unbound free fatty acid with a reagent that consists essentially of a fatty acid binding protein that:

(a) binds specifically to unbound free fatty acid in aqueous solution,

(b) has been labeled with a fluorescent moiety, and

(c) exhibits a first fluorescence

when unbound in aqueous solution and a measurably different second fluorescence when bound to previously unbound free fatty acid in the aqueous solution; measuring the fluorescence difference that results from the binding of the fatty acid binding protein with the previously unbound free fatty acid; and obtaining the concentration of unbound free fatty acid in the aqueous solution from the measured fluorescence difference.

5,470,715

COMPOSITION FOR DETERMINATION OF CHLORIDE ION

Katsuhiko Mizuguchi; Shin'ichi Teshima, and Tsuneo Hanyu, all of Tsuruga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

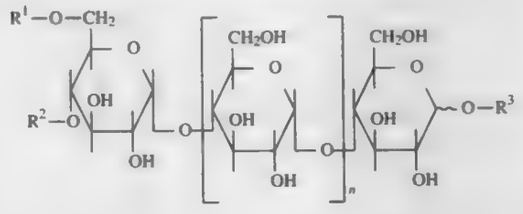
Continuation of Ser. No. 733,449, Jul. 22, 1991, abandoned. This application Jan. 3, 1994, Ser. No. 176,707

Claims priority, application Japan, Jul. 23, 1990, 2-194282; Aug. 10, 1990, 2-212933

Int. Cl.[6] C12Q *1/40*

U.S. Cl. 435—22 7 Claims

1. A composition for determination of chloride ion, comprising: (1) a maltooligosaccharide derivative possessing a non-reducing terminal and a reducing terminal, the 1-hydroxyl position of the maltooligosaccharide reducing terminal being modified by a phenyl substituted with one or more substituents selected from the group consisting of a hydrogen, halogen, nitro and hydroxy group. and said derivative having the following formula (I):



wherein at least one of R^1 and R^2 is an alkyl having 1 to 6 carbon atoms, a substituted alkyl selected from the group consisting of hydroxymethyl, hydroxyethyl, sulfomethyl, carboxymethyl, sulfoethyl, carboxyethyl, 2-ketopropyl, 2-ketobutyl, 2-ketopentyl, 3-ketopentyl, 4-ketopentyl and benzyl, a phenyl or a substituted phenyl selected from the group consisting of4-methylphenyl, 4-hydroxyphenyl, 4-carboxyphenyl, and 4-sulfophenyl, and the other is a hydrogen atom, or R^1 and R^2 may together form crosslinked methylene, R^3 is phenyl or substituted phenyl which possesses a substituent selected from the group consisting of halogen, nitro and hydroxy, and n is an integer of 1 to 8, wherein the maltooligosaccharide derivative has a modified non-reducing terminal and a modified reducing terminal; (2) a metal chelating agent; (3) nonactivated α-amylase and (4) an adjuvant enzyme which is an enzyme or combination of enzymes selected from the group consisting of α-glucosidase, β-glucosidase and glucoamylase, provided that the adjuvant enzyme is not present when the maltooligosaccharide derivative possesses a reducing terminal with a modifying group of said 1-hydroxyl position bound in α-orientation and said composition not containing a calcium chelate compound.

5,470,716

METHOD FOR DIAGNOSING KAWASAKI SYNDROME

Donald Leung, Englewood, Colo.; Patrick Schlievert, Minneapolis, Minn.; Cody Meissner, Arlington, Mass., and David Fulton, Chestnut Hill, Mass., assignors to National Jewish Center For Immunology and Respiratory Medicine, Denver, Colo.; New England Medical Center Hospital, Inc., Boston, Mass.; University of Minnesota, and Regents of the University of Minnesota, both of Minneapolis, Minn.

Filed Apr. 5, 1993, Ser. No. 42,731

Int. Cl.[6] C12Q *1/04;1/00;* G01N *33/48*

U.S. Cl. 435—34 6 Claims

1. Method for screening for possibility of Kawasaki Syndrome in a subject, comprising assaying a sample taken from a subject suspected of being afflicted with Kawasaki Syndrome who exhibits primary clinical manifestations of Kawasaki Syndrome with an antibody which specifically binds to toxic shock syndrome toxin-1

(TSST-1) and determining binding between TSST-1 and said antibody as an indication of possibility of Kawasaki Syndrome in said subject.

5,470,717

METHOD FOR THE PREPARATION OF CERTAIN β-LACTAM ANTIBIOTICS

Kim Clausen, Tølløse, Denmark, assignor to Gist-Brocades N.V., Netherlands

PCT No. PCT/DK92/00388, § 371 Date May 12, 1994, § 102(e) Date May 12, 1994, PCT Pub. No. WO93/12250, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 18, 1992, Ser. No. 240,772

Claims priority, application European Pat. Off., Dec. 19, 1991, 91610096; Denmark, May 14, 1992, 0642/92

Int. Cl.[6] C12P *37/04;35/00;* C07D *501/06*

U.S. Cl. 435—47 11 Claims

1. A method of preparing a β-lactam antibiotic comprising enzymatic acylation of a 7-amino-8-oxo-5-thia-1-azabicyclo[4.2.0]oct-2-ene nucleus in water or in a mixture of water and one or more water-miscible organic solvents by enzymatic acylation with the acid or a derivative of the acid corresponding to the desired side chain, characterized in that naphthalene or a naphthalene derivative with the formula

Naphthyl-R

wherein Naphthyl- designates 1-naphthyl or 2-naphthyl and R is selected from the group consisting of hydrogen, halogen, hydroxy, nitro, cyano, branched or unbranched alkyl of 1 to 6 carbon atoms optionally substituted with cyano, branched or unbranched alkoxy of 1 to 6 carbon atoms and alkanoyl of 1 to 6 carbon atoms, where on a molar basis the ratio between the amount of naphthalene or naphthalene derivative present in the reaction mixture and the amount of β-lactam antibiotic present in the reaction mixture is at least 0.45, is present in the reaction mixture during the formation of a naphthalene complex of the β-lactam antibiotic which is isolated or decomposed to the β-lactam antibiotic by deprotection of a protected intermediate.

5,470,718

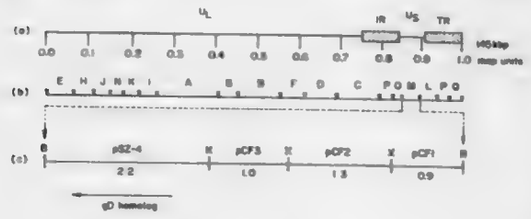
EQUINE HERPESVIRUS TYPE 1 GLYCOPROTEIN D NUCLEIC ACIDS

Dennis J. O'Callaghan, Shreveport, La., assignor to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation of Ser. No. 561,553, Aug. 1, 1990, abandoned. This application Sep. 30, 1992, Ser. No. 954,417

Int. Cl.[6] C12P *21/00;21/02;* C07H *21/04*

U.S. Cl. 435—69.1 15 Claims



1. An isolated nucleic acid having a nucleotide sequence that encodes the equine herpesvirus type 1 glycoprotein D polypeptide having the amino acid sequence of FIG. 2.

5,470,719

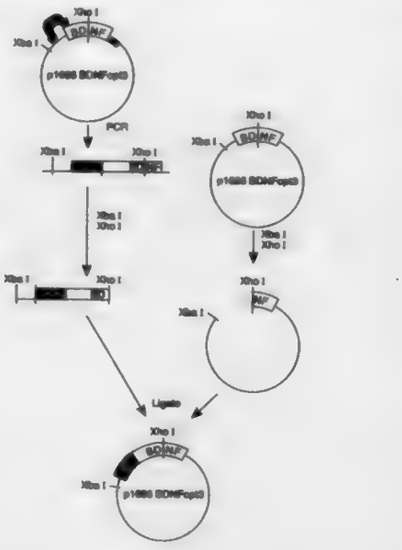
MODIFIED OMPA SIGNAL SEQUENCE FOR ENHANCED SECRETION OF POLYPEPTIDES

Shi-Yuan Meng, Agoura Hills; Charles F. Morris, Newbury Park, and Larry B. Tsai, Agoura, all of Calif.

Filed Mar. 18, 1994, Ser. No. 215,138

Int. Cl.[6] C12N *15/11;15/12*

U.S. Cl. 435—69.1 27 Claims



7. A nucleic acid comprising the sequence of SEQ ID NO:21.

5,470,720

HIV ANTIBODY ASSAYS COMPRISING P24-GP41 CHIMERIC ANTIGENS

Torsten B. Helting, La Jolla, Calif.; Hakan Drevin, Uppsala, Sweden, and Michael F. Nunn, San Diego, Calif., assignors to Pharmacia Genetic Engineering Inc., La Jolla, Calif.

Division of Ser. No. 344,237, Apr. 26, 1989, Pat. No. 5,204,259, which is a continuation-in-part of Ser. No. 191,229, May 6, 1988, abandoned, Ser. No. 206,499, Jun. 13, 1988, abandoned, and Ser. No. 258,016, Oct. 14, 1988, abandoned. This application Apr. 20, 1993, Ser. No. 49,531

Int. Cl.[6] G01N *33/53;* C07K *14/155;* C12N *15/49*

U.S. Cl. 435—69.3 6 Claims

1. A diagnostic system, in kit form, comprising, in an amount sufficient to perform at least one assay, a HIV p24-gp41 fusion protein, said HIV p24-gp41 fusion protein being expressed in *E. coli*, being soluble in aqueous buffer solution, being essentially free from (a) host cell-specific antigens and (b) HIV p15 and HIV p17 antigens, and having a sequence selected from the group consisting of those shown in FIG. 1B from amino acid residue 2 to amino acid residue 248, in FIG. 1C from amino acid residue 2 to amino acid residue 249 and in FIG. 1E from amino acid residue 2 to amino acid residue 274.

5,470,721

PRODUCTION OF HUMAN SOMATOMEDIN C

Gary N. Buell, and Nageswararao Movva, both of Geneva, Switzerland, assignors to Biogen, Inc., Cambridge, Mass.

Division of Ser. No. 965,847, Oct. 21, 1992, Pat. No. 5,242,811, which is a continuation of Ser. No. 496,086, Mar. 15, 1990, abandoned, which is a continuation of Ser. No. 938,170, Nov. 19, 1986, abandoned. This application Jun. 23, 1993, Ser. No. 81,979

Claims priority, application United Kingdom, Mar. 26, 1985, 8507833

The portion of the term of this patent subsequent to Sep. 7, 2010, has been disclaimed.

Int. Cl.[6] C12N *15/62;15/16;15/74;15/81*

U.S. Cl. 435—69.7 9 Claims

1. A process for producing an SMC polypeptide characterized by the step of culturing a bacterial or yeast host transformed by a vector selected from the group consisting of pLC24muSMC 1 through pLC24muSMC 10.

5,470,722

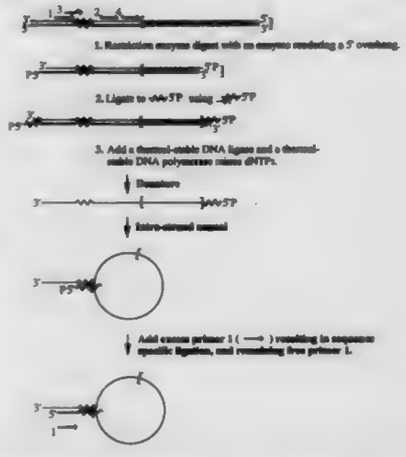
METHOD FOR THE AMPLIFICATION OF UNKNOWN FLANKING DNA SEQUENCE

Douglas H. Jones, Iowa City, Iowa, assignor to University of Iowa Research Foundation, Oakdale, Iowa

Filed May 6, 1993, Ser. No. 58,907

Int. Cl.[6] C12N *15/70;* C12Q *1/68*

U.S. Cl. 435—91.2 29 Claims



1. A method for the amplification of an unknown DNA sequence that flanks a known DNA sequence, comprising the steps of:

(a) digesting a double-stranded DNA fragment with a restricuion enzyme to yield 5' phosphorylated nucleotide overhang sequences, wherein said DNA fragment comprises a region of known DNA sequence and a region of unknown flanking DNA sequence to be amplified;

(b) annealing a 5' phosphorylated single-stranded oligonucieotide to a bridging-oligonucleotide to yield a double-stranded oligonucleotide with a 5' phosphorylated end;

(c) ligating said 5' phosphorylated single-stranded oligonucleotide of said double-stranded oligonucleotide whose non-phosphorylated 5' end is complementary to the cohesive ends generated in step (a) of said double-stranded DNA fragment to yield 5' phosphorylated nucleotide sequences complementary to a sequence portion within said known sequence region of said DNA fragment, wherein said sequence portion is an annealing site for said 5' phosphorylated nucleotide sequences;

(d) denaturing said 5' end-modified DNA fragment to produce single-stranded fragments containing said 5' phosphorylated nucleotide sequences;

(e) intra-strand annealing of a 5' phosphorylated nucleotide sequence to said annealing site within said known sequence region of a single-stranded fragment, wherein said single-stranded fragment is a fragment containing said annealing site located downstream (3') to said unknown flanking sequence region, to form a single-stranded loop, or pan portion, with a double-stranded stem of an otherwise single-stranded handle, of a panhandle structure;

f) heat stable ligating an oligonucleotide primer 1, complementary to a known sequence region downstream (3') from said annealing cite for said 5' phosphorylated nucleotide sequences, to the recessed 5' phosphorylated end of said double-stranded portion of said handle to elongate said double-stranded portion of said otherwise single-stranded handle of said panhandle structure; and

(g) performing a first stage polymerace amplification reaction using a first set of oligonucleotide primers including said primer 1 annealing to said known sequence region downstream (3') from said annealing site for said 5' phosphorylated nucleotide sequences and a primer 2 complementary to a known sequence region both downstream (3') from said unknown flanking sequence region and upstream (5') from said annealing site for said 5' phosphorylated nucleotide sequences wherein initial priming by primer 2 occurs following annealing to said pan portion of said panhandle structure and is not inhibited by snapback annealing of said double-stranded handle of said panhandle structure.

5,470,723

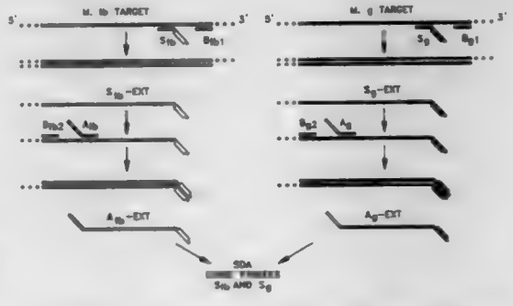
DETECTION OF MYCOBACTERIA BY MULTIPLEX NUCLEIC ACID AMPLIFICATION

George T. Walker; James G. Nadeau, both of Chapel Hill; Patricia A. Spears; Colleen M. Nycz, both of Raleigh; Daryl D. Shank, Durham; James L. Schram, Nightdale, and Stewart R. Jurgensen, Raleigh, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation-in-part of Ser. No. 73,197, Jun. 4, 1993, Pat. No. 5,422,252, Ser. No. 58,648, May 5, 1993, Pat. No. 5,348,980, and Ser. No. 60,842, May 11, 1993, abandoned. This application Aug. 24, 1993, Ser. No. 111,076

Int. Cl.[6] C12Q *1/68;* C12P *19/34;* C07H *15/12;17/00*

U.S. Cl. 435—91.2 31 Claims



1. A method for simultaneously amplifying multiple Mycobacterium target sequences in a sample comprising:

a) hybridizing a first primer consisting of SEQ ID NO: 1 to the target sequences, extending the first primer with polymerase to produce a first extension product and displacing the first extension product;

b) hybridizing a second primer consisting of SEQ ID NO: 2 to the first extension product, extending the second primer to produce a second extension product and displacing the second extension product;

c) hybridizing a third primer consisting of SEQ ID NO: 5 to the target sequences, extending the third primer with polymerase to produce a third extension product and displacing the third extension product;

d) hybridizing a fourth primer consisting of SEQ ID NO: 6 to the third extension product, extending the fourth primer with polymerase to produce a fourth extension product and displacing the fourth extension product, and;

e) simultaneously amplifying the second and fourth extension products in a Strand Displacement Amplification reaction using; SEQ ID NO: 1 and SEQ ID NO: 5 as amplification primers.

5,470,724

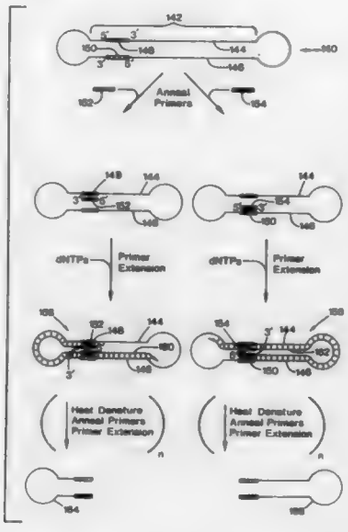
BOOMERANG DNA AMPLIFICATION

Kevin G. Ahern, Corvallis, Oreg., assignor to State of Oregon Acting by and through the Oregon State Board of Higher Education on behalf of Oregon State University, Eugene, Oreg.

Continuation of Ser. No. 841,320, Feb. 20, 1992, abandoned. This application Jan. 19, 1994, Ser. No. 184,941

Int. Cl.[6] C12P *19/34*

U.S. Cl. 435—91.2 **44 Claims**



1. A method for amplifying a DNA sequence of interest in a DNA-containing sample, the method comprising:

(a) cleaving the DNA in the sample to form discrete duplex DNA fragments having ligatable ends each including a 3' terminus and a 5' terminus, wherein at least one of the duplex DNA fragments comprises a sequence of interest and a primer target site ligated to the sequence of interest with or without intervening sequences;

(b) ligating the duplex DNA fragments produced in step (a) to adapter polynucleotides to form ligated duplexes, the adapter polynucleotides each having a structure as shown schematically in FIG. **2**A or FIG. **2**B and comprising a first sequence **51** in FIG. **2**A (or **51***a* or **51***b* in FIG. **2**B); a second sequence **52** in FIG. **2**A for **52***a* or **52***b* in FIG. **2**B) complementary to the first sequence; a spacer sequence situated between the first sequence and second sequence, the spacer sequence permitting the first sequence and the second sequence on any of said adapter polynucleotides to form a duplex of each other with the spacer sequence forming a single-stranded loop connecting the first sequence and second sequence together; and at least one adapter end region comprising a duplex of the first sequence and the second sequence, the adapter end region having a 3' terminus and a 5' terminus and being ligatable to the ends of the duplex DNA fragments such that, in each ligation, at least one of the 3' and 5' termini of an adapter polynucleotide becomes ligated to the corresponding 5' or 3' terminus, respectively, of an end of a duplex DNA fragment;

(c) denaturing the ligated duplexes formed in step (b) to form templates;

(d) annealing oligonucleotide primers to the templates, each primer being homologous with the primer target site so as to anneal to a primer target site under conditions in which a primer and a primer target site can anneal to each other and form a duplex of each other at which primer extension can occur; and

(e) extending the annealed primers under DNA replication conditions to form duplex products, the duplex products comprising the template and a segment homologous with the template, the homologous segment being capable of forming a duplex with itself and representing an amplification of the sequence of interest.

5,470,725

THERMOSTABLE (1,3-1,4)-β-GLUCANASE

Rainer Borriss, Berlin; Jürgen Hofemeister, Gatersleben, both of, Germany; Karl K. Thomsen, Slagelse, Denmark; Ole Olsen, Copenhagen, Denmark, and Dietrich Von Wettstein, Værløse, Denmark, assignors to Carlsberg A/S, Copenhagen, Denmark, and Akademie der Wissenchaften der DDR, Berlin, Germany

Continuation of Ser. No. 773,652, Oct. 16, 1991, abandoned. This application Aug. 10, 1993, Ser. No. 103,998

Claims priority, application German Dem. Rep., Feb. 16, 1989, 325 8000; Denmark, Aug. 4, 1989, 3848/89

Int. Cl.[6] C12P *19/02*; C12N *9/24*;*15/56*

U.S. Cl. 435—93 **72 Claims**

1. A thermostable hybrid (1,3-1,4)-β-glucanase of the general formula

A–M

where A is a polypeptide consisting of a 5 to 107 amino acid sequence which is at least 75% identical to the amino acid sequence of the N-terminal part of the *Bacillus amyloliquefaciens* (1,3-1,4)-β-glucanase and M is a polypeptide consisting of a 107 to 200 amino acid sequence which is at least 75% identical to the amino acid sequence of the C-terminal part of the *Bacillus macerans* (1,3-1,4)-β -glucanase said hybrid (1,3-1,4)-β-glucanase retaining at least 50% of its activity after 10 minutes or more of incubation in 5–10 mM $CaCl_2$, 20–40 mM Na-acetate at a pH of 6.0 or lower and at a temperature of 65° C. or higher, the incubated solution having an enzyme concentration range from 0.05 mg to 1 mg (1,3-1,4)-β-glucanase per ml, the activity of (1,3-1,4)-β-glucanase being understood as the ability of the enzyme to hydrolyze β-glycosidic linkages in (1,3-1,4)-β-glucans, the hybrid (1,3-1,4)-β-glucanase being more thermostable than any of the glucanases encoded by the parental (1,3-1,4)-β-glucanase genes.

5,470,726

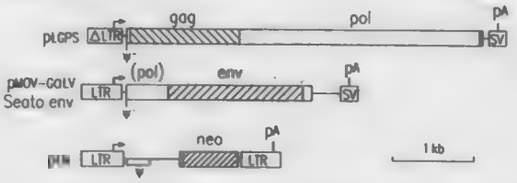
RETROVIRUS PACKAGING AND PRODUCER CELL LINES BASED ON GIBBON APE LEUKEMIA VIRUS

A. Dusty Miller; Jose V. Garcia-Martinez, both of Seattle, Wash.; Maribeth V. Elden, Bethesda, Md., and Carolyn A. Wilson, Arlington, Va., assignors to Fred Hutchinson Cancer Research Center, Seattle, Wash., and The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 660,616, Feb. 22, 1991, abandoned. This application Aug. 11, 1993, Ser. No. 105,471

Int. Cl.[6] C12N *5/10*;*15/48*;*15/86*;*5/06*

U.S. Cl. 435—172.3 **4 Claims**



1. A retrovirus packaging cell line PG13 (ATCC No. CRL 10686).

5,470,727

CHROMOSOMAL EXPRESSION OF NON-BACTERIAL GENES IN BACTERIAL CELLS

Desmond Mascarenhas, San Rafael, and Pamela S. Olson, Cupertino, both of Calif., assignors to Celtrix Pharmaceuticals, Inc., Santa Clara, Calif.

Filed Dec. 21, 1993, Ser. No. 170,588
Int. Cl.[6] C12N *15/64;15/66*
U.S. Cl. 435—172.3 **1 Claim**

1. A method for introducing a non-bacterial gene of interest into a chromosome of a host cell comprising the steps of:

ligating a restriction fragment from a first plasmid vector with a restriction fragment from a second plasmid vector, wherein the first plasmid vector comprises a first origin of replication and a non-bacterial gene of interest lacking an operably linked promoter, the second plasmid vector comprises a second origin of replication and a promoter, the origins of replication and the promoter are functional in the host cell, and either said first plasmid vector or said second plasmid vector comprises a site-specific recombination site, thereby producing a chromosomal transfer DNA comprising a non-bacterial gene of interest operably linked to a promoter functional in the host cell, a selectable marker, and a first site-specific recombination site, and lacking an origin of replication;

transferring the chromosomal transfer DNA into a host cell, the host cell comprising a chromosome, the chromosome comprising a second site-specific recombination site and a DNA sequence encoding an enzyme which is capable of catalyzing the site-specific recombination of the first and second recombination sites;

expressing the enzyme, thereby causing integration of the chromosomal transfer DNA into the chromosome of the host cell at the second site-specific recombination site; and

selecting for host cells having an integrated chromosomal transfer DNA;

whereby the non-bacterial gene of interest is at no time operably linked to a functional promoter in a multicopy number vector.

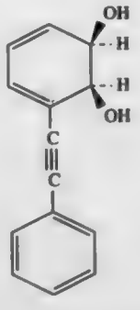
5,470,728

FORMATION OF AND DEHYDRATION OF HYDROXYLATED DIPHENYL ACETYLENES USING PSEUDOMONAS ATCC 55272

Alan D. Grund, Manitowoc, Wis., assignor to Bio-Technical Resources, Manitowoc, Wis.

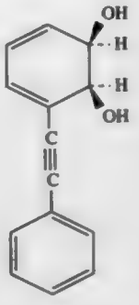
Continuation of Ser. No. 831,585, Feb. 5, 1992, abandoned. This application Aug. 8, 1994, Ser. No. 286,900
Int. Cl.[6] C12P *7/22;7/02;1/04*
U.S. Cl. 435—156 **1 Claim**

1. A process for the production of a product compound of the formula



comprising growing Pseudomonas ATCC 55272 in a growth medium at 25° C. to 35° C. and at a pH in the range of 6 to 8, supplying a compound of the formula

to the growing strain to produce the product compound of formula



, and recovering the product compound from the medium.

5,470,729

METHOD OF ISOLATING RESTRICTION FRAGMENT DELETIONS IN *VIBRIO CHOLERAE*, AND PRODUCTS THEREOF

James B. Kaper, Columbia; Bernadette Baudry-Maurelli, Silver Spring, both of Md., and Alessio Fasano, Salerno, Italy, assignors to University of Maryland At Baltimore, Baltimore, Md.

Continuation-in-part of Ser. No. 821,872, Jan. 16, 1992, abandoned, which is a continuation of Ser. No. 533,315, Jun. 5, 1990, abandoned, and a continuation-in-part of Ser. No. 581,406, Feb. 17, 1984, Pat. No. 5,135,862, which is a continuation-in-part of Ser. No. 472,276, Mar. 4, 1983, abandoned, and a continuation-in-part of Ser. No. 363,383, Jun. 5, 1989, Pat. No. 4,935,364, which is a continuation of Ser. No. 867,633, May 27, 1986, abandoned, which is a continuation of Ser. No. 472,276, Mar. 4, 1983, abandoned. This application Aug. 12, 1992, Ser. No. 931,943
Int. Cl.[6] A61K *35/74;* C12N *1/21;15/63;* C12R *1/63*
U.S. Cl. 435—172.3 **16 Claims**

1. A culture of *Vibrio cholerae* comprising a strain of the Ogawa or Inaba serotype having the chromosomal DNA coding for the A subunit and B subunit of *Vibrio cholerae* toxin deleted from the toxin locus to confer avirulence and retaining the capacity to colonize the intestine of a host animal, and having a second DNA fragment coding for zonula occludens toxin deleted.

5,470,730

METHOD FOR PRODUCING T_H-INDEPENDENT CYTOTOXIC T LYMPHOCYTES

Phillip D. Greenberg, Mercer Island, and Robert W. Overell, Seattle, both of Wash., assignors to Immunex, and Fred Hutchinson Cancer Research Center, both of Seattle, Wash.

Continuation of Ser. No. 55,903, Apr. 29, 1993, abandoned, which is a continuation of Ser. No. 764,596, Sep. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 614,167, Nov. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 589,939, Sep. 28, 1990, abandoned. This application Aug. 8, 1994, Ser. No. 287,111

Int. Cl.[6] **C12N** *15/12;5/10*

U.S. Cl. 435—172.3 **13 Claims**

1. A method for producing a $CD8^+$ cytotoxic T lymphocyte (CTL) capable of T helper cell (T_H)-independent growth comprising introducing into a T_H-dependent $CD8^+$ CTL a recombinant expression vector encoding an Interleukin-1 receptor wherein the Interleukin-1 receptor is capable of stable expression and when expressed enhances growth or proliferation of the CTL.

5,470,731

COATED TRANSPLANT AND METHOD FOR MAKING SAME

Kent C. Cochrum, Davis, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Continuation of Ser. No. 890,896, May 19, 1992, abandoned. This application Jun. 8, 1994, Ser. No. 255,577

Int. Cl.[6] **A61K** *9/107;* **A61F** *2/02;* **A01N** *1/02;* **C12N** *11/04*

U.S. Cl. 435—182 **22 Claims**

1. A method for coating a tissue transplant with an immunological barrier protecting the transplant against destruction by the immune system of an immunologically incompatible transplant host recipient, said method comprising steps:

(a) isolating the transplant tissue;

(b) coating the transplant tissue with a first coating by suspending the transplant in an aqueous solution of a mixture of agarose and a cationic or anionic non-cytotoxic amino acid polymer at a temperature which renders the agarose to be in a liquid sol state;

(c) lowering a temperature of the suspension of step (b) until the agarose changes from the liquid sol to a gel;

(d) coating the transplant with a second coating by dispersing the suspension of step (c) in a solution of an cationic or anionic amino acid polymer having the charge opposite to the amino acid polymer used in the step (b), and chemical bonding the amino acid of the first coating with the amino acid of the second coating, said chemical bonding formed by one or more covalent, ionic or hydrogen bonds between the first and second layer.

5,470,732

RESTRICTION ENZYME FROM *BREVIBACTERIUM LINENS*

Katsuhiko Yamamoto; Hiroaki Sagawa, both of Otsu; Hirokazu Kotani, Muko; Nobutsugu Hiraoka, Matsudo, and Teruya Nakamura, Kusatsu, all of, Japan, assignors to Takara Shuzo Co., Ltd., Japan

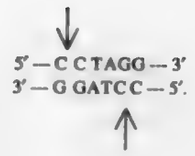
Filed Apr. 22, 1991, Ser. No. 688,426

Claims priority, application Japan, Apr. 20, 1990, 2-106231

Int. Cl.[6] **C12P** *19/34;* **C12N** *9/22;1/00*

U.S. Cl. 435—196 **1 Claim**

1. A process for producing a restriction enzyme which comprises cultivating a strain of *Brevibacterium linens* having all the identifying characteristics of *Brevibacterium linens* IAM 1902 (FERM BP-2870) under conditions sufficient to produce said restriction enzyme, and recovering said restriction enzyme, wherein said restriction enzyme cleaves the following nucleotide sequence specifically at the arrow-marked sites:



5,470,733

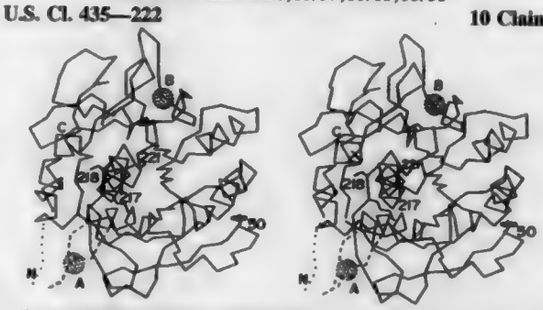
CALCIUM FREE SUBTILISIN MUTANTS

Philip N. Bryan; Patrick A. Alexander, both of Silver Spring, and Susan L. Strausberg, Rockville, all of Md., assignors to University of Maryland, College Park, Md.

Filed Jun. 1, 1993, Ser. No. 69,863

Int. Cl.[6] **C12N** *9/56;15/57;15/63;15/00*

U.S. Cl. 435—222 **10 Claims**



1. A subtilisin protein which has been mutated to eliminate the ability of said subtilisin protein to bind calcium at a high affinity calcium binding site and which mutated subtilisin protein retains enzymatic activity, wherein the mutated subtilisin protein comprises a deletion of the amino acids at positions 75–83 corresponding to nucleotide positions 993–1019 of SEQ ID NO:1.

5,470,734

RECOMBINANT HERPESVIRUS OF TURKEYS AND LIVE VECTOR VACCINES DERIVED THEREOF

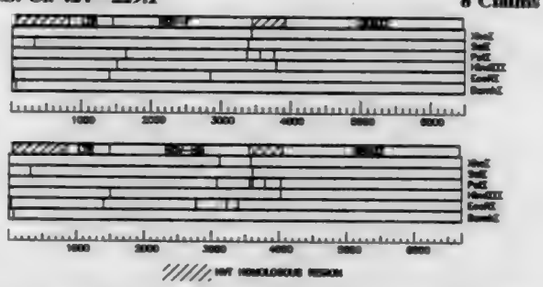
Paulus J. A. Sondermeijer; Johannes A. J. Claessens, both of Boxmeer, Netherlands, and Albert P. A. Mockett, Huntington Cames, United Kingdom, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Division of Ser. No. 621,193, Nov. 30, 1990, Pat. No. 5,187,087. This application Feb. 16, 1993, Ser. No. 18,489

Claims priority, application European Pat. Off., Dec. 4, 1989, 89203071

Int. Cl.[6] **A61K** *31/715;31/70;39/255;* **C12N** *15/45*

U.S. Cl. 424—229.1 **8 Claims**



1. A vaccine comprising a recombinant herpesvirus of turkeys (HVT) comprising a heterologous nucleic acid sequence that encodes an antigen of an avian pathogen, said nucleic acid sequence being introduced in an insertion region of the HVT genome from the end of ORF-1 through ORF-5 located within a DNA fragment of the HVT genome having a restriction enzyme map defined in FIG. 1.

5,470,735

INSECTICIDAL PLECTOXINS FROM *PLECTREURYS TRISTIS*

Douglas J. Leisy, Palo Alto; Gary B. Quistad, Mountain View, and Wayne S. Skinner, Portola Valley, all of Calif., assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 163,602, Dec. 6, 1993, abandoned, which is a continuation of Ser. No. 58,051, May 3, 1993, abandoned, which is a continuation of Ser. No. 837,194, Feb. 11, 1992, abandoned. This application Mar. 30, 1994, Ser. No. 221,285

Int. Cl.[6] **C12N** *7/01;15/63;15/12;* **A61K** *45/00*

U.S. Cl. 435—235.1 **8 Claims**

1. An isolated and purified DNA encoding a polypeptide, free from associated arachnoidal polypeptides, comprising the following amino acid sequence (SEQ. ID. NO.:1; Formula A):

$$AA_1\text{-}AA_2\text{Lys-Cys-}AA_5\text{-Gly-Trp-}AA_8\text{-}AA_9\text{-}AA_{10}\text{-Cys-}AA_{12}\text{-Gly-}AA_{14}\text{-}AA_{15}\text{ -}AA_{16}\text{-Cys-Cys-}AA_{19}\text{-}AA_{20}\text{-Cys-Val-Met-}AA_{24} \quad (A)$$

wherein AA_1 is Ala or Glu; AA_2 is Val or Leu; AA_5 is Ile or Gln; AA_8 is Gln or Val; AA_9 is Glu or Asp; AA_{10} is Thr or Tyr; AA_{12} is Asn or Arg; AA_{14} is Asn or Lys; AA_{15} is Leu or Val; AA_{16} is Pro or Glu; AA_{19} is Asn or Asp; AA_{20} is Glu, Gly, or Asp; and AA_{24} is Cys or Tyr; or

a polypeptide comprising the sequence of Formula A and further comprising the following additional amino acids after AA_{24} (SEQ. ID. NO.:2; Formula B):

$$\text{-Glu-Cys-Asn-Ile-Met-Gly-Gln-Asn-Cys-Arg-Cys-Asn-His-Pro-}AA_{39}\text{-}AA_{40}\text{-Thr-}AA_{42} \quad (B)$$

wherein AA_{39} is Lys or Arg; AA_{40} is Ala, Met, or Ile; and AA_{42} is Asn or Ser; or

a polypeptide comprising the sequence of Formula B and further comprising an additional Glu after AA_{42} (Formula C); or

a polypeptide comprising the sequence of Formula C and further comprising the following additional amino acid sequence following the Glu at position 43 (Formula D):

$$\text{-Cys-}AA_{45} \quad (D)$$

wherein AA_{45} is Glu or Gly; or

a polypeptide comprising the sequence of Formula D and further comprising a Ser after AA_{45}; (Formula E) or

a polypeptide of the Formula F comprising the following amino acid sequence (SEQ. ID. NO.:3):

Cys-Ala-Lys-His-Ser-Glu-Thr-Cys-Lys-Asn-Gly-Asn-Cys-Cys-Thr-Cys-Thr-Gln-Tyr-Arg-Gly-Lys-Asp-Glu -Pro-Met-Ala-Cys-Arg-Arg-Gly-Thr-His-Gly-Gln-Arg-Cys-Gln-Cys-Val-Met-Lys-Ile-Met-Lys-His (F)

or a polypeptide of the Formula G comprising the following amino acid sequence (SEQ. ID. NO.:4):

Gly-Cys-Lys-Gly-Phe-Leu-Val-Lys-Cys-Asp-Ser-Asn-Ser-Glu-Cys-Cys-Lys-Thr-Ala-Ile-Val-Lys-Gly-Lys-Lys-Lys -Gln-Leu-Ser-Cys-Leu-Cys-Gly-Ala-Trp-Gly-Ala-Gly-Cys-Ser-Cys-Ser-Phe-Arg-Cys-Gly-Asn-Arg-Cys-OH (G)

or homologous polypeptides of Formula A–G, wherein the cysteine residues of said homologous peptide is identical to the number and position of the cysteine residues of one of the polypeptides of Formula A–G and wherein the complementary strand of the DNA molecule encoding said homologous peptide will hybridize to the DNA molecule encoding one of the polypeptides of Formula A–G under stringent hybridization conditions.

5,470,736

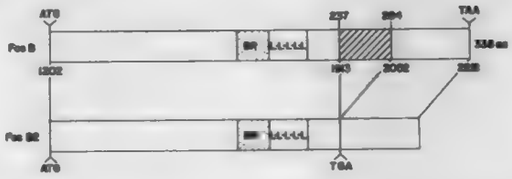
TRANSDOMINANT NEGATIVE PROTO-ONCOGENE

Inder M. Verma, Solana Beach; Ronald M. Wisdom, Del Mar, both of Calif., and Jong-Young J. Yen, West Orange, N.J., assignors to The Salk Institute for Biological Studies, La Jolla, Calif.

Continuation of Ser. No. 710,862, Jun. 10, 1991, abandoned. This application Mar. 28, 1994, Ser. No. 218,686

Int. Cl.[6] **C12N** *15/12;5/10;15/79;15/86*

U.S. Cl. 435—240.2 **20 Claims**



1. An isolated polynucleotide encoding a trans-repressing FosB2 protein, wherein the protein is characterized by:

(a) having a leucine zipper domain; and

(b) forming a heterodimer with a Jun related protein, wherein the heterodimer is capable of:

(i) binding to an AP-1 site; and

(ii) suppressing transcriptional transactivation of a promoter containing the AP-1 site; and

(c) having an amino acid sequence of Sequence ID No. 2, wherein amino acids 238– 284 are deleted therefrom.

5,470,737

STABLY-TRANSFORMED CELLS EXPRESSING HUMAN THIOPURINE METHYLTRANSFERASE

Richard M. Weinshilboum, Rochester; Ronald Honchel, Kasson; Ibrahim A. Aksoy, Rochester; Carol L. Szumlanski, Rochester; Thomas C. Wood, Rochester; Diane M. Otterness, Rochester, and Eric D. Wieben, Rochester, all of Minn., assignors to Mayo Foundation for Medical Education and Research, Rochester, Minn.

Continuation of Ser. No. 74,348, Jun. 9, 1993, abandoned. This application Oct. 3, 1994, Ser. No. 317,707

Int. Cl.[6] **C12N** *5/10;9/10;* **C07H** *15/12*

U.S. Cl. 435—240.2 **9 Claims**

1. A mammalian cell line, the genome of which has been augmented by chromosomally integrated non-native DNA encoding mammalian thiopurine methyltransferase, wherein said DNA hybridizes with DNA complementary to DNA having SEQ ID NO:1 under the stringency conditions of hybridization in buffer containing 20% formamide, 5× Denhardt's, 6× SSC, 100 mg/ml RNA and 0.05% sodium pyrophosphate at 42° C., followed by washing at 60° C. and 1× SSC, 0.1% SDS.

5,470,738

ANTIBODIES THAT BIND TO A LIGAND-INDUCED BINDING SITE ON GPIIIA

Andrew L. Frelinger, III; Edward F. Plow, and Mark H. Ginsberg, all of San Diego, Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Division of Ser. No. 417,565, Oct. 5, 1989, Pat. No. 5,284,751, which is a continuation-in-part of Ser. No. 175,342, Mar. 31, 1988, Pat. No. 5,114,842, which is a continuation-in-part of Ser. No. 70,953, Jul. 8, 1987, abandoned. This application Oct. 4, 1993, Ser. No. 131,320

Int. Cl.[6] **C12N** *5/12;* **C07K** *16/18;16/28*

U.S. Cl. 435—240.27 **7 Claims**

1. A monoclonal antibody composition comprising antibody molecules, or fragments thereof, that are capable of specifically immunoreacting with a ligand-induced binding site on GPIIIa when GPIIIa-containing receptor is specifically bound to a GPIIb-

IIIa-specific ligand, but do not immunoreact with either said GPIIIa-containing receptor or said ligand when either is in non-bound form.

5,470,739

CELL CULTURE SUPPORT HAVING PATTERNED SUBSTANCE THAT INFLUENCES CELL ADHESION

Toshihiro Akaike; Seishiro Tobe, both of Kanagawa; Shigeyuki Miyamoto, and Akio Ohashi, both of Tokyo, all of, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 22, 1992, Ser. No. 994,685

Claims priority, application Japan, Dec. 26, 1991, 3-357910

Int. Cl.[6] C12M *3/00;* **C12N** *5/00*

U.S. Cl. 435—240.243 **21 Claims**

1. A cell culture support which provides for the adhesion and culturing of one or more types of adhesive cells which is produced by a process comprising:

(i) applying a photoresist onto a cell culture support surface and then partially removing the photoresist by photolithography;

(ii) pretreating the support surface from (i) with a reagent that imparts hydrophobicity to the support surface;

(iii) forming a crosslinked collagen film on the support surface from (ii); and

(iv) dissolving the photoresist remaining on the support surface from (iii) to produce said cell culture support.

5,470,740

CLONED NSII RESTRICTION-MODIFICATION SYSTEM

Mary C. Longo, Germantown, and Michael D. Smith, Rockville, both of Md., assignors to Life Technologies, Inc., Gaithersburg, Md.

Filed Nov. 4, 1993, Ser. No. 145,518

Int. Cl.[6] C12N *15/55;1/21;5/10;15/70*

U.S. Cl. 435—252.33 **8 Claims**

1. An isolated DNA coding for the NsiI restriction endonuclease.

5,470,741

MUTANT OF *GEOTRICHUM CANDIDUM* WHICH PRODUCES NOVEL ENZYME SYSTEM TO SELECTIVELY HYDROLYZE TRIGLYCERIDES

Dean A. Oester, Cincinnati; Allen L. Hall, Amelia, and Stephen J. Vesper, Kettering, all of Ohio, assignors to Henkel Corporation, Plymouth Meeting, Pa.

Filed Jul. 22, 1992, Ser. No. 918,328

Int. Cl.[6] C12N *1/14;9/20*

U.S. Cl. 435—254.1 **2 Claims**

1. A biologically pure culture of a strain of *Geotrichum candidum* having all the identifying characteristics of the strain ATCC 74170.

5,470,742

DEHALOGENATION OF ORGANOHALOGEN-CONTAINING COMPOUNDS

Alan Bull; David J. Hardman; Brian M. Stubbs, and Paul J. Sallis, all of Kent, United Kingdom, assignors to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 866,216, Apr. 9, 1992, abandoned, which is a continuation-in-part of Ser. No. 690,765, Apr. 24, 1991, abandoned. This application May 16, 1994, Ser. No. 243,492

Int. Cl.[6] C12S *13/00;* **C12P** *9/00;* **C08F** *6/06;* **C08G** *63/89*

U.S. Cl. 435—262 **18 Claims**

1. A method for treating an aqueous composition comprising a nitrogen-free organohalogen compound and a nitrogen-containing cationic polymer, to reduce a level of the nitrogen-free organohalogen compound, comprising:

A. adding a culture of a microorganism to the aqueous composition, the culture comprising at least one member selected from the group consisting of *Agrobacterium tumefaciens* NCIMB 40272 and a mixed culture NCIMB 40313 of *Arthrobacter histidinolovorens* and *Agrobacterium tumefaciens*, the culture of a microorganism being capable of dehalogenating the nitrogen-free organohalogen compound while leaving the nitrogen-containing cationic polymer intact; and

B. dehalogenating the nitrogen-free organohalogen compound with the culture of a microorganism under suitable conditions, to provide a composition containing a nitrogen-containing cationic polymer having a reduced level of the nitrogen-free organohalogen compound;

the nitrogen-free organohalogen compound comprising at least one member selected from the group consisting of 1,3-dichloro-2-propanol and 1-chloro-2,3-propanediol, the nitrogen-containing cationic polymer comprising at least one member selected from the group consisting of an epichlorohydrin polyamide wet strength resin and an epichlorohydrin polyaminoamide resin, and the nitrogen-containing cationic polymer being present in the aqueous composition in an amount of from about 1 to 50 weight percent, based on a total weight of the aqueous composition.

5,470,743

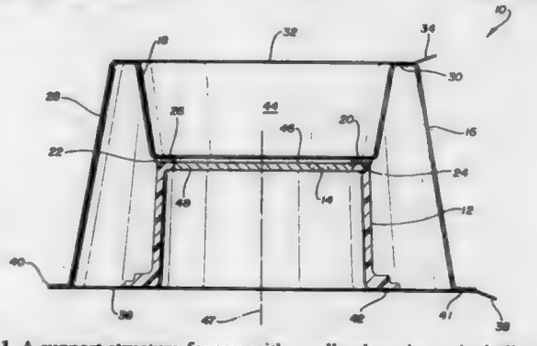
TRANSMEMBRANE CELL CULTURE DEVICE

Edward F. Mussi, Hewitt, and Harry E. Gray, Bloomingdale, both of N.J., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 62,482, May 17, 1993, abandoned, which is a continuation of Ser. No. 924,394, Aug. 3, 1992, abandoned, which is a continuation of Ser. No. 665,383, Mar. 6, 1991, abandoned. This application Apr. 12, 1994, Ser. No. 226,448

Int. Cl.[6] C12M *3/06*

U.S. Cl. 435—297.1 **2 Claims**



1. A support structure for use with a cell culture insert including a permeable membrane, comprising:

a longitudinal axis;

a top portion and a bottom portion;

an annular skirt extending from said top portion to said bottom portion and having an inner surface and an outer surface;

an inner inverted skirt portion, defining a culture chamber extending from said top portion to a lower portion and surrounded by said tuner surface of said annular skirt;

an annular flat lip having a top surface and a bottom surface on said lower portion of said inner inverted skirt;

a flange extending from said bottom portion of said annular skirt;

a gasket material comprising a double sided adhesive that is located on said bottom surface of said annular flat lip on said lower portion of said inverted skirt; and

wherein said flat lip is spaced from said flange such that the culture insert is contained within the annular skirt when a bottom surface of the culture insert is attached to said gasket material.

5,470,744

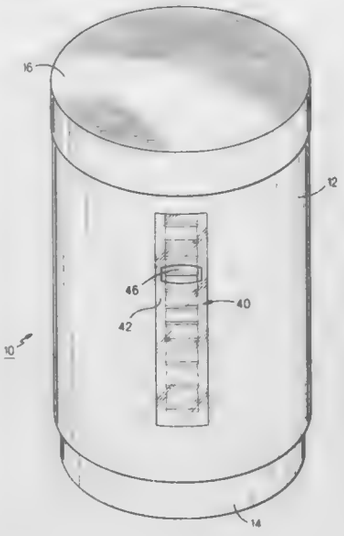
BIOASSAY INCUBATOR FOR USE WITH ROBOTIC ARMS

Thomas W. Astle, 607 Harborview Rd., Orange, Conn. 06477

Filed Apr. 14, 1994, Ser. No. 227,712

Int. Cl.[6] C12M *1/00;1/38*

U.S. Cl. 435—286.7 6 Claims



1. A bioassay incubator for use with a robotic arm, said incubator comprising:

(a) a housing;

(b) a first plurality of linearly spaced apart shelves disposed within said housing, said shelves dimensioned to support thereon bioassay trays;

(c) a robotic access opening defined in said housing and extending along said first plurality of shelves, through which robotic access opening said first plurality of shelves may be accessed by a robotic arm to place on, or to remove from, said bioassay trays;

(d) sealing means disposed over and substantially sealing said robotic access opening;

(e) said sealing means having defined therethrough a robotic access window, said robotic access window being positionable adjacent a selected one of said first plurality of shelves and being minimally dimensioned to permit said robotic arm to access said selected one of said shelves therethrough, while said sealing means otherwise substantially seals said robotic access opening to minimize disturbance of the interior environment of said incubator;

(f) said sealing means comprising a flexible curtain, with said robotic access window therein selectively positionable in said robotic access opening by moving said flexible curtain back and forth across said robotic access opening;

(g) one end of said flexible curtain being attached to a head roller disposed at one end of said robotic access opening and the other end of said flexible curtain being attached to a tail roller disposed at the other end of said robotic access opening; and

(h) an electric motor attached to both said head and tail rollers to simultaneously rotate both said head and tail rollers.

5,470,745

APPARATUS FOR CONTROLLING THE METHANE FERMENTATION OF ORGANIC MATERIALS

Jean-François Beteau, Grenoble, and Philippe Graindorge, Gieres, both of, France, assignors to Valorga Process, Vendargues, France

Division of Ser. No. 133,029, Oct. 8, 1993. This application Aug. 2, 1994, Ser. No. 284,167

Claims priority, application France, Feb. 12, 1992, 92 01577

Int. Cl.[6] C12M *1/36*

U.S. Cl. 435—286.1 7 Claims

1. Apparatus for controlling the methane fermentation of organic materials comprising

a first fermentor in which the organic materials are situated,

sensors coupled to said first fermentor for taking physical-chemical measurements of the material in said first fermentor,

a first computer for processing these measurements and converting the measurements with the assistance of a fermentation model, into a characteristic variable of the biological state of the organic materials in said first fermentor, said fermentation model constituting a function of the concentration of non-ionized acetic acid, the concentration of total acetic acid, the pH value and the concentration of ionized acetic acid in the organic materials,

a second computer for controlling said first fermentor from said characteristic variable, and

an experimentation device comprising a second fermentor containing a sample of material taken from said first fermentor, sensors coupled to said second fermentor for measuring data of the methane fermentation of said sample in said second fermentor and a third computer for processing the data from said sensors coupled to said second fermentor and for sending the data to said first computer,

said fermentation model being adjusted in said first computer based on the methane fermentation data of said sample in said second fermentor.

5,470,746

PICKLED VEGETABLES FERMENTATION DETECTING DEVICE

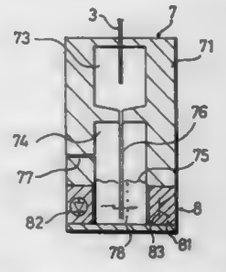
Jae I. Kim, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Continuation of Ser. No. 451,565, Dec. 18, 1989, abandoned. This application Aug. 2, 1993, Ser. No. 100,340

Claims priority, application Rep. of Korea, Dec. 30, 1988, 1988/17993

Int. Cl.[6] C12M *1/34*

U.S. Cl. 435—287.1 16 Claims



1. A pickled vegetable fermentation detector, comprising:

means for collecting gas generated during fermentation of pickled vegetables;

a bubble generator providing bubbles with the gas from said gas collecting means, said bubble generator comprising:

a container having an upper portion providing a constant volume accumulating said gas from said gas collecting means under pressure, and a lower portion containing a liquid phase medium; and

connecting tube means extending into the liquid phase medium and providing a sole and direct connection between said lower portion of said container and said upper

portion of said container, for discharging a series of bubbles of said gas within said liquid phase medium as a function of said volume and said pressure;

detecting means for enabling detection of a state of curing of the pickled vegetables in dependence upon said bubbles generated in said bubble generator, said detecting means comprising

a main body separate from said container, said main body partially surrounding said lower portion of said container while separated from said liquid phase medium by said container, said main body including means for making a count of said bubbles discharged from said connecting tube means.

5,470,747

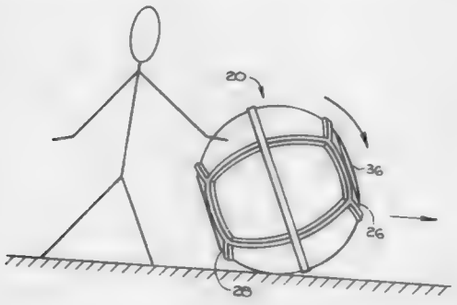
SPHERICAL COMPOSTER

Joseph Sikorski, 26960 S. Lakeview Dr., Wauconda, Ill. 60084

Filed Jan. 31, 1994, Ser. No. 188,891

Int. Cl.[6] **C05F** *11/06;17/02;* **C12N** *1/10*

U.S. Cl. 435—290.1 **4 Claims**



1. A spherical composter, comprising a composter which is spherical in shape and of relatively large size enabling rolling said composter by a user who is in a standing position, said composter accommodating a great mass of compost,

the composter having a central axis and including two main parts, namely a bottom part and a top pard, both hemispherical in shape, and each including a wall element,

the bottom part being of one-piece construction and constituting a complete hemisphere,

the top part including a surrounding piece with a hole therein and a cover snap-fitted in the hole, the surrounding piece and cover constituting a complete hemisphere,

the bottom part and the top part being made up entirely of molded material,

the main parts having open sides of circular shape lying in a plane perpendicular to said central axis, and each part terminating in a continuous equatorial rim surrounding its open side and including an annular flange extending radially outwardly from the wall element of the part and a cylindrical flange at the radially outer edge of the annular flange and extending axially away from the wall element, the cylindrical flanges being of slightly different diameter to enable telescoping thereof,

the main parts being capable of being fitted together with their open sides interfacing and the cylindrical flanges telescoped, and the smaller cylindrical flange engaging the annular flange on the other part, and

connector means detachably extending radially through the telescoped cylindrical flanges at positions distributed circumferentially around the composter, and operable for securing the parts together,

said connector means constituting the only means for securing the parts together,

the interengaging flanges of the equatorial rims and the connector means together also forming an oquatorial strengthening rib, extending radially outwardly beyond the wall elements.

5,470,748

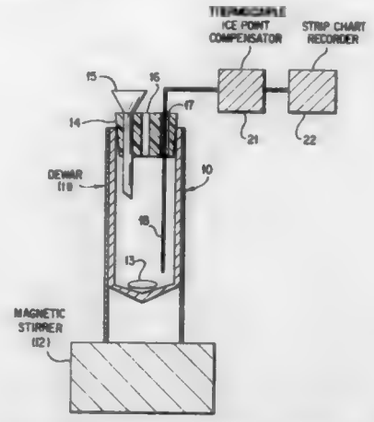
METHOD FOR MEASURING THE RELATIVE CATALYTIC ACTIVITY OF CARBONACEOUS CHARS

Richard A. Hayden, and Thomas M. Matviya, both of Pittsburgh, Pa., assignors to Calgon Carbon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 6,470, Jan. 21, 1993, abandoned. This application Jun. 27, 1994, Ser. No. 266,137

Int. Cl.[6] **G01N** *31/10;25/20*

U.S. Cl. 436—37 **12 Claims**



1. A method for establishing an index of catalytic activity for a carbonaceous char for the purpose of comparing the relative catalytic activity between carbonaceous chars said method comprising:

(a) combining a carbonaceous char with a material that undergoes an exothermic reaction, said reaction being catalyzed by the presence of said char to provide a temperature rise;

(b) determining said temperature rise from initiation of said reaction by measuring temperature as a function of elapsed time from the initiation of said reaction to a maximum temperature of said reaction;

(c) establishing an index of catalytic activity for said carbonaceous chars by determining the minimum time required for said temperature rise to achieve a predetermined temperature which is less than or equal to said maximum temperature, wherein said minimum time to achieve temperature is said index of catalytic activity for said carbonaceous char.

5,470,749

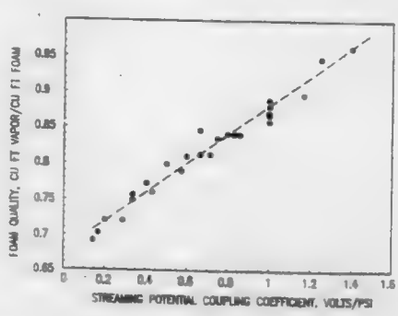
METHOD FOR DETERMINING STEAM QUALITY USING A FOAMING SURFACTANT

Nizar F. Djabbarah, Richardson, and Eve S. Sprunt, Farmers Branch, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Aug. 27, 1993, Ser. No. 112,292

Int. Cl.[6] **G01N** *33/00*

U.S. Cl. 436—38 **6 Claims**



1. A method for continuously measuring the quality of a flowing stream of steam at pressure and temperature substantially above atmospheric pressure and room temperature comprising:

a) mixing steam of a known quality (volume of vapor per volume of vapor and liquid) with a surfactant not greater than about 1% by weight of the liquid phase of the steam to form a stable foam having a quality (volume of vapor per volume of vapor and liquid) equal to the steam quality (volume of vapor per volume of vapor and liquid);

b) passing the stable foam from step a) through an electrically non-conductive shielded capillary tube and measuring the voltage drop between two electrodes spaced across a selected length of the tube and the pressure drop across the same selected length of the tube;

c) repeating steps a) and b) using steam of different qualities;

d) plotting the relationship between the ratio of voltage drop and pressure drop versus the foam quality (volume of vapor per volume of vapor and liquid) for each sample of steam tested in steps a) and b);

e) withdrawing successive a samples of the flowing stream of steam of unknown quality and repeating steps a) and b) for each sample to determine the ratio of voltage drop and pressure drop of the stable foam formed from said steam and measuring the temperature of the stable foam formed from said steam to determine the specific volume of the liquid-water and water-vapor phase of the steam forming the stable foam;

f) determining the foam quality (volume/volume) of each sample of the stable foam in step e) graphically from the relationship between foam quality (volume/volume) and the ratio of voltage drop and pressure drop plotted in step d) which equals steam quality; and

g) converting the steam quality (volume of vapor per volume of foam) obtained in step f) for each sample to steam quality (mass of vapor per mass of vapor and liquid) using the specific volume of the liquid-water and water-vapor phase of the steam determined in step e).

5,470,750

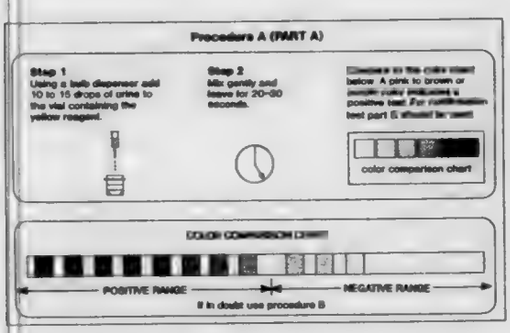
DETECTION OF APPENDICITIS BY MEASUREMENT OF ORTHOHYDROXYHIPPURIC ACID

David Bar-Or, Englewood, Colo., assignor to Appenditech, Inc., Englewood, Colo.

Continuation-in-part of Ser. No. 436,823, Nov. 15, 1989, abandoned. This application Jul. 9, 1992, Ser. No. 911,159

Int. Cl.[6] G01N *33/52;30/02;30/90;30/96*

U.S. Cl. 436—63 **18 Claims**



1. A method for diagnosing appendicitis, said method comprising;

obtaining a urine sample from a human being suspected of having appendicitis; and

determining, by a color-producing chemical reaction, that the concentration of σ-hydroxyhippuric acid in the urine sample is at least about 10 mg/liter and thereby indicating the probable presence of appendicitis in said human being.

5,470,751

REAGENT FOR DETECTING MALARIA INFECTED CELLS AND A DETECTING METHOD FOR MALARIA INFECTED CELLS USING THE SAME

Takashi Sakata, Kakogawa, and Hideaki Matsumoto, Takasago, both of, Japan, assignors to Toa Medical Electronics Co., Ltd., Hyogo, Japan

Filed Feb. 18, 1994, Ser. No. 199,339

Claims priority, application Japan, Feb. 22, 1993, 5-031757

Int. Cl.[6] G01N *33/48*

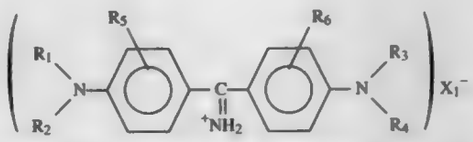
U.S. Cl. 436—63 **22 Claims**

1. A method for detecting malaria infected cells which comprises the steps of:

(1) treating a test sample with a staining solution which comprises

at least one first dye of an Auramine analogue having the formula (I):

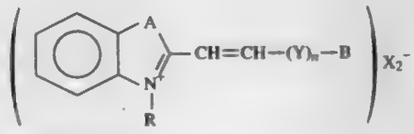
(I)



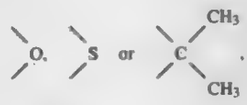
wherein R_1 to R_6 independently represents a hydrogen atom, a methyl group or an ethyl group, and X_1 represents a halogen atom, and

at least one second dye of a condensed benzene derivative having the formula (II):

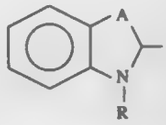
(II)



wherein A represents



R represents a C_{1-6} alkyl group,
X_2 represents a halogen atom,
Y represents —CH= or —NH—,
n represents 0 or 1, and
B represents



or a phenyl group substituted with (i) two lower alkoxy groups, (ii) a lower alkyl group and a cyanoalkylamino group or (iii) one di-lower alkyamino group, to stain malaria infected cells: and

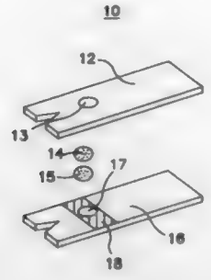
(2) optically detecting stained malaria infected cells.

5,470,752

MULTI-LAYER DEVICES AND METHODS OF ASSAYING FOR FRUCTOSAMINE

John F. Burd; Talei Hoblitzell, both of San Diego, and Gebhard Neyer, Los Angeles, all of Calif., assignors to LXN Corporation, Irvine, Calif.

Filed Jun. 29, 1994, Ser. No. 269,351
Int. Cl.[6] G01M 33/52
U.S. Cl. 436—87 25 Claims



18. A method for analyzing the concentration of fructosamine in a liquid sample, comprising the steps of:

(a) providing a test device having a non-opaque, liquid permeable buffer layer containing a buffer having a pH value of at least 9, an indicator layer containing an indicator capable of being reduced by fructosamine, and a support member optionally having a detection aperture, wherein the buffer layer is superposed above the indicator layer;

(b) applying a liquid sample to the test device; and

(c) analyzing the indicator layer for the concentration of fructosamine present in the liquid sample.

5,470,753

PEPTIDE SEQUENCING USING MASS SPECTROMETRY

Nikolai Sepetov; Olga Issakova; Viktor Krchnak, and Michal Lebl, all of Oro Valley, Ariz., assignors to Selectide Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 939,811, Sep. 3, 1992, abandoned. This application May 28, 1993, Ser. No. 68,947
Int. Cl.[6] G01N 33/00
U.S. Cl. 436—89 3 Claims

1. A method for determining the sequence of a peptide comprising:

(a) determining the possible amino acid compositions of a peptide according to a method comprising the following steps:

(i) determining the mass of a peptide from a mass spectrum of the peptide;

(ii) determining the mass of a first derivative of the peptide;

(iii) determining the number of reactive moieties in the peptide from the difference between the mass of the peptide and the mass of the first derivative of the peptide; and

(iv) eliminating compositions that do not contain the number of reactive moieties determined in step (iii);

(b) calculating all possible fragments consistent with the amino acid compositions determined in step (a);

(c) evaluating the calculated fragments of step (b) as N-terminal fragments and as C-terminal fragments;

(d) selecting N-terminal and C-terminal fragment ions from fragments calculated in step (b) that match a daughter ion peak found in the mass spectrum of the peptide; and

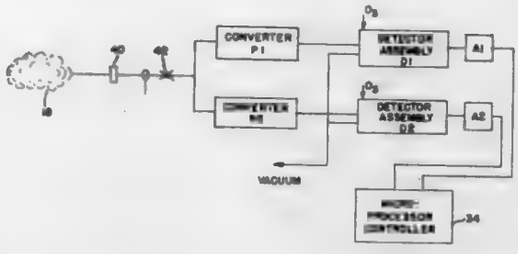
(e) constructing candidate sequences from fragment ions selected in step (d).

5,470,754

METHOD AND SYSTEM FOR SAMPLING AND DETERMINING THE PRESENCE OF COMPOUNDS

David P. Rounbehler, Bedford; David H. Fine, Sudbury; Eugene K. Achter, Lexington, all of Mass.; Stephen J. MacDonald, Salem, N.H., and Daniel B. Dennison, Kennesaw, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.

Continuation-in-part of Ser. No. 890,863, Jun. 1, 1992, Pat. No. 5,352,611, and a continuation-in-part of Ser. No. 890,864, Jun. 1, 1992. This application Feb. 22, 1993, Ser. No. 20,804
Int. Cl.[6] G01N 21/76
U.S. Cl. 436—106 9 Claims



1. A method of detecting selected compounds, including certain nitrogen containing compounds in a sample by chemiluminescent gas phase reaction of nitric oxide with ozone, said nitric oxide being present as both a background component in the sample, and as a product of the conversion of one of said nitrogen containing compounds comprising the steps of:

collecting the sample;

dividing the sample into first and second portions;

heating the first portion of the sample to a first predetermined temperature in a first pyrolyzer having first conversion properties such that no appreciable amounts of nitric oxide can be produced therein from conversion of the nitrogen containing compounds;

heating the second portion of the sample to a second predetermined temperature in a second pyrolyzer having second conversion properties such that measurable amounts of nitric oxide can be produced therein from the nitrogen containing compounds;

mixing the heated first portion of the sample with ozone to cause a chemical reaction therewith in order to generate radiation by chemiluminescence having characteristic wavelengths related to nitric oxide from the background component in said first portion;

mixing the heated second portion of the sample with ozone to cause a chemical reaction therewith in order to generate radiation by chemiluminescence having characteristic wavelengths related to nitric oxide in the background component and also nitric oxide produced from nitrogen containing compounds in said second portion which are converted in the second pyrolyzer;

selectively detecting radiation emitted by chemiluminescence from the first portion of the sample;

selectively detecting radiation emitted by chemiluminescence from the second portion of the sample;

generating first electrical signals from the radiation selectively detected from the first portion of the sample and second electrical signals from the radiation selectively detected from the second portion of the sample; and

comparing the first electrical signals with the second electrical signals in order to determine the presence or absence of selected nitrogen containing compounds in the sample;

wherein said heating, mixing, detecting, and generating steps are performed at substantially the same times for said first portion as for said second portion and wherein the step of comparing includes the steps of subtracting the first electrical signals from the second electrical signals so as to cancel background components of nitric oxide signals in said portions and comparing the net result to first predetermined threshold criteria.

5,470,755

PROCESS FOR DETERMINING THE ALCOHOL CONTENT OF A BIOLOGICAL SAMPLE

Wilhelm Simon, Zurich, Switzerland, assignor to Willi Möller AG, Switzerland

Continuation of Ser. No. 853,672, Mar. 19, 1992, Pat. No. 5,374,562. This application Aug. 25, 1994, Ser. No. 296,380

Claims priority, application Switzerland, Mar. 21, 1991, 875/91

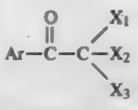
The portion of the term of this patent subsequent to Oct. 20, 2011, has been disclaimed.

Int. Cl.[6] G01N *33/14*

U.S. Cl. 436—131 **24 Claims**

1. A process for determining the alcohol content of a liquid or gaseous sample of biological origin containing an alcohol of the formula R'—OH comprising:

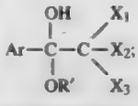
A) determining, in the absence of said alcohol, a light absorption or fluorescence of an optical sensor in the ultraviolet, visible or infrared range, the optical sensor comprising a keto compound of formula I



I

incorporated into or supported by a carrier material;

B) contacting the sample with said optical sensor to form a hemiacetal of formula II



II

C) determining a change in the light absorption or fluorescence of the optical sensor; and

D) determining the alcohol content of the sample based on the change in the light absorption or fluorescence of the optical sensor,

wherein R' is an aliphatic or cycloaliphatic residue, X_1, X_2, and X_3 are independently chlorine or fluorine, and Ar is a member selected from the group consisting of:

(a) an aromatic system selected from the group consisting of: substituted benzene, naphthalene, substituted naphthalene, phenanthrene, substituted phenanthrene, anthracene, and substituted anthracene, wherein the substituted molecules have at least one non-acidic substituent selected from the group consisting of nonpolar substituents, weakly polar substituents, basic substituents, and chromophorous substituents; and

(b) a heterocyclic system selected from the group consisting of:

thiophene, substituted thiophene, furan, substituted furan, benzofuran, substituted benzofuran, benzothiophene, substituted benzothiophene, pyrrole, substituted pyrrole, 1,2-diazole, substituted 1,2-diazole, 1,3-diazole, substituted 1,3-diazole, triazole, substituted triazole, pyridine, substituted pyridine, thiazole, substituted thiazole, 1,2-diazine, substituted 1,2-diazine, 1,3-diazine, substituted 1,3-diazine, 1,4-diazine, substituted 1,4-diazine, 1,3,5-triazine, substituted 1,3,5-triazine, 1,2,4-triazine, substituted 1,2,4-triazine, 1,2,3-triazine, substituted 1,2,3-triazine, tetrazine, substituted tetrazine, 1-azanaphthalene, substituted 1-azanaphthalene, 2-azanaphthalene, substituted 2-azanaphthalene, diazanaphthalenes, substituted diazanaphthalenes, triazanaphthalenes, substituted triazanaphthalenes, indole, substituted indole, carbazole, substituted carbazole, monoazaanthracenes, substituted monoazaanthracenes, diazaanthracenes, substituted diazaanthracenes, triazaanthracenes, substituted triazaanthracenes, triazaphenanthrenes, substituted triazaphenanthrenes, tetraazaanthracenes, substituted tetraazaanthracenes, tetraazaphenanthrenes, and substituted tetraazaphenanthrenes, wherein the substituted molecules have at least one non-acidic substituent as defined in (a) above.

5,470,756

GAS SENSORS

Gary S. V. Coles, and Geraint Williams, both of Swansea, United Kingdom, assignors to British Gas plc, London, England

PCT No. PCT/GB91/00400, § 371 Date Nov. 19, 1992, § 102(e) Date Nov. 19, 1992, PCT Pub. No. WO91/14939, PCT Pub. Date Oct. 3, 1991

PCT Filed Mar. 15, 1991, Ser. No. 949,847

Claims priority, application United Kingdom, Mar. 19, 1990, 90 06176

Int. Cl.[6] G01N *33/00*

U.S. Cl. 436—144 **12 Claims**

1. A method of measuring hydrogen concentrations in gases comprising the use of a sensor of the SnO_2 type comprising a layer of tin (IV) oxide (SnO_2) incorporating bismuth (III) oxide (Bi_2O_3) wherein the Bi_2O_3 is present in an amount in excess of 17% by weight and less than 35% by weight based on the total amount of SnO_2 and Bi_2O_3 and sufficient that the sensor has hydrogen sensitivity and selectivity over the gases CO and CH_4.

5,470,757

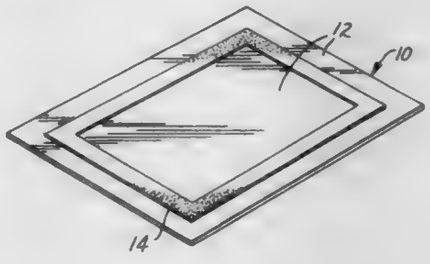
SPECTROSCOPIC SAMPLE HOLDER AND METHOD FOR USING SAME

James E. Gagnon, Minneapolis; Neale P. Povey, Stillwater; David R. Gagnon, St. Paul, and Roland R. Midgley, Minneapolis, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 903,578, Jun. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 720,713, Jun. 25, 1991, abandoned. This application Jun. 28, 1994, Ser. No. 267,839

Int. Cl.[6] G01N *21/00;1/00;21/01*

U.S. Cl. 436—164 **18 Claims**



1. A method for spectroscopically analyzing a sample, said method consisting essentially of:

a) providing a sample holder consisting essentially of a microporous polymeric sheet, at least a portion of said sheet being an exposed transit area for placement of a sample thereon, said sheet being substantially flat across said transit area and having an average baseline transmittance of at least 1 percent and having a plurality of interconnecting microscopic pores opening through at least one face of said sheet, said pores ranging from about 0.1 to about 50 microns in width in their average characteristic width;

b) applying said sample to said transit area of said sheet;

c) transmitting infrared radiation through said sample and said sheet; and

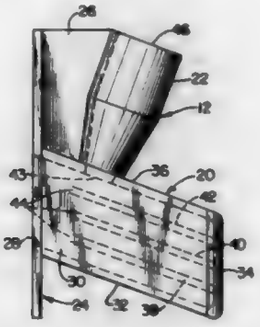
d) analyzing the radiation transmitted through said sample and said sheet in a spectral region of interest.

5,470,758

LARGE CYTOLOGY SAMPLE CHAMBER FOR DISTRIBUTING MATERIAL ONTO A MICROSCOPE SLIDE

William J. Hayes, Edgeworth, Pa., assignor to Shandon, Inc., Pittsburgh, Pa.

Filed Dec. 14, 1994, Ser. No. 355,630
Int. Cl.[6] G01N 9/30
U.S. Cl. 436—177 16 Claims



1. A unitary disposable cytological sample chamber for receiving a sample of biological material in a liquid suspension and distributing said biological material onto a microscope slide during centrifugation of said suspension in said chamber in a centrifuge, said chamber comprising a sample holding portion, a liquid suspension-receiving funnel through which said sample is directed into said holding portion of said chamber, a generally flat, solid flange member defining a support surface and having a discharge opening in said flange member in communication with said holding portion, said holding portion having a pair of spaced sidewalls, a bottom wall, a back wall spaced from said opening and staggered baffle means for directing said sample along a tortuous path upon which said biological material may settle until said chamber is centrifuged. Whereby said biological material is centrifugally transported through said discharge opening and distributed onto said microscope slide.

5,470,759

ANTI-GLYCATED HEMOGLOBIN MONOCLONAL ANTIBODY AND METHOD FOR MEASURING GLYCATED HEMOGLOBIN

Masami Sugiyama; Yoshiaki Uchida; Yoshihiro Kurano; Aiko Tanaka, and Tetsuji Tanimoto, all of Tokyo, Japan, assignors to Fujirebio, Inc., Tokyo, Japan

Filed Jun. 7, 1993, Ser. No. 73,340
Claims priority, application Japan, Jun. 10, 1992, 4-177444; Jun. 16, 1992, 4-181708
Int. Cl.[6] G01N 33/538;33/72
U.S. Cl. 436—541 2 Claims

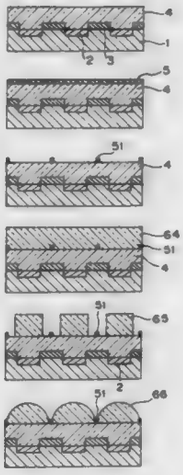
1. A method of measuring hemoglobin A_{1c} which comprises:
mixing a sample with unsensitized latex particles and an anti-hemoglobin A_{1c} antibody specific for native glycated hemoglobin to cause an immunoagglutination reaction, and then measuring agglutinations formed by the immunoagglutination reaction.

5,470,760

SOLID STATE IMAGING DEVICE HAVING PARTITION WALL FOR PARTITIONING BOTTOM PORTIONS OF MICRO LENSES AND MANUFACTURING METHOD THEREFOR

Junichi Nakai, Fukuyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 195,756, Feb. 14, 1994, Pat. No. 5,396,090. This application Nov. 23, 1994, Ser. No. 344,506
Claims priority, application Japan, Feb. 17, 1993, 5-27864
Int. Cl.[6] H01L 31/18
U.S. Cl. 437—2 1 Claim



1. A solid state imaging device manufacturing method comprising the steps of:
forming a plurality of photodetecting portions and an electric charge transfer portion on a substrate;
forming a flattening layer which has a light transmitting property and serves to cover the plurality of photodetecting portions and the electric charge transfer portion;
forming a partition wall material layer for covering the flattening layer;
removing a plurality of approximately polygonal regions of the partition wall material layer corresponding to micro lens to form a partition wall;
forming a resin layer which has a thermosoftening property and a light transmitting property and serves to cover the flattening layer and the partition wall;
separating the resin layer into a plurality of blocks corresponding to the plurality of photodetecting portions by removing a region of the resin layer covering the partition wall; and
thermally softening the plurality of blocks by heat application to transform the blocks into the plurality of micro lenses of which bottom portions are partitioned by the partition wall.

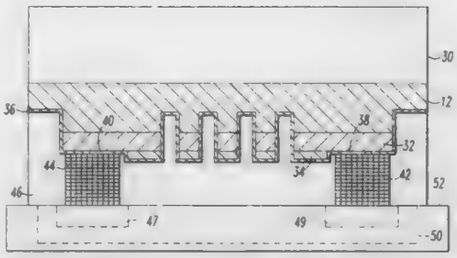
5,470,761

PROCESS FOR FABRICATING A FRONT SURFACE RESONANT MESH ARRAY DETECTOR

Richard C. McKee, Ellicott City, and Sandra L. Baumler, Crownsville, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sep. 13, 1993, Ser. No. 119,640
Int. Cl.[6] H01L 31/16
U.S. Cl. 437—5 15 Claims

1. A process for fabricating a front surface resonant mesh array detector, comprising the steps of:
forming a photodetector film overlying a substrate;
forming a dielectric film overlying said photodetector film;
forming a reflective layer overlying said dielectric film;
etching a plurality of parallel grooves in said reflective layer, said dielectric film, and in said photodetector film, each



adjacent pair of said grooves defining one of a plurality of photodetector elements therebetween;

removing a first portion of said reflective layer to provide a first electrical contact to said photodetector elements, and a second portion of said reflective layer to provide a second electrical contact to said photodetector elements;

removing said substrate to expose one side of said photodetector film; and

etching the exposed side of said photodetector film to a depth sufficient to electrically isolate each of said plurality of photodetector elements from one another.

5,470,762

METHOD OF FABRICATING A THIN FILM TRANSISTOR

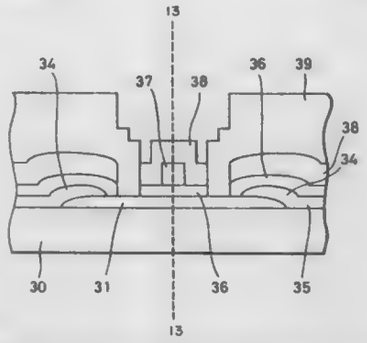
Mitsufumi Codama, and Noriaki Kondo, both of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Filed Nov. 20, 1992, Ser. No. 979,261

Claims priority, application Japan, Nov. 29, 1991, 3-340338

Int. Cl.[6] H01L *21/00;21/336;21/302*

U.S. Cl. 437—21 **13 Claims**



1. A method for forming a thin film transistor comprising the steps of:

forming a first layer on a semiconductor layer;

forming a mask pattern on said first layer;

etching said first layer to form a side recess under said mask pattern on said semiconductor layer; and

anisotropically etching said semiconductor layer with said mask pattern to leave a semiconductor island with a side portion of said semiconductor island being tapered so that thickness of said side portion of said semiconductor island is monotonously decreased toward an end of said side portion of said semiconductor island.

12. A method for forming a thin film transistor comprising the steps of:

forming a semiconductor island comprising a channel forming region, a source region and a drain region therein;

forming a first insulator on a side portion of said semiconductor island; and

forming a gate insulating film on said first insulator and said semiconductor island wherein said gate insulating film directly contacts said semiconductor island at said channel forming region and is formed to cover both said semiconductor island and said first insulator.

5,470,763

METHOD FOR MANUFACTURING THIN FILM TRANSISTOR WITH SHORT HYDROGEN PASSIVATION TIME

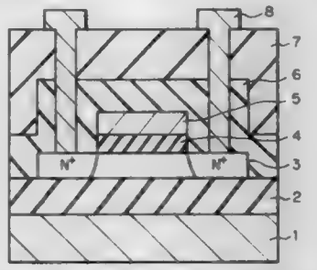
Koji Hamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 19, 1994, Ser. No. 308,447

Claims priority, application Japan, Sep. 21, 1993, 5-234710

Int. Cl.[6] H01L *21/336;21/30*

U.S. Cl. 437—21 **13 Claims**



1. A method for manufacturing a thin film transistor, comprising the steps of:

forming a polycrystalline silicon layer on a substrate;

forming a gate insulating layer on said polycrystalline silicon layer;

forming a gate electrodes layer on said gate insulating layer;

patterning said gate electrode layer and said gate insulating layer;

introducing impurity ions into said polycrystalline silicon layer in self-alignment with said patterned gate electrode layer to create source and drain regions in said polycrystalline silicon layer;

forming a non-doped insulating layer on said patterned gate electrode layer and said polycrystalline silicon layer, said non-doped insulating layer having a thickness of less than approximately 100 nm;

patterning said non-doped insulating layer;

forming a metal connection layer over said patterned non-doped insulating layer; and

performing hydrogen passivation upon said polycrystalline silicon layer after said metal connection layer is formed.

5,470,764

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE WITH HYDROGEN ION INTERCEPTING LAYER

Masaaki Ikegami, and Tetsuo Higuchi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushik Kaisha, Tokyo, Japan

Division of Ser. No. 960,650, Oct. 14, 1992, Pat. No. 5,327,224. This application May 23, 1994, Ser. No. 247,425

Claims priority, application Japan, May 20, 1992, 4-127609

Int. Cl.[6] H01L *21/265;21/02*

U.S. Cl. 437—24 **9 Claims**

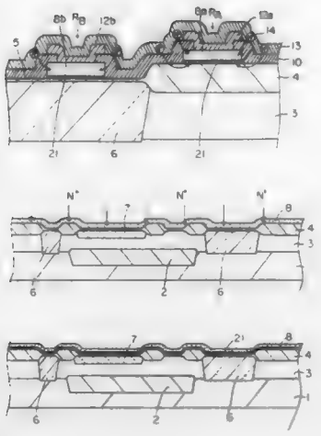
1. A manufacturing method of a semiconductor device comprising the steps of:

forming a first insulating oxide film and a second insulating oxide film, which continues to said first insulating oxide film and has a thickness larger than that of said first insulating oxide film, on a semiconductor substrate;

forming a polysilicon film, which covers said first and second insulating oxide film, on said semiconductor substrate;

forming a silicon nitride layer in a lowermost layer portion of said polysilicon film by implanting nitrogen ions into said lowermost layer portion of said polysilicon film and then applying a heat treatment thereto;

patterning said polysilicon film and said silicon nitride layer, for forming a first polysilicon resistance film and a second polysilicon resistance film on said first insulating oxide film and said second insulating oxide film, respectively;



forming a first electrode connected to said first polysilicon resistance film and a second electrode connected to said second polysilicon resistance film; and

forming an insulating protection film, which covers said first polysilicon resistance film, said second polysilicon resistance film, said first electrode and said second electrode, over said semiconductor substrate.

7. A manufacturing method of a semiconductor device comprising the steps of:

forming a first insulating oxide film and a second insulating oxide film, which continues to said first insulating oxide film and has a thickness larger than that of said first insulating oxide film, on a semiconductor substrate;

forming a pattern of a first silicon nitride film and a pattern of a second silicon nitride film on said first insulating oxide film and said second insulating oxide film, respectively;

growing a polysilicon film on each of said pattern of said first silicon nitride film and said pattern of said second silicon nitride film, thereby forming a first polysilicon resistance film and a second polysilicon resistance film over said first insulating oxide film and said second insulating oxide film, respectively;

forming a first electrode connected to said first polysilicon resistance film and a second electrode connected to said second polysilicon resistance film; and

forming an insulating protection film, which covers said first polysilicon resistance film, said second polysilicon resistance film, said first electrode and said second electrode, over said semiconductor substrate.

5,470,765

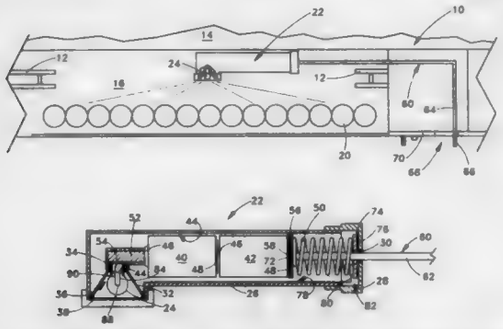
POOL TABLE BALL RETURN COMPARTMENT LIGHT

Joseph C. Stiefvater, HC 65, Box 346A, Tornado, W. Va. 25202

Filed Feb. 14, 1994, Ser. No. 195,086

Int. Cl.[6] A63B *71/00*

U.S. Cl. 473—28 **9 Claims**



1. In combination with a pool table having a gravity fed ball return system and a ball return compartment beneath the playing surface of the table, an electrical light to illuminate the ball compartment, comprising:

an electrical circuit comprising:

at least one battery for energizing said bulb, said at least one battery having a first electrical pole and a second electrical pole; and

a switch for manually opening and closing said electrical circuit:

an electrical light bulb, in the electrical circuit; and

the electrical light bulb disposed within said ball return compartment;

a rigid housing mounted in the ball return compartment of the pool table;

said bulb and said at least one battery retained in the rigid housing;

an electrically conductive reflector, having a socket for receiving said light bulb, joined to said housing;

a bulb connecting contact secured to said reflector for providing an electrical connection between the first electrical pole of said at least one battery and said reflector; and

said switch includes:

an electrically insulating gasket, having a central bore, disposed adjacent said at least one battery;

an electrically conductive rod slidably engaged with said housing and having a first free end disposed within said central bore;

an electrically conductive plate secured to said rod and in electrical contact therewith;

an electrically conductive strip having one of its ends in contact with said reflector and having its second end disposed adjacent said plate; and

a compressed spring positioned between said gasket and said plate for normally biasing said plate away from said conductive strip;

whereby selective longitudinal movement of said rod brings the first free end of said rod into contact with the second electrical pole of said at least one battery and brings said plate into contact with said strip thereby completing an electrical circuit causing said bulb to glow.

5,470,766

EFFICIENT METHOD FOR FABRICATING OPTIMAL BICMOS N-WELLS FOR BIPOLAR AND FIELD EFFECT TRANSISTORS

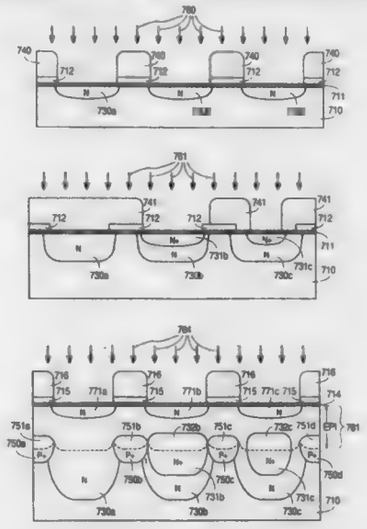
Chuen-Der Lien, Mountain View, Calif., assignor to Integrated Devices Technology, Inc., Santa Clara, Calif.

Filed Jun. 6, 1994, Ser. No. 254,817

Int. Cl.[6] H01L *21/265;21/70;27/00;21/302*

U.S. Cl. 437—31 **9 Claims**

1. A method for fabricating a well of a first conductivity type in



a lightly doped monocrystalline semiconductor wafer, the method comprising the steps of:

introducing a first dopant of the first conductivity type from a surface of said lightly doped monocrystalline semiconductor wafer, into a first region along the surface of said lightly doped monocrystalline semiconductor wafer to achieve a first dopant concentration in said first region;

introducing a second dopant of the first conductivity type from the surface of said lightly doped monocrystalline semiconductor wafer to form a second region of said first conductivity type above said first region, said second region achieving a second dopant concentration higher than said first dopant concentration;

growing a lightly doped epitaxial layer over said surface of said lightly doped monocrystalline semiconductor wafer, such that said first and second regions become buried regions in said lightly dope monocrystalline semiconductor wafer; and

introducing a third dopant of the first conductivity type from the surface of said lightly doped monocrystalline semiconductor wafer into said epitaxial layer to form a third region of said lightly doped monocrystalline semiconductor wafer above said buried regions.

5,470,767

METHOD OF MAKING FIELD EFFECT TRANSISTOR

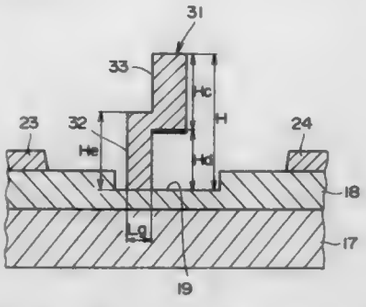
Takahiro Nakamoto, and Tetsuya Yagi, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 101,690, Aug. 4, 1993, abandoned. This application Oct. 14, 1994, Ser. No. 321,851

Claims priority, application Japan, Aug. 6, 1992, 4-209940

Int. Cl.[6] H01L *21/265;21/44;21/48*

U.S. Cl. 437—39 **3 Claims**



1. A method of making a semiconductor device having a gate electrode, a drain electrode, and a source electrode comprising:

depositing a first amorphous material layer on a semiconductor active layer disposed on a semiconductor substrate;

depositing a crystalline metal layer on said first amorphous material layer;

forming a first resist layer on said crystalline metal layer, said first resist layer having a first opening for defining dimensions and location of a leg of a gate electrode to be formed;

using said first resist layer as a mask, removing a portion of said crystalline metal layer, and thereafter etching said first amorphous material layer to form a first through-hole communicating with the first opening in said first resist layer and extending through said first amorphous material layer and said crystalline metal layer;

removing said first resist layer;

depositing a second amorphous material layer covering said crystalline metal layer and filling the first through-hole;

forming a second resist layer on said second amorphous material layer, said second resist layer having a second opening therein, a source electrode side edge of the second opening being substantially in alignment with a source electrode side edge of the first through-hole, a drain electrode side edge of the second opening being closer to a drain electrode side than a drain electrode side edge of the first through-hole;

using said second resist layer as a mask, etching said second amorphous material layer to form a second through-hole communicating with the second opening in said second resist layer and extending through said second amorphous material layer;

removing said second resist layer;

selectively depositing a gate electrode metal on said semiconductor active layer and said crystalline metal layer exposed by the second through-hole to form the gate electrode;

removing said second amorphous material layer and, thereafter, removing said crystalline metal layer; and

removing said first amorphous material layer.

5,470,768

METHOD FOR FABRICATING A THIN-FILM TRANSISTOR

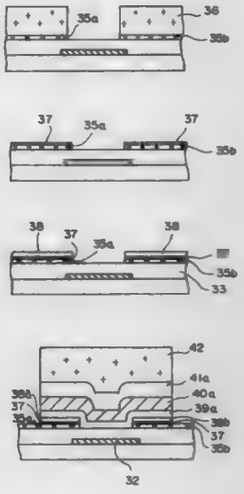
Ken-ichi Yanai; Tsutomu Tanaka; Koji Ohgata; Yutaka Takizawa; Ken-ichi Oki, and Takuya Hirano, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 5, 1993, Ser. No. 102,248

Claims priority, application Japan, Aug. 7, 1992, 4-211491; Aug. 10, 1992, 4-212554; Aug. 10, 1992, 4-232656; Jul. 22, 1993, 5-181063

Int. Cl.[6] H01L *21/86*

U.S. Cl. 437—40 **28 Claims**



1. A method for fabricating a thin-film transistor, comprising the steps of:

forming electrodes in at least a source region and a drain region on a substrate insulator;

selectively applying a conductive material only to the electrodes;

selectively forming an impurity-contained semiconductor film on the electrodes by alternately repeating etching and deposition using a difference of deposition rate due to a deposition base;

forming an active semiconductor layer for covering the impurity-contained semiconductor film and the substrate insulator;

forming a gate insulating film on the active semiconductor layer;

forming a conductive film for a gate on the gate insulating film; and

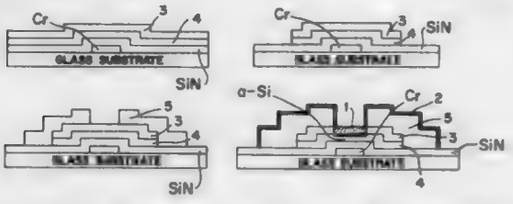
patterning the conductive film, the gate insulating film, the active semiconductor layer, and the impurity-contained semiconductor film to define a gate region.

5,470,769

PROCESS FOR THE PREPARATION OF A THIN FILM TRANSISTOR

Jung J. Kim, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 216, Jan. 4, 1993, abandoned, which is a continuation-in-part of Ser. No. 675,760, Mar. 27, 1991, abandoned. This application Jul. 25, 1994, Ser. No. 280,241
Claims priority, application Rep. of Korea, Mar. 27, 1990, 4100/1990
Int. Cl.[6] H01L 21/86
U.S. Cl. 437—40 2 Claims



1. A process for the preparation of a thin film transistor, comprising the steps of:

providing a gate electrode on a glass substrate;

depositing a gate insulating layer, an amorphous silicon layer, and an n^+ amorphous silicon layer over said gate electrode;

patterning said amorphous silicon layer and said n^+ amorphous silicon layer at the same time;

depositing and patterning an aluminum layer over said n^+ amorphous silicon layer and said gate insulating layer to provide a source electrode and a drain electrode and an exposed portion of said n^+ amorphous silicon layer between said source electrode and said drain electrode in a channel of the thin film transistor; and

oxidizing said exposed portion of said n^+ amorphous silicon layer between said source electrode and said drain electrode, and a surface of said source electrode and a surface of said drain electrode at the same time by means of a plasma oxidation process so as to provide a channel in said amorphous silicon layer and leave a passivation layer on said source electrode and drain electrode which is not removed.

5,470,770

MANUFACTURING METHOD OF SEMICONDUCTOR DEVICE

Shigeki Takahashi, Okazaki; Mitsuhiro Kataoka, Kariya, and Tsuyoshi Yamamoto, Chiryu, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 30, 1995, Ser. No. 413,404
Claims priority, application Japan, Mar. 31, 1994, 6-062447
Int. Cl.[6] H01L 21/8234
U.S. Cl. 437—41 7 Claims

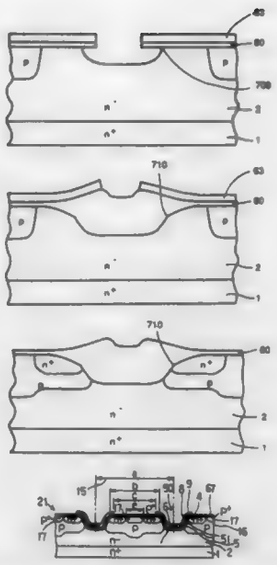
3. A manufacturing method for a semiconductor device comprising:

a mask formation process for forming a mask having an opening part within a specified region on a main surface of a first conductivity type semiconductor substrate;

an etching process for forming a first groove having an inlet part wider than the opening part on the semiconductor substrate by etching the semiconductor substrate through the opening part of the mask;

a selective oxidation process for forming a selective oxide film to a specified thickness on a surface of the first groove and between the mask and the semiconductor substrate by selectively oxidizing a region including the first groove and concurrently forming a curve part on a boundary surface of the semiconductor substrate with the selective oxide film;

an impurity introduction process for forming a base layer by diffusing second conductivity type impurities from the main surface so as to include a surface of the semiconductor substrate being in contact with a side surface of the selective oxide film and for forming a first conductivity type source



layer by diffusing first conductivity type impurities from the main surface within the base layer to a region deeper than the curve part so as to form a channel region in the region deeper than the curve part within the base layer of the first groove;

a selective oxide film removal process for forming a second groove to a specified depth deeper than the first groove by removing the selective oxide film; and

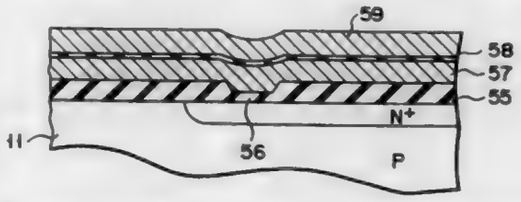
an electrode formation process for forming a source electrode which is to electrically contact both the source layer and the base layer by forming a gate electrode through a gate oxide film on a surface of the second groove and for forming a drain electrode which is to electrically contact other main surface of the semiconductor substrate.

5,470,771

METHOD OF MANUFACTURING A FLOATING GATE MEMORY DEVICE

Tetsuo Fujii, Toyohashi; Minekazu Sakai, Aichi, and Akira Kuroyanagi, Okazaki, all of, Japan, assignors to Nippondenso Co., Ltd., Aichi, Japan

Division of Ser. No. 344,605, Apr. 28, 1989, Pat. No. 5,017,979.
This application Feb. 21, 1991, Ser. No. 658,773
Int. Cl.[6] H01L 21/3215;21/8247
U.S. Cl. 437—43 14 Claims



1. A method of manufacturing a semiconductor memory device, comprising:

a first step of forming a first insulating film at a position corresponding to a tunnel region on a surface of a semiconductor substrate, and forming a second insulating film having a thickness larger than that of said first insulating film on portions other than said tunnel region so as to be in contact with said first insulating film, said first and second insulating films constituting a gate insulating film;

a second step of forming a floating gate on said gate insulating film including a portion on said tunnel region, said floating gate being comprised of a first conductive layer in contact with said gate insulating film and a second conductive layer formed on said first conductive layer, an impurity concentra-

tion of said first conductive layer being set to be lower than that of said second conductive layer; and

a third step of forming a third insulating film between said first and second conductive layers constituting said floating gate, said third insulating film being formed to prevent diffusion of impurity from said second conductive layer to said first insulating layer and having a thickness which enable movement of carriers between the first and second conductive layers.

5,470,772

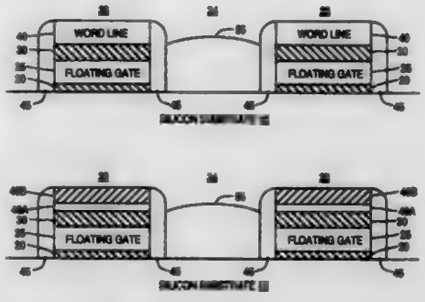
SILICIDATION METHOD FOR CONTACTLESS EPROM RELATED DEVICES

Been-Jon Woo, Saratoga, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 788,351, Nov. 6, 1991, abandoned. This application May 24, 1993, Ser. No. 67,269

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **24 Claims**



1. A process for forming a silicide on an array of floating gate memory devices, said array having first regions of exposed silicon where silicide is to be formed and having second regions of exposed silicon where no silicide is to be formed, said process comprising the steps of:

depositing an oxide on said array;

etching said oxide from said first regions while leaving at least a portion of said oxide in said second regions, said steps of depositing said oxide and etching said oxide from said first regions while leaving at least a portion of said oxide in said second regions being performed without use of a masking layer;

depositing metal on said array in said first regions and on said unetched portion of said oxide in said second regions;

forming a metal silicide in said first regions; and

removing said metal from all regions of said array except said first regions.

5,470,773

METHOD PROTECTING A STACKED GATE EDGE IN A SEMICONDUCTOR DEVICE FROM SELF ALIGNED SOURCE (SAS) ETCH

David K. Y. Liu, Cupertino; Yu Sun, Saratoga, and Chi Chang, Redwood City, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 25, 1994, Ser. No. 233,174

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **8 Claims**

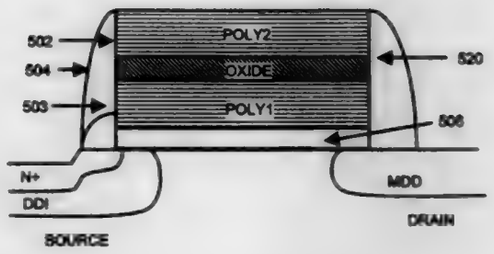
1. A method for protecting a stacked gate edge to minimize damage to a tunnel oxide and to maintain source junction uniformity of a semiconductor device comprising the sequential steps of:

(a) providing the stacked gate edge on the semiconductor device;

(b) performing a source implant on the semiconductor device;

(c) providing a spacer on the stacked gate edge; and

(d) providing a self aligned source (SAS) etch on the semiconductor device.



5,470,774

FABRICATION METHOD OF A READ-ONLY SEMICONDUCTOR MEMORY DEVICE

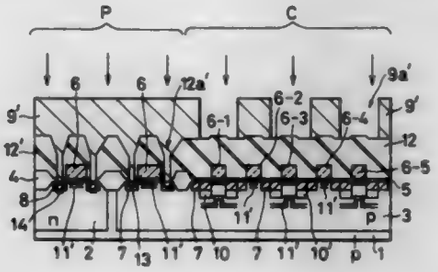
Masao Kunitou, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 6, 1994, Ser. No. 319,099

Claims priority, application Japan, Jan. 8, 1993, 5-277883

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—45 **16 Claims**



1. A fabrication method of a semiconductor memory device, said method comprising the steps of:

(a) preparing memory cells formed of first MOS transistors and peripheral circuits formed of second MOS transistors on a semiconductor substrate of a first conductivity type, said memory cells being formed in a memory cell area of said substrate, said peripheral circuits being formed in a peripheral circuit area of said substrate;

(b) forming a photoresist film on said subetrate to cover said memory cell area and said peripheral circuit area;

(c) patterning said photoresist film to have windows so that selected ones of said first transistors to be coded are exposed from said photoresist film through said windows, respectively;

(d) selectively doping a first dopant of a second conductivity type for coding into said selected ones of said first transistors using said patterned photoresist film as a mask, so that first impurity-doped regions of said second conductivity type being formed in channel areas of said selected ones of said first transistors, respectively, said second conductivity type being opposite in polarity to said first conductivity type; and

(e) doping a second dopant of said first conductivity type for threshold adjustment into said first transistors and said second transistors through said patterned photoresist film, so that second impurity-doped regions of said first conductivity type being formed in channel areas of unselected ones of said first transistors and said second transistors, respectively;

wherein

during said step of (e), said second dopant doped through said selected ones of said first transistors forms third impurity-doped regions of said first conductivity type apart from said channel areas of said selected ones of said first transistors in said substrate, respectively;

and wherein

said third impurity-doped regions serve to restrain said first dopant doped into said selected ones of said first transistors in said step of (d) from laterally diffusing in said substrate.

5,470,775

METHOD OF FORMING A POLYSILICON-ON-SILICIDE CAPACITOR

Subhash R. Nariani, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Nov. 9, 1993, Ser. No. 149,085
Int. Cl.[6] H01L 27/00;21/70
U.S. Cl. 437—52 16 Claims

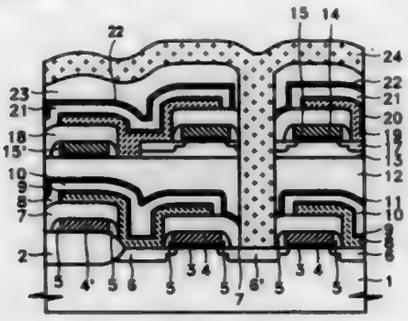
9. A method for producing a capacitor comprising the steps of:
(a) forming a conductive layer over an insulating region on a substrate, including forming a doped polysilicon sub-layer and on top of the doped polysilicon sub-layer, forming a metal-silicide sub-layer;
(b) forming a dielectric layer on top of the conductive layer;
(c) forming a polysilicon layer on top of the dielectric layer;
(d) etching the polysilicon layer to form a top electrode; and,
(e) after step (d) etching the conductive layer to form a bottom electrode.

5,470,776

METHOD FOR FABRICATING STACKED DYNAMIC RANDOM ACCESS MEMORY CELL

Eui K. Ryou, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Dec. 30, 1994, Ser. No. 366,677
Claims priority, application Rep. of Korea, Dec. 31, 1993, 93-31910
Int. Cl.[6] H01L 21/70;27/00
U.S. Cl. 437—52 6 Claims



1. A method for fabricating a semiconductor dynamic random access memory, comprising the steps of:
growing a field oxide film on a semiconductor wafer formed with a P-well, sequentially depositing a first gate oxide film and a first polysilicon layer on the semiconductor wafer, implanting first N type impurity ions in the first polysilicon layer, etching the first polysilicon layer using a gate electrode/word line mask, thereby forming a first gate electrode and a word line pattern, then implanting second N type impurity ions in the semiconductor wafer, forming a first spacer oxide film on side walls of the first gate electrode and word line pattern, then implanting third N type impurity ions which have a higher concentration than said second N type impurity ions in the semiconductor wafer, thereby forming a metal oxide semiconductor field effect transistor having source and drain active regions with a lightly doped drain structure;
depositing a first insulating film on the resulting structure obtained after the formation of the transistor, selectively etching a portion of the first insulating film disposed over the source active region of the transistor using a storage electrode contact hole mask, then depositing a second polysilicon layer such that it is in contact with the source active region, patterning the second polysilicon layer using a storage electrode mask, thereby forming a first storage electrode, forming a first dielectric film over the first storage electrode, then depositing a third polysilicon layer, patterning the third polysilicon layer using a plate electrode mask, thereby forming a first plate electrode, then depositing a second insulating film;
depositing a third insulating film on the resulting structure obtained after the deposition of the second insulating film, planarizing the third insulating film, depositing a fourth polysilicon layer to serve as a substrate of a thin film metal oxide semiconductor field effect transistor over the polarized third insulating film, then subjecting the wafer to a recrystallization process or a thermal process, removing portions of the thin film transistor except for a portion to be used as the substrate using a thin film metal oxide semiconductor field effect transistor substrate mask, then depositing a second gate oxide film and a fifth polysilicon layer for gate electrode/word line;
implanting impurity ions in the fifth polysilicon layer, etching the fifth polysilicon layer using the gate electrode/word line mask, thereby forming a second gate electrode and a word line pattern, then implanting fourth N type impurity ions in the substrate; forming a second spacer oxide film on side walls of the second gate electrode and word line pattern, and implanting fifth N type impurity ions which have a higher concentration than the fourth N type impurity ions in the substrate, thereby forming the thin film transistor having source and drain active regions with a lightly doped drain structure;
depositing a fourth insulating film over the entire exposed surface of the resulting structure obtained after the formation of the thin film transistor, selectively etching a portion of the fourth insulating film disposed over the source active region of the thin film transistor using the storage electrode contact hole mask, the depositing a sixth polysilicon layer such that it is in contact with the source active region of the thin film transistor, and patterning the sixth polysilicon layer using the storage electrode mask, thereby forming a second storage electrode;
forming a second dielectric film over the second storage electrode, then depositing a seventh polysilicon layer, and patterning the seventh polysilicon layer using the plate electrode mask, thereby forming a second plate electrode; and
depositing a fifth insulating film and a sixth insulating film over the entire exposed surface of the resulting structure obtained after the formation of the second plate electrode, selectively etching the sixth insulating film and the fifth insulating film, the fourth insulating film, the drain active region of the thin film transistor, the substrate, the third insulating film, the second insulating film and the first insulating film in a sequential manner using the bit line contact hole mask so that the drain active region of the transistor is exposed, then depositing an eighth polysilicon layer or a polycide layer such that it is in contact with the drain active region of the transistor, and patterning the eighth polysilicon layer using a bit line mask, thereby forming a bit line electrode.

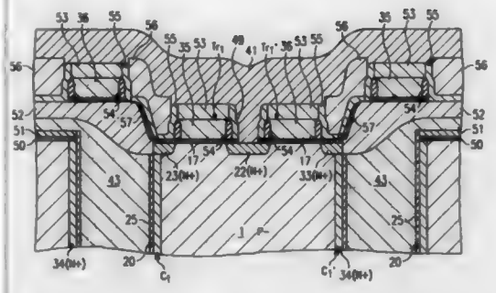
5,470,777

METHOD OF FABRICATING RANDOM ACCESS MEMORY DEVICE HAVING SIDEWALL INSULATING LAYER ON THE LAMINATE STRUCTURE

Toshiyuki Nagata, Tsukuba; Hiroyuki Yoshida, Ryugasaki, and Takayuki Niuya, Tsukuba, all of, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 135,866, Oct. 13, 1993, abandoned, which is a continuation of Ser. No. 882,783, May 14, 1992, abandoned. This application May 25, 1994, Ser. No. 248,830
Claims priority, application Japan, May 24, 1991, 3-149755
Int. Cl.[6] H01L 27/00;21/70
U.S. Cl. 437—52 8 Claims

1. A method of making a semiconductor device comprising:
providing a semiconductor substrate of one conductivity type and having a top surface;



forming doped regions having a dopant impurity of the other conductivity type in the semiconductor substrate of said one conductivity type in spaced relation to each other and opening onto the top surface of the semiconductor substrate;

forming a first insulation layer on the top surface of the semiconductor substrate of said one conductivity type;

forming a first layer of electrically conductive material over the first insulation layer;

forming a second insulation layer over the first electrically conductive layer;

defining laminate structures from the first layer of electrically conductive material and the second insulating layer so as to provide at least respective first and second laminate structures of electrically conductive material and overlying insulation material in stacked relationship on the first insulation layer and spaced from each other to provide an exposed portion of the first insulation layer overlying the semiconductor substrate;

forming a third insulation layer covering only the sides of the first layer of electrically conductive material included in the first and second laminate structures;

forming a fourth insulation layer overlying the first and second laminate structures and covering the sides thereof so as to overlie said third insulation layer and lying between the first and second laminate structures so as to cover the exposed portion of the first insulation layer;

removing the portion of the fourth insulation layer lying between the first and second laminate structures, and also removing the underlying portion of the first insulation layer to expose a portion of at least one of the doped regions of the other conductivity type in the semiconductor substrate of said one conductivity type and opening onto the top surface thereof; and

forming a second layer of electrically conductive material over the second insulation layer included in the first and second laminate structures and into the space between the first and second laminate structures to connect with the at least one exposed doped region of the other conductivity type located therebetween.

5,470,778

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

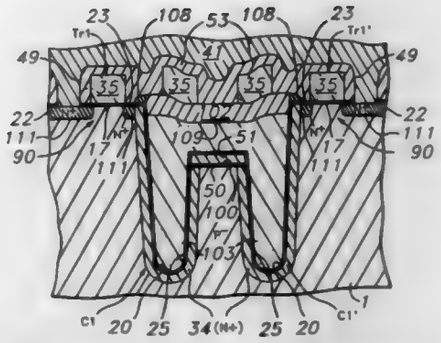
Toshiyuki Nagata, Tsukuba; Hiroyuki Yoshida, Ryugasaki; Takayuki Niuya, Tsukuba; Yoshihiro Ogata; Katsushi Boku, both of Tsuchivra, and Yoichi Miyai, Ibaraki, all of, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 889,323, May 27, 1992, Pat. No. 5,317,177. This application May 31, 1994, Ser. No. 251,866
Claims priority, application Japan, Jun. 7, 1991, 3-163912
Int. Cl.[6] H01L *21/8242*
U.S. Cl. 437—52 **23 Claims**

1. A method for manufacturing a semiconductor device, which comprises the steps of:

forming a first depression within an uppermost surface of a semiconductor device;

forming a second depression continuous with the first depression and to be deeper than the first depression;



burying a conductor in the first and second depressions to a level which is lower than the uppermost surface of the semiconductor substrate surface; and

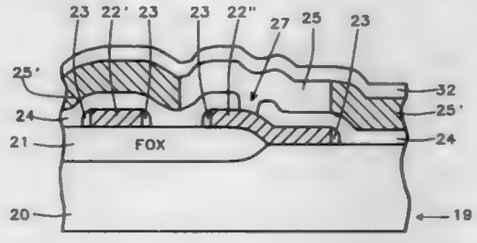
forming an insulating film on top of the conductor such that said insulating film abuts said conductor at a level below said uppermost surface of said semiconductor device.

5,470,779

METHOD OF MANUFACTURE OF SRAM WITH SIPOS RESISTOR

Chue-San Yoo, Hsin-chu, Taiwan, Prov. of China, assignor to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-chu, Taiwan, Prov. of China

Filed Jul. 25, 1994, Ser. No. 280,219
Int. Cl.[6] H01L *21/70;27/00*
U.S. Cl. 437—52 **3 Claims**



1. A method of manufacture of a semiconductor device on a semiconductor substrate including an SRAM cell with a resistor comprising

formation of a first polysilicon layer on said semiconductor substrate,

patterning and etching said first polysilicon layer,

formation of an interpolysilicon layer composed of silicon dioxide over said first polysilicon layer,

patterning and etching an opening through said interpolysilicon layer exposing a contact area on the surface of said first polysilicon layer,

forming a SIPOS resistor layer said SIPOS being formed at a temperature within the range 620° C. to 800° C. from SiH_4 plus N_2O by a process selected from the group consisting of LPCVD and plasma CVD and being composed of additional polysilicon and oxygen with from 10% to 45% oxygen in said additional polysilicon and oxygen formed over said interpolysilicon layer in contact with said first polysilicon layer through said opening, and

formation of a load resistor mask over a load resistor region to be formed in said SIPOS layer, and

ion implanting the remainder of said SIPOS layer not covered by said load resistor mask to convert said remainder of said SIPOS layer from a resistor into an interconnect structure integral with a load resistor in said load resistor region by ion implanting with a phosphorus or arsenic ions implanted with a

dose between 1×10^{14} ions/cm^2 and 9×10^{15} ions/cm^2 at an energy between 20 keV and 40 keV, and

formation an IPO layer over said SIPOS layer subsequent to said ion implantation, and

said IPO layer is densified by the process of furnace annealing at a temperature within the range 800° C. to 900° C. in a furnace chamber.

5,470,780

METHOD OF FABRICATING POLY-SILICON RESISTOR

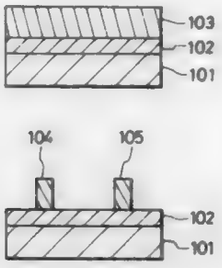
Seiichi Shishiguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 1, 1994, Ser. No. 298,958

Claims priority, application Japan, Sep. 16, 1993, 5-230366

Int. Cl.^{6} H01L *21/70*

U.S. Cl. 437—60 **6 Claims**



1. A method of fabricating a poly-silicon resistor comprising the steps of:

providing a dopant gas and a nitrous oxide gas as well as a silane gas;

depositing a poly-silicon layer on a substrate by chemical vapor deposition under a deposition temperature not higher than 600 degrees centigrade, said silicon layer including the dopant of said dopant gas and oxygen; and

annealing said poly-silicon layer under a temperature not lower than 600 degrees centigrade;

wherein said poly-silicon layer includes said dopant at a concentration not higher than 1 at. % and said oxygen at a concentration not higher than 1 at. %.

5,470,781

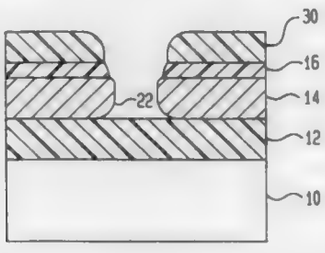
METHOD TO REDUCE STRESS FROM TRENCH STRUCTURE ON SOI WAFER

Dureseti Chidambarrao, Derby, Conn.; Louis L. Hsu, Fishkill, N.Y.; J. Daniel Mis, and James P. Peng, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 991,010, Dec. 16, 1992, abandoned. This application Dec. 14, 1993, Ser. No. 166,415

Int. Cl.^{6} H01L *21/302*

U.S. Cl. 437—68 **5 Claims**



1. A method of forming an isolation trench in a silicon-on-insulator wafer including a silicon layer overlying an insulator layer, comprising the steps of:

etching through an opening in a masking layer that overlies said silicon layer to a surface of said insulator layer with an etchant that selectively etches said silicon layer at a higher rate compared with the rate at which it etches said insulator layer; and

undercutting said silicon layer at said surface of said insulator layer continuing the etching process of said etching step for an interval so that walls formed in said silicon layer are outwardly curved where they meet said insulator layer.

5,470,782

METHOD FOR MANUFACTURING AN INTEGRATED CIRCUIT ARRANGEMENT

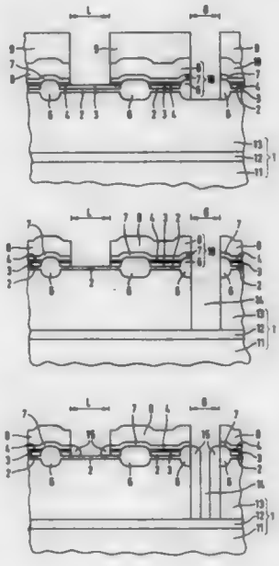
Udo Schwalke, Heldenstein, and Fritz Bieringer, Munich, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 17, 1994, Ser. No. 342,052

Claims priority, application Germany, Dec. 2, 1993, 43 41 171.1

Int. Cl.^{6} H01L *21/76*

U.S. Cl. 437—70 **9 Claims**



1. A method for manufacturing a trench structure and an auxiliary lithography structure employed in an integrated circuit arrangement, comprising the steps of:

producing the trench structure in a substrate wafer by use of a trench mask in a trench process comprising at least first and second etching steps, the first etching step comprising producing the trench mask by structuring at least one layer and the second etching step comprising providing the trench structure in the substrate wafer;

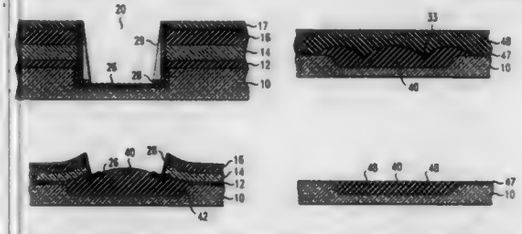
producing the auxiliary lithography structure outside the circuit arrangement during the trench process on the substrate wafer; and

forming a protective structure for protecting the substrate wafer in a region of the auxiliary lithography structure against an etching attack during the first etching step in the manufacture of the trench mask.

5,470,783
METHOD FOR INTEGRATED CIRCUIT DEVICE ISOLATION

Tzu-Yin Chiu, Martinsville, N.J.; Frank M. Erceg, Bethlehem, Pa.; Te-Yin M. Liu, Hsin-Chu, Taiwan, Prov. of China; Kenenth G. Moerschel, Bethlehem; Michael A. Prozonic, Germansville, both of Pa., and Janmye Sung, Warren, N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.

Continuation of Ser. No. 254,088, Jun. 6, 1994, abandoned.
This application Jan. 9, 1995, Ser. No. 369,977
Int. Cl.[6] H01L *21/76*
U.S. Cl. 437—72 10 Claims



1. A process for forming field oxide regions between active regions in a semiconductor substrate comprising:

forming over a semiconductor substrate with active regions therein a pad oxide layer;

forming over the pad oxide layer a first silicon nitride layer;

depositing a layer of silicon dioxide with a thickness of about 10 nm to about 100 nm over the first silicon nitride layer, thereby forming a semiconductor substrate structure;

forming a resist mask over the deposited oxide layer, the resist mask covering over those areas of the semiconductor substrate structure that correspond to the device active regions and not covering over those areas of the semiconductor substrate structure that correspond to field oxide regions in the semiconductor substrate;

anisotropically etching through the layers of deposited silicon dioxide, silicon nitride and pad oxide in the areas of the semiconductor substrate structure that are not covered by the mask and into the substrate to define field oxide regions with substantially vertical sidewalls in the semiconductor substrate structure;

forming a layer of silicon dioxide on the exposed surface of the substrate in the field oxide region;

forming a conformal second silicon nitride layer over the surface of the semiconductor substrate structure;

forming a conformal layer of polycrystalline silicon over the second silicon nitride layer, the polycrystalline silicon layer having a thickness that is less than about one-half of the field oxide region defined by the substantially vertical sidewalls;

forming a sidewall mask of the second silicon nitride layer on the semiconductor substrate structure sidewalls by anisotropically etching the horizontally disposed portions of the polycrystalline silicon layer, removing the exposed portions of the second silicon nitride layer, removing the remaining portions of the polycrystalline silicon layer adjacent to the sidewalls, removing the deposited silicon dioxide layer;

thermally oxidizing the exposed portions of the semiconductor to grow a field oxide in the field region of the semiconductor substrate, thereby lifting and bending the silicon nitride sidewall mask from the end of the mask nearest the silicon substrate surfaces and thereby forming grooves in the field oxide;

removing the first layer of nitride from the semiconductor substrate;

removing the pad oxide layer from the semiconductor substrate;

forming a thin layer of silicon dioxide on the active regions of the substrate;

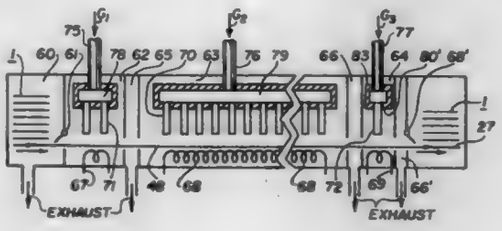
forming a layer of silicon nitride over the surface of the substrate, wherein the thickness of the silicon nitride layer is at least one-half the width of the groove formed in the field oxide; and

removing the silicon nitride from the substrate surface without removing the silicon nitride from the grooves in the field oxide.

5,470,784
METHOD OF FORMING SEMICONDUCTING MATERIALS AND BARRIERS USING A MULTIPLE CHAMBER ARRANGEMENT

John H. Coleman, Locust Valley, N.Y., assignor to Plasma Physics Corp., Locust Valley, N.Y.

Continuation of Ser. No. 639,197, Mar. 11, 1991, Pat. No. 5,187,115, which is a division of Ser. No. 394,281, Aug. 16, 1989, Pat. No. 5,049,523, which is a continuation of Ser. No. 180,720, Apr. 4, 1988, abandoned, which is a continuation of Ser. No. 935,606, Dec. 1, 1986, abandoned, which is a continuation of Ser. No. 716,409, Mar. 27, 1985, abandoned, which is a division of Ser. No. 355,202, Mar. 5, 1982, abandoned, which is a division of Ser. No. 88,100, Oct. 24, 1979, Pat. No. 4,328,258, which is a division of Ser. No. 857,690, Dec. 5, 1977, Pat. No. 4,226,897. This application Sep. 23, 1992, Ser. No. 949,753
The portion of the term of this patent subsequent to Feb. 11, 2010, has been disclaimed.
Int. Cl.[6] H01L *21/00;21/02;21/20*
U.S. Cl. 437—101 34 Claims



1. A process for glow discharge deposition in an apparatus comprising, a first deposition chamber adapted to be evacuated, first gas introducing means for introducing a first gaseous material into said first deposition chamber, first electrode means disposed in said first deposition chamber, a second deposition chamber adapted to be evacuated, second gas introducing means for introducing a second gaseous material into said second deposition chamber, second electrode means disposed in said second deposition chamber, restricting means for restricting the flow of at least one of said gaseous materials from one of said deposition chambers into the other one of said deposition chamber, said restricting means being disposed between said first deposition chamber and said second deposition chamber, and transporting means for transporting said substrate from one of said deposition chambers to the other one of said deposition chambers through said restricting means, said process comprising the steps of:

disposing said substrate in said first deposition chamber;

introducing said first gaseous material in said first deposition chamber and applying a first electric field to a first region in said first deposition chamber by said first electrode so as to generate a first glow discharge, whereby a first layer is deposited on said substrate;

transporting said substrate on which said first layer is deposited from said first deposition chamber to said second deposition chamber through said restricting means, while each interior of said deposition chambers is shielded from an external atmosphere; disposing said substrate on which said first layer is deposited in said second deposition chamber; and

introducing said second gaseous material in said second deposition chamber and applying a second electric field to a second region in said second deposition chamber by said second electrode so as to generate a second glow discharge, whereby a second layer is deposited on said first layer.

5,470,785

METHOD OF MANUFACTURING BURIED HETEROSTRUCTURE SEMICONDUCTOR LASER

Yasuhiro Kondo, Kanagawa, Japan, assignor to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

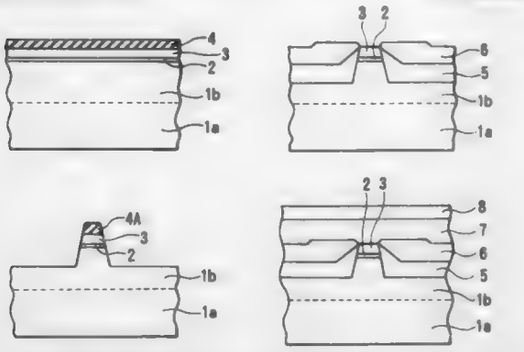
Continuation of Ser. No. 909,953, Jul. 7, 1992, Pat. No. 5,260,230. This application Oct. 7, 1993, Ser. No. 133,507

Claims priority, application Japan, Jul. 12, 1991, 3-172059; Jan. 7, 1991, 3-285470

The portion of the term of this patent subsequent to Nov. 9, 2010, has been disclaimed.

Int. Cl.[6] **H01L** *21/20;21/203*

U.S. Cl. 437—129 **22 Claims**



1. A method of manufacturing a buried heterostructure semiconductor laser, comprising the steps of:

sequentially depositing an active layer and a p-type cladding layer on an n-type group III-V semiconductor substrate by metalorganic vapor phase epitaxy;

masking a surface of said deposited layer in a stripe shape and selectively and partially etching said cladding layer, said active layer, and part of said semiconductor substrate to form a mesa structure; and

sequentially depositing a p-type current blocking layer, an n-type current confining layer containing a group VI dopant having a concentration of not less than 5×10^{18} atoms-cm^{-3}, a p-type cladding layer, and a p-type cap layer on an entire upper surface of said mesa structure by the metalorganic vapor phase epitaxy.

5,470,786

SEMICONDUCTOR LASER DEVICE

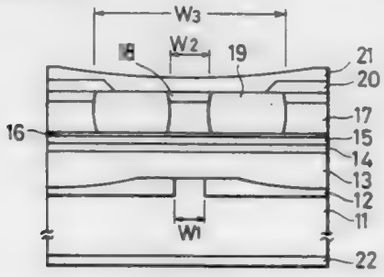
Michinori Irikawa, Yokohama, and Masayuki Iwase, Tokyo, both of, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 77,191, Jun. 16, 1993, Pat. No. 5,319,661, which is a continuation-in-part of Ser. No. 814,271, Dec. 27, 1991, abandoned. This application Mar. 17, 1994, Ser. No. 214,256

Claims priority, application Japan, Dec. 27, 1990, 2-417845

Int. Cl.[6] **H01L** *21/20*

U.S. Cl. 437—129 **2 Claims**



1. A fabrication method of a semiconductor laser diode including a (100) oriented InP substrate of a first conductivity type, a double-heterostructure including at least an active layer and a pair of cladding layers of a first and a second conductivity type, comprising the steps of etching off part of said cladding layer of said second conductivity type to form a ridge guide structure, current confining structure formed between said cladding layer of said first conductivity type and said substrate, providing a pair of reflecting means for optical feedback and a pair of ohmic metals, wherein said current confining structure comprises an InP convex mesa stripe having an isosceles triangle cross section in $(0\bar{1}1)$ cleavage surface and having a pair of symmetrical surfaces (111)B and is formed by etching off part of said substrate or part of an epitaxial layer on said substrate or formed by epitaxial growth, and providing an InP current blocking layer of a second conductivity type covering partly said triangle shaped mesa, so that the top part of said mesa projects into said cladding layer of said first conductivity type to form a current injection channel, wherein at least said InP current blocking layer is formed by metal organic chemical vapor deposition method.

5,470,787

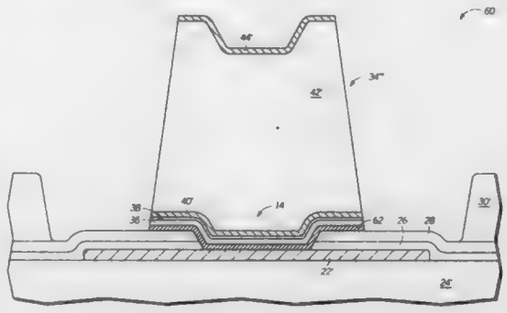
SEMICONDUCTOR DEVICE SOLDER BUMP HAVING INTRINSIC POTENTIAL FOR FORMING AN EXTENDED EUTECTIC REGION AND METHOD FOR MAKING AND USING THE SAME

Stuart E. Greer, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1994, Ser. No. 236,320

Int. Cl.[6] **H01L** *21/44*

U.S. Cl. 437—183 **13 Claims**



1. A method for making a solder bump on a bonding pad of a semiconductor device, comprising the steps of:

providing a first metal layer overlying the bonding pad to provide adhesion of the solder bump to the semiconductor device;

providing a second metal layer overlying the first metal layer;

forming in a vacuum environment a first tin layer overlying the second metal layer, wherein the first tin layer and the second metal layer are mutually soluble such that an intermetallic of the second metal layer and the first tin layer may be formed;

in situ forming a lead layer overlying the first tin layer without breaking the vacuum environment, wherein the lead layer is thicker than the first tin layer; and

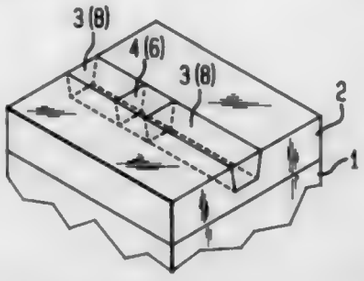
forming a second tin layer overlying the lead layer without breaking the vacuum environment, wherein the second tin layer is thinner than the lead layer to provide localized eutectic formation at a top of the solder bump during solder reflow.

5,470,788

METHOD OF MAKING SELF-ALIGNED, LATERAL DIFFUSION BARRIER IN METAL LINES TO ELIMINATE ELECTROMIGRATION

Glenn A. Biery, Poughkeepsie, N.Y.; Daniel M. Boyne, Austin, Tex., and Hormazdyar M. Dalal, Milton, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1994, Ser. No. 203,158
Int. Cl.[6] H01L *21/441*
U.S. Cl. 437—190 12 Claims



1. A method of providing interconnections to a semiconductor integrated chip, wherein said interconnections are designed to minimize electromigration, said method comprising the steps of:

forming islands of refractory metal on an insulated substrate at locations where an interconnection is to be made;

inserting an aluminum island between every two adjoining said refractory metal islands, wherein

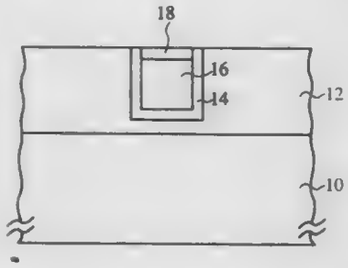
said refractory metal islands alternating with said aluminum islands are serially connected to each other to ensure electrical continuity.

5,470,789

PROCESS FOR FABRICATING INTEGRATED CIRCUIT DEVICES

Nobuhiro Misawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 204,986, Mar. 2, 1994, abandoned. This application Mar. 7, 1995, Ser. No. 400,504
Claims priority, application Japan, Mar. 19, 1993, 5-059889
Int. Cl.[6] H01L *21/44*
U.S. Cl. 437—190 16 Claims



1. A process for fabricating an integrated circuit device comprising:

a first step of forming an opening in an insulating layer formed on a substrate;

a second step of depositing a copper layer on the substrate including the opening;

a third step of abrading the copper layer to remove the copper layer deposited on the insulating layer, while part of the copper layer deposited in the opening is removed until the upper surface of the copper layer deposited in the opening becomes lower then the upper surface of the insulating layer;

a fourth step of depositing a barrier layer on the substrate including the copper layer in the opening; and

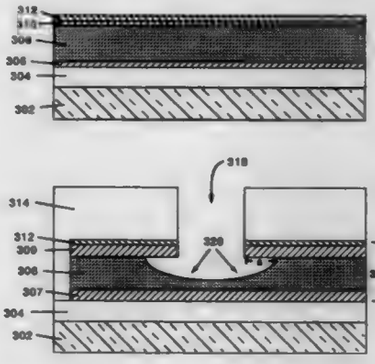
a fifth step of abrading the barrier layer to remove part of the barrier layer on the insulating layer while part of the barrier layer on the copper layer in the opening is left, so as to planarize the surface.

5,470,790

VIA HOLE PROFILE AND METHOD OF FABRICATION

Alan M. Myers, Hillsboro; Peter K. Charvat, Portland; Thomas A. Letson, Beaverton; Shi-ning Yang, Portland, and Peng Bai, Aloha, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 17, 1994, Ser. No. 324,763
Int. Cl.[6] H01L *21/302*
U.S. Cl. 437—192 15 Claims



11. A process for forming an interconnection structure of an integrated circuit comprising the steps of:

forming an interconnection;

etching said interconnection a first time to form a first opening having a first width in said interconnection; and

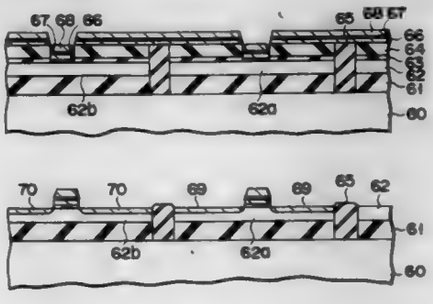
etching said interconnection a second time beneath said first opening such that said interconnection is etched laterally to form a second opening which extends laterally further into said interconnection than said first opening.

5,470,791

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Kyoichi Suguro, Yokohama, and Haruo Okano, Tokyo, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 981,422, Nov. 25, 1992, abandoned, which is a division of Ser. No. 654,895, Feb. 13, 1991, Pat. No. 5,192,714. This application Feb. 7, 1995, Ser. No. 385,376
Claims priority, application Japan, Feb. 14, 1990, 2-32689; Feb. 7, 1991, 3-016586
Int. Cl.[6] H01L *21/28;21/283*
U.S. Cl. 437—192 9 Claims



1. A method of manufacturing a semiconductor device, comprising the steps of:

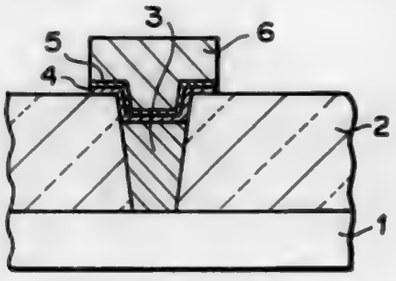
forming an insulating layer on a substrate;
patterning said insulating layer; and
forming a first conductive layer of a first material on said substrate and simultaneously forming a second conductive layer of said first material on said insulating layer by a directional chemical vapor deposition.

5,470,792

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE

Yoshiaki Yamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 2, 1994, Ser. No. 205,902
Claims priority, application Japan, Mar. 3, 1993, 5-041617
Int. Cl.[6] H01L *21/44*
U.S. Cl. 437—155 **39 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:
forming a hole at an interlayer insulating film on a semiconductor substrate so as to reach a lower layer wiring or the semiconductor substrate, said hole having a depth greater than the size thereof measured along the surface of said insulating film;
embedding a first electrically conductive material into said hole to form a first electrically conductive layer so as to make the upper surface of the first electrically conductive layer lower than the upper surface of said insulating film and to make the difference in height between the upper surface of the insulating film and the upper surface of the first electrically conductive layer smaller than said size of the hole; and
then embedding a second electrically conductive material having a melting point lower than said first electrically conductive material into said hole to form a second electrically conductive layer on said first electrically conductive layer, thereby said hole becomes completely filled with the first and second electrically conductive layers while said semiconductor substrate is heated to a sufficiently high temperature to fluidize the second electrically conductive material.

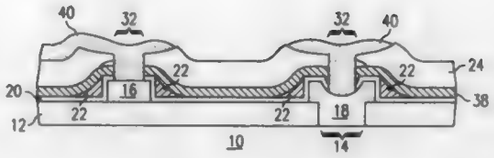
5,470,793

METHOD OF VIA FORMATION FOR THE MULTILEVEL INTERCONNECT INTEGRATED CIRCUITS

Alexander Kalnitsky, Dallas, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 36,229, Mar. 24, 1993, abandoned, which is a continuation of Ser. No. 726,792, Jun. 28, 1991, abandoned. This application Oct. 27, 1994, Ser. No. 329,767
Int. Cl.[6] H01L *21/283;21/311*
U.S. Cl. 437—195 **4 Claims**

1. A method for forming an integrated circuit contact structure, comprising the steps of:
forming a metal conductive element over a lower insulating layer;
forming a conformal oxide layer over said metal conductive element and said lower insulating layer;
forming a layer of spin on glass over said conformal oxide layer;



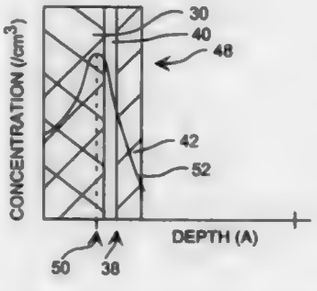
forming a barrier layer over said conformal oxide layer;
forming an insulating layer over said barrier layer, wherein the barrier layer is made of a material that is not etched by a wet etch that etches said insulating layer;
depositing and patterning a photoresist layer over said insulating layer;
performing a wet etch part way through the insulating layer in a region defined by the patterned photoresist layer, leaving a remainder of the insulating layer which is not etched through; and
performing an anisotropic etch through the remainder of the insulating layer, the barrier layer, and the conformal oxide layer in the region defined by the patterned photoresist layer to expose a portion of the metal conductive element;
wherein the insulating layer has a crack in the region defined by the patterned. photoresist layer, wherein the crack extends through the insulating layer to the barrier layer, and wherein, during the step of performing a wet etch, the barrier layer acts as an etch stop for etchant which moves through the crack.

5,470,794

METHOD FOR FORMING A SILICIDE USING ION BEAM MIXING

Mohammed Anjum; Ibrahim K. Burki, both of Austin, and Craig W. Christian, Buda, all of Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Feb. 23, 1994, Ser. No. 200,628
Int. Cl.[6] H01L *21/283;21/265*
U.S. Cl. 437—200 **16 Claims**



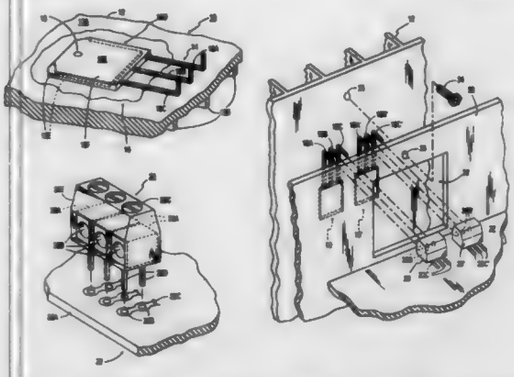
7. A method for enhancing the formation of a metal silicide upon a polycrystalline silicon, comprising the steps of:
providing a polysilicon upon a substrate upper surface, wherein said polysilicon includes a polysilicon upper surface;
implanting an impurity into said polysilicon to a first peak density at a first elevation below said polysilicon upper surface;
depositing a metal upon said polysilicon upper surface, wherein said metal comprises a film having a metal upper surface;
implanting germanium into said metal to a second peak density at a second elevation below said polysilicon upper surface, and above said substrate upper surface thereby allowing a plurality of atoms of said germanium to impact upon and move a plurality of atoms of said metal to a third elevation below said polysilicon upper surface, wherein said third elevation is between said first elevation and said second elevation; and
annealing said substrate to react said metal layer with said silicon substrate in order to form a metal silicide.

5,470,795

METHOD OF CONNECTING TERMINALS OF A PLASTIC-ENCAPSULATED POWER TRANSISTOR TO A PRINTED-CIRCUIT BOARD

Vladimir V. Shushurin, 3015 Brighton 13th St., Suite 3J, Brooklyn, N.Y. 11235

Filed Feb. 25, 1994, Ser. No. 201,657
Int. Cl.[6] H01L *21/48;21/58;21/603;* **H05K** *7/20*
U.S. Cl. 437—208 **18 Claims**



1. Method of connecting the terminals of at least one heat-sinked, plastic-encapsulated power transistor to circuits of a printed-circuit board, comprising the steps of:

(a) adhering a main flat surface of the plastic-encapsulated power transistor to a first side of a heat sink; said transistor having a plurality of terminals projecting from one end of a transistor body in an orientation generally parallel to said main flat surface of the transistor and carrying power transistor-level currents during normal operation;

(b) mounting on a printed-circuit board mechanical coupling means having conductors with terminal-receiving apertures, for receiving and being connected to said terminals of said transistor with a sufficiently low contact resistance to permit conduction through the resulting connections of power transistor-level current; said conductors being for connection to circuits of said printed-circuit board; said printed-circuit board being adapted to be located on said first side of said heat sink in an assembled position;

(c) positioning said heat sink, with said transistor mounted thereon, such that each of said terminals is inserted into a different aperture in said mechanical coupling means;

(d) affixing said heat sink to a support member that is in fixed relation to said printed-circuit board; and

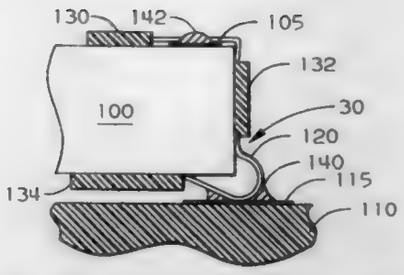
(e) mechanically securing said terminals in said apertures of said mechanical coupling means, including the step of moving tensioning devices from a non-pressing, to a sufficiently pressing, relation against said terminals that so-pressed portions of said terminals become substantially deformed in a manner that assures an adequately low ohmic contact resistance between said terminals and said conductors of said mechanical coupling means with respect to power transistor-level current.

5,470,796

ELECTRONIC PACKAGE WITH LEAD WIRE CONNECTIONS AND METHOD OF MAKING SAME

Yutaka Tsukada; Yasukazu Kobayakawa; Yoji Maeda, all of Shiga, and Shuhei Tsuchita, Kusatsu, all of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 186,737, Jan. 25, 1994. This application Apr. 21, 1995, Ser. No. 426,536
Int. Cl.[6] H01L *21/60*
U.S. Cl. 437—209 **5 Claims**



1. A method of making an electronic package, said method comprising the steps of:

providing a first substrate including at least one electrical conductor thereon;

positioning a semiconductor device on said first substrate to electrically connecting said device to said conductor;

providing a second substrate including at least one electrical conductor thereon; and

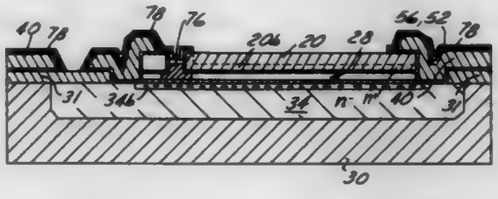
electrically connecting said conductor on said first substrate to said conductor on said second substrate, utilizing at least one lead wire, said connection accomplished by attaching said lead wire to at least three surfaces of said first substrate, said lead wire including a projection portion, said method including electrically connecting said projection portion to said conductor on said second substrate.

5,470,797

METHOD FOR PRODUCING A SILICON-ON-INSULATOR CAPACITIVE SURFACE MICROMACHINED ABSOLUTE PRESSURE SENSOR

Carlos H. Mastrangelo, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 43,044, Apr. 5, 1993, Pat. No. 5,369,544. This application Oct. 31, 1994, Ser. No. 331,445
Int. Cl.[6] H01L *21/46;* **G01L** *9/12*
U.S. Cl. 437—225 **9 Claims**



1. A method for producing a capacitive transducer, comprising the steps of:

(a) selectively forming a first well within the substrate of an SOI wafer having a top silicon layer and a sacrificial layer of known thickness therebetween,

(b) depositing an epitaxial layer of silicon on said top silicon layer, said epitaxial silicon layer combining with said top silicon layer to form a single crystal silicon layer supported by said sacrificial layer,

(c) masking and etching said epitaxial layer and said sacrificial layer down to said substrate so as to define a diaphragm from said epitaxial layer,

(d) depositing an electrically insulating conformal support layer for coupling to and supporting said diaphragm above said substrate so as to seal said sacrificial layer therebetween,

(e) selectively etching an access opening through said diaphragm,

(f) selectively etching, through said access opening, and removing said sacrificial layer from between said diaphragm and said substrate so as to form a diaphragm cavity therebetween, said diaphragm cavity having a thickness substantially equal to said known thickness of said sacrificial layer, and

(g) diffusing conductive ions through said diaphragm cavity and into opposing sections of said flexible diaphragm and said substrate for defining deformable and fixed conductive electrodes of the capacitive transducer,

(h) selectively depositing a plug within and for sealing said access opening without significantly reducing the volume of said diaphragm cavity, wherein the deflection of said flexible diaphragm responsive to variations between the ambient pressure and the pressure sealed within said diaphragm cavity causes a corresponding change in the capacitance between said fixed and deformable electrodes.

5,470,798

MOISTURE-FREE SOG PROCESS

Luc Ouellet, Granby, Canada, assignor to Mitel Corporation, Kanata, Canada

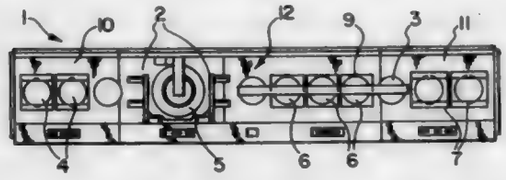
PCT No. PCT/CA91/00176, § 371 Date Jan. 26, 1993, § 102(e) Date Jan. 26, 1993, PCT Pub. No. WO91/19316, PCT Pub. Date Dec. 12, 1991

PCT Filed May 28, 1991, Ser. No. 965,264

Claims priority, application Canada, May 29, 1990, 2017719

Int. Cl.[6] H01L *21/469*

U.S. Cl. 437—231 **7 Claims**



1. A method of planarizing a semiconductor wafer having interconnect tracks of non-refractory material formed thereon, comprising the steps of:

i) applying a layer of inorganic phosphorus-based spin-on glass to the wafer in a coating and spinning chamber in the absence of moisture;

ii) transferring the wafer in the absence of moisture to a curing station;

(iii) curing the spin-on glass at a temperature in the range of at least about 80° C. and not more than 450° C. in the absence of moisture at said curing station to form an SiO_2 lattice connected to phosphorus atoms;

(iv) returning the wafer to the coating and spinning chamber and repeating steps (i) to (iii) until a sufficient film thickness has been achieved without in the interim exposing the wafer to moisture so as to minimize reverse hydrolysis during a planarization process and thereby prevent irreversible reactions that form phosphorus acids and thus lead to disconnection of the phosphorus atoms from the SiO_2 lattice.

5,470,799

METHOD FOR PRETREATING SEMICONDUCTOR SUBSTRATE BY PHOTOCHEMICALLY REMOVING NATIVE OXIDE

Hiromi Itoh; Masanobu Iwasaki; Akira Tokui, and Katsuhiro Tsukamoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1989, Ser. No. 342,045

Claims priority, application Japan, Apr. 28, 1988, 63-108106; Jan. 24, 1988, 63-267391

Int. Cl.[6] H01L *21/00;21/02;21/302;21/463*

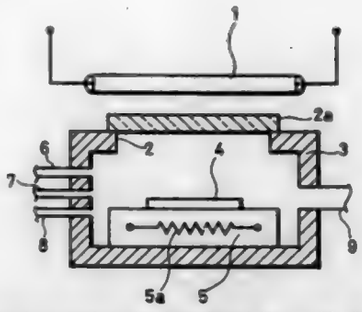
U.S. Cl. 437—238 **10 Claims**

1. A method for pretreating a silicon semiconductor substrate in order to remove a natural oxide film or contaminant adhering on a surface of the semiconductor substrate, said method comprising the steps of:

placing said silicon semiconductor substrate in a chamber;

introducing into said chamber a reaction gas capable of reacting with said natural oxide film or said contaminant, said reaction gas comprising HCl;

heating said semiconductor substrate at a temperature in the range of 200°–700° C., and



irradiating the reaction gas introduced into said chamber with light at said temperature in the range of 200°–700° C., while said semiconductor substrate is heated,

said light having a wavelength which causes a photochemical reaction of the natural oxide film or contaminant adhering on said semiconductor substrate surface with said reaction gas.

5,470,800

METHOD FOR FORMING AN INTERLAYER FILM

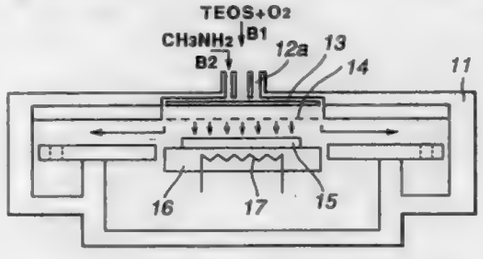
Masakazu Muroyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 26, 1993, Ser. No. 37,645

Claims priority, application Japan, Apr. 3, 1992, 4-081283; Jul. 24, 1992, 4-218551

Int. Cl.[6] H01L *21/02*

U.S. Cl. 437—238 **5 Claims**



1. A process for forming a semiconductor device comprising:

providing a wafer including a semiconductor substrate having an oxidized silicone insulating layer thereon having aluminum wirings including clearances defined thereon;

forming a first insulating interlayer on said aluminum wirings and insulating layer by a chemical vapor deposition process wherein a gaseous material including at least one organic silicone compound and free from water is introduced into a reaction chamber containing said wafer until membrane formation is started and thereafter introducing a dehydration condensation catalyst into said reaction chamber to provide a high molecular weight first insulating interlayer on said wafer having a reduced concentration of hydroxyl groups as compared to a similar interlayer formed by hydrolysis;

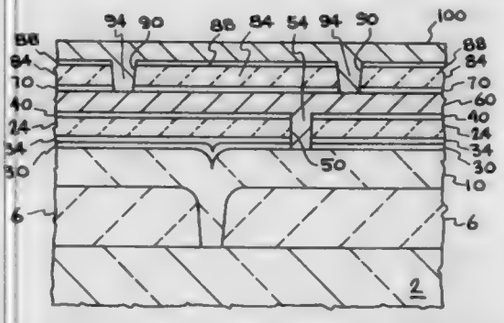
forming a second insulating interlayer on said first insulating interlayer by a chemical vapor deposition process wherein a gaseous material including at least one organic silicone compound, an oxidant and a dehydration condensation catalyst are introduced into the reaction chamber and reacted until a second insulating interlayer is formed on the wafer;

etching said second insulation interlayer back so that said second insulating interlayer remains only in the clearances of the wirings; and

thereafter forming a third insulating interlayer on said wafer by a chemical vapor deposition process wherein a gaseous material including at least one organic silicone compound and free from water is introduced into a reaction chamber containing said wafer until membrane formation is started and thereafter introducing a dehydration condensation catalyst into said reaction chamber to provide a high molecular weight third insulating interlayer on said wafer having a reduced concen-

tration of hydroxyl groups as compared to a similar interlayer formed by hydrolysis;
whereby said wafer may be annealed with less shrinkage and cracking to provide an improved semiconductor device.

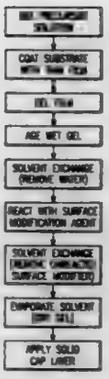
5,470,801
LOW DIELECTRIC CONSTANT INSULATION LAYER FOR INTEGRATED CIRCUIT STRUCTURE AND METHOD OF MAKING SAME
Ashok K. Kapoor, Palo Alto, and Nicholas F. Pasch, Pacifica, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.
Filed Jun. 28, 1993, Ser. No. 84,821
Int. Cl.[6] H01L *21/02*
U.S. Cl. 437—238 **21 Claims**



1. A process for forming a low dielectric constant insulation layer on an integrated circuit structure on a semiconductor wafer which comprises:
a) forming on an integrated circuit structure, an insulation layer consisting essentially of:
i) a non-extractable insulation material selected from the group consisting of an oxide of silicon, silicon nitride, aluminum oxide, and mixtures of same; and
ii) an extractable material selected from the group consisting of germanium oxide, germanium sulfide, and silicon sulfide; and
b) thereafter forming a porous structure in said insulation layer by removing said extractable material from said insulation layer, thereby reducing the dielectric constant of said insulation layer;
to thereby form said low dielectric constant insulation layer.

5,470,802
METHOD OF MAKING A SEMICONDUCTOR DEVICE USING A LOW DIELECTRIC CONSTANT MATERIAL
Bruce E. Gnade, Dallas; Chih-Chen Cho, Richardson, both of Tex., and Douglas M. Smith, Albuquerque, N.M., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed May 20, 1994, Ser. No. 247,195
Int. Cl.[6] H01L *21/02*
U.S. Cl. 437—238 **20 Claims**

1. A method of forming a porous dielectric on a semiconductor device comprising:
(a) providing a first conductor and a horizontally adjacent second conductor, formed on a substrate wherein a gap is formed between said first and said second conductors;
(b) providing a solution capable of forming a wet gel;
(c) coating said substrate with said solution such that the gap between said first and second conductors is filled substantially with said solution;
(d) gelling said solution to form a wet gel on said substrate, said wet gel containing pores arranged in an open-pored structure; and
(e) drying said wet gel to form a substantially undensified porous dielectric layer, said porous dielectric having a dielectric constant less than 3.0 and a pore diameter of less than 80 nm, whereby the capacitive coupling between conductors on the same level is substantially reduced compared to a solid silicon dioxide dielectric.



5,470,803
METHOD FOR THE PREPARATION OF CARBONATED HYDROXYAPATITE COMPOSITIONS
William Bonfield, Welwyn; Serena M. Best, Ridgmont, and Jake E. Barralet, Bristol, all of, United Kingdom, assignors to Queen Mary and Westfield College, London, United Kingdom
Filed May 18, 1994, Ser. No. 245,679
Claims priority, application United Kingdom, May 19, 1993, 9310321
Int. Cl.[6] C04B *35/00*
U.S. Cl. 501—1 **14 Claims**

1. A method for the preparation of a carbonated hydroxyapatite composition which has a density of at least 95% of the theoretical density, which method comprises sintering at substantially atmosphere pressure a dry green carbonated hydroxyapatite compact which contains up to 20% by weight of CO_3 ions but which does not contain any binder and which has a green density of from 25 to 60% of the theoretical density at a temperature in the range of from 750° to 1450° C. in carbon dioxide containing from 0.001 to 0.10 grams of water per liter of gas, the sintering temperature being selected within the above range and the green compact being sintered for a period of time sufficient to cause the green compact to densify to at least 95% of the theoretical density.

5,470,804
MILL ADDITIONS FOR SEALING GLASSES
Robert Morena, Lindley, N.Y., assignor to Corning Incorporated, Corning, N.Y.
Filed Aug. 3, 1994, Ser. No. 285,232
Int. Cl.[6] C03C *8/24*
U.S. Cl. 501—15 **9 Claims**

1. A material for a fusion-type seal, the material consisting essentially of a thermally crystallizable, PbO—ZnO—B_2O_3 sealing glass frit and a mill addition, the mill addition consisting essen-

tially of at least one additive that enhances seal strength, that is selected from a group consisting of alumina, zircon, and manganese dioxide, and that is present in an amount sufficient to provide a mechanical strength of at least 55.2 MPas (8000 psi) in a fusion seal made with the material, the amount of additive being at least 2%, but not over about 5% by weight of the sealing material.

5,470,805

GLASS COMPOSITION SUITABLE FOR USE IN ELECTRIC LAMPS, STEM MANUFACTURED FROM THIS GLASS COMPOSITION AND FLUORESCENT LAMP HAVING A LAMP ENVELOPE OF THIS GLASS COMPOSITION

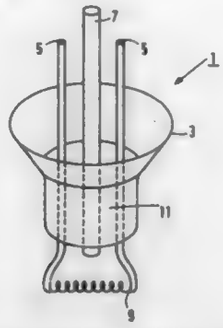
Bartholomeus Filmer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 164,249, Dec. 7, 1993, abandoned. This application Nov. 17, 1994, Ser. No. 341,347

Claims priority, application European Pat. Off., Dec. 14, 1992, 92203890

Int. Cl.[6] C03C *3/093;3/085;3/087;3/078*

U.S. Cl. 501—55 **4 Claims**



1. A glass composition for components of glass lamps, in which the glass consists the following essentially of constituents, expressed in percent by weight:

SiO_2 60–72
Al_2O_3 1–5
Li_2O 0.5–1.5
Na_2O 5–9
K_2O 3–7
MgO 1–2
CaO 1–3
SrO 1–5
BaO 7–11.

5,470,806

MAKING OF SINTERED SILICON CARBIDE BODIES

Vladimir D. Krstic, and Milan Vlajic, both of Queen'University, Department of Materials and Metallurgical Eng., Nicol Hall, Kingston, Ontario, Canada

Filed Sep. 20, 1993, Ser. No. 123,918

Int. Cl.[6] C04B *35/56*

U.S. Cl. 501—90 **9 Claims**

1. A process for pressureless sintering of silicon carbide comprising: Forming a mixture consisting essentially of silicon carbide particles having a size from 0.3 to 5 micrometers and from about 1% to about 29% by weight of a transition metal oxide, from about 1% to about 29% by weight of alumina and from 0.1 to 5% by weight carbon; shaping the mixture into a green body; placing the green body into a sealed graphite crucible and surrounding the body with a powder bed consisting essentially of about 30 to 60% by weight of silicon carbide, from 68 to 38% by weight of aluminum oxide, and about 0.5 to 7% by weight of carbon powder, and sintering the green body at a temperature ranging from about 1750° C. to about 2050° C. for about 1 minute to about 45 minutes at atmospheric pressure or above atmospheric pressure of argon or CO gas to produce a resultant sintered body having a fracture toughness higher than 7 $MPa.m^{1/2}$and hardness higher than 20 GPa.

5,470,807

CHROMIUM CARBIDE BASED CERAMICS COMPOSITE BLOCK GAUGE

Chung-Ping Lai; Cheng-Tsu Fu; Jia-Ruey Duann; Ai-Kang Li, and Kai-Li Ko, all of Chutung, Taiwan, Prov. of China, assignors to Industrial Technology Reserch Institute, Taiwan, Prov. of China

Filed Mar. 17, 1995, Ser. No. 405,832

Int. Cl.[6] C04B *35/56*

U.S. Cl. 501—93 **4 Claims**

1. A block gauge comprising a ceramic composite material comprising a chromium carbide as the main ingredient and 5 to 35 vol. % tungsten carbide which are sintered in a controlled low-oxygen environment and under pressure and elevated temperature.

5,470,808

DIELECTRIC CERAMIC COMPOSITIONS AND DIELECTRIC RESONATORS

Kojiro Okuyama, Ikoma; Yoichiro Yokotani, Suita, and Koichi Kugimiya, Toyonaka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 115,643, Sep. 2, 1993, Pat. No. 5,356,843. This application Oct. 17, 1994, Ser. No. 325,083

Claims priority, application Japan, Sep. 10, 1992, 4-241640; Feb. 15, 1993, 5-025284

Int. Cl.[6] C04B *35/49*

U.S. Cl. 501—134 **5 Claims**

1. A $TE_{01}\delta$-mode dielectric resonator comprising a dielectric ceramic which comprises a complex oxide consisting essentially of Zr and Ti, at least one component selected from the group (A) consisting of Mg, Co, Zn, Ni and Mn, and at least one component selected from the group (B) consisting of Nb and Ta.

5,470,809

METHOD TO TREAT AN ION-EXCHANGER CATALYST FOR THE PROCESS TO SYNTHESIZE ALKYLPHENOLS

Maciej Kiedik; Andrzej Krueger, both of K+z,700 dzierzyn-Koźle; Józef Ko+z,701 t, Zabrze; Bogus+z,701 aw Tkacz, K+z,700 dzierzyn-Koźle; Tatiana Pers, K+z,700 dzierzyn-Koźle; Teresa Rdesinska-Cwik, K+z,700 dzierzyn-Koźle; Jan Niedziela, Kobylice; Ryszard Kosciuk, K+z,700 dzierzyn-Koźle; Anna Rzodeczko, K+z,700 dzierzyn-Koźle; Zbigniew Swiderski, K+z,700 dzierzyn-Koźle, and W+z,701 adys+z,701 ad Jankowski, K+z,700 dzierzyn-Koźle, all of, Poland, assignors to Instytut Ciezniej Syntezy Organicznej Blachownia, and Zaklady Chemiczne Blachownia, both of Kedzierzyn-Kozle, Poland

Filed May 10, 1994, Ser. No. 240,239

Claims priority, application Poland, May 14, 1993, P-298970

Int. Cl.[6] B01J *37/30*

U.S. Cl. 502—12 **1 Claim**

1. A method for reducing the water content of an ion exchange catalyst used in the synthesis of alkyl phenols, wherein the catalyst comprises a cation exchange bed of a sulphonated styrene-divinylbenzene copolymer containing 4–50% divinylbenzene, in hydrogen form, and having a moisture content of up to 70% by weight, comprising the steps or sequence of:

(1) passing phenol containing 0.01–1% by weight water through the cation exchange bed at a temperature in the range 50°–100° C. to provide a resultant first effluent containing 50–99.5% by weight phenol and 0.5–50% by weight water,

(2) running said resultant first effluent through a basic anion exchange resin to obtain a resultant second effluent,

(3) removing water from the second effluent by distillation to obtain a dewatered phenol containing from 0.01–1% moisture by weight,

(4) recycling said dewatered phenol through the cation exchange bed and its resultant first effluent throughout anion exchange resin until the water content of said cation exchanger is at or below 10%.

(5) washing the cation exchange bed at a temperature of 60 °–130° C. with a mixture consisting of 35–80% by weight phenol, 5–20 by weight C_6–C_{12} olefins, 5–60% by weight Alkyl phenols having at least one substitute chain containing 6–12 carbon atoms, 0.1–5% by weight dialkyl phenols having substitute chains containing 6–12 carbon atoms, 0.1–15% by weight saturated C_6–C_{12} hydrocarbons and 0.05–2% by weight water and collecting the effluent,

(6) contacting the effluent with the basic ion exchange resin,

(7) recycling said contacted effluent through said cation exchange bed and basic ion exchange resin until the cation exchange bed has a moisture contempt of not more than 3% by weight.

5,470,810

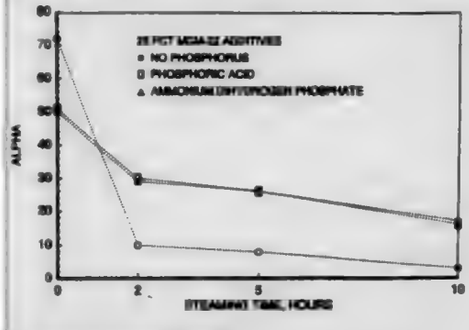
CATALYST AND METHOD OF MANUFACTURE

Thomas F. Degnan, Moorestown, N.J.; Anthony S. Fung, Wilmington, Del.; George H. Hatzikos, Mantua, N.J.; Gordon J. Kennedy, Turnersville, N.J., and Jocelyn A. Kowalski, Clarksboro, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Feb. 2, 1994, Ser. No. 190,438

Int. Cl.[6] B01J *29/06*

U.S. Cl. 502—64 **24 Claims**



1. A composition comprising:

a porous crystalline material characterized by an X-ray diffraction pattern including values substantially as set forth in Table 1 of the specification wherein said crystalline material has been treated with a source of phosphorus selected from the group consisting of ammonium monohydrogen phosphate, ammonium dihydrogen phosphate, triammonium phosphate, ammonium hypophosphate, ammonium orthophosphate, ammonium dihydrogen orthosphosphate, ammonium monohydrogen orthophosphate, ammonium hypophosphite, ammonium dihydrogen orthophosphite, phosphoric acid and mixtures thereof.

5,470,811

POLYMERIZATION CATALYSTS, THEIR PRODUCTION AND USE

Moses O. Jejelowo, Kingwood, and Robert L. Bamberger, Crosby, both of Tex., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Continuation of Ser. No. 103,505, Aug. 6, 1993, abandoned. This application Feb. 13, 1995, Ser. No. 388,121

Int. Cl.[6] C08F *4/64*

U.S. Cl. 502—117 **34 Claims**

1. A catalyst for polymerizing olefins comprising:

a) a first component comprising at least one transition metal of Group IV, V or VI and bonded to at least two cyclopentadienyl containing rings, said rings each having at least two substituents bonded to each of said rings in the same position;

b) a second component comprising said transition metal and said cyclopentadienyl containing rings, said rings each having at least two substituents bonded to each of said rings; wherein the substituents of said first and second components are the same and said substituents of said first and second components are bonded to said rings in different positions; and

c) a third component comprising said transition metal bonded to said cyclopentadienyl containing rings where one of said rings is substituted identically as said first component and another of said rings is substituted identically as said second component.

5,470,812

HIGH ACTIVITY POLYETHYLENE CATALYSTS PREPARED WITH ALKOXYSILANE REAGENTS

Robert I. Mink, Warren, and Thomas E. Nowlin, West Windsor, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 788,386, Nov. 6, 1991, Pat. No. 5,336,652. This application Nov. 15, 1993, Ser. No. 151,666

Int. Cl.[6] B01J *31/12*

U.S. Cl. 502—125 **17 Claims**

1. A catalyst composition for copolymerizing ethylene and an alpha olefin of 3 to 10 carbon atoms, comprising a catalyst precursor and a trialkylaluminum cocatalyst to activate said catalyst precursor, wherein the improvement comprises a precursor comprising

(i) silica, wherein the silica has 0.4 to 0.9 mmoles of OH groups per gram of silica;

(ii) dibutylmagnesium, in an amount to provide a molar ratio of Mg:OH of 1.0 to 1.8

(iii) tetraethyl orthosilicate, in an amount to provide a tetraethyl orthosilicate:Mg molar ratio of 0.50 to 0.80;

(iv) and $TiCl_4$, in an amount to provide a molar ratio of Ti:Mg of 0.7 to 1.4 wherein the catalyst precursor has a K value, which is defined as

$$K = \frac{[Ti]}{[Mg] + 4[Si]},$$

wherein is titanium metal concentration provided by $TiCl_4$, is magnesium metal concentration provided by said dibutylmagnesium; is the concentration provided by said tetraethyl orthosilicate, and K is 0.23 to 0.31 wherein concentration of each of, and is in units of mmole/gram silica support; and wherein the precursor is prepared at a temperature in the range of 40° to 65° C.

5,470,813

DOUBLE METAL CYANIDE COMPLEX CATALYSTS

Bi Le-Khac, West Chester, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Nov. 23, 1993, Ser. No. 156,534

Int. Cl.[6] B01J *27/26*

U.S. Cl. 502—175 **36 Claims**

1. A catalyst which comprises at least about 70 wt. % of a substantially amorphous double metal cyanide (DMC) complex, wherein the catalyst is useful for polymerizing epoxides.

14. A method of making a double metal cyanide (DMC) complex catalyst, said method comprising: (a) intimately combining and reacting aqueous solutions of a water-soluble metal salt and a water-soluble metal cyanide salt in the presence of a complexing agent to produce an aqueous mixture containing a precipitated DMC complex catalyst; and (b) isolating and drying the DMC complex catalyst.

5,470,814

CMS/SiO_2/AL_2O_3 CATALYSTS FOR IMPROVED SELECTIVITY IN THE SYNTHESIS OF AMINES FROM METHANOL AND/OR DIMETHYL ETHER AND AMMONIA

Henry C. Foley, Newark; George C. Soumichsen; Loren D. Brake, both of Wilmintgon; Ravindra K. Mariwala, Newark, all of Del., and David S. Lafyatis, Gent, Belgium, assignors to University of Delaware, Newark, and E. I. Du Pont de Nemours & Co., Inc., Wilmington, both of Del.

Division of Ser. No. 100,463, Jul. 30, 1993, Pat. No. 5,354,893. This application Jul. 21, 1994, Ser. No. 278,643

Int. Cl.[6] B01J *21/18;21/04*

U.S. Cl. 502—182 **15 Claims**

1. A method of making a carbon molecular sieve/SiO_2/Al_2O_3 catalyst material comprising

a) mixing SiO_2/Al_2O_3 catalyst material with a precursor material to form a mixture;

b) heating said mixture to pyrolyze the precursor material and form a carbon molecular sieve/SiO_2/Al_2O_3 material;

c) comminuting the carbon molecular sieve/SiO_2/Al_2O_3 material formed in step b);

d) mixing the comminuted carbon molecular sieve/SiO_2/Al_2O_3 material from step c) with additional precursor material to form a second mixture; and

e) heating said second mixture to pyrolyze the additional precursor material and form additional carbon molecular sieve material on said comminuted carbon molecular sieve/SiO_2/Al_2O_3 material.

5,470,815

MULTICOMPONENT OXIDE CATALYST

Jong-Seob Kim, Taejon, and Seong-Ihl Woo, Seoul, both of, Rep. of Korea, assignors to Korea Advanced Istitue of Science and Technology, Rep. of Korea

Filed Dec. 29, 1993, Ser. No. 175,286

Claims priority, application Rep. of Korea, Dec. 31, 1992, 92-27095

Int. Cl.[6] B01J *23/10;23/28*

U.S. Cl. 502—304 **5 Claims**

1. A multicomponent oxide catalyst composition for preparing acrylonitrile from propane by ammoxidation which is $AgPbMgCoNiCeGaBi_7Mo_{14}$ oxide.

5,470,816

THERMAL RECORDING SHEET

Toshimi Satake; Toshiyuki Takano; Hideki Hayasaka; Yukiko Uehori, and Tomoaki Nagai, all of Tokyo, Japan, assignors to Nippon Paper Industries Co., Ltd., Tokyo, Japan

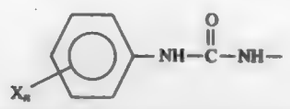
Filed Jul. 6, 1994, Ser. No. 267,903

Claims priority, application Japan, Jul. 8, 1993, 5-169244; Dec. 13, 1993, 5-311502

Int. Cl.[6] B41M *5/30*

U.S. Cl. 503—201 **15 Claims**

1. A thermal recording sheet having a thermal recording layer containing a colorless or pale colored dye precursor and a color developer reactable with said dye precursor upon heating to develop a color, wherein said color developer is a urea compound having at least two groups of Formula (1) in the molecule, and the thermal recording layer contains at least one of said urea compound:



(1)

wherein X is alkyl group having 1 to 12 carbon atoms, halogenated alkyl group having 1 to 6 carbon atoms, aralkyl group having 7 to 14 carbon atoms, alkoxy group having 1 to 12 carbon atoms, aryloxy group having 6 to 12 carbon atoms, alkoxycarbonyl group having 1 to 12 carbon atoms, acyl group having 1 to 12 carbon atoms, dialkylamino group having 1 to 12 carbon atoms, arylalkylamino group having 7 to 12 carbon atoms, arylamino group having 6 to 12 carbon atoms, acylamino group having 1 to 12 carbon atoms, nitro group, cyano group, halogen group or hydrogen group.

5,470,817

PRINTING SHEET AND MANUFACTURING METHOD THEREFOR

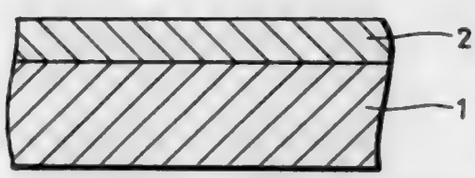
Yoshinori Nakamura; Huy Sam, both of Miyagi; Yoshio Fujiwara, Tochigi; Toshikazu Nagura; Shigeo Hayasi, both of Kanagawa, and Yukio Kusaka, Tochigi, all of, Japan, assignors to Sony Corporation, and New Ojil Paper Co., Ltd., both of Tokyo, Japan

Filed Jun. 7, 1994, Ser. No. 257,093

Claims priority, application Japan, Jun. 8, 1993, 5-164321

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **2 Claims**



1. A printing sheet for use in a thermal transfer system including a support having a dye receiving layer disposed thereon, said dye receiving layer consisting essentially of:

(A) a film forming resin selected from the group consisting of: thermoplastic resins, thermosetting resins, ultraviolet setting resins, electron setting resins and mixtures of any of the foregoing resins;

(B) from about 0.5 to about 30 parts by weight per 100 parts by weight of said film forming resin component (A) of a previously prepared isocyanate group-containing polymer produce by reaction of a multifunctional polyisocyanate with an amine-terminated polysiloxane, said isocyanate group-containing polymer having a molecular weight of from about 3,000 to about 15,000; and

(C) optionally including an additive selected from the group consisting of dye dispersing agents, fluorescent whitening agents, white pigments, antistatic agents, plasticizers, UV absorbers and antioxidants.

5,470,818

PRINTING SHEET COMPRISING A DYE RECEIVING LAYER MADE OF AN ISOCYANATE GROUP-CONTAINING POLYMER

Yoshinori Nakamura; Huy Sam, both of Miyagi, and Yoshio Fujiwara, Tochigi, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

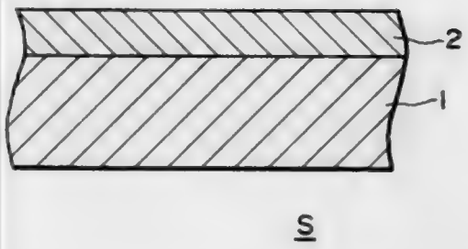
Filed Aug. 1, 1994, Ser. No. 282,499

Claims priority, application Japan, Aug. 3, 1993, 5-210978

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **11 Claims**

1. A printing sheet for use in a thermal transfer printing system, including a substrate having a dye-receiving layer thereon, said dye-receiving layer consisting essentially of 100 parts by weight of at least one film-forming resin selected from the group consisting of AS resins, cellulose acetylbutyrate resins, polyvinyl butyral resins, and vinyl chloride-vinyl acetate copolymer resins and from about 0.5 to about 30 parts by weight of said film-forming resin of an isocyanate group-containing polymer produced by reacting a mixture consisting essentially of a multi-functional polyisocyanate



S

and a hydroxy-terminated silicone, said dye-receiving layer optionally including at least one additive selected from the group consisting of sensitizers, fluorescent brighteners, white pigments, antistatic agents, plasticizers, ultraviolet absorbers and antioxidants.

5,470,819

FUNGICIDES

Vivienne M. Anthony, Maidenhead; John M. Clough, Marlow; Paul deFraine, Wokingham; Christopher R. A. Godfrey, Bracknell; Ian Ferguson, Todmorden; Patrick J. Crowley, Crowthorne, and Michael G. Hutchings, Prestwich, all of, England, assignors to Zeneca Limited, London, England

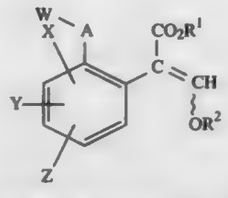
Continuation of Ser. No. 738,311, Jul. 31, 1991, abandoned, which is a division of Ser. No. 465,526, Jan. 17, 1990, Pat. No. 5,057,146, which is a continuation of Ser. No. 39,252, Apr. 17, 1987, abandoned. This application May 9, 1994, Ser. No. 239,845

Claims priority, application United Kingdom, Apr. 17, 1986, 8609454; Dec. 23, 1986, 8630825

Int. Cl.[6] **A01N** *43/40;* **C07D** *213/62;401/12*

U.S. Cl. 504—244 **9 Claims**

1. A compound having the formula (I):



(I)

and stereoisomers thereof, wherein W is a substituted pyridinyl group linked to A by any one of its carbon atoms, W being substituted with a pyridinyl ring, and may be further substituted with 1 substituent selected from the group consisting of halogen, hydroxy, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{1-6} alkoxy, C_{1-6} alkylthio, nitro, cyano or NR'R"; X, Y and Z are all hydrogen; R^1 and R^2, which are the same or different, are C_{1-6} alkyl; any of the foregoing alkyl, alkenyl or alkynyl moieties being optionally substituted with C_{1-4} alkoxy, fluorine, chlorine or bromine, phenyl, nitro, amino, cyano, hydroxyl or carboxyl; said phenyl, pyridinyl moieties being optionally substituted with halogen, hydroxy, C_{1-4} alkyl, C_{1-4} alkoxy, halo (C_{1-4}) alkyl, halo(C_{1-4})alkoxy, C_{1-4} alkylthio, C_{1-4} alkoxy(C1-4) alkyl, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl (C_{1-4})alkyl, phenyl, phenoxy, phenyl(C_{1-4}) alkyl, phenyl(C_{1-4}) alkoxy, phenoxy(C_{1-4})alkyl, cyano, thiocyanato, nitro, —NR'R", —NHCOR', —NHCONR'R", —COOR, —OSO_2R', —SO_2R', —OCOR', —CR'=NR" or N=CR'R"; R' and R" are independently hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, C_{1-4} alkylthio, C_{3-6} cycloalkyl, C_{3-6} cycloalkyl(C_{1-4})alkyl, phenyl or benzyl, the phenyl and benzyl groups being optionally substituted with halogen, C_{1-4} alkyl or C_{1-4} alkoxy; and metal complexes thereof.

5,470,820

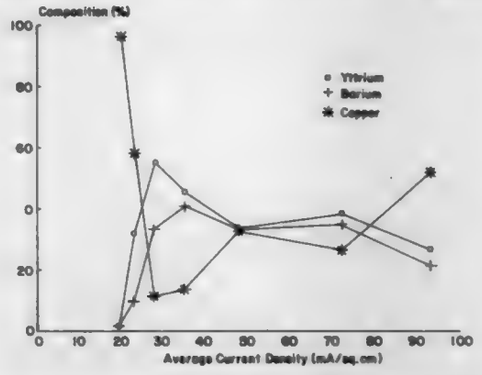
ELECTROPLATING OF SUPERCONDUCTOR ELEMENTS

Ray L. Hauser; Bolin Zheng, both of Boulder; Michael Renbarger, Littleton, and Mark A. Lange, Golden, all of Colo., assignors to Hauser Chemical Research, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 892,227, Jun. 2, 1992, Pat. No. 5,244,875, which is a continuation-in-part of Ser. No. 695,942, May 6, 1991, abandoned. This application Sep. 10, 1993, Ser. No. 120,172

Int. Cl.[6] **H01L** *39/00;* **C25D** *5/04*

U.S. Cl. 505—472 **24 Claims**



1. A process for concurrent electroplating of yttrium, barium and copper elements from aqueous solution onto an electrically conductive substrate comprising the steps of:

(a) dissolving compounds of said elements in water containing complexing agent and adjusted to a pH of 5 or less, said complexing agent is selected from the group consisting of picolinic acid, ethylenediamine-N,N'-diacetic acid, diethylenetriamine pentaacetic acid, 1,3-diamino-2-hydroxypropane-N,N,N',N'-tetraacetic acid, nitrilotriacetic acid, triethylenetetra-amine hexaacetic acid, N-(2-hydroxyethyl)ethylenediamine triacetic acid, 1,3-acetonedicarboxylic acid, 2-nitrobenzoic acid, or a salt thereof;

(b) inserting an anode and a cathode into said solution; wherein said cathode comprises said substrate; and

(c) creating an electrical potential on said cathode at −0.5 volts or less with a current density of at least about 15 mA/cm^2 to cause electrodeposition of said elements onto said cathode.

5,470,821

SUPERCONDUCTORS HAVING CONTINUOUS CERAMIC AND ELEMENTAL METAL MATRICES

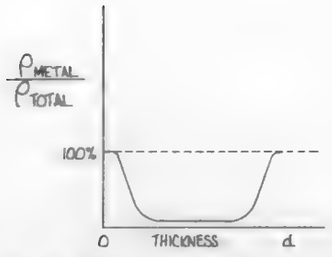
Kai W. Wong; Xin Fei; Ying Xin, all of Lawrence, Kans., and Yi-Han Kao, Williamsville, N.Y., assignors to The University of Kansas, and Midwest Superconductivity, Inc., both of Lawrence, Kans.

Continuation of Ser. No. 67,267, May 21, 1993, abandoned, which is a continuation of Ser. No. 892,199, Jun. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 865,074, Apr. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 844,736, Mar. 2, 1992, abandoned. This application Feb. 15, 1995, Ser. No. 389,544

Int. Cl.[6] **H01B** *12/00;* **H01L** *39/12*

U.S. Cl. 505—236 **13 Claims**

1. A superconducting composite material comprising a sintered, bulk body formed entirely from compressed first and second matrix-defining particulates and having a thickness of at least about 0.2 mm, wherein said body comprises a first matrix of superconducting ceramic oxide crystalline grains, and a second matrix of elemental metal situated within the interstices between said crystalline grains, said first matrix-defining particulates and the grains of said body being selected from the group consisting of single or mixed phase **1223**, **1212**, **2212**, **2223** and **2201** superconductors, said second matrix-defining particulates and the elemental



metal of said body being selected from the group consisting of elemental gold, silver and palladium, said elemental metal matrix being essentially uniform throughout said bulk body except in the region of the surface layer thereof, said elemental metal of said body being derived from said second matrix-defining elemental metal particulates and being the only elemental metal present in said composite material, said body having a layer of essentially continuous elemental metal defining substantially all of the outer surface region of said body, the distribution of elemental metal in said body being at a maximum at the outermost surface of said body wherein it is almost entirely metal, and having a progressively smaller distribution from said outermost surface to a central region of the body where the distribution of said elemental metal is substantially constant, said body being self-sustaining with said layer defining the outermost portion of the body, said layer being continuous with said second matrix, said body exhibiting at least one of a measured, D.C. voltage-induced transport current density of at least about 1,500 amps/cm^2 at zero applied magnetic field and a body temperature of about 77K, and a measured, D.C. voltage-induced transport current density of at least about 250 amps/cm^2 at 1 Tesla applied magnetic field and a body temperature of about 77K.

5,470,822

LOW-TOXICITY INVERT EMULSION FLUIDS FOR WELL DRILLING

Usama E. Younes, West Chester, Pa., assignor to Arco Chemical Technology, L.P., Greenville, Del.

Filed May 18, 1994, Ser. No. 245,329

Int. Cl.^{6} C09K *7/06*

U.S. Cl. 507—133 **12 Claims**

1. A low toxicity invert emulsion drilling fluid comprising:

A. a non-hydrocarbon, non-mineral oil continuous phase comprising a polymer or a blend of polymers, each polymer having a polyoxyalkylene core having 2 to 3 end groups each end group selected from the group consisting of hydroxyl, C_6–C_{30} acyloxy, and C_6–C_{30} alkanamido, with the proviso that 50% or more of the total end groups must be selected from the group consisting of C_6–C_{30} acyloxy and C_6–C_{30} alkanamido, and in which the polyoxyalkylene core has a number average molecular weight within the range of from about 150 to about 1,500;

B. a dispersed aqueous phase;

C. at least one weight additive; and,

D. at least one emulsifier.

5,470,823

STIMULATION OF COALBED METHANE PRODUCTION

Dennis A. Williams, Houston; James R. Looney, Brady, both of Tex.; Michael W. Conway, Marlow, Okla., and Robert A. Swenson, Janesville, Wis., assignors to Exxon Chemical Patents Inc., Linden, N.J.

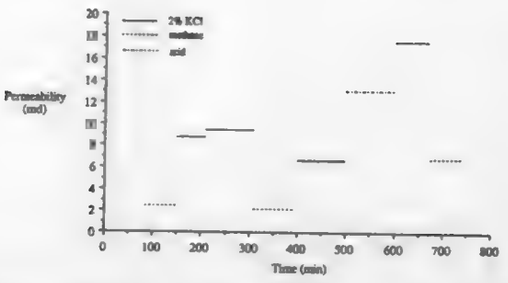
Filed May 3, 1993, Ser. No. 56,674

The portion of the term of this patent subsequent to Jun. 21, 2011, has been disclaimed.

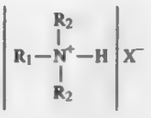
Int. Cl.^{6} E21B *43/27*

U.S. Cl. 507—241 **7 Claims**

1. A method of recovering methane from a coalbed formation which comprises injecting into the formation an aqueous acid



solution containing an effective amount of an organic tertiary ammonium surfactant having the following formula:



where

R_1 is independently a benzyl group or C4–C_8 alkyl group;

R_2 is independently a propanoic or 2-methyl propanoic acid group; and

X is independently Cl, HCOO, NH_2SO_3 or CH_3COO.

5,470,824

METHOD TO TREAT KAPOSI'S SARCOMA

Steven A. Miles, Sherman Oaks; Ronald H. Stevens, Marina Del Rey; Otoniel M. Martinez, Valencia, all of Calif.; Tadamitsu Kishimoto, Osaka, Japan, and David J. Klashman, Sherman Oaks, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed May 31, 1991, Ser. No. 707,863

Int. Cl.^{6} A61K *37/00*

U.S. Cl. 514—2 **1 Claim**

1. A method to intervene in the progress of Kaposi's sarcoma, which method comprises administering to a subject in need of such intervention an amount of IL-4 effective to decrease IL-6 function in Kaposi's sarcoma-involved cells.

5,470,825

BASOPHIL GRANULE PROTEINS

Randy W. Scott, Sunnyvale, Calif.; Gerald J. Gleich, Rochester, Minn., and Craig G. Wilde, Foster City, Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Continuation of Ser. No. 551,263, Jul. 10, 1990, abandoned. This application Jun. 15, 1994, Ser. No. 259,564

The portion of the term of this patent subsequent to Jul. 10, 2010, has been disclaimed.

Int. Cl.^{6} A61K *38/02;* **C07K** *2/00*

U.S. Cl. 514—2 **2 Claims**

1. An injectable composition, comprising:

a pharmaceutically acceptable excipient; and

a human basophil granule protein in an isolated and purified form, the protein having an N-terminal sequence selected from the group consisting of:

Asp-Ile-Gly-Pro-Gln-His-Thr-Ser-Arg-Pro-Trp-Gly-Gln-Thr;

Asp-Val-Lys-Lys-Asp-Met-Glu-Val-Ser-Cys-Pro-Asp-Gly-Tyr-Thr;

Val-Met-X-Pro-Asp-Ala-Arg-Ser-X-Arg-Pro-Asp-Gly-X-Thr;

Ala-Ile-Tyr-X-Arg-Ile-Pro-X-X-Ile-Ala-Gly-Glu-Phe-Arg-Tyr-Gly-Thr-Val-Tyr-Tyr-Gln-Gly-Ser-Leu;

Asp-Ile-Pro-Glu-Val-X-Val-X-Leu-Ala-Ala-Asp-Glu-Ser-Leu-Ala-Pro-Lys;

Tyr-Pro-Gln-Leu-Ala-Ile-Asn; and

Ser-Ile-Gly-Phe-Val-Glu-Val-X-Leu-Val-Leu;

wherein the N-terminal sequence is determined from Edman degradation fractions taken from human basophil granule proteins and further wherein X is an amino acid residue present at the indicated position, the human basophil granule protein being isolatable from human basophil granules.

5,470,826

SINGLE CHAIN PROTEINS WITH FHS SUPPRESSING ACTIVITY ISOLATED FROM FOLLICULAR FLUID AND USES THEREOF

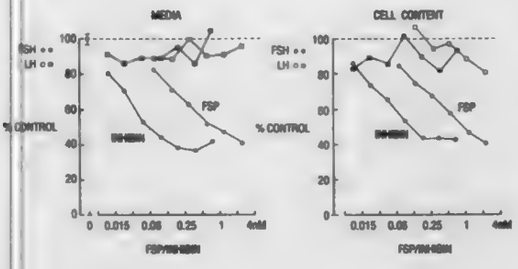
David M. De Kretser, Surrey Hills; Henry G. Burger, East Melbourne; Milton T. W. Hearn, Balwyn; David M. Milne-Robertson, Glen Waverley; Richard E. H. Wettenhall, Camberwell, all of, Australia; Robert I. McLachlan, Seattle, Wash., and Fiona De Vos, Glen Waverley, Australia, assignors to Biotechnology Australia Pty Ltd., New South Wales; Monash University, Clayton; Monash Medical Centre, Melbourne, and St. Vincents Institute of Medical Research, Fitzroy, all of, Australia

Continuation of Ser. No. 970,645, Nov. 2, 1992, abandoned, which is a continuation of Ser. No. 281,706, Nov. 29, 1988, abandoned. This application Nov. 3, 1993, Ser. No. 145,194

Claims priority, application Australia, Jan. 29, 1987, PI0081; Jun. 17, 1987, PI2525; Dec. 7, 1987, PI5765; Dec. 7, 1987, PI5766

Int. Cl.[6] A61K *38/22;* C07K *14/575*

U.S. Cl. 514—8 20 Claims



1. A substantially pure, single-chain protein derived from follicular fluid, said protein being characterized by:

a molecular weight of between about 30 kD and about 60 kD as estimated by SDS-PAGE in the absence of reducing agents;

an in vitro FSH-suppressing activity which is not inhibited by neutralizing inhibin anti-sera; and

lack of inhibin immunoactivity.

5,470,827

METHOD OF PRODUCING ITURIN A AND ANTIFUNGAL AGENT FOR PROFOUND MYCOSIS

Yasushi Tanaka, Chiba; Takashi Tojo; Kazuhiko Uchida, both of Choshi; Jun Uno, Tokyo; Yasushi Uchida, Saga, and Osamu Shida, Choshi, all of, Japan, assignors to Higeta Shoyu Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1994, Ser. No. 312,911

Claims priority, application Japan, Sep. 30, 1993, 5-265446; Sep. 20, 1994, 6-250150

Int. Cl.[6] C12P *21/04;* A61K *38/12*

U.S. Cl. 514—11 1 Claim

1. A process for the treatment of profound mycosis, comprising administering to an animal in need of such treatment, an amount of iturin A sufficient for the treatment of said profound mycosis.

5,470,828

PEPTIDE ANALOGS OF INSULIN-LIKE GROWTH FACTOR II

Francis J. Ballard, Glenalta; John C. Wallace, Coromandel Valley, and Julian R. E. Wells, College Park, all of, Australia, assignors to Gropep Pty. Ltd., Australia

Continuation-in-part of Ser. No. 408,518, Aug. 24, 1989, Pat. No. 5,164,370. This application Sep. 17, 1992, Ser. No. 947,514

Claims priority, application Australia, Dec. 24, 1987, PI 6068

Int. Cl.[6] A61K *38/30*

U.S. Cl. 514—12 3 Claims

1. A peptide analog of human bovine, ovine, porcine or chicken insulin-like growth factor II (IGF-II) having the following modified N-terminal sequence:

Thr-Leu-Cys-

with the Cys residue shown being the amino acid residue at position **8** or **9** from the N-terminal of the native amino acid sequence of the IGF-II with the remainder of the IGF-II peptide analog sequence being an amino acid sequence of a human, bovine, ovine, porcine or chicken IGF-II beginning at the amino acid residue immediately following the Cys residue at position **8** or **9** from the N-terminal of the native IGF-II amino acid sequence.

5,470,829

PHARMACEUTICAL PREPARATION

Per Prisell, Wollmar Yxkullsgatan 15A, S-116 50 Stockholm, and Gunnar Norstedt, Foerfattavaegen 46, S-116 42 Bromma, both of, Sweden

Continuation-in-part of Ser. No. 690,898, Jun. 22, 1990, abandoned. This application Mar. 25, 1993, Ser. No. 37,124

Claims priority, application Sweden, Nov. 17, 1988, 8804164

Int. Cl.[6] A61K *38/00;45/05;* C08G *63/91;63/48*

U.S. Cl. 514—12 9 Claims

1. In a method for administering ligand selected from the group consisting of growth factors and hormones to an animal comprising administering said ligand in combination with an adjuvant which controls the release of said ligand, said adjuvant comprising a biodegradable polymer and a receptor for said ligand, wherein said receptor is conjugated to a biodegradable polymer, the improvement wherein

said receptor comprises (1) a protein for binding said ligand, said protein being selected from the group consisting of insulin-like growth factor-1-receptor; erythropoietin-receptor; insulin-like growth factor-2-receptor; insulin-receptor; platelet derived growth factor-receptor; fibroblast growth factor-receptor; colony stimulating growth factor-receptor; transforming growth factor-receptor; growth hormone-receptor; parathyroid hormone-receptor; calcitonin-receptor; estrogen-receptor; insulin-like growth factor serum binding protein; epidermal growth factor receptor; corticosteroid binding globulin; and bone morphogenic protein and

(2) said biodegradable polymer is selected from the group consisting of alginates; hyaluronic acid and derivatives thereof: polyglycolide; copolymers of glycolide; copolymers of glycolide and L-lactide; copolymers of glycolide and trimethylene carbonate; polylactides; stereo-copolymers of polylactides; poly-L-lactide; poly-DL-lactide; copolymers of L-lactide and DL-lactide; copolymers of polylactide; copolymers of lactide and tetramethylglycolide; copolymers of lactide and trimethylene carbonate; copolymers of lactide and α-valerolactone; copolymers of lactide and ϵ-caprolactone; copolymers of polylactide and polyethylene oxide; copolymers of poly-β-hydroxybutyrate; polyurethanes; methylmethacrylate-N-vinyl pyrrolidone copolymers; and poly-p-dioxanone;

said ligand being a ligand specific to said protein and being linked to said protein.

5,470,830

MOTILIN-LIKE POLYPEPTIDES THAT INHIBIT GASTROINTESTINAL MOTOR ACTIVITY

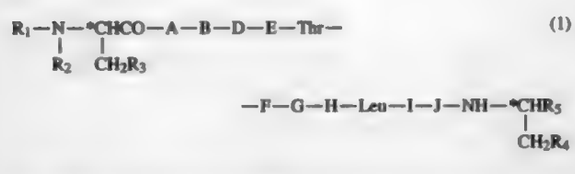
Mark J. Macielag, Branchburg; Ramalinga Dharanipragada, Chatham, and Mary S. Marvin, Morristown, all of N.J., assignors to Ohmeda Pharmaceutical Products Division Inc., Liberty Corner, N.J.

Filed Aug. 6, 1993, Ser. No. 103,489

Int. Cl.[6] A61K *38/00;* **C07K** *5/00;7/00;17/00*

U.S. Cl. 514—13 **19 Claims**

1. Polypeptides having gastrointestinal motor inhibitory activity represented by the formula:



(1)

including optically active isomeric forms and the pharmaceutically acceptable acid addition salts thereof wherein:

A is the L-stereoisomer of a lipophilic aliphatic amino acid;

B is selected from the group consisting of phenylalanine, p-fluorophenylalanine, p-chlorophenylalanine, p-bromophenylalanine, p-iodophenylalanine, tyrosine, p-methaxyphenylalanine, 1-naphthylalanine, 2-naphthalalanine, tryptophan, β-2-thienylalanine, homophenylalanine, β-3-pyridylalanine, and cyclohexylalanine;

D is the L-stereoisomer of a lipophilic aliphatic amino acid;

E is the L-stereoisomer of an aromatic, aliphatic, or alicyclic amino acid;

F is the L-stereoisomer of an aromatic or heteroaromatic amino acid;

G is glycine or D-alanine;

H is L-glutamic acid or L-glutamine;

I is L-glutamine, L-glutamic acid, or L-alanine;

J is a direct bond between I and group —NH— or is selected from the group consisting of Z, Z-Leu, Z-Leu-Gln, Z-Leu-Gln-Glu (SEQ ID NO:2), Z-Leu-Gln-Glu-Lys (SEQ ID NO:3), Z-Leu-Gln-Glu-Lys-Glu (SEQ ID NO:4), Z-Leu-Gln-Glu-Lys-Glu-Arg (SEQ ID NO:5), Z-Leu-Gln-Glu-Lys-Glu-Arg-Asn (SEQ ID NO:6), Z-Leu-Gln-Glu-Lys-Glu-Arg-Asn-Lys (SEQ ID NO:7), and Z-Leu-Gln-Glu-Lys-Glu-Arg-Asn-Lys-Gly (SEQ ID NO:8), wherein Z is selected from the group consisting of arginine, D-arginine, D-homoarginine, D-lysine, D-ornithine, D-2,4-diaminobutyric acid, D-glutamine, D-asparagine, and D-alanine;

R_1 and R_2 are independently hydrogen or lower-alkyl;

R_3 is cycloalkyl or aryl which may be unsubstituted or substituted with one or more substituents selected from the group consisting of halogen, hydroxy, and lower-alkoxy;

R_4 is selected from the group consisting of $—CH_2CONH_2$, aminoalkyl groups containing from 1 to 3 carbon atoms, and guanidinoalkyl groups containing 2 or 3 carbon atoms;

R_5 is —COOH or $—CONH_2$; and

the symbol * represents an asymmetric carbon atom which may be in the D or L configuration, and each lower-alkyl group contains from 1 to 4 carbon atoms, with the proviso that R_4 is $—CH_2CONH_2$ only when J is Z-Leu or Z-Leu-Gln-Glu-Lys-Glu-Arg-Asn-Lys-Gly (SEQ ID NO:8).

5,470,831

ANGIOGENIC PEPTIDES

Russell B. Whitman, Dix Hills; Robert Wohl, South Setauket, and Ronald G. Duff, East Moriches, all of N.Y., assignors to Curative Technologies, Inc., Setauket, N.Y.

Continuation of Ser. No. 631,823, Dec. 21, 1990, abandoned. This application Mar. 24, 1993, Ser. No. 37,486

Int. Cl.[6] C07K *5/10;7/06;* **A61K** *38/07;38/08*

U.S. Cl. 514—16 **16 Claims**

1. An angiogenic peptide consisting of the amino acid sequence Thr-Thr-Ser-Gln-Val-Arg-Pro-Arg.

5,470,832

INHIBITORS OF GERANYLGERANYL-PROTEIN TRANSFERASE

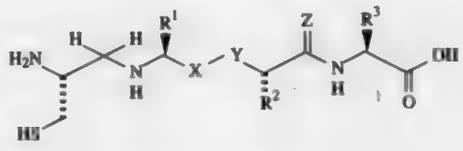
Jackson B. Gibbs, Chalfont, and Samuel L. Graham, Schwenksville, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 31, 1994, Ser. No. 189,772

Int. Cl.[6] A61K *38/00;* **C07K** *5/00;7/00;17/00*

U.S. Cl. 514—18 **10 Claims**

1. A compound which inhibits geranylgeranyl protein transferase type I, and is a selectively more potent inhibitor of geranylgeranyl protein transferase than of farnesyl protein transferase, having the formula I:



I

wherein:

R^1 and R^2 are independently selected from:

a) C_2–C_8 alkyl;

b) C_2–C_8 alkenyl;

c) C_2–C_8 alkynyl;

d) substituted C_1–C_8 alkyl;

e) aryl;

f) substituted aryl;

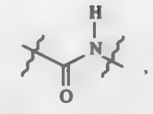
g) heteroaryl;

h) substituted heteroaryl; and

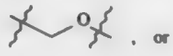
i) the side chain of a naturally occurring amino acid;

R^3 is selected from alkyl, alkenyl and alkynyl of 1 to 6 carbon atoms, either branched or straight chain, which is unsubstituted or substituted with a phenyl group;

X—Y is

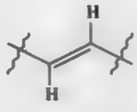


a)



. or

b)



c)

and Z is H_2 or O;

or the pharmaceutically acceptable: salts thereof.

5,470,833

ENDOTHELIN ANTAGONISTIC PEPTIDE DERIVATIVES

Kiyofumi Ishikawa; Takehiro Fukami; Takashi Hayama; Kenji Niiyama; Toshio Nagase; Toshiaki Mase; Kagari Fujita; Masaki Ihara; Fumihiko Ikemoto, and Mitsuo Yano, all of Tokyo, Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

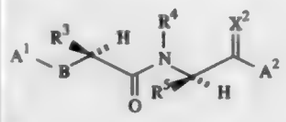
Continuation of Ser. No. 884,189, May 18, 1992, abandoned, which is a division of Ser. No. 712,095, Jun. 7, 1991, abandoned. This application Mar. 14, 1994, Ser. No. 213,829

Claims priority, application Japan, Jun. 7, 1990, 2-149105

Int. Cl.[6] **A61K** *38/00;* **C07K** *5/00;5/08;5/10*

U.S. Cl. 514—18 **55 Claims**

1. A peptide of the formula:



(I)

wherein

A^1 is a group of the formula R^{11}—CO—; wherein R^{11} is a lower alkyl group, a cycloalkyl group, a cycloalkyl lower alkyl group, a group of the formula Ar^1—$(CH_2)_p$— wherein Ar^1 is a phenyl group, a furyl group or a thienyl group, and p is 0, 1 or 2, a 1,3-dithiol-2-ylidenemethyl group, or a 1,3-dithiol-2-ylidene(lower alkoxycarbonyl)methyl group,

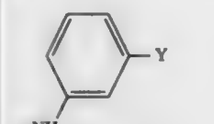
B is an oxygen atom or a group of the formula —NR^2— wherein R^2 is a hydrogen atom or a methyl group,

R^3 is a lower alkyl group having 3 to 5 carbon atoms; R^4 is a hydrogen atom or a methyl group;

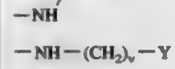
R^5 is a 3-indolylmethyl group, a (2,3-dihydro-2-oxo-3-indolyl)methyl group, a 3-indolylmethyl group wherein the indole ring is substituted at the 1-position by a group of the formula R^{51}—CO—$(CH_2)_s$— wherein R^{51} is a hydrogen atom, a lower alkyl group, a hydroxyl group, a lower alkoxy group, a benzyloxy group, an amino group or a mono lower alkylamino group, s is an integer of from 0 to 6, provided that when s= 0, R^{51} is other than a hydroxyl group, or a group of the formula $(R^{52}O)_2P(=O)$—$(CH_2)_t$— wherein R^{52} is a hydrogen atom, a lower alkyl group or a benzyl group, and t is an integer of from 0 to 6, a benzyl group wherein an optional hydrogen atom on the benzene ring may be replaced by a group of the formula $R^{53}O$—CO—$(CH_2)_u$— wherein R^{53} is a hydrogen atom or a lower alkyl group, and u is an integer of from 0 to 6, a benzyl group wherein one or two optional hydrogen atoms on the benzene ring are replaced by a hydroxyl group(s), or two optional hydrogen atoms on the benzene ring are replaced by a hydroxyl group and a sulfo group, a 3-benzothienylmethyl group, a (1-oxo-3-benzothienyl)methyl group, or a (1,1-dioxo-3-benzothienyl)methyl group;

X^2 is an oxygen atom or a sulfur atom;

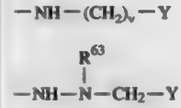
A^2 is selected from the group consisting of the following formulas (V), (VII, (VII) and (VIII):



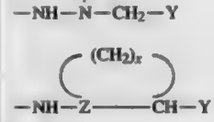
(V)



(VI)



(VII)



(VIII)

wherein Y is

(a) a group of the formula —CO_2R^{91} wherein R^{91} is a hydrogen atom, a lower alkyl group or a benzyl group, or

(b) a group of the formula —$CONR^{92}R^{93}$ wherein R^{92} is a hydrogen atom, a lower alkyl group, a lower alkylsulfonyl group, a phenylsulphonyl group wherein one to five optional hydrogen atoms on the benzene ring may independently be replaced by a lower alkyl group or a halogen atom, or a carboxymethyl group, and R^{93} is a hydrogen atom or a lower alkyl group, v is 3, 4 or 5, R^{63} is a hydrogen atom, a lower alkyl group, a carboxy lower alkyl group, a group of the formula Ar^4—$(CH_2)_w$— wherein Ar^4 is a phenyl group, a furyl group or a thienyl group, and w is 1 or 2, Z is CH or N, and x is 1, 2 or 3; or a pharmaceutically acceptable salt thereof.

5,470,834

SULFOXIMINE AND SULIDODIIMINE MATRIX METALLOPROTEINASE INHIBITORS

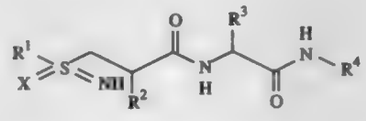
Martin A. Schwartz, Tallahassee, Fla., and Harold Van Wart, Los Altos, Calif., assignors to Florida State University, Tallahassee, Fla.

Filed Oct. 6, 1993, Ser. No. 132,411

Int. Cl.[6] **A61K** *38/05;38/06;* **C07K** *5/062;5/065*

U.S. Cl. 514—19 **43 Claims**

1. A compound of the formula



wherein:

R^1 is selected from the group consisting of lower-alkyl, hydroxy lower-alkyl, amino lower-alkyl, carbamoyl lower-alkyl, lower-alkyl carbonyl, lower-alkyoxyalkyl, aralkyl and heteroaralkyl;

X is NH or O;

R^2 is selected from the group consisting of hydrogen, lower-alkyl and aralkyl;

R^3 is selected from the group consisting of hydrogen, lower-alkyl, amino lower-alkyl, guanyl lower-alkyl, aralkyl and heteroaralkyl; and

R^4 is selected from the group consisting of lower alkyl, aralkyl and —$CH(R^5)$—$C(O)NH_2$,

wherein R^5 is selected from the group consisting of hydrogen, lower-alkyl, amino lower-alkyl, guanyl lower-alkyl, imidazoylalkyl, hydroxymethyl, 1-hydroxyethyl, mercapto lower-alkyl, and methylthio lower-alkyl;

or a pharmaceutically acceptable ester, ether or salt thereof.

5,470,835

TRANSFER FACTOR AND METHODS OF USE

Charles H. Kirkpatrick, Denver, and Stephen J. Rozzo, Aurora, both of Colo., assignors to National Jewish Center for Immunology and Respiratory Medicine, Denver, Colo.

Continuation of Ser. No. 20,244, Feb. 19, 1993, abandoned, which is a continuation of Ser. No. 718,571, Jun. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 547,500, Jul. 2, 1990, abandoned. This application Jul. 22, 1994, Ser. No. 279,278

Int. Cl.[6] **A61K** *38/00;* **C07K** *5/00;7/00;17/00*

U.S. Cl. 514—21 **23 Claims**

1. An isolated transfer factor with a specific activity of at least 5000 units of transfer factor activity per absorbance unit at 214 nm wherein a unit of transfer factor activity is defined as the amount of material that produces a half-maximal footpad swelling response in mice, and wherein the isolated transfer factor is capable of transferring delayed-type cell mediated immunity to a non-immune human or animal.

5,470,836

PAROMOMYCIN OR ITS DERIVATIVES OR SALTS THEREOF IN COMBINATION WITH SODIUM STIROGLUCONATE FOR PARENTERAL TREATMENT OF HUMAN PARASITIC DISEASES

Luigi Donno, Milan, and Giuseppe Cassinelli, Voghera, both of, Italy, assignors to Farmitalia Carlo Erba S.r.l., Milan, Italy

Continuation of Ser. No. 86,565, Jul. 6, 1993, abandoned, which is a continuation of Ser. No. 943,139, Sep. 10, 1990, abandoned, which is a continuation of Ser. No. 598,611, Oct. 25, 1990, abandoned. This application Dec. 5, 1994, Ser. No. 354,017

Claims priority, application United Kingdom, Apr. 29, 1988, 8810246

Int. Cl.[6] A61K *31/70*

U.S. Cl. 514—38 **6 Claims**

1. A method of treatment of visceral leishmaniasis which comprises administering parenterally to a subject suffering therefrom, paromomycin or a non-toxic acid addition salt thereof, and sodium stibogluconate, in a weight ratio of from 1:9 to 9:1.

5,470,837

5'-VINYLHALO-ARISTEROMYCIN/ADENOSINE ANALOGS AND IMMUNOSUPPRESSANTS

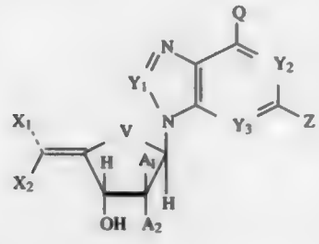
Jeffrey A. Wolos, Loveland; Niall S. Doherty, West Chester; Esa T. Jarvi, Cincinnati, and James R. McCarthy, West Chester, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 150,579, Nov. 10, 1993, abandoned, which is a continuation of Ser. No. 900,549, Jun. 18, 1992, abandoned, which is a continuation of Ser. No. 568,579, Aug. 16, 1990, abandoned. This application Jun. 16, 1994, Ser. No. 260,617

Int. Cl.[6] A61K *31/70*

U.S. Cl. 514—45 **8 Claims**

1. A method of effecting immunosuppression in a patient in need thereof comprising administering to said patient an effective immunosuppressive amount of a compound of the formula



wherein

V is oxy or methylene,

X_1 and X_2 are each independently hydrogen or halogen with the proviso that at least one of X_1 and X_2 is always a halogen atom,

A_1 and A_2 are each independently hydrogen, halogen,or hydroxy with the provisos that where A_1 is hydroxy, A_2 is hydrogen, and that where A_2 is hydroxy, A_1 is hydrogen,

Y_1 is nitrogen, a CH group, a CCl group, a CBr group or a CNH_2 group,

Y_2 and Y_3 are each independently nitrogen or a CH group,

Q is NH_2, NHOH, $NHCH_3$, or hydrogen, and Z is hydrogen, halogen, or NH_2.

5,470,838

METHOD OF DELIVERING EXOGENOUS URIDINE OR CYTIDINE USING ACYLATED URIDINE OR CYTIDINE

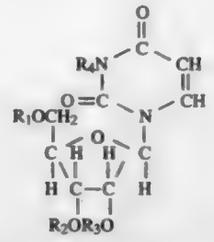
Reid W. von Borstel, and Michael K. Bamat, both of Darnestown, Md., assignors to Pro-Neuron, Inc., Rockville, Md.

Continuation of Ser. No. 438,493, Jun. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 115,929, Oct. 28, 1987, abandoned. This application Dec. 30, 1992, Ser. No. 997,657

Int. Cl.[6] A61K *31/70;* **C07H** *19/067*

U.S. Cl. 514—50 **61 Claims**

1. A method of delivering exogenous uridine to the tissue of an animal, comprising the step of administering to said animal an acyl derivative of uridine having the formula (I)



(I)

wherein R_1, R_2, R_3, and R_4 are the same or different and each is hydrogen or an acyl radical of a carboxylic acid selected from the group consisting of glycolic acid, pyruvic acid, lactic acid, enolpyruvic acid, an amino acid, a fatty acid of 2 to 22 carbon atoms, lipoic acid, pantothenic acid, succinic acid, fumaric acid, adipic acid, acetoacetic acid, p-aminobenzoic acid, betahydroxybutyric acid, orotic acid, and creatine, provided that at least one of said R substituents is not hydrogen, or a pharmaceutically acceptable salt thereof.

5,470,839

ENTERAL DIET AND METHOD FOR PROVIDING NUTRITION TO A DIABETIC

Philip Laughlin, Winnetka; John Alexander, Kenilworth; A. Reza Kamarei, Wilmette; Robert P. Dobbie, Lincolnshire, all of Ill.; Paul Lin, Fullerton, Calif.; Shen-Youn Chang, Wadsworth, Ill.; Sekhar Reddy, New Milford, Conn.; Etienne Grasset, Boulogne-Billancourt, France, and Christian Melin, Winnetka, Ill., assignors to Clintec Nutrition Company, Deerfield, Ill.

Continuation-in-part of Ser. No. 51,632, Apr. 22, 1993, abandoned. This application Jul. 6, 1994, Ser. No. 271,114

Int. Cl.[6] A61K *31/00*

U.S. Cl. 514—53 **20 Claims**

1. A method for providing nutrition to a diabetic patient without substantially increasing blood glucose levels comprising the steps of enterally administering to the diabetic patient a low carbohydrate, high fat enteral composition comprising:

a protein source;

a carbohydrate source including a slowly digested high amylose starch component; and

a fat source that includes medium chain triglycerides and has an n-6:n-3 ratio of not more than 10.

5,470,840

ANTI-INFLAMMATORY COMPOUNDS AND COMPOSITIONS

David Cullis-Hill, Bondi Junction, and Peter Ghosh, Fairlight, both of, Australia, assignors to Arthropharm Pty Limited, Bondi Junction, Australia

Division of Ser. No. 423,455, Sep. 19, 1989, Pat. No. 5,145,841. This application Jun. 10, 1992, Ser. No. 903,081

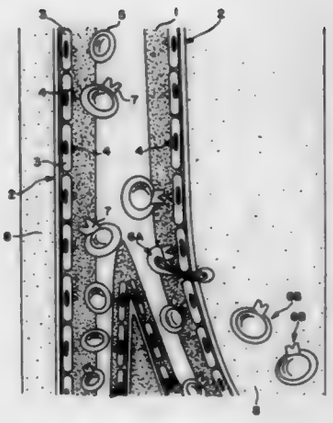
Claims priority, application Australia, Mar. 19, 1987, PI0951; Jun. 15, 1987, PI2478; Dec. 9, 1987, PI5819

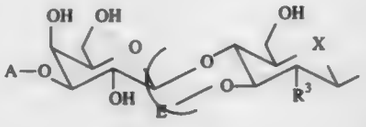
Int. Cl.[6] A61K *31/70;31/72;31/715;* **C07N** *3/00*

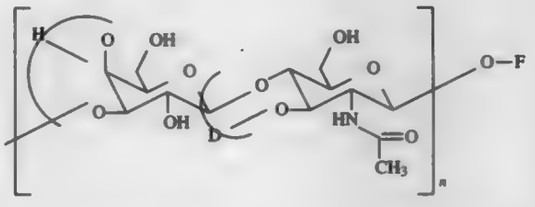
U.S. Cl. 514—54 **12 Claims**

1. A divalent metal ion chelate of a polysulfate of xylan having glycosidically linked D-glucuronyl side chains with divalent metal ions chelated thereto wherein 83% to 100% of all monovalent ions have been substituted by divalent metal ions, said divalent metal ion being selected from the group consisting of Ca^{2+}, Mg^{2+}, Cu^{2+} and Zn^{2+}.

7. A therapeutical composition with anti-inflammatory activity, which comprises an effective amount of a chelate as claimed in claim 1 and a therapeutically acceptable carrier.







5,470,841

METABOLIZABLE PLASMA SUBSTITUTE

Harald Förster; Fatima Asskali, both of Frankfurt am Main, Germany, and Ernst Nitsch, Linz, Austria, assignors to Laevosan-Gesellschaft mbH, Linz/Donau, Australia

Filed Jan. 7, 1994, Ser. No. 178,543

The portion of the term of this patent subsequent to Jul. 25, 2012, has been disclaimed.

Int. Cl.[6] A61K *31/72;* **C08B** *31/04;35/02;* **C08L** *3/16*

U.S. Cl. 514—60 **14 Claims**

1. A blood plasma substitute, comprising a starch ester in aqueous solution, wherein said starch ester is substituted with acyl groups of monocarboxylic acids with 2 to 6 C atoms, dicarboxylic acids with 2 to 6 C atoms or mixtures of said mono and dicarboxylic acids, and wherein said starch ester has a molecular weight (Mw) of > 20000 Daltons and a molar substitution of 0.1 to 1.5.

5,470,842

NEW CARBOHYDRATE-BASED ANTI-INFLAMMATORY AGENTS

Brian K. Brandley, Alameda; Michael Tiemeyer; Stuart J. Swiedler, both of Oakland; Margaret Moreland, Berkeley, and Hans Schweingruber, Mountain View, all of Calif., assignors to Glycomed, Incorporated, Alameda, Calif.

Division of Ser. No. 683,458, Apr. 11, 1991, Pat. No. 5,211,937, which is a continuation-in-part of Ser. No. 637,868, Jan. 7, 1991, Pat. No. 5,143,712, which is a continuation-in-part of Ser. No. 613,113, Nov. 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 559,836, Jul. 30, 1990, Pat. No. 5,211,936. This application Mar. 2, 1992, Ser. No. 844,102

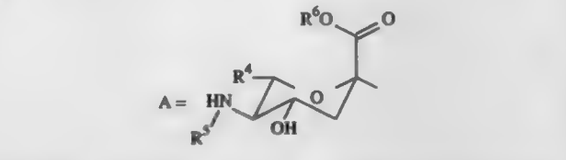
Int. Cl.[6] A61K *31/725*

U.S. Cl. 514—61 **9 Claims**

1. An injectable pharmaceutical composition, comprising:

a pharmaceutically acceptable, injectable excipient carrier; and

a compound which binds to ELAM-1 wherein the compound has the following structure:



each of the saccharide rings shown, is connected at its 1-position to the next saccharide ring at a position selected from the group consisting of the 3-position and the 4-position and wherein the variables are defined as follows:

wherein R^4 is selected from the group consisting of H, and an alkyl containing 1 to 6 carbons;

R^5 is selected from the group consisting of H, alkyl containing 1 to 6 carbons, and $COCH_3$; and

R^6 is selected from the group consisting of H, and an alkyl containing 1 to 6 carbons;

E and D are each independently H or fucose wherein E or one D is fucose connected to the 3-position or 4-position of the sugar to which it is bound and the bond is in an alpha configuration;

R^3 is selected from the group consisting of OH and NAc with the proviso that R^3 is OH if n is O;

n is an integer of from 0 to 10 with the proviso that if n is O, then R^3 is OH and E is fucose;

F is a linking group bound to a pharmaceutically active drug;

X is O;

wherein the compound which binds to ELAM-1 is present in the composition in an amount in the range of about 1% to about 95% by weight.

5,470,843

CARBOHYDRATE-CONTAINING POLYMERS, THEIR PREPARATION AND USE

Wilhelm Stahl, Frankfurt am Main; Michael Ahlers, Mainz; Axel Walch, Frankfurt am Main; Eckhart Bartnik, Wiesbaden; Gerhard Kretzschmar, Eschborn; Susanne Grabley, Koenigstein, and Rudolf Schleyerbach, Hofheim/Taunus, all of, Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 13, 1993, Ser. No. 165,805

Claims priority, application Germany, Dec. 11, 1992, 42 41 829.1; Aug. 10, 1993, 43 26 777.7

Int. Cl.[6] A61K *31/735*

U.S. Cl. 514—61 **14 Claims**

1. A carbohydrate-containing polymer comprising:

(i) a hydrophilic polymer selected from the group consisting of poly-D,L-succinimide, poly-α,β-(2-hydroxyethyl)-D,L-aspartamide, poly-D,L-succinimide-poly-α,β-(2-hydroxyethyl)-D,L-aspartamide copolymer, poly-L-lysine methyl ester-fumaramide, polyglutamate, and hydroxyethylstarch;

(ii) a carbohydrate selected from the group consisting of N-acetylglucosamine, sialyl-Lewis X and sialyl-Lewis A; and

(iii) a bifunctional spacer linking said carbohydrate to said hydrophilic polymer.

5,470,844

HETEROCYCLIC-NMDA ANTAGONISTS

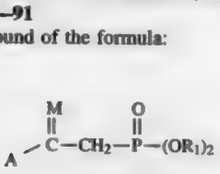
Jeffrey P. Whitten, Cincinnati, Ohio, assignor to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 986,222, Dec. 7, 1992, abandoned, which is a division of Ser. No. 675,156, Mar. 28, 1991, Pat. No. 5,194,430, which is a continuation-in-part of Ser. No. 525,290, May 17, 1990, abandoned. This application Nov. 30, 1993, Ser. No. 159,913

Int. Cl.[6] C07D *261/14;* **A61K** *31/365*

U.S. Cl. 514—91 **17 Claims**

1. A compound of the formula:

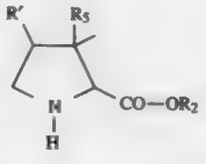


Formula I

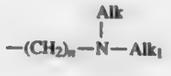
in which R_1 is represented by hydrogen, C_{1-4} alkyl or CF_3; M is represented by O, N—O—R_4 or

in which R_4 is represented by hydrogen, C_{1-4} alkyl or phenyl (C_{1-3} alkyl);

A is represented by:



in which R_2 is represented by hydrogen, C_{1-4} alkyl, cyclopentyl, cyclohexyl,



phenyl, substituted phenyl in which the phenyl moiety is substituted with up to 3 substituents with each substituent being independently selected from the group consisting of halogens, C_1–C_4 alkyl, C_1–C_4 alkoxyl, CF_3, OCF_3, OH, CN, $COOR_6$ and $CONR_6R_7$, phenyl (C_{1-3} alkyl) in which the phenyl moiety may be optionally substituted;

R_5 is represented by hydrogen, linear C_{1-4} alkyl, or phenyl (C_{1-3} alkyl); R' is represented by hydrogen, C_{1-4} alkyl, phenyl, phenyl (C_{1-3} alkyl), or cyclohexylmethyl; R_6 and R_7 are each represented by hydrogen or a C_1–C_4 alkyl;

in which n is represented by an integer from 2–4 and Alk and Alk_1 are each represented by a C_{1-4} alkyl; or a pharmaceutically acceptable salt thereof.

5,470,845

METHODS OF USING α-PHOSPHONOSULFONATE SQUALENE SYNTHETASE INHIBITORS INCLUDING THE TREATMENT OF ATHEROSCLEROSIS AND HYPERCHOLESTEROLEMIA

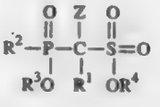
David R. Magnin, Hamilton; Scott A. Biller, Ewing; John K. Dickson, Jr., Mount Holly, all of N.J.; R. Michael Lawrence, Yardley, Pa., and Richard B. Sulsky, Franklin Park, N.J., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Division of Ser. No. 109,762, Aug. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 967,904, Oct. 28, 1992, abandoned. This application Jul. 5, 1994, Ser. No. 266,843

Int. Cl.[6] A61K *31/66*

U.S. Cl. 514—121 **14 Claims**

1. A method of inhibiting cholesterol biosynthesis, or inhibiting and/or treating hyperlipemia, hyperlipidemia, hyperlipoproteinemia, hypercholesterolemia, and/or hypertriglyceridemia, or inhibiting and/or treating atherosclerosis, which comprises administering to a patient in need of such treatment a therapeutically effective amount of a compound having the structure



wherein

R^2 is OR^5 or R^{5a};

R^3 and R^5 are independently H, alkyl, arylalkyl, aryl, cycloalkyl, metal ion or other pharmaceutically acceptable salt, or prodrug ester;

R^{5a} is H, alkyl, arylalkyl or aryl;

R^4 is H, alkyl, aryl, cycloalkyl, arylalkyl, metal ion, or other pharmaceutically acceptable salt, or prodrug ester;

R^1 is a lipophilic group containing at least 7 carbons;

Z is H, halogen, lower alkyl or lower alkenyl.

5,470,846

TREATMENT OF NEUROLOGICAL AND MENTAL DISORDERS

Reuven Sandyk, 7 Piper Ct., Roslyn, N.Y. 11576

Filed Jan. 14, 1994, Ser. No. 181,677

Int. Cl.[6] A61K *31/60*

U.S. Cl. 514—159 **27 Claims**

1. A method of treating neurological and mental disorders which are associated with and related pathogenetically to deficient serotonin neurotransmission and impaired pineal melatonin functions in humans and for treating neurological and mental disorders which are associated with or related pathogenetically to deficient serotonin neurotransmission and impaired pineal melatonin functions in humans, which comprises administering to a human in need thereof an effective amount of a composition which increases serotonin transmission to the patient to be treated followed by the application to the brain of the patient of a sufficient amount of AC pulsed magnetic field of proper intensity and frequency to treat the disorder.

5,470,847

OVULATION CONTROL BY REGULATING NITRIC OXIDE LEVELS WITH ARGININE DERIVATIVES

Robert E. Garfield, Friendswood, and Chandrasekhar Yallampalli, Houston, both of Tex., assignors to Board of Regents, the University of Texas System, Austin, Tex.

Filed Dec. 10, 1993, Ser. No. 165,309

Int. Cl.[6] A61K *31/195;31/56*

U.S. Cl. 514—171 19 Claims

1. A method of contraception comprising:

administering an inhibitor of nitric oxide production selected from the group consisting of N^G-nitro-L-arginine methyl ester, N^G-ethyl-L-arginine, N-iminoethyl-L-arginine, L-N^G-methylarginine and N^G-nitro-L-arginine to a female in an amount inhibiting ovulation.

5,470,848

PENETRATION ENHANCERS FOR TRANSDERMAL DELIVERY OF SYSTEMIC AGENTS

Gevork Minaskanian, 8 Havenwood, Irvine, Calif. 92714, and James V. Peck, 2524 Bowdoin Pl., Costa Mesa, Calif. 92626

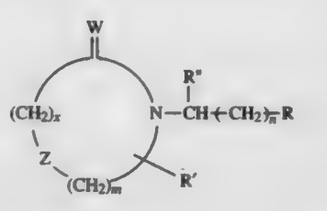
Division of Ser. No. 989,434, Dec. 11, 1992, abandoned, which is a division of Ser. No. 611,613, Nov. 13, 1990, Pat. No. 5,234,959, which is a continuation of Ser. No. 199,801, Jun. 20, 1988, Pat. No. 4,996,199, which is a continuation-in-part of Ser. No. 179,144, Apr. 8, 1988, abandoned. This application Oct. 22, 1993, Ser. No. 139,684

The portion of the term of this patent subsequent to Jun. 2, 2009, has been disclaimed.

Int. Cl.[6] A61K *31/56;31/445;31/40;31/04*

U.S. Cl. 514—182 7 Claims

1. A method for topically administering systemically active agents through the skin or mucosal membranes of a human or animal which method comprises the topical administration of effective amounts of a systemically active agent and a membrane penetration enhancer having the structural formula



or the pharmaceutically acceptable salt thereof, wherein

W represents oxygen, sulfur or two hydrogen radicals;

Z represents —CH_2—;

R represents alkyl optionally substituted with one to three double or triple bonds, —SR'", —OR'", —NHR'", or —$COOR_1$;

R'" represents alkyl, alkylthioalkyl, alkoxyalkyl, aminoalkyl, optionally substituted with a phenyl, or benzoyl;

R' represents hydrogen, alkyl, alkoxy, acyloxy, alkylthio, hydroxy or —$(CH_2)_yCOOR_1$;

R" represents hydrogen or —$(CH_2)_yCOOR_1$;

R_1, in each instance, independently represents hydrogen or lower alkyl;

y, in each instance, is between zero and 3, inclusive;

m is between one and 4, inclusive;

n is between one and 24, inclusive; and

x is zero or one, inclusive;

with the provisos that when R" is hydrogen, then W is two hydrogen radicals and R' is not hydrogen; and when R' is hydrogen, then R" is not hydrogen.

5,470,849

γ-TURN PEPTIDOMIMETICS AS FIBRINOGEN ANTAGONISTS

James F. Callahan, Philadelphia, and William F. Huffman, Malvern, both of Pa., assignors to SmithKline Beecham Corp., Philadelphia, Pa.

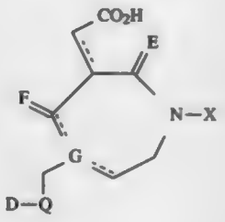
PCT No. PCT/US91/08166, § 371 Date Apr. 30, 1993, § 102(e) Date Apr. 30, 1993

PCT Filed Oct. 31, 1991, Ser. No. 50,178

Int. Cl.[6] A61K *31/55;* C07D *401/00;405/00;409/00*

U.S. Cl. 514—212 16 Claims

1. A compound of the formula:

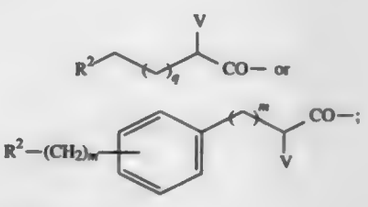


(II)

wherein:

Q is NR' or O;

D is



E and F are (H,H), O or S;

G is N or C;

V is H, R', SR', A-B-O or A-B-NR';

A is H, R', $(CH_2)_nAr$, R_1CO, R_1OCO, $R_1OCH(R_{1'})CO$, $R_1NHCH(R_{1'})CO$, $R_1SCH(R_{1'})CO$, R_1SO_2 or R_1SO;

R_1 and $R_{1'}$ are H, C_{1-5}alkyl, C_{3-7}cycloalkyl, aryl or aryl substituted by one or two C_{1-5}alkyl, trifluoromethyl, hydroxy, C_{1-5}alkoxy or halogen groups;

R^2 is $N(R')_2$, NR'C(=O)NHR', C(=NR')NHR' or NR'C(=NR')NHR';

B is absent, Arg, HArg, (Me_2)Arg, (Et_2)Arg, Ala, Gly, His, Abu or an α-R' substituted derivative thereof, or Pro;

X is R", $CHRCH_2$-Y-Z or CHRCO-Y-Z;

Y is absent or a D- or L- amino acid chosen from Tyr, (Alk)Tyr, Phe, (4'W)Phe, HPhe, Phg, Trp, His, Ser, (Alk)Ser, Thr, (Alk)Thr, Cys, (Alk)Cys, Pen, (Alk)Pen, Ala, Val, Nva, Met, Leu, Ile, Nle and Nal;

Z is R" or OR", NR'R" or R";

R is H, C_{1-6}alkyl, $(CH_2)_n$Het, $(CH_2)_n$CONHR', $(CH_2)_n$NR'R', $(CH_2)_nNC{=}N$-NR', $(CH_2)_n$OR' or $(CH_2)_n$SR' or $(CH_2)_n$Ar;

R' is H, C_{1-4} alkyl or $(CH_2)_n$Ar;

R" is H, C_{1-6}alkyl, C_{3-7}cycloalkyl, amino, Ar, $(CHR')_n(CH_2)_n$-Ar, C_{3-7}cycloalkyl-Ar, Het, $(CH_2)_n$Het or C_{3-7}cycloalkyl-Het;

Ar is phenyl or naphthyl optionally substituted by one or two C_{1-5}alkyl, C_{1-5}alkoxy, C_{1-5}alkylthio, CO_2R', $CON(R')_2$, hydroxy, halogen, trifluoromethyl, amino or nitro groups.

Het is pyridyl, indolyl, imidazolyl or thienyl substituted by one or two C_{1-4}alkyl, CO_2R', $CON(R')_2$, OR' or SR';

-- is a single or double bond;

m is 0 to 2;

n is 0 to 3;

p is 1 to 3;

q is 1 to 4; and

pharmaceutically acceptable salts thereof.

5,470,850

2,3,4,5-TETRAHYDRO-1H-3-BENZAZEPINES

Christian Foged, Birkerød; Rolf Holweg, Kvistgaard, and Erik Nielsen, Vælgse, all of, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

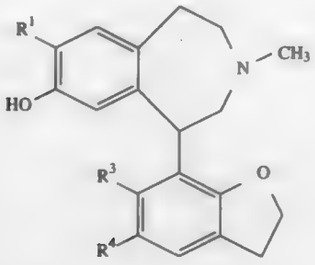
Continuation-in-part of Ser. No. 161,856, Dec. 3, 1993, abandoned, which is a continuation of Ser. No. 15,942, Feb. 10, 1993, abandoned. This application May 6, 1994, Ser. No. 238,996

Claims priority, application Denmark, Feb. 24, 1992, 0233/92

Int. Cl.[6] **C07D** *405/02;405/10;* **A61K** *31/55*

U.S. Cl. 514—213 **7 Claims**

1. 2,3,4,5-tetrahydro-1H-3-benzazepines having the formula I



(I)

wherein

R^1 is Cl or Br;

R^3 and R^4 independently are hydrogen, halogen, CF_3, CN, NO_2 or NH_2 and all optical isomers thereof, and pharmaceutically acceptable acid addition salts thereof, provided that R^3 and R^4 cannot be hydrogen at the same time.

6. A method of treating a mental disorder relating to a dysfunction of a dopamine D-1 receptor in a person in need of such treatment characterized in administering to said person an amount of a compound according to claim 1 effective in alleviation of such an ailment.

5,470,851

THIAZOLIDINECARBOXYLIC ACID AMIDE DERIVATIVES AND THEIR THERAPEUTIC USES

Hiroshi Fukumi; Toshiaki Sakamoto; Mitsuo Sugiyama; Takeshi Yamaguchi; Takeshi Oshima; Fumitoshi Asai, and Yasuteru Iijima, all of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

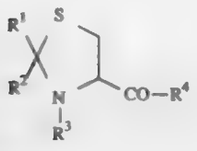
Continuation-in-part of Ser. No. 997,357, Dec. 28, 1992, abandoned, Ser. No. 95,313, Jul. 21, 1993, abandoned, and Ser. No. 974,187, Nov. 10, 1992, abandoned, said Ser. No. 95,313is a continuation of Ser. No. 3,850, Jan. 11, 1993, abandoned, which is a continuation of Ser. No. 720,639, Jun. 25, 1991, abandoned. This application Sep. 30, 1993, Ser. No. 129,774

Claims priority, application Japan, Jun. 27, 1990, 2-169479; Dec. 27, 1991, 3-345736; Mar. 13, 1992, 4-054698

Int. Cl.[6] **C07D** *417/04;417/14;487/04;* **A61K** *31/55*

U.S. Cl. 514—214 **90 Claims**

1. A compound of formula (I):



(I)

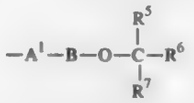
wherein:

R^1 represents a pyridyl group which is unsubstituted or is substituted by at least one substituent selected from the group consisting of alkyl groups having from 1 to 4 carbon atoms and alkoxy groups having from 1 to 4 carbon atoms;

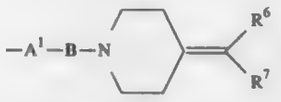
R^2 represents a hydrogen atom, or a pyridyl group which is unsubstituted or is substituted by at least one substituent selected from the group consisting of alkyl groups having from 1 to 4 carbon atoms and alkoxy groups having from 1 to 4 carbon atoms;

R^3 represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms;

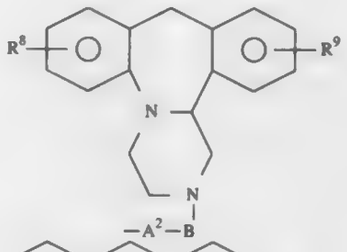
R^4 represents a group of formula (II), (III), (IV), (V) or (VI):



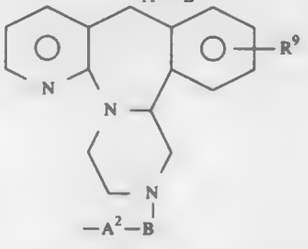
(II)



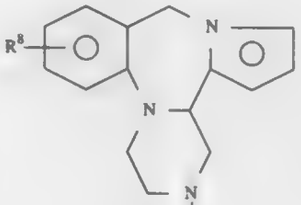
(III)



(IV)



(V)



(VI)

wherein:

R^5 represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms;

R^6 and R^7 are independently selected from the group consisting of:

unsubstituted phenyl groups,

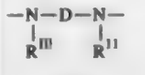
substituted phenyl groups which are substituted by at least one substituent selected from the group consisting of alkyl groups having from 1 to 4 carbon atoms, haloalkyl groups having 1 to 4 carbon atoms and having at least one halogen atom, alkoxy groups having from 1 to 4 carbon atoms and halogen atoms,

cycloalkyl groups having from 3 to 6 ring carbon atoms, and

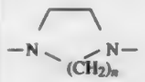
aromatic heterocyclic groups having 5 or 6 ring atoms of which from 1 to 3 are hetero-atoms selected from the group consisting of nitrogen, oxygen and sulfur atoms and the remainder are carbon atoms;

R^8 and R^9 are independently from the group consisting of hydrogen atoms, alkyl groups having from 1 to 4 carbon atoms, haloalkyl groups having from 1 to 4 carbon atoms and having at least one halogen atom, alkoxy groups having from 1 to 4 carbon atoms, hydroxy groups and halogen atoms;

A^1 represents a group of formula (VII) or (VIII):



(VII)



(VIII)

where:

R^{11} and R^{111} are independently selected from the group consisting of hydrogen atoms and alkyl groups having from 1 to 4 carbon atoms;

D represents an alkylene or alkylidene group having from 2 to 5 carbon atoms; and

n is 2 or 3;

A^2 represents a group of formula (VIII), above, or (IX):

(IX)

where R^{10} is as defined above; and

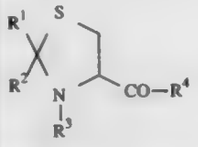
B represents an alkylene or alkylidene group having from 2 to 4 carbon atoms; or

—A^2—B— represents a single bond;

or a pharmaceutically acceptable salt thereof.

53. A method for the treatment or prophyaxis of hsitamine-related disorders in a mammal, which comprises administering to said mammal an effective amount of an anti-histamine, wherein the anti-histamine is at least one compound selected from the group consisting of compounds of formula (I) and pharmaceutically acceptable salts thereof, as claimed in claim **1**.

57. Compounds of formula (I):



(I)

wherein:

R^1 represents a pyridyl group which is unsubstituted or is substituted by at least one substituent selected from the group consisting of alkyl groups having from 1 to 4 carbon atoms and alkoxy groups having from 1 to 4 carbon atoms;

R^2 represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms, or a pyridyl group which is unsubstituted or which is substituted by at least one substituent selected from the group consisting of alkyl groups having from 1 to 4 carbon atoms and alkoxy groups having from 1 to 4 carbon atoms;

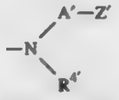
R^3 represents a hydrogen atom, an alkyl group having from 1 to 4 carbon atoms, an alkoxycarbonyl group having from 2 to 5 carbon atoms, an aralkyloxycarbonyl group in which the alkyl part has from 1 to 4 carbon atoms and the aryl part is as defined below, an aryloxycarbonyl group in which the aryl part is as defined below, an aliphatic carboxylic acyl group having from 1 to 5 carbon atoms, an aliphatic carboxylic acyl group which has from 2 to 5 carbon atoms and which is substituted by at least one halogen atom, an arylcarbonyl group in which the aryl part is as defined below, an alkylsulfonyl group having from 1 to 4 carbon atoms, an arylsulfonyl group in which the aryl part is as defined below, or a group formula -B'-$NR^{5'}R^{6'}$, in which

B' represents an alkylene or alkylidene group having from 2 to 4 carbon atoms; and

$R^{5'}$ and $R^{6'}$ are independently selected from the group consisting of hydrogen atoms and alkyl groups having from 1 to 4 carbon atoms;

said aryl groups have from 6 to 10 ring atoms and are unsubstituted or are substituted by at least one substituent selected from the group consisting of alkyl groups having from 1 to 4 carbon atoms, alkoxy groups having from 1 to 4 carbon atoms and halogen atoms;

R^4 represents a group of formula (VI)':

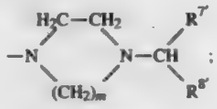


(VI)'

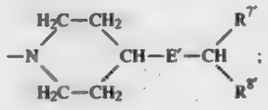
$R^{4'}$ represents a hydrogen atom or an alkyl group having from 1 to 4 carbon atoms;

A' represents an alkylene or alkylidene group having from 2 to 7 carbon atoms; and

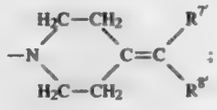
Z' represents a group of formula:



(II)'

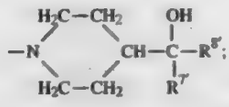


(III)'



(IV)'

or



(V)'

or a group of formulae (II)', (III)', (IV)' or (V)' in which one or more of the ring atoms is substituted by an alkyl group having from 1 to 4 carbon atoms;

in which:

$R^{7'}$ and $R^{8'}$ are independently selected from the group consisting of unsubstituted phenyl groups, substituted phenyl groups which are substituted by at least one substituent selected from the group consisting of substituents (a), defined below, and aromatic heterocyclic groups which have 5 or 6 ring atoms of which 1 or 2 are hetero-atoms selected from the group consisting of nitrogen, oxygen and sulfur hetero-atoms, said aromatic heterocyclic groups being unsubstituted or being substituted by at least one substituent selected from the group consisting of substituents (a), defined below;

said substituents (a) are selected from the group consisting of alkyl groups having from 1 to 4 carbon atoms, alkoxy groups having from 1 to 4 carbon atoms, halogen atoms and haloalkyl groups having from 1 to 4 carbon atoms;

E' represents a direct carbon-carbon single bond or an oxygen atom; and

m is 2 or 3;

or a pharmaceutically acceptable salt thereof.

5,470,852

TETRAHYDROPROTOBERBERINE QUATERNARY AMMONIUM COMPOUNDS USEFUL IN FOR TREATING ARRHYTHMIA

Sixun Peng; Dezai Dai; Zhenya Huang; Wenlong Huang; Youqun Wang; Can Zhang, and Feng Yu, all of Nanjing, China, assignors to China Pharmaceutical University, Nanjing, and Administrative Center of New Drug Research, The State Pharmaceutical Administration of China, Beijing, both of, China

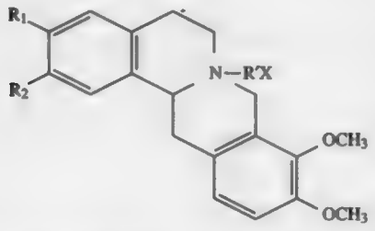
Continuation of Ser. No. 964,252, Oct. 21, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,463

Claims priority, application China, Jan. 21, 1991, 91107511.9

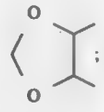
Int. Cl.[6] A61K *31/435;* **C07D** *221/18*

U.S. Cl. 514—231.5 **3 Claims**

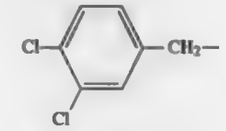
1. A method of treating arrhythmia comprising administering an effective anti-arrhythmia amount of a tetrahydroprotoberberine quaternary ammonium compound having the formula:

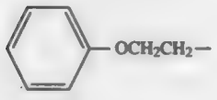


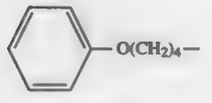
wherein R_1 and R_2 are CH_3O—, or taken together with the adherent carbon atoms to form a ring represented by the structure

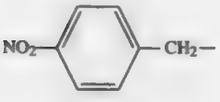


X is I, Cl or Br; and R' is —CH_3 when X is I, R' is —C_2H_5, —$CH_2CH{=}CH_2$, —$CH_2COOC_2H_5$

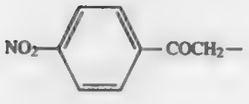




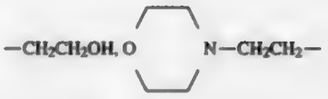




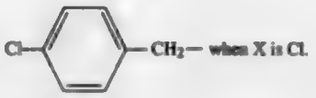
or



when X is Br, and R' is



or



to a patient in need thereof.

5,470,853

6-SUBSTITUTED-HEXAHYDROBENZ [CD] INDOLES

Michael E. Flaugh, and Michael J. Martinelli, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

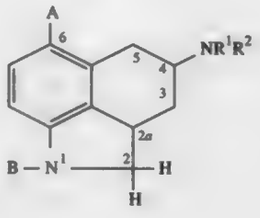
Continuation of Ser. No. 68,561, May 27, 1993, Pat. No. 5,302,612, which is a continuation of Ser. No. 883,803, May 13, 1992, abandoned, which is a continuation of Ser. No. 567,986, Aug. 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 482,811, Feb. 26, 1990, Pat. No. 5,204,340. This application Mar. 30, 1994, Ser. No. 221,439

The portion of the term of this patent subsequent to Apr. 12, 2011, has been disclaimed.

Int. Cl.[6] A61K *31/535;31/41;* **C07D** *209/90;413/02*

U.S. Cl. 514—232.8 **7 Claims**

1. A substantially pure stereoisomer of a compound of the formula



wherein

A is

CN,

NO_2, NR^5R^6, $NHC(O)R^6$, $NHSO_2R^6$, $S(C_1\text{-}C_4$ alkyl) or CF_3;

R^1 is hydrogen, $C_1\text{-}C_4$ alkyl, $C_3\text{-}C_4$ alkenyl, cyclopropylmethyl, phenyl-substituted $C_1\text{-}C_4$ alkyl, —COR^4, —$(CH_2)_nS$ ($C_1\text{-}C_4$ alkyl), or —$(CH_2)_nCONR^9R^{10}$;

R^2 is hydrogen, $C_1\text{-}C_4$ alkyl, $C_3\text{-}C_4$ alkenyl, or cyclopropylmethyl;

Q is OR^3, SR^3, NR^5R^6 or hydrogen;

R^3 is $C_1\text{-}C_8$ alkyl, $C_1\text{-}_{C8}$ alkyl substituted with one or two moieties independently selected from $C_1\text{-}C_3$ alkoxy, halo, hydroxy, $C_1\text{-}C_3$ alkylthio or nitro, aryl, aryl substituted with one or two moieties independently selected from $C_1\text{-}C_3$ alkoxy, halo, hydroxy, $C_1\text{-}C_3$ alkylthio, nitrO, $C_1\text{-}C_3$alkyl or trifluoromethy, aryl ($C_1\text{-}C_4$ alkyl), aryl ($C_1\text{-}C_4$ alkyl) substituted with one or two moleties independently selected from $C_1\text{-}C_3$ alkoxy, halo, hydroxy, $C_1\text{-}C_3$ alkylthio, nitro, $C_1\text{-}C_3$ alkyl or trifluoromethyl, or $C_3\text{-}C_7$ cycloalkyl;

n is 1–4;

R^4 is hydrogen, C_1-C_4 alkyl, C_1-C_4 haloalkyl, C_1-C_4 alkoxy or phenyl;

R^5 and R^6 are independently hydrogen, a C_1-C_4 alkyl, a C_1-C_4 alkyl substituted with a phenyl group, phenyl, or together form a C_3-C_5 heterocyclic ring;

R^9 and R^{10} are independently hydrogen, C_1-C_4 alkyl, or C_5-C_8 cycloalkyl with the proviso that when one of R^9 or R^{10} is a cycloalkyl the other is hydrogen;

B is hydrogen, C_1-C_4 alkyl, or an amino-blocking group;

X is oxygen or sulfur;

wherein the configuration at position 2a is S and the configuration at position 4 is R; or a pharmaceutically acceptable salt thereof.

5,470,854

2-PHENYLBENZO[B]FURANS, PROCESS FOR THEIR MANUFACTURE AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Erwin von Angerer, Grasslfing; Sebastian Erber, and Martin Schneider, both of Berlin, all of, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/DE92/00435, § 371 Date Apr. 14, 1994, § 102(e) Date Apr. 14, 1994, PCT Pub. No. WO92/21669, PCT Pub. Date Dec. 10, 1992

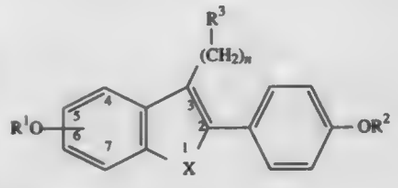
PCT Filed May 25, 1992, Ser. No. 142,462

Claims priority, application Germany, May 25, 1991, 41 17 512.3

Int. Cl.[6] A61K *31/535;* **C07D** *333/64;307/83*

U.S. Cl. 514—233.5 **10 Claims**

1. A 2-Phenylbenzo[b]furan or -thiophene of formula I



(I)

wherein

R^1 and R^2 each independently are hydrogen; C_{1-10}-alkyl; benzyl; $C(O)R^4$, wherein R^4 is C_{1-10}-alkyl or -alkoxy, or a phenyl radical; or a carbamoyl group $—C(O)NR^5R^6$, wherein R^5 and R^6 each independently are hydrogen or C_{1-10}-alkyl; and

when

R^3 is an amino group $—NR^7R^8$,

wherein

R^7 and R^8, each independently, are hydrogen or C_{1-10}-alkyl, or R^7 and R^8 together are an alkylene group—$(CH_2)_m$—, or —$(CH_2)_2O(CH_2)_2$—,

wherein

m is 2, 3, 4, 5 or 6;

X is O or S; and

n is an integer from 4 to 12 when X is S, or

n is an integer from 5 to 12 when X is O; or

when

R^3 is hydrogen, X is S, and n is 2–12.

5,470,855

CERTAIN HETEROCYCLIC THIAZOLE DERIVATIVES AND THEIR THERAPEUTIC USE

André Bernat, Cugnaux; Jean-Marc Herbert, Plaisance du Touch, and Gérard Valette, Lacroix, all of, France, assignors to Sanofi, Paris, France

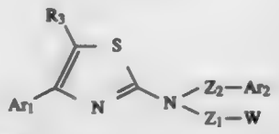
Continuation of Ser. No. 743,309, Aug. 26, 1991, abandoned. This application Aug. 25, 1993, Ser. No. 111,732

Claims priority, application France, Dec. 29, 1989, 89 17491

Int. Cl.[6] C07D *413/04;417/04;401/04;* **A61K** *31/445*

U.S. Cl. 514—236.8 **23 Claims**

1. Compound of formula:



I

in which

when Z_1 is C_1–C_4 alkylene, W is NR_1R_2, in which R_1 is selected from H and C_1–C_4 alkyl, and R_2 is selected from H, C_1–C_4 alkyl, $CONQ_1Q_2$ and $CSNQ_1Q_2$ in which Q_1 and Q_2 are independently selected from H and C_1–C_4 alkyl, SO_2Q_3 in which Q3 is C_1–C_4 alkyl, $COOQ_4$ in which Q_4 is selected from C_1–C_4 aikyl and benzyl, or R_1 and R_2 taken together form with N a saturated heterocycle morpholine, pyrrolidine, piperidine, piperazine or 4-(C_1–C_3)alkyl-piperazine; or W is $N(O)R_1R_2$ in which R_1, R_2 independently selected from H and C_1–C_4 alkyl; or W is selected from the group consisting of C_1–C_4 alkoxy, and C_1–C_4 thioalkoxy;

when Z_1 is phenylene, W is NR_1R_2 in which R_1 and R_2 are independently selected from H and C_1–C_4 alkyl;

Z_2 is C_1–C_4 alkylene;

R_3 is selected from H, C_1–C_8 alkyl and halogen;

Ar_1 is selected from phenyl optionally substituted by one or more groups selected from halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C4 thioalkoxy, hydroxy, $COOQ_6$ in which Q_6 is C_1–C_4 alkyl, carboxamido, cyano, amino, acetamido, nitro, trifluoromethyl; naphtyl, benzyl and cyclohexyl;

Ar_2 is pyridyl, optionally substituted by a radical selected from C_1–C_3 alkyl, C_1–C_3 alkoxy and halogen; or a pharmaceutically acceptable acid or base salt thereof.

5,470,856

TETRAHYDROPYRIMIDINE DERIVATIVES

Ralf Plate, Oss, Netherlands, assignor to Akzo Nobel N.V., Arnhem, Netherlands

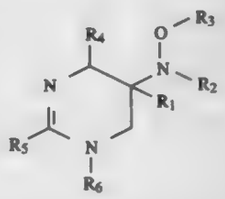
Filed Mar. 3, 1993, Ser. No. 25,707

Claims priority, application European Pat. Off., Apr. 3, 1992, 92200822

Int. Cl.[6] C07D *239/48;239/42;* **A61K** *31/505*

U.S. Cl. 514—256 **12 Claims**

1. A tetrahydropyrimidine derivative having formula I



I

wherein

R_1 is hydrogen;

R_2 is selected from the group consisting of hydrogen, a lower alkyl group having 1 to 6 carbon atoms, and a lower acyl group derived from an aliphatic carboxylic acid having 2 to 6 carbon atoms;

or R_1 and R_2 represent together a bond;

R_3 is selected from the group consisting of hydrogen, COR_7 and a lower hydrocarbon group containing 1–18 carbon atoms and optionally substituted with halogen, CN, alkoxycarbonyl, phenyl or a phenyl group substituted with a substituent selected from the group consisting of OH, F, Cl, Br, CF_3, lower alkyl and lower alkoxy;

R_4 is selected from the group consisting of hydrogen, a lower alkyl group, a lower alkenyl group having 1 to 6 carbon atoms, phenyl or a phenyl group substituted with a substituent selected from the group consisting of OH, F, CL, BR, CF_3, lower alkyl and lower alkoxy;

R_5 is selected from the group consisting of hydrogen, amino, lower alkyl substituted amino, and a lower alkyl group; and

R_6 is hydrogen or methyl, provided that when R_1 and R_2 together represent a bond and R_3, R_4 and R_5 are hydrogen, R_6 is methyl;

R_7 is selected from the group consisting of amino, lower akyl-substituted amino, and a lower alkyl group; or a pharmaceutically acceptable salt thereof.

5,470,857

CARBOCYCLIC NUCLEOSIDE ANALOGS USEFUL AS IMMUNOSUPPRESSANTS

David R. Borcherding, Overland; Carl K. Edwards, III, Olathe, both of Kans.; Ronald E. Esser, Kansas City, Mo., and Douglas L. Cole, Carlsbad, Calif., assignors to Marion Merrell Dow Inc., Cincinnati, Ohio

Continuation of Ser. No. 212,338, Mar. 14, 1994, abandoned, which is a continuation of Ser. No. 123,577, Sep. 17, 1993, abandoned, which is a continuation of Ser. No. 824,413, Jan. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 748,173, Aug. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 582,265, Sep. 14, 1990, abandoned. This application Nov. 8, 1994, Ser. No. 336,706

Int. Cl.[6] A61K *31/505;31/52;* **C07D** *473/02;239/00*

U.S. Cl. 514—258 **24 Claims**

1. A method of effecting immunosuppression in a patient in need thereof comprising administering to said patient an effective immunosuppressive amount of (1R,33)-Cis-1-(9-adenyl)-3-hydroxy-4-cyclopentene or pharmaceutically acceptable salt thereof.

5,470,858

DERIVATIVES OF (HETERO)AROMATIC ETHERS AND THIOETHERS HAVING ANTIHYPERLIPIDEMIC ACTIVITY, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Cristina Fraire; Massimo Bani; Ermes Vanotti, and Vincenzo Olgiati, all of Milan, Italy, assignors to Pierrel SpA, Capua, Italy

Filed Jun. 19, 1992, Ser. No. 901,628

Claims priority, application Italy, Jun. 21, 1991, MI91A1717

Int. Cl.[6] A61K *31/52;* **C07H** *19/20*

U.S. Cl. 514—261 **9 Claims**

1. A compound represented by the following formula I:

$$(HET)Ar—X—CH_2—Y—CH_2—O—R \quad (I)$$

wherein:

(HET) Ar represents a bicyclic nucleus consisting of fused 6-5 membered rings, the 6-membered ring containing 2 nitrogen atoms in the relative positions 1–3, the 5-membered ring containing two nitrogen heteroatoms also in the relative positions 1–3, the bicyclic nucleus bearing one to three substituents, identical to or different from each other, selected from the group consisting of straight chain C_1–C_5 alkyl, branched chain C_1–C_5, alkyl, NH_2, —OH, lower alkoxy, phenyl, and halogen, X represents —S—;

Y represents —CO—, —C=N—R_2, in which R_2 is OH, an alkoxy having 1 to 10 carbon atoms, aryloxy, arylalkoxy, —NH_2, —NHCONH$_2$, —NHCSNH$_2$; and R represents a phenyl substituted at para position with a carboxyl or a (C_1–C_{20}) alkoxycarbonyl group in which the alkoxy group is linear or branched.

5,470,859

AZABICYCLIC COMPOUNDS WITH MUSCARINIC ACTIVITY USEFUL FOR TREATING DEMENTIA

Harry J. Wadsworth; Paul A. Wyman; Steven Dabbs, and Sarah M. Jenkins, all of Harlow, England, assignors to Beecham Group p.l.c., Middlesex, England

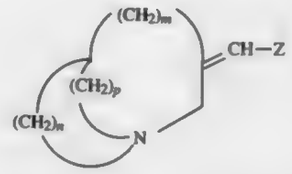
Filed Aug. 2, 1990, Ser. No. 561,974

Claims priority, application United Kingdom, Aug. 5, 1989, 8917957

Int. Cl.[6] C07D *453/02;* **A61K** *31/435*

U.S. Cl. 514—299 **9 Claims**

1. A pharmaceutical composition which comprises a compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

in which either p is 1 and m is 0 and n is 2, or p is 2 and m is 0 and n is 2, and Z is

1,2,4-oxadizol-5-yl, 1,3-oxazole-2-yl, or 1,3-thiazole-2-yl wherein any ring carbon atom is optionally substituted by a group R_1, or Z is 1,3-oxazole-5-yl in which the 2-position is optionally substituted by R_2, and R_1 and R_2 are independently selected from hydrogen, halogen, N(R_4)$_2$, C_{2-3} alkenyl, C_{2-3} alkynyl, or C_{1-2} alkyl optionally substituted with one, two, or three fluorine atoms, in which R_4 is hydrogen or methyl, and a pharmaceutically acceptable carrier.

5,470,860

1,4-DIHYDROPYRIDINES FOR USE IN THE TREATMENT OF DERMATOSES

Karl Sanders, Konstanz, Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Konstanz, Germany

PCT No. PCT/EP92/02807, § 371 Date Jun. 13, 1994, § 102(e) Date Jun. 13, 1994, PCT Pub. No. WO93/11766, PCT Pub. Date Jun. 24, 1994

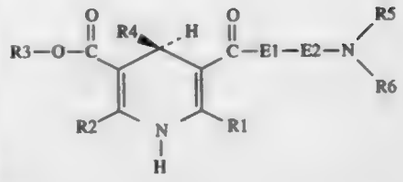
PCT Filed Dec. 4, 1992, Ser. No. 244,887

Claims priority, application Switzerland, Dec. 13, 1991, 03671/91

Int. Cl.[6] A61K *31/445;31/495*

U.S. Cl. 514—318 **16 Claims**

1. A method of treating an amenable dermatosis by administering to a subject so afflicted an effective amount of a pharmaceutical composition comprising active component and pharmacologically-acceptable carrier therefor, wherein the active component is a 1,4-dihydropyridine of the formula



(I)

in which

R1 is 1–6C-alkyl or 1–4C-alkoxy-2–4C-alkyl,

R2 is hydrogen, amino (NH_2), 1–6C-alkyl or 1–4C-alkoxy-2–4C-alkyl,

R3 is 1–6C-alkyl or 1–4C-alkoxy-2–4C-alkyl,

R4 is phenyl substituted by R41 and R42,

R41 is hydrogen, hydroxyl, halogen, nitro, cyano, trifluoromethyl, 1–4C-alkyl, 1–4C-alkoxy, 1–4C-alkoxy which is substituted completely or partially by fluorine, 1–4C-alkoxycarbonyl, 2–5C-acyl, amino, or mono- or di-1–4C-alkylamino,

R42 is hydrogen, hydroxyl, halogen, nitro, cyano, trifluoromethyl, 1–4C-alkyl, 1–4C-alkoxy, 1–4C-alkoxy which is substituted completely or partially by fluorine, 1–4C-alkoxycarbonyl, 2–5C-acyl, amino, or mono- or di-1–4C-alkylamino,

E1 is oxygen (O),

E2 is straight-chain or branched 1–5C-alkylene, the group $—(CH_2)_m—E—(CH_2)_n—$ or the group —A1—O—A2—,

E is vinylene (—CH=CH—) or ethynylene (—C≡C—),

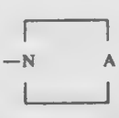
m is 1 or 2,

n is 1 or 2,

A1 is 2–4C-alkylene,

A2 is 2–4C-alkylene or 2C-alkyleneoxy-2C-alkylene,

R5 and R6 together, including the nitrogen atom to which both are attached, are a radical of the formula Ia



(Ia)

in which

A is $—CH_2—CH_2—C(R7)R8—CH_2—CH_2—$, $—CH_2—CH_2—CHR9—CH_2—CH_2—$ or $—CH_2—CH_2—CH_2—CHR10—$,

R7 is hydrogen (H) or aryl and

R8 is aryl, or

R7 and R8 together are diarylmethylene,

R9 is diaryl-1–4C-alkyl, and

R10 is aryl-1–4C-alkyl,

wherein aryl is phenyl which is substituted by R11 and R12, and where R11 and R12 are identical or different and are hydrogen (H), 1–4C-alkyl, 1–4C-alkoxy, halogen, hydroxyl, trifluoromethyl or together are methylenedioxy,

or a pharmacologically-acceptable salt thereof.

5,470,861

METHOD OF PROMOTING HAIR GROWTH

Charles S. Harmon, Bloomfield, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 4, 1994, Ser. No. 286,152

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—337 **19 Claims**

1. A method of promoting hair growth comprising topically administering to a host afflicted with androgenic alopecia an effective amount of the compound 2-(6 -cyano-3,4-dihydro-2,2-dimethyl-2H-1-benzopyran-4-yl)pyridine-1-oxide.

5,470,862

SUBSTITUTED PYRAZOLYL COMPOUNDS AND METHODS EMPLOYING SUCH COMPOUNDS

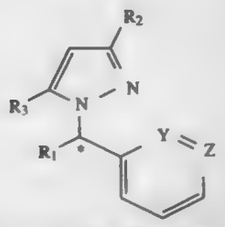
Bor-Sheng Lin, Berkeley Heights; Joseph W. Scheblein, Flemington, and Jerome R. Bagley, North Plainfield, all of N.J., assignors to Ohmeda Pharmaceutical Products Division Inc., Liberty Corner, N.J.

Filed Feb. 3, 1995, Ser. No. 384,294

Int. Cl.[6] A61K *31/41;31/44;* **C07D** *213/06*

U.S. Cl. 514—341 **20 Claims**

1. A compound represented by the Formula:



(I)

including geometric and optically active isomeric forms, and pharmaceutically acceptable acid addition salts thereof, wherein:

one of Y and Z is nitrogen, and the other is CH;

R_1 is hydrogen or lower-alkyl;

R_2 and R_3 are selected from the group consisting of hydrogen, —CHO, lower-alkylcarbonyl, lower-alkoxycarbonyl, lower-alkylaminocarbonyl, lower-alkyl, lower-alkenyl, lower-alkoxy-lower-alkenyl, lower-alkylcarbonyloxymethyl, substituted and unsubstituted heterocyclic rings, and substituted or unsubstituted aryl groups, wherein the symbol * represents a carbon atom which may be asymmetric and with the proviso that at least one of R_2 and R_3 is other than hydrogen and methyl.

5,470,863

OXIMIC DERIVATIVES WITH A FUNGICIDE ACTIVITY

Giovanni Camaggi, Novara; Lucio Filippini, San Donato Milanese; Marilena Gusmeroli, Monza; Giovanni Meazza, Saronno; Gianpaolo Zanardi, Vigevano; Carlo Garavaglia, Cuggiono, and Luigi Mirenna, Milan, all of, Italy, assignors to Ministero Dell'Universita' E Della Ricerca Scientifica E Technologica, Rome, Italy

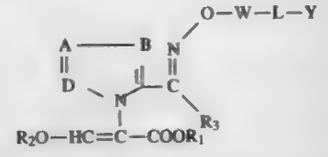
Filed Sep. 10, 1992, Ser. No. 943,333

Claims priority, application Italy, Sep. 13, 1991, MI91A2422

Int. Cl.[6] A01N *43/36;43/40;* **C07D** *207/335;401/12*

U.S. Cl. 514—343 **12 Claims**

1. Oximic derivatives with a fungicide activity having the formula:



(I)

wherein:

A, B, D, the same or different, represent a nitrogen atom, or a =C—G group;

G represents a hydrogen atom, a halogen atom, the nitro group, the cyano group, a —$COOR_4$ group, a C_1–C_6 alkyl group or C_1–C_6 haloalkyl group;

R_1, R_2, R_4 and R_5, the same or different, represent C_1–C_6 alkyl or C_1–C_6 haloalkyl groups;

R_3 represents a hydrogen atom, a C_1–C_6 alkyl group or C_1–C_6 haloalkyl group, or a —$COOR_5$ group;

W represents a linear or branched C_2–C_{10} alkylene group, possibly substituted with one or more halogen atoms, or a C_3–C_6 cycloalkyl, a C_4–C_8 cycloalkylalkyl;

L represents O or S;

Y represents a phenyl, a naphthyl, a heterocycle with 5–6 atoms wherein the hetero-atoms are O, N, S, a benzocondensated heterocycle with 9–10 atoms wherein the hetero-atoms are selected from oxygen, nitrogen, sulphur, all said groups optionally substituted with one or more groups selected from: halogen atoms, C_1–C_4 alkyls or C_1–C_4 haloalkyls, C_1– C_4 alkoxyls or C_1–C_4 haloalkoxyls, phenyl groups or phenoxylic groups suitably substituted;

Y can also be a linear or branched alkyl substituted with one or more groups selected from: halogen atoms, C_1–C_4 alkoxyls or C_1–C_4 haloalkoxyls or C_1–C_4 haloalkoxyhaloalkoxyl, phenyl or phenoxylic groups.

5,470,864

α-AMINO ACID COMPOUNDS

Muriel Duflos, Saint Pazanne; Sylvie Robert-Piessard; Lucien Welin, both of Nantes; Guillaume Le Baut, Saint Sebastien sur Loire; Daniel-Henri Caignard, Paris; Pierre Renard, Versailles, and Gérard Adam, Le Mesnil le Roi, all of, France, assignors to Adir et Compagnie, Courbevoie, France

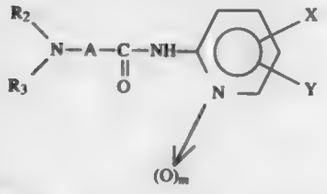
Filed Jun. 30, 1994, Ser. No. 268,289

Claims priority, application France, Jun. 30, 1993, 93 07928

Int. Cl.[6] C07D *213/75;* **A61K** *31/44*

U.S. Cl. 514—352 **17 Claims**

1. A compound selected from those of the formula (I):



(I)

wherein:

m is 0 or 1,

each of X and Y, which may be identical or different, represents an alkyl group,

A represents: a group

and

R_1 represents:

a hydrogen atom,

an alkyl group,

an alkyl group substituted by an amino group,

an alkylthioalkyl group,

an alkyl group substituted by an amino group that is itself substituted on the amino group by a group selected from tert-butoxycarbonyl, benzyloxycarbonyl and fluorenylmethoxycarbonyl,

a phenyl or phenylalkyl group,

a phenyl or phenylalkyl group substituted on the aromatic ring by an alkyl, hydroxy, alkoxy or trifluoromethyl group or by a halogen atom,

and in that case—where A represents a —CH(R_1)— group:

R_2 represents a hydrogen atom or R_2 forms with R_1 and the N—CH grouping carrying them a monocyclic or bicyclic ring system, each ring containing 5 or 6 ring members and being saturated or unsaturated, and

R_3 represents:

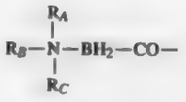
a hydrogen atom,

a tert-butoxycarbonyl, benzyloxycarbonyl or fluorenylmethoxycarbonyl group,

a benzoyl group,

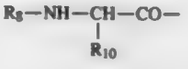
a benzoyl group substituted by an alkyl, alkoxy, hydroxy or trifluoromethyl group or by a halogen atom,

a group



wherein R_A, R_B and R_C, which may be identical or different, represent a hydrogen atom or an alkyl group, or two groups from among R_A, R_B and R_C form with the nitrogen atom carrying them a heterocyclic system selected from pyrrolidine, piperidine, azepine and morpholine, the third group from among R_A, R_B and R_C then being either a hydrogen atom or an alkyl group,

a group



wherein R_8 represents hydrogen, tert-butoxycarbonyl, benzyloxycarbonyl or fluorenylmethyloxycarbonyl, glycyl, glycyl itself substituted on the amino group by a group selected from tert-butoxycarbonyl, benzyloxycarbonyl and fluorenylmethoxycarbonyl and R_{10} represents hydrogen; alkyl; alkyl substituted by an amino group; alkyl substituted by an amino group that is itself substituted by a tert-butoxycarbonyl, benzyloxycarbonyl, fluorenylmethyloxycarbonyl; a phenyl group; or phenylalkyl group; or a phenyl or phenylalkyl group substituted on the phenyl ring by an alkyl, hydroxy, alkoxy or trifluoromethyl group or by a halogen atom,

their isomers, epimers, enantiomers, diastereoisomers and also their addition salts with a pharmaceutically-acceptable acid or base,

wherein alkyl and alkoxy are linear or branched groups containing 1 to 6 carbon atoms inclusive.

5,470,865

PHARMACEUTICAL COMPOSITION

Mary K. McCauley, Lafayette; Kenneth P. Moder, West Lafayette, and Jeffrey L. Speakman, Romney, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 30, 1994, Ser. No. 298,486

Int. Cl.[6] A01N *43/78*

U.S. Cl. 514—365 **17 Claims**

1. A pharmaceutical composition of nizatidine, in which the nizatidine has been heated in the presence of water to remove N-methyl-1-methylthio-2-nitroethyleneamine.

5,470,866

METHOD FOR THE CONVERSION OF CEPHALOMANNINE TO TAXOL AND FOR THE PREPARATION OF N-ACYL ANALOGS OF TAXOL

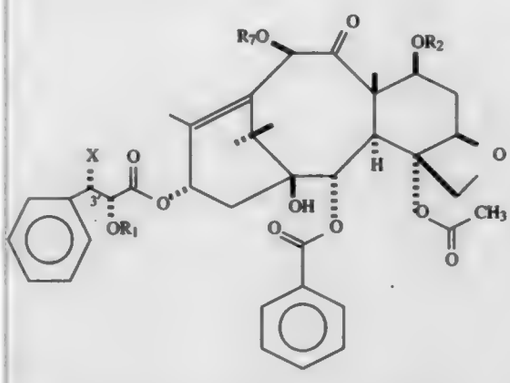
David G. I. Kingston, Blacksburg, Va.; Anthony A. Molinero, Ashland City, Tenn., and A. A. Leslie Gunatilaka, Blacksburg, Va., assignors to Virginia Polytechnic Institute and State University, Blacksburg, Va.

Continuation-in-part of Ser. No. 931,319, Aug. 18, 1992, Pat. No. 5,319,112. This application Mar. 9, 1994, Ser. No. 208,361

Int. Cl.[6] **C07D** *305/14;* **A61K** *31/335*

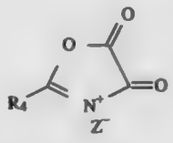
U.S. Cl. 514—376 **22 Claims**

1. Compounds having the following structure:



wherein:

R_1 and R_2 are independently H, $Si(CH_3)_3$, $Si(C_2H_5)_3$ or acyl, and X is selected from the group comprised of:



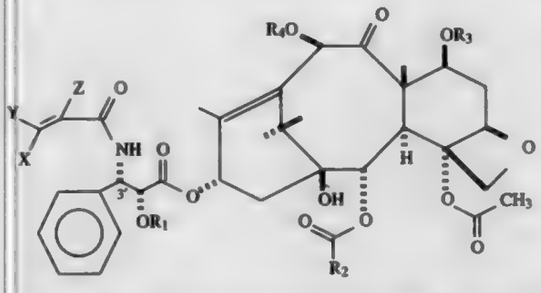
and NHY; wherein R_4 is an alkyl, or aryl, and Y is selected from the group consisting of C(O)C(O)OR_5 and C(O)C(O)NHR_6 wherein:

R_5 is hydrogen, an alkali metal, an alkyl, an alkenyl, an alkynyl, or an aryl;

R_6 is hydrogen, an alkyl, an alkenyl, an alkynyl, or an aryl; and

R_7 is selected from the group consisting of H and $CH_3C(O)$; and Z^- is a counter ion.

9. Compounds having biological activity and having the structure:



wherein X is selected from the group consisting of hydrogen lower alkyl and halogen; Y is selected from the group consisting of hydrogen and lower alkyl; Z is selected from the group consisting of hydrogen and halogen; provided that when Y and Z are hydrogen, X is not lower alkyl and that at least one of X or is halogen;

and further wherein R_1 is selected from the group consisting of hydrogen, acyl, and protecting group; R_2 is phenyl, R_3 is selected from the group consisting of hydrogen, acyl and protecting group; and R_4 is selected from the group consisting of hydrogen and acyl.

5,470,867

IMIDAZOLES AND THEIR SALTS HAVING ANTHGONISTIC ACTIVITY TO ANGIOTESIN II RECETORS

Michel Fortin; Daniel Frechet, both of Paris; Gilles Hamon, Le Raincy; Simone Jouquey, Paris, and Jean-Paul Vevert, Pantin, all of, France, assignors to Roussel-Uclaf, France

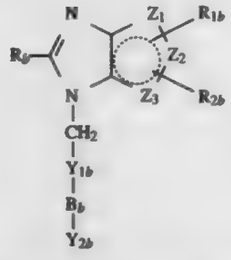
Division of Ser. No. 74,106, Jun. 9, 1993, Pat. No. 5,389,634, which is a division of Ser. No. 712,247, Jun. 7, 1991, Pat. No. 5,338,756. This application Oct. 17, 1994, Ser. No. 324,772

Claims priority, application France, Jun. 8, 1990, 90 67136; Mar. 13, 1991, 91 03032

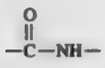
Int. Cl.[6] **A61K** *31/435;31/505;31/41;* **C07D** *471/04;495/04;487/04*

U.S. Cl. 514—393 **8 Claims**

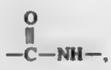
1. A compound selected from the group consisting of a compound of the formula



wherein R_b is n-butyl or butenyl, one of Z_1, Z_2 and Z_3 is sulfur and the other two are =CH—, R_{1b} and R_{2b} are individually selected from the group consisting of hydrogen; halogen; —OH, —SH; alkoxy, alkyl and alkylthio of 1 to 6 carbon atoms, alkenyl and alkynyl of 2 to 6 carbon atoms, carbocyclic aryl, carbocyclic aralkyl and carbocyclic aralkenyl with up to 6 alkyl and alkenyl carbon atoms, all the alkyl, alkenyl, alkynyl, alkylthio, aryl, aralkyl and aralkenyl unsubstituted or substituted with at least one member of the group consisting of halogen, —OH, —SH, alkoxy and alkylthio of 1 to 4 carbon atoms, acyl and acyloxy; carboxy and carboxy esterified with alkyl of 1 to 4 carbon atoms, Y_{1b} is phenyl, B_b is a single bond or



and when B_b is a single bond or



Y_{2b} is phenyl unsubstituted or substituted with carboxy, esterified carboxy tetrazolyl, tetrazolyl-methyl or tetrazolyl-carbamoyl, $—SO_2—X_b—R_{14b}$, X_b is selected from the group consisting of a single bond, —NH—, —CO— and

and R_{1b} is selected from the group consisting of methyl, ethyl, vinyl, allyl, pyridylmethyl, pyridylethyl, pyridyl, phenyl and benzyl and when B_b is a single bond, Y_{2b} is cyano or free carboxy, salified or carboxy esterified with alkyl of 1 to 4 carbon atoms with the proviso that at least one of R_{1b} and R_{2b} is —OH and their non-toxic pharmaceutically acceptable salts with acid and base.

5,470,865

METHODS FOR TREATING EMESIS AND NAUSEA USING OPTICALLY PURE R(+) ONDANSETRON

James W. Young, Palo Alto, Calif., assignor to Sepracor Inc., Marlborough, Mass.

Continuation of Ser. No. 750,387, Aug. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 721,868, Jun. 26, 1991, abandoned. This application Dec. 7, 1993, Ser. No. 164,734

Int. Cl.[6] A61K *31/415*

U.S. Cl. 514—397 **9 Claims**

1. A method of eliciting an antiemetic effect while avoiding the concomitant liability of adverse effects, which comprises administering to a human in need of antiemetic therapy, an amount sufficient to alleviate nausea and vomiting, but insufficient to cause said adverse effects, of R(+) ondansetron, or a pharmaceutically acceptable salt thereof, substantially free of its S(−) stereoisomer.

5,470,869

PYRAZOLIUM FUNGICIDAL COMPOSITIONS

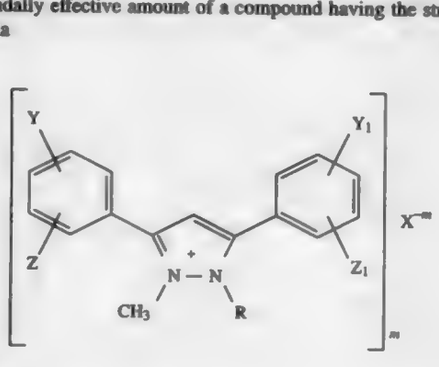
Peter N. Tayler, Stubbington, England, and Lynn S. Evans, Langhorne, Pa., assignors to American Cyanamid Company, Wayne, N.J.

Filed Jan. 31, 1994, Ser. No. 189,380

Int. Cl.[6] A01N *43/56*

U.S. Cl. 514—406 **23 Claims**

1. A composition for controlling phytopathogenic fungi without causing a significant increase in phytotoxicity which comprises a fungicidally effective amount of a compound having the structural formula



wherein

R is C_1–C_3alkyl, allyl, propynyl, ethylcarboxymethyl, phenyl or benzyl;

Y, Y_1, Z and Z_1 are each independently hydrogen, halogen, C_1–C_4alkyl or C_1–C_4alkoxy;

X is an anion having a charge of 1 or 2; and

m is an integer of 1 or2, and "an enhancing effective amount of an oil selected from the group consisting of a mineral oil, a vegetable oil, an animal oil and mixtures thereof".

5,470,870

NMDA ANTAGONISTS

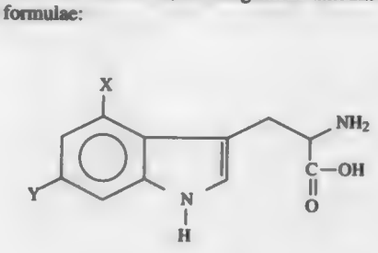
Michael G. Palfreyman, Cincinnati; Ian A. McDonald, Loveland; Francesco G. Salituro, Fairfield, all of Ohio; Robert Schwarcz, Baltimore, Md., and Bruce M. Baron, Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 187,353, Jan. 25, 1994, Pat. No. 5,360,814, which is a continuation of Ser. No. 57,195, May 3, 1993, abandoned, which is a continuation of Ser. No. 827,188, Feb. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 662,670, Feb. 28, 1991, abandoned. This application Jun. 17, 1994, Ser. No. 261,609

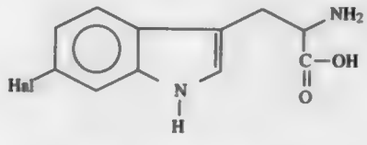
Int. Cl.[6] A61K *31/405;31/18*

U.S. Cl. 514—419 **9 Claims**

1. A method for antagonizing the effects of excitatory amino acids upon the NMDA receptor complex comprising administering to a patient in need thereof, an antagonistic amount of a compound of the formulae:



(Ia)



II(a)

or a (pharmaceutically acceptable salt thereof, in which X and Y are each independently represented by Cl, Br, F, CH_3 or CH_2CH_3; and Hal is a halogen atom.

5,470,871

THERAPEUTIC COMPOSITIONS BASED ON 1,2-DITHIOLE-3-THIONE DERIVATIVES

Marie-Odile Christen, Paris, and Jean-Louis Burgot, Rennes, both of, France, assignors to Laboratoires De Therapeutique Moderne, Suresnes Cedex, France

PCT No. PCT/FR92/00392, § 371 Date Dec. 27, 1993, § 102(e) Date Dec. 27, 1993, PCT Pub. No. WO92/19613, PCT Pub. Date Nov. 12, 1992

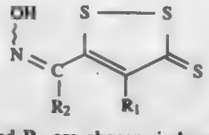
PCT Filed Apr. 30, 1992, Ser. No. 140,132

Claims priority, application France, May 2, 1991, 91 05411

Int. Cl.[6] C07D *339/04;* **A61K** *31/385*

U.S. Cl. 514—441 **6 Claims**

1. Compounds of formula



(II)

in which R_1 and R_2 are chosen, independently of one another, from hydrogen, a halogen, a nitro group, a nitroso group, a thiocyano group, a C_1–C_6 alkyl group, a C_2–C_6 alkenyl group, an aryl group, an aryl (C_1–C_6 alkyl) group, an aryl(C_2–C_6 alkenyl) group, a carboxyl group, a (C_1–C_6 alkyl)carbonyl group, an arylcarbonyl group, a (C_1–C_6 alkoxy)carbonyl group, a (C_1–C_6 alkoxy)carbonyl(C_1–C_6 alkyl) group, a C_1–C_6 alkoxy group, a trifluoromethyl group, an amino group, a di(C_1–C_6 alkyl)-amino(C_1–C_6 alkyl) group, an acylamino group of formula —$NHCOC_nH_{2n+1}$ with n from 0 to 6, a

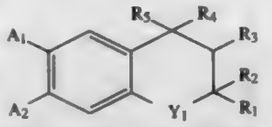
group —NH—CSC_nH_{2n+1} with n from 0 to 6, a terpenyl group, a cyano group, a C_2–C_6 alkynyl group, a C_2–C_6 alkynyl group substituted with a C_1–C_6 alkyl or an aryl group, a hydroxy(C_1–C_6 alkyl) group, a (C_1–C_6 acyl)-oxy(C_1–C_6 alkyl) group, a (C_1–C_6 alkyl)thio group and an arylthio group, or alternatively R_1 and R_2 together form a mono- or polycyclic C_2–C_{20} alkylene group optionally comprising one or more hetero atoms, with the exception of the 2,2-dimethyltrimethylene group, or a C_3–C_{12} cycloalkylene group.

5,470,872
BENZOFYRANOLS

Derek R. Buckle; Ivan L. Pinto, and David G. Smith, all of Epsom, England, assignors to Beecham Group plc, England

Continuation of Ser. No. 449,577, Dec. 12, 1989, abandoned.
This application Dec. 14, 1993, Ser. No. 166,612
Claims priority, application United Kingdom, Dec. 13, 1988, 8829066; Apr. 25, 1989, 8909381; Jun. 20, 1989, 8914096
Int. Cl.[6] A61K *31/35*; C07D *311/04*
U.S. Cl. 514—456 **36 Claims**

1. A compound of formula (I):



(I)

or, where appropriate, a pharmaceutically acceptable salt thereof, or a pharmaceutically acceptable solvate thereof, wherein:

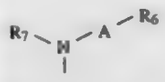
one of A_1 or A_2 represents hydrogen and the other represents a group CF_3—Y— wherein Y represents —CF_2;

Y_1 represents —O—,

R_1 and R_2 independently represent hydrogen or C_{1-12} alkyl; or R_1 and R_2 together represent a C_{2-7} polymethylene moiety;

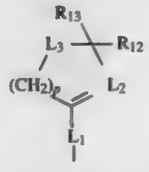
R_3 represents hydrogen, hydroxy, C_{1-12} alkoxy or C_{1-12} alkylcarbonyloxy and R_4 is hydrogen, or R_3 and R_4 together represent a bond;

R_5 represents either a moiety of formula (a):



(a)

wherein A represents >C=X wherein X is O, S or NR_8 wherein R_8 represents CN, NO_2, COR_9 wherein R_9 is C_{1-12} alkyl, amino, mono-C_{1-12} alkylamino fluoro C_{1-2} alkyl comprising one or more fluorine atoms, phenyl or phenyl optionally substituted with up to five substituents selected from the group consisting of halogen, C_{1-12} alkyl, phenyl, C_{1-12} alkoxy, halo-C_{1-12}-alkyl, hydroxy, amino, nitro, carboxy, C_{1-12} alkoxycarbonyl, C_{1-12} alkoxycarbonylalkyl, C_{1-12} alkylcarbonyloxy and C_{1-12} alkylcarbonyl or R_8 is SO_2R_9 wherein R_9 is as defined above, or A represents a bond; when A represents >C=X wherein X is O or S, then R_6 is hydrogen; C_{1-12} alkyl optionally substituted by one or more groups or atoms selected from halogen, hydroxy, C_{1-12} alkoxy, C_{1-12} alkoxycarbonyl, carboxy or an ester or amide thereof, amino, mono-C_{1-12} alkylamino, and di-C_{1-12} alkylamino; C_{2-12} alkenyl; amino optionally substituted by a C_{1-12} alkyl or C_{2-12} alkenyl group or by a C_{1-12} alkanoyl group optionally substituted by up to three halo atoms, by a phenyl group optionally substituted by C_{1-12} alkyl, C_{1-12} alkoxy or halogen; phenyl or naphthyl optionally substituted by 1, 2, 3 or 4 substituents selected from the group consisting of C_{1-12} alkyl, C_{1-12} alkoxy, hydroxy, halogen, fluoro C_{1-12} alkyl comprising one or more fluorine atoms, nitro, cyano, carboxy or an ester thereof, C_{1-12} alkyl carbonyloxy, amino, mono-C_{1-12} alkylamino, and di-C_{1-12} alkylamino; aminocarbonyl, mono-C_{1-12} alkylaminocarbonyl, or di-C_{1-12} alkylaminocarbonyl; or 5- or 6-membered monocyclic heteroaryl moieties selected from the group consisting of furyl, thienyl, pyrrolyl, oxazolyl, thiazolyl, imidazolyl and thiadiazolyl, and pyridyl, pyridazyl, pyrimidyl, pyrrazyl and triazyl or 9- or 10-membered bicyclic heteroaryl groups selected from the group consisting of benzofuryl, benzothienyl, indolyl and indazolyl, quinolinyl and isoquinolinyl and quinazolinyl, optionally substituted by 1, 2, 3 or 4 substituents selected from the group consisting of C_{1-12} alkyl, C_{1-12} alkoxy, hydroxy, halogen, fluoro C_{1-12} alkyl comprising one or more fluorine atoms, nitro, cyano, carboxy or an ester thereof, C_{1-12} alkylcarbonyloxy, amino, mono-C_{1-12} alkylamino, di-C_{1-12} alkylamino, aminocarbonyl, mono-C 1-12alkylaminocarbonyl and di-C_{1-12} alkylaminocarbonyl; and R_7 represents hydrogen or C_{1-12} alkyl; or R_6 and R_7 together represent a linking chain of formula —A_3—A_4—, A_3 being attached to the nitrogen atom of the moiety —N—A— and A_4 being attached to the group A on the said moiety, and wherein A_3 represents a C_{1-12} alkyl- substituted or unsubstituted methylene group, A_4 represents 2 or 3 linking members, one of the linking members optionally representing O, S or NR and the other linking members each independently representing a C_{1-12} alkyl- substituted or unsubstituted methylene group; R represents hydrogen, C_{1-12} alkyl, C_{1-12} alkanoyl, phenyl C_{1-4}-alkyl, phenylcarbonyl or naphthylcarbonyl optionally substituted with up to five substituents selected from the group consisting of halogen, C_{1-12} alkyl, phenyl, C_{1-12} alkoxy, halo-C_{1-12}-alkyl, hydroxy, amino, nitro, carboxy, C_{1-12} alkoxycarbonyl, C_{1-12} alkoxycarbonylalkyl, C_{1-12} alkylcarbonyloxy, and C_{1-12} alkylcarbonyl; or R is furylcarbonyl, thienylcarbonyl or indolylcarbonyl; when A represents >C=X wherein X represents NR_8, then R_6 represents —NH.R_{10} wherein R_{10} is hydrogen, C_{1-12} alkyl C_{3-6} cycloalkyl, C_{2-12} alkenyl or C_{2-12} alkynyl and R_7 is hydrogen or C_{1-12} alkyl; or R_7 and R_{10} together represent C_{2-4} polymethylene; when A represents a bond, then R_6 and R_7 together with the nitrogen atom to which they are attached, form an unsaturated heterocyclic ring having 5 to 7 ring atoms, selected from the group consisting of unsubstituted pyridonyl, pyridonyl substituted with C_{1-12}-alkyl, hydroxyl, halogen, alkoxy, alkanoyloxy, nitro, amino, C_{1-12}alkylcarbonyl amino, carboxy or alkoxy carbonyl, unsubstituted thiopyridonyl, or thiopyridonyl substituted with C_{1-12}-alkyl, hydroxyl, halogen, alkoxy, alkanoyloxy, nitro, amino, C_{1-12}alkylcarbonyl amino, carboxy or alkoxy carbonyl, or R_5 represents a moiety of formula (c)



(c)

wherein L_1 represents O or NR_{11} wherein R_{11} represents hydrogen, C_{1-12}alkyl, formyl, acetyl or hydroxymethyl, L_2 represents N or CL_4 wherein L_4 is hydrogen, halogen, formyl or hydroxymethyl, L_3 represents CH_2, O, S, >CHL_5 wherein L_5 is halogen or NL_6 wherein L_6 is hydrogen or C_{1-12} alkyl and R_{12} and R_{13} each independently represent hydrogen or C_{1-12} alkyl or R_{12} together with R_{13} represents oxo or thioxo; and p represents 1, 2 or 3.

24. A pharmaceutical composition for the treatment of respiratory tract disorders in mammals, which comprises an effective, non-toxic amount of a compound of formula (I), or a pharmaceutically acceptable salt thereof or a pharmaceutically acceptable solvate thereof, and a pharmaceutically acceptable carrier.

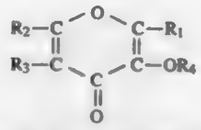
5,470,873

DIABETES PREVENTION AND TREATMENT USING GAMMA-PYRONES

Ji-Won Yoon, Calgary, Canada, assignor to University Technologies International, Inc., Calgary, Canada

Continuation-in-part of Ser. No. 978,958, Nov. 23, 1992, Pat. No. 5,298,525. This application Jan. 10, 1994, Ser. No. 179,555
The portion of the term of this patent subsequent to Mar. 29, 2011, has been disclaimed.
Int. Cl.[6] A61K *31/35;35/78*
U.S. Cl. 514—460 9 Claims

1. A method for preventing type II diabetes in a mammal susceptible to developing said diabetes comprising administering to said mammal an effective amount of at least one compound of the formula I:



I

wherein R_1, R_2 and R_3 are independently selected from the group consisting of H, an alkyl of from 1 to 8 carbon atoms, an alkyl-o-alkyl of from 2 to 8 carbon atoms, a haloalkyl of from 1 to 8 carbon atoms and 1 to 3 halogen atoms, an alkenyl of from 2 to 8 carbon atoms with one site of unsaturation, ketones of from 2 to 8 carbon atoms, aldehydes of from 1 to 8 carbon atoms, and any of the above compounds which are alcohol-substituted; and R_4 is either H or —COR_5, wherein R_5 is an alkyl of from 1 to 5 carbon atoms; or a salt thereof.

5,470,874

ASCORBIC ACID AND PROANTHOCYANIDINE COMPOSITION FOR TOPICAL APPLICATION TO HUMAN SKIN

Sheldon Lerner, 3399 First Ave., San Diego, Calif. 92103

Filed Oct. 14, 1994, Ser. No. 323,095
Int. Cl.[6] A61K *6/00;31/34;31/355*
U.S. Cl. 514—474 18 Claims

1. A topically applied composition of ascorbic acid for repairing and stimulating the growth of human skin comprising:
at least 10% to 25% ascorbic acid;
at least 30% but not more than 90% water;
at least 10% methylparaben;
at least 0.3% propylparaben;
at least 0.1% sodium hydroxide;
at least 3% propylene glycol;
at least 1% xanthum gum;
at least 0.3% hyaluronic acid;
at least 1% ascorbic palmitate;
0.1% or less diazolidinyl urea;
0.1% or less thretonate; and
0.1% or less tetrasodium EDTA.

5,470,875

WATER SOLUBLE, ANTIMICROBIAL COMPOSITIONS OF POLYHEXAMETHYLENE BIGUANIDE AND IODOPROPYNYLBUTYL CARBAMATE

John J. Merianos, Middletown; Todd Elder, Florham Park, and Paul Garelick, South Plainfield, all of N.J., assignors to ISP Chemicals Inc., Chatham, N.J.

Filed Jan. 6, 1995, Ser. No. 369,600
Int. Cl.[6] A01N *47/12;* A61K *31/155;31/785;* A61L *2/18*
U.S. Cl. 514—479 3 Claims

1. A water soluble antimicrobial composition having antifungal activity useful for disinfecting a contact lens comprising (a) polyhexamethylene biguanide and (b) iodopropynylbutyl carbamate, in a weight ratio of (a):(b) of at least 100:1.

5,470,876

TOPICAL SOD FOR TREATING HAIR LOSS

Peter H. Proctor, Twelve Oaks Medical Tower 4126 SW. Freeway, Suite 1616, Houston, Tex. 77027

Continuation-in-part of Ser. No. 21,970, Feb. 24, 1993, Pat. No. 5,352,442, and a continuation-in-part of Ser. No. 193,228, Feb. 7, 1994, which is a continuation-in-part of Ser. No. 149,720, Jan. 29, 1988, abandoned, which is a continuation-in-part of Ser. No. 8,186, Jan. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 858,050, Apr. 30, 1986, abandoned, which is a continuation-in-part of Ser. No. 757,131, Jul. 18, 1985, abandoned. This application Apr. 18, 1994, Ser. No. 229,374
Int. Cl.[6] A61K *31/28;38/00;* C07F *1/08;3/06*
U.S. Cl. 514—492 19 Claims

1. A method for stimulating hair growth comprising the step of:
applying in a topical pharmaceutical carrier to skin a transition metal compound having SOD activity, said compound selected from copper salicylate, copper aspirinate, indomethacin-copper and a complex of an amino acid or peptide and a transition metal, wherein the peptide consists of amino acids selected from glycine, histidine, lysine, arginine, cysteine or methionine.

7. a composition suitable for treating hair loss, comprising:
a transition metal compound having SOD activity selected from copper salicylate, copper aspirinate, indomethacin-copper, and a complex of a basic amino acid and a transition metal; and
a topical pharmaceutical carrier selected from oil and water emulsions, urea, propanol, butanol and glycols.

12. A composition useful for treating hair loss, comprising:
a transition metal compound of the formula R-M having superoxide dismutase activity wherein R is salicyl, acetylsalicyl or indomethacin, and M is copper, iron, zinc, or manganese; and
a topical pharmaceutical carrier selected from creams, lotions, shampoos and cream rinses.

5,470,877

USES OF PERILLIC ACID METHYL ESTER

Michael N. Gould, Madison, Wis.; Pamela L. Crowell, Indianapolis, Ind.; Charles E. Elson, and Zhibin Ren, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 865,561, Apr. 9, 1992. This application Mar. 15, 1994, Ser. No. 213,408
Int. Cl.[6] A61K *31/215;31/045*
U.S. Cl. 514—529 3 Claims

1. A method for causing the regression of a carcinoma, comprising the step of administering to a carcinoma-containing mammal an effective amount of perillic acid methyl ester, wherein after the administration the carcinoma is smaller in size than its size at the beginning of said administering step.

5,470,878

CELL SIGNALING INHIBITORS

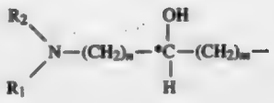
John Michnick, Seattle; Gail E. Underiner, Brier; J. Peter Klein, Vashon Island, and Glenn C. Rice, Seattle, all of Wash., assignors to Cell Therapeutics, Inc., Seattle, Wash.

Continuation-in-part of Ser. No. 40,820, Mar. 31, 1993, abandoned. This application Dec. 8, 1993, Ser. No. 164,081
Int. Cl.[6] A61K *31/20;* C07C *233/00*
U.S. Cl. 514—558 10 Claims

1. A compound, being a racemate, isolated R or S enantionmer, solvate, hydrate or salt and having the aliphatic formula:

X-terminal acyclic moiety,

wherein the terminal acyclic moiety, an hydroxyl, ester, amide, or carboxylic acid functional moiety, X is



wherein:

*C is a chiral carbon atom;

one or more carbon atoms of $(CH_2)_n$ may be substituted with an oxygen atom or hydroxy group;

n is an integer from one to four;

m is an integer from seven to fourteen; and independently, R_1 and R_2 are hydrogen, a straight or branched alkyl or alkenyl of up to twelve carbon atoms in length.

5,470,879

TREATMENT OF NON-INSULIN-DEPENDENT DIABETES

Yves Sauvaire, Montferrier sur Lez, and Gerard Ribes, Montpellier, both of, France, assignors to Laboratories Monal, France

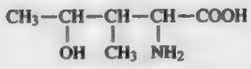
Division of Ser. No. 113,951, Aug. 31, 1993, abandoned. This application Dec. 23, 1994, Ser. No. 364,079

Claims priority, application France, Sep. 7, 1992, 92 10644

Int. Cl.[6] A61K *35/78*

U.S. Cl. 514—561 **5 Claims**

1. Process for stimulating the secretion of insulin and for the treatment of non-insulin dependent diabetes by the administration of effective quantities of substantially pure 4-hydroxyisoleucine of the formula:



or its lactone form or mixtures thereof.

5,470,880

METHOD OF USING CITRIC ACID FOR THE TREATMENT OF WRINKLES

Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002, and Eugene J. Van Scott, 3 Hidden La., Abington, Pa. 19001

Continuation of Ser. No. 89,101, Jul. 12, 1993, Pat. No. 5,389,677, which is a division of Ser. No. 8,223, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 812,858, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 469,738, Jan. 19, 1990, abandoned, which is a continuation of Ser. No. 945,680, Dec. 23, 1986, abandoned. This application Jan. 10, 1994, Ser. No. 179,190

Int. Cl.[6] A61K *7/48;31/19*

U.S. Cl. 514—574 **10 Claims**

1. Method of visibly reducing a human skin wrinkle comprising topically applying to said wrinkle citric acid, or a topically effective salt thereof, in an amount and for a period of time sufficient to visibly reduce said wrinkle.

5,470,881

UREA OPHTHALMIC OINTMENT AND SOLUTION

Judie F. Charlton, Morgantown, W. Va.; Ivan R. Schwab, Sacramento, Calif., and Robert M. Stuchell, Morgantown, W. Va., assignors to West Virginia University Research Corporation

Filed Sep. 9, 1993, Ser. No. 118,265

Int. Cl.[6] A61K *31/17*

U.S. Cl. 514—588 **9 Claims**

1. A method for treating ocular conditions selected from the group consisting of dryness, noninfectious keratitis, and corneal or conjuctival epithelial irregularities, the method comprising the steps of:

applying to the ocular surface of a mammalian eye an ophthalmic ointment comprising urea and/or urea derivatives or mixtures thereof.

5,470,882

ANTI-INFLAMMATORY COMPOUNDS

James S. Dixon, Malvern; Raplh F. Hall, Villanova; Lisa A. Marshall, Wyndmoor, all of Pa.; Floyd H. Chilton, III, Pilot Mountain, N.C.; Ruth J. Mayer, Wayne, and James D. Winkler, Fort Washington, both of Pa., assignors to SmithKline Beecham Corp., Philadelphia, Pa.

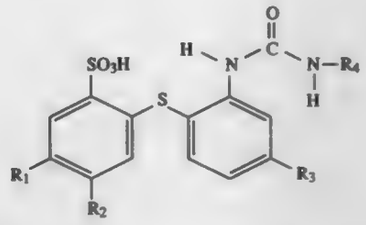
Filed Jun. 2, 1994, Ser. No. 252,716

Int. Cl.[6] A01N *47/28*

U.S. Cl. 514—596 **5 Claims**

1. A method for treating an inflammatory disease or disorder in a mammal in need thereof which method comprises administering to said mammal an effective amount of a compound of Formula (I

(I)



wherein

R_4 is a phenyl substiuted one to two times independently with chlorine or CF_3;

R_1 is chlorine;

R_2 is hydrogen or chlorine;

R_3 is chlorine or CF_3;

provided that when R_1 and R_2 are both chlorine then R_3 is CF_3; and pharmaceutically acceptable salts thereof.

5,470,883

METHOD OF TREATING PERIPHERAL VASOCONSTRICTION WITH TAMOXIFEN CITRATE

Brent V. Stromberg, 511 Corley Dr., Chesterfield, Mo. 63017

Filed May 23, 1994, Ser. No. 247,771

Int. Cl.[6] A61K *31/135*

U.S. Cl. 514—648 **8 Claims**

1. A method of modifying the vasoactive effect of epinephrine, norepinephrine or dopamine comprising the administration of a pharmacologically acceptable salt of tamoxifen.

5,470,884

ANTI-ACNE COMPOSITIONS

Ann M. Corless, Fairfield; George E. Deckner, Cincinnati; Bonnie J. Hall, Mason, and Joseph A. Listro, Loveland, all of Ohio, assignors to Procter & Gamble, Cincinnati, Ohio

Filed May 19, 1994, Ser. No. 245,777

Int. Cl.[6] A61K *31/075*

U.S. Cl. 514—714 **20 Claims**

1. An anti-acne composition comprising:

(a) from about 0.1% to about 20% benzoyl peroxide particles,

(b) from about 0.01% to about 10% of a wetting agent,

(c) from about 20% to about 99.74% water,

(d) from about 0.1% to about 10% of a non-volatile emollient component which is a liquid at 25° C. and which has a weighted arithmetic mean solubility parameter of less than or equal to about 7, and

(e) from about 0.05% to about 5% of a water soluble or dispersible gelling agent.

5,470,885

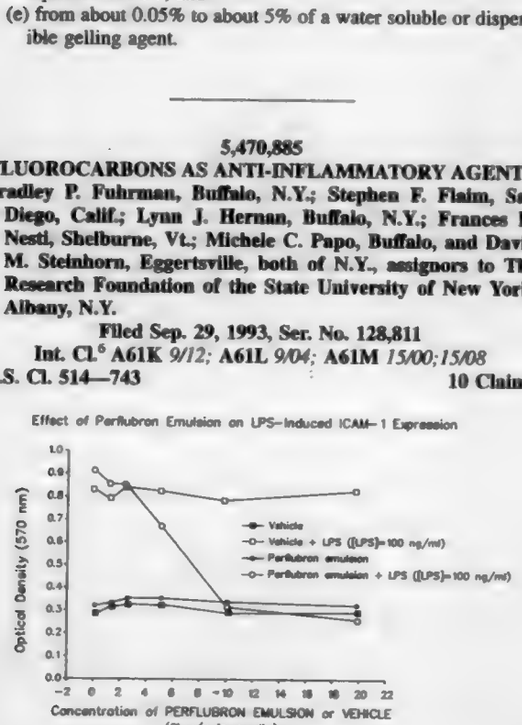
FLUOROCARBONS AS ANTI-INFLAMMATORY AGENTS

Bradley P. Fuhrman, Buffalo, N.Y.; Stephen F. Flaim, San Diego, Calif.; Lynn J. Hernan, Buffalo, N.Y.; Frances D. Nesti, Shelburne, Vt.; Michele C. Papo, Buffalo, and David M. Steinhorn, Eggertsville, both of N.Y., assignors to The Research Foundation of the State University of New York, Albany, N.Y.

Filed Sep. 29, 1993, Ser. No. 128,811

Int. Cl.[6] A61K *9/12;* **A61L** *9/04;* **A61M** *15/00;15/08*

U.S. Cl. 514—743 **10 Claims**



1. A method for reducing the inflammatory response in lung of a patient in need of such treatment, comprising the step of administering an effective, inflammation-reducing amount of a fluorocarbon gas or aerosol into said lung from an external source.

5,470,886

CURABLE, SPRAYABLE COMPOSITIONS FOR REINFORCED THIN RIGID PLATES

Joseph M. Makhlouf, Mars, and John R. Schneider, Glenshaw, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 31, 1994, Ser. No. 220,656

Int. Cl.[6] C08K *9/10;7/02;* **C08L** *63/02;63/00*

U.S. Cl. 521—59 **12 Claims**

1. A curable, sprayable composition comprising:

(i) a thermosetting resinous composition comprising an epoxy-based material containing at least two epoxide groups per molecule and a catalyst to initiate cure of the epoxy-based material;

(ii) from about 1 to about 7 percent by weight based upon the total weight of the composition of expandable microspheres which expand during curing of the composition so that the composition with expanded microspheres overcomes deformation of the substrate to which the composition is applied, wherein said deformation is due to shrinkage, and wherein the composition does not fall or blow off the substrate during curing; and

(iii) from about 8 to about 40 weight percent based upon total weight of the composition of a particulate reinforcing material selected from the group consisting of milled glass fibers, milled carbon fibers, and mixtures thereof.

5,470,887

VESICULATED POLYMER BEADS

Neil Perrins, High Wycombe, and Mary E. Kelly, Slough, both of, Great Britain, assignors to Imperial Chemical Industries, PLC, United Kingdom

Filed Apr. 25, 1994, Ser. No. 232,643

Claims priority, application United Kingdom, Apr. 29, 1993, 9308895

Int. Cl.[6] C08F *8/00*

U.S. Cl. 521—65 **12 Claims**

1. In a process for producing vesiculated polymer beads in which a water-in-oil emulsion containing a crosslinkable polymer and a copolymerisable monomer in the oil phase is heated in the presence of an initiator to cure the polymer beads, the improvement in the process comprising:

crosslinking the polymer and the copolymerisable monomer by addition copolymerization, where the polymer is a partially ethylenically unsaturated polyester resin and the monomer is unsaturated monomer, by (a) commencing curing in a first stage by a substantially water insoluble perester initiator and, when the beads are sufficiently stable, (b) completing the curing in a second stage in the presence of at a partially water soluble initiator selected from a peroxide or a peracid, and at a temperature higher than the first stage curing.

5,470,888

PROCESS FOR FOAMING FLAME RETARDANT POLYSTYRENE AND POLYSTYRENE SHAPED ARTICLES

Hub A. G. Vonken, CW Weert, and Jan op den Buysch, RC Budel-Dorplein, both of, Netherlands, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 17, 1994, Ser. No. 243,824

Claims priority, application Germany, Jun. 5, 1993, 43 18 743.9

Int. Cl.[6] C08J *9/00*

U.S. Cl. 521—79 **13 Claims**

1. A process for producing a foamed polymer article having flame retardant properties, comprising the steps of:

extruding a melt of styrene polymer granules, a flameproofing agent and a nucleating agent in a first extrusion step;

injecting up to 4.3 by weight of a blowing agent comprising propane, butane or a mixture of propane and butane into said styrene polymer melt at the end of said first extrusion step, under a pressure of up to about 350 bar;

homogenizing and cooling the styrene melt to a melt temperature of below about 150° C. before a second extrusion; and

subjecting the styrene polymer melt to a second extrusion to produce an extruded foamed polymer article.

5,470,889

CATALYST FOR POLYISOCYANURATE FOAMS MADE WITH ALTERNATIVE BLOWING AGENTS

Michael E. Londrigan, Clearwater, and Kenneth G. Trout, Tampa, both of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 224,414, Apr. 8, 1994, Pat. No. 5,405,884, which is a continuation-in-part of Ser. No. 203,183, Feb. 28, 1994, abandoned, which is a division of Ser. No. 62,914, May 18, 1993, Pat. No. 5,308,883, which is a continuation-in-part of Ser. No. 971,105, Nov. 4, 1992, abandoned. This application Feb. 10, 1995, Ser. No. 386,391

Int. Cl.[6] C08J 9/00

U.S. Cl. 521—125 21 Claims

1. A closed cell, rigid polyisocyanurate foam which comprises the reaction product of (1) a polyisocyanate and (2) a polyester polyol or a mixture of a polyester polyol and at least one other isocyanate-reactive compound in the presence of (a) a hydrogen-containing blowing agent or a mixture of a hydrogen-containing blowing agent and at least one co-blowing agent, and (b) a catalytically effective amount of a catalyst mixture comprising (i) a salt of a carboxylic acid selected from the group consisting of an alkali metal salt and an alkaline earth metal salt and mixtures thereof, (ii) a tertiary amine, and (iii) a quaternary ammonium carboxylate salt, wherein the mole ratio of carboxylate metal salt: tertiary amine is a value less than about 2:1, and the total moles of quaternary ammonium carboxylate salt are less than the combined moles of the carboxylate metal salt and the teritary amine.

5,470,890

BIS-(N-ALKYLAMINOCYCLOHEXYL)METHANES AS CURING AGENTS IN POLYURETHANE AND POLYUREA FLEXIBLE FOAM MANUFACTURE

David W. House, Arlington Heights; Ray V. Scott, Jr., Schaumburg, and Mark J. Gattuso, Palatine, all of Ill., assignors to UOP, Des Plaines, Ill.

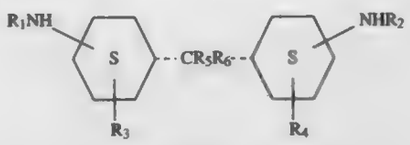
Filed Jun. 17, 1994, Ser. No. 262,106

The portion of the term of this patent subsequent to May 17, 2011, has been disclaimed.

Int. Cl.[6] C08G 18/10

U.S. Cl. 521—128 18 Claims

1. A polyurethane flexible foam resulting from the reaction of from about 0.85 to about 1.25 equivalents of a polyisocyanate reactant or mixture of polyisocyanate reactants with one equivalent of compounds having isocyanate-reactive hydrogens selected from the group consisting of 1)first polyamines, 2) blends of said first polyamines with polyols, 3) blends of said first polyamines with second polyamines, and 4)blends of said first polyamines with polyols and second polyamines, said first polyamines having the structure



where R_1 and R_2 are independently selected from the group consisting of alkyl groups with from 1 up to about 10 carbon atoms, and R_3, R_4, R_5 and R_6 are independently selected from the group consisting of hydrogen and alkyl groups with from 1 up to about 5 carbon atoms, said reaction conducted in the presence of a blowing agent.

5,470,891

DIMENSIONALLY STABLE CLOSED CELL RIGID POLYISOCYANATE BASED FOAM PREPARED FROM A FROTH FOAMING MIXTURE

Todd J. Green, Canton, and John R. Tucker, Wyandotte, both of Mich., assignors to BASF Corporation, Mt. Olive, N.J.

Division of Ser. No. 419,202, Apr. 10, 1995, Pat. No. 5,451,614. This application Jun. 16, 1995, Ser. No. 491,555

Int. Cl.[6] C08G 18/48

U.S. Cl. 521—131 11 Claims

1. A rigid closed cell polyisocyanate based foam having a closed cell content of at least 85 percent, prepared from a froth foaming mixture comprising:

a) a polyol composition comprising compound(s) having at least two isocyanate active hydrogens, said compound(s) having an average hydroxyl number of less than 400 and an average functionality of greater than 4.0; and water as a co-blowing agent;

b) a polymethylene polyphenylene polyisocyanate; and

c) a C_1–C_4 hydrofluorocarbon co-blowing agent having a boiling point of 300K or less; said foam having a uniform density gradient varying by not more than 10 percent.

5,470,892

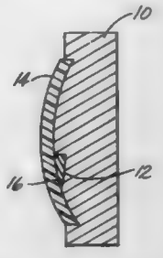
POLYMERIZABLE RESIN FOR FORMING CLEAR, HARD PLASTICS

Amitava Gupta, San Marino, Calif., and Ronald D. Blum, Roanoke, Va., assignors to Innotech, Inc., Roanoke, Va.

Filed May 1, 1992, Ser. No. 877,105

Int. Cl.[6] B29D 11/00; C08F 26/02

U.S. Cl. 522—42 38 Claims



1. A resin for forming a coating upon an optical preform in a gasketless casting process, comprising: about 50–90% by weight of a polymerizable base component; no more than about 25% by weight of a cross-linker; between about 0.5% and 6% by weight of an initiator; and between about 0.5% and 20% by weight of a viscosity control agent; wherein the resin has a viscosity greater than 25 centistokes and less than 130 centistokes at 68° F.

5,470,893

POWDER COATING COMPOSITIONS

John D. Sinclair-Day, Tyne & Wear; Stephen P. Cassidy, Newcastle upon Tyne; John Ring, Newcastle upon Tyne, and Andrew G. Cordiner, Newcastle upon Tyne, all of, Great Britain, assignors to Courtaulds Coatings (Holdings) Limited, London, England

Continuation-in-part of Ser. No. 687,901, Jul. 25, 1991, Pat. No. 5,319,001. This application Jan. 29, 1993, Ser. No. 955,734

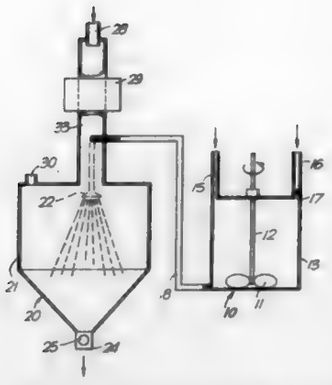
Claims priority, application United Kingdom, Jun. 1, 1990, 9012315

The portion of the term of this patent subsequent to Jun. 7, 2011, has been disclaimed.

Int. Cl.[6] C09C 3/10; C09D 5/03; C08J 3/20

U.S. Cl. 523—205 12 Claims

1. A process for the preparation of a powder coating composition suitable for providing a coating having desired appearance or performance attributes, said process comprising the steps of:



providing a primary film-forming component and one or more other, different, components selected from film-forming components and non-film-forming components,

each said component consisting of solid particles and

each particle of said primary film-forming component comprising a solid polymeric binder system at least a portion of which is a film-forming resin in an amount sufficient to impart film forming properties to the composition, the particles of said other, different, components containing at least one substance that, when processed into a coating with said primary film-forming component, provides with said primary film-forming component said desired appearance or performance attribute to said coatings, provided that, if the agglomerate contains a metallic or lustre component and a fluidisable film-forming component, it also contains an incompatible film-forming component or a non-film-forming performance component, or two or more such components, and

comminuting the components and mixing and agglomerating them to produce composite particles such that the composition is air fluidisable and can be applied to a substrate by electrostatic spray and the individual particles in said composite particles are bonded together such that the composite particles do not break down under the mechanical and/or electrostatic forces associated with application of the composition to the substrate,

wherein the identities, the particle sizes, and the proportions of the components mixed are such that, when applied to a substrate and heated to form a continuous coating, a film having the desired appearance or performance attribute is formed.

5,470,894

LOW VOC (VOLATILE ORGANIC COMPOUNDS), SOLVENT-BASED CPVC PIPE ADHESIVES WHICH MAINTAIN JOINT ADHESIVE PERFORMANCE

Naresh D. Patel, 9223 Paso Robles Ave., Northridge, Calif. 91325, and Mark D. Brown, 9216 Tweedy La., Downey, Calif. 90240

Continuation-in-part of Ser. No. 122,139, Sep. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 837,810, Feb. 18, 1992, Pat. No. 5,252,634. This application Aug. 31, 1994, Ser. No. 299,791

The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.

Int. Cl.[6] C08J *9/32;* **C08K** *5/34;5/15;5/20*

U.S. Cl. 523—218 **18 Claims**

1. A chlorinated polyvinyl chloride (CPVC) adhesive for joining CPVC pipes consisting essentially of:

(a) about 18 to 28 wt % CPVC resin;

(b) a high vapor pressure solvent consisting essentially of about 15 to 35 wt % tetrahydrofuran and 0 to about 30 wt % methyl ethyl ketone, with the total high vapor pressure solvent concentration not exceeding a maximum concentration of about 55 wt % of said adhesive;

(c) a low vapor pressure solvent consisting essentially of about 20 to 45 wt % cyclohexanone, 0 to about 35 wt % N-methyl pyrrolidone, and 0 to about 10 wt % of a mixture of at least two refined dimethyl esters selected from the group consisting of adipic, glutaric, and succinic acids, with the total low vapor pressure solvent concentration at least about 20 wt % of said adhesive; and

(d) up to about 8 wt % of at least one component selected from the group consisting of pigments, fillers, thixotropic agents, and stabilizers,

said adhesive having a volatile organic compound concentration not exceeding 450 g/l.

5,470,895

AGGLOMERATING AGENT LATEX WITH BOUND POLY(ETHYLENE OXIDE)

Kevin R. Kidder, Malta, N.Y.; Vijaya K. Kuruganti, Washington, W. Va.; Donald M. Kulich, Marietta, Ohio, and John F. Graf, Vienna, W. Va., assignors to General Electric Company, Parkersburg, W. Va.

Filed Jun. 13, 1994, Ser. No. 259,314

Int. Cl.[6] C08J *3/02*

U.S. Cl. 523—335 **11 Claims**

1. A process for agglomerating latexes of rubbery polymers comprising:

(A) formation of an agglomerating latex by radical copolymerization of (a) an ethylenically unsaturated monomer, and (b) a vinyl functional non-surfactant polyoxyethylene; said copolymerization taking place in the presence of water, said copolymerization resulting in the formation of polyoxyethylene bound agglomerating particles; and

(B) admixing said agglomerating particles with a latex of rubbery particles having an average particle size of 15 nanometers to 200 nanometers in diameter on a weight average basis, to form agglomerated particles.

5,470,896

STORAGE-STABLE SOLUTIONS OF ACCELERATOR SYSTEMS

Alex Wegmann, Allschwil, and Heinz Wolleb, Chesalles, both of, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 168,741, Dec. 16, 1993, abandoned. This application Jan. 20, 1995, Ser. No. 376,539

Claims priority, application Switzerland, Dec. 22, 1992, 3938/92-9

Int. Cl.[6] C08K *5/17;* **C08L** *63/02*

U.S. Cl. 523—428 **9 Claims**

1. A solution of an accelerator system, which comprises a binary system comprising:

a) 10 to 90% by weight of a salt of formula I

$$[Me]_m^{x\oplus}[R]_n^{y\ominus} \quad (I),$$

wherein x and y are the respective number of charges and m and n are each a number 1, 2, 3 or 4, Me is a metal atom and R is the radical of an alcohol, phenol or thiophenol or of a carboxylic acid or thiocarboxylic acid, or

10 to 90% by weight of a salt of formula II

$$[Me_1]_m^{x\oplus}[A]_n^{y\ominus} \quad (II),$$

with an organic complex former containing one or more hetero atoms having free electron pairs,

wherein Me_1 is a metal atom or a group of the formula $N(R_1)_4$, $S(R_1)_3$ or $P(R_1)_4$ wherein each R_1 independently of the others is hydrogen, an unsubstituted or substituted C_1–C_6alkyl or aryl radical, A is any anion and x, y, m and n are as defined above, and wherein the salts of formula II used contain no water of crystallisation and also contain solvents that are anhydrous, and

b) 90 to 10% by weight of an organic solvent selected from a monohydric alcohol and a solvent containing at least one —OR_1 or —COR_1 group wherein R_1 is hydrogen, an unsubstituted or substituted C_1–C_6alkyl or aryl radical.

5,470,897

RADICALLY CURABLE COATING COMPOSITIONS AND THEIR USE FOR COATING WOOD SUBSTRATES

Jürgen Meixner, Krefeld; Wolfgang Fischer, Meerbusch, and Manfred Müller, Erkelenz, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 28, 1994, Ser. No. 234,753

Claims priority, application Germany, May 5, 1993, 43 14 866.2

Int. Cl.[6] C08L *67/06;* **C08K** *5/10;5/01*

U.S. Cl. 523—518 **8 Claims**

1. A coating composition which may be radically cured at temperatures below 80° C. and which comprises

A) 50 to 95 parts by weight of an α,β-ethylenically unsaturated polyester component having a viscosity at 23° C. of 1,000 to 15,000 mPa.s and containing at least one polyester resin prepared by reacting at an equivalent ratio of carboxyl groups to hydroxyl groups of at most 1:1

a) a dicarboxylic acid component containing 75 to 100 carboxyl-equivalent-% of one or more α,β-ethylenically unsaturated dicarboxylic acids having 4 or 5 carbon atoms and/or their corresponding anhydrides and 0 to 25 carboxyl-equivalent-% of one or more other dicarboxylic acids having 4 to 10 carbon atoms or their anhydrides with

b) an alcohol component containing 15 to 60 hydroxyl-equivalent-% of one or more β,γ-ethylenically unsaturated alkenyl ether alcohols having 6 to 14 carbon atoms and 40 to 85 hydroxyl-equivalent-% of one or more other mono- and/or dihydric alcohols having a molecular weight of 32 to 400,

B) 5 to 50 parts by weight of compounds containing (meth)acryloyl groups and/or vinyl ether groups and having a viscosity at 23° C. of 10 to 1,000 mPa.s and a molecular weight of 72 to 1,000,

wherein the sum of the parts by weight of components A) and B) is 100, based on the total weight of components A) and B),

C) 0.01 to 0.3 wt. %, based on the total weight of components A) to D), of a barrier agent containing one or more waxes and/or paraffins having a melting point of 35° to 100° C. and

D) 0 to 10 wt. %, based on the total weight of components A) to D), of one or more plasticizers or carbamic acid resins.

5,470,898

SORBITOL DERIVATIVES AS NUCLEATORS AND CLARIFIERS FOR POLYOLEFINS, AND POLYOLEFIN COMPOSITIONS OBTAINED THEREWITH

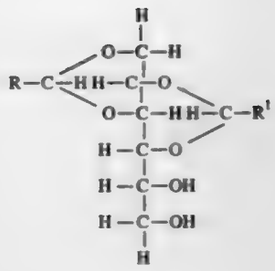
Abuzar Syed, New Castle County, Del., assignor to Montell North America Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 85,717, Jun. 30, 1993, abandoned. This application May 13, 1994, Ser. No. 239,230

Int. Cl.[6] C08K *5/15*

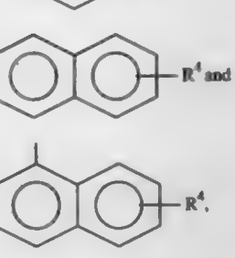
U.S. Cl. 524—84 **7 Claims**

1. A polyolefin composition consisting essentially of at least semi-crystalline to crystalline one homopolymer or copolymer of a C_2 to C_8 alpha-monoolefin and about 0.05 to about 2.5% by weight, of said composition of a D-sorbitol derivative of the following formula:



wherein:

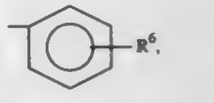
(a) R and R^1 are the same and represent a member selected from the group consisting of



wherein R^2 is mono-, di- or tri-substituted on the ring and represents a member selected from the class consisting of NO_2 and CN; and wherein R^4 is mono-, di-, or tri-substituted on the ring and represents a member selected from the class consisting of C_1–C_6 alkyl or O-alkyl, and NO_2; or

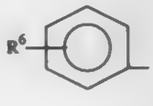
(b) R and R^1 are different and one of R and R^1 is

wherein R^5 represents a member selected from the class consisting of H, C_1–C_6 alkyl, NO_2, Cl, Br and F, and the other of R and R^1 is

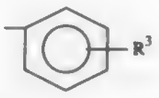


wherein R^6 is mono-, di-, or tri-substituted on the ring and represents a member selected from the class consisting of alkyl or O-alkyl groups having 1 to 8 carbon atoms, NO_2, CN and COOY, wherein Y is an alkyl having 1 to 8 carbon atoms; or

(c) R and R^1 are different and R is



wherein R^6 is as defined above, and R^1 is



wherein R^3 is mono-, di-, or tri-substituted on the ring and represents an alkyl group having 4 to 6 carbon atoms.

5,470,899

REDUCTION IN THE PH OF ANIONIC POLYURETHANE DISPERSIONS WHICH ARE STABILIZED BY CARBOXYLATE OR SULFONATE GROUPS

Erich Gulbins, Heidelberg; Karl Haeberle, Speyer; Ulrike Licht, Mannheim, and Alexander Wallon, Limburgerhof, all of, Germany, assignors to BASF Aktiegesellschaft, Ludwigshafen, Germany

Filed Dec. 28, 1993, Ser. No. 174,283

Claims priority, application Germany, Jan. 7, 1993, 43 00 162.9

Int. Cl.[6] C08K *5/10;5/101;* **C08L** *75/04*

U.S. Cl. 524—158 **3 Claims**

1. A process for reducing the pH of anionic polyurethane dispersions which are stabilized by carboxylate or sulfonate groups to a pH of ≧6, which comprises adding a compound which has from 1 to 4 ester groups, but no acid group or acid halide or anhydride group to the dispersions,

wherein said compound is an ester produced from the reaction of an inorganic acid or an organic acid selected from the group consisting of acids having the formula

$$(R)_x C_n H_{(2n+2-x)}$$

wherein n is an integer from 1 to 8, x is an integer from 1 to 4, and R is —COOH, $-SO_3H$, $-P(OH)_2$ or $-PO(OH)_2$;

with a monoalcohol having 1 to 6 carbon atoms.

5,470,900

POWDER MOLDING PROCESS USING A THERMOPLASTIC ELASTOMER POWDER

Toshio Sasaki; Takeshi Ebara, both of Ichihara; Toshio Igarashi, Kyoto; Masayuki Tatsumi, Ibaraki, and Kazuki Wakamatsu, Sodegaura, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 38,947, Mar. 29, 1993, abandoned. This application May 19, 1994, Ser. No. 245,829

Claims priority, application Japan, Apr. 3, 1992, 4-081990

Int. Cl.[6] C08F *297/08;* **C08L** *23/16;53/00*

U.S. Cl. 524—269 **11 Claims**

1. A powder molding process comprising the forming of a propylene based prepolymer by one method selected from the group consisting of:

a method comprising carrying out a polymerization in liquified propylene,

a method comprising carrying out a polymerization in liquified propylene and thereafter carrying out a polymerization in gas phase, and

a method comprising carrying out a polymerization in gas phase,

to obtain a propylene-base prepolymer and thereafter carrying out a random copolymerization of ethylene and α-olefin to make an ethylene/α-olefin random copolymer portion in the presence of the propylene-based prepolymer in gas phase by the use of a catalyst system consisting of:

(A) a solid catalyst component comprising a porous carrier and a polymerization accelerator comprising titanium, magnesium and halogen supported on the porous carrier,

(B) an organoaluminum compound, and

(C) an electron donative compound,

to form elastomer powder; the elastomer powder having a melt flow rate (MFR) of 15–200 g/10 min, an intrinsic viscosity $[\eta]_T$ of 1.25–1.70, a content of ethylene in the ethylene/α-olefin random copolymer portion of 20–85% by mole, and a complex dynamic viscosity η^* (1) at a frequency of 1 radian/second of 1.5×10^5 poises or below as determined by dynamic viscoelastic measurement at 250° C., and having a Newtonian viscosity index n of 0.67 or below as calculated from the following equation:

$$n=\{\log \eta^*(1)-\log \eta^*(100)\}/2$$

wherein η^* (1) is the complex dynamic viscosity at frequency of 1 radian/second and η^* (100) is a complex dynamic viscosity at a frequency of 100 radians/second, and forming a molded article from said elastomer powder.

5,470,901

POLYPHENYLENE SULFIDE RESIN COMPOSITION AND PROCESS FOR PREPARING THE SAME

Kazuo Ishiwari; Yoshihisa Yamamoto, and Tetsuo Shimizu, all of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 134,369, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 619,420, Nov. 29, 1990, abandoned. This application Jan. 23, 1995, Ser. No. 376,437

Claims priority, application Japan, Nov. 30, 1989, 1-311507

Int. Cl.[6] C08L *83/00;81/02*

U.S. Cl. 524—345 **8 Claims**

1. A polyphenylene sulfide resin composition which comprises 100 parts by weight of an uncrosslinked polyphenylene sulfide resin and 0.5 to 50 parts by weight of a crosslinked fluorine-containing elastomer which is crosslinked with a crosslinking agent selected from the group consisting of polyamine compounds, polyhydroxy compounds and polythiol compounds.

5,470,902

RESIN COMPOSITION FOR AUTOMOBILE RELAY BOX AND AUTOMOBILE RELAY BOX COMPRISING THE SAME

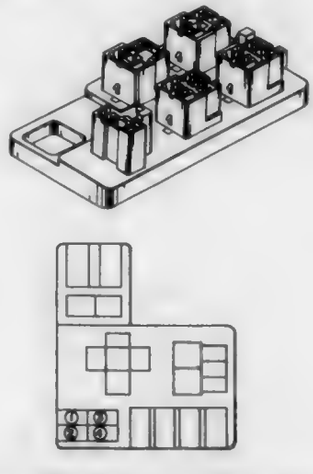
Yoshinobu Kubo, and Masamitsu Chishima, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Oct. 19, 1993, Ser. No. 137,937

Claims priority, application Japan, Jan. 21, 1992, 4-282883; Jan. 21, 1992, 4-282884

Int. Cl.[6] C08K *5/09*

U.S. Cl. 524—400 **15 Claims**



1. A resin composition for an automobile relay box, comprising 100 parts by weight of a mixture containing

(A) 20 to 70% by weight of a polyphenylene ether which is modified with an unsaturated carboxylic acid compound having a) an ethylenic double bond and b) a carboxyl group or an acid anhydride group in a molecule and

(B) 30 to 80% by weight of a polyamide which comprises 100 parts by weight of 6,6-nylon and 10 to 100 parts by weight of 6-nylon, and

0.1 to 3 parts by weight of (C) a metal salt of montanic acid.

5,470,903

N-VINYLAMIDE POLYMERS AS STABILIZING PROTECTIVE COLLOIDS IN AQUEOUS EMULSION POLYMERIZATION

William E. Lenney, Allentown, and Dennis Sagl, Bethlehem, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 20, 1994, Ser. No. 277,827

The portion of the term of this patent subsequent to Jul. 5, 2011, has been disclaimed.

Int. Cl.[6] C08F *2/30;* **C08L** *39/02*

U.S. Cl. 524—458 **13 Claims**

1. In a method for preparing an aqueous polymer emulsion containing a thermoplastic polymer therein by the free radical aqueous emulsion polymerization of at least one monomer in the presence of a stabilizing composition, the improvement which comprises using a stabilizing composition comprising from 0.5 to 20% by weight of water soluble polymer containing poly(N-vinylformamide) units.

5,470,904

PERMANENT AQUEOUS MARKER INKS

Rachel M. Loftin, Halifax, and Kimberly B. Sanborn, South Weymouth, both of Mass., assignors to The Gillette Company, Boston, Mass.

Division of Ser. No. 968,001, Oct. 28, 1992, which is a continuation-in-part of Ser. No. 917,455, Jul. 21, 1992, abandoned. This application Feb. 2, 1994, Ser. No. 190,287

Int. Cl.[6] C08K *5/02;* **C09D** *11/00;13/00*

U.S. Cl. 524—462 **17 Claims**

1. A marker comprising

a hollow tubular body defining an ink reservoir, the reservoir containing an ink comprising a silicone surfactant, a pigment, a film-forming polymer and water and

a tip in fluid communication with said reservoir for delivering said ink to a substrate by capillary action.

5,470,905

ADHESION PROMOTERS FOR RUBBER AND SYNTHETIC MIXTURES

Karl Meier, Alfter; Udo Goerl, Bornheim-Roisdorf, and Siegfried Wolff, Bornheim-Merten, all of, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 8,563, Jan. 22, 1993, Pat. No. 5,321,070. This application Mar. 23, 1994, Ser. No. 216,296

Claims priority, application Germany, Jan. 25, 1992, 42 02 023.9

Int. Cl.[6] C08K *3/36;5/13;* **C08L** *61/12;* **B60C** *13/00*

U.S. Cl. 524—493 **4 Claims**

1. A vulcanizable rubber adhesion mixture comprising:

a rubber material; and

a blend including 5–95% by weight resorcinol and 95–5% by weight precipitated silica, relative to a total weight of the resorcinol/silica blend, wherein the silica has a pH of greater than 8 in a 5% aqueous suspension; wherein the rubber adhesion mixture includes 1.5 to 5 parts by weight resorcinol relative to parts by weight rubber.

5,470,906

ODOR FREE, AIR DRY, DECORATIVE LATEX PAINTS

Gary P. Craun, Berea; George S. Rosekelly, Lakewood, both of Ohio, and F. Louis Floyd, Silver Spring, Md., assignors to The Glidden Company, Cleveland, Ohio

Filed Dec. 27, 1993, Ser. No. 173,069

Int. Cl.[6] C08L *67/00;75/00*

U.S. Cl. 524—507 **8 Claims**

1. A process for producing an aqueous dispersed., ambient dry paint coating composition containing a polymeric binder free of volatile organic coaleacing solvent, the process steps for producing the polymeric binder comprising:

preparing a low molecular weight oligomeric modifier having a number average molecular weight between 300 and 5,000 and a Tg less than −20° C., the oligomeric modifier selected from a polyurethane and a polyester;

heating a mixture of the oligomeric modifier, water, and surfactant to a temperature between about 45° C. and 100° C. to provide a heated aqueous mixture containing between 40% and 70% by weight oligomeric modifier;

micronizing by high shear mixing the heated aqueous mixture to produce a preformed micronized, aqueous micro-emulsion of oligomeric modifier having an organic phase droplet size less than 1 micron; and

mixing the preformed micro-emulsion of oligomer with a preformed aqueous emulsion of addition copolymer of copolymerized ethylenically unsaturated monomers to produce a polymeric binder containing by weight between 3% and 30% oligomeric modifier, where the polymeric binder has a Tg less than 20° C.

5,470,907

AQUEOUS POLYURETHANE DISPERSIONS

Alexander Wallon, Limburgerhof; Gerhard Auchter, Bad Duerkheim; Ulrike Licht, Mannheim; Karl Haeberle, Speyer, and Angelika Funhoff, Heidelberg, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jun. 21, 1994, Ser. No. 263,233

Claims priority, application Germany, Jun. 21, 1993, 43 20 455.4

Int. Cl.[6] C08J *3/00;* **C08K** *3/20;* **C08L** *75/00;* **C08F** *283/04*

U.S. Cl. 524—507 **10 Claims**

1. An aqueous polyurethane dispersion containing

A) at least one polyurethane (component A) dispersed in an aqueous medium and having negatively charged groups at a pH of the aqueous dispersing medium of ≧6, as the main component, and

B) 0.1 to 5.0% by weight, based on component A, of at least one polymer (component B) which comprises, in polymerized form,

a) from 25 to 100% by weight of at least one unsaturated monomer which has at least one Brönsted acid group (monomers Ba) and

b) from 0 to 75% by weight of one or more monomers capable of undergoing free radical copolymerization (monomers Bb),

with the proviso that component B has a number average molecular weight of from 1,000 to 50,000,

component B acts as a Brönsted acid when added to water at 25° C., the aqueous dispersing medium of the aqueous polyurethane dispersion has a pH of ≧6 at 25° C. and wherein the aqueous polyurethane dispersion contains no polyvalent metal ions.

5,470,908

WATER-BASED ACRYLIC COATING COMPOSITIONS

Donald L. Schmidt; Robert F. Harris, and Charles Coburn, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 28, 1993, Ser. No. 144,924
Int. Cl.[6] C08J 3/26; C08K 5/32; C08L 27/00
U.S. Cl. 524—520 20 Claims

1. A composition comprising at least 10 percent by weight of water and, based on the weight of components (a), (b), and (c);

(a) 0 to about 95 percent by weight of a water-compatible polymer having at least two pendant carboxylate groups;

(b) 1 to about 60 percent by weight of a polymeric polycarboxylate different from component (a) which has (1) at least two pendant carboxylate groups and (2) at least one internal amide, thioamide, urea, thiourea, biuret, dithiobiuret, or urethane group; and

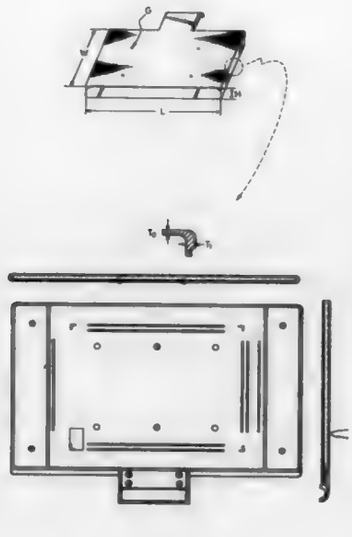
(c) 2 to about 70 percent by weight of a polyfunctional crosslinking agent having ionic or potentially ionic moeity counter ions capable of reacting with the carboxylate groups of (a) and (b).

5,470,909

POLYAMIDE RESIN COMPOSITION AND HOUSING FOR ELECTRONIC EQUIPMENT

Kota Nishii; Kouichi Kimura; Masanobu Ishizuka, and Katsura Adachi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 25, 1993, Ser. No. 111,480
Claims priority, application Japan, Feb. 18, 1993, 5-029328
Int. Cl.[6] C08K 3/00; C08L 71/12
U.S. Cl. 524—538 4 Claims



1. A polyamide resin composition comprising 100 parts by weight of a resin composition comprised of 20% to 80% by weight of an aromatic polyamide resin containing a m-xylene group and 80% to 20% by weight of a modified polyphenylene ether resin, the total amount of the aromatic polyamide resin and the modified polyphenylene ether resin being 100% by weight and, incorporated in said resin composition, based on 100 parts by weight of the resin composition, 0.5 to 30 parts by weight of a copolyester liquid-crystalline polymer, 0.01 to 3 parts by weight of phenylenebisoxazoline and 2 to 40 parts by weight of an inorganic filler, wherein the modified polyphenylene ether resin is produced by reacting a polyphenylene ether resin with an unsaturated aliphatic carboxylic acid or its acid anhydride.

5,470,910

COMPOSITE MATERIALS CONTAINING NANOSCALAR PARTICLES, PROCESS FOR PRODUCING THEM AND THEIR USE FOR OPTICAL COMPONENTS

Lubomir Spanhel, Saarbrücken-Dudweiler, Germany; Ertugrul Arpac, Antalia, Turkey; Rüdiger Nass, Riegelsberg, and Helmut Schmidt, Saarbrücken-Güdingen, both of, Germany, assignors to Institut Fuer Neue Materialien Gemeinnuetzige GmbH, Saarbruecken, Germany

PCT No. PCT/EP92/02327, § 371 Date Jun. 28, 1994, § 102(e) Date Jun. 28, 1994, PCT Pub. No. WO93/07179, PCT Pub. Date Apr. 15, 1993
PCT Filed Oct. 9, 1992, Ser. No. 211,431
Claims priority, application Germany, Jan. 10, 1991, 41 33 621.6
Int. Cl.[6] C08K 3/10;3/22;3/16;3/30
U.S. Cl. 524—785 18 Claims

1. A process for producing a composite material, comprising nanoscaled particles having an average particle size of from about 0.5 to 20 nm distributed throughout, which process comprises:

a) reacting a compound a), which contains a metal selected from the group consisting of groups VIa, VIIa, VIIIa, Ib, IIb, IIIb, IVb, Vb, and lanthanides, in a solvent, and soluble therein, with a precipitating reagent b), thereby precipitating antimonides, arsenides, chalcogenides, halogenides or phosphides of said metal of said compound in the presence of a bifunctional compound c), which contains at least one electron pair-donor group and at least one group, which is convertible through polymerization of polycondensation into an organic or inorganic network, to form a stabilized sol of said nanoscaled particles; and

b) mixing said stabilized sol of said nanoscaled particles with a compound d), which is polymerizable or thermally or photochemically curable into a polymer, and a polymerization initiator; and hydrolyzing and polycondensing said mixture, and curing the same to form said composite material.

5,470,911

GLYCOSAMINOGLYCAN-SYNTHETIC POLYMER CONJUGATES

Woonza M. Rhee, Palo Alto, and Richard A. Berg, Los Altos, both of Calif., assignors to Collagen Corporation, Palo Alto, Calif.

Division of Ser. No. 146,843, Nov. 3, 1993, which is a continuation-in-part of Ser. No. 907,518, Jul. 2, 1992, Pat. No. 5,324,775, which is a continuation-in-part of Ser. No. 433,441, Nov. 14, 1989, Pat. No. 5,162,430, which is a continuation-in-part of Ser. No. 274,071, Nov. 21, 1988, abandoned. This application May 4, 1995, Ser. No. 433,656
Int. Cl.[6] C08G 63/48;63/91;63/40
U.S. Cl. 525—54.1 8 Claims

1. A biocompatible, biologically inert conjugate comprising a difunctionally activated hydrophilic synthetic polymer chemically conjugated to both collagen, or a derivative thereof, and to a glycosaminoglycan, or a derivative thereof.

5,470,912

POLYMERIC POWDER COATING COMPOSITIONS COMPRISING LOW MOLECULAR WEIGHT POLYETHYLENE POLYOLS

Donald F. Loar, Washington, N.J., assignor to AlliedSignal Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 28,734, Mar. 8, 1993, abandoned. This application Jul. 22, 1993, Ser. No. 94,733
Int. Cl.[6] C08L 33/08;23/04
U.S. Cl. 525—58 17 Claims

1. A polymeric powder coating composition comprising:

(a) polymeric powder coating resin selected from the group consisting of unsaturated polyester coating resin and acrylic coating resin, and

(b) at least one low molecular weight ethylene copolymer having a degree of saponification of at least 25%, and having a melt index of greater than 400 g/min. as determined by the procedure of ASTM D1239-86 using the conditions 125/0.235 and having a number average molecular weight equal to or less than about 4000.

5,470,913

POLYMER MIXTURE WHICH COMPRISES A POLYAMIDE, A POLYPHENYLENE ETHER AND AN AGENT TO IMPROVE THE IMPACT RESISTANCE

Roelof van der Meer, Bergen op Zoom, Netherlands; Charles F. Pratt, Niskayuna, N.Y.; Johannes W. J. de Munck, Huybergen, Netherlands, and Jean M. H. Heuschen, Schoten, Belgium, assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 275,685, Nov. 23, 1988, abandoned, which is a continuation of Ser. No. 7,161, Jan. 27, 1987, abandoned. This application Oct. 26, 1989, Ser. No. 428,402

Claims priority, application Netherlands, Jan. 27, 1986, 8600166

Int. Cl.[6] **C08L** *77/00*

U.S. Cl. 525—66 **2 Claims**

1. A polyphenylene ether-polyamide composition comprising, based on 100 parts by weight of a combination of (A) and (C):

(A) (i) 5 to 94 percent by weight of a polyphenylene ether and (ii) 5 to 94 percent by weight of a polyamide;

(B) one or more compatibilizing agents in an amount sufficient to effect compatibilization between (A) (i) and (A) (ii); and

(C) 1 to 50 percent by weight of at least one agent to improve the impact resistance of the composition, wherein the improvement comprises employing as component (C) at least one agent to improve the impact resistance comprised of an alkylene-alkyl(meth)acrylate having a functional group, said functional group selected from the group consisting of carboxylic acid groups, acid anhydride groups, acid amide groups, imido groups, carboxylic acid ester groups, amino groups, hydroxyl groups, epoxy groups and combinations of more than one of the foregoing; and

wherein the polymer mixture comprises more than one polyamide, more than one polyphenylene ether and more than one of said impact resistance agents.

5,470,914

POLYMER BLENDS CONTAINING A SOLID ELASTOMERIC BLOCK COPOLYMER

Thomas S. Coolbaugh, Morrisville; Frederick C. Loveless, Yardley, both of Pa., and Demetreos N. Matthews, Ewing, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 282,297, Jul. 29, 1994, Pat. No. 5,399,629, which is a division of Ser. No. 143,718, Nov. 1, 1993, Pat. No. 5,352,743, which is a division of Ser. No. 836,577, Feb. 18, 1992, Pat. No. 5,276,100, which is a continuation-in-part of Ser. No. 466,233, Jan. 16, 1990, Pat. No. 5,187,236, and a continuation-in-part of Ser. No. 735,552, Jul. 25, 1991, Pat. No. 5,292,820. This application Mar. 13, 1995, Ser. No. 402,666

Int. Cl.[6] **C08L** *51/00;53/00*

U.S. Cl. 525—66 **32 Claims**

1. A blend comprising a solid elastomeric block copolymer and a material selected from the group consisting of isotactic polypropylene, polystyrene, polyethylene, nylon, polycarbonates, polyesters, styrene-acrylonitrile resins, ethylene-propylene-diene rubber (EPDM), butyl rubber, and rubbers based on butadiene or isoprene, said block copolymer being such that either 1) the terminal blocks are polymers of at least one conjugated diene I (I polymer), said diene containing at least five carbon atoms with at least one of each pair of double-bonded carbon atoms in the polymerized diene I units being additionally single-bonded to two carbon atoms; at least one middle or interior block is a hydrogenated polybutadiene (B polymer); and at least one middle or interior block is an essentially straight chain polyethylene (E polymer) from the hydrogenation of a polybutadiene composed of at least 80% of 1,4-units; or 2) the terminal blocks are each a random IB copolymer of at least one diene I and hydrogenated butadiene (B), and at least one middle or interior block is an essentially straight chain polyethylene (E polymer) as previously defined, the hydrogenated butadiene units in said B polymer or random IB copolymer blocks being composed of not more than about 65% of 1,4- units and at least about 35% of 1,2- units and said B polymer or random IB copolymer blocks containing not more than about 10% of polyethylene crystallinity and the number of unsaturated polymerized diene I units in said I polymer or random IB polymer blocks being sufficient to vulcanize said block copolymer.

5,470,915

ABS RESINS HAVING IMPACT RESISTANCE AND LOW-GLOSS PROPERTIES AND PROCESSES FOR PREPARING THEM

Jin Y. Cha, Kyungnam, and Kwang Y. Kim, Seoul, both of, Rep. of Korea, assignors to Miwon Petrochemical Corporation, Seoul, Rep. of Korea

Filed Jun. 28, 1994, Ser. No. 266,837

Claims priority, application Rep. of Korea, Jun. 28, 1993, 93-11807

Int. Cl.[6] **C08L** *51/04;55/02*

U.S. Cl. 525—86 **16 Claims**

1. A process for preparing an ABS resin having low-gloss properties comprising:

a) dissolving between 5 wt % and 20 wt % of a first rubber in a solution of between 30 wt % and 70 wt % of a first aromatic vinyl monomer and between 10 wt % and 50 wt % of a first cyanized vinyl monomer; adding a polymerization controller and radical initiator to form a first reaction mixture; and polymerizing the first reaction mixture at a temperature ranging from about 80° to 120° C. while stirring to achieve an extent of polymerization of between 20 and 50% as first step of bulk polymerization;

(b) adding a second reaction mixture consisting of between 40 wt % and 70 wt % of a second aromatic vinyl monomer, between 10 wt % and 40 wt % of a second cyanized vinyl monomer and between 5 wt % and 15 wt % of a second rubber; and stirring for an additional 30 to 60 minutes as second step of bulk polymerization; and

(c) adding distilled water and a suspending agent to disperse the mixture; and polymerizing with a radical catalyst as step of suspension polymerization.

5,470,916

FORMULATIONS FOR POLYACRYLAMIDE MATRICES IN ELECTROKINETIC AND CHROMATOGRAPHIC METHODOLOGIES

Pier G. Righetti, Via Archimede, 114, Milan I-20129, and Marcella Chiari, Battista Brocchi, 11, Milan I-20131, both of, Italy

PCT No. PCT/EP92/01772, § 371 Date Jun. 3, 1994, § 102(e) Date Jun. 3, 1994, PCT Pub. No. WO93/11174, PCT Pub. Date Jun. 10, 1993

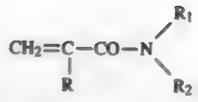
PCT Filed Aug. 5, 1992, Ser. No. 244,608

Claims priority, application Italy, Dec. 6, 1991, M191A3271

Int. Cl.[6] **C08F** *120/58;2/00;2/46*

U.S. Cl. 525—296 **15 Claims**

1. A poly-(N-substituted)acrylamide matrix in the form of a gel, to be used in electrokinetic or chromatographic methods, obtained by polymerization of monomers having the formula (I):



(I)

in which R represents hydrogen or CH_3, while R_1 and R_2, independently, represent hydrogen or a group having the formula $-\{(CH_2)_n-O-(CH_2)_n-O\}_m-H$, where n=2 or 3 and m=1–5, with the proviso that one of R_1 and R_2 is different from hydrogen, or by copolymerization of the same monomers with other acrylamides or methacrylamides, said polymerization or copolymerization conducted in the presence of a hydrophilic polymer producing lateral chain aggregation.

5,470,917

VULCANIZABLE BROMINE-CONTAINING FLUORORUBBER COMPOSITION CONTAINING A PEROXY-BENZOATE

Shuji Suyama; Hideyo Ishigaki, both of Aichi; Masayasu Tomoda, Osaka; Yoshihiro Shirai, Osaka; Hiroyuki Tanaka, Osaka, and Masaharu Komai, Osaka, all of, Japan, assignors to Daikin Industries Limited, Osaka, Japan

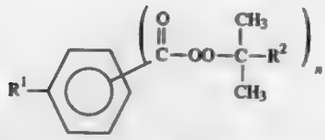
Division of Ser. No. 858,505, Mar. 27, 1992, Pat. No. 5,296,549. This application Jan. 4, 1994, Ser. No. 177,860

Claims priority, application Japan, Mar. 27, 1991, 3-62923

Int. Cl.[6] C08F *8/06*

U.S. Cl. 525—326.3 **3 Claims**

1. A vulcanizable rubber composition which comprises a bromine-containing fluororubber and an organic peroxide of the formula:



(I)

wherein R^1 is a hydrogen atom, a chlorine atom or methyl group, R^2 is a linear or branched alkyl group having 2 to 5 carbon atoms, and n is an integer of 1 to 3, wherein an amount of the organic peroxide is from 0.1 to 5 parts by weight per 100 parts by weight of the fluororubber.

5,470,918

WATER-RESISTANT SURFACE COATING FORMULATIONS AND PAPER COATED THEREWITH

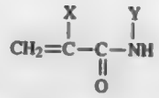
Haruki Tsutumi; Yoshiaki Ikemoto, both of Kanagawa; Mitsuhiro Maehama, Yamaguchi; Toshiki Oyanagi, and Tsugio Matsubara, both of Kanagawa, all of, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed May 24, 1994, Ser. No. 248,183

Int. Cl.[6] C08F *8/30*

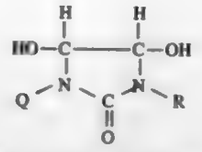
U.S. Cl. 525—329.2 **9 Claims**

1. A water-resistant surface coating formulation comprising a reaction product obtained by reacting an acrylamide polymer of at least one acrylamide monomer represented by the following formula



(1)

wherein X represents H or CH_3 and Y represents H or CH_2OH, and, optionally, at least one comonomer selected from the group consisting of acrylic acid, methacrylic acid, acrylonitrile and itaconic acid, with 0.1 to 20 parts by mole, per 100 parts by mole of amido groups in the acrylamide polymer, of a glyoxalmonoureine represented by the following formula (2):



(2)

wherein Q and R independently represent H, CH_3 or CH_2OH; wherein the acrylamide polymer is produced from 100 to 60 parts by mole of the at least one acrylamide represented by the formula (1) and 0 to 40 parts by parts by mole of at least one comonomer selected from the group consisting of acrylic acid, methacrylic acid, acrylonitrile and itaconic acid.

5,470,919

CHLORINATED ETHYLENE/α-OLEFIN COPOLYMER RUBBER AND COMPOSITION CONTAINING THE SAME

Tetsuo Tojo; Muneyuki Matsumoto, and Yoshiharu Kikuchi, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jul. 26, 1994, Ser. No. 280,831

Claims priority, application Japan, Jul. 29, 1993, 5-187886

Int. Cl.[6] C08F *8/20*

U.S. Cl. 525—334.1 **5 Claims**

1. A chlorinated ethylene/α-olefin copolymer rubber:

which has a chlorine content of 20 to 40% by weight,

which has a Mooney viscosity [ML_{1+4}(121° C.)] of 10 to 190, and

in which the ethylene/α-olefin copolymer rubber before the chlorination has a vinylidene bond at the terminal of the molecule, the number of said vinylidene bond being 0.05 to 1.00 per 1,000 carbon atoms.

5,470,920

IMPREGNATING SOLUTIONS BASED ON AT LEAST ONE REACTIVE THERMOPLASTIC POLY (IMIDE-AMIDE) OLIGOMER AND A COREACTANT, WHICH CAN BE USED ESPECIALLY FOR THE PRODUCTION OF PREIMPREGNATED INTERMEDIATE ARTICLES

Yves Camberlin, Caluire; René Dien, Millery, and Philippe Michaud, Lyons, all of, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

PCT No. PCT/FR92/00298, § 371 Date Oct. 1, 1993, § 102(e) Date Oct. 1, 1993, PCT Pub. No. WO92/17526, PCT Pub. Date Oct. 15, 1992

PCT Filed Apr. 3, 1992, Ser. No. 122,600

Claims priority, application France, Apr. 4, 1991, 91 04382

Int. Cl.[6] C08G *73/14*; C08L *79/08*

U.S. Cl. 525—421 **19 Claims**

1. A solution comprising an active principle containing a reactive oligomer and at least one organic solvent for the oligomer, which active principle comprises:

(A) at least one reactive thermoplastic poly(imide-amide)oligomer selected from the group consisting of:

(A1) a linear aromatic poly(imide-amide) oligomer containing alkenyloxy end groups, which oligomer is obtained by direct reaction of (i) an aromatic diisocyanate, (ii) a monoanhydride of a tricarboxylic acid, and (iii) a monocarboxylic acid substituted by an alkenyloxy group;

(A2) a linear aromatic poly(imide-amide) oligomer containing maleimido end groups optionally substituted on the maleic double bond by a methyl group, which oligomer is obtained by direct reaction of (i) an aromatic diisocyanate, (ii) a monoanhydride of a tricarboxylic acid, and (iii) a monocar-

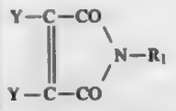
boxylic acid substituted by a maleimido group which may be substituted by a methyl group; and

(A3) a linear aromatic poly(imide-amide) oligomer containing end groups each of which includes a residue with a latent maleimide functional group, which oligomer is obtained by direct reaction of (i) an aromatic diisocyanate, (ii) a monoanhydride of a tricarboxylic acid, and (iii) a carboxylic acid containing a residue with a latent maleimide functional group; and

(B) a coreactant comprising a compound selected from:

(B1) at least one imide selected from the group consisting of:

(B1-i) a monoimide represented by the formula:

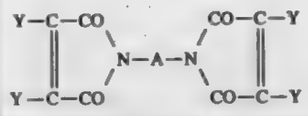


(I)

wherein in formula I:

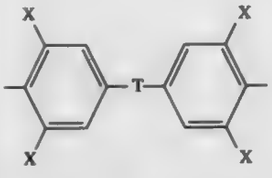
each Y is identical or different and denotes H, CH_3 or Cl, and R_1 denotes H or an aliphatic, cycloaliphatic or aromatic monovalent hydrocarbon radical containing up to 20 carbon atoms, each hydrocarbon radical being unsubstituted or substituted by a Cl, alkoxy or alkenyloxy;

(B1-ii) an N,N'-bisimide represented by the formula:

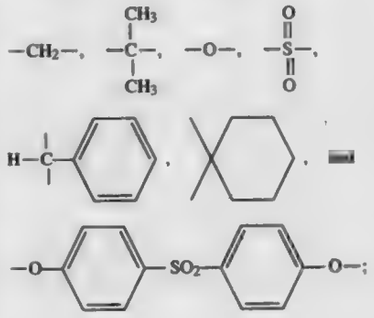


(II)

wherein in formula II: Y has the meaning given in formula I; A denotes a divalent radical selected from the group consisting of cyclohexylene, phenylene, 4-methyl-1,3-phenylene, 2-methyl-1,3-phenylene, 5-methyl-1,3-phenylene, 2,5-diethyl-3-methyl-1,4-phenylene, and a radical represented by the formula:

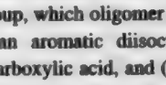


in which T denotes a single valency bond or divalent radical selected from the group consisting of:



and each X is identical or different and denotes hydrogen, methyl, ethyl or isopropyl;

(B2) at least one acrylate represented by the formula:

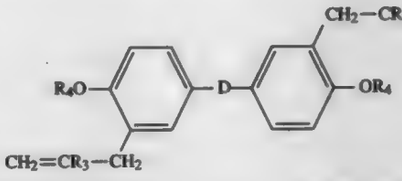


(III)

wherein in formula III: R_2 denotes hydrogen or methyl; n is a number of from 1 to 8;

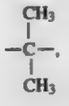
B denotes an organic radical of valency n selected from the group consisting of: (i) a saturated, linear or branched aliphatic residue containing from 1 to 30 carbon atoms optionally interrupted by one or more oxygen atoms and optionally substituted by hydroxy groups; (ii) an aryl or araliphatic residue containing from 6 to 150 carbon atoms which is a benzene nucleus that is optionally substituted by one to three alkyl radicals containing from 1 to 5 carbon atoms or a number of benzene nuclei optionally substituted as indicated above and joined one to another by a single valency bond, an inert group or an alkylene radical containing from 1 to 3 carbon atoms, wherein the said aryl or araliphatic residue is optionally interrupted in its structure or one or more oxygen atoms and optionally substituted by one or more hydroxy groups, and wherein the free valencies of the aromatic radical B are optionally carried by a carbon atom of an aliphatic chain or by a carbon atom of a benzene nucleus;

(B3) at least one alkenylphenol represented by the formula:



(IV)

wherein in formula IV: D denotes a single valency bond or divalent radical selected from the group consisting of:



each R_3 is identical or different and denotes hydrogen or methyl;

each R_4 is identical or different and denotes hydrogen, a linear or branched alkyl radical containing from 1to 6 carbon atoms, or phenyl;

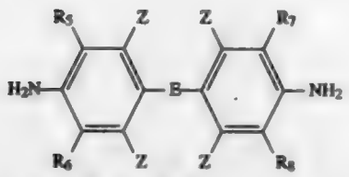
(B4) at least one thermoplastic phenol/formaldehyde polycondensate in which the molar ratio of formaldehyde to phenol is between 0.6 and 0.95 and the softening point ranges from 50° to 110° C.;

(B5) at least one coreactant other than an acrylate, containing a vinyl double bond which is selected from the group consisting of vinylpyridines, N-vinyl-2-pyrrolidone, vinyltetrahydrofuran, styrene, and mixtures thereof;

(B6) at least one nonhalogenated epoxy resin;

(B7) at least one amino coreactant containing one or more hindered diprimary diamines, which amino coreactant is selected from the group consisting of:

(B7-i) at least one compound represented by the formula:



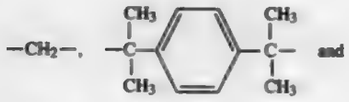
(V)

wherein in formula V:

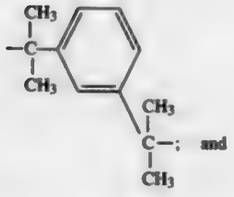
R_5, R_6, R_7 and R_8 are identical or different and denote methyl, ethyl, propyl or isopropyl;

Z is identical or different and denotes hydrogen or chlorine;

E denotes a divalent radical selected from the group consisting of:

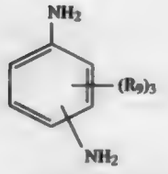


and



and

(B7-ii) at least one compound represented by the formula:



(VI)

wherein in formula VI:

the amino radicals are in meta or para position relative to one another;

each R_9 is identical or different and denotes methyl, ethyl, propyl or isopropyl; and

(B8) a mixture of two or more of the coreactants (B1) to (B7);

wherein the concentration of the active principle, expressed as a mixture of A+B relative to the entire solution, is between 2% and 80% by weight, and the proportions of the ingredients B1 to B7, when these ingredients are employed separately to devise the active principle A1+Bx (where x =1, 2, 3, 4, 5, 6 or 7), are the following:

B1: from 2 to 50,

B2: from 2 to 50,

B3: from 1 to 30,

B4: from 1 to 30,

B5: from 2 to 50,

B6: from 2 to 50,

B7: from 1 to 30%, these proportions expressing the weight percentage of each ingredient Bx in the combination A+Bx.

5,470,921

SYNTHETIC POLYAMIDES AND THEIR SALTS

Bansi L. Kaul, Biel-Benken, Switzerland; Angelos-Elie Vougioukas, St. Louis, France, and Jürgen Goldmann, Münchenstein, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

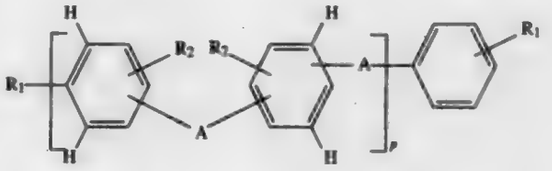
Continuation of Ser. No. 727,506, Jul. 9, 1991, abandoned. This application May 20, 1994, Ser. No. 247,132

Claims priority, application Germany, Sep. 9, 1989, 39 30 089.7; Jan. 3, 1989, 39 32 912.7

Int. Cl.[6] C08G *69/32*

U.S. Cl. 525—432 **14 Claims**

1. A compound of formula I, or salt form thereof

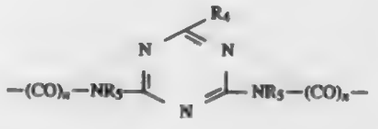


in which each R_1, independently is selected from hydrogen, carboxyl, amino or a group of formula α

$$-A_1-R_{10} \qquad (\alpha)$$

each R_2 independently is hydrogen or a group of formula α;

A is a bridging group of the formula -CO-NR_3-, -NR_3-CO- or

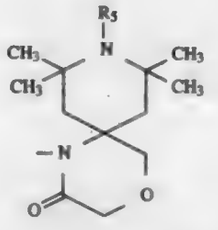


A_1 is a bridging group;

n is 0 or 1;

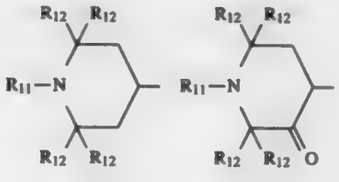
R_3 is hydrogen, C_{1-12} alkyl or a group R_{10};

R_4 is a group R_{10} or a group of formula α,



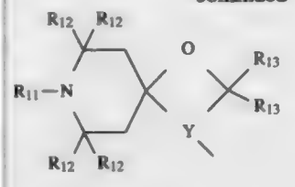
R_5 is hydrogen or C_{1-12}alkyl;

each R_{10}, independently, is a group of formula (a), (b), (c), (d) or (e)

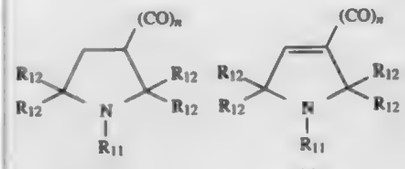


(a) (b)

-continued



(c)



(d) (e)

R_{12} is hydrogen or C_{1-4}alkyl;
each R_{12}, independently, is C_{1-5}alkyl;
each R_{13}, independently, is hydrogen, C_{1-2}alkyl or one group R_{13} is phenyl and the other R_{13} is hydrogen or C_{1-2}alkyl or both groups R_{13} together form a group of the formula $-(CH_2)_{11}-$;
Y is -N-CO- or -CO-N- wherein one of the two free valence bonds attached to each nitrogen corresponds to the free valence bond attached to Y in formula (c);
p is an integer from 5 to 200;
with the proviso that the compound of formula I contains 1–400 sterically hindered amine groups;
or a salt thereof.

5,470,922

POLYIMIDE POLYMERIC BLENDS

Mureo Kaku, Wilmington, Del., and Robert R. Luise, Boothwyn, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 996,256, Dec. 23, 1992, Pat. No. 5,346,969. This application May 10, 1994, Ser. No. 241,220

Int. Cl.[6] C08L *79/08;67/03*

U.S. Cl. 525—436 **14 Claims**

1. A polymeric blend comprising
(a) about from 99 to 20% by weight of at least one polyester polymer which is melt processible at a temperature of less than about 400° C. and, complementally,
(b) about from 1 to 80% by weight of polyimide precursor resin prepared from at least one aromatic diamine and at least one aromatic dianhydride in which less than about 98% of the polymeric units are converted to polyimide.

5,470,923

MOISTURE-CURABLE SILICONE PRESSURE-SENSITIVE ADHESIVES

Robert H. Krahnke; Shawn K. Mealey; William J. Schoenherr, all of Midland; Schyler B. Smith, deceased, late of Midland, and Thomas J. Tangney, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 748,478, Aug. 22, 1991, abandoned. This application May 14, 1993, Ser. No. 63,105

The portion of the term of this patent subsequent to May 11, 2010, has been disclaimed.

Int. Cl.[6] C08F *283/00*

U.S. Cl. 525—477 **19 Claims**

1. A composition comprising a silicone pressure sensitive adhesive component bearing curing radicals having the formula $(MeO)_3SiC_2H_4SiMe_2O$— wherein Me denotes methyl and wherein the silicone pressure sensitive adhesive component bearing curing radicals has been prepared by a method comprising reacting (i) a silicone pressure sensitive adhesive composition having reactive sites of the formula ≡SiX, and X denotes an alkenyl radical, a hydroxyl radical or a hydrogen atom, substantially all X being OH, with (ii) a moisture-reactive compound having the formula $\{(MeO)_3SiC_2H_4SiMe_2\}_2NH$; all other silicon-bonded radicals in (i) being selected from the group consisting of divalent oxygen atoms linking silicon atoms, hydrogen atoms and monovalent hydrocarbon radicals.

5,470,924

PHENOL FORMALDEHYDE RESINS

Barry W. Ryan, 214 Broad St., Labrador, Queensland 4000, Australia

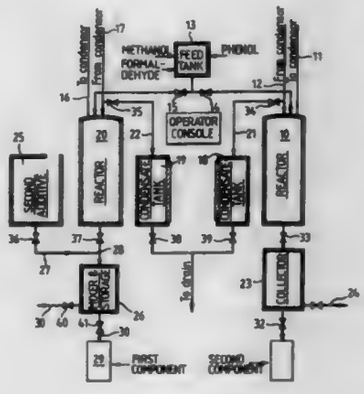
PCT No. PCT/AU92/00138, § 371 Date Nov. 24, 1993, § 102(e) Date Nov. 24, 1993, PCT Pub. No. WO92/17528, PCT Pub. Date Oct. 15, 1992

PCT Filed Apr. 2, 1992, Ser. No. 122,598

Claims priority, application Australia, Apr. 5, 1991, PK5454

Int. Cl.[6] C08F *6/00*

U.S. Cl. 525—501 **27 Claims**



1. A process for forming a phenol formaldehyde resin consisting essentially of the steps of:
(i) forming a first additive by mixing a glycol with an aromatic dicarboxylic acid or anhydride of said acid in a ratio of from 2:1 to 5:1;
(ii) forming a first resin component by reacting phenol with excess formaldehyde in the presence of non-aqueous solvent and a catalyst for about 40–55 minutes until water has separated from the reactants forming a two phase solution having immiscible layers, and then adding said first additive as well as an alpha hydroxy acid;
(iii) isolating or storing said first resin component with said first additive formed in (ii), said first resin component being maintained in a non-cured state by the addition of said first additive;
(iv) forming a second resin additive by mixing a solution consisting essentially of zinc chloride, glycerol, an alpha hydroxy acid, p-toluene sulphonic acid, sulphuric or hydrochloric acid, and a non-aqueous solvent;
(v) forming a second resin component by reacting phenol with excess formaldehyde in the presence of methanol and an aliphatic dicarboxylic acid catalyst for about 20–30 minutes, and then adding said second additive;
(vi) combining the components formed in (ii) and (v) in a ratio of from about 2:1 to 4:1 to form a phenol formaldehyde resin and then allowing the mixture thus formed to cure.

5,470,925

PROCESS FOR THE PRODUCTION OF ALKENE POLYMERS

Ramakrishnan Ramachandran, Allendale, and Loc H. Dao, Bound Brook, both of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Continuation-in-part of Ser. No. 129,278, Sep. 30, 1993, abandoned. This application Apr. 22, 1994, Ser. No. 232,543

Int. Cl.[6] C08F 2/34

U.S. Cl. 526—68 43 Claims

1. A process for the production of a propylene polymer comprising the steps:

(a) contacting a propylene-propane mixture with a polymerization catalyst in a reaction zone under conditions which result in the production of a product containing a propylene polymer, unreacted propylene and propane;

(b) separating a gas mixture comprising unreacted propylene and propane from said product;

(c) selectively adsorbing propylene from said gas mixture by passing said gas mixture through an adsorption zone containing an adsorbent which selectively adsorbs propylene;

(d) regenerating said adsorbent, thereby producing a propylene-enriched gas stream; and

(e) recycling at least part of said propylene-enriched gas stream to said reaction zone.

5,470,926

PROCESS OF POLYMERIZING OLEFINS IN THE PRESENCE OF A CHROMIUM-CONTAINING CATALYST

William K. Reagen, Stillwater, Minn., and Brian K. Conroy, Batavia, Ill., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 978,852, Nov. 19, 1992, Pat. No. 5,288,823, which is a division of Ser. No. 698,515, May 10, 1991, Pat. No. 5,198,563, which is a division of Ser. No. 454,554, Dec. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 392,688, Aug. 10, 1989, abandoned. This application Nov. 19, 1993, Ser. No. 154,895

Int. Cl.[6] C08F 4/69

U.S. Cl. 526—120 18 Claims

1. A process comprising polymerizing olefins in the presence of a catalyst prepared by a process comprising forming a mixture of and refluxing:

(a) a chromium source selected from the group consisting of a chromium salt having the formula CrXn, wherein X can be the same or different and is an organic or inorganic radical and n is an integer from 1 to 6, and chromium metal;

(b) a metal amide selected from the group consisting of alkali metal amide salts alkaline earth metal amide salts, and mixtures thereof; and

(c) an electron pair donor solvent which can affect a reaction between the chromium source and the metal amide.

5,470,927

IONIC METALLOCENE CATALYST COMPOSITIONS

Howard W. Turner; Gregory G. Hlatky, and Richard R. Eckman, all of Houston, Tex., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Division of Ser. No. 19,726, Feb. 19, 1993, Pat. No. 5,384,299, which is a continuation-in-part of Ser. No. 737,611, Jul. 30, 1991, Pat. No. 5,198,401, which is a continuation-in-part of Ser. No. 555,977, Jun. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 133,480, Dec. 22, 1987, abandoned, which is a continuation-in-part of Ser. No. 8,800, Jan. 30, 1987, abandoned, and a continuation-in-part of Ser. No. 133,052, Dec. 21, 1987, abandoned, which is a continuation-in-part of Ser. No. 11,471, Jan. 30, 1987, abandoned. This application Oct. 5, 1994, Ser. No. 318,304

Int. Cl.[6] C08F 4/72; B01T 31/00

U.S. Cl. 526—126 22 Claims

1. A method for polymerizing olefins, diolefins, or acetylenically unsaturated monomers containing two or more carbon atoms, either alone or in combination with each other or with other polymerizable monomers, comprising contacting the monomers with an ionic polymerization catalyst comprising (1) a cation derived from a bis(cyclopentadienyl) Group IV-B metal compound by abstracting a ligand to create a positively charged species and (2) a stabilizing non-coordinating anion, said anion being sufficiently labile to permit displacement by an olefin, diolefin and/or acetylenically unsaturated monomer during polymerization.

5,470,928

FREE RADICAL COPPER(II)-ENOLATE POLYMERIZATION INITIATORS

H. James Harwood, Stow, Ohio, and Stephen D. Goodrich, Mankato, Minn., assignors to University of Akron, Akron, Ohio

Division of Ser. No. 34,103, Mar. 22, 1993, Pat. No. 5,405,913. This application Jan. 31, 1995, Ser. No. 381,472

Int. Cl.[6] C08F 4/50

U.S. Cl. 526—172 11 Claims

1. A process for the synthesis of a polymer with controlled, predictable polymer end-group structures under mild oxidative conditions thereby permitting other useful functional groups to be present on the polymer end-groups comprising the steps of:

(a) adding aldehydes or ketones bearing enolizable hydrogen atoms into a reaction vessel;

(b) inducing an enolate oxidation reaction with a Cu^{II} salt to form an enolate radical which has a greater electron donating capability toward the Cu^{II} ion than the non-enolized or enol form of the aldehydes or ketones, the Cu^{II} converting the initiator into α-carbonyl free radicals capable of initiating free radical polymerizations; and

(c) reacting the enolate radical with a free-radical polymerizable monomer at a temperature from about −100° C. to about +200° C., for a reaction time from about 1 second to about 48 hours.

5,470,929

PROCESS FOR SYNTHESIZING STYRENE-ISOPRENE RUBBER

David J. Zanzig, Uniontown; Paul H. Sandstrom, Tallmadge; Joseph K. Hubbell, Akron; Wen-Liang Hsu, Copley; Adel F. Halasa, Bath, and John J. A. Verthe, Kent, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

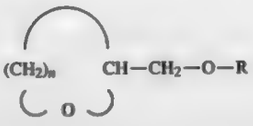
Continuation-in-part of Ser. No. 37,835, Mar. 29, 1993, Pat. No. 5,359,016. This application Sep. 6, 1994, Ser. No. 300,907

The portion of the term of this patent subsequent to Oct. 25, 2011, has been disclaimed.

Int. Cl.[6] C08F *4/48;236/10*

U.S. Cl. 526—181 13 Claims

1. A process for the synthesis of styrene-isoprene rubbers which exhibit essentially a single glass transition temperature and which are particularly useful in tire tread rubber compounds, said process comprising copolymerizing a monomer mixture containing from about 2 weight percent to about 15 weight percent styrene monomer and from about 85 weight percent to about 98 weight percent isoprene monomer in an organic solvent in the presence of a catalyst system which is comprised of (a) a lithium initiator and (b) a modifier having the structural formula:



wherein n represents an integer within the range of 3 to 6, wherein R represents an alkyl group containing from 1 to about 10 carbon atoms, and wherein the molar ratio of the modifier to the lithium initiator is within the range of 2: 1 to 40: 1.

5,470,930

PROCESS FOR PRODUCING POLYMER HAVING HYDROXYL GROUP AT BOTH TERMINALS

Taketo Toba, Hyogo; Kazuo Takei, Osaka; Toshiaki Matsunaga, Osaka; Hiroyuki Ikeuchi, Osaka, and Fumihide Tamura, Shiga, all of, Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Filed Feb. 16, 1994, Ser. No. 197,177

Claims priority, application Japan, Feb. 18, 1993, 5-029486

Int. Cl.[6] C08F *2/00*

U.S. Cl. 526—204 9 Claims

1. A process for producing a polymer having a hydroxyl group at both terminals, which comprises carrying out a polymerization reaction of a vinyl-based monomer (a) which is at least one member selected from the group consisting of (meth)acrylic acid, an alkyl (meth)acrylate, an aryl (meth)acrylate, a substituted alkyl(meth)acrylate, a (meth)acrylic acid-ethylene oxide adduct, maleic anhydride, maleic acid, a monoalkyl ester of maleic acid, a dialkyl ester of maleic acid, a maleimide derivative and an amide group-containing vinyl-based monomer by using hydrogen peroxide (b);

said process being characterized in that a hydrogen peroxide-decomposing accelerator (c) which is at least one member selected from the group consisting of hydrochloric acid, hydrobromic acid, hydroiodic acid, perchloric acid, sulfuric acid, fuming sulfuric acid, nitric acid, fuming nitric acid, chromic acid, a sulfonic acid, an onium salt and a heterocyclic amine is further used,

and that the total amount of any component other than (a), (b) and (c) is 5% by weight or less based on the total amount of all components.

5,470,931

THERMOSTABLE POLYMERS FROM 1',2',3,3',4,4',6,6'-OCTA-O-ALLYLSUCROSE

Navzer D. Sachinvala; Redford F. Ju, both of Aiea, Hi., and Morton H. Litt, Cleveland, Ohio, assignors to Hawaiian Sugar Planters' Association, Aiea, Hi.

Continuation-in-part of Ser. No. 28,545, Mar. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 877,813, May 4, 1992, Pat. No. 5,248,747, which is a continuation-in-part of Ser. No. 697,983, May 10, 1991, Pat. No. 5,116,961, which is a continuation-in-part of Ser. No. 623,548, Dec. 7, 1990, abandoned. This application Feb. 28, 1994, Ser. No. 199,695

Int. Cl.[6] C08F *224/00*

U.S. Cl. 526—238.23 13 Claims

1. A method for producing bulk polymers which are thermostable at which comprises polymerizing a mixture comprising:

(a) an octa-O-allyl saccharide monomer, and

(b) one or more monomers selected from the group consisting of methacrylate ester monomers, acrylonitrile monomers and styrene monomers, in relative amounts sufficient to produce a bulk monomer exhibiting thermal stability at a temperature of 200° C.

5,470,932

POLYMERIZABLE YELLOW DYES AND THEIR USE IN OPTHALMIC LENSES

David L. Jinkerson, Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Oct. 18, 1993, Ser. No. 138,663

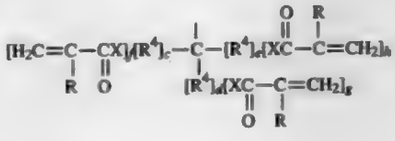
Int. Cl.[6] C08F *226/02;220/10*

U.S. Cl. 526—312 11 Claims

1. A polymeric ophthalmic lens material comprising:

one or more lens-forming monomers selected from the group consisting of acrylate monomers and methacrylate monomers, and

one or more polymerizable yellow dyes having from one to four polymerizable acrylate or methacrylate groups, wherein each acrylate or methacrylate group is displaced from the dye moiety by a spacing group according to the formula



wherein

R=H or CH_3

R^4=acyclic organic spacing group of up to 10 atoms consisting of C, H, Si, O, N, P, S, Cl, Br or F, alone or in any combination;

X=O, NH or NR^5;

R^5=C_1 to C_{10} alkyl;

d, e, g, and h independently=an integer from 0 to 3; and

c and f independently=an integer from 1 to 4.

5,470,933

PREPARATION OF POLYAMINOBORAZINES

Gerard Mignani, Lyons; Christophe Richard, Corbas, and Roger Trichon, Villeurbanne, all of, France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Sep. 15, 1993, Ser. No. 120,815
Claims priority, application France, Sep. 15, 1992, 92 10952
Int. Cl.[6] C08F 30/06
U.S. Cl. 528—24 17 Claims

1. A process for the preparation of a homogeneous polyaminoborazine, the process comprising a step of thermally polycondensing a trifunctional aminoborazine at polycondensation reaction equilibrium.

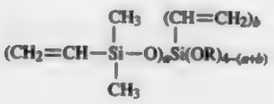
5,470,934

VINYL- AND ALKOXY-FUNCTIONAL ORGANOSILICON COMPOUNDS AND METHOD FOR THE PREPARATION THEREOF

Toshio Saruyama, and Masahiko Suzuki, both of Chiba, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1994, Ser. No. 306,788
Claims priority, application Japan, Sep. 29, 1993, 5-265585; Nov. 12, 1993, 5-307367
Int. Cl.[6] C08G 77/18
U.S. Cl. 52.8—34 11 Claims

1. A vinyl- and alkoxy-functional organosilicon compound with a general formula



in which R denotes C_1 to C_7 alkyl and a is 1, 2, or 3, b is 0 or 1, and a+b is 2 or 3.

5,470,935

PREPARATION OF CAST ELASTOMERS USING 2-METHYL-1,3-PROPANEDIOL AS CHAIN EXTENDER

Robson M. Mafoti, Pittsburgh, and Bruce H. Potts, Beaver, both of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 991,012, Dec. 15, 1992, abandoned. This application Mar. 29, 1994, Ser. No. 219,153
Int. Cl.[6] C08G 18/32;18/42;18/48;18/10
U.S. Cl. 528—65 8 Claims

1. A process for preparing transparent polyurethane elastomers having tensile strengths ranging from 9 MPa to 42 MPa comprising reacting in a open mold at an isocyanate index of 90 to 110

(a) an isocyanate prepolymer having an isocyanate content of 2 to 15% by weight and having a molecular weight of from 800 to 5000, wherein said prepolymer is a reaction product of

(i) at least one organic polyisocyanate with

(ii) at least one isocyanate-reactive compound having at least two isocyanate-reactive groups and having a molecular weight of from 250 to 4000 selected from the group consisting of (1) polyethers, (2) polyesters prepared by reaction of polyhydric alcohols with polybasic carboxylic acids, polybasic carboxylic acid anhydrides, or polybasic carboxylic acid esters, and (3) mixtures thereof;

with

(b) 2-methyl-1,3-propanediol as chain extender, optionally in admixture with up to 10 percent by weight of a different chain extender having two isocyanate-reactive hydrogen atoms and having a molecular weight of from 32 to 250;

optionally in the presence of

(c) one or more catalysis and/or additives, thereby giving a transparent polyurethane elastomer having a tensile strength of 9 MPa to 42 MPa.

5,470,936

PROCESS FOR PREPARING HIGH-ADHESION AND HIGH-SOLUBILITY POLY (AMIDE-IMIDE-ESTER)

Chien-Hui Li, Hsinchu; Han L. Chen, Nantou-Hsien, and Tsong-Ming Lee, Taipei, all of, Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

Filed May 28, 1993, Ser. No. 70,539
Int. Cl.[6] C08G 18/30
U.S. Cl. 528—73 12 Claims

1. A poly(amide-imide-ester) resin prepared from a monomer composition dissolved in an organic solvent, said monomer composition comprising:

(a) a diisocyanate;

(b) a trimellitic anhydride; and

(c) a bis-anhydride of trimellitic anhydride; wherein each of said trimellitic anhydride and said bis-anhydride of trimellitic anhydride constituting 1 to 40%, on a molar basis, of said monomer composition, and the amount of said diisocyanate equaling about 1.0 to 1.2 times, also on a molar basis, the sum of said trimellitic anhydride and said bis-anhydride of trimellitic anhydride, wherein said poly(amide-imide-ester) is soluble in dimethylacetamide (DMAC), dimethylformamide (DMF), or N-methyl-2-pyrrolidone (NMP).

5,470,937

ANISOTROPICALLY ORIENTED PHASE DIFFERENCE COMPENSATION FILM OF A BRANCHED POLYCARBONATE

Masaya Okamoto; Shigeki Kuze; Noriyuki Kunishi, all of Ichihara, and Taisuke Nakashima, Tokyo, all of, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP93/00237, § 371 Date Oct. 18, 1993, § 102(e) Date Oct. 18, 1993, PCT Pub. No. WO93/17358, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 25, 1993, Ser. No. 137,108
Claims priority, application Japan, Feb. 28, 1992, 4-042800; Nov. 5, 1992, 4-296162
Int. Cl.[6] C08G 64/00
U.S. Cl. 528—198 20 Claims

1. A phase difference compensation film comprising an anisotropic orientation film of a branched polycarbonate having a viscosity-average molecular weight of less than 40,000.

5,470,938

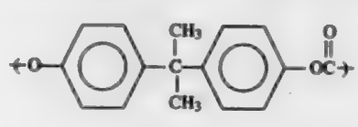
COPOLYMERIC POLYCARBONATE COMPOSITIONS CONTAINING A SULFONIC ACID COMPOUND

Takeshi Sakashita, Iwakuni; Tomoaki Shimoda, Kuga, and Kotaro Kishimura, Kwakuni, all of, Japan, assignors to GE Plastics Japan, Tokyo, Japan

Division of Ser. No. 171,088, Dec. 21, 1993, Pat. No. 5,401,826, which is a division of Ser. No. 944,377, Sep. 14, 1992, Pat. No. 5,286,834. This application Feb. 2, 1995, Ser. No. 382,728
Int. Cl.[6] C08G 64/00
U.S. Cl. 528—198 5 Claims

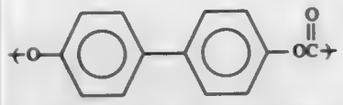
1. A copolymeric polycarbonate composition consisting of:

[A] a copolymeric polycarbonate containing repeating constituent units having the formula



[I]

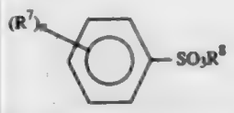
and repeating constituent units having the formula



[III]

in a molar ratio of I:II of from 98:2 to 40:60, and

[B] 0.05–10 ppm, based on copolymeric polycarbonate [A], of a sulfonic acid compound having formula [V] below



[V]

where R^7 is a hydrocarbon group in which the hydrogens may be substituted with halogens) having 1–6 carbons; R^8 is a hydrocarbon group in which the hydrogens may be substituted with 1–8 carbons having 1–8 carbons; and n is an integer from 0 to 3.

5,470,939

POLYCARBONATE COPOLYMER

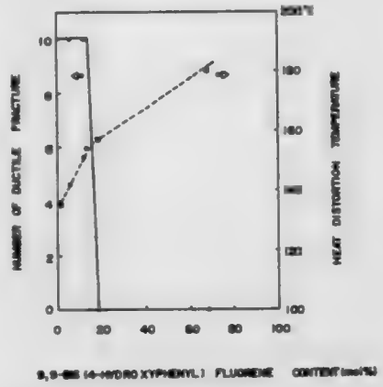
Mitsugu Nakae, Ichihara, Japan, assignor to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Division of Ser. No. 130,359, Oct. 1, 1993, Pat. No. 5,391,693. This application Oct. 13, 1994, Ser. No. 322,794

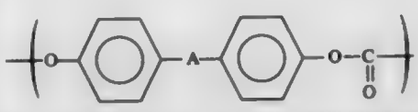
Claims priority, application Japan, Jan. 9, 1992, 4-271711; Nov. 12, 1992, 4-302358

Int. Cl.[6] C08G 64/00

U.S. Cl. 528—201 **7 Claims**



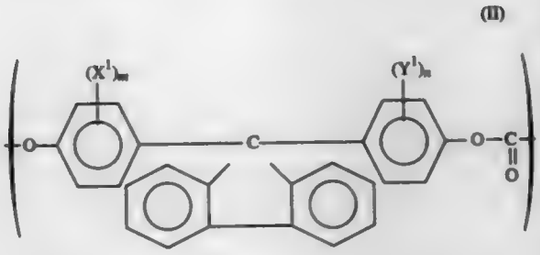
1. A polycarbonate copolymer which comprises a main chain comprising (a) a carbonate structural unit of the formula (I):



(I)

wherein A is selected from the group consisting of an alkylidene group having 1 to 12 carbon atoms, an alkylene group having 1 to 15 carbon atoms, an arylene group having 6 to 15 carbon atoms, an arylalkylene group having 7 to 15 carbon atoms, —O—, —S— and —SO_2— or A is a single bond, and

(b) a carbonate structural unit of formula (II):



(II)

wherein X^1 and Y^1 are independently selected from the group consisting of a hydrogen atom, a halogen atom and an organic group having 1 to 8 carbon atoms, and m and n are independently an integer of 1 to 4,

the proportion of the carbonate structural unit of the formula (II) being 2 to 15 mol % based on the total amount of the carbonate structural unit of the formula (I) and the carbonate structural unit of the formula (II),

the copolymer having a viscosity average molecular weight of 15,000 to 40,000 and the copolymer containing less than 200 ppm of residual chlorine-based solvent.

5,470,940

TRANSFER MATERIAL SUPPORTING MEMBER AND IMAGE FORMING DEVICE USING THIS TRANSFER MATERIAL SUPPORTING MEMBER

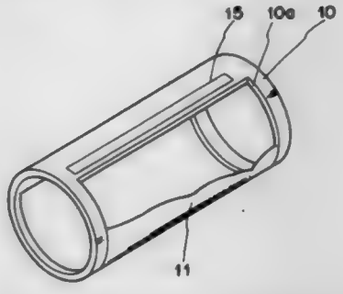
Noriko Otani, and Teigo Sakakibara, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1993, Ser. No. 80,495

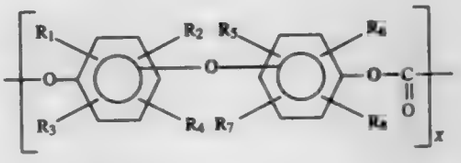
Claims priority, application Japan, Jun. 29, 1992, 4-192809; Jun. 29, 1992, 4-192810

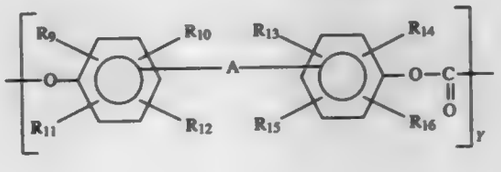
Int. Cl.[6] B32B 9/00

U.S. Cl. 528—204 **6 Claims**



1. A transfer material supporting member consisting essentially of a film formed mainly of a polymer represented by the formula (1):





wherein each of R_1 to R_{16} is a hydrogen atom, a halogen atom or an alkyl group, A is a divalent group, and each of X and Y is a copolymerization ratio.

5,470,941

THERMOPLASTIC BIODEGRADABLE RESINS AND A PROCESS OF PREPARATION THEREOF

Hyo Y. Kim; Ki H. Hwang; Hoon Chae, all of Kyungki-Do; Soo I. Sho, Seoul, and Jung N. Jun, Kungki-Do, all of, Rep. of Korea, assignors to Sunkyong Industries, Kyungki-Do, Rep. of Korea

Filed Dec. 23, 1993, Ser. No. 172,281

Claims priority, application Rep. of Korea, Dec. 24, 1992, 92-25478; Jan. 23, 1993, 93-20638

Int. Cl.[6] C08G *63/02*

U.S. Cl. 528—272 **9 Claims**

1. A thermoplastic biodegradable aliphatic polyester consisting essentially of an aliphatic polyester having a number average molecular weight of 25,000–45,000, which is prepared by polycondensing one or a plurality of aliphatic dicarboxylic acids presented by formula (I) with one or a plurality of aliphatic diols represented by formula (II):

$$ROOC—(—CH_2—)_n—COOR \quad (I)$$

$$HO—(—CH_2—)_m—OH \quad (II)$$

wherein R and R' are both hydrogen or are both methyl, n is 2 to 8 and m is 2 to 6.

5,470,942

PREPARATION OF ANHYDROPOLYAMINO ACIDS

Gregory C. Alexander, University City; Mark E. Jason, Chesterfield, and Dennis J. Kalota, Fenton, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 16, 1995, Ser. No. 390,202

Int. Cl.[6] C08G *69/10*

U.S. Cl. 528—328 **13 Claims**

1. A process for preparing anhydropolyamino acid which comprises heating L-aspartic acid to a temperature above about 140° C. for a period of time sufficient to cause thermal condensation in the presence of a catalytically effective amount of a methylene phosphonic acid whereby the rate of said condensation is increased.

5,470,943

POLYIMIDE

Yoshihiro Sakata; Wataru Yamashita; Yuichi Okawa; Shoji Tamai; Tsutomu Ishida; Mitsunori Matsuo, all of Kanagawa; Keizaburo Yamaguchi, Chiba, and Akihiro Yamaguchi, Kanagawa, all of, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

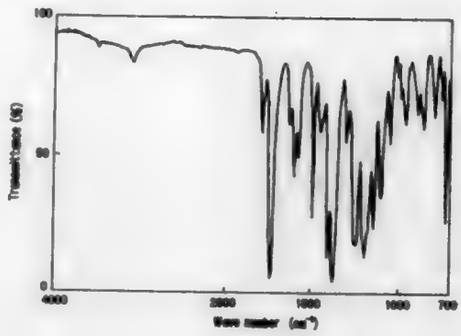
Filed Dec. 21, 1994, Ser. No. 360,584

Claims priority, application Japan, Jan. 7, 1994, 6-000398; Mar. 2, 1994, 6-032095

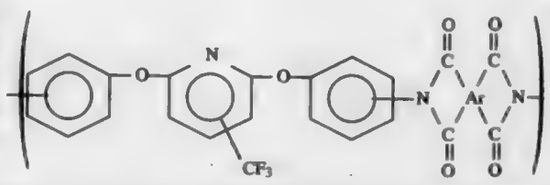
Int. Cl.[6] C08G *77/10;69/26;* **C07D** *213/69*

U.S. Cl. 528—353 **18 Claims**

1. A polyimide comprising a requisite structural unit consisting of one or more recurring structural units; represented by the formula (1):



(1)



wherein Ar is a tetravalent radical having 6 to 27 carbon atoms and being selected from the group consisting of a monoaromatic radical, condensed polyaromatic radical and noncondensed polyaromatic radical having aromatic radicals connected to each other with a direct bond or a bridge member, a trifluoromethyl radical is situated at the 3- or the 4-position on a pyridine nucleus, and an imide nitrogen atom is connected at the 3- or the 4-position to an ether bond.

5,470,944

PRODUCTION OF HIGH MOLECULAR WEIGHT POLYLACTIC ACID

Patrick V. Bonsignore, Joliet, Ill., assignor to ARCH Development Corporation, Chicago, Ill.

Filed Feb. 13, 1992, Ser. No. 835,166

Int. Cl.[6] C08G *63/08*

U.S. Cl. 528—354 **13 Claims**

1. A poly(lactic acid) having an average number molecular weight of about 25,000–100,000, comprising:

poly(lactic acid) polymeric units having terminal end groups selected from the group consisting of one of carboxyl and hydroxyl groups, said polymeric units coupled one to another by coupling agents selected from the group consisting of bis-epoxides, bis-oxazolines and bis-orthoesters.

5,470,945

THERMALLY REVERSIBLE ISOCYANATE-BASED POLYMERS

Richard A. Markle; Phyllis L. Brusky, both of Columbus; George E. Cremeans, Groveport; Joel D. Eßard, Hilliard; Donald M. Bigg, and Sylvester Sowell, both of Columbus, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

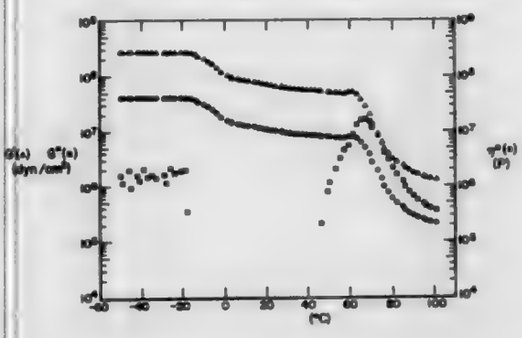
PCT No. PCT/US92/06493, § 371 Date Feb. 3, 1994, § 102(e) Date Feb. 3, 1994, PCT Pub. No. WO91/11476, PCT Pub. Date Aug. 8, 1991

Continuation-in-part of Ser. No. 851,840, Mar. 16, 1992, abandoned, which is a continuation of Ser. No. 651,020, Feb. 4, 1991, Pat. No. 5,097,010, and Ser. No. 740,335, Aug. 5, 1991, Pat. No. 5,239,039, which is a continuation-in-part of Ser. No. 475,112, Feb. 5, 1990, abandoned, said Ser. No. 651,020is a continuation-in-part of Ser. No. 475,112, Feb. 5, 0. This PCT application Aug. 4, 1992, Ser. No. 193,029

Int. Cl.[6] C08G 75/00

U.S. Cl. 528—390 10 Claims

1. A process for preparing a polyarylsulfide oligomer with phe-



nolic hydroxyl endgroups comprising:

a. combining an aryldihalide, a monohalo phenolic hydroxyl aryl group, sodium sulfide nonahydrate, sodium carbonate and a non-aqueous solvent to form a mixture; and

b. heating said mixture so as to drive off water of hydration from said sodium sulfide and to react said aryldihalide with said sodium sulfide to form said polyarylsulfide oligomer.

5,470,946

PRODUCTS RESULTING FROM POLYMERIZING OR CURING POLYCYANATES CONTAINING MESOGENIC MOIETIES AS LATERAL SUBSTITUENTS

Robert E. Hefner, Jr., and Jimmy D. Earls, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 996,457, Dec. 24, 1992, Pat. No. 5,374,769, which is a division of Ser. No. 770,791, Oct. 3, 1991, Pat. No. 5,206,321. This application Oct. 12, 1994, Ser. No. 291,962

Int. Cl.[6] C08G 73/00

U.S. Cl. 528—422 12 Claims

1. The product resulting from polymerizing a polycyanate composition containing one or more mesogenic moieties as lateral substituent(s); and, optionally, subjecting said composition to orientation during polymerization.

5,470,947

CHRH ANTAGONISTS WITH LOW HISTAMINE RELEASE

Karl A. Folkers; Anders Ljungqvist; Dong-Mei Feng, all of Austin, Tex.; Minoru Kubota, Yotsukaido, Japan; Pui-Fun L. Tang, Hong Kong, Hong Kong, and Cyril Y. Bowers, New Orleans, La., assignors to Board of Regents, The University of Texas System, Austin, Tex., and The Administrators of the Tulane Educational Fund, New Orleans, La.

Continuation-in-part of Ser. No. 88,431, Aug. 24, 1987, Pat. No. 4,935,491. This application Jun. 26, 1989, Ser. No. 371,552

Int. Cl.[6] C07K 7/23

U.S. Cl. 530—313 42 Claims

1. An LHRH antagonist having low histamine releasing activity comprising a decapeptide of the formula AA^1-D-pClPhe^2-D-3Pal^3-Ser^4-AA^5-AA^6-AA^7-AA^8-Pro^9-D-Ala^{10}-NH_2, wherein

AA^1 is N-Ac-D-2Nal, N-Ac-D-pClPhe or N-Ac-D-Cl_2Phe;

AA^5 is Tyr, NicLys, PicLys, MNicLys, MPicLys, INicLys, DMGLys, PzcLys, or c-PzACAla;

AA^6 is D-NicLys, D-PicLys, D-MNicLys, D-MPicLys, D-INicLys, D-BzLys, D-PzcLys, D-PzACAla, D-NACAla, or D-PACAla;

AA^7 is Leu, Aile, Nle, Val, NVal, Abu, or Ala; and

AA^8 is ILys or IOrn.

5,470,948

VASOPRESSIN AND VASOTOCIN DERIVATIVES

Falk Fahrenholz, Frankfurt am Main; Walter Elger, Berlin; Marianne Fähnrich, Berlin, and Kryzsztof Chwalisz, Berlin, all of, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/EP91/02496, § 371 Date Jun. 22, 1993, § 102(e) Date Dec. 20, 1993, PCT Pub. No. WO92/11287, PCT Pub. Date Jul. 9, 1992

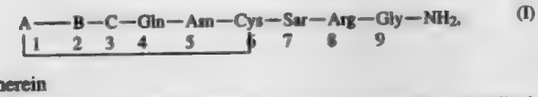
PCT Filed Dec. 21, 1991, Ser. No. 78,289

Claims priority, application Germany, Dec. 22, 1990, 40 42 009.6

Int. Cl.[6] A61K 38/00; C07K 7/16

U.S. Cl. 530—315 11 Claims

1. A vasopressin or vasotocin derivative of formula I



(I)

wherein

A is a 3-mercapto-3,3-cyclopentamethylene-propionyl radical (Mca) or a 3-mercapto-propionyl radical (Mpa),

B is an amino acid radical D-Tyr, D-Tyr(Et), D-Phe, Tyr(OMe), D-Ile, D-Trp or a radical of a hydrophobic D-amino acid, and

C is Phe (vasopressin derivative) or Ile (vasotocin derivative), with the proviso that B is not D-Phe when C is Phe.

5,470,949

METHOD FOR MAKING AMINO ACID GLYCOSIDES AND GLYCOPEPTIDES

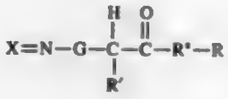
Robin L. Polt, Tucson, Ariz., assignor to The Arizona Board of Regents on Behalf of the University of Arizona, Tucson, Ariz.

Filed Dec. 15, 1992, Ser. No. 990,960

Int. Cl.[6] A61K *38/00;* C07K *5/00;7/00;17/00*

U.S. Cl. 530—322 3 Claims

1. A compound of the formula



wherein X is an imino-bonded moiety selected from the group consisting of an imine, a Schiff's base, and an imidate ester;

wherein G is a carbon chain of 0–10 carbons;

wherein R is selected from the group consisting of phenyl and diphenyl groups;

wherein R' is selected from the group consisting of groups containing a hydroxyl moiety, groups containing a protected hydroxyl moiety, and groups containing an O-linked sugar; and

wherein R" is an amino acid chain having no more than thirteen amino acids.

5,470,950

BIOLOGICALLY ACTIVE AMPHIPHILIC PEPTIDE COMPOSITIONS AND USES THEREFOR

W. Lee Maloy; U. Prasad Kari, both of Lansdale, Pa., and Jon I. Williams, Robbinsville, N.J., assignors to Magainin Pharmaceuticals Inc., Plymouth Meeting, Pa.

Continuation of Ser. No. 870,960, Apr. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 760,054, Sep. 13, 1991, abandoned. This application Feb. 8, 1994, Ser. No. 193,521

Int. Cl.[6] A61K *38/03*

U.S. Cl. 530—324 8 Claims

1. A biologically active amphiphilic peptide, said peptide having the following basic structure X_{14}; $R_1—R_2—R_2—R_1—R_1—R_2—R_2—R_1—R_2—R_2—R_1—R_1—R_2—R_2—R_3$, wherein R_1 is a hydrophobic amino acid, R_2 is a basic hydrophilic or neutral hydrophilic amino acid, and R_3 is a neutral hydrophilic amino acid.

5,470,951

PEPTIDES FOR ANTAGONIZING THE EFFECTS OF AMYLOID βPROTEIN

Eugene Roberts, Monrovia, Calif., assignor to City of Hope, Duarte, Calif.

Filed Sep. 29, 1993, Ser. No. 127,904

Int. Cl.[6] A61K *38/00;* C07K *5/00;7/00;17/00*

U.S. Cl. 530—330 4 Claims

1. A peptide having the sequence of SEQ ID NO: 1, SEQ ID NO: 2 or SEQ ID NO: 3.

5,470,952

CNTF AND IL-6 ANTAGONISTS

Neil Stahl, Carmel; Aris N. Economides, New York, and George D. Yancopoulos, Yorktown Heights, all of N.Y., assignors to Regeneron Pharmaceuticals, Inc., Tarrytown, N.Y.

Filed Oct. 20, 1993, Ser. No. 140,222

Int. Cl.[6] C07K *14/475*

U.S. Cl. 530—350 2 Claims

1. An IL-6 antagonist, capable of binding IL-6 to form a non-functional complex, comprising:

a) soluble IL-6Rα; and

b) the extracellular domain of gp130.

5,470,953

HUMAN β_2 INTEGRIN α SUBUNIT

W. Michael Gallatin, and Monica Van der Vieren, both of Seattle, Wash., assignors to ICOS Corporation, Bothell, Wash.

Continuation-in-part of Ser. No. 173,497, Dec. 23, 1993. This application Aug. 5, 1994, Ser. No. 286,889

Int. Cl.[6] C07K *1/00;2/00;* C07H *19/00;21/00*

U.S. Cl. 530—350 5 Claims

5. A purified and isolated α_x polypeptide consisting of the amino acid sequence set out in SEQ ID NO: 2.

5,470,954

ULTRAPURIFICATION PROCESS FOR FACTOR VIII

Michael J. Griffith, Claremont; Gerald G. Neslund, Diamond Bar, and Shu-Len Liu, Cerritos, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 887,387, May 21, 1992, abandoned, which is a continuation of Ser. No. 167,902, Mar. 28, 1988, abandoned, which is a continuation-in-part of Ser. No. 32,880, Mar. 31, 1987, abandoned. This application Oct. 21, 1993, Ser. No. 140,695

Int. Cl.[6] A61K *35/16;* C07K *1/18;1/22;14/755*

U.S. Cl. 530—383 39 Claims

1. A method of purifying Factor VIII:C from a mixture of polypeptides and contaminants comprising:

(a) adsorbing an antibody to a matrix to form an immunoaffinity matrix, which antibody binds by hydrophobic attraction to the Factor VIII:C to be purified to form hydrophobic bonds, adding the mixture to said antibody before or after said antibody is bound to the matrix, thereby adsorbing said Factor VIII:C in the immunoaffinity matrix;

(b) eluting the Factor VIII:C from the immobilized antibody by treating the Factor VIII:C:immunoaffinity matrix with a desorbing substance which breaks the hydrophobic bonds between the Factor VIII:C and the immobilized antibody to desorb the Factor VIII:C from said matrix wherein the desorbing substance is a non-polar agent in a buffered salt solution;

(c) passing the Factor VIII:C to be purified through an affinity region which is an ion-exchange region capable of binding to the Factor VIII:C, thereby binding the Factor VIII:C to the affinity material while allowing the contaminants to pass through the affinity region; and

(d) eluting the purified Factor VIII:C from the affinity region.

5,470,955

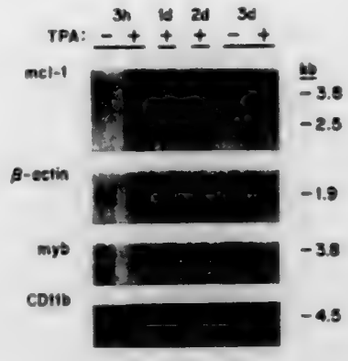
ANTIBODIES WHICH SPECIFICALLY BIND MCL-1 POLYPEPTIDE

Ruth W. Craig, Hanover, N.H., assignor to Dartmouth College, Hanover, N.H.

Continuation-in-part of Ser. No. 12,307, Feb. 2, 1993, abandoned. This application Jun. 16, 1993, Ser. No. 77,848

Int. Cl.[6] C07K *16/00;16/30*

U.S. Cl. 530—387.7 3 Claims



1. An antibody which specifically binds. the mcl-1 polypeptide having the sequence of SEQ ID NO:2.

5,470,956

ANTIBODIES FOR MEVALONIC ACID AND METHODS FOR IMMUNOLOGICAL DETERMINATION OF MEVALONIC ACID BY USING THEM

Akio Hayashi; Makoto Hiramatsu, and Nobuyuki Hamanaka, all of Osaka, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

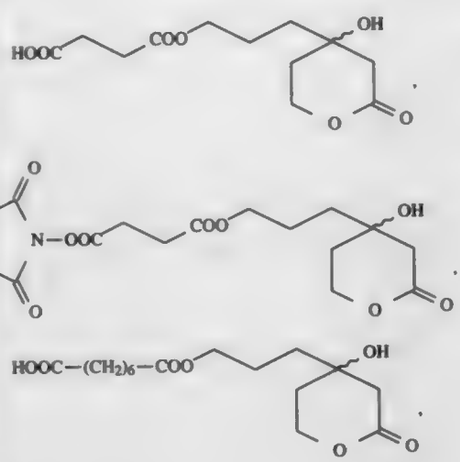
Filed Jan. 21, 1994, Ser. No. 184,178

Claims priority, application Japan, Jan. 20, 1993, 5-024747

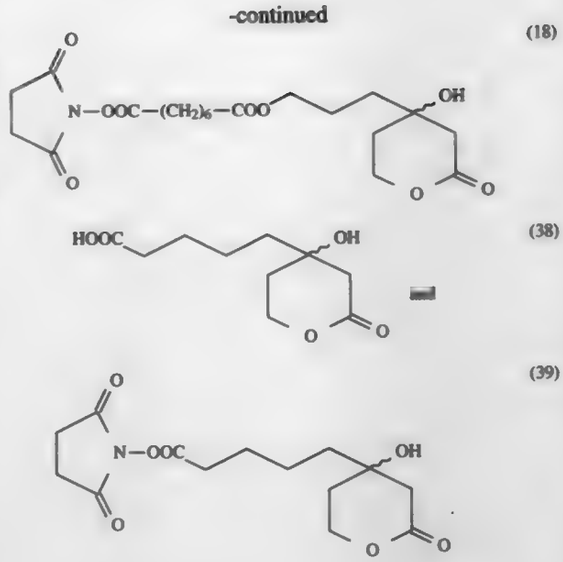
Int. Cl.[6] C07K *16/06;16/18*

U.S. Cl. 530—388.9 10 Claims

1. An antibody specifically binds to mevalonic acid which is obtained by using, as antigen, a conjugate of protein selected from the group consisting of albumin, globulin, thyroglobulin, hemocyanin, edestin, and polylysine and a mevalonic acid derivative selected from the group consisting of the formula:



-continued



5,470,957

IMMUNOINHIBITORS OF FACTOR XIII

Guy Reed, Winchester, Mass., assignor to President and Fellows of Harvard College, Cambridge, and The General Hospital Corporation, Boston, both of Mass.

Filed Oct. 1, 1993, Ser. No. 131,199

Int. Cl.[6] A61K *39/395;* C07K *16/36;16/18*

U.S. Cl. 530—388.25 2 Claims

1. A monoclonal antibody which inhibits the ability of Factor XIII to catalyze the formation of a blood clot, wherein said antibody inhibits thrombin cleavage of said Factor XIII but does not bind to the thrombin-cleavage site of said Factor XIII, wherein said antibody binds to the same epitope on Factor XIII as antibodies selected from the group consisting of 9C11 produced by the hybridoma having the accession number ATCC CRL 11458 and 10G10 produced by the hybridoma having the accession number ATCC CRL 11457.

5,470,958

ANTISERA AGAINST A PEB1 ANTIGEN FROM +I CAMPYLOBACTER JEJUNI

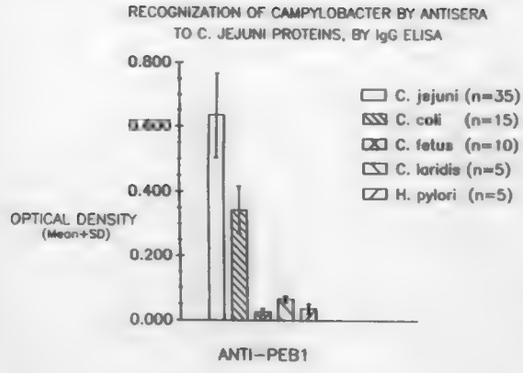
Martin J. Blaser, Nashville, Tenn.; Richard T. Ellison, III, Denver, Colo., and Zhi H. Pei, Nashville, Tenn., assignors to Enteric Research Laboratories Inc., Nashville, Tenn.

Continuation of Ser. No. 986,928, Dec. 8, 1992, abandoned, which is a division of Ser. No. 612,330, Nov. 13, 1990, Pat. No. 5,200,344. This application Sep. 16, 1994, Ser. No. 307,480

Int. Cl.[6] A61K *35/16;39/106*

U.S. Cl. 530—389.5 1 Claim

1. Antisera raised against a purified PEB1 antigen which is obtained from *Campylobacter jejuni* and has an apparent molecular weight of 28 kDa as measured on sodium dodecyl sulfate polyacrylamide gel under reducing conditions, a molecular weight of 28.9±1.0 kDa as measured by gel filtration chromatography under native conditions, and an isoelectric point of 8.5.



5,470,959

POLYAZO DYES HAVING A DIAZO COMPONENT OF THE AMINOBENZOPHENONE SERIES

Gunther Lamm, Hassloch; Udo Mayer, Frankenthal; Helmut Reichelt, Neustadt, and Georg Zeidler, Dannstadt-Schauernheim, all of, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

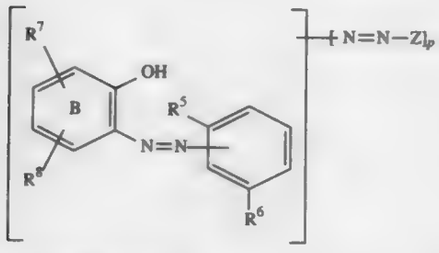
Continuation of Ser. No. 988,756, Dec. 10, 1992, abandoned. This application Jan. 24, 1994, Ser. No. 185,235

Claims priority, application Germany, Dec. 21, 1991, 41 42 696.7

Int. Cl.[6] C09B *45/24;33/02;33/24;* **C06P** *3/32*

U.S. Cl. 534—680 **4 Claims**

1. A polyazo dye of the formula (Ia)



where p is from 1 to 2,

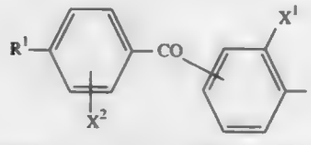
R^5 and R^6, identical or different, are hydroxyl or amino;

R^7 is hydrogen, C_{1-4} alkyl, halogen, nitro, hydroxsulfonyl, sulfamoyl, C_{1-4}mono- or -dialkylsulfamoyl, phenylsulfamoyl or C_{1-4}-alkylsulfonyl;

R^8 is hydrogen, halogen, nitro or hydroxysulfonyl;

the ring B can be fused by an optionally nitro- or hydroxysulfonyl-substituted benzo ring, in free form or as a copper, chromium, iron, cobalt or nickel complex;

and Z is a radical of the formula (IIa)



where one of the radicals X^1 and X^2 is hydrogen and the other is hydroxysulfonyl;

R^1 is chlorine or C_{1-4}-alkyl; and

the carbonyl group of the radical (IIa) is para to X^1 or to the azo group.

5,470,960

PHENYLALANINE-GLYCINE DERIVATIVES, PROCESS FOR PREPARATION THEREOF, AND PHARMACEUTICAL COMPOSITION CONTAINING SAID DERIVATIVES

Koichi Niimura; Takako Kawabe, both of Saitama; Takao Ando, and Kenichi Saito, both of Tokyo, all of, Japan, assignors to Kureha Chemical Industry Co., Ltd., Tokyo, Japan

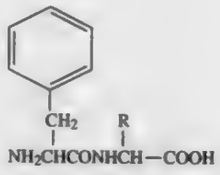
Division of Ser. No. 31,478, Mar. 15, 1993, Pat. No. 5,411,964. This application Jan. 11, 1995, Ser. No. 371,564

Claims priority, application Japan, Mar. 14, 1992, 4-89564

Int. Cl.[6] C07H *15/24;* **C07C** *229/00*

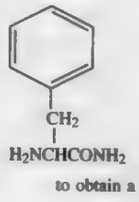
U.S. Cl. 536—6.4 **1 Claim**

1. A process for preparing an L-phenylalanine-glycine derivative of the general formula (I):

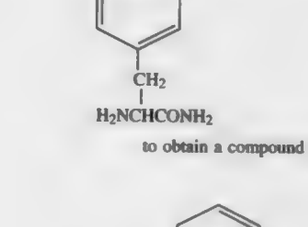


wherein R represents a residue of an antitumor substance, or a salt or an ester thereof, comprising the steps of:

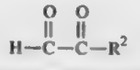
(1) reacting carbobenzoxychloride with a salt of phenylalaninea-mide of the formula (V):



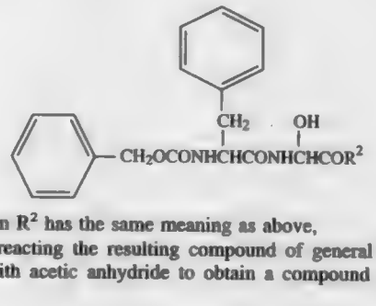
to obtain a compound of the formula (IV):



(2) reacting the resulting compound of the formula (IV) with a glyoxylic acid compound of the general formula (VI):



wherein R^2 represents a benzyloxy group or an alkoxy group with 1 to 4 carbon atoms, to obtain a compound of the general formula (IIIa):

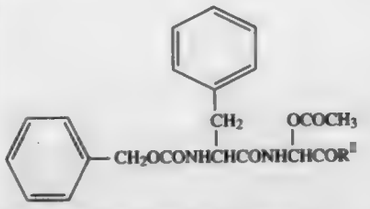


wherein R^2 has the same meaning as above,

(3) reacting the resulting compound of general formula (IIIa) with acetic anhydride to obtain a compound of the general

formula (IIIb):

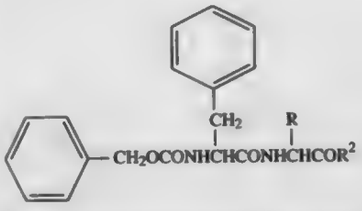
(IIIb)



wherein R^2 has the same meaning as above,

(4) reacting the resulting compound of the general formula (IIIb) with the antitumor substance to obtain a compound of the general formula (II):

(II)



wherein R and R^2 have the same meanings as above, and

(5) removing the protecting group(s) from the resulting compound of the general formula (II).

5,470,961

14 AND/OR 15-HYDROXY 6,9 HEMIACETAL ERYTHROMYCIN DERIVATIVES

Setsuo Harada, Kawanishi; Yasunori Funabashi, Osaka; Nobuhiro Inatomi, Osaka; Shigeharu Tanayama, Osaka, and Seiichi Tanida, Kyoto, all of, Japan, assignors to Takeda Chemical Ind., Ltd., Osaka, and Kitasato Kenkyushio, Tokyo, both of, Japan

Filed Mar. 19, 1993, Ser. No. 33,777

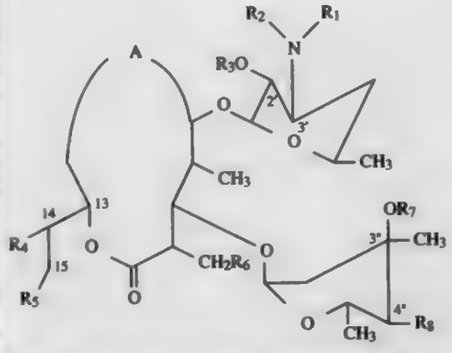
Claims priority, application Japan, Mar. 19, 1992, 4-064243; Jun. 11, 1992, 4-152467

Int. Cl.[6] C07J *17/08;* **A61K** *31/70*

U.S. Cl. 536—7.4 **16 Claims**

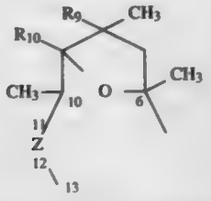
1. A 6,9-hemiacetal-erythromycin compound or the salt thereof, in which said 6,9-hemiacetal-erythromycin compound is represented by the formula [1]:

[1]



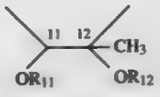
wherein R_1 represents hydrogen or an aliphatic hydrocarbon group selected from the group consisting of a C_{1-6} alkyl, a C_{3-7} cydloalkyl, a C_{2-6} alkenyl and C_{2-6} alkynyl, and R_2 represents hydrogen or an aliphatic hydrocarbon group as defined in R_1 above, or R_1 and R_2 form a heterocyclic group having a carbon chain of 3 to 6 carbon atoms together with the adjacent nitrogen atom; R_3 represents hydrogen or an acyl group selected from the group consisting of carboxylic acyl, sulfonic acyl, phosphorous acyl and phosphoric acyl; R_4 represents a hydroxyl group and R_5 represents a hydrogen or hydroxyl group; R_6 represents hydrogen or a hydroxyl group; R_7 represents hydrogen or a methyl group; R_8 is selected from the group consisting of hydrogen, a hydroxyl group, an acyloxy group selected from the group consisting of carboxylic acyloxy, sulfonic acyloxy, phosphorous acyloxy and phosphoric acyloxy, and a C_{1-3}alkoxy group which is unsubstituted or substituted by C_{1-3} alkoxy or C_{2-6} alkoxyalkoy; and —A— represents the formula [2]:

[2]



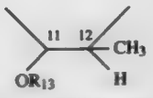
wherein R_9 and R_{10} both represent hydrogen or together form a double bond; and Z is selected from the group consisting of (i) the formula [3]:

[3]



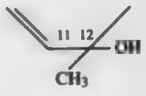
wherein R_{11} is selected from the group consisting of hydrogen, an acyl group selected from the group consisting of carboxylic acyl, sulfonic acyl, phosphorous acyl and phosphoric acyl, and a C_{1-3} alkyl group; and R_{12} is selected from the group consisting of hydrogen, a C_{1-6} carboxylacyl group, and a C_{1-3} alkyl group which is unsubstituted or substituted by a C_{1-3} alkylthio group, (ii) the formula [4]:

[4]



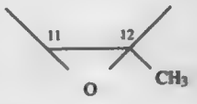
wherein R_{13} is the same as defined in R_{11} above, (iii) the formula [5]:

[5]



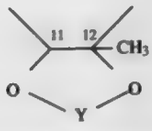
(iv) the formula [6]:

[6]



and (v) the formula [7]:

[7]



wherein Y is selected from the group consisting of

(a) the formula >B—R_{14}; wherein R_{14} represents a C_{1-6} alkyl group or an aryl group,

(b) >S=O, >C=O, >C=S, and

(c) the formula [8]:

[II]

wherein R_{15} and R_{16}, which may be the same or different, are selected from the group consisting of hydrogen and a C_{1-6} alkyl groups, or from a C_{1-6} cyclic alkyl group together with the adjacent carbon atom, or one of them is selected from the group consisting of hydrogen, a C_{1-6} alkyl group, and an aryl group, and the other represents a C_{1-3} dialkylamino group.

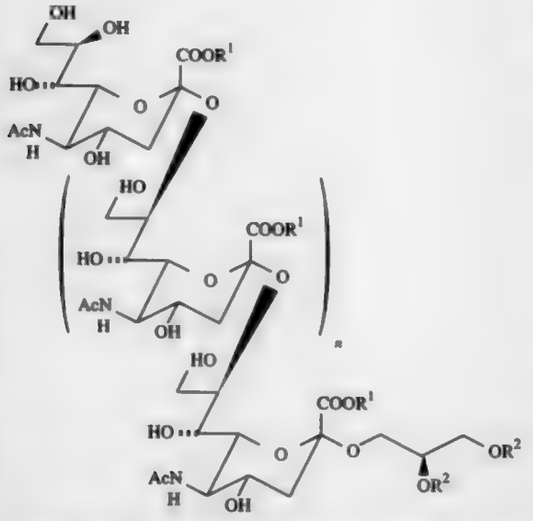
5,470,962

OLIGOSIALYL-1,2-DIALKYL-SN-GLYCEROLS AND SYNTHETIC INTERMEDIATES FOR THEIR PREPARATION

Tomoya Ogawa; Shigeki Nunomura, both of Wako, and Mamoru Sugimoto, Tokyo, all of, Japan, assignors to Rikagaku Kenkyusho, Wako, and Meet Corporation, Tokyo, both of, Japan

Filed Sep. 7, 1993, Ser. No. 108,672
Claims priority, application Japan, Mar. 4, 1991, 3-037594
Int. Cl.[6] C07H *5/06*
U.S. Cl. 536—17.2 **4 Claims**

1. An oligosialyl-1,2-dialkyl-sn-glycerol represented by the following formula (I):



(I)

wherein each R^1 independently represents a group selected from the group consisting of a hydrogen atom and alkali metal atoms, each R^2 independently represents an alkyl group having 14 to 18 carbon atoms, Ac represents an acetyl group, and n represents an integer of from 0 to 20.

5,470,963

Patent Not Issued For This Number

5,470,964

PROCESS FOR THE PREPARATION OF MODIFIED POLYSACCHARIDES HAVING IMPROVED ABSORBENT PROPERTIES

Jian Qin, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 837,304, Feb. 14, 1992, abandoned. This application Sep. 2, 1993, Ser. No. 116,180
Int. Cl.[6] C08B *37/08*
U.S. Cl. 536—20 **21 Claims**

1. A method for producing a crosslinked, modified polysaccharide, the method comprising the following steps:

forming a mixture comprising water and a crosslinking agent wherein the crosslinking agent is water soluble and comprises a compound having at least two functional groups or functionalities capable of reacting in an aqueous solution with a carboxyl, hydroxyl, or amino group of a modified polysaccharide;

adding to said mixture an amount of a water-soluble, modified polysaccharide, that is free from a substantial degree of crosslinking, such that the weight ratio of water-soluble, modified polysaccharide to water in said mixture is from about 1:2 to about 1:40, wherein said water-soluble modified polysaccharide becomes crosslinked and wherein said crosslinked modified polysaccharide comprises a substantially non-crosslinked, water-soluble, modified polysaccharide core and a crosslinked, water-insoluble modified polysaccharide shell at least partially surrounding said core, said crosslinked modified polysaccharide being swellable in said mixture; and

drying said crosslinked modified polysaccharide, wherein said crosslinked, modified polysaccharide has an initial Absorbency Under Load at least about 200 percent greater than said water-soluble, modified polysaccharide.

5,470,965

COMPLEXABLE HETEROGENOUS OLIGOSACCHARIDES AND ALPHA-HYDOSANES HAVING THERAPEUTICAL ACTIVITY, PROCESS FOR THEIR PREPARATION AND RELATED PHARMACEUTICAL COMPOSITIONS

Massimo Baldacci, and Ugo Baldacci, both of Pisa, Italy, assignors to Laboratori Baldacci Spa, Pisa, Italy

Continuation of Ser. No. 296,913, Jan. 12, 1989, abandoned, which is a continuation of Ser. No. 628,421, Jul. 6, 1984, abandoned. This application Jul. 17, 1990, Ser. No. 554,972
Claims priority, application Italy, Jul. 13, 1983, 22045/83
Int. Cl.[6] C08B *37/10*
U.S. Cl. 536—21 **3 Claims**

3. A substantially pure fraction of heparan sulfate having an average molecular weight range of from 7.0 kd to 13.5 kd and at least one activity selected from the group consisting of fibrinolytic activity and antithrombolytic activity, but substantially no anticoagulant activity and no antilipemic activity.

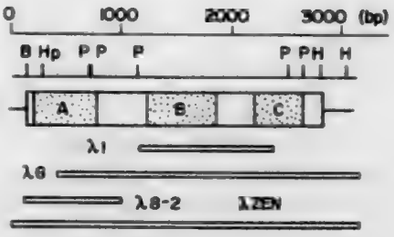
5,470,966

NEURAL α-CATENIN

Shinji Hirano, Okazaki; Naomi Kimoto, Kyoto; Yutaka Shimoyama, Hiratsuka; Setsuo Hirohashi, Chiyoda, and Masatoshi Takeichi, Kyoto, all of, Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan

Filed Jul. 22, 1993, Ser. No. 94,889
Claims priority, application Japan, Dec. 25, 1992, 4-358026
Int. Cl.[6] C12N *15/09;15/12*
U.S. Cl. 536—23.5 **6 Claims**

1. Isolated gene encoding chicken neural α-catenin having an amino acid sequence as shown by SEQ ID No. 1.

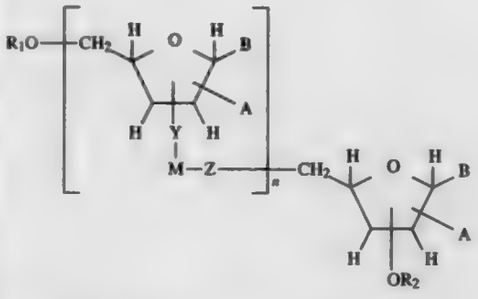


5,470,967
OLIGONUCLEOTIDE ANALOGS WITH SULFAMATE LINKAGES

Edward M. Huie, and George L. Trainor, both of Wilmington, Del., assignors to The Dupont Merck Pharmaceutical Company, Wilmington, Del.

Filed Apr. 10, 1990, Ser. No. 507,693
Int. Cl.[6] C07H *21/00;21/04*
U.S. Cl. 536—24.3 **24 Claims**

1. A compound of the formula:



wherein:

A is H, OH, OR_8, OQ or halogen;

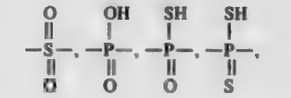
B is a naturally occurring nucleic acid base or modified nucleic acid base;

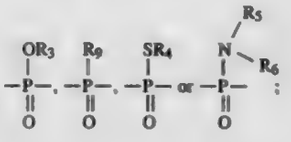
Y is —N(R)— or O;

Z is —N(R_7)— or O;

wherein Y, OR_2, and A are independently bonded to the 2' or 3' position and provided further that A is bonded to a position different from that of Y or OR_2;

wherein each M is independently selected from





provided at least one M is S(=O)=O; and provided that when M is S(=O)=O, Y and Z cannot both be O;

n is 1 to 75;

R is H or alkyl of 1 to 6 carbon atoms;

R_1 is H_2PO_3, $H_3P_2O_5$, $H_4P_3O_7$ and their suitable salts, H or an hydroxyl protecting group;

R_2 is H_2PO_3, $H_3P_2O_5$, $H_4P_3O_7$ and their suitable salts, H or an hydroxyl protecting group;

R_3 is alkyl or cyanoethyl;

R_4 is H or alkyl of i to 6 carbon atoms;

R_5 is H or alkyl of 1 to 6 carbon atoms;

R_6 is H or alkyl of 1 to 6 carbon atoms;

R_7 is H or alkyl of 1 to 6 carbon atoms;

R_8 is alkyl of 1 to 6 carbon atoms;

R_9 is alkyl of 1 to 6 carbon atoms or cyanoethyl; and

Q is an hydroxyl protecting group;

provided that when each M is S(=O)=O, then at least one B group is not thymine.

5,470,968
PROCESS FOR PREPARING NON-HYDROXYPROPYLATED, CROSSLINKED, PREGELATINIZED, STARCH AND PRODUCT

Jay H. Katcher, Chestnut Ridge, N.Y., and Charles W. Bertalan, New Brunswick, N.J., assignors to Kraft Foods, Inc., Northfield, Ill.

Continuation of Ser. No. 92,158, Jul. 15, 1993, Pat. No. 5,342,932, which is a continuation-in-part of Ser. No. 17,711, Feb. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 823,510, Jan. 21, 1992, Pat. No. 5,187,272. This application Aug. 30, 1994, Ser. No. 298,525

The portion of the term of this patent subsequent to Feb. 16, 2010, has been disclaimed.

Int. Cl.[6] C08B *31/08;33/04;* **A23L** *1/05;1/187*
U.S. Cl. 536—102 **11 Claims**

1. A process for preparing a non-hydroxypropylated, crosslinked, prgelatinized cereal starch selected from the group consisting of corn hybrids and genetic corn varieties comprising:

a) obtaining raw starch from cereal grain by means of a refining process:

b) washing the raw starch of step a) with water which contains from 0.01 to 2.0% by weight of an emulsifier having an HLB value greater than 1.0;

c) dispersing and agitating the raw, refined cereal starch in water to form a homogeneous slurry containing at least 25% starch;

d) crosslinking the starch using any food-acceptable procedure;

e) gelatinizing and drying the starch using a process selected from the group consisting of spray drying using a two-fluid nozzle, drum drying, and cooking in a water-miscible solvent at high temperature and pressure followed by drying.

5,470,969
CATALYZED SUCROSE-6-ESTER PROCESS

George H. Sankey, Athens, Ga.; Nicholas M. Vernon, Durham, England, and Robert E. Wingard, Jr., Athens, Ga., assignors to McNeil-PPC, Inc., Milltown, N.J.

Continuation of Ser. No. 30,930, Mar. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 870,190, Apr. 13, 1992, abandoned, which is a continuation of Ser. No. 572,816, Aug. 27, 1990, abandoned. This application May 2, 1994, Ser. No. 237,947

Int. Cl.[6] C07H *1/00;13/02;15/04*
U.S. Cl. 536—115 **40 Claims**

20. A process which comprises:

(1) preparing a solution of sucrose and a 1,3-diacyloxy-1,1,3,3-tetra(hydrocarbyl)distannoxane in a polar aprotic solvent to form a first reaction mixture; and

(2) adding a carboxylic acid anhydride to said first reaction mixture to form a second reaction mixture and maintaining said second reaction mixture at a temperature and for a period of time sufficient to produce a sucrose-6-ester.

5,470,970

MASPIN, A SERPIN WITH TUMOR SUPPRESING ACTIVITY

Ruth Sager, Brookline, Mass.; Anthony Anisowicz, West Newton, Mass., and Zhiqiang Zou, Gaithersburg, Md., assignors to Dana-Farber Cancer Institute, Inc., Boston, Mass.

Continuation-in-part of Ser. No. 938,823, Sep. 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 844,296, Feb. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 662,216, Feb. 28, 1991, abandoned. This application Sep. 1, 1993, Ser. No. 121,714

Int. Cl.[6] **C12N** *1/21;5/10;15/15;* **C07K** *14/47*

U.S. Cl. 536—23.5 **17 Claims**

1. A single- or double-stranded isolated DNA encoding a polypeptide having at least 90% sequence identity to maspin (SEQ ID NO:2) wherein said DNA hybridizes under stringent conditions with DNA sequence of SEQ ID NO:1, or the complement of said single stranded DNA.

10. A single- or double-stranded isolated DNA encoding maspin (SEQ ID NO:2), or the complement of said single-stranded DNA.

16. A purified preparation of maspin (SEQ ID NO:2).

5,470,971

STRESS-INDUCED PROTEINS, GENES CODING THEREFOR, TRANSFORMED CELLS OF ORGANISMS, METHODS AND APPLICATIONS

Keiji Kondo, Edison, and Masayori Inouye, Bridgewater, both of N.J., assignors to The University of Medicine and Dentistry of New Jersey, Newark, N.J.

Filed Mar. 11, 1991, Ser. No. 667,276

Int. Cl.[6] **C12N** *15/31;15/81*

U.S. Cl. 536—23.7 **23 Claims**

1. An isolated yeast gene having the following nucleotide sequence, as in SEQ. ID. NO. 1:

```
   1 GATCTGGTTATGGTTTTTCTTGACTATAACCTT
                                AATTATGAGACTAATGTCTTCGGGAGG  60
  61 TCCCTTTTCCGATTTTCCGACTCTTTTCCGTTG
                                AAGAATGTACTTGTGGTTTTGAATCCT 120
 121 ACGGCAGTTATTGCGGCGGTTTGGCCCTTTCTT
                                TCAAAGATTGTGATGGAAATAATTGAT 180
 181 TGTTCCGGGAAATGTGTCTTATTTTCTAAAAGC
                                ATCTTTTTTTCTCTCCAATTCTTCGAG 240
 241 CTATTTCCAGTAAAGGAAAAAAAAAGGTTTGCTG
                                TAAGGGTGAATATGTCTCCAACCTCTT 300
 301 TGAGGTACTGCGTTGCTTCATTCACCATTTAAT
                                ATAAATAGTACATTGGCAGCCCTCTTT 360
 361 CAAACGTCAATTATTCTCGCTTGCCTAACTTTG
                                TTCGGACCGAAATTATAAAGGCATTCA 420
 421 ATCAGTAACAATAATTGCTATTGCATAACTATA
                                CCCTCTGCTAAATAAAATAAAATGTCC 480
 481 GTTTCCAAGATTGCTTTCGTTTTAAGTGCCATT
                                GCCTCTTTGGCCGTCGCTGACACCAGC 540
 541 GCCGCCGAAACTGCTGAATTGCAAGCTATTATC
                                GGTGACATCAACTCTCATCTTTCTGAC 600
 601 TACTTGGGTCTAGAAACTGGCAACAGTGGATTC
                                CAAATTCCATCTGATGTCTTGAGTGTG 660
 661 TATCAACAAGTCATGACTTACACCGATGACGCT
                                TACACTACCTTGTTTAGTGAATTGGAC 720
 721 TTTGATGCTATCACTAAGACAATTGTTAAATTG
                                CCATGGTACACCACAAGATTGAGTTCT 780
 781 GAAATCGCTGCTGCTCTTGCCTCCGTTTCCCCA
                                GCTTCTTCCGAGGCTGCATCTTCTTCC 840
 841 GAGGCTGCATCTTCTTCCAAGGCTGCATCTTCT
                                TCCGAAGCTACATCCTCTGCCGCTCCA 900
 901 TCCTCTTCTGCTGCCCCATCTTCTTCTGCTGCC
                                CCATCATCATCTGCCGAATCATCTTCT 960
 961 AAGGCCGTTTCTTCTTCTGTCGCTCCAACTACC
                                TCTTCTGTCAGCACTTCTACAGTCGAA 1020
1021 ACTGCTTCCAATGCCGGTCAAAGAGTCAATGCA
                                GGCGCTGCCTCTTTCGGTGCTGTTGTT 1080
1081 GCAGGTGCAGCTGCTTTATTGTTATAAAAGGGA
                                ACCTTTTACAACAAATATTTGAAAAAT 1140
1141 TACCTCCATTATTATACCTTCTCTTTATGTAAT
                                TGTTAGTTCGAAAATTTTTTCTTCATT 1200
1201 AATATAATCAACTTCTAAAACTTTCTAAAAACG
                                TTCTCTTTTTCGAGATTAGTGCTTCTT 1260
1261 CCCAATCCGTAAGAAATGTTTCCTTTCTTGACA
                                ATTGGCACCAGCTGGCTACTCGTTGCT 1320
1321 CGAAAACTACTCTCTTTTATTTTTAATTTACGA
                                ACGATTATCTTTCGAAGGAACGACCAA 1380
1381 ACGAGCTAAATATGGGCATCGCCAACGTTAAAA
                                AAATGGACCCTACCGAAGACGTTATTA 1440
1441 TGCCAAGGCGCAGCGAAGAGTCTTTCTCCTTGA
                                GAAAAAATATGCATGAAACAAAATAGA 1500
1501 CAGGACCAGACCCTCTTCGGGAAAAAAAGTCAA
                                GATTTAACACGTGGCTACACCGGCTGG 1560
1561 CTTACAACCAACCAACATAAGATC 1584.
```

5,470,972

PROCESS FOR PREPARING EXAMETHYLENECEPHEM COMPOUNDS

Shigeru Torii, Akaiwa; Hideo Tanaka, Okayama; Mitio Sasaoka; Takashi Shiroi, both of Itano, and Yutaka Kameyama, Okayama, all of, Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

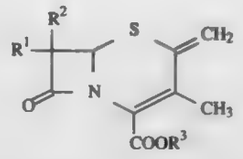
Filed Oct. 14, 1993, Ser. No. 129,130

Claims priority, application Japan, Feb. 18, 1992, 4-030310; Feb. 18, 1992, 4-030311

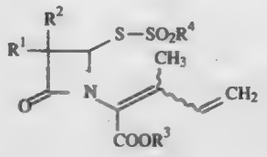
Int. Cl.[6] C07D *501/04;* **A61K** *31/545*

U.S. Cl. 540—230 **3 Claims**

1. A process for preparing a 2-exomethylenecephem compound of the formula



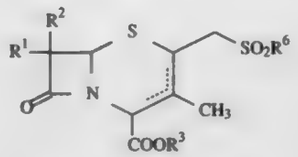
wherein R^1 represents a hydrogen atom, a halogen atom, an amino group or a protected amino group; R^2 represents a hydrogen atom, a halogen atom, a lower alkoxy group, a lower acyl group, a lower alkyl group, a lower alkyl group substituted by a hydroxyl or protected hydroxyl group, a hydroxyl group or a protected hydroxyl group; R^1 and R^2 taken together represent =O; and R^3 represents a hydrogen atom or a carboxy-protecting group; which comprises reacting at a temperature in the range −70° to 180° C. a β-lactam compound of the formula



wherein R^1, and R^2 and R^3 are as defined above, and R^4 represents a phenyl or napthyl group, or a phenyl or naphthyl group substituted by a halogen, hydroxy, nitro, cyano, phenyl, naphthyl, lower alkyl, amino, mono (lower) alkylamino, di (lower) alkylamino, mercapto, alkylthio, phenylthio, naphthylthio, formyloxy, acyloxy, alkoxy, phenoxy, naphthoxy, carboxy, alkoxycarbonyl, phenoxy carbonyl or naphthoxy carbonyl group; with a nucleophilic agent of the formula

R^6SO_2M

wherein R^6 has the same values as R^4 defined above, and M represents an alkali metal atom; to form a 2-substituted methyl-3-cephem compound of the formula



and reacting at a temperature in the range −70° to 180° C. the 2-substituted methyl-3-cephem compound with an amine.

5,470,973

SYNTHESIS OF SULFONAMIDE INTERMEDIATES

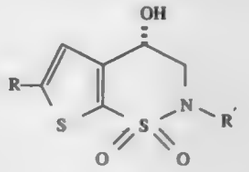
Roman Hoff, Lausen, Switzerland, assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Oct. 3, 1994, Ser. No. 317,043

Int. Cl.[6] C07D *513/04*

U.S. Cl. 544—48 **3 Claims**

1. A process for making a compound of formula:



1

wherein:

R is H or Cl; and

R' is C_{1-6} alkyl, $CH_2(CH_2)_nOR''$, wherein R'' is CH_3 or $(CH_2)_nCH_3$ and n is 1–4, $CH_2(CH_2)_nX$, wherein X is Br, Cl, or I, and n is 1–4, or $(CH_2)_nAr$, wherein Ar is unsubstituted phenyl, 3-methoxyphenyl, or 4-methoxyphenyl and n is 1 or 2, which comprises:

a. reducing 3-bromoacetyl)-2-thiophenesulfonamide 2 to racemic 3-(2-bromo- 1-hydroxyethyl)-2-thiophenesulfonamide 3 with sodium borohydride;

b. cyclizing 3 to racemic 3,4-dihydro-2H-thieno[3,2-e]-1,2-thiazin-4-ol 1,1 -dioxide 4 with sodium hydroxide;

c. N-alkylating 4 in dimethylsulfoxide in the presence of potassium carbonate to give 3,4-dihydro-2-alkyl-2H-thieno[3,2-e]-1,2-thiazin-4-ol 1,1-dioxide 5;

d. oxidizing 5 to 2,3-dihydro-2-alkyl-4H-thieno[3,2-e]-1,2-thiazin-4-one 1,1-dioxide 6 with sodium dichromate;

treating 6 with boran tetrahydrofuran and a catalytic amount of (S)-tetrahydro-1-methyl-3,3-diphenyl-1H,3H-pyrrolo-[1,2-c]1,3,2 oxazaborole or (S)-tetrahydro-1,3,3-triphenyl-1H,3H-pyrrolol[1,2-c]1,3,2 oxazaborole to provide 1.

5,470,974

UNCHARGED POLYNUCLEOTIDE-BINDING POLYMERS

James Summerton; Dwight Weller, and Eugene Stirchak, all of Corvallis, Oreg., assignors to Neu-Gene Development Group, Corvallis, Oreg.

Continuation of Ser. No. 880,883, May 8, 1992, abandoned, which is a division of Ser. No. 100,033, Sep. 23, 1987, Pat. No. 5,142,047, which is a continuation-in-part of Ser. No. 712,396, Mar. 15, 1985, abandoned, and a continuation-in-part of Ser. No. 911,258, Sep. 24, 1986, abandoned, and a continuation-in-part of Ser. No. 944,707, Dec. 18, 1986, Pat. No. 5,217,866.

This application Feb. 25, 1994, Ser. No. 202,664

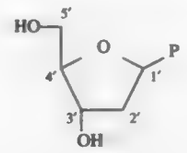
Int. Cl.[6] C07D *413/04;413/12;473/26*

U.S. Cl. 544—118 **2 Claims**

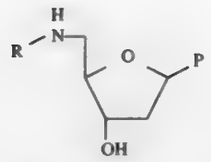
1. A method of producing a polymer composition effective to bind to a single-stranded polynucleotide containing a preselected target sequence of bases, comprising

providing a subunit having one of the following structures:

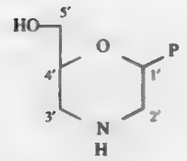
A.



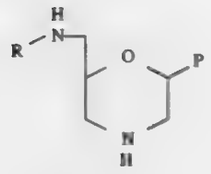
B.



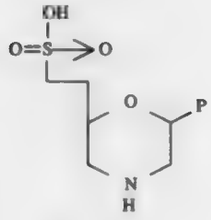
C.



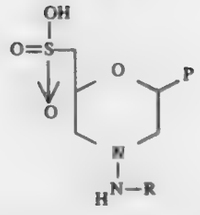
D.



E.



F.

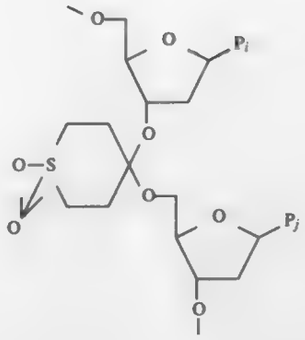


where:

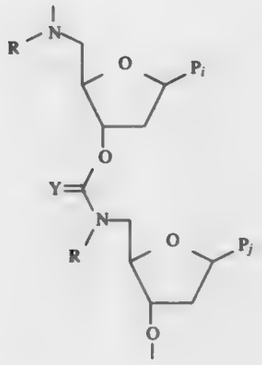
(i) P is a base-pairing moiety selected from the group consisting of purine and pyrimidine bases which are capable of binding by Watson/Crick pairing to contiguous, complementary bases in such target sequence, and

(ii) R is H, an alkyl or a substituted alkyl group; and coupling the subunits to form heteromeric polymer molecules having one of the following corresponding structures, which show two of the subunits of the structure and an intersubunit linkage:

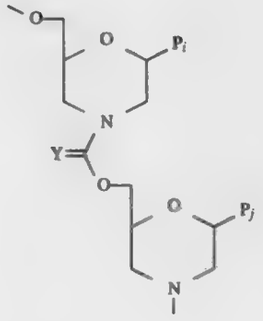
A-A



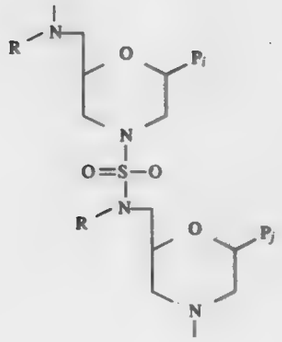
B-B



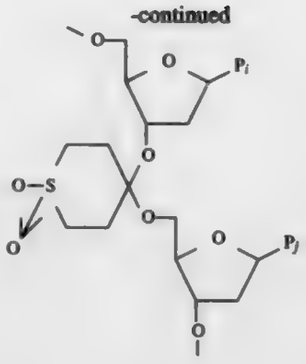
C-C



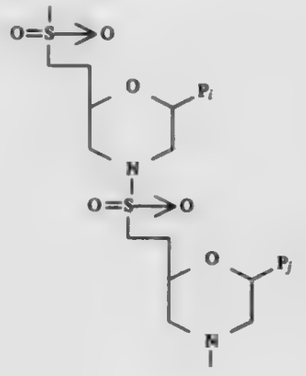
D-D



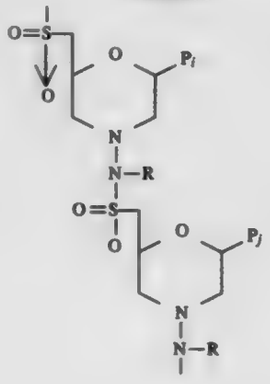
-continued



-continued



-continued



where:

i) P_i and P_j are base-pairing moieties selected from the group consisting of purine and pyrimidine bases, which are capable of binding by Watson/Crick pairing to contiguous, complementary bases in the target sequence,

(ii) the total number of base-pairing moieties in the polymer molecules is such that the moieties are effective to form at lease 12 hydrogen bonds with the complementary bases of the target sequence, and

(iii) Y is an oxygen or sulfur atom.

5,470,975

DIHYDROPYRIMIDINE DERIVATIVES

A-A **Karnail Atwal, Newtown, Pa., assignor to E.R. Squibb & Sons, Inc., Princeton, N.J.**

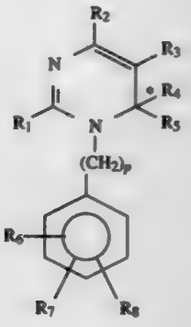
Continuation of Ser. No. 762,127, Sep. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 629,293, Dec. 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 599,220, Oct. 16, 1990, abandoned. This application Jan. 11, 1994, Ser. No. 180,243

Int. Cl.[6] **C07D** *239/20;239/22;239/72;239/78;239/80;239/84;239/88, 239/93*

U.S. Cl. 544—334 **4 Claims**

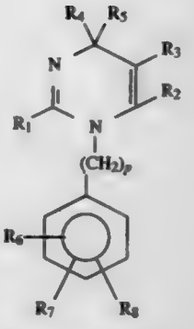
1. A compound of the formula

B-E



or its isomer

F-F

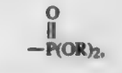


or pharmaceutically acceptable salts thereof

wherein R_1 is alkyl of 1 to 10 carbon atoms, alkenyl or alkynyl of 3 to 10 carbon atoms or the same groups substituted with F or $—CO_2R_{22}$; cycloalkyl of 3 to 8 carbon atoms, cycloalkylalkyl of 4 to 10 carbon atoms, cycloalkylalkenyl or cycloalkylalkynyl of 5 to 10 carbon atoms; $—(CH_2)_zZ(CH_2)_mR'$ (wherein R' is H, C_{1-6}alkyl, C_{3-6}cycloalkyl, C_{2-4}alkenyl or C_{2-4}alkynyl) optionally substituted with F or $—CO_2R_{22}$; benzyl or benzyl substituted on the phenyl ring with 1 or 2 halogens, alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, haloalkyl or nitro; $—SR_4$, $—OR_4$ (where $R_4 \neq H$) or $—NR_4R_5$;

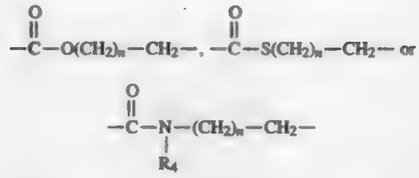
R_2 is hydrogen, halogen, R_4', —CN, haloalkyl, $—OR_4$, $—SR_4$ $—COOR_4$, COR_4, (R_4'O)alkyl, (R_4'S)alkyl, (substituted amino)alkyl;

R_3 is R_4, —COOR, $—CONH_2$, —CO-substituted amino, —COR, —CN, $—NO_2$,



$—SO_2R$ (wherein R is R_4, aminoalkyl or (substituted amino)alkyl), (R_4'O)alkyl, (R_4'S)alkyl, (substituted amino)alkyl, (R_4'OOC)alkyl, (R_4'CO)alkyl, (amino-CO)alkyl, (substituted amino-CO)alkyl, (ROCO)alkyl (wherein R is R_4 excluding hydrogen);

or R_2 and R_3 taken together are



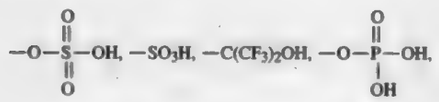
to form a 5- to 7-membered ring with the carbons to which they are attached;

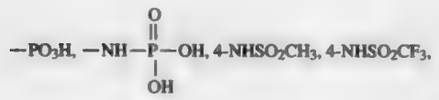
or R_2 and R_3 taken together with the carbon atoms to which they are attached form an aryl;

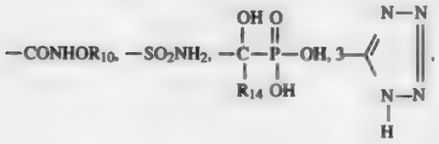
R_4' is selected from hydrogen, alkyl, alkenyl, alkynyl, aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, heterocyclo, (heterocyclo)alkyl, haloalkyl;

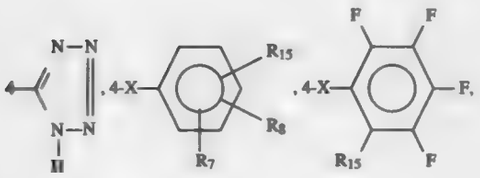
R_4 and R_5 are independently selected from alkyl, alkenyl, alkynyl, aryl, arylalkyl, cycloalkyl, (cycloalkyl)alkyl, heterocyclo, (heterocyclo)alkyl, haloalkyl;

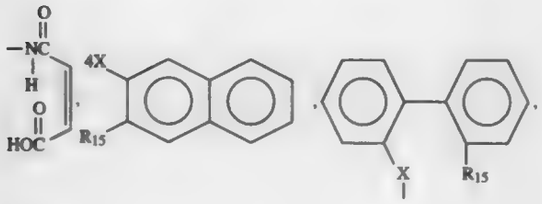
R_6 is 4-CO_2H, 4-CO_2R_9,

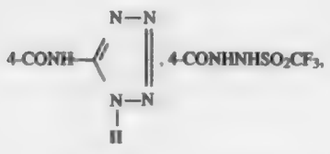


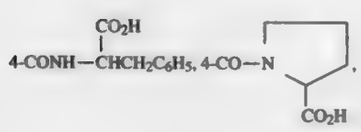




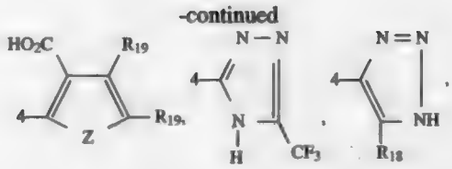


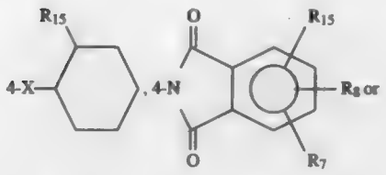


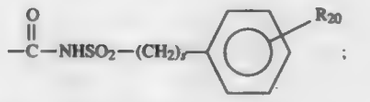




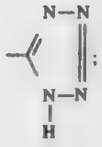
-continued





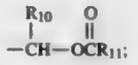


R_7 is hydrogen, halogen, —NO_2, —CN, alkyl of 1 to 4 carbons, acyloxy of 1 to 4 carbons, alkoxy of 1 to 4 carbons, —CO_2H, CO_2R_9, —$NHSO_2CH_3$, —$NHSO_2CF_3$, —$CONHOR_{10}$, —SO_2NH_2, aryl, furyl or



R_8 is hydrogen, halogen, alkyl of 1 to 4 carbons or alkoxy of 1 to 4 carbons;

R_9 is hydrogen or



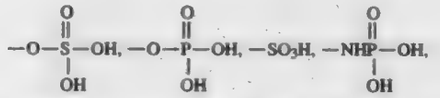
R_{10} is hydrogen, methyl or benzyl;

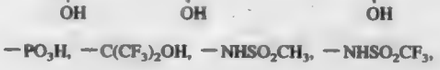
R_{11} is alkyl of 1 to 6 carbons, $NR_{12}R_{13}$;

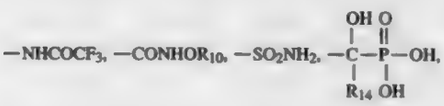
R_{12} and R_{13} are independently hydrogen, benzyl, alkyl of 1 to 6 carbons or taken together are 3 to 6 methylene groups forming a 4- to 7-membered ring with the nitrogen atom to which they are attached;

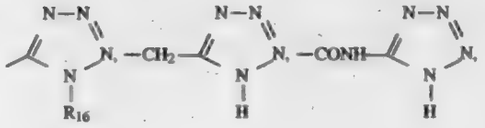
R_{14} is hydrogen, alkyl of 1 to 5 carbons or phenyl;

R_{15} is —CO_2H, —CO_2R_9, —CH_2CO_2H, —$CH_2CO_2R_9$,

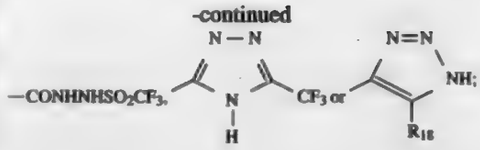




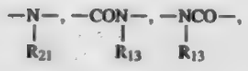




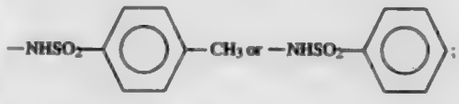
-continued



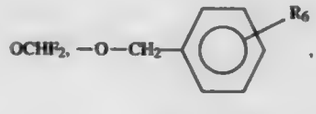
R_{16} is hydrogen, alkyl of 1 to 4 carbons, $—CH_2CH=CH_2$ or $—CH_2C_6H_4R_{17}$;
R_{17} is hydrogen, $—NO_2$, $—NH_2$, —OH or $—OCH_3$;
R_{18} is —CN, $—NO_2$ or $—CO_2R_{19}$;
R_{19} is hydrogen, alkyl of 1 to 6 carbons, cycloalkyl of 3 to 6 carbons, phenyl or benzyl;
R_{20} and R_{20}' are independently hydrogen, alkyl of 1 to 5 carbons or phenyl;
X is a carbon-carbon single bond, —CO—, $—CH_2—$, —O—, —S—,

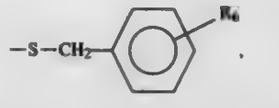


R_{21} is hydrogen, alkyl of 1 to 6 carbons, benzyl or alkyl;
R_{22} is hydrogen, alkyl or perfluoroalkyl of 1 to 8 carbons, cycloalkyl of 3 to 6 carbons, phenyl or benzyl;
R_{23} is $—N(R_{20})(R_{20}')$, $—NHCONH_2$, $—NHCSNH_2$,



R_{24} and R_{25} are independently alkyl of 1 to 4 carbons or taken together are $—(CH_2)_4$;
Z is O, NR_{19} or S;
m is 1 to5;
n is 0 to 2;
p is 0 to 2;
q is 2 to 3; and
s is 0 to 5;
wherein the term "alkyl", as used by itself or as part of a larger group, refers to groups having 1 to 10 carbon atoms;
the term "aryl" refers to phenyl, 1-naphthyl, 2-naphthyl, monosubstituted phenyl, 1-naphthyl, or 2-naphthyl wherein said substituent is alkyl of 1 to 4 carbons, alkylthio of 1 to 4 carbons, alkoxy of 1 to 4 carbons, halo, nitro, cyano, hydroxy, amino, —NH-alkyl wherein alkyl is of 1 to 4 carbons, $—N(alkyl)_2$, wherein alkyl is of 1 to 4 carbons, CF_3,





or —S—CH_2-cycloalkyl, and disubstituted phenyl, 1-naphthyl, or 2-naphthyl wherein said substituents are selected from methyl, methoxy, methylthio, halo, CF_3, nitro, amino, and $OCHF_2$;
the term "heterocyclo" refers to 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyridyl, 3-pyridyl, 4-pyridyl and imidazolyl wherein the pyridyls may be substituted with alkyl of 1 to 4 carbons, alkoxy of 1 to 4 carbons or alkylthio of 1 to 4 carbons; and
the terms "substituted amino" refers to a group of the formula $—NZ_1Z_2$ wherein Z_1 is hydrogen, alkyl, or aryl-(CH_2)- and Z_2 is alkyl or aryl-$(CH_2)_m$- (where m is 0 to 2) or Z_1 and Z_2 taken together with the nitrogen atom to which they are attached are 1-pyrrolidinyl, 1-piperidinyl, 1-azepinyl, 4-morpholinyl, 4-thiamorpholinyl, 1-piperazinyl, 4-alkyl- 1-piperazinyl, 4-arylalkyl- 1-piperazinyl, 4-diarylalkyl-1-piperazinyl, or 1-pyrrolidinyl, 1-piperidinyl, or 1-azepinyl substituted with alkyl, alkoxy, alkylthio, halo, trifluoromethyl or hydroxy.

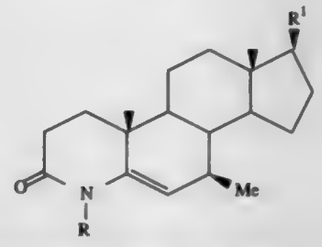
5,470,976

PROCESS FOR THE STEREOSELECTIVE REDUCTION OF STEROID ENELACTAMS

Guy R. Humphrey, Belle Mead, and Ross A. Miller, Fanwood, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 7, 1994, Ser. No. 301,949
Int. Cl.[6] C07D *221/18*
U.S. Cl. 546—77 **18 Claims**

1. A process for the stereoselective reduction of a Δ-5 steroidal enelactam of the formula I, wherein R is selected from H and C_{1-5} alkyl, and R^1 is C_{1-10} alkyl;



(I)

which comprises a treatment selected from:
a) dissolving said Δ-5 steroidal enelactam in a solvent in the presence of a rhodium-based catalyst and treating with H_2; and
b) refluxing said Δ-5 steroidal enelactam in an ionizing medium in the presence of a trialkylsilane of the formula $(R^2)_3SiH$, wherein R^2 is selected from C_{1-6} alkyl and phenyl.

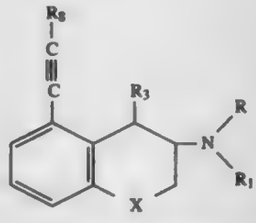
5,470,977

RING-SUBSTITUTED 2-AMINO-1,2,3,4-TETRAHYDRONAPHTHALENES, 3-AMINOCHROMANES AND 3-AMINOTHIOCHROMANES

John M. Schaus, Zionsville; Craig S. Hoechstetter, Indianapolis; Diane Huser, Indianapolis; Charles J. Paget, Indianapolis, and Robert D. Titus, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 168,794, Dec. 16, 1993, Pat. No. 5,426,229, which is a division of Ser. No. 48,553, Apr. 16, 1993, Pat. No. 5,286,753, which is a continuation of Ser. No. 567,985, Aug. 15, 1990, abandoned. This application Mar. 14, 1995, Ser. No. 404,390
Int. Cl.[6] C07C *211/42*; C07D *221/06*
U.S. Cl. 546—101 **6 Claims**

1. A compound of the formula



IV

in which R is C_1–C_4alkyl, C_3–C_4alkenyl, or cyclopropylmethyl;
R_3 is hydrogen; or
R and R_3 taken together are a divalent group of the formula $—CH_2CH_2CH_2—$;

R_1 is hydrogen, C_1–C_4alkyl, C_3–C_4alkenyl, cyclopropylmethyl, aryl(C_1–C_4-alkyl), —COR_4, —$(CH_2)_nS(C_1$–C_4alkyl) or —$(CH_2)_nCONR_5R_6$;
n is an integer from 1 to 4;
R_4 is hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, or phenyl;
R_5 and R_6 are independently hydrogen, C_1–C_4 alkyl, or C_3–C_7cycloalkyl with the proviso that when one of R_5 or R_6 is cycloalkyl the other is hydrogen;
S is —CH—, —O—, —S—, >SO, or $>SO_2$;
and R_8 is hydrogen, C_1–C_7alkyl, substituted C_1–C_7alkyl, aryl, substituted aryl, aryl(C_1–C_3 alkyl), or substituted aryl(C_1–C_3alkyl).

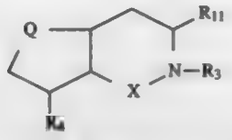
5,470,978

PROCESS AND INTERMEDIATES FOR THE PREPARATION OF EXCITATORY AMINO ACID RECEPTOR ANTAGONISTS

Anita Melikian-Badalian, and Paul L. Ornstein, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 18, 1992, Ser. No. 977,940
Int. Cl.[6] C07D *217/24;217/26;217/14;217/18*
U.S. Cl. 546—141 **12 Claims**

1. An enantioselective process for preparing a compound of formula (IIa)

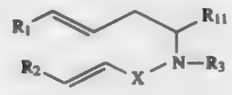


(IIa)

wherein R_{11} is CO_2R_2, $CON(R_2)_2$, CN, CH_2OH, or protected hydroxymethyl;
R_2 is independently hydrogen, C_1–C_6 alkyl, C_3–C_6 alkenyl, aryl, or C_7–C_{16} arylalkyl;
R_3 is hydrogen, C_1–C_6 alkyl, C_3–C_6 alkenyl, $CON(R_6)_2$, SO_2R_6, COR_6, CO_2R_6, benzyl, or substituted benzyl having from one to two substituents independently selected from the group consisting of C_1–C_6 alkyl, C_3–C_8 cycloalkyl, NO_2, halo, halo(C_1–C_6)alkyl, C_3–C_6 alkenyl, C_3–C_8 cycloalkyl-(C_1–C_3)alkyl, phenyl, C_5–C_8 cycloalkenyl, C_5–C_8 cycloalkenyl-(C_1–C_3)alkyl, COR_2, C_1–C_{10} alkanoyl, OR_2, and C_7–C_{16} arylalkyl;
R_4 is hydrogen or CHO;
X is —CH_2—,

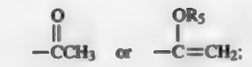
R_6 and R_7 independently are selected from the group consisting of C_1–C_6 alkyl, aryl, C_7–C_{16} arylalkyl, and C_3–C_6 alkenyl;
Q is

and
R_{10} is silyl, C_1–C_4 alkyl, or C_1–C_{10} alkanyoyl;
or a pharmaceutically acceptable salt thereof;
which process comprises contacting a substrate of the formula (Ia)



(Ia)

wherein
R_1 is



R_{11} is CO_2R_2, $CON(R_2)_2$, CN, CH_2OH, or protected hydroxymethyl;
R_2 is independently hydrogen, C_1–C_6 alkyl, C_3–C_8 alkenyl, aryl, and C_7–C_{16} arylalkyl;
R_3 is hydrogen, C_1–C_6 alkyl, C_3–C_6 alkenyl, $CON(R_6)_2$, SO_2R_6, COR_6, CO2R6, benzyl, or substituted benzyl having from one to two substituents independently selected from the group consisting of C_1–C_6 alkyl, C_3–C_8 cycloalkyl, NO_2, halo, halo(C_1–C_6)alkyl, C_3–C_6 alkenyl, C_3–C_8 cycloalkyl-(C_1–C_3)alkyl, phenyl, C_5–C_8 cycloalkenyl, C_5–C_8 cycloalkenyl-(C_1–C_3)alkyl, COR_2, C_1–C_{10} alkanoyl, OR_2, and C_7–C_{16} arylalkyl; or
X is —CH_2—,

R4 is hydrogen or CHO;
R_5 is silyl, C_1–C_4 alkyl, or C_1–C_{10} alkanyoyl; and
R_6 and R_7 independently are selected from the group consisting of C_1–C_6 alkyl, aryl, C_7–C_{16} arylalkyl, and C_3–C_6 alkenyl;
or a pharmaceutically acceptable salt thereof;
with a silyl compound and a tertiary amine in the presence of an organic solvent.

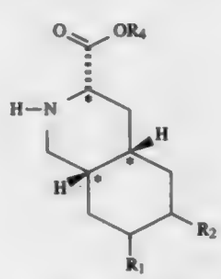
5,470,979

ASYMMETRIC SYNTHESIS OF BICYCLIC AMINO ACID ESTERS

Michael P. Trova, Salisbury Mills, N.Y., assignor to American Cyanamid Company, Wayne, N.J.

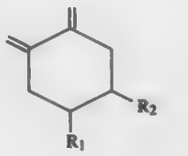
Filed Jul. 1, 1994, Ser. No. 270,199
Int. Cl.[6] C07D *217/26*
U.S. Cl. 546—147 **20 Claims**

1. A process for producing a compound of formula IV:



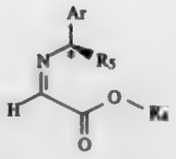
IV

wherein:
R_1 and R_2 may be the same or different and are selected from H; straight or branched (C_1–C_5)alkyl; phenyl; and —$(CH_2)_nOSi(R_3)_3$, n=0–2, and R_3 may be the same or different and is selected from (C_4–C_5)alkyl and phenyl; and
R_4 is (C_1–C_4) alkyl;
which comprises:
reacting a compound of formula I:



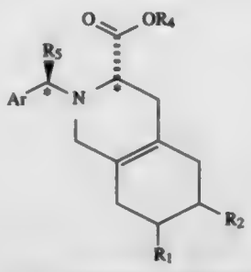
I

wherein:
R_1 and R_2 are as defined hereinabove;
with a chiral compound of formula II, which contains a chiral auxiliary;



II

wherein:
R_4 is as defined hereinabove;
R_5 is a straight or branched (C_1–C_4)alkyl; and
Ar is phenyl; substituted phenyl wherein the substituents are selected from (C_1–C_4)alkoxide, (C_1–C_5) alkyl, nitro and phenyl; naphthyl; or substituted naphthyl wherein the substituents are selected from (C_1–C_4)alkoxide, (C_1–C_5)alkyl, and phenyl; in an inert solvent with an acid catalyst and a catalytic amount of water; and obtaining a compound of formula III:



III

wherein R_1, R_2, R_4, R_5 and Ar are as defined hereinabove;
removing, from the compound of formula III, the chiral auxiliary and reducing the olefin by hydrogenation using a transition metal catalyst and thereby obtaining a compound of formula IV wherein R_1, R_2, R_4, and R_5 are as defined hereinabove.

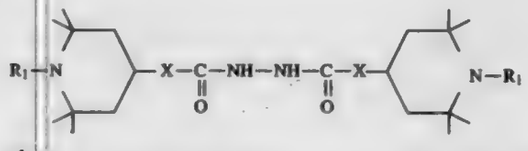
5,470,980

AZODICARBOXYLIC ACID DERIVATIVES CONTAINING HINDERED AMINE MOIETIES AS POLYMER STABILIZERS

Ramanathan Ravichandran, Nanuet, and Ambelal R. Patel, Scarsdale, both of N.Y., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

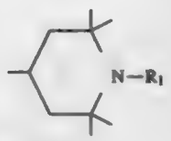
Continuation-in-part of Ser. No. 224,616, Apr. 7, 1994, Pat. No. 5,380,828, which is a continuation-in-part of Ser. No. 132,081, Oct. 5, 1993, abandoned. This application Sep. 30, 1994, Ser. No. 316,272
Int. Cl.[6] C07D *211/36*
U.S. Cl. 546—190 **2 Claims**

1. A hydrazine derivative of formula III



III

where
R_1 is hydrogen, oxyl, hydroxyl, alkyl of 1 to 8 carbon atoms, alkyl of 2 to 4 carbon atoms substituted by one hydroxyl group, allyl, benzyl, benzyl substituted by one or two alkyl of 1 to 4 carbon atoms or R_1 is an alkanoyl of 1 to 8 carbon atoms, and
X is —O— or —NR_2— where R_2 is hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms, alkyl of 2 to 4 carbon atoms substituted by one alkoxy group of 1 to 12 carbon atoms or a group of formula II



II

in which R_1 is as defined above.

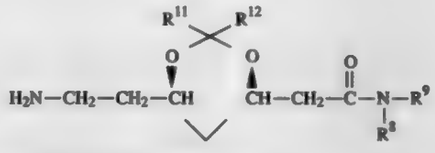
5,470,981

PROCESS FOR +1 TRANS-6-[2-(SUBSTITUTED-PYRROL-1-YL)ALKYL]PYRAN-2-ONE INHIBITORS OF CHOLESTEROL SYNTHESIS

Donald E. Butler, Holland; Tung V. Le, Jenison, and Thomas N. Nanninga, Holland, all of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 323,291, Oct. 14, 1994, which is a division of Ser. No. 243,673, May 16, 1994, Pat. No. 5,397,792, which is a division of Ser. No. 135,385, Oct. 12, 1993, Pat. No. 5,342,952, which is a division of Ser. No. 25,701, Mar. 3, 1993, Pat. No. 5,298,627. This application Jan. 18, 1995, Ser. No. 374,356
Int. Cl.[6] C07D *405/02;319/04*
U.S. Cl. 546—207 **10 Claims**

1. A compound of Formula V



V

wherein R^8 or R^9 is independently
alkyl of from one to ten carbon atoms,
cyclopropyl,
cyclobutyl,
cyclopentyl,
cyclohexyl,
benzyl or
phenyl or
R^8 and R^9 together are
—$(CH_2)_4$—,
—$(CH_2)_5$—,
—$(CH(R^{10})—CH_2)_3$—,
—$(CH(R^{10})—CH_2)_4$—,
—$(CH(R^{10})—(CH_2)_2—CH(R^{10}))$—,
—$(CH(R^{10})—(CH_2)_3—CH(R^{10}))$—,
—$CH_2—CH_2—O—CH_2—CH_2$—,
—$CH(R^{10})—CH_2—O—CH_2—CH_2$—,
—$CH(R^{10})—CH_2—O—CH_2—CH(R^{10})$—,
wherein R^{10} is alkyl of from one to four carbon atoms provided R^8 and R^9 are not both methyl; and
R^{11} or R^{12} is independently alkyl of from one to three carbon atoms or phenyl or R^{11} and R^{12} are taken together as —$(CH_2)_n$— wherein n is 4 or 5.

5,470,982
DISUBSTITUTED PYRIDINES

Rolf Angerbauer; Peter Fey; Walter Hübsch, all of Wuppertal; Thomas Philipps, Cologne; Hilmar Bischoff, Wuppertal; Dieter Petzinna, Düsseldorf; Delf Schmidt, Wuppertal, all of, Germany, and Günter Thomas, Arese, Italy, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

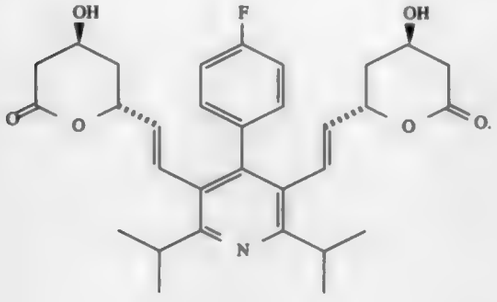
Division of Ser. No. 587,700, Sep. 25, 1990, abandoned, which is a continuation-in-part of Ser. No. 298,453, Jan. 17, 1989, Pat. No. 4,968,689. This application Sep. 24, 1992, Ser. No. 950,623

Claims priority, application Germany, Jan. 20, 1988, 38 01 440.8; Italy, Jul. 29, 1988, 21587/88

Int. Cl.[6] C07D *405/14*

U.S. Cl. 546—268 1 Claim

1. The compound 2,6-diisopropyl-4-(4-fluorophenyl)-3,5-bis-pyridine of the formula



5,470,983
PREPARATION OF OMEPRAZOLE AND LANSOPRAZOLE, AND INTERMEDIATES USEFUL THEREIN

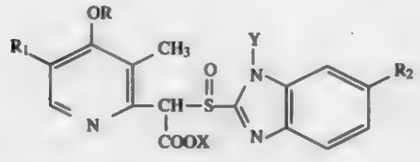
Clarke Slemon, North York, and Bob Macel, Thornhill, both of, Canada, assignors to Torcan Chemical Ltd., Aurora, Canada

Division of Ser. No. 145,572, Nov. 4, 1993, Pat. No. 5,374,730. This application Jul. 18, 1994, Ser. No. 276,378

Int. Cl.[6] C07D *401/12*

U.S. Cl. 546—271 3 Claims

1. The sulfoxide-carboxylate compound of the formula:



in which either (a) R and R_1 are each methyl and R_2 is methoxy; or (b) R is 1,1,1-trifuloromethyl and R_1 and R_2 are both hydrogen; x is an alkali metal, y is hydrogen or an alkali metal, or x and y together represent a divalent alkaline earth metal.

5,470,984
1-DIMETHYLCARBAMOYL-3-SUBSTITUTED-5-SUBSTITUTED-1H-1,2,4-TRIAZOLES

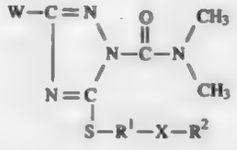
Richard M. Jacobson, Chalfont; J. Roger Ramsay, Quakertown; Harold E. Aller, Norristown, and Muthuvelu Thirugnanam, Langhorne, all of Pa., assignors to Shell Research Limited, United Kingdom

Division of Ser. No. 601,496, Oct. 22, 1990, Pat. No. 5,319,092, which is a continuation of Ser. No. 878,759, Jul. 2, 1986, abandoned, which is a continuation-in-part of Ser. No. 759,016, Jul. 25, 1985, Pat. No. 4,742,072. This application May 10, 1994, Ser. No. 240,362

Int. Cl.[6] C07D *249/12*; A01N *43/653*

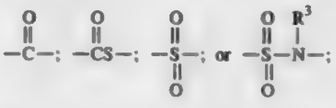
U.S. Cl. 548—264.4 76 Claims

1. A compound having the formula:



wherein

R^1 is an unsubstituted or substituted (C_1–C_6) straight chain alkylidene (—$(CH_2)_n$—) group having one to four of the same or different substituents selected from cyano; nitro; OR; CO_2R; OCOR; COR; lower (C_2–C_6)alkenyl; lower (C_2–C_6)alkynyl; lower (C_1–C_6)alkyl; or unsubstituted or substituted phenyl having one to three of the same or different halo, cyano, nitro, trifluoromethoxy, difluoromethoxy, tetrafluoroethoxy, trifluorothiomethoxy, tetrafluorothiomethoxy, CO_2R, COR, OCOR, lower (C_1–C_4)alkyl, lower (C_1–C_4)alkoxy, lower (C_1–C_4)haloalkyl or lower (C_2–C_6)alkenyl;



R^2 is hydrogen;

unsubstituted or substituted (C_1–C_6)alkyl where the substituent is halo, cyano, nitro, OR, CO_2R, COR, or OCOR;

unsubstituted or substituted phen(C_1–C_4)alkyl where the phenyl ring has one to three of the same or different substituents selected from halo, cyano, nitro, trifluoromethoxy, difluoromethoxy, tetrafluoroethoxy, trifluorothiomethoxy, tetrafluorothiomethoxy, CO_2R, COR, OCOR, lower(C_1–C_4)alkyl, lower (C_1–C_4)alkoxy, lower (C_1–C_4)haloalkyl or lower (C_2–C_6)alkenyl;

unsubstituted or substituted phenyl having one to three of the same or different substituents selected from halo, cyano, nitro, trifluoromethoxy, difluoromethoxy, tetrafluoroethoxy, trifluorothiomethoxy, tetrafluorothioethoxy, CO_2R, COR, OCOR, lower (C_1–C_4)alkyl, lower (C_1–C_4)alkoxy, lower (C_1–C_4)haloalkyl or lower (C_2–C_6)alkenyl;

R^3 is hydrogen; or (C_1–C_6)alkyl;

R^2 and R^3 can be taken together along with the nitrogen atom to which they are attached to form a pyrrolidino, morpholino or piperidino ring;

W is isopropyl; sec-butyl; t-butyl; t-amyl; or 2-methylthio-2-propyl;

where R is hydrogen; lower (C_1–C_6)alkyl; or phenyl optionally substituted with one to three of the same or different halo, cyano, nitro, hydroxy, trifluoromethyl, trifluoromethoxy, difluoromethoxy, tetrafluoroethoxy, trifluorothiomethoxy, tetrafluorothioethoxy, lower (C_1–C_4)alkyl, lower (C_1–C_4)alkoxy, lower (C_1–C_4)haloalkyl, lower (C_2–C_6)alkenyl, carboxy, lower (C_1–C_4)alkoxycarbonyl; and agronomically acceptable salts thereof.

5,470,985

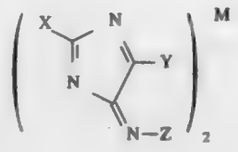
METAL COMPLEX COMPOUND

Hidetaka Ninomiya; Yuko Nagasawa, and Kazuo Asano, all of Hino, Japan, assignors to Konica Corporation, Japan

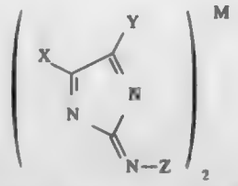
Filed Jul. 21, 1994, Ser. No. 278,172
Claims priority, application Japan, Jul. 27, 1993, 5-185207
Int. Cl.[6] C07D *231/10*
U.S. Cl. 548—312.4 **15 Claims**

1. A metal complex compound represented by the following Formula I or II

(I)



(II)



wherein at least one of X and Y is substituted aryl having a substituent independently selected from hydroxyl, mercapto, acylamino, having an electron withdrawing group as a substituent, alkylsulfonamido, arylsulfonamido, alkoxy, alkylthio, and alkylamino; when one of X and Y is said substituted aryl, another of X and Y is heterocyclic, which may have an alkyl group or a halogen atom as a substituent, hydrogen, or a group of non-metal atoms; Z is substituted aryl having a substituent selected from hydroxyl, amino, alkyl substituted amino, alkoxy, anilino, acylamino, add alkylsulfonamido, at the para-position thereof; and M is Ni^{2+} ion or its salt, Cu^{2+} ion or its salt, Co^{2+} ion or its salt, Zn^{2+} ion or its salt, Fe^{2+} ion or its salt, Pd^{2+} ion or its salt, or Pt^{2+} ion or its salt.

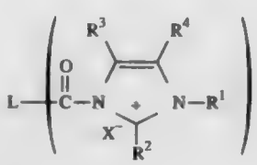
5,470,986

IMIDAZOLIUM HARDENERS FOR HYDROPHILIC COLLOID

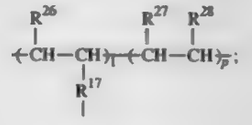
Ludovic Fodor; Timothy D. Weatherill, both of Hendersonville, and Rolf T. Weberg, Brevard, all of N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

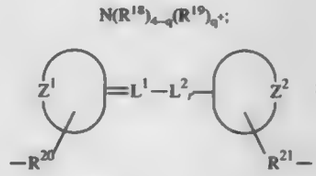
Filed Jun. 27, 1994, Ser. No. 266,403
Int. Cl.[6] C07D *233/64;233/61;233/72;* **B05D** *3/02*
U.S. Cl. 548—312.7 **3 Claims**

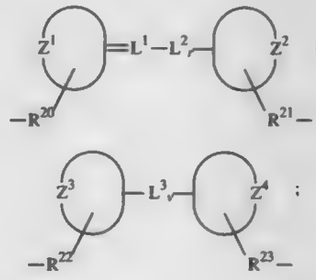
1. A hardener for hydrophilic colloid defined by the formula:



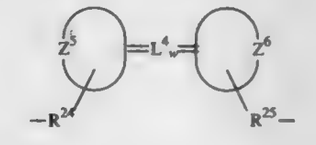
wherein:
L is an n-valent linking group;
R^1 is an alkyl of 1 to 24 carbons; aryl of 6 to 24 carbons; aralkyl of 7 to 25 carbons; atoms chosen from C, N, O, and S necessary to form a 5- or 6-membered ring; or —C(O)R^5;
R^2 is hydrogen; alkyl of 1 to 24 carbons; aryl of 6 to 24 carbons; aralkyl of 7 to 25 carbons;. —OR^6; nitro; carboxyl; mercapto; alkylamino of 1 to 24 carbons; atoms chosen from C, N, O and S necessary to form a 5- or 6-membered ring; or halogen;
R^3 and R^4 independently represent hydrogea; alkyl of 1 to 24 carbons; nitro; carboxyl; mercapto; —OR^7; or atoms chosen from C, N, O, and S necessary to form a 5- or 6-membered ring; or R^3 and R^4 taken together represent atoms chosen from C, N, O, and S necessary to form a 5- or 6-membered ring;
R^5 represents an alkyl of 1 to 24 carbons; aryl of 6 to 24 carbons; aralkyl of 7 to 25 carbons; —OR^8; —CN; —NR^9R^{10}; atoms chosen from C, N, O and S necessary to form a 5- or 6-membered ring;
R^6 represents hydrogen or alkyl of 1 to 24 carbons;
R^7 represents hydrogen or alkyl of 1 to 24 carbons;
R^8 represents hydrogen; alkyl of 1 to 24 carbons or aryl of 6 to 24 carbons;
R^9 and R^{10} independently represent hydrogen; alkyl of 1 to 24 carbons; aryl of 6 to 24 carbons; aralkyl of 7 to 25 carbons; or atoms chosen from C, N, O and S necessary to from a 5- or 6-membered ring; or R^9 and R^{10} taken together represent atoms chosen from C, N, O and S necessary to form a 5- or 6-membered ring;
n is an integer of at least 2;
X^{31} is a counter ion; and wherein:
L is chosen from a set consisting of alkyl of 1 to 20 carbons; phenyl; naphthyl; diphenyl; anthracene; phenanthrene; benzyl; —R^{11}—O—R^{12}—; —$(R^{13}O)_m R^{14}$—; —$R^{15}SR^{16}$ —;





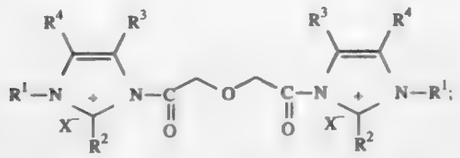


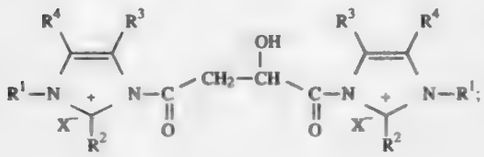
and



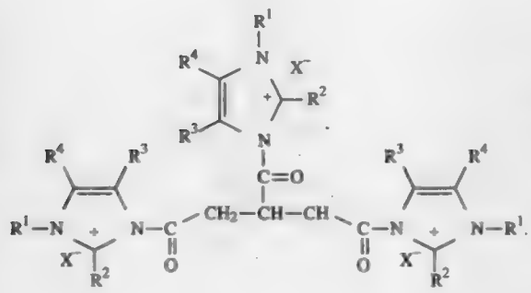
wherein:
R^{11} and R^{12} independently represent alkyl of 1 to 24 carbons; or aryl of 6 to 24 carbons;
R^{13} and R^{14} independently represent alkyl of 1 to 10 carbons;
R^{15} and R^{16} independently represent alkyl of 1 to 24 carbons;
R^{17} represents a linking group;
R^{18} is an alkyl of 1 to 24 carbons;
R^{19} is an alkylene of 1 to 24 carbons;
R^{20}, R^{21}, R^{22}, R^{23}, R^{24} and R^{25} independently represent a chemical linkage; an alkyl of 1 to 10 carbons; an aryl of 6 to 24 carbons; an aralkyl of 7–24 carbons; or alkoxy of 1 to 10 carbons;
R^{26}, R^{27} and R^{28} independently represent hydrogen; or alkyl of 1 to 5 carbons;
L^1 represents methine or nitrogen;
L^2 and L^3 independently represent methine or dimethine;
L^4 represents dimethine;
Z^1, Z^2, Z^3, Z^4, Z^5 and Z^6 independently represent atoms chosen from C, N, O, and S necessary to form a 5- or 6-membered ring;

l is an integer of 2 to 400,000;
m ms an integer of 1 to 40;
p ms an integer of 0 to 400,000;
w is an integer of 0 to 5;
v is an integer of 0 to 5;
q is an integer of 2 to 4;
r is an integer of 0 to 5; and wherein said hardener is chosen from the set consisting of:





and



5,470,987

BISIMIDE MONOMERS

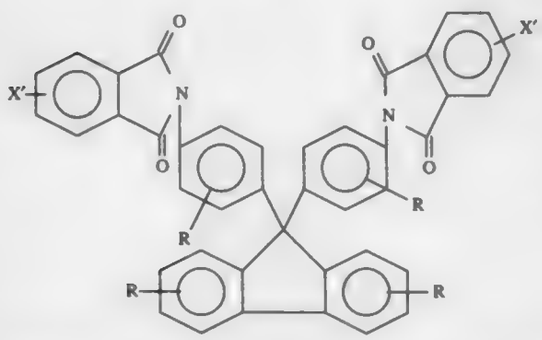
Muthiah N. Inbasekaran, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 161,969, Dec. 3, 1993, Pat. No. 5,386,002. This application Sep. 29, 1994, Ser. No. 315,054

Int. Cl.[6] C07D *403/10*

U.S. Cl. 548—462 **6 Claims**

1. A bisimide of the formula:



wherein R is independently in each occurrence hydrogen, alkyl of from 1 to 20 carbons, aralkyl of from 1 to 20 carbons, halogen, or NO_2; X' is F, Cl, OH, or NO_2.

5,470,988

PROCESS FOR THE PREPARATION OF PURIFIED PHTHALIMIDOALKANECARBOXYLIC ACIDS

Frank Jaekel, Bad Soden/Ts, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Jan. 13, 1994, Ser. No. 181,575

Claims priority, application Germany, Jan. 16, 1993, 43 01. 024.5

Int. Cl.[6] C07D *209/48*

U.S. Cl. 548—479 **21 Claims**

1. A process for the preparation of purified phthalimidoalkanecarboxylic acids from previously prepared, contaminated phthalimidoalkanecarboxylic acids which are contaminated with phthalic acid, lactam, water or a mixture thereof, including the following steps:

a) fusing the previously prepared, contaminated phthalimidoalkanecarboxylic acid to obtain a melt,

b) holding the melt for a period and at a temperature sufficient to cause the phthalic acid, lactam, water, or mixture thereof to substantially separate from the melt, and

c) cooling the resulting purified product melt.

5,470,989

PROCESS FOR THE PRODUCTION OF MIXTURES OF STEREOISOMERS OF 8,12-OXIDO-13,14,15,16-TETRANORLABDANE

Thomas Gerke, Neuss, Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP92/01565, § 371 Date Jan. 18, 1994, § 102(e) Date Jan. 18, 1994, PCT Pub. No. WO93/02073, PCT Pub. Date Feb. 4, 1993

PCT Filed Jul. 10, 1992, Ser. No. 186,000

Claims priority, application Germany, Jul. 18, 1991, 41 23 767.6

Int. Cl.[6] C07D *307/92*

U.S. Cl. 549—458 **19 Claims**

1. A process for the production of stereoisomer mixtures of 8,12-oxido-13, 14,15,16-tetranorlabdane by cyclizing dehydration of stereoisomer mixtures of 8,12-dihydroxy- 13,14,15,16-tetranorlabdane, wherein acid-loaded aluminum oxide is used for the cyclization.

5,470,990

SULFONATION OF BENZOFURANYLBIPHENYLS

Kurt Weber, Basel; Hans R. Meyer, Binningen, both of, Switzerland; Jürgen Kaschig, Freiburg, Germany, and Claude Eckhardt, Riedisheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

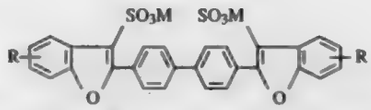
Continuation of Ser. No. 47,586, Apr. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 789,392, Nov. 7, 1991, abandoned, which is a continuation of Ser. No. 360,576, Jun. 1, 1989, abandoned. This application Oct. 18, 1994, Ser. No. 325,010

Claims priority, application Switzerland, Jun. 2, 1988, 2090/88

Int. Cl.[6] C07D *307/82*

U.S. Cl. 549—466 **6 Claims**

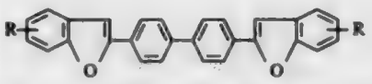
1. A process for the preparation of a compound of the formula (IIIa)



(IIIa)

in which M is hydrogen and/or one equivalent of a non-chromophoric cation and R is one or more hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, halogen, phenoxy or benzyloxy radicals, which

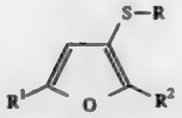
comprises reacting one mole of a compound of the formula (X)



(X)

wherein R is as defined above, with at least a stoichiometric amount of an SO_3/base complex in an inert organic solvent, at a temperature of from 20° C. up to the boiling point of the solvent used,

into a subsequent product of the formula



I'

wherein R=R^4; or SR^5 in which SR^5 represents (i) S—C_{1-6}-alkyl optionally functionalized with halogen, hydroxy, SH, carbonyl or carboxyl, (ii) S-aryl or (iii) S-heteroaryl.

5,470,991

PROCESS FOR THE MANUFACTURE OF FURAN DERIVATIVES

Huber Ulrich, Zurich, Switzerland, assignor to Givaudan-Roure Corporation, Clifton, N.J.

PCT No. PCT/CH92/00199, § 371 Date Jun. 3, 1993, § 102(e) Date Jun. 3, 1993, PCT Pub. No. WO93/07134, PCT Pub. Date Apr. 15, 1993

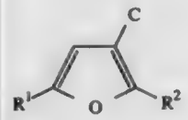
PCT Filed Oct. 2, 1992, Ser. No. 70,418

Claims priority, application Switzerland, Jan. 11, 1991, 2994/91

Int. Cl.[6] C07D *307/02*

U.S. Cl. 549—479 **7 Claims**

1. A process for the manufacture of compounds of the formula



I

wherein

R^1 and R^2 signify hydrogen, C_{1-6}-alkyl or C_{2-6}-alkenyl and

C represents a sulphur-containing radical, which process comprises, as a primary reaction, cyclizing a compound

II

or an acetal or ketal thereof using a reagent III which contains at least one nucleophilic sulphur atom

III

wherein

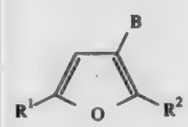
A=H^+, NH_4^+, $N(C_{1-6}\text{-alkyl})_3H^+$, an alkali metal cation, or an alkaline earth metal cation, and

B=R^4—S^-, SCN^-, $AS_2O_3^-$, H_2N—C(=S)NH—, R_5—S(=O)O^-, or R_5—S—S^-,

wherein

R^4=H, C_{1-6}-alkyl, C_{2-6}-alkenyl, C_{2-6}-alkynyl, C_{1-6}-alkyl substituted by halogen, OH, SH, C=O, a C_{1-6}-carboxylic acid residue, a C_{1-6}-alkylcarboxylic acid derivative, C_{1-6}-acyl or optionally substituted acyl, and R^5=C_{1-6}-alkyl, aryl, or heteroaryl, and,

if desired, converting the primary reaction product of the formula



I'

5,470,992

METHOD FOR THE SYNTHESIS OF BETAINES CONTAINING ≦10 PPM OF ORGANICALLY BOUND CHLORINE

Burghard Gruning; Willi Foitzik, Bottrop; Christian Weitemeyer, and Hans-Dieter Kaseborn, both of Essen, all of, Germany, assignors to Th. Goldschmidt AG, Essen, Germany

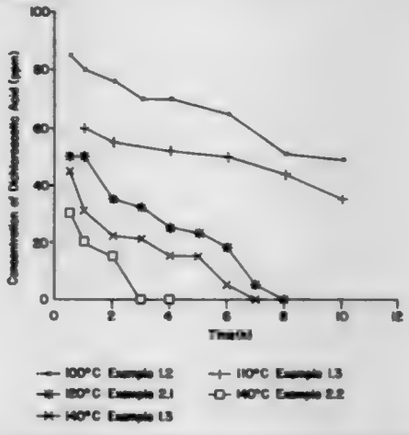
Continuation of Ser. No. 15,489, Feb. 9, 1993, abandoned. This application Mar. 14, 1994, Ser. No. 212,540

Claims priority, application Germany, Feb. 26, 1992, 42 05 880.5

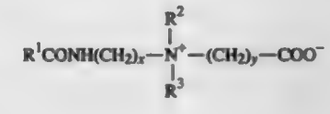
The portion of the term of this patent subsequent to Oct. 11, 2011, has been disclaimed.

Int. Cl.[6] C07C *231/00*

U.S. Cl. 554—69 **3 Claims**



1. A method for the synthesis of betaines of the general formula



wherein

R^1CO is an acyl group derived from a fatty acid or a fatty acid mixture with 6 to 8 carbon atoms,

R^2 and R^3 are the same or different and represent alkyl groups with 1 to 4 carbon atoms,

x=2 or 3 and

y=1, 2 or 3,

by quaternizing the fatty acid amide dialkylamine of the general formula

with chlorocarboxylic acids of the formula $Cl(CH_2)_xCOOH$ or their salts in aqueous solution, comprising carrying out the reaction between about 115° to 180° C., until organically bound chlorine is about ≦10 ppm, the fatty acid amide dialkylamine optionally being quaternized at least partially in a first step between about 80° to 100° C.

5,470,993

TITANIUM(II) OR ZIRCONIUM(II) COMPLEXES AND ADDITION POLYMERIZATION CATALYSTS THEREFROM

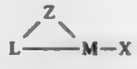
David D. Devore; Francis J. Timmers; David R. Wilson, all of Midland, Mich., and Robert K. Rosen, Sugar Land, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 230,051, Apr. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 82,197, Jun. 24, 1993, abandoned. This application May 12, 1994, Ser. No. 241,523

Int. Cl.[6] C08F *4/642;* **C07F** *17/00*

U.S. Cl. 556—11 **14 Claims**

1. A metal complex containing one and only one cyclic delocalized, anionic, π-bonded group, said complex corresponding to the formula:



wherein:

M is titanium or zirconium in the +2 formal oxidation state;

L is a group containing a cyclic, delocalized, anionic, π-system through which the group is bound to M, and which group is also bound to Z;

Z is a moiety bound to M via a σ-bond, comprising boron, and the members of Group 14 of the Periodic Table of the Elements, and also comprising an element selected from the groups consisting of an element selected from the groups consisting of nitrogen, phosphorus, sulfur and oxygen, said moiety having up to 60 nonhydrogen atoms; and

X is a neutral, conjugated or nonconjugated diene, optionally substituted with one or more groups selected from hydrocarbyl or trimethylsilyl groups, said X having up to 40 carbon atoms and forming a π-complex with M.

5,470,994

SULFONIUM SALTS AND THE USE THEREOF AS PHOTOINITIATORS

Franklin D. Saeva, Webster, and David T. Breslin, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 161,811, Feb. 29, 1988, Pat. No. 4,933,377. This application Apr. 5, 1990, Ser. No. 504,825

Int. Cl.[6] C07C *255/50;255/32;381/12*

U.S. Cl. 556—64 **4 Claims**

4. 9-(10-methoxyanthryl)methyl-p-cyanobenzyl sulfonium hexafluoroantimonate.

5,470,995

CONTINUOUS PROCESS FOR MAKING A DIALKYLTIN THIOCARBOXYLIC ACID ESTER

Kevin S. Kolin, Chicago, Ill., and Anthony J. Siegmann, Middletown, Ohio, assignors to Morton International, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 259,604, Jun. 14, 1994, abandoned, which is a continuation of Ser. No. 84,381, Jun. 29, 1993, abandoned. This application Jul. 22, 1994, Ser. No. 278,769

Int. Cl.[6] C07F *7/22*

U.S. Cl. 556—91 **9 Claims**

1. A method for the continuous manufacture of an alkyltin thiocarboxylic acid ester comprising simultaneously adding an alkyltin halide, a thiocarboxylic acid ester, and an acid acceptor to an agitated aqueous medium in a reaction vessel over an indefinite period of time, agitating the mixture with one or more impellers at a turnover per minute rate of at least about 90 substantially throughout the volume of the mixture, maintaining the resulting reaction mixture at a pH of from greater than 7 to about 8.2, continuously withdrawing the mixture from said reaction vessel simultaneously with the addition of the reactants, and continuously separating it as it is withdrawn into an aqueous phase and an organic phase without the need for demulsification means.

5,470,996

PATTERN FORMING MATERIAL AND PROCESS FOR FORMING PATTERN USING THE SAME

Takumi Ueno; Hiroshi Shiraishi, both of Hachioji; Nobuaki Hayashi, Saitama; Emiko Fukuma, Wako, and Keiko Tadano, Kodaira, all of, Japan, assignors to Hitachi, Ltd., and Hitachi Chemical Company, Ltd., both of Tokyo, Japan

Continuation of Ser. No. 862,947, Apr. 3, 1992, abandoned, which is a division of Ser. No. 493,533, Mar. 14, 1990, Pat. No. 5,118,582. This application Sep. 13, 1993, Ser. No. 119,802

Claims priority, application Japan, Mar. 20, 1989, 1-066281

Int. Cl.[6] C07C *309/65;309/66*

U.S. Cl. 558—46 **1 Claim**

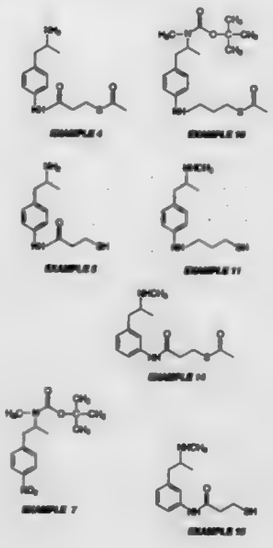
1. A compound obtained by reacting a phenolic compound having three or more phenolic hydroxyl groups selected from the group consisting of pyrogallol, phloroglucinol, trihydroxybenzophenone and tetrahydroxybenzophenone, with a reactive derivative of optionally chloro substituted alkylsulfonic acid, said obtained compound being capable of forming a compound having one or more phenolic hydroxyl groups and an alkylsulfonic acid when exposed to light or irradiation and is selected from the group consisting of tris(methanesulfonyloxy)benzene, tris(ethanesulfonyloxy)benzene, tris(propanesulfonyloxy)benzene, tris(butanesulfonyloxy)benzene, tris(methanesulfonyloxy)benzophenone, tetra(methanesulfonyloxy)benzophenone, and tris(trichloromethanesulfonyloxy)benzene.

5,470,997

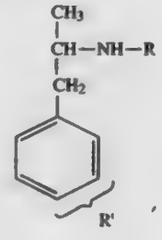
AMPHETAMINE DERIVATIVES AND PROTEIN AND POLYPEPTIDE AMPHETAMINE DERIVATIVE CONJUGATES AND LABELS

Kenneth F. Buechler, San Diego; Joseph B. Noar, Solana Beach, and Si S. Moi, Escondido, all of Calif., assignors to Biosite Diagnostics Incorporated, San Diego, Calif.

Filed Apr. 6, 1992, Ser. No. 864,108
Int. Cl.[6] C07C *327/22;323/41;323/52*
U.S. Cl. 558—254 **2 Claims**

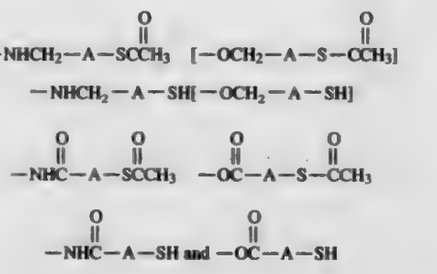


1. A compound of the formula:



where R is —H, —CH_3

where R' is an ortho, meta or para linking group consisting of one of the following;



Where A is a linking group of from 1 to 20 carbons and from 0 to 10 heterocarbons (NH, O, S), either branched or straight chain.

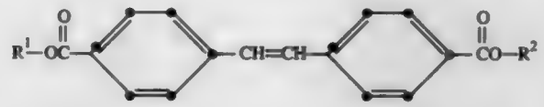
5,470,998

PROCESS FOR THE PREPARATION OF ESTERS OF STILBENEDICARBOXYLIC ACID

Richard H. S. Wang, Kingsport, Tenn., assignor to Eastman Chemical Company, Kingsport, Tenn.

Filed Mar. 6, 1995, Ser. No. 398,841
Int. Cl.[6] C07C *67/343*
U.S. Cl. 560—96 **9 Claims**

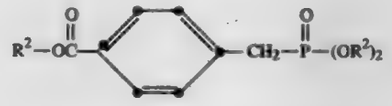
1. Process for the preparation of a dialkyl 4,4'-stilbenedicarboxylate having the formula



by the steps comprising:

(1) preparing p-(chloromethyl)benzoic acid by chlorinating p-toluic acid with sulfuryl chloride in the presence of a free radical initiator and chlorobenzene or dichlorobenzene;

(2) contacting the p-(chloromethyl)benzoic acid of step (1) with a trialkyl phosphite having the formula $(R^2O)_3P$ to obtain a phosphonate compound having the formula:



(II)

and

(1) contacting the phosphonate ester compound of step (3) with an alkyl p-formylbenzoate in the presence of an alkali metal alkoxide and an inert solvent to obtain the dialkyl 4,4'-stilbenedicarboxylate; wherein R^1 is alkyl of 1 to 6 carbon atoms and R^2 is alkyl of 2 to 6 carbon atoms.

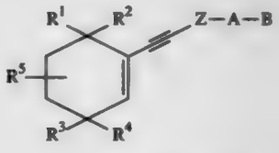
5,470,999

CYCLOHEXENE AND BICYCLIC AROMATIC SUBSTITUTED ETHYNE COMPOUNDS HAVING RETINOID-LIKE BIOLOGICAL ACTIVITY

Roshantha A. Chandraratna, Mission Viejo, Calif., assignor to Allergan, Inc., Irvine, Calif.

Filed Dec. 30, 1993, Ser. No. 175,706
Int. Cl.[6] C07C *69/76;* A01N *37/10*
U.S. Cl. 560—100 **20 Claims**

1. A compound of the formula



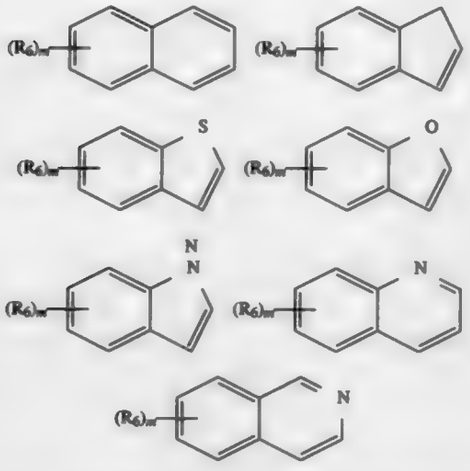
where R_1–R_5 are hydrogen, lower alkyl of 1–6 carbons, or halogen;

A is $(CH_2)_n$ where n is 0–5, lower branched chain alkyl having 3–6 carbons, cycloalkyl having 3–6 carbons, alkenyl having 2–6 carbons and 1 or 2 double bonds, alkynyl having 2–6 carbons and 1 or 2 triple bonds;

B is hydrogen, COOH or a pharmaceutically acceptable salt thereof, $COOR_8$, $CONR_9R_{10}$, —CH_2OH, CH_2OR_{11}, CH_2OCOR_{11}, CHO, $CH(OR_{12})_2$, $CHOR_{13}O$, —COR_7, $CR_7(OR_{12})_2$, or $CR_7OR_{13}O$, where R_7 is an alkyl, cycloalkyl or alkenyl group containing 1 to 5 carbons, R_8 is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or R_8 is phenyl or lower alkylphenyl, R_9 and R10 independently are hydrogen, an alkyl group of 1 to 10

carbons, or a cycloalkyl group of 5–10 carbons, or phenyl or lower alkylphenyl, R_{11} is lower alkyl, phenyl or lower alkylphenyl, R_{12} is lower alkyl, and R_{13} is divalent alkyl radical of 2–5 carbons, and

Z is selected from a bivalent radical derived from the groups



wherein R_6 is hydrogen, lower alkyl of 1–6 carbons, or halogen, R_6 can be attached to any available position on the Z group, and m is an integer between 0 to 4, or a pharmaceutically acceptable salt thereof.

5,471,000

PROCESS FOR THE MANUFACTURE OF AMINOMETHANEPHOSPHONIC ACID

Kenneth R. Randles, and Paul G. LeGras, both of Huddersfield, England, assignors to Zeneca Limited, London, United Kingdom

Filed Mar. 24, 1994, Ser. No. 217,399

Claims priority, application United Kingdom, Apr. 7, 1993, 9307235

Int. Cl.[6] C07F *9/38*

U.S. Cl. 562—16 **11 Claims**

1. A process for the manufacture of aminomethanephosphonic acid which comprises

a) reacting a compound of formula R—CH_2—NH—CO—NH—CH_2—R' wherein R and R', which may be the same or different, represent a phosphonation leaving group with a phosphonating agent and subsequently

b) hydrolysing the product of step (a) to form aminomethanephosphonic acid.

5,471,001

CRYSTALLIZATION OF ADIPIC ACID

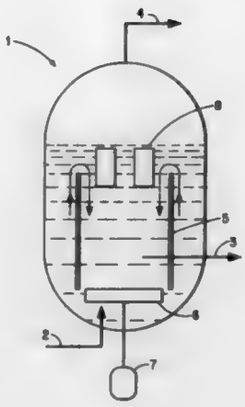
Howard W. Anderson, Hockessin; John B. Carberry, Newark, both of Del.; Harold F. Staunton, Avondale, Pa., and Bhagya C. Sutradhar, Orange, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 15, 1994, Ser. No. 356,758

Int. Cl.[6] C07C *51/42*; A44B *1/04;11/25*

U.S. Cl. 562—593 **10 Claims**

1. A process for the crystallization of adipic acid which comprise subjecting an aqueous based mother liquor containing dissolved adipic acid and nascent crystals of adipic acid to low intensity ultrasonic agitation while cooling the mother liquor and/or decreasing the water content of the mother liquor.



5,471,002

PROCESS FOR PREPARING TRIFLUOROMETHYLANILINES

Wolfgang Appel, Taunusstrasse 74a, D-65779 Kelkheim, and Günter Siegemund, Frankfurter Strasse 21, D-65719 Hofheim, both of, Germany

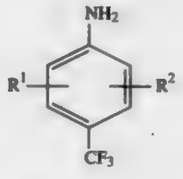
Filed Aug. 18, 1994, Ser. No. 292,723

Claims priority, application Germany, Aug. 20, 1993, 43 28 028.5

Int. Cl.[6] C07C *209/22*

U.S. Cl. 564—412 **14 Claims**

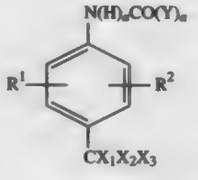
1. A process for preparing trifluoromethylanilines of the formula (I),



(I)

in which

R^1 and R^2, independently of each other, are hydrogen, halogen, (C_1–C_4)alkyl, hydroxyl, alkoxy, alkylthio, carboxyl, or a nitro or cyano group, wherein compounds of the formula (II)



(II)

in which

X_1, X_2 and X_3 are in each case, identically or differently, halogen atoms,

a is 0 or 1,

Y is fluorine, chlorine or bromine, and

R^1 and R^2 have the defined meaning, are reacted with anhydrous hydrofluoric acid and the resulting aniline hydrofluorides are converted with a base into the free amine.

5,471,003

PURIFICATION OF CYCLOPROPANECARBOXALDEHYDE

Shaowo Liang, Kingsport, Tenn., assignor to Eastman Chemical Company, Kingsport, Tenn.

Filed Nov. 28, 1994, Ser. No. 345,192

Int. Cl.[6] C07C *47/00;45/62*

U.S. Cl. 568—420 **4 Claims**

1. Process for the purification of cyclopropanecarboxaldehyde contaminated with crotonaldehyde comprising the steps of:

(1) contacting a mixture comprising cyclopropanecarboxaldehyde and crotonaldehyde with hydrogen in the presence of a palladium, platinum or rhodium catalyst under hydrogenation conditions of temperature and pressure; and

(2) subjecting the hydrogenated mixture from step (1) to distillation to remove butyraldehyde therefrom to obtain cyclopropanecarboxaldehyde substantially free of crotonaldehyde.

5,471,004

PROCESS FOR PRODUCING α,β-UNSATURATED ALDEHYDES

Tatsuhiko Kaneko, Shimamoto; Noritaka Kuroda, Toyono, and Kenichi Kashiwa, Kobe, all of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

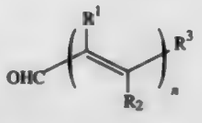
Filed Jun. 14, 1994, Ser. No. 260,233

Claims priority, application Japan, Jun. 14, 1993, 5-142135

Int. Cl.[6] C07C *45/42*

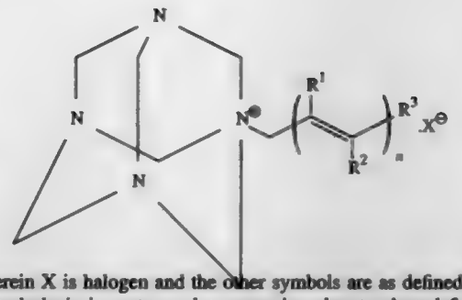
U.S. Cl. 568—455 **32 Claims**

1. A process for producing a compound of the formula (II):



(II)

wherein R^1 and R^2 are each hydrogen or a straight-chain or branched alkyl group having 1 to 6 carbon atoms, R^3 is hydrogen or an unsubstituted or substituted hydrocarbon group having 1 to 20 carbon atoms, and n is an integer of 1 to 10, which comprises subjecting a compound of the formula (I):



(I)

wherein X is halogen and the other symbols are as defined above, to hydrolysis in water and an organic solvent selected from the group consisting of hydrocarbons, halogenated hydrocarbons, ethers and esters.

5,471,005

METHOD OF MAKING 2,7-DIMETHYL-2,4,6-OCTATRIENEDIAL, A KEY INTERMEDIATE IN THE COMMERCIAL SYNTHESES OF VARIOUS CAROTENOIDS

James H. Babler, Chicago, Ill., assignor to Loyola University of Chicago, Chicago, Ill.

Filed Nov. 18, 1994, Ser. No. 339,659

Int. Cl.[6] C07C *47/20;45/61*

U.S. Cl. 568—459 **21 Claims**

1. A process for forming sodium methylmalonaldehyde comprising:

A) forming a first reaction mixture comprising:

i) one equivalent of a sodium alkoxide having the formula NaOR';

ii) an alkyl formate of the formula HCOOR, wherein the molar quantity of said formate is in excess of the molar quantity of said alkoxide; and

iii) an alcohol cosolvent of the formula R'OH;

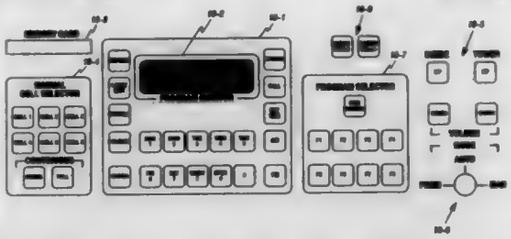
wherein R and R', which can be the same or different, are C_1–C_4 alkyl;

B) slowly adding propionaldehyde to said first reaction mixture at a rate whereby the molar ratio of alkyl formate to propionaldehyde is greater than 5000:1, while maintaining said reaction mixture at a temperature of between about 15° C. and about 50° C.

5,471,006
ELECTRONIC CARILLON SYSTEM AND SEQUENCER MODULE THEREFOR

Gregory L. Schwartz, Spinnerstown, and Karl Frick, Richlandtown, both of Pa., assignors to Schulmerich Carillons, Inc., Sellersville, Pa.

Filed Dec. 18, 1992, Ser. No. 992,832
Int. Cl.[6] G10H 7/00
U.S. Cl. 84—609 23 Claims



1. An electronic carillon system, comprising sequencer means for programmatically receiving, storing and outputting timing data and sequence data representing a prescribed number of distinct bell strikes, each bell strike being composed of a unique combination of bell tones, said sequencer means comprising:

(a) program memory means for memorizing user-defined program points representing intervals of time during which an event is to occur;

(b) music sequencer means for reading musical selections from an electronic memory and memorizing said selections, said musical selections being composed of pre-defined arrangements of said bell strikes, said musical selections being represented by sequence and timing data identifying individual notes to be played and a time delay between successive notes;

(c) user-interface means for programmatically displaying information to and receiving information from a user; and

(d) program code means for controlling the operation of said music sequencer means and user-interface means, said program code means controlling said music sequencer means in outputting sequence and timing data for a selected composition.

5,471,007
MULTIDIMENSIONAL DIGITAL WAVEGUIDE SIGNAL SYNTHESIS SYSTEM AND METHOD

Scott A. Van Duyne, Stanford, and Julius O. Smith, III, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

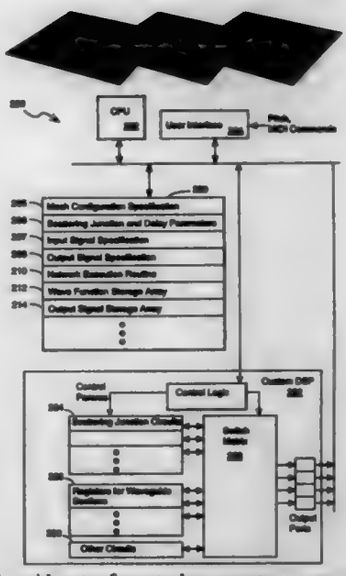
Filed May 4, 1993, Ser. No. 57,253
Int. Cl.[6] G10H 1/02;1/12;1/46
U.S. Cl. 84—622 10 Claims

1. A signal synthesizer, comprising:

a digital waveguide network including a two-dimensional matrix of waveguide sections interconnected by junctions, wherein said matrix is formed by a two-dimensional pattern of said waveguide sections that is repeated in two distinct directions, each waveguide section including two digital delay lines running parallel to each other for propagating signals in opposite directions; each said junction connected between waveguide sections having associated reflection and propagation coefficients for controlling reflection and propagation of signals in the waveguide sections connected to said junction; wherein a majority of said junctions each interconnect at least three of said waveguide sections so as to scatter and intermix signals in said at least three waveguide sections;

at least one signal source, coupled to specified junctions of said digital waveguide network, which provides excitation signals to said digital waveguide network;

parameter storage for storing sets of control parameters, each set of control parameters including waveguide control parameters for controlling how said digital waveguide network filters signals propagating therethrough and signal source parameters which govern the excitation signals produced by said at least one signal source; wherein said waveguide control parameters



in each said set of control parameters cause said digital waveguide network to simulate operation of a physical system modeled by said control parameters; and

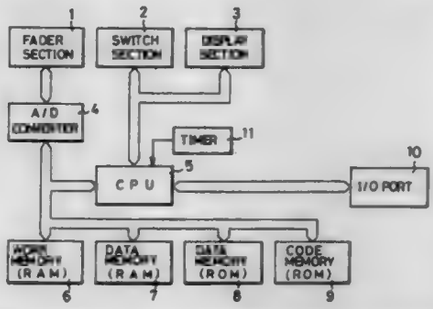
control means for operating said signal source and said digital waveguide network using a selected sets of said control parameters;

wherein said signals propagated by said waveguide sections simulate wave behavior of signals at spatial positions of said physical system corresponding to positions of said waveguide sections in said two-dimensional matrix.

5,471,008
MIDI CONTROL APPARATUS

Akihiro Fujita, Iwata; Seiji Nakano, Hamamatsu, and Katsushi Ishii, Iwata, all of, Japan, assignors to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Continuation of Ser. No. 849,038, Apr. 9, 1992, abandoned.
This application Oct. 21, 1994, Ser. No. 327,261
Claims priority, application Japan, Nov. 19, 1990, 311464
Int. Cl.[6] G09B 15/02; G10H 1/46;7/00
U.S. Cl. 84—633 13 Claims



9. A MIDI control apparatus for displaying positive and negative numerals in the absence of positive and negative signs, comprising:

display means for temporarily displaying a plurality of numbers;

said plurality of numbers being subject to continual change as data input into said MIDI control apparatus changes;

means for highlighting negative numbers of said plurality of numbers, said negative numbers being highlighted when displayed by said display means;

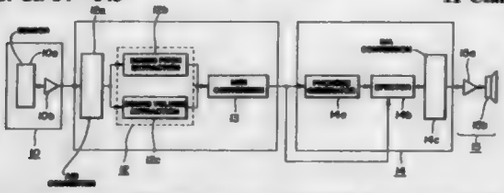
said display means including no space for positive or negative signs.

5,471,009

SOUND CONSTITUTING APPARATUS

Haruo Oba, and Junnichi Nagahara, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 17, 1993, Ser. No. 122,363
Claims priority, application Japan, Sep. 21, 1992, 4-274795
Int. Cl.[6] G10H *7/00*
U.S. Cl. 84—645 **11 Claims**



1. A sound constituting apparatus in which information of phoneme elements constituting a first sound is previously stored in a storage element and is interacted with a state of an external environment or changes of said state to produce a modified sound on a real-time basis without constraint as to a play time interval, comprising:

input detection means for detecting the state of the external environment or change of said state and producing output electrical signals;

data extraction means for extracting results of analyses of the electrical signals obtained from said input detection means as data;

sound source controlling means for outputting sound source control data based on the data extracted by said data extraction means;

sound source means for outputting output sound signals by modifying the information of phoneme elements in response to said sound source control data; and

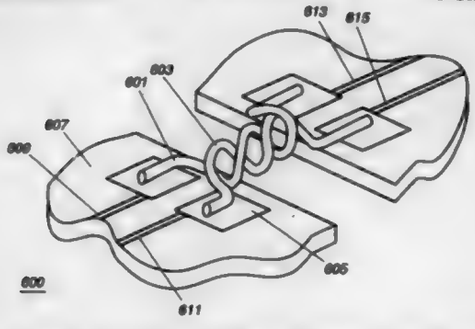
sound producing means for converting output sound signals of said sound source means into the modified sound.

5,471,010

SPATIALLY SEPARATED UNINSULATED TWISTED WIRE PAIR

David E. Bockelman, Plantation, and Douglas H. Weisman, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 299,857, Sep. 1, 1994, which is a continuation of Ser. No. 115,174, Aug. 31, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 330,877
Int. Cl.[6] H01B *11/06*
U.S. Cl. 174—36 **6 Claims**



1. A device for reducing coupling between electrical circuits comprising:

a first uninsulated conductor;

a second uninsulated conductor, and

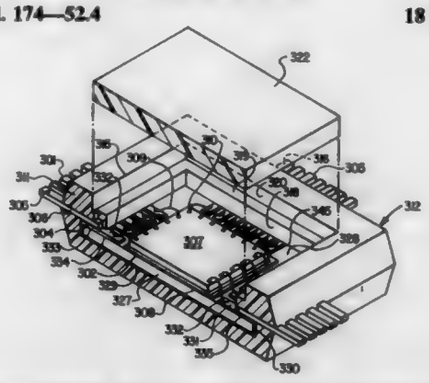
wherein said first uninsulated conductor and said second uninsulated conductor are positioned about one another to form substantially a helical portion without either of said first uninsulated conductor or said second uninsulated conductor making physical contact with each other or any other material in said helical portion.

5,471,011

HOMOGENEOUS THERMOPLASTIC SEMICONDUCTOR CHIP CARRIER PACKAGE

William H. Maslakow, Lewisville, Tex., assignor to AK Technology, Inc., Irving, Tex.

Filed May 26, 1994, Ser. No. 250,153
Int. Cl.[6] H01L *23/02*
U.S. Cl. 174—52.4 **18 Claims**



1. A thermoplastic chip carrier cavity package, said cavity package comprising:

a circuit substrate which is laminated with a suitable thermoplastic in order to form a base, said base providing integral reinforcement of said circuit substrate, said circuit substrate comprising:

a chip die mounting pad; and

a plurality of lead traces each of which are located so as to provide electrical isolation from each other and said chip die mounting pad;

a lead frame comprising a plurality of lead members each of which is attached to a different one of said plurality of lead traces;

a casing, which is comprised of said suitable thermoplastic, said casing covering said laminated circuit substrate and said lead frame so that a cavity is formed, and said casing being chemically fused to a portion of said base of said laminated circuit substrate; and

a lid which is comprised of said suitable thermoplastic and chemically fused to said cavity.

5,471,012

ELECTRICAL WIRE BOX APPARATUS

George E. Opel, Ambler, Pa., assignor to Geo Ventures, Ambler, Pa.

Filed Jul. 28, 1994, Ser. No. 281,594
Int. Cl.[6] H02G *3/08*
U.S. Cl. 174—53 **18 Claims**

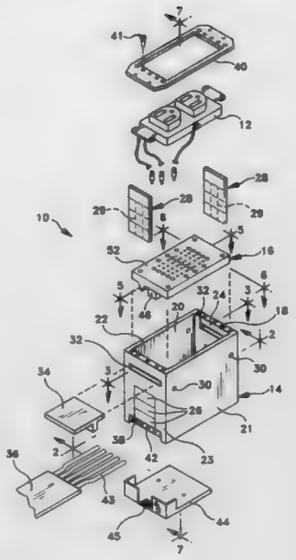
1. A wiring box assembly for an electrical fixture, comprising:

a box structure having a retaining means therein for retaining a plurality of wires from an incoming cable at a set position and orientation;

an insert positionable within said box structure, said insert including a plurality of conductive elements disposed therein;

coupling means for electrically coupling each of said plurality of wires to one of said plurality of conductive elements;

connecting means for selectively connecting the electrical fixture to said plurality of conductive elements, thereby selectively coupling the electrical fixture to the plurality of wires from the incoming cable and electrically enabling the electrical fixture.

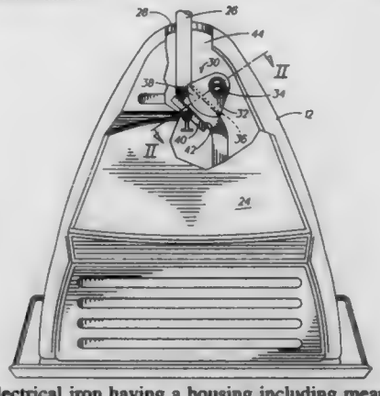


5,471,013

STRAIN RELIEF FOR AN ELECTRICAL APPLIANCE

Michael J. Marchetti, Bridgeport, Conn., assignor to Black & Decker Inc., Newark, Del.

Filed Jul. 6, 1993, Ser. No. 88,299
Int. Cl.[6] H02G 3/18
U.S. Cl. 174—65 R 4 Claims



1. An electrical iron having a housing including means defining an opening, and a rear wall, an electrical power supply cord extending through said opening, and a strain relief for said power supply cord, said strain relief comprising:

a first member pivotably connected to said rear wall of said housing and including a generally planar surface comprising a plurality of spaced teeth;

a second member connected to said rear wall of said housing and having a generally planar surface facing and parallel to the planar surface of the first member and spaced therefrom to define an electrical supply cord receiving slot, the planar surface of the second member including a plurality of spaced teeth, the width of said slot being a maximum when the first and second surfaces are disposed in parallel relation; and

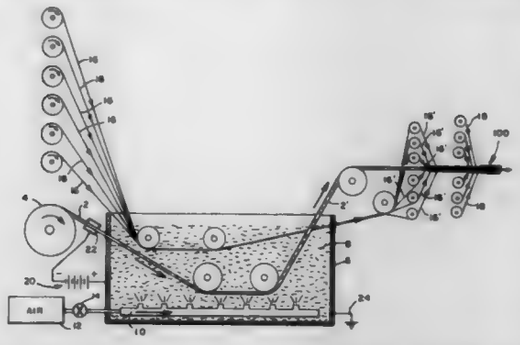
an electrical supply cord movably disposed in said slot in a direction parallel to the longitudinal axis of said cord, with movement of the cord in either longitudinal direction causing the first member to rotate relative to the second member to move the first surface relatively closer to the second surface to reduce the width of the slot so that the teeth of the first and second members grip the surface of the insulation of the cord to prevent further movement of the cord in the same longitudinal direction, tensile stress on said cord being transmitted from said first and second members to said rear wall of said housing.

5,471,014

INSULATED ELECTRICAL CONDUCTOR CONTAINING FREE-FLOWING MICA

Edward A. Green, 4419 State Rte. 82, Mantua, Ohio 44255

Filed Mar. 24, 1993, Ser. No. 36,170
Int. Cl.[6] H01B 7/00
U.S. Cl. 174—124 R 10 Claims



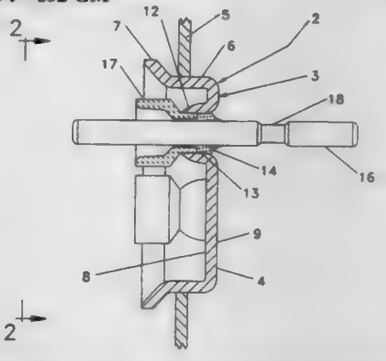
1. An electrical conductor insulated with at least one layer of fibrous material and having free-flowing mica devoid of binder disposed about the layer of fibrous material.

5,471,015

SEAL FOR HERMETIC TERMINAL ASSEMBLIES

F. Dieter Paterek, Hamilton, Ohio, and Richard L. Teaford, Campbell, Ky., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 26, 1992, Ser. No. 906,228
Int. Cl.[6] H01B 17/30
U.S. Cl. 174—152 GM 2 Claims



1. A hermetic terminal assembly housing wall comprising:

a wall defined aperture extending between opposed inner and outer faces of a portion of said housing wall;

a current conducting pin extending in spaced relation through said wall defined aperture from said outer face to said inner face of said wall defining aperture with a smaller preselected portion of said pin having a preselected smaller cross-sectional area to act as a fuse; and,

a sealing member surrounding and extending radially between the peripheral surface of said pin and said wall defined aperture to hermetically seal said current conducting pin in said aperture, said sealing member having a preselected coefficient of expansion compatible with the coefficient of expansion of said pin and said wall defining said aperture and a softening point temperature in excess of the conductive heat temperature adjacent the surrounded periphery surface area of the pin occasioned by melting of said fuse to avoid melting and venting through said sealing member, said sealing member being a glass having a preselected high temperature softening point in the range of approximately 685° to 825° C. comprised approximately by weight of 50–65% SiO_2, 1–5% B_2O_3, 8–15% Al_2O_3, 15–20% light metal oxides of the first metal group of the periodic chemical table and 15–20% light

metal oxides of the second metal group of the periodic chemical table having softening points of 750° to 825° C. with a coefficient of thermal expansion in the range of 87 to 94×10^{-7} in./in. °C. at temperatures ranging from 20° to 300° C.

5,471,016

APPARATUS HAVING AT LEAST ONE BATTERY SECURED TO A PRINTED CIRCUIT BOARD

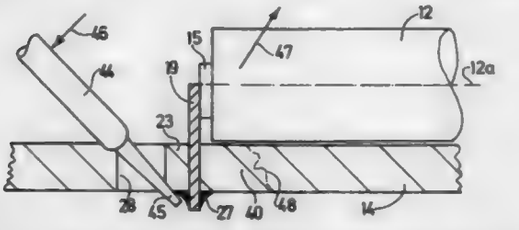
Erich Krainer, and Martin Sonnek, both of St. Veit and der Glan, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 18, 1994, Ser. No. 215,441

Claims priority, application Austria, Apr. 1, 1993, 673/93

Int. Cl.[6] A05K *1/00*

U.S. Cl. 174—254 **6 Claims**



1. An apparatus comprising a printed circuit board (**14**) and at least one battery (**12**, **13**) mounted on a surface of the printed circuit board (**14**), which said at least one battery is intended for powering the apparatus and has two terminals (**15**, **16**, **17**, **18**), provided on at least one surface of the said at least one battery (**12**, **13**), each terminal provided with a solder lug (**19**, **20**, **21**, **22**) which is fixedly connected to a mounting portion (**23**, **24**, **25**, **26**) of the printed circuit board (**14**) by means of a solder joint (**27**), which mounting portions (**23**, **24**, **25**, **26**), situated on a surface of the printed circuit board (**14**), can be severed from the remainder of the printed circuit board (**14**) to enable the said at least one battery (**13**, **14**) to be removed from the apparatus, characterized in that each mounting portion (**23**, **24**, **25**, **26**) of the printed circuit board (**14**) is surrounded by the remainder of the printed circuit board (**14**), and is partially separated therefrom by an opening (**28**, **29**, **30**, **31**) formed in the printed circuit board (**14**) between each mounting portion (**23**, **24**, **25**, **26**) and the remainder of the printed circuit board (**14**), which opening partly surrounds the relevant mounting portion (**23**, **24**, **25**, **26**) and which opening **28**, **29**, **30**, **31** has two ends opposing (**32**, **33**; **34**, **35**; **36**, **37**; **38**, **39**), and each mounting portion (**23**, **24**, **25**, **26**) is connected to the remainder of the printed circuit board (**14**) by a connecting portion (**40**, **41**, **42**, **43**) of the printed circuit board (**14**), which connecting portion is situated between the two ends (**32**, **33**, **34**, **35**, **36**, **37**, **38**) of each opening (**28**, **29**, **30**, **31**), which mounting portions (**23**, **24**, **25**, **26**), which are each situated within an opening (**28**, **29**, **30**, **31**), can each be severed from the remainder of the printed circuit board (**14**) substantially at the location of a connecting portion (**40**, **42**, **42**, **43**).

5,471,017

NO FIXTURE METHOD TO CURE DIE ATTACH FOR BONDING IC DIES TO SUBSTRATES

Linden T. Halstead, Temple, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 31, 1994, Ser. No. 250,977

Int. Cl.[6] F05K *1/00*

U.S. Cl. 174—260 **19 Claims**

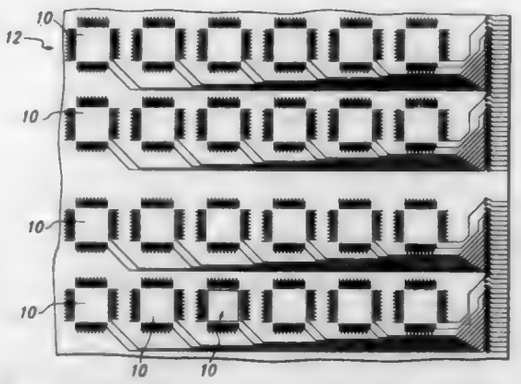
1. A product formed by the process of:

providing a substrate;

providing a die attach film;

coating both sides of said die attach film with a solvent to soften said die attach film;

placing said solvent coated die attach film on said substrate;



placing a semiconductor device on said solvent coated die attach film; and

allowing said solvent to dry.

5,471,018

AUDIO OR VIDEO APPARATUS WITH A BUILT-IN LOUDSPEAKER

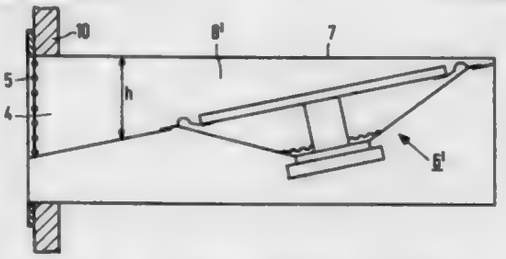
Joris A. M. Nieuwendijk; Johannes W. T. Bax, both of Eindhoven, Netherlands; Cornelis J. Oepkes, Singapore, Singapore; Henricus H. Roelofs, and Martinus P. M. Van Den Thillart, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 28, 1991, Ser. No. 662,045

Claims priority, application Netherlands, Mar. 13, 1990, 9000570

Int. Cl.[6] H05K *5/00*

U.S. Cl. 181—152 **15 Claims**



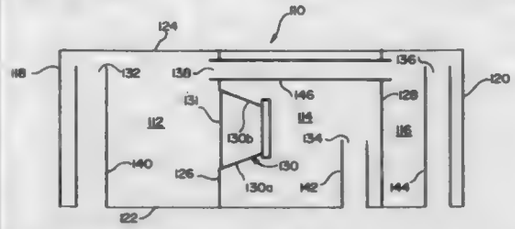
1. Audio or video apparatus comprising: a housing, a cone loud-speaker incorporated in the housing, wherein the housing accommodates an acoustic channel having one end opening into an aperture in a side of the housing, wherein the loud-speaker acoustically cooperates with the channel and a diaphragm of the loud-speaker forms a part of a wall of the acoustic channel, and the acoustic channel has a perpendicular cross-section which continuously increases viewed in the direction of the aperture in said side, characterized in that the length of the loud-speaker viewed in the longitudinal direction of the acoustic channel is greater than or equal to half the length of the acoustic channel, and in that the loud-speaker is arranged in the channel and the channel is shaped in a manner such that for a part of the loud-speaker diaphragm, the size of said part being greater than or equal to half the surface of the diaphragm, lines perpendicular to said part of the diaphragm surface, once they have been reflected by the channel surface one time, are not directed at said aperture, said lines forming equal angles of incidence and reflection to the channel surface, and wherein the part of the channel wall opposite the loud-speaker has a form which is accommodated to the form of the loud-speaker cone.

5,471,019

MULTIPLE CHAMBER LOUDSPEAKER SYSTEM

R. L. Maire, Missoula, Mont., assignor to Sounds Resources, Inc., Missoula, Mont.

Filed Dec. 29, 1994, Ser. No. 366,487
Int. Cl.[6] H05K 5/00
U.S. Cl. 181—156 10 Claims



1. A loudspeaker system comprising:

a) an enclosure means providing an interior having three acoustic chambers comprising a speaker housing and a first partition means and a second partition means, said first and second partition means subdividing said housing into a first acoustic chamber, a second acoustic chamber and a third acoustic chamber;

b) an electro-acoustical transducing means for converting an input electrical signal into a corresponding acoustic output signal, said transducing means being mounted by said first partition means so that said first and second chambers are in direct acoustic communication with said transducing means; and

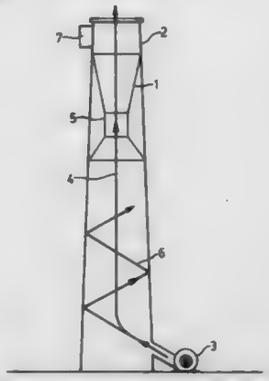
c) port tube means providing a first port acoustically communicating said first chamber to the ambient, a second port acoustically communicating said second chamber to the ambient, a third port acoustically communicating said third chamber to the ambient, and a fourth port acoustically communicating either said first chamber or said second chamber to said third chamber, so that said third chamber is acoustically separated from direct acoustic communication with said transducing means and only indirectly communicated with said transducing means by way of said fourth port, and so that said third chamber is only communicated with one of said first and second chambers.

5,471,020

MODAL SILENCER

John T. Kelsall, Oakville, and Theodorus A. Gerritsen, Burlington, both of, Canada, assignors to Hatch Associates Ltd., Mississauga, Canada

Filed Aug. 30, 1993, Ser. No. 112,967
Int. Cl.[6] E04F 17/04
U.S. Cl. 181—224 4 Claims



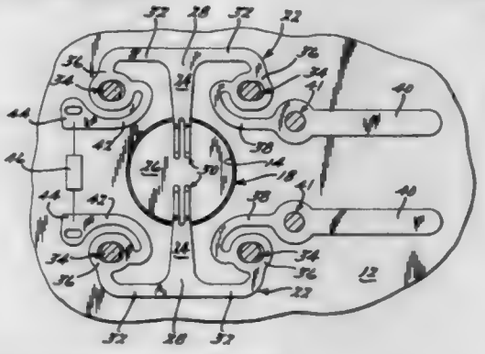
1. A method of reducing noise nuisance due to the emission of sound at a frequency in the range of 50 Hz–4000 Hz from a gas filled duct having a cross-sectional area with a cross-sectional dimension of at least 50 cm, comprising installing in the duct a modal silencer in the form of a venturi having a throat with a cross-sectional area less than 80% of that of the duct to reduce substantially the propagation through the duct of higher order modes of sound in said frequency range.

5,471,021

ACCELERATION SENSOR WITH LATERALLY-SUPPORTED BEAM CONTACTS

Michael W. Malesko, Ann Arbor, Mich., assignor to Automotive Systems Laboratory, Inc., Farmington Hills, Mich.

Filed Jul. 18, 1994, Ser. No. 276,450
Int. Cl.[6] H01H 35/14; 1/00
U.S. Cl. 200—61.45 R 6 Claims



1. In an acceleration sensor having:

a housing having an internal passage formed therein about a first axis;

a sensing mass within said passage, said sensing mass being movable along said first axis from a first position to a second position therein in response to application of an acceleration input to said housing along said first axis, said sensing mass having an electrically-conductive surface thereon; and

an elongate electrically-conductive beam contact having a supported end secured to said housing and a free end extending in a first direction into said passage such that the electrically-conductive surface on said sensing mass contacts the free end of said beam contact when said sensing mass moves to said second position,

the improvement wherein:

the supported end of said beam contact includes a pair of diametrical arms, each of the arms being secured to the housing only at an outboard end thereof, with the supported end of said beam contact not otherwise being secured to said housing intermediate the outboard ends of the arms.

5,471,022

PNEUMATIC ACUTATED SWITCH

Vince Kiss, Concord Township, and Matthew A. Davis, Mentor, both of Ohio, assignors to Tridelta Industries, Inc., Mentor, Ohio

Filed Sep. 2, 1994, Ser. No. 300,410
Int. Cl.[6] H01H 35/34
U.S. Cl. 200—83 B 25 Claims

1. A pressure switch comprising:

a housing having at least one pressure chamber,

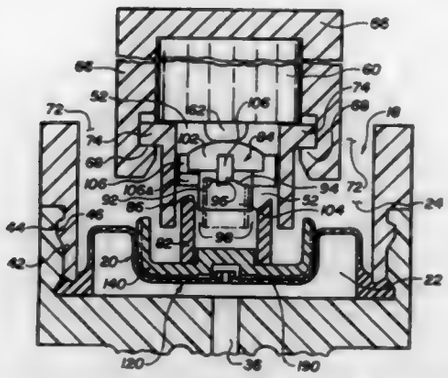
a flexible diaphragm within said housing adjacent said pressure chamber;

an electric switch mounted to said housing;

a pressure plate positioned against said diaphragm on the side of said diaphragm facing away from said pressure chamber, said pressure plate adapted to be moved by said diaphragm to actuate said switch in response to a pressure change in said pressure chamber, said pressure plate including:

a sealing surface facing said diaphragm and defining an open space between said plate and diaphragm,

a first vent passage communicating with said open space, and



a second vent passage communicating with said open space and with a pressure relief chamber, said vent passages and said open space defining a vent path when said diaphragm is in said neutral position, and

a port through said diaphragm communicating with said first vent passage, said port dimensioned to permit gradual rates of pressure change to vent along said vent path.

5,471,023

LIGHT ILLUMINATION MEMBRANE SWITCH WITH REDUCED SIZE AND IMPROVED LIGHT ILLUMINATION

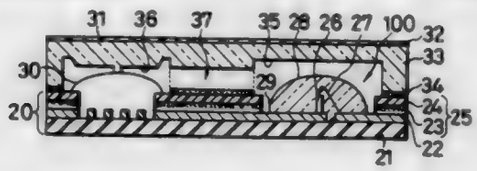
Masahiro Kaizu, and Atsuhiro Horii, both of Chiba, Japan, assignors to Fujikura Ltd., Tokyo, Japan

Filed Dec. 23, 1992, Ser. No. 995,896

Claims priority, application Japan, Jan. 22, 1992, 4-009508; Jan. 24, 1992, 4-011353; Feb. 10, 1992, 4-024150; Jun. 11, 1992, 4-152492

Int. Cl.[6] H01H *9/00*

U.S. Cl. 200—310 **4 Claims**



1. A light illumination membrane switch, comprising:

a flexible printed circuit board including an insulative base layer, electrode layer, adhesive layer, and polyimide film laminated in that order;

a bare LED element submerged within a space having the polyimide layer and the adhesive layer for walls, the bare LED element mounted directly on the electrode layer;

a bonding wire having an end attached to the bare LED element and having another end attached to the electrode layer;

a dam structure positioned on the electrode layer and surrounding the bare LED element for defining a lip of translucent diffuser resin; and

translucent diffuser resin deposited in the dam structure which entirely covers and is in contact with the bare LED element and the bonding wire.

5,471,824

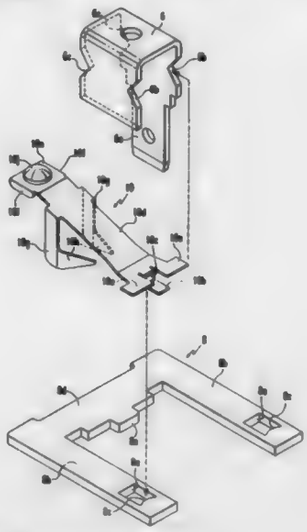
ELECTRIC SWITCH HAVING IMPROVED ATTACHMENT OF MOVABLE CONTACT TO CONTACT CARRIER

Michael E. Ross, Clayton; Robert A. Borsos, and Lawrence G. Corey, both of Smithfield, N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 12, 1994, Ser. No. 304,291

Int. Cl.[6] H01H *5/10*

U.S. Cl. 200—458 **19 Claims**



1. In an electric switch comprising

an insulating housing;

stationary contact means mounted in said housing;

electrically conductive terminal means mounted in said housing, said terminal means comprising two spaced bearing points;

a movable insulating member disposed in said housing;

switch operating means mounted to said housing for movement between extreme positions, said operating means being connected to said movable insulating member;

movable contact means disposed between said spaced bearing points and having fulcrum means extending in opposite directions in a primary plane of said movable contact means, said fulcrum means engaging said spaced bearing points for pivotally supporting said movable contact means on said terminal means, said movable contact means further having a flexible beam extending obliquely out of said primary plane, said beam having a movable contact element on a distal end thereof; and

attachment means for attaching said movable contact means to one side of said movable insulating member for substantially positive rotatable movement with said insulating member about said engaged fulcrum means and bearing points and for pivotal movement in said primary plane relative to said insulating member, said obliquely extending flexible beam overlying said insulating member and being spaced therefrom;

the improvement wherein said attachment means comprises:

convex surface means on said insulating member;

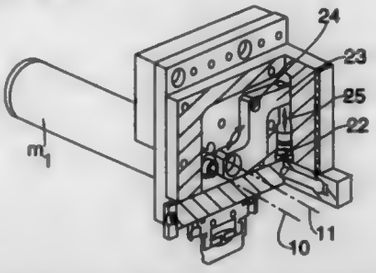
offset tab means on said movable contact means offset from said primary plane and extending along a side of said insulating member opposite said one side for holding said movable contact means to said insulating member; and

transition means between said movable contact means primary plane and said offset tab means providing substantially flat surface means normal to said primary plane abutting said convex surface means for permitting said pivotal movement of said movable contact means in said primary plane relative to said insulating member.

5,471,025
AUTOMATIC WIRE-THREADING DEVICE FOR ELECTROEROSION MACHINES

Jose M. Onandia, Eguzkitza, s/n., 48200 Durango-Vizcaya, Spain

Filed Mar. 4, 1994, Ser. No. 207,569
Int. Cl.[6] B23H 7/10
U.S. Cl. 219—69.12 5 Claims



1. Automatic wire-threading device for electroerosion machines having an upper head and a lower head and a wire that travels from the upper head to the lower head, characterized in that said device comprises a traction threading mechanism comprising:

a) a first free wheel and a second free wheel, each of the wheels having an inner traction surface and an outer loose surface;

b) a pivoting arm bearing the second wheel;

c) a fluid mechanical means for reversibly moving the pivoting arm and the second wheel from a first position to a second position in which the second wheel is in contact with the first wheel for dragging said wire;

d) a threading motor which, under threading conditions, drives the first and second wheels by a gear train;

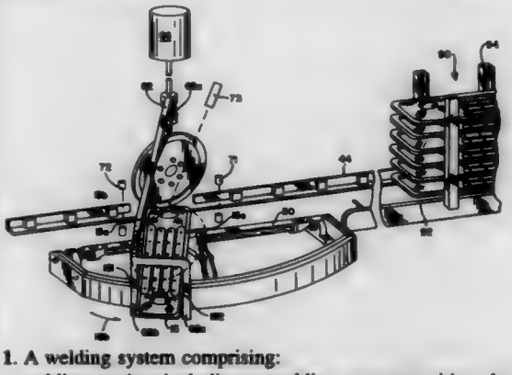
e) a cutting mechanism and a fine-jet guide water circuit;

f) a central processing unit controlling the pivoting arm, the threading motor, and the cutting mechanism.

5,471,026
CONTINUOUS RESISTANCE WELDING APPARATUS AND METHOD

Andrei N. Iliev, Chicago, Ill., assignor to Lakewood Engineering & Manufacturing Co., Chicago, Ill.

Filed Mar. 30, 1994, Ser. No. 219,944
Int. Cl.[6] B23K 11/06;11/087;11/093
U.S. Cl. 219—83 19 Claims



1. A welding system comprising:

a welding station including a welding means positioned at a weld position point for continuously welding along superimposed and aligned predetermined marginal portions of aligned superimposed workpiece sections and means for conveying these superimposed workpiece sections to be welded past said weld position point, said marginal portions of each workpiece section to be welded including at least a pair of straight marginal portions interconnected by at least one rounded corner;

guide apparatus including first guide wall means for guiding said straight superimposed marginal portions of the superimposed workpiece sections to be welded, sliding therealong and aligned with each other, along a straight predetermined longitudinally extending path of travel and into and through the weld position point and a workpiece-rotating tracking system for guiding the aligned rounded corners of the superimposed workpiece sections through said weld position point by rotating the superimposed sections so that the welding means welds said superimposed rounded corners together, said tracking system including an arm having an inner end located near said weld position point and pivoted about an axis extending through or near the center point of the superimposed aligned curved corners to be welded, and an outer end positioned for engaging the outer leading already welded edges of said first pair of straight marginal portions of the workpiece sections being welded, to cause the outer end of said arm to push against the same to rotate the workpiece sections inwardly about said axis so that said superimposed rounded corners are slidably pivoted against said first guide wall means near said weld position point where they are welded by said welding means, said outer end of said arm being bifurcated to produce a first portion adapted to engage the superimposed straight marginal portions of the superimposed workpieces as described, and a second portion which is located adjacent the opposite side of the superimposed workpiece sections to prevent overshoot of the superimposed workpiece sections upon termination of the welding of the first rounded corners to be welded of said superimposed workpiece sections;

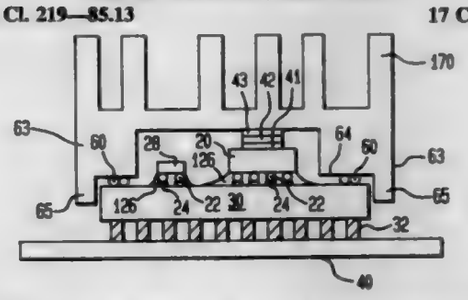
a sensing system including at least first sensing means responsive to the completion of a welding together of said first of said pair of straight marginal portions by generating a control signal; and

a controller means interactively connected with said workpiece-rotating tracking system and said first sensor means for initiating rotation of said pivoted arm to cause said arm to rotate inwardly about said pivot axis, to rotate the superimposed workpiece sections so that said rounded corners are moved past said weld position point, and for terminating rotation thereof by completion of the welding of the superimposed rounded corners, whereby the next straight marginal portions of the superimposed workpiece section can then be welded as they are guided by said guide wall means past said weld position point.

5,471,027
METHOD FOR FORMING CHIP CARRIER WITH A SINGLE PROTECTIVE ENCAPSULANT

Anson J. Call, Holmes; Stephen H. Meisner, Hudson; Frank L. Pompeo, Walden, and Jeffrey A. Zitz, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 22, 1994, Ser. No. 279,606
Int. Cl.[6] B23K 1/00; H01L 21/56
U.S. Cl. 219—85.13 17 Claims



1. A method for forming a chip carrier having a single encapsulant, comprising:

(a) electrically connecting at least one chip to a first surface of a substrate, and forming an electrical connection between said at least one chip and said substrate,

(b) applying an encapsulant precursor to at least a portion of said electrical connection and to at least a portion of said first surface of said substrate,

(c) heating said encapsulant precursor to a temperature of about 70° C., ±10° C., for a minimum of of about 5 minutes and a maximum of about 15 minutes, until said encapsulant precursor has transformed into a gel,

(d) heating said encapsulant gel for a minimum of about 1 hour and a maximum of about 2 hours, at a temperature of about 70° C., ±10 ° C.,

(e) hardening said encapsulant gel at a temperature of between about 130° C., ±10° C., and about 160° C., ±10° C., for a minimum of about 4 hours and a maximum of about 6 hours,

(f) cooling said hardened encapsulant until said hardened encapsulant has reached room temperature, and thereby forming said chip carrier having a single encapsulant.

5,471,028

RESISTANCE WELDING MACHINE

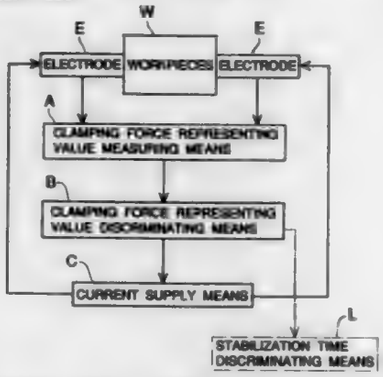
Shingo Kawai, Nagoya, Japan, assignor to NADEX Co., Ltd., Japan

Filed Aug. 26, 1994, Ser. No. 296,415

Claims priority, application Japan, Aug. 26, 1993, 5-211666

Int. Cl.[6] B23K *11/24*

U.S. Cl. 219—110 **8 Claims**



1. A resistance welding machine including a pair of electrodes between which workpieces are clamped and are welded by welding current supplied through the electrodes, said resistance welding machine comprising:

clamping force measuring means for measuring a clamping fore applied to the workpieces by the electrodes;

clamping force discriminating means responsive to the clamping force measured by said clamping force measuring means for determining whether the clamping force measured by said clamping force measuring means is fluctuating or is stabilized; and

current supply means for supplying the welding current to the electrodes when the clamping force discriminating means determines that the clamping force is stabilized.

5,471,029

WATER COOLED RESISTANCE WELDING ASSEMBLY

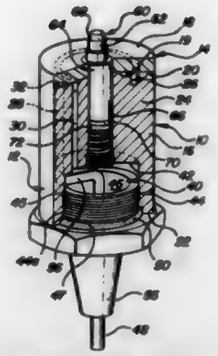
Michael S. Simmons, Greer, S.C., assignor to Tuffaloy Products, Inc., Greer, S.C.

Filed Jul. 22, 1994, Ser. No. 278,821

Int. Cl.[6] B23K *11/30*

U.S. Cl. 219—120 **13 Claims**

1. A welding electrode assembly for welding nuts or studs to sheet metal that includes an electrode with a flat outer surface and an inner portion seated in a housing having a cooling system for removing heat from the electrode characterized by: said electrode having a flat inboard surface; said housing having an annular passage at said inboard surface of said electrode; said housing



further including longitudinally directed inlet and outlet passages communicating with said annular passage at spaced locations thereon; a divider provided along said annular passage between said inlet and outlet passages for directing flow from said inlet passage to said outlet passage in one direction only along said annular passage for maintaining a continuous vortex flow across said flat inboard surface.

5,471,030

INTERNAL EQUIPMENT FOR ELECTRON BEAM BUTT WELDING OF TWO ANNULAR PARTS AND UTILIZATION OF SUCH EQUIPMENT

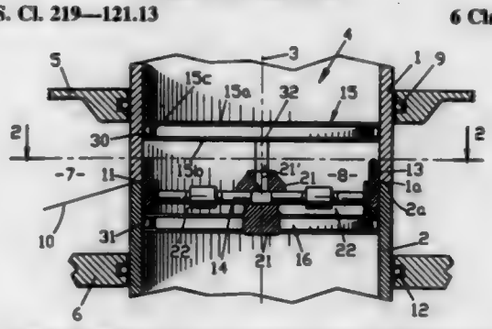
Gérard Boula, Meursault, France, assignor to Framatome, France

Filed May 12, 1994, Ser. No. 241,653

Claims priority, application France, May 12, 1993, 93 05726

Int. Cl.[6] B23K *15/04*

U.S. Cl. 219—121.13 **6 Claims**



1. Internal equipment for the electron beam welding from the outside of two annular parts disposed in an axial extension of each other and having axial ends brought into abutment against one another in a connection region, said equipment comprising, in combination:

(a) a metal ring having an outside diameter substantially equal to an inside diameter of said annular parts, said metal ring comprising a first part in the form of an incomplete annular element having a plurality of radially extending slots over a part of a width of said first part of said ring defining adjacent interconnected ring segments, two end surfaces between which said incomplete annular element defines a gap, and a key having an annular sector shape corresponding to a shape of said gap of said incomplete annular element; and

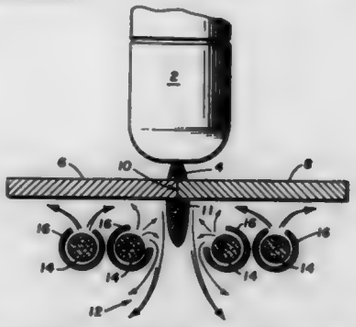
(b) a device for maintaining and thrusting said metal ring against inner surfaces of said annular parts in said connection region and comprising a central support part and a plurality of arms of adjustable length having a radiating disposition around said central part, each of said arms comprising a first end part fixed to said central part, a second end part, a ring support carried by said second end part and in the form of an annular sector having an outer surface which has a radius substantially equal to the radius of said inner surface of said ring, and means located between said two end parts for extending and retracting each of said arms.

5,471,031

CHAMBER FREE PLASMA WELDING ROOT SIDE PURGING METHOD AND APPARATUS

J. R. Dailey, Washington, D.C.; William F. McGee, Decatur, and Daniel J. Rybicki, Huntsville, both of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 29, 1993, Ser. No. 158,331
Int. Cl.[6] B23K *10/00*
U.S. Cl. 219—121.46 18 Claims



1. A chamber free root side inert gas purging apparatus for plasma arc welding of reactive base materials, comprising:

a plasma arc welding torch for providing plasma arc penetration welding of reactive materials;

porous medium means for supplying inert gas blanket to the root side of the penetration welding and welding seam, said porous medium means positioned substantially parallel to borders of the weld seam allowing unobstructed view of the root side of the weld seam;

means associated with said porous medium gas supply means and means for supporting same which allow for mobility and travel synchronously with the welding arc; and

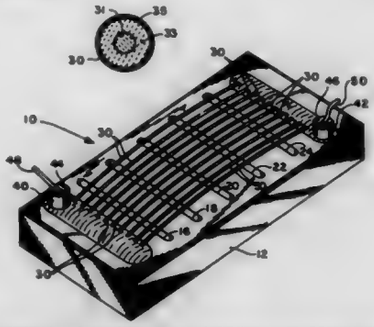
a continuous source of inert gas for use in blanketing the weld seam root side.

5,471,032

ELECTRICAL RESISTANCE IGNITOR WITH SPACED PARALLEL FILAMENTS BRAZED IN REFRACTORY BLOCK RECESSES

Gordon B. Spellman, Mequon, and C. Greg Chen, River Hills, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 30, 1993, Ser. No. 129,510
Int. Cl.[6] F23Q *7/22*
U.S. Cl. 219—270 3 Claims



1. The method of making an electrical resistance ignitor for gaseous fuel comprising:

(a) forming a pair of spaced recesses in a refractory base;

(b) disposing an array of relatively thin filaments coated with silicon carbide material with opposite ends thereof in said recesses;

(c) disposing a mixture of elemental silicon and chromium silicide ($CrSi_2$) in said recesses; and,

(d) heating said base, filaments, and mixture to a temperature of at least 1300° C. and melting said mixture and securing the ends of said filaments by weldment in said recesses; and,

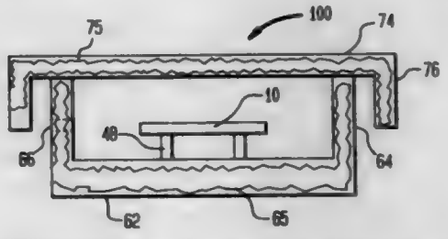
(e) providing terminal means and securing same in said weldment and brazing a connector to said .terminal means at a temperature substantially less than said 1300° C.

5,471,033

PROCESS AND APPARATUS FOR CONTAMINATION-FREE PROCESSING OF SEMICONDUCTOR PARTS

Nunzio DiPaolo, Poughkeepsie, and Daniel J. Ferguson, Marlboro, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 15, 1994, Ser. No. 227,937
Int. Cl.[6] F27B *9/06*
U.S. Cl. 219—388 12 Claims



1. A process for treating a part in a second environment wherein said part is protected from said second environment, comprising the steps of:

(a) placing said part on a part carrier in a first environment,

(b) placing a cover over said part carrier and enveloping said part to form a boat wherein at least one of said cover and said part carrier has embedded resistance heating means,

(c) removing said boat from said first environment, and

(d) placing said boat in said second environment for treating said part wherein said second environment has more contamination than said first environment.

5,471,034

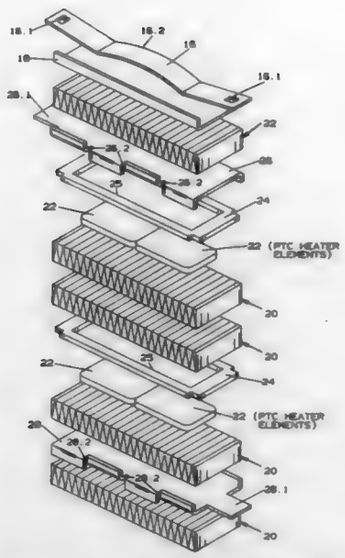
HEATER APPARATUS AND PROCESS FOR HEATING A FLUID STREAM WITH PTC HEATING ELEMENTS ELECTRICALLY CONNECTED IN SERIES

Keith W. Kawate, and Peter G. Berg, both of Attleboro Falls, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 17, 1993, Ser. No. 32,940
Int. Cl.[6] H05B *1/02*
U.S. Cl. 219—485 13 Claims

1. Heater apparatus for heating a fluid passing through said heater at a selected flow rate comprising first and second elongated frame members, the frame members each formed with a recess aligned with and facing one another and forming a flow passage having an inlet and outlet,

a plurality of pairs of electrically conductive heat transfer members having opposite distal end portions received in the respective recesses of the frame members, the heat transfer members each configured to define a plurality of fluid receiving passages communicating with the inlet and outlet of the flow passage, a plurality of standard self-regulating electrical resistance heater elements having opposed upper and lower electrically conductive surfaces, at least one heater element disposed between each pair of heat transfer members, with the upper and lower electrically conductive surfaces thereof in electrical engagement with respective heat transfer members of a pair and having thermally conductive grease placed between the heater elements and contiguous heat transfer members; and



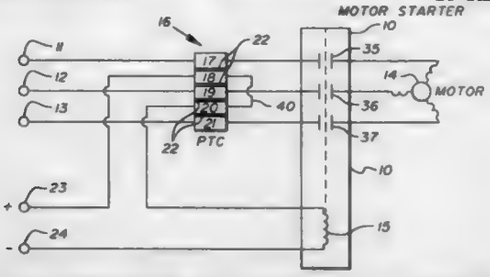
electrical terminals, connected to said heater elements, said heater elements electrically connected in series.

5,471,035

SANDWICH CONSTRUCTION FOR CURRENT LIMITING POSITIVE TEMPERATURE COEFFICIENT PROTECTIVE DEVICE

Francis A. Holmes, Hendersonville, N.C., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 22, 1993, Ser. No. 139,679
Int. Cl.[6] H05B *1/02*
U.S. Cl. 219—505 **16 Claims**



1. A protective device for a load having an energizable load actuator to activate the load, comprising;

at least one load current limiting positive temperature coefficient resistive element section coupled in series with a power source and a load, said load current limiting positive temperature coefficient resistive element section substantially increasing in resistance upon an increase in its internal temperature to above a threshold level;

an activating electrical power source;

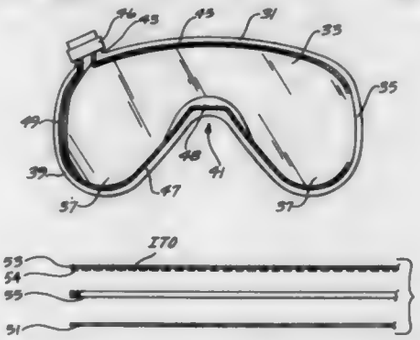
at least one actuator current limiting positive temperature coefficient resistive element section coupled in series with an energizable load actuator and actuating electrical power source, said at least one actuator current limiting positive temperature coefficient resistance element section substantially increasing in resistance upon an increase in its internal temperature to above a threshold level, said at least one load current limiting positive temperature coefficient resistive element section and said actuator current limiting positive temperature coefficient resistive element section placed in an abutting relationship such that increase in internal temperature of said at least one load current limiting positive temperature coefficient resistive element section to above the threshold value causes a related increase in internal temperature of said at least one actuator current limiting positive temperature coefficient resistive element section to above the threshold value thereby causing a substantial increase in resistance of said at least one actuator current limiting positive temperature coefficient resistive element section to substantially reduce current to said actuator to turn off the load.

5,471,036

GOGGLE DEFOGGING SYSTEM WITH TRANSPARENT INDIUM-TIN-OXIDE HEATING LAYER DISPOSED ON A LENS

Scott W. Sperbeck, 20007 - 45th Dr. SE., Bothell, Wash. 98012

Continuation-in-part of Ser. No. 189,958, Jan. 31, 1994, Pat. No. 5,354,966, which is a continuation-in-part of Ser. No. 801,278, Dec. 2, 1991, abandoned. This application Sep. 21, 1994, Ser. No. 310,151
Int. Cl.[6] A42B *1/08;* **H05B** *3/00*
U.S. Cl. 219—522 **18 Claims**



1. A goggle defogging system for a goggle including a frame and a lens housed in the frame, said lens including an inner layer and an outer layer held in a spaced-apart relationship, said frame and said lens including a nose region, said goggle defogging system comprising:

(a) an indium tin oxide (ITO) coating located on said inner layer of said lens, said ITO coating including an interior heating zone electrically isolated from the edge of said inner layer of said lens, said interior heating zone including the eye regions of said inner layer of said lens;

(b) a pair of bus bars located along opposing edges of said interior heating zones such that one bus bar lies near the upper edge of said inner layer of said lens and said other bus bar lies near the lower edge of said eye regions, said other bus bar being isolated from said interior heating zone in said nose region of said inner layer of said lens; and

(c) an electrical power supply coupled to said bus bars.

5,471,037

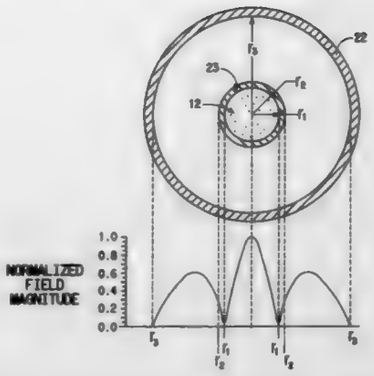
PROCESS FOR PREPARING POLYMERIC MATERIAL WITH MICROWAVE

Peter J. Goethel, Waynesboro, Va.; Richjard W. Lewis, Wilmington, Del., and Wilford J. Teerlink, Waynesboro, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 18, 1992, Ser. No. 931,742
Int. Cl.[6] H05B *6/78*
U.S. Cl. 219—750 **4 Claims**

1. An improved process for making a polymeric material which comprises mixing reactants, optionally in the presence of a solvent, to form a liquid reactant stream, heating the stream and providing sufficient reaction time to form the polymeric material, wherein the improvement comprises

rapidly heating the reactant stream in a microwave resonant cavity operating with microwave energy producing a TM_{0n0} mode with minimum heating at radial boundaries of the stream, and



continuing the reaction as the stream advances substantially in plug flow through an annular zone of a volume controlled to provide a total residence time from the time the reactant stream enters the microwave cavity until the time product is removed from the annular zone that is constant and independent of mass-flow.

5,471,038

SMART-DISKETTE READ/WRITE DEVICE HAVING FIXED HEAD

Raymund H. Eisele, Idstein, Germany, and Paul Barrett, Worcester Park, Great Britain, assignors to Smart-Diskette GmbH, Idstein, Germany

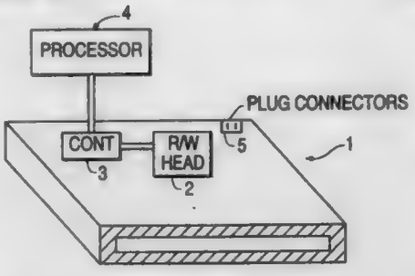
PCT No. PCT/EP92/02272, § 371 Date Apr. 6, 1994, § 102(e) Date Apr. 6, 1994, PCT Pub. No. WO93/07555, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 1, 1992, Ser. No. 211,488

Claims priority, application Germany, Jan. 8, 1991, 41 33 246.6

Int. Cl.[6] G06K *19/07*

U.S. Cl. 235—380 **11 Claims**



1. A data storage system comprising:

a data read/write device which can be incorporated in electronic data processing (EDP) devices with the external shape of a 88.9 mm (3½) inch diskette drive, which contains a read/write head and a controller, which transacts the protocol to write and read and is connected with a processor of the EDP device, and

a data carrier constructed as as smart-diskette in the shape and the dimensions of a 88.9 mm (3½ inch) diskette which can be inserted into the data read/write device, which data carrier therefore has electronic components, including controller, microprocessor and memory as well as a stationary magnetic transducer which is firmly connected with the data carrier,

wherein data transfers are carried out through and between the read/write head and the stationary magnetic transducer, and

wherein the data read/write device has no moving parts at all, i.e., there is no drive motor for a magnetic diskette present, and the read/write head is fastened stationarily in the data read/write device, so that data exchanges between the data read/write device and the data carrier constructed as a smart-diskette are carried out only through the read/write head and the stationary magnetic transducer with the data carrier microprocessor and memory.

5,471,039

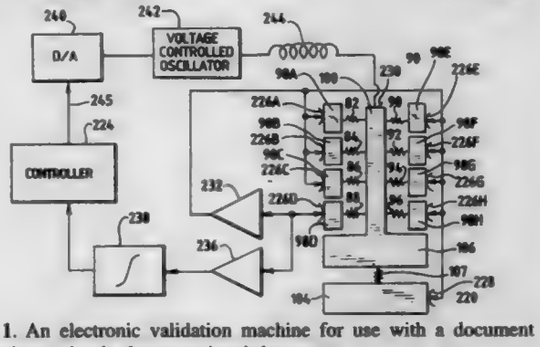
ELECTRONIC VALIDATION MACHINE FOR DOCUMENTS

Kenneth E. Irwin, Jr., Alpharetta, Ga.; Gary R. Streeter, Andover, Mass., and Steven J. Daigle, Sunset, La., assignors to Panda Eng. Inc., Alpharetta, Ga.

Filed Jun. 22, 1994, Ser. No. 263,890

Int. Cl.[6] G06K *7/06*

U.S. Cl. 235—441 **67 Claims**



1. An electronic validation machine for use with a document having a circuit element printed thereon:

document interface means for receiving the document;

coupling means for electronically coupling with the circuit element when the document is received by said document interface means; and

detection means operatively connected to said coupling means for generating a detection signal identifying the circuit element.

5,471,040

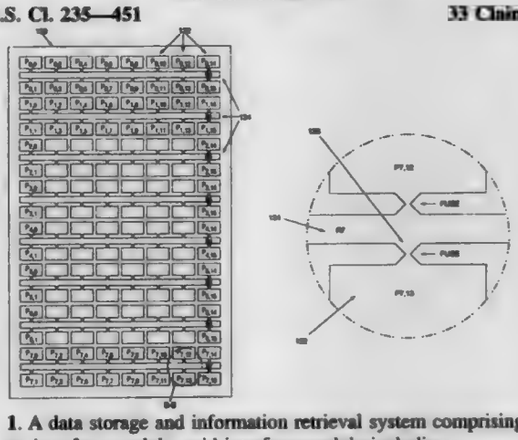
CAPACITIVE DATA CARD SYSTEM

George May, 5852 East Sooke Road, Sooke, B.C. Y0S 1N0, Canada

Filed Nov. 15, 1993, Ser. No. 148,611

Int. Cl.[6] G06K *7/08*

U.S. Cl. 235—451 **33 Claims**



1. A data storage and information retrieval system comprising:

an interface module, said interface module including;

a plurality of individually addressable primary interface electrodes;

at least one secondary interface electrode, said interface electrodes being arranged in a predetermined pattern;

a data card having changeable bits of information, said card including;

a plurality of primary card electrodes;

at least one secondary card electrode, said card electrodes being arranged in a predetermined pattern selected so that when the

card is placed next to the interface module, the interface electrodes will be in register with the card electrodes; and

a bridge formed between each primary card electrode and the secondary card electrode, said bridge having a resistance which can be either a first level or a second level, with the level of resistance being representative of a bit of information; and

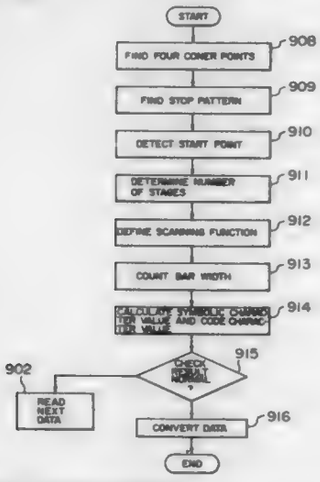
means located in said interface module for generating an alternating current output having two different voltage profiles, said output being applied to selectable interface electrodes in a manner to capacitively couple a current to the opposing card electrodes and wherein the level of resistance of a particular bridge on said card can be evaluated by measuring the amount of current which passes through the bridge when an output having a first voltage profile is applied to the interface electrodes and wherein the resistance of said bridge can be changed by applying an output having a second voltage profile to said interface electrodes and wherein the frequency of said second voltage profile is greater than the frequency of the first voltage profile.

5,471,041

BAR-CODE READER DEVICE

Katsushi Inoue, Kyoto; Seiichiro Tamai, Osaka; Keiichi Kobayashi, Higashiosaka, and Marie Dosho, Katano, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 16, 1993, Ser. No. 77,096
Claims priority, application Japan, Jun. 22, 1992, 4-161543
Int. Cl.[6] G06K *7/10*
U.S. Cl. 235—462 **2 Claims**



1. A bar-code reader comprising:

an image sensor for producing an output signal in response to light incident on said image sensor;

light emission means for projecting a light beam onto a bar code label, said bar code label having a bar code symbol, to effect a scanning across the bar code symbol;

light reception means for focusing a portion of the light beam which is reflected from the bar code label onto said image sensor;

signal processing means for processing the output signal of said image sensor to generate processed data;

memory means for storing said processed data provided by said signal processing means in a serial manner in synchronism with the scanning across the bar code symbol and for storing a two-dimensional array of pixels, having a start address, representing an image of said bar code symbol, said image of said bar code symbol having a plurality of edges including first edge which is closest to said start address;

extraction means for extracting said image of said bar code symbol from said memory means, said extraction means comprising (i) means for reading said two-dimensional array of pixels beginning at said start address to detect said first edge and (ii) means for tracing said edges beginning with said first edge and for detecting corner points of said image which are defined by said edges, whereby a location of said image of said bar code symbol in said two-dimensional array of pixels is determined; and

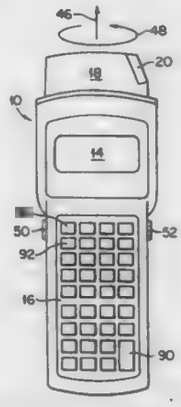
decoding means for decoding the image of the bar code symbol extracted by said extraction means, said decoding means comprising (i) means for detecting a start pattern and a stop pattern in said image, determining a shortest line between said start pattern and said stop pattern, and scanning said image along said shortest line to obtain a first scan result and (ii) stage counting means for determining a number of stages of said bar code symbol, wherein said stage counting means comprises means for scanning said image along a line extending diagonally across said image between two of said corner points to obtain a second scan result, comparing said first scan result to said second scan result and, if said first scan result and said second scan result agree, determining that said bar code symbol is a one-dimensional bar code symbol.

5,471,042

HANDHELD DATA ENTRY TERMINAL HAVING DUAL TRIGGER SWITCHES

David Kirkeby, Fullerton, Calif.; Boris Metlitsky, Stony Brook, N.Y.; Mark Krichever, Hauppauge, N.Y., and Jerome Swartz, Old Field, N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Continuation-in-part of Ser. No. 79,761, Jun. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 881,280, May 11, 1992, Pat. No. 5,306,900, which is a continuation-in-part of Ser. No. 193,265, May 11, 1988, Pat. No. 5,144,120.
This application Nov. 17, 1993, Ser. No. 153,443
Int. Cl.[6] G06K *7/10*
U.S. Cl. 235—472 **16 Claims**



1. A handheld data entry terminal comprising:

a housing;

a scanning head mounted to the housing for pivotal movement between at least first and second reading positions, the scanning head containing components, when actuated, for optically scanning an encoded symbol and for detecting light reflected from the encoded symbol while the scanning head is in either of the first and second reading positions;

first and second trigger switches mounted by the housing; and

conversion means selectively conditioned by a user for disabling the second trigger switch from actuating the scanning head components and enabling the first trigger switch to actuate the scanning head components when the scanning head is positioned in the first reading position and for disabling the first trigger switch from actuating the scanning head components and enabling the second trigger switch to actuate the scanning head components when the scanning head is positioned in the second position.

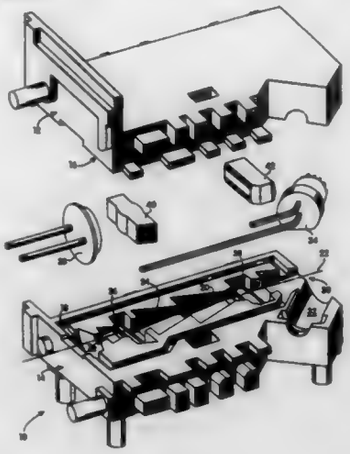
5,471,043
ELECTRO-OPTIC BARCODE READER

Herbert C. Knapp, Holliston; Vance A. Parker, Princeton; Larry K. Baxter, Marblehead, all of Mass., and Jon F. Evans, Litchfield, N.H., assignors to Kronos Incorporated, Waltham, Mass.

Continuation of Ser. No. 956,726, Oct. 2, 1992, Pat. No. 5,326,963. This application Apr. 15, 1994, Ser. No. 228,514

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—472 **15 Claims**



1. A barcode reader for reading barcodes having a plurality of interspaced marks of minimum standardized dimensions, comprising:

a housing having first a first channel with a longitudinal axis and having a second channel with a longitudinal axis, each of the first and second channels in open communication with a barcode reading region defined at a preselected location of said housing, wherein the channels are provided in said housing such that an intersection of the first and second longitudinal axis of the channels forms an angle less than 90 degrees;

a photo-detector having an active area, said photo-detector disposed in said housing such that the photo-detector active area is at least partially aligned along the longitudinal axis of the first channel;

a photo-emitter disposed in the second channel and in open communication with said barcode reading region;

at least one optical element having at least one curved surface, said at least one optical element disposed in the first channel of said housing to define a virtual optical window co-located at said barcode reading region, said at least one optical element having a field of view of a preselected shape selected to be no bigger than the minimum standardized dimension of the interspaced marks of the barcodes to be read and having a focal point originating at the active area of the photo-detector; and

a second optical element having at least one curved surface, said second optical element disposed a first predetermined distance from said at least one optical element with the curved surface of the second optical element orthogonally disposed with respect to the at least one curved surface of the at least one optical element and wherein said housing includes first and second mating housing portions that, when mated together, are in light-sealing relation.

5,471,044
INFORMATION RECORDING CARD, AND INFORMATION RECORDING AND RECOGNITION METHODS USING THE CARD

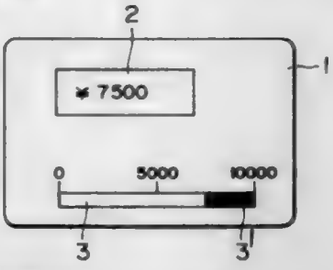
Yoshihiko Hotta, Mishima; Makoto Kawaguchi, Shizuoka, and Tetsuya Amano, Numazu, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 8, 1994, Ser. No. 194,348

Claims priority, application Japan, Feb. 8, 1993, 5-044514

Int. Cl.[6] G06K *19/00*

U.S. Cl. 235—487 **16 Claims**



1. A card comprising:

a reversible thermosensitive recording portion capable of recording information therein and deleting recorded information therefrom reversibly, wherein the information recorded in the reversible thermosensitive recording portion is visually displayed; and

an irreversible recording portion capable of recording information therein which cannot be deleted, the information recorded in the irreversible recording portion being substantially the same contents as the information recorded in the reversible recording portion and also being visually displayed;

wherein said reversible thermosensitive recording portion is capable of assuming at least two different states with respect to the color tone and/or transparency thereof.

5,471,045
SMART CARD LOCKING PROCESS

François Geronimi, Aix en Provence, France, assignor to Gemplus Card International, Gemenos, France

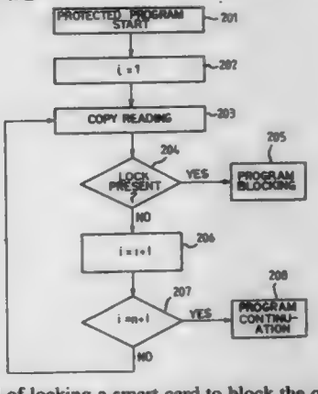
PCT No. PCT/FR92/00407, § 371 Date Mar. 28, 1994, § 102(e) Date Mar. 28, 1994, PCT Pub. No. WO92/20042, PCT Pub. Date Nov. 12, 1992

PCT Filed May 5, 1992, Ser. No. 140,114

Claims priority, application France, May 6, 1991, 91 05514

Int. Cl.[6] G06K *5/00*

U.S. Cl. 235—492 **5 Claims**



1. A method of locking a smart card to block the operation of at least one protected program stored in a read-only memory or ROM of the smart card, the smart card incorporating a central processor, the ROM, an erasable programmable read-only memory or EPROM and a random access memory or RAM, the method comprising the steps of: entering a logic lock in the EPROM, making multiple copies of the logic lock in the EPROM, carrying

out a logic OR on the logic lock in the EPROM and the multiple copies of the logic lock in the EPROM in order to block the performance of the protected program upon the detection of either (a) the logic lock in the EPROM or (b) at least one of the multiple copies of the logic lock in the EPROM, recopying the logic lock in the RAM, and performing the logic OR on the logic lock in the EPROM, the multiple copies of the logic lock in the EPROM, and the logic lock in the RAM.

5,471,046

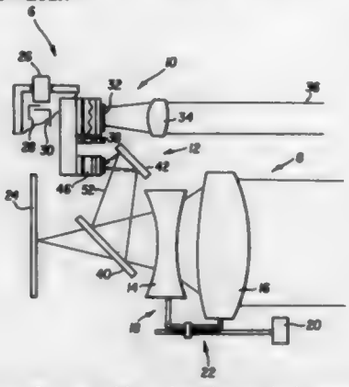
CAMERA AUTO-FOCUSING SYSTEM WITH DESIGNATOR USING A VOLUME HOLOGRAPHIC ELEMENT

Mark M. Meyers, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 25, 1994, Ser. No. 201,597

Int. Cl.[6] G03B *13/36*

U.S. Cl. 250—201.7 **27 Claims**



1. Apparatus for use with an imaging optical system having an adjustable focus; said apparatus comprising:

an opto-electronic transducer providing an electrical signal proportional to characteristics of radiation on said transducer;

a volume holographic optical element exposed to a broad wavelength spectrum of radiation, said volume holographic optical element filtering radiation from said broad wavelength spectrum primarily into a narrow wavelength spectrum and directing said narrow wavelength spectrum of radiation into a path centered on said transducer; and,

means responsive to the signal from said transducer for providing a focusing signal to the optical system.

5,471,047

MATRIX IMAGING METHOD AND SYSTEM USING A MATRIX DETECTOR WITH A PLURALITY OF SEQUENTIALLY ILLUMINATED DETECTOR ELEMENTS FOR MEASURING RADIATION OF SEPARATE PORTIONS OF A SCENE BEING VIEWED

Doron Even-Sturiesi, Timrat, and Micha Oron, Kiryat Yam, both of, Israel, assignors to State of Israel Ministry of Defense, Armament Development Authority Rafael, Haifa, Israel

Filed Jul. 30, 1993, Ser. No. 100,733

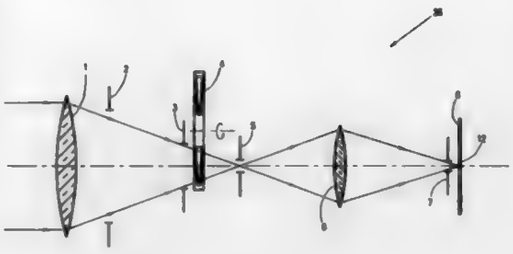
Claims priority, application Israel, Jul. 31, 1992, 102696

Int. Cl.[6] H01J *40/14*

U.S. Cl. 250—208.1 **48 Claims**

1. A method of viewing a scene with a detector comprising a matrix of detector elements, comprising the step of:

sequentially illuminating the matrix of elements for first and second time periods wherein each element views a separate portion of the scene during the first time period and each element is illuminated during the second time period by a light intensity level substantially equal to the average intensity of the scene.



5,471,048

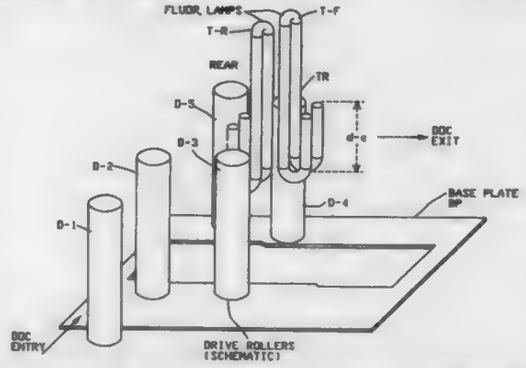
DOCUMENT IMAGING LAMPS WITH BENT DARK ENDS

Johan P. Bakker, West Bloomfield; Clive E. Catchpole, Birmingham; David B. Tratar, Dearborn, and John D. Vala, Plymouth, all of Mich., assignors to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 89,818, Jul. 12, 1993, Pat. No. 5,371,356, which is a division of Ser. No. 873,956, Apr. 27, 1992, Pat. No. 5,272,331. This application Sep. 12, 1994, Ser. No. 304,328

Int. Cl.[6] G01N *9/04*; H04N *1/21*

U.S. Cl. 250—208.1 **15 Claims**



1. A method, for a document-imaging camera, of illuminating a prescribed image-site past which documents are urged, and to direct document images along a prescribed image-path to image-sensor means; this method comprising providing one or more pairs of essentially-identical medial illumination lamp segments, with flanking darker portions, to illuminate said image site; disposing the segments symmetrically about the site so as to illuminate it; causing said images to be sent back between said lamp segments to the camera; and bending said lamp segments so as to hide said darker portions from said image-site behind a medial illumination segment.

5,471,049

LIGHT DETECTING APPARATUS HAVING LOW NOISE AUTOMATIC GAIN CONTROL CIRCUIT

Gary L. Cain, Springfield, Ohio, assignor to Apache Technologies, Inc., Dayton, Ohio

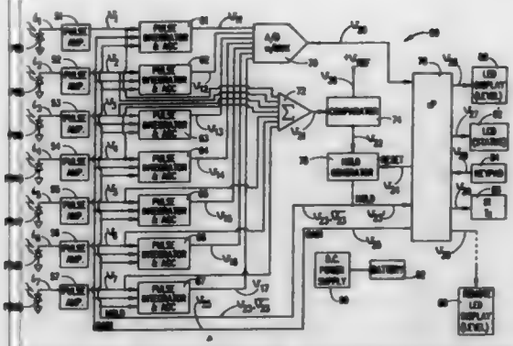
Continuation of Ser. No. 81,404, Jun. 22, 1993, Pat. No. 5,343,033. This application Aug. 25, 1994, Ser. No. 295,592

Int. Cl.[6] H01J *40/14*

U.S. Cl. 250—208.2 **6 Claims**

1. A light detecting circuit, comprising:

(a) a plurality of light-sensitive elements arranged in an array for detecting pulses of light energy striking said light detecting circuit, thereby creating a plurality of first electrical signals, wherein the magnitude of each of said plurality of first electrical signals is proportional to the power of light striking its corresponding light-sensitive element, each of the light-sensitive elements in said array having a known physical location with respect to one another, and each pair of adjacent



light-sensitive elements forming an individual gap of known distance between the respective proximal edges of said pair of adjacent light-sensitive elements;

(b) an amplifying and integrating circuit that amplifies and integrates each of said plurality of first electrical signals, thereby creating a plurality of second electrical signals, wherein the gain of said amplifying and integrating circuit is automatically controlled so as to keep said plurality of second electrical signals within the active dynamic range of said light detecting circuit, and wherein the peak magnitude of each of said plurality of second electrical signals is proportional to the power and to the duration time of light striking its corresponding light-sensitive element;

(c) a comparator device that determines which of said plurality of second electrical signals is greater in magnitude, said greater second electrical signal being indicative of the physical location that substantially the center of said light energy is striking said array of light-sensitive elements; and

(d) a display for indicating said actual physical location, in comparison to the desired physical location, that substantially the center of said light energy is striking said array of light-sensitive elements.

5,471,050

PHOTOELECTRIC CONVERSION METHOD AND APPARATUS THEREOF

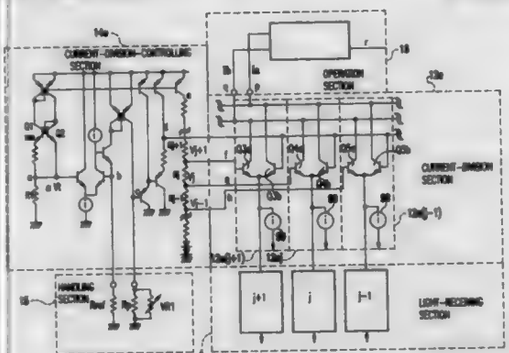
Ikuo Nishimoto, and Minoru Tanaka, both of Kanagawa, Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1993, Ser. No. 144,798

Claims priority, application Japan, Aug. 3, 1993, 5-192613; Aug. 3, 1993, 5-192614; Aug. 3, 1993, 5-192615; Aug. 3, 1993, 5-192617

Int. Cl.[6] H01J *40/14*; G01J *1/20*

U.S. Cl. 250—214 A **19 Claims**



1. The photoelectric conversion method comprising the steps of:

arranging n light-receiving elements in a predetermined direction, where n>2;

dividing each photoelectric current I1, I2, . . . , In of each of said light-receiving elements in predetermined ratios k1 to 1−k1, k2 to 1−k2, . . . , kn to 1−kn, respectively;

leading the divided photoelectric currents to a first and a second photoelectric current output terminal; and

controlling the predetermined ratios to satisfy relationships k1>0.5>kn and km≦kp, where p=m−1; m=2 to n.

5,471,051

PHOTOCATHODE CAPABLE OF DETECTING POSITION OF INCIDENT LIGHT IN ONE OR TWO DIMENSIONS, PHOTOTUBE, AND PHOTODETECTING APPARATUS CONTAINING SAME

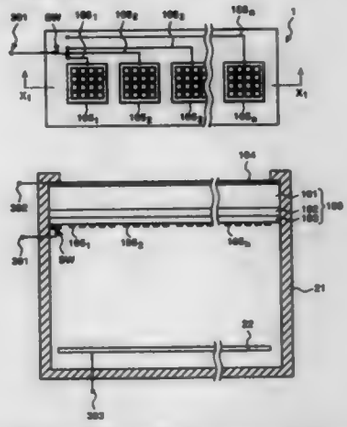
Minoru Niigaki; Katsuyuki Kinoshita; Teru Hirohata; Tuneo Ihara; Masami Yamada; Norio Asakura; Yasuharu Negi, and Tomoko Suzuki, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Jun. 1, 1994, Ser. No. 251,928

Claims priority, application Japan, Jun. 2, 1993, 5-132216

Int. Cl.[6] H01J *40/14*

U.S. Cl. 250—214 VT **26 Claims**



1. A photocathode for emitting electrons in response to light input thereto, said photocathode comprising:

a semiconductor layer having a first surface and a second surface facing said first surface, wherein the light is incident on said second surface and the electrons are emitted from said first surface;

a first pixel electrode, being a single unitary solid member and having a plurality of openings therein, said first pixel electrode being in contact with said first surface of said semiconductor layer;

a first wire electrically connected to said first pixel electrode;

a second pixel electrode, also being a single unitary solid member, having a plurality of openings therein, said second pixel electrode being in contact with said first surface of said semiconductor layer, said second pixel electrode being physically isolated from said first pixel electrode;

a second wire electrically connected to said second pixel electrode; and

a second surface electrode contacting said second surface of said semiconductor.

5,471,052

COLOR SENSOR SYSTEM USING A SECONDARY LIGHT RECEIVER

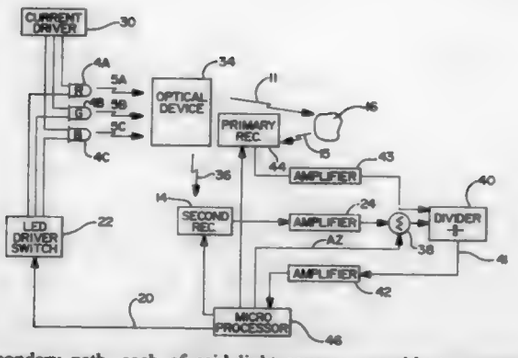
Lawrence J. Ryczek, Oconomowoc, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 25, 1993, Ser. No. 140,837

Int. Cl.[6] H01J *5/16;40/14*

U.S. Cl. 250—226 **18 Claims**

1. A photoelectric color sensor comprising: at least two light sources disposed in a fixed array directed toward an optical transmission device having a primary path for transmitting light from said light sources to an object whose color is to be measured and a



secondary path, each of said light sources operable to generate emitted light having a limited characteristic range of chromaticity differing from the characterization range of chromaticity of each other light source;

a primary photosensitive receiver positioned to receive said emitted light reflected from an object whose color is to be measured;

a secondary photosensitive receiver positioned to receive a portion of said emitted light transmitted from said light sources through said secondary path; said secondary photosensitive receiver generating an output signal representing the level of said emitted light;

a control circuit connected between said secondary photosensitive receiver and said light sources for controlling the light energy emitted by said light sources, said control conduit having a level comparator electrically connected to said secondary photosensitive receiver for comparing said output signal to a reference level and controlling a current driver for powering said light sources to produce a level of emitted light according to said reference level

logic means in circuit with said light sources and said primary photosensitive receiver operative to sequentially energize said light sources and to receive resultant sample signals from said primary photosensitive receiver in response to each said light source energization, said logic means being further operative to generate a resultant signal as a function of said sample signals, to compare said resultant signal with a predetermined reference standard and generate a condition output signal when the difference between said resultant signal and reference standard exceeds a tolerance limit, wherein said reference standard has been established during an earlier test mode operation of said logic means in which a standard color mode operation of said logic means in which sensing region and sequentially illuminated by said light sources, said reference standard and said resultant signal comprising a respective single signal for each said characteristic range of chromaticity.

5,471,053

LIGHT COLLECTOR

Bruce A. Diner, Chadds Ford, Pa.; Steven Gutteridge, Wilmington, Del.; Gary L. Peterson, Tucson, Ariz., and William E. Wolf, Chesapeake City, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 24, 1994, Ser. No. 264,890

Int. Cl.[6] G01J *1/00;1/42*

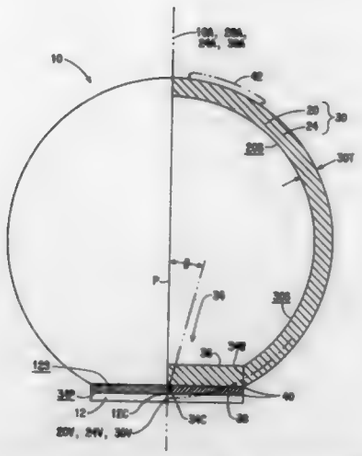
U.S. Cl. 250—228 **17 Claims**

1. A light collector for use with a photodetector having a photosensitive surface, the photosensitive surface of the photodetector having a geometric center, the photodetector having a predetermined output response that is functionally related to the polar angle of incidence of light thereon,

the light collector comprising:

a generally spheroidally-shaped light direction changer having a light diffusing surface; and

a generally spheroidally-shaped polar attenuator,



the generally spheroidally-shaped light direction changer having an axis of revolution and having a vertex lying on the axis of revolution,

the geometric center of the photosensitive surface of the photodetector being adjacent to the vertex of the generally spheroidally-shaped light direction changer,

the light direction changer and the polar attenuator cooperating to collect light over a predetermined polar angular range and to direct collected light toward a photodetector,

so that, when associated with the light collector, the photodetector generates a uniform output response over the polar angular range regardless of the polar angle of incidence of light upon the collector.

5,471,054

ENCODER FOR PROVIDING CALIBRATED MEASUREMENT CAPABILITY OF ROTATION OR LINEAR MOVEMENT OF AN OBJECT, LABEL MEDIUM AND AN OPTICAL IDENTIFICATION SYSTEM

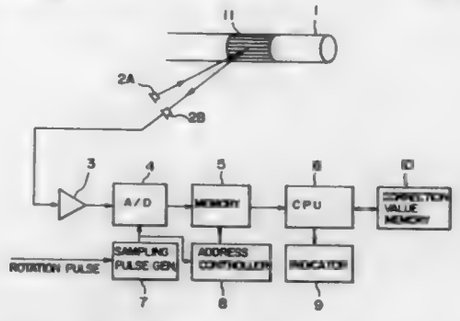
Asao Watanabe, Kawasaki, Japan, assignor to NF. T&M. Systems, Inc., Kawasaki, Japan

Filed Sep. 25, 1992, Ser. No. 951,221

Claims priority, application Japan, Sep. 30, 1991, 3-276329; Jan. 9, 1991, 3-290855

Int. Cl.[6] G01D *5/34*

U.S. Cl. 250—231.13 **15 Claims**



1. An encoder comprising:

a scale to be attached to a rotating object to be measured by way of a mounting member, said scale having a regular arrangement of portions with different optical or magnetic response;

detection means to detect the difference in response of said scale;

measurement means to measure position information of rotating movement of said object to be measured based on the change in time in the response detected by said detection means;

memory means for storing the position information of said scale when said object to be measured is rotated by a known amount; and

calibration means for calibrating the measured position information based upon the stored position information of said scale in said memory means,

wherein said mounting member comprises a first mounting portion adapted to partially surround the rotating object and a second mounting portion adapted to partially surround the rotating object, said first mounting portion having a coupler portion and said second mounting portion having a corresponding mating portion for receiving said coupler portion, thereby securely engaging the first and second mounting portions to one another in surrounding engagement with the rotating object.

5,471,055

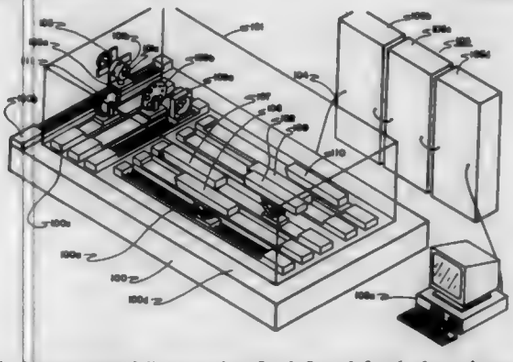
FOCAL PLANE ARRAY TEST FACILITY

Christopher R. Costanzo, Stafford; David R. Kaplan, Burke, and Khoa V. Dang, Annandale, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 28, 1993, Ser. No. 68,341

Int. Cl.[6] G01D *18/00*

U.S. Cl. 250—252.1 **8 Claims**



1. An automated "test station for infrared focal plane detector arrays comprising:

a stable optical bench platform;

a housing member mounted on said platform covering a central portion only of the top of said platform, the remaining edge portion of said top forming an outer support shelf for detector mounting modules;

at least a first aperture in said housing having a door the top of which is pivotally attached to said housing to close said aperture automatically when not in use;

a plurality of infrared source modules in said housing, each including a source to project a different infrared image along a first optical axis through said aperture in response to a set of computer test source signals;

at least one detector mounting module positioned on said support shelf whereby each said detector mounting module forms a test pair with each source module, each said detector mounting module further including,

a planar end transparent to far infrared adjacent said housing member and normal to said first optical axis;

a first socket means mounted in said detector mounting module electrically interfacing and supporting a planar personality circuit board parallel to said planar end;

said personality circuit board including,

a plurality of electrodes,

a second socket means electrically bonded to said plurality of electrodes to mate with a focal plane infrared detector array to be tested, said second socket means and said array being oriented parallel to said planar end, and

means for periodically sampling and temporarily storing the electrical responses of said array to infrared light from said sources in response to a set of computer sampling signals;

a terminal board carrying a plurality of coaxial connectors mounted on said detector mounting module opposite said planar end, more than half of said connectors being electrically coupled to said first socket means;

a temperature control means located in said detector mounting module to maintain the temperature therein constant at a temperature within the operating temperature range of said array;

remote controlled positioning and angular orientation means mounted on said platform and supporting at least one module of a pair including one source module and one detector mounting module for changing the relative position and orientation between various parts of said pair in response to a set of computer positioning signals;

a memory means for permanently storing data related to said electrical responses sampled by said personality circuit board in response to a set of computer storing signals;

a monitor means to display said data in response to a set of computer displaying signals; and

a computer-controller means electrically intercoupled with said personality circuit board, said sources, said memory means, said monitor means and said positioning and angular orientation means for generating sets of precise bias voltages and clocked signals which constitute said test source, positioning, sampling, displaying and storing signals and for processing said data to determine the operating characteristics of said array.

5,471,056

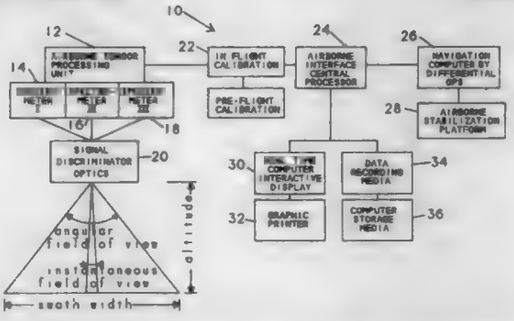
AIRBORNE SCANNER IMAGE SPECTROMETER

Alfredo E. Prelat, Missouri City, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 950,519, Sep. 25, 1992, abandoned. This application May 23, 1994, Ser. No. 247,421

Int. Cl.[6] G01J *3/50*

U.S. Cl. 250—253 **3 Claims**



1. An airborne reconnaissance system capable of acquiring contiguous co-registered image data from 0.4 to 2.5 microns in wavelength and from 8–12 microns in wavelength, comprising:

a plurality of electromagnetic energy sensor arrays;

means for receiving and processing data from said sensor arrays;

calibration means for substantially continuously calibrating said system;

platform means adapted to be mounted in an aircraft for carrying said system therein;

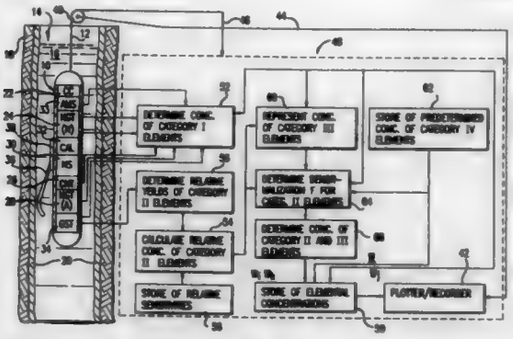
means for determining relative flight characteristics of said platform means including the pitch, roll and yaw axes of an aircraft carrying said platform means; and

central processing means for receiving data from said means to receive and process data from said sensor arrays, said means for determining relative flight characteristics and said calibration means to determine electromagnetic spectral image data characteristics for an area being surveyed.

5,471,057
METHOD AND APPARATUS FOR DETERMINING ELEMENTAL CONCENTRATIONS FOR γ RAY SPECTROSCOPY TOOLS

Susan L. Herron, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, Ridgefield, Conn.

Filed Sep. 9, 1994, Ser. No. 303,903
Int. Cl.[6] G01V *5/10*
U.S. Cl. 250—269.6 **23 Claims**



1. A method for determining the elemental concentrations in a formation surrounding a borehole, comprising:

a) positioning a tool in the borehole adjacent to a formation to be investigated

b) irradiating the formation with neutrons from the tool;

c) detecting γ rays resulting from neutron capture by the elements in the formation so as to obtain a spectrum;

d) determining the contribution of each element in the formation to the spectrum;

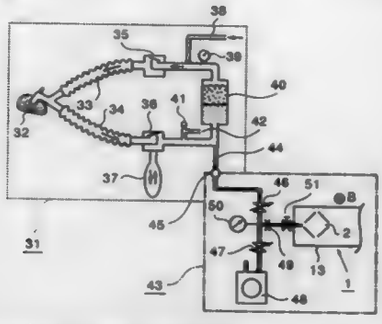
e) determining a factor for modifying the contribution of iron to the spectrum γ ray yields to compensate for a lack of aluminum measurement; and

f) using the spectrum and the factor to determine elemental concentrations in the formation.

5,471,058
ANESTHESIA MONITOR

Kazuo Nakagawa; Yuichi Iritani; Hiromi Yamazaki, and Yasushi Takakuwa, all of Tokyo, Japan, assignors to Nikkiso Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1993, Ser. No. 9,798
Claims priority, application Japan, Jan. 27, 1992, 4-011916
Int. Cl.[6] B01D *59/44*
U.S. Cl. 250—291 **12 Claims**



1. An anesthesia monitor comprising:

a pair of permanent magnets having a gap therebetween and a steady state magnetic field in said gap;

a measurement cell having pair of receiving electrodes, a pair of irradiation electrodes and a vacuum chamber exposed to said pairs of receiving and irradiation electrodes, the measurement cell being disposed in said gap and exposed to said steady state magnetic field;

a temperature bath associated with said pair permanent magnets to keep constant the temperature of the permanent magnets and maintain constant the steady state magnetic field;

means for introducing a gas sample including a first component and an anesthetic component into the measurement cell vacuum chamber;

an ion source to ionize said introduced gas sample components in said measurement cell;

means for applying a high frequency voltage to the irradiation electrodes after ionization of said introduced gas components to cause a cyclotron resonance of said ions in said vacuum chamber;

means for making a detection and amplification of a high frequency signal voltage caused by said resonance at said receiving electrodes;

means for converting said detected and amplified signal into a digital signal;

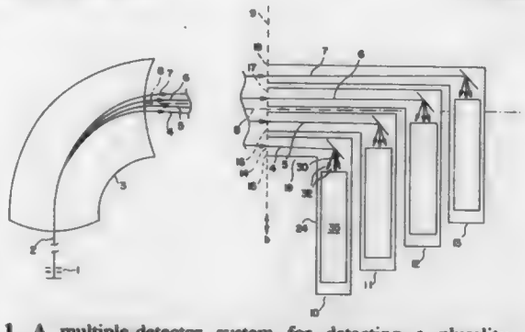
means for storing said digital signals in a memory;

means for executing a Fourier transformation process on said stored digital signals to obtain a mass spectrum of said introduced gas sample to perform a separation and a determination of each component of said introduced gas sample.

5,471,059
MULTIPLE-DETECTOR SYSTEM FOR DETECING CHARGED PARTICLES

Philip A. Freedman, Hartford, and Edward F. H. Hall, Winsford, both of, England, assignors to Fisons PLC, Ipswich, England

Continuation of Ser. No. 194,928, Feb. 14, 1994, abandoned. This application Dec. 16, 1994, Ser. No. 358,231
Claims priority, application United Kingdom, Feb. 12, 1993, 9302886
Int. Cl.[6] H01J *49/30*
U.S. Cl. 250—299 **11 Claims**



1. A multiple-detector system for detecting a plurality of charged-particle beams in an analytical device, said detector system comprising at least one group of charged particle detector assemblies;

wherein each of said detector assemblies comprises a first arm and a second arm extending at an angle to said first arm, said first arm having a member at one end thereof defining an entrance aperture, said second arm having a detector therein;

wherein said detector assemblies are arranged such that said entrance apertures lie substantially on a first plane which intersects the paths of said charged-particle beams, one or more of said detector assemblies being positioned so that a selected charged-particle beam passes through said entrance aperture of a selected detector assembly into said first arm of said selected assembly;

each said detector assembly further comprising a secondary-emissive element positioned to intersect the path of a said charged particle beam which enters said detector assembly through said entrance aperture, said secondary emissive element emitting secondary particles in response to said charged particle beam incident upon it, such that at least some of said secondary particles pass into said second arm of said detector assembly to be detected by said detector.

5,471,060

PYROELECTRIC INFRARED RADIATION DETECTOR AND METHOD OF PRODUCING THE SAME

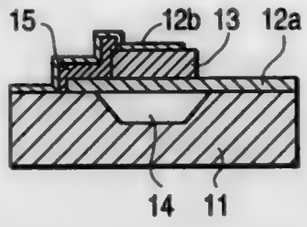
Koji Nomura; Tutomu Nakanishi; Tokumi Kotani, all of Osaka, and Keizaburo Kuramasu, Tsuzuki, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 30, 1994, Ser. No. 220,450

Claims priority, application Japan, Aug. 23, 1993, 5-207660; Aug. 23, 1993, 5-207661; Aug. 23, 1993, 5-207662; Aug. 23, 1993, 5-207663

Int. Cl.[6] G01J 5/02

U.S. Cl. 250—338.3 12 Claims



1. A pyroelectric infrared radiation detector comprising:

a substrate made of a (100) magnesium oxide single crystal material;

an infrared radiation detecting structure comprising a first electrode disposed on the substrate, a pyroelectric thin film disposed on the first electrode, and a second electrode disposed on the pyroelectric thin film for absorption of infrared radiation; and

said substrate having a recess provided in the upper surface thereof where the infrared radiation detecting structure is seated.

5,471,061

METHOD AND APPARATUS FOR TRANSMISSION MEASUREMENTS TO FORM A 2-D OR A 3-D IMAGE IN TOMOGRAPHY APPLICATIONS

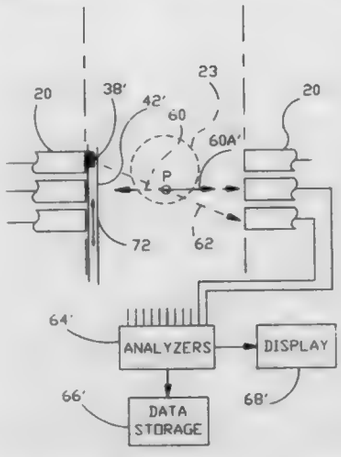
J. Clifton Moyers, Oak Ridge; Ronald Nutt, and William F. Jones, both of Knoxville, all of Tenn., assignors to CTI Pet Systems, Inc., Knoxville, Tenn.

Filed Mar. 21, 1994, Ser. No. 210,960

The portion of the term of this patent subsequent to Mar. 22, 2011, has been disclaimed.

Int. Cl.[6] G01T 1/161

U.S. Cl. 259—363.03 37 Claims



1. A method for forming multi-dimensional attenuation correction data of radiation transmission through an object positioned in a tomograph device, said device having radiation detectors defining a plurality of faces of said radiation detectors, said method comprising:

positioning a selected point source of radioactive radiation proximate each of said radiation detectors in a selected sequence using a selected transporting device, said radioactive radiation being directed through the object and received by said radiation detectors of said tomograph device; and

processing signals received from outputs of said detectors of said tomograph device to determine transmission data of radiation from said source of radiation during passage of said radiation through the object for forming said attenuation correction data.

5,471,062

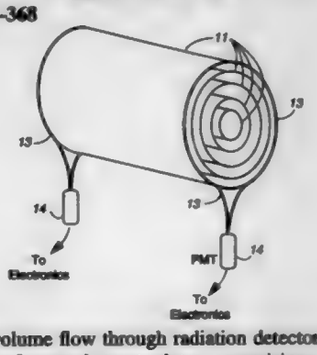
LARGE VOLUME FLOW-THROUGH SCINTILLATING DETECTOR

Russ E. Gritzo, and Malcolm M. Fowler, both of Los Alamos, N.M., assignors to The Regents of the University of California, Oakland, Calif.

Filed Mar. 21, 1994, Ser. No. 217,394

Int. Cl.[6] G01T 1/20

U.S. Cl. 250—368 8 Claims



1. A large volume flow through radiation detector comprising:

a plurality of spaced apart plates comprising a scintillating material;

a plurality of photomultiplier tubes, two or more of said plurality of photomultiplier tubes associated with each of said plurality of flat plates;

a plurality of light guide means connected between said plurality of flat plates and said plurality of photomultiplier tubes for conducting light generated in said flat plates due to said radiation entering said plurality of flat plates to said plurality of photomultiplier tubes.

5,471,063

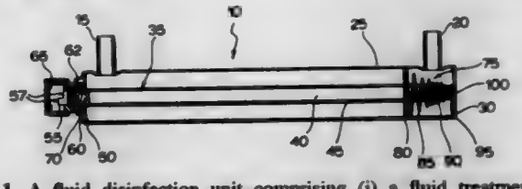
FLUID DISINFECTION SYSTEM

Stewart J. Hayes; Richard Pearcey, and Philip T. White, all of London, Canada, assignors to Trojan Technologies, Inc., Canada

Filed Jan. 13, 1994, Ser. No. 181,107

Int. Cl.[6] C02F 1/32

U.S. Cl. 250—436 20 Claims



1. A fluid disinfection unit comprising (i) a fluid treatment housing, (ii) an electrical supply module, and (iii) electrical connection means connecting the fluid treatment housing and the electrical supply module;

(i) the fluid treatment housing comprising a fluid inlet and a fluid outlet in communication with a reaction chamber, an ultravio-

let radiation lamp disposed in the reaction chamber and having a first electrical connection means at a first end of said lamp, said lamp being surrounded by a sleeve, an end of the sleeve distal the first end of said lamp having a closed end and being received and held in place by a spring having a first diameter less than diameter of said sleeve, and a second diameter greater than a diameter of said sleeve;

(ii) the electrical supply module comprising ballast means and a second electrical connection means; and

(iii) the electrical connection means comprising lamp connector means for removable connection to said first electrical connection means, and ballast connector means for connection to said second electrical connection means.

5,471,064

PRECISION MACHINING METHOD, PRECISION MACHINING APPARATUS AND DATA STORAGE APPARATUS USING THE SAME

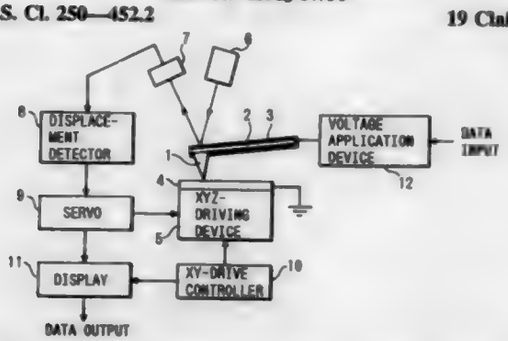
Hajime Koyanagi, Koshigaya; Sumio Hosaka, Hinodemachi, and Ryo Imura, Tokorozawa, all of, Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 14, 1993, Ser. No. 120,541

Claims priority, application Japan, Sep. 14, 1992, 4-244508

Int. Cl.[6] H01J *37/30*

U.S. Cl. 250—452.2 **19 Claims**



8. Apparatus for machining a surface of a medium consisting of a layer of electrically insulative material carried on an electrically conductive member, said apparatus comprising:

a scanning probe microscope having a probe with a pointed tip projecting therefrom, said tip having an electrically conductive surface layer applied to a surface thereof;

a voltage source coupled to apply voltage between said tip and said electrically conductive member, so as to cause field evaporation of atoms in at least one of said electrically conductive surface layer of said tip and said electrically insulative material of said medium, whereby atoms are transferred to or from said medium; and

an xyz-drive coupled to move said tip in close proximity to said surface.

5,471,065

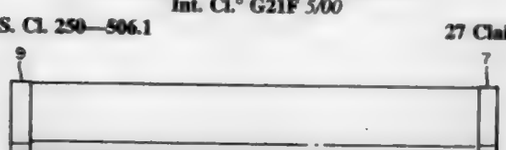
MACROENCAPSULATION OF HAZARDOUS WASTE

James L. Harrell, 216 Gunn St., Montgonery, Ala. 36124, and James S. Hotard, Jr., 6628 Orleans Ave., New Orleans, La. 70128

Filed Jan. 27, 1994, Ser. No. 186,911

Int. Cl.[6] G21F *5/00*

U.S. Cl. 250—506.1 **27 Claims**



1. A method of encapsulating hazardous waste material, said method including the steps of:

providing a high density polyethylene unit having a first open end and a second open end;

positioning said hazardous waste material within said unit by heating said end cap at a lip area, heating an outer edge of the containment unit to a near melting point, reheating the outer edge of the containment unit and the end cap lip area again and pressing the end cap and the containment unit together to form an integral seal and,

butt fusing a second sealing end cap on said second open end to encapsulate said hazardous material within said unit.

5,471,066

DEFECT INSPECTION APPARATUS OF ROTARY TYPE

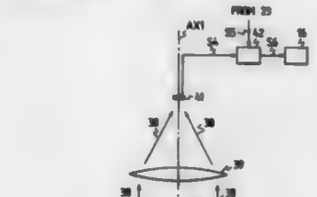
Tsuneyuki Hagiwara, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Aug. 24, 1994, Ser. No. 294,990

Claims priority, application Japan, Aug. 26, 1993, 5-211245; Sep. 13, 1993, 5-226866

Int. Cl.[6] G01N *21/88*

U.S. Cl. 250—559.48 **8 Claims**



1. A defect inspection apparatus for detecting defects on a surface of a substrate with a predetermined pattern formed thereon comprising:

illuminating means for emitting light flux for inspection to a predetermined inspection area on the surface of said substrate;

a Fourier transform optical device for performing Fourier transform of the light flux reflected from said substrate, an optical axis of said Fourier transform optical device intersecting a direction of the specular light of the light flux reflected from the surface of said substrate;

a spatial filter disposed in the vicinity of a Fourier transform plane caused by said Fourier transform optical device, portions of said spatial filter coinciding with bright portions of a Fourier transform pattern of a nonerroneous reference pattern obtained by forming said circuit pattern on said substrate so as to have no defect being made to be a light-shielding portion;

photoelectric converting means for converting light flux passed through said spatial filter photoelectrically;

a turn table for rotating said substrate centered on a shaft parallel to the optical axis of said Fourier transform optical device;

filter rotating means for rotating said spatial filter centered on a predetermined shaft in synchronism with rotation of said turn table; and

shifting means for shifting said substrate in a plane perpendicular to the optical axis of said Fourier transform optical device,

wherein said surface of said substrate is scanned in said predetermined inspection area spirally by rotating and shifting said substrate by said turn table and said shifting means respectively, said spatial filter is rotated by said filter rotating means in synchronism with rotation of said substrate, and defects of

said predetermined pattern on said substrate are detected by a photoelectric conversion signal output from said photoelectric converting means.

5,471,067

SEMICONDUCTOR METAL CONTACTING STRUCTURE AND A LIGHT EMITTING DEVICE

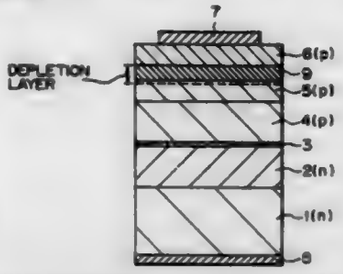
Mamo Ikeda; Satoshi Ito; Yoshino Iochi; Takao Miyajima; Masafumi Ozawa; Katsuhiro Akimoto; Akira Ishibashi, and Futoshi Hiei, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 18, 1993, Ser. No. 78,837

Claims priority, application Japan, Jun. 19, 1992, 4-185821; Apr. 21, 1993, 5-117678; Apr. 28, 1993, 5-125521

Int. Cl.[6] H01L *27/14;31/00*

U.S. Cl. 257—14 **12 Claims**



1. A semiconductor metal contacting structure comprising:

a first p-type compound semiconductor layer;

a second p-type compound semiconductor layer on said first p-type compound semiconductor layer;

a contacting metal on said second p-type compound semiconductor layer;

a multiquantum well layer in a depletion layer produced between said first p-type compound semiconductor layer and said second p-type compound semiconductor layer, said multiquantum well layer having a plurality of quantum wells and a plurality of barriers, at least one of said quantum wells and said barriers having different thicknesses.

5,471,068

SEMICONDUCTOR PHOTODETECTOR USING AVALANCHE MULTIPLICATION AND STRAINED LAYERS

Masayoshi Tsuji, and Kikuo Makita, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Continuation of Ser. No. 856,499, Mar. 24, 1992, abandoned. This application Feb. 28, 1994, Ser. No. 203,869

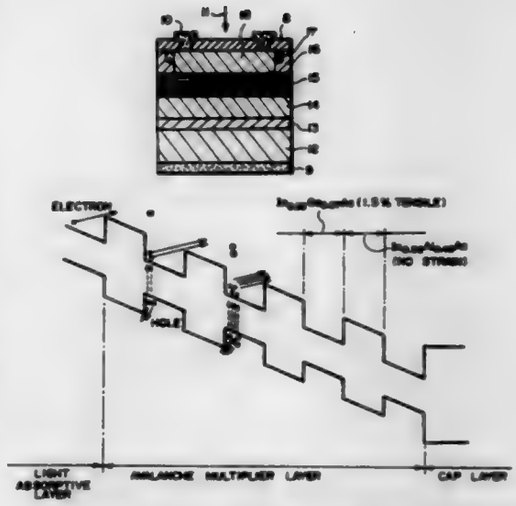
Claims priority, application Japan, Mar. 28, 1991, 3-064267; Jun. 21, 1991, 3-149123; Jun. 21, 1991, 3-149124; Jul. 3, 1991, 3-163457

Int. Cl.[6] H01L *31/075;31/0304*

U.S. Cl. 257—21 **15 Claims**

1. A semiconductor photodetector comprising at least a light absorptive layer and a superlattice avalanche multiplier layer on a semiconductor substrate, electrons generated at said light absorptive layer being injected to said superlattice avalanche multiplier layer under reverse bias, said superlattice avalanche multiplier layer comprising a first semiconductor layer and a second semiconductor layer, the second layer having a lattice structure which matches the lattice structure of the substrate to produce a minimal strain, and wherein EA>EC and EB<ED where the mean ionizing energies of group III atoms and group V atoms of said first semiconductor layer are EA and EB, respectively, and the mean ionizing energies of group III atoms and group V atoms of said second semiconductor layer are EC and ED, respectively,

a discontinuity of energy of the lower end of a conduction band being present at all the boundaries of said first and second



semiconductor layers, first values of said discontinuity for all the boundaries being substantially equal, and

the first semiconductor layer having a tensile strain and the second semiconductor layer having substantially no strain so that an effective mass of a hole within said first semiconductor layer, which travels in a direction of layer thickness, is made lighter than an effective mass of a hole in a material identical in composition to said first semiconductor layer when under no strain.

5,471,069

SUPERCONDUCTING DEVICE HAVING AN EXTREMELY SHORT SUPERCONDUCTING CHANNEL FORMED OF EXTREMELY THIN OXIDE SUPERCONDUCTOR FILM

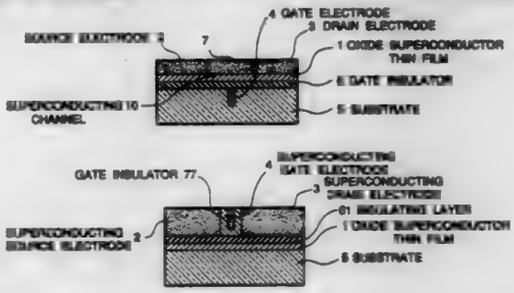
Takao Nakamura; Hiroshi Inada, and Michitomo Iiyama, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 785,324, Oct. 31, 1991, abandoned. This application May 13, 1994, Ser. No. 242,074

Claims priority, application Japan, Jan. 31, 1990, 2-294287; Jan. 31, 1990, 2-294288; Jan. 31, 1990, 2-294289

Int. Cl.[6] H01L *39/22;* **H01B** *12/00;* **B05D** *5/12*

U.S. Cl. 257—39 **14 Claims**



1. A superconducting device comprising:

a substrate,

an oxide superconductor thin film deposited on a deposition surface of said substrate, said superconductor thin film defining a superconducting channel therein;

a source electrode and a drain electrode formed on said oxide superconductor thin film at opposite ends of said superconducting channel, so that a superconducting current can flow through said superconducting channel between said source electrode and said drain electrode, and a gate electrode formed on a gate insulator layer on said superconducting channel so as to control superconducting current flow through said superconducting channel, said gate electrode being pro-

vided by a thin film which has been formed perpendicular with respect to said gate insulator layer whereby, in a direction of current flow through said superconducting channel between said source and drain electrodes, said gate electrode having a gate length of no more than 100 nm.

5,471,070

THIN-FILM TRANSISTOR CIRCUIT HAVING AN AMORPHOUS SILICON LOAD AND A DRIVER TRANSISTOR AND A METHOD OF PRODUCING THE SAME

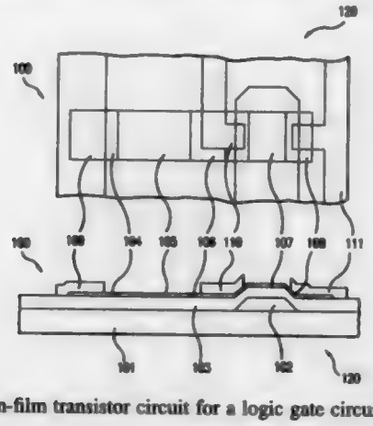
Yoshinori Shimada, Yamatokoriyama; Naofumi Kondo, Nara; Takehisa Sakurai, Kusatsu; Yoshiharu Kataoka, Suita; Manabu Takahama, Tenri, and Mikio Katayama, Ikomo, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 142,238, Oct. 25, 1993, abandoned. This application Feb. 13, 1995, Ser. No. 387,361

Claims priority, application Japan, Jan. 30, 1992, 4-293526

Int. Cl.[6] H01L *27/02;29/78*

U.S. Cl. 257—57 **10 Claims**



1. A thin-film transistor circuit for a logic gate circuit, comprising:

a continuous amorphous silicon layer substantially having a uniform thickness;

a driver transistor having a source region, a drain region, a channel region, and a gate electrode, said source, drain, and channel regions being formed in said continuous amorphous silicon layer; and

a load device formed in said continuous amorphous silicon layer and made of n^- amorphous silicon, said load device being directly connected to said source region of said driver transistor, wherein said n^- amorphous silicon is doped with an n^- type impurity at a lower concentration than that of said source and drain regions.

5,471,071

SEMICONDUCTOR STATIC RANDOM ACCESS MEMORY STRUCTURE

Ikuo Yoshihara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 656,596, Feb. 19, 1991, Pat. No. 5,350,933. This application Sep. 22, 1994, Ser. No. 310,628

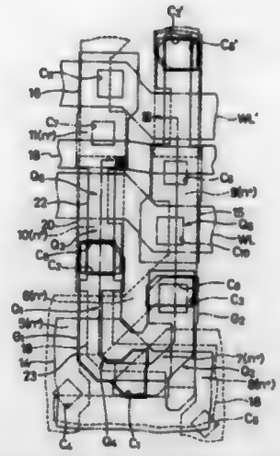
Claims priority, application Japan, Feb. 21, 1990, 2-040666; Jan. 26, 1990, 2-290162

Int. Cl.[6] H01L *29/10*

U.S. Cl. 257—69 **1 Claim**

1. A semiconductor memory comprising a memory cell having a flip-flop circuit consisting of a pair of driver transistors of a first conductivity type channel and a pair of load transistors of a second conductivity type channel, and a pair of access transistors,

wherein said pair of load transistors of the second conductivity type channel are formed by semiconductor thin films and gate



electrodes of said pair of load transistors of the second conductivity type channel are formed by semiconductor thin films of the second conductivity type and further wherein a dimension in length of the gate electrodes of said pair of load transistors is larger than a dimension in width of the gate electrodes of said pair of load transistors,

a dimension in width of the gate electrodes of said pair of driver transistors is larger than a dimension in length of the gate electrodes of said pair of driver transistors, and

the lengths of the gate electrodes of said pair of load transistors extend perpendicular to the lengths of the gate electrodes of said pair of driver transistors.

5,471,072

PLATINUM AND PLATINUM SILICIDE CONTACTS ON β-SILICON CARBIDE

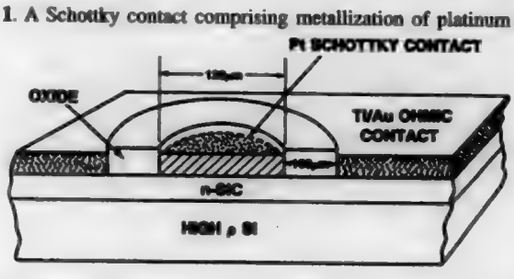
Nicolas A. Papanicolaou, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 920,738, Jul. 28, 1992, Pat. No. 5,270,252, which is a division of Ser. No. 262,400, Oct. 25, 1988, abandoned. This application Dec. 13, 1993, Ser. No. 165,617

Int. Cl.[6] H01L *29/48*

U.S. Cl. 257—77 **9 Claims**

1. A Schottky contact comprising metallization of platinum on



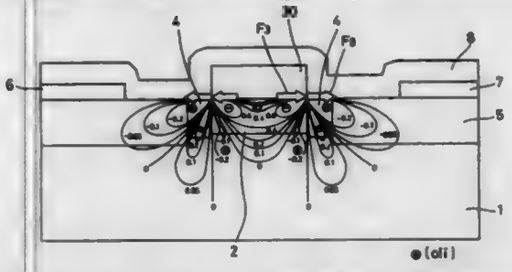
n-type β-silicon carbide, and an interfacial layer including PtSi, said Schottky contact being stable to catastrophic degradation of rectifying characteristics at temperatures up to 800° C.

5,471,073
FIELD EFFECT TRANSISTOR AND METHOD FOR PRODUCING THE FIELD EFFECT TRANSISTOR

Yasutaka Kohno, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1993, Ser. No. 114,369
Claims priority, application Japan, Jan. 29, 1993, 5-13687
Int. Cl.[6] H01L 29/48;21/265
U.S. Cl. 257—108 13 Claims

1. A field effect transistor including a compound semiconductor



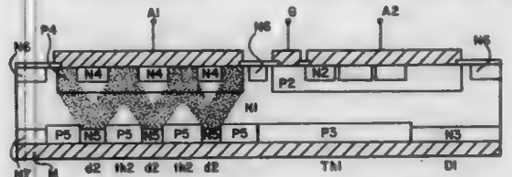
substrate having a surface, an active region in said substrate adjacent the surface, a Schottky gate electrode disposed on the surface at the active region, first side wall films disposed on and contacting opposite sides of said gate electrode, second side wall films disposed on and contacting opposite sides of respective first side wall films, and source and drain electrodes disposed on the surface spaced from and on opposite site sides of said gate electrode wherein positive piezoelectric charges are produced in said substrate proximate the surface between said gate electrode and said source and drain electrodes by a first stress comprising a first stress component within said gate electrode and a second stress component applied by said first side wall films, the first and second stress components acting in the same direction, and a second stress comprising a third stress component applied by said first side wall films and a fourth stress component applied by said second side wall films, the second stress acting in the direction opposite to the first stress.

5,471,074
A.C. SWITCH TRIGGERED AT A PREDETERMINED HALF-PERIOD

Robert Pezzani, Vouvray, France, assignor to SGS-Thomson Microelectronics S.A., Saint-Genis, France

Filed Mar. 17, 1993, Ser. No. 32,680
Claims priority, application France, Mar. 20, 1992, 92 03763
Int. Cl.[6] H01L 29/74
U.S. Cl. 257—121 6 Claims

1. An alternating current switch including first and second input



terminals and a gate terminal, the switch comprising:

a first thyristor having an anode, a cathode and the gate terminal, the cathode of the first thyristor being coupled to the second terminal;

a first diode, having an anode and a cathode, disposed in parallel with the first thyristor, the anode of the first diode connected to the cathode of the first thyristor and the cathode of the first diode connected to the anode of the first diode;

a second thyristor, having an anode and a cathode, the anode of the second thyristor being connected to the anode of the first thyristor and the cathode of the first thyristor being connected to the first input terminal; and

a second diode, having an anode and a cathode, disposed in parallel with the second thyristor, the anode of the second diode connected to the cathode of the second thyristor and the cathode of the second diode connected to the anode of the second thyristor;

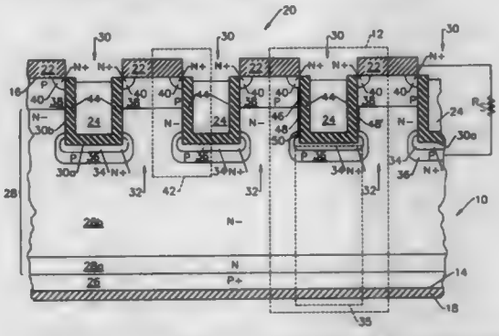
wherein the second thyristor and the second diode are vertically disposed in a common substrate with a conductive path of the second thyristor being intimately coupled to a conductive path of the second diode such that a polarity inversion on the first and second terminals following a conduction period of the second diode causes the second thyristor to become conductive.

5,471,075
DUAL-CHANNEL EMITTER SWITCHED THYRISTOR WITH TRENCH GATE

Mallikarjunaswamy S. Shekar, Santa Clara, Calif.; B. Jayant Baliga, Raleigh, N.C., and Jacek Korec, Mörfelden-Walldorf, Germany, assignors to North Carolina State University, Raleigh, N.C.

Filed May 26, 1994, Ser. No. 249,898
Int. Cl.[6] H01L 29/74;31/111
U.S. Cl. 257—139 17 Claims

1. A semiconductor switching device comprising:



a semiconductor substrate having first and second opposing faces;

a first base region of first conductivity type in said substrate;

an anode region of second conductivity type in said substrate, between said first base region and said first face;

a trench in said substrate at said second face, said trench having a trench sidewall extending adjacent said first base region and a trench bottom;

a floating emitter region of first conductivity type at the bottom of said trench;

a second base region of second conductivity type surrounding said floating emitter region at the bottom of said trench and forming a P-N junction therewith and a P-N junction with said first base region;

a third base region of second conductivity type in said substrate, between said first base region and said second face, said third base region extending adjacent the trench sidewall and forming a P-N junction with said first base region;

a cathode region of first conductivity type in said third base region, said cathode region extending adjacent the trench sidewall;

a cathode contact on the second face, electrically connected to said cathode region, said second base region and said third base region;

an anode contact on the first face, electrically connected to said anode region; and

insulated-gate transistor means, in said substrate, for electrically connecting said cathode region to said first base region in response to a turn-on bias signal, said insulated-gate transistor means comprising a dual-channel field effect transistor having active regions in said first, second and third base regions, a gate electrode in said trench and a gate insulating layer lining said trench so that the trench sidewall defines an interface

between said gate insulating layer and said first base region and an interface between said gate insulating layer and said third base region.

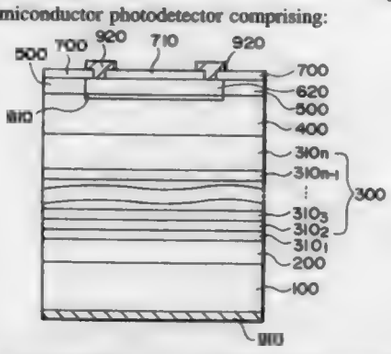
5,471,076

SEMICONDUCTOR LIGHT-RECEIVING DEVICE WITH GRADED LAYER

Tadayoshi Murakami, and Hideo Takahashi, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Jul. 14, 1994, Ser. No. 274,830
Int. Cl.[6] H01L *27/14*
U.S. Cl. 257—184 **10 Claims**

1. A semiconductor photodetector comprising:



a substrate consisting of a compound semiconductor crystal having a first conductivity type;

a first electrode formed on a first surface of said substrate;

a graded layer having stacked mixed crystal sublayers sequentially epitaxially grown on a second surface of said substrate and consisting of at least two types of compound semiconductors having the first conductivity type and a different composition ratio;

a light-absorbing layer epitaxially grown on a surface of said graded layer and having a lattice constant smaller than that of an uppermost mixed crystal sublayer of said graded layer;

a first conductive layer having a second conductivity type and formed by diffusing an impurity near a first region of a surface of said light-absorbing layer from said first region toward said graded layer;

a second conductive layer formed on a surface of said first conductive layer, having a lattice constant substantially similar to but not equal to that of said uppermost layer of said graded layer, and having the second conductivity type;

a capping layer, formed on said surface of said light-absorbing layer next to said second conductive layer, having a lattice constant substantially similar to but not equal to that of said uppermost layer of said graded layer, and consisting of a compound semiconductor mixed crystal having the first conductivity type; and

a second electrode formed on a surface of said second conductive layer.

5,471,077

HIGH ELECTRON MOBILITY TRANSISTOR AND METHODE OF MAKING

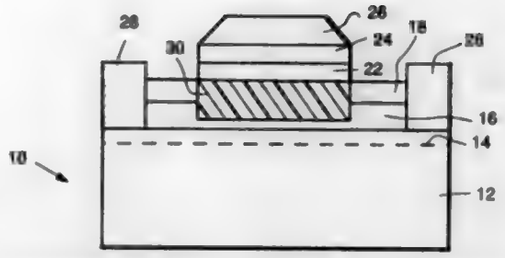
Marko Sokolich, Los Angeles, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 10, 1991, Ser. No. 774,503
Int. Cl.[6] H01L *29/161;29/205;29/48;29/56*
U.S. Cl. 257—192 **4 Claims**

1. A high electron mobility transistor (HEMT), comprising:

a current carrying active layer formed of an epitaxial layer of gallium arsenide (GaAs) on a semi-insulating substrate, the active layer including source and drain regions;

a gate layer of aluminum gallium arsenide (AlGaAs) on the active layer;



a Schottky barrier layer on the gate layer, the Schottky barrier layer being formed of a metal alloy comprising platinum gallium (PtGa) and platinum arsenide (PtAs);

a diffusion barrier layer of titanium nitride (TiN) on the Schottky barrier; and

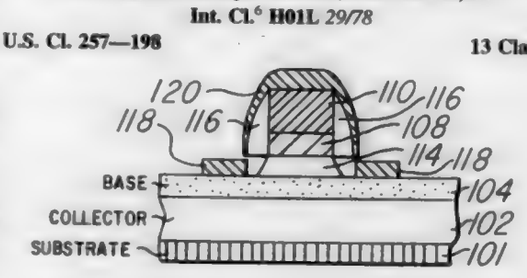
ohmic contacts formed on the gate, source and drain regions.

5,471,078

SELF-ALIGNED HETEROJUNCTION BIPOLAR TRANSISTOR

Burhan Bayraktaroglu, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 942,474, Sep. 9, 1992, Pat. No. 5,344,786.
This application Apr. 25, 1994, Ser. No. 232,557
Int. Cl.[6] H01L *29/78*
U.S. Cl. 257—198 **13 Claims**



1. A heterojunction bipolar transistor device, comprising:

(a) a substrate of semi-insulating semiconductor material having a first surface;

(b) a doped collector layer over said first surface;

(c) a doped base layer over said collector layer, said base layer of conductivity type opposite that of said collector layer;

(d) a doped emitter layer over said base layer, said emitter layer of the same conductivity type as said collector;

(e) an ohmic emitter contact layer over said emitter layer;

(f) an insulator layer over said emitter contact layer, said insulator layer with edges aligned to said emitter contact layer;

(g) an insulator sidewall covering the exposed vertical surfaces of said emitter contact layer and said insulator layer and extending a distance horizontally from said surfaces; and

(h) a metal base contact layer covering said insulator layer, said insulator sidewall area and a portion of said base layer such that said base contact layer does not come into contact with said emitter layer or said emitter contact layer.

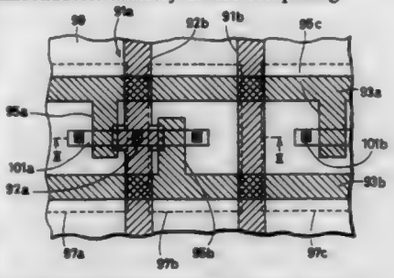
5,471,079

SEMICONDUCTOR MEMORY DEVICE AND MANUFACTURING METHOD THEREOF

Yutaka Ikeda, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 622,074, Dec. 4, 1990, Pat. No. 5,177,575. This application Jun. 9, 1992, Ser. No. 896,532
Claims priority, application Japan, Dec. 18, 1989, 1-329321
The portion of the term of this patent subsequent to Jan. 5, 2010, has been disclaimed.
Int. Cl.[6] **H01L** *29/68;29/40;23/48*
U.S. Cl. 257—296 **14 Claims**

1. A semiconductor memory device comprising:



a semiconductor substrate having a main surface;
a word line formed on said main surface;
a field effect transistor including a first impurity region formed in said main surface, a second impurity region formed in said main surface and spaced apart from said first impurity region to define a channel region therebetween, and a gate electrode portion, said gate electrode portion branching laterally from said word line to overlap said channel region, the entire side surface of said gate electrode portion being defined by a straight line perpendicular to said word line;
a bit line formed on said main surface to be electrically connected to said first impurity region, said bit line crossing said word line at a different level above the substrate; and
a capacitor including a first electrode layer electrically connected to said second impurity region, and a second electrode layer facing said first electrode layer with a first dielectric therebetween,
at least one of said first and second electrode layers being formed at an equal level to or at a higher level than the level of said bit line formed on said main surface.

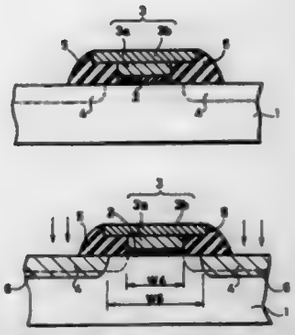
5,471,080

FIELD EFFECT TRANSISTOR WITH A SHAPED GATE ELECTRODE

Shinichi Satoh; Hiroji Ozaki, and Takahisa Eimori, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 787,912, Nov. 5, 1991, which is a continuation-in-part of Ser. No. 242,116, Sep. 8, 1988, Pat. No. 5,089,863. This application Nov. 29, 1993, Ser. No. 158,257
Int. Cl.[6] **H01L** *21/336;29/423;29/78*
U.S. Cl. 257—344 **2 Claims**

1. A field effect transistor comprising:
a semiconductor substrate having a main surface and a predetermined impurity concentration of a first conductivity type;
impurity layers of a second conductivity type formed spaced apart at the main surface of the semiconductor substrate, said impurity layers constituting source.drain regions, and a region between said impurity layers defining a first channel region at said main surface; and
a shaped conductive layer formed by etching on said first channel region with an insulating film interposed therebetween at said main surface, said shaped conductive layer having an upper portion and a lower portion, the upper portion being longer than the lower portion, the length of the lower portion adjacent the insulating film being substantially equal to or



shorter than the length of said first channel region, and the upper and lower portions being formed of polysilicon, the upper portion polysilicon of said shaped conductive layer having a first ion impurity therein and the lower portion polysilicon of said shaped conductive layer having a second ion impurity therein, the first and second ion impurities being different elements and being selected so that the lower portion has a faster etch rate as compared with an etch rate of the upper portion to thereby determine the lengths of the lower portion and upper portion under the same etching conditions.

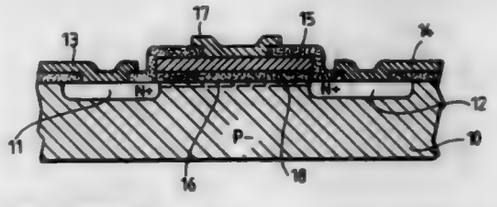
5,471,081

SEMICONDUCTOR DEVICE WITH REDUCED TIME-DEPENDENT DIELECTRIC FAILURES

Bruce J. Fishbein, Marlboro, and Brian S. Doyle, Framingham, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 672,002, Mar. 18, 1991, abandoned, which is a continuation of Ser. No. 510,164, Apr. 16, 1990, abandoned. This application Mar. 4, 1993, Ser. No. 26,625
Int. Cl.[6] **H01L** *29/68;29/78*
U.S. Cl. 257—356 **5 Claims**

1. A method of operating a semiconductor device, said semicon-



ductor device including:
a substrate composed of silicon semiconductor material and having a surface-adjacent region at a face of said substrate; an insulating layer on said face composed of silicon oxide overlying said surface-adjacent region of the substrate; an electrode on said face overlying said insulating layer above said surface adjacent region, said electrode being composed of polysilicon semiconductor material doped with impurities, wherein said electrode is a gate of a field-effect transistor or plate of a field-effect capacitor; comprising the steps of:
a) applying a first bias voltage to said electrode with respect to said face, said first bias voltage being substantially above a substrate inversion threshold voltage for said semiconductor device but below a selected level, and wherein said selected level is about that of a voltage supply for said semiconductor device, to produce a voltage across said insulating layer of approximately said applied first bias voltage, said first bias voltage being applied after a positive fixed charge is provided at the interface of said insulating layer and said electrode, said positive fixed charge preventing said first bias voltage from causing depletion in said electrode; and
b) applying a second bias voltage to said electrode with respect to said face, said second bias voltage being above

said selected level, to produce a voltage across said insulating layer of substantially less than said second bias voltage,

said polysilicon semiconductor material being doped at a level not more that about $5\times10^{18}/cm^3$ so that an inversion layer is created in said surface-adjacent region by said second bias voltage applied to said electrode.

5,471,082

SEMICONDUCTOR DEVICE AND A METHOD FOR MANUFACTURING THE SAME

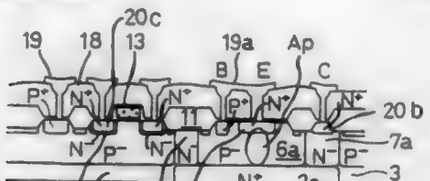
Hiroshi Maeda, Matsubara, Japan, assignor to Sharp Kabushiki Kaisha, Japan

Filed Sep. 14, 1994, Ser. No. 305,601

Claims priority, application Japan, Dec. 27, 1993, 5-333781

Int. Cl.[6] H01L *27/02*

U.S. Cl. 257—362 **12 Claims**



1. A semiconductor device having an electrostatic discharge protection device, in which the electrostatic discharge protection device comprises a vertical type bipolar transistor including,

a semiconductor substrate,

an epitaxial layer laminated on the semiconductor substrate,

a buried collector of a first conductive type which is formed of the semiconductor substrate or which is formed from the surface of the semiconductor substrate to the epitaxial layer,

a base of a second conductive type which is a lightly doped well and formed on the epitaxial layer, and

an emitter of the first conductive type and formed on the surface layer of the base of the second conductive type; and in which

the depth of the diffusion of the base being in the range from 0.8 to 2.3 microns, and

the base and the emitter being shorted with each other.

5,471,083

SEMICONDUCTOR DEVICE INCLUDING A FIELD EFFECT TRANSISTOR AND A BIPOLAR TRANSISTOR AND A METHOD OF MANUFACTURING THE SAME

Tatsuhiko Ikeda, Hyogo, and Kazuhito Niwano, Kanagawa, both of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 13, 1994, Ser. No. 304,898

Claims priority, application Japan, Dec. 16, 1993, 5-316769

Int. Cl.[6] H01L *23/48;29/44;29/52;29/78*

U.S. Cl. 257—370 **10 Claims**

1. A semiconductor device comprising:

a semiconductor substrate having a first semiconductor region and a second semiconductor region;

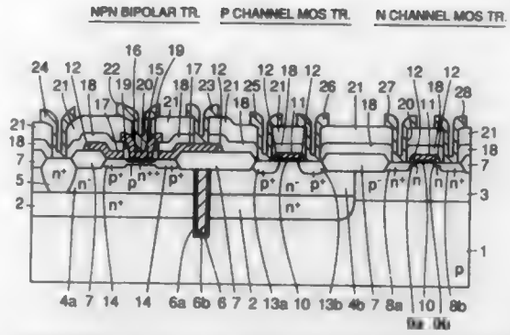
a field effect transistor comprising:

a pair of source/drain regions of a second conductivity type formed in said first semiconductor region, said pair of source/drain regions having a first junction depth and spaced apart to define a channel region therebetween; and

a gate electrode formed on said channel region with an insulating layer therebetween;

a bipolar transistor comprising:

a collector region of a first conductivity type formed in said second semiconductor region;



an external base region of the second conductivity type formed in said collector region and having a second junction depth;

an internal base region of the second conductivity type contiguous with said external base region, formed in said collector region and having a third junction depth;

an emitter legion of the first conductivity type formed in said internal base region;

wherein said second junction depth and said third junction depth are shallower than said first junction depth.

5,471,084

MAGNETORESISTIVE ELEMENT AND MANUFACTURING METHOD THEREFOR

Yasutoshi Suzuki, Okazaki; Kenichi Ao, Tokai; Hirofumi Uenoyama, Shikatsu; Hiroki Noguchi, Nishio; Koji Eguchi, Obu; Ichiro Ito, Anjo, and Yoshimi Yoshino, Inuyama, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

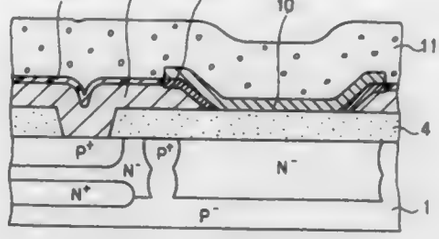
PCT No. PCT/JP92/01581, § 371 Date Jul. 30, 1993, § 102(e) Date Jul. 30, 1993, PCT Pub. No. WO93/11569, PCT Pub. Date Jun. 10, 1993

PCT Filed Dec. 3, 1992, Ser. No. 94,142

Claims priority, application Japan, Dec. 3, 1991, 3-319444; Jan. 31, 1992, 4-016834; Mar. 27, 1992, 4-071489; Jan. 22, 1992, 4-284683; Jan. 27, 1992, 4-289099; Nov. 25, 1992, 4-314847

Int. Cl.[6] H01L *27/22*

U.S. Cl. 257—421 **8 Claims**



3. A magnetoresistive element comprising:

a substrate;

an aluminum-based wiring metal disposed on said substrate and having a connection region defined thereon;

a nickel-based magnetoresistive element thin film disposed on said substrate such that a portion of said nickel-based magnetoresistive element thin film overlaps at least a portion of said connection region of said aluminum-based wiring metal;

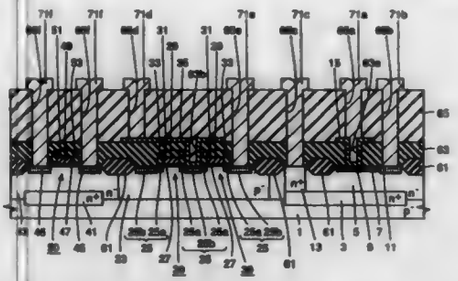
a barrier film disposed between said nickel-based magnetoresistive element thin film and said aluminum-based wiring metal, said barrier film having a consistency such that said barrier film is impermeable to nitrogen, wherein said barrier film is a aluminum-based metal film which covers said connection region; and

a surface protection film of nitride that covers said nickel-based magnetoresistive element thin film.

5,471,085
SEMICONDUCTOR DEVICE WITH POLYCRYSTALLINE SILICON EMITTER CONDUCTIVE LAYER

Yoshiyuki Ishigaki; Hiroki Honda; Kimibaru Uga, and Masahiro Ishida, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1994, Ser. No. 310,526
Claims priority, application Japan, Jan. 4, 1993, 5-248355
Int. Cl.[6] H01L *29/72*
U.S. Cl. 257—370 **5 Claims**

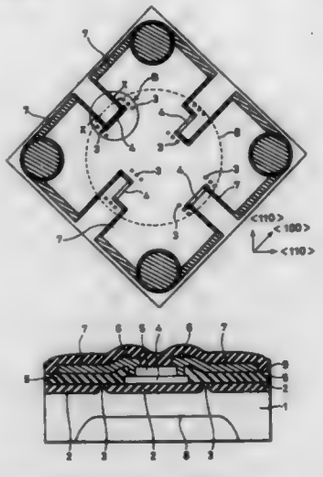


1. A semiconductor device comprising:
a semiconductor substrate having a main surface;
a collector impurity region of a first conductivity type formed at the main surface of said semiconductor substrate;
a base impurity region of a second conductivity type formed at the main surface of said semiconductor substrate within said collector impurity region;
an emitter impurity region of the first conductivity type formed at the main surface of said semiconductor substrate within said base impurity region; and
a conductive layer adjoining to said emitter impurity region,
said conductive layer having a polycrystalline silicon layer substantially uniformly doped with phosphorus at a concentration of at least 1×10^{20} cm^{-3}.

5,471,086
SEMICONDUCTOR DEVICE HAVING PIEZO RESISTANCE

Takashi Ipposhi, and Tadashi Nishimura, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 127,540, Sep. 28, 1993, abandoned. This application Oct. 31, 1992, Ser. No. 332,623
Claims priority, application Japan, Sep. 29, 1992, 4-259744
Int. Cl.[6] H01L *29/84;41/04;41/08*
U.S. Cl. 257—417 **11 Claims**

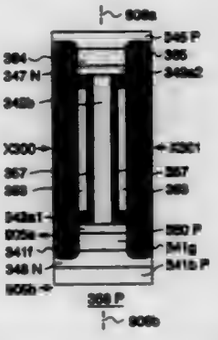


1. A semiconductor device comprising:
a single crystal semiconductor substrate having a seed crystal region;
an insulating layer being formed on said single crystal semiconductor substrate; and
a piezo resistance layer, having piezo characteristics, consisting of a single crystal layer being formed by laterally growing single crystals from said seed crystal region on said insulating layer,
said piezo resistance layer being so formed as to have one or more crystal sub-grain boundaries therein, and contacts which define a current path therebetween, said contacts being selectively positioned so that any portion of the current path is not traversed by any crystal sub-grain boundary in said piezo resistance layer.

5,471,087
SEMI-MONOLITHIC MEMORY WITH HIGH-DENSITY CELL CONFIGURATIONS

Walter R. Buerger, Jr., 20769 Mesarica Rd., Covina, Calif. 91724

Continuation-in-part of Ser. No. 265,329, Jun. 24, 1994, abandoned, which is a continuation-in-part of Ser. No. 105,464, Aug. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 769,850, Oct. 2, 1991, abandoned. This application Jan. 17, 1995, Ser. No. 375,383
Int. Cl.[6] H01L *27/02*
U.S. Cl. 257—532 **10 Claims**



3. An electronic integrated circuit memory element structure comprising
(a) at least a plurality of electronic integrated circuit components which are semiconductor devices, said electronic integrated circuit memory element structure occupying an integrated circuit die having a general plane which is predominate,
(b) where fabrication process steps to create said electronic integrated circuit memory element structure include at least one mask which is substantially in said general plane of said integrated circuit die, and substantially perpendicular extension of each said at least one mask,
(c) said at least one mask and each said substantially perpendicular extension being substantially oriented around a central axis which is substantially perpendicular to each said at least one mask,
(d) said electronic integrated circuit components being stacked in a column which is perpendicular to said general plane, and said central axis of each said electronic integrated circuit component being substantially centered around a central columnar axis which is substantially perpendicular to said general plane which is predominate on said integrated circuit die,
(e) said electronic integrated circuit components being stacked in component relationship of an architectural column comprising at least one upper capital component, at least one central component, and at least one lower base component,
(f) said electronic integrated circuit memory element structure being an element of a memory composed of one or more such electronic integrated circuit memory element structures, said electronic integrated circuit memory element structures being memory cells, and

(g) said electronic integrated circuit memory element structure comprising conductive means for both reading and writing to said electronic integrated circuit memory element structure.

5,471,088

SEMICONDUCTOR PACKAGE AND METHOD FOR MANUFACTURING THE SAME

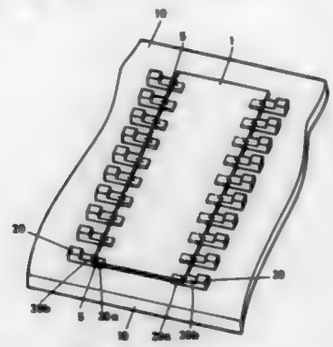
Chi J. Song, Daejon, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-do, Rep. of Korea

Continuation of Ser. No. 147,265, Nov. 5, 1993, abandoned. This application Mar. 23, 1995, Ser. No. 409,911

Claims priority, application Rep. of Korea, Nov. 7, 1992, 20847/1992

Int. Cl.[6] H01L *23/48;21/44*

U.S. Cl. 257—668 **10 Claims**



1. A semiconductor package comprising:

a semiconductor chip having a plurality of bonding pads;

a plurality of distinct lead bars, each attached to an adhesive tape, for providing an electrical connection of said semiconductor chip with an external circuit, each of said lead bars having a semiconductor chip-connecting portion; and

a molding resin enclosing the semiconductor chip and the lead bars, wherein the lead bars are exposed at an external surface of the molding resin, so that a surface of the lead bars is substantially coplanar with the molding resin.

5,471,089

SEMICONDUCTOR POWER MODULE

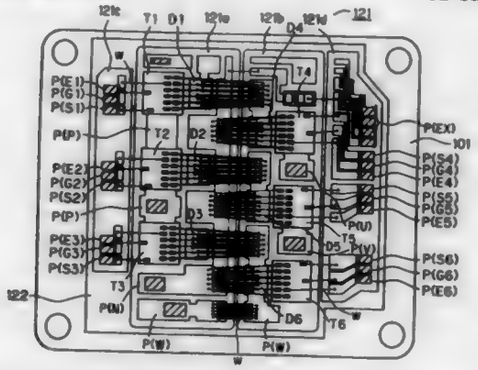
Akihiro Nagatomo; Hiroshi Yoshida; Masaki Nishiyama, and Seiichi Oshima, all of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1993, Ser. No. 80,781

Claims priority, application Japan, Jun. 30, 1992, 4-172774

Int. Cl.[6] H01L *23/16*

U.S. Cl. 257—691 **32 Claims**



1. A semiconductor power module comprising:

(a) a semiconductor element for electric power control;

(b) a circuit board, comprising:

(b-1) a circuit board body having an insulator; and

(b-2) first and second wiring patterns disposed on one major surface of said circuit board in such a manner that principal parts of said first and said second wiring patterns are longitudinally adjacent each other, said first and said second wiring patterns transmitting first and second power source potentials to said semiconductor element for electric power control, respectively; and

(c) a first and a second power source terminals which are connected to said first and said second wiring patterns, respectively,

said first and second wiring patterns and said first and second power source terminals being disposed in such a manner that power source currents flow in said first and said second wiring patterns in substantially parallel but opposite directions.

5,471,090

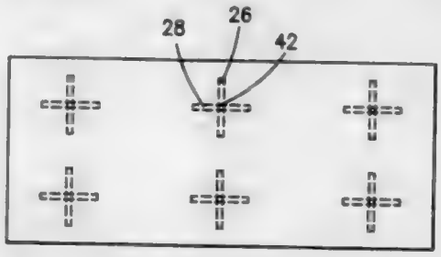
ELECTRONIC STRUCTURES HAVING A JOINING GEOMETRY PROVIDING REDUCED CAPACITIVE LOADING

Alina Deutsch, Chappaqua; David A. Lewis, Carmel; Chandrasekhar Narayan, Hopewell Junction, and Anthony L. Plachy, Hyde Park, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1993, Ser. No. 28,023

Int. Cl.[6] H01L *23/48;29/44*

U.S. Cl. 257—734 **24 Claims**



1. A structure comprising:

a first substrate having a first side;

a second substrate having a second side;

a plurality of first electrical conductors arranged in a first array on said first side;

a plurality of second electrical conductors arranged in a second array on said second side;

said first electrical conductors having an elongated shape in a first direction;

said second electrical conductors having an elongated shape in a second direction;

said first side being disposed facing said second side with each of said first conductors in electrical contact in an overlapping region with a corresponding one of said second electrical conductor and aligned so that said first direction is nonparallel with respect to said second direction.

5,471,091

TECHNIQUES FOR VIA FORMATION AND FILLING

Nicholas F. Pasch, Pacifica, and Roger Patrick, Santa Clara, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

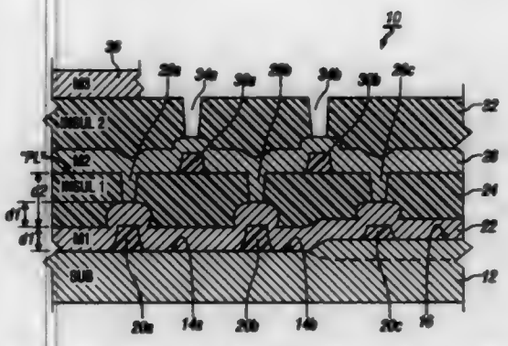
Continuation-in-part of Ser. No. 711,624, Jun. 6, 1991, Pat. No. 5,290,396. This application Aug. 26, 1991, Ser. No. 750,832

Int. Cl.[6] H01L *23/48*

U.S. Cl. 257—752 **5 Claims**

1. A semiconductor device, comprising:

a substrate;



a first structure-containing layer, overlying the substrate, containing first structures requiring inter-connection through first subsequently formed vias from a higher level;

a first insulating layer overlying the first structure-containing layer;

a second structure-containing layer overlying the first insulating layer, disposed at a higher level than the first structure-containing layer, and containing second structures requiring inter-connection through second subsequently formed vias from the higher level;

a second insulating layer overlying the second structure-containing layer; and

planarized metal filling the second and first vias and making contact from the higher level to the second and first structures, respectively;

wherein:

the second vias are shallow vias formed through the second insulating layer to the second structures;

the first vias are deep vias formed through the second insulating layer and through the first insulating layer to the first structures; and

any excess metal initially over-filling the vias is subsequently removed by polishing.

5,471,092

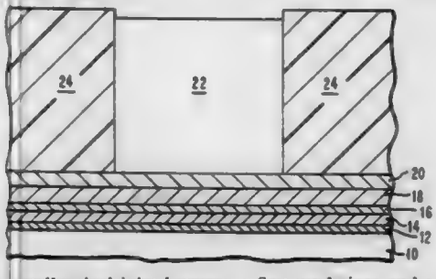
METALLURGICAL JOINT INCLUDING A STRESS RELEASE LAYER

Chin-Jong Chan, Fong-Shan, Taiwan, Prov. of China; Jei-Wei Chang, Tuckahoe, and Lubomyr T. Romankiw, Briarcliff Manor, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 945,309, Sep. 15, 1992. This application Dec. 21, 1994, Ser. No. 360,528

Int. Cl.[6] **H01L** *23/48;29/46*

U.S. Cl. 257—753 **25 Claims**



1. A metallurgical joint between a first workpiece and a second workpiece to be joined comprising:

a first workpiece,

an adhesive layer coupled to said first workpiece;

a low yield point metal stress release layer coupled to said adhesive layer;

a barrier layer which does not react with Sn and will block Sn penetration into the stress release layer selected from the group consisting of Cr, TiW, Ta and alloys of Cr, TiW or Ta coupled to said stress release layer;

a phased metal layer coupled to said barrier metal layer;

a solder reactive metal layer selected from the group consisting of CrCu, Cu, Ni, Co, Au, Ag, Pd, Pt, Rh, Ni(P), Co(P) and combinations thereof coupled to said phased metal layer;

a solder layer selected from the group consisting of PbSn, AuSn, PbIn, AuIn, AuInSn and BiSn coupled to said solder reactive layer and isolated from said low yield point metal stress release layer by said barrier layer, and

a second workpiece coupled to said solder layer.

5,471,093

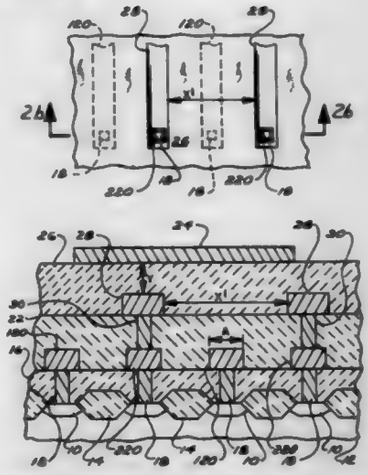
PSEUDO-LOW DIELECTRIC CONSTANT TECHNOLOGY

Robin W. Cheung, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 28, 1994, Ser. No. 330,767

Int. Cl.[6] **H01L** *23/48;21/3205;21/441*

U.S. Cl. 257—758 **26 Claims**



1. A method of reducing capacitance between metal interconnects electrically contacting metal contacts in semiconductor devices comprising doped regions contacted by said metal contacts surrounded by a first interlevel dielectric layer, said method comprising:

(a) electrically contacting a first group of said metal contacts with a first group of first metal interconnects and electrically contacting a second group of said metal contacts with a second group of first metal interconnects, said first metal interconnects formed on a first level and surrounded by a second interlevel dielectric layer, said first metal interconnects being spaced apart by a distance X; and

(b) electrically contacting said second group of first metal interconnects with second metal interconnects by means of metal plugs, said metal plugs surrounded by said second interlevel dielectric layer, and said second metal interconnects surrounded by a third interlevel dielectric layer, said second metal interconnects being spaced apart by a distance X' which is greater than said distance X.

5,471,094

SELF-ALIGNED VIA STRUCTURE

Chuen-Der Lien, Mountain View, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

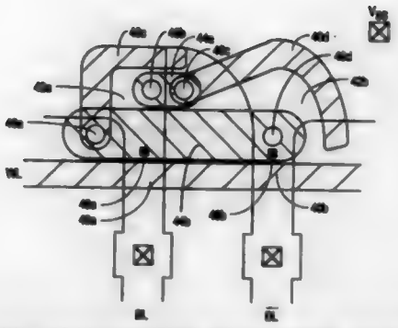
Filed Feb. 24, 1994, Ser. No. 201,437

Int. Cl.[6] **H01L** *23/48;29/76;23/52;27/11*

U.S. Cl. 257—774 **5 Claims**

1. A self-aligned via structure, comprising:

a semiconductor substrate;



a polysilicon first interconnect layer overlying one surface of said substrate, a portion of said first interconnect layer forming a gate of a metal oxide semiconductor field effect transistor;

a first dielectric layer formed directly upon said first interconnect layer, said first dielectric layer having upper and lower surfaces and having an opening extending between said upper and lower surfaces, and said first dielectric layer having at least one edge aligned with one edge of said first interconnect layer;

a polysilicon conductive plug formed within said opening, said conductive plug having an upper surface and having a lower surface contacting the upper surface of said first interconnect layer, and said conductive plug having at least one edge aligned with one edge of said first interconnect layer; and

a second dielectric layer overlying said substrate surface, and overlying at least one edge of said first dielectric layer, at least one edge of said first interconnect layer, and at least one edge of said conductive plug, but not overlying the upper surface of said conductive plug.

5,471,095

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE AND METHOD OF FABRICATING SAME

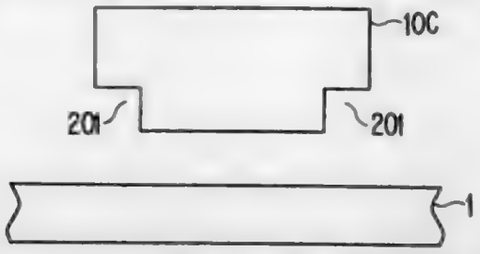
Isamu Kaminaga; Shuuichi Matsue; Takahiko Arakawa; Shuuichi Katoh, and Masahiro Ueda, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1994, Ser. No. 237,309

Claims priority, application Japan, May 10, 1993, 5-107877

Int. Cl.[6] H01L *23/48;29/62*

U.S. Cl. 257—775 **3 Claims**



3. A semiconductor integrated circuit device including a plurality of semiconductor elements formed on a semiconductor substrate, said semiconductor integrated circuit device comprising:

an element-to-element line for electrically connecting said plurality of semiconductor elements to each other said element-to-element line being formed of eight sides including first and second parallel sides separated by a first distance, third and fourth parallel sides which are perpendicular to the first and second sides and are separated by a second distance, fifth and sixth parallel sides which are perpendicular to the first and second sides and are separated by a third distance which is less than the second distance, and seventh and eighth sides connecting respectively the third side to the fifth side and the fourth side to the sixth side.

5,471,096

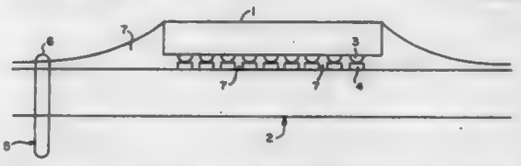
SOLDER INTERCONNECTION FROM A COMPOSITION CONTAINING A MIXTURE OF DICYANATES

Kostas I. Papathomas; Frederick R. Christie, both of Endicott, and David W. Wang, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 745,760, Aug. 16, 1991, abandoned. This application Nov. 4, 1993, Ser. No. 145,678

Int. Cl.[6] H01L *23/29*

U.S. Cl. 257—778 **17 Claims**



1. A solder interconnection for forming connections between an integrated semiconductor device and a carrier substrate comprising

a plurality of solder connections that extend from the carrier substrate to electrodes on said semiconductor device to form a gap between said carrier substrate and the semiconductor device, wherein said gap is filled with a composition obtained from curing a composition containing:

A. binder component containing

1) about 40% to about 70% by weight of bisphenol M dicyanate, prepolymer thereof, or mixtures thereof; and

2) correspondingly about 60% to about 30% by weight of 4,4'-ethylidene bisphenol dicyanate, prepolymer thereof, or mixtures thereof; and

B. Filler having a maximum particle size of 20 microns and being substantially free of alpha particle emissions; wherein the amount of A is about 30% to about 50% by weight of the total of A and B and correspondingly, the amount of B is about 70% to about 50% by weight based upon the amount of A and B.

5,471,097

RESIN ENCAPSULATED SEMICONDUCTOR DEVICE WITH AN ELECTRICALLY INSULATING SUPPORT AND DISTORTION PREVENTING MEMBER

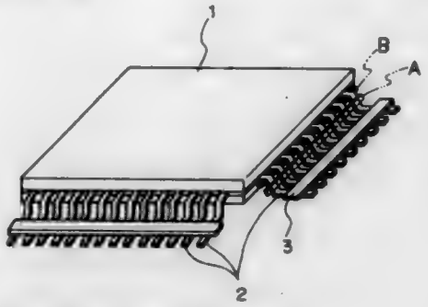
Kazutaka Shibata, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 12,655, Feb. 3, 1993, abandoned. This application Sep. 9, 1994, Ser. No. 303,597

Claims priority, application Japan, Feb. 7, 1992, 4-022650; Sep. 8, 1992, 4-239495

Int. Cl.[6] H01L *23/48;29/44;29/52;29/60*

U.S. Cl. 257—787 **5 Claims**



1. A semiconductor device comprising:

a semiconductor chip;

a plurality of leads each electrically connected at one end thereof to said semiconductor chip;

a synthetic resin portion which encapsulates said semiconductor chip and said one end of said leads; and

an insulating support and distortion preventing member formed of a same synthetic resin as said synthetic resin portion, said

insulating support and distortion preventing member having a thickness larger than a thickness of each of said leads,

another end of said leads being bent to have a gull-wing like shape extending outwardly from said synthetic resin portion, and

said insulating support and distortion preventing member provided in a flat portion of said leads, said flat portion located closer to said synthetic resin portion than a bottom soldering face of said leads having said gull-wing like shape, said leads being fixed to each other.

5,471,098

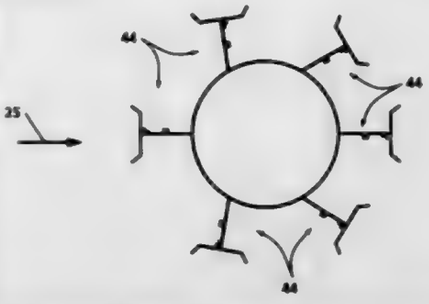
DEVICE FOR CONNECTING FLOW ENERGY OF WATER INTO ELECTRICAL ENERGY

Bill Asay, 711 Sapphire Ave., Billings, Mont. 59105

Filed Sep. 26, 1994, Ser. No. 312,087

Int. Cl.[6] F03B *13/10;3/14*

U.S. Cl. 290—54 **9 Claims**



1. A device for converting energy associated with fluid flow into electrical energy comprising:

A) a bridge having a front end, a rear end, two sides, a top and a bottom, said bridge top being located above water when said bridge is located in a body of moving water, such as a stream;

B) float means attached to said bridge for maintaining said bridge afloat in the water;

C) anchor means attached to said bridge for holding said bridge stationary with respect to water flowing therepast in a selected location in the water whereby water flows past said bridge;

D) power generating means on said bridge for converting rotary movement into electrical power; and

E) translating means mounted on said bridge for translating movement of water past said bridge into rotary movement including

(1) a central arm means rotatably mounted on said bridge and connected to said power generating means and extending from said bottom into the water for applying rotary movement to said power generating means, and

(2) means mounted on said central arm for converting water movement past said bridge into rotary movement of said central arm including

(a) a plurality of radial arms, each radial arm attached at a proximal end thereof to said central arm and having a distal end spaced radially outward from said central arm, and

(b) a hydrowing movably attached to the distal end of each radial arm, each hydrowing including

(i) a body oriented to be parallel to a tangent to said central arm at the proximal end of the radial arm to which said body is attached when the hydrowing is in a neutral orientation,

(ii) a first water impact section on one end of said body and having a front surface and a rear surface,

(iii) a second water impact section on a second end of said body and having a first surface and a second surface,

(iv) each of said first water impact sections being oriented at a first angle with respect to the body to which it is attached and having a front water impact area on said front surface and a rear water impact area on said rear surface,

(v) each of said second water impact sections being oriented at a second angle with respect to the body to which it is attached and having a first water impact area on said first surface and a second water impact area on said second surface,

(vi) said first and second angles having equal absolute values,

(vii) said first water impact section being larger than said second water impact section, and

(viii) attaching means on each radial arm movably connecting the hydrowing on that arm to that radial arm for orienting each hydrowing with respect to the flow direction of the water flowing past said bridge to present a greater total impact area on one side of said central arm than on the diametrically opposite side of said central arm whereby a net force is generated by the water flowing past said bridge on said central arm tending to rotate said central arm, said attaching means being located between said first water impact section and said second water impact section.

5,471,099

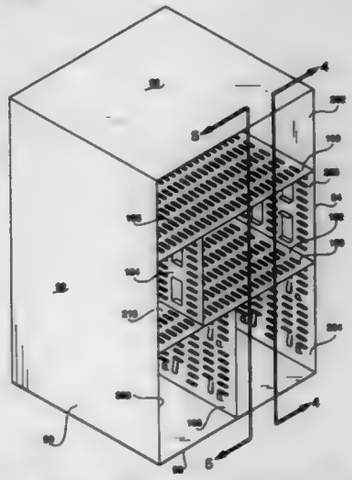
MODULAR ENCLOSURE APPARATUS

Henri J. Larabell, Cupertino, and Richard S. Davis, Palo Alto, both of Calif., assignors to HJS&E Engineering, Sunnyvale, Calif.

Filed Nov. 16, 1992, Ser. No. 977,297

Int. Cl.[6] H05K *7/20*

U.S. Cl. 307—53 **29 Claims**



1. A modular enclosure for connection to a computer bus for a small computer system, namely a personal computer or a computer work station, the enclosure comprising:

a housing having a base, upstanding side walls, a back and a top;

a cooling module removably connected to the enclosure for cooling the enclosure;

a frame removably connected to the housing, the frame including:

means for mounting a plurality of electrical devices within the frame, the means for mounting electrical devices includes a tab;

a memory storage device module removably connected to the frame, the memory storage device module including means for removably connecting at least one memory storage device, the means for removeably connecting at least one memory storage device includes a locking recess, the locking recess connects with the tab;

a power supply module removably connected to the frame, the power supply module including power supply means for supplying power to the enclosure;

first interconnect means for connecting the enclosure to the computer bus;

second interconnect means for connecting the memory storage device module to the first interconnect means; and

third interconnect means for connecting the power supply module to the cooling module and the memory storage device module,

whereby, each of the modules is removably connected, allowing any of the modules to be removed and replaced.

5,471,100

LINEAR ELECTROMAGNETIC DRIVING APPARATUS AND USE OF SAME FOR LENS ADJUSTMENT

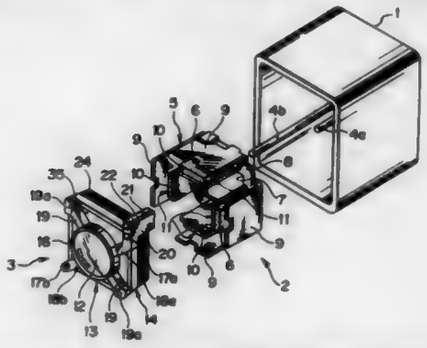
Satoshi Sakamoto, and Shinichi Orimo, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 29, 1994, Ser. No. 219,474

Claims priority, application Japan, Mar. 30, 1993, 5-093856

Int. Cl.[6] H02K *41/02*

U.S. Cl. 310—12 **39 Claims**



1. Linear electromagnetic driving apparatus comprising stator means including a substantially rectangular tube-shaped magnetic yoke comprised of outer frame plates, inner frame plates spaced from and facing said outer frame plates to form a gap therebetween, a connecting member for connecting the outer and inner frame plates and providing a magnetic flux path therethrough and at least one magnet secured to one of said outer and inner frame plates to generate said magnetic flux, said rectangular tube-shaped magnetic yoke having a longitudinal axis and also having corners, at least one of said corners being cut out to define an open portion; movable means slidable within said gap between said outer and inner frame plates and including a drive member comprised of a bobbin positioned within said gap and a coil wound on said bobbin and extending in a direction parallel to said longitudinal axis, a driven member secured to and coaxial with said bobbin and having openings to receive said inner frame plates of said yoke means such that when said coil is energized to move said movable means in said gap, said inner frame plates extend into and through said bobbin and into and through the openings of said driven member; a fixed shaft extending parallel to said longitudinal axis of the rectangular tube-shaped magnetic yoke; and bearing means secured to said movable means and extending outwardly therefrom substantially perpendicular to said longitudinal axis and passing through the open portion of said at least one corner of said rectangular tube-shaped magnetic yoke, said bearing means receiving and being slidable on said fixed shaft.

5,471,101

HIGH EFFICIENCY ELECTRICAL MACHINE WITH MINIMIZED MATERIAL CONTENT

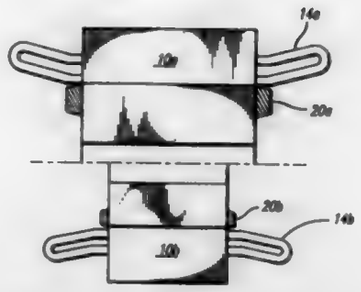
Bruce T. Hein, Lexington, Tenn., assignor to MagneTek Century Electric, Inc., St. Louis, Mo.

Filed Nov. 22, 1993, Ser. No. 156,276

Int. Cl.[6] H02K *1/06;15/02*

U.S. Cl. 310—42 **5 Claims**

1. An electrical machine having minimized material content, comprising a laminated stator and rotor with the laminations designed by:



(a) selecting the maximum practical value of air gap flux density B_g consistent with maintaining acceptable noise and vibration levels;

(b) using the value of B_g selected to determine the dimensions of the stator and rotor laminations so as to result in flux density levels that minimize core losses and magnetizing current requirements.

5,471,102

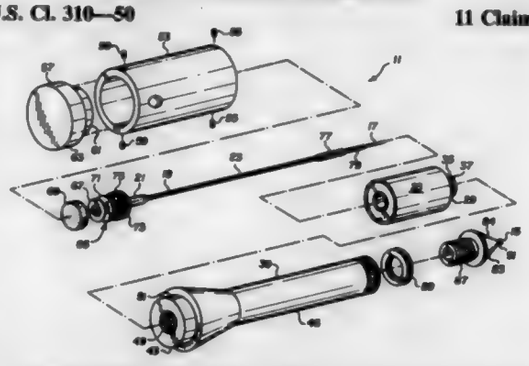
RECIPROCATING SHAFT DEVICE

Gregory R. Becker, R.R. 2 Box 182, Red Hook, N.Y. 12571, and Mitchell I. Rapoport, P.O. Box 324, Woodstock, N.Y. 12498

Filed May 9, 1994, Ser. No. 239,467

Int. Cl.[6] A61M *31/00;* B26F *1/24*

U.S. Cl. 310—50 **11 Claims**



1. A reciprocating shaft device having an upper end and a lower end, said reciprocating shaft device comprising:

a shaft assembly;

an inner housing;

a coil assembly including an electromagnetic coil, the electromagnetic coil being encased within the inner housing;

a nose assembly secured to the coil assembly and having a passageway extending longitudinally and generally concentrically through it, the shaft assembly extending into the passageway of the nose assembly and being generally symmetrically located and slideably mounted within the magnetic coil;

a coil cover affixed to the nose assembly and encasing the inner housing;

a cap assembly secured to the coil cover assembly at the upper end;

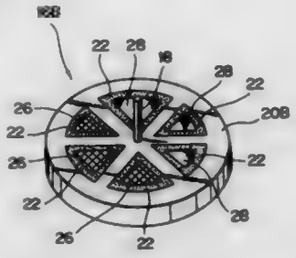
dampening means located at the end of the shaft assembly;

an electrical circuit means repeatedly to energize the electromagnetic coil at a variable selectable rate so as to cause the shaft assembly to reciprocate.

5,471,103
MOTOR FOR PROVIDING A VIBRATING ACTION FOR A RADIO PAGER

Masahiro Fujii, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 14, 1992, Ser. No. 990,597
Claims priority, application Japan, Dec. 17, 1991, 3-352971
Int. Cl.[6] H02K *7/065;1/04*
U.S. Cl. 310—81 **11 Claims**



9. A motor for providing a vibrating action incorporated in a radio pager, said motor comprising:

a casing;

a stator affixed inside of said casing and comprising a permanent magnet having a plurality of poles;

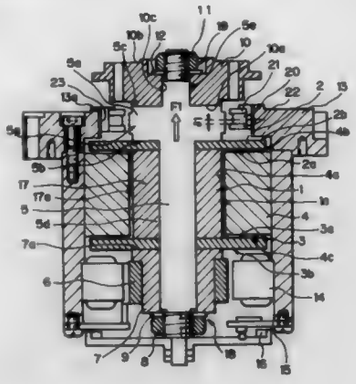
a rotor rotatably mounted on a shaft inside of said casing while facing said stator, said rotor being provided with a plurality of coils uniformly distributed around a circumference of said rotor; and

a weight buried within a sector part of said rotor to cause an eccentric action upon a rotation of said rotor.

5,471,104
DRUM MOTOR FOR VCR

Manabu Toshimitsu, Kanagawa; Shunichi Aiyoshizawa, Tokyo; Yoshikazu Suganuma, and Daisuke Konno, both of Kanagawa, all of, Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Aug. 19, 1993, Ser. No. 109,706
Claims priority, application Japan, Aug. 20, 1992, 4-244181
Int. Cl.[6] H02K *7/14;7/08*
U.S. Cl. 310—90 **14 Claims**



1. A drum motor comprising:

a rotor-side bearing member comprising a cylindrical radial bearing element having an outer peripheral surface and respective axial end surfaces, and first and second thrust plates directly contacting the axial end surfaces of said cylindrical radial bearing element, respectively, and extending radially therefrom so as to have mutually facing surfaces, said rotor-side bearing member also having a through-hole extending centrally therethrough;

a stator-side bearing member comprising a cylindrical radial sleeve extending around said cylindrical radial bearing element and interposed between said first and second thrust plates of said rotor-side bearing member, said sleeve having an inner peripheral surface confronting and slidable relative to the outer peripheral surface of the cylindrical radial bearing element of said rotor-side bearing member, and said sleeve having respective axial end surfaces confronting and slidable relative to the mutually facing surfaces of the thrust plates of said rotor-side bearing member, respectively;

at least the surfaces of said stator-side bearing member and said rotor-side bearing member that are slidable relative to each other being of a ceramic material;

one of both of the axial end surfaces of said sleeve and both of the mutually facing surfaces of said thrust plates having dynamic pressure-generating grooves therein such that said axial end surfaces and said mutually facing surfaces constitute hydrodynamic thrust bearings, and the confronting peripheral surfaces of said sleeve and said cylindrical radial bearing element cooperating to constitute a radial bearing;

a rotary shaft extending through the through-hole of said rotor-side bearing member, said rotary shaft having a radially enlarged portion defining a flat surface extending at right angles to the axial direction of said shaft so as to form a step in the shaft, said flat surface being in direct contact with a surface of said first thrust plate that is opposite the surface of the first thrust plate that contacts the axial end surface of said cylindrical radial bearing element;

a cylindrical back yoke of a magnetic material fitted around said rotary shaft, said back yoke having a flat end surface extending at right angles relative to the axial direction thereof, the end surface of said back yoke directly contacting a surface of said second thrust plate that is opposite the surface of said second thrust plate that contacts the axial end surface of said cylindrical radial bearing element;

a rotor magnet secured to said cylindrical back yoke and extending axially therealong;

a motor casing having an inner peripheral surface to which the sleeve of said stator-side bearing member is secured at the outer peripheral surface of said sleeve;

a stator secured to said rotor casing and facing said rotor magnet; and

locking means, provided on said rotary shaft, for pressing said back yoke and the thrust plates and the cylindrical radial bearing element of said rotor-side bearing member in the axial direction of said rotary shaft against the flat surface of the radially enlarged portion of said shaft with a predetermined force to thereby integrate said rotor-side bearing member with said rotary shaft.

5,471,105
NULL FLUX MAGNETIC BEARING WITH CROSS-CONNECTED LOOP PORTIONS

David B. Clifton, Leander; Scott R. Little, and Joseph F. Pinkerton, both of Austin, all of Tex., assignors to Magnetic Bearing Technologies, Inc., Austin, Tex.

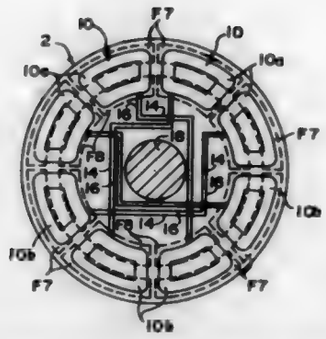
Continuation-in-part of Ser. No. 996,192, Dec. 23, 1992, Pat. No. 5,305,874, which is a continuation-in-part of Ser. No. 950,607, Sep. 25, 1992. This application Apr. 6, 1994, Ser. No. 223,668
Int. Cl.[6] H02K *7/09*
U.S. Cl. 310—90.5 **10 Claims**

1. A magnetic bearing system, comprising,

a member having a plurality of loop portions of electrically conductive material fixed thereon,

a plurality of field magnets for producing a plurality of magnetic fields,

said member and said field magnets being relatively rotatable about an axis of rotation so that said loop portions travel along a prescribed circular path relative to and through said magnetic fields,



said field magnets being at locations where their magnetic fields subject said loop portions to magnetic flux to produce electromotive forces in said loop portions so that an electrical current is induced in said loop portions when they deviate from the prescribed circular path; said electrical current having a direction which, in the presence of said magnetic fields, exerts Lorentz forces on said loop portions and said member in directions which are lateral with respect to said circular path,

at least first and second said loop portions being electrically interconnected to form a closed loop, said first and second loop portions being circumferentially spaced from each other and lying in circumferentially spaced magnetic fields.

5,471,106

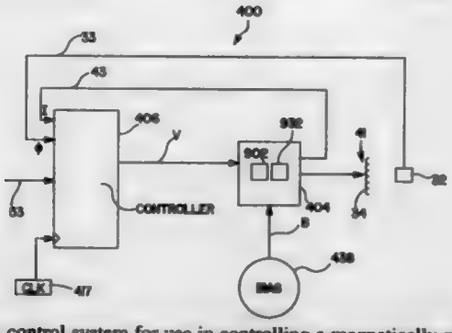
METHODS AND APPARATUS FOR CLOSED-LOOP CONTROL OF MAGNETIC BEARINGS

Alan R. D. Curtis, Phoenix, and James E. Joseph, Mesa, both of Ariz., assignors to Noise Cancellation Technologies, Inc., Linthicum, Md.

Continuation of Ser. No. 27,739, Mar. 8, 1993, abandoned. This application Apr. 26, 1994, Ser. No. 233,538

Int. Cl.[6] H02K *7/09*

U.S. Cl. 310—90.5 **39 Claims**



1. A control system for use in controlling a magnetically permeable body movably mounted within a plurality of magnetic bearings, each of the magnetic bearings comprising an electromagnet having a coil wound about a magnetically permeable core integral with at least one of the magnetic bearings, wherein each of the magnetic beatings is disposed adjacent and in close proximity to the body, forming a gap intermediate the body and the electromagnet, wherein electric current flowing through the coil generates magnetic flux having a given polarity and magnitude permeating the body through the core and across the gap, comprising:

a first flux sensor for generating indicia of flux resident in said gap; and

a controller for sampling said flux indicia and providing at least one control signal to said electromagnet to control the current flowing through said coil and the position of the body based on at least said flux indicia, said controller including

a levitation controller for controlling levitation of the body based on at least said flux indicia; and

a disturbance rejection controller for effecting disturbance rejection of the body based on at least said flux indicia.

5,471,107

END CAP AND BRUSH HOLDER ASSEMBLY FOR DYNAMOELECTRIC MACHINE

Earl W. Rawls, 177 Viking Dr., Columbus, Miss. 39702

Filed Dec. 30, 1993, Ser. No. 176,020

Int. Cl.[6] H02K *5/14;13/00*

U.S. Cl. 310—249 **3 Claims**

1. An end cap and brush holder apparatus for a dynamoelectric machine, said apparatus comprising:

a brush;

a brush shunt electrically coupled to the brush;

an electrical cable having a terminal electrically coupled at a first end thereof and having a second end portion connected to said brush shunt through a crimp member;

a brush box cover slidably disposed on said electrical cable intermediate said electrical terminal and said second end portion of said electrical cable via a brush box cover aperture;

biasing means disposed over a portion of said electrical cable intermediate said brush box cover and said second end portion of said electrical cable;

means for electrically securing said brush shunt to said second end portion of said electrical cable after said biasing means has been disposed over a portion of said electrical cable;

said brush shunt being flexible to allow said biasing means to be slidably urged thereover toward said brush by sliding movement of said brush box cover along said electrical cable, whereafter said brush box cover is slidably engageable in a single step and releasably disengageable in a single step with a brush box to thus cause said biasing means to bias said brush outwardly of said brush box; and

said crimp member sized to allow complete passage of said crimp member through said biasing means and to prevent passage through said brush box cover aperture.

5,471,108

REALIZATION PROCESS OF A DISTRIBUTION NETWORK OF ELECTRIC SIGNALS, OBTAINED DISTRIBUTION NETWORK AND PIEZOELECTRIC MOTOR INCLUDING SUCH A NETWORK

Daniel Guyomar, Nice; Thierry Mazoyer, Vence; Jean-Denis Sauzade, Grasse, and Gil Ching, Cagnes Sur Mer, all of, France, assignors to IMRA Europe SA and Techsonic, Valbonne, France

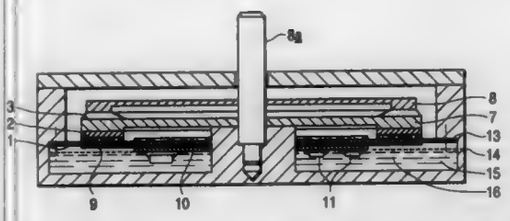
Filed Feb. 3, 1994, Ser. No. 193,658

Claims priority, application France, Feb. 5, 1993, 93 01286

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—323 **17 Claims**

1. A distribution network of electric signals in a piezoelectric or ultrasonic waves motor, characterized by the fact that electrodes of conductive material are deposited on one face of a strip of dielectric material, that on the other face of the strip conductive tracks are deposited according to an interconnection diagram, designed beforehand to supply the piezoelectric elements with proper volt-



age, that drillings going through the strip between the conductive tracks and the electrodes are made, and that through plating or deposit of conducting material, these drillings are made conductive.

5,471,109

METHOD AND APPARATUS FOR PREVENTING REVERSE FLOW IN AIR OR GAS COOLED LAMPS

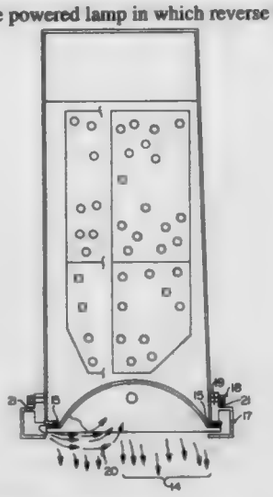
Jayavant P. Gore, West Lafayette, Ind., and Robert J. Sweetman, Olney, Md., assignors to Fusion Systems Corporation, Rockville, Md.

Filed Dec. 31, 1992, Ser. No. 999,133

Int. Cl.[6] H01J *7/24;* **F21V** *7/20*

U.S. Cl. 313—22 **7 Claims**

1. A microwave powered lamp in which reverse flows of cooling



air or gas are prevented, comprising,

a bulb containing a plasma forming medium,

a microwave cavity comprised of a reflector and mesh in which said bulb is located,

said reflector having a set of openings,

means for providing air or gas under pressure, at least part of which is fed through said set of reflector openings, said air or gas after being fed through said openings being used for cooling and comprising respective streams which entrain air or gas,

means for providing a source of clean air or gas, and

means for causing said clean air or gas provided by said source to replace the air or gas which is entrained by said streams in sufficient amount to prevent said reverse flows from occurring.

5,471,110

HIGH PRESSURE DISCHARGE LAMP HAVING FILAMENT ELECTRODES

Bart van der Leeuw, Hammondsport; Joseph E. Canale, Painted Post; Albert E. Kowal, Savona, all of N.Y.; Henrikus J. H. Pragt, Eindhoven, Netherlands, and Thomas W. Morris, Bath, N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

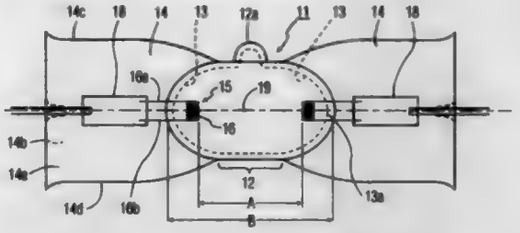
Continuation-in-part of Ser. No. 994,752, Dec. 22, 1992, abandoned. This application Sep. 24, 1993, Ser. No. 126,834

Claims priority, application European Pat. Off., Dec. 23, 1991, 91203379

Int. Cl.[6] H01J *61/073;61/22;61/36*

U.S. Cl. 313—25 **34 Claims**

14. A metal halide discharge lamp, comprising:



a) an outer envelope sealed in a gas-tight manner;

b) a discharge vessel arranged within said outer envelope, said discharge vessel comprising (i) a body of fused silica having a tubular portion of substantially constant cross section defining a longitudinal axis of the discharge vessel, opposing planar seals sealing the discharge vessel in a gas-tight manner, and end chambers of continuously reducing cross-section extending between said tubular portion and each of said seals, (ii) a discharge electrode mounted in each end chamber between which an arc discharge is maintained during lamp operation, each discharge electrode comprising a filament of refractory metal wire having a plurality of successive coil turns extending transverse to the longitudinal axis, said discharge electrodes being free of thoria, (iii) conductive feed-throughs connected to each filament and extending through a respective seal in a gas-tight manner, and (iv) a discharge sustaining filling within said discharge vessel comprising mercury, a rare gas and one or more metal halides, said discharge sustaining filling being free of metals of low work function which are pyrolitically decomposable and subject to plating out on said electrodes during lamp operation;

c) a light transmissive sleeve arranged about said discharge vessel; and

c) frame means for supporting said sleeve and discharge vessel within said outer envelope and for connecting said feed-throughs to a source of electric potential outside of said lamp envelope.

5,471,111

LIQUID COOLING TYPE PROJECTION CATHODE RAY TUBE

Sang-muk Kim, Suwon, Rep. of Korea, assignor to Samsung Electron Devices Co., Ltd., Kyungki, Rep. of Korea

Filed May 19, 1993, Ser. No. 63,490

Claims priority, application Rep. of Korea, Dec. 15, 1992, 92-25540 U

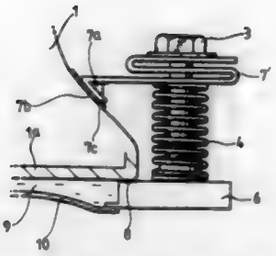
Int. Cl.[6] H01J *29/86*

U.S. Cl. 313—36 **2 Claims**

1. A projection cathode ray tube, comprising:

a funnel-shaped body having an electron gun in a neck end and a face plate provided with a screen at a projection end;

a rectangular radiating plate having a frontal glass element corresponding to said face plate having said screen located inside thereof, firmly attached to said face plate;



a liquid coolant layer, having a predetermined thickness and located between said face plate and said frontal glass of said radiating plate; and

clamping means coupled by a bolt and a spring provided thereon at each corner of said rectangular radiating plate for clamping the radiating plate to the projection end of the body, and a setting clasp supported to each bolt, having a contacting surface of a predetermined size in contact with the side of said funnel, whereby said setting clasp engages said funnel while pressing thereto,

wherein each said bolt of said clamping supports a corresponding elastic reinforcing member of sheet iron bent into a V-shape to act on a corresponding setting clasp so that the corresponding setting clasp is elastically acted upon at one side by said spring and on an opposite side by said V-shaped reinforcing member.

5,471,112

PLASMA PANEL WITH LOW-SCATTER SCREEN

Olivier Hamon, St Egreve, and Andréas Oppenlander, Chilly Mazarin, both of, France, assignors to Thomson Tubes Electroniques, Velizy, France

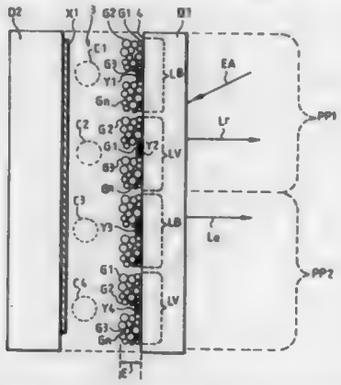
Filed Jun. 17, 1993, Ser. No. 77,545

Claims priority, application France, Jun. 19, 1992, 92 07481

Int. Cl.[6] H01J *1/62*

U.S. Cl. 313—485 **8 Claims**

1. A plasma panel display device comprising a front plate and a



back plate between which a gaseous base is formed, said front plate having at least one photoluminescent layer which is constituted by grains of luminophor materials each having a diameter of less than 1.5 μm, a thickness of said at least one photoluminescent layer being approximately two to three times as great as said diameter of said grains of luminophor materials.

5,471,113

LOW-PRESSURE MERCURY DISCHARGE LAMP

Josephus W. M. De Backer, and Cornelia M. J. De Bie, both of Roosendaal, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 22, 1993, Ser. No. 125,383

Claims priority, application European Pat. Off., Sep. 23, 1992, 92202915

Int. Cl.[6] H01J *1/62*

U.S. Cl. 313—487 **21 Claims**

1. A low-pressure mercury discharge lamp with a very good

colour rendering and with a colour point (x_L, y_L) on or close to the Planckian locus, said lamp comprising a gastight, radiation-transmitting envelope which contains mercury and rare gas, and having a luminescent layer comprising

a first luminescent material activated by bivalent europium and having an emission band whose maximum lies between 470 nm and 500 nm and whose half-value width is at most 90 nm,

a second luminescent material activated by bivalent manganese and having at least an emission band mainly in the red region of the visible spectrum,

a third luminescent material with a band emission whose maximum lies between 430 nm and 490 nm,

a fourth luminescent material with emission mainly between 520 nm and 565 nm, and

a fifth luminescent material with emission mainly between 590 nm and 630 nm.

5,471,114

FAIL-SAFE UNINTERRUPTIBLE LIGHTING SYSTEM

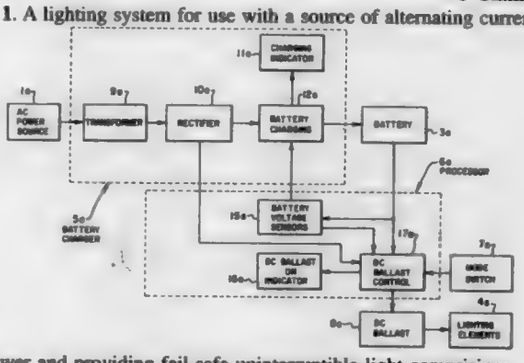
M. Larry Edwards, Woodward, and W. Joe Watson, Edmond, both of Okla., assignors to DMI Holdings, Inc., Woodward, Okla.

Continuation of Ser. No. 63,359, May 17, 1993, abandoned, which is a continuation of Ser. No. 792,025, Nov. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 629,256, Dec. 18, 1990, abandoned. This application Jun. 15, 1994, Ser. No. 260,487

Int. Cl.[6] H05B *37/00*

U.S. Cl. 315—86 **5 Claims**

1. A lighting system for use with a source of alternating current



power and providing fail-safe uninterruptible light comprising:

(a) A flourescent lighting element;

(b) A battery; and

(c) Control means, including control circuits for controlling said lighting element, effective:

(i) when in a first mode for interconnecting said lighting element concurrently with said battery and with said source of alternating current power to normally energize said lighting element from both said battery and said source of alternating current power and for providing continuing uninterrupted and unswitched power to said lighting ele-

ment from said battery when said source of alternating current power is interrupted;

(ii) when in a second mode for sensing the power-on/power-off condition of voltage applied to said lighting element and, when voltage is applied to said lighting element to concurrently supply said lighting element from both said battery and said source of alternating current power when said alternating current power is uninterrupted, said control means being normally and selectively effective when in said second mode, when a voltage is not applied to said lighting element and when said alternating current power is interrupted, to energize and turn on said lighting element from said battery;

said control circuits including circuits for sensing the mode of said control means and when said control circuits are in a first selectable condition and said control means is in said first mode for ensuring energization of said lighting element, said circuits being effective when in a second selectable condition, when said control means is in said second mode, when said voltage is not applied to said lighting element and when said alternating current power is interrupted, to prevent energization of said lighting element from said battery.

5,471,115

METHOD AND APPARATUS FOR MEASURING ELECTRON DENSITY OF PLASMA

Yukinobu Hikosaka, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

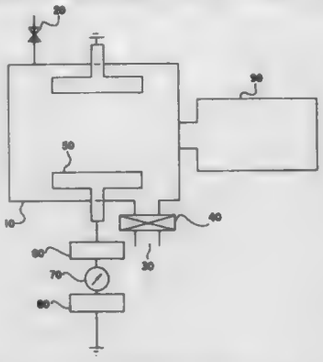
Filed Sep. 15, 1994, Ser. No. 305,970

Claims priority, application Japan, Sep. 16, 1993, 5-229363; Sep. 6, 1994, 6-212636

Int. Cl.[6] H01J *7/24*

U.S. Cl. 315—111.21 **11 Claims**

1. A method for measuring electron density of a plasma in a



plasma reaction chamber comprising the steps of:

injecting electrons into the plasma from a space charge layer (so called "sheath") formed in a vicinity of each of a pair of electrodes by applying an alternating electromagnetic field or an alternating electromagnetic field with a bias so that electrons injected into the plasma create an unstable condition in the plasma and eventually, generate plasma oscillation,

measuring a plasma oscillation frequency which gives a maximum amplitude in the plasma oscillation, and

calculating the electron density of a plasma in the plasma reaction chamber by using a value of the plasma oscillation frequency.

5,471,116

GENERAL ASSEMBLY FOR CONTROLLING LIGHT INTENSITY OF A GAS DISCHARGE LAMP

Uri Schiller, Tel-Aviv, Israel, assignor to Ready Light Energy Ltd. Israeli Company, Rishon le Zion, Israel

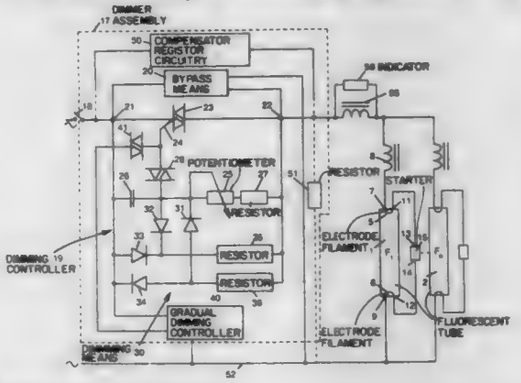
Filed Dec. 13, 1993, Ser. No. 166,501

Claims priority, application Israel, Apr. 30, 1993, 105564

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—209 R **17 Claims**

1. A dimmer assembly for controlling light intensity of a gas



discharge lamp, comprising:

dimming controller having an input terminal connectable to one pole of an alternating current source and having an output terminal connectable to the line leading to one of the two filament electrodes of the lamp, the dimming controller being adapted to provide an attenuated and conditioned power at its output terminal;

the dimming controller being adapted upon feeding the input terminal with the current, to operate in a first mode constituting a full power mode for a time period t_1, during which the link between the two terminals is in full conductance bringing about full light intensity of the discharge lamp, and being further adapted after t_1 to enter into a second mode constituting a dimming mode, during which the link between the two terminals is in partial conductance bringing about attenuated intensity of the discharge lamp; the said time t_1 is sufficient to facilitate effective dimming in the dimming mode; said dimmer assembly further comprising:

a starter unit having two terminals one connectable to each of the filament electrodes of the lamp, which, when initially energized enables electrical connectivity between the electrodes, and after a predetermined time delay disconnects the said electrical connectivity, whereby the only connection between the two terminals being then through the discharged gas inside the lamp.

5,471,117

LOW POWER UNITY POWER FACTOR BALLAST

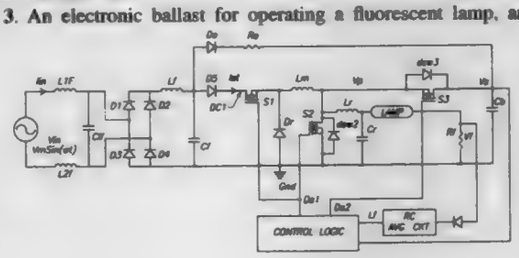
Krishnappa Ranganath, and Alexander Kurnia, both of Milwaukee, Wis., assignors to MTI International, Inc., Menomonee Falls, Wis.

Filed May 11, 1994, Ser. No. 241,058

Int. Cl.[6] H05B *41/16*

U.S. Cl. 315—247 **8 Claims**

3. An electronic ballast for operating a fluorescent lamp, and



adapted to be used with an AC power supply, said ballast comprising:

rectifier means, adapted to be connected to the AC power supply, for converting AC to a DC voltage, said rectifier means having a positive DC output terminal and a negative DC output terminal;

transformer means arranged in self oscillation mode, and providing first and second complementary drive signals;

buck boost circuitry means including an inductor having first and second ends, a first switch connected between said positive DC output terminal of said rectifier means and said first end of said inductor, said first switch being controlled by said first drive signal, a diode connected between said negative DC output terminal of said rectifier means and said first end of said inductor, and a second switch connected between said second end of said inductor and said negative DC output terminal of said rectifier means, said second switch also being controlled by said first drive signal;

means for connecting a fluorescent lamp having first and second ends such that said first end of the fluorescent lamp is adapted to be connected to said second end of said inductor, with said second switch connected between said first end of the fluorescent lamp and said negative DC output terminal of said rectifier means, and such that said second end of said fluorescent lamp is adapted to be connected to said negative DC output terminal of said rectifier means; and

a third switch connected between said second end of said inductor and said negative DC output terminal of said rectifier means, and controlled by said second output of said control circuit means,

wherein energy is stored in said inductor when said first and second switches are turned on, and energy stored in said inductor is delivered to the lamp when said third switch is turned on.

5,471,118

ELECTRONIC BALLAST WITH POWER-FACTOR-CORRECTING PRE-CONVERTER

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 20,696, Feb. 22, 1993, and Ser. No. 901,989, Jun. 22, 1992, which is a continuation-in-part of Ser. No. 856,392, Mar. 23, 1992, which is a continuation-in-part of Ser. No. 734,188, Jul. 22, 1991, which is a continuation-in-part of Ser. No. 646,497, Jan. 28, 1991, abandoned, which is a continuation of Ser. No. 107,795, Oct. 13, 1987, abandoned, which is a continuation-in-part of Ser. No. 658,423, Oct. 5, 1984, abandoned, which is a continuation-in-part of Ser. No. 555,426, Nov. 23, 1983, which is a continuation of Ser. No. 178,107, Aug. 14, 1980, abandoned, which is a continuation-in-part of Ser. No. 973,741, Dec. 28, 1978, abandoned, which is a continuation-in-part of Ser. No. 890,586, Mar. 20, 1978, Pat. No. 4,184,128, said Ser. No. 20,696is a continuation-in-part of Ser. No. 840,528, Feb. 25, 1992, Pat. No. 5,189,342, which is a continuation of Ser. No. 646,497, Feb. 25, 0, which is a continuation of Ser. No. 107,795, Feb. 25, 0, which is a continuation-in-part of Ser. No. 658,423, Feb. 25, 0, which is a continuation-in-part of Ser. No. 555,426, Feb. 25, 0, which is a continuation of Ser. No. 178,107, Feb. 25, 0, which is a continuation-in-part of Ser. No. 973,741, Feb. 25, 0, which is a continuation-in-part of Ser. No. 890,586, Feb. 25, 0. This application Sep. 12, 1994, Ser. No. 304,690

Int. Cl.[6] H05B *37/00*

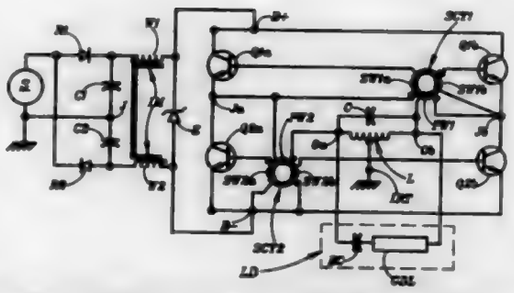
U.S. Cl. 315—247 **21 Claims**

1. An arrangement comprising:

a power line source operative to provide an AC power line voltage across a pair of power line terminals;

rectifying circuit connected with the power line terminals and operative to provide unfiltered full-wave-rectified AC power line voltage at a first pair of DC terminals;

inductor device having a set of inductor terminals;



auxiliary rectifier device having a set of auxiliary rectifier terminals;

filter capacitor connected between a second pair of DC terminals; a DC voltage of substantially constant magnitude existing between the second pair of DC terminals;

gas discharge lamp having a set of lamp terminals;

inverter-type ballasting circuit connected between the second pair of DC terminals and the lamp terminals, thereby to supply a high-frequency current thereto; the frequency of the high-frequency current being substantially higher than the frequency of the AC power line voltage; the inverter-type ballasting means being further characterized by including a pair of auxiliary inverter output terminals across which is provided a high-frequency voltage; and

connection device operative to cause series-connection of: (i) the first pair of DC terminals; (ii) the inductor terminals; (iii) the auxiliary inverter output terminals; (iv) the auxiliary rectifier terminals; and (v) the second pair of DC terminals.

5,471,119

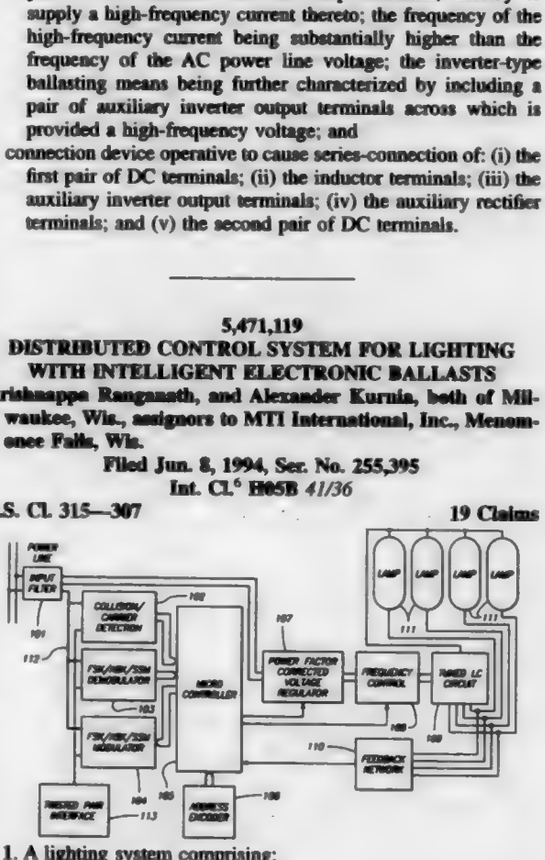
DISTRIBUTED CONTROL SYSTEM FOR LIGHTING WITH INTELLIGENT ELECTRONIC BALLASTS

Krishnappa Ranganath, and Alexander Kurnia, both of Milwaukee, Wis., assignors to MTI International, Inc., Menomonee Falls, Wis.

Filed Jun. 8, 1994, Ser. No. 255,395

Int. Cl.[6] H05B *41/36*

U.S. Cl. 315—307 **19 Claims**



1. A lighting system comprising:

an AC power line;

an electronic ballast adapted to be used with a fluorescent lamp, said ballast including means for receiving and interpreting commands transmitted on said power line to control dimming of the fluorescent lamp, said ballast including address defining means for defining an address identifying said ballast, said address defining means providing a plurality of levels of addressing, said ballast including means for initiating an arc to start the fluorescent lamp, for limiting current through the fluorescent lamp after the arc is initiated, and for dimming the light output of the fluorescent lamp; and

a control element spaced apart from said electronic ballast and including means for sending commands on said power line in a format that said ballast is capable of interpreting, said control element including means for sending an address with said command at any selected one of a plurality of levels corresponding to said plurality of levels of addressing pro-

vided by said address defining means of said ballast, said ballast including means for comparing said sent address with the address defined by said address defining means and responding to said command if said sent address matches the address defined by said address defining means, at the level selected by said control element.

5,471,120

Patent Not Issued For This Number

5,471,121

CIRCUIT FOR PRODUCING A DYNAMIC FOCUSING VOLTAGE IN A TELEVISION SET

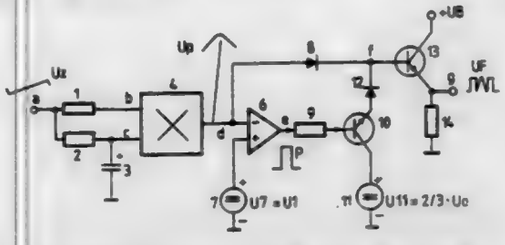
Achim Elgert, Bad Dürrheim, Germany, assignor to Deutsche Thomson-Brandt GmbH, Germany

Filed Feb. 23, 1994, Ser. No. 200,604

Claims priority, application Germany, Sep. 4, 1991, 41 29 335.5

Int. Cl.[6] H01J *29/58*

U.S. Cl. 315—382.1 **5 Claims**



1. A circuit for generating a dynamic focusing voltage in a television receiver having a tube utilizing overscan periods comprising:

means for generating a focusing voltage;

means for applying said focusing voltage to said tube during a normal scan period and during overscan periods;

means for comparing said focusing voltage and a reference voltage and providing a switching signal when said focusing voltage goes below said reference voltage;

switch means responsive to said switching signal for applying a direct focusing voltage to said tube during said overscan periods, said direct focusing voltage having a level which maintains the arithmetic mean of said focusing voltage the same during said normal scan period and said overscan periods.

5,471,122

DC-MOTOR BRIDGE DRIVER WITH END-OF-BRAKING DETECTOR

Alberto Bilotti, Florida, and Jose L. Tallarico, Buenos Aires, both of, Argentina, assignors to Allegro Microsystems, Inc., Worcester, Mass.

Filed Sep. 14, 1993, Ser. No. 210,498

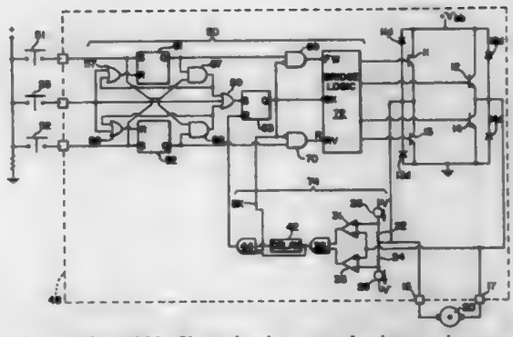
Int. Cl.[6] H02P *3/00*

U.S. Cl. 318—284 **7 Claims**

1. A full-bridge permanent magnet DC-motor driver circuit of the kind having four transistor switches connected in bridge configuration and having two bridge output terminals to which a motor may be connected, wherein the improvement comprises:

an end-of-braking detector including:

a) a differential window comparator having a differential input connected to said bridge output terminals and having a comparator output, for producing a binary signal of a first level at said comparator output only when the voltage across said two bridge output terminals is within a small voltage range centered at about zero volts; and



b) a pulse-width filter circuit means having an input connected to said window comparator output and having a filter circuit output, for producing an end-of-braking signal of a particular binary level at said filter circuit output only when said comparator-produced binary signal remains at the first level for greater than a predetermined time.

5,471,123

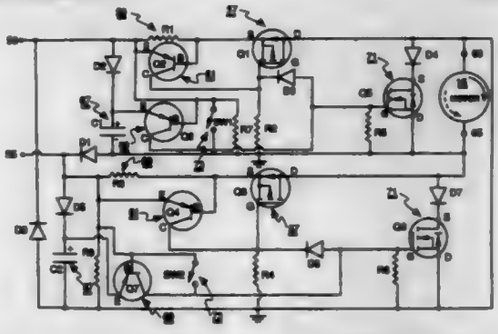
CONTROL CIRCUIT FOR FEEDBACK, MOTOR-OPERATED VALVE

Bill Tice, Carlsbad, Calif., assignor to ETI Systems, Carlsbad, Calif.

Division of Ser. No. 177,062, Jan. 3, 1994. This application Mar. 16, 1995, Ser. No. 404,916

Int. Cl.[6] H02P *3/12*

U.S. Cl. 318—373 **9 Claims**



1. A control circuit for instantaneously braking rotation of a direct-current driven motor upon termination of power from a voltage source comprising:

a) means for storing a potential during circuit operation including a normally-open, voltage-actuated first switch means for isolating said stored potential from the rest of said circuit during motor operation;

b) voltage-regulated, current-passing means for passing current from a direct-voltage source to the motor; and,

c) a normally-open, voltage-actuated second switch means interconnected said first switch means, the motor, and ground during application of power to the motor;

d) whereupon terminating drive voltage to said motor causes said first switch means to close and release said stored potential simultaneously to said current-passing means to deactivate said current-passing means and to said second switch means to ground the motor terminals to immediately drain all forward and reverse EMF to ground and stop rotation of the motor.

5,471,124
METHOD FOR DETERMINING THE POSITION IN A CASSETTE RECORDER

Jürgen Kaaden, Villingen-Schwenningen, and Gerhard Reiner, Schonach, both of, Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany

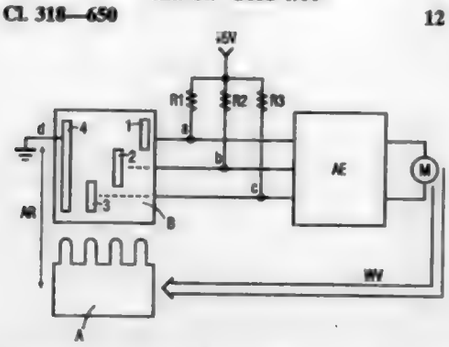
PCT No. PCT/EP92/02671, § 371 Date Jun. 23, 1994, § 102(e) Date Jun. 23, 1994, PCT Pub. No. WO93/11534, PCT Pub. Date Jun. 10, 1993

PCT Filed Nov. 20, 1992, Ser. No. 240,752

Claims priority, application Germany, Nov. 29, 1991, 41 39 218.3

Int. Cl.[6] G05F *1/10*

U.S. Cl. 318—650 **12 Claims**



1. Method for determining the position of a tape thread-in and thread-out mechanism of a cassette recorder having position switches, comprising the steps of:

in a calibration operation,

stepping said mechanism through a plurality of positions for producing signals in said position switches that vary in accordance with said plurality of positions;

applying said position switches signals to a resistor network;

applying an output signal of said resistor network to an analog-to-digital converter for producing an output signal of said converter at a plurality of values that are indicative of said plurality of positions, respectively;

storing said plurality of values in a memory; and,

in normal operation,

retrieving said stored plurality of values for determining the position of said mechanism.

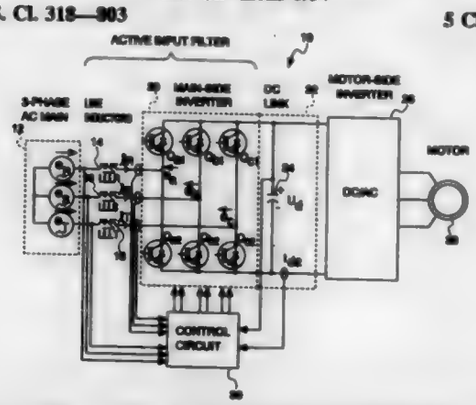
5,471,125
AC/DC UNITY POWER-FACTOR DC POWER SUPPLY FOR OPERATING AN ELECTRIC MOTOR

Jian M. Wu, Rockford, Ill., assignor to Danfoss A/S, Nordborg, Denmark

Filed Sep. 9, 1994, Ser. No. 303,373

Int. Cl.[6] H02P *5/34*

U.S. Cl. 318—803 **5 Claims**



1. A unit power-factor direct current power supply for the supply of an inverter which operates a three phase motor load, said power supply having a pwm-controlled power converter supplied from a three phase alternating current source and comprising self-commutated semiconductor switch devices for delivering an output DC voltage for the supply of the load connected thereto, said converter having a control circuit comprising a voltage regulator having an input supplied with a signal representing a voltage deviation between a DC reference voltage and the output DC voltage and an output fed to a first input of three modulators as a current reference value, each of said modulators having a second input being connected to a sinusoidal phase voltage signal derived from the three phase alternating current source, said modulators having outputs comprising current reference signals, said current reference signals being applied to a gate signal circuit which includes means to produce firing pulses for operating switch devices of the converter, and including a sequence circuit connected to said gate signal circuit, said sequence circuit including means to allow the converter to operate in a first mode and a second mode depending on control deviation of said voltage regulator, the sequence circuit in the first mode generating a first switch pattern for controlling the switch devices to operate in a motor mode, the sequence circuit in the second mode generating a second switch pattern for controlling the switches in a generating mode, whereby in both modes currents of the three phase alternating current source are substantially sinusoidal, but in the second mode in a phase opposite to that of the voltages of the alternating current source, said second switch pattern being generated when the output DC voltage tends to rise above the DC reference voltage.

5,471,126
SLIP FREQUENCY CONTROL METHOD FOR INDUCTION MOTORS

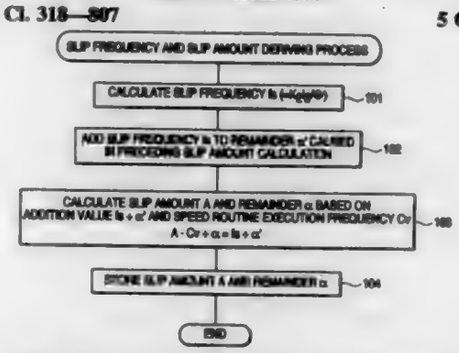
Shinichi Kono, and Masaaki Fukukura, both of Oshino, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Continuation of Ser. No. 566,472, Aug. 21, 1990, abandoned. This application Jan. 13, 1994, Ser. No. 181,873

Claims priority, application Japan, Dec. 24, 1988, 63-324795

Int. Cl.[6] H02P *7/00*

U.S. Cl. 318—807 **5 Claims**



1. A slip frequency control method for an induction motor, comprising the steps of:

(a) deriving slip frequency data on the basis of a secondary current command generated based on a torque command determined by a difference between an actual speed of the induction motor and a speed command, and an excitation magnetic flux command, in a speed control software routine;

(b) deriving slip amount data for the one period of the speed control software routine on the basis of the derived slip frequency data;

(c) deriving slip distribution data for one period of a current control software routine on the basis of the derived slip amount data;

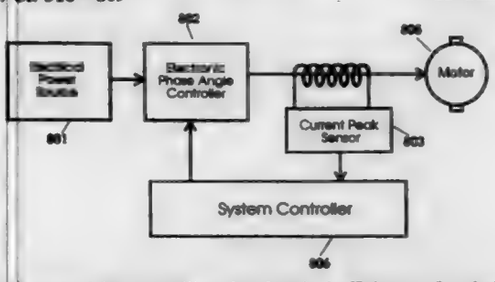
(d) adding speed data indicative of the actual speed of the induction motor to the derived slip distribution data, to derive excitation magnetic flux frequency data; and

(e) controlling the induction motor based on the excitation magnetic flux frequency data.

5,471,127
INDUCTION MOTOR CONTROL

Mark C. V. Vaughan, and Simon P. Vaughan, both of Cornwall, England, assignors to Energy Reduction International Ltd., England

Filed May 4, 1994, Ser. No. 238,154
Int. Cl.[6] H02P *5/28*
U.S. Cl. 318—809 **13 Claims**



1. A method for controlling the electrical efficiency of an induction motor that is subject to mechanical loads that can vary with time, by employing a phase controller in series with the motor's supply line voltage comprising the following steps:

(a) measuring a reference current peak value supplied to said motor;

(b) incrementally increasing a phase gap in the line voltage applied to said motor, until an increase more than a predetermined amount in an immediately-subsequent current peak value occurs;

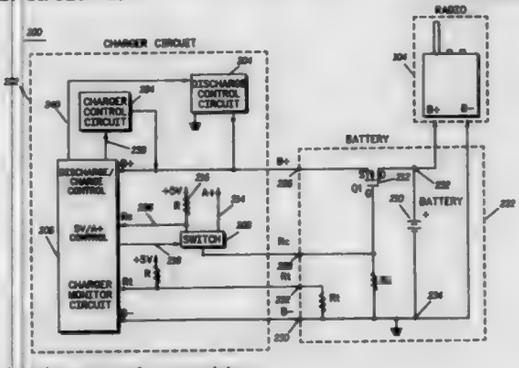
(c) incrementally reducing said phase gap to a magnitude incrementally narrower than the phase gap that caused the occurrence of said increase more than a predetermined amount in said immediately-subsequent current peak value in step (b) ; and

(d) repeating steps (a), (b), and (c) sequentially as the motor runs.

5,471,128
BATTERY AND METHOD FOR CHARGING/ DISCHARGING THE BATTERY

Joseph Patino, Plantation; Henry A. Bogut, Coral Springs, and James L. Tidwell, Fort Lauderdale, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 26, 1993, Ser. No. 157,499
Int. Cl.[6] H01M *10/44*
U.S. Cl. 320—13 **11 Claims**



1. A battery pack, comprising:

reverse discharge protection circuitry;

a battery pack contact;

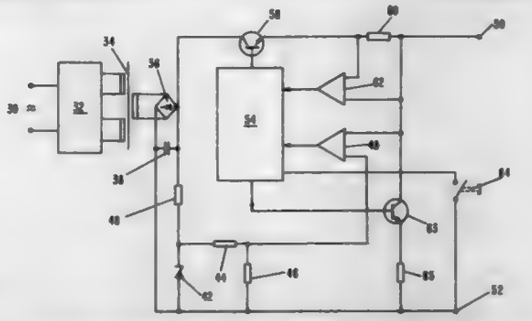
a battery cell having a battery terminal; and

a switchable means coupled between the battery terminal and the battery pack contact, the switchable means switching between a first state allowing for current to flow between the battery terminal and the battery pack contact and a second state in which current is not allowed to flow between the battery pack contact and the battery terminal.

5,471,129
RECHARGEABLE LIGHT CURING APPARATUS

Roland Mann, Vaduz, Liechtenstein, assignee to Ivoclar AG, Schaan, Liechtenstein

Filed Apr. 2, 1993, Ser. No. 42,021
Claims priority, application Germany, Apr. 3, 1992, 42 11 230.3
Int. Cl.[6] H01M *10/46;10/48*
U.S. Cl. 320—21 **32 Claims**



1. A rechargeable light curing apparatus in combination with a recharging unit, wherein said rechargeable light curing apparatus comprises:

at least one hand-operated device with a handle and an on/off switch comprising:

a) a battery pack with at least one accumulator;

b) an electrical contact for recharging said battery pack;

c) a lamp, connected to said battery pack, for emitting light at a defined light emission state when switched on by said on/off switch;

d) light conducting elements positioned in the vicinity of said lamp for receiving and conducting the emitted light;

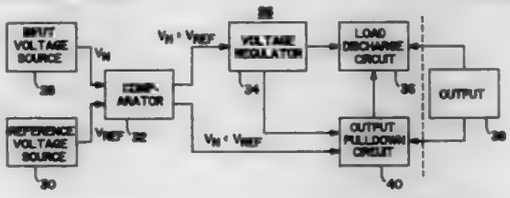
e) a capacity measuring circuit connected between said battery pack and said lamp for determining a remaining operating period of said battery pack remaining before a recharging of said battery pack is required; and wherein

said recharging unit is detachably connected to said hand-operated device, wherein, when said hand-operated device is inserted into said recharging unit, a quick recharging mode is switched on, said recharging unit comprising a control unit for switching from said quick recharging mode to a charge maintaining mode, wherein in said quick recharging mode a pulsed recharging current is used having a characteristic curve adapted to the charge level of said battery pack, and wherein intervals between two pulses of said pulsed recharging current, a terminal voltage, corresponding to the charging level of said battery pack, to be measured during a respective interval is prepared.

5,471,130
POWER SUPPLY CONTROLLER HAVING LOW STARTUP CURRENT

Dan Agiman, Rosh Haain, Israel, assignor to Linfinity Microelectronics, Inc., Garden Grove, Calif.

Filed Nov. 12, 1993, Ser. No. 151,512
Int. Cl.[6] G05F *5/00*
U.S. Cl. 323—303 **27 Claims**



1. A power supply controller coupled to a capacitive load

capable of providing power temporarily and responsive to an input voltage comprising the combination of:

means for driving the load when the input voltage exceeds a reference value; and

means for driving the load into a pull down mode using power stored in the capacitive load from the output of tile load when the input voltage is less than the threshold value.

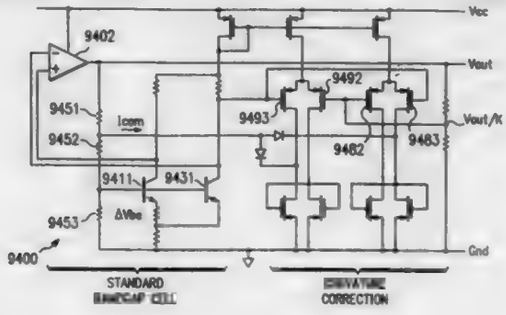
5,471,131
ANALOG-TO-DIGITAL CONVERTER AND REFERENCE VOLTAGE CIRCUITRY

Ken R. King, Palm Bay; David W. Riemer, Melbourne Beach, and Gerald M. Cotreau, Melbourne, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 785,395, Oct. 30, 1991, Pat. No. 5,382,916. This application Aug. 9, 1994, Ser. No. 287,763

Int. Cl.[6] G05F *3/20*

U.S. Cl. 323—314 **5 Claims**



5. A reference voltage circuit, comprising:

a bandgap generator including:

first and second bipolar transistors of differing emitter sizes and bases tied together; and

a differential amplifier with inputs sensing the collector currents of said first and second bipolars, and with output driving the bases of said bipolars through a resistive divider, said bandgap generator providing an uncompensated output with a maximum when the temperature of operation equals Tp;

a correction circuit connected to said resistive divider to provide a compensation current of a single polarity and dependent upon the difference between the temperature of operation and Tp and including:

a differential pair dividing a fixed current, said pair including first and second devices with said first device controlled by a signal varying (to first order approximation) linearly with the temperature of operation and with said second device controlled by a signal not varying (to first order approximation) with the temperature of operation; and

first and second diodes connecting said resistive divider to said first and second devices, respectively;

said first and second devices sized to draw no current from said resistive divider at temperature Tp

whereby at temperatures above Tp said correction circuit draws current from said resistive divider through said first diode, and at temperatures below Tp said correction circuit draws current from said resistive divider through said second diode.

5,471,132
LOGARITHMIC AND EXPONENTIAL CONVERTER CIRCUITS

Marc H. Ryat, Santa Clara, Calif., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

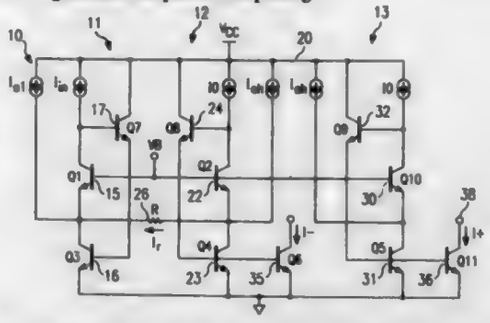
Continuation-in-part of Ser. No. 70,274, Oct. 1, 1993, which is a continuation-in-part of Ser. No. 31,647, Mar. 15, 1993, which is a continuation-in-part of Ser. No. 950,091, Sep. 23, 1992, abandoned. This application Jun. 1, 1993, Ser. No. 70,276

Claims priority, application France, Sep. 30, 1991, 91 12278

Int. Cl.[6] G05F *3/26*

U.S. Cl. 323—315 **20 Claims**

1. A logarithmic amplifier comprising:



first and second mirror circuits, each comprising an active transistor, a cascode transistor, and a base current compensating transistor, the cascode and active transistors being connected in series between an input node connected to the cascode transistor and a reference potential connected to the active transistor, a base of the cascode transistor being connected to a bias voltage, and the base current compensating transistor being connected between a supply voltage source and a base of the active transistor, a base of the base current compensating transistor being connected to the input node;

a resistor connected between the cascode and active transistors of the first and second mirror circuits;

and a first output circuit for developing a first output signal in response to a current flowing of one of said active transistors said first output circuit comprising a first output transistor between a first output signal node and the reference potential, and having a base connected to the base of the active transistor of the second mirror circuit;

a second output circuit, said second output circuit comprising a third mirror circuit including:

an active transistor, a cascode transistor, and a base current compensating transistor, the cascode and active transistors being connected in series between an input node connected to the cascode transistor and a reference potential connected to the active transistor, a base of the cascode transistor being connected to the base of the cascode transistor of the second mirror circuit, and the base current compensating transistor being connected between a supply voltage source and a base of the active transistor, a base of the base current compensating transistor being connected to the input node of the third mirror circuit: and

a second output transistor connected between a second output signal node and the reference potential, having a base connected to the base of the active transistor of the third mirror circuit, whereby when a second reference current is applied between the input node of the third mirror circuit and the supply voltage source, the first and second output signals are differential signals;

whereby when an input current is applied between the input node and the supply voltage source of the first mirror circuit, and a first reference current is applied between the input node and the supply voltage source of the second mirror circuit, the first and second output signals have a logarithmic relationship to the input current.

5,471,133

DIGITAL DEVICE FOR MEASURING THE FREQUENCY OF AN ELECTRICAL SIGNAL

Tevfik Sezi, Berlin, Germany, assignor to Siemens Aktiengesellschaft, München, Germany

PCT No. PCT/DE93/00262, § 371 Date Oct. 5, 1994, § 102(e) Date Oct. 5, 1994, PCT Pub. No. WO93/20454, PCT Pub. Date Oct. 14, 1993

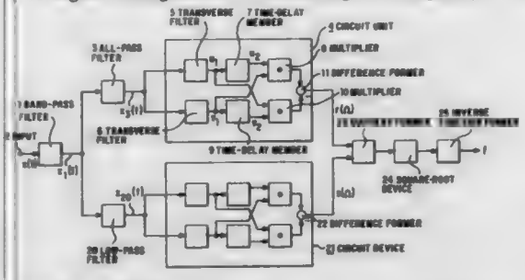
PCT Filed Mar. 18, 1993, Ser. No. 318,617

Claims priority, application Germany, Apr. 6, 1992, 42 11 946.4

Int. Cl.[6] G01R *23/165;23/167*

U.S. Cl. 324—76.44 4 Claims

1. A digital arrangement for measuring the frequency of an



electrical signal x(t) comprising:

a. a linear-phase non-recursive digital filter with symmetrically distributed filter coefficients (a(n)) is developed as an all-pass filter and is acted on by the electrical signal;

b. a second linear-phase non-recursive digital filter with symmetrically distributed filter coefficients (t(n)), which also acted on by the electrical signal, is so developed as a low-pass filter that its transfer function (T(n)) at a predetermined frequency (f_n) of the electrical signal (x(t)) has a value of one;

c. following said all-pass filter there is arranged a circuit unit which includes,

i. a first branch containing a linear phase transverse filter with symmetrically distributed filter coefficients (h(n)), a time-delay member following the linear phase transverse filter and a first multiplier following said time-delay member,

ii. a second branch, parallel to said first branch and having a further linear-phase transverse filter with anti-symmetrically distributed filter coefficients (g(n)) and a value of one of its transfer function with the predetermined frequency (f_n), a further time-delay member following said linear phase transverse filter of said second branch, and a further multiplier arranged following said further time-delay member,

iii. said first multiplier on the input side also being connected to an output of said further transverse filter and the further multiplier also being connected to the output of said transverse filter, and

iv. a difference former which has its inputs connected to the outputs of the first and further multipliers;

d. a circuit device, identical in construction to said circuit unit is arranged following said second linear-phase non-recursive digital filter;

e. a quotient former to which the outputs of the difference formers of said circuit unit and said circuit device are connected;

f. a square-root device following said quotient former; and

g. an inverse-function being connected to said square-root device.

5,471,134

MEASURING APPARATUS WITH ADJUSTABLE INDICATOR FOR MEASURING THE REAL LOAD FACTOR ON AN ELECTRICITY SOURCE

Jean-Claude Oudille, Joue Les Tours, and Antonio Veiga, Tours, both of, France, assignors to Saft, Romainville, France

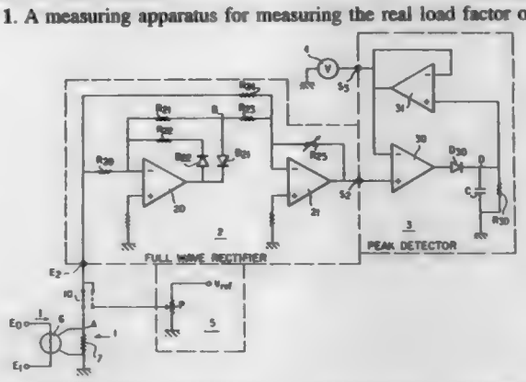
Filed Nov. 24, 1992, Ser. No. 980,970

Claims priority, application France, Nov. 26, 1991, 91 14558

Int. Cl.[6] G01R *19/00;27/00*

U.S. Cl. 324—103 P 7 Claims

1. A measuring apparatus for measuring the real load factor on



an electricity source delivering an AC current to a consumer appliance;

wherein the apparatus comprises:

a current sensor supplying a signal that is continuously proportional to the current delivered by the source;

a rectifier circuit receiving said signal and supplying a rectified signal;

a peak detector circuit receiving the rectified signal and extracting therefrom the peak value;

an indication means for displaying a percentage value comprised between 0% and 100%; and

means for adjusting the gain of the measuring apparatus so that the indication means displays 100% when the measured peak value reaches a specified maximum level which is the highest peak intensity which can be supplied by the source.

5,471,135

TESTER AND METHOD FOR TESTING A RECTIFIER-REGULATOR

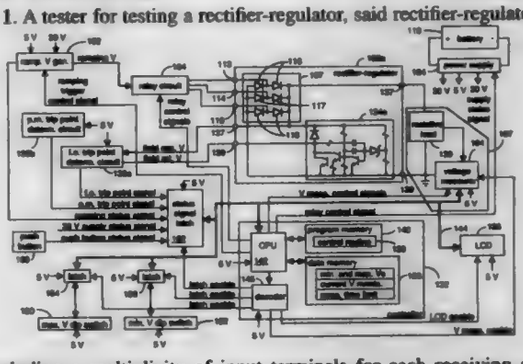
Eric Jagger, 111 Bean Creek Rd. #144, Scotts Valley, Calif. 95066, and Hyung Paek, 2645 California St. #305, Mountain View, Calif. 94040

Filed Oct. 20, 1994, Ser. No. 325,970

Int. Cl.[6] G01R *31/00*

U.S. Cl. 324—158.1 12 Claims

1. A tester for testing a rectifier-regulator, said rectifier-regulator



including a multiplicity of input terminals for each receiving an input voltage from an alternator and an output terminal for providing in response an output current at an output voltage to a battery, said rectifier-regulator having a trip point at which said output

current is regulated by said rectifier-regulator and at which said output voltage is a trip point output voltage, said tester comprising;

a ramping voltage generator configured to generate a ramping input voltage during each of a multiplicity of ramping cycles in response to a ramping control signal for each ramping cycle;

a relay circuit configured to relay said ramping input voltage to one of said input terminals during each ramping cycle in response to relay control signals for each ramping cycle, said rectifier-regulator providing in response a ramping output voltage at said output terminal during each of said ramping cycles;

a trip point determination circuit configured to (A) determine when said trip point occurs during each of said ramping cycles and (B) generate in response a trip point signal during each of said ramping cycles indicating that said trip point has occurred;

a voltage measurement circuit configured to make voltage measurements during each of said ramping cycles representing said ramping output voltage;

a memory configured to store a predefined maximum trip point voltage and a predefined minimum trip point voltage;

a controller configured to (A) generate said ramping control signals, (B) generate said relay control signals, (C) estimate said trip point output voltage for each ramping cycle in response to said trip point signal and said voltage measurements, (D) compare said estimated trip point voltage for each of said ramping cycles with said stored predefined maximum and minimum voltages, and (E) generate a trip point error flag indicating a trip point error for each of said ramping cycles for which said compared trip point voltage does not fall within a range between said stored predefined maximum and minimum voltages.

5,471,136

TEST SYSTEM FOR CALCULATING THE PROPAGATION DELAYS IN SIGNAL PATHS LEADING TO A PLURALITY OF PINS ASSOCIATED WITH A CIRCUIT

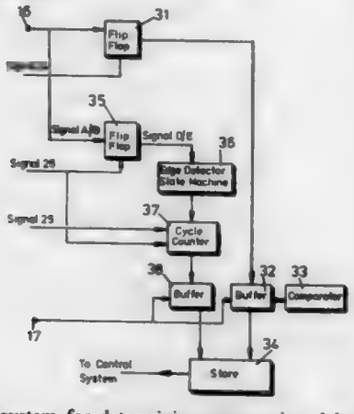
Richard Pye, Stockport, United Kingdom, assignor to Genrad Limited, United Kingdom

Continuation-in-part of Ser. No. 898,229, Jun. 12, 1992, abandoned. This application Nov. 2, 1993, Ser. No. 146,989

Claims priority, application United Kingdom, Jul. 24, 1991, 9115992

Int. Cl.[6] **G01R** *31/28*

U.S. Cl. 324—158.1 **14 Claims**



1. A test system for determining propagation delays in signal paths leading to an array of pins associated with a circuit comprising:

(a) means for applying timing signals to each of the signal paths in parallel;

(b) means for applying a unique pin identifying signal to each of the signal paths;

(c) a probe adapted to be wiped across the pins for detecting signals on each pin with which it comes into contact,

(d) means for identifying a pin with which said probe is in contact from said unique pin identifying signal detected by said probe; and

(e) means for calculating the propagation delay in the signal path leading to the pin with which said probe is in contact from said timing signals detected by said probe.

5,471,137

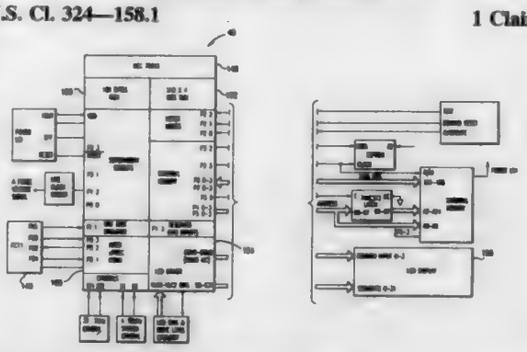
SYSTEM CHECKING AND TROUBLESHOOTING PACKAGE FOR AN ELECTRONIC METERING DEVICE

Forrest W. Briese, Norcross, Ga.; Charles C. Hyder, Danbury, England; John M. Schlarb, Duluth, Ga.; Christophe J. A. Fouquet, Norcross, Ga., and Coy S. Lowe, Talking Rock, Ga., assignors to Schlumberger Industries, Inc., Norcross, Ga.

Division of Ser. No. 37,938, Mar. 26, 1993. This application Nov. 3, 1994, Ser. No. 333,660

Int. Cl.[6] **G01R** *13/00;* **G06F** *15/20*

U.S. Cl. 324—158.1 **1 Claim**



1. An apparatus for calculating the phase angle of at least one phasor relative to a selected base phasor in a multi-phase electrical system, the apparatus including:

a microprocessor;

memory storage means for storing accumulated digital values corresponding to the instantaneous voltage measured for the base phasor, X_B;

memory storage means for storing accumulated digital values corresponding to the instantaneous value measured for another selected phasor X_N;

logic for calculating, for a pre-defined period, the RMS values for X_B and X_N, denoted $X_{B(RMS)}$ and $X_{N(RMS)}$, respectively;

logic for determining the product, P, of $X_{B(RMS)}$ and $X_{N(RMS)}$;

logic for determining the average value, Q, of the product of the two sine waves corresponding to X_B and X_N;

logic for determining the average value, Y, of the product of the two sine waves corresponding to a shifted version of X_B, denoted $X_{B(-90)}$, and X_N;

logic for determining the phase angle θ equal to arccos (Q/P).

5,471,138

INDUCTIVE VALVE MOTION SENSOR FOR POSITIONING OUTSIDE THE BODY OF THE VALVE

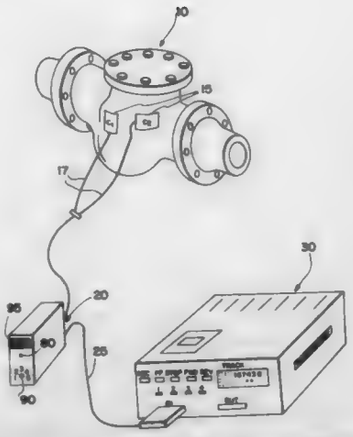
Samuel W. Glass, III, 222 Norfolk Ave., Lynchburg, Va. 24503; Timothy A. Rossman, 107 Edgewood Dr., Lynchburg, Va. 24502, and Vedat T. Ataman, 2400G Weeping Willow Dr., Lynchburg, Va. 24501

Filed Feb. 23, 1993, Ser. No. 21,376

Int. Cl.[6] **G01B** *7/14;* **F16K** *37/00*

U.S. Cl. 324—207.19 **3 Claims**

1. A system for inductively inspecting a valve having an internal



moving part within a body of the valve, from outside the body of the valve, the system comprising:

at least one inductive coil mounted to an outer surface of the body of the valve for projecting a magnetic field into the body such that the moving part can move across the magnetic field;

sensing means connected to the inductive coil for detecting movement by the moving part through the magnetic field produced by the coil, the sensing means generating an output signal corresponding to any movement of the part, the sensing means comprising an oscillator for generating an excitation signal, the excitation signal being provided to the inductive coil for producing the magnetic field, a bridge circuit connected to the coil for detecting a change in the magnetic field caused by any movement of the part within the magnetic field, the bridge circuit providing the output signal corresponding to any movement of the part within the magnetic field, at least one amplifier connected between the oscillator and the bridge circuit for amplifying the excitation signal, an amplifier in the bridge circuit for amplifying the output signal, a rectification and low pass filter circuit connected to the bridge circuit for rectifying and filtering the output signal, a sample and hold circuit connected to the rectification and low pass filter circuit for sampling the output signal at a selected sample time, a balance and null circuit connected to the sample and hold circuit for receiving the sampling of the output signal, and being connected to the rectification and low pass filter circuit for receiving the output signal, the balance and null circuit including a balancing amplifier for receiving the output signal from the rectification and low pass filter circuit and the sampling of the output signal from the sample and bold circuit, and a last stage gain and filter circuit connected to the balance and null circuit for a final gain control and filtering of the output signal;

display means connected to the last stage gain and filter circuit for displaying the output signal; and

recording means connected to the last stage gain and filter circuit for recording the output signal.

5,471,139

FIBER OPTIC LINE MAGNETOMETER HAVING THERMAL COMPENSATION

Leon N. Zadoff, Merrick, N.Y., assignor to EMS Development Corporation, Farmingdale, N.Y.

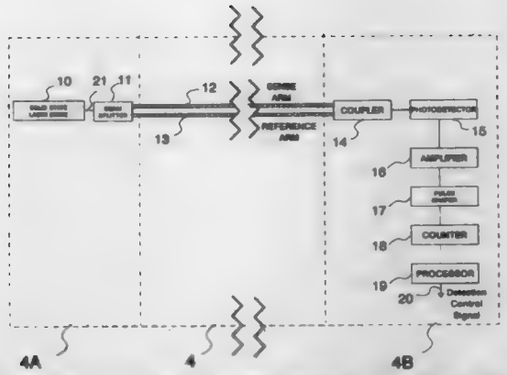
Filed Jun. 28, 1993, Ser. No. 83,121

Int. Cl.[6] **G01B** *7/14;9/02;* **G02B** *5/14*

U.S. Cl. 324—244.1 **15 Claims**

1. A fiber optic line magnetometer for detecting the magnetic field form by a train positioned within a predetermined block of a train track, the fiber optic line magnetometer comprising;

a. means for generating a light source:



b. reference arm means optically coupled to said light source, said reference arm means optically transmitting said light source over the length of said reference arm and outputting a first optical signal;

c. sense arm means optically coupled to said light source, said sense arm means optically transmitting said light source over the length of said sense arm and outputting a second optical signal, said sense arm means varying optical transmission characteristics in response to the magnetic field of the train being applied thereto;

said sense arm means and said reference arm means being positioned closely adjacent to each other, both said sense arm means and said reference arm means position substantially parallel to the train tracks over substantially the entire length of the predetermined block; and

d. a processing means optically coupled to receive said first optical signal and said second optical signal, said processing means arranged to output a detection signal when a phase shift between said first optical signal and said second optical signal exceeds a predetermined threshold,

wherein said sense arm means comprises;

a. a first fiber optic cable for optically transmitting the light source over the length of the sense arm means;

b. a plurality of magnetostrictive elements, each of said plurality of magnetostrictive elements varying in length as a function of the magnetic field applied thereto; and

c. mechanical coupling means for mechanically coupling each of said plurality of magnetostrictive elements to said first fiber optic cable in a manner such that changes in the length of the magnetostrictive elements causes changes in the length of the first fiber optic cable, and

wherein said plurality of magnetostrictive elements of said sense arm means have a first thermal expansion coefficient, and wherein said reference arm means comprises;

a. a second fiber optic cable for optically transmitting the light source over the length of the reference arm means;

b. a plurality of non-magnetostictive elements, each of said plurality of non-magnetostrictive elements having a second thermal expansion coefficient, said ratio of the length of each of said plurality of magnetostrictive elements to the length of each of said plurality of non-magnetostrictive elements equals said first thermal expansion coefficient divided by said second thermal expansion coefficient; and

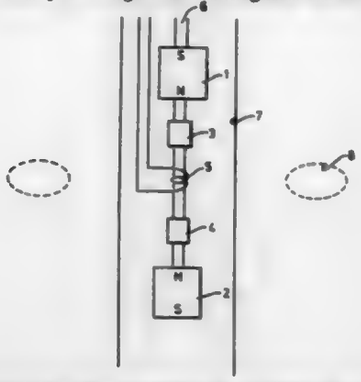
c. mechanical coupling means for mechanically coupling each of said plurality of non-magnetostrictive elements to said second fiber optic cable in a manner such that changes in the length of the non-magnetostrictive elements causes changes in the length of the second fiber optic cable.

5,471,140
MAGNETIC FIELD GENERATING ASSEMBLY

Peter Hanley, Gloucestershire, Great Britain, assignor to Oxford Instruments Limited, Oxford, Great Britain

Continuation of Ser. No. 39,049, Apr. 12, 1993, abandoned. This application Nov. 17, 1994, Ser. No. 343,880
Claims priority, application United Kingdom, Jan. 11, 1990, 9022145
Int. Cl.[6] G01R *33/20*
U.S. Cl. 324—303 29 Claims

1. An assembly which generates a magnetic field in a working



volume spaced from the assembly, the assembly for use in NMR apparatus and comprising:

first and second magnets, each having a north and a south pole and a respective magnet axis which joins the north and south poles, the first and second magnets being positioned so that the respective magnet axes are along a main axis of the assembly and a pole of the first magnet faces a like pole of the second magnet; and

third and fourth magnets, each having a north and a south pole and a respective magnet axis which joins the north and south poles, the third and fourth magnets being positioned so that the respective magnet axes are substantially parallel with the main axis, wherein the position of at least one magnet of the group comprising the first, second, third and fourth magnets is adjustable in the direction of the main axis and the relative positions and magnetic field strengths of the first, second, third and fourth magnets are chosen to control the radial dimension and the characteristics of the magnetic field generated in the working volume to form a magnetic field suitable for use in an NMR experiment.

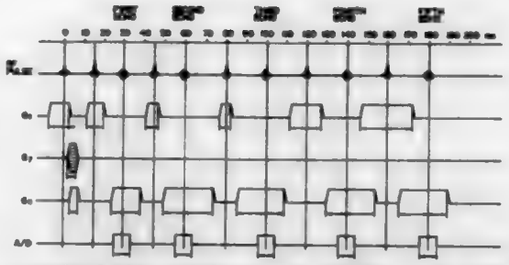
5,471,141
METHOD AND APPARATUS FOR REGULATING RADIO FREQUENCY PULSE

Makoto Yoshida; Naoki Satoh, both of Katsuta; Hidehiko Asoh, Mito; Tuyosi Shudo, Katsuta; Ryuzaburo Takeda, Mito, and Jun'ichi Taguchi, Yokohama, all of, Japan, assignors to Hitachi, Ltd., and Hitachi Instrument Engineering Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 131,570, Oct. 4, 1993, abandoned, which is a continuation of Ser. No. 696,640, May 7, 1991, abandoned. This application Jan. 20, 1995, Ser. No. 376,065
Claims priority, application Japan, May 7, 1990, 2-115766
Int. Cl.[6] G01R *33/48*
U.S. Cl. 324—314 14 Claims

1. For a sample placed inside a static magnetic field in which a radio frequency pulse is irradiated to said sample and an image on the status of said sample is obtained on the basis of a nuclear magnetic resonance signal obtained thereby from said sample, a method of regulating said radio frequency pulse to be executed for obtaining the image, associated with said sample, comprising the steps of:

inhibiting occurrence of nuclear magnetic resonance signals from portions in a slice of said sample other than a selected portion of said slice including when said selected portion is



associated with a relatively weaker NMR signal than NMR signals from other than said selected portion of said slice, said slice corresponding to a selected cross-section of said sample, wherein said selected portion of said slice is defined by a grid portion thereof corresponding to a plan view area of said slice surrounded by rectangular grid portions of said slice disposed to become saturated such that when said radio frequency pulse is irradiated to said sample the image to be formed is comprised from said selected portion in said slice;

generating said nuclear magnetic resonance signal from the selected portion in the slice of said sample under such a signal occurrence inhibition state; and

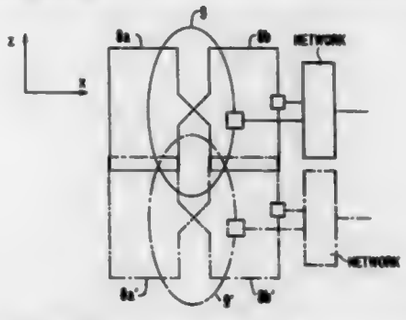
regulating at least one of the irradiation time and amplitude of said radio frequency pulse so as to set a flip angle of a spin of said selected portion to a desired angle on the basis of said nuclear magnetic resonance signal generated from said selected portion.

5,471,142
CIRCULARLY POLARIZED LOCAL ANTENNA ARRANGEMENT FOR A NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS AND METHOD FOR OPERATING SAME

Jianmin Wang, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 24, 1993, Ser. No. 125,804
Claims priority, application Germany, Sep. 30, 1992, 42 32 827.6
Int. Cl.[6] G01R *33/28*
U.S. Cl. 324—318 6 Claims

1. A circularly polarized local antenna arrangement for a nuclear



magnetic resonance tomography apparatus, said antenna arrangement comprising:

an array of at least three local coils which are individually linearly polarized, said local coils being disposed relative to each other to overlap for geometrically decoupling said local coils from each other, each local coil generating an output signal; and

combination network means, supplied with said output signals from said local coils, for conducting a complex operation on said output signals for producing a radio-frequency signal corresponding to a circular polarization of said array.

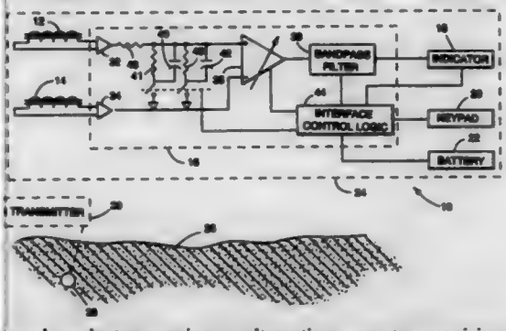
5,471,143

APPARATUS FOR LOCATING BURIED CONDUCTORS USING PHASE-SHIFTED SIGNALS

Ziyad H. Doany, Austin, Tex., assignor to Minnesota Mining and Manufacturing Co.

Filed Jan. 29, 1993, Ser. No. 11,383
Int. Cl.[6] G01V 3/10
U.S. Cl. 324—326 18 Claims

1. An apparatus for detecting a test signal radiating from an



obscured conductor carrying an alternating current, comprising:

first means for sensing the test signal and creating a first electrical signal based thereon;

second means for sensing the test signal and creating a second electrical signal based thereon, said second sensing means being spatially displaced from said first sensing means, each of said first and second sensing means being parallel;

means for shifting the phase of said first electrical signal relative to said second electrical signal, resulting in a phase-shifted signal;

means for subtractively comparing said phase-shifted signal to said second electrical signal, yielding an electrical output signal; and

means for providing an indication of the amplitude of said output signal.

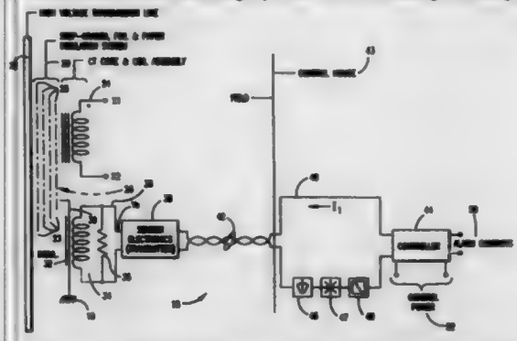
5,471,144

SYSTEM FOR MONITORING THE INSULATION QUALITY OF STEP GRADED INSULATED HIGH VOLTAGE APPARATUS

Thomas J. Meyer, Pinellas Park, Fla., assignor to Square D Company, Palatine, Ill.

Filed Sep. 27, 1993, Ser. No. 127,207
Int. Cl.[6] G01R 31/12
U.S. Cl. 324—551 19 Claims

1. An insulation monitoring system for measuring a charging



current through an insulation system between a high voltage conductor and earth ground, said insulation monitoring system comprising:

a. an AC current sensor for measuring said charging current and for converting said charging current to a first voltage signal proportional to said charging current;

b. a transmission network;

c. a transmitter coupled between said AC current sensor and said transmission network, said transmitter having electronic circuit means for converting said first voltage signal to a DC current and modulating a first current signal by said DC current for transmission over said transmission network, said modulated first current signal proportional to said charging current;

d. a controller for generating said first current signal and coupled to said transmitter by said transmission network to receive said modulated first current signal, said controller for demodulating said modulated first current signal to extract said DC current, converting said DC current to a voltage proportionally to said charging current, comparing said proportional voltage with a preset voltage level, and generating an alarm signal when said proportional voltage exceeds said preset voltage level; and

e. wherein said insulation monitoring system continuously monitors said insulation system.

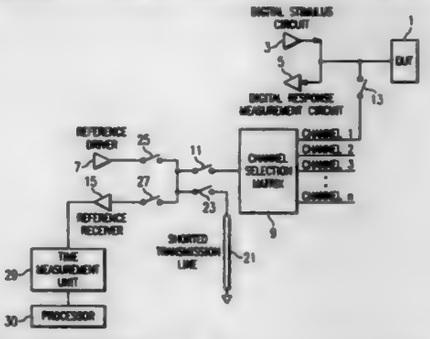
5,471,145

CALIBRATING TRANSITION DEPENDENT TIMING ERRORS IN AUTOMATIC TEST EQUIPMENT USING A PRECISE PULSE WIDTH GENERATOR

Marc R. Mydill, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 7, 1994, Ser. No. 224,225
Int. Cl.[6] G04F 10/00
U.S. Cl. 324—601 5 Claims

1. A method of calibrating transition dependent equipment tim-



ing errors, comprising the steps of:

generating an incident signal onto a short circuited transmission line to ground;

measuring a time difference measurement between said incident signal and a reflection of said incident signal resulting from generation of said reference signal onto said short circuited transmission line;

determining the difference between said time difference measurement and a known pulse width of said short circuited transmission line to provide an indication of the transition-dependent error of said time difference measurement; and

compensating subsequent pulse width measurements in response to said indicating the transition-dependent error.

5,471,146

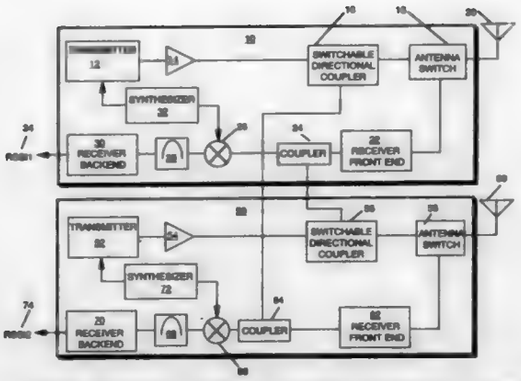
METHOD AND APPARATUS FOR MEASURING RETURN LOSS

Paul D. Krayeski, Plantation; Paul D. Marko, Fort Lauderdale, and Stellos J. Patsiokas, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 14, 1993, Ser. No. 76,218
Int. Cl.[6] H04B 1/00
U.S. Cl. 324—637 14 Claims

1. A return loss meter for base stations, comprising:

a first transceiver having a first transmitter, a first receiver, and a first antenna;



a second transceiver having a second transmitter, a second receiver, and a second antenna, wherein the first transceiver and the second transceiver are coupled and are both within the base station;

means for measuring reflected and transmitted power of the first antenna via a first directional coupler capable of being switched between the first antenna and the second receiver and via a device capable of measuring received signal strength at the second receiver;

means for measuring reflected and transmitted power of the second antenna via a second directional coupler capable of being switched between the second antenna and the first receiver and via a device capable of measuring received signal strength at the first receiver, wherein the first directional coupler and the second directional coupler comprise a dual directional coupler coupled to a first anttenuator and a second attenuator and wherein the dual directional coupler, comprises a coupler having a first input port and a second input port and first output port and a second output port, the first input port receives transmitted power from the first transmitter, while the second input port receives reflected power and out of band energy from the second antenna, the first output port provides coupled transmitted power through the first attenuator while the second output port provides coupled reflected power and out of band energy through the second attenuator and a switching means for providing a desired coupled power output for measuring return loss.

5,471,147

APPARATUS AND METHOD FOR DETERMINING THE LINEAR POSITION OF A HYDRAULIC CYLINDER

William E. Allen; Ali A. Bitar, both of Peoria, and Robert A. Herold, Peoria Heights, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

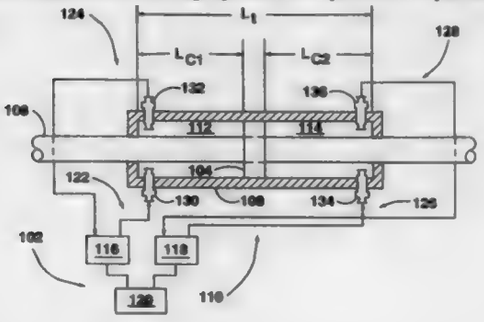
PCT No. PCT/US91/07313, § 371 Date Oct. 3, 1991, § 102(e) Date Oct. 3, 1991, PCT Pub. No. WO93/07444, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 3, 1991, Ser. No. 30,184

Int. Cl.[6] G01R *27/04*

U.S. Cl. 324—635 **15 Claims**

10. A method for detecting a position of a piston and a piston rod being movable within a housing, said piston, piston rod, and housing defining first and second coaxial resonant cavities, including the steps of:



determining the resonant frequency of one of said first and second coaxial resonant cavities and responsively producing a first resonant frequency signal;

receiving said first resonant frequency signal and responsively determining a first location of said piston;

determining if said first determined location is valid; and

determining the resonant frequency of the other of said first and second coaxial resonant cavities and responsively determining a second location of said piston, if said first determined location is not valid.

5,471,148

PROBE CARD CHANGER SYSTEM AND METHOD

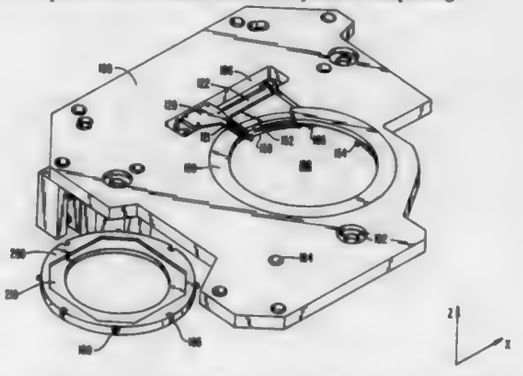
Roger Sinsheimer, Petaluma, and James Anderson, Santa Rosa, both of Calif., assignors to Xandex, Inc., Petaluma, Calif.

Continuation-in-part of Ser. No. 82,403, Jun. 24, 1993, abandoned. This application Jan. 28, 1994, Ser. No. 188,636

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—754 **21 Claims**

12. A prober-to-test head interface system, comprising;



a carriage having a plurality of cam followers on the perimeter of said carriage;

a cam ring having a plurality of cam grooves on the interior of said cam ring;

positioning means detachably coupled to said carriage for positioning said cam followers in said cam grooves, said positioning means comprising:

an arm detachably coupled at one end to said carriage;

a first air cylinder coupled to another end of said arm for moving said carriage in a direction substantially parallel to the plane of said cam ring; and

a second air cylinder coupled to said another end of said arm and said first cylinder for moving said carriage in a direction substantially perpendicular to the plane of said cam ring;

rotating means coupled to said cam ring for rotating said cam ring, thereby causing said cam followers to track in said cam grooves and move said carriage in a direction perpendicular to the plane of said cam ring, said rotating means comprising:

a cam-locking cylinder coupled to said cam ring for rotating said cam ring when said cam-locking cylinder is actuated, and

a theta ring concentric with and adjacent said cam ring for finely adjusting the angular positioning of said carriage with respect to the orientation of a device under test.

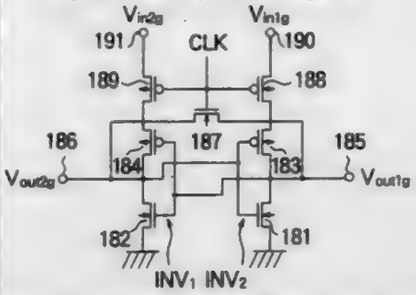
5,471,149

HIGH-SPEED LARGE OUTPUT AMPLITUDE VOLTAGE LEVEL SHIFTING CIRCUIT

Hideki Usuki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 6, 1994, Ser. No. 300,220
Claims priority, application Japan, Sep. 27, 1993, 5-240179
Int. Cl.[6] H03K *19/094*
U.S. Cl. 326—68 5 Claims

1. A voltage level shifting circuit comprising:



a voltage level shifting unit including a pair of inverters each having a power side connection terminal and having their respective inputs and output terminals connected cross-wise; and

a pair of transfer gates, each connected to the power side connection terminal of said inverters and to a signal source, said transfer gates being responsive to an input clock signal to selectively connect said signal sources and said power side connection terminals of said inverters.

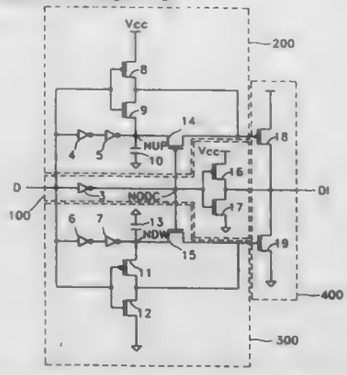
5,471,150

BUFFER WITH HIGH AND LOW SPEED INPUT BUFFERS

Chil-min Jung, Seoul; Kyeong-rae Kim, Kyungki, and Jeong-hee Lee, Seoul, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 22, 1993, Ser. No. 171,468
Claims priority, application Rep. of Korea, Dec. 30, 1992, 1992-26599
Int. Cl.[6] H03K *19/20*
U.S. Cl. 326—87 21 Claims

1. An input buffer comprising:



a low-speed input buffer receiving an input signal and generating a buffered output signal during low-speed operation;

a high-speed, logically high input buffer controlled by the low-speed input buffer, receiving the input signal, and generating a logically high output signal during high-speed operation;

a high-speed, logically low input buffer controlled by the low-speed input buffer, receiving the input signal, and generating a logically low output signal during high-speed operation; and

an output driver exclusively receiving the logically high output signal and the logically low output signal, and generating an output signal in response thereto.

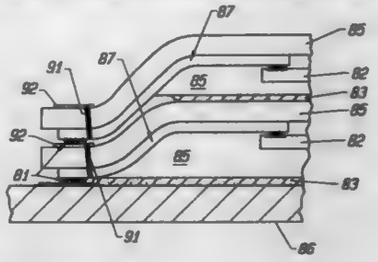
5,471,151

ELECTRICAL INTERCONNECT USING PARTICLE ENHANCED JOINING OF METAL SURFACES

Louis DiFrancesco, Hayward, Calif., assignor to Particle Interconnect, Inc., Hayward, Calif.

Continuation-in-part of Ser. No. 720,182, Jul. 22, 1991, abandoned, which is a division of Ser. No. 479,696, Feb. 14, 1990, Pat. No. 5,083,697. This application Sep. 28, 1992, Ser. No. 951,860
Int. Cl.[6] G01R *1/06;* B23K *20/16*
U.S. Cl. 324—757 28 Claims

1. A method for electrically coupling discontinuous component



substrates, comprising the steps of:

bringing at least one terminal of a first substrate into contact with at least one terminal of a second substrate, each individual terminal having a metal contact layer, including associated particles having a hardness greater than that of said metal; and

applying compressive force normal to said first substrate and said second substrate;

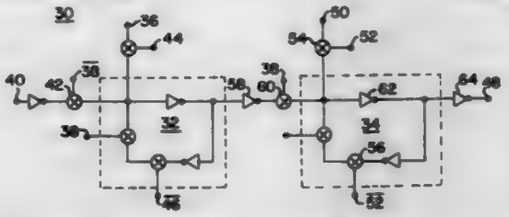
whereby a metal matrix is formed between each terminal of said first substrate and a corresponding terminal of said second substrate when said particles on each individual terminal of said at least one substrate pierce a surface portion of a corresponding terminal on said other substrate.

5,471,152

STORAGE ELEMENT FOR DELAY TESTING

Tushar Gheewala, Los Altos; Rustam Mehta, Sunnyvale, and Prab Varma, Mountain View, all of Calif., assignors to CrossCheck Technology, Inc., San Jose, Calif.

Filed Oct. 8, 1993, Ser. No. 133,588
Int. Cl.[6] G01R *31/00;31/02*
U.S. Cl. 324—758 6 Claims



3. A method for generating a logic transition in an integrated circuit, the method employing a storage element comprising a master latch, a slave latch coupled to an input to a delay path, a first sense input port, and a second sense input port, the method comprising the steps of:

transmitting a first logic state into the master latch by means of the first sense input port;

latching the first logic state into the slave latch;

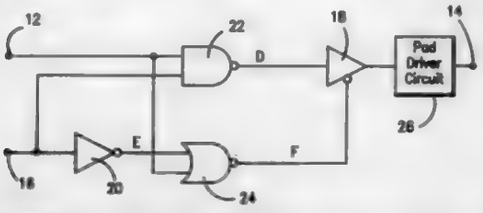
applying a second logic state to the slave latch from outside the storage element by means of the second sense input port; and

causing the logic transition in the slave latch and on the input to the delay path from the first logic state to the second logic state by application of and in close synchronization with a first control signal, the logic transition occurring where the first logic state is different from the second logic state.

5,471,153
METHODS AND CIRCUITS FOR TESTING OPEN COLLECTORS AND OPEN DRAINS

William C. Martin, Carrollton, Tex., assignor to VLSI Technologies, Inc., San Jose, Calif.

Continuation of Ser. No. 692,103, Apr. 26, 1991, abandoned. This application Nov. 4, 1994, Ser. No. 334,114
Int. Cl.[6] G01R 31/28
U.S. Cl. 324—763 12 Claims



1. Method of testing circuits having at least two output conditions during a non-test mode, a first of said output conditions being of higher impedance during the non-test mode than a second of said output conditions, in response to an output enable signal, said method comprising the steps of:

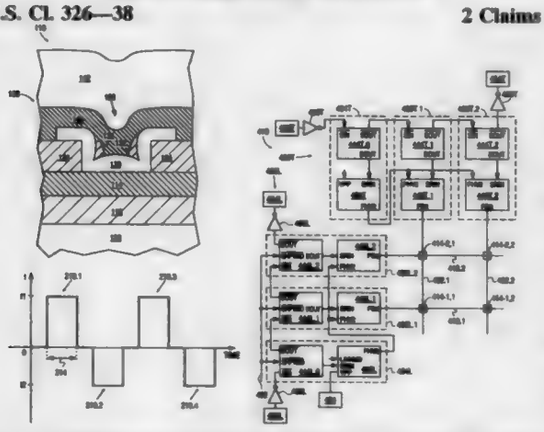
placing said circuit in a test mode of operation in response to a test signal input; and

driving an output of said circuit during the test mode, in response to said test signal and said enable signal, from said second output condition to a logic level used to represent said first output condition, at a rate which is faster than a rate said output is driven from said second output condition to said first output condition during said non-test mode.

5,471,154
PROGRAMMING OF ANTIFUSES

Kathryn E. Gordon, Mountain View, and Andrew K. Chan, Palo Alto, both of Calif., assignors to QuickLogic Corporation, Santa Clara, Calif.

Continuation of Ser. No. 94,677, Jul. 20, 1993, Pat. No. 5,397,939, which is a division of Ser. No. 738,707, Jul. 31, 1991, Pat. No. 5,302,546. This application Jan. 13, 1995, Ser. No. 372,611
Int. Cl.[6] H03K 19/173; G06F 7/38
U.S. Cl. 326—38 2 Claims



1. A method for programming an antifuse, the method comprising the steps of:

generating a first current pulse through the antifuse to program the antifuse; and

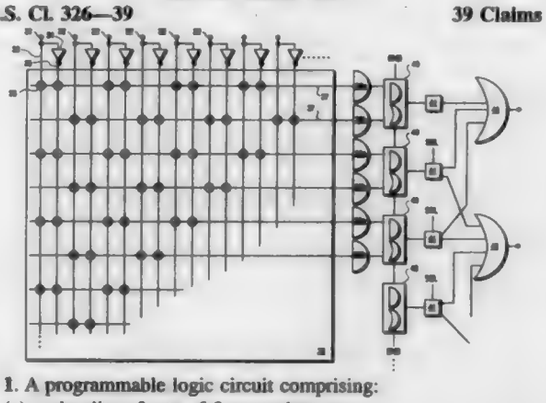
generating a second current pulse through the antifuse of a polarity opposite from the polarity of the first pulse,

wherein the antifuse resistance after the second pulse is below 100 ohms.

5,471,155
USER PROGRAMMABLE PRODUCT TERM WIDTH EXPANDER

Randy C. Steele, Folsom, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 42,086, Mar. 31, 1993, abandoned. This application Aug. 19, 1994, Ser. No. 293,280
Int. Cl.[6] H03K 19/177
U.S. Cl. 326—39 39 Claims



1. A programmable logic circuit comprising:

(a) a plurality of sets of first conductors;

(b) a plurality of sets of second conductors;

(c) a plurality of sets of programmable devices, each set of the plurality of sets of programmable devices coupled to a corresponding set of the plurality of sets of first conductors and coupled to a corresponding set of the plurality of sets of second conductors for selectively coupling the corresponding set of the plurality of sets of first conductors to the corresponding set of the plurality of sets of second conductors,

wherein each set of the plurality of sets of first conductors is coupled to only one set of programmable devices and wherein each set of the plurality of sets of second conductors is coupled to only one set of programmable devices;

(d) a plurality of sets of AND gates, each set of the plurality of sets of AND gates coupled to a corresponding set of the plurality of sets of second conductors and each AND gate of the plurality of sets of AND gates for outputting a first output signal; and

(e) at least one multiple-function gate, each of the at least one multiple-function gate coupled to receive the first output signal from at least two corresponding AND gates of the plurality of sets of AND gates for performing a selected function using the first output signal from the at least two corresponding AND gates to produce a second output signal.

5,471,156
DEVICE AND METHOD FOR BINARY-MULTILEVEL OPERATION

Jin U. Kim; Sun Y. Kim, and Jeom D. Lee, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

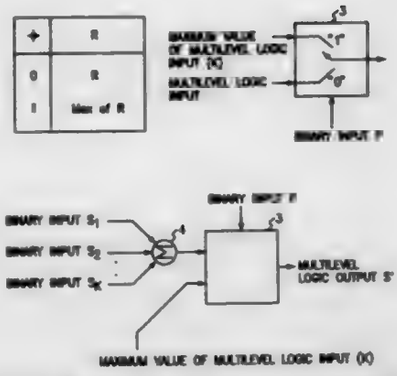
Filed Nov. 30, 1994, Ser. No. 352,057
Claims priority, application Rep. of Korea, Nov. 30, 1993, 1993-25909; Nov. 30, 1993, 1993-25910; Nov. 30, 1993, 1993-25911
Int. Cl.[6] H03K 19/00;19/02
U.S. Cl. 326—60 12 Claims

1. A binary-multilevel OR gate, comprising:

a multilevel logic signal input line for transferring a multilevel logic signal (R), to be supplied from multilevel logic signal sources, as an object of the operation;

a multilevel logic signal maximum value input line which transfers a maximum value signal (Max. of R) of the multilevel logic signals in a fixed manner; and

selection means for selecting and outputting either the multilevel logic signal or the maximum value signal of the multilevel logic signals, when a multilevel logic signal from said multi-



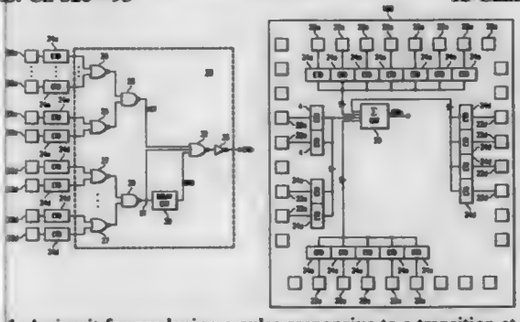
level logic signal input line and a maximum value signal from said multilevel logic signal maximum value input line are inputted respectively, as input signals, and a binary logic signal is inputted, as a control signal and is another object of the operation.

5,471,157

INTEGRATED CIRCUIT WITH CENTRALIZED CONTROL OF EDGE TRANSITION DETECTION PULSE GENERATION

David C. McClure, Denton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Mar. 31, 1994, Ser. No. 220,834
Int. Cl.[6] H03K *19/00*; H01L *25/00*
U.S. Cl. 326—93 **18 Claims**



1. A circuit for producing a pulse responsive to a transition at an input, comprising:

a first plurality of transition detection circuits, each associated with one of a first plurality of input terminals, for generating a transition detection pulse having a first duration responsive to a transition at its associated input terminal, each of said first plurality of transition detection circuits having an output at which the transition detection pulse is presented;

a second plurality of transition detection circuits, each associated with one of a second plurality of input terminals, for generating a transition detection pulse having a third duration responsive to a transition at its associated input terminal;

a summing circuit, coupled to each of said plurality of transition detection circuits, for generating a summed transition detection pulse having a second duration substantially longer than the first duration, responsive to receiving a transition detection pulse from one of said plurality of transition detection circuits, comprising:

first logic circuitry having a plurality of inputs, each input coupled to an output of one of said first plurality of transition detection circuits, for presenting a signal at its output responsive to receiving a transition detection signal from one of said first plurality of transition detection circuits;

second logic circuitry having a plurality of inputs, each input coupled to an output of one of said second plurality of transition detection circuits, for presenting a signal at its output responsive to receiving a transition detection signal from one of said second plurality of transition detection circuits;

a delay circuit coupled to the output of said first logic circuitry, for generating at its output a delayed lengthened pulse responsive to the output of said first logic circuitry; and

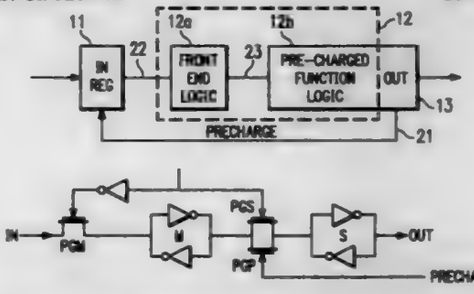
output circuitry, coupled to said first logic circuitry, and to said second logic circuitry, and to said delay circuit, for generating the summed transition detection pulse responsive to either the signal at the output of said first logic circuitry, the signal at the output of said second logic circuitry, or to the delayed lengthened pulse at the output of said delay circuit.

5,471,158

PRE-CHARGE TRIGGERING TO INCREASE THROUGHPUT BY INITIATING REGISTER OUTPUT AT BEGINNING OF PRE-CHARGE PHASE

Aswin N. Mehta, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 714,190, Jun. 12, 1991, abandoned. This application Jan. 21, 1994, Ser. No. 184,409
Int. Cl.[6] H03K *19/096*
U.S. Cl. 326—95 **18 Claims**



1. A pre-charge triggering method for use in a precharged digital device that includes input logic that is triggerable during each clock cycle to initiate an active phase, and the digital device generating a PRECHARGE signal to indicate the end of one active phase and the beginning of a pre-charge phase and the beginning of the next active phase, comprising the steps:

presenting input data to the input logic in preparation for the beginning of the next clock cycle; and

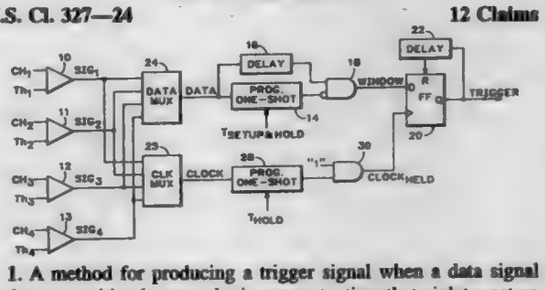
prior to the beginning of each clock cycle, triggering the input logic using the PRECHARGE signal to pass the input data to the output of the input logic.

5,471,159

SETUP OR HOLD VIOLATION TRIGGERING

Carlton Stuebing, Tigard, and George J. Caspell, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Sep. 18, 1992, Ser. No. 947,205
Int. Cl.[6] H03K *5/22*
U.S. Cl. 327—24 **12 Claims**



1. A method for producing a trigger signal when a data signal makes a transition between logic states at a time that violates set up or hold time requirements relative to an active edge of a clock signal, the method comprising the steps of:

generating a window pulse when the data signal undergoes a transition in logic state, the window pulse having a duration of a first time interval, the first time interval corresponding to the sum of a set up time requirement and a hold time requirement;

delaying an active edge of the clock signal for a second time interval, the second time interval corresponding to the hold time requirement;

applying the window pulse to a data input of a bit storage means;

clocking the bit storage means with the delayed active edge of the clock signal, the bit storage means thereby producing the output trigger pulse if the first pulse was active when the clocking occurred; and

resetting the bit storage means with a delayed version of the output trigger pulse to terminate the output trigger pulse after a third time interval.

5,471,160

SENSE AMPLIFIER INCLUDING COMPARATOR

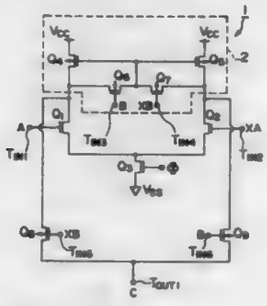
Naoshi Higaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 25, 1994, Ser. No. 280,324

Claims priority, application Japan, Sep. 10, 1993, 5-226224

Int. Cl.[6] G01R *19/00*

U.S. Cl. 327—51 **15 Claims**



1. A logic circuit comprising:

a differential amplifier circuit to which a first input signal and a second input signal both of which are complementary are to be supplied, having a circuit for outputting a first output signal and a second output signal both of which are complementary, the first and second output signals depending on a difference between the first and second input signals;

an output terminal; and

switching means for, based on a first switching signal and a second switching signal which are complementary, performing a switching operation so that either the first output signal or the second output signal is selected as a signal supplied to said output terminal, wherein the signal supplied to the output terminal is a result of an logical operation of the first input signal and the first switching signal.

5,471,161

CIRCUIT FOR CALCULATING THE MINIMUM VALUE

Guoliang Shou; Weikang Yang; Wiwat Wongwarawipat; Sunao Takatori, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan Inc., and Sharp Corporation, both of Tokyo, Japan

Continuation of Ser. No. 986,765, Dec. 8, 1992, abandoned.

This application Oct. 12, 1994, Ser. No. 322,407

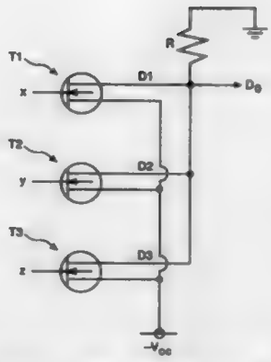
Claims priority, application Japan, Aug. 26, 1992, 4-252093

Int. Cl.[6] H03K *5/153*

U.S. Cl. 327—58 **1 Claim**

1. A circuit for outputting a minimum voltage of one of a plurality of inputs comprising:

a common output;



a resistance having a first terminal which is grounded and a second terminal; and

a plurality of pMOS transistors, wherein each one of said plurality of pMOS transistors corresponds to one of said plurality of inputs, and wherein each said pMOS transistor comprises:

a transistor source connected to a common power source;

a transistor drain connected to said second terminal and to said common output; and

a transistor gate connected to said corresponding one of said plurality of inputs; and

wherein one of said plurality of transistors that receives a minimum voltage of said plurality of inputs conducts, causing said minimum input voltage to be applied to said drain of each remaining transistor so that each remaining transistor becomes non-conductive because each gate voltage becomes higher than a drain voltage for each remaining transistor, and wherein said pMOS transistors are connected within said circuit such that a minimal amount of current is drawn therethrough.

5,471,162

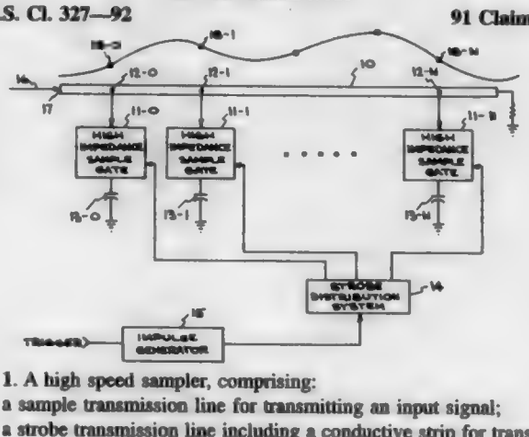
HIGH SPEED TRANSIENT SAMPLER

Thomas E. McEwan, Livermore, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Sep. 8, 1992, Ser. No. 942,164

Int. Cl.[6] H03K *5/125*

U.S. Cl. 327—92 **91 Claims**



1. A high speed sampler, comprising:

a sample transmission line for transmitting an input signal;

a strobe transmission line including a conductive strip for transmitting a strobe signal; and

sampler circuitry having a plurality of positions coupled with the conductive strip of the strobe transmission line and coupled with the sample transmission line, which samples the input signal at the plurality of positions in response to the strobe signal to supply a plurality of samples of the input signal, wherein the plurality of samples are spaced in time on the input signal by less than about 150 picoseconds;

wherein the sampler circuitry includes a plurality of diode bridge sample gates having relatively high impedance strobe line inputs connected to the sample transmission line at each of the plurality of positions.

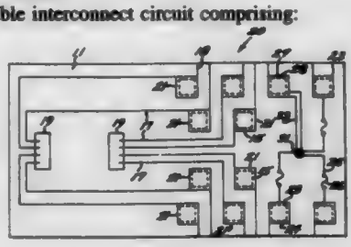
5,471,163

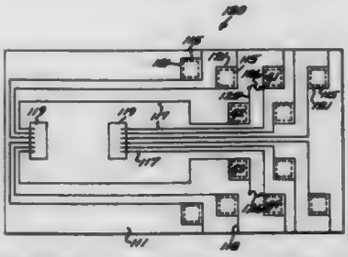
TAB CIRCUIT FUSIBLE LINKS FOR DISCONNECTION OR ENCODING INFORMATION

Winthrop D. Childers, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 16, 1993, Ser. No. 153,728
Int. Cl.[6] H01H 37/76
U.S. Cl. 327—525 12 Claims

1. A flexible interconnect circuit comprising:





a flexible dielectric substrate having a metallized side and a non-metallized side;

a first conductive pad disposed on the metallized side of said dielectric substrate over a first opening in said dielectric substrate so as to be contacted from the non-metallized side of said dielectric substrate through said first opening;

a second conductive pad disposed on the metallized side of said dielectric substrate over a second opening in said dielectric substrate so as to be contacted from the non-metallized side of said dielectric substrate through said second opening; and

an electrically conductive fusible link connected between said first conductive pad and said second conductive pad.

5,471,164

MICROWAVE AMPLIFIER LINEARIZER

James R. Penny, Indutec, Inc. P.O. Box 4328, Fayetteville, Ark. 72702-4328

Filed Feb. 23, 1995, Ser. No. 393,281
Int. Cl.[6] H03F 1/26;3/60
U.S. Cl. 330—149 19 Claims

1. A linearizer for a microwave amplifier having a predetermined output center frequency particularly adapted to reduce harmonic distortion and intermodulation distortion from said amplifier comprising:

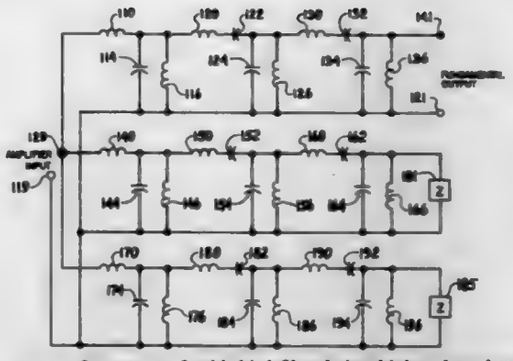
a first combline filter having a waveguide configuration and including a plurality of series-connected high Q resonators;

a second combline filter having a waveguide configuration and including a plurality of series-connected high Q resonators;

a third combline filter having a waveguide configuration and including a plurality of series-connected high Q resonators;

said first, second and third filters being electrically connected in parallel with the common input therefor being adapted to receive the output from said amplifier;

the center frequency of said second filter being approximately an integral multiple of said output center frequency and the



center frequency of said third filter being higher than that of said second filter and being approximately an integral multiple of said output center frequency;

an impedance element having a selectable impedance value connected as a load at the output of said second filter; and,

an impedance element having a selectable impedance value connected as a load at the output of said third filter;

the impedance of each said impedance element being selected to operate in conjunction with the filter with which it is associated to tend to cause cancellation of harmonic frequency output power of said amplifier;

whereby the presence of distortion produced harmonic frequencies and of intermodulation distortion in the output of said first filter is substantially reduced.

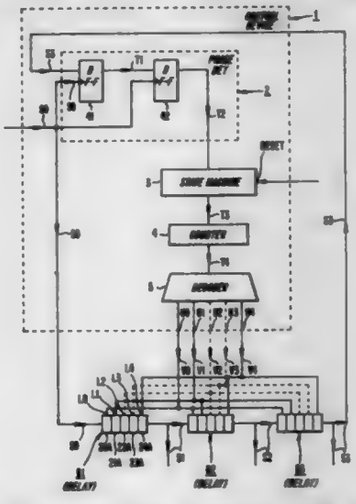
5,471,165

SIGNAL PROCESSING CIRCUIT AND A METHOD OF DELAYING A BINARY PERIODIC INPUT SIGNAL

Nils P. Å. Liedberg, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Feb. 24, 1994, Ser. No. 201,851
Claims priority, application Sweden, Feb. 24, 1993, 9300624
Int. Cl.[6] H03H 11/16
U.S. Cl. 327—250 19 Claims

1. A method of delaying a binary periodic input signal in a



digital signal processing circuit comprising delay devices and a control means, wherein at least two of the delay devices are connected in series and are semiconductor devices having a variable delay, and in which method the input signal is delayed successively in the series-connected delay devices, said delay devices being connected to the control means and each delivering a delayed output signal, the method comprising the steps of:

forming each of the delay devices by connecting in series a plurality of delay elements all of which are manufactured at a

same time by a common process step in a same semiconductor process, so that the delay elements will have mutually a same delay time;

comparing a phase of the binary periodic input signal with a phase of the output signal of an indicated delay device, said phase comparison being carried out in a phase detector in the control means;

generating control signals in the control means in correspondence with the phase comparison;

delivering the control signals from control outputs of the control means to each of the series-connected delay devices;

in a second regulating sequence, using the control signals from the control outputs of the control means to activate a number of delay elements such that a delay between the input signal and the output signal from the indicated delay device will reach a predetermined number of half periods of the input signal; and

using the control signals to activate an equal number of delay elements in each of the series-connected delay devices.

5,471,166

LOGARITHMIC AMPLIFYING CIRCUIT USING QUADRITAIL CELLS

Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

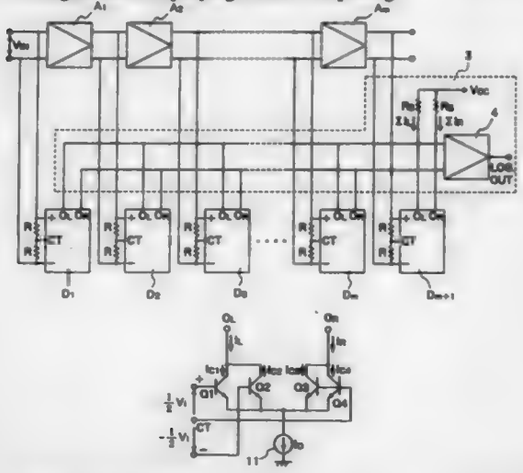
Filed Jul. 13, 1994, Ser. No. 274,435

Claims priority, application Japan, Jul. 13, 1993, 5-196936

Int. Cl.[6] G06F *7/556*; G06G *7/24*

U.S. Cl. 327—351 **13 Claims**

1. A logarithmic amplifying circuit comprising:



a differential amplifier;

a plurality of rectifiers coupled to an input terminal and output terminal of said differential amplifier; and

an adder for adding an output signal of each of said rectifiers;

wherein said rectifiers each comprise a quadritail cell composed of a single tail current source and four emitter-connected or source-connected transistors driven by said tail current source;

bases or gates of a first transistor and a second transistor of said quadritail cell being connected to respective terminals of a differential input pair of said rectifier, collectors or drains of said first and second transistors being connected in common to one output terminal of said rectifier, collectors or drains of a third and fourth transistors of said quadritail cell being connected in common to the other output terminal of said rectifier, bases or gates of said third and fourth transistors being connected in common, and a neutral voltage with reference to said differential input pair being applied to said bases or gates of said third and fourth transistors.

5,471,167

CIRCUIT FOR USE WITH A FEEDBACK ARRANGEMENT

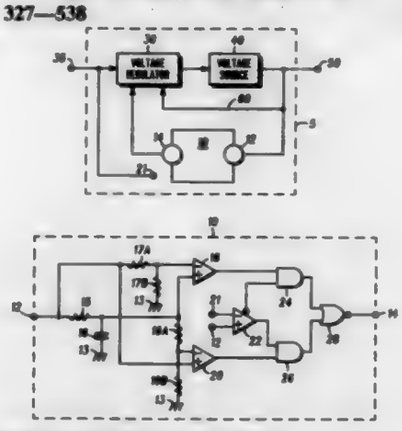
François L'Hermite, Lasserre, and Joel Turchi, Toulouse, both of, France, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 3, 1994, Ser. No. 285,466

Claims priority, application France, Aug. 13, 1993, 93 09980

Int. Cl.[6] H02J *1/00*; H03K *5/153*

U.S. Cl. 327—538 **5 Claims**



1. A feedback arrangement, comprising;

a voltage regulator having an output providing a regulation control signal;

a variable voltage source operating in response to the regulation control signal for providing a variable voltage to an output terminal of the feedback arrangement;

a feedback path coupled between the output terminal of the feedback arrangement and the voltage regulator for providing a feedback signal to the voltage regulator; and

a feedback circuit including,

(a) an input terminal coupled for receiving the feedback signal from the feedback arrangement,

(b) an output terminal coupled to the voltage regulator of the feedback arrangement,

(c) sampling means coupled to the input terminal of the feedback circuit for providing a delayed feedback signal, and

(d) disabling means coupled to receive a predetermined reference signal and further coupled to the output terminal of the feedback circuit for comparing the feedback signal with the delayed feedback signal and with the predetermined reference signal and for disabling the regulating means if a predetermined relationship exists between the compared signals.

5,471,168

QUALITY FACTOR TUNING SYSTEM FOR A TUNABLE FILTER AND CURRENT RECTIFIER USED THEREIN

Joannes M. J. Sevenhans, Prins Kavelle, and Mark G. S. J. Van Paemel, De Huisten, both of, Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands

Continuation of Ser. No. 96,517, Jul. 23, 1993, abandoned. This application Mar. 17, 1995, Ser. No. 407,497

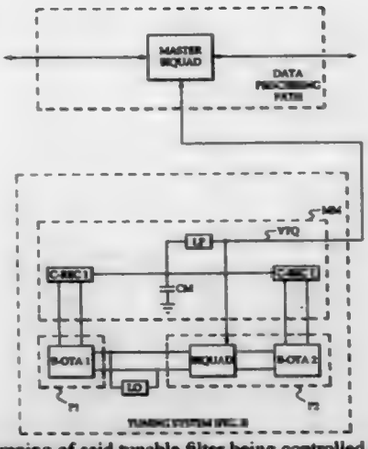
Claims priority, application European Pat. Off., Jul. 24, 1992, 92202292

Int. Cl.[6] H03B *5/00*

U.S. Cl. 327—553 **13 Claims**

1. Tuning system for generating a tuning signal (VTQ) to be applied to at least one master tunable filter in order to tune the quality factor of the master tunable filter to substantially equal a desire quality factor value, the tuning system comprising:

a tunable filter which is a replica of the master tunable filter, said tuning signal also being applied to said tunable filter (BIQUAD) in order to tune the quality factor of said tunable filter to substantially equal said desired quality factor value,



the damping of said tunable filter being controlled in response to changes in said tuning signal;

means for providing a reference signal;

first means responsive to said reference signal for providing a first output signal (IO1) indicative of said reference signal multiplied by a first gain (Z1);

said tunable filter being responsive to said reference signal for providing a tunable filter output signal (VO) indicative of said reference signal multiplied by the passband gain of said tunable filter;

second means responsive to said tunable filter output signal (VO) for providing a second output signal (IO2) indicative of said tunable filter output signal multiplied by a second gain (Z2);

wherein the ratio of said first gain to said second gain is indicative of a desired gain value, the value of said desired gain value being equal to the value of the passband gain of said tunable filter corresponding to said desired quality factor value; and

difference means (CM), responsive to said first and second output signals for providing a tuning system output signal which is a function of the difference of said first and second output signals from which said tuning signal (VTQ) is derived, wherein said tuning signal (VTQ) is provided as negative feedback to said tunable filter to change the magnitude of said passband gain to substantially equal said desired gain value.

5,471,169

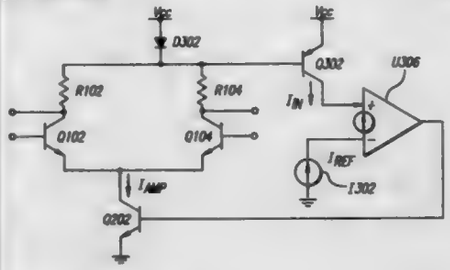
CIRCUIT FOR SINKING CURRENT WITH NEAR-GROUND VOLTAGE COMPLIANCE

Stan Dendinger, Irvine, Calif., assignor to Silicon Systems, Inc., Tustin, Calif.

Division of Ser. No. 140,757, Oct. 20, 1993, Pat. No. 5,428,307. This application Mar. 14, 1995, Ser. No. 404,021

Int. Cl.[6] H03K 5/22

U.S. Cl. 327—563 **3 Claims**



1. A circuit comprising:

a diode coupled to a supply voltage;

current sinking means coupled to ground;

a differential pair, having a circuit input and output, coupled between said diode and said current sinking means;

a transistor means coupled to said differential pair and said diode for detecting a first current provided to said current sinking means, said transistor means providing a second current in response to said first current;

Norton amplification means coupled to said current sinking means for receiving said second current and a reference current, said Norton amplification means controlling said first current through said current sinking means in response to said second current and said reference current.

5,471,170

CURRENT-MODE AMPLIFICATION SYSTEM, AND CORRESPONDING OPERATIONAL AMPLIFIER, GAIN SECTION AND AMPLIFICATION ELEMENT

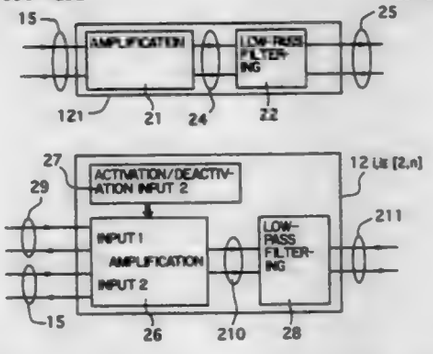
Pierre Genest, Butry Sur Oise, France, assignor to Alcatel Mobile Communication France, Paris, France

Filed Sep. 26, 1994, Ser. No. 312,037

Claims priority, application France, Sep. 27, 1993, 93 11455

Int. Cl.[6] H03F 3/45

U.S. Cl. 330—151 **15 Claims**



1. A current-mode amplification system, including a first gain section and at least one second gain section chained together to form a chain of gain sections;

said first gain section comprising:

amplification means receiving an input current which is the input current of said amplification system, and delivering an amplified output current; and

low-pass filtering means receiving said amplified output current from said amplification means of said first gain section, and delivering an amplified and filtered output current;

said second gain section comprising:

amplification means having firstly a first input receiving the amplified and filtered output current from the preceding gain section in said chain, and secondly a second input receiving the input current of said amplification system, and delivering an amplified output current;

activation/deactivation means for activating/deactivating said second input; and

low-pass filtering means receiving said amplified output current from said amplification means of said second gain section, and delivering an amplified and filtered output current;

and wherein said low-pass filtering means of each of said chained-together gain sections has a high cut-off frequency,

the high cut-off frequencies of the various gain sections increasing from the input to the output of said amplification system.

5,471,171

AMPLIFIER DEVICE CAPABLE OF REALIZING HIGH SLEW RATE WITH LOW POWER CONSUMPTION

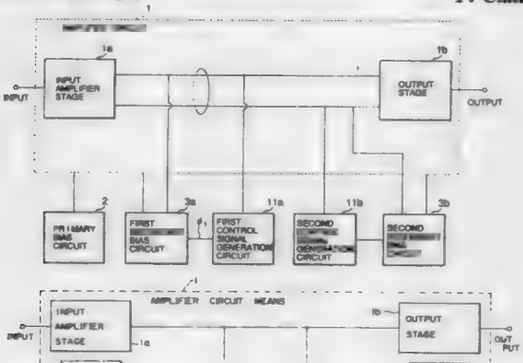
Tetsuro Itakura, Fujisawa, and Hiroshi Tanimoto, Kawasaki, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 774,184, Oct. 9, 1991, abandoned. This application Apr. 9, 1993, Ser. No. 45,537

Claims priority, application Japan, Jan. 9, 1990, 2-271392; Jul. 25, 1991, 3-208564; Aug. 7, 1992, 4-211088

Int. Cl.[6] **H03F** *3/45*

U.S. Cl. 330—253 **14 Claims**



1. An amplifier device capable of performing an efficient amplifying operation with a low power consumption, comprising:

amplifier circuit means at least having an input amplifier stage which amplifies a level change of an input signal, and an output stage which outputs an amplified current as a driving output to a capacitive load;

primary bias means for ordinarily supplying a main fixed bias current to said amplifier circuit means;

determination means for determining a change condition of said level change of the input signal, which is supplied from said input amplifier stage, so as to generate a control signal corresponding to said change condition; and

driving capability increase means as secondary bias means for increasing a total bias current at least by supplying said total bias current to said input amplifier stage thereby changing an output issued from said input amplifier stage in order to increase said driving output supplied to said capacitive load when said control signal is input.

5,471,172

"AB CASCODE" AMPLIFIER IN AN INPUT STAGE OF AN AMPLIFIER OR COMPARATOR

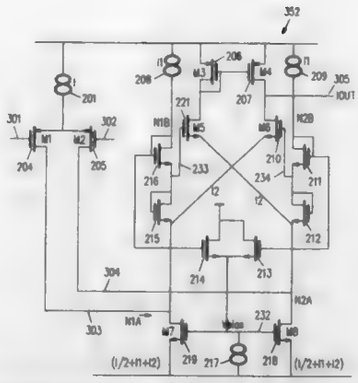
Kwok-Fu Chiu, and Don R. Sauer, both of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 24, 1994, Ser. No. 296,057

Int. Cl.[6] **H03F** *3/45*

U.S. Cl. 330—253 **3 Claims**

1. An AB Cascode input circuit, comprising:



a first current source having first and second terminals, said first terminal of said first current source being coupled to a first supply voltage source;

a second current source having first and second terminals, said first terminal of said second current source being coupled to said first supply voltage source;

a third current source having first and second terminals, said first terminal of said third current source being coupled to said first supply voltage source;

a fourth current source having first and second terminals, said first terminals of said fourth current source being coupled to a second supply voltage source;

a fifth current source having first and second terminals, said first terminals of said fifth current source being coupled to said second supply voltage source;

a first transistor having a source terminal coupled to said first current source, a gate terminal coupled to receive a first input signal and a drain terminal coupled to said second terminal of said fourth current source;

a second transistor having a source terminal coupled to said first current source, a gate terminal coupled to receive a second input signal and a drain terminal coupled to said second terminal of said fifth current source;

a first level converter having first and second terminals, said first terminal of said first level converter coupled to said second terminal of said fourth current source, said second terminal of said first level converter coupled to said second terminal of said second current source;

a second level converter having first and second terminals, said first terminal of said second level converter coupled to said second terminal of said fifth current source, said second terminal of said second level converter coupled to said second terminal of said third current source;

a third transistor having a source terminal coupled to said first supply voltage source and a gate and a drain terminal coupled together;

a fourth transistor having a source terminal coupled to said first supply voltage source and a gate coupled to said gate terminal of said third transistor and a drain terminal;

a fifth transistor having a source terminal coupled to said second terminal of said fifth current source, a gate terminal coupled to said first terminal of said first level converter, and a drain terminal coupled to said drain terminal of said third transistor; and

a sixth transistor having a source terminal coupled to said second terminal of said fourth current source, a gate terminal coupled to said first terminal of said second level converter, and a drain terminal coupled to said drain terminal of said fourth transistor.

5,471,173
CASCADED AMPLIFIER HAVING TEMPERATURE COMPENSATION

Paul A. Moore, Seaford, and Anthony R. Cusdin, Horley, both of, England, assignors to U.S. Philips Corporation, New York, N.Y.

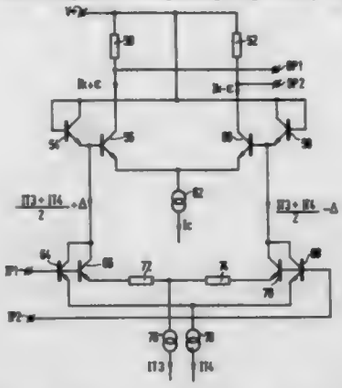
Filed Jun. 30, 1994, Ser. No. 269,811

Claims priority, application United Kingdom, Jul. 5, 1993, 9313840

Int. Cl.[6] H03F *3/45*

U.S. Cl. 330—256 **13 Claims**

1. A cascaded amplifier comprising a plurality of amplifying



stages coupled in cascade, each amplifying stage comprising a linear amplifier and a limiting amplifier, the linear amplifier and the limiting amplifier being provided with a stage input signal and providing respective output signals which are combined to provide a stage output signal, wherein each amplifying stage in the cascade further comprises a temperature dependent device for controlling the small signal gain of that amplifying stage to be substantially independent of temperature and a final stage of the amplifier comprises an overall temperature dependent device for controlling the overall output limit voltage of the cascaded amplifier to be substantially independent of temperature.

5,471,174
AMPLIFIER HAVING AN OUTPUT STAGE WITH BIAS CURRENT CANCELLATION

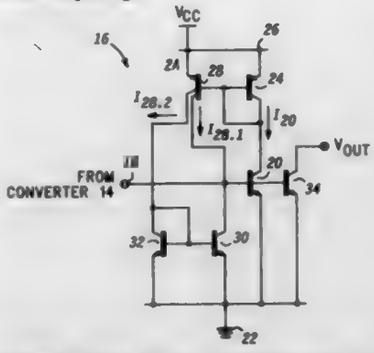
Thomas D. Petty, Tempe; Troy L. Stockstad, Phoenix, and Robert L. Vyne, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1994, Ser. No. 349,578

Int. Cl.[6] H03F *3/45*

U.S. Cl. 330—257 **17 Claims**

1. A circuit, comprising:



a first transistor having a base, a collector and an emitter, said base being coupled to an input of the circuit, said emitter being coupled to a first power supply conductor;

a first current mirror circuit having an input coupled to said collector of said first transistor;

a second current mirror circuit having an input and an output, said output being coupled to a first output of said first current mirror circuit and to said input of the circuit, said input being coupled to a second output of said first current mirror circuit; and

a second transistor having a base, a collector and an emitter, said base being coupled to said input of the circuit, said emitter being coupled to said first power supply conductor, said collector providing an output signal of the circuit.

5,471,175
INPUT PROTECTION CIRCUIT FOR A CMOS COMPARATOR

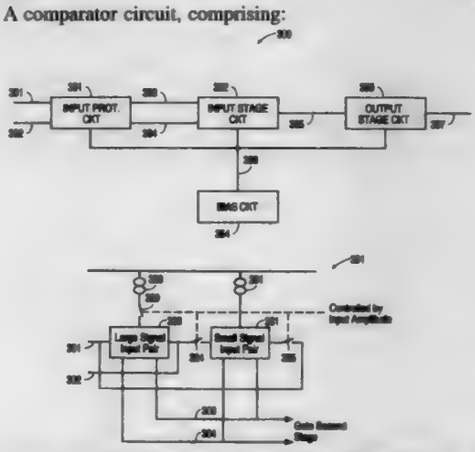
Kwok-Fu Chiu, and Don R. Sauer, both of San Jose, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Aug. 24, 1994, Ser. No. 296,056

Int. Cl.[6] H03F *3/04*

U.S. Cl. 330—298 **7 Claims**

1. A comparator circuit, comprising:



an input protection circuit receiving a differential input signal and providing a differential output signal corresponding to said differential input signal, said input protection circuit including a small signal input circuit, a large signal input circuit, and a switch circuit, said switching circuit disabling said small signal input circuit when said differential input signal has a magnitude exceeding a predetermined value;

an input stage circuit receiving said differential output signal, for providing a comparator output signal indicating whether said differential input signal is positive or negative; and

a bias circuit for providing a bias voltage used in said input protection circuit and said input stage circuit.

5,471,176
GLITCHLESS FREQUENCY-ADJUSTABLE RING OSCILLATOR

James A. Henson, Morgan Hill; Scott E. Richmond, San Jose, and William R. Akin, Jr., Morgan Hill, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

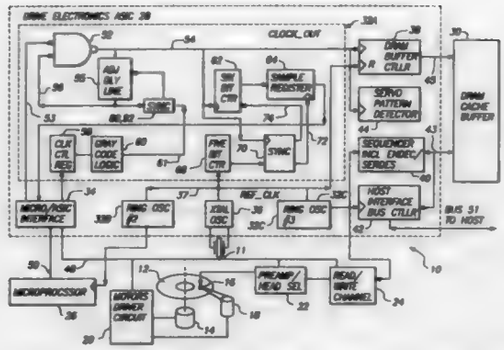
Filed Jun. 7, 1994, Ser. No. 255,162

Int. Cl.[6] H03L *7/00*

U.S. Cl. 331—1 A **18 Claims**

1. A glitchless frequency adjustable clock generation circuit comprising:

a reference clock putting out a stable reference clocking signal, a digital ring oscillator including a series circuit loop of at least



one inverting gate, a delay line comprised of plural delays formed of digital transmission gates connected in series in a path between an output and an input of the inverting gate, there being a series of taps along the plurality of digital transmission gates, and a clock output for providing a present, adjustable clocking signal,

the programmable delay line comprising at least a first multiplexer for selecting among the series of taps in accordance with a present tap selection value,

clock monitoring circuitry connected to compare the clock output with the stable reference clocking signal and to produce a digital clock cycle count for each comparison made,

programmed microcontroller means connected to receive the digital clock cycle count and to generate and put out a new tap selection value for controlling tap selection of the first multiplexer as a function of the digital clock cycle count and a desired clock output frequency set point, and

synchronization means connected to the programmed microcontroller means and to the digital ring oscillator for synchronizing and applying the new tap selection value to the first multiplexer in relation to the present, adjustable clocking signal, and to a logical state of a successor, adjustable clocking signal to be put out by the digital ring oscillator following application of the new tap selection value without generating a glitch during multiplexer tap switching.

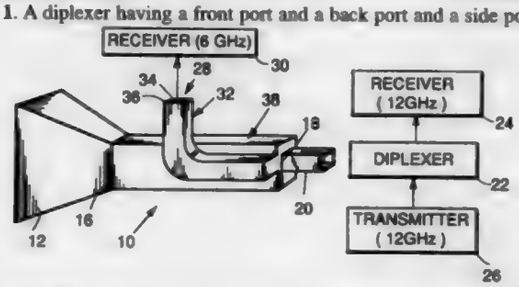
5,471,177

OCTAVE BAND GAP DIPLEXER

Thomas Hudspeth, Malibu, and Fritz Steinberg, Culver City, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 29, 1994, Ser. No. 286,034
Int. Cl.[6] H01P *1/213*
U.S. Cl. 333—126 **19 Claims**

1. A diplexer having a front port and a back port and a side port



for communicating a first spectral region of electromagnetic power between said front port and said side port and a second spectral region of electromagnetic power between said front port and said back port, wherein a center frequency of said second spectral region is greater than a center frequency of said first spectral region by a factor greater than or equal approximately to two, the diplexer comprising:

a first waveguide and a second waveguide each having a rectangular cross section and supporting a transverse electric mode of electromagnetic wave, said first waveguide having a cut-off frequency below said first spectral region, said second waveguide having a cut-off frequency below said second spectral region and above said first spectral region;

a back wall terminating said first waveguide, said back wall having an opening through which said second waveguide extends for communicating with said first waveguide, said opening having cross sectional dimensions smaller than corresponding cross sectional dimensions of said first waveguide, said opening serving as said back port, said back wall serving as a shorting element to inhibit propagation of radiation at said first spectral region into said second waveguide, an end of said first waveguide opposite said back wall serving as said front port; and

wherein said side port comprises an aperture disposed in a sidewall of said first waveguide, a third waveguide, and a coupling element extending from said third waveguide through said aperture into said first waveguide for coupling electromagnetic power at said first spectral region between said first and said third waveguides; and

tuning means disposed within said third waveguide for inhibiting propagation of electromagnetic power at said second spectral region between said first and said third waveguides.

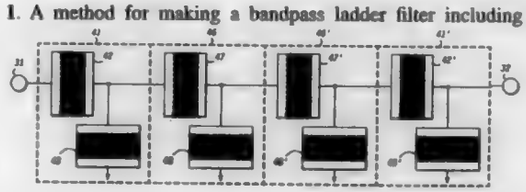
5,471,178

LADDER FILTER AND METHOD FOR PRODUCING CONJUGATELY MATCHED IMPEDANCE

Thomas S. Hickernell, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1994, Ser. No. 191,232
Int. Cl.[6] H03H *9/64*
U.S. Cl. 333—193 **21 Claims**

1. A method for making a bandpass ladder filter including a



center frequency, a first port and a second port, said method comprising steps of:

providing a first L network including a first connection, a second connection and a net inductive impedance at the center frequency of the bandpass filter;

providing a second L network including a first connection, a second connection and a net capacitive impedance at the center frequency of the bandpass filter;

coupling the first connection of the first L network to the first port;

coupling the first connection of the second L network to the second connection of the first L network; and

coupling the second connection of the second L network to the second port, wherein including the inductive impedance of the first L network and the capacitive impedance of the second L network provides conjugate impedance matching between the L networks at the center frequency of the bandpass filter.

5,471,179
SURFACE ACOUSTIC WAVE BANDPASS FILTER INCLUDING UNIQUE V-SHAPED ELECTRODE AND PHASE COMPENSATOR

Petr K. Koshkin; Alexander A. Sveshnikov, and Jury M. Bobrovskikh, all of Voronezh, Russian Federation, assignors to Opytny Zavod Mikroelektroniki "RIF", Voronezn, Russian Federation

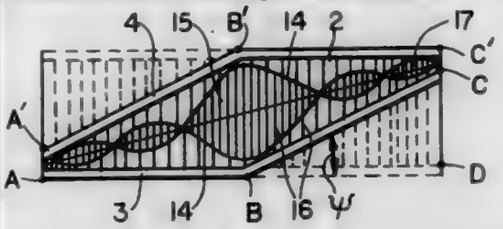
Continuation of Ser. No. 74,844, Jun. 9, 1993, abandoned. This application Dec. 20, 1994, Ser. No. 360,173

Claims priority, application Russian Federation, Jan. 17, 1991, 5005974

Int. Cl.[6] H03H *9/64*

U.S. Cl. 333—195 **1 Claim**

1. A surface acoustic wave bandpass filter comprising:



a piezoelectric substrate for propagation of electroacoustic waves in a direction along a longitudinal axis of said substrate;

an input apodized electroacoustic transducer on a surface of said substrate, said transducer having a tilted apodization structure;

an output unapodized electroacoustic transducer spaced from said apodized transducer on said surface of said substrate;

a phase compensator and a shield, which are metal film areas disposed on said surface of said substrate between said apodized and unapodized transducers;

said apodized transducer having a length L in said direction of propagation of said acoustic waves and including a first summing bus, which is a metal strip on said surface of said substrate, said strip having a width d' and being connected to a first plurality of parallel electrode fingers;

a second summing bus, which is a metal strip on said surface of said substrate, said strip having also a width d' and being connected to a second plurality of electrode fingers directed oppositely and in parallel to said first electrode fingers and defining together therewith a zone of overlapping of said first and second electrode fingers, the contour thereof being a boundary of apodization;

said boundary of apodization being symmetrical relative to a tilted line extending along a diagonal of said input apodized transducer;

said first summing bus being V-shaped and consisting of a first part arranged in parallel to said direction of propagation of said acoustic waves and a second part aligned at an angle Ψ with respect to said first part so that this bar extends along said boundary of apodization as near as possible thereto on one side thereof with respect to said tilted line;

said second summing bus being V-shaped like said first summing bus and consisting of a first part arranged in parallel to said direction of propagation of said acoustic waves and a second part aligned at said angle Ψ with respect to said first part, said second summing bus being disposed symmetrically to said first summing bus relative to said tilted line so that said second summing bus extends along said boundary of apodization as near as possible thereto on an opposite side with respect to said tilted line;

said phase compensator being shaped as a triangle having a base "a" and a height "b" and disposed on said substrate so that its base is at the level of said first part of said first summing bus and so that said second part of said first summing bus is nearer to said phase compensator than said first part thereof, values of said base "a" and said height "b" being selected to conform to the relationships a=L/4−d and b=(L/2−d)tg Ψ, where d is the projection of said width d' of said second part of said first summing bus bar on said direction of propagation of said acoustic waves.

5,471,180
LOW-LOSS DIELECTRIC RESONANT DEVICES HAVING LATTICE STRUCTURES WITH ELONGATED RESONANT DEFECTS

Karl Brommer, Hampton Falls; Henry Mullaney, Amherst, both of N.H.; Robert Meade, Winchester, Mass.; Andrew Rappe, Emeryville, Calif., and John Joannopoulos, Belmont, Mass., assignors to Lockheed Sanders, Inc., Nashua, N.H., and Massachusetts Institute of Technology, Cambridge, Mass.

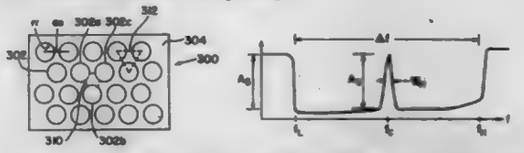
PCT No. PCT/US92/01228, § 371 Date Dec. 6, 1993, § 102(e) Date Dec. 6, 1993, PCT Pub. No. WO92/15124, PCT Pub. Date Sep. 3, 1992

Continuation-in-part of Ser. No. 656,812, Feb. 15, 1991, Pat. No. 5,187,461. This PCT application Feb. 13, 1992, Ser. No. 104,116

Int. Cl.[6] H01P *1/20;7/10*

U.S. Cl. 333—202 **10 Claims**

1. A dielectric device comprising:



a first dielectric material for receiving electromagnetic energy;

a lattice structure comprised of a plurality of elongate elements of a second dielectric material extending substantially in parallel to each other in a two-dimensional periodic arrangement within the first dielectric material, said lattice structure having dimensions proportioned such that electromagnetic energy having frequencies within a first frequency band is prevented from propagating through the lattice structure; and

a resonant defect structure located within the lattice structure for introducing a lattice imperfection into the lattice structure, the resonant defect structure having a resonant frequency within a second frequency band within the first frequency band such that electromagnetic energy having frequencies within the second frequency band is allowed to propagate through the lattice structure.

5,471,181
INTERCONNECTION BETWEEN LAYERS OF STRIPLINES OR MICROSTRIP THROUGH CAVITY BACKED SLOT

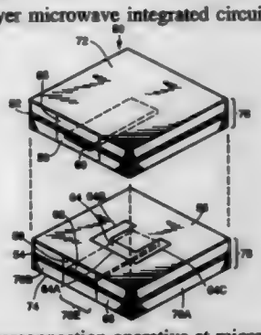
Pyong K. Park, Agoura Hills, Calif., assignor to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Mar. 8, 1994, Ser. No. 207,765

Int. Cl.[6] H01P *5/00*

U.S. Cl. 333—246 **28 Claims**

1. In a multilayer microwave integrated circuit, an electromagnetic coupling interconnection operative at microwave frequencies between first and second microwave circuit conductors in first and



second different layers of said circuit, comprising a first ground plane disposed between said first and second layers, a coupling slot defined in said first ground plane, said slot having an effective electrical length equivalent to one half wavelength at a frequency of operation, said slot further having a midsection extending substantially transverse to said first and second conductors, and conductive cavity-defining means for completely surrounding said interconnection coupling slot, said interconnection ground plane and said interconnection circuit conductors with conductive surfaces defining first and second cavities, said first circuit conductor disposed within said first cavity, said second circuit conductor disposed within said second cavity, said conductive surfaces for preventing coupling to parallel plate transmission line modes.

5,471,182

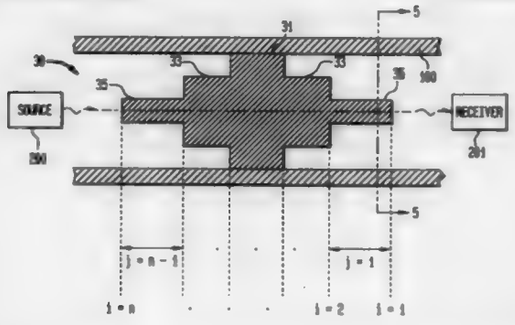
BROADBAND PRESSURE BARRIER FOR CIRCULAR WAVEGUIDE

David F. Rivera, Westerly, R.I.; Thomas R. Floyd, Waterford, and Michael J. Josypenko, Norwich, both of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 8, 1994, Ser. No. 287,023

Int. Cl.[6] H01P *1/08*

U.S. Cl. 333—252 **12 Claims**



1. A broad passband waveguide/pressure barrier arrangement comprising:

a fixed radius circular waveguide for transmitting radio frequency (RF) energy in a spatially circumferential field mode between a source and a receiver;

at least three cylindrical barrier regions formed of a dielectric material, said at least three barrier regions coaxially aligned and arranged symmetrically in mirror image fashion about a radial plane of said circular waveguide, said at least three cylindrical barrier regions including at least one solid cylindrical plug region sealed in a cross-section of said circular waveguide and having a longitudinal thickness sufficient to withstand a predetermined pressure load, and at least one solid cylindrical tuning region having a radius less than that of said circular waveguide and further having a longitudinal thickness; and

said radius of said at least one tuning region and said longitudinal thicknesses of said at least three cylindrical barrier regions sized so that an input impedance of said at least three cylindrical barrier regions as seen by the source is equal to a characteristic impedance of said circular waveguide for a passband of interest.

5,471,183

COAXIAL SWITCH

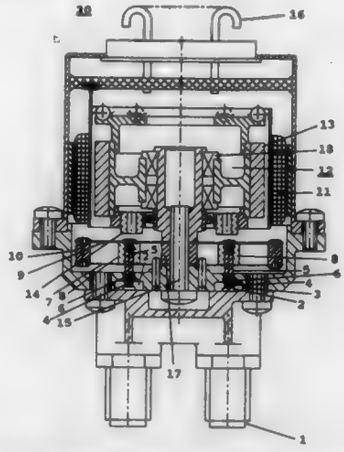
Eckart Hettlage, Karlsruhe, and Gerd Ruff, Heidelberg, both of, Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed Mar. 31, 1994, Ser. No. 220,487

Claims priority, application Germany, Mar. 31, 1993, 43 10 463.0

Int. Cl.[6] H01H *53/00*

U.S. Cl. 335—4 **7 Claims**



1. A coaxial switch for making or breaking an electric contact between a first and a second inner conductor of a first and a second coaxial cable, comprising

(a) first and second terminals holding end portions of said first and second coaxial cables; said first and second terminals being electrically connected to one another for electrically permanently interconnecting outer conductors of the first and second coaxial cables;

(b) a wall component defining an inner space into which end portions of said first and second inner conductors project;

(c) a contact guiding assembly supported for displacement in a direction towards or away from the end portions of the inner conductors; said contact guiding assembly includes

(1) first and second parallel-spaced spring diaphragms each having an outer peripheral portion and a mid portion; one of said portions of each spring diaphragm being fixedly held and another of said portions being displaceable in said direction;

(2) first and second leaf springs provided in said first and second spring diaphragms, respectively; said first and second leaf springs being in alignment with one another as viewed in said direction; said first and second leaf springs constituting a leaf spring unit; each leaf spring having

(i) a first segment connected to a respective said spring diaphragm for hinging displacements relative thereto; and

(ii) a second segment hingedly connected to said first segment; said first and second segments being oriented such that motion components of said first and second segments transverse to said direction are opposite one another;

(d) a support element mounted on said second segment and passing with a clearance through an aperture in said wall component and projecting into said hollow space;

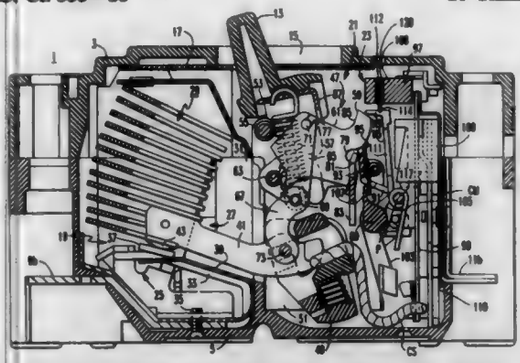
(e) an electric contact element carried by said support element for making or breaking electric contact between said inner conductors; and

(f) drive means for displacing said contact guiding assembly in said direction.

5,471,184
CIRCUIT BREAKER

Yun-Ko Chien, Murrysville, and Norman L. Ovick, Pittsburgh, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 13, 1994, Ser. No. 274,320
Int. Cl.[6] H01H 75/12
U.S. Cl. 335—35 10 Claims



1. A circuit breaker for responding to abnormal currents in a conductor in an electrical system, said circuit breaker comprising:

electrical contacts operable between a closed position in which a circuit is completed through said conductor and an open position in which said circuit through said conductor is interrupted;

a latchable operating mechanism operable to open said electrical contacts when unlatched;

a trip bar rotatable from a biased position to a trip position to unlatch said operating mechanism; and

a magnetic trip assembly comprising:

a frame;

a stationary magnetic structure mounted to said frame;

a movable armature which is attracted to said stationary magnetic structure by said abnormal current through said conductor to rotate said trip bar to a trip position, said movable armature including a nib extending angularly therefrom, said nib defining a detent;

pivot means pivotably mounting said movable armature for rotation about a pivot axis; and

biasing means supported by said frame and engaging into said detent to bias said armature away from said stationary magnetic structure to form a gap therebetween, said biasing means disengaging from said detent when said armature is attracted to said stationary magnetic structure by said abnormal current through said conductor to allow said movable armature to rotate about said pivot axis and trip said trip bar to interrupt said circuit.

5,471,185
ELECTRICAL CIRCUIT PROTECTION DEVICES COMPRISING CONDUCTIVE LIQUID COMPOSITIONS

John J. Shea, Pittsburgh; James D. B. Smith, Monroeville, and Karl F. Schoch, Jr., Pittsburgh, all of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 6, 1994, Ser. No. 350,291
Int. Cl.[6] H01H 29/00
U.S. Cl. 335—51 31 Claims

1. An electrical circuit protection device, which comprises:

(a) an elongated flexible capsule having a length and two ends;

(b) an effective amount of a conductive liquid composition contained within the flexible capsule between the two ends, the conductive liquid being capable of carrying an applied current and switching the current path therein from conductivity to resistivity when subject to an effective amount of constriction transverse to the length of the flexible capsule and transverse to the direction of the electrical current applied to the conductive liquid;

(c) two electrodes having an annulus substantially surrounding the two ends of the flexible capsule, the two electrodes being

electrically connected to the conductive liquid composition and electrically connectable to a source of electrical power to cause a current to pass through the conductive liquid composition, and each annulus of the two electrodes being sealed by a flexible membrane;

(d) an elongated insulating housing having a length and two ends, the housing containing the flexible capsule, the housing being closed at both ends by the two sealed electrodes;

(e) an effective amount of a magnetizable fluid composition contained within the housing and generally surrounding the flexible capsule, the magnetizable fluid being electromagnetically connected to the two electrodes; and,

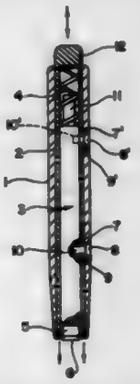
(f) an elongated resistor having a length and two ends, the resistor generally surrounding the insulating housing and electrically connected to the two electrodes,

in which an excessive current when applied to the electrical circuit protection device generates a magnetic field transverse to the direction of the applied current flowing through the conductive liquid composition along the length of the flexible capsule causing the ferromagnetic fluid to redistribute and deform the flexible capsule by transverse contraction and axial expansion to cause a switching of the current path through the conductive liquid between the electrodes from conductivity to resistivity and a commutating of the excessive current to the resistor to effectively limit the let through current to a safe value.

5,471,186
MAGNETIC PENCIL FOR MOVING SEMICONDUCTOR PACKAGES

Jung Y. Seo, Kyeongsangbuk-do, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Cheongju, Rep. of Korea

Filed Oct. 20, 1993, Ser. No. 141,163
Claims priority, application Rep. of Korea, Jan. 20, 1992, 92-20184
Int. Cl.[6] B66C 1/04
U.S. Cl. 335—285 11 Claims



1. A magnetic pencil for moving semiconductor packages, comprising:

a housing having a tubular shape and provided with pin holes;

a hollow push rod inserted into the housing, the hollow push rod having guide slots formed in positions corresponding to the pin holes of the housing;

an insertion rod inserted into the hollow push rod, the insertion rod having a magnet attached to its lower end and screw holes provided in positions corresponding to the pin holes of the housing;

a spring installed between the upper end of the insertion rod and the upper end of the hollow push rod; and

guide pins for coupling the housing and the insertion rod through the guide slots of the hollow push rod, wherein the guide pins are engaged with the pin holes and screw holes and serve to guide the movement of the hollow push rod with respect to the housing and the insertion rod;

wherein a rubber material is affixed to the magnet in such a manner that a semiconductor package attracted to the magnet contacts the rubber material, wherein the semiconductor package is attracted to the magnet sufficiently to enable the magnetic pencil to move the semiconductor package, wherein movement of the push rod enables the semiconductor package to be separated from the magnetic pencil, wherein the semiconductor package may be moved with the magnetic pencil in such a manner as to prevent damage or contamination.

5,471,187

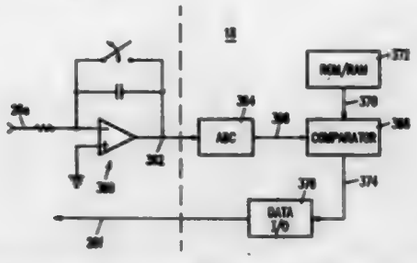
DATA SIGNAL COMPARATION WITH SELF-ADJUSTING THRESHOLD

Jens Hansen, Norresundby, Denmark; Benny Madsen, Santa Clara, Calif., and Jens T. Petersen, Norresundby, Denmark, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 29,134, Mar. 10, 1993. This application Sep. 20, 1994, Ser. No. 309,265

Int. Cl.[6] H03K *9/08;3/017*

U.S. Cl. 340—146.2 **24 Claims**



1. A data signal comparator with a self-adjusting threshold signal for comparing therewith an input signal representing serial data, comprising:

threshold generator means for receiving a threshold control signal and in accordance therewith generating a threshold signal;

input comparator means coupled to said threshold generator means for receiving and comparing said threshold signal and an input signal representing a first plurality of serial binary data bits, and in accordance therewith generating a binary output signal which has an output duty cycle and corresponds to said first plurality of serial binary data bits; and

output monitor means coupled to said input comparator means for receiving and monitoring a temporal characteristic of said binary output signal, and in accordance therewith providing said threshold control signal.

5,471,188

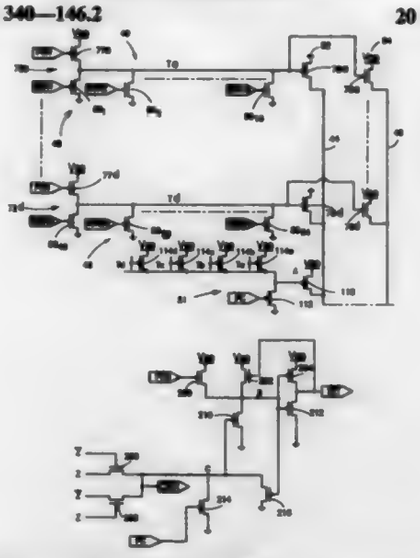
FAST COMPARATOR CIRCUIT

Barbara A. Chappell; Terry I. Chappell, both of Amawalk; Bruce M. Fleischer, Mount Kisco, and Stanley E. Schuster, Granite Springs, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 7, 1994, Ser. No. 320,477

Int. Cl.[6] G06F *7/02*

U.S. Cl. 340—146.2 **20 Claims**



1. A fast comparator circuit, comprising:

a plurality of first switch means for respectively receiving a data bit from a first data word into a first input thereof and for receiving a corresponding data bit from a second data word into a second input thereof, and each of said first switch means providing a first logic state output when said first word data bit matches said corresponding second word data bit and a second logic state output when said first word data bit does not match said corresponding second word data bit;

a plurality of second switch means, connected in parallel with each other and in series respectively with said plurality of first switch means, for receiving as inputs the logic state output of each of said first switch means, said second switch means producing a first combined logic state output, in response to the combination of said inputs representing a bit match, and a second combined logic state output in response to the combination of said inputs representing a bit mismatch;

a first branch node and a second branch node; and

third switch means, responsive to the first and second combined logic state outputs of said plurality of second switch means and coupled to both said first branch node and said second branch node, for providing a first voltage differential between said first branch node and said second branch node indicative of a combined output representing a bit match, and a second voltage differential between said first branch node and said second branch node indicative of a combined output representing a bit mismatch.

5,471,189

COMPARATOR CIRCUITRY AND METHOD OF OPERATION

Carl D. Dietz, Kyle, and Kathryn J. Hoover, Austin, both of Tex., assignors to International Business Machines Corp., Armonk, N.Y.

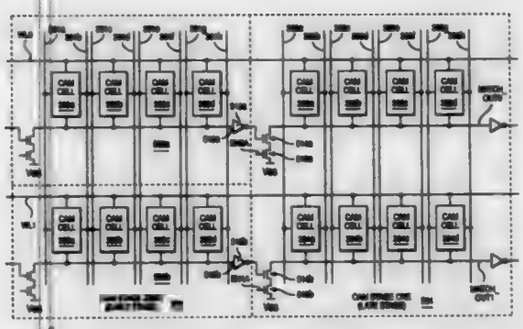
Filed Dec. 14, 1994, Ser. No. 355,874

Int. Cl.[6] G11C *15/00*

U.S. Cl. 340—146.2 **19 Claims**

1. Comparator circuitry, comprising:

first circuitry for precharging first and second match lines;



second circuitry for comparing first and second information and selectively discharging said first match line in response thereto;

third circuitry for comparing third and fourth information and selectively discharging said second match line in response thereto; and

fourth circuitry for discharging said second match line in response to discharging said first match line.

5,471,190

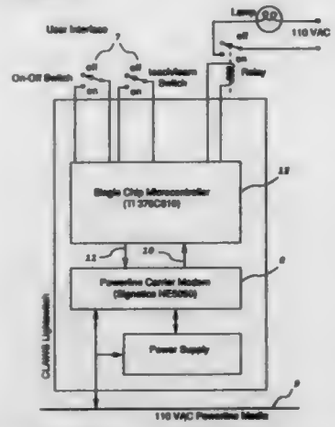
METHOD AND APPARATUS FOR RESOURCE ALLOCATION IN A COMMUNICATION NETWORK SYSTEM

Philip R. Zimmermann, Boulder, Colo., assignor to Timothy D. Schoechle, Boulder, Colo.

Continuation of Ser. No. 596,217, Oct. 12, 1990, abandoned, which is a continuation of Ser. No. 468,836, Jan. 19, 1990, abandoned, which is a continuation of Ser. No. 382,262, Jul. 20, 1989, abandoned. This application Apr. 15, 1992, Ser. No. 868,684

Int. Cl.[6] H04B *3/00*

U.S. Cl. 340—310.01 **13 Claims**



1. An electric utility network comprising:

a plurality of devices including outlets and switches for selectively controlling said outlets, each of said devices having plural activation states such as on and off;

all of said devices being electrically inter-connected, and each having means; for initially generating and remembering a unique unit identifying code upon occurrence of a certain event and declaring said unit identifying code to the other devices, and

at least one of said devices having means for monitoring said unit identifying codes declared by at least one of said other devices, and

at least one of said devices having means for changing its own activation state in response to certain unit codes corresponding to at least one of said other devices.

5,471,191

GOLF SCORE DISPLAY DEVICE

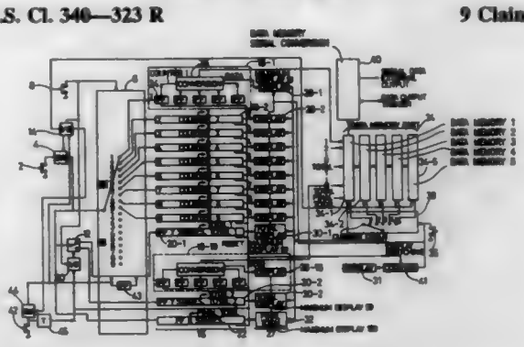
Fujiaki Narita, 23-5, Mukonoso 5-chome, Amagasaki-shi, Hyogo 661, Japan

Filed Nov. 16, 1993, Ser. No. 152,238

Claims priority, application Japan, Nov. 16, 1992, 4-331156

Int. Cl.[6] G08B *23/00*

U.S. Cl. 340—323 R **9 Claims**



1. A golf score display device, comprising:

a counter switch for being depressed every stroke for inputting a stroke number;

a hole switch for being depressed every hole;

a counter part connected to said counter switch, said counter part comprising eighteen first counters corresponding to respective holes for one round, two second counters corresponding to first and second halves of said round, respectively, and a third counter corresponding to a total score for the entire round;

first switching means for connecting said counter switch to any one of said first counters while successively switching such connection by outputs of said hole switch;

first frequency divider means for receiving said outputs of said hole switch and for generating an output corresponding to a total score for a particular half of said round;

second switching means for connecting said counter switch to either one of said second counters while alternatively switching such connection by outputs of said first frequency divider means; and

a display part provided with eighteen digital display elements for said first counters, two digital display elements for said second counters and one digital display element for said third counter, and said digital display elements having display switching functions.

5,471,192

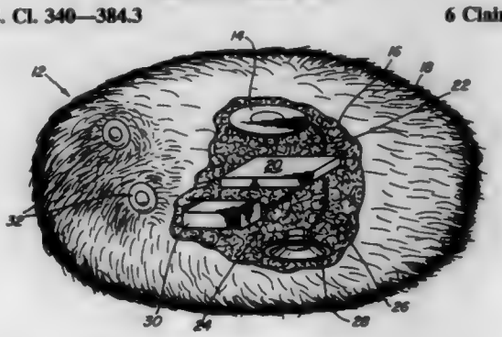
SOUND PRODUCING DEVICE STIMULATED BY PETTING

Glen Dash, 968 Lowell Rd., Concord, Mass. 01742

Filed Jan. 24, 1994, Ser. No. 186,014

Int. Cl.[6] G08B *3/00*

U.S. Cl. 340—384.3 **6 Claims**



1. An amusement device comprising

a pressure transducer having an output, said pressure transducer generating an electrical resultant at said output of said pres-

sure transducer in response to change of pressure on a surface of said pressure transducer;

a pliable covering having a hardness less than said pressure transducer, said pliable covering being mechanically coupled to said pressure transducer in such a manner as to allow for the movement of at least a portion of said pliable covering across said surface of said pressure transducer;

an enclosure containing said pliable covering arranged so as to transfer movement along a surface of said enclosure to said pliable covering thereby causing movement of at least said portion of said pliable covering across said surface of said pressure transducer;

a signal processing means including an amplifying valve, an input and an output, wherein said electronic resultant produced by said pressure transducer is connected to said input of said signal processing means and thereby multiplied in amplitude by a predetermined amount producing a processed resultant and presenting said processed resultant at said output of said signal processing means;

a threshold detection means including an input connected to said output of said signal processing means, and an output, wherein an electronic trigger of predetermined form is presented at said output of said threshold detection means when said processed resultant presented at said output of said signal processing means attains a predetermined form;

a retriggerable memory having an input and an output, said input of said memory connected to said output of said threshold detection means wherein an electronic resultant of said retriggerable memory is produced at said output of said retriggerable memory which is a function of past changes in said processed resultant presented at said output of said threshold detection means;

a sound generating means including an input and an output, said input being connected to said output of said retriggerable memory, said sound generating means producing electronic signals representative of sounds at said output of said sound generating means when said electronic resultant of said retriggerable memory attains a predetermined form;

an amplification means including an input and an output, said input being connected to said output of said sound generating means, said amplification means amplifying said electronic signals representative of sounds by a predetermined amount producing a waveform and presenting said waveform at said output of said amplification means;

an output sound transducer having an input, said input of said output sound transducer being connected to said output of said amplification means, said output sound transducer producing audible sounds when said waveform produced at said output of said amplification means attains a predetermined form.

5,471,193

TAMPER-RESISTANT VEHICLE EVENT RECORDER

Francis C. Peterson, Prescott, and James A. Weinert, West Bend, both of Wis., assignors to Phillips Plastics Corporation, Prescott, Wis.

Filed Jul. 12, 1993, Ser. No. 90,327

Int. Cl.[6] B60Q *1/00*

U.S. Cl. 340—438 **10 Claims**

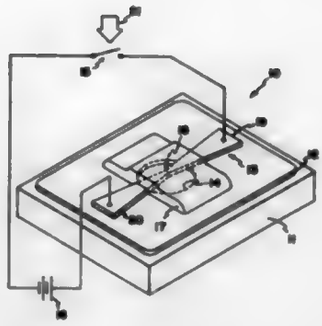
1. A temper-resistant vehicle event recorder comprising:

(a) a polymeric substrate;

(b) a combustible fuel coating on said polymeric substrate;

(c) an igniter for igniting said combustible fuel coating; and

(d) activation means connected to said igniter for activating the igniter in response to a vehicular event.



5,471,194

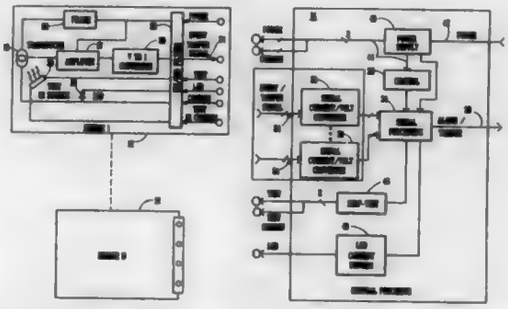
EVENT DETECTION SYSTEM WITH CENTRALIZED SIGNAL PROCESSING AND DYNAMICALLY ADJUSTABLE DETECTION THRESHOLD

John K. Guscott, Hickory, N.C., assignor to Aritech Corporation, Hickory, N.C.

Filed Mar. 23, 1993, Ser. No. 35,978

Int. Cl.[6] G08B *25/14*

U.S. Cl. 340—511 **17 Claims**



1. An event detection system with centralized signal processing and dynamically adjustable detection threshold, comprising:

a plurality of event detection units, each of said plurality of event detection units including:

at least one event detector, for providing an event signal having a variable value, said event signal indicating the detection of an event; and

a single, centralized signal processing unit, coupled to each of said plurality of event detection units, said centralized signal processing unit including:

at least one event detection signal processor, for processing said event signal, said at least one event detection signal processor including:

a comparator, for comparing the value of said event signal with a dynamically adjustable threshold value having a predetermined initial value, and for providing a first detection signal upon the value of said event signal exceeding the initial value of said dynamically adjustable threshold value;

a threshold generator, responsive to said event signal and to a predetermined offset value, for adjusting the value of said dynamically adjustable threshold, and for providing an adjusted threshold value to said comparator upon the value of said event signal exceeding said predetermined offset value, said adjusted threshold value increasing as a function of increases in value of said event detection voltage signal;

said comparator providing a second, confirming detection signal upon said event signal exceeding the value of said adjusted threshold value; and

alarm apparatus, responsive to said second, confirming detection signal, for providing an indication of a detected and confirmed event;

each of said plurality of event detection units further comprises a current signal source, coupled to said event detector and responsive to said event signal, for providing an event detection current signal; and

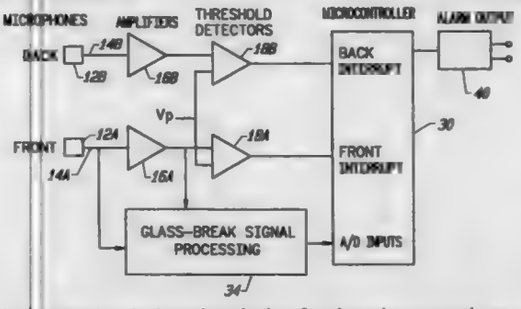
said centralized signal processing unit further comprises a plurality of current-to-voltage signal converters, each of said plurality of current-to-voltage signal converters responsive to one of said event detector current signals provided by one of said event detection unites, for converting said event detection current signal to an event detection voltage signal having a corresponding value.

5,471,195

DIRECTION-SENSING ACOUSTIC GLASS BREAK DETECTING SYSTEM

Stephen A. Rickman, Loomis, Calif., assignor to C & K Systems, Inc., Folsom, Calif.

Filed May 16, 1994, Ser. No. 243,205
Int. Cl.[6] G08B *13/00;* **H04B** *3/00*
U.S. Cl. 340—550 **14 Claims**



1. A glass break detection device for detecting acoustic wave signals, representative of glass breakage, from a preferred direction, said device comprising:

a first sensor means in a first location, said first sensor means being sensitive to sound in a specified frequency range, for detecting a first acoustic wave signal and for generating a first electrical signal in response thereto;

a second sensor means in a second location spaced from said first location, said second sensor means being sensitive to sound in said specified frequency range, for detecting a second acoustic wave signal, and for generating a second electrical signal in response thereto; and

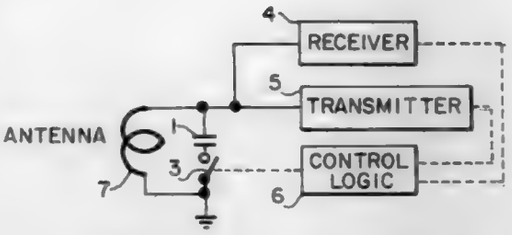
means for processing said first and second electrical signals for detecting the breakage of glass from the preferred direction, wherein said preferred direction is a function of the first and second locations, and wherein said processing means further comprises means for enabling the processing of said first electrical signal, in the event said first electrical signal precedes said second electrical signal, and for inhibiting the processing of said first electrical signal, in the event said first electrical signal does not precede said second electrical signal.

5,471,196

SECURITY SYSTEM FOR SURVEILLING THE PASSAGE OF COMMODITIES THROUGH DEFINED ZONES

Karsten G. Pilested, No. 171, Skovdiget, DK-2880 Bagsværd, Denmark

PCT No. PCT/DK91/00048, § 371 Date Aug. 13, 1992, § 102(e) Date Aug. 13, 1992, PCT Pub. No. WO91/12598, PCT Pub. Date Aug. 22, 1991
PCT Filed Feb. 19, 1991, Ser. No. 916,992
Claims priority, application Denmark, Feb. 19, 1990, 0433/90
Int. Cl.[6] G08B *13/14*
U.S. Cl. 340—572 **2 Claims**



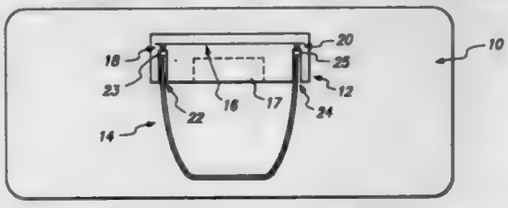
1. A security system for surveilling the presence of one or more objects in a monitored zone, said system comprising an antenna (7) and at least one tuning capacitor (1) in the monitored zone, a plurality of receiver/transmitter devices, each functioning as a tuned resonance circuit and being placed on respective ones of the one or more objects to be monitored, the antenna transmitting at short intervals an electrical signal that makes the receiver/transmitter devices, when present in the monitored zone, undergo oscillations which occur during intermissions between antenna (7) transmissions, said oscillations being received by the antenna (7) and used to determine the presence of the one or more objects in the monitored zone, and a switch (3) which temporarily electrically disconnects the at least one tuning capacitor from the antenna without short circuiting the antenna at commencement of each antenna (7) intermission to untune the antenna and thereby prevent it from storing energy.

5,471,197

TAMPER-PROOF BRACELET FOR HOME ARREST SYSTEM

Jim McCurdy, Middletown; Michael Doyle, Cincinnati, and Michael McLaughlin, Dayton, all of Ohio, assignors to Cincinnati Microwave, Inc., Cincinnati, Ohio

Filed Feb. 19, 1993, Ser. No. 20,207
Int. Cl.[6] G08B *13/186*
U.S. Cl. 340—573 **4 Claims**



1. A personnel monitoring apparatus, comprising:

a housing having a pair of slots each having a clear window therein;

a strap having two ends each for coupling to a respective slot;

an optical fiber incorporated with the strap and having two ends each adapted to be optically aligned with respective windows upon coupling of the strap; and

a circuit board mounted inside the housing and comprising:

first means for transmitting a data encoded signal comprised of a plurality of data bits;

second means adjacent one of said windows for emitting an optical signal;

third means adjacent the other of said windows for detecting an optical signal;

fourth means for comparing the detected optical signal to a reference signal, wherein a preselected one of said data bits has a value that is dependent on the result of said comparison.

5,471,198

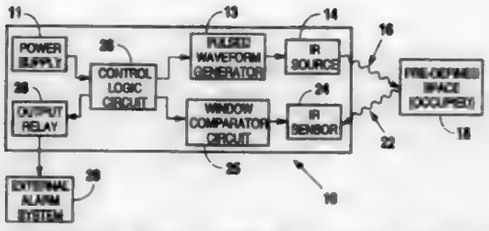
DEVICE FOR MONITORING THE PRESENCE OF A PERSON USING A REFLECTIVE ENERGY BEAM

Paul Newham, 707 Cypresstree, San Antonio, Tex. 78245

Filed Nov. 22, 1994, Ser. No. 343,259
Int. Cl.[6] G08B *13/183;23/00*
U.S. Cl. 340—573 **19 Claims**

1. An apparatus capable of monitoring the presence of a person within a pre-defined space, comprising:

a wave energy beam source;



a wave energy sensor capable of detecting reflected wave energy;

a control logic circuit electrically connected to said energy sensor and able to receive data from said energy sensor indicating the level of reflected energy detected; and

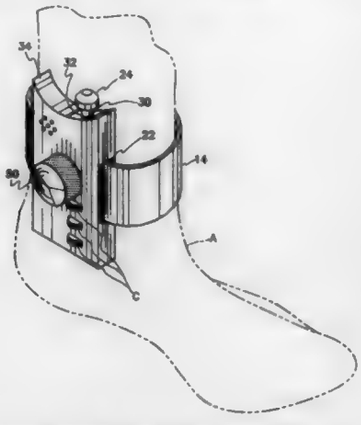
an output relay connected to said control logic circuit for receipt of control signals indicating the presence of an individual within said pre-defined space for interfacing to an external monitoring system.

5,471,199

PERSONAL LOCKABLE ALARM DEVICE

Zhiping Yuan, 215 Sand Beach Blvd. Apt. 2002, Shreveport, La. 71105

Filed Jun. 3, 1994, Ser. No. 253,901
Int. Cl.[6] G08B *15/00*
U.S. Cl. 340—574 **12 Claims**



1. A personal lockable alarm device comprising:

an outer housing;

a band having a first end attached to said outer housing and a second end opposite said first end;

a receptacle located on said outer housing for receiving said second end of said band;

locking means for selectively engaging said second end of said band within said receptacle, thereby maintaining said second end of said band therein and, alternatively, for releasing said second end of said strap therefrom when said locking means is located in an unlocked position;

alarm signal generation means located within said outer housing for producing an alarm signal when activated;

a manual alarm switch;

an alarm enabling switch located within said outer housing selectively adjustable between an enabling position for activating said alarm signal generation means upon the actuation of said manual alarm switch and a disabling position for deactivating said alarm signal generation means;

lock position detection means for detecting when said locking means is located in said locked position and, alternatively, in said unlocked position; and

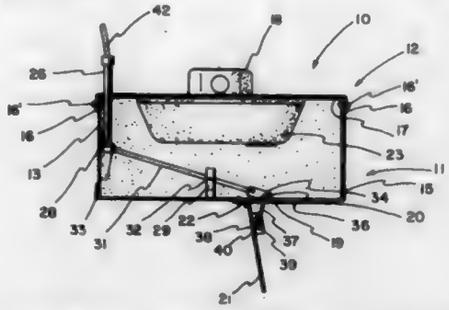
means for deactivating said alarm signal generation means by said alarm enablings when said locking means is located in said unlocked position as detected by said lock position detection means.

5,471,200

SMOKE DETECTOR PROTECTOR

Kindrick W. Romine, 511 Stack St., St. Pauls, N.C. 28384

Filed Apr. 19, 1994, Ser. No. 229,764
Int. Cl.[6] G08B *17/10*
U.S. Cl. 340—628 **6 Claims**



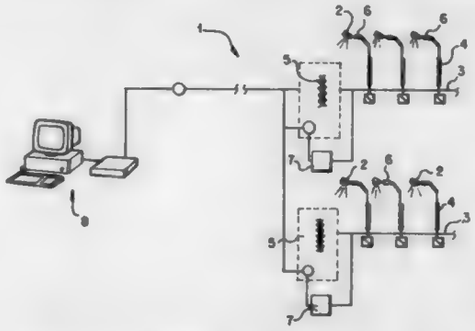
1. A smoke detector protector comprising: an enclosure for preventing airborne particles in the ambient air from entering such enclosure; a smoke detecting means operatively mounted within said enclosure; and automated means for exposing the interior of said enclosure and its smoke detecting means to the ambient air whereby when airborne pollutants in the ambient air are of sufficient concentration to cause the smoke detecting means to false alarm, the enclosure will protect such smoke detecting means from such pollution, and when the concentration of airborne pollutants is sufficiently reduced so as not to cause malfunctioning false alarms, said smoke detecting means will be exposed to the ambient atmosphere so that in case of fire, the smoke therefrom can be sensed and an alarm sounded.

5,471,201

METHOD AND APPARATUS FOR MONITORING THE OPERATING CONDITION OF LAMPS IN A PUBLIC LIGHTING NETWORK

Pietro Cerami, Seregno; Pierluigi Gatti, Bresso, and Pierluigi Melis, Milan, all of, Italy, assignors to Schlumberger Industries S.r.l., Milan, Italy

Filed May 24, 1993, Ser. No. 65,002
Claims priority, application Italy, Jun. 3, 1992, MI92A1368
Int. Cl.[6] G08B *21/00*
U.S. Cl. 340—641 **15 Claims**



1. A method of monitoring a state of operation of a lamp in a public lighting network, comprising the steps of:

sensing a voltage at terminals of the lamp;

sensing intensity of luminous flux emitted by the lamp when the lamp is first installed;

storing the voltage at the lamp as a first reference voltage;

storing the luminous flux as a first reference luminous flux intensity, which may be represented as a first reference point on a Cartesian diagram having a voltage axis along an x-axis and an intensity axis along a y-axis;

sensing at each moment a present voltage at the lamp terminals and a present intensity of the luminous flux emitted by the

lamp, with the present voltage and the present intensity at each moment being represented as a working point on the Cartesian diagram;

comparing the present voltage with the first reference voltage;

waiting until a moment when a difference between the present voltage and the first reference voltage exceeds a preset value;

storing the voltage at that moment and the intensity of luminous flux emitted at that moment as the second reference voltage and the second reference luminous flux intensity, which may be represented as a second reference point on the Cartesian diagram;

establishing a third reference point as a meeting point between the voltage axis and a line passing through the first and second reference points;

calculating at each moment an efficiency index of the lamp as ratio between an angular coefficient of a line joining the first and third reference points and a line joining the third reference point with the working point.

5,471,202

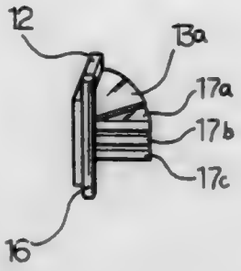
ROTATION SENSING DEVICE FOR DETECTING A FINE DISPLACEMENT OF A HANDLE AND CONTROL SYSTEM IN ELECTRICAL POWER STEERING DEVICE

Chang-Soo Kim, Taeku, Rep. of Korea, assignor to Samsung Heavy Ind. Co. Ltd., Kyung-Nam, Rep. of Korea

Filed Feb. 25, 1994, Ser. No. 201,630

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—672 **2 Claims**



1. A rotation sensing device for detecting a fine displacement of a handle shaft in an electrical power steering device comprising:

a fixing member having a support plate and a plurality of polarity plates fixed to one side of said support plate, each of said polarity plates being spaced at a predetermined interval; and

a dielectric member having a plurality of dielectric plates fixed to one side of said handle shaft, each of said dielectric plates being spaced at a predetermined interval and inserted into the interval between each of said polarity plates, whereby a capacitance of said dielectric member varies based on a mechanical displacement of said handle shaft, and wherein said handle shaft is inserted along cutout portions formed at one side of each of said polarity plates.

5,471,203

ADMISSION MANAGING SYSTEM

Michiyuki Sasaki; Kenji Suzuki, both of Sendai; Kenji Morosawa, Kawasaki; Toshimitsu Ohba, Kawasaki, and Tooru Kadonaga, Kawasaki, all of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

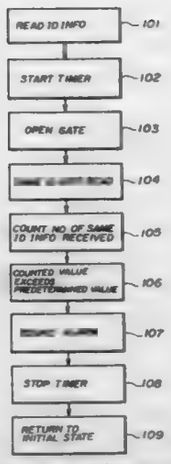
Continuation of Ser. No. 975,092, Nov. 12, 1992, abandoned. This application Feb. 1, 1995, Ser. No. 383,604

Claims priority, application Japan, Nov. 14, 1991, 3-299087

Int. Cl.[6] H04Q *9/00*; **G08B** *23/00*; **G06F** *7/04*

U.S. Cl. 340—825.31 **10 Claims**

1. An admission managing system for admitting a card holder of an integrated circuit card which has operating means, including a battery, for operating the integrated circuit card, means for receiving an external command to activate said operating means, a memory storing identification information, and means for at least communicating in a non-contact manner including reception of the command and transmission of the identification information, said admission managing system comprising:



a gate admitting the card holder of the integrated circuit card when opened;

first means for transmitting the external command to the integrated circuit card to activate said operating means and for receiving the identification information received from the integrated circuit card in response to the command;

second means, coupled to said first means, for storing identification information of authorized card holders to be admitted;

third means, coupled to said first and second means and to said gate, for comparing the identification information received from the integrated circuit card with identification information of each authorized card holder stored in said second means and opening said gate when the identification information received by said first means from the integrated circuit card is identical to one of the identification information stored in said second means; and

fourth means, coupled to said first and third means, for determining number of times the same identification information is received by said third means from said first means and outputting a warning to the card holder if the number of times the same identification information is consecutively received by said first means from the integrated circuit card exceeds a predetermined value so as to avoid repeated transmission of the identification information from the integrated circuit card exceeding a certain time, so that an unnecessary power consumption of the battery of said operating means of the integrated circuit card is prevented.

5,471,204

RADIO COMMUNICATION APPARATUS CAPABLE OF NOTIFYING RECEPTION OF A CALL SIGNAL IN A PERCEPTUAL MODE DETERMINED BY COUNTING A NUMBER OF TIMES OF THE RECEPTION

Kazuhiro Kudoh; Akira Muramatsu, and Tetsumi Ishiguro, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

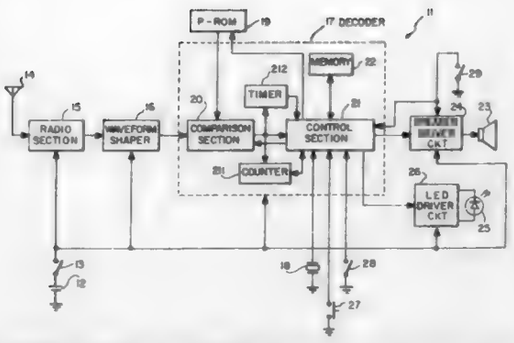
Continuation of Ser. No. 782,768, Oct. 28, 1991, abandoned, which is a continuation of Ser. No. 419,360, Oct. 10, 1989, abandoned, which is a continuation-in-part of Ser. No. 335,349, Apr. 10, 1989, abandoned. This application Jan. 10, 1994, Ser. No. 180,810

Claims priority, application Japan, Apr. 9, 1988, 63-86279; Jan. 12, 1988, 63-256251

Int. Cl.[6] G08B *7/00*

U.S. Cl. 340—825.44 **13 Claims**

1. A radio communication apparatus comprising:



receiving means for receiving call signals, a first number of said call signals being addressed to the radio communication apparatus, each of said first number of call signals being a specific call signal, and a second number of said call signals not addressed to the radio communication apparatus, each of said second number of call signals being other than a specific call signal;

determining means for determining whether or not the received call signal is a specific call signal and for producing a received signal whenever it is determined that the received call signal is a specific call signal;

counting means connected to said receiving means and given an initial count for counting up from said initial count one by one in response to said received signal to produce a reception count signal representative of a reception count of said specific call signal and indicative of the number of times said specific call signal has been received;

audibly notifying means for giving notice of receiving said specific call signal with a perceptually changeable notifying mode which is perceptually changed and which is specified by increasing a volume of an audible tone determined by said reception count of the specific call signal;

a reset switch for manually resetting said audible tone; and

controlling means connected to said counting means and responsive to said reception count signal for controlling the volume of said audible tone to vary said volume of the audible tone from one to another in accordance with said reception count represented by said reception count signal to keep the volume of the audible tone constant and to stop the audible tone after lapse of a predetermined duration even when said apparatus is not reset by the reset switch.

5,471,205

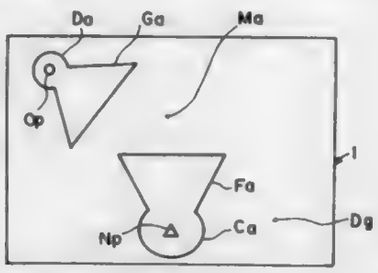
MAP DISPLAYING METHOD

Michio Izawa, 6-15-408 Tsunashimahigashi 3-chome, Kohoku-ku, Yokohama, Kanagawa, Japan

Filed Aug. 31, 1994, Ser. No. 297,549

Int. Cl.[6] G08G *1/123*

U.S. Cl. 340—995 **19 Claims**



1. A map display method wherein, when displaying a map of a desired area on a display screen of a liquid crystal display or CRT, the current point and the target or objective point, are displayed such that a display area for the current point is defined by a circular region having a predetermined radius and a fan-shaped region which spreads at a predetermined central angle from the current point toward the target or objective point and has substantially the form of a fan or an inverted-triangle, map information included in said display area of the current point being displayed on said display screen, and a display area for the target or objective point is defined by a circular region having a predetermined radius and an inverted-fan-shaped region which spreads at a predetermined central angle from the target or objective point toward the current point and has substantially the form of an inverted-fan or a triangle, map information included in said display area of the target or objective point being also displayed on said display screen.

5,471,206

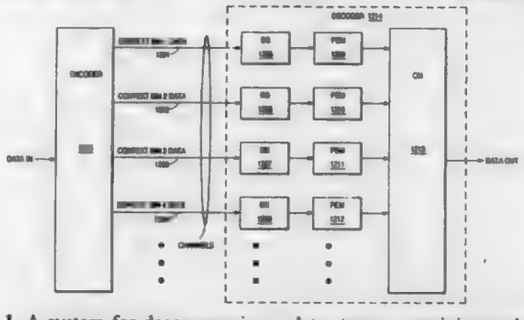
METHOD AND APPARATUS FOR PARALLEL DECODING AND ENCODING OF DATA

James D. Allen, Castro Valley; Martin Bolick, Palo Alto, and Edward L. Schwartz, Sunnyvale, all of Calif., assignors to Ricoh Corporation, Menlo Park, Calif., and Ricoh Company Ltd, Tokyo, Japan

Continuation of Ser. No. 16,035, Feb. 10, 1993, Pat. No. 5,381,145. This application Dec. 5, 1994, Ser. No. 350,321

Int. Cl.[6] H03M *7/34*

U.S. Cl. 341—51 **10 Claims**



1. A system for decompressing a data stream containing coded data compressed according to a coding scheme employing context and probability as attributes, said system comprising:

a channel control device coupled to receive the coded data, wherein the channel control device separates the coded data into a plurality of streams of coded data based on an attribute of the coding scheme and outputs the plurality of streams of coded data; and

a plurality of decoders coupled to receive the plurality of streams, wherein one of the plurality of decoders is coupled to a distinct one of the plurality of streams, said plurality of decoders decoding the plurality of streams in parallel, such that the plurality of coded data is decoded.

5,471,207

COMPRESSION OF PALETTIZED IMAGES AND BINARIZATION FOR BITWISE CODING OF M-ARY ALPHABETS THEREFOR

Ahmad Zandi, Cupertino; David G. Stork, Sanford, and James Allen, Mountain View, all of Calif., assignors to Ricoh Company Ltd., Tokyo, Japan, and Ricoh Corporation, Menlo Park, Calif.

Filed Feb. 23, 1994, Ser. No. 200,233

Int. Cl.[6] H03M *7/30*

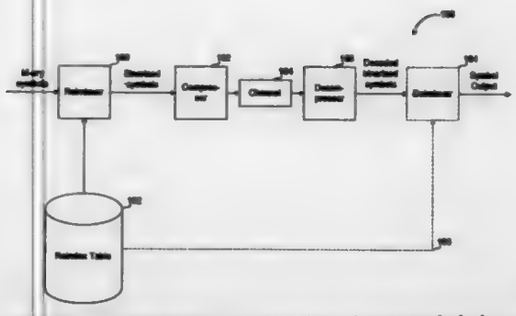
U.S. Cl. 341—107 **24 Claims**

1. A method of compressing input symbols, where each input symbol is selected from an alphabet of M symbols to represent a pixel in a palettized image, into codewords which are represented in fewer bits and from which the input symbols can be decoded, comprising the steps of:

selecting a context model;

reading an input stream of M-ary input symbols;

determining a distribution of contexts indicated by said context model over said input stream;



determining a distribution of said M-ary input symbols in said contexts over in said input stream;

assigning a first binary sequence to a first symbol of the M symbols in the alphabet, wherein said binary sequence is K bits, K being an integer greater than or equal to $\log_2 M$;

assigning subsequent binary sequences to subsequent symbols of the M symbols in the alphabet, wherein the subsequent binary sequence is the binary sequence, selected from all unassigned binary sequences, which results in a minimum partial bitwise entropy over a partial alphabet of symbols of the alphabet which have already been assigned a binary sequence and the selected binary sequence, thereby forming a reindexing table for translating any M-ary symbol to its assigned binarization;

repeating said step of assigning subsequent binary sequences at least until M−1 binary sequences are assigned to symbols;

assigning a remaining binary sequence to a remaining symbol, thus completing said reindexing table;

binarizing each M-ary input symbol using said reindexing table to form a bit stream; and

entropy encoding said bit stream to form the codewords in a compressed codeword stream.

5,471,208

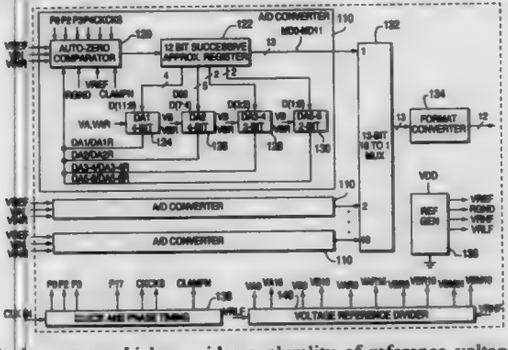
REFERENCE LADDER AUTO-CALIBRATION CIRCUIT FOR AN ANALOG TO DIGITAL CONVERTER

Donald J. Sauer, Monmouth, N.J., assignor to David Sarnoff Research Center, Inc., Princeton, N.J.

Filed May 20, 1994, Ser. No. 247,155

Int. Cl.[6] H03M *1/10*

U.S. Cl. 341—120 **10 Claims**



1. Apparatus which provides a plurality of reference voltages, comprising:

a resistor ladder, having a first end and a second end coupled to respective first and second sources of reference potential, and having a plurality of serially connected resistors, each having first and second terminals and a resistance defined therebetween;

variable resistance means, coupled to one resistor of the serially connected resistors, for changing the resistance thereof responsive to a control signal;

comparison means, coupled to the one resistor, for generating a difference signal representing a difference between a predetermined reference potential and a potential measured between the first and second terminals of the one resistor; and

control means, responsive to the difference signal for generating the control signal for the variable resistance means, said control signal changing the resistance of the one resistor in a sense to reduce the difference signal in magnitude.

5,471,209

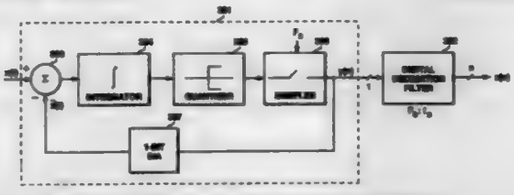
SIGMA-DELTA CONVERTER HAVING A DIGITAL LOGIC GATE CORE

Philip H. Sutterlin, San Jose, and Walter J. Downey, Los Gatos, both of Calif., assignors to Echelon Corporation, Palo Alto, Calif.

Filed Mar. 3, 1994, Ser. No. 205,704

Int. Cl.[6] H03M *3/02*

U.S. Cl. 341—143 **23 Claims**



1. An analog to digital converter circuit comprising:

an integrator for integrating an analog input signal to produce an integrated signal, wherein said integrator is comprised of a logic gate inverter;

a quantizer coupled to said integrator for quantizing said integrated signal to produce a quantized signal;

a sampler coupled to said quantizer for sampling said quantized signal;

a decimator coupled to said sampler for decimating a sampled signal from said sampler, said decimator outputting a digital signal representative of an amplitude of said analog signal.

5,471,210

ANALOG DIGITAL CONVERTER

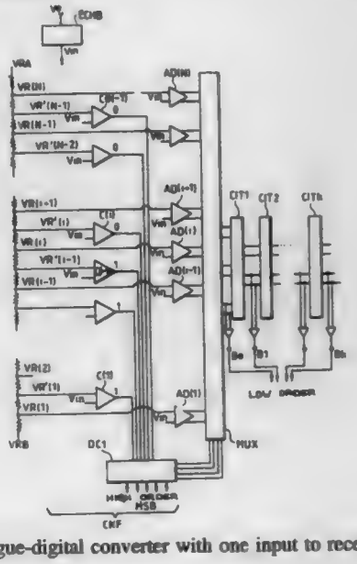
Marc Wingender, Grenoble, and Stéphane Le Tual, St Egreve, both of, France, assignors to Thomson-CSF Semiconducteurs Specifiques, Paris, France

Filed Nov. 15, 1993, Ser. No. 151,852

Claims priority, application France, Dec. 4, 1992, 92 14640

Int. Cl.[6] H03M *1/34*

U.S. Cl. 341—156 **12 Claims**



1. Analogue-digital converter with one input to receive an ana

logue voltage Vin to be converted, wherein it comprises three main reference voltages VR(i−1), VR(i), VR(i+1) and three differential amplifiers (ADA, ADB, ADC), each receiving on their first input, the voltage to be converted Vin variable between two extreme values Vext1 and Vext2 outside the interval between the main reference voltages, each of the amplifiers receiving one of the main reference voltages on second input, each amplifier supplying two output voltages (VAa, VAb; VBa, VBb; VCa, VCb) that vary symmetrically as a function of the voltage Vin, almost linearly about an average value Vm that is identical for the three amplifiers and that is obtained as an amplifier output when voltages on the two inputs of this amplifier are equal, the output voltages varying monotonically as a function of Vin for values of Vin between the extreme values Vext1 and Vext2, the converter also including a first interpolation circuit (CIT1) receiving the six amplifier output voltages and supplying four rank 1 interpolation voltages (V1*a*, V1*b*, V'1*a*, V'1*b*), variable as a function of Vin, according to a function that is near-sinusoidal for values of Vin between the main reference voltages, identical in amplitude for the four voltages but is out of phase, and representing a single sine period, the four interpolation voltages varying inversely in pairs, two of them (V1*a*, V1*b*) o passing through an average value and one of the two others (V'1*a*, V'1*b*) with a maximum and the other with a minimum when the voltage Vin is equal to any one of the three main reference voltages.

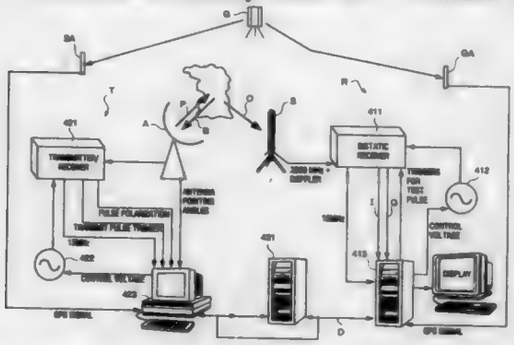
5,471,211

RECEIVER ANTENNA FOR BISTATIC DOPPLER RADAR NETWORK

Mitchell A. Randall; Christopher L. Holloway, and Joshua M. A. R. Wurman, all of Boulder, Colo., assignors to University Corporation for Atmospheric Research, Boulder, Colo.

Filed Nov. 30, 1993, Ser. No. 158,758
Int. Cl.[6] G01S *13/95*
U.S. Cl. 342—26 **12 Claims**

1. A radar receiver remotely located from a transmitter for



determining presence and locus of scatterers in a predefined space, wherein said transmitter transmits a focused beam of high frequency energy into said predefined space in a predetermined scan pattern, comprising:

transmitted beam that are reflected from scatterers in a predetermined sector of said predefined space and to reject ground clutter; and

means, responsive to receipt of said components by said directional antenna, for generating data indicative of presence and locus of said scatterers in said predefined space.

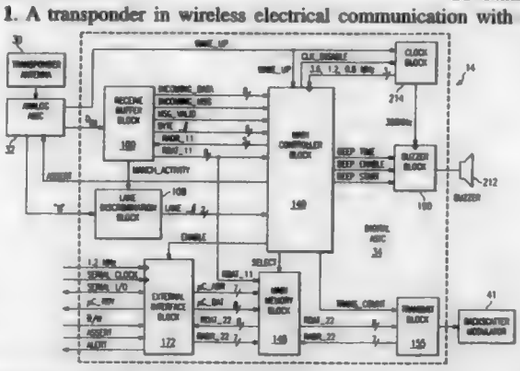
5,471,212

MULTI-STAGE TRANSPONDER WAKE-UP, METHOD AND STRUCTURE

Claude A. Sharpe, McKinney; Dwaine S. Hurta; Mark A. Hamlett, both of Garland, all of Tex., and Guenther Froschermeier, Abensberg, Germany, assignors to Texas Instruments Incorporated, Dallas, Tex., and Texas Instruments Deutschland GmbH, Germany

Filed Apr. 26, 1994, Ser. No. 233,839
Int. Cl.[6] G01S *13/75*
U.S. Cl. 342—51 **21 Claims**

1. A transponder in wireless electrical communication with an



interrogator, said transponder comprising:

a) an antenna, said antenna operable to receive an RF interrogation from said interrogator;

b) a threshold detector in electrical communication with said antenna, said threshold detector operable to measure the power level of said RF interrogation, to compare said power level to a threshold, and to provide a threshold signal indicating whether said power level is greater than said threshold;

c) a modulation detector in electrical communication with said antenna, said modulation detector for detecting modulation of said RF interrogation signal and for providing a modulation present signal; and

d) a control circuit that upon reception of said threshold signal and said modulation present signal is enabled for receiving said RF interrogation from said antenna and for performing actions in response to data modulated upon said RF interrogation.

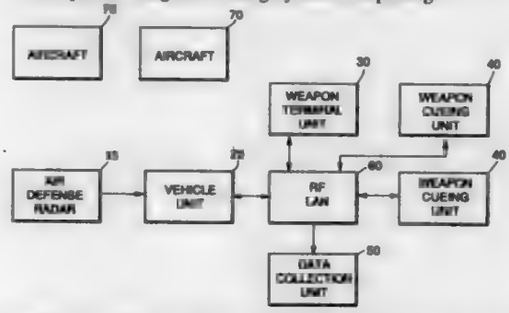
5,471,213

MULTIPLE REMOTED WEAPON ALERTING AND CUEING SYSTEM

Peter D. Hergesheimer, La Habra, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 26, 1994, Ser. No. 280,264
Int. Cl.[6] G01S *13/86*; F41G *7/28*;*5/08*
U.S. Cl. 342—67 **6 Claims**

1. A weapon alerting and cueing system comprising:



a weapon terminal responsive to radar track reports for radar detected aircraft, and for identifying selected radar detected aircraft as aircraft targets;

a first weapon launcher operated by a first weapon operator;

a first weapon pointing sensor associated with said first weapon launcher for providing azimuth and elevation information about said first weapon launcher;

a first cueing sight associated with said first weapon launcher for providing visual pointing cues to the first weapon operator;

first weapon cueing processor means responsive to said radar track reports, said weapon terminal, and said first pointing sensor for controlling said first cueing sight such that said first cueing sight provides visual cues for cueing said first weapon launcher to one of said aircraft targets;

a second weapon launcher operated by a second weapon operator;

a second weapon pointing sensor associated with said second weapon launcher for providing azimuth and elevation information about said second weapon launcher;

a second cueing sight associated with said second weapon launcher for providing visual pointing cues to the second weapon operator;

second weapon processor means responsive to said radar track reports, said weapon terminal, and said second pointing sensor for controlling said second cueing sight such that said second cueing sight provides visual cues for cueing said second weapon launcher to one of said aircraft targets; and

a plurality of RF modems respectively connected to said weapon terminal, said first weapon processor, and said second weapon processor for interconnecting said weapon terminal, said first weapon processor and said second weapon processor, such that said weapon terminal, said first weapon processor, and second weapon processor exchange data messages via said RF modems.

5,471,214

COLLISION AVOIDANCE AND WARNING SYSTEM

Sorin Faibish, Haifa; Ezra Shamay, Kiryat Bialik, and Shalom Shteckelman, Kiryat Haim, all of, Israel, assignors to State of Israel Ministry of Defense, Armament Developmental Authority, Rafael, Haifa, Israel

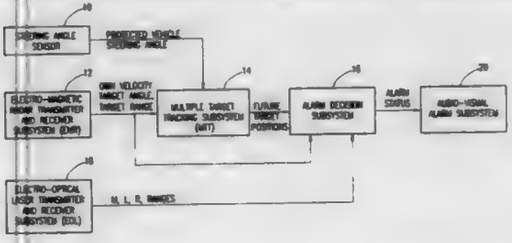
Filed Nov. 25, 1992, Ser. No. 982,188

Claims priority, application Israel, Nov. 27, 1991, 100175

Int. Cl.[6] G01S *13/93*

U.S. Cl. 342—70 **22 Claims**

1. A collision avoidance and warning system for land vehicles



comprising:

a radar transmitter/receiver module for sensing the presence of objects within a spatial range relative to a vehicle;

an auxiliary laser radar including a laser beam generator associated with a target intrusion sensor which detects intrusion of a target into a danger region having laser beam defined walls by generating a trigger signal indicating that one of the walls has been encountered by an object; and

an alarm activator receiving an input from said radar transmitter/receiver module and from said target intrusion sensor for indicating the alarm status of a target and for providing an output indication to alarm generating apparatus.

5,471,215

RADAR APPARATUS

Hiroshige Fukuhara, Yokosuka; Hiroyuki Kamishima, Kanagawa, and Toshiro Muramatsu, Zushi, all of, Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

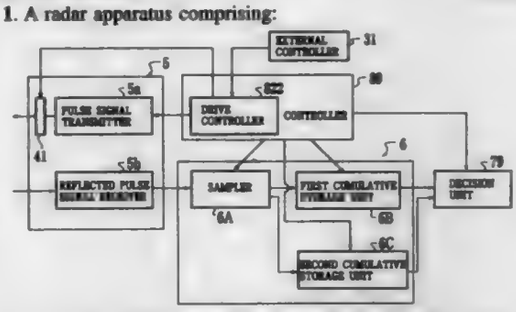
Filed Jun. 6, 1994, Ser. No. 254,827

Claims priority, application Japan, Jun. 28, 1993, 5-156643

Int. Cl.[6] G01S *13/93*

U.S. Cl. 342—70 **4 Claims**

1. A radar apparatus comprising:



(a) means for transmitting an output signal such as one of optical, electromagnetic, and sonic wave signals;

(b) means for controlling and driving said transmission means;

(c) means for receiving a reflected signal such as one of optical, electromagnetic, and sonic wave signals;

(d) means for sampling the received signal at predetermined intervals;

(e) means for accumulating data according to the contents of a first sampled signal sampled by said sampling means while said transmission means is operating as well as a second sampled signal sampled by said sampling means while said transmission means is inactive;

(f) first storage means for storing the accumulated data based on the first sampled signal;

(g) second storage means for storing the accumulated data based on the second sampled signal;

(h) means for controlling said sampling means and first and second storage means;

(i) means for detecting all levels of the accumulated data stored in said second storage means and employing the levels as thresholds for determining whether or not the accumulated data stored in said first storage means contain a reflected signal from an external target; and

(j) means for reading the accumulated data out of said first and second storage means and determining whether or not the accumulated data contain the reflected pulse from the target according to the thresholds.

5,471,216

ASSOCIATIVE PROCESSOR FOR DETECTING REDUNDANT RADAR DATA AND METHOD OF USE THEREOF

William B. Sullivan, Verona, N.J., assignor to Wide Band Systems, Inc., Franklin, N.J.

Filed Dec. 10, 1993, Ser. No. 165,246

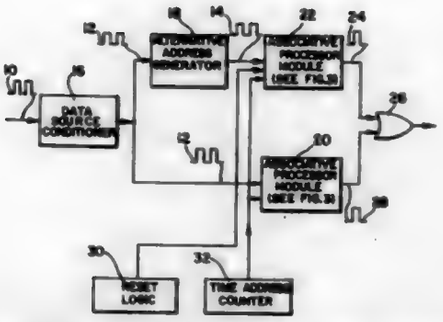
Int. Cl.[6] G06F *7/04*

U.S. Cl. 342—195 **19 Claims**

1. A circuit arrangement for processing a serial stream of randomly received digital words represented by logic "1's" and "0's" and combinations thereof to determine if each word is an exact or similar word as those previously received, said circuit arrangement comprising:

(a) circuit means for truncating each received word to a predetermined most significant bit (MSB) resolution by dropping at least one least significant bit (LSB) at the right end of the received word, said truncated word serving as an exact word reference;

(b) circuit means for examining the dropped least significant bit and if it is a "1" then adding " 1" to the truncated word and, conversely, if the least significant bit is a "0 ", then subtract-



ing a "1" from said truncated word, said adding or subtracting forming a similar word reference;

(c) first circuit means for receiving, holding and comparing said similar word reference against a previous similar word reference and generating a first output signal if there is a difference therebetween;

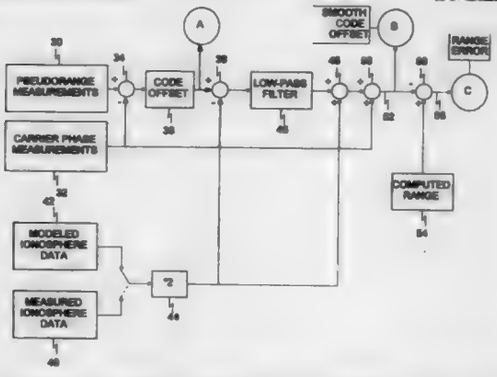
(d) second circuit means for receiving, holding and comparing said exact word reference against a previous exact word reference and generating a second output signal if there is a difference therebetween.

5,471,217

METHOD AND APPARATUS FOR SMOOTHING CODE MEASUREMENTS IN A GLOBAL POSITIONING SYSTEM RECEIVER

Ronald R. Hatch, Wilmington, and Jerry E. Knight, Long Beach, both of Calif., assignors to Magnavox Electronic Systems Company, Fort Wayne, Ind.

Filed Feb. 1, 1993, Ser. No. 12,061
Int. Cl.[6] H04B 7/185; G01S 5/02
U.S. Cl. 342—357 **24 Claims**



1. For use in a global positioning system (GPS) receiver having a single frequency of operation, a method for smoothing GPS code measurements of pseudorange with carrier phase measurements over an extended time interval without distortion due to divergence between code measurements and carrier measurements, the method comprising the steps of:

obtaining pseudorange code measurements and integrated carrier phase measurements in a single-frequency GPS receiver;

deriving from the pseudorange code measurements and the integrated carrier phase measurements a composite set of measurements that is substantially free of Doppler effects and ionospheric signal delay effects;

filtering the composite set of measurements over an extended time interval to remove errors that affect pseudorange measurements more than integrated carrier phase measurements; and

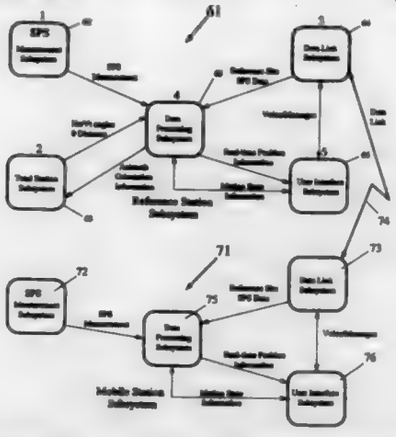
replacing Doppler effects in the filtered composite set of measurements, to obtain smoothed pseudorange code measurements.

5,471,218

INTEGRATED TERRESTRIAL SURVEY AND SATELLITE POSITIONING SYSTEM

Nicholas C. Talbot, Cupertino, and Mark Nichols, Sunnyvale, both of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Jul. 1, 1993, Ser. No. 86,665
Int. Cl.[6] G01S 5/02; H04B 7/185
U.S. Cl. 342—357 **40 Claims**



1. Apparatus for improved accuracy in measuring survey parameters, the apparatus comprising:

a first station, having an axis that is locally vertical, that provides a reference for the survey and whose location is known with high accuracy, the first station comprising:

a first Satellite Positioning System (SATPS) antenna and first SATPS receiver/processor, connected together, for receiving SATPS signals from two or more SATPS satellites and for determining the location of the first station according to the SATPS signals, the first SATPS receiver/processor also being adapted for determining a first station location difference, if any, between the known location of the first station and the location of the first station as determined by the SATPS signals;

a first station communications means, connected to the first SATPS receiver/processor, for transmitting or receiving information on station location and on SATPS satellite attributes; and

distance measurement means, whose spatial orientation can be varied arbitrarily, connected to the first SATPS receiver/processor, for transmitting an electromagnetic signal including a selected wavelength, for determining the distance from the first station to a selected object that is spaced apart from the first station by receipt of a return electromagnetic signal from the object, for determining an elevation difference, if any, between the first station and the object, and for determining an angular displacement, if any, between a line drawn from the first station to the object and a selected reference line lying in a plane containing the first station; and

a second station, having an axis that is locally vertical, that is spaced apart from and movable relative to the first station and acts as a mobile measurement unit for the survey, the second station comprising:

a second SATPS antenna and :second SATPS receiver/processor, connected together, for receiving SATPS signals from two or more SATPS satellites and for determining the location of the second station according to the SATPS signals;

a second station communications means, connected to the second SATPS receiver/processor, for communicating with the first station communications means and for transmitting or receiving information on station location and satellite attributes as determined by the SATPS satellite signals; and

distance measurement responder means, for receiving the electromagnetic waves transmitted by the distance mea-

surement means and for providing a return electromagnetic signal that is received by the distance measurement means;

where at least one of the first SATPS receiver/processor and the second SATPS receiver/processor uses the first station location difference to correct or increase the accuracy of the SATPS-determined location of the second station.

5,471,219

METHOD FOR AUTOMATICALLY POSITIONING A SATELLITE DISH ANTENNA TO SATELLITES IN A GEOSYNCHRONOUS BELT

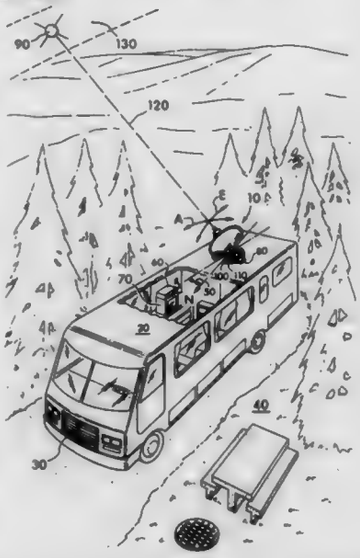
Charles E. Rodeffer, Burlington, Iowa; John D. Byers, Arvada, Colo., and Michael E. Rodeffer, Burlington, Iowa, assignors to Winegard Company, Burlington, Iowa

Continuation of Ser. No. 978,289, Nov. 18, 1992, Pat. No. 5,296,862. This application Mar. 17, 1994, Ser. No. 210,160

The portion of the term of this patent subsequent to Mar. 22, 2011, has been disclaimed.

Int. Cl.[6] H01Q *3/00*

U.S. Cl. 342—359 **25 Claims**



1. An automated method for positioning a satellite dish antenna mounted on the roof of a parked vehicle in order to receive signals from a plurality of satellites located in a geosynchronous belt, a receiver in the vehicle connected to receive signals from the satellite dish antenna, said automated method comprising:

(a) moving the satellite dish antenna in the azimuth and elevation directions to an initial search position in response to signals from the receiver, and

(b) with the satellite dish antenna in the initial search position, moving the satellite dish antenna to reading positions at intervals in predetermined search patterns in the azimuth and elevation directions until detecting in the receiver a signal peak reading for a selected audio subcarrier frequency in a selected channel of a target satellite located in the geosynchronous belt, the selected audio subcarrier frequency being unique in that the frequency of the selected audio subcarrier is not present in the corresponding selected channels of satellites near the target satellite.

5,471,220

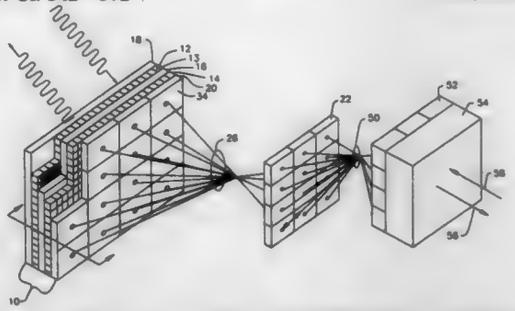
INTEGRATED ADAPTIVE ARRAY ANTENNA

David E. Hammers, Los Angeles, Calif., and Michael D. Conway, Roanoke, Va., assignors to ITT Corporation, New York, N.Y.

Filed Feb. 17, 1994, Ser. No. 198,410

Int. Cl.[6] H01Q *3/24*

U.S. Cl. 342—372 **21 Claims**



19. A method of constructing substantially planar integrated active array antenna system, comprising the steps of:

forming an antenna layer consisting of a plurality of antenna elements arranged in a planar geometry;

forming a transceiver layer having a plurality of integrated circuit transceiver chips arranged in a planar geometry, said transceiver chips operative for transmitting and receiving electromagnetic energy through said antenna elements, each of said transceiver chips having an input port;

forming a combining layer including at least one subarray operable to combine and divide signals passing through said transceiver chips, each said subarray including a coupling network having a plurality of output ports with each output port coupled to at least one input port of said transceiver chips; and

affixing said antenna, transceiver, and combining layers to one another in a sandwich type configuration, with each of said antenna layer, said transceiver layer and said combining layer as one layer of said sandwich type configuration.

5,471,221

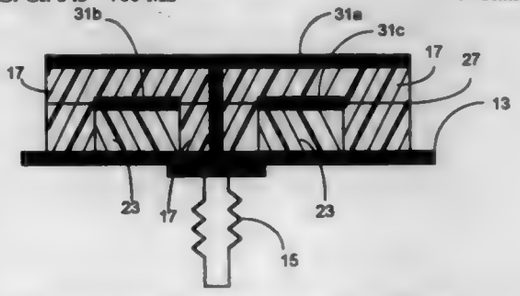
DUAL-FREQUENCY MICROSTRIP ANTENNA WITH INSERTED STRIPS

Vahakn Nalbandian, Ocean, N.J., and Choon S. Lee, Dallas, Tex., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 27, 1994, Ser. No. 272,911

Int. Cl.[6] H01Q *1/38*

U.S. Cl. 343—700 MS **9 Claims**



1. A dual-frequency microstrip antenna comprising:

a conductive ground plate means having a feed inserted therethrough;

at least three strips of a first dielectric material bonded to the conductive ground plate means in a spatially-separated manner, the first dielectric material having a first dielectric constant;

at least two strips of a second dielectric material bonded to the conductive ground plate means at locations within spaces separating the three strips of the first dielectric material, the

strips of a second dielectric material having a conductive cladding which is separated from the conductive ground plate means and the feed, and the strips of a second dielectric material having a second dielectric constant which is higher than the first dielectric constant; and

a dielectric covering over an upper surface of the three strips of the first dielectric material and over an upper surface of the two strips of the second dielectric material, the dielectric covering having a radiating conductive cladding which electrically contacts the feed;

wherein the three strips of the first dielectric material form low dielectric regions and the two strips of the second dielectric material form high dielectric regions, and wherein the high and low dielectric regions establish low and high resonance regions, respectively, wherein fields of lower resonance are excited in the high dielectric regions and exponentially decay in the low dielectric regions and fields of higher resonance are excited in the low dielectric regions.

5,471,222

ULTRAHIGH FREQUENCY MOBILE ANTENNA SYSTEM USING DIELECTRIC RESONATORS FOR COUPLING RF SIGNALS FROM FEED LINE TO ANTENNA

Xin Du, Glen Ellyn, Ill., assignor to The Antenna Company, Itasca, Ill.

Filed Sep. 28, 1993, Ser. No. 128,367
Int. Cl.[6] H01Q *1/32;1/50*
U.S. Cl. 343—713 **32 Claims**

27. A method for coupling an omnidirectional antenna to a utilization device in a vehicle, said method comprising: providing an elevated feed radiating element, providing a pair of dielectric resonators, disposing a first of said resonators on an outside surface and a second of said resonators on an inside surface of a window of said vehicle in generally opposing, registering relationship, electrically coupling said radiating element to the first resonator, electrically coupling a utilization device within the vehicle to the second resonator and coupling RF energy through the window by resonance mode coupling of said first and second resonators.

5,471,223

LOW VSWR HIGH EFFICIENCY UWB ANTENNA

John McCorkle, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 1, 1993, Ser. No. 160,304
Int. Cl.[6] H01Q *13/02*
U.S. Cl. 343—786 **10 Claims**

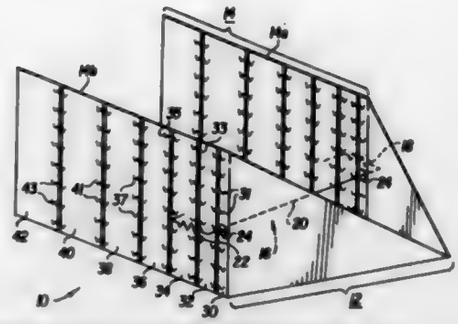
1. An antenna for radiating UWB RF pulses, comprising:

a transverse electromagnetic mode antenna having an input end and an output end;

a resistively loaded parallel plate section connected to said output end of said transverse electromagnetic mode antenna;

a shunt network connected between parallel plates of said resistively loaded parallel plate section;

wherein said resistively loaded parallel plate section comprises two sections of parallel plates; and



wherein each of said parallel sections of plates is comprised of a plurality of plates having varying widths.

5,471,224

FREQUENCY SELECTIVE SURFACE WITH REPEATING PATTERN OF CONCENTRIC CLOSED CONDUCTOR PATHS, AND ANTENNA HAVING THE SURFACE

Sina Barkeshli, Saratoga, Calif., assignor to Space Systems/Loral Inc., Palo Alto, Calif.

Filed Nov. 12, 1993, Ser. No. 151,501
Int. Cl.[6] H01Q *15/02;15/24*
U.S. Cl. 343—909 **17 Claims**

1. A microwave frequency selective element being reflective in a first frequency band and transmissive in a second frequency band different from said first frequency band, comprising:

a substantially periodic array of sets of radiators disposed along a surface of the element, wherein each of the sets of the radiators comprises at least two radiators of which one radiator is an innermost radiator and a second radiator is an outermost radiator which encircles the innermost radiator, each radiator having a configuration which encircles a point on the surface of the element;

wherein said second frequency band is lower than said first frequency band, and the outermost radiator has a circumference approximately equal to a wavelength of radiation in the lower one of said frequency bands.

5,471,225

LIQUID CRYSTAL DISPLAY WITH INTEGRATED FRAME BUFFER

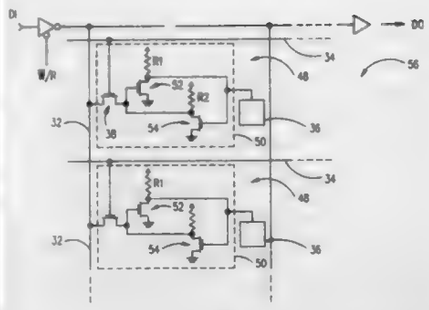
Terry J. Parks, Round Rock, Tex., assignor to Dell USA, L.P., Austin, Tex.

Continuation of Ser. No. 55,174, Apr. 28, 1993, abandoned. This application May 17, 1994, Ser. No. 245,801
Int. Cl.[6] G02F *1/133*
U.S. Cl. 345—98 **18 Claims**

1. A storage cell capable of storing video data within a liquid crystal display, comprising:

a display electrode arranged within said liquid crystal display;

a storage element arranged within said liquid crystal display, said storage element comprising:



a source-drain path for receiving video data when said source-drain path is conductive; and

a memory circuit having first and second transistors, each of said transistors having a gate and first and second terminals, said first terminals being connectable to a power supply, said second terminals being grounded, said first terminal of said first transistor being further connected to said gate of said second transistor and said source-drain path, said first terminal of said second transistor being further connected to said gate of said first transistor and said display electrode, thereby storing said video data and providing driving current and voltage to charge said display electrode.

5,471,226

COORDINATE INPUT APPARATUS AND CALIBRATION METHOD FOR THE SAME

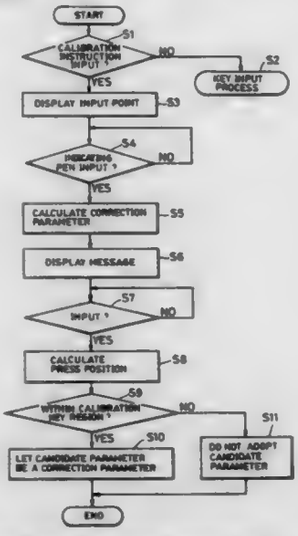
Noriyuki Suzuki, Tokyo, and Shinsuke Takeuchi, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 499,986, Mar. 27, 1990, abandoned. This application Oct. 7, 1992, Ser. No. 958,454

Claims priority, application Japan, Mar. 27, 1989, 1-71897

Int. Cl.[6] G09G *3/02*

U.S. Cl. 345—173 **4 Claims**



1. A coordinate input apparatus, comprising:

a coordinate input member having a first coordinate system for inputting a coordinate value of an indicated position thereon indicated at a desired position with an indicating pen;

display means having a second coordinate system for displaying in dot form the indicated position of said indicating pen on said coordinate input member;

instruction means for instructing a calibration process for matching the coordinate systems of said coordinate input member and said display means when a specific region on said coordinate input member has been indicated by said indicating pen;

display controlling means for displaying a pattern by said display means to be indicated by said indicating pen, which is necessary to derive a correction parameter for matching the coordinate systems when said instruction means has instructed;

correction parameter derivation means for deriving a correction parameter on the basis of a prescribed indication by said indicating pen at the position on said coordinate input member corresponding to said pattern;

prompting means for prompting an operator to indicate a specific region on said coordinate input member by said indicating pen again after a correction parameter is derived by said correction parameter derivation means;

judgment means for Judging whether the indicated position coordinate by the indicating pen belongs to said specific region on said coordinate input member on the basis of the indicated position coordinate value derived by using the correction parameter derived by said correction parameter derivation means; and

coordinate value derivation means for deriving the coordinate value of the indicated position by said indicating pen using the correction parameter derived by the correction parameter derivation means when said judgment means judges that the indicated position coordinate by the indication pen belongs to the specific region.

5,471,227

RECORDING METHOD WITH VARIABLE RECORDING INTERVAL

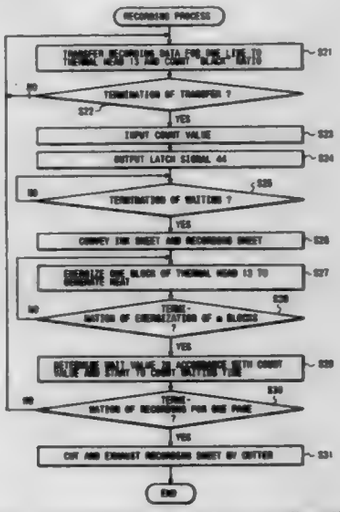
Tomoyuki Takeda, Yokohama; Takehiro Yoshida, Tokyo; Takeshi Ono, Yokohama; Makoto Kobayashi, Tama; Satoshi Wada, Kawasaki; Yasushi Ishida, Tokyo; Minoru Yokoyama, Yokohama; Akihiro Tomoda, Yokohama; Masakatsu Yamada, Yokohama, and Takashi Awai, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 883,172, May 15, 1992, abandoned, which is a division of Ser. No. 552,016, Jul. 13, 1990, Pat. No. 5,144,329. This application May 9, 1994, Ser. No. 240,214

Claims priority, application Japan, Jul. 14, 1989, 1-180525; Jul. 3, 1990, 2-174461

Int. Cl.[6] B41J *2/01*

U.S. Cl. 347—9 **3 Claims**



1. An ink jet recording method for recording linewise on a recording medium by using an ink jet recording head having a plurality of electrothermal converting members and discharging an ink using thermal energy generated by said electrothermal converting members, said method comprising the steps of:

measuring a driving ratio of said electrothermal converting members for each one line;

determining a time period between termination of recording of a previous line and commencement of a recording of a next line in accordance with the driving ratio measured for said next line in said measuring step; and

allowing said next line to be recorded after passage of said determined time period.

5,471,228

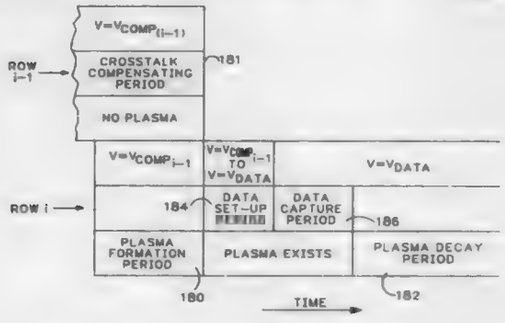
ADAPTIVE DRIVE WAVEFORM FOR REDUCING CROSSTALK EFFECTS IN ELECTRO-OPTICAL ADDRESSING STRUCTURES

Kevin J. Ilcisin, Beaverton, and Dennis W. Prince, Banks, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Continuation of Ser. No. 958,631, Oct. 9, 1992, abandoned. This application Feb. 1, 1994, Ser. No. 189,999

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—58 **25 Claims**



1. A driving method for an electro-optical addressing structure having an array of display elements defined by the intersections of plural data drive electrodes arranged in columns and plural data strobe electrodes arranged in rows, the display elements in a row storing in response to a data strobe signal applied to the data strobe electrode of the row data information corresponding to voltage values of data drive signals applied to the data drive electrodes during a row address period and display elements in subsequent rows storing data information corresponding to voltage values of data drive signals applied to the data [strobe] drive electrodes during subsequent row address periods of a frame addressing period, the mean square average voltage across portions of each display element during the frame address period being incidentally affected by crosstalk, the method comprising:

determining for each row address period a compensating signal having a voltage value corresponding to voltage values of data drive signals applied to a first and at least one other data drive electrodes during the row address period; and

applying the compensating signal to the first data drive electrode during _a compensation phase of the row address period, whereby the compensating signal offsets much of the crosstalk to more accurately maintain a nominal mean square voltage value across portions of the display element during the frame addressing period.

5,471,229

DRIVING METHOD FOR LIQUID CRYSTAL DEVICE

Shinjiro Okada, Isehara; Yutaka Inaba, Kawaguchi, and Kazunori Katakura, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

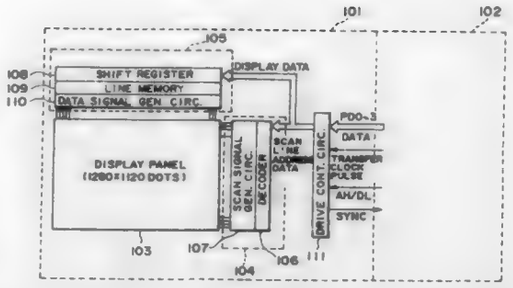
Filed Feb. 9, 1994, Ser. No. 193,740

Claims priority, application Japan, Feb. 10, 1993, 5-044364

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—89 **9 Claims**

1. A driving method for a liquid crystal device of the type comprising a pair of oppositely disposed electrode plates having



thereon a group of scanning lines and a group of data lines, respectively, and a liquid crystal disposed between the pair of electrode plates so as to form a pixel at each intersection of the Scanning lines and data lines, said driving method comprising:

for displaying a halftone, applying to a data line a halftone signal selected from plural halftone signals determined according to a first relationship between applied voltage and transmittance of a pixel; and

for displaying a minimum or a maximum transmittance, applying to a data line an extreme signal determined according to a second relationship between applied voltage and transmittance of a pixel, said second relationship being different from said first relationship,

wherein a scanning line is supplied with a reset signal for resetting pixels thereon and then a selection signal for writing, and said halftone signal or extreme signal is selectively applied to a data line for an associated pixel in synchronism with the selection signal.

5,471,230

CAPPING MEANS AND INK JET RECORDING APPARATUS USING THE SAME

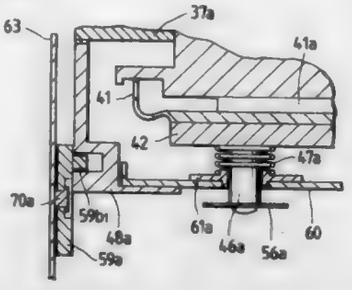
Atsushi Saito, Yokohama; Akiro Okubo, Tokyo; Fumihiko Watanabe, and Yasuyuki Shinada, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1991, Ser. No. 655,153

Claims priority, application Japan, Feb. 13, 1990, 2-31700; Feb. 13, 1990, 2-31707; Feb. 13, 1990, 2-31708; Feb. 13, 1990, 2-31716; Feb. 13, 1990, 2-31718; Feb. 13, 1990, 2-31720; Feb. 13, 1991, 3-19939

Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—29 **24 Claims**



1. A recovery device for use in an ink jet recording apparatus for recording on a recording medium by discharging ink onto the recording medium, the device comprising:

a capping member for contacting an entire periphery of a discharge portion of an ink jet recording head for discharging ink to effect recording on the recording medium; and

a pushing member provided on an inner side of said capping member for pushing and sealingly closing with pressure a discharge port of the discharge portion, wherein said pushing member is disposed for direct contact with the discharge port to prevent ink from flowing therefrom.

5,471,231
INK JET HEAD

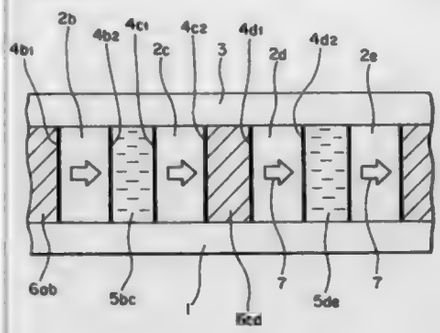
Hisato Hiraishi, Tokyo; Motonobu Hoshino, and Tadashi Mitsuhashi, both of Saitama, all of, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1993, Ser. No. 143,050

Claims priority, application Japan, Jan. 30, 1992, 4-314257; Dec. 1, 1992, 4-343594

Int. Cl.[6] B41J *2/045;2/055*

U.S. Cl. 347—68 19 Claims



1. An ink jet head comprising:

a plurality of elongated members formed of piezoelectric material, said elongated members being spaced apart from one another so as to define therebetween a plurality of elongated channels, alternating ones of said elongated channels defining ink channels;

electrodes formed in said channels on opposing sides of said elongated members;

a channel closing member mounted to said elongated members to cover portions of said channels, said channel closing member having nozzle holes respectively formed therein in alignment with at least some of said channels;

wherein said elongated members are polarized in at least one transverse direction across said elongated members and said channels;

wherein said elongated members and said electrodes comprise an ink jetting means for selectively jetting ink from said nozzle holes by selectively changing volumes of said ink channels by expansion mode deformation of selected ones of said elongated members, upon application of a drive voltage, having a polarity corresponding to a direction of polarization of said elongated members, to selected ones of said electrodes.

5,471,232
INK JET RECORDING HEAD

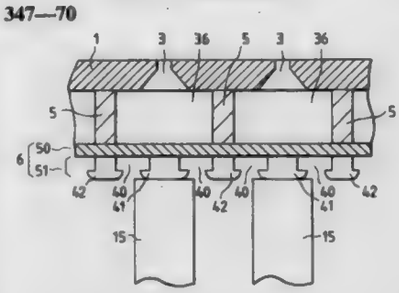
Satoru Hosono; Takahiro Naka; Shuji Yonekubo, and Satoshi Shinada, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Mar. 2, 1993, Ser. No. 24,769

Claims priority, application Japan, Mar. 3, 1992, 4-45194; Sep. 10, 1992, 4-242222; Sep. 16, 1992, 4-246778; Feb. 22, 1993, 5-56553

Int. Cl.[6] B41J *2/045*

U.S. Cl. 347—70 7 Claims



1. An ink jet recording head comprising:

a nozzle plate having a plurality of nozzle holes for ejecting ink;

a vibration plate having a first layer and a second layer, said first and said second layer being composed of different materials;

a spacer member disposed between said nozzle plate and said vibration plate and fixedly secured to said nozzle plate and said vibration plate, said spacer member having a plurality of openings formed therein, said openings being enclosed on one side by said vibration plate and on another side by said nozzle plate to thereby form pressure chambers;

a plurality of piezoelectric vibrators each of which extends and contracts in an axial direction thereof; and

a plurality of islands projecting from said first layer of said vibration plate to form said second layer of said vibration plate, a fore end of each of said piezoelectric vibrators being fixed to said vibration plate through each of said islands.

5,471,233
INK JET RECORDING APPARATUS

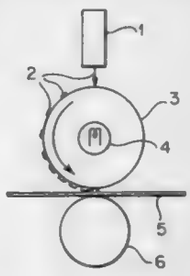
Toru Okamoto, and Kazuo Maruyama, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 983,223, Nov. 30, 1992, abandoned. This application Nov. 23, 1994, Ser. No. 347,166

Claims priority, application Japan, Jan. 29, 1992, 4-038789

Int. Cl.[6] B41J *2/01*

U.S. Cl. 347—103 7 Claims



1. An ink jet recording apparatus comprising:

a recording head adapted to hold fusible ink;

a transfer member facing said recording head without contacting it;

heating means for heating said transfer member to a predetermined temperature;

pressure applying means facing said transfer member in such a way that a recording medium can pass therebetween, and cooperating with said transfer member for applying pressure to said recording medium; and

voltage applying means for applying a voltage between said recording head and said transfer member;

said recording head supplying the fusible ink in a molten state to said transfer member, said predetermined temperature being higher than the softening point of said ink and lower than the melting point of said ink, and said transfer member comprising materials having a surface energy approximately equal to the value of the critical surface tension of said ink and smaller than the surface energy of said recording medium.

5,471,234
RECORDING APPARATUS

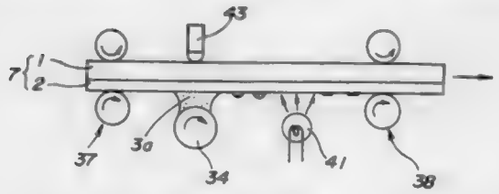
Yasuo Katano, Yokohama; Tsutomu Nakajima; Yoshikazu Kaneko, both of Numazu, and Hiroyuki Horiguchi, Yokohama, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 620,579, Dec. 3, 1990, Pat. No. 5,278,126, which is a continuation-in-part of Ser. No. 501,871, Mar. 29, 1990, abandoned. This application Jun. 10, 1993, Ser. No. 74,405

Claims priority, application Japan, Mar. 31, 1989, 1-81181; Sep. 6, 1989, 1-232019; Feb. 23, 1990, 2-43599; Aug. 8, 1990, 2-209396

Int. Cl.[6] B41M *5/00*

U.S. Cl. 347—171 52 Claims



1. A recording apparatus comprising:

a recording medium having a recording layer having a characteristic in which a receding contact angle decreases when said recording layer is heated in a condition where said recording layer is in contact with a liquid;

first heating means, coupled to said recording medium, for selectively heating said recording layer in accordance with image information; and

first supplying means, coupled to said recording medium, for supplying a contact material to a surface of said recording layer, said contact material being selected from a liquid, a vapor and a solid which generates or changes to either a vapor or liquid under conditions of a temperature lower than a temperature at which the receding contact angle on said recording layer starts to decrease,

wherein the receding contact angle on an area on the surface of said recording layer, where said contact material is supplied and said first heating means heats, decreases so that a latent image corresponding to said area is formed on the surface of said recording layer.

5,471,235
DEVICE FOR READING THE PRINTING DONE BY A TRANSFER THERMAL PRINTER

Bernard Patry, Orsay, France, assignor to Axiohm, Montrouge, France

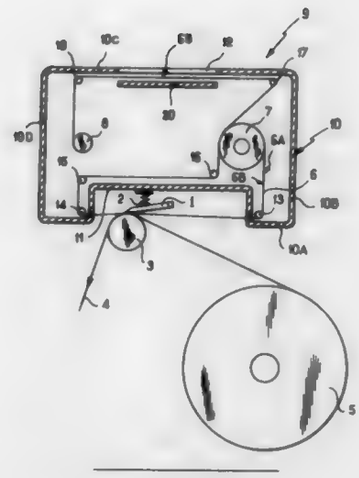
Filed Nov. 23, 1994, Ser. No. 346,290

Claims priority, application France, Nov. 24, 1993, 93 14070

Int. Cl.[6] B41J *32/00*

U.S. Cl. 347—214 5 Claims

1. In a device for reading impressions made by a transfer thermal printer having a print head, wherein the device has a transfer film paid out from a roll and taken up by a drum, the transfer film having a face for contacting the print head of the transfer thermal printer, the roll and the drum being disposed inside a cassette having a side wall including a setback defining a print zone, the improvement wherein the cassette has a read window other than the print zone, and guides for imposing a path on the transfer film such that the transfer film travels from the print zone to the read window between the roll and the drum.



5,471,236
MULTI-BEAM SCAN OPTICAL SYSTEM

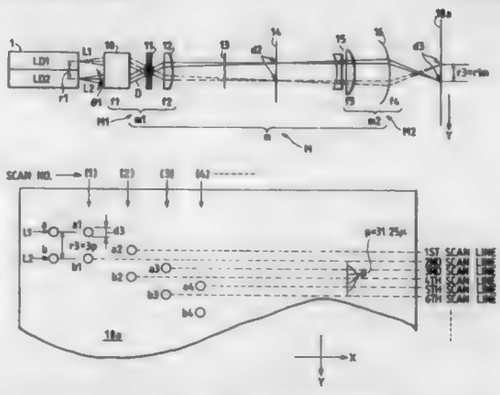
Masao Ito, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 842,712, Feb. 27, 1992. This application Aug. 25, 1992, Ser. No. 934,314

Claims priority, application Japan, Feb. 28, 1991, 3-034374; Jun. 28, 1991, 3-158608; Aug. 26, 1991, 3-214000

Int. Cl.[6] B41J *2/455*

U.S. Cl. 347—233 4 Claims



1. A multi-beam scan optical system comprising:

a laser array including a plurality of laser diodes, said laser diodes having oscillation positions separated from each other by a distance r_1;

a rotating polygen mirror having facets;

a first scan optical system having an optical axis and including a collimate lens for collimating a plurality of laser beams emitted from the plurality of laser diodes, said collimated laser beams crossing the optical axis of the first scan optical system at a position, each of the laser beams emitted by the laser diodes having a divergence angle θ_1 which corresponds to an angle within which an intensity of each of the plurality of laser beams is at least $1/e^2$ times a maximum intensity of each of the plurality of laser beams in a subsidiary scan direction and a wave length λ, a first subsidiary-scan directional power optical member, having an optical power in the subsidiary scan direction, for focusing the collimated laser beams on said facets of said rotating polygon mirror, and an aperture having a diameter and located at the position where the plurality of collimated laser beams cross the optical axis of said first scan optical system; and

a second scan optical system including an f-θ lens disposed between the rotating polygon mirror and a photoreceptor surface, said f-θ lens receiving laser beams reflected from the rotating polygon mirror and emanating the received laser

beams, and a second subsidiary-scan directional power optical member, having an optical power in the subsidiary scan direction, for focusing the laser beams emanated from said f-θ lens on the photoreceptor surface in a state that the laser beams are separated from each other by a given interlaced scanning period i in the subsidiary scan direction,

wherein said parameters r_1, λ, θ_1, and i are selected so as to satisfy the following relation:

$$K=\frac{4}{\pi}\,\alpha\,\frac{i\lambda}{r_1\theta_1}$$

where K is a number in a range from 1.0 to 1.8, and α is a value which depends on said diameter of the aperture as viewed in the subsidiary scan direction and satisfies the following relation:

$$d_2=(4\alpha/\pi)(\lambda f_2/D)$$

where π is a circular constant, f_2 indicates a focal distance of the first subsidiary-scan directional power optical member, D indicates a diameter in which the intensity is at least $1/e^2$ times the maximum intensity of each of the collimated laser beams entering the aperture, where $1/e^2$ is a constant, and d_2 indicates a spot diameter in the subsidiary scan direction of each of the laser beams which are focused on the facets of the rotating polygon mirror.

5,471,237

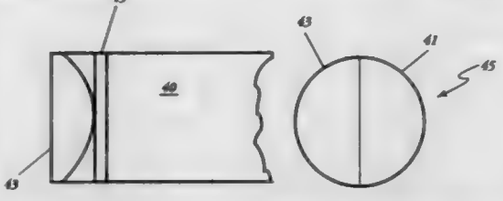
SINGLE LENS STEREOSCOPIC VIDEO CAMERA

John L. Shipp, Tullahoma, Tenn., assignor to Apollo Camer, LLC, Tullahoma, Tenn.

Continuation-in-part of Ser. No. 905,278, Jun. 26, 1992, Pat. No. 5,264,925. This application Nov. 22, 1993, Ser. No. 156,036

Int. Cl.[6] A61B *1/04;1/06;* **H04N** *7/18*

U.S. Cl. 348—46 **6 Claims**



1. A stereoscopic video camera system for viewing an object, the system comprising:

a. a lens mounted in an optical tube for focusing light reflected from the object onto a sensor mounted within said optical tube, said sensor responsive to a level of the light reflected from the object focused on said sensor by said lens;

b. said optical tube having a center line and an inner circumferential margin defining an optical path between said lens and said sensor;

c. a shutter mounted transversely across said optical tube, said shutter comprising left and right optical zones, each of said left and right optical zones switchable between a light transmissive state and an opaque state in response to a shutter drive signal; and

d. said left and right optical zones each having inner margins immediately adjacent each other proximate said center line of said optical tube and having outer margins proximate said inner circumferential margin of said optical tube, whereby said right and left optical zones together occupy substantially all of said optical path.

5,471,238

UNIT FOR TRANSFERRING IMAGES ON FILM ONTO VIDEOTAPE MOUNTED IN A VIDEO CAMERA WITH SYNCHRONOUS SOUND RECORDING

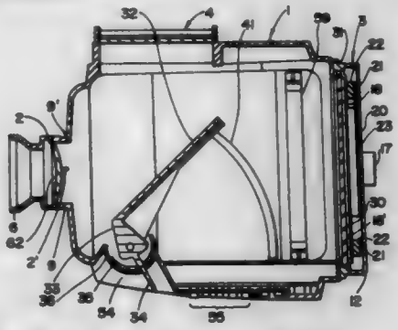
Jong-Chan Bae, Seoul, Rep. of Korea, assignor to Dongyang Jonghap Corporation, Chungchong Pukdo, Rep. of Korea

Filed Oct. 13, 1992, Ser. No. 959,913

Claims priority, application Rep. of Korea, Jan. 12, 1991, 16979/1991

Int. Cl.[6] H04N *5/253*

U.S. Cl. 348—98 **3 Claims**



1. A film-to-tape transfer apparatus comprising:

a case body having a lens mount, a glass screen mount and a photo mount;

a control panel disposed on a side of said case body, for controlling input audio and video signals to be transferred;

a filter case aperture forming a hollow aperture through said lens mount; and

a adjustable reflecting mirror located inside the case body, the reflecting mirror being used to reflect an image projected from the glass mount through the lens mount, the reflecting mirror having a manipulating knob extending outside of the case body;

wherein a filter case loaded with a plurality of filters is inserted into said filter case aperture, the filter case having a plurality of U-shaped indentations on an upper peripheral edge of the filter case and a plurality of L-shaped tongues on a lower peripheral edge of the filter case for engagement with the filter case aperture.

5,471,239

DETECTING SCENE CHANGES

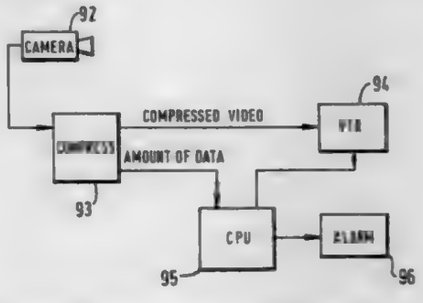
Philip N. C. Hill, Newbury, and Bruce W. Randall, Banbury, both of, Great Britain, assignors to Solid State Logic Limited, Oxfordshire, England

PCT No. PCT/GB93/00634, § 371 Date Dec. 8, 1993, § 102(e) Date Dec. 8, 1993, PCT Pub. No. WO93/19467, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 26, 1993, Ser. No. 142,461

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—155 **27 Claims**



1. A method of detecting the position of a scene change in a

video frame sequence, said method comprising the steps of:

generating data representing the amount of information present in each video frame;

processing said data to locate significant changes in said amount of information between frames, and

identifying the frame position of said significant changes, so as to identify the frame position of likely scene changes.

5,471,240

NONUNIFORMITY CORRECTION OF AN IMAGING SENSOR USING REGION-BASED CORRECTION TERMS

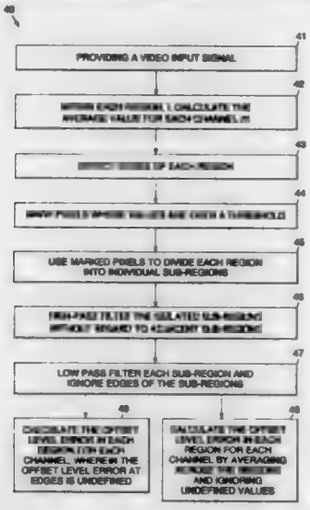
Kenneth E. Prager, Los Angeles; Stephen J. Herbst, Redondo Beach; Jerry N. Simeros, Los Angeles; John J. Wootan, Long Beach, and Douglas M. Gleichman, Redondo Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 15, 1993, Ser. No. 152,154

Int. Cl.[6] H04N 5/33

U.S. Cl. 348—164 **18 Claims**

1. A scene based nonuniformity correction method for use with a



scanning infrared sensor, said method comprising the steps of:

providing a video input signal derived from an image;

processing the video input signal such that a vector representing offset correction terms is formed, wherein each element in the vector represents a correction term for a particular detector of the scanning infrared sensor and wherein the vector is initially set to zero;

separating the image into vertically oriented regions, each region comprising a plurality of channels;

computing an average of each channel within a region

forming a set of region vectors, such that there is one region vector for each region;

globally high-pass filtering each region vector wherein edges larger than predefined threshold are detected and marked

separating each region vector into sub-regions demarcated by the edges;

locally high-pass filtering each sub-region

computing the offset correction terms for each vertical region vector from said high-pass filtered sub-regions; and

applying the offset correction terms to the video signal.

5,471,241

IMAGE SENSING METHOD AND APPARATUS FOR PRODUCING A COLOR VIDEO SIGNAL AND LUMINANCE VIDEO SIGNAL

Teruo Hieda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

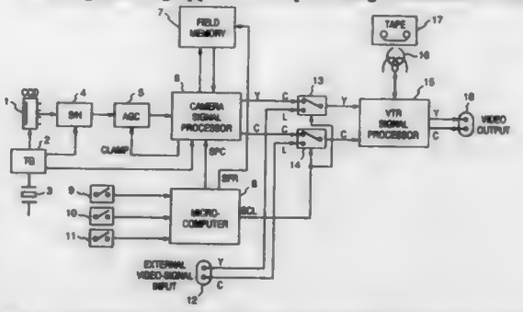
Filed Mar. 2, 1994, Ser. No. 205,664

Claims priority, application Japan, Mar. 5, 1993, 5-044951

Int. Cl.[6] H04N 9/64

U.S. Cl. 348—222 **8 Claims**

3. An image sensing apparatus for producing a luminance video



signal by subjecting an output video signal from a color image sensing element to digital signal processing, comprising:

analog-to-digital converting means for converting the output video signal of the color image sensing element into a digital video signal;

intensity-signal extracting means for extracting an intensity signal from a digital video signal, which is a signal analog-to-digital converted from the output video signal from the color image sensing element;

color-difference signal extracting means for extracting color-difference signals from the digital video signal;

gain control means for controlling the gain of the color difference signals;

gamma-correcting means for gamma-correcting the intensity signal;

synchronization means for synchronizing said intensity signal gamma-corrected by said gamma-correcting means with said color-difference signals gain-controlled by said gain control means; and

luminance video signal producing means for correcting said intensity signal synchronized by said synchronization means based upon said color-difference signals gain-controlled by said gain control means, and producing a luminance video signal based upon said corrected intensity signal and a blanking signal.

7. An image sensing method for producing a luminance video signal by subjecting an output video signal from a color image sensing element to digital signal processing, comprising:

an analog-to-digital converting step of converting the output video signal of the color image sensing element into a digital video signal;

an intensity-signal extracting step of extracting an intensity signal from digital video signal, which is a signal analog-to-digital convened from the output video signal from the color image sensing element;

a color-difference signal extracting step of extracting color-difference signals from the digital video signal;

a gain control step of controlling the gain of the color-difference signals;

a gamma-correcting step of gamma-correcting the intensity signal;

a synchronization step of synchronizing said intensity signal gamma-corrected by said gamma-correcting step with said color-difference signals gain-controlled by said gain control step; and

a luminance video signal producing step of correcting said intensity signal synchronized by said synchronization step based upon said color-difference signals gain-controlled by

said gain-control step, and producing a luminance video signal based upon said corrected intensity signal and a blanking signal.

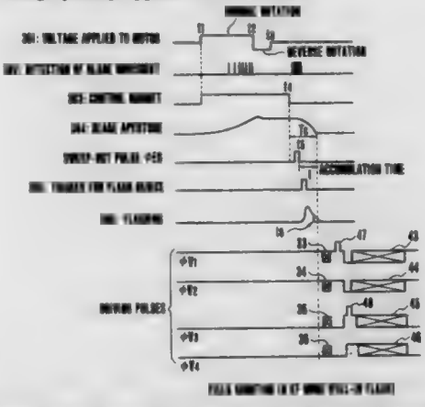
5,471,242

STILL IMAGE PICKUP APPARATUS WITH SHORTENED EXPOSURE TIME

Makoto Kondo, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1993, Ser. No. 26,991
Claims priority, application Japan, Mar. 10, 1992, 4-051710
Int. Cl.[6] H04N *5/238*
U.S. Cl. 348—224 **13 Claims**

1. An image pickup apparatus comprising:



(a) image pickup means for producing an electrical signal based on an optical image;

(b) shutter means for shielding said image pickup means from said optical image; and

(c) control means for controlling and causing said image pickup means to start producing the electrical signal after controlling and causing said shutter means to start shielding said image pickup means.

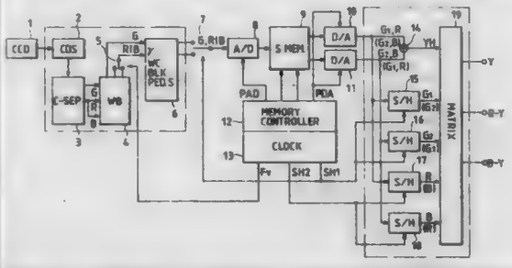
5,471,243

ELECTRONIC STILL CAMERA

Masao Suzuki, Tokyo; Kazuyuki Matoba, Yokohama; Yuji Sakaegi, Kawasaki, and Takashi Sasaki, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 10,495, Jan. 28, 1993, abandoned, which is a continuation of Ser. No. 575,382, Aug. 28, 1990, abandoned. This application Jun. 15, 1994, Ser. No. 260,039
Claims priority, application Japan, Aug. 31, 1989, 1-225366; Nov. 28, 1989, 1-306495; Nov. 28, 1989, 1-306496
Int. Cl.[6] H04N *9/07*
U.S. Cl. 348—234 **12 Claims**

1. An image pickup apparatus for performing a frame read



operation by interlaced scanning an image pickup element comprising color filters, comprising:

a. a luminance signal processing unit including means for storing first-field signals in a first field memory at a first timing, means for outputting a sum of the signal stored in said first field memory and a second-field signal as a new first-field signal at a second timing, means for storing a sum of the signal stored in said first field memory and a signal obtained by delaying the second-field signal by one horizontal scanning period in said first field memory at the second timing, and means for outputting the sum stored in said first field memory as a new second-field signal at a third timing; and

b. a color signal processing unit including means for storing the first-field signal in a second field memory at the first timing, means for outputting a sum and a difference of the signal stored in said second field memory and the second-field signal as new first-field signals at the second timing, means for storing a sum of the signal stored in said second field memory and a signal obtained by delaying the second-field signal by one horizontal scanning period in said second field memory, and storing a difference between these signals in a third field memory at the second timing, and means for outputting the sum and difference stored in said second and third field memories as new second-field signals.

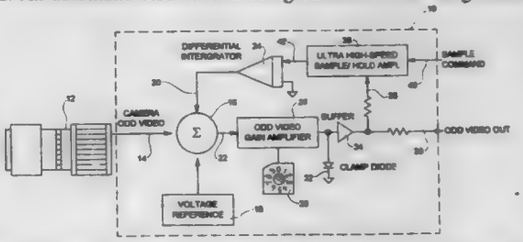
5,471,244

AUTOMATIC DARK LEVEL ZEROING FOR AN ANALOG VIDEO SIGNAL

Kenneth I. Wolfe, Maplewood, Minn., assignor to 3M Company, St. Paul, Minn.

Filed May 31, 1994, Ser. No. 250,820
Int. Cl.[6] H04N *5/16*
U.S. Cl. 348—257 **13 Claims**

1. An automatic dark level zeroing circuit for removing a dark



level DC bias from an analog video signal generated by a charge-coupled device (CCD) camera, comprising:

a summing node that is DC-coupled to the CCD camera and combines the analog video signal and a zero correction signal to produce a zeroed video signal;

a video gain amplifier connected to the summing node that amplifies the zeroed video signal in response to a user-supplied setting to produce an output video signal;

a sample/hold circuit that samples the output video signal to produce a sampled video value in response to a sample command indicative of when the output video signal represents the dark level DC bias; and

a difference integrator connected to the sample/hold circuit to subtract the sampled video value from a zero voltage value to produce the zero correction signal,

such that the automatic dark level zeroing circuit forms an adaptive feedback loop that removes the dark level DC bias from the analog video signal.

5,471,245

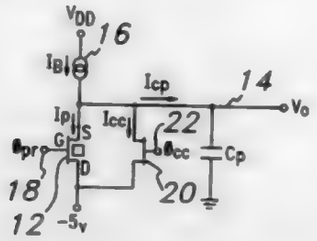
BULK CHARGED MODULATED DEVICE (BCMD) IMAGE SENSORS WITH INCREASED DYNAMIC RANGE

Alan N. Cooper, Coppell; William P. McCracken, Garland, and Jaroslav Hynecek, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 969,668, Oct. 30, 1992, Pat. No. 5,335,015. This application May 19, 1994, Ser. No. 245,933

Int. Cl.[6] H04N *3/14*

U.S. Cl. 348—302 1 Claim



1. An image array having at least one photosite transistor, at least one column sense line and at least one column clamp transistor, wherein:

a source of said photosite transistor is coupled to said column sense line;

a source of said column clamp transistor is coupled to said photosite source;

a drain of said column clamp transistor is coupled to a drain of said photosite transistor;

a clocked voltage is applied to a gate of said column clamp transistor; and

a variable current is coupled to said column sense line, the variable current is decreased when the clocked voltage is increased.

5,471,246

APPARATUS FOR DETERMINING CHARGE/VOLTAGE CONVERSION RATIOS IN CHARGE COUPLED DEVICES

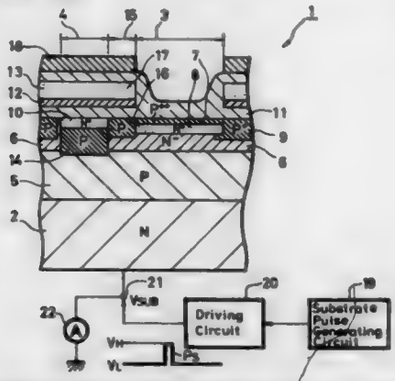
Osamu Nishima; Tomoyuki Suzuki, and Kazuhiko Nishibori, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 48,953, Apr. 16, 1993, abandoned, which is a continuation of Ser. No. 766,504, Sep. 27, 1991, abandoned. This application Apr. 21, 1994, Ser. No. 232,421

Claims priority, application Japan, Sep. 27, 1990, 2-258515

Int. Cl.[6] H04N *5/335*

U.S. Cl. 348—322 1 Claim



1. A solid state image pickup apparatus for use in determining a charge/voltage conversion ratio comprising:

a semiconductor substrate having a first conductivity type;

a photosensitive portion formed on said semiconductor substrate, and consisting of a first semiconductor layer having a second conductivity type and formed on said substrate, a storage region of the first conductivity type formed on the first semiconductor layer, the photosensitive portion being capable of transferring signal charges accumulated in said storage region to the substrate through said first semiconductor layer;

a vertical shift register formed on said first semiconductor layer;

a horizontal shift register coupled to one end of said vertical shift register;

an output terminal connected to a last stage of said horizontal shift register;

a substrate pulse generating circuit generating a first level pulse which causes a first potential at the first semiconductor layer which is less than the potential of the storage region; and a second level pulse which causes a second potential at the first semiconductor layer which is greater than the potential of the storage region;

a substrate terminal connected to said substrate and receiving the outputs of said pulse generating circuit;

a first detecting means connected to said substrate terminal so as to measure a substrate current flowing through said substrate terminal when said first level pulse is supplied to said substrate terminal; and

a second detecting means connected to said output terminal so as to measure an output voltage of said output terminal wherein the charge/voltage conversion ratio is obtained in accordance with a ration between the output voltage and the substrate current.

5,471,247

ELECTRONIC PICTURE REPRODUCTION DEVICE

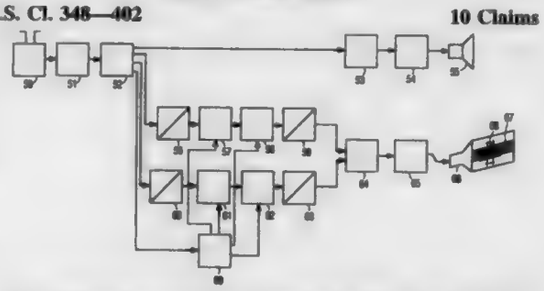
Wolfgang Hartnack, Burgdorf, Germany, assignor to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany

Continuation of Ser. No. 750,051, Aug. 27, 1991, abandoned. This application May 6, 1993, Ser. No. 57,404

Claims priority, application Germany, Mar. 3, 1989, 39 06 712.2

Int. Cl.[6] H04N *5/228*

U.S. Cl. 348—402 10 Claims



1. In a system for processing a video signal representing a single image constituted by a plurality of image processing blocks with adjacent blocks being separated by a border region, each block containing a plurality of picture elements (pixels), each block exhibiting either first and second different types of image motion, and each block having a perimeter pixel region comprising edge pixels and pixels in the immediate vicinity of said edge pixels; perimeter pixel blending apparatus for selectively modifying perimeter pixel values to soften border regions of adjacent blocks when exhibiting different types of motion, comprising:

a signal source providing a digital representation of said video signal;

a signal processor responsive to said video signal for providing a control signal indicating the type of motion of said first or second types respectively associated with said image blocks;

a digital signal processor responsive to said control signal and to said digital representation of said video signal, for processing image blocks in accordance with the type of motion identified by said control signal for respective blocks;

an adaptive signal translating network responsive to an output signal from said digital processor for selectively providing, when a first block and an adjacent second block exhibit different types of motion, an output video signal with original edge pixel values of said first block substantially exclusive of inner pixels of said first block selectively modified as a function of both (a) a first rule is used to determine the original pixel values of said first block which exhibits said static image content, and (b) a second rule is used to determine pixel values in a block which exhibits said dynamic image content; and

an image display device responsive to said output video signal from said translating network.

5,471,248

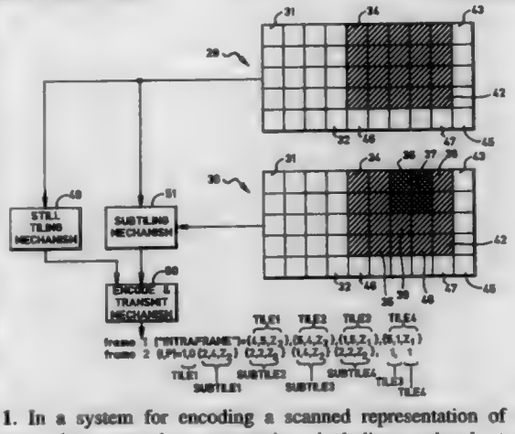
SYSTEM FOR TILE CODING OF MOVING IMAGES

Vivek Bhargava, Santa Clara; Andrew Jue, San Jose; Michael A. Van Scherrenburg, Cupertino, and Les J. Wilson, Morgan Hill, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 13, 1992, Ser. No. 975,668

Int. Cl.[6] H04N *7/26*

U.S. Cl. 348—420 **30 Claims**



1. In a system for encoding a scanned representation of an image, the scanned representation including ordered, two-dimensional arrays of pixels, each pixel including an intensity value, a combination comprising:

a buffer for storing a succession of two-dimensional arrays of pixels, each two-dimensional array representing a temporal instantiation of an image;

a first tiling unit coupled to the buffer for:

partitioning pixels of a first two-dimensional array into a plurality of tiles, wherein within each of the tiles, a variance among pixel intensity values is less than a first predetermined value; and

generating a single pixel intensity value for each tile; and

a second tiling unit coupled to the buffer and to the first tiling unit for producing a representation of change in the image occurring between the first two-dimensional array and a second two-dimensional array following the first two-dimensional array, the representation of change including a plurality of sub-tiles in the second two-dimensional array, each sub-tile corresponding to at least a portion of a tile in the first two-dimensional array, wherein within each sub-tile a variance among pixel intensity values is less than the first predetermined value, and for at least one sub-tile in the second two-dimensional array, the variance between an intensity value for a pixel in the sub-tile and a single pixel intensity value for a corresponding tile in the first two-dimensional array is greater than a second predetermined value.

5,471,249

SCAN CONVERTING APPARATUS FOR TRANSFERRING SUBTITLES ON A SCREEN

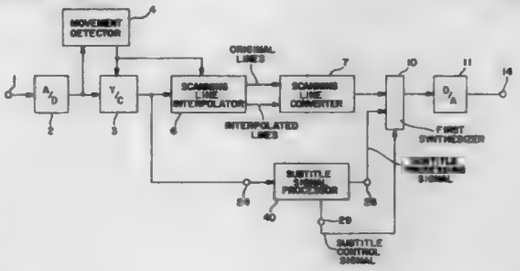
Hiroki Monta, Ibaraki, and Ryuji Matsuura, Takatsuki, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 11, 1993, Ser. No. 105,034

Claims priority, application Japan, Aug. 11, 1992, 4-213875

Int. Cl.[6] H04N *5/278*

U.S. Cl. 348—445 **5 Claims**



1. A scan converting apparatus comprising:

a video signal input terminal,

an A/D converter connected to said video signal input terminal and which converts an input analogue signal to a digital signal,

a movement detector connected to the output of said A/D converter and detects moving parts in the video signal,

a brightness/chrominance signal separator connected to the output of said A/D converter and the output of said movement detector and which separates a brightness signal from the video signal,

a subtitle signal processor connected to a brightness signal output of said brightness/chrominance signal separator and extracts and transfers a subtitle signal,

a constant value input terminal,

a second synthesizer connected to said constant value input terminal and the brightness signal output of said brightness/chrominance signal separator and which masks a subtitle part of the output signal from said brightness/chrominance signal separator with a constant value from said constant value input terminal according to a subtitle mask control signal from said subtitle signal processor,

a scanning line converter connected to an output of said second synthesizer and converts numbers of scanning lines,

a first synthesizer connected to a subtitle signal output of said subtitle signal processor, a subtitle control signal output of said subtitle signal processor, and a video output of said scanning line converter and synthesizes said subtitle signal output from said subtitle signal processor and said video output from said scanning line converter according to said subtitle control signal output from said subtitle signal processor to generate a further digital signal,

a D/A converter connected to an output of said first synthesizer and converts said further digital signal to a further analogue signal, and

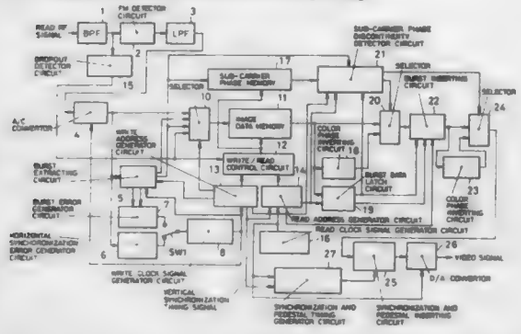
a video signal output terminal which receives said further analogue signal from said D/A converter.

5,471,250
DIGITAL TIME BASE CORRECTOR WITH DROPOUT COMPENSATING FUNCTION

Hiroshi Otaki, and Masahiro Nakajima, both of Koufu, Japan, assignors to Pioneer Video Corporation, Yamanashi, and Pioneer Electronic Corp., Tokyo, both of, Japan

Filed Dec. 16, 1994, Ser. No. 357,861
Claims priority, application Japan, Dec. 16, 1993, 5-316939
Int. Cl.[6] H04N *5/94;5/956;5/95*
U.S. Cl. 348—498 **1 Claim**

1. A digital time base corrector comprising:



A/D converting means for sampling a color video signal, which has been read from a recording medium and reproduced, to convert said color video signal to a digital signal;

polarity data generating means for generating polarity data indicating the polarity of a burst signal from said digital signal at intervals of one horizontal scan period;

an image data memory for storing said digital signal as image data in sample units at intervals of one horizontal scan period;

a sub-carrier phase memory having a number of positions, for storing said polarity data, equal to the number of said image data sample units written into said image data memory;

dropout detecting means for generating a dropout detection signal when dropout occurs in said color video signal;

memory control means for writing said image data at storing positions in said image data memory sequentially specified in accordance with a write clock signal, phase-synchronized with time base fluctuations included in said color video signal and writing said polarity data into storing positions in said sub-carrier phase memory sequentially specified in accordance with said write clock signal, said memory control means further for reading said image data from storing positions in said image data memory sequentially specified in accordance with a read clock signal having a constant duration and reading said polarity data from storing positions in said sub-carrier phase memory sequentially specified in accordance with said read clock signal, said memory control means in response to said dropout detection signal for inhibiting said image data and said polarity data from being written into said image data memory and said sub-carrier phase memory;

latch means for holding and outputting said polarity data generated by said polarity data generating means during a data read operation period of said memory control means corresponding to the horizontal scan period in which said polarity data was generated;

discrepancy detecting means for generating a discrepancy detection signal when discrepancy is detected between said polarity data read by said memory control means and polarity data held in said latch means;

color phase inverting means for relaying said image data read from said memory control means and, responsive to said discrepancy detection signal for inverting the color phase of said image data read from said memory control means and relaying said image data with the inverted color phase; and

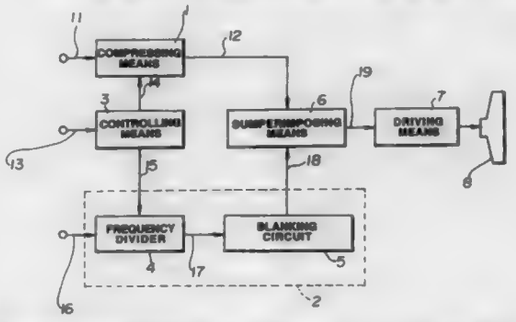
means for generating an analog video signal based on said image data output from said color phase inverting means.

5,471,251
VIDEO DISPLAYING APPARATUS CAPABLE OF DISPLAYING A VIDEO WHILE FORMING A BLANKING REGION

Hitoshi Inaba, and Hidenobu Kimura, both of Saitama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 10, 1993, Ser. No. 74,441
Claims priority, application Japan, Jun. 15, 1992, 4-154925
Int. Cl.[6] H04N *5/265;5/262*
U.S. Cl. 348—634 **3 Claims**

1. A video displaying apparatus capable of displaying a video



while forming a blanking region adjacent to the video displaying region, said video displaying apparatus comprising:

a video signal source for providing a video signal;

compressing means for compressing said video signal in a predetermined time direction, thereby converting said video signal to a compressed signal;

blanking signal generating means for generating a blanking signal gradually varying relative to a width of said blanking region;

superimposing means for superimposing said blanking signal on a vacant region produced by compressing said video signal, thereby producing a blanking added video signal; and

driving means for displaying a video corresponding to said blanking added video signal produced by said superimposing means.

5,471,252
METHOD AND APPARATUS FOR ESTIMATING MOTION VECTOR FIELDS BY REJECTING LOCAL OUTLIERS

Siu-Leong Iu, Bensalem, Pa., assignor to Matsushita Electric Industrial Corporation of America, Secaucus, N.J.

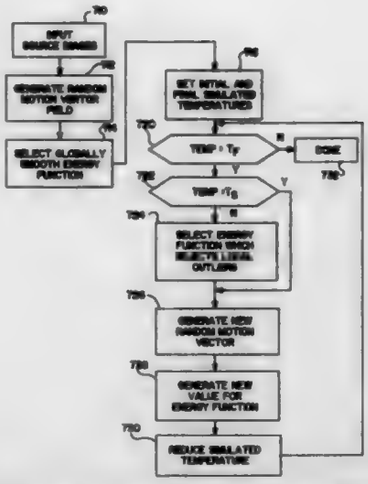
Filed Nov. 3, 1993, Ser. No. 146,746
Int. Cl.[6] H04N *7/32*
U.S. Cl. 348—699 **18 Claims**

1. Apparatus for generating sample values representing a motion vector field which describes motion of individual image components of a current image frame and corresponding image components of at least one other image frame in a sequence of image frames, the apparatus comprising:

memory means for holding data values representing respective image components of the current image frame and the one other image frame;

initialization means, coupled to the memory means, for generating a plurality of motion vectors, each of said plurality of motion vectors corresponding to an estimate of motion between one of the image components in the current image frame and a corresponding image component in the one other image frame;

means for generating an energy function value for a target motion vector of the plurality of motion vectors which said target motion vector corresponds to a current image compo-



nent in the current image frame, said energy function value being a function of the target motion vector and of neighboring motion vectors which said neighboring motion vectors are ones of the plurality of motion vectors which correspond to ones of the image components that surround the current image component in the current image frame;

means for selecting ones of said neighboring motion vectors of the target motion vector for further processing, each one of the neighboring motion vectors is selected if the one neighboring motion vector differs in value from the target motion vector by less than a predetermined threshold; and

means for minimizing the energy function value of each motion vector of the plurality of motion vectors as a function of the selected motion vectors to produce a corresponding optimized motion vector value, wherein the optimized motion vectors corresponding to the plurality of motion vectors define the motion vector field.

5,471,253

VIDEO/AUDIO ELECTRONIC DEVICE CONTROL SIGNAL SOURCE SELECTION SWITCH

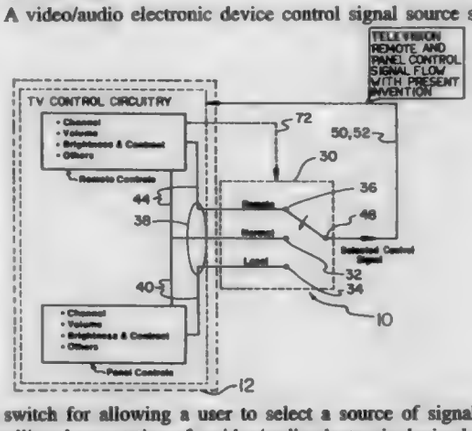
Dien V. Nguyen, 2708 W. 144th St., Gardena, Calif. 90249

Filed Mar. 28, 1994, Ser. No. 218,418

Int. Cl.[6] H04N *5/44*

U.S. Cl. 348—734 **6 Claims**

6. A video/audio electronic device control signal source selection switch for allowing a user to select a source of signals for controlling the operation of a video/audio electronic device having resident panel controls and an accompanying remote control mechanism comprising:



a switch further comprising:

two orientations for enabling a normal mode of operation and a remote mode of operation thereof;

an input terminal adapted to receive both internal panel control signals that are generated through user interaction with the panel controls and internal remote control signals that are generated through user interaction with the remote control mechanism; and

an output terminal for transmitting selected remote control signals and selected panel control signals in a mode of operation based on the orientation thereof, with the normal mode of operation allowing the transmission of both selected remote control signals and selected panel control signals, whereby permitting the user to control the operation of the electronic device using both the remote control and the panel controls and the remote mode of operation allowing the transmission of only selected remote control signals, whereby permitting the user to control the operation of the electronic device with the remote control but preventing the user from controlling the operation of the electronic device with the panel controls; and

transmission means adapted to be coupled between the electronic device and the switch for delivering the internal remote control signals and the internal panel control signals from the video/audio electronic device to the switch and supplying selected remote control signals and selected panel control signals from the switch back to the video/audio electronic device for controlling its operation.

5,471,254

REMOTE CONTROL UNIT WITH TILTABLE COVER HAVING DISPLAYING INFORMATION THEREON

Henning Claassen, Lüneburg, Germany, assignor to Chemcoat, Inc., Peachtree City, Ga.

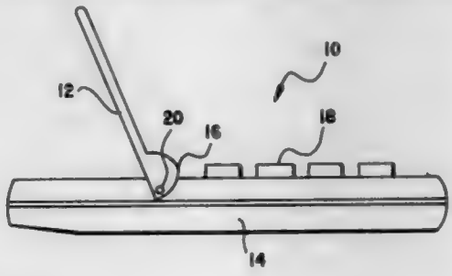
Continuation of Ser. No. 106,984, Aug. 16, 1993, abandoned. This application Jan. 12, 1995, Ser. No. 371,603

Claims priority, application Germany, Mar. 5, 1993, 9303260 U

Int. Cl.[6] H04N *5/44*

U.S. Cl. 348—734 **19 Claims**

1. A remote control device for a video/audio apparatus, comprising:



a casing;

electric circuit means, within said casing, for sending operational signals to the video/audio apparatus;

operational controls, on a top surface of said casing and connected to said electric circuit means, for providing actuating functions of the video/audio apparatus;

a tiltable lid movably mounted to the casing, said lid being movable to a closed position covering at least one essential operation control wherein said lid is covering said top surface of said casing and being movable to an open position wherein the lid exposes the at least one essential operation control and in which said lid is moved away from said top surface of said casing;

an information card capable of being removably held on said lid such that said information card is completely removable and replaceable with a separate information card;

said lid being equipped with holding means to removably hold the information card such that said information card is completely removable from said remote control device and replaceable with a separate information card;

wherein the information card has an illustration at least on its inner surface facing the control elements whereby in said

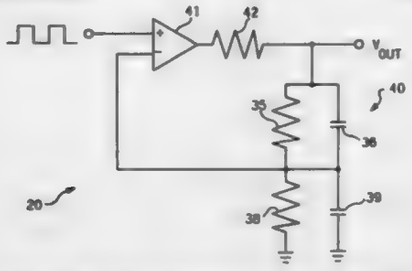
closing position said lid and said information card obstructs the view of said at least one essential operational control and in said open position said at least one essential operation control is exposed and said inner surface of said card having said illustration is also exposed for viewing by a user.

5,471,255

BIAS DRIVE AND NOISE REDUCTION IN IMAGE PROJECTORS

James G. Hagerman, 5137 Camino Playa Malaga, San Diego, Calif. 92124

Filed Nov. 24, 1992, Ser. No. 980,681
Int. Cl.[6] H04N *9/31*
U.S. Cl. 348—761 **13 Claims**



1. A bias drive circuit for use in an image projector, said bias drive circuit comprising:

an amplifier having first and second inputs and an output, and wherein the first input of the amplifier is adapted to receive a square wave input signal;

a feedback network means coupled between the output and the second input of the amplifier for feeding back output signals provided by the bias drive circuit to the amplifier and for modifying the output signal therefrom such that its output waveform is a non-square wave that, when applied to the image projector, results in a square wave within the image projector; and

a frequency synthesizer comprising:

a divide by two divider having an input adapted to receive an input frequency signal;

a phase detector having a first input coupled to an output of the divide by two divider;

a filter circuit having an input coupled to an output of the phase detector;

a voltage controlled oscillator having an input coupled to an output of the filter circuit;

a second divide by two divider having an input coupled to an output of the voltage controlled oscillator, said second divide by two divider providing an output frequency signal (f_{OUT}) from the frequency synthesizer by way of an output, said output frequency signal (f_{OUT}) comprising said square wave input signal received by said amplifier first input; and

a divide by N divider coupled between the output of the second divide by two divider and a second input of the phase detector.

5,471,256

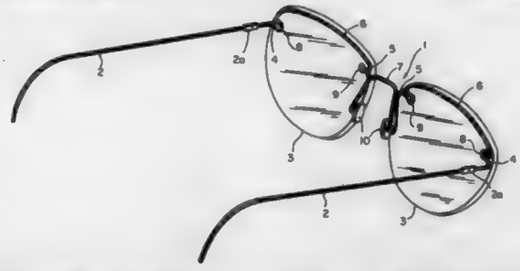
Patent Not Issued For This Number

5,471,257

RENT-WIRE SPECTACLE FRAME

Jan Houmand, 27-29, Stuclestræde, DK-1455 København K, Denmark

PCT No. PCT/DK91/00322, § 371 Date Apr. 26, 1993, § 102(e) Date Apr. 26, 1993, PCT Pub. No. WO92/08158, PCT Pub. Date May 14, 1992
PCT Filed Oct. 22, 1991, Ser. No. 50,160
Claims priority, application Denmark, Jan. 25, 1990, 2572/90
Int. Cl.[6] G02C *1/08*
U.S. Cl. 351—86 **7 Claims**



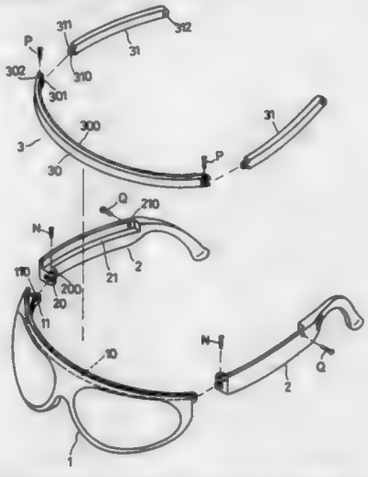
1. Spectacles having two lenses made of a plastic material and each connected to a temple by means of a temple mounting member, and a bridge interconnecting the lenses, the temples, the temple mounting members and the bridge being made of wire material, wherein the temple mounting members and the bridge are formed by a single common piece of wire material bent to provide eyelets for supporting the head of a screw, said screw comprising a shaft of a yielding plastic material adapted for form-fit engagement with threaded bore drilled directly in the lens between the front and back of same, opposite ends of said single piece of wire material being connected with said temples via hinge joints.

5,471,258

EYEGLASSES WITH A HAIR CLIP

Shou-Tun Hsieh, No. 16, Alley 191, Lane 174, An-Chung St. Tainan, Taiwan, Prov. of China

Filed Apr. 24, 1995, Ser. No. 426,879
Int. Cl.[6] G02C *5/14*
U.S. Cl. 351—123 **2 Claims**



1. A pair of eyeglasses with a hair clip comprising:

a lens frame;

two temples pivotally combined with two ends of said lens frame;

wherein characterized by said lens frame having a lengthwise recess on its upper edge, two temples respectively having a lengthwise recess in an upper inner edge, a detachable hair clip set consisting of a front elongate curved arm and two side arms, said front arm and said two side arms combined with said lens frame and said two temples and received respec-

tively in said frame lengthwise recess and said temple lengthwise recesses, said two side arms having their rear ends pivotally connected with said two temples, and said hair clip set able to be swung up curvingly with said pivots connecting the rear ends of said two side arms with said two temples so that said front arm and said two side arms may be swung up to be positioned on the hairs of the head of a user, protecting them from blown to be dishevelled.

5,471,259

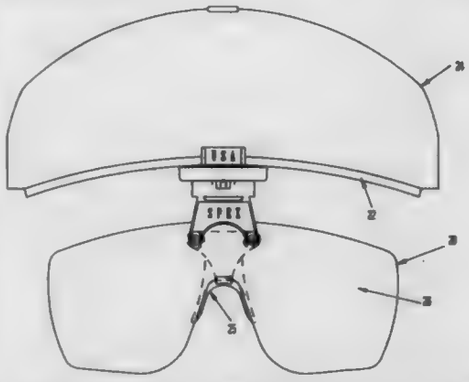
CLIP-ON SUNGLASSES ASSEMBLY FOR THE BRIM OF A HAT

Robert B. Cahill, 10087 Via Marmol, Escondido, Calif. 92026

Filed May 9, 1994, Ser. No. 239,684

Int. Cl.[6] G02C *3/00*

U.S. Cl. 351—155 **10 Claims**



1. A clip-on sunglasses assembly for the brim of a hat comprising:

an elongated base member having a front end, a rear end, a left edge, a right edge, a top surface, a bottom surface and a longitudinal axis;

clip means secured to the top of said base member for detachably securing said base member to the bottom surface of the brim of a hat;

a spring action sled having a front edge, a rear edge, a left edge, a right edge, a top surface, a bottom surface and a longitudinal axis; said spring action sled having a pair of laterally spaced longitudinally extending members whose opposite ends are connected by a front cross member and a rear cross member that forms a central opening; said spring action sled having a drum enclosure hook portion extending downwardly from the bottom surface of said rear cross member and it extends forwardly below said central opening, said drum enclosure hook portion having a front surface; an elongated depressible spring finger having a front end and a rear end, the front end of said elongated spring finger is connected to the bottom surface of said front cross member and it extends downwardly and rearwardly below said central opening toward said drum enclosure hook portion and it has an upwardly and rearwardly extending mating hook portion adjacent its rear end, said mating hook portion having a rear surface, said mating hook portion and said drum enclosure hook portion being spaced a predetermined distance apart and when said elongated depressible spring finger is depressed upwardly into the central opening of said spring action sled the cylindrical shaped drum of a lens holder member can be inserted between or removed from between said mating hook portion and said drum enclosure hook portion.

means for reciprocally sliding said spring action sled back and forth along the bottom of said base member along its longitudinal axis;

a lens having a top edge, a bottom edge, a left edge, a right edge, a front surface, and a rear surface; and

means for pivotally securing said lens to said spring action sled so that said lens can be pivoted from a first position having the rear surface of the lens in front of the eyes of a person wearing a hat to a second position having the front surface of the lens directed upwardly, said means for pivotally securing said lens to said spring action sled comprising a lens holder member having a front end and a rear end, the front end of said lens holder member being secured to said lens adjacent its top edge, the rear end of said lens holder member being connected to the lateral surface of said cylindrical shaped drum, said cylindrical shaped drum being removably received between said mating hook portion and said drum enclosure hook portion.

5,471,260

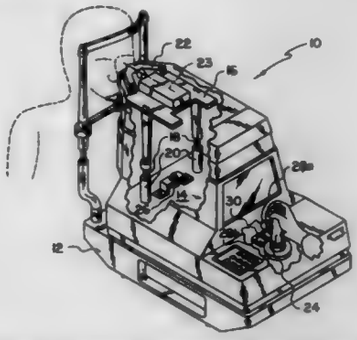
JOYSTICK FOR AN OPHTHALMIC INSTRUMENT WHERE VERTICAL MOVEMENT IS CONTROLLED BY ROTATING THE JOYSTICK

David A. Luce, Clarence Center, and Joseph L. Zelvin, Larchmont, both of N.Y., assignors to Leica Inc., Depew, N.Y.

Filed Oct. 28, 1994, Ser. No. 331,016

Int. Cl.[6] A61B *3/10*

U.S. Cl. 351—205 **8 Claims**



1. An improved ophthalmic instrument having optical means for testing an eye of a patient comprising: a frame; a support for said optical means connected to said frame; a motor for moving said support in either vertical direction, said motor being responsive to a switch means; lever means for controlling movement of said support in three dimensions, said lever means being tilted for horizontal movement of said support and rotated for vertical movement of said support; and an actuator connected to said lever means and being positioned to operatively engage said switch means upon rotation of said lever in either direction, whereby vertical movement is controlled by rotation of said lever and is independent of the amount of rotation.

5,471,261

APPARATUS FOR OBTAINING IMAGES OF CORNEA ENDOTHELIUM

Ikegami Yoshizo; Kunioni Abe, and Masahiko Konagaya, all of Nishinomiya, Japan, assignors to Konan Inc., Hyogo, Japan

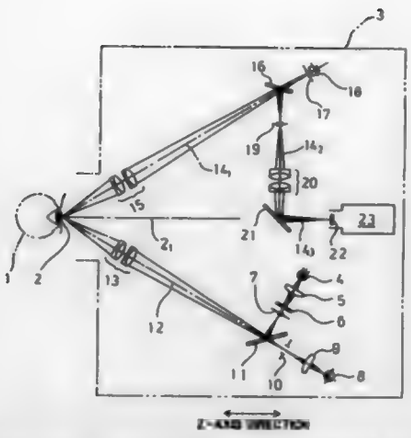
Filed Aug. 25, 1994, Ser. No. 296,031

Claims priority, application Japan, Sep. 2, 1993, 5-241986; Nov. 30, 1993, 5-329658

Int. Cl.[6] A61B *3/14*

U.S. Cl. 351—210 **10 Claims**

1. An apparatus for obtaining images of cornea endothelium, which comprises an illumination system for illuminating through a slit an eyeball surface of a subject eye, a magnification-imaging optical system for forming a magnified image of a subject part based on slit illumination light with which the eyeball surface has been illuminated, focusing-detection use receiving optics set in such a position as to receive cornea endothelium reflected light and cornea epithelium reflected light of the slit light via at least an objective lens when a cornea endothelium image is formed on an imaging surface of the magnification-imaging optical system in a



focused state, and a means for moving the apparatus body in the direction of the subject eye so that the apparatus body is brought to a cornea endothelium focused position, wherein the focusing-detection use receiving optics comprises a photoreceptor for receiving cornea endothelium reflected light and a photoreceptor for receiving cornea epithelium reflected light.

5,471,262

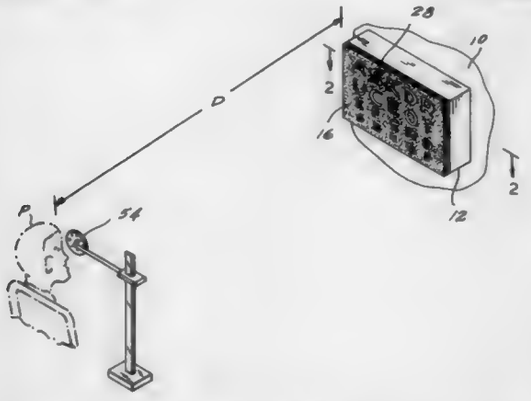
APPARATUS AND METHOD TO MEASURE VISUAL FUNCTION UNDER SIMULATED NIGHTTIME CONDITIONS

Stephen L. Trokel, 190 E. 72nd St., New York, N.Y. 10021

Filed May 4, 1994, Ser. No. 237,634

Int. Cl.[6] A61B *3/02*

U.S. Cl. 351—239 **9 Claims**



1. An apparatus for testing visual function of a person following refractive surgical procedures where the corneal optics have been modified, under simulated nighttime conditions when the pupil is large, comprising:

a test field having recognizable indicia of variable irradiance which appear on a light absorbing, completely black background having substantially zero irradiance to maximize pupillary size during the test;

whereby said indicia of variable irradiance provide a bright resolution target for the person being tested while said black background of substantially zero-irradiance maintains extremely low ambient illumination when the test is performed in a darkened room.

5,471,263

METHOD FOR RECORDING A DIGITAL AUDIO SIGNAL ON A MOTION PICTURE FILM AND A MOTION PICTURE FILM HAVING DIGITAL SOUNDTRACKS

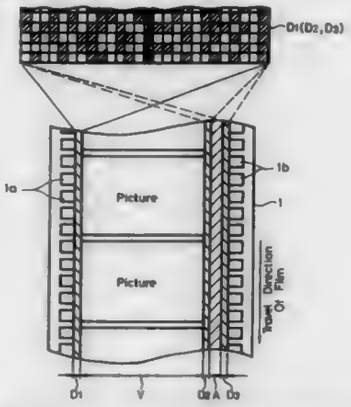
Kentaro Odaka, Tokyo, Japan, assignor to Sony Corporation, Japan

Filed Oct. 8, 1992, Ser. No. 958,664

Claims priority, application Japan, Jan. 14, 1991, 3-265001

Int. Cl.[6] G03B *31/02*

U.S. Cl. 352—27 **26 Claims**



1. A method for recording a digital audio signal including words on a motion picture film having a direction of travel, the motion picture film including two opposed edges, a picture area, the picture area including two opposed edges parallel to the opposed edges of the motion picture film, and a row of sprocket holes inset from each of the two opposed edges of the motion picture film, the audio signal being recorded in addition to a conventional analog soundtrack formed in the direction of travel, the conventional analog soundtrack having two opposed edges, and being located on the motion picture film between the row of sprocket holes inset from one of the opposed edges of the motion picture film and one of the opposed edges of the picture area, the method comprising steps of:

(a) adding error correction code words to the digital audio signal, the words of the digital audio signal and the error correction code words collectively words of a coded digital audio signal, the words of the coded digital audio signal each including bits;

(b) arraying the bits of each of the words of the coded digital audio in a rectangular array to provide rectangularly-arrayed words;

(c) sequentially arranging the rectangularly-arrayed words of the coded audio signal into rows; and

(d) recording each of the rows of the rectangularly-arrayed words of the coded digital audio signal as a row in two digital soundtracks located on the motion picture film outside the picture area and outside the analog soundtrack, one of the digital soundtracks being located between the one of the edges of the picture area further from the analog soundtrack and the row of sprocket holes further from the analog sound track, the other of the digital soundtracks being located between the one of the edges of the analog soundtrack further from the picture area and the row of sprocket holes closer to the analog soundtrack, each of the rows of the rectangularly-arrayed words being recorded in the digital soundtracks in a direction perpendicular to the direction of travel, successive rows being recorded in the direction of travel, such that ones of the bits of each of the rectangularly-arrayed words are arrayed in the direction of travel and others of the bits of each of the rectangularly-arrayed words are in the direction perpendicular to the direction of travel.

5,471,264

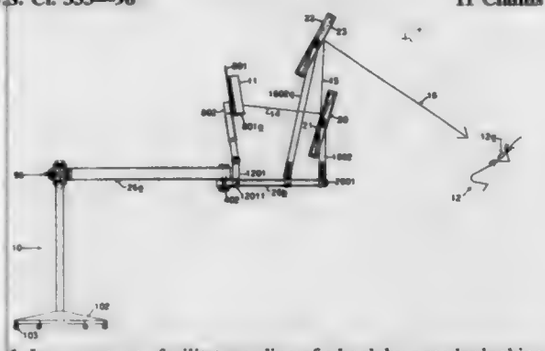
READING DEVICE

Chih-Yu Hsia, 301 Warren Way, and Chih-Hung Hsia, 210 W. Las Tunas Dr., both of Arcadia, Calif. 91006

Continuation-in-part of Ser. No. 83,165, Jun. 29, 1993, abandoned. This application Oct. 17, 1994, Ser. No. 323,878

Int. Cl.[6] G02B *7/198;* G03B *21/28*

U.S. Cl. 353—98 11 Claims



1. In apparatus to facilitate reading of a book by a reader looking upward and rearwardly, the combination comprising

a) support means,

b) a carrier for said book, the carrier supported by the support means so that the book faces forwardly,

c) a first mirror spaced generally forwardly of the carrier and having a reflecting surface facing toward the carrier,

d) a second mirror spaced generally upwardly relative to the first mirror and having a reflecting surface facing forwardly and downwardly toward the eye of the reader,

e) said mirrors having relative positions characterized in that an optical path extends from a book on the carrier to the first mirror reflecting surface, then to the second mirror reflecting surface, and then to the eye of the reader,

f) said support means including:

i) an upright stand,

ii) a beam carried by the stand to extend generally horizontally,

iii) and first and second upright posts carried by the beam and respectively supporting the first and second mirrors,

g) and wherein at least one of said posts has adjustable movable connection to the beam to allow forward and rearward shifting of said one post relative to the other post.

5,471,265

METHOD OF MAKING PHOTOGRAPHS OF DIFFERENT ASPECT RATIOS AND A PHOTOGRAPHIC FILM CARTRIDGE, A CAMERA AND A PHOTOGRAPHIC PRINTER FOR USE IN PRACTICING THE METHOD

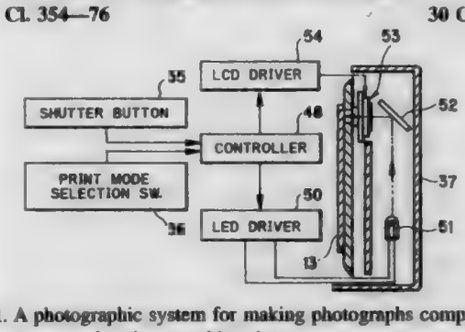
Tadayoshi Shibata, and Nakao Oi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 13, 1992, Ser. No. 912,714

Claims priority, application Japan, Jul. 11, 1991, 3-197118

Int. Cl.[6] G03B *13/10;17/24;27/32;29/00*

U.S. Cl. 354—76 30 Claims



11. A photographic system for making photographs comprising: a camera, and a photographic printer;

selecting means for selecting a print aspect ratio of a photographic print to be made from an original frame before photographing said original frame on photographic film;

recording means for recording trimming data on said photographic film during photographing said original frame, said trimming data representing said selected print aspect ratio;

reading means for reading said trimming data on said photographic film after development;

printing means for making a photographic print having said selected print aspect ratio by printing onto photographic paper said original frame at a constant magnification, independently of the selected print aspect ratio represented by said trimming data, said photographic print having a constant dimension in the direction of the width of said photographic paper, regardless of the selected print aspect ratio, wherein said photographic printer comprises a printing paper mask member for masking said photographic paper so as to leave a printing area having said selected print aspect ratio, said printing area being disposed in a printing light path.

5,471,266

DATA RECORDING APPARATUS OF CAMERA

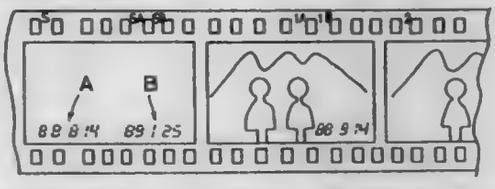
Osamu Satou, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 517,689, May 2, 1990, abandoned. This application Mar. 23, 1992, Ser. No. 855,652

Claims priority, application Japan, May 2, 1989, 1-113019

Int. Cl.[6] G03B *17/24*

U.S. Cl. 354—106 8 Claims



1. A data recording apparatus of a camera, wherein the apparatus records data on a film, said apparatus comprising:

first detecting means for detecting loading of the film;

first recording means for recording data regarding loading of the film in a first predetermined frame, based upon said first detecting means detecting loading of the film;

second detecting means for detecting rewinding of the film;

second recording means for recording data regarding rewinding of the film in a second predetermined frame, based upon said second detecting means detecting rewinding of the film.

5,471,267

INFORMATION RECORDING APPARATUS OF CAMERA

Tetsuro Goto, Funabashi, and Kosho Miura, Kamakura, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Sep. 24, 1993, Ser. No. 126,360

Claims priority, application Japan, Sep. 25, 1992, 4-256100; Mar. 23, 1993, 5-088011; Apr. 9, 1993, 5-107546

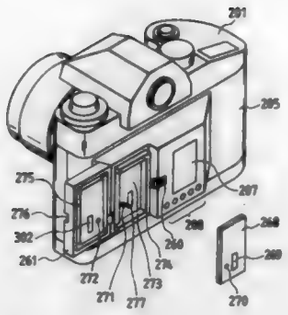
Int. Cl.[6] G03B *17/24*

U.S. Cl. 354—106 9 Claims

1. An information recording apparatus capable of recording a plurality of items of information on a photographic film, said information recording apparatus comprising:

a first recorder for recording first information in a first position in the vicinity of a photographing frame on said film, the first recorder including

a card member, being attachable to and detachable from the information recording apparatus, having a masking plate on which said first information is recorded as to be identifiable, a mask portion through which said first information is identifiable from outside, and a switch manipulatable from outside, and



a light source for irradiating said mask portion with light, wherein said light source does not irradiate said mask portion with the light if said switch is turned off;

a second recorder for recording second information different from said first information in a second position different from said first position but in the vicinity of said photographing frame; and

a controller for controlling said first and second recorders independently.

5,471,268

CHARACTER IMPRINTING DEVICE FOR A CAMERA

Yong-joon Jeong; Myung-je Park; Kang-won Lee, and Heui-seong Park, all of Kyeongsangnam-do, Rep. of Korea, assignors to Samsung Aerospace Industries, Ltd., Kyeongsangnam-do, Rep. of Korea

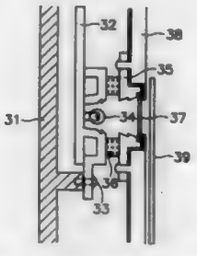
Continuation of Ser. No. 144,821, Oct. 28, 1993, abandoned.

This application Dec. 2, 1994, Ser. No. 348,754

Claims priority, application Rep. of Korea, Nov. 3, 1992, 92-24114 U; Dec. 1, 1992, 92-24114; Apr. 14, 1993, 93-6235

Int. Cl.[6] G03B *17/24*

U.S. Cl. 354—106 **5 Claims**



1. A character imprinting device for a camera comprising;

a light emitting means for emitting light in response to an actuation signal;

a carrier connected to a rear cover of a camera and mounting said light emitting means thereon;

a film presser for guiding a photographic film in a path to be exposed to a light emitted from said light emitting means;

a mask support member connected to said film presser for receiving a light emitted from said light emitting means;

a shading means located between said carrier and said mask support member for shading a space between said carrier and said mask support member for outside light; and

a stationary character imprinting mask removably mounted on said support member between said film presser and said support member to receive the light emitted from said light emitting means, said mask being of plate shape and having one or a plurality of colored characters printed thereon for imaging onto said film in response to actuation of said light emitting means.

5,471,269

Patent Not Issued For This Number

5,471,270

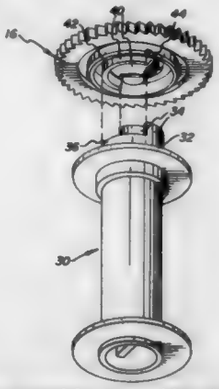
SPOOL DRIVE FOR FILM CARTRIDGE IN SINGLE-USE CAMERA

Edward N. Balling, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1994, Ser. No. 214,714

Int. Cl.[6] G03B *1/00*

U.S. Cl. 354—212 **5 Claims**



1. A film cartridge comprising a cartridge shell and a film spool rotatably supported inside said shell with a cylindrical drive hub end protruding from said shell, is characterized in that:

said cylindrical drive hub end has a pair of adjoining semi-cylindrical wall portions, one of which protrudes farther from said shell than the other to be engaged to rotate said film spool.

5,471,271

REAL IMAGE MODE VARIABLE MAGNIFICATION FINDER OPTICAL SYSTEM

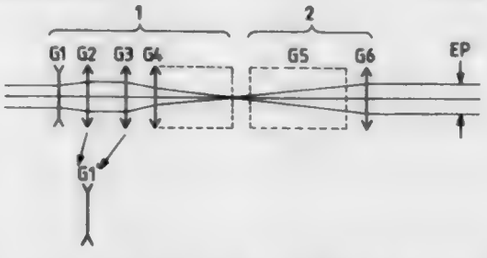
Yuji Kamo, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 26, 1993, Ser. No. 111,911

Claims priority, application Japan, Aug. 27, 1992, 4-228953

Int. Cl.[6] G03B *13/10*

U.S. Cl. 354—222 **11 Claims**



1. A real image mode variable magnification finder optical system forming a finder optical path independent of a photographic optical path formed by a photographic objective lens, comprising:

an objective system having a positive refracting power as a whole; and

an eyepiece system having a positive refracting power as a whole, for observing an image of an object formed by said objective system,

wherein said objective system comprises a first lens unit which is a front optical unit having at least one lens, a second lens unit which is an alternative front optical unit having a refracting power different from that of said first lens unit, said first and second lens units being alternatively insertable into the

finder optical path, an intermediate lens unit disposed after one of said first and second lens units, whichever is inserted into the finder optical path, said intermediate lens unit having at least one lens unit movable along the finder optical path for performing a zooming operation irrespective of which of said first and second units is disposed in said finder optical path, and a rear optical unit disposed after said intermediate lens unit and having a plurality of reflecting surfaces.

5,471,272

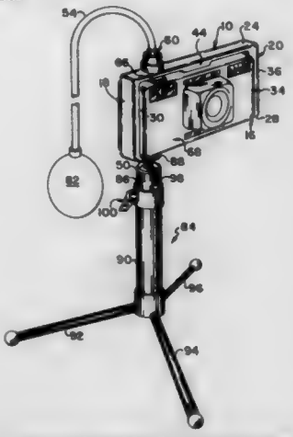
ACCESSORY USEFUL FOR CAMERA HAVING NO REMOTE OPERATION CAPABILITY

Sebastian Bucolo, 45 Dolphin St., Revere, Mass. 02151

Filed Mar. 25, 1992, Ser. No. 857,269

Int. Cl.[6] G03B *17/38*

U.S. Cl. 354—269 **16 Claims**



1. Accessory means adaptable for operative association with a camera for allowing remote operation of the camera's shutter release button comprising a closely fitting frame member for enclosing the camera comprising horizontally disposed top and bottom members parallel to one another each defined by a top and bottom surface and by first and second ends, and by parallel spaced-apart vertically disposed opposing side walls each defined by upper and lower ends and by inner and outer surfaces, said top and bottom members and said side walls being interconnected together at their respective ends and defining the frame member for frictional engagement with respective members of the camera, a vertically disposed opening being provided in said top member of the frame member and extending therethrough, such opening being so located in said top member as to be directly opposed to the shutter release button of the camera at its centrally disposed location when the camera is located in the frame member enclosure.

5,471,273

CAMERA BACKCOVER CLOSING PREVENTION DEVICE

Yong-han Kim, Kyeongsangnam-do, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Kyeongsangnam-do, Rep. of Korea

Filed Jun. 27, 1994, Ser. No. 265,763

Claims priority, application Rep. of Korea, Jun. 28, 1993, 93-11546 U

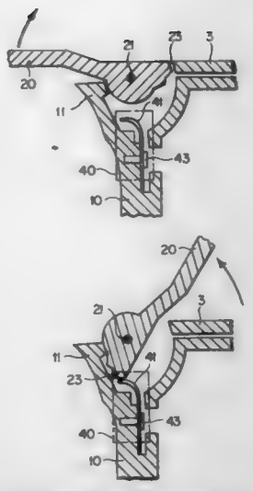
Int. Cl.[6] G03B *17/02*

U.S. Cl. 354—288 **5 Claims**

1. A camera backcover closing prevention apparatus, comprising:

a backcover rotatably attached to a camera and having an end portion; and

latching means in the camera and engageable with said end portion of the backcover for stopping the rotation of the backcover at times when the backcover is rotated at a predetermined angle with respect to the camera, wherein said latching means includes means engageable with said end portion of the backcover for retaining the backcover at a fixed position.



5,471,274

AUTOMATIC FILM REWINDER

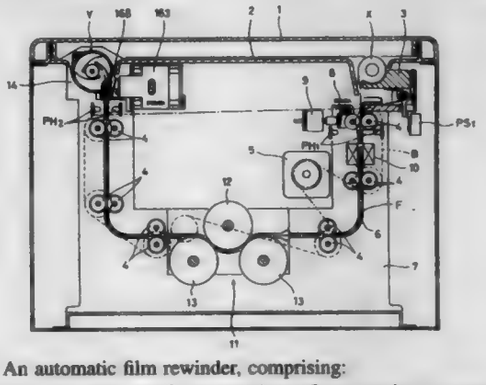
Takuji Yamaguchi, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Jun. 6, 1994, Ser. No. 254,914

Claims priority, application Japan, Jun. 7, 1993, 5-135988

Int. Cl.[6] G03D *13/00;7/00*

U.S. Cl. 354—298 **7 Claims**



1. An automatic film rewinder, comprising:

a first support means for supporting a first container accommodating a film;

a cutter means for cutting a rear end of the film accommodated in the first container;

a second support means for supporting a second container;

a film feed device for feeding the film in the first container to the second container, said film feed device having a magnetic means for reading magnetic information recorded on the film and writing magnetic information onto the film while the film is being fed through said film feed device and a curl removing means for removing any curling tendency of the film while the film is being fed through the film feed device by heating the film with a heating drum having two presser drums pressing the film into contact with said heating drum; and

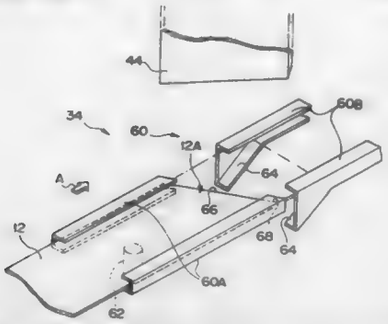
a take-up means for taking up the film into the second container, said take-up means comprising a means for opening and closing a film inlet and outlet of the second container.

5,471,275

PHOTOSENSITIVE MATERIAL PROCESSING APPARATUS

Akira Masuda, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 5, 1994, Ser. No. 318,339
Claims priority, application Japan, Nov. 29, 1993, 5-297763
Int. Cl.[6] G03D *3/08*
U.S. Cl. 354—321 20 Claims



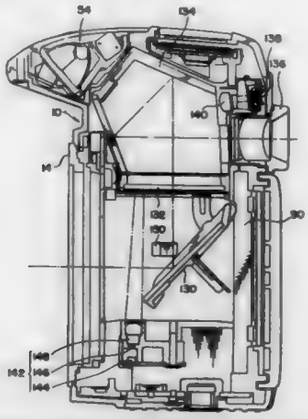
1. A photosensitive material processing apparatus comprising:
a roller which conveys a photosensitive material;
guide grooves, each of said guide grooves being provided at a conveying path transverse direction side of the photosensitive material and guiding a transverse direction end portion of the photosensitive material, the photosensitive material being conveyed by said roller and said guide grooves while being curved by said roller and said guide grooves; and
a cutter which, before processing of the photosensitive material begins, cuts the photosensitive material such that at least one transverse direction edge of the photosensitive material projects, in a conveying direction of the photosensitive material, further than a conveying path transverse direction central portion of the photosensitive material.

5,471,276

PHOTOMETRY SYSTEM

Isamu Hirai, and Hideaki Tsuji, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 245,164, May 17, 1994, abandoned.
This application Apr. 17, 1995, Ser. No. 424,606
Claims priority, application Japan, May 17, 1993, 5-139551
Int. Cl.[6] G03B *17/18*
U.S. Cl. 354—465 25 Claims



1. A photometry system for a camera, said camera comprising:
a finder optical system for receiving light from an object and for forming an image of said object on a finder field, said image corresponding to an image to be formed on a film surface;
an indicator that produces a predetermined image; and
means for projecting said predetermined image onto a predetermined area of said finder field,
wherein said photometry system comprises:
photometry means for detecting a brightness of said image formed on said finder field; and
control means for inhibiting said projecting of said predetermined image for a period of time when said photometry means detects detecting a brightness of a predetermined portion of said finder field, said predetermined portion of said finder field including said predetermined area.

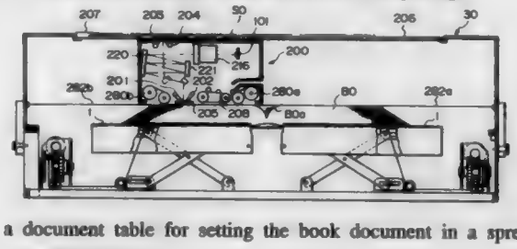
5,471,277

BOOK DOCUMENT READING DEVICE HAVING A PAGE TURNING CAPABILITY

Tetsuya Fujioka, Yokohama; Kazunori Bannai, Tokyo, and Hiroshi Takahashi, Kawasaki, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 5, 1994, Ser. No. 223,026
Claims priority, application Japan, Apr. 5, 1993, 5-078198
Int. Cl.[6] G03B *27/32;* H04N *1/04;* B65H *29/30*
U.S. Cl. 355—25 24 Claims

1. A device for reading a book document, comprising:



a document table for setting the book document in a spread position face up;
page turning means for turning a page of the book document; and
a scanning unit supporting said page turning means for scanning the book document;
said page turning means comprising:
a belt made of a dielectric material;
support means over which said belt is passed such that said belt has a flat portion at an underside thereof;
drive means for rotating said belt in a direction in which said scanning unit moves;
electric field generating means for generating an electric field on said belt for electrostatically attracting an uppermost leaf of the book document and separating said uppermost leaf from other leaves; and
moving means for moving said support means between a first position where said flat portion of said belt contacts the uppermost leaf of the book document for attracting said uppermost leaf, and a second position where said flat portion is spaced apart from said book document while carrying said uppermost leaf therewith to thereby separate said uppermost leaf from other leaves;
the device further including at least one page feed roller which contacts said belt to form a nip between said belt and said

page feed roller when said support means is in said second position, and wherein a leaf of said book document is fed into said nip between said belt and said page feed roller.

5,471,278

CADMIUM/RARE GAS DISCHARGE LAMP OF THE SHORT ARC TYPE, AS WELL AS PROJECTION EXPOSURE DEVICE USING THE SAME

Yukio Yasuda; Akiyasu Yamaguchi; Tatsushi Igarashi; Yasuo Oonishi; Kenzo Kai; Masanori Sugihara, all of Himeji; Takashi Mori, Kawasaki, and Akira Miyaji, Tokyo, all of, Japan, assignors to Ushiodenki Kabushiki Kaisha, and Kabushiki Kaisha Nikon, both of Tokyo, Japan

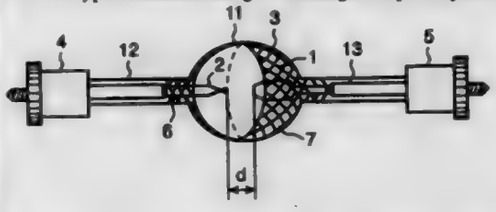
Filed Nov. 19, 1993, Ser. No. 154,404

Claims priority, application Japan, Nov. 20, 1992, 4-333765; Jan. 22, 1993, 5-286219; Jan. 22, 1993, 5-286219

Int. Cl.[6] H01J *61/18*

U.S. Cl. 355—67 **14 Claims**

1. An arc-type cadmium/rare gas discharge lamp comprising a



temperature-regulated quartz tube for use in a stationary lighting operation, said tube comprising a pair of electrodes, together with a rare gas selected from the group consisting of xenon, krypton, argon, neon, and mixtures thereof, and metal cadmium enclosed with a cadmium pressure (P) of at least 14 kPa in a stationary lighting operation, wherein the lamp is operable at a discharge current (J), such that J/P is in a range of 0.13 to 15 amperes/kiloPascals.

5,471,279

APPARATUS AND METHOD FOR SUPPORTING A SUBSTRATE

Takeshi Takizawa, Kunitachi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

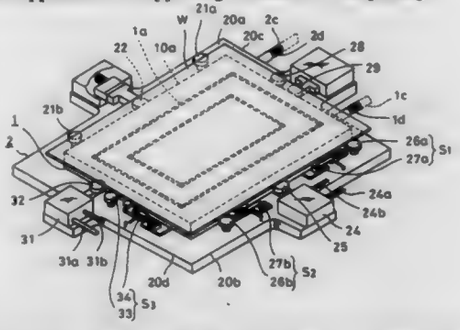
Continuation of Ser. No. 13,088, Feb. 3, 1993, abandoned. This application Jan. 26, 1995, Ser. No. 378,878

Claims priority, application Japan, Feb. 10, 1992, 4-057512

Int. Cl.[6] G03B *27/42*

U.S. Cl. 355—73 **22 Claims**

1. An apparatus for supporting a substrate, comprising:



an attraction plate comprising an attracting mechanism producing a force attracting a substrate;

a base plate on which said attraction plate is detachably mounted;

force producing means for producing a vacuum attraction force attracting said attraction plate and said base plate to each other;

moving means for moving said attraction plate relative to said base plate to move the substrate to a predetermined position when said substrate is attracted to said attraction plate; and

substrate position detection means for detecting the completion of the movement of said substrate attracted to said attraction plate to a predetermined position with respect to said base plate, whereupon a vacuum attraction force is started to be produced by said force producing means on the basis of an output from said substrate position detection means.

5,471,280

ELECTROPHOTOGRAPHIC PRINTING APPARATUS HAVING AIR FLOW PASSAGE

Hironori Taguchi, Tosu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

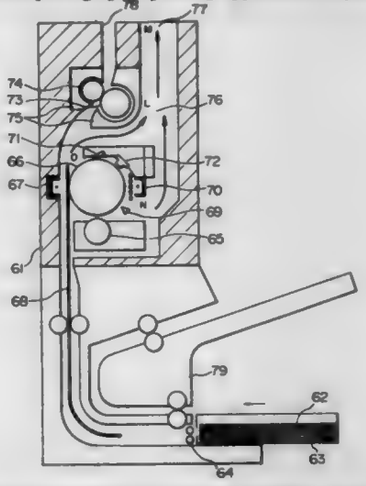
Filed May 12, 1994, Ser. No. 242,088

Claims priority, application Japan, Jun. 3, 1993, 5-133125

Int. Cl.[6] G03G *21/20*

U.S. Cl. 355—200 **6 Claims**

1. An electrophotographic printing apparatus comprising:



a vertically long housing forming an exterior of said apparatus and having a top part formed therein with a first opening, and a bottom part formed therein with a second opening;

a first unit exhibiting a temperature higher than a temperature of an atmosphere surrounding said housing in an operating condition, and located in said housing;

a second unit exhibiting a temperature lower than said temperature of said first unit and producing gas in the operating condition and located in said housing substantially vertically below said first unit;

an air flow passage means for leading an air stream from said second opening to said first opening by way of said second and first units, whereby an air stream is induced in said air flow passage due to a difference in temperature between said first and second units; and

a sheet conveying means including a sheet conveying path which is different from a path of said air stream.

5,471,281

IMAGE READING APPARATUS AND COPYING APPARATUS HAVING MEANS FOR RADIATING VISIBLE AND NON-VISIBLE LIGHT, IMAGE PROCESSING APPARATUS HAVING MEANS FOR DISCRIMINATING A SPECIFIC ORGINAL AND IMAGE PROCESSING METHOD THEREFOR

Toshio Hayashi, Kawasaki; Shinobu Arimoto, Yokohama; Kazuo Yoshinaga, Machida; Takehiko Nakai, Tokyo; Tsutomu Utagawa, Yokohama; Tetsuya Nagase, Kawasaki, and Nobuatsu Sasanuma, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

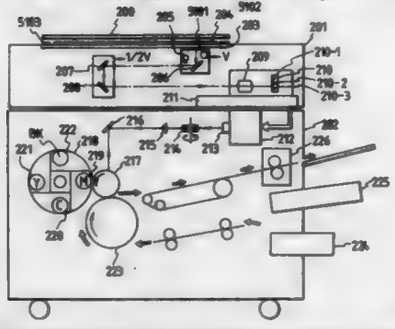
Filed Oct. 21, 1993, Ser. No. 139,172

Claims priority, application Japan, Jan. 23, 1992, 4-286351; Jan. 23, 1992, 4-286379; Jan. 23, 1992, 4-286382

Int. Cl.[6] G03G *21/04*

U.S. Cl. 155—201 **28 Claims**

1. An image reading apparatus which comprises illumination



means for radiating both light including a visible component and light including a non-visible component, and detection means for detecting light obtained from an image in accordance with the light radiated from said illumination means, further comprising:

first filter means which can be switched in accordance with whether the visible or non-visible component is radiated from said illumination means onto the image;

control means for controlling a switching operation of said filter means; and

second filter means for changing a light component detected by said detection means.

5,471,282

DEPOSITED TONER QUANTITY MEASURING METHOD AND IMAGE FORMING APPARATUS USING THE SAME

Koji Hayashi, and Takashi Bisaiji, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 17, 1993, Ser. No. 168,155

Claims priority, application Japan, Dec. 19, 1992, 4-355921

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—203 **14 Claims**

1. A deposited toner quantity measuring method for measuring a quantity of deposited toner corresponding to a gradient of a gradated density pattern by irradiating a beam onto a visual image of a gradated density pattern formed on an image carrier and detecting a quantity of reflected light with an electrophotosensitive chip, comprising the steps of:

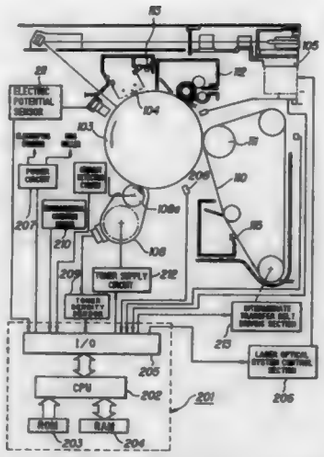
detecting a surface electric potential on an electrostatic latent image of the gradated density pattern;

measuring a quantity of reflected light from a visual image of the gradated density pattern;

classifying the quantity of reflected light as corresponding to a saturated range or an unsaturated range;

obtaining a first relational expression between a surface electric potential and a quantity of deposited toner when the quantity of reflected light is in said unsaturated range;

obtaining a second relational expression between the quantity of reflected light in said unsaturated range and the quantity of deposited toner; and



computing a quantity of deposited toner using said second relational expression when the quantity of reflected light is in said unsaturated range, and using said first relational expression when the quantity of reflected light is in said saturated region.

5,471,283

DEVICE FOR PREVENTING BREAKDOWN OF CONTACT CHARGER FOR USE IN ELECTROPHOTOGRAPHIC PRINTING MACHINE

Kouichi Irihara, Nara; Hideo Yamasa, Ikoma; Fumio Shimazu, Yamatokoriyama, and Takasumi Wada, Nara, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

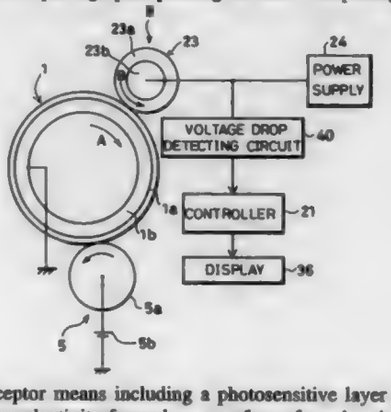
Continuation of Ser. No. 989,808, Dec. 11, 1992, abandoned. This application Apr. 14, 1994, Ser. No. 227,693

Claims priority, application Japan, Dec. 11, 1991, 3-327773

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—205 **42 Claims**

1. An electrophotographic printing machine comprising:



photoreceptor means including a photosensitive layer having a photoconductivity formed on a surface of an electrically conductive base being connected to ground;

contact charger means in contact with the photosensitive layer for charging the photosensitive layer by applying thereto a voltage;

abnormality detecting signal output means for detecting a defect on the photosensitive layer, such a defect allowing direct electrical conduction to occur between said contact charger means and said electrically conductive base, by detecting excessive current flowing into said photoreceptor means, the excessive current being larger than a current flowing into said photoreceptor means when no defect exists on the photosensitive layer of said photoreceptor means and for outputting an abnormality detecting signal for switching from a first level to a second level; and

control means for controlling an operation of said printing machine based on the abnormality detecting signal from said abnormality detecting signal output means.

5,471,284

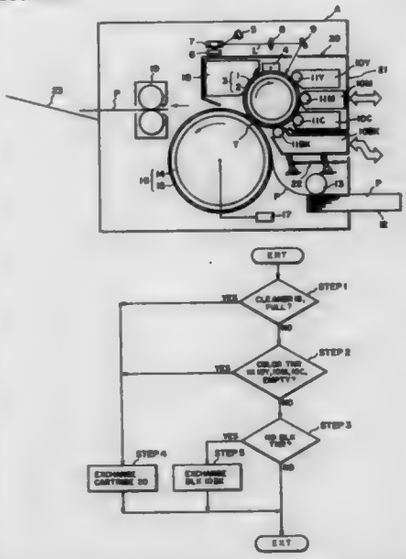
IMAGE FORMING APPARATUS HAVING TONER DEPLETION DETECTION FEATURE

Haruo Fujii, Yokohama; Tatsuya Kobayashi, Tokyo; Nobuhiro Imai, Kawasaki; Hisayoshi Kojima, Yokohama; Masao Umezawa; Hideki Tada, both of Yokohama; Akira Ito, Tokyo; Kaoru Seto, Chigasaki; Motoi Katoh, and Daisuke Murata, both of Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 219,232, Mar. 28, 1994, abandoned, which is a continuation of Ser. No. 946,161, Sep. 17, 1992, abandoned, which is a continuation of Ser. No. 642,895, Jan. 18, 1991, abandoned. This application May 16, 1994, Ser. No. 242,851

Int. Cl.[6] G03G *13/00*

U.S. Cl. 355—210 17 Claims



1. An image forming apparatus usable with a process cartridge for forming an image on a recording material, said process cartridge comprising an image bearing member, at least one developing means for developing a latent image formed on said image bearing member with a developer, each of said at least one developing means comprising respective developer accommodating means for accommodating a respective developer to be used in said at least one developing means, said image forming apparatus comprising:

mounting means for mounting said process cartridge;

auxiliary developing means exterior to said process cartridge for developing a latent image formed on said image bearing member with a developer, said auxiliary developing means comprising auxiliary developer accommodating means for accommodating the developer to be used in said auxiliary developing means; and

detecting means for detecting a respective predetermined level of developer in said auxiliary developer accommodating means and in each of said respective developer accommodating means of said at least one developing means.

5,471,285

CHARGING MEMBER HAVING A SURFACE LAYER FORMED OF MOISTURE-PERMEABLE SYNTHETIC RESIN MATERIAL AND CHARGING DEVICE INCLUDING THE SAME

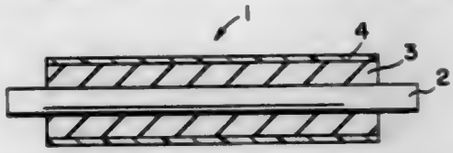
Takayuki Nagase; Yasuhiko Yoshida; Makoto Hasegawa, and Arata Tani, all of Kobe, Japan, assignors to Bando Chemical Industries, Ltd., Japan

Filed Apr. 15, 1994, Ser. No. 228,273

Claims priority, application Japan, Apr. 16, 1993, 5-090196; Jun. 3, 1993, 5-133257

Int. Cl.[6] G03G *15/02*

U.S. Cl. 355—219 22 Claims



1. A charging member comprising a surface layer formed of moisture-permeable synthetic resin material, said surface layer having a moisture permeability of about 2000 or more and a water-swelling degree of about 5 or less when the thickness of said layer is set at 20 μm.

5,471,286

IMAGE FORMING APPARATUS WITH RETRACTABLE DEVELOPING UNIT INCLUDING PLURAL SELF-ALIGNING DEVELOPER BEARING ROLLERS

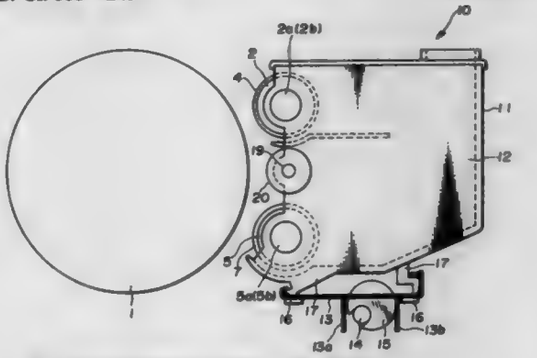
Makoto Tanaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1993, Ser. No. 123,220

Claims priority, application Japan, Jan. 2, 1992, 4-287109; Jul. 20, 1993, 5-179242

Int. Cl.[6] G03G *15/06*

U.S. Cl. 355—245 19 Claims



1. An image forming apparatus, comprising:

an image bearing member;

a developing unit for developing an electrostatic latent image formed on said image bearing member;

supporting means for supporting said developing unit for movement relative to said image bearing member between a contact position and a non-contact position; and

pressing means for advancing and retracting said developing unit between the contact position and the non-contact position, and for pressing said developing unit against said image bearing member in the contact position;

said developing unit comprising:

first and second developer bearing members facing said image bearing member for carrying a developer and for supplying the developer to said image bearing member;

holding means for holding said first and second developer bearing members and for aligning said first and second developer bearing members in a moving direction of said image bearing member; and

first and second spacers disposed at one end portion of said developing unit in a longitudinal direction of said developer bearing members with an interval spacing in a moving direction of said image bearing member, and a third spacer disposed at the other end portion of said developing unit in the longitudinal direction of said developer bearing members, said first, second and third spacers being arranged for contacting said image bearing member in the contact position with a pressing force of said pressing means, thereby to form a first gap between said first developer bearing member and said image bearing member, and a second gap between said second developer bearing member and said image bearing member.

5,471,287

SYSTEM FOR REPLENISHING LIQUID ELECTROSTATIC DEVELOPER

David E. Blair, Charleston, W. Va.; William A. Houle, Flat Rock, N.C.; Gregg A. Lane, San Diego, Calif.; James R. Larson, Fairport, N.Y., and Kathryn A. Pearistine, Wilmington, Del., assignors to E.I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 4, 1994, Ser. No. 237,804

Int. Cl.[6] G06G *15/10;9/12*

U.S. Cl. 355—256 **8 Claims**

1. A system for replenishing a liquid electrostatic developer present in a supply vessel, the liquid developer consisting essentially of

(A) a nonpolar liquid having a Kauri-butanol value of less than 30,

(B) thermoplastic resin particles having a median particle size (volume weighted) less than 15 μm, and with 90% of the particles (volume weighted) less than 30 μm, and

(C) a charge director compound,

the percent of solids in the developer being about 0.5 to 4% by weight based on the total weight of liquid developer; the system comprising

at least one liquid toner concentrate vessel containing aggregates of thermoplastic resin particles having a median particle size (volume weighted) greater than 15 μm and with 90% of the particles (volume weighted) not less than 30 μm composed of 50 to 100% by weight of particles (B), 0 to 50% by weight of component (A) being present in the vessel,

a liquid vessel containing component (A),

means for supplying aggregates of thermoplastic resin particles from the liquid toner concentrate vessel to a dispersing vessel,

means for supplying component (A) from the liquid vessel to the dispersing vessel,

the dispersing vessel containing high shearing or high impact means, said vessel receiving thermoplastic resin particles from liquid toner concentrate vessel and component (A) from the liquid vessel and dispersing the aggregates of the thermoplastic resin particles in component (A) to form resin particles having a median particle size (volume weighted) of less than 15 μm, with 90% of the particles (volume weighted) less than 30 μm, said dispersion containing about 0.5 to 20% by weight particles (B) and about 99.5 to 80% by weight component (A),

means for supplying and metering the dispersion of thermoplastic resin particles from the dispersing vessel into a supply vessel containing the liquid developer to be replenished to maintain the concentration of solids in the liquid developer in the range of about 0.5 to 4% by weight based on the total weight of liquid developer.

5,471,288

IMAGE HEATING APPARATUS AND HEATING FILM

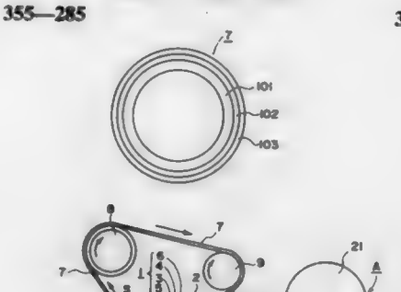
Yasumasa Ohtsuka, Yokohama; Yohji Tomoyuki, Ichikawa, and Hideyuki Hatakeyama, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1994, Ser. No. 206,851

Claims priority, application Japan, Mar. 5, 1993, 5-069059; Jul. 8, 1993, 5-169201

Int. Cl.[6] G03G *15/20*

U.S. Cl. 355—285 **39 Claims**



1. An image heating apparatus, comprising:

a heater; and

a movable film having a first surface in contact with said heater and a second surface contactable with a recording material supporting a toner image;

the toner image on the recording material being heated by heat from said heater; and

said film comprising an insulative base layer chargeable to a polarity opposite from that of the toner and having a volume resistivity of not less than 10^{11} Ω.cm and an electrically conductive layer, with a surface resistance of not more than 10^{7} Ω/□, at a position closer to said insulative base layer.

5,471,289

FIXING DEVICE HAVING A SKEW COMPENSATION CAPABILITY

Minoru Satoh, and Kazuhito Nakamura, both of Niigata, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 67,625, May 28, 1993, abandoned. This application Sep. 7, 1994, Ser. No. 302,082

Claims priority, application Japan, Jun. 16, 1992, 4-156631

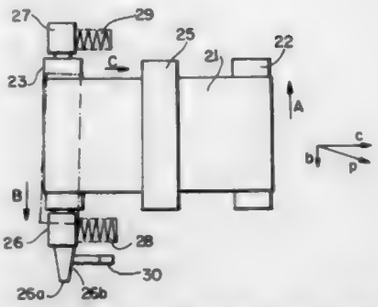
Int. Cl.[6] G03G *15/20*

U.S. Cl. 355—290 **10 Claims**

1. A fixing device incorporated in an image recording apparatus for fixing an image formed on a sheet by heating a toner constituting the image, comprising:

an endless belt having an inner and an outer surface;

drive means for rotating said endless belt;



heating means, which contacts with the inner surface of said endless belt, for supplying heat to a toner image formed on a sheet via said endless belt;

a tension roller mounted for rotation about an axis and which contacts with the inner surface of said endless belt, said tension roller imparting a predetermined tension to said endless belt in a tension direction and being movable axially along said axis of said tension roller;

a tapered member, which has a tapered side surface, coupled to one end of said tension roller; and

a guide member which contacts with said tapered side surface of said tapered member and is fixed on said fixing device;

said tension roller being moved along said axis by a skew of said endless belt, and the movement along said axis causing a contacting position between said tapered side surface and said guide member to be changed to incline said tension roller along said tapered side surface for canceling the skew.

5,471,290

IMAGE FORMING APPARATUS

Masato Nagayama; Seiji Inuyama; Kenji Sawada; Makoto Ohshita, and Fumiaki Harada, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

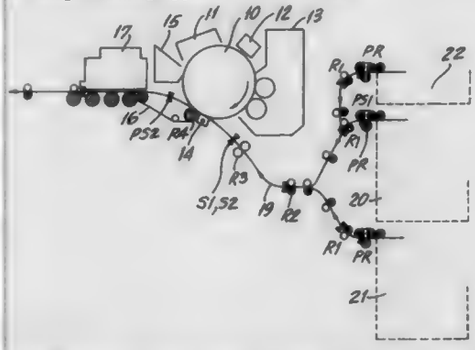
Filed Apr. 15, 1994, Ser. No. 228,217

Claims priority, application Japan, May 20, 1993, 5-142903

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—309 **20 Claims**

1. An image forming apparatus comprising:



an endless type rotatable image forming body;

image forming means for forming an image on said image forming body;

transfer means for transferring said image on said image forming body onto a sheet being fed;

feeding means for feeding said sheet;

first detecting means for detecting said sheet being fed at a first predetermined position in a feeding path of said sheet;

second detecting means, located on a side of said transfer means at a second predetermined position, for detecting said sheet being fed; and

control means for controlling a feeding speed of said feeding means to compensate for a transfer position of said sheet, in accordance with a measured feeding time from said first predetermined position to said second predetermined position based on outputs of said first and second detecting means, wherein:

said control means computes an amount of a positional deviation from a time difference between said feeding time and an expected time, computes a compensation speed and a compensation period from a computed positional deviation amount, and controls said feeding means to said compensation speed only for said compensation period, and

said control means computes a compensation speed and a compensation period from a distance from said second predetermined position to said transfer position and said computed positional deviation amount, and controls said feeding means to said compensation speed only for said compensation period.

5,471,291

COLOR IMAGING WITH CONTACT TRANSFER HEATING STATION

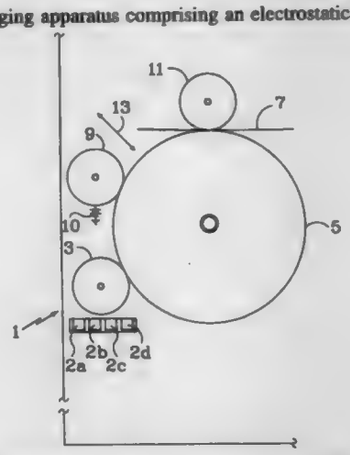
Todd L. Janes; Alexander D. Meade; Ashok Murthy; Pramod K. Sharma, and Peter E. Wallin, all of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.

Filed May 31, 1994, Ser. No. 251,429

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—326 R **10 Claims**

1. An imaging apparatus comprising an electrostatically charge-



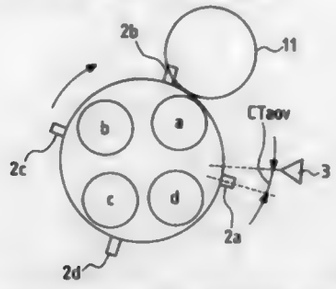
able roller, means to tone said chargeable roller in patterns of images, an intermediate transfer member to receive said toned images, said intermediate transfer member accumulating at least three of said toned images in registration, a heating element for contacting said three toned images in registration on said intermediate transfer member and to apply an electrical bias to repel said toned images in registration while having an elevated surface temperature of at least 85 degrees C. to coalesce said three toned images in registration, said heating element not applying an elevated temperature to coalesce said toned images until after the third image of said three images in registration is received on said intermediate transfer member, and a transfer station to transfer said images coalesced by said heating element with pressure to paper of other substrate.

5,471,292
IMAGE FORMING APPARATUS CAPABLE OF ADJUSTING DRIVE CONTROL OF DEVELOPER UNIT

Kazuhiko Okazawa, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1994, Ser. No. 259,686
Claims priority, application Japan, Jun. 15, 1993, 5-168586; Jun. 15, 1993, 5-168587; Sep. 14, 1993, 5-250972
Int. Cl.[6] G03G *15/01;15/06*
U.S. Cl. 355—326 R **16 Claims**

1. An image forming apparatus comprising:



an image carrier for carrying an electrostatic image;

a developer unit having a plurality of developers each for developing the electrostatic image on said image carrier;

drive means for driving said developer unit to stop a selected developer at a predetermined position facing said image carrier;

detection means for detecting a stop position of the developer; and

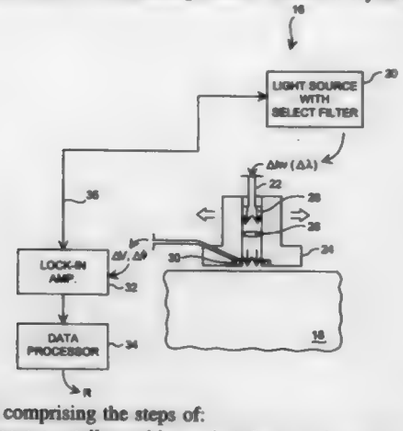
adjustment means for adjusting drive control of said developer unit by said drive means in accordance with a detection output from said detection means.

5,471,293
METHOD AND DEVICE FOR DETERMINING DEFECTS WITHIN A CRYSTALLOGRAPHIC SUBSTRATE

John K. Lowell, Round Rock; Mohammed Anjum, Austin; Valerie A. Wenner, Austin; Norman L. Armour, Austin, and Maung H. Kyaw, Austin, all of Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Feb. 2, 1994, Ser. No. 191,387
Int. Cl.[6] G01N *21/00*
U.S. Cl. 356—30 **16 Claims**

1. A method for determining defects within a crystallographic



substrate comprising the steps of:

radiating a crystallographic semiconductor substrate with a plurality of dissimilar photon energies to produce a respective plurality of reciprocal photovoltages;

determining a plurality of reciprocal absorption coefficients corresponding to respective said plurality of photovoltages;

mapping a set of observed points, wherein each of said set of observed points corresponds to one of said plurality of photovoltages plotted as a function of a respective one of said plurality of absorption coefficients;

computing a least square correlation factor between said set of observed points and a sloped line; and

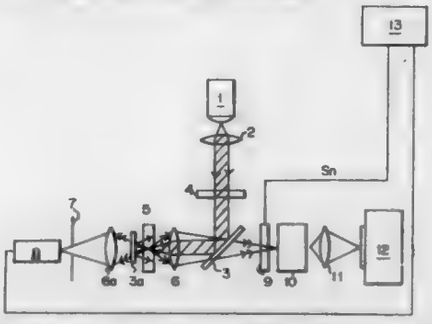
ascertaining the presence of defects within said semiconductor substrate based upon the magnitude of said least square correlation factor being less than a pre-determined amount.

5,471,294
FLOW IMAGING CYTOMETER

Shinichi Ogino, Hyogo, Japan, assignor to TOA Medical Electronics Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 882,704, May 14, 1992, abandoned. This application Sep. 29, 1994, Ser. No. 315,183
Claims priority, application Japan, Jan. 24, 1991, 3-277560
Int. Cl.[6] G01N *21/64;21/05*
U.S. Cl. 356—73 **12 Claims**

1. A flow imaging cytometer comprising:



a flow cell through which a specimen solution containing cells to be detected is caused to flow in a state that a sheath liquid surrounds said specimen solution said cells including a cell of interest;

a light source for irradiating a flow zone of the specimen solution in said flow cell with light;

image pick-up means for picking up a still image of the cell of interest in the specimen solution; and

image processing means for executing desired data processing based upon a set of image data obtained from said image pick-up means;

wherein fluorescent images of the cells which flow through said flow cell are picked up by said image pick up means and analyzed; and

the irradiating light from said light source is light for exciting fluorescence in the cells;

the flow imaging cytometer further comprising:

reflecting means positioned at an opposite side with respect to a light entrant side of the excitation light for reflecting excitation light transmitted by said flow cell during irradiation of said specimen solution and for transmitting the fluorescence emitted by the cells in order to redirect said transmitted excitation light to said specimen solution again so as to enhance the fluorescent images of the cells by the redirected excitation light;

detecting means for detecting the fluorescence light, which is emitted by the cells in said flow cell, separately of said image pick-up means; and

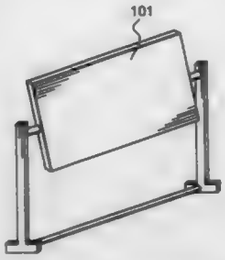
decision control means for detecting a cell of interest based upon the detection signal from said detecting means, determining whether the cell of interest requires operation of said image pick-up means, and generating a prescribed control signal for pick-up of the image when the cell of interest requires pick-up of the image.

5,471,295

ANGLE MEASURING METHOD AND APPARATUS USING PROJECTED GRAPHIC

Satoshi Hirotsune, Settsu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 3, 1994, Ser. No. 176,550
Claims priority, application Japan, Jan. 19, 1993, 5-006400
Int. Cl.[6] G01B *11/26*
U.S. Cl. 356—138 22 Claims



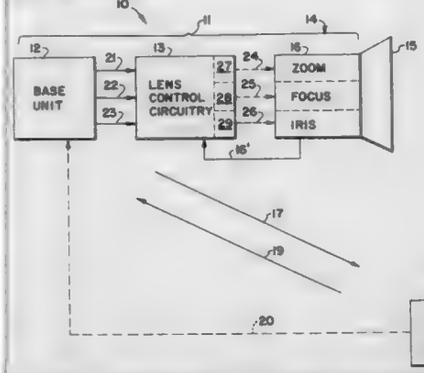
1. An angle measuring method comprising the steps of:
forming an initial test graphic on an original graphic forming face;
projecting the initial test graphic onto a screen so as to form a projected graphic on the screen;
deforming the initial test graphic so as to turn the projected graphic into a predetermined shape; and
identifying the extent of the deformation of the initial test graphic in turning the projected graphic into the predetermined shape.

5,471,296

CAMERA LENS CONTROL SYSTEM AND METHOD

Jeffrey L. Parker; David F. Sorrells, and John D. Mix, all of Jacksonville, Fla., assignors to ParkerVision, Inc., Jacksonville, Fla.

Continuation-in-part of Ser. No. 530,999, May 31, 1990, Pat. No. 5,268,734, and a continuation-in-part of Ser. No. 736,729, Jul. 26, 1991, abandoned. This application Jun. 16, 1993, Ser. No. 78,434
Int. Cl.[6] G01B *11/26;* G01J *1/20;* H04N *5/225;* G05B *1/06*
U.S. Cl. 356—139.06 34 Claims



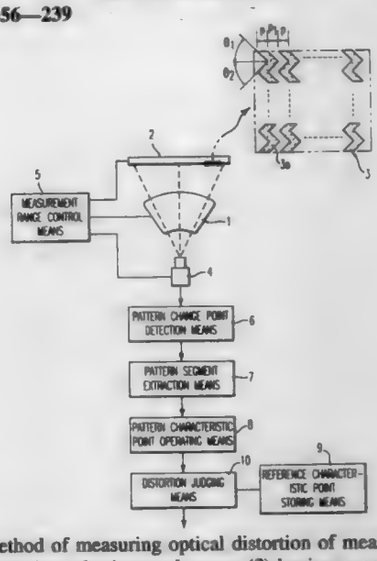
1. A method of automatically controlling the field of view of a camera relative to a specific subject within the field of view of the camera by an automatic control system comprising the steps of:
A. identifying automatically by the automatic control system the specific subject that is to be within the field of view by detecting the subject;
B. determining by the automatic control system a relationship of the subject to the field of view of the camera;
C. controlling the field of view of the camera by the automatic control system in response to the determined relationship of step B; and
D. determining the distance between the subject and the camera.

5,471,297

METHOD OF AND APPARATUS FOR MEASURING OPTICAL DISTORTION

Hidehito Tani, Yokohama, Japan, assignor to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 26, 1994, Ser. No. 296,412
Claims priority, application Japan, Aug. 31, 1993, 5-239031
Int. Cl.[6] G01N *21/88*
U.S. Cl. 356—239 6 Claims



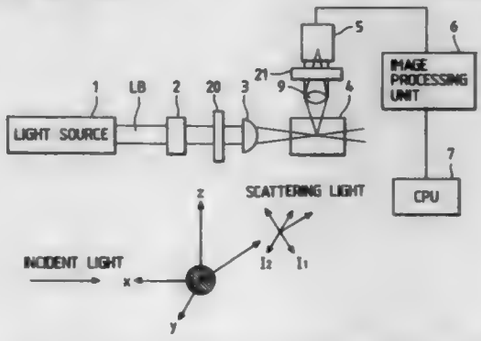
1. A method of measuring optical distortion of measured material by disposing a background screen (2) having a predetermined regular pattern (3) in rear of a measured material (1) having light transmission properties; disposing an image pick-up device (4) capable of line-scanning in front of the measured material (1); taking a picture of the background screen through the measured material (1) by successively line-scanning the entirety of a range to be measured of the measured material (1) with the image pick-up device (4), and measuring the optical distortion of the measured material (1) on the basis of data in the picture, the method being characterized in that the regular pattern (3) of the background screen is composed of triangle-wave-like unit patterns (3a), each substantially extending continuously in a predetermined direction, which are arranged at distances of equal pitch.

5,471,298

METHOD AND APPARATUS FOR MEASURING SIZE OF PARTICLE OR DEFECT

Kazuo Moriya, Ageo, Japan, assignor to Mitsui Minings & Melting Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1993, Ser. No. 36,986
Claims priority, application Japan, Mar. 27, 1992, 4-071593
Int. Cl.[6] G01N *15/02;21/53*
U.S. Cl. 356—336 12 Claims



4. An apparatus for measuring a size of particle or defect in an object, comprising:

a light source for radiating a laser beam;
a first optical system for irradiating an object with said laser beam;
a light receiving element for receiving through a second optical system scattered light from a particle or defect in said object;
means for obtaining a two-dimensional scattering image based on the scattered light detected by said light receiving element; and
means for integrating the two-dimensional scattering intensity of said scattered light and for determining the maximum value of the integrated scattered light to obtain a size of the particle or defect.

5,471,299

APPARATUS AND METHOD FOR THE ANALYSIS OF PARTICLE CHARACTERISTICS USING MONOTONICALLY SCATTERED LIGHT

Paul H. Kaye, Kimpton, and Edwin Hirst, Hemel Hempstead, both of, Great Britain, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

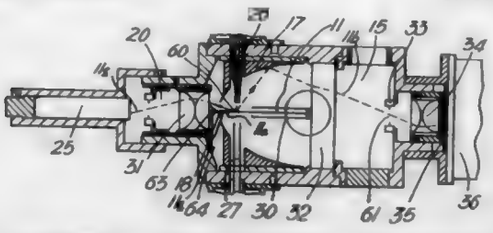
PCT No. PCT/GB93/00337, § 371 Date Jul. 29, 1994, § 102(e) Date Jul. 29, 1994, PCT Pub. No. WO93/17322, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 18, 1993, Ser. No. 256,983

Claims priority, application United Kingdom, Feb. 21, 1992, 9203799; Jan. 13, 1993, 9300527

Int. Cl.[6] G01N *15/02*

U.S. Cl. 356—336 **18 Claims**



1. Apparatus for analysis of individual particle characteristics from an aerosol or other suspension of particles in a particle stream, said apparatus including:
a scattering chamber including an optical system having an ellipsoidal reflector with an orifice therein leading to a rear chamber;
a monochromatic light source adapted to transmit a collimated beam of light along a main axis of the reflector;
means for directing said particle stream in a stream of finite thickness containing said particles through the beam of light at substantially a main focus of the reflector;
an optical system comprising a means for collecting scattered light from a solid angle of at least 3π around a region where the particle stream crosses the light beam;
a detector having a two dimensional array of a multitude of sensors for forming an image from light scattered from a particle in the particle stream and collected by the optical system;
and a data processor for comparing parameters of the image with parameters stored in a memory to determine a characteristic of the particle;
the detector is associated with an imaging screen positioned behind a secondary focus of the reflector said optical system, said light source, and said means for directing, in combination, comprising a means for providing monotonically ordered scattered rays of light at said imaging screen such that, whatever part of the finite thickness of the particle stream occupied by the particle when it passes through the beam of light, rays of light scattered from the particle and imaged thereon by the optical system are monotonically ordered with respect to the angle of scattering of the rays from the particle so that the image recorded on the imaging screen is substantially independent of position of the particle in the particle stream.

5,471,300

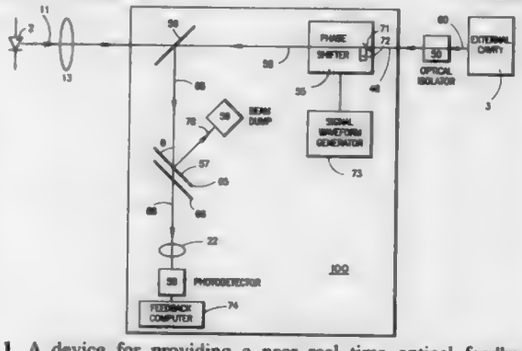
APPARATUS AND METHOD FOR PROVIDING A FEEDBACK MEASUREMENT IN A LASER SYSTEM

Robert E. Ryan, Levittown, and Sal Soriano, Rosedale, both of N.Y., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Apr. 12, 1994, Ser. No. 226,341

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—345 **14 Claims**



1. A device for providing a near real time optical feedback measurement in a laser system, said device comprising:
means for phase modulating the feedback to induce a shift in a frequency of the feedback;
frequency discriminating means for detecting in real time the frequency shift induced in said feedback; and
means for computing an amount of feedback at a preselected location as a function of the detected frequency shift.

5,471,301

OPTICAL FIBER GYRO

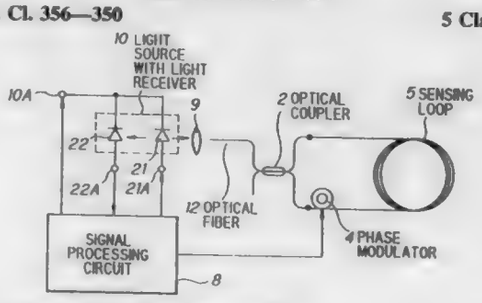
Tatsuya Kumagai; Hisao Iitsuka, both of Hitachi; Hiroshi Kajioka, Moriya; Wataru Ohnuki, Hitachi, and Toshiyuki Tetsu, Kitaibaraki, all of, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed Apr. 5, 1994, Ser. No. 223,711

Claims priority, application Japan, Aug. 23, 1993, 5-227802; Aug. 23, 1993, 5-227803; Dec. 20, 1993, 5-344503

Int. Cl.[6] G01C *19/64*

U.S. Cl. 356—350 **5 Claims**



1. An optical fiber gyro, comprising:
a light source for emitting a light signal;
an optical coupler for receiving said light signal to be divided into first and second light signals, and receiving third and fourth light signals to be combined as a combined light signal;
an optical fiber sensing loop having first and second ends, said first and second light signals being optically coupled to said first and second ends of said optical fiber sensing loop to be propagated through said optical fiber sensing loop in clock-

wise and counter clockwise directions and to be supplied as said third and fourth light signals from said first and second ends;

a light receiver for receiving said combined light signal to be converted into an electric signal, said combined light signal being transmitted through said light source, and said light receiver being positioned behind said light source; and

a signal processing circuit for processing said electric signal to provide a rotation angular velocity of a rotating member in accordance with a phase difference of said third and fourth light signals, said rotating member being loaded with said optical fiber sensing loop;

wherein said light source has a difference in attenuation or amplification factor between two light signals of orthogonal polarizations; and

said optical fiber sensing loop is of a polarization plane maintaining optical fiber.

5,471,302

INTERFEROMETRIC PROBE FOR DISTANCE MEASUREMENT UTILIZING A DIFFRACTION REFLECTING ELEMENT AS A REFERENCE SURFACE

Vladimir V. Khopov, St. Petersburg, Russian Federation, assignor to Renishaw plc, Gloucestershire, United Kingdom

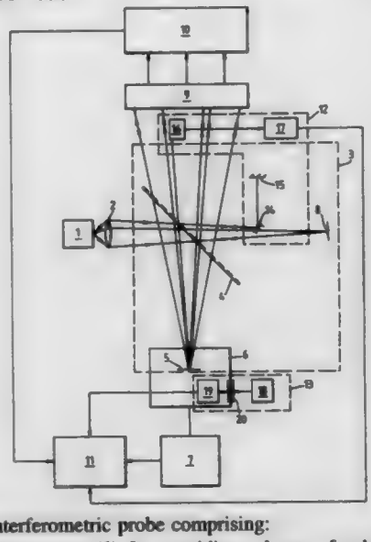
PCT No. PCT/GB93/01582, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO94/05966, PCT Pub. Date Mar. 17, 1994

PCT Filed Jul. 27, 1993, Ser. No. 211,658

Claims priority, application Russian Federation, Aug. 27, 1992, RU5056697

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—356 **11 Claims**



1. An interferometric probe comprising:

a radiation source (**1**) for providing a beam of coherent radiation,

a beam splitter (**4**) for generating from said radiation beam, a measuring beam directed towards the surface of an object, the distance to which is to be measured, and a reference beam directed towards a reflector (**5**), and for re-combining portions of the measuring and reference beams which are reflected respectively from the object and the reflector,

a detector system (**9,10**) for providing a signal indicative of interference in the re-combined beam,

characterised in that the reflector (**5**) is a diffracting reflector which produces a plurality of diffracted beams, and the detector system (**9,10**) produces signals indicative of the interference between the reflected radiation from the surface of the object and at least two of said diffracted beams from the reflector.

5,471,303

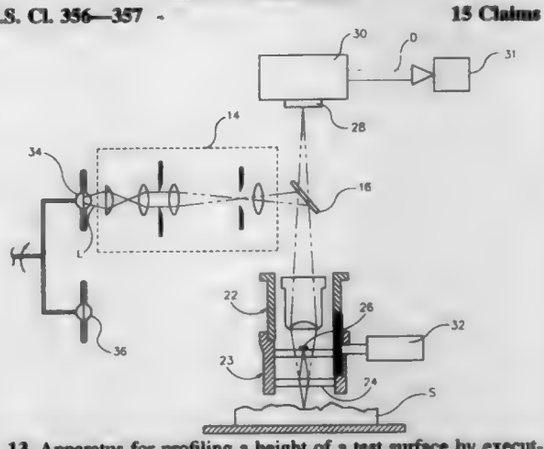
COMBINATION OF WHITE-LIGHT SCANNING AND PHASE-SHIFTING INTERFEROMETRY FOR SURFACE PROFILE MEASUREMENTS

Chiayu Ai, and Paul J. Caber, both of Tucson, Ariz., assignors to Wyko Corporation, Tucson, Ariz.

Continuation-in-part of Ser. No. 235,105, Apr. 29, 1994. This application May 20, 1994, Ser. No. 247,065

Int. Cl.[6] G01B *11/02*

U.S. Cl. 356—357 **15 Claims**



13. Apparatus for profiling a height of a test surface by executing white-light vertical-scanning and phase-shifting interferometric measurements in a single test instrument, said apparatus comprising, in combination:

(a) test-surface arm for holding the test surface;

(b) a reference mirror mounted on a reference arm positioned at a variable distance from said test surface;

(c) an array of light-intensity detectors disposed in an optical path with said test surface and reference mirror;

(d) means for varying the distance between said test surface and said reference mirror by predetermined amounts;

(e) means for emitting a white-light beam to illuminate both said reference mirror and test surface to provide white-light interference patterns on said array of light-intensity detectors as the distance between said test surface and reference mirror is varied according to a vertical-scanning interferometric technique;

(f) means for measuring a plurality of intensities of said white-light interference patterns as a result of vertical-scanning signals produced by said light-intensity detectors and for computing corresponding coarse height measurements for the test surface by application of said vertical-scanning interferometric technique, such that a coarse height for a region of said test surface corresponding to each light-intensity detector is calculated;

(g) means for emitting a quasi-monochromatic light beam having a central wavelength to illuminate both said reference mirror and test surface to provide single-wavelength interference patterns on said array of light-intensity detectors as the distance between said test surface and reference mirror is varied according to a phase-shifting interferometric technique;

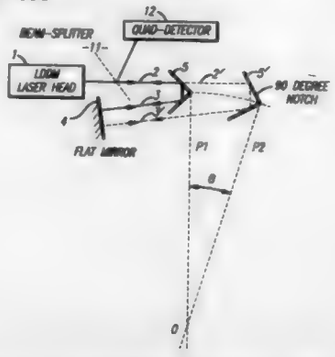
(h) means for measuring a plurality of intensities of said single-wavelength interference patterns as a result of phase-shifting signals produced by said light-intensity detectors and for computing corresponding phase data comprising phase and fine height measurements for the test surface by application of said phase-shifting interferometric technique, such that a phase and a fine height for said region of the test surface corresponding to each light-intensity detector are calculated; and

means for integrating said phase data to produce a vertically-integrated fine height for each said region of the test surface by adding or subtracting multiples of one half of said central wavelength of said quasi-monochromatic light to or from each said fine height, such that the difference between said vertically-integrated fine height and said coarse height is less than one quarter of the central wavelength.

5,471,304
LASER POSITIONING METHOD AND APPARTUS FOR ROTARY ACTUATOR ARMS, AND THE LIKE

Charles P. Wang, 1180 Mahalo Pl., Compton, Calif. 90220

Filed Mar. 21, 1904, Ser. No. 214,986
Int. Cl.[6] G01B 9/02
U.S. Cl. 356—358 11 Claims

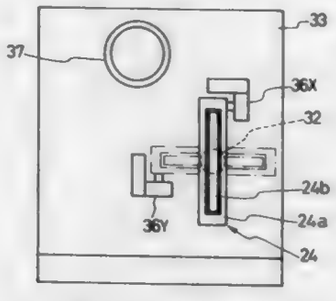


1. Apparatus for determining the angular position of a body about a fixed axis of rotation, said apparatus comprising: reflecting means mounted on said body; a stationary flat mirror mounted at a position displaced from said body; laser means for producing a laser output beam and for directing said output beam to said reflecting means, said reflecting means reflecting said output beam as a first reflected beam and for directing said first reflected beam to said flat mirror along a path perpendicular to said flat mirror, said flat mirror being positioned to reflect said first reflected beam back to said reflecting means as a second reflected beam along the same path as said first reflected beam but in the opposite direction, and said reflecting means reflecting said second reflected beam back to said laser means along a path parallel to the path of said output beam but in the opposite direction as a return beam displaced from said output beam to enable said laser means to determine the angular position of said body with respect to said fixed axis of rotation.

5,471,305
ALIGNMENT VERIFICATION SYSTEM FOR USE WITH INTERFEROMETER AND HAVING A LINE SENSOR

Masami Yoneda, and Toshikazu Akaogi, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Jul. 22, 1994, Ser. No. 278,842
Claims priority, application Japan, Jul. 23, 1993, 5-202087
Int. Cl.[6] G01B 9/02
U.S. Cl. 356—363 6 Claims



1. An alignment verification system for adjusting the posture of a test piece on a support table into alignment with a reference plate on an interferometer including a light source to irradiate said test piece and reference plate, said verification system comprising:

a bi-axial adjustment means for tilting said test piece on said support table in the directions of perpendicularly intersecting X- and Y-axis; spot image forming means arranged to converge light reflections from a master surface of said reference plate and an inspecting surface of said test piece into spot images of a predetermined diameter at a predetermined spot image-forming plane;

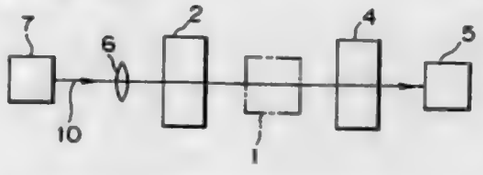
a line sensor located at the spot image-forming plane across the spot image of the reference plate and having a linear light receiving face arranged to be switchable through 90° between an X-axis position and a Y-axis position corresponding to the directions of said X- and Y-axes of said bi-axial adjustment means, for detecting the spot image of said test piece in relation with tilting adjustments of said support table by said hi-axial adjustment mechanism in each of said X- and Y-axis positions; and

a sensor drive mechanism adapted to switch said light receiving face of said line sensor from said X-axis position to said Y-axis position or vice versa upon detecting said spot image of said test piece in one of said X- and Y-axis positions.

5,471,306
METHOD FOR ASSEMBLING OPTICAL ISOLATOR AND METHOD FOR MEASURING ISOLATION

Dai Yui; Shigeru Hirai, and Shigeru Semura, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Aug. 26, 1994, Ser. No. 296,802
Claims priority, application Japan, Aug. 27, 1993, 5-212552
Int. Cl.[6] G02F 1/09
U.S. Cl. 356—367 9 Claims



1. A method for assembling an optical isolator, comprising the steps of:

constructing a measuring system in which a light source, a lens system, a polarizer, an analyzer, and a light receiver are arranged in this order, and light projected from said light source and then transmitted through said lens system, said polarizer, and said analyzer, is received by said light receiver;

arranging optical elements for constituting a main body of the optical isolator between said polarizer and said analyzer;

measuring a maximum value and a minimum value in levels of the light received by said light receiver while said analyzer is rotated, thereby to calculate a ratio of said minimum value to said maximum value; and

adjusting rotation positions of said respective optical elements in order that said ratio becomes minimal.

5,471,307
SHEET FLATNESS MEASUREMENT SYSTEM AND METHOD

Chris L. Koliopoulos, and Shouhong Tang, both of Tucson, Ariz., assignors to Phase Shift Technology, Inc., Tucson, Ariz.

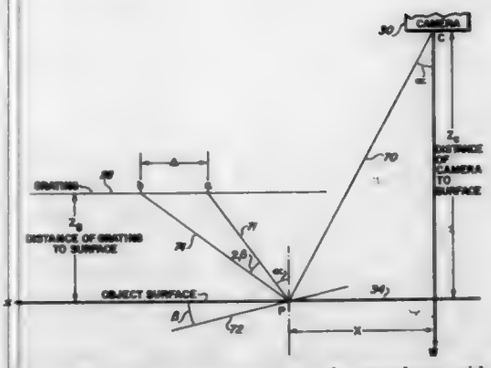
Filed Sep. 21, 1992, Ser. No. 947,389
Int. Cl.[6] C01B 11/30
U.S. Cl. 356—371 19 Claims

1. A method for measuring the flatness of relatively large flat reflective and semi-reflective surfaces including the steps of:

providing a flat structured illumination in the form of a periodic pattern of opaque and illuminated regions;

orienting said structured illumination in a plane parallel to the plane of a flat surface undergoing measurement to simultaneously illuminate the entire surface undergoing measurement;

moving said structured illumination relative to the surface undergoing measurement to cause the light level on the sur



face undergoing measurement to vary in accordance with the periodicity of the structured illumination;

detecting the light level reflected from multiple locations on the surface undergoing measurement; and

determining the change in the slope of the detected structured illumination pattern corresponding to variations in the local slope of the surface undergoing measurement.

5,471,308

PHASE SHIFTING DEVICE

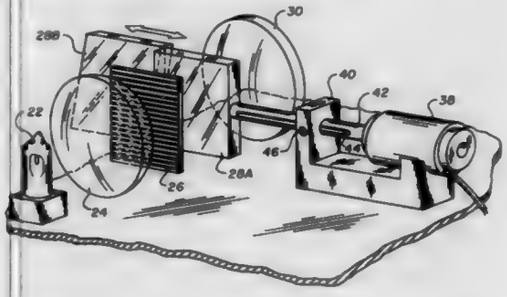
Robert Zelen, 150-T Executive Dr., Edgewood, N.Y. 11717

Filed Sep. 22, 1994, Ser. No. 310,491

Int. Cl.[6] G01B *11/24*

U.S. Cl. 356—376 **6 Claims**

1. A phase shifting projector comprising:



a. a light source;

b. a condensing lens receiving light from the light source;

c. a transparent slide having a grating thereon;

d. a projecting lens;

e. a first flat transparent plate disposed in a plane at a first angle with respect to a plane in which said grating is disposed;

f. a second flat transparent plate disposed in a plane at a second angle with respect to a plane in which said grating is disposed; and

g. a positioning mechanism for alternately positioning each of said flat plates between the grating and the projecting lens, in a path of projected light which passes from the light source through the condensing lens, grating and projecting lens, in order to shift the phase of an image of the grating projected on a test surface.

5,471,309

PRINT QUALITY CONTROL DEVICE FOR PERFECTING PRESS

Ing H.-B. Bolza-Schünemann, Würburg, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

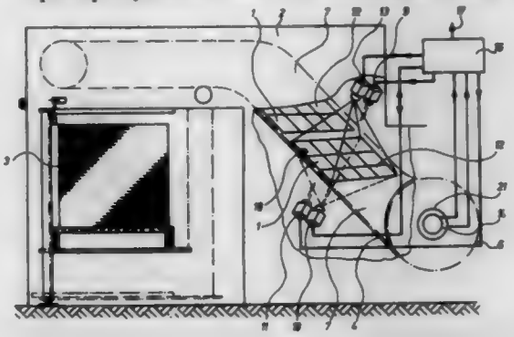
Continuation of Ser. No. 69,185, May 28, 1993, abandoned. This application Sep. 12, 1994, Ser. No. 302,445

Claims priority, application Germany, May 30, 1992, 42 17 942.4

Int. Cl.[6] G01B *11/00*; G01N *21/86*

U.S. Cl. 356—394 **4 Claims**

1. A print quality control device for controlling the quality of



sheets printed on both sides in a perfecting rotary printing press, said print quality control device comprising;

a sheet delivery device having spaced sheet transport gripper chains driven by shaft supported chain wheels and being usable to receive printed sheets from a perfecting printing press and to transport said sheets to a sheet stacking device;

a sheet transport path in said sheet delivery device;

first and second encoder means being usable to determine the number of shaft revolutions of said shaft supported chain wheels;

an upper flash source and an upper video camera positioned in said sheet delivery device above said sheet transport path;

a lower flash source and a lower video camera positioned in said sheet delivery device below said transport path;

an upper trigger device positioned in said sheet delivery device above said sheet transport path and being selectively armed in response to said first encoder means, and a lower trigger device positioned in said sheet delivery device below said sheet transport path and being selectively armed in response to said second encoder means, each of said upper and lower trigger devices being selectively operable after being armed in response to its associated encoder means to recognize a printed sheet on said sheet delivery device;

a microprocessor for receiving signals from said first and second encoder means and for selectively arming each of said upper and lower trigger devices in response to said received signals from said first and second encoder means for selectively recognizing a printed sheet on said sheet delivery device and for selectively activating each of said upper and lower flash sources and video cameras when a selected printed sheet whose print quality to be controlled is sensed by said selectively armed trigger devices and is positioned in said sheet transport path between said upper and lower flash sources and video cameras in an unobstructed viewing position to provide an unobstructed image of each of said upper and lower printed sides of said selected one of said printed sheets; and

means in said microprocessor for comparison of said images with a standard.

5,471,310

SYSTEM FOR PLACEMENT AND MOUNTING OF FINE PITCH INTEGRATED CIRCUIT DEVICES

Donald J. Spigarelli, Carlisle, Mass., and John M. DeCarlo, York, Me., assignors to Sierra Research and Technology, Inc.

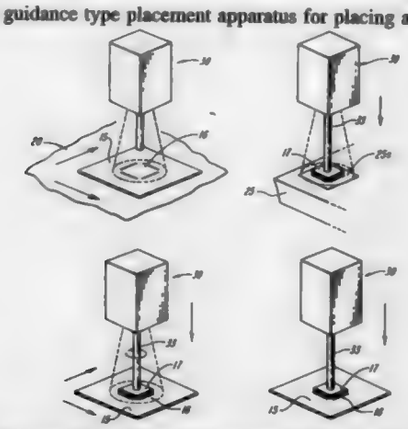
Continuation of Ser. No. 713,966, Jun. 11, 1991, Pat. No. 5,235,407, which is a division of Ser. No. 573,459, Aug. 27, 1990, abandoned. This application May 20, 1993, Ser. No. 64,426

The portion of the term of this patent subsequent to Oct. 5, 2010, has been disclaimed.

Int. Cl.[6] G01B 11/27

U.S. Cl. 356—399 14 Claims

1. A guidance type placement apparatus for placing and mounting an integrated circuit device in aligned combination on a designated placement site of a printed circuit board, the placement apparatus comprising:



a mechanical positioner operative for sequentially positioning the designated placement site and the integrated circuit device for aligning the integrated circuit device with the designated placement site of the printed circuit board, and for placing the integrated circuit device at the designated placement site; of the printed circuit board; and

image acquisition means for generating an image corresponding to at least one pair of opposed corners of the designated placement site superimposed by at least one pair of opposed corners of the integrated circuit device to define a location and orientation of the integrated circuit device relative to the designated placement site, wherein the mechanical positioner adjusts the relative position of the integrated circuit and the placement site in response to the image provided by the image acquisition means.

5,471,311

INFORMATION SYSTEM FOR MONITORING PRODUCTS IN SORTING APPARATUS

Herman van den Bergh, Pine Lodge, Lackandaragh, Enniskerry, Wicklow, Ireland; Marvin Lane, 6405 Orange Hill La., Carmichael, Calif. 95608, and John Mallon, 2 Dun An Oir Milfrod Grange, Castletroy, Limerick, Ireland

PCT No. PCT/IE92/00012, § 371 Date Jun. 1, 1994, § 102(e) Date Jun. 1, 1994, PCT Pub. No. WO93/07468, PCT Pub. Date Apr. 15, 1993

PCT Filed Sep. 30, 1992, Ser. No. 211,400

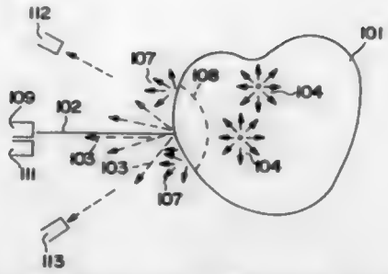
Claims priority, application Isle of Man, Jan. 1, 1991, 3454/91

Int. Cl.[6] G01N 21/89;21/49

U.S. Cl. 356—446 11 Claims

1. An information gathering system comprising:

(a) means for directing at least one light beam at a surface of a material having internal light-scattering properties for which information is required in respect of at least one specified characteristic of the material, to impinge upon a target region on said surface of said material,



(b) means for effecting scanning displacement of said at least one light beam relative to said surface of said material so that said target region comprises one of a succession of target regions,

(c) means for detecting reflected light returned from said target region,

(d) means for detecting internally-scattered light emanating from a region of said surface of said material other than said target region, said region other than said target region being substantially adjacent to or continuous with said target region,

(e) means for deriving a signal indicative of said at least one specified characteristic of the material by analysis of the levels of said reflected light and said emanating light during said scanning displacement, and

(f) means for effecting displacement of said surface of said material relative to said at least one light beam in a direction substantially at right angles to said direction of scanning displacement,

wherein

(i) the speed of said scanning displacement is determined in conjunction with the speed of displacement of said surface of said material so that a succession of scanning displacements of said at least one light beam relative to said surface of said material is achieved,

(ii) said signal deriving means comprises memory means to enable build-up of image data for said surface from the levels of said reflected light and said emanating light during each of said succession of scanning displacements to provide said signal indicative of said at least one specified characteristic of the material by analysis of said image data,

(iii) said signal deriving means is adapted to provide said signal indicative of said at least one specified characteristic of the material at least from the intensity of said reflected light and said emanating light and/or by comparison of the relative levels of said reflected light and said emanating light at each of said succession of target regions for each of said succession of scanning displacements, and

(iv) said information is required in respect of said at least one specified characteristic for a vegetable or other comestible product which is substantially spheroidal or of generally circular cross-section, said means for effecting displacement of said surface of said material being adapted to effect rolling or rotation of said vegetable or comestible product in said direction substantially at right angles to said direction of scanning displacement.

5,471,312

AUTOMATIC CALIBRATION METHOD

Atsushi Watanabe; Fumikazu Terawaki, and Fumikazu Warashina, all of Oshino, Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

PCT No. PCT/JP92/00851, § 371 Date Feb. 19, 1993, § 102(e) Date Feb. 19, 1993, PCT Pub. No. WO93/01029, PCT Pub. Date Jan. 21, 1993

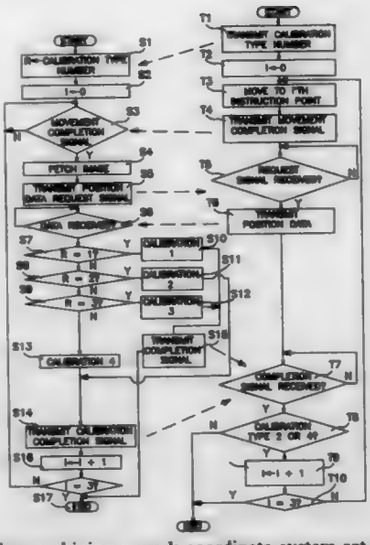
PCT Filed Jul. 6, 1992, Ser. No. 975,557

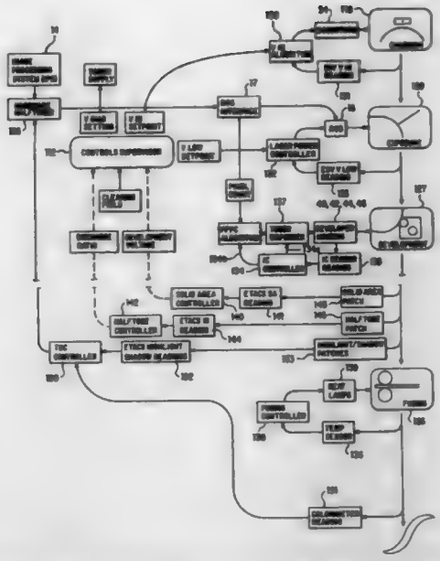
Claims priority, application Japan, Jul. 4, 1991, 3-189525

Int. Cl.[6] H04N 1/21

U.S. Cl. 358—296 9 Claims

1. A method of automatically calibrating a camera of an image processing apparatus which processes an image of an object of





operation by combining a work coordinate system set in a control device of an automatic machine with a camera coordinate system set in the image processing apparatus, said method comprising the steps of:

(a) giving the automatic machine an instruction point for a position of the automatic machine wherein a whole body of a jig mounted on the automatic machine comes within the range of the camera of the image processing apparatus, and storing first data of the instruction point in first storage means in the automatic machine;

(b) setting, in the image processing apparatus, second data relating to an object of recognition attached to said jig, and storing said second data relating to the object of recognition in second storage means in the image processing apparatus;

(c) mounting said jig on the automatic machine;

(d) issuing a calibration start command to actuate the image processing apparatus and the automatic machine;

(e) moving the automatic machine to said instruction point based on said first data stored in said first storage means;

(f) photographing said jig with the camera, to produce image data; and

(g) combining the camera coordinate system and the work coordinate system in accordance with the image data obtained by said photographing in said step (f), said second data relating to the object of recognition stored in said second storage means, and said position data of the automatic machine at said instruction point, while maintaining communication between the image processing apparatus and the automatic machine;

said steps (e), (f) and (g) being automatically repeated in response to said calibration start command issued in said step (d).

5,471,313

METHOD AND CONTROL SYSTEM ARCHITECTURE FOR CONTROLLING TONE REPRODUCTION IN A PRINTING DEVICE

Tracy E. Thieret, Webster; Thomas A. Henderson, Rochester, and Michael A. Butler, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 24, 1993, Ser. No. 21,438

Int. Cl.[6] **H04N** *1/00;1/32;* **G03G** *21/00;* **G01D** *15/14*

U.S. Cl. 358—296 **35 Claims**

1. A control assembly for controlling tone reproduction in a system having a plurality of printing subsystems, the printing subsystems cooperating to form and output image on a substrate, the control assembly comprising:

means for inputting image data representative of an input image;

a first plurality of control means, each of the first plurality of control means controlling a corresponding one of the plurality of printing subsystems, each of said first plurality of control means comprising:

sensing means for sensing and outputting subsystem performance data of the corresponding printing subsystem, and

controller means for generating and outputting a subsystem performance control signal to the corresponding printing subsystem based on a current subsystem performance parameter and the sensed subsystem performance data output by the corresponding sensing means, the corresponding printing subsystem controlled to minimize a difference between the sensed subsystem performance data and the current subsystem performance parameter;

a second plurality of control means, each of the second plurality of control means controlling and adjusting an intermediate process output, each of said second plurality of control means comprising:

sensing means for sensing intermediate process output data,

generating means for generating at least one recommended subsystem performance parameter for at least one corresponding control means of the first plurality of control means based on the intermediate process output data and at least one intermediate system performance setpoint, and

output means for outputting at least one of said at least one recommended subsystem performance parameters; and

a controls supervisor communicating with said first plurality of control means and said second plurality of control means and inputting the at least one recommended subsystem performance parameter output from said second plurality of control means, said controls supervisor comprising:

revising means for revising at least one subsystem performance parameter based on the at least one recommended subsystem performance parameter output by the second plurality of control means and at least one current subsystem performance parameter of the first plurality of control means, and

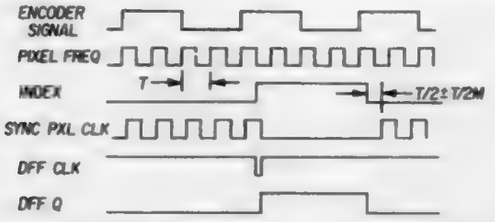
output means for outputting the at least one revised subsystem performance parameter determined by said revising means to corresponding ones of said first plurality of control means.

5,471,314

LINE START SYNCHRONIZER FOR RASTER SCANNER

David M. Orlicki, and James A. Larrabee, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 14, 1993, Ser. No. 76,522
Int. Cl.[6] H04N *1/21*
U.S. Cl. 358—296 11 Claims



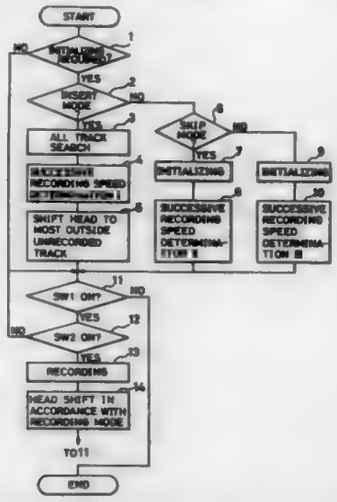
1. An apparatus comprising: an encoder wheel having an encoder track and an index track; a first sensor for reading the encoder track and generating an encoder signal; a second sensor for reading the index track and generating an index signal; a pixel clock circuit for generating a synchronized pixel clock in response to the encoder signal and the index signal, wherein the phase of the synchronized pixel clock signal is within one-half a pixel clock period of the index signal.

5,471,315

RECORDING APPARATUS WITH MULTIPLE RECORDING MODES AND REDUCED WASTE OF RECORDING CAPACITY

Shigeru Jinnai, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 369,638, Jun. 21, 1989, abandoned.
This application Jan. 6, 1992, Ser. No. 281,941
Claims priority, application Japan, Jun. 29, 1988, 63-163112
Int. Cl.[6] H04N *5/76*
U.S. Cl. 358—337 8 Claims



1. An image information recording apparatus that records image information of a plurality of image planes successively for each image plane in order into a recording medium which has a plurality of recording areas, each of the plurality of recording areas having a predetermined information recording capacity, comprising:

a) recording means for recording the image information into the recording medium, said recording means being operative in either one of a first recording mode, in which said recording means records the image information in order into a first plurality of said recording areas at first recording time intervals while not recording image information in a corresponding number of said recording areas, and a second recording mode, in which said recording means records the image information in order into a second plurality of said recording areas at second recording time intervals shorter than the first recording time intervals without keeping any recording areas from being recorded in;

b) recording mode instructing means for providing an instruction to said recording means to operate in one of the first recording mode and the second recording mode; and

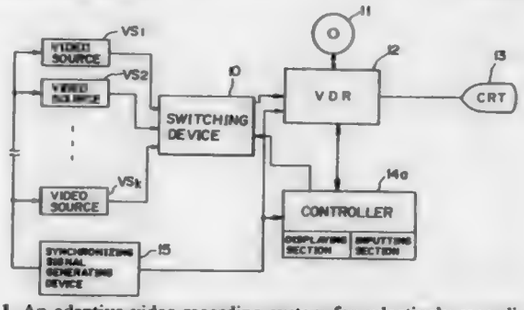
c) recording operation control means for controlling said recording means to record the image information at the respective recording time interval corresponding to the instruction of said recording mode instruction means.

5,471,316

ADAPTIVE SYSTEM FOR SELECTIVELY RECORDING FROM A PLURALITY OF VIDEO SOURCES AND METHOD THEREOF

Kazuaki Sugawara, and Hideo Ito, both of Meguro, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 15, 1993, Ser. No. 77,841
Claims priority, application Japan, Jun. 18, 1992, 4-159831; Sep. 28, 1992, 4-258577
Int. Cl.[6] H04N *5/76;5/78;* G11B *5/09*
U.S. Cl. 358—342 15 Claims



1. An adaptive video recording system for selectively recording a plurality of video signals outputted from a plurality of video sources one after another, comprising:

a recording disc, to which at least the video signals and recording information data related to the video signals, are to be recorded in a directly accessible manner;

a recorder for recording the video signals, by a field or frame unit in a time divisional manner by use of a recording format, which is set in accordance with the number of said video sources (k) and in which a field or frame number of the video signals of each video source is expressed by {kn+(1, 2, ..., k)} on said recording disc wherein k denotes the number of said video sources and n denotes the block number of the video signals, and the recording information data, which is related to the video signals and includes information indicating the number of said video sources (k) and the block number (n), to said recording disc; and

a switcher, coupled to said video sources and said recorder, for switching and outputting the video signals from said video sources to said recorder by the field or frame unit.

5,471,317

VIDEOTEX FACSIMILE MACHINE

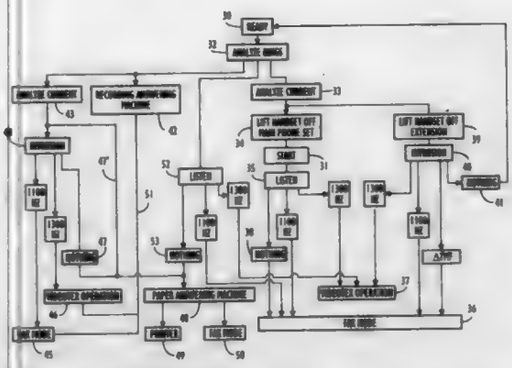
Philippe Charbonnier, Yvelines, France, assignor to Societe d'Applications Generales d'Electricite et de Mecanique Sagem, Paris, France

Filed Jan. 7, 1993, Ser. No. 1,715
Claims priority, application France, Jan. 14, 1992, 92 00299
Int. Cl.[6] H04N *1/00;* H04M *11/00*
U.S. Cl. 358—400 1 Claim

1. A facsimile machine comprising:

a processor,

a modem,



at least one main telephone set,

connecting means for connecting said at least one main telephone set and said modem to a data transmission line,

a module for recognizing the type of incoming calls, and

a printer,

characterized in that:

said modem is a combined facsimile and videotex modem, and in that detection means are provided so that, when the videotex modem portion of said modem is linked to the data transmission line, events on the data transmission line are detected and their nature is recognized such that the data transmission line is routed to the facsimile modem portion of said modem or the videotex modem portion of said modem as a function of the nature of the events on the data transmission line, said facsimile machine further comprising:

direct connecting means for connecting said facsimile machine to at least one non-videotex terminal; and

means for linking the non-videotex terminal to the data transmission line,

wherein said data transmission line comprises one of the two networks ISDN and STN, and wherein said detection means selectively routes the data transmission line to said facsimile machine or the non-videotex terminal when the non-videotex terminal is linked to the data transmission line, and

wherein a telephone extension set is branched in parallel from the data transmission line, and said facsimile machine further comprises:

means for detecting the event of an incoming call and the handset being lifted off said telephone extension set, and for switching the facsimile machine into a parallel intrusion mode for listening to the signals of said telephone extension set and recognizing the nature of the signals.

5,471,318

MULTIMEDIA COMMUNICATIONS NETWORK

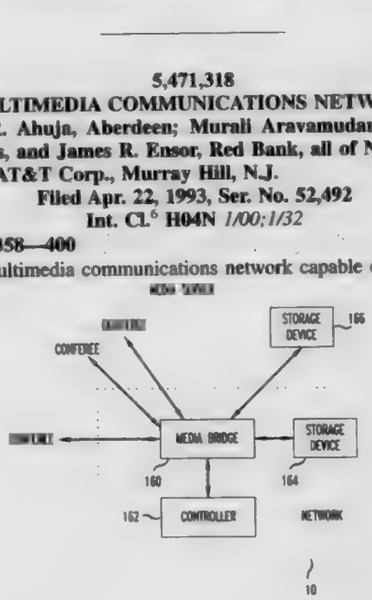
Sudhir R. Ahuja, Aberdeen; Murali Aravamudan, Berkeley Heights, and James R. Ensor, Red Bank, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Apr. 22, 1993, Ser. No. 52,492

Int. Cl.[6] H04N *1/00;1/32*

U.S. Cl. 358—400 **2 Claims**

1. A multimedia communications network capable of establishing predetermined voice, video, and data connections between two or more users, comprising:



a plurality of multimedia ports connectable to a plurality of users capable of communication by way of voice, video, and data;

a virtual meeting server in the network connected to the multimedia ports for creating and maintaining a circuit configuration in the network representing a controllably persistent virtual meeting room having predetermined user defined characteristics, the characteristics of the virtual meeting room being determined in response to commands from any one of the user terminals, the commands identifying a plurality of meeting participants and multimedia communications capabilities of each participant, the virtual meeting room comprising a virtual meeting room identification, a plurality of server descriptions, a meeting description, and a plurality of participant descriptions, the virtual meeting server having a means/br automatically associating a voice server, a video server, and a data server in the network with a meeting between a plurality of multimedia participants in response to at least one of the descriptions in the virtual meeting room;

a voice server, responsive to the virtual meeting server, tbr transmitting and receiving voice signals to and from selected multimedia ports in accordance with the meeting and participant descriptions in the virtual meeting room;

a video server, responsive to the virtual meeting server, for transmitting and receiving video signals to and from selected multimedia ports in accordance with the meeting and participant descriptions in the virtual meeting room; and

a data server, responsive to the virtual meeting server, for transmitting and receiving data signals to and from selected multimedia ports in accordance with the meeting and participant descriptions in the virtual meeting room;

the virtual meeting room being controllably persistent such that it can exist in the network independent of participants of a meeting being connected to the network.

5,471,319

IMAGE PROCESSING METHOD AND IMAGE PROCESSING APPARATUS

Nobuo Ogawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki

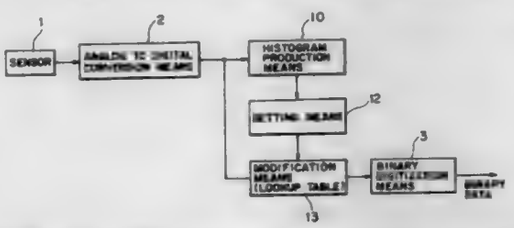
Division of Ser. No. 250,506, May 27, 1994. This application Feb. 1, 1995, Ser. No. 382,192

Claims priority, application Japan, Sep. 16, 1993, 5-230527

Int. Cl.[6] H04N *1/40;1/407*

U.S. Cl. 358—445 **6 Claims**

1. An image processing method wherein analog density values



obtained from a sensor, which detects a density value of image data for each picture element, are converted into digital density values by analog to digital conversion means, which converts analog density values obtained from said sensor into digital density values of a fixed number of bits for a conversion density range, and the digital density values thus obtained are compared for the individual picture elements with a threshold level to convert each of the digital density values into one of two binary values of white and black, comprising the steps of:

producing a histogram of density values of a noticed picture element and picture elements around the noticed picture element:

setting a conversion density range for the noticed picture element in response to a density range of a peak appearing in the histogram: and

converting a digital density value of the noticed picture element from said analog to digital conversion means into another digital density value using a scale obtained by dividing the set conversion density range by a number provided by the fixed number of bits.

5,471,320

STACK FILTERS FOR 1-TO-N BIT IMAGE PROCESSING IN ELECTRONIC PRINTERS

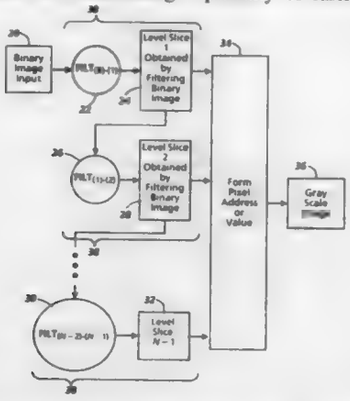
Ronald E. Jodoin, Pittsford; Robert P. Loce; R. Victor Klassen, both of Webster, and Ying-Wei Lin, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 11, 1994, Ser. No. 241,432

Int. Cl.[6] H04N *1/40;1/407;* **G06T** *5/00*

U.S. Cl. 358—455 **30 Claims**

1. A method of transforming a plurality of rasterized binary



signals indicative of a binary input image into a multiple-bit per pixel gray scale image, comprising the steps of:

(a) receiving the plurality of rasterized binary signals;

(b) filtering the rasterized binary signals to produce a binary level slice from each one of a plurality of level-slice filters; and

(c) combining the binary level slices to produce the multiple-bit per pixel gray scale image.

5,471,321

COLOR IMAGE READING DEVICE

Michitaka Setani, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

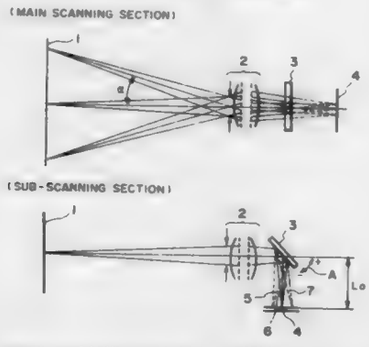
Filed Aug. 25, 1992, Ser. No. 934,213

Claims priority, application Japan, Aug. 28, 1991, 3-242644

Int. Cl.[6] G02B *27/00*

U.S. Cl. 358—474 **18 Claims**

1. A color image reading device comprising:



a line sensor, said line sensor comprising only a single line sensor;

an imaging optical system for focusing the image of an object on said line sensor; and

a blazed diffraction grating, positioned between said imaging optical system and said line sensor, for color-separating a light from the object into plural colored lights,

wherein said blazed diffraction grating is rotatable in a sub scanning direction.

5,471,322

RECORDING APPARATUS WITH REDUCED MEMORY CAPACITY REQUIREMENT

Daisuke Murata, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 282,174, Jul. 29, 1994, abandoned, which is a continuation of Ser. No. 611,539, Nov. 13, 1990, abandoned. This application Feb. 1, 1995, Ser. No. 383,687

Claims priority, application Japan, Nov. 14, 1989, 1-296785; Feb. 20, 1990, 2-037447

Int. Cl.[6] H04N *1/21;1/23;1/50;1/64*

U.S. Cl. 358—502 **127 Claims**

82. A recording apparatus comprising:

first memory means for inputting and storing control information representing one page of image data to be recorded;

means for generating and storing in second memory means, on the basis of the control information stored in said first memory means, bit image data of a partial area smaller than an output area designated by the control information stored in said first memory means; and

means for outputting data on the basis of the bit image data stored in the second memory means by ejecting an ink droplet from an opening by means of heat energy, wherein a recovery process for high quality recording is executed during the recording of the image of the designated output area.

102. A recording apparatus comprising:

first memory means for inputting and storing control information representing one page of image data to be recorded;

means for generating and storing in second memory means, on the basis of the control information stored in said first memory, bit image data of a partial area smaller than an output area designated by the control information stored in said first memory means; and

means for recording data on the basis of the bit image data stored in the second memory means in color.

112. A printing apparatus comprising:

first memory means for receiving and storing control information representing image data to be printed;

discriminating means for discriminating whether a detachable memory is connected to said printing apparatus;

setting means for setting the size of a second memory means which stores bit image data as a one-page size or a partial size smaller than one page in response to a discrimination by said discriminating means; and

print means for printing data in color on the basis of the bit image data stored in the second memory means.

116. A printing apparatus comprising:

first memory means for receiving and storing control information representing image data to be printed;

discriminating means for discriminating whether a detachable memory is connected to said printing apparatus;

setting means for setting the size of a second memory means which stores bit image data as a one-page size or a partial size smaller than one page in response to a discrimination by said discriminating means; and

print means for printing data on the basis of the bit image data stored in the second memory by ejecting an ink droplet from an opening by means of heat energy, wherein a recovery process for high quality recording can be executed during a printing operation by said print means.

5,471,323

SOLID STATE VIDEO CAMERA HAVING IMPROVED CHROMATIC ABERRATION SUPPRESSION AND MOIRE SUPPRESSION

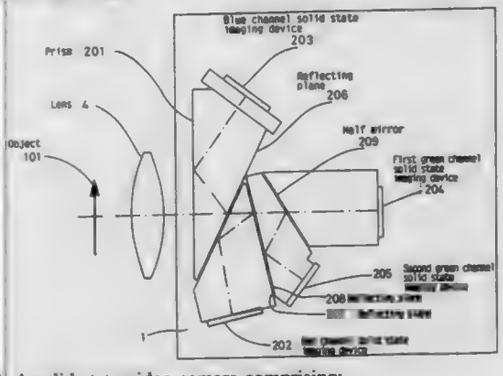
Keisuke Suetsugi, Osaka; Hiroshi Kanno, Kashiwara; Masayuki Sugawara, Komae; Kohji Mitani, Sagamihara; Yoshihiro Fujita, Tama; Toshinori Saitoh, Komae, and Yuichi Ninomiya, Kawasaki, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd, Osaka; Matsushita Communication Industrial Co., Ltd., Yokohama, and Nippon Hoso Kyokai, Tokyo, all of, Japan

Filed May 17, 1994, Ser. No. 245,192

Claims priority, application Japan, May 19, 1993, 5-116937

Int. Cl.[6] H04N *9/097*

U.S. Cl. 358—511 **7 Claims**



1. A solid state video camera comprising:

an imaging part having:

a prism for decomposing an optical image into first and second green channels, a red channel, and a blue channel, the prism including first and second green optical outputs respectively corresponding to the first and second green channels, a red optical output corresponding to the red channel, and a blue optical output corresponding to the blue channel;

first and second green channel solid state imaging devices respectively disposed at the first and second green optical outputs for outputting first and second green video signals corresponding to the respective channels, the first and second green channel imaging devices being mutually offset by one half of a pixel in a horizontal direction with respect to the optical image; and

red and blue channel solid state imaging devices respectively disposed at the red and blue optical outputs for outputting red and blue video signals corresponding to the respective channels, the red and blue channel imaging devices being mutually offset by one half of a pixel in the horizontal direction with respect to the optical image; and

a signal processing part having:

a white balance circuit for receiving video signals corresponding to the first and second green video signals and the red and blue video signals, for summing the video signals corresponding to the first and second green video signals in a 1:1 ratio, for performing a white balance adjustment on the summed green video signals and the video signals corresponding to the red and blue video signals, and for outputting white balanced red, green, and blue channel signals;

a first matrix circuit for receiving the white balanced red, green, and blue channel signals and outputting a first luminance signal according to a first matrix ratio determined by a television standard in use;

a second matrix circuit for receiving the white balanced red, green, and blue channel signals and outputting a second luminance signal according to a second matrix ratio Kr:Kg:Kb where Kr+Kg+Kb=1, Kg is the factor of to the green channel signal and is determined by the television standard, Kr is the factor of the red channel signal and is determined according to the formula Kr=(1=Kg)/2, and Kb is the factor of the blue channel signal and is determined according to the formula Kb=(1−Kg)/2; and

a mixing circuit for receiving and summing luminance signals corresponding to the first and second luminance signals, and outputting a summed luminance signal.

5,471,324

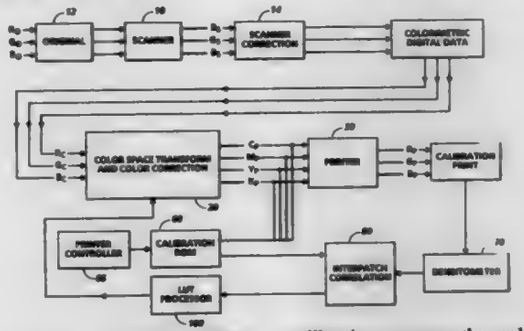
COLOR PRINTER CALIBRATION WITH IMPROVED COLOR MAPPING LINEARITY

Robert J. Rolleston, Penfield, N.Y., assignor to Xerox Corporation, Stamfor, Conn.

Filed Apr. 5, 1994, Ser. No. 223,194

Int. Cl.[6] H04N *1/46;* **G03F** *3/08*

U.S. Cl. 358—518 **13 Claims**



7. A color printer including a calibration system, the color printer responsive to printer signals to deposit printer colorants on a medium in accordance with printer signals received, including the steps of:

means for operating the color printer with printer signals selected to cause the printer to print color samples on the medium;

means for measuring a colorimetric response at each color sample printed on the medium, and producing a colorimetric signal indicative thereof, mapped to a corresponding printer signal, said colorimetric signals are dispersed through a gamut of the printer at irregular intervals;

means for preprocessing the colorimetric signals to increase the number thereof with interpolated signals, using interpolation between spatially proximate responses;

means for mapping the increased number of colorimetric signals to printer signals, to produce a regular interval dispersal of calculated colorimetric signals through color space, each of the calculated colorimetric signals mapped to a corresponding printer signal and derived from the measured colorimetric values and the interpolated values;

means for storing the mapping in a color conversion memory for use in converting color definitions from a first color space to the printer signals suitable for producing a corresponding response at the color printer.

13. A color printer including a calibration system, the color printer responsive to printer signals to deposit printer colorants on a medium in accordance with printer signals received, including the steps of:

a printer controller, controlling printer operation;

a calibration memory, storing a set of printer signals suitable to drive the printer to print a test sheet;

a printer, responsive to control signals from the printer controller and the calibration memory to print the test sheet;

means for measuring the colorimetric response of the printer in printing the test sheet and producing as an output a set of measured colorimetric signals;

means for mapping measured colorimetric signals to printer signals that caused the printer to print the colorimetric signals;

a look up table processor, preprocessing the measured colorimetric signals to increase the number thereof with interpolated signals, using interpolation between spatially proximate responses;

a colorimetic signal interpolation processor producing a regular interval dispersal of calculated colorimetric signals through color space, each of the calculated colorimetric signals mapped to a corresponding printer signal and derived from the measured colorimetric values and the interpolated values;

a color space conversion memory, storing a lookup table, for use in converting colorimetic signals from a first color space to the printer signals suitable for producing a corresponding response at the printer.

5,471,325

STORING CODED COLOR COMPONENTS OF CODED INPUT IMAGE AND CODED IMAGE DATA RECEIVED FROM A TRANSMISSION LINE

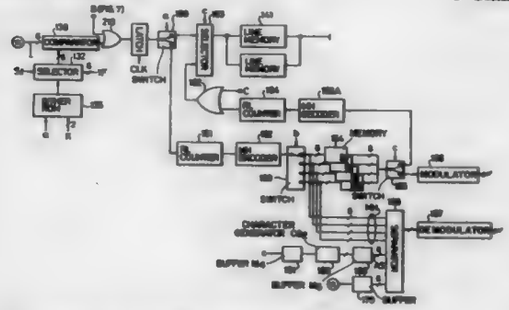
Shunichi Abe, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 796,875, Nov. 25, 1991, abandoned, which is a division of Ser. No. 538,730, Jun. 15, 1990, abandoned, which is a continuation of Ser. No. 271,362, Nov. 14, 1988, Pat. No. 4,953,012, which is a continuation of Ser. No. 180,640, Apr. 6, 1988, abandoned, which is a continuation of Ser. No. 73,873, Jul. 15, 1987, abandoned, which is a continuation of Ser. No. 585,233, Mar. 1, 1984, abandoned. This application Jun. 28, 1993, Ser. No. 84,087

Claims priority, application Japan, Mar. 8, 1983, 58-37712; Mar. 17, 1983, 58-44992; Mar. 17, 1983, 58-44993

Int. Cl.[6] H04N *1/46*

U.S. Cl. 358—524 **3 Claims**



1. An image processing apparatus comprising:

input means for inputting first color image data;

coding means for coding the first color image data input by said input means so as to obtain coded first color image data having a respective plurality of coded color components;

receiving means for receiving coded second color image data from a transmission line, the coded second color image data having a respective plurality of coded color components;

separating means for separating each of the plurality of coded color components from others of the plurality of coded color components for the coded second color image data, said separating means separating on the basis of command data for each coded color component; and

common memory means for storing the coded first color image data coded by said coding means and the coded second color image data received by said receiving means,

wherein both of the coded first color image data and the coded second color image data are represented by the same kind of coded color components.

5,471,326

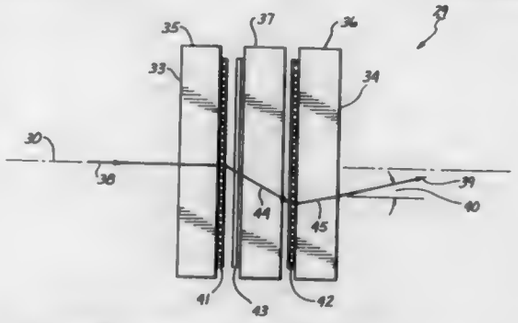
HOLOGRAPHIC LASER SCANNER AND RANGEFINDER

James T. Hall, Torrance; Arthur B. O'Connor, Redondo Beach; Susan M. Raffensperger, Long Beach, and Seymour Levine, Topanga, all of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Apr. 30, 1993, Ser. No. 56,218

Int. Cl.[6] G02B *5/32;5/28;27/42*

U.S. Cl. 359—15 **13 Claims**



1. A holographic optical element, comprising:

means in a form of a substrate structure having rotational symmetry with respect to a rotational axis for rotatively supporting at least two holograms, the substrate structure including first, second, and third substrates bonded together such that the third substrate is bonded between the first and second substrates;

means in the form of a first hologram on the first substrate in the path of a normally incident beam for diffracting the beam by a first acute angle and in a first radial direction from the rotational axis to a first redirected path;

means in the form of a second hologram on the second substrate in the first redirected path for diffracting the beam by a different second acute angle and in an opposite second radial direction from the rotational axis to a second redirected path, whereby the second redirected path is at an angle to the rotational axis that has a size which is the difference between the size of the first angle and the size of the second angle; and,

means in the form of a filter element on the third substrate for suppressing zero-order leakage of the incident beam through the first hologram.

5,471,327

HOLOGRAPHIC DIFFUSER FOR BACK-LIT DISPLAY

James M. Tedesco, Livonia; Lois A. K. Brady, Dexter, and Willis S. Colburn, Ann Arbor, all of Mich., assignors to Kaiser Optical Systems, Inc., Ann Arbor, Mich.

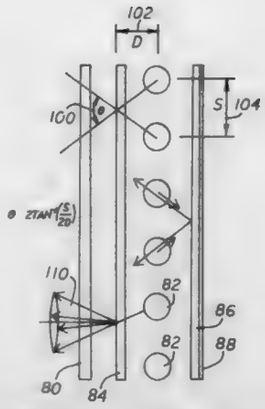
Filed May 14, 1993, Ser. No. 62,381

Int. Cl.[6] G02B *5/32*

U.S. Cl. 359—15 **10 Claims**

1. A backlight assembly for use with a transmissive-type flat-panel display having a back surface, the assembly comprising:

a source of backlighting including a plurality of parallel, spaced-apart, elongated lamp segments supported in a first plane;



a holographically recorded diffuser operatively disposed between the lamp segments and the display panel, in a second plane, the distance between the segments and the two planes defining a lamp geometry, the geometry associated with the recording of the diffuser being a function of the lamp geometry, resulting in a diffuser operative to receive light from the segments over a range of angles of incidence, and redirect the light toward the back surface of the display with an asymmetric scattering pattern characterized in that the angle of scattering is substantially greater within a plane perpendicular to the longitudinal direction of the lamp segments as compared to the direction parallel to the lamp segments, so as to fill in gaps of illumination Which would otherwise be visually evident in the display between said lamp segments.

5,471,328

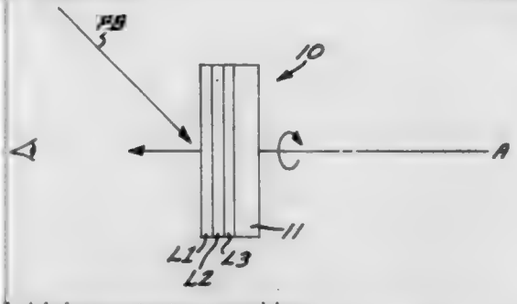
SEGMENTED IMAGE HOLOGRAPHIC DISKS

John E. Wreede, Azusa, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jul. 23, 1993, Ser. No. 96,586

Int. Cl.[6] G02B *27/00;* **G03H** *1/28*

U.S. Cl. 359—22 **6 Claims**



1. A hologram structure comprising:

a plurality of holograms having substantially identical reconstruction characteristics, including an identical reconstruction angle, disposed on a substrate for rotation about a rotation axis, each hologram containing a segment of a composite image that is comprised of the superposition of the segments contained in the holograms and being angularly offset relative to each other such that all segments of the composite image are perceived, as a result of vision persistence, in at least one narrow solid angular region pursuant to rotation of the holograms about the rotation axis at a sufficiently high rate and illumination of the holograms with a reconstruction beam, whereby each segment is independently perceived when the holograms are rotated at a rate that is lower than such sufficiently high rate.

5,471,329

ACTIVE MATRIX TYPE LIQUID CRYSTAL DISPLAY PANEL AND A METHOD FOR PRODUCING THE SAME, HAVING A CONSTRUCTION CAPABLE OF PREVENTING BREAKDOWN OF THE SWITCHING ELEMENTS OR DETERIORATION DUE TO STATIC ELECTRICITY

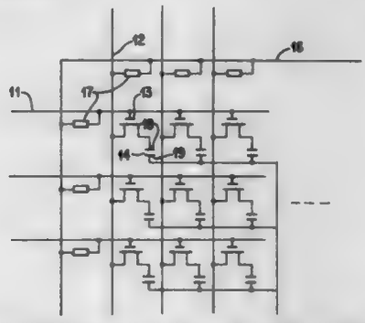
Mutsumi Nakajima; Nobuyoshi Nagashima, and Kyoushi Tanaka, all of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1993, Ser. No. 171,235

Claims priority, application Japan, Dec. 21, 1992, 4-340778

Int. Cl.[6] G02F *1/1343*

U.S. Cl. 359—54 **20 Claims**



18. A method for producing an active matrix type liquid crystal display panel comprising a first and a second insulating substrates which face each other, said method comprising a process for producing said first insulating substrate, said process including the steps of:

forming first parallel lines including first bus lines and a first short-circuit line on a face of said first insulating substrate, the face facing said second insulting substrate;

forming insulating thin films on said first lines by anodizing surfaces of said first lines; and

forming second parallel lines including second bus lines and a second short-circuit line on said insulating thin films, said second lines crossing said first lines.

5,471,330

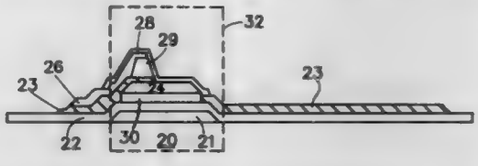
POLYSILICON PIXEL ELECTRODE

Kalluri R. Sarma, Mesa, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 29, 1993, Ser. No. 99,961

Int. Cl.[6] G02F *1/1343;* **H01L** *21/26;21/469*

U.S. Cl. 359—59 **16 Claims**



1. A liquid crystal display pixel comprising:

a glass substrate;

a metal gate layer formed on a first portion of said glass substrate;

a gate dielectric layer formed on said metal gate layer and on a second portion of said glass substrate;

an amorphous silicon channel layer formed on a first portion of said gate dielectric layer and located proximate to said metal gate layer;

a polysilicon source layer formed adjacent to said amorphous silicon channel layer;

a polysilicon drain layer formed adjacent to said amorphous silicon channel layer; and

a polysilicon pixel electrode layer formed on a second portion of said gate dielectric layer.

5,471,331

SPATIAL LIGHT MODULATOR ELEMENT WITH AMORPHOUS FILM OF GERMANIUM, CARBON AND SILICON FOR LIGHT BLOCKING LAYER

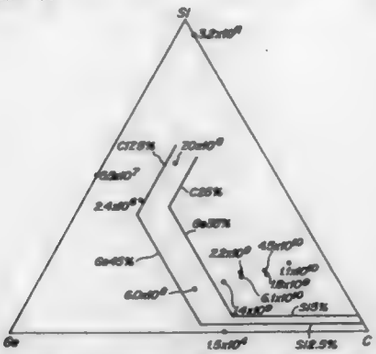
Kuniharu Takizawa; Hiroshi Kikuchi, both of Setagaya; Yukihisa Osugi, and Shoji Tange, both of Nagoya, all of, Japan, assignors to Nippon Hoso Kyokai, and NGK Insulators, Ltd., both of, Japan

Filed Jan. 28, 1993, Ser. No. 10,301

Claims priority, application Japan, Feb. 4, 1992, 4-018987; Feb. 4, 1992, 4-018988; Feb. 4, 1992, 4-018989

Int. Cl.[6] G02F *1/1335;1/135*

U.S. Cl. 359—67 **14 Claims**



9. A spatial light modulator comprising: a first transparent electrode film, provided on a substrate, a photoconductive layer provided on the first transparent electrode film, a light blocking layer provided on the photoconductive layer, a dielectric multilayered film provided on the light blocking layer, a light modulation layer provided on the dielectric multilayered film, and a second transparent electrode film, provided on the light modulation layer, the light modulation layer consisting of a liquid crystal material for changing intensity, phase or running direction of read-out light, wherein the light blocking layer is an amorphous film consisting essentially of 5–45 atomic % of germanium, 17.5–92.5 atomic % of carbon and 2.5–77.5 atomic % of silicon, and the photoconductive layer comprises a single crystal selected from the group consisting of a single crystal of $Bi_{12}SiO_{20}$, a single crystal of $Bi_{12}GeO_{20}$ and a single crystal of GaAs.

5,471,332

HITLESS SWITCHING APPARATUS AND METHOD FOR OPTICAL NETWORK

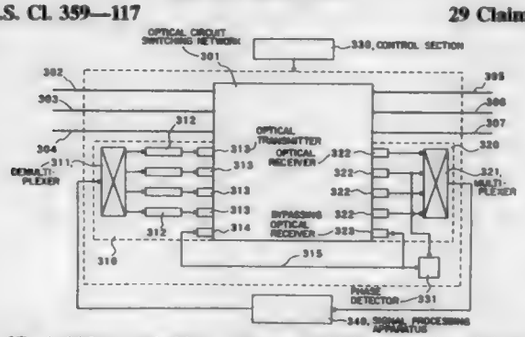
Tatsuya Shiragaki; Takahiro Shiozawa; Syuji Suzuki, and Masahiko Fujiwara, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 18, 1994, Ser. No. 228,896

Claims priority, application Japan, Apr. 16, 1993, 5-089014; Jun. 23, 1993, 5-152042

Int. Cl.[6] H04J *14/00*

U.S. Cl. 359—117 **29 Claims**



27. A hitless switching apparatus which is employed in an optical network and which performs hitless switching between a plurality of optical transmission lines, comprising:

an optical switch having a plurality of input terminals and a plurality of output terminals for receiving, at two of said input terminals thereof, two optical signals transmitting the same information to perform switching of a signal at said output terminal by continuously and complimentarily varying the ratio between optical signals to be selected at said output terminals from a signal at one of said input terminals selected at present to another one of said input terminals to be selected next;

an optical receiver connected to one of said output terminals of said optical switch;

phase coincidence means for making phase conditions of the same information signals to be inputted to two of said input terminals of said optical switch coincide at said optical receiver; and

optical signal conversion means connected to said optical switch for converting an optical signal to another optical signal having a low coherence,

wherein hitless switching is performed by inputting the same optical signals to first and second input terminals of said optical switch and changing condition of said optical switch from a condition wherein an optical signal at said first input terminal is received at said optical receiver to another condition wherein an optical signal at said second input terminal is received by said optical receiver, and said optical signal conversion means converts said optical signal supplied to said second input terminal to said optical signal having a low coherence.

5,471,333

OPTICAL COMMUNICATION SYSTEM

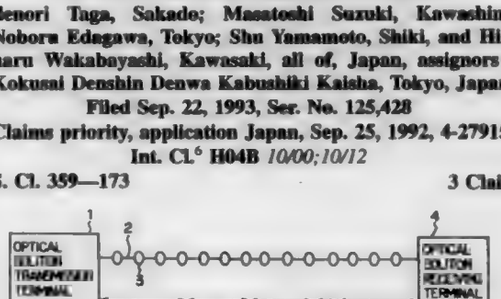
Hidenori Taga, Sakado; Masatoshi Suzuki, Kawashima; Nobora Edagawa, Tokyo; Shu Yamamoto, Shiki, and Hiroharu Wakabayashi, Kawasaki, all of, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1993, Ser. No. 125,428

Claims priority, application Japan, Sep. 25, 1992, 4-279158

Int. Cl.[6] H04B *10/00;10/12*

U.S. Cl. 359—173 **3 Claims**



1. An optical communication system comprising:

an optical transmission terminal station for transmitting return-to-zero optical pulses representative of digital information;

an optical receiving terminal station for receiving said return-to-zero optical pulses;

an optical fiber transmission line connected for transmission of said optical pulses from said optical transmission terminal station to said optical receiving terminal station;

an optical fiber and a plurality of optical amplifier repeaters to amplify the optical pulses connected along the length of the optical fiber spaced from each other defining said optical fiber transmission line;

an average value of wavelength dispersion on the entire length of the optical fiber transmission line being a positive value effectively compensating for pulse compression effect and pulse expansion effect on the optical pulses applied to the optical receiving terminal station;

first sections and second sections of said optical fiber transmission line being alternately allocated along the length of the optical fiber transmission line;

each of said first sections having an average value of the wavelength dispersion relatively larger than said average value of the wavelength dispersion on the entire length of the optical fiber transmission line; and

each of said second sections having an average value of the wavelength dispersion relatively smaller than said average

value of the wavelength dispersion on the entire length of the optical fiber transmission line;

whereby the average value of the wavelength dispersion of the entire length of the optical transmission line effectively assumes said positive value.

5,471,334

METHOD AND APPARATUS FOR MONITORING NOISE FIGURE OF OPTICAL AMPLIFIER

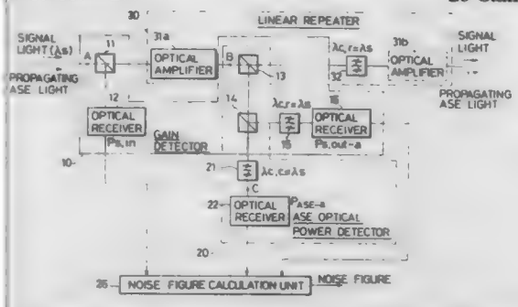
Hiroji Masuda; Kazuo Aida, and Kiyoshi Nakagawa, all of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Oct. 19, 1993, Ser. No. 139,227

Claims priority, application Japan, Jan. 21, 1992, 4-282890; Jun. 18, 1993, 5-147706

Int. Cl.[6] H04B *17/00*

U.S. Cl. 359—177 **20 Claims**



1. An apparatus for monitoring a noise figure of a linear repeater including at least one optical amplifier for amplifying input signal light and at least one narrow bandwidth optical filter for removing amplified spontaneous emission (ASE) light generated at the optical amplifier, the apparatus comprising:

gain detector means for detecting a gain of the optical amplifier;

ASE optical power detector means for detecting an optical power of the ASE light generated at the optical amplifier, including:

splitter means for splitting lights entering into the narrow bandwidth optical filter;

optical filter means having a central transmission wavelength displaced from a wavelength of the input signal light, for extracting the ASE light generated at the optical amplifier from the lights split by the splitter means; and

optical power detection means for detecting the optical power of the ASE light extracted by the optical filter means; and

noise figure calculation means for calculating the noise figure according to the gain detected by the gain detector means and the optical power of the ASE light detected by the ASE optical power detector means.

5,471,335

SEMICONDUCTOR OPTICAL AMPLIFIER DEVICE AND A METHOD OF USING THE SAME

Jun Nitta, Sagamihara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1992, Ser. No. 972,413

Claims priority, application Japan, Nov. 11, 1991, 3-322452

Int. Cl.[6] H04B *10/17;10/04;10/06*

U.S. Cl. 359—179 **23 Claims**

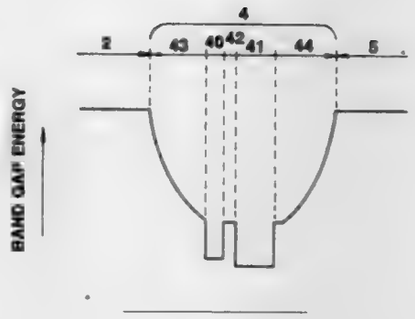
1. A semiconductor optical amplifier device comprising:

a first section and a second section which are arranged along a resonator direction;

a common electrode for injecting a current into said first and second sections; and

a waveguide formed through said first and second sections,

wherein said waveguide has an active layer in the first section and a plurality of active layers in the second section.



5,471,336

COLD START CONTROL SYSTEM AND METHOD FOR USE IN COHERENT LIGHTWAVE COMMUNICATIONS SYSTEM

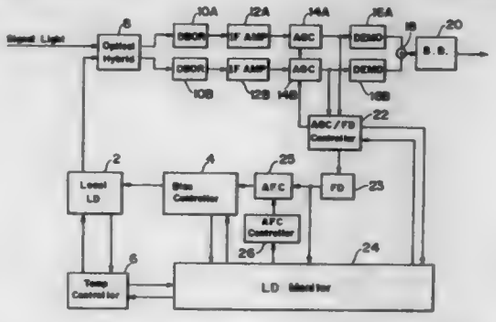
Hiroshi Onaka; Hideyuki Miyata, and Takao Naito, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 11, 1992, Ser. No. 928,101

Claims priority, application Japan, Aug. 14, 1991, 3-204489

Int. Cl.[6] H04N *5/50*

U.S. Cl. 359—191 **17 Claims**



16. A cold start control method for use in a coherent lightwave communications system in which received signal light is mixed with local light to obtain an intermediate-frequency signal having a center frequency, said cold start control method comprising the steps of:

sweeping at least one of a frequency of the local light and a frequency of the signal light;

determining a relative frequency position, indicative of which one of the frequency of the signal light and the frequency of the local light is higher than the other one, between the local light and the signal light when the intermediate-frequency signal is detected;

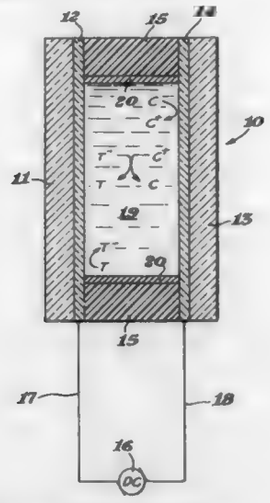
correcting at least one of the frequency of the local light and the frequency of the signal light when the relative frequency position obtained in said step of determining a relative frequency is different from a predetermined relative frequency position; and

starting automatic frequency control when the relative frequency position obtained in said determining step is one of in agreement with the predetermined relative frequency position and the correction of the frequency of said at least one of the frequency of the signal light and the frequency of the local light to be corrected is made in said correcting step.

5,471,337
PHOTOSTABLE SELF-ERASING ELECTROCHROMIC DEVICE

Susan J. Babinec, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1994, Ser. No. 296,300
Int. Cl.[6] G02F *1/153*
U.S. Cl. 359—269 **10 Claims**

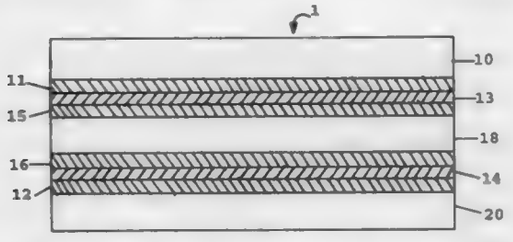


1. An electrochromic device comprising:
(a) a first electrode;
(b) a second electrode, the second electrode spaced apart from the first electrode so that there is a space between the first electrode and the second electrode; and
(c) a dispersion positioned in the space between the first electrode and the second electrode, the dispersion being in electrical contact with the first electrode and with the second electrode, the dispersion comprising a polyoxometalate, a counter electrode couple and a solvent, the solvent selected from the group consisting of propylene carbonate, ethylene carbonate, gamma valerolactone, acetone, methylene chloride, ethylene dichloride, alkanes and water.

5,471,338
ELECTROCHROMIC DEVICE WITH PLASTIC SUBSTRATE

Phillip C. Yu, Pittsburgh; David L. Backfisch, Monroeville, and Thomas G. Rukavina, Lower Burrell, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 12, 1993, Ser. No. 152,343
Int. Cl.[6] G02F *1/15*
U.S. Cl. 359—273 **12 Claims**

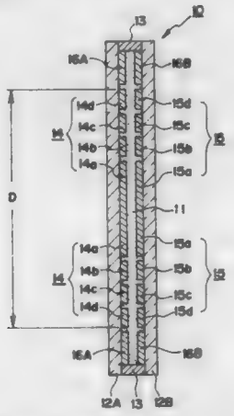


12. An electrochromic article comprising the following transparent layers:
a. a substrate polymerized from diethylene glycol bis(allylcarbonate) monomer;
b. a primer layer copolymerized from acrylic acid and methyl methacrylate deposited on a surface of said substrate;
c. an electroconductive film comprising tin-doped indium oxide deposited on said primer layer;
d. an electrochromic film of tungsten oxide deposited on said electroconductive film;
e. a second substrate polymerized from diethylene glycol bis(allylcarbonate) monomer;
f. a second primer layer copolymerized from acrylic acid and methyl methacrylate deposited on a surface of said second substrate;
g. a second electroconductive film comprising tin-doped indium oxide deposited on said second primer layer;
h. a complementary electrochromic film of iridium oxide deposited on said second electroconductive film; and
i. a proton-conducting copolymer of 2-acrylamido-2-methylpropanesulfonic acid and N,N-dimethylacrylamide disposed between and bonded to said electrochromic films.

5,471,339
ELECTROCHROMIC DIAPHRAGM DEVICE

Koichi Ise, Chiba; Yasuo Nishida, and Akio Yasuda, both of Tokyo, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 14, 1994, Ser. No. 209,713
Claims priority, application Japan, Mar. 19, 1993, 5-060753
Int. Cl.[6] G02F *1/153*
U.S. Cl. 359—275 **4 Claims**



1. A diaphragm device comprising:
an electrochromic element the light transmitting properties of which are changed on forcing an electrical voltage thereacross,
a first set of transparent electrodes and a second set of transparent electrodes each having a concentric array of a plurality of transparent electrodes, said first set of the transparent electrodes and the second set of the transparent electrodes being arranged on both sides of said electrochromic element, and
third electrodes arranged on both sides of the electrochromic element constituting counter-electrodes for said first set of the transparent electrodes and the second set of the transparent electrodes, said third electrodes being arranged on the outermost peripheries of said first set of the transparent electrodes and the second set of the transparent electrodes.

5,471,340
REFLECTIVE OPTICAL NON-RECIPROCAL DEVICES

Yihao Cheng, Kanata, and Gary S. Duck, Nepean, both of, Canada, assignors to JDS Fitel Inc., Nepean, Canada

Filed Jan. 7, 1994, Ser. No. 178,838
Int. Cl.[6] G02B *5/30;27/28;* **G02F** *1/09;1/095*
U.S. Cl. 359—281 **15 Claims**

1. An optical non-reciprocal device for coupling light beams between a plurality of ports, the device comprising at least a first port and a second port at one end of the device, mirror means at an opposite end of the device and, disposed between the plurality of

ports and the mirror means, a optical elements for spatially separating first and second polarization components of a light beam leaving said first port, conveying the first and second polarization components non-reciprocally to and from the minor means such that the first and second polarization components travel along first and second paths, respectively, recombining said first and second polarization components and coupling the recombined light beam to the second port, the optical elements being configured such that a second light beam leaving the second port will be separated into first and second polarization components, and the first and second polarization components of the second light beam will travel along third and fourth paths, respectively, and be recombined at a position at said one end of the device, which position is spaced from both the first port and the second port in a plane extending through the first and second ports.

5,471,341

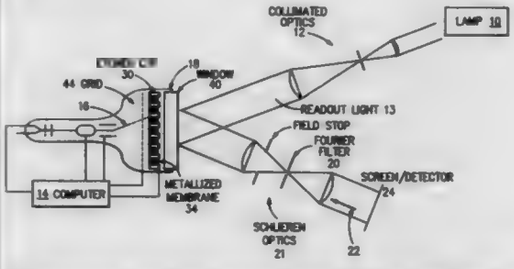
MEMBRANE LIGHT MODULATING SYSTEMS

Cardinal Warde, Newtonville; Thomas N. Horsky, Acton; Craig M. Schiller, Arlington, and George J. Genetti, Beverly, all of Mass., assignors to Optron Systems, Inc., Bedford, Mass.

Division of Ser. No. 734,289, Jul. 17, 1991, Pat. No. 5,287,215. This application Dec. 16, 1993, Ser. No. 168,760

Int. Cl.[6] G02B *26/00*

U.S. Cl. 359—293 **9 Claims**



1. A system for modulating incident light by impinging said light on a membrane mirror which can be deformed in accordance with an electric charge on individual pixel portions of the membrane mirror;

the improvement wherein the membrane is supported on a plurality of insulating walls which are formed on an electrode-containing surface to define potential wells, each said potential well constituting a pixel so that the bottom of each of said wells has said electrode surface thereon and a charge difference can be created between the electrode and the portion of the membrane overlying each pixel, and means for creating an image defining charge difference across said membrane by addressing said membrane by impinging upon one side of said membrane with an image modified electron stream, each of said plurality of insulating walls including two transparent insulators and a mirror surface interposed between said two insulators, said insulating walls being mounted on a transparent electrode, said incident light to be modulated impinging upon the side of said membrane opposite to said one side.

5,471,342

FIBER OPTICAL AMPLIFIER HAVING A DETECTOR FOR MEASURING SCATTERED LIGHT AT A SPLICE

Bernhard Junginger, Herrenberg; Rainer Fritschi, and Heinz Krimmel, both of Stuttgart, all of, Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Mar. 30, 1994, Ser. No. 219,990

Claims priority, application Germany, Mar. 30, 1993, 43 10 294.8; May 12, 1993, 43 15 846.3

Int. Cl.[6] H01S *3/094;3/17*

U.S. Cl. 359—341 **11 Claims**

1. A fiber-optic amplifier connectable to a transmission line (9), consisting of

a pump coupler with several connecting points,

a pumping light source connected to a first connecting point of the pump coupler,

a length (7) of fiber having optical amplifying characteristics with one end being joined to a second connecting point of the pump coupler defining one splice area (11) and with another end to be joined to the transmission line (9) defining another splice area (12), and

at least one detector (13, 15) being arranged at at least one end of the length (7) of fiber with optical amplifying characteristics and being pointed at a respective splice area (11, 12) to measure scattered light (S1', P1', S2', P2') leaking from the respective splice area (11, 12).

5,471,343

IMAGING DEVICE

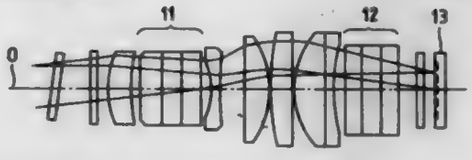
Yoshiharu Takasugi, Iruma, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1993, Ser. No. 159,615

Claims priority, application Japan, Nov. 30, 1992, 4-320208

Int. Cl.[6] G02B *5/30;27/28;* **G02F** *1/23*

U.S. Cl. 359—494 **15 Claims**



1. An imaging device comprising:

an imaging optical system;

an optical low-pass filter including a plurality of first birefringent plates, thereby incident light being separated to be emergent from a plurality of spots on a last surface of said plurality of first birefringent plates from an entrance side; and

a solid-state image sensor;

said plurality of spots including spots located adjacent to one another with a distance therebetween being approximately equal to or less than three times a Rayleigh limit determined dependent on an F number of said imaging optical system; and

said plurality of first birefringent plates being constructed so that a phase difference between light waves respectively emergent from said spots located adjacent to one another is larger than a wavelength of said light waves in a visible wavelength region.

5,471,344
PHOTOGRAPHING APPARATUS HAVING OPTICAL LOW-PASS FILTER

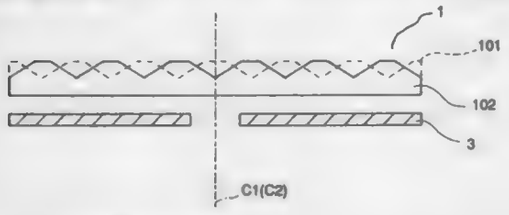
Saburo Sugawara, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 858,605, Mar. 27, 1992, abandoned. This application Jul. 1, 1994, Ser. No. 266,360

Claims priority, application Japan, Mar. 29, 1991, 3-065836; Jun. 21, 1991, 3-177194; Jun. 21, 1991, 3-177199; Jun. 21, 1991, 3-177200; Jul. 19, 1991, 3-203251

Int. Cl.[6] G02B *5/18;5/20;27/44;* **G03B** *33/00*

U.S. Cl. 359—566 **12 Claims**



11. An apparatus comprising:

taking lens means; and

an optical low-pass filter provided in an optical path of said taking lens means, said optical low-pass filter comprising a plurality of prism portions arranged in succession at a predetermined pitch, each of said prism portions having slope planes;

wherein said apparatus satisfies the relationship:

$$.5<\theta_r/\theta_f<1.4,$$

wherein θ_f is the first-order diffraction angle of said optical low-pass filter and θ_r is the refraction angle of light of said slope planes.

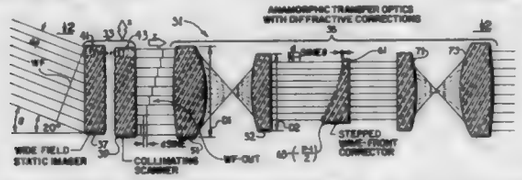
5,471,345
WAVEFRONT CORRECTOR FOR SCANNING MICROLENS ARRAYS

George Gal, Palo Alto; William W. Anderson, Half Moon Bay; Bruce J. Herman, Mountain View, and Dean M. Shough, Newark, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Division of Ser. No. 64,947, May 20, 1993, Pat. No. 5,444,572, which is a continuation-in-part of Ser. No. 11,323, Jan. 29, 1993, which is a continuation-in-part of Ser. No. 982,514, Nov. 27, 1992, Pat. No. 5,310,623. This application Jul. 7, 1994, Ser. No. 271,638

Int. Cl.[6] G02B *27/09*

U.S. Cl. 359—619 **2 Claims**



1. A method of correcting and removing steps in a stepped wavefront output produced by certain angles of scan and by certain positions of scan in unit cell trains of scanning microlens arrays having the unit cell trains arranged in rows and columns in the arrays, said method comprising,

scanning one array of microlenses in one direction only, said one direction corresponding to the direction of alignment of the columns of the microlenses in the arrays,

forming from outputs of all of the unit cell trains in the arrays a unique, separate, linear image at each position of scan of the scanning arrays, said linear images extending in said one direction,

placing, in the path of each unique, separate, linear image a unique, stepped, wavefront corrector plate,

each unique, stepped wavefront corrector plate being constructed of a material having an index of refraction different from air,

said each unique, stepped, wavefront corrector plate having a specific step for a particular row of the unit cell trains,

each step in said each unique, stepped, wavefront corrector plate having a selected thickness effective to vary the time of optical passage through the material thickness in an amount to restore the wavefront to a continuous, unstepped form at an outlet of said material.

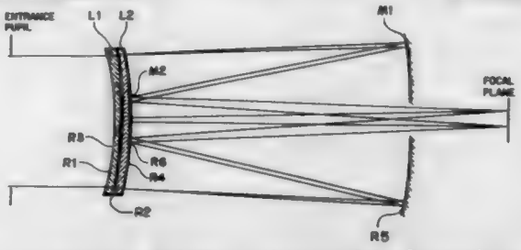
5,471,346
CASEGRAIN TELESCOPE WITH SPHERICAL MIRROR SURFACES

Alan J. Ames, Mountain View, Calif., assignor to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Continuation of Ser. No. 850,629, Mar. 13, 1992, abandoned. This application Jan. 31, 1994, Ser. No. 189,615

Int. Cl.[6] G02B *17/00;21/00*

U.S. Cl. 359—731 **11 Claims**



1. A method for designing a telescope of the Cassegrain type having spherical primary and secondary mirrors and also having a plurality of lens elements functioning as a corrector lens group, said method being characterized in that:

(A) a specified optical power for said telescope and correction for astigmatism of said mirrors are provided primarily by determining relative positions of said mirrors said relative positions of said mirrors being substantially independent of relative positions of the lens elements of said corrector lens group, and

(B) correction for other geometrical aberrations of said telescope is provided primarily by said corrector lens group,

said method comprising the steps of:

a) selecting a design form for a conventional Cassegrain-type telescope having a concave spherical primary mirror and a convex spherical secondary mirror, said primary and secondary mirrors of said conventional Cassegrain-type telescope being coaxially disposed with respect to each other along an optic axis, said concave spherical primary mirror of said conventional Cassegrain-type telescope having a specified focal length defining a front focal plane of said primary mirror, said primary and secondary mirrors of said conventional Cassegrain-type telescope providing said specified optical power, said design form for said conventional Cassegrain-type telescope serving as a "starting design form" with which to begin designing said telescope;

b) locating an entrance pupil for said telescope at said front focal plane of said concave primary mirror of said conventional Cassegrain-type telescope in said "starting design form";

c) developing an "intermediate design form" for said telescope by:

(i) positioning a plurality of lens elements coaxially with respect to each other along said optic axis in said "starting design form", said plurality of lens elements in combination with each other having negligible optical power, said lens elements functioning as said corrector lens group, all refractive surfaces of said lens elements of said corrector lens group being spherical surfaces;

(ii) removing said secondary mirror of said conventional Cassegrain-type telescope from said "starting design form"; and

(iii) providing a reflective coating on a central portion of a refractive surface of the lens element of said corrector lens group that is closest to said concave primary mirror in said "starting design form" so that said reflective coating faces said concave primary mirror, said reflective coating replacing said secondary mirror of said conventional Cassegrain-type telescope that has been removed from said "starting design form", said reflective coating functioning as a secondary mirror for said telescope, said concave primary mirror together with said collector lens group and said reflective coating serving as optical elements of said "intermediate design form";

d) adjusting separation between said concave primary mirror and said secondary mirror along said optic axis in said "intermediate design form" so as to provide correction for astigmatism of said mirrors, adjustment of the separation between said primary mirror and said secondary mirror introducing a change in optical power for said telescope in said "intermediate design form"; and

e) adjusting geometrical parameters of said corrector lens group in said "intermediate design form" so as:

(i) to restore said specified optical power for said telescope, and

(ii) to correct for other geometrical aberrations of said telescope.

5,471,347

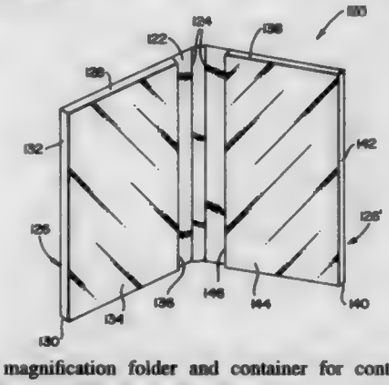
MAGNIFYING CONTAINER FOR PRINTED MATTER

Alfred J. Galiani, 1207 Ina La., McLean, Va. 22102

Filed Sep. 22, 1993, Ser. No. 124,452

Int. Cl.[6] G02B *27/02;* **B42D** *5/00;* **G09F** *3/18*

U.S. Cl. 359—807 **11 Claims**



1. A magnification folder and container for containing and magnifying printed matter, comprising:

(a) a folding cover including two cover panels and having at least one fold line between said two cover panels;

(b) inner pockets being affixed to each of said cover panels and being located on opposite sides of said fold line and defining pocket openings located adjacent said fold line, said inner pockets forming inner walls, transverse side and end walls extending from respective side and end edges of said folding cover; and

(c) magnifier lens panels defining substantially the entire surface of each of said inner walls of said inner pockets so that substantially all of the printed matter contained within each of said inner pockets and facing each of said magnifier lens panels is magnified by said magnifier lens panels, each of said magnifier lens panels being connected to respective side and end walls and being supported in spaced substantially parallel relation with said folding cover by said side and end walls, wherein each of said magnifier lens panels is spaced from the printed matter contained within a respective inner pocket.

5,471,348

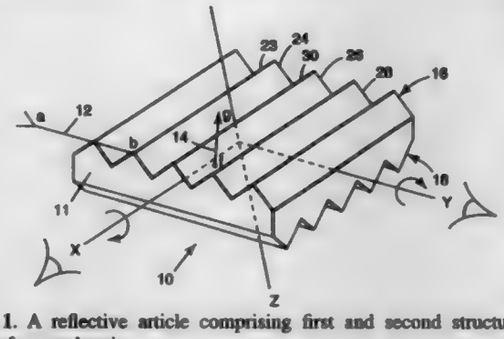
DIRECTED REFLECTION OPTICAL DEVICE

Richard A. Miller, Stillwater; Kenneth A. Aho, Chisago City, and John F. Dreyer, Jr., North Oaks, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 13, 1994, Ser. No. 242,264

Int. Cl.[6] G02B *5/12;5/04*

U.S. Cl. 359—837 **12 Claims**



1. A reflective article comprising first and second structured surfaces, wherein:

said first structured surface includes a first array of prisms aligned in a first orientation;

said second structured surface includes a second array of prisms aligned in a second orientation, wherein the second orientation is different from said first orientation;

such that a light ray incident on said first structured surface at an entrance angle is reflected at said second structured surface and exits from said first structured surface at an exit angle, the exit angle measured relative to said entrance angle.

5,471,349

DRIVE CIRCUIT FOR A DUAL-ELEMENT MAGNETIC HEAD ASSEMBLY WHICH INCLUDES AN ENCODOR, FLIP-FLOP CIRCUIT, RECORD BIT ADDING CIRCUIT, AND RECORD AMPLIFIER

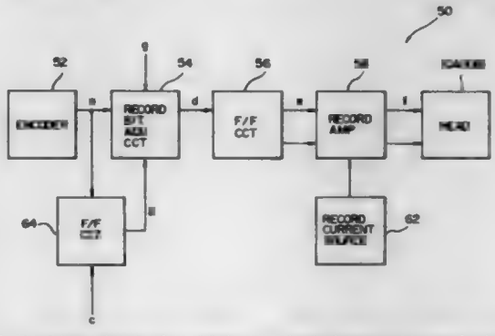
Takao Maruyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 868,493, Apr. 15, 1992, abandoned. This application May 31, 1994, Ser. No. 251,648

Claims priority, application Japan, Apr. 15, 1991, 3-108297

Int. Cl.[6] G11B *5/09;5/03*

U.S. Cl. 360—46 **7 Claims**



5. A drive circuit for driving a dual-element magnetic head assembly, comprising:

a magnetoresistive (MR) readback head including an MR film and a soft magnetic film, said soft magnetic film applying a magnetic bias to said MR film;

a record magnetic head for generating a magnetic field, said record magnetic head including a magnetic yoke having upper and lower magnetic shields, a coil wound around said magnetic yoke, and a gap formed between said upper and lower magnetic shields at a side where said record magnetic head faces a magnetic recording medium;

an encoder for generating record data having a number of recorded bits;

a first flip-flop circuit connected to said encoder and configured to receive said record data and an end of record signal, said first flip-flop circuit determining, upon receiving said end of record signal, whether the number of recorded bits of said record data is odd or even and outputting a determination signal as a result thereof;

a record bit adding circuit connected to receive said determination signal from said first flip-flop circuit and said record data from said encoder, and configured to add an additional bit to said record data as needed to assure that said record data output from said record bit adding circuit always includes an even number of bits;

a second flip-flop connected to said record bit adding circuit and configured to output an odd/even signal having one of a first state and a second state, said odd/even signal being in said first state when said record data output from said record bit adding circuit corresponds to an even number of bits, and said odd/even signal being in said second state when said record data output from said record bit adding circuit corresponds to an odd number of bits; and

a record amplifier connected to said second flip-flop and configured to output a bipolar signal having one of a positive state and a negative state, said bipolar signal being in said positive state when said odd/even signal is in said first state, and said bipolar signal being in said negative state when said odd/even signal is in said second state,

wherein said record magnetic head being responsive to said bipolar signal such that said magnetic field in the vicinity of said MR readback head is always in the same direction after transition of said dual element magnetic head assembly from a recording operation to a readback operation, and thus the direction of the magnetic field at the soft magnetic film coincides with the direction of a magnetization in said soft magnetic film.

5,471,350

RECORD CARRIER WITH ALTERNATING FRAMES AND INTERFRAME GAPS

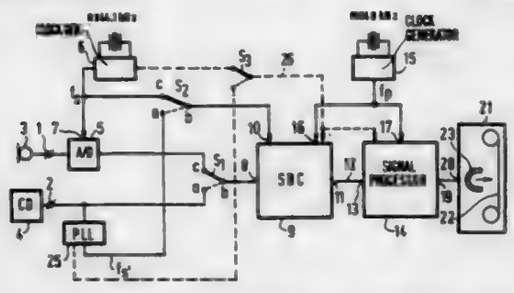
Gerardus C. P. Lokhoff, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 669,136, Mar. 13, 1991, Pat. No. 5,267,098. This application Jul. 26, 1993, Ser. No. 37,636

Claims priority, application Netherlands, Mar. 20, 1990, 9000635

Int. Cl.[6] G11B *5/09*

U.S. Cl. 360—48 **16 Claims**



1. A record carrier having a plurality of longitudinally juxtaposed tracks which each comprises frames and interframe gaps alternating with one another longitudinally along that track, the interframe gap directly following each frame in each track having substantially the same bit density as that frame, the interframe gaps of adjacent tracks being situated at substantially the same position, viewed in the longitudinal direction of the tracks, and adjacent interframe gaps having substantially the same lengths.

5,471,351

METHOD AND APPARATUS OF VERIFYING ACCURATE WRITING THROUGH COMPARISONS OF WRITTEN AND READ DATA

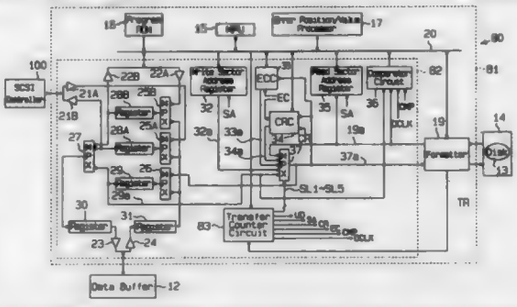
Masayuki Ishiguro, Kasugaishi, Japan, assignor to Fujitsu Limited, Kawasaki, and Fujitsu VLSI Limited, Kasugai, both of, Japan

Filed Jul. 11, 1994, Ser. No. 272,529

Claims priority, application Japan, Jul. 9, 1993, 5-170670

Int. Cl.[6] G11B *5/09;27/36*

U.S. Cl. 360—53 **7 Claims**



1. A method of verifying accurate writing of data onto a recording medium, the data including at least a user data portion, the method comprising the steps of:

providing data to be written on the recording medium;

writing said provided data onto the recording medium;

reading data written on the recording medium from the recording medium;

comparing a user data portion in said data to be written on the recording medium with a user data portion in said data read from said recording medium, so as to count a first number of errors between said both user data portions;

performing an ECC error correction on said data read from the recording medium, to count a second number of errors with respect to said user data portion in said read data; and

comparing said first number of errors with said second number of errors, so as to determine that data writing on the recording medium has been accomplished accurately if the first number of errors and second number of errors coincide, and to determine that data writing has been accomplished inaccurately if the first and second numbers of errors do not coincide.

5,471,352

RECORDING/PLAYBACK APPARATUS IN WHICH HEAD AND TAPE ARE HELD IN INTERMITTENT CONTACT DURING RAPID SEARCH

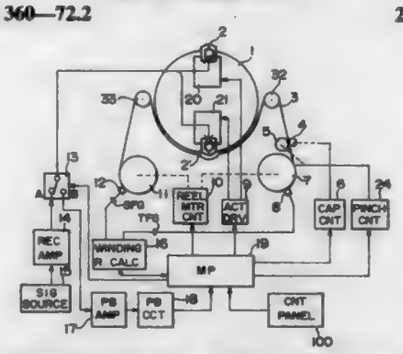
Kouji Fujita, Yokohama, and Shigemitsu Higuchi, Fujisawa, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 21, 1993, Ser. No. 89,528

Claims priority, application Japan, Jul. 21, 1992, 4-194201

Int. Cl.[6] G11B *15/18*

U.S. Cl. 360—72.2 **26 Claims**



1. A playback apparatus for playing back a magnetic signal indicative of positional information and previously recorded on a magnetic tape, said apparatus comprising:

tape traveling means for causing the magnetic tape to travel in a path;

playback head;

an actuator for supporting said playback head adjacent the tape travel path, said actuator responsive to a read command to bring said playback head into and out of contact with the magnetic tape as the magnetic tape travels on the tape travel path;

acceptance means for accepting target position information indicative of a target position on the magnetic tape;

a controller for applying a read command to said actuator to bring said playback head into and out of contact with the magnetic tape to cause said playback head to intermittently read the positional information magnetic signal from the magnetic tape;

generation means responsive to the read positional information magnetic signal for generating positional information indicative of the position of said playback head on the magnetic tape; and

means responsive to the generated positional information for detecting whether the target position has been reached;

wherein said controller is responsive to said playback apparatus being in a search mode for applying the read command to said actuator so as to bring said playback head into contact with the magnetic tape a plurality of times at time intervals determined in accordance with the difference between the position of said playback head indicated by the generated positional information and the target position.

5,471,353

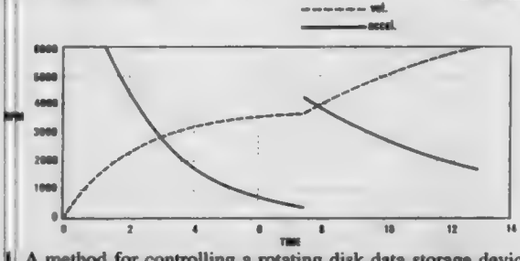
DISK DRIVE EMPLOYING MULTI-MODE SPINDLE DRIVE SYSTEM

Rafi Codilian, San Dimas, and Donald Stupeck, Laguna Hills, both of Calif., assignors to Western Digital (Sea), Pte., Ltd., Singapore, Singapore

Filed Dec. 18, 1992, Ser. No. 992,743

Int. Cl.[6] G11B *19/28*

U.S. Cl. 360—73.03 **2 Claims**



1. A method for controlling a rotating disk data storage device, used with a host computer, said data storage device including one or more rotatable data storage disks each having a plurality of concentric data tracks on one or more disk surfaces thereof; a spindle for rotatably supporting said data storage disks; a spindle motor for rotationally driving said spindle, said spindle motor having three or more motor windings; an actuator for supporting one or more read/write transducer heads adjacent to said one or more disk surfaces in an air bearing manner; and spindle motor driver and control circuitry for driving said spindle motor so as to rotate said one or more rotatable data storage disks at a desired rotational velocity: said method for controlling said rotating disk data storage device, comprising the steps of:

starting said rotational driving of said spindle motor using a tripolar driving mode, and accelerating in said tripolar driving mode;

switching said rotational driving of said spindle motor to a second driving mode during said acceleration before said acceleration drops significantly below a minimum desired acceleration, said second driving mode allowing a higher rotational velocity of said one or more rotatable storage disks than said tripolar driving mode;

stopping said rotational driving of said spindle motor accordance with a command from said host computer or a predetermined time after said data has been transferred between said host interface/disk controller circuitry and said one or more disk surfaces; and

repeating skid starting and switching steps in response to a new host computer data request;

wherein said tripolar driving mode can accelerate said one or more rotatable storage disks up to a first rotational velocity, and said step of switching said rotational driving of said spindle motor from said tripolar driving mode to said second driving mode comprises switching said driving mode at a rotational velocity of less than eighty-five percent of said first rotational velocity for a fixed nominal supply voltage; and

wherein said step of switching driving modes comprises monitoring spindle motor acceleration during said tripolar driving mode and switching when said acceleration drops below a predetermined value.

5,471,354

SERVO HEAD WITH CLOSE SERVO TRANSDUCER PLACEMENT FOR IMPROVED PASSIVE NOISE CANCELLATION

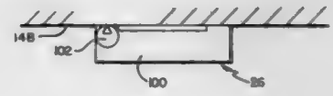
John Bortins, Bloomington; Frank Stageberg, Edina; Lance E. Stover, Chaska, and Gerald L. Weispfenning, St. Paul, all of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

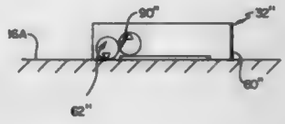
Continuation of Ser. No. 935,056, Aug. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 573,878, Aug. 27, 1990, Pat. No. 5,210,669. This application May 25, 1994, Ser. No. 248,756

The portion of the term of this patent subsequent to May 11, 2010, has been disclaimed.

Int. Cl.[6] G11B *5/17*

U.S. Cl. 360—77.05 **22 Claims**





1. A data storage system, comprising:

a spindle;

a first magnetic disk mounted on the spindle for storing information;

a second magnetic disk mounted on the spindle for storing information;

a first head, positioned between the first and second magnetic disks and adjacent the first magnetic disk, the first head including a first slider and a first transducer mounted on the first slider for writing information to the first magnetic disk; and

a second head, positioned between the first and second magnetic disks and adjacent the second magnetic disk, for producing an output signal as a function of the information stored on the second magnetic disk, the second head including a second slider, a second transducer mounted on the second slider for reading the information stored on the second magnetic disk, and a third transducer mounted on the second slider non-coaxial with the second transducer, wherein the third transducer is so disposed and arranged with respect to the second transducer as to be positioned immediately adjacent to the second transducer so that the second and third transducers are connected to produce the output signal so noise signals induced in the second transducer by operation of the first

transducer tend to be canceled by noise signals induced in the third transducer by operation of the first transducer, the immediately adjacent position of the third transducer relative to the second transducer being limited such that the second and third transducers are not in physical contact.

5,471,355

MAGNETIC HEAD AND A DIGITAL RECORDING MAGNETIC HEAD

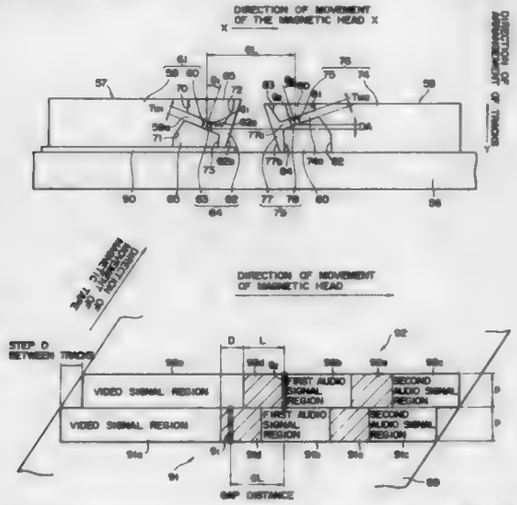
Seiichi Ogata, Miyagi; Moriyuki Kawaguchi, Tokyo; Keiji Kanota, Kanagawa; Yukio Kubota, Kanagawa; Heikichi Sato, Miyagi, and Iwao Abe, Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 852,729, Mar. 17, 1992, abandoned. This application Mar. 22, 1994, Ser. No. 216,599

Claims priority, application Japan, Mar. 29, 1991, 3-091543; Apr. 4, 1991, 3-097885; Nov. 11, 1991, 3-322580

Int. Cl.[6] G11B *5/02;5/027;5/127*

U.S. Cl. 360—84 **20 Claims**



1. In a digital video tape recorder that records video and audio signals on a magnetic tape by means of a magnetic head that moves relative to said tape in a scanning direction to form successive slant tracks thereon while the tape is advanced so that adjacent tracks are displaced with respect to each other in said scanning direction by a step distance and are displaced with respect to each other in a transverse direction perpendicular to the scanning direction by a pitch distance, each track having a video signal region and an audio signal region which define therebetween an interblock gap, and said video signal region of each track is disposed in a leading position with respect to said audio signal region of said track; said magnetic head comprising:

a head base; and

a pair of magnetic head chips disposed respectively at different azimuth angles on the head base and each having a respective magnetic gap;

said pair of magnetic head chips being displaced with respect to each other in said transverse direction by a distance that is substantially equal to said pitch distance, and the respective magnetic gaps being displaced with respect to each other in said scanning direction by a distance that is less than the sum of the length of said interblock gap and said step distance; and

a leading one of said pair of magnetic head chips commencing scanning said audio signal region of a first track scanned by said leading one at a time that is after a time at which the other one of said pair of magnetic head chips has completed scanning of the video signal region of a second track that is adjacent to said first track, said first and second tracks being scanned substantially simultaneously by said pair of magnetic head chips.

5,471,356

AUTO-EJECT DEVICE FOR DISC PLAYERS HAVING COMPACT TWIN CAM MOTOR UNIT

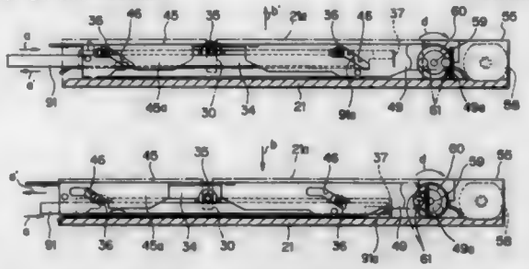
Kiyoaki Tsuji, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 21, 1994, Ser. No. 263,197

Claims priority, application Japan, Jun. 25, 1993, 5-177555

Int. Cl.[6] G11B *17/04;5/016;33/02*

U.S. Cl. 360—99.03 **5 Claims**



1. A disc driving apparatus for driving a disc recording medium accommodated in a disc cassette comprising:

a chassis having a disc table for rotating said disc recording medium;

a cassette holder for holding said disc cassette and operative to move in a first direction which is vertical with respect to said disc table;

a slide plate slidably connected to said cassette holder and having a link portion;

a box-like motor assembly unit which can be detachably fastened as an individual unit to said chassis without interference with said slide plate, said motor assembly unit comprising:

a motor, said motor having an output shaft which is normal to said first direction;

a cam shaft, said cam shaft being parallel with said output shaft;

a reduction gear operatively interconnecting said output shaft and said cam shaft to establish a drive connection therebetween;

a first cam member connected to a first end of said cam shaft and operative to rotate in accordance with a rotation of said output cam shaft and said cam gear output shaft of said motor said first cam member having a connecting portion which engages said link portion to provide an operative connection with said slide plate and so that said slide plate is moved with respect to said chassis, said output cam member being rotatable about an axis which is parallel to said output shaft of said motor;

switch means;

a second cam which is connected to a second end of said cam shaft, said second cam being operatively connected with said switch means to cause said switch means to selectively switch between an OFF position and an ON position; and

eject means, responsive to said switch means, for ejecting said disc cassette on the basis of the movement of said slide means.

5,471,357

MAGNETIC DISK DRIVE DEVICE HAVING A LIQUID INSULATING MATERIAL PROVIDED IN DIFFERENT THICKNESSES ON AN IRON CORE

Yutaka Ishizuka, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Feb. 23, 1994, Ser. No. 200,511

Claims priority, application Japan, Feb. 23, 1993, 5-12009 U

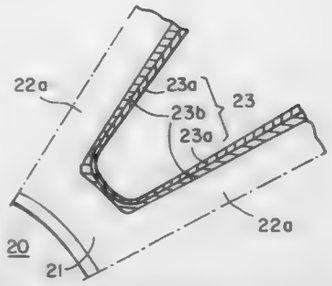
Int. Cl.[6] G11B *17/02*

U.S. Cl. 360—99.08 **7 Claims**

1. A magnetic disk drive device comprising:

a rotatably supported hub for setting a magnetic disc adapted for rotation thereon;

a drive magnet secured to said hub;



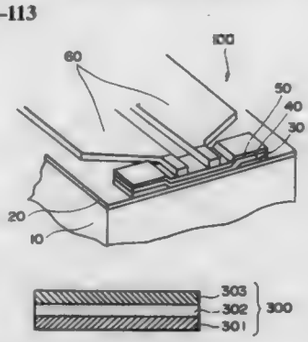
an iron core disposed in opposition to said drive magnet, said iron core having a plurality of salient poles radially protruding from an outer circumferential portion of said iron core, a surface of said iron core being coated with a film made of liquid insulating material, a thickness of said insulating film on the proximal portion of each said salient pole being thinner than that of the insulating film on the distal portion of said salient pole.

5,471,358

THIN FILM MAGNETORESISTIVE HEAD WHICH INCLUDES A DOMAIN SUPPRESSING LAYER AND METHOD FOR MANUFACTURING THE SAME

Shigeru Tadokoro, Hitachi; Shinji Narishige, Mito; Hiroaki Koyanagi, Hiratsuka, and Tetsuo Kobayashi, Kanagawa, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 16, 1992, Ser. No. 851,927
Claims priority, application Japan, Mar. 14, 1991, 3-049811
Int. Cl.[6] G11B *5/39;5/147*
U.S. Cl. 360—113 **19 Claims**



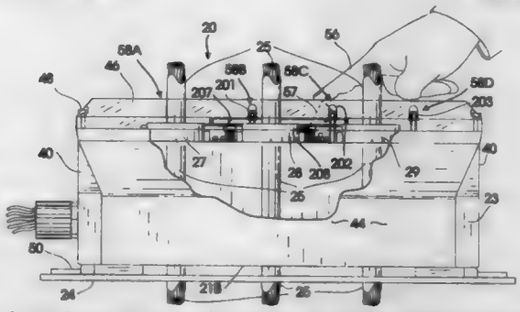
1. A magnetoresistive head comprising:
(a) a substrate;
(b) electrodes;
(c) a magnetoresistive film; and
(d) a domain suppressing layer disposed only at each of opposite end portions of said magnetoresistive film for making said magnetoresistive film a single domain, wherein said domain suppressing layer is a three-layer film including a first layer comprised of one of a first layer ferromagnetic film and a nonmagnetic crystalline film, a second layer comprised of an antiferromagnetic film and a third layer comprised of a third layer ferromagnetic film which are laminated over one another in this order, said third layer ferromagnetic film being in contact with said magnetoresistive film.

5,471,359

POLYPHASE CURRENT MONITOR AND CONTROL SYSTEM

Elmer J. Simpson, Port Saint Lucie, Fla., and Sergio Picado, London, Ark., assignors to Impco Inc., Fort Sumner, N.M.

Filed Feb. 25, 1993, Ser. No. 22,306
Int. Cl.[6] H02H *3/093*
U.S. Cl. 361—93 **20 Claims**



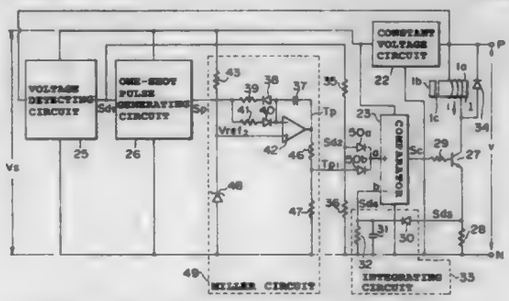
1. An electronic system for monitoring and controlling current in an electrical load, said system comprising:
means for sensing electrical current in said load, said current sensing means comprising toroidal coil means circumscribing a conductor to be monitored for sensing conductor current therein;
subcircuit means for generating a first analog signal corresponding to said conductor current from said sensing means, and a second analog signal that is proportionally larger that said first analog signal;
CPU means for selecting either said first or second analog signal from said subcircuit means and digitally evaluating current phases and amplitudes, said CPU operable to process digitized information derived from said first or second analog signals to determine the existence of emergency conditions;
logic lines outputted from said CPU;
relay means responsive to said logic lines for interrupting power in a conductor sensed by said system;
alarm means responsive to said logic lines for providing a warning when a preselected condition occurs;
display means for visually displaying digital data and menus in response to said CPU;
touch responsive data input means interconnected with said logic lines for programming said system; and,
computer program means for instructing said CPU means.

5,471,360

DC ELECTROMAGNET APPARATUS

Minoru Ishikawa, and Kimitada Ishikawa, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 14, 1993, Ser. No. 166,031
Claims priority, application Japan, Dec. 15, 1992, 4-333340
Int. Cl.[6] H01H *47/02*
U.S. Cl. 361—154 **5 Claims**



1. A DC electromagnet apparatus comprising:
a power source for generating a power supply voltage;
a stator core on which an operation coil is wound;
a movable core facing the stator core via a gap;

a switching device connected in series with the operation coil;

a detecting resistor, connected in series with the operation coil and the switching device, for detecting a coil current flowing through the operation coil;

a voltage detecting circuit for detecting said power supply voltage, and generating a detection signal when the power supply voltage exceeds a predetermined reference voltage;

a one-shot pulse generating circuit for generating a one-shot pulse whose pulse width corresponds to a duration of a making coil current flowing through the operation coil;

a Miller circuit receiving the one-shot pulse outputted from the one-shot pulse generating circuit, and producing a trapezoidal pulse having a predetermined rising rate, a predetermined peak value, and a pulse width substantially equal to that of the one-shot pulse;

a voltage divider dividing the detection signal outputted from the voltage detecting circuit at a predetermined ratio;

an integrator integrating a voltage across the detecting resistor for detecting the coil current flowing through the operation coil; and

a comparator having a first input terminal supplied with the higher of the output of the voltage divider and the peak value of the trapezoidal pulse outputted from the Miller circuit, and whose second input terminal is supplied with the output of the integrator, the comparator supplying an ON control signal to a control terminal of the switching device when the voltage applied to the first input terminal is higher than that applied to the second input terminal.

5,471,361

VEHICLE WHEEL SENSORS, AND METHOD OF CONVERTING A SINE WAVE SIGNAL IN A COUNTING OR MEASURING DEVICE

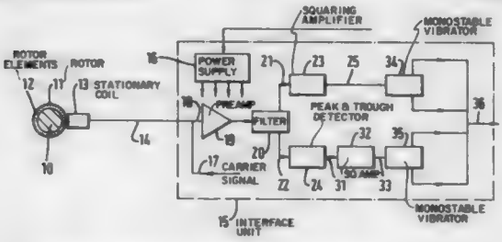
Frederick M. J. Wootton, Ventnor, England, assignor to Westland Aerospace Limited, United Kingdom

Filed Jul. 20, 1992, Ser. No. 915,542

Claims priority, application United Kingdom, Jul. 20, 1991, 9115709

Int. Cl.[6] H01H *47/00*

U.S. Cl. 361—236 **3 Claims**



1. A vehicle wheel speed sensor comprising:

a rotor connected to said vehicle wheel for rotation therewith having a series of circumferentially spaced rotor elements;

a sensing means mounted adjacent to said rotor on a relatively non-rotatable support for producing a substantially sine wave signal when influenced by said rotor elements;

a squaring amplifier for converting said sine wave signal into a square wave signal, the edges of the square wave signal corresponding to the zero cross-over points of said sine wave signal;

a peak and trough detection means for detecting the peaks and troughs of said sine wave signal; and

a pulse generating means for generating pulses at said edges of said square wave signal and said peaks and troughs of said sine wave signal.

5,471,362

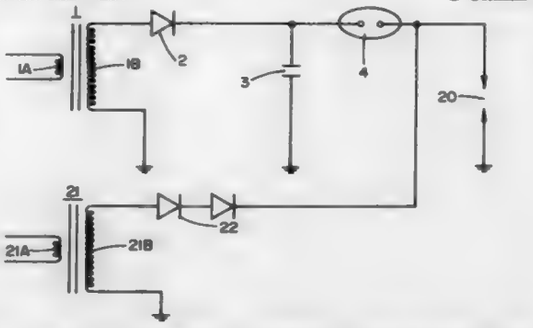
CORONA ARC CIRCUIT

Thomas L. Gowan, South Jamesport, N.Y., assignor to Frederick Cowan & Company, Inc., Riverhead, N.Y.

Filed Feb. 26, 1993, Ser. No. 23,371

Int. Cl.[6] F23Q *5/00*

U.S. Cl. 361—257 **2 Claims**



2. A corona arc circuit for providing the ground path for the discharge side of a spark gap controlled discharge circuit, said corona arc circuit comprising:

a first transformer having a primary winding and a secondary winding having a first end and a second end, said second end being connected to ground potential, providing a determined voltage at said first end;

a second transformer having a primary winding and a secondary winding having a first end and a second end, said second end being connected to ground potential, said secondary winding providing a voltage substantially twice said determined voltage;

a capacitor having two electrodes, one of said electrodes being electrically connected to ground;

a diode rectifier electrically connected between the first end of said secondary winding of said first transformer and the other electrode of said capacitor;

a spark gap having a first side connected to said diode rectifier and the other electrode of the capacitor and a second side;

a spark plug having two electrodes, one of said electrodes being electrically connected with the second side of said spark gap and the other of said electrodes being connected to ground; and

high voltage diode means electrically connected between the first end of said secondary winding of said second transformer and a point between said second side of said spark gap and said one of said electrodes of said spark plug whereby the secondary winding of said transformer produces DC current by way of a spark between the two electrodes of said spark plug whereby the current path of the spark plug side of the spark gap is reduced to substantially ground potential to insure that the discharge of said capacitor is delayed until the breakdown voltage of the spark gap is reached and that this spark concurrently directs the discharge of the capacitor along its current path through said spark gap to ground after the breakdown of the spark gap.

5,471,363

FERROELECTRIC CAPACITIVE ELEMENT

Takashi Mihara, Iruma, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan, and Symetrix Corporation, Colorado Springs, Colo.

Filed Sep. 19, 1994, Ser. No. 308,647

Claims priority, application Japan, Sep. 22, 1993, 5-235330

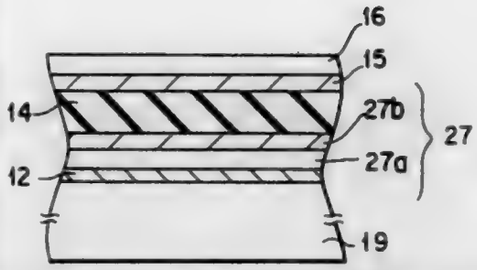
Int. Cl.[6] H01G *4/008*

U.S. Cl. 361—305 **12 Claims**

7. A ferroelectric capacitive element comprising:

a substrate constituted by an insulator;

a first lower electrode formed on said substrate and constituted by precious metal;



a second lower electrode formed on said first lower electrode and constituted by a first conductive oxide film;

a ferroelectric thin film formed on said second lower electrode and constituted by a ferroelectric;

a second conductive oxide film formed on said ferroelectric thin film and having a reduction power which is higher than a reduction power of said ferroelectric thin film; and

an upper electrode formed on said second conductive oxide film and constituted by at least one metallic material other than precious metal.

5,471,364

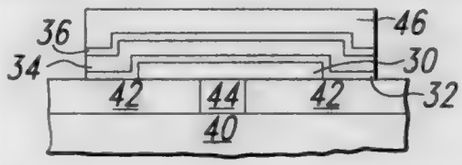
ELECTRODE INTERFACE FOR HIGH-DIELECTRIC-CONSTANT MATERIALS

Scott R. Summerfelt, Dallas, and Howard R. Berutan, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 31, 1993, Ser. No. 41,025

Int. Cl.[6] H01G *4/10;1/01*

U.S. Cl. 361—321.4 **18 Claims**



1. A method of forming a microelectronic structure, said method comprising:

(a) forming a first thin dielectric buffer layer of a first leakage-current-density material with a first dielectric-constant;

(b) forming a high-dielectric-constant layer of a second leakage-current-density material on said first thin dielectric buffer layer; and

(c) forming a second thin dielectric buffer layer of a third leakage-current-density material with a second dielectric-constant on said high-dielectric-constant layer, wherein said first and third leakage-current-density materials have substantially lower leakage-current-densities than said second leakage-current-density material, wherein said first and second thin dielectric buffer layers are selected from the group consisting of: perovskites, ferroelectrics, high-dielectric-constant oxides, acceptor doped perovskites, acceptor doped ferroelectrics, acceptor doped high-dielectric-constant oxides, donor doped perovskites, donor doped ferroelectrics, donor doped high-dielectric-constant oxides, and combinations thereof, and whereby said first and second thin dielectric buffer layers substantially limit the leakage-current-density of the structure, with only modest degradation of the dielectric constant of the structure.

5,471,365

SOLID ELECTROLYTIC CAPACITOR AND ITS MANUFACTURING METHOD

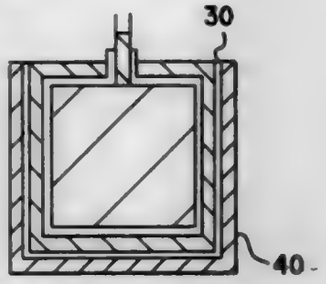
Shinji Nakamura, and Choujirou Kuriyama, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 940,277, Sep. 3, 1992. This application Jun. 22, 1994, Ser. No. 264,193

Claims priority, application Japan, Sep. 5, 1991, 3-254596; Mar. 18, 1992, 4-062067

Int. Cl.[6] H01G *9/00*

U.S. Cl. 361—523 **7 Claims**



1. A solid electrolytic capacitor comprising:

a sintered body made of a valve metal and having a terminal wire;

a dielectric film formed on a periphery of the sintered body;

a metallic oxide layer provided on the dielectric film; and

a conductive polymer layer provided on the metallic oxide layer, wherein said conductive polymer layer covers an entire periphery of the sintered body to a unction with the terminal wire.

5,471,366

MULTI-CHIP MODULE HAVING AN IMPROVED HEAT DISSIPATION EFFICIENCY

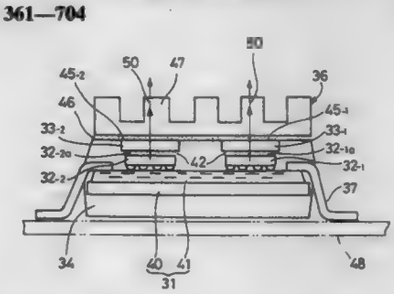
Takashi Ozawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 28, 1994, Ser. No. 281,672

Claims priority, application Japan, Aug. 19, 1993, 5-205444

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—704 **5 Claims**



1. A multi-chip module comprising:

a substrate having upper and lower major surfaces;

an interconnection pattern provided on said upper major surface of said substrate;

a plurality of semiconductor chips provided commonly upon said upper major surface of said substrate in electrical connection with said interconnection pattern;

a plurality of thermally conductive blocks each provided on corresponding one of said plurality of semiconductor chips in an intimate contact therewith;

a resin package body that encapsulates therein said plurality of semiconductor chips and said plurality of thermally conductive blocks together with said substrate;

said plurality of thermally conductive blocks having respective upper major surfaces at a level such that said upper major

surfaces of said thermally conductive blocks form a substantially flush, planar surface with an upper major surface of said resin package body, said upper major surfaces of said thermally conductive blocks being thereby exposed at said upper major surface of said resin package body;

a plurality of leads projecting from said resin package body, each of said plurality of leads being connected electrically to said interconnection pattern on said substrate; and

a heat sink mounted upon said upper major surface of said resin package body such that said heat sink establishes an intimate contact with respective upper major surfaces of said thermally conducting blocks.

5,471,367

COMPOSITE STRUCTURE FOR HEAT TRANSFER AND RADIATION

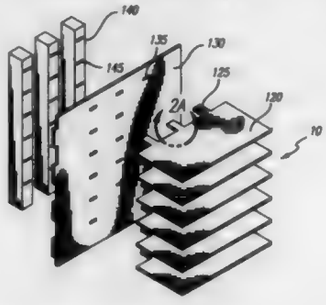
Gary C. Krumweide; Duane E. Krumweide, both of Escondido, and Randy Clark, San Diego, all of Calif., assignors to Composite Optics, Inc., San Diego, Calif.

Filed Mar. 15, 1994, Ser. No. 212,948

Int. Cl.[6] H05K *7/20*

U.S. Cl. 361—719 **24 Claims**

1. A guide rail assembly for mounting to an electronic module



panel, the guide rail assembly comprising:

a heat dissipating fin having a first edge having at least one tenon on said first edge; and

a guide rail for holding an electronic circuit board, the guide rail having a first channel along a first longitudinal side for receiving said tenon of said fin, and a second longitudinal side for receiving the edge of an electronic circuit board,

wherein said guide rail and said fin when attached have a space between them that slidably fits within a slot in said electronic module panel.

5,471,368

MODULE HAVING VERTICAL PERIPHERAL EDGE CONNECTION

Alan P. Downie; Peter Gallagher, both of Greenock; John J. Garrity, and Brian L. Robertson, both of Gourock, all of, United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1994, Ser. No. 254,342

Claims priority, application United Kingdom, Nov. 16, 1993, 9323646

Int. Cl.[6] H05K *7/02*

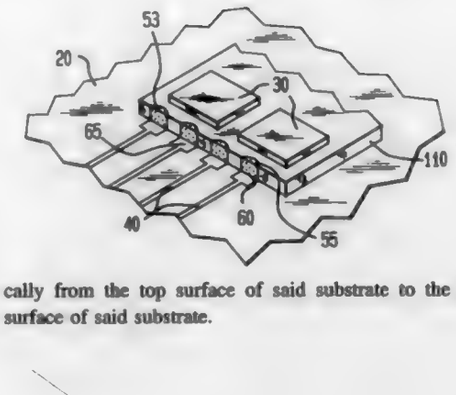
U.S. Cl. 361—760 **13 Claims**

1. An electronic circuit module comprising:

a substrate carrying at least one printed circuit line,

at least one electronic component secured to said substrate so as to be in electrical contact with said at least one printed circuit line, and

wherein said substrate has at least one electrically conductive connection pad formed along at least one edge such that said at least one electrically conductive connection pad runs vertically from the top surface of said substrate to the bottom surface of said substrate.



5,471,369

SEMICONDUCTOR DEVICE HAVING A PLURALITY OF SEMICONDUCTOR CHIPS

Toshiyuki Honda, Kawasaki, and Takao Haranoono, Satsuma, both of, Japan, assignors to Fujitsu Limited, Kawasaki, and Kyushu Fujitsu Electronics Limited, Satsuma, both of, Japan

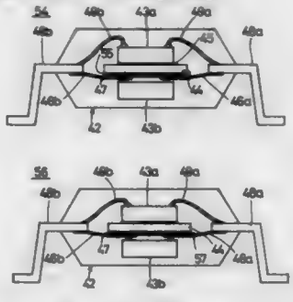
Filed Mar. 17, 1994, Ser. No. 214,318

Claims priority, application Japan, Jul. 9, 1993, 5-170540

Int. Cl.[6] H05K *5/02;* **H01L** *23/28*

U.S. Cl. 361—813 **8 Claims**

1. A semiconductor device comprising:



a package having at least a first semiconductor chip and a second semiconductor chip, said first semiconductor chip being positioned above said second semiconductor chip, a surface of said first semiconductor chip on which circuitry is provided facing upwardly and a surface of said second semiconductor chip on which circuitry is provided facing upwardly;

at least two lead frames disposed in and extending from said package to provide electrical connection of said first semiconductor chip and said second semiconductor chip to external devices;

a die stage positioned between said first semiconductor chip and said second semiconductor chip;

wiring extending between said first semiconductor chip and said lead frames;

TAB leads connecting said second semiconductor chip to said lead frames; and

an insulating member disposed between said die stage and said TAB leads and attached to said die stage with an adhesive therebetween.

5,471,370

STROBE CONTROL APPARATUS OF CAMERA

Satoshi Takami, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

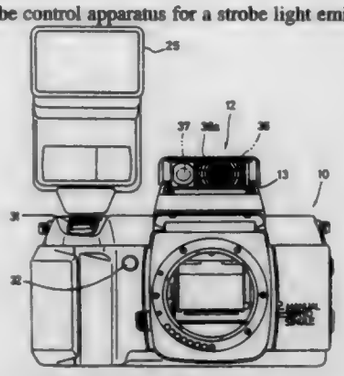
Division of Ser. No. 982,009, Nov. 24, 1992, which is a continuation of Ser. No. 593,970, Oct. 9, 1990, abandoned. This application Jul. 12, 1994, Ser. No. 273,924

Claims priority, application Japan, Jan. 6, 1989, 1-261809; Jan. 11, 1989, 1-264534; Jan. 16, 1989, 1-268671; Jan. 16, 1989, 1-268672

Int. Cl.[6] G03B *15/03*

U.S. Cl. 362—4 15 Claims

15. A strobe control apparatus for a strobe light emitter incorporated into a camera body comprising:



auxiliary light emitting means for projecting a light pattern onto an object to be photographed for automatic distance measurement;

said auxiliary light emitting means further comprising means for providing an optical indication of the camera being set in said self-timer mode.

5,471,371

HIGH EFFICIENCY ILLUMINATOR

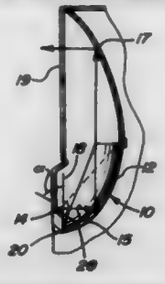
Prasad M. Koppolu, Troy; Amir Fallahi, Holly, and Jeyachandrabose Chinniah, Troy, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 8, 1993, Ser. No. 2,006

Int. Cl.[6] F21V *7/04*

U.S. Cl. 362—32 17 Claims

1. An illuminator for use with a vehicle comprising:



a light source, said light source having a distribution pattern within a solid angle of 2π steradians; and

a reflective surface for collecting and distributing substantially all of the light emitted from said light source, said reflective surface having a focal point and a focal axis wherein said light source is positioned near the focal point and inclined with respect to said focal axis such that the light collected and distributed by said reflective surface does not strike said light source.

5,471,372

LIGHTING SYSTEM FOR COMMERCIAL REFRIGERATOR DOORS

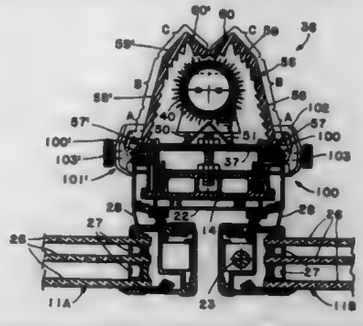
Richard A. Mamelson, Crown Point, Ind.; Richard C. Kim, Ann Arbor, and Damon F. Kvamme, Plymouth, both of Mich., assignors to Ardco, Inc., Chicago, Ill.

Filed Dec. 6, 1993, Ser. No. 163,741

Int. Cl.[6] F21V *5/02*; F25D *27/00*

U.S. Cl. 362—92 29 Claims

1. A refrigerator cabinet light fixture assembly comprising an elongated base for mounting within the refrigerator cabinet, an elongated fluorescent lamp bulb spaced from said base and having an axis extending substantially parallel to said base, a reflector located between said base and said bulb, a lens extending from said base and at least partially enclosing said bulb and said reflector in spaced relation with said bulb, said lens having a one-piece plastic construction and including a first portion connected to said base adjacent one side of said bulb and inclined at an acute included angle relative to said base so as to converge toward said bulb upon progressing away from said base, said first portion extending away from said base to a location beyond the axis of said bulb, said lens including a second portion inclined at an obtuse included angle relative to said first portion and extending away from said location and toward a second plane containing said axis and disposed perpendicular to a predetermined target plane parallel to said base, said second portion extending beyond said bulb, and said first and second portions having inner sides with multiple facets which coact with said reflector to redistribute light energy radiating from said bulb substantially uniformly across said target plane.



5,471,373

ENTERTAINMENT APPARATUS FOR USE WITH A SUCKER TYPE POP

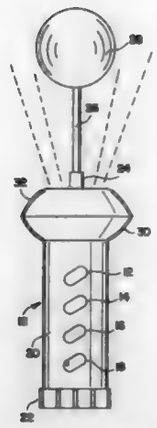
Thomas J. Coleman, 89 Winding Way Rd., Bristol, Va. 24201; William K. Schlotter, IV, 175 Toluca Rd., Stafford, Va. 22554; Princess A. Coleman, 89 Winding Way Rd., Bristol, Va. 24201, and Ann M. Schlotter, 175 Toluca Rd., Stafford, Va. 22554

Filed Jan. 25, 1995, Ser. No. 377,709

Int. Cl.[6] F21V *33/00*

U.S. Cl. 362—109 3 Claims

1. A holder for a candy sucker in which the holder includes a sound producing integrated circuit synthesizer, an electrical source, an electrical circuit, a speaker, a light producing means, and control mean for operating the electrical circuit interconnecting said circuit synthesizer, said electrical source, said speaker and said light producing means the holder includes a lower end to which an enclosure is to be attached and an upper end having an end cap to which the candy sucker is to be attached, said end cap is juxtaposed said speaker and light producing means, said end cap includes apertures therein through which flashes of light and sound pass whereby light flashes will be flashing upon a persons face as the candy sucker is consumed and the sound will pass through the apertures.

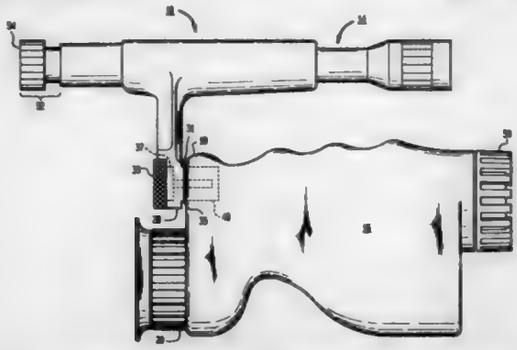


5,471,374

ILLUMINATOR BRACKET FOR A NIGHT VISION DEVICE

Gary L. Palmer, Vinton, Va., assignor to ITT Corporation, New York, N.Y.

Filed Mar. 22, 1994, Ser. No. 215,512
Int. Cl.[6] F21L 15/04
U.S. Cl. 362—191 21 Claims



1. An apparatus for coupling an illuminating device having an independent power supply to a night vision device having a separate independent power supply and contained within a housing, said apparatus comprising:

support means for supporting and holding said illuminating device, said support means including a cylindrical member for receiving said illuminating device and a stem protruding from one end of said cylindrical member, said stem having a reinforcing rib member that projects from a surface of said stem to increase the stability thereof and mounting means thereon for attaching said apparatus to said housing of said night vision device, wherein said illuminating device is activatable to illuminate a field of view substantially in front of said night vision device, said illuminating device requiring no additional power consumption from said power supply of said night vision device.

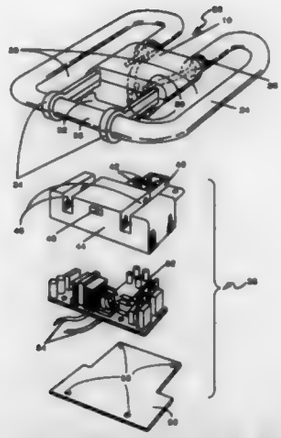
5,471,375

FLUORESCENT LIGHT BALLAST LAMP MOUNTING SOCKET CONSTRUCTION

Kenneth Lau, 4327 Point Reyes Ct., Carlsbad, Calif. 92008

Continuation-in-part of Ser. No. 832,988, Feb. 10, 1992. This application Jan. 31, 1994, Ser. No. 188,807
Int. Cl.[6] F21S 5/00; F21V 29/00
U.S. Cl. 363—260 14 Claims

1. For a fluorescent lamp having a fluorescent discharge tube substantially defining a planar space and delineating a substantially open area lying within said planar space, and having a lamp



support housing into which the ends of said discharge tube enter and are fixedly mounted, one end of said discharge tube having an exhaust tube extending therefrom inside said lamp support housing, said housing also defining a mechanical and electrical coupling, a space-saving ballast-housing base assembly comprising:

(a) a socket for engaging said coupling and electrically coupling with same;

(b) a ballast housing housing a ballast electrically connected to said socket and lying adjacent to said socket in relation thereto such that when said lamp is mounted in said socket, said ballast housing lies substantially entirely within said substantially open area within said planar space,

whereby said ballast is substantially confined to within said planar space defined by said lamp, and is separate from the lamp support housing to avoid the heating of the ballast by the exhaust tube;

(c) said discharge tube ends being inserted and fixed into one side of said lamp support housing and said ballast housing being disposed on a side of said lamp support housing opposite said one side to isolate said ballast from the heat of said ends of said discharge tube;

(d) said discharge tube of said fluorescent lamp extending from said one side of said lamp support housing and looping around same in spaced relation thereto to define a generally straight central segment spaced on the opposite side of said lamp support housing from said tube ends;

(e) said fluorescent lamp having a pair of tube support arms extending from said lamp support housing to said central segment and supportively engaging same; and,

(f) said ballast housing defining two spaced slots to receive said arms such that said ballast housing nestles around said arms in said planar space.

5,471,376

LOW-LOSS ACTIVE VOLTAGE-CLAMP CIRCUIT FOR SINGLE-ENDED FORWARD PWM CONVERTER

Fu-Sheng Tsai, Northboro, and William W. Ng, Leominster, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 5, 1993, Ser. No. 27,217
Int. Cl.[6] H02M 3/335
U.S. Cl. 363—20 17 Claims

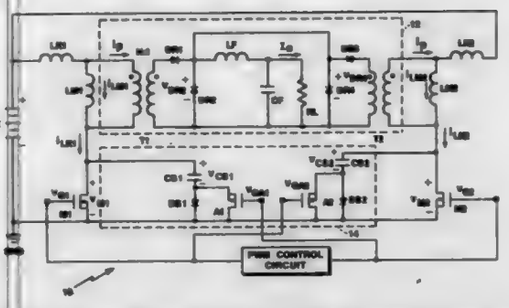
1. A forward converter circuit comprising:

a transformer having a primary side and a secondary side;

rectifier means coupled to the secondary side of said transformer, for rectifying an induced secondary signal and generating a rectified signal;

filter means coupled to said rectifying means, for filtering said rectified signal to remove signal frequencies causing undesired amplitude variation of said rectified signal;

main current switch means, connected in series with the primary side of said transformer for switching main current on and off in response to a main switch gating control signal; and



active voltage clamp means for clamping voltage across said main current switch means to a predetermined peak value in response to an auxiliary switch gating control signal.

5,471,377

PROCESS FOR CONTROLLING A POWER SUPPLY WHICH SUPPLIES POWER TO AN ELECTROSTATIC FILTER IN WHICH SECONDARY CIRCUIT STATES ARE DETERMINED BASED ON MEASURED PRIMARY CIRCUIT VALUES AND IN WHICH SHORT CIRCUITS ARE DETECTED

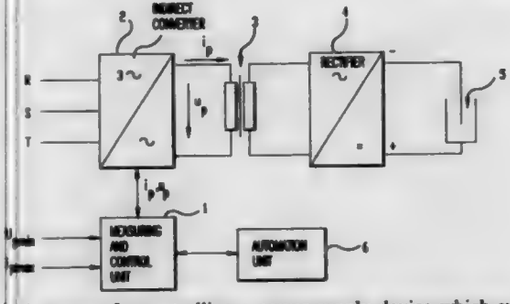
Gerhard Dönig, Erlangen; Roland Hümpfner, Herzogenaurach; Norbert Grass, Feucht; Hans-Joachim Knaak, Erlangen; Franz Neulinger, Erzhausen, and Helmut Schummer, Heusenstamm, all of, Germany, assignors to Siemans Aktiengesellschaft, München, Germany

Filed Dec. 4, 1992, Ser. No. 930,696

Claims priority, application Germany, Apr. 4, 1990, 9000262

Int. Cl.[6] H02M *3/335*

U.S. Cl. 363—21 **19 Claims**



1. A process for controlling a power supply device which supplies power to an electrostatic filter, said power supply device comprising,

an indirect converter, equipped with a measuring and control unit, and

a high voltage transformer, comprising the steps of:

a) measuring primary-circuit values, including a primary voltage and a primary current, at the primary side of the transformer with said measuring and control unit;

b) automatically determining secondary-circuit values based on the measured primary-circuit values;

c) detecting a filter short circuit when a measured primary voltage of the high-voltage transformer drops below a specified minimum value and does not rise above said specified minimum value during a specified delay period and a filter current is greater than a specified maximum current;

d) blocking a current supply to an intermediate circuit of the indirect converter for a predeterminable time delay when said filter short circuit is detected;

e) incrementing and storing a count of said filter short circuit when said filter short circuit is detected; and

f) disconnecting said indirect converter from the filter when the count of stored filter short circuits exceeds a limit within a predeterminable time span to de-ionize the filter when a sustained short circuit is present.

5,471,378

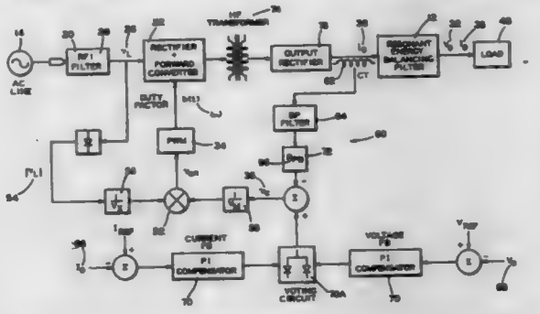
AC TO DC CONVERTER SYSTEM WITH RIPPLE FEEDBACK CIRCUIT

Roger J. King, Holland, Ohio, assignor to The University of Toledo, Toledo, Ohio

Continuation-in-part of Ser. No. 902,939, Jun. 23, 1992, Pat. No. 5,237,492. This application Aug. 13, 1993, Ser. No. 106,813

Int. Cl.[6] H02M *1/12*

U.S. Cl. 363—46 **18 Claims**



1. An AC to DC converter system for supplying DC electrical power to a load, comprising:

a) input means for receiving an AC power supply having an AC line frequency;

b) filter means connected to said input means for suppressing the transmission of a switching frequency current to the AC power supply;

c) rectifier means connected to said filter means for converting the AC power supply to a DC power supply for transmittal to a load;

d) filter means connected between said rectifier means and the load for providing the energy storage required for unity power factor operation;

e) control means connected to said rectifier means for controlling the DC power supply transmitted to the load; and

f) nonlinear ripple feedback means connected to said control means for sensing a current ripple in the DC power supply and providing a feedback signal to said control means, whereby a sinusoidal AC line current is maintained.

5,471,379

Patent Not Issued For This Number

5,471,380

PROGRAMMABLE CONTROLLER AND METHODS OF SETTING AND DISPLAYING ITS INTERNAL INFORMATION

Shinzi Itami, and Takeshi Ando, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Mitsubishi Electric Engineering Co., Ltd., both of Tokyo, Japan

Filed Feb. 22, 1994, Ser. No. 200,010

Claims priority, application Japan, Mar. 31, 1993, 5-074196

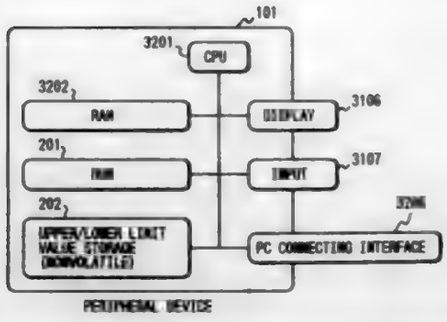
Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—146 **11 Claims**

1. A programmable controller equipped with a programmable controller unit and a peripheral device which store as internal information set values defined as reference values for judging the magnitudes of current values of predetermined information and which operate under the control of a sequence program, said programmable controller comprising:

input means disposed in said peripheral device;

upper/lower limit value storage means disposed in said peripheral device for storing the upper and lower limit values of said set values;



register means disposed in said peripheral device for registering said upper and lower limit values entered from said input means into said upper/lower limit value storage means;

judging means provided in said peripheral device for judging whether or not an input value entered from said input means lies within the range of said upper and lower limit values stored in said upper/lower limit value storage means; and

internal information updating means for replacing said set value with said input value according to the upper/lower limit value range judgment of said judging means.

5,471,381

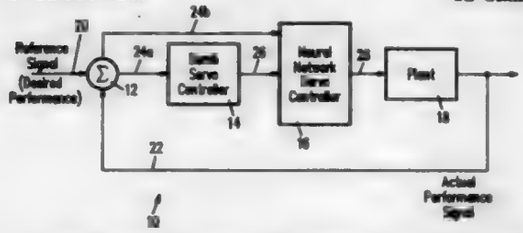
INTELLIGENT SERVOMECHANISM CONTROLLER

Emdadur R. Khan, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 585,494, Sep. 20, 1990, abandoned. This application Oct. 28, 1992, Ser. No. 967,992

Int. Cl.[6] G06F *15/18*; G05B *13/02*

U.S. Cl. 364—148 **52 Claims**



1. A neural network controller for a plant which has a desired plant performance parameter represented by a reference signal and which has an actual plant performance parameter represented by an actual performance signal, said neural network controller comprising:

a first input port for inputting a controller weights adjust signal;

a second input port for inputting a dumb control signal;

neural network means coupled to said first and second input ports for receiving said inputted controller weights adjust signal and dumb control signal, and for processing said inputted dumb control signal in accordance with said inputted controller weights adjust signal to generate a plant control signal;

an output port for outputting said plant control signal; and

input signal combiner means coupled to said first input port for receiving and combining a reference signal and an actual performance signal and for providing in accordance therewith a first performance error signal, wherein said reference signal represents a desired plant performance parameter, said actual performance signal represents an actual plant performance parameter and said first performance error signal represents a first difference between said desired plant performance parameter and said actual plant performance parameter.

5,471,382

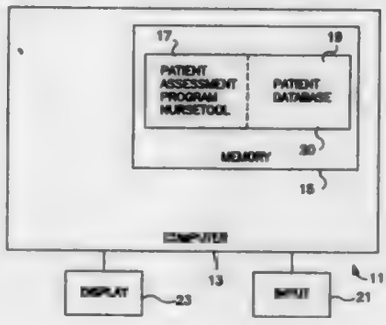
MEDICAL NETWORK MANAGEMENT SYSTEM AND PROCESS

Joseph P. Tallman; Elizabeth M. Snowden, both of Boulder, Colo., and Barry W. Wolcott, Derwood, Md., assignors to Informed Access Systems, Inc., Boulder, Colo.

Filed Jan. 10, 1994, Ser. No. 180,090

Int. Cl.[6] G06F *159/00*

U.S. Cl. 364—406 **57 Claims**



1. A medical network management system for managing access to medical providers which comprises a data processing system including a memory, a display, and input means, said memory containing a patient assessment stored program and a patient database, said patient assessment stored program including means for checking patient eligibility, means for selecting a branched chain logic algorithm for assessing a patient's level of medical risk and determining an appropriate timing, type, and level of medical care, and a plurality of branched chain logic algorithms, each of said branched chain logic algorithms for assessing the patient's level of medical risk and determining an appropriate timing, type, and level of medical care, said data processing system being configured by said patient assessment stored program when executed on said data processing system to present a first series of questions on said display for checking patient eligibility to receive medical care, to receive a first series of answers responsive to the first series of questions from said input means, to supply the first series of answers to said means for checking patient eligibility which accesses said patient database to check patient eligibility to present a second series of questions on said display for selecting one of said plurality of branched chain algorithms, to receive a second series of answers responsive to the second series of questions from said input means, to supply the second series of answers to said means for selecting a branched chain logic algorithm which selects one of said plurality of branched chain logic algorithms, to use the selected branched chain logic algorithm to present questions to the display, receive answers from the input means, present further questions to the display based on the answers, receive further answers from the input means, assess the patient's level of medical risk, and determined an appropriate timing, type and level of medical care and to provide the timing, type, and level of medical care determination on said display each of said plurality of branched chain logic algorithms being configured to present a series of questions answerable with "yes" or "no", answers to said questions being used by said data processing system to categorize the patient either as having a sufficiently low post-test probability of an illness or injury under consideration so as not to justify further medical provider care or as not having a sufficiently low post-test probability of an illness or injury under consideration so as to eliminate possible need for further medical provider care.

5,471,383

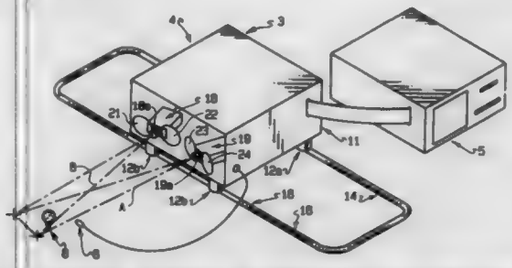
MONITORING SYSTEMS TO MEASURE AND DISPLAY FLIGHT CHARACTERISTICS OF MOVING SPORTS OBJECT

William Gobush, No. Dartmouth; Diane Pelletier, Fairhaven, and Charles Days, So. Dartmouth, all of Mass., assignors to Acushnet Company, Fairhaven, Mass.

Continuation-in-part of Ser. No. 242,590, May 13, 1994, which is a continuation of Ser. No. 63,611, May 18, 1993, abandoned, which is a continuation of Ser. No. 823,732, Jan. 22, 1992, abandoned. This application Sep. 30, 1994, Ser. No. 316,599

Int. Cl.[6] G06F *151/00*

U.S. Cl. 364—410 46 Claims



1. A system for monitoring the initial portion of the flight of an object through a field of view comprising:

(a) a support means for the object;

(b) a portable housing including at least two cameras in fixed relationship in such housing;

(c) a first camera unit in such housing having a light sensitive panel, said first camera unit being focused on the field of view through which the object passes during the initial portion of its flight;

(d) a second camera unit in such housing having a light sensitive panel focused on the field of view;

(e) means for shuttering or gating the camera units at least twice as the object passes through the field of view;

(f) three or more contrasting areas on the object positioned so that light emitting from such areas reaches such light sensitive panels to form light patterns thereon and create an analog image signal when the camera shutters are open; and

(g) computer means in or near such portable housing for receiving and processing such analog signals to determine the path of the object, its speed and spin during such initial portion of flight.

5,471,384

ELECTROMOBILE

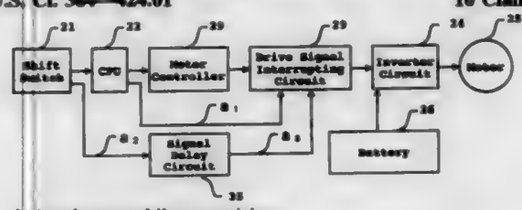
Motohiro Nakashima, Nishio, and Shinichi Otake, Okazaki, both of, Japan, assignors to Aishin AW Co., Ltd., Japan

Filed Sep. 15, 1993, Ser. No. 120,906

Claims priority, application Japan, Sep. 17, 1992, 4-247711

Int. Cl.[6] B60K *1/00*

U.S. Cl. 364—424.01 10 Claims



4. An electromobile comprising:

a power source;

a motor for converting motor current into an output torque for driving the electromobile;

a shift switch for detecting a range selected by a driver and for outputting a torque cutting signal responsive to detection of selection of a predetermined range;

a CPU for calculating an output torque command corresponding to vehicle speed and accelerator opening of the electromobile;

a motor controller for outputting a signal for controlling said motor in response to the output torque command;

an inverter circuit for receiving current from said power source and for converting the received current, in accordance with the signal of said motor controller, into the motor current fed to said motor; and

torque cutting means connected between said shift switch and said inverter circuit for outputting a motor stopping signal directly to said inverter circuit in response to said torque cutting signal from said shift switch.

5,471,385

ROUTELESS GUIDING METHOD FOR MOVING BODY

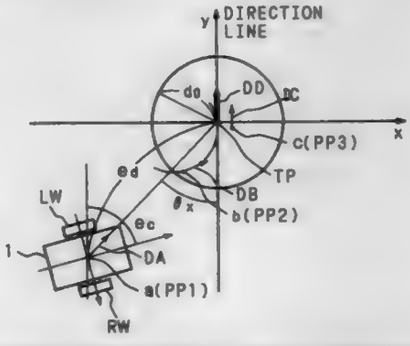
Kenshi Suzuki, Takatsuki; Kazuhiro Shibatani, Izumiotsu, and Hisao Nishii, Osaka, all of, Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Apr. 28, 1993, Ser. No. 55,215

Claims priority, application Japan, May 21, 1992, 4-155800

Int. Cl.[6] G01C *21/10*

U.S. Cl. 364—424.02 4 Claims



1. A routeless guiding method for guiding a moving body having independently controlled right and left wheels comprising the steps of:

independently controlling the driving speeds of said right and left driving wheels to direct movement of the body from a present position of the body to a target position without designating a route according to an operational expression including a parameter based on a positional relation between the body present position and the target position, and making a traveling direction of said moving body coincide with a predetermined direction at said target position,

changing a gain of said parameter of said operational expression responsive to a distance between the present position of said moving body and the said target position.

5,471,386

VEHICLE TRACTION CONTROLLER WITH TORQUE AND SLIP CONTROL

Davorin Hrovat, Dearborn; Jahanbakhsh Asgari, Detroit, and Michael G. Fodor, Taylor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 3, 1994, Ser. No. 316,760

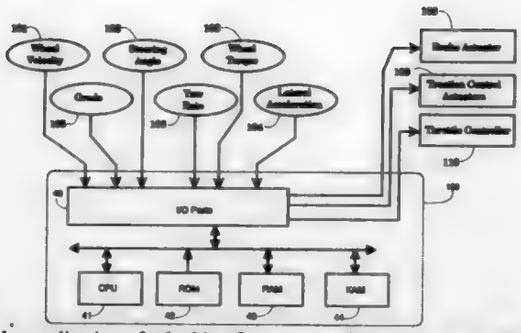
Int. Cl.[6] B60T *8/66*

U.S. Cl. 364—426.02 11 Claims

1. A method of controlling vehicle directional stability and the traction of one or more wheels of said vehicle being driven over a surface, said vehicle having at least a pair of driven wheels, said method comprising in combination, the steps of:

(a) generating a rotational velocity value indicative of the rotational velocity of said vehicle;

(b) selecting, as a function of said rotational velocity value, from the wheels of said vehicle, a first pair of wheels to be controlled



by application of a braking force upon said wheels, said pair of wheels both existing on the same side of said vehicle;

(c) comparing said rotational velocity value to a predefined rotational velocity range indicative of a range of acceptable rotational velocity values;

(d) responding to said rotational velocity value being outside of said rotational velocity range by generating a wheel torque value which is indicative of a braking force to be applied independently of driver initiated braking to one of said first pair of wheels;

(e) determining if either of said driven wheels is spinning and responding to the spinning of either of said driven wheels by generating a wheel torque value indicative of a braking force to be applied to the spinning wheel; and

(f) determining if either of said driven wheels is skidding and responding to the skidding of either of said driven wheels by generating a braking adjustment value indicative of an amount by which a braking force being applied to said skidding wheel is to be modulated to reduce skidding of said wheel.

5,471,387

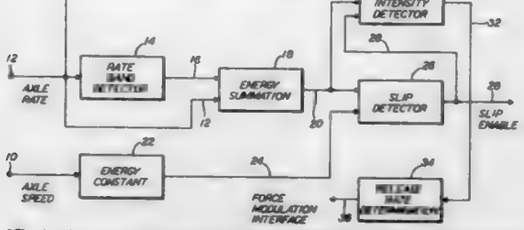
METHOD OF AND APPARATUS FOR THE COMBINED DETECTION OF SPEED VARYING ENERGY LEVEL WHEEL SLIP DETECTION AND DETERMINATION OF WHEEL SLIP INTENSITY OF A RAILWAY VEHICLE BRAKE SYSTEM

James A. Wood, Spartanburg, and David A. Greer, Simpsonville, both of S.C., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Apr. 18, 1994, Ser. No. 228,660

Int. Cl.[6] B60T *8/00*

U.S. Cl. 364—426.03 **20 Claims**



17. A slip control system for a passenger transit type railway vehicle brake system, said slip control system comprising:

(a) a means for monitoring a speed of a wheel/axle set to produce an axle speed signal and an axle rate signal;

(b) a rate band detector responsive to said axle rate signal and a deceleration rate signal, to produce a first logical output signal indicative of whether said axle rate signal is in a slippage range;

(c) an energy summation means responsive to said first logical output logical signal to produce an energy summation signal;

(d) an energy constant means responsive to said axle speed signal to determine an energy loss limit value indicative of a loss of energy due to braking wheel slippage of such wheel/axle set being monitored, and to produce an energy loss limit signal defining an energy loss limit value;

(e) a slip detector, responsive to said energy summation signal to determine whether such wheel/axle set being monitored is in a slip condition that must be corrected, and to produce a second logical signal indicative of whether such correction is needed;

(f) a wheel slip intensity detector responsive to said axle rate signal, said energy summation output signal, and said second logical output signal, to produce a wheel slip intensity signal having a value of "0" if said second logical output signal indicates that no correction is needed, and if said second logical signal indicates that correction is needed, said intensity output signal will have a value equal to said axle rate signal;

(g) a release rate determination means responsive to said intensity output signal to convert said intensity output signal to a command signal; and

(h) a force modulation interface responsive to said command signal to vary the a rate of braking force reduction.

5,471,388

METHOD AND APPARATUS FOR PREVENTING VEHICLE HANDLING INSTABILITIES

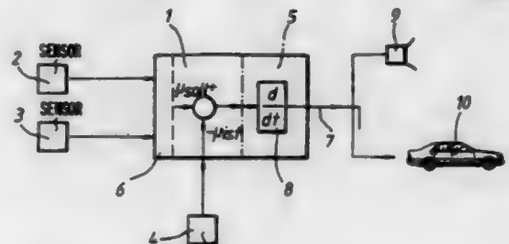
Adam Zomotor, Waiblingen; Walter Klinkner, Stuttgart; Erich Schindler, Unterweissach; Frank-Werner Mohn, Esslingen, and Thomas Wohland, Stuttgart, all of, Germany, assignors to Mercedes-Benz AG, Germany

Filed Jul. 13, 1992, Ser. No. 912,371

Claims priority, application Germany, Jul. 13, 1991, 41 23 232.1

Int. Cl.[6] B62D *5/00;6/00*

U.S. Cl. 364—424.05 **14 Claims**



1. A method of preventing handling instabilities in a motor vehicle, comprising the steps of

(a) forming a vehicle yaw angular velocity required value from measured quantities in a means for computing,

(b) supplying the computing means with at least one sensor signal from which an actual value of vehicle yaw angular velocity is formed,

(c) forming a difference between the yaw angular velocity required value and the yaw angular velocity actual value in the computing means by subtracting the yaw angular velocity actual value from the yaw angular velocity required value,

(d) forming a time derivative of the difference in the computing means,

(e) forming at least one output signal in the computing means from the difference and as a function of the time derivative to represent one of a detected handling situation and the yaw behavior of the motor vehicle and to contain information on vehicle understeering and oversteering,

(f) wherein, based upon a determination of at least one of oversteering and understeering in steps (a)–(e) above, in vehicles with driven rear wheels, the required changed lateral guidance force is deduced, for both oversteering and understeering, when drive slip occurs and, for oversteering when an engine braking torque occurs, and, in vehicles with driven front wheels, the required changed lateral guidance force is deduced, for both oversteering and understeering, when drive slip occurs and, for understeering, when an engine braking torque occurs, such that the motor vehicle is handled with

minimum instability by selectively braking and accelerating individual wheels, and

(g) varying a slip threshold value in a direction toward zero in the computing means when an analysis of the at least one output signal deduces that a changed lateral guidance force is required on drive axle wheels of the motor vehicle, such that control systems of the motor vehicle are operative to reduce said threshold value when drive slip occurs and increase said threshold value when an engine braking torque occurs.

5,471,389

SELECTIVE CONTROL OF DEVICES IN A MOTOR VEHICLE

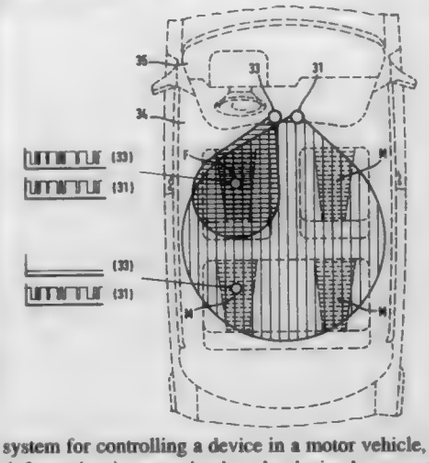
Günter Hahlganss, Kriftel, Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Jan. 28, 1993, Ser. No. 10,601

Claims priority, application Germany, Feb. 19, 1992, 42 04 996.2

Int. Cl.[6] B60N *3/00*

U.S. Cl. 364—424.05 **12 Claims**



1. A system for controlling a device in a motor vehicle, wherein control information is transmitted to the device by a control unit, the system comprising

a control unit located in the vehicle for control of the device by transmission of control information to the device;

a signal transmission path extending to said device for transmission of the control information;

means disposed in said signal transmission path for blocking said transmission of control information;

wherein said control unit is movable and, during a travelling of the vehicle, action of the control information is at least partially blocked by said blocking means upon a positioning of said control unit adjacent the driver.

5,471,390

DIFFERENTIAL LIMITING TORQUE CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES

Hiroki Sasaki, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Jul. 5, 1994, Ser. No. 270,829

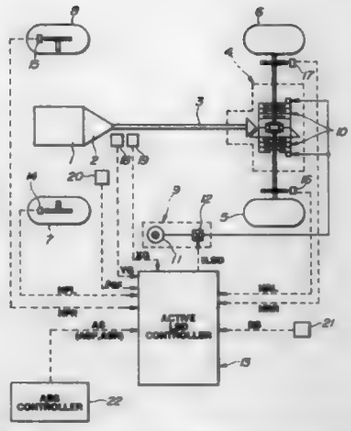
Claims priority, application Japan, Jul. 23, 1993, 5-182716

Int. Cl.[6] B60T *8/52*

U.S. Cl. 364—424.05 **6 Claims**

1. A differential limiting torque control system for an automotive vehicle with an anti-skid brake control device which operates to suppress wheel lock by adjusting a brake-fluid pressure in a road wheel cylinder during braking, said system comprising:

differential limiting means mounted between right and left drive road wheels, for producing a differential limiting torque through which a differential action is limited;



sensor means for detecting a deceleration of the vehicle, a lateral acceleration exerted on the vehicle, a vehicle speed and a drive-wheel speed difference between said right and left drive road wheels;

first derivation means responsive to both the detected deceleration and the detected lateral-acceleration, for deriving a first target torque having a specified torque characteristic according to which said first target torque is increased in accordance with the detected deceleration;

second derivation means responsive to the detected drive-wheel speed difference, for deriving a second target torque having a specified torque characteristic according to which said second target torque is increased in accordance with the detected drive-wheel speed difference; and

control means for controlling said differential limiting means to adjust said differential limiting torque to a higher one of said first and second target torques, only when said anti-skid brake control device is conditioned in an operative state.

5,471,391

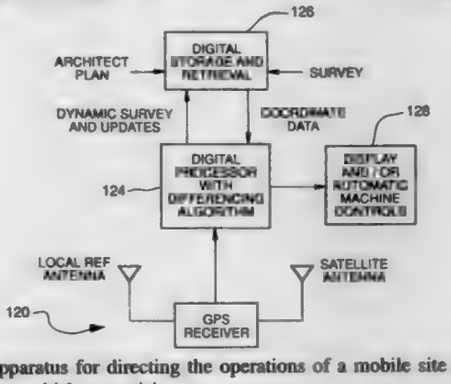
METHOD AND APPARATUS FOR OPERATING COMPACTING MACHINERY RELATIVE TO A WORK SITE

Adam J. Gudat, Edelstein, and Daniel L. Henderson, Washington, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Dec. 8, 1993, Ser. No. 164,171

Int. Cl.[6] G06F *165/00*

U.S. Cl. 364—424.07 **86 Claims**



1. Apparatus for directing the operations of a mobile site compacting machine comprising:

(a) digital data storage and retrieval means for storing a first site model representing the desired degree of compaction of a site and a second site model representing the actual degree of compaction of the site;

(b) means for generating digital signals representing in real time the instantaneous position in three-dimensional space of at least a portion of the compacting machine as it traverses the site;

(c) means for receiving said position signals and for updating the second model in accordance therewith;

(d) means for determining the difference between the first and second models in real time; and

(e) means for directing the operation of the compacting machine in accordance with the difference to bring the updated second model into conformity with the first model.

5,471,392

GEOGRAPHIC INFORMATION DISPLAY APPARATUS

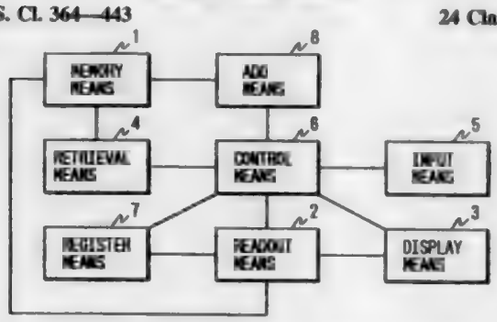
Kenyu Yamashita, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 16, 1994, Ser. No. 261,079

Claims priority, application Japan, Aug. 17, 1993, 5-203151

Int. Cl.[6] G06F *165/00*

U.S. Cl. 364—443 **24 Claims**



1. A geographic information display apparatus comprising:

memory means for memorizing graphic data of a plurality of maps, terminological information representing various names including place names, route names and facility names on maps, position information representing latitude and longitude data corresponding to said various names, and index information including a number of names to be retrieved as a designated name;

readout means for reading out a desirable information from said memory means;

display means for displaying the information read out by said readout means;

retrieval means for executing a retrieval operation using said index information of said memory means on the basis of a name inputted by a user through an input means;

said input means allowing the user to select one of resultant names after said retrieval operation of said retrieval means is finished;

said display means displaying one of the maps stored in said memory means in response to the name selected by the user with said input means;

register means for responding to designation by the user of one spot on said map displayed on said display means, and registering said one spot defined in terms of position information paired with the selected name; and

said readout means reading out names stored in said register means, and said display means displaying said names read out by said readout means, and further said input means allowing the user to select one of said names displayed on said display means, and

control means for controlling said readout means to read out one of the maps stored in said memory means in response to said one of names selected by the user with said input means on the basis of said position information, and controlling said display means to display said map read out by said readout means.

5,471,393

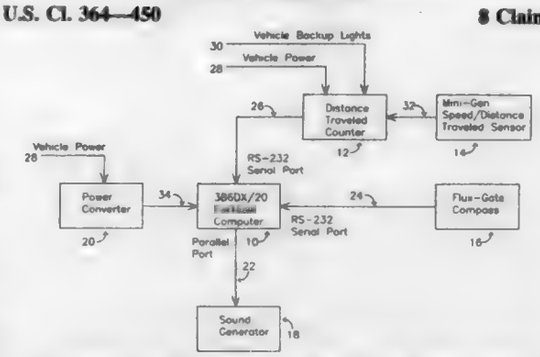
DRIVER'S ASSOCIATE: A SYSTEM FOR VEHICLE NAVIGATION AND DRIVING ASSISTANCE

Joe Bolger, 1404 Alegria, Austin, Tex. 78757

Filed Jan. 26, 1994, Ser. No. 187,743

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—450 **8 Claims**



1. An apparatus for vehicle navigation and driving assistance, comprising:

a computer;

a road map database stored in said computer;

means for acquiring a vehicle's distance traveled and compass heading;

means for calculating dead-reckoned coordinates from said vehicle's distance traveled and compass heading;

means for acquiring roadway projected coordinates from said road map database;

means for determining a probable navigation route for acquiring the next roadway projected coordinates from said map database;

means for normalizing said dead-reckoned coordinates to said roadway projected coordinates; and

means for displaying said normalized coordinates on a visual representation of a portion of said road map database to assist the user in determining said vehicle's current location.

5,471,394

METHOD FOR DEFINING MACHINING AREAS OF A WORKPIECE

Teruyuki Matsumura, Hachioji, and Masatoshi Nakajima, Yamanashi, both of, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

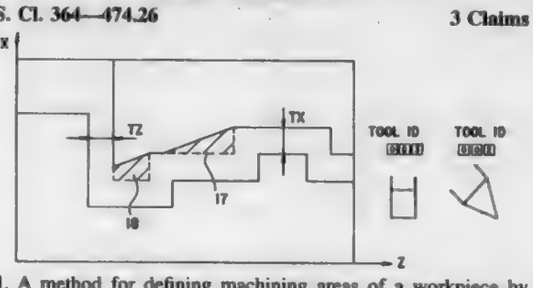
PCT No. PCT/JP93/00519, § 371 Date Dec. 7, 1993, § 102(e) Date Dec. 7, 1993, PCT Pub. No. WO93/21570, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 21, 1993, Ser. No. 157,064

Claims priority, application Japan, Apr. 22, 1992, 4-102915

Int. Cl.[6] G06F *15/46*

U.S. Cl. 364—474.26 **3 Claims**



1. A method for defining machining areas of a workpiece by means of a CRT screen display in an interactive computer system for creating a program for numerical control machining comprising the steps of:

a) prior to programming a step of machining of the workpiece, providing a first CRT screen display showing the whole workpiece before machining including representations of an entire designated area of the workpiece to be machined in the

present machining operation and the final shape of the workpiece after completion of machining;

b) providing a second CRT screen display identifying a first area of said workpiece to be machined by a designated tool No. 1 in a first machining operation;

c) after programming of said first machining operation by an operator, providing a third CRT screen display representing overlapping views of said first and second CRT screen displays and further identifying all uncut designated machining areas of said workpiece required to be machined by further machining operations requiring further programming by the operator; and

d) checking, in accordance with the result of the displayed overlapping views, whether uncut areas exist and, if so, displaying an identification of all uncut areas together with candidate tools for machining each uncut area identified.

5,471,395
CONTROL OF CNC MACHINE TOOLS

Glenn C. Brien, Harkaway, Australia, assignor to Anca Pty. Ltd., Bayswater North, Australia

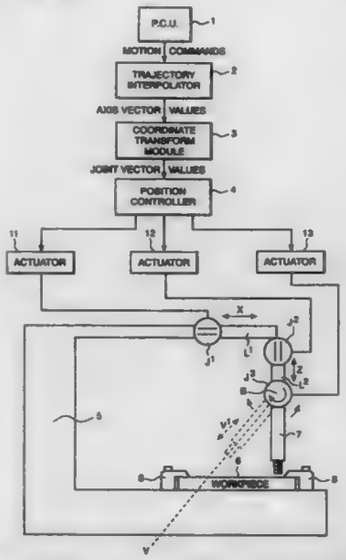
PCT No. PCT/AU92/00260, § 371 Date Dec. 3, 1993, § 102(e) Date Dec. 3, 1993, PCT Pub. No. WO92/22024, PCT Pub. Date Dec. 10, 1992

PCT Filed Jun. 4, 1992, Ser. No. 157,091

Claims priority, application Australia, Jun. 4, 1991, PK6494

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—474.28 **22 Claims**



1. A method of operating a multi-axis CNC machine having workpiece mounting means for mounting a workpiece, a cutting tool operable upon said workpiece, a plurality of machine members and a plurality of controllable joint means movable under the control of the machine to cause relative movement between the cutting tool and the workpiece mounting means,

said method comprising the steps of programming the machine with a plurality of principal programmable positioning axes which axes constitute the minimum number of axes required to position the cutting tool relative to the workpiece mounting moans, and programming the machine to control movement of the joint means in accordance with a part program so as to cause the cutting tool to move along a programmed path relative to the workpiece mounting

the method further comprising the step of programming the machine to synthesize at least one additional concurrently programmable axis whereby relative movement of said cutting tool and said workpiece mounting means is automatically controllable in relation to said additional concurrently programmable axis in accordance with said part program without physical location of said additional concurrently programmable axis by joint means.

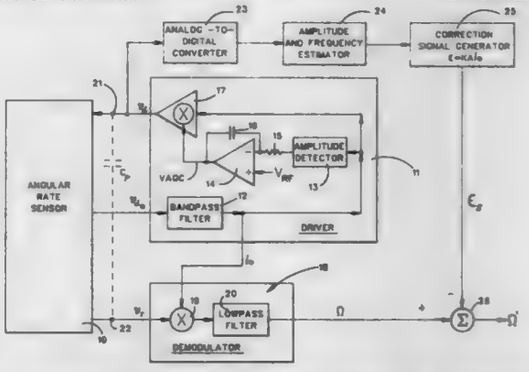
5,471,396
ESTIMATOR OF AMPLITUDE AND FREQUENCY OF A NOISY-BIASED SINUSOID FROM SHORT BURSTS OF SAMPLES

Stanley A. White, San Clemente, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Continuation of Ser. No. 105,265, Aug. 12, 1993, abandoned. This application Mar. 24, 1995, Ser. No. 410,643

Int. Cl.[6] G06F *15/20*

U.S. Cl. 364—480 **26 Claims**



1. A method of obtaining and using an indication of a characteristic of an analog drive signal exciting an angular rate sensor, said method comprising the steps of:

a) exciting said angular rate sensor with said analog drive signal;

b) digitizing said drive signal in an analog-to-digital converter, thereby producing a sequence of sample values (x_1, x_2, x_3, . . . , x_m) at respective spaced instants of time;

c) computing in a computer operating pursuant to software a series of ratios of algebraic functions of triplets (x_j, x_{j-1}, x_{j-2}) of neighboring ones of said sample values;

d) computing in a computer operating pursuant to software an average of said ratios to produce said indication of said characteristic;

e) applying said indication of said characteristic to a correction signal generator to produce a correction signal; and

f) subtracting, in an adder unit, the correction signal from an angular rate signal generated by said angular rate sensor to produce a corrected angular rate signal.

5,471,397
IDENTIFYING SUBSETS OF NOISE VIOLATORS AND CONTRIBUTORS IN PACKAGE WIRING

Edward P. Hsieh, Bedford Hills, N.Y., and Raghu V. Hudli, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1993, Ser. No. 168,015

Int. Cl.[6] H05K *7/06*

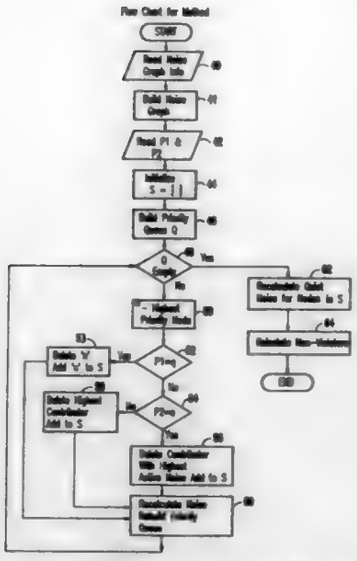
U.S. Cl. 364—489 **8 Claims**

1. A computer implemented method for identifying a subset of nets from a plurality of nets in a multi-chip module in order to reduce coupled noise on each net in said multi-chip module to a specified level by rerouting said subset of nets, comprising the steps of:

modeling said plurality of nets as a weighted graph with each net as a node in the graph and noise coupled between pairs of nets as edges between nodes;

prioritizing said nets in a queue as a function of the magnitude of said noise coupled to each net or said noise coupled from each of said nets, as selected by a user;

identifying a net for deletion, starting with a net of a highest priority;



recalculating the noise coupled from each net from other nets and the noise coupled from each net to other nets on a basis that a net of highest priority has been deleted from said multi-chip module; and

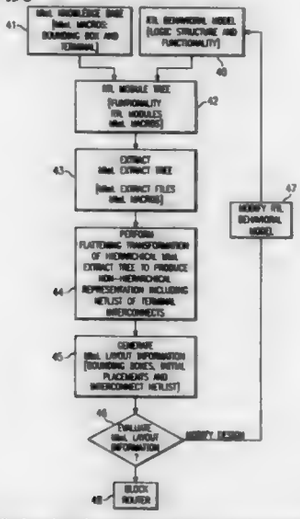
repeating said prioritizing, deleting and recalculating steps until coupled noise on the remaining nets is reduced to a specified level or a predetermined number of nets have been deleted.

5,471,398

MTOL SOFTWARE TOOL FOR CONVERTING AN RTL BEHAVIORAL MODEL INTO LAYOUT INFORMATION COMPRISING BOUNDING BOXES AND AN ASSOCIATED INTERCONNECT NETLIST

Arthur Stephens, Sugar Land, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 1, 1991, Ser. No. 724,286
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—490 **12 Claims**



1. An MtoL (behavioral model to layout information) method for converting an RTL (register transfer level) behavioral model in the form of an RTL module tree including a plurality of hierarchical RTL modules representing the logic structure and functionality of an integrated circuit, into MtoL layout information for use in a block router, comprising the steps:

assigning to selected ones of the RTL modules MtoL macros that define corresponding geometric and terminal information;

extracting these MtoL macros along with the RTL modules for inclusion in the MtoL extract tree;

extracting from the RTL module tree the hierarchical RTL modules to create a corresponding hierarchical MtoL extract tree;

performing a flattening transformation of the hierarchical Mtol extract tree to provide a non-hierarchical representation including a terminal interconnection netlist, said performing said flattening transformation accomplished by the substeps of

performing a breadth first traversal through the hierarchical MtoL extract tree to create a linked list of all leaf nodes, which correspond to layout style blocks or intermediate blocks designated as leaf nodes, and

performing a depth first search of the Mtol extract tree to generate a netlist that describes a routine network; and

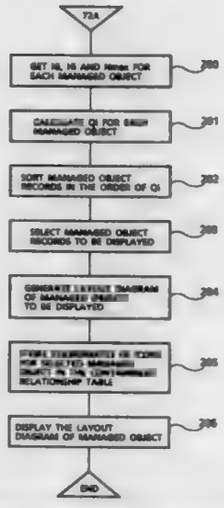
using the non-hierarchical representation and terminal interconnect netlist, generating MtoL layout information.

5,471,399

NETWORK MANAGEMENT SYSTEM AND NETWORK STATUS DISPLAY METHOD

Yasuhiro Tanaka, Kawasaki; Yasuhiko Nagai, Tokyo; Michio Suzuki; Takashi Kagei, both of Yokohama; Kohsuke Shinnai, Hirakata; Goro Ikeba, and Masato Saito, both of Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 17, 1992, Ser. No. 931,201
Claims priority, application Japan, Aug. 28, 1991, 3-216916
Int. Cl.[6] G06F *11/32*
U.S. Cl. 364—491 **11 Claims**



1. A network status display method for use in a communication network management system including display means having a display screen for displaying a network layout thereon, first storing means for storing therein network configuration information defining connection relationships between a plurality of managed object instances constituting the network, second storing means for storing therein containment relationship information beforehand defined between the plural managed object instances and information representing a display priority beforehand defined for each of the managed object instances, and data processing means for executing an information processing operation according to predetermined programs, the method comprising the steps of:

calculating for each of the managed object instances an evaluated value for display according to a predetermined algorithm based on the containment relationship information beforehand defined between the plural managed object instances and the information representing a display priority beforehand defined for each of the managed object instances stored in the second storing means;

selecting a number of managed object instances in a descending order of the evaluated values thus calculated for the respective instances wherein the selected instances are limited to a first

set of the managed object instances having at least a predetermined value of display priority and wherein a second set of the managed object instances having an evaluated value less than said predetermined value are determined to be concealed, the selected instances being representable on the display screen;

generating a layout diagram indicating a network status including a plurality of icons representing the plural selected instances and lines denoting connection relationships between the icons, the relationships being determined according to the network configuration information stored in the first storing means; and

displaying the layout diagram on the display screen.

5,471,400

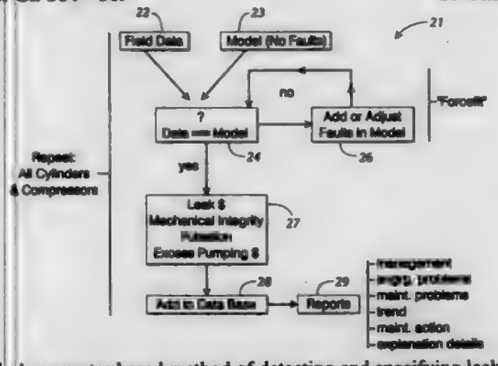
METHOD FOR DETECTING AND SPECIFYING COMPRESSOR CYLINDER LEAKS

Anthony J. Smalley; C. Richard Gerlach, both of San Antonio, Tex., and Ralph E. Harris, Cary, N.C., assignors to Gas Research Institute, Chicago, Ill.

Filed May 24, 1994, Ser. No. 248,458

Int. Cl.[6] G01F *22/02;25/00;* **G06G** *7/57*

U.S. Cl. 364—509 **16 Claims**



1. A computer based method of detecting and specifying leaks in a reciprocating compressor cylinder having a suction valve, a discharge valve, a reciprocating piston, and piston rings, said method comprising the steps of:

(a) operating the compressor cylinder to generate time varying pressure as a function of cylinder volume within the cylinder;

(b) sensing the pressure within the operating cylinder at predetermined intervals of cylinder volume and generating signals indicative of the sensed pressures;

(c) converting the generated signals to digital data representing the characteristic measured pressure versus volume function for the operating compressor;

(d) conveying the digital data to a computer-based control means;

(e) in the computer-based control means, simulating operation of the compressor cylinder with a predictive analytical model that includes simulations of the effects of leaks in the compressor elements to produce a predicted pressure versus volume function for the compressor, the measured and predicted pressure versus volume functions each exhibiting a compression line and a re-expansion line with a region of difference being defined between the re-expansion lines of the measured and predicted functions and between the compressor lines of the measured and predicted functions;

(f) subdividing in pressure/volume space the region of difference between the re-expansion lines of the measured and predicted functions into subregions S1 and S2, subregion S1 being bounded by the measured and predicted re-expansion lines, by a constant volume line at the volume where maximum pressure on the measured re-expansion line occurs, and by a constant volume line at the volume where measured pressure is midway between the minimun and maximum pressure on the measured re-expansion line, subregion S2 being bounded by the measured and predicted re-expansion lines, by a constant volume line at the volume where measured pressure is midway between the minimum and maximum pressure on the measured re-expansion line, and by a constant volume line at the volume where minimum pressure occurs on the measured re-expansion line, and subdividing the region of difference between the compression lines of the measured and predicted functions into subregions S5 and S6, subregion S5 being bounded by the measured and predicted compression lines, by a constant volume line at the volume where minimum pressure occurs on the measured compression line, and by a constant volume line at the volume where measured pressure is midway between the minimum and maximum pressure on the measured compression line, subregion S6 being bounded by the measured and predicted compression lines, by a constant volume line at the volume where measured pressure is midway between the minimum and maximum pressure on the measured pressure line, and by a constant volume line at the volume where maximum pressure occurs on the measured compression line, the areas of each of the subregions S1, S2, S5, and S6 being positive if measured pressure is greater than predicted pressure in the subregion and negative if measured pressure is less than predicted pressure in the subregion.

(g) analyzing the areas of subregions S1, S2, S5, and S6;

(h) determining based on the results of step (g) the nature of changes in simulated leaks within the predictive analytical model that likely would cause a desired change in the areas of and relationships between the subregions S1, S2, S5, and S6;

(i) changing the simulated leaks within the predictive analytical model according to the determination of step (h);

(j) repeating steps (e) through (i) until, in step (d), the areas of and relationships between subregions S1, S2, S5, and S6 meet a predetermined criteria;

(k) analyzing the final valves of the simulated leaks to predict and specify the nature of probable actual leaks present in the compressor cylinder; and

(l) determining a course of remedial repairs to be performed on the compressor cylinder based upon the predictions and specifications of step (k).

5,471,401

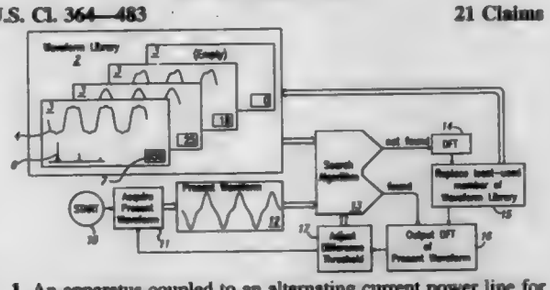
WAVEFORM LIBRARY FOR CHARACTERIZING AN AC POWER LINE SPECTRUM

Jamie Nicholson, Foster City, and Alexander McEachern, Oakland, both of Calif., assignors to Basic Measuring Instruments, Inc., San Jose, Calif.

Filed Sep. 9, 1992, Ser. No. 942,735

Int. Cl.[6] G01R *19/25*

U.S. Cl. 364—483 **21 Claims**



1. An apparatus coupled to an alternating current power line for characterizing an alternating current power line voltage or current frequency spectrum comprising:

a. means for acquiring a power line voltage or current waveform and converting it into an acquired time-domain representation, coupled to the alternating current power line;

b. means for comparing the acquired waveform to a library of previously stored waveforms, the library having a digital time-domain representation and a corresponding frequency-domain representation for each waveform stored;

c. means for retrieving the corresponding frequency-domain representation, if there is a waveform stored in the library

which corresponds to the acquired time-domain representation within a difference threshold;

d. means for converting the acquired time-domain representation into an acquired frequency-domain representation, if there is no waveform stored in the library which corresponds to the acquired time-domain representation within a difference threshold; and

e. means for storing the acquired frequency-domain representation in the waveform library, if there is no waveform stored in the library which corresponds to the acquired time-domain representation within a difference threshold.

5,471,402

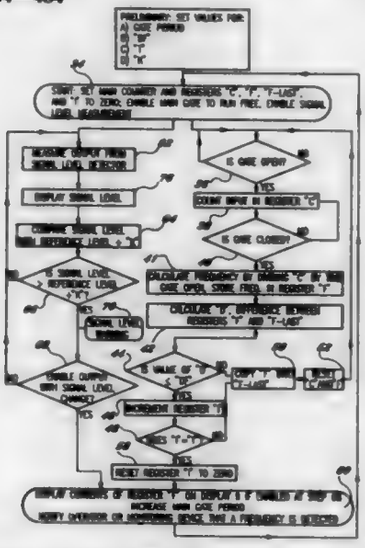
FREQUENCY COUNTER

William P. Owen, Ft. Lauderdale, Fla., assignor to Optoelectronics, Inc., Fort Lauderdale, Fla.

Continuation of Ser. No. 695,568, May 31, 1991, abandoned. This application Sep. 21, 1994, Ser. No. 310,228

Int. Cl.[6] G01R *23/00;* **G06F** *17/00*

U.S. Cl. 364—484 **29 Claims**



1. A method for distinguishing the frequency of a main periodic RF signal carrier input of interest from the frequency of signal noise inherent in the main periodic RF signal carrier which becomes more apparent when said main periodic RF signal carrier is amplified, said method comprising the steps of:

(a) periodically sampling said main periodic input RF signal carrier to receive at least two signal samples;

(b) measuring the frequency of each said at least two signal samples to acquire at least two frequency measurements;

(c) calculating a difference in frequency measurements between said at least two frequency measurements and comparing said difference to a preselected amount;

(d) incrementing a measurement counting register in response to a determination that said difference in frequency measurements between said at least two signal samples differs by less than said preselected amount; and

(e) generating control signals when said measurement counting register equals a predetermined value.

5,471,403

METHOD FOR PREDICTING THE THREE-DIMENSIONAL TOPOGRAPHY OF SURFACES OF SEMICONDUCTOR DEVICES AFTER REFLOW PROCESSING

Masato Fujimaga, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

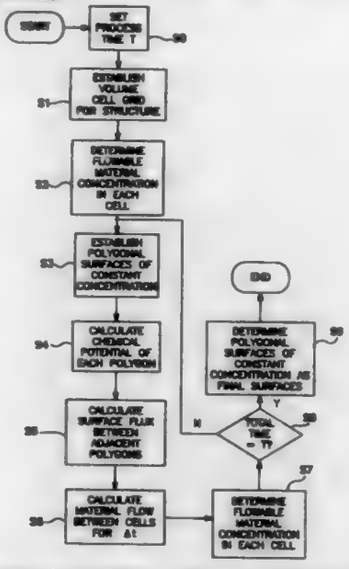
Filed Mar. 6, 1992, Ser. No. 846,702

Claims priority, application Japan, Mar. 8, 1991, 3-043258

The portion of the term of this patent subsequent to Mar. 8, 2011, has been disclaimed.

Int. Cl.[6] G01B *21/20;* **G06F** *17/10;* **G06T** *17/20*

U.S. Cl. 364—488 **1 Claim**



1. A method of controlling reflow of a flowable material to produce a desired three-dimensional topography of the flowable material comprising:

establishing reflow process conditions including a total process time;

establishing a grid of three-dimensional cells encompassing at least part of a semiconductor device and including a flowable material;

specifying the concentration of the flowable material in each cell;

establishing polygonal surfaces of constant flowable material concentration that extend amongst the cells;

calculating the chemical potential of each constant concentration polygonal surface;

calculating the surface flux of the flowable material between adjacent polygonal surfaces;

calculating the material flow between cells for a time interval Δt less than the total process time by multiplying the surface flux by the time Δt;

determining the flowable material concentration in each cell after the material flow;

repeating the foregoing steps from establishing the polygonal surfaces of constant concentration through determining the flowable material concentration in each cell for successive time intervals Δt until the sum of the time intervals reaches the specified process time;

establishing as a three-dimensional surface of the flowable material a surface of constant concentration of the flowable material;

comparing the three-dimensional surface of the flowable material with a desired three-dimensional surface of the flowable material and, if the three-dimensional surfaces are different, changing the reflow process conditions and repeating the foregoing steps from establishing a grid of three-dimensional cells through establishing the three-dimensional surface of the flowable material; and

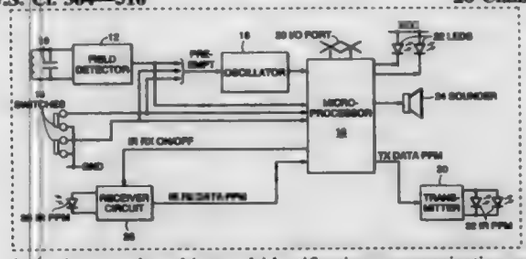
reflowing the reflowable material under the process conditions determined in the foregoing steps that produced a three-dimensional surface that coincided with the desired three-dimensional surface.

5,471,404

OCCLUSION DETECTION SYSTEM FOR LOCATOR DEVICES

Murray S. Mazer, 7 Mountain Ave., Somerville, Mass. 02143-1308

Filed Dec. 23, 1993, Ser. No. 173,437
Int. Cl.[6] G01S *3/02*
U.S. Cl. 364—516 **26 Claims**



1. An improved tracking and identification communication system which comprises: a plurality of badges, each badge carried by an object, each badge having a transmitter circuit for transmitting an identification signal and a receiver for accepting external communication; a plurality of transceiver sensor stations which are positioned to communicate with the badges within a predetermined area;

an uncertainty interval timer in the badge which initiates an action upon lapse of an uncertainty interval;

a transmitter in the badge that sends a request for acknowledgement to the sensor stations during the uncertainty interval;

a sensor station which acknowledges the requests from the badge; and

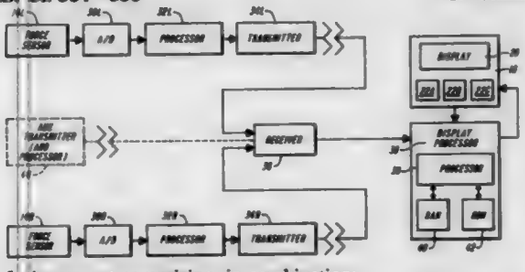
a reset mechanism which resets the uncertainty interval timer upon receipt of a signal from the sensor station.

5,471,405

APPARATUS FOR MEASUREMENT OF FORCES AND PRESSURES APPLIED TO A GARMENT

Stephen A. Marsh, 21 Payson Estate, 456 Belmont St., Watertown, Mass. 02172

Continuation of Ser. No. 975,854, Nov. 13, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 272,928
Int. Cl.[6] G01L *1/00;5/16;* A43B *5/00*
U.S. Cl. 364—556 **19 Claims**



1. A garment comprising, in combination:

at least one individual force sensor physically connected to said garment for sensing each application of force applied to said sensor and for generating a force signal representative of said each application of force to said sensor;

processing means disposed on said garment for processing each said force signal so as to produce a time and intensity profile of said force signal, said profile being characterized in having at least three discrete time segments, and for representing each of said segments of said profile by a value selected from a coded series of reference values, said segments including an attack segment representative of the parameters of the initial application of said force to said garment; a sustain segment representative of the parameters of the continued application of said force to said garment, and a release segment representative of the parameters of the diminution and termination of the force applied to said garment;

means for transmitting said selected values of said coded series of reference values; and

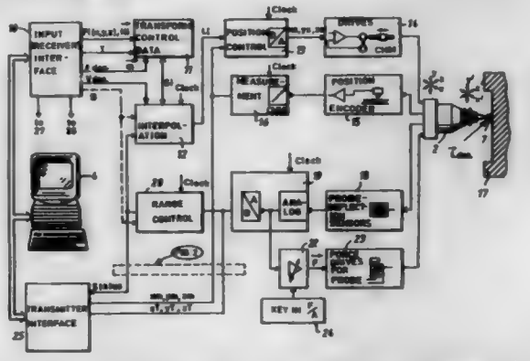
means for receiving and decoding the transmitted selected values of said coded series of reference values to recover time and intensity information therefrom for analysis of the physical performance of a wearer of said garment.

5,471,406

METHOD OF MEASURING ELEMENTAL SHAPES OF A WORKPIECE ON A COORDINATE MEASURING MACHINE

Karl-Hermann Breyer, Heidenheim; Berndt Kammleiter, Oberkochen, and Otto Rock, Pfahlheim, all of, Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Germany

Filed Mar. 23, 1993, Ser. No. 35,716
Claims priority, application Germany, Apr. 14, 1992, 42 12 455.7
Int. Cl.[6] G05B *19/19;19/4093*
U.S. Cl. 364—559 **16 Claims**



1. A method of measuring an elemental shape or feature of a workpiece in any desired orientation in space, to determine deviations of an actual contour of the elemental shape from a desired contour of the elemental shape, using a computer-operated coordinate-measuring machine (CMM) having a control system for multiple-coordinate drives for positioning a measuring probe head (2) in machine-coordinate axes (X, Y, Z), wherein the measuring probe head (2);

has a deflectable probe with a probe ball for workpiece contact, has, within a permissible measurement range (MR), measurement means (18) producing signals which indicate probe deflection (A_{mc2}) in coordinate directions (X', Y', Z'), and

contains measurement-force generators (23) by which measurement force (F) which the deflectable probe exerts on the workpiece (17) can be adjusted for the coordinate directions (X', Y', Z') or contains springs which produce in the coordinate directions a measurement force which is directionally proportional to probe deflection, said method being characterized by the following method steps:

(a) predetermined-path data Pi (X, Y, Z) which are 3-dimensional and which describe a desired location and a desired contour of the elemental shape to be measured are transmitted by the computer (4) of the coordinate measuring machine to the control system for control of the coordinate drives of the coordinate measuring machine;

(b) from the predetermined-path data of step (a), path data (Li) are derived along which the measuring probe head (2) is moved in such manner with respect to the desired contour that the probe ball (7) on the deflectable probe remains applied against the workpiece (17) and the probe deflection

(A_{act}) remains within the permissible measurement range (MR) of the measuring probe head (2);

(c) forces of the measurement-force generators (23) or a predetermined probe deflection (A_{des}) corresponding to the desired contour are so adjusted that a resultant total measurement force (F_{des}) is applied at each measurement point along the desired contour; and

(d) from the signals of the measurement means (18) of the measuring probe head, deviations of the actual contour of the elemental shape from the desired contour or characteristics such as location of center point, or magnitude of diameter, of the elemental shape are calculated.

5,471,407

METHOD OF DETECTING LONGITUDINAL DIRECTION OF INSPECTION OBJECT AND IDENTIFYING CONFIGURATION OF THE SAME

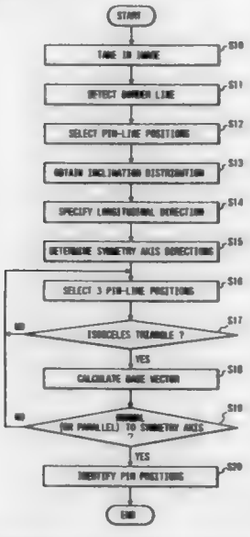
Toru Akasaka, Chikushino, and Taisuke Mori, Fukuoka, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 30, 1993, Ser. No. 39,670

Claims priority, application Japan, Mar. 31, 1992, 4-076686

Int. Cl.[6] G06K *9/52*

U.S. Cl. 364—559 **11 Claims**



1. A method of detecting a longitudinal direction of an electronic component to be mounted on a substrate, the method comprising:

a first step of taking in an image of the electronic component by a camera, and obtaining a border line of said image;

a second step of obtaining inclination angles of a plurality of vectors whose start and end points are disposed at predetermined intervals along an entire length of said border line, and obtaining a distribution of said inclination angles of said vectors;

a third step of finding a specific inclination angle having a largest frequency in said distribution, and determining a direction corresponding to said specific inclination angle as a longitudinal direction of the electronic component:

a fourth step of adjusting a direction of said electronic component by a direction adjusting device, with reference to said direction of said electronic component detected in said third step, and

a fifth step of mounting said electronic component on a predetermined position of said substrate by a transporting device.

5,471,408

METHOD FOR OPTIMIZING RESOURCE ALLOCATION AND AN APPARATUS USING THE METHOD

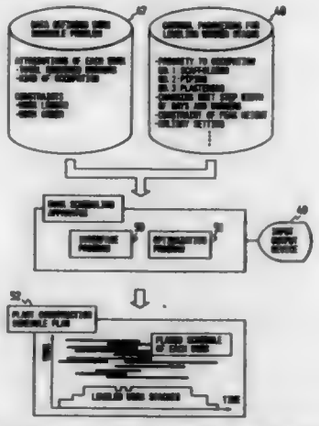
Masanori Takamoto, Hitachi; Naoyuki Yamada, and Yasuhiro Kobayashi, both of Katsuta, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 19, 1993, Ser. No. 92,917

Claims priority, application Japan, Aug. 3, 1992, 4-226465

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—578 **4 Claims**



1. A method of optimizing allocation of plural usable physical resources to allocation objects, executed in a resource allocation planning support system using a resource allocation optimization model stored in a memory and processed by a calculating unit, said model represented by linear allocation constraints, an allocation state description of each allocation object and a quadratic objective function, comprising the steps of:

inputting input data designating available physical resources, said linear allocation constraints, a specification of said allocation objects, and an initial state of said each allocation object;

storing said input data in said memory;

iteratively selecting, using a means for optimizing, a variable describing a resource allocation state of said resource allocation optimization model to be changed using a variable selection rule based on an evaluation vector representing present resource allocation stacks of all allocation objects;

renewing, using said means for optimizing, a variable of said resource allocation optimization model using the variable selected in said interactively selecting step;

judging, using said means for optimizing, termination of said iteratively selecting step for selecting said variable based on an evaluation index provided for evaluating whether an improvement of said quadratic objective function is obtained, said quadratic objective function being made of said resource allocation stacks of all allocation objects;

storing variables finally obtained when said quadratic objective function cannot be further improved, as an optimized resource allocation in said memory; and

visually outputting a plan for allocating said physical resources to said each allocating objects by using said optimized resource allocation stored in said memory.

5,471,409

LOGIC SIMULATION APPARATUS AND CIRCUIT SIMULATION APPARATUS

Takahiro Tani, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

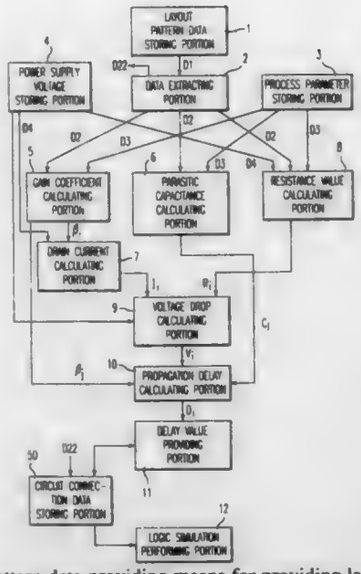
Filed Sep. 14, 1993, Ser. No. 120,438

Claims priority, application Japan, Jan. 12, 1992, 4-272905

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—578 **8 Claims**

1. A logic simulation apparatus, comprising:



layout pattern data providing means for providing layout pattern data defining layout pattern of a logic circuit;

data extracting means for extracting, on the basis of said layout pattern, circuit connection data defining relation of connections among elements constituting said logic circuit, circuit constant data of said elements, interconnection dimension data including dimension information of diffusion regions forming said elements and dimension information of interconnections among each element and divided power-supply line data including a divided power-supply line, in which a power-supply line from an external power-supply input terminal to said element is divided in branch point units, a length and a width thereof;

process parameter providing means for providing a process parameter required in a process of manufacturing said logic circuit;

power-supply information providing means for providing power-supply information including a power-supply voltage value and an internal resistance value of the external power-supply for operation of said logic circuit;

gain coefficient calculating means for calculating a gain coefficient for each element of said logic circuit on the basis of said circuit constant data and said process parameter;

parasitic capacitance value calculating means for calculating an interconnection parasitic capacitance value which is a capacitance value associated with each interconnection of said logic circuit on the basis of said circuit constant data, said interconnection dimension data and said process parameter;

conduction current calculating means for calculating a conduction current value flowing when each element of said logic circuit turns on on the basis of said gain coefficient and said power-supply information;

resistance value calculating means for calculating a voltage drop resistance value which is a sum of an interconnection resistance value of the power-supply line and said internal resistance value for each element of said logic circuit on the basis of said divided power-supply line data, said process parameter and said internal resistance value of said power-supply information;

voltage drop value calculating means for calculating a voltage drop value occurring in the power-supply path extending from the external power-supply to said element when each said element of said logic circuit turns on on the basis of said power-supply voltage value of said power-supply information, said conduction current value and said voltage drop resistance value;

signal propagation delay calculating means for calculating signal propagation delay time required for each said element of said logic circuit to propagate a logic signal on the basis of said gain coefficient, said interconnection parasitic capacitance and said voltage drop value; and

logic simulation performing means for performing logic simulation on the basis of said circuit connection data and said signal propagation delay time.

5,471,410

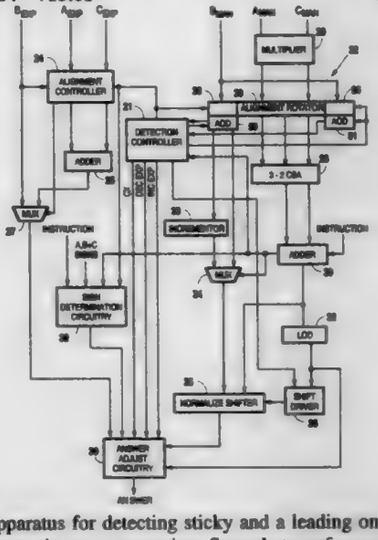
METHOD AND APPARATUS FOR STICKY AND LEADING ONE DETECTION

Roger N. Bailey; Steven M. Burchfiel, and Michael P. Taborn, all of Austin, Tex., assignors to International Business Machines Corporation, San Antonio, Tex.

Filed Oct. 14, 1994, Ser. No. 323,476

Int. Cl.[6] **G06F** *7/00;7/38*

U.S. Cl. 364—715.01 **30 Claims**



1. An apparatus for detecting sticky and a leading one of a first operand input into an execution flow that performs arithmetic operations between the first operand and a second operand input into the execution flow, the execution flow comprising arithmetic circuitry for performing arithmetic operations on the first and second operands and comparison circuitry for furnishing an output representing the comparison of the exponent of the first operand with the exponent of the second operand, comprising:

circuitry, responsive to the of the comparison circuitry, for detecting both sticky and a leading one;

said circuitry detecting the position of the leading one utilizing the output of the comparison circuitry when that output indicates the exponent of the first operand exceeds the exponent of the second operand; and

said circuitry inputting selected bit fields of the first operand to detect sticky when the output of the comparison circuitry indicates that the exponent of the first operand is less than the exponent of the second operand.

5,471,411

INTERPOLATION FILTER WITH REDUCED SET OF FILTER COEFFICIENTS

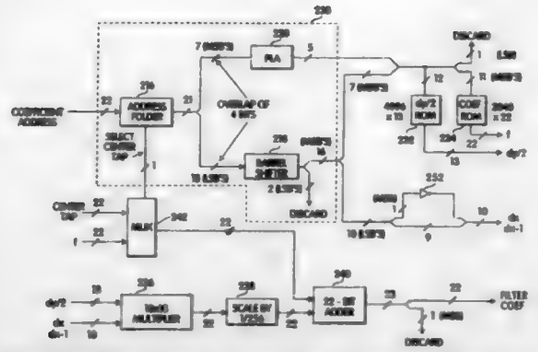
Robert W. Adams, Acton, Mass.; Tom W. Kwan, Santa Clara, Calif., and Michael Coln, Lexington, Mass., assignors to Analog Devices, Inc., Norwood, Mass.

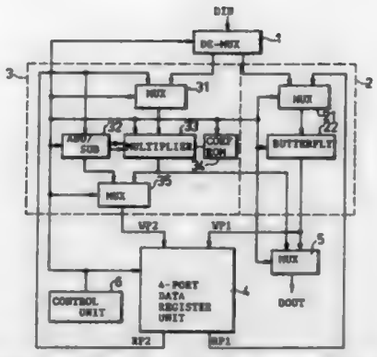
Division of Ser. No. 954,149, Sep. 30, 1992. This application Apr. 28, 1994, Ser. No. 234,177

Int. Cl.[6] **G06F** *15/31*

U.S. Cl. 364—724.01 **3 Claims**

1. An electronic device for producing a desired filter coefficient of a large set of filter coefficients for a digital filter, wherein each desired filter coefficient in the large set has a corresponding binary coefficient address in an address space defined by a number of taps





of the digital filter, using a smaller set of coefficients stored in a memory element and a binary coefficient address in the address space and having a plurality of bits, said electronic device comprising:

a look-up table which maps the binary coefficient address to one of a plurality of regions of the address space, wherein an average first-order difference between adjacent filter coefficients corresponding to binary coefficient addresses in each region is substantially constant, wherein the look-up table has an input for receiving the binary coefficient address and an output providing an indication of the region corresponding to the binary coefficient address;

a shifter connected to receive a portion of the least significant bits of the binary coefficient address and for shifting the portion by an amount determined by the region indicated by the output of the look-up table to provide a shifter output;

means for combining the output of the look-up table with a portion of the most significant bits of the shifter output to produce an address N to access the memory element;

means for accessing the memory element to obtain a first coefficient ROM(N) from the smaller set using the address produced by the means for combining;

means for accessing the memory element to obtain a second coefficient ROM(N+1) from the smaller set using an address adjacent to the address produced by the means for combining;

means for generating an interpolation number INTERP, having a number K of bits from low-order bits of the shifter output; and

means, connected to both the means for accessing and the means for generating, for performing a linear interpolation to obtain the desired filter coefficient wherein the desired filter coefficient is equal to ROM(N)+(ROM(N+1)–ROM(N))*(INTERP/2^K).

5,471,412

RECYCLING AND PARALLEL PROCESSING METHOD AND APPARATUS FOR PERFORMING DISCRETE COSINE TRANSFORM AND ITS INVERSE

Rong-Fuh Shyu, Hsinchu, Taiwan, Prov. of China, assignor to Winbond Electronic Corp., Hsinchu, Taiwan, Prov. of China

Filed Oct. 27, 1993, Ser. No. 143,837

Int. Cl.[6] **G06F** *7/38;7/52*

U.S. Cl. 364—725 **11 Claims**

3. A one-dimensional discrete cosine transform (DCT) apparatus for performing a six-stage DCT fast algorithm to parallel process a sequence of input data of an 8×8 data block so as to generate a sequence of transform data, said DCT fast algorithm including first, third and fifth stages, each of which involving a plurality of butterfly operations, second and fourth stages, each of which involving a plurality of post-addition multiplication operations, and a sixth stage involving a plurality of intrinsic multiplication operations, said DCT apparatus comprising:

an input unit receiving said input data;

a butterfly operation unit controllable so as to perform said first, third and fifth stages of said DCT fast algorithm and so as to generate respectively first-, third- and fifth-stage output data when performing said first, third and fifth stages of said DCT algorithm;

a multiplication operation unit controllable so as to perform said second, fourth and sixth stages of said DCT fast algorithm and so as to generate respectively second-, fourth- and sixth-stage output data when performing said second, fourth and sixth stages of said DCT fast algorithm;

a data register unit connected to said butterfly operation unit and said multiplication operation unit and controllable so as to store said first-, second-, third-, fourth- and fifth-stage output data therein;

a control unit connected to said input unit, said butterfly operation unit, said data register unit and said multiplication operation unit;

said control unit controlling said input unit to provide said input data to said butterfly operation unit in order to enable said butterfly operation unit to perform said first stage of said DCT fast algorithm;

said control unit further controlling said data register unit to store said first-stage output data from said butterfly operation unit therein;

said control unit further controlling said data register unit to provide predetermined ones of said first-stage output data to said multiplication operation unit in order to enable said multiplication operation unit to begin performing said second stage of said DCT fast algorithm when said predetermined ones of said first-stage output data have been stored in said data register unit, while said butterfly operation unit continues to perform said first-stage of said DCT fast algorithm;

said control unit further controlling said data register unit to store said second-stage output data from said multiplication operation unit therein;

said control unit further controlling said data register unit to provide said first- and second-stage output data in a predetermined sequence to said butterfly operation unit in order to enable said butterfly operation unit to perform said third stage of said DCT fast algorithm after said butterfly operation unit has finished performing said first stage of said DCT fast algorithm;

said control unit further controlling said data register unit to store said third-stage output data from said butterfly operation unit therein;

said control unit further controlling said data register unit to provide predetermined ones of said third-stage output data to said multiplication operation unit in order to enable said multiplication operation unit to begin performing said fourth stage of said DCT fast algorithm when said predetermined ones of said third-stage output data have been stored in said data register unit, while said butterfly operation unit continues to perform said third-stage of said fast DCT algorithm;

said control unit further controlling said data register unit to store said fourth-stage output data from said multiplication operation unit therein;

said control unit further controlling said data register unit to provide said third- and fourth-stage output data in a predetermined sequence to said butterfly operation unit in order to enable said butterfly operation unit to perform said fifth stage

of said DCT fast algorithm after said butterfly operation unit has finished performing said third sage of said DCT fast algorithm;

said control unit further controlling said data register unit to store said fifth-stage output data from said butterfly operation unit therein;

said control unit further controlling said data register unit to provide said fifth-stag output data to said multiplication operation unit in order to enable said multiplication operation unit to perform said sixth stage of said DCT fast algorithm; and

an output unit connected to said multiplication operation unit and said control unit and controlled by said control unit so as to receive said sixth-stage output data from said multiplication operation unit.

5,471,413
FAST ADDER CHAIN

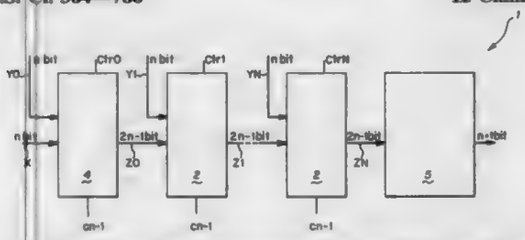
Luigi M. Sali, St.Angelo Lodigiano, and Carla Golla, Sesto S.G., both of, Italy, assignors to SGS-Thomson Microelectronics S.A., Pouilly, France

Filed May 25, 1993, Ser. No. 66,567

Claims priority, application European Pat. Off., May 27, 1992, 92830268

Int. Cl.[6] G06F *7/52*

U.S. Cl. 364—786 **12 Claims**



1. An adder chain for adding together at least first, second, and third digital words, each digital word having n bits, the adder chain comprising:

an initial block including:

n/2 two-bit adders, each two-bit adder receiving a two-bit portion of the first digital word and a two-bit portion of the second digital word for computing pseudosums and a pseudocarry for the received portions of the first and second digital words, and

storing means, coupled to the two-bit adders, for storing the pseudosums and pseudocarries, and for transmitting the pseudosums and the pseudocarries to a subsequent block of more significant order, wherein the storing means includes two sets of storage elements cascade connected to one another and coupled to the adders, one of the sets being coupled to a control signal for selective overriding; and

at least one i-th adder block arranged in an order from a least significant block coupled to the initial block to a most significant block, where i is a natural number greater than 1, for receiving pseudosums and pseudocarries from a (i−1)th block and for receiving an (i+2)th digital word, for computing pseudosums and pseudocarries from the received pseudosums and pseudocarries and the received (i+2)th digital word; and

a final block, receiving pseudosums and pseudocarries from the most significant adder block, including a plurality of adders and storage elements for selectively combining and storing the received pseudosums and pseudocarries and for providing an output word.

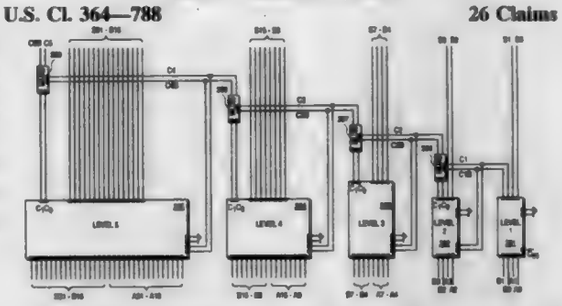
5,471,414
FAST STATIC CMOS ADDER

Sudarshan Kumar, and Jashojiban Banik, both of Aloha, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 17, 1993, Ser. No. 32,607

Int. Cl.[6] G06F *7/50;7/38*

U.S. Cl. 364—788 **26 Claims**



1. An N-bit conditional sum adder, wherein N is a number of bits to be added, said adder comprising:

X number of M-bit adders coupled together, wherein X * M=N and wherein one of said M-bit adders includes a sum circuit coupled to a plurality of input lines for generating sum bits by adding together a plurality of input bits corresponding to said input lines, said one of said M-bit adders also including a carry circuit coupled to said input lines for generating a first carry signal assuming a preceding M-bit adder outputs a carry and generating a second carry signal assuming said preceding M-bit adder outputs no carry;

a first buffer coupled to said carry circuit for generating a buffered first carry signal;

a second buffer coupled to said carry circuit, parallel to said first buffer, for also generating said buffered first carry signal;

a first inverter coupled to an output of said second buffer for generating an inverted buffered first carry signal;

a third buffer coupled to said carry circuit for generating a buffered second carry signal;

a fourth buffer coupled to said carry circuit, parallel to said third buffer, for also generating said buffered second carry signal;

a second inverter coupled to an output of said fourth buffer for generating an inverted buffered second carry signal: and,

a selector circuit having four passgates coupled to receive said buffered first carry signal, said inverted buffered first carry signal, said buffered second carry_ signal, and said inverted buffered second carry signal for generating a carry according to whether said preceding M-bit adder outputs a carry or said preceding M-bit adder outputs no carry.

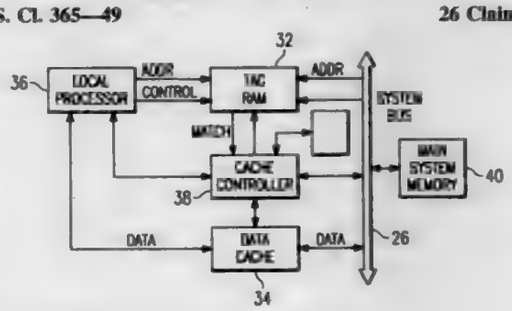
5,471,415
CACHE TAG MEMORY

David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 30, 1993, Ser. No. 85,588

Int. Cl.[6] G11C *15/00;13/00*

U.S. Cl. 365—49 **26 Claims**



1. A digital computer system comprising:

a processor

a main memory;

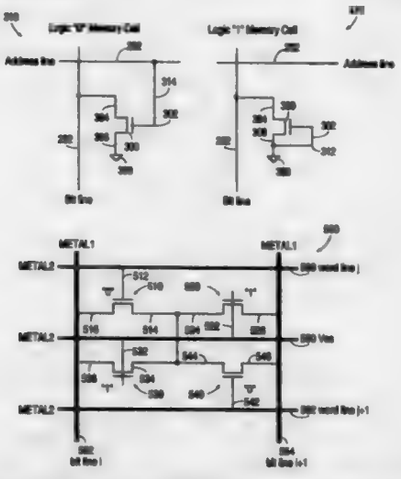
a data cache connected to the processor and the main memory;
a true data signal and a complement data signal; and
a tag cache memory connected to the processor and the main memory, the tag cache memory including:
a plurality of memory groups, each memory group having a plurality of true and complement outputs;
a plurality of true and complement data bus lines, wherein each true data bus line is connected to a true output from each of the plurality of memory groups, each complement data bus line is connected to a complement output from each of the plurality of subgroups, and the true and complement data bus lines having the true and complement data signals, respectively;
a plurality of data bus circuits, each data bus circuit including:
a true circuit input and a complement circuit input, wherein the true and complement circuit inputs are connected to a true and complement data bus line;
a true circuit output and a complement circuit output;
a first transistor, having a drain connected to the true circuit input, a source connected to a power supply voltage, and a gate connected to the complement data signal; and
a second transistor having a drain connected to the complement circuit input, a source connected to the power supply voltage, and a
gate connected to the true data signal; and a compare circuit having a plurality of input pairs, each input pair having a true input and a complement input, and an output for indicating the presence of a hit, wherein true input of each input pair is connected to the true circuit input of a data bus circuit and the complement input of each input pair is connected to the complement circuit input of the data bus circuit, wherein the presence of a hit may be indicated at the output of the compare circuit.

5,471,416

METHOD OF PROGRAMMING A CMOS READ ONLY MEMORY AT THE SECOND METAL LAYER IN A TWO-METAL PROCESS

Ziv Azmanov, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 14, 1994, Ser. No. 337,793
Int. Cl.[6] G11C *17/00*
U.S. Cl. 365—104 **7 Claims**



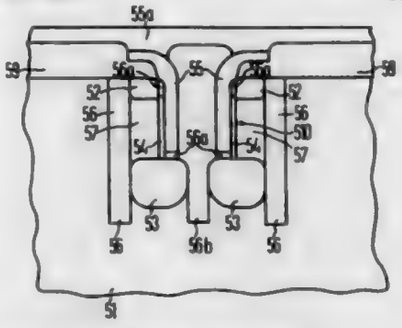
1. A method of programming a ROM using a standard two-metal layer polysilicon gate CMOS process, comprising the steps of:
forming an array of transistors having drain regions. coupled to a plurality of bit-lines in a first metal layer and having source regions coupled to a plurality of reference voltage lines in a second metal layer;
forming a plurality of word-lines in the second metal layer; and
selectively coupling a word-line to the gate of a transistor to program a memory cell to a first state or alternatively coupling a reference voltage line to the gate of the transistor to program the memory cell to a second state.

5,471,417

FERROELECTRIC MEMORY CELL ARRANGEMENT

Wolfgang Krautschneider, Ottobrunn, and Wolfram Wersing, Kirchheim, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

PCT No. PCT/DE91/00957, § 371 Date Jul. 9, 1993, § 102(e) Date Jul. 9, 1993, PCT Pub. No. WO92/12518, PCT Pub. Date Jul. 23, 1992
PCT Filed Dec. 10, 1991, Ser. No. 87,814
Claims priority, application Germany, Jan. 9, 1991, 41 00 465.5
Int. Cl.[6] G11C *11/22*
U.S. Cl. 365—145 **12 Claims**



1. A memory cell arrangement, comprising:
a semiconductor substrate,
at least one field-effect transistor in said semiconductor substrate having a source region, a drain region, a gate dielectric and a gate electrode, said at least one field-effect transistor being a memory cell said semiconductor substrate being doped with a first type of conductivity and said source region and said drain region being doped with a second type of conductivity which is opposite to the first type of conductivity,
said gate dielectric including at least one ferroelectric layer,
said at least one field-effect transistor including a plurality of adjacent field-effect transistors in said semiconductor substrate,
a word line connecting each gate electrode of said plurality of adjacent field-effect transistors to one another,
insulation areas in said semiconductor substrate insulating said plurality of adjacent field-effect transistors from one another,
a first doped layer doped with said first type of conductivity and a second doped layer doped with said second type of conductivity provided in said semiconductor substrate below each of said plurality of adjacent field-effect transistors,
said insulation areas laterally bounding said first doped layer and said second doped layer for laterally insulating respective ones of said plurality of adjacent field-effect transistors,
a third doped layer doped with the first type of conductivity and arranged below said second doped layer in said semiconductor substrate and a fourth doped layer doped with the second type of conductivity and arranged below said third doped layer,
said insulation areas laterally bounding said third doped layer and said fourth doped layer for laterally insulating respective ones of said plurality of adjacent field-effect transistors,
a dopant concentration of said first doped layer, of said second doped layer and of said third doped layer being of such a magnitude that Zener diodes are formed from said first doped layer and said second doped layer and from said second doped layer and said third doped layer having breakdown voltages which are exceeded by a voltage required for polarization of said ferroelectric layer.

5,471,418

SEMICONDUCTOR MEMORY WITH STACKED-CAPACITOR CELLS

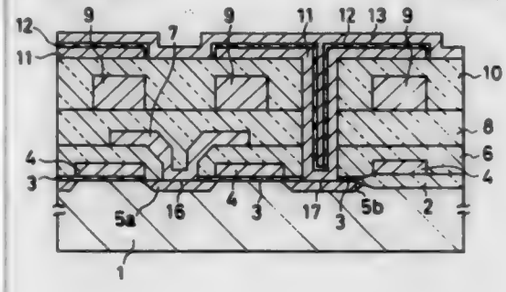
Takaho Tanigawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 7, 1993, Ser. No. 116,675

Claims priority, application Japan, Sep. 7, 1992, 4-237945

Int. Cl.[6] G11C *11/24*

U.S. Cl. 365—149 13 Claims



1. A semiconductor memory containing an array of memory cells, bit lines and word lines, said bit lines and said word lines being electrically connected to said memory cells, respectively, each of said memory cells comprising:

an MOS select transistor having a pair of source/drain regions formed in a semiconductor substrate and a gate electrode formed on a gate insulator on said substrate, said gate electrode acting as a part of one of said word lines;

a first interlayer insulator film formed on said substrate and covering said select transistor, said bit lines being placed on said first interlayer insulator film and one of said bit lines contacting one of said pair of source/drain regions through a first contact hole penetrating said first interlayer insulator film;

a second interlayer insulator film formed on said first interlayer insulator film and covering said bit lines;

a first patterned wiring film formed on said second interlayer insulator film, said first patterned wiring film acting as a part of one of said word lines;

a third interlayer insulator film formed on said second interlayer insulator film and covering said first patterned wiring film;

a first capacitor electrode constituting a storage capacitor, said first capacitor electrode being formed on said third interlayer insulator film and contacting the other of said pair of source/drain regions through a second contact hole penetrating said first, second and third interlayer insulator films;

a capacitor dielectric constituting said storage capacitor, said capacitor dielectric being formed on said first storage electrode and covering an entire surface of said capacitor electrode; and

a second capacitor electrode constituting said storage capacitor, said second capacitor electrode being formed on said capacitor dielectric and covering an entire surface of said dielectric;

wherein each of said memory cells further comprises a second patterned wiring film acting as a selection line of a column decoder between said first patterned wiring film and said capacitor storage electrode.

5,471,419

SEMICONDUCTOR DEVICE HAVING A PROGRAMMABLE MEMORY CELL

Lakshmi N. Sankaranarayanan; Jan W. Slotboom, and Arjen G. Van Der Sijde, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

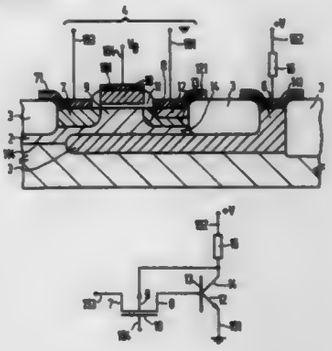
Continuation of Ser. No. 989,624, Dec. 14, 1992, abandoned.

This application Apr. 22, 1994, Ser. No. 231,860

Claims priority, application European Pat. Off., Dec. 16, 1991, 91203306

Int. Cl.[6] G11C *11/40*

U.S. Cl. 365—177 1 Claim

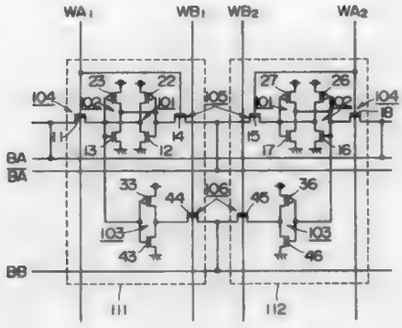


1. A semiconductor device comprising a semiconductor body with a programmable memory cell which comprises a single bipolar transistor with an emitter region and a collector region of a first conductivity type mutually separated by a base region of a second, opposite conductivity type, the emitter region being coupled to a first supply line and the collector region being coupled to a second supply line, while the base region is connected through a control transistor to a third supply line in order to provide the bipolar transistor with a controllable base current at least temporarily during operation, wherein the collector region is laterally electrically insulated, the collector region is connected to the second supply line through a load, and the collector region provides feedback to the control transistor such that during operation within a given voltage domain a change in magnitude of the potential difference between the emitter region and the collector region in a first direction causes a change in conductance of the control transistor in a second, opposite direction, which contributes to a change in the magnitude of the base current in said second direction, the control transistor comprises a field effect transistor having a source zone and a drain zone of the second conductivity type which are mutually separated by a controllable channel region, the collector region provides feedback to the channel region of the field effect transistor, the channel region is separated from a gate electrode by a dielectric layer, the collector region is electrically connected to the channel region, the channel region and the collector region are together formed by a first semiconductor zone of the first conductivity type and one of the source zone and the drain zone together with the base region are formed by a second semiconductor zone of the second conductivity type, the device further comprising a similar further memory cell, the memory cell and further memory cell comprising a collector region adjoining the surface and situated on a buried layer of the second conductivity type, which buried layer forms the base region, the buried layer being situated on an emitter region of the first conductivity type common to both cells, the cells being mutually separated by a groove which extends from the surface at least to the emitter region, and the gate electrode being provided in said groove and being common to both cells.

5,471,420
MEMORY CELL ARRAY SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Koji Nii, and Hideshi Maeno, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1994, Ser. No. 202,823
Claims priority, application Japan, Mar. 1, 1993, 5-039722
Int. Cl.[6] G11C *11/40*
U.S. Cl. 365—182 8 Claims



1. A memory cell array comprising:

at least a first memory cell including at least first and second pairs of rows of transistors;

each of said pairs including first and second rows having first and second conductivity types, respectively;

first, second, third and fourth transistors in said first row of said first pair;

fifth and sixth transistors in said second row of said first pair;

each of said first, second, third and fourth transistors being adjacent and sharing source/drain regions with an adjacent one of said first, second, third and fourth transistors;

each of said fifth and sixth transistors being adjacent and sharing a source/drain region;

said second and fifth transistors being connected in series between first and second reference voltages to form a first inverter;

said third and sixth transistors being connected in series between said first and second reference voltages to form a second inverter;

an input of said first inverter being connected to an output of said second inverter;

an input of said second inverter being connected to an output of said first inverter;

said first and fourth transistors having sources connected to first and second bit lines, respectively;

said first and fourth transistors having gates connected to a write word line;

said first and fourth transistors having drains connected to said input of said first inverter and said input of said second inverter, respectively;

seventh and eighth transistors in said first and second row of said second pair, respectively;

said seventh and eighth transistors being connected in series between said first and second reference voltages to form a third inverter;

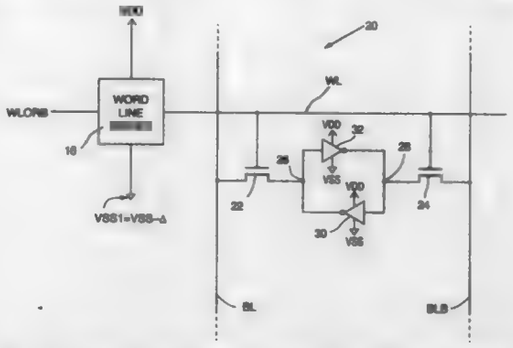
an input of said third inverter being connected to said output of said second inverter; and

a ninth transistor having a drain connected to an output of said third inverter, a source connected to a read out line, and a gate connected to a read word line.

5,471,421
STORAGE CELL USING LOW POWERED/LOW THRESHOLD CMOS PASS TRANSISTORS HAVING REDUCED CHARGE LEAKAGE

James W. Rose, San Carlos; Godfrey P. D'Souza, Santa Clara; Jonathan J. Stinehelfer, San Jose, and James F. Testa, Mountain View, all of Calif., assignors to Sun Microsystems, Inc., Del.

Filed Dec. 16, 1994, Ser. No. 358,202
Int. Cl.[6] Q11C *13/00*
U.S. Cl. 365—182 23 Claims



14. A method of providing a memory device, comprising the steps of:

providing a storage cell having a storage node for holding a logic state indicative of a data value;

providing a bit line associated with the storage cell;

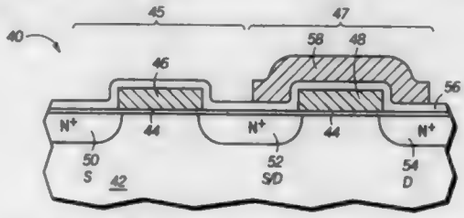
providing a pass transistor coupled to the bit line and the storage node of the storage cell; and

providing a reverse-biasing circuit, coupled to the pass transistor, for reverse-biasing the pass transistor regardless of whether the storage node is maintained at a logical 1 or a logical 0.

5,471,422
EEPROM CELL WITH ISOLATION TRANSISTOR AND METHODS FOR MAKING AND OPERATING THE SAME

Ko-Min Chang; Danny P. Shum, and Kuo-Tung Chang, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 11, 1994, Ser. No. 225,868
Int. Cl.[6] G11C *11/34*; H01L *29/68*
U.S. Cl. 365—185.26 21 Claims



1. An electrically erasable and programmable read-only memory cell comprising:

a semiconductor substrate;

a tunnel dielectric formed on the substrate;

a floating gate transistor having a floating gate and a control gate overlying the floating gate, wherein the floating gate is formed on the tunnel dielectric;

an isolation transistor having an isolation gate formed on the tunnel dielectric;

wherein the tunnel dielectric has a substantially uniform thickness beneath both the floating gate and the isolation gate within the cell, and wherein the substantially uniform thickness is less than approximately 120 angstroms.

5,471,423

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

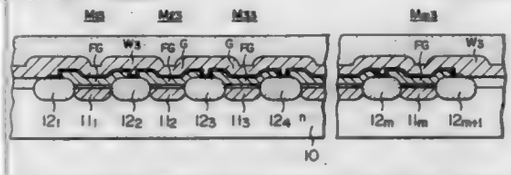
Shoichi Iwasa, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed May 16, 1994, Ser. No. 243,621

Claims priority, application Japan, May 17, 1993, 5-139093; May 17, 1993, 5-139094

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.01 **17 Claims**



1. A non-volatile semiconductor memory device comprising:

a plurality of semiconductor layers of a first conductivity type, said semiconductor layers extending parallelly in a column direction and being isolated from each other;

a plurality of memory cells disposed in a matrix of columns and rows, each memory cell having source and drain regions of a second conductivity type different from said first conductivity type, a channel region formed between said source and drain regions and a gate structure formed on the channel region with a gate insulating layer interposed therebetween and including a floating gate, an interlayer insulating layer and a control gate, said memory cells being divided into a plurality of memory cell groups formed on the semiconductor layers, respectively, so that all the memory cells included in one of said memory cell groups are formed on one of the semiconductor layers respectively and drain-source circuits of the memory cells of each group are connected in series to provide a series electrical path;

a plurality of first bit lines provided to said plurality of memory cell groups, respectively, each first bit line being connected to the semiconductor layer on which the memory cells included in an associated one of said plurality of memory cell groups are formed;

a plurality of second bit lines provided to said plurality of memory cell groups, respectively, each second bit line being connected to one end of the series electrical path provided to the memory cells included in an associated one of said plurality of memory cell groups: and

a plurality of word lines, each word line being connected to the control gates of the memory cells disposed in one of the rows.

5,471,424

WRITE ONCE TYPE INFORMATION RECORDING MEDIUM, METHOD AND APPARATUS FOR FORMATTING THE SAME, AND METHOD AND APPARATUS FOR WRITING DATA TO OR READING DATA FROM THE SAME

Masayuki Takada; Osamu Yamada; Toru Kuroda, all of Tokyo; Koichi Yamazaki, Sakado, and Kazuo Noda, Yokohama, all of, Japan, assignors to Nippon Hoso Kyokai, and Nippon Conlux Co., Ltd., both of Tokyo, Japan

Filed Mar. 28, 1994, Ser. No. 219,303

Claims priority, application Japan, Mar. 29, 1993, 5-069830; Mar. 15, 1994, 6-044032

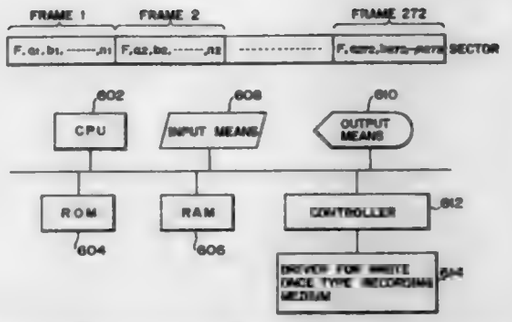
Int. Cl.[6] G11C *7/00*; G06K *7/10*

U.S. Cl. 365—189.01 **18 Claims**

14. A data writing apparatus for writing data into a write once type recording medium having a format including a plurality of sectors, each of said sectors including x p-bit frames, respectively containing f-bit synchronization signal regions and d-bit data regions, said data writing apparatus comprising:

a ROM (read-only memory) for storing a program for executing an initializing process of said data writing apparatus when said data writing apparatus is energized;

a memory for storing at least one x-bit packet in which a v-bit error correction code is added to u-bit data;



data writing means for writing each of x bits of said packet read out from said memory into each of said data regions of said x frames; and

output means for outputting an output indicating that data writing is completed after said data is written;

where x, p, f, d, u and v are positive integers.

5,471,425

DYNAMIC RANDOM ACCESS MEMORY HAVING SENSE AMPLIFIER CONTROL CIRCUIT SUPPLIED WITH EXTERNAL SENSE AMPLIFIER ACTIVATING SIGNAL

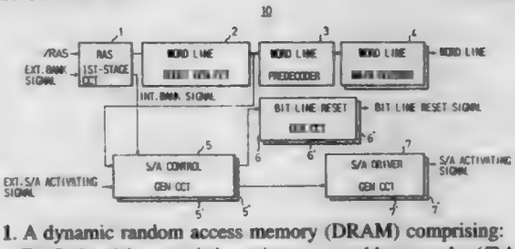
Fuminori Yumitori, and Yasuhiro Fujii, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 26, 1994, Ser. No. 186,609

Claims priority, application Japan, Mar. 10, 1993, 5-049379

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—190 **6 Claims**



1. A dynamic random access memory (DRAM) comprising:

a /RAS signal input unit inputting a row address strobe (/RAS) signal;

a plurality of memory cells selected by word lines and bit lines;

sense amplifiers connected to each one of said bit lines;

a word line (WL) boost signal-generating circuit activating at least one of said word lines, in response to an input of the row address strobe (/RAS) signal; and

a sense amplifier control signal-generating circuit, coupled to said word line (WL) boost signal-generating circuit, controlling said sense amplifiers to activate.or deactivate said sense amplifiers, in response to said row address strobe (/RAS) signal and an external sense amplifier activating signal output from an external sense amplifier activating signal generating circuit,

wherein said external sense amplifier activating signal generating circuit maintains said sense amplifier under the active condition when said row address strobe (/RAS) signal is de-activated.

5,471,426

REDUNDANCY DECODER

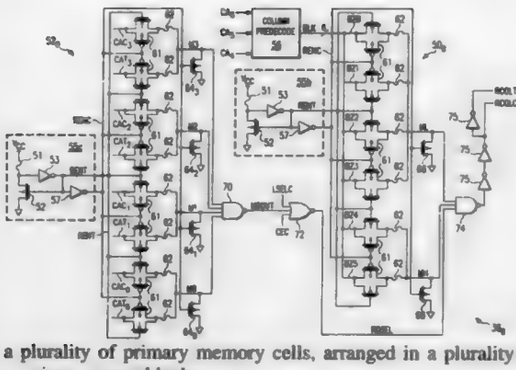
David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jan. 31, 1992, Ser. No. 830,315

Int. Cl.[6] G11C *7/00;29/00*

U.S. Cl. 365—200 **2 Claims**

1. An integrated circuit, comprising:



a plurality of primary memory cells, arranged in a plurality of primary array blocks;

means for accessing a primary memory cell responsive to a column address signal presented thereto, comprising:

a column predecoder, having a plurality of block select outputs, for decoding a first portion of the column address signal and for generating a block select signal at its block select outputs to select one of the plurality of primary array blocks corresponding to the value of the first portion of the column address signal; and

a column decoder, for decoding a second portion of the column address signal, and for selecting a column in the selected primary array block corresponding to the second portion of the column address signal;

a redundant memory array comprising a plurality of redundant memory cells; and

a redundant decoder, for selecting a redundant memory cell responsive to an address signal presented thereto corresponding to a programmed value in said redundant decoder, said redundant decoder comprising:

an enable circuit, comprising a fuse, having an output indicating whether or not the redundant decoder is enabled responsive to the state of its fuse;

a first plurality of compare circuits, each having an input for receiving an associated one of the block select outputs of said column predecoder, and each having an output, the outputs of the first plurality of compare circuits being connected together;

a second plurality of compare circuits, each having an input coupled to an address line corresponding to the second portion of the column address signal, and having an outputs, each of said first and second pluralities of compare circuits comprising (a) a pass gate having a conduction path, and having a control terminal coupled to the output of said enable circuit so that said pass gate is conductive responsive to the enable circuit indicating that the redundant decoder is enabled, and (b) a fuse, connected in series with the conduction path of the pass gate between the input and output of its compare circuit, for disconnecting, when opened, the input of its compare circuit from the output of its compare circuit;

a conjunctive logic circuit coupled to receive the connected-together outputs of said first plurality of compare circuits, and to receive the outputs of said second plurality of compare circuits, said conjunctive logic circuit having an output coupled to enable selection of a redundant memory cell in said redundant memory array responsive to the column address signal matching a programmed value corresponding to a pattern of opened fuses in the first and second pluralities of compare circuits; and

a plurality of bias transistors, each having a conduction path coupled between the output of one of said first and second pluralities of compare circuits and a bias voltage, and each having a control terminal coupled to the output of said enable circuit in such a manner that, when the redundant decoder is not enabled, each of the inputs to said conjunctive logic circuit is biased to said bias voltage to cause the output of said conjunctive logic circuit not to enable selection of a redundant memory cell in said redundant memory array.

5,471,427

CIRCUIT FOR REPAIRING DEFECTIVE BIT IN SEMICONDUCTOR MEMORY DEVICE AND REPAIRING METHOD

Shuji Murakami; Tomohisa Wada, and Kenji Anami, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

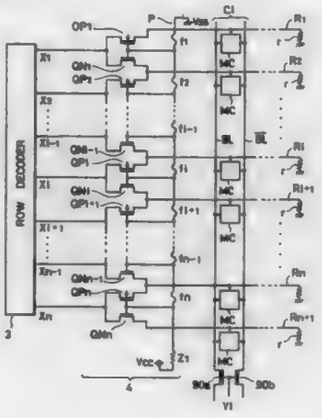
Continuation of Ser. No. 828,284, Jan. 30, 1992, which is a continuation of Ser. No. 500,965, Mar. 29, 1990, Pat. No. 5,134,585. This application Jun. 20, 1994, Ser. No. 262,755

Claims priority, application Japan, Jun. 5, 1989, 1-142450

The portion of the term of this patent subsequent to Jul. 28, 2009, has been disclaimed.

Int. Cl.[6] **G11C** *7/00;29/00*

U.S. Cl. 365—200 **2 Claims**



1. A semiconductor memory device with redundant memory cells, comprising:

a plurality of memory cells arranged in a matrix of (n+2) rows and m columns;

(n+2) row lines arranged in said (n+2) rows, each row line having connected thereto memory cells arranged in a corresponding row;

m column lines arranged in said m columns, each column line having connected thereto memory cells arranged in a corresponding column;

row decoder means receiving row address signals and having n output lines, and for selecting one of said n output lines in accordance with received row address signals;

column decoder means responsive to column address signals for selecting a column line of said m column lines;

n connecting means, one for each output line of said row decoder means, provided between said n output lines of said row decoder means and said (n+2) row lines, each said connecting means including a first transistor element having a first conduction terminal connected to a corresponding output line of said row decoder means and a second conduction terminal connected to a row line arranged in a related row, and a second transistor having a first conduction terminal connected to said corresponding output line of said row decoder means and a second conduction terminal connected to a row line arranged in a next nearest row in a physical sequence with respect to said related row; and

selecting means for setting one of the first and second transistor elements of each connecting means in a conductive state, and for setting the other of the first and second transistor elements in a non-conductive state.

5,471,428
HIGH PERFORMANCE SINGLE PORT RAM GENERATOR ARCHITECTURE

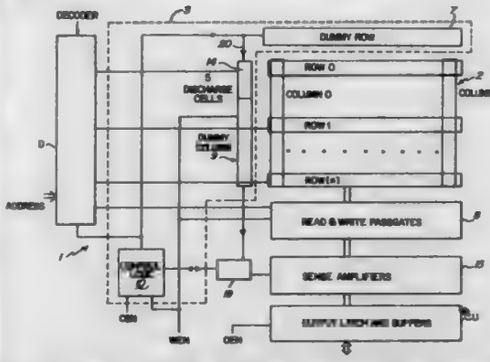
Andrea Baroni, Viadana; Giovanni Mastrodomenico, Campobasso; Taliercio Michele, Ariuno; Piero Capocelli, Milan, all of, Italy; Luigi Carro, Porto Alegre, Brazil, and Rajamohan Varambally, Karnataka, Ind., assignors to SGS-Thomson Microelectronics S.r.l, Agrate Brianza, Italy

Filed Nov. 30, 1993, Ser. No. 159,181

Claims priority, application European Pat. Off., Nov. 30, 1992, 92830644

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—201 **30 Claims**



1. A single-port RAM generator architecture for generating different RAMs structures in a CAD environment and including a Static RAM matrix and a self timed architecture, wherein the self timed architecture comprises a dummy row and a dummy column having, respectively, an equivalent load of a word line and of a bit column of said matrix, said dummy column being discharged at a faster rate than the corresponding bit column.

5,471,429
BURN-IN CIRCUIT AND METHOD THEREFOR OF SEMICONDUCTOR MEMORY DEVICE

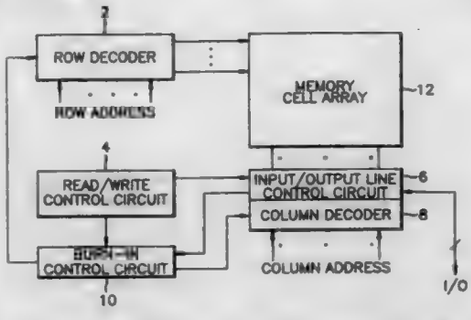
Seung-Keun Lee, and Choong-Keun Kwak, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 28, 1994, Ser. No. 348,180

Claims priority, application Rep. of Korea, Nov. 26, 1993, 1993-25324

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—201 **24 Claims**



1. A semiconductor memory device including a memory cell array which has a plurality of memory cells that are accessed in response to an address which is provided to row and column decoders, said semiconductor memory device comprising:

an input/output line control circuit connected between data input/output pins and columns of the memory cells, for selectively transmitting data provided from the memory cell array to the data input and output pins or data provided from the data input and output pins to the memory cell array in response to read and write signals, said data provided from the data input and output pins being outputted to be used as a burn-in test data during a burn-in operation of the memory cell array;

a read/write control circuit for supplying the read and write signals to the input/output line control circuit, and outputting a write burn-in signal which is generated by the write signal; and

a burn-in control circuit for receiving said write burn-in signal and said data provided from the data input and output pins, and supplying a burn-in signal to said row and column decoders, thereby performing the burn-in operation of the memory cell array after a package process to the device is finished.

5,471,430
TEST CIRCUIT FOR REFRESH COUNTER OF CLOCK SYNCHRONOUS TYPE SEMICONDUCTOR MEMORY DEVICE

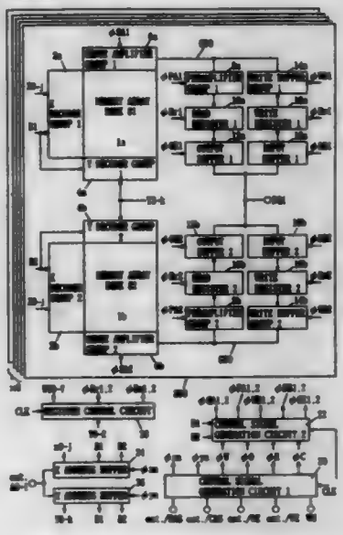
Seiji Sawada, and Yasuhiro Konishi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1994, Ser. No. 245,784

Claims priority, application Japan, May 24, 1993, 5-121179

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—222 **29 Claims**



1. A synchronous semiconductor memory device having a plurality of dynamic memory cells requiring refresh operations and taking in external signals in synchronization with a clock signal being formed of a series of pulses, said synchronous semiconductor memory device comprising:

refresh address generation means for generating a refresh address for specifying a memory cell to be refreshed among said plurality of dynamic memory cells;

refresh means for refreshing said memory cell specified by said refresh address generated from said refresh address generation means in response to a refresh designating signal;

first inactivation means for inactivating said refresh means after a lapse of a prescribed time in response to said refresh designating signal;

second inactivation means for inhibiting said first inactivation means from operation in response to a first operation mode designating signal being different from said refresh designating signal; and

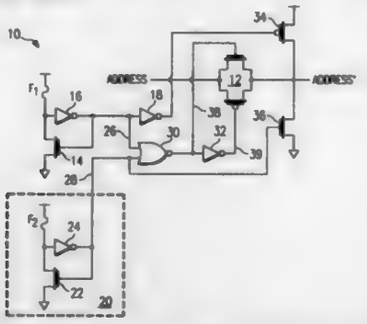
third inactivation means for inactivating said refresh means in response to a second operation mode designating signal.

5,471,431

STRUCTURE TO RECOVER A PORTION OF A PARTIALLY FUNCTIONAL EMBEDDED MEMORY

David C. McClure, Carrollton, Tex., assignor to SGS-THOMSON Microelectronics, Inc., Carrollton, Tex.

Filed Apr. 22, 1993, Ser. No. 51,184
Int. Cl.[6] G11C 13/00
U.S. Cl. 365—225.7 22 Claims



1. A method for selecting a desired portion of an embedded memory which is housed in a device, comprising the steps of:

identifying at least a first address bit to define the desired portion of the embedded memory; and

setting a first address signal, which correspond to the identified first address bit, to either a first logic state or a second logic state so as to define the desired portion of the embedded memory, wherein setting the first address signal is controlled by a transmission gate, a first fuse circuit, a second fuse circuit, pull-up circuitry which provides pull-up to a first supply voltage, and pull-down circuitry which provides pull-down to a second supply voltage, and

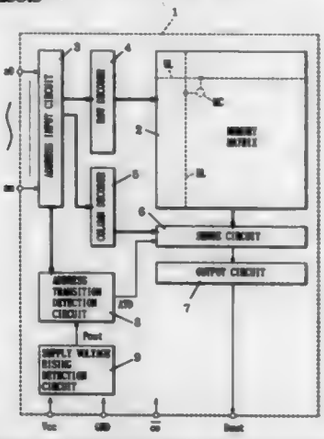
wherein when the first fuse circuit is blown and the second fuse circuit is not blown, the transmission gate does not conduct and the pull-up circuitry sets the first address signal to the first logic state.

5,471,432

SEMICONDUCTOR MEMORY DEVICE HAVING ADDRESS TRANSITION AND SUPPLY VOLTAGE DETECTING CIRCUITS

Hiroyasu Makihara, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 831,437, Feb. 5, 1992, abandoned.
This application Jan. 13, 1994, Ser. No. 181,487
Claims priority, application Japan, Feb. 12, 1991, 3-042707
Int. Cl.[6] G11C 8/00
U.S. Cl. 365.233.5— 13 Claims



10. An address transition detecting device for detecting transition of an address signal including:

detecting means for detecting the transition of said address signal and generating a detection signal to read out data stored in a read only memory means; and

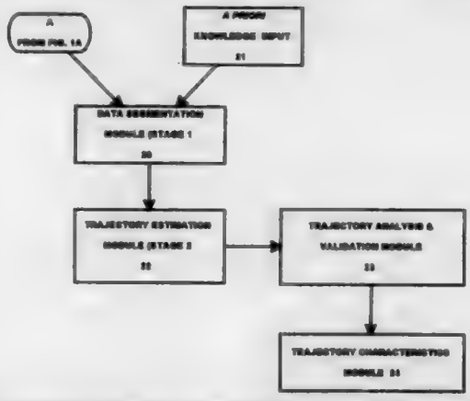
inhibiting means for inhibiting an operation of said detecting means until a supply voltage reaches a predetermined voltage after application of power such that said detection signal is generated only after the supply voltage has reached the predetermined voltage.

5,471,433

SYSTEM AND METHOD FOR RAPIDLY TRACKING HIGHLY DYNAMIC VEHICLES

Sherry E. Hammell, Little Compton; Kai F. Gong, Pawtucket; Neil A. Jackson, North Kingston, all of R.I.; Kathleen D. Keay, Fairhaven, and John F. MacDonald, Westport, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1994, Ser. No. 324,638
Int. Cl.[6] G01S 15/66;15/58
U.S. Cl. 367—118 7 Claims



1. A trajectory estimation system for estimating a trajectory of a target in response to a series of data items which generated in response to motion of the target, said trajectory estimation system comprising:

data segmentation means for processsing the series of data items in accordance with a multiple-hypothesis regression methodology to generate a plurality of segments, each having associated data items which have similar features; and

trajectory selection means for processing said segments in accordance with a multiple-model hypothesis methodology to generate a corresponding statistically-supportable candidate trajectory motion estimate of target motion thereby to provide indicia of an overall trajectory of the target.

5,471,434

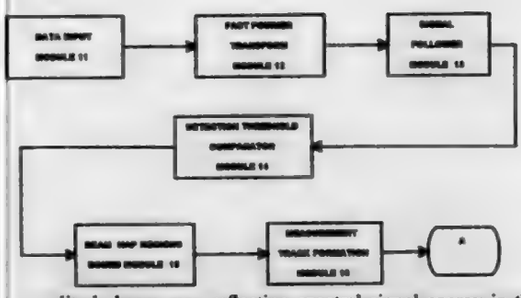
SYSTEM AND METHOD FOR RAPIDLY TRACKING VEHICLES OF SPECIAL UTILITY IN LOW SIGNAL-TO-NOISE ENVIRONMENTS

John S. Davis, Swansea, Mass.; Kai F. Gong, Pawtucket, and Sherry E. Hammel, Little Compton, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 18, 1994, Ser. No. 324,639
Int. Cl.[6] G01S 15/00
U.S. Cl. 367—124 4 Claims

1. A system for facilitating the tracking of a target vehicle in an ocean environment in connection with successively-received acoustic sensor signal data items representative of the motion of said target vehicle, said system comprising:

fast Fourier transform means for performing a fast Fourier transform operation in connection with each successive acoustic sensor signal data item to generate a phase and



amplitude beam map reflecting spectral signal energy in the received acoustic sensor signal data item;

a signal detector means for determining whether the beam map generated by said fast Fourier transform means for a acoustic sensor signal data item indicates that the acoustic sensor signal data item represents a signal having a signal-to-noise ratio above a first predetermined threshold value;

a beam map regions bound module for, in response to a positive determination by said signal detector means, using a beam map generated by the fast Fourier transform means for at least the acoustic sensor signal data item immediately proceeding the acoustic sensor signal data item for the signal having a signal-to noise ratio above a predetermined threshold value to generate a bounded beam map, and determining whether the bounded beam map represents a signal having a second predetermined signal-to-noise ratio; and

processing means responsive to a positive determination by said beam map regions bound module for using both the beam map for the acoustic sensor signal data item representing the signal having a signal-to-noise ratio above the first predetermined threshold value and the beam map for the acoustic sensor signal data item whose bounded beam map represents a signal having a second predetermined signal-to-noise ratio to generate tracking information for said target vehicle.

5,471,435

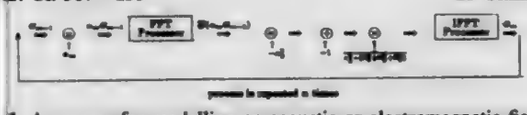
METHOD FOR ACOUSTIC/ELECTROMAGNETIC SIGNAL PROCESSING

Richard A. Marschall, Ft. Pierce, Fla., assignor to Marshall Acoustics Pty., Ltd., Parramatta, Australia

Filed May 13, 1994, Ser. No. 242,555

Int. Cl.[6] G01R *23/16*

U.S. Cl. 367—135 **18 Claims**



1. A process for modelling an acoustic or electromagnetic field at a given wave number in an inhomogeneous medium comprising:

setting a grid of locations within the medium, $\bar{x}$,

determining a medium model set of data points corresponding to the wave field, $G_0(\bar{x})$, and the wave velocity in a homogeneous medium at each said location;

forming sequentially a fixed number of perturbed data sets $\alpha_1(\bar{x})G_0(\bar{x}), \ldots, \alpha_m(\bar{x})G_{m-1}(\bar{x})$, each intermediate a set of data points corresponding to the homogeneous medium and the n-th medium model of data points, for each said perturbed data set, the data corresponding to a location sequentially changing from the data for a homogeneous medium to the data in the n-th medium model;

said perturbed data sets being the product of a step-wise increasing perturbation function, $\alpha(\bar{x})$, and the initial homogeneous medium model and iteratively successively produced approximate models;

forming the Fast Fourier Transform 143500_001$\{\alpha_m(\bar{x})G_{m-1}(\bar{x})\}$ of said product;

forming the transformed product

$$\frac{-1-\kappa_0^2 \quad \{\alpha_m(\bar{x})G_{m-1}(\bar{x})\}}{\kappa_0^2-|\bar{\Omega}|^2}$$

where k_0^2 is the constant part of the wave number squared and $\bar{\Omega}$ is the transformed space coordinates;

forming the Inverse Fast Fourier Transform of the transformed product to produce a new approximate model;

repeating the procedure n times; and:

outputting the resulting n-th model against the chosen location grid, $\bar{x}$, as the wave field model of the acoustic or electromagnetic field.

5,471,436

VIBRATION ISOLATION MODULES (VIM) FOR TOWED ARRAY STREAMERS

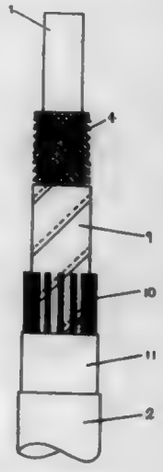
Anthony P. Harvey, Burwood, Australia, assignor to GEC Marconi Systems PTY Limited ACN 003 890 515, Meadowbank, Australia

PCT No. PCT/AU92/00066, § 371 Date Aug. 19, 1994, § 102(e) Date Aug. 19, 1994, PCT Pub. No. WO93/17355, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 21, 1992, Ser. No. 290,985

Int. Cl.[6] H04R *1/44;* **H01B** *7/12*

U.S. Cl. 367—154 **14 Claims**



1. A towed streamer comprising:

a central core, said central core including a longitudinal core tube;

a plurality of longitudinally extending non-compliant strength members aligned in spaced-apart relationship within the core tube of said central core;

a gel disposed within the core tube of said central core and surrounding said non-compliant strength members;

a data bearer layer disposed annularly about said central core, said data bearer layer including data bearer wires, a gel filling, and a wrapping;

a plurality of compliant strength members positioned on said data bearer layer;

an inner jacket formed over and around said plurality of compliant strength members; and

an outer jacket encasing said inner jacket, whereby said compliant strength members render the streamer compliant for a predetermined elongation, after which the non-compliant strength members act to render the streamer non-compliant.

5,471,437

ELECTRODYNAMIC ACOUSTIC TRANSDUCER

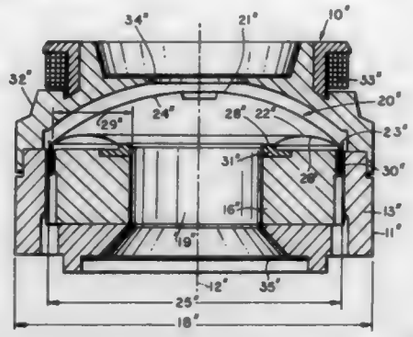
Ernst Schutter, and Vladimir Gorelik, both of Hanover, Germany, assignors to Sennheiser electronic KG, Wedemark, Germany

Filed Aug. 30, 1994, Ser. No. 298,378

Claims priority, application Germany, Sep. 4, 1993, 43 29 982.2

Int. Cl.[6] G10K *13/00*

U.S. Cl. 367—175 **2 Claims**



1. In an electrodynamic acoustic transducer with a diaphragm substantially having two parts with different profiles,

namely an acoustically active central part with a domed top and an annular part for resilient suspension of the diaphragm and which adjoins the central part,

wherein a coil seat for a wire coil of the transducer is arranged in an annular transitional area between said central part and said annular part, said coil seat forming an outer boundary of the central part,

the improvement comprising that said coil seat additionally forms an outer boundary of the annular part and determines the maximum outer diameter of the diaphragm in its entirety,

and that the annular part is arranged below the domed top of the central part so as to be offseat axially thereto and extends inward radially proceeding from the coil set.

5,471,438

ELECTRONIC DEVICE DESIGNED TO PERMIT DETACHABLE ATTACHMENT OF AN EXTERNAL MEMORY DEVICE THERETO

Tuneo Kobayashi, Tokyo; Kazunori Kita, Mizuhomachi, and Satomi Suzuki, Tachikawa, all of, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Division of Ser. No. 955,751, Dec. 17, 1992, Pat. No. 5,355,352. This application Apr. 7, 1994, Ser. No. 224,239

Claims priority, application Japan, Apr. 24, 1991, 3-122101; Jun. 24, 1991, 3-178848; Jun. 24, 1991, 3-178849; Apr. 15, 1992, PCT/JP92/00474

Int. Cl.[6] G04B *37/00*

U.S. Cl. 368—281 **27 Claims**

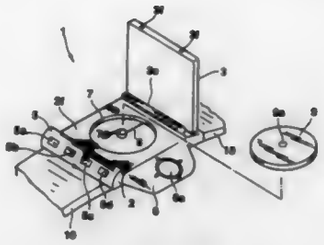
1. An electronic device comprising:

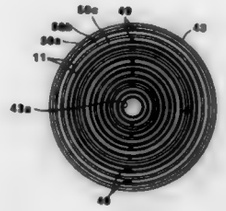
an external storage medium which includes a memory circuit for storing data, said external storage medium having an outer surface on which a plurality of connector electrodes are formed concentrical or in a concentric arc shape, the data stored in said memory circuit being supplied to at least one of said plurality of connector electrodes;

a body case having a retaining section for detachably accommodating said external storage medium;

a cover member, which is openable, said cover member being attached to said body case, and said cover member holding said external storage medium in said retaining section when said cover member is closed, said cover member including an optical display device therein; and

an electronic circuit receiving data stored in said external storage medium and for supplying a display signal to said optical display device.





5,471,439

MAGNETIC HEAD DEVICE WITH SLIDABLE AND ADJUSTABLE MAGNETIC HEAD

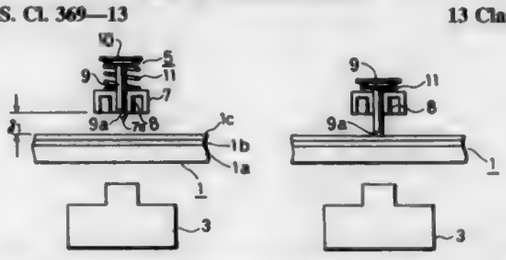
Yoshio Katayama; Seiichi Fujii; Sadao Uchiyama; Ryouichi Soejima; Hitoshi Moori, and Hideo Yoshida, all of Higashihiroshima, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Jan. 26, 1993, Ser. No. 9,064

Claims priority, application Japan, Feb. 14, 1992, 4-027614

Int. Cl.[6] G11B *11/10;5/54*

U.S. Cl. 369—13 **13 Claims**



13. A magneto-optical recording and reproducing apparatus for recording data on a magneto-optical disk through magnetic field modulation, comprising:

a magnetic head device which includes:

coil support means having a hollow tubular portion;

a single coil provided outside the hollow tubular portion of said coil support means;

magnetic means slidably provided within the hollow tubular portion of said coil support means; and elastic support means for supporting said magnetic head means so as to place it in a stand-by position where said magnetic means and the magneto-optical

disk do not contact with one another by an elastic force exerted on said magnetic means in a direction moving away from the magneto-optical disk;

an optical pickup for raising a temperature of a recording portion of the magneto-optical disk by projecting a laser beam onto the magneto-optical disk; and

control means, including memory means for temporarily storing the recording data, for generating an electromagnetic force by supplying thereto an excitation current to said single coil that then moves said magnetic means toward the magneto-optical disk in a direction opposite to the elastic force exerted by said elastic support means so as to come in contact with the magneto-optical disk when starting a recording operation, said control means being arranged so as to supply to said single coil a recording signal current corresponding to the recording data read out from said memory means when the magneto-optical disk has reached a desired rotation speed, and also

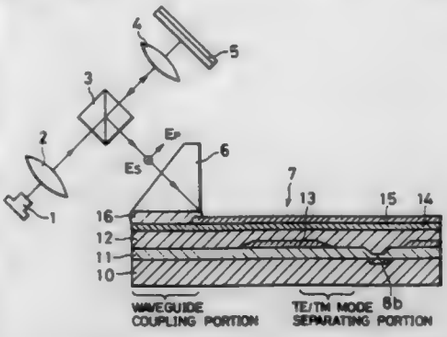
arranged so as to raise the temperature of the recording portion above its Curie temperature.

5,471,440

MAGNETOOPTIC APPARATUS WITH INTEGRATED DETECTING ELEMENT PROVIDING SIGNAL WITH HIGH S/N RATIO

Tami Isobe, Yokohama, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1993, Ser. No. 127,746
Claims priority, application Japan, Sep. 29, 1992, 4-260073
Int. Cl.[6] G11B *11/00;7/00*
U.S. Cl. 369—13 **4 Claims**



1. An apparatus for recording and reading out magnetooptic information in which light reflected from a magnetooptic recording medium is detected by an integrated detection element of a waveguide type, the magnetooptic information recording and reading out apparatus comprising:

a coupler for coupling the light reflected from the magnetooptic recording medium into said integrated detection element of a waveguide type; and

the integrated detection element, which element comprises:

a TE/TM mode separating element for separating the light coupled into said integrated detection element into TE and TM modes,

a first waveguide photodetector for detecting the separated TE mode, and

a second waveguide photodetector for detecting the separated TM mode,

wherein a polarization direction of said light reflected from the magnetooptic recording medium is inclined by an angle other than 45° with respect to perpendicular polarization directions of lights in the TE and TM modes in said integrated detection element, and wherein an output I_{TE} of said first waveguide photodetector is set to be approximately equal to an output I_{TM} of said second waveguide photodetector.

5,471,441

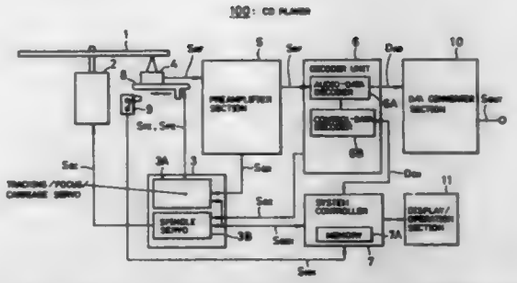
CD PLAYER CAPABLE OF PLAYING BACK PARTIALLY RECORDED CD

Yoshiya Nonaka; Yoshio Aoyagi; Hiroyuki Abe; Alex Bradshaw; Kazuhiro Kiyoura; Seiji Kato, and Koichiro Haraguchi, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 22, 1993, Ser. No. 7,856
Claims priority, application Japan, Jan. 24, 1992, 4-011437; Jan. 24, 1992, 4-011438; Jan. 24, 1992, 4-011439
Int. Cl.[6] G11B *17/22*
U.S. Cl. 369—32 **22 Claims**

1. A CD player capable of reproducing information from a CD and reproducing recorded information from a program area of a partially recorded CD, comprising:

unrecorded-area detecting means for detecting an unrecorded area, where no information is recorded, of a disk being played back;



address storing means for updating and storing an address of a current playback position on the disk, and for holding an address of a preceding playback position;

setup operation control means for, when the unrecorded area is detected, performing a setup operation at a position of that detection, and for performing a setup operation at a reference setup position if the setup operation at the position of detection has been unsuccessful;

playback control means for initiating playback from the preceding playback position in accordance with the address held by said address storing means when the setup operation at the reference setup position is complete; and

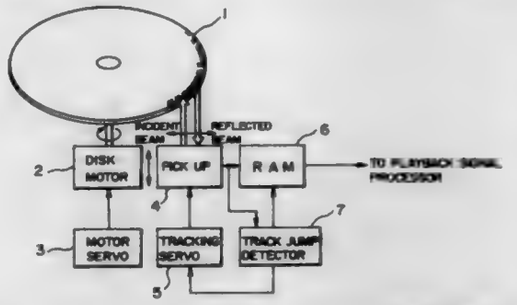
recording-end position discriminating means for discriminating position corresponding to an address stored by said address storing means as a recording end position of said disk when the playback from the preceding playback position and detection of the unrecorded area are repeated a predetermined number of times.

5,471,442

COMPACT DISC PLAYER USING SUB-Q DATA FOR TRACK JUMP COMPENSATION

Kazutoshi Shimizume, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 837,894, Feb. 20, 1992, abandoned. This application Dec. 29, 1993, Ser. No. 174,761
Claims priority, application Japan, Feb. 22, 1991, 3-050468
Int. Cl.[6] G11B *21/08;7/00;20/18*
U.S. Cl. 369—32 **6 Claims**



1. An apparatus for reproducing a signal including frames of data recorded in tracks on a disc, each frame of data having sub-Q data, comprising:

pickup means for reproducing the recorded signal to generate a reproduced signal,

comparison means for detecting whether an incremented value of sub-Q data in a first frame of the reproduced signal is equal to a value of sub-Q data in a second frame of the reproduced signal to generate a control signal indicating that a track jump has occurred,

means for adding a predetermined value to the sub-Q data in the first frame to generate the incremented sub-Q value,

servo means for controlling the pickup means to search for the first frame on the disc as a function of said control signal,

memory means for storing the reproduced signal, and

means for writing the reproduced signal into the memory means as a function of said control signal, said means for writing exhibiting only two operative conditions, a first condition to write the reproduced signal into the memory means at only one predetermined rate and a second condition to cease writing.

5,471,443

METHOD OF SELECTIVELY CONCEALING MAGNETO-OPTICAL COMPACT DISK DATA FOR PLAYBACK UPON DEMAND

Randall Jamail, P.O. Box 980369, Houston, Tex. 77098, and David Thompson, Houston, Tex., assignors to Randall Jamail, Houston, Tex.

Continuation of Ser. No. 172,849, Dec. 22, 1993, abandoned. This application Sep. 6, 1994, Ser. No. 301,040

Int. Cl.[6] G11B *17/22*

U.S. Cl. 369—32 **1 Claim**

1. A method of recording data on a magneto-optical compact disk for concealing the data for selective playback upon express demand, the data operatively associated with the disk,

the disk adapted for communication with a player or transcriber such that the disk has a start communication location and a terminate communication location with at least one track therebetween,

each track including a data recording area for executing at least one of recording and reproducing the data, and each track including a start mark indicative of a beginning location for the data recording area for that track, the start communication location precedes the first start mark for the first track, and the stop communication location follows the last data recording area for the last track,

the disk has a predefined begin play location which directs the player to begin playing at the begin play location such that the begin play location is at or in close proximity to the first start mark indicative of the beginning position for the first track, and the start mark for each track is identifiable by the player for determining the location on the disk to begin reproducing data for playback from the respective track,

such that upon normal playback the disk is engaged for communication with the player at the begin play location and the data begins to be removed from the disk by the player at the first start mark of the first track which track contains the first data recording area, and further upon demand additional data can be removed from each data recording area on the disk by the player directed by the start mark for each track identified by communication between the player and the disk for determining the location on the disk to begin reproducing data for playback from the data recording area of each respective track, the method comprising the steps of:

(a) setting the position of the start communication location on the disk,

(b) setting the position of the terminate communication location on the disk,

(c) setting the position of the begin play location on the disk remote from the start communication location such that the begin play location initiates communication between the disk and the player,

(d) disengaging along the disk in a direction remote from the begin play location and toward the start communication location sufficient to define a pre-gap track on the disk, the pre-gap track being between the begin play location and the start communication location for receiving data for recording and reproduction, the pre-gap track having a predetermined start location and end location based upon the amount of data to be impressed in the pre-gap track,

(e) determining the size of the pre-gap track by at least one of time measurement along the disk or distance measurement along the disk,

(f) impressing data on the disk within the pre-gap track for generating hidden data since the data in the pre-gap track is not affiliated with any combination of track and respective start mark which start mark is used by the player to receive direction for playing the respective track thus rendering the pre-gap track, and the associated hidden data, undetectable and concealed from the player,

(g) impressing data on the disk in the data recording area associated with each combination of track and respective start mark such that the start mark comprises information indicative of a beginning position for the respective track,

(h) engaging the player in communication with the disk for locating the begin play location,

(i) further engaging the player to locate the start location of the pre-gap track,

(j) demanding the player to play the hidden data from the pre-gap track between the start communication location and the begin play location, and

(k) transcribing the player past the begin play location for playing the data from the disk between the begin play location and the terminate communication location.

5,471,444

SEEK CIRCUIT FOR OPTICAL DISC

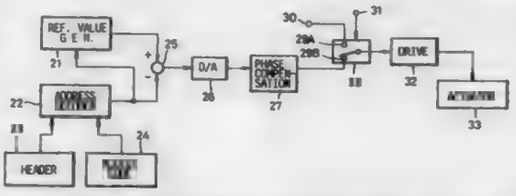
Shigeaki Wachi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 674,329, Apr. 15, 1991, abandoned. This application Sep. 13, 1994, Ser. No. 305,804

Claims priority, application Japan, Aug. 29, 1989, 1-222647

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—32 **5 Claims**



1. A seek circuit for moving an optical pickup to a set target track on an optical disc divided into sectors having a header area with a sector address and a track address and having an access code formed in a servo area of each sector, comprising:

a header decoder for decoding the sector address and the track address from a playback signal of said optical disc;

an access code decoder for decoding the access code from the playback signal of said optical disc;

an address decoder receiving the sector address and track address from said header decoder and said access code from said access code decoder for detecting an address of a current track;

drive means for moving said optical pickup in a radial direction of said optical disc;

reference value generating means receiving the address of said current track from said address decoder for generating a reference value which chronologically changes with time in a non-linear fashion while said optical pickup is being moved from the address of said current track to an address of said target track, said reference value generating means computing said reference value based on a predetermined average moving speed of said drive means set therein and the distance between the current track position and the target track position as determined based on the address of said current track at which a seek operation is started received from said address decoder and the address of said target track; and

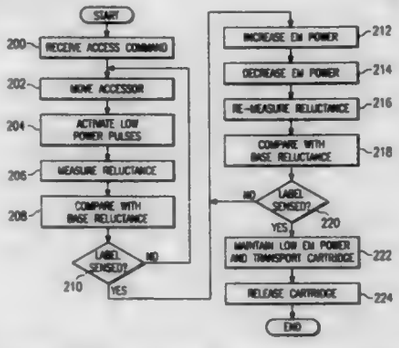
means for computing the difference between the address of said current track and said reference value and for controlling said drive means in accordance with said difference.

5,471,445

APPARATUS AND METHOD FOR SENSING AND HOLDING AN ITEM

Robert G. Emberty; Felix J. Misewich, and Edward J. Pawlowski, all of Tuscson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1994, Ser. No. 262,718
Int. Cl.[6] G11B *15/68*
U.S. Cl. 369—34 **11 Claims**



1. A method for transporting an information cartridge in an automated storage and retrieval library system, comprising the steps of:

receiving a command to transport a selected cartridge, having a magnetically attractable label, to a target location;

moving a library accessor to a first location adjacent the selected cartridge;

activating a magnetic field on the accessor to a first strength;

measuring the reluctance of the magnetic field;

making a first comparison of the measured reluctance with a base reluctance;

if said first comparison step indicates the presence of the magnetically attractable label of the selected cartridge, increasing the magnet field to a second strength;

decreasing the magnet field to a third strength;

remeasuring the reluctance of the magnetic field;

making a second comparison of the remeasured reluctance with the base reluctance; and

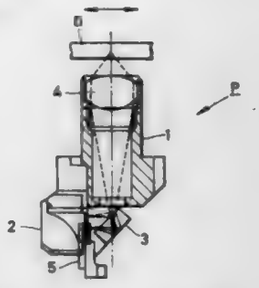
if the second comparison step indicates the continued presence of the magnetically attractable label, maintaining the magnetic field at the third strength and transporting the selected cartridge to the target location.

5,471,446

OPTICAL DISK PLAYER HAVING BEAM CORRECTION MEANS

Yuji Tawaragi; Satoshi Kusano; Toshio Suzuki, and Noriko Obitsu, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 4, 1991, Ser. No. 664,125
Claims priority, application Japan, Jul. 24, 1990, 2-195681
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—44.14 **6 Claims**



1. An optical disk drive system, comprising:

a source for producing a light beam;

an information pick up having a body;

a lens for converging the light beam on an information reading spot on the recording surface of a disk-shaped optical recording medium, the lens being immoveable with respect to the body;

a tracking servo means for producing a tracking error signal indicating the amount of radially directed deviation of the light beam from the information reading spot and for shifting the information pick up in a radial direction an amount corresponding to the tracking error signal;

a focusing servo means for producing a focusing error signal indicative of an error in the position of the information pick up along the optical axis of the disk drive system and for shifting the information pick up along the optical axis an amount corresponding to the focusing error signal;

amplifying means for amplifying said focusing error signal at a predetermined gain; and

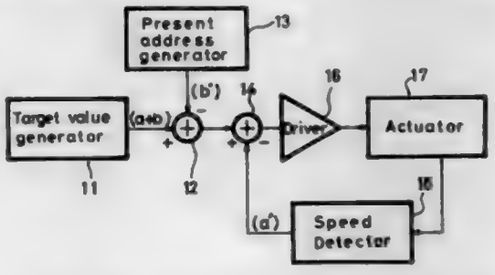
adding means for adding said focusing error signal amplified by said amplifying means to the tracking error signal.

5,471,447

SEEK CONTROL FOR INFORMATION STORAGE DISC DRIVE

Shigeaki Wachi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 14, 1991, Ser. No. 744,966
Claims priority, application Japan, Sep. 13, 1990, 2-243469
Int. Cl.[6] G11B *7/00;21/10;5/596*
U.S. Cl. 369—44.28 **4 Claims**



1. A seek control system for controlling a read/write head to move to a target track on an information storage disc, comprising:

means for generating a target value signal indicative of a linear combination of a speed value and a distance value, wherein

the speed value is indicative of a speed at which the read/write head is to move toward said target track, and the distance value is indicative of a distance through which the read/write head is to move toward said target track; and

means for generating a control signal for moving the read/write head in response to the target signal.

5,471,448

TRACKING SERVO APPARATUS FOR USE IN AN OPTICAL DISK PLAYER

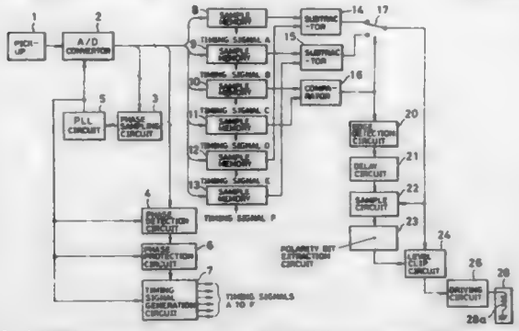
Fumihiko Yokogawa, Tsurugashima, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 7, 1994, Ser. No. 335,086

Claims priority, application Japan, Nov. 8, 1993, 5-278404

Int. Cl.[6] G11B *7/095*

U.S. Cl. 369—44.29 **3 Claims**



1. A tracking servo apparatus for use in an optical disk player having:

generating means for generating a tracking error signal indicating a displacement between a position for reading information by a pick-up and a track in the radial direction of an optical disk;

switching relay means for outputting a brake signal according an instruction for drawing, and relaying and outputting said tracking error signal in place of said brake signal in correspondence to a drop of a frequency of said tracking error signal;

driving means for driving a tracking actuator provided in said pick-up so that said position for reading information is located on a track according an output signal from said selective relay switch, wherein said switching relay means comprises:

odd/even discriminating means for generating an odd/even discrimination signal indicating on which of an odd number track or an even number track said position for reading information is currently present;

means for detecting an edge of said odd/even discriminating signal and generating an edge pulse;

sampling means for sampling said tracking error signal according to said edge pulse; and

means for selectively outputting either a positive or a negative section of said tracking error signal according to a polarity of the tracking error signal sampled by said sampling means as said brake signal.

5,471,449

APPARATUS FOR RECORDING DEFECTIVE-POSITION INDICATING SIGNAL ON DISK MEDIUM

Shinji Kaneko, and Kan Ebisawa, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

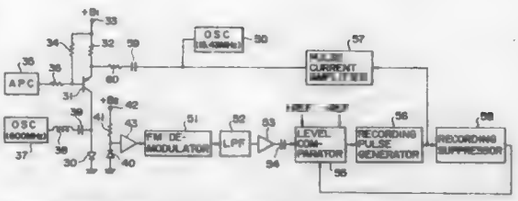
Filed Feb. 24, 1994, Ser. No. 201,258

Claims priority, application Japan, Feb. 26, 1993, 5-038953

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—58 **7 Claims**

1. An apparatus for recording a defective-position indicating signal on a recording disk medium, comprising:



a laser beam source for generating a laser beam for irradiating said disk medium;

an optical detector for receiving a reflection of the laser beam from said disk medium and generating a reflection signal having a value corresponding to a reflectivity of said disk medium;

defect detection means for detecting a defect on said disk medium by comparing the reflection signal with a predetermined reference value; and

laser power control means for modulating the power of the laser beam by a fixed-frequency signal at a first power level normally and, responsive to detection of a defect by said defect detection means, shifting the power of the laser beam to a second power level greater than said first power level for a first predetermined time after said detection, said second power level being adequate to record on said disk medium.

5,471,450

DIGITAL DATA REPRODUCING APPARATUS AND METHOD EMPLOYING BUFFER MEMORIES FOR ERROR COMPENSATION AND ACCOMODATING DIFFERENCES IN REPRODUCTION AND PROCESSING RATES

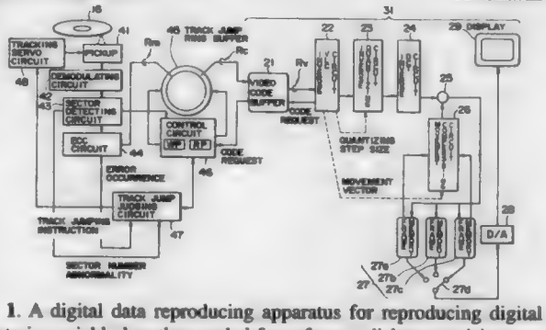
Jun Yonemitsu; Hideki Koyanagi, and Yoshiyuki Akiyama, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 908,164, Jul. 2, 1992, abandoned. This application Dec. 8, 1994, Ser. No. 350,385

Claims priority, application Japan, Jul. 12, 1991, 3-198591; Mar. 18, 1992, 4-092223

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—60 **33 Claims**



1. A digital data reproducing apparatus for reproducing digital data in variable length encoded form from a disk, comprising:

pickup means for picking up the digital data from the disk;

first storage means for storing the digital data and for reading the stored digital data therefrom at a first variable rate;

second storage means for storing the digital data read from the first storage means, the second storage means being operative to store the digital data at said first variable rate and to read the digital data stored therein at a second variable rate varying within a predetermined range inching at least one value higher than a maximum value of said first variable rate;

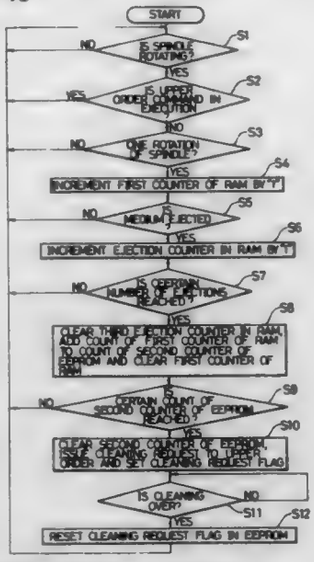
inverse variable length code means for inverse variable length code processing the data read from said second storage means to produce inverse variable length code processed data, the inverse variable length code means being operative to receive the data at said second variable rate; and

jump controlling means for causing said pickup means to track jump in accordance with an amount of data stored in said first storage means.

5,471,451
DISK APPARATUS INCLUDING NOTIFYING OF CLEANING TIMING AND CONTROL METHOD THEREOF

Takashi Masaki; Shigenori Yanagi, both of Kawasaki, and Manabu Yamamoto, Sayama, all of, Japan, assignors to Fujitsu Limited, Kawasaki, and Nippon Telegraph and Telephone Corporation, Tokyo, both of, Japan

Filed Aug. 24, 1993, Ser. No. 111,084
Claims priority, application Japan, Aug. 27, 1992, 4-228506
Int. Cl.[6] G11B *3/58*
U.S. Cl. 369—71 **4 Claims**



1. An optical disk apparatus, comprising:

disk rotating means for rotating an optical disk medium;

optical head means for reading at least information from the optical disk medium rotated by said disk rotating means by projecting light thereon;

disk mounting/dismounting means for mounting said optical disk medium accommodated in a cartridge on a disk rotating shaft when said optical disk medium is inserted, and removing said optical disk medium from said rotating shaft and ejecting said removed optical disk medium according to a medium ejection instruction;

first counter means;

second counter means;

third counter means;

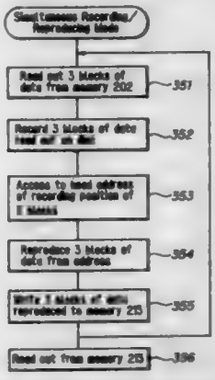
rotation time measuring means for counting rotating pulses which are generated from said disk rotating means by said first counter means, disk mounting/dismounting measuring means for counting the number of ejection times of the optical disk medium due to said cartridge mounting/dismounting means by said third counter means, and each time a count value of said third counter means reaches a predetermined number of ejection times, adding a count value of said first counter means to a count value of said second counter means and updating and clearing said first counter means; and

cleaning management means for clearing said second counter means and transmitting a cleaning request signal of the optical disk apparatus to an upper apparatus when the count value of said second counter means reaches a predetermined value corresponding to a predetermined time at which a cleaning of the optical head means is necessary and displaying said cleaning request signal and for further setting cleaning request flag information.

5,471,452
METHOD OF EDITING INFORMATION SIGNALS RECORDED ON RECORDING MEDIUM

Yoshio Kishi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 8, 1994, Ser. No. 208,021
Claims priority, application Japan, Mar. 9, 1993, 5-076349
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—83 **7 Claims**



1. A method of editing information signals previously recorded on a recording medium comprising the steps of;

(1) determining a vacant recording area of said recording medium,

(2) selecting from said previously recorded information signals a plurality of editing information signals to be edited,

(3) determining an editing area of said recording medium where the editing information signals will be re-recorded,

(4) selecting a one of the editing information signals,

(5) determining if a portion of the editing area where the one of the editing information signals will be re-recorded contains any editing information signals which have not yet been re-recorded in the editing area,

(6) if the portion of the editing area where the one of the editing information signals will be re-recorded contains any other editing information signals, reproducing and re-recording the other editing information signals in said vacant recording area of said medium,

(7) reproducing and re-recording the one of said editing information signals in the editing area, and

(8) marking as vacant an area of said recording medium where the one of the editing information signals was previously recorded.

5,471,453
INFORMATION RECORDING-REPRODUCING APPARATUS

Yasuo Suzuki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 753,933, Sep. 3, 1991, abandoned.
This application Mar. 19, 1993, Ser. No. 33,973
Claims priority, application Japan, Sep. 13, 1990, 2-241234
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—100 **5 Claims**

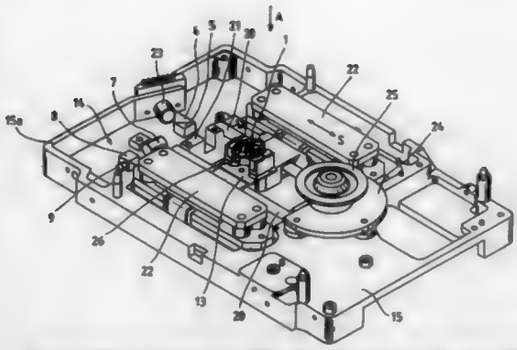
1. An information recording-reproducing apparatus for effecting at least one of recording, reproducing and erasing of information on a disk-like recording medium by a light beam, said apparatus comprising:

a base bed fixed to said apparatus;

a light source, directly fixed on a surface of said base bed, for emitting the light beam;

an optical system, directly fixed on the surface of said base bed, for guiding the light beam emitted from said light source to the recording medium;

a movable unit movable radially of the recording medium and carrying thereon at least an objective lens for applying onto



the recording medium the light beam emitted from said light source and passed through said optical system; and

a guide member, fixed on said base bed, for guiding said movable unit radially of the recording medium.

5,471,454

OPTICAL HEAD HAVING SEMICONDUCTOR LASER

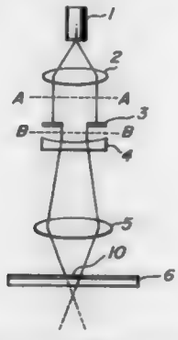
Naoaki Tani, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 27, 1993, Ser. No. 67,954

Claims priority, application Japan, May 27, 1992, 4-134990

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—100 **9 Claims**



1. An optical head for reading information simultaneously from a plurality of tracks on an optical record medium by projecting a slit-shaped light spot comprising:

a semiconductor laser for emitting a laser beam having a substantially elliptical cross section;

a first optical system for converting said laser beam emitted from the semiconductor laser into a laser beam which is parallel along a track direction in which said information tracks extends and is non-parallel along a direction perpendicular to said track direction;

a second optical system including an objective lens for projecting said laser beam emanating from said first optical system onto said optical record medium as a slit-shaped laser spot such that a longitudinal direction of the slit-shaped laser spot is substantially aligned with a direction perpendicular to said track direction and a plurality of information tracks are simultaneous illuminated, said second optical system forming images of said simultaneously illuminated plurality of information tracks;

a photodetector having a plurality of light receiving elements each of which receives respective one of said images of a plurality of information tracks to derive a plurality of information signals; and

a light distribution uniformizing means arranged between said semiconductor laser and said objective lens for extracting a portion of the laser beam impinging upon said objective lens, said portion having a substantially uniform distribution in an amount of light along a direction which is substantially perpendicular to said track direction, said light distribution uniformizing means comprising a stop arranged between said light source and said objective lens, wherein said stop has a circular aperture whose diameter is slightly shorter than a dimension of the elliptical laser beam along a direction of a minor axis thereof.

5,471,455

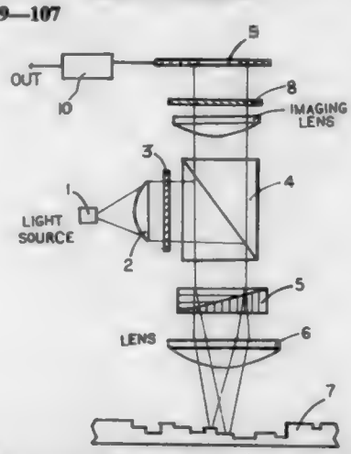
HIGH DENSITY OPTICAL STORAGE SYSTEM

Salim N. Jabr, 2703 Doverton Sq., Mountain View, Calif. 94040

Filed May 17, 1994, Ser. No. 245,023

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—107 **19 Claims**



1. In a high density optical information storage system having a light source that generates partially coherent incident light of a characteristic wavelength for illuminating simultaneously a plurality of adjacent track regions and decoding compressed information stored in said system, wherein an atomic unit of said compressed information corresponds to an M-bit word of decoded information, M being a fixed integer greater than 1, an information storage record carrier comprising:

a track structure defined on a substrate consisting of a plurality of said track regions, said M-bit word being uniquely encoded and stored as an optically-detectable difference in a common physical characteristic of adjacent, first and second track regions; such that, when said first and second track regions are illuminated simultaneously by said partially coherent incident light, a reflected light signal with corresponding first and second reflected beams results, said first and second reflected beams having, respectively, a first and second phase with a phase difference uniquely determined by said optically-detectable difference; said phase difference uniquely corresponding to said M-bit word of decoded information.

5,471,456

OPTICAL MEDIUM RECORDING APPARATUS WITH A ROTATABLE OPTICAL BEAM DEFLECTOR

Haruki Tokumaru; Koichi Maruyama, and Syunitirou Wakamiya, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, and Nippon Hoso Kyokai, both of Tokyo, Japan

Filed Jan. 21, 1994, Ser. No. 184,447

Claims priority, application Japan, Jan. 21, 1993, 5-008017; Jan. 21, 1993, 5-008018

Int. Cl.[6] G11B 7/09

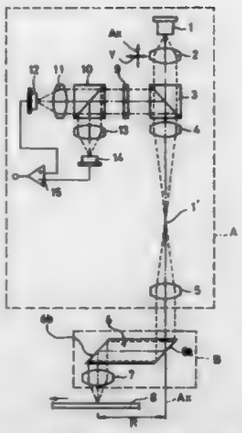
U.S. Cl. 369—112 **30 Claims**

20. An optical recording and reproducing apparatus comprising:

a light source;

an objective lens group which focuses a plurality of beams on an optical recording medium;

a focusing lens group provided along an optical axis of said beams between said light source and said objective lens



group, wherein said focusing lens group is driven along the optical axis direction; and

a relay lens group provided between said focusing lens group and said objective lens group, wherein a point located at a predetermined distance from a rear principal point of said focusing lens group is maintained substantially conjugate with a front focal point of said objective lens group by said relay lens group, and wherein said predetermine distance is equivalent to a distance between said light source and a front principal point of said focusing lens group, said rear principal point being defined as the principal point of said focusing lens group on an objective lens side of said optical axis, said front principal point being defined as the principal point of said focusing lens group on a light source side of the optical axis, and said front focal point being defined as the focal point of said objective lens group on said light source side of the optical axis.

5,471,457

METHODS AND DEVICES FOR RECORDING ONE OR MORE SIGNALS WHICH HAVE BEEN ENCODED BY ON ERROR DETECTION AND CORRECTION ALGORITHM ON A RECORD CARRIER BY MEANS OF AN OPTIMAL RECORDING INTENSITY

Johannes L. Bakx; Johannes H. M. Spruit, and Hindrik Veldhuis, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 5, 1993, Ser. No. 148,781

Claims priority, application European Pat. Off., Nov. 20, 1992, 92203585

Int. Cl.[6] G11B *11/10*

U.S. Cl. 369—116 **34 Claims**

1. A method for recording one or more signals encoded by means of an error detection and correction algorithm in a track on a record carrier of a type that can be overwritten, the method comprising the following steps:

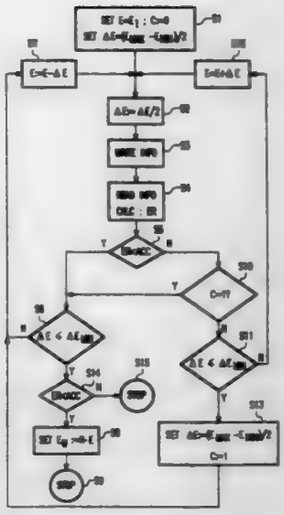
(a) recording a test information pattern on the record carrier by means of a radiation beam being set at a selected recording intensity to produce a recorded information pattern on the record carrier, the test information pattern having been encoded by means of the error detection and correction algorithm;

(b) reading the recorded information pattern from the record carrier to produce a reproduced information pattern;

(c) determining an error rate for the reproduced information pattern on the basis of the error detection and correction algorithm;

(d) selecting an optimal recording intensity for use in recording the one or more signals on the basis of the error rate; and

(e) recording the one or more signals on the record carrier by means of the radiation beam being set at the optimal recording intensity.



5,471,458

MULTI-PROBE INFORMATION RECORDING/ REPRODUCING APPARATUS INCLUDING A PROBE DISPLACEMENT CONTROL CIRCUIT

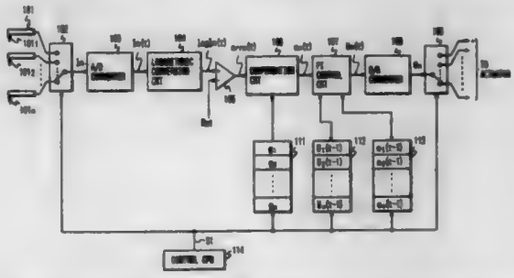
Takahiro Oguchi, Yamato; Katsunori Hatanaka, Yokohama; Kunihiro Sakai, Isehara; Akihiko Yamano, and Shunichi Shido, both of Sagamihara, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 8, 1993, Ser. No. 117,675

Claims priority, application Japan, Sep. 10, 1992, 4-242246; Aug. 27, 1993, 5-213120

Int. Cl.[6] G11B *9/00*

U.S. Cl. 369—126 **18 Claims**



1. An apparatus for effecting observation of a surface of an object using a plurality of probes, comprising:

a plurality of probes;

a plurality of actuators provided for the respective probes for displacing the respective probes;

a single control circuit which is selectively connected to the plurality of actuators; and

a switching circuit for selectively connecting the plurality of actuators to the control circuit.

5,471,459

METHOD AND APPARATUS FOR SUPERVISING ACCESS AND PROTECTING AGAINST UNAUTHORIZED ACCESS IN A COMMUNICATION METWORK

Max B. Gut, Ahornweg 15, CH-6353 Weggis, Switzerland

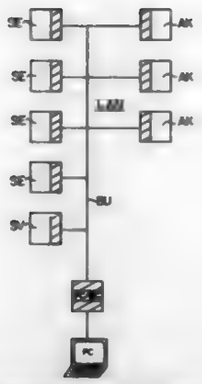
Filed May 12, 1993, Ser. No. 60,749

Claims priority, application Switzerland, May 15, 1992, 01560/92; Jun. 16, 1992, 01893/92

Int. Cl.[6] H04L *9/32*

U.S. Cl. 370—13 **10 Claims**

1. A method for supervising access and protecting against unauthorized access in message networks whereby information in the



form of messages is transmitted over a network having a plurality of stations and a central supervision device configured to receive each of the messages transmitted on the network and a particular portion of the information contained in the message is employed for supervising the right-of-access at the message receiver, said method comprising the steps of:

generating, at a first station, a message destined for a second station, said first station message including signals indicating a right of access of said first station with other stations in the network;

transmitting said first station message over the network;

intercepting said transmitted first station message at said central supervision device;

comparing said transmitted first station message right of access signals with supervisory signals stored in a table in said central supervision device indicative of authorized access to said second station;

generating cancellation signals if said comparison indicates that access to said second station is unauthorized;

transmitting said cancellation signals to said second station;

halting execution of said transmitted first station message by said second station upon receipt of said cancellation signals; and

beginning the comparison of the right-of-access by means of the central supervision device (SV) during the transmission of a message and terminating said comparison before the end of the message, and in the case of an unauthorized access the central supervision device (SV) editing a portion of said transmitted message to guarantee its non-effectiveness.

5,471,460

ATM SWITCHING SYSTEM WITH UNIT SWITCH SELECTING FUNCTION FOR AVOIDING FAULTY UNIT SWITCH

Senichi Tanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 110,735, Aug. 23, 1993, abandoned, which is a continuation of Ser. No. 781,319, Oct. 25, 1991, abandoned. This application Mar. 16, 1994, Ser. No. 213,797

Claims priority, application Japan, Jan. 25, 1990, 2-289635

Int. Cl.[6] H04J *3/14*

U.S. Cl. 370—16 **6 Claims**

1. A switching system comprising:

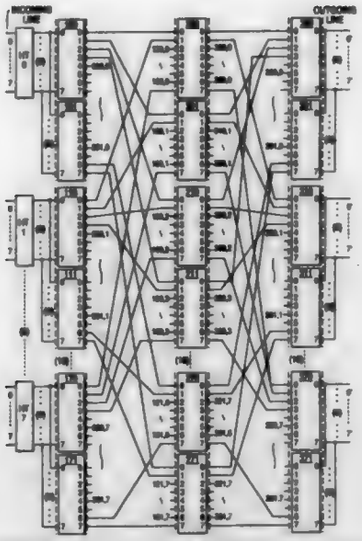
a multistage switching network, operating in an asynchronous transfer mode, comprising

a plurality of switching stages including a first switching stage and a final switching stage, each of said first switching stage and said final switching stage including a plurality of pairs of unit switches, and

a plurality of links for connecting unit switches of adjoining switching stages as one switching network;

a plurality of incoming lines;

first connection means for connecting each incoming line of said incoming lines through a header translator in parallel to both unit switches of corresponding pair of unit switches in said



first switching stage, a control line from said header translator being in parallel to both unit switches of corresponding pair of unit switches in said first switching stage, and selecting one of be unit switches of corresponding pair of unit switches to be used for signal cell routing by instruction of said header translator through said control line;

a plurality of outgoing lines;

second connection means for connecting each outgoing line of said outgoing lines in parallel to both of the unit switches of corresponding pair of unit switches in said final switching stage; and

a control unit for controlling said links and said first connection means for forming selective link connections between said unit switches of said adjoining switching stages and, when there is a faulty unit switch in a particular switching stage, for treating said faulty unit switch as a busy unit switch and for forming an alternate link connection to another unit switch paired to said faulty unit switch in said particular switching stage;

wherein said multistage switching network has a link transmission speed for signal cells which is greater than signal cell transmission speed in said incoming and outgoing lines.

5,471,461

DIGITAL COMMUNICATION NETWORK WITH A MODERATOR STATION ELECTION PROCESS

Jonathan R. Engdahl; Mark A. Lucak, both of Saline; David J. Gee, Ann Arbor, and Paul Kucharski, Saline, all of Mich., assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Apr. 28, 1993, Ser. No. 54,581

Int. Cl.[6] H04L *12/24*

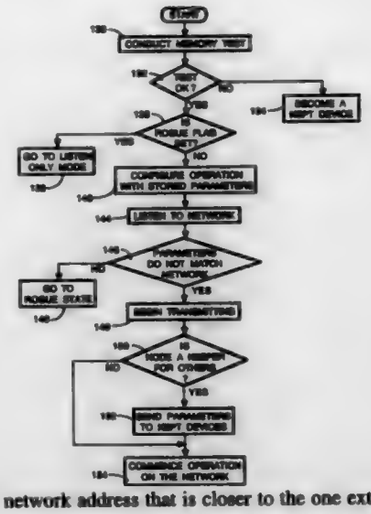
U.S. Cl. 370—17 **15 Claims**

1. In a communication network having a plurality of nodes connected to a medium with each node being assigned a unique network address within a range of numerical values, and wherein one of the plurality of nodes is designated as a moderator which periodically transmits a set of communication protocol parameter values over the medium, a method by which a given node determines whether to function as the moderator comprising:

receiving messages sent by other nodes over the medium, each message including an identification of the network address from which the message originated;

determining from received messages whether another node is assigned a network address that is closer to one extreme of the range of numerical values than a network address assigned to the given node; and

functioning as the moderator by periodically transmitting communication protocol parameter values, when the given node



has a network address that is closer to the one extreme of the range of numerical values than all other nodes which are sending messages over the medium.

5,471,462

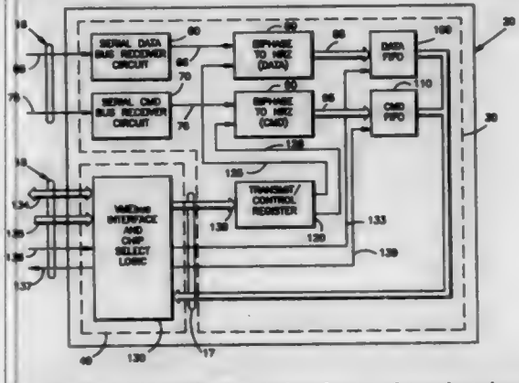
BIPHASE BUS MONITOR

José J. Amador, Cocoa, Fla., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 28, 1994, Ser. No. 219,327

Int. Cl.[6] H03M 5/00

U.S. Cl. 370—17 **7 Claims**



1. A method for monitoring a data bus to determine signals transmitted on the bus, comprising the steps of:

initializing a data capturing means with parameters characteristic of a protocol used to transmit data on the monitored data bus, including word size and parity, and initializing the data capturing means with trigger words, which when recognized by the data capturing means, are used to initiate data capturing from the monitored bus;

capturing data words from a monitored system bus based on the initializing parameters;

converting captured data words having a first data format to data words having a second data format;

storing said converted data words in a storage device;

retrieving said converted data words from the storage device; and,

displaying said converted data words.

5,471,463

RADIO COMMUNICATION SYSTEMS

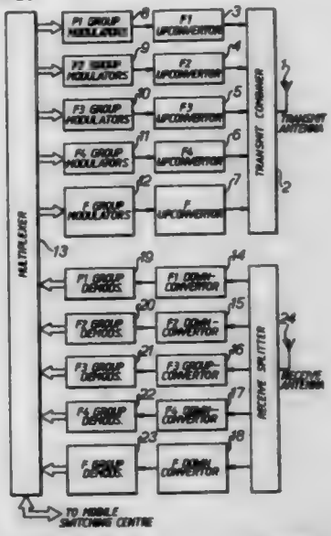
Anthony P. Hulbert, Southampton, England, assignor to Roke Manor Research Limited, Hampshire, England

Filed Apr. 27, 1993, Ser. No. 52,968

Claims priority, application United Kingdom, May 27, 1992, 921178

Int. Cl.[6] H04J 13/02

U.S. Cl. 370—18 **4 Claims**



1. A radio communication system comprising a base station which is arranged in communication with a plurality of mobile stations for the transmission of speech using a first set of channels and for the transmission of data using a second set of channels, the channels of the first set each having substantially the same bandwidth and comprising a plurality of groups of channels wherein each group of channels is arranged to operate using a different frequency, and wherein all channels within a group are arranged to operate on a same carrier frequency, and wherein the data and speech in the respective channels of each group are transmitted using CDMA (Code Division Multiple Access), each channel of a group being distinguished from every other channel of that group by a unique CDMA code, the channels of the second set being transmitted each on the same carrier frequency using CDMA for mutual discrimination, the frequency bandwidth used for the channels of the second set being arranged to correspond within the bandwidth occupied by at least some of the groups of the first set.

5,471,464

ORTHOGONAL FREQUENCY DIVISION MULTIPLEX DEMODULATION APPAARATUS

Yasunari Ikeda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 26, 1994, Ser. No. 281,255

Claims priority, application Japan, Jul. 26, 1993, 5-184251

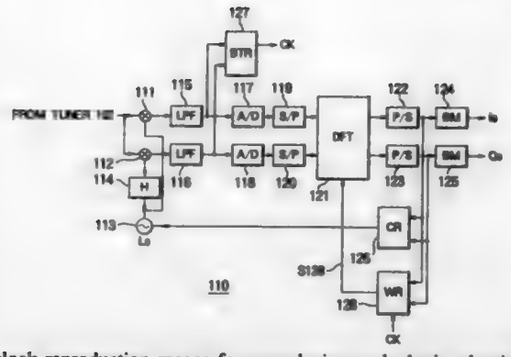
Int. Cl.[6] H04J 1/00;11/00

U.S. Cl. 370—19 **16 Claims**

1. An orthogonal frequency division multiplex (OFDM) demodulation apparatus for demodulating an OFDM modulated signal which is comprised of a first component signal including a synchronization symbol and a second component signal including a synchronization symbol in an orthogonal relationship with the first component signal, which component signals are multiplexed by orthogonal frequency division, which OFDM demodulation apparatus comprises:

first signal extracting means for extracting a first component signal from the OFDM modulated signal,

second signal extracting means for extracting a second component signal from the OFDM modulated signal,



clock reproduction means for reproducing a clock signal using the first component signal and the second component signal,

first DFT means for performing DFT on the extracted first component signal using a first time window signal to generate a first frequency region component signal,

second DFT means for performing DFT on the extracted second component signal using said first time window signal to generate a second frequency region component signal, and

time window synchronization signal generating means including basic time window signal means for dividing in frequency the reproduced clock signal and generating a basic time window signal, phase adjusting means for detecting the timing in which the synchronization symbol is present using the first frequency region component signal and the second frequency region component signal and for adjusting the phase of the basic time window signal, and synchronization pull-in means for performing synchronization pull-in of the basic time window signal to the phase of the synchronization symbol using the first frequency region component signal and the second frequency region component signal, the basic time window signal subjected to the synchronization pull-in and phase adjustment being applied to the first DFT means and the second DFT means as said first time window signal.

5,471,465

EXCHANGE HAVING OVERDIMENSIONED DIGITAL SWITCHING NETWORK

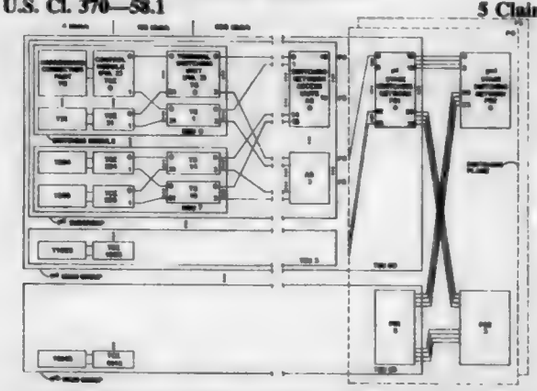
Bernhard Gamm, Strasse, Germany, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed Jun. 23, 1993, Ser. No. 81,807

Claims priority, application Germany, Jun. 27, 1992, 42 21 188.3

Int. Cl.[6] H04Q *11/04*

U.S. Cl. 370—58.1 **5 Claims**



1. An exchange comprising a digital switching network (TS, AS, PS) and peripheral units (TO, . . . , T6143), said peripheral units being connected to said switching network by switching elements, said peripheral units serving to interface with subscribers, other exchanges, or maintenance devices, and said switching network serving to establish arbitrary traffic relations between said peripheral units, particularly to establish switched connections between attached subscribers or exchanges, characterized in that at the switching element (TCE0, . . . , TCE6143) connected between at least one of said peripheral units and said switching network, the maximum traffic rate between the switching element and said switching network is more than twice the maximum traffic rate between said at least one of said peripheral units and the switching element.

5,471,466

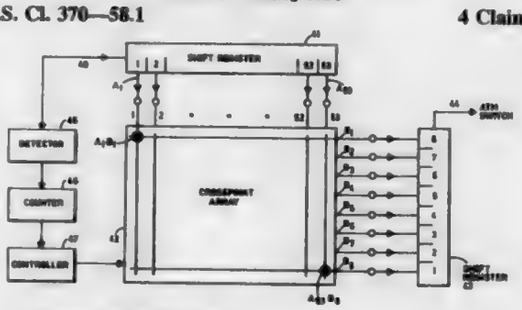
METHOD AND APPARATUS FOR ATM CELL ALIGNMENT

Michael Cooperman, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 17, 1993, Ser. No. 153,695

Int. Cl.[6] H04J *3/06*

U.S. Cl. 370—58.1 **4 Claims**



1. An apparatus comprising:

a serial-to-parallel shift register having a serial input and a plurality of parallel outputs;

a crosspoint switching array having a plurality of inputs each coupled to a respective one of the shift register outputs, a plurality of outputs, and a plurality of crosspoint switching means arranged in a matrix for selectably connecting any one of one of said plurality of array inputs to any one of said plurality of array outputs:

a parallel-to-serial shift register having a plurality of parallel inputs each coupled to a respective one of the crosspoint switching array outputs, and serial output;

wherein the serial-to-parallel shift register includes fifty-three (53) byte register locations;

said crosspoint switching array has fifty-three (53) inputs and eight (8) outputs; and

the parallel-to-serial shift register includes eight (8) bit register locations.

5,471,467

ROUTING LOGIC MEANS AND METHOD FOR DISTRIBUTING A PACKET AMONG NETWORK NODES

Charles F. M. Johaan, Eindhoven, Netherlands, assignor to Alcatel N.V., Amsterdam, Netherlands

Filed May 4, 1993, Ser. No. 57,656

Claims priority, application European Pat. Off., May 8, 1992, 92201314

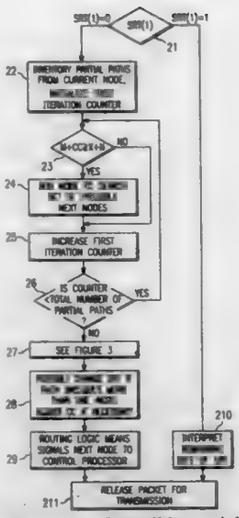
Int. Cl.[6] H04L *12/56*

U.S. Cl. 370—60 **51 Claims**

1. A method of routing a packet from a predetermined node to a destination node along a switching network comprising a plurality of packet switching nodes interconnected by respective links, comprising the steps of:

identifying a plurality of possible partial paths wherein each of said possible partial paths originates from said predetermined node and comprises X of said other packet switching nodes and their respective interconnecting links, where X is a positive integer; and

choosing a selected partial path from said plurality of possible partial paths, wherein said choosing step further comprises at least the steps of:



for each of said plurality of possible partial paths, determining a first cost value equal to an estimated transmission delay over a first portion of a possible path, said possible path connecting said predetermined node with said destination node and including said possible partial path, said first portion comprising an arbitrarily selectable number of said packet switching nodes;

for each of said plurality of possible partial paths, determining a second cost value equal to an estimated transfer cost, different from said transmission delay, over a second portion of said possible path; and

combining said first and second cost values to choose said selected partial path based on said combination, wherein said step of combining said first and second cost values comprises determining a third cost value by combining a weighed value of a first relative value and a second relative value, wherein said first relative value is determined by dividing said first cost value by the mean value of said first cost value taken over said first portion of all of said plurality of possible partial paths, and wherein said second relative value is determined by dividing said second cost value by the mean value of second cost value taken over said second portion for all of said plurality of possible partial paths, and wherein said choosing step comprises choosing said selected partial path having a minimal third cost value.

5,471,468

SQUARE SWITCHING ARCHITECTURE

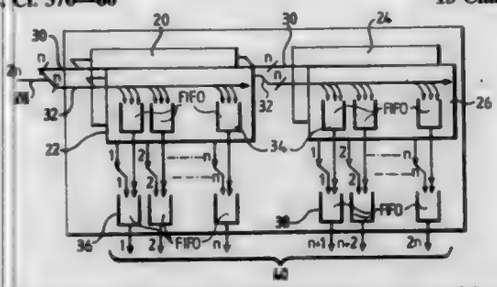
Rolf S. Sandin, Sollentuna, and Per A. M. Ljungberg, Stockholm, both of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed May 26, 1993, Ser. No. 67,012

Claims priority, application Sweden, Jun. 1, 1992, 9201697

Int. Cl.[6] H04L *12/56*

U.S. Cl. 370—60 **13 Claims**



1. A packet switch with a switching architecture comprising:

a cross network of input and output switching links crossing each other; and

a number of tree structures connected to said output switching links, said number of tree structures including an upper buffering level containing a number of intermediate storing buffers for packets entering on said input links, and a lower buffering level with at least one output buffer connected for receiving the contents of at least two of said intermediate storing buffers of said upper buffering level, the output buffer having an output provided to its respective output switching link.

5,471,469

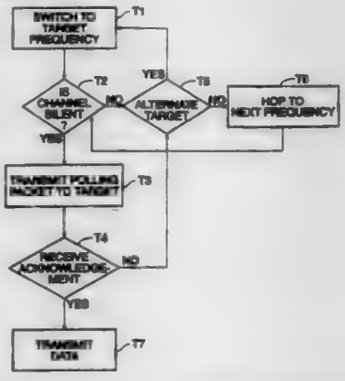
METHOD OF RESOLVING MEDIA CONTENTION IN RADIO COMMUNICATION LINKS

George H. Flammer, III, Cupertino, and Brett D. Galloway, Campbell, both of Calif., assignors to Metricon, Inc., Los Gatos, Calif.

Filed Feb. 8, 1994, Ser. No. 193,338

Int. Cl.[6] H04B *1/713;* **H04J** *13/06*

U.S. Cl. 370—94.1 **16 Claims**



1. In a communications network having a plurality of nodes each capable of transmitting and or receiving data over any one of a plurality of shared channels, a method for enabling any transmitting node to transmit data to any receiving node without contention from any other transmitting node comprising the steps of:

assigning to each receiving node a channel hopping band plan that is known to any node in the network wishing to transmit data to said receiving node and enabling said receiving node to follow said channel hopping band plan;

monitoring for silence at a transmitting node an expected channel of a receiving node according to said receiving node's channel hopping band plan in order to determine if said receiving node is idle;

transmitting from a transmitting node a polling packet to a receiving node at an expected channel according to said receiving node's channel hopping band plan;

receiving at said transmitting node from said receiving node an acknowledgement packet if said receiving node is available to receive data packets; and,

transmitting data from said transmitting node to said receiving node on a channel which is different from the expected channel for said receiving node according to said receiving node's channel hopping band plan.

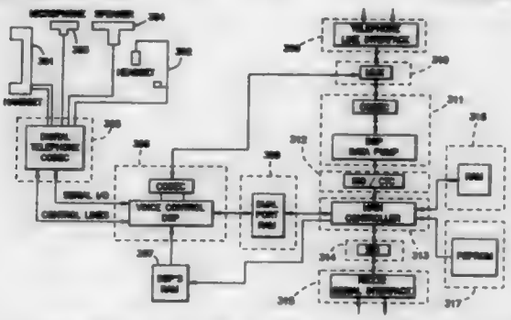
5,471,470
COMPUTER-BASED MULTIFUNCTION PERSONAL COMMUNICATIONS SYSTEM

Raghu Sharma, North Oaks; Jeffrey P. Davis, Ham Lake; Timothy D. Gunn, Mounds View; Ping Li, New Brighton, all of Minn.; Sidhartha Maitra, Saratoga, Calif.; Ashish Thanawala, Saratoga, Calif., and Steve Young, Saratoga, Calif., assignors to Multi-Tech Systems, Inc., Mounds View, Minn.

Division of Ser. No. 2,467, Jan. 8, 1993. This application Aug. 11, 1994, Ser. No. 289,294

Int. Cl.[6] H04J 3/17

U.S. Cl. 370—81 **12 Claims**



1. A communication module for use with a personal computer, comprising:

communications interface means connected for communicating to the personal computer for transferring data between the personal computer and the communications module;

telephone line interface means for connection to a telephone line and for full duplex digital communication over the telephone line;

voice interface means for receiving local voice signals from a local user and for conveying remote voice signals from a remote user to the local user;

full-duplex conversion means connected to the voice interface means for converting the local voice signals into outgoing digital voice data and for converting incoming digital voice data into the remote voice signals;

digital signal processor means connected to the full-duplex conversion means for compressing the outgoing digital voice data into compressed outgoing digital voice data packets and for decompressing compressed incoming digital voice data packets into the incoming digital voice data, each of the compressed outgoing digital voice data packets having headers and each of the compressed incoming digital voice data packets having headers;

main control means connected to the telephone line interface means, connected for receiving the compressed outgoing digital voice data packets from the digital signal p ocessor means, connected for receiving outgoing computer digital data packets from the personal computer through the communications interface means, operable for multiplexing the compressed outgoing digital voice data packets and the computer digital data packets to produce multiplexed outgoing data and for sending the multiplexed outgoing data to the telephone line interface means for transmission over the telephone line: and

the main control means further operable for receiving multiplexed incoming data from the telephone line interface means, the multiplexed incoming data containing incoming computer digital data packets multiplexed with the compressed incoming digital voice data packets, the main control means further operable for demultiplexing the incoming computer digital data packets and the compressed incoming digital voice data packets, and for sending the incoming computer digital data packets to the personal computer through the communications interface means and for sending the compressed incoming digital voice data packets to the digital signal processor means.

5,471,471
SIGNAL COMMUNICATION METHOD AND APPARATUS

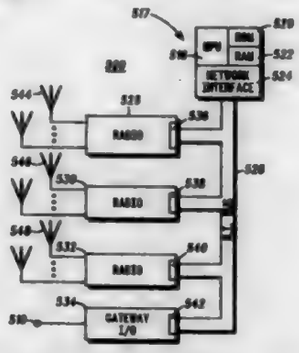
Thomas A. Freeburg, Arlington Heights; Dennis E. Burke, Elmhurst, and Paul Odlyzko, Arlington Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1992, Ser. No. 817,023

The portion of the term of this patent subsequent to Sep. 28, 2011, has been disclaimed.

Int. Cl.[6] H04B 7/00; H04J 3/12

U.S. Cl. 370—79 **15 Claims**



7. In a communications system having a plurality of Radio Frequency (RF) communications devices integrated into a Node, some of the RF communications devices having incompatible RF transmission protocols, a device for communicating signals, consisting of control and data information, to said plurality of RF communications devices comprising:

a bus having control lines and data lines, each RF communications device operably coupled to the bus;

means, operably coupled to the control lines, for communicating control information to and from the plurality of RF communications devices;

means, operably coupled to the data lines, for processing signals transferred over the data lines by an RF communications device, into processed signals;

memory, operably coupled to the processing means, for storing the processed signals;

means, operably coupled to the memory for returning the processed signals stored in memory back onto the data lines;

means, operably coupled to the plurality of RF communications devices, for monitoring the control lines to detect data line activity; and

means, operably coupled to the communications devices, for extracting information from the data lines as a function of the detected data line activity.

5,471,472
NETWORK MULTIPLEXER

R. Bruce McClure, Harvard; Christopher P. Lawler, Wellesley, and Shannon Q. Hill, Westford, all of Mass., assignors to Synernetics Inc., North Billerica, Mass.

Filed Jul. 30, 1991, Ser. No. 738,200

Int. Cl.[6] H04J 3/02

U.S. Cl. 370—85.13 **5 Claims**

1. An apparatus for passing a data packet, having a destination address, between an FDDI network and a plurality of Ethernet networks, said apparatus comprising:

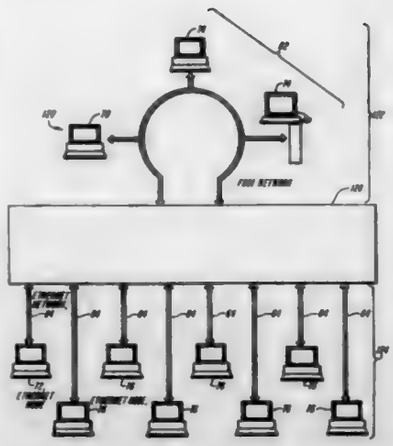
a VME bus;

a backplane FDDI ring;

a processor module in communication with said VME bus;

a trunk attach module in communication with said VME bus, and between said backplane FDDI ring and said FDDI network; and

at least one Ethernet module in communication with said VME bus, said backplane FDDI ring and said plurality of Ethernet networks;



said processor module controlling said trunk attach module and said at least one Ethernet module by way of signals transmitted over said VME bus,

said data packet passing between said trunk attach module and said at least one Ethernet module by way of said backplane FDDI ring, and

said at least one Ethernet module passing said data packet from a first one of said plurality of Ethernet networks to said trunk attach module if said destination address does not correspond to an node address of a node on a second one of said plurality of Ethernet networks and passing said data packet to said second one of said plurality of Ethernet networks from said trunk attach module only if said packet destination address is a node address of a node on said second one of said plurality of Ethernet networks.

5,471,473

COMMUNICATION SYSTEM AND DEVICES THEREOF

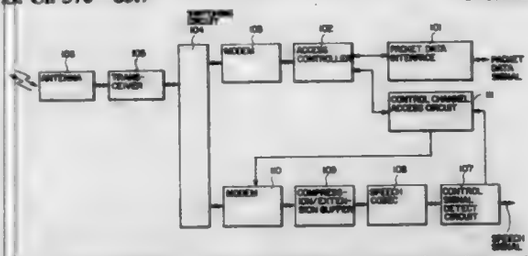
Shunichiro Tejima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 30, 1994, Ser. No. 220,026

Claims priority, application Japan, Mar. 30, 1993, 5-072183

Int. Cl.[6] H04B *7/26;* **H04J** *3/16*

U.S. Cl. 370—85.7 **8 Claims**



1. A communication system comprising a central station and a plurality of peripheral stations, being constructed such that said central station and said peripheral stations interchange packet data by using a predetermined first carrier frequency assigned for a packet data communication:

said central station including:

receiving means for receiving a request signal from any one of said peripheral stations in the form of a packet data signal by using said first carrier frequency;

assigning means for assigning a second carrier frequency for sending a speech signal in response to said request signal; and

sending means for sending a report signal reporting assignment of said second carrier frequency to said peripheral stations in the form of a packet data signal by using said first carrier frequency;

each of said peripheral stations including:

sending means for sending said request signal for requesting said speech channel to said central station by using said first carrier frequency;

receiving means for receiving said report signal sent from said central station by using said first carrier frequency; and

setting means for setting up said second carrier frequency for speech-communicating between said central station and said peripheral stations or between two or more of said peripheral stations in accordance with said report signal.

5,471,474

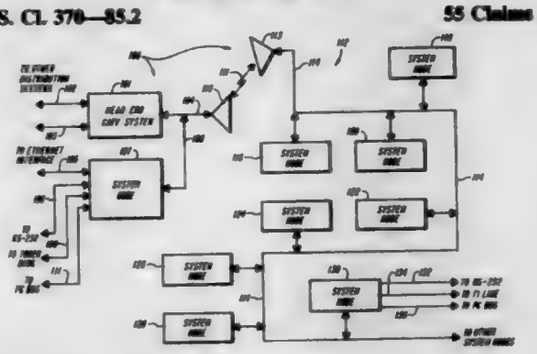
COMMUNICATIONS HIGHWAY NETWORK SYSTEM

Christopher Grobicki, Andover; Cynthia Mazza, Lynn; Edward O'Connell, N. Andover; John Uhn, Pepperell, and Gerard White, Tyngsborough, all of Mass., assignors to LANcity Corporation, Andover, Mass.

Filed Jun. 4, 1993, Ser. No. 72,985

Int. Cl.[6] H04J *3/02*

U.S. Cl. 370—85.2 **55 Claims**



1. A communications network for interactive communications among network users, comprising:

a network bus;

a plurality of system nodes connected to the network bus with each system node having a loop delay associated therewith;

a pacer connected to the network bus for providing timing signals thereon for synchronizing network bus access operations by the plurality of system nodes;

an allocator that is capable of substantially simultaneously allocating the plurality of system nodes access to a network bus bandwidth by a plurality of bus allocation methods according to a network bus protocol that is based on the network bus being segmented in a time domain into repeating periods, compensation by each system node of its loop delay before accessing the network bus to transmit data during a repeating period, dynamically allocating access to the network bus bandwidth according to the plurality of bus allocation methods, and timing signals from the pacer, with at least one of the bus allocation methods being based on system nodes accessing the network bus bandwidth according to this method being given a requested discrete portion of network bus bandwidth for a predetermined number of repeating periods for transmitting data on the network bus.

5,471,475

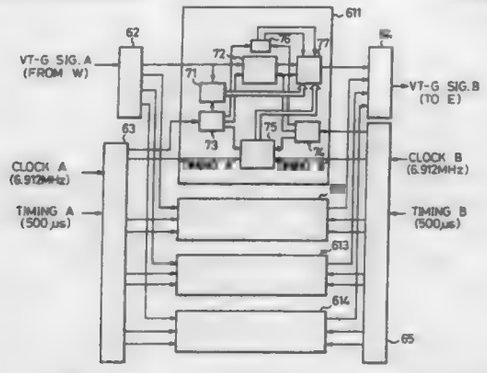
Patent Not Issued For This Number

5,471,476

SYNCHRONOUS PAYLOAD POINTER PROCESSING SYSTEM IN DIGITAL DATA TRANSMISSION NETWORK

Masanori Hiramoto, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Continuation of Ser. No. 894,025, Jun. 5, 1992, abandoned.
This application Aug. 1, 1994, Ser. No. 283,657
Claims priority, application Japan, Jun. 5, 1991, 4-145988; Jun. 6, 1991, 3-135119
Int. Cl.[6] H04J 3/06
U.S. Cl. 370—105.1 3 Claims



1. A synchronous payload envelope pointer processing system in synchronous transmission equipment for transmitting information in SONET signals or CCITT signals, the processing system comprising:

a pointer detection unit for monitoring a group of pointer bytes in a receive multiplex signal applied to said pointer detection unit and for determining a group of pointer values included in the monitored group of pointer bytes, said receive multiplex signal being comprised of a plurality of multiplexed synchronous payload envelope signals, each associated with one of the pointer bytes;

a storage unit for storing payload data carried by the receive multiplex signal;

a write timing signal generator unit receiving a receive clock signal and generating a write clock signal and being coupled to said pointer detection unit and to said storage unit, said write timing signal generator unit supplying said write clock signal to said storage unit;

a read timing signal generator unit receiving a transmit clock signal and generating a read clock signal, said read timing signal generator unit being coupled to said storage unit and supplying said read clock signal thereto;

a phase difference counter unit receiving a receive frame timing signal and a transmit frame timing signal, and being coupled to said write timing signal generator unit and said read timing signal generator unit, said phase difference counter unit counting a phase difference between said receive frame timing signal and said transmit frame timing signal;

a phase comparator unit coupled to said write timing signal generator unit and said read timing signal generator unit for comparing a phase between said write clock signal and said read clock signal to produce a control signal;

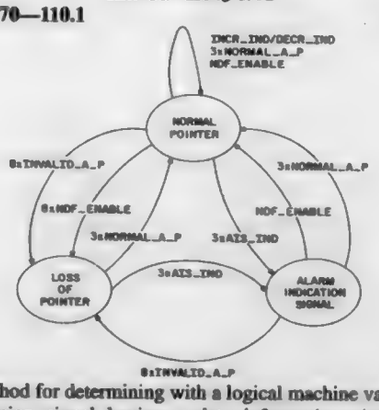
a pointer addition unit coupled to said storage unit, said pointer detection unit, said phase difference counter unit, said read timing signal generator unit and said phase comparator unit, for processing said group of pointer values determined by said pointer detection unit, the phase difference counted by said phase difference counter unit and said control signal produced by said phase comparator unit to produce a new group of pointer values, and for adding overhead bytes including the new group of pointer values to payload data read from the storage unit to produce a transmit multiplex signal.

5,471,477

LOGICAL MACHINE FOR PROCESSING CONTROL INFORMATION OF TELECOMMUNICATION TRANSMISSION FRAMES

Johan M. F. Dries, Noorderwijk, and Yves Therasse, Chastre, both of, Belgium, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Dec. 23, 1992, Ser. No. 995,088
Claims priority, application European Pat. Off., Dec. 24, 1991, 91203410
Int. Cl.[6] H04J 3/12
U.S. Cl. 370—110.1 18 Claims



1. A method for determining with a logical machine valid data in a transmission signal having a data information signal and a control information signal with a pointer information signal and a repeated concatenation information signal, the pointer information signal indicating a location of the data information signal in the transmission signal, and the repeated concatenation information signal indicating the data structure of the data information signals, comprising the steps of:

providing a logical machine;

operating the logical machine according to a single predetermined state diagram having state transitions;

receiving the transmission signal at an input of the logical machine;

simultaneously performing the state transitions on the repeated concatenation information signal with the logical machine; and

generating a pointer and data indication signal indicating whether a pointer is defined and the data information signal is valid in the transmission signal.

5,471,478

FLASH EEPROM ARRAY DATA AND HEADER FILE STRUCTURE

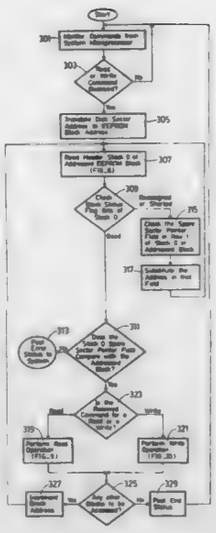
John S. Mangan, Santa Cruz; Robert D. Norman, San Jose; Jeffrey Craig, Freemont; Richard Albert, Santa Clara; Anil Gupta, Irvine; Jeffrey D. Stai, Placentia, and Karl M. J. Lofgren, Newport Beach, all of Calif., assignors to SunDisk Corporation, Santa Clara, and Western Digital Corporation, Irvine, both of Calif.

Continuation of Ser. No. 252,052, Jun. 1, 1994, Pat. No. 5,438,573, which is a continuation of Ser. No. 759,497, Sep. 13, 1991, abandoned. This application Mar. 10, 1995, Ser. No. 401,942
Int. Cl.° G06F 11/00
U.S. Cl. 371—10.3 11 Claims

1. A method of operating a non-volatile memory system including an array of floating gate memory cells arranged in rows and columns and characterized by at least one type of defect in a column rendering inoperable all of the cells in that column, comprising:

operating the memory system with the rows of the array separated into unique blocks of cells that are individually addressable for simultaneous erasure of the cells within an addressed block,

maintaining a list identifying any inoperable columns,



designating a plurality of contiguous columns, not including a column on said list, for storage of at least one chunk of overhead data within the individual blocks and designating memory cells of columns other than those designated for overhead data for storage of a plurality of chunks of user data within the individual blocks,

writing user data to and reading user data from memory cells, at least one chunk at a time, of the individual blocks that lie in columns designated for the storage of user data, and

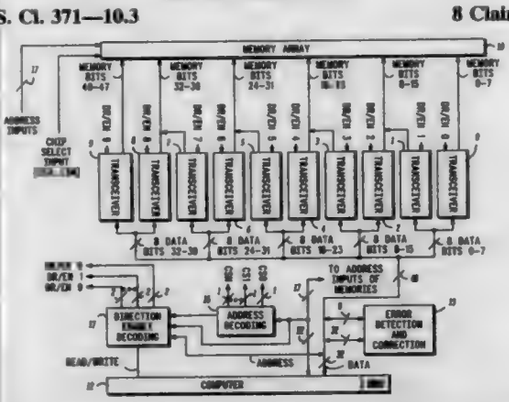
writing overhead data to and reading overhead data from memory cells, at least one chunk at a time, of the individual blocks that lie in columns designated for overhead data, said overhead data including information about the individual blocks themselves or any user data stored therein.

5,471,479

ARRANGEMENT FOR COLUMN SPARING OF MEMORY

Louis A. McRoberts, Scottsdale, and Donald E. Borden, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 925,149, Aug. 6, 1992, abandoned.
This application Jun. 27, 1994, Ser. No. 266,418
Int. Cl.[6] G06F *11/00*
U.S. Cl. 371—10.3 **8 Claims**



1. A memory replacement arrangement for replacing faulty memory elements in a memory array and said memory array including M-rows X N-columns including one replacement column, an Nth column, of memory elements, said memory array including said replacement column of memory elements coupled to a computer via address and data buses, said memory replacement arrangement comprising:

transceiver means coupled between said computer and said memory array, said transceiver means for selectively coupling said memory elements of said memory array to said computer via said data bus;

enabling means coupled to said transceiver means and to said computer via said address bus, and for said faulty memory elements, said enabling means selectively replacing said faulty memory elements in different columns in each of said M-rows of said memory array enabling said transceiver means to couple a plurality of memory elements from said M-rows and from (N−1) columns of said different columns including at least one replacement memory element in a selectable column in any of said M-rows to said computer for transferring a selected computer word into or out of said memory array;

said enabling means including:

address decoding means coupled to said computer via said address bus, said address decoding means generating a plurality of chip selects from an address transmitted from said computer, said chip selects enabling said M rows of memory elements of said memory array; and

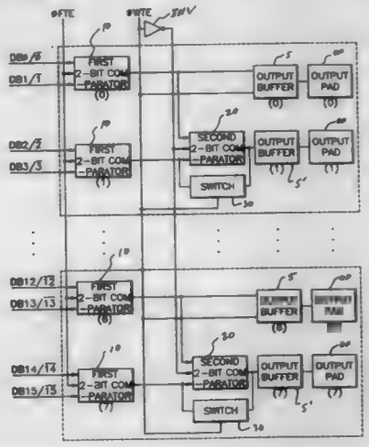
direction and enable decoding means coupled to said computer via said address bus, and to said memory array, said direction and enable decoding means producing a plurality of enable signals for selectively enabling said transceiver means to select (N−1) of said columns of memory elements of said different columns of memory elements including said plurality replacement memory elements.

5,471,480

PARALLEL TEST CIRCUIT FOR USE IN A SEMICONDUCTOR MEMORY DEVICE

Jei-Hwan You, Kyungki, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 22, 1993, Ser. No. 50,779
Claims priority, application Rep. of Korea, Apr. 22, 1992, 6727/1992
Int. Cl.[6] G01R *31/28;31/26;* **C11C** *29/00*
U.S. Cl. 371—21.2 **13 Claims**



1. A parallel test circuit for use in a semiconductor memory chip, comprising:

a plurality of first comparators, each coupled to receive test data on a plurality of bit lines, each generating a comparison output in response to received data and in response to a test enable signal;

a first set of output buffers coupled to receive a first set of outputs from first ones of said first comparators;

a second set of output buffers coupled to selectively receive one of a) a second set of outputs from remaining ones of said first comparators or b) a third set of outputs from a corresponding plurality of second comparators;

said plurality of second comparators coupled to generate said third set of outputs in accordance with corresponding ones of said first set of outputs and corresponding ones of said second set of outputs; and

switching means, responsive to a selection signal, which causes either said second set of outputs generated from said remaining ones of said first comparators said third set of outputs generated from said second comparators to be outputted to said second set of output buffers.

5,471,481

TESTING METHOD FOR ELECTRONIC APPARATUS

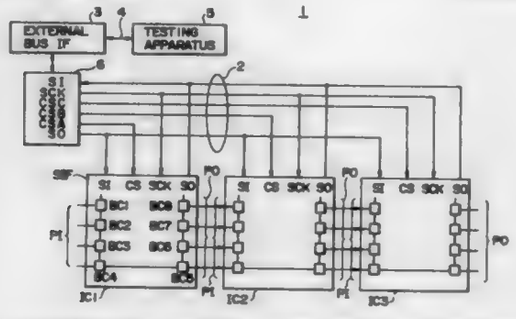
Koji Okumoto, Tokyo; Katsumi Matsuno, Kanagawa; Toru Shiono, Tokyo; Toshitaka Senuma, Tokyo; Tokuya Fukuda, Tokyo, and Shinji Takeda, Kanagawa, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 17, 1993, Ser. No. 61,731

Claims priority, application Japan, May 22, 1992, 4-154090; May 18, 1992, 4-170054

Int. Cl.[6] G06F *11/25*

U.S. Cl. 371—22.3 **15 Claims**



1. A method of testing the interconnection of first and second integrated circuits each including a parallel data input/output terminal, serial input and output terminals, and boundary scan cells associated with said parallel data input/output terminal, said first and second integrated circuits each selectively having a test mode in which the respective serial input and output terminals are operable to receive and supply test serial data and a non-test mode in which said serial input and output terminals are operable to receive and supply non-test serial data, and said parallel data input/output terminal of said first integrated circuit being connected to said parallel data input/output terminal of said second integrated circuit, the method comprising the steps of:

selectively setting said first and second integrated circuits in said test mode and said non-test mode;

supplying test data to said serial input terminal of said first integrated circuit when said first integrated circuit is in said test mode;

controlling said first integrated circuit to serially store said test data in said boundary scan cells and to supply the test data stored in said boundary scan cells as parallel data from said first integrated circuit at said p rallel data input/output terminal;

controlling said second integrated circuit to store in its boundary scan cells said parallel data supplied to its parallel data input/output terminal from said parallel data input/output terminal of said first integrated circuit, and to serially supply the parallel data stored in said boundary scan cells as output test data from said second integrated circuit at its serial output terminal; and

comparing the output test data supplied from said serial output terminal of said second integrated circuit with said test data supplied to said serial input terminal of said first integrated circuit as an indication of the state of said interconnection between said first and second integrated circuits.

5,471,482

VLSI EMBEDDED RAM TEST

Larry L. Byers, Apple Valley; Donald W. Mackenthun, Fridley; Philip J. Fye, Maplewood; Gerald J. Maciona, Mounds View; Jeff A. Engel, Chisago City; Ferris T. Price, late of Mayer, and Dale K. Seppa, New Brighton, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 5, 1994, Ser. No. 223,435

Int. Cl.[6] G01R *31/28;31/26;* **G01C** *29/00*

U.S. Cl. 371—21.2 **2 Claims**

1. A method for performing a test of a RAM structure having a plurality of RAM cells, comprising the steps of:

a. writing a first data pattern built from a seed to each RAM cell consecutively between the minimum cell address and the maximum cell address;

b. reading back the data pattern from the minimum cell address of the RAM structure and comparing the result to the data written to that address in step (a) and indicating a fault if the data read does not match the data written;

c. writing a second data pattern built from a compliment of the seed to the minimum cell address of the RAM structure;

d. reading back the data pattern from the minimum cell address of the RAM structure and comparing the result to the data written to that address in step (c) and indicating a fault if the data read does not match the data written;

e. rewriting the second data pattern built from the compliment of the seed to the minimum cell address of the RAM structure;

f. repeating steps (b)–(e) for each address in the RAM structure from the minimum cell address to the maximum cell address;

g. reading back the data pattern from the minimum cell address of the RAM structure and comparing the result to the data written to that address in step (f) and indicating a fault if the data read does not match the data written;

h. writing a data pattern built from the original seed to the minimum cell address of the RAM structure;

i. reading back the data pattern from the minimum cell address of the RAM structure and comparing the result to the data written to that address in step (h) and indicating a fault if the data read does not match the data written;

j. rewriting the data pattern built from the original seed to the minimum Cell address of the RAM structure;

k. repeating steps (g)–(j) for each address in the RAM structure from the minimum cell address to the maximum cell address;

l. reading back the data pattern from the maximum cell address of the RAM structure and comparing the result to the data written to that address in step (k) and indicating a fault if the data read does not match the data written;

m. writing a second data pattern built from a compliment of the seed to the maximum cell address of the RAM structure;

n. reading back the data pattern from the maximum cell address of the RAM structure and comparing the result to the data

written to that address in step m, and indicating a fault if the data read does not match the data written;

o. rewriting the second data pattern built from the compliment of the seed to the maximum cell address of the RAM structure;

p. repeating steps (l)–(o) for each address in the RAM structure from the maximum cell address to the minimum cell address;

q. reading back the data pattern from the maximum cell address of the RAM structure and comparing the result to the data written to that address in step p, and indicating a fault if the data read does not match the data written;

r. writing a data pattern built from the original seed to the maximum cell address of the RAM structure;

s. reading back the data pattern from the maximum cell address of the RAM structure and comparing the result to the data written to that address in step r, and indicating a fault if the data read does not match the data written; and

t. rewriting the data pattern built from the original seed to the maximum cell address of the RAM structure;

u. repeating steps (q)–(t) for each address in the RAM structure from the maximum cell address to the minimum cell address.

5,471,483

Patent Not Issued For This Number

5,471,484

METHOD AND APPARATUS FOR TESTING DIGITAL SIGNALS

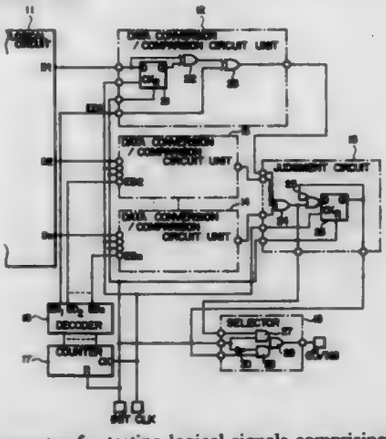
Soichi Kawasaki, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 20, 1992, Ser. No. 854,897

Claims priority, application Japan, Mar. 20, 1991, 3-57028

Int. Cl.[6] G01R *31/28*; G06F *11/00*

U.S. Cl. 371—25.1 **7 Claims**



2. An apparatus for testing logical signals comprising:

first comparison means for comparing a first logical signal outputted from a logical circuit to be tested with a test signal which assumes an expected value corresponding to a correct level of said first logical signal, during at least one arbitrary unit test cycle;

change point detecting means for detecting a time when said first logical signal changes level and outputting change point information, by comparing said first logical signal delayed by said unit test cycle with said first logical signal that has not been delayed;

expected change point generating means for generating an expected change point signal indicating a bit position at which said level of said test signal changes; and

second comparison means for comparing said change point information with said expected change point signal, wherein said logical circuit to be tested is tested using comparison results of said first and second comparison means.

5,471,485

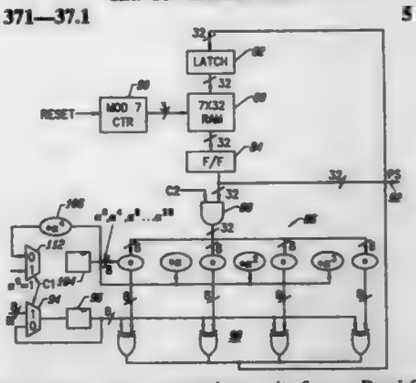
REED-SOLOMON DECODER USING DISCRETE TIME DELAY IN POWER SUM COMPUTATION

Po Tong, Fremont, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Nov. 24, 1992, Ser. No. 980,944

Int. Cl.[6] H03M *13/00*

U.S. Cl. 371—37.1 **5 Claims**



4. The power sum computation unit for a Reed-Solomon decoder in which a code word, R, comprises a first plurality, n, said power sum computation unit comprising multiplication means for multiplying in parallel said n symbols by powers of a finite field element, α, to obtain the power sums

$$Si = \sum_{j=0}^{n-1} Rj\alpha^{ij}$$

for $i = 0, 1, \ldots, r-1$

said multiplication means including M multipliers for simultaneously multiplying M symbols by powers of said finite field element,

memory delay means for storing symbols and simultaneously providing M Symbols to said multiplication means, said memory delay means comprising a latch having a bit width equal in the number of symbols per word times the number of bits per symbol (Mxm), a random access memory having an input and an output, said random access memory having a bit width equal to Mxm, said latch being connected to an input of said random access memory, and a flipflop having a bit width equal to Mxm, said flipflop being connected to the output of said random access memory, and

exclusive OR means for selectively connecting products from said multiplication means and data input symbols to said memory delay means.

5,471,486

METHODS AND DEVICES FOR ENCODING DATA SYMBOLS IN ACCORDANCE WITH A BCH CODE TO OBTAIN A CODE WORD IN WHICH PARITY SYMBOLS ARE LOCATED IN THE MIDDLE OF THE CODE WORD

Constant P. M. J. Baggen, and Erik W. Gaal, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 107,547, Aug. 17, 1993, abandoned. This application Feb. 7, 1995, Ser. No. 385,397

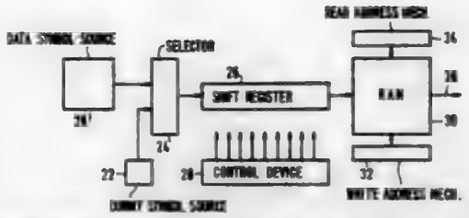
Claims priority, application European Pat. Off., Aug. 21, 1992, 92202562

Int. Cl.[6] G06F *11/10*

U.S. Cl. 371—37.1 **26 Claims**

11. A device for encoding data symbols in accordance with a BCH code to obtain a code word having a code word order in which parity symbols for the code word are interposed between a first portion of the data symbols and a second portion of the data symbols, the device comprising:

parity determining means for (a) receiving the data symbols in a predetermined order in which the second portion precedes the



first portion and zero data symbols are located in between the second portion and the first portion, and (b) producing the parity symbols therefrom, said parity determining means including

a shift register which (a) sequentially receives the data symbols and zero data symbols in accordance with the predetermined order, and initially modifies each of the data symbols and zero data symbols upon receipt based upon at least one of data symbols and zero data symbols previously received by said shift register; and (b) sequentially shifts each of the data symbols and zero data symbols, after initial modification, through said shift register in accordance with the predetermined order, and further modifies each of the data symbols and zero data symbols as each is shifted through said shift register based upon at least one of data symbols and zero data symbols later received by said shift register to produce the parity symbols; and

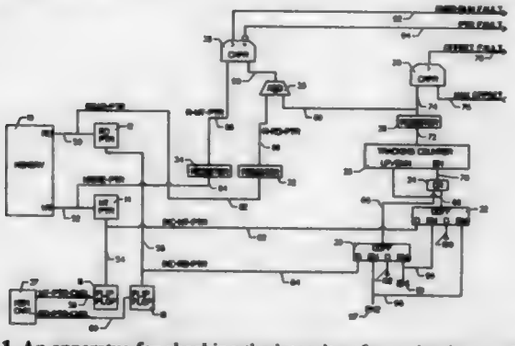
positioning means for positioning the parity symbols with respect to the data symbols so that the parity symbols are interposed between the first portion and the second portion to obtain the code word.

5,471,487

STACK READ/WRITE COUNTER THROUGH CHECKING

Robert H. Andrighetti, Woodbury, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 26, 1994, Ser. No. 233,232
Int. Cl.[6] G06F *11/00*
U.S. Cl. 371—57.1 **22 Claims**



1. An apparatus for checking the integrity of a read pointer value stored in a read pointer register and a write pointer value stored in a write pointer register, the read pointer register and the write pointer register being coupled to a memory device and controlled by a number of control signals provided by a memory controller, comprising:

a. determining means coupled to the read pointer register and to the write pointer register for determining an expected difference between the read pointer value and the write pointer value, said determining means determining the expected difference by monitoring predetermined ones of the number of control signals provided by the memory controller;

b. adding means coupled to said determining means for adding the expected difference to the read pointer value and obtaining an expected write pointer value; and

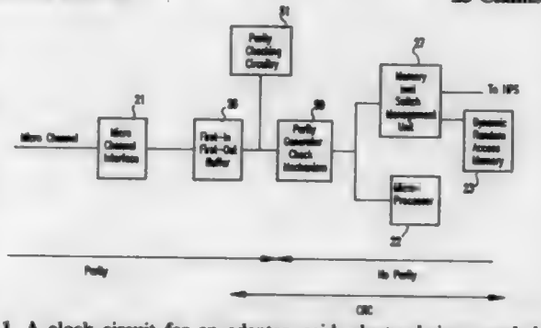
c. first comparing means coupled to said adding means and further coupled to the write pointer register for comparing the expected write pointer value to the write pointer value and for notifying the memory controller when the expected write pointer value does not have a predetermined relationship with the write pointer value.

5,471,488

CLOCK FAULT DETECTION CIRCUIT

Carl A. Bender, Highland, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 5, 1994, Ser. No. 222,813
Int. Cl.[6] G11B *27/00*; H03M *13/00*; H04L *7/00*
U.S. Cl. 371—61 **23 Claims**



1. A clock circuit for an adaptor, said adaptor being coupled between a channel of a main processor and a switching mechanism, said clock circuit comprising:

a switch clock located in said switching mechanism, said switch clock having an output coupled to said adaptor, said switch clock generating a clock signal having a first state and a second state;

a counting mechanism in said adaptor including:

a first input connected to an output of said switch clock for sensing transmission of said clock signal from said first state to said second state,

a second input connected to said output of said switch clock the sensing a transition of said clock signal the said second state to said first state,

a counter connected to said first and second inputs for starting counting from an initial value to a terminal value responsive to the sensing of one of the transitions in said clock signal, and

an output for generating a reset signal responsive to said counter counting to said terminal value, a frequency of said counter being greater than that of said clock signal such that a missing clock signal transition allows said counting mechanism to reach said terminal value;

reset means, operatively coupled to said output of said counting mechanism, for resetting said adaptor responsive to said reset signal; and

reset transmitting means, coupled between said reset means and said channel of said main processor, for transmitting a reset condition of said adaptor to said channel, such that said channel avoids being left in a hung condition if a clock signal transition is missed.

5,471,489

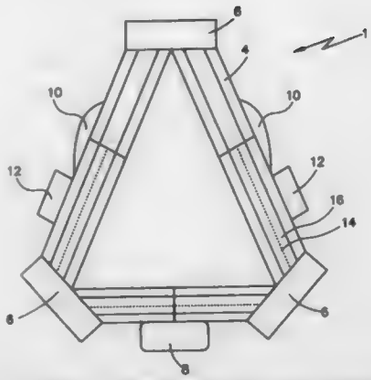
MAGNETIC MEANS FOR SUPPRESSION OF LASING IN CERTAIN WAVELENGTHS IN A RING LASER GYRO

Rodney H. Thorland, Shoreview, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 29, 1994, Ser. No. 315,164
Int. Cl.[6] H01S *3/098*
U.S. Cl. 372—19 **10 Claims**

1. Means to control a lasing operation at specific wavelengths in a ring laser gyro which comprises:

a ring laser gyro block;



an interior gain bore within the ring laser gyro block having a plurality of sides and a plurality of ends and containing gain medium;

a plurality of mirrors positioned at the ends of the interior gain bore to allow laser beams to reflect and perform the lasing operation;

a plurality of electrodes positioned at the sides of the ring laser gyro block for generating counterpropagating laser beams within the interior gain bore in which a current flows through the electrodes to the interior gain bore to create gain legs; and

magnetic device in proximity to the gain legs that suppresses the lasing operation at the specific wavelengths by creating a inhomogenous magnetic field.

5,471,490

DEVICE IN WHICH ELECTROMAGNETIC RADIATION IS RAISED IN FREQUENCY AND APPARATUS FOR OPTICALLY SCANNING AN INFORMATION PLANE, COMPRISING SUCH A DEVICE

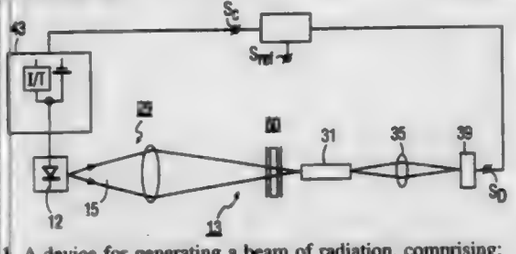
Coen T. H. F. Liedenbaum, Eindhoven; Arnoldus L. G. J. Severens, Breda; Ronald R. Drenten, and Michiel J. Jongerius, both of Eindhoven, all of, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 23, 1992, Ser. No. 996,215

Claims priority, application European Pat. Off., Dec. 30, 1991, 91203426; Dec. 3, 1992, 92203740

Int. Cl.[6] H01S *3/133;3/139*

U.S. Cl. 372—32 **37 Claims**



1. A device for generating a beam of radiation, comprising:

a non-linear optical medium having an acceptance bandwidth,

a multimode pulsed laser producing radiation at a plurality of wavelengths,

means for directing said radiation into said medium, and

feedback means having an active control system comprising a detector producing an output signal responsive to frequency-raised radiation from said medium, and a control unit responsive to said output signal for controlling at least one parameter affecting said pulsed laser so that at least one of said wavelengths or an average value of two of said wavelengths falls within said acceptance bandwidth, and for influencing the quantity of said frequency-raised radiation.

5,471,491

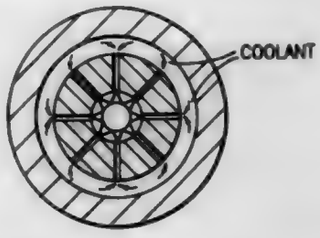
METHOD AND STRUCTURE FOR IMPINGEMENT COOLING A LASER ROD

Peter E. Phillips, Redondo Beach; Landon A. Strattan, Playa Del Ray, and Vikram D. Desai, Lake Forest, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Nov. 15, 1994, Ser. No. 339,616

Int. Cl.[6] H01S *3/04*

U.S. Cl. 372—35 **8 Claims**



1. A cooling structure for a laser rod having a longitudinal axis and contained within a pumped laser apparatus comprising;

an annular channel disposed radially around said laser rod, said laser rod operating at a known temperature and at a high power density; and

a means for cooling disposed between said annular channel and said laser rod, said means for cooling including at least one jet aperture radially extending from said laser rod to permit fluid to pass from said annular channel said fluid impinging substantially normal and in a radial directions onto said laser rod said fluid having a lower temperature than the known operating temperature of said laser, said impingement thereby reducing temperature differential between said rod and said fluid, to thereby increase the cooling efficiency of said laser.

5,471,492

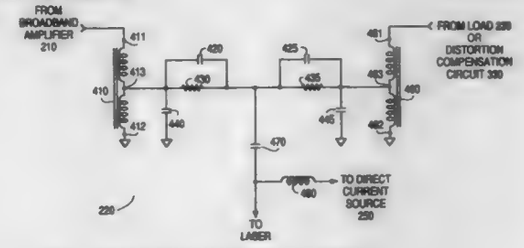
BROADBAND MATCHING NETWORK

Rezin E. Pidgeon, Jr., Atlanta, and Grover H. Martin, Stone Mountain, both of Ga., assignors to Scientific Atlanta, Inc., Norcross, Ga.

Filed Dec. 1, 1992, Ser. No. 983,754

Int. Cl.[6] H01S *3/00*

U.S. Cl. 372—38 **20 Claims**



1. A laser transmission system comprising:

a laser;

a broadband source for outputting a modulated signal; and

an impedance matching network, coupled to said broadband source, for matching the impedance of said laser to the impedance of said broadband source and for supplying the modulated signal to drive said laser the modulated signal facilitating efficient power transfer between said broadband source and said laser such that said broadband source does not generate high output levels that cause intermodulation distortion, said impedance matching network comprising

a first transformer, an input terminal of said first transformer coupled to said broadband source, and

a filter circuit having a first input terminal coupled to an output terminal of said first transformer and having an output terminal coupled to an input terminal of said laser, said filter circuit outputting the modulated signal from the output terminal to drive said laser.

5,471,493

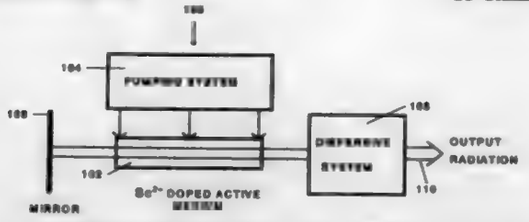
SC^{2+} BASED ACTIVE CRYSTALLINE LUMINESCENT MEDIA FOR LASER SYSTEMS TUNABLE IN UV-VISIBLE SPECTRAL RANGE

Sergey B. Mirov, Birmingham, and William A. Sibley, Homewood, both of Ala., assignors to The UAB Research Foundation, Birmingham, Ala.

Filed Sep. 16, 1994, Ser. No. 308,102

Int. Cl.[6] H01S 3/16

U.S. Cl. 372—42 **21 Claims**



1. A tunable laser system having output radiation tunable in the UV-visible spectral range, comprising:

a pumping system;

an Sc^{2+} active crystalline luminescent medium coupled to said pumping system to receive pumping radiation from said laser pumping system and to emit output radiation in the UV-visible spectral range, said active crystalline luminescent medium being an alkali-earth-halide crystal having Sc^{2+} ion impurities providing stable luminescent optical centers and having a d^1 electron configuration which provides no energy levels above an upper laser level that will cause losses due to excited state absorption; and

a dispersive system coupled to said laser pumping system and said Sc^{2+} active crystalline luminescent medium to tune said output radiation in the UV-visible spectral range.

5,471,494

METHOD FOR SELECTING A SELF PULSATING SEMICONDUCTOR LASER

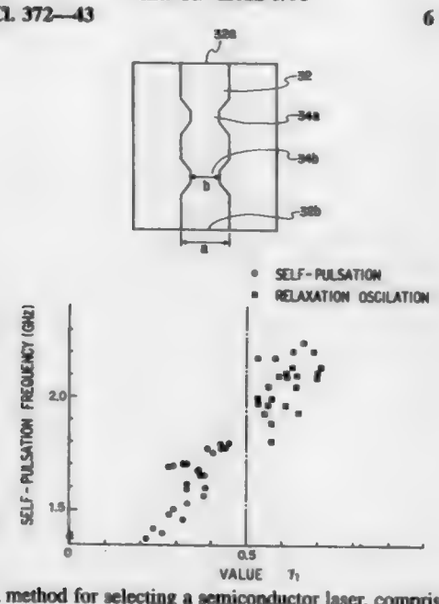
Hiroshi Mataki; Satoshi Uchida, and Hajime Sakiyama, all of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 36,727, Mar. 25, 1983, abandoned. This application Jun. 6, 1994, Ser. No. 254,079

Claims priority, application Japan, Apr. 8, 1992, 4-87152; Apr. 15, 1992, 4-95452

Int. Cl.[6] H01S 3/18

U.S. Cl. 372—43 **6 Claims**



1. A method for selecting a semiconductor laser, comprising the steps of:

(a) measuring highest peak intensity, Ia, and next highest peak intensity, Ib, of an interference fringes pattern of laser radiation of each semiconductor laser using an interferometer to find a damping ratio of visibility of the interference fringes pattern, γ=Ib/Ia; and

(b) selecting a semiconductor laser exhibiting self-pulsation by selecting a semiconductor laser which emits laser radiation whose damping ratio of visibility, γ, is 0.5 or less.

5,471,495

ELECTRIC ARC FURNACE ARRANGEMENT FOR PRODUCING STEEL

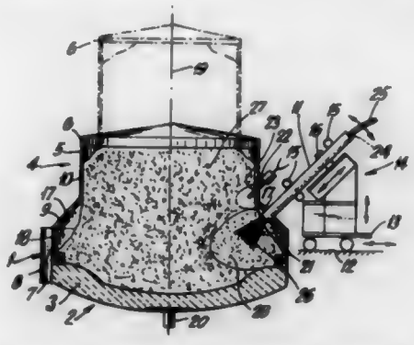
Harald Berger; Peter Mitteg, both of Linz; Johannes Steins, Gallneukirchen, and Gert Pfeiffer, Leonding, all of, Austria, assignors to Voest-Alpine Industrieanlagenbeau GmbH, Linz, Austria

Filed Nov. 12, 1992, Ser. No. 974,792

Claims priority, application Austria, Nov. 18, 1991, 2282/91; Dec. 16, 1991, 2490/91

Int. Cl.[6] H05B 11/00

U.S. Cl. 373—2 **28 Claims**



1. In an electric arc furnace arrangement comprising a furnace vessel having an upper part, a lower part and a bottom associated with said lower part for receiving a metal charge to be melted, said metal charge to be received comprising at least one ferrous metal selected from the group consisting of iron scrap, sponge iron and pig iron, wherein said furnace vessel has at least one graphite electrode projecting therein capable of displacement along its longitudinal axis and of forming an electric arc by ignition with said metal charge, the improvement:

wherein a region of said lower part of the furnace vessel is outwardly radially enlarged relative to its upper part to form a radially enlarged part,

wherein said at least one graphite electrode projects laterally from outside of said vessel into the vessel in a region of entry into the radially enlarged part of said vessel and is arranged at a level with respect to the vertical axis of said furnace vessel, and

wherein a plurality of oxygen burner lances are symmetrically radially arranged with respect to said vertical axis and horizontally disposed adjacent to said at least one graphite electrode on at least one level located above a level on which said graphite electrode is arranged for introducing fossil energy, said at least one graphite electrode being directed to a region in said lower part of the vessel adapted to receive and confine said metal charge for the melting thereof.

5,471,496

ELECTRODE SUPPORT DEVICE FOR ARC FURNACES

Lutz Becker, Duisburg, and Andreas Schüring, Mülheim/Ruhr, both of, Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Germany

Filed Oct. 15, 1993, Ser. No. 138,233
Claims priority, application Germany, Jan. 20, 1992, 42 36 158.3
Int. Cl.[6] H05B 7/10
U.S. Cl. 373—94 7 Claims

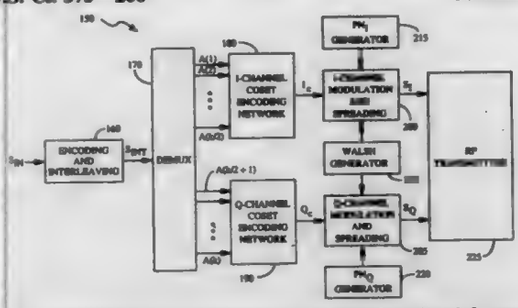
1. An electrode support device for arc furnaces, comprising at least one support arm constructed as a hollow section with a wall formed at least partially from current-carrying material of high conductivity and having an inner surface and an Outer surface, the wall of the hollow section having a coolant guiding system including ducts arranged within the wall between the inner surface and the outer surface so as to be parallel to one another and to a center axis of the support arm, the ducts being dimensioned and provided in a quantity so as to enable sufficient cooling without a reduction in strength of the support arm.

5,471,497

METHOD AND APPARATUS FOR VARIABLE RATE SIGNAL TRANSMISSION IN A SPREAD SPECTRUM COMMUNICATION SYSTEM USING COSET CODING

Ephraim Zehavi, 5365 Toscana Way, San Diego, Calif. 92122

Filed Nov. 1, 1993, Ser. No. 146,642
Int. Cl.[6] H04L 27/30
U.S. Cl. 375—200 30 Claims



1. A transmitter for modulating an information signal for transmission in a spread spectrum communication system comprising:

means for demultiplexing said information signal into first and second subsignals;

first means for combining said first subsignal with a first coset code and for combining said second subsignal with a second coset code orthogonal to said first coset code so as to produce a first composite coset-encoded signal;

means for generating an orthogonal function signal; and

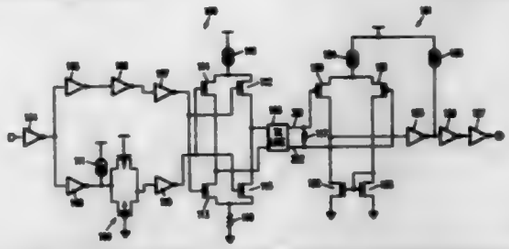
means for modulating said first composite coset-encoded signal with said orthogonal function signal in order to provide a first modulated signal.

5,471,498

HIGH-SPEED LOW-VOLTAGE DIFFERENTIAL SWING TRANSMISSION LINE TRANSCEIVER

James R. Kuo, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 15, 1993, Ser. No. 47,731
Int. Cl.[6] H04L 27/04; 1/02; H03K 9/00; H03F 3/04
U.S. Cl. 375—295 29 Claims



1. A data transmitter for converting single-ended digital data to differential data, said transmitter comprising:

an input terminal;

first and second parallel conduction paths;

a first inverter connected in said first conduction path and a second inverter connected in said second conduction path, said second inverter being formed in CMOS;

a temperature compensation unit connected to an output of said second inverter, said temperature compensation unit providing a current which increases with increasing temperature so as to regulate a rise time of pulses generated at said output of said second inverter; and

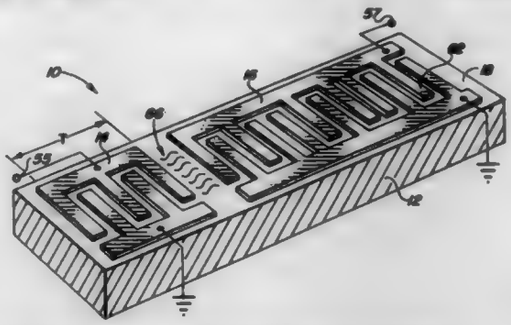
a switching circuit connected to said first and second conduction paths, said switching circuit providing differential output data in response to single-ended input data at said input terminal.

5,471,499

MINIMUM SHIFT KEYED SAW DEVICE AND METHOD

Roy B. Brown, 456 Forestwood Ln., Maitland, Fla. 32751, and Neal J. Tolar, 703 Blue Lake Dr., Longwood, Fla. 32779

Filed Mar. 19, 1993, Ser. No. 34,404
Int. Cl.[6] H04L 27/12
U.S. Cl. 375—305 11 Claims



1. A surface acoustic wave (SAW) device comprising:

a piezoelectric medium;

an input transducer provided on the medium having a length equal to one code bit length, the input transducer for receiving an impulse input and launching a surface acoustic wave, the input transducer also having a characteristic center frequency defined by the sum of the input waveform frequency and the reciprocal of four times the code bit length, the surface wave having a center frequency defined by the input transducer; and

an output transducer for detecting the launched surface acoustic wave and providing a minimum shift-keyed waveform, the output transducer having a length equal to a predefined number of code bits times the code bit length, the output transducer having a finger structure that follows a phase modulation of the bit code, the output transducer further having a

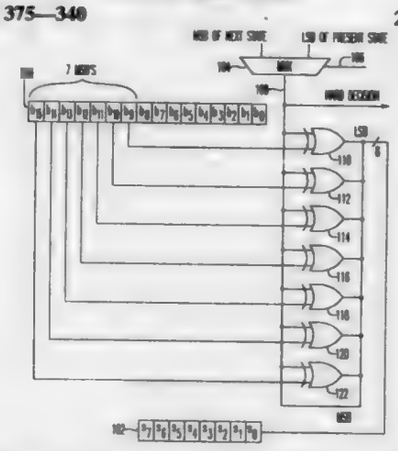
characteristic center frequency equal to the difference between the input waveform frequency and the reciprocal of four times the code bit length.

5,471,500

SOFT SYMBOL DECODING

David M. Blaker, Emmaus; Gregory S. Ellard, Forest Park, and Mohammad S. Mobin, Whitehall, all of Pa., assignors to AT&T IPM Corp., Coral Gables, Fla.

Filed Mar. 8, 1994, Ser. No. 208,156
Int. Cl.[6] H04L 27/06
U.S. Cl. 375—340 20 Claims



8. A circuit for generating a binary soft symbol for use in decoding a received digital signal into bits that are ones and zeroes, the circuit comprising:

means for receiving a hard decision bit, the hard decision bit associated with a state;

means for storing a binary representation of a branch metric associated with the state;

a plurality of exclusive OR gates corresponding in number to predetermined number of bits of the binary representation of the branch metric associated with the state, each of the plurality of exclusive OR gates having a first input to receive a bit of the binary representation of the branch metric, a second input to receive the hard decision bit, and an output, the output of the plurality of exclusive OR gates collectively providing the least significant bits of a soft symbol; and

means for providing the hard decision bit as the most significant bit of the soft symbol.

5,471,501

ENHANCED DIGITAL COMMUNICATIONS RECEIVER USING CHANNEL IMPULSE ESTIMATES

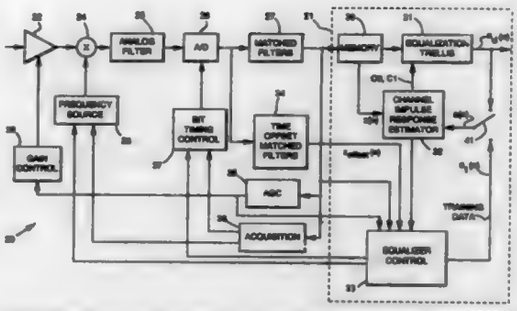
Michael L. Parr, San Diego; John L. Watson, Carlsbad, and T. G. Vishwanath, San Diego, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 722,440, Jun. 27, 1991, Pat. No. 5,263,026. This application Aug. 13, 1993, Ser. No. 107,264
Int. Cl.[6] H04L 7/00
U.S. Cl. 375—354 29 Claims

1. In a digital communications receiver in which signals received sequentially within time slots of a transmission channel, having a carrier and an impulse response are sampled, a method for adjusting timing of the signal sampling and for tracking offset of the transmission channel carrier comprising the steps of:

storing samples of the sequentially received signals in a time sequential manner;

generating transmission channel impulse response estimates associated with the stored samples, the estimates having associated taps;



generating from the samples an error measurement comprising a first measure of the degree to which a channel impulse response estimate matches the actual channel impulse response;

determining a sample time setting that minimizes the above error measurement and adjusting the timing of the signal sampling in accordance with the newly determined sample time setting;

recording at least two samples of at least one tap of a channel impulse response estimate at at least one selected location within a time slot;

estimating the location within the time slot at which any fade in power received over the channel is a maximum; the time slot having a preamble and a postamble;

during the reception of each time slot, selecting the half of the time slot that does not include the estimated location of maximum power fade;

recording two samples of each of two taps of the channel impulse response estimates, the first tap being just after the preamble or in the postamble, depending upon the estimated location of maximum power fade, and the second tap being a predetermined number of symbols later or earlier, depending upon the estimated location of maximum power fade;

selecting a dominant tap;

using recorded settings for the selected dominant tap, calculating a phase change, yielding an estimate of the frequency offset;

filtering the estimate of the frequency offset over many time slots to generating an estimate of the offset of the transmission channel carrier adapted for use as a feedback signal to adjust carrier tracking; and

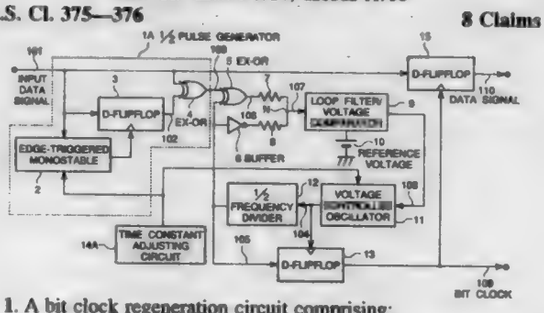
adjusting a controllable frequency source to track the offset of the transmission channel carrier using the feedback signal.

5,471,502

BIT CLOCK REGENERATION CIRCUIT FOR PCM DATA, IMPLEMENTABLE ON INTEGRATED CIRCUIT

Yoshiaki Ishizeki, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 17, 1994, Ser. No. 243,707
Claims priority, application Japan, May 17, 1993, 5-113559
Int. Cl.[6] H03D 3/24; H03K 11/00
U.S. Cl. 375—376 8 Claims



1. A bit clock regeneration circuit comprising:

time constant adjusting means for outputting a time constant adjusting signal;

a T/2 pulse generator receiving an input pulse code modulation (PCM) data signal having a minimum pulse width T, for

generating a T/2 pulse signal having a pulse width corresponding to one half of the minimum pulse width T,

the T/2 pulse generator including an edge-triggered flipflop circuit for receiving and responding to the input PCM data signal for outputting a pulse signal having its pulse width adjusted by said time constant adjusting signal output by said time constant adjusting means;

a voltage-controlled oscillator having a reference oscillation frequency corresponding to 2/T, and controlled by a frequency control signal so as to change its oscillation frequency based on a voltage of the frequency control signal;

a ½ frequency divider receiving an output of the voltage-controlled oscillator, for generating a frequency-divided signal having its frequency one half of the oscillation frequency of the voltage-controlled oscillator;

a phase comparator receiving the T/2 pulse signal and the frequency-divided signal, for generating a phase comparison pulse signal indicative of a phase difference between the T/2 pulse signal and the frequency-divided signal;

filter and comparison means receiving the phase comparison pulse signal, for generating a mean voltage indicative of the phase difference between the T/2 pulse signal and the frequency-divided signal, and comparing the mean voltage with a reference voltage so as to generate a voltage different signal as the frequency control signal to the voltage-controlled oscillator;

first latch means for latching the frequency-divided signal in response to the output of the voltage-controlled oscillator so as to generate a bit clock that is delayed from the frequency-divided signal by T/4; and

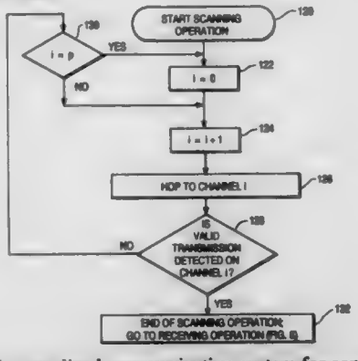
second latch means for latching the input PCM data signal in response to the bit clock so as to generate a data signal.

5,471,503

SCANNING METHOD FOR RECEIVING A TRANSMISSION IN A COMMUNICATION SYSTEM WITH SLOW FREQUENCY HOPPING AND CODING

Paulette R. Altmaier, Cupertino, and Peter J. Potrebic, Mountain View, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Dec. 29, 1992, Ser. No. 997,880
Int. Cl.[6] H04B *1/713*
U.S. Cl. 375—202 **24 Claims**



19. In a decentralized communication system for communicating between two or more of a plurality of unsynchronized stations, a method for detecting and receiving a packet of data transmitted by an arbitrary transmitting station of said plurality of stations using frequency hopping in a predetermined channel sequence of N radio frequencies including a first p (p<N) frequencies, in which said transmitting station encodes and arranges the packet into a plurality of N segments including a first p (p<N) segments each having a corresponding preamble time length t_1, comprising the steps of:

(a) in an arbitrary receiving station that is unsynchronized with said transmitting station, scanning and testing said first p frequencies in a second time period t_2 that is less than the preamble time length t_1;

(b) if a transmission is detected on a first one of said p frequencies, then performing a receiving step (c), otherwise returning to step (a); and

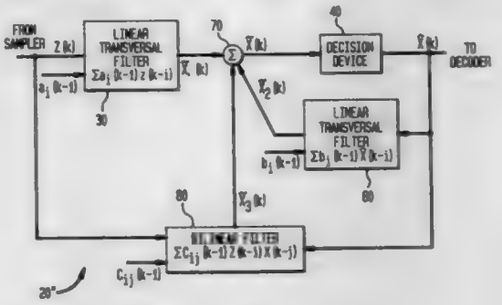
(c) if a transmission is detected in the step (a), receiving the segment associated with said first one of said p frequencies, hopping to the next frequency in the predetermined channel sequence and receiving a segment on that channel, and continuing to hop and receive until the N^{th} segment has been received.

5,471,504

BILINEAR DECISION FEEDBACK EQUALIZER

Junghsi Lee, Taipei, and Ginkou Ma, Hsinchu, both of, Taiwan, Prov. of China, assignors to Computer & Communication Research Laboratories, Hsinchu, Taiwan, Prov. of China

Filed Apr. 14, 1994, Ser. No. 227,535
Int. Cl.[6] H03H *7/30*
U.S. Cl. 375—233 **8 Claims**



1. A channel equalizer, comprising:

a first linear filter connected to receive an equalizer input signal and to output a first filtered signal;

a decision device connected to receive a combined filtered signal from a summer and to output an equalized output signal, said equalized output signal being an output of said equalizer;

a second linear filter connected to receive said equalized output signal and to output a second filtered signal;

a bilinear filter connected to receive said equalized output signal and said equalizer input signal, and to output a third filtered signal; and

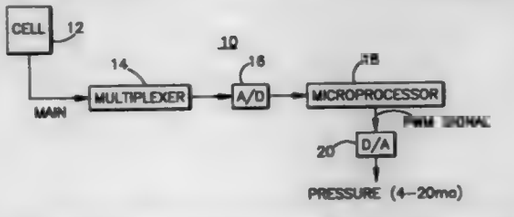
the summer connected to receive said first, second, and third filtered signals, and to output said combined filtered signal.

5,471,505

METHOD AND APPARATUS FOR INCREASING THE RESOLUTION OF A DIGITAL TO ANALOG CONVERTED PULSE WIDTH MODULATED SIGNAL

Tourang Birangi, Eastlake, and Joseph C. Nemer, Mayfield Heights, both of Ohio, assignors to Elsag International N.V., Amsterdam, Netherlands

Filed Oct. 1, 1993, Ser. No. 130,178
Int. Cl.[6] H03K *7/08*
U.S. Cl. 375—238 **10 Claims**



1. In an instrument that measures a parameter of a process and provides an output signal representative of said measured process parameter, said instrument having a computing device therein, said computing device having a clock signal having a predetermined

number of cycles per second, a method for increasing the resolution of said output signal comprising the steps of:

a) measuring said process parameter and developing an analog signal representative of said measured process parameter;

b) converting said analog signal representative of said measured process parameter to a pulse width modulated signal having a least significant bit, N lower order bits one of which is said least significant bit and a predetermined number of cycles per second; and

c) determining in said computing device if the resolution of a cycle of said pulse width modulated signal is to be increased comprising the steps of:

i. scaling said pulse width modulated signal to 2^N times said predetermined number of clock signal cycles per second where N is a positive nonzero integer; and

ii. determining if each of said N lower order bits of said scaled pulse width modulated signal have a value of one; and

d) increasing in said computing device the resolution of said cycle of said pulse width modulated signal if any of said N lower order bits in said cycle of said scaled pulse width modulated signal have a value of one by adding in 2^N consecutive cycles of said clock signal a value of one to said least significant bit of said pulse width modulated signal in a pattern determined by which of said N lower order bits of said scaled pulse width modulated signal have a value of one.

5,471,506

METHOD AND APPARATUS FOR PULSE COMMUNICATION

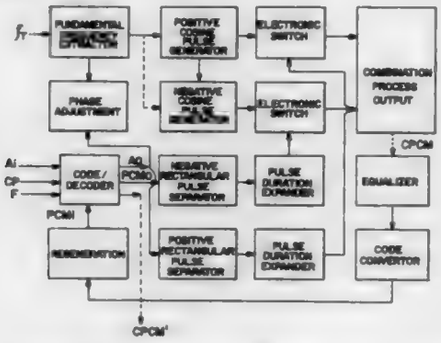
Kejiong Chen, Bldg. 117 Meiyuan, Fujiapo, Wuchang District, Wuhan, Hubei 430070, China, assignor to Kejiong Chen; Shuzhen He; Chunhui Chen, and Cuiwei Chen, all from Wuhan, China

Filed Jul. 9, 1993, Ser. No. 88,364

Claims priority, application China, Jul. 10, 1992, 92105793.8

Int. Cl.[6] H04B *14/04*

U.S. Cl. 375—242 **4 Claims**



1. A communication apparatus comprising a pulse communication circuit consisting of a transmitter and receiver portions, said communication circuit being used to convert rectangular pulse communication to cosine pulse communication, wherein the pulse communication circuit is a cosine pulse code modulation circuit, and its transmitter circuit comprises: a coder/decoder (IC_1) for outputting first and second rectangular pulse code modulation output signal PCMs, a positive and negative rectangular pulse separator to generate a first switching pulse signal from said first rectangular pulse code modulation output signal PCM, a positive and negative pulse duration expander for expanding a duration of said first switching signal, a fundamental frequency extractor for extracting a fundamental frequency from said second rectangular pulse code modulation output signal PCM, a phase adjustor for adjusting a phase of said second rectangular pulse code modulation output signal PCM, a positive and negative cosine pulse generator for generating positive and negative cosine pulses forming a second switching signal, a positive and negative electronic switch adapted to receive said first and second switching signals, and a positive and negative cosine pulse combining processing and outputting portion adapted to receive and combine a positive and negative cosine pulse from said electronic switch to form a cosine pulse code modulation signal CPCM.

5,471,507

CIRCUIT FOR DETECTING OBJECT SIGNAL FROM INPUT SIGNAL

Yutaka Awata, and Mitsuo Kakuishi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

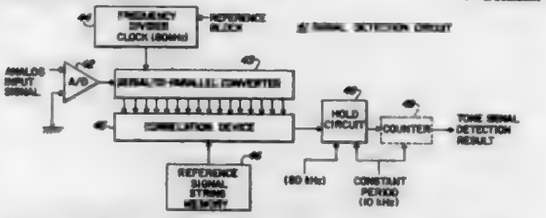
PCT No. PCT/JP93/00100, § 371 Date Sep. 28, 1993, § 102(e) Date Sep. 28, 1993, PCT Pub. No. WO93/15580, PCT Pub. Date May 8, 1993

PCT Filed Jan. 28, 1993, Ser. No. 122,500

Claims priority, application Japan, Jan. 29, 1992, 4-014175

Int. Cl.[6] H04L *27/06*

U.S. Cl. 375—340 **7 Claims**



1. A signal detection circuit comprising:

A/D conversion means for converting an analog signal having a periodicity into one-bit digital signals;

serial-to-parallel converting means for converting the one-bit digital signals into parallel signals of a predetermined number of bits by using a clock signal having a frequency equal to at least twice that of a detection object signal, the predetermined number of bits corresponding to a number of bits of the detection object signal;

correlation means for detecting a correlation between the parallel signals and a reference signal string indicating a signal component of the detection object signal; and

hold means for holding a state of detection of the correlation when an output signal of the correlation means becomes indicative of the state of detection of the correlation at least one time in a period of the detection object signal.

5,471,508

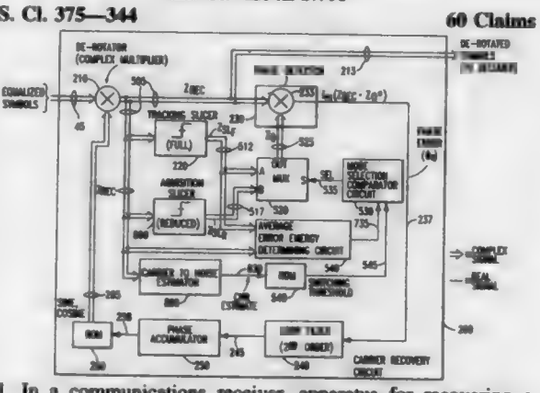
CARRIER RECOVERY SYSTEM USING ACQUISITION AND TRACKING MODES AND AUTOMATIC CARRIER-TO-NOISE ESTIMATION

Joshua L. Koslov, East Windsor, N.J., assignor to Hitachi America, Ltd., Tarrytown, N.Y.

Filed Aug. 20, 1993, Ser. No. 109,742

Int. Cl.[6] H04L *27/06*

U.S. Cl. 375—344 **60 Claims**



1. In a communications receiver, apparatus for recovering a carrier signal from a received signal and for producing de-rotated symbols therefrom, said apparatus comprising:

means, responsive to an incoming stream of symbols obtained from said received signal and to a reference carrier signal, for producing a stream of de-rotated symbols;

tracking slicing means for converting each one of said de-rotated symbols into a corresponding first sliced value so as to define a stream of first sliced values, wherein each of said first sliced values defines a corresponding symbol in a pre-selected constellation;

acquisition slicing means for converting ones of said de-rotated symbols into corresponding second sliced values, wherein each one of said second sliced values is specified by a pre-defined attribute of a corresponding one of said de-rotated symbols;

means, operative in response to a mode select signal, for comparing said each one of said de-rotated symbols to a corresponding one of selectively either said first or second sliced values in order to generate a phase error signal;

means, operative in response to said stream of first sliced values and to said stream of de-rotated symbols, for producing a mode error signal;

means, responsive to said mode error signal and a switching threshold value, for producing said mode select signal; and

means, responsive to said phase error signal, for generating said reference carrier.

5,471,509

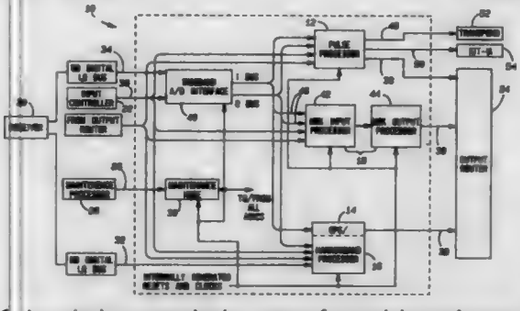
UNIVERSAL MATCHED FILTER

Steven L. Wood, and Manuel L. Garcia, both of San Diego, Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Mar. 18, 1993, Ser. No. 33,717

Int. Cl.[6] H04B *1/10;17/02*

U.S. Cl. 375—350 **15 Claims**



1. An avionic communication system for receiving and processing radio frequency signals, said signals being characterized as pulsed, minimum shift keying (MSK), narrowband and global positioning system (GPS) signal types, said communication system comprising:

front end receiver means for receiving pulsed, minimum shift keying (MSK), narrowband and global positioning system (GPS) signal types;

selection means for selecting one of said signal types received by said front end receiver means for processing;

pulse processor means for processing said pulsed signals and inhibiting said minimum shift keying (MSK), narrowband and global positioning system (GPS), signal types received by said front end receiver means;

minimum shift keying (MSK) processor means for processing said minimum shift keying (MSK) signals and inhibiting said pulsed, narrowband and global positioning system (GPS) signal types received by said front end receiver means;

narrowband processor means for processing said narrowband signals and inhibiting said pulsed, minimum shift keying (MSK) and global positioning system (GPS) signal types received by said front end receiver means;

global positioning system (GPS) processor means for processing said global positioning system (GPS) signals and inhibiting said pulsed, minimum shift keying (MSK) and narrowband signal types received by said front end receiver means; and

interface means for directing said pulsed, minimum shift keying (MSK), narrowband and global positioning system (GPS) signal types received by said front end receiver means to each of said processor means for processing.

5,471,510

ASYNCHRONOUS TRANSFER MODE DIGITAL TELECOMMUNICATION NETWORK TERMINAL EQUIPMENT SYNCHRONIZATION DEVICE

Denis Renault, Janvry, and Roland Campana, Les Ulis, both of, France, assignors to Alcatel Cit, Paris, France

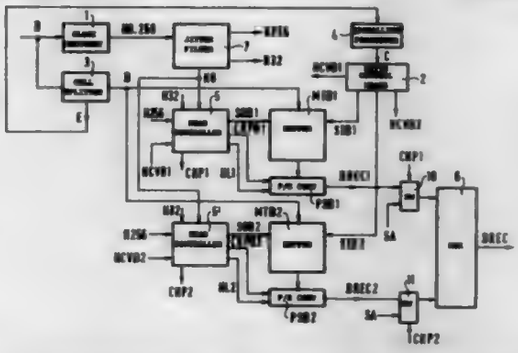
PCT No. PCT/FR92/00912, § 371 Date May 28, 1993, § 102(e) Date May 28, 1993, PCT Pub. No. WO93/07695, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 1, 1992, Ser. No. 70,329

Claims priority, application France, Jan. 4, 1991, 91 12266

Int. Cl.[6] H04L *25/36;7/00*

U.S. Cl. 375—372 **9 Claims**



1. A synchronization device, in an asynchronous transfer mode digital telecommunication network terminal equipment comprising filter and control means for filtering transfer jitter affecting a data signal received via a network and for slaving the frequency of a local clock signal supplied by a local clock internal to said equipment, said device further characterized in that it comprises: a buffer written with said data at a writing clock frequency at which data is received by said equipment; and means for reading said buffer at the frequency of said local clock signal with a time-delay relative to writing, determined in such a way as to minimize risks associated with excessively low bit rates in the recovery of data after such reading during a reaction time of said filter and control means without departing from a permissible margin for a data recovery time-delay.

5,471,511

DIGITAL PHASE-LOCKED LOOP ARRANGEMENT FOR USE IN A DESYNCHRONIZER

Marc R. F. De Langhe, Sleidinge; Peter P. F. Reusens, Laarne; Johan J. G. Haspeslagh, Heverlee, and Stefaan M. A. Van Hoogenbemt, Mechlin, all of, Belgium, assignors to Alcatel N.V., Netherlands

Filed Jun. 16, 1994, Ser. No. 260,771

Claims priority, application European Pat. Off., Jun. 18, 1993, 93201758

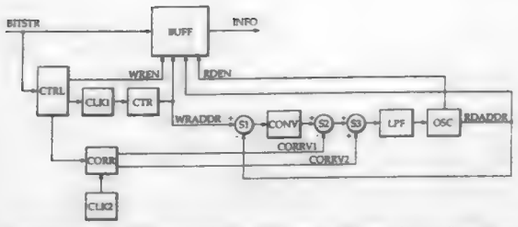
Int. Cl.[6] H03D *3/24;* **H04L** *7/00*

U.S. Cl. 375—376 **10 Claims**

1. Digital phase locked loop arrangement for use in a desynchronizer, comprising:

a low pass filter (LPF), responsive to a corrected read/write address difference signal, for providing a low pass filtered signal;

an oscillator (OSC), responsive to the low pass filtered signal for providing a read address signal (RDADDR);



a subtracter (S1), responsive at a positive input thereof to a write address signal (WRADDR) and at a negative input thereof to the read address signal, for providing a read/write address difference signal;

a gapped clock (CLK1), responsive to a pattern adaptation signal, for providing a gapped clock stream normally constituted by consecutive like patterns each comprising pulses and gaps;

a control (CTRL) having a control signal generator means, responsive to a bitstream (BITSTR), for providing at least a first control signal (V1/V2) and having a control means, responsive to the first control signal (V1/V2), for providing the pattern adaptation signal for adapting said patterns of said gapped clock stream;

a counter means (CTR), responsive to the gapped clock stream, for providing the write address signal (WRADDR);

wherein said digital phase locked loop arrangement further comprises:

a second subtracter (S2), responsive at a positive input thereof to the read/write address difference signal, and responsive at a negative input thereof to a correction value signal (CORRV1), for providing the corrected read/write address difference signal;

a second clock (CLK2) for providing a second clock signal having a second rate; and

a correction means (CORR) including a first correction circuit, responsive to the first control signal (V1/V2) and to the second clock (CLK2) signal, for providing the correction value signal (CORRV1) which is varied to zero at the second rate of the second clock (CLK2) and which is varied with a predetermined value in response to the first control signal (V1/V2).

5,471,512

PHASE-LOCKED LOOP CONFIGURATION

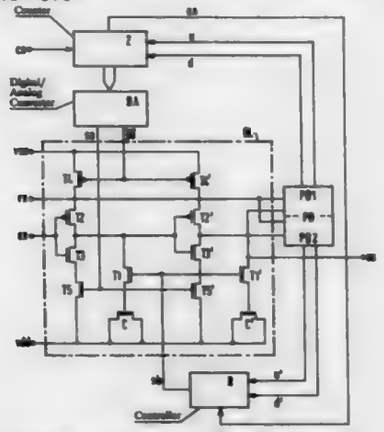
Heinz Werker, Taufkirchen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 3, 1994, Ser. No. 285,399

Claims priority, application Germany, Aug. 3, 1993, 43 26 062.4

Int. Cl.[6] **H03L** *7/06;* **H03K** *5/159;* **G06F** *1/12*

U.S. Cl. 375—376 **4 Claims**



4. A phase-locked loop configuration, comprising:

a controllable delay device receiving an input signal and producing an output signal, said delay device having a signal path with at least one inverter having Supply lines, at least one field effect transistor having a load path, and at least one capacitor connecting the load path transversely to the signal path, said field effect transistor being connected in series with said at least one capacitor and said field effect transistor and said capacitor being connected in parallel with said at least one inverter;

a phase detector receiving a reference signal and the output signal of said delay device;

a first controller connected downstream of said phase detector for controlling the load path of said at least one field effect transistor in said delay device;

said delay device further including at least one pair of further field-effect transistors having load paths connected into the supply lines of said at least one inverter; and

a second controller connected downstream of said phase detector for controlling the load paths of said further field effect transistors;

wherein said phase detector includes two mutually independent partial detectors being respectively triggered by the reference signal and the input signal, and each of said partial detectors triggers a respective one of said two controllers.

5,471,513

SPLIT CONTROL ROD DRIVE

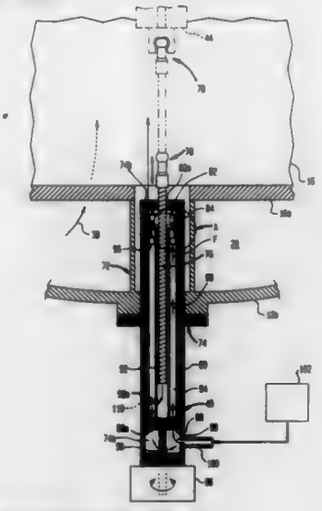
Richard A. Ose, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Division of Ser. No. 908,119, Jul. 2, 1992, Pat. No. 5,406,597.

This application Aug. 1, 1994, Ser. No. 283,886

Int. Cl.[6] **G21C** *7/12*

U.S. Cl. 376—232 **12 Claims**



1. A control rod drive comprising:

means for coupling to a control rod;

a drive assembly which is rotatable in response to electrical power, said drive assembly comprising first threaded means;

second threaded means connected to said coupling means for transforming rotation of said drive assembly into vertical translation of said coupling means;

first means for moving said first threaded means into threaded engagement with said second threaded means;

second means for moving said first threaded means out of engagement with said second threaded means; and

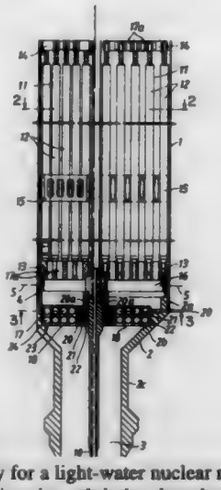
means for applying a force which causes said first means to move said first threaded means into engagement with said second threaded means, wherein said second means move said first threaded means out of engagement with said second threaded means when application of said force ceases.

5,471,514

FUEL ELEMENT FOR A LIGHT-WATER NUCLEAR REACTOR

Anders Söderlund, Surahammar, Sweden, assignor to ABB Atom AB, Västerås, Sweden

Filed Jul. 16, 1993, Ser. No. 93,151
Claims priority, application Sweden, Sep. 30, 1992, 9202828
Int. Cl.[6] G21C 3/32;19/20;15/00
U.S. Cl. 376—313 8 Claims



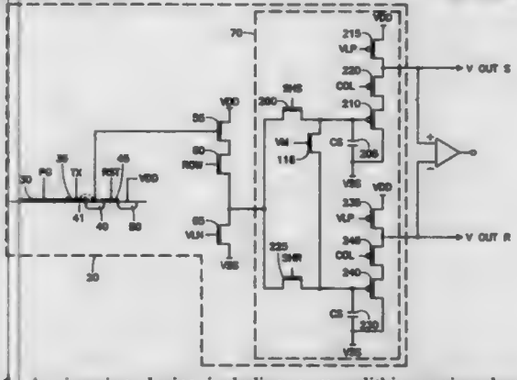
1. A fuel assembly for a light-water nuclear reactor comprising a bottom tie plate having through-holes therethrough, a top tie plate having through-holes therethrough, a plurality of vertical fuel rods extending between the bottom tie plate and the top tie plate, an inlet nozzle for directing coolant upwardly to said bottom tie plate so as to pass through said bottom tie plate, past said vertical fuel rods and through said top tie plate, said inlet nozzle defining a central vertical axis, and a debris catcher fixedly positioned within said inlet nozzle, said debris catcher comprising a support means for supporting at least one helical spring, said support means defining a channel which encircles said central vertical axis and extends in a first plane which is substantially perpendicular to said central vertical axis, and a helical spring fixedly positioned within said channel so as to extend in said first plane and trap debris in said coolant passing therethrough.

5,471,515

ACTIVE PIXEL SENSOR WITH INTRA-PIXEL CHARGE TRANSFER

Eric R. Fossum, LaCrescenta; Sunetra Mendis, Pasadena, and Sabrina E. Kemeny, LaCrescenta, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Jan. 28, 1994, Ser. No. 188,032
Int. Cl.[6] G11C 19/28; H01L 27/14;27/02; H03K 5/159
U.S. Cl. 377—60 18 Claims



1. An imaging device including a monolithic semiconductor integrated circuit substrate, said imaging device comprising a focal plane array of pixel cells, each one of said cells comprising:

a photogate overlying said substrate for accumulating photogenerated charge in an underlying portion of said substrate;

a readout circuit comprising at least an output transistor formed in said substrate;

a charge coupled device section formed on said substrate adjacent said photogate having a sensing node connected to said output transistor and at least one charge coupled device stage for transferring charge from said underlying portion of said substrate to said sensing node; and

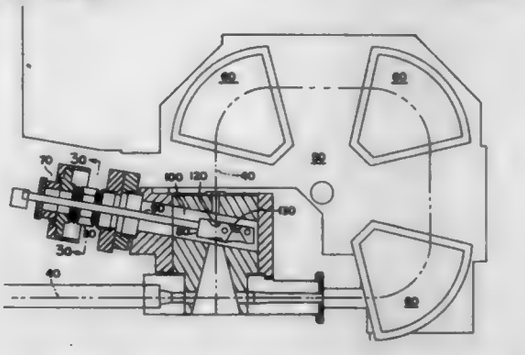
wherein said readout circuit is a complementary metal oxide semiconductor (CMOS) circuit formed on said substrate, said substrate being of a first conductivity type, said CMOS circuit comprising plural metal oxide field effect transistors of a first conductivity type, a well region of a second conductivity type in said substrate and plural metal oxide semiconductor transistors of a second conductivity type formed in said well region.

5,471,516

RADIOTHERAPY APPARATUS EQUIPPED WITH LOW DOSE LOCALIZING AND PORTAL IMAGING X-RAY SOURCE

Craig S. Nunan, deceased, late of Los Altos Hills, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 6, 1994, Ser. No. 319,185
Int. Cl.[6] A61N 5/10
U.S. Cl. 378—65 11 Claims



1. An apparatus for generating therapeutic and diagnostic radiation for medical imaging and treatment of a treatment field, said apparatus comprises:

an accelerator, said accelerator having a first electron gun and accelerating means for producing a high energy electron beam, said beam capable of being converted to a therapeutic X-ray beam;

a movable target for conversion of electrons to X-rays, said target having a body and angular face insert disposed at one end of said body, wherein in treatment mode said target body located on a trajectory of said high energy electron beam and in diagnostic mode said target body located off the trajectory of said high energy electron beam;

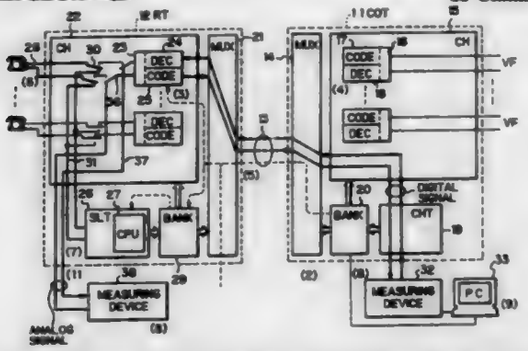
means for positioning said target for diagnostic imaging and treatment; and

a second electron gun for producing a low energy electron beam placed within said means for positioning said target, said low energy electron beam impinging on said target face insert and producing a diagnostic X-ray beam into said treatment field, said diagnostic X-ray beam having a central axis which is collinear and coincident with a central axis of said therapeutic beam and a central axis of said treatment field, said X-ray diagnostic and therapeutic beams having identical source coordinates.

5,471,517
SUBSCRIBER SYSTEM TESTING METHOD

Shouichi Nakagawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 31, 1994, Ser. No. 189,859
Claims priority, application Japan, Sep. 9, 1993, 5-224352
Int. Cl.[6] H04M 1/24
U.S. Cl. 379—29 **11 Claims**



1. A test method for a subcriber line transmission system, said transmission system, by means of multiplexed transmission lines, connecting subscriber lines and associated subscriber circuits located at a remote terminal to associated subscriber circuits located at a central office terminal, said central office terminal being connected to a switching system and including a control terminal, said remote terminal servicing a plurality of subscribers and including a subscriber line tester, said subscriber line transmission system also including a first measuring device located at one of said central office terminal and said remote terminal, for testing subscriber circuits, comprising the steps:

(a) separating a selected subscriber line from an associated subscriber circuit in said remote terminal;

(b) connecting said selected subscriber line to said subscriber line tester;

(c) connecting said first measuring device to said associated subscriber circuit corresponding to said selected subscriber line;

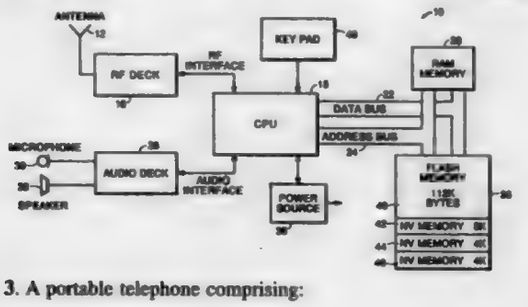
(d) testing said connected subscriber line with said line tester and simultaneously testing said connected associated subscriber circuit with said first measuring device,

said connecting and simultaneous testing being in response to signals from said control terminal located in said central office terminal, the time required for system testing being reduced by said simultaneous testing.

5,471,518
METHOD AND APPARATUS FOR NON-VOLATILE DATA STORAGE IN RADIO TELEPHONES AND THE LIKE

Douglas K. Barber, and Stephan W. Hortensius, both of Calgary, Canada, assignors to NovAtel Communications Ltd., Calgary, Canada

Filed Aug. 10, 1993, Ser. No. 104,870
Int. Cl.[6] H04M 11/00
U.S. Cl. 379—58 **5 Claims**



3. A portable telephone comprising:

A) a radio section responsive to processor data signals applied thereto to generate radio signals and responsive to radio signals received thereby to generate radio-section data signals;

B) an audio section responsive to processor data signals applied thereto to generate sonic signals and responsive to sound signals received thereby to generate audio-section data signals;

C) a central processing unit, connected to apply processor data signals to the audio and radio sections and receive the radio- and audio-section data signals, for fetching machine instructions from a program address space and executing the instructions thus fetched; and

D) a sectored non-volatile memory circuit comprising a plurality of sectors, each of which includes a plurality of memory locations comprising respective pluralities of bit cells, the memory circuit being of the type in which bit cells can be set individually to a first binary value but a bit cell in a given sector can be set to the second binary value only simultaneously with all other bit cells in the same sector, the memory circuit being connected to place into the program address space of the central processing unit a first of the sectors, the first sector containing machine instructions that direct the central processing unit to process the audio and radio data signals, apply control signals to the audio and radio sections, and change the contents of a second sector so as to store a data value in the second sector by:

i) searching memory locations in the second sector by treating each location as comprising separate tag and information parts and determining whether the tag part contains a predetermined tag value;

ii) if the tag part of a memory location contains the predetermined tag value and the information part does not contain the data value or a value that can be changed to the data value by only replacing one or more ONEs with ZEROs, changing the contents of that memory location's tag part by writing at least one ZERO therein so that the tag part no longer contains the predetermined tag value;

iii) finding a memory location whose tag part contains a predetermined vacancy value;

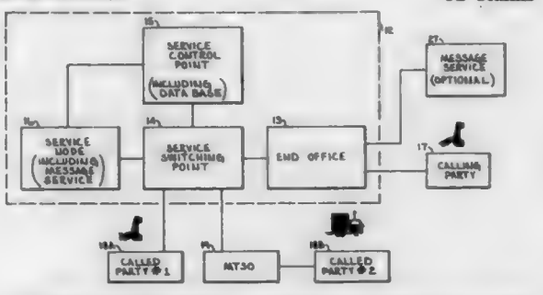
iv) writing the predetermined tag value into that memory location's tag part; and

v) writing the data value into that memory location's information part.

5,471,519
COMMUNICATIONS MONITORING AND CONTROL SYSTEM

Wayne Howe, Duluth; Ed Silver, Atlanta; Kim Bailey, Newnan; Jerry Shih, Roswell; Kitty Morel, Dunwoody; Peter Hill; Cathy Addison, both of Atlanta; Larry Woodring, Decatur, and Dale Malik, Dunwoody, all of Ga., assignors to BellSouth Corporation, Atlanta, Ga.

Filed Feb. 26, 1993, Ser. No. 25,370
Int. Cl.[6] H04M 3/22
U.S. Cl. 379—67 **32 Claims**



1. A method for processing a communication directed to a called party, comprising the steps of:

receiving said communication;

advising said called party of said communication;

receiving disposition information regarding said communication, said disposition information comprising a request for monitoring said communication;

in response to receiving said request for monitoring, routing said communication to a message service and establishing a one-way connection from said communication to said called party, whereby said communication routed to said message service may be monitored by said called party through said one-way connection.

5,471,520

Patent Not Issued For This Number

5,471,521

DISTRIBUTED SYSTEM FOR CALL PROCESSING

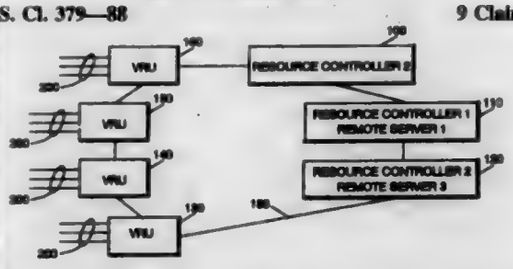
Michael K. Minakami, Sunnyvale, Calif.; Brian Hulse, Romsey Hampshire, England; Jonathan Cook, North End Portsmouth, England, and John B. Pickering, St. Cross Winchester, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1993, Ser. No. 156,193

Claims priority, application United Kingdom, Jul. 29, 1993, 9315695

Int. Cl.[6] H04M *1/64;3/42*

U.S. Cl. 379—88 **9 Claims**



1. A method of interactively processing a telephone call in a distributed system comprising at least a first computer connected to a set of computers by a communications network, the first computer being further interfaced to a telephone network, and the set of computers including at least a second computer, at least one server means, and a resource controller, said method comprising the steps of:

maintaining at the resource controller a list of available server means of the at least one server means and current usages of the at least one server means;

receiving at the first computer an incoming telephone signal formed of a voice signal from the telephone network;

requesting access by the first computer to a requested server means of the at least one server means responsive to reception during said step of receiving of the incoming telephone signal;

responding by the resource controller to the first computer responsive to the access requested during said step of requesting to indicate whether or not the requested server means is available;

forwarding the incoming telephone signal over the communications network to the requested server means when the requested server means is listed amongst the available server means during said step of responding;

processing the voice signal forming the incoming telephone signal at the requested server means by performing a voice recognition function on the voice signal and generating voice data responsive to identification of the digits of the voice signal forwarded to the server means and processed thereat;

transmitting the voice data from the requested server means at the second computer to the first computer responsive to said step of processing, and responding to said incoming telephone signal at the first computer in accordance with said voice data.

5,471,522

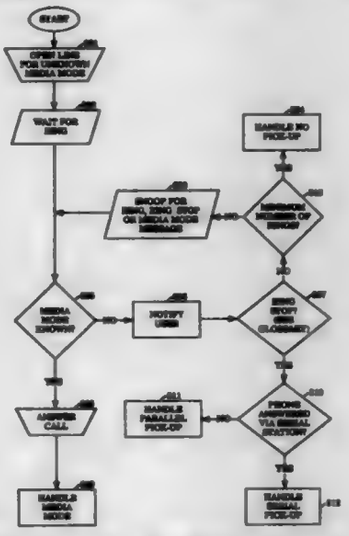
TELEPHONE LINE SHARING FOR A PERSONAL COMPUTER SYSTEM

Chris Sells, Hillsboro, and Russ Hampsten, Beaverton, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 4, 1993, Ser. No. 101,908

Int. Cl.[5] H04M *11/00*

U.S. Cl. 379—97 **32 Claims**



1. A method of telephone line sharing in a computer system, comprising the steps of:

monitoring a telephone line for an indication of a media mode for an incoming call on the telephone line;

if the indication of the media mode is detected, then passing the incoming call to a telephony application program that corresponds to the media mode and that executes on the computer system;

if the indication of the media mode is not detected, then determining a user option for handling the incoming call including determining whether a ring stop has occurred, and if occurred due to a parallel telephone pick-up, then monitoring the telephone line for the length of the incoming telephone call for a tone indicating that a telephony application is to be initiated.

5,471,523

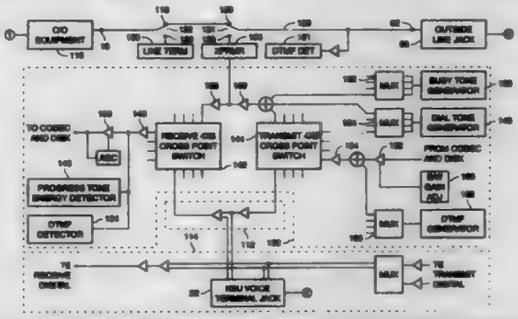
TELEPHONE CALL AND VOICE PROCESSING SYSTEM

Bernard J. Smith, Sunnyvale; David B. Seager, San Jose; Raymond L. Tong, Milpitas, and Thomas E. Rowley, San Jose, all of Calif., assignors to Voysys Corporation, Fremont, Calif.

Filed Jul. 14, 1993, Ser. No. 91,893

Int. Cl.[6] H04M *1/00;1/64*

U.S. Cl. 379—165 **12 Claims**



1. A call and voice processing system for use with a telephone key system, said telephone key system of a specific model type, said telephone key system having at least a first central office

telephone port adapted for connection to a central office telephone line and at least a first and a second digital feature telephone port, said first digital feature telephone port not connected to a digital feature telephone and said second digital feature telephone port coupled to a user's digital feature telephone, said call and voice processing system comprising:

a voice mail system including:

a plurality of user voice mail boxes, at least one of said user voice mail boxes associated with a user;

at least one telephone emulation port adapted for communicating both digital control data and voice signals between said voice mail system and the telephone key system, said at least one telephone emulation port adapted to be coupled to the telephone key system at least at the first digital feature telephone port through which both said digital control data and said voice signals are communicated;

a switch capable of assuming one of either of a normal state and an interrupt state, said switch having a common node, a normally closed node and a normally open node, said common node connected to said normally closed node only while said switch is in said normal state and said common node connected to said normally open node only when said switch is in said interrupt state, said interrupt state entered while said user seeks to access one of said user voice mail boxes from said user's digital feature telephone;

a first line-in port adapted to be directly coupled to both a central office telephone line and said normally closed node while said switch is in said normal state; and

a first line-out port adapted to be directly coupled to both the first central office telephone port of the telephone key system and said common node;

wherein said voice mail system is directly coupled to said normally open node so that the central office telephone line is connected to the first central office telephone port of the telephone key system through said switch while said switch is in said normal state and said voice mail system is connected to the first central office telephone port of the telephone key system through said switch while said switch is in said interrupt state.

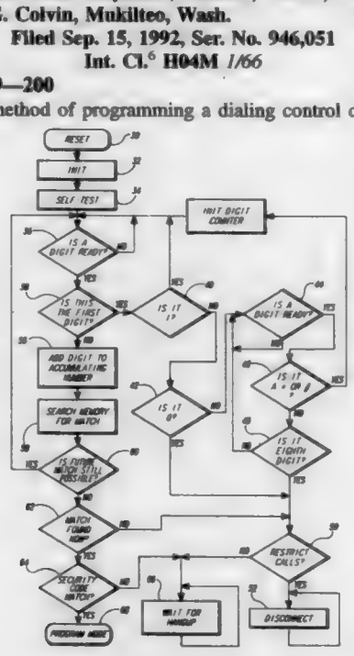
5,471,524

TOLL CALL RESTRICTOR METHOD AND APPARATUS

Donald G. Colvin, 10312 - 62nd Place W., Mukilteo, Wash. 98275, and Peter Reynolds, Everett, Wash., assignors to Donald G. Colvin, Mukilteo, Wash.

Filed Sep. 15, 1992, Ser. No. 946,051
Int. Cl.[6] H04M *1/66*
U.S. Cl. 379—200 **17 Claims**

14. The method of programming a dialing control circuit comprising:



decoding a DTMF signal entered from a local telephone;

determining if the number entered matches the selected security code, said security code having fewer digits than that required to complete a phone call through the central office telephone line;

disconnecting the local telephone from the central office telephone line after the security code has been properly entered and recognized;

automatically reconnecting the local telephone line to the central office phone line at a selected time after the disconnection between the local telephone and the central office phone line has occurred, the selected time being sufficiently long that the central office system registers that the local telephone has been completely disconnected and hung up, the reconnection of the local telephone to the central office telephone lines resulting in a new dial tone being obtained;

permitting the dialing of a toll call after the dial tone has been re-obtained following the disconnection after the security code was entered;

permitting, alternatively, the programming of the dialing control circuit by entering programming digits into the local telephone, each permissible programming sequence being selected to ensure that a disconnection between the local telephone and the central office telephone lines occurs on a regular basis and in each event prior to the central office system recognizing the numbers input as being a potential number and attempting to connect the local telephone to a number which is perceived to have been dialed;

upon entry from the local telephone of an end of step signal, disconnecting the local telephone from the central office telephone line; and

automatically reconnecting the local telephone line to the central office phone line at a second selected time after the disconnection between the local telephone and the central office phone line has occurred, the second selected time being sufficiently long that the central office system registers that the local telephone has been completely disconnected and hung up, the reconnection of the local telephone to the central office telephone lines resulting in a new dial tone being obtained.

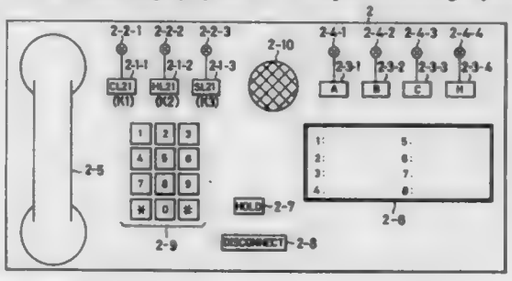
5,471,525

LINE STATUS DISPLAY SYSTEM FOR TELEPHONE EXCHANGE SYSTEM

Yoshihisa Domoto, Sukagawa; Toshie Takahashi, Nihonmatsu, and Toshimi Kurumada, Koriyama, all of, Japan, assignors to Hitachi Telecom Technologies, Ltd., Koriyama, Japan

Continuation of Ser. No. 240,536, May 10, 1994, abandoned, which is a continuation of Ser. No. 842,189, Mar. 19, 1992, abandoned. This application Sep. 23, 1994, Ser. No. 312,153
Claims priority, application Japan, Apr. 20, 1990, 2-102977
Int. Cl.[6] H04M *3/00;3/22;1/00*
U.S. Cl. 379—247 **9 Claims**

1. A line status display system for a telephone exchange system,



comprising:

an exchange apparatus containing a plurality of lines; and

a plurality of terminals respectively connected to said exchange apparatus, said terminals displaying and controlling said line status in association with said exchange apparatus,

wherein said exchange apparatus includes control means for simultaneously informing all of said terminals of line status information including status of said lines and line identification information for identifying said lines,

wherein each of said terminals include,

a memory for storing a line status display table for controlling the line identification information relating to a line which is responsive to a one-touch manual operation in said plurality of lines contained in said exchange apparatus, and for storing the line identification information relating to a line which is responsive to an operation other than said one-touch manual operation in said plurality of lines contained in said exchange apparatus,

a first status display means provided corresponding to the line which is responsive to said one-touch manual operation,

a second status display means provided corresponding to the line which is responsive to said operation other than said one-touch manual operation,

a recognition means for referring to the line identification information of said line status information informed from control means of said exchange apparatus on the basis of said line status display table when said line status information is informed from said control means of said exchange apparatus, and for recognizing whether a line corresponding to the referred line status information is responsive to said one-touch manual operation, or whether the line corresponding to the referred line status information is responsive to said operation other than said one-touch manual operation; and

a display control means for displaying and controlling the status of the line corresponding to the line status information on the first status display means when said recognition means recognizes that the line is responsive to said one-touch manual operation, and for displaying and controlling the status of the line corresponding to said line status information on the second status display means when said recognition means recognizes that the line is responsive to said operation other than said one-touch manual operation.

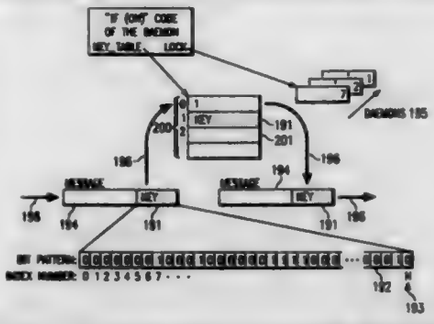
5,471,526

TRACING WITH KEYS AND LOCKS ON A TELECOMMUNICATION NETWORK

Nils O. A. Linnermark, Trngsund, and Karl U. Carlsson, Skarpnack, both of, Swedes, assignors to Telefonaktiebolaget L M Ericsson (publ.), Stockholm, Sweden

Filed Feb. 28, 1994, Ser. No. 203,277
Int. Cl.[6] H04M *1/24*
U.S. Cl. 379—268 **71 Claims**

1. A method for detecting events occurring in a telecommunications network comprising stored program control (SPC) exchanges, each SPC exchange comprising a switch and processors for executing software programs to control the switch, said method comprising the steps of:



implanting a plurality of daemons in selected portions of the software programs, each of said daemons being operable to perform at least one activity in response to the detection of an event which satisfies a conditional statement contained within said daemon;

assigning a lock value to each of the daemons, each lock value uniquely identifying the corresponding daemon and being operable to activate the processor for executing the daemon in response to a key value being equal to the lock value;

comparing each lock value of each daemon to a key value stored in said SPC exchange for each corresponding daemon and selectively activating the processor to execute said daemon if said lock value of said daemon equals the corresponding key value;

executing the activity specified in said daemon if the detected event satisfies the conditional statement contained within said daemon; and

continuing execution of the software program after each activity within an activated daemon is executed whereby continuous-processing in the SPC exchange is maintained.

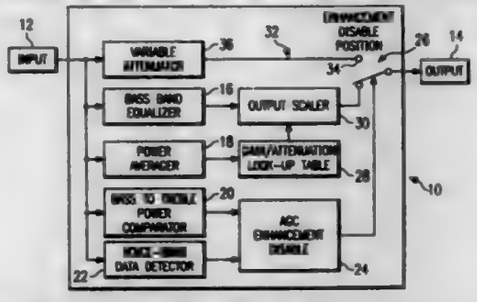
5,471,527

VOICE ENHANCEMENT SYSTEM AND METHOD

Helena S. Ho, San Jose, Calif.; Michael K. Pratt, Plano, Tex.; Pong C. Lim, Los Altos, and Thomas T. Oshidari, San Jose, both of Calif., assignors to DSC Communications Corporation, Plano, Tex.

Filed Dec. 2, 1993, Ser. No. 161,120
Int. Cl.[6] H04M *1/00;9/00*
U.S. Cl. 379—347 **35 Claims**

1. A method for providing voice enhancement in a telecommunications network, comprising the steps of:



determining the average power of an input voice-band signal;

determining a scaling factor in response to the average power of the input voice-band signal;

equalizing the input voice-band signal by attenuating a predetermined portion of the input voice-band signal;

scaling the equalized input voice-band signal with the scaling factor;

measuring the power of the input voice-band signal above and below a predetermined frequency;

comparing the power measurements to power measurements expected for a previously scaled signal; and

coupling the scaled voice-band signal to an output or decoupling the scaled voice-band signal from the output in response to the comparing step.

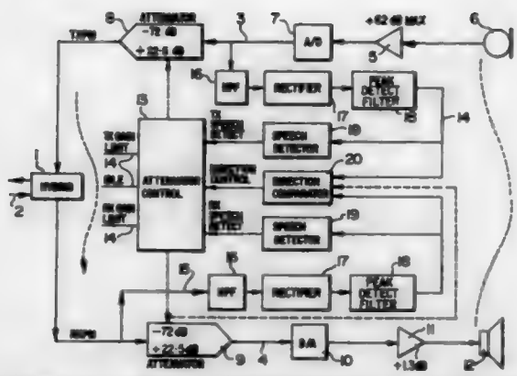
5,471,528

VOICE SWITCHED SPEAKERPHONE WITH FILTERS HAVING EXPONENTIAL TRANSFER FUNCTION IN THE MONITORING PATH

Gordon J. Reesor, Ottawa, Canada, assignor to Mitel Corporation, Kanata, Canada

PCT No. PCT/CA92/00412, § 371 Date Mar. 23, 1994, § 102(e) Date Mar. 23, 1994, PCT Pub. No. WO93/06679, PCT Pub. Date Apr. 1, 1993
PCT Filed Sep. 25, 1992, Ser. No. 211,181
Claims priority, application Canada, Sep. 27, 1991, 2052351
Int. Cl.[6] H04M *1/60*
U.S. Cl. 379—390 **10 Claims**

1. A handsfree telephone circuit with separate transmit and receive audio paths for connection to a microphone and speaker



respectively, comprising a controllable attenuator in each of said transmit and receive paths; attenuator control means responsive to level control signals for incrementally setting the attenuation level of said attenuators, said control means responsive to a directional control signal for determining which audio path at any moment is a controlling path having control of said attenuators and which audio path is a non-controlling path; a pair of monitoring circuits for generating said level control signals, said monitoring circuits defining respective monitoring paths connected to each of said transmit and receive paths for sensing audio signals therein, each said monitoring circuit comprising a high pass filter for attenuating background noise, a rectifier, a peak level detector, and a speech detector; a pair of low pass filters having a fast attack and slow decay with a transfer function of approximately inverted exponential form connected to the outputs of the respective peak level detectors in the two monitoring circuits; and a switching comparator for comparing the outputs of said low pass filters to produce said directional control signal for said attenuator control means; and means for disabling the low pass filter receiving the output of the peak detector in the non-controlling audio path, the output of said low pass filter in the controlling audio path preventing the switching comparator from outputting the directional control signal upon echo signals appearing in the non-controlling path.

5,471,529

UNIVERSALLY-LINKED REINFORCING HANDSET MEANS FOR PAY PHONE

Run-Chi Hsu, c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei, Taiwan, Prov. of China

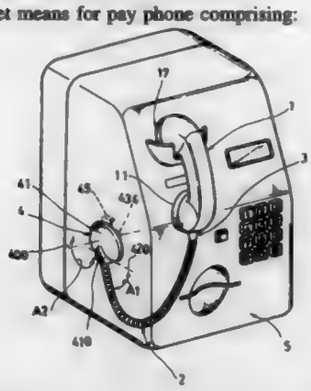
Filed Jun. 23, 1994, Ser. No. 264,518

Claims priority, application China, Dec. 30, 1993, 93121191.3

Int. Cl.[6] H04M *1/00*

U.S. Cl. 379—438 **6 Claims**

1. A handset means for pay phone comprising:



a handset (1) including a microphone portion (11) with a transmitter (14) formed therein and an earpiece portion (17) with a receiver (171) formed therein, an armored cord (2) remotely securing the handset (1) to a pay phone (5), a reinforcing coupler (3) secured to the microphone portion (11) of the handset (1) for fixing a first end portion of the armored cord (2) in the reinforcing coupler (3) and having a retarding member (36) retained on a transmitter bracket (15) which holds the transmitter (14) therein, said reinforcing coupler (3) retarding an inwardly protruding of the armored cord (2) into the handset for firmly securing the armored cord (2) with the handset (1), and a universal adapter (4) universally mounted on the pay phone (5) and having a second end portion of the armored cord (2) secured in the universal adapter (4) for universally linking the armored cord (2) to the pay phone (5) for ergonomically holding the handset (1) when using the pay phone (5);

said handset (1) including: said microphone portion (11) formed on a lower portion of the handset (1), the transmitter (14) held in the transmitter bracket (15) having a retaining flange (151) circumferentially formed on a circumference of the transmitter bracket (15) with the retaining flange (151) retained between transmitter seat (13) and a microphone cover (12) shielding the seat (13) and the transmitter (14) within the microphone portion (11), collar (16) defining a central opening (161) in the collar (16) integral to a lower portion of the microphone portion (111) for securing the retaining coupler (3) on the collar (16), the earpiece portion (17) formed on an upper portion of the handset (1) opposite to the microphone portion (11) with the receiver (171) held in the earpiece portion (17), and a weight core (18) embedded in an upper portion of the handset (1) adjacent to the earpiece portion (17);

said armored cord (2) including: a communication cord (21) having a transmitting wire (211) electrically connected to the transmitter (14) in the handset (1), a receiving wire loop (212) electrically connected to the receive (171) in the handset (1); a flexible hose (22) surrounding the communication cord (21) having a handset end (221)of the hose (22) secured in the reinforcing coupler (3) in the microphone portion (11) and an adaptor end (222) of the hose (22) secured in the universal adapter (4) for remotely securing the handset (1) to the pay phone (5); and a reinforcing steel wire (23) securing the handset (1) to the universal adapter (4) universally mounted on the pay phone (5) with a handset-side end (231) of the steel wire (23) secured to the weight core (18) in the handset (1) and with an adapter-side end (232) of the steel wire (23) fixed in the universal adapter (4) and

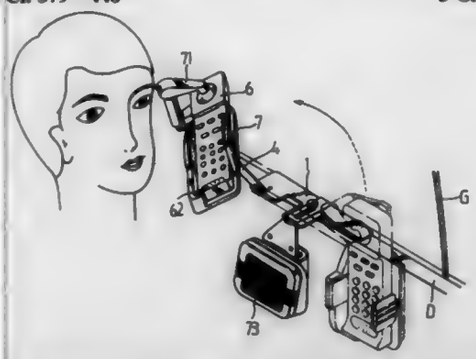
said reinforcing coupler (3) including: a locking head (32) having a packing member (34) embedded in the locking head (32) for fixing a fixing screw (35) through the locking head (32) and the packing member (34) towards the handset end (221) of the flexible hose (22) of the armored cord (2) passing through a through hole (30) formed in the coupler (3) for fastening the armored cord (2) with the handset (1), a sleeve portion (31) protruding outwardly from the locking head (32) to dispose around the flexible hose (22), both sleeve portion (31) and locking head (32) being made of elastomer materials, a neck portion (33) concentrically recessed in between the locking head (32) and the sleeve portion (31) for engaging the collar (16) of the handset (1) for firmly locking the reinforcing coupler (3) with the handset (1), and a retarding member (36) integrally secured to the transmitter bracket (15) for retaining the locking head (32) of the reinforcing coupler (3) for resisting in inwardly protruding of the reinforcing coupler and the armored cord (2) fixed therein as backed by the transmitter bracket (15) which is retained in between the transmitter seat (13) and the microphone cover (12) for firmly securing the reinforcing coupler (3) and the armored cord (2) with the handset (1).

5,471,530

RETAINING RACK FOR A CELLULAR PHONE PERMITTING HANDFREE USE OF PHONE IN DRIVING

Stephen Chen, Changhua, Taiwan, Prov. of China, assignor to E Lead Electronic Co., Ltd., Changhua, Taiwan, Prov. of China

Filed Oct. 20, 1994, Ser. No. 326,241
Int. Cl.[6] H04M *1/00*
U.S. Cl. 379—446 **5 Claims**



1. A retaining rack for securing of a cellular phone permitting handfree use of the phone in driving a vehicle, comprising:

a mounting base having a vertical portion and a horizontal portion;

said horizontal portion of said mounting base having an upwardly oblique extension;

said vertical portion of said mounting base being inserted into a fissure between a door and a glass thereof of a vehicle;

a clamping board adjustably engaged with said horizontal portion of said mounting base;

a battery box fixed to one side of said clamping board;

a speaker fixed to the opposite side of said clamping board;

an elongated pivot arm having one end pivotally fixed to said upwardly oblique extension;

a retaining seat for holding a cellular phone in place being engaged with a securing piece;

a voice pick-up means electrically connected to said speaker and adjustably engaged with said retaining seat being movable to abut against a receiver of said cellular phone; said securing piece being pivotally engaged with the other end of said elongated pivot arm;

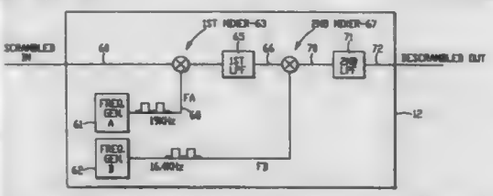
whereby said cellular phone held by said retaining seat is movable by pivotal adjustment of said pivot arm and said retaining seat close to the mouth of a driver.

5,471,531

METHOD AND APPARATUS FOR LOW COST AUDIO SCRAMBLING AND DESCRAMBLING

Ronald Quan, Cupertino, Calif., assignor to Macrovision Corporation, Sunnyvale, Calif.

Filed Dec. 14, 1993, Ser. No. 145,066
Int. Cl.[6] H04N *7/167*
U.S. Cl. 380—19 **50 Claims**



1. A system of descrambling a scrambled non-inverted frequency translated audio signal capable of reproducing a spectral range of an original audio signal of about 50 Hz to about 15 Khz comprising:

a scrambled audio input signal, said input signal having a frequency range of 50 Hertz to substantially 15 Kilohertz;

means for generating a first modulation carrier signal having a frequency greater than the highest frequency in said scrambled audio input signal;

first modulating means for double sideband modulating said scrambled audio signal into said first modulation frequency, a first upper sideband signal and a first lower sideband signal;

first filtering means for filtering out said first modulation fundamental frequency, harmonics of said first modulation fundamental frequency, said upper sideband signal and harmonics from said double sideband signal produced by said harmonics of first modulation fundamental frequency and passing said first lower sideband signal;

means for generating a second modulation carrier frequency having a frequency less than said first modulation frequency;

a second modulating means for double sideband modulating said first lower sideband signal with said second modulation carrier frequency to produce a second modulating frequency, a second upper sideband signal and a second lower sideband signal;

means for filtering to pass said second lower sideband signal to produce a descrambled audio signal:

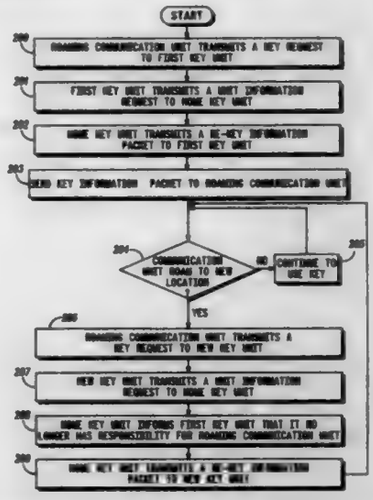
whereby use and selection of said first and second modulation carrier signals, said first and second modulation means and said first and second filter means is to produce a descrambled audio signal that contains substantially no audible whistle component at a low cost.

5,471,532

METHOD OF REKEYING ROAMING COMMUNICATION UNITS

Kevin Gardeck, Algonquin; David A. Green, Bartlett, and Kevin Cutts, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 15, 1994, Ser. No. 196,352
Int. Cl.[6] H04L *9/08*
U.S. Cl. 380—21 **10 Claims**



1. In a communication system including a home key unit with an associated home coverage area, a first key unit with an associated first coverage area, a second key unit with an associated second coverage area, and including a communication unit that may roam from the home coverage area to the first coverage area or the second coverage area, a method for over-the-air rekeying of the roaming communication unit as it roams from the home coverage area, the method comprising the steps of:

a) after entering the first coverage area, transmitting, by the roaming communication unit, a key request to the first key unit, wherein the key request includes a communication unit identification code for the roaming communication unit, a home identification code, and a request for a key;

b) transmitting, by the first key unit, a unit information request to the home key unit, wherein the home key unit is affiliated with a system identified by the home identification code, the unit information request including the communication unit identification code, the home key unit identification code, and the request for a key;

c) transmitting, by the home key unit, a rekeying information packet to the first key unit; and

d) transmitting, by the first key unit, a key information packet to the roaming communication unit.

5,471,533

RECORD WITH ENCODED DATA

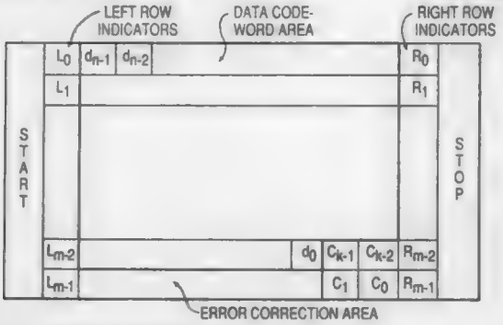
Yujiun P. Wang, Stony Brook; Jerome Swartz, Old Field, and Daniel R. McGlynn, Brooklyn, all of N.Y., assignors to Symbol Technologies, Inc., Bohemia, N.Y.

Continuation of Ser. No. 891,742, Jun. 1, 1992, Pat. No. 5,337,361, which is a continuation-in-part of Ser. No. 851,493, Mar. 16, 1992, Pat. No. 5,319,181, Ser. No. 653,822, Feb. 11, 1991, Pat. No. 5,113,445, and Ser. No. 461,881, Jan. 5, 1990, Pat. No. 5,304,786, said Ser. No. 653,822is a continuation of Ser. No. 550,023, Jul. 9, 1990, abandoned. This application May 20, 1994, Ser. No. 246,786

The portion of the term of this patent subsequent to May 12, 2009, has been disclaimed.

Int. Cl.[6] G09C *3/08*

U.S. Cl. 380—51 **13 Claims**



1. A record comprising

an image portion containing a graphic image; and

an information portion including data encoded in a two-dimensional, machine-readable format having a plurality of codewords, each said codeword being represented by at least one pattern of marks.

5,471,534

DEVICES, SYSTEMS AND METHODS FOR COMPOSITE SIGNAL DECODING EMPLOYING INTERPOLATION FILTER

Mark E. Utter, Indianapolis, Ind., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 27, 1993, Ser. No. 127,209

Int. Cl.[6] H04N *7/04*

U.S. Cl. 381—4 **47 Claims**

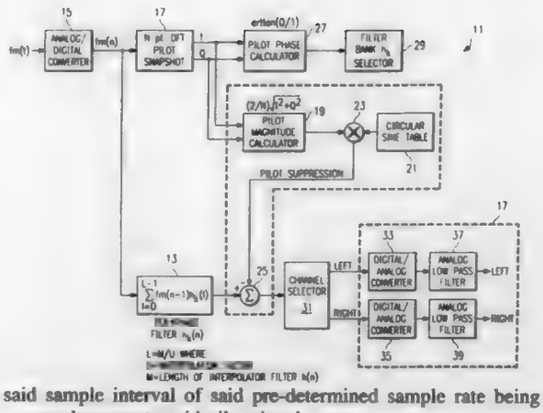
1. A decoder for decoding a composite signal sampled during a sample interval at a pre-determined sample rate; said composite signal synchronized with a pilot signal; said decoder including

a filter for filtering selected portions of said composite signal;

said filter including filter coefficients for operating on said composite signal;

means for developing said filter coefficients as a function of said pilot signal;

an interpolator filter for constructively determining a value of said composite signal in said sample interval and at such instances as the phase of said pilot signal obtains an integral multiple of a pre-determined phase angle; and



said sample interval of said pre-determined sample rate being asynchronous to said pilot signal.

5,471,535

METHOD FOR DETECTING A CONTOUR OF A GIVEN SUBJECT TO BE SEPARATED FROM IMAGES AND APPARATUS FOR SEPARATING A GIVEN SUBJECT FROM IMAGES

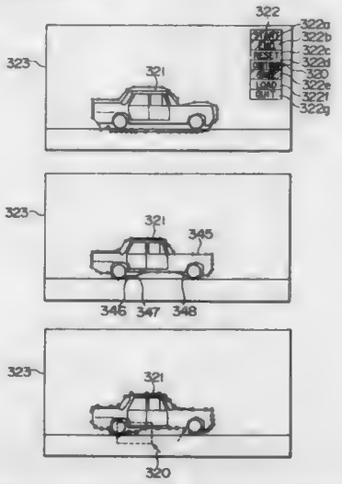
Mitsuru Ikezawa, Kodaira; Takafumi Miyatake, Hachioji; Hirotada Ueda, Kokubunji; Shigeo Sumino, Chofu, and Satoshi Yoshizawa, Kawasaki, all of, Japan, assignors to Institute for Personalized Information Environment, Tokyo, Japan

Filed Feb. 25, 1992, Ser. No. 840,822

Claims priority, application Japan, Sep. 18, 1991, 3-237899

Int. Cl.[6] G06K *9/48*

U.S. Cl. 382—199 **11 Claims**



1. A method for detecting image separating points where only a given subject image is separated from images, said method comprising the steps of:

a first step for displaying on a screen a plurality of candidate points in the vicinity of a boundary of said given subject image, which are input by a user;

a second step for determining and displaying a smooth curve which connects said plurality of candidate points;

a third step for determining a rate of change in intensity of each of a plurality of light components of said image having different wavelengths along a straight line normal to said curve at each of said plurality of candidate points;

a fourth step for correcting the position of each of said candidate points, respectively, by calculating a corrected position for each of said plurality of candidate points based upon the rate of change in intensity of light determined at each of said plurality of light components of said plurality of candidate points;

the calculation of the corrected position of each of said plurality of candidate points includes determining a preliminary corrected point for each of said plurality of light components of each of said plurality of candidate points based on the rate of change in intensity of each of said plurality of light components; and

a fifth step for determining and displaying a smooth curve connecting said corrected candidate points.

5,471,536

FIGURE DIGITIZING SYSTEM

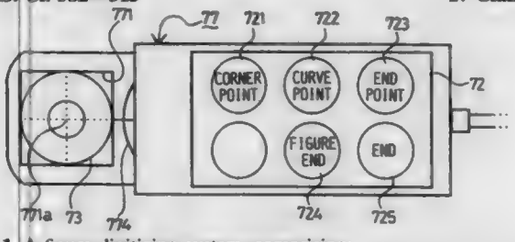
Yuji Kurokawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 1, 1993, Ser. No. 69,861

Claims priority, application Japan, Aug. 20, 1992, 4-245650

Int. Cl.[6] G06K *9/22*

U.S. Cl. 382—315 **17 Claims**



1. A figure digitizing system, comprising:

pointing means for specifying an intended characteristic point of a figure, wherein the intended characteristic point is one of at least a corner point, a curve point and an end point;

pointing means position determining means for determining nominal position coordinates of the intended characteristic point;

reading means for reading image information from the figure at a plurality of positions near the intended characteristic point specified by the pointing means;

reading means position determining means for determining relative position coordinates of the plurality of positions of the image information read by the reading means, relative position coordinates being relative to the nominal position coordinates of the intended characteristic point;

characteristic point coordinate determining means for determining actual position coordinates of the intended characteristic point specified by the pointing means based on the relative position coordinates of the plurality of positions of the image information determined by the reading means position determining means and the nominal position coordinates of the intended characteristic point determined by the pointing means position determining means.

5,471,537

KITCHEN VENTILATOR

Lennart W. Castwall, Täby, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

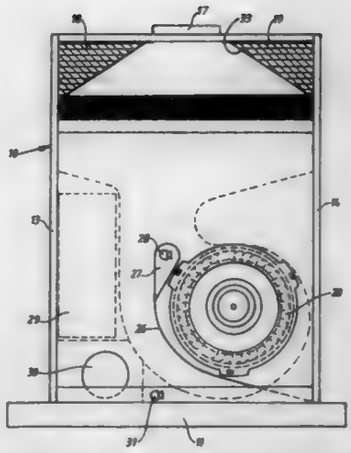
Filed Oct. 29, 1993, Ser. No. 145,350

Claims priority, application Sweden, Nov. 3, 1992, 92032481

Int. Cl.[6] G10K *11/16*

U.S. Cl. 381—71 **6 Claims**

1. Kitchen ventilator comprising a housing (**10**), a motor powered fan (**20**) having a horizontal axis arranged in a bottom portion of the housing, an inlet (**11**), an inlet passage (**25**) extending between the inlet and the fan, an outlet (**17**), an outlet passage (**23**) extending between the fan and the outlet, and a removable front wall (**16**) including sound absorbing material, said passages being separated by a generally vertical partition wall (**22**) which defines an opening through which air from the inlet passage is drawn by said fan into said outlet passage, wherein the inlet passage is defined in part by a baffle wall (**26**) provided between the inlet (**11**) and the fan (**20**), said baffle wall (**26**) forcing air entering said inlet



to flow in an indirect path toward said fan and helping to reduce the transmission of noise from said fan to said inlet, said outlet passage (**23**) having a narrowing portion (**33**) which is bounded on opposite sides by sound absorbing material (**18, 19**).

5,471,538

MICROPHONE APPARATUS

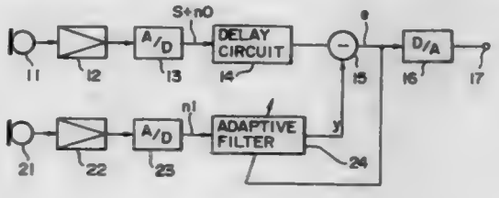
Tooru Sasaki, Tokyo, and Kaoru Gyotoku, Kanagawa, both of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 7, 1993, Ser. No. 57,821

Claims priority, application Japan, May 8, 1992, 4-143209

Int. Cl.[6] H04R *3/00*

U.S. Cl. 381—92 **6 Claims**



1. A microphone apparatus comprising:

a first microphone for picking up at least a desired sound coming from an arrival direction;

a second microphone arranged in proximity to arid adjacent said first microphone and having a directionality in which said second microphone has a low sound-pickup sensitivity in said arrival direction of said desired sound wherein said second microphone comprises a plurality of non-directional microphone units axially aligned and placed in proximity to each other so as to be spaced apart by a predetermined distance, a filter receiving an output from one of said plurality of microphone units and wherein output sound signals of remaining ones of said plurality of nondirectional microphone units and an output of said filter are combined to provide an output representing a directional microphone;

adaptive filter means to which said output from said second microphone is supplied; and

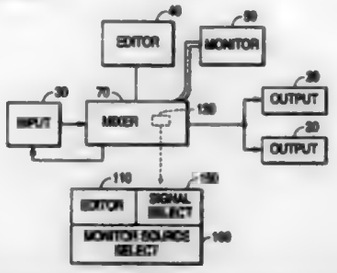
subtracting means for subtracting an output of said adaptive filter means from a signal picked up by said first microphone for producing an output signal of said microphone apparatus;

wherein said adaptive filter means is adjusted in response to the output signal of said subtracting means to minimize a power of the output signal of said subtracting means.

5,471,539
EDIT SELECT SWITCH FOR MONITOR SOURCE SELECT

Alan Flum, Tamarac; Michael A. Zampini, Boca Raton, both of Fla., and Masahiro Fujita, Yokohama, Japan, assignors to Sony Electronics Inc., Park Ridge, N.J.

Filed Mar. 31, 1993, Ser. No. 40,594
Int. Cl.[6] H04B *1/00*
U.S. Cl. 351—119 **12 Claims**



1. An audio mixer coupled to at least one input device providing a plurality of input audio signals to the mixer, and further coupled to an editor providing a plurality of control signals to the mixer, the audio mixer comprising:

edit select switching means located on a monitor select portion of the mixer for enabling the control of the selection of one or more monitor audio signals from said input audio signals according to monitor selection control signals supplied from the editor, whereby at least one monitor audio signal is routed to one or more monitor source terminals on the mixer; and

signal select switching means for selecting one or more monitor audio signals from said input audio signals, whereby at least one monitor audio signal is routed to said one or more monitor source terminals when said edit select switching means is not enabled;

wherein said signal select switching means selects said one or more monitor audio signal regardless of editor control of non-monitor select functions performed by the mixer; and

wherein said edit select switching means includes an analog edit select switch and said signal select switching means includes a plurality of analog switches, and the audio mixer further comprises:

circuit means for detecting the respective positions of said edit select switch and said plurality of analog switches;

logic circuit means for selectively coupling said input audio signals to said one or more monitor source terminals; and the audio mixer further comprises

circuit means coupled to said means for detecting for supplying to said logic circuit means a plurality of logic signals indicative of the detected positions of said edit select switch and said plurality of analog switches;

wherein said logic circuit means determines which of said input audio signals are coupled to said one or more monitor source terminals based on said plurality of logic signals.

5,471,540
ELECTROSTATIC LOUDSPEAKER HAVING STATIONARY ELECTRODES FORMED AS MULTIPLE SHEETS INSULATED FROM EACH OTHER

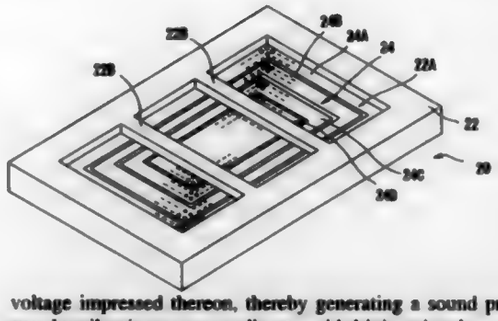
Keijiro Maeda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 22, 1993, Ser. No. 141,887
Int. Cl.[6] H04R *25/00*
U.S. Cl. 381—191 **11 Claims**

1. An electrostatic loudspeaker system comprising:

a pair of stationary electrodes which are maintained to face each other in which multiple through holes are formed and on which a driving signal having different voltages is impressed;

a diaphragm, which is fixed at outer peripheral edges and is maintained between said pair of stationary electrodes and which forms a movable electrode having a direct current bias



voltage impressed thereon, thereby generating a sound pressure by vibrating corresponding to said driving signal; and

a boost means for boosting the driving signal impressed to said stationary electrodes: wherein;

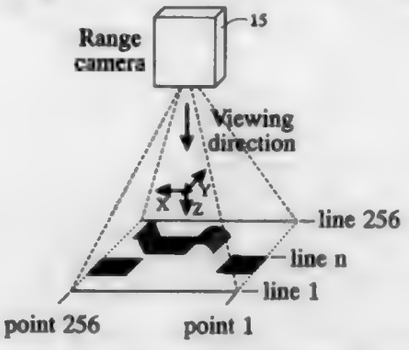
said stationary electrodes are arranged in front and back of said diaphragm flatly, and are composed of multiple sheet electrodes insulated from each other; and

said boost means impresses the driving signal having the different voltages on said multiple sheet electrodes respectively.

5,471,541
SYSTEM FOR DETERMINING THE POSE OF AN OBJECT WHICH UTILIZES RANGE PROFILES AND SYNETHIC PROFILES DERIVED FROM A MODEL

Nestor Bartnyk, Kanata, and Michael A. Greenspan, Ottawa, both of, Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Nov. 16, 1993, Ser. No. 152,745
Int. Cl.[6] G06T *7/00*; G01B *11/24*
U.S. Cl. 382—153 **4 Claims**



1. A method of determining the 3-D position and orientation of an object relative to a scanning device, given a surface model of the object, range profiles that have been acquired by scanning the object, and the object's approximate location defined by the 3-D position and orientation relative to the scanning device, the method comprising the steps of:

a) generating a set of at least 2 synthetic 2-D profiles of the object from a model of the object by simulating how the scanning device would have scanned the object if the object were located at the approximate 3-D location;

b) searching through the acquired range profiles to select a subset of these profiles whose 2-D waveforms most closely match the 2-D waveforms of the set of synthetic profiles;

c) determining the amount of 2-D translational and rotational offset between the 2-D waveforms of the synthetic profiles and the 2-D waveforms of the acquired range profiles that produced this most close match;

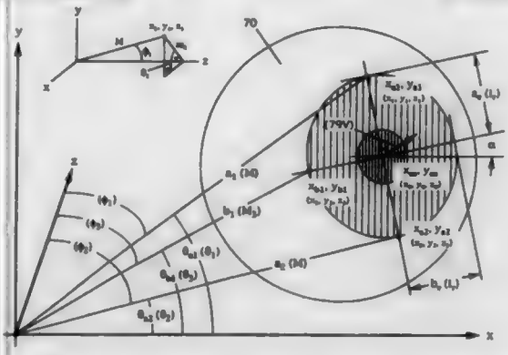
d) calculating a correction of the approximate three dimensional position and orientation of the model representing the object from these 2-D offsets between the synthetic profiles and the acquired range profiles that produced the best match in step (b) to obtain a closer approximate 3-D position and orientation of the object; and,

e) repeating steps (a) to (d) until the correction is below a predetermined threshold.

5,471,542
POINT-OF-GAZE TRACKER

Richard R. Ragland, 2010 Sea Village Clr., Cardiff, Calif. 92007

Filed Sep. 27, 1993, Ser. No. 126,892
Int. Cl.[6] G06K *9/00*
U.S. Cl. 382—128 **17 Claims**



1. A device for determining, relative to a camera, an optical axis vector of an operator; said device comprising:

a camera oriented so as to observe at least a portion of the iridal-scleral boundary of an eye of an operator; said camera for obtaining an image of at least a portion of the iridal-scleral boundary of the eye of the operator; and

a computer with memory including:

analyzing means for analyzing the obtained image and for locating therein a plurality of points on the iridal-scleral boundary;

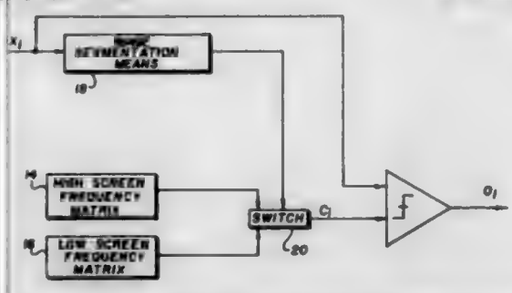
determining means for determining, from the plurality of located points on the iridal-scleral boundary, the size and position of the iridal ellipse in the image; and

formulating means for formulating, using the determined ellipse, the optical axis vector for the eye relative to said camera.

5,471,543
MIXED SCREEN FREQUENCIES WITH IMAGE SEGMENTATION

Yee S. Ng, Fairport, and Hwai-Tzuu Tai, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 542,993, Jun. 25, 1990, abandoned.
This application Apr. 30, 1992, Ser. No. 877,353
Int. Cl.[6] G06K *9/00*
U.S. Cl. 382—173 **24 Claims**



1. Apparatus for producing a screened halftone image of continuous tone original images, said apparatus comprising:

means for producing a series of input signals whose values are representative of the gray levels of successive picture elements of an original image;

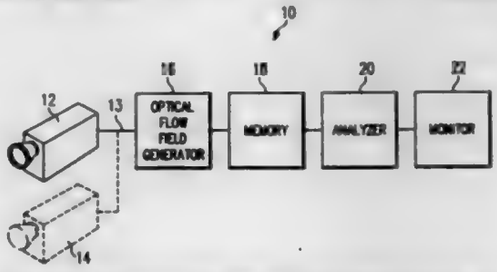
means for examining each pixel for an image characteristic and (1) means for classifying pixels by said image characteristic and (2) means for grouping pixels having the same classification to form segmented regions: and

means for printing groups of sub-elements sequentially organized into two dimensional matrix halftone cells, each halftone cell being associated with one of said input signals; said printing means being adapted to print halftone cells associated with one of said segmented regions at a first screen frequency and to print halftone cells associated with another of said segmented regions at a second screen frequency higher than said first screen frequency.

5,471,544
CONDITION NUMBER-BASED SMOOTHING OF OPTICAL FLOW FIELDS

Vishal Markandey, 5630 Loring Dr., #157, and Bruce E. Flinchbaugh, 6518 Copper Creek Dr., both of Dallas, Tex. 75248

Filed May 18, 1992, Ser. No. 883,640
Int. Cl.[6] G06K *9/36;9/00;9/40;* **H04N** *7/18*
U.S. Cl. 382—264 **20 Claims**



1. A method of processing images, comprising the steps of:

generating an image signal in an image sensor;

transmitting the image signal to an optical flow field generator device;

generating a plurality of optical flow vectors in an initial flow field in said generator device;

generating in said generator device a condition number for each of the optical flow vectors dependent on an image intensity of said image signal at each associated pixel location;

smoothing in said generator device the initial optical flow field by minimizing each sum of a lack of accuracy and a product of the condition number and a lack of smoothness for each optical flow vector;

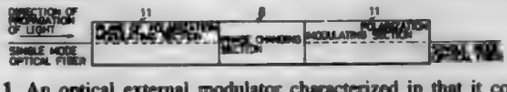
storing the smoothed optical flow field in a memory; and

processing the smoothed optical flow field.

5,471,545
OPTICAL EXTERNAL MODULATOR FOR OPTICAL TELECOMMUNICATIONS

Shoichi Negami; Toshiya Hikami; Shigeaki Nishikawa, and Matsue Murata, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1994, Ser. No. 331,903
Claims priority, application Japan, Jan. 29, 1993, 5-294163; Jan. 29, 1993, 5-294165; Jun. 14, 1994, 6-155363
Int. Cl.[6] G02F *1/01*
U.S. Cl. 385—1 **15 Claims**



1. An optical external modulator characterized in that it comprises a substrate (1), an optical transmission line (7), a phase changing section (8) and a polarization modulating section (11) for changing the state of polarization of the light being propagated through the optical transmission line (7) by applying a stress to the optical transmission line (7) as a function of a modulation signal

given thereto and the phase changing section (8) for changing the phase difference between the X-component and the Y-component of the light being propagated through the optical transmission line (7) by (2m−1)*π/2 (m is a positive integer).

5,471,546

FIBER-OPTIC TRANSMISSION SENSOR WITH MODULATOR

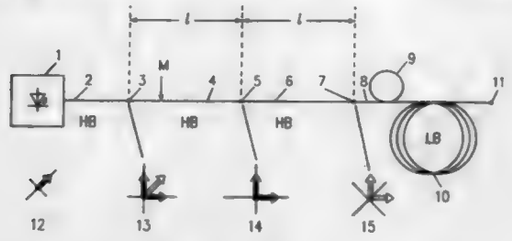
Markus Meier, Aarau, Switzerland, assignor to ABB Research Ltd., Zurich, Switzerland

Filed Dec. 13, 1994, Ser. No. 354,809

Claims priority, application Germany, Dec. 29, 1993, 43 44 856.9

Int. Cl.[6] G01C *19/64;* **G02B** *6/17*

U.S. Cl. 385—11 **5 Claims**



1. A fiber-optic transmission sensor

a) having a light source,

b) which, via a polarization-maintaining, highly birefringent 1st reference optical fiber having a 1st optical principal axis and a 2nd orthogonal thereto, the propagation velocity of the light in the 1st optical principal axis being greater than in the 2nd optical principal axis, and

c) via a polarization-maintaining, highly birefringent 2nd reference optical fiber having a 1st optical principal axis and a 2nd orthogonal thereto, the propagation velocity of the light in the 1st optical principal axis being greater than in the 2nd optical principal axis, and

d) via a λ/4-delay device, is connected optically to an optical sensor,

e) in addition having at least one phase modulator, which is operatively connected to one of the two 1st and 2nd reference optical fibers, wherein,

f) the 1st reference optical fiber has the same length as the 2nd reference optical fiber and

g) is connected optically to the latter, rotated by 90°, in such a way that the 1st optical principal axis of the 1st reference optical fiber is connected to the 2nd optical principal axis of the 2nd reference optical fiber, and the 2nd optical principal axis of the 1st reference optical fiber to the 1st optical principal axis of the 2nd reference optical fiber.

5,471,547

Patent Not Issued For This Number

5,471,548

SEGMENTED WAVEGUIDE GRATINGS USED AS OPTICAL RECORDING SENSORS

John C. Brazas, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 4,811, Jan. 15, 1993, abandoned.

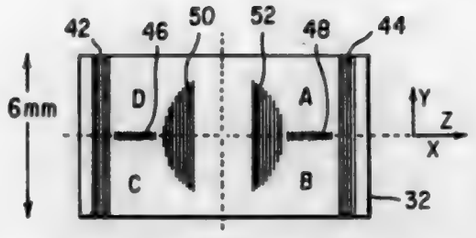
This application Jun. 2, 1994, Ser. No. 252,635

Int. Cl.[6] G11B *7/00;* **G02B** *6/34*

U.S. Cl. 385—37 **6 Claims**

1. A waveguide device comprising:

a substrate having a surface lying in a plane defined by perpendicular x and y axes; a plurality of waveguide regions formed



on the substrate which input couple a return beam that has undergone change in at least one of collimation and asymmetry; wherein each of the waveguide region has a different nominal input coupling angle and each of the nominal coupling angel is separated from each other to provide some overlap of signals from each waveguide regions such that the waveguide regions are angularly detuned to provide a continuous error signal; each of the waveguide regions includes a linear input coupling grating segment; the orientation, relative to said x and y axes, of each linear input coupling grating in each of the plurality of waveguide regions is different; a waveguide layer segment formed over the input coupling grating; a cladding layer contacting the waveguide layer segment; a plurality of detectors that correspond to the plurality of waveguide regions; and means for transferring light coupled in each waveguide region to its corresponding detector.

5,471,549

METHOD OF DETECTING AND CORRECTING A DIRECTION OF IMAGE DATA AND DOCUMENT IMAGE FILING SYSTEM EMPLOYING THE SAME

Yasuo Kurosu, Yokosuka; Hidefumi Masuzaki, Hadano, and Hiromichi Fujisawa, Tokorozawa, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

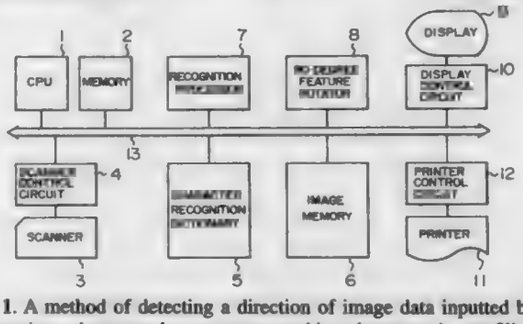
Continuation of Ser. No. 796,408, Nov. 22, 1991, abandoned.

This application Apr. 29, 1994, Ser. No. 235,195

Claims priority, application Japan, Nov. 28, 1990, 2-322782

Int. Cl.[6] G06K *9/32*

U.S. Cl. 382—290 **14 Claims**



1. A method of detecting a direction of image data inputted by scanning a document by a scanner, used in a document image filing system including at least a central processing unit, a character recognition dictionary and said scanner, said method comprising the steps of:

extracting data of one character from the input image data;

extracting a feature from the extracted data of the one character;

storing standard patterns in said character recognition dictionary;

reading one of the standard patterns corresponding to the extracted feature;

rotating the read standard pattern, corresponding to the extracted feature, stored in said character recognition dictionary to produce a plurality of features, corresponding to the extracted feature, in different directions from one another;

calculating degrees of similarity between the feature of the data of one character and the plurality of features in different direction from one another;

detecting a direction of the input image data on the basis of the degrees of similarity; and

correcting the direction of the image data by rotating an angle of the input image data so as to correct the input image data to a proper direction.

5,471,550

APPARATUS FOR CONVERTING IMAGE OUTLINE DATA INTO DOT DATA REPRESENTATIVE OF IMAGE DOTS

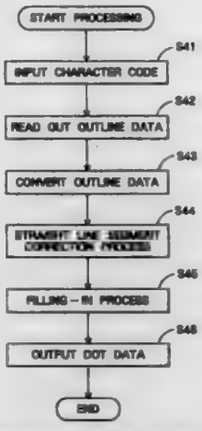
Atsuhiko Kurachi, Aichi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 15, 1993, Ser. No. 151,850

Claims priority, application Japan, Nov. 16, 1992, 4-305653

Int. Cl.[6] G06K *9/48*

U.S. Cl. 382—200 **11 Claims**



1. A data converting apparatus for converting a set of outline data representative of an outline of a desired image, such as a character, into a set of dot data representative of a dot image corresponding to the desired image, said apparatus comprising:

a memory means for storing at least one set of outline data, each set of outline data representative of an outline of an image;

selection means for selecting a set of outline data representative of an outline of a desired image;

coordinate defining means for defining the outline of the desired image selected by said selection means relative to a coordinate system where the dot image corresponding to the desired image is to be formed, said coordinate defining means converting the outline data for the desired image selected by said selection means into data of coordinate values indicative of a position of at least one point on the outline of the desired image relative to the coordinate system, picture elements being defined in the coordinate system;

straight line segment determining means for determining whether the set of outline data of the desired image selected by said selection means includes at least one straight line segment;

direction determining means for determining whether a difference defined between a direction of each straight line segment and a predetermined reference direction falls within a predetermined range by comparing, with the predetermined reference direction, each straight line segment of the outline determined by said straight line segment determining means, when the straight line segment determining means determines that the set of outline data of the desired image includes at least one straight line segment;

offset error determining means for determining whether an offset error, which will be produced when a straight line segment that is determined by said direction determining means to have a difference falling within the predetermined range is converted to a dot image, deviates from a predetermined tolerance range, the offset error determining means including maximum calculating means for calculating a maximum value of offset error which would occur dependent on a position of the straight outline segment relative to the coordinate system and maximum offset judging means for judging whether the maximum value of the offset error falls outside from the predetermined tolerance range;

correction means for correcting a straight line segment, that is determined by said offset error determining means to produce an offset error deviating from the predetermined tolerance range, so that the offset error of the determined straight line segment may not fall outside the tolerance range, the correction means correcting the coordinate values indicative of a position of at least one point on the corrected straight line segment relative to the coordinate system; and

filling-in means for converting the outline data including any straight line segment corrected by said correction means to a dot image and outputting dot data for creation of the dot image, said filling-in means including picture element determining means for determining, based on the coordinate values, picture elements where image dots should be located for substantially reproducing the desired image, and dot data producing means for producing the dot data for an image dot to be formed in each of the determined picture elements.

5,471,551

COMPONENT FOR USE IN THE TRANSMISSION OF OPTICAL SIGNALS

Hans Kragl, Ober-Ramstadt, and Jens Weber, Kelkheim-Fischbach, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

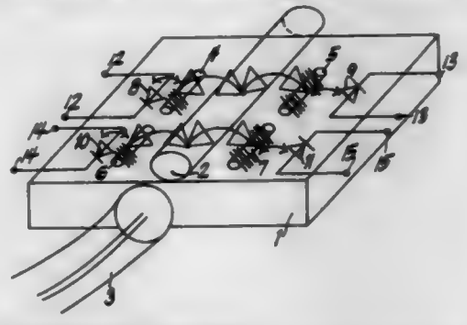
Filed Jun. 23, 1994, Ser. No. 256,212

Claims priority, application Germany, Dec. 24, 1991, 41 42 922.2

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—37 **18 Claims**

1. A component for use in transmitting frequency-division multiplexed optical signals, comprising:



a first waveguide, which is capable of being supplied with the multiplexed optical signals;

at least one further waveguide, running substantially parallel to the first waveguide, being evanescently coupled to the first waveguide, and being structured in the longitudinal direction as a Bragg resonator; and

at least one semiconductor diode optically coupled directly to the at least one Bragg resonator.

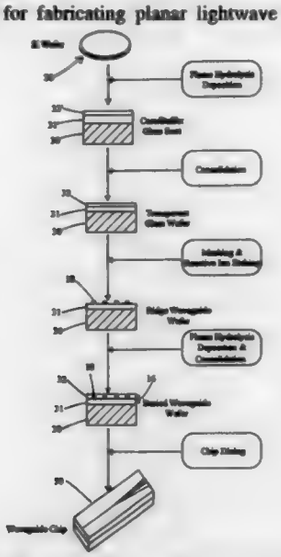
5,471,552

FABRICATION OF STATIC-ALIGNMENT FIBER-GUIDING GROOVES FOR PLANAR LIGHTWAVE CIRCUITS

Dong-Sing Wuu; Tzung-Rue Hsieh; Try-Ying Lin, and Hong-Ming Chen, all of Hsinchu, Taiwan, Prov. of China, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan, Prov. of China

Filed Feb. 22, 1995, Ser. No. 391,850
Int. Cl.[6] G02B *6/30;6/10*
U.S. Cl. 385—49 20 Claims

1. A method for fabricating planar lightwave circuits with at



least one static-alignment fiber-guiding groove comprising the steps of:

(a) fabricating a sandwiched Si-substrate by forming an etching stop layer on a first Si layer, followed by forming a second Si layer on said etching stop layer;

(b) fabricating a waveguide layer on said Si-substrate, said waveguide layer containing a first cladding layer, a second cladding layer, and at least one planar waveguide channel buried between said first cladding layer and said second cladding layer;

(c) forming a photomask on said waveguide layer so as to allow at least one fiber-guiding groove to be fabricated;

(d) using said photomask and a first reactive ion etching procedure to form a first portion of said fiber-guiding groove, said first reactive ion etching procedure is controlled such that it etches through said waveguide layer and stops in said second Si layer; and

(e) using a second reactive ion etching procedure to form a second portion of said fiber-guiding groove, wherein said second reactive ion etching procedure is effective with respect to said second Si layer but is ineffective with respect to said etching stop layer, such that said second reaction ion etching stops at an interface between said etching stop layer and said second Si layer so as to provide a precise depth control.

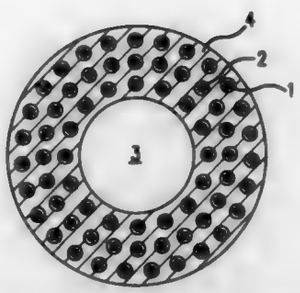
5,471,553

MULTICORE HOLLOW OPTICAL FIBER AND A METHOD FOR PREPARATION THEREOF

Shinichi Teshima, Yokohama, Japan, assignor to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP92/01260, § 371 Date Mar. 23, 1993, § 102(e) Date Mar. 23, 1993
PCT Filed Sep. 30, 1992, Ser. No. 30,425
Int. Cl.[6] G02B *6/20*
U.S. Cl. 385—125 10 Claims

1. A multicore hollow optical fiber comprising a hollow central part and a plastic peripheral part, wherein a cross-section of the



peripheral part has (a) an islands-in-sea structure; (b) islands comprising a core resin having at least higher refractive index than a cladding resin; (c) a sea comprising the cladding resin or a third resin; (d) the core resin surrounded by the cladding resin; and (e) no substantial voids; and the multicore hollow optical fiber having, in the direction of the axis of the multicore hollow optical fiber, approximately the same cross-section of the peripheral part continuously from one end to the other end of the multicore hollow optical fiber.

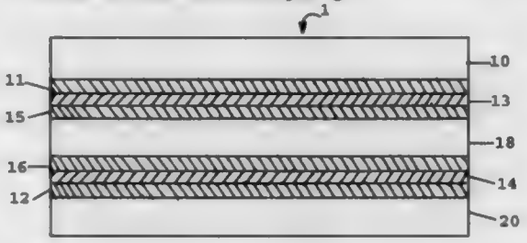
5,471,554

PRIMER FOR ELECTROCHROMIC DEVICE WITH PLASTIC SUBSTRATE

Thomas G. Rukavina, Lower Burrell, and John B. Slobodnik, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 12, 1993, Ser. No. 152,337
Int. Cl.[6] G02B *6/138;* G02F *1/17*
U.S. Cl. 385—131 10 Claims

1. An article of manufacture comprising:



a. A transparent polymeric substrate;

b. a primary layer comprising a copolymer of acrylic acid and a substituted acrylate disposed on a surface of said substrate;

c. an electroconductive metal oxide film deposited on said primer layer; and

d. an electrochromic film deposited on said electroconductive metal oxide.

5,471,555

FIBER OPTIC RIBBON BREAK-OUT DEVICE WITH ENHANCED STRAIN RELIEF

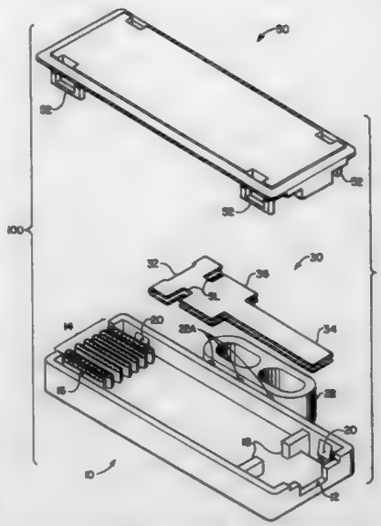
David J. Braga, Raleigh; Thomas L. Carter, Cary; Edward M. Dozier, Raleigh, all of N.C., and John P. Sarbell, Grand Island, Fla., assignors to Sumitomo Electric Lightwave Corp., Research Triangle Park, N.C.

Filed Nov. 21, 1994, Ser. No. 342,849
Int. Cl.[6] G02B *6/36*
U.S. Cl. 385—136 13 Claims

1. A break-out device for a fiber optic ribbon comprising:

(a) a housing adapted to receive a fiber optic ribbon within one end thereof and to provide an exit for a plurality of buffered fibers at an opposing end thereof; and

(b) a flexible elongate strain relief clamp adapted to be fixedly positioned within said housing and having an aperture in the medial portion thereof, said strain relief clamp being further



adapted to receive a fiber optic ribbon within said aperture and to then be folded back upon itself at said aperture so as to fixedly engage the fiber optic ribbon between the overlaying portions thereof.

5,471,556

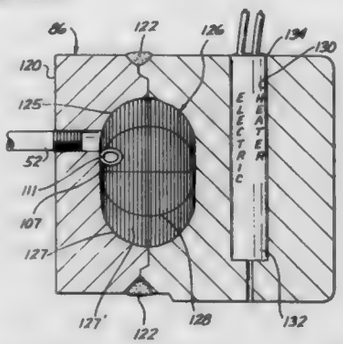
SUPERHEATED VAPOR GENERATOR AND CONTROL SYSTEM AND METHOD

Max Friedheim, P.O. Box 99838, San Diego, Calif. 92169

Filed Jul. 16, 1993, Ser. No. 93,071

Int. Cl.[6] F22B *1/02;1/28*

U.S. Cl. 392—399 **41 Claims**



1. A superheated vapor generating and control system comprising:

(1) at least one vapor generator member, said vapor generator member defining an internal vaporizing chamber, said vaporizing chamber having a peripheral surface at least a portion of which includes a plurality of ridges and grooves, the height and depth of said ridges and grooves varying substantially randomly;

(2) at least one heating element member in thermal contact with said vaporizing chamber and connectable to a source of power for heating said heating element thereby to heat said vaporizing chamber; and

(3) means for supplying liquid for vaporizing to said vaporizing chamber.

5,471,557

SPEECH RECOGNITION SYSTEM UTILIZING A NEURAL NETWORK

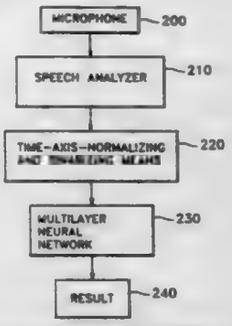
Ho-sun Chung, and Soo-yong Lee, both of Taegu, Rep. of Korea, assignors to Gold Star Electron Co., Ltd., Cheongju-city, Rep. of Korea

Filed Aug. 26, 1993, Ser. No. 112,037

Claims priority, application Rep. of Korea, Aug. 27, 1992, 92-15484

Int. Cl.[6] G10L *5/06;9/00*

U.S. Cl. 395—2.41 **5 Claims**



1. A speech recognition system comprising:

a) a microphone for receiving speech pronounced by a user;

b) speech analyzing means for analyzing the speech input via said microphone;

c) normalizing and binarizing means for detecting a vocal section of the speech received from the speech analyzing means and for performing a time axis normalization and binarization for said vocal section, said normalizing and binarizing means including

first means for, if the output of a first frequency band in said vocal section and time-axis-normalized data is greater than that of a second frequency band which neighbors with said first frequency band, assigning a first state value to said first frequency band, else assigning a second state value to said first frequency band,

second means for, if the output of a first frequency band in said vocal-section-detected and time-axis-normalized data is greater than those of its neighboring frequency bands between which said first frequency band is positioned, assigning the first state value to said first frequency band, else assigning the second state value to said first frequency band, and

third means for normalizing said vocal-section-detected and time-axis-normalized data at a predetermined proportion, and if an output value of a frequency band is greater than a threshold value assigning the first state value to said frequency band, else assigning the second state value to said frequency band; and

d) a multilayer neural network for receiving the binarization data from said normalizing and binarizing means, then performing a learning, to thereby output a speech recognition result.

5,471,558

DATA COMPRESSION METHOD AND APPARATUS IN WHICH QUANTIZING BITS ARE ALLOCATED TO A BLOCK IN A PRESENT FRAME IN RESPONSE TO THE BLOCK IN A PAST FRAME

Kyoya Tsutsui, Kanagawa, Japan, assignor to Sony Corporation, Japan

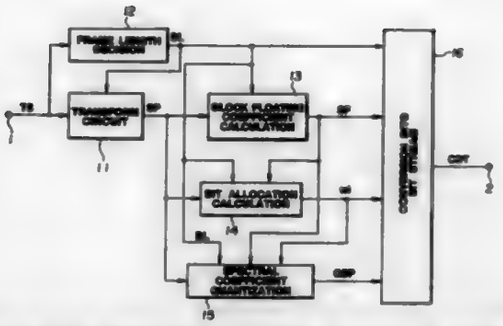
Filed Sep. 29, 1992, Ser. No. 953,556

Claims priority, application Japan, Sep. 30, 1991, 3-276167

Int. Cl.[6] G10L *3/02;9/00*

U.S. Cl. 395—2.28 **32 Claims**

1. A signal processing apparatus for compressing a digital input signal to generate a compressed output signal, the apparatus comprising:



input signal dividing means, receiving the digital input signal, for determining a time division of the digital input signal into frames, the frames including a past frame preceding a present frame;

deriving means, receiving the digital input signal, for deriving data divided into blocks from the digital input signal in each of the frames determined by the input signal dividing means, the blocks whereinto the data derived from each of the frames is divided numbering at least one;

block floating means, receiving the blocks of the data from the deriving means, for applying block floating to each thereof to generate respective blocks of floating-processed data from the blocks of the data;

memory means for storing past-frame information;

bit allocation means, receiving the blocks of the data from the deriving means, for calculating an adaptive allocation of quantizing bits for quantizing the blocks of floating-processed data generated from the blocks of the data derived by the deriving means from the digital input signal in the present frame, the bit allocation means calculating the adaptive allocation of quantizing bits from the past-frame information read out from the memory means, the bit allocation means determining the past-frame information from the blocks of the data derived from the digital input signal in the past frame, and storing the past-frame information in the memory means for use in calculating the adaptive allocation of quantizing bits for quantizing the blocks of floating-processed data generated from the blocks of the data derived from the digital input signal in the present frame;

quantizing means, receiving the blocks of floating-processed data from the block floating means and the respective adaptive allocation of quantizing bits from the bit allocation means, for quantizing the blocks of floating-processed data according to the adaptive allocation of quantizing bits to generate respective blocks of quantized data; and

bit stream forming means, receiving the blocks of quantized data from the bit allocation means, for forming the compressed output signal from the blocks of quantized data.

5,471,559

METHOD AND APPARATUS FOR FUZZY KNOWLEDGE REASONING

Chizuko Yasunobu; Fumihiko Mori, both of Yokohama; Hiroshi Yamada, Kawasaki; Seiji Yasunobu, Yokohama, and Ryuko Someya, Kawasaki, all of, Japan, assignors to Hitachi, Ltd.

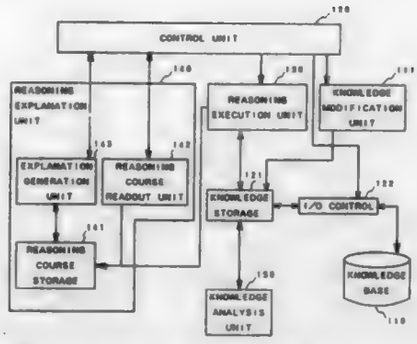
Filed Mar. 27, 1990, Ser. No. 500,067

Claims priority, application Japan, Mar. 31, 1989, 1-078219

Int. Cl.[6] G06F *9/44*

U.S. Cl. 395—61 **31 Claims**

1. In a fuzzy reasoning system comprising a control Unit including a program stating a modification procedure of the fuzzy knowledge and an execution start procedure, a knowledge modification unit, a reasoning execution unit, a knowledge storage unit, a knowledge base unit and an external data storage unit, a method of fuzzy reasoning for effecting fuzzy reasoning based on dynamically defined fuzzy knowledge stored in the knowledge storage unit, the method comprising the steps of:



(a) editing the modification procedure of the fuzzy knowledge in said program of said control unit;

(b) transferring the fuzzy knowledge from the knowledge base unit to the knowledge storage unit;

(c) modifying the fuzzy knowledge in said knowledge storage unit in accordance with the edited modification procedure in said control unit; and,

(d) executing the fuzzy reasoning by the reasoning execution unit based on the modified fuzzy knowledge in said knowledge storage unit in accordance with the execution start procedure in said control unit.

5,471,560

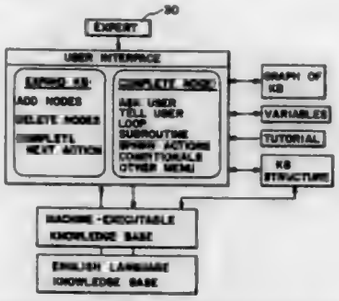
METHOD OF CONSTRUCTION OF HIERARCHICALLY ORGANIZED PROCEDURAL NODE INFORMATION STRUCTURE INCLUDING A METHOD FOR EXTRACTING PROCEDURAL KNOWLEDGE FROM AN EXPERT, AND PROCEDURAL NODE INFORMATION STRUCTURE CONSTRUCTED THEREBY

James R. Allard, St. Paul; Edward L. Cochran, and Alan S. Wolff, both of Minneapolis, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 774,642, Oct. 11, 1991, abandoned, which is a continuation of Ser. No. 338,552, Apr. 11, 1989, abandoned, which is a continuation of Ser. No. 1,949, Jan. 9, 1987, abandoned. This application Feb. 17, 1994, Ser. No. 197,661

Int. Cl.[6] G06F *15/20*

U.S. Cl. 395—77 **5 Claims**



1. A method for eliciting procedural knowledge from an expert for constructing an expert system said method being executable on a computer having an associated display device which results in the generation and display, in order, to the expert of a representation of an organized procedural information structure having properly ordered nodes, each of said nodes defining a goal, each said goal a parent goal to either a set of daughter goals which when completed effectuate said parent goal, or alternatively, a set of procedures for effectuating said parent goal, wherein each said procedure consists of instructions and questions to be put to said users in order to lead said user to achieve said goals, said method comprising the following steps wherein the requesting of said knowledge from said experts and his responses thereto are via said display device:

A. requesting said expert to generally categorize said procedural knowledge to define a current reference goal which is initially a root goal which a user would want to achieve;

B. requesting said expert to specify in a preferred order all goals which are daughters of the current reference goal, said daughter goals to be achieved before achieving their parent thereof, i.e., the current reference goal, which preferred order will determine the order to which said user may be displayed any of said goals or nodes, and also requesting said expert to specify the conditional relationships, if any, between any daughter goals and the current reference goal, each of said conditional relationships determining whether particular procedures will be displayed to the user, and each of said conditional relationships being designated by the expert as relative to information already made available to the expert system by said expert or by a user in response to procedures at run time, and in the absence of any said daughter goals proceeding to step D;

C. designating on said display means and in accordance with said preferred order the new current reference goal and returning to step B;

D. requesting said expert to specify procedures and to complete said current reference goal;

E. designating on said display means the parent goal of said current reference goal as the current reference goal and, if there is at least a remaining one of said goals branching therefrom, then designating the next one of said remaining one of said goals in accordance with said preferred order as the current reference goal and returning to step B;

F. stopping if said current reference goal is said root goal but otherwise returning to step E.

5,471,561
AUTOMATED STORAGE LIBRARY WITH ROTATABLE ARM AND OBLIQUE ANGLE EFFECTORS

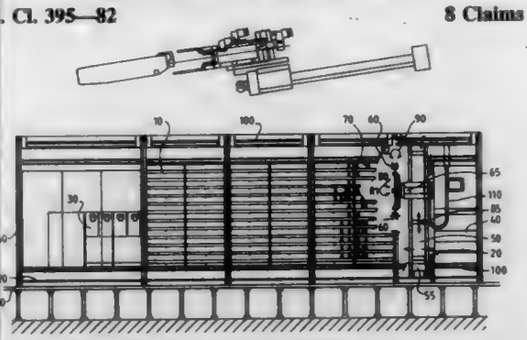
Richard B. Cowgill, Eastleigh, and David C. Teale, Winchester, both of, England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1993, Ser. No. 63,485

Claims priority, application United Kingdom, Aug. 8, 1992, 9216874

Int. Cl.[6] G06F *15/46*; B65G *1/06*

U.S. Cl. 395—82 **8 Claims**



1. An automated storage library comprising:

a plurality of storage cells for storing data storage cassettes at an oblique angle with respect to the horizontal plane;

one or more data transfer devices for transferring data between the data storage cassettes and a host processor;

a robotic picker for transporting data storage cassettes between the storage cells and one of the data transfer devices, the robotic picker comprising:

a carriage coupled to a drive mechanism for moving the carriage between the storage cells and one of the data transfer devices along a substantially horizontal axis;

an arm attached to the carriage so as to be rotatable about the horizontal axis;

means for moving the arm in a substantially vertical direction along the carriage; and

a first pair of robotic effectors mounted at one end of the arm for gripping data storage cassettes, the effectors being rotatable about an axis substantially parallel to the arm, wherein the robotic effectors are presented at the oblique angle for removal and placement of data storage cassettes in the cells by means of an arcuate movement and a linear movement of the arm.

5,471,562
PRINTER HAVING A BIT SHIFT FUNCTION

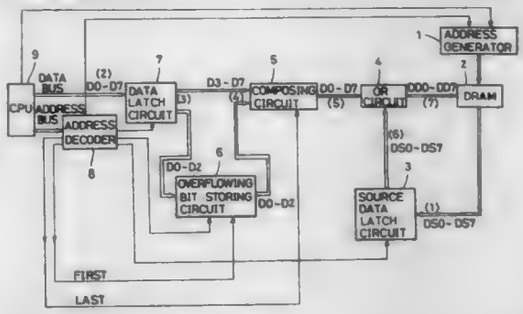
Kouichi Shibata, Sakai; Yusuke Morikawa, Shijohnawate, and Ikuhiro Ohmi, Osaka, all of, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 2, 1992, Ser. No. 907,619

Claims priority, application Japan, Jul. 11, 1991, 3-198843

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—101 **8 Claims**



1. A printer comprising:

a shift means for processing image data on a per word basis, wherein said image data consist of a predetermined number of bits in an order; and

a bit map memory for receiving image data from said shift means after a shift process by said shift means, said shift means including

storing means for storing at least one bit of a bit string constituting a word, which at least one bit overflows into a succeeding word; and

composing means for composing remaining bits of said word, and at least one overflowing bit from a word previously stored in said storing means, in order to output composed image data, said image data received by said bit map memory being based upon said composed image data.

5,471,563
SYSTEM AND METHOD FOR AUTOMATIC RESOLUTION REDUCTION

Stephen V. Dennis, Bothell; Steve Shaiman, Seattle; William B. McCormick, Bellevue; Robert C. Flagg, and Paul A. Schuster, both of Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

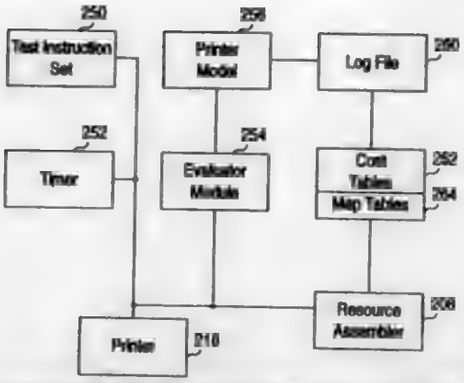
Continuation-in-part of Ser. No. 911,767, Jul. 10, 1992, and a continuation-in-part of Ser. No. 912,098, Jul. 10, 1992, Pat. No. 5,337,258. This application Nov. 16, 1992, Ser. No. 976,348

Int. Cl.[6] G06F *13/14*

U.S. Cl. 395—114 **39 Claims**

1. A computer-printer system employing a printer and a host computer for controlling and printing a document on the printer, the host computer having a resource storage area for storing resources, a plurality of resources stored in the resource storage area, and a data file for the document containing data describing a plurality of objects to be printed, the printer containing a print engine, the system comprising:

a resource assembler within the host computer for:



examining the data file and selecting some of the resources from the resource storage area to form a selected set of resources required for printing the document;

translating the data file into a set of primitives corresponding to the plurality of objects within a particular portion of the document;

determining a subset of said selected resources which are required from said host resource store for printing said particular portion of the document;

determining if said subset of required resources and said set of primitives will fit within the printer; and

determining if the printer can process said set of primitives into a bit-map data file in real-time or if the printer can process said set of primitives into said bit-map data file before the print engine is activated, said resource assembler then converting said set of primitives into said bit-map data file if the printer cannot store said subset of required resources and said set of primitives or if the printer can neither process said set of primitives into said bit-map data file in real-time nor process said set of primitives into said bit-map data file before the print engine is activated;

a printer resource store within the printer for receiving said subset of required resources and said set of primitives or said bit-map data file from said host resource store and storing said subset of required resources and said set of primitives or said bit-map data file;

a resource scheduler within the printer for controlling transfer of said subset of required resources and said set of primitives to said printer resource store or said bit-map data file; and

a resource executor within the printer for creating said bit-map data file corresponding to said subset of required resources and said set of primitives, and transferring said bit-map data file to the print engine for printing.

5,471,564

SYSTEM AND METHOD FOR DYNAMIC PRINTER TIMEOUT

Stephen V. Dennis, Bothell; Steven J. Fluegel; Brett C. Gerlach, both of Bellevue, and Robert C. Flagg, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

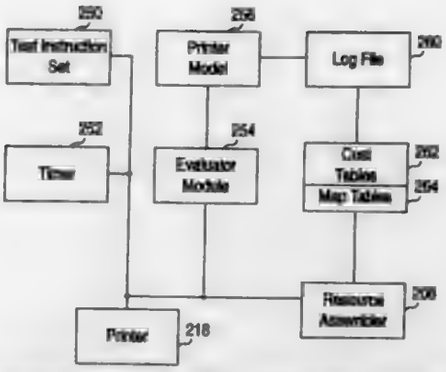
Continuation-in-part of Ser. No. 911,767, Jul. 10, 1992, and a continuation-in-part of Ser. No. 912,098, Jul. 10, 1992, Pat. No. 5,337,258. This application Nov. 16, 1992, Ser. No. 976,355

Int. Cl.[6] G06F *13/14*

U.S. Cl. 395—114 **26 Claims**

16. A method in a computer-printer system including a printer and a host computer for controlling and printing a document on the printer, the host computer having a resource storage area for storing resources, a plurality of resources stored in the resource storage area, and a data file for the document containing data describing a plurality of objects to be printed, the printer containing a print engine, the method comprising the steps of:

(a) examining the data file and selecting at least some of the resources from the resource storage area to form a subset of selected resources required for printing the document;



(b) translating the data file into a set of primitives corresponding to the plurality of objects within a particular portion of the document;

(c) calculating a rendering cost for rendering said set of primitives into a bit-map data file within the printer;

(d) setting a timeout period at least as great as said rendering cost;

(e) transferring said subset of selected resources and said set of primitives from the host computer to the printer;

(f) creating said bit-map data file corresponding to said subset of selected resources and said set of primitives, the printer being out of communication with the host computer while creating said bit-map data file; and

(g) transferring said bit-map data file to the print engine for printing, whereby said timeout period corresponds to the actual rendering time.

5,471,565

METHOD OF DISPLAYING A ROTARY BODY

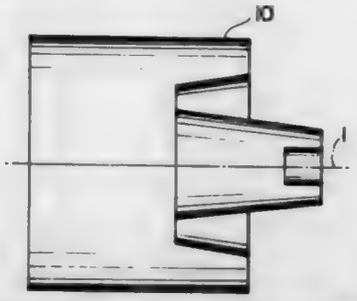
Yoshinori Tsujido, and Eriko Tayaoka, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 698,984, May 13, 1991, abandoned. This application Sep. 8, 1994, Ser. No. 302,385

Claims priority, application Japan, May 14, 1990, 2-125145; Nov. 2, 1990, 2-298703

Int. Cl.[6] G06T *15/50*

U.S. Cl. 395—126 **3 Claims**



1. A method of displaying on a graphic display a representation of a rotary body to be machined according to a machining program, said rotary body having a rotation axis about which said body rotates and data representing the three-dimensional shape of said body including point data representing a cross-sectional shape of said body being stored in a means accessible to said graphic display, comprising the steps of:

displaying on said display an external cross-sectional shape of said body in a plane of said rotation axis in accordance with stored point data representing an external, closed line denoting said cross-sectional shape, said external line including segments representing boundaries of projected surfaces of said body with respect to said plane and segments representing boundaries of recessed surfaces with respect to said plane as viewed on said display;

shading a first projected surface of said body in an area between said rotation axis and a segment of said external line representing a boundary of said first projected surface by inserting shading data in said area from said rotation axis to said segment representing the state of said first projected surface;

shading a second projected surface of said body in an area between a segment of said external line representing a boundary of said second projected surface and a segment of said external line representing a boundary of a first recessed surface by inserting shading data in said area from said segment representing said first recessed surface to said segment representing said second projected surface;

shading a second recessed surface of said body in an area between said rotation axis and a segment of said external line representing a boundary of said second recessed surface by inserting shading data in said area from said rotation axis to said segment representing a boundary of said second recessed surface; and

shading said first recessed surface of said body in an area between a segment of said external line representing a boundary of said first recessed surface and a segment of said external line representing a boundary of said first projected surface by inserting shading data in said area from said segment representing a boundary of said first projected surface to said segment representing a boundary of said first recessed surface.

5,471,566

METHODS AND APPARATUS FOR GENERATING GRAPHICS PATTERNS USING PIXEL VALUES FROM A HIGH RESOLUTION PATTERN

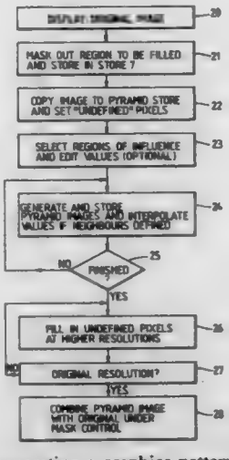
Richard A. Kirk, Herts, United Kingdom, assignor to Crosfield Electronics Limited, Hertfordshire, United Kingdom

Filed Aug. 16, 1993, Ser. No. 106,568

Claims priority, application United Kingdom, Aug. 14, 1992, 9217361

Int. Cl.[6] G06F *15/62*

U.S. Cl. 395—131 **8 Claims**



1. A method of generating a graphics pattern comprising digital data defining the color content of pixels of the pattern within a pattern area at a first, high resolution, the method comprising

(a) defining the color content of first pixels at selected positions within said pattern area which are to influence a resultant pattern, all pixels in said pattern area at said first high resolution other than said first pixels being considered as having undefined color content;

(b) generating successively lower spatial resolution versions of said pattern area in accordance with a predetermined algorithm which, when a predetermined number of defined pixels exist in a next higher resolution version neighboring an undefined pixel, interpolates color data for the corresponding lower resolution pixel, until all pixels of a lower resolution version contain defined data; and

(c) generating a version of said pattern area at said first, high resolution wherein the content of at least the previously undefined first high resolution pixels is obtained from said lower resolution versions of said pattern area.

5,471,567

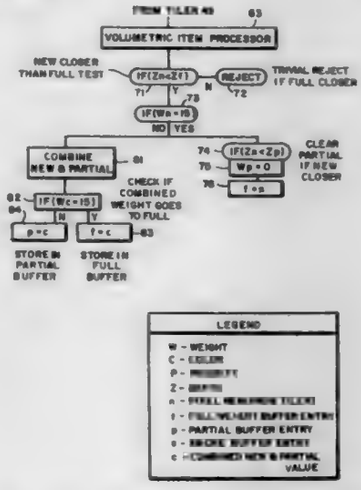
IMAGE ELEMENT DEPTH BUFFERING USING TWO BUFFERS

Brian T. Soderberg, Woodinville, and Mark L. Kenworthy, Renton, both of Wash., assignors to Bolt Beranek and Newman Inc., Cambridge, Mass.

Filed Aug. 8, 1991, Ser. No. 741,999

Int. Cl.[6] G06T *17/00*

U.S. Cl. 395—133 **8 Claims**



1. In a real time image generation system operating from a database in which objects can be defined with greater precision than the pixel resolution of the display and in which a weight value is provided with each object pixel definition which indicates the degree of pixel coverage and a depth value is provided which represents distance from viewpoint, the method of combining on a pixel basis contributions from successively presented different objects using first and second buffers; said method comprising:

inputting a succession of object pixels defined by respective attributes including said weight value and said depth value;

storing in a first buffer the attributes of each new object pixel definition whose weight value represents full coverage and whose depth value represents a position closer to the viewpoint than attributes currently stored in said first buffer;

combining contributions weighted in accordance with respective weight values from:

(i) the attributes of each new object pixel definition whose weight value represents less than full coverage and whose depth value represents a position closer to the viewpoint than attributes currently stored in said first buffer, and

(ii) any attributes previously stored in said second buffer

if the combined weight of the combined contributions is less than full coverage, storing the combined contributions in said second buffer;

if the combined weight of the combined contributions equals full coverage and if the depth value represents a position closer the viewpoint than attributes stored in said first buffer, storing the combined attributes in said first buffer; and

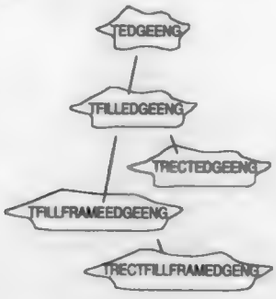
outputting a pixel definition defined by a set of attributes which is a mixture, weighted in accordance with respective weight values, of the attributes in the two buffers if the depth value in the second buffer is closer the viewpoint than the depth value in the first buffer and is equal to those attributes stored in said first buffer if the depth value in the first buffer is closer the viewpoint than the depth value in the second buffer.

5,471,568

OBJECT-ORIENTED APPARATUS AND METHOD FOR SCAN LINE CONVERSION OF GRAPHIC EDGES

Richard D. Webb, and Arthur W. Cabral, both of Sunnyvale, Calif., assignors to Taligent, Inc., Cupertino, Calif.

Filed Jun. 30, 1993, Ser. No. 85,340
Int. Cl.[6] G06T *15/00*
U.S. Cl. 395—133 **19 Claims**



1. An object-oriented method for scan converting a closed geometric figure having a plurality of edges into a plurality of scan line pixels, the method operating in a computer system having a memory, wherein the geometric figure is represented by a graphic object which is comprised of data describing the plurality of edges and an object function for traversing the plurality of edges to outline the figure, the method comprising the steps of:

(a) loading the graphic object into the memory;

(b) creating a plurality of edge objects each of which edge objects comprises edge data describing a predetermined edge shape and an edge function for moving along the predetermined edge shape, utilizing the steps of:

(b1) selecting a single name for the plurality of edge objects;

(b2) assigning the selected name to each of the plurality of edge objects; and

(b3) assigning different parameters to each of the plurality of edge objects;

(c) accessing the graphic object and utilizing the data and the object function therein to select ones of the plurality of edge objects to represent the edges;

(d) creating an edge engine object comprising a plurality of scan line functions for identifying portions of scan lines which lie within the geometric figure and on the edges; and

(e) using the edge engine object scan line functions and the selected ones of the plurality of edge objects to generate a plurality of scan line pixels corresponding to identified portions of scan lines.

5,471,569

RETRIEVAL SPACE DETERMINATION SYSTEM FOR THREE-DIMENSIONALLY SHAPED PARTS IN A CAD SYSTEM

Akira Katoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 29, 1992, Ser. No. 953,027
Claims priority, application Japan, Jan. 2, 1991, 3-255483
Int. Cl.[6] G06T *15/30*
U.S. Cl. 395—134 **2 Claims**

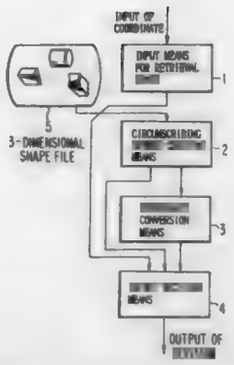
1. A retrieval space determination system for three-dimensionally shaped parts in a CAD system, comprising:

input unit inputting coordinates of two points defining one side of a retrieval space, having sides and being a three-dimensional polygon, displayed on a display screen, and inputting a depth of the retrieval space with respect to the one side;

memory storing three-dimensional shape data; and

a computer, comprising

a circumscribing sphere creating means for reading three-dimensional shape data corresponding to a selected three-dimensionally shaped part from the three-dimensional



shape data stored in the file, and creating a circumscribing sphere for the selected three-dimensionally shaped part, the circumscribing sphere having center coordinates and a radius;

coordinate conversion means for converting the center coordinates of the circumscribing sphere created by the circumscribing sphere creating unit into coordinates of the retrieval space input to the input means; and

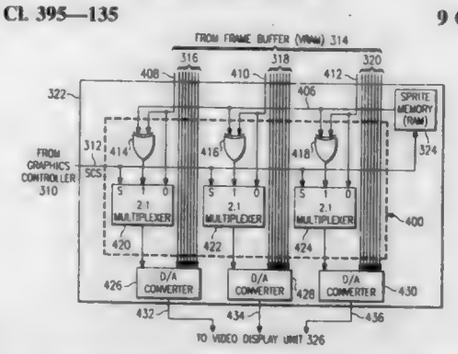
in/out decision means for comparing the center coordinates of the circumscribing sphere converted into coordinates of the retrieval space, the radius of the circumscribing sphere created by the circumscribing sphere creating unit, and the coordinates of the one side and depth of the retrieval space and deciding whether the circumscribing sphere is completely included within the retrieval space or is only partially included within the retrieval space.

5,471,570

HARDWARE XOR SPRITE FOR COMPUTER DISPLAY SYSTEMS

Darwin P. Rackley, Boca Raton, Fla., and R. Michael P. West, Colchester, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1993, Ser. No. 176,128
Int. Cl.[6] G06T *11/00*
U.S. Cl. 395—135 **9 Claims**



1. In a computer display system comprising a video display unit (VDU) and a video random access memory (VRAM) for storing pixels comprising an image to be displayed on said VDU and for outputting said pixels one at a time, an apparatus for controlling a color of a sprite overlaid on said displayed image, the apparatus comprising:

a sprite random access memory (RAM) for storing a plurality of sprite data bits corresponding to pixels of said sprite for indicating whether said corresponding pixels are active;

a first exclusive OR (XOR) gate having a first input connected said VRAM to receive a most significant bit (MSB) of a first color component of an image pixel output from said VRAM and a second input connected to an output of said sprite RAM;

a second XOR gate having a first input connected to receive an MSB of a second color component of said output pixel and a second input connected to receive said sprite RAM signal;

a third XOR gate having a first input connected to receive an MSB of a third color component of said output pixel and a second input connected to receive said sprite RAM signal;

a first multiplexor (MUX) having a first input connected to receive said first color component MSB, a second input connected to an output of said first XOR gate and a select input connected to receive a sprite control signal from said graphics controller, wherein a signal applied to said first input of said first MUX is output from said first MUX when said sprite control signal is inactive and a signal applied to said second input of said first MUX is output from said first MUX when said sprite control signal is active;

a second MUX comprising a first input connected to receive said second color component MSB, a second input connected to an output of said second XOR gate and a select input connected to receive said sprite control signal, wherein a signal applied to said first input of said second MUX is output from said second MUX when said sprite control signal is inactive and a signal applied to said second input of said second MUX is output from said second MUX when said sprite control signal is active;

a third MUX comprising a first input connected to receive said third color component MSB, a second input connected to an output of said third XOR gate and a select input connected to receive said sprite control signal, wherein a signal applied to said first input of said third MUX is output from said third MUX when said sprite control signal is inactive and a signal applied to said second input of said third MUX is output from said third MUX when said sprite control signal is active;

wherein when said sprite RAM signal is active, said first, second and third color component MSBs are inverted by said first, second and third XOR gates, respectively; and

wherein when said sprite RAM signal is inactive, said first, second and third color component MSBs are throughput said XOR gates.

5,471,571

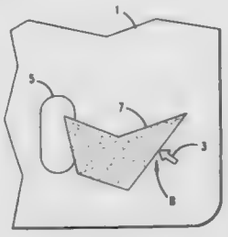
METHOD AND APPARATUS FOR SETTING A GRAPHICAL OBJECT'S POSITION AND ORIENTATION WITH VISCOUS DRAGGING

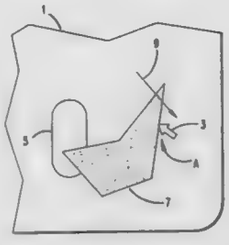
Randall B. Smith; John C. Tang, and D. Austin Henderson, Jr., all of Palo Alto, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 813,714, Dec. 27, 1991, abandoned. This application Jul. 17, 1992, Ser. No. 914,304

Int. Cl.[6] G06F *15/60*

U.S. Cl. 395—137 **43 Claims**





1. In a computer system, a method of controlling movement of an N-dimensional graphical object on a display having a plurality of coordinate values, comprising:

displaying said graphical object at a selected location and orientation on said display;

positioning a cursor at a desired location on said display with a cursor movement device;

moving said cursor along a desired path of motion on said display with said cursor movement device, where said location and path of motion are defined by N variables; and

modifying said graphical object on said display, such that said location and orientation of said graphical object are modified in dependance on said desired location and said desired path of motion.

5,471,572

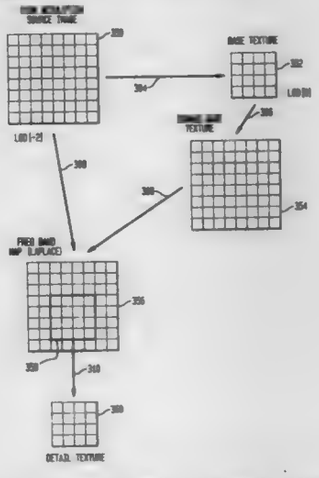
SYSTEM AND METHOD FOR ADDING DETAIL TO TEXTURE IMAGERY IN COMPUTER GENERATED INTERACTIVE GRAPHICS

Gregory C. Buchner, Sunnyvale, and Robert A. Drebin, Mountain View, both of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.

Filed Jul. 9, 1993, Ser. No. 88,349

Int. Cl.[6] G06T *5/00*

U.S. Cl. 395—139 **18 Claims**



18. A method of interactively magnifying a base texture to generate an unblurred magnified image of the base texture, said method comprising the steps of:

filtering a high resolution source image to generate a base texture;

extracting a representative portion of high frequency information from said source image to generate a detail texture, said detail texture comprising said extracted representative portion of high frequency information;

generating a scale factor for a particular level of detail;

multiplying signals representing said detail texture with signals representing said scale factor to thereby generate a scaled detail texture for said particular level of detail;

determining whether said base texture represents a color image or an intensity image;

multiplying signals representing said scaled detail texture with signals representing the generated base texture to thereby generate a scaled base texture when said base texture represents a color image;

adding signals representing said generated base texture to signals representing said scaled base texture to thereby generate a magnified image of said generated base texture at said

particular level of detail when said base texture represents a color image; and

adding signals representing said generated base texture to signals representing said scaled detail texture to thereby generate a magnified image of said generated base texture at said particular level of detail when said base texture represents an intensity image.

5,471,573

OPTIMIZED SCAN CONVERSION OF OUTLINES FOR GENERATING RASTER IMAGES

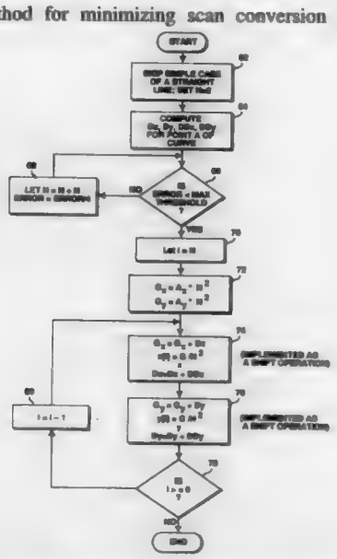
Sampo Kaasila, Plaistow, N.H., assignor to Apple Computer, Inc., Cupertino, Calif.

Continuation of Ser. No. 25,727, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 447,369, Dec. 7, 1989, abandoned. This application Sep. 27, 1993, Ser. No. 128,312

Int. Cl.[6] G06T *11/00*

U.S. Cl. 395—141 **30 Claims**

1. A method for minimizing scan conversion processing in



displaying an outline image on a display device from a resulting bitmap of a graphic display system, comprising the steps of:

approximating said outline image with recursive subdivision to represent said outline image as a plurality of segments;

fitting each segment of said plurality of segments of said outline image with forward differencing within an error threshold, said forward differencing producing a plurality of intervals, wherein said error threshold includes a distance between a point on each of said plurality of intervals and a point representing said outline image;

comparing said error threshold with a predetermined maximum error threshold, said maximum error threshold relating to a size of said resulting bitmap;

determining an optimum number of said plurality of intervals required to ensure that said error threshold is less than said maximum error threshold; and

generating said optimum number of said plurality of intervals to store data representative of pixels in a refresh buffer to thereby provide said resulting bitmap to activate pixels on said display device according to said resulting bitmap of said graphic display system.

5,471,574

IMPROVED METHOD FOR DISPLAYING A COMPUTER GENERATED GRAPHIC ON A RASTER OUTPUT SCANNER

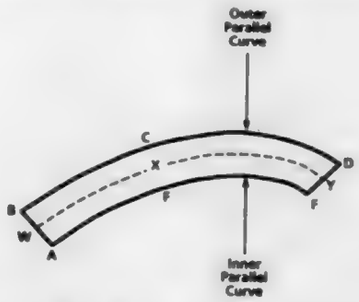
Bindiganavele A. Prasad, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 136,226, Oct. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 537,951, Jun. 14, 1990, abandoned. This application Aug. 29, 1994, Ser. No. 297,746

Int. Cl.[6] G06T *11/00*

U.S. Cl. 395—142 **2 Claims**

1. A method for displaying a computer generated image



described in page description language on a raster output scanner comprising the steps of:

generating a trajectory from said page description language which trajectory is described in page description language

approximating a part of said trajectory by an original parabola having control points A, B and C which original parabola approximates said part of said trajectory, to within a predetermined error limit,

generating for said original parabola a set of approximating parabolas which approximating parabolas together constitute two curved lines that are parallel to, and a predetermined distance away from, said original parabola, said generating step comprising:

a. determining a number of segments that the original parabola must be divided into in order that an approximating parabola can be generated for each segment,

b. dividing said original parabola into said segments, and

c. generating an approximating parabola for each of said segments, converting said set of approximating parabolas into a bit map, and sending said bit map to a raster output scanner,

wherein said determining step comprises

a. testing said original parabola having control points A, B, C by dividing distance AB by distance BC if distance AB is longer or distance BC by distance AB if distance BC is longer, to generate a result K and comparing the result K to a limit which is a function of included angle ABC,

b. if the result is less than the limit, the parabola does not need to be subdivided,

c. if the result is greater than the limit, the parabola is subdivided, and this method returns to step a. for each resultant segment.

5,471,575

INTERACTIVE PARAMETER DRIVEN ITERATIVE FINANCIAL SPREADSHEET ANALYSIS WITH CONTEXT AND LAYOUT SENSITIVE HELP SCREEN

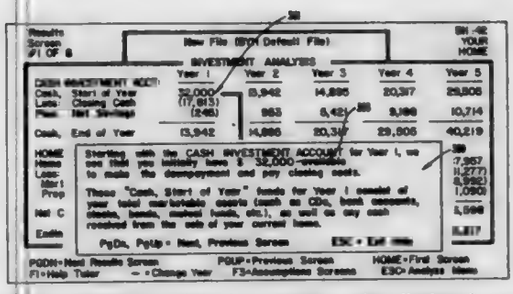
Joseph E. Giansante, Mountain View, Calif., assignor to Home Equity Software, Inc., Mountain View, Calif.

Filed Jan. 3, 1992, Ser. No. 816,892

Int. Cl.[6] G06F *17/21*

U.S. Cl. 395—144 **8 Claims**

1. A method for displaying help text on a display screen in a computer system, wherein the computer is coupled to a user input device for generating signals in response to the actions of a human user, where said screen initially displays first text having a plurality



of items, wherein each item is a numeric value displayed on the display screen, wherein the initially displayed first text and plurality of items describe a mathematical calculation performed by using the items in a fixed order, said method comprising the steps of:

storing a predefined data structure in the computer, wherein the data structure includes references to a plurality of the initially displayed items, wherein the references in the data structure are arranged in a predefined order corresponding to the fixed order of the referenced items;

repeating, in response to signals from the user input device, the following steps to display help text associated with the items referenced by the data structure:

selecting a reference from the data structure in accordance with the ordering of the references in the data structure;

using the computer to select predefined help text corresponding to the item referenced by the selected reference;

using the computer to determine an area on said screen large enough to contain said selected help text;

using the computer to determine a position for the area on said screen, where said position does not cause said area to overlap said item;

displaying said help text within said area;

displaying a linear pointer on said screen, where one end of said pointer is substantially near to said help text and the other end of the pointer is substantially near to said referenced item thereby visually connecting said help text with said referenced item;

displaying the selected help text in the determined position on the screen;

removing the selected help text from the determined position on the screen.

5,471,576

AUDIO/VIDEO SYNCHRONIZATION FOR APPLICATION PROGRAMS

Raymond L. Yee, Coral Springs, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 16, 1992, Ser. No. 976,628

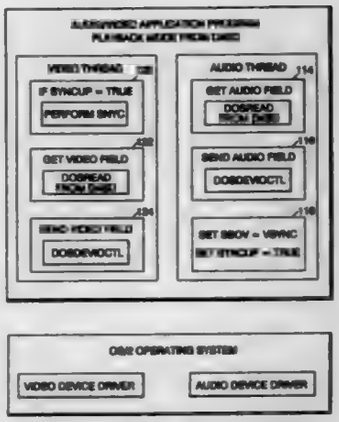
Int. Cl.[6] G06F *13/10*

U.S. Cl. 395—154 **13 Claims**

5. In a computing system for generating audio/visual presentations, an apparatus for synchronizing the playback of video data fields with audio data fields, said computing system having a processor, storage devices, an audio adapter with an audio device for playing back audio fields, and a video adapter with a video device for playing back video fields, said apparatus being driven by an audio/visual computer program running on the computing system and said apparatus comprising:

first means for getting and saving a sequence of video fields in the computing system for subsequent playback in an audio/visual presentation;

second means for retrieving an audio field at the same time said first means is getting and saving video fields, said audio field to accompany the sequence of video fields during the playback of the audio/visual presentation;



third means for counting each video field, as the video field is stored by said second means and for sending a sync count to said second means as each video field is stored by said first means;

fourth means responsive to the sync count from said third means for appending the sync count to the audio field retrieved by said second means and for saving the audio field with the appended sync count in the computing system for subsequent playback with the sequence of audio fields in the audio/visual presentation;

audio sending means for sending a sequence of audio fields stored in the system to the audio adapter for playback;

video sending means for sending the sequence of video fields stored in the system to the video adapter for playback;

means for synchronously starting said audio sending means and said video sending means;

means for counting the video fields as each video field is processed at the video adapter for playback and providing an actual count of processed video fields;

said audio adapter providing an audio completed signal after each audio field has been processed by the adapter;

means responsive to the audio completed signal for comparing the sync count of the processed audio field with the actual count from said counting means of the processed video field; and

means for synchronizing the playback of the audio fields and video fields based on a comparison of the sync count of the processed audio field with the actual count.

5,471,577

DISPLAYING A SUBSAMPLED VIDEO IMAGE ON A COMPUTER DISPLAY

Timothy R. Lightbody, Northboro; Daniel F. Cutter, Boxboro, and Brian M. Nowokunski, Leominster, all of Mass., assignors to Data Translation, Inc., Marlboro, Mass.

Continuation of Ser. No. 49,100, Apr. 16, 1993, abandoned. This application May 30, 1995, Ser. No. 451,655

Int. Cl.[6] G06F *3/14;* **G06T** *1/20*

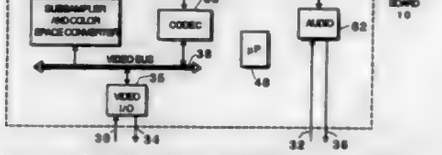
U.S. Cl. 395—157 **26 Claims**

1. Apparatus for displaying a reduced-size video image in a window of a display of a host computer, the image being based upon subsampled digital image data, the host computer including a central processing unit (CPU), a display, a display memory connected to said display, and a system bus connected to said central processing unit and said display memory, said apparatus comprising:

a peripheral controller including

a subsampler that receives video digital source image data for an image that is changing in real time and outputs subsampled video image data that changes in real time, and

window display means for receiving said subsampled video image data and a directive from said host computer indicating the location on said display for said window and for thereafter



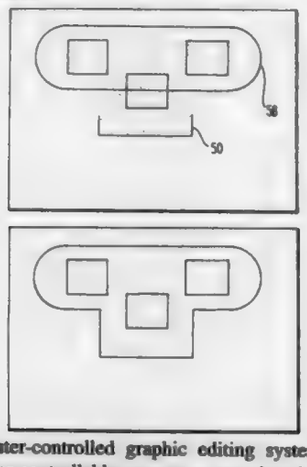
autonomously writing blocks of said subsampled data through said system bus into said display memory at addresses corresponding to said window such that said window displays active, real time video, said writing of said blocks being carried out independently of said host CPU.

5,471,578

APPARATUS AND METHOD FOR ALTERING ENCLOSURE SELECTIONS IN A GESTURE BASED INPUT SYSTEM

Thomas P. Moran, Palo Alto; Patrick Chiu, Menlo Park, and William Van Melle, Los Altos, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 30, 1993, Ser. No. 175,841
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—161 **18 Claims**



1. A computer-controlled graphic editing system including a display and user controllable means connected to the computer for generating objects on said display and for generating a line image on said display, said system further comprising:

(a) first means for generating a first line image having a first location on said display, said first line image representing selection of a first set of objects on said display,

(b) second means responsive to a user action subsequent to generating of said first line image for generating a second line image having a second location on said display,

(c) third means for determining whether the second line image has said second location satisfying a predetermined spatial relation to the first location of the first line image,

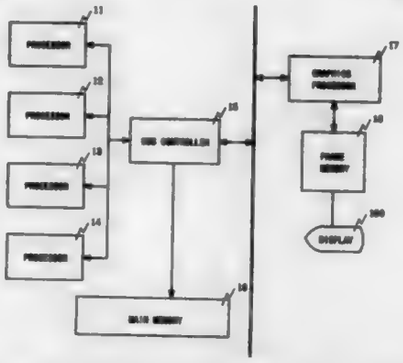
(d) fourth means in response to the third means determining that the second line image does satisfy the predetermined spatial relation for combining the first and second line images to generate a third line image on said display visible to the user, said third line image representing a selection of a second set of objects on the display that is different from said first set of objects.

5,471,579

GRAPHICS SYSTEM USING PARALLEL PROCESSORS AND PROCESSING METHOD OF THE SAME

Shinji Kimura, Sagamihara; Yumiko Sugita, Musashino; Shouji Nakamura, Yokohama, and Eriko Koda, Machida, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1993, Ser. No. 147,982
Claims priority, application Japan, Nov. 10, 1992, 4-299550
Int. Cl.[6] G06F *15/16*
U.S. Cl. 395—163 **15 Claims**



1. A graphics system having a plurality of processors to be operated in parallel comprising means for:

classifying a series of graphics output primitives created by an application program into a plurality of groups according to characteristics thereof;

obtaining at least a frequency of occurrence of at least one of the graphics output primitives belonging to at least one of the classified groups, said frequency being in correspondence with the one of said classified groups; and

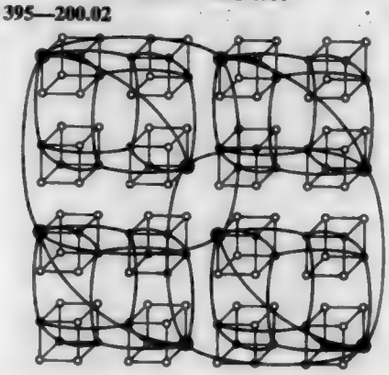
determining a number of processors in said plurality of processors, for executing at least a graphics output primitive to be processed after obtaining said at least a frequency according to said frequency of occurrence.

5,471,580

HIERARCHICAL NETWORK HAVING LOWER AND UPPER LAYER NETWORKS WHERE GATE NODES ARE SELECTIVELY CHOSEN IN THE LOWER AND UPPER LAYER NETWORKS TO FORM A RECURSIVE LAYER

Shinji Fujiwara, Kokubunji, Japan; Yoichi Shintani, Palo Alto, Calif., and Mitsuru Nagasaka, Kodaira, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 30, 1992, Ser. No. 954,025
Claims priority, application Japan, Jan. 1, 1991, 3-280748
Int. Cl.[6] G06F *9/00*
U.S. Cl. 395—200.02 **10 Claims**



1. A hierarchical network comprising:

a plurality of lower layer networks, each of said lower layer networks being a p-array, n-cube network where p and n are integers greater than 1, and connecting a plurality of nodes provided for each lower layer network, wherein part of said

plurality of nodes are selected as a plurality of gate nodes in said each lower layer network; and

an upper layer network being a p-array, n-cube networks where p and n are integers greater than 1, and connecting a group of gate nodes selected for said plurality of lower layer networks;

wherein said plurality of lower layer networks, said upper layer network and said group of gate nodes establish communication between nodes belonging to different lower layer networks, in such a manner that communication provided by a first node included in a plurality of nodes connected by a first one of said plurality of lower layer networks is first relayed by way of said first lower layer network to a first gate node included in a plurality of gate nodes selected for said first lower layer network, said first gate node being nearest to said first node among said plurality of gate nodes selected for said first lower layer network;

said communication is further relayed by said upper layer network to a second gate node included in a plurality of gate nodes selected for a second one of said plurality of lower level networks which connect a plurality of nodes which includes a second node to which said communication is to be transferred, said second gate node being one nearest to said second node among said plurality of gate nodes selected for said second lower layer network; and

said communication is further transferred by way of said second lower layer network from said second gate node to said second node.

5,471,581

ELASTIC CONFIGURABLE BUFFER FOR BUFFERING ASYNCHRONOUS DATA

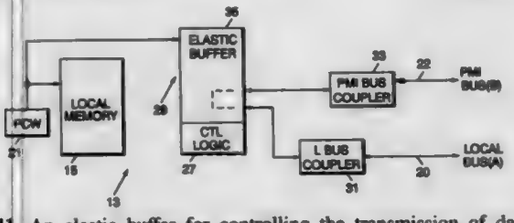
Jean-Marie Munier, Cagnes sur Mer; Andre Pauporte, La Colle sur Loup, and Clement Poiraud, Cagnes sur Mer, all of, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 612,773, Nov. 13, 1990, abandoned. This application Jun. 23, 1993, Ser. No. 146,770

Claims priority, application European Pat. Off., Dec. 22, 1989, 89480187

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—250 **11 Claims**



11. An elastic buffer for controlling the transmission of data between a plurality of data buses operating asynchronously comprising:

a RAM partitioned into a plurality of sectors, each of said sectors containing successive memory addresses into which data is written or from which data is read;

at least one mark flag being associated with each sector, said mark flag being operable to be set in a first state indicating the sector can be written into or a second state indicating the sector cannot be written into; and

means operatively coupled to dynamically set selected mark flags into the first state and dynamically set other mark flags into a second state so that each state indicating sectors in which data can be written into (write mode) and sectors from which data can be read (read mode), with the writing of data and the reading of data occurring simultaneously;

a Move In Pointer (MIP) to identify sequential addresses whereat data is to be written in a sector marked for writing; and

a Move Out Pointer (MOP) to identify sequential addresses whereat data is to be read from a sector marked for reading.

5,471,582

MULTIPLE RANK HIERARCHICAL DATA STORAGE SYSTEM WITH DATA COHERENCE

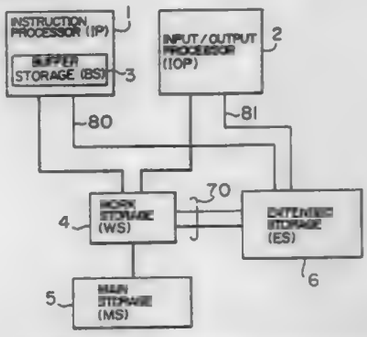
Yoshio Kiriu, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 950,745, Sep. 24, 1992, Pat. No. 5,307,461, which is a continuation of Ser. No. 313,721, Feb. 21, 1989, abandoned. This application Dec. 29, 1993, Ser. No. 175,285

Claims priority, application Japan, Feb. 22, 1988, 63-37437

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—250 **4 Claims**



1. A data processing system employing hierarchical data storage areas having an instruction processor,

a main storage,

a first buffer storage placed for data communication between the data processing system instruction processor and the main storage for storing therein a part of contents of the main storage to supply the instruction processor with data stored therein, wherein the first buffer storage has less storage capacity than the main storage but faster access to each location than the main storage,

a second buffer storage placed for data communication between the first buffer storage and the main storage to supply the first buffer storage with data stored therein,

wherein the second buffer storage has intermediate storage capacity and access speed between these of the main storage and first buffer storage, and

an extended storage having a data path capable of communicating data between the second buffer storage and the extended storage, wherein the extended storage has larger storage capacity than the main storage but slower access to each location than the main storage and has different and independent address spaces from the main storage,

wherein data written in the first buffer storage is immediately written into the second buffer storage and data written in the second buffer storage is written in the main storage when the data become least recently used data.

5,471,583

FIFO BUFFER HAVING WRITE COUNTER FOR GENERATING EMPTY FLAG VALUE TO BE COMPARED WITH READ POINTER VALUE TO INDICATE THE BUFFER IS FULL

Fu L. Au, Milpitas, and Einat Yogev, Santa Clara, both of Calif., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.

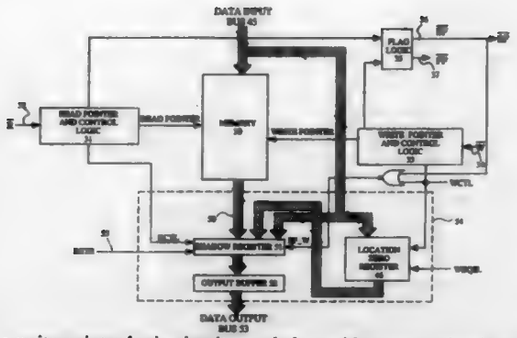
Continuation of Ser. No. 210,185, Mar. 17, 1994, abandoned, which is a continuation of Ser. No. 567,213, Aug. 14, 1990, Pat. No. 5,325,487. This application Mar. 31, 1995, Ser. No. 415,100

Int. Cl.[6] G06F *13/14*

U.S. Cl. 395—250 **4 Claims**

1. A FIFO buffer for sequentially transmitting data from a first digital system to a second digital system comprising:

a memory circuit having a plurality of storage locations and having an input port and an output port;



a write pointer logic circuit coupled to said memory circuit, said write pointer logic circuit having a first write counter, and a second write counter, wherein said first write counter generates a write pointer value indicating the storage location of said memory circuit to which incoming data is written, and wherein said second write counter generates an empty flag reference value, said empty flag reference value being greater than or equal to said write pointer value;

a read pointer logic circuit coupled to said memory circuit , said read pointer logic circuit having a read counter, wherein said read counter generates a read pointer value indicating the storage location of said memory circuit from which outgoing data is read; and

a flag logic circuit coupled to said write pointer logic circuit and to said read pointer logic circuit, wherein said flag logic circuit includes a comparator circuit for generating a comparator signal indicative of a predetermined relationship between said empty flag reference value and the read pointer value, wherein the comparator signal is associated with a first logical state when the FIFO buffer is filled with data and wherein the comparator signal makes a transition to a second logical state before the FIFO buffer becomes empty, and wherein said flag logic circuit further includes an empty flag output circuit coupled to an output line of said comparator circuit, said empty flag output circuit for selectively asserting an empty flag signal in response to a read signal when the comparator signal is in the second logical state.

5,471,584
SPATIAL LIGHT MODULATOR WITH SUB-DIVIDED MODULATION ELEMENTS

Peter W. Blaxtan, Welwyn, and John Gillespie, Ware, both of, United Kingdom, assignors to Rank Brimar Limited, United Kingdom

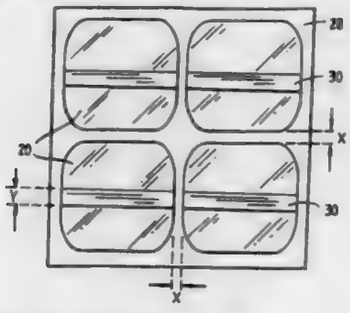
PCT No. PCT/GB91/02034, § 371 Date Aug. 28, 1993, § 102(e) Date Aug. 28, 1993, PCT Pub. No. WO92/09001, PCT Pub. Date May 29, 1992

PCT Filed Nov. 18, 1991, Ser. No. 50,414

Claims priority, application United Kingdom, Nov. 16, 1990, 9024979

Int. Cl.[6] G02F *1/31*

U.S. Cl. 359—263 **10 Claims**



1. A spatial light modulator, comprising:

(a) a plurality of individual unitary light-modifying pixel elements, said pixel elements being arranged in a plurality of lines to form an array; and

(b) means for separately changing the light-modifying condition of each of said individual light-modifying elements;

(c) each of said pixel elements including:

i) an active surface from or through which light may be reflected or transmitted; and

ii) one or more inactive bands on said active surface, said inactive band or bands dividing said active surface of said pixel element into a plurality of substantially equal light-modifying portions forming a greater number of lines of narrower width than the width of said pixel element; and wherein

iii) all said portions on each said pixel element each result in an identical light-modifying action.

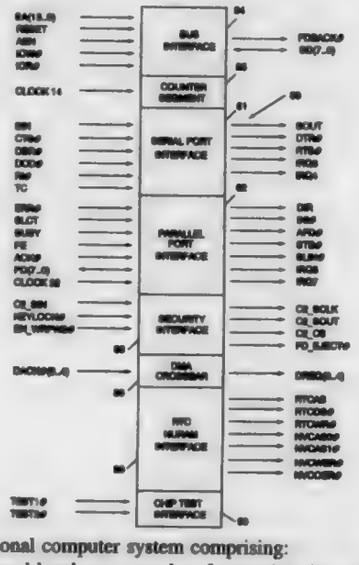
5,471,585
PERSONAL COMPUTER SYSTEM WITH INPUT/OUTPUT CONTROLLER HAVING SERIAL/PARALLEL PORTS AND A FEEDBACK LINE INDICATING READINESS OF THE PORTS

Edmond H. Barakat; Arthur L. Chin, and Eric B. Schorn, all of Boca Raton, Fla., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Sep. 17, 1992, Ser. No. 947,020

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—308 **5 Claims**



1. A personal computer system comprising:

a high speed local processor bus for passing data signals;

a microprocessor operatively connected with said local processor bus for transfer of data signals therethrough;

an option bus for receiving option cards and for passing data signals to and from any option card received;

a planar I/O bus for passing data signals;

a bus controller operatively connected with said local processor bus and said option bus and said planar I/O bus for controlling passage of data signals therebetween to and from said microprocessor; and

an I/O controller having a plurality of segments,

a first one of said segments providing a serial port for exchange of data signals with said local processor bus,

a second one of said segments providing a parallel port for exchange of data signals with said local processor bus, and

a third one of said segments providing a selectable interface for connection with a selected one of said option bus and said planar I/O bus, said third segment of said I/O controller further having a signal line for transmission of a feed-

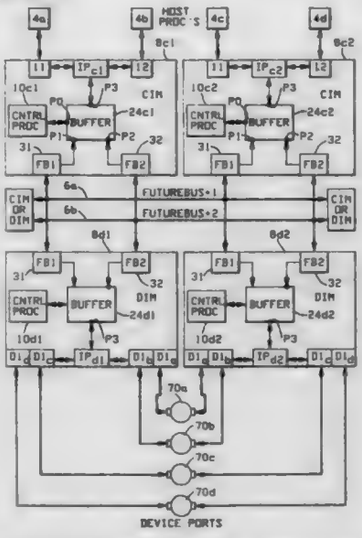
back signal indicative of a readiness for transfer of data signals through one of said first and second segments of said I/O controller.

5,471,586

INTERFACE SYSTEM HAVING PLURALITY OF CHANNELS AND ASSOCIATED INDEPENDENT CONTROLLERS FOR TRANSFERRING DATA BETWEEN SHARED BUFFER AND PERIPHERAL DEVICES INDEPENDENTLY

Khorvash Sefidvash, Laguna Niguel, and Seyed H. Hashemi, Mission Viejo, both of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 22, 1992, Ser. No. 949,286
Int. Cl.[6] G06F *13/00;13/12;13/36*
U.S. Cl. 395—284 5 Claims



4. A multiple device interface module system where a plurality of device interface modules communicate with first and second system busses, said system comprising:

(a) a plurality of device interface modules wherein each device interface module includes:

(a1) first and second I/O port means connected to said first and second system busses for receiving and/or sending data to/from an internal buffer memory means;

(a2) said buffer memory means for storing data received from said first and second system busses and for storing data received from a plurality of groups of peripheral devices;

(a3) four independent protocol-processor port means connecting four channel bus means to four groups of peripheral devices for data transfer operations;

(a4) each of said four channel bus means for transferring data to/from said protocol-processor port means from/to said buffer memory means and including:

(a4a) script memory means for holding commands and programs received from a control processor means to manage data transfer operations;

wherein each of said protocol-processor port means executes the commands independently for controlling the data transfer operations between the peripheral devices connected thereto and the buffer memory means;

(a5) bus control logic means, coupling to each of said channel bus means, for granting equal time access period to each of said channel bus means; and

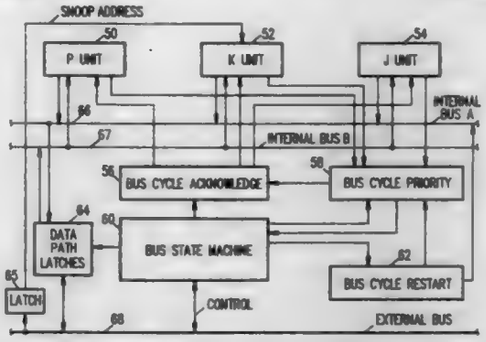
(a6) control processor means, coupling to each of said channel bus means, for generating said script commands and programs for each of said protocol controller means to control said data transfer operations.

5,471,587

FRACTIONAL SPEED BUS COUPLING

Roshan Fernando, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Sep. 30, 1992, Ser. No. 954,871
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—309 24 Claims



1. Apparatus for enabling internal data processing logic that includes a number of units clocked by an internal clock operating at a first frequency to operate with an external bus clocked by an external clock operating at a second frequency that is a fraction m/n of said first frequency comprising:

an internal bus connected to said number of units;

said internal bus including readers and drivers for effecting data transfer between said internal bus and said number of units; and,

control means connected to said internal bus for controlling said readers and drivers;

said control means including priority logic connected to said readers and drivers, responsive to said number of units for determining priority between said units with respect to transfer of data on said external bus with a selected one of said units;

said control means further including first means operative upon a condition that m=1 and n is an integer of the integers 1, 2, and 3, for transferring data from said internal bus to said selected one of said units on every rising edge of said external clock and for transferring data from said selected one of said units to said internal bus at a point in time that said internal clock and said external clock are aligned.

5,471,588

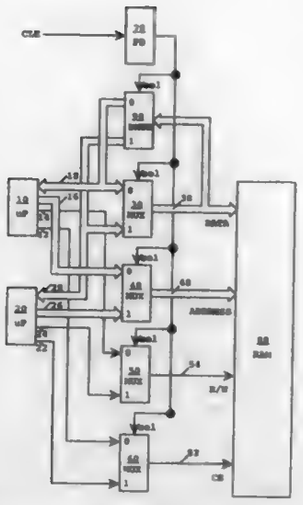
TECHNIQUE AND CIRCUIT FOR PROVIDING TWO OR MORE PROCESSORS WITH TIME MULTIPLEXED ACCESS TO A SHARED SYSTEM RESOURCE

Hanumanthrao Nimishakavi, Fremont, and Ravi Swami, San Jose, both of Calif., assignors to Zilog, Inc., Campbell, Calif.

Filed Nov. 25, 1992, Ser. No. 981,889
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—293 2 Claims

1. A circuit providing shared access for a plurality of access requesting devices individually having an input and at least one output, to an electronic device having a output and at least one input, wherein said output of said electronic device is a data output, said at least one input of said electronic device includes a data input and an address input, said input of individual ones of said plurality of access requesting devices is a data input, and said at least one output of individual ones of said plurality of access requesting devices includes a data output and an address output, said circuit comprising:

means responsive to a clock signal, for generating a select signal having a plurality of voltage levels uniquely corresponding to respective ones of said plurality of access requesting devices;



a first multiplexer circuit having a select input receiving said select signal, a plurality of inputs respectively connected to corresponding outputs of said plurality of access requesting devices, and an output connected to a corresponding one of said at least one inputs of said electronic device, wherein said plurality of inputs of said first multiplexer circuit are respectively connected to corresponding data outputs of said plurality of access requesting devices, and said output of said first multiplexer circuit is connected to said data input of said electronic device;

a demultiplexer circuit having a select input receiving said select signal, an input connected to said output of said electronic device, and a plurality of outputs respectively connected to corresponding inputs of said plurality of access requesting devices, wherein said input of said demultiplexer circuit is connected to said data output of said electronic device, and said plurality of outputs of said demultiplexer circuit are respectively connected to corresponding data inputs of said plurality of access requesting devices; and

a second multiplexer circuit having a select input receiving said select signal, a plurality of inputs respectively connected to corresponding address outputs of said plurality of access requesting devices, and an output connected to said address input of said electronic device.

5,471,589

MULTIPROCESSOR DATA PROCESSING SYSTEM HAVING NONSYMMETRICAL CHANNEL(X) TO CHANNEL(Y) INTERCONNECTIONS

Isam W. Akkawi, Aptos; Scott H. Hayashida, San Diego; Vivek Ladha, Santa Clara, and John E. Rudy, Poway, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Sep. 8, 1993, Ser. No. 118,164

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **13 Claims**

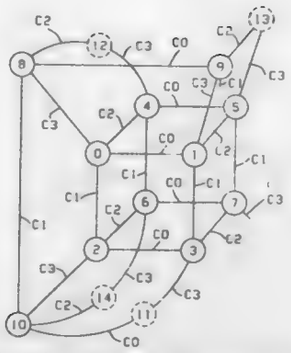
1. A multiprocessor data processing system comprising:

a plurality of data processing nodes with the total number of nodes in said plurality being more than 2^{n-1} and less than 2^n where n is an integer larger than two;

each node having n input/output channels which respectively are channel(0), channel(1), . . . channel(n−1); and each node having a binary address $b_{n-1} \ldots b_1 b_0$ which runs consecutively from node to node;

all of said nodes being interconnected by said channels in an array which is unsymmetrical;

each pair of nodes in said unsymmetrical array whose binary addresses differ by only one binary bit b_x being interconnected by a channel(x) to channel(x) connection, where x=0,1, . . . n−1; and,



at least one pair of nodes in said unsymmetrical array whose binary addresses differ by two binary bits b_x and b_y being interconnected by a channel(x) to channel(y) connection with no intervening node therebetween, where x and y=0,1, . . . n−1.

5,471,590

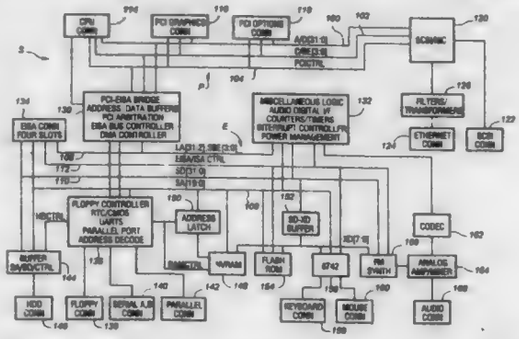
BUS MASTER ARBITRATION CIRCUITRY HAVING IMPROVED PRIORITIZATION

Maria L. Melo, Houston, and Randy M. Bonella, Cypress, both of Tex., assignors to Compaq Computer Corp., Houston, Tex.

Filed Jan. 28, 1994, Ser. No. 188,456

Int. Cl.[6] G06F *13/36*

U.S. Cl. 395—288 **9 Claims**



7. A method for bus arbitration of a computer system, the computer system having a bus for connection to a plurality of bus masters and bus slaves, each bus master requesting control of the bus by use of a bus request signal and receiving control by use of a grant signal, wherein bus masters may request a lock on a bus slave by using a lock signal, wherein operation cycles of the bus masters can be directed to be retried by the bus slaves and wherein one of the slaves provides an indication when a retried cycle can proceed, the bus arbitration method comprising the steps of:

receiving the bus request signals from the bus masters;

determining when an operation cycle is to be retried and if said operation cycle to be retried was directed to the bus slave which provides the retried cycle can proceed indication;

determining the bus request priority of the bus masters with respect to each other;

granting control of the bus to the highest priority requesting bus master and providing the proper bus grant signal; and

masking the bus request of the retried bus master until the bus slave indicates that the retried cycle can proceed if the bus slave directing a retry to the bus master is the bus slave which provides the indication, unless the retried bus master has locked the bus slave and then the bus request is not masked.

5,471,591

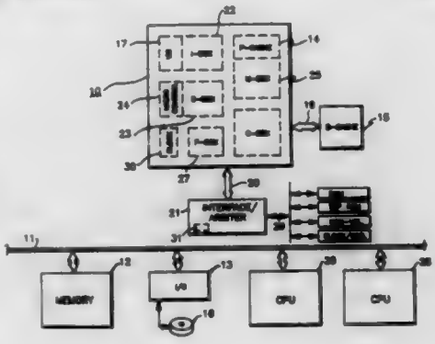
COMBINED WRITE-OPERAND QUEUE AND READ-AFTER-WRITE DEPENDENCY SCOREBOARD

John H. Edmondson, Cambridge, and Larry L. Biro, Oakham, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 34,581, Mar. 22, 1993, Pat. No. 5,317,720, which is a continuation of Ser. No. 547,699, Jun. 29, 1990, abandoned. This application Oct. 30, 1992, Ser. No. 969,126

Int. Cl.[6] G06F *9/312*

U.S. Cl. 395—375 18 Claims



1. A method of processing instructions in a pipelined digital computer having an instruction decoder, and an instruction execution unit for overlapped execution of a plurality of instructions for which execution is initiated but not yet completed, multiple general purpose registers, a source queue for temporarily storing register source specifiers of said instructions, and a destination queue for temporarily storing register destination specifiers of said instructions, said method comprising the steps of:

decoding said plurality of instructions to obtain said register source specifiers and said register destination specifiers from said plurality of instructions and inserting said register source specifiers into said source queue and inserting said register destination specifiers into said destination queue;

removing said register source specifiers from said source queue and using said source specifiers in the execution of said plurality of instructions by said execution unit; and

just prior to initiating execution of a current one of said plurality of instructions, checking for a register read-after-write conflict between a register source specifier of said current instruction of said plurality of instructions and a register destination specifier of a previous one of said plurality of instructions for which said execution has been initiated but not yet completed, and when a register read-after-write conflict is found between a register source specifier of said current instruction of said plurality of instructions and said previous one of said plurality of instructions for which said execution has been initiated but not yet completed, delaying the initiation of execution of said current one of said plurality of instructions; and

marking each register destination specifier in said destination queue when execution is initiated for said current one of said plurality of instructions from which said each register destination specifier is obtained during said decoding of said plurality of instructions, and wherein said checking for a register read-after-write conflict includes comparing said register source specifier to each register destination specifier that is marked in said destination queue.

5,471,592

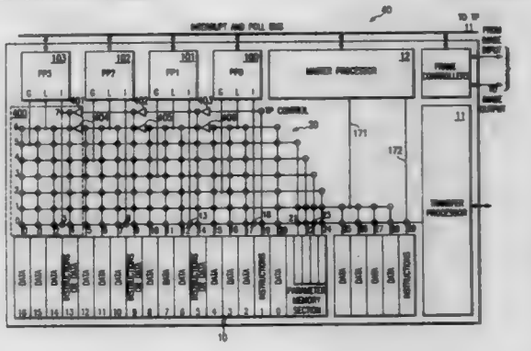
MULTI-PROCESSOR WITH CROSSBAR LINK OF PROCESSORS AND MEMORIES AND METHOD OF OPERATION

Robert J. Gove, Plano; Karl M. Guttag, Missouri City, both of Tex.; Keith Balmer, and Nicholas K. Ing-Simmons, both of Bedfordshire, England, assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 135,754, Nov. 12, 1993, abandoned, which is a continuation of Ser. No. 933,865, Aug. 21, 1993, abandoned, which is a continuation of Ser. No. 435,591, Nov. 17, 1989, abandoned. This application Jun. 21, 1994, Ser. No. 263,504

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—300.03 12 Claims



1. A method of operating a multiprocessing system having processors, said processors generating addresses within a predetermined range of addresses and operable from instruction streams provided from memories each having a unique addressable memory spaces, said unique addressable memory space of each of said memories being separate and distinct from said unique addressable space of any other of said memories and said unique addressable memory space of each of said m memories being within said predetermined range of addresses of said n processors, so that instructions are executed by said processors, said method comprising the steps of:

selectively and concurrently interconnecting via a switch matrix any of said processors with any of said memories to establish selective interconnections for the communication over said selective interconnections of instructions from one or more of said addressable memory spaces and data from other of said addressable memory spaces;

wherein said switch matrix contains a plurality of crosspoints and wherein said method further comprises operating at least one of said processors to provide an address;

controlling each of said crosspoints in response to the address thus provided to connect one of the memories having said address generated by one of said processors in its unique addressable memory space to only the processor which provided that address thereby to pass both address and data through the same crosspoint to said one of the memories;

establishing a priority for accessing when more than one of said n processors attempts to access any particular one memory in said m memories, a processor making a last successful access to said particular one memory assigned a lowest priority; and

changing said selective interconnection between said processors and said memories on a processor cycle-by-cycle basis.

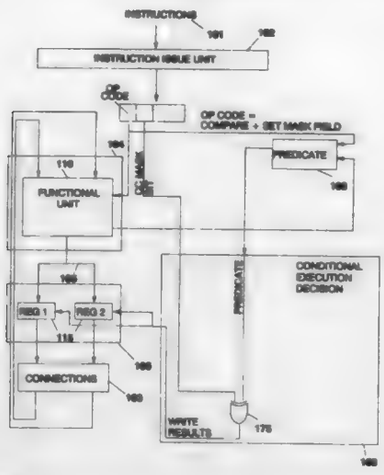
5,471,593

COMPUTER PROCESSOR WITH AN EFFICIENT MEANS OF EXECUTING MANY INSTRUCTIONS SIMULTANEOUSLY

Michael H. Branigin, 151 Ivy Hills Rd., Southbury, Conn. 06488

Continuation of Ser. No. 448,720, Dec. 11, 1989, abandoned.
This application Jan. 21, 1994, Ser. No. 184,355
Int. Cl.[6] G06F 9/38
U.S. Cl. 395—375 12 Claims

7. A pipelined processor for executing instructions comprising:



a conditional execution decision logic pipeline stage, a least one instruction execution pipeline stage prior to said conditional execution decision logic pipeline stage;

at least one condition code;

said instructions including branch instructions and non-branch instructions and including opcodes specifying operations, operand specifiers specifying operands, and conditional execution specifiers;

the pipelined processor further including at least one write pipeline stage for writing the result(s) of each instruction to specified destination(s);

at least one of the instructions including a means for specifying writing said condition code with a condition code result;

the conditional execution decision logic pipeline stage performing a boolean algebraic evaluation of the condition code and said conditional execution specifier and producing an enable-write with at least two states, true and false;

said enable-write when true enabling and when false disabling the writing of instruction results at said write pipeline stage;

fetching means for fetching source operands specified by said operand specifiers;

operating means for performing the operation specified by said opcode;

condition code fetching means for fetching the condition code, when specified by the conditional execution specifier, at the pipeline stage immediately preceding the conditional execution decision logic;

the conditional execution decision logic pipeline stage, when specified by the conditional execution specifier, determining the enable-write using the boolean algebraic evaluation;

writing means for writing said non-branch instruction results to a destination specified by the operand specifiers and writing to the condition code when specified, if enable-write is true; and

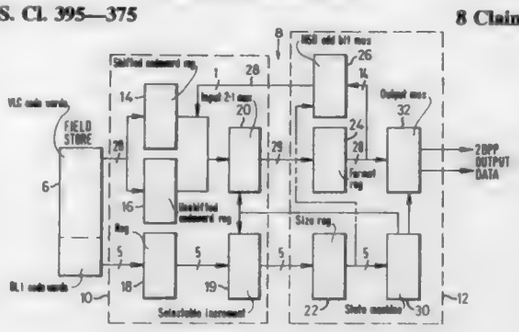
said writing means further for discarding or not writing the non-branch instruction results and discarding or not writing the condition code, if enable-write is false.

5,471,594

DATA FORMATTER FOR FORMATTING VARIABLE LENGTH DATA WORDS INTO FIXED LENGTH DATA WORDS

Jonathan J. Stone, Reading, United Kingdom, assignor to Sony United Kingdom Limited, Staines

Continuation of Ser. No. 925,199, Aug. 6, 1992, abandoned.
This application May 23, 1994, Ser. No. 248,637
Claims priority, application United Kingdom, Jan. 11, 1991, 9121669
Int. Cl.[6] H03M 7/40
U.S. Cl. 395—375 8 Claims



2. A data formatting apparatus for formatting successive input variable bit length data words into a stream of fixed bit length data words each having a predetermined fixed bit length, said data formatting apparatus comprising:

first storage means for storing each of said variable bit length data words, said first storage means having a bit length storage capacity greater than the aggregate bit length of at least two of said fixed bit length data words and having a plurality of plural-stage data registers, one of said data registers storing unshifted versions of said successive input variable bit length data words and the remaining data registers storing said variable bit length data words supplied to stages therein which are left-shifted by differing amounts;

second storage means for storing bit length indicating words corresponding to said variable bit length data words, respectively;

splitting means for receiving variable bit length data words from said first storage means and responsive to the respective bit length indicating words in said second storage means for splitting each received variable bit length data word into at least one data word of said predetermined fixed bit length and a remainder portion which is insufficient in length to form an additional fixed length data word;

determining means for determining whether a remainder portion is formed by said splitting means;

incrementing means for selectively incrementing a succeeding bit length indicating word according to the length of said determined remainder portion;

supplying means for supplying said remainder portion to said first storage means; and

concatenating means for concatenating any said remainder portion with a subsequent variable bit length data word in said first storage means.

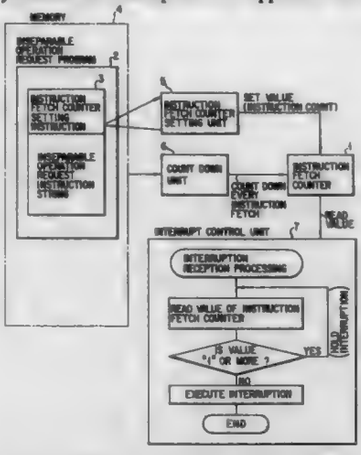
5,471,595

ASYNCHRONOUS INTERRUPT INHIBIT METHOD AND APPARATUS FOR AVOIDING INTERRUPT OF AN INSEPARABLE OPERATION

Takayuki Yagi, Tokyo, and Yoichiro Takeuchi, Urawa, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 863,250, Apr. 3, 1992, abandoned. This application Sep. 16, 1994, Ser. No. 307,050
Claims priority, application Japan, Apr. 4, 1991, 3-071294
Int. Cl.[6] G06F *9/40*
U.S. Cl. 395—375 **15 Claims**

1. An asynchronous interrupt inhibit apparatus for controlling



activation and deactivation of an interrupt condition whereby a series of sequential instructions are interrupted, comprising:

fetch means for storing a value corresponding to a number of instructions included in an inseparable operation;

means for decrementing said value stored in said fetch means each time an instruction included in said inseparable operation is executed;

interrupting means for activating said interrupt condition during execution of said series of sequential instructions; and

interrupt inhibiting control means for inhibiting activation of said interrupt conditions by said interrupting means during execution of said inseparable operation, and allowing activation of said interrupt condition when said value reaches a predetermined number.

5,471,596

COMPUTER MEMORY DEVICE HOLDING A DATA STRUCTURE FOR IMPLEMENTATION OF FUNCTION OBJECTS

Robert Brown, III, Nashua, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 868,015, Apr. 13, 1992, abandoned. This application Nov. 10, 1994, Ser. No. 338,267
Int. Cl.[6] G06F *9/00*
U.S. Cl. 395—375 **9 Claims**

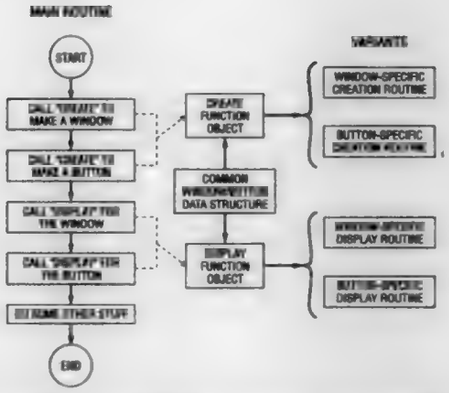
1. A memory device in a computing system, said memory device holding a data structure for allowing a processor to adapt a specified function, said function requiting a specified set of data for execution, to one or more input interfaces and one or more output interfaces, the data structure comprising:

(a) an operational data structure, the operational data structure containing said specified set of data;

(b) a pointer to the operational data structure;

(c) one or more machine executable input routines for obtaining at least a portion of said set of data, each input routine receiving as an argument the pointer to the operational data structure and each input routine configured to receive data through a particular input interface;

(d) one or more machine executable output routines for outputting at least a portion of said set of data, each output routine



receiving as an argument the pointer to the operational data structure and each output routine configured to output data through a particular output interface;

(e) respective pointers to each input and output routine;

(f) a variant number; and

(g) a routine matrix array having at least one entry, wherein each entry associates (1) a pointer to a specified input routine with (2) a pointer to a specified output routine, the variant number serving as an index into the routine matrix array for selecting the entry.

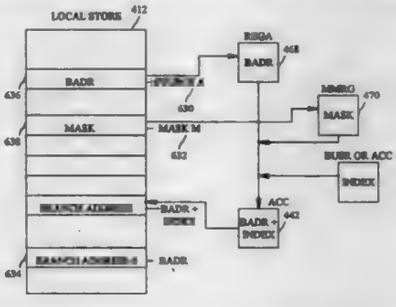
5,471,597

SYSTEM AND METHOD FOR EXECUTING BRANCH INSTRUCTIONS WHEREIN BRANCH TARGET ADDRESSES ARE DYNAMICALLY SELECTABLE UNDER PROGRAMMER CONTROL FROM WRITABLE BRANCH ADDRESS TABLES

Larry L. Byers, Apple Valley; Joseba M. De Subijana, Minneapolis, and Wayne A. Michaelson, Circle Pines, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Continuation of Ser. No. 173,545, Dec. 23, 1993, abandoned. This application Dec. 8, 1994, Ser. No. 352,299
Int. Cl.[6] G06F *9/26*
U.S. Cl. 395—375 **2 Claims**

1. A microsequencer bus controller for executing branch pro-



gram instructions fetched from a read-only-memory control store comprising:

a random-access-memory local store, said random-access-memory local store including:

one or more branch address tables, each of said branch address tables including a plurality of branch target addresses pointing to instructions in the read-only-memory control store, wherein the size, location, and contents of said branch address tables may be changed by the execution of instructions fetched from the read-only-memory control store;

a base address table, wherein said base address table has one or more entries, each one of said entries corresponding to

one of said branch address tables, each one of said entries containing a base address of one of said branch address tables; and

a mask/merge table, wherein said mask/merge table has one or more mask/merge entries, each one of said mask/merge entries containing a plurality of mask/merge flags;

instruction decode means, coupled to the read-only-memory control store, for determining if an instruction fetched from the read-only-memory control store is a branch program instruction, and for extracting parameters specified by said branch program instruction, said parameters including a base pointer addressing one of said entries in said base address table and a mask/merge pointer addressing one of said mask/merge entries in said mask/merge table;

a base address register to store said base address fetched from said entry in said base address table addressed by said base pointer;

a mask/merge register to store said mask/merge flags fetched from said mask/merge entry in said mask/merge table addressed by said mask/merge pointer;

an index register for receiving an index resulting from the execution of the previous instruction;

mask logic, coupled to said instruction decode means, said base address register, and said mask/merge register, for masking selected bit pairs of said base address register according to the even-numbered bits of said mask/merge register to produce an intermediate indicator;

merge logic, coupled to said mask logic, said index register, and said mask/merge register, for merging selected bit pairs of said intermediate indicator with selected bits of said index register according to the odd-numbered bits of said mask/merge register to produce an indicator into said selected branch address table where a selected branch target address is stored; and

branch control logic, coupled to said merge logic, and said instruction decode means, for conditionally selecting the instruction addressed by either a next sequential address or said selected branch target address pointed to by said indicator as a next instruction to be fetched from the read-only-memory control store.

5,471,598

DATA DEPENDENCY DETECTION AND HANDLING IN A MICROPROCESSOR WITH WRITE BUFFER

Marc A. Quattromani, Allen; Raul A. Garibay, Jr., Richardson; Nital Patwa, Plano, and Mark W. Hervin, Dallas, all of Tex., assignors to Cyrix Corporation, Richardson, Tex.

Filed Oct. 18, 1993, Ser. No. 139,596

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—449 **6 Claims**

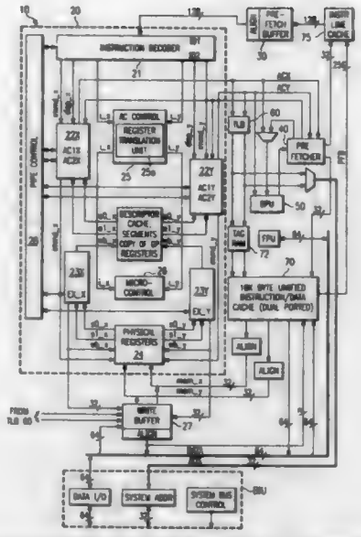
1. A microprocessor, comprising:

(a) a pipelined core unit including an address calculation stage, followed by an execution stage, followed by a writeback stage;

(b) a write buffer having a plurality of entries coupled to said execution stage and said writeback stage, each of said plurality of entries containing contents corresponding to a write instruction executed in said execution stage and written from said writeback stage, said contents including a data field, an address field, a data a valid control bit, and a non-cacheable write bit representing whether said write instruction is non-cacheable;

(c) a cache memory having a plurality of entries coupled to receive said data and address fields from said write buffer; and,

(d) control logic circuitry coupled to said address calculation stage and to said write buffer, to compare an address of a read instruction in said address calculation stage to each of said plurality of address fields in said write buffer, and responsive to an address match, said data valid control bit being set, and



said non-cacheable write bit being clear, bypassing said data field in said write buffer to said execution stage in said pipelined core unit.

5,471,599

PARTITIONING OF VIRTUAL ADDRESSING MEMORY

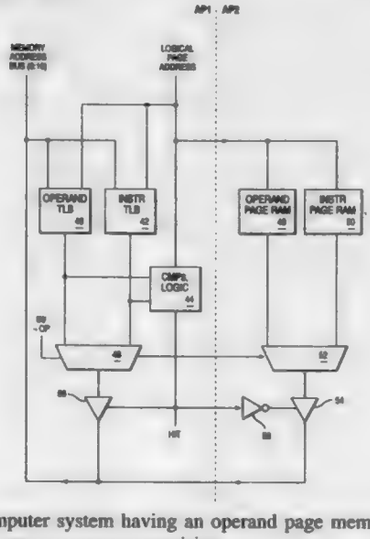
Timothy B. Brodnax, Austin, Tex.; Bryan K. Bullis, Woodbridge, Va.; Steven A. King, Herndon, Va., and Dale A. Rickard, Manassas, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 691,622, Apr. 25, 1991, abandoned.

This application Apr. 18, 1994, Ser. No. 228,948

Int. Cl.[6] G06F *12/10;12/00*

U.S. Cl. 395—412 **2 Claims**



1. A computer system having an operand page memory and an instruction page memory, comprising:

first and second address processing units, wherein the second address processing unit includes the operand and instruction page memories;

an operand translation lookaside buffer in the first address processing unit associated with the operand page memory for storing a most recently accessed physical address for an operand page;

an instruction translation lookaside buffer in the first address processing unit associated with the instruction page memory for storing a most recently accessed physical address for an instruction page;

means for generating a logical address, wherein the address processing units output an associated physical address in response to said logical address; and

means for determining whether the generated logical address is associated with one of the most recently accessed physical addresses and initiating outputting the associated physical address onto a memory address bus from a corresponding one of said operand and instruction translation lookaside buffers if the logical address is so associated, and initiating, within a single clock cycle, outputting the associated physical address onto the memory address bus from a corresponding one of said operand and instruction page memories if the logical address is not so associated.

5,471,600

ADDRESS GENERATING CIRCUIT USING A BASE POINTER OF LOOP AREA

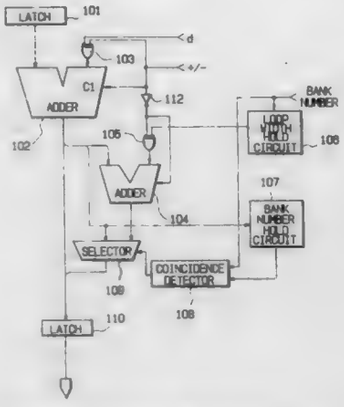
Takashi Nakamoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 812,706, Dec. 23, 1991, abandoned. This application Feb. 22, 1995, Ser. No. 392,420

Claims priority, application Japan, Dec. 29, 1990, 2-417198

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—405 **6 Claims**



5. An address generating circuit comprising:

a first latch means (**101**) for temporarily latching a base address value of a base pointer (Bp);

an adder (**102**) for receiving an output from said first latch means (**101**) and a given address distance value (d) and performing an addition operation therebetween to output a first address composed of a first set of most significant bits and a first set of least significant bits;

a first data hold means (**111**) for holding an output of a constant data representing a loop width of an arbitrary one of a plurality of numbered memory banks, said constant data including a second set of most significant bits;

a subtracter means (**404**), coupled to said adder means (**102**) and said first data hold means (**111**), for receiving said first set of most significant bits of said first address and said second set of most significant bits of said constant data and performing a subtraction operation therebetween to output partial address information;

a second data hold means (**107**), coupled to said adder means (**102**), for receiving said first set of most significant bits of said first address to output a first memory bank number to which a memory address indicated by said first address belongs;

a coincidence detecting means (**108**) for receiving said first memory bank number and a given second memory bank number to output a selection signal that assumes a first level when said first memory bank number is equal to said second memory bank number and a second level when said first memory bank number is unequal to said second memory bank number;

a selecting means (**109**), coupled to said adder means (**102**) and said subtracter means (**404**), for receiving said first set of most significant bits of said first address and said partial address information to output said first set of most significant bits of said first address when said selection signal assumes said first level and said partial address information when said selection signal assumes said second level; and

a second latch means (**110**), coupled to said adder means (**102**) and said selecting means (**109**), for outputting a second address that has a third set of most significant bits composed of one of said first set of most significant bits of said first address and said partial address information that is outputted by said selecting means (**109**) and a second set of least significant bits composed of said first set of least significant bits of said first address.

5,471,601

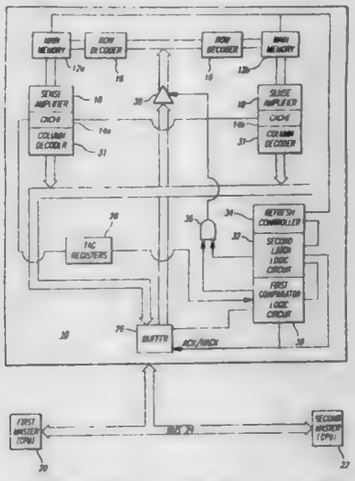
MEMORY DEVICE AND METHOD FOR AVOIDING LIVE LOCK OF A DRAM WITH CACHE

Mark A. Gonzales, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 17, 1992, Ser. No. 900,180

Int. Cl.[6] G06F *13/14*

U.S. Cl. 395—403 **7 Claims**



1. A memory device that is coupled to a master device which provides a first request package that has a first request address, comprising:

a main memory block;

a cache that is connected to said main memory block and has a cache address;

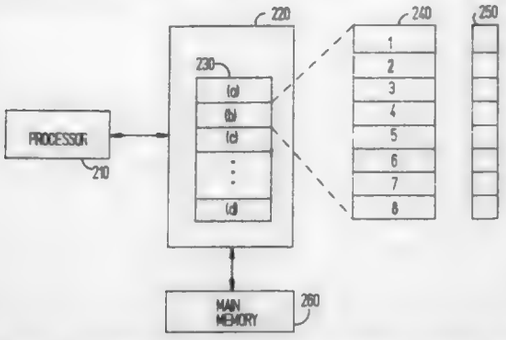
a first logic circuit that is connected to said cache and said main memory block and which compares said first request address with said cache address, and performs a first cache fetch such that data associated with said first request address is transferred from said main memory block to said cache when said cache does not contain the first request address, wherein said first logic circuit provides an acknowledge (ACK) signal when said cache contains said first request address and provides a no acknowledge (NACK) signal when said cache does not contain said first request address; and,

a latching logic circuit connected to said main memory block and said first logic circuit, said latching logic circuit being set and preventing a second cache fetch when said cache does not contain the first request address and the NACK signal is provided, and is reset and allows the second cache fetch when said cache contains the first request address and the ACK signal is provided when the first request package is resubmitted.

5,471,602
SYSTEM AND METHOD OF SCOREBOARDING INDIVIDUAL CACHE LINE SEGMENTS

Eric R. DeLano, Ft. Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 31, 1992, Ser. No. 923,187
Int. Cl.[6] G06F *13/16;13/00*
U.S. Cl. 395—445 **17 Claims**



17. In a computer-based system having a central processing unit (CPU) and a cache memory, wherein the cache memory has a plurality of cache lines, each cache line having a plurality of data units, an apparatus for updating the contents of the cache memory, comprising:

(1) means for sending a store request to a cache line of the cache memory, said store request resulting in either a cache hit or a cache miss;

(2) means for activating, upon occurrence of a cache miss, a cache-miss mechanism, comprising:

(a) means for zeroing a store-scoreboard which keeps track of the relative age of data in said cache memory;

(b) means for posting store data in a data unit in said cache line of said cache memory and for activating a store-miss routine;

(c) means for setting a bit in said store-scoreboard which corresponds to said data unit in said cache line; and

(d) means for copying-in a missed cache line into said cache line around said posted store data by consulting said store-scoreboard.

5,471,603
MODULAR HIGH-CAPACITY SOLID-STATE MASS DATA STORAGE DEVICE INCLUDING CONTROLLER/MEMORY MODULES ARRANGED IN PARALLEL CHANNELS

Timothy A. Yokote, Torrance; Eric L. Upton; Arthur G. Enyedy, both of Redondo Beach; Grant J. Stockton, Long Beach, and Dirk K. Brandis, Hermosa Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 744,050, Aug. 12, 1991, Pat. No. 5,289,377. This application Oct. 19, 1992, Ser. No. 963,192
Int. Cl.[6] G06F *13/00;13/12*
U.S. Cl. 395—402 **11 Claims**

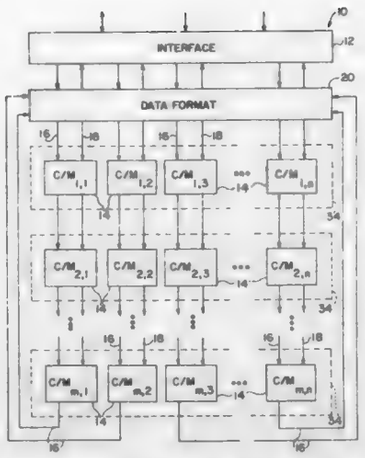
1. A modular solid-state mass data storage device providing high-density, high capacity storage of data, comprising:

first and second parallel controller/memory channels, each including first and last controller/memory modules;

a data format module;

first and second busses connecting outputs of said data format module to inputs of each of said first and last controller/memory modules, the first bus also connecting outputs of the last controller/memory module in each channel back to an input of the data format module,

wherein each controller/memory module includes a memory controller coupled to an array of random access memory chips, and

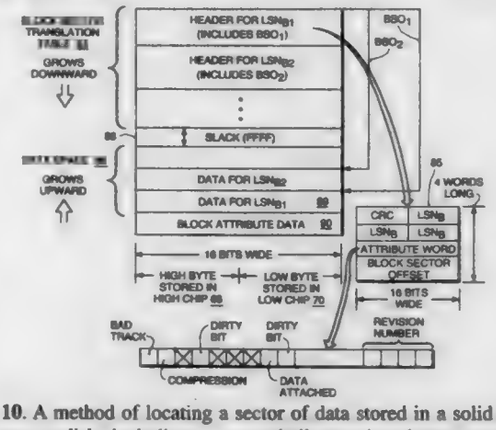


wherein each memory controller performs at least one of addressing said RAM chips for a read operation, addressing said RAM chips for a write operation, and refreshing said RAM chips.

5,471,604
METHOD FOR LOCATING SECTOR DATA IN A MEMORY DISK BY EXAMINING A PLURALITY OF HEADERS NEAR AN INITIAL POINTER

Robert N. Hasbun, Shingle Springs, and Stephen Wells, Citrus Heights, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 30, 1992, Ser. No. 969,780
Int. Cl.[6] G06F *12/02*
U.S. Cl. 395—404 **12 Claims**



10. A method of locating a sector of data stored in a solid state memory disk including a nonvolatile semiconductor memory device having a block, the block including a block translation table storing headers and a data space storing sectors of data, comprising the steps of:

a) receiving an input sector number and a pointer into the block translation table;

b) initializing a scan count; and

c) repeating the steps of

c.1) selecting a selected header from a multiplicity of headers near a location pointed to by the pointer, each of the multiplicity of headers including a selected logical sector number, a selected offset representing an offset to a selected sector of data associated with the selected logical sector number;

c.2) indicating the selected offset if the selected logical sector number of the selected header equals the input sector number; and

c.3) incrementing the scan count if the selected logical sector number does not equal the input sector number;

until a maximum scan count is reached or the selected logical sector number of the selected header equals the input sector number.

5,471,605

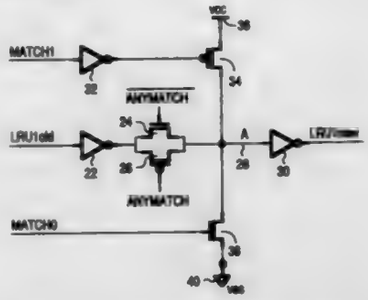
APPARATUS FOR UPDATING A MULTI-WAY SET ASSOCIATIVE CACHE MEMORY STATUS ARRAY

William M. Ruby, Santa Clara, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 936,252, Aug. 27, 1992, abandoned. This application Feb. 6, 1995, Ser. No. 384,622

Int. Cl.[6] **G06F** *12/00;12/12;* **G11C** *7/00*

U.S. Cl. 395—445 **6 Claims**



1. In a multi-way set associative cache memory, an apparatus for updating status bits wherein the status bits depend on a match in at most one way of said cache memory, the apparatus comprising:

a first transistor of a first conductivity type, a gate of said first transistor being coupled to a first match signal, a source of said first transistor being coupled to a power supply, a drain of said first transistor being coupled to a first node;

a second transistor of said first conductivity type and a third transistor of a second conductivity type, drains of said second and third transistors being coupled together and to said first node, sources of said second and third transistors being coupled together and to a first old status bit, gates of said second and third transistors being coupled to a fifth signal, said fifth signal causing said second and third transistors to turn on only when there is no match in any way of said cache memory; and

a fourth transistor of said second conductivity type, a gate of said fourth transistor being coupled to a second match signal, a source of said fourth transistor being coupled to ground, a drain of said fourth transistor being coupled to said first node, said first node providing a first updated status bit.

5,471,606

INFORMATION STORAGE AND PROCESSING

Han Huang, Agoura Hills; Craig A. Morioka, Los Angeles; Osman Ratib, Pacific Palisades; Paul N. S. Cho, Culver City; Bruce K. T. Ho, Los Angeles, all of Calif.; Takeo Sonobe, and Toru Shinagawa, both of Toride, Japan, assignors to The Regents of the University of California, Oakland, Calif., and Hitachi Maxwell, Ltd., Ibaraki, Japan

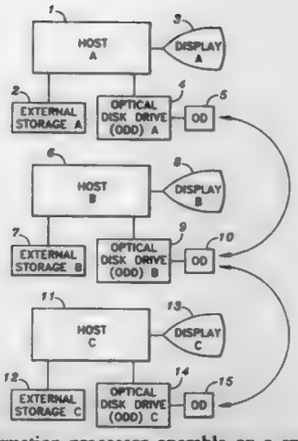
Division of Ser. No. 967,558, Oct. 27, 1992, Pat. No. 541,676, which is a continuation of Ser. No. 401,146, Aug. 31, 1989, abandoned. This application Mar. 14, 1994, Ser. No. 212,066

Int. Cl.[6] **G11B** *7/007;* **G06F** *13/00*

U.S. Cl. 395—500 **35 Claims**

1. A portable optical disk usable among different information processing systems operable on respective specific operating systems respectively different from each other, for transporting information among the different information processing systems,

(1) wherein each of said different information processing systems comprise:



(i) an information processor operable on a specific different operating system for processing data and directories;

(ii) an external storage reactive with the information processor for storing and retrieving therein and therefrom the data and directories in a specific format based on its specific operating system;

(iii) a format converter reactive with the information processor for converting the data and directories in the specific format to data and directories in said independent format, and vice versa; and

(iv) an optical disk drive reactive with the information processor and the format converter for storing and retrieving data and directories in the independent format in and from the optical disk, and

(2) wherein said portable optical disk is formatted in an independent format for storing and reading data and directories therein and therefrom in said independent format which is independent of the formats based on the respective operating systems of the different information processing systems,

whereby said portable optical disk is compatibly operable with the different information processing systems to transport the data and directories from one to another information processing system through their optical disk drives and format converters irrespective of difference in the operating systems.

5,471,607

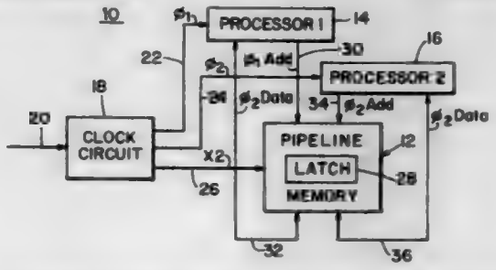
MULTI-PHASE MULTI-ACCESS PIPELINE MEMORY SYSTEM

Douglas Garde, Dover, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Apr. 22, 1993, Ser. No. 52,073

Int. Cl.[6] **G06F** *9/38;5/06;* **H04l** *7/00;* **G11C** *7/04*

U.S. Cl. 395—550 **12 Claims**



1. A dual phase, dual access pipeline memory system comprising:

first and second processors;

a pipeline memory including latch means;

bus means for connecting each of said processors with said pipeline memory;

a clock circuit responsive to a clock signal, said clock circuit providing a first clock signal in phase with said system clock signal for operating said first processor, a second clock signal

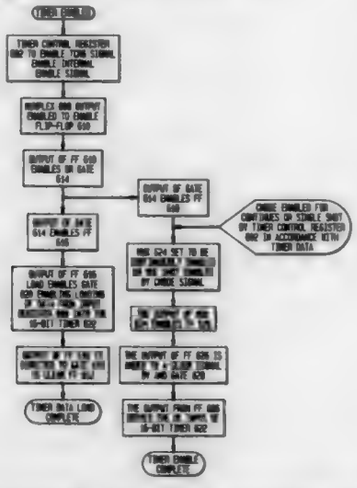
out of phase with said system clock signal for operating said second processor out of phase with said first processor and a third clock signal at twice the system clock signal rate, said third clock signal clocking said pipeline memory through said latch means to allow an address to be supplied to said pipeline memory by said first processor during one phase while said first processor is accessing data from the previous cycle in the same phase and, conversely, to allow an address to be supplied to said pipeline memory by said second processor during the other phase while the said second processor is accessing data from the previous cycle in the same phase.

5,471,608

DYNAMICALLY PROGRAMMABLE TIMER-COUNTER HAVING ENABLE MODE FOR TIMER DATA LOAD AND MONITORING CIRCUIT TO ALLOW ENABLE MODE ONLY UPON TIME-OUT

Young W. Lee, Orange; Sungwon Moh, Wilton, and Arno Muller, Westport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 9, 1993, Ser. No. 137,460
Int. Cl.[6] G06F *9/18*
U.S. Cl. 395—550 **8 Claims**



1. A programmable timer circuit comprising: programmable timer counter means having timer counter input means for receiving count data and for receiving a periodical clock signal and counting to a count representing said count data in response to said clock signal and having an output means for generating a signal representative of said count,

a programmable means for generating count data in response to programming of said programmable means,

timer data register means for receiving said count from programmable means,

first gate means having an enabled mode and an non-enabled mode for enabling loading of said count data from said timer data register means to said timer counter input mean only when said first gate means is in said enabled mode,

monitoring means for monitoring said signal of said timer counter means and enabling said first gate means to said enabled mode only when said timer counter means has generated a time-out signal;

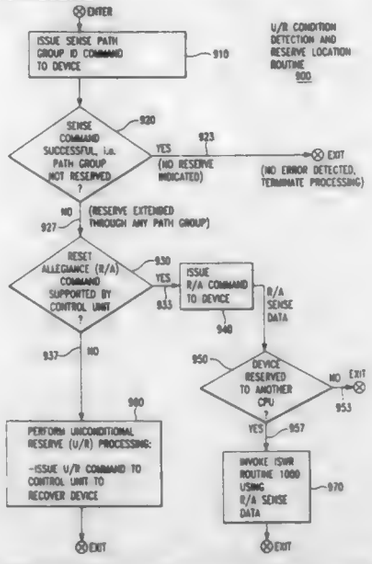
a second gate means having an enabled mode in response to a control signal from said programmable means for permitting said programmable means to read data written to said timer data register means without disruption of the running count of said timer counter means.

5,471,609

METHOD FOR IDENTIFYING A SYSTEM HOLDING A 'RESERVE'

Harry M. Yudenfriend, Wappingers Falls; David H. Surman, Milton, both of N.Y., and Brent C. Beardsley, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 22, 1992, Ser. No. 949,282
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—182.02 **3 Claims**



1. In a multi-processing environment having a plurality of systems organized as a sysplex such that said systems communicate with each other through a cross system coupling facility (XCF) and connected through a corresponding plurality of links to a control unit associated with a device and each of said links comprises a path group, wherein each of said systems gains and relinquishes access to said device by issuing a "Reserve" or "Release" command, respectively, over a corresponding one of said links to the control unit, a method of locating a particular one of the systems then holding a "reserve" for said device, said method comprising the steps of:

determining, through any one of said systems, whether a pre-defined command previously sent to the device by said one system has successfully completed;

issuing a reset allegiance (R/A) command by said any one system and over a corresponding one of said links connected to said one system in the event said pre-defined command has not successfully completed;

providing, by said control unit and over said corresponding one link and in response to said R/A command, sense data comprising an identification of a particular one of said links through which said particular system holds the reserve for the device, said identification comprising an identifier for further identifying said particular one of the systems as being connected to said particular one link;

translating the identifier into a common system name wherein said translating step comprises the steps of:

searching through a record situated within a Coupled Dataset accessible by each of said systems through the XCF, to locate an entry containing said path group identifier contained in the sense data returned by said R/A command; and

reading a common system name in said entry as the particular system then holding the reserve; and

generating, in said any one system and in response to the identifier in the sense data, a message incorporating said common system name for specifying the particular system then holding the reserve, wherein said any one system is a host operating system executing on a central processing unit, a guest operating system operating on a central processing unit, or the central processing unit itself with the particular system being one of a plurality of central processing units.

5,471,610

METHOD FOR CHARACTER STRING COLLATION WITH FILTERING FUNCTION AND APPARATUS

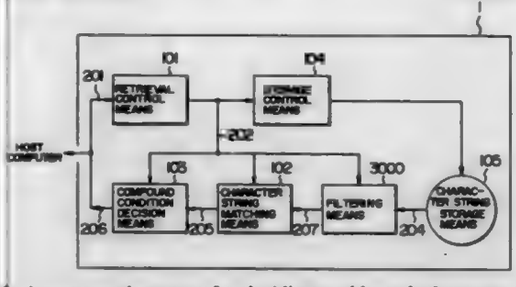
Hisamitsu Kawaguchi, Sagamihara; Katsumi Tada, Kokubunji; Kanji Kato, Tokorozawa, and Masatsugu Shinozaki, Hadano, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 985,795, Nov. 30, 1992, which is a division of Ser. No. 555,483, Jun. 14, 1990, Pat. No. 5,168,533. This application Mar. 15, 1993, Ser. No. 31,625

Claims priority, application Japan, Jun. 14, 1989, 1-149630; Jul. 24, 1989, 1-188772; Jul. 24, 1989, 1-188773; Sep. 8, 1989, 1-231567; Mar. 19, 1992, 4-063867; Sep. 18, 1992, 4-249191; Nov. 17, 1992, 4-306748

Int. Cl.[6] G06F *17/21*

U.S. Cl. 395—600 38 Claims



1. A text search system for deciding en bloc whether or not a plurality of user-designated search terms exist in a text composed of characters expressed in the form of character codes,

characterized in that said system comprises:

character string storage means for storing a text;

filtering means for fetching character codes from the text read out from said character string storage means to thereby output only those character codes that are included in said search terms;

character string matching means for matching en bloc a string of character codes outputted from said filtering means with said search terms to thereby decide whether or not said search terms exist in said string of character codes outputted from said filtering means; and

synchronizing means provided between said filtering means and said character string matching means for buffering differences in processing speed while transferring data from said filtering means to said character string matching means.

5,471,611

COMPUTERISED INFORMATION-RETRIEVAL DATABASE SYSTEMS

Douglas R. McGregor, Clarkston, United Kingdom, assignor to University of Strathclyde, Glasgow, United Kingdom

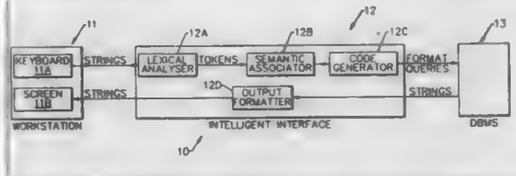
PCT No. PCT/GB92/00446, § 371 Date Sep. 10, 1993, § 102(e) Date Sep. 10, 1993, PCT Pub. No. WO92/16906, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 12, 1992, Ser. No. 117,106

Claims priority, application United Kingdom, Mar. 13, 1991, 9105367

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 2 Claims



1. A computer system for retrieving data stored in a database, the computer system comprising:

an input device arranged to input a natural language query from a user thereof; and

an intelligent interface device connected to said input device to responsively transform a natural language query received from said input device to a formal computer language of the computer system, said intelligent interface device having means for solving a Steiner Problem wherein a conceptual graph representing a database is unrestricted, said Steiner Problem solving means comprising:

means for identifying N nodes in a query set received from the database responsive to the natural language query received from said input device,

means in communication with said identifying means for storing a collection of N triple-part markers at each node of a conceptual graph of the database, each of said N triple-part markers including a first-part having an initial node identity, a second-part having an indication of cost to said triple-part marker in traversing between adjacent nodes, and a third-part having a pointer to a link between adjacent nodes immediately and previously traversed by said triple-part marker, and wherein said collection of N triple-part markers initially comprises N triple-part markers having said first-part identifying each of the N nodes, the respective said second-part and said third-part for N−1 of said N triple-part markers being an undefined value, and a remaining triple-part marker of said N triple-part markers having the respective said second-part and said third-part thereof set to zero, said remaining triple-part marker having an initial node identity identifying the node at which said collection is stored,

means in communication with each node for storing global values which are available to each node, said global values being a node identifier to identify a current root of that node with all said second-parts being defined wherein the accumulated value for said second

part of said triple-part marker is a current minimum,

means in communication with said global value storing means for initializing the current root of the identified node to null and for initializing the current minimum of said second-part of said triple-part marker to a maximum value,

means in communication with each of the nodes for transmitting data messages from each of the nodes to each immediately adjacent node via respective links therebetween and having a traverse cost of which is proportional to a length of the respective links,

means at each adjacent node in communication with said transmitting means for receiving said data messages, each received data message containing a duplicate of all said triple-part markers stored in a transmitting node with respective said second-parts of said triple-part markers equal to a previous cost of said second-part markers and with respective said third-parts of said triple-part markers identifying the link traversed by that marker,

means in communication with said receiving means and said marker storing means for iteratively comparing received and stored triple-part markers responsive to an initial node identity, the comparison being between the respective second-parts of said triple-part markers to identify and discard those received triple-part markers of greater cost than the stored triple-part markers, other than when said second-part of the stored triple-part marker is undefined, and with a predetermined number of received triple-part markers in each iterative comparison equally sharing an additional traverse cost of a particular link, and for storing a collection of N markers which are respectively of least defined cost responsive to termination of an iteration,

means in communication with said comparing means for updating the current minimum and the current root when any one node has N triple

part markers each having a defined second-part and having an aggregate cost value less than the previously stored value of the current minimum,

means in communication with said updating means for initiating data message transmission from a node on each occurrence of a change in a stored collection of triple-part markers at that node and when that node has an accumulated cost value less than the current minimum,

means in communication with said initiating means for identifying when message transmission has been completed for every node, and

means in communication with said completed message identifying means for tracing the traverse of each triple-part marker in a finally identified current root node back to an originating node in order to determine a Steiner Tree.

5,471,612

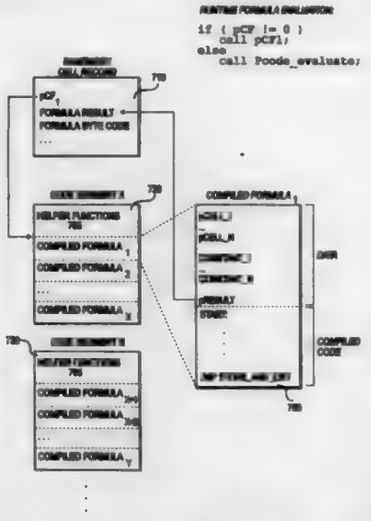
ELECTRONIC SPREADSHEET SYSTEM AND METHODS FOR COMPILING A FORMULA STORED IN A SPREADSHEET INTO NATIVE MACHINE CODE FOR EXECUTION BY A FLOATING-POINT UNIT UPON SPREADSHEET RECALCULATION

Roger Schlafly, Soquel, Calif., assignor to Borland International, Inc., Scotts Valley, Calif.

Filed Mar. 3, 1994, Ser. No. 205,922

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **32 Claims**



1. In an electronic spreadsheet system for modeling user-specified information in a spreadsheet model, said spreadsheet model comprising a plurality of cells storing formulas and values calculated from said formulas, a computer-implemented method for recalculating the spreadsheet model, the computer-implemented method comprising:

(a) receiving input specifying a formula for a particular cell;

(b) converting said input into a sequence comprising operand and operator tokens, at least one of said operand tokens comprising a cell identifier for referencing a value stored in another cell;

(c) for each cell identifier in step (b) which references a value stored in another cell, determining a memory address where the value for the cell is stored in system memory;

(d) compiling said formula for the particular cell into a machine language sequence for execution by a target processor, said machine language sequence including said memory address for each cell identifier in step (b) which references a value stored in another cell;

(e) storing in system memory the machine language sequence for the particular cell; and

(f) recalculating the spreadsheet model by executing said machine language sequence stored in system memory.

5,471,613

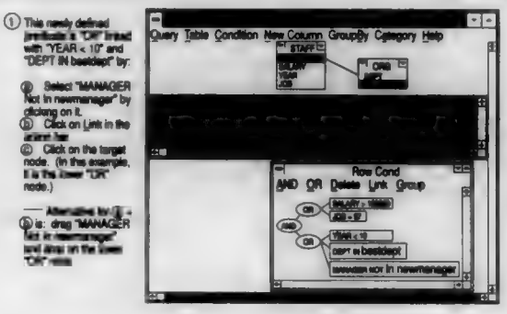
TREE STRUCTURE REPRESENTATION OF AN SQL CLAUSE

Kenneth R. Banning; Wendy S. James; Shih-Gong Li, all of Austin, and Anton Versteeg, Georgetown, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 628,543, Dec. 17, 1990, abandoned. This application Aug. 11, 1994, Ser. No. 289,142

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **5 Claims**



1. A computer system for accessing information in a relational database of a computer, comprising:

means for a user of the computer to define predicates of a query to be executed in the computer by direct graphical manipulation of images on a video display of the computer;

means for depicting WHERE or HAVING clauses of the query in graphical format on the video display of the computer and in response to user manipulation using a tree structure which links three or more predicates for a logical operator;

means for deriving an SQL statement equivalent of the tree structure which links three or more predicates; and

means for accessing information from the relational database using the derived SQL statement.

5,471,614

DATABASE SYSTEM CONCURRENCY CONTROL APPARATUS USING TIMESTAMPS AND PROCESSING TIME ESTIMATION

Mitsuru Kakimoto, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 10, 1990, Ser. No. 596,704

Claims priority, application Japan, Jan. 17, 1989, 1-268048

Int. Cl.[6] G06F *9/38*

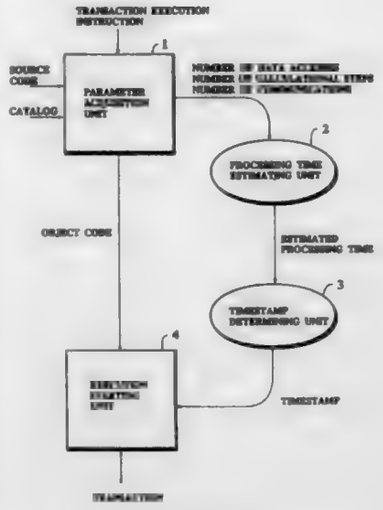
U.S. Cl. 395—650 **11 Claims**

1. An apparatus for attaching timestamps to transactions to be executed concurrently in a database system in which a concurrency control is carried out according to the timestamps of the transactions, comprising:

means for estimating a processing time for each transaction;

means for determining a timestamp appropriate for each transaction from the processing time estimated by the estimating means and a current time at which the timestamp is determined; and

means for attaching the determined timestamp to said each transaction such that concurrency control for execution of the transactions is carried out according to the attached timestamps.



5,471,615

DISTRIBUTED DATA PROCESSING SYSTEM HAVING FRONT-END AND BACK-END COMPUTERS WITH DIFFERENT OPERATING SYSTEMS

Keiji Amatsu, Kamakura; Zenhachiroh Butoh, Tokyo; Hiroshi Hirai, Ryugasaki; Minoru Massaki; Hirofumi Morita, both of Kawasaki; Takeo Nakajima, Yokohama; Nobuo Nomura, Mitaka; Mikio Sakaki, Tokyo; Stephen J. Schmandt, and Katsuhiro Tanaka, both of Tokyo, all of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

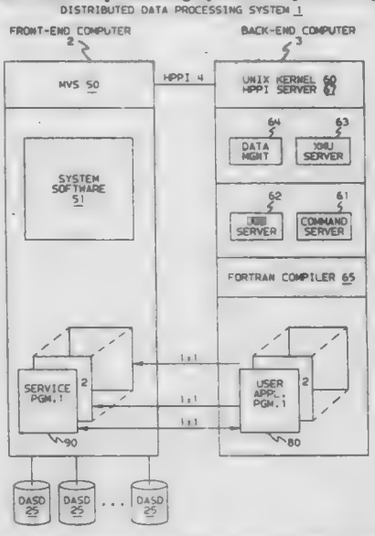
Continuation of Ser. No. 988,657, Dec. 10, 1992, abandoned. This application Jun. 22, 1994, Ser. No. 263,954

Claims priority, application Japan, Dec. 26, 1991, 3-344732

Int. Cl.[6] G06F *13/00;15/16*

U.S. Cl. 395—200.03 **5 Claims**

1. A distributed data processing system for processing front-end



jobs and back-end jobs submitted by a user comprising:

a front-end computer means, having a front-end file system and a front-end job control system, for initiating and executing said front-end jobs, and for initiating and controlling said back-end jobs using said front-end file system and said front-end job control system, said front-end computer means having a first operating system and a front-end storage;

a back-end computer means for executing said back-end jobs using back-end programs and back-end data files, said back-end computer means having processing resources and a second operating system different from said first operating system;

a non-volatile storage means, connected to said front-end storage and controlled by said front-end computer means, for storing said back-end programs and said back-end data files using said front-end file system;

a communication link connected between said front-end storage and controlled by said front-end computer means, for storing said back-end programs and said back-end data files using said front-end file system;

a communication link connected between said front-end computer means and said back-end computer means; and

system control means, located in said front-end computer means, for creating a back-end address space in said back-end computer means in which said back-end jobs are executed on said back-end computer means by using said processing resources of said back-end computer means.

5,471,616

METHOD OF AND APPARATUS FOR PROVIDING EXISTENTIAL PRESENCE ACKNOWLEDGEMENT

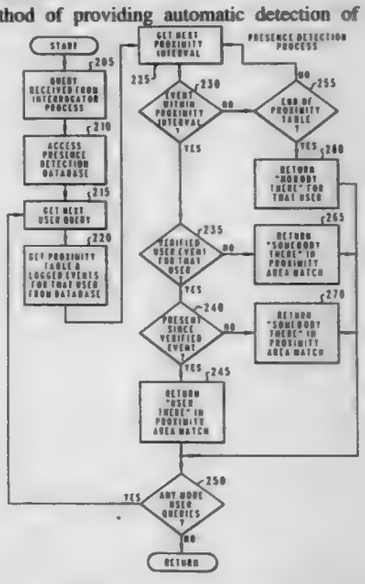
William J. Johnson, Flower Mound; Robert S. Keller, Grapevine; George C. Manthuruthil, Coppell, and Marvin L. Williams, Lewisville, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1992, Ser. No. 877,908

Int. Cl.[6] G06F *7/04*

U.S. Cl. 395—700 **8 Claims**

1. A method of providing automatic detection of a physical



presence of a user of a data processing system, said method being performed by the data processing system, comprising the steps of:

detecting a presence indicating event in the data processing system, wherein the presence indicating event is an event which occurs in the data processing system and which indicates the physical presence of a user within a physical area in proximity to the data processing system, wherein the presence indicating event is a verified event, wherein a verified event is a presence indicating event which requires a user's presence and is verified by a user;

evaluating the presence indicating event to determine the physical presence of a user; and

the step of evaluating the presence indicating event to determine the physical presence of a user comprises the step of determining if the presence indicating event occurs during a proximity interval, wherein the proximity interval is an interval of time required for a user to leave the physical area;

wherein the step of evaluating the presence indicating event to determine the physical presence of a user, further comprises the step of logging the presence indicating event in a database;

the step of evaluating the presence indicating event to determine the physical presence of a user, further comprises the steps of:

i. determining a user is physically present in a physical area corresponding to a proximity interval if there is not a time interval, between logged presence indicating events since an occurrence of a verified event, greater than a proximity interval;

ii. determining someone is physically present in a physical area corresponding to a proximity interval if there is a time interval, between logged presence indicating events since an occurrence of a verified event, greater than a proximity interval;

iii. determining someone is physically present in a physical area corresponding to a proximity interval if a proximity interval is greater than a time interval since a last presence indicating event, but there is not a verified event logged for a user; and

iv. determining no one is physically present in a physical area corresponding to a proximity interval if a proximity interval is not greater than a time interval since a last presence indicating event.

5,471,617

COMPUTER MANAGEMENT SYSTEM AND ASSOCIATED MANAGEMENT INFORMATION BASE

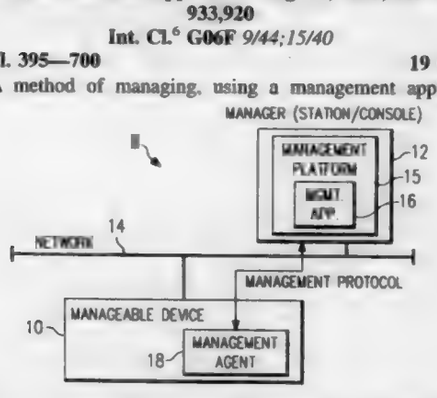
Scott C. Farrand, Tomball; Jonathan R. Didner, Houston; Daniel J. Mazina, Houston; Jeffrey S. Autor, Houston; Paul J. Muraski, Spring; Gregory M. Stewart, Houston, and John A. Dysart, Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 720,259, Jun. 24, 1991, Pat. No. 5,367,670. This application Aug. 21, 1992, Ser. No. 933,920

Int. Cl.[6] G06F *9/44;15/40*

U.S. Cl. 395—700 **19 Claims**

1. A method of managing, using a management application



running on a management console, a plurality of networked manageable devices which include at least one file server using a constructed management information base, said at least one file server having a system board, a drive array subsystem associated with said file server and a server manager installed in said file server for monitoring said system board, comprising the steps of:

collecting a plurality of objects describing said system board in a first subMIB;

collecting a plurality of objects describing said drive array subsystem in a second subMIB;

collecting a plurality of objects describing said server manager in a third subMIB;

assembling said first subMIB containing said plurality of objects describing said system board, said second subMIB containing said second plurality of objects describing said drive array subsystem and said third subMIB containing said plurality of objects describing said server manager into a management information base ("MIB"); and

managing said file server from said management console using said assembled MIB by monitoring performance of said system board, said drive array subsystem and said server manager using said plurality of objects describing said system board, said drive array subsystem and said server manager respectively contained in said first subMIB, said second subMIB and said third subMIB.

5,471,618

SYSTEM FOR CLASSIFYING INPUT/OUTPUT EVENTS FOR PROCESSES SERVICING THE EVENTS

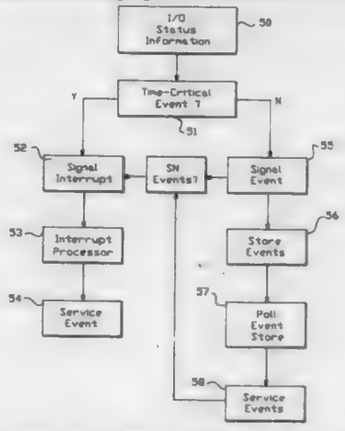
Mark S. Isfeld, San Jose, Calif., assignor to 3Com Corporation, Santa Clara, Calif.

Filed Nov. 30, 1992, Ser. No. 982,876

Int. Cl.[6] G06F *13/26*

U.S. Cl. 395—839 **46 Claims**

42. A method for managing status information having prespecified priority levels and identifying I/O events generated by I/O processes in a data processing system having a processor servicing the I/O events, comprising the steps of:



classifying status information into a first class of status indications for I/O events having a need for relatively more time-critical service and a second class of status indications for I/O events having a need for relatively less time-critical service;

storing event data identifying I/O events corresponding to the first and second class of status indications in a processor interface coupled to the processor;

polling the stored event data of the second class with the processor to service the I/O events corresponding to the event data of the second class in a normal course; and

interrupting the processor by the processor interface in response to storing event data of the first class in the processor interface to service the I/O events corresponding to the event data of the first class.

5,471,619

METHOD AND SYSTEM FOR CONTROLLING ACCESS TO OBJECTS IN A DATA PROCESSING SYSTEM

Massimo Messina, Rome, Italy, assignor to International Business Machines Corporation, Armonk, N.Y.

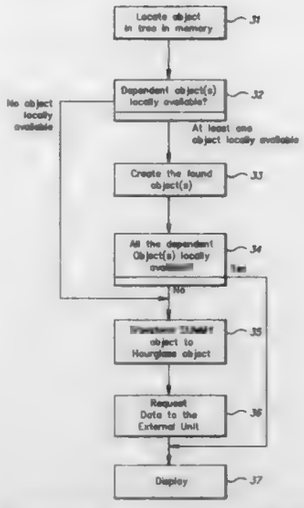
Filed Sep. 24, 1993, Ser. No. 126,463

Claims priority, application Italy, Sep. 25, 1992, 002214

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—600 **17 Claims**

1. A method for controlling access to objects in a data processing application capable of exchanging data with at least one external unit, the objects being hierarchically structured and each of the objects being either locally available or retrievable from the external unit, said method comprising the steps of:



associating a counter with each object indicating whether there is at least one object dependent on the object;

appending a dummy dependent object to each locally available object having at least one object dependent on the locally available object that is retrievable from the external unit;

responsive to the appending step, adjusting the counter, if necessary to indicate there is at least one object dependent on the object associated with the counter;

selecting an object;

checking the counter associated with the selected object;

if the counter associated with the selected object indicates there is at least one object dependent on the selected object, then making accessible for a command, accessing an object dependent on the selected object, an object dependent on the selected object that is locally available and locking an access to an object dependent on the selected object which is retrievable from the external unit; an

unlocking the access to the object dependent on the selected object that is retrievable from the external unit when all related information has been retrieved from the external unit.

5,471,620

DATA PROCESSOR WITH MEANS FOR SEPARATELY RECEIVING AND PROCESSING DIFFERENT TYPES OF INTERRUPTS

Toru Shimizu, and Shunichi Iwata, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

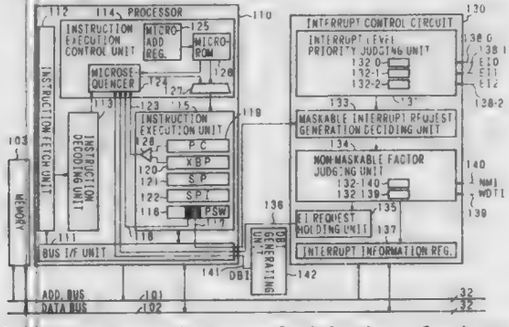
Filed Jun. 10, 1994, Ser. No. 257,844

Claims priority, application Japan, Jun. 29, 1993, 5-158827

Int. Cl.[6] G06F *13/24;9/46*

U.S. Cl. 395—375 **6 Claims**

1. A data processor, comprising:



first interrupt requesting means for informing a first interrupt request which is generated on the basis of a first interrupt factor and requests activation of a first interrupt processing;

second interrupt requesting means for informing a second interrupt request which is generated on the basis of a second interrupt factor and requests activation of a second interrupt processing;

third interrupt requesting means for informing a third interrupt request which is generated on the basis of a third interrupt factor and requests activation of a third interrupt processing;

instruction executing means for executing said first, second and third interrupt processings;

controlling means for receiving said first, second and third interrupt requests, and for activating execution of said interrupt processing corresponding to respective received interrupt request done by said instruction executing means; and

storing means for storing two statuses; either the enabling status where said controlling means receives an interrupt request or the prohibiting status where said controlling means does not receive an interrupt request;

wherein said controlling means

when said storing means stores the prohibiting status, does not activate any of said first, second and third interrupt processings,

when said storing means stores the enabling status, and said first interrupt request is generated, makes said storing means store the prohibiting status and activates said first interrupt processing regardless of the presence or absence of the generation of said second interrupt request and said third interrupt request,

when said storing means stores the enabling status, and said first, interrupt request is not generated and said second interrupt request is generated, makes said storing means store the prohibiting status and activates said second interrupt processing regardless of the presence or absence of the generation of said third interrupt request, and

when said storing means stores the enabling status, and both said first interrupt request and said second interrupt request are not generated, and said third interrupt request is generated, makes said storing means hold the enabling status and activates said third interrupt processing.

5,471,621

INFORMATION PROCESSING SYSTEMS HAVING A MAIN CPU AND A SUB-CPU WHICH CONTROLS THE OVERALL SYSTEM TO ACHIEVE POWER SAVINGS

Tetsuji Ohtsuki, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

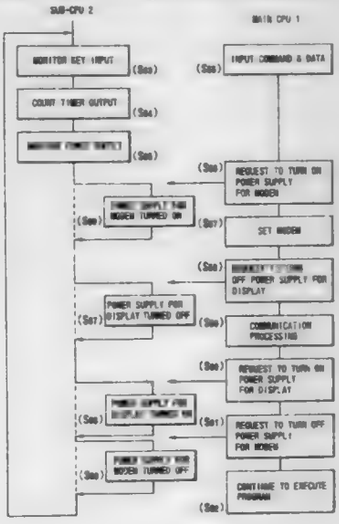
Filed May 5, 1992, Ser. No. 878,467

Claims priority, application Japan, May 9, 1991, 3-104361

Int. Cl.[6] G06F *1/32*

U.S. Cl. 395—750 **5 Claims**

1. An information processing system comprising:



a main CPU having an operation mode in which the main CPU consumes a first amount of power for performing first predetermined processing and a halt mode in which the main CPU consumes a second amount of power which is less than said first amount of power;

a plurality of input/output units including a keyboard, a timer and a display unit;

a sub-CPU, operatively connected to said main CPU and said plurality of input/output units, for performing second predetermined processing including key input monitoring of said keyboard, timer output counting of said timer and power supply monitoring of a power supply;

a memory unit connected to said main CPU and storing programs and data; and

a power supply control circuit, connected to said main CPU, said sub-CPU and said plurality of input/output units, for controlling power supply to said plurality of input/output units and said main CPU in response to commands from said sub-CPU, wherein:

said sub-CPU comprises means for placing said main CPU in said halt mode while said sub-CPU is awaiting a key input of said keyboard during said key input monitoring and circuitry for controlling said power supply control circuit to cease power supply to each one of said plurality of input/output units that is not currently in use while said sub-CPU is performing said key input monitoring,

said power supply control circuit comprises means for causing initial activation of said sub-CPU in response to turn on of a main power supply, and

said sub-CPU further comprises means, responsive to said initial activation, for causing subsequent activation of said main CPU and means, responsive to an OFF-indicating condition of the main power supply, for causing said main CPU to perform termination processing including register saving in said memory unit and, when said termination processing is completed, for controlling said power supply control circuit to turn off power supply to said main CPU and said plurality of input/output units and then to turn off power supply from the main power supply, wherein:

said plurality of input/output units further comprise a modem, a floppy disk drive and an extension slot, and

said sub-CPU comprises means for controlling said power supply circuit, in response to receipt from said main CPU of turn on and turn off requests that relate individually to said display unit, said modem, said floppy disk drive and said extension slot and that are associated with input commands and data processing executed by said main CPU, to cause individual turn on and turn off of said display unit, said modem, said floppy disk drive and said extension slot during execution of said input commands and said data processing by said main CPU.

5,471,622

RUN-TIME SYSTEM HAVING NODES FOR IDENTIFYING PARALLEL TASKS IN A LOGIC PROGRAM AND SEARCHING FOR AVAILABLE NODES TO EXECUTE THE PARALLEL TASKS

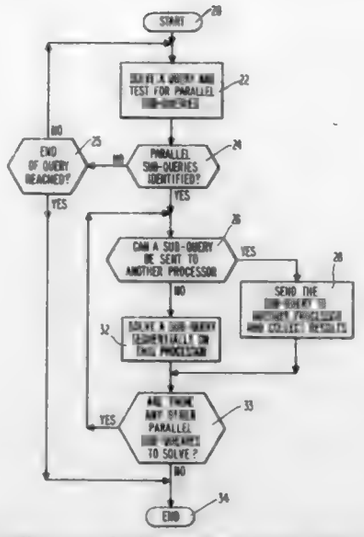
Douglas J. Eadline, Bethlehem, Pa., assignor to Paralogic, Inc., Bethlehem, Pa.

Continuation of Ser. No. 268,158, Jun. 28, 1994, abandoned, which is a continuation of Ser. No. 73,964, Jun. 7, 1993, abandoned, which is a continuation of Ser. No. 417,203, Oct. 4, 1989, abandoned. This application Apr. 20, 1995, Ser. No. 425,712

Int. Cl.[6] G06F *9/44;9/00*

U.S. Cl. 395—650 **19 Claims**

1. A method of operating an arbitrary computer network to solve a logic query with respect to a logic program and distribute subqueries associated with said logic query over said network, said network comprising a plurality of nodes, each node of said plurality of nodes including a processor and local memory which is accessible by said processor in said node, and a plurality of communication channels for transmitting information between said plurality of nodes, each one of said plurality of communication



channels coupling one of said plurality of nodes with at least one different node of said plurality of nodes in said network, comprising the steps of:

a. receiving said logic query with a first node of said plurality of nodes;

b. partially solving said received query on said first node to provide a received query partial solution;

c. testing said received query partial solution on said first node for OR-parallel subqueries and, if said received query partial solution includes said OR-parallel subqueries, identifying and collecting said OR-parallel subqueries on said first node which are included in said received query partial solution;

d. if said received query partial solution does not include said OR-parallel subqueries, returning to step b and continuing to solve said received query on said first node;

e. if said OR-parallel subqueries are identified in step c, determining with said first node whether a second node coupled to said first node by at least one of said plurality of communication channels is available for solution of said OR-parallel subqueries without waiting for a subquery request from the second node;

f. if said OR-parallel subqueries are identified in step c and said second node is determined to be available in step e, transmitting at least one of said identified OR-parallel subqueries from said first node to said second node coupled to said first node; and

g. if said OR-parallel subqueries are identified in step c and no second node is determined to be available in step e, sequentially solving on said first node said OR-parallel subqueries identified in step c; wherein steps a–g are performed only at run-time, and

wherein steps b–d are repeated until said received query has been solved without identification of said OR-parallel subqueries or said OR-parallel subqueries have been identified in said received query partial solution.

5,471,623

LAMBDA NETWORK HAVING 2^{M-1} NODES IN EACH OF M STAGES WITH EACH NODE COUPLED TO FOUR OTHER NODES FOR BIDIRECTIONAL ROUTING OF DATA PACKETS BETWEEN NODES

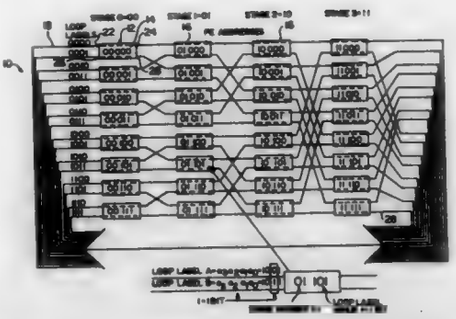
Leonard M. Napolitano, Jr., 825 El Quanito Dr., Danville, Calif. 94526

Filed Feb. 26, 1991, Ser. No. 660,503

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.03 **14 Claims**

1. A multiprocessor communication network for transfer of data packets in a distributed memory parallel processor computing system, comprising:



(a) a plurality of nodes arranged in m stages with 2^{m-1} nodes in each of said stages, each of said nodes being connected by links to four other nodes;

(b) a plurality of processing elements equal to the number of nodes, one of each of said processing elements located at and connected to one node by a link;

(c) means at each node for localized control of packet routing between nodes; and

(d) means at each node for bidirectionally routing packets between nodes, whereby the number of nodes in said network is $m2^{m-1}$ nodes, where m is an integer having a value greater than two.

5,471,624

APPARATUS AND METHOD FOR SUSPENDING AND RESUMING SOFTWARE APPLICATIONS ON A COMPUTER

Nobuyuki Enoki, Kadoma; Masaya Miyazaki, Ikeda, and Mitsuaki Morita, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

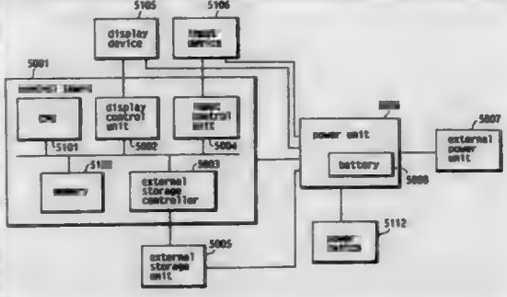
Filed Jun. 8, 1992, Ser. No. 895,131

Claims priority, application Japan, Jun. 10, 1991, 3-137485

Int. Cl.[6] G06F *1/26*

U.S. Cl. 395—750 **2 Claims**

1. A control unit for a computer system capable of executing a



computer program and an I/O process by processing execution data in volatile data locations, comprising:

means for providing an on-signal and an off-signal for turning the computer system on and off;

means for applying power to the computer system in response to the on-signal and for removing power from the computer system in response to an overall power-off signal;

a temporary storing means for storing data while the computer system is off;

means for storing the execution data in the temporary storing means in response to the off-signal and for providing a power-off enabling signal;

means for judging a completion of the I/O process in response to the off-signal and for providing a power-off indicating signal after the I/O process is judged complete;

a power-off control means for providing the overall power-off signal to remove power from the computer system in response to the power-off enabling signal and the power-off indicating signal,

whereby an I/O process that is relatively short or cannot be restarted may be completed before turning the computer system off.

5,471,625

METHOD AND APPARATUS FOR ENTERING A LOW-POWER MODE AND CONTROLLING AN EXTERNAL BUS OF A DATA PROCESSING SYSTEM DURING LOW-POWER MODE

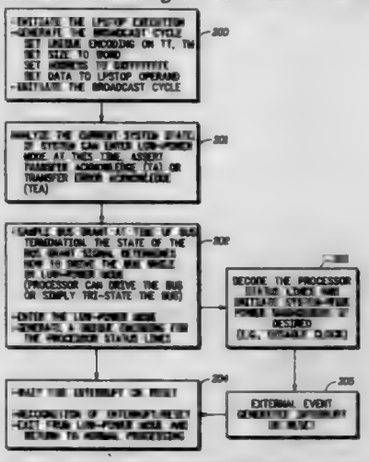
Gary A. Mussemann, Austin, Tex.; Joseph C. Circello, Phoenix, Ariz., and James G. Gay, Pflugerville, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 27, 1993, Ser. No. 125,851

Int. Cl.[6] G06F *1/32;13/00*

U.S. Cl. 395—750 **24 Claims**

1. A method for controlling a bus within a data processing



system, the data processing system having a data processor coupled by at least one control bit line to circuitry for providing bus management, the method comprising:

determining that the data processor is to be placed into a low-power mode;

performing a low-power mode broadcast through the bus wherein the data processor communicates to the circuitry for providing bus management that the data processor is to be placed into a low-power mode of operation;

placing the data processor into a state wherein the data processor waits for the circuitry for providing bus management to communicate permission to the data processor to enter low-power mode, the permission being sent within an amount of time determined by the circuitry for providing bus management; and

determining via the circuitry for providing bus management whether the data processor is to drive the bus to a predetermined plurality of voltage values or electrically tri-state the bus when in the low-power mode of operation.

5,471,626

VARIABLE STAGE ENTRY/EXIT INSTRUCTION PIPELINE

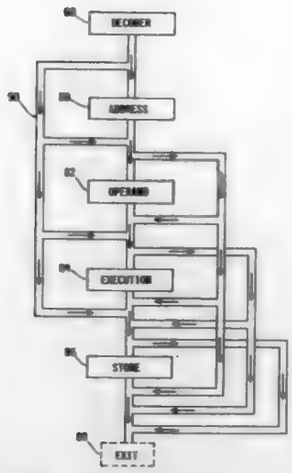
Michael J. Carnevale, Rochester; Ronald N. Kalla, Zumbro Falls; Gary P. McClannahan, and Michael R. Trombley, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 6, 1992, Ser. No. 879,651

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—775 **17 Claims**

1. An apparatus for governing the execution of operations upon data in a digital processing device, said apparatus including:



a pipeline including a plurality of interconnected stages, each stage being dedicated to one of a plurality of data operations executed on data in a digital processing device;

a pipeline input for receiving a plurality of digital control words into the pipeline for governing the execution of the data operations as the digital control words progress through the pipeline;

each one of the digital control words including control information dedicated to at least one selected operation of the data operations and further including mapping information indicating each selected data operation to which the control information, of said one of the control words, is dedicated;

each one of the digital control words further governing the performance of the selected data operation when said one of the control words resides in a particular one of the pipeline stages dedicated to the selected data operation;

means coupling the pipeline input and a pipeline exit to each one of the pipeline stages to enable one each of the control words to occupy only selected ones of the pipeline stages as said one of the control word progresses through the pipeline; and

a control word routing means for selectively and individually routing said one of the control words through the pipeline via only selected pipeline stages, the selected pipeline stages for said one of the control words depending upon the mapping information of said one of the control words.

5,471,627

SYSTOLIC ARRAY IMAGE PROCESSING SYSTEM AND METHOD

Robert W. Means, Rancho Santa Fe, and Horace J. Sklar, Escondido, both of Calif., assignors to HNC, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 419,040, Oct. 10, 1989, Pat. No. 5,138,695. This application May 26, 1992, Ser. No. 889,620

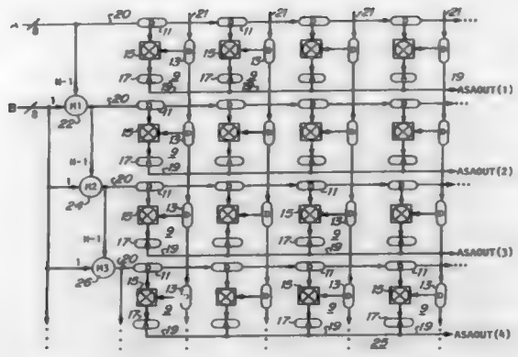
The portion of the term of this patent subsequent to Aug. 11, 2009, has been disclaimed.

Int. Cl.[6] G06K *9/64*

U.S. Cl. 395—800 **15 Claims**

3. A method for performing a two-dimensional image processing convolution of an M×M pixel data array with an L×L kernel data array in an N×N systolic array of processing elements, wherein in each clock cycle of the systolic array each processing element in row i and column j of the systolic array, PE(i,j), receives a pixel data element and a kernel data element, forms the product of the elements and adds the product to the contents of an accumulator, comprising the steps of:

scanning the L×L kernel data array for kernel data values and transmitting these values to the processing elements such that the value received by PE(i,j) is also received by PE(i+1,j) delayed by one clock cycle, and also received by PE(i,j+1) delayed by L+1 clock cycles;



scanning the M×M pixel data array for pixel data values and transmitting these values to the processing elements such that the value received by PE(i,j) is also received by PE(i,j+1) delayed by one clock cycle;

scanning the M×M pixel data array to form a first pixel data stream A and a second pixel data stream B, wherein each stream contains an entire scan of the pixel data array;

transmitting data stream A to the first row of processing elements PE(i,j);

transmitting pixel data from pixel data streams A and B to the remaining rows of processing elements such that during each sequence of L clock cycles the pixel data values received by PE(i+1,j) are the same as the values received by PE(i,j) for L-1 of said cycles, and for the remaining 1 cycle the pixel data value received by PE(i+1,j) is obtained from said second data stream B; and

after each scan of the pixel data array and kernel data array, repeating each such scan until the entire convolution has been computed.

5,471,628

MULTI-FUNCTION PERMUTATION SWITCH FOR ROTATING AND MANIPULATING AN ORDER OF BITS OF AN INPUT DATA BYTE IN EITHER CYCLIC OR NON-CYCLIC MODE

James E. Phillips, Binghamton; Bartholomew Blaner, Newark Valley, and Stamatis Vassiliadis, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1992, Ser. No. 906,729

Int. Cl.[6] G06F *9/315*

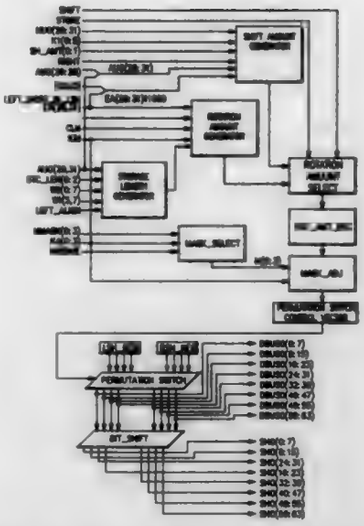
U.S. Cl. 395—800 **11 Claims**

1. In a digital computer system executing, as primitive instructions, data processing instructions that require an order of bits in an output data byte to be rotated with respect to an order of bits in an input data byte and instructions that require such rotation in combination with additional manipulation of said input data byte, apparatus for rotating and manipulating an input data byte comprising:

a multifunction permutation switch comprised of an interconnection network connecting n inputs with m outputs with any permutation of the n inputs capable of being connected to the m outputs, said permutation switch having a plurality of input bit lines equal in number to at least a number of bits in a data byte and a plurality of output data lines equal in number to at least said number of bits in said data byte;

means, in response to said data processing instructions, for controlling said multifunction permutation switch in a cyclic mode of operation to connect bits on said input bit lines to said output bit lines so that the sequence of input bits is maintained on said output bit lines when said bits on said input lines are considered as arranged in a circle; and

means, in response to said data processing instructions, for controlling said multifunction permutation switch in a non-



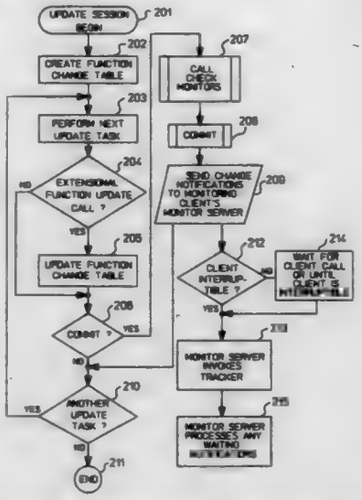
cyclic mode of operation to connect bits on said input bit lines to said output bit lines to execute gather operations and spread operations.

5,471,629

METHOD OF MONITORING CHANGES IN AN OBJECT-ORIENTED DATABASE WITH TUNED MONITORS

Tore J. M. Risch, Linköping, Sweden, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 286,556, Dec. 19, 1988, Pat. No. 5,133,075. This application Jul. 20, 1992, Ser. No. 918,182
The portion of the term of this patent subsequent to Jul. 21, 2009, has been disclaimed.
Int. Cl.[6] G06F *7/20*
U.S. Cl. 395—800 **12 Claims**



1. In a computer database system, a method of monitoring an object in a database in response to a request from any of a plurality of client programs, the method comprising the following steps carried out by the system:

keeping a record of any request from a client to monitor an attribute of the object;

keeping a record indicating any interdependence relationships between the attribute being monitored and other attributes;

keeping a record of a value of each attribute being monitored by accessing said interdependence relationship record;

during a database update session, keeping a record of any database update transactions initiated by a client; and

if a client which has initiated an update transaction requests that said update transaction be stored in the database, determining whether a predetermined criterion pertaining to a monitored attribute has been satisfied and, if the criterion has been satisfied, notifying any client which had requested monitoring of that attribute;

wherein said criterion comprises either of:

a) a minimum change value in said monitored attribute and determining whether the criterion has been satisfied comprises:

determining whether said monitored attribute may have been affected by said transaction; and

if said attribute may have been affected, determining whether the value of the attribute has changed by an amount which exceeds a minimum change value by computing an updated value for the attribute and comparing the updated value with the value in the attribute value record; or

b) a minimum time interval and determining whether said criterion has been satisfied comprises:

determining whether said monitored attribute may have been affected by said transaction;

if said attribute may have been affected, determining whether an amount of time that exceeds a minimum time interval has elapsed subsequent to a previous event;

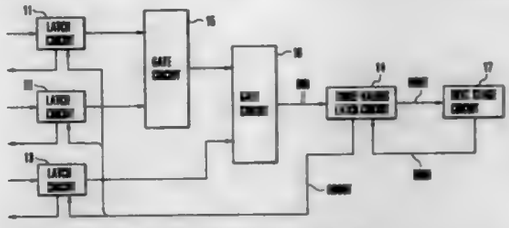
if the minimum time interval has elapsed, determining whether the value of the attribute has changed by computing an updated value for the attribute and comparing the updated value with the value in the attribute value record.

5,471,630

DATA PROCESSOR WITH QUICKER LATCH INPUT TIMING OF VALID DATA

Toshinori Otsuka, Ibaragi, Japan, assignor to Intel Corporation, Santa Clara, Calif.

Filed Oct. 27, 1993, Ser. No. 143,914
Claims priority, application Japan, May 13, 1993, 5-134145
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—800 **2 Claims**



1. A data processing apparatus comprising:

first data holding means for outputting a signal as three values data representing a first valid value having a first logic value, a second valid value having a second logic value, and an invalid value, the three values data from said first data holding means being an analog signal whose voltage level changes to the three values on one signal line;

second data holding means for holding the three values data from said first data holding means, wherein said second data holding means comprises a latch circuit for latching only binary data of the first and second valid values from said first data holding means, and a switch circuit for selectively outputting the binary data from said latch circuit and invalid data;

signal processing means for receiving the three values data from said second data holding means and outputting a first ready signal indicating completion of data processing; and

control means for controlling said second data holding means to hold the three values data from said first data holding means, and also outputting a second signal indicating completion of data processing in said second data holding means to said first data holding means when the three values data from said first data holding means exhibits one of the first and second valid values and the first ready signal is input from said signal processing means, said control means including a valid data

detecting circuit for detecting input of the first and second valid values from the three values data from said first data holding means, and a signal control circuit for outputting a latch signal, a selection signal for selecting an output from said latch circuit, and the second signal to said latch circuit, said switch circuit, and said first data holding means, respectively, on the basis of a valid data detection output from said valid data detecting circuit and the first ready signal from said signal processing means.

5,471,631

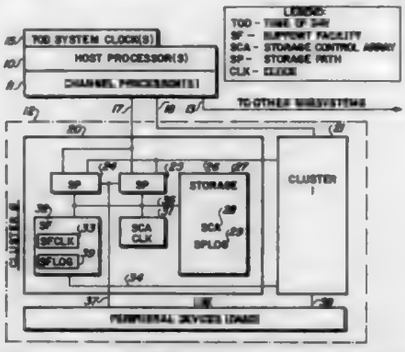
USING TIME STAMPS TO CORRELATE DATA PROCESSING EVENT TIMES IN CONNECTED DATA PROCESSING UNITS

Brent C. Beardsley; Allen C. Brailey, and Peter L. H. Leung, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 19, 1992, Ser. No. 963,347

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—650 **46 Claims**



1. A data processing (DP) system having two DP means, said two DP means comprising host processor DP means and peripheral subsystem DP means, data channel means connecting the host processor DP means to the peripheral subsystem DP means for exchanging control information and data therebetween, said host processor DP means having a time of day clock, a data storage means in the peripheral subsystem DP means;

the improvement including, in combination:

a peripheral time clock in the peripheral subsystem DP means that continuously operates for indicating a peripheral time in the peripheral subsystem DP means;

time stamping means in the peripheral subsystem DP means connected to the peripheral time clock for reading said peripheral time for storing in said data storage means said read peripheral time as a logging time stamp;

a first one of said DP means, via said data channel means, sending a correlation request to a second one of said DP means, said host processor DP means is to send, via said data channel means, a current time of said current time of say indication to said time stamping means, said host processor DP means responding to said correlation request to read said current time of day indication and then send said read current time of delay indication as a host time stamp to said peripheral subsystem DP means via said data channel means;

said time stamping means being connected to said data channel means for receiving said host time stamp, said time stamping means connected to said peripheral time clock, said time stamping means responding to receiving said host time stamp to read a current time of said peripheral time clock for generating a time-event logging time stamp and recording both said host time correlating entry in said data storage means; and

data processing event means connected to said data storage means and to said time stamping means for recording in said data storage means a second read time of said peripheral time clock as a predetermined logging time stamp plus data indicating a predetermined data processing event.

5,471,632

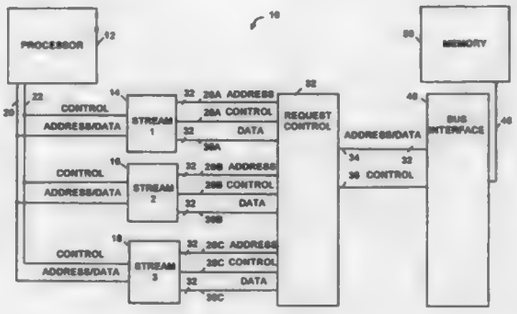
SYSTEM FOR TRANSFERRING DATA BETWEEN A PROCESSOR AND A SYSTEM BUS INCLUDING A DEVICE WHICH PACKS, UNPACKS, OR BUFFERS DATA BLOCKS BEING TRANSFERRED

Vincent G. Gavin, Galway, Ireland; Michael J. Seaman, San Jose, Calif.; Neal A. Crook, Reading, and Bipin Mistry, Edgware, both of, United Kingdom, assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 10, 1992, Ser. No. 819,468

Int. Cl.[6] G06F *13/38*

U.S. Cl. 395—284 **11 Claims**



7. A data transfer device for coupling a processor to a system bus, said data transfer device comprising:

a processor bus system adapted for coupling to the processor for transfer of bus address information and bus data length information from the processor;

a pair of addressable registers, each one of the addressable registers being coupled to the processor bus system, the pair of addressable registers including:

i) an address register for storing the bus address information and having a bus address output adapted for coupling to the system bus, and

ii) a bus data length register for storing the bus data length information and having a bus data length output;

a register address bus adapted for coupling to the processor for input of register address information;

a decoder coupled to the register address bus and to each of the addressable registers for enabling one of the registers at a time for input of bus address information and bus data length information from the processor bus system as a function of the register address information placed on the register address bus by the processor, in a sequence of processor operating cycles;

a bus data input adapted for coupling to the system bus for input of data from the system bus;

an internal buffer memory system coupled to the bus data input for input of write data to the internal buffer memory system;

the internal buffer memory system having a processor data output coupled to the processor bus system;

a control state machine system coupled to each of the internal buffer memory system and the decoder and including an internal memory address generator for generating memory addresses for controllably writing data to the internal buffer memory system via the coupling to the bus data input;

the control state machine system being responsive to the enabling of the bus data length register by the decoder to independently initiate a bus transaction with the system bus to write data from the system bus to the internal buffer memory system via the bus data input as a function of the bus address information output of the address register and the bus data length information output by the bus data length register.

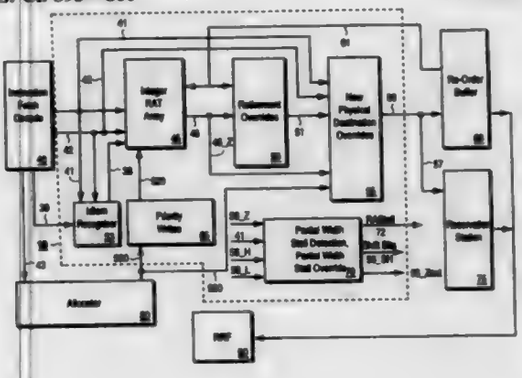
5,471,633
IDIOM RECOGNIZER WITHIN A REGISTER ALIAS TABLE

Robert P. Colwell, Portland; Andrew F. Glew, Hillsboro; David B. Papworth, Beaverton; Glenn J. Hinton, Portland, and David W. Clift, Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 129,867, Sep. 30, 1993. This application Mar. 1, 1994, Ser. No. 205,842

Int. Cl.[6] G06F *7/00*

U.S. Cl. 395—800 56 Claims



1. In a mechanism for renaming a current set of logical registers to a current set of physical registers of an extended register set, said current set of logical registers being associated with a current set of operations, an apparatus for selectively overriding partial width stalls of said renaming mechanism, said apparatus comprising:

array means for renaming said current set of logical registers to said current set of physical registers, wherein said logical registers and said physical registers have partial width registers, wherein said logical registers have logical register sizes and said physical registers have physical register sizes, wherein each of said physical registers has a corresponding set of zero bits for indicating whether predetermined portions of said logical registers contain zeros;

size comparison means, coupled to said array means, for comparing said logical register sizes to said physical register sizes;

partial width stall means, coupled to said size comparison means and said array means, for stalling renaming of a first logical register by said array means when said first logical register is of larger size than a corresponding first partial width register to which said first logical register would otherwise be renamed by said array means, said first logical register being one of said current set of logical registers, said first partial width register being part of a first physical register, said first physical register being one of said current set of physical registers, wherein said first logical register has a first and second contiguous portions, said first partial width register corresponds to said first contiguous portion, said first physical register has a third portion contiguous with said first partial width register, and said third portion corresponds to said second portion; and

partial width stall override means, coupled to said partial width stall means, for overriding said stalling of said array means when a first set of zero bits corresponding to said first logical register indicates that said second contiguous portion of said first logical register contains zeros.

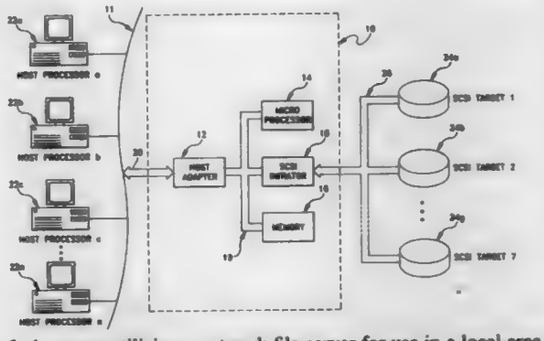
5,471,634
NETWORK FILE SERVER WITH AUTOMATIC SENSING MEANS

Paul J. Giorgio, Providence, and Stephen J. Anuro, Middletown, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1994, Ser. No. 219,556

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—600 7 Claims



1. A system utilizing a network file server for use in a local area network, with said network file server having automatic sensing means, said system comprising:

a plurality of host processors;

said local area network having said plurality of host processors on it;

said network file server comprising a controller logically connected through said local area network to each of said plurality of host processors, said controller including an interconnection of only one SCSI initiator, a host adapter, a microprocessor, and a memory;

a plurality of SCSI targets with each of said plurality of SCSI targets connected to said controller;

said each of said plurality of host processors having issuing and receiving means for issuing separate commands to designated SCSI targets through said controller and for receiving information in response to said commands from said designated SCSI targets through said controller;

said memory further having storage means for storing said information as one of said ATTENTION DATA and PM DATA from each of said plurality of SCSI targets for each of said plurality of host processors, said storage means

each of said SCSI targets having generating and transmitting means for generating and transmitting said ATTENTION DATA and PM DATA responses to said controller on receiving said non-intrusive status requests.

5,471,635
METHODS AND APPARATUS PULSE-WIDTH MODULATION THAT USE A COUNTER AND A MODULUS DEVICE

Stephen R. Williams, Los Gatos, Calif., assignor to NEC Electronics Inc., Mountain View, Calif.

Division of Ser. No. 534,382, Jun. 6, 1990, Pat. No. 5,377,346. This application May 31, 1994, Ser. No. 251,802

Int. Cl.[6] G06F *9/00*

U.S. Cl. 395—800 3 Claims

2. A device for generating a 2-level square wave signal of a predetermined period and a predetermined non-50% duty cycle, comprising:

a computer processor comprising:

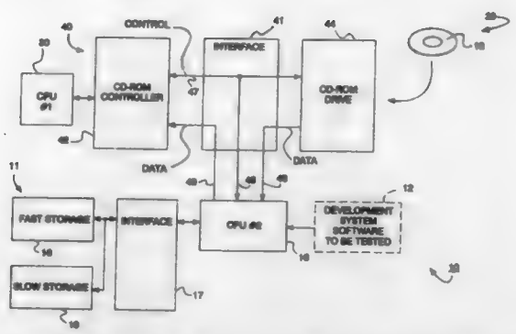
an output lead for providing thereon said square wave signal;

a counter;

means for providing a clock signal to the counter to cause the counter to count on every cycle of the clock signal and;

a modulus device;

means for determining from said period and said duty cycle a duration of a first-level portion of said square wave signal and



a duration of a second-level portion of said square wave signal, the duration of the first-level portion being different from the duration of the second-level portion;

means for determining from the duration of the first-level portion a first number which is a number of cycles of the clock signal in the first-level portion of said square wave signal, and for determining from the duration of the second-level portion a second number which is a number of cycles of the clock signal in the second-level portion of said square wave signal, wherein said second number of cycles is different from said first number of cycles;

means for decrementing each of the first and second numbers, before loading any one of the first and second numbers into the counter, by a number of cycles required to load a value from the modulus device into the counter;

said computer processor further comprising:

means for generating an interrupt signal when said counter reaches a selected final value;

means responsive to said generating means, for changing said square wave signal on said output lead to a second level if said square wave signal is of a first level, and to said first level if said square wave signal is of said second level;

means responsive to said generating means, for loading a value from said modulus device into said counter in response to said interrupt signal; and

means responsive to said changing means and said loading means, for counting by said counter to said final value; and

means, which comprises an interrupt service routine and is responsive to said interrupt signal, for loading said modulus device, before said counter counts to said final value and while said counter counts towards said final value, with:

said first number of clock cycles if said square wave signal is of said second level; and

said second number of clock cycles if said square wave signal is of said first level, to provide on the output lead the square wave signal of the non-50% duty cycle.

5,471,636

SOFTWARE DEVELOPMENT SYSTEM AND METHOD OF USING SAME

Lane T. Hauck, 5346 Bragg St., San Diego, Calif. 92122

Filed Jun. 6, 1994, Ser. No. 254,156

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **17 Claims**

16. A software development system responsive to data file requesting means for facilitating the development of a presentation program to be stored on a storage media device, comprising:

low speed storage means for retrieving target data files stored on the storage media device after an actual access time interval;

high speed storage means for retrieving untested data files indicative of a presentation program to be tested; and

control means for supplying to the data file requesting means said untested data files in place of said target data files at a start time which begins substantially immediately after said actual access time interval;

said start time for sending the program data files to be tested corresponding to the actual time said low speed storage means attempts to send its target data files to said data file requesting means;

whereby the actual access characteristic of the low speed storage means are used to develop the presentation program.

5,471,637

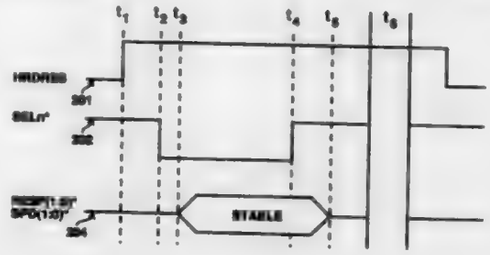
METHOD AND APPARATUS FOR CONDUCTING BUS TRANSACTIONS BETWEEN TWO CLOCK INDEPENDENT BUS AGENTS OF A COMPUTER SYSTEM USING A TRANSACTION BY TRANSACTION DETERMINISTIC REQUEST/RESPONSE PROTOCOL AND BURST TRANSFER

Stephen S. Pawlowski, Beaverton; Peter D. MacWilliams, Aloha, and Jerzy B. Kolinski, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 111,773, Aug. 25, 1993, abandoned, which is a continuation of Ser. No. 724,726, Jul. 2, 1991, abandoned, which is a continuation-in-part of Ser. No. 292,476, Dec. 30, 1988, abandoned. This application Apr. 26, 1995, Ser. No. 429,658

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—296 **6 Claims**



Memory Configuration

1. In a computer system comprising a processor module having a processor, a memory subsystem of pre-installed memory modules, a bus coupling the processor module and the memory subsystem to each other, an apparatus for sequentially conducting a plurality of bus transactions between the processor and the pre-installed memory modules, the apparatus comprising:

first circuitry disposed in the processor module and coupled to the bus for initiating and facilitating each bus transaction by generating and maintaining a first plurality of request signals on the bus for each bus transaction, one bus transaction at a time, referencing a first operating clock of the processor;

second circuitry disposed in a first pre-installed memory module of the memory subsystem and coupled to the bus for conditionally outputting a first plurality of response signals onto the bus for a bus transaction, responsive to the bus transaction's request signals, referencing a second operating clock of the

memory subsystem, which is independent of the first operating clock of the processor, whenever the bus transaction's request signals address the first pre-installed memory module, the first response signals conveying access characteristic information about the first pre-installed memory module;

third circuitry disposed in the first pre-installed memory module and coupled to the bus for conditionally bursting a series of response data onto the bus for a bus transaction, responsive to the bus transaction's request signals, referencing the independent second operating clock, whenever the bus transaction's request signals denote a memory burst read bus transaction, and the bus transactions' request signals address the first pre-installed memory module;

fourth circuitry disposed in the processor module and coupled to the bus for conditionally determining a time value in terms of the first operating clock for a bus transaction, referencing the first operating clock, whenever the bus transaction's request signals solicited the first response signals, the time value being dynamically determined using the conveyed access characteristic information of the bus transaction, and denoting an amount of time in terms of the first operating clock the first circuitry is to wait before concluding the bus transaction; and

the first circuitry is further used for concluding each bus transaction whose request signals solicited the first response signals, by ceasing to maintain the request signals on the bus, after having waited accordingly.

5,471,638

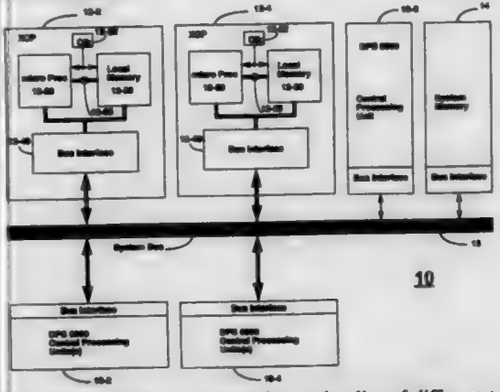
BUS INTERFACE STATE MACHINES WITH INDEPENDENT ACCESS TO MEMORY, PROCESSOR AND REGISTERS FOR CONCURRENT PROCESSING OF DIFFERENT TYPES OF REQUESTS

James W. Keeley, Nashua, N.H., assignor to Bull HN Information Systems Inc., Billerica, Mass.

Continuation of Ser. No. 771,712, Oct. 4, 1991, abandoned. This application Jun. 22, 1994, Ser. No. 263,987

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—800 **13 Claims**



1. A processing unit for processing a plurality of different types of system bus transactions, said processing unit being tightly coupled to a system bus which is operated according to a predetermined protocol, said processing unit including a microprocessor, a local memory tightly coupled to said microprocessor, a plurality of system visible registers and a system bus interface operatively coupled to said microprocessor, said local memory and said system visible registers for receiving and transmitting different types of requests including read/write commands, input/output commands and external read memory commands, said system bus interface comprising:

a first interface section coupled to said system bus and to said microprocessor for processing a first type of request corresponding to said read/write commands generated and transferred by said microprocessor to said system bus;

a second interface section coupled to said local memory for processing a second type of request corresponding to said external read memory commands transferred to said local memory from said system bus; and,

a third interface section coupled to said system bus in common to said plurality of system visible registers for processing a third type of request corresponding to said external input/output commands received from said system bus reading and writing different ones of said registers, said interface sections each including a state machine programmed for independently processing each command until receipt of either a signal from said system bus indicating a successful completion of said each command or until completion of a predetermined retry procedure specific to the type of command being executed as defined by said predetermined protocol of said system bus thereby enabling simultaneous independent processing of said plurality of different types of bus transactions by said processing unit.

5,471,639

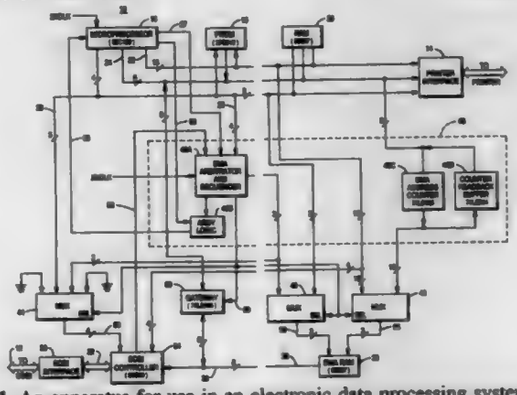
APPARATUS FOR ARBITRATING FOR A HIGH SPEED DIRECT MEMORY ACCESS BUS

Gary L. Harrington, Wichita, Kans., assignor to AT&T Global Information Solutions Company, Dayton, Ohio, and Hyundai Electronics America, Milpitas, Calif.

Filed Oct. 24, 1990, Ser. No. 602,610

Int. Cl.[6] G06F *13/28*

U.S. Cl. 395—842 **8 Claims**



1. An apparatus for use in an electronic data processing system having a DMA controller, a DMA data bus, and a microprocessor that is connected to a processor address bus, a processor data bus and a processor control bus, comprising:

input/output means for receiving a data word from an external high speed bus, said input/output means having a buffer register to store the data word for subsequent transfer to the DMA data bus;

first multiplexer means for multiplexing control signals to the input/output means;

DMA RAM means connected to the DMA data bus for receiving and storing the data word;

second multiplexer means for multiplexing the control signals and address signals to the DMA RAM means;

gateway means for switchably connecting or disconnecting the processor data bus to said DMA data bus, said gateway means is responsive to a control signal from the DMA controller for either connecting or disconnecting the processor data bus from the DMA data bus;

said first multiplexer means has a first input connected to the processor control bus for receiving control signals from said microprocessor and a second input connected to a DMA control bus for receiving control signals from said DMA controller;

said second multiplexer means has a first input connected to the processor control bus, a second input connected to the processor address bus, a third input connected to the DMA control bus and a fourth input connected to a DMA address bus; and

an arbitration circuit is included as a part of the DMA controller, the arbitration circuit having an arbitration control input con-

nected to and controlled by said microprocessor, a select output connected to said first and second multiplexers, and a gateway control output connected to said gateway means;

if the microprocessor outputs a first arbitration signal to said arbitration circuit said arbitration circuit multiplexes said second input of said first multiplexer means and said third and fourth inputs of said second multiplexer means from the DMA controller to said input/output means for receiving a data word from an external high speed bus and said high speed RAM means respectively;

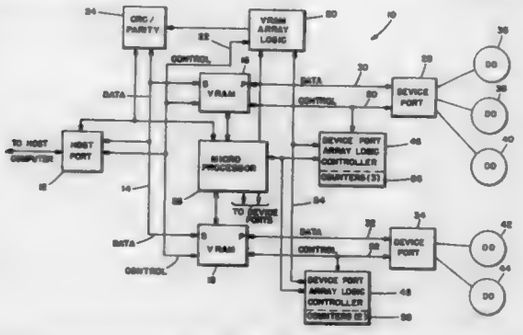
if the microprocessor outputs a second arbitration signal to said arbitration circuit said arbitration circuit multiplexes said first input of said first multiplexer means and said first and second inputs of said second multiplexer means from the microprocessor to said input/output means and said DMA RAM means respectively, and switches said gateway means to connect said DMA data bus to said processor data bus.

5,471,640

PROGRAMMABLE DISK ARRAY CONTROLLER HAVING N COUNTERS FOR N DISK DRIVES FOR STRIPPING DATA WHERE EACH COUNTER ADDRESSES SPECIFIC MEMORY LOCATION BY A COUNT N

John G. McBride, Boise, Id., assignor to Hewlett-Packard, Palo Alto, Calif.

Filed Jul. 6, 1992, Ser. No. 909,902
Int. Cl.[6] H01J 3/00
U.S. Cl. 395—842 **13 Claims**



1. A programmable disk array controller for distributing data from a host processor across a plurality of disk drives, said controller comprising:

device port means;

n disk drives connected to said device port means;

buffer memory means for receiving and storing data from said host processor and connected to said device port means;

programmable controller means for accessing a sequence of data segments from said buffer memory means, and for causing said sequence of data segments to be fed to said device port means for storage into a sequence of said n disk drives, said programmable controller means including a counter means associated with each disk drive, each said counter means programmable to sequentially increment by a count of n so that said buffer memory means distributes said sequence of data segments across said n disk-drives by providing every nth data segment to a disk drive associated with a said counter means.

5,471,641

TELECOMMUNICATIONS NETWORK HAVING SWITCHING CENTERS FOR LINKING SATELLITES

Frédéric Dosiere, Toulouse; Jean-Pierre Boutes, Ramonville, and Gérard Maral, Goyrans, all of, France, assignors to France Telecom, Paris, France

Filed Sep. 15, 1993, Ser. No. 122,720
Claims priority, application France, Sep. 15, 1992, 92 10948
Int. Cl.[6] H04B 7/14
U.S. Cl. 455—13.1 **10 Claims**

6. A method of telecommunicating comprising the steps of:

transmitting a signal from an earth-based sending point to a first satellite, the first satellite traveling in a first orbit which is in a plane that includes the polar axis or an axis slightly inclined with respect to the polar axis;

transmitting the signal from the first satellite to an earth-based switching center;

transmitting the signal from the earth-based switching center to a second satellite, the second satellite traveling in a second orbit which is different than the first orbit and which is in a plane that includes the polar axis or an axis slightly inclined with respect to the polar axis; and

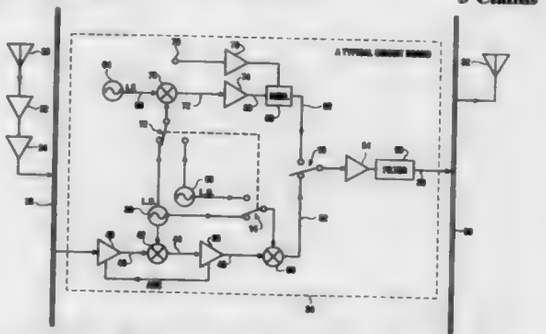
transmitting the signal from the second satellite to an earth-based receiving point.

5,471,642

RE-BROADCAST SYSTEM FOR A PLURALITY OF AM SIGNALS

James K. Palmer, 134 Fel Mar Dr., San Luis Obispo, Calif. 93405

Filed Jan. 28, 1994, Ser. No. 188,030
Int. Cl.[6] H04B 7/14
U.S. Cl. 455—17 **5 Claims**



1. Apparatus for simultaneously receiving a plurality of AM signals of widely differing strengths on carriers having frequencies of $f_1, \ldots f_i, \ldots f_N$ where N is an integer greater than 1 and for re-broadcasting the AM signals at an equal strength and at the original carrier frequencies, said apparatus comprising in combination:

a receiving antenna;

an input bus connected to said receiving antenna;

an output radiator;

an output bus connected to said output radiator;

a plurality of circuit boards, one for each of said plurality of AM signals, each of said plurality of circuit boards connected to

said input bus and to said output bus. the circuit board for carrier frequency f_i including

a local oscillator producing an output having a frequency equal to $f_i \pm f_o$, where f_o is a chosen intermediate frequency (IF) which is the same for all of the circuit boards;

a down-converter connected to said input bus and connected to said local oscillator and producing an amplitude modulated carrier of frequency f_o as an output;

an IF amplifier connected to receive the output of said down-converter, having a controllable gain, and producing an output;

first means connected to said IF amplifier for controlling its gain in inverse relation to the strength of the carrier of frequency f_o whereby the gain is reduced if the carrier of frequency f_i is strong, and whereby the gain is increased if the carrier of frequency f_i is weak;

an up-converter connected to said IF amplifier and connected to said local oscillator for mixing the output of said IF amplifier of frequency f_o with the output of said local oscillator of frequency $f_i \pm f_o$ to produce on an output terminal an output of frequency f_i having a signal strength that is substantially uniform for all of said plurality of circuit boards; and,

second means connecting the output terminal of said up-converter to said output bus.

5,471,643

RADIO TELECOMMUNICATION APPARATUS

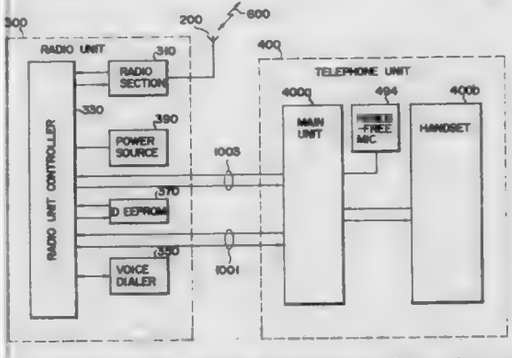
Kuniyoshi Marui, Tokorozawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 29, 1991, Ser. No. 647,498

Claims priority, application Japan, Jan. 31, 1990, 2-20888

Int. Cl.[6] H04Q *7/32*

U.S. Cl. 455—33.1 **16 Claims**



1. A radio telecommunication subscriber unit for use in a radio telecommunication system, wherein said radio telecommunication system encompasses a plurality of service areas each having a system identifier, said radio telecommunication subscriber unit comprising:

storing means for storing a system identifier corresponding to a home service area of said radio telecommunication subscriber unit;

input means, operable by a subscriber, for inputting a system identifier corresponding to a service area of said radio telecommunication system; and

supplying means for supplying the subscriber-input system identifier to said storing means to designate the service area corresponding to the subscriber-input system identifier as a home service area.

5,471,644

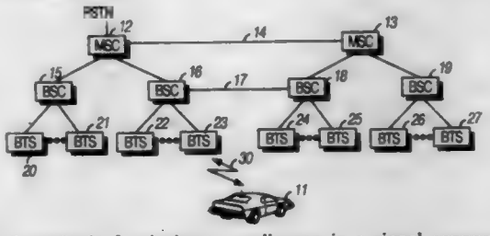
METHOD OF REDUCING AUDIO GAP IN DOWNLINK DURING HANDOFF OF CELLULAR RADIOTELPHONE

Steven V. Schatz, McHenry; Thomas W. Richie, Arlington Heights; Barry J. Menich, Schaumburg; Jeffrey D. Bonta, Arlington Heights, and Akingbade Akinniyi, Mundelein, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 81,895, Jun. 25, 1994, Pat. No. 5,386,456. This application Jul. 29, 1993, Ser. No. 98,980

Int. Cl.[6] H04M *11/00;* **H04Q** *7/00*

U.S. Cl. 455—33.2 **10 Claims**



1. A method of reducing an audio gap in a signal connection with a communication unit during handoff in a cellular communication system, the method comprising the steps of:

establishing a temporary inter-base site signal connection between a source base site and a target base site for routing signals from the communication unit through the target base site to the source base site;

establishing a trunk connection between a source mobile switching center associated with the source base site and a target mobile switching center associated with the target base site:

interconnecting, at the target base site, the temporary inter-base site signal connection, the trunk connection and the communication unit; and

routing signals from the communication unit to the source mobile switching center through the trunk connection.

5,471,645

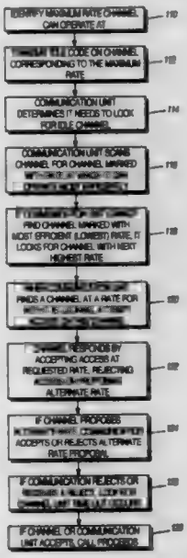
METHOD OF ALLOCATING CHANNELS IN MULTI-RATE CHANNEL ENVIRONMENT

Kenneth A. Felix, Crystal Lake, Ill., assignor to Motorola, Schaumburg, Ill.

Filed Sep. 25, 1992, Ser. No. 950,540

Int. Cl.[6] H04B *15/00*

U.S. Cl. 455—34.2 **12 Claims**



1. A method of allocating channels in a trunked radio frequency communications system having a plurality of channels, each with a channel rate, the method comprising the steps of: transmitting

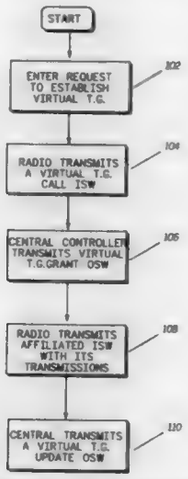
channel characteristics, including a maximum rate at which the channel can operate at on idle channels of the plurality of channels by a base site; scanning the idle channels for the channel characteristics by a communication unit; and, seizing an idle channel, by the communication unit, based at least in part, upon matching a most efficient communication rate of the communication unit with the maximum rate at which the channel can operate.

5,471,646

METHOD FOR ESTABLISHING A USER DEFINED RADIO TALK GROUP IN A TRUNKED RADIO COMMUNICATION SYSTEM

Charles P. Schultz, Hialeah, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 1, 1994, Ser. No. 283,327
Int. Cl.[6] H04Q *7/28*
U.S. Cl. 455—54.1 **9 Claims**



1. A method for establishing a user defined virtual talk group in a trunked radio communication system which has pre-established radio talk groups so that a plurality of radios from different pre-established radio talk groups can communicate with each other using the virtual talk group, comprising the steps of:

(a) entering a virtual talk group number at each of the plurality of radios so as to place each of the plurality of radios in the same virtual talk group; and

(b) transmitting by one of the plurality of radios a data packet which includes the virtual talk group number and a special code to differentiate the virtual talk group number from the pre-established radio talk groups.

5,471,647

METHOD FOR MINIMIZING CROSS-TALK IN ADAPTIVE TRANSMISSION ANTENNAS

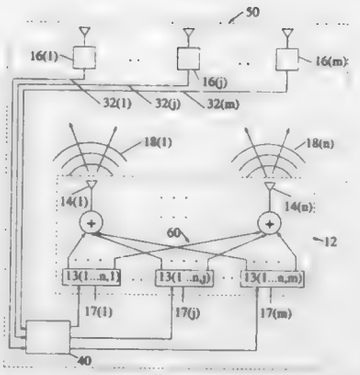
Derek Gerlach, Los Altos Hills, and Arogyaswami J. Paulraj, Stanford, both of Calif., assignors to The Leland Stanford Junior University, Stanford, Calif.

Filed Apr. 14, 1993, Ser. No. 46,631
Int. Cl.[6] H04B *1/10*
U.S. Cl. 455—63 **18 Claims**

1. A method for minimizing cross-talk among information signals in a wireless communication system comprising an array of transmitting elements and a collection of receivers, the method comprising the steps of:

transmitting a set of probing signals from the array according to a probing weight matrix;

feeding back from the receivers to the array in response to the probing signals a set of feedback signals measuring the cross-talk;



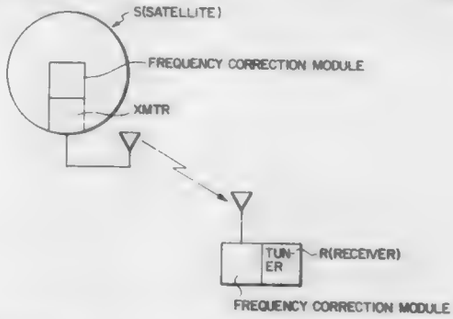
calculating from the feedback signals a new weight matrix that reduces the cross-talk measured by the feedback signals; and transmitting a set of new information signals according to the new weight matrix.

5,471,648

DEVICE FOR CORRECTING FREQUENCY SHIFT DUE TO THE DOPPLER EFFECT IN A TRANSMISSION SYSTEM

Frédéric Gourgue, Paris, France, assignor to Societe Anonyme Dite Alcatel Radiotelephone, Paris, France

Filed Nov. 1, 1993, Ser. No. 143,749
Claims priority, application France, Nov. 3, 1992, 92 13156
Int. Cl.[6] H04B *1/10;7/185;* **H04J** *3/06*
U.S. Cl. 455—63 **8 Claims**



8. Equipment for two-way communication by means of signals in respectively opposite communication directions, the equipment comprising a device for correcting a frequency shift due to the Doppler effect in a transmission system where a signal is transmitted in a transmission lobe between a transmitter and a receiver in relative motion, wherein said frequency shift is the difference between a received frequency of said signal as measured at said receiver and a transmitted frequency of said signal as measured at said transmitter, and wherein said frequency shift is also defined as the sum of a center frequency, characteristic of said transmission lobe, plus a position frequency which is a function of a position of said receiver in said transmission lobe, the device comprising means for tuning said receiver, which has a tuning frequency, to make said tuning frequency equal to the sum of said transmitted frequency and of said center frequency.

5,471,649

BASE STATION TRANSCEIVER DIAGNOSTIC EQUIPMENT

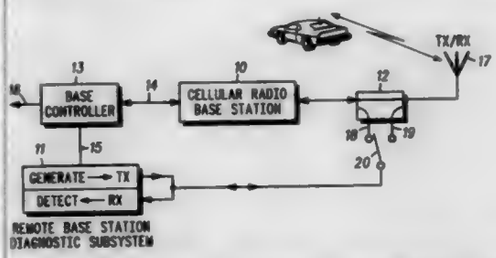
Idris J. M. Rees, Reading, and Phillip Pickersgill, Wantage, both of, United Kingdom, assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 787,438, Nov. 4, 1991, abandoned. This application May 26, 1994, Ser. No. 249,677

Claims priority, application United Kingdom, Mar. 31, 1990, 9007330

Int. Cl.[6] H04B *17/00*

U.S. Cl. 455—67.4 **12 Claims**



1. Base station transceiver equipment for communication with a mobile transceiver in a radio communications system, said equipment comprising:

principal transceiver equipment for receiving signals from and transmitting signals to the mobile transceiver;

means for measuring, by the principal transceiver equipment, a parameter, of a signal from the mobile transceiver;

means, at the principal transceiver equipment, for instructing, the mobile transceiver to adjust said parameter of its transmitted signals by issuing a command to the mobile transceiver;

stationary subsidiary transceiver equipment in relative proximity and coupled to the principal transceiver equipment for simulating transmissions of the mobile transceiver to the means for measuring, and for receiving the command from the principal transceiver equipment, the subsidiary transceiver equipment having means for changing said parameter of its transmissions to simulate relative distance from the principal transceiver equipment to the mobile transceiver, said parameter being selected to generate a specific command from said means for instructing; and

means for testing, at the stationary subsidiary transceiver, that the means for instructing issued the specific command to instruct the subsidiary transceiver equipment to adjust said parameter of its transmissions to compensate for said simulated distance.

5,471,650

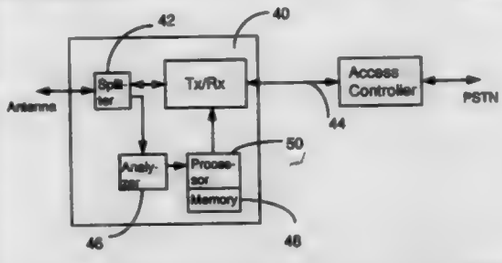
RADIO LINK PARAMETER CONTROL IN WIRELESS PERSONAL COMMUNICATIONS SYSTEM

Manuel Vezler, Kanata, and Victor F. Emerson, Ottawa, both of, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jan. 7, 1993, Ser. No. 104,265

Int. Cl.[6] H04B *1/40;7/26;* **G05B** *23/02*

U.S. Cl. 455—69 **7 Claims**



1. A wireless personal telecommunications system for duplex communication between a portable handset and a base station, which base station comprises analyzing means for analyzing wireless link parameters indicative of the quality of the wireless link between the portable handset and base station by monitoring the wireless signal received from the portable handset and sending means for sending back to the handset an indication of the quality of the wireless link, the invention being characterized in that the base station further includes:

memory means for storing a plurality of templates which are indicative of predefined values of the wireless link parameters of the received wireless signal in response to the analyzing means;

selecting means for selecting, in response to the analyzing means, one of the templates; and

generating means for generating as the indication of the quality of the wireless link a digitally encoded signal which indicates said selected one of the templates.

5,471,651

METHOD AND SYSTEM FOR COMPRESSING THE DYNAMIC RANGE OF AUDIO SIGNALS

Stephen G. T. Wilson, Carnforth, United Kingdom, assignor to British Broadcasting Corporation, London, United Kingdom

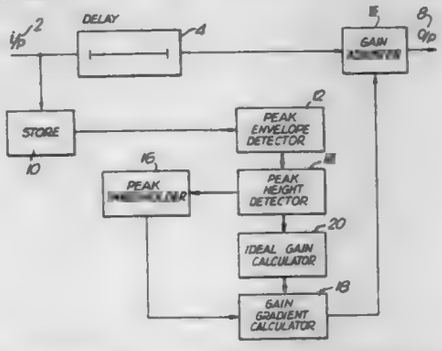
PCT No. PCT/GB92/00502, § 371 Date Nov. 13, 1992, § 102(e) Date Nov. 13, 1992, PCT Pub. No. WO92/16996, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 20, 1992, Ser. No. 949,244

Claims priority, application United Kingdom, Mar. 20, 1991, 9105896; Mar. 21, 1991, 9106014

Int. Cl.[6] H03G *7/00;* **H04B** *1/16*

U.S. Cl. 455—72 **33 Claims**



1. A method for compressing the dynamic range of an audio signal comprising the steps of sampling a block of the audio signal, deriving an ideal signal level for that block of audio signal, deriving a gain control signal for adjusting the gain applied to that block towards the said ideal signal level, and deriving a further gain control signal to reduce the gain applied to the block when a portion of the block exceeds a predetermined amplitude limit.

5,471,652

FREQUENCY SYNTHESIZER AND MULTIPLIER CIRCUIT ARRANGEMENT FOR A RADIO TELEPHONE

Jaakko Hulkko, Oulu, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland

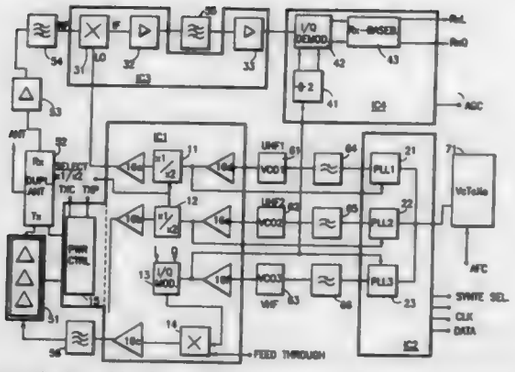
Filed Jul. 26, 1993, Ser. No. 96,864

Claims priority, application Finland, Jul. 28, 1992, 923412

Int. Cl.[6] H04B *1/50*

U.S. Cl. 455—76 **10 Claims**

1. A circuit arrangement for a radio telephone comprising at least one UHF frequency synthesizer circuit (UHF1, UHF2) and a VHF synthesizer circuit (VHF) each including an output therefrom and an oscillator (71) having a reference frequency output therefrom, said at least one UHF synthesizer circuit and said VHF synthesizer circuit each including a corresponding Phase Locked Loop (PLL) circuit (21, 22) (23) coupled to said oscillator (71) and



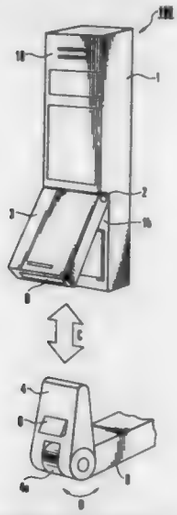
responsive to said reference frequency output therefrom, multiplier means (**11**, **12**) for frequency multiplying coupled to said output of said at least one UHF synthesizer circuit and responsive to a first control signal (select X1/X2) to change the frequency of a signal output from said multiplier means (**11**, **12**), thereby selectively changing the operational frequency range of the circuit arrangement and an I/Q modulator means (**13**) responsive to the output of said VHF synthesizer circuit to provide a modulating signal.

5,471,653

PORTABLE RADIO APPARATUS AND MOUNT STRUCTURE THEREFOR

Michio Nagai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 22, 1994, Ser. No. 231,058
Claims priority, application Japan, May 7, 1993, 5-105794
Int. Cl.[6] H04B *1/38*
U.S. Cl. 455—90 **18 Claims**



1. A portable radio apparatus comprising:

a housing having a longitudinally elongated, thin, rectangular parallelepiped shape;

a receiver unit arranged on one side surface of an upper portion of said housing located inside said housing;

a transmitter unit arranged on the same side surface of a lower portion of said housing as that of said receiver unit located outside said housing; and

a hinge member for pivotally supporting an upper end portion of said transmitter unit with respect to said housing,

wherein when said transmitter unit is pivoted up to a predetermined angle, a lower end portion of said transmitter unit is unfolded to form a mount gap between the lower end portion and said housing,

wherein said hinge member has a predetermined frictional force for holding said transmitter unit still at a halfway position in a process of pivoting said transmitter unit, a pivot angle of said transmitter unit with respect to said housing is arbitrarily set by said hinge member having the predetermined frictional force,

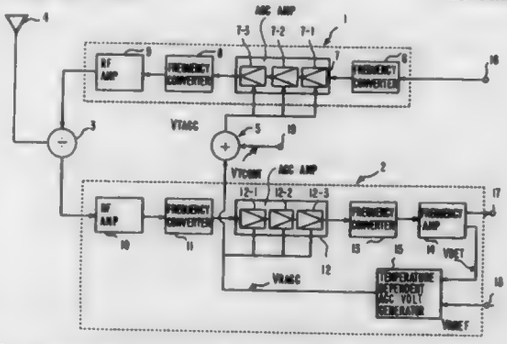
wherein said transmitter unit has a thick plate shape shape, and a stepped portion is formed on one side surface of said housing to store said transmitter unit such that one surface of said housing and a surface of said transmitter unit constitute the same plane.

5,471,654

TRANSMITTING/RECEIVING UNIT HAVING AUTOMATIC GAIN CONTROL SYSTEM WITH TEMPERATURE COMPENSATION

Mitsunari Okazaki, and Kazuharu Aoki, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed May 20, 1994, Ser. No. 246,585
Claims priority, application Japan, May 21, 1993, 5-120027
Int. Cl.[6] H04B *4/00*
U.S. Cl. 455—126 **12 Claims**



1. A transmitting/receiving unit comprising:

a signal transmitting portion; and

a signal receiving portion for generating an output signal, a level of the output signal being determined by a level of a received signal;

wherein said signal transmitting portion includes first variable-gain amplifying means having an amplified gain which is varied in response to a first automatic gain control voltage;

wherein said signal receiving portion includes:

second variable-gain amplifying means having an amplified gain which is varied in response to a second automatic gain control voltage,

wave-detection means for generating a DC voltage which is proportional to a level of an output signal generated by said second variable-gain amplifying means, and

temperature-dependent-type automatic gain control voltage generating means for converting said DC voltage into an automatic gain control voltage which is determined by a change in environmental temperature; and

wherein said automatic gain control voltage supplied from said temperature-dependent-type automatic gain control voltage generating means is used as said first and second automatic gain control voltages to compensate a temperature change of said gain so that said level of said output signal corresponds to said level of said received signal regardless of the change in the environmental temperature;

wherein said temperature-dependent-type automatic gain control voltage generating means includes:

a first voltage-divider which divides said DC voltage to generate a first divided DC voltage which is raised to correspond to a rise in the environmental temperature,

a second voltage-divider which divides said DC voltage to generate a second divided DC voltage which is lowered to correspond to rise in the environmental temperature, and

a difference amplifier for amplifying the difference between said first and second divided DC voltages to generate the

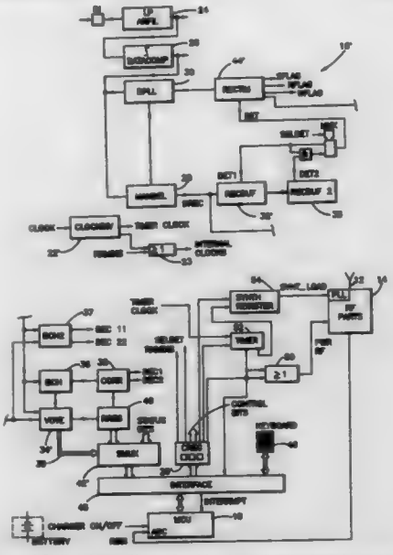
automatic gain control voltage in response to the change in the environmental temperature.

5,471,655

METHOD AND APPARATUS FOR OPERATING A RADIOTELEPHONE IN AN EXTENDED STAND-BY MODE OF OPERATION FOR CONSERVING BATTERY POWER

Raimo Kivari, Haukipudas, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland

Filed Dec. 3, 1993, Ser. No. 162,864
Int. Cl.[6] H04B *1/04*
U.S. Cl. 455—127 **28 Claims**



1. A method for reducing the power consumption of a radiotelephone, comprising the steps of:

receiving at least a Word Synchronization pattern during a transmitted frame;

receiving a first repeat of a message that follows the Word Synchronization pattern within the frame;

determining if the first repeat was correctly received;

if the first repeat was correctly received, determining if at least one reception-related criterion is met, wherein the at least one reception-related criterion is indicative of a characteristic of a received signal during a period of time that precedes the reception of at least the Word Synchronization pattern during the transmitted frame; and

if the at least one reception-related criterion is determined to be met, selectively removing operating power from one or more portions of the radiotelephone for a predetermined time period during a remainder of the frame.

5,471,656

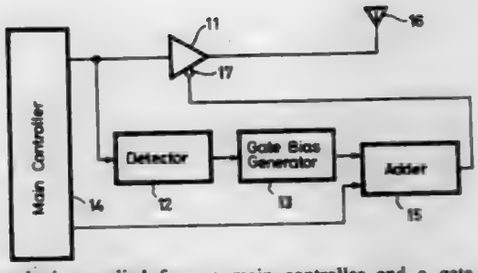
COMMUNICATION APPARATUS UTILIZING HIGH POWER AMPLIFIER

Shigeo Kusunoki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 231,689, Apr. 25, 1994, abandoned. This application Jan. 4, 1995, Ser. No. 368,768
Claims priority, application Japan, Apr. 28, 1993, 5-103214
Int. Cl.[6] H04B *1/04*
U.S. Cl. 455—127 **12 Claims**

1. A communication apparatus comprising:

a semiconductor power amplifier integrated circuit using a junction type field effect transistor having an input terminal to which a high-frequency input signal having a variable magnitude is supplied from a main controller and a gate bias terminal to which a gate bias voltage is applied;



a detector for extracting a part of said variable magnitude high-frequency input signal supplied from said main controller and performing a direct current (DC) detection of the extracted high-frequency signal to thereby output a variable DC voltage having a variable magnitude corresponding to the magnitude of said input signal;

a gate bias generator for inputting thereto the variable DC voltage output from said detector and converting the variable DC voltage to thereby generate a variable gate bias voltage which varies in accordance with said variable DC voltage; and

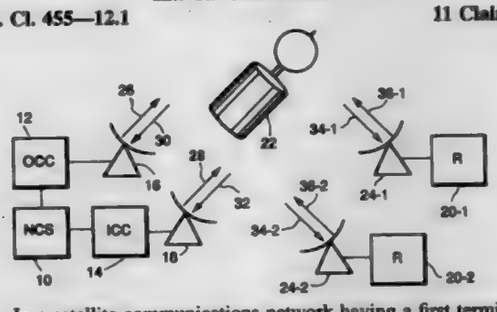
an adder having a first input terminal to which a control signal voltage is applied from said main controller and a second input terminal to which said variable gate bias voltage is applied for obtaining a sum of the input control signal voltage and the variable input gate bias voltage thereby to apply the sum to said gate bias terminal of said semiconductor power amplifier integrated circuit.

5,471,657

FREQUENCY TUNING FOR SATELLITE GROUND STATIONS

Archana M. Gharpuray, Gaithersburg, Md., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 4, 1992, Ser. No. 986,845
Int. Cl.[6] H04B *7/185*
U.S. Cl. 455—12.1 **11 Claims**



1. In a satellite communications network having a first terminal for transmitting and receiving signals, a second terminal in communication with the first terminal for transmitting signals and a satellite for receiving signals from the terminals and retransmitting them, the frequency of the retransmitted signals being offset from the frequency at which the signals were received, a method for compensating a transmit frequency of the second terminal for satellite and terminal frequency offsets comprising:

transmitting a signal from the first terminal to the satellite at a first frequency for retransmission to the first and second terminals;

receiving the signal transmitted by the first terminal from the satellite at the first terminal at a second frequency, the second frequency being offset from the first frequency by the satellite;

measuring, at the first terminal, the difference between the first frequency and the second frequency to obtain a first offset;

transmitting the first offset from the first terminal to the second terminal;

receiving, at the second terminal, a signal from the first terminal via the satellite for which the transmission frequency from the first terminal is known;

subtracting, at the second terminal, the known first terminal transmission frequency and the first offset from the frequency of the received signal to obtain a terminal offset;

adding, at the second terminal, the difference between the terminal offset and the first offset to the second terminal transmit frequency.

5,471,658

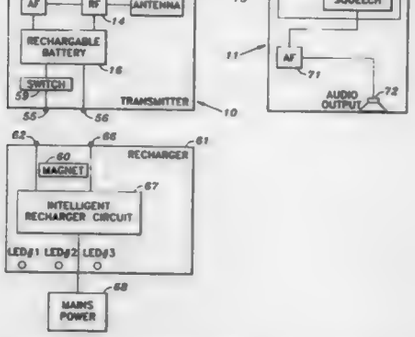
HERMETICALLY SEALED COMMUNICATION SYSTEM WITH RECHARGEABLE BATTERY

Gene A. Iacono, 1608 Morning Sun Ave., Walnut, Calif. 91789

Filed Mar. 26, 1993, Ser. No. 38,124

Int. Cl.[6] H04B *1/034;13/02;1/10;* **H01M** *10/44*

U.S. Cl. 455—128 **34 Claims**



30. In a sealed water resistant casing, a communication means having within the casing

(i) audio frequency means,

(ii) radio frequency means,

(iii) antenna means,

(iv) rechargeable battery means,

(v) first switch means in the casing operable from outside the casing for selectively activating the communication means, the means for operating the first switch means not penetrating the casing, and

(vi) second switch means operable from a location external to the casing, the second switch means being firstly for closing an electrical circuit in the casing for permitting recharging of the rechargeable battery means and for preventing activation of the communication means, and secondly for isolating the electrical circuit.

5,471,659

DUAL RADIO

Danny C. Y. Wong, 222 Littlefield Ave., South San Francisco, Calif. 94080

Filed Jul. 26, 1993, Ser. No. 96,223

Int. Cl.[6] H04B *1/38*

U.S. Cl. 455—132 **17 Claims**

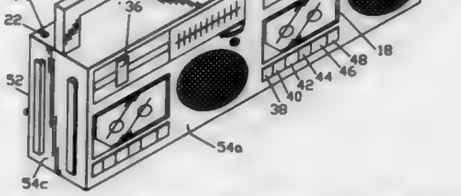
1. An integral dual radio comprising:

(a) an electrical power input;

(b) an antenna;

(c) a first independent electronic device for generating audible sound, the first independent electronic device having a first radio receiver, a first set of electronic controls including a first tuner control for tuning the first receiver, and at least one first speaker;

(d) a second independent electronic device for generating audible sound, the second independent electronic device having a second radio receiver for receiving a radio signal independent of the first radio receiver, a second set of electronic controls including a second tuner control for tuning the second receiver to the same or different radio frequency as the first receiver, and at least one second speaker; the second independent electronic device generates audible sound through the second speaker which is independent of the first independent electronic device; and



(e) a single, housing means enclosing and fixedly attached to the first radio receiver, the first set of electronic controls, the second radio receiver, and the second set of electronic controls;

wherein the electrical power input and the antenna are electrically connected to the first and second independent electronic devices.

5,471,660

CHANNEL SELECTING METHOD FOR RADIO RECEIVER AND HIGHSPEED SCANNING TYPE RADIO RECEIVER

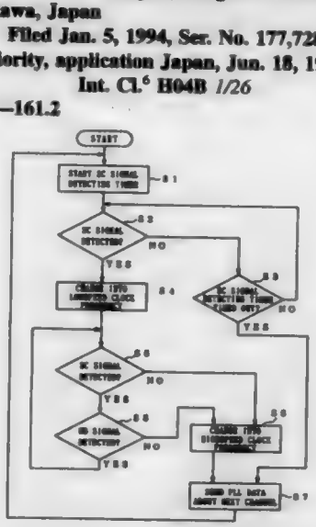
Tateo Masaki, Ichikawa, Japan, assignor to Uniden Corporation, Ichikawa, Japan

Filed Jan. 5, 1994, Ser. No. 177,728

Claims priority, application Japan, Jun. 18, 1993, 5-147503

Int. Cl.[6] H04B *1/26*

U.S. Cl. 455—161.2 **10 Claims**



1. In a radio receiver comprising a frequency synthesizer and a microcomputer for controlling the frequency synthesizer, a method for scanning a plurality of channels to select one channel of the plurality of channels, comprising the steps of:

operating the microcomputer under a highspeed clock to control the frequency synthesizer, thereby scanning said plurality of channels, and changing the highspeed clock for the microcomputer into a lowspeed clock when a reception signal is initially detected in a certain scanned channel;

if said reception signal has been initially detected, causing said microcomputer to be operated under said lowspeed clock to finally detect said reception signal in said certain scanned channel of the plurality of channels; and

if the reception signal is not finally detected, assuming that the initial detection of the reception signal in said certain scanned channel is caused by high frequency noise, changing the lowspeed clock for the microcomputer into the highspeed clock to commence a search operation of a subsequent channel in said plurality of channels.

5,471,661

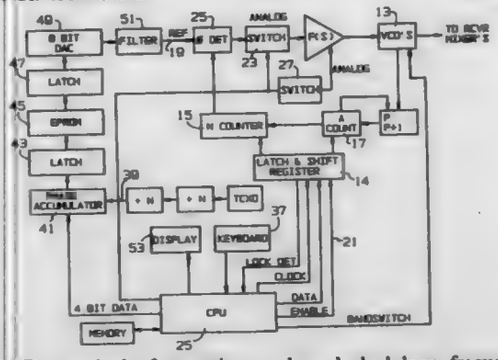
ULTRA HIGH SPEED SCAN SYSTEM

Noel D. Atkinson, 4710 Ingleside La., Indianapolis, Ind. 46227

Continuation of Ser. No. 583,040, Sep. 14, 1990, Pat. No. 5,212,817. This application Nov. 6, 1992, Ser. No. 972,855

Int. Cl.[6] H04B *1/26*

U.S. Cl. 455—165.1 **2 Claims**



1. The method of operating a phase locked loop frequency synthesizer to sequentially generate a plurality of different frequency signals including the steps, for each such frequency, of:

coarse tuning the closed loop to achieve phase coincidence at a first frequency near the desired final frequency;

fine tuning the closed loop to adjust the frequency from the first frequency to the desired final frequency;

opening the loop for a short time interval between the steps of coarse tuning and fine tuning to prevent undesirable disturbances in the operation of the loop; and

reclosing the loop to complete the fine tuning at a time when the loop is near phase coincidence.

5,471,662

RADIO DATA SYSTEM RECEIVER

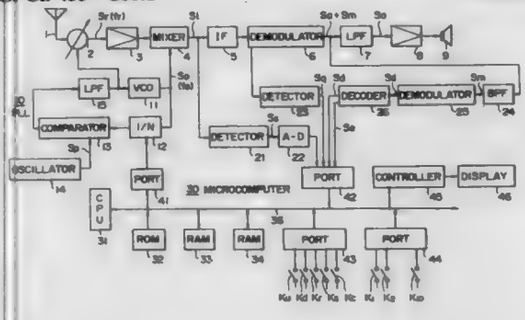
Shinichi Shiota, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 860,916, Mar. 31, 1992, abandoned. This application Dec. 3, 1993, Ser. No. 164,281

Claims priority, application Japan, Apr. 1, 1991, 3-094765; Apr. 4, 1991, 3-099420

Int. Cl.[6] H04B *1/16*

U.S. Cl. 455—166.1 **4 Claims**



1. A radio frequency receiver comprising:

receiving means for receiving a broadcast signal;

tuning means for tuning said receiver to a current broadcast signal of a specified frequency;

said tuning means comprises a tuner;

decoding means for decoding signal characteristic data from said current broadcast signal received by said receiving means;

first memory means for storing said decoded signal characteristic data;

scanning means for scanning alternate frequencies identified by said decoded signal characteristic data while said tuning means for tuning said receiver to a current broadcast signal of a specified frequency is temporarily interrupted from tuning said receiver to said current broadcast of a Specified frequency;

said scanning means comprises said tuner;

detecting means for detecting alternate broadcast signals broadcast on said scanned alternate frequencies identified by said signal characteristic data;

first comparing means for comparing signal characteristic data of a detected alternate broadcast signal with the characteristic data decoded from said current broadcast signal which is stored in said first memory means;

second comparing means for comparing the field strength of a detected alternate broadcast signal with the field strength of said current broadcast signal;

second memory means for storing the frequency and signal characteristic data of a detected alternate broadcast signal where said detected alternate broadcast signal has signal characteristic data identical to the characteristic data decoded from said current broadcast signal which is stored in said first memory means, and the field strength of said detected alternate broadcast signal is greater than the field strength of said current broadcast signal;

means for sorting said alternate frequencies stored in said second memory means in an order from alternate frequency which carries the alternate broadcast signal of greatest field strength to alternate frequency which carries the alternate broadcast signal of least field strength; and

means for selectively tuning said receiver to said alternate frequencies stored in said second memory means in a successive order from alternate frequency which carries an alternate broadcast signal of greatest field strength to an alternate frequency which carries an alternate broadcast signal of least field strength.

5,471,663

EXPANDED MICROCOMPUTER SYSTEM FOR CONTROLLING RADIO FREQUENCY INTERFERENCE

Walter L. Davis, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 1, 1993, Ser. No. 83,584

Int. Cl.[6] H04B *1/10*; H03K *3/01*

U.S. Cl. 455—296 **22 Claims**

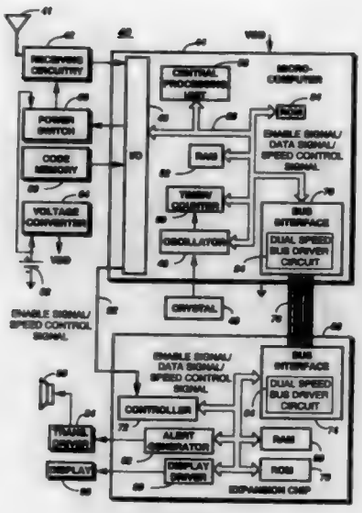
1. A radio receiver for receiving an RF signal, comprising:

receiving circuitry for receiving and demodulating the RF signal;

a microcomputer coupled to the receiving circuitry for enabling and disabling the receiving circuitry at predetermined times;

an expansion chip coupled to and controlled by the microcomputer for communicating therewith to further process the RF signal; and

wherein communication between the microcomputer and the expansion chip occurs at a first speed when the receiving circuitry is enabled and at a second speed faster than the first speed when the receiving circuitry is disabled.

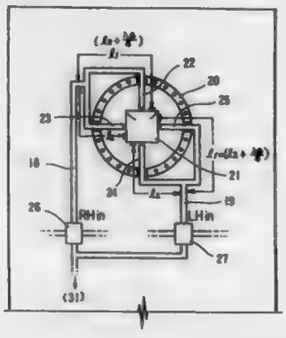


5,471,664

CLOCKWISE AND COUNTERCLOCKWISE CIRCULARLY POLARIZED WAVE COMMON RECEIVING APPARATUS FOR LOW NOISE CONVERTER

Hyo C. Kim, Anyang City, Rep. of Korea, assignor to Samsung Electro-Mechanics Co., Ltd., Suwon City, Rep. of Korea

Filed Dec. 30, 1993, Ser. No. 176,217
Int. Cl.[6] H04B *1/26*; H04H *1/00*; H01P *1/16;1/26*
U.S. Cl. 455—323 1 Claim



1. An apparatus for commonly receiving clockwise and counterclockwise circularly polarized waves for a low noise converter, comprising: first and second Hemt switching sections for receiving clockwise and counterclockwise circularly polarized wave signals of input probes installed adjacently to a rectangular microstrip patch through first and second feed lines, to selectively supply said signals to a low noise amplifier in accordance with the magnitude of the voltage of a low noise block converter; and a mixer for mixing output signals of said low noise amplifier with oscillation signals of a local oscillator to generate IF signals,

wherein four input probes are installed adjacently to the edges of said rectangular microstrip patch;

pairs of said four input probes adjacently positioned on said rectangular microstrip patch are commonly connected to said first and second feed lines; and

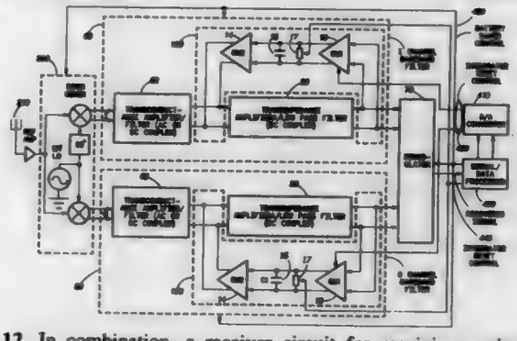
the lengths of one of the probes of said common probes connected to said first and second feed lines shows a difference of $\lambda_g/4$ relative to the other input probe of said common probes which is connected to either of said first or second feed lines.

5,471,665

DIFFERENTIAL DC OFFSET COMPENSATION CIRCUIT

Gary L. Pace, Boca Raton, and James D. Hughes, Boynton Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 18, 1994, Ser. No. 324,634
Int. Cl.[6] H04B *1/06*; H03F *3/45*
U.S. Cl. 455—343 21 Claims



12. In combination, a receiver circuit for receiving a signal detected by an antenna, and a control circuit for controlling ON and OFF time of the receiver circuit, the receiver circuit comprising:

a radio frequency (RF) amplifier coupled to the antenna for amplifying the signal detected by the antenna and generating an amplified signal;

a mixer coupled to the RF amplifier for mixing the amplified signal with an oscillator signal of a predetermined frequency and generating at an output a mixed signal;

an amplifier stage coupled to the mixer comprising:

an amplifier coupled to the output of the mixer for amplifying the mixed signal and generating at an output a differential amplified signal;

a differential integrator coupled to the output of the amplifier for receiving as input the differential amplified signal and generating at an output a differential integrator output; and

a summing network coupled to the output of the differential integrator and to the output of the amplifier, the summing network summing the differential integrator output with the differential amplified signal for canceling any DC offsets of the amplifier;

wherein the control circuit generates a receiver power control signal comprising a receiver ON time interval for turning ON the RF amplifier, mixer and amplifier stage, and a receiver OFF time interval for turning OFF the RF amplifier, mixer and amplifier stage.

5,471,666

ELECTRONIC INSTRUMENT CASING

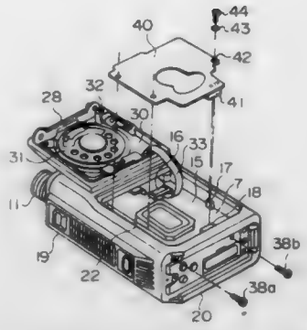
Shohji Sugiyama, and Akira Tokube, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 68,223, May 28, 1993, abandoned.
This application Sep. 7, 1994, Ser. No. 302,042
Claims priority, application Japan, May 29, 1992, 4-139332
Int. Cl.[6] H04B *1/38*
U.S. Cl. 455—348 3 Claims

1. An electronic instrument casing comprising:

a hollow case for detachably receiving a radio unit, said hollow case having a front surface side, an opening formed in a portion of said front surface side, and a cell-unit mounting portion formed separately from said opening;

a front-surface panel configured to detachably close said opening in said front surface side of said case, said front-surface panel having a front surface and a rear surface, a sheet switch having a plurality of keys provided on said front surface, and a first printed circuit board provided on said rear surface, said first printed circuit board being provided with a speaker and a microphone;



a second printed circuit board located on said radio unit;

a flexible harness connecting said second printed circuit board to said first printed circuit board;

a first engaging piece provided on one of said hollow case and said front-surface panel;

a second engaging piece engageable with said first engaging piece and provided on the other of said hollow case and said front-surface panel; and

screw means for securing said front-surface panel to said cell-unit mounting portion of said hollow case.

5,471,667

WATERPROOF TYPE UNIT CASING

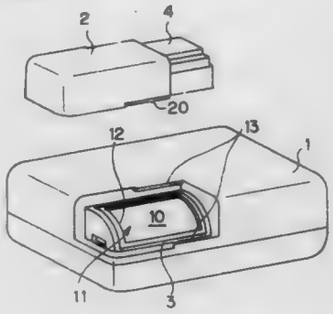
Hiroyasu Yamada, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 24, 1994, Ser. No. 217,379

Claims priority, application Japan, Mar. 29, 1993, 5-070250

Int. Cl.[6] H04B *1/08;* **H01M** *2/10*

U.S. Cl. 455—351 **9 Claims**



1. A casing for a waterproof type radio communication unit comprising a first cover having a battery accommodation section, said battery accommodation section having an opening, an elastic packing disposed along said opening, a second inner cover removably disposed over said opening for closing said opening in close contact with said packing, and a third battery cover for urging said second inner cover against said opening, said third battery cover being slidable relative to said second inner cover in a direction different from the direction of urging said packing against said opening for locking said third battery cover to said first cover.

5,471,668

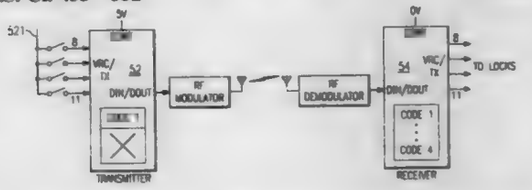
COMBINED TRANSMITTER/RECEIVER INTEGRATED CIRCUIT WITH LEARN MODE

Eric G. Soenen, Plano; Gregory B. Davis, Allen; Thomas Adkins, Coppell, and Russell K. MacDonald, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 15, 1994, Ser. No. 259,819

Int. Cl.[6] H04B *9/00;* **H04Q** *1/00;* **H04M** *11/00*

U.S. Cl. 455—352 **7 Claims**



1. An integrated circuit configurable as a transmitter and configurable as a receiver, comprising:

a configuration pin to which one voltage may be applied to configure the integrated circuit as a transmitter and to which another voltage may be applied to configure the integrated circuit as a receiver;

an bidirectional input/output pin for the transmission of data when the integrated circuit may be configured as a transmitter and for the reception of data when the integrated circuit may be configured as a receiver; and

circuitry coupled to the configuration pin and the bidirectional input/output pin having a program that allows the integrated circuit to learn an identification code of a transmitter when the integrated circuit may be configured as a receiver.

5,471,669

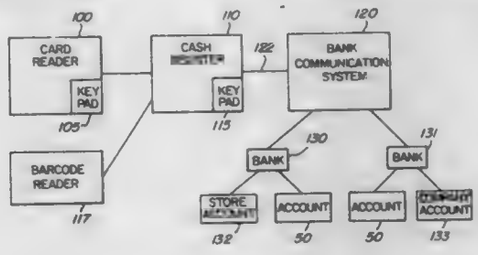
COUPON SAVINGS ACCOUNT SYSTEM

David G. Lidman, West Roxbury, Mass., assignor to Alchemist and Company, Inc., West Roxbury, Mass.

Filed Mar. 17, 1994, Ser. No. 214,613

Int. Cl.[6] G06K *19/00*

U.S. Cl. 235—383 **19 Claims**



1. A product coupon savings system comprising:

a cash register for totaling one or more product coupons in connection with product purchases;

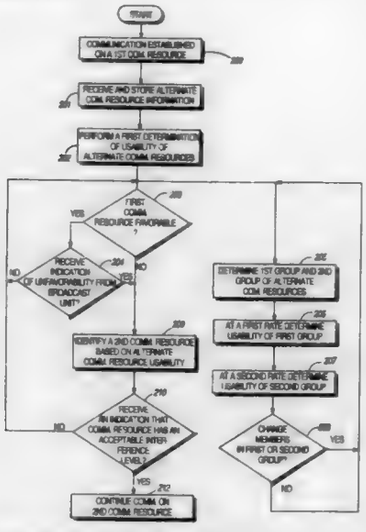
account means for identifying a purchaser's money account to receive and accumulate funds transferred through said product coupon savings system; and

crediting means, communicating with said cash register, for crediting said identified money account in an amount equal to said total of said product coupons.

5,471,670
METHOD FOR DETERMINING COMMUNCIATION RESOURCE HANDOFFS

Garry C. Hess, Elgin; Barry S. Leung, Palatine, and Timothy J. Wilson, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 2, 1993, Ser. No. 85,486
Int. Cl.[6] H04B *7/26;* **H04M** *11/00;* **H04Q** *7/38*
U.S. Cl. 455—33.2 **9 Claims**



1. In a communication system that includes a plurality of communication units, a plurality of sites, a limited number of communication resources, and a plurality of broadcast units, wherein the plurality of broadcast units are distributed throughout the plurality of sites and transceive the limited number of communication resources, a method for determining when to handoff a communication that is occurring on a first communication resource to a second communication resource, the method comprises the steps of:

a) upon allocation of the first communication resource and receipt of alternate communication resource information generated at the site where the first communication resource reside, storing, by a communication unit involved in the communication, the alternate communication resource information;

b) determining, at a first predetermined rate, by the communication unit, the usability of the first communication resource based on the communication received from an associated broadcast unit that is associated with the first communication resource;

c) determining, at a second predetermined rate, by the associated broadcast unit, the usability of the first communication resource based on the communication received from the communication unit;

d) determining, at a third predetermined rate, by the communication unit, the usability of each alternate communication resource identified in the alternate communication resource information;

e) storing, by the communication unit, an indication of the usability of each alternate communication resource to produce stored alternate communication resource usability information;

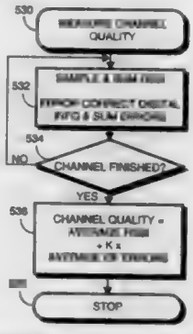
f) when either the communication unit or the associated broadcast unit determines that the usability of first communication resource is unfavorable, identifying, by the communication unit together with the associated broadcast unit, the second communication resource based on the second communication resource information and interference levels of inbound and outbound directions of the second communication resource; and

g) when the second communication resource has an acceptable interference level, selecting, by the communication unit, the second communication resource and continuing the communication on the second communication resource.

5,471,671
HANSET FOR A MULTIPLE CHANNEL COMMUNICATION SYSTEM AND USE THEREOF

Zhonghe Wang, Lake Worth, and Brian K. A. Johnson, Boca Raton, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 823,531, Jan. 21, 1992, Pat. No. 5,280,630. This application Nov. 3, 1993, Ser. No. 145,115
Int. Cl.[6] H04B *17/00*
U.S. Cl. 455—226.2 **12 Claims**



1. A method of determining a quality level of a communication channel having an information signal modulated upon a radio frequency carrier, the method comprising the steps of:

(a) receiving the radio frequency carrier;

(b) determining a received signal quality level of the radio frequency carrier;

(c) demodulating the information signal;

(d) determining an information quality level of the information signal;

(e) analyzing the received signal quality level and the information quality level comprising:

multiplying the information quality level by a predetermined constant to produce a weighted information quality level; and

adding the received signal quality level to the weighted information quality level; and

(f) generating a channel quality level signal in response to said step of adding.

5,471,672
METHOD FOR IMPLEMENTING A HIGH SPEED COMPUTER GRAPHICS BUS

Chandrashekar M. Reddy, Santa Clara, and Sung-Soo Cho, Sunnyvale, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

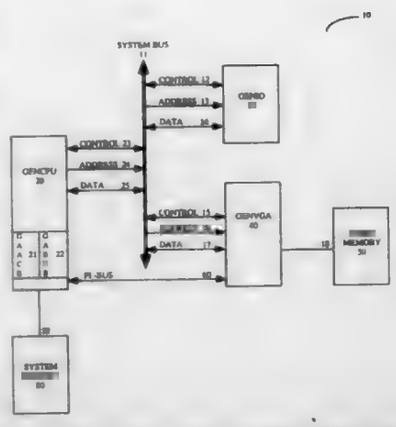
Continuation of Ser. No. 736,026, Jul. 25, 1991, abandoned. This application Sep. 2, 1994, Ser. No. 300,368
Int. Cl.[6] G06F *13/38;* **H01J** *3/00;13/00*
U.S. Cl. 395—296 **4 Claims**

1. In a computer system having a system bus, a processing component coupled to said system bus, and a display component coupled to said system bus, a process for high speed transfer of information between said processing component and said display component, said process comprising the steps of:

(a) receiving an instruction from a system memory, said instruction received by said processing component;

(b) decoding said instruction in order to determine a destination address of said instruction, said instruction decoded by said processing component;

(c) comparing said destination address of said instruction using registers defining a space range of said display component, said destination address compared by said processing component;



(d) placing said instruction onto said system bus if said destination address does not correspond to said display component space range as programmed in said registers, said instruction placed onto said system bus by said processing component;

(e) generating a start signal and placing said start signal onto a high speed bus if said destination address corresponds to said display component space range as programmed in said registers, said high speed bus coupling said processing component and said display component, said start signal generated by said processing component;

(f) placing a command corresponding to said display component onto said high speed bus after said start signal has been placed on said high speed bus, said command placed onto said high speed bus by said processing component;

(g) receiving said start signal from said processing component and selecting said high speed bus, said start signal received by said display component, and said high speed bus selected by said display component;

(h) placing a busy signal onto said high speed bus indicating that a high speed bus cycle is in progress, said busy signal placed onto said high speed bus by said processing component;

(i) receiving said command and instruction from said processing component by said display component;

(j) processing said instruction by said display component;

(k) placing a ready signal onto said high speed bus indicating that said display component is finished with said command and said instruction, said ready signal placed onto said high speed bus by said display component; and

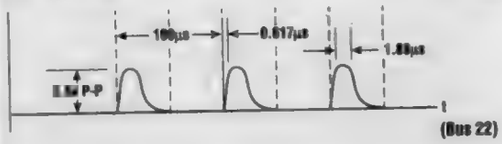
(l) after receiving said ready signal sent by said display component, completing said high speed bus cycle by deactivating said busy signal, said busy signal deactivated by said processing component.

5,471,673

MULTIPLE RF CARRIER SYNTHESIZER

James K. Palmer, 134 Fel Mar Dr., San Luis Obispo, Calif. 93405

Filed Jan. 28, 1994, Ser. No. 188,019
Int. Cl.[6] H04B *1/06;7/00;* **H03L** *7/00*
U.S. Cl. 455—260 **3 Claims**



1. A circuit for producing a plurality of single frequency waves suitable for use as amplitude modulation carriers having frequencies selected from a set of assignable frequencies uniformly spaced across a broadcast band, said circuit comprising in combination:

first means for producing a train of pulses having a pulse repetition frequency equal to the separation in frequency between successive assignable frequencies in the broadcast band, each pulse having a pulsewidth approximately equal to the reciprocal of the frequency of the lower end of the broadcast band and each pulse having a rise time approximately equal to the reciprocal of the frequency of the upper end of the broadcast band, wherein the spectrum of said train of pulses includes components having frequencies equal to all of the assignable frequencies in the broadcast band; and,

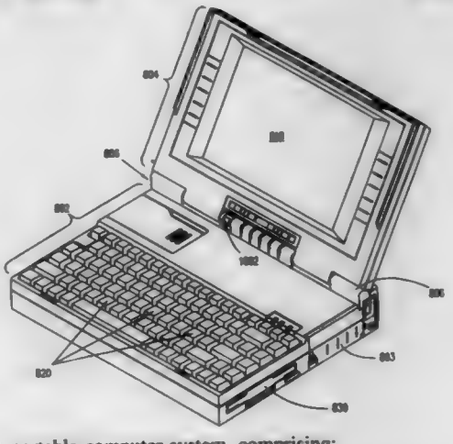
second means connected to said first means for isolating selected frequency components of said train of pulses and for presenting the selected frequency components on separate conductors.

5,471,674

COMPUTER SYSTEM WITH PLUG-IN OVERRIDE OF SYSTEM ROM

Gregory N. Stewart; Anthony L. Overfield, both of Austin, and Mark T. Ellis, Cedar Park, all of Tex., assignors to Dell USA, L.P., Austin, Tex.

Continuation of Ser. No. 831,218, Feb. 7, 1992, abandoned.
This application Feb. 16, 1994, Ser. No. 197,110
Int. Cl.[6] G06F *9/445*
U.S. Cl. 395—650 **29 Claims**



1. A portable computer system, comprising:

at least one input device and at least one output device;

a chassis, containing at least one motherboard which carries

at least one central processing unit (CPU),

at least one main memory connected to be read/write accessed by said CPU, and

at least one nonvolatile boot memory having one or more control inputs, a plurality of address inputs, a plurality of data outputs, and connected to be read-accessed by said CPU at an address location such that said CPU will begin execution of programs from said boot memory when emerging from at least some reset conditions;

a plurality of input/output interface connections, each connected to at least one line which is accessible to said CPU; and

a special external connector, comprising multiple lines operatively connected to said CPU and to said boot memory, said lines including at least:

at least one line connected to at least one control input of said nonvolatile memory,

a plurality of lines connected to address inputs of said nonvolatile memory, and

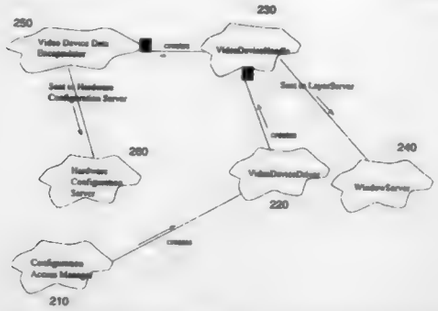
a plurality of lines operatively connected to data inputs of said CPU, said special external connector capable of receiving a boot card, said boot card containing alternative programs to be executed by said CPU in lieu of said programs stored in said boot memory, said CPU capable of communicating with said boot card to retrieve and execute said alternative programs.

5,471,675

OBJECT ORIENTED VIDEO FRAMEWORK SYSTEM

Jeff Zias, Santa Clara, Calif., assignor to Taligent, Inc., Cupertino, Calif.

Filed Jul. 27, 1993, Ser. No. 97,507
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—162 32 Claims



19. A video framework for allowing a client to manipulate video devices, the framework comprising:

a hierarchy of video device subclasses derived from a base video device class, each of the video device subclasses comprising a device data component and device control methods for manipulating a predetermined type of video device;

a hierarchy of video device handle subclasses derived from a base class of video device handle class, the hierarchy of video device handle subclasses including a subclass corresponding to each of the video device subclasses, each of the video device handle subclasses comprising a data component and methods for interfacing with the client;

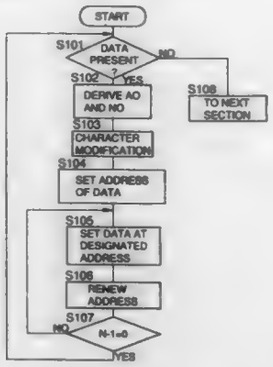
and wherein each of the video device subclasses comprises object methods for instantiating a video device handle object from a corresponding subclass and an object method for copying at least one of the device control methods into the video device handle object.

5,471,676

CHARACTER DATA COMPRESSING METHOD AND CHARACTER MODIFYING METHOD

Masayuki Muraishi, Kamiyamada, Japan, assignor to Nakajima All Precision Co., Ltd., Nagano, Japan

Continuation of Ser. No. 689,284, Jun. 17, 1991. This application Jun. 28, 1994, Ser. No. 267,178
Claims priority, application Japan, Jan. 17, 1989, 1-269322; Jan. 27, 1989, 1-285437
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—110 1 Claim



1. A character data compressing method comprising the steps of:

cutting out a bit map made of dots arranged in m rows and n columns, said dots constituting a character, at a predetermined pitch in a row or column direction; the method further comprising the steps of:

providing a dot presence data for each row or column cut out if there exits a print dot in the row or column; and

providing, for each row or column where said print dot exists, print information including a print start position of said print dot and number of continuous print dots, wherein said information comprises:

a most significant bit indicating that a set of continuous print dots is the row or column or that another set of continuous dots exist in the row or column;

a bit next to the most significant bit indicating that the data size in one byte or two bytes; and

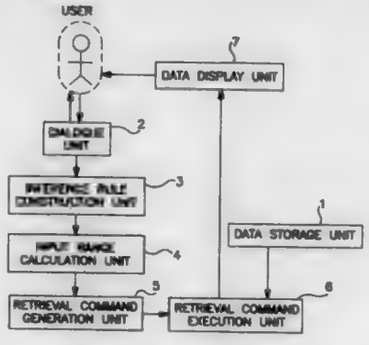
if said data size is one byte, third and following bits representing number of dots and dot position, or if said data size is two bytes, a third and following bits of a first byte representing dot position and the second byte data representing number of dots.

5,471,677

DATA RETRIEVAL USING USER EVALUATION OF DATA PRESENTED TO CONSTRUCT INTERFERENCE RULES AND CALCULATE RANGE OF INPUTS NEEDED FOR DESIRED OUTPUT AND TO FORMULATE RETRIEVAL QUERIES

Takeshi Imanaka, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 24, 1993, Ser. No. 81,634
Claims priority, application Japan, Jun. 24, 1992, 4-165834
Int. Cl.[6] G06F *17/30;17/15*
U.S. Cl. 395—600 13 Claims



1. A data retrieval apparatus comprising:

data storage means for storing storage data;

dialogue means for displaying one data and allowing a user to enter an evaluation data corresponding to the displayed data;

inference rule construction means, coupled to the dialogue means, for generating inference rules which can approximate an input-output relation between the displayed data designated as an input and the user evaluation data designated as an output;

input range calculation means, coupled to the inference rule construction means, for calculating a range of the input to produce the output which satisfies given conditions under the inference rules generated by the inference rule construction means;

retrieval command generation means, coupled to the input range calculation means, for generating a data retrieval command according to the input range calculated by the input range calculation means;

retrieval execution means, coupled to the data storage means and the retrieval command generation means, for performing a retrieval of the storage data from the data storage means in response to the data retrieval command; and

data display means, coupled to the retrieval execution means, for displaying the retrieval result of the retrieval execution means.

DESIGNS

NOVEMBER 28, 1995

364,491

INFUSION PACKAGE

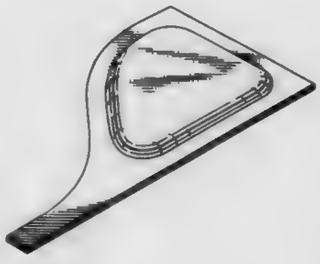
Richard D. Bradfield, North Fetcham, and Graham A. Dick, Selsdon, both of, United Kingdom, assignors to Thomas J. Lipton Co., Division of Conopco., Inc., Englewood Cliffs, N.J.

Filed May 4, 1994, Ser. No. 22,364

Claims priority, application United Kingdom, Nov. 5, 1993, 2035013

Term of patent 14 years

U.S. Cl. D1—199



364,492

INFUSION PACKAGE

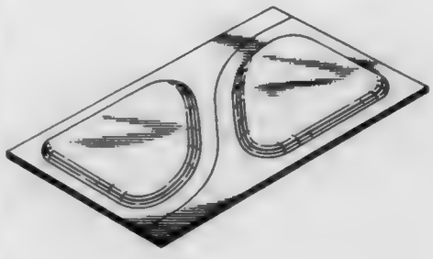
Richard D. Bradfield, North Fetcham, and Graham A. Dick, Selsdon, both of, United Kingdom, assignors to Thomas J. Lipton Co., Division of Conopco, Inc., Englewood Cliffs, N.J.

Filed May 4, 1994, Ser. No. 22,376

Claims priority, application United Kingdom, Nov. 5, 1993, 2035014

Term of patent 14 years

U.S. Cl. D1—199



364,493

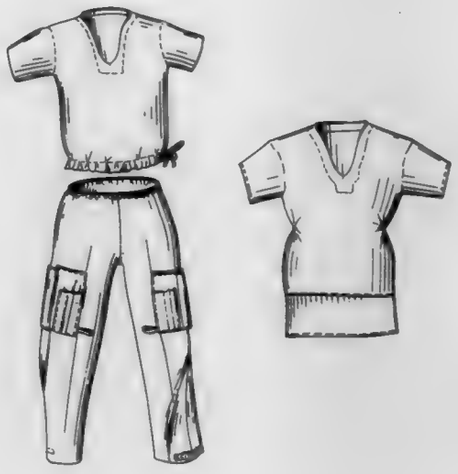
SURGICAL SCRUB SUIT

Eleanor R. Williams, 888 E. Clinton St., Apt. 1133, Phoenix, Ariz. 85020

Filed Jan. 4, 1993, Ser. No. 3,256

Term of patent 14 years

U.S. Cl. D2—714



364,494

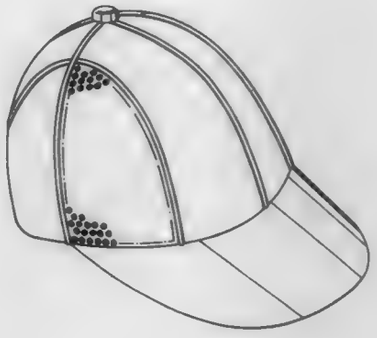
BASKETBALL CAP

Gino Sisera, and Victor Sisto, both of Uniscreen Design Ltd., 6315 Shawson Drive, Unit 18, Mississauga, Ontario, Canada

Filed Aug. 24, 1994, Ser. No. 27,537

Term of patent 14 years

U.S. Cl. D2—369



364,495

HAIR PROTECTOR

Shirley H. Smith, 145 Rolling Meadow Trail, Fayetteville, Ga. 30214

Filed Feb. 18, 1994, Ser. No. 18,897
Term of patent 14 years
U.S. Cl. D2—877

364,496

SHOCK ABSORBING INSERT FOR A CAP

Clifford Lejuez, 18 Satinwood Rd., Bayville, N.Y. 11709

Filed Sep. 26, 1994, Ser. No. 28,595
Term of patent 14 years
U.S. Cl. D2—892

364,497

SPORT SANDAL WITH SNAP CLOSURE SYSTEM

John W. Schelling, P.O. Box 1646, Orinda, Calif. 94563

Filed Aug. 1, 1994, Ser. No. 25,986
Term of patent 14 years
U.S. Cl. D2—916

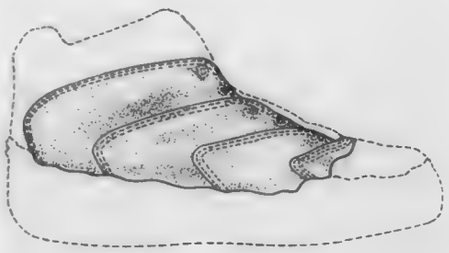
364,498

SHOE UPPER

Tracy L. Teague, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

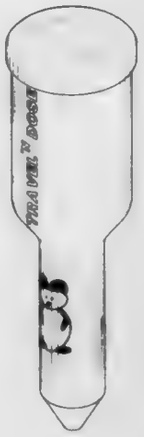
Filed May 25, 1995, Ser. No. 39,269
Term of patent 14 years
U.S. Cl. D2—969

364,499
ELEMENT OF A SHOE UPPER
Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Dec. 6, 1994, Ser. No. 32,135
Term of patent 14 years
U.S. Cl. D2—970

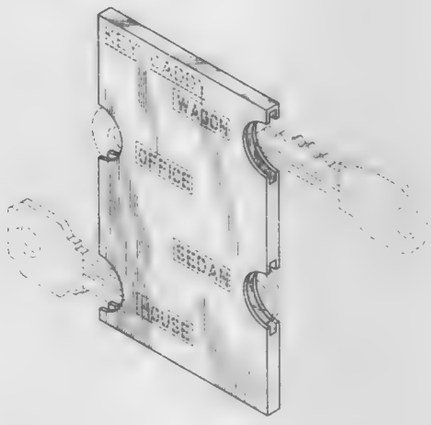


364,500
SOCK
Frederick Kluttz, and Lisa A. Kluttz, both of 3217 Cedar Ave. S., Minneapolis, Minn. 55407
Filed Feb. 4, 1994, Ser. No. 11,337
Term of patent 14 years
U.S. Cl. D2—980

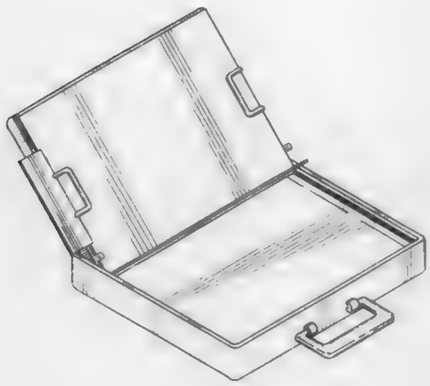
364,501
SYRINGE TRAVELING CASE
Merrie B. Gough, 916 Skylar Ct., Wake Forest, N.C. 27587
Filed Jul. 12, 1993, Ser. No. 10,554
Term of patent 14 years
U.S. Cl. D3—203



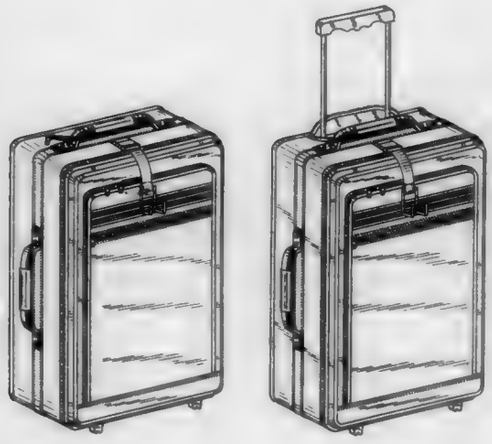
364,502
KEY CADDY
James E. Howard, 387 Boling Rd., Utica, Ky. 42376
Filed Jul. 15, 1994, Ser. No. 25,967
Term of patent 14 years
U.S. Cl. D3—207



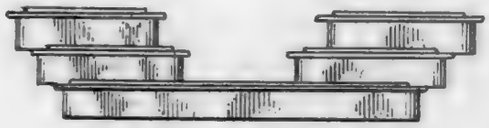
364,503
COMBINED CASE AND BOOK SUPPORT
Eric S. Johnson, 26 Carriage Dr., Eastampton, N.J. 08060
Filed Feb. 16, 1994, Ser. No. 18,828
Term of patent 14 years
U.S. Cl. D3—273



364,504
SUITCASE
David Bieber, East Greenwich, R.I.; Hyun S. Kim, New Castle, Pa.; Richard L. Conrad, Dublin, Ohio, and John N. Gualtieri, Hauppauge, N.Y., assignors to Airway Industries, Inc., Ellwood City, Pa.
Filed Nov. 8, 1994, Ser. No. 30,775
Term of patent 14 years
U.S. Cl. D3—276

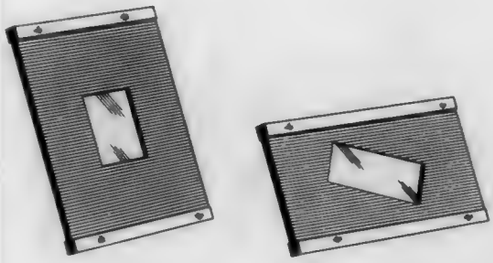


364,505
JEWELRY ORGANIZER
Nicholas R. King, 3979 Lockridge St., San Diego, Calif. 92102
Filed Dec. 3, 1993, Ser. No. 14,630
Term of patent 14 years
U.S. Cl. D3—313

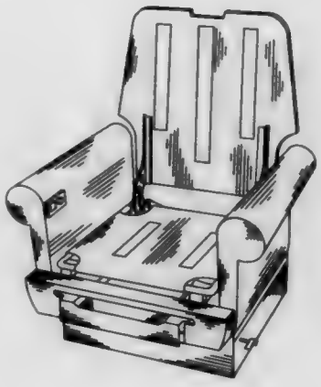


364,506
DISH BRUSH
Morison S. Cousins, Winter Park, Fla., assignor to Dart Industries Inc., Deerfield, Ill.
Filed Jun. 3, 1994, Ser. No. 23,551
Term of patent 14 years
U.S. Cl. D4—133

364,507
PICTURE FRAME
Harold W. Schwartz, 127 Brite Ave., Scarsdale, N.Y. 10583
Filed Oct. 4, 1994, Ser. No. 29,401
Term of patent 14 years
U.S. Cl. D6—300

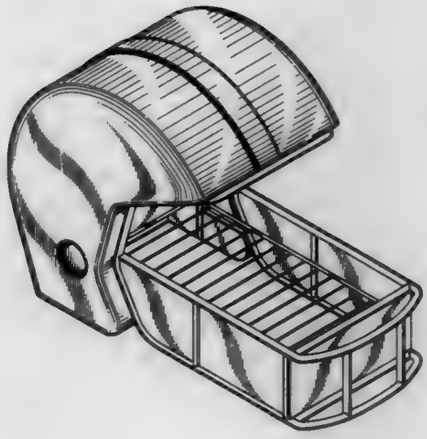


364,508
AIRCRAFT SEAT
Timothy B. Pryor, and Steven S. Retlick, both of Marinette, Wis., assignors to ERDA, Inc., Peshtigo, Wis.
Filed Jul. 19, 1993, Ser. No. 10,791
Term of patent 14 years
U.S. Cl. D6—356



364,509
PATIO SEAT
Olivier H. Rinaldi, Calle Cuello No. 9, La Campina, 1050 Caracas, Venezuela
Continuation-in-part of Ser. No. 662,893, Mar. 1, 1991, abandoned. This application Nov. 3, 1993, Ser. No. 14,919
Term of patent 14 years
U.S. Cl. D6—370

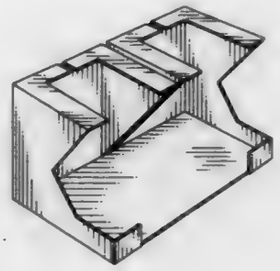
364,510
CHILD'S BED
Daniel J. Harrison, 2023 50th St., NW., North Canton, Ohio 44709
Filed Feb. 9, 1995, Ser. No. 34,671
Term of patent 14 years
U.S. Cl. D6—388



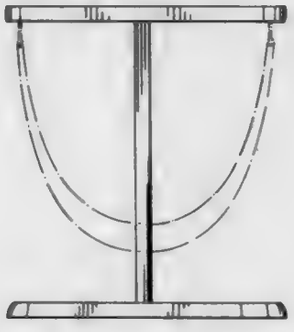
364,511
POSTER BED
Richard D. Berry, Jr., and David A. Clark, both of Hickory, N.C., assignors to Ethan Allen Inc., Danbury, Conn.
Filed Dec. 19, 1994, Ser. No. 32,407
Term of patent 14 years
U.S. Cl. D6—393

364,512
CD STORAGE TOWER
David M. Stravitz, 16 Park Ave., Ste. 14A, New York, N.Y. 10016
Filed Jul. 1, 1993, Ser. No. 10,304
Term of patent 14 years
U.S. Cl. D6—407

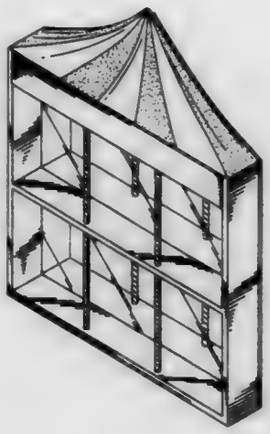
364,513
GLOVE DISPLAY UNIT
Craig Andrews, Cambridge, Mass., assignor to Rooster Products International, Inc., San Antonio, Tex.
Filed Jun. 14, 1994, Ser. No. 24,414
Term of patent 14 years
U.S. Cl. D6—411



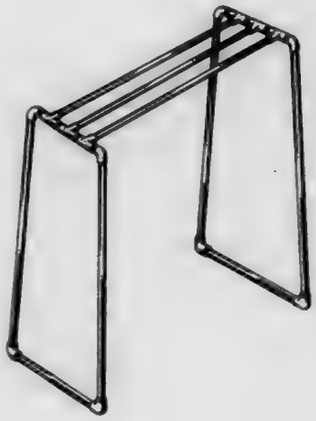
364,514
PRODUCE HOLDER
Fred Hollinger, Kings Park, N.Y., assignor to E. Mishan & Sons, Inc., New York, N.Y.
Filed Oct. 26, 1994, Ser. No. 30,297
Term of patent 14 years
U.S. Cl. D6—449



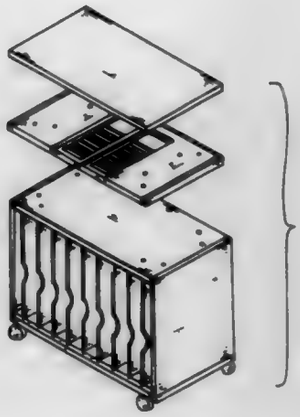
364,515
DISPLAY CASE
Jack Hou, P.O. Box 78-5, Taipei, Taiwan, Prov. of China
Division of Ser. No. 479,575, Feb. 2, 1990, Pat. No. Des. 334,853. This application Jan. 19, 1993, Ser. No. 3,736
Term of patent 14 years
U.S. Cl. D6—450



364,516
STAND
Tomasz K. Helenowski, 936 Burnham Ct., Glenview, Ill. 60025-4140
Filed Sep. 19, 1994, Ser. No. 28,638
Term of patent 14 years
U.S. Cl. D6—462



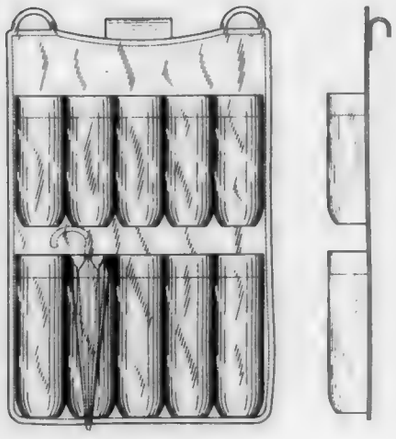
364,517
INDEXABLE VERTICAL BOOKSHELF FOR OVERSIZED BOOKS
Beatrice E. Martinez, 1401 Middlebury Dr., Alexandria, Va. 22307
Filed Jul. 6, 1993, Ser. No. 10,315
Term of patent 14 years
U.S. Cl. D6—467



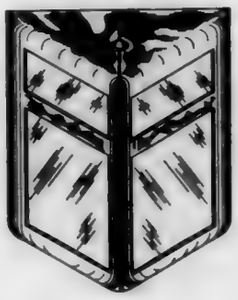
364,518
QUILT FRAME LEG
Ralph E. Koehler, and Laverne Koehler, both of 11555 Waterman Rd., Waterman, Ill. 60556
Filed Jun. 20, 1994, Ser. No. 24,698
Term of patent 14 years
U.S. Cl. D6—495

364,519
JEWELRY ORGANIZER
Amanda L. Daughtry, 4158 Sequoia Rd., Memphis, Tenn. 38117
Filed Nov. 14, 1994, Ser. No. 30,952
Term of patent 14 years
U.S. Cl. D6—513

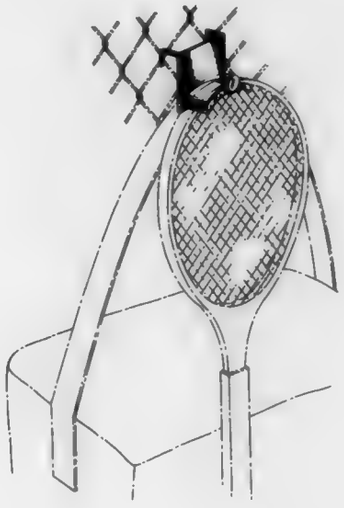
364,520
UMBRELLA RACK
Alvita L. Matthews, 161 Country Club Dr., Lansdale, Pa. 19446
Filed Jun. 27, 1994, Ser. No. 25,101
Term of patent 14 years
U.S. Cl. D6—514



364,521
COUPON DISPENSING APPARATUS
Zvi Yaniv, Farmington Hills, Mich., assignor to Kent Display Systems, L.P, Kent, Ohio
Filed Sep. 29, 1994, Ser. No. 29,119
Term of patent 14 years
U.S. Cl. D6—515

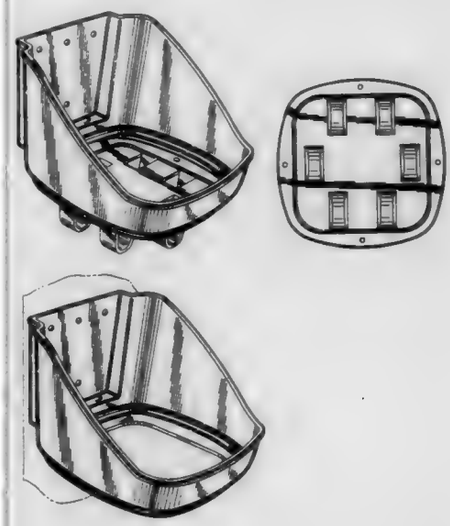


364,522
SPORTS IMPLEMENT HOLDER
Gottfried E. Haug, 8 Blacksmith Cir., Phillips Ranch, Calif. 91766
Filed Jun. 14, 1994, Ser. No. 24,464
Term of patent 14 years
U.S. Cl. D6—552

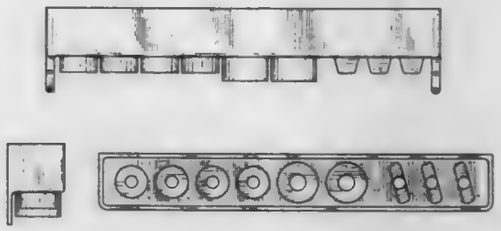


364,523
STOCKING WREATH
Janet L. Carter, 1200 E. Guava Ave., Lompoc, Calif. 93436
Filed Dec. 1, 1994, Ser. No. 31,643
Term of patent 14 years
U.S. Cl. D6—553

364,524
WALL MOUNTED HOLDER FOR A VACUUM AND/OR ATTACHMENTS
Louis M. Bassler, Montoursville, and Robert C. Berfield, Jersey Shore, both of Pa., assignors to Shop Vac Corporation, Williamsport, Pa.
Filed May 17, 1994, Ser. No. 23,049
Term of patent 14 years
U.S. Cl. D6—567

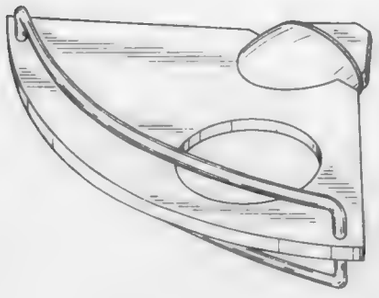


364,525
SHAMPOO AND CONDITIONER RACK
Roy J. Petska, 6275 Johnston Dr., Two Rivers, Wis. 54241
Filed Aug. 25, 1994, Ser. No. 27,612
Term of patent 14 years
U.S. Cl. D6—567



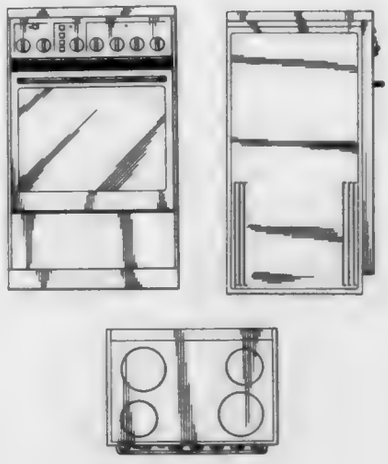
364,526
SOCKET ORGANIZER
Tim J. Laufenberg, 5938 Monticello Way, Madison, Wis. 53719
Filed Jun. 13, 1994, Ser. No. 24,457
Term of patent 14 years
U.S. Cl. D6—570

364,527
CORNER SHELF
In-Ho Moon, Seoul, Rep. of Korea, assignor to American Standard Inc., Piscataway, N.J.
Filed Feb. 17, 1994, Ser. No. 18,908
Claims priority, application Rep. of Korea, Aug. 18, 1993, 1993-16706; Aug. 18, 1993, 1993-16707; Aug. 18, 1993, 1993-16709; Aug. 18, 1993, 1993-16715
Term of patent 14 years
U.S. Cl. D6—574

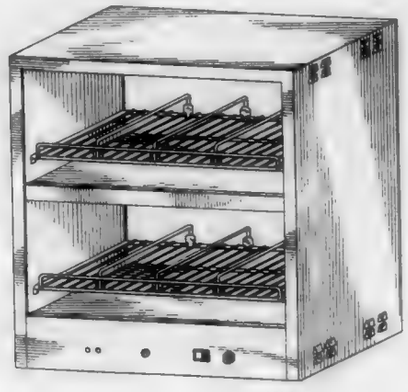


364,528
ELECTRIC ESPRESSO MACHINE
Günter Storsberg, Adolfstrasse 15, 5650 Solingen 1, Germany
Filed Dec. 27, 1993, Ser. No. 16,766
Claims priority, application France, Jun. 24, 1993, 93 3323
Term of patent 14 years
U.S. Cl. D7—309

364,529
ELECTRIC RANGE
Gerd Wilsdorf, Olching, Germany, assignor to Bosch-Siemen Hausgeraete GmbH, Munich, Germany
Filed Aug. 16, 1993, Ser. No. 11,859
Claims priority, application Germany, Feb. 15, 1993, M9301278.0
Term of patent 14 years
U.S. Cl. D7—340



364,530
FOOD WARMER
Chester F. Robards, Jr., Roselle, and Ross B. Gepty, Bolingbrook, both of Ill., assignors to Prince Castle Inc., Carol Stream, Ill.
Filed Apr. 8, 1994, Ser. No. 21,098
Term of patent 14 years
U.S. Cl. D7—350



364,531

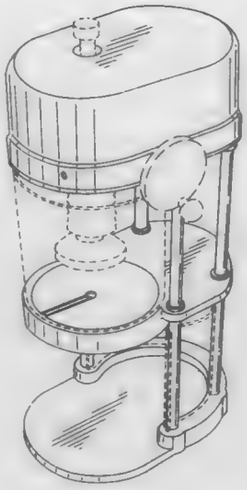
ICE SHAVER APPARATUS BODY

John M. Berner, Golden Valley; Richard H. Jacobs, New Brighton; Richard D. Ipsen, Plymouth, all of Minn.; Thomas J. Novetzke, 5621 14th Ave. South, Minneapolis, Minn. 55417; Paulette M. Magnuson, Crystal, and Steve Wrobel, Rogers, both of Minn., assignors to Richard Ipsen, Plymouth, and Thomas J. Novetzke, Minneapolis, both of Minn.

Filed Nov. 30, 1990, Ser. No. 15,845

Term of patent 14 years

U.S. Cl. D7—374



364,532

ELECTRIC KITCHEN MIXER

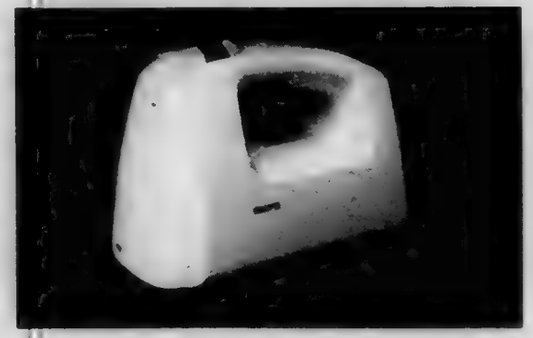
Florian Seiffert, Wiesbaden, Germany, assignor to Robert Krups GmbH & Co. KG, Solingen, Germany

Filed Jan. 21, 1993, Ser. No. 3,888

Claims priority, application France, Jul. 20, 1992, 92 4538

Term of patent 14 years

U.S. Cl. D7—379



364,533

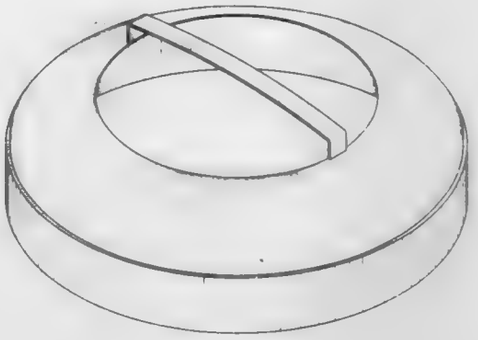
PIE CRUST SHIELD

Marilyn J. Brophy, 2703 Hatteras Pl., Davis, Calif. 95616

Filed Sep. 28, 1984, Ser. No. 29,058

Term of patent 14 years

U.S. Cl. D7—387



364,534

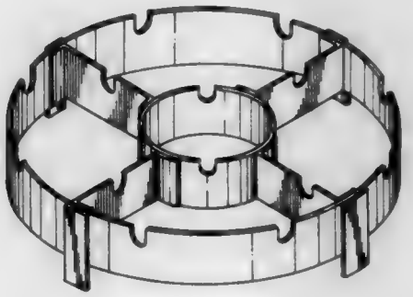
ADAPTER FOR ELEVATING AN ACCESSORY ABOVE A STOVE HEATING ELEMENT

R. A. Brown, and Nora Brown, both of P.O. Box 393, Branford, Fla. 32008

Filed Jun. 30, 1994, Ser. No. 25,372

Term of patent 14 years

U.S. Cl. D7—407



364,535

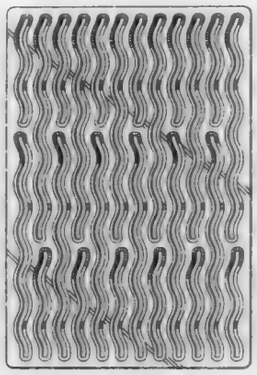
COOKING GRATE

Devin Moore, Decatur, Ga., assignor to W. C. Bradley Company, Columbus, Ga.

Filed Aug. 12, 1994, Ser. No. 27,108

Term of patent 14 years

U.S. Cl. D7—409



364,536

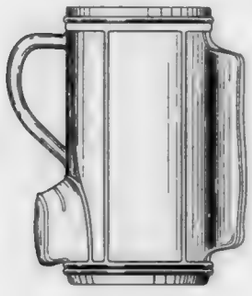
BEVERAGE MUG AND HOLDER

T. Scott Law, Carmel, Ind., assignor to Sports Mugs International, Inc., Carmel, Ind.

Filed Sep. 10, 1993, Ser. No. 12,789

Term of patent 14 years

U.S. Cl. D7—515



364,537

FOOD TRAY

John W. Anderson, Springfield, Mass., assignor to Temp-Tech Co., Inc., Springfield, Mass.

Filed Aug. 31, 1992, Ser. No. 936,917

Term of patent 14 years

U.S. Cl. D7—553

364,538

TUBULAR COMPARTMENTALIZED BEVERAGE COOLING WRAP

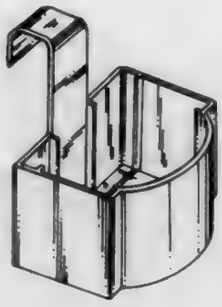
Thomas E. Hughes, Cedar Mountain, N.C., assignor to Epicurean International Corp., Wallingford, Conn.

Filed Aug. 9, 1994, Ser. No. 26,926

Term of patent 14 years

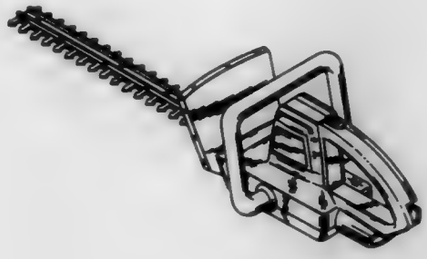
U.S. Cl. D7—608

364,539
BEVERAGE HOLDER
Trent S. Dickey, Martinsville, and Leon N. Costa, Skillman, both of N.J., assignors to LCTD, L.L.C., Martinsville, N.J.
Continuation-in-part of Ser. No. 12,606, Jul. 22, 1993, Pat. No. Des. 355,336. This application Aug. 24, 1994, Ser. No. 29,276
Term of patent 14 years
U.S. Cl. D7—620



364,540
FUNNEL FOR SEEDS
Richard M. Wasyln, 628 E. Beecher Hill, Owego, N.Y. 13827
Filed Jul. 25, 1994, Ser. No. 26,292
Term of patent 14 years
U.S. Cl. D8—2

364,541
HEDGE TRIMMER
Mark A. McJunkin, Westeminster; Daniel A. Chunn, Greenville, both of S.C., and James B. Watson, Conyers, Ga., assignors to Ryobi Motor Products, Easley, S.C.
Division of Ser. No. 7,335, Apr. 20, 1993, Pat. No. Des. 354,891. This application Jan. 31, 1995, Ser. No. 34,284
Term of patent 14 years
U.S. Cl. D8—8



364,542
UNIVERSAL CURB STOP KEY
Jerry K. Pollard, 15 Surrey Trail, Rome, Ga. 30161
Filed Apr. 26, 1994, Ser. No. 21,921
Term of patent 14 years
U.S. Cl. D8—14

364,543

SPARK PLUG TOOL

Joseph A. Hennen, 33 Nassau St., Islip Terrace, N.Y. 11752

Filed Dec. 6, 1994, Ser. No. 31,776

Term of patent 14 years

U.S. Cl. D8—14

364,544

MINIATURE SANDER WITH TWO FINGER THROTTLE

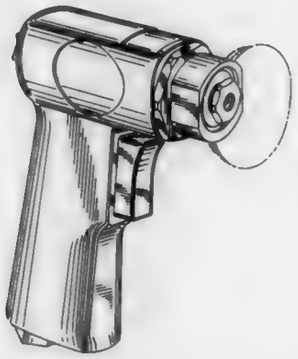
Nobuyuki Izumisawa, Tokyo, Japan, assignor to Shinano, Inc., Saitama, Japan

Continuation-in-part of Ser. No. 20,523, Mar. 28, 1994, Pat. No. Des. 357,849, which is a continuation-in-part of Ser. No. 19,291, Feb. 25, 1994, Pat. No. Des. 358,314. This application Jun. 10, 1994, Ser. No. 24,269

The portion of the term of this patent subsequent to May 16, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D8—62



364,545

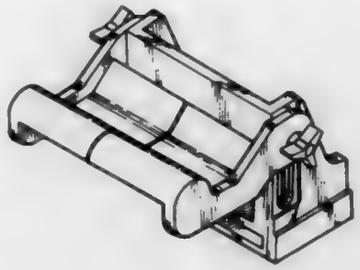
PLATE JOINER FENCE

Daniel A. Chunn, Greenville, and James A. Keith, Jr., Pickens, both of S.C., assignors to Ryobi Motor Products, Easley, S.C.

Division of Ser. No. 6,401, Mar. 26, 1993, Pat. No. Des. 350,468. This application Aug. 26, 1994, Ser. No. 27,643

Term of patent 14 years

U.S. Cl. D8—70



364,546

TILTABLE MIXING BOWL SUPPORT

Belinda J. Tieffel, and Dennis Quast, both of 201 W. Poplar, Effingham, Ill. 62401

Filed Oct. 3, 1994, Ser. No. 29,814

Term of patent 14 years

U.S. Cl. D8—71

364,547

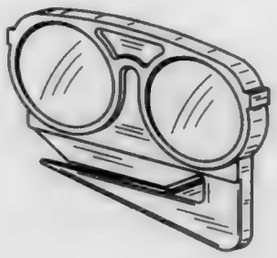
ENVELOPE OPENER CONTAINING LENSES

David P. Lage, St. Louis, Mo., assignor to Quick Point, Inc., Fenton, Mo.

Filed May 31, 1994, Ser. No. 23,726

Term of patent 14 years

U.S. Cl. D8—103



364,548

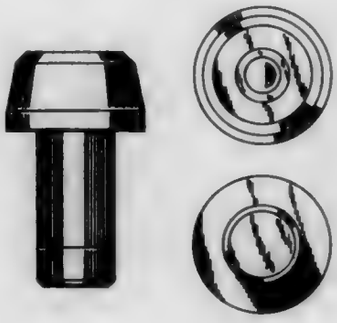
GATE LOCK

Stephen J. Platt, 1465 Country Club Dr., Lancaster, Pa. 17601

Filed Feb. 3, 1994, Ser. No. 18,543

Term of patent 14 years

U.S. Cl. D8—331



364,549

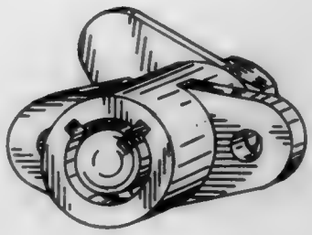
MOTORCYCLE SADDLE BAG LOCK

Gary L. Myers, Monee, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Aug. 25, 1994, Ser. No. 27,607

Term of patent 14 years

U.S. Cl. D8—331



364,550

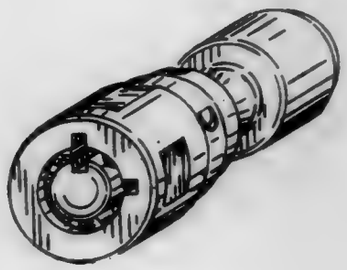
MOTORCYCLE STEERING FORK LOCK

Gary L. Myers, Monee, Ill., assignor to Fort Lock Corporation, River Grove, Ill.

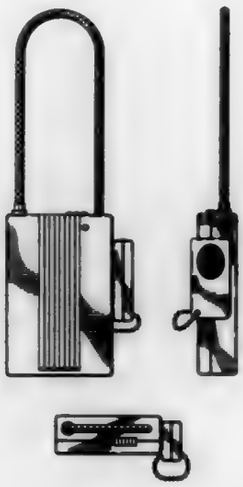
Filed Sep. 20, 1994, Ser. No. 28,713

Term of patent 14 years

U.S. Cl. D8—331



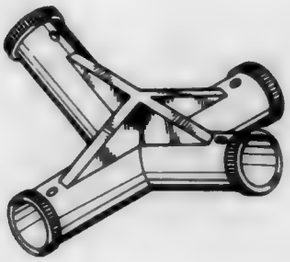
364,551
COMBINED PADLOCK AND REMOVABLE ELECTRONIC KEY
Lee C. Christenson, and Jennifer Christenson, both of P.O. Box 524, Cape Neddick, Me. 03902
Filed Aug. 19, 1994, Ser. No. 27,362
Term of patent 14 years
U.S. Cl. D8—334



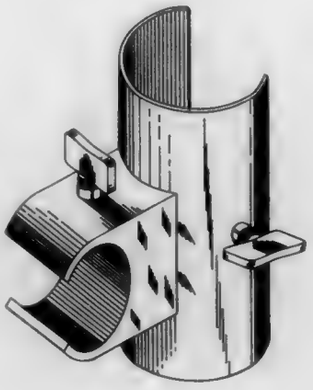
364,552
HOOK FOR SUSPENDING OR CARRYING BOTTLES CONTAINING BEVERAGES
Torbjørn Mathiassen, Vensøyveien, Box 113, N-4870 Fevik, Norway
Filed Nov. 30, 1994, Ser. No. 31,904
Claims priority, application Norway, May 30, 1994, D940347
Term of patent 14 years
U.S. Cl. D8—367

364,553
CLIP FOR HANGING PICTURE FRAMES
Arthur K. Wilson, 1050 McNicoll, Unit 12, Scarborough, Ontario, M1W 2L8, Canada
Filed Oct. 3, 1994, Ser. No. 29,255
Term of patent 14 years
U.S. Cl. D8—373

364,554
CONNECTOR MEMBER
Chun S. Seo, 1003-112 Juk Jen-Ri, Suji-Myon, Yongin-Gun Kyung Ki-Do, Rep. of Korea
Filed May 18, 1993, Ser. No. 8,452
Term of patent 14 years
U.S. Cl. D8—382



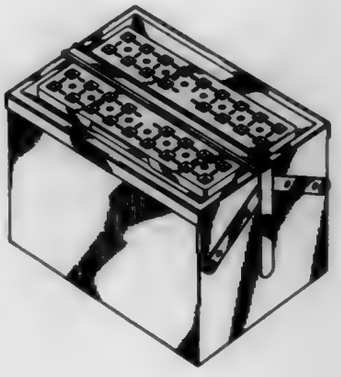
364,555
INTRAVENOUS BOTTLE STAND CLAMP
Todd W. Neiert, 5759 Hanley Close, Milford, Ohio 45150
Filed Dec. 3, 1993, Ser. No. 15,967
Term of patent 14 years
U.S. Cl. D8—396



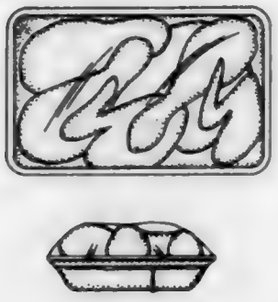
364,556
SNOW GUARD
Ho Lee, Bowie, Md., and David M. Hurr, Falls Church, Va., assignors to Snoloc Corporation, Upper Marlboro, Md.
Filed Aug. 30, 1994, Ser. No. 27,836
Term of patent 14 years
U.S. Cl. D8—499

364,557
CONTAINER
Hans Linner, Kalmar, Sweden, assignor to Norden Pac Development AB, Sweden
Filed Feb. 16, 1994, Ser. No. 18,856
Claims priority, application Sweden, Aug. 17, 1993, 93-1854
Term of patent 14 years
U.S. Cl. D9—302

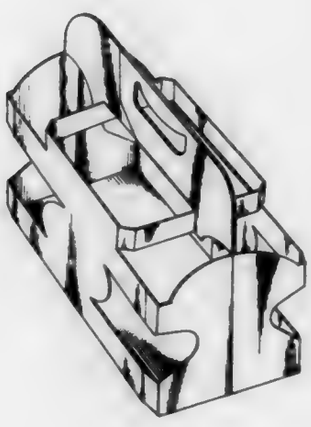
364,558
CONTAINER FOR TOYS
Jacques Guegan, L'Hay les Roses; Francis Lecocq, Hames-Boucres; Jean-Pierre Moussaud, Les Attaques; Jean-Jacques Urvoy, and Valerie Gautier, both of Paris, all of, France, assignors to Meccano, S.A., Calais, France
Filed Jun. 2, 1994, Ser. No. 23,896
Claims priority, application WIPO, Jan. 6, 1994, DM028335; Jan. 6, 1994, DM028336
Term of patent 14 years
U.S. Cl. D9—341



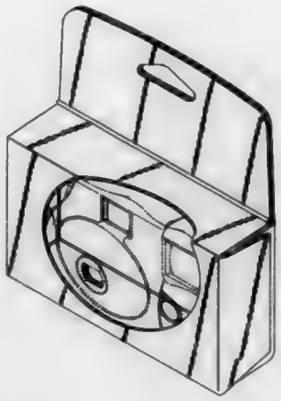
364,559
FILM WRAPPED PRODUCT FILLED TRAY HAVING AN OFFSET BOTTOM SEAL
Sidney S. Tolson, Scotland Neck, N.C., assignor to Ossid Corporation, Rocky Mount, N.C., and Ibaraki Seiki Machinery Co., Ltd., Osaka, Japan
Filed Jan. 6, 1994, Ser. No. 17,168
Term of patent 14 years
U.S. Cl. D9—345



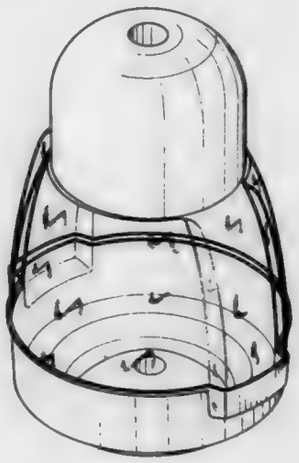
364,560
CARRIER FOR CONTAINERS
Alan B. Colvin, Minneapolis, and Joseph P. Duffy, III, Edina, both of Minn., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Sep. 28, 1994, Ser. No. 29,044
Term of patent 14 years
U.S. Cl. D9—346



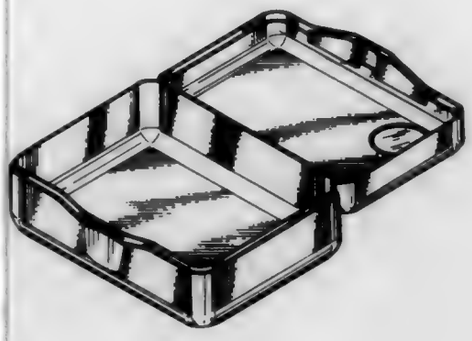
364,561
PACKAGE FOR FLASH CAMERA
Steven S. Chapman, Corfu, and Daniel C. Jackson, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 20, 1994, Ser. No. 29,973
Term of patent 14 years
U.S. Cl. D9—415



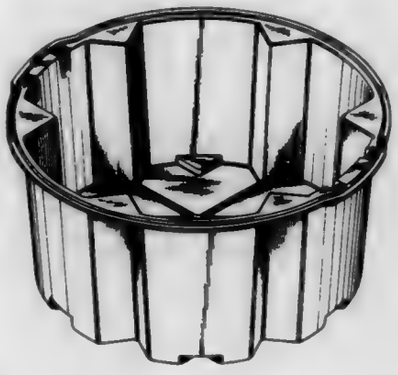
364,562
CONTAINER WITH A LID
Jørgen Pedersen-Rask, Bredsten, Denmark, assignor to Interlego AG, Baar, Switzerland
Filed Dec. 1, 1994, Ser. No. 31,663
Term of patent 14 years
U.S. Cl. D9—418



364,563
BOX
Charles D. Miller, Rockford; Joseph M. Kornick, Chicago, both of Ill., and Robert W. Pritchard, Pittsburgh, Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.
Filed Aug. 4, 1994, Ser. No. 26,760
Term of patent 14 years
U.S. Cl. D9—423

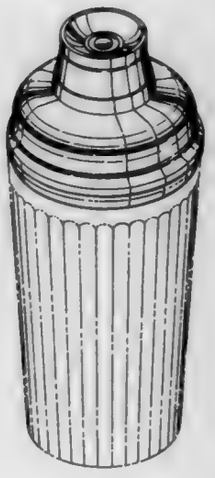


364,564
CONTAINER
Richard L. Moore, Fairhope, Ala., assignor to The Lerio Corporation, Mobile, Ala.
Filed Oct. 19, 1994, Ser. No. 29,930
Term of patent 14 years
U.S. Cl. D9—429

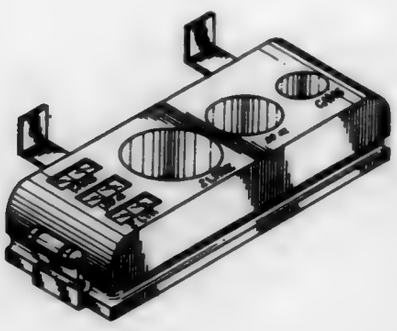


364,565
CONTAINER SIDEWALL
Dwayne G. Vailliencourt, Manchester, Mich., and Theodore F. Eberle, Jr., Kapellen, Belgium, assignors to Hoover Universal, Inc., Milwaukee, Wis.
Filed Mar. 26, 1993, Ser. No. 6,385
The portion of the term of this patent subsequent to Nov. 8, 2008, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—434

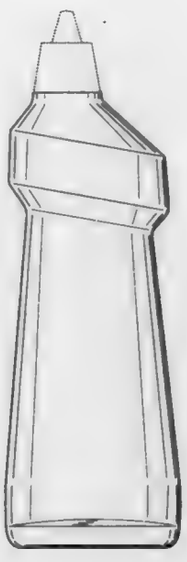
364,566
UNIQUE CAP WHICH CONVERTS A CUP INTO A HIGH QUALITY SHAKER
Morris I. Douer, P.O. Box 230-244 Gravesend Station, Brooklyn, N.Y. 11223
Filed Jun. 24, 1994, Ser. No. 24,978
Term of patent 14 years
U.S. Cl. D9—436



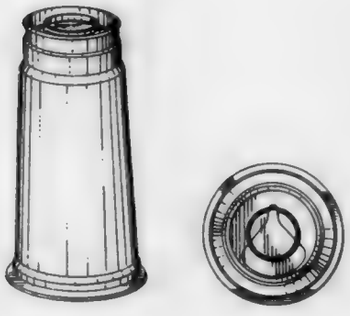
364,567
CONTAINER COVER WITH COUNTING AND DISPLAY MEANS
Ronald M. Dancel, and Leticia M. Dancel, both of 14490 Talbot, Oak Park, Mich. 48237
Filed Nov. 15, 1993, Ser. No. 15,318
Term of patent 14 years
U.S. Cl. D9—436



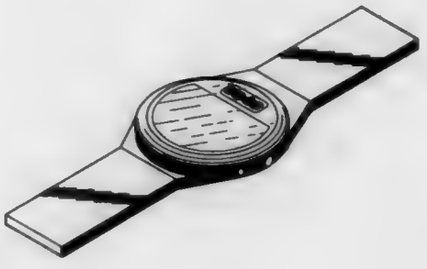
364,569
EXTERIOR SURFACE OF A BOTTLE
Gwen H. Lorio, Dublin; Katerine J. M. Ketsdever, San Francisco, both of, Calif., and Albert Hofmeister, Toledo, Ohio, assignors to The Clorox Company, Oakland, Calif.
Filed Sep. 23, 1994, Ser. No. 28,878
Term of patent 14 years
U.S. Cl. D9—523



364,568
BEVERAGE PACKAGE
Mikio Ishimoto, Tokushima, Japan, assignor to Shikoku Kakoki Co., Ltd., Tokushima, Japan
Filed Sep. 2, 1994, Ser. No. 27,950
Term of patent 14 years
U.S. Cl. D9—502



364,570
COMBINED WRISTWATCH AND PAGER WITH BAND PORTIONS
Lakdas Nanayakkara, 22822 Pine Wood Ct., Boca Raton, Fla. 33433
Filed Jul. 15, 1993, Ser. No. 10,671
The portion of the term of this patent subsequent to Sep. 19, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—31



364,571

WRIST WATCH

Atsushi Goto, Ome, and Masao Wada, Tokyo, both of, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1995, Ser. No. 34,218

Term of patent 14 years

U.S. Cl. D10—38

364,572

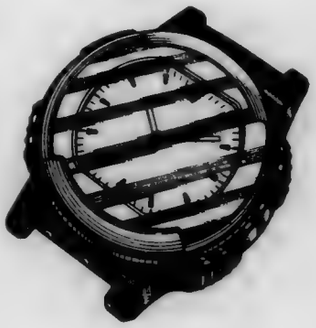
WRIST WATCH

Atsushi Goto, and Takashi Nikaido, both of Ome, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1995, Ser. No. 34,230

Term of patent 14 years

U.S. Cl. D10—39



364,573

CONTROL UNIT

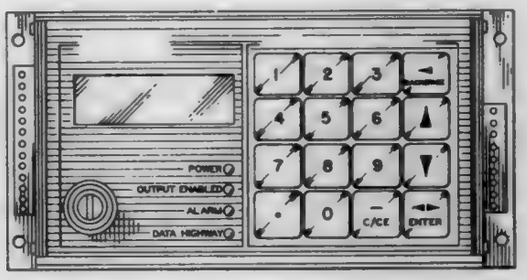
Ronald W. Pearsall, London, Canada, assignor to Accutron Systems Inc., London, Canada

Filed Mar. 31, 1994, Ser. No. 20,734

Claims priority, application Canada, Dec. 3, 1993, 03-12-93-1

Term of patent 14 years

U.S. Cl. D10—50



364,574

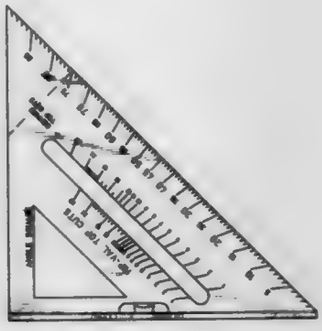
SPEED SQUARE WITH LEVEL

Russell L. Utz, and William H. Utz, Sr., both of 1002 Grand Valley Rd., Hanover, Pa. 17331

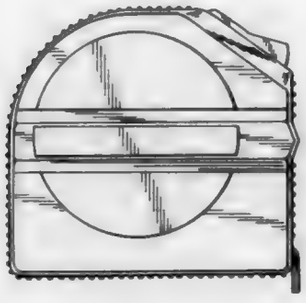
Filed Feb. 2, 1995, Ser. No. 34,348

Term of patent 14 years

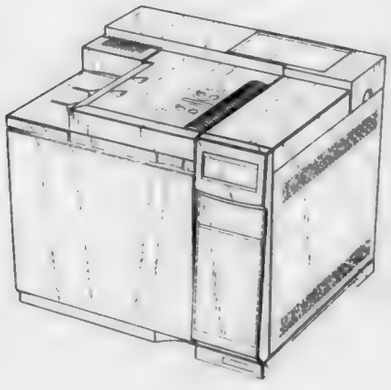
U.S. Cl. D10—62



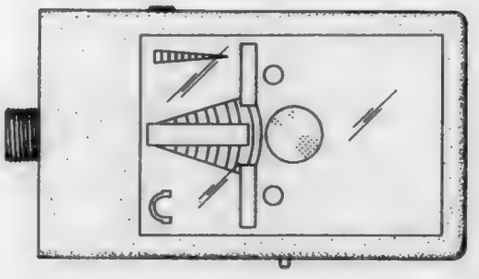
364,575
RETRACTABLE TAPE MEASURE
Sandor Goldner, 1251 46th St., Brooklyn, N.Y. 11219
Filed Jan. 31, 1992, Ser. No. 26,131
Term of patent 14 years
U.S. Cl. D10—72



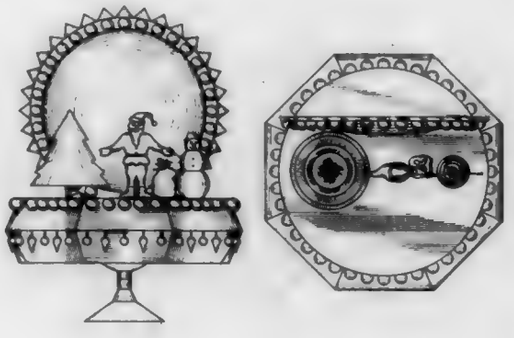
364,576
CHROMATOGRAPH
Michael D. Glaser, West Grove, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Jan. 13, 1995, Ser. No. 33,454
Term of patent 14 years
U.S. Cl. D10—81



364,577
LEAK DETECTOR
Michael W. Moore, Rising Fawn, Ga., assignor to Tenelex Industries, Inc., Chattanooga, Tenn.
Filed Nov. 10, 1994, Ser. No. 30,851
Term of patent 14 years
U.S. Cl. D10—96



364,578
CHRISTMAS ORNAMENT
Carol M. Gloston, 1211 E. 8th St., Port Arthur, Tex. 77640
Filed Dec. 16, 1994, Ser. No. 32,357
Term of patent 14 years
U.S. Cl. D11—121



364,579

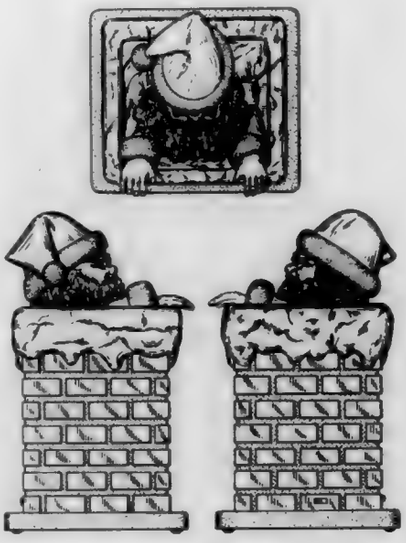
SANTA IN CHIMNEY FIGURE

Seymour Cohen, Jericho, N.Y., assignor to Telco Cretions, Inc., Hicksville, N.Y.

Filed Mar. 8, 1994, Ser. No. 19,674

Term of patent 14 years

U.S. Cl. D11—129



364,580

SCULPTURE

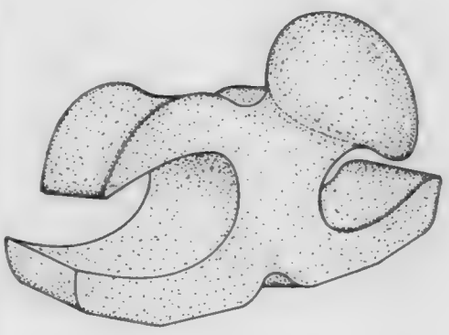
Veronique Deleuse, 25, rue des Belles Feuilles, 75116, Paris, France

Filed Nov. 29, 1993, Ser. No. 15,771

Claims priority, application France, May 28, 1993, 93 2814

Term of patent 14 years

U.S. Cl. D11—131



364,581

FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Dec. 16, 1991, Ser. No. 807,673

The portion of the term of this patent subsequent to Jul. 9, 2005, has been disclaimed.

Term of patent 14 years

U.S. Cl. D11—164

364,582

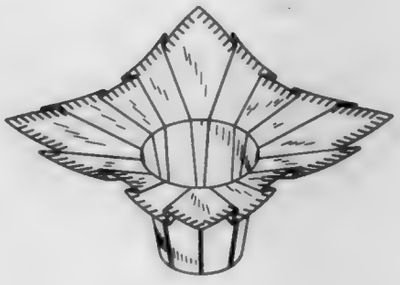
FLOWER POT COVER

Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.

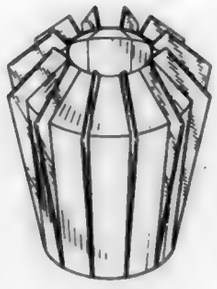
Continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Dec. 16, 1991, Ser. No. 807,897

Term of patent 14 years

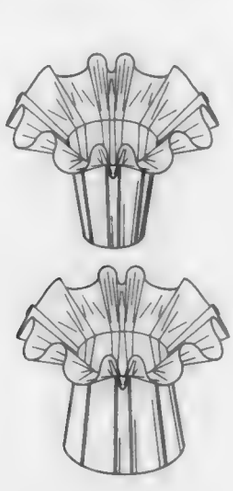
U.S. Cl. D11—164



364,583
FLOWER POT COVER WITH FINS
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, Pat. No. Des. 348,634, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, and Ser. No. 411,245, Sep. 22, 1989. This application Sep. 29, 1992, Ser. No. 953,581
The portion of the term of this patent subsequent to Sep. 19, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164

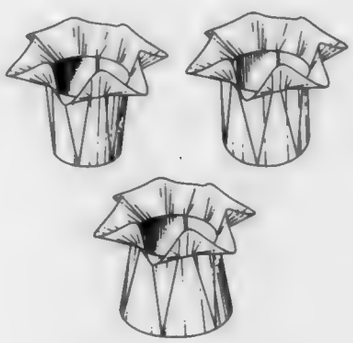


364,584
FLOWER POT COVER
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 808,566, Dec. 16, 1991, Pat. No. 8,352,918, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, said Ser. No. 710,272is a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. 8,358,113, said Ser. No. 710,272is a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, said Ser. No. 710,272is a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Dec. 23, 1992, Ser. No. 2,915
Term of patent 14 years
U.S. Cl. D11—164



364,585
FLOWER POT COVER
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 807,674, Dec. 16, 1991, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, said Ser. No. 710,272is a continuation of Ser. No. 411,245, Sep. 22, 1989, said Ser. No. 710,272is a continuation of Ser. No. 411,247, Sep. 22, 1989, said Ser. No. 710,272is a continuation of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113. This application Dec. 23, 1992, Ser. No. 2,916
Term of patent 14 years
U.S. Cl. D11—164

364,586
FLOWER POT COVER
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to Highland Supply Corporation, Highland, Ill.
Continuation-in-part of Ser. No. 808,315, Dec. 16, 1991, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, said Ser. No. 710,272and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, said Ser. No. 710,272and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, said Ser. No. 710,272and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Jan. 8, 1993, Ser. No. 3,582
Term of patent 14 years
U.S. Cl. D11—164



364,587

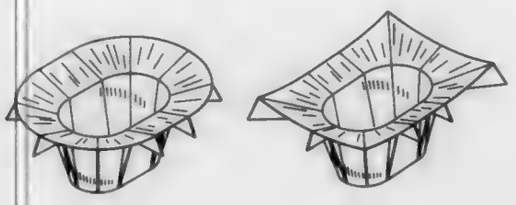
FLOWER POT COVER

Donald E. Weder, Highland, Ill., and Jon S. Shryock, Bethany, Okla., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 781,453, Oct. 21, 1991, Pat. No. 8,348,634, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. 8,358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Jun. 11, 1993, Ser. No. 9,447

Term of patent 14 years

U.S. Cl. D11—164



364,588

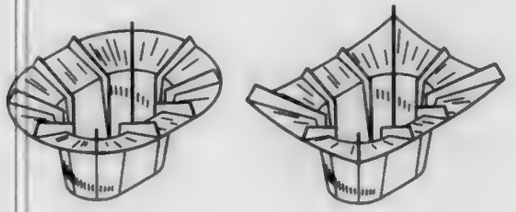
FLOWER POT COVER

Donald E. Weder, Highland, Ill., and Jon S. Shryock, Bethany, Okla., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 782,237, Oct. 18, 1991, Pat. No. Des. 349,076, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Jun. 11, 1993, Ser. No. 9,457

Term of patent 14 years

U.S. Cl. D11—164



364,589

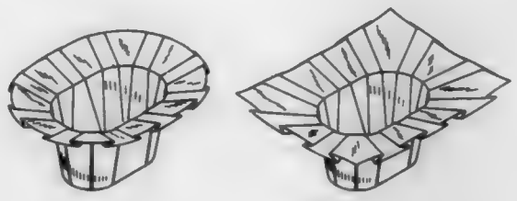
FLOWER POT COVER

Donald E. Weder, Highland, Ill., and Jon S. Shryock, Bethany, Okla., assignors to Highland Supply Corporation, Highland, Ill.

Continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, said Ser. No. 710,272and a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. 8,358,113, said Ser. No. 710,272and a continuation-in-part of Ser. No. 411,247, Sep. 22, 1989, said Ser. No. 710,272and a continuation-in-part of Ser. No. 411,245, Sep. 22, 1989. This application Jun. 14, 1993, Ser. No. 9,490

Term of patent 14 years

U.S. Cl. D11—164



364,590

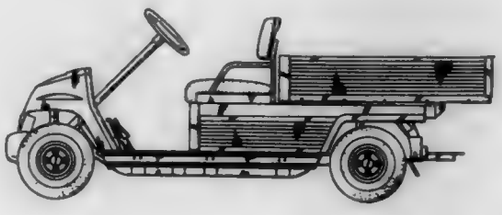
UTILITY VEHICLE

Izumi Yamashita, Newnan, Ga., assignor to Yamaha Motor Manufacturing Corporation of America, Newnan, Ga.

Filed May 11, 1994, Ser. No. 22,756

Term of patent 14 years

U.S. Cl. D12—15

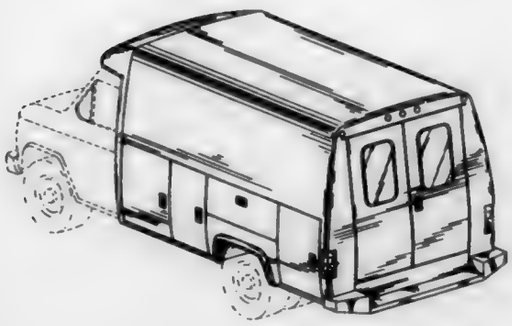


364,591

VAN BODY

Richard Lewellen, and Robert M. Lapsley, both of Wooster, Ohio, assignors to Stahl/Scott Fetzer Company, Wooster, Ohio

Filed May 9, 1994, Ser. No. 22,612
Term of patent 14 years
U.S. Cl. D12—96

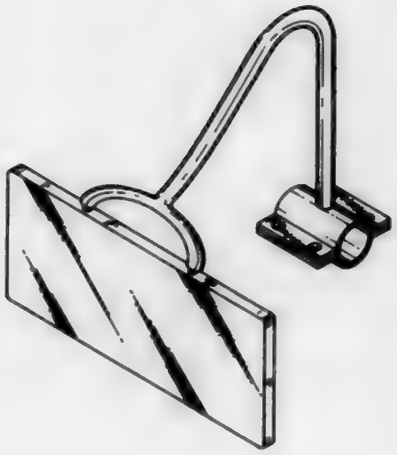


364,592

STROLLER MOUNTABLE SUN VISOR

Judith A. Thompson, 40154 166th St. East, Palmdale, Calif. 93591

Filed Aug. 16, 1994, Ser. No. 27,205
Term of patent 14 years
U.S. Cl. D12—133

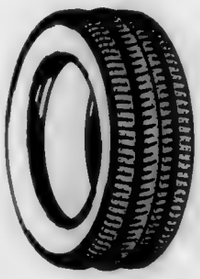


364,593

AUTOMOBILE TIRE

Masatoshi Tanaka, Takarazuka, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Jun. 20, 1994, Ser. No. 24,672
Claims priority, application Japan, Dec. 21, 1993, 5-39106
Term of patent 14 years
U.S. Cl. D12—146



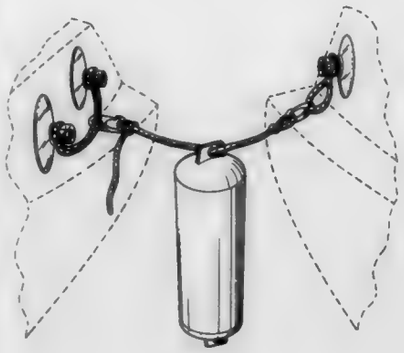
364,594

TIRE TREAD

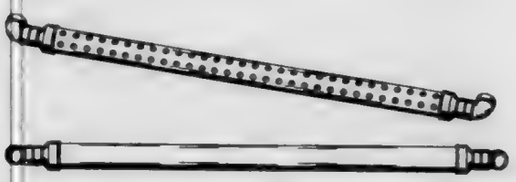
Dennis W. Krupa, Kent; James G. Guspodin, Akron, and Roger W. Marble, Kent, all of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Jul. 21, 1994, Ser. No. 26,187
Term of patent 14 years
U.S. Cl. D12—147

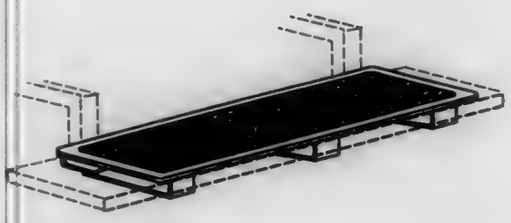
364,595
AQUATIC VESSEL CONNECTOR WITH SUCTION CUPS
Patrick W. Doyle, Willits, Calif., assignor to Chakota LLC, Emeryville, Calif.
Continuation-in-part of Ser. No. 3,138, Dec. 29, 1992, Pat. No. Des. 353,355. This application Dec. 12, 1994, Ser. No. 32,258
Term of patent 14 years
U.S. Cl. D12—168



364,596
VEHICULAR PIPE
James C. Stewart, P.O. Box 321, Elverta, Calif. 95626
Filed Aug. 22, 1994, Ser. No. 27,400
Term of patent 14 years
U.S. Cl. D12—194



364,597
ATTACHABLE TRUCK MAT
James D. Branch, 4355 Crestview Dr., Norco, Calif. 91760
Filed Nov. 8, 1993, Ser. No. 15,021
Term of patent 14 years
U.S. Cl. D12—203



364,598
BOAT OAR
Marvin Eversole, Rte. 2 Box 313, Aurora, N.C. 27806
Filed Jul. 25, 1994, Ser. No. 26,397
Term of patent 14 years
U.S. Cl. D12—215

364,599
WATER CRAFT
Gregory M. Burton, Seattle, Wash., assignor to Ocean Kayak, Inc., Ferndale, Wash.
Filed Jan. 6, 1995, Ser. No. 33,234
Term of patent 14 years
U.S. Cl. D12—302

364,600

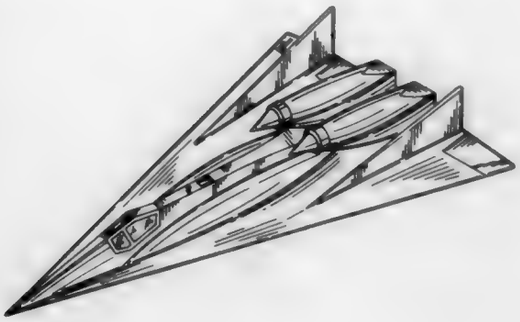
AIRPLANE

John J. Andrews, San Diego, Calif., assignor to The Testor Corporation, Rockford, Ill.

Filed Apr. 20, 1994, Ser. No. 21,562

Term of patent 14 years

U.S. Cl. D12—333



364,601

BATTERY UNIT

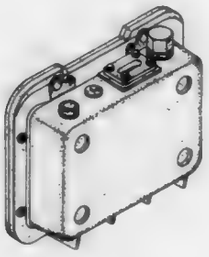
Yumio Iwaki, Odawara; Yoshihiro Sekino, Ichihara, and Yoshitaka Watanabe, Nagareyama, all of, Japan, assignors to Japex Geoscience Institute, Inc., Tokyo, Japan

Filed Dec. 2, 1994, Ser. No. 32,761

Claims priority, application Japan, Jun. 3, 1994, 6-16282

Term of patent 14 years

U.S. Cl. D13—103



364,602

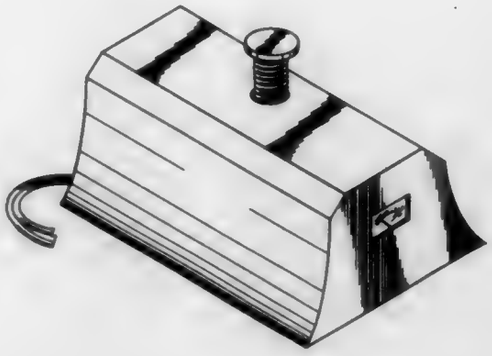
MANUALLY DRIVEN ALTERNATOR FOR BATTERY JUMP-STARTING

John Qualls; Robert Qualls, and Miklos Penzes, all of 933 7th St., Wyandotte, Mich. 48192

Filed Sep. 6, 1994, Ser. No. 27,987

Term of patent 14 years

U.S. Cl. D13—112



364,603

LIGHT RECEIVING MODULE

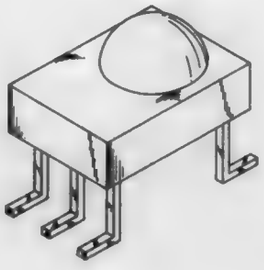
Masao Tanaka; Susumu Maeta, and Takashi Yamaoka, all of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, and Tottori Sanyo Electric Co., Ltd., Tottori, both of, Japan

Filed Nov. 21, 1994, Ser. No. 31,296

Claims priority, application Japan, Jun. 20, 1994, 6-18265

Term of patent 14 years

U.S. Cl. D13—165



364,604

LIGHT RECEIVING MODULE

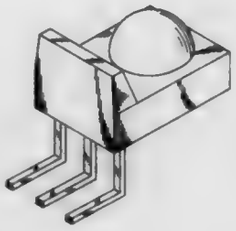
Masuo Tanaka, and Susumu Maeta, both of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, and Totori Sanyo Electric Co., Ltd., Tottori, both of, Japan

Filed Nov. 21, 1994, Ser. No. 31,297

Claims priority, application Japan, Jul. 27, 1994, 6-22728

Term of patent 14 years

U.S. Cl. D13—165



364,605

COMPUTER

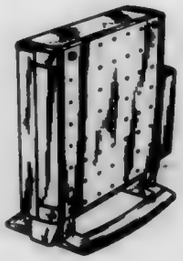
Jochen Backs, San Francisco, Calif., assignor to Samsung Electronics Co. Ltd., Kung-do, Rep. of Korea

Filed Jul. 7, 1994, Ser. No. 25,627

Claims priority, application Rep. of Korea, Jan. 7, 1994, 1994-233

Term of patent 14 years

U.S. Cl. D14—100



364,606

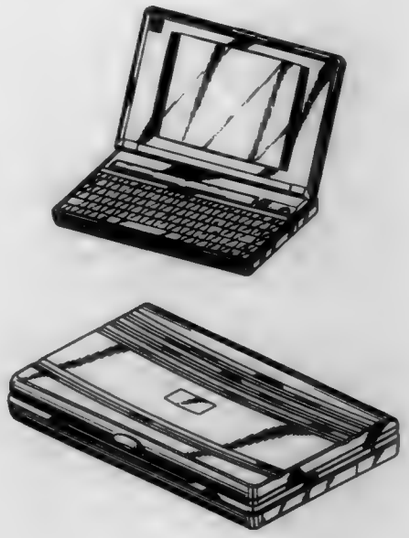
PORTABLE COMPUTER

Robert P. Bliven, Corvallis, Oreg., assignor to Hewlett- Packard Corporation, Palo Alto, Calif.

Filed Nov. 4, 1994, Ser. No. 30,633

Term of patent 14 years

U.S. Cl. D14—106



364,607

MONITOR FOR COMPUTERS

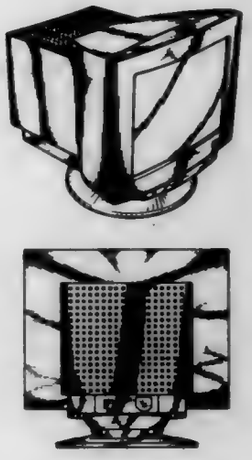
Jochen Backs, San Francisco, Calif., assignor to Samsung Electronics Co. Ltd., Kung-Do, Rep. of Korea

Filed Jul. 7, 1994, Ser. No. 25,631

Claims priority, application Rep. of Korea, Jan. 7, 1994, 1994-235

Term of patent 14 years

U.S. Cl. D14—113



364,608

CRT DISPLAY

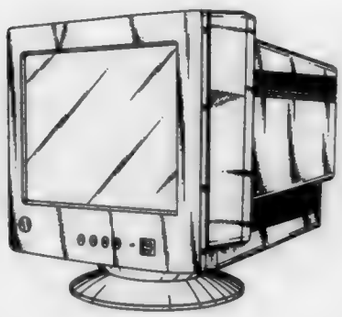
Kazuo Nakada, Kanagawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 10, 1994, Ser. No. 26,970

Claims priority, application Japan, Feb. 21, 1994, 6-4156

Term of patent 14 years

U.S. Cl. D14—113



364,609

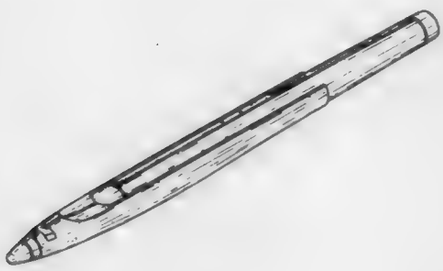
COMPUTER INPUT DEVICE

Russell Sanchez; Steven T. Kaneko; Bridget Greenberg; Mike M. Paull, all of Seattle, Wash., and Robert Dillon, Portland, Oreg., assignors to Microsoft Corporation, Redmond, Wash.

Filed May 18, 1994, Ser. No. 23,097

Term of patent 14 years

U.S. Cl. D14—114



364,610

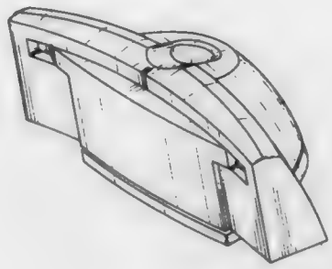
COMPUTER INPUT DEVICE

Russell Sanchez; Steven T. Kaneko; Bridget Greenberg; Mike M. Paull, all of Seattle, Wash., and Robert Dillon, Portland, Oreg., assignors to Microsoft Corporation, Redmond, Wash.

Filed May 18, 1994, Ser. No. 23,196

Term of patent 14 years

U.S. Cl. D14—114



364,611

CHASSIS FOR HOUSING ELECTRICAL COMPONENTS OF A RADIO FREQUENCY COMMUNICATION SYSTEM

Lisa M. Leding, 107 Bent Creek Ct., Palatine, Ill. 60067; Arnold R. Crater, 101 Stirling La., Schaumburg, Ill. 60194; Ron Santoro, 1424 Keele Dr., Carpentersville, Ill. 60110; Amy McKernan, 1050 N. Benson La., Green Oaks, Ill. 60048, and David A. Chrest, 2039 Muirfield Cir., Elgin, Ill. 60123

Filed Sep. 23, 1994, Ser. No. 28,872

Term of patent 14 years

U.S. Cl. D14—114

364,612

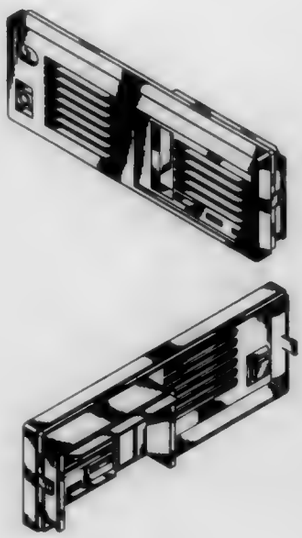
FRONT PANEL FOR A TAPE DRIVE POWER UNIT WITH INTEGRATED TAPE DRIVE

Steven L. Felde; Jay E. Lee, and Hsifu Wang, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 14,184, Oct. 14, 1993. This application Apr. 14, 1995, Ser. No. 37,518

Term of patent 14 years

U.S. Cl. D14—115



364,613

FACSIMILE

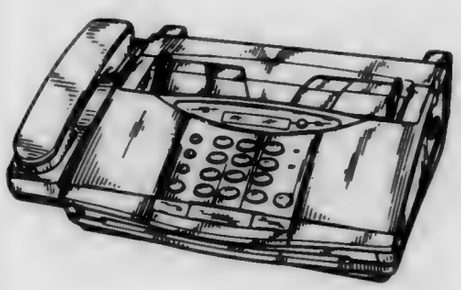
Bong U. Lim, Kyunggi-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyunggi-do, Rep. of Korea

Filed Feb. 10, 1994, Ser. No. 18,728

Claims priority, application Rep. of Korea, Nov. 19, 1993, 23714

Term of patent 14 years

U.S. Cl. D14—118



364,614

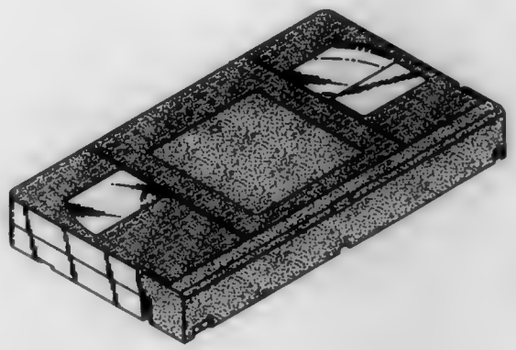
VIDEOCASSETTE

John A. Bailey, Woodbury; Glenn A. Bloomer, Maplewood; Gregory H. Johnson, Oakdale, all of Minn.; Mark J. Cieslo, Hilliard, and Donald J. Staufenberg, Dublin, both of Ohio, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 5, 1994, Ser. No. 20,909

Term of patent 14 years

U.S. Cl. D14—121



364,615

MOUNT FOR OVERHEAD TRANSPARENCY

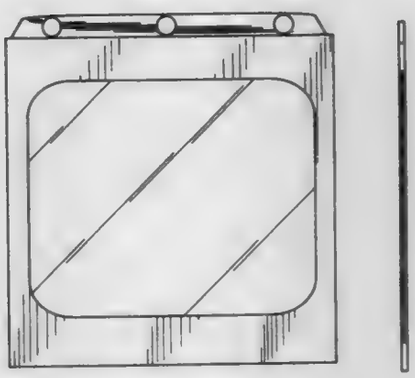
Robert J. Radel, Florence, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Filed Jun. 14, 1993, Ser. No. 9,466

The portion of the term of this patent subsequent to May 23, 2009, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—123



364,616

HOUSING OF A HAND-HELD TYPE PORTABLE TELEPHONE

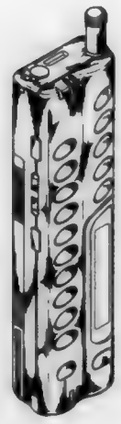
Teruo Oda, Gamagori; Kenzi Nakamura, Toyota; Yoshito Itoh, Nagoya; Yumiko Kimura, Tokyo, and Hiroshi Kobayashi, Hidaka, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, and Nippon Idou Tsushin Corporation, Tokyo, both of, Japan

Filed Dec. 7, 1994, Ser. No. 31,860

Claims priority, application Japan, Jun. 8, 1994, 6-16973

Term of patent 14 years

U.S. Cl. D14—138



364,617

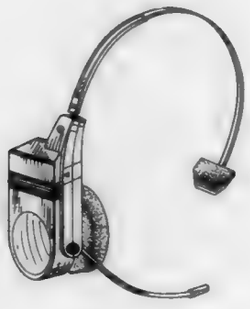
CORDLESS TELEPHONE HEADSET

Robert M. Fitzgerald, 233 Milwaukee, Denver, Colo. 80206

Filed Nov. 29, 1993, Ser. No. 15,780

Term of patent 14 years

U.S. Cl. D14—142



364,618

TELEPHONE BASESTATION

Vincent Somoza, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 27, 1994, Ser. No. 30,329

Claims priority, application Canada, Jul. 27, 1994, 1994-1473

Term of patent 14 years

U.S. Cl. D14—142

364,619

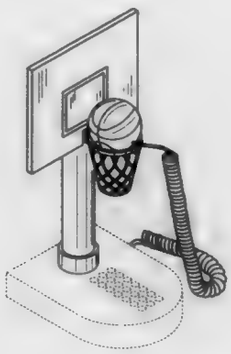
BASKETBALL TELEPHONE

Katherine Kilo, 38 Countryside La., St. Louis, Mo. 63131

Filed Jul. 29, 1994, Ser. No. 26,221

Term of patent 14 years

U.S. Cl. D14—143



364,620

TELEPHONE HANDSET

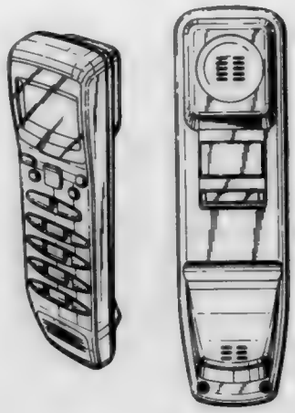
Sean Prior, Richmond, and Mark R. Mason, Hemel Hempstead, both of, United Kingdom, assignors to Nokia Mobile Phones Ltd., Salo, Finland

Filed Dec. 2, 1994, Ser. No. 31,672

Claims priority, application United Kingdom, Jun. 2, 1994, 2039440

Term of patent 14 years

U.S. Cl. D14—147



364,621

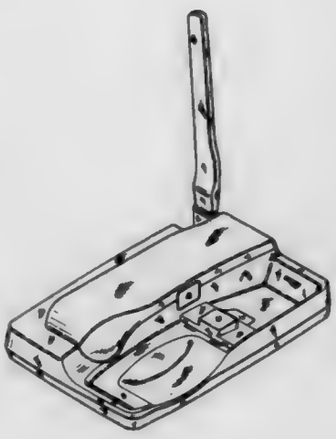
TELEPHONE STAND

John E. Clarke, Colts Neck, N.J.; David C. Danielson, Litchfield, Conn.; Bernard A. DeSiena, Parlin, N.J.; Sonia M. Estevez-Alcolado, Holmdel, N.J.; James R. Graham, Bedminster, N.J.; Michael L. Moroze, New Egypt, N.J.; Daniel J. O'Donnell, Flanders, N.J.; Donald A. Palaski, Tinton Falls, N.J.; Dhirendra M. Patel, Jersey City, N.J.; Robert T. Saizan, Howell, N.J.; David C. Stowers, Nutley, N.J., and Susan L. Tuttle, East Windsor, N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 5, 1994, Ser. No. 31,718

Term of patent 14 years

U.S. Cl. D14—149



364,622

TELEPHONE STATION

Stefan Hillenmayer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 7, 1993, Ser. No. 7,992

Claims priority, application Germany, Nov. 9, 1992, M9208269.6

The portion of the term of this patent subsequent to Oct. 4, 2006, has been disclaimed.

Term of patent 14 years

U.S. Cl. D14—151

364,623

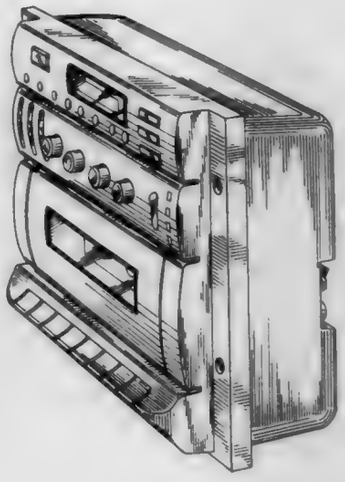
AM/FM CASETTE PLAYER

Michael Khadivar, 5151 N. Shore, Lincolnwood, Ill. 60646

Filed Jun. 8, 1994, Ser. No. 24,115

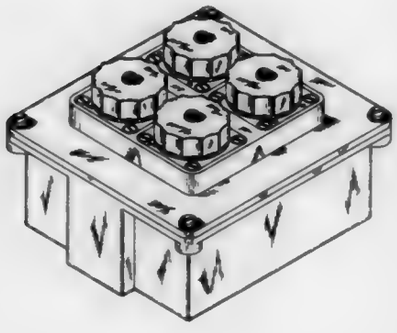
Term of patent 14 years

U.S. Cl. D14—162

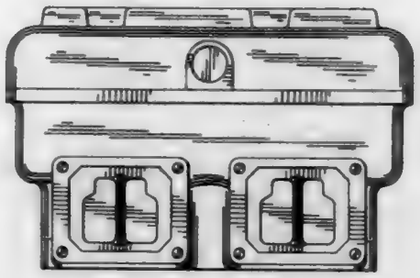


364,624
FOLDING ANTENNA FOR A PORTABLE RADIO PACKET MODEM
William E. Fenton, Surrey; Brian Redman, Richmond, and Roman P. Rak, Delta, all of, Canada, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 7, 1994, Ser. No. 18,418
Term of patent 14 years
U.S. Cl. D14—234

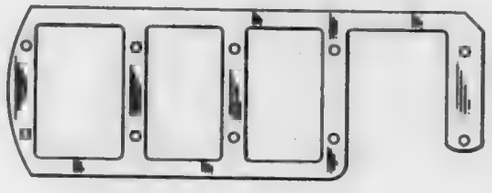
364,625
FOUR-GANG JACKBOX ASSEMBLY
Frank Grande, Highland Beach, Fla., assignor to Hose-McCann Telephone Co., Inc., Deerfield Beach, Fla.
Filed Apr. 15, 1994, Ser. No. 21,415
The portion of the term of this patent subsequent to Mar. 7, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—240



364,626
COMBINED ENGINE CYLINDER AND HEAD
Charles R. Brown, 8038 SE. Ogden, Portland, Oreg. 97206
Filed Jan. 21, 1994, Ser. No. 17,744
Term of patent 14 years
U.S. Cl. D15—5



364,627
MAIN CAP STUD GIRDLE
Richard R. Brush, 24 Chenango Bridge Rd., Binghamton, N.Y. 13901
Filed Jan. 24, 1994, Ser. No. 17,861
Term of patent 14 years
U.S. Cl. D15—5



364,628

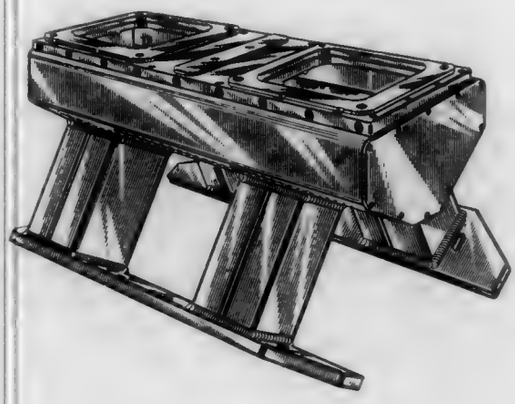
INTAKE MANIFOLD

Fred T. Haller, 7352 N. Lawndale, Skokie, Ill. 60076, assignor to Fred T. Haller, Skokie, Ill.

Filed Oct. 13, 1994, Ser. No. 29,694

Term of patent 14 years

U.S. Cl. D15—5



364,629

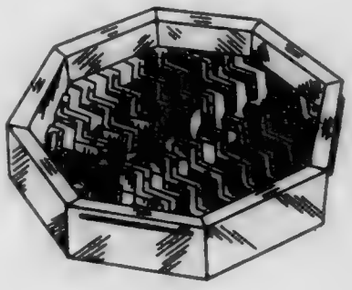
DRUM TOP DRAINFIELD FUNNEL

Mark D. Shaw, 9620 Preston Trail, Pointe Vedra Beach, Fla. 32082; J. Tad Heyman, 11858 Olde Oaks Ct. N., Jacksonville, Fla. 32223; Laurence M. Bierce, 105 Sandra Rd., Jacksonville, Fla. 32211, and Jesse Ehredt, 1711 Duffton Ln., Painesville, Ohio 44077

Filed Jul. 7, 1994, Ser. No. 25,634

Term of patent 14 years

U.S. Cl. D15—150



364,630

OIL FUNNEL

Mark Akiona, 91-1139 Mikohu St. #27-D, Ewa Beach, Hi. 96706-3828

Filed Jan. 19, 1995, Ser. No. 33,750

Term of patent 14 years

U.S. Cl. D15—150

364,631

BINOCULARS

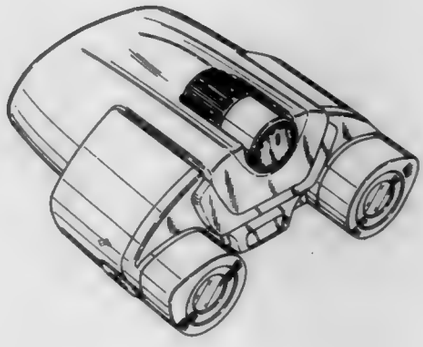
Toshihiro Hamamura, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1994, Ser. No. 23,907

Claims priority, application Japan, Dec. 2, 1993, 5-36531

Term of patent 14 years

U.S. Cl. D16—133

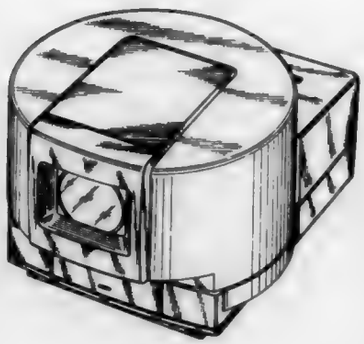


364,632

TELEVISION CAMERA

Toshihiro Nakashima; Makoto Nishida, and Kazuma Yoshimura, all of Fukuoka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 21, 1994, Ser. No. 32,595
Claims priority, application Japan, Jun. 21, 1994, 6-18364
Term of patent 14 years
U.S. Cl. D16—202

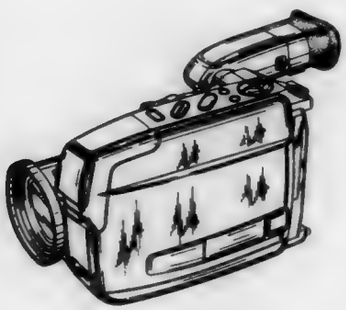


364,633

VIDEO CAMERA WITH VIDEO TAPE RECORDER

Masaaki Goto, and Shigetada Ninomiya, both of Ehime, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 21, 1995, Ser. No. 35,138
Claims priority, application Japan, Sep. 29, 1994, 6-29812
Term of patent 14 years
U.S. Cl. D16—202

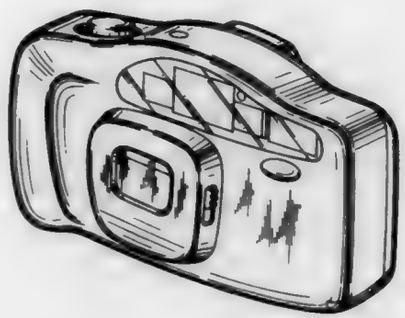


364,634

35 MM CAMERA

Takeshi Matsushita, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1994, Ser. No. 32,879
Claims priority, application Japan, Jun. 30, 1994, 6-19393
Term of patent 14 years
U.S. Cl. D16—209

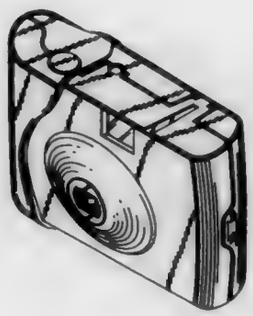


364,635

DAYLIGHT CAMERA

Steven S. Chapman, Corfu; John K. McBride, Rochester, and James G. Rydelek, Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1994, Ser. No. 30,415
Term of patent 14 years
U.S. Cl. D16—218



364,636

SPECTACLES

Tien-Tzu Chang, No. 1, Alley 99, Lane 274, S. Chung-Chen Road, Yung-Kang, Tainan Shien, Taiwan, Prov. of China

Filed Jul. 11, 1994, Ser. No. 25,750

Term of patent 14 years

U.S. Cl. D16—306

364,637

SPECTACLES

Tien-Tzu Chang, No. 1, Alley 99, Lane 274, S. Chung-Chen Road, Yung-Kang, Tainan Shien, Taiwan, Prov. of China

Filed Jul. 11, 1994, Ser. No. 25,751

Term of patent 14 years

U.S. Cl. D16—306

364,638

SUNGLASSES

Luciano Simioni, Montebelluna, Italy, assignor to Killer Loop S.p.A., Pederobba, Italy

Filed Jul. 15, 1994, Ser. No. 25,902

Claims priority, application Italy, Jan. 17, 1994, TV940000005

Term of patent 14 years

U.S. Cl. D16—327

364,639

PRINTER FOR ELECTRONIC COMPUTER

Naoki Tashiro, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

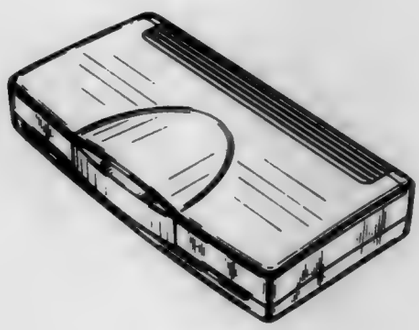
Filed Mar. 28, 1994, Ser. No. 20,556

Claims priority, application Japan, Sep. 29, 1993, 5-29391

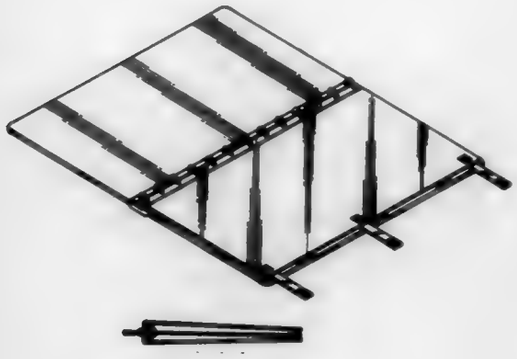
The portion of the term of this patent subsequent to Nov. 1, 2008, has been disclaimed.

Term of patent 14 years

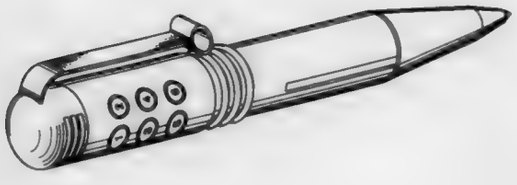
U.S. Cl. D18—50



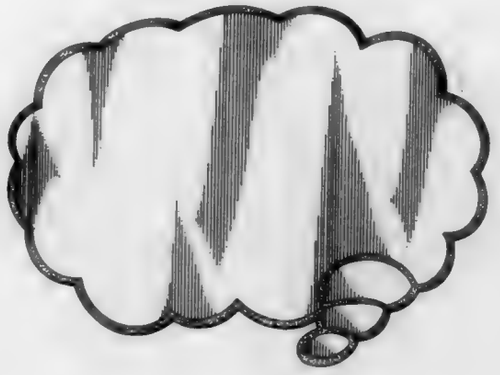
364,640
BINDER FOR LARGE SHEETS
Tim Zimbelman, 1036 Limestone Cir., Vrela, Calif. 96097
Filed Nov. 4, 1993, Ser. No. 14,897
Term of patent 14 years
U.S. Cl. D19—27



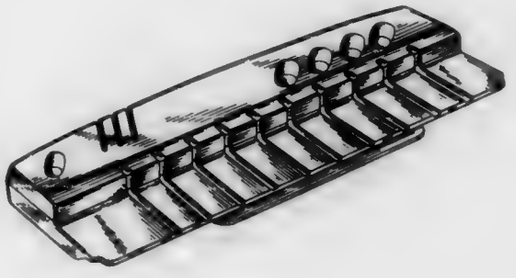
364,641
PEN RECORDER HOUSING
Ralph F. Osterhout, San Francisco, Calif., assignor to Tiger Electronics, Inc., Vernon Hills, Ill.
Filed Jan. 6, 1995, Ser. No. 33,206
Term of patent 14 years
U.S. Cl. D19—36



364,642
WRITING BOARD
Philip S. Adler, 1034 Selby Ave., Los Angeles, Calif. 90024
Division of Ser. No. 17,325, Jan. 11, 1994, Pat. No. Des. 361,347. This application May 8, 1995, Ser. No. 38,580
Term of patent 14 years
U.S. Cl. D19—52



364,643
ELECTRONIC QUIZ UNIT FOR ATTACHMENT TO BOOKS
Eddie J. Marfori, Lakewood, and Gregory B. Bergeron, La Habra, both of Calif., assignors to Educational Insights, Dominguez Hills, Calif.
Filed Aug. 12, 1994, Ser. No. 27,086
Term of patent 14 years
U.S. Cl. D19—60



364,644

TRANSFER TAPE HOLDER

Kazuya Watanabe, and Kiyofumi Hayashi, both of Osaka, Japan, assignors to Fujicopian Co., Ltd., Osaka, Japan

Filed Dec. 27, 1994, Ser. No. 32,757
Claims priority, application Japan, Sep. 6, 1994, 6-27139
Term of patent 14 years

U.S. Cl. D19—69

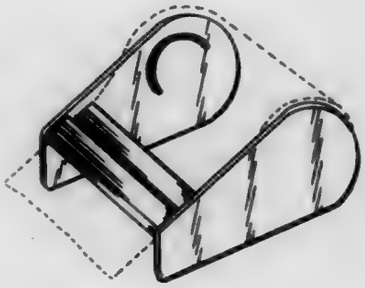
364,645

ROLL NOTE DISPENSER

Drake L. Koch, Kansas City, Mo., assignor to Z-International, Inc., North Kansas City, Mo.

Filed Apr. 18, 1994, Ser. No. 21,573
Term of patent 14 years

U.S. Cl. D19—89



364,646

COLD DRINK VENDING MACHINE

Albert J. Maldonis, Rockwall, Tex., assignor to Rowe International, Inc., Grand Rapids, Mich.

Filed Apr. 2, 1993, Ser. No. 6,592
Term of patent 14 years

U.S. Cl. D20—4

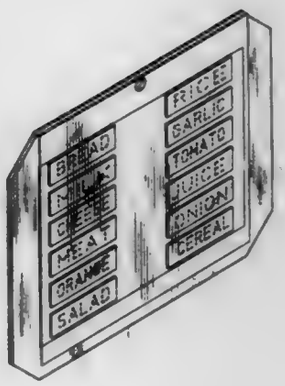
364,647

DISPLAY BOARD FOR A GROCERY LIST

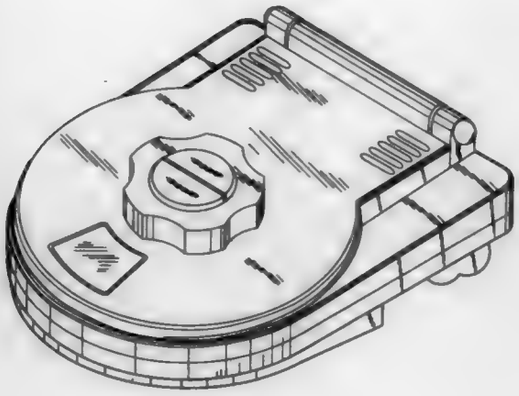
Barbara S. Johnson, 7035 Moondale La., Dallas, Tex. 75217

Filed Nov. 10, 1994, Ser. No. 30,886
Term of patent 14 years

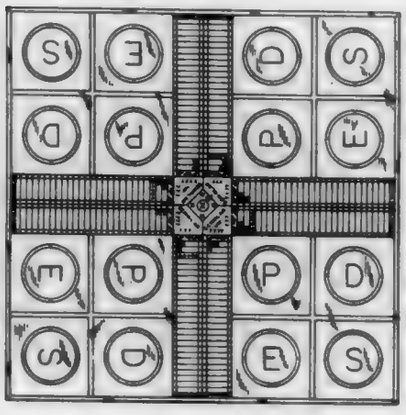
U.S. Cl. D20—18



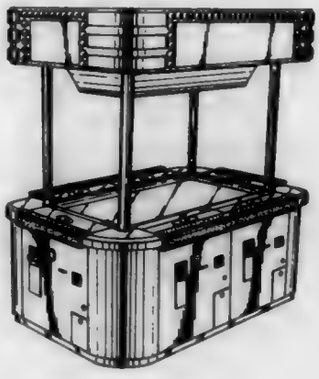
364,648
HAND-HELD ELECTRONIC GAME HOUSING
Ralph F. Osterhout, San Francisco, Calif., assignor to Tiger Electronics, Inc., Vernon Hills, Ill.
Filed Jan. 13, 1995, Ser. No. 33,520
Term of patent 14 years
U.S. Cl. D21—13



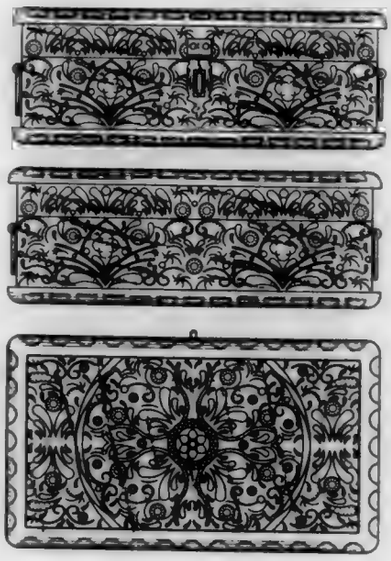
364,649
GAME BOARD
Nelson Diaz, 2273 Church Ave., Brooklyn, N.Y. 11226
Filed May 5, 1994, Ser. No. 22,433
Term of patent 14 years
U.S. Cl. D21—34



364,650
VIDEO CRAPS TABLE
Cory J. Hanscom, New Hope, Minn., assignor to Innovative Gaming Corporation of America, Plymouth, Minn.
Filed Jun. 24, 1994, Ser. No. 24,959
Term of patent 14 years
U.S. Cl. D21—37



364,651
BOX FOR A MAGICAL TOOTH FAIRY KIT
Karen L. Anderson, and Keith E. Anderson, both of 1422 Mountain Valley Bend, Nashville, Tenn. 37209
Continuation of Ser. No. 10,138, Jul. 1, 1993, abandoned. This application Jul. 5, 1994, Ser. No. 25,497
Term of patent 14 years
U.S. Cl. D21—59



364,652

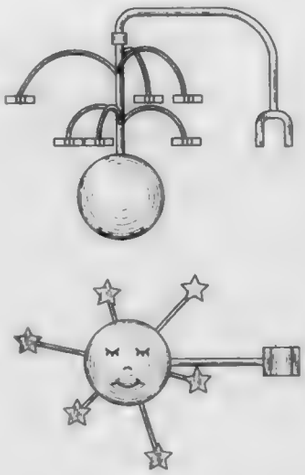
MOON AND STARS GLOW IN THE DARK BABY MOBILE

Annette Santana, 712 Curtis Dr., Pennsville, N.J. 08070

Filed Apr. 25, 1994, Ser. No. 21,892

Term of patent 14 years

U.S. Cl. D21—63



364,653

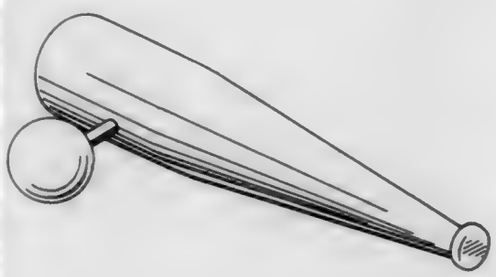
BASEBALL NOISE MAKER

Bonnie C. Boden, 107 Roxborough Street West, Apt. #2, Toronto, Ontario, Canada

Filed Aug. 15, 1994, Ser. No. 27,343

Term of patent 14 years

U.S. Cl. D21—64



364,654

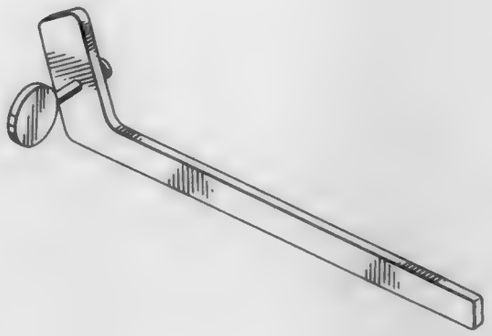
HOCKEY NOISE MAKER

Bonnie C. Boden, 107 Roxborough Street West, Apt. #2, Toronto, Ontario, Canada

Filed Aug. 15, 1994, Ser. No. 27,344

Term of patent 14 years

U.S. Cl. D21—64



364,655

TOY BALLOON

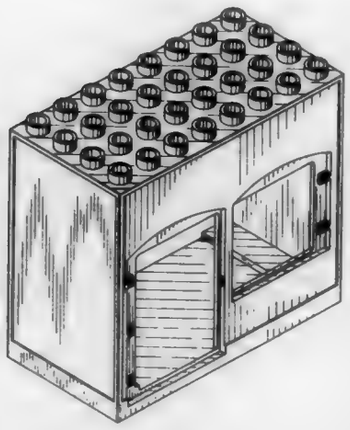
Randy H. Weinstein, Oxnard, Calif., assignor to Betta Products, Inc., Oxnard, Calif.

Filed Jul. 25, 1994, Ser. No. 26,341

Term of patent 14 years

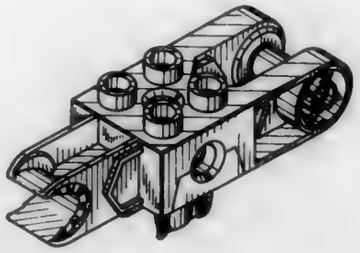
U.S. Cl. D21—84

364,656
TOY BUILDING ELEMENT
Ede F. Ruszkai, Copenhagen, Denmark, assignor to Interlego AG, Baar, Switzerland
Filed Sep. 29, 1994, Ser. No. 29,132
Term of patent 14 years
U.S. Cl. D21—108



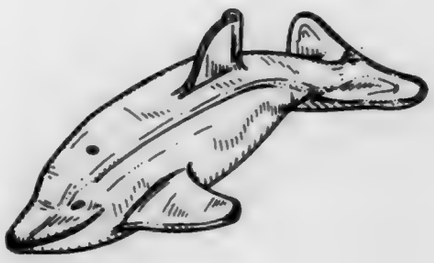
364,657
BELT DRIVE WHEEL FOR A TOY BUILDING SET
Sten Schmidt, Grindsted, and Kurt Jensen, Vejle, both of, Denmark, assignors to Interlego AG, Baar, Switzerland
Filed Sep. 29, 1994, Ser. No. 29,141
Term of patent 14 years
U.S. Cl. D21—108

364,658
TOY BUILDING ELEMENT
Per Brømse, Copenhagen, Denmark, assignor to Interlego AG, Baar, Switzerland
Filed Sep. 29, 1994, Ser. No. 29,154
Term of patent 14 years
U.S. Cl. D21—108



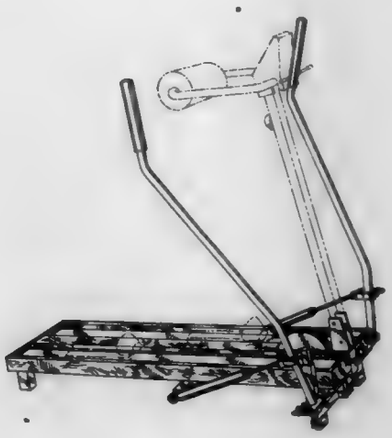
364,659
TOY SWORD
Chung-Hing Choi, Hong Kong, Hong Kong, assignor to Hing Fat Toys Manufacturer Limited, Hong Kong, Japan
Filed Oct. 19, 1994, Ser. No. 29,913
Term of patent 14 years
U.S. Cl. D21—145

364,660
TOY DOLPHIN
Helle Rahbek, Vildbjerg, Denmark, assignor to Interlego AG, Baar, Switzerland
Filed Sep. 29, 1994, Ser. No. 29,103
Term of patent 14 years
U.S. Cl. D21—157



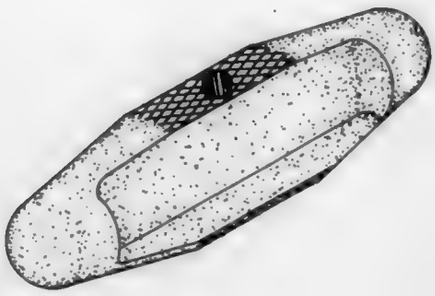
364,661
ILLUMINATED DOLL
Maria-Teresa Azocar, 6141 Franconia Station La., Alexandria, Va. 22310
Filed Dec. 7, 1994, Ser. No. 31,831
Term of patent 14 years
U.S. Cl. D21—171

364,662
COMBINED BASE AND ARM MECHANISM FOR A SKI EXERCISE MACHINE
David K. Camfield, Olney, and Jeffrey D. Metcalf, Albion, both of Ill., assignors to Roadmaster Corporation, Olney, Ill.
Division of Ser. No. 24,843, Jun. 22, 1994, which is a continuation of Ser. No. 9,717, Jan. 27, 1993, Pat. No. 5,338,273. This application Jun. 5, 1995, Ser. No. 33,136
Term of patent 14 years
U.S. Cl. D21—191



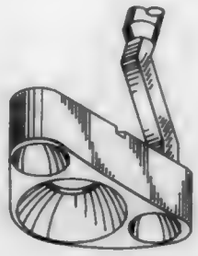
364,663
RUBBER BALL
Douglas A. Engel, 2935 W. Chenango Ave., Englewood, Colo. 80110
Filed Aug. 26, 1994, Ser. No. 27,658
Term of patent 14 years
U.S. Cl. D21—204

364,664
GOLF PUTTER HEAD
Sean P. McNamara, Orchard Hill Rd., Katonah, N.Y. 10536
Filed Jul. 27, 1994, Ser. No. 26,387
Term of patent 14 years
U.S. Cl. D21—217

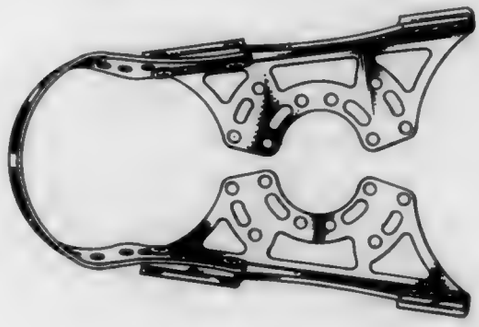


364,665
GOLF CLUB HEAD
Burton J. Goodrich, 1030 Timberline Dr., Portland, Oreg. 97201
Filed Sep. 30, 1994, Ser. No. 29,243
Term of patent 14 years
U.S. Cl. D21—217

364,666
GOLF PUTTER
Emil Nagy, P.O. Box 668, Claremont, N.H. 03743
Filed Jul. 14, 1994, Ser. No. 25,882
Term of patent 14 years
U.S. Cl. D21—219



364,667
SNOW BOARD BINDING
Duane E. Pacha, 23707 Via Canon #201, Newhall, Calif. 91321
Filed Mar. 20, 1995, Ser. No. 36,403
Term of patent 14 years
U.S. Cl. D21—230



364,668

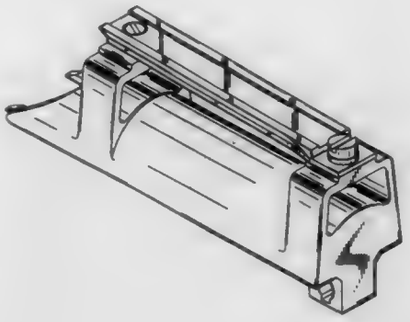
RIFLE SCOPE MOUNT AND RECEIVER COVER

Da Keng, 875 Wharton Dr., SW., Atlanta, Ga. 30336

Filed Apr. 29, 1994, Ser. No. 22,087

Term of patent 14 years

U.S. Cl. D22—110



364,669

PERSONAL PROTECTION SPRAY DISPENSER

Kevin D. Winner, Hermitage, Pa., assignor to Winner International Royalty Corporation, Sharon, Pa.

Filed Mar. 2, 1994, Ser. No. 19,386

Term of patent 14 years

U.S. Cl. D22—117

364,670

FISHING LURE PLUG

Ronald Dennison, 14975 Unity Rd., New Springfield, Ohio 44443

Filed Jun. 27, 1994, Ser. No. 25,068

Term of patent 14 years

U.S. Cl. D22—133

364,671

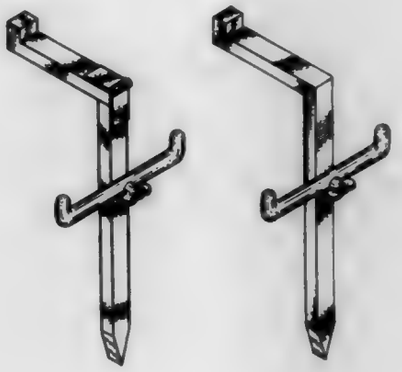
FISHING ROD HOLDER

Robert E. Perry, Jr., P.O. Box 175, Bath, N.Y. 14810

Filed Jul. 15, 1994, Ser. No. 25,975

Term of patent 14 years

U.S. Cl. D22—147

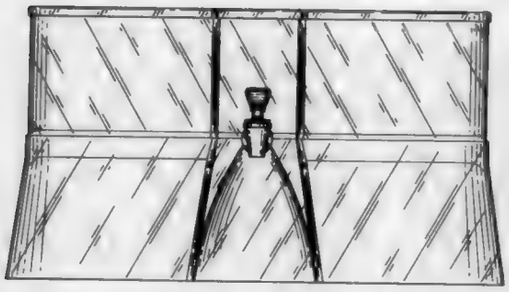


364,672

COUNTERTOP WATER PURIFICATION UNIT

Alfred J. Lipshultz, 4090 Lake Dr., Coconut Creek, Fla. 33066, and Mitchell Lipshultz, 4100 Galt Ocean Dr. #1601, Ft. Lauderdale, Fla. 33308

Filed Jul. 18, 1994, Ser. No. 26,046
Term of patent 14 years
U.S. Cl. D23—209



364,673

SPRAY GUN

Morgan Gustafsson, Oberägeri, Sweden, assignor to Bo Nyberg, Oberageri, Sweden

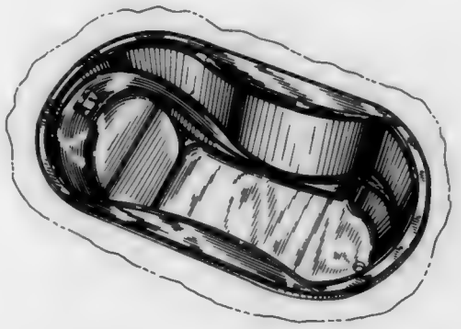
Filed Dec. 2, 1994, Ser. No. 31,909
Claims priority, application Sweden, Jun. 2, 1994, 94-1281
Term of patent 14 years
U.S. Cl. D23—223

364,674

TUB FOR BATHING

Carter J. Thomas, Port Washington; Todd D. Dannenberg, and Mary J. Reid, both of Sheboygan, all of Wis., assignors to Kohler Co., Kohler, Wis.

Filed Jan. 25, 1995, Ser. No. 33,972
Term of patent 14 years
U.S. Cl. D23—280.4



364,675

DOUBLE BOWL WASH BASIN

Sharon M. Tebbe, 5299 Banker Dr., Fairfield, Ohio 45014

Filed May 11, 1992, Ser. No. 880,990
Term of patent 14 years
U.S. Cl. D23—290

364,676

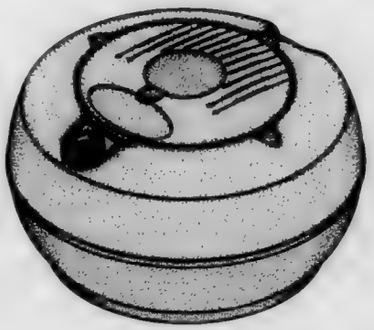
COOL MIST IMPELLER HUMIDIFIER

Bernard Chiu, Wellesley; John Longan, Natick, both of Mass., and Robert L. Marvin, Jr., Farmington, Conn., assignors to Duracraft Corporation, Whitinsville, Mass.

Filed Jan. 9, 1995, Ser. No. 33,302

Term of patent 14 years

U.S. Cl. D23—356



364,677

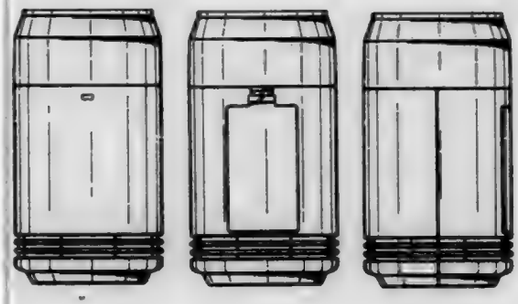
DEODORIZER

Hai P. Cheng, Hong Kong, Hong Kong, assignor to Topace Company, Hong Kong

Filed Nov. 17, 1994, Ser. No. 31,264

Term of patent 14 years

U.S. Cl. D23—366



364,678

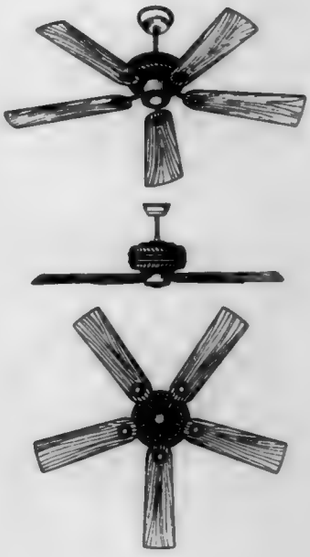
COMBINED CEILING FAN AND LIGHT

Ching-Tan Lee, No. 52 Lane 488, Section 2, Fenghsi Rd., Fengyuan, Taichung Hsien, Taiwan, Prov. of China

Filed May 31, 1995, Ser. No. 39,441

Term of patent 14 years

U.S. Cl. D23—377



364,679

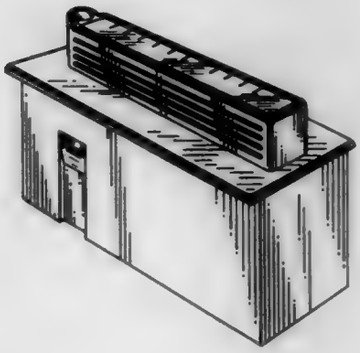
WOUND DRAINAGE DISPOSABLE CANISTER

Keith Heaton, Poole, United Kingdom, and Cesar Z. Lina, Universal City, Tex., assignors to Kinetic Concepts, Inc., San Antonio, Tex.

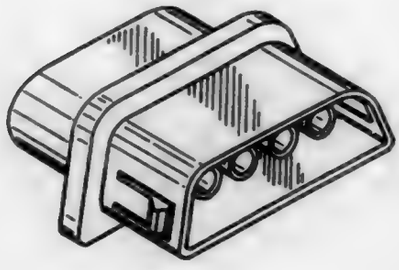
Filed Aug. 22, 1994, Ser. No. 27,446

Term of patent 14 years

U.S. Cl. D24—118



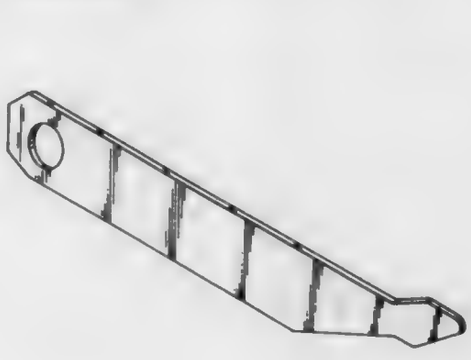
364,680
CONNECTOR FOR APPLYING COMPRESSIVE PRESSURE TO THE LEG
John F. Dye, Bridgewater, Mass., assignor to The Kendall Company, Mansfield, Mass.
Filed Apr. 26, 1994, Ser. No. 21,941
The portion of the term of this patent subsequent to Apr. 25, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D24—129



364,681
SURGICAL EYE RESTRAINT INSTRUMENT
Richard G. Livernois, 400 Newport Center Dr., Suite 704, Newport Beach, Calif. 92660
Filed Apr. 7, 1993, Ser. No. 6,856
Term of patent 14 years
U.S. Cl. D24—133

364,682
EPILATOR
Albart J. Kip, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 10, 1994, Ser. No. 26,968
Claims priority, application WIPO, Feb. 24, 1994, DM/028 798
Term of patent 14 years
U.S. Cl. D24—133

364,683
SURGICAL KNIFE DEPTH GAUGE
Norio Otsuka, Sheki, Japan, assignor to Feather Safety Razor Co., Ltd., Osaka, Japan
Filed Sep. 2, 1993, Ser. No. 12,516
Claims priority, application Japan, Mar. 5, 1993, 5-6124
Term of patent 14 years
U.S. Cl. D24—140



364,684

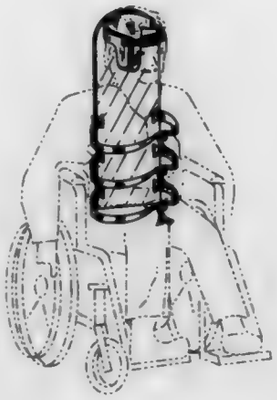
COMBINED CERVICAL AND HEAD SUPPORT

Karen L. Bonn, Brandenburg, Ky., and Lawrence A. Brown, Pekin, Ind., assignors to Restorative Medical, Inc., Brandenburg, Ky.

Filed Apr. 1, 1994, Ser. No. 20,774

Term of patent 14 years

U.S. Cl. D24—191



364,685

PACIFIER

Steven C. Christensen, 22 Tahanto St., Concord, N.H. 03301

Continuation-in-part of Ser. No. 747,535, Aug. 12, 1991, abandoned. This application Apr. 5, 1994, Ser. No. 20,907

Term of patent 14 years

U.S. Cl. D24—195

364,686

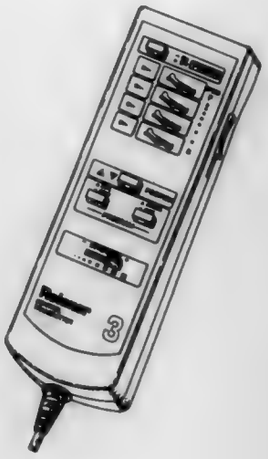
WAND FOR A MASSAGE SYSTEM

Maurice G. T. Teo, Central, Hong Kong, and Craig M. Loud, Whittier, Calif., assignors to JB Research, Inc., Los Angeles, Calif.

Filed Dec. 10, 1993, Ser. No. 16,221

Term of patent 14 years

U.S. Cl. D24—200



364,687

MASSAGER

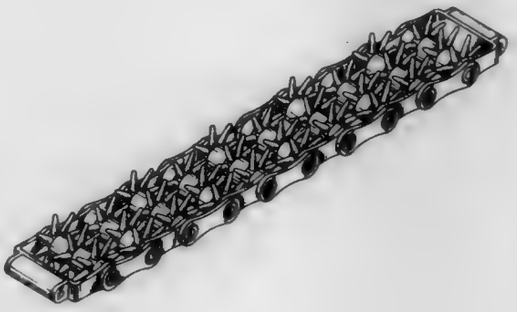
Kam S. Yim, and Kwong T. Tsang, both of Flat/Room B 6/F, High Win Factory Building, 47 Hoi Yuen Road, Kwun Tong, Kowloon, Hong Kong

Filed Aug. 2, 1994, Ser. No. 26,635

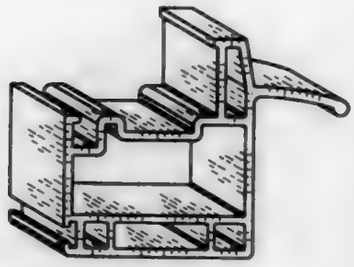
Claims priority, application United Kingdom, Feb. 2, 1994, 2036723

Term of patent 14 years

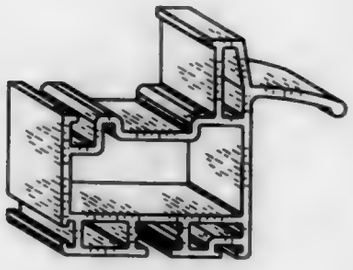
U.S. Cl. D24—211



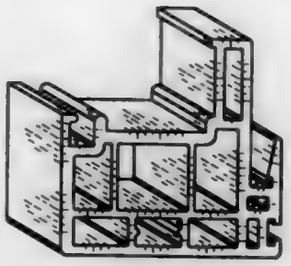
364,688
WINDOW COMPONENT EXTRUSION
Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.
Filed Dec. 15, 1994, Ser. No. 32,247
Term of patent 14 years
U.S. Cl. D25—124



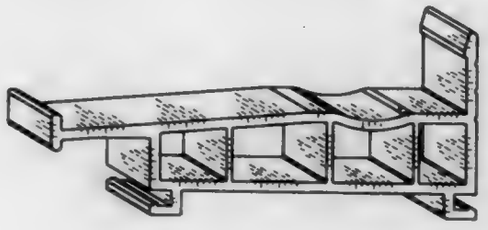
364,689
WINDOW COMPONENT EXTRUSION
Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.
Filed Dec. 15, 1994, Ser. No. 32,248
Term of patent 14 years
U.S. Cl. D25—124



364,690
WINDOW COMPONENT EXTRUSION
Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.
Filed Dec. 15, 1994, Ser. No. 32,286
Term of patent 14 years
U.S. Cl. D25—124



364,691
WINDOW COMPONENT EXTRUSION
Lorane C. Goss, Jr., Slippery Rock, Pa., assignor to Mikron Industries, Inc., Kent, Wash.
Filed Dec. 15, 1994, Ser. No. 32,246
Term of patent 14 years
U.S. Cl. D25—125

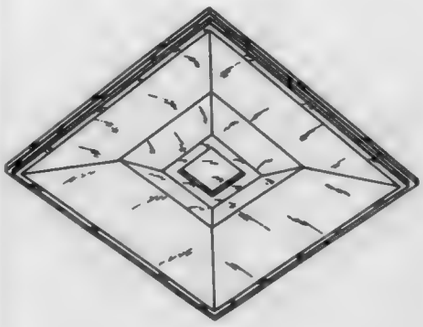


364,692

FIBERGLASS REINFORCED GYPSUM CEILING PANEL

William J. Tinen, Glenview, Ill., assignor to USG Interiors, Inc., Chicago, Ill.

Filed Nov. 30, 1994, Ser. No. 31,509
Term of patent 14 years
U.S. Cl. D25—138



364,693

BUILDING TOOL FOR AN IGLOO

William L. Peery, P.O. Box 312, Jonesville, Vt. 05466

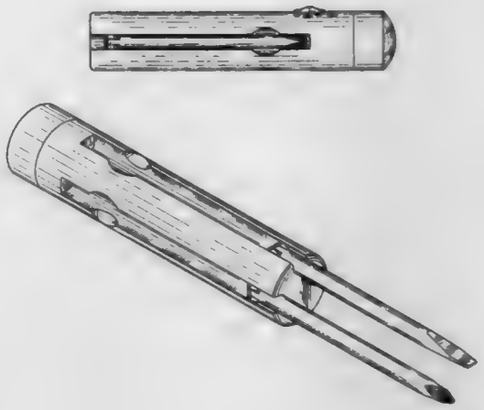
Filed Jun. 27, 1994, Ser. No. 25,035
Term of patent 14 years
U.S. Cl. D25—199

364,694

COMBINED DUAL END FLASHLIGHT AND TOOL SET

John D. Silvia, 911 Running Brook Dr., Prattville, Ala. 36066-6134

Filed Feb. 2, 1994, Ser. No. 18,288
Term of patent 14 years
U.S. Cl. D26—38

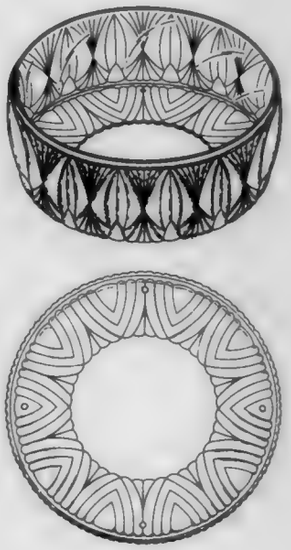


364,695

LAMP SHADE

San-Jyh Yan, 58, Ma Yuan West St., Taichung, Taiwan, Prov. of China

Filed Aug. 11, 1994, Ser. No. 27,050
Term of patent 14 years
U.S. Cl. D26—131



364,696

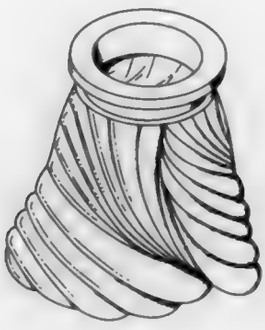
LAMP SHADE

Wesley Chen, 58, Ma Yuan West St., Taichung, Taiwan, Prov. of China

Filed Aug. 11, 1994, Ser. No. 27,049

Term of patent 14 years

U.S. Cl. D26—133



364,697

GLASS SHADE

Chi J. Chen, No. 101, Jian-Shan,Chi-Ding,Li,Jwu-Nan Jenn, Miau-Li Hsien, Taiwan, Prov. of China

Filed Oct. 4, 1994, Ser. No. 29,350

Term of patent 14 years

U.S. Cl. D26—133

364,698

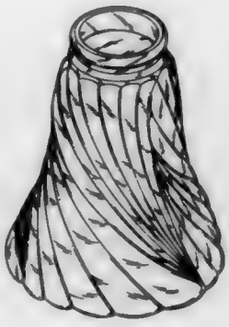
GLASS SHADE

Chi J. Chen, No. 101,, Jian-Shan, Chi-Ding, Li, Jwu-Nan Jenn, Miau-Li Hsien, Taiwan, Prov. of China

Filed Oct. 4, 1994, Ser. No. 29,352

Term of patent 14 years

U.S. Cl. D26—133



364,699

LAMP SHADE

San-Jyh Yan, 58, Ma Yuan West St., Taichung, Taiwan, Prov. of China

Filed Aug. 11, 1994, Ser. No. 27,051

Term of patent 14 years

U.S. Cl. D26—134

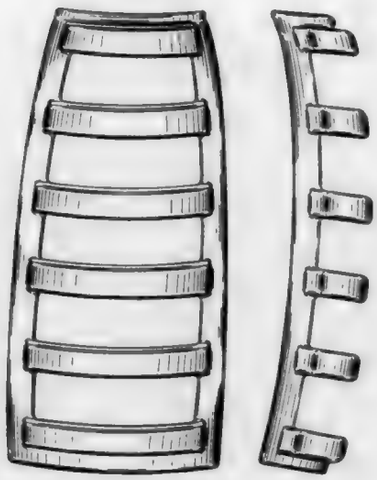
364,700
GLASS SHADE
Chi J. Chen, No. 101, Jian-Shan, Chi-Ding Li, Jwu-Nan Jenn, Miau-Li Hsien, Taiwan, Prov. of China
Filed Oct. 4, 1994, Ser. No. 29,353
Term of patent 14 years
U.S. Cl. D26—134

364,701
GLASS SHADE
Chun F. Sung, No. 1427, Ren-Ay Rd., Chi-Ding Li, Jwu-Nan Jenn, Miau-Li Hsien, Taiwan, Prov. of China
Filed Oct. 4, 1994, Ser. No. 29,347
Term of patent 14 years
U.S. Cl. D26—136

364,702
GLASS SHADE
Chun F. Sung, No. 1427, Ren-Ay Rd., Chi-Ding Li, Jwu-Nan Jenn, Miau-Li Hsien, Taiwan, Prov. of China
Filed Oct. 4, 1994, Ser. No. 29,348
Term of patent 14 years
U.S. Cl. D26—136

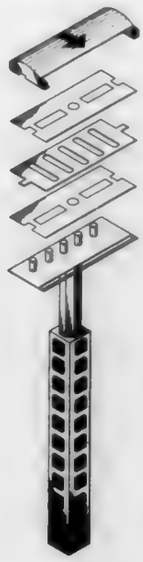
364,703
GLASS SHADE
Chi J. Chen, No. 101, Jian-Shan, Chi-Ding Li, Jwu-Nan Jenn, Miau-Li Hsien, Taiwan, Prov. of China
Filed Oct. 4, 1994, Ser. No. 29,349
Term of patent 14 years
U.S. Cl. D26—136

364,704
TAILLIGHT LENS PROTECTOR FOR A VEHICLE
Craig N. Alger, 312 Otterson Dr., Ste. H, Chico, Calif. 95928
Filed Nov. 15, 1994, Ser. No. 31,010
Term of patent 14 years
U.S. Cl. D26—139

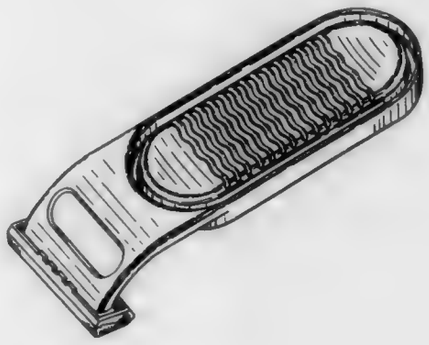


364,705
HAIR ACCESSORY
Chad R. Frame, and Bridget R. Frame, both of 1920 Parkview Ave., Rock Springs, Wyo. 82901
Filed Jan. 27, 1993, Ser. No. 4,126
Term of patent 14 years
U.S. Cl. D28—41

364,706
RAZOR
Sean Corcoran, 38 Westview Rd., Northport, N.Y. 11768
Filed Dec. 16, 1991, Ser. No. 808,288
Term of patent 14 years
U.S. Cl. D28—46



364,707
RAZOR
Jill M. Shurtleff, South Boston, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Sep. 21, 1993, Ser. No. 13,217
Term of patent 14 years
U.S. Cl. D28—46



364,708

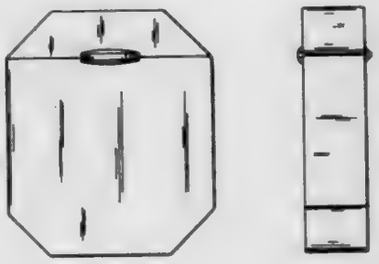
DENTAL FLOSS HOLDER

Emanuel B. Tarrson; Andrew Alger, and Lew Blahuta, all of Chicago, Ill., assignors to John O. Butler Company, Chicago, Ill.

Continuation of Ser. No. 341,069, Apr. 20, 1989, abandoned. This application Aug. 21, 1992, Ser. No. 933,878

Term of patent 14 years

U.S. Cl. D28—64



364,709

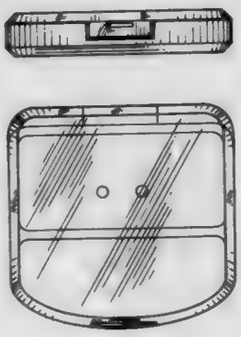
EYESHADOW COMPACT

Ellen Gavin, Atlantic Highlands, N.J., assignor to L'Oreal SA, France

Filed Aug. 1, 1994, Ser. No. 26,589

Term of patent 14 years

U.S. Cl. D28—78



364,710

BATTERY POWERED HEATED EAR COVERS

Nathan Byrd, 112 Hoyt St. #5J, Stamford, Conn. 06905

Filed Jul. 20, 1994, Ser. No. 26,139

Term of patent 14 years

U.S. Cl. D29—112

364,711

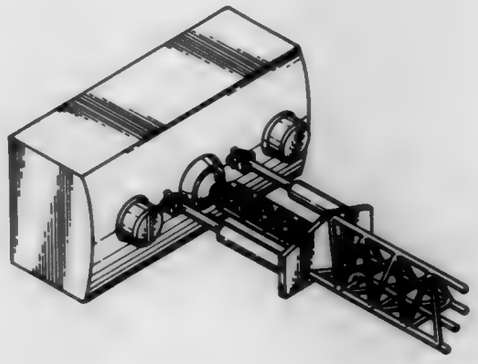
FIRE FIGHTING SPRAYING UNIT AND SHIELD

Eugene Fleming, 1505 N. Myrtlewood St., Philadelphia, Pa. 19121

Filed Jul. 22, 1993, Ser. No. 10,916

Term of patent 14 years

U.S. Cl. D29—125



364,712

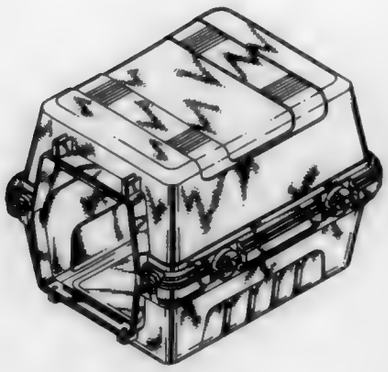
PET KENNEL

Thomas B. Murphy, Arlington; Melaney L. Northrop, Cleburne, and Richard Nesbitt, Arlington, all of Tex., assignors to Doskocil Manufacturing Company, Inc., Arlington, Tex.

Filed Jun. 1, 1994, Ser. No. 23,829

Term of patent 14 years

U.S. Cl. D30—108



364,713

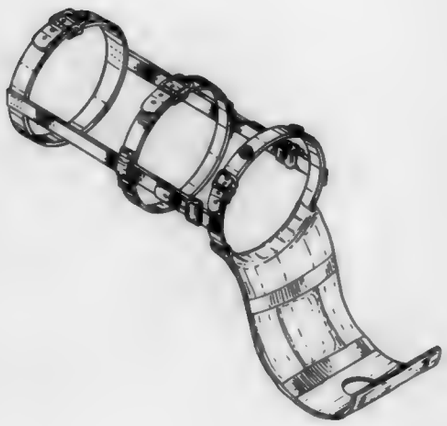
DOG HARNESS FOR FEMALE DOGS IN HEAT

Edward Daville, 390 Holly St., Bridge City, Tex. 77611

Filed Apr. 25, 1994, Ser. No. 21,839

Term of patent 14 years

U.S. Cl. D30—144



364,714

CYLINDRICAL DIPSTICK CLEANER

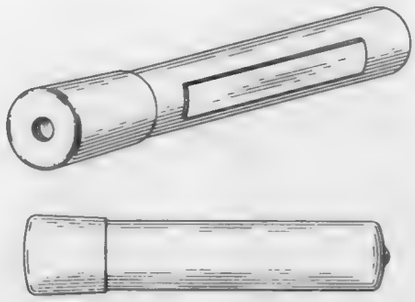
Robert T. Jeffery, San Francisco, Calif., assignor to LDB Automotive, Inc., Daly City, Calif.

Filed Nov. 4, 1992, Ser. No. 1,117

The portion of the term of this patent subsequent to Nov. 9, 2007, has been disclaimed.

Term of patent 14 years

U.S. Cl. D32—35



364,715

WASHING TOOL ATTACHMENT FOR HOSE

Denise S. Amram, 9 Carluke Crescent, Willowdale, Ontario, Canada, and Charles G. Shepherd, 1008 Westdale Road, Oakville, Ontario, Canada

Filed Apr. 3, 1995, Ser. No. 37,020

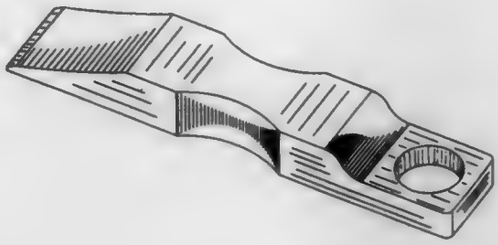
Term of patent 14 years

U.S. Cl. D32—35

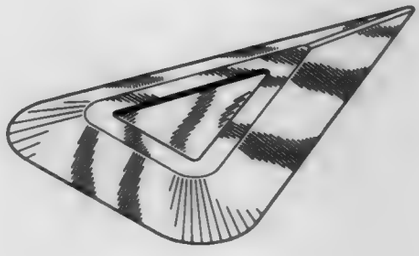
364,716
MOP HEAD
Johanna D. Lazar, 117 E. 57th St., New York, N.Y. 10022
Continuation of Ser. No. 824,507, Jan. 23, 1992, Pat. No. 5,199,130. This application Mar. 22, 1993, Ser. No. 6,051
Term of patent 14 years
U.S. Cl. D32—40

364,717
DEVICE FOR MAINTENANCE OF A SWIMMING POOL
Virginia M. Trapp, 1024 Northwood Rd., Augusta, Ga. 30909
Filed Oct. 13, 1993, Ser. No. 14,139
Term of patent 14 years
U.S. Cl. D32—42

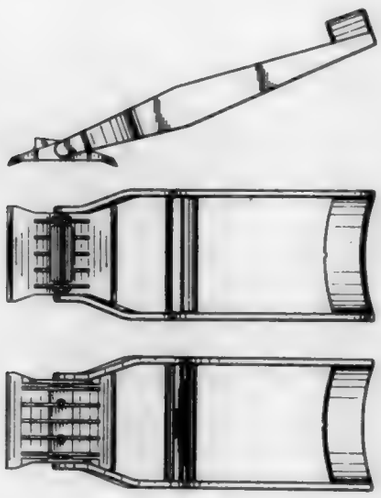
364,718
LOTTERY TICKET SCRAPER
Mark A. Reuss, P.O. Box 1704, Pittsfield, Mass. 01202-1704
Filed May 13, 1994, Ser. No. 22,868
Term of patent 14 years
U.S. Cl. D32—46



364,719
SPOT CLEANING TOOL FOR CARPET AND UPHOLSTERY
Eddie R. Crawford, 609 McCoy Dr., Irving, Tex. 75062
Filed Dec. 16, 1994, Ser. No. 32,358
Term of patent 14 years
U.S. Cl. D32—46



364,720
ICE SCRAPER
Paul S. Francis, and Teryl K. Rouse, both of Kansas City, Mo., assignors to Innovation Development, Inc., Kansas City, Mo.
Filed Nov. 26, 1993, Ser. No. 15,690
Term of patent 14 years
U.S. Cl. D32—49



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28th DAY OF NOVEMBER, 1995

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Pikka, Olavi; and Rönkönharju, Hannu, 5,470,432, Cl. 162-55.000.

Aalst, Gerrit V., to Fuller Offshore Finance Corporation B.V. Multi purpose unloading arm. 5,470,191, Cl. 414-726.000.

ABB Atom AB: *See*—
Söderlund, Anders, 5,471,514, Cl. 376-313.000.

ABB EPT Construction Pty. Limited: *See*—
Kwok, Alexander K. W., 5,470,186, Cl. 414-388.000.

ABB Flakt Aktiebolag: *See*—
Tupov, Vladimir; Nilsson, Patrick; and Nilsson, Börje, 5,470,200, Cl. 415-195.000.

ABB Research Ltd.: *See*—
Meier, Markus, 5,471,546, Cl. 385-11.000.

Abbott Laboratories: *See*—
Helgren, R. Hayes; and Kramer, David E., 5,470,327, Cl. 604-411.000.

Abdulmassih, Antoine: *See*—
Luthi, Oscar; Abdulmassih, Antoine; and Merchel, Frank J., III, 5,470,471, Cl. 210-386.000.

Abe, Hiroyuki: *See*—
Nonaka, Yoshiya; Aoyagi, Yoshio; Abe, Hiroyuki; Bradshaw, Alex; Kiyoura, Kazuhiro; Kato, Seiji; and Haraguchi, Koichiro, 5,471,441, Cl. 369-32.000.

Abe, Iwao: *See*—
Ogata, Seiichi; Kawaguchi, Moriyuki; Kanota, Keiji; Kubota, Yukio; Sato, Heikichi; and Abe, Iwao, 5,471,355, Cl. 360-84.000.

Abe, Koichi: *See*—
Sakamoto, Jun; Yoshida, Minoru; Aoyama, Masatoshi; Suzuki, Masaru; Nakamori, Yukari; Okazaki, Iwao; and Abe, Koichi, 5,470,637, Cl. 428-143.000.

Abe, Kuniomi: *See*—
Yoshizo, Ikegami; Abe, Kuniomi; and Konagaya, Masahiko, 5,471,261, Cl. 351-210.000.

Abe, Shunichi, to Canon Kabushiki Kaisha. Storing coded color components of coded input image and coded image data received from a transmission line. 5,471,325, Cl. 358-524.000.

Abrams, Richard S.: *See*—
Swartz, Conrad M.; and Abrams, Richard S., 5,470,347, Cl. 607-45.000.

Acampora, Salvatore: *See*—
McLarty, Daniel R.; and Acampora, Salvatore, 5,470,158, Cl. 384-484.000.

Achter, Eugene K.: *See*—
Rounbehler, David P.; Fine, David H.; Achter, Eugene K.; MacDonald, Stephen J.; and Dennison, Daniel B., 5,470,754, Cl. 436-106.000.

Acushnet Company: *See*—
Gobush, William; Pelletier, Diane; and Days, Charles, 5,471,383, Cl. 364-410.000.

Acutus Industries, Inc.: *See*—
Linse, Vonne D.; and Horn, Bruce D., 5,470,012, Cl. 228-107.000.

Adachi, Hiroshi: *See*—
Kodama, Satoshi; and Adachi, Hiroshi, 5,470,491, Cl. 216-22.000.

Adachi, Hiroyuki: *See*—
Shirai, Hiroyuki; Sekine, Kazumi; Tsuda, Tadayuki; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shoji, Takeo; Noda, Shinya; Kobayashi, Kazunori; and Adachi, Hiroyuki, 5,470,635, Cl. 428-131.000.

Adachi, Katsura: *See*—
Nishii, Kota; Kimura, Kouichi; Ishizuka, Masanobu; and Adachi, Katsura, 5,470,909, Cl. 524-538.000.

Adachi, Kinichi: *See*—
Gamou, Takaharu; Taniguchi, Noboru; Niikura, Junji; Hatoh, Kazuhito; Yasumoto, Eiichi; and Adachi, Kinichi, 5,469,913, Cl. 165-104.120.

Adam, Gérard: *See*—
Dufios, Muriel; Robert-Piessard, Sylvie; Welin, Lucien; Le Baut, Guillaume; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,470,864, Cl. 514-352.000.

Adam, James R. Rain leggings. 5,469,637, Cl. 36-2.00R.

Adams, Daniel O., to SCIMED Life Systems, Inc. Over-the-wire type balloon catheter with proximal hypotube. 5,470,315, Cl. 604-96.000.

Adams, Delbert J. Bicycle trailer hitch assembly and bicycle trailer incorporating same. 5,470,088, Cl. 280-204.000.

Adams, Robert W.; Kwan, Tom W.; and Coln, Michael, to Analog Devices, Inc. Interpolation filter with reduced set of filter coefficients. 5,471,411, Cl. 364-724.010.

Adams, Theodore P., to Angeion Corporation. Connector ports for an implantable defibrillator. 5,470,346, Cl. 607-37.000.

Addison, Cathy: *See*—
Howe, Wayne; Silver, Ed; Bailey, Kim; Shih, Jerry; Morel, Kitty; Hill, Peter; Addison, Cathy; Woodring, Larry; and Malik, Dale, 5,471,519, Cl. 379-67.000.

Adegbite, Valerie: *See*—
Hawley, Martin C.; Wei, Jianghua; Adegbite, Valerie; and Lin, Min, 5,470,423, Cl. 156-166.000.

Adell, Loren S.; and Adell, Michael. Packaging for a consumer product. 5,469,866, Cl. 128-860.000.

Adell, Michael: *See*—
Adell, Loren S.; and Adell, Michael, 5,469,866, Cl. 128-860.000.

Adiletta, Joseph G., to Pall Corporation. Regenerable diesel exhaust filter. 5,470,364, Cl. 55-484.000.

Adir et Compagnie: *See*—
Dufios, Muriel; Robert-Piessard, Sylvie; Welin, Lucien; Le Baut, Guillaume; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,470,864, Cl. 514-352.000.

Adkins, Thomas: *See*—
Soenen, Eric G.; Davis, Gregory B.; Adkins, Thomas; and MacDonald, Russell K., 5,471,668, Cl. 455-352.000.

Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, to Mannesmann Aktiengesellschaft. Assisted steering system for non-trackbound vechile. 5,469,928, Cl. 180-6.280.

ADM Tronics Unlimited, Inc.: *See*—
Di Mino, André, 5,470,594, Cl. 426-87.000.

Administrative Center of New Drug Research, The State Pharmaceutical Administration of China: *See*—
Peng, Sixun; Dai, Dezai; Huang, Zhenya; Huang, Wenlong; Wang, Youqun; Zhang, Can; and Yu, Feng, 5,470,852, Cl. 514-231.500.

Advanced Interventional Systems, Inc.: *See*—
Goldenberg, Tsvi; Wardle, John; and Anderson, William, 5,470,330, Cl. 606-7.000.

Advanced Micro Devices: *See*—
Anjum, Mohammed; Burki, Ibrahim K.; and Christian, Craig W., 5,470,794, Cl. 437-200.000.
Lowell, John K.; Anjum, Mohammed; Wenner, Valerie A.; Armour, Norman L.; and Kyaw, Maung H., 5,471,293, Cl. 356-30.000.

Advanced Micro Devices, Inc.: *See*—
Cheung, Robin W., 5,471,093, Cl. 257-758.000.
Liu, David K. Y.; Sun, Yu; and Chang, Chi, 5,470,773, Cl. 437-43.000.

Advantest Corporation: *See*—
Igarashi, Noriyuki; and Fukumoto, Keiichi, 5,469,953, Cl. 198-345.200.

Aeroquip Corporation: *See*—
Burnell, Joseph G.; and Clark, Gary J., 5,470,276, Cl. 454-155.000.

Agency of Industrial Science & Technology: *See*—
Umeda, Kazunori, 5,470,494, Cl. 252-12.000.

Agiman, Dan, to Linfinity Microelectronics, Inc. Power supply controller having low startup current. 5,471,130, Cl. 323-303.000.

Agren, Lennart: *See*—
Lund, Arne; and Agren, Lennart, 5,469,891, Cl. 138-98.000.

Agria-Werke GmbH: *See*—
Falkner, Raimund, 5,470,023, Cl. 241-85.000.

Ahern, Kevin G., to State of Oregon Acting by and through the Oregon State Board of Higher Education on behalf of Oregon State University. Boomerang DNA amplification. 5,470,724, Cl. 435-91.200.

Ahlers, Michael: *See*—
Stahl, Wilhelm; Ahlers, Michael; Walch, Axel; Bartnik, Eckhart; Kretzschmar, Gerhard; Grabley, Susanne; and Schleyerbach, Rudolf, 5,470,843, Cl. 514-61.000.

Ahmad, Umar M.: *See*—
Sachdev, Krishna G.; Whitaker, Joel R.; and Ahmad, Umar M., 5,470,693, Cl. 430-315.000.

Ahn, Byung T.; Moon, Dae G.; and Lee, Jeong N., to Korea Advanced Institute of Science and Technology. Method of the production of polycrystalline silicon thin films. 5,470,619, Cl. 427-578.000.

Aho, Kenneth A.: *See*—
Miller, Richard A.; Aho, Kenneth A.; and Dreyer, John F., Jr., 5,471,348, Cl. 359-837.000.

Ahuja, Sudhir R.; Aravamudan, Murali; and Enaor, James R., to AT&T Corp. Multimedia communications network. 5,471,318, Cl. 358-400.000.

Ai, Chiayu; and Caber, Paul J., to Wyko Corporation. Combination of white-light scanning and phase-shifting interferometry for surface profile measurements. 5,471,303, Cl. 356-357.000.

Aida, Kazuo: *See*—
Masuda, Hiroji; Aida, Kazuo; and Nakagawa, Kiyoshi, 5,471,334, Cl. 359-177.000.

Aiken, Lewis B., to Atlantic Richfield Company. System for recovery of oil from snow and ice surfaces. 5,469,645, Cl. 37-291.000.

Air Products and Chemicals, Inc.: *See*—
Lenney, William E.; and Sagl, Dennis, 5,470,903, Cl. 524-458.000.

Aishin AW Co., Ltd.: *See*—
Nakashima, Motohiro; and Otake, Shinichi, 5,471,384, Cl. 364-424.010.

Aisin AW Co., Ltd.: *See*—
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Kasuya, Satoru; Sugiura, Nobutada; and Nishida, Masaaki, 5,470,284, Cl. 475-204.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Ito, Sadao, 5,470,121, Cl. 296-65.100.
Tozu, Kenji; Asano, Kenji; and Kawai, Hiroaki, 5,470,136, Cl. 303-147.000.

Aiyoshizawa, Shunichi: *See*—
Toshimitsu, Manabu; Aiyoshizawa, Shunichi; Suganuma, Yoshikazu; and Konno, Daisuke, 5,471,104, Cl. 310-90.000.

Ajinomoto Co., Inc.: *See*—
Sasaki, Hitoshi; Kobayashi, Yuikio; and Igota, Shyoji, 5,470,419, Cl. 156-244.120.

AK Technology, Inc.: *See*—
Maslakow, William H., 5,471,011, Cl. 174-52.400.

Akademie der Wissenchaften der DDR: *See*—
Borriss, Rainer; Hofemeister, Jürgen; Thomsen, Karl K.; Olsen, Ole; and Von Wettstein, Dietrich, 5,470,725, Cl. 435-93.000.

Akaike, Toshihiro; Tobe, Seishiro; Miyamoto, Shigeyuki; and Ohashi, Akio, to NEC Corporation. Cell culture support having patterned substance that influences cell adhesion. 5,470,739, Cl. 435-240.243.

Akaogi, Toshikazu: *See*—
Yoneda, Masami; and Akaogi, Toshikazu, 5,471,305, Cl. 356-363.000.

Akasaka, Toru; and Mori, Taisuke, to Matsushita Electric Industrial Co., Ltd. Method of detecting longitudinal direction of inspection object and identifying configuration of the same. 5,471,407, Cl. 364-559.000.

Akeley, Tom; and West, Neil, to Bell Sports, Inc. Strap lock buckle. 5,469,583, Cl. 2-421.000.

Akimoto, Katsuhiro: *See*—
Ikeda, Masao; Ito, Satoshi; Iochi, Yoshino; Miyajima, Takao; Ozawa, Masafumi; Akimoto, Katsuhiro; Ishibash, Akira; and Hiei, Futoshi, 5,471,067, Cl. 257-14.000.

Akin, William R., Jr.: *See*—
Henson, James A.; Richmond, Scott E.; and Akin, William R., Jr., 5,471,176, Cl. 331-1.00A.

Akinniyi, Akingbade: *See*—
Schatz, Steven V.; Richie, Thomas W.; Menich, Barry J.; Bonta, Jeffrey D.; and Akinniyi, Akingbade, 5,471,644, Cl. 455-33.200.

Akisue, Osamu: *See*—
Yoshinaga, Naoki; Ushioda, Kohsaku; Akisue, Osamu; and Nishimura, Kunio, 5,470,403, Cl. 148-330.000.

Akiyama, Yoshiyuki: *See*—
Yonemitsu, Jun; Koyanagi, Hideki; and Akiyama, Yoshiyuki, 5,471,450, Cl. 369-60.000.

Akkawi, Isam W.; Hayashida, Scott H.; Ladha, Vivek; and Rudy, John E., to Unisys Corporation. Multiprocessor data processing system having non-symmetrical channel(x) to channel(y) interconnections. 5,471,589, Cl. 395.800.000.

Aksoy, Ibrahim A.: *See*—
Weinshilboum, Richard M.; Honchel, Ronald; Aksoy, Ibrahim A.; Szumlanski, Carol L.; Wood, Thomas C.; Otterness, Diane M.; and Wieben, Eric D., 5,470,737, Cl. 435-240.200.

Aktiebolaget Electrolux: *See*—
Castwall, Lennart W., 5,471,537, Cl. 381-71.000.

Akzo Nobel N.V.: *See*—
Diemeer, Martinus B. J.; Horsthuis, Winfried H. G.; McDonach, Alaster; and Copeland, John M., 5,470,692, Cl. 430-290.000.
Plate, Ralf, 5,470,856, Cl. 514-256.000.
Sondermeijer, Paulus J. A.; Claessens, Johannes A. J.; and Mockett, Albert P. A., 5,470,734, Cl. 424-229.100.

Akzo Nobel NV: *See*—
Ansorge, Wolfgang; Hornscheidt, Ralf; Jungheim, Andreas; and Müller, Klaus, 5,470,474, Cl. 210-500.230.

Akzo NV: *See*—
Baumgart, Rudolf; Martin, Manfred; Löw, Lothar; and Scheven, Gunter, 5,470,659, Cl. 428-398.000.

Alandale Industries, Inc.: *See*—
Gutschmit, Alan, 5,469,718, Cl. 66-168.000.

Albano, Richard K.: *See*—
Marts, Donna J.; Richardson, John G.; Albano, Richard K.; and Morrison, John L., Jr., 5,470,043, Cl. 251-65.000.

Albert, Richard: *See*—
Mangan, John S.; Norman, Robert D.; Craig, Jeffrey; Albert, Richard; Gupta, Anil; Stai, Jeffrey D.; and Lofgren, Karl M. J., 5,471,478, Cl. 371-10.300.

Alcan International Limited: *See*—
Dube, Ghyslain; Litalien, Marko; Pelletier, Roger; and Wang, Zhou, 5,470,376, Cl. 75-672.000.
Grolman, Robert J.; Holywell, George C.; Kimmerle, Frank M.; and Turcotte, Gilles R., 5,470,559, Cl. 423-489.000.

Alcatel Cit: *See*—
Renault, Denis; and Campana, Roland, 5,471,510, Cl. 375-372.000.

Alcatel Mobile Communication France: *See*—
Genest, Pierre, 5,471,170, Cl. 330-151.000.

Alcatel N.V.: *See*—
De Langhe, Marc R. F.; Reusens, Peter P. F.; Haspeslagh, Johan J. G.; and Van Hoogenbemt, Stefaan M. A., 5,471,511, Cl. 375-376.000.
Dries, Johan M. F.; and Therasse, Yves, 5,471,477, Cl. 370-110.100.
Gamm, Bernhard, 5,471,465, Cl. 370-58.100.
Johann, Charles F. M., 5,471,467, Cl. 370-60.000.
Junginger, Bernhard; Pritschi, Rainer; and Krimmel, Heinz, 5,471,342, Cl. 359-341.000.
Sevenhans, Joannes M. J.; and Van Paemel, Mark G. S. J., 5,471,168, Cl. 327-553.000.

Alchemist and Company, Inc.: *See*—
Lidman, David G., 5,471,669, Cl. 235-383.000.

Alcon Laboratories, Inc.: *See*—
Hoff, Roman, 5,470,973, Cl. 544-48.000.
Jinkerson, David L., 5,470,932, Cl. 526-312.000.

Alexander, Gregory C.; Jason, Mark E.; and Kalota, Dennis J., to Monsanto Company. Preparation of anhydropolyamino acids. 5,470,942, Cl. 528-328.000.

Alexander, John: *See*—
Laughlin, Philip; Alexander, John; Kamarei, A. Reza; Dobbie, Robert P.; Lin, Paul; Chang, Shen-Youn; Reddy, Sekhar; Grasset, Etienne; and Melin, Christian, 5,470,839, Cl. 514-53.000.

Alexander, Patrick A.: *See*—
Bryan, Philip N.; Alexander, Patrick A.; and Strausberg, Susan L., 5,470,733, Cl. 435-222.000.

Alfred D. Lobo Co., L.P.A.: *See*—
Sanko, William J., 5,470,428, Cl. 156-498.000.

Alfred Teves GmbH: *See*—
Buhl, Harro; and Rienhardt, Hans-Peter, 5,469,757, Cl. 74-526.000.

Allais, Daniel G. P.: *See*—
Grandvallet, Pierre; Allais, Daniel G. P.; and Dejnifve, Pierre E. J. G., 5,470,454, Cl. 208-144.000.

Allard, James R.; Cochran, Edward L.; and Wolff, Alan S., to Honeywell Inc. Method of construction of hierarchically organized procedural node information structure including a method for extracting procedural knowledge from an expert, and procedural node information structure constructed thereby. 5,471,560, Cl. 395-77.000.

Allard, John E.: *See*—
Smith, Bradley W.; Rasmussen, Kirk; and Allard, John E., 5,470,102, Cl. 280-728.200.

Allegro Microsystems, Inc.: *See*—
Bilotti, Alberto; and Tallarico, Jose L., 5,471,122, Cl. 318-284.000.

Allen-Bradley Company, Inc.: *See*—
Engdahl, Jonathan R.; Lucak, Mark A.; Gee, David J.; and Kucharski, Paul, 5,471,461, Cl. 370-17.000.

Allen, James: *See*—
Zandi, Ahmad; Stork, David G.; and Allen, James, 5,471,207, Cl. 341-107.000.

Allen, James D.; Boliek, Martin; and Schwartz, Edward L., to Ricoh Corporation; and Ricoh Company Ltd. Method and apparatus for parallel decoding and encoding of data. 5,471,206, Cl. 341-51.000.

Allen, William E.; Bitar, Ali A.; and Herold, Robert A., to Caterpillar Inc. Apparatus and method for determining the linear position of a hydraulic cylinder. 5,471,147, Cl. 324-635.000.

Aller, Harold E.: *See*—
Jacobson, Richard M.; Ramsay, J. Roger; Aller, Harold E.; and Thirugnanam, Muthuvelu, 5,470,984, Cl. 548-264.400.

Allergan, Inc.: *See*—
Chandraratna, Roshantha A., 5,470,999, Cl. 560-100.000.
Zanger, Frank; Zaleski, Edward R.; and Cole, Mark, 5,470,312, Cl. 604-34.000.

AlliedSignal Inc.: *See*—
Ennis, Thomas A., 5,470,101, Cl. 280-728.200.
Loar, Doanld F., 5,470,912, Cl. 525-58.000.

Alps Electric Co., Ltd.: *See*—
Okazaki, Mitsunari; and Aoki, Kazuharu, 5,471,654, Cl. 455-126.000.

Alsept, Jerry D.: *See*—
Alsept, Mark A.; and Alsept, Jerry D., 5,469,621, Cl. 30-50.000.

Alsept, Mark A.; and Alsept, Jerry D. Sefety razors with a reduced sized head and blades. 5,469,621, Cl. 30-50.000.

Alter, Lloyd. Theater design. 5,469,669, Cl. 52-8.000.

Altmaier, Paulette R.; and Potrebic, Peter J., to Apple Computer, Inc. Scanning method for receiving a transmission in a communication system with slow frequency hopping and coding. 5,471,503, Cl. 375-202.000.

Aluminum Company of America: *See*—
King, Eugene O.; and Teasley, G. Alfred, 5,470,005, Cl. 226-1.000.

Aluminum Design Corporation: *See*—
Pritchard, Ross E.; and Laub, Ronald J., 5,470,014, Cl. 228-208.000.

Amador, José J., to United States of America, National Aeronautics and Space Administration. Biphase bus monitor. 5,471,462, Cl. 370-17.000.

Amano, Tetsuya: *See*—
Hotta, Yoshihiko; Kawaguchi, Makoto; and Amano, Tetsuya, 5,471,044, Cl. 235-487.000.

Amatsu, Keiji; Butoh, Zenhachiroh; Hirai, Hiroshi; Massaki, Minoru; Morita, Hirofumi; Nakajima, Takeo; Nomura, Nobuo; Sakaki, Mikio; Schmandt, Stephen J.; and Tanaka, Katsuhiro, to International Business Machines Corporation. Distributed data processing system having front-end and back-end computers with different operating systems. 5,471,615, Cl. 395-200.030.

Ambroz, Holly K. Dual string yo-yo. 5,470,269, Cl. 446-250.000.

American Cyanamid Company: *See*—

Tayler, Peter N.; and Evans, Lynn S., 5,470,869, Cl. 514-406.000.
Trova, Michael P., 5,470,979, Cl. 546-147.000.
American Knife, Inc.: *See—*
Sharp, Gary A.; and Jonsson, Jan-Erik, 5,469,902, Cl. 144-241.000.
American Sterilizer Company: *See—*
Hillebrenner, H. William, 5,470,548, Cl. 422-295.000.
America^3 Foundation: *See—*
Meldner, Heiner; and Downs, Roland J., 5,470,632, Cl. 428-110.000.
Americore Technologies, Inc.: *See—*
Nolan, Brian J.; Mahaffey, Glenn L.; and Svoboda, John M., Sr., 5,470,131, Cl. 299-41.100.
Ames, Alan J., to Lockheed Missiles & Space Co., Inc. Casegrain telescope with spherical mirror surfaces. 5,471,346, Cl. 359-731.000.
Amity Machine Corp.: *See—*
Wissler, Vernon J., 5,470,236, Cl. 439-12.000.
AMKO International B.V.: *See—*
Van Rumpt, Jacob, 5,469,955, Cl. 198-689.100.
Amoco Corp.: *See—*
Cha, Chang Y.; Plancher, Henry; and Kraus, Lawrence S., 5,470,384, Cl. 106-284.030.
Mongon, John M.; Twesme, Edward N.; and Weiss, Peggy A., 5,470,396, Cl. 136-251.000.
Amore, John A.; and Balsamo, Pasquale, to Balsamore Corp. Automatic pizza dough press device with interchangeable molds. 5,469,779, Cl. 99-349.000.
Amuro, Stephen J.: *See—*
Giorgio, Paul J.; and Amuro, Stephen J., 5,471,634, Cl. 395-600.000.
Analog Devices, Inc.: *See—*
Adams, Robert W.; Kwan, Tom W.; and Coln, Michael, 5,471,411, Cl. 364-724.010.
Garde, Douglas, 5,471,607, Cl. 395-550.000.
Anami, Kenji: *See—*
Murakami, Shuji; Wada, Tomohisa; and Anami, Kenji, 5,471,427, Cl. 365-200.000.
Anastos, William N.: *See—*
Burrill, James T.; and Anastos, William N., 5,469,631, Cl. 33-364.000.
Anbarci, Ahmet: *See—*
Kopp, Gabriele M.; Laudenbach, Erich; and Anbarci, Ahmet, 5,470,595, Cl. 426-231.000.
Anca Pty. Ltd.: *See—*
Brien, Glenn C., 5,471,395, Cl. 364-474.280.
Anchor, David: *See—*
Ljungström, Tommy B. G.; and Anchor, David, 5,470,016, Cl. 229-101.100.
Anderson, Howard W.; Carberry, John B.; Staunton, Harold F.; and Sutradhar, Bhagya C., to Du Pont de Nemours, E. I., and Company. Crystallization of adipic acid. 5,471,001, Cl. 562-593.000.
Anderson, Iver E.: *See—*
McCallum, R. William; Dennis, Kevin W.; Lograsso, Barbara K.; and Anderson, Iver E., 5,470,401, Cl. 148-302.000.
Anderson, James: *See—*
Sinsheimer, Roger; and Anderson, James, 5,471,148, Cl. 324-754.000.
Anderson, Paul G.: *See—*
Smith, Christopher P.; and Anderson, Paul G., 5,469,737, Cl. 73-168.000.
Anderson, Richard A.: *See—*
Kandybin, Alexander I.; Anderson, Richard A.; and Reichley, Daniel L., 5,470,378, Cl. 95-100.000.
Anderson, William: *See—*
Goldenberg, Tsvi; Wardle, John; and Anderson, William, 5,470,330, Cl. 606-7.000.
Anderson, William W.: *See—*
Gal, George; Anderson, William W.; Herman, Bruce J.; and Shough, Dean M., 5,471,345, Cl. 359-619.000.
Andersson, Hans: *See—*
Henningsson, Göran; and Andersson, Hans, 5,469,607, Cl. 24-716.000.
Ando, Shigeru: *See—*
Yamanobe, Takashi; Satou, Michio; Ishigami, Takashi; Obata, Minoru; Kawai, Mituo; Yagi, Noriaki; Maki, Toshihiro; and Ando, Shigeru, 5,470,527, Cl. 419-53.000.
Ando, Takao: *See—*
Niimura, Koichi; Kawabe, Takako; Ando, Takao; and Saito, Kenichi, 5,470,960, Cl. 536-6.400.
Ando, Takashi: *See—*
Hayakawa, Fumiko; Ando, Takashi; Kimura, Takahide; and Hara, Yukihiko, 5,470,565, Cl. 424-52.000.
Ando, Takeshi: *See—*
Itami, Shinzi; and Ando, Takeshi, 5,471,380, Cl. 364-146.000.
Andou, Sadamasa, to Nissei Kabushiki Kaisha. Biodegradable molded articles. 5,470,382, Cl. 106-124.000.
Andre, Michel: *See—*
Calmettes, Lionel; Detable, Pascal; and Andre, Michel, 5,469,604, Cl. 24-20.0CW.
Andreatta, Alejandro: *See—*
Smith, Paul; Heeger, Alan J.; Cao, Yong; Chiang, Jin-Chih; and Andreatta, Alejandro, 5,470,505, Cl. 252-500.000.
Andrighetti, Robert H., to Unisys Corporation. Stack read/write counter through checking. 5,471,487, Cl. 371-57.100.
Anelva Corporation: *See—*
Kobayashi, Masahiko; and Takahashi, Nobuyuki, 5,470,451, Cl. 204-298.030.
Angeion Corporation: *See—*
Adams, Theodore P., 5,470,346, Cl. 607-37.000.
Angerbauer, Rolf; Fey, Peter; Hübsch, Walter; Philippe, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, to Bayer Aktiengesellschaft. Disubstituted pyridines. 5,470,982, Cl. 546-268.000.
Anisowicz, Anthony: *See—*
Sager, Ruth; Anisowicz, Anthony; and Zou, Zhiqiang, 5,470,970, Cl. 536-23.500.
Anjum, Mohammed; Burki, Ibrahim K.; and Christian, Craig W., to Advanced Micro Devices. Method for forming a silicide using ion beam mixing. 5,470,794, Cl. 437-200.000.
Anjum, Mohammed: *See—*
Lowell, John K.; Anjum, Mohammed; Wenner, Valerie A.; Armour, Norman L.; and Kyaw, Maung H., 5,471,293, Cl. 356-30.000.
Anma, Hideyuki, to Kabushiki Kaisha Toshiba. Sheet stacking apparatus. 5,470,050, Cl. 271-3.030.
Ansorge, Wolfgang; Hornscheidt, Ralf; Jungheim, Andreas; and Müller, Klaus, to Akzo Nobel NV. Process for cleaning hollow fibers. 5,470,474, Cl. 210-500.230.
Antenna Company, The: *See—*
Du, Xin, 5,471,222, Cl. 343-713.000.
Anthony, Vivienne M.; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Ferguson, Ian; Crowley, Patrick J.; and Hutchings, Michael G., to Zeneca Limited. Fungicides. 5,470,819, Cl. 504-244.000.
Anzai, Hidenobu; Gotoh, Moritaka; and Hisada, Youichi, to Fujikura Ltd. Fluid clutch device. 5,469,947, Cl. 192-21.500.
Ao, Kenichi: *See—*
Suzuki, Yasutoshi; Ao, Kenichi; Uenoyama, Hirofumi; Noguchi, Hiroki; Eguchi, Koji; Ito, Ichiro; and Yoshino, Yoshimi, 5,471,084, Cl. 257-421.000.
Aoki, Kazuharu: *See—*
Okazaki, Mitsunari; and Aoki, Kazuharu, 5,471,654, Cl. 455-126.000.
Aoki, Koso: *See—*
Misawa, Hiromitsu; Fujioka, Kazuo; Aoki, Koso; Kurita, Eiichi; Okano, Yoji; and Kozawa, Minoru, 5,470,660, Cl. 428-403.000.
Aoki, Shigehisa; Iwasaki, Shinichi; Sugiura, Nobuo; Suzuki, Sakaru; and Kimata, Koji, to Seikagaku Kogyo Kabushiki Kaisha. Antirheumatic composition. 5,470,578, Cl. 424-450.000.
Aoki, Teruo: *See—*
Taira, Toshimitsu; Ohmuma, Masao; Hanada, Hisao; Aoki, Teruo; and Kuhara, Tetsuro, 5,470,048, Cl. 266-236.000.
Aoyagi, Yoshio: *See—*
Nonaka, Yoshiya; Aoyagi, Yoshio; Abe, Hiroyuki; Bradshaw, Alex; Kiyoura, Kazuhiro; Kato, Seiji; and Haraguchi, Koichiro, 5,471,441, Cl. 369-32.000.
Aoyama, Masatoshi: *See—*
Sakamoto, Jun; Yoshida, Minoru; Aoyama, Masatoshi; Suzuki, Masaru; Nakamori, Yukari; Okazaki, Iwao; and Abe, Koichi, 5,470,637, Cl. 428-143.000.
Apache Technologies, Inc.: *See—*
Cain, Gary L., 5,471,049, Cl. 250-208.200.
Apollo Camer, LLC: *See—*
Shipp, John I., 5,471,237, Cl. 348-46.000.
Appel, Wolfgang; and Siegemund, Günter. Process for preparing trifluoromethylanilines. 5,471,002, Cl. 564-412.000.
Appenditech, Inc.: *See—*
Bar-Or, David, 5,470,750, Cl. 436-63.000.
Apple Computer, Inc.: *See—*
Altmaier, Paulette R.; and Potrebic, Peter J., 5,471,503, Cl. 375-202.000.
Kaasila, Sampo, 5,471,573, Cl. 395-141.000.
Xanthopoulos, Eric, 5,469,692, Cl. 53-474.000.
Applied Biosystems, Inc.: *See—*
Grossman, Paul D.; Pang, Steven; Meachen, Steven M.; Woo, Sam L.; and Winn-Deen, Emily S., 5,470,705, Cl. 435-6.000.
Aprica Kassai Kabushikikaisha: *See—*
Kassai, Kenzou; and Inoue, Keiji, 5,470,127, Cl. 297-174.000.
Aradigm Corporation: *See—*
Lloyd, Peter M.; Ritson, Carl; Johansson, Eric T.; and Rubsamen, Reid M., 5,469,750, Cl. 73-861.610.
Arai, Masumi: *See—*
Ohara, Fumio; Hamori, Tadashi; Ito, Nobuei; Hattori, Yutaka; and Arai, Masumi, 5,470,618, Cl. 427-529.000.
Arai, Yuji; Matumoto, Takanobu; Shin, Yuaki; and Ishiguro, Takashi, to Taiyo Yuden, Co., Ltd. Optical information medium. 5,470,691, Cl. 430-273.000.
Arakawa, Takahiko: *See—*
Kaminaga, Isamu; Matsue, Shunichi; Arakawa, Takahiko; Katoh, Shunichi; and Ueda, Masahiro, 5,471,095, Cl. 257-775.000.
Araki, Hideaki: *See—*
Fukuta, Junzo; Fukaya, Masashi; and Araki, Hideaki, 5,470,412, Cl. 156-89.000.
Aravamudan, Murali: *See—*
Ahuja, Sudhir R.; Aravamudan, Murali; and Ensor, James R., 5,471,318, Cl. 358-400.000.
Arbor Research Corporation: *See—*
Kandybin, Alexander I.; Anderson, Richard A.; and Reichley, Daniel L., 5,470,378, Cl. 95-100.000.
Arca Regler GmbH: *See—*
Kaspers, Rüdiger, 5,469,774, Cl. 91-54.000.
ARCH Development Corporation: *See—*
Bonsignore, Patrick V., 5,470,944, Cl. 528-354.000.
Lee, Raphael C., 5,470,568, Cl. 424-78.020.
ARCO Chemical Technology, L.P.: *See—*

Le-Khac, Bi, 5,470,813, Cl. 502-175.000.
Younes, Usama E., 5,470,822, Cl. 507-133.000.

Ardco, Inc.: *See—*
Mamelson, Richard A.; Kim, Richard C.; and Kvamme, Damon F., 5,471,372, Cl. 362-92.000.

Arde, Inc.: *See—*
Sneddon, Kirk; and Brandmaier, Harold, 5,469,701, Cl. 60-259.000.

Argo, Brian P.: *See—*
Choy, Clement K.; Argo, Brian P.; Brodbeck, Kevin J.; and Hearn, Lynn M., 5,470,499, Cl. 252-99.000.

Arhancet, Graciela B., to Betz Laboratories, Inc. Method for inhibiting vinyl aromatic monomer polymerization. 5,470,440, Cl. 203-9.000.

Arikita, Shuhei: *See—*
Nakamura, Hiroyuki; Hama, Yoshinori; Arikita, Shuhei; and Ikeshita, Shingo, 5,470,374, Cl. 75-348.000.

Arimoto, Shinobu: *See—*
Hayashi, Toshio; Arimoto, Shinobu; Yoshinaga, Kazuo; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,471,281, Cl. 155-201.000.

Aritech Corporation: *See—*
Guscott, John K., 5,471,194, Cl. 340-511.000.

Arkenstone, Inc.: *See—*
Fruchterman, James R.; Schwegler, William C.; Merritt, Bruce W.; and LaPierre, Charles, 5,470,233, Cl. 434-112.000.

Armour, Norman L.: *See—*
Lowell, John K.; Anjum, Mohammed; Wenner, Valerie A.; Armour, Norman L.; and Kyaw, Maung H., 5,471,293, Cl. 356-30.000.

Arnett, Jeffery D.; Gately, Nicholas V.; Grulke, David H.; Hilsbos, Ruth A.; and Sertic, James L., to Stryker Corporation. Irrigation handpiece with built in pulsing pump. 5,470,305, Cl. 601-161.000.

Arpac, Ertugrul: *See—*
Spanhel, Lubomir; Arpac, Ertugrul; Nass, Rüdiger; and Schmidt, Helmut, 5,470,910, Cl. 524-785.000.

Arteon, Marcel. Anchoring piece, in particular for concrete. 5,469,675, Cl. 52-125.500.

Arthropharm Pty Limited: *See—*
Cullis-Hill, David; and Ghosh, Peter, 5,470,840, Cl. 514-54.000.

Asahi Denka Kogyo Kabushikikaisya: *See—*
Watanabe, Akinori; Horiguchi, Itaru; Sato, Atsushi; Kohno, Hiroshige; Ikeda, Kenji; and Iwasaki, Yujiro, 5,470,608, Cl. 427-133.000.

Asahi Glass Company Ltd.: *See—*
Tani, Hidehito, 5,471,297, Cl. 356-239.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Teshima, Shinichi, 5,471,553, Cl. 385-125.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Hirai, Isamu; and Tsuji, Hideaki, 5,471,276, Cl. 354-465.000.
Satou, Osamu, 5,471,266, Cl. 354-106.000.
Takami, Satoshi, 5,471,370, Cl. 362-4.000.
Tokumaru, Haruki; Maruyama, Koichi; and Wakamiya, Syunitirou, 5,471,456, Cl. 369-112.000.

Asai, Fumitoshi: *See—*
Fukumi, Hiroshi; Sakamoto, Toshiaki; Sugiyama, Mitsuo; Yamaguchi, Takeshi; Oshima, Takeshi; Asai, Fumitoshi; and Iijima, Yasuteru, 5,470,851, Cl. 514-214.000.

Asakawa, Yoshiyuki; Yamamura, Kazuyoshi; Muraoka, Toshinori; and Hatano, Masaru. Overlapped transfer-preventing mechanism. 5,470,052, Cl. 271-118.000.

Asakura, Norio: *See—*
Niigaki, Minoru; Kinoshita, Katsuyuki; Hirohata, Toru; Ihara, Tuneo; Yamada, Masami; Asakura, Norio; Negi, Yasuharu; and Suzuki, Tomoko, 5,471,051, Cl. 250-214.0VT.

Asano, Kazuo: *See—*
Ninomiya, Hidetaka; Nagasawa, Yuko; and Asano, Kazuo, 5,470,985, Cl. 548-312.400.

Asano, Kenji: *See—*
Tozu, Kenji; Asano, Kenji; and Kawai, Hiroaki, 5,470,136, Cl. 303-147.000.

Asano, Nobukazu: *See—*
Ochi, Koji; Narita, Kazuyuki; Matsuda, Kazunori; and Asano, Nobukazu, 5,470,406, Cl. 149-35.000.

Asay, Bill. Device for connecting flow energy of water into electrical energy. 5,471,098, Cl. 290-54.000.

Asgari, Jahanbakhsh: *See—*
Hrovat, Davorin; Asgari, Jahanbakhsh; and Fodor, Michael G., 5,471,386, Cl. 364-426.020.

Ashcroft, Dale A.: *See—*
Berger, John G.; and Ashcroft, Dale A., 5,469,819, Cl. 123-179.600.

Ashiya, Seiji; Suzuki, Takahiro; and Murase, Masanori, to Fuji Xerox Co., Ltd. Electrophotographic photoreceptor containing granular trigonal selenium. 5,470,682, Cl. 430-84.000.

Ashman, John J.: *See—*
Byczek, Roger W.; Hendrich, Randy; and Ashman, John J., 5,470,237, Cl. 439-76.100.

Askew, Andy R., to Fairchild Industrial Products Company. Electric to pneumatic transducer. 5,469,877, Cl. 137-85.000.

Asoh, Hidehiko: *See—*
Yoshida, Makoto; Satoh, Naoki; Asoh, Hidehiko; Shudo, Tuyosi; Takeda, Ryuzaburo; and Taguchi, Jun'ichi, 5,471,141, Cl. 324-314.000.

Asskali, Fatima: *See—*
Förster, Harald; Asskali, Fatima; and Nitsch, Ernst, 5,470,841, Cl. 514-60.000.

Astle, Thomas W. Bioassay incubator for use with robotic arms. 5,470,744, Cl. 435-286.700.

Aswegen, Helmut: *See—*
Spahn, Karl-Heinz; Aswegen, Helmut; and Schwerdt, Franz, 5,469,727, Cl. 70-278.000.

Asyst Technologies, Inc.: *See—*
Bonora, Anthony C.; Rosenquist, Frederick T.; Jain, Sudhir; and Davis, Mark R., 5,469,963, Cl. 206-709.000.

AT&T Corp.: *See—*
Ahuja, Sudhir R.; Aravamudan, Murali; and Ensor, James R., 5,471,318, Cl. 358-400.000.
Lilienthal, Peter F., II; Pawlenko, Ivan; and Wong, Ching-Ping, 5,470,217, Cl. 425-110.000.

AT&T Global Information Solutions Company: *See—*
Harrington, Gary L., 5,471,639, Cl. 395-842.000.

AT&T IPM Corp.: *See—*
Blaker, David M.; Ellard, Gregory S.; and Mobin, Mohammad S., 5,471,500, Cl. 375-340.000.
Cava, Robert J.; and Siegrist, Theo, 5,470,530, Cl. 420-416.000.
Chiu, Tzu-Yin; Erceg, Frank M.; Liu, Te-Yin M.; Moerschel, Kenenth G.; Prozonic, Michael A.; and Sung, Janmye, 5,470,783, Cl. 437-72.000.

Ataman, Vedat T.: *See—*
Glass, Samuel W., III; Rossman, Timothy A.; and Ataman, Vedat T., 5,471,138, Cl. 324-207.190.

Atkinson, Noel D. Ultra high speed scan system. 5,471,661, Cl. 455-165.100.

Atlantic Richfield Company: *See—*
Aiken, Lewis B., 5,469,645, Cl. 37-291.000.

Attwood, Martin D.: *See—*
Beck, Anthony L.; Wallis, Julian M.; Attwood, Martin D.; and Newman, Stephen, 5,470,699, Cl. 430-621.000.

Atwal, Karnail, to E.R. Squibb & Sons, Inc. Dihydropyrimidine derivatives. 5,470,975, Cl. 544-334.000.

Au, Fu L.; and Yogev, Einat, to Integrated Device Technology, Inc. FIFO buffer having write counter for generating empty flag value to be compared with read pointer value to indicate the buffer is full. 5,471,583, Cl. 395-250.000.

Auburn Farms, Inc.: *See—*
Petelle, Joey; Stoesz, Karen D.; and Williams, Lisa R., 5,470,600, Cl. 426-237.000.

Auchter, Gerhard: *See—*
Wallon, Alexander; Auchter, Gerhard; Licht, Ulrike; Haeberle, Karl; and Funhoff, Angelika, 5,470,907, Cl. 524-507.000.

Auditec GmbH: *See—*
Voss, Gunter, 5,469,732, Cl. 73-31.040.

Aug.Winkhaus GmbH & Co. KG: *See—*
Spahn, Karl-Heinz; Aswegen, Helmut; and Schwerdt, Franz, 5,469,727, Cl. 70-278.000.

Aulanko, Esko: *See—*
Hakala, Harri; and Aulanko, Esko, 5,469,937, Cl. 187-266.000.

Autoliv Development AB: *See—*
Persson, Dan; and Malmenstam, Jonas, 5,470,634, Cl. 428-120.000.

Automatic Control Technology Inc.: *See—*
Maung, Michael; and Moorehead, Jack, 5,470,465, Cl. 210-205.000.

Automotive Systems Laboratory, Inc.: *See—*
Malesko, Michael W., 5,471,021, Cl. 200-61.45R.

Autor, Jeffrey S.: *See—*
Farrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., 5,471,617, Cl. 395-700.000.

Autry, Sidney D.: *See—*
Tovey, H. Jonathan; and Autry, Sidney D., 5,470,316, Cl. 604-118.000.

Awai, Takashi: *See—*
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,471,227, Cl. 347-9.000.

Awano, Yoji: *See—*
Nishino, Kazuaki; Awano, Yoji; Takamiya, Hiroyuki; Ito, Mitsufumi; Suzuki, Masami; and Genma, Yoshikazu, 5,470,402, Cl. 148-325.000.

Awata, Yutaka; and Kakuishi, Mitsuo, to Fujitsu Limited. Circuit for detecting object signal from input signal. 5,471,507, Cl. 375-340.000.

Axiohm: *See—*
Patry, Bernard, 5,471,235, Cl. 347-214.000.

Axis USA, Inc.: *See—*
Sbalchiero, Federico; and Carboncini, Marco, 5,470,615, Cl. 427-459.000.

Ayukawa, Kazumasa, to Unitta Company. Belt tensioner. 5,470,280, Cl. 474-135.000.

Azmanov, Ziv, to National Semiconductor Corporation. Method of programming a CMOS read only memory at the second metal layer in a two-metal process. 5,471,416, Cl. 365-104.000.

Azuma, Yusaku: *See—*
Miura, Toshihiko; and Azuma, Yusaku, 5,470,193, Cl. 414-774.000.

Baba, Yoshinobu: *See—*
Mayama, Shinya; Ikeda, Takeshi; Baba, Yoshinobu; and Ogata, Naoya, 5,470,687, Cl. 430-137.000.

Babinec, Susan J., to Dow Chemical Company, The. Photostable self-erasing electrochromic device. 5,471,337, Cl. 359-269.000.

Babler, James H., to Loyola University of Chicago. Method of making 2,7-dimethyl-2,4,6-octatrienedial, a key intermediate in the commercial syntheses of various carotenoids. 5,471,005, Cl. 568-459.000.

Bach, Gary J.: *See*—
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Mastalski, Henry T., 5,470,271, Cl. 451-55.000.

Bachot, Jean; and Stutzmann, Pascal, to Rhone-Poulenc Chimie. Microporous asbestos-free diaphragms/cathodes for electrolytic cells. 5,470,449, Cl. 204-252.000.

Backfisch, David L.: *See*—
Yu, Phillip C.; Backfisch, David L.; and Rukavina, Thomas G., 5,471,338, Cl. 359-273.000.

Backlund, Ake: *See*—
Oulie, Finn; Backlund, Ake; and Svanberg, Johanna, 5,470,437, Cl. 162-237.000.

Bae, Jong-Chan, to Dongyang Jonghap Corporation. Unit for transferring images on film onto videotape mounted in a video camera with synchronous sound recording. 5,471,238, Cl. 348-98.000.

Bae, Kwang W., to Samsung Electro-Mechanics Co., Ltd. Process for manufacturing MPP core forming powder, and process for manufacturing MPP core using the powder. 5,470,399, Cl. 148-104.000.

Baggen, Constant P. M. J.; and Gaal, Erik W., to U.S. Philips Corporation. Methods and devices for encoding data symbols in accordance with a BCH code to obtain a code word in which parity symbols are located in the middle of the code word. 5,471,486, Cl. 371-37.100.

Bagley, Jerome R.: *See*—
Lin, Bor-Sheng; Scheblein, Joseph W.; and Bagley, Jerome R., 5,470,862, Cl. 514-341.000.

Bahat, Oded: *See*—
Daftary, Fereidoun; and Bahat, Oded, 5,470,230, Cl. 433-174.000.

Bai, Peng: *See*—
Myers, Alan M.; Charvat, Peter K.; Letson, Thomas A.; Yang, Shi-ning; and Bai, Peng, 5,470,790, Cl. 437-192.000.

Bailey, Eddy R. Multiple syringe unsheathing and resheathing device. 5,469,964, Cl. 206-364.000.

Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Lanulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., to International Business Machines Corporation. Diamond-like carbon films from a hydrocarbon helium plasma. 5,470,661, Cl. 428-408.000.

Bailey, Kim: *See*—
Howe, Wayne; Silver, Ed; Bailey, Kim; Shih, Jerry; Morel, Kitty; Hill, Peter; Addison, Cathy; Woodring, Larry; and Malik, Dale, 5,471,519, Cl. 379-67.000.

Bailey, Roger N.; Burchfiel, Steven M.; and Taborn, Michael P., to International Business Machines Corporation. Method and apparatus for sticky and leading one detection. 5,471,410, Cl. 364-715.010.

Baird, Bernard W.: *See*—
Kelso, Thomas M.; Koech, John K.; Boyle, Damon J.; Meiser, David H.; Flaherty, William P.; and Baird, Bernard W., 5,470,232, Cl. 434-45.000.

Baird, David P.; and Reiter, Richard L., to Dorr-Oliver Incorporated. Rotary drum filter with reciprocating nozzle means. 5,470,472, Cl. 210-391.000.

Bait Data, Inc.: *See*—
McGuire, Michael P., 5,469,739, Cl. 73-301.000.

Baitz, Günter: *See*—
Kohlhage, Hermann; Baitz, Günter; and Malke, Wolfgang, 5,470,053, Cl. 271-213.000.

Baker Hughes Incorporated: *See*—
Park, David B.; and Crawley, Michael F., 5,470,473, Cl. 210-402.000.

Bakker, Eric: *See*—
Nipkow, Andre; and Bakker, Eric, 5,470,453, Cl. 204-435.000.

Bakker, Johan P.; Catchpole, Clive E.; Tratar, David B.; and Vala, John D., to Unisys Corporation. Document imaging lamps with beat dark ends. 5,471,048, Cl. 250-208.100.

Bakx, Johannes L.; Spruit, Johannes H. M.; and Veldhuis, Hindrik, to U.S. Philips Corporation. Methods and devices for recording one or more signals which have been encoded by on error detection and correction algorithm on a record carrier by means of an optimal recording intensity. 5,471,457, Cl. 369-116.000.

Balagot, Edgar R.; and Toft, Carolyn M. Footrest for a chairlift. 5,470,130, Cl. 297-423.280.

Baldacci, Massimo; and Baldacci, Ugo, to Laboratori Baldacci Spa. Complexable heterogenous oligosaccharides and alpha-hydosanes having therapeutical activity, process for their preparation and related pharmaceutical compositions. 5,470,965, Cl. 536-21.000.

Baldacci, Ugo: *See*—
Baldacci, Massimo; and Baldacci, Ugo, 5,470,965, Cl. 536-21.000.

Baliga, B. Jayant: *See*—
Shekar, Mallikarjunaswamy S.; Baliga, B. Jayant; and Korec, Jacek, 5,471,075, Cl. 257-139.000.

Ball Corporation: *See*—
Hager, Milton S., 5,469,729, Cl. 72-379.400.

Ballard, Francis J.; Wallace, John C.; and Wells, Julian R. E., to Gropep Pty. Ltd. Peptide analogs of insulin-like growth factor II. 5,470,828, Cl. 514-12.000.

Ballard Power Systems Inc.: *See*—
Fletcher, Nicholas J.; Lamont, Gordon J.; Basura, Vesna; Voss, Henry H.; and Wilkinson, David P., 5,470,671, Cl. 429-26.000.

Balling, Edward N., to Eastman Kodak Company. Spool drive for film cartridge in single-use camera. 5,471,270, Cl. 354-212.000.

Bally Gaming International, Inc.: *See*—
LeStrange, Michael M.; Watson, William H.; Raven, Richard C., deceased, 5,470,079, Cl. 273-138.00A.

Balmer, Keith: *See*—
Gove, Robert J.; Guttag, Karl M.; Balmer, Keith; and Ing-Simmons, Nicholas K., 5,471,592, Cl. 395-300.030.

Balsamo, Pasquale: *See*—
Amore, John A.; and Balsamo, Pasquale, 5,469,779, Cl. 99-349.000.

Balsamore Corp.: *See*—
Amore, John A.; and Balsamo, Pasquale, 5,469,779, Cl. 99-349.000.

Baltezor, Michael J.: *See*—
Hendrickson, Dennis L.; Dimmitt, Dan C.; Williams, Mark S.; Skultety, Paul F.; and Baltezor, Michael J., 5,470,584, Cl. 424-490.000.

Balz, Werner: *See*—
Lehner, August; Schneider, Norbert; Roller, Hermann; Balz, Werner; Lenz, Werner; and Kohl, Albert, 5,470,650, Cl. 428-323.000.

Bamat, Michael K.: *See*—
von Borstel, Reid W.; and Bamat, Michael K., 5,470,838, Cl. 514-50.000.

Bamberger, Robert L.: *See*—
Jejelowo, Moses O.; and Bamberger, Robert L., 5,470,811, Cl. 502-117.000.

Bamford Excavators, Limited: *See*—
Bamford, Joseph C.; and Moeller, Frank, 5,470,190, Cl. 414-686.000.

Bamford, Joseph C.; and Moeller, Frank, to Bamford Excavators, Limited. Loader vehicle. 5,470,190, Cl. 414-686.000.

Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, to Mitsubishi Denki Kabushiki Kaisha; and Japan Organo Co., Ltd. Apparatus for producing pure water. 5,470,461, Cl. 210-188.000.

Bando Chemical Industries, Ltd.: *See*—
Nagase, Takayuki; Yoshida, Yasuhiko; Hasegawa, Makoto; and Tasi, Arata, 5,471,285, Cl. 355-219.000.

Bani, Massimo: *See*—
Fraire, Cristina; Bani, Massimo; Vanotti, Ermes; and Olgiati, Vincenzo, 5,470,858, Cl. 514-261.000.

Banik, Jashojiban: *See*—
Kumar, Sudarshan; and Banik, Jashojiban, 5,471,414, Cl. 364-788.000.

Bankos, Kevin; and Bingler, Douglas J., to Keystone Railway Equipment Company, Inc. Condition indicating system for railway car cushioning unit. 5,469,978, Cl. 213-223.000.

Bannai, Kazunori: *See*—
Fujioka, Tetsuya; Bannai, Kazunori; and Takahashi, Hiroshi, 5,471,277, Cl. 355-25.000.

Banner, Alvin C.; and Heaton, Mark T., to Globe Products Inc. Method and apparatus for monitoring and controlling an armature winding machine including missed tang detection. 5,470,025, Cl. 242-7.030.

Banning, Kenneth R.; James, Wendy S.; Li, Shih-Gong; and Versteeg, Anton, to International Business Machines Corporation. Tree structure representation of an SQL clause. 5,471,613, Cl. 395-600.000.

Banno, Yoshikazu: *See*—
Nomura, Ichiro; Banno, Yoshikazu; Kaneko, Tetsuya; Takeda, Toshihiko; and Iwai, Kumi, 5,470,265, Cl. 445-24.000.

Banyu Pharmaceutical Co., Ltd.: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; and Yano, Mitsuo, 5,470,833, Cl. 514-18.000.

Barakat, Edmond H.; Chin, Arthur L.; and Schorn, Eric B., to International Business Machines Corp. Personal computer system with input/output controller having serial/parallel ports and a feedback line indicating readiness of the ports. 5,471,585, Cl. 395-308.000.

Barber, Douglas K.; and Hortensius, Stephan W., to NovAtel Communications Ltd. Method and apparatus for non-volatile data storage in radio telephones and the like. 5,471,518, Cl. 379-58.000.

Barbosa, Rui M.: *See*—
Hillman, Michael J.; Jacoby, Bruce E.; and Barbosa, Rui M., 5,470,218, Cl. 425-144.000.

Bardahl Manufacturing Corporation: *See*—
Kiehn, Arthur J.; and Eskridge, Mark H., 5,470,504, Cl. 252-49.600.

Bare, Rex O.: *See*—
Zinreich, Simion J.; Zinreich, Eva S.; and Bare, Rex O., 5,469,847, Cl. 128-653.100.

Bares, Joseph E.; Johnson, Byron G.; and Cornforth, Frederick J., to Phillips Petroleum Company. Stabilization of hydrocarbons by the addition of hydrazine. 5,470,457, Cl. 208-255.000.

Barkeshli, Sina, to Space Systems/Loral Inc. Frequency selective surface with repeating pattern of concentric closed conductor paths, and antenna having the surface. 5,471,224, Cl. 343-909.000.

Barmag AG: *See*—
Beifuss, Horst, 5,469,609, Cl. 28-271.000.

Barnes, Vernon B.; Wilkinson, Donald R.; Hancock, Lloyd H.; Oesterling, Erwin; Schlisio, Siegfried; and Hinz, Werner, to R. J. Reynolds Tobacco Company. Cigarette and method of making same. 5,469,871, Cl. 131-194.000.

Barnhart Industries, Inc.: *See*—
DeWoskin, Irvin S., 5,470,116, Cl. 294-1.100.

Baron, Bruce M.: *See*—

Palfreyman, Michael G.; McDonald, Ian A.; Salituro, Francesco G.; Schwarcz, Robert; and Baron, Bruce M., 5,470,870, Cl. 514-419.000.

Baroni, Andrea; Mastrodomenico, Giovanni; Michele, Taliercio; Capocelli, Piero; Carro, Luigi; and Varambally, Rajamohan, to SGS-Thomson Microelectronics S.r.l. High performance single port RAM generator architecture. 5,471,428, Cl. 365-201.000.

Bar-Or, David, to Appenditech, Inc. Detection of appendicitis by measurement of orthohydroxyhippuric acid. 5,470,750, Cl. 436-63.000.

Barralet, Jake E.: *See*—
Bonfield, William; Best, Serena M.; and Barralet, Jake E., 5,470,803, Cl. 501-1.000.

Barrett, Paul: *See*—
Eisele, Raymund H.; and Barrett, Paul, 5,471,038, Cl. 235-380.000.

Barrington, James W.; Masters, Randy W.; and Denny, Mark D., to Rust Industrial Services Inc. Apparatus and process for treatment of liquids. 5,470,459, Cl. 210-149.000.

Bartak, Duane E.; Lemieux, Brian E.; and Woolsey, Earl R., to Technology Applications Group. Hard anodic coating for magnesium alloys. 5,470,664, Cl. 428-472.100.

Barth, Wolfgang: *See*—
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Grosser, Martin; Schneider, Peter; Barth, Wolfgang; Moll, Hermann; and Pollmann, Horst, 5,469,938, Cl. 187-408.000.

Bartholomy & Co.: *See*—
Schmidt, Adolf, 5,470,117, Cl. 294-64.100.

Bartnik, Eckhart: *See*—
Stahl, Wilhelm; Ahlers, Michael; Walch, Axel; Bartnik, Eckhart; Kretzschmar, Gerhard; Grabley, Susanne; and Schleyerbach, Rudolf, 5,470,843, Cl. 514-61.000.

BASF Aktiegesellschaft: *See*—
Gulbins, Erich; Haeberle, Karl; Licht, Ulrike; and Wallon, Alexander, 5,470,899, Cl. 524-158.000.

BASF Aktiengesellschaft: *See*—
Hahn, Erwin; Ostertag, Werner; and Seybold, Guenther, 5,470,502, Cl. 252-301.350.
Lamm, Gunther; Mayer, Udo; Reichelt, Helmut; and Zeidler, Georg, 5,470,959, Cl. 534-680.000.
Wallon, Alexander; Auchter, Gerhard; Licht, Ulrike; Haeberle, Karl; and Funhoff, Angelika, 5,470,907, Cl. 524-507.000.

BASF Corporation: *See*—
Fishback, Thomas L.; and Lee, Thomas B., 5,470,501, Cl. 252-182.280.
Green, Todd J.; and Tucker, John R., 5,470,891, Cl. 521-131.000.

Basi Magnetics GmbH: *See*—
Lehner, August; Schneider, Norbert; Roller, Hermann; Balz, Werner; Lenz, Werner; and Kohl, Albert, 5,470,650, Cl. 428-323.000.

Basic Measuring Instruments, Inc.: *See*—
Nicholson, Jamie; and McEachern, Alexander, 5,471,401, Cl. 364-483.000.

Bass, Mark; and Rafalovich, Alexander P., to Copeland Corporation. Scroll compressor with liquid injection. 5,469,716, Cl. 62-505.000.

Bassetti, Kevin J.: *See*—
Ross, Randall D.; and Bassetti, Kevin J., 5,470,334, Cl. 606-72.000.

Basura, Vesna: *See*—
Fletcher, Nicholas J.; Lamont, Gordon J.; Basura, Vesna; Voss, Henry H.; and Wilkinson, David P., 5,470,671, Cl. 429-26.000.

Bates, Robert K.: *See*—
Murray, James A.; Nees, Michael R.; Imrie, William P.; Rayner, Christopher C.; Pfalzgraff, Chris L.; Bates, Robert K.; Ness, Valmer H.; and Cox, Terrance J., 5,470,445, Cl. 204-105.00R.

Battelle Memorial Institute: *See*—
Markle, Richard A.; Brusky, Phyllis L.; Cremeans, George E.; Elhard, Joel D.; Bigg, Donald M.; and Sowell, Sylvester, 5,470,945, Cl. 528-390.000.

Batts, Inc.: *See*—
Bredeweg, Robert; Blanchard, Russell O.; Morgan, Donald F.; and Dooley, Edward J., 5,469,995, Cl. 223-85.000.

Baudry-Maurelli, Bernadette: *See*—
Kaper, James B.; Baudry-Maurelli, Bernadette; and Fasano, Alessio, 5,470,729, Cl. 435-172.300.

Bauman, Thomas G.: *See*—
Rowlands, Kenneth C.; and Bauman, Thomas G., 5,469,649, Cl. 42-43.000.

Baumann, Hans-Peter, to Sandoz Ltd. Organic compounds. 5,470,355, Cl. 8-587.000.

Baumann, James A.; Kuchcik, Joel G.; and Lanigan, John J., Sr., to Mi-Jack Products, Inc. Side latch assembly for lifting trailers and containers. 5,470,189, Cl. 414-618.000.

Baumann, Otto: *See*—
Reibetanz, Wilbert; Baumann, Otto; Mueller, Rolf; and Ruckh, Bernd, 5,470,084, Cl. 279-19.300.

Baumgart, Rudolf; Martin, Manfred; Löw, Lothar; and Scheven, Gunter, to Akzo NV. Hollow fibers. 5,470,659, Cl. 428-398.000.

Baumler, Sandra L.: *See*—
McKee, Richard C.; and Baumler, Sandra L., 5,470,761, Cl. 437-5.000.

Bax, Johannes W. T.: *See*—
Nieuwendijk, Joris A. M.; Bax, Johannes W. T.; Oepkes, Cornelis J.; Roelofs, Henricus H.; and Van Den Thillart, Martinus P. M., 5,471,018, Cl. 181-152.000.

Baxter, Bobby G., to Binkley Company, The. Wheeled vehicle suspension. 5,470,096, Cl. 280-712.000.

Baxter International Inc.: *See*—
Cook, Charles; Zomorodi, Mostafa; and Dark, Richard C. G., 5,470,324, Cl. 604-319.000.
Griffith, Michael J.; Nealund, Gerald G.; and Liu, Shu-Len, 5,470,954, Cl. 530-383.000.

Baxter, Larry K.: *See*—
Knapp, Herbert C.; Parker, Vance A.; Baxter, Larry K.; and Evans, Jon F., 5,471,043, Cl. 235-472.000.

Bayer Aktiengesellschaft: *See*—
Angerbauer, Rolf; Fey, Peter; Hübsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, 5,470,982, Cl. 546-268.000.
Grimm, Wolfgang; Eisen, Norbert; and Ruprecht, Hans-Dieter, 5,470,515, Cl. 264-45.700.
Jansen, Bernhard; Grönen, Jürgen; and Müller, Hanns P., 5,470,523, Cl. 264-328.600.
Meixner, Jürgen; Fischer, Wolfgang; and Müller, Manfred, 5,470,897, Cl. 523-518.000.

Bayer Corporation: *See*—
Mafoti, Robson M.; and Potts, Bruce H., 5,470,935, Cl. 528-65.000.

Bayraktaroglu, Burhan, to Texas Instruments Incorporated. Self-aligned heterojunction bipolar transistor. 5,471,078, Cl. 257-198.000.

Beamon, Cecil H., Jr.; and Beamon, Linda L. Doll with baby-hugging capabilities. 5,470,270, Cl. 446-354.000.

Beamon, Linda L.: *See*—
Beamon, Cecil H., Jr.; and Beamon, Linda L., 5,470,270, Cl. 446-354.000.

Bean, Eric S.; Waldman, Cheryl; and Sanders, Ronald, to Synbiotics Corporation. Saliva enhancement reagent for feline leukemia virus elisa. 5,470,711, Cl. 435-7.100.

Beard, Hoyt S.; Conrad, Lucas J.; Crook, J. Edward; Lovette, James E.; Johnson, Robert C.; Newton, Donald A.; and Neshan, Hamid, to R. J. Reynolds Tobacco Company. Tobacco expansion processes and apparatus. 5,469,872, Cl. 131-291.000.

Beardsley, Brent C.; Brailey, Allen C.; and Leung, Peter L. H., to International Business Machines Corporation. Using time stamps to correlate data processing event times in connected data processing units. 5,471,631, Cl. 395-650.000.

Beardsley, Brent C.: *See*—
Yudenfriend, Harry M.; Surman, David H.; and Beardsley, Brent C., 5,471,609, Cl. 395-182.020.

Bechtel Group, Inc.: *See*—
Greenwalt, Richard B., 5,470,375, Cl. 75-505.000.
Murray, James A.; Nees, Michael R.; Imrie, William P.; Rayner, Christopher C.; Pfalzgraff, Chris L.; Bates, Robert K.; Ness, Valmer H.; and Cox, Terrance J., 5,470,445, Cl. 204-105.00R.

Beck, Anthony L.; Wallis, Julian M.; Attwood, Martin D.; and Newman, Stephen, to Minnesota Mining and Manufacturing Company. Hardening of gelatin-containing layers. 5,470,699, Cl. 430-621.000.

Becker, Gregory R.; and Rapoport, Mitchell I. Reciprocating shaft device. 5,471,102, Cl. 310-50.000.

Becker, Lutz; and Schüring, Andreas, to Mannesmann Aktiengesellschaft. Electrode support device for arc furnaces. 5,471,496, Cl. 373-94.000.

Becton, Dickinson and Company: *See*—
Griffith, Richard L., III; Gregg, Joseph J.; and Yurkewych, George, 5,470,318, Cl. 604-161.000.
Mussi, Edward F.; and Gray, Harry E., 5,470,743, Cl. 435-297.100.
Walker, George T.; Nadeau, James G.; Spears, Patricia A.; Nycz, Colleen M.; Shank, Daryl D.; Schram, James L.; and Jurgensen, Stewart R., 5,470,723, Cl. 435-91.200.
Williams, Joel L.; Nahir, Tal M.; and Qiu, Yong-Jian, 5,470,677, Cl. 429-190.000.

Bedi, James J.: *See*—
Rothfuss, Robert G.; Okorocha, Livyn O.; Bishop, Gregory D.; Sambi, Narinderjit S.; Bedi, James J.; Privitera, Salvatore; and Sherrill, Michael, 5,470,010, Cl. 227-177.000.

Beecham Group p.l.c.: *See*—
Wadsworth, Harry J.; Wyman, Paul A.; Dabbs, Steven; and Jenkins, Sarah M., 5,470,859, Cl. 514-299.000.

Beecham Group plc: *See*—
Buckle, Derek R.; Pinto, Ivan L.; and Smith, David G., 5,470,872, Cl. 514-456.000.

Begemann, Malcolm J. S., to Vitatron Medical, B.V. Rate responsive pacemake with improved rate change dynamics and pacing method. 5,470,344, Cl. 607-17.000.

Beifuss, Horst, to Barmag AG. Yarn texturing apparatus. 5,469,609, Cl. 28-271.000.

Beiss, Günter: *See*—
Schäfer, Horst; Schaaf, Günter; Scholz, Bernhard; and Beiss, Günter, 5,470,204, Cl. 416-157.00R.

Bell Communications Research, Inc.: *See*—
Schmutz, Caroline N.; Shokoohi, Frough K.; Tarascon, Jean-Marie; and Warren, Paul C., 5,470,357, Cl. 29-623.500.

Bell Sports, Inc.: *See*—
Akeley, Tom; and West, Neil, 5,469,583, Cl. 2-421.000.

Belle de St. Claire: *See*—
Chmel, James; and Berger, Robert P., 5,469,908, Cl. 164-376.000.

BellSouth Corporation: *See*—
Howe, Wayne; Silver, Ed; Bailey, Kim; Shih, Jerry; Morel, Kitty; Hill, Peter; Addison, Cathy; Woodring, Larry; and Malik, Dale, 5,471,519, Cl. 379-67.000.

Beneckert, Hartmut; and Schillinger, Dieter, to Putzmeister-Werk Maschinenfabrik GmbH. Locking device for pull-out supports. 5,470,167, Cl. 403-322.000.

Bender, Carl A., to International Business Machines Corporation. Clock fault detection circuit. 5,471,488, Cl. 371-61.000.

Bendo, Christopher J. T-shaped golf putter. 5,470,070, Cl. 273-167.00R.

Bendorf, Robert L., to Whitaker Corporation, The. Electrical connector with snorting switch. 5,470,243, Cl. 439-188.000.

Bené, Bernard; and Goux, Nicolas, to Hospal Industrie. Device and method for controlling the balance of fluids in an extracorporeal blood circuit. 5,470,483, Cl. 210-741.000.

Beratan, Howard R.: *See*—
Summerfelt, Scott R.; and Beratan, Howard R., 5,471,364, Cl. 361-321.400.

Beresniewicz, Aleksander: *See*—
Weber, Andrew M.; and Beresniewicz, Aleksander, 5,470,662, Cl. 428-421.000.

Berg, Lloyd, to Berg, Lloyd. Separation of isopropanol from 2-butanone by extractive distillation. 5,470,443, Cl. 203-57.000.

Berg, Peter G.: *See*—
Kawate, Keith W.; and Berg, Peter G., 5,471,034, Cl. 219-485.000.

Berg, Richard A.: *See*—
Rhee, Woonza M.; and Berg, Richard A., 5,470,911, Cl. 525-54.100.

Berg, Robert D. W.; and Domsten, Eugene R., to DeBourgh Manufacturing Company. Recessed three-point latching mechanism and method for a storage locker. 5,470,115, Cl. 292-335.000.

Berg, William C.: *See*—
Kuehn, Kevin P.; Rossing, Martin A.; and Berg, William C., 5,470,341, Cl. 607-5.000.

Berger, Faize: *See*—
Daute, Peter; Wegener; Ingo; Meffert, Alfred; and Berger, Faize, 5,470,493, Cl. 252-8.700.

Berger, Harald; Mittag, Peter; Steins, Johannes; and Pfeiffer, Gert, to Voest-Alpine Industrieanlagenbeau GmbH. Electric arc furnace arrangement for producing steel. 5,471,495, Cl. 373-2.000.

Berger, John G.; and Ashcroft, Dale A., to Ford New Holland, Inc. Adaptive engine preheat. 5,469,819, Cl. 123-179.600.

Berger, Robert P.: *See*—
Chmel, James; and Berger, Robert P., 5,469,908, Cl. 164-376.000.

Bergles, Eduard: *See*—
Steuer, Werner; and Bergles, Eduard, 5,469,755, Cl. 74-371.000.

Bernard, Bernie B.: *See*—
Jiang, Kenneth K.; and Bernard, Bernie B., 5,470,380, Cl. 96-102.000.

Bernat, André; Herbert, Jean-Marc; and Valette, Gérard, to Sanofi. Certain heterocyclic thiazole derivatives and their therapeutic use. 5,470,855, Cl. 514-236.800.

Bertalan, Charles W.: *See*—
Katcher, Jay H.; and Bertalan, Charles W., 5,470,968, Cl. 536-102.000.

Berwind Pharmaceutical Services, Inc.: *See*—
Grillo, Susan M.; Steffenino, Rita M.; Kunkle, Diane C.; and Saraceni, Kathleen, 5,470,581, Cl. 424-479.000.

Best, Serena M.: *See*—
Bonfield, William; Best, Serena M.; and Barralet, Jake E., 5,470,803, Cl. 501-1.000.

Beteau, Jean-François; and Graindorge, Philippe, to Valorga Process. Apparatus for controlling the methane fermentation of organic materials. 5,470,745, Cl. 435-286.100.

Betz Laboratories, Inc.: *See*—
Arhancet, Graciela B., 5,470,440, Cl. 203-9.000.
Rodzewich, Edward A., 5,470,613, Cl. 427-388.100.

Bezwada, Rao S.; Shalaby, Shalaby W.; and Koelmel, Donald F., to Ethicon, Inc. Copolymers of (p-dioxanone/glycolide and/or lactide) and p-dioxanone. 5,470,340, Cl. 606-231.000.

Bhagat, Gopal C.; and Webster, James M., to Compaq Computer Corporation. Apparatus for a computer pointing device. 5,470,040, Cl. 248-222.400.

Bhargava, Vivek; Jue, Andrew; Van Scherrenburg, Michael A.; and Wilson, Les J., to National Semiconductor Corporation. System for tile coding of moving images. 5,471,248, Cl. 348-420.000.

Biancalani, Fiorenzo, to Officina Meccanica Biancalani & C. di Biancalani Florenzo & C. S.N.C. Machine for treatment of fabric in cord form, with rollers incorporating electric driving motors, for fulling and for other operations. 5,469,608, Cl. 26-19.000.

Biebuyck, Lawrence, to Butler Manufacturing Corporation. Threshold system. 5,469,665, Cl. 49-470.000.

Bieringer, Fritz: *See*—
Schwalke, Udo; and Bieringer, Fritz, 5,470,782, Cl. 437-70.000.

Biery, Glenn A.; Boyne, Daniel M.; and Dalal, Hormazdyar M., to International Business Machines Corporation. Method of making self-aligned, lateral diffusion barrier in metal lines to eliminate electromigration. 5,470,788, Cl. 437-190.000.

Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Grosser, Martin; Schneider, Peter; Barth, Wolfgang; Moll, Hermann; and Pollmann, Horst, to C. Haushahn GmbH & Co. Guide arrangement for elevators. 5,469,938, Cl. 187-408.000.

Bigg, Donald M.: *See*—
Markle, Richard A.; Brusky, Phyllis L.; Cremeans, George E.; Elhard, Joel D.; Bigg, Donald M.; and Sowell, Sylvester, 5,470,945, Cl. 528-390.000.

Biller, Scott A.: *See*—
Magnin, David R.; Biller, Scott A.; Dickson, John K., Jr.; Lawrence, R. Michael; and Sulsky, Richard B., 5,470,845, Cl. 514-121.000.

Billingham, Paul R. Modular filing system. 5,470,141, Cl. 312-205.000.

Bilotti, Alberto; and Tallarico, Jose L., to Allegro Microsystems, Inc. DC-motor bridge driver with end-of-braking detector. 5,471,122, Cl. 318-284.000.

Bingham, Ian R.: *See*—
Jones, Larren F.; Emrich, Robert K.; and Bingham, Ian R., 5,469,648, Cl. 37-457.000.

Bingler, Douglas J.: *See*—
Bankos, Kevin; and Bingler, Douglas J., 5,469,978, Cl. 213-223.000.

Binkley Company, The: *See*—
Baxter, Bobby G., 5,470,096, Cl. 280-712.000.

Bio-Technical Resources: *See*—
Grund, Alan D., 5,470,728, Cl. 435-156.000.

Biogen, Inc.: *See*—
Buell, Gary N.; and Movva, Nageswararao, 5,470,721, Cl. 435-69.700.

Biomet Inc.: *See*—
Hershberger, Troy W.; and Booth, Robert E., Jr., 5,470,354, Cl. 623-20.000.

Biosite Diagnostics Incorporated: *See*—
Buechler, Kenneth F.; Noar, Joseph B.; and Moi, Si S., 5,470,997, Cl. 558-254.000.

Biotechnology Australia Pty Ltd.: *See*—
De Kretser, David M.; Burger, Henry G.; Hearn, Milton T. W.; Milne-Robertson, David M.; Wettenhall, Richard E. H.; McLachlan, Robert I.; and De Vos, Fiona, 5,470,826, Cl. 514-8.000.

Birangi, Tourang; and Nemer, Joseph C., to Elsag International N.V. Method and apparatus for increasing the resolution of a digital to analog converted pulse width modulated signal. 5,471,505, Cl. 375-238.000.

Biro, Larry L.: *See*—
Edmondson, John H.; and Biro, Larry L., 5,471,591, Cl. 395-375.000.

Bisaiji, Takashi: *See*—
Hayashi, Koji; and Bisaiji, Takashi, 5,471,282, Cl. 355-203.000.

Bischoff, Hilmar: *See*—
Angerbauer, Rolf; Fey, Peter; Hübsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, 5,470,982, Cl. 546-268.000.

Bishop, Gregory D.: *See*—
Rothfuss, Robert G.; Okorocha, Livyn O.; Bishop, Gregory D.; Sambi, Narinderjit S.; Bedi, James J.; Privitera, Salvatore; and Sherrill, Michael, 5,470,010, Cl. 227-177.000.

Bissinger, Ronald, to SKF GmbH. Retaining bushing for joining bearing rings. 5,470,165, Cl. 403-313.000.

Bitar, Ali A.: *See*—
Allen, William E.; Bitar, Ali A.; and Herold, Robert A., 5,471,147, Cl. 324-635.000.

Bjorge, Scott W. Soil aerator. 5,469,922, Cl. 172-22.000.

Bjornard, Erik J.: *See*—
Dickey, Eric R.; and Bjornard, Erik J., 5,470,452, Cl. 204-298.210.

Black & Decker Inc.: *See*—
Marchetti, Michael J., 5,471,013, Cl. 174-65.00R.

Blair, David E.; Houle, William A.; Lane, Gregg A.; Larson, James R.; and Pearlstine, Kathryn A., to E.I. Du Pont de Nemours and Company. System for replenishing liquid electrostatic developer. 5,471,287, Cl. 355-256.000.

Blaker, David M.; Ellard, Gregory S.; and Mobin, Mohammad S., to AT&T IPM Corp. Soft symbol decoding. 5,471,500, Cl. 375-340.000.

Blanchard, Russell O.: *See*—
Bredeweg, Robert; Blanchard, Russell O.; Morgan, Donald F.; and Dooley, Edward J., 5,469,995, Cl. 223-85.000.

Blaner, Bartholomew: *See*—
Phillips, James E.; Blaner, Bartholomew; and Vassiliadis, Stamatis, 5,471,628, Cl. 395-800.000.

Blank, David L.; Crill, Roger O.; Pusey, Bruce A.; and Shah, Kashyap H., to Globe-Union, Inc. Vacuum turret. 5,470,195, Cl. 414-797.000.

Blaser, Martin J.; Ellison, Richard T., III; and Pei, Zhi H., to Enteric Research Laboratories Inc. Antisera against a PEB1 antigen from *Campylobacter jejuni*. 5,470,958, Cl. 530-389.500.

Blaxtan, Peter W.; and Gillespie, John, to Rank Brimar Limited. Spatial light modulator with sub-divided modulation elements. 5;471,584, Cl. 359-263.000.

Blease Medical Equipment Limited: *See*—
Laybourne, John R.; and Mott, Justin, 5,470,511, Cl. 261-55.000.

Blight, M. Andrew: *See*—
Jensen, Darrell V.; Hobbs, Carl J.; and Blight, M. Andrew, 5,470,175, Cl. 404-72.000.

Blue Coral, Inc.: *See*—
Lupyan, David A.; and Sokol, Bryan L., 5,470,500, Cl. 252-174.150.

Blum, Ronald D.: *See*—
Gupta, Amitava; and Blum, Ronald D., 5,470,892, Cl. 522-42.000.

Board of Regents, The University of Texas System: *See*—
Folkers, Karl A.; Ljungqvist, Anders; Feng, Dong-Mei; Kubota, Minoru; Tang, Pui-Fun L.; and Bowers, Cyril Y., 5,470,947, Cl. 530-313.000.
Garfield, Robert E.; and Yallampalli, Chandrasekhar, 5,470,847, Cl. 514-171.000.

Board of Trustees operating Michigan State University: *See*—
Hawley, Martin C.; Wei, Jianghua; Adegbite, Valerie; and Lin, Min, 5,470,423, Cl. 156-166.000.

Bobrovskikh, Jury M.: *See*—
Koshkin, Petr K.; Sveshnikov, Alexander A.; and Bobrovskikh, Jury M., 5,471,179, Cl. 333-195.000.

BOC Group, Inc., The: *See*—

Ramachandran, Ramakrishnan; and Dao, Loc H., 5,470,925, Cl. 526-68.000.

BOC Group plc, The: *See*—
Garrett, Michael E., 5,470,379, Cl. 96-4.000.

Bockelman, David E.; and Weisman, Douglas H., to Motorola, Inc. Spatially separated uninsulated twisted wire pair. 5,471,010, Cl. 174-36.000.

Bodford, Robert E., Jr., to Paddle Games Unlimited, Inc. Paddle game. 5,470,057, Cl. 273-30.000.

Boehringer Mannheim GmbH: *See*—
Lubitz, Werner; and Szostak, Michael P., 5,470,573, Cl. 424-200.100.

Boenning, Robert A., to Westinghouse Electric Corp. Capacitive angle sensor employing a vertical cantilever beam. 5,469,632, Cl. 33-366.000.

Bogatin, Yakov; Robinson, Mark; Greenwald, Frank S.; and Ormerod, John, to SPS Technologies, Inc. Rare earth anisotropic magnetic materials for polymer bonded magnets. 5,470,400, Cl. 148-301.000.

Bogdanovich, Birdie: *See*—
Whitson, Damaras E.; and Bogdanovich, Birdie, 5,470,089, Cl. 280-87.041.

Bogut, Henry A.: *See*—
Patino, Joseph; Bogut, Henry A.; and Tidwell, James L., 5,471,128, Cl. 320-13.000.

Bohanan, Montgomery A.: *See*—
Meilinger, John H.; Brown, C. Gordon; and Bohanan, Montgomery A., 5,470,593, Cl. 426-36.000.

Böhme-Kovac, Jozef: *See*—
Schermann, Walter; Miller, Dennis; Hilgenfeldt, Eckhard; and Böhme-Kovac, Jozef, 5,470,383, Cl. 106-170.000.

Bohrman, Joseph K., to Huffy Corporation. One-piece extension arm. 5,470,054, Cl. 273-1.50R.

Boku, Katsushi: *See*—
Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, 5,470,778, Cl. 437-52.000.

Bolger, Joe. Driver's associate: a system for vehicle navigation and driving assistance. 5,471,393, Cl. 364-450.000.

Boliek, Martin: *See*—
Allen, James D.; Boliek, Martin; and Schwartz, Edward L., 5,471,206, Cl. 341-51.000.

Bolt Beranek and Newman Inc.: *See*—
Soderberg, Brian T.; and Kenworthy, Mark L., 5,471,567, Cl. 395-133.000.

Bolza-Schünemann, Ing H.-B., to Koenig & Bauer Aktiengesellschaft. Print quality control device for perfecting press. 5,471,309, Cl. 356-394.000.

Bonduel, Pascal: *See*—
Gier, Achim R.; Bonduel, Pascal; Heckel, Robert J.; and Fin, Enrico, 5,469,656, Cl. 49-28.000.

Bonella, Randy M.: *See*—
Melo, Maria L.; and Bonella, Randy M., 5,471,590, Cl. 395-288.000.

Bonfield, William; Best, Serena M.; and Barralet, Jake E., to Queen Mary and Westfield College. Method for the preparation of carbonated hydroxyapatite compositions. 5,470,803, Cl. 501-1.000.

Bonora, Anthony C.; Rosenquist, Frederick T.; Jain, Sudhir; and Davis, Mark R., to Asyst Technologies, Inc. Sealable transportable container having improved liner. 5,469,963, Cl. 206-709.000.

Bonsignore, Patrick V., to ARCH Development Corporation. Production of high molecular weight polylactic acid. 5,470,944, Cl. 528-354.000.

Bonta, Jeffrey D.: *See*—
Schatz, Steven V.; Richie, Thomas W.; Menich, Barry J.; Bonta, Jeffrey D.; and Akinniyi, Akingbade, 5,471,644, Cl. 455-33.200.

Bonte, Frédéric; Dumas, Marc; Meybeck, Alain; and Marechal, Christian, to LVMH, Recherche. Xanthines, optionally incorporated in liposomes, for promoting skin or hair pigmentation. 5,470,579, Cl. 424-450.000.

Boorady, Charles A., to Boorady, Charles A. Method for converting a bag between two functional carrying modes. 5,469,967, Cl. 206-527.000.

Booth, Hubert J.; Steagall, Paul H., III; and Wright, Michael W., to Wellman, Inc. Sorting optically different solid masses. 5,469,973, Cl. 209-580.000.

Booth, Robert E., Jr.: *See*—
Hershberger, Troy W.; and Booth, Robert E., Jr., 5,470,354, Cl. 623-20.000.

bor-mor, Inc.: *See*—
Lessard, Willie J., 5,469,926, Cl. 175-424.000.

Borcherding, David R.; Edwards, Carl K., III; Esser, Ronald E.; and Cole, Douglas L., to Marion Merrell Dow Inc. Carbocyclic nucleoside analogs useful as immunosuppressants. 5,470,857, Cl. 514-258.000.

Borden, Donald E.: *See*—
McRoberts, Louis A.; and Borden, Donald E., 5,471,479, Cl. 371-10.300.

Borg-Warner Automotive, Inc.: *See*—
Ledvina, Timothy J.; and Mott, Philip J., 5,470,282, Cl. 474-156.000.
Leitz, Hermann, 5,469,949, Cl. 192-45.100.
Schneider, Karl F.; Dembosky, Stanley K.; Fairbank, Donn K.; Spokas, Romas B.; and Keeney, Bradley L., 5,470,285, Cl. 475-210.000.

Borges, Gregory: *See*—
French, Barry J.; Ferguson, Kevin R.; McDonald, Halley A., III; Glass, Andrew B.; Mohansingh, Timothy; and Borges, Gregory, 5,469,740, Cl. 73-379.040.

Borland International, Inc.: *See*—
Schlafly, Roger, 5,471,612, Cl. 395-600.000.

Bormann, Thomas J.: *See*—
Matkovich, Vlado I.; Bormann, Thomas J.; Gsell, Thomas C.; and Pascale, Frank R., 5,470,488, Cl. 210-767.000.

Born, Maurice: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; Marchand, Pierre; Dixmier, Francoise; and Prigent, Monique, 5,470,495, Cl. 252-18.000.

Borriss, Rainer; Hofemeister, Jürgen; Thomsen, Karl K.; Olsen, Ole; and Von Wettstein, Dietrich, to Carlsberg A/S; and Akademie der Wissenchaften der DDR. Thermostable (1,3-1,4)-β-glucanase. 5,470,725, Cl. 435-93.000.

Borsos, Robert A.: *See*—
Ross, Michael E.; Borsos, Robert A.; and Corey, Lawrence G., 5,471,024, Cl. 200-458.000.

Bortins, John; Stageberg, Frank; Stover, Lance E.; and Weispfenning, Gerald L., to Seagate Technology, Inc. Servo head with close servo transducer placement for improved passive noise cancellation. 5,471,354, Cl. 360-77.050.

Bortz, Steven J., to Radian Corporation. Apparatus and method for reducing NO_x, CO and hydrocarbon emissions when burning gaseous fuels. 5,470,224, Cl. 431-182.000.

Boschetti, Egisto: *See*—
Girot, Pierre; and Boschetti, Egisto, 5,470,463, Cl. 210-198.200.

Bouc, Gary L.: *See*—
Mack, Donald F.; Logman, Timothy M.; Bouc, Gary L.; and Greenlee, Larry W., 5,470,046, Cl. 251-329.000.

Boula, Gérard, to Framatome. Internal equipment for electron beam butt welding of two annular parts and utilization of such equipment. 5,471,030, Cl. 219-121.130.

Boutes, Jean-Pierre: *See*—
Dosiere, Frédéric; Boutes, Jean-Pierre; and Maral, Gérard, 5,471,641, Cl. 455-13.100.

Bowers, Cyril Y.: *See*—
Folkers, Karl A.; Ljungqvist, Anders; Feng, Dong-Mei; Kubota, Minoru; Tang, Pui-Fun L.; and Bowers, Cyril Y., 5,470,947, Cl. 530-313.000.

Boyer, Geoffrey. Inflatable package with valve. 5,469,966, Cl. 206-522.000.

Boyle, Damon J.: *See*—
Kelso, Thomas M.; Kotch, John K.; Boyle, Damon J.; Meiser, David H.; Flaherty, William P.; and Baird, Bernard W., 5,470,232, Cl. 434-45.000.

Boyle, William H., to Envirex, Inc. Clarifier. 5,470,475, Cl. 210-519.000.

Boyne, Daniel M.: *See*—
Biery, Glenn A.; Boyne, Daniel M.; and Dalal, Hormazdyar M., 5,470,788, Cl. 437-190.000.

Bozych, Dennis E.: *See*—
Harris, Bernard; and Bozych, Dennis E., 5,470,414, Cl. 156-174.000.

BP Chemicals Limited: *See*—
Pes, Robert, 5,470,540, Cl. 422-145.000.

Brace, Philip J.: *See*—
Sargeant, Adrian A.; Currie, William H.; Ouwens, Willem; Brace, Philip J.; Todd, Robert W.; and Scholz, Hans-Joachim, 5,470,142, Cl. 312-258.000.

Bracken, William D. Instrument mounting apparatus for sailboats. 5,469,804, Cl. 114-343.000.

Braconnier, Jean-Jacques, to Rhone-Poulenc Chimie. Granular rare earth phosphates having characteristic morphology. 5,470,503, Cl. 252-301.40P.

Bradbury, E. Douglas: *See*—
Stewart, Gerald M.; and Bradbury, E. Douglas, 5,470,090, Cl. 280-276.000.

Bradshaw, Alex: *See*—
Nonaka, Yoshiya; Aoyagi, Yoshio; Abe, Hiroyuki; Bradshaw, Alex; Kiyoura, Kazuhiro; Kato, Seiji; and Haraguchi, Koichiro, 5,471,441, Cl. 369-32.000.

Brady, Lois A. K.: *See*—
Tedesco, James M.; Brady, Lois A. K.; and Colburn, Willis S., 5,471,327, Cl. 359-15.000.

Braga, David J.; Carter, Thomas L.; Dozier, Edward M.; and Sarbell, John P., to Sumitomo Electric Lightwave Corp. Fiber optic ribbon break-out device with enhanced strain relief. 5,471,555, Cl. 385-136.000.

Brailey, Allen C.: *See*—
Beardsley, Brent C.; Brailey, Allen C.; and Leung, Peter L. H., 5,471,631, Cl. 395-650.000.

Brake, Loren D.: *See*—
Foley, Henry C.; Sonnichsen, George C.; Brake, Loren D.; Mariwala, Ravindra K.; and Lafyatis, David S., 5,470,814, Cl. 502-182.000.

Brandenstein, Manfred; Friedrich, Wolfgang; Haas, Roland; Herrmann, Gerhard; and Olschewski, Armin, to SKF GmbH. Presettable belt tension device. 5,470,279, Cl. 474-135.000.

Brandis, Dirk K.: *See*—
Yokote, Timothy A.; Upton, Eric L.; Enyedy, Arthur G.; Stockton, Grant J.; and Brandis, Dirk K., 5,471,603, Cl. 395-402.000.

Brandley, Brian K.; Tiemeyer, Michael; Swiedler, Stuart J.; Moreland, Margaret; and Schweingruber, Hans, to Glycomed, Incorporated. Carbohydrate-based anti-inflammatory agents. 5,470,842, Cl. 514-61.000.

Brandmaier, Harold: *See*—
Sneddon, Kirk; and Brandmaier, Harold, 5,469,701, Cl. 60-259.000.

Branigin, Michael H. Computer processor with an efficient means of executing many instructions simultaneously. 5,471,593, Cl. 395-375.000.

Brazas, John C., to Eastman Kodak Company. Segmented waveguide gratings used as optical recording sensors. 5,471,548, Cl. 385-37.000.

Bredeweg, Robert; Blanchard, Russell O.; Morgan, Donald F.; and Dooley, Edward J., to Batts, Inc. Garment hanger sizing system. 5,469,995, Cl. 223-85.000.

Brenton, Billy H.; and Stagnone, James J. Interchangeable thumb ringlets for pivoted cutting and grasping instruments. 5,469,624, Cl. 30-232.000.

Breslin, David T.: *See*—

Saeva, Franklin D.; and Breslin, David T., 5,470,994, Cl. 556-64.000.
Breslin, Michael K. Pneumatically powered submersible fluids pump with casing activator. 5,470,206, Cl. 417-131.000.
Brewster, Wilfred G.; and Forrester, Michael D., to Golf Games International (Australia) Pty Ltd. Golf board game apparatus. 5,470,077, Cl. 273-245.000.
Breyer, Karl-Hermann; Kammleiter, Berndt; and Ruck, Otto, to Carl Zeiss-Stiftung. Method of measuring elemental shapes of a workpiece on a coordinate measuring machine. 5,471,406, Cl. 364-559.000.
Bridges, James E. Transportable golf bag. 5,470,095, Cl. 280-646.000.
Brien, Glenn C., to Anca Pty. Ltd. Control of CNC machine tools. 5,471,395, Cl. 364-474.280.
Brienza, David M.: *See*—
Brubaker, Clifford E.; Brienza, David M.; and Brienza, Michael J., 5,470,590, Cl. 425-2.000.
Brienza, Michael J.: *See*—
Brubaker, Clifford E.; Brienza, David M.; and Brienza, Michael J., 5,470,590, Cl. 425-2.000.
Briese, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Fouquet, Christophe J. A.; and Lowe, Coy S., to Schlumberger Industries, Inc. System checking and troubleshooting package for an electronic metering device. 5,471,137, Cl. 324-158.100.
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Mastalski, Henry T., to Xerox Corporation. Flexible belt reclaiming. 5,470,271, Cl. 451-55.000.
Brinkman, Wesley H.: *See*—
Steed, C. Edward; and Brinkman, Wesley H., 5,469,589, Cl. 5-400.000.
Bristol-Myers Squibb Company: *See*—
Magnin, David R.; Biller, Scott A.; Dickson, John K., Jr.; Lawrence, R. Michael; and Sulsky, Richard B., 5,470,845, Cl. 514-121.000.
Nair, Xina; and Tramposch, Kenneth M., 5,470,567, Cl. 424-59.000.
Bristow, James A.: *See*—
Staats, Louis T., III; Bristow, James A.; Noronha, Anil P. F.; and Murphy, Gregory E., 5,470,487, Cl. 210-767.000.
British Broadcasting Corporation: *See*—
Wilson, Stephen G. T., 5,471,651, Cl. 455-72.000.
British Gas plc: *See*—
Coles, Gary S. V.; and Williams, Geraint, 5,470,756, Cl. 436-144.000.
British Technology Group Ltd.: *See*—
Street, Michael J.; and Mottram, Toby T. F., 5,469,808, Cl. 119-27.000.
Broadbent, Craig L.: *See*—
Broadbent, Lynn C.; and Broadbent, Craig L., 5,469,838, Cl. 126-524.000.
Broadbent, Lynn C.; and Broadbent, Craig L. Gas fireplace capable of being installed without masonry work. 5,469,838, Cl. 126-524.000.
Broadway Companies, Inc.: *See*—
Gaiser, William R., 5,470,221, Cl. 425-556.000.
Brock, Waine T.: *See*—
TenBrink, Jay T.; Farkas, Maryanne R.; Vendt, Robert J.; and Brock, Waine T., 5,469,662, Cl. 49-352.000.
Brodbeck, Kevin J.: *See*—
Choy, Clement K.; Argo, Brian P.; Brodbeck, Kevin J.; and Hearn, Lynn M., 5,470,499, Cl. 252-99.000.
Brodersen, Karl-Heinz; Dahlmann, Gerhard; and Leopold, Heinrich. Process for the delignification of cellulose fiber raw materials using alcohol and alkali. 5,470,433, Cl. 162-77.000.
Brodnax, Timothy B.; Bullis, Bryan K.; King, Steven A.; and Rickard, Dale A., to International Business Machines Corporation. Partitioning of virtual addressing memory. 5,471,599, Cl. 395-412.000.
Brodrecht, Gerald. Bale bagging apparatus. 5,469,693, Cl. 53-567.000.
Brommer, Karl; Mullaney, Henry; Meade, Robert; Rappe, Andrew; and Joannopoulos, John, to Lockheed Sanders, Inc.; and Massachusetts Institute of Technology. Low-loss dielectric resonant devices having lattice structures with elongated resonant defects. 5,471,180, Cl. 333-202.000.
Brossier, Pascal N.; Pincemin, Jean-Marie N.; and Wurniesky, Pascal, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.). Combination turbojet engine nozzle and thrust reverser. 5,470,020, Cl. 239-265.330.
Brother Kogyo Kabushiki Kaisha: *See*—
Inaishi, Kouji, 5,470,683, Cl. 430-106.000.
Kurachi, Atsuhiko, 5,471,550, Cl. 382-200.000.
Kurokawa, Yuji, 5,471,536, Cl. 382-315.000.
Brotz, Gregory R. Nautical fuel overflow protection device and method. 5,469,800, Cl. 114-74.00R.
Brown, C. Gordon: *See*—
Meilinger, John H.; Brown, C. Gordon; and Bohanan, Montgomery A., 5,470,593, Cl. 426-36.000.
Brown, Glenn M.: *See*—
Diehl, Donald R.; and Brown, Glenn M., 5,470,695, Cl. 430-522.000.
Brown, Jeffrey R.: *See*—
Harrison, Howard R.; and Brown, Jeffrey R., 5,469,708, Cl. 62-3.640.
Brown, Mark D.: *See*—
Patel, Naresh D.; and Brown, Mark D., 5,470,894, Cl. 523-218.000.
Brown, Robert, III, to Digital Equipment Corporation. Computer memory device holding a data structure for implementation of function objects. 5,471,596, Cl. 395-375.000.
Brown, Ronald E., to Phillips Petroleum Company. Packed column vaporizer and vaporizing process. 5,470,441, Cl. 203-49.000.
Brown, Roy B.; and Tolar, Neal J. Minimum shift keyed saw device and method. 5,471,499, Cl. 375-305.000.
Brubaker, Clifford E.; Brienza, David M.; and Brienza, Michael J., to University of Pittsburgh. Reusable die shape for the manufacture of molded cushions. 5,470,590, Cl. 425-2.000.
Brunner, Timothy A.; Dove, Derek B.; and Hsu, Louis L., to International Business Machines Corporation. Phase shift mask using liquid phase oxide deposition. 5,470,681, Cl. 430-5.000.
Brunswick Corporation: *See*—
Eick, Edward C., 5,470,264, Cl. 440-83.000.
Griffiths, John M.; Gussert, David A.; and Karls, Michael A., 5,470,263, Cl. 440-75.000.
Brunt, William F., II. Foldable life size poster and method for making the same. 5,470,301, Cl. 493-323.000.
Brusky, Phyllis L.: *See*—
Markle, Richard A.; Brusky, Phyllis L.; Cremeans, George E.; Elhard, Joel D.; Bigg, Donald M.; and Sowell, Sylvester, 5,470,945, Cl. 528-390.000.
Bryan, Philip N.; Alexander, Patrick A.; and Strausberg, Susan L., to University of Maryland. Calcium free subtilisin mutants. 5,470,733, Cl. 435-222.000.
Bryant, Charles P.: *See*—
Pialet, Joseph W.; Lal, Kasturi; and Bryant, Charles P., 5,470,498, Cl. 252-76.000.
Buchanan, Douglas A.: *See*—
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.
Buchholtz, Gerhard; and Schaetzle, Ulrich, to Siemens Aktiengesellschaft. System for the treatment of pathological tissue having a catheter with a pressure sensor. 5,470,350, Cl. 607-97.000.
Buchner, Gregory C.; and Drebin, Robert A., to Silicon Graphics, Inc. System and method for adding detail to texture imagery in computer generated interactive graphics. 5,471,572, Cl. 395-139.000.
Buckle, Derek R.; Pinto, Ivan L.; and Smith, David G., to Beecham Group plc. Benzopyranols. 5,470,872, Cl. 514-456.000.
Buckman Laboratories International, Inc.: *See*—
McNeel, Thomas E., 5,470,484, Cl. 210-746.000.
Bucolo, Sebastian. Accessory useful for camera having no remote operation capability. 5,471,272, Cl. 354-269.000.
Budd Company, The: *See*—
Herring, James M., Jr.; and Greve, Bruce N., 5,470,416, Cl. 156-196.000.
Buechler, Kenneth F.; Noar, Joseph B.; and Moi, Si S., to Biosite Diagnostics Incorporated. Amphetamine derivatives and protein and polypeptide amphetamine derivative conjugates and labels. 5,470,997, Cl. 558-254.000.
Buell, Gary N.; and Movva, Nageswararao, to Biogen, Inc. Production of human somatomedin C. 5,470,721, Cl. 435-69.700.
Buerger, Walter R., Jr. Semi-monolithic memory with high-density cell configurations. 5,471,087, Cl. 257-532.000.
Buhl, Harro; and Rienhardt, Hans-Peter, to Alfred Teves GmbH. Apparatus for the limitation of the wiping angle of a windscreen wiper unit. 5,469,757, Cl. 74-526.000.
Bühler AG: *See*—
Reh, Lothar; Tesch, Marc; Häni, Beat; and Ruf, Arthur, 5,469,994, Cl. 222-630.000.
Bull, Alan; Hardman, David J.; Stubbs, Brian M.; and Sallis, Paul J., to Hercules Incorporated. Dehalogenation of organohalogen-containing compounds. 5,470,742, Cl. 435-262.000.
Bull HN Inforamtion Systems Inc.: *See*—
Keeley, James W., 5,471,638, Cl. 395-800.000.
Bullis, Bryan K.: *See*—
Brodnax, Timothy B.; Bullis, Bryan K.; King, Steven A.; and Rickard, Dale A., 5,471,599, Cl. 395-412.000.
Burchell, James R. Shelf allocation and management system. 5,469,976, Cl. 211-59.300.
Burchfiel, Steven M.: *See*—
Bailey, Roger N.; Burchfiel, Steven M.; and Taborn, Michael P., 5,471,410, Cl. 364-715.010.
Burd, John F.; Hoblitzell, Talei; and Neyer, Gebhard, to LXN Corporation. Multi-layer devices and methods of assaying for fructosamine. 5,470,752, Cl. 436-87.000.
Burenkov, Eduard K.: *See*—
Pertsov, Nikolay V.; Ulberg, Zoya R.; Vember, Vladimir E.; Podolskaya, Valentina I.; Kogan, Boris S.; and Burenkov, Eduard K., 5,470,460, Cl. 210-151.000.
Burger, Henry G.: *See*—
De Kretser, David M.; Burger, Henry G.; Hearn, Milton T. W.; Milne-Robertson, David M.; Wettenhall, Richard E. H.; McLachlan, Robert I.; and De Vos, Fiona, 5,470,826, Cl. 514-8.000.
Burgess, Robert M.: *See*—
Gorsuch, Ian; Ennis, Mark R.; and Burgess, Robert M., 5,470,362, Cl. 51-295.000.
Burgot, Jean-Louis: *See*—
Christen, Marie-Odile; and Burgot, Jean-Louis, 5,470,871, Cl. 514-441.000.
Burkard, Christopher J.; and Manley, Norman G., to Minnesota Mining and Manufacturing Company. Protective cover with locking collar and installation tool. 5,469,679, Cl. 52-301.000.
Burke, Dennis E.: *See*—

Freeburg, Thomas A.; Burke, Dennis E.; and Odlyzko, Paul, 5,471,471, Cl. 370-79.000.
Burkholder, Joseph K.: *See*—
Yang, Ning-Sun; Swain, William F.; Burkholder, Joseph K.; and Fuller, Deborah L., 5,470,708, Cl. 435-6.000.
Burki, Ibrahim K.: *See*—
Anjum, Mohammed; Burki, Ibrahim K.; and Christian, Craig W., 5,470,794, Cl. 437-200.000.
Burks, Geoffrey R. Calf carrier. 5,469,812, Cl. 119-728.000.
Burnell, Joseph G.; and Clark, Gary J., to Aeroquip Corporation. Diffuser air outlet. 5,470,276, Cl. 454-155.000.
Burrill, James T.; and Anastos, William N., to Rule Industries Inc. Air bubble free compass and method of manufacturing same. 5,469,631, Cl. 33-364.000.
Burtnyk, Nestor; and Greenspan, Michael A., to National Research Council of Canada. System for determining the pose of an object which utilizes range profiles and synethic profiles derived from a model. 5,471,541, Cl. 382-153.000.
Burton, James E. Shear device for well service tools. 5,470,118, Cl. 294-86.180.
Busam, Edward P., to Hasbro, Inc. Spark producing mechanism. 5,470,267, Cl. 446-22.000.
Bustillo Investment Corp.: *See*—
Bustillo, Pedro, Sr., 5,470,262, Cl. 440-72.000.
Bustillo, Pedro, Sr., to Bustillo Investment Corp. Propeller enclosure. 5,470,262, Cl. 440-72.000.
Butler, Donald E.; Le, Tung V.; and Nanninga, Thomas N., to Warner-Lambert Company. Process for *trans*-6-[2-(substituted-pyrrol-1-yl)alkyl]pyran-2-one inhibitors of cholesterol synthesis. 5,470,981, Cl. 546-207.000.
Butler Manufacturing Corporation: *See*—
Biebuyck, Lawrence, 5,469,665, Cl. 49-470.000.
Butler, Michael A.: *See*—
Thieret, Tracy E.; Henderson, Thomas A.; and Butler, Michael A., 5,471,313, Cl. 358-296.000.
Butoh, Zenhachiroh: *See*—
Amatsu, Keiji; Butoh, Zenhachiroh; Hirai, Hiroshi; Massaki, Minoru; Morita, Hirofumi; Nakajima, Takeo; Nomura, Nobuo; Sakaki, Mikio; Schmandt, Stephen J.; and Tanaka, Katsuhiro, 5,471,615, Cl. 395-200.030.
Butterworth, Arthur: *See*—
Wardle, Frank; Jacobson, Bo; Dolfsma, Henk; and Butterworth, Arthur, 5,469,713, Cl. 62-84.000.
Byczek, Roger W.; Hendrich, Randy; and Ashman, John J., to Elco Corporation. Latch mechanism for joining the cover and connector of a removable memory device. 5,470,237, Cl. 439-76.100.
Byers, John D.: *See*—
Rodeffer, Charles E.; Byers, John D.; and Rodeffer, Michael E., 5,471,219, Cl. 342-359.000.
Byers, Larry L.; Mackenthun, Donald W.; Fye, Philip J.; Maciona, Gerald J.; Engel, Jeff A.; Price, Ferris T., deceased (by Robert H. Price, executor); and Seppa, Dale K., to Unisys Corporation. VLSI embedded RAM test. 5,471,482, Cl. 371-21.200.
Byers, Larry L.; De Subijana, Joseba M.; and Michaelson, Wayne A., to Unisys Corporation. System and method for executing branch instructions wherein branch target addresses are dynamically selectable under programmer control from writable branch address tables. 5,471,597, Cl. 395-375.000.
Byk Gulden Lomberg Chemische Fabrik GmbH: *See*—
Sanders, Karl, 5,470,860, Cl. 514-318.000.
C & K Systems, Inc.: *See*—
Rickman, Stephen A., 5,471,195, Cl. 340-550.000.
C. Haushahn GmbH & Co.: *See*—
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Grosser, Martin; Schneider, Peter; Barth, Wolfgang; Moll, Hermann; and Pollmann, Horst, 5,469,938, Cl. 187-408.000.
C. L. Femme Inc.: *See*—
Leonard, Cynthia D.; and Gayne, Lawrence, 5,470,303, Cl. 601-84.000.
Caber, Paul J.: *See*—
Ai, Chiayu; and Caber, Paul J., 5,471,303, Cl. 356-357.000.
Cabral, Arthur W.: *See*—
Webb, Richard D.; and Cabral, Arthur W., 5,471,568, Cl. 395-133.000.
Cadorniga, Lauro C., to Dunlop Slazenger Corporation. Golf ball. 5,470,076, Cl. 273-232.000.
Cafarelli, Robert S. Turbine pump with boundary layer blade inserts. 5,470,197, Cl. 415-90.000.
Cahen, Raymond M.: *See*—
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., 5,470,456, Cl. 208-244.000.
Cahill, Robert B. Clip-on sunglasses assembly for the brim of a hat. 5,471,259, Cl. 351-155.000.
Caignard, Daniel-Henri: *See*—
Duflos, Muriel; Robert-Piessard, Sylvie; Welin, Lucien; Le Baut, Guillaume; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,470,864, Cl. 514-352.000.
Cain, Gary L., to Apache Technologies, Inc. Light detecting apparatus having low noise automatic gain control circuit. 5,471,049, Cl. 250-208.200.
Calgon Carbon Corporation: *See*—
Hayden, Richard A.; and Matviya, Thomas M., 5,470,748, Cl. 436-37.000.
California Institute of Technology: *See*—
Fossum, Eric R.; Mendis, Sunetra; and Kemeny, Sabrina E., 5,471,515, Cl. 377-60.000.
Call, Anson J.; Meisner, Stephen H.; Pompeo, Frank L.; and Zitz, Jeffrey A., to International Business Machines Corporation. Method for forming chip carrier with a single protective encapsulant. 5,471,027, Cl. 219-85.130.
Callahan, James F.; and Huffman, William F., to SmithKline Beecham Corp. γ-turn peptidomimetics as fibrinogen antagonists. 5,470,849, Cl. 514-212.000.
Callaway Golf Company: *See*—
Schmidt, Glenn H.; and Helmstetter, Richard C., 5,470,068, Cl. 273-167.00A.
Schmidt, Glenn H.; and Helmstetter, Richard C., 5,470,069, Cl. 273-167.00A.
Callegari, Alessandro C.: *See*—
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.
Calmettes, Lionel; Detable, Pascal; and Andre, Michel, to Etablissements Caillau. Ring for swaging and method of fabricating it. 5,469,604, Cl. 24-20.0CW.
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Meazza, Giovanni; Zanardi, Giampaolo; Garavaglia, Carlo; and Mirenna, Luigi, to Ministero Dell'Universita' E Della Ricerca Scientifica E Technologica. Oximic derivatives with a fungicide activity. 5,470,863, Cl. 514-343.000.
Camberlin, Yves; Dien, René; and Michaud, Philippe, to Ciba-Geigy Corporation. Impregnating solutions based on at least one reactive thermoplastic poly (imide-amide) oligomer and a coreactant, which can be used especially for the production of preimpregnated intermediate articles. 5,470,920, Cl. 525-421.000.
Camco International Inc.: *See*—
Griffin, Nigel D., 5,469,927, Cl. 175-432.000.
Pringle, Ronald E., 5,469,878, Cl. 137-155.000.
Campagnolo S.r.l.: *See*—
Romano, Antonio, 5,470,277, Cl. 474-70.000.
Campana, Roland: *See*—
Renault, Denis; and Campana, Roland, 5,471,510, Cl. 375-372.000.
Campbell, Michael C. Gas tank evacuator. 5,469,898, Cl. 141-65.000.
Canale, Joseph E.: *See*—
van der Leeuw, Bart; Canale, Joseph E.; Kowal, Albert E.; Pragt, Henrikus J. H.; and Morris, Thomas W., 5,471,110, Cl. 313-25.000.
Cananzey, John J.; and Lucey, Scot M., to Design Standards Corporation. Swivel barrel assembly for inflation syringe. 5,470,317, Cl. 604-121.000.
Canon Kabushiki Kaisha: *See*—
Abe, Shunichi, 5,471,325, Cl. 358-524.000.
Fujii, Haruo; Kobayashi, Tatsuya; Imai, Nobuhiro; Kojima, Hisayoshi; Umezawa, Masao; Tada, Hideki; Ito, Akira; Seto, Kaoru; Katoh, Motoi; and Murata, Daisuke, 5,471,284, Cl. 355-210.000.
Hayashi, Toshio; Arimoto, Shinobu; Yoshinaga, Kazuo; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,471,281, Cl. 155-201.000.
Hieda, Teruo, 5,471,241, Cl. 348-222.000.
Ishihara, Shunichi; Hanna, Junichi; Shimizu, Isamu; and Hirooka, Masaaki, 5,470,389, Cl. 118-719.000.
Jinnai, Shigeru, 5,471,315, Cl. 358-337.000.
Kondo, Makoto, 5,471,242, Cl. 348-224.000.
Kotaki, Takaaki; Taya, Masaaki; Unno, Makoto; Mikuriya, Yushi; and Dojyo, Tadashi, 5,470,684, Cl. 430-109.000.
Mayama, Shinya; Ikeda, Takeshi; Baba, Yoshinobu; and Ogata, Naoya, 5,470,687, Cl. 430-137.000.
Miura, Toshihiko; and Azuma, Yusaku, 5,470,193, Cl. 414-774.000.
Murata, Daisuke, 5,471,322, Cl. 358-502.000.
Nitta, Jun, 5,471,335, Cl. 359-179.000.
Nomura, Ichiro; Banno, Yoshikazu; Kaneko, Tetsuya; Takeda, Toshihiko; and Iwai, Kumi, 5,470,265, Cl. 445-24.000.
Oguchi, Takahiro; Hatanaka, Katsunori; Sakai, Kunihiro; Yamano, Akihiko; and Shido, Shunichi, 5,471,458, Cl. 369-126.000.
Ohtsuka, Yasumasa; Tomoyuki, Yohji; and Hatakeyama, Hideyuki, 5,471,288, Cl. 355-285.000.
Okada, Shinjiro; Inaba, Yutaka; and Katakura, Kazunori, 5,471,229, Cl. 345-89.000.
Okazawa, Kazuhiko, 5,471,292, Cl. 355-326.00R.
Otani, Noriko; and Sakakibara, Teigo, 5,470,940, Cl. 528-204.000.
Saito, Atsushi; Okubo, Akiro; Watanabe, Fumihiko; and Shinada, Yasuyuki, 5,471,230, Cl. 347-29.000.
Setani, Michitaka, 5,471,321, Cl. 358-474.000.
Shirai, Hiroyuki; Sekine, Kazumi; Tsuda, Tadayuki; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shoji, Takeo; Noda, Shinya; Kobayashi, Kazunori; and Adachi, Hiroyuki, 5,470,635, Cl. 428-131.000.
Suematsu, Hiroyuki; Ochi, Hisayuki; Ohno, Manabu; and Kuwashima, Tetsuhito, 5,470,686, Cl. 430-111.000.
Sugawara, Saburo, 5,471,344, Cl. 359-566.000.
Suzuki, Masao; Matoba, Kazuyuki; Saksegi, Yuji; and Sasaki, Takashi, 5,471,243, Cl. 348-234.000.
Suzuki, Noriyuki; and Takeuchi, Shinsuke, 5,471,226, Cl. 345-173.000.
Suzuki, Yasuo, 5,471,453, Cl. 369-100.000.

Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,471,227, Cl. 347-9.000.

Takizawa, Takeshi, 5,471,279, Cl. 355-73.000.

Tanaka, Makoto, 5,471,286, Cl. 355-245.000.

Cao, Yong: *See*—

Smith, Paul; Heeger, Alan J.; Cao, Yong; Chiang, Jin-Chih; and Andreatta, Alejandro, 5,470,505, Cl. 252-500.000.

Caple, Matthew V.: *See*—

Walthall, Ben J.; Caple, Matthew V.; and Murphy, Thomas J., 5,470,151, Cl. 366-165.100.

Capocelli, Piero: *See*—

Baroni, Andrea; Mastrodomenico, Giovanni; Michele, Taliercio; Capocelli, Piero; Carro, Luigi; and Varambally, Rajamohan, 5,471,428, Cl. 365-201.000.

Caporusso, Alessandro; and Caporusso, Mario. Shaped groove countermatrix for rotary groove pulley matrix and countermatrix bending head pipe bending machines. 5,469,728, Cl. 72-154.000.

Caporusso, Mario: *See*—

Caporusso, Alessandro; and Caporusso, Mario, 5,469,728, Cl. 72-154.000.

Capper, Harry M.: *See*—

Hawk, Kenneth C.; Capper, Harry M.; and Robertson, James W., 5,470,250, Cl. 439-409.000.

Carberry, John B.: *See*—

Anderson, Howard W.; Carberry, John B.; Staunton, Harold F.; and Sutradhar, Bhagya C., 5,471,001, Cl. 562-593.000.

Carboncini, Marco: *See*—

Sbalchiero, Federico; and Carboncini, Marco, 5,470,615, Cl. 427-459.000.

Carderm Capital L.P.: *See*—

Hendrickson, Dennis L.; Dimmitt, Dan C.; Williams, Mark S.; Skultety, Paul F.; and Baltezor, Michael J., 5,470,584, Cl. 424-490.000.

Cardiovascular Dynamics, Inc.: *See*—

Crocker, Michael; McB. Hodgson, John; and Kebede, Girma, 5,470,313, Cl. 604-96.000.

Carey, Jay F., II; and Zamanzadeh, Mehrooz, to Louis Berkman Company, The. Architectural material coating. 5,470,667, Cl. 428-659.000.

Carisella, James V. Programmed shape inflatable packer device and method. 5,469,919, Cl. 166-387.000.

Carl Zeiss-Stiftung: *See*—

Breyer, Karl-Hermann; Kammleiter, Berndt; and Ruck, Otto, 5,471,406, Cl. 364-559.000.

Carlisle, Lonnie E.; and Pesmark, Chester M., to Detroit Diesel Corporation. System and method of using Coriolis mass flow rate meter. 5,469,747, Cl. 73-861.370.

Carlsberg A/S: *See*—

Borriss, Rainer; Hofemeister, Jürgen; Thomsen, Karl K.; Olsen, Ole; and Von Wettstein, Dietrich, 5,470,725, Cl. 435-93.000.

Carlson, David C. Multi-bicycle rear mounting bicycle rack. 5,469,997, Cl. 224-521.000.

Carlsson, Karl U.: *See*—

Linnermark, Nils O. A.; and Carlsson, Karl U., 5,471,526, Cl. 379-265.000.

Carmichael, James: *See*—

Manganaro, James L.; Sacks, Martin E.; and Carmichael, James, 5,470,564, Cl. 423-521.000.

Carnevale, Michael J.; Kalla, Ronald N.; McClannahan, Gary P.; and Trombley, Michael R., to International Business Machines Corporation. Variable stage entry/exit instruction pipeline. 5,471,626, Cl. 395-775.000.

Carpentier, James R. Hose mobile plug. 5,469,890, Cl. 138-89.000.

Carro, Luigi: *See*—

Baroni, Andrea; Mastrodomenico, Giovanni; Michele, Taliercio; Capocelli, Piero; Carro, Luigi; and Varambally, Rajamohan, 5,471,428, Cl. 365-201.000.

Carson, Gary: *See*—

Sjogren, Axel; Carson, Gary; Estergreen, Steve; Taga, Timothy; and Stewart, Rodger, 5,470,531, Cl. 422-46.000.

Carter, Thomas L.: *See*—

Braga, David J.; Carter, Thomas L.; Dozier, Edward M.; and Sarbell, John P., 5,471,555, Cl. 385-136.000.

Cartwright, Dewight L. Tunnelling head and method. 5,470,132, Cl. 299-56.000.

Casartelli, Gabriele, to E.D.C. Sarl. Crash-helmet for motorcyclists, cyclists and the like, provided with a sunshade front-piece of rigid material. 5,469,584, Cl. 2-422.000.

Case Corporation: *See*—

Orbach, Abraham; Panoushek, Dale W.; and Schubert, William L., 5,469,921, Cl. 172-4.000.

Panousheck, Dale W.; and Iilender, Jeffrey S., 5,469,694, Cl. 56-10.20E.

Casio Computer Co., Ltd.: *See*—

Kobayashi, Tuneo; Kita, Kazunori; and Suzuki, Satomi, 5,471,438, Cl. 368-281.000.

Cason, Thomas C. Screen for rear windows of vehicles. 5,469,906, Cl. 160-105.000.

Caspell, George J.: *See*—

Stuebing, Carlton; and Caspell, George J., 5,471,159, Cl. 327-24.000.

Cassidy, Stephen P.: *See*—

Sinclair-Day, John D.; Cassidy, Stephen P.; Ring, John; and Cordiner, Andrew G., 5,470,893, Cl. 523-205.000.

Cassinelli, Giuseppe: *See*—

Donno, Luigi; and Cassinelli, Giuseppe, 5,470,836, Cl. 514-38.000.

Castro, Michael: *See*—

Whitfield, Kenneth H.; Scott, Ian M.; and Castro, Michael, 5,470,338, Cl. 606-144.000.

Castwall, Lennart W., to Aktiebolaget Electrolux. Kitchen ventilator. 5,471,537, Cl. 381-71.000.

Catchpole, Clive E.: *See*—

Bakker, Johan P.; Catchpole, Clive E.; Tratar, David B.; and Vala, John D., 5,471,048, Cl. 250-208.100.

Caterpillar Inc.: *See*—

Allen, William E.; Bitar, Ali A.; and Herold, Robert A., 5,471,147, Cl. 324-635.000.

Gudat, Adam J.; and Henderson, Daniel L., 5,471,391, Cl. 364-424.070.

Hill, John H.; Mooberry, Randall L.; and Schartman, Daniel J., 5,469,943, Cl. 188-264.00F.

Siems, W. Peter; and Philyaw, Dale A., 5,470,253, Cl. 439-491.000.

Causey, James D., III: *See*—

Mann, Brian M.; and Causey, James D., III, 5,470,342, Cl. 607-5.000.

Cauwet, Daniele: *See*—

Dubief, Claude; and Cauwet, Daniele, 5,470,551, Cl. 424-70.120.

Cava, Robert J.; and Siegrist, Theo, to AT&T IPM Corp. Article comprising an intermetallic superconductor material. 5,470,530, Cl. 420-416.000.

Caveney, Jack E.; and Nicoli, Robert, to Panduit Corp. Tab and slot fiber optic fitting. 5,469,893, Cl. 138-162.000.

Cecil, Christopher R., to Moore, David J. Broccoli head trimming apparatus and method. 5,470,602, Cl. 426-481.000.

Cedarleaf, Calvin P., to Dexter Corporation, The. Process of making a lighting strike composite. 5,470,413, Cl. 156-90.000.

Cell Therapeutics, Inc.: *See*—

Michnick, John; Underiner, Gail E.; Klein, J. Peter; and Rice, Glenn C., 5,470,878, Cl. 514-558.000.

Celotex Corporation, The: *See*—

Londrigan, Michael E.; and Trout, Kenneth G., 5,470,889, Cl. 521-125.000.

Celtrix Pharmaceuticals, Inc.: *See*—

Mascarenhas, Desmond; and Olson, Pamela S., 5,470,727, Cl. 435-172.300.

Central Tools, Inc.: *See*—

Rogler, Albert C., 5,469,629, Cl. 33-831.000.

Cerami, Pietro; Gatti, Pierluigi; and Melis, Pierluigi, to Schlumberger Industries S.r.l. Method and apparatus for monitoring the operating condition of lamps in a public lighting network. 5,471,201, Cl. 340-641.000.

Cesaroni, Anthony J., to Cesaroni, Anthony J. Panel heat exchanger formed from tubes and sheets. 5,469,915, Cl. 165-171.000.

Cessna Aircraft Company, The: *See*—

Gonzalez, Cesar, 5,469,830, Cl. 123-515.000.

Cetus Oncology Corporation: *See*—

Kawasaki, Ernest S.; Ladner, Martha B.; Van Arsdell, Janelle N.; Wang, Alice M.; Ralph, Peter; Coyne, Mazie Y.; and Warren, Mary K., 5,470,569, Cl. 424-85.100.

Cha, Chang Y.; Plancher, Henry; and Kraus, Lawrence S., to Univ. of Wyoming; and Amoco Corp. Process for co-recycling tires and oils. 5,470,384, Cl. 106-284.030.

Cha, Jin Y.; and Kim, Kwang Y., to Miwon Petrochemical Corporation. ABS resins having impact resistance and low-gloss properties and processes for preparing them. 5,470,915, Cl. 525-86.000.

Chae, Hoon: *See*—

Kim, Hyo Y.; Hwang, Ki H.; Chae, Hoon; Sho, Soo I.; and Jun, Jung N., 5,470,941, Cl. 528-272.000.

Chan, Andrew K.: *See*—

Gordon, Kathryn E.; and Chan, Andrew K., 5,471,154, Cl. 326-38.000.

Chan, Chin-Jong; Chang, Jei-Wei; and Romankiw, Lubomyr T., to International Business Machines Corporation. Metallurgical joint including a stress release layer. 5,471,092, Cl. 257-753.000.

Chandler, Charles W. Screw hole plug. 5,470,184, Cl. 411-377.000.

Chandraratna, Roshantha A., to Allergan, Inc. Cyclohexene and bicyclic aromatic substituted ethyne compounds having retinoid-like biological activity. 5,470,999, Cl. 560-100.000.

Chang, Chi: *See*—

Liu, David K. Y.; Sun, Yu; and Chang, Chi, 5,470,773, Cl. 437-43.000.

Chang, Chun Y. Combined minidisc box. 5,469,961, Cl. 206-312.000.

Chang, Jei-Wei: *See*—

Chan, Chin-Jong; Chang, Jei-Wei; and Romankiw, Lubomyr T., 5,471,092, Cl. 257-753.000.

Chang, Ko-Min; Shum, Danny P.; and Chang, Kuo-Tung, to Motorola, Inc. EEPROM cell with isolation transistor and methods for making and operating the same. 5,471,422, Cl. 365-185.260.

Chang, Kuo-Tung: *See*—

Chang, Ko-Min; Shum, Danny P.; and Chang, Kuo-Tung, 5,471,422, Cl. 365-185.260.

Chang, Se-Yeob: *See*—

Shin, Yoon-Sub; Chang, Se-Yeob; Lee, Sang-Jin; and Kim, Jae-Kon, 5,470,047, Cl. 266-76.000.

Chang, Shen-Youn: *See*—

Laughlin, Philip; Alexander, John; Kamarei, A. Reza; Dobbie, Robert P.; Lin, Paul; Chang, Shen-Youn; Reddy, Sekhar; Grasset, Etienne; and Melin, Christian, 5,470,839, Cl. 514-53.000.

Chappell, Barbara A.; Chappell, Terry I.; Fleischer, Bruce M.; and Schuster, Stanley E., to International Business Machines Corporation. Fast comparator circuit. 5,471,188, Cl. 340-146.200.

Chappell, Terry I.: *See*—
Chappell, Barbara A.; Chappell, Terry I.; Fleischer, Bruce M.; and Schuster, Stanley E., 5,471,188, Cl. 340-146.200.

Charbonnier, Philippe, to Societe d'Applications Generales d'Electricite et de Mecanique Sagem. Videotex facsimile machine. 5,471,317, Cl. 358-400.000.

Charlton, Judie F.; Schwab, Ivan R.; and Stuchell, Robert M., to West Virginia University Research Corporation. Urea ophthalmic ointment and solution. 5,470,881, Cl. 514-588.000.

Chartered Semiconductor Manufacturing Pte LTD: *See*—
Neoh, Soon E., 5,470,604, Cl. 427-8.000.

Chartrand, François, to Chartrand, François. Apparatus for measuring the deformation of damaged vehicles and for reconstructing crime scenes. 5,469,628, Cl. 33-608.000.

Charvat, Peter K.: *See*—
Myers, Alan M.; Charvat, Peter K.; Letson, Thomas A.; Yang, Shi-ning; and Bai, Peng, 5,470,790, Cl. 437-192.000.

Chatelain, Gerri L.: *See*—
Perkins, Roger W.; and Chatelain, Gerri L., 5,470,415, Cl. 156-916.000.

Chau, Danny: *See*—
Cheng, Lee M.; Choy, Conrad; and Chau, Danny, 5,470,242, Cl. 439-157.000.

Chaudhuri, Ratan K.: *See*—
Narayanan, Kolazi S.; Chaudhuri, Ratan K.; Login, Robert B.; and Fusiak, Frank, 5,470,508, Cl. 252-542.000.

Cheau, Tei-Chih: *See*—
Hao-Chung, Hsia; Cheau, Tei-Chih; and Tsai, Shang-Lin, 5,470,553, Cl. 423-139.000.

Chemcoat, Inc.: *See*—
Claassen, Henning, 5,471,254, Cl. 348-734.000.

Chen, C. Greg: *See*—
Spellman, Gordon B.; and Chen, C. Greg, 5,471,032, Cl. 219-270.000.

Chen, Ching C. Pen incorporated with and illuminator. 5,470,164, Cl. 401-195.000.

Chen, Chunhui: *See*—
Chen, Kejiong, 5,471,506, Cl. 375-242.000.

Chen, Cuiwei: *See*—
Chen, Kejiong, 5,471,506, Cl. 375-242.000.

Chen, George C.; and Rowell, Roger M., to United States of America, Agriculture. Treatment of wood and other lignocellulosic materials with iodates. 5,470,614, Cl. 427-440.000.

Chen, Han L.: *See*—
Li, Chien-Hui; Chen, Han L.; and Lee, Tzong-Ming, 5,470,936, Cl. 528-73.000.

Chen, Hong-Ming: *See*—
Wuu, Dong-Sing; Hsieh, Tzung-Rue; Lin, Tzy-Ying; and Chen, Hong-Ming, 5,471,552, Cl. 385-49.000.

Chen, Kejiong, to Chen, Kejiong; He, Shuzhen; Chen, Chunhui; and Chen, Cuiwei. Method and apparatus for pulse communication. 5,471,506, Cl. 375-242.000.

Chen, Stephen, to E Lead Electronic Co., Ltd. Retaining rack for a cellular phone permitting handfree use of phone in driving. 5,471,530, Cl. 379-446.000.

Chen, Tse-Min. Elastic seat of bicycle brake device. 5,469,939, Cl. 188-24.210.

Chen, Tse-Min. Adjustable device for tensioning a bicycle drive chain. 5,470,278, Cl. 474-133.000.

Chen, Zhongping: *See*—
Lewis, Aaron; Chen, Zhongping; and Takei, Hiroyuki, 5,470,690, Cl. 430-269.000.

Cheng, Lee M.; Choy, Conrad; and Chau, Danny, to Tongrand Limited. Dual readout socket connector. 5,470,242, Cl. 439-157.000.

Cheng, Yihao; and Duck, Gary S., to JDS Fitel Inc. Reflective optical non-reciprocal devices. 5,471,340, Cl. 359-281.000.

Cherry, Joshua L.: *See*—
Weiss, Robert B.; Kimball, Alvin W.; Gesteland, Raymond F.; Ferguson, F. Mark; Dunn, Diane M.; Di Sera, Leonard J.; and Cherry, Joshua L., 5,470,710, Cl. 435-6.000.

Chesebrough-Pond's USA Co., Division of Conopco, Inc.: *See*—
Klugkist, Jan; and Saxton, Charles A., 5,470,561, Cl. 424-49.000.

Cheung, Robin W., to Advanced Micro Devices, Inc. Pseudo-low dielectric constant technology. 5,471,093, Cl. 257-758.000.

Chi, James. Safety faucet. 5,470,044, Cl. 251-98.000.

Chiang, Chao-Cheng; and Chiang, Chi-Shyong. Smoke exhauster having cleaning device. 5,469,837, Cl. 126-299.00D.

Chiang, Chi-Shyong: *See*—
Chiang, Chao-Cheng; and Chiang, Chi-Shyong, 5,469,837, Cl. 126-299.00D.

Chiang, Jin-Chih: *See*—
Smith, Paul; Heeger, Alan J.; Cao, Yong; Chiang, Jin-Chih; and Andreatta, Alejandro, 5,470,505, Cl. 252-500.000.

Chiang, Ming-Tsung. Raising control apparatus for living fish and water plants. 5,469,810, Cl. 119-248.000.

Chiari, Marcella: *See*—
Righetti, Pier G.; and Chiari, Marcella, 5,470,916, Cl. 525-296.000.

Chiba, Yoshie: *See*—
Mochizuki, Yuji; Chiba, Yoshie; Takada, Toshikazu; and Usui, Akira, 5,469,806, Cl. 117-97.000.

Chidambarrao, Dureseti; Hsu, Louis L.; Mis, J. Daniel; and Peng, James P., to International Business Machines Corporation. Method to reduce stress from trench structure on SOI wafer. 5,470,781, Cl. 437-68.000.

Chiel, David: *See*—
Zehavi, Eitan; and Chiel, David, 5,469,695, Cl. 56-340.100.

Chien, Yun-Ko; and Ovick, Norman L., to Eaton Corporation. Circuit breaker. 5,471,184, Cl. 335-35.000.

Childers, Winthrop D., to Hewlett-Packard Company. Tab circuit fusible links for disconnection or encoding information. 5,471,163, Cl. 327-525.000.

Childs, Stephen L.; Robertson, Alvin M.; Corona, Alessandro, III; and Russ, Karl J., to Procter & Gamble Company, The. Dryer-activated fabric conditioning articles with soft polyester substrate. 5,470,492, Cl. 252-8.900.

Chilton, Floyd H., III: *See*—
Dixon, James S.; Hall, Raplh F.; Marshall, Lisa A.; Chilton, Floyd H., III; Mayer, Ruth J.; and Winkler, James D., 5,470,882, Cl. 514-596.000.

Chilton, John B.; Gevaras, Peter H.; Herb, Paul C.; and Wellen, Thomas W., to Estee Lauder Inc. Method and apparatus for deagglomerating powder. 5,469,971, Cl. 209-235.000.

Chin, Arthur L.: *See*—
Barakat, Edmond H.; Chin, Arthur L.; and Schorn, Eric B., 5,471,585, Cl. 395-308.000.

Chin, Peter P. S.: *See*—
Lindquist, Craig R.; Clarke, John T.; Chin, Peter P. S.; MacDonald, Michael J.; and Walsh, J. Peter, 5,470,631, Cl. 428-105.000.

China Pharmaceutical University: *See*—
Peng, Sixun; Dai, Dezai; Huang, Zhenya; Huang, Wenlong; Wang, Youqun; Zhang, Can; and Yu, Peng, 5,470,852, Cl. 514-231.500.

Chinai, Kays: *See*—
Dabi, Shmuel; and Chinai, Kays, 5,470,326, Cl. 604-383.000.

Ching, Gil: *See*—
Guyomar, Daniel; Mazoyer, Thierry; Sauzade, Jean-Denis; and Ching, Gil, 5,471,108, Cl. 310-323.000.

Chinniah, Jeyachandrabose: *See*—
Koppolu, Prasad M.; Fallahi, Amir; and Chinniah, Jeyachandrabose, 5,471,371, Cl. 362-32.000.

Chino, Takashi: *See*—
Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,469,752, Cl. 73-866.000.

Chiou, Wen-Nen. Adjustable sealed can. 5,469,979, Cl. 215-228.000.

Chishima, Masamitsu: *See*—
Kubo, Yoshinobu; and Chishima, Masamitsu, 5,470,902, Cl. 524-600.000.

Chiu, Kwok-Fu; and Sauer, Don R., to National Semiconductor Corporation. "AB Cascode" amplifier in an input stage of an amplifier or comparator. 5,471,172, Cl. 330-253.000.

Chiu, Kwok-Fu; and Sauer, Don R., to National Semiconductor Corporation. Input protection circuit for a CMOS comparator. 5,471,175, Cl. 330-298.000.

Chiu, Patrick: *See*—
Moran, Thomas P.; Chiu, Patrick; and Van Melle, William, 5,471,578, Cl. 395-161.000.

Chiu, Tzu-Yin; Erceg, Frank M.; Liu, Te-Yin M.; Moerschel, Kenenth G.; Prozonic, Michael A.; and Sung, Janmye, to AT&T IPM Corp. Method for integrated circuit device isolation. 5,470,783, Cl. 437-72.000.

Chmel, James; and Berger, Robert P., to Belle de St. Claire. Cap for investment molds for precision casting. 5,469,908, Cl. 164-376.000.

Cho, Chih-Chen: *See*—
Gnade, Bruce E.; Cho, Chih-Chen; and Smith, Douglas M., 5,470,802, Cl. 437-238.000.

Cho, Paul N. S.: *See*—
Huang, Han; Morioka, Craig A.; Ratib, Osman; Cho, Paul N. S.; Ho, Bruce K. T.; Sonobe, Takeo; and Shinagawa, Toru, 5,471,606, Cl. 395-500.000.

Cho, Sung-Soo: *See*—
Reddy, Chandrashekar M.; and Cho, Sung-Soo, 5,471,672, Cl. 395-296.000.

Chowhan, Zakauddin T.: *See*—
Kuramoto, Roy; Chowhan, Zakauddin T.; Pendleton, Ranal O.; and Hafezzadeh, Hafez, 5,470,580, Cl. 424-464.000.

Choy, Clement K.; Argo, Brian P.; Brodbeck, Kevin J.; and Hearn, Lynn M., to Clorox Company, The. Thickened aqueous abrasive cleanser with improved rinsability. 5,470,499, Cl. 252-99.000.

Choy, Conrad: *See*—
Cheng, Lee M.; Choy, Conrad; and Chau, Danny, 5,470,242, Cl. 439-157.000.

Christe, Marcel; and Schaich, Urs, to Sulzer Rueti AG. Rotatable cutting device for weft threads. 5,469,896, Cl. 139-450.000.

Christen, Marie-Odile; and Burgot, Jean-Louis, to Laboratoires De Therapeutique Moderne. Therapeutic compositions based on 1,2-dithiole-3-thione derivatives. 5,470,871, Cl. 514-441.000.

Christensen, David. Base rail for utility rack. 5,470,120, Cl. 296-3.000.

Christian, Craig W.: *See*—
Anjum, Mohammed; Burki, Ibrahim K.; and Christian, Craig W., 5,470,794, Cl. 437-200.000.

Christie, Frederick R.: *See*—
Papathomas, Kostas I.; Christie, Frederick R.; and Wang, David W., 5,471,096, Cl. 257-778.000.

Chrysler Corporation: *See*—
Golab, Pawel J.; and Lee, Anson, 5,469,825, Cl. 123-479.000.
TenBrink, Jay T.; Farkas, Maryanne R.; Vendt, Robert J.; and Brock, Waine T., 5,469,662, Cl. 49-352.000.

TenBrink, Jay T.; and Parkas, Maryanne R., 5,469,663, Cl. 49-375.000.
Thomas, Christopher P.; Weber, Gregory T.; and Tallarek, Glen E., 5,469,826, Cl. 123-488.000.
Chung, Ho-sun; and Lee, Soo-yong, to Gold Star Electron Co., Ltd. Speech recognition system utilizing a neural network. 5,471,557, Cl. 395-2.410.
Chwalisz, Kryzsztof: *See*—
Fahrenholz, Falk; Elger, Walter; Pähnrich, Marianne; and Chwalisz, Kryzsztof, 5,470,948, Cl. 530-315.000.
Ciba Corning Diagnostics Corp.: *See*—
Parkes, Deborah L.; and Coates, Stephen R., 5,470,704, Cl. 435-5.000.
Ciba-Geigy AG: *See*—
Wolf, Jean-Pierre; Schulthess, Adrian; Steinmann, Bettina; and Hunziker, Max, 5,470,689, Cl. 430-269.000.
Ciba-Geigy Corporation: *See*—
Camberlin, Yves; Dien, René; and Michaud, Philippe, 5,470,920, Cl. 525-421.000.
Ravichandran, Ramanathan; and Patel, Ambelal R., 5,470,980, Cl. 546-190.000.
Weber, Kurt; Meyer, Hans R.; Kaschig, Jürgen; and Eckhardt, Claude, 5,470,990, Cl. 549-466.000.
Wegmann, Alex; and Wolleb, Heinz, 5,470,896, Cl. 523-428.000.
Cincinnati Microwave, Inc.: *See*—
McCurdy, Jim; Doyle, Michael; and McLaughlin, Michael, 5,471,197, Cl. 340-573.000.
Circello, Joseph C.: *See*—
Mussemann, Gary A.; Circello, Joseph C.; and Gay, James G., 5,471,625, Cl. 395-750.000.
Cistone, David R.: *See*—
O'Meara, John R.; Cistone, David R.; and Travalent, Louis, Jr., 5,469,980, Cl. 215-228.000.
Citizen Watch Co., Ltd.: *See*—
Hiraishi, Hisato; Hoshino, Motonobu; and Mitsuhashi, Tadashi, 5,471,231, Cl. 347-68.000.
City of Hope: *See*—
Roberts, Eugene, 5,470,951, Cl. 530-330.000.
Claassen, Henning, to Chemcoat, Inc. Remote control unit with tiltable cover having displaying information thereon. 5,471,254, Cl. 348-734.000.
Claessens, Johannes A. J.: *See*—
Sondermeijer, Paulus J. A.; Claessens, Johannes A. J.; and Mockett, Albert P. A., 5,470,734, Cl. 424-229.100.
Clark, Gary J.: *See*—
Burnell, Joseph G.; and Clark, Gary J., 5,470,276, Cl. 454-155.000.
Clark, Randy: *See*—
Krumweide, Gary C.; Krumweide, Duane E.; and Clark, Randy, 5,471,367, Cl. 361-719.000.
Clark, R. John. Self-stabilizing seat support. 5,470,038, Cl. 248-156.000.
Clarke, James R.: *See*—
Rao, V. Durga N.; and Clarke, James R., 5,469,777, Cl. 92-223.000.
Clarke, John T.: *See*—
Lindquist, Craig R.; Clarke, John T.; Chin, Peter P. S.; MacDonald, Michael J.; and Walsh, J. Peter, 5,470,631, Cl. 428-105.000.
Clausen, Kim, to Gist-Brocades N.V. Method for the preparation of certain β-lactam antibiotics. 5,470,717, Cl. 435-47.000.
Clayton, Richard A. Game apparatus. 5,470,082, Cl. 273-445.000.
Clearfield, Howard M.: *See*—
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.
Clift, David W.: *See*—
Colwell, Robert P.; Glew, Andrew F.; Papworth, David B.; Hinton, Glenn J.; and Clift, David W., 5,471,633, Cl. 395-800.000.
Clifton, David B.; Little, Scott R.; and Pinkerton, Joseph F., to Magnetic Bearing Technologies, Inc. Null flux magnetic bearing with cross-connected loop portions. 5,471,105, Cl. 310-90.500.
Clintec Nutrition Company: *See*—
Laughlin, Philip; Alexander, John; Kamarei, A. Reza; Dobbie, Robert P.; Lin, Paul; Chang, Shen-Youn; Reddy, Sekhar; Grasset, Etienne; and Melin, Christian, 5,470,839, Cl. 514-53.000.
Clipmate Corporation: *See*—
Waldock, Kevin H., 5,470,256, Cl. 439-501.000.
Clorox Company, The: *See*—
Choy, Clement K.; Argo, Brian P.; Brodbeck, Kevin J.; and Hearn, Lynn M., 5,470,499, Cl. 252-99.000.
Clough, John M.: *See*—
Anthony, Vivienne M.; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Ferguson, Ian; Crowley, Patrick J.; and Hutchings, Michael G., 5,470,819, Cl. 504-244.000.
Coates, Stephen R.: *See*—
Parkes, Deborah L.; and Coates, Stephen R., 5,470,704, Cl. 435-5.000.
Cobe Laboratories, Inc.: *See*—
Sjogren, Axel; Carson, Gary; Estergreen, Steve; Taga, Timothy; and Stewart, Rodger, 5,470,531, Cl. 422-46.000.
Coburn, Charles: *See*—
Schmidt, Donald L.; Harris, Robert F.; and Coburn, Charles, 5,470,908, Cl. 524-520.000.
Coca-Cola Company, The: *See*—
Roumbehler, David P.; Fine, David H.; Achter, Eugene K.; MacDonald, Stephen J.; and Dennison, Daniel B., 5,470,754, Cl. 436-106.000.
Cochran, Edward L.: *See*—
Allard, James R.; Cochran, Edward L.; and Wolff, Alan S., 5,471,560, Cl. 395-77.000.
Cochrum, Kent C., to University of California, The Regents of the. Coated transplant and method for making same. 5,470,731, Cl. 435-182.000.
Codama, Mitsufumi; and Kondo, Noriaki, to Semiconductor Energy Laboratory Co., Ltd. Method of fabricating a thin film transistor. 5,470,762, Cl. 437-21.000.
Codilian, Raffi; and Stupeck, Donald, to Western Digital (Sea), Pte., Ltd. Disk drive employing multi-mode spindle drive system. 5,471,353, Cl. 360-73.030.
Cohen, Bernard: *See*—
Isaac, Robert L.; Cohen, Bernard; and Jameson, Lee K., 5,470,424, Cl. 156-253.000.
Coin Controls Limited: *See*—
Kershaw, John; and Hutton, Lesley, 5,469,952, Cl. 194-317.000.
Colantonio, Jo-Ann: *See*—
Lamontagne, Daniel A.; and Colantonio, Jo-Ann, 5,469,635, Cl. 34-164.000.
Colburn, Todd B.; and Lorentzen, John F., to Ektelon. Racquetball racquet having increased stiffness at tip. 5,470,061, Cl. 273-73.00C.
Colburn, Willis S.: *See*—
Tedesco, James M.; Brady, Lois A. K.; and Colburn, Willis S., 5,471,327, Cl. 359-15.000.
Colby, David M., to Koch Membrane Systems, Inc. Spiral filtration module having bypass prevention flange. 5,470,468, Cl. 210-321.600.
Cole, Douglas L.: *See*—
Borcherding, David R.; Edwards, Carl K., III; Esser, Ronald E.; and Cole, Douglas L., 5,470,857, Cl. 514-258.000.
Cole, Mark: *See*—
Zanger, Frank; Zaleski, Edward R.; and Cole, Mark, 5,470,312, Cl. 604-34.000.
Coleman, Douglas, to Super Dry Industries, Inc. Non dusting clumping animal litter. 5,469,809, Cl. 119-173.000.
Coleman, John H., to Plasma Physics Corp. Method of forming semiconducting materials and barriers using a multiple chamber arrangement. 5,470,784, Cl. 437-101.000.
Coleman, Princess A.: *See*—
Coleman, Thomas J.; Schlotter, William K., IV; Coleman, Princess A.; and Schlotter, Ann M., 5,471,373, Cl. 362-109.000.
Coleman, Thomas J.; Schlotter, William K., IV; Coleman, Princess A.; and Schlotter, Ann M. Entertainment apparatus for use with a sucker type pop. 5,471,373, Cl. 362-109.000.
Coles, Gary S. V.; and Williams, Geraint, to British Gas plc. Gas sensors. 5,470,756, Cl. 436-144.000.
Collagen Corporation: *See*—
Rhee, Woonza M.; and Berg, Richard A., 5,470,911, Cl. 525-54.100.
Collette, Wayne N.; and Krishnakumar, Suppayan M., to Continental PET Technologies, Inc. Method for forming a strain-hardenable plastic container. 5,469,612, Cl. 29-453.000.
Coln, Michael: *See*—
Adams, Robert W.; Kwan, Tom W.; and Coln, Michael, 5,471,411, Cl. 364-724.010.
Colsman, Alfred, to Round Palis AG. Motor-vehicle parking system. 5,469,676, Cl. 52-174.000.
Colvin, Donald G.; and Reynolds, Peter, to Colvin, Donald G. Toll call restrictor method and apparatus. 5,471,524, Cl. 379-200.000.
Colwell, Robert P.; Glew, Andrew F.; Papworth, David B.; Hinton, Glenn J.; and Clift, David W., to Intel Corporation. Idiom recognizer within a register alias table. 5,471,633, Cl. 395-800.000.
Commier, Philippe; Phelipon, Axel; and Le Masson, Jacques, to Salomon S.A. Ski equipped with variable length elastic transmitters on either side of the binding zone. 5,470,094, Cl. 280-602.000.
Compaq Computer Corporation: *See*—
Bhagat, Gopal C.; and Webster, James M., 5,470,040, Cl. 248-222.400.
Parrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., 5,471,617, Cl. 395-700.000.
Melo, Maria L.; and Bonella, Randy M., 5,471,590, Cl. 395-288.000.
Composite Optics, Inc.: *See*—
Krumweide, Gary C.; Krumweide, Duane E.; and Clark, Randy, 5,471,367, Cl. 361-719.000.
Computer & Communication Research Laboratories: *See*—
Lee, Junghsi; and Ma, Ginkou, 5,471,504, Cl. 375-233.000.
Concast Standard AG: *See*—
Kawa, Franciszek; Stilli, Adrian; and Roehrig, Adalbert, 5,469,910, Cl. 164-459.000.
Condon, Duane R. Partially recessed valve fixture for connection to faucets and commodes. 5,469,882, Cl. 137-360.000.
Conklin, Dennis R., Jr. Decorative fan blade. 5,470,205, Cl. 416-205.000.
Conlan, Tye M. Computer controlled target shooting system. 5,470,078, Cl. 273-317.000.
Conley, Ed. Method of pultrusion. 5,470,517, Cl. 264-137.000.
Conoco Inc.: *See*—
Sas-Jaworsky, Alex; and Williams, Jerry G., 5,469,916, Cl. 166-64.000.
Conrad, Lucas J.: *See*—
Beard, Hoyt S.; Conrad, Lucas J.; Crook, J. Edward; Lovette, James E.; Johnson, Robert C.; Newton, Donald A.; and Neshan, Hamid, 5,469,872, Cl. 131-291.000.
Conroy, Brian K.: *See*—

Reagen, William K.; and Conroy, Brian K., 5,470,926, Cl. 526-120.000.

Conti, Ronald S.; and Lazzara, Charles P., to United States of America, Interior. Inflatable partition for fighting mine fires. 5,469,920, Cl. 169-48.000.

Continental PET Technologies, Inc.: *See*—
Collette, Wayne N.; and Krishnakumar, Suppayan M., 5,469,612, Cl. 29-453.000.

Control Components Inc.: *See*—
Phan, Chan B.; and Walsh, Michael, 5,469,881, Cl. 137-315.000.

Conway, Michael D.: *See*—
Hammers, David E.; and Conway, Michael D., 5,471,220, Cl. 342-372.000.

Conway, Michael W.: *See*—
Williams, Dennis A.; Looney, James R.; Conway, Michael W.; and Swenson, Robert A., 5,470,823, Cl. 507-241.000.

Coogan, James J.: *See*—
Jacob, Steven D.; Coogan, James J.; and Petras, Stefan G., 5,470,275, Cl. 454-61.000.

Cook, Charles; Zomorodi, Mostafa; and Dark, Richard C. G., to Baxter International Inc. Non-refluxing suction canister system and components therefor. 5,470,324, Cl. 604-319.000.

Cook, Jonathan: *See*—
Minakami, Michael K.; Hulse, Brian; Cook, Jonathan; and Pickering, John B., 5,471,521, Cl. 379-88.000.

Coolbaugh, Thomas S.; Loveless, Frederick C.; and Matthews, Demetreos N., to Mobil Oil Corporation. Polymer blends containing a solid elastomeric block copolymer. 5,470,914, Cl. 525-66.000.

Cooper, Alan N.; McCracken, William P.; and Hynecek, Jaroslav, to Texas Instruments Incorporated. Bulk charged modulated device (BCMD) image sensors with increased dynamic range. 5,471,245, Cl. 348-302.000.

Cooperman, Michael, to GTE Laboratories Incorporated. Method and apparatus for ATM cell alignment. 5,471,466, Cl. 370-58.100.

Copeland Corporation: *See*—
Bass, Mark; and Rafalovich, Alexander P., 5,469,716, Cl. 62-505.000.

Copeland, John M.: *See*—
Diemeer, Martinus B. J.; Horsthuis, Winfried H. G.; McDonach, Alaster; and Copeland, John M., 5,470,692, Cl. 430-290.000.

Corbett, Nicholas C.; and Lines, Norman P., to Rolls-Royce plc. Turbine engine control system. 5,469,700, Cl. 60-39.060.

Corcoran, John; Molvi, Ikbal A.; Hower, Joseph W.; and Moseley, William A., to Manhole Adjusting Contractors Inc. System and method for controlling emissions created by spraying liquids from moving vehicles. 5,470,176, Cl. 404-72.000.

Cordiner, Andrew G.: *See*—
Sinclair-Day, John D.; Cassidy, Stephen P.; Ring, John; and Cordiner, Andrew G., 5,470,893, Cl. 523-205.000.

Corey, Lawrence G.: *See*—
Ross, Michael E.; Borsos, Robert A.; and Corey, Lawrence G., 5,471,024, Cl. 200-458.000.

Corless, Ann M.; Deckner, George E.; Hall, Bonnie J.; and Listro, Joseph A., to Procter & Gamble. Anti-acne compositions. 5,470,884, Cl. 514-714.000.

Cornell Research Foundation, Inc.: *See*—
Lewis, Aaron; Chen, Zhongping; and Takei, Hiroyuki, 5,470,690, Cl. 430-269.000.

Cornforth, Frederick J.: *See*—
Bares, Joseph E.; Johnson, Byron G.; and Cornforth, Frederick J., 5,470,457, Cl. 208-255.000.

Corning Incorporated: *See*—
Morena, Robert, 5,470,804, Cl. 501-15.000.

Corona, Alessandro, III: *See*—
Childs, Stephen L.; Robertson, Alvin M.; Corona, Alessandro, III; and Russ, Karl J., 5,470,492, Cl. 252-8.600.

Corporate Concept Marketing: *See*—
Uthoff, David C., 5,469,581, Cl. 2-69.000.

Costanzo, Christopher R.; Kaplan, David R.; and Dang, Khoa V., to United States of America, Army. Focal plane array test facility. 5,471,055, Cl. 250-252.100.

Cotreau, Gerald M.: *See*—
King, Ken R.; Riemer, David W.; and Cotreau, Gerald M., 5,471,131, Cl. 323-314.000.

Coulter, J. Scott: *See*—
Ray, Carl; and Coulter, J. Scott, 5,470,535, Cl. 422-101.000.

Council, Thomas G.: *See*—
Hotchkiss, Dennis B.; and Council, Thomas G., 5,470,074, Cl. 273-195.000.

Courage & Khazaka Electronic GmbH: *See*—
Kleditsch, Bernhard; and Khazaka, Gabriel, 5,470,349, Cl. 607-75.000.

Courian, Curtis C.; and Courian, Kenneth J. Fastening tool and fastener. 5,469,610, Cl. 29-243.521.

Courian, Kenneth J.: *See*—
Courian, Curtis C.; and Courian, Kenneth J., 5,469,610, Cl. 29-243.521.

Courtaulds Coatings (Holdings) Limited: *See*—
Sinclair-Day, John D.; Cassidy, Stephen P.; Ring, John; and Cordiner, Andrew G., 5,470,893, Cl. 523-205.000.

Cowgill, Richard B.; and Teale, David C., to International Business Machines Corporation. Automated storage library with rotatable arm and oblique angle effectors. 5,471,561, Cl. 395-82.000.

Cox, Terrance J.: *See*—
Murray, James A.; Nees, Michael R.; Imrie, William P.; Rayner, Christopher C.; Pfalzgraff, Chris L.; Bates, Robert K.; Ness, Valmer H.; and Cox, Terrance J., 5,470,445, Cl. 204-105.00R.

Coyne, Mazie Y.: *See*—
Kawasaki, Ernest S.; Ladner, Martha B.; Van Arsdell, Janelle N.; Wang, Alice M.; Ralph, Peter; Coyne, Mazie Y.; and Warren, Mary K., 5,470,569, Cl. 424-85.100.

Craig, Jeffrey: *See*—
Mangan, John S.; Norman, Robert D.; Craig, Jeffrey; Albert, Richard; Gupta, Anil; Stai, Jeffrey D.; and Lofgren, Karl M. J., 5,471,478, Cl. 371-10.300.

Craig, Ruth W., to Dartmouth College. Antibodies which specifically bind mcl-1 polypeptide. 5,470,955, Cl. 530-387.700.

Craun, Gary P.; Rosekelly, George S.; and Floyd, F. Louis, to Glidden Company, The. Odor free, air dry, decorative latex paints. 5,470,906, Cl. 524-507.000.

Crawford, Howard E., III, to Medical Materials Corporation. Forefoot spring apparatus. 5,469,638, Cl. 36-28.000.

Crawley, Michael F.: *See*—
Park, David B.; and Crawley, Michael F., 5,470,473, Cl. 210-402.000.

Create Ishikawa Co., Ltd.: *See*—
Fujiwara, Hideyoshi; and Ishikawa, Naomi, 5,470,225, Cl. 431-215.000.

Creative Products Resource Associates, Ltd.: *See*—
Smith, James A.; and Murphy, Betty J., 5,470,323, Cl. 604-289.000.

Cremeans, George E.: *See*—
Markle, Richard A.; Brusky, Phyllis L.; Cremeans, George E.; Elhard, Joel D.; Bigg, Donald M.; and Sowell, Sylvester, 5,470,945, Cl. 528-390.000.

Crill, Roger O.: *See*—
Blank, David L.; Crill, Roger O.; Pusey, Bruce A.; and Shah, Kashyap H., 5,470,195, Cl. 414-797.000.

Critical Device Corporation: *See*—
Mayer, Bruno P. P., 5,470,319, Cl. 604-167.000.

Critz, Kurt M.: *See*—
Molter, Trent M.; and Critz, Kurt M., 5,470,448, Cl. 204-252.000.

Crocker, Michael; McB. Hodgson, John; and Kebede, Girma, to Cardiovascular Dynamics, Inc. Variable diameter balloon dilatation catheter. 5,470,313, Cl. 604-96.000.

Crook, J. Edward: *See*—
Beard, Hoyt S.; Conrad, Lucas J.; Crook, J. Edward; Lovette, James E.; Johnson, Robert C.; Newton, Donald A.; and Neshan, Hamid, 5,469,872, Cl. 131-291.000.

Crook, Neal A.: *See*—
Gavin, Vincent G.; Seaman, Michael J.; Crook, Neal A.; and Mistry, Bipin, 5,471,632, Cl. 395-284.000.

Crosby, Shawn P.: *See*—
Roeker, David C.; Manor, Edward L.; and Crosby, Shawn P., 5,469,623, Cl. 30-169.000.

Crosfield Electronics Limited: *See*—
Kirk, Richard A., 5,471,566, Cl. 395-131.000.

CrossCheck Technology, Inc.: *See*—
Gheewala, Tushar; Mehta, Rustam; and Varma, Prab, 5,471,152, Cl. 324-758.000.

Crowell, Pamela L.: *See*—
Gould, Michael N.; Crowell, Pamela L.; Elson, Charles E.; and Ren, Zhibin, 5,470,877, Cl. 514-529.000.

Crowley, Patrick J.: *See*—
Anthony, Vivienne M.; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Ferguson, Ian; Crowley, Patrick J.; and Hutchings, Michael G., 5,470,819, Cl. 504-244.000.

CTI Pet Systems, Inc.: *See*—
Moyers, J. Clifton; Nutt, Ronald; and Jones, William F., 5,471,061, Cl. 259-363.030.

Cucheran, John S., to JAC Products, Inc. Adjustable cross rail for a vehicle article carrier. 5,470,003, Cl. 224-316.000.

Cucinotta, James L. Workstation for laptop-type computer. 5,470,041, Cl. 248-349.000.

Culler, Scott R., to Minnesota Mining and Manufacturing Company. Reduced viscosity slurries, abrasive articles made therefrom, and methods of making said articles. 5,470,368, Cl. 51-298.000.

Cullis-Hill, David; and Ghosh, Peter, to Arthropharm Pty Limited. Anti-inflammatory compounds and compositions. 5,470,840, Cl. 514-54.000.

Cummins Engine Company, Inc.: *See*—
Hoag, Kevin L., 5,469,817, Cl. 123-41.790.

Cunningham, Tom. Golf practice device. 5,470,072, Cl. 273-186.300.

Curative Technologies, Inc.: *See*—
Whitman, Russell B.; Wohl, Robert; and Duff, Ronald G., 5,470,831, Cl. 514-16.000.

Currie, William H.: *See*—
Sargeant, Adrian A.; Currie, William H.; Ouwens, Willem; Brace, Philip J.; Todd, Robert W.; and Scholz, Hans-Joachim, 5,470,142, Cl. 312-258.000.

Curtis, Alan R. D.; and Joseph, James E., to Noise Cancellation Technologies, Inc. Methods and apparatus for closed-loop control of magnetic bearings. 5,471,106, Cl. 310-90.500.

Curtis, James L. Exercise apparatus. 5,470,298, Cl. 482-130.000.

Cusdin, Anthony R.: *See*—
Moore, Paul A.; and Cusdin, Anthony R., 5,471,173, Cl. 330-256.000.

Cuthbert, Victor W.; Zahrn, Joseph H., Jr.; and Johnston, Vonda K., to Whirlpool Corporation. Basket positioning system for a top loading horizontal axis automatic washer. 5,469,593, Cl. 8-159.000.

Cutter, Daniel F.: *See*—
Lightbody, Timothy R.; Cutter, Daniel F.; and Nowokunski, Brian M., 5,471,577, Cl. 395-157.000.

Cutts, Kevin: *See*—
Gardeck, Kevin; Green, David A.; and Cutts, Kevin, 5,471,532, Cl. 380-21.000.
Cyrix Corporation: *See*—
Quattromani, Marc A.; Garibay, Raul A., Jr.; Patwa, Nital; and Hervin, Mark W., 5,471,598, Cl. 395-449.000.
Daams, Johannes L. C.: *See*—
Eisenhand, Robert E. F.; Lippits, Gerardus J. M.; Daams, Johannes L. C.; and Notten, Petrus H. L., 5,470,675, Cl. 429-101.000.
Dabbs, Steven: *See*—
Wadsworth, Harry J.; Wyman, Paul A.; Dabbs, Steven; and Jenkins, Sarah M., 5,470,859, Cl. 514-299.000.
Dabi, Shmuel; and Chinai, Kays, to McNeil-PPC, Inc. Clean dry facing needled composite. 5,470,326, Cl. 604-383.000.
Dadachanji, Fali M., to Protimeter PLC. Apparatus for, and method of, providing an atmosphere of predetermined humidity. 5,469,707, Cl. 62-3.300.
Dadak, Tony M.; and Roberts, John L., to General Motors Corporation. Motor vehicle power steering gear. 5,469,929, Cl. 180-149.000.
Daewoo Heavy Industries Ltd.: *See*—
Lee, Seung H., 5,469,883, Cl. 137-513.300.
Daewood Heavy Industries Co., Ltd.: *See*—
Shin, Yoon-Sub; Chang, Se-Yeob; Lee, Sang-Jin; and Kim, Jae-Kon, 5,470,047, Cl. 266-76.000.
Daftary, Fereidoun; and Bahat, Oded. Anatomical dental implant with expandable root. 5,470,230, Cl. 433-174.000.
Dahlmann, Gerhard: *See*—
Brodersen, Karl-Heinz; Dahlmann, Gerhard; and Leopold, Heinrich, 5,470,433, Cl. 162-77.000.
Dai, Dezai: *See*—
Peng, Sixun; Dai, Dezai; Huang, Zhenya; Huang, Wenlong; Wang, Youqun; Zhang, Can; and Yu, Feng, 5,470,852, Cl. 514-231.500.
Daido Metal Company, Ltd.: *See*—
Tanaka, Tadashi; Sakamoto, Masaaki; and Sato, Yoshiaki, 5,470,666, Cl. 428-653.000.
Daige, Inc.: *See*—
Harris, Ira M., 5,470,386, Cl. 118-244.000.
Daigle, Steven J.: *See*—
Irwin, Kenneth E., Jr.; Streeter, Gary R.; and Daigle, Steven J., 5,471,039, Cl. 235-441.000.
Daikin Industries, Ltd.: *See*—
Ishiwari, Kazuo; Yamamoto, Yoshihisa; and Shimizu, Tetsuo, 5,470,901, Cl. 524-345.000.
Suyama, Shuji; Ishigaki, Hideyo; Tomoda, Masayasu; Shirai, Yoshihiro; Tanaka, Hiroyuki; and Komai, Masaharu, 5,470,917, Cl. 525-326.300.
Daikuzono, Norio, to S.L.T. Japan Co., Ltd. Laser light irradiation apparatus for medical treatment. 5,470,331, Cl. 606-16.000.
Dailey, J. R.; McGee, William F.; and Rybicki, Daniel J., to United States of America, National Aeronautics and Space Administration. Chamber free plasma welding root side purging method and apparatus. 5,471,031, Cl. 219-121.460.
Dais, Brian C.; and Porchia, Jose, to DowBrands L.P. Process and apparatus for controlling the gap width of a reclosable closure profile for a thermoplastic container. 5,470,518, Cl. 264-145.000.
Dalal, Hormazdyar M.: *See*—
Biery, Glenn A.; Boyne, Daniel M.; and Dalal, Hormazdyar M., 5,470,788, Cl. 437-190.000.
Daman, Ernest L., to Foster Wheeler Development Corporation. Method and apparatus for generating electrical energy utilizing a boiler and a gas turbine powered by a carbonizer. 5,469,699, Cl. 60-39.020.
Dana-Farber Cancer Institute, Inc.: *See*—
Sager, Ruth; Anisowicz, Anthony; and Zou, Zhiqiang, 5,470,970, Cl. 536-23.500.
Danek Medical, Inc.: *See*—
Ray, R. Charles, 5,470,333, Cl. 606-61.000.
Danforth Biomedical Inc.: *See*—
Horzewski, Michael J.; and Matani, Nitin P., 5,470,322, Cl. 604-280.000.
Danfoss A/S: *See*—
Martensen, Lars; Hansen, Ove T.; Moeller, Henry M.; and Jepsen, Hardy, 5,469,776, Cl. 92-170.100.
Wu, Jian M., 5,471,125, Cl. 318-803.000.
Dang, Khoa V.: *See*—
Costanzo, Christopher R.; Kaplan, David R.; and Dang, Khoa V., 5,471,055, Cl. 250-252.100.
Danzuka, Toshio: *See*—
Tsuchiya, Ichiro; Danzuka, Toshio; and Ito, Masumi, 5,470,369, Cl. 65-379.000.
Dao, Loc H.: *See*—
Ramachandran, Ramakrishnan; and Dao, Loc H., 5,470,925, Cl. 526-68.000.
Daoudal, Bertrand: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; Marchand, Pierre; Dixmier, Francoise; and Prigent, Monique, 5,470,495, Cl. 252-18.000.
Dara, Chester P. Windshield wiper blade slapper apparatus. 5,469,595, Cl. 15-250.190.
Darfler, Stephen C., to Hexcel Corporation. High thermal conductivity non-metallic honeycomb with optimum pitch fiber angle. 5,470,633, Cl. 428-116.000.
Dark, Richard C. G.: *See*—
Cook, Charles; Zomorodi, Mostafa; and Dark, Richard C. G., 5,470,324, Cl. 604-319.000.
Darolia, Ramgopal, to General Electric Company. Dispersion streagthened alloy containing in-situ-formed dispersoids and articles and methods of manufacture. 5,470,371, Cl. 75-229.000.
Dartmouth College: *See*—
Craig, Ruth W., 5,470,955, Cl. 530-387.700.
Dasa, Madhava. Model airplane or toy glider. 5,470,268, Cl. 446-67.000.
Dash, Glen. Sound producing device stimulated by petting. 5,471,192, Cl. 340-384.300.
Data, Stanley E.; Koziara, Robert P.; Lent, Mark S.; O'Gorman, Patrick A.; Rose, Thomas K.; Shanks, Eugene G.; and Norrick, Daniel A., to Onan Corporation. Auxiliary power unit for a hybrid electrical vehicle. 5,469,820, Cl. 123-192.200.
Data Translation, Inc.: *See*—
Lightbody, Timothy R.; Cutter, Daniel F.; and Nowokunski, Brian M., 5,471,577, Cl. 395-157.000.
Daute, Peter; Wegener, Ingo; Meffert, Alfred; and Berger, Faize, to Henkel Kommanditgesellschaft auf Aktien. Process for softening fabrics by contacting them with a thiodiglycol derivative. 5,470,493, Cl. 252-8.700.
David Sarnoff Research Center, Inc.: *See*—
Sauer, Donald J., 5,471,208, Cl. 341-120.000.
Davidson Textron Inc.: *See*—
Vaillancourt, Glenn M.; and Gridley, Lee E., 5,470,103, Cl. 280-730.100.
Davis, Gregory B.: *See*—
Soenen, Eric G.; Davis, Gregory B.; Adkins, Thomas; and MacDonald, Russell K., 5,471,668, Cl. 455-352.000.
Davis, Jeffrey P.: *See*—
Sharma, Raghu; Davis, Jeffrey P.; Gunn, Timothy D.; Li, Ping; Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, 5,471,470, Cl. 370-81.000.
Davis, John S.; Gong, Kai F.; and Hammel, Sherry E., to United States of America, Navy. System and method for rapidly tracking vehicles of special utility in low signal-to-noise environments. 5,471,434, Cl. 367-124.000.
Davis, Mark R.: *See*—
Bonora, Anthony C.; Rosenquist, Frederick T.; Jain, Sudhir; and Davis, Mark R., 5,469,963, Cl. 206-709.000.
Davis, Matthew A.: *See*—
Kiss, Vince; and Davis, Matthew A., 5,471,022, Cl. 200-83.00B.
Davis, Richard S.: *See*—
Larabell, Henri J.; and Davis, Richard S., 5,471,099, Cl. 307-53.000.
Davis, Terry R.: *See*—
Rose, Larry D.; Lauritzen, Donald R.; Ravenberg, Mike J.; Thompson, Mark A.; Green, David J.; and Davis, Terry R., 5,470,105, Cl. 280-740.000.
Davis, Walter L., to Motorola, Inc. Expanded microcomputer system for controlling radio frequency interference. 5,471,663, Cl. 455-296.000.
Davison, Roger C.; and Mathur, Achint P., to Tranter, Inc. All-welded plate heat exchanger. 5,469,914, Cl. 165-166.000.
Davy, Kenneth C.: *See*—
Milinkovic, Miroslav; Mathews, Tony P.; and Davy, Kenneth C., 5,470,651, Cl. 428-325.000.
Dawes, Christopher J.: *See*—
Thomas, Wayne M.; Nicholas, Edward D.; Jones, Stephen B.; Lilley, Roger H.; Dawes, Christopher J.; and Dolby, Richard E., 5,469,617, Cl. 29-889.210.
Days, Charles: *See*—
Gobush, William; Pelletier, Diane; and Days, Charles, 5,471,383, Cl. 364-410.000.
Deakyne, Clifford K.; and Weeks, Gregory P., to Du Pont de Nemours, E. I., and Company. Process for making fluoropolymer composites. 5,470,409, Cl. 156-62.400.
De Backer, Josephus W. M.; and De Bie, Cornelia M. J., to U.S. Philips Corporation. Low-pressure mercury discharge lamp. 5,471,113, Cl. 313-487.000.
De Bie, Cornelia M. J.: *See*—
De Backer, Josephus W. M.; and De Bie, Cornelia M. J., 5,471,113, Cl. 313-487.000.
De Boer, Johannes, to U.S. Philips Corporation. Method of manufacturing an antistatic coating on a substrate, in particular, a cathode ray tube, comprising latex particles of a polypyrrole compound in a silicon dioxide matrix. 5,470,606, Cl. 427-64.000.
DeBourgh Manufacturing Company: *See*—
Berg, Robert D. W.; and Domsten, Eugene R., 5,470,115, Cl. 292-335.000.
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., to Fina Research, S.A. Process for removing carbonyl-sulfide from liquid hydrocarbon feedstocks. 5,470,456, Cl. 208-244.000.
Debrouwere, Tom: *See*—
Embo, Georges; Debrouwere, Tom; and Moyaert, Werner, 5,470,261, Cl. 439-752.000.
Decanto, Anthony. Apparatus and method for providing pressure point therapy. 5,470,304, Cl. 601-134.000.
DeCarlo, John M.: *See*—
Spigarelli, Donald J.; and DeCarlo, John M., 5,471,310, Cl. 356-399.000.
Decker, Hans-Josef; and Schwarz, Klaus-Peter, to Siemens Aktiengesellschaft. Apparatus and method for a gas quantity setting system. 5,469,731, Cl. 73-23.310.
Deckner, George E.: *See*—

Corless, Ann M.; Deckner, George E.; Hall, Bonnie J.; and Listro, Joseph A., 5,470,884, Cl. 514-714.000.

De Clippeleir, Georges E. M. J.: *See*—
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., 5,470,456, Cl. 208-244.000.

deFraine, Paul: *See*—
Anthony, Vivienne M.; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Ferguson, Ian; Crowley, Patrick J.; and Hutchings, Michael G., 5,470,819, Cl. 504-244.000.

Degnan, Thomas F.; Fung, Anthony S.; Hatzikos, George H.; Kennedy, Gordon J.; and Kowalski, Jocelyn A., to Mobil Oil Corporation. Catalyst and method of manufacture. 5,470,810, Cl. 502-64.000.

Deguchi, Toshihisa: *See*—
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 5,470,694, Cl. 430-321.000.

Degussa Aktiengesellschaft: *See*—
Meier, Karl; Goerl, Udo; and Wolff, Siegfried, 5,470,905, Cl. 524-493.000.

Dejaifve, Pierre E. J. G.: *See*—
Grandvallet, Pierre; Allais, Daniel G. P.; and Dejaifve, Pierre E. J. G., 5,470,454, Cl. 208-144.000.

De Kretser, David M.; Burger, Henry G.; Hearn, Milton T. W.; Milne-Robertson, David M.; Wettenhall, Richard E. H.; McLachlan, Robert I.; and De Vos, Fiona, to Biotechnology Australia Pty Ltd.; Monash University; Monash Medical Centre; and St. Vincents Institute of Medical Research. Single chain proteins with FHS suppressing activity isolated from follicular fluid and uses thereof. 5,470,826, Cl. 514-8.000.

De Langhe, Marc R. F.; Reusens, Peter P. F.; Haspeslagh, Johan J. G.; and Van Hoogenbemt, Stefaan M. A., to Alcatel N.V. Digital phase-locked loop arrangement for use in a desynchronizer. 5,471,511, Cl. 375-376.000.

DeLano, Eric R., to Hewlett-Packard Company. System and method of scoreboarding individual cache line segments. 5,471,602, Cl. 395-445.000.

Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; Marchand, Pierre; Dixmier, Francoise; and Prigent, Monique, to Institut Francais Du Petrole. Colloidal products containing calcium and/or magnesium, as well as boron and/or phosphorus and/or sulfur, their preparation and their utilization as additives for lubricants. 5,470,495, Cl. 252-18.000.

Dell USA, L.P.: *See*—
Parks, Terry J., 5,471,225, Cl. 345-98.000.
Stewart, Gregory N.; Overfield, Anthony L.; and Ellis, Mark T., 5,471,674, Cl. 395-650.000.

DeLonzor, Russell; and Middleman, Lee, to Nellcor Incorporated. Disposable pulse oximeter sensor. 5,469,845, Cl. 128-633.000.

Delrod Sales Corporation: *See*—
Rodarmer, Kenneth W.; and Money, Louis W., 5,469,875, Cl. 134-63.000.

Demarest, David; Duncan, Robert B.; Sobel, Martin; Lenihan, Timothy P.; and Rattan, William, to Ethicon, Inc. Machine for the automated packaging of needles and attached sutures and method of utilizing the packaging machine. 5,469,689, Cl. 53-430.000.

Dembosky, Stanley K.: *See*—
Schneider, Karl F.; Dembosky, Stanley K.; Fairbank, Donn K.; Spokas, Romas B.; and Keeney, Bradley L., 5,470,285, Cl. 475-210.000.

Demeny, Rodney L., to Fendall Company. Portable emergency decontamination shower. 5,469,587, Cl. 4-599.000.

de Munck, Johannes W. J.: *See*—
van der Meer, Roelof; Pratt, Charles F.; de Munck, Johannes W. J.; and Heuschen, Jean M. H., 5,470,913, Cl. 525-66.000.

De Naeghel, Emiel, to Machines Collette. Mixing device for aerating and mixing pumpable semi-liquid products. 5,470,153, Cl. 366-303.000.

Dendinger, Stan, to Silicon Systems, Inc. Circuit for sinking current with near-ground voltage compliance. 5,471,169, Cl. 327-563.000.

Denham, Dale L., Jr.: *See*—
Schmidt, Roland; and Denham, Dale L., Jr., 5,470,554, Cl. 423-206.200.

Dennesen, Christopher F. Apparatus for impeding the movement of a ball. 5,470,056, Cl. 273-29.00B.

Dennis, Kevin W.: *See*—
McCallum, R. William; Dennis, Kevin W.; Lograsso, Barbara K.; and Anderson, Iver E., 5,470,401, Cl. 148-302.000.

Dennis, Stephen V.; Shaiman, Steve; McCormick, William B.; Flagg, Robert C.; and Schuster, Paul A., to Microsoft Corporation. System and method for automatic resolution reduction. 5,471,563, Cl. 395-114.000.

Dennis, Stephen V.; Fluegel, Steven J.; Gerlach, Brett C.; and Flagg, Robert C., to Microsoft Corporation. System and method for dynamic printer timeout. 5,471,564, Cl. 395-114.000.

Dennison, Daniel B.: *See*—
Rounbehler, David P.; Fine, David H.; Achter, Eugene K.; MacDonald, Stephen J.; and Dennison, Daniel B., 5,470,754, Cl. 436-106.000.

Denny, Bradley J.; and Hannon, Richard H., to Plop Golf Company. Apparatus for fitting a golf club to a player. 5,469,627, Cl. 33-508.000.

Denny, Mark D.: *See*—
Barrington, James W.; Masters, Randy W.; and Denny, Mark D., 5,470,459, Cl. 210-149.000.

Desa International, Inc.: *See*—
McCoy, Hugh W., 5,470,223, Cl. 431-24.000.
Smith, Ronald G., 5,470,018, Cl. 236-15.00A.

Desaga, Hans. Hand-operated utensil for crushing granular foods. 5,470,024, Cl. 241-234.000.

Desai, Vikram D.: *See*—
Phillips, Peter E.; Strattan, Landon A.; and Desai, Vikram D., 5,471,491, Cl. 372-35.000.

De Santis, Stephen A. Fine needle aspiration cytology device syringe holder. 5,469,860, Cl. 128-765.000.

Design Standards Corporation: *See*—
Canaanzey, John J.; and Lacey, Scot M., 5,470,317, Cl. 604-121.000.

De Subijana, Joseba M.: *See*—
Byers, Larry L.; De Subijana, Joseba M.; and Michaelson, Wayne A., 5,471,597, Cl. 395-375.000.

Detable, Pascal: *See*—
Calmettes, Lionel; Detable, Pascal; and Andre, Michel, 5,469,604, Cl. 24-20.0CW.

Detroit Diesel Corporation: *See*—
Carlisle, Lonnie E.; and Pesmark, Chester M., 5,469,747, Cl. 73-861.370.

Deutsch, Alina; Lewis, David A.; Narayan, Chandrasekhar; and Plachy, Anthony L., to International Business Machines Corporation. Electronic structures having a joining geometry providing reduced capacitive loading. 5,471,090, Cl. 257-734.000.

Deutsche Thomson-Brandt GmbH: *See*—
Elgert, Achim, 5,471,121, Cl. 315-382.100.
Hartnack, Wolfgang, 5,471,247, Cl. 348-402.000.
Kaaden, Jürgen; and Reiner, Gerhard, 5,471,124, Cl. 318-650.000.

Devices for Vascular Intervention, Inc.: *See*—
Perkins, Roger W.; and Chatelain, Gerri L., 5,470,415, Cl. 156-916.000.

Devon Industries, Inc.: *See*—
Sandel, Dan, 5,469,600, Cl. 16-111.00R.

Devore, David D.; Timmers, Francis J.; Wilson, David R.; and Rosen, Robert K., to Dow Chemical Company, The. Titanium(II) or zirconium(II) complexes and addition polymerization catalysts therefrom. 5,470,993, Cl. 556-11.000.

De Vos, Fiona: *See*—
De Kretser, David M.; Burger, Henry G.; Hearn, Milton T. W.; Milne-Robertson, David M.; Wettenhall, Richard E. H.; McLachlan, Robert I.; and De Vos, Fiona, 5,470,826, Cl. 514-8.000.

DeWoskin, Irvin S., to Barnhart Industries, Inc. Device for holding pressure-sensitive adhesive tape for adhesively gripping items to be gripped and method of manufacture. 5,470,116, Cl. 294-1.100.

Dexter Corporation, The: *See*—
Cedarleaf, Calvin P., 5,470,413, Cl. 156-90.000.

DFC Co. Ltd.: *See*—
Sato, Toshiyuki; Sakamoto, George; Takigawa, Morikuni; and Kawasaki, Hirotoki, 5,470,081, Cl. 273-438.000.

Dharanipragada, Ramalinga: *See*—
Macielag, Mark J.; Dharanipragada, Ramalinga; and Marvin, Mary S., 5,470,830, Cl. 514-13.000.

Diagnostic Products Corporation: *See*—
El Shami, A. Said; Hand, Christopher W.; Miller, Susan A.; and Moore, Robert A., 5,470,713, Cl. 435-7.720.

Di Bartolomeo, Joseph R. Composition and method for treatment of patulous eustachian tube syndrome and atrophic rhinitis. 5,470,587, Cl. 424-661.000.

Dickey, Eric R.; and Bjornard, Erik J., to Viratec Thin Films, Inc. Shielding for arc suppression in rotating magnetron sputtering systems. 5,470,452, Cl. 204-298.210.

Dickson, John K., Jr.: *See*—
Magnin, David R.; Biller, Scott A.; Dickson, John K., Jr.; Lawrence, R. Michael; and Sulsky, Richard B., 5,470,845, Cl. 514-121.000.

Didner, Jonathan R.: *See*—
Farrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., 5,471,617, Cl. 395-700.000.

Diehl, Donald R.; and Brown, Glenn M., to Eastman Kodak Company. Solid particle dispersions of filter dyes for photographic elements. 5,470,695, Cl. 430-522.000.

Diemeer, Martinus B. J.; Horsthuis, Winfried H. G.; McDonach, Alaster; and Copeland, John M., to Akzo Nobel N.V.; and Koninklijke P.T.T. Integrated optic components. 5,470,692, Cl. 430-290.000.

Dien, René: *See*—
Camberlin, Yves; Dien, René; and Michaud, Philippe, 5,470,920, Cl. 525-421.000.

Dieta, Dennis R.: *See*—
Law, Wing K.; Ranalletta, Joseph V.; Oakley, Clyde G.; Douglas, Stephen J.; and Dieta, Dennis R., 5,469,853, Cl. 128-662.060.

Dietz, Carl D.; and Hoover, Kathryn J., to International Business Machines Corp. Comparator circuitry and method of operation. 5,471,189, Cl. 340-146.200.

DiFrancesco, Louis, to Particle Interconnect, Inc. Electrical interconnect using particle enhanced joining of metal surfaces. 5,471,151, Cl. 324-757.000.

Digianni, Michele; and Marocco, Norbert. Louvre shutter device with variable slats. 5,469,658, Cl. 49-82.100.

Digital Equipment Corporation: *See*—
Brown, Robert, III, 5,471,596, Cl. 395-375.000.
Edmondson, John H.; and Biro, Larry L., 5,471,591, Cl. 395-375.000.
Fishbein, Bruce J.; and Doyle, Brian S., 5,471,081, Cl. 257-356.000.
Gavin, Vincent G.; Seaman, Michael J.; Crook, Neal A.; and Mistry, Bipin, 5,471,632, Cl. 395-284.000.
Tsai, Fu-Sheng; and Ng, William W., 5,471,376, Cl. 363-20.000.

DiMatteo, Paul; and DiMatteo, Paul C., to Nova Technologies, Inc. Patient transfer arrangement. 5,469,588, Cl. 5-81.100.

DiMatteo, Paul C.: *See—*
DiMatteo, Paul; and DiMatteo, Paul C., 5,469,588, Cl. 5-81.100.
Di Mino, André, to ADM Tronics Unlimited, Inc. Paper pouch for food products. 5,470,594, Cl. 426-87.000.
Dimmitt, Dan C.: *See—*
Hendrickson, Dennis L.; Dimmitt, Dan C.; Williams, Mark S.; Skultety, Paul F.; and Baltezor, Michael J., 5,470,584, Cl. 424-490.000.
Diner, Bruce A.; Gutteridge, Steven; Peterson, Gary L.; and Wolf, William E., to Du Pont de Nemours, E. I., and Company. Light collector. 5,471,053, Cl. 250-228.000.
DiPaolo, Nunzio; and Ferguson, Daniel J., to International Business Machines Corporation. Process and apparatus for contamination-free processing of semiconductor parts. 5,471,033, Cl. 219-388.000.
Diresta, James D., to Rapid Mounting & Finishing Co. Detachable puck dispensing apparatus and method for hockey stick. 5,470,067, Cl. 273-57.200.
Dischb, Karoly, to Sandoz Ltd. Monomer preparations for the construction industry. 5,470,425, Cl. 156-332.000.
Di Sera, Leonard J.: *See—*
Weiss, Robert B.; Kimball, Alvin W.; Gesteland, Raymond F.; Ferguson, F. Mark; Dunn, Diane M.; Di Sera, Leonard J.; and Cherry, Joshua L., 5,470,710, Cl. 435-6.000.
DiStefano, Alfred: *See—*
DiStefano, Richard; and DiStefano, Alfred, 5,470,002, Cl. 224-275.000.
DiStefano, Richard; and DiStefano, Alfred. Food container self-leveling device. 5,470,002, Cl. 224-275.000.
Dixmier, Francoise: *See—*
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; Marchand, Pierre; Dixmier, Francoise; and Prigent, Monique, 5,470,495, Cl. 252-18.000.
Dixon, James S.; Hall, Raplh F.; Marshall, Lisa A.; Chilton, Floyd H., III; Mayer, Ruth J.; and Winkler, James D., to SmithKline Beecham Corp. Anti-inflammatory compounds. 5,470,882, Cl. 514-596.000.
Djabbarah, Nizar F.; and Sprunt, Eve S., to Mobil Oil Corporation. Method for determining steam quality using a foaming surfactant. 5,470,749, Cl. 436-38.000.
DMJ Holdings, Inc.: *See—*
Edwards, M. Larry; and Watson, W. Joe, 5,471,114, Cl. 315-86.000.
Doany, Fuad E.: *See—*
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.
Doany, Ziyad H., to Minnesota Mining and Manufacturing Co. Apparatus for locating buried conductors using phase-shifted signals. 5,471,143, Cl. 324-326.000.
Dobbie, Robert P.: *See—*
Laughlin, Philip; Alexander, John; Kamarei, A. Reza; Dobbie, Robert P.; Lin, Paul; Chang, Shen-Youn; Reddy, Sekhar; Grasset, Etienne; and Melin, Christian, 5,470,839, Cl. 514-53.000.
Doddapaneni, Narayan; and Ingersoll, David. Electrolyte salts for power sources. 5,470,674, Cl. 429-50.000.
Doherty, Niall S.: *See—*
Wolos, Jeffrey A.; Doherty, Niall S.; Jarvi, Esa T.; and McCarthy, James R., 5,470,837, Cl. 514-45.000.
Dojyo, Tadashi: *See—*
Kotaki, Takaaki; Taya, Masaaki; Unno, Makoto; Mikuriya, Yushi; and Dojyo, Tadashi, 5,470,684, Cl. 430-109.000.
Dolby, Richard E.: *See—*
Thomas, Wayne M.; Nicholas, Edward D.; Jones, Stephen B.; Lilley, Roger H.; Dawes, Christopher J.; and Dolby, Richard E., 5,469,617, Cl. 29-889.210.
Dolfsma, Henk: *See—*
Wardle, Frank; Jacobson, Bo; Dolfsma, Henk; and Butterworth, Arthur, 5,469,713, Cl. 62-84.000.
Domoto, Yoshihisa; Takahashi, Toshie; and Kurumada, Toshimi, to Hitachi Telecom Technologies, Ltd. Line status display system for telephone exchange system. 5,471,525, Cl. 379-247.000.
Domsten, Eugene R.: *See—*
Berg, Robert D. W.; and Domsten, Eugene R., 5,470,115, Cl. 292-335.000.
Donaldson Company, Inc.: *See—*
Tuma, Daniel L.; Van Peteghem, Jacques V.; and Ronneau, Olivier H., 5,469,702, Cl. 60-311.000.
Donders, Adrianus P.: *See—*
Hassler, Beth A.; and Donders, Adrianus P., 5,470,345, Cl. 607-36.000.
Dongyang Jonghap Corporation: *See—*
Bae, Jong-Chan, 5,471,238, Cl. 348-98.000.
Dönig, Gerhard; Hümpfner, Roland; Grass, Norbert; Knaak, Hans-Joachim; Neulinger, Franz; and Schummer, Helmut, to Siemans Aktiengesellschaft. Process for controlling a power supply which supplies power to an electrostatic filter in which secondary circuit states are determined based on measured primary circuit values and in which short circuits are detected. 5,471,377, Cl. 363-21.000.
Donno, Luigi; and Cassinelli, Giuseppe, to Farmitalia Carlo Erba S.r.l. Paromomycin or its derivatives or salts thereof in combination with sodium stirogluconate for parenteral treatment of human parasitic diseases. 5,470,836, Cl. 514-38.000.
Dooley, Edward J.: *See—*
Bredeweg, Robert; Blanchard, Russell O.; Morgan, Donald F.; and Dooley, Edward J., 5,469,995, Cl. 223-85.000.
Dorfman, Jay R., to Du Pont de Nemours, E. I., and Company. Polymer thick film resistor compositions. 5,470,643, Cl. 428-206.000.
Dorfman, Leonid P.; Scheithauer, Michael J.; Houck, David L.; and Kopatz, Nelson E., to Osram Sylvania Inc. Method of making tungsten-copper composite oxides. 5,470,549, Cl. 423-61.000.
Dorr-Oliver Incorporated: *See—*
Baird, David P.; and Reiter, Richard L., 5,470,472, Cl. 210-391.000.
Dosho, Marie: *See—*
Inoue, Katsushi; Tamai, Seiichiro; Kobayashi, Keiichi; and Dosho, Marie, 5,471,041, Cl. 235-462.000.
Dosiere, Frédéric; Boutes, Jean-Pierre; and Maral, Gérard, to France Telecom. Telecommunications network having switching centers for linking satellites. 5,471,641, Cl. 455-13.100.
Doubleday, Walter D., to Kirschner Medical Corporation. Medical bandaging article and packaging system. 5,470,306, Cl. 602-8.000.
Dougherty, John D.; Moldovan, Mark R; Otto, Dennis L.; and Varonis, Orestes J., to Timken Company, The. Bearing seal for sensing angular velocity. 5,470,157, Cl. 384-448.000.
Douglas, Stephen J.: *See—*
Law, Wing K.; Ranalletta, Joseph V.; Oakley, Clyde G.; Douglas, Stephen J.; and Dieta, Dennis R., 5,469,853, Cl. 128-662.060.
Douty, George H.: *See—*
McCleerey, Earl W.; Moll, Hurley C., Jr.; Landis, John M.; and Douty, George H., 5,470,255, Cl. 439-500.000.
Dove, Derek B.: *See—*
Brunner, Timothy A.; Dove, Derek B.; and Hsu, Louis L., 5,470,681, Cl. 430-5.000.
Dow Chemical Company, The: *See—*
Babinec, Susan J., 5,471,337, Cl. 359-269.000.
Devore, David D.; Timmers, Francis J.; Wilson, David R.; and Rosen, Robert K., 5,470,993, Cl. 556-11.000.
Hefner, Robert E., Jr.; and Earls, Jimmy D., 5,470,946, Cl. 528-422.000.
Inbasekaran, Muthiah N., 5,470,987, Cl. 548-462.000.
Schmidt, Donald L.; Harris, Robert F.; and Coburn, Charles, 5,470,908, Cl. 524-520.000.
Dow Corning Corporation: *See—*
Krahnke, Robert H.; Mealey, Shawn K.; Schoenherr, William J.; Smith, Schyler B., deceased; and Tangney, Thomas J., 5,470,923, Cl. 525-477.000.
Dow Corning Toray Silicone Co., Ltd.: *See—*
Saruyama, Toshio; and Suzuki, Masahiko, 5,470,934, Cl. 52.8-34.000.
DowBrands L.P.: *See—*
Dais, Brian C.; and Porchia, Jose, 5,470,518, Cl. 264-145.000.
Downey, Walter J.: *See—*
Sutterlin, Philip H.; and Downey, Walter J., 5,471,209, Cl. 341-143.000.
Downie, Alan P.; Gallagher, Peter; Garrity, John J.; and Robertson, Brian L., to International Business Machines Corporation. Module having vertical peripheral edge connection. 5,471,368, Cl. 361-760.000.
Downs, Roland J.: *See—*
Meldner, Heiner; and Downs, Roland J., 5,470,632, Cl. 428-110.000.
Doyle, Brian S.: *See—*
Fishbein, Bruce J.; and Doyle, Brian S., 5,471,081, Cl. 257-356.000.
Doyle, Michael: *See—*
McCurdy, Jim; Doyle, Michael; and McLaughlin, Michael, 5,471,197, Cl. 340-573.000.
Dozier, Edward M.: *See—*
Braga, David J.; Carter, Thomas L.; Dozier, Edward M.; and Sarbell, John P., 5,471,555, Cl. 385-136.000.
Dr. Ing. h.c.F. Porsche AG: *See—*
Wöhler, Hans J.; and Germano, Francesco, 5,470,049, Cl. 267-172.000.
Drago, Joseph A.: *See—*
Keating, Kent G.; and Drago, Joseph A., 5,470,410, Cl. 156-63.000.
Dray, Robert F. Injection molding method for a shot of determined mass. 5,470,514, Cl. 264-40.400.
Drebin, Robert A.: *See—*
Buchner, Gregory C.; and Drebin, Robert A., 5,471,572, Cl. 395-139.000.
Drenten, Ronald R.: *See—*
Liedenbaum, Coen T. H. F.; Severens, Arnoldus L. G. J.; Drenten, Ronald R.; and Jongerius, Michiel J., 5,471,490, Cl. 372-32.000.
Drevin, Hakan: *See—*
Helting, Torsten B.; Drevin, Hakan; and Nunn, Michael F., 5,470,720, Cl. 435-69.300.
Drew, Roger C. Security-transfer systems. 5,469,657, Cl. 49-68.000.
Drexl, Hans-Jürgen: *See—*
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.
Dreyer, John F., Jr.: *See—*
Miller, Richard A.; Abo, Kenneth A.; and Dreyer, John F., Jr., 5,471,348, Cl. 359-837.000.
Dries, Johan M. F.; and Therasse, Yves, to Alcatel N.V. Logical machine for processing control information of telecommunication transmission frames. 5,471,477, Cl. 370-110.100.
Drosdak, Joseph. Fishing leader and connector. 5,469,652, Cl. 43-44.830.
DSC Communications Corporation: *See—*
Ho, Helena S.; Pratt, Michael K.; Lim, Pong C.; and Oshidari, Thomas T., 5,471,527, Cl. 379-347.000.

D'Souza, Godfrey P.: *See*—
Rose, James W.; D'Souza, Godfrey P.; Stinehelfer, Jonathan J.; and Testa, James F., 5,471,421, Cl. 365-182.000.

Du Pont de Nemours, E. I., and Company: *See*—
Anderson, Howard W.; Carberry, John B.; Staunton, Harold F.; and Sutradhar, Bhagya C., 5,471,001, Cl. 562-593.000.
Deakyne, Clifford K.; and Weeks, Gregory P., 5,470,409, Cl. 156-62.400.
Diner, Bruce A.; Gutteridge, Steven; Peterson, Gary L.; and Wolf, William E., 5,471,053, Cl. 250-228.000.
Dorfman, Jay R., 5,470,643, Cl. 428-206.000.
Eckman, Thomas J., 5,470,469, Cl. 210-321.800.
Fodor, Ludovic; Weatherill, Timothy D.; and Weberg, Rolf T., 5,470,986, Cl. 548-312.700.
Foley, Henry C.; Sonnichsen, George C.; Brake, Loren D.; Mariwala, Ravindra K.; and Lafyatis, David S., 5,470,814, Cl. 502-182.000.
Goethel, Peter J.; Lewis, Richjard W.; and Teerlink, Wilford J., 5,471,037, Cl. 219-750.000.
Kaku, Mureo; and Luise, Robert R., 5,470,922, Cl. 525-436.000.
Kennard, Jeffrey L.; Kodokian, George K.; Popper, Peter; and Samant, Kalika R., 5,470,656, Cl. 428-370.000.
Koch, Theodore A.; Krause, Karl R.; and Mehdizadeh, Mehrdad, 5,470,541, Cl. 422-186.000.
Mahler, Barry A.; and Miller, Ralph N., 5,470,442, Cl. 203-56.000.
Mokhtar, Ahmed M.; Popper, Peter; and Walker, Wiliam C., 5,470,629, Cl. 428-85.000.
Pearlman, Paul S.; and Kumar, Vijayendra, 5,470,648, Cl. 428-247.000.
Rushmere, John D.; and Moffett, Robert H., 5,470,435, Cl. 162-181.600.
Weber, Andrew M.; and Beresniewicz, Aleksander, 5,470,662, Cl. 428-421.000.

Du, Xin, to Antenna Company, The. Ultrahigh frequency mobile antenna system using dielectric resonators for coupling RF signals from feed line to antenna. 5,471,222, Cl. 343-713.000.

Duann, Jia-Ruey: *See*—
Lai, Chung-Ping; Fu, Cheng-Tsu; Duann, Jia-Ruey; Li, Ai-Kang; and Ko, Kai-Li, 5,470,807, Cl. 501-93.000.

Dube, Ghyslain; Litalien, Marko; Pelletier, Roger; and Wang, Zhou, to Alcan International Limited. Recovery of non-ferrous metals from dross. 5,470,376, Cl. 75-672.000.

Dubief, Claude; and Cauwet, Daniele, to L'Oreal. Use in cosmetics or in topical application of an aqueous dispersion based on organopolysiloxanes and on a cross-linked acrylamide/neutralized 2-acrylamido-2-methylpropanesulfonic acid copolymer. 5,470,551, Cl. 424-70.120.

Duck, Gary S.: *See*—
Cheng, Yihao; and Duck, Gary S., 5,471,340, Cl. 359-281.000.

Duckworth, Donald L. Portable continual mixer. 5,470,147, Cl. 366-34.000.

Dudley, Alan L.: *See*—
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Mastalski, Henry T., 5,470,271, Cl. 451-55.000.

Duff, Ronald G.: *See*—
Whitman, Russell B.; Wohl, Robert; and Duff, Ronald G., 5,470,831, Cl. 514-16.000.

Duflos, Muriel; Robert-Piessard, Sylvie; Welin, Lucien; Le Baut, Guillaume; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, to Adir et Compagnie. α-amino acid compounds. 5,470,864, Cl. 514-352.000.

Dufour, Jean G., to Johnson Level & Tool Mfg. Co., Inc. Quick rewind chalk line reel. 5,470,029, Cl. 242-394.000.

Duke University: *See*—
Gerhart, Donald J., 5,470,586, Cl. 424-609.000.

Dumas, Marc: *See*—
Bonte, Frédéric; Dumas, Marc; Meybeck, Alain; and Marechal, Christian, 5,470,579, Cl. 424-450.000.

Dunbar, Michael D.; and Vohnout, Vincent J., to Dunbar, Michael D. Method for wrapping silverware in a napkin. 5,469,688, Cl. 53-419.000.

Duncan, Carolyn B.: *See*—
Schlosberg, Richard H.; Duncan, Carolyn B.; and Krevalis, Martin A., Jr., 5,470,497, Cl. 252-68.000.

Duncan, Robert B.: *See*—
Demarest, David; Duncan, Robert B.; Sobel, Martin; Lenihan, Timothy P.; and Rattan, William, 5,469,689, Cl. 53-430.000.

Dunlop Slazenger Corporation: *See*—
Cadorniga, Lauro C., 5,470,076, Cl. 273-232.000.

Dunn, Diane M.: *See*—
Weiss, Robert B.; Kimball, Alvin W.; Gesteland, Raymond F.; Ferguson, F. Mark; Dunn, Diane M.; Di Sera, Leonard J.; and Cherry, Joshua L., 5,470,710, Cl. 435-6.000.

Dupont, Henri: *See*—
Pioch, Olivier; Martineau, Dominique; and Dupont, Henri, 5,470,289, Cl. 477-111.000.

Dupont Merck Pharmaceutical Company, The: *See*—
Huie, Edward M.; and Trainor, George L., 5,470,967, Cl. 536-24.300.

Durabag, Inc., a California corporation: *See*—
Huang, Frank F. J., 5,469,969, Cl. 206-554.000.

Durabla Pump Components, Inc.: *See*—
Madrid, Ronn G., 5,469,884, Cl. 137-515.700.

Durant, David. Apparatus and method for fabrication of printed circuit boards. 5,470,644, Cl. 428-209.000.

Du Toit, Guilluame T., to Technology Finance Corporation (Proprietary) Limited. Method for carrying out an osteotomy procedure. 5,470,335, Cl. 606-73.000.

Dykeman, Deidra A.: *See*—
Hotaling, Steven P.; and Dykeman, Deidra A., 5,470,612, Cl. 427-377.000.

Dynafoils, Inc.: *See*—
Payne, Peter R., 5,469,801, Cl. 114-282.000.

Dysart, John A.: *See*—
Farrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., 5,471,617, Cl. 395-700.000.

E.D.C. Sarl: *See*—
Casartelli, Gabriele, 5,469,584, Cl. 2-422.000.

E.I. Du Pont de Nemours and Company: *See*—
Blair, David E.; Houle, William A.; Lane, Gregg A.; Larson, James R.; and Pearlstine, Kathryn A., 5,471,287, Cl. 355-256.000.

E Lead Electronic Co., Ltd.: *See*—
Chen, Stephen, 5,471,530, Cl. 379-446.000.

E.R. Squibb & Sons, Inc.: *See*—
Atwal, Karnail, 5,470,975, Cl. 544-334.000.

Eadline, Douglas J., to Paralogic, Inc. Run-time system having nodes for identifying parallel tasks in a logic program and searching for available nodes to execute the parallel tasks. 5,471,622, Cl. 395-650.000.

Earls, Jimmy D.: *See*—
Hefner, Robert E., Jr.; and Earls, Jimmy D., 5,470,946, Cl. 528-422.000.

Eastman Chemical Company: *See*—
Liang, Shaowo, 5,471,003, Cl. 568-420.000.
Wang, Richard H. S., 5,470,998, Cl. 560-96.000.

Eastman Kodak Company: *See*—
Balling, Edward N., 5,471,270, Cl. 354-212.000.
Brazas, John C., 5,471,548, Cl. 385-37.000.
Diehl, Donald R.; and Brown, Glenn M., 5,470,695, Cl. 430-522.000.
Fleming, James C.; Lange, Gerald R.; and Preuss, Donald R., 5,470,626, Cl. 428-64.800.
Meyers, Mark M., 5,471,046, Cl. 250-201.700.
Na, George C.; and Rajagopalan, Natarajan, 5,470,583, Cl. 424-489.000.
Ng, Yee S.; and Tai, Hwai-Tzuu, 5,471,543, Cl. 382-173.000.
Orlicki, David M.; and Larrabee, James A., 5,471,314, Cl. 358-296.000.
Saeva, Franklin D.; and Breslin, David T., 5,470,994, Cl. 556-64.000.
Texter, John; Welter, Thomas R.; Southby, David T.; and Mooberry, Jared B., 5,470,688, Cl. 430-203.000.
Wen, Xin, 5,470,698, Cl. 430-567.000.
Williamson, Hugh M., 5,470,696, Cl. 430-543.000.
Yokajty, Joseph E., 5,470,420, Cl. 156-566.000.

Eaton Corporation: *See*—
Chien, Yun-Ko; and Ovick, Norman L., 5,471,184, Cl. 335-35.000.
Holmes, Francis A., 5,471,035, Cl. 219-505.000.
Organek, Gregory J.; Preston, David M.; and Janson, David A., 5,469,948, Cl. 192-35.000.
Ross, Michael E.; Borsos, Robert A.; and Corey, Lawrence G., 5,471,024, Cl. 200-458.000.
Ryczek, Lawrence J., 5,471,052, Cl. 250-226.000.
Shea, John J.; Smith, James D. B.; and Schoch, Karl F., Jr., 5,471,185, Cl. 335-51.000.
Spellman, Gordon B.; and Chen, C. Greg, 5,471,032, Cl. 219-270.000.

EB Brühl Aluminiumtechnik GmbH: *See*—
Gosch, Rolf, 5,469,821, Cl. 123-193.200.

EBAC Corporation: *See*—
Ebato, Hiroshi, 5,470,188, Cl. 414-545.000.

Ebara Corporation: *See*—
Toshimitsu, Manabu; Aiyoshizawa, Shunichi; Suganuma, Yoshikazu; and Konno, Daisuke, 5,471,104, Cl. 310-90.000.

Ebara, Takeshi: *See*—
Sasaki, Toshio; Ebara, Takeshi; Igarashi, Toshio; Tatsumi, Masayuki; and Wakamatsu, Kazuki, 5,470,900, Cl. 524-269.000.

Ebato, Hiroshi, to EBAC Corporation. Lift for loading and unloading a truck. 5,470,188, Cl. 414-545.000.

Ebe, Yoichi: *See*—
Kawata, Yutaka; Ebe, Yoichi; Hino, Harumichi; and Kawai, Hidenobu, 5,469,931, Cl. 180-379.000.

Ebisawa, Kan: *See*—
Kaneko, Shinji; and Ebisawa, Kan, 5,471,449, Cl. 369-58.000.

Echelon Corporation: *See*—
Sutterlin, Philip H.; and Downey, Walter J., 5,471,209, Cl. 341-143.000.

Eckhardt, Claude: *See*—
Weber, Kurt; Meyer, Hans R.; Kaschig, Jürgen; and Eckhardt, Claude, 5,470,990, Cl. 549-466.000.

Eckman, Richard R.: *See*—
Turner, Howard W.; Hlatky, Gregory G.; and Eckman, Richard R., 5,470,927, Cl. 526-126.000.

Eckman, Thomas J., to Du Pont de Nemours, E. I., and Company. Hollow fiber cartridge. 5,470,469, Cl. 210-321.800.

Economides, Aris N.: *See*—
Stahl, Neil; Economides, Aris N.; and Yancopoulos, George D., 5,470,952, Cl. 530-350.000.

Edagawa, Noboru: *See*—
Taga, Hidenori; Suzuki, Masatoshi; Edagawa, Noboru; Yamamoto, Shu; and Wakabayashi, Hiroharu, 5,471,333, Cl. 359-173.000.

Edelmann, Ludwig: *See*—

Sitte, Hellmuth; Neumann, Klaus; Edelmann, Ludwig; Haessig, Helmut; Lang, Anton; and Kleber, Heinrich, 5,469,712, Cl. 62-51.100.
Edelstein, Alan S.; Kastz, Forrest H.; and Harris, Vincent G., to United States of America, Navy. Oxidation resistant copper. 5,470,373, Cl. 75-255.000.
Edelstein, Beth E.: *See*—
Potes, Michael M.; Lambarth, Edwin H.; Frasher, Troy A.; Edelstein, Beth E.; Kelley, Lowell D.; and Lewis, Cynthia J., 5,470,220, Cl. 425-216.000.
Edmondson, John H.; and Biro, Larry L., to Digital Equipment Corporation. Combined write-operand queue and read-after-write dependency scoreboard. 5,471,591, Cl. 395-375.000.
Edwards, Carl K., III: *See*—
Borcherding, David R.; Edwards, Carl K., III; Esser, Ronald E.; and Cole, Douglas L., 5,470,857, Cl. 514-258.000.
Edwards, M. Larry; and Watson, W. Joe, to DMI Holdings, Inc. Fail-safe uninterruptible lighting system. 5,471,114, Cl. 315-86.000.
Edwards, Stuart D.; Lax, Ronald G.; Sharkey, Hugh R.; and Lundquist, Ingemar H., to Vidamed, Inc. Medical probe with biopsy stylet. 5,470,308, Cl. 604-22.000.
Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; and Sharkey, Hugh R., to Vidamed, Inc. Medical ablation apparatus utilizing a heated stylet. 5,470,309, Cl. 604-22.000.
Egigian, Donald S. Paint saver pad. 5,470,642, Cl. 428-192.000.
Eguchi, Koji: *See*—
Suzuki, Yasutoshi; Ao, Kenichi; Uenoyama, Hirofumi; Noguchi, Hiroki; Eguchi, Koji; Ito, Ichiro; and Yoshino, Yoshimi, 5,471,084, Cl. 257-421.000.
Eick, Edward C., to Brunswick Corporation. Marine drive shift shaft mounting system. 5,470,264, Cl. 440-83.000.
Eiden, Maribeth V.: *See*—
Miller, A. Dusty; Garcia-Martinez, Jose V.; Eiden, Maribeth V.; and Wilson, Carolyn A., 5,470,726, Cl. 435-172.300.
Eimori, Takahisa: *See*—
Satoh, Shinichi; Ozaki, Hiroji; and Eimori, Takahisa, 5,471,080, Cl. 257-344.000.
Einerhand, Robert E. F.; Lippits, Gerardus J. M.; Daams, Johannes L. C.; and Notten, Petrus H. L., to U.S. Philips Corporation. Electrochemical cell comprising a hydride-forming intermetallic compound. 5,470,675, Cl. 429-101.000.
Eisele, Raymund H.; and Barrett, Paul, to Smart-Diskette GmbH. Smart-diskette read/write device having fixed head. 5,471,038, Cl. 235-380.000.
Eisen, Norbert: *See*—
Grimm, Wolfgang; Eisen, Norbert; and Ruprecht, Hans-Dieter, 5,470,515, Cl. 264-45.700.
EKA Nobel, Inc.: *See*—
Gray, John M.; and Lovetro, David C., 5,470,480, Cl. 210-632.000.
Ektelon: *See*—
Colburn, Todd B.; and Lorentzen, John F., 5,470,061, Cl. 273-73.00C.
Elco Corporation: *See*—
Byczek, Roger W.; Hendrich, Randy; and Ashman, John J., 5,470,237, Cl. 439-76.100.
Elder, Todd: *See*—
Merianos, John J.; Elder, Todd; and Garelick, Paul, 5,470,875, Cl. 514-479.000.
Electronics and Telecommunications Research Institute: *See*—
Kim, Jin U.; Kim, Sun Y.; and Lee, Jeom D., 5,471,156, Cl. 326-60.000.
Elger, Walter: *See*—
Fahrenholz, Falk; Elger, Walter; Fähnrich, Marianne; and Chwalisz, Kryzsztof, 5,470,948, Cl. 530-315.000.
Elgert, Achim, to Deutsche Thomson-Brandt GmbH. Circuit for producing a dynamic focusing voltage in a television set. 5,471,121, Cl. 315-382.100.
Elgin Molded Plastics, Inc.: *See*—
Lindner, Henry, 5,470,170, Cl. 404-9.000.
Elhard, Joel D.: *See*—
Markle, Richard A.; Brusky, Phyllis L.; Cremeans, George E.; Elhard, Joel D.; Bigg, Donald M.; and Sowell, Sylvester, 5,470,945, Cl. 528-390.000.
Eli Lilly and Company: *See*—
Flaugh, Michael E.; and Martinelli, Michael J., 5,470,853, Cl. 514-232.800.
McCauley, Mary K.; Moder, Kenneth P.; and Speakman, Jeffrey L., 5,470,865, Cl. 514-365.000.
Melikian-Badalian, Anita; and Ornstein, Paul L., 5,470,978, Cl. 546-141.000.
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,470,977, Cl. 546-101.000.
Eliash, Bruce M.: *See*—
Ludwig, Frank A.; Townsend, Carl W.; and Eliash, Bruce M., 5,470,669, Cl. 429-17.000.
Ellard, Gregory S.: *See*—
Blaker, David M.; Ellard, Gregory S.; and Mobin, Mohammad S., 5,471,500, Cl. 375-340.000.
Ellefsen, Robert J. Hasp for a cylinder lock. 5,469,722, Cl. 70-56.000.
Eller, Mark: *See*—
Gilchrest, Barbara A.; Yaar, Mina; and Eller, Mark, 5,470,577, Cl. 424-450.000.
Ellis, Mark T.: *See*—
Stewart, Gregory N.; Overfield, Anthony L.; and Ellis, Mark T., 5,471,674, Cl. 395-650.000.
Ellison, Anthony W.: *See*—
Jennett, Timothy A.; Harnsworth, Patrick D.; Martin, Dave; and Ellison, Anthony W., 5,470,446, Cl. 204-177.000.
Ellison, Richard T., III: *See*—
Blaser, Martin J.; Ellison, Richard T., III; and Pei, Zhi H., 5,470,958, Cl. 530-389.500.
Elqadah, Wael S.; and Harris, Bradley D., to Morton International, Inc. Closure for air bag installation. 5,470,097, Cl. 280-728.300.
Elsag International N.V.: *See*—
Birangi, Tourang; and Nemer, Joseph C., 5,471,505, Cl. 375-238.000.
El Shami, A. Said; Hand, Christopher W.; Miller, Susan A.; and Moore, Robert A., to Diagnostic Products Corporation. Method and element for measuring analytes in biological fluids using immobilized binder-analyte labeled complex. 5,470,713, Cl. 435-7.720.
Elson, Charles E.: *See*—
Gould, Michael N.; Crowell, Pamela L.; Elson, Charles E.; and Ren, Zhibin, 5,470,877, Cl. 514-529.000.
Elting, James J.: *See*—
Ling, Robin S. M.; Mikhail, W. E. Michael; Elting, James J.; Gie, Graham A.; Slooff, Tom J. J. H.; and Vanderlinden, Jacques J., 5,470,336, Cl. 606-105.000.
Eltoukhy, Atef H.: *See*—
Mahvan, Nader; Eltoukhy, Atef H.; and Teng, Edward F., 5,470,447, Cl. 204-192.160.
Emaux de Briare Technologies, S.A.: *See*—
Lucas, Jacques, 5,470,623, Cl. 428-47.000.
Emberty, Robert G.; Misewich, Felix J.; and Pawlowski, Edward J., to International Business Machines Corporation. Apparatus and method for sensing and holding an item. 5,471,445, Cl. 369-34.000.
Embo, Georges; Debrouwere, Tohn; and Moyaert, Werner, to Siemens Aktiengesellschaft. Press-in spring contact connector. 5,470,261, Cl. 439-752.000.
EMCO Wheaton, Inc.: *See*—
Weeks, F. Bruce; and Johnson, John L., 5,469,900, Cl. 141-392.000.
Emerson Electric Co.: *See*—
Paterek, F. Dieter; and Teaford, Richard L., 5,471,015, Cl. 174-152.0GM.
Emerson, Victor F.: *See*—
Vexler, Manuel; and Emerson, Victor F., 5,471,650, Cl. 455-69.000.
Emrich, Robert K.: *See*—
Jones, Larren F.; Emrich, Robert K.; and Bingham, Ian R., 5,469,648, Cl. 37-457.000.
EMS Development Corporation: *See*—
Zadoff, Leon N., 5,471,139, Cl. 324-244.100.
Endo, Masao: *See*—
Nishii, Masanobu; Shimizu, Yuichi; Kawanishi, Shunichi; Sugimoto, Shunichi; Endo, Masao; and Nagase, Tomohiro, 5,470,617, Cl. 427-521.000.
Energy Reduction International Ltd.: *See*—
Vaughan, Mark C. V.; and Vaughan, Simon P., 5,471,127, Cl. 318-809.000.
Engdahl, Jonathan R.; Lucak, Mark A.; Gee, David J.; and Kucharski, Paul, to Allen-Bradley Company, Inc. Digital communication network with a moderator station election process. 5,471,461, Cl. 370-17.000.
Engel, Jeff A.: *See*—
Byers, Larry L.; Mackenthun, Donald W.; Fye, Philip J.; Maciona, Gerald J.; Engel, Jeff A.; Price, Ferris T., deceased; and Seppa, Dale K., 5,471,482, Cl. 371-21.200.
Ennis, Mark R.: *See*—
Gorsuch, Ian; Ennis, Mark R.; and Burgess, Robert M., 5,470,362, Cl. 51-295.000.
Ennis, Thomas A., to AlliedSignal Inc. Driver side air bag module. 5,470,101, Cl. 280-728.200.
Enoki, Nobuyuki; Miyazaki, Masaya; and Morita, Mitsuaki, to Matsushita Electric Industrial Co., Ltd. Apparatus and method for suspending and resuming software applications on a computer. 5,471,624, Cl. 395-750.000.
Ensor, James R.: *See*—
Ahuja, Sudhir R.; Aravamudan, Murali; and Ensor, James R., 5,471,318, Cl. 358-400.000.
Enteric Research Laboratories Inc.: *See*—
Blaser, Martin J.; Ellison, Richard T., III; and Pei, Zhi H., 5,470,958, Cl. 530-389.500.
Envirco Corporation: *See*—
Leader, William J.; and Smith, Dennis K., 5,470,363, Cl. 55-276.000.
Envirex, Inc.: *See*—
Boyle, William H., 5,470,475, Cl. 210-519.000.
Environmental Projects, Inc.: *See*—
Schmidt, Roland; and Denham, Dale L., Jr., 5,470,554, Cl. 423-206.200.
Enyedy, Arthur G.: *See*—
Yokote, Timothy A.; Upton, Eric L.; Enyedy, Arthur G.; Stockton, Grant J.; and Brandis, Dirk K., 5,471,603, Cl. 395-402.000.
Erber, Sebastian: *See*—
von Angerer, Erwin; Erber, Sebastian; and Schneider, Martin, 5,470,854, Cl. 514-233.500.
Erceg, Frank M.: *See*—
Chiu, Tzu-Yin; Erceg, Frank M.; Liu, Te-Yin M.; Moerschel, Kenneth G.; Prozonic, Michael A.; and Sung, Janmye, 5,470,783, Cl. 437-72.000.
Ericsson, Lars P.; and Nilstam, Bo, to VOAC Hydraulics Boras AB. Device for controlling a hydraulic motor. 5,469,703, Cl. 60-399.000.
Ernst, Gregory R. Rail structure for canopy installation on a truck box. 5,470,124, Cl. 296-100.000.

Ernst Winter & Sohn (GmbH & Co.): *See—*
Mertens, Udo, 5,470,273, Cl. 451-548.000.
Esco Corporation: *See—*
Jones, Larren F.; Emrich, Robert K.; and Bingham, Ian R., 5,469,648, Cl. 37-457.000.
Eskridge, Mark H.: *See—*
Kiehn, Arthur J.; and Eskridge, Mark H., 5,470,504, Cl. 252-49.600.
Esser, Ronald E.: *See—*
Borcherding, David R.; Edwards, Carl K., III; Esser, Ronald E.; and Cole, Douglas L., 5,470,857, Cl. 514-258.000.
Etablissements Mesnel: *See—*
Le Marrec, Robert, 5,469,667, Cl. 49-477.100.
Estee Lauder Inc.: *See—*
Chilton, John B.; Gevaras, Peter H.; Herb, Paul C.; and Weilen, Thomas W., 5,469,971, Cl. 209-235.000.
Estergreen, Steve: *See—*
Sjogren, Axel; Carson, Gary; Estergreen, Steve; Taga, Timothy; and Stewart, Rodger, 5,470,531, Cl. 422-46.000.
Etablissement Supervis: *See—*
Müntener, Herbert; and Walser, Michael, 5,470,107, Cl. 280-777.000.
Etablissements Caillau: *See—*
Calmettes, Lionel; Detable, Pascal; and Andre, Michel, 5,469,604, Cl. 24-20.0CW.
Ethicon, Inc.: *See—*
Bezwada, Rao S.; Shalaby, Shalaby W.; and Koelmel, Donald F., 5,470,340, Cl. 606-231.000.
Demarest, David; Duncan, Robert B.; Sobel, Martin; Lenihan, Timothy P.; and Rattan, William, 5,469,689, Cl. 53-430.000.
Rothfuss, Robert G.; Okorocha, Lǔvyn O.; Bishop, Gregory D.; Sambi, Narinderjit S.; Bedi, James J.; Privitera, Salvatore; and Sherrill, Michael, 5,470,010, Cl. 227-177.000.
ETI Systems: *See—*
Tice, Bill, 5,471,123, Cl. 318-373.000.
Eubanks Engineering Company: *See—*
Hoffa, Jack L., 5,469,763, Cl. 81-9.510.
European Gas Turbines SA: *See—*
Gandia, Liberto; and Rouget, Frédéric, 5,469,894, Cl. 138-172.000.
Evans, Jon F.: *See—*
Knapp, Herbert C.; Parker, Vance A.; Baxter, Larry K.; and Evans, Jon F., 5,471,043, Cl. 235-472.000.
Evans, Lynn S.: *See—*
Tayler, Peter N.; and Evans, Lynn S., 5,470,869, Cl. 514-406.000.
Even-Sturlesi, Doron; and Oron, Micha, to State of Israel Ministry of Defense, Armament Development Authority Rafael. Matrix imaging method and system using a matrix detector with a plurality of sequentially illuminated detector elements for measuring radiation of separate portions of a scene being viewed. 5,471,047, Cl. 250-208.100.
Every, Peter; Sivulka, Gerald; and Fuller, Edward M., to Kelsey-Hayes. Copy valve for an anti-lock brake system. 5,470,137, Cl. 303-188.000.
Exergen Corporation: *See—*
Pompei, Francesco; Ternullo, Janus; and Malecki, William W., 5,469,855, Cl. 128-664.000.
Exploweld AB: *See—*
Persson, Ingemar, 5,470,013, Cl. 228-108.000.
Exxon Chemical Patents Inc.: *See—*
Jejelowo, Moses O.; and Bamberger, Robert L., 5,470,811, Cl. 502-117.000.
Schlosberg, Richard H.; Duncan, Carolyn B.; and Krevalis, Martin A., Jr., 5,470,497, Cl. 252-68.000.
Turner, Howard W.; Hlatky, Gregory G.; and Eckman, Richard R., 5,470,927, Cl. 526-126.000.
Wadsworth, Larry C.; and Khan, Ahamad Y., 5,470,663, Cl. 428-421.000.
Williams, Dennis A.; Looney, James R.; Conway, Michael W.; and Swenson, Robert A., 5,470,823, Cl. 507-241.000.
Exxon Research & Engineering Co.: *See—*
Gaughan, Roger G., 5,470,358, Cl. 44-426.000.
Ezell, Edward F.: *See—*
Nishizawa, Juinchi; Kijima, Takahiko; Ezell, Edward F.; and Makihara, Akira, 5,470,154, Cl. 374-141.000.
Fähnrich, Marianne: *See—*
Fahrenholz, Falk; Elger, Walter; Fähnrich, Marianne; and Chwalisz, Kryzsztof, 5,470,948, Cl. 530-315.000.
Fahrenholz, Falk; Elger, Walter; Fähnrich, Marianne; and Chwalisz, Kryzsztof, to Schering Aktiengesellschaft. Vasopressin and vasotocin derivatives. 5,470,948, Cl. 530-315.000.
Faibish, Sorin; Shamay, Ezra; and Shteckelman, Shalom, to State of Israel Ministry of Defense, Armament Developmental Authority, Rafael. Collision avoidance and warning system. 5,471,214, Cl. 342-70.000.
Fairbank, Donn K.: *See—*
Schneider, Karl F.; Dembosky, Stanley K.; Fairbank, Donn K.; Spokas, Romas B.; and Keeney, Bradley L., 5,470,285, Cl. 475-210.000.
Fairchild Industrial Products Company: *See—*
Askew, Andy R., 5,469,877, Cl. 137-85.000.
Fajnsztajn, Aleksander. Mount for use with a postal sorting tray. 5,469,975, Cl. 211-10.000.
Falkner, Raimund, to Agria-Werke GmbH. Crushing apparatus for waste material. 5,470,023, Cl. 241-85.000.
Fallah, Michel: *See—*
Gloton, Jean-Pierre; Laroche, Damien; Turin, Joël; and Fallah, Michel, 5,470,411, Cl. 156-64.000.
Fallahi, Amir: *See—*
Koppolu, Prasad M.; Fallahi, Amir; and Chinniah, Jeyachandrabose, 5,471,371, Cl. 362-32.000.
Faller, Frederick W.: *See—*
Fincke, Randall W.; Lopin, Michael L.; and Faller, Frederick W., 5,470,343, Cl. 607-5.000.
Fan, Changming, to General Motors Corporation. Reaction carrier assembly having zero relative pin deflection. 5,470,286, Cl. 475-331.000.
Fanuc Ltd.: *See—*
Kono, Shinichi; and Fukukura, Masaaki, 5,471,126, Cl. 318-807.000.
Matsumura, Teruyuki; and Nakajima, Masatoshi, 5,471,394, Cl. 364-474.260.
Watanabe, Atsushi; Terawaki, Fumikazu; and Warashina, Fumikazu, 5,471,312, Cl. 358-296.000.
Farbman, Jon. Marching shoes. 5,469,642, Cl. 36-103.000.
Fardy, Paul. Bicycle frame. 5,470,092, Cl. 280-288.000.
Farkas, Maryanne R.: *See—*
TenBrink, Jay T.; Farkas, Maryanne R.; Vendt, Robert J.; and Brock, Waine T., 5,469,662, Cl. 49-352.000.
TenBrink, Jay T.; and Farkas, Maryanne R., 5,469,663, Cl. 49-375.000.
Farley, Gary L., to United States of America, National Aeronautics and Space Administration. Composite with through the thickness reinforcement. 5,470,649, Cl. 428-303.000.
Farmitalia Carlo Erba S.r.l.: *See—*
Donno, Luigi; and Cassinelli, Giuseppe, 5,470,836, Cl. 514-38.000.
Farnsworth, Albert M., to Farnsworth Family Trust. Parts washer. 5,470,477, Cl. 210-634.000.
Farnsworth Family Trust: *See—*
Farnsworth, Albert M., 5,470,477, Cl. 210-634.000.
Farrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., to Compaq Computer Corporation. Computer management system and associated management information base. 5,471,617, Cl. 395-700.000.
Fasano, Alessio: *See—*
Kaper, James B.; Baudry-Maurelli, Bernadette; and Fasano, Alessio, 5,470,729, Cl. 435-172.300.
Fasteners for Retail, Inc.: *See—*
Kump, Daniel J., 5,470,138, Cl. 312-34.400.
Fei, Xin: *See—*
Wong, Kai W.; Fei, Xin; Xin, Ying; and Kao, Yi-Han, 5,470,821, Cl. 505-236.000.
Feiten, Wendelin, to Siemens Aktiengesellschaft. Flexible robot arm. 5,469,756, Cl. 74-490.050.
Felder, Anton; and Valentin, Franz. Method and inlet device for charging shallow grit chambers or settling tanks. 5,470,489, Cl. 210-788.000.
Felix, Kenneth A., to Motorola. Method of allocating channels in multi-rate channel environment. 5,471,645, Cl. 455-34.200.
Fem-Aero: *See—*
Gallo, Jean-Pierre, 5,469,803, Cl. 114-315.000.
Fendall Company: *See—*
Demeny, Rodney L., 5,469,587, Cl. 4-599.000.
Feng, Dong-Mei: *See—*
Folkers, Karl A.; Ljungqvist, Anders; Feng, Dong-Mei; Kubota, Minoru; Tang, Pui-Fun L.; and Bowers, Cyril Y., 5,470,947, Cl. 530-313.000.
Feng, Henry. Extension unit for sun visor. 5,470,122, Cl. 296-97.600.
Fenkl, Karl: *See—*
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Grosser, Martin; Schneider, Peter; Barth, Wolfgang; Moll, Hermann; and Pollmann, Horst, 5,469,938, Cl. 187-408.000.
Ferguson, Daniel J.: *See—*
DiPaolo, Nunzio; and Ferguson, Daniel J., 5,471,033, Cl. 219-388.000.
Ferguson, F. Mark: *See—*
Weiss, Robert B.; Kimball, Alvin W.; Gesteland, Raymond F.; Ferguson, F. Mark; Dunn, Diane M.; Di Sera, Leonard J.; and Cherry, Joshua L., 5,470,710, Cl. 435-6.000.
Ferguson, Ian: *See—*
Anthony, Vivienne M.; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Ferguson, Ian; Crowley, Patrick J.; and Hutchings, Michael G., 5,470,819, Cl. 504-244.000.
Ferguson, Kevin R.: *See—*
French, Barry J.; Ferguson, Kevin R.; McDonald, Halley A., III; Glass, Andrew B.; Mohansingh, Timothy; and Borges, Gregory, 5,469,740, Cl. 73-379.040.
Fernando, Roshan, to Intel Corporation. Fractional speed bus coupling. 5,471,587, Cl. 395-309.000.
Ferrero, Ferruccio, to Ferrero Giulio, S.p.A. Adjustable vehicle seat. 5,470,129, Cl. 297-330.000.
Ferrero Giulio, S.p.A.: *See—*
Ferrero, Ferruccio, 5,470,129, Cl. 297-330.000.
Ferromatik Milacron Maschinenbau GmbH: *See—*
Steger, Reinhard, 5,470,592, Cl. 425-3.000.
Fertin Laboratories A/S (Dansk Tyggegummi Fabrik A/S): *See—*
Lützen, Claude E., 5,470,566, Cl. 424-54.000.
Festo KG: *See—*
Stoll, Kurt; Waldmann, Dieter; and Feyrer, Thomas, 5,469,775, Cl. 92-88.000.
Fey, Peter: *See—*
Angerbauer, Rolf; Fey, Peter; Hübsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, 5,470,982, Cl. 546-268.000.
Feyrer, Thomas: *See—*

Stoll, Kurt; Waldmann, Dieter; and Feyrer, Thomas, 5,469,775, Cl. 91-68.000.

Fiberweb North America, Inc.: *See*—
Gessner, Scott L.; Newkirk, David D.; Thomason, Michael M.; and Reeder, James O., 5,470,639, Cl. 428-152.000.

Fichr GmbH: *See*—
Heimberg, Wolfgang; Hellmich, Wolfram; Kogl, Franz; and Malatinszky, Paul, 5,469,828, Cl. 123-497.000.

Fichtel & Sachs AG: *See*—
Steuer, Werner; and Bergles, Eduard, 5,469,755, Cl. 74-371.000.

Fietz, Ralf-Peter; and Knoop, Franz, to Siemens Nixdorf Informationssysteme Aktiengesellschaft. Supporting device for a machine. 5,470,042, Cl. 248-678.000.

Figlioli, Danny W.: *See*—
Staser, Brian H.; Figlioli, Danny W.; and Manuel, Mark, 5,469,664, Cl. 49-452.000.

Filippini, Lucio: *See*—
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Meazza, Giovanni; Zanardi, Giampaolo; Garavaglia, Carlo; and Mirenna, Luigi, 5,470,863, Cl. 514-343.000.

Filmer, Bartholomeus, to U.S. Philips Corporation. Glass composition suitable for use in electric lamps, stem manufactured from this glass composition and fluorescent lamp having a lamp envelope of this glass composition. 5,470,805, Cl. 501-55.000.

Fin, Enrico: *See*—
Gier, Achim R.; Bonduel, Pascal; Heckel, Robert J.; and Fin, Enrico, 5,469,656, Cl. 49-28.000.

Fina Research, S.A.: *See*—
Debras, Guy L. G.; De Clippeleir, Georges E. M. J.; and Cahen, Raymond M., 5,470,456, Cl. 208-244.000.

Fincke, Randall W.; Lopin, Michael L.; and Faller, Frederick W., to ZMD Corporation. Detachable power supply for supplying external power to a portable defibrillator. 5,470,343, Cl. 607-5.000.

Fine, David H.: *See*—
Rounbehler, David P.; Fine, David H.; Achter, Eugene K.; MacDonald, Stephen J.; and Dennison, Daniel B., 5,470,754, Cl. 436-106.000.

Finkelstein, Burl; and Thorsen, Thomas A., to Kason Industries, Inc. Sliding door foot treadle. 5,469,661, Cl. 49-276.000.

Finocchiaro, Eugene T.: *See*—
Mallee, Francis M.; and Finocchiaro, Eugene T., 5,470,391, Cl. 127-38.000.

Finna Carl Freudenberg: *See*—
Morweiser, Karl-Heinz; Veeser, Klaus; and Stini, Harald, 5,470,485, Cl. 210-748.000.

Fischer, Wolfgang: *See*—
Meixner, Jürgen; Fischer, Wolfgang; and Müller, Manfred, 5,470,897, Cl. 523-518.000.

Fishback, Thomas L.; and Lee, Thomas B., to BASF Corporation. Processability of hydrocarbon blown, polyisocyanate based foams through use of a compatibilizing agent. 5,470,501, Cl. 252-182.280.

Fishbein, Bruce J.; and Doyle, Brian S., to Digital Equipment Corporation. Semiconductor device with reduced time-dependent dielectric failures. 5,471,081, Cl. 257-356.000.

Fisher & Paykel Limited: *See*—
Sargeant, Adrian A.; Currie, William H.; Ouwens, Willem; Brace, Philip J.; Todd, Robert W.; and Scholz, Hans-Joachim, 5,470,142, Cl. 312-258.000.

Fisher, Dale P. Adjustable golf club putter. 5,470,063, Cl. 273-80.100.

Fisher, Larry M. Awning flash strip. 5,469,672, Cl. 52-74.000.

Fiskars Inc.: *See*—
Melter, Craig H.; and Schofield, Robert T., 5,469,625, Cl. 30-251.000.

Fisons PLC: *See*—
Freedman, Philip A.; and Hall, Edward F. H., 5,471,059, Cl. 250-299.000.

Fladung, Philip E., to Woods Industries, Inc. Light-permeable extension cord connector. 5,470,252, Cl. 439-490.000.

Flagello, Donis G.: *See*—
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Dossy, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.

Flagg, Robert C.: *See*—
Dennis, Stephen V.; Shaiman, Steve; McCormick, William B.; Flagg, Robert C.; and Schuster, Paul A., 5,471,563, Cl. 395-114.000.
Dennis, Stephen V.; Fluegel, Steven J.; Gerlach, Brett C.; and Flagg, Robert C., 5,471,564, Cl. 395-114.000.

Flaherty, William P.: *See*—
Kelso, Thomas M.; Kotch, John K.; Boyle, Damon J.; Meiser, David H.; Flaherty, William P.; and Baird, Bernard W., 5,470,232, Cl. 434-45.000.

Flaim, Stephen F.: *See*—
Fuhrman, Bradley P.; Flaim, Stephen F.; Hernan, Lynn J.; Nesti, Frances D.; Papo, Michele C.; and Steinhorn, David M., 5,470,885, Cl. 514-743.000.

Flammer, George H., III; and Galloway, Brett D., to Metricon, Inc. Method of resolving media contention in radio communication links. 5,471,469, Cl. 370-94.100.

Flaugh, Michael E.; and Martinelli, Michael J., to Eli Lilly and Company. 6-substituted-hexahydrobenz [CD] indoles. 5,470,853, Cl. 514-232.800.

Fleischer, Bruce M.: *See*—
Chappell, Barbara A.; Chappell, Terry I.; Fleischer, Bruce M.; and Schuster, Stanley E., 5,471,188, Cl. 340-146.200.

Fleming, James C.; Lange, Gerald R.; and Preuss, Donald R., to Eastman Kodak Company. Optical recording layers containing sulfur. 5,470,626, Cl. 428-64.800.

Fletcher, Nicholas J.; Lamont, Gordon J.; Basura, Vesna; Voss, Henry H.; and Wilkinson, David P., to Ballard Power Systems Inc. Electrochemical fuel cell employing ambient air as the oxidant and coolant. 5,470,671, Cl. 429-26.000.

Flinchbaugh, Bruce E.: *See*—
Markandey, Vishal; and Flinchbaugh, Bruce E., 5,471,544, Cl. 382-264.000.

Florentin, Thierry: *See*—
Vadin-Michaud, Gilles; and Florentin, Thierry, 5,469,753, Cl. 74-7.00A.

Florida State University: *See*—
Schwartz, Martin A.; and Van Wart, Harold, 5,470,834, Cl. 514-19.000.

Floyd, F. Louis: *See*—
Craun, Gary P.; Rosekelly, George S.; and Floyd, F. Louis, 5,470,906, Cl. 524-507.000.

Floyd, Thomas R.: *See*—
Rivera, David F.; Floyd, Thomas R.; and Josypenko, Michael J., 5,471,182, Cl. 333-252.000.

Fluegel, Steven J.: *See*—
Dennis, Stephen V.; Fluegel, Steven J.; Gerlach, Brett C.; and Flagg, Robert C., 5,471,564, Cl. 395-114.000.

Flum, Alan; Zampini, Michael A.; and Fujita, Masahiro, to Sony Electronics Inc. Edit select switch for monitor source select. 5,471,539, Cl. 351-119.000.

Flynn, Stephen. CPR face mask. 5,469,842, Cl. 128-203.110.

FMC Corporation: *See*—
Manganaro, James L.; Sacks, Martin E.; and Carmichael, James, 5,470,564, Cl. 423-521.000.

Fodor, Ludovic; Weatherill, Timothy D.; and Weberg, Rolf T., to Du Pont de Nemours, E. I., and Company. Imidazolium hardeners for hydrophilic colloid. 5,470,986, Cl. 548-312.700.

Fodor, Michael G.: *See*—
Hrovat, Davorin; Asgari, Jahanbakhsh; and Fodor, Michael G., 5,471,386, Cl. 364-426.020.

Foged, Christian; Holweg, Rolf; and Nielsen, Erik, to Novo Nordisk A/S. 2,3,4,5-tetrahydro-1H-3-benzazepines. 5,470,850, Cl. 514-213.000.

Foitzik, Willi: *See*—
Gruning, Burghard; Foitzik, Willi; Weitemeyer, Christian; and Kaseborn, Hans-Dieter, 5,470,992, Cl. 554-69.000.

Fold-A-Shield: *See*—
McKinney, Roy L.; and Wien, Abraham, 5,469,905, Cl. 160-35.000.

Foley, Henry C.; Sonnichsen, George C.; Brake, Loren D.; Mariwala, Ravindra K.; and Lafyatis, David S., to University of Delaware; and Du Pont de Nemours, E. I., and Company. $CMS/SiO_2/Al_2O_3$ catalysts for improved selectivity in the synthesis of amines from methanol and/or dimethyl ether and ammonia. 5,470,814, Cl. 502-182.000.

Folkers, Karl A.; Ljungqvist, Anders; Feng, Dong-Mei; Kubota, Minoru; Tang, Pui-Fun L.; and Bowers, Cyril Y., to Board of Regents, The University of Texas System; and Tulane Educational Fund, The Administrators of the. CHRH antagonists with low histamine release. 5,470,947, Cl. 530-313.000.

Folsom, Marc D.: *See*—
Szigethy, Attila; Jenkins, Brian C.; and Folsom, Marc D., 5,470,098, Cl. 280-728.200.

Fontenla, Juan M., to Garci, Inc. Electronic system for controlling timing signals in an internal combustion engine. 5,469,824, Cl. 123-416.000.

Foote, James B.; Kaake, Steven A. F.; Meyers, Peter V.; and Nolan, James F., to Solar Cells, Inc. Process for making photovoltaic devices and resultant product. 5,470,397, Cl. 136-260.000.

Ford Motor Company: *See*—
Hrovat, Davorin; Asgari, Jahanbakhsh; and Fodor, Michael G., 5,471,386, Cl. 364-426.020.
Koppolu, Prasad M.; Fallahi, Amir; and Chinnish, Jeyachandrabose, 5,471,371, Cl. 362-32.000.
Mastrangelo, Carlos H., 5,470,797, Cl. 437-225.000.
Palansky, Bruce J.; Greene, Thomas L.; and Schock, Eileen A., 5,470,288, Cl. 477-110.000.
Rao, V. Durga N.; and Clarke, James R., 5,469,777, Cl. 92-223.000.

Ford New Holland, Inc.: *See*—
Berger, John G.; and Ashcroft, Dale A., 5,469,819, Cl. 123-179.600.

Forrest, William E., to Mountain Safety Research. Snowshoe. 5,469,643, Cl. 36-122.000.

Forrester, Michael D.: *See*—
Brewster, Wilfred G.; and Forrester, Michael D., 5,470,077, Cl. 273-245.000.

Forschungszentrum Julich GmbH: *See*—
Naoumidis, Aristides, 5,470,672, Cl. 429-40.000.

Förster, Harald; Asskali, Fatima; and Nitsch, Ernst, to Laevosan-Gesellschaft mbH. Metabolizable plasma substitute. 5,470,841, Cl. 514-60.000.

Forster, Michel Ch.; Guillemin, François H.; and Lignon, Dominique H., to Forster, Michel Ch. Device for attaching a flexible tube to a patient's skin. 5,470,321, Cl. 604-174.000.

Fortin, Michel; Prechet, Daniel; Hamon, Gilles; Jouquey, Simone; and Vevert, Jean-Paul, to Roussel-Uclaf. Imidazoles and their salts having anthgonistic activity to angiotesin II recetors. 5,470,867, Cl. 514-393.000.

Possum, Eric R.; Mendis, Sunetra; and Kemeny, Sabrina E., to California Institute of Technology. Active pixel sensor with intra-pixel charge transfer. 5,471,515, Cl. 377-60.000.

Foster Wheeler Development Corporation: *See*—
Daman, Ernest L., 5,469,699, Cl. 60-39.020.

Foster Wheeler USA Corporation: *See*—
Garcia-Mallol, Juan A., 5,469,698, Cl. 60-39.020.

Fouache, Catherine: *See*—
Ribadeau-Dumas, Guillaume; Fouache, Catherine; and Serpelloni, Michel, 5,470,591, Cl. 426-3.000.

Fouquet, Christophe J. A.: *See*—
Briese, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Fouquet, Christophe J. A.; and Lowe, Coy S., 5,471,137, Cl. 324-158.100.

Fowler, Malcolm M.: *See*—
Gritzo, Russ E.; and Fowler, Malcolm M., 5,471,062, Cl. 250-368.000.

Fraire, Cristina; Bani, Massimo; Vanotti, Ermes; and Olgiati, Vincenzo, to Pierrel SpA. Derivatives of (hetero)aromatic ethers and thioethers having antihyperlipidemic activity, process for their preparation and pharmaceutical compositions containing them. 5,470,858, Cl. 514-261.000.

Framatome: *See*—
Boula, Gérard, 5,471,030, Cl. 219-121.130.
Lhenry, Bernard, 5,470,547, Cl. 422-295.000.

France Telecom: *See*—
Dosiere, Frédéric; Boutes, Jean-Pierre; and Maral, Gérard, 5,471,641, Cl. 455-13.100.

Frank, Kurt: *See*—
Kleppner, Stephan; Frank, Kurt; and Mutschler, Jan, 5,469,829, Cl. 123-514.000.

Frank, Robert G.; and Schwartz, James H., to PPG Industries, Inc. Method and apparatus for processing a glass sheet. 5,470,366, Cl. 65-104.000.

Franklin, James W. Concrete building frame construction method. 5,469,684, Cl. 52-745.130.

Franklin, Michael J. Self-locking hand tools. 5,469,765, Cl. 81-324.000.

Franseen, Steve A.; and Peterson, Jeffrey A., to RMO, Inc. Edgewise orthodontic bracket. 5,470,228, Cl. 433-8.000.

Frantz, Robert H.: *See*—
Kaufman, John W.; Frantz, Robert H.; and Root, John A., 5,470,241, Cl. 439-159.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft: *See*—
Theurer, Josef; and Wörgötter, Herbert, 5,469,791, Cl. 104-5.000.

Franz, Walter K.: *See*—
Setterstrom, Jean A.; Jacob, Elliot; and Franz, Walter K., 5,470,311, Cl. 604-24.000.

Frasher, Troy A.: *See*—
Potes, Michael M.; Lambarth, Edwin H.; Frasher, Troy A.; Edelstein, Beth E.; Kelley, Lowell D.; and Lewis, Cynthia J., 5,470,220, Cl. 425-216.000.

Fraunhofer-Gesellschaft Zur Foederung der angewandten Porschung e.V.: *See*—
Goedicke, Klaus; Metzner, Christoph; Schmidt, Joerg; Heisig, Ullrich; Schiller, Siegfried; and Reschke, Jonathan, 5,470,388, Cl. 118-716.000.

Frechet, Daniel: *See*—
Fortin, Michel; Frechet, Daniel; Hamon, Gilles; Jouquey, Simone; and Vevert, Jean-Paul, 5,470,867, Cl. 514-393.000.

Fred Hutchinson Cancer Research Center: *See*—
Greenberg, Phillip D.; and Overell, Robert W., 5,470,730, Cl. 435-172.300.
Miller, A. Dusty; Garcia-Martinez, Jose V.; Eiden, Maribeth V.; and Wilson, Carolyn A., 5,470,726, Cl. 435-172.300.

Frederick Cowan & Company, Inc.: *See*—
Gowan, Thomas L., 5,471,362, Cl. 361-257.000.

Fredj, Abdennaceur; Johnston, James P.; and Thoen, Christiaan A. J., to Procter & Gamble Co., The. Dye transfer inhibiting compositions comprising polymeric dispersing agents. 5,470,507, Cl. 252-542.000.

Freeburg, Thomas A.; Burke, Dennis E.; and Odlyzko, Paul, to Motorola, Inc. Signal communication method and apparatus. 5,471,471, Cl. 370-79.000.

Freedman, Philip A.; and Hall, Edward F. H., to Fisons PLC. Multiple-detector system for detecing charged particles. 5,471,059, Cl. 250-299.000.

Prelinger, Andrew L., III; Plow, Edward F.; and Ginsberg, Mark H., to Scripps Research Institute, The. Antibodies that bind to a ligand-induced binding site on GPIIIa. 5,470,738, Cl. 435-240.270.

French, Barry J.; Ferguson, Kevin R.; McDonald, Halley A., III; Glass, Andrew B.; Mohansingh, Timothy; and Borges, Gregory, to Impulse Technology, Inc. Interactive video testing and training system. 5,469,740, Cl. 73-379.040.

Frentzel, Herman E.: *See*—
Rief, Dieter J.; and Frentzel, Herman E., 5,469,596, Cl. 15-1.700.

Frick, Karl: *See*—
Schwartz, Gregory L.; and Frick, Karl, 5,471,006, Cl. 84-609.000.

Friedheim, Max. Superheated vapor generator and control system and method. 5,471,556, Cl. 392-399.000.

Friedrich, Wolfgang: *See*—
Brandenstein, Manfred; Friedrich, Wolfgang; Haas, Roland; Herrmann, Gerhard; and Olschewski, Armin, 5,470,279, Cl. 474-135.000.

Frinerman, Yafim: *See*—
Tsoglin, Alexander; and Frinerman, Yafim, 5,469,859, Cl. 128-723.000.

Fritschi, Rainer: *See*—
Junginger, Bernhard; Fritschi, Rainer; and Krimmel, Heinz, 5,471,342, Cl. 359-341.000.

Fritz, Philip F.: *See*—
Wright, Glenn A.; Fritz, Philip F.; and Nguyen, Tuan Q., 5,470,022, Cl. 241-33.000.

Fritz, Thomas A.: *See*—
Unger, Evan C.; Fritz, Thomas A.; Matsunaga, Terry; Ramaswami, VaradaRajan; Yellowhair, David; and Wu, Guanli, 5,469,854, Cl. 128-661.020.

Froschermeier, Guenther: *See*—
Sharpe, Claude A.; Hurta, Dwaine S.; Hamlett, Mark A.; and Froschermeier, Guenther, 5,471,212, Cl. 342-51.000.

Fruchterman, James R.; Schwegler, William C.; Merritt, Bruce W.; and LaPierre, Charles, to Arkenstone, Inc. System and method for tracking a pedestrian. 5,470,233, Cl. 434-112.000.

Fry, Eugene L.: *See*—
Fry, Gene, 5,469,783, Cl. 100-49.000.

Fry, Gene, to Fry, Eugene L. Collector for empty used recyclable beverage cans. 5,469,783, Cl. 100-49.000.

Fu, Cheng-Tsu: *See*—
Lai, Chung-Ping; Fu, Cheng-Tsu; Duann, Jia-Ruey; Li, Ai-Kang; and Ko, Kai-Li, 5,470,807, Cl. 501-93.000.

Fuchigami, Masahiro, to Texas Instruments Incorporated. Burn-in socket apparatus. 5,470,247, Cl. 439-264.000.

Fuchs, Karl-Heinz: *See*—
Graf, Lothar; and Fuchs, Karl-Heinz, 5,469,989, Cl. 222-82.000.

Fudaki, Tsutomu, to Yoshida Kogyo K.K. Method of molding a separable bottom stop assembly on a concealed slide fastener. 5,470,516, Cl. 264-135.000.

Fuhrman, Bradley P.; Flaim, Stephen F.; Herman, Lynn J.; Nesti, Frances D.; Papo, Michele C.; and Steinhorn, David M., to State University of New York, The Research Foundation of the. Fluorocarbons as anti-inflammatory agents. 5,470,885, Cl. 514-743.000.

Fuji Electric Co., Ltd.: *See*—
Ishikawa, Minoru; and Ishikawa, Kimitada, 5,471,360, Cl. 361-154.000.

Fuji Photo Film Co., Ltd.: *See*—
Masuda, Akira, 5,471,275, Cl. 354-321.000.
Shibata, Tadayoshi; and Oi, Nakao, 5,471,265, Cl. 354-76.000.

Fuji Photo Optical Co., Ltd.: *See*—
Yoneda, Masami; and Akaogi, Toshikazu, 5,471,305, Cl. 356-363.000.

Fuji Xerox Co., Ltd.: *See*—
Ashiya, Seiji; Suzuki, Takahiro; and Murase, Masanori, 5,470,682, Cl. 430-84.000.
Ito, Masao, 5,471,236, Cl. 347-233.000.
Okamoto, Toru; and Maruyama, Kazuo, 5,471,233, Cl. 347-103.000.

Fujii, Haruo; Kobayashi, Tatsuya; Imai, Nobuhiro; Kojima, Hisayoshi; Umezawa, Masao; Tada, Hideki; Ito, Akira; Seto, Kaoru; Katoh, Motoi; and Murata, Daisuke, to Canon Kabushiki Kaisha. Image forming apparatus having toner depletion detection feature. 5,471,284, Cl. 355-210.000.

Fujii, Masahiro, to NEC Corporation. Motor for providing a vibrating action for a radio pager. 5,471,103, Cl. 310-81.000.

Fujii, Seiichi: *See*—
Katayama, Yoshio; Fujii, Seiichi; Uchiyama, Sadao; Soejima, Ryouichi; Moori, Hitoshi; and Yoshida, Hideo, 5,471,439, Cl. 369-13.000.

Fujii, Tetsuo; Sakai, Minekazu; and Kuroyanagi, Akira, to Nippondenso Co., Ltd. Method of manufacturing a floating gate memory device. 5,470,771, Cl. 437-43.000.

Fujii, Yasuhiro: *See*—
Yumitori, Fuminori; and Fujii, Yasuhiro, 5,471,425, Cl. 365-190.000.

Fujiki, Keiichi: *See*—
Makino, Tetsuo; Fujiki, Keiichi; and Tajima, Toshimi, 5,470,439, Cl. 162-216.000.

Fujikura Ltd.: *See*—
Anzai, Hidenobu; Gotoh, Moritaka; and Hisada, Youichi, 5,469,947, Cl. 192-21.500.
Kaizu, Masahiro; and Horii, Atsuhiro, 5,471,023, Cl. 200-310.000.

Fujimaga, Masato, to Mitsubishi Denki Kabushiki Kaisha. Method for predicting the three-dimensional topography of surfaces of semiconductor devices after reflow processing. 5,471,403, Cl. 364-488.000.

Fujimoto, Satoshi: *See*—
Nogawa, Makoto; and Fujimoto, Satoshi, 5,470,513, Cl. 264-40.100.

Fujimoto, Takanori, to Mitsubishi Denki Kabushiki Kaisha. Common type engine controller for controlling automotive engine in accordance with the type of transmission. 5,470,287, Cl. 477-99.000.

Fujimura, Akira: *See*—
Hara, Fumio; Fujimura, Akira; Hara, Yoshihisa; and Sakanushi, Masahiro, 5,469,833, Cl. 123-698.000.

Fujioka, Kazuo: *See*—
Misawa, Hiromitsu; Fujioka, Kazuo; Aoki, Koso; Kurita, Eiichi; Okano, Yoji; and Kozawa, Minoru, 5,470,660, Cl. 428-403.000.

Fujioka, Tetsuya; Bannai, Kazunori; and Takahashi, Hiroshi, to Ricoh Company, Ltd. Book document reading device having a page turning capability. 5,471,277, Cl. 355-25.000.

Fujirebio, Inc.: *See*—
Sugiyama, Masami; Uchida, Yoshiaki; Kurano, Yoshihiro; Tanaka, Aiko; and Tanimoto, Tetsuji, 5,470,759, Cl. 436-541.000.

Fujisawa, Hiromichi: *See*—
Kurosu, Yasuo; Masuzaki, Hidefumi; and Fujisawa, Hiromichi, 5,471,549, Cl. 382-290.000.

Fujita, Akihiro; Nakano, Seiji; and Ishii, Katsushi, to Kabushiki Kaisha Kawai Gakki Seisakusho. MIDI control apparatus. 5,471,008, Cl. 84-633.000.

Fujita, Kagari: *See*—

Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; and Yano, Mitsuo, 5,470,833, Cl. 514-18.000.
Fujita, Kouji; and Higuchi, Shigemitsu, to Hitachi, Ltd. Recording/playback apparatus in which head and tape are held in intermittent contact during rapid search. 5,471,352, Cl. 360-72.200.
Fujita, Masahiro: *See*—
Flinn, Alan; Zampini, Michael A.; and Fujita, Masahiro, 5,471,539, Cl. 351-119.000.
Fujita, Yoshihiro: *See*—
Suetsugi, Keisuke; Kanno, Hiroshi; Sugawara, Masayuki; Mitani, Kohji; Fujita, Yoshihiro; Saitoh, Toshinori; and Ninomiya, Yuichi, 5,471,323, Cl. 358-511.000.
Fujitechno Ltd.: *See*—
Furuichi, Kazuo; and Gomi, Tatsuya, 5,469,985, Cl. 220-632.000.
Fujitsu Limited: *See*—
Awata, Yutaka; and Kakuishi, Mitsuo, 5,471,507, Cl. 375-340.000.
Higaki, Naoshi, 5,471,160, Cl. 327-51.000.
Hikosaka, Yukinobu, 5,471,115, Cl. 315-111.210.
Hiramoto, Masanori, 5,471,476, Cl. 370-105.100.
Hoeda, Tosiyuki; and Harasosono, Takao, 5,471,369, Cl. 361-813.000.
Iizuka, Miyuki; and Shiba, Akira, 5,469,850, Cl. 128-660.070.
Ishiguro, Masayuki, 5,471,351, Cl. 360-53.000.
Katoh, Akira, 5,471,569, Cl. 395-134.000.
Masaki, Takashi; Yanagi, Shigenori; and Yamamoto, Manabu, 5,471,451, Cl. 369-71.000.
Misawa, Nobuhiro, 5,470,789, Cl. 437-190.000.
Nagayama, Masato; Inuyama, Seiji; Sawada, Kenji; Ohshita, Makoto; and Harada, Fumiaki, 5,471,290, Cl. 355-309.000.
Nakagawa, Shuuichi, 5,471,517, Cl. 379-29.000.
Nishii, Kota; Kimura, Kouichi; Ishizuka, Masanobu; and Adachi, Katsura, 5,470,909, Cl. 524-538.000.
Ogawa, Nobuo, 5,471,319, Cl. 358-445.000.
Onaka, Hiroshi; Miyata, Hideyuki; and Naito, Takao, 5,471,336, Cl. 359-191.000.
Ozawa, Takashi, 5,471,366, Cl. 361-704.000.
Sasaki, Michiyuki; Suzuki, Kenji; Morosawa, Kenji; Ohba, Toshimitsu; and Kadonaga, Tooru, 5,471,203, Cl. 340-825.310.
Yanai, Ken-ichi; Tanaka, Tsutomu; Ohgata, Koji; Takizawa, Yutaka; Oki, Ken-ichi; and Hirano, Takuya, 5,470,768, Cl. 437-40.000.
Yumitori, Fuminori; and Fujii, Yasuhiro, 5,471,425, Cl. 365-190.000.
Fujitsu VLSI Limited: *See*—
Ishiguro, Masayuki, 5,471,351, Cl. 360-53.000.
Fujiwara, Hideyoshi; and Ishikawa, Naomi, to Create Ishikawa Co., Ltd. Atomizing type burner. 5,470,225, Cl. 431-215.000.
Fujiwara, Masahiko: *See*—
Shiragaki, Tatsuya; Shiozawa, Takahiro; Suzuki, Syuji; and Fujiwara, Masahiko, 5,471,332, Cl. 359-117.000.
Fujiwara, Shinji; Shintani, Yoichi; and Nagasaka, Mitsuru, to Hitachi, Ltd. Hierarchical network having lower and upper layer networks where gate nodes are selectively chosen in the lower and upper layer networks to form a recursive layer. 5,471,580, Cl. 395-200.020.
Fujiwara, Yoshio: *See*—
Nakamura, Yoshinori; Sam, Huy; Fujiwara, Yoshio; Nagura, Toshikazu; Hayasi, Shigeo; and Kusaka, Yukio, 5,470,817, Cl. 503-227.000.
Nakamura, Yoshinori; Sam, Huy; and Fujiwara, Yoshio, 5,470,818, Cl. 503-227.000.
Fukagawa, Tomoki: *See*—
Nomura, Shigeki; Komatsubara, Nozomi; Mizui, Naomitsu; Kunishige, Kazutoshi; and Fukagawa, Tomoki, 5,470,529, Cl. 420-103.000.
Fukami, Takehiro: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; and Yano, Mitsuo, 5,470,833, Cl. 514-18.000.
Fukanuma, Tetsuhiko: *See*—
Iguchi, Masao; Fukanuma, Tetsuhiko; Yamaguchi, Tetsuya; and Yoshida, Tetsuo, 5,470,213, Cl. 418-55.200.
Fukata, Masatoshi: *See*—
Iwai, Kiyoshi; Kondo, Kimio; Sezaki, Yoshiaki; Fukata, Masatoshi; Hashimoto, Eiji; and Yoshioka, Toshio, 5,469,799, Cl. 114-74.00A.
Fukaya, Masashi: *See*—
Fukuta, Junzo; Fukaya, Masashi; and Araki, Hideaki, 5,470,412, Cl. 156-89.000.
Fukazawa, Yuji, to Kabushiki Kaisha Toshiba. Semiconductor wafer treating method. 5,470,393, Cl. 134-3.000.
Fukuda, Tokuya: *See*—
Okumoto, Koji; Matsuno, Katsumi; Shiono, Toru; Senuma, Toshitaka; Fukuda, Tokuya; and Takada, Shinji, 5,471,481, Cl. 371-22.300.
Fukuhara, Hiroshige; Kamishima, Hiroyuki; and Muramatsu, Toshiro, to Nissan Motor Co., Ltd. Radar apparatus. 5,471,215, Cl. 342-70.000.
Fukukura, Masaaki: *See*—
Kono, Shinichi; and Fukukura, Masaaki, 5,471,126, Cl. 318-807.000.
Fukuma, Emiko: *See*—
Ueno, Takumi; Shiraishi, Hiroshi; Hayashi, Nobuaki; Fukuma, Emiko; and Tadano, Keiko, 5,470,996, Cl. 558-46.000.
Fukumi, Hiroshi; Sakamoto, Toshiaki; Sugiyama, Mitsuo; Yamaguchi, Takeshi; Oshima, Takeshi; Asai, Fumitoshi; and Iijima, Yasuteru, to Sankyo Company, Limited. Thiazolidinecarboxylic acid amide derivatives and their therapeutic uses. 5,470,851, Cl. 514-214.000.
Fukumoto, Keiichi: *See*—
Igarashi, Noriyuki; and Fukumoto, Keiichi, 5,469,953, Cl. 198-345.200.
Fukumoto, Takaaki: *See*—
Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, 5,470,461, Cl. 210-188.000.
Fukunaga, Masao; Sakurai, Yutaka; Saito, Kouji; and Ishihara, Tamio, to Hitachi, Ltd. Electromagnetic flow meter. 5,469,746, Cl. 73-861.120.
Fukuoka, Satoshi: *See*—
Sasaki, Koji; Yamaguchi, Shizuka; Fumeno, Tsuyoshi; and Fukuoka, Satoshi, 5,469,611, Cl. 29-426.200.
Fukuta, Junzo; Fukaya, Masashi; and Araki, Hideaki, to Sumitomo Metal Ceramics Inc. Process for producing a circuit substrate. 5,470,412, Cl. 156-89.000.
Fuller, Deborah L.: *See*—
Yang, Ning-Sun; Swain, William F.; Burkholder, Joseph K.; and Fuller, Deborah L., 5,470,708, Cl. 435-6.000.
Fuller, Edward M.: *See*—
Every, Peter; Sivulka, Gerald; and Fuller, Edward M., 5,470,137, Cl. 303-188.000.
Fuller Offshore Finance Corporation B.V.: *See*—
Aalst, Gerrit V., 5,470,191, Cl. 414-726.000.
Fulton, David: *See*—
Leung, Donald; Schlievert, Patrick; Meissner, Cody; and Fulton, David, 5,470,716, Cl. 435-34.000.
Fumeno, Tsuyoshi: *See*—
Sasaki, Koji; Yamaguchi, Shizuka; Fumeno, Tsuyoshi; and Fukuoka, Satoshi, 5,469,611, Cl. 29-426.200.
Funabashi, Yasunori: *See*—
Harada, Setsuo; Funabashi, Yasunori; Inatomi, Nobuhiro; Tanayama, Shigeharu; and Tanida, Seiichi, 5,470,961, Cl. 536-7.400.
Funakura, Masami: *See*—
Yoshida, Yuji; Funakura, Masami; Nakatani, Kazuo; and Tagashira, Minoru, 5,470,496, Cl. 252-67.000.
Fundock, Michael. Ostomy bag with combination venting/cleaning assembly. 5,470,325, Cl. 604-332.000.
Fung, Anthony S.: *See*—
Degnan, Thomas F.; Fung, Anthony S.; Hatzikos, George H.; Kennedy, Gordon J.; and Kowalski, Jocelyn A., 5,470,810, Cl. 502-64.000.
Fung, Steven: *See*—
Grossman, Paul D.; Fung, Steven; Menchen, Steven M.; Woo, Sam L.; and Wian-Deen, Emily S., 5,470,705, Cl. 435-6.000.
Funhoff, Angelika: *See*—
Wallon, Alexander; Auchter, Gerhard; Licht, Ulrike; Haeberle, Karl; and Funhoff, Angelika, 5,470,907, Cl. 524-507.000.
Furnish, Greg; and Hipps, Michael, to Snowden-Pencer, Inc. Surgical instrument handle and actuator means. 5,470,328, Cl. 606-1.000.
Furuichi, Kazuo; and Gomi, Tatsuya, to Fujitechno Ltd.; and Suntory Limited. Stainless steel container with deformation protecting device. 5,469,985, Cl. 220-632.000.
Furukawa Denchi Kabushiki Kaisha: *See*—
Nakano, Kenji, 5,470,676, Cl. 429-139.000.
Furukawa Electric Co., Ltd., The: *See*—
Irikawa, Michinori; and Iwase, Masayuki, 5,470,786, Cl. 437-129.000.
Negami, Shoichi; Hikami, Toshiya; Nishikawa, Shigeaki; and Murata, Matsue, 5,471,545, Cl. 385-1.000.
Sasaki, Koji; Yamaguchi, Shizuka; Fumeno, Tsuyoshi; and Fukuoka, Satoshi, 5,469,611, Cl. 29-426.200.
Fusiak, Frank: *See*—
Narayanan, Kolazi S.; Chaudhuri, Ratan K.; Login, Robert B.; and Fusiak, Frank, 5,470,508, Cl. 252-542.000.
Fusion Systems Corporation: *See*—
Gore, Jayavant P.; and Sweetman, Robert J., 5,471,109, Cl. 313-22.000.
Fye, Philip J.: *See*—
Byers, Larry L.; Mackenthun, Donald W.; Fye, Philip J.; Maciona, Gerald J.; Engel, Jeff A.; Price, Ferris T., deceased; and Seppa, Dale K., 5,471,482, Cl. 371-21.200.
G & G Intellectual Properties, Inc.: *See*—
Gearin, Peter; and Leech, Everett A., 5,470,490, Cl. 211-13.000.
Gaal, Erik W.: *See*—
Baggen, Constant P. M. J.; and Gaal, Erik W., 5,471,486, Cl. 371-37.100.
Gagneur, John P.: *See*—
Scourtes, George; and Gagneur, John P., 5,469,741, Cl. 73-462.000.
Gagnon, David R.: *See*—
Gagnon, James E.; Povey, Neale P.; Gagnon, David R.; and Midgley, Roland R., 5,470,757, Cl. 436-164.000.
Gagnon, James E.; Povey, Neale P.; Gagnon, David R.; and Midgley, Roland R., to Minnesota Mining and Manufacturing Company. Spectroscopic sample holder and method for using same. 5,470,757, Cl. 436-164.000.
Gagnon, Kevin. Reusable waste matrix sleeve. 5,470,031, Cl. 242-571.000.
Gairns, Stuart A.: *See*—
Modell, Michael; Hauptmann, Edward G.; and Gairns, Stuart A., 5,470,481, Cl. 210-652.000.
Gaiser, William R., to Broadway Companies, Inc. Compact core and ejector assembly. 5,470,221, Cl. 425-556.000.
Gal, George; Anderson, William W.; Herman, Bruce J.; and Shough, Dean M., to Lockheed Missiles & Space Company, Inc. Wavefront corrector for scanning microlens arrays. 5,471,345, Cl. 359-619.000.
Galiani, Alfred J. Magnifying container for printed matter. 5,471,347, Cl. 359-807.000.
Galion Solid Waste Equipment Co., Inc.: *See*—
Smith, Fred T.; and Smith, Fred P., 5,470,187, Cl. 414-408.000.

Gallagher, Peter: *See*—
Downie, Alan P.; Gallagher, Peter; Garrity, John J.; and Robertson, Brian L., 5,471,368, Cl. 361-760.000.
Gallant Industries Co., Ltd.: *See*—
Lin, Ming-Teng, 5,469,602, Cl. 16-115.000.
Gallatin, W. Michael; and Van der Vieren, Monica, to ICOS Corporation. Human β_2 integrin α subunit. 5,470,953, Cl. 530-350.000.
Gallo, Jean-Pierre, to Fem-Aero. Individual underwater propulsion device. 5,469,803, Cl. 114-315.000.
Galloway, Brett D.: *See*—
Flammer, George H., III; and Galloway, Brett D., 5,471,469, Cl. 370-94.100.
Galloway, Terry R., to Synthetica Technologies, Inc. System for steam-reforming of liquid or slurry feed material. 5,470,544, Cl. 422-213.000.
Gamm, Bernhard, to Alcatel N.V. Exchange having overdimensioned digital switching network. 5,471,465, Cl. 370-58.100.
Gamo, Takaharu: *See*—
Yasumoto, Eiichi; Niikura, Junji; Hatoh, Kazuhito; and Gamo, Takaharu, 5,470,670, Cl. 429-20.000.
Gamou, Takaharu; Taniguchi, Noboru; Niikura, Junji; Hatoh, Kazuhito; Yasumoto, Eiichi; and Adachi, Kinichi, to Matsushita Electric Industrial Co., Ltd. Vehicle using hydrogen absorbing alloys. 5,469,913, Cl. 165-104.120.
Gandia, Liberto; and Rouget, Frédéric, to European Gas Turbines SA. Metal duct subjected to steep temperature gradients. 5,469,894, Cl. 138-172.000.
Garavaglia, Carlo: *See*—
Camaggi, Giovanni; Filippini, Lucio; Guzmeroli, Marilena; Meazza, Giovanni; Zanardi, Giampaolo; Garavaglia, Carlo; and Mirenna, Luigi, 5,470,863, Cl. 514-343.000.
Garci, Inc.: *See*—
Fontenla, Juan M., 5,469,824, Cl. 123-416.000.
Garcia, Manuel L.: *See*—
Wood, Steven L.; and Garcia, Manuel L., 5,471,509, Cl. 375-350.000.
Garcia, Richard J. Safety device for machine tools. 5,470,181, Cl. 409-134.000.
Garcia-Mallol, Juan A., to Foster Wheeler USA Corporation. Pressurized circulating fluidized bed reactor combined cycle power generation system. 5,469,698, Cl. 60-39.020.
Garcia-Martinez, Jose V.: *See*—
Miller, A. Dusty; Garcia-Martinez, Jose V.; Eiden, Maribeth V.; and Wilson, Carolyn A., 5,470,726, Cl. 435-172.300.
Garde, Douglas, to Analog Devices, Inc. Multi-phase multi-access pipeline memory system. 5,471,607, Cl. 395-550.000.
Gardeck, Kevin; Green, David A.; and Cutts, Kevin, to Motorola, Inc. Method of rekeying roaming communication units. 5,471,532, Cl. 380-21.000.
Garelick, Paul: *See*—
Merianos, John J.; Elder, Todd; and Garelick, Paul, 5,470,875, Cl. 514-479.000.
Garfield, Robert E.; and Yallampalli, Chandrasekhar, to Board of Regents, the University of Texas System. Ovulation control by regulating nitric oxide levels with arginine derivatives. 5,470,847, Cl. 514-171.000.
Garibay, Raul A., Jr.: *See*—
Quattromani, Marc A.; Garibay, Raul A., Jr.; Patwa, Nital; and Hervin, Mark W., 5,471,598, Cl. 395-449.000.
Garney, Bryan W., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Zeolites. 5,470,557, Cl. 423-249.000.
Garrett, Michael E., to BOC Group plc, The. Membrane plant: automatic control of. 5,470,379, Cl. 96-4.000.
Garrity, John J.: *See*—
Downie, Alan P.; Gallagher, Peter; Garrity, John J.; and Robertson, Brian L., 5,471,368, Cl. 361-760.000.
Gas Research Institute: *See*—
Smalley, Anthony J.; Gerlach, C. Richard; and Harris, Ralph E., 5,471,400, Cl. 364-509.000.
Gasca, Jean-Philippe; and Tardy, Gerard, to Vetrotex France. Glass fibers for reinforcing organic matrices. 5,470,658, Cl. 428-391.000.
Gately, Nicholas V.: *See*—
Arnett, Jeffery D.; Gately, Nicholas V.; Grulke, David H.; Hilsbos, Ruth A.; and Sertic, James L., 5,470,305, Cl. 601-161.000.
Gatti, Pierluigi: *See*—
Cerami, Pietro; Gatti, Pierluigi; and Melis, Pierluigi, 5,471,201, Cl. 340-641.000.
Gattuso, Mark J.: *See*—
House, David W.; Scott, Ray V., Jr.; and Gattuso, Mark J., 5,470,890, Cl. 521-128.000.
Gauch, Hermann, to Union Special GmbH. Thread cutting device and method for a chain stitch sewing machine. 5,469,798, Cl. 112-298.000.
Gauger, Raymond G. Apparatus for preventing scale formation in water systems. 5,470,462, Cl. 210-198.100.
Gaughan, Roger G., to Exxon Research & Engineering Co. Unleaded aviation gasoline. 5,470,358, Cl. 44-426.000.
Gavin, Vincent G.; Seaman, Michael J.; Crook, Neal A.; and Mistry, Bipin, to Digital Equipment Corporation. System for transferring data between a processor and a system bus including a device which packs, unpacks, or buffers data blocks being transferred. 5,471,632, Cl. 395-284.000.
Gay, James G.: *See*—
Mussemann, Gary A.; Circello, Joseph C.; and Gay, James G., 5,471,625, Cl. 395-750.000.
Gayne, Lawrence: *See*—
Leonard, Cynthia D.; and Gayne, Lawrence, 5,470,303, Cl. 601-84.000.
GE Plastics Japan: *See*—
Sakashita, Takeshi; Shimoda, Tomoaki; and Kishimura, Kotaro, 5,470,938, Cl. 528-198.000.
Gearin, Peter; and Leech, Everett A., to G & G Intellectual Properties, Inc. Adjustable vehicle-carrying frame. 5,470,490, Cl. 211-13.000.
Gebhard, Peter T. E.: *See*—
Gray, Donald J.; and Gebhard, Peter T. E., 5,469,876, Cl. 134-105.000.
GEC Marconi Systems PTY Limited ACN 003 890 515: *See*—
Harvey, Anthony P., 5,471,436, Cl. 367-154.000.
Gee, David J.: *See*—
Engdahl, Jonathan R.; Lucak, Mark A.; Gee, David J.; and Kucharski, Paul, 5,471,461, Cl. 370-17.000.
Gemplus Card International: *See*—
Geronimi, François, 5,471,045, Cl. 235-492.000.
Gloton, Jean-Pierre; Laroche, Damien; Turin, Joël; and Fallah, Michel, 5,470,411, Cl. 156-64.000.
GenCorp Inc.: *See*—
Leach, Burr L.; and Hawkins, David, 5,470,609, Cl. 427-140.000.
Genentech, Inc.: *See*—
Martin, David W., Jr., 5,470,560, Cl. 424-9.200.
General Electric Company: *See*—
Darolia, Ramgopal, 5,470,371, Cl. 75-229.000.
Kidder, Kevin R.; Kuruganti, Vijaya K.; Kulich, Donald M.; and Graf, John F., 5,470,895, Cl. 523-335.000.
LeMonds, Jeffrey; McConnelee, James E.; Kelley, John R.; Wiggs, Gene E.; and Martini, Gary T., 5,469,618, Cl. 29-889.720.
Oae, Richard A., 5,471,513, Cl. 376-232.000.
Umney, Michael A.; Walters, Steven A.; and Koss, Christopher R., 5,470,114, Cl. 285-367.000.
van der Meer, Roelof; Pratt, Charles F.; de Munck, Johannes W. J.; and Heuschen, Jean M. H., 5,470,913, Cl. 525-66.000.
General Hospital Corporation, The: *See*—
Reed, Guy, 5,470,957, Cl. 530-388.250.
General Motors Corporation: *See*—
Dadak, Tony M.; and Roberts, John L., 5,469,929, Cl. 180-149.000.
Fan, Changming, 5,470,286, Cl. 475-331.000.
Gordon, John E., 5,470,100, Cl. 280-728.200.
Staser, Brian H.; Figlioli, Danny W.; and Manuel, Mark, 5,469,664, Cl. 49-452.000.
Williams, Duane D., 5,470,099, Cl. 280-728.200.
General Signal Corporation: *See*—
Rains, Robert L., 5,470,152, Cl. 366-273.000.
Genest, Pierre, to Alcatel Mobile Communication France. Current-mode amplification system, and corresponding operational amplifier, gain section and amplification element. 5,471,170, Cl. 330-151.000.
Genetti, George J.: *See*—
Warde, Cardinal; Horsky, Thomas N.; Schiller, Craig M.; and Genetti, George J., 5,471,341, Cl. 359-293.000.
Genma, Yoshikazu: *See*—
Nishino, Kazuaki; Awano, Yoji; Takamiya, Hiroyuki; Ito, Mitsufumi; Suzuki, Masami; and Genma, Yoshikazu, 5,470,402, Cl. 148-325.000.
Genrad Limited: *See*—
Pye, Richard, 5,471,136, Cl. 324-158.100.
Geo Ventures: *See*—
Opel, George E., 5,471,012, Cl. 174-53.000.
Georgia-Pacific Corporation: *See*—
Moorman, Stephen E., 5,469,795, Cl. 108-51.300.
Gerhard, Hoeber, to Rieter Ingolstadt Spinnereimaschinenbau AG. Process and device to determine the diameter of a bobbin at a spinning station of a spinning machine. 5,469,696, Cl. 57-264.000.
Gerhart, Donald J., to Duke University. Antifouling coating and method for using same. 5,470,586, Cl. 424-609.000.
Gerke, Thomas, to Henkel Kommanditgesellschaft auf Aktien. Process for the production of mixtures of stereoisomers of 8,12-oxido-13,14,15,16-tetranorlabdane. 5,470,989, Cl. 549-458.000.
Gerlach, Brett C.: *See*—
Dennis, Stephen V.; Fluegel, Steven J.; Gerlach, Brett C.; and Flagg, Robert C., 5,471,564, Cl. 395-114.000.
Gerlach, C. Richard: *See*—
Smalley, Anthony J.; Gerlach, C. Richard; and Harris, Ralph E., 5,471,400, Cl. 364-509.000.
Gerlach, Derek; and Paulraj, Arogyaswami J., to Leland Stanford Junior University, The. Method for minimizing cross-talk in adaptive transmission antennas. 5,471,647, Cl. 455-63.000.
Germano, Francesco: *See*—
Wöhler, Hans J.; and Germano, Francesco, 5,470,049, Cl. 267-172.000.
Geronimi, François, to Gemplus Card International. Smart card locking process. 5,471,045, Cl. 235-492.000.
Gerritsen, Theodorus A.: *See*—
Kelsall, John T.; and Gerritsen, Theodorus A., 5,471,020, Cl. 181-224.000.
Gessner, Scott L.; Newkirk, David D.; Thomason, Michael M.; and Reeder, James O., to Fiberweb North America, Inc. Elastic nonwoven webs and method of making same. 5,470,639, Cl. 428-152.000.
Gesteland, Raymond F.: *See*—
Weiss, Robert B.; Kimball, Alvin W.; Gesteland, Raymond F.; Ferguson, F. Mark; Dunn, Diane M.; Di Sera, Leonard J.; and Cherry, Joshua L., 5,470,710, Cl. 435-6.000.
Gevaras, Peter H.: *See*—

Chilton, John B.; Gevaras, Peter H.; Herb, Paul C.; and Wellen, Thomas W., 5,469,971, Cl. 209-235.000.

Gharpurey, Archana M., to Hughes Aircraft Company. Frequency tuning for satellite ground stations. 5,471,657, Cl. 455-12.100.

Gheewala, Tushar; Mehta, Rustam; and Varma, Prab, to CrossCheck Technology, Inc. Storage element for delay testing. 5,471,152, Cl. 324-758.000.

Ghosh, Peter: *See*—
Cullis-Hill, David; and Ghosh, Peter, 5,470,840, Cl. 514-54.000.

Giansante, Joseph E., to Home Equity Software, Inc. Interactive parameter driven iterative financial spreadsheet analysis with context and layout sensitive help screen. 5,471,575, Cl. 395-144.000.

Gibbs, Douglas P.: *See*—
Van Dusen, Donn S.; and Gibbs, Douglas P., 5,469,998, Cl. 224-506.000.

Gibbs, Jackson B.; and Graham, Samuel L., to Merck & Co., Inc. Inhibitors of geranylgeranyl-protein transferase. 5,470,832, Cl. 514-18.000.

Gibbs, Stephen, to Keystone International Holdings Corp. High visibility valve position indicator. 5,469,805, Cl. 116-284.000.

Gie, Graham A.: *See*—
Ling, Robin S. M.; Mikhail, W. E. Michael; Elting, James J.; Gie, Graham A.; Slooff, Tom J. J. H.; and Vanderlinden, Jacques J., 5,470,336, Cl. 606-105.000.

Gier, Achim R.; Bonduel, Pascal; Heckel, Robert J.; and Fin, Enrico, to Rockwell Body and Chassis Systems. Safety device for an electric glass-winder of a vehicle of the type having a cable slidable along a guide rail. 5,469,656, Cl. 49-28.000.

Gilbert, Ronald E.; Mordue, George S.; and Vild, Chris T., to Metaullics Systems Co., L.P. Molten metal pump with vaned impeller. 5,470,201, Cl. 415-200.000.

Gilchrest, Barbara A.; Yaar, Mina; and Eller, Mark, to Trustees of Boston University. Stimulation of tanning by DNA fragments or single-stranded DNA. 5,470,577, Cl. 424-450.000.

Gilchrist, Thomas, to Giltech Limited. Medicinal substance for topical application. 5,470,585, Cl. 424-604.000.

Gill, John F., to Steelcase Inc. Self-locking snap-on suspension unit for furniture cabinets and the like. 5,470,143, Cl. 312-334.400.

Gillespie, John: *See*—
Blaxtan, Peter W.; and Gillespie, John, 5,471,584, Cl. 359-263.000.

Gillespie, Ralph D., to UOP. Conversion of water-soluble inorganic sulfide compounds in an aqueous stream. 5,470,486, Cl. 210-758.000.

Gillette Company, The: *See*—
Loftin, Rachel M.; and Sanborn, Kimberly B., 5,470,904, Cl. 524-462.000.

Giltech Limited: *See*—
Gilchrist, Thomas, 5,470,585, Cl. 424-604.000.

Ginsberg, Mark H.: *See*—
Feelinger, Andrew L., III; Plow, Edward F.; and Ginsberg, Mark H., 5,470,738, Cl. 435-240.270.

Giorgi, Janis V.; and Hultin, Lance, to University of California, The Regents of the. Method for determining favorable prognosis in an HIV positive subject using HLA-DR$^+$/CD38$^-$ CD8^{bright} cells. 5,470,701, Cl. 435-5.000.

Giorgio, Paul J.; and Amuro, Stephen J., to United States of America, Navy. Network file server with automatic sensing means. 5,471,634, Cl. 395-600.000.

Giros, Pierre; and Boschetti, Egisto, to Sepracor Inc. Passivated porous supports and methods for the preparation and use of same. 5,470,463, Cl. 210-198.200.

Gist-Brocades N.V.: *See*—
Clausen, Kim, 5,470,717, Cl. 435-47.000.

Givaudan-Roure Corporation: *See*—
Ulrich, Huber, 5,470,991, Cl. 549-479.000.

Gladczak, Robert J.: *See*—
Gruettner, David R.; and Gladczak, Robert J., 5,469,958, Cl. 198-834.000.

Glass, Andrew B.: *See*—
French, Barry J.; Ferguson, Kevin R.; McDonald, Halley A., III; Glass, Andrew B.; Mohansingh, Timothy; and Borges, Gregory, 5,469,740, Cl. 73-379.040.

Glass, Samuel W., III; Rossman, Timothy A.; and Ataman, Vedat T. Inductive valve motion sensor for positioning outside the body of the valve. 5,471,138, Cl. 324-207.190.

Gleich, Gerald J.: *See*—
Scott, Randy W.; Gleich, Gerald J.; and Wilde, Craig G., 5,470,825, Cl. 514-2.000.

Gleichman, Douglas M.: *See*—
Prager, Kenneth E.; Herbst, Stephen J.; Sisneros, Jerry N.; Wootan, John J.; and Gleichman, Douglas M., 5,471,240, Cl. 348-164.000.

Glenn Albert Wright: *See*—
Wright, Glenn A.; Fritz, Philip F.; and Nguyen, Tuan Q., 5,470,022, Cl. 241-33.000.

Glenn, John K., Jr., to Nash Engineering Company, The. Heat recovery in a liquid ring pump seal liquid chiller system. 5,469,705, Cl. 60-693.000.

Glew, Andrew F.: *See*—
Colwell, Robert P.; Glew, Andrew F.; Papworth, David B.; Hinton, Glenn J.; and Clift, David W., 5,471,633, Cl. 395-800.000.

Glidden Company, The: *See*—
Craun, Gary P.; Rosekelly, George S.; and Floyd, F. Louis, 5,470,906, Cl. 524-507.000.

Globe Products Inc.: *See*—
Banner, Alvin C.; and Heaton, Mark T., 5,470,025, Cl. 242-7.030.

Globe-Union, Inc.: *See*—
Blank, David L.; Crill, Roger O.; Pusey, Bruce A.; and Shah, Kashyap H., 5,470,195, Cl. 414-797.000.

Gloton, Jean-Pierre; Laroche, Damien; Turin, Joël; and Pallah, Michel, to Gemplus Card International. Method for continuous assembly of patterned strips and integrated circuit micromodule obtained by said method. 5,470,411, Cl. 156-64.000.

Glycomed, Incorporated: *See*—
Brandley, Brian K.; Tiemeyer, Michael; Swiedler, Stuart J.; Moreland, Margaret; and Schweingruber, Hans, 5,470,842, Cl. 514-61.000.

Gnade, Bruce E.; Cho, Chih-Chen; and Smith, Douglas M., to Texas Instruments Incorporated. Method of making a semiconductor device using a low dielectric constant material. 5,470,802, Cl. 437-238.000.

GNB Battery Technologies Inc.: *See*—
Lund, David L.; Kump, William H.; and Groff, Donald W., 5,470,679, Cl. 429-210.000.

Gobush, William; Pelletier, Diane; and Days, Charles, to Acushnet Company. Monitoring systems to measure and display flight characteristics of moving sports object. 5,471,383, Cl. 364-410.000.

Godbout, André: *See*—
St-Pierre, Jean-Guy; and Godbout, André, 5,469,972, Cl. 209-245.000.

Godfrey, Christopher R. A.: *See*—
Anthony, Vivienne M.; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Ferguson, Ian; Crowley, Patrick J.; and Hutchings, Michael G., 5,470,819, Cl. 504-244.000.

Goedicke, Klaus; Metzner, Christoph; Schmidt, Joerg; Heisig, Ulrich; Schiller, Siegfried; and Reschke, Jonathan, to Fraunhofer-Gesellschaft Zur Foederung der angewandten Forschung e.V. Device for the vacuum coating of mass produced products. 5,470,388, Cl. 118-716.000.

Goerl, Udo: *See*—
Meier, Karl; Goerl, Udo; and Wolff, Siegfried, 5,470,905, Cl. 524-493.000.

Goethel, Peter J.; Lewis, Richjard W.; and Teerlink, Wilford J., to Du Pont de Nemours, E. I., and Company. Process for preparing polymeric material with microwave. 5,471,037, Cl. 219-750.000.

Goings, William L. Combination can crushing and retrieving device. 5,469,785, Cl. 100-137.000.

Golab, Pawel J.; and Lee, Anson, to Chrysler Corporation. Fuel injector failure detection circuit. 5,469,825, Cl. 123-479.000.

Gold, Peter. Auto insert molding and method of installation. 5,470,422, Cl. 156-108.000.

Gold Star Electron Co., Ltd.: *See*—
Chung, Ho-sun; and Lee, Soo-yong, 5,471,557, Cl. 395-2.410.

Golden Aluminum Company: *See*—
McAuliffe, Donald C., 5,469,912, Cl. 164-476.000.

Goldenberg, Tsvi; Wardle, John; and Anderson, William, to Advanced Interventional Systems, Inc. Guidance and delivery system for high-energy pulsed laser light. 5,470,330, Cl. 606-7.000.

Goldmann, Jürgen: *See*—
Kaul, Bansi L.; Vougioukas, Angelos-Elie; and Goldmann, Jürgen, 5,470,921, Cl. 525-432.000.

Goldstar Co., Ltd.: *See*—
Kim, Jung J., 5,470,769, Cl. 437-40.000.
Shin, Chang J.; and Moon, Jong D., 5,470,214, Cl. 418-63.000.

Goldstar Electron Co., Ltd.: *See*—
Seo, Jung Y., 5,471,186, Cl. 335-285.000.
Song, Chi J., 5,471,088, Cl. 257-668.000.

Golf Games International (Australia) Pty Ltd.: *See*—
Brewster, Wilfred G.; and Forrester, Michael D., 5,470,077, Cl. 273-245.000.

Golla, Carla: *See*—
Sali, Luigi M.; and Golla, Carla, 5,471,413, Cl. 364-786.000.

Gomi, Tatsuya: *See*—
Furuichi, Kazuo; and Gomi, Tatsuya, 5,469,985, Cl. 220-632.000.

Gong, Kai F.: *See*—
Davis, John S.; Gong, Kai F.; and Hammel, Sherry E., 5,471,434, Cl. 367-124.000.
Hammell, Sherry E.; Gong, Kai F.; Jackson, Neil A.; Keay, Kathleen D.; and MacDonald, John F., 5,471,433, Cl. 367-118.000.

Gonzales, Mark A., to Intel Corporation. Memory device and method for avoiding live lock of a DRAM with cache. 5,471,601, Cl. 395-403.000.

Gonzalez, Cesar, to Cessna Aircraft Company, The. Fuel blending system method and apparatus. 5,469,830, Cl. 123-515.000.

Goode, David P.; and Vogel, Frank E. Improved ski pole grip assembly. 5,470,108, Cl. 280-823.000.

Goodrich, Stephen D.: *See*—
Harwood, H. James; and Goodrich, Stephen D., 5,470,928, Cl. 526-172.000.

Goodyear Tire & Rubber Company, The: *See*—
Zanzig, David J.; Sandstrom, Paul H.; Hubbell, Joseph K.; Hsu, Wen-Liang; Halasa, Adel F.; and Verthe, John J. A., 5,470,929, Cl. 526-181.000.

Gordecki, Ryszard J.; and Tan, Kian T., to Motorola, Inc. Four-sided housing latch. 5,469,982, Cl. 220-4.020.

Gordon, John E., to General Motors Corporation. Air bag module inflator retainer. 5,470,100, Cl. 280-728.200.

Gordon, Kathryn E.; and Chan, Andrew K., to QuickLogic Corporation. Programming of antifuses. 5,471,154, Cl. 326-38.000.

Gore, Jayavant P.; and Sweetman, Robert J., to Fusion Systems Corporation. Method and apparatus for preventing reverse flow in air or gas cooled lamps. 5,471,109, Cl. 313-22.000.

Gorelik, Vladimir: *See*—

Schutter, Ernst; and Gorelik, Vladimir, 5,471,437, Cl. 367-175.000.

Gorr, Richard H.; and Siegel, Gunther R. Portable cement-mixing apparatus having upper and lower notched plates affixed to a shaft. 5,470,148, Cl. 366-64.000.

Gorsuch, Ian; Ennis, Mark R.; and Burgess, Robert M., to Minnesota Mining and Manufacturing Company. Method for making coated abrasive belts. 5,470,362, Cl. 51-295.000.

Gosch, Rolf, to EB Brühl Aluminiumtechnik GmbH. Cylinder block and method of making the same. 5,469,821, Cl. 123-193.200.

Gossen, Jan A.: *See*—
Vijg, Jan; and Gossen, Jan A., 5,470,706, Cl. 435-6.000.

Goto, Tetsuro; and Miura, Kosho, to Nikon Corporation. Information recording apparatus of camera. 5,471,267, Cl. 354-106.000.

Gotoh, Moritaka: *See*—
Anzai, Hidenobu; Gotoh, Moritaka; and Hisada, Youichi, 5,469,947, Cl. 192-21.500.

Goulait, David J. K., to Procter & Gamble Company, The. Method of making multi-layer female component for refastenable fastening device. 5,470,417, Cl. 156-201.000.

Gould, Michael N.; Crowell, Pamela L.; Elson, Charles E.; and Ren, Zhibin, to Wisconsin Alumni Research Foundation. Uses of perillic acid methyl ester. 5,470,877, Cl. 514-529.000.

Gourgue, Frédéric, to Societe Anonyme Dite Alcatel Radiotelephone. Device for correcting frequency shift due to the doppler effect in a transmission system. 5,471,648, Cl. 455-63.000.

Goux, Nicolas: *See*—
Bene, Bernard; and Goux, Nicolas, 5,470,483, Cl. 210-741.000.

Gove, Robert J.; Guttag, Karl M.; Balmer, Keith; and Ing-Simmons, Nicholas K., to Texas Instruments Incorporated. Multi-processor with crossbar link of processors and memories and method of operation. 5,471,592, Cl. 395-300.030.

Gowan, Thomas L., to Frederick Cowan & Company, Inc. Corona arc circuit. 5,471,362, Cl. 361-257.000.

Grabley, Susanne: *See*—
Stahl, Wilhelm; Ahlers, Michael; Walch, Axel; Bartnik, Eckhart; Kretzschmar, Gerhard; Grabley, Susanne; and Schleyerbach, Rudolf, 5,470,843, Cl. 514-61.000.

Gradoni, John T. Pizza cutting scissors. 5,469,622, Cl. 30-146.000.

Graf, John F.: *See*—
Kidder, Kevin R.; Kuruganti, Vijaya K.; Kulich, Donald M.; and Graf, John F., 5,470,895, Cl. 523-335.000.

Graf, Lothar; and Fuchs, Karl-Heinz, to Ing. Erich Pfeiffer GmbH & Co. KG. Dispenser for positively discharging a medium through a plurality of motions. 5,469,989, Cl. 222-82.000.

Graham, Samuel L.: *See*—
Gibbs, Jackson B.; and Graham, Samuel L., 5,470,832, Cl. 514-18.000.

Graindorge, Philippe: *See*—
Beteau, Jean-François; and Graindorge, Philippe, 5,470,745, Cl. 435-286.100.

Grande, Dennis. Adjustable book jacket and method for making same. 5,470,109, Cl. 281-34.000.

Grandvallet, Pierre; Allais, Daniel G. P.; and Dejaifve, Pierre E. J. G., to Shell Oil Company. Process for the preparation of lubricating base oils. 5,470,454, Cl. 208-144.000.

Grass, Norbert: *See*—
Dönig, Gerhard; Hümpfner, Roland; Grass, Norbert; Knaak, Hans-Joachim; Neulinger, Franz; and Schummer, Helmut, 5,471,377, Cl. 363-21.000.

Grasset, Etienne: *See*—
Laughlin, Philip; Alexander, John; Kamarei, A. Reza; Dobbie, Robert P.; Lin, Paul; Chang, Shen-Youn; Reddy, Sekhar; Grasset, Etienne; and Melin, Christian, 5,470,839, Cl. 514-53.000.

Gray, Donald J.; and Gebhard, Peter T. E. Cleaning method and system. 5,469,876, Cl. 134-105.000.

Gray, Harry E.: *See*—
Mussi, Edward F.; and Gray, Harry E., 5,470,743, Cl. 435-297.100.

Gray, John M.; and Lovetro, David C., to EKA Nobel, Inc. Process for treating waste water effluent. 5,470,480, Cl. 210-632.000.

Green, David A.: *See*—
Gardeck, Kevin; Green, David A.; and Cutts, Kevin, 5,471,532, Cl. 380-21.000.

Green, David J.: *See*—
Rose, Larry D.; Lauritzen, Donald R.; Ravenberg, Mike J.; Thompson, Mark A.; Green, David J.; and Davis, Terry R., 5,470,105, Cl. 280-740.000.

Green, Edward A. Insulated electrical conductor containing free-flowing mica. 5,471,014, Cl. 174-124.00R.

Green, Todd J.; and Tucker, John R., to BASF Corporation. Dimensionally stable closed cell rigid polyisocyanate based foam prepared from a froth foaming mixture. 5,470,891, Cl. 521-131.000.

Greenall, Jonathan. Solid fuel heating appliance. 5,469,836, Cl. 126-77.000.

Greenberg, Phillip D.; and Overell, Robert W., to Immunex; and Fred Hutchinson Cancer Research Center. Method for producing T_H-independent cytotoxic T lymphocytes. 5,470,730, Cl. 435-172.300.

Greene, Thomas L.: *See*—
Palansky, Bruce J.; Greene, Thomas L.; and Schock, Eileen A., 5,470,288, Cl. 477-110.000.

Greenlee, Larry W.: *See*—
Mack, Donald F.; Logman, Timothy M.; Bouc, Gary L.; and Greenlee, Larry W., 5,470,046, Cl. 251-329.000.

Greenspan, Michael A.: *See*—
Burtnyk, Nestor; and Greenspan, Michael A., 5,471,541, Cl. 382-153.000.

Greenwald, Frank S.: *See*—
Bogatin, Yakov; Robinson, Mark; Greenwald, Frank S.; and Ormerod, John, 5,470,400, Cl. 148-301.000.

Greenwalt, Richard B., to Bechtel Group, Inc. Method of processing waste material containing non ferrous metal oxides. 5,470,375, Cl. 75-505.000.

Greer, David A.: *See*—
Wood, James A.; and Greer, David A., 5,471,387, Cl. 364-426.030.

Greer, Stuart E., to Motorola, Inc. Semiconductor device solder bump having intrinsic potential for forming an extended eutectic region and method for making and using the same. 5,470,787, Cl. 437-183.000.

Gregg, Joseph J.: *See*—
Griffith, Richard L., III; Gregg, Joseph J.; and Yurkewych, George, 5,470,318, Cl. 604-161.000.

Greve, Bruce N.: *See*—
Herring, James M., Jr.; and Greve, Bruce N., 5,470,416, Cl. 156-196.000.

Greve, Christopher G.; and Lapeyre, Robert S., to Laitram Corporation, The. Modular conveyor belt and flight members therefor. 5,469,956, Cl. 198-699.100.

Grey, Michael J.; and Shaw, William H., to Resource America, Inc. Process for recycling a shipping container. 5,469,691, Cl. 53-472.000.

Gridley, Lee E.: *See*—
Vaillancourt, Glenn M.; and Gridley, Lee E., 5,470,103, Cl. 280-730.100.

Griffin, Arthur B.: *See*—
Harrogate, Ian W. R.; Taylor, David H.; Griffin, Arthur B.; and Tuson, David W., 5,470,198, Cl. 415-115.000.

Griffin, Nigel D., to Camco International Inc. Cutting elements for rotary drill bits. 5,469,927, Cl. 175-432.000.

Griffith, George L.; and Vance, Ricky T., to Nelson Brothers, Inc. Method of varying rate of detonation in an explosive composition. 5,470,407, Cl. 149-109.600.

Griffith, Michael J.; Neslund, Gerald G.; and Liu, Shu-Len, to Baxter International Inc. Ultrapurification process for factor VIII. 5,470,954. Cl. 530-383.000.

Griffith, Richard L., III; Gregg, Joseph J.; and Yurkewych, George, to Becton, Dickinson and Company. Catheter/needle assembly kit and method for administering therapeutic agents to the subarachnoid space. 5,470,318, Cl. 604-161.000.

Griffiths, John M.; Gussert, David A.; and Karls, Michael A., to Brunswick Corporation. Method and apparatus for improving reverse thrust of a marine drive. 5,470,263, Cl. 440-75.000.

Grigoleit Company, The: *See*—
Howie, Robert K., Jr., 5,469,758, Cl. 74-553.000.

Grillo, Susan M.; Steffenino, Rita M.; Kunkle, Diane C.; and Saraceni, Kathleen, to Berwind Pharmaceutical Services, Inc. Aqueous maltodextrin and cellulosic polymer film coatings. 5,470,581, Cl. 424-479.000.

Grimm, Wolfgang; Eisen, Norbert; and Ruprecht, Hans-Dieter, to Bayer Aktiengesellschaft. Rotational molding process for insulating pipes. 5,470,515, Cl. 264-45.700.

Gritzo, Russ E.; and Fowler, Malcolm M., to University of California, The Regents of the. Large volume flow-through scintillating detector. 5,471,062, Cl. 250-368.000.

Grobicki, Christopher; Mazza, Cynthia; O'Connell, Edward; Ulm, John; and White, Gerard, to LANcity Corporation. Communications highway network system. 5,471,474, Cl. 370-85.200.

Groff, Donald W.: *See*—
Lund, David L.; Kump, William H.; and Groff, Donald W., 5,470,679, Cl. 429-210.000.

Grolman, Robert J.; Holywell, George C.; Kimmerle, Frank M.; and Turcotte, Gilles R., to Alcan International Limited. Recycling of spent pot linings. 5,470,559, Cl. 423-489.000.

Grönen, Jürgen: *See*—
Jansen, Bernhard; Grönen, Jürgen; and Müller, Hanns P., 5,470,523, Cl. 264-328.600.

Groom, Bruce M., legal representative: *See*—
Krahnke, Robert H.; Mealey, Shawn K.; Schoenherr, William J.; Smith, Schyler B., deceased; and Tangney, Thomas J., 5,470,923, Cl. 525-477.000.

Gropep Pty. Ltd.: *See*—
Ballard, Francis J.; Wallace, John C.; and Wells, Julian R. E., 5,470,828, Cl. 514-12.000.

Grosser, Martin: *See*—
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Grosser, Martin; Schneider, Peter; Barth, Wolfgang; Moll, Hermann; and Pollmann, Horst, 5,469,938, Cl. 187-408.000.

Grossman, Paul D.; Fung, Steven; Menchen, Steven M.; Woo, Sam L.; and Winn-Deen, Emily S., to Applied Biosystems, Inc. Probe composition containing a binding domain and polymer chain and methods of use. 5,470,705, Cl. 435-6.000.

Grosvenor, Martin P.: *See*—
Staniforth, John N.; and Grosvenor, Martin P., 5,470,603, Cl. 427-2.140.

Gruettner, David R.; and Gladczak, Robert J., to UCC Corporation. Conveyor drive spocket. 5,469,958, Cl. 198-834.000.

Grulke, David H.: *See*—
Arnett, Jeffery D.; Gately, Nicholas V.; Grulke, David H.; Hilsbos, Ruth A.; and Sertic, James L., 5,470,305, Cl. 601-161.000.

Grund, Alan D., to Bio-Technical Resources. Formation of and dehydration of hydroxylated diphenyl acetylenes using Pseudomonas ATCC 55272. 5,470,728, Cl. 435-156.000.

Grunewald, Fred A.: *See*—
McKenna, Gregory B.; and Grunewald, Fred A., 5,469,683, Cl. 52-730.300.

Gruning, Burghard; Foitzik, Willi; Weitemeyer, Christian; and Kaseborn, Hans-Dieter, to Th. Goldschmidt AG. Method for the synthesis of betaines containing ≦10 ppm of organically bound chlorine. 5,470,992, Cl. 554-69.000.

Gsell, Thomas C.: *See*—
Markovich, Vlado I.; Bormann, Thomas J.; Gsell, Thomas C.; and Pascale, Frank R., 5,470,488, Cl. 210-767.000.

GTE Laboratories Incorporated: *See*—
Cooperman, Michael, 5,471,466, Cl. 370-58.100.

Gudat, Adam J.; and Henderson, Daniel L., to Caterpillar Inc. Method and apparatus for operating compacting machinery relative to a work site. 5,471,391, Cl. 364-424.070.

Guess, Ronald W.: *See*—
Janke, Donald E.; Szynal, Joseph M.; and Guess, Ronald W., 5,469,715, Cl. 62-155.000.

Guilford Mills, Inc.: *See*—
Nielsen, Arne; Moghaddassi, Majid; Vishnepolsky, Boris; and Smith, Keith, 5,470,030, Cl. 242-533.800.

Guillemin, François H.: *See*—
Forster, Michel Ch.; Guillemin, François H.; and Lignon, Dominique H., 5,470,321, Cl. 604-174.000.

Gulbins, Erich; Haeberle, Karl; Licht, Ulrike; and Wallon, Alexander, to BASF Aktiegesellschaft. Reduction in the pH of anionic polyurethane dispersions which are stabilized by carboxylate or sulfonate groups. 5,470,899, Cl. 524-158.000.

Gummer, Raymond J. E., to Wigwam Mills, Inc. Hosiery display package. 5,469,959, Cl. 206-299.000.

Gummiwerk Kraiburg Development GmbH: *See*—
Schmidt, Peter, 5,470,173, Cl. 404-32.000.

Gunatilaka, A. A. Leslie: *See*—
Kingston, David G. I.; Molinero, Anthony A.; and Gunatilaka, A. A. Leslie, 5,470,866, Cl. 514-376.000.

Gunn, Timothy D.: *See*—
Sharma, Raghu; Davis, Jeffrey P.; Gunn, Timothy D.; Li, Ping; Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, 5,471,470, Cl. 370-81.000.

Gupta, Amitava; and Blum, Ronald D., to Innotech, Inc. Polymerizable resin for forming clear, hard plastics. 5,470,892, Cl. 522-42.000.

Gupta, Anil: *See*—
Mangan, John S.; Norman, Robert D.; Craig, Jeffrey; Albert, Richard; Gupta, Anil; Stai, Jeffrey D.; and Lofgren, Karl M. J., 5,471,478, Cl. 371-10.300.

Guscott, John K., to Aritech Corporation. Event detection system with centralized signal processing and dynamically adjustable detection threshold. 5,471,194, Cl. 340-511.000.

Gusmeroli, Marilena: *See*—
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Meazza, Giovanni; Zanardi, Giampaolo; Garavaglia, Carlo; and Mirenna, Luigi, 5,470,863, Cl. 514-343.000.

Gussert, David A.: *See*—
Griffiths, John M.; Gussert, David A.; and Karls, Michael A., 5,470,263, Cl. 440-75.000.

Gut, Max B. Method and apparatus for supervising access and protecting against unauthorized access in a communication network. 5,471,459, Cl. 370-13.000.

Guth, Reuven. Device for producing streaks in hair. 5,469,873, Cl. 132-270.000.

Gutschmit, Alan, to Alandale Industries, Inc. Debris cleaning apparatus for circular knitting machines and like textile machines. 5,469,718, Cl. 66-168.000.

Guttag, Karl M.: *See*—
Gove, Robert J.; Guttag, Karl M.; Balmer, Keith; and Ing-Simmons, Nicholas K., 5,471,592, Cl. 395-300.030.

Gutteridge, Steven: *See*—
Diner, Bruce A.; Gutteridge, Steven; Peterson, Gary L.; and Wolf, William E., 5,471,053, Cl. 250-228.000.

Guyonvar, Daniel; Mazoyer, Thierry; Sauzade, Jean-Denis; and Ching, Gil, to IMRA Europe SA and Techsonic. Realization process of a distribution network of electric signals, obtained distribution network and piezoelectric motor including such a network. 5,471,108, Cl. 310-323.000.

Gyotoku, Kaoru: *See*—
Sasaki, Tooru; and Gyotoku, Kaoru, 5,471,538, Cl. 381-92.000.

H. C. Starck, Inc.: *See*—
Tripp, Terrance B.; and Shaw, Malcolm, 5,470,525, Cl. 419-36.000.

Haas, Roland: *See*—
Brandenstein, Manfred; Friedrich, Wolfgang; Haas, Roland; Herrmann, Gerhard; and Olschewski, Armin, 5,470,279, Cl. 474-135.000.

Haberman, John P., to Texaco Inc. Positive displacement device to improve placement of cement plugs. 5,469,918, Cl. 166-291.000.

Habermehl, G. Lyle. Screwdriving apparatus for use in driving screws joined together in a strip. 5,469,767, Cl. 81-434.000.

Haddad, Louis C.: *See*—
Hagen, Donald F.; Haddad, Louis C.; Perkins, Robert E.; and Markell, Craig G., 5,470,532, Cl. 422-57.000.

Haeberle, Karl: *See*—
Gulbins, Erich; Haeberle, Karl; Licht, Ulrike; and Wallon, Alexander, 5,470,899, Cl. 524-158.000.
Wallon, Alexander; Auchter, Gerhard; Licht, Ulrike; Haeberle, Karl; and Funhoff, Angelika, 5,470,907, Cl. 524-507.000.

Haessig, Helmut: *See*—
Sitte, Hellmuth; Neumann, Klaus; Edelmann, Ludwig; Haessig, Helmut; Lang, Anton; and Kleber, Heinrich, 5,469,712, Cl. 62-51.100.

Hafezzadeh, Hafez: *See*—
Kuramoto, Roy; Chowhan, Zakauddin T.; Pendleton, Ranal O.; and Hafezzadeh, Hafez, 5,470,580, Cl. 424-464.000.

Hagan Electronics International: *See*—
Hagan, James C., 5,469,974, Cl. 209-652.000.

Hagan, James C., to Hagan Electronics International. Method and apparatus for selectively directing work objects. 5,469,974, Cl. 209-652.000.

Hagen, Donald F.; Haddad, Louis C.; Perkins, Robert E.; and Markell, Craig G., to Minnesota Mining and Manufacturing Company. Composite reactive articles for the determination of cyanide. 5,470,532, Cl. 422-57.000.

Hager, Milton S., to Ball Corporation. Method and apparatus for performing multiple necking operations on a container body. 5,469,729, Cl. 72-379.400.

Hagerman, James G. Bias drive and noise reduction in image projectors. 5,471,255, Cl. 348-761.000.

Hagihara, Masahiro: *See*—
Kobayashi, Kazunari; Omachi, Kenji; Tatsuno, Yutaka; Hagihara, Masahiro; Kidawara, Atsuki; Hara, Tadayoshi; and Yazawa, Nobuyoshi, 5,469,841, Cl. 600-158.000.

Hagiwara, Tsuneyuki, to Nikon Corporation. Defect inspection apparatus of rotary type. 5,471,066, Cl. 250-559.480.

Hahlganss, Günter, to VDO Adolf Schindling AG. Selective control of devices in a motor vehicle. 5,471,389, Cl. 364-424.050.

Hahn, Andreas: *See*—
Knott, Erwin; and Hahn, Andreas, 5,470,211, Cl. 417-477.900.

Hahn, Erwin; Ostertag, Werner; and Seybold, Guenther, to BASF Aktiengesellschaft. Fluorescent pigments. 5,470,502, Cl. 252-301.350.

Haijima, Hideki; and Okuda, Shinji, to Sony Corporation. Printing sheet making and printing apparatus. 5,469,789, Cl. 101-477.000.

Hakala, Harri; and Aulanko, Esko, to Kone Oy. Traction sheave elevator with drive machine below. 5,469,937, Cl. 187-266.000.

Halasa, Adel F.: *See*—
Zanzig, David J.; Sandstrom, Paul H.; Hubbell, Joseph K.; Hsu, Wen-Liang; Halasa, Adel F.; and Verthe, John J. A., 5,470,929, Cl. 526-181.000.

Hall, Allen L.: *See*—
Oester, Dean A.; Hall, Allen L.; and Vesper, Stephen J., 5,470,741, Cl. 435-254.100.

Hall, Bonnie J.: *See*—
Corless, Ann M.; Deckner, George E.; Hall, Bonnie J.; and Listro, Joseph A., 5,470,884, Cl. 514-714.000.

Hall, Edward F. H.: *See*—
Freedman, Philip A.; and Hall, Edward F. H., 5,471,059, Cl. 250-299.000.

Hall, James T.; O'Connor, Arthur B.; Raffensperger, Susan M.; and Levine, Seymour, to Northrop Grumman Corporation. Holographic laser scanner and rangefinder. 5,471,326, Cl. 359-15.000.

Hall, John L. Apparatus for storing and sterilizing bio-hazardous waste. 5,470,546, Cl. 422-292.000.

Hall, Raplh F.: *See*—
Dixon, James S.; Hall, Raplh F.; Marshall, Lisa A.; Chilton, Floyd H., III; Mayer, Ruth J.; and Winkler, James D., 5,470,882, Cl. 514-596.000.

Hall, Robin G.: *See*—
Willey, Alan D.; and Hall, Robin G., 5,470,510, Cl. 252-546.000.

Halliburton Company: *See*—
Moake, Gordon, 5,469,736, Cl. 73-151.000.

Halstead, Linden T., to Texas Instruments Incorporated. No fixture method to cure die attach for bonding IC dies to substrates. 5,471,017, Cl. 174-260.000.

Hama, Yoshinori: *See*—
Nakamura, Hiroyuki; Hama, Yoshinori; Arikita, Shuhei; and Ikeshita, Shingo, 5,470,374, Cl. 75-348.000.

Hamada, Koji, to NEC Corporation. Method for manufacturing thin film transistor with short hydrogen passivation time. 5,470,763, Cl. 437-21.000.

Hamada, Yuichi: *See*—
Kashida, Meguru; Shirasaki, Toru; Hamada, Yuichi; Nagata, Yoshihiko; Kawaguchi, Sakae; and Kubota, Yoshihiro, 5,470,621, Cl. 428-14.000.

Hämäläinen, Eino. Device for portioning a liquid substance. 5,469,991, Cl. 222-188.000.

Hamamatsu Photonics K.K.: *See*—
Murakami, Tadayoshi; and Takahashi, Hideo, 5,471,076, Cl. 257-184.000.
Niigaki, Minoru; Kinoshita, Katsuyuki; Hirohata, Toru; Ihara, Tuneo; Yamada, Masami; Asakura, Norio; Negi, Yasuharu; and Suzuki, Tomoko, 5,471,051, Cl. 250-214.0VT.

Hamanaka, Nobuyuki: *See*—
Hayashi, Akio; Hiramatsu, Makoto; and Hamanaka, Nobuyuki, 5,470,956, Cl. 530-388.900.

Hamano, Hisashi; Hosoi, Masahiro; Kobayshi, Ieyasu; and Saeki, Yasuhiro, to Teijin, Ltd. Biaxially oriented unidirectionally long polyethylene-2, 6-naphthalenedicarboxylate film. 5,470,665, Cl. 428-480.000.

Hamlett, Mark A.: *See*—

Sharpe, Claude A.; Hurta, Dwaine S.; Hamlett, Mark A.; and Froschermeier, Guenther, 5,471,212, Cl. 342-51.000.
Hammel, Sherry E.: *See*—
Davis, John S.; Gong, Kai F.; and Hammel, Sherry E., 5,471,434, Cl. 367-124.000.
Hammell, Sherry E.; Gong, Kai F.; Jackson, Neil A.; Keay, Kathleen D.; and MacDonald, John F., to United States of America, Navy. System and method for rapidly tracking highly dynamic vehicles. 5,471,433, Cl. 367-118.000.
Hammers, David E.; and Conway, Michael D., to ITT Corporation. Integrated adaptive array antenna. 5,471,220, Cl. 342-372.000.
Hamon, Gilles: *See*—
Fortin, Michel; Frechet, Daniel; Hamon, Gilles; Jouquey, Simone; and Vevert, Jean-Paul, 5,470,867, Cl. 514-393.000.
Hamon, Olivier; and Oppenlander, Andréas, to Thomson Tubes Electroniques. Plasma panel with low-scatter screen. 5,471,112, Cl. 313-485.000.
Hampsten, Russ: *See*—
Sells, Chris; and Hampsten, Russ, 5,471,522, Cl. 379-97.000.
Hanada, Hisao: *See*—
Taira, Toshimitsu; Ohnuma, Masao; Hanada, Hisao; Aoki, Teruo; and Kuhara, Tetsuro, 5,470,048, Cl. 266-236.000.
Hancock, Lloyd H.: *See*—
Barnes, Vernon B.; Wilkinson, Donald R.; Hancock, Lloyd H.; Oesterling, Erwin; Schlisio, Siegfried; and Hinz, Werner, 5,469,871, Cl. 131-194.000.
Hand, Christopher W.: *See*—
El Shami, A. Said; Hand, Christopher W.; Miller, Susan A.; and Moore, Robert A., 5,470,713, Cl. 435-7.720.
Handa, Tokuhiko: *See*—
Tominaga, Junji; Haratani, Susumu; Handa, Tokuhiko; and Inaba, Ryo, 5,470,628, Cl. 428-64.400.
Häni, Beat: *See*—
Reh, Lothar; Tesch, Marc; Häni, Beat; and Ruf, Arthur, 5,469,994, Cl. 222-630.000.
Hanley, Peter, to Oxford Instruments Limited. Magnetic field generating assembly. 5,471,140, Cl. 324-303.000.
Hanna, Junichi: *See*—
Ishihara, Shunichi; Hanna, Junichi; Shimizu, Isamu; and Hirooka, Masaaki, 5,470,389, Cl. 118-719.000.
Hannon, Richard H.: *See*—
Denny, Bradley J.; and Hannon, Richard H., 5,469,627, Cl. 33-508.000.
Hansen, Arne. Clamp means for joining objects together. 5,469,606, Cl. 24-662.000.
Hansen, Jens; Madsen, Benny; and Petersen, Jens T., to National Semiconductor Corporation. Data signal comparation with self-adjusting threshold. 5,471,187, Cl. 340-146.200.
Hansen, Ove T.: *See*—
Martensen, Lars; Hansen, Ove T.; Moeller, Henry M.; and Jepsen, Hardy, 5,469,776, Cl. 92-170.100.
Hanyu, Tsuneo: *See*—
Mizuguchi, Katsuhiko; Teshima, Shin'ichi; and Hanyu, Tsuneo, 5,470,715, Cl. 435-22.000.
Hao-Chung, Hsia; Cheau, Tei-Chih; and Tsai, Shang-Lin, to Industrial Technology Research Institute. Method for separating cobalt, nickel, and aluminum ions in sulfuric acid aqueous solutions and the extractant compositions used therein. 5,470,553, Cl. 423-139.000.
Hara, Fumio; Fujimura, Akira; Hara, Yoshihisa; and Sakanushi, Masahiro, to Honda Giken Kogyo Kabushiki Kaisha. Control system for internal combustion engines. 5,469,833, Cl. 123-698.000.
Hara, Tadayoshi: *See*—
Kobayashi, Kazunari; Omachi, Kenji; Tatsuno, Yutaka; Hagihara, Masahiro; Kidawara, Atsuki; Hara, Tadayoshi; and Yazawa, Nobuyoshi, 5,469,841, Cl. 600-158.000.
Hara, Yoshihisa: *See*—
Hara, Fumio; Fujimura, Akira; Hara, Yoshihisa; and Sakanushi, Masahiro, 5,469,833, Cl. 123-698.000.
Hara, Yukihiko: *See*—
Hayakawa, Fumiko; Ando, Takashi; Kimura, Takahide; and Hara, Yukihiko, 5,470,565, Cl. 424-52.000.
Harada, Fumiaki: *See*—
Nagayama, Masato; Inuyama, Seiji; Sawada, Kenji; Ohshita, Makoto; and Harada, Fumiaki, 5,471,290, Cl. 355-309.000.
Harada, Setsuo; Funabashi, Yasunori; Inatomi, Nobuhiro; Tanayama, Shigeharu; and Tanida, Seiichi, to Takeda Chemical Ind., Ltd.; and Kitasato Kenkyushio. 14 and/or 15-hydroxy 6,9 hemiacetal erythromycin derivatives. 5,470,961, Cl. 536-7.400.
Harada, Yoshinori: *See*—
Sasaki, Yuji; and Harada, Yoshinori, 5,470,707, Cl. 435-6.000.
Haraga, Hisato: *See*—
Tsutsui, Osamu; Haraga, Hisato; Makita, Atsuo; and Takeuchi, Hirofumi, 5,469,586, Cl. 4-4515.000.
Haraguchi, Koichiro: *See*—
Nonaka, Yoshiya; Aoyagi, Yoshio; Abe, Hiroyuki; Bradshaw, Alex; Kiyoura, Kazuhiro; Kato, Seiji; and Haraguchi, Koichiro, 5,471,441, Cl. 369-32.000.
Haranosono, Takao: *See*—
Honda, Tosiyuki; and Haranosono, Takao, 5,471,369, Cl. 361-813.000.
Haratani, Susumu: *See*—
Tominaga, Junji; Haratani, Susumu; Handa, Tokuhiko; and Inaba, Ryo, 5,470,628, Cl. 428-64.400.
Harayama, Akira: *See*—
Miyazaki, Satomichi; Harayama, Akira; Kazama, Nobuyuki; and Ishida, Masao, 5,469,616, Cl. 29-888.074.
Hardman, David J.: *See*—
Bull, Alan; Hardman, David J.; Stubbs, Brian M.; and Sallis, Paul J., 5,470,742, Cl. 435-262.000.
Harley-Davidson, Inc.: *See*—
Wiers, Paul C., 5,469,930, Cl. 180-227.000.
Harmon, Charles S., to Hoffmann-La Roche Inc. Method of promoting hair growth. 5,470,861, Cl. 514-337.000.
Harmsworth, Patrick D.: *See*—
Jennett, Timothy A.; Harmsworth, Patrick D.; Martin, Dave; and Ellison, Anthony W., 5,470,446, Cl. 204-177.000.
Harnischfeger Corporation: *See*—
Profio, Richard L., 5,469,647, Cl. 37-398.000.
Harrell, James L.; and Hotard, James S., Jr. Macroencapsulation of hazardous waste. 5,471,065, Cl. 250-506.100.
Harrington, Donald G.: *See*—
Wyatt-Mair, Gavin F.; and Harrington, Donald G., 5,470,405, Cl. 148-551.000.
Harrington, Gary L., to AT&T Global Information Solutions Company; and Hyundai Electronics America. Apparatus for arbitrating for a high speed direct memory access bus. 5,471,639, Cl. 395-842.000.
Harris, Bernard; and Bozych, Dennis E., to Rexnord Corporation. Method of making flat stock having a bearing surface and the flat stock made thereby. 5,470,414, Cl. 156-174.000.
Harris, Bradley D.: *See*—
Elqadah, Wael S.; and Harris, Bradley D., 5,470,097, Cl. 280-728.300.
Harris Corporation: *See*—
King, Ken R.; Riemer, David W.; and Cotreau, Gerald M., 5,471,131, Cl. 323-314.000.
Harris, George W., Jr.: *See*—
Mehl, Thomas L., Sr.; Harris, George W., Jr.; and Zaias, Nardo, 5,470,332, Cl. 606-36.000.
Harris, Ira M., to Daige, Inc. Liquid adhesive applicator means and associated method. 5,470,386, Cl. 118-244.000.
Harris, Kenneth R., to Imtran Industries, Inc. Enclosed ink cup with improved seal. 5,469,786, Cl. 101-163.000.
Harris, Ralph E.: *See*—
Smalley, Anthony J.; Gerlach, C. Richard; and Harris, Ralph E., 5,471,400, Cl. 364-509.000.
Harris, Robert F.: *See*—
Schmidt, Donald L.; Harris, Robert F.; and Coburn, Charles, 5,470,908, Cl. 524-520.000.
Harris, Vincent G.: *See*—
Edelstein, Alan S.; Kaatz, Forrest H.; and Harris, Vincent G., 5,470,373, Cl. 75-255.000.
Harrison, Howard R.; and Brown, Jeffrey R. Water cooler. 5,469,708, Cl. 62-3.640.
Harrogate, Ian W. R.; Taylor, David H.; Griffin, Arthur B.; and Tuson, David W., to Rolls-Royce plc. Sealing structures for gas turbine engines. 5,470,198, Cl. 415-115.000.
Hartley, E. Dale; and Hartley, F. Scott, to Shurflo Pump Manufacturing Co. Offset reciprocable device. 5,470,209, Cl. 417-401.000.
Hartley, F. Scott: *See*—
Hartley, E. Dale; and Hartley, F. Scott, 5,470,209, Cl. 417-401.000.
Hartnack, Wolfgang, to Deutsche Thomson-Brandt GmbH. Electronic picture reproduction device. 5,471,247, Cl. 348-402.000.
Harvey, Anthony P., to GEC Marconi Systems PTY Limited ACN 003 890 515. Vibration isolation modules (VIM) for towed array streamers. 5,471,436, Cl. 367-154.000.
Harwood, H. James; and Goodrich, Stephen D., to University of Akron. Free radical copper(II)-enolate polymerization initiators. 5,470,928, Cl. 526-172.000.
Hasan, Syed R.: *See*—
Rathgeber, Juergen O.; Kish, Frederick A.; Hasan, Syed R.; and Hindman, Craig A., 5,469,671, Cl. 52-58.000.
Hasbro, Inc.: *See*—
Busam, Edward P., 5,470,267, Cl. 446-22.000.
Hasbun, Robert N.; and Wells, Stephen, to Intel Corporation. Method for locating sector data in a memory disk by examining a plurality of headers near an initial pointer. 5,471,604, Cl. 395-404.000.
Hasegawa, Makoto: *See*—
Nagase, Takayuki; Yoshida, Yasuhiko; Hasegawa, Makoto; and Tani, Arata, 5,471,285, Cl. 355-219.000.
Hashemi, Seyed H.: *See*—
Sefidvash, Khorvash; and Hashemi, Seyed H., 5,471,586, Cl. 395-284.000.
Hashima, Hidekazu: *See*—
Tanigami, Yoshinori; Tabata, Takahiro; Hashima, Hidekazu; and Konishi, Akio, 5,470,506, Cl. 252-518.000.
Hashimoto, Eiji: *See*—
Iwai, Kiyoshi; Kondo, Kimio; Sezaki, Yoshiaki; Fukata, Masatoshi; Hashimoto, Eiji; and Yoshioka, Toshio, 5,469,799, Cl. 114-74.00A.
Hashizume, Yoshinori: *See*—
Nishikawa, Yukinobu; Hashizume, Yoshinori; and Kimura, Takako, 5,470,390, Cl. 118-719.000.
Haspeslagh, Johan J. G.: *See*—
De Langhe, Marc R. F.; Reusens, Peter P. F.; Haspeslagh, Johan J. G.; and Van Hoogenbemt, Stefaan M. A., 5,471,511, Cl. 375-376.000.

Hassler, Beth A.; and Donders, Adrianus P., to Medtronic, Inc. Implantable medical device with multi-layered ceramic enclosure. 5,470,345, Cl. 607-36.000.

Hatakeyama, Hideyuki: *See*—
Ohtsuka, Yasumasa; Tomoyuki, Yohji; and Hatakeyama, Hideyuki, 5,471,288, Cl. 355-285.000.

Hatanaka, Katsunori: *See*—
Oguchi, Takahiro; Hatanaka, Katsunori; Sakai, Kunihiro; Yamano, Akihiko; and Shido, Shunichi, 5,471,458, Cl. 369-126.000.

Hatano, Masaru: *See*—
Asakawa, Yoshiyuki; Yamamura, Kazuyoshi; Muraoka, Toshinori; and Hatano, Masaru, 5,470,052, Cl. 271-118.000.

Hatch Associates Ltd.: *See*—
Kelsall, John T.; and Gerritsen, Theodorus A., 5,471,020, Cl. 181-224.000.

Hatch, Ronald R.; and Knight, Jerry E., to Magnavox Electronic Systems Company. Method and apparatus for smoothing code measurements in a global positioning system receiver. 5,471,217, Cl. 342-357.000.

Hatoh, Kazuhito: *See*—
Gamou, Takaharu; Taniguchi, Noboru; Niikura, Junji; Hatoh, Kazuhito; Yasumoto, Eiichi; and Adachi, Kinichi, 5,469,913, Cl. 165-104.120.
Yasumoto, Eiichi; Niikura, Junji; Hatoh, Kazuhito; and Gamo, Takaharu, 5,470,670, Cl. 429-20.000.

Hattori, Tadashi: *See*—
Ohara, Fumio; Hattori, Tadashi; Ito, Nobuei; Hattori, Yutaka; and Arai, Masumi, 5,470,618, Cl. 427-529.000.

Hattori, Yutaka: *See*—
Ohara, Fumio; Hattori, Tadashi; Ito, Nobuei; Hattori, Yutaka; and Arai, Masumi, 5,470,618, Cl. 427-529.000.

Hatzikos, George H.: *See*—
Degnan, Thomas F.; Fung, Anthony S.; Hatzikos, George H.; Kennedy, Gordon J.; and Kowalski, Jocelyn A., 5,470,810, Cl. 502-64.000.

Hauck, Lane T. Software development system and method of using same. 5,471,636, Cl. 395-800.000.

Hauf, Barry W.; Jones, Stephen K.; Johnson, Joseph E., Jr.; and Paquin, Roger L., to Monsanto Company. Dispensing system. 5,469,993, Cl. 222-383.300.

Hauptmann, Edward G.: *See*—
Modell, Michael; Hauptmann, Edward G.; and Gairns, Stuart A., 5,470,481, Cl. 210-652.000.

Hauser Chemical Research, Inc.: *See*—
Hauser, Ray L.; Zheng, Bolin; Renbarger, Michael; and Lange, Mark A., 5,470,820, Cl. 505-472.000.

Hauser, Ray L.; Zheng, Bolin; Renbarger, Michael; and Lange, Mark A., to Hauser Chemical Research, Inc. Electroplating of superconductor elements. 5,470,820, Cl. 505-472.000.

Hawaiian Sugar Planters' Association: *See*—
Sachinvala, Navzer D.; Ju, Redford F.; and Litt, Morton H., 5,470,931, Cl. 526-238.230.

Hawk, Kenneth C.; Capper, Harry M.; and Robertson, James W., to Whitaker Corporation, The. Bridging terminal block. 5,470,250, Cl. 439-409.000.

Hawkins, David: *See*—
Leach, Burr L.; and Hawkins, David, 5,470,609, Cl. 427-140.000.

Hawkins, Michael R., to Standard Havens, Inc. Countercurrent drum mixer asphalt plant. 5,470,146, Cl. 366-25.000.

Hawley, Martin C.; Wei, Jianghua; Adegbite, Valerie; and Lin, Min, to Board of Trustees operating Michigan State University. Improved microwave pultrusion apparatus and method of use. 5,470,423, Cl. 156-166.000.

Hayabuchi, Masahiro: *See*—
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Kasuya, Satoru; Sugiura, Nobutada; and Nishida, Masaaki, 5,470,284, Cl. 475-204.000.

Hayakawa, Fumiko; Ando, Takashi; Kimura, Takahide; and Hara, Yukihiko, to Mitsui Norin Co., Ltd. Composition for strengthening acid resistancy of teeth. 5,470,565, Cl. 424-52.000.

Hayama, Takashi: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; and Yano, Mitsuo, 5,470,833, Cl. 514-18.000.

Hayami, Hiroshi, to Sumitomo Electric Industries, Ltd. Heat-resistant, high-voltage lead wire for direct current. 5,470,657, Cl. 428-373.000.

Hayasaka, Hideki: *See*—
Satake, Toshimi; Takano, Toshiyuki; Hayasaka, Hideki; Uehori, Yukiko; and Nagai, Tomoaki, 5,470,816, Cl. 503-201.000.

Hayashi, Akio; Hiramatsu, Makoto; and Hamanaka, Nobuyuki, to Ono Pharmaceutical Co., Ltd. Antibodies for mevalonic acid and methods for immunological determination of mevalonic acid by using them. 5,470,956, Cl. 530-388.900.

Hayashi, Koji; and Bisaiji, Takashi, to Ricoh Company, Ltd. Deposited toner quantity measuring method and image forming apparatus using the same. 5,471,282, Cl. 355-203.000.

Hayashi, Nobuaki: *See*—
Ueno, Takumi; Shiraishi, Hiroshi; Hayashi, Nobuaki; Fukuma, Emiko; and Tadano, Keiko, 5,470,996, Cl. 558-46.000.

Hayashi, Toshio; Arimoto, Shinobu; Yoshinaga, Kazuo; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, to Canon Kabushiki Kaisha. Image reading apparatus and copying apparatus having means for radiating visible and non-visible light, image processing apparatus having means for discriminating a specific orginal and image processing method therefor. 5,471,281, Cl. 155-201.000.

Hayashida, Scott H.: *See*—
Akkawi, Isam W.; Hayashida, Scott H.; Ladha, Vivek; and Rudy, John E., 5,471,589, Cl. 395-800.000.

Hayasi, Shigeo: *See*—
Nakamura, Yoshinori; Sam, Huy; Fujiwara, Yoshio; Nagura, Toshikazu; Hayasi, Shigeo; and Kusaka, Yukio, 5,470,817, Cl. 503-227.000.

Hayden, Richard A.; and Matviya, Thomas M., to Calgon Carbon Corporation. Method for measuring the relative catalytic activity of carbonaceous chars. 5,470,748, Cl. 436-37.000.

Hayes, Stewart J.; Pearcey, Richard; and White, Philip T., to Trojan Technologies, Inc. Fluid disinfection system. 5,471,063, Cl. 250-436.000.

Hayes, William J., to Shandon, Inc. Large cytology sample chamber for distributing material onto a microscope slide. 5,470,758, Cl. 436-177.000.

Haytner, Avi: *See*—
Haytner, Oren; and Haytner, Avi, 5,469,897, Cl. 141-27.000.

Haytner, Oren; and Haytner, Avi. Apparatus for filling grease guns. 5,469,897, Cl. 141-27.000.

He, Shuzhen: *See*—
Chen, Kejiong, 5,471,506, Cl. 375-242.000.

Heaman, Norman L. Pipe bending machine. 5,469,730, Cl. 72-389.000.

Hearn, Lynn M.: *See*—
Choy, Clement K.; Argo, Brian P.; Brodbeck, Kevin J.; and Hearn, Lynn M., 5,470,499, Cl. 252-99.000.

Hearn, Milton T. W.: *See*—
De Kretser, David M.; Burger, Henry G.; Hearn, Milton T. W.; Milne-Robertson, David M.; Wettenhall, Richard E. H.; McLachlan, Robert I.; and De Vos, Fiona, 5,470,826, Cl. 514-8.000.

Hearne, David C., Jr. Sugar cane planter. 5,469,797, Cl. 111-200.000.

Heath Custom Press, Inc.: *See*—
Turner, Michael R.; and Miller, Leslie L., 5,469,787, Cl. 101-211.000.

Heaton, Mark T.: *See*—
Banner, Alvin C.; and Heaton, Mark T., 5,470,025, Cl. 242-7.030.

Heckel, Robert J.: *See*—
Gier, Achim R.; Bonduel, Pascal; Heckel, Robert J.; and Fin, Enrico, 5,469,656, Cl. 49-28.000.

Heeger, Alan J.: *See*—
Smith, Paul; Heeger, Alan J.; Cao, Yong; Chiang, Jin-Chih; and Andreatta, Alejandro, 5,470,505, Cl. 252-500.000.

Hefner, Robert E., Jr.; and Earls, Jimmy D., to Dow Chemical Company, The. Products resulting from polymerizing or curing polycyanates containing mesogenic moieties as lateral substituents. 5,470,946, Cl. 528-422.000.

Heim, Gunther; and Kroll, Bruno, to YMOS Aktiengesellschaft Industrieprodukte. Vehicle door. 5,469,668, Cl. 49-502.000.

Heimberg, Wolfgang; Hellmich, Wolfram; Kogl, Franz; and Malatinszky, Paul, to Ficht GmbH. Fuel injection device according to the solid-state energy storage principle for internal combustion engines. 5,469,828, Cl. 123-497.000.

Hein, Bruce T., to MagneTek Century Electric, Inc. High efficiency electrical machine with minimized material content. 5,471,101, Cl. 310-42.000.

Heino, Markku: *See*—
Parri, Mauri; and Heino, Markku, 5,470,192, Cl. 414-741.000.

Heisig, Ullrich: *See*—
Goedicke, Klaus; Metzner, Christoph; Schmidt, Joerg; Heisig, Ullrich; Schiller, Siegfried; and Reschke, Jonathan, 5,470,388, Cl. 118-716.000.

Helgren, R. Hayes; and Kramer, David E., to Abbott Laboratories. Pointed adapter for blunt entry device. 5,470,327, Cl. 604-411.000.

Hellmich, Wolfram: *See*—
Heimberg, Wolfgang; Hellmich, Wolfram; Kogl, Franz; and Malatinszky, Paul, 5,469,828, Cl. 123-497.000.

Helmstetter, Richard C.: *See*—
Schmidt, Glenn H.; and Helmstetter, Richard C., 5,470,068, Cl. 273-167.00A.
Schmidt, Glenn H.; and Helmstetter, Richard C., 5,470,069, Cl. 273-167.00A.

Helting, Torsten B.; Drevin, Hakan; and Nuns, Michael F., to Pharmacia Genetic Engineering Inc. HIV antibody assays comprising p24-gp41 chimeric antigens. 5,470,720, Cl. 435-69.300.

Henderson, Daniel L.: *See*—
Gudat, Adam J.; and Henderson, Daniel L., 5,471,391, Cl. 364-424.070.

Henderson, D. Austin, Jr.: *See*—
Smith, Randall B.; Tang, John C.; and Henderson, D. Austin, Jr., 5,471,571, Cl. 395-137.000.

Henderson, Thomas A.: *See*—
Thieret, Tracy E.; Henderson, Thomas A.; and Butler, Michael A., 5,471,313, Cl. 358-296.000.

Hendrich, Randy: *See*—
Byczek, Roger W.; Hendrich, Randy; and Ashman, John J., 5,470,237, Cl. 439-76.100.

Hendrickson, David L. Wind speed indicator. 5,469,738, Cl. 73-170.070.

Hendrickson, Dennis L.; Dimmitt, Dan C.; Williams, Mark S.; Skultety, Paul F.; and Baltezor, Michael J., to Carderm Capital L.P. Diltiazem formulation. 5,470,584, Cl. 424-490.000.

Heng, Henry H. Q.; and Tsui, Lap-Chee, to HSC Research & Development Ltd. Partnership. Gene mapping by hybridisation to free chromatin. 5,470,709, Cl. 435-6.000.

Henkel Corporation: *See*—
Kordosky, Gary A.; and Olafson, Stephen M., 5,470,552, Cl. 423-139.000.
Oester, Dean A.; Hall, Allen L.; and Vesper, Stephen J., 5,470,741, Cl. 435-254.100.

Henkel Kommanditgesellschaft auf Aktien: *See*—

Daute, Peter; Wegener, Ingo; Meffert, Alfred; and Berger, Faize, 5,470,493, Cl. 252-8.700.
Gerke, Thomas, 5,470,989, Cl. 549-458.000.
Henningsson, Göran; and Andersson, Hans, to Ludvig Svensson International B.V. Cloth hanger clip. 5,469,607, Cl. 24-716.000.
Henson, James A.; Richmond, Scott E.; and Akin, William R., Jr., to Quantum Corporation. Glitchless frequency-adjustable ring oscillator. 5,471,176, Cl. 331-1.00A.
Herb, Paul C.: *See*—
Chilton, John B.; Gevaras, Peter H.; Herb, Paul C.; and Wellen, Thomas W., 5,469,971, Cl. 209-235.000.
Herbert, Jean-Marc: *See*—
Bernat, André; Herbert, Jean-Marc; and Valette, Gérard, 5,470,855, Cl. 514-236.800.
Herbert, William G.: *See*—
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Masialski, Henry T., 5,470,271, Cl. 451-55.000.
Herbst, Stephen J.: *See*—
Prager, Kenneth E.; Herbst, Stephen J.; Sisneros, Jerry N.; Wootan, John J.; and Gleichman, Douglas M., 5,471,240, Cl. 348-164.000.
Hercules Incorporated: *See*—
Bull, Alan; Hardman, David J.; Stubbs, Brian M.; and Sallis, Paul J., 5,470,742, Cl. 435-262.000.
Modrak, James P., 5,470,640, Cl. 428-171.000.
Hergesheimer, Peter D., to Hughes Aircraft Company. Multiple remoted weapon alerting and cueing system. 5,471,213, Cl. 342-67.000.
Herlyn, Meenhard; and Rodeck, Ulrich, to Wistar Institute, The. Method of treating human EGF receptor-expressing gliomas using radiolabeled EGF receptor-specific MAB 425. 5,470,571, Cl. 424-1.490.
Herman, Bruce J.: *See*—
Gal, George; Anderson, William W.; Herman, Bruce J.; and Shough, Dean M., 5,471,345, Cl. 359-619.000.
Hernan, Lynn J.: *See*—
Fuhrman, Bradley P.; Flaim, Stephen F.; Hernan, Lynn J.; Nesti, Frances D.; Papo, Michele C.; and Steinhorn, David M., 5,470,885, Cl. 514-743.000.
Herold, Robert A.: *See*—
Allen, William E.; Bitar, Ali A.; and Herold, Robert A., 5,471,147, Cl. 324-635.000.
Herring, James M., Jr.; and Greve, Bruce N., to Budd Company, The. Bonding method using mixture of adhesive and non-compressible beads. 5,470,416, Cl. 156-196.000.
Herrmann, Gerhard: *See*—
Brandenstein, Manfred; Friedrich, Wolfgang; Haas, Roland; Herrmann, Gerhard; and Olschewski, Armin, 5,470,279, Cl. 474-135.000.
Herrmann, Klaus: *See*—
Krauss, Guenther; and Herrmann, Klaus, 5,470,302, Cl. 601-2.000.
Herron, Susan L., to Schlumberger Technology Corporation. Method and apparatus for determining elemental concentrations for γ ray spectroscopy tools. 5,471,057, Cl. 250-269.600.
Hershberger, Troy W.; and Booth, Robert E., Jr., to Biomet Inc. Force sensing apparatus and method for orthopaedic joint reconstruction. 5,470,354, Cl. 623-20.000.
Hervin, Mark W.: *See*—
Quattromani, Marc A.; Garibay, Raul A., Jr.; Patwa, Nital; and Hervin, Mark W., 5,471,598, Cl. 395-449.000.
Hess, Garry C.; Leung, Barry S.; and Wilson, Timothy J., to Motorola, Inc. Method for determining communciation resource handoffs. 5,471,670, Cl. 455-33.200.
Hess, Harald, to Sulzer-Escher Wyss GmbH. Calender assembly including an additional roll displaced into the path of the web of material. 5,469,784, Cl. 100-93.0RP.
Hettlage, Eckart; and Ruff, Gerd, to Teldix GmbH. Coaxial switch. 5,471,183, Cl. 335-4.000.
Heuschen, Jean M. H.: *See*—
van der Meer, Roelof; Pratt, Charles F.; de Munck, Johannes W. J.; and Heuschen, Jean M. H., 5,470,913, Cl. 525-66.000.
Hewlett-Packard: *See*—
McBride, John G., 5,471,640, Cl. 395-842.000.
Hewlett-Packard Company: *See*—
Childers, Winthrop D., 5,471,163, Cl. 327-525.000.
DeLano, Eric R., 5,471,602, Cl. 395-445.000.
Lipschutz, David, 5,469,851, Cl. 128-661.010.
Risch, Tore J. M., 5,471,629, Cl. 395-800.000.
Rogler, Dietrich, 5,469,844, Cl. 128-630.000.
Staats, Louis T., III; Bristow, James A.; Noronha, Anil P. F.; and Murphy, Gregory E., 5,470,487, Cl. 210-767.000.
Hewlett-Packard Corporation: *See*—
Osborne, Jeffrey C., 5,469,858, Cl. 128-710.000.
Hewuse, Monte P. Oil filter removal aid. 5,469,935, Cl. 184-1.500.
Hexcel Corporation: *See*—
Darfler, Stephen C., 5,470,633, Cl. 428-116.000.
Hibino, Hiroki: *See*—
Tanii, Yoshiyuki; Nakamura, Motokazu; Nagayama, Yoshikatsu; Morita, Katsuaki; Hibino, Hiroki; and Suzuki, Akira, 5,469,840, Cl. 600-117.000.
Hickernell, Thomas S., to Motorola, Inc. Ladder filter and method for producing conjugately matched impedance. 5,471,178, Cl. 333-193.000.
Hieda, Teruo, to Canon Kabushiki Kaisha. Image sensing method and apparatus for producing a color video signal and luminance video signal. 5,471,241, Cl. 348-222.000.
Hiei, Futoshi: *See*—
Ikeda, Masao; Ito, Satoshi; Iochi, Yoshino; Miyajima, Takao; Ozawa, Masafumi; Akimoto, Katsuhiro; Ishibash, Akira; and Hiei, Futoshi, 5,471,067, Cl. 257-14.000.
Higaki, Naoshi, to Fujitsu Limited. Sense amplifier including comparator. 5,471,160, Cl. 327-51.000.
Higeta Shoyu Co., Ltd.: *See*—
Tanaka, Yasushi; Tojo, Takashi; Uchida, Kazuhiko; Uno, Jun; Uchida, Yasushi; and Shida, Osamu, 5,470,827, Cl. 514-11.000.
Higgins, Ronald; and Smith, Allan F., to Precision Shooting Equipment, Inc. Archery bow with tilting and translating grip. 5,469,834, Cl. 124-88.000.
Highland Supply Corporation: *See*—
Weder, Donald E., 5,470,620, Cl. 428-4.000.
Higuchi, Shigemitsu: *See*—
Fujita, Kouji; and Higuchi, Shigemitsu, 5,471,352, Cl. 360-72.200.
Higuchi, Tetsuo: *See*—
Ikegami, Masaaki; and Higuchi, Tetsuo, 5,470,764, Cl. 437-24.000.
Hikami, Toshiya: *See*—
Negami, Shoichi; Hikami, Toshiya; Nishikawa, Shigeaki; and Murata, Matsue, 5,471,545, Cl. 385-1.000.
Hiki, Susumu: *See*—
Nakamura, Hisashi; Nagai, Yasutaka; and Hiki, Susumu, 5,469,852, Cl. 128-662.060.
Hikosaka, Yukinobu, to Fujitsu Limited. Method and apparatus for measuring electron density of plasma. 5,471,115, Cl. 315-111.210.
Hilchie, Robert. Slider puzzle. 5,470,065, Cl. 273-155.000.
Hilgenfeldt, Eckhard: *See*—
Schermann, Walter; Miller, Dennis; Hilgenfeldt, Eckhard; and Böhme-Kovac, Jozef, 5,470,383, Cl. 106-170.000.
Hilger, Jeff H., to Koala Corporation. Foldable infant seat cradle and support stand. 5,470,039, Cl. 248-164.000.
Hill, John H.; Mooberry, Randall L.; and Schartman, Daniel J., to Caterpillar Inc. Brake assembly having a dump valve. 5,469,943, Cl. 188-264.00F.
Hill, Larry W., Jr. Fishing equipment lanyard. 5,469,651, Cl. 43-25.000.
Hill, Peter: *See*—
Howe, Wayne; Silver, Ed; Bailey, Kim; Shih, Jerry; Morel, Kitty; Hill, Peter; Addison, Cathy; Woodring, Larry; and Malik, Dale, 5,471,519, Cl. 379-67.000.
Hill, Philip N. C.; and Randall, Bruce W., to Solid State Logic Limited. Detecting scene changes. 5,471,239, Cl. 348-155.000.
Hill, Shannon Q.: *See*—
McClure, R. Bruce; Lawler, Christopher P.; and Hill, Shannon Q., 5,471,472, Cl. 370-85.130.
Hillebrenner, H. William, to American Sterilizer Company. System for sterilization of objects. 5,470,548, Cl. 422-295.000.
Hillman, Michael J.; Jacoby, Bruce E.; and Barbosa, Rui M., to Wheaton Inc. Graphical interface driven injection blow molding apparatus. 5,470,218, Cl. 425-144.000.
Hillmann, Reinhart, to SKF GmbH. Cage guide for rolling bearings, in particular for axial cylindrical roller bearings. 5,470,159, Cl. 384-623.000.
Hilsbos, Ruth A.: *See*—
Arnett, Jeffery D.; Gately, Nicholas V.; Grulke, David H.; Hilsbos, Ruth A.; and Sertic, James L., 5,470,305, Cl. 601-161.000.
Hindman, Craig A.: *See*—
Rathgeber, Juergen O.; Kish, Frederick A.; Hasan, Syed R.; and Hindman, Craig A., 5,469,671, Cl. 52-58.000.
Hines, Charles P., Jr., to MascoTech Automotive Systems Group, Inc. Retractable hardtop vehicle roof. 5,470,126, Cl. 296-219.000.
Hino, Harumichi: *See*—
Kawata, Yutaka; Ebe, Yoichi; Hino, Harumichi; and Kawai, Hidenobu, 5,469,931, Cl. 180-379.000.
Hinton, Glenn J.: *See*—
Colwell, Robert P.; Glew, Andrew F.; Papworth, David B.; Hinton, Glenn J.; and Clift, David W., 5,471,633, Cl. 395-800.000.
Hinz, Werner: *See*—
Barnes, Vernon B.; Wilkinson, Donald R.; Hancock, Lloyd H.; Oesterling, Erwin; Schlisio, Siegfried; and Hinz, Werner, 5,469,871, Cl. 131-194.000.
Hipeaux, Jean-Claude: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; Marchand, Pierre; Dixmier, Francoise; and Prigent, Monique, 5,470,495, Cl. 252-18.000.
Hipps, Michael: *See*—
Furnish, Greg; and Hipps, Michael, 5,470,328, Cl. 606-1.000.
Hirai, Hiroshi: *See*—
Amatsu, Keiji; Butoh, Zenhachiroh; Hirai, Hiroshi; Massaki, Minoru; Morita, Hirofumi; Nakajima, Takeo; Nomura, Nobuo; Sakaki, Mikio; Schmandt, Stephen J.; and Tanaka, Katsuhiro, 5,471,615, Cl. 395-200.030.
Hirai, Ikuhito: *See*—
Shibuta, Takekazu; Nakamori, Toshinori; and Hirai, Ikuhito, 5,469,717, Cl. 66-69.000.
Hirai, Isamu; and Tsuji, Hideaki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photometry system. 5,471,276, Cl. 354-465.000.
Hirai, Kengo, to Japan Gore-Tex, Inc. Polytetrafluoroethylene filamentary material. 5,470,655, Cl. 428-364.000.
Hirai, Shigeru: *See*—

Yui, Dai; Hirai, Shigeru; and Semura, Shigeru, 5,471,306, Cl. 356-367.000.

Hiraishi, Hisato; Hoshino, Motonobu; and Mitsuhashi, Tadashi, to Citizen Watch Co., Ltd. Ink jet head. 5,471,231, Cl. 347-68.000.

Hiramatsu, Makoto: *See*—
Hayashi, Akio; Hiramatsu, Makoto; and Hamanaka, Nobuyuki, 5,470,956, Cl. 530-388.900.

Hiramoto, Masanori, to Fujitsu Limited. Synchronous payload pointer processing system in digital data transmission network. 5,471,476, Cl. 370-105.100.

Hirano, Shinji; Kimoto, Naomi; Shimoyama, Yutaka; Hirohashi, Setsuo; and Takeichi, Masatoshi, to Takara Shuzo Co., Ltd. Neural α-catenin. 5,470,966, Cl. 536-23.500.

Hirano, Takuya: *See*—
Yasui, Ken-ichi; Tanaka, Tsutomu; Ohgata, Koji; Takizawa, Yutaka; Oki, Ken-ichi; and Hirano, Takuya, 5,470,768, Cl. 437-40.000.

Hirano, Yoshihito: *See*—
Morigami, Yusuke; Matsuo, Hirokazu; Tanahashi, Hirofumi; Hirano, Yoshihito; Nagato, Hiroyasu; and Ishikawa, Takuma, 5,470,051, Cl. 271-7.000.

Hirao, Takashi: *See*—
Shibuya, Munehiro; Kitagawa, Masatoshi; Kamada, Takeshi; and Hirao, Takashi, 5,470,398, Cl. 148-33.300.

Hiraoka, Nobutsugu: *See*—
Yamamoto, Katsuhiko; Sagawa, Hiroaki; Kotani, Hirokazu; Hiraoka, Nobutsugu; and Nakamura, Teruya, 5,470,732, Cl. 435-196.000.

Hirohashi, Setsuo: *See*—
Hirano, Shinji; Kimoto, Naomi; Shimoyama, Yutaka; Hirohashi, Setsuo; and Takeichi, Masatoshi, 5,470,966, Cl. 536-23.500.

Hirohata, Toru: *See*—
Niigaki, Minoru; Kinoshita, Katsuyuki; Hirohata, Toru; Ihara, Tuneo; Yamada, Masami; Asakura, Norio; Negi, Yasuharu; and Suzuki, Tomoko, 5,471,051, Cl. 250-214.0VT.

Hirokane, Junji: *See*—
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 5,470,694, Cl. 430-321.000.

Hirooka, Masaaki: *See*—
Ishihara, Shunichi; Hanna, Junichi; Shimizu, Isamu; and Hirooka, Masaaki, 5,470,389, Cl. 118-719.000.

Hirotsune, Satoshi, to Matsushita Electric Industrial Co., Ltd. Angle measuring method and apparatus using projected graphic. 5,471,295, Cl. 356-138.000.

Hirschberg, Jakub: *See*—
Neubauer, Heinz; Hirschberg, Jakub; and Strandberg, Hans, 5,470,348, Cl. 607-68.000.

Hirst, Edwin: *See*—
Kaye, Paul H.; and Hirst, Edwin, 5,471,299, Cl. 356-336.000.

Hisada, Youichi: *See*—
Anzai, Hidenobu; Gotoh, Moritaka; and Hisada, Youichi, 5,469,947, Cl. 192-21.500.

Hitachi America, Ltd.: *See*—
Koslov, Joshua L., 5,471,508, Cl. 375-344.000.

Hitachi Cable, Ltd.: *See*—
Kumagai, Tatsuya; Iitsuka, Hisao; Kajioka, Hiroshi; Ohnuki, Wataru; and Tetsu, Toshiyuki, 5,471,301, Cl. 356-350.000.

Hitachi Chemical Company, Ltd.: *See*—
Ueno, Takumi; Shiraishi, Hiroshi; Hayashi, Nobuaki; Fukuma, Emiko; and Tadano, Keiko, 5,470,996, Cl. 558-46.000.

Hitachi Instrument Engineering Co., Ltd.: *See*—
Yoshida, Makoto; Satoh, Naoki; Asoh, Hidehiko; Shudo, Tuyosi; Takeda, Ryuzaburo; and Taguchi, Jun'ichi, 5,471,141, Cl. 324-314.000.

Hitachi, Ltd.: *See*—
Fujita, Kouji; and Higuchi, Shigemitsu, 5,471,352, Cl. 360-72.200.
Fujiwara, Shinji; Shintani, Yoichi; and Nagasaka, Mitsuru, 5,471,580, Cl. 395-200.020.
Fukunaga, Masao; Sakurai, Yutaka; Saito, Kouji; and Ishihara, Tamio, 5,469,746, Cl. 73-861.120.
Imai, Kyoko; Imai, Kazumichi; and Nomura, Yasushi, 5,470,534, Cl. 422-67.000.
Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Shinozaki, Masatsugu, 5,471,610, Cl. 395-600.000.
Kimura, Shinji; Sugita, Yumiko; Nakamura, Shouji; and Koda, Eriko, 5,471,579, Cl. 395-163.000.
Kiriu, Yoshio, 5,471,582, Cl. 395-250.000.
Koyanagi, Hajime; Hosaka, Sumio; and Imura, Ryo, 5,471,064, Cl. 250-452.200.
Kurosu, Yasuo; Masuzaki, Hidefumi; and Fujisawa, Hiromichi, 5,471,549, Cl. 382-290.000.
Minowa, Toshimichi; Kimura, Hiroshi; Yboshida, Yoshiyuki; Ohyama, Yoshishige; and Nishimura, Yutaka, 5,470,290, Cl. 477-115.000.
Sasaki, Yuji; and Harada, Yoshinori, 5,470,707, Cl. 435-6.000.
Shimada, Satoshi; Ugai, Seiichi; Tobita, Tomoyuki; and Yamamoto, Yoshimi, 5,469,749, Cl. 73-861.470.
Tadokoro, Shigeru; Narishige, Shinji; Koyanagi, Hiroaki; and Kobayashi, Tetsuo, 5,471,358, Cl. 360-113.000.
Takamoto, Masanori; Yamada, Naoyuki; and Kobayashi, Yasuhiro, 5,471,408, Cl. 364-578.000.
Tanaka, Yasuhiro; Nagai, Yasuhiko; Suzuki, Michio; Kagei, Takashi; Shinnai, Kohsuke; Ikeba, Goro; and Saito, Masato, 5,471,399, Cl. 364-491.000.
Ueno, Takumi; Shiraishi, Hiroshi; Hayashi, Nobuaki; Fukuma, Emiko; and Tadano, Keiko, 5,470,996, Cl. 558-46.000.
Yasunobu, Chizuko; Mori, Fumihiko; Yamada, Hiroshi; Yasunobu, Seiji; and Someya, Ryuko, 5,471,559, Cl. 395-61.000.
Yoshida, Makoto; Satoh, Naoki; Asoh, Hidehiko; Shudo, Tuyosi; Takeda, Ryuzaburo; and Taguchi, Jun'ichi, 5,471,141, Cl. 324-314.000.

Hitachi Maxell, Ltd.: *See*—
Yumiba, Hideaki; Matsumoto, Kazunobu; and Kawakami, Akira, 5,470,678, Cl. 429-194.000.

Hitachi Maxwell, Ltd.: *See*—
Huang, Han; Morioka, Craig A.; Ratib, Osman; Cho, Paul N. S.; Ho, Bruce K. T.; Sonobe, Takeo; and Shinagawa, Toru, 5,471,606, Cl. 395-500.000.

Hitachi Metals, Ltd.: *See*—
Kazama, Yoichiro; and Oyama, Tomihisa, 5,470,045, Cl. 251-129.150.

Hitachi Telecom Technologies, Ltd.: *See*—
Domoto, Yoshihisa; Takahashi, Toshie; and Kurumada, Toshimi, 5,471,525, Cl. 379-247.000.

Hitachi Zosen Corporation: *See*—
Iwai, Kiyoshi; Kondo, Kimio; Sezaki, Yoshiaki; Fukata, Masatoshi; Hashimoto, Eiji; and Yoshioka, Toshio, 5,469,799, Cl. 114-74.00A.

HJS&E Engineering: *See*—
Larabell, Henri J.; and Davis, Richard S., 5,471,099, Cl. 307-53.000.

Hlatky, Gregory G.: *See*—
Turner, Howard W.; Hlatky, Gregory G.; and Eckman, Richard R., 5,470,927, Cl. 526-126.000.

Hlava, Lorens G.; and Pulliam, Thomas A., to Zebco Corporation. Antireverse assembly for a fishing reel. 5,470,027, Cl. 242-247.000.

HNC, Inc.: *See*—
Means, Robert W.; and Sklar, Horace J., 5,471,627, Cl. 395-800.000.

Ho, Bruce K. T.: *See*—
Huang, Han; Morioka, Craig A.; Ratib, Osman; Cho, Paul N. S.; Ho, Bruce K. T.; Sonobe, Takeo; and Shinagawa, Toru, 5,471,606, Cl. 395-500.000.

Ho, Helena S.; Pratt, Michael K.; Lim, Pong C.; and Oshidari, Thomas T., to DSC Communications Corporation. Voice enhancement system and method. 5,471,527, Cl. 379-347.000.

Hoag, Kevin L., to Cummins Engine Company, Inc. Turbulator for a liner cooling jacket. 5,469,817, Cl. 123-41.790.

Hobbs, Carl J.: *See*—
Jensen, Darrell V.; Hobbs, Carl J.; and Blight, M. Andrew, 5,470,175, Cl. 404-72.000.

Hoblitzell, Talei: *See*—
Burd, John F.; Hoblitzell, Talei; and Neyer, Gebhard, 5,470,752, Cl. 436-87.000.

Hodges, Joseph M. Adjustable spanner wrench. 5,469,766, Cl. 81-367.000.

Hodson, Peter D., to Minnesota Mining and Manufacturing Company. Inhalation device. 5,469,843, Cl. 128-203.150.

Hoechst Aktiengesellschaft: *See*—
Jaekel, Frank, 5,470,988, Cl. 548-479.000.
Schermann, Walter; Miller, Dennis; Hilgenfeldt, Eckhard; and Böhme-Kovac, Jozef, 5,470,383, Cl. 106-170.000.
Stahl, Wilhelm; Ahlers, Michael; Walch, Axel; Bartmil, Eckhart; Kretzschmar, Gerhard; Grabley, Susanne; and Schleyerbach, Rudolf, 5,470,843, Cl. 514-61.000.
Vonken, Hub A. G.; and op den Buysch, Jan, 5,470,888, Cl. 521-79.000.

Hoechst UK Limited: *See*—
Staniforth, John N.; and Grosvenor, Martin P., 5,470,603, Cl. 427-2.140.

Hoechstetter, Craig S.: *See*—
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,470,977, Cl. 546-101.000.

Hofemeister, Jürgen: *See*—
Borriss, Rainer; Hofemeister, Jürgen; Thomsen, Karl K.; Olsen, Ole; and Von Wettstein, Dietrich, 5,470,725, Cl. 435-93.000.

Hoff, Roman, to Alcon Laboratories, Inc. Synthesis of sulfonamide intermediates. 5,470,973, Cl. 544-48.000.

Hoffa, Jack L., to Eubanks Engineering Company. Wire and cable processing system. 5,469,763, Cl. 81-9.510.

Hoffmann-La Roche Inc.: *See*—
Harmon, Charles S., 5,470,861, Cl. 514-337.000.

Hokkai Can Co., Ltd.: *See*—
Shinomiya, Tsutomu; Miyazaki, Shunzo; Tanaka, Yasuyuki; Tsukada, Shinichi; and Tamura, Michiya, 5,470,429, Cl. 156-510.000.

Holler, Helge: *See*—
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Grosser, Martin; Schneider, Peter; Barth, Wolfgang; Moll, Hermann; and Pollmann, Horst, 5,469,938, Cl. 187-408.000.

Hollister Incorporated: *See*—
Jensen, Marvin E., 5,470,353, Cl. 607-104.000.

Holloway, Christopher L.: *See*—
Randall, Mitchell A.; Holloway, Christopher L.; and Wurman, Joshua M. A. R., 5,471,211, Cl. 342-26.000.

Holman, Thomas J.: *See*—
Thome, Scott P.; and Holman, Thomas J., 5,470,522, Cl. 264-328.100.

Holmes, Francis A., to Eaton Corporation. Sandwich construction for current limiting positive temperature coefficient protective device. 5,471,035, Cl. 219-505.000.

Holowczak, John E.; and Zabielski, Martin F., to United Technologies Corporation. Heating unit with a high emissivity, porous ceramic flame holder. 5,470,222, Cl. 431-7.000.

Holt, Randall E., to UOP. Control process for simulated moving bed para-xylene separation. 5,470,482, Cl. 210-662.000.

Holweg, Rolf: *See—*
Foged, Christian; Holweg, Rolf; and Nielsen, Erik, 5,470,850, Cl. 514-213.000.

Holy Ghost, Duquesne University of the: *See—*
Khan, Shahed U. M., 5,469,846, Cl. 128-635.000.

Holywell, George C.: *See—*
Grolman, Robert J.; Holywell, George C.; Kimmerle, Frank M.; and Turcotte, Gilles R., 5,470,559, Cl. 423-489.000.

Home Equity Software, Inc.: *See—*
Giansante, Joseph E., 5,471,575, Cl. 395-144.000.

Honchel, Ronald: *See—*
Weinshilboum, Richard M.; Honchel, Ronald; Aksoy, Ibrahim A.; Szumlanski, Carol L.; Wood, Thomas C.; Otterness, Diane M.; and Wieben, Eric D., 5,470,737, Cl. 435-240.200.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hara, Fumio; Fujimura, Akira; Hara, Yoshihisa; and Sakanoshi, Masahiro, 5,469,833, Cl. 123-698.000.
Sakai, Takafumi; Wakamatsu, Hideki; Tsuboi, Yoshihiro; and Kawauchi, Masaya, 5,469,754, Cl. 74-336.00R.
Yamazaki, Shouji, 5,470,125, Cl. 296-146.600.

Honda, Hiroki: *See—*
Ishigaki, Yoshiyuki; Honda, Hiroki; Uga, Kimibaru; and Ishida, Masahiro, 5,471,085, Cl. 257-370.000.

Honda, Tosiyuki; and Haranosono, Takao, to Fujitsu Limited; and Kyushu Fujitsu Electronics Limited. Semiconductor device having a plurality of semiconductor chips. 5,471,369, Cl. 361-813.000.

Honeycutt, Travis W.; Lee, Baosheng; and Shreffler, James R., to Isolyser Company, Inc. Disposable mop heads. 5,470,653, Cl. 428-357.000.

Honeywell Inc.: *See—*
Allard, James R.; Cochran, Edward L.; and Wolff, Alan S., 5,471,560, Cl. 395-77.000.
Sarma, Kalluri R., 5,471,330, Cl. 359-59.000.
Thorland, Rodney H., 5,471,489, Cl. 372-19.000.

Honkawa, Bryan K., to Roll International Corporation. Container with bag dispenser. 5,469,987, Cl. 221-96.000.

Hoover, Kathryn J.: *See—*
Dietz, Carl D.; and Hoover, Kathryn J., 5,471,189, Cl. 340-146.200.

Hoover Universal, Inc.: *See—*
Potes, Michael M.; Lambarth, Edwin H.; Prasher, Troy A.; Edelstein, Beth E.; Kelley, Lowell D.; and Lewis, Cynthia J., 5,470,220, Cl. 425-216.000.

Horiguchi, Hiroyuki: *See—*
Katano, Yasuo; Nakajima, Tsutomu; Kaneko, Yoshikazu; and Horiguchi, Hiroyuki, 5,471,234, Cl. 347-171.000.

Horiguchi, Itaru: *See—*
Watanabe, Akinori; Horiguchi, Itaru; Sato, Atsushi; Kohno, Hiroshige; Ikeda, Kenji; and Iwasaki, Yujiro, 5,470,608, Cl. 427-133.000.

Horii, Atsuhiro: *See—*
Kaizu, Masahiro; and Horii, Atsuhiro, 5,471,023, Cl. 200-310.000.

Horikawa, Mitsuo, to Yoshida Kogyo K.K. Slide fastener. 5,469,605, Cl. 24-403.000.

Horn, Bruce D.: *See—*
Linse, Vonne D.; and Horn, Bruce D., 5,470,012, Cl. 228-107.000.

Hornscheidt, Ralf: *See—*
Ansorge, Wolfgang; Hornscheidt, Ralf; Jungheim, Andreas; and Müller, Klaus, 5,470,474, Cl. 210-500.230.

Horsky, Thomas N.: *See—*
Warde, Cardinal; Horsky, Thomas N.; Schiller, Craig M.; and Genetti, George J., 5,471,341, Cl. 359-293.000.

Horsthuis, Winfried H. G.: *See—*
Diemeer, Martinus B. J.; Horsthuis, Winfried H. G.; McDonach, Alaster; and Copeland, John M., 5,470,692, Cl. 430-290.000.

Hortensius, Stephan W.: *See—*
Barber, Douglas K.; and Hortensius, Stephan W., 5,471,518, Cl. 379-58.000.

Horvath, Robert L., to Williamson, James T. Automatic handbrake release system for a railroad car. 5,469,941, Cl. 188-107.000.

Horzewski, Michael J.; and Matani, Nitin P., to Danforth Biomedical Inc. Reinforced multilumen catheter for axially varying stifness. 5,470,322, Cl. 604-280.000.

Hosaka, Sumio: *See—*
Koyanagi, Hajime; Hosaka, Sumio; and Imura, Ryo, 5,471,064, Cl. 250-452.200.

Hoshino, Motonobu: *See—*
Hiraishi, Hisato; Hoshino, Motonobu; and Mitsuhashi, Tadashi, 5,471,231, Cl. 347-68.000.

Hoshino, Shigetaka: *See—*
Kato, Masaru; Yazawa, Yutaka; and Hoshino, Shigetaka, 5,470,381, Cl. 106-1.230.

Hosoi, Masahiro: *See—*
Hamano, Hisashi; Hosoi, Masahiro; Kobayshi, Ieyasu; and Saeki, Yasuhiro, 5,470,665, Cl. 428-480.000.

Hosono, Satoru; Naka, Takahiro; Yonekubo, Shuji; and Shinada, Satoshi, to Seiko Epson Corporation. Ink jet recording head. 5,471,232, Cl. 347-70.000.

Hospal Industrie: *See—*
Bene, Bernard; and Goux, Nicolas, 5,470,483, Cl. 210-741.000.

Hossain, Mustaque: *See—*
Hu, Kuo-Kuang; Kirmser, Philip G.; Swartz, Stuart E.; and Hossain, Mustaque, 5,470,174, Cl. 404-52.000.

Hotaling, Steven P.; and Dykeman, Deidra A., to United States of America, Air Force. Aerogel mesh getter. 5,470,612, Cl. 427-377.000.

Hotard, James S., Jr.: *See—*
Harrell, James L.; and Hotard, James S., Jr., 5,471,065, Cl. 250-506.100.

Hotchkiss, Dennis B.; and Council, Thomas G. Golf practice tee apparatus having selectively adjustable inclination for simulating uneven lies and method for use of same. 5,470,074, Cl. 273-195.00B.

Hoth, Dennis J.: *See—*
Raynor, Dennis L.; and Hoth, Dennis J., 5,469,673, Cl. 52-79.700.

Hotta, Yoshihiko; Kawaguchi, Makoto; and Amano, Tetsuya, to Ricoh Company, Ltd. Information recording card, and information recording and recognition methods using the card. 5,471,044, Cl. 235-487.000.

Houck, David L.: *See—*
Dorfman, Leonid P.; Scheithauer, Michael J.; Houck, David L.; and Kopatz, Nelson E., 5,470,549, Cl. 423-61.000.

Houle, William A.: *See—*
Blair, David E.; Houle, William A.; Lane, Gregg A.; Larson, James R.; and Pearistine, Kathryn A., 5,471,287, Cl. 355-256.000.

Houmand, Jan. Bent-wire spectacle frame. 5,471,257, Cl. 351-86.000.

House, David W.; Scott, Ray V., Jr.; and Gattuso, Mark J., to UOP. Bis-(*N*-alkylaminocyclohexyl)methanes as curing agents in polyurethane and polyurea flexible foam manufacture. 5,470,890, Cl. 521-128.000.

Hovanessian, Ara G.; Rey, Marie-Anne; Laurent, Anne G.; Krust, Bernard; and Montagnier, Luc, to Institut Pasteur. HIV-2 transmembrane glycoprotein homodimer (gp 80). 5,470,702, Cl. 435-5.000.

Hovel, Harold J.: *See—*
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.

Howard, Henry E.; Prosser, Neil M.; and Roberts, Mark J., to Praxair Technology, Inc. Cryogenic rectification system with enhanced argon recovery. 5,469,710, Cl. 62-22.000.

Howe, Wayne; Silver, Ed; Bailey, Kim; Shih, Jerry; Morel, Kitty; Hill, Peter; Addison, Cathy; Woodring, Larry; and Malik, Dale, to BellSouth Corporation. Communications monitoring and control system. 5,471,519, Cl. 379-67.000.

Hower, Joseph W.: *See—*
Corcoran, John; Molvi, Ikbal A.; Hower, Joseph W.; and Moseley, William A., 5,470,176, Cl. 404-72.000.

Howie, Robert K., Jr., to Grigoleit Company, The. Knob with soft plastic cover. 5,469,758, Cl. 74-553.000.

Hoya, Hiroshi, to Sophia Precision Corp. Liquid fuel atomizing unit for miniature jet engine. 5,469,706, Cl. 60-739.000.

Hrovat, Davorin; Asgari, Jahanbakhsh; and Fodor, Michael G., to Ford Motor Company. Vehicle traction controller with torque and slip control. 5,471,386, Cl. 364-426.020.

HSC Research & Development Ltd. Partnership: *See—*
Heng, Henry H. Q.; and Tsui, Lap-Chee, 5,470,709, Cl. 435-6.000.

Hsia, Chih-Hung: *See—*
Hsia, Chih-Yu; and Hsia, Chih-Hung, 5,471,264, Cl. 353-98.000.

Hsia, Chih-Yu; and Hsia, Chih-Hung. Reading device. 5,471,264, Cl. 353-98.000.

Hsiao, Szu-Chang. Combined display case. 5,470,139, Cl. 312-140.000.

Hsieh, Edward P.; and Hudli, Raghu V., to International Business Machines Corporation. Identifying subsets of noise violators and contributors in package wiring. 5,471,397, Cl. 364-489.000.

Hsieh, Shou-Tun. Eyeglasses with a hair clip. 5,471,258, Cl. 351-123.000.

Hsieh, Tzung-Rue: *See—*
Wuu, Dong-Sing; Hsieh, Tzung-Rue; Lin, Tzy-Ying; and Chen, Hong-Ming, 5,471,552, Cl. 385-49.000.

Hsu, David K.: *See—*
Patton, Thadd C.; and Hsu, David K., 5,469,744, Cl. 73-644.000.

Hsu, Kevin; and Lin, Chun S. Golf swing training device. 5,470,071, Cl. 273-186.400.

Hsu, Louis L.: *See—*
Brunner, Timothy A.; Dove, Derek B.; and Hsu, Louis L., 5,470,681, Cl. 430-5.000.
Chidambarrao, Dureseti; Hsu, Louis L.; Mis, J. Daniel; and Peng, James P., 5,470,781, Cl. 437-68.000.

Hsu, Run-Chi. Universally-linked reinforcing handset means for pay phone. 5,471,529, Cl. 379-438.000.

Hsu, Wen-Liang: *See—*
Zanzig, David J.; Sandstrom, Paul H.; Hubbell, Joseph K.; Hsu, Wen-Liang; Halasa, Adel F.; and Verthe, John J. A., 5,470,929, Cl. 526-181.000.

Hu, Kuo-Kuang; Kirmser, Philip G.; Swartz, Stuart E.; and Hossain, Mustaque, to Kansas State University Research Foundation. Expansion joint assembly having load transfer capacity. 5,470,174, Cl. 404-52.000.

Huang, Douglas X. Apparatus for dispensing particulate condiments. 5,469,988, Cl. 222-1.000.

Huang, Frank F. J., to Durabag, Inc., a California corporation. Self-opening plastic bag pack system. 5,469,969, Cl. 206-554.000.

Huang, Han; Morioka, Craig A.; Ratib, Osman; Cho, Paul N. S.; Ho, Bruce K. T.; Sonobe, Takeo; and Shinagawa, Toru, to University of California, The Regents of the ; and Hitachi Maxwell, Ltd. Information storage and processing. 5,471,606, Cl. 395-500.000.

Huang, Wenlong: *See—*

Peng, Sixun; Dai, Dezai; Huang, Zhenya; Huang, Wenlong; Wang, Youqun; Zhang, Can; and Yu, Feng, 5,470,852, Cl. 514-231.500.
Huang, Zhenya: *See*—
Peng, Sixun; Dai, Dezai; Huang, Zhenya; Huang, Wenlong; Wang, Youqun; Zhang, Can; and Yu, Feng, 5,470,852, Cl. 514-231.500.
Hubbell, Joseph K.: *See*—
Zanzig, David J.; Sandstrom, Paul H.; Hubbell, Joseph K.; Hsu, Wen-Liang; Halasa, Adel F.; and Verthe, John J. A., 5,470,929, Cl. 526-181.000.
Hübsch, Walter: *See*—
Angerbauer, Rolf; Fey, Peter; Hübsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, 5,470,982, Cl. 546-268.000.
Hudli, Raghu V.: *See*—
Hsieh, Edward P.; and Hudli, Raghu V., 5,471,397, Cl. 364-489.000.
Hudspeth, Thomas; and Steinberg, Fritz, to Hughes Aircraft Company. Octave band gap diplexer. 5,471,177, Cl. 333-126.000.
Huf, Gerald D. Flexible removable carrying harness. 5,470,119, Cl. 294-157.000.
Huffman, Gary A., to Pioneer Hi-Bred Internation, Inc. Regulatory element conferring tapetum specificity. 5,470,359, Cl. 47-58.000.
Huffman, William F.: *See*—
Callahan, James F.; and Huffman, William F., 5,470,849, Cl. 514-212.000.
Huffy Corporation: *See*—
Bohrman, Joseph K., 5,470,054, Cl. 273-1.50R.
Hugel, Stefan: *See*—
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Grosser, Martin; Schneider, Peter; Barth, Wolfgang; Moll, Hermann; and Pollmann, Horst, 5,469,938, Cl. 187-408.000.
Hughes Aircraft Company: *See*—
Gharpurey, Archana M., 5,471,657, Cl. 455-12.100.
Hergesheimer, Peter D., 5,471,213, Cl. 342-67.000.
Hudspeth, Thomas; and Steinberg, Fritz, 5,471,177, Cl. 333-126.000.
Ludwig, Frank A.; Townsend, Carl W.; and Eliash, Bruce M., 5,470,669, Cl. 429-17.000.
Park, Joon, 5,470,196, Cl. 414-797.900.
Parr, Michael I.; Watson, John L.; and Vishwanath, T. G., 5,471,501, Cl. 375-354.000.
Phillips, Peter E.; Strattan, Landon A.; and Desai, Vikram D., 5,471,491, Cl. 372-35.000.
Prager, Kenneth E.; Herbst, Stephen J.; Sisneros, Jerry N.; Wootan, John J.; and Gleichman, Douglas M., 5,471,240, Cl. 348-164.000.
Sokolich, Marko, 5,471,077, Cl. 257-192.000.
Wreede, John E., 5,471,328, Cl. 359-22.000.
Hughes, Christopher T. Hydro wall. 5,470,177, Cl. 405-115.000.
Hughes, James D.: *See*—
Pace, Gary L.; and Hughes, James D., 5,471,665, Cl. 455-343.000.
Hughes Missile Systems Company: *See*—
Park, Pyong K., 5,471,181, Cl. 333-246.000.
Huie, Edward M.; and Trainor, George L., to Dupont Merck Pharmaceutical Company, The. Oligonucleotide analogs with sulfamate linkages. 5,470,967, Cl. 536-24.300.
Hulbert, Anthony P., to Roke Manor Research Limited. Radio communication systems. 5,471,463, Cl. 370-18.000.
Hulkko, Jaakko, to Nokia Mobile Phones Ltd. Frequency synthesizer and multiplier circuit arrangement for a radio telephone. 5,471,652, Cl. 455-76.000.
Hulse, Brian: *See*—
Minakami, Michael K.; Hulse, Brian; Cook, Jonathan; and Pickering, John B., 5,471,521, Cl. 379-88.000.
Hultin, Lance: *See*—
Giorgi, Janis V.; and Hultin, Lance, 5,470,701, Cl. 435-5.000.
Hümpfner, Roland: *See*—
Dönig, Gerhard; Hümpfner, Roland; Grass, Norbert; Knaak, Hans-Joachim; Neulinger, Franz; and Schummer, Helmut, 5,471,377, Cl. 363-21.000.
Humphrey, Guy R.; and Miller, Ross A., to Merck & Co., Inc. Process for the stereoselective reduction of steroid enelactams. 5,470,976, Cl. 546-77.000.
Hunt, David L., to Revere Copper Products, Inc. Metal roofing system. 5,469,680, Cl. 52-520.000.
Hunziker, Max: *See*—
Wolf, Jean-Pierre; Schultheiss, Adrian; Steinmann, Bettina; and Hunziker, Max, 5,470,689, Cl. 430-269.000.
Hupe, Lawrence R. Safety shield for flange type coupling. 5,470,110, Cl. 285-13.000.
Hürlimann, Paul, to Tavaro, S.A. Threading device. 5,469,996, Cl. 223-99.000.
Hurta, Dwaine S.: *See*—
Sharpe, Claude A.; Hurta, Dwaine S.; Hamlett, Mark A.; and Froschermeier, Guenther, 5,471,212, Cl. 342-51.000.
Huser, Diane: *See*—
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,470,977, Cl. 546-101.000.
Hutchings, Michael G.: *See*—
Anthony, Vivienne M.; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Ferguson, Ian; Crowley, Patrick J.; and Hutchings, Michael G., 5,470,819, Cl. 504-244.000.
Hutchinson, Charles A.: *See*—
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Mastalski, Henry T., 5,470,271, Cl. 451-55.000.
Hutton, Lesley: *See*—
Kershaw, John; and Hutton, Lesley, 5,469,952, Cl. 194-317.000.
Hwang, Ki H.: *See*—
Kim, Hyo Y.; Hwang, Ki H.; Chae, Hoon; Sho, Soo I.; and Jun, Jung N., 5,470,941, Cl. 528-272.000.
Hyder, Charles C.: *See*—
Briese, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Fouquet, Christophe J. A.; and Lowe, Coy S., 5,471,137, Cl. 324-158.100.
Hydrowash Recycling Systems, Inc.: *See*—
Page, Thomas A., 5,469,597, Cl. 15-321.000.
Hynecek, Jaroslav: *See*—
Cooper, Alan N.; McCracken, William P.; and Hynecek, Jaroslav, 5,471,245, Cl. 348-302.000.
Hyper Corporation, The: *See*—
Peterson, Tom; and Piper, Neal, 5,470,086, Cl. 280-11.220.
Hyundai Electronics America: *See*—
Harrington, Gary L., 5,471,639, Cl. 395-842.000.
Hyundai Electronics Industries Co., Ltd.: *See*—
Ryou, Eui K., 5,470,776, Cl. 437-52.000.
Iacono, Gene A. Hermetically sealed communication system with rechargeable battery. 5,471,658, Cl. 455-128.000.
Ichimura, Yoshiaki, to Japan Aviation Electronics Industry, Limited. Electrical connector having flat and elastic multi-contact members. 5,470,245, Cl. 439-259.000.
Ichinose, Hiroki: *See*—
Yoshioka, Mamoru; Obata, Haruyuki; Tanoue, Ken; Iwashita, Yoshihiro; Kashiwagura, Toshimi; Suzuki, Makoto; Ichinose, Hiroki; and Okamizu, Hironori, 5,469,818, Cl. 123-90.150.
ICOS Corporation: *See*—
Gallatin, W. Michael; and Van der Vieren, Monica, 5,470,953, Cl. 530-350.000.
Idemitsu Petrochemical Co., Ltd.: *See*—
Nakae, Mitsugu, 5,470,939, Cl. 528-201.000.
Okamoto, Masaya; Kuze, Shigeki; Kunishi, Noriyuki; and Nakashima, Taisuke, 5,470,937, Cl. 528-198.000.
Igarashi, Noriyuki; and Fukumoto, Keiichi, to Advantest Corporation. Transport mechanism for IC handlers. 5,469,953, Cl. 198-345.200.
Igarashi, Tatsushi: *See*—
Yasuda, Yukio; Yamaguchi, Akiyasu; Igarashi, Tatsushi; Oonishi, Yasuo; Kai, Kenzo; Sugihara, Masanori; Mori, Takashi; and Miyaji, Akira, 5,471,278, Cl. 355-67.000.
Igarashi, Toshio: *See*—
Sasaki, Toshio; Ebara, Takeshi; Igarashi, Toshio; Tatsumi, Masayuki; and Wakamatsu, Kazuki, 5,470,900, Cl. 524-269.000.
Igota, Shyoji: *See*—
Sasaki, Hitoshi; Kobayashi, Yuikio; and Igota, Shyoji, 5,470,419, Cl. 156-244.120.
Iguchi, Masao; Fukanuma, Tetsuhiko; Yamaguchi, Tetsuya; and Yoshida, Tetsuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Scroll type compressor having a ring for compressive force transmission and orbit determination. 5,470,213, Cl. 418-55.200.
Ihara, Masaki: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; and Yano, Mitsuo, 5,470,833, Cl. 514-18.000.
Ihara, Tuneo: *See*—
Niigaki, Minoru; Kinoshita, Katsuyuki; Hirobata, Toru; Ihara, Tuneo; Yamada, Masami; Asakura, Norio; Negi, Yasuharu; and Suzuki, Tomoko, 5,471,051, Cl. 250-214.0VT.
Iijima, Yasuteru: *See*—
Fukumi, Hiroshi; Sakamoto, Toshiaki; Sugiyama, Mitsuo; Yamaguchi, Takeshi; Oshima, Takeshi; Asai, Fumitoshi; and Iijima, Yasuteru, 5,470,851, Cl. 514-214.000.
Iilender, Jeffrey S.: *See*—
Panousheck, Dale W.; and Iilender, Jeffrey S., 5,469,694, Cl. 56-10.20E.
Iitsuka, Hisao: *See*—
Kumagai, Tatsuya; Iitsuka, Hisao; Kajioka, Hiroshi; Ohnuki, Wataru; and Tetsu, Toshiyuki, 5,471,301, Cl. 356-350.000.
Iiyama, Michitomo: *See*—
Nakamura, Takao; Inada, Hiroshi; and Iiyama, Michitomo, 5,471,069, Cl. 257-39.000.
Iizuka, Miyuki; and Shiba, Akira, to Fujitsu Limited. Ultrasonic diagnostic system. 5,469,850, Cl. 128-660.070.
Ikeba, Goro: *See*—
Tanaka, Yasuhiro; Nagai, Yasuhiko; Suzuki, Michio; Kagei, Takashi; Shinnai, Kohsuke; Ikeba, Goro; and Saito, Masato, 5,471,399, Cl. 364-491.000.
Ikeda, Kenji: *See*—
Watanabe, Akinori; Horiguchi, Itaru; Sato, Atsushi; Kohno, Hiroshige; Ikeda, Kenji; and Iwasaki, Yujiro, 5,470,608, Cl. 427-133.000.
Ikeda, Masao; Ito, Satoshi; Iochi, Yoshino; Miyajima, Takao; Ozawa, Masafumi; Akimoto, Katsuhiro; Ishibash, Akira; and Hiei, Futoshi, to Sony Corporation. Semiconductor metal contacting structure and a light emitting device. 5,471,067, Cl. 257-14.000.
Ikeda, Takeshi: *See*—
Mayama, Shinya; Ikeda, Takeshi; Baba, Yoshinobu; and Ogata, Naoya, 5,470,687, Cl. 430-137.000.

Ikeda, Tatsuhiko; and Niwano, Kazuhito, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device including a field effect transistor and a bipolar transistor and a method of manufacturing the same. 5,471,083, Cl. 257-370.000.

Ikeda, Yasunari, to Sony Corporation. Orthogonal frequency division multiplex demodulation appaaratus. 5,471,464, Cl. 370-19.000.

Ikeda, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device and manufacturing method thereof. 5,471,079, Cl. 257-296.000.

Ikegami, Masaaki; and Higuchi, Tetsuo, to Mitsubishi Denki Kabushik Kaisha. Method of manufacturing a semiconductor device with hydrogen ion intercepting layer. 5,470,764, Cl. 437-24.000.

Ikemoto, Fumihiko: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; and Yano, Mitsuo, 5,470,833, Cl. 514-18.000.

Ikemoto, Isao: *See*—
Shirai, Hiroyuki; Sekine, Kazumi; Tsuda, Tadayuki; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shoji, Takeo; Noda, Shinya; Kobayashi, Kazunori; and Adachi, Hiroyuki, 5,470,635, Cl. 428-131.000.

Ikemoto, Yoshiaki: *See*—
Tsutumi, Haruki; Ikemoto, Yoshiaki; Maehama, Mitsuhiro; Oyanagi, Toshiki; and Matsubara, Tsugio, 5,470,918, Cl. 525-329.200.

Ikeshita, Shingo: *See*—
Nakamura, Hiroyuki; Hama, Yoshinori; Arikita, Shuhei; and Ikeshita, Shingo, 5,470,374, Cl. 75-348.000.

Ikeuchi, Hiroyuki: *See*—
Toba, Takeo; Takei, Kazuo; Matsunaga, Toshiaki; Ikeuchi, Hiroyuki; and Tamura, Fumihide, 5,470,930, Cl. 526-204.000.

Ikezawa, Mitsuru; Miyatake, Takafumi; Ueda, Hirotada; Sumino, Shigeo; and Yoshizawa, Satoshi, to Institute for Personalized Information Environment. Method for detecting a contour of a given subject to be separated from images and apparatus for separating a given subject from images. 5,471,535, Cl. 382-199.000.

Ilcisin, Kevin J.; and Prince, Dennis W., to Tektronix, Inc. Adaptive drive waveform for reducing crosstalk effects in electro-optical addressing structures. 5,471,228, Cl. 345-58.000.

Ilies, Andrei N., to Lakewood Engineering & Manufacturing Co. Continuous resistance welding apparatus and method. 5,471,026, Cl. 219-83.000.

Illinois Tool Works Inc.: *See*—
Rathgeber, Juergen O.; Kish, Frederick A.; Hasan, Syed R.; and Hindman, Craig A., 5,469,671, Cl. 52-58.000.

Imagawa, Katsuhiko: *See*—
Sawada, Shuichi; Imagawa, Katsuhiko; and Murase, Yoshihiko, 5,469,769, Cl. 84-193.000.

Imai, Kazumichi: *See*—
Imai, Kyoko; Imai, Kazumichi; and Nomura, Yasushi, 5,470,534, Cl. 422-67.000.

Imai, Kyoko; Imai, Kazumichi; and Nomura, Yasushi, to Hitachi, Ltd. Analytical system useful in diagnosis of the condition of a disease. 5,470,534, Cl. 422-67.000.

Imai, Nobuhiro: *See*—
Fujii, Haruo; Kobayashi, Tatsuya; Imai, Nobuhiro; Kojima, Hisayoshi; Umezawa, Masao; Tada, Hideki; Ito, Akira; Seto, Kaoru; Katoh, Motoi; and Murata, Daisuke, 5,471,284, Cl. 355-210.000.

Imai, Tooru; Matsumoto, Satoru; Okazaki, Kiyoshi; and Nagata, Yuji, to Kabushiki Kaisha Toshiba. Full automatic washing machine. 5,469,719, Cl. 68-12.040.

Imai, Yumiko: *See*—
Noji, Minoru; Kunugise, Akira; and Imai, Yumiko, 5,470,512, Cl. 264-4.100.

Imamura, Tsuyoshi; Mizuguchi, Katsumi; Shibai, Yasuhiro; Ishii, Keizou; Ishikura, Shinichi; and Saito, Koichi, to Nippon Paint Co., Ltd. Continuous polymerization method and apparatus. 5,470,539, Cl. 422-136.000.

Imanaka, Takeshi, to Matsushita Electric Industrial Co., Ltd. Data retrieval using user evaluation of data presented to construct interference rules and calculate range of inputs needed for desired output and to formulate retrieval queries. 5,471,677, Cl. 395-600.000.

ImaR$_x$ Pharmaceutical Corp.: *See*—
Unger, Evan C.; Fritz, Thomas A.; Matsunaga, Terry; Ramaswami, VaradaRajan; Yellowhair, David; and Wu, Guanli, 5,469,854, Cl. 128-662.020.

Immunex: *See*—
Greenberg, Phillip D.; and Overell, Robert W., 5,470,730, Cl. 435-172.300.

Impco Inc.: *See*—
Simpson, Elmer J.; and Picado, Sergio, 5,471,359, Cl. 361-93.000.

Imperial Chemical Industries, PLC: *See*—
Perrins, Neil; and Kelly, Mary E., 5,470,887, Cl. 521-65.000.

Impulse Technology, Inc.: *See*—
French, Barry J.; Ferguson, Kevin R.; McDonald, Halley A., III; Glass, Andrew B.; Mohansingh, Timothy; and Borges, Gregory, 5,469,740, Cl. 73-379.040.

IMRA Europe SA and Techsonic: *See*—
Guyomar, Daniel; Mazoyer, Thierry; Sauzade, Jean-Denis; and Ching, Gil, 5,471,108, Cl. 310-323.000.

Imrie, William P.: *See*—
Murray, James A.; Nees, Michael R.; Imrie, William P.; Rayner, Christopher C.; Pfalzgraff, Chris L.; Bates, Robert K.; Ness, Valmer H.; and Cox, Terrance J., 5,470,445, Cl. 204-105.00R.

Imtran Industries, Inc.: *See*—
Harris, Kenneth R., 5,469,786, Cl. 101-163.000.

Imura, Ryo: *See*—
Koyanagi, Hajime; Hosaka, Sumio; and Imura, Ryo, 5,471,064, Cl. 250-452.200.

Inaba, Hitoshi; and Kimura, Hidenobu, to Kabushiki Kaisha Toshiba. Video displaying apparatus capable of displaying a video while forming a blanking region. 5,471,251, Cl. 348-634.000.

Inaba, Ryo: *See*—
Tominaga, Junji; Haratani, Susumu; Handa, Tokuhiko; and Inaba, Ryo, 5,470,628, Cl. 428-64.400.

Inaba, Yutaka: *See*—
Okada, Shinjiro; Inaba, Yutaka; and Katakura, Kazunori, 5,471,229, Cl. 345-89.000.

Inada, Hiroshi: *See*—
Nakamura, Takao; Inada, Hiroshi; and Iiyama, Michitomo, 5,471,069, Cl. 257-39.000.

Inaishi, Kouji, to Brother Kogyo Kabushiki Kaisha. Photosensitive microcapsule toner. 5,470,683, Cl. 430-106.000.

Inatomi, Nobuhiro: *See*—
Harada, Setsuo; Funabashi, Yasunori; Inatomi, Nobuhiro; Tanayama, Shigeharu; and Tanida, Seiichi, 5,470,961, Cl. 536-7.400.

Inbasekaran, Muthiah N., to Dow Chemical Company, The. Bisimide monomers. 5,470,987, Cl. 548-462.000.

Incyte Pharmaceuticals, Inc.: *See*—
Scott, Randy W.; Gleich, Gerald J.; and Wilde, Craig G., 5,470,825, Cl. 514-2.000.

Industrial Technology Research Institute: *See*—
Hao-Chung, Hsia; Cheau, Tei-Chih; and Tsai, Shang-Lin, 5,470,553, Cl. 423-139.000.
Li, Chien-Hui; Chen, Han L.; and Lee, Tzong-Ming, 5,470,936, Cl. 528-73.000.
Wuu, Dong-Sing; Hsieh, Tzung-Rue; Lin, Tzy-Ying; and Chen, Hong-Ming, 5,471,552, Cl. 385-49.000.

Industrial Technology Reserch Institute: *See*—
Lai, Chung-Ping; Fu, Cheng-Tsu; Duann, Jin-Ruey; Li, Ai-Kang; and Ko, Kai-Li, 5,470,807, Cl. 501-93.000.

Informed Access Systems, Inc.: *See*—
Tallman, Joseph P.; Snowden, Elizabeth M.; and Wolcott, Barry W., 5,471,382, Cl. 364-406.000.

Infrared Components Corporation: *See*—
McCoy, Joseph R., 5,469,711, Cl. 62-51.100.

Ing. Erich Pfeiffer GmbH & Co. KG: *See*—
Graf, Lothar; and Fuchs, Karl-Heinz, 5,469,989, Cl. 222-82.000.

Ingersoll, David: *See*—
Doddapaneni, Narayan; and Ingersoll, David, 5,470,674, Cl. 429-50.000.

Ingersoll-Rand Company: *See*—
Luthi, Oscar; Abdulmassih, Antoine; and Merchel, Frank J., III, 5,470,471, Cl. 210-386.000.

Ingleby, James Richard: *See*—
Yuill, Robert M., 5,469,960, Cl. 206-315.300.

Ingram, Steven E., to T&M Toys, Inc. Baby walkaround. 5,470,294, Cl. 482-66.000.

Ing-Simmons, Nicholas K.: *See*—
Gove, Robert J.; Guttag, Karl M.; Balmer, Keith; and Ing-Simmons, Nicholas K., 5,471,592, Cl. 395-300.030.

Innotech, Inc.: *See*—
Gupta, Amitava; and Blum, Ronald D., 5,470,892, Cl. 522-42.000.

Inomata, Shigemitsu: *See*—
Suzuki, Takehiro; Inomata, Shigemitsu; and Komori, Mikio, 5,469,869, Cl. 131-60.000.

Inoue, Katsushi; Tamai, Seiichiro; Kobayashi, Keiichi; and Dosho, Marie, to Matsushita Electric Industrial Co., Ltd. Bar-code reader device. 5,471,041, Cl. 235-462.000.

Inoue, Keiji: *See*—
Kassai, Kenzou; and Inoue, Keiji, 5,470,127, Cl. 297-174.000.

Inouye, Masayori: *See*—
Kondo, Keiji; and Inouye, Masayori, 5,470,971, Cl. 536-23.700.

Instance, David J. Method and apparatus for producing labels. 5,470,418, Cl. 156-231.000.

Institut Francais Du Petrole: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; Marchand, Pierre; Dixmier, Francoise; and Prigent, Monique, 5,470,495, Cl. 252-18.000.
Lonchamp, Daniel; and Schwob, Yvan, 5,470,370, Cl. 71-25.000.

Institut Fuer Neue Materialien Gemeinnuetzige GmbH: *See*—
Spanhel, Lubomir; Arpac, Ertugrul; Nass, Rüdiger; and Schmidt, Helmut, 5,470,910, Cl. 524-785.000.

Institut Pasteur: *See*—
Hovanessian, Ara G.; Rey, Marie-Anne; Laurent, Anne G.; Krust, Bernard; and Montagnier, Luc, 5,470,702, Cl. 435-5.000.

Institute for Personalized Information Environment: *See*—
Ikezawa, Mitsuru; Miyatake, Takafumi; Ueda, Hirotada; Sumino, Shigeo; and Yoshizawa, Satoshi, 5,471,535, Cl. 382-199.000.

Instytut Ciezkiej Syntezy Organicznej Blachownia: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kolt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Władysład, 5,470,809, Cl. 502-12.000.

Integrated Device Technology, Inc.: *See*—

Au, Fu L.; and Yogev, Einat, 5,471,583, Cl. 395-250.000.
Lien, Chuen-Der, 5,471,094, Cl. 257-774.000.
Integrated Devices Technology, Inc.: *See*—
Lien, Chuen-Der, 5,470,766, Cl. 437-31.000.
Intel Corporation: *See*—
Colwell, Robert P.; Glew, Andrew F.; Papworth, David B.; Hinton, Glenn J.; and Clift, David W., 5,471,633, Cl. 395-800.000.
Fernando, Roshan, 5,471,587, Cl. 395-309.000.
Gonzales, Mark A., 5,471,601, Cl. 395-403.000.
Hasbun, Robert N.; and Wells, Stephen, 5,471,604, Cl. 395-404.000.
Kumar, Sudarshan; and Banik, Jashojiban, 5,471,414, Cl. 364-788.000.
Myers, Alan M.; Charvat, Peter K.; Letson, Thomas A.; Yang, Shi-ning; and Bai, Peng, 5,470,790, Cl. 437-192.000.
Otsuka, Toshinori, 5,471,630, Cl. 395-800.000.
Pawlowski, Stephen S.; MacWilliams, Peter D.; and Kolinski, Jerzy B., 5,471,637, Cl. 395-296.000.
Reddy, Chandrashekar M.; and Cho, Sung-Soo, 5,471,672, Cl. 395-296.000.
Ruby, William M., 5,471,605, Cl. 395-445.000.
Sells, Chris; and Hampsten, Russ, 5,471,522, Cl. 379-97.000.
Steele, Randy C., 5,471,155, Cl. 326-39.000.
Woo, Been-Jon, 5,470,772, Cl. 437-43.000.
Intercon Systems, Inc.: *See*—
Walden, John D., 5,470,238, Cl. 439-98.000.
Interface, Inc.: *See*—
Thompson, Andrew, 5,470,630, Cl. 428-95.000.
International Business Machines Corporation: *See*—
Amatsu, Keiji; Butoh, Zenhachiroh; Hirai, Hiroshi; Massaki, Minoru; Morita, Hirofumi; Nakajima, Takeo; Nomura, Nobuo; Sakaki, Mikio; Schmandt, Stephen J.; and Tanaka, Katsuhiro, 5,471,615, Cl. 395-200.030.
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C., Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.
Bailey, Roger N.; Burchfiel, Steven M.; and Taborn, Michael P., 5,471,410, Cl. 364-715.010.
Banning, Kenneth R.; James, Wendy S.; Li, Shih-Gong; and Versteeg, Anton, 5,471,613, Cl. 395-600.000.
Barakat, Edmond H.; Chin, Arthur L.; and Schorn, Eric B., 5,471,585, Cl. 395-308.000.
Beardsley, Brent C.; Brailey, Allen C.; and Leung, Peter L. H., 5,471,631, Cl. 395-650.000.
Bender, Carl A., 5,471,488, Cl. 371-61.000.
Biery, Glenn A.; Boyne, Daniel M.; and Dalal, Hormazdyar M., 5,470,788, Cl. 437-190.000.
Brodnax, Timothy B.; Bullis, Bryan K.; King, Steven A.; and Rickard, Dale A., 5,471,599, Cl. 395-412.000.
Brunner, Timothy A.; Dove, Derek B.; and Hsu, Louis L., 5,470,681, Cl. 430-5.000.
Call, Anson J.; Meisner, Stephen H.; Pompeo, Frank L.; and Zitz, Jeffrey A., 5,471,027, Cl. 219-85.130.
Carnevale, Michael J.; Kalla, Ronald N.; McClannahan, Gary P.; and Trombley, Michael R., 5,471,626, Cl. 395-775.000.
Chan, Chin-Jong; Chang, Jei-Wei; and Romankiw, Lubomyr T., 5,471,092, Cl. 257-753.000.
Chappell, Barbara A.; Chappell, Terry I.; Fleischer, Bruce M.; and Schuster, Stanley E., 5,471,188, Cl. 340-146.200.
Chidambarrao, Dureseti; Hsu, Louis L.; Mis, J. Daniel; and Peng, James P., 5,470,781, Cl. 437-68.000.
Cowgill, Richard B.; and Teale, David C., 5,471,561, Cl. 395-82.000.
Deutsch, Alina; Lewis, David A.; Narayan, Chandrasekhar; and Plachy, Anthony L., 5,471,090, Cl. 257-734.000.
DiPaolo, Nunzio; and Ferguson, Daniel J., 5,471,033, Cl. 219-388.000.
Dietz, Carl D.; and Hoover, Kathryn J., 5,471,189, Cl. 340-146.200.
Downie, Alan P.; Gallagher, Peter; Garrity, John J.; and Robertson, Brian L., 5,471,368, Cl. 361-760.000.
Emberty, Robert G.; Misewich, Felix J.; and Pawlowski, Edward J., 5,471,445, Cl. 369-34.000.
Hsieh, Edward P.; and Hudli, Raghu V., 5,471,397, Cl. 364-489.000.
Johnson, William J.; Keller, Robert S.; Manthuruthil, George C.; and Williams, Marvin L., 5,471,616, Cl. 395-700.000.
Messina, Massimo, 5,471,619, Cl. 395-600.000.
Minakami, Michael K.; Hulse, Brian; Cook, Jonathan; and Pickering, John B., 5,471,521, Cl. 379-88.000.
Munier, Jean-Marie; Pauporte, Andre; and Poiraud, Clement, 5,471,581, Cl. 395-250.000.
Papathomas, Kostas I.; Christie, Frederick R.; and Wang, David W., 5,471,096, Cl. 257-778.000.
Phillips, James E.; Blaner, Bartholomew; and Vassiliadis, Stamatis, 5,471,628, Cl. 395-800.000.
Rackley, Darwin P.; and West, R. Michael P., 5,471,570, Cl. 395-135.000.
Sachdev, Krishna G.; Whitaker, Joel R.; and Ahmad, Umar M., 5,470,693, Cl. 430-315.000.
Srikrishnan, Kris V.; White, James F.; and Yang, Jer-Ming, 5,469,981, Cl. 216-13.000.
Tsukada, Yutaka; Kobayakawa, Yasukazu; Maeda, Yoji; and Tsuchita, Shuhei, 5,470,796, Cl. 437-209.000.
Yee, Raymond L., 5,471,576, Cl. 395-154.000.
Yudenfriend, Harry M.; Surman, David H.; and Beardsley, Brent C., 5,471,609, Cl. 395-182.020.
International Fuel Cells Corporation: *See*—
Sederquist, Richard A., 5,470,360, Cl. 48-94.000.
International Paper Company: *See*—
Wagle, Dinkar G.; and Volpe, Raymond A., 5,470,436, Cl. 162-207.000.
Inui, Tetsuya: *See*—
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 5,470,694, Cl. 430-321.000.
Inuyama, Seiji: *See*—
Nagayama, Masato; Inuyama, Seiji; Sawada, Kenji; Ohshita, Makoto; and Harada, Fumiaki, 5,471,290, Cl. 355-309.000.
Iochi, Yoshino: *See*—
Ikeda, Masao; Ito, Satoshi; Iochi, Yoshino; Miyajima, Takao; Ozawa, Masafumi; Akimoto, Katsuhiro; Ishibash, Akira; and Hiei, Futoshi, 5,471,067, Cl. 257-14.000.
Iowa State University Research Foundation, Inc.: *See*—
McCallum, R. William; Dennis, Kevin W.; Lograsso, Barbara K.; and Anderson, Iver E., 5,470,401, Cl. 148-302.000.
Patton, Thadd C.; and Hsu, David K., 5,469,744, Cl. 73-644.000.
Ipposhi, Takashi; and Nishimura, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having piezo resistance. 5,471,086, Cl. 257-417.000.
Ipumatic AB: *See*—
Lundström, Bo; and Severinsson, Lars, 5,469,950, Cl. 192-85.000.
Irihara, Kouichi; Yamasa, Hideo; Shimazu, Fumio; and Wada, Takasumi, to Sharp Kabushiki Kaisha. Device for preventing breakdown of contact charger for use in electrophotographic printing machine. 5,471,283, Cl. 355-205.000.
Irikawa, Michinori; and Iwase, Masayuki, to Furukawa Electric Co., Ltd., The. Semiconductor laser device. 5,470,786, Cl. 437-129.000.
Iritani, Yuichi: *See*—
Nakagawa, Kazuo; Iritani, Yuichi; Yamazaki, Hiromi; and Takakuwa, Yasushi, 5,471,058, Cl. 250-291.000.
Irvine Scientific Sales Co.: *See*—
Walthall, Ben J.; Caple, Matthew V.; and Murphy, Thomas J., 5,470,151, Cl. 366-165.100.
Irwin, Kenneth E., Jr.; Streeter, Gary R.; and Daigle, Steven J., to Panda Eng. Inc. Electronic validation machine for documents. 5,471,039, Cl. 235-441.000.
Isa, Takashi: *See*—
Tanaka, Hiroshi; Kobayashi, Toshiaki; Nanba, Tomiyuki; Ishiwatari, Masaaki; Yoneyama, Toshio; Ohno, Kimio; Matsumoto, Takashi; Kanbe, Tetsuya; Isa, Takashi; and Ogusu, Yoshiyuki, 5,470,563, Cl. 424-448.000.
Isaac, Robert L.; Cohen, Bernard; and Jameson, Lee K., to Kimberly-Clark Corporation. Process for forming liquid impermeable sheet material having a fibrous surface and products formed thereby. 5,470,424, Cl. 156-253.000.
Ise, Koichi; Nishida, Yasuo; and Yasuda, Akio, to Sony Corporation. Electrochromic diaphragm device. 5,471,339, Cl. 359-275.000.
Isfeld, Mark S., to 3Com Corporation. System for classifying input/output events for processes servicing the events. 5,471,618, Cl. 395-839.000.
Ishibash, Akira: *See*—
Ikeda, Masao; Ito, Satoshi; Iochi, Yoshino; Miyajima, Takao; Ozawa, Masafumi; Akimoto, Katsuhiro; Ishibash, Akira; and Hiei, Futoshi, 5,471,067, Cl. 257-14.000.
Ishida, Hitoshi: *See*—
Kosuge, Takuo; Tsuji, Kuniro; Ishida, Hitoshi; and Kosuge, Yoshiki, 5,470,574, Cl. 424-401.000.
Ishida, Masahiro: *See*—
Ishigaki, Yoshiyuki; Honda, Hiroki; Uga, Kimibaru; and Ishida, Masahiro, 5,471,085, Cl. 257-370.000.
Ishida, Masao: *See*—
Miyazaki, Satomichi; Harayama, Akira; Kazama, Nobuyuki; and Ishida, Masao, 5,469,616, Cl. 29-888.074.
Ishida, Tsutomu: *See*—
Sakata, Yoshihiro; Yamashita, Wataru; Okawa, Yuichi; Tamai, Shoji; Ishida, Tsutomu; Matsuo, Mitsunori; Yamaguchi, Keizaburo; and Yamaguchi, Akihiro, 5,470,943, Cl. 528-353.000.
Ishida, Yasushi: *See*—
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,471,227, Cl. 347-9.000.
Ishidai, Hiroshi: *See*—
Kita, Hiroshi; Ishidai, Hiroshi; and Kaneko, Yutaka, 5,470,697, Cl. 430-558.000.
Ishigaki, Hideyo: *See*—
Suyama, Shuji; Ishigaki, Hideyo; Tomoda, Masayasu; Shirai, Yoshihiro; Tanaka, Hiroyuki; and Komai, Masaharu, 5,470,917, Cl. 525-326.300.
Ishigaki, Yoshiyuki; Honda, Hiroki; Uga, Kimibaru; and Ishida, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device with polycrystalline silicon emitter conductive layer. 5,471,085, Cl. 257-370.000.
Ishigami, Takashi: *See*—
Yamanobe, Takashi; Satou, Michio; Ishigami, Takashi; Obata, Minoru; Kawai, Mituo; Yagi, Noriaki; Maki, Toshihiro; and Ando, Shigeru, 5,470,527, Cl. 419-53.000.
Ishiguro, Masayuki, to Fujitsu Limited; and Fujitsu VLSI Limited. Method and apparatus of verifying accurate writing through comparisons of written and read data. 5,471,351, Cl. 360-53.000.
Ishiguro, Takashi: *See*—

Arai, Yuji; Matumoto, Takanobu; Shin, Yuaki; and Ishiguro, Takashi, 5,470,691, Cl. 430-273.000.
Ishiguro, Tetsumi: *See*—
Kudoh, Kazuhiro; Muramatsu, Akira; and Ishiguro, Tetsumi, 5,471,204, Cl. 340-825.440.
Ishihara, Shunichi; Hanna, Junichi; Shimizu, Isamu; and Hirooka, Masaaki, to Canon Kabushiki Kaisha. Apparatus for forming deposited film. 5,470,389, Cl. 118-719.000.
Ishihara, Tamio: *See*—
Fukunaga, Masao; Sakurai, Yutaka; Saito, Kouji; and Ishihara, Tamio, 5,469,746, Cl. 73-861.120.
Ishii, Katsushi: *See*—
Fujita, Akihiro; Nakano, Seiji; and Ishii, Katsushi, 5,471,008, Cl. 84-633.000.
Ishii, Keizou: *See*—
Imamura, Tsuyoshi; Mizuguchi, Katsumi; Shibai, Yasuhiro; Ishii, Keizou; Ishikura, Shinichi; and Saito, Koichi, 5,470,539, Cl. 422-136.000.
Ishikawa, Kimitada: *See*—
Ishikawa, Minoru; and Ishikawa, Kimitada, 5,471,360, Cl. 361-154.000.
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; and Yano, Mitsuo, to Banyu Pharmaceutical Co., Ltd. Endothelin antagonistic peptide derivatives. 5,470,833, Cl. 514-18.000.
Ishikawa, Minoru; and Ishikawa, Kimitada, to Fuji Electric Co., Ltd. DC electromagnet apparatus. 5,471,360, Cl. 361-154.000.
Ishikawa, Naomi: *See*—
Fujiwara, Hideyoshi; and Ishikawa, Naomi, 5,470,225, Cl. 431-215.000.
Ishikawa, Takuma: *See*—
Morigami, Yuusuke; Matsuo, Hirokazu; Tanahashi, Hirofumi; Hirano, Yoshihito; Nagato, Hiroyasu; and Ishikawa, Takuma, 5,470,051, Cl. 271-7.000.
Ishikura, Shinichi: *See*—
Imamura, Tsuyoshi; Mizuguchi, Katsumi; Shibai, Yasuhiro; Ishii, Keizou; Ishikura, Shinichi; and Saito, Koichi, 5,470,539, Cl. 422-136.000.
Ishiwari, Kazuo; Yamamoto, Yoshihisa; and Shimizu, Tetsuo, to Daikin Industries, Ltd. Polyphenylene sulfide resin composition and process for preparing the same. 5,470,901, Cl. 524-345.000.
Ishiwatari, Masaaki: *See*—
Tanaka, Hiroshi; Kobayashi, Toshiaki; Nanba, Tomiyuki; Ishiwatari, Masaaki; Yoneyama, Toshio; Ohno, Kimio; Matsumoto, Takashi; Kanbe, Tetsuya; Isa, Takashi; and Ogusu, Yoshiyuki, 5,470,563, Cl. 424-448.000.
Ishizeki, Yoshiaki, to NEC Corporation. Bit clock regeneration circuit for PCM data, implementable on integrated circuit. 5,471,502, Cl. 375-376.000.
Ishizuka, Masanobu: *See*—
Nishii, Kota; Kimura, Kouichi; Ishizuka, Masanobu; and Adachi, Katsura, 5,470,909, Cl. 524-538.000.
Ishizuka, Yutaka, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Magnetic disk drive device having a liquid insulating material provided in different thicknesses on an iron core. 5,471,357, Cl. 360-99.080.
Isobe, Tami, to Ricoh Co., Ltd. Magnetooptic apparatus with integrated detecting element providing signal with high S/N ratio. 5,471,440, Cl. 369-13.000.
Isolyser Company, Inc.: *See*—
Honeycutt, Travis W.; Lee, Baosheng; and Shreffler, James R., 5,470,653, Cl. 428-357.000.
Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft: *See*—
Zimics, Bela; and Orthofer, Willibald, 5,470,647, Cl. 428-229.000.
ISP Chemicals Inc.: *See*—
Merianos, John J.; Elder, Todd; and Garelick, Paul, 5,470,875, Cl. 514-479.000.
ISP Investments Inc.: *See*—
Narayanan, Kolazi S.; Chaudhuri, Ratan K.; Login, Robert B.; and Fusiak, Frank, 5,470,508, Cl. 252-542.000.
Issakova, Olga: *See*—
Sepetov, Nikolai; Issakova, Olga; Krchnak, Viktor; and Lebl, Michal, 5,470,753, Cl. 436-89.000.
Itakura, Tetsuro; and Tanimoto, Hiroshi, to Kabushiki Kaisha Toshiba. Amplifier device capable of realizing high slew rate with low power consumption. 5,471,171, Cl. 330-253.000.
Itami, Shinzi; and Ando, Takeshi, to Mitsubishi Denki Kabushiki Kaisha; and Mitsubishi Electric Engineering Co., Ltd. Programmable controller and methods of setting and displaying its internal information. 5,471,380, Cl. 364-146.000.
Ito, Akira: *See*—
Fujii, Haruo; Kobayashi, Tatsuya; Imai, Nobuhiro; Kojima, Hisayoshi; Umezawa, Masao; Tada, Hideki; Ito, Akira; Seto, Kaoru; Katoh, Motoi; and Murata, Daisuke, 5,471,284, Cl. 355-210.000.
Ito, Hideo: *See*—
Sugawara, Kazuaki; and Ito, Hideo, 5,471,316, Cl. 358-342.000.
Ito, Ichiro: *See*—
Suzuki, Yasutoshi; Ao, Kenichi; Uenoyama, Hirofumi; Noguchi, Hiroki; Eguchi, Koji; Ito, Ichiro; and Yoshino, Yoshimi, 5,471,084, Cl. 257-421.000.
Ito, Masao, to Fuji Xerox Co., Ltd. Multi-beam scan optical system. 5,471,236, Cl. 347-233.000.
Ito, Masataka: *See*—
Miura, Takaharu; Nemoto, Hiroyuki; Ito, Masataka; Kobayashi, Masafumi; and Tanaka, Chieko, 5,470,652, Cl. 428-328.000.
Ito, Masumi: *See*—
Tsuchiya, Ichiro; Danzuka, Toshio; and Ito, Masumi, 5,470,369, Cl. 65-379.000.
Ito, Mitsufumi: *See*—
Nishino, Kazuaki; Awano, Yoji; Takamiya, Hiroyuki; Ito, Mitsufumi; Suzuki, Masami; and Genma, Yoshikazu, 5,470,402, Cl. 148-325.000.
Ito, Nobuei: *See*—
Ohara, Fumio; Hattori, Tadashi; Ito, Nobuei; Hattori, Yutaka; and Arai, Masumi, 5,470,618, Cl. 427-529.000.
Ito, Sadao, to Aisin Seiki Kabushiki Kaisha. Seat sliding apparatus for vehicle and a method of making a seat sliding apparatus for a vehicle. 5,470,121, Cl. 296-65.100.
Ito, Satoshi: *See*—
Ikeda, Masao; Ito, Satoshi; Iochi, Yoshino; Miyajima, Takao; Ozawa, Masafumi; Akimoto, Katsuhiro; Ishibash, Akira; and Hiei, Futoshi, 5,471,067, Cl. 257-14.000.
Ito, Sumio: *See*—
Terasawa, Hidekazu; Tanimura, Masashi; and Ito, Sumio, 5,470,434, Cl. 162-117.000.
Itoh, Hiromi; Iwasaki, Masanobu; Tokui, Akira; and Tsukamoto, Katsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Method for pretreating semiconductor substrate by photochemically removing native oxide. 5,470,799, Cl. 437-238.000.
ITT Automotive, Inc.: *See*—
Noone, David L.; and Mitchell, Frank L., 5,469,892, Cl. 138-121.000.
ITT Corporation: *See*—
Hammers, David E.; and Conway, Michael D., 5,471,220, Cl. 342-372.000.
Palmer, Gary L., 5,471,374, Cl. 362-191.000.
Stanley, Donald H.; Peckman, Robert; and Peregoy, Weston K., Jr., 5,470,266, Cl. 445-59.000.
ITT Industries: *See*—
Mosquera, Rene A., 5,470,246, Cl. 439-260.000.
Iu, Siu-Leong, to Matsushita Electric Industrial Corporation of America. Method and apparatus for estimating motion vector fields by rejecting local outliers. 5,471,252, Cl. 348-699.000.
Ivicevic, Dragomir. Boat anchor. 5,469,802, Cl. 114-301.000.
Ivoclar AG: *See*—
Mann, Roland, 5,471,129, Cl. 320-21.000.
Iwai, Kiyoshi; Kondo, Kimio; Sezaki, Yoshiaki; Fukata, Masatoshi; Hashimoto, Eiji; and Yoshioka, Toshio, to Hitachi Zosen Corporation. Liquid cargo transport ship having double-hull structure. 5,469,799, Cl. 114-74.00A.
Iwai, Kumi: *See*—
Nomura, Ichiro; Banno, Yoshikazu; Kaneko, Tetsuya; Takeda, Toshihiko; and Iwai, Kumi, 5,470,265, Cl. 445-24.000.
Iwasa, Shoichi, to Nippon Steel Corporation. Non-volatile semiconductor memory device. 5,471,423, Cl. 365-185.010.
Iwasaki, Junji: *See*—
Yamada, Yoshiaki; Iwasaki, Junji; and Ohmori, Masashi, 5,470,392, Cl. 134-2.000.
Iwasaki, Masanobu: *See*—
Itoh, Hiromi; Iwasaki, Masanobu; Tokui, Akira; and Tsukamoto, Katsuhiro, 5,470,799, Cl. 437-238.000.
Iwasaki, Shinichi: *See*—
Aoki, Shigehisa; Iwasaki, Shinichi; Sugiura, Nobuo; Suzuki, Sakaru; and Kimata, Koji, 5,470,578, Cl. 424-450.000.
Iwasaki, Yujiro: *See*—
Watanabe, Akinori; Horiguchi, Itaru; Sato, Atsushi; Kohno, Hiroshige; Ikeda, Kenji; and Iwasaki, Yujiro, 5,470,608, Cl. 427-133.000.
Iwase, Masayuki: *See*—
Irikawa, Michinori; and Iwase, Masayuki, 5,470,786, Cl. 437-129.000.
Iwashita, Yoshihiro: *See*—
Yoshioka, Mamoru; Obata, Haruyuki; Tanoue, Ken; Iwashita, Yoshihiro; Kashiwagura, Toshimi; Suzuki, Makoto; Ichinose, Hiroki; and Okamizu, Hironori, 5,469,818, Cl. 123-90.150.
Iwata, Keiichi: *See*—
Shimada, Takashi; Iwata, Keiichi; and Yasuda, Masako, 5,470,555, Cl. 423-219.000.
Iwata, Shunichi: *See*—
Shimizu, Toru; and Iwata, Shunichi, 5,471,620, Cl. 395-375.000.
Izawa, Michio. Map displaying method. 5,471,205, Cl. 340-995.000.
IZI Corporation: *See*—
Zinreich, Simion J.; Zinreich, Eva S.; and Bare, Rex O., 5,469,847, Cl. 128-653.100.
J.C. Ford Company: *See*—
Ruhe, Thomas A., 5,470,599, Cl. 426-231.000.
J.M. Voith GmbH: *See*—
Plomer, Anton, 5,469,636, Cl. 34-117.000.
Sollinger, Hans-Peter; and Schiel, Christian, 5,470,438, Cl. 162-273.000.
J. W. Broadbent Nominees Pty. Ltd.: *See*—
Kosuge, Takuo; Tsuji, Kuniro; Ishida, Hitoshi; and Kosuge, Yoshiki, 5,470,574, Cl. 424-401.000.
Jabr, Salim N. High density optical storage system. 5,471,455, Cl. 369-107.000.
JAC Products, Inc.: *See*—
Cucheran, John S., 5,470,003, Cl. 224-316.000.
Jackson, Linda J. Grip cover. 5,469,601, Cl. 16-111.00R.

Jackson, Neil A.: *See*—
Hammell, Sherry E.; Gong, Kai F.; Jackson, Neil A.; Keay, Kathleen D.; and MacDonald, John F., 5,471,433, Cl. 367-118.000.

Jacob, Elliot: *See*—
Setterstrom, Jean A.; Jacob, Elliot; and Franz, Walter K., 5,470,311, Cl. 604-24.000.

Jacob, Steven D.; Coogan, James J.; and Petras, Stefan G., to Landis & Gyr Powers, Inc. Method and apparatus for controlling fume hood face velocity using variable by-pass resistance. 5,470,275, Cl. 454-61.000.

Jacobson, Bo: *See*—
Wardle, Frank; Jacobson, Bo; Dolfsma, Henk; and Butterworth, Arthur, 5,469,713, Cl. 62-84.000.

Jacobson, Richard M.; Ramsay, J. Roger; Aller, Harold E.; and Thirugnanam, Muthuvelu, to Shell Research Limited. 1-dimethylcarbamoyl-3-substituted-5-substituted-1H-1,2,4-triazoles. 5,470,984, Cl. 548-264.400.

Jacoby, Bruce E.: *See*—
Hillman, Michael J.; Jacoby, Bruce E.; and Barbosa, Rui M., 5,470,218, Cl. 425-144.000.

Jaekel, Frank, to Hoechst Aktiengesellschaft. Process for the preparation of purified phthalimidoalkanecarboxylic acids. 5,470,988, Cl. 548-479.000.

Jagger, Eric; and Paek, Hyung. Tester and method for testing a rectifier-regulator. 5,471,135, Cl. 324-158.100.

Jain, Sudhir: *See*—
Bonora, Anthony C.; Rosenquist, Frederick T.; Jain, Sudhir; and Davis, Mark R., 5,469,963, Cl. 206-709.000.

Jamail, Randall; and Thompson, David, to Jamail, Randall. Method of selectively concealing magneto-optical compact disk data for playback upon demand. 5,471,443, Cl. 369-32.000.

James, Wendy S.: *See*—
Banning, Kenneth R.; James, Wendy S.; Li, Shih-Gong; and Versteeg, Anton, 5,471,613, Cl. 395-600.000.

Jameson, Lee K.: *See*—
Isaac, Robert L.; Cohen, Bernard; and Jameson, Lee K., 5,470,424, Cl. 156-253.000.

Janes, Todd L.; Meade, Alexander D.; Murthy, Ashok; Sharma, Pramod K.; and Wallin, Peter E., to Lexmark International, Inc. Color imaging with contact transfer heating station. 5,471,291, Cl. 355-326.00R.

Jang, Kean H. Fruit box. 5,469,986, Cl. 220-762.000.

Jang, Son-Sing. Smoke exhauster. 5,470,365, Cl. 55-510.000.

Janke, Donald E.; Szynal, Joseph M.; and Guess, Ronald W., to Whirlpool Corporation. Defrost cycle controller. 5,469,715, Cl. 62-155.000.

Jankowski, Władysław: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kołt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Władysław, 5,470,809, Cl. 502-12.000.

Jansen, Bernhard; Grönen, Jürgen; and Müller, Hanns P., to Bayer Aktiengesellschaft. Process of molding products by rim. 5,470,523, Cl. 264-328.600.

Janson, David A.: *See*—
Organek, Gregory J.; Preston, David M.; and Janson, David A., 5,469,948, Cl. 192-35.000.

Japan Aviation Electronics Industry, Limited: *See*—
Ichimura, Yoshiaki, 5,470,245, Cl. 439-259.000.
Suzuki, Keiichiro, 5,470,240, Cl. 439-157.000.

Japan Gore-Tex, Inc.: *See*—
Hirai, Kengo, 5,470,655, Cl. 428-364.000.

Japan Organo Co., Ltd: *See*—
Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, 5,470,461, Cl. 210-188.000.

Japan Pionics Co., Ltd.: *See*—
Shimada, Takashi; Iwata, Keiichi; and Yasuda, Masako, 5,470,555, Cl. 423-219.000.

Japan Tobacco Inc.: *See*—
Suzuki, Takehiro; Inomata, Shigemitsu; and Komori, Mikio, 5,469,869, Cl. 131-60.000.

Jarvi, Esa T.: *See*—
Wolos, Jeffrey A.; Doherty, Niall S.; Jarvi, Esa T.; and McCarthy, James R., 5,470,837, Cl. 514-45.000.

Järvimäki, Kari, to Labsystems Oy. Cuvette matrix. 5,470,536, Cl. 422-102.000.

Jason, Mark E.: *See*—
Alexander, Gregory C.; Jason, Mark E.; and Kalota, Dennis J., 5,470,942, Cl. 528-328.000.

JDS Fitel Inc.: *See*—
Cheng, Yihao; and Duck, Gary S., 5,471,340, Cl. 359-281.000.

Jejelowo, Moses O.; and Bamberger, Robert L., to Exxon Chemical Patents Inc. Polymerization catalysts, their production and use. 5,470,811, Cl. 502-117.000.

Jenkins, Brian C.: *See*—
Szigethy, Attila; Jenkins, Brian C.; and Folsom, Marc D., 5,470,098, Cl. 280-728.200.

Jenkins, Johnny L. Multi-compartmented device for dispensing exact quantities of dry material. 5,469,992, Cl. 222-362.000.

Jenkins, Sarah M.: *See*—
Wadsworth, Harry J.; Wyman, Paul A.; Dabbs, Steven; and Jenkins, Sarah M., 5,470,859, Cl. 514-299.000.

Jenkins, William G.: *See*—
Keemer, Craig B.; Jenkins, William G.; Lamborn, H. Taylor; and Scheller, Joseph B., 5,470,385, Cl. 106-404.000.

Jennett, Timothy A.; Harmsworth, Patrick D.; Martin, Dave; and Ellison, Anthony W., to Tioxide Specialties Limited. Process for the production of silicon nitride. 5,470,446, Cl. 204-177.000.

Jensen, Darrell V.; Hobbs, Carl J.; and Blight, M. Andrew, to Spudnik Equipment Company. Apparatus and methods for efficient and precise placement of discrete quantities of materials adjacent to the apparatus. 5,470,175, Cl. 404-72.000.

Jensen, Earl M., to Luxtron Corporation. Apparatus and method for measuring temperatures at a plurality of locations using luminescent-type temperature sensors which are excited in a time sequence. 5,470,155, Cl. 374-161.000.

Jensen, Marvin E., to Hollister Incorporated. Post-operative thermal blanket. 5,470,353, Cl. 607-104.000.

Jeong, Yong-joon; Park, Myung-je; Lee, Kang-won; and Park, Heui-seong, to Samsung Aerospace Industries, Ltd. Character imprinting device for a camera. 5,471,268, Cl. 354-106.000.

Jepsen, Hardy: *See*—
Martensen, Lars; Hansen, Ove T.; Moeller, Henry M.; and Jepsen, Hardy, 5,469,776, Cl. 92-170.100.

Jiang, Kenneth K.; and Bernard, Bernie B., to O. I. Corporation. Management device for gas chromatography sample concentration. 5,470,380, Cl. 96-102.000.

Jidosha Buhin Kogyo Co., Ltd.: *See*—
Kawata, Yutaka; Ebe, Yoichi; Hino, Harumichi; and Kawai, Hidenobu, 5,469,931, Cl. 180-379.000.

Jinkerson, David L., to Alcon Laboratories, Inc. Polymerizable yellow dyes and their use in opthalmic lenses. 5,470,932, Cl. 526-312.000.

Jinnai, Shigeru, to Canon Kabushiki Kaisha. Recording apparatus with multiple recording modes and reduced waste of recording capacity. 5,471,315, Cl. 358-337.000.

Joannopoulos, John: *See*—
Brommer, Karl; Mullaney, Henry; Meade, Robert; Rappe, Andrew; and Joannopoulos, John, 5,471,180, Cl. 333-202.000.

Jodoin, Ronald E.; Loce, Robert P.; Klassen, R. Victor; and Lin, Ying-Wei, to Xerox Corporation. Stack filters for 1-to-N bit image processing in electronic printers. 5,471,320, Cl. 358-455.000.

Johann, Charles F. M., to Alcatel N.V. Routing logic means and method for distributing a packet among network nodes. 5,471,467, Cl. 370-60.000.

Johansson, Eric T.: *See*—
Lloyd, Peter M.; Ritson, Carl; Johansson, Eric T.; and Rubsamen, Reid M., 5,469,750, Cl. 73-861.610.

John Mezzalingua Assoc. Inc.: *See*—
Szegda, Andrew, 5,470,257, Cl. 439-578.000.

Johnson, Brian K. A.: *See*—
Wang, Zhonghe; and Johnson, Brian K. A., 5,471,671, Cl. 455-226.200.

Johnson, Byron G.: *See*—
Bares, Joseph E.; Johnson, Byron G.; and Cornforth, Frederick J., 5,470,457, Cl. 208-255.000.

Johnson, John L.: *See*—
Weeks, F. Bruce; and Johnson, John L., 5,469,900, Cl. 141-392.000.

Johnson, Joseph E., Jr.: *See*—
Hauf, Barry W.; Jones, Stephen K.; Johnson, Joseph E., Jr.; and Paquin, Roger L., 5,469,993, Cl. 222-383.300.

Johnson Level & Tool Mfg. Co., Inc.: *See*—
Dufour, Jean G., 5,470,029, Cl. 242-394.000.

Johnson, Mark C. Geometrically efficient self-inflating seat cushion. 5,469,592, Cl. 5-654.000.

Johnson, Robert C.: *See*—
Beard, Hoyt S.; Conrad, Lucas J.; Crook, J. Edward; Lovette, James E.; Johnson, Robert C.; Newton, Donald A.; and Neshan, Hamid, 5,469,872, Cl. 131-291.000.

Johnson, William J.; Keller, Robert S.; Manthuruthil, George C.; and Williams, Marvin L., to International Business Machines Corporation. Method of and apparatus for providing existential presence acknowledgement. 5,471,616, Cl. 395-700.000.

Johnston, James P.: *See*—
Fredj, Abdennaceur; Johnston, James P.; and Thoen, Christiaan A. J., 5,470,507, Cl. 252-542.000.

Johnston, Vonda K.: *See*—
Cuthbert, Victor W.; Zahra, Joseph H., Jr.; and Johnston, Vonda K., 5,469,593, Cl. 8-159.000.

Jones, Charles R., Jr.: *See*—
Krantz, Kermit T.; and Jones, Charles R., Jr., 5,470,028, Cl. 242-343.200.

Jones, Douglas H., to University of Iowa Research Foundation. Method for the amplification of unknown flanking DNA sequence. 5,470,722, Cl. 435-91.200.

Jones, James E., to PRC. Food product forming apparatus and method. 5,470,596, Cl. 426-512.000.

Jones, Larren F.; Emrich, Robert K.; and Bingham, Ian R., to Esco Corporation. Excavating tooth. 5,469,648, Cl. 37-457.000.

Jones, Stephen B.: *See*—
Thomas, Wayne M.; Nicholas, Edward D.; Jones, Stephen B.; Lilley, Roger H.; Dawes, Christopher J.; and Dolby, Richard E., 5,469,617, Cl. 29-889.210.

Jones, Stephen K.: *See*—
Hauf, Barry W.; Jones, Stephen K.; Johnson, Joseph E., Jr.; and Paquin, Roger L., 5,469,993, Cl. 222-383.300.

Jones, William F.: *See*—
Moyers, J. Clifton; Nutt, Ronald; and Jones, William F., 5,471,061, Cl. 259-363.030.

Jongerius, Michiel J.: *See*—
Liedenbaum, Coen T. H. F.; Severens, Arnoldus L. G. J.; Drenten, Ronald R.; and Jongerius, Michiel J., 5,471,490, Cl. 372-32.000.
Jonsson, Jan-Erik: *See*—
Sharp, Gary A.; and Jonsson, Jan-Erik, 5,469,902, Cl. 144-241.000.
Jordan, Anita E. Beverage dispensing urn and drip collector device. 5,470,011, Cl. 222-108.000.
Jore, Matthew B. Reversible drill/driver tool. 5,470,180, Cl. 408-239.00R.
Joseph, James E.: *See*—
Curtis, Alan R. D.; and Joseph, James E., 5,471,106, Cl. 310-90.500.
Josypenko, Michael J.: *See*—
Rivera, David F.; Floyd, Thomas R.; and Josypenko, Michael J., 5,471,182, Cl. 333-252.000.
Jouquey, Simone: *See*—
Fortin, Michel; Frechet, Daniel; Hamon, Gilles; Jouquey, Simone; and Vevert, Jean-Paul, 5,470,867, Cl. 514-393.000.
Jserng, Yueh-Chy. Foldaway luggage pull handle. 5,469,945, Cl. 190-115.000.
Ju, Redford F.: *See*—
Sachinvala, Navzer D.; Ju, Redford F.; and Litt, Morton H., 5,470,931, Cl. 526-238.230.
Jud, Wilfried, to Teich Aktiengesellschaft. Tubular pouch with opening aid. 5,470,015, Cl. 229-87.050.
Jue, Andrew: *See*—
Bhargava, Vivek; Jue, Andrew; Van Scherrenburg, Michael A.; and Wilson, Les J., 5,471,248, Cl. 348-420.000.
Jun, Jung N.: *See*—
Kim, Hyo Y.; Hwang, Ki H.; Chae, Hoon; Sho, Soo I.; and Jun, Jung N., 5,470,941, Cl. 528-272.000.
Jung, Chil-min; Kim, Kyeong-rae; and Lee, Jeong-hee, to Samsung Electronics Co., Ltd. Buffer with high and low speed input buffers. 5,471,150, Cl. 326-87.000.
Jung, Jun-gyo: *See*—
Yang, Chang-jip; and Jung, Jun-gyo, 5,470,611, Cl. 427-255.400.
Jungheim, Andreas: *See*—
Ansorge, Wolfgang; Hornscheidt, Ralf; Jungheim, Andreas; and Müller, Klaus, 5,470,474, Cl. 210-500.230.
Junginger, Bernhard; Fritschi, Rainer; and Krimmel, Heinz, to Alcatel N.V. Fiber optical amplifier having a detector for measuring scattered light at a splice. 5,471,342, Cl. 359-341.000.
Jurgensen, Stewart R.: *See*—
Walker, George T.; Nadeau, James G.; Spears, Patricia A.; Nycz, Colleen M.; Shank, Daryl D.; Schram, James L.; and Jurgensen, Stewart R., 5,470,723, Cl. 435-91.200.
K-2 Corporation: *See*—
Meibock, Antonin A.; and Svensson, John E., 5,470,085, Cl. 280-11.200.
K-Swiss Inc.: *See*—
Nichols, Steven B., 5,469,640, Cl. 36-50.100.
Kaaden, Jürgen; and Reiner, Gerhard, to Deutsche Thomson-Brandt GmbH. Method for determining the position in a cassette recorder. 5,471,124, Cl. 318-650.000.
Kaake, Steven A. F.: *See*—
Foote, James B.; Kaake, Steven A. F.; Meyers, Peter V.; and Nolan, James F., 5,470,397, Cl. 136-260.000.
Kaasila, Sampo, to Apple Computer, Inc. Optimized scan conversion of outlines for generating raster images. 5,471,573, Cl. 395-141.000.
Kaatz, Forrest H.: *See*—
Edelstein, Alan S.; Kaatz, Forrest H.; and Harris, Vincent G., 5,470,373, Cl. 75-255.000.
Kabushi Kaisha Daikin Seisakusho: *See*—
Kamio, Takenori, 5,469,760, Cl. 74-572.000.
Kabushiki Kaisha Ace Denken: *See*—
Takemoto, Takatoshi; and Kawashima, Kazunari, 5,469,951, Cl. 194-206.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Fujita, Akihiro; Nakano, Seiji; and Ishii, Katsushi, 5,471,008, Cl. 84-633.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nogawa, Makoto; and Fujimoto, Satoshi, 5,470,513, Cl. 264-40.100.
Takamura, Fujitoshi, 5,469,646, Cl. 37-382.000.
Kabushiki Kaisha Nikon: *See*—
Yasuda, Yukio; Yamaguchi, Akiyasu; Igarashi, Tatsushi; Oonishi, Yasuo; Kai, Kenzo; Sugihara, Masanori; Mori, Takashi; and Miyaji, Akira, 5,471,278, Cl. 355-67.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
Ishizuka, Yutaka, 5,471,357, Cl. 360-99.080.
Kabushiki Kaisha Toshiba: *See*—
Anma, Hideyuki, 5,470,050, Cl. 271-3.030.
Fukazawa, Yuji, 5,470,393, Cl. 134-3.000.
Imai, Tooru; Matsumoto, Satoru; Okazaki, Kiyoshi; and Nagata, Yuji, 5,469,719, Cl. 68-12.040.
Inaba, Hitoshi; and Kimura, Hidenobu, 5,471,251, Cl. 348-634.000.
Itakura, Tetsuro; and Tanimoto, Hiroshi, 5,471,171, Cl. 330-253.000.
Kakimoto, Mitsuru, 5,471,614, Cl. 395-650.000.
Kawasaki, Soichi, 5,471,484, Cl. 371-25.100.
Marui, Kuniyoshi, 5,471,643, Cl. 455-33.100.
Nakamura, Hisashi; Nagai, Yasutaka; and Hiki, Susumu, 5,469,852, Cl. 128-662.060.
Oguchi, Toshihiko; Takeuchi, Hajime; and Murano, Minori, 5,470,645, Cl. 428-212.000.
Okamura, Masami; Sawa, Takao; Yamauchi, Yoshiyuki; and Kusada, Takao, 5,470,646, Cl. 428-216.000.
Sasaki, Hiroshi; and Tsujino, Hiroyuki, 5,469,849, Cl. 128-660.070.
Suguro, Kyoichi; and Okano, Haruo, 5,470,791, Cl. 437-192.000.
Yagi, Takayuki; and Takeuchi, Yoichiro, 5,471,595, Cl. 395-375.000.
Yamanobe, Takashi; Satou, Michio; Ishigami, Takashi; Obata, Minoru; Kawai, Mituo; Yagi, Noriaki; Maki, Toshihiro; and Ando, Shigeru, 5,470,527, Cl. 419-53.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Iguchi, Masao; Fukanuma, Tetsuhiko; Yamaguchi, Tetsuya; and Yoshida, Tetsuo, 5,470,213, Cl. 418-55.200.
Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Nishino, Kazuaki; Awano, Yoji; Takamiya, Hiroyuki; Ito, Mitsufumi; Suzuki, Masami; and Genma, Yoshikazu, 5,470,402, Cl. 148-325.000.
Kadi, Rachid; Leclere, Jean; and Plusa, Janusz, to Normaclass R.D. Device for classifying carcasses of large cattle, calves, hogs or sheep. 5,470,274, Cl. 452-184.000.
Kadonaga, Tooru: *See*—
Sasaki, Michiyuki; Suzuki, Kenji; Morosawa, Kenji; Ohba, Toshimitsu; and Kadonaga, Tooru, 5,471,203, Cl. 340-825.310.
Kagei, Takashi: *See*—
Tanaka, Yasuhiro; Nagai, Yasuhiko; Suzuki, Michio; Kagei, Takashi; Shinnai, Kohsuke; Ikeba, Goro; and Saito, Masato, 5,471,399, Cl. 364-491.000.
Kai, Kenzo: *See*—
Yasuda, Yukio; Yamaguchi, Akiyasu; Igarashi, Tatsushi; Oonishi, Yasuo; Kai, Kenzo; Sugihara, Masanori; Mori, Takashi; and Miyaji, Akira, 5,471,278, Cl. 355-67.000.
Kai, Nobuto: *See*—
Kikuchi, Naoki; and Kai, Nobuto, 5,470,272, Cl. 451-344.000.
Kai, Susumu: *See*—
Shindo, Isao; Mutou, Shigeo; Terayama, Takao; Okayama, Masao; and Kai, Susumu, 5,470,533, Cl. 422-63.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Wyatt-Mair, Gavin F.; and Harrington, Donald G., 5,470,405, Cl. 148-551.000.
Kaiser Optical Systems, Inc.: *See*—
Tedesco, James M.; Brady, Lois A. K.; and Colburn, Willis S., 5,471,327, Cl. 359-15.000.
Kaizu, Masahiro; and Horii, Atsuhiro, to Fujikura Ltd. Light illumination membrane switch with reduced size and improved light illumination. 5,471,023, Cl. 200-310.000.
Kajioka, Hiroshi: *See*—
Kumagai, Tatsuya; Iitsuka, Hisao; Kajioka, Hiroshi; Ohnuki, Wataru; and Tetsu, Toshiyuki, 5,471,301, Cl. 356-350.000.
Kakimoto, Mitsuru, to Kabushiki Kaisha Toshiba. Database system concurrency control apparatus using timestamps and processing time estimation. 5,471,614, Cl. 395-650.000.
Kaku, Mureo; and Luise, Robert R., to Du Pont de Nemours, E. I., and Company. Polyimide polymeric blends. 5,470,922, Cl. 525-436.000.
Kakuishi, Mitsuo: *See*—
Awata, Yutaka; and Kakuishi, Mitsuo, 5,471,507, Cl. 375-340.000.
Kalkanis, Petros, to Procter & Gamble Company, The. Container of thermoplastic material for containing liquids. 5,469,984, Cl. 220-606.000.
Kalla, Ronald N.: *See*—
Carnevale, Michael J.; Kalla, Ronald N.; McClannahan, Gary P.; and Trombley, Michael R., 5,471,626, Cl. 395-775.000.
Kalnitsky, Alexander, to SGS-Thomson Microelectronics, Inc. Method of via formation for the multilevel interconnect integrated circuits. 5,470,793, Cl. 437-195.000.
Kalota, Dennis J.: *See*—
Alexander, Gregory C.; Jason, Mark E.; and Kalota, Dennis J., 5,470,942, Cl. 528-328.000.
Kalotay, Paul Z., to Micro Motion, Inc. Noise reduction filter system for a coriolis flowmeter. 5,469,748, Cl. 73-861.380.
Kamada, Takeshi: *See*—
Shibuya, Munehiro; Kitagawa, Masatoshi; Kamada, Takeshi; and Hirao, Takashi, 5,470,398, Cl. 148-33.300.
Kamarei, A. Reza: *See*—
Laughlin, Philip; Alexander, John; Kamarei, A. Reza; Dobbie, Robert P.; Lin, Paul; Chang, Shen-Youn; Reddy, Sekhar; Grasset, Etienne; and Melin, Christian, 5,470,839, Cl. 514-53.000.
Kameyama, Yutaka: *See*—
Torii, Shigeru; Tanaka, Hideo; Sasaoka, Mitio; Shiroi, Takashi; and Kameyama, Yutaka, 5,470,972, Cl. 540-230.000.
Kami, Akio: *See*—
Yamamoto, Hitoshi; Kaneko, Kunihisa; Watanabe, Masayuki; and Kami, Akio, 5,469,940, Cl. 188-67.000.
Kaminaga, Isamu; Matsue, Shuuichi; Arakawa, Takahiko; Katoh, Shuuichi; and Ueda, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device and method of fabricating same. 5,471,095, Cl. 257-775.000.
Kamio, Takenori, to Kabushi Kaisha Daikin Seisakusho. Clutch wear-compensating compound flywheel assembly. 5,469,760, Cl. 74-572.000.
Kamishima, Hiroyuki: *See*—
Fukuhara, Hiroshige; Kamishima, Hiroyuki; and Muramatsu, Toshiro, 5,471,215, Cl. 342-70.000.
Kammleiter, Berndt: *See*—
Breyer, Karl-Hermann; Kammleiter, Berndt; and Ruck, Otto, 5,471,406, Cl. 364-559.000.

Kamo, Yuji, to Olympus Optical Co., Ltd. Real image mode variable magnification finder optical system. 5,471,271, Cl. 354-222.000.
Kanamori, Junichiro; and Matsumura, Masafumi, to Nippondenso Co., Ltd. Screw tightening apparatus. 5,469,924, Cl. 173-176.000.
Kanbe, Tetsuya: *See*—
Tanaka, Hiroshi; Kobayashi, Toshiaki; Nanba, Tomiyuki; Ishiwatari, Masaaki; Yoneyama, Toshio; Ohno, Kimio; Matsumoto, Takashi; Kanbe, Tetsuya; Isa, Takashi; and Ogusu, Yoshiyuki, 5,470,563, Cl. 424-448.000.
Kandybin, Alexander I.; Anderson, Richard A.; and Reichley, Daniel L., to Arbor Research Corporation. System for separation of oxygen from argon/oxygen mixture. 5,470,378, Cl. 95-100.000.
Kaneko, Kunihisa: *See*—
Yamamoto, Hitoshi; Kaneko, Kunihisa; Watanabe, Masayuki; and Kami, Akio, 5,469,940, Cl. 188-67.000.
Kaneko, Shinji; and Ebisawa, Kan, to Sony Corporation. Apparatus for recording defective-position indicating signal on disk medium. 5,471,449, Cl. 369-58.000.
Kaneko, Tatsuhiko; Kuroda, Noritaka; and Kashiwa, Kenichi, to Takeda Chemical Industries, Ltd. Process for producing α,β-unsaturated aldehydes. 5,471,004, Cl. 568-455.000.
Kaneko, Tetsuya: *See*—
Nomura, Ichiro; Banno, Yoshikazu; Kaneko, Tetsuya; Takeda, Toshihiko; and Iwai, Kumi, 5,470,265, Cl. 445-24.000.
Kaneko, Yoshikazu: *See*—
Katano, Yasuo; Nakajima, Tsutomu; Kaneko, Yoshikazu; and Horiguchi, Hiroyuki, 5,471,234, Cl. 347-171.000.
Kaneko, Yutaka: *See*—
Kita, Hiroshi; Ishidai, Hiroshi; and Kaneko, Yutaka, 5,470,697, Cl. 430-558.000.
Kaney, Howard W., to West Bend Company, The. Terminal block for small appliances. 5,470,254, Cl. 439-439.000.
Kanno, Hiroshi: *See*—
Suetsugi, Keisuke; Kanno, Hiroshi; Sugawara, Masayuki; Mitani, Kohji; Fujita, Yoshihiro; Saitoh, Toshinori; and Ninomiya, Yuichi, 5,471,323, Cl. 358-511.000.
Kanota, Keiji: *See*—
Ogata, Seiichi; Kawaguchi, Moriyuki; Kanota, Keiji; Kubota, Yukio; Sato, Heikichi; and Abe, Iwao, 5,471,355, Cl. 360-84.000.
Kansas State University Research Foundation: *See*—
Hu, Kuo-Kuang; Kirmser, Philip G.; Swartz, Stuart E.; and Hossain, Mustaque, 5,470,174, Cl. 404-52.000.
Kanto Kagaku Kabushiki Kaisha: *See*—
Kato, Masaru; Yazawa, Yutaka; and Hoshino, Shigetaka, 5,470,381, Cl. 106-1.230.
Kao Corporation: *See*—
Nakamura, Hiroyuki; Hama, Yoshinori; Arikita, Shuhei; and Ikeshita, Shingo, 5,470,374, Cl. 75-348.000.
Kao, Yi-Han: *See*—
Wong, Kai W.; Fei, Xin; Xin, Ying; and Kao, Yi-Han, 5,470,821, Cl. 505-236.000.
Kaper, James B.; Baudry-Maurelli, Bernadette; and Fasano, Alessio, to University of Maryland At Baltimore. Method of isolating restriction fragment deletions in *Vibrio cholerae*, and products thereof. 5,470,729, Cl. 435-172.300.
Kaplan, David R.: *See*—
Costanzo, Christopher R.; Kaplan, David R.; and Dang, Khoa V., 5,471,055, Cl. 250-252.100.
Kapoor, Ashok K.; and Pasch, Nicholas F., to LSI Logic Corporation. Low dielectric constant insulation layer for integrated circuit structure and method of making same. 5,470,801, Cl. 437-238.000.
Kari, U. Prasad: *See*—
Maloy, W. Lee; Kari, U. Prasad; and Williams, Jon L., 5,470,950, Cl. 530-324.000.
Karls, Michael A.: *See*—
Griffiths, John M.; Gussert, David A.; and Karls, Michael A., 5,470,263, Cl. 440-75.000.
Karlsson, Peter: *See*—
Lundstrom, Lena; Karlsson, Peter; and Ohlsson, Thomas, 5,469,856, Cl. 128-696.000.
Kaschig, Jürgen: *See*—
Weber, Kurt; Meyer, Hans R.; Kaschig, Jürgen; and Eckhardt, Claude, 5,470,990, Cl. 549-466.000.
Kaseborn, Hans-Dieter: *See*—
Gruning, Burghard; Foitzik, Willi; Weitemeyer, Christian; and Kaseborn, Hans-Dieter, 5,470,992, Cl. 554-69.000.
Kashida, Meguru; Shirasaki, Toru; Hamada, Yuichi; Nagata, Yoshihiko; Kawaguchi, Sakae; and Kubota, Yoshihiro, to Shin-Etsu Chemical Co., Ltd. Frame-supported pellicle for dustproof protection of photomask. 5,470,621, Cl. 428-14.000.
Kashiwa, Kenichi: *See*—
Kaneko, Tatsuhiko; Kuroda, Noritaka; and Kashiwa, Kenichi, 5,471,004, Cl. 568-455.000.
Kashiwa, Yoichi: *See*—
Suzuki, Mitsuru; Shindo, Mikio; and Kashiwa, Yoichi, 5,470,258, Cl. 439-595.000.
Kashiwagura, Toshimi: *See*—
Yoshioka, Mamoru; Obata, Haruyuki; Tanoue, Ken; Iwashita, Yoshihiro; Kashiwagura, Toshimi; Suzuki, Makoto; Ichinose, Hiroki; and Okamizu, Hironori, 5,469,818, Cl. 123-90.150.
Kason Industries, Inc.: *See*—
Finkelstein, Burl; and Thorsen, Thomas A., 5,469,661, Cl. 49-276.000.
Kaspers, Rüdiger, to Arca Regler GmbH. Pneumatic actuating drive. 5,469,774, Cl. 91-54.000.
Kassai, Kenzou; and Inoue, Keiji, to Aprica Kassai Kabushikikaisha. Baby table chair usable as shoulder harness. 5,470,127, Cl. 297-174.000.
Kasulis, Anthony S.; and Kasulis, Clara J. Apparatus for enhancing the visual effects of a fire and for increasing its heat utilization. 5,469,839, Cl. 126-552.000.
Kasulis, Clara J.: *See*—
Kasulis, Anthony S.; and Kasulis, Clara J., 5,469,839, Cl. 126-552.000.
Kasuya, Satoru: *See*—
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Kasuya, Satoru; Sugiura, Nobutada; and Nishida, Masaaki, 5,470,284, Cl. 475-204.000.
Katakura, Kazunori: *See*—
Okada, Shinjiro; Inaba, Yutaka; and Katakura, Kazunori, 5,471,229, Cl. 345-89.000.
Katano, Yasuo; Nakajima, Tsutomu; Kaneko, Yoshikazu; and Horiguchi, Hiroyuki, to Ricoh Company, Ltd. Recording apparatus. 5,471,234, Cl. 347-171.000.
Kataoka, Mitsuhiro: *See*—
Takahashi, Shigeki; Kataoka, Mitsuhiro; and Yamamoto, Tsuyoshi, 5,470,770, Cl. 437-41.000.
Kataoka, Yoshiharu: *See*—
Shimada, Yoshinori; Kondo, Naofumi; Sakurai, Takehisa; Kataoka, Yoshiharu; Takahama, Manabu; and Katayama, Mikio, 5,471,070, Cl. 257-57.000.
Katayama, Mikio: *See*—
Shimada, Yoshinori; Kondo, Naofumi; Sakurai, Takehisa; Kataoka, Yoshiharu; Takahama, Manabu; and Katayama, Mikio, 5,471,070, Cl. 257-57.000.
Katayama, Yoshio; Fujii, Seiichi; Uchiyama, Sadao; Soejima, Ryouichi; Moori, Hitoshi; and Yoshida, Hideo, to Sharp Kabushiki Kaisha. Magnetic head device with slidable and adjustable magnetic head. 5,471,439, Cl. 369-13.000.
Katayanagi, Mamoru: *See*—
Nakada, Akira; Yoneya, Akira; Kobayashi, Noriyuki; Katayanagi, Mamoru; Kawashima, Tsutomu; and Yoshida, Hiroshi, 5,470,421, Cl. 156-642.100.
Katcher, Jay H.; and Bertalan, Charles W., to Kraft Foods, Inc. Process for preparing non-hydroxypropylated, crosslinked, pregelatinized, starch and product. 5,470,968, Cl. 536-102.000.
Kato, Izumi: *See*—
Yokoyama, Kin-ichi; and Kato, Izumi, 5,470,219, Cl. 425-144.000.
Kato, Kanji: *See*—
Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Shinozaki, Masatsugu, 5,471,610, Cl. 395-600.000.
Kato, Keisuke: *See*—
Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,469,752, Cl. 73-866.000.
Kato, Masaki: *See*—
Yawata, Masaya, 5,469,983, Cl. 220-412.000.
Kato, Masaru; Yazawa, Yutaka; and Hoshino, Shigetaka, to Kanto Kagaku Kabushiki Kaisha. Electroless gold plating solution. 5,470,381, Cl. 106-1.230.
Kato, Osamu: *See*—
Takashima, Hiroaki; Kato, Osamu; and Kihara, Tsutomu, 5,470,558, Cl. 423-447.600.
Kato, Seiji: *See*—
Nonaka, Yoshiya; Aoyagi, Yoshio; Abe, Hiroyuki; Bradshaw, Alex; Kiyoura, Kazuhiro; Kato, Seiji; and Haraguchi, Koichiro, 5,471,441, Cl. 369-32.000.
Katoh, Akira, to Fujitsu Limited. Retrieval space determination system for three-dimensionally shaped parts in a CAD system. 5,471,569, Cl. 395-134.000.
Katoh, Motoi: *See*—
Fujii, Haruo; Kobayashi, Tatsuya; Imai, Nobuhiro; Kojima, Hisayoshi; Umezawa, Masao; Tada, Hideki; Ito, Akira; Seto, Kaoru; Katoh, Motoi; and Murata, Daisuke, 5,471,284, Cl. 355-210.000.
Katoh, Shohichi: *See*—
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 5,470,694, Cl. 430-321.000.
Katoh, Shuuichi: *See*—
Kaminaga, Isamu; Matsue, Shuuichi; Arakawa, Takahiko; Katoh, Shuuichi; and Ueda, Masahiro, 5,471,095, Cl. 257-775.000.
Kaufman, John W.; Frantz, Robert H.; and Root, John A., to Whitaker Corporation, The. Retention mechanism for memory cards. 5,470,241, Cl. 439-159.000.
Kaufman, John W.; Root, John A.; and Schroeder, James L., III, to Whitaker Corporation, The. Grounding shroud for surface mounted electrical connector. 5,470,259, Cl. 439-607.000.
Kaul, Bansi L.; Vougioukas, Angelos-Elie; and Goldmann, Jürgen, to Sandoz Ltd. Synthetic polyamides and their salts. 5,470,921, Cl. 525-432.000.
Kawa, Franciszek; Stilli, Adrian; and Roehrig, Adalbert, to Concast Standard AG. Process for the continuous casting of metal, in particular of steel into bloom and billet cross-sections. 5,469,910, Cl. 164-459.000.
Kawabe, Takako: *See*—
Niimura, Koichi; Kawabe, Takako; Ando, Takao; and Saito, Kenichi, 5,470,960, Cl. 536-6.400.
Kawada, Kazuhiko: *See*—

Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, 5,470,461, Cl. 210-188.000.

Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Shinozaki, Masatsugu, to Hitachi, Ltd. Method for character string collation with filtering function and apparatus. 5,471,610, Cl. 395-600.000.

Kawaguchi, Makoto: *See*—
Hotta, Yoshihiko; Kawaguchi, Makoto; and Amano, Tetsuya, 5,471,044, Cl. 235-487.000.

Kawaguchi, Moriyuki: *See*—
Ogata, Seiichi; Kawaguchi, Moriyuki; Kanota, Keiji; Kubota, Yukio; Sato, Heikichi; and Abe, Iwao, 5,471,355, Cl. 360-84.000.

Kawaguchi, Sakae: *See*—
Kashida, Meguru; Shirasaki, Toru; Hamada, Yuichi; Nagata, Yoshihiko; Kawaguchi, Sakae; and Kubota, Yoshihiro, 5,470,621, Cl. 428-14.000.

Kawai, Hidenobu: *See*—
Kawata, Yutaka; Ebe, Yoichi; Hino, Harumichi; and Kawai, Hidenobu, 5,469,931, Cl. 180-379.000.

Kawai, Hiroaki: *See*—
Tozu, Kenji; Asano, Kenji; and Kawai, Hiroaki, 5,470,136, Cl. 303-147.000.

Kawai, Mituo: *See*—
Yamanobe, Takashi; Satou, Michio; Ishigami, Takashi; Obata, Minoru; Kawai, Mituo; Yagi, Noriaki; Maki, Toshihiro; and Ando, Shigeru, 5,470,527, Cl. 419-53.000.

Kawai, Shingo, to NADEX Co., Ltd. Resistance welding machine. 5,471,028, Cl. 219-110.000.

Kawakami, Akira: *See*—
Yumiba, Hideaki; Matsumoto, Kazunobu; and Kawakami, Akira, 5,470,678, Cl. 429-194.000.

Kawamura, Junkichi: *See*—
Kitagawa, Toshiyuki; Nagai, Hideharu; Kawamura, Junkichi; and Mizuguchi, Hitoshi, 5,469,962, Cl. 206-723.000.

Kawanishi, Shunichi: *See*—
Nishii, Masanobu; Shimizu, Yuichi; Kawanishi, Shunichi; Sugimoto, Shunichi; Endo, Masao; and Nagase, Tomohiro, 5,470,617, Cl. 427-521.000.

Kawasaki, Ernest S.; Ladner, Martha B.; Van Arsdell, Janelle N.; Wang, Alice M.; Ralph, Peter; Coyne, Mazie Y.; and Warren, Mary K., to Cetus Oncology Corporation. Recombinant colony stimulating factor-1. 5,470,569, Cl. 424-85.100.

Kawasaki, Hirotoki: *See*—
Sato, Toshiyuki; Sakamoto, George; Takigawa, Morikuni; and Kawasaki, Hirotoki, 5,470,081, Cl. 273-438.000.

Kawasaki, Soichi, to Kabushiki Kaisha Toshiba. Method and apparatus for testing digital signals. 5,471,484, Cl. 371-25.100.

Kawashima, Kazunari: *See*—
Takemoto, Takatoshi; and Kawashima, Kazunari, 5,469,951, Cl. 194-200.000.

Kawashima, Tsutomu: *See*—
Nakada, Akira; Yoneya, Akira; Kobayashi, Noriyuki; Katayanagi, Mamoru; Kawashima, Tsutomu; and Yoshida, Hiroshi, 5,470,421, Cl. 156-642.100.

Kawata, Yutaka; Ebe, Yoichi; Hino, Harumichi; and Kawai, Hidenobu, to Jidosha Buhin Kogyo Co., Ltd. Propeller shaft arrangement. 5,469,931, Cl. 180-379.000.

Kawate, Keith W.; and Berg, Peter G., to Texas Instruments Incorporated. Heater apparatus and process for heating a fluid stream with PTC heating elements electrically connected in series. 5,471,034, Cl. 219-485.000.

Kawauchi, Masaya: *See*—
Sakai, Takafumi; Wakamatsu, Hideki; Tsuboi, Yoshihiro; and Kawauchi, Masaya, 5,469,754, Cl. 74-336.00R.

Kawneer Company, Inc.: *See*—
McKenna, Gregory B.; and Grunewald, Fred A., 5,469,683, Cl. 52-730.300.

Kaye, Paul H.; and Hirst, Edwin, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Apparatus and method for the analysis of particle characteristics using monotonically scattered light. 5,471,299, Cl. 356-336.000.

Kazama, Nobuyuki: *See*—
Miyazaki, Satomichi; Harayama, Akira; Kazama, Nobuyuki; and Ishida, Masao, 5,469,616, Cl. 29-888.074.

Kazama, Yoichiro; and Oyama, Tomihisa, to Hitachi Metals, Ltd. Solenoid-actuated diaphragm valve with biased disc spring. 5,470,045, Cl. 251-129.150.

Keating, Henry M., to Keating Koupling, Inc. Adjustable coupling ring. 5,470,112, Cl. 285-24.000.

Keating, Kent G.; and Drago, Joseph A., to Photo Sculptures, Inc. Method for producing a three-dimensional work from a two-dimensional work. 5,470,410, Cl. 156-63.000.

Keating Koupling, Inc.: *See*—
Keating, Henry M., 5,470,112, Cl. 285-24.000.

Keay, Kathleen D.: *See*—
Hammell, Sherry E.; Gong, Kai F.; Jackson, Neil A.; Keay, Kathleen D.; and MacDonald, John F., 5,471,433, Cl. 367-118.000.

Kebede, Girma: *See*—
Crocker, Michael; McB. Hodgson, John; and Kebede, Girma, 5,470,313, Cl. 604-96.000.

Keeley, James W., to Bull HN Inforamtion Systems Inc. Bus interface state machines with independent access to memory, processor and registers for concurrent processing of different types of requests. 5,471,638, Cl. 395-800.000.

Keemer, Craig B.; Jenkins, William G.; Lamborn, H. Taylor; and Scheller, Joseph B., to Silberline Manufacturing Co., Ltd. Water resistant metal pigment particles. 5,470,385, Cl. 106-404.000.

Keeney, Bradley L.: *See*—
Schneider, Karl F.; Dembosky, Stanley K.; Fairbank, Donn K.; Spokas, Romas B.; and Keeney, Bradley L., 5,470,285, Cl. 475-210.000.

Keller, Robert S.: *See*—
Johnson, William J.; Keller, Robert S.; Manthuruthil, George C.; and Williams, Marvin L., 5,471,616, Cl. 395-700.000.

Kelley, John R.: *See*—
LeMonds, Jeffrey; McConnelee, James E.; Kelley, John R.; Wiggs, Gene E.; and Martini, Gary T., 5,469,618, Cl. 29-889.720.

Kelley, Lowell D.: *See*—
Potes, Michael M.; Lambarth, Edwin H.; Prasher, Troy A.; Edelstein, Beth E.; Kelley, Lowell D.; and Lewis, Cynthia J., 5,470,220, Cl. 425-216.000.

Kelly, Mary E.: *See*—
Perrins, Neil; and Kelly, Mary E., 5,470,887, Cl. 521-65.000.

Kelsall, John T.; and Gerritsen, Theodorus A., to Hatch Associates Ltd. Modal silencer. 5,471,020, Cl. 181-224.000.

Kelsey-Hayes: *See*—
Every, Peter; Sivulka, Gerald; and Fuller, Edward M., 5,470,137, Cl. 303-188.000.

Kelso, Thomas M.; Kotch, John K.; Boyle, Damon J.; Meiser, David H.; Flaherty, William P.; and Baird, Bernard W., to United States of America, Navy. Reconfigurable aircraft stick control and method for connecting and removing stick control from aircraft simulator. 5,470,232, Cl. 434-45.000.

Kemeny, Sabrina E.: *See*—
Fossum, Eric R.; Mendis, Sunetra; and Kemeny, Sabrina E., 5,471,515, Cl. 377-60.000.

Kendall Company, The: *See*—
Patel, Harish A., 5,470,576, Cl. 424-445.000.

Kennard, Jeffrey L.; Kodokian, George K.; Popper, Peter; and Samant, Kalika R., to Du Pont de Nemours, E. I., and Company. Moisture-stable flexible structural adhesive strand. 5,470,656, Cl. 428-370.000.

Kennedy, Gordon J.: *See*—
Degnan, Thomas F.; Fung, Anthony S.; Hatzikos, George H.; Kennedy, Gordon J.; and Kowalski, Jocelyn A., 5,470,810, Cl. 502-64.000.

Kenworthy, Mark L.: *See*—
Soderberg, Brian T.; and Kenworthy, Mark L., 5,471,567, Cl. 395-133.000.

Kerkham, Katrina A., to Sebel Furniture Limited. Article of furniture. 5,470,128, Cl. 297-232.000.

Kershaw, John; and Hutton, Lesley, to Coin Controls Limited. Coin discrimination apparatus. 5,469,952, Cl. 194-317.000.

Keystone International Holdings Corp.: *See*—
Gibbs, Stephen, 5,469,805, Cl. 116-284.000.

Keystone Railway Equipment Company, Inc.: *See*—
Bankos, Kevin; and Bingler, Douglas J., 5,469,978, Cl. 213-223.000.

Khamis, Adel A., to Tevco, Inc. Cosmetic pigment coating and method of application in nail polish. 5,470,562, Cl. 424-61.000.

Khan, Ahamad Y.: *See*—
Wadsworth, Larry C.; and Khan, Ahamad Y., 5,470,663, Cl. 428-421.000.

Khan, Emdadur R., to National Semiconductor Corporation. Intelligent servomechanism controller. 5,471,381, Cl. 364-148.000.

Khan, Shahed U. M., to Holy Ghost, Duquesne University of the. Implantable non-enzymatic electrochemical glucose sensor. 5,469,846, Cl. 128-635.000.

Khazaka, Gabriel: *See*—
Kleditsch, Bernhard; and Khazaka, Gabriel, 5,470,349, Cl. 607-75.000.

Khopov, Vladimir V., to Renishaw plc. Interferometric probe for distance measurement utilizing a diffraction reflecting element as a reference surface. 5,471,302, Cl. 356-356.000.

Khoshnood, Ben: *See*—
Lim, Gunsang; Marowsky, Richard D.; and Khoshnood, Ben, 5,470,244, Cl. 439-189.000.

Khuri-Yakub, Butrus T.: *See*—
Lee, Yong J.; Khuri-Yakub, Butrus T.; and Saraswat, Krishna C., 5,469,742, Cl. 73-597.000.

Kidawara, Atsuki: *See*—
Kobayashi, Kazunari; Omachi, Kenji; Tatsuno, Yutaka; Hagihara, Masahiro; Kidawara, Atsuki; Hara, Tadayoshi; and Yazawa, Nobuyoshi, 5,469,841, Cl. 600-158.000.

Kidder, Kevin R.; Kuruganti, Vijaya K.; Kulich, Donald M.; and Graf, John F., to General Electric Company. Agglomerating agent latex with bound poly(ethylene oxide). 5,470,895, Cl. 523-335.000.

Kiedik, Maciej; Krueger, Andrzej; Kołt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Ćwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Władysław, to Instytut Ciezniej Syntezy Organicznej Blachownia; and Zaklady Chemiczne Blachownia. Method to treat an ion-exchanger catalyst for the process to synthesize alkylphenols. 5,470,809, Cl. 502-12.000.

Kiehn, Arthur J.; and Eskridge, Mark H., to Bardahl Manufacturing Corporation. Siloxane polymer compositions. 5,470,504, Cl. 252-49.600.

Kihara, Tsutomu: *See*—

Takashima, Hiroaki; Kato, Osamu; and Kihara, Tsutomu, 5,470,558, Cl. 423-447.600.
Kijima, Takahiko: *See*—
Nishizawa, Juinchi; Kijima, Takahiko; Ezell, Edward F.; and Makihara, Akira, 5,470,154, Cl. 374-141.000.
Kikuchi, Hiroshi: *See*—
Takizawa, Kuniharu; Kikuchi, Hiroshi; Osugi, Yukihisa; and Tange, Shoji, 5,471,331, Cl. 359-67.000.
Kikuchi, Naoki; and Kai, Nobuto, to Ryobi Motor Products Corp. Removable working tool assembly. 5,470,272, Cl. 451-344.000.
Kikuchi, Yoshiharu: *See*—
Tojo, Tetsuo; Matsumoto, Muneyuki; and Kikuchi, Yoshiharu, 5,470,919, Cl. 525-334.100.
Kim, Chang-Soo, to Samsung Heavy Ind. Co. Ltd. Rotation sensing device for detecting a fine displacement of a handle and control system in electrical power steering device. 5,471,202, Cl. 340-672.000.
Kim, Hyo C., to Samsung Electro-Mechanics Co., Ltd. Clockwise and counterclockwise circularly polarized wave common receiving apparatus for low noise converter. 5,471,664, Cl. 455-323.000.
Kim, Hyo Y.; Hwang, Ki H.; Chae, Hoon; Sho, Soo I.; and Jun, Jung N., to Sunkyong Industries. Thermoplastic biodegradable resins and a process of preparation thereof. 5,470,941, Cl. 528-272.000.
Kim, Jae I., to SamSung Electronics Co., Ltd. Pickled vegetables fermentation detecting device. 5,470,746, Cl. 435-287.100.
Kim, Jae-Kon: *See*—
Shin, Yoon-Sub; Chang, Se-Yeob; Lee, Sang-Jin; and Kim, Jae-Kon, 5,470,047, Cl. 266-76.000.
Kim, Jin U.; Kim, Sun Y.; and Lee, Jeom D., to Electronics and Telecommunications Research Institute. Device and method for binary-multilevel operation. 5,471,156, Cl. 326-60.000.
Kim, Jong-Seob; and Woo, Seong-Ihl, to Korea Advanced Istitue of Science and Technology. Multicomponent oxide catalyst. 5,470,815, Cl. 502-304.000.
Kim, Jung J., to Goldstar Co., Ltd. Process for the preparation of a thin film transistor. 5,470,769, Cl. 437-40.000.
Kim, Kwang Y.: *See*—
Cha, Jin Y.; and Kim, Kwang Y., 5,470,915, Cl. 525-86.000.
Kim, Kyeong-rae: *See*—
Jung, Chil-min; Kim, Kyeong-rae; and Lee, Jeong-hee, 5,471,150, Cl. 326-87.000.
Kim, Richard C.: *See*—
Mamelson, Richard A.; Kim, Richard C.; and Kvamme, Damon F., 5,471,372, Cl. 362-92.000.
Kim, Sang-muk, to Samsung Electron Devices Co., Ltd. Liquid cooling type projection cathode ray tube. 5,471,111, Cl. 313-36.000.
Kim, Sun Y.: *See*—
Kim, Jin U.; Kim, Sun Y.; and Lee, Jeom D., 5,471,156, Cl. 326-60.000.
Kim, Yong-han, to Samsung Aerospace Industries, Ltd. Camera backcover closing prevention device. 5,471,273, Cl. 354-288.000.
Kimata, Koji: *See*—
Aoki, Shigehisa; Iwasaki, Shinichi; Sugiura, Nobuo; Suzuki, Sakaru; and Kimata, Koji, 5,470,578, Cl. 424-450.000.
Kimball, Alvin W.: *See*—
Weiss, Robert B.; Kimball, Alvin W.; Gesteland, Raymond F.; Ferguson, F. Mark; Dunn, Diane M.; Di Sera, Leonard J.; and Cherry, Joshua L., 5,470,710, Cl. 435-6.000.
Kimberly-Clark Corporation: *See*—
Isaac, Robert L.; Cohen, Bernard; and Jameson, Lee K., 5,470,424, Cl. 156-253.000.
Qin, Jian, 5,470,964, Cl. 536-20.000.
Kimmerle, Frank M.: *See*—
Grolman, Robert J.; Holywell, George C.; Kimmerle, Frank M.; and Turcotte, Gilles R., 5,470,559, Cl. 423-489.000.
Kimoto, Naomi: *See*—
Hirano, Shinji; Kimoto, Naomi; Shimoyama, Yutaka; Hirohashi, Setsuo; and Takeichi, Masatoshi, 5,470,966, Cl. 536-23.500.
Kimura, Hidenobu: *See*—
Inaba, Hitoshi; and Kimura, Hidenobu, 5,471,251, Cl. 348-634.000.
Kimura, Hiroshi: *See*—
Minowa, Toshimichi; Kimura, Hiroshi; Yhoshida, Yoshiyuki; Ohyama, Yoshishige; and Nishimura, Yutaka, 5,470,290, Cl. 477-115.000.
Kimura, Katsuji, to NEC Corporation. Logarithmic amplifying circuit using quadritail cells. 5,471,166, Cl. 327-351.000.
Kimura, Kouichi: *See*—
Nishii, Kota; Kimura, Kouichi; Ishizuka, Masanobu; and Adachi, Katsura, 5,470,909, Cl. 524-538.000.
Kimura, Shinji; Sugita, Yumiko; Nakamura, Shouji; and Koda, Eriko, to Hitachi, Ltd. Graphics system using parallel processors and processing method of the same. 5,471,579, Cl. 395-163.000.
Kimura, Takahide: *See*—
Hayakawa, Fumiko; Ando, Takashi; Kimura, Takahide; and Hara, Yukihiko, 5,470,565, Cl. 424-52.000.
Kimura, Takako: *See*—
Nishikawa, Yukinobu; Hashizume, Yoshinori; and Kimura, Takako, 5,470,390, Cl. 118-719.000.
King, Eugene O.; and Teasley, G. Alfred, to Aluminum Company of America. Method of sheet processing using a tension exciter. 5,470,005, Cl. 226-1.000.
King, Ken R.; Riemer, David W.; and Cotreau, Gerald M., to Harris Corporation. Analog-to-digital converter and reference voltage circuitry. 5,471,131, Cl. 323-314.000.
King, Roger J., to University of Toledo, The. AC to DC converter system with ripple feedback circuit. 5,471,378, Cl. 363-46.000.
King, Steven A.: *See*—
Brodnax, Timothy B.; Bullis, Bryan K.; King, Steven A.; and Rickard, Dale A., 5,471,599, Cl. 395-412.000.
Kingston, David G. I.; Molinero, Anthony A.; and Gunatilaka, A. A. Leslie, to Virginia Polytechnic Institute and State University. Method for the conversion of cephalomannine to taxol and for the preparation of n-acyl analogs of taxol. 5,470,866, Cl. 514-376.000.
Kinoshita, Katsuyuki: *See*—
Niigaki, Minoru; Kinoshita, Katsuyuki; Hirohata, Toru; Ihara, Tuneo; Yamada, Masami; Asakura, Norio; Negi, Yasuharu; and Suzuki, Tomoko, 5,471,051, Cl. 250-214.0VT.
Kinoshita, Kenji: *See*—
Motomura, Hiroharu; Takasaki, Soichi; and Kinoshita, Kenji, 5,470,528, Cl. 420-84.000.
Kiriu, Yoshio, to Hitachi, Ltd. Multiple rank hierarchical data storage system with data coherence. 5,471,582, Cl. 395-250.000.
Kirk, Richard A., to Crosfield Electronics Limited. Methods and apparatus for generating graphics patterns using pixel values from a high resolution pattern. 5,471,566, Cl. 395-131.000.
Kirkeby, David; Metlitsky, Boris; Krichever, Mark; and Swartz, Jerome, to Symbol Technologies, Inc. Handheld data entry terminal having dual trigger switches. 5,471,042, Cl. 235-472.000.
Kirkpatrick, Charles H.; and Rozzo, Stephen J., to National Jewish Center for Immunology and Respiratory Medicine. Transfer factor and methods of use. 5,470,835, Cl. 514-21.000.
Kirmser, Philip G.: *See*—
Hu, Kuo-Kuang; Kirmser, Philip G.; Swartz, Stuart E.; and Hossain, Mustaque, 5,470,174, Cl. 404-52.000.
Kirschner Medical Corporation: *See*—
Doubleday, Walter D., 5,470,306, Cl. 602-8.000.
Kiser, Charles M., to Torp, Lovella V. Auxiliary wheelchair attachment for pulling a wheelchair. 5,470,093, Cl. 280-304.100.
Kish, Frederick A.: *See*—
Rathgeber, Juergen O.; Kish, Frederick A.; Hasan, Syed R.; and Hindman, Craig A., 5,469,671, Cl. 52-58.000.
Kishi, Yoshio, to Sony Corporation. Method of editing information signals recorded on recording medium. 5,471,452, Cl. 369-83.000.
Kishimoto, Tadamitsu: *See*—
Miles, Steven A.; Stevens, Ronald H.; Martinez, Otoniel M.; Kishimoto, Tadamitsu; and Klashman, David J., 5,470,824, Cl. 514-2.000.
Kishimura, Kotaro: *See*—
Sakashita, Takeshi; Shimoda, Tomoaki; and Kishimura, Kotaro, 5,470,938, Cl. 528-198.000.
Kiss, Vince; and Davis, Matthew A., to Tridelta Industries, Inc. Pneumatic acutated switch. 5,471,022, Cl. 200-83.00B.
Kita, Hiroshi; Ishidai, Hiroshi; and Kaneko, Yutaka, to Konica Corporation. Silver halide color photographic light sensitive material. 5,470,697, Cl. 430-558.000.
Kita, Kazunori: *See*—
Kobayashi, Tuneo; Kita, Kazunori; and Suzuki, Satomi, 5,471,438, Cl. 368-281.000.
Kitagawa, Masatoshi: *See*—
Shibuya, Munehiro; Kitagawa, Masatoshi; Kamada, Takeshi; and Hirao, Takashi, 5,470,398, Cl. 148-33.300.
Kitagawa, Toshiyuki; Nagai, Hideharu; Kawamura, Junkichi; and Mizuguchi, Hitoshi, to Matsushita Electric Industrial Co., Ltd. Packing materials for electrolytic capacitors. 5,469,962, Cl. 206-723.000.
Kitai, Mikio: *See*—
Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,469,752, Cl. 73-866.000.
Kitajima, Hiroshi: *See*—
Tsubota, Takahiro; and Kitajima, Hiroshi, 5,470,185, Cl. 414-264.000.
Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, to Shin-Etsu Chemical Co., Ltd. Apparatus for automatically inspecting powdery products for the presence of foreign substances. 5,469,752, Cl. 73-866.000.
Kitasato Kenkyushio: *See*—
Harada, Setsuo; Funabashi, Yasunori; Inatomi, Nobuhiro; Tanayama, Shigeharu; and Tanida, Seiichi, 5,470,961, Cl. 536-7.400.
Kitazume, Nobuyuki: *See*—
Yamamoto, Kazuhiko; Miyake, Yuichi; Okada, Chikara; and Kitazume, Nobuyuki, 5,470,404, Cl. 148-426.000.
Kivari, Raimo, to Nokia Mobile Phones Ltd. Method and apparatus for operating a radiotelephone in an extended stand-by mode of operation for conserving battery power. 5,471,655, Cl. 455-127.000.
Kiyohara, Masako: *See*—
Nishimura, Ryutaro, 5,469,885, Cl. 137-568.000.
Kiyoura, Kazuhiro: *See*—
Nonaka, Yoshiya; Aoyagi, Yoshio; Abe, Hiroyuki; Bradshaw, Alex; Kiyoura, Kazuhiro; Kato, Seiji; and Haraguchi, Koichiro, 5,471,441, Cl. 369-32.000.
Klashman, David J.: *See*—
Miles, Steven A.; Stevens, Ronald H.; Martinez, Otoniel M.; Kishimoto, Tadamitsu; and Klashman, David J., 5,470,824, Cl. 514-2.000.
Klassen, R. Victor: *See*—
Jodoin, Ronald E.; Loce, Robert P.; Klassen, R. Victor; and Lin, Ying-Wei, 5,471,320, Cl. 358-455.000.

Kleber, Heinrich: *See*—
Sitte, Hellmuth; Neumann, Klaus; Edelmann, Ludwig; Haessig, Helmut; Lang, Anton; and Kleber, Heinrich, 5,469,712, Cl. 62-51.100.

Kleditsch, Bernhard; and Khazaka, Gabriel, to Courage & Khazaka Electronic GmbH. Device for treating inflammatory skin changes in the initial stage, and method for using same. 5,470,349, Cl. 607-75.000.

Klein Bicycle Corporation: *See*—
Voss, Darrell; Klein, Gary; O'Connor, Sean; and Pauls, Lonney. 5,470,091, Cl. 280-281.100.

Klein, Bodo: *See*—
Toepfer, Bernhard; Reiner, Michael; and Klein, Bodo, 5,470,134, Cl 303-9.610.

Klein, Gary: *See*—
Voss, Darrell; Klein, Gary; O'Connor, Sean; and Pauls, Lonney 5,470,091, Cl. 280-281.100.

Klein, J. Peter: *See*—
Michnick, John; Underiner, Gail E.; Klein, J. Peter; and Rice, Glenn C., 5,470,878, Cl. 514-558.000.

Kleineibst, Desmond: *See*—
Visser, Alexis W., 5,469,923, Cl. 172-22.000.

Kleinfeld, Alan M., to Lidak Pharmaceuticals. One-step free fatty acid determination method. 5,470,714, Cl. 435-7.800.

Kleppner, Stephan; Frank, Kurt; and Mutschler, Jan, to Robert Bosch GmbH. Arrangement for supplying internal combustion engine with fuel from supply container. 5,469,829, Cl. 123-514.000.

Kletschka, Harold D. Fluid pump with magnetically levitated impeller 5,470,208, Cl. 417-356.000.

Klinkner, Walter: *See*—
Zomotor, Adam; Klinkner, Walter; Schindler, Erich; Mohn, Frank-Werner; and Wohland, Thomas, 5,471,388, Cl. 364-424.050.

Klugkist, Jan; and Saxton, Charles A., to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Mouthwash compositions. 5,470,561, Cl. 424-49.000.

Knaak, Hans-Joachim: *See*—
Dönig, Gerhard; Hümpfner, Roland; Grass, Norbert; Knaak, Hans-Joachim; Neulinger, Franz; and Schummer, Helmut, 5,471,377, Cl. 363-21.000.

Knapp, Herbert C.; Parker, Vance A.; Baxter, Larry K.; and Evans, Jon F., to Kronos Incorporated. Electro-optic barcode reader. 5,471,043, Cl. 235-472.000.

Knight, Jerry E.: *See*—
Hatch, Ronald R.; and Knight, Jerry E., 5,471,217, Cl. 342-357.000.

Knight, Thomas G., to RJF International. Solid end cap/corner unit for wall protection system. 5,469,682, Cl. 52-718.010.

Knoop, Franz: *See*—
Fietz, Ralf-Peter; and Knoop, Franz, 5,470,042, Cl. 248-678.000.

Knott, Erwin; and Hahn, Andreas, to Stöckert Instrumente GmbH. Roller pump. 5,470,211, Cl. 417-477.900.

Ko, Kai-Li: *See*—
Lai, Chung-Ping; Fu, Cheng-Tsu; Duann, Jia-Ruey; Li, Ai-Kang; and Ko, Kai-Li, 5,470,807, Cl. 501-93.000.

Kołt, Józef: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kołt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Władysław, 5,470,809, Cl. 502-12.000.

Koala Corporation: *See*—
Hilger, Jeff H., 5,470,039, Cl. 248-164.000.

Kobayakawa, Yasukazu: *See*—
Tsukada, Yutaka; Kobayakawa, Yasukazu; Maeda, Yoji; and Tsuchita, Shuhei, 5,470,796, Cl. 437-209.000.

Kobayashi, Kazunari; Omachi, Kenji; Tatsuno, Yutaka; Hagihara, Masahiro; Kidawara, Atsuki; Hara, Tadayoshi; and Yazawa, Nobuyoshi, to Olympus Optical Co., Ltd. Endoscope apparatus provided with liquid removing mechanism for the electric connector. 5,469,841, Cl. 600-158.000.

Kobayashi, Kazunori: *See*—
Shirai, Hiroyuki; Sekine, Kazumi; Tsuda, Tadayuki; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shoji, Takeo; Noda, Shinya; Kobayashi, Kazunori; and Adachi, Hiroyuki, 5,470,635, Cl. 428-131.000.

Kobayashi, Keiichi: *See*—
Inoue, Katsushi; Tamai, Seiichiro; Kobayashi, Keiichi; and Dosho, Marie, 5,471,041, Cl. 235-462.000.

Kobayashi, Makoto: *See*—
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,471,227, Cl. 347-9.000.

Kobayashi, Masafumi: *See*—
Miura, Takaharu; Nemoto, Hiroyuki; Ito, Masataka; Kobayashi, Masafumi; and Tanaka, Chieko, 5,470,652, Cl. 428-328.000.

Kobayashi, Masahiko; and Takahashi, Nobuyuki, to Anelva Corporation. Sputtering apparatus. 5,470,451, Cl. 204-298.030.

Kobayashi, Noriyuki: *See*—
Nakada, Akira; Yoneya, Akira; Kobayashi, Noriyuki; Katayanagi, Mamoru; Kawashima, Tsutomu; and Yoshida, Hiroshi, 5,470,421, Cl. 156-642.100.

Kobayashi, Tatsuya: *See*—
Fujii, Haruo; Kobayashi, Tatsuya; Imai, Nobuhiro; Kojima, Hisayoshi; Umezawa, Masao; Tada, Hideki; Ito, Akira; Seto, Kaoru; Katoh, Motoi; and Murata, Daisuke, 5,471,284, Cl. 355-210.000.

Kobayashi, Tetsuo: *See*—
Tadokoro, Shigeru; Narishige, Shinji; Koyanagi, Hiroaki; and Kobayashi, Tetsuo, 5,471,358, Cl. 360-113.000.

Kobayashi, Toshiaki: *See*—
Tanaka, Hiroshi; Kobayashi, Toshiaki; Nanba, Tomiyuki; Ishiwatari, Masaaki; Yoneyama, Toshio; Ohno, Kimio; Matsumoto, Takashi. Kanbe, Tetsuya; Isa, Takashi; and Ogusu, Yoshiyuki, 5,470,563, Cl 424-448.000.

Kobayashi, Tuneo; Kita, Kazunori; and Suzuki, Satomi, to Casio Computer Co., Ltd. Electronic device designed to permit detachable attachment of an external memory device thereto. 5,471,438, Cl. 368-281.000.

Kobayashi, Yasuhiro: *See*—
Takamoto, Masanori; Yamada, Naoyuki; and Kobayashi, Yasuhiro 5,471,408, Cl. 364-578.000.

Kobayashi, Yuikio: *See*—
Sasaki, Hitoshi; Kobayashi, Yuikio; and Igota, Shyoji, 5,470,419, Cl 156-244.120.

Kobayashi, Yukio: *See*—
Uenishi, Masamoto; Mizobuchi, Tsukasa; Takesue, Masatoshi; Kobayashi, Yukio; and Nagai, Shoichi, 5,470,616, Cl. 427-515.000.

Kobayshi, Ieyasu: *See*—
Hamano, Hisashi; Hosoi, Masahiro; Kobayshi, Ieyasu; and Saeki, Yasuhiro, 5,470,665, Cl. 428-480.000.

Koch Membrane Systems, Inc.: *See*—
Colby, David M., 5,470,468, Cl. 210-321.600.

Koch, Theodore A.; Krause, Karl R.; and Mehdizadeh, Mehrdad, to Du Pont de Nemours, E. I., and Company. Apparatus and process for the preparation of hydrogen cyanide. 5,470,541, Cl. 422-186.000.

Koda, Eriko: *See*—
Kimura, Shinji; Sugita, Yumiko; Nakamura, Shouji; and Koda, Eriko. 5,471,579, Cl. 395-163.000.

Kodama, Satoshi; and Adachi, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Process for producing a thin-film magnetic head having an insulation formed of a ladder-type silicone resin. 5,470,491, Cl. 216-22.000.

Kodokian, George K.: *See*—
Kennard, Jeffrey L.; Kodokian, George K.; Popper, Peter; and Samant, Kalika R., 5,470,656, Cl. 428-370.000.

Koelmel, Donald F.: *See*—
Bezwada, Rao S.; Shalaby, Shalaby W.; and Koelmel, Donald F., 5,470,340, Cl. 606-231.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Bolza-Schünemann, Ing H.-B., 5,471,309, Cl. 356-394.000.
Michalik, Horst B., 5,469,788, Cl. 101-227.000.

Koenig, Donald E., to Mosler, Inc. Multi-layer panels for modular vault structure. 5,469,796, Cl. 109-49.500.

Kogan, Boris S.: *See*—
Pertsov, Nikolay V.; Ulberg, Zoya R.; Vember, Vladimir E.; Podolskaya, Valentina I.; Kogan, Boris S.; and Burenkov, Eduard K., 5,470,460, Cl. 210-151.000.

Kogl, Franz: *See*—
Heimberg, Wolfgang; Hellmich, Wolfram; Kogl, Franz; and Malatinszky, Paul, 5,469,828, Cl. 123-497.000.

Kohl, Albert: *See*—
Lehner, August; Schneider, Norbert; Roller, Hermann; Balz, Werner; Lenz, Werner; and Kohl, Albert, 5,470,650, Cl. 428-323.000.

Kohlhage, Hermann; Baitz, Günter; and Malke, Wolfgang, to Siemens Nixdorf Informationssysteme Aktiengesellschaft. Device for collecting sheet-like notes and for dispensing a bundle of notes. 5,470,053, Cl. 271-213.000.

Kohno, Hiroshige: *See*—
Watanabe, Akinori; Horiguchi, Itaru; Sato, Atsushi; Kohno, Hiroshige; Ikeda, Kenji; and Iwasaki, Yujiro, 5,470,608, Cl. 427-133.000.

Kohno, Yasutaka, to Mitsubishi Denki Kabushiki Kaisha. Field effect transistor and method for producing the field effect transistor. 5,471,073, Cl. 257-108.000.

Kojima, Hisayoshi: *See*—
Fujii, Haruo; Kobayashi, Tatsuya; Imai, Nobuhiro; Kojima, Hisayoshi; Umezawa, Masao; Tada, Hideki; Ito, Akira; Seto, Kaoru; Katoh, Motoi; and Murata, Daisuke, 5,471,284, Cl. 355-210.000.

Kojima, Masayoshi: *See*—
Okuda, Nobuyuki; and Kojima, Masayoshi, 5,470,431, Cl. 159-28.600.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Taga, Hidenori; Suzuki, Masatoshi; Edagawa, Noboru; Yamamoto, Shu; and Wakabayashi, Hiroharu, 5,471,333, Cl. 359-173.000.

Kolbus GmbH & Co. KG: *See*—
Rathert, Horst; and Staudinger, Reimar, 5,469,954, Cl. 198-412.000.

Kolin, Kevin S.; and Siegmann, Anthony J., to Morton International, Inc. Continuous process for making a dialkyltin thiocarboxylic acid ester. 5,470,995, Cl. 556-91.000.

Kolinski, Jerzy B.: *See*—
Pawlowski, Stephen S.; MacWilliams, Peter D.; and Kolinski, Jerzy B., 5,471,637, Cl. 395-296.000.

Koliopoulos, Chris L.; and Tang, Shouhong, to Phase Shift Technology, Inc. Sheet flatness measurement system and method. 5,471,307, Cl. 356-371.000.

Komai, Masaharu: *See*—
Suyama, Shuji; Ishigaki, Hideyo; Tomoda, Masayasu; Shirai, Yoshihiro; Tanaka, Hiroyuki; and Komai, Masaharu, 5,470,917, Cl. 525-326.300.

Komala, Ernest. Folding lotion applicator. 5,470,163, Cl. 401-126.000.

Komatsubara, Nozomi: *See*—

Nomura, Shigeki; Komatsubara, Nozomi; Mizui, Naomitsu; Kunishige, Kazutoshi; and Fukagawa, Tomoki, 5,470,529, Cl. 420-103.000.

Komori, Mikio: *See*—
Suzuki, Takehiro; Inomata, Shigemitsu; and Komori, Mikio, 5,469,869, Cl. 131-60.000.

Konagaya, Masahiko: *See*—
Yoshizo, Ikegami; Abe, Kuniomi; and Konagaya, Masahiko, 5,471,261, Cl. 351-210.000.

Konan Inc.: *See*—
Yoshizo, Ikegami; Abe, Kuniomi; and Konagaya, Masahiko, 5,471,261, Cl. 351-210.000.

Konchan, Larry L. Jars for carrying fisherman's bait and support member for the jars. 5,470,001, Cl. 224-253.000.

Kondo, Keiji; and Inouye, Masayori, to University of Medicine and Dentistry of New Jersey, The. Stress-induced proteins, genes coding therefor, transformed cells of organisms, methods and applications. 5,470,971, Cl. 536-23.700.

Kondo, Kimio: *See*—
Iwai, Kiyoshi; Kondo, Kimio; Sezaki, Yoshiaki; Fukata, Masatoshi; Hashimoto, Eiji; and Yoshioka, Toshio, 5,469,799, Cl. 114-74.00A.

Kondo, Makoto, to Canon Kabushiki Kaisha. Still image pickup apparatus with shortened exposure time. 5,471,242, Cl. 348-224.000.

Kondo, Naofumi: *See*—
Shimada, Yoshinori; Kondo, Naofumi; Sakurai, Takehisa; Kataoka, Yoshiharu; Takahama, Manabu; and Katayama, Mikio, 5,471,070, Cl. 257-57.000.

Kondo, Noriaki: *See*—
Codama, Mitsufumi; and Kondo, Noriaki, 5,470,762, Cl. 437-21.000.

Kondo, Yasuhiro, to Nippon Telegraph and Telephone Corporation. Method of manufacturing buried heterostructure semiconductor laser. 5,470,785, Cl. 437-129.000.

Kone Oy: *See*—
Hakala, Harri; and Aulanko, Esko, 5,469,937, Cl. 187-266.000.

Konica Corporation: *See*—
Kita, Hiroshi; Ishidai, Hiroshi; and Kaneko, Yutaka, 5,470,697, Cl. 430-558.000.
Marui, Toshiyuki, 5,470,700, Cl. 430-567.000.
Ninomiya, Hidetaka; Nagasawa, Yuko; and Asano, Kazuo, 5,470,985, Cl. 548-312.400.
Oguchi, Toshihiko; Takeuchi, Hajime; and Murano, Minori, 5,470,645, Cl. 428-212.000.

Koninklijke P.T.T.: *See*—
Diemeer, Martinus B. J.; Horsthuis, Winfried H. G.; McDonach, Alaster; and Copeland, John M., 5,470,692, Cl. 430-290.000.

Konishi, Akio: *See*—
Tanigami, Yoshinori; Tabata, Takahiro; Hashima, Hidekazu; and Konishi, Akio, 5,470,506, Cl. 252-518.000.

Konishi, Yasuhiro: *See*—
Sawada, Seiji; and Konishi, Yasuhiro, 5,471,430, Cl. 365-222.000.

Konno, Daisuke: *See*—
Toshimitsu, Manabu; Aiyoshizawa, Shunichi; Suganuma, Yoshikazu; and Konno, Daisuke, 5,471,104, Cl. 310-90.000.

Kono, Shinichi; and Fukukura, Masaaki, to Fanuc Ltd. Slip frequency control method for induction motors. 5,471,126, Cl. 318-807.000.

Kontiainen, Veijo. Apparatus and procedure for cutting square timber. 5,469,904, Cl. 144-370.000.

Kopatz, Nelson E.: *See*—
Dorfman, Leonid P.; Scheithauer, Michael J.; Houck, David L.; and Kopatz, Nelson E., 5,470,549, Cl. 423-61.000.

Kopec, John: *See*—
Reid, Alister P.; Kopec, John; and Sumner, Christopher, 5,469,659, Cl. 49-169.000.

Kopp, Gabriele M.; Laudenbach, Erich; and Anbarci, Ahmet, to Kraft General Foods R&D, Inc. Method and system for processing cheese. 5,470,595, Cl. 426-231.000.

Koppolu, Prasad M.; Fallahi, Amir; and Chinniah, Jeyachandrabose, to Ford Motor Company. High efficiency illuminator. 5,471,371, Cl. 362-32.000.

Kordosky, Gary A.; and Olafson, Stephen M., to Henkel Corporation. Nickel extraction process. 5,470,552, Cl. 423-139.000.

Korea Advanced Institute of Science and Technology: *See*—
Ahn, Byung T.; Moon, Dae G.; and Lee, Jeong N., 5,470,619, Cl. 427-578.000.

Korea Advanced Istitue of Science and Technology: *See*—
Kim, Jong-Seob; and Woo, Seong-Ihl, 5,470,815, Cl. 502-304.000.

Korec, Jacek: *See*—
Shekar, Mallikarjunaswamy S.; Baliga, B. Jayant; and Korec, Jacek, 5,471,075, Cl. 257-139.000.

Kosciuk, Ryszard: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kołt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Władysład, 5,470,809, Cl. 502-12.000.

Koshkin, Petr K.; Sveshnikov, Alexander A.; and Bobrovskikh, Jury M., to Opytny Zavod Mikroelektroniki "RIF" . Surface acoustic wave bandpass filter including unique V-shaped electrode and phase compensator. 5,471,179, Cl. 333-195.000.

Koslov, Joshua L., to Hitachi America, Ltd. Carrier recovery system using acquisition and tracking modes and automatic carrier-to-noise estimation. 5,471,508, Cl. 375-344.000.

Kosmaczeska, Alicia. Expandable window pet bin. 5,469,807, Cl. 119-19.000.

Koss, Christopher R.: *See*—
Umney, Michael A.; Walters, Steven A.; and Koss, Christopher R., 5,470,114, Cl. 285-367.000.

Kosuge, Takuo; Tsuji, Kuniro; Ishida, Hitoshi; and Kosuge, Yoshiki, to J. W. Broadbent Nominees Pty. Ltd. Active principle isolated from shark tissue. 5,470,574, Cl. 424-401.000.

Kosuge, Yoshiki: *See*—
Kosuge, Takuo; Tsuji, Kuniro; Ishida, Hitoshi; and Kosuge, Yoshiki, 5,470,574, Cl. 424-401.000.

Kotaki, Takaaki; Taya, Masaaki; Unno, Makoto; Mikuriya, Yushi; and Dojyo, Tadashi, to Canon Kabushiki Kaisha. Toner for developing electrostatic image, one-component type developer, and two-component type developer. 5,470,684, Cl. 430-109.000.

Kotani, Hirokazu: *See*—
Yamamoto, Katsuhiko; Sagawa, Hiroaki; Kotani, Hirokazu; Hiraoka, Nobutsugu; and Nakamura, Teruya, 5,470,732, Cl. 435-196.000.

Kotani, Tokumi: *See*—
Nomura, Koji; Nakanishi, Tutomu; Kotani, Tokumi; and Kuramasu, Keizaburo, 5,471,060, Cl. 250-338.300.

Kotch, John K.: *See*—
Kelso, Thomas M.; Kotch, John K.; Boyle, Damon J.; Meiser, David H.; Flaherty, William P.; and Baird, Bernard W., 5,470,232, Cl. 434-45.000.

Kotzur, Frank W., to Windings, Inc. Uniform width payout hole. 5,470,026, Cl. 242-18.00R.

Kou, Jim H.: *See*—
Supersaxo, Andreas; and Kou, Jim H., 5,470,582, Cl. 424-489.000.

Kovacevic, Nebojsa, to N.K. Biotechnical Engineering Company. Range of motion analysis system. 5,469,862, Cl. 128-782.000.

Kowal, Albert E.: *See*—
van der Leeuw, Bart; Canale, Joseph E.; Kowal, Albert E.; Pragt, Henrikus J. H.; and Morris, Thomas W., 5,471,110, Cl. 313-25.000.

Kowalski, Jocelyn A.: *See*—
Degnan, Thomas F.; Pung, Anthony S.; Hatzikos, George H.; Kennedy, Gordon J.; and Kowalski, Jocelyn A., 5,470,810, Cl. 502-64.000.

Koyanagi, Hajime; Hosaka, Sumio; and Imura, Ryo, to Hitachi, Ltd. Precision machining method, precision machining apparatus and data storage apparatus using the same. 5,471,064, Cl. 250-452.200.

Koyanagi, Hideki: *See*—
Yonemitsu, Jun; Koyanagi, Hideki; and Akiyama, Yoshiyuki, 5,471,450, Cl. 369-60.000.

Koyanagi, Hiroaki: *See*—
Tadokoro, Shigeru; Narishige, Shinji; Koyanagi, Hiroaki; and Kobayashi, Tetsuo, 5,471,358, Cl. 360-113.000.

Kozawa, Minoru: *See*—
Misawa, Hiromitsu; Fujioka, Kazuo; Aoki, Koso; Kurita, Eiichi; Okano, Yoji; and Kozawa, Minoru, 5,470,660, Cl. 428-403.000.

Koziara, Robert P.: *See*—
Data, Stanley E.; Koziara, Robert P.; Leat, Mark S.; O'Gorman, Patrick A.; Rose, Thomas K.; Shanks, Eugene G.; and Norrick, Daniel A., 5,469,820, Cl. 123-192.200.

Kraft Foods, Inc.: *See*—
Katcher, Jay H.; and Bertalan, Charles W., 5,470,968, Cl. 536-102.000.

Kraft General Foods R&D, Inc.: *See*—
Kopp, Gabriele M.; Laudenbach, Erich; and Anbarci, Ahmet, 5,470,595, Cl. 426-231.000.

Kragl, Hans; and Weber, Jens, to Robert Bosch GmbH. Component for use in the transmission of optical signals. 5,471,551, Cl. 385-37.000.

Krahnke, Robert H.; Mealey, Shawn K.; Schoenherr, William J.; Smith, Schyler B., deceased (by Bruce M. Groom, legal representative); and Tangney, Thomas J., to Dow Corning Corporation. Moisture-curable silicone pressure-sensitive adhesives. 5,470,923, Cl. 525-477.000.

Krainer, Erich; and Sonnek, Martin, to U.S. Philips Corporation. Apparatus having at least one battery secured to a printed circuit board. 5,471,016, Cl. 174-254.000.

Kraiselburd, Edmundo, to University of Puerto Rico. Non-infectious simian immunodeficiency virus particles produced by cell line CRL 11393. 5,470,572, Cl. 424-208.100.

Kramer, David E.: *See*—
Helgren, R. Hayes; and Kramer, David E., 5,470,327, Cl. 604-411.000.

Kramer, Otmar, to Mannesmann Rexroth GmbH. Hydraulic drive apparatus comprising a cylinder. 5,469,704, Cl. 60-455.000.

Krämer, Rudi: *See*—
Schwan, Rainer; and Krämer, Rudi, 5,470,260, Cl. 439-630.000.

Krampe, Franz. Device for stripping electric conductors and/or wires. 5,469,762, Cl. 81-9.430.

Krantz, Kermit T.; and Jones, Charles R., Jr., to V-Lite Corporation. Lightweight video cassette cartridge. 5,470,028, Cl. 242-343.200.

Kraus, Lawrence S.: *See*—
Cha, Chang Y.; Plancher, Henry; and Kraus, Lawrence S., 5,470,384, Cl. 106-284.030.

Krause, Karl R.: *See*—
Koch, Theodore A.; Krause, Karl R.; and Mehdizadeh, Mehrdad, 5,470,541, Cl. 422-186.000.

Krauss, Guenther; and Herrmann, Klaus, to Siemens Aktiengesellschaft. Medical apparatus having an adjustable apparatus part for application to the body surface of a patient. 5,470,302, Cl. 601-2.000.

Krautschneider, Wolfgang; and Wersing, Wolfram, to Siemens Aktiengesellschaft. Ferroelectric memory cell arrangement. 5,471,417, Cl. 365-145.000.

Krayeski, Paul D.; Marko, Paul D.; and Patsiokas, Stelios J., to Motorola, Inc. Method and apparatus for measuring return loss. 5,471,146, Cl. 324-637.000.

Krchnak, Viktor: *See—*
Sepetov, Nikolai; Issakova, Olga; Krchnak, Viktor; and Lebl, Michal, 5,470,753, Cl. 436-89.000.

Kretzschmar, Gerhard: *See—*
Stahl, Wilhelm; Ahlers, Michael; Walch, Axel; Bartnik, Eckhart; Kretzschmar, Gerhard; Grabley, Susanne; and Schleyerbach, Rudolf, 5,470,843, Cl. 514-61.000.

Krevalis, Martin A., Jr.: *See—*
Schlosberg, Richard H.; Duncan, Carolyn B.; and Krevalis, Martin A., Jr., 5,470,497, Cl. 252-68.000.

Krichever, Mark: *See—*
Kirkeby, David; Metlitsky, Boris; Krichever, Mark; and Swartz, Jerome, 5,471,042, Cl. 235-472.000.

Krimmel, Heinz: *See—*
Junginger, Bernhard; Pritschi, Rainer; and Krimmel, Heinz, 5,471,342, Cl. 359-341.000.

Krishnakumar, Suppayan M.: *See—*
Collette, Wayne N.; and Krishnakumar, Suppayan M., 5,469,612, Cl. 29-453.000.

Kroll, Bruno: *See—*
Heim, Gunther; and Kroll, Bruno, 5,469,668, Cl. 49-502.000.

Kronos Incorporated: *See—*
Knapp, Herbert C.; Parker, Vance A.; Baxter, Larry K.; and Evans, Jon F., 5,471,043, Cl. 235-472.000.

Krosaki Corporation: *See—*
Taira, Toshimitsu; Ohnuma, Masao; Hanada, Hisao; Aoki, Teruo; and Kuhara, Tetsuro, 5,470,048, Cl. 266-236.000.

Krstic, Vladimir D.; and Vlajic, Milan. Making of sintered silicon carbide bodies. 5,470,806, Cl. 501-90.000.

Krueger, Andrzej: *See—*
Kiedik, Maciej; Krueger, Andrzej; Kolt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Władysław, 5,470,809, Cl. 502-12.000.

Krueger, Wolfgang; and Wei, William, to MTU Motoren- Und Turbinen-Union Muenchen GmbH. Method for manufacturing a blade ring for drum-shaped rotors of turbomachinery. 5,470,524, Cl. 419-5.000.

Krumm, Walter E., Sr. Arcuate brake system with fastener-free replaceable brake lining. 5,469,942, Cl. 188-250.00G.

Krumweide, Duane E.: *See—*
Krumweide, Gary C.; Krumweide, Duane E.; and Clark, Randy, 5,471,367, Cl. 361-719.000.

Krumweide, Gary C.; Krumweide, Duane E.; and Clark, Randy, to Composite Optics, Inc. Composite structure for heat transfer and radiation. 5,471,367, Cl. 361-719.000.

Krupotich, Edward A.; and Rosensweig, Burton J., to Omation Corporation. Envelope opening machine. 5,470,182, Cl. 409-137.000.

Krupp Koppers GmbH: *See—*
Linke, Adolf; Pohl, Werner; Schmid, Karl; and Wetzel, Rolf, 5,470,361, Cl. 48-197.00R.

Krust, Bernard: *See—*
Hovanessian, Ara G.; Rey, Marie-Anne; Laurent, Anne G.; Krust, Bernard; and Montagnier, Luc, 5,470,702, Cl. 435-5.000.

Krutchen, Charles M.: *See—*
Wenzel, Richard A.; Sable, Lewis E.; Krutchen, Charles M.; and Williams, Phillip A., 5,470,521, Cl. 264-321.000.

KSB Aktiengesellschaft: *See—*
Schäfer, Horst; Schaaf, Günter; Scholz, Bernhard; and Beiss, Günter, 5,470,204, Cl. 416-157.00R.
Schäfer, Horst; and Schaaf, Günter, 5,470,199, Cl. 415-129.000.

Kubo, Yoshinobu; and Chishima, Masamitsu, to Sumitomo Wiring Systems, Ltd. Resin composition for automobile relay box and automobile relay box comprising the same. 5,470,902, Cl. 524-400.000.

Kubota, Minoru: *See—*
Folkers, Karl A.; Ljungqvist, Anders; Feng, Dong-Mei; Kubota, Minoru; Tang, Pui-Fun L.; and Bowers, Cyril Y., 5,470,947, Cl. 530-313.000.

Kubota, Norio: *See—*
Mori, Masukazu; Yamanaka, Hiroyoshi; Kubota, Norio; and Shimokawa, Naoki, 5,470,203, Cl. 416-144.000.

Kubota, Yoshihiro: *See—*
Kashida, Meguru; Shirasaki, Toru; Hamada, Yuichi; Nagata, Yoshihiko; Kawaguchi, Sakae; and Kubota, Yoshihiro, 5,470,621, Cl. 428-14.000.

Kubota, Yukio: *See—*
Ogata, Seiichi; Kawaguchi, Moriyuki; Kanota, Keiji; Kubota, Yukio; Sato, Heikichi; and Abe, Iwao, 5,471,355, Cl. 360-84.000.

Kucharski, Paul: *See—*
Engdahl, Jonathan R.; Lucak, Mark A.; Gee, David J.; and Kucharski, Paul, 5,471,461, Cl. 370-17.000.

Kuchcik, Joel G.: *See—*
Baumann, James A.; Kuchcik, Joel G.; and Lanigan, John J., Sr., 5,470,189, Cl. 414-618.000.

Kudoh, Kazuhiro; Muramatsu, Akira; and Ishiguro, Tetsumi, to NEC Corporation. Radio communication apparatus capable of notifying reception of a call signal in a perceptual mode determined by counting a number of times of the reception. 5,471,204, Cl. 340-825.440.

Kuehn, Kevin P.; Rossing, Martin A.; and Berg, William C., to Medtronic, Inc. High voltage switch drive for implantable cardioverter/defibrillator. 5,470,341, Cl. 607-5.000.

Kugimiya, Koichi: *See—*
Okuyama, Kojiro; Yokotani, Yoichiro; and Kugimiya, Koichi, 5,470,808, Cl. 501-134.000.

Kuhara, Tetsuro: *See—*
Taira, Toshimitsu; Ohnuma, Masao; Hanada, Hisao; Aoki, Teruo; and Kuhara, Tetsuro, 5,470,048, Cl. 266-236.000.

Kulich, Donald M.: *See—*
Kidder, Kevin R.; Kuruganti, Vijaya K.; Kulich, Donald M.; and Graf, John F., 5,470,895, Cl. 523-335.000.

Kumagai, Tatsuya; Iitsuka, Hisao; Kajioka, Hiroshi; Ohnuki, Wataru; and Tetsu, Toshiyuki, to Hitachi Cable, Ltd. Optical fiber gyro. 5,471,301, Cl. 356-350.000.

Kumar, Sudarshan; and Banik, Jashojiban, to Intel Corporation. Fast static CMOS adder. 5,471,414, Cl. 364-788.000.

Kumar, Vijayendra: *See—*
Peariman, Paul S.; and Kumar, Vijayendra, 5,470,648, Cl. 428-247.000.

Kump, Daniel J., to Fasteners for Retail, Inc. Coupon display and dispenser device. 5,470,138, Cl. 312-34.400.

Kump, William H.: *See—*
Lund, David L.; Kump, William H.; and Groff, Donald W., 5,470,679, Cl. 429-210.000.

Kunishi, Noriyuki: *See—*
Okamoto, Masaya; Kuze, Shigeki; Kunishi, Noriyuki; and Nakashima, Taisuke, 5,470,937, Cl. 528-198.000.

Kunishige, Kazutoshi: *See—*
Nomura, Shigeki; Komatsubara, Nozomi; Mizui, Naomitsu; Kunishige, Kazutoshi; and Fukagawa, Tomoki, 5,470,529, Cl. 420-103.000.

Kunitou, Masao, to NEC Corporation. Fabrication method of a read-only semiconductor memory device. 5,470,774, Cl. 437-45.000.

Kunkle, Diane C.: *See—*
Grillo, Susan M.; Steffenino, Rita M.; Kunkle, Diane C.; and Saraceni, Kathleen, 5,470,581, Cl. 424-479.000.

Kunugise, Akira: *See—*
Noji, Minoru; Kunugise, Akira; and Imai, Yumiko, 5,470,512, Cl. 264-4.100.

Kuo, James R., to National Semiconductor Corporation. High-speed low-voltage differential swing transmission line transceiver. 5,471,498, Cl. 375-295.000.

Kuo, Tse-Hsin; and Sheu, Lieh-Jou. Bicycle wheel rim assembly. 5,470,133, Cl. 301-95.000.

Kurachi, Atsuhiko, to Brother Kogyo Kabushiki Kaisha. Apparatus for converting image outline data into dot data representative of image dots. 5,471,550, Cl. 382-200.000.

Kuramasu, Keizaburo: *See—*
Nomura, Koji; Nakanishi, Tutomu; Kotani, Tokumi; and Kuramasu, Keizaburo, 5,471,060, Cl. 250-338.300.

Kuramoto, Roy; Chowhan, Zakiuddin T.; Pendleton, Ranal O.; and Hafezzadeh, Hafez, to Syntex Pharmaceuticals International Limited. Directly-compressible naproxen or naproxen sodium compositions. 5,470,580, Cl. 424-464.000.

Kurano, Yoshihiro: *See—*
Sugiyama, Masami; Uchida, Yoshiaki; Kurano, Yoshihiro; Tanaka, Aiko; and Tanimoto, Tetsuji, 5,470,759, Cl. 436-541.000.

Kurashishiki Boseki Kabushiki Kaisha: *See—*
Nishii, Masanobu; Shimizu, Yuichi; Kawanishi, Shunichi; Sugimoto, Shunichi; Endo, Masao; and Nagase, Tomohiro, 5,470,617, Cl. 427-521.000.

Kureha Chemical Industry Co., Ltd.: *See—*
Niimura, Koichi; Kawabe, Takako; Ando, Takao; and Saito, Kenichi, 5,470,960, Cl. 536-6.400.

Kurita, Eiichi: *See—*
Misawa, Hiromitsu; Fujioka, Kazuo; Aoki, Koso; Kurita, Eiichi; Okano, Yoji; and Kozawa, Minoru, 5,470,660, Cl. 428-403.000.

Kuriyama, Choujirou: *See—*
Nakamura, Shinji; and Kuriyama, Choujirou, 5,471,365, Cl. 361-523.000.

Kurnia, Alexander: *See—*
Ranganath, Krishnappa; and Kurnia, Alexander, 5,471,117, Cl. 315-247.000.
Ranganath, Krishnappa; and Kurnia, Alexander, 5,471,119, Cl. 315-307.000.

Kuroda, Noritaka: *See—*
Kaneko, Tatsuhiko; Kuroda, Noritaka; and Kashiwa, Kenichi, 5,471,004, Cl. 568-455.000.

Kuroda, Toru: *See—*
Takada, Masayuki; Yamada, Osamu; Kuroda, Toru; Yamazaki, Koichi; and Noda, Kazuo, 5,471,424, Cl. 365-189.010.

Kurokawa, Yuji, to Brother Kogyo Kabushiki Kaisha. Figure digitizing system. 5,471,536, Cl. 382-315.000.

Kuroki Chain Mfg., Co., Ltd.: *See—*
Kuroki, Katsuhiko, 5,469,697, Cl. 59-35.100.

Kuroki, Katsuhiko, to Kuroki Chain Mfg., Co., Ltd. Stud link chain. 5,469,697, Cl. 59-35.100.

Kurosu, Yasuo; Masuzaki, Hidefumi; and Fujisawa, Hiromichi, to Hitachi, Ltd. Method of detecting and correcting a direction of image data and document image filing system employing the same. 5,471,549, Cl. 382-290.000.

Kuroyanagi, Akira: *See—*

Fujii, Tetsuo; Sakai, Minekazu; and Kuroyanagi, Akira, 5,470,771, Cl. 437-43.000.
Kuruganti, Vijaya K.: *See*—
Kidder, Kevin R.; Kuruganti, Vijaya K.; Kulich, Donald M.; and Graf, John F., 5,470,895, Cl. 523-335.000.
Kurumada, Toshimi: *See*—
Domoto, Yoshihisa; Takahashi, Toshie; and Kurumada, Toshimi, 5,471,525, Cl. 379-247.000.
Kusada, Takao: *See*—
Okamura, Masami; Sawa, Takao; Yamauchi, Yoshiyuki; and Kusada, Takao, 5,470,646, Cl. 428-216.000.
Kusaka, Yukio: *See*—
Nakamura, Yoshinori; Sam, Huy; Fujiwara, Yoshio; Nagura, Toshikazu; Hayasi, Shigeo; and Kusaka, Yukio, 5,470,817, Cl. 503-227.000.
Kusano, Satoshi: *See*—
Tawaragi, Yuji; Kusano, Satoshi; Suzuki, Toshio; and Obitsu, Noriko, 5,471,446, Cl. 369-44.140.
Kusunoki, Shigeo, to Sony Corporation. Communication apparatus utilizing high power amplifier. 5,471,656, Cl. 455-127.000.
Kuwashima, Tetsuhito: *See*—
Suematsu, Hiroyuki; Ochi, Hisayuki; Ohno, Manabu; and Kuwashima, Tetsuhito, 5,470,686, Cl. 430-111.000.
Kuze, Shigeki: *See*—
Okamoto, Masaya; Kuze, Shigeki; Kunishi, Noriyuki; and Nakashima, Taisuke, 5,470,937, Cl. 528-198.000.
Kvaerner Pulping Technologies AB: *See*—
Oulie, Finn; Backlund, Ake; and Svanberg, Johanna, 5,470,437, Cl. 162-237.000.
Kvamme, Damon F.: *See*—
Mamelson, Richard A.; Kim, Richard C.; and Kvamme, Damon F., 5,471,372, Cl. 362-92.000.
Kwak, Choong-Keun: *See*—
Lee, Seung-Keun; and Kwak, Choong-Keun, 5,471,429, Cl. 365-201.000.
Kwan, Tom W.: *See*—
Adams, Robert W.; Kwan, Tom W.; and Coln, Michael, 5,471,411, Cl. 364-724.010.
Kwok, Alexander K. W., to ABB EPT Construction Pty. Limited. System for discharge of bulk materials from vehicles. 5,470,186, Cl. 414-388.000.
Kyaw, Maung H.: *See*—
Lowell, John K.; Anjum, Mohammed; Wenner, Valerie A.; Armour, Norman L.; and Kyaw, Maung H., 5,471,293, Cl. 356-30.000.
Kyosan Denki Co., Ltd.: *See*—
Noya, Tamotsu, 5,469,886, Cl. 137-599.000.
Kyushu Fujitsu Electronics Limited: *See*—
Honda, Tosiyuki; and Haranosono, Takao, 5,471,369, Cl. 361-813.000.
L & S Bearing Co.: *See*—
Shockey, Roy L.; and McCulley, William W., 5,470,207, Cl. 417-313.000.
LABCON, North America: *See*—
Lind, Peter M., 5,470,538, Cl. 422-104.000.
Laboratoires De Therapeutique Moderne: *See*—
Christen, Marie-Odile; and Burgot, Jean-Louis, 5,470,871, Cl. 514-441.000.
Laboratori Baldacci Spa: *See*—
Baldacci, Massimo; and Baldacci, Ugo, 5,470,965, Cl. 536-21.000.
Laboratories Monal: *See*—
Sauvaire, Yves; and Ribes, Gerard, 5,470,879, Cl. 514-561.000.
Labtystems Oy: *See*—
Järvimäki, Kari, 5,470,536, Cl. 422-102.000.
Labuguen, Ronald: *See*—
Taylor, Ronald P.; Sutherland, William M.; Reist, Craig; Wright, Eleanor L.; Webb, Donna; and Labuguen, Ronald, 5,470,570, Cl. 424-93.730.
Laderoute, Richard; and Sasser, Lynn. Rail mounted table rotatable about a longitudinal edge. 5,469,794, Cl. 108-48.000.
Ladha, Vivek: *See*—
Akkawi, Isam W.; Hayashida, Scott H.; Ladha, Vivek; and Rudy, John E., 5,471,589, Cl. 395-800.000.
Ladner, Martha B.: *See*—
Kawasaki, Ernest S.; Ladner, Martha B.; Van Arsdell, Janelle N.; Wang, Alice M.; Ralph, Peter; Coyne, Mazie Y.; and Warren, Mary K., 5,470,569, Cl. 424-85.100.
Laevosan-Gesellschaft mbH: *See*—
Förster, Harald; Asskali, Fatima; and Nitsch, Ernst, 5,470,841, Cl. 514-60.000.
Lafyatis, David S.: *See*—
Foley, Henry C.; Soanichsen, George C.; Brake, Loren D.; Mariwala, Ravindra K.; and Lafyatis, David S., 5,470,814, Cl. 502-182.000.
Lagerquist, Roger: *See*—
Pixley, Alan K.; Vidal, Claude A.; and Lagerquist, Roger, 5,470,007, Cl. 227-175.000.
Lai, Chung-Ping; Fu, Cheng-Tzu; Duann, Jia-Ruey; Li, Ai-Kang; and Ko, Kai-Li, to Industrial Technology Reserch Institute. Chromium carbide based ceramics composite block gauge. 5,470,807, Cl. 501-93.000.
L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Nagamura, Takashi; Yamamoto, Takao; and Tomita, Shinji, 5,470,543, Cl. 422-211.000.
Nishikawa, Yukinobu; Hashizume, Yoshinori; and Kimura, Takako, 5,470,390, Cl. 118-719.000.
Laitram Corporation, The: *See*—
Greve, Christopher G.; and Lapeyre, Robert S., 5,469,956, Cl. 198-699.100.
Lakewood Engineering & Manufacturing Co.: *See*—
Ilies, Andrei N., 5,471,026, Cl. 219-83.000.
Lal, Kasturi: *See*—
Pialet, Joseph W.; Lal, Kasturi; and Bryant, Charles P., 5,470,498, Cl. 252-76.000.
Lallement, Jacques: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; Marchand, Pierre; Dixmier, Francoise; and Prigent, Monique, 5,470,495, Cl. 252-18.000.
Lambarth, Edwin H.: *See*—
Potes, Michael M.; Lambarth, Edwin H.; Frasher, Troy A.; Edelstein, Beth E.; Kelley, Lowell D.; and Lewis, Cynthia J., 5,470,220, Cl. 425-216.000.
Lamborn, H. Taylor: *See*—
Keemer, Craig B.; Jenkins, William G.; Lamborn, H. Taylor; and Scheller, Joseph B., 5,470,385, Cl. 106-404.000.
Lamm, Gunther; Mayer, Udo; Reichelt, Helmut; and Zeidler, Georg, to BASF Aktiengesellschaft. Polyazo dyes having a diazo component of the aminobenzophenone series. 5,470,959, Cl. 534-680.000.
Lamont, Gordon J.: *See*—
Fletcher, Nicholas J.; Lamont, Gordon J.; Basura, Vesna; Voss, Henry H.; and Wilkinson, David P., 5,470,671, Cl. 429-26.000.
Lamontagne, Daniel A.; and Colantonio, Jo-Ann. Baby bottle dryers for multiple bottles. 5,469,635, Cl. 34-104.000.
LANcity Corporation: *See*—
Grobicki, Christopher; Mazza, Cynthia; O'Connell, Edward; Ulm, John; and White, Gerard, 5,471,474, Cl. 370-85.200.
Landec Corporation: *See*—
Schmitt, Edward E., 5,469,867, Cl. 128-898.000.
Landis & Gyr Powers, Inc.: *See*—
Jacob, Steven D.; Coogan, James J.; and Petras, Stefan G., 5,470,275, Cl. 454-61.000.
Landis, John M.: *See*—
McCleerey, Earl W.; Moll, Hurley C., Jr.; Landis, John M.; and Douty, George H., 5,470,255, Cl. 439-500.000.
Landry, Francis. Game apparatus. 5,470,064, Cl. 273-85.00A.
Lane, Gregg A.: *See*—
Blair, David E.; Houle, William A.; Lane, Gregg A.; Larson, James R.; and Pearlstine, Kathryn A., 5,471,287, Cl. 355-256.000.
Lane, Marvin: *See*—
van den Bergh, Herman; Lane, Marvin; and Mallon, John, 5,471,311, Cl. 356-446.000.
Lang, Anton: *See*—
Sitte, Hellmuth; Neumann, Klaus; Edelmann, Ludwig; Haessig, Helmut; Lang, Anton; and Kleber, Heinrich, 5,469,712, Cl. 62-51.100.
Lang, Richard A. Dual handle lug wrench. 5,469,764, Cl. 81-177.200.
Lange, Gerald R.: *See*—
Fleming, James C.; Lange, Gerald R.; and Preuss, Donald R., 5,470,626, Cl. 428-64.800.
Lange, Mark A.: *See*—
Hauser, Ray L.; Zheng, Bolin; Reinbarger, Michael; and Lange, Mark A., 5,470,820, Cl. 505-472.000.
Lanigan, John J., Sr.: *See*—
Baumann, James A.; Kuchcik, Joel G.; and Lanigan, John J., Sr., 5,470,189, Cl. 414-618.000.
Lapeyre, Robert S.: *See*—
Greve, Christopher G.; and Lapeyre, Robert S., 5,469,956, Cl. 198-699.100.
LaPierre, Charles: *See*—
Fruchterman, James R.; Schwegler, William C.; Merritt, Bruce W.; and LaPierre, Charles, 5,470,233, Cl. 434-112.000.
Larabell, Henri J.; and Davis, Richard S., to HJS&E Engineering. Modular enclosure apparatus. 5,471,099, Cl. 307-53.000.
Largent, Gerald A. Soft spherical playing ball and method of making same. 5,470,059, Cl. 273-60.00B.
Laroche, Damien: *See*—
Glotos, Jean-Pierre; Laroche, Damien; Turin, Joël; and Fallah, Michel, 5,470,411, Cl. 156-64.000.
Larrabee, James A.: *See*—
Orlicki, David M.; and Larrabee, James A., 5,471,314, Cl. 358-296.000.
Larsen, Hans K., to Nestec S.A. Product filling assembly. 5,470,210, Cl. 417-477.700.
Larson, James R.: *See*—
Blair, David E.; Houle, William A.; Lane, Gregg A.; Larson, James R.; and Pearlstine, Kathryn A., 5,471,287, Cl. 355-256.000.
Latulipe, Douglas C., Jr.: *See*—
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.
Lau, Kenneth. Fluorescent light ballast lamp mounting socket construction. 5,471,375, Cl. 363-260.000.
Laub, Ronald J.: *See*—
Pritchard, Ross E.; and Laub, Ronald J., 5,470,014, Cl. 228-208.000.
Laudenbach, Erich: *See*—
Kopp, Gabriele M.; Laudenbach, Erich; and Anbarci, Ahmet, 5,470,595, Cl. 426-231.000.

Lane, Charles E., to Lane, Charles E. Push rod button and method of making same. 5,469,761, Cl. 74-579.00R.
Lauga, Olivier; Revol, Nicolas; and Murou, Lionel. Support device for an item of retractable street furniture having electrical actuation. 5,469,936, Cl. 187-205.000.
Laughlin, Philip; Alexander, John; Kamarei, A. Reza; Dobbie, Robert P.; Lin, Paul; Chang, Shen-Youn; Reddy, Sekhar; Grasset, Etienne; and Melin, Christian, to Clintec Nutrition Company. Enteral diet and method for providing nutrition to a diabetic. 5,470,839, Cl. 514-53.000.
Laurent, Anne G.: *See*—
Hovanessian, Ara G.; Rey, Marie-Anne; Laurent, Anne G.; Krust, Bernard; and Montagnier, Luc, 5,470,702, Cl. 435-5.000.
Laurent, Estan; and Magnusson, Monica, to Siemens Elema AB. Apparatus for measuring electrical activity in the heart with graphical display of electrode contact with tissue. 5,469,857, Cl. 128-710.000.
Lauritzen, Donald R.: *See*—
Rose, Larry D.; Lauritzen, Donald R.; Ravenberg, Mike J.; Thompson, Mark A.; Green, David J.; and Davis, Terry R., 5,470,105, Cl. 280-740.000.
Law, Wing K.; Ranalletta, Joseph V.; Oakley, Clyde G.; Douglas, Stephen J.; and Dieta, Dennis R., to Tetrad Corporation. Bendable ultrasonic probe and sheath for use therewith. 5,469,853, Cl. 128-662.060.
Lawler, Christopher P.: *See*—
McClure, R. Bruce; Lawler, Christopher P.; and Hill, Shannon Q., 5,471,472, Cl. 370-85.130.
Lawrence, R. Michael: *See*—
Magnin, David R.; Biller, Scott A.; Dickson, John K., Jr.; Lawrence, R. Michael; and Sulsky, Richard B., 5,470,845, Cl. 514-121.000.
Lax, Ronald G.: *See*—
Edwards, Stuart D.; Lax, Ronald G.; Sharkey, Hugh R.; and Lundquist, Ingemar H., 5,470,308, Cl. 604-22.000.
Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; and Sharkey, Hugh R., 5,470,309, Cl. 604-22.000.
Laybourne, John R.; and Mott, Justin, to Blease Medical Equipment Limited. Vaporizer overfill safety device. 5,470,511, Cl. 261-55.000.
Lazzara, Charles P.: *See*—
Conti, Ronald S.; and Lazzara, Charles P., 5,469,920, Cl. 169-48.000.
Le, Tung V.: *See*—
Butler, Donald E.; Le, Tung V.; and Nanninga, Thomas N., 5,470,981, Cl. 546-207.000.
Leach, Burr L.; and Hawkins, David, to GenCorp Inc. Repair of plastic substrates utilizing powder coating compositions. 5,470,609, Cl. 427-140.000.
Leader, William J.; and Smith, Dennis K., to Envirco Corporation. Air blower and filter assemblies. 5,470,363, Cl. 55-276.000.
Le Baut, Guillaume: *See*—
Duflos, Muriel; Robert-Piessard, Sylvie; Welin, Lucien; Le Baut, Guillaume; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,470,864, Cl. 514-352.000.
Lebl, Michal: *See*—
Sepetov, Nikolai; Issakova, Olga; Krchnak, Viktor; and Lebl, Michal, 5,470,753, Cl. 436-89.000.
Leclere, Jean: *See*—
Kadi, Rachid; Leclere, Jean; and Plusa, Janusz, 5,470,274, Cl. 452-164.000.
Ledvina, Timothy J.; and Mott, Philip J., to Borg-Warner Automotive, Inc. Phased chain assemblies having links with a single toe. 5,470,282, Cl. 474-156.000.
Lee, Anson: *See*—
Golab, Pawel J.; and Lee, Anson, 5,469,825, Cl. 123-479.000.
Lee, Baosheng: *See*—
Honeycutt, Travis W.; Lee, Baosheng; and Shreffler, James R., 5,470,653, Cl. 428-357.000.
Lee, Byung M., to Samsung Electronics Co., Ltd. Regenerator for Vuilleumier heat pump. 5,469,709, Cl. 62-6.000.
Lee, Choon S.: *See*—
Nalbandian, Vahakn; and Lee, Choon S., 5,471,221, Cl. 343-700.0MS.
Lee, Jeom D.: *See*—
Kim, Jin U.; Kim, Sun Y.; and Lee, Jeom D., 5,471,156, Cl. 326-60.000.
Lee, Jeong N.: *See*—
Ahn, Byung T.; Moon, Dae G.; and Lee, Jeong N., 5,470,619, Cl. 427-578.000.
Lee, Jeong-hee: *See*—
Jung, Chil-min; Kim, Kyeong-rae; and Lee, Jeong-hee, 5,471,150, Cl. 326-87.000.
Lee, Junghsi; and Ma, Ginkou, to Computer & Communication Research Laboratories. Bilinear decision feedback equalizer. 5,471,504, Cl. 375-233.000.
Lee, Kang-won: *See*—
Jeong, Yong-joon; Park, Myung-je; Lee, Kang-won; and Park, Heui-seong, 5,471,268, Cl. 354-106.000.
Lee, Neville K.; and Tan, Kwan Y., to Quantum Corporation. Double-sided optical media for a disk storage device. 5,470,627, Cl. 428-64.400.
Lee, Raphael C., to Arch Development Corporation. Methods and compositions of a polymer (poloxamer) for cell repair. 5,470,568, Cl. 424-78.020.
Lee, Sang-Jin: *See*—
Shin, Yoon-Sub; Chang, Se-Yeob; Lee, Sang-Jin; and Kim, Jae-Kon, 5,470,047, Cl. 266-76.000.
Lee, Seung H., to Daewoo Heavy Industries Ltd. Flow modulation device having an elastically deformable disk-like flap. 5,469,883, Cl. 137-513.300.
Lee, Seung-Keun; and Kwak, Choong-Keun, to Samsung Electronics Co., Ltd. Burn-in circuit and method therefor of semiconductor memory device. 5,471,429, Cl. 365-201.000.
Lee, Soo-yong: *See*—
Chung, Ho-sun; and Lee, Soo-yong, 5,471,557, Cl. 395-2.410.
Lee, Thomas B.: *See*—
Fishback, Thomas L.; and Lee, Thomas B., 5,470,501, Cl. 252-182.280.
Lee, Tzong-Ming: *See*—
Li, Chien-Hui; Chen, Han L.; and Lee, Tzong-Ming, 5,470,936, Cl. 528-73.000.
Lee, Yong J.; Khuri-Yakub, Butrus T.; and Saraswat, Krishna C. Acoustic temperature and film thickness monitor and method. 5,469,742, Cl. 73-597.000.
Lee, Young W.; Moh, Sungwon; and Muller, Arno, to Pitney Bowes Inc. Dynamically programmable timer-counter having enable mode for timer data load and monitoring circuit to allow enable mode only upon time-out. 5,471,608, Cl. 395-550.000.
Leech, Everett A.: *See*—
Gearin, Peter; and Leech, Everett A., 5,470,490, Cl. 211-13.000.
LeGras, Paul G.: *See*—
Randles, Kenneth R.; and LeGras, Paul G., 5,471,000, Cl. 562-16.000.
Leguin, Dana. Double action disc hog with chip sizing grate. 5,469,901, Cl. 144-163.000.
Lehner, August; Schneider, Norbert; Roller, Hermann; Balz, Werner; Lenz, Werner; and Kohl, Albert, to Basi Magnetics GmbH. Magnetic recording media. 5,470,650, Cl. 428-323.000.
Leica AG: *See*—
Sitte, Hellmuth; Neumann, Klaus; Edelmann, Ludwig; Haessig, Helmut; Lang, Anton; and Kleber, Heinrich, 5,469,712, Cl. 62-51.100.
Leica Inc.: *See*—
Luce, David A.; and Zelvin, Joseph L., 5,471,260, Cl. 351-205.000.
Leisses, Keith V.: *See*—
Lewis, Tommy D.; and Leisses, Keith V., 5,470,430, Cl. 156-577.000.
Leisy, Douglas J.; Quistad, Gary B.; and Skinner, Wayne S., to Sandoz Ltd. Insecticidal plectoxins from *Plectreurys tristis*. *5,470,735, Cl. 435-235.100.*
Leitz, Hermann, to Borg-Warner Automotive, Inc. Sprag clutch with one cage ring. 5,469,949, Cl. 192-45.100.
Le-Khac, Bi, to ARCO Chemical Technology, L.P. Double metal cyanide complex catalysts. 5,470,813, Cl. 502-175.000.
Leland Stanford Junior University, The: *See*—
Gerlach, Derek; and Paulraj, Arogyaswami J., 5,471,647, Cl. 455-63.000.
Leland Stanford Junior University, The Board of Trustees of the: *See*—
Van Duyne, Scott A.; and Smith, Julius O., III, 5,471,007, Cl. 84-622.000.
Le Marrec, Robert, to Etablissements Mesnel. Sealing profile for doors of motor vehicles. 5,469,667, Cl. 49-477.100.
Le Masson, Jacques: *See*—
Commier, Philippe; Phelipon, Axel; and Le Masson, Jacques, 5,470,094, Cl. 280-602.000.
Lemieux, Brian E.: *See*—
Bartak, Duane E.; Lemieux, Brian E.; and Woolsey, Earl R., 5,470,664, Cl. 428-472.100.
LeMonds, Jeffrey; McConnelee, James E.; Kelley, John R.; Wiggs, Gene E.; and Martini, Gary T., to General Electric Company. Method for manufacturing hollow airfoils (two-piece concept). 5,469,618, Cl. 29-889.720.
Lemont, Harold E. Propulsive thrust ring system. 5,470,202, Cl. 415-211.100.
Lenihan, Timothy P.: *See*—
Demarest, David; Duncan, Robert B.; Sobel, Martin; Lenihan, Timothy P.; and Rattan, William, 5,469,689, Cl. 53-430.000.
Lenk, Leopold, to SGP Verkehrstechnik Gesellschaft m.b.h. Railborne vehicle having articulated beam connection system between carriages. 5,469,792, Cl. 105-4.100.
Lenney, William E.; and Sagl, Dennis, to Air Products and Chemicals, Inc. N-vinylamide polymers as stabilizing protective colloids in aqueous emulsion polymerization. 5,470,903, Cl. 524-458.000.
Lent, Mark S.: *See*—
Data, Stanley E.; Koziara, Robert P.; Lent, Mark S.; O'Gorman, Patrick A.; Rose, Thomas K.; Shanks, Eugene G.; and Norrick, Daniel A., 5,469,820, Cl. 123-192.200.
Lenz, Werner: *See*—
Lehner, August; Schneider, Norbert; Roller, Hermann; Balz, Werner; Lenz, Werner; and Kohl, Albert, 5,470,650, Cl. 428-323.000.
Leonard, Cynthia D.; and Gayne, Lawrence, to C. L. Femme Inc. Massage device. 5,470,303, Cl. 601-84.000.
Leopold, Heinrich: *See*—
Brodersen, Karl-Heinz; Dahlmann, Gerhard; and Leopold, Heinrich, 5,470,433, Cl. 162-77.000.
Lerner, Sheldon. Ascorbic acid and proanthocyanidine composition for topical application to human skin. 5,470,874, Cl. 514-474.000.
Lerrick, Andrew J. Surgical scalpel safety blade. 5,470,339, Cl. 606-167.000.
les Équipements Vibrotech Inc.: *See*—
St-Pierre, Jean-Guy; and Godbout, André, 5,469,972, Cl. 209-245.000.
Lessard, Willie J., to bor-mor, Inc. Directional boring drill bit blade. 5,469,926, Cl. 175-424.000.
Lester, Dean M.: *See*—
Nielson, Daniel B.; and Lester, Dean M., 5,470,408, Cl. 149-109.600.

LeStrange, Michael M.; Watson, William H.; Raven, Richard C., deceased (by Barbara B. Raven, administratrix), to Bally Gaming International, Inc. Game machine accounting and monitoring system. 5,470,079, Cl. 273-138.00A.

Letson, Thomas A.: *See*—
Myers, Alan M.; Charvat, Peter K.; Letson, Thomas A.; Yang, Shi-ning; and Bai, Peng, 5,470,790, Cl. 437-192.000.

Le Tual, Stéphane: *See*—
Wingender, Marc; and Le Tual, Stéphane, 5,471,210, Cl. 341-156.000.

Leung, Barry S.: *See*—
Hess, Garry C.; Leung, Barry S.; and Wilson, Timothy J., 5,471,670, Cl. 455-33.200.

Leung, Donald; Schlievert, Patrick; Meissner, Cody; and Fulton, David, to National Jewish Center For Immunology and Respiratory Medicine; New England Medical Center Hospital, Inc.; University of Minnesota; and University of Minnesota, Regents of the. Method for diagnosing kawasaki syndrome. 5,470,716, Cl. 435-34.000.

Leung, Peter L. H.: *See*—
Beardsley, Brent C.; Brailey, Allen C.; and Leung, Peter L. H., 5,471,631, Cl. 395-650.000.

Leva, Max. Apparatus and method for stripping and absorption of volatile materials. 5,470,478, Cl. 210-634.000.

Levine, Seymour: *See*—
Hall, James T.; O'Connor, Arthur B.; Raffensperger, Susan M.; and Levine, Seymour, 5,471,326, Cl. 359-15.000.

Lewis, Aaron; Chen, Zhongping; and Takei, Hiroyuki, to Cornell Research Foundation, Inc. Optical information storage on a bacteriorhodopsin - containing film. 5,470,690, Cl. 430-269.000.

Lewis, Cynthia J.: *See*—
Potes, Michael M.; Lambarth, Edwin H.; Frasher, Troy A.; Edelstein, Beth E.; Kelley, Lowell D.; and Lewis, Cynthia J., 5,470,220, Cl. 425-216.000.

Lewis, David A.: *See*—
Deutsch, Alina; Lewis, David A.; Narayan, Chandrasekhar; and Plachy, Anthony L., 5,471,090, Cl. 257-734.000.

Lewis, Richjard W.: *See*—
Goethel, Peter J.; Lewis, Richjard W.; and Teerlink, Wilford J., 5,471,037, Cl. 219-750.000.

Lewis, Tommy D.; and Leisses, Keith V. Masking apparatus. 5,470,430, Cl. 156-577.000.

Lewis, William P., Jr. Walkable secure patio door threshold. 5,469,666, Cl. 49-471.000.

Lewis, W. Stan. Gimballed compass device. 5,469,630, Cl. 33-355.00R.

Lexmark International, Inc.: *See*—
Janes, Todd L.; Meade, Alexander D.; Murthy, Ashok; Sharma, Pramod K.; and Wallin, Peter E., 5,471,291, Cl. 355-326.00R.

Leyat Fils Marketing SA: *See*—
Leyat, Jean-Claude, 5,470,470, Cl. 210-350.000.

Leyat, Jean-Claude, to Leyat Fils Marketing SA. Liquid filter fiber module disposed in an inflatable belt. 5,470,470, Cl. 210-350.000.

Lhenry, Bernard, to Framatome. Device for sterilizing products at high pressure. 5,470,547, Cl. 422-295.000.

L'Hermite, François; and Turchi, Joel, to Motorola, Inc. Circuit for use with a feedback arrangement. 5,471,167, Cl. 327-538.000.

Li, Ai-Kang: *See*—
Lai, Chung-Ping; Fu, Cheng-Tsu; Duann, Jia-Ruey; Li, Ai-Kang; and Ko, Kai-Li, 5,470,807, Cl. 501-93.000.

Li, Chien-Hui; Chen, Han L.; and Lee, Tzong-Ming, to Industrial Technology Research Institute. Process for preparing high-adhesion and high-solubility poly (amide-imide-ester). 5,470,936, Cl. 528-73.000.

Li, Nam T. Easy open stackable handle bags. 5,469,970, Cl. 206-554.000.

Li, Ping: *See*—
Sharma, Raghu; Davis, Jeffrey P.; Gunn, Timothy D.; Li, Ping; Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, 5,471,470, Cl. 370-81.000.

Li, Shih-Gong: *See*—
Banning, Kenneth R.; James, Wendy S.; Li, Shih-Gong; and Versteeg, Anton, 5,471,613, Cl. 395-600.000.

Li, Wang-Jr: *See*—
Tsai, Yeong-Shyeong; and Li, Wang-Jr, 5,470,033, Cl. 244-110.00E.

Liang, Shaowo, to Eastman Chemical Company. Purification of cyclopropanecarboxaldehyde. 5,471,003, Cl. 568-420.000.

Liao, Gordon, to Union Sports Co., Ltd. Device for speedily mounting objects on tubes and bars. 5,470,168, Cl. 403-368.000.

Liborius, Erik, to Niro A/S. Continuous multicell process and apparatus for particle coating including particle recirculation. 5,470,387, Cl. 118-303.000.

Licht, Ulrike: *See*—
Gulbins, Erich; Haeberle, Karl; Licht, Ulrike; and Wallon, Alexander, 5,470,899, Cl. 524-158.000.
Wallon, Alexander; Auchter, Gerhard; Licht, Ulrike; Haeberle, Karl; and Funhoff, Angelika, 5,470,907, Cl. 524-507.000.

Lidak Pharmaceuticals: *See*—
Kleinfeld, Alan M., 5,470,714, Cl. 435-7.800.

Lidman, David G., to Alchemist and Company, Inc. Coupon savings account system. 5,471,669, Cl. 235-383.000.

Liedberg, Nils P. Å., to Telefonaktiebolaget LM Ericsson. Signal processing circuit and a method of delaying a binary periodic input signal. 5,471,165, Cl. 327-250.000.

Liedenbaum, Coen T. H. F.; Severens, Arnoldus L. G. J.; Drenten, Ronald R.; and Jongerius, Michiel J., to U.S. Philips Corporation. Device in which electromagnetic radiation is raised in frequency and apparatus for optically scanning an information plane, comprising such a device. 5,471,490, Cl. 372-32.000.

Lien, Chuen-Der, to Integrated Devices Technology, Inc. Efficient method for fabricating optimal BiCMOS N-wells for bipolar and field effect transistors. 5,470,766, Cl. 437-31.000.

Lien, Chuen-Der, to Integrated Device Technology, Inc. Self-aligned via structure. 5,471,094, Cl. 257-774.000.

Life Technologies, Inc.: *See*—
Longo, Mary C.; and Smith, Michael D., 5,470,740, Cl. 435-252.330.

Lightbody, Timothy R.; Cutter, Daniel F.; and Nowokunski, Brian M., to Data Translation, Inc. Displaying a subsampled video image on a computer display. 5,471,577, Cl. 395-157.000.

Lignon, Dominique H.: *See*—
Forster, Michel Ch.; Guillemin, François H.; and Lignon, Dominique H., 5,470,321, Cl. 604-174.000.

Lilienthal, Peter F., II; Pawlenko, Ivan; and Wong, Ching-Ping, to AT&T Corp. Apparatus for fixturing modules. 5,470,217, Cl. 425-110.000.

Lilley, Roger H.: *See*—
Thomas, Wayne M.; Nicholas, Edward D.; Jones, Stephen B.; Lilley, Roger H.; Dawes, Christopher J.; and Dolby, Richard E., 5,469,617, Cl. 29-889.210.

Lim, Gunsang; Marowsky, Richard D.; and Khoshnood, Ben, to Thomas & Betts Corporation. Electrical connector having reduced cross-talk. 5,470,244, Cl. 439-189.000.

Lim, Pong C.: *See*—
Ho, Helena S.; Pratt, Michael K.; Lim, Pong C.; and Oshidari, Thomas T., 5,471,527, Cl. 379-347.000.

Lin, Bor-Sheng; Scheblein, Joseph W.; and Bagley, Jerome R., to Ohmeda Pharmaceutical Products Division Inc. Substituted pyrazolyl compounds and methods employing such compounds. 5,470,862, Cl. 514-341.000.

Lin, Chin T. Soil guard wall assembly. 5,469,655, Cl. 47-83.000.

Lin, Chun S.: *See*—
Hsu, Kevin; and Lin, Chun S., 5,470,071, Cl. 273-186.400.

Lin, Min: *See*—
Hawley, Martin C.; Wei, Jianghua; Adegbite, Valerie; and Lin, Min, 5,470,423, Cl. 156-166.000.

Lin, Ming-Teng, to Gallant Industries Co., Ltd. Collapsicle handle of baggage. 5,469,602, Cl. 16-115.000.

Lin, Paul: *See*—
Laughlin, Philip; Alexander, John; Kamarei, A. Reza; Dobbie, Robert P.; Lin, Paul; Chang, Shen-Youn; Reddy, Sekhar; Grasset, Etienne; and Melin, Christian, 5,470,839, Cl. 514-53.000.

Lin, Tzy-Ying: *See*—
Wuu, Dong-Sing; Hsieh, Tzung-Rue; Lin, Tzy-Ying; and Chen, Hong-Ming, 5,471,552, Cl. 385-49.000.

Lin, Ying-Wei: *See*—
Jodoin, Ronald E.; Loce, Robert P.; Klassen, R. Victor; and Lin, Ying-Wei, 5,471,320, Cl. 358-455.000.

Lin, Yu-An. Aquarium having leak-proof bubbling port. 5,469,811, Cl. 119-263.000.

Lind, Peter M., to LABCON, North America. Pipette tip rack loader. 5,470,538, Cl. 422-104.000.

Lindall, Arnold W. Catheter system for controllably releasing a therapeutic agent at a remote tissue site. 5,470,307, Cl. 604-20.000.

Lindner, Henry, to Elgin Molded Plastics, Inc. Pavement markers and method for making. 5,470,170, Cl. 404-9.000.

Lindquist, Craig R.; Clarke, John T.; Chin, Peter P. S.; MacDonald, Michael J.; and Walsh, J. Peter, to Masonite Corporation. Flat oriented strand board-fiberboard composite structure and method of making the same. 5,470,631, Cl. 428-105.000.

Lindsay, Richard A., to Vinten Group plc. Tiltable load supporting platforms. 5,469,793, Cl. 108-2.000.

Lines, Norman P.: *See*—
Corbett, Nicholas C.; and Lines, Norman P., 5,469,700, Cl. 60-39.060.

Linfinity Microelectronics, Inc.: *See*—
Agiman, Dan, 5,471,130, Cl. 323-303.000.

Ling, Robin S. M.; Mikhail, W. E. Michael; Elting, James J.; Gie, Graham A.; Slooff, Tom J. J. H.; and Vanderlinden, Jacques J. System for performing hip prosthesis revision surgery. 5,470,336, Cl. 606-105.000.

Linke, Adolf; Pohl, Werner; Schmid, Karl; and Wetzel, Rolf, to Krupp Koppers GmbH. Process for working up municipal plastic waste materials by gasification. 5,470,361, Cl. 48-197.00R.

Linnermark, Nils O. A.; and Carlsson, Karl U., to Telefonaktiebolaget L M Ericsson (publ.). Tracing with keys and locks on a telecommunication network. 5,471,526, Cl. 379-268.000.

Linse, Vonne D.; and Horn, Bruce D., to Acutus Industries, Inc. Method for forming surfaces of continuous casting molds. 5,470,012, Cl. 228-107.000.

Linvatec Corporation: *See*—
Ross, Randall D.; and Bassetti, Kevin J., 5,470,334, Cl. 606-72.000.

Lippits, Gerardus J. M.: *See*—
Einerhand, Robert E. F.; Lippits, Gerardus J. M.; Daams, Johannes L. C.; and Notten, Petrus H. L., 5,470,675, Cl. 429-101.000.

Lipschutz, David, to Hewlett-Packard Company. Time multiplexed digital ultrasound beamformer. 5,469,851, Cl. 128-661.010.

Lisco, Inc.: *See*—
Nesbitt, R. Dennis; and Sullivan, Michael J., 5,470,075, Cl. 273-720.000.

Sullivan, Michael J.; and Nesbitt, R. Dennis, 5,470,058, Cl. 273-65.00B.

Listro, Joseph A.: *See*—
Corless, Ann M.; Deckner, George E.; Hall, Bonnie J.; and Listro, Joseph A., 5,470,884, Cl. 514-714.000.

Litalien, Marko: *See*—
Dube, Ghyslain; Litalien, Marko; Pelletier, Roger; and Wang, Zhou, 5,470,376, Cl. 75-672.000.

Litt, Morton H.: *See*—
Sachinvala, Navzer D.; Ju, Redford F.; and Litt, Morton H., 5,470,931, Cl. 526-238.230.

Little, Scott R.: *See*—
Clifton, David B.; Little, Scott R.; and Pinkerton, Joseph F., 5,471,105, Cl. 310-90.500.

Litwin, Noel; and Scherz, Abraham I. Safety locks. 5,469,723, Cl. 70-107.000.

Litzenberger, Ingo F.; Roller, Günter; and Stein, Dieter, to Metallgesellschaft Aktiengesellschaft. Process for preparing low iron ammonium alum. 5,470,444, Cl. 204-93.000.

Liu, David K. Y.; Sun, Yu; and Chang, Chi, to Advanced Micro Devices, Inc. Method protecting a stacked gate edge in a semiconductor device from self aligned source (SAS) etch. 5,470,773, Cl. 437-43.000.

Liu, Shu-Len: *See*—
Griffith, Michael J.; Neslund, Gerald G.; and Liu, Shu-Len, 5,470,954, Cl. 530-383.000.

Liu, Te-Yin M.: *See*—
Chiu, Tzu-Yin; Erceg, Frank M.; Liu, Te-Yin M.; Moerschel, Kenenth G.; Prozonic, Michael A.; and Sung, Janmye, 5,470,783, Cl. 437-72.000.

Livingston, Diane. Breast feeding cover. 5,469,582, Cl. 2-104.000.

Ljungberg, Per A. M.: *See*—
Sandin, Rolf S.; and Ljungberg, Per A. M., 5,471,468, Cl. 370-60.000.

Ljungqvist, Anders: *See*—
Folkers, Karl A.; Ljungqvist, Anders; Feng, Dong-Mei; Kubota, Minoru; Tang, Pui-Fun L.; and Bowers, Cyril Y., 5,470,947, Cl. 530-313.000.

Ljungström, Tommy B. G.; and Anchor, David. Reducible volume containers. 5,470,016, Cl. 229-101.100.

Lloyd, Peter M.; Ritson, Carl; Johansson, Eric T.; and Rubsamen, Reid M., to Aradigm Corporation. Method and apparatus for sensing flow in two directions and automatic calibration thereof. 5,469,750, Cl. 73-861.610.

Loar, Doankl F., to AlliedSignal Inc. Polymeric powder coating compositions comprising low molecular weight polyethylene polyols. 5,470,912, Cl. 525-58.000.

Loce, Robert P.: *See*—
Jodoin, Ronald E.; Loce, Robert P.; Klassen, R. Victor; and Lin, Ying-Wei, 5,471,320, Cl. 358-455.000.

Lockheed Idaho Technologies Company: *See*—
Marts, Donna J.; Richardson, John G.; Albano, Richard K.; and Morrison, John L., Jr., 5,470,043, Cl. 251-65.000.

Lockheed Missiles & Space Co., Inc.: *See*—
Ames, Alan J., 5,471,346, Cl. 359-731.000.

Lockheed Missiles & Space Company, Inc.: *See*—
Gal, George; Anderson, William W.; Herman, Bruce J.; and Shough, Dean M., 5,471,345, Cl. 359-619.000.

Lockheed Sanders, Inc.: *See*—
Brommer, Karl; Mullaney, Henry; Meade, Robert; Rappe, Andrew; and Joannopoulos, John, 5,471,180, Cl. 333-202.000.

Lofgren, Karl M. J.: *See*—
Mangan, John S.; Norman, Robert D.; Craig, Jeffrey; Albert, Richard; Gupta, Anil; Stai, Jeffrey D.; and Lofgren, Karl M. J., 5,471,478, Cl. 371-10.300.

Loftin, Rachel M.; and Sanborn, Kimberly B., to Gillette Company, The. Permanent aqueous marker inks. 5,470,904, Cl. 524-462.000.

Login, Robert B.: *See*—
Narayanan, Kolazi S.; Chaudhuri, Ratan K.; Login, Robert B.; and Fusiak, Frank, 5,470,508, Cl. 252-542.000.

Logman, Timothy M.: *See*—
Mack, Donald F.; Logman, Timothy M.; Bouc, Gary L.; and Greenlee, Larry W., 5,470,046, Cl. 251-329.000.

Lograsso, Barbara K.: *See*—
McCallum, R. William; Dennis, Kevin W.; Lograsso, Barbara K.; and Anderson, Iver E., 5,470,401, Cl. 148-302.000.

Lokhoff, Gerardus C. P., to U.S. Philips Corporation. Record carrier with alternating frames and interframe gaps. 5,471,350, Cl. 360-48.000.

Lonchamp, Daniel; and Schwob, Yvan, to Institut Francais Du Petrole; and Transvalor. Complex composition resulting from the action of urea on a sulfuric sludge of petroleum origin, process for the preparation thereof and use thereof as a source of fertilizing material. 5,470,370, Cl. 71-25.000.

Londrigan, Michael E.; and Trout, Kenneth G., to Celotex Corporation, The. Catalyst for polyisocyanurate foams made with alternative blowing agents. 5,470,889, Cl. 521-125.000.

Longo, Mary C.; and Smith, Michael D., to Life Technologies, Inc. Cloned NsiI restriction-modification system. 5,470,740, Cl. 435-252.330.

Looney, James Q., to MPHusky Corporation. Cable support apparatus and method. 5,470,021, Cl. 248-49.000.

Looney, James R.: *See*—
Williams, Dennis A.; Looney, James R.; Conway, Michael W.; and Swenson, Robert A., 5,470,823, Cl. 507-241.000.

Lopez, Reyero, to Productos Bituminosos, S.A. (Probisa). Process and apparatus for the dispersion and proportioning of fibers used in the building sector in general. 5,470,145, Cl. 366-13.000.

Lopin, Michael L.: *See*—
Fincke, Randall W.; Lopin, Michael L.; and Faller, Frederick W., 5,470,343, Cl. 607-5.000.

L'Oreal: *See*—
Dubief, Claude; and Cauwet, Daniele, 5,470,551, Cl. 424-70.120.

Lorentzen, John F.: *See*—
Colburn, Todd B.; and Lorentzen, John F., 5,470,061, Cl. 273-73.00C.

Louis Berkman Company, The: *See*—
Carey, Jay F., II; and Zamanzadeh, Mehrooz, 5,470,667, Cl. 428-659.000.

Loutfy, Raouf O.; and Withers, James C., to Materials and Electrochemical Research Corp. Electrochemical fullerene system. 5,470,680, Cl. 429-218.000.

Loveless, Frederick C.: *See*—
Coolbaugh, Thomas S.; Loveless, Frederick C.; and Matthews, Demetreos N., 5,470,914, Cl. 525-66.000.

Lovetro, David C.: *See*—
Gray, John M.; and Lovetro, David C., 5,470,480, Cl. 210-632.000.

Lovette, James E.: *See*—
Beard, Hoyt S.; Conrad, Lucas J.; Crook, J. Edward; Lovette, James E.; Johnson, Robert C.; Newton, Donald A.; and Neshan, Hamid, 5,469,872, Cl. 131-291.000.

Löw, Lothar: *See*—
Baumgart, Rudolf; Martin, Manfred; Löw, Lothar; and Scheven, Gunter, 5,470,659, Cl. 428-398.000.

Lowe, Coy S.: *See*—
Briese, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Fouquet, Christophe J. A.; and Lowe, Coy S., 5,471,137, Cl. 324-158.100.

Lowell, John K.; Anjum, Mohammed; Wenner, Valerie A.; Armour, Norman L.; and Kyaw, Maung H., to Advanced Micro Devices. Method and device for determining defects within a crystallographic substrate. 5,471,293, Cl. 356-30.000.

Loyola University of Chicago: *See*—
Babler, James H., 5,471,005, Cl. 568-459.000.

LSI Logic Corporation: *See*—
Kapoor, Ashok K.; and Pasch, Nicholas F., 5,470,801, Cl. 437-238.000.
Pasch, Nicholas F.; and Patrick, Roger, 5,471,091, Cl. 257-752.000.
Tong, Po, 5,471,485, Cl. 371-37.100.

Lubitz, Werner; and Szostak, Michael P., to Boehringer Mannheim GmbH. Immunogens comprising the non-lytic membrane spanning domain of bacteriophages MS2 or PhiX174. 5,470,573, Cl. 424-200.100.

Lubrizol Corporation, The: *See*—
Pialet, Joseph W.; Lal, Kasturi; and Bryant, Charles P., 5,470,498, Cl. 252-76.000.

Lucak, Mark A.: *See*—
Engdahl, Jonathan R.; Lucak, Mark A.; Gee, David J.; and Kucharski, Paul, 5,471,461, Cl. 370-17.000.

Lucas Automation & Control Engineering, Inc.: *See*—
Scourtes, George; and Gagneur, John P., 5,469,741, Cl. 73-462.000.

Lucas, Jacques, to Emaux de Briare Technologies, S.A. Decorative panel having adhesively set and arbitrarily positioned polygonal mosaic elements. 5,470,623, Cl. 428-47.000.

Luce, David A.; and Zelvin, Joseph L., to Leica Inc. Joystick for an ophthalmic instrument where vertical movement is controlled by rotating the joystick. 5,471,260, Cl. 351-205.000.

Lucey, Scot M.: *See*—
Cananzey, John J.; and Lucey, Scot M., 5,470,317, Cl. 604-121.000.

Ludvig Svensson International B.V.: *See*—
Henningsson, Göran; and Andersson, Hans, 5,469,607, Cl. 24-716.000.

Ludwig, Frank A.; Townsend, Carl W.; and Eliash, Bruce M., to Hughes Aircraft Company. Thermoelectrochemical system and method. 5,470,669, Cl. 429-17.000.

Luise, Robert R.: *See*—
Kaku, Mureo; and Luise, Robert R., 5,470,922, Cl. 525-436.000.

Lund, Arne; and Agren, Lennart, to Uponor Innovation AB. Method for relining underground pipelines. 5,469,891, Cl. 138-98.000.

Lund, David L.; Kump, William H.; and Groff, Donald W., to GNB Battery Technologies Inc. Method of assembling a bipolar lead-acid battery and the resulting bipolar battery. 5,470,679, Cl. 429-210.000.

Lundeen, Richard H., to Minnesota Mining and Manufacturing Company. Universal adhesion promoting composition for plastics repair, kit including same, and method of use. 5,470,605, Cl. 427-11.000.

Lundquist, Ingemar H.: *See*—
Edwards, Stuart D.; Lax, Ronald G.; Sharkey, Hugh R.; and Lundquist, Ingemar H., 5,470,308, Cl. 604-22.000.
Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; and Sharkey, Hugh R., 5,470,309, Cl. 604-22.000.

Lundström, Bo; and Severinsson, Lars, to Ipumatic AB. Device for transmitting torque between two rotatable shafts. 5,469,950, Cl. 192-85.000.

Lundstrom, Lena; Karlsson, Peter; and Ohlsson, Thomas, to Siemens Aktiengesellschaft. Method and device for filtering out baseline fluctuations from an electrocardiogram. 5,469,856, Cl. 128-696.000.

Lupyan, David A.; and Sokol, Bryan I., to Blue Coral, Inc. Composition for cleaning and waterproofing a substrate and inhibiting the build-up of static electricity on said substrate. 5,470,500, Cl. 252-174.150.

Lustig, Naftali E.: *See*—
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.

Lüthi, Kurt, to VSL International AG. Stressing anchorage for at least one tension element running inside an encasing tube and method of producing the stressing anchorage. 5,469,677, Cl. 52-223.130.

Luthi, Oscar; Abdulmassih, Antoine; and Merchel, Frank J., III, to Ingersoll-Rand Company. Anti-rewet deck for press rolls. 5,470,471, Cl. 210-386.000.

Lutz, Dieter: *See*—
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.

Lützen, Claude E., to Fertin Laboratories A/S (Dansk Tyggegummi Fabrik A/S). Solid oral anticariogenic composition. 5,470,566, Cl. 424-54.000.

Luxtron Corporation: *See*—
Jensen, Earl M., 5,470,155, Cl. 374-161.000.

LVMH, Recherche: *See*—
Bonte, Frédéric; Dumas, Marc; Meybeck, Alain; and Marechal, Christian, 5,470,579, Cl. 424-450.000.

LXN Corporation: *See*—
Burd, John F.; Hoblitzell, Talei; and Neyer, Gebhard, 5,470,752, Cl. 436-87.000.

Lyonnais, Debra. Electrical outlet cover remover. 5,469,614, Cl. 29-764.000.

M.I.C. Industries, Inc.: *See*—
Morello, Frederick, 5,469,674, Cl. 52-86.000.

Ma, Ginkou: *See*—
Lee, Junghsi; and Ma, Ginkou, 5,471,504, Cl. 375-233.000.

MacDonald, John F.: *See*—
Hammell, Sherry E.; Gong, Kai F.; Jackson, Neil A.; Keay, Kathleen D.; and MacDonald, John F., 5,471,433, Cl. 367-118.000.

MacDonald, Michael J.: *See*—
Lindquist, Craig R.; Clarke, John T.; Chin, Peter P. S.; MacDonald, Michael J.; and Walsh, J. Peter, 5,470,631, Cl. 428-105.000.

MacDonald, Russell K.: *See*—
Soenen, Eric G.; Davis, Gregory B.; Adkins, Thomas; and MacDonald, Russell K., 5,471,668, Cl. 455-352.000.

MacDonald, Stephen J.: *See*—
Rounbehler, David P.; Fine, David H.; Achter, Eugene K.; MacDonald, Stephen J.; and Dennison, Daniel B., 5,470,754, Cl. 436-106.000.

Macel, Bob: *See*—
Slemon, Clarke; and Macel, Bob, 5,470,983, Cl. 546-271.000.

Machinefabriek Meyn B.V.: *See*—
Zegers, Cornelis J. M., 5,470,194, Cl. 414-786.000.

Machines Collette: *See*—
De Naeghel, Emiel, 5,470,153, Cl. 366-303.000.

Maciel, Vitor G., to Petroleo Brasileiro S.A. - Petrobras. Widened-base structure for supporting an offshore platform. 5,470,179, Cl. 405-224.000.

Macielag, Mark J.; Dharanipragada, Ramalinga; and Marvin, Mary S., to Ohmeda Pharmaceutical Products Division Inc. Motilin-like polypeptides that inhibit gastrointestinal motor activity. 5,470,830, Cl. 514-13.000.

Maciona, Gerald J.: *See*—
Byers, Larry L.; Mackenthun, Donald W.; Fye, Philip J.; Maciona, Gerald J.; Engel, Jeff A.; Price, Ferris T., deceased; and Seppa, Dale K., 5,471,482, Cl. 371-21.200.

Mack, Donald F.; Logman, Timothy M.; Bouc, Gary L.; and Greenlee, Larry W., to Mueller Company. Gate valve structure. 5,470,046, Cl. 251-329.000.

Mackenthun, Donald W.: *See*—
Byers, Larry L.; Mackenthun, Donald W.; Fye, Philip J.; Maciona, Gerald J.; Engel, Jeff A.; Price, Ferris T., deceased; and Seppa, Dale K., 5,471,482, Cl. 371-21.200.

Macrovision Corporation: *See*—
Quan, Ronald, 5,471,531, Cl. 380-19.000.

MacWilliams, Peter D.: *See*—
Pawlowski, Stephen S.; MacWilliams, Peter D.; and Kolinski, Jerzy B., 5,471,637, Cl. 395-296.000.

Madrid, Ronn G., to Durabla Pump Components, Inc. Check valve for meter run. 5,469,884, Cl. 137-515.700.

Madsen, Benny: *See*—
Hansen, Jens; Madsen, Benny; and Petersen, Jens T., 5,471,187, Cl. 340-146.200.

Maeda, Hiroshi, to Sharp Kabushiki Kaisha. Semiconductor device and a method for manufacturing the same. 5,471,082, Cl. 257-362.000.

Maeda, Keijiro, to Sony Corporation. Electrostatic loudspeaker having stationary electrodes formed as multiple sheets insulated from each other. 5,471,540, Cl. 381-191.000.

Maeda, Yoji: *See*—
Tsukada, Yutaka; Kobayakawa, Yasukazu; Maeda, Yoji; and Tsuchita, Shuhei, 5,470,796, Cl. 437-209.000.

Maehama, Mitsuhiro: *See*—
Tsutumi, Haruki; Ikemoto, Yoshiaki; Maehama, Mitsuhiro; Oyanagi, Toshiki; and Matsubara, Tsugio, 5,470,918, Cl. 525-329.200.

Maeno, Hideshi: *See*—
Nii, Koji; and Maeno, Hideshi, 5,471,420, Cl. 365-182.000.

Mafoti, Robson M.; and Potts, Bruce H., to Bayer Corporation. Preparation of cast elastomers using 2-methyl-1,3-propanediol as chain extender. 5,470,935, Cl. 528-65.000.

Magainin Pharmaceuticals Inc.: *See*—
Maloy, W. Lee; Kari, U. Prasad; and Williams, Jon I., 5,470,950, Cl. 530-324.000.

Magnavox Electronic Systems Company: *See*—
Hatch, Ronald R.; and Knight, Jerry E., 5,471,217, Cl. 342-357.000.

MagneTek Century Electric, Inc.: *See*—
Hein, Bruce T., 5,471,101, Cl. 310-42.000.

Magnetic Bearing Technologies, Inc.: *See*—
Clifton, David B.; Little, Scott R.; and Pinkerton, Joseph F., 5,471,105, Cl. 310-90.500.

Magnin, David R.; Biller, Scott A.; Dickson, John K., Jr.; Lawrence, R. Michael; and Sulsky, Richard B., to Bristol-Myers Squibb Company. Methods of using α-phosphonosulfonate squalene synthetase inhibitors including the treatment of atherosclerosis and hypercholesterolemia. 5,470,845, Cl. 514-121.000.

Magnusson, Monica: *See*—
Laurent, Estan; and Magnusson, Monica, 5,469,857, Cl. 128-710.000.

Mahaffey, Glenn L.: *See*—
Nolan, Brian J.; Mahaffey, Glenn L.; and Svoboda, John M., Sr., 5,470,131, Cl. 299-41.100.

Mahler, Barry A.; and Miller, Ralph N., to Du Pont de Nemours, E. I., and Company. Separating and removing impurities from tetrafluoroethanes by using extractive distillation. 5,470,442, Cl. 203-56.000.

Mahvan, Nader; Eltoukhy, Atef H.; and Teng, Edward F., to StorMedia, Inc. Method for applying a protective coating on a magnetic recording head. 5,470,447, Cl. 204-192.160.

Mainard, Tommy D.; and Reinbold, James F., to UNR Industries, Inc. Shopping cart having gate hinged to handle. 5,470,087, Cl. 280-33.992.

Maire, R. L., to Sounds Resources, Inc. Multiple chamber loudspeaker system. 5,471,019, Cl. 181-156.000.

Maitra, Sidhartha: *See*—
Sharma, Raghu; Davis, Jeffrey P.; Gunn, Timothy D.; Li, Ping; Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, 5,471,470, Cl. 370-81.000.

Makhlouf, Joseph M.; and Schneider, John R., to PPG Industries, Inc. Curable, sprayable compositions for reinforced thin rigid plates. 5,470,886, Cl. 521-59.000.

Maki, Toshihiro: *See*—
Yamanobe, Takashi; Satou, Michio; Ishigami, Takashi; Obata, Minoru; Kawai, Mituo; Yagi, Noriaki; Maki, Toshihiro; and Ando, Shigeru, 5,470,527, Cl. 419-53.000.

Makihara, Akira: *See*—
Nishizawa, Juinchi; Kijima, Takahiko; Ezell, Edward F.; and Makihara, Akira, 5,470,154, Cl. 374-141.000.

Makihara, Hiroyasu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory device having address transition and supply voltage detecting circuits. 5,471,432, Cl. 365.233.500.

Makino, Tetsuo; Fujiki, Keiichi; and Tajima, Toshimi, to Mitsubishi Jukogyo Kabushiki Kaisha. End portion flow rate regulating apparatus for a paper machine headbox. 5,470,439, Cl. 162-216.000.

Makita, Atsuo: *See*—
Tsutsui, Osamu; Haraga, Hisato; Makita, Atsuo; and Takeuchi, Hirofumi, 5,469,586, Cl. 4-4515.000.

Makita, Kikuo: *See*—
Tsuji, Masayoshi; and Makita, Kikuo, 5,471,068, Cl. 257-21.000.

Malatinszky, Paul: *See*—
Heimberg, Wolfgang; Hellmich, Wolfram; Kogl, Franz; and Malatinszky, Paul, 5,469,828, Cl. 123-497.000.

Malecki, William W.: *See*—
Pompei, Francesco; Ternullo, Janus; and Malecki, William W., 5,469,855, Cl. 128-664.000.

Malesko, Michael W., to Automotive Systems Laboratory, Inc. Acceleration sensor with laterally-supported beam contacts. 5,471,021, Cl. 200-61.45R.

Malik, Dale: *See*—
Howe, Wayne; Silver, Ed; Bailey, Kim; Shih, Jerry; Morel, Kitty; Hill, Peter; Addison, Cathy; Woodring, Larry; and Malik, Dale, 5,471,519, Cl. 379-67.000.

Malke, Wolfgang: *See*—
Kohlhage, Hermann; Baitz, Günter; and Malke, Wolfgang, 5,470,053, Cl. 271-213.000.

Mallee, Francis M.; and Finocchiaro, Eugene T., to Opta Food Ingredients, Inc. Starch-based texturizing agent. 5,470,391, Cl. 127-38.000.

Mallon, John: *See*—
van den Bergh, Herman; Lane, Marvin; and Mallon, John, 5,471,311, Cl. 356-446.000.

Malmenstam, Jonas: *See*—
Persson, Dan; and Malmenstam, Jonas, 5,470,634, Cl. 428-120.000.

Maloy, W. Lee; Kari, U. Prasad; and Williams, Jon I., to Magainin Pharmaceuticals Inc. Biologically active amphiphilic peptide compositions and uses therefor. 5,470,950, Cl. 530-324.000.

Mamelson, Richard A.; Kim, Richard C.; and Kvamme, Damon F., to Ardco, Inc. Lighting system for commercial refrigerator doors. 5,471,372, Cl. 362-92.000.

Manabe, Toshiki: *See*—
Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, 5,470,461, Cl. 210-188.000.

Mangan, John S.; Norman, Robert D.; Craig, Jeffrey; Albert, Richard; Gupta, Anil; Stai, Jeffrey D.; and Lofgren, Karl M. J., to SunDisk Corporation; and Western Digital Corporation. Flash EEPROM array data and header file structure. 5,471,478, Cl. 371-10.300.

Manganaro, James L.; Sacks, Martin E.; and Carmichael, James, to FMC Corporation. Method for producing caro's acid. 5,470,564, Cl. 423-521.000.

Manganello, Robert D. Electrical power cord retaining connector. 5,470,249, Cl. 439-369.000.

Manhole Adjusting Contractors Inc.: *See*—

Corcoran, John; Molvi, Ikbal A.; Hower, Joseph W.; and Moseley, William A., 5,470,176, Cl. 404-72.000.

Manitou Mountain Bikes, Inc.: *See—*
Stewart, Gerald M.; and Bradbury, E. Douglas, 5,470,090, Cl. 280-276.000.

Manley, Norman G.: *See—*
Burkard, Christopher J.; and Manley, Norman G., 5,469,679, Cl 52-301.000.

Mann, Brian M.; and Causey, James D., III, to Pacesetter, Inc. Adaptive refractory period within implantable cardioverter-defibrillator 5,470,342 Cl. 607-5.000.

Mann, Roland, to Ivoclar AG. Rechargeable light curing apparatus. 5,471,129, Cl. 320-21.000.

Mannesmann Aktiengesellschaft: *See—*
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.
Becker, Lutz; and Schüring, Andreas, 5,471,496, Cl. 373-94.000.

Mannesmann Rexroth GmbH: *See—*
Kramer, Otmar, 5,469,704, Cl. 60-455.000.

Manor, Edward L.: *See—*
Roeker, David C.; Manor, Edward L.; and Crosby, Shawn P., 5,469,623 Cl. 30-169.000.

Manthuruthil, George C.: *See—*
Johnson, William J.; Keller, Robert S.; Manthuruthil, George C., and Williams, Marvin L., 5,471,616, Cl. 395-700.000.

Manuel, Mark: *See—*
Staser, Brian H.; Figlioli, Danny W.; and Manuel, Mark, 5,469,664, Cl 49-452.000.

Manz, Kenneth W.; and Snyder, Sandra, to SPX Corporation. Method and apparatus for analyzing refrigerant properties. 5,469,714, Cl. 62-125.000.

Maral, Gérard: *See—*
Dosiere, Frédéric; Boutes, Jean-Pierre; and Maral, Gérard, 5,471,641, Cl. 455-13.100.

Marchand, Pierre: *See—*
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; Marchand, Pierre; Dixmier, Francoise; and Prigent, Monique, 5,470,495, Cl. 252-18.000.

Marchetti, Michael J., to Black & Decker Inc. Strain relief for an electrical appliance. 5,471,013, Cl. 174-65.00R.

Marechal, Christian: *See—*
Bonte, Frédéric; Dumas, Marc; Meybeck, Alain; and Marechal, Christian, 5,470,579, Cl. 424-450.000.

Marion Merrell Dow Inc.: *See—*
Borcherding, David R.; Edwards, Carl K., III; Esser, Ronald E., and Cole, Douglas L., 5,470,857, Cl. 514-258.000.

Mariwala, Ravindra K.: *See—*
Foley, Henry C.; Sonnichsen, George C.; Brake, Loren D.; Mariwala, Ravindra K.; and Lafyatis, David S., 5,470,814, Cl. 502-182.000.

Markandey, Vishal; and Flinchbaugh, Bruce E. Condition number-based smoothins of optical flow fields. 5,471,544, Cl. 382-264.000.

Markell, Craig G.: *See—*
Hagen, Donald F.; Haddad, Louis C.; Perkins, Robert E.; and Markell, Craig G., 5,470,532, Cl. 422-57.000.

Markle, Richard A.; Brusky, Phyllis L.; Cremeans, George E.; Elhard, Joel D.; Bigg, Donald M.; and Sowell, Sylvester, to Battelle Memorial Institute. Thermally reversible isocyanate-based polymers. 5,470,945, Cl. 528-390.000.

Marko, Paul D.: *See—*
Krayeski, Paul D.; Marko, Paul D.; and Patsiokas, Stelios J., 5,471,146, Cl. 324-637.000.

Marks, Trevor S.; and Maule, Andrew, to United Kingdom of Great Britain and Northern Ireland, The Public Health Laboratory Service Board in Her Britannic Majesty's Government of the. Corrin mediated degradation of organic nitrogen compounds. 5,470,545, Cl. 422-292.000.

Markulin, John, to Viskase Corporation. Method of manufacturing a cellulosic article containing an olefinic oxide polymer. 5,470,519, Cl. 264-193.000.

Marocco, Norbert: *See—*
Digianni, Michele; and Marocco, Norbert, 5,469,658, Cl. 49-82.100.

Marowsky, Richard D.: *See—*
Lim, Gunsang; Marowsky, Richard D.; and Khoshnood, Ben, 5,470,244, Cl. 439-189.000.

Marschall, Richard A., to Marshall Acoustics Pty., Ltd. Method for acoustic/electromagnetic signal processing. 5,471,435, Cl. 367-135.000.

Marsh, Stephen A. Apparatus for measurement of forces and pressures applied to a garment. 5,471,405, Cl. 364-556.000.

Marshall Acoustics Pty., Ltd.: *See—*
Marschall, Richard A., 5,471,435, Cl. 367-135.000.

Marshall, Lisa A.: *See—*
Dixon, James S.; Hall, Raplh F.; Marshall, Lisa A.; Chilton, Floyd H., III; Mayer, Ruth J.; and Winkler, James D., 5,470,882, Cl. 514-596.000.

Martensen, Lars; Hansen, Ove T.; Moeller, Henry M.; and Jepsen, Hardy, to Danfoss A/S. Hydraulic pumping device. 5,469,776, Cl. 92-170.100.

Mårtensson, Göran, to Riverlake Investments Ltd. Device for controlling heating boilers. 5,470,019, Cl. 237-19.000.

Martin, Dave: *See—*
Jennett, Timothy A.; Harmsworth, Patrick D.; Martin, Dave; and Ellison, Anthony W., 5,470,446, Cl. 204-177.000.

Martin, David W., Jr., to Genentech, Inc. Method for evaluating immunogenicity. 5,470,560, Cl. 424-9.200.

Martin, Grover H.: *See—*
Pidgeon, Rezin E., Jr.; and Martin, Grover H., 5,471,492, Cl. 372-38.000.

Martin, Manfred: *See—*
Baumgart, Rudolf; Martin, Manfred; Löw, Lothar; and Scheven, Gunter, 5,470,659, Cl. 428-398.000.

Martin Marietta Magnesia Specialties Inc.: *See—*
Witkowski, Joseph T.; and Raffensperger, Steve D., 5,470,149, Cl. 366-101.000.

Martin, William C., to VLSI Technologies, Inc. Methods and circuits for testing open collectors and open drains. 5,471,153, Cl. 324-763.000.

Martineau, Dominique: *See—*
Pioch, Olivier; Martineau, Dominique; and Dupont, Henri, 5,470,289, Cl. 477-111.000.

Martinelli, Michael J.: *See—*
Flaugh, Michael E.; and Martinelli, Michael J., 5,470,853, Cl. 514-232.800.

Martinez, Otoniel M.: *See—*
Miles, Steven A.; Stevens, Ronald H.; Martinez, Otoniel M.; Kishimoto, Tadamitsu; and Klashman, David J., 5,470,824, Cl. 514-2.000.

Martini, Gary T.: *See—*
LeMonds, Jeffrey; McConnelee, James E.; Kelley, John R.; Wiggs, Gene E., and Martini, Gary T., 5,469,618, Cl. 29-889.720.

Marts, Donna J.; Richardson, John G.; Albano, Richard K. and Morrison, John L., Jr., to Lockheed Idaho Technologies Company. Magnetic latching solenoid. 5,470,043, Cl. 251-65.000.

Marui, Kuniyoshi, to Kabushiki Kaisha Toshiba. Radio telecommunication apparatus. 5,471,643, Cl. 455-33.100.

Marui, Toshiyuki, to Konica Corporation. Light-sensitive silver halide X-ray photographic material containing a mixture of tabular grains. 5,470,700, Cl. 430-567.000.

Maruyama, Kazuo: *See—*
Okamoto, Toru; and Maruyama, Kazuo, 5,471,233, Cl. 347-103.000.

Maruyama, Koichi: *See—*
Tokumaru, Haruki; Maruyama, Koichi; and Wakamiya, Syunitirou, 5,471,456, Cl. 369-112.000.

Maruyama, Takao, to NEC Corporation. Drive circuit for a dual-element magnetic head assembly which includes an encodor, flip-flop circuit, record bit adding circuit, and record amplifier. 5,471,349, Cl. 360-46.000.

Marvin, Mary S.: *See—*
Macielag, Mark J.; Dharanipragada, Ramalinga; and Marvin, Mary S., 5,470,830, Cl. 514-13.000.

Masaki, Takashi; Yanagi, Shigenori; and Yamamoto, Manabu, to Fujitsu Limited; and Nippon Telegraph and Telephone Corporation. Disk apparatus including notifying of cleaning timing and control method thereof. 5,471,451, Cl. 369-71.000.

Masaki, Tateo, to Uniden Corporation. Channel selecting method for radio receiver and highspeed scanning type radio receiver. 5,471,660, Cl. 455-161.200.

Mascarenhas, Desmond; and Olson, Pamela S., to Celtrix Pharmaceuticals, Inc. Chromosomal expression of non-bacterial genes in bacterial cells. 5,470,727, Cl. 435-172.300.

Masco Corporation: *See—*
Tang, Tage D., 5,469,889, Cl. 137-625.410.

Mascotech Accessories, Inc.: *See—*
Van Dusen, Donn S.; and Gibbs, Douglas P., 5,469,998, Cl. 224-506.000.

MascoTech Automotive Systems Group, Inc.: *See—*
Hines, Charles P., Jr., 5,470,126, Cl. 296-219.000.

Mase, Toshiaki: *See—*
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; and Yano, Mitsuo, 5,470,833, Cl. 514-18.000.

Maslakow, William H., to AK Technology, Inc. Homogeneous thermoplastic semi-conductor chip carrier package. 5,471,011, Cl. 174-52.400.

Masonite Corporation: *See—*
Lindquist, Craig R.; Clarke, John T.; Chin, Peter P. S.; MacDonald, Michael J.; and Walsh, J. Peter, 5,470,631, Cl. 428-105.000.

Massachusetts Institute of Technology: *See—*
Brommer, Karl; Mullaney, Henry; Meade, Robert; Rappe, Andrew; and Joannopoulos, John, 5,471,180, Cl. 333-202.000.

Massaki, Minoru: *See—*
Amatsu, Keiji; Butoh, Zenhachiroh; Hirai, Hiroshi; Massaki, Minoru; Morita, Hirofumi; Nakajima, Takeo; Nomura, Nobuo; Sakaki, Mikio; Schmandt, Stephen J.; and Tanaka, Katsuhiro, 5,471,615, Cl. 395-200.030.

Mastalski, Henry T.: *See—*
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Mastalski, Henry T., 5,470,271, Cl. 451-55.000.

Masters, Randy W.: *See—*
Barrington, James W.; Masters, Randy W.; and Denny, Mark D., 5,470,459, Cl. 210-149.000.

Mastrangelo, Carlos H., to Ford Motor Company. Method for producing a silicon-on-insulator capacitive surface micromachined absolute pressure sensor. 5,470,797, Cl. 437-225.000.

Mastrodomenico, Giovanni: *See—*

Baroni, Andrea; Mastrodomenico, Giovanni; Michele, Taliercio; Capocelli, Piero; Carro, Luigi; and Varambally, Rajamohan, 5,471,428, Cl. 365-201.000.

Masuda, Akira, to Fuji Photo Film Co., Ltd. Photosensitive material processing apparatus. 5,471,275, Cl. 354-321.000.

Masuda, Hiroji; Aida, Kazuo; and Nakagawa, Kiyoshi, to Nippon Telegraph and Telephone Corporation. Method and apparatus for monitoring noise figure of optical amplifier. 5,471,334, Cl. 359-177.000.

Masuda, Yasuo: *See*—
Tanaka, Hiroshi; and Masuda, Yasuo, 5,470,450, Cl. 204-279.000.

Masuzaki, Hidefumi: *See*—
Kurosu, Yasuo; Masuzaki, Hidefumi; and Fujisawa, Hiromichi, 5,471,549, Cl. 382-290.000.

Mataki, Hiroshi; Uchida, Satoshi; and Sakiyama, Hajime, to Rohm Co., Ltd. Method for selecting a self pulsating semiconductor laser. 5,471,494, Cl. 372-43.000.

Matani, Nitin P.: *See*—
Horzewski, Michael J.; and Matani, Nitin P., 5,470,322, Cl. 604-280.000.

Materials and Electrochemical Research Corp.: *See*—
Loutfy, Raouf O.; and Withers, James C., 5,470,680, Cl. 429-218.000.

Mathews, Tony P.: *See*—
Milinkovic, Miroslav; Mathews, Tony P.; and Davy, Kenneth C., 5,470,651, Cl. 428-325.000.

Mathur, Achint P.: *See*—
Davison, Roger C.; and Mathur, Achint P., 5,469,914, Cl. 165-166.000.

Matkovich, Vlado I.; Bormann, Thomas J.; Gsell, Thomas C.; and Pascale, Frank R., to Pall Corporation. Method for processing separate containers of biological fluid. 5,470,488, Cl. 210-767.000.

Matoba, Kazuyuki: *See*—
Suzuki, Masao; Matoba, Kazuyuki; Sakaegi, Yuji; and Sasaki, Takashi, 5,471,243, Cl. 348-234.000.

Matsubara, Tsugio: *See*—
Tsutumi, Haruki; Ikemoto, Yoshiaki; Maehama, Mitsuhiro; Oyanagi, Toshiki; and Matsubara, Tsugio, 5,470,918, Cl. 525-329.200.

Matsuda, Kazunori: *See*—
Ochi, Koji; Narita, Kazuyuki; Matsuda, Kazunori; and Asano, Nobukazu, 5,470,406, Cl. 149-35.000.

Matsue, Shuuichi: *See*—
Kaminaga, Isamu; Matsue, Shuuichi; Arakawa, Takahiko; Katoh, Shuuichi; and Ueda, Masahiro, 5,471,095, Cl. 257-775.000.

Matsumoto, Hideaki: *See*—
Sakata, Takashi; and Matsumoto, Hideaki, 5,470,751, Cl. 436-63.000.

Matsumoto, Kazunobu: *See*—
Yumiba, Hideaki; Matsumoto, Kazunobu; and Kawakami, Akira, 5,470,678, Cl. 429-194.000.

Matsumoto, Muneyuki: *See*—
Tojo, Tetsuo; Matsumoto, Muneyuki; and Kikuchi, Yoshiharu, 5,470,919, Cl. 525-334.100.

Matsumoto, Satoru: *See*—
Imai, Tooru; Matsumoto, Satoru; Okazaki, Kiyoshi; and Nagata, Yuji, 5,469,719, Cl. 68-12.040.

Matsumoto, Takahiro: *See*—
Sasaki, Kunimasa; Wakiyama, Youichi; Matsumoto, Takahiro; Tanaka, Kisaburo; and Yamamoto, Keiichi, 5,469,909, Cl. 164-428.000.

Matsumoto, Takashi: *See*—
Tanaka, Hiroshi; Kobayashi, Toshiaki; Nanba, Tomiyuki; Ishiwatari, Masaaki; Yoneyama, Toshio; Ohno, Kimio; Matsumoto, Takashi; Kanbe, Tetsuya; Isa, Takashi; and Ogusu, Yoshiyuki, 5,470,563, Cl. 424-448.000.

Matsumura, Masafumi: *See*—
Kanamori, Junichiro; and Matsumura, Masafumi, 5,469,924, Cl. 173-176.000.

Matsumura, Teruyuki; and Nakajima, Masatoshi, to Fanuc Ltd. Method for defining machining areas of a workpiece. 5,471,394, Cl. 364-474.260.

Matsunaga, Terry: *See*—
Unger, Evan C.; Fritz, Thomas A.; Matsunaga, Terry; Ramaswami, VaradaRajan; Yellowhair, David; and Wu, Guanli, 5,469,854, Cl. 128-662.020.

Matsunaga, Toshiaki: *See*—
Toba, Taketo; Takei, Kazuo; Matsunaga, Toshiaki; Ikeuchi, Hiroyuki; and Tamura, Fumihide, 5,470,930, Cl. 526-204.000.

Matsuno, Katsumi: *See*—
Okumoto, Koji; Matsuno, Katsumi; Shiono, Toru; Senuma, Toshitaka; Fukuda, Tokuya; and Takada, Shinji, 5,471,481, Cl. 371-22.300.

Matsuo, Hirokazu: *See*—
Morigami, Yuusuke; Matsuo, Hirokazu; Tanahashi, Hirofumi; Hirano, Yoshihito; Nagato, Hiroyasu; and Ishikawa, Takuma, 5,470,051, Cl. 271-7.000.

Matsuo, Mitsunori: *See*—
Sakata, Yoshihiro; Yamashita, Wataru; Okawa, Yuichi; Tamai, Shoji; Ishida, Tsutomu; Matsuo, Mitsunori; Yamaguchi, Keizaburo; and Yamaguchi, Akihiro, 5,470,943, Cl. 528-353.000.

Matsushita Communication Industrial Co., Ltd.: *See*—
Suetsugi, Keisuke; Kanno, Hiroshi; Sugawara, Masayuki; Mitani, Kohji; Fujita, Yoshihiro; Saitoh, Toshinori; and Ninomiya, Yuichi, 5,471,323, Cl. 358-511.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Akasaka, Toru; and Mori, Taisuke, 5,471,407, Cl. 364-559.000.
Enoki, Nobuyuki; Miyazaki, Masaya; and Morita, Mitsuaki, 5,471,624, Cl. 395-750.000.
Gamou, Takaharu; Taniguchi, Noboru; Niikura, Junji; Hatoh, Kazuhito; Yasumoto, Eiichi; and Adachi, Kinichi, 5,469,913, Cl. 165-104.120.
Hirotsune, Satoshi, 5,471,295, Cl. 356-138.000.
Imanaka, Takeshi, 5,471,677, Cl. 395-600.000.
Inoue, Katsushi; Tamai, Seiichiro; Kobayashi, Keiichi; and Dosho, Marie, 5,471,041, Cl. 235-462.000.
Kitagawa, Toshiyuki; Nagai, Hideharu; Kawamura, Junkichi; and Mizuguchi, Hitoshi, 5,469,962, Cl. 206-723.000.
Monta, Hiroki; and Matsuura, Ryuji, 5,471,249, Cl. 348-445.000.
Mori, Masukazu; Yamanaka, Hiroyoshi; Kubota, Norio; and Shimokawa, Naoki, 5,470,203, Cl. 416-144.000.
Nomura, Koji; Nakanishi, Tutomu; Kotani, Tokumi; and Kuramasu, Keizaburo, 5,471,060, Cl. 250-338.300.
Ohtsuki, Tetsuji, 5,471,621, Cl. 395-750.000.
Okuyama, Kojiro; Yokotani, Yoichiro; and Kugimiya, Koichi, 5,470,808, Cl. 501-134.000.
Shibuya, Munehiro; Kitagawa, Masatoshi; Kamada, Takeshi; and Hirao, Takashi, 5,470,398, Cl. 148-33.300.
Suetsugi, Keisuke; Kanno, Hiroshi; Sugawara, Masayuki; Mitani, Kohji; Fujita, Yoshihiro; Saitoh, Toshinori; and Ninomiya, Yuichi, 5,471,323, Cl. 358-511.000.
Sugiyama, Shohji; and Tokube, Akira, 5,471,666, Cl. 455-348.000.
Taguchi, Hironori, 5,471,280, Cl. 355-200.000.
Yamashita, Kenyu, 5,471,392, Cl. 364-443.000.
Yasumoto, Eiichi; Niikura, Junji; Hatoh, Kazuhito; and Gamo, Takaharu, 5,470,670, Cl. 429-20.000.
Yoshida, Yuji; Funakura, Masami; Nakatani, Kazuo; and Tagashira, Minoru, 5,470,496, Cl. 252-67.000.

Matsushita Electric Industrial Corporation of America: *See*—
Iu, Siu-Leong, 5,471,252, Cl. 348-699.000.

Matsuura, Ryuji: *See*—
Monta, Hiroki; and Matsuura, Ryuji, 5,471,249, Cl. 348-445.000.

Mattes, Paul B., to Varo, Inc. Night vision goggle headgear mount. 5,469,578, Cl. 2-6.700.

Matthews, Demetreos N.: *See*—
Coolbaugh, Thomas S.; Loveless, Frederick C.; and Matthews, Demetreos N., 5,470,914, Cl. 525-66.000.

Matthews, Gene C.; and Speight, Mary C., to Reynolds Metals Company. Peel-peel-push childproof packaging structure. 5,469,968, Cl. 206-532.000.

Mattis, John: *See*—
McMills, Corey; and Mattis, John, 5,469,613, Cl. 29-751.000.

Matumoto, Takanobu: *See*—
Arai, Yuji; Matumoto, Takanobu; Shin, Yuaki; and Ishiguro, Takashi, 5,470,691, Cl. 430-273.000.

Matviya, Thomas M.: *See*—
Hayden, Richard A.; and Matviya, Thomas M., 5,470,748, Cl. 436-37.000.

Maule, Andrew: *See*—
Marks, Trevor S.; and Maule, Andrew, 5,470,545, Cl. 422-292.000.

Maung, Michael; and Moorehead, Jack, to Automatic Control Technology Inc. Vortex system for separating particles from a liquid stream. 5,470,465, Cl. 210-205.000.

May, George. Capacitive data card system. 5,471,040, Cl. 235-451.000.

May, Timothy J., to Reynolds Consumer Products, Inc. Closure arrangement having a peelable seal. 5,470,156, Cl. 383-210.000.

Mayama, Shinya; Ikeda, Takeshi; Baba, Yoshinobu; and Ogata, Naoya, to Canon Kabushiki Kaisha. Process for producing toner particles using free space formed in a polymeric medium. 5,470,687, Cl. 430-137.000

Mayer, Bruno F. P., to Critical Device Corporation. Needleless injection site. 5,470,319, Cl. 604-167.000.

Mayer, Ruth J.: *See*—
Dixon, James S.; Hall, Raplh F.; Marshall, Lisa A.; Chilton, Floyd H., III; Mayer, Ruth J.; and Winkler, James D., 5,470,882, Cl. 514-596.000.

Mayer, Udo: *See*—
Lamm, Gunther; Mayer, Udo; Reichelt, Helmut; and Zeidler, Georg, 5,470,959, Cl. 534-680.000.

Mayo Foundation for Medical Education and Research: *See*—
Weinshilboum, Richard M.; Honchel, Ronald; Aksoy, Ibrahim A.; Szumlanski, Carol L.; Wood, Thomas C.; Otterness, Diane M.; and Wieben, Eric D., 5,470,737, Cl. 435-240.200.

Mazda Motor Corporation: *See*—
Shitani, Yuji; Okazaki, Haruki; and Miyamoto, Seiji, 5,470,135, Cl. 303-122.030.

Mazer, Murray S. Occlusion detection system for locator devices. 5,471,404, Cl. 364-516.000.

Mazina, Daniel J.: *See*—
Farrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., 5,471,617, Cl. 395-700.000.

Mazoyer, Thierry: *See*—
Guyomar, Daniel; Mazoyer, Thierry; Sauzade, Jean-Denis; and Ching, Gil, 5,471,108, Cl. 310-323.000.

Mazza, Cynthia: *See*—
Grobicki, Christopher; Mazza, Cynthia; O'Connell, Edward; Ulm, John; and White, Gerard, 5,471,474, Cl. 370-85.200.

McAlister, Graeme J., to Sapico Establishment. Control valve. 5,469,888, Cl. 137-625.170.

McAuliffe, Donald C., to Golden Aluminum Company. Process for producing aluminum alloy sheet product. 5,469,912, Cl. 164-476.000.

McB. Hodgson, John: *See*—

Crocker, Michael; McB. Hodgson, John; and Kebede, Girma, 5,470,313, Cl. 604-96.000.

McBride, John G., to Hewlett-Packard. Programmable disk array controller having n counters for n disk drives for stripping data where each counter addresses specific memory location by a count n. 5,471,640, Cl. 395-842.000.

McCallum, R. William; Dennis, Kevin W.; Lograsso, Barbara K.; and Anderson, Iver E., to Iowa State University Research Foundation, Inc. Method of making bonded or sintered permanent magnets. 5,470,401, Cl. 148-302.000.

McCarthy, James R.: *See*—
Wolos, Jeffrey A.; Doherty, Niall S.; Jarvi, Esa T.; and McCarthy, James R., 5,470,837, Cl. 514-45.000.

McCauley, Mary K.; Moder, Kenneth P.; and Speakman, Jeffrey L., to Eli Lilly and Company. Pharmaceutical composition. 5,470,865, Cl. 514-365.000.

McClannahan, Gary P.: *See*—
Carnevale, Michael J.; Kalla, Ronald N.; McClannahan, Gary P.; and Trombley, Michael R., 5,471,626, Cl. 395-775.000.

McCleerey, Earl W.; Moll, Hurley C., Jr.; Landis, John M.; and Douty, George H., to Whitaker Corporation, The. Extended height connector for a battery. 5,470,255, Cl. 439-500.000.

McClellan, John C.: *See*—
Mueller, Mark D.; and McClellan, John C., 5,469,925, Cl. 175-61.000.

McClure, David C., to SGS-Thomson Microelectronics, Inc. Integrated circuit with centralized control of edge transition detection pulse generation. 5,471,157, Cl. 326-93.000.

McClure, David C., to SGS-Thomson Microelectronics, Inc. Cache tag memory. 5,471,415, Cl. 365-49.000.

McClure, David C., to SGS-Thomson Microelectronics, Inc. Redundancy decoder. 5,471,426, Cl. 365-200.000.

McClure, David C., to SGS-THOMSON Microelectronics, Inc. Structure to recover a portion of a partially functional embedded memory. 5,471,431, Cl. 365-225.700.

McClure, R. Bruce; Lawler, Christopher P.; and Hill, Shannon Q., to Synernetics Inc. Network multiplexer. 5,471,472, Cl. 370-85.130.

McConnelee, James E.: *See*—
LeMonds, Jeffrey; McConnelee, James E.; Kelley, John R.; Wiggs, Gene E.; and Martini, Gary T., 5,469,618, Cl. 29-889.720.

McCorkle, John, to United States of America, Army. Low VSWR high efficiency UWB antenna. 5,471,223, Cl. 343-786.000.

McCormick, William B.: *See*—
Dennis, Stephen V.; Shaiman, Steve; McCormick, William B.; Flagg, Robert C.; and Schuster, Paul A., 5,471,563, Cl. 395-114.000.

McCoy, Hugh W., to Desa International, Inc. Microprocessor controlled fuel and ignition control for a fuel burning device. 5,470,223, Cl. 431-24.000.

McCoy, Joseph R., to Infrared Components Corporation. Cryogenic packaging for uniform cooling. 5,469,711, Cl. 62-51.100.

McCracken, William P.: *See*—
Cooper, Alan N.; McCracken, William P.; and Hynecek, Jaroslav, 5,471,245, Cl. 348-302.000.

McCulley, William W.: *See*—
Shockey, Roy L.; and McCulley, William W., 5,470,207, Cl. 417-313.000.

McCurdy, Jim; Doyle, Michael; and McLaughlin, Michael, to Cincinnati Microwave, Inc. Tamper-proof bracelet for home arrest system. 5,471,197, Cl. 340-573.000.

McDonach, Alaster: *See*—
Diemeer, Martinus B. J.; Horsthuis, Winfried H. G.; McDonach, Alaster; and Copeland, John M., 5,470,692, Cl. 430-290.000.

McDonald, Halley A., III: *See*—
French, Barry J.; Ferguson, Kevin R.; McDonald, Halley A., III; Glass, Andrew B.; Mohansingh, Timothy; and Borges, Gregory, 5,469,740, Cl. 73-379.040.

McDonald, Ian A.: *See*—
Palfreyman, Michael G.; McDonald, Ian A.; Salituro, Francesco G.; Schwarcz, Robert; and Baron, Bruce M., 5,470,870, Cl. 514-419.000.

McEachern, Alexander: *See*—
Nicholson, Jamie; and McEachern, Alexander, 5,471,401, Cl. 364-483.000.

McEwan, Thomas E., to University of California, The Regents of the. High speed transient sampler. 5,471,162, Cl. 327-92.000.

McFadden, Willie, Jr.: *See*—
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Mastalski, Henry T., 5,470,271, Cl. 451-55.000.

McGee, William F.: *See*—
Dailey, J. R.; McGee, William F.; and Rybicki, Daniel J., 5,471,031, Cl. 219-121.460.

McGlynn, Daniel R.: *See*—
Wang, Yujiun P.; Swartz, Jerome; and McGlynn, Daniel R., 5,471,533, Cl. 380-51.000.

McGregor, Douglas R., to University of Strathclyde. Computerised information-retrieval database systems. 5,471,611, Cl. 395-600.000.

McGuire, Michael P., to Bait Data, Inc. On-line fishing depth indicator with encapsulated components. 5,469,739, Cl. 73-301.000.

McGuire Nicholas Company, Inc.: *See*—
Muñoz, Jose C., 5,470,000, Cl. 224-224.000.

McKee, Richard C.; and Baumler, Sandra L., to Westinghouse Electric Corporation. Process for fabricating a front surface resonant mesh array detector. 5,470,761, Cl. 437-5.000.

McKenna, Gregory B.; and Grunewald, Fred A., to Kawneer Company, Inc. Thermally insulating composite frame member with snap-in thermal isolator. 5,469,683, Cl. 52-730.300.

McKinney, Roy L.; and Wien, Abraham, to Fold-A-Shield. Security and hurricane shutter. 5,469,905, Cl. 160-35.000.

McLachlan, Robert I.: *See*—
De Kretser, David M.; Burger, Henry G.; Hearn, Milton T. W.; Milne-Robertson, David M.; Wettenhall, Richard E. H.; McLachlan, Robert I.; and De Vos, Fiona, 5,470,826, Cl. 514-8.000.

McLarty, Daniel R.; and Acampora, Salvatore, to Torrington Company, The. Seal for rolling bearings. 5,470,158, Cl. 384-484.000.

McLaughlin, Michael: *See*—
McCurdy, Jim; Doyle, Michael; and McLaughlin, Michael, 5,471,197, Cl. 340-573.000.

McMills, Corey; and Mattis, John, to Raychem Corporation. Tool for connecting a coaxial cable terminus to a connection jack. 5,469,613, Cl. 29-751.000.

McNair, Edward P. Sound barrier with oblique surfaces. 5,469,932, Cl. 181-210.000.

McNeel, Thomas E., to Buckman Laboratories International, Inc. Method and apparatus for controlling the feed of water treatment chemicals using a voltammetric sensor. 5,470,484, Cl. 210-746.000.

McNeil-PPC, Inc.: *See*—
Dabi, Shmuel; and Chinai, Kays, 5,470,326, Cl. 604-383.000.
Sankey, George H.; Vernon, Nicholas M.; and Wingard, Robert E., Jr., 5,470,969, Cl. 536-115.000.

McRoberts, Louis A.; and Borden, Donald E., to Motorola, Inc. Arrangement for column sparing of memory. 5,471,479, Cl. 371-10.300.

Meade, Alexander D.: *See*—
Janes, Todd L.; Meade, Alexander D.; Murthy, Ashok; Sharma, Pramod K.; and Wallin, Peter E., 5,471,291, Cl. 355-326.00R.

Meade, Robert: *See*—
Brommer, Karl; Mullaney, Henry; Meade, Robert; Rappe, Andrew; and Joannopoulos, John, 5,471,180, Cl. 333-202.000.

Meador, Murray P. Secondary smoke filtration device. 5,469,870, Cl. 131-187.000.

Mealey, Shawn K.: *See*—
Krahnke, Robert H.; Mealey, Shawn K.; Schoenherr, William J.; Smith, Schyler B., deceased; and Tangney, Thomas J., 5,470,923, Cl. 525-477.000.

Means, Robert W.; and Sklar, Horace J., to HNC, Inc. Systolic array image processing system and method. 5,471,627, Cl. 395-800.000.

Meazza, Giovanni: *See*—
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Meazza, Giovanni; Zanardi, Giampaolo; Garavaglia, Carlo; and Mirenna, Luigi, 5,470,863, Cl. 514-343.000.

Mechsner, Klaus, to VAW Aluminium AG. Oil pan for combustion machines and method of making the oil pan. 5,469,822, Cl. 123-195.00C.

Mect Corporation: *See*—
Ogawa, Tomoya; Nunomura, Shigeki; and Sugimoto, Mamoru, 5,470,962, Cl. 536-17.200.

Medical Materials Corporation: *See*—
Crawford, Howard E., III, 5,469,638, Cl. 36-28.000.

Medtronic, Inc.: *See*—
Hassler, Beth A.; and Donders, Adrianus P., 5,470,345, Cl. 607-36.000.
Kuehn, Kevin P.; Rossing, Martin A.; and Berg, William C., 5,470,341, Cl. 607-5.000.
Perrault, James J., 5,470,625, Cl. 428-48.000.

Meffert, Alfred: *See*—
Daute, Peter; Wegener, Ingo; Meffert, Alfred; and Berger, Faize, 5,470,493, Cl. 252-8.700.

Mehdizadeh, Mehrdad: *See*—
Koch, Theodore A.; Krause, Karl R.; and Mehdizadeh, Mehrdad, 5,470,541, Cl. 422-186.000.

Mehl, Thomas L., Sr.; Harris, George W., Jr.; and Zaias, Nardo, to Mehl, Sr., Thomas L. System for permanent removal of multiple hairs. 5,470,332, Cl. 606-36.000.

Mehta, Aswin N., to Texas Instruments Incorporated. Pre-charge triggering to increase throughput by initiating register output at beginning of pre-charge phase. 5,471,158, Cl. 326-95.000.

Mehta, Rustam: *See*—
Gheewala, Tushar; Mehta, Rustam; and Varma, Prab, 5,471,152, Cl. 324-758.000.

Meibock, Antonin A.; and Svensson, John E., to K-2 Corporation. Braking apparatus for in-line roller skates. 5,470,085, Cl. 280-11.200.

Meier, Karl; Goerl, Udo; and Wolff, Siegfried, to Degussa Aktiengesellschaft. Adhesion promoters for rubber and synthetic mixtures. 5,470,905, Cl. 524-493.000.

Meier, Markus, to ABB Research Ltd. Fiber-optic transmission sensor with modulator. 5,471,546, Cl. 385-11.000.

Meiji Seika Kaisha, Ltd.: *See*—
Yamaguchi, Mitsuo; Ohgo, Kenjiro; and Nagasawa, Makoto, 5,469,780, Cl. 99-450.700.

Meilinger, John H.; Brown, C. Gordon; and Bohanan, Montgomery A., to Raskas Foods Inc. Process for the manufacture of a fat free cream cheese product. 5,470,593, Cl. 426-36.000.

Meiser, David H.: *See*—

Kelso, Thomas M.; Kotch, John K.; Boyle, Damon J.; Meiser, David H.; Flaherty, William P.; and Baird, Bernard W., 5,470,232, Cl. 434-45.000.

Meisner, Stephen H.: *See*—
Call, Anson J.; Meisner, Stephen H.; Pompeo, Frank L.; and Zitz, Jeffrey A., 5,471,027, Cl. 219-85.130.

Meissner, Cody: *See*—
Leung, Donald; Schlievert, Patrick; Meissner, Cody; and Fulton, David, 5,470,716, Cl. 435-34.000.

Meixner, Jürgen; Fischer, Wolfgang; and Müller, Manfred, to Bayer Aktiengesellschaft. Radically curable coating compositions and their use for coating wood substrates. 5,470,897, Cl. 523-518.000.

Meldner, Heiner; and Downs, Roland J., to America^3 Foundation. Composite material for fabrication of sails and other articles. 5,470,632, Cl. 428-110.000.

Melikian-Badalian, Anita; and Ornstein, Paul L., to Eli Lilly and Company. Process and intermediates for the preparation of excitatory amino acid receptor antagonists. 5,470,978, Cl. 546-141.000.

Melin, Christian: *See*—
Laughlin, Philip; Alexander, John; Kamarei, A. Reza; Dobbie, Robert P.; Lin, Paul; Chang, Shen-Youn; Reddy, Sekhar; Grasset, Etienne; and Melin, Christian, 5,470,839, Cl. 514-53.000.

Melis, Pierluigi: *See*—
Cerami, Pietro; Gatti, Pierluigi; and Melis, Pierluigi, 5,471,201, Cl. 340-641.000.

Melo, Maria L.; and Bonella, Randy M., to Compaq Computer Corp. Bus master arbitration circuitry having improved prioritization. 5,471,590, Cl. 395-288.000.

Melter, Craig H.; and Schofield, Robert T., to Fiskars Inc. Compound action hand pruner. 5,469,625, Cl. 30-251.000.

Menchen, Steven M.: *See*—
Grossman, Paul D.; Fung, Steven; Menchen, Steven M.; Woo, Sam L.; and Winn-Deen, Emily S., 5,470,705, Cl. 435-6.000.

Mendenhall, Von T., to Utah State University. Ultra-high temperature pasteurization of meat products. 5,470,597, Cl. 426-521.000.

Mendis, Sunetra: *See*—
Fossum, Eric R.; Mendis, Sunetra; and Kemeny, Sabrina E., 5,471,515, Cl. 377-60.000.

Meng, Shi-Yuan; Morris, Charles F.; and Tsai, Larry B. Modified OmpA signal sequence for enhanced secretion of polypeptides. 5,470,719, Cl. 435-69.100.

Menich, Barry J.: *See*—
Schatz, Steven V.; Richie, Thomas W.; Menich, Barry J.; Bonta, Jeffrey D.; and Akinniyi, Akingbade, 5,471,644, Cl. 455-33.200.

Mercedes-Benz AG: *See*—
Toepfer, Bernhard; Reiner, Michael; and Klein, Bodo, 5,470,134, Cl. 303-9.610.
Zomotor, Adam; Klinkner, Walter; Schindler, Erich; Mohn, Frank-Werner; and Wohland, Thomas, 5,471,388, Cl. 364-424.050.

Merchel, Frank J., III: *See*—
Luthi, Oscar; Abdulmassih, Antoine; and Merchel, Frank J., III, 5,470,471, Cl. 210-386.000.

Merck & Co., Inc.: *See*—
Gibbs, Jackson B.; and Graham, Samuel L., 5,470,832, Cl. 514-18.000.
Humphrey, Guy R.; and Miller, Ross A., 5,470,976, Cl. 546-77.000.

Merianos, John J.; Elder, Todd; and Garelick, Paul, to ISP Chemicals Inc. Water soluble, antimicrobial compositions of polyhexamethylene biguanide and iodopropynylbutyl carbamate. 5,470,875, Cl. 514-479.000.

Merocel Corporation: *See*—
Rosenblatt, Solomon, 5,469,864, Cl. 128-849.000.

Merrell Dow Pharmaceuticals Inc.: *See*—
Palfreyman, Michael G.; McDonald, Ian A.; Salituro, Francesco G.; Schwarcz, Robert; and Baron, Bruce M., 5,470,870, Cl. 514-419.000.
Whitten, Jeffrey P., 5,470,844, Cl. 514-91.000.
Wolos, Jeffrey A.; Doherty, Niall S.; Jarvi, Esa T.; and McCarthy, James R., 5,470,837, Cl. 514-45.000.

Merritt, Bruce W.: *See*—
Fruchterman, James R.; Schwegler, William C.; Merritt, Bruce W.; and LaPierre, Charles, 5,470,233, Cl. 434-112.000.

Mertens, Udo, to Ernst Winter & Sohn (GmbH & Co.). Grinding wheel for surface cutting of workpieces. 5,470,273, Cl. 451-548.000.

Messina, Massimo, to International Business Machines Corporation. Method and system for controlling access to objects in a data processing system. 5,471,619, Cl. 395-600.000.

Meszaros, Laszlo A. Sulfur dye compositions and their production. 5,470,356, Cl. 8-652.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Litzenberger, Ingo F.; Roller, Günter; and Stein, Dieter, 5,470,444, Cl. 204-93.000.

Metaullics Systems Co., L.P.: *See*—
Gilbert, Ronald E.; Mordue, George S.; and Vild, Chris T., 5,470,201, Cl. 415-200.000.

Metlitsky, Boris: *See*—
Kirkeby, David; Metlitsky, Boris; Krichever, Mark; and Swartz, Jerome, 5,471,042, Cl. 235-472.000.

Metricon, Inc.: *See*—
Flammer, George H., III; and Galloway, Brett D., 5,471,469, Cl. 370-94.100.

Mettler-Toledo AG: *See*—
Nipkow, Andre; and Bakker, Eric, 5,470,453, Cl. 204-435.000.

Metzner, Christoph: *See*—
Goedicke, Klaus; Metzner, Christoph; Schmidt, Joerg; Heisig, Ullrich; Schiller, Siegfried; and Reschke, Jonathan, 5,470,388, Cl. 118-716.000.

Meybeck, Alain: *See*—
Bonte, Frédéric; Dumas, Marc; Meybeck, Alain; and Marechal, Christian, 5,470,579, Cl. 424-450.000.

Meyer, David M.: *See*—
Meyer, Stuart L.; Meyer, Eric S.; Meyer, David M.; and Meyer, Jonathan L., 5,469,874, Cl. 132-323.000.

Meyer, Eric S.: *See*—
Meyer, Stuart L.; Meyer, Eric S.; Meyer, David M.; and Meyer, Jonathan L., 5,469,874, Cl. 132-323.000.

Meyer, Hans R.: *See*—
Weber, Kurt; Meyer, Hans R.; Kaschig, Jürgen; and Eckhardt, Claude, 5,470,990, Cl. 549-466.000.

Meyer, Jonathan L.: *See*—
Meyer, Stuart L.; Meyer, Eric S.; Meyer, David M.; and Meyer, Jonathan L., 5,469,874, Cl. 132-323.000.

Meyer, Stuart L.; Meyer, Eric S.; Meyer, David M.; and Meyer, Jonathan L., to Televideo Consultants, Inc. Apparatus and method for preforming dental flossing. 5,469,874, Cl. 132-323.000.

Meyer, Thomas J., to Square D Company. System for monitoring the insulation quality of step graded insulated high voltage apparatus. 5,471,144, Cl. 324-551.000.

Meyers, Mark M., to Eastman Kodak Company. Camera auto-focusing system with designator using a volume holographic element. 5,471,046, Cl. 250-201.700.

Meyers, Peter V.: *See*—
Foote, James B.; Kaake, Steven A. F.; Meyers, Peter V.; and Nolan, James F., 5,470,397, Cl. 136-260.000.

Mezaki, Tamotsu, to Sugai Corporation. Draining and drying apparatus of semiconductor materials. 5,469,634, Cl. 34-58.000.

Mi-Jack Products, Inc.: *See*—
Baumann, James A.; Kuchcik, Joel G.; and Lanigan, John J., Sr., 5,470,189, Cl. 414-618.000.

Michaelson, Wayne A.: *See*—
Byers, Larry L.; De Subijana, Joseba M.; and Michaelson, Wayne A., 5,471,597, Cl. 395-375.000.

Michalik, Horst B., to Koenig & Bauer Aktiengesellschaft. Paper train inlet in a longitudinal fold gate. 5,469,788, Cl. 101-227.000.

Michaud, Philippe: *See*—
Camberlin, Yves; Dien, René; and Michaud, Philippe, 5,470,920, Cl. 525-421.000.

Michel, Georges L.; and Nathan, Olivier M., to Sapi Equipements S.A. Method and apparatus for treating and cleaning plates by means of a central reactor. 5,470,394, Cl. 134-25.400.

Michele, Taliercio: *See*—
Baroni, Andrea; Mastrodomenico, Giovanni; Michele, Taliercio; Capocelli, Piero; Carro, Luigi; and Varambally, Rajamohan, 5,471,428, Cl. 365-201.000.

Michnick, John; Underiner, Gail E.; Klein, J. Peter; and Rice, Glenn C., to Cell Therapeutics, Inc. Cell signaling inhibitors. 5,470,878, Cl. 514-558.000.

Micro Motion, Inc.: *See*—
Kalotay, Paul Z., 5,469,748, Cl. 73-861.380.

Microsoft Corporation: *See*—
Dennis, Stephen V.; Shaiman, Steve; McCormick, William B.; Flagg, Robert C.; and Schuster, Paul A., 5,471,563, Cl. 395-114.000.
Dennis, Stephen V.; Fluegel, Steven J.; Gerlach, Brett C.; and Flagg, Robert C., 5,471,564, Cl. 395-114.000.

Middleman, Lee: *See*—
DeLonzor, Russell; and Middleman, Lee, 5,469,845, Cl. 128-633.000.

Midgley, Roland R.: *See*—
Gagnon, James E.; Povey, Neale P.; Gagnon, David R.; and Midgley, Roland R., 5,470,757, Cl. 436-164.000.

Midwest Superconductivity, Inc.: *See*—
Wong, Kai W.; Fei, Xin; Xin, Ying; and Kao, Yi-Han, 5,470,821, Cl. 505-236.000.

Mignani, Gerard; Richard, Christophe; and Trichon, Roger, to Rhone-Poulenc Chimie. Preparation of polyaminoborazines. 5,470,933, Cl. 528-24.000.

Mihara, Takashi, to Olympus Optical Co., Ltd.; and Symetrix Corporation. Ferroelectric capacitive element. 5,471,363, Cl. 361-305.000.

Mikel, Dennis A.; and Rosen, Richard H., to Pitney Bowes Inc. Postal automated labeling system. 5,470,427, Cl. 156-387.000.

Mikhail, W. E. Michael: *See*—
Ling, Robin S. M.; Mikhail, W. E. Michael; Elting, James J.; Gie, Graham A.; Slooff, Tom J. J. H.; and Vanderlinden, Jacques J., 5,470,336, Cl. 606-105.000.

Mikuriya, Yushi: *See*—
Kotaki, Takaaki; Taya, Masaaki; Unno, Makoto; Mikuriya, Yushi; and Dojyo, Tadashi, 5,470,684, Cl. 430-109.000.

Miles, Steven A.; Stevens, Ronald H.; Martinez, Otoniel M.; Kishimoto, Tadamitsu; and Klashman, David J., to University of California, The Regents of the. Method to treat Kaposi's sarcoma. 5,470,824, Cl. 514-2.000.

Milinkovic, Miroslav; Mathews, Tony P.; and Davy, Kenneth C., to Mirotech, Inc. Mandrel for use in nickel vapor deposition processes and nickel molds made thereform. 5,470,651, Cl. 428-325.000.

Miller, A. Dusty; Garcia-Martinez, Jose V.; Eiden, Maribeth V.; and Wilson, Carolyn A., to Fred Hutchinson Cancer Research Center; and United States of America, Health and Human Services. Retrovirus packaging and producer cell lines based on gibbon ape leukemia virus. 5,470,726, Cl. 435-172.300.
Miller, Dennis: *See*—
Schermann, Walter; Miller, Dennis; Hilgenfeldt, Eckhard; and Böhme-Kovac, Jozef, 5,470,383, Cl. 106-170.000.
Miller, Leslie L.: *See*—
Turner, Michael R.; and Miller, Leslie L., 5,469,787, Cl. 101-211.000.
Miller, Ralph N.: *See*—
Mahler, Barry A.; and Miller, Ralph N., 5,470,442, Cl. 203-56.000.
Miller, Richard A.; Aho, Kenneth A.; and Dreyer, John F., Jr., to Minnesota Mining and Manufacturing Company. Directed reflection optical device. 5,471,348, Cl. 359-837.000.
Miller, Ross A.: *See*—
Humphrey, Guy R.; and Miller, Ross A., 5,470,976, Cl. 546-77.000.
Miller, Susan A.: *See*—
El Shami, A. Said; Hand, Christopher W.; Miller, Susan A.; and Moore, Robert A., 5,470,713, Cl. 435-7.720.
Milne-Robertson, David M.: *See*—
De Kretser, David M.; Burger, Henry G.; Hearn, Milton T. W.; Milne-Robertson, David M.; Wettenhall, Richard E. H.; McLachlan, Robert I.; and De Vos, Fiona, 5,470,826, Cl. 514-8.000.
Mims, Carl W.; and Zwicker, Roger D., to Victor Equipment Company. Pilot igniter torch with cutoff preheat valves. 5,470,227, Cl. 431-255.000.
Minakami, Michael K.; Hulse, Brian; Cook, Jonathan; and Pickering, John B., to International Business Machines Corporation. Distributed system for call processing. 5,471,521, Cl. 379-88.000.
Minaskanian, Gevork; and Peck, James V. Penetration enhancers for transdermal delivery of systemic agents. 5,470,848, Cl. 514-182.000.
Mineki, Ryohachi, to Mineki, Takayoshi. Separating apparatus for a punched sheet. 5,470,004, Cl. 225-99.000.
Mineki, Takayoshi: *See*—
Mineki, Ryohachi, 5,470,004, Cl. 225-99.000.
Ministero Dell'Universita' E Della Ricerca Scientifica E Technologica: *See*—
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Meazza, Giovanni; Zanardi, Giampaolo; Garavaglia, Carlo; and Mirenna, Luigi, 5,470,863, Cl. 514-343.000.
Ministry of International Trade & Industry: *See*—
Umeda, Kazunori, 5,470,494, Cl. 252-12.000.
Mink, Robert I.; and Nowlin, Thomas E., to Mobil Oil Corporation. High activity polyethylene catalysts prepared with alkoxysilane reagents. 5,470,812, Cl. 502-125.000.
Minneman, Sue A. F. Mouthguard having an extra-oral portion and an intra-oral portion. 5,469,865, Cl. 128-859.000.
Minnesota Mining and Manufacturing Company: *See*—
Beck, Anthony L.; Wallis, Julian M.; Attwood, Martin D.; and Newman, Stephen, 5,470,699, Cl. 430-621.000.
Burkard, Christopher J.; and Manley, Norman G., 5,469,679, Cl. 52-301.000.
Culler, Scott R., 5,470,368, Cl. 51-298.000.
Doany, Ziyad H., 5,471,143, Cl. 324-326.000.
Gagnon, James E.; Povey, Neale P.; Gagnon, David R.; and Midgley, Roland R., 5,470,757, Cl. 436-164.000.
Gorsuch, Ian; Ennis, Mark R.; and Burgess, Robert M., 5,470,362, Cl. 51-295.000.
Hagen, Donald F.; Haddad, Louis C.; Perkins, Robert E.; and Markell, Craig G., 5,470,532, Cl. 422-57.000.
Hodson, Peter D., 5,469,843, Cl. 128-203.150.
Lundeen, Richard H., 5,470,605, Cl. 427-11.000.
Miller, Richard A.; Aho, Kenneth A.; and Dreyer, John F., Jr., 5,471,348, Cl. 359-837.000.
Pfyley, Alan K.; Vidal, Claude A.; and Lagerquist, Roger, 5,470,007, Cl. 227-175.000.
Roeker, David C.; Manor, Edward L.; and Crosby, Shawn P., 5,469,623, Cl. 30-169.000.
Wilfong, Debra L.; Rutherford, Denise R.; and Rolando, Richard J., 5,470,526, Cl. 428-36.600.
Yamazaki, Hideo, 5,469,615, Cl. 29-846.000.
Minolta Camera Kabushiki Kaisha: *See*—
Morigami, Yuusuke; Matsuo, Hirokazu; Tanahashi, Hirofumi; Hirano, Yoshihito; Nagato, Hiroyasu; and Ishikawa, Takuma, 5,470,051, Cl. 271-7.000.
Minowa, Toshimichi; Kimura, Hiroshi; Yhoshida, Yoshiyuki; Ohyama, Yoshishige; and Nishimura, Yutaka, to Hitachi, Ltd. Change gear control device using acceleration and gear ratio as parameters for automatic transmission in a motor vehicle and the method therefor. 5,470,290, Cl. 477-115.000.
Mirenna, Luigi: *See*—
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Meazza, Giovanni; Zanardi, Giampaolo; Garavaglia, Carlo; and Mirenna, Luigi, 5,470,863, Cl. 514-343.000.
Mirotech, Inc.: *See*—
Milinkovic, Miroslav; Mathews, Tony P.; and Davy, Kenneth C., 5,470,651, Cl. 428-325.000.
Mirov, Sergey B.; and Sibley, William A., to UAB Research Foundation, The. Sc^{2+} based active crystalline luminescent media for laser systems tunable in UV-visible spectral range. 5,471,493, Cl. 372-42.000.
Mis, J. Daniel: *See*—
Chidambarrao, Dureseti; Hsu, Louis L.; Mis, J. Daniel; and Peng, James P., 5,470,781, Cl. 437-68.000.
Misawa, Hiromitsu; Fujioka, Kazuo; Aoki, Koso; Kurita, Eiichi; Okano, Yoji; and Kozawa, Minoru, to Toda Kogyo Corporation. Iron oxide particles and process for producing the same. 5,470,660, Cl. 428-403.000.
Misawa, Nobuhiro, to Fujitsu Limited. Process for fabricating integrated circuit devices. 5,470,789, Cl. 437-190.000.
Misewich, Felix J.: *See*—
Emberty, Robert G.; Misewich, Felix J.; and Pawlowski, Edward J., 5,471,445, Cl. 369-34.000.
Mistry, Bipin: *See*—
Gavin, Vincent G.; Seaman, Michael J.; Crook, Neal A.; and Mistry, Bipin, 5,471,632, Cl. 395-284.000.
Mita Industrial Co., Ltd.: *See*—
Shibata, Kouichi; Morikawa, Yusuke; and Ohmi, Ikuhiro, 5,471,562, Cl. 395-101.000.
Mitani, Kohji: *See*—
Suetsugi, Keisuke; Kanno, Hiroshi; Sugawara, Masayuki; Mitani, Kohji; Fujita, Yoshihiro; Saitoh, Toshinori; and Ninomiya, Yuichi, 5,471,323, Cl. 358-511.000.
Mitchell, Frank L.: *See*—
Noone, David L.; and Mitchell, Frank L., 5,469,892, Cl. 138-121.000.
Mitel Corporation: *See*—
Ouellet, Luc, 5,470,798, Cl. 437-231.000.
Reesor, Gordon J., 5,471,528, Cl. 379-390.000.
Mitsubishi Denki Kabushik Kaisha: *See*—
Ikegami, Masaaki; and Higuchi, Tetsuo, 5,470,764, Cl. 437-24.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Bae, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, 5,470,461, Cl. 210-188.000.
Fujimaga, Masato, 5,471,403, Cl. 364-488.000.
Fujimoto, Takanori, 5,470,287, Cl. 477-99.000.
Ikeda, Tatsuhiko; and Niwano, Kazuhito, 5,471,083, Cl. 257-370.000.
Ikeda, Yutaka, 5,471,079, Cl. 257-296.000.
Ipposhi, Takashi; and Nishimura, Tadashi, 5,471,086, Cl. 257-417.000.
Ishigaki, Yoshiyuki; Honda, Hiroki; Uga, Kimiharu; and Ishida, Masahiro, 5,471,085, Cl. 257-370.000.
Itami, Shinzi; and Ando, Takeshi, 5,471,380, Cl. 364-146.000.
Itoh, Hiromi; Iwasaki, Masanobu; Tokui, Akira; and Tsukamoto, Katsuhiro, 5,470,799, Cl. 437-238.000.
Kaminaga, Isamu; Matsue, Shuuichi; Arakawa, Takahiko; Katoh, Shuuichi; and Ueda, Masahiro, 5,471,095, Cl. 257-775.000.
Kodama, Satoshi; and Adachi, Hiroshi, 5,470,491, Cl. 216-22.000.
Kohno, Yasutaka, 5,471,073, Cl. 257-108.000.
Makihara, Hiroyasu, 5,471,432, Cl. 365.233.500.
Murakami, Shuji; Wada, Tomohisa; and Anami, Kenji, 5,471,427, Cl. 365-200.000.
Nagatomo, Akihiro; Yoshida, Hiroshi; Nishiyama, Masaki; and Oshima, Seiichi, 5,471,089, Cl. 257-691.000.
Nakamoto, Takahiro; and Yagi, Tetsuya, 5,470,767, Cl. 437-39.000.
Nii, Koji; and Maeno, Hideshi, 5,471,420, Cl. 365-182.000.
Satoh, Shinichi; Ozaki, Hiroji; and Eimori, Takahisa, 5,471,080, Cl. 257-344.000.
Sawada, Seiji; and Konishi, Yasuhiro, 5,471,430, Cl. 365-222.000.
Shimizu, Toru; and Iwata, Shunichi, 5,471,620, Cl. 395-375.000.
Takahashi, Tatsuhiko, 5,469,831, Cl. 123-680.000.
Tani, Takahiro, 5,471,409, Cl. 364-578.000.
Tsujido, Yoshinori; and Tayaoka, Eriko, 5,471,565, Cl. 395-126.000.
Yamada, Yoshiaki; Iwasaki, Junji; and Ohmori, Masashi, 5,470,392, Cl. 134-2.000.
Yasue, Takao; and Nishioka, Tadashi, 5,469,733, Cl. 73-105.000.
Mitsubishi Electric Engineering Co., Ltd.: *See*—
Itami, Shinzi; and Ando, Takeshi, 5,471,380, Cl. 364-146.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Makino, Tetsuo; Fujiki, Keiichi; and Tajima, Toshimi, 5,470,439, Cl. 162-216.000.
Sasaki, Kunimasa; Wakiyama, Youichi; Matsumoto, Takahiro; Tanaka, Kisaburo; and Yamamoto, Keiichi, 5,469,909, Cl. 164-428.000.
Mitsubishi Materials Corporation: *See*—
Tanaka, Hiroshi; and Masuda, Yasuo, 5,470,450, Cl. 204-279.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Uenishi, Masamoto; Mizobuchi, Tsukasa; Takesue, Masatoshi; Kobayashi, Yukio; and Nagai, Shoichi, 5,470,616, Cl. 427-515.000.
Mitsubishi Steel Mfg. Co., Ltd.: *See*—
Motomura, Hiroharu; Takasaki, Soichi; and Kinoshita, Kenji, 5,470,528, Cl. 420-84.000.
Mitsuhashi, Tadashi: *See*—
Hiraishi, Hisato; Hoshino, Motonobu; and Mitsuhashi, Tadashi, 5,471,231, Cl. 347-68.000.
Mitsui Minings & Melting Co., Ltd.: *See*—
Moriya, Kazuo, 5,471,298, Cl. 356-336.000.
Mitsui Norin Co., Ltd.: *See*—
Hayakawa, Fumiko; Ando, Takashi; Kimura, Takahide; and Hara, Yukihiko, 5,470,565, Cl. 424-52.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Tojo, Tetsuo; Matsumoto, Muneyuki; and Kikuchi, Yoshiharu, 5,470,919, Cl. 525-334.100.
Mitsui Toatsu Chemicals, Inc.: *See*—
Sakata, Yoshihiro; Yamashita, Wataru; Okawa, Yuichi; Tamai, Shoji; Ishida, Tsutomu; Matsuo, Mitsunori; Yamaguchi, Keizaburo; and Yamaguchi, Akihiro, 5,470,943, Cl. 528-353.000.

Tsutsumi, Haruki; Ikemoto, Yoshiaki; Machama, Mitsuhiro; Oyanagi, Toshiki; and Matsubara, Tsugio, 5,470,918, Cl. 525-329.200.

Mittag, Peter: *See*—
Berger, Harald; Mittag, Peter; Steins, Johannes; and Pfeiffer, Gert, 5,471,495, Cl. 373-2.000.

Miura, Kosho: *See*—
Goto, Tetsuro; and Miura, Kosho, 5,471,267, Cl. 354-106.000.

Miura, Takaharu; Nemoto, Hiroyuki; Ito, Masataka; Kobayashi, Masafumi; and Tanaka, Chieko, to Oji Paper Co., Ltd. Support sheet for photographic printing paper and process for producing the sheet. 5,470,652, Cl. 428-328.000.

Miura, Toshihiko; and Azuma, Yusaku, to Canon Kabushiki Kaisha. Pallet supply apparatus and control method thereof. 5,470,193, Cl. 414-774.000.

Miwon Petrochemical Corporation: *See*—
Cha, Jin Y.; and Kim, Kwang Y., 5,470,915, Cl. 525-86.000.

Mix, John D.: *See*—
Parker, Jeffrey L.; Sorrells, David F.; and Mix, John D., 5,471,296, Cl. 356-139.060.

Miyai, Yoichi: *See*—
Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, 5,470,778, Cl. 437-52.000.

Miyaji, Akira: *See*—
Yasuda, Yukio; Yamaguchi, Akiyasu; Igarashi, Tatsushi; Oonishi, Yasuo; Kai, Kenzo; Sugihara, Masanori; Mori, Takashi; and Miyaji, Akira, 5,471,278, Cl. 355-67.000.

Miyajima, Takao: *See*—
Ikeda, Masao; Ito, Satoshi; Iochi, Yoshino; Miyajima, Takao; Ozawa, Masafumi; Akimoto, Katsuhiro; Ishibash, Akira; and Hiei, Futoshi, 5,471,067, Cl. 257-14.000.

Miyake, Yuichi: *See*—
Yamamoto, Kazuhiko; Miyake, Yuichi; Okada, Chikara; and Kitazume, Nobuyuki, 5,470,404, Cl. 148-426.000.

Miyamoto, Seiji: *See*—
Shitani, Yuji; Okazaki, Haruki; and Miyamoto, Seiji, 5,470,135, Cl. 303-122.030.

Miyamoto, Shigeyuki: *See*—
Akaike, Toshihiro; Tobe, Seishiro; Miyamoto, Shigeyuki; and Ohashi, Akio, 5,470,739, Cl. 435-240.243.

Miyata, Hideyuki: *See*—
Onaka, Hiroshi; Miyata, Hideyuki; and Naito, Takao, 5,471,336, Cl. 359-191.000.

Miyatake, Takafumi: *See*—
Ikezawa, Mitsuru; Miyatake, Takafumi; Ueda, Hirotada; Sumino, Shigeo; and Yoshizawa, Satoshi, 5,471,535, Cl. 382-199.000.

Miyazaki, Masaya: *See*—
Enoki, Nobuyuki; Miyazaki, Masaya; and Morita, Mitsuaki, 5,471,624, Cl. 395-750.000.

Miyazaki, Satomichi; Harayama, Akira; Kazama, Nobuyuki; and Ishida, Masao, to Teikoku Piston Ring Co., Ltd. Method of manufacturing a side rail of a combined oil ring. 5,469,616, Cl. 29-888.074.

Miyazaki, Shunzo: *See*—
Shinomiya, Tsutomu; Miyazaki, Shunzo; Tanaka, Yasuyuki; Tsukada, Shinichi; and Tamura, Michiya, 5,470,429, Cl. 156-510.000.

Miyazawa, Kenichi: *See*—
Wakui, Yukio; Nishitani, Yoshiki; and Miyazawa, Kenichi, 5,470,636, Cl. 428-141.000.

Mizobuchi, Tsukasa: *See*—
Uenishi, Masamoto; Mizobuchi, Tsukasa; Takesue, Masatoshi; Kobayashi, Yukio; and Nagai, Shoichi, 5,470,616, Cl. 427-515.000.

Mizuguchi, Hitoshi: *See*—
Kitagawa, Toshiyuki; Nagai, Hideharu; Kawamura, Junkichi; and Mizuguchi, Hitoshi, 5,469,962, Cl. 206-723.000.

Mizuguchi, Katsuhiko; Teshima, Shin'ichi; and Hanyu, Tsuneo, to Toyo Boseki Kabushiki Kaisha. Composition for determination of chloride ion. 5,470,715, Cl. 435-22.000.

Mizuguchi, Katsumi: *See*—
Imamura, Tsuyoshi; Mizuguchi, Katsumi; Shibai, Yasuhiro; Ishii, Keizou; Ishikura, Shinichi; and Saito, Koichi, 5,470,539, Cl. 422-136.000.

Mizui, Naomitsu: *See*—
Nomura, Shigeki; Komatsubara, Nozomi; Mizui, Naomitsu; Kunishige, Kazutoshi; and Fukagawa, Tomoki, 5,470,529, Cl. 420-103.000.

Moake, Gordon, to Halliburton Company. Apparatus and method for measuring a borehole. 5,469,736, Cl. 73-151.000.

Mobil Oil Corporation: *See*—
Coolbaugh, Thomas S.; Loveless, Frederick C.; and Matthews, Demetreos N., 5,470,914, Cl. 525-66.000.
Degnan, Thomas F.; Fung, Anthony S.; Hatzikos, George H.; Kennedy, Gordon J.; and Kowalski, Jocelyn A., 5,470,810, Cl. 502-64.000.
Djabbarah, Nizar F.; and Sprunt, Eve S., 5,470,749, Cl. 436-38.000.
Mink, Robert I.; and Nowlin, Thomas E., 5,470,812, Cl. 502-125.000.
Wenzel, Richard A.; Sable, Lewis E.; Krutchen, Charles M.; and Williams, Phillip A., 5,470,521, Cl. 264-321.000.

Mobin, Mohammad S.: *See*—
Blaker, David M.; Ellard, Gregory S.; and Mobin, Mohammad S., 5,471,500, Cl. 375-340.000.

Mochizuki, Yuji; Chiba, Yoshie; Takada, Toshikazu; and Usui, Akira, to NEC Corporation. Method for epitaxial growth of semiconductor crystal by using halogenide. 5,469,806, Cl. 117-97.000.

Mockett, Albert P. A.: *See*—
Sondermeijer, Paulus J. A.; Claessens, Johannes A. J.; and Mockett, Albert P. A., 5,470,734, Cl. 424-229.100.

Modell Environmental Corporation: *See*—
Modell, Michael; Hauptmann, Edward G.; and Gairns, Stuart A., 5,470,481, Cl. 210-652.000.

Modell, Michael; Hauptmann, Edward G.; and Gairns, Stuart A., to Modell Environmental Corporation. Method and apparatus for recovering wash water from pulp and paper mill effluent. 5,470,481, Cl. 210-652.000.

Moder, Kenneth P.: *See*—
McCauley, Mary K.; Moder, Kenneth P.; and Speakman, Jeffrey L., 5,470,865, Cl. 514-365.000.

Modrak, James P., to Hercules Incorporated. High loft and high strength nonwoven fabric. 5,470,640, Cl. 428-171.000.

Moeller, Frank: *See*—
Bamford, Joseph C.; and Moeller, Frank, 5,470,190, Cl. 414-686.000.

Moeller, Henry M.: *See*—
Martensen, Lars; Hansen, Ove T.; Moeller, Henry M.; and Jepsen, Hardy, 5,469,776, Cl. 92-170.100.

Moerschel, Kenenth G.: *See*—
Chiu, Tzu-Yin; Erceg, Frank M.; Liu, Te-Yin M.; Moerschel, Kenenth G.; Prozonic, Michael A.; and Sung, Janmye, 5,470,783, Cl. 437-72.000.

Moffett, Robert H.: *See*—
Rushmere, John D.; and Moffett, Robert H., 5,470,435, Cl. 162-181.600.

Moghaddassi, Majid: *See*—
Nielsen, Arne; Moghaddassi, Majid; Vishnepolsky, Boris; and Smith, Keith, 5,470,030, Cl. 242-533.800.

Moh, Sungwon: *See*—
Lee, Young W.; Moh, Sungwon; and Muller, Arno, 5,471,608, Cl. 395-550.000.

Mohansingh, Timothy: *See*—
French, Barry J.; Ferguson, Kevin R.; McDonald, Halley A., III; Glass, Andrew B.; Mohansingh, Timothy; and Borges, Gregory, 5,469,740, Cl. 73-379.040.

Mohn, Frank-Werner: *See*—
Zomotor, Adam; Klinkner, Walter; Schindler, Erich; Mohn, Frank-Werner; and Wohland, Thomas, 5,471,388, Cl. 364-424.050.

Moi, Si S.: *See*—
Buechler, Kenneth F.; Noar, Joseph B.; and Moi, Si S., 5,470,997, Cl. 558-254.000.

Mokhtar, Ahmed M.; Popper, Peter; and Walker, Wiliam C., to Du Pont de Nemours, E. I., and Company. Method and apparatus for making a pile article and the products thereof. 5,470,629, Cl. 428-85.000.

Moldovan, Mark R: *See*—
Dougherty, John D.; Moldovan, Mark R; Otto, Dennis L.; and Varonis, Orestes J., 5,470,157, Cl. 384-448.000.

Molex Incorporated: *See*—
Sano, Minoru, 5,470,251, Cl. 439-489.000.

Molinero, Anthony A.: *See*—
Kingston, David G. I.; Molinero, Anthony A.; and Gunatilaka, A. A. Leslie, 5,470,866, Cl. 514-376.000.

Moll, Hermann: *See*—
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Grosser, Martin; Schneider, Peter; Barth, Wolfgang; Moll, Hermann; and Pollmann, Horst, 5,469,938, Cl. 187-408.000.

Moll, Hurley C., Jr.: *See*—
McCleerey, Earl W.; Moll, Hurley C., Jr.; Landis, John M.; and Douty, George H., 5,470,255, Cl. 439-500.000.

Molter, Trent M.; and Critz, Kurt M., to United Technologies Corporation. High performance electrolytic cell electrode/membrane structures and a process for preparing such electrode structures. 5,470,448, Cl. 204-252.000.

Molvi, Ikbal A.: *See*—
Corcoran, John; Molvi, Ikbal A.; Hower, Joseph W.; and Moseley, William A., 5,470,176, Cl. 404-72.000.

Monash Medical Centre: *See*—
De Kretser, David M.; Burger, Henry G.; Hearn, Milton T. W.; Milne-Robertson, David M.; Wettenhall, Richard E. H.; McLachlan, Robert I.; and De Vos, Fiona, 5,470,826, Cl. 514-8.000.

Monash University: *See*—
De Kretser, David M.; Burger, Henry G.; Hearn, Milton T. W.; Milne-Robertson, David M.; Wettenhall, Richard E. H.; McLachlan, Robert I.; and De Vos, Fiona, 5,470,826, Cl. 514-8.000.

Money, Louis W.: *See*—
Rodarmer, Kenneth W.; and Money, Louis W., 5,469,875, Cl. 134-63.000.

Mongon, John M.; Twesme, Edward N.; and Weiss, Peggy A., to Amoco Corporation. Solar cell module package and method for its preparation. 5,470,396, Cl. 136-251.000.

Monsanto Company: *See*—
Alexander, Gregory C.; Jason, Mark E.; and Kalota, Dennis J., 5,470,942, Cl. 528-328.000.
Hauf, Barry W.; Jones, Stephen K.; Johnson, Joseph E., Jr.; and Paquin, Roger L., 5,469,993, Cl. 222-383.300.

Monta, Hiroki; and Matsuura, Ryuji, to Matsushita Electric Industrial Co., Ltd. Scan converting apparatus for transferring subtitles on a screen. 5,471,249, Cl. 348-445.000.

Montagnier, Luc: *See*—
Hovanessian, Ara G.; Rey, Marie-Anne; Laurent, Anne G.; Krust, Bernard; and Montagnier, Luc, 5,470,702, Cl. 435-5.000.

Montell North America Inc.: *See*—

Syed, Abuzar, 5,470,898, Cl. 524-84.000.
Mooberry, Jared B.: *See*—
Texter, John; Welter, Thomas R.; Southby, David T.; and Mooberry, Jared B., 5,470,688, Cl. 430-203.000.
Mooberry, Randall L.: *See*—
Hill, John H.; Mooberry, Randall L.; and Schartman, Daniel J., 5,469,943, Cl. 188-264.00F.
Moon, Dae G.: *See*—
Ahn, Byung T.; Moon, Dae G.; and Lee, Jeong N., 5,470,619, Cl. 427-578.000.
Moon, Jong D.: *See*—
Shin, Chang J.; and Moon, Jong D., 5,470,214, Cl. 418-63.000.
Moore, David J.: *See*—
Cecil, Christopher R., 5,470,602, Cl. 426-481.000.
Moore, Paul A.; and Cusdin, Anthony R., to U.S. Philips Corporation. Cascaded amplifier having temperature compensation. 5,471,173, Cl. 330-256.000.
Moore, Robert A.: *See*—
El Shami, A. Said; Hand, Christopher W.; Miller, Susan A.; and Moore, Robert A., 5,470,713, Cl. 435-7.720.
Moorehead, Jack: *See*—
Maung, Michael; and Moorehead, Jack, 5,470,465, Cl. 210-205.000.
Moori, Hitoshi: *See*—
Katayama, Yoshio; Fujii, Seiichi; Uchiyama, Sadao; Soejima, Ryouichi; Moori, Hitoshi; and Yoshida, Hideo, 5,471,439, Cl. 369-13.000.
Moorman, Stephen E., to Georgia-Pacific Corporation. Pallet constructed of sheet material. 5,469,795, Cl. 108-51.300.
Moran, Thomas P.; Chiu, Patrick; and Van Melle, William, to Xerox Corporation. Apparatus and method for altering enclosure selections in a gesture based input system. 5,471,578, Cl. 395-161.000.
Mordue, George S.: *See*—
Gilbert, Ronald E.; Mordue, George S.; and Vild, Chris T., 5,470,201, Cl. 415-200.000.
Morel, Kitty: *See*—
Howe, Wayne; Silver, Ed; Bailey, Kim; Shih, Jerry; Morel, Kitty; Hill, Peter; Addison, Cathy; Woodring, Larry; and Malik, Dale, 5,471,519, Cl. 379-67.000.
Moreland, Margaret: *See*—
Brandley, Brian K.; Tiemeyer, Michael; Swiedler, Stuart J.; Moreland, Margaret; and Schweingruber, Hans, 5,470,842, Cl. 514-61.000.
Morello, Frederick, to M.I.C. Industries, Inc. Arched roof vertical wall self supporting metal building constructions. 5,469,674, Cl. 52-86.000.
Morena, Robert, to Corning Incorporated. Mill additions for sealing glasses. 5,470,804, Cl. 501-15.000.
Morgan, Donald F.: *See*—
Bredeweg, Robert; Blanchard, Russell O.; Morgan, Donald F.; and Dooley, Edward J., 5,469,995, Cl. 223-85.000.
Mori, Fumihiko: *See*—
Yasunobu, Chizuko; Mori, Fumihiko; Yamada, Hiroshi; Yasunobu, Seiji; and Someya, Ryuko, 5,471,559, Cl. 395-61.000.
Mori, Masukazu; Yamanaka, Hiroyoshi; Kubota, Norio; and Shimokawa, Naoki, to Matsushita Electric Industrial Co., Ltd. Blower blade assembly having counterbalancers. 5,470,203, Cl. 416-144.000.
Mori, Taisuke: *See*—
Akasaka, Toru; and Mori, Taisuke, 5,471,407, Cl. 364-559.000.
Mori, Takashi: *See*—
Yasuda, Yukio; Yamaguchi, Akiyasu; Igarashi, Tatsushi; Oonishi, Yasuo; Kai, Kenzo; Sugihara, Masanori; Mori, Takashi; and Miyaji, Akira, 5,471,278, Cl. 355-67.000.
Morigami, Yuusuke; Matsuo, Hirokazu; Tanahashi, Hirofumi; Hirano, Yoshihito; Nagato, Hiroyasu; and Ishikawa, Takuma, to Minolta Camera Kabushiki Kaisha. Automatic document feeder. 5,470,051, Cl. 271-7.000.
Morikawa, Yusuke: *See*—
Shibata, Kouichi; Morikawa, Yusuke; and Ohmi, Ikuhiro, 5,471,562, Cl. 395-101.000.
Morioka, Craig A.: *See*—
Huang, Han; Morioka, Craig A.; Ratib, Osman; Cho, Paul N. S.; Ho, Bruce K. T.; Sonobe, Takeo; and Shinagawa, Toru, 5,471,606, Cl. 395-500.000.
Morita, Hirofumi: *See*—
Amatsu, Keiji; Butoh, Zenhachiroh; Hirai, Hiroshi; Massaki, Minoru; Morita, Hirofumi; Nakajima, Takeo; Nomura, Nobuo; Sakaki, Mikio; Schmandt, Stephen J.; and Tanaka, Katsuhiro, 5,471,615, Cl. 395-200.030.
Morita, Katsuaki: *See*—
Tanii, Yoshiyuki; Nakamura, Motokazu; Nagayama, Yoshikatsu; Morita, Katsuaki; Hibino, Hiroki; and Suzuki, Akira, 5,469,840, Cl. 600-117.000.
Morita, Mitsuaki: *See*—
Enoki, Nobuyuki; Miyazaki, Masaya; and Morita, Mitsuaki, 5,471,624, Cl. 395-750.000.
Moriya, Kazuo, to Mitsui Minings & Melting Co., Ltd. Method and apparatus for measuring size of particle or defect. 5,471,298, Cl. 356-336.000.
Morosawa, Kenji: *See*—
Sasaki, Michiyuki; Suzuki, Kenji; Morosawa, Kenji; Ohba, Toshimitsu; and Kadonaga, Tooru, 5,471,203, Cl. 340-825.310.
Morris, Charles F.: *See*—
Meng, Shi-Yuan; Morris, Charles F.; and Tsai, Larry B., 5,470,719, Cl. 435-69.100.
Morris, Thomas W.: *See*—
van der Leeuw, Bart; Canale, Joseph E.; Kowal, Albert E.; Pragt, Henrikus J. H.; and Morris, Thomas W., 5,471,110, Cl. 313-25.000.
Morrison, John L., Jr.: *See*—
Marts, Donna J.; Richardson, John G.; Albano, Richard K.; and Morrison, John L., Jr., 5,470,043, Cl. 251-65.000.
Morton International, Inc.: *See*—
Elqadah, Wael S.; and Harris, Bradley D., 5,470,097, Cl. 280-728.300.
Kolin, Kevin S.; and Siegmann, Anthony J., 5,470,995, Cl. 556-91.000.
Rose, Larry D.; Lauritzen, Donald R.; Ravenberg, Mike J.; Thompson, Mark A.; Green, David J.; and Davis, Terry R., 5,470,105, Cl. 280-740.000.
Smith, Bradley W.; Rasmussen, Kirk; and Allard, John E., 5,470,102, Cl. 280-728.200.
Smith, Bradley W.; and Rink, Karl K., 5,470,104, Cl. 280-737.000.
Szigethy, Attila; Jenkins, Brian C.; and Folsom, Marc D., 5,470,098, Cl. 280-728.200.
Morweiser, Karl-Heinz; Veeser, Klaus; and Stini, Harald, to Firma Carl Freudenberg. Electrostatically-effective air filter material. 5,470,485, Cl. 210-748.000.
Moseley, William A.: *See*—
Corcoran, John; Molvi, Ikbal A.; Hower, Joseph W.; and Moseley, William A., 5,470,176, Cl. 404-72.000.
Mosler, Inc.: *See*—
Koenig, Donald E., 5,469,796, Cl. 109-49.500.
Mosquera, Rene A., to ITT Industries. Low profile edge connector. 5,470,246, Cl. 439-260.000.
Moss, Gerald. Surgical fastener. 5,470,337, Cl. 606-139.000.
Motomura, Hiroharu; Takasaki, Soichi; and Kinoshita, Kenji, to Mitsubishi Steel Mfg. Co., Ltd. Low decarburization spring steel. 5,470,528, Cl. 420-84.000.
Motorola: *See*—
Felix, Kenneth A., 5,471,645, Cl. 455-34.200.
Motorola, Inc.: *See*—
Bockelman, David E.; and Weisman, Douglas H., 5,471,010, Cl. 174-35.000.
Chang, Ko-Min; Shum, Danny P.; and Chang, Kuo-Tung, 5,471,422, Cl. 365-185.260.
Davis, Walter L., 5,471,663, Cl. 455-296.000.
Freeburg, Thomas A.; Burke, Dennis E.; and Odlyzko, Paul, 5,471,471, Cl. 370-79.000.
Gardeck, Kevin; Green, David A.; and Cutts, Kevin, 5,471,532, Cl. 380-21.000.
Gordecki, Ryszard J.; and Tan, Kian T., 5,469,982, Cl. 220-4.020.
Greer, Stuart E., 5,470,787, Cl. 437-183.000.
Hess, Garry C.; Leung, Barry S.; and Wilson, Timothy J., 5,471,670, Cl. 455-33.200.
Hickernell, Thomas S., 5,471,178, Cl. 333-193.000.
Krayeski, Paul D.; Marko, Paul D.; and Patsiokas, Stelios J., 5,471,146, Cl. 324-637.000.
L'Hermite, François; and Turchi, Joel, 5,471,167, Cl. 327-538.000.
McRoberts, Louis A.; and Borden, Donald E., 5,471,479, Cl. 371-10.300.
Mussemann, Gary A.; Circello, Joseph C.; and Gay, James G., 5,471,625, Cl. 395-750.000.
Pace, Gary L.; and Hughes, James D., 5,471,665, Cl. 455-343.000.
Patino, Joseph; Bogut, Henry A.; and Tidwell, James L., 5,471,128, Cl. 320-13.000.
Petty, Thomas D.; Stockstad, Troy L.; and Vyne, Robert L., 5,471,174, Cl. 330-257.000.
Rees, Idris J. M.; and Pickersgill, Phillip, 5,471,649, Cl. 455-67.400.
Schatz, Steven V.; Richie, Thomas W.; Menich, Barry J.; Bonta, Jeffrey D.; and Akinniyi, Akingbade, 5,471,644, Cl. 455-33.200.
Schultz, Charles P., 5,471,646, Cl. 455-54.100.
Wang, Zhonghe; and Johnson, Brian K. A., 5,471,671, Cl. 455-226.200.
Mott, Justin: *See*—
Laybourne, John R.; and Mott, Justin, 5,470,511, Cl. 261-55.000.
Mott, Philip J.: *See*—
Ledvina, Timothy J.; and Mott, Philip J., 5,470,282, Cl. 474-156.000.
Mottram, Toby T. F.: *See*—
Street, Michael J.; and Mottram, Toby T. F., 5,469,808, Cl. 119-27.000.
Mountain Safety Research: *See*—
Forrest, William E., 5,469,643, Cl. 36-122.000.
Movva, Nageswararao: *See*—
Buell, Gary N.; and Movva, Nageswararao, 5,470,721, Cl. 435-69.700.
Moy, Deirdre L.; and Moy, Kelly A. Small animal recovery collar. 5,469,814, Cl. 119-815.000.
Moy, Kelly A.: *See*—
Moy, Deirdre L.; and Moy, Kelly A., 5,469,814, Cl. 119-815.000.
Moyaert, Werner: *See*—
Embo, Georges; Debrouwere, Tom; and Moyaert, Werner, 5,470,261, Cl. 439-752.000.
Moyers, J. Clifton; Nutt, Ronald; and Jones, William F., to CTI Pet Systems, Inc. Method and apparatus for transmission measurements to form a 2-d or a 3-d image in tomography applications. 5,471,061, Cl. 259-363.030.
MPHusky Corporation: *See*—
Looney, James Q., 5,470,021, Cl. 248-49.000.
MTI International, Inc.: *See*—
Ranganath, Krishnappa; and Kurnia, Alexander, 5,471,117, Cl. 315-247.000.
Ranganath, Krishnappa; and Kurnia, Alexander, 5,471,119, Cl. 315-307.000.

MTU Motoren- Und Turbinen-Union Muenchen GmbH: *See*—
Krueger, Wolfgang; and Wei, William, 5,470,524, Cl. 419-5.000.

Mueller Company: *See*—
Mack, Donald F.; Logman, Timothy M.; Bouc, Gary L.; and Greenlee, Larry W., 5,470,046, Cl. 251-329.000.

Mueller, Mark D.; and McClellan, John C., to Union Oil Company of California. Downhole tube turning tool. 5,469,925, Cl. 175-61.000.

Mueller, Rolf: *See*—
Reibetanz, Wilbert; Baumann, Otto; Mueller, Rolf; and Ruckh, Bernd, 5,470,084, Cl. 279-19.300.

Mullaney, Henry: *See*—
Brommer, Karl; Mullaney, Henry; Meade, Robert; Rappe, Andrew; and Joannopoulos, John, 5,471,180, Cl. 333-202.000.

Muller, Arno: *See*—
Lee, Young W.; Moh, Sungwon; and Muller, Arno, 5,471,608, Cl. 395-550.000.

Müller, Hanns P.: *See*—
Jansen, Bernhard; Grönen, Jürgen; and Müller, Hanns P., 5,470,523, Cl. 264-328.600.

Müller, Klaus: *See*—
Ansorge, Wolfgang; Hornscheidt, Ralf; Jungheim, Andreas; and Müller, Klaus, 5,470,474, Cl. 210-500.230.

Müller, Manfred: *See*—
Meixner, Jürgen; Fischer, Wolfgang; and Müller, Manfred, 5,470,897, Cl. 523-518.000.

Multi-Tech Systems, Inc.: *See*—
Sharma, Raghu; Davis, Jeffrey P.; Gunn, Timothy D.; Li, Ping; Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, 5,471,470, Cl. 370-81.000.

Munier, Jean-Marie; Pauporte, Andre; and Poiraud, Clement, to International Business Machines Corporation. Elastic configurable buffer for buffering asynchronous data. 5,471,581, Cl. 395-250.000.

Muñoz, Jose C., to McGuire Nicholas Company, Inc. Support, carrier belt system. 5,470,000, Cl. 224-224.000.

Müntener, Herbert; and Walser, Michael, to Etablissement Supervis. Energy absorbing steering column mounting. 5,470,107, Cl. 280-777.000.

Muraishi, Masayuki, to Nakajima All Precision Co., Ltd. Character data compressing method and character modifying method. 5,471,676, Cl. 395-110.000.

Murakami, Shuji; Wada, Tomohisa; and Anami, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Circuit for repairing defective bit in semiconductor memory device and repairing method. 5,471,427, Cl. 365-200.000.

Murakami, Tadayoshi; and Takahashi, Hideo, to Hamamatsu Photonics K.K. Semiconductor light-receiving device with graded layer. 5,471,076, Cl. 257-184.000.

Murakawa, Takaji; Yagi, Toyoji; and Tashiro, Hiroshi, to Nippondenso Co., Ltd. Control mechanism for an electric generator motor in an internal combustion engine. 5,469,816, Cl. 123-2.000.

Muramatsu, Akira: *See*—
Kudoh, Kazuhiro; Muramatsu, Akira; and Ishiguro, Tetsumi, 5,471,204, Cl. 340-825.440.

Muramatsu, Toshiro: *See*—
Fukuhara, Hiroshige; Kamishima, Hiroyuki; and Muramatsu, Toshiro, 5,471,215, Cl. 342-70.000.

Murano, Minori: *See*—
Oguchi, Toshihiko; Takeuchi, Hajime; and Murano, Minori, 5,470,645, Cl. 428-212.000.

Muraoka, Toshinori: *See*—
Asakawa, Yoshiyuki; Yamamura, Kazuyoshi; Muraoka, Toshinori; and Hatano, Masaru, 5,470,052, Cl. 271-118.000.

Murase, Masanori: *See*—
Ashiya, Seiji; Suzuki, Takahiro; and Murase, Masanori, 5,470,682, Cl. 430-84.000.

Murase, Yoshihiko: *See*—
Sawada, Shuichi; Imagawa, Katsuhiko; and Murase, Yoshihiko, 5,469,769, Cl. 84-193.000.

Muraski, Paul J.: *See*—
Farrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., 5,471,617, Cl. 395-700.000.

Murata, Daisuke, to Canon Kabushiki Kaisha. Recording apparatus with reduced memory capacity requirement. 5,471,322, Cl. 358-502.000.

Murata, Daisuke: *See*—
Fujii, Haruo; Kobayashi, Tatsuya; Imai, Nobuhiro; Kojima, Hisayoshi; Umezawa, Masao; Tada, Hideki; Ito, Akira; Seto, Kaoru; Katoh, Motoi; and Murata, Daisuke, 5,471,284, Cl. 355-210.000.

Murata, Matsue: *See*—
Negami, Shoichi; Hikami, Toshiya; Nishikawa, Shigeaki; and Murata, Matsue, 5,471,545, Cl. 385-1.000.

Murou, Lionel: *See*—
Lauga, Olivier; Revol, Nicolas; and Murou, Lionel, 5,469,936, Cl. 187-205.000.

Muroyama, Masakazu, to Sony Corporation. Method for forming an interlayer film. 5,470,800, Cl. 437-238.000.

Murphy, Betty J.: *See*—
Smith, James A.; and Murphy, Betty J., 5,470,323, Cl. 604-289.000.

Murphy, Gregory E.: *See*—
Staats, Louis T., III; Bristow, James A.; Noronha, Anil P. F.; and Murphy, Gregory E., 5,470,487, Cl. 210-767.000.

Murphy, Thomas J.: *See*—
Walthall, Ben J.; Caple, Matthew V.; and Murphy, Thomas J., 5,470,151, Cl. 366-165.100.

Murray, James A.; Nees, Michael R.; Imrie, William P.; Rayner, Christopher C.; Pfalzgraff, Chris L.; Bates, Robert K.; Neas, Valmer H.; and Cox, Terrance J., to Bechtel Group, Inc. Electrode cap with integral tank cover for acid mist collection. 5,470,445, Cl. 204-105.00R.

Murthy, Ashok: *See*—
Janes, Todd L.; Meade, Alexander D.; Murthy, Ashok; Sharma, Pramod K.; and Wallin, Peter E., 5,471,291, Cl. 355-326.00R.

Mussemann, Gary A.; Circello, Joseph C.; and Gay, James G., to Motorola, Inc. Method and apparatus for entering a low-power mode and controlling an external bus of a data processing system during low-power mode. 5,471,625, Cl. 395-750.000.

Mussi, Edward F.; and Gray, Harry E., to Becton, Dickinson and Company. Transmembrane cell culture device. 5,470,743, Cl. 435-297.100.

Mutou, Shigeo: *See*—
Shindo, Isao; Mutou, Shigeo; Terayama, Takao; Okayama, Masao; and Kai, Susumu, 5,470,533, Cl. 422-63.000.

Mutschler, Jan: *See*—
Klepper, Stephan; Frank, Kurt; and Mutschler, Jan, 5,469,829, Cl. 123-514.000.

Mydill, Marc R., to Texas Instruments Incorporated. Calibrating transition dependent timing errors in automatic test equipment using a precise pulse width generator. 5,471,145, Cl. 324-601.000.

Myers, Alan M.; Charvat, Peter K.; Letson, Thomas A.; Yang, Shi-ning; and Bai, Peng, to Intel Corporation. Via hole profile and method of fabrication. 5,470,790, Cl. 437-192.000.

N.I. Medical Ltd.: *See*—
Tsoglin, Alexander; and Frinerman, Yafim, 5,469,859, Cl. 128-723.000.

N.K. Biotechnical Engineering Company: *See*—
Kovacevic, Nebojsa, 5,469,862, Cl. 128-782.000.

Na, George C.; and Rajagopalan, Natarajan, to Eastman Kodak Company. Method of preparing nanoparticle compositions containing charged phospholipids to reduce aggregation. 5,470,583, Cl. 424-489.000.

Nadeau, James G.: *See*—
Walker, George T.; Nadeau, James G.; Spears, Patricia A.; Nycz, Colleen M.; Shank, Daryl D.; Schram, James L.; and Jurgensen, Stewart R., 5,470,723, Cl. 435-91.200.

NADEX Co., Ltd.: *See*—
Kawai, Shingo, 5,471,028, Cl. 219-110.000.

Nagahara, Junnichi: *See*—
Oba, Haruo; and Nagahara, Junnichi, 5,471,009, Cl. 84-645.000.

Nagai, Hideharu: *See*—
Kitagawa, Toshiyuki; Nagai, Hideharu; Kawamura, Junkichi; and Mizuguchi, Hitoshi, 5,469,962, Cl. 206-723.000.

Nagai, Michio, to NEC Corporation. Portable radio apparatus and mount structure therefor. 5,471,653, Cl. 455-90.000.

Nagai, Shoichi: *See*—
Uenishi, Masamoto; Mizobuchi, Tsukasa; Takesue, Masatoshi; Kobayashi, Yukio; and Nagai, Shoichi, 5,470,616, Cl. 427-515.000.

Nagai, Tomoaki: *See*—
Satake, Toshimi; Takano, Toshiyuki; Hayasaka, Hideki; Uehori, Yukiko; and Nagai, Tomoaki, 5,470,816, Cl. 503-201.000.

Nagai, Yasuhiko: *See*—
Tanaka, Yasuhiro; Nagai, Yasuhiko; Suzuki, Michio; Kagei, Takashi; Shinnai, Kohsuke; Ikeba, Goro; and Saito, Masato, 5,471,399, Cl. 364-491.000.

Nagai, Yasutaka: *See*—
Nakamura, Hisashi; Nagai, Yasutaka; and Hiki, Susumu, 5,469,852, Cl. 128-662.060.

Nagamura, Takashi; Yamamoto, Takao; and Tomita, Shinji, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Ultra-high purity nitrogen generator. 5,470,543, Cl. 422-211.000.

Nagasaka, Mitsuru: *See*—
Fujiwara, Shinji; Shintani, Yoichi; and Nagasaka, Mitsuru, 5,471,580, Cl. 395-200.020.

Nagasawa, Makoto: *See*—
Yamaguchi, Mitsuo; Ohgo, Kenjiro; and Nagasawa, Makoto, 5,469,780, Cl. 99-450.700.

Nagasawa, Yuko: *See*—
Ninomiya, Hidetaka; Nagasawa, Yuko; and Asano, Kazuo, 5,470,985, Cl. 548-312.400.

Nagase, Takayuki; Yoshida, Yasuhiko; Hasegawa, Makoto; and Tani, Arata, to Bando Chemical Industries, Ltd. Charging member having a surface layer formed of moisture-permeable synthetic resin material and charging device including the same. 5,471,285, Cl. 355-219.000.

Nagase, Tetsuya: *See*—
Hayashi, Toshio; Arimoto, Shinobu; Yoshinaga, Kazuo; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,471,281, Cl. 155-201.000.

Nagase, Tomohiro: *See*—
Nishii, Masanobu; Shimizu, Yuichi; Kawanishi, Shunichi; Sugimoto, Shunichi; Endo, Masao; and Nagase, Tomohiro, 5,470,617, Cl. 427-521.000.

Nagase, Toshio: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; and Yano, Mitsuo, 5,470,833, Cl. 514-18.000.

Nagashima, Nobuyoshi: *See*—
Nakajima, Mutsumi; Nagashima, Nobuyoshi; and Tanaka, Kyoushi, 5,471,329, Cl. 359-54.000.

Nagata, Toshiyuki; Yoshida, Hiroyuki; and Niuya, Takayuki, to Texas Instruments Incorporated. Method of fabricating random access memory device having sidewall insulating layer on the laminate structure. 5,470,777, Cl. 437-52.000.

Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, to Texas Instruments Incorporated. Method of manufacturing a semiconductor device. 5,470,778, Cl. 437-52.000.

Nagata, Yoshihiko: *See*—
Kashida, Meguru; Shirasaki, Toru; Hamada, Yuichi; Nagata, Yoshihiko; Kawaguchi, Sakae; and Kubota, Yoshihiro, 5,470,621, Cl. 428-14.000.

Nagata, Yuji: *See*—
Imai, Tooru; Matsumoto, Satoru; Okazaki, Kiyoshi; and Nagata, Yuji, 5,469,719, Cl. 68-12.040.

Nagato, Hiroyasu: *See*—
Morigami, Yuusuke; Matsuo, Hirokazu; Tanahashi, Hirofumi; Hirano, Yoshihito; Nagato, Hiroyasu; and Ishikawa, Takuma, 5,470,051, Cl. 271-7.000.

Nagatomo, Akihiro; Yoshida, Hiroshi; Nishiyama, Masaki; and Oshima, Seiichi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor power module. 5,471,089, Cl. 257-691.000.

Nagayama, Masato; Imuyama, Seiji; Sawada, Kenji; Ohshita, Makoto; and Harada, Fumiaki, to Fujitsu Limited. Image forming apparatus. 5,471,290, Cl. 355-309.000.

Nagayama, Yoshikatsu: *See*—
Tanii, Yoshiyuki; Nakamura, Motokazu; Nagayama, Yoshikatsu; Morita, Katsuaki; Hibino, Hiroki; and Suzuki, Akira, 5,469,840, Cl. 600-117.000.

Nagler, Franz: *See*—
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.

Nagura, Toshikazu: *See*—
Nakamura, Yoshinori; Sam, Huy; Fujiwara, Yoshio; Nagura, Toshikazu; Hayasi, Shigeo; and Kusaka, Yukio, 5,470,817, Cl. 503-227.000.

Nahir, Tal M.: *See*—
Williams, Joel L.; Nahir, Tal M.; and Qiu, Yong-Jian, 5,470,677, Cl. 429-190.000.

Nair, Xina; and Tramposch, Kenneth M., to Bristol Myers Squibb Company. Synergistic skin depigmentation composition. 5,470,567, Cl. 424-59.000.

Naito, Takao: *See*—
Onaka, Hiroshi; Miyata, Hideyuki; and Naito, Takao, 5,471,336, Cl. 359-191.000.

Naka, Takahiro: *See*—
Hosono, Satoru; Naka, Takahiro; Yonekubo, Shuji; and Shinada, Satoshi, 5,471,232, Cl. 347-70.000.

Naka, Yuji; and Yamamoto, Masanobu, to Sega of America, Inc. Multi-player video game apparatus with single screen mode and split screen mode. 5,470,080, Cl. 273-437.000.

Nakada, Akira; Yoneya, Akira; Kobayashi, Noriyuki; Katayanagi, Mamoru; Kawashima, Trutomu; and Yoshida, Hiroshi, to Nisso Engineering Co., Ltd. Method for purification of etching solution. 5,470,421, Cl. 156-642.100.

Nakae, Mitsugu, to Idemitsu Petrochemical Co., Ltd. Polycarbonate copolymer. 5,470,939, Cl. 528-201.000.

Nakagawa, Hideo: *See*—
Nishimura, Kunio; Nakagawa, Hideo; and Takahashi, Nobuo, 5,470,106, Cl. 280-743.100.

Nakagawa, Kazuo; Iritani, Yuichi; Yamazaki, Hiromi; and Takakuwa, Yasushi, to Nikkiso Co., Ltd. Anesthesia monitor. 5,471,058, Cl. 250-291.000.

Nakagawa, Kiyoshi: *See*—
Masuda, Hiroji; Aida, Kazuo; and Nakagawa, Kiyoshi, 5,471,334, Cl. 359-177.000.

Nakagawa, Shuuichi, to Fujitsu Limited. Subscriber system testing method. 5,471,517, Cl. 379-29.000.

Nakai, Junichi, to Sharp Kabushiki Kaisha. Solid state imaging device having partition wall for partitioning bottom portions of micro lenses and manufacturing method therefor. 5,470,760, Cl. 437-2.000.

Nakai, Takehiko: *See*—
Hayashi, Toshio; Arimoto, Shinobu; Yoshinaga, Kazuo; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,471,281, Cl. 155-201.000.

Nakajima All Precision Co., Ltd.: *See*—
Muraishi, Masayuki, 5,471,676, Cl. 395-110.000.

Nakajima, Masahiro: *See*—
Otaki, Hiroshi; and Nakajima, Masahiro, 5,471,250, Cl. 348-498.000.

Nakajima, Masatoshi: *See*—
Matsumura, Teruyuki; and Nakajima, Masatoshi, 5,471,394, Cl. 364-474.260.

Nakajima, Mutsumi; Nagashima, Nobuyoshi; and Tanaka, Kyoushi, to Sharp Kabushiki Kaisha. Active matrix type liquid crystal display panel and a method for producing the same, having a construction capable of preventing breakdown of the switching elements or deterioration due to static electricity. 5,471,329, Cl. 359-54.000.

Nakajima, Takeo: *See*—
Amatsu, Keiji; Butoh, Zenhachiroh; Hirai, Hiroshi; Masaki, Minoru; Morita, Hirofumi; Nakajima, Takeo; Nomura, Nobuo; Sakaki, Mikio; Schmandt, Stephen J.; and Tanaka, Katsuhiro, 5,471,615, Cl. 395-100.000.

Nakajima, Tsutomu: *See*—
Katano, Yasuo; Nakajima, Tsutomu; Kaneko, Yoshikazu; and Horiguchi, Hiroyuki, 5,471,234, Cl. 347-171.000.

Nakamori, Toshinori: *See*—
Shibuta, Takekazu; Nakamori, Toshinori; and Hirai, Ikuhito, 5,469,717, Cl. 66-69.000.

Nakamori, Yukari: *See*—
Sakamoto, Jun; Yoshida, Minoru; Aoyama, Masatoshi; Suzuki, Masaru; Nakamori, Yukari; Okazaki, Iwao; and Abe, Koichi, 5,470,637, Cl. 428-143.000.

Nakamoto, Takahiro; and Yagi, Tetsuya, to Mitsubishi Denki Kabushiki Kaisha. Method of making field effect transistor. 5,470,767, Cl. 437-39.000.

Nakamoto, Takashi, to NEC Corporation. Address generating circuit using a base pointer of loop area. 5,471,600, Cl. 395-405.000.

Nakamura, Hiroyuki; Hama, Yoshinori; Arikita, Shuhei; and Ikeshita, Shingo, to Kao Corporation. Method for production of magnetic metal particles and apparatus therefor. 5,470,374, Cl. 75-348.000.

Nakamura, Hisashi; Nagai, Yasutaka; and Hiki, Susumu, to Kabushiki Kaisha Toshiba. Ultrasound diagnosis apparatus and probe therefor. 5,469,852, Cl. 128-662.060.

Nakamura, Kazuhito: *See*—
Satoh, Minoru; and Nakamura, Kazuhito, 5,471,289, Cl. 355-290.000.

Nakamura, Motokazu: *See*—
Tanii, Yoshiyuki; Nakamura, Motokazu; Nagayama, Yoshikatsu; Morita, Katsuaki; Hibino, Hiroki; and Suzuki, Akira, 5,469,840, Cl. 600-117.000.

Nakamura, Shinji; and Kuriyama, Choujirou, to Rohm Co., Ltd. Solid electrolytic capacitor and its manufacturing method. 5,471,365, Cl. 361-523.000.

Nakamura, Shouji: *See*—
Kimura, Shinji; Sugita, Yumiko; Nakamura, Shouji; and Koda, Eriko, 5,471,579, Cl. 395-163.000.

Nakamura, Takao; Inada, Hiroshi; and Iiyama, Michitomo, to Sumitomo Electric Industries, Ltd. Superconducting device having an extremely short superconducting channel formed of extremely thin oxide superconductor film. 5,471,069, Cl. 257-39.000.

Nakamura, Teruya: *See*—
Yamamoto, Katsuhiko; Sagawa, Hiroaki; Kotani, Hirokazu; Hiraoka, Nobutsugu; and Nakamura, Teruya, 5,470,732, Cl. 435-196.000

Nakamura, Yoshinori; Sam, Huy; Fujiwara, Yoshio; Nagura, Toshikazu; Hayasi, Shigeo; and Kusaka, Yukio, to Sony Corporation; and New Ojil Paper Co., Ltd. Printing sheet and manufacturing method therefor. 5,470,817, Cl. 503-227.000.

Nakamura, Yoshinori; Sam, Huy; and Fujiwara, Yoshio, to Sony Corporation. Printing sheet comprising a dye receiving layer made of an isocyanate group-containing polymer. 5,470,818, Cl. 503-227.000.

Nakanishi, Tutomu: *See*—
Nomura, Koji; Nakanishi, Tutomu; Kotani, Tokumi; and Kuramasu, Keizaburo, 5,471,060, Cl. 250-338.300.

Nakano, Kenji, to Furukawa Denchi Kabushiki Kaisha. Lead-acid storage battery containing pocket-type electrode assembly. 5,470,676, Cl. 429-139.000.

Nakano, Seiji: *See*—
Fujita, Akihiro; Nakano, Seiji; and Ishii, Katsushi, 5,471,008, Cl. 84-633.000.

Nakashima, Motohiro; and Otake, Shinichi, to Aishin AW Co., Ltd. Electromobile. 5,471,384, Cl. 364-424.010.

Nakashima, Taisuke: *See*—
Okamoto, Masaya; Kuze, Shigeki; Kunishi, Noriyuki; and Nakashima, Taisuke, 5,470,937, Cl. 528-198.000.

Nakatani, Kazuo: *See*—
Yoshida, Yuji; Funakura, Masami; Nakatani, Kazuo; and Tagashira, Minoru, 5,470,496, Cl. 252-67.000.

Nalbandian, Vahakn; and Lee, Choon S., to United States of America, Army. Dual-frequency microstrip antenna with inserted strips. 5,471,221, Cl. 343-700.0MS.

Nanba, Tomiyuki: *See*—
Tanaka, Hiroshi; Kobayashi, Toshiaki; Nanba, Tomiyuki; Ishiwatari, Masaaki; Yoneyama, Toshio; Ohno, Kimio; Matsumoto, Takashi; Kanbe, Tetsuya; Isa, Takashi; and Ogusu, Yoshiyuki, 5,470,563, Cl. 424-448.000.

Nanninga, Thomas N.: *See*—
Butler, Donald E.; Le, Tung V.; and Nanninga, Thomas N., 5,470,981, Cl. 546-207.000.

Naoumidis, Aristides, to Forschungszentrum Julich GmbH. Fuel cells and process for the production of the anode. 5,470,672, Cl. 429-40.000.

Napolitano, Leonard M., Jr. Lambda network having 2^{m-1} nodes in each of m stages with each node coupled to four other nodes for bidirectional routing of data packets between nodes. 5,471,623, Cl. 395-200.030.

Narayan, Chandrasekhar: *See*—
Deutsch, Alina; Lewis, David A.; Narayan, Chandrasekhar; and Plachy, Anthony L., 5,471,090, Cl. 257-734.000.

Narayanan, Kolazi S.; Chaudhuri, Ratan K.; Login, Robert B.; and Fusiak, Frank, to ISP Investments Inc. Aqueous oil removal composition containing higher-alkyl pyrrolidone. 5,470,508, Cl. 252-542.000.

Nariani, Subhash R., to VLSI Technology, Inc. Method of forming a polysilicon-on-silicide capacitor. 5,470,775, Cl. 437-52.000.
Narishige, Shinji: *See*—
Tadokoro, Shigeru; Narishige, Shinji; Koyanagi, Hiroaki; and Kobayashi, Tetsuo, 5,471,358, Cl. 360-113.000.
Narita, Fujiaki. Golf score display device. 5,471,191, Cl. 340-323.00R.
Narita, Kazuyuki: *See*—
Ochi, Koji; Narita, Kazuyuki; Matsuda, Kazunori; and Asano, Nobukazu, 5,470,406, Cl. 149-35.000.
Nash Engineering Company, The: *See*—
Glenn, John K., Jr., 5,469,705, Cl. 60-693.000.
Nass, Rüdiger: *See*—
Spanhel, Lubomir; Arpac, Ertugrul; Nass, Rüdiger; and Schmidt, Helmut, 5,470,910, Cl. 524-785.000.
Nathan, Olivier M.: *See*—
Michel, Georges L.; and Nathan, Olivier M., 5,470,394, Cl. 134-25.400.
National Coupling Inc.: *See*—
Smith, Robert E., III, 5,469,887, Cl. 137-614.040.
National Jewish Center for Immunology and Respiratory Medicine: *See*—
Kirkpatrick, Charles H.; and Rozzo, Stephen J., 5,470,835, Cl. 514-21.000.
Leung, Donald; Schlievert, Patrick; Meissner, Cody; and Fulton, David, 5,470,716, Cl. 435-34.000.
National Research Council of Canada: *See*—
Burtnyk, Nestor; and Greenspan, Michael A., 5,471,541, Cl. 382-153.000.
National Scientific Company: *See*—
Siegel, Barney, 5,470,537, Cl. 422-104.000.
National Semiconductor Corporation: *See*—
Azmanov, Ziv, 5,471,416, Cl. 365-104.000.
Bhargava, Vivek; Jue, Andrew; Van Scherrenburg, Michael A.; and Wilson, Les J., 5,471,248, Cl. 348-420.000.
Chiu, Kwok-Fu; and Sauer, Don R., 5,471,172, Cl. 330-253.000.
Chiu, Kwok-Fu; and Sauer, Don R., 5,471,175, Cl. 330-298.000.
Hansen, Jens; Madsen, Benny; and Petersen, Jens T., 5,471,187, Cl. 340-146.200.
Khan, Emdadur R., 5,471,381, Cl. 364-148.000.
Kuo, James R., 5,471,498, Cl. 375-295.000.
National Trackwork, Inc.: *See*—
Sargis, Isaac, 5,470,035, Cl. 246-221.000.
Nayak, Umesh P.: *See*—
Snyder, Thomas S.; Peterson, Steven H.; and Nayak, Umesh P., 5,470,479, Cl. 210-635.000.
NEC Corporation: *See*—
Akaike, Toshihiro; Tobe, Seishiro; Miyamoto, Shigeyuki; and Ohashi, Akio, 5,470,739, Cl. 435-240.243.
Fujii, Masahiro, 5,471,103, Cl. 310-81.000.
Hamada, Koji, 5,470,763, Cl. 437-21.000.
Ishizeki, Yoshiaki, 5,471,502, Cl. 375-376.000.
Kimura, Katsuji, 5,471,166, Cl. 327-351.000.
Kudoh, Kazuhiro; Muramatsu, Akira; and Ishiguro, Tetsumi, 5,471,204, Cl. 340-825.440.
Kunitou, Masao, 5,470,774, Cl. 437-45.000.
Maruyama, Takao, 5,471,349, Cl. 360-46.000.
Mochizuki, Yuji; Chiba, Yoshie; Takada, Toshikazu; and Usui, Akira, 5,469,806, Cl. 117-97.000.
Nagai, Michio, 5,471,653, Cl. 455-90.000.
Nakamoto, Takashi, 5,471,600, Cl. 395-405.000.
Satoh, Minoru; and Nakamura, Kazuhito, 5,471,289, Cl. 355-290.000.
Shiragaki, Tatsuya; Shiozawa, Takahiro; Suzuki, Syuji; and Fujiwara, Masahiko, 5,471,332, Cl. 359-117.000.
Shishiguchi, Seiichi, 5,470,780, Cl. 437-60.000.
Tanabe, Senichi, 5,471,460, Cl. 370-16.000.
Tanigawa, Takaho, 5,471,418, Cl. 365-149.000.
Tejima, Shunichiro, 5,471,473, Cl. 370-85.700.
Tsuji, Masayoshi; and Makita, Kikuo, 5,471,068, Cl. 257-21.000.
Yamada, Hiroyasu, 5,471,667, Cl. 455-351.000.
Yamada, Yoshiaki, 5,470,792, Cl. 437-155.000.
Yoshida, Kazuyoshi, 5,470,426, Cl. 156-345.000.
NEC Electronics Inc.: *See*—
Williams, Stephen R., 5,471,635, Cl. 395-800.000.
Nederlandse Organisatie voor toegepastwetenschappelijk onderzoek TNO: *See*—
Vijg, Jan; and Gossen, Jan A., 5,470,706, Cl. 435-6.000.
Needham, Anthony H.: *See*—
Ripley, Ian; and Needham, Anthony H., 5,470,458, Cl. 208-370.000.
Nees, Michael R.: *See*—
Murray, James A.; Nees, Michael R.; Imrie, William P.; Rayner, Christopher C.; Pfalzgraff, Chris L.; Bates, Robert K.; Ness, Valmer H.; and Cox, Terrance J., 5,470,445, Cl. 204-105.00R.
Negami, Shoichi; Hikami, Toshiya; Nishikawa, Shigeaki; and Murata, Matsue, to Furukawa Electric Co., Ltd., The. Optical external modulator for optical telecommunications. 5,471,545, Cl. 385-1.000.
Negi, Yasuharu: *See*—
Niigaki, Minoru; Kinoshita, Katsuyuki; Hirohata, Toru; Ihara, Tuneo; Yamada, Masami; Asakura, Norio; Negi, Yasuharu; and Suzuki, Tomoko, 5,471,051, Cl. 250-214.0VT.
Nellcor Incorporated: *See*—
DeLonzor, Russell; and Middleman, Lee, 5,469,845, Cl. 128-633.000.
Nelson Brothers, Inc.: *See*—
Griffith, George L.; and Vance, Ricky T., 5,470,407, Cl. 149-109.600.
Nelson, John M.; and Willis, Ray D., to Tuboscope Vetco International, Inc. Plastic coating thread and coupling assembly. 5,470,111, Cl. 285-55.000.
Nelson, Thomas J., to Ralph Wilson Plastics Company. Furniture edge construction. 5,469,685, Cl. 52-782.200.
Nemer, Joseph C.: *See*—
Birangi, Tourang; and Nemer, Joseph C., 5,471,505, Cl. 375-238.000.
Nemoto, Hiroyuki: *See*—
Miura, Takaharu; Nemoto, Hiroyuki; Ito, Masataka; Kobayashi, Masafumi; and Tanaka, Chieko, 5,470,652, Cl. 428-328.000.
Nemoto, Mamoru. Canister purge control method and apparatus for internal combustion engine. 5,469,832, Cl. 123-682.000.
Neoh, Soon E., to Chartered Semiconductor Manufacturing Pte LTD. Apparatus and method for spreading resist on a wafer and detecting bubbles in the resist. 5,470,604, Cl. 427-8.000.
Nesbitt, R. Dennis; and Sullivan, Michael J., to Lisco, Inc. Golf ball. 5,470,075, Cl. 273-220.000.
Nesbitt, R. Dennis: *See*—
Sullivan, Michael J.; and Nesbitt, R. Dennis, 5,470,058, Cl. 273-65.00B.
Neshan, Hamid: *See*—
Beard, Hoyt S.; Conrad, Lucas J.; Crook, J. Edward; Lovette, James E.; Johnson, Robert C.; Newton, Donald A.; and Neshan, Hamid, 5,469,872, Cl. 131-291.000.
Neslund, Gerald G.: *See*—
Griffith, Michael J.; Neslund, Gerald G.; and Liu, Shu-Len, 5,470,954, Cl. 530-383.000.
Ness, Valmer H.: *See*—
Murray, James A.; Nees, Michael R.; Imrie, William P.; Rayner, Christopher C.; Pfalzgraff, Chris L.; Bates, Robert K.; Ness, Valmer H.; and Cox, Terrance J., 5,470,445, Cl. 204-105.00R.
Nestec S.A.: *See*—
Larsen, Hans K., 5,470,210, Cl. 417-477.700.
Nesterov, Vladimir G.: *See*—
Sundberg, Staffan; Sergeev, Vilaly E.; and Nesterov, Vladimir G., 5,470,166, Cl. 403-314.000.
Nesti, Frances D.: *See*—
Fuhrman, Bradley P.; Flaim, Stephen F.; Herman, Lynn J.; Nesti, Frances D.; Papo, Michele C.; and Steinhorn, David M., 5,470,885, Cl. 514-743.000.
Neu-Gene Development Group: *See*—
Summerton, James; Weller, Dwight; and Stirchak, Eugene, 5,470,974, Cl. 544-118.000.
Neubauer, Heinz; Hirschberg, Jakub; and Strandberg, Hans, to Pacesetter AB. Device for stimulating living tissue. 5,470,348, Cl. 607-68.000.
Neulinger, Franz: *See*—
Dönig, Gerhard; Hümpfner, Roland; Grass, Norbert; Knaak, Hans-Joachim; Neulinger, Franz; and Schummer, Helmut, 5,471,377, Cl. 363-21.000.
Neumann, Klaus: *See*—
Sitte, Hellmuth; Neumann, Klaus; Edelmann, Ludwig; Haessig, Helmut; Lang, Anton; and Kleber, Heinrich, 5,469,712, Cl. 62-51.100.
Neumann, Rainer: *See*—
Schwalm, Dieter; and Neumann, Rainer, 5,470,113, Cl. 285-255.000.
New England Medical Center Hospital, Inc.: *See*—
Leung, Donald; Schlievert, Patrick; Meissner, Cody; and Fulton, David, 5,470,716, Cl. 435-34.000.
New Ojil Paper Co., Ltd.: *See*—
Nakamura, Yoshinori; Sam, Huy; Fujiwara, Yoshio; Nagura, Toshikazu; Hayasi, Shigeo; and Kusaka, Yukio, 5,470,817, Cl. 503-227.000.
Newham, Paul. Device for monitoring the presence of a person using a reflective energy beam. 5,471,198, Cl. 340-573.000.
Newkirk, David D.: *See*—
Gessner, Scott L.; Newkirk, David D.; Thomason, Michael M.; and Reeder, James O., 5,470,639, Cl. 428-152.000.
Newman, Stephen: *See*—
Beck, Anthony L.; Wallis, Julian M.; Attwood, Martin D.; and Newman, Stephen, 5,470,699, Cl. 430-621.000.
Newton, Donald A.: *See*—
Beard, Hoyt S.; Conrad, Lucas J.; Crook, J. Edward; Lovette, James E.; Johnson, Robert C.; Newton, Donald A.; and Neshan, Hamid, 5,469,872, Cl. 131-291.000.
Neyer, Gebhard: *See*—
Burd, John F.; Hoblitzell, Talei; and Neyer, Gebhard, 5,470,752, Cl. 436-87.000.
NF. T&M. Systems, Inc.: *See*—
Watanabe, Asao, 5,471,054, Cl. 250-231.130.
Ng, William W.: *See*—
Tsai, Fu-Sheng; and Ng, William W., 5,471,376, Cl. 363-20.000.
Ng, Yee S.; and Tai, Hwai-Tzuu, to Eastman Kodak Company. Mixed screen frequencies with image segmentation. 5,471,543, Cl. 382-173.000.
NGK Insulators, Ltd.: *See*—
Takizawa, Kuniharu; Kikuchi, Hiroshi; Osugi, Yukihisa; and Tange, Shoji, 5,471,331, Cl. 359-67.000.
Nguyen, Dien V. Video/audio electronic device control signal source selection switch. 5,471,253, Cl. 348-734.000.
Nguyen, Phuong H. Clutch actuation system. 5,469,946, Cl. 192-3.580.
Nguyen, Tuan Q.: *See*—
Wright, Glenn A.; Fritz, Philip F.; and Nguyen, Tuan Q., 5,470,022, Cl. 241-33.000.
Nicholas, Edward D.: *See*—

Thomas, Wayne M.; Nicholas, Edward D.; Jones, Stephen B.; Lilley, Roger H.; Dawes, Christopher J.; and Dolby, Richard E., 5,469,617, Cl. 29-889.210.

Nichols, Mark: *See—*
Talbot, Nicholas C.; and Nichols, Mark, 5,471,218, Cl. 342-357.000.

Nichols, Steven B., to K-Swiss Inc. Quick adjusting shoe lacing system. 5,469,640, Cl. 36-50.100.

Nicholson, Jamie; and McEachern, Alexander, to Basic Measuring Instruments, Inc. Waveform library for characterizing an AC power line spectrum. 5,471,401, Cl. 364-483.000.

Nicoli, Robert: *See—*
Caveney, Jack E.; and Nicoli, Robert, 5,469,893, Cl. 138-162.000.

Nidek Co., Ltd.: *See—*
Sumiya, Toshifumi, 5,470,329, Cl. 606-4.000.

Niedziela, Jan: *See—*
Kiedik, Maciej; Krueger, Andrzej; Kołt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Wladyslad, 5,470,809, Cl. 502-12.000.

Nielsen, Arne; Moghaddassi, Majid; Vishnepolsky, Boris; and Smith, Keith, to Guilford Mills, Inc. Fabric take-up frame for a textile fabric producing machine. 5,470,030, Cl. 242-533.800.

Nielsen, Erik: *See—*
Foged, Christian; Holweg, Rolf; and Nielsen, Erik, 5,470,850, Cl. 514-213.000.

Nielson, Daniel B.; and Lester, Dean M., to Thiokol Corporation. Use of carbon fibrils to enhance burn rate of pyrotechnics and gas generants. 5,470,408, Cl. 149-109.600.

Nieuwendijk, Joris A. M.; Bax, Johannes W. T.; Oepkes, Cornelis J.; Roelofs, Henricus H.; and Van Den Thillart, Martinus P. M., to U.S. Philips Corporation. Audio or video apparatus with a built-in loudspeaker. 5,471,018, Cl. 181-152.000.

Nihon Tensaiseito Kabushiki Kaisha: *See—*
Terasawa, Hidekazu; Tanimura, Masashi; and Ito, Sumio, 5,470,434, Cl. 162-117.000.

Nii, Koji; and Maeno, Hideshi, to Mitsubishi Denki Kabushiki Kaisha. Memory cell array semiconductor integrated circuit device. 5,471,420, Cl. 365-182.000.

Niigaki, Minoru; Kinoshita, Katsuyuki; Hirohata, Toru; Ihara, Tuneo; Yamada, Masami; Asakura, Norio; Negi, Yasuharu; and Suzuki, Tomoko, to Hamamatsu Photonics K.K. Photocathode capable of detecting position of incident light in one or two dimensions, phototube, and photodetecting apparatus containing same. 5,471,051, Cl. 250-214.0VT.

Niikura, Junji: *See—*
Gamou, Takaharu; Taniguchi, Noboru; Niikura, Junji; Hatoh, Kazuhito; Yasumoto, Eiichi; and Adachi, Kinichi, 5,469,913, Cl. 165-104.120.
Yasumoto, Eiichi; Niikura, Junji; Hatoh, Kazuhito; and Gamo, Takaharu, 5,470,670, Cl. 429-20.000.

Niimura, Koichi; Kawabe, Takako; Ando, Takao; and Saito, Kenichi, to Kureha Chemical Industry Co., Ltd. Phenylalanine-glycine derivatives, process for preparation thereof, and pharmaceutical composition containing said derivatives. 5,470,960, Cl. 536-6.400.

Niiyama, Kenji: *See—*
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; and Yano, Mitsuo, 5,470,833, Cl. 514-18.000.

Nikkiso Co., Ltd.: *See—*
Nakagawa, Kazuo; Iritani, Yuichi; Yamazaki, Hiromi; and Takakuwa, Yasushi, 5,471,058, Cl. 250-291.000.

Nikon Corporation: *See—*
Goto, Tetsuro; and Miura, Kosho, 5,471,267, Cl. 354-106.000.
Hagiwara, Tsuneyuki, 5,471,066, Cl. 250-559.480.

Nilssen, Ole K. Electronic ballast with power-factor-correcting pre-converter. 5,471,118, Cl. 315-247.000.

Nilsson, Börje: *See—*
Tupov, Vladimir; Nilsson, Patrick; and Nilsson, Börje, 5,470,200, Cl. 415-195.000.

Nilsson, Patrick: *See—*
Tupov, Vladimir; Nilsson, Patrick; and Nilsson, Börje, 5,470,200, Cl. 415-195.000.

Nilstam, Bo: *See—*
Ericsson, Lars P.; and Nilstam, Bo, 5,469,703, Cl. 60-399.000.

Nimishakavi, Hanumanthrao; and Swami, Ravi, to Zilog, Inc. Technique and circuit for providing two or more processors with time multiplexed access to a shared system resource. 5,471,588, Cl. 395-293.000.

Ninomiya, Hidetaka; Nagasawa, Yuko; and Asano, Kazuo, to Konica Corporation. Metal complex compound. 5,470,985, Cl. 548-312.400.

Ninomiya, Yuichi: *See—*
Suetsugi, Keisuke; Kanno, Hiroshi; Sugawara, Masayuki; Mitani, Kohji; Fujita, Yoshihiro; Saitoh, Toshinori; and Ninomiya, Yuichi, 5,471,323, Cl. 358-511.000.

Nipkow, Andre; and Bakker, Eric, to Mettler-Toledo AG. Reference electrode with ion barrier for electrochemical measuring systems. 5,470,453, Cl. 204-435.000.

Nippon Conlux Co., Ltd.: *See—*
Takada, Masayuki; Yamada, Osamu; Kuroda, Toru; Yamazaki, Koichi; and Noda, Kazuo, 5,471,424, Cl. 365-189.010.

Nippon Hoso Kyokai: *See—*
Suetsugi, Keisuke; Kanno, Hiroshi; Sugawara, Masayuki; Mitani, Kohji; Fujita, Yoshihiro; Saitoh, Toshinori; and Ninomiya, Yuichi, 5,471,323, Cl. 358-511.000.
Takada, Masayuki; Yamada, Osamu; Kuroda, Toru; Yamazaki, Koichi; and Noda, Kazuo, 5,471,424, Cl. 365-189.010.
Tokumaru, Haruki; Maruyama, Koichi; and Wakamiya, Syunitirou, 5,471,456, Cl. 369-112.000.

Nippon Hōsō Kyōkai: *See—*
Takizawa, Kuniharu; Kikuchi, Hiroshi; Osugi, Yukihisa; and Tange, Shoji, 5,471,331, Cl. 359-67.000.

Nippon Kayaku Kabushiki Kaisha: *See—*
Noji, Minoru; Kunugise, Akira; and Imai, Yumiko, 5,470,512, Cl. 264-4.100.

Nippon Oil Company, Limited: *See—*
Takashima, Hiroaki; Kato, Osamu; and Kihara, Tsutomu, 5,470,558, Cl. 423-447.600.

Nippon Paint Co., Ltd.: *See—*
Imamura, Tsuyoshi; Mizuguchi, Katsumi; Shibai, Yasuhiro; Ishii, Keizou; Ishikura, Shinichi; and Saito, Koichi, 5,470,539, Cl. 422-136.000.

Nippon Paper Industries Co., Ltd.: *See—*
Satake, Toshimi; Takano, Toshiyuki; Hayasaka, Hideki; Uehori, Yukiko; and Nagai, Tomoaki, 5,470,816, Cl. 503-201.000.

Nippon Petrochmicals Company, Limited: *See—*
Saito, Masao; and Yamanaka, Hideo, 5,470,216, Cl. 425-72.100.

Nippon Shokubai Co., Ltd.: *See—*
Toba, Taketo; Takei, Kazuo; Matsunaga, Toshiaki; Ikeuchi, Hiroyuki; and Tamura, Fumihide, 5,470,930, Cl. 526-204.000.

Nippon Soken, Inc.: *See—*
Ohara, Fumio; Hattori, Tadashi; Ito, Nobuei; Hattori, Yutaka; and Arai, Masumi, 5,470,618, Cl. 427-529.000.

Nippon Steel Corporation: *See—*
Iwasa, Shoichi, 5,471,423, Cl. 365-185.010.
Yoshinaga, Naoki; Ushioda, Kohsaku; Akisue, Osamu; and Nishimura, Kunio, 5,470,403, Cl. 148-330.000.

Nippon Telegraph and Telephone Corporation: *See—*
Kondo, Yasuhiro, 5,470,785, Cl. 437-129.000.
Masaki, Takashi; Yanagi, Shigenori; and Yamamoto, Manabu, 5,471,451, Cl. 369-71.000.
Masuda, Hiroji; Aida, Kazuo; and Nakagawa, Kiyoshi, 5,471,334, Cl. 359-177.000.

Nippondenso Co., Ltd.: *See—*
Fujii, Tetsuo; Sakai, Minekazu; and Kuroyanagi, Akira, 5,470,771, Cl. 437-43.000.
Kanamori, Junichiro; and Matsumura, Masafumi, 5,469,924, Cl. 173-176.000.
Murakawa, Takaji; Yagi, Toyoji; and Tashiro, Hiroshi, 5,469,816, Cl. 123-2.000.
Suzuki, Yasutoshi; Ao, Kenichi; Uenoyama, Hirofumi; Noguchi, Hiroki; Eguchi, Koji; Ito, Ichiro; and Yoshino, Yoshimi, 5,471,084, Cl. 257-421.000.
Takahashi, Shigeki; Kataoka, Mitsuhiro; and Yamamoto, Tsuyoshi, 5,470,770, Cl. 437-41.000.

Niro A/S: *See—*
Liborius, Erik, 5,470,387, Cl. 118-303.000.

Nish, Terry E., to Servi-Tech Inc. Stabilization of cans with a smaller footprint on a can elevating platform of automatic beverage filling machinery. 5,469,899, Cl. 141-275.000.

Nishibori, Kazuhiko: *See—*
Nishima, Osamu; Suzuki, Tomoyuki; and Nishibori, Kazuhiko, 5,471,246, Cl. 348-322.000.

Nishida, Masaaki: *See—*
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Kasuya, Satoru; Sugiura, Nobutada; and Nishida, Masaaki, 5,470,284, Cl. 475-204.000.

Nishida, Yasuo: *See—*
Ise, Koichi; Nishida, Yasuo; and Yasuda, Akio, 5,471,339, Cl. 359-275.000.

Nishii, Hisao: *See—*
Suzuki, Kenshi; Shibatani, Kazuhiro; and Nishii, Hisao, 5,471,385, Cl. 364-424.020.

Nishii, Kota; Kimura, Kouichi; Ishizuka, Masanobu; and Adachi, Katsura, to Fujitsu Limited. Polyamide resin composition and housing for electronic equipment. 5,470,909, Cl. 524-538.000.

Nishii, Masanobu; Shimizu, Yuichi; Kawanishi, Shunichi; Sugimoto, Shunichi; Endo, Masao; and Nagase, Tomohiro, to Kurashishiki Boseki Kabushiki Kaisha. Process for modifying the surfaces of the molded materials made of fluorine resins. 5,470,617, Cl. 427-521.000.

Nishikawa, Shigeaki: *See—*
Negami, Shoichi; Hikami, Toshiya; Nishikawa, Shigeaki; and Murata, Matsue, 5,471,545, Cl. 385-1.000.

Nishikawa, Yukinobu; Hashizume, Yoshinori; and Kimura, Takako, to Teisan Kabushiki Kaisha; and L'Air Liquide Societe Anonyme Pour L'Etude et L'Exploitation Des Procedes Georges Claude. Mixed gas supply system with a backup supply system. 5,470,390, Cl. 118-719.000.

Nishima, Osamu; Suzuki, Tomoyuki; and Nishibori, Kazuhiko, to Sony Corporation. Apparatus for determining charge/voltage conversion ratios in charge coupled devices. 5,471,246, Cl. 348-322.000.

Nishimoto, Ikuo; and Tanaka, Minoru, to Yamatake-Honeywell Co., Ltd. Photoelectric conversion method and apparatus thereof. 5,471,050, Cl. 250-214.00A.

Nishimura, Kunio; Nakagawa, Hideo; and Takahashi, Nobuo, to Teijin Limited. Air bag having a high burst strength. 5,470,106, Cl. 280-743.100.

Nishimura, Kunio: *See—*

Yoshinaga, Naoki; Ushioda, Kohsaku; Akisue, Osamu; and Nishimura, Kunio, 5,470,403, Cl. 148-330.000.

Nishimura, Ryutaro, to Kiyohara, Masako. Block valve with tank chamber. 5,469,885, Cl. 137-568.000.

Nishimura, Tadashi: *See*—
Ipposhi, Takashi; and Nishimura, Tadashi, 5,471,086, Cl. 257-417.000.

Nishimura, Yutaka: *See*—
Minowa, Toshimichi; Kimura, Hiroshi; Yboshida, Yoshiyuki; Ohyama, Yoshishige; and Nishimura, Yutaka, 5,470,290, Cl. 477-115.000.

Nishino, Kazuaki; Awano, Yoji; Takamiya, Hiroyuki; Ito, Mitsufumi; Suzuki, Masami; and Genma, Yoshikazu, to Toyota Jidosha Kabushiki Kaisha; and Kabushiki Kaisha Toyota Chuo Kenkyusho, Ferritic heat-resistant cast steel and process for producing the same. 5,470,402, Cl. 148-325.000.

Nishioka, Tadashi: *See*—
Yasue, Takao; and Nishioka, Tadashi, 5,469,733, Cl. 73-105.000.

Nishitani, Yoshiki: *See*—
Wakui, Yukio; Nishitani, Yoshiki; and Miyazawa, Kenichi, 5,470,636, Cl. 428-141.000.

Nishiyama, Masaki: *See*—
Nagatomo, Akihiro; Yoshida, Hiroshi; Nishiyama, Masaki; and Oshima, Seiichi, 5,471,089, Cl. 257-691.000.

Nishizawa, Juinchi; Kijima, Takahiko; Ezell, Edward F.; and Makihara, Akira, to Osaka Sanso Kogyo Ltd. Method of cleaning the reflector mirror in an optical dew point meter and an optical dew point meter equipped with a cleaning device. 5,470,154, Cl. 374-141.000.

Nissan Motor Co., Ltd.: *See*—
Fukuhara, Hiroshige; Kamishima, Hiroyuki; and Muramatsu, Toshiro, 5,471,215, Cl. 342-70.000.
Sasaki, Hiroki, 5,471,390, Cl. 364-424.050.

Nissei Kabushiki Kaisha: *See*—
Andou, Sadamasa, 5,470,382, Cl. 106-124.000.

Niuso Engineering Co., Ltd.: *See*—
Nakada, Akira; Yoneya, Akira; Kobayashi, Noriyuki; Katayanagi, Mamoru; Kawashima, Tsutomu; and Yoshida, Hiroshi, 5,470,421, Cl. 156-642.100.

Nitsch, Ernst: *See*—
Förster, Harald; Asskali, Fatima; and Nitsch, Ernst, 5,470,841, Cl. 514-60.000.

Nitta, Jun, to Canon Kabushiki Kaisha. Semiconductor optical amplifier device and a method of using the same. 5,471,335, Cl. 359-179.000.

Niuya, Takayuki: *See*—
Nagata, Toshiyuki; Yoshida, Hiroyuki; and Niuya, Takayuki, 5,470,777, Cl. 437-52.000.
Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, 5,470,778, Cl. 437-52.000.

Niwano, Kazuhito: *See*—
Ikeda, Tatsuhiko; and Niwano, Kazuhito, 5,471,083, Cl. 257-370.000.

Noar, Joseph B.: *See*—
Buechler, Kenneth F.; Noar, Joseph B.; and Moi, Si S., 5,470,997, Cl. 558-254.000.

Noda, Kazuo: *See*—
Takada, Masayuki; Yamada, Osamu; Kuroda, Toru; Yamazaki, Koichi; and Noda, Kazuo, 5,471,424, Cl. 365-189.010.

Noda, Shinya: *See*—
Shirai, Hiroyuki; Sekine, Kazumi; Tsuda, Tadayuki; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shoji, Takeo; Noda, Shinya; Kobayashi, Kazunori; and Adachi, Hiroyuki, 5,470,635, Cl. 428-131.000.

NOF Corporation: *See*—
Ochi, Koji; Narita, Kazuyuki; Matsuda, Kazunori; and Asano, Nobukazu, 5,470,406, Cl. 149-35.000.

Nogami, Yuji: *See*—
Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,469,752, Cl. 73-866.000.

Nogawa, Makoto; and Fujimoto, Satoshi, to Kabushiki Kaisha Komatsu Seisakusho. Controlling screw speed to injection compression molding machine. 5,470,513, Cl. 264-40.100.

Noguchi, Hiroki: *See*—
Suzuki, Yasutoshi; Ao, Kenichi; Uenoyama, Hirofumi; Noguchi, Hiroki; Eguchi, Koji; Ito, Ichiro; and Yoshino, Yoshimi, 5,471,084, Cl. 257-421.000.

Noise Cancellation Technologies, Inc.: *See*—
Curtis, Alan R. D.; and Joseph, James E., 5,471,106, Cl. 310-90.500.

Noji, Minoru; Kunugise, Akira; and Imai, Yumiko, to Nippon Kayaku Kabushiki Kaisha. Process for producing microcapsules. 5,470,512, Cl. 264-4.100.

Nokia-Maillefer Holding S.A.: *See*—
Parri, Mauri; and Heino, Markku, 5,470,192, Cl. 414-741.000.

Nokia Mobile Phones Ltd.: *See*—
Hulkko, Jaakko, 5,471,652, Cl. 455-76.000.
Kivari, Raimo, 5,471,655, Cl. 455-127.000.

Nokihara, Kiyoshi; and Yamamoto, Rintaro, to Shimadzu Corporation. Method for peptide C-terminal fragment sequence analysis and apparatus for collecting peptide fragment. 5,470,703, Cl. 435-4.000.

Nolan, Brian J.; Mahaffey, Glenn L.; and Svoboda, John M., Sr., to Americore Technologies, Inc. Methods and apparatus for cutting circular slots in pavement extending about manhole castings. 5,470,131, Cl. 299-41.100.

Nolan, James F.: *See*—
Foote, James B.; Kaake, Steven A. F.; Meyers, Peter V.; and Nolan, James F., 5,470,397, Cl. 136-260.000.

Nolte, Werner. Cleaning tool. 5,469,594, Cl. 15-121.000.

Nomura, Ichiro; Banno, Yoshikazu; Kaneko, Tetsuya; Takeda, Toshihiko; and Iwai, Kumi, to Canon Kabushiki Kaisha. Multi-electron source, image-forming device using multi-electron source, and methods for preparing them. 5,470,265, Cl. 445-24.000.

Nomura, Katsuyoshi, to Paramount Bed Company Limited. Bottom structure for a bed. 5,469,591, Cl. 5-613.000.

Nomura, Koji; Nakanishi, Tutomu; Kotani, Tokumi; and Kuramasu, Keizaburo, to Matsushita Electric Industrial Co., Ltd. Pyroelectric infrared radiation detector and method of producing the same. 5,471,060, Cl. 250-338.300.

Nomura, Nobuo: *See*—
Amatsu, Keiji; Butoh, Zenhachiroh; Hirai, Hiroshi; Massaki, Minoru; Morita, Hirofumi; Nakajima, Takeo; Nomura, Nobuo; Sakaki, Mikio; Schmandt, Stephen J.; and Tanaka, Katsuhiro, 5,471,615, Cl. 395-200.030.

Nomura, Shigeki; Komatsubara, Nozomi; Mizui, Naomitsu; Kunishige, Kazutoshi; and Fukagawa, Tomoki, to Sumitomo Metal Industries, Ltd. High tensile strength steel sheet having improved formability. 5,470,529, Cl. 420-103.000.

Nomura, Yasushi: *See*—
Imai, Kyoko; Imai, Kazumichi; and Nomura, Yasushi, 5,470,534, Cl. 422-67.000.

Nonaka, Yoshiya; Aoyagi, Yoshio; Abe, Hiroyuki; Bradshaw, Alex; Kiyoura, Kazuhiro; Kato, Seiji; and Haraguchi, Koichiro, to Pioneer Electronic Corporation. CD player capable of playing back partially recorded CD. 5,471,441, Cl. 369-32.000.

Noone, David L.; and Mitchell, Frank L., to ITT Automotive, Inc. Corrugated polymeric tubing having at least three layers with at least two respective layers composed of polymeric materials dissimilar to one another. 5,469,892, Cl. 138-121.000.

Nordell, Joakim. Cam mechanism for bending carton blanks fed from the magazine of a packaging machine. 5,469,690, Cl. 53-458.000.

Noritsu Koki Co., Ltd.: *See*—
Yamaguchi, Takuji, 5,471,274, Cl. 354-298.000.

Normaclass R.D.: *See*—
Kadi, Rachid; Leclere, Jean; and Plusa, Janusz, 5,470,274, Cl. 452-184.000.

Norman, Robert D.: *See*—
Mangan, John S.; Norman, Robert D.; Craig, Jeffrey; Albert, Richard; Gupta, Anil; Stai, Jeffrey D.; and Lofgren, Karl M. J., 5,471,478, Cl. 371-10.300.

Noronha, Anil P. F.: *See*—
Staats, Louis T., III; Bristow, James A.; Noronha, Anil P. F.; and Murphy, Gregory E., 5,470,487, Cl. 210-767.000.

Norrick, Daniel A.: *See*—
Data, Stanley E.; Koziara, Robert P.; Lent, Mark S.; O'Gorman, Patrick A.; Rose, Thomas K.; Shanks, Eugene G.; and Norrick, Daniel A., 5,469,820, Cl. 123-192.200.

Norstedt, Gunnar: *See*—
Prisell, Per; and Norstedt, Gunnar, 5,470,829, Cl. 514-12.000.

North Carolina State University: *See*—
Shekar, Mallikarjunaswamy S.; Baliga, B. Jayant; and Korec, Jacek, 5,471,075, Cl. 257-139.000.

Northeastern University: *See*—
Rappaport, Carey M., 5,470,352, Cl. 607-101.000.

Northern Telecom Limited: *See*—
Vexler, Manuel; and Emerson, Victor F., 5,471,650, Cl. 455-69.000.

Northrop Grumman Corporation: *See*—
Hall, James T.; O'Connor, Arthur B.; Raffensperger, Susan M.; and Levine, Seymour, 5,471,326, Cl. 359-15.000.
Ryan, Robert E.; and Soriano, Sal, 5,471,300, Cl. 356-345.000.

Notten, Petrus H. L.: *See*—
Einerhand, Robert E. F.; Lippits, Gerardus J. M.; Daams, Johannes L. C.; and Notten, Petrus H. L., 5,470,675, Cl. 429-101.000.

Nova Technologies, Inc.: *See*—
DiMatteo, Paul; and DiMatteo, Paul C., 5,469,588, Cl. 5-81.100.

NovAtel Communications Ltd.: *See*—
Barber, Douglas K.; and Hortensius, Stephan W., 5,471,518, Cl. 379-58.000.

Novo Nordisk A/S: *See*—
Foged, Christian; Holweg, Rolf; and Nielsen, Erik, 5,470,850, Cl. 514-213.000.

Nowlin, Linda. Check preparation method and apparatus incorporating check sum proof entry. 5,470,160, Cl. 400-105.000.

Nowlin, Thomas E.: *See*—
Mink, Robert I.; and Nowlin, Thomas E., 5,470,812, Cl. 502-125.000.

Nowokunski, Brian M.: *See*—
Lightbody, Timothy R.; Cutter, Daniel F.; and Nowokunski, Brian M., 5,471,577, Cl. 395-157.000.

Noya, Tamotsu, to Kyosan Denki Co., Ltd. Solenoid valve. 5,469,886, Cl. 137-599.000.

Nunan, Analee F., administratrix: *See*—
Nunan, Craig S., deceased, 5,471,516, Cl. 378-65.000.

Nunan, Craig S., deceased (by Analee F. Nunan, administratrix), to Varian Associates, Inc. Radiotherapy apparatus equipped with low dose localizing and portal imaging X-ray source. 5,471,516, Cl. 378-65.000.

Nunn, Michael F.: *See*—
Helting, Torsten B.; Drevin, Hakan; and Nunn, Michael F., 5,470,720, Cl. 435-69.300.

Nunomura, Shigeki: *See*—

Ogawa, Tomoya; Nunomura, Shigeki; and Sugimoto, Mamoru, 5,470,962, Cl. 536-17.200.

Nutt, Ronald: *See*—
Moyers, J. Clifton; Nutt, Ronald; and Jones, William F., 5,471,061, Cl. 259-363.030.

Nycz, Colleen M.: *See*—
Walker, George T.; Nadeau, James G.; Spears, Patricia A.; Nycz, Colleen M.; Shank, Daryl D.; Schram, James L.; and Jurgensen, Stewart R., 5,470,723, Cl. 435-91.200.

O. I. Corporation: *See*—
Jiang, Kenneth K.; and Bernard, Bernie B., 5,470,380, Cl. 96-102.000.

O'3 Callaghan, Dennis J., to Research Corporation Technologies, Inc. Equine herpesvirus type 1 glycoprotein D nucleic acids. 5,470,718, Cl. 435-69.100.

Oakley, Clyde G.: *See*—
Law, Wing K.; Ranalletta, Joseph V.; Oakley, Clyde G.; Douglas, Stephen J.; and Dieta, Dennis R., 5,469,853, Cl. 128-662.060.

Oba, Haruo; and Nagahara, Junnichi, to Sony Corporation. Sound constituting apparatus. 5,471,009, Cl. 84-645.000.

Obata, Haruyuki: *See*—
Yoshioka, Mamoru; Obata, Haruyuki; Tanoue, Ken; Iwashita, Yoshihiro; Kashiwagura, Toshimi; Suzuki, Makoto; Ichinose, Hiroki; and Okamizu, Hironori, 5,469,818, Cl. 123-90.150.

Obata, Minoru: *See*—
Yamanobe, Takashi; Satou, Michio; Ishigami, Takashi; Obata, Minoru; Kawai, Mituo; Yagi, Noriaki; Maki, Toshihiro; and Ando, Shigeru, 5,470,527, Cl. 419-53.000.

Obitsu, Noriko: *See*—
Tawaragi, Yuji; Kusano, Satoshi; Suzuki, Toshio; and Obitsu, Noriko, 5,471,446, Cl. 369-44.140.

Ochi, Hisayuki: *See*—
Suematsu, Hiroyuki; Ochi, Hisayuki; Ohno, Manabu; and Kuwashima, Tetsuhito, 5,470,686, Cl. 430-111.000.

Ochi, Koji; Narita, Kazuyuki; Matsuda, Kazunori; and Asano, Nobukazu, to NOF Corporation. Gas generator composition and process for manufacturing the same. 5,470,406, Cl. 149-35.000.

Ochs, Martin: *See*—
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.

O'Connell, Edward: *See*—
Grobicki, Christopher; Mazza, Cynthia; O'Connell, Edward; Ulm, John; and White, Gerard, 5,471,474, Cl. 370-85.200.

O'Connor, Arthur B.: *See*—
Hall, James T.; O'Connor, Arthur B.; Raffensperger, Susan M.; and Levine, Seymour, 5,471,326, Cl. 359-15.000.

O'Connor, Sean: *See*—
Voss, Darrell; Klein, Gary; O'Connor, Sean; and Pauls, Lonney, 5,470,091, Cl. 280-281.100.

Odaka, Kentaro, to Sony Corporation. Method for recording a digital audio signal on a motion picture film and a motion picture film having digital soundtracks. 5,471,263, Cl. 352-27.000.

Odashima, Satoshi; and Yoshida, Kazuyoshi, to Shin-Etsu Polymer Co., Ltd. Heat-sealable connector and method for the preparation thereof. 5,470,607, Cl. 427-96.000.

Odlyzko, Paul: *See*—
Freeburg, Thomas A.; Burke, Dennis E.; and Odlyzko, Paul, 5,471,471, Cl. 370-79.000.

Oepkes, Cornelis J.: *See*—
Nieuwendijk, Joris A. M.; Bax, Johannes W. T.; Oepkes, Cornelis J.; Roelofs, Henricus H.; and Van Den Thillart, Martinus P. M., 5,471,018, Cl. 181-152.000.

Oester, Dean A.; Hall, Allen L.; and Vesper, Stephen J., to Henkel Corporation. Mutant of *Geotrichum candidum* which produces novel enzyme system to selectively hydrolyze triglycerides. 5,470,741, Cl. 435-254.100.

Oesterling, Erwin: *See*—
Barnes, Vernon B.; Wilkinson, Donald R.; Hancock, Lloyd H.; Oesterling, Erwin; Schlisio, Siegfried; and Hinz, Werner, 5,469,871, Cl. 131-194.000.

Officina Meccanica Biancalani & C. di Biancalani Fiorenzo & C. S.N.C.: *See*—
Biancalani, Fiorenzo, 5,469,608, Cl. 26-19.000.

Ogata, Naoya: *See*—
Mayama, Shinya; Ikeda, Takeshi; Baba, Yoshinobu; and Ogata, Naoya, 5,470,687, Cl. 430-137.000.

Ogata, Seiichi; Kawaguchi, Moriyuki; Kanota, Keiji; Kubota, Yukio; Sato, Heikichi; and Abe, Iwao, to Sony Corporation. Magnetic head and a digital recording magnetic head. 5,471,355, Cl. 360-84.000.

Ogata, Yoshihiro: *See*—
Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, 5,470,778, Cl. 437-52.000.

Ogawa, Nobuo, to Fujitsu Limited. Image processing method and image processing apparatus. 5,471,319, Cl. 358-445.000.

Ogawa, Tomoya; Nunomura, Shigeki; and Sugimoto, Mamoru, to Rikagaku Kenkyusho; and Mect Corporation. Oligosialyl-1,2-dialkyl-sn-glycerols and synthetic intermediates for their preparation. 5,470,962, Cl. 536-17.200.

Ogino, Shinichi, to TOA Medical Electronics Co., Ltd. Flow imaging cytometer. 5,471,294, Cl. 356-73.000.

O'Gorman, Patrick A.: *See*—
Data, Stanley E.; Koziara, Robert P.; Lent, Mark S.; O'Gorman, Patrick A.; Rose, Thomas K.; Shanks, Eugene G.; and Norrick, Daniel A., 5,469,820, Cl. 123-192.200.

Oguchi, Takahiro; Hatanaka, Katsunori; Sakai, Kunihiro; Yamano, Akihiko; and Shido, Shunichi, to Canon Kabushiki Kaisha. Multi-probe information recording/reproducing apparatus including a probe displacement control circuit. 5,471,458, Cl. 369-126.000.

Oguchi, Toshihiko; Takeuchi, Hajime; and Murano, Minori, to Kabushiki Kaisha Toshiba; and Konica Corporation. Magnetic recording medium having two magnetic layers comprising magnetic powder and binder. 5,470,645, Cl. 428-212.000.

Ogusu, Yoshiyuki: *See*—
Tanaka, Hiroshi; Kobayashi, Toshiaki; Nanba, Tomiyuki; Ishiwatari, Masaaki; Yoneyama, Toshio; Ohno, Kimio; Matsumoto, Takashi; Kanbe, Tetsuya; Isa, Takashi; and Ogusu, Yoshiyuki, 5,470,563, Cl. 424-448.000.

Ohara, Fumio; Hattori, Tadashi; Ito, Nobuei; Hattori, Yutaka; and Arai, Masumi, to Nippon Soken, Inc. Method of making zinc-based transparent conductive film. 5,470,618, Cl. 427-529.000.

Ohashi, Akio: *See*—
Akaike, Toshihiro; Tobe, Seishiro; Miyamoto, Shigeyuki; and Ohashi, Akio, 5,470,739, Cl. 435-240.243.

Ohba, Toshimitsu: *See*—
Sasaki, Michiyuki; Suzuki, Kenji; Morosawa, Kenji; Ohba, Toshimitsu; and Kadonaga, Tooru, 5,471,203, Cl. 340-825.310.

Ohgata, Koji: *See*—
Yanai, Ken-ichi; Tanaka, Tsutomu; Ohgata, Koji; Takizawa, Yutaka; Oki, Ken-ichi; and Hirano, Takuya, 5,470,768, Cl. 437-40.000.

Ohgo, Kenjiro: *See*—
Yamaguchi, Mitsuo; Ohgo, Kenjiro; and Nagasawa, Makoto, 5,469,780, Cl. 99-450.700.

Ohlsson, Thomas: *See*—
Lundstrom, Lena; Karlsson, Peter; and Ohlsson, Thomas, 5,469,856, Cl. 128-696.000.

Ohmeda Pharmaceutical Products Division Inc.: *See*—
Lin, Bor-Sheng; Scheblein, Joseph W.; and Bagley, Jerome R., 5,470,862, Cl. 514-341.000.
Macielag, Mark J.; Dharanipragada, Ramalinga; and Marvin, Mary S., 5,470,830, Cl. 514-13.000.

Ohmi, Ikuhiro: *See*—
Shibata, Kouichi; Morikawa, Yusuke; and Ohmi, Ikuhiro, 5,471,562, Cl. 395-101.000.

Ohmori, Masashi: *See*—
Yamada, Yoshiaki; Iwasaki, Junji; and Ohmori, Masashi, 5,470,392, Cl. 134-2.000.

Ohno, Kimio: *See*—
Tanaka, Hiroshi; Kobayashi, Toshiaki; Nanba, Tomiyuki; Ishiwatari, Masaaki; Yoneyama, Toshio; Ohno, Kimio; Matsumoto, Takashi; Kanbe, Tetsuya; Isa, Takashi; and Ogusu, Yoshiyuki, 5,470,563, Cl. 424-448.000.

Ohno, Manabu: *See*—
Suematsu, Hiroyuki; Ochi, Hisayuki; Ohno, Manabu; and Kuwashima, Tetsuhito, 5,470,686, Cl. 430-111.000.

Ohnuki, Wataru: *See*—
Kumagai, Tatsuya; Iitsuka, Hisao; Kajioka, Hiroshi; Ohnuki, Wataru; and Tetsu, Toshiyuki, 5,471,301, Cl. 356-350.000.

Ohnuma, Masao: *See*—
Taira, Toshimitsu; Ohnuma, Masao; Hanada, Hisao; Aoki, Teruo; and Kuhara, Tetsuro, 5,470,048, Cl. 266-236.000.

Ohshita, Makoto: *See*—
Nagayama, Masato; Inuyama, Seiji; Sawada, Kenji; Ohshita, Makoto; and Harada, Fumiaki, 5,471,290, Cl. 355-309.000.

Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, to Sharp Kabushiki Kaisha. Optical memory element & manufacturing method thereof. 5,470,694, Cl. 430-321.000.

Ohtsuka, Yasumasa; Tomoyuki, Yohji; and Hatakeyama, Hideyuki, to Canon Kabushiki Kaisha. Image heating apparatus and heating film. 5,471,288, Cl. 355-285.000.

Ohtsuki, Tetsuji, to Matsushita Electric Industrial Co., Ltd. Information processing systems having a main CPU and a sub-CPU which controls the overall system to achieve power savings. 5,471,621, Cl. 395-750.000.

Ohyama, Yoshishige: *See*—
Minowa, Toshimichi; Kimura, Hiroshi; Yhoshida, Yoshiyuki; Ohyama, Yoshishige; and Nishimura, Yutaka, 5,470,290, Cl. 477-115.000.

Oi, Nakao: *See*—
Shibata, Tadayoshi; and Oi, Nakao, 5,471,265, Cl. 354-76.000.

Oji Paper Co., Ltd: *See*—
Miura, Takaharu; Nemoto, Hiroyuki; Ito, Masataka; Kobayashi, Masafumi; and Tanaka, Chieko, 5,470,652, Cl. 428-328.000.

Okada, Chikara: *See*—
Yamamoto, Kazuhiko; Miyake, Yuichi; Okada, Chikara; and Kitazume, Nobuyuki, 5,470,404, Cl. 148-426.000.

Okada, Shinjiro; Inaba, Yutaka; and Katakura, Kazunori, to Canon Kabushiki Kaisha. Driving method for liquid crystal device. 5,471,229, Cl. 345-89.000.

Okamizu, Hironori: *See*—
Yoshioka, Mamoru; Obata, Haruyuki; Tanoue, Ken; Iwashita, Yoshihiro; Kashiwagura, Toshimi; Suzuki, Makoto; Ichinose, Hiroki; and Okamizu, Hironori, 5,469,818, Cl. 123-90.150.

Okamoto Industries, Inc.: *See*—

Watanabe, Akinori; Horiguchi, Itaru; Sato, Atsushi; Kohno, Hiroshige; Ikeda, Kenji; and Iwasaki, Yujiro, 5,470,608, Cl. 427-133.000.

Okamoto, Masaya; Kuze, Shigeki; Kunishi, Noriyuki; and Nakashima, Taisuke, to Idemitsu Petrochemical Co., Ltd. Anisotropically oriented phase difference compensation film of a branched polycarbonate. 5,470,937, Cl. 528-198.000.

Okamoto, Toru; and Maruyama, Kazuo, to Fuji Xerox Co., Ltd. Ink jet recording apparatus. 5,471,233, Cl. 347-103.000.

Okamura, Masami; Sawa, Takao; Yamauchi, Yoshiyuki; and Kusada, Takao, to Kabushiki Kaisha Toshiba. Magnetic core and method of manufacturing core. 5,470,646, Cl. 428-216.000.

Okano, Haruo: *See*—
Suguro, Kyoichi; and Okano, Haruo, 5,470,791, Cl. 437-192.000.

Okano, Yoji: *See*—
Misawa, Hiromitsu; Fujioka, Kazuo; Aoki, Koso; Kurita, Eiichi; Okano, Yoji; and Kozawa, Minoru, 5,470,660, Cl. 428-403.000.

Okawa, Yuichi: *See*—
Sakata, Yoshihiro; Yamashita, Wataru; Okawa, Yuichi; Tamai, Shoji; Ishida, Tsutomu; Matsuo, Mitsunori; Yamaguchi, Keizaburo; and Yamaguchi, Akihiro, 5,470,943, Cl. 528-353.000.

Okayama, Masao: *See*—
Shindo, Isao; Mutou, Shigeo; Terayama, Takao; Okayama, Masao; and Kai, Susumu, 5,470,533, Cl. 422-63.000.

Okazaki, Haruki: *See*—
Shitani, Yuji; Okazaki, Haruki; and Miyamoto, Seiji, 5,470,135, Cl. 303-122.030.

Okazaki, Iwao: *See*—
Sakamoto, Jun; Yoshida, Minoru; Aoyama, Masatoshi; Suzuki, Masaru; Nakamori, Yukari; Okazaki, Iwao; and Abe, Koichi, 5,470,637, Cl. 428-143.000.

Okazaki, Kiyoshi: *See*—
Imai, Tooru; Matsumoto, Satoru; Okazaki, Kiyoshi; and Nagata, Yuji, 5,469,719, Cl. 68-12.040.

Okazaki, Mitsunari; and Aoki, Kazuharu, to Alps Electric Co., Ltd. Transmitting/receiving unit having automatic gain control system with temperature compensation. 5,471,654, Cl. 455-126.000.

Okazawa, Kazuhiko, to Canon Kabushiki Kaisha. Image forming apparatus capable of adjusting drive control of developer unit. 5,471,292, Cl. 355-326.00R.

Oki, Ken-ichi: *See*—
Yanai, Ken-ichi; Tanaka, Tsutomu; Ohgata, Koji; Takizawa, Yutaka; Oki, Ken-ichi; and Hirano, Takuya, 5,470,768, Cl. 437-40.000.

Okorocha, Livyn O.: *See*—
Rothfuss, Robert G.; Okorocha, Livyn O.; Bishop, Gregory D.; Sambi, Narinderjit S.; Bedi, James J.; Privitera, Salvatore; and Sherrill, Michael, 5,470,010, Cl. 227-177.000.

Okubo, Akiro: *See*—
Saito, Atsushi; Okubo, Akiro; Watanabe, Fumihiko; and Shinada, Yasuyuki, 5,471,230, Cl. 347-29.000.

Okuda, Nobuyuki; and Kojima, Masayoshi, to Showa Aluminum Corp. Stack type evaporator. 5,470,431, Cl. 159-28.600.

Okuda, Shinji: *See*—
Haijima, Hideki; and Okuda, Shinji, 5,469,789, Cl. 101-477.000.

Okumoto, Koji; Matsuno, Katsumi; Shiono, Toru; Senuma, Toshitaka; Fukuda, Tokuya; and Takada, Shinji, to Sony Corporation. Testing method for electronic apparatus. 5,471,481, Cl. 371-22.300.

Okuyama, Kojiro; Yokotani, Yoichiro; and Kugimiya, Koichi, to Matsushita Electric Industrial Co., Ltd. Dielectric ceramic compositions and dielectric resonators. 5,470,808, Cl. 501-134.000.

Olafson, Stephen M.: *See*—
Kordosky, Gary A.; and Olafson, Stephen M., 5,470,552, Cl. 423-139.000.

Olgiati, Vincenzo: *See*—
Fraire, Cristina; Bani, Massimo; Vanotti, Ermes; and Olgiati, Vincenzo, 5,470,858, Cl. 514-261.000.

Olschewski, Armin: *See*—
Brandenstein, Manfred; Friedrich, Wolfgang; Haas, Roland; Herrmann, Gerhard; and Olschewski, Armin, 5,470,279, Cl. 474-135.000.

Olsen, Ole: *See*—
Borriss, Rainer; Hofemeister, Jürgen; Thomsen, Karl K.; Olsen, Ole; and Von Wettstein, Dietrich, 5,470,725, Cl. 435-93.000.

Olson, Allen L., to Riverwood International Corporation. Apparatus for forming stacked article groups utilizing clip-type carriers. 5,469,687, Cl. 53-48.100.

Olson, Pamela S.: *See*—
Mascarenhas, Desmond; and Olson, Pamela S., 5,470,727, Cl. 435-172.300.

Olympus Optical Co., Ltd.: *See*—
Kamo, Yuji, 5,471,271, Cl. 354-222.000.
Kobayashi, Kazunari; Omachi, Kenji; Tatsuno, Yutaka; Hagihara, Masahiro; Kidawara, Atsuki; Hara, Tadayoshi; and Yazawa, Nobuyoshi, 5,469,841, Cl. 600-158.000.
Mihara, Takashi, 5,471,363, Cl. 361-305.000.
Takasugi, Yoshiharu, 5,471,343, Cl. 359-494.000.
Tani, Naoaki, 5,471,454, Cl. 369-100.000.

Olympus Optical, Ltd.: *See*—
Tanii, Yoshiyuki; Nakamura, Motokazu; Nagayama, Yoshikatsu; Morita, Katsuaki; Hibino, Hiroki; and Suzuki, Akira, 5,469,840, Cl. 600-117.000.

Omachi, Kenji: *See*—
Kobayashi, Kazunari; Omachi, Kenji; Tatsuno, Yutaka; Hagihara, Masahiro; Kidawara, Atsuki; Hara, Tadayoshi; and Yazawa, Nobuyoshi, 5,469,841, Cl. 600-158.000.

Omation Corporation: *See*—
Krupotich, Edward A.; and Rosensweig, Burton J., 5,470,182, Cl. 409-137.000.

O'Meara, John R.; Cistone, David R.; and Travalent, Louis, Jr., to Wheaton Holding, Inc. Child resistant container closure assembly. 5,469,980, Cl. 215-228.000.

Onaka, Hiroshi; Miyata, Hideyuki; and Naito, Takao, to Fujitsu Limited. Cold start control system and method for use in coherent lightwave communications system. 5,471,336, Cl. 359-191.000.

Onan Corporation: *See*—
Data, Stanley E.; Koziara, Robert P.; Leat, Mark S.; O'Gorman, Patrick A.; Rose, Thomas K.; Shanks, Eugene G.; and Norrick, Daniel A., 5,469,820, Cl. 123-192.200.

Onandia, Jose M. Automatic wire-threading device for electroerosion machines. 5,471,025, Cl. 219-69.120.

Ono Pharmaceutical Co., Ltd.: *See*—
Hayashi, Akio; Hiramatsu, Makoto; and Hamanaka, Nobuyuki, 5,470,956, Cl. 530-388.900.

Ono, Takeshi: *See*—
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,471,227, Cl. 347-9.000.

Oonishi, Yasuo: *See*—
Yasuda, Yukio; Yamaguchi, Akiyasu; Igarashi, Tatsushi; Oonishi, Yasuo; Kai, Kenzo; Sugihara, Masanori; Mori, Takashi; and Miyaji, Akira, 5,471,278, Cl. 355-67.000.

op den Buysch, Jan: *See*—
Vonken, Hub A. G.; and op den Buysch, Jan, 5,470,888, Cl. 521-79.000.

Opel, George E., to Geo Ventures. Electrical wire box apparatus. 5,471,012, Cl. 174-53.000.

Oppenlander, Andréas: *See*—
Hamon, Olivier; and Oppenlander, Andréas, 5,471,112, Cl. 313-485.000.

Opta Food Ingredients, Inc.: *See*—
Mallee, Francis M.; and Finocchiaro, Eugene T., 5,470,391, Cl. 127-18.000.

Optical Coating Laboratory, Inc.: *See*—
Rancourt, James D., 5,470,239, Cl. 439-105.000.

Optoelectronics, Inc.: *See*—
Owen, William P., 5,471,402, Cl. 364-484.000.

Optron Systems, Inc.: *See*—
Warde, Cardinal; Horsky, Thomas N.; Schiller, Craig M.; and Genetti, George J., 5,471,341, Cl. 359-293.000.

Opytny Zavod Mikroelektroniki "RIF" : *See*—
Koshkin, Petr K.; Sveshnikov, Alexander A.; and Bobrovskikh, Jury M., 5,471,179, Cl. 333-195.000.

Orbach, Abraham; Panoushek, Dale W.; and Schubert, William L., to Case Corporation. Hitch assembly control system. 5,469,921, Cl. 172-4.000.

Oreglia, Aurelio; and Vietto, Paolo, to W. R. Grace & Co.-Conn. Ostomy film. 5,470,624, Cl. 428-36.100.

Organek, Gregory J.; Preston, David M.; and Janson, David A., to Eaton Corporation. Clutch ball ramp actuator with coast lock. 5,469,948, Cl. 192-35.000.

Orient Chemical Industries, Ltd.: *See*—
Sugawara, Shuji; Sukata, Kazuaki; and Yamanaka, Shun-ichiro, 5,470,685, Cl. 430-110.000.

Orimo, Shinichi: *See*—
Sakamoto, Satoshi; and Orimo, Shinichi, 5,471,100, Cl. 310-12.000.

Orlicki, David M.; and Larrabee, James A., to Eastman Kodak Company. Line start synchronizer for raster scanner. 5,471,314, Cl. 358-296.000.

Ormerod, John: *See*—
Bogatin, Yakov; Robinson, Mark; Greenwald, Frank S.; and Ormerod, John, 5,470,400, Cl. 148-301.000.

Ornstein, Paul L.: *See*—
Melikian-Badalian, Anita; and Ornstein, Paul L., 5,470,978, Cl. 546-141.000.

Oron, Micha: *See*—
Even-Sturlesi, Doron; and Oron, Micha, 5,471,047, Cl. 250-208.100.

Orsini, Louis V., Jr., to Torrington Company, The. Camshaft and method of making a camshaft. 5,469,759, Cl. 74-567.000.

Orthofer, Willibald: *See*—
Zimics, Bela; and Orthofer, Willibald, 5,470,647, Cl. 428-229.000.

Osaka Sanso Kogyo Ltd.: *See*—
Nishizawa, Juinchi; Kijima, Takahiko; Ezell, Edward F.; and Makihara, Akira, 5,470,154, Cl. 374-141.000.

Osborne, Jeffrey C., to Hewlett-Packard Corporation. ECG P-QRS-T onset/offset annotation method and apparatus. 5,469,858, Cl. 128-710.000.

Ose, Richard A., to General Electric Company. Split control rod drive. 5,471,513, Cl. 376-232.000.

Oshidari, Thomas T.: *See*—
Ho, Helena S.; Pratt, Michael K.; Lim, Pong C.; and Oshidari, Thomas T., 5,471,527, Cl. 379-347.000.

Oshima, Seiichi: *See*—
Nagatomo, Akihiro; Yoshida, Hiroshi; Nishiyama, Masaki; and Oshima, Seiichi, 5,471,089, Cl. 257-691.000.

Oshima, Takeshi: *See*—

Fukumi, Hiroshi; Sakamoto, Toshiaki; Sugiyama, Mitsuo; Yamaguchi, Takeshi; Oshima, Takeshi; Asai, Fumitoshi; and Iijima, Yasuteru, 5,470,851, Cl. 514-214.000.

Osram Sylvania Inc.: *See*—
Dorfman, Leonid P.; Scheithauer, Michael J.; Houck, David L.; and Kopatz, Nelson E., 5,470,549, Cl. 423-61.000.

Ostertag, Werner: *See*—
Hahn, Erwin; Ostertag, Werner; and Seybold, Guenther, 5,470,502, Cl. 252-301.350.

Osugi, Yukihisa: *See*—
Takizawa, Kuniharu; Kikuchi, Hiroshi; Osugi, Yukihisa; and Tange, Shoji, 5,471,331, Cl. 359-67.000.

Otake, Shinichi: *See*—
Nakashima, Motohiro; and Otake, Shinichi, 5,471,384, Cl. 364-424.010.

Otaki, Hiroshi; and Nakajima, Masahiro, to Pioneer Video Corporation; and Pioneer Electronic Corp. Digital time base corrector with dropout compensating function. 5,471,250, Cl. 348-498.000.

Otani, Noriko; and Sakakibara, Teigo, to Canon Kabushiki Kaisha. Transfer material supporting member and image forming device using this transfer material supporting member. 5,470,940, Cl. 528-204.000.

Otsuka Kagaku Kabushiki Kaisha: *See*—
Torii, Shigeru; Tanaka, Hideo; Sasaoka, Mitio; Shiroi, Takashi; and Kameyama, Yutaka, 5,470,972, Cl. 540-230.000.

Otsuka, Toshinori, to Intel Corporation. Data processor with quicker latch input timing of valid data. 5,471,630, Cl. 395-800.000.

Ott, Karl; Walter, Klaus; and Strate, Joachim, to Robert Bosch GmbH. Sensor arrangement for rapid cylinder detection in a multi-cylinder internal combustion engine. 5,469,823, Cl. 123-414.000.

Otterness, Diane M.: *See*—
Weinshilboum, Richard M.; Honchel, Ronald; Aksoy, Ibrahim A.; Szumlanski, Carol L.; Wood, Thomas C.; Otterness, Diane M.; and Wieben, Eric D., 5,470,737, Cl. 435-240.200.

Otto, Dennis L.: *See*—
Dougherty, John D.; Moldovan, Mark R; Otto, Dennis L.; and Varonis, Orestes J., 5,470,157, Cl. 384-448.000.

Oudille, Jean-Claude; and Veiga, Antonio, to Saft. Measuring apparatus with adjustable indicator for measuring the real load factor on an electricity source. 5,471,134, Cl. 324-103.00P.

Ouellet, Luc, to Mitel Corporation. Moisture-free sog process. 5,470,798, Cl. 437-231.000.

Oulie, Finn; Backlund, Ake; and Svanberg, Johanna, to Kvaerner Pulping Technologies AB. Digester for cooking pulp having staggered screens. 5,470,437, Cl. 162-237.000.

Ouwens, Willem: *See*—
Sargeant, Adrian A.; Currie, William H.; Ouwens, Willem; Brace, Philip J.; Todd, Robert W.; and Scholz, Hans-Joachim, 5,470,142, Cl. 312-258.000.

Ovako Couplings AB: *See*—
Sundberg, Staffan; Sergeev, Vilaly E.; and Nesterov, Vladimir G., 5,470,166, Cl. 403-314.000.

Overell, Robert W.: *See*—
Greenberg, Phillip D.; and Overell, Robert W., 5,470,730, Cl. 435-172.300.

Overfield, Anthony L.: *See*—
Stewart, Gregory N.; Overfield, Anthony L.; and Ellis, Mark T., 5,471,674, Cl. 395-650.000.

Ovick, Norman L.: *See*—
Chien, Yun-Ko; and Ovick, Norman L., 5,471,184, Cl. 335-35.000.

Owen, William P., to Optoelectronics, Inc. Frequency counter. 5,471,402, Cl. 364-484.000.

Oxford Instruments Limited: *See*—
Hanley, Peter, 5,471,140, Cl. 324-303.000.

Oyama, Tomihisa: *See*—
Kazama, Yoichiro; and Oyama, Tomihisa, 5,470,045, Cl. 251-129.150.

Oyanagi, Toshiki: *See*—
Tsutumi, Haruki; Ikemoto, Yoshiaki; Maehama, Mitsuhiro; Oyanagi, Toshiki; and Matsubara, Tsugio, 5,470,918, Cl. 525-329.200.

Ozaki, Hiroji: *See*—
Satoh, Shinichi; Ozaki, Hiroji; and Eimori, Takahisa, 5,471,080, Cl. 257-344.000.

Ozawa, Masafumi: *See*—
Ikeda, Masao; Ito, Satoshi; Iochi, Yoshino; Miyajima, Takao; Ozawa, Masafumi; Akimoto, Katsuhiro; Ishibash, Akira; and Hiei, Futoshi, 5,471,067, Cl. 257-14.000.

Ozawa, Takashi, to Fujitsu Limited. Multi-chip module having an improved heat dissipation efficiency. 5,471,366, Cl. 361-704.000.

Pace, Gary L.; and Hughes, James D., to Motorola, Inc. Differential DC offset compensation circuit. 5,471,665, Cl. 455-343.000.

Pacesetter AB: *See*—
Neubauer, Heinz; Hirschberg, Jakub; and Strandberg, Hans, 5,470,348, Cl. 607-68.000.

Pacesetter, Inc.: *See*—
Mann, Brian M.; and Causey, James D., III, 5,470,342, Cl. 607-5.000.

Paddle Games Unlimited, Inc.: *See*—
Bodford, Robert E., Jr., 5,470,057, Cl. 273-30.000.

Paek, Hyung: *See*—
Jagger, Eric; and Paek, Hyung, 5,471,135, Cl. 324-158.100.

Page Automated Telecommunications Systems, Inc.: *See*—
Wiener, Patricia, 5,469,895, Cl. 139-420.00R.

Page, Thomas A., to Hydrowash Recycling Systems, Inc. Closed loop surface cleaning system. 5,469,597, Cl. 15-321.000.

Paget, Charles J.: *See*—
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,470,977, Cl. 546-101.000.

Paggi, Roberto, to Paggi S.r.l. Machine for dyeing fabrics wound up into endless fabric loops. 5,469,720, Cl. 68-13.00R.

Paggi S.r.l.: *See*—
Paggi, Roberto, 5,469,720, Cl. 68-13.00R.

Palansky, Bruce J.; Greene, Thomas L.; and Schock, Eileen A., to Ford Motor Company. Engine torque compensation shift scheduling of an automatic transmission for motor vehicles. 5,470,288, Cl. 477-110.000.

Palfreyman, Michael G.; McDonald, Ian A.; Salituro, Francesco G.; Schwarcz, Robert; and Baron, Bruce M., to Merrell Dow Pharmaceuticals Inc. NMDA antagonists. 5,470,870, Cl. 514-419.000.

Pall Corporation: *See*—
Adiletta, Joseph G., 5,470,364, Cl. 55-484.000.
Matkovich, Vlado I.; Bormann, Thomas J.; Gaell, Thomas C.; and Pascale, Frank R., 5,470,488, Cl. 210-767.000.

Palmer, Gary L., to ITT Corporation. Illuminator bracket for a night vision device. 5,471,374, Cl. 362-191.000.

Palmer, James K. Re-broadcast system for a plurality of AM signals. 5,471,642, Cl. 455-17.000.

Palmer, James K. Multiple RF carrier synthesizer. 5,471,673, Cl. 455-260.000.

Pancheri, Eugene J., to Procter & Gamble Company, The. Low pH granular detergent composition having improved biodegradability and cleaning performance. 5,470,509, Cl. 252-544.000.

Panda Eng. Inc.: *See*—
Irwin, Kenneth E., Jr.; Streeter, Gary R.; and Daigle, Steven J., 5,471,039, Cl. 235-441.000.

Panduit Corp.: *See*—
Caveney, Jack E.; and Nicoli, Robert, 5,469,893, Cl. 138-162.000.

Panousheck, Dale W.; and Hilender, Jeffrey S., to Case Corporation. Agricultural vehicle including a system for automatically moving an implement to a predetermined operating position. 5,469,694, Cl. 56-10.20E.

Panoushek, Dale W.: *See*—
Orbach, Abraham; Panoushek, Dale W.; and Schubert, William L., 5,469,921, Cl. 172-4.000.

Papaleo, Stephen. Child behavior improvement system. 5,470,235, Cl. 434-238.000.

Papanicolaou, Nicolas A., to United States of America, Navy. Platinum and platinum silicide contacts on β-silicon carbide. 5,471,072, Cl. 257-77.000.

Papathomas, Kostas I.; Christie, Frederick R.; and Wang, David W., to International Business Machines Corporation. Solder interconnection from a composition containing a mixture of dicyanates. 5,471,096, Cl. 257-778.000.

Papo, Michele C.: *See*—
Fuhrman, Bradley P.; Flaim, Stephen F.; Hernan, Lynn J.; Nesti, Frances D.; Papo, Michele C.; and Steinhorn, David M., 5,470,885, Cl. 514-743.000.

Papworth, David B.: *See*—
Colwell, Robert P.; Glew, Andrew F.; Papworth, David B.; Hinton, Glenn J.; and Clift, David W., 5,471,633, Cl. 395-800.000.

Paquin, Roger L.: *See*—
Hauf, Barry W.; Jones, Stephen K.; Johnson, Joseph E., Jr.; and Paquin, Roger L., 5,469,993, Cl. 222-383.300.

Paralogic, Inc.: *See*—
Eadline, Douglas J., 5,471,622, Cl. 395-650.000.

Paramount Bed Company Limited: *See*—
Nomura, Katsuyoshi, 5,469,591, Cl. 5-613.000.

Pardikes, Dennis G. System for mixing and activating polymers. 5,470,150, Cl. 366-137.000.

Park, David B.; and Crawley, Michael F., to Baker Hughes Incorporated. Rotary vacuum filtration drum with valved hopper cake treatment means. 5,470,473, Cl. 210-402.000.

Park, Heui-seong: *See*—
Jeong, Yong-joon; Park, Myung-je; Lee, Kang-won; and Park, Heui-seong, 5,471,268, Cl. 354-106.000.

Park, John. Aerobic exercise equipment. 5,470,297, Cl. 482-127.000.

Park, Joon, to Hughes Aircraft Company. Carrier handling system. 5,470,196, Cl. 414-797.900.

Park, Myung-je: *See*—
Jeong, Yong-joon; Park, Myung-je; Lee, Kang-won; and Park, Heui-seong, 5,471,268, Cl. 354-106.000.

Park, Pyong K., to Hughes Missile Systems Company. Interconnection between layers of striplines or microstrip through cavity backed slot. 5,471,181, Cl. 333-246.000.

Parker, Gary B., to Reynolds Metals Company. Method for improving surface quality of electromagnetically cast aluminum alloys and products therefrom. 5,469,911, Cl. 164-467.000.

Parker, Jeffrey L.; Sorrells, David F.; and Mix, John D., to ParkerVision, Inc. Camera lens control system and method. 5,471,296, Cl. 356-139.060.

Parker, Vance A.: *See*—
Knapp, Herbert C.; Parker, Vance A.; Baxter, Larry K.; and Evans, Jon F., 5,471,043, Cl. 235-472.000.

ParkerVision, Inc.: *See*—
Parker, Jeffrey L.; Sorrells, David F.; and Mix, John D., 5,471,296, Cl. 356-139.060.

Parkes, Deborah L.; and Coates, Stephen R., to Ciba Corning Diagnostics Corp. Herpes simplex virus type 2-glycoprotein G proteins and polypeptides. 5,470,704, Cl. 435-5.000.

Parks, Terry J., to Dell USA, L.P. Liquid crystal display with integrated frame buffer. 5,471,225, Cl. 345-98.000.
Parr, Michael L; Watson, John L.; and Vishwanath, T. G., to Hughes Aircraft Company. Enhanced digital communications receiver using channel impulse estimates. 5,471,501, Cl. 375-354.000.
Parri, Mauri; and Heino, Markku, to Nokia-Maillefer Holding S.A. Arrangement for handling cylindrical bodies provided with central holes. 5,470,192, Cl. 414-741.000.
Particle Interconnect, Inc.: *See*—
DiFrancesco, Louis, 5,471,151, Cl. 324-757.000.
Pascale, Frank R.: *See*—
Matkovich, Vlado I.; Bormann, Thomas J.; Gsell, Thomas C.; and Pascale, Frank R., 5,470,488, Cl. 210-767.000.
Pasch, Nicholas F.; and Patrick, Roger, to LSI Logic Corporation. Techniques for via formation and filling. 5,471,091, Cl. 257-752.000.
Pasch, Nicholas F.: *See*—
Kapoor, Ashok K.; and Pasch, Nicholas F., 5,470,801, Cl. 437-238.000.
Patel, Ambelal R.: *See*—
Ravichandran, Ramanathan; and Patel, Ambelal R., 5,470,980, Cl. 546-190.000.
Patel, Harish A., to Kendall Company, The. Process for preparing the alginate-containing wound dressing. 5,470,576, Cl. 424-445.000.
Patel, Naresh D.; and Brown, Mark D. Low VOC (volatile organic compounds), solvent-based CPVC pipe adhesives which maintain joint adhesive performance. 5,470,894, Cl. 523-218.000.
Paterek, F. Dieter; and Teaford, Richard L., to Emerson Electric Co. Seal for hermetic terminal assemblies. 5,471,015, Cl. 174-152.0GM.
Patino, Joseph; Bogut, Henry A.; and Tidwell, James L., to Motorola, Inc. Battery and method for charging/discharging the battery. 5,471,128, Cl. 320-13.000.
Patrick, Roger: *See*—
Pasch, Nicholas F.; and Patrick, Roger, 5,471,091, Cl. 257-752.000.
Patry, Bernard, to Axiohm. Device for reading the printing done by a transfer thermal printer. 5,471,235, Cl. 347-214.000.
Patsiokas, Stelios J.: *See*—
Krayeski, Paul D.; Marko, Paul D.; and Patsiokas, Stelios J., 5,471,146, Cl. 324-637.000.
Patton, Thadd C.; and Hsu, David K., to Iowa State University Research Foundation Inc. Apparatus for acoustically inspecting a workpiece. 5,469,744, Cl. 73-644.000.
Patwa, Nital: *See*—
Quattromani, Marc A.; Garibay, Raul A., Jr.; Patwa, Nital; and Hervin, Mark W., 5,471,598, Cl. 395-449.000.
Paulraj, Arogyaswami J.: *See*—
Gerlach, Derek; and Paulraj, Arogyaswami J., 5,471,647, Cl. 455-63.000.
Pauls, Lonney: *See*—
Voss, Darrell; Klein, Gary; O'Connor, Sean; and Pauls, Lonney, 5,470,091, Cl. 280-281.100.
Pauporte, Andre: *See*—
Munier, Jean-Marie; Pauporte, Andre; and Poiraud, Clement, 5,471,581, Cl. 395-250.000.
Pawlenko, Ivan: *See*—
Lilienthal, Peter F., II; Pawlenko, Ivan; and Wong, Ching-Ping, 5,470,217, Cl. 425-110.000.
Pawlowski, Edward J.: *See*—
Emberty, Robert G.; Misewich, Felix J.; and Pawlowski, Edward J., 5,471,445, Cl. 369-34.000.
Pawlowski, Stephen S.; MacWilliams, Peter D.; and Kolinski, Jerzy B., to Intel Corporation. Method and apparatus for conducting bus transactions between two clock independent bus agents of a computer system using a transaction by transaction deterministic request/response protocol and burst transfer. 5,471,637, Cl. 395-296.000.
Payne, Peter R., to Dynafoils, Inc. Advanced marine vehicles for operation at high speed in or above rough water. 5,469,801, Cl. 114-282.000.
Pearce, Francis H. Humidity control system including a peristaltic pump and incubators containing the same. 5,470,212, Cl. 417-477.130.
Pearcey, Richard: *See*—
Hayes, Stewart J.; Pearcey, Richard; and White, Philip T., 5,471,063, Cl. 250-436.000.
Pearl, David S., II; and Smith, Frank G., to Uniweld Products, Inc. Combustion device. 5,470,226, Cl. 431-255.000.
Pearlman, Paul S.; and Kumar, Vijayendra, to Du Pont de Nemours, E. I., and Company. Composite fabrics of nonwoven nylon layers and fiberglass scrim. 5,470,648, Cl. 428-247.000.
Pearlstine, Kathryn A.: *See*—
Blair, David E.; Houle, William A.; Lane, Gregg A.; Larson, James R.; and Pearlstine, Kathryn A., 5,471,287, Cl. 355-256.000.
Peck, James V.: *See*—
Minaskanian, Gevork; and Peck, James V., 5,470,848, Cl. 514-182.000.
Peckman, Robert: *See*—
Stanley, Donald H.; Peckman, Robert; and Peregoy, Weston K., Jr., 5,470,266, Cl. 445-59.000.
Pedea, Kevin H. Prisoner restraint. 5,469,813, Cl. 119-770.000.
Pei, Zhi H.: *See*—
Blaser, Martin J.; Ellison, Richard T., III; and Pei, Zhi H., 5,470,958, Cl. 530-389.500.
Pekkanen, Olli. Device in a training apparatus. 5,470,291, Cl. 482-49.000.
Pelletier, Diane: *See*—
Gobush, William; Pelletier, Diane; and Days, Charles, 5,471,383, Cl. 364-410.000.
Pelletier, Roger: *See*—
Dube, Ghyslain; Litalien, Marko; Pelletier, Roger; and Wang, Zhou, 5,470,376, Cl. 75-672.000.
Pendleton, Ranal O.: *See*—
Kuramoto, Roy; Chowhan, Zakauddin T.; Pendleton, Ranal O.; and Hafezzadeh, Hafez, 5,470,580, Cl. 424-464.000.
Peng, James P.: *See*—
Chidambarrao, Dureseti; Hsu, Louis L.; Mis, J. Daniel; and Peng, James P., 5,470,781, Cl. 437-68.000.
Peng, Sixun; Dai, Dezai; Huang, Zhenya; Huang, Wenlong; Wang, Youqun; Zhang, Can; and Yu, Peng, to China Pharmaceutical University; and Administrative Center of New Drug Research, The State Pharmaceutical Administration of China. Tetrahydroprotoberberine quaternary ammonium compounds useful in for treating arrhythmia. 5,470,852, Cl. 514-231.500.
Penny, James R. Microwave amplifier linearizer. 5,471,164, Cl. 330-149.000.
Peregoy, Weston K., Jr.: *See*—
Stanley, Donald H.; Peckman, Robert; and Peregoy, Weston K., Jr., 5,470,266, Cl. 445-59.000.
Perkins, Robert E.: *See*—
Hagen, Donald F.; Haddad, Louis C.; Perkins, Robert E.; and Markell, Craig G., 5,470,532, Cl. 422-57.000.
Perkins, Roger W.; and Chatelain, Gerri L., to Devices for Vascular Intervention, Inc. Balloon connection and inflation lumen for atherectomy catheter. 5,470,415, Cl. 156-916.000.
Perrault, James J., to Medtronic, Inc. Strand-of-beads wound packing product. 5,470,625, Cl. 428-48.000.
Perrins, Neil; and Kelly, Mary E., to Imperial Chemical Industries, PLC. Vesiculated polymer beads. 5,470,887, Cl. 521-65.000.
Pers, Tatiana: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kolt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Władysład, 5,470,809, Cl. 502-12.000.
Persson, Dan; and Malmenstam, Jonas, to Autoliv Development AB. Cover for air-bag installation. 5,470,634, Cl. 428-120.000.
Persson, Ingemar, to Exploweld AB. Method of cladding tubes. 5,470,013, Cl. 228-108.000.
Pertsov, Nikolay V.; Ulberg, Zoya R.; Vember, Vladimir E.; Podolskaya, Valentina I.; Kogan, Boris S.; and Burenkov, Eduard K., to 958075 Ontario Inc. Apparatus for the purification of cyanide-containing waste water. 5,470,460, Cl. 210-151.000.
Pes, Robert, to BP Chemicals Limited. Apparatus and process for introducing a suspension into a reactor. 5,470,540, Cl. 422-145.000.
Pesmark, Chester M.: *See*—
Carlisle, Lonnie E.; and Pesmark, Chester M., 5,469,747, Cl. 73-861.370.
Petelle, Joey; Stoesz, Karen D.; and Williams, Lisa R., to Auburn Farms, Inc. Method of making fat free potato chips. 5,470,600, Cl. 426-237.000.
Petersen, Jens T.: *See*—
Hansen, Jens; Madsen, Benny; and Petersen, Jens T., 5,471,187, Cl. 340-146.200.
Peterson, Francis C.; and Weinert, James A., to Phillips Plastics Corporation. Tamper-resistant vehicle event recorder. 5,471,193, Cl. 340-438.000.
Peterson, Gary L.: *See*—
Diner, Bruce A.; Gutteridge, Steven; Peterson, Gary L.; and Wolf, William E., 5,471,053, Cl. 250-228.000.
Peterson, Jeffrey A.: *See*—
Franseen, Steve A.; and Peterson, Jeffrey A., 5,470,228, Cl. 433-8.000.
Peterson, Steven H.: *See*—
Snyder, Thomas S.; Peterson, Steven H.; and Nayak, Umesh P., 5,470,479, Cl. 210-635.000.
Peterson, Tom; and Piper, Neal, to Hyper Corporation, The. In-line roller skate assembly. 5,470,086, Cl. 280-11.220.
Petras, Stefan G.: *See*—
Jacob, Steven D.; Coogan, James J.; and Petras, Stefan G., 5,470,275, Cl. 454-61.000.
Petroleo Brasileiro S.A. - Petrobras: *See*—
Maciel, Vitor G., 5,470,179, Cl. 405-224.000.
Petty, Thomas D.; Stockstad, Troy L.; and Vyne, Robert L., to Motorola, Inc. Amplifier having an output stage with bias current cancellation. 5,471,174, Cl. 330-257.000.
Petzinna, Dieter: *See*—
Angerbauer, Rolf; Fey, Peter; Hübsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, 5,470,982, Cl. 546-268.000.
Pezzani, Robert, to SGS-Thomson Microelectronics S.A. A.c. switch triggered at a predetermined half-period. 5,471,074, Cl. 257-121.000.
Pfalzgraff, Chris L.: *See*—
Murray, James A.; Nees, Michael R.; Imrie, William P.; Rayner, Christopher C.; Pfalzgraff, Chris L.; Bates, Robert K.; Ness, Valmer H.; and Cox, Terrance J., 5,470,445, Cl. 204-105.00R.
Pfeiffer, Gert: *See*—
Berger, Harald; Mittag, Peter; Steins, Johannes; and Pfeiffer, Gert, 5,471,495, Cl. 373-2.000.
Phan, Chan B.; and Walsh, Michael, to Control Components Inc. Valve assemblies. 5,469,881, Cl. 137-315.000.
Pharmacia Genetic Engineering Inc.: *See*—
Helting, Torsten B.; Drevin, Hakan; and Nunn, Michael F., 5,470,720, Cl. 435-69.300.
Phase Shift Technology, Inc.: *See*—

Koliopoulos, Chris L.; and Tang, Shouhong, 5,471,307, Cl. 356-371.000.

Phelipon, Axel: *See—*
Commier, Philippe; Phelipon, Axel; and Le Masson, Jacques, 5,470,094, Cl. 280-602.000.

Pherigo, Calvin L. Fully-adjustable tree stand. 5,469,934, Cl. 182-187.000.

Philipps, Thomas: *See—*
Angerbauer, Rolf; Fey, Peter; Hübsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, 5,470,982, Cl. 546-268.000.

Philips Electronics North America Corporation: *See—*
van der Leeuw, Bart; Canale, Joseph E.; Kowal, Albert E.; Pragt, Henrikus J. H.; and Morris, Thomas W., 5,471,110, Cl. 313-25.000.

Phillips, James E.; Blaner, Bartholomew; and Vassiliadis, Stamatis, to International Business Machines Corporation. Multi-function permutation switch for rotating and manipulating an order of bits of an input data byte in either cyclic or non-cyclic mode. 5,471,628, Cl. 395-800.000.

Phillips, Peter E.; Strattan, Landon A.; and Desai, Vikram D., to Hughes Aircraft Company. Method and structure for impingement cooling a laser rod. 5,471,491, Cl. 372-35.000.

Phillips Petroleum Company: *See—*
Bares, Joseph E.; Johnson, Byron G.; and Cornforth, Frederick J., 5,470,457, Cl. 208-255.000.
Brown, Ronald E., 5,470,441, Cl. 203-49.000.
Reagen, William K.; and Conroy, Brian K., 5,470,926, Cl. 526-120.000.

Phillips Plastics Corporation: *See—*
Peterson, Francis C.; and Weinert, James A., 5,471,193, Cl. 340-438.000.

Philyaw, Dale A.: *See—*
Siems, W. Peter; and Philyaw, Dale A., 5,470,253, Cl. 439-491.000.

Phirippidis, George. Modular storage and organizing system for vehicles. 5,469,999, Cl. 224-542.000.

Photo Sculptures, Inc.: *See—*
Keating, Kent G.; and Drago, Joseph A., 5,470,410, Cl. 156-63.000.

Pialet, Joseph W.; Lal, Kasturi; and Bryant, Charles P., to Lubrizol Corporation, The. Polymeric salts as dispersed particles in electrorheological fluids. 5,470,498, Cl. 252-76.000.

Picado, Sergio: *See—*
Simpson, Elmer J.; and Picado, Sergio, 5,471,359, Cl. 361-93.000.

Pickering, John B.: *See—*
Minakami, Michael K.; Hulse, Brian; Cook, Jonathan; and Pickering, John B., 5,471,521, Cl. 379-88.000.

Pickersgill, Phillip: *See—*
Rees, Idris J. M.; and Pickersgill, Phillip, 5,471,649, Cl. 455-67.400.

Pidgeon, Rezin E., Jr.; and Martin, Grover H., to Scientific Atlanta, Inc. Broadband matching network. 5,471,492, Cl. 372-38.000.

Pierrel SpA: *See—*
Fraire, Cristina; Bani, Massimo; Vanotti, Ermes; and Olgiati, Vincenzo, 5,470,858, Cl. 514-261.000.

Pikka, Olavi; and Rönkönharju, Hannu, to A. Ahlstrom Corporation. Method and arrangement for the treatment of a fiber suspension. 5,470,432, Cl. 162-55.000.

Pilested, Karsten G. Security system for surveilling the passage of commodities through defined zones. 5,471,196, Cl. 340-572.000.

Pincemin, Jean-Marie N.: *See—*
Brossier, Pascal N.; Pincemin, Jean-Marie N.; and Wurniesky, Pascal, 5,470,020, Cl. 239-265.330.

Pinkerton, Joseph F.: *See—*
Clifton, David B.; Little, Scott R.; and Pinkerton, Joseph F., 5,471,105, Cl. 310-90.500.

Pinto, Ivan L.: *See—*
Buckle, Derek R.; Pinto, Ivan L.; and Smith, David G., 5,470,872, Cl. 514-456.000.

Pioch, Olivier; Martineau, Dominique; and Dupont, Henri, to Siemens Automotive S.A. Method for smoothing out acceleration jerks of a vehicle propelled by an internal-combustion engine. 5,470,289, Cl. 477-111.000.

Pioneer Electronic Corporation: *See—*
Nonaka, Yoshiya; Aoyagi, Yoshio; Abe, Hiroyuki; Bradshaw, Alex; Kiyoura, Kazuhiro; Kato, Seiji; and Haraguchi, Koichiro, 5,471,441, Cl. 369-32.000.
Otaki, Hiroshi; and Nakajima, Masahiro, 5,471,250, Cl. 348-498.000.
Sugawara, Kazuaki; and Ito, Hideo, 5,471,316, Cl. 358-342.000.
Tawaragi, Yuji; Kusano, Satoshi; Suzuki, Toshio; and Obitsu, Noriko, 5,471,446, Cl. 369-44.140.
Yokogawa, Fumihiko, 5,471,448, Cl. 369-44.290.

Pioneer Hi-Bred Internation, Inc.: *See—*
Huffman, Gary A., 5,470,359, Cl. 47-58.000.

Pioneer Video Corporation: *See—*
Otaki, Hiroshi; and Nakajima, Masahiro, 5,471,250, Cl. 348-498.000.

Piper, Neal: *See—*
Peterson, Tom; and Piper, Neal, 5,470,086, Cl. 280-11.220.

Piscopo, Mark F.; Stetson, Bruce E.; and Stetson, Nancy E., to Piscopo, Mark F. Posture monitor. 5,469,861, Cl. 128-781.000.

Pitney Bowes Inc.: *See—*
Lee, Young W.; Moh, Sungwon; and Muller, Arno, 5,471,608, Cl. 395-550.000.
Mikel, Dennis A.; and Rosen, Richard H., 5,470,427, Cl. 156-387.000.

Plachy, Anthony L.: *See—*
Deutsch, Alina; Lewis, David A.; Narayan, Chandrasekhar; and Plachy, Anthony L., 5,471,090, Cl. 257-734.000.

Plancher, Henry: *See—*
Cha, Chang Y.; Plancher, Henry; and Kraus, Lawrence S., 5,470,384, Cl. 106-284.030.

Plasma Physics Corp.: *See—*
Coleman, John H., 5,470,784, Cl. 437-101.000.

Plate, Ralf, to Akzo Nobel N.V. Tetrahydropyrimidine derivatives. 5,470,856, Cl. 514-256.000.

Plomer, Anton, to J.M. Voith GmbH. Device for selective treatment of material webs. 5,469,636, Cl. 34-117.000.

Plop Golf Company: *See—*
Denny, Bradley J.; and Hannon, Richard H., 5,469,627, Cl. 33-508.000.

Plow, Edward F.: *See—*
Frelinger, Andrew L., III; Plow, Edward F.; and Ginsberg, Mark H., 5,470,738, Cl. 435-240.270.

Plusa, Janusz: *See—*
Kadi, Rachid; Leclere, Jean; and Plusa, Janusz, 5,470,274, Cl. 452-184.000.

Plyley, Alan K.; Vidal, Claude A.; and Lagerquist, Roger, to Minnesota Mining and Manufacturing Company. Laparoscopic stapler with overload sensor and interlock. 5,470,007, Cl. 227-175.000.

Podolskaya, Valentina I.: *See—*
Pertsov, Nikolay V.; Ulberg, Zoya R.; Vember, Vladimir E.; Podolskaya, Valentina I.; Kogan, Boris S.; and Burenkov, Eduard K., 5,470,460, Cl. 210-151.000.

Pohl, Werner: *See—*
Linke, Adolf; Pohl, Werner; Schmid, Karl; and Wetzel, Rolf, 5,470,361, Cl. 48-197.00R.

Poiraud, Clement: *See—*
Munier, Jean-Marie; Pauporte, Andre; and Poiraud, Clement, 5,471,581, Cl. 395-250.000.

Pollard, Jerry K. Fire hydrant locking device. 5,469,724, Cl. 70-178.000.

Pollmann, Horst: *See—*
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Grosser, Martin; Schneider, Peter; Barth, Wolfgang; Moll, Hermann; and Pollmann, Horst, 5,469,938, Cl. 187-408.000.

Polt, Robin L., to University of Arizona, The Arizona Board of Regents on Behalf of the. Method for making amino acid glycosides and glycopeptides. 5,470,949, Cl. 530-322.000.

Polygenex International, Inc.: *See—*
Shah, Tilak M., 5,469,863, Cl. 128-844.000.

Pomerene, Andrew T. S.: *See—*
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.

Pompei, Francesco; Ternullo, Janus; and Malecki, William W., to Exergen Corporation. Continuous temperature monitor. 5,469,855, Cl. 128-664.000.

Pompeo, Frank L.: *See—*
Call, Anson J.; Meisner, Stephen H.; Pompeo, Frank L.; and Zitz, Jeffrey A., 5,471,027, Cl. 219-85.130.

Popper, Peter: *See—*
Kennard, Jeffrey L.; Kodokian, George K.; Popper, Peter; and Samant, Kalika R., 5,470,656, Cl. 428-370.000.
Mokhtar, Ahmed M.; Popper, Peter; and Walker, Wiliam C., 5,470,629, Cl. 428-85.000.

Porchia, Jose: *See—*
Dais, Brian C.; and Porchia, Jose, 5,470,518, Cl. 264-145.000.

Potes, Michael M.; Lambarth, Edwin H.; Frasher, Troy A.; Edelstein, Beth E.; Kelley, Lowell D.; and Lewis, Cynthia J., to Hoover Universal, Inc. Flexible part deflasher. 5,470,220, Cl. 425-216.000.

Potrebic, Peter J.: *See—*
Altmaier, Paulette R.; and Potrebic, Peter J., 5,471,503, Cl. 375-202.000.

Potts, Bruce H.: *See—*
Mafoti, Robson M.; and Potts, Bruce H., 5,470,935, Cl. 528-65.000.

Povey, Neale P.: *See—*
Gagnon, James E.; Povey, Neale P.; Gagnon, David R.; and Midgley, Roland R., 5,470,757, Cl. 436-164.000.

PPG Industries, Inc.: *See—*
Frank, Robert G.; and Schwartz, James H., 5,470,366, Cl. 65-104.000.
Makhlouf, Joseph M.; and Schneider, John R., 5,470,886, Cl. 521-[illegible]99.000.
Rukavina, Thomas G.; and Slobodnik, John B., 5,471,554, Cl. 385-131.000.
Yu, Phillip C.; Backfisch, David L.; and Rukavina, Thomas G., 5,471,338, Cl. 359-273.000.

Prager, Kenneth E.; Herbst, Stephen J.; Sisneros, Jerry N.; Wootan, John J.; and Gleichman, Douglas M., to Hughes Aircraft Company. Nonuniformity correction of an imaging sensor using region-based correction terms. 5,471,240, Cl. 348-164.000.

Pragt, Henrikus J. H.: *See—*
van der Leeuw, Bart; Canale, Joseph E.; Kowal, Albert E.; Pragt, Henrikus J. H.; and Morris, Thomas W., 5,471,110, Cl. 313-25.000.

Prasad, Bindiganavele A., to Xerox Corporation. Improved method for displaying a computer generated graphic on a raster output scanner. 5,471,574, Cl. 395-142.000.

Pratt, Charles F.: *See—*
van der Meer, Roelof; Pratt, Charles F.; de Munck, Johannes W. J.; and Heuschen, Jean M. H., 5,470,913, Cl. 525-66.000.

Pratt, Michael K.: *See—*
Ho, Helena S.; Pratt, Michael K.; Lim, Pong C.; and Oshidari, Thomas T., 5,471,527, Cl. 379-347.000.

Praxair Technology, Inc.: *See—*

Howard, Henry E.; Prosser, Neil M.; and Roberts, Mark J., 5,469,710, Cl. 62-22.000.

PRC: *See*—
Jones, James E., 5,470,596, Cl. 426-512.000.

Precision Shooting Equipment, Inc.: *See*—
Higgins, Ronald; and Smith, Allan F., 5,469,834, Cl. 124-88.000.

Prelat, Alfredo E., to Texaco Inc. Airborne scanner image spectrometer 5,471,056, Cl. 250-253.000.

Premium Products, Inc.: *See*—
Spiegel, H. Jay, 5,470,060, Cl. 273-65.00E.

President and Fellows of Harvard College: *See*—
Reed, Guy, 5,470,957, Cl. 530-388.250.

Preston, David M.: *See*—
Organek, Gregory J.; Preston, David M.; and Janson, David A., 5,469,948, Cl. 192-35.000.

Preuss, Donald R.: *See*—
Fleming, James C.; Lange, Gerald R.; and Preuss, Donald R., 5,470,626, Cl. 428-64.800.

Price, Ferris T., deceased (by Robert H. Price, executor): *See*—
Byers, Larry L.; Mackenthun, Donald W.; Fye, Philip J.; Maciona, Gerald J.; Engel, Jeff A.; Price, Ferris T., deceased; and Seppa, Dale K., 5,471,482, Cl. 371-21.200.

Price, Robert H., executor: *See*—
Byers, Larry L.; Mackenthun, Donald W.; Fye, Philip J.; Maciona, Gerald J.; Engel, Jeff A.; Price, Ferris T., deceased; and Seppa, Dale K., 5,471,482, Cl. 371-21.200.

Priegnitz, James W., to UOP. Small scale simulated moving bed separation apparatus and process. 5,470,464, Cl. 210-198.200.

Prigent, Monique: *See*—
Delfort, Bruno; Daoudal, Bertrand; Lallement, Jacques; Born, Maurice; Hipeaux, Jean-Claude; Marchand, Pierre; Dixmier, Francoise; and Prigent, Monique, 5,470,495, Cl. 252-18.000.

Prince Corporation: *See*—
Snyder, Ronald P., 5,470,123, Cl. 296-97.900.

Prince, Dennis W.: *See*—
Ilcisin, Kevin J.; and Prince, Dennis W., 5,471,228, Cl. 345-58.000.

Pringle, Ronald E., to Camco International Inc. Coiled tubing concentric gas lift valve assembly. 5,469,878, Cl. 137-155.000.

Prisell, Per; and Norstedt, Gunnar. Pharmaceutical preparation. 5,470,829, Cl. 514-12.000.

Pritchard, Ross E.; and Laub, Ronald J., to Aluminum Design Corporation. Brazing of aluminum-beryllium alloy. 5,470,014, Cl. 228-208.000.

Privitera, Salvatore: *See*—
Rothfuss, Robert G.; Okorocha, Livyn O.; Bishop, Gregory D.; Sambi, Narinderjit S.; Bedi, James J.; Privitera, Salvatore; and Sherrill, Michael, 5,470,010, Cl. 227-177.000.

Pro-Neuron, Inc.: *See*—
von Borstel, Reid W.; and Bamat, Michael K., 5,470,838, Cl. 514-50.000.

Procter & Gamble: *See*—
Corless, Ann M.; Deckner, George E.; Hall, Bonnie J.; and Listro, Joseph A., 5,470,884, Cl. 514-714.000.

Procter & Gamble Co., The: *See*—
Fredj, Abdennaceur; Johnston, James P.; and Thoen, Christiaan A. J., 5,470,507, Cl. 252-542.000.

Procter & Gamble Company, The: *See*—
Childs, Stephen L.; Robertson, Alvin M.; Corona, Alessandro, III; and Russ, Karl J., 5,470,492, Cl. 252-8.600.
Goulait, David J. K., 5,470,417, Cl. 156-201.000.
Kalkanis, Petros, 5,469,984, Cl. 220-606.000.
Pancheri, Eugene J., 5,470,509, Cl. 252-544.000.
Scavone, Timothy A., 5,470,598, Cl. 426-607.000.
Willey, Alan D.; and Hall, Robin G., 5,470,510, Cl. 252-546.000.

Proctor, Peter H. Topical sod for treating hair loss. 5,470,876, Cl. 514-492.000.

Productos Bituminosos, S.A. (Probisa): *See*—
Lopez, Reyero, 5,470,145, Cl. 366-13.000.

Profio, Richard L., to Harnischfeger Corporation. Power shovel. 5,469,647, Cl. 37-398.000.

Proseus, Erwin E.: *See*—
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Mastalski, Henry T., 5,470,271, Cl. 451-55.000.

Prosser, Neil M.: *See*—
Howard, Henry E.; Prosser, Neil M.; and Roberts, Mark J., 5,469,710, Cl. 62-22.000.

Protimeter PLC: *See*—
Dadachanji, Fali M., 5,469,707, Cl. 62-3.300.

Prozonic, Michael A.: *See*—
Chiu, Tzu-Yin; Erceg, Frank M.; Liu, Te-Yin M.; Moerschel, Kenenth G.; Prozonic, Michael A.; and Sung, Janmye, 5,470,783, Cl. 437-72.000.

Prudhomme, Malcolm J. Fryer basket lift. 5,469,778, Cl. 99-336.000.

Pulliam, Thomas A.: *See*—
Hlava, Lorens G.; and Pulliam, Thomas A., 5,470,027, Cl. 242-247.000.

Purushothaman, Sampath: *See*—
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.

Pusey, Bruce A.: *See*—
Blank, David L.; Crill, Roger O.; Pusey, Bruce A.; and Shah, Kashyap H., 5,470,195, Cl. 414-797.000.

Putzmeister-Werk Maschinenfabrik GmbH: *See*—
Benckert, Hartmut; and Schillinger, Dieter, 5,470,167, Cl. 403-322.000.

Pye, Richard, to Genrad Limited. Test system for calculating the propagation delays in signal paths leading to a plurality of pins associated with a circuit. 5,471,136, Cl. 324-158.100.

Pykiet, Kenneth L., to Rockwell International Corp. Composite structural truss element. 5,469,686, Cl. 52-793.110.

Pyle, Stephen K. Boat propeller case and lock. 5,469,721, Cl. 70-14.000.

Qin, Jian, to Kimberly-Clark Corporation. Process for the preparation of modified polysaccharides having improved absorbent properties. 5,470,964, Cl. 536-20.000.

Qiu, Yong-Jian: *See*—
Williams, Joel L.; Nahir, Tal M.; and Qiu, Yong-Jian, 5,470,677, Cl. 429-190.000.

Quan, Ronald, to Macrovision Corporation. Method and apparatus for low cost audio scrambling and descrambling. 5,471,531, Cl. 380-19.000.

Quantum Corporation: *See*—
Henson, James A.; Richmond, Scott E.; and Akin, William R., Jr., 5,471,176, Cl. 331-1.00A.
Lee, Neville K.; and Tan, Kwan Y., 5,470,627, Cl. 428-64.400.

Quattromani, Marc A.; Garibay, Raul A., Jr.; Patwa, Nital; and Hervin, Mark W., to Cyrix Corporation. Data dependency detection and handling in a microprocessor with write buffer. 5,471,598, Cl. 395-449.000.

Queen Mary and Westfield College: *See*—
Bonfield, William; Best, Serena M.; and Barralet, Jake E., 5,470,803, Cl. 501-1.000.

QuickLogic Corporation: *See*—
Gordon, Kathryn E.; and Chan, Andrew K., 5,471,154, Cl. 326-38.000.

Quistad, Gary B.: *See*—
Leisy, Douglas J.; Quistad, Gary B.; and Skinner, Wayne S., 5,470,735, Cl. 435-235.100.

R. J. Reynolds Tobacco Company: *See*—
Barnes, Vernon B.; Wilkinson, Donald R.; Hancock, Lloyd H.; Oesterling, Erwin; Schlisio, Siegfried; and Hinz, Werner, 5,469,871, Cl. 131-194.000.
Beard, Hoyt S.; Conrad, Lucas J.; Crook, J. Edward; Lovette, James E.; Johnson, Robert C.; Newton, Donald A.; and Neshan, Hamid, 5,469,872, Cl. 131-291.000.

Rackley, Darwin P.; and West, R. Michael P., to International Business Machines Corporation. Hardware XOR sprite for computer display systems. 5,471,570, Cl. 395-135.000.

Radian Corporation: *See*—
Bortz, Steven J., 5,470,224, Cl. 431-182.000.

Rafalovich, Alexander P.: *See*—
Bass, Mark; and Rafalovich, Alexander P., 5,469,716, Cl. 62-505.000.

Raffensperger, Steve D.: *See*—
Witkowski, Joseph T.; and Raffensperger, Steve D., 5,470,149, Cl. 366-101.000.

Raffensperger, Susan M.: *See*—
Hall, James T.; O'Connor, Arthur B.; Raffensperger, Susan M.; and Levine, Seymour, 5,471,326, Cl. 359-15.000.

Ragland, Richard R. Point-of-gaze tracker. 5,471,542, Cl. 382-128.000.

Rains, Robert L., to General Signal Corporation. Radially mounted magnetic coupling. 5,470,152, Cl. 366-273.000.

Rajagopalan, Natarajan: *See*—
Na, George C.; and Rajagopalan, Natarajan, 5,470,583, Cl. 424-489.000.

Ralph, Peter: *See*—
Kawasaki, Ernest S.; Ladner, Martha B.; Van Arsdell, Janelle N.; Wang, Alice M.; Ralph, Peter; Coyne, Mazie Y.; and Warren, Mary K., 5,470,569, Cl. 424-85.100.

Ralph Wilson Plastics Company: *See*—
Nelson, Thomas J., 5,469,685, Cl. 52-782.200.

Ramachandran, Ramakrishnan; and Dao, Loc H., to BOC Group, Inc., The. Process for the production of alkene polymers. 5,470,925, Cl. 526-68.000.

Ramaswami, VaradaRajan: *See*—
Unger, Evan C.; Fritz, Thomas A.; Matsunaga, Terry; Ramaswami, VaradaRajan; Yellowhair, David; and Wu, Guanli, 5,469,854, Cl. 128-662.020.

Ramsay, J. Roger: *See*—
Jacobson, Richard M.; Ramsay, J. Roger; Aller, Harold E.; and Thirugnanam, Muthuvelu, 5,470,984, Cl. 548-264.400.

Ranalletta, Joseph V.: *See*—
Law, Wing K.; Ranalletta, Joseph V.; Oakley, Clyde G.; Douglas, Stephen J.; and Dieta, Dennis R., 5,469,853, Cl. 128-662.060.

Rancourt, James D., to Optical Coating Laboratory, Inc. International electrical ground connector-adaptor for computer monitor. 5,470,239, Cl. 439-105.000.

Randall, Bruce W.: *See*—
Hill, Philip N. C.; and Randall, Bruce W., 5,471,239, Cl. 348-155.000.

Randall, Mitchell A.; Holloway, Christopher L.; and Wurman, Joshua M. A. R., to University Corporation for Atmospheric Research. Receiver antenna for bistatic doppler radar network. 5,471,211, Cl. 342-26.000.

Randles, Kenneth R.; and LeGras, Paul G., to Zeneca Limited. Process for the manufacture of aminomethanephosphonic acid. 5,471,000, Cl. 562-16.000.

Ranganath, Krishnappa; and Kurnia, Alexander, to MTI International, Inc. Low power unity power factor ballast. 5,471,117, Cl. 315-247.000.

Ranganath, Krishnappa; and Kurnia, Alexander, to MTI International, Inc. Distributed control system for lighting with intelligent electronic ballasts. 5,471,119, Cl. 315-307.000.

Rank Brimar Limited: *See*—
Blaxtan, Peter W.; and Gillespie, John, 5,471,584, Cl. 359-263.000.

Rao, V. Durga N.; and Clarke, James R., to Ford Motor Company. Piston assembly having abradable coating. 5,469,777, Cl. 92-223.000.

Rapid Mounting & Finishing Co: *See*—
Diresta, James D., 5,470,067, Cl. 273-57.200.

Rapoport, Mitchell I.: *See*—
Becker, Gregory R.; and Rapoport, Mitchell I., 5,471,102, Cl. 310-50.000.

Rappaport, Carey M., to Northeastern University. Balloon angioplasty device. 5,470,352, Cl. 607-101.000.

Rappe, Andrew: *See*—
Brommer, Karl; Mullaney, Henry; Meade, Robert; Rappe, Andrew; and Joannopoulos, John, 5,471,180, Cl. 333-202.000.

Raskas Foods Inc.: *See*—
Meilinger, John H.; Brown, C. Gordon; and Bohanan, Montgomery A., 5,470,593, Cl. 426-36.000.

Rasmussen, John. Condensate trap and drain for systems under pressure. 5,469,879, Cl. 137-187.000.

Rasmussen, Kirk: *See*—
Smith, Bradley W.; Rasmussen, Kirk; and Allard, John E., 5,470,102, Cl. 280-728.200.

Rathert, Horst; and Staudinger, Reimar, to Kolbus GmbH & Co. KG. Conveying apparatus with product reorientation capability. 5,469,954, Cl. 198-412.000.

Rathgeber, Juergen O.; Kish, Frederick A.; Hasan, Syed R.; and Hindman, Craig A., to Illinois Tool Works Inc. Roof perimeter composite securing element and method of installing. 5,469,671, Cl. 52-58.000.

Ratib, Osman: *See*—
Huang, Han; Morioka, Craig A.; Ratib, Osman; Cho, Paul N. S.; Ho, Bruce K. T.; Sonobe, Takeo; and Shinagawa, Toru, 5,471,606, Cl. 395-500.000.

Rattan, William: *See*—
Demarest, David; Duncan, Robert B.; Sobel, Martin; Lenihan, Timothy P.; and Rattan, William, 5,469,689, Cl. 53-430.000.

Raven, Barbara B., administratrix: *See*—
LeStrange, Michael M.; Watson, William H.; Raven, Richard C., deceased, 5,470,079, Cl. 273-138.00A.

Raven, Richard C., deceased (by Barbara B. Raven, administratrix): *See*—
LeStrange, Michael M.; Watson, William H.; Raven, Richard C., deceased, 5,470,079, Cl. 273-138.00A.

Ravenberg, Mike J.: *See*—
Rose, Larry D.; Lauritzen, Donald R.; Ravenberg, Mike J.; Thompson, Mark A.; Green, David J.; and Davis, Terry R., 5,470,105, Cl. 280-740.000.

Ravichandran, Ramanathan; and Patel, Ambelal R., to Ciba-Geigy Corporation. Azodicarboxylic acid derivatives containing hindered amine moieties as polymer stabilizers. 5,470,980, Cl. 546-190.000.

Rawls, Earl W. End cap and brush holder assembly for dynamoelectric machine. 5,471,107, Cl. 310-249.000.

Ray, Carl; and Coulter, J. Scott, to Xcel Industrial Group, Inc. Universal zero-headspace extractor vessel. 5,470,535, Cl. 422-101.000.

Ray, R. Charles, to Danek Medical, Inc. System for stabilizing the cervical and the lumbar region of the spine. 5,470,333, Cl. 606-61.000.

Raychem Corporation: *See*—
McMills, Corey; and Mattis, John, 5,469,613, Cl. 29-751.000.
Rinde, James A.; and Rowe, Richard M., 5,470,622, Cl. 428-34.900.

Rayner, Christopher C.: *See*—
Murray, James A.; Nees, Michael R.; Imrie, William P.; Rayner, Christopher C.; Pfaizgraff, Chris L.; Bates, Robert K.; Ness, Valmer H.; and Cox, Terrance J., 5,470,445, Cl. 204-105.00R.

Raynor, Dennis L.; and Hoth, Dennis J. Integrated residential dwelling units 5,469,673, Cl. 52-79.700.

Rdesinska-Cwik, Teresa: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kolt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Władysław, 5,470,809, Cl. 502-12.000.

Ready Light Energy Ltd. Israeli Company: *See*—
Schiller, Uri, 5,471,116, Cl. 315-209.00R.

Reagen, William K.; and Conroy, Brian K., to Phillips Petroleum Company. Process of polymerizing olefins in the presence of a chromium-containing catalyst. 5,470,926, Cl. 526-120.000.

Reddy, Chandrashekar M.; and Cho, Sung-Soo, to Intel Corporation. Method for implementing a high speed computer graphics bus. 5,471,672, Cl. 395-296.000.

Reddy, Sekhar: *See*—
Laughlin, Philip; Alexander, John; Kamarei, A. Reza; Dobbie, Robert P.; Lin, Paul; Chang, Shen-Youn; Reddy, Sekhar; Grasset, Etienne; and Melin, Christian, 5,470,839, Cl. 514-53.000.

Reed, Guy, to President and Fellows of Harvard College; and General Hospital Corporation, The. Immunoinhibitors of factor XIII. 5,470,957, Cl. 530-388.250.

Reeder, James O.: *See*—
Gessner, Scott L.; Newkirk, David D.; Thomason, Michael M.; and Reeder, James O., 5,470,639, Cl. 428-152.000.

Rees, Idris J. M.; and Pickersgill, Phillip, to Motorola, Inc. Base station transceiver diagnostic equipment. 5,471,649, Cl. 455-67.400.

Reesor, Gordon J., to Mitel Corporation. Voice switched speakerphone with filters having exponential transfer function in the monitoring path. 5,471,528, Cl. 379-390.000.

Reeves, Malcolm, to Westinghouse Brake & Signal Holding Ltd. Railway track circuits. 5,470,034, Cl. 246-122.00R.

Regeneron Pharmaceuticals, Inc.: *See*—
Stahl, Neil; Economides, Aris N.; and Yancopoulos, George D., 5,470,952, Cl. 530-350.000.

Reger Medical Inc.: *See*—
Reger, Vincent A., 5,469,868, Cl. 128-898.000.

Reger, Vincent A., to Reger Medical Inc. Method of making an artificial heart valve stent. 5,469,868, Cl. 128-898.000.

Reh, Lothar; Tesch, Marc; Häni, Beat; and Ruf, Arthur, to Bühler AG. Apparatus and method for dosing a particulate phase present in a gas/particle flow from a fluidized bed. 5,469,994, Cl. 222-630.000.

Reibetanz, Wilbert; Baumann, Otto; Mueller, Rolf; and Ruckh, Bernd, to Robert Bosch GmbH. Hand drill, in particular hammer drill. 5,470,084, Cl. 279-19.300.

Reichelt, Helmut: *See*—
Lamm, Gunther; Mayer, Udo; Reichelt, Helmut; and Zeidler, Georg, 5,470,959, Cl. 534-680.000.

Reichley, Daniel L.: *See*—
Kandybin, Alexander I.; Anderson, Richard A.; and Reichley, Daniel L., 5,470,378, Cl. 95-100.000.

Reid, Alister P.; Kopec, John; and Sumner, Christopher, to Reilor Limited. Pet Door. 5,469,659, Cl. 49-169.000.

Reilly, Susann R. Method of increasing vaginal lubrication. 5,470,588, Cl. 424-667.000.

Reilor Limited: *See*—
Reid, Alister P.; Kopec, John; and Sumner, Christopher, 5,469,659, Cl. 49-169.000.

Reinbold, James F.: *See*—
Mainard, Tommy D.; and Reinbold, James F., 5,470,087, Cl. 280-33.992.

Reiner, Gerhard: *See*—
Kaaden, Jürgen; and Reiner Gerhard, 5,471,124, Cl. 318-650.000.

Reiner, Michael: *See*—
Toepfer, Bernhard; Reiner, Michael; and Klein, Bodo, 5,470,134, Cl. 303-9.610.

Reist, Craig: *See*—
Taylor, Ronald P.; Sutherland, William M.; Reist, Craig; Wright, Eleanor L.; Webb, Donna; and Labuguen, Ronald, 5,470,570, Cl. 424-93.730.

Reiter, Richard L.: *See*—
Baird, David P.; and Reiter, Richard L., 5,470,472, Cl. 210-391.000.

Remington Arms Company, Inc.: *See*—
Rowlands, Kenneth C.; and Bauman, Thomas G., 5,469,649, Cl 42-43.000.

Ren, Zhibin: *See*—
Gould, Michael N.; Crowell, Pamela L.; Elson, Charles E.; and Ren, Zhibin, 5,470,877, Cl. 514-529.000.

Renard, Pierre: *See*—
Duflos, Muriel; Robert-Piessard, Sylvie; Welin, Lucien; Le Baut, Guillaume; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,470,864, Cl. 514-352.000.

Renault, Denis; and Campana, Roland, to Alcatel Cit. Asynchronous transfer mode digital telecommunication network terminal equipment synchronization device. 5,471,510, Cl. 375-372.000.

Renbarger, Michael: *See*—
Hauser, Ray L.; Zheng, Bolin; Renbarger, Michael; and Lange, Mark A., 5,470,820, Cl. 505-472.000.

Renck, Lawrence E., to Sonoco Products Company. Tubular core assembly having inside-diameter reducing end members secured by mechanical interlocking member. 5,469,619, Cl. 29-895.200.

Renishaw plc: *See*—
Khopov, Vladimir V., 5,471,302, Cl. 356-356.000.

Reschke, Jonathan: *See*—
Goedicke, Klaus; Metzner, Christoph; Schmidt, Joerg; Heisig, Ullrich; Schiller, Siegfried; and Reschke, Jonathan, 5,470,388, Cl. 118-716.000.

Research Corporation Technologies, Inc.: *See*—
O'3 Callaghan, Dennis J., 5,470,718, Cl. 435-69.100.

Resource America, Inc.: *See*—
Grey, Michael J.; and Shaw, William H., 5,469,691, Cl. 53-472.000.

Reusens, Peter P. F.: *See*—
De Langhe, Marc R. F.; Reusens, Peter P. F.; Haspeslagh, Johan J. G.; and Van Hoogenbemt, Stefaan M. A., 5,471,511, Cl. 375-376.000.

Revere Copper Products, Inc.: *See*—
Hunt, David L., 5,469,680, Cl. 52-520.000.

Revol, Nicolas: *See*—
Lauga, Olivier; Revol, Nicolas; and Murou, Lionel, 5,469,936, Cl. 187-205.000.

Rexnord Corporation: *See*—
Harris, Bernard; and Bozych, Dennis E., 5,470,414, Cl. 156-174.000.

Rey, Marie-Anne: *See*—
Hovanessian, Ara G.; Rey, Marie-Anne; Laurent, Anne G.; Krust, Bernard; and Montagnier, Luc, 5,470,702, Cl. 435-5.000.

Reynolds Consumer Products, Inc.: *See*—
May, Timothy J., 5,470,156, Cl. 383-210.000.

Reynolds Metals Company: *See*—
Matthews, Gene C.; and Speight, Mary C., 5,469,968, Cl. 206-532.000.
Parker, Gary B., 5,469,911, Cl. 164-467.000.
Reynolds, Peter: *See*—
Colvin, Donald G.; and Reynolds, Peter, 5,471,524, Cl. 379-200.000.
Rhee, Woonza M.; and Berg, Richard A., to Collagen Corporation. Glycosaminoglycan-synthetic polymer conjugates. 5,470,911, Cl. 525-54.100.
Rhone-Poulenc Chimie: *See*—
Bachot, Jean; and Stutzmann, Pascal, 5,470,449, Cl. 204-252.000.
Braconnier, Jean-Jacques, 5,470,503, Cl. 252-301.40P.
Mignani, Gerard; Richard, Christophe; and Trichon, Roger, 5,470,933, Cl. 528-24.000.
Ribadeau-Dumas, Guillaume; Fouache, Catherine; and Serpelloni, Michel, to Roquette Freres. Sweetening syrup based on maltitol and confectionery using this syrup. 5,470,591, Cl. 426-3.000.
Ribes, Gerard: *See*—
Sauvaire, Yves; and Ribes, Gerard, 5,470,879, Cl. 514-561.000.
Rice, Glenn C.: *See*—
Michnick, John; Underiner, Gail E.; Klein, J. Peter; and Rice, Glenn C., 5,470,878, Cl. 514-558.000.
Richard, Christophe: *See*—
Mignani, Gerard; Richard, Christophe; and Trichon, Roger, 5,470,933, Cl. 528-24.000.
Richardson, John G.: *See*—
Marts, Donna J.; Richardson, John G.; Albano, Richard K.; and Morrison, John L., Jr., 5,470,043, Cl. 251-65.000.
Richie, Thomas W.: *See*—
Schatz, Steven V.; Richie, Thomas W.; Menich, Barry J.; Bonta, Jeffrey D.; and Akinniyi, Akingbade, 5,471,644, Cl. 455-33.200.
Richmond, Scott E.: *See*—
Henson, James A.; Richmond, Scott E.; and Akin, William R., Jr., 5,471,176, Cl. 331-1.00A.
Rickard, Dale A.: *See*—
Brodnax, Timothy B.; Bullis, Bryan K.; King, Steven A.; and Rickard, Dale A., 5,471,599, Cl. 395-412.000.
Rickman, Stephen A., to C & K Systems, Inc. Direction-sensing acoustic glass break detecting system. 5,471,195, Cl. 340-550.000.
Ricoh Company, Ltd.: *See*—
Fujioka, Tetsuya; Bannai, Kazunori; and Takahashi, Hiroshi, 5,471,277, Cl. 355-25.000.
Hayashi, Koji; and Bisaiji, Takashi, 5,471,282, Cl. 355-203.000.
Hotta, Yoshihiko; Kawaguchi, Makoto; and Amano, Tetsuya, 5,471,044, Cl. 235-487.000.
Katano, Yasuo; Nakajima, Tsutomu; Kaneko, Yoshikazu; and Horiguchi, Hiroyuki, 5,471,234, Cl. 347-171.000.
Zandi, Ahmad; Stork, David G.; and Allen, James, 5,471,207, Cl. 341-107.000.
Ricoh Company Ltd: *See*—
Allen, James D.; Boliek, Martin; and Schwartz, Edward L., 5,471,206, Cl. 341-51.000.
Isobe, Tami, 5,471,440, Cl. 369-13.000.
Ricoh Corporation: *See*—
Allen, James D.; Boliek, Martin; and Schwartz, Edward L., 5,471,206, Cl. 341-51.000.
Zandi, Ahmad; Stork, David G.; and Allen, James, 5,471,207, Cl. 341-107.000.
Rief, Dieter J.; and Frentzel, Herman E., to Sta-Rite Industries, Inc. Dual-use and manual pool cleaning apparatus. 5,469,596, Cl. 15-1.700.
Riemer, David W.: *See*—
King, Ken R.; Riemer, David W.; and Cotreau, Gerald M., 5,471,131, Cl. 323-314.000.
Rienhardt, Hans-Peter: *See*—
Buhl, Harro; and Rienhardt, Hans-Peter, 5,469,757, Cl. 74-526.000.
Rieter Ingolstadt Spinnereimaschinenbau AG: *See*—
Gerhard, Hoeber, 5,469,696, Cl. 57-264.000.
Righetti, Pier G.; and Chiari, Marcella. Formulations for polyacrylamide matrices in electrokinetic and chromatographic methodologies. 5,470,916, Cl. 525-296.000.
Rikagaku Kenkyusho: *See*—
Ogawa, Tomoya; Nunomura, Shigeki; and Sugimoto, Mamoru, 5,470,962, Cl. 536-17.200.
Riker, Wayne F.: *See*—
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Mastalski, Henry T., 5,470,271, Cl. 451-55.000.
Rinde, James A.; and Rowe, Richard M., to Raychem Corporation. Enclosing a substrate with a heat-recoverable article. 5,470,622, Cl. 428-34.900.
Rineer Hydraulics, Inc.: *See*—
Stone, Stephen R., 5,470,215, Cl. 418-266.000.
Ring, John: *See*—
Sinclair-Day, John D.; Cassidy, Stephen P.; Ring, John; and Cordiner, Andrew G., 5,470,893, Cl. 523-205.000.
Rink, Karl K.: *See*—
Smith, Bradley W.; and Rink, Karl K., 5,470,104, Cl. 280-737.000.
Rinne, Erkki, to Unicraft Oy. Seal assembly with a hard seal layer actuated through a silicone layer. 5,470,083, Cl. 277-3.000.
Ripley, Ian; and Needham, Anthony H. Method for the recovery of black oil residues. 5,470,458, Cl. 208-370.000.
Risch, Tore J. M., to Hewlett-Packard Company. Method of monitoring changes in an object-oriented database with tuned monitors. 5,471,629, Cl. 395-800.000.
Ritchie, Gregory A. Baseball and golf hitter's training device. 5,470,055, Cl. 273-26.00R.
Ritson, Carl: *See*—
Lloyd, Peter M.; Ritson, Carl; Johansson, Eric T.; and Rubsamen, Reid M., 5,469,750, Cl. 73-861.610.
Rivera, David F.; Floyd, Thomas R.; and Josypenko, Michael J., to United States of America, Navy. Broadband pressure barrier for circular waveguide. 5,471,182, Cl. 333-252.000.
Riverlake Investments Ltd.: *See*—
Mårtensson, Göran, 5,470,019, Cl. 237-19.000.
Riverwood International Corporation: *See*—
Olson, Allen L., 5,469,687, Cl. 53-48.100.
RJF International: *See*—
Knight, Thomas G., 5,469,682, Cl. 52-718.010.
RMO, Inc.: *See*—
Franseen, Steve A.; and Peterson, Jeffrey A., 5,470,228, Cl. 433-8.000.
Ro-An Industries Corporation: *See*—
Terranova, Peter, 5,470,300, Cl. 493-11.000.
Robert Bosch GmbH: *See*—
Kleppner, Stephan; Frank, Kurt; and Mutschler, Jan, 5,469,829, Cl. 123-514.000.
Kragl, Hans; and Weber, Jens, 5,471,551, Cl. 385-37.000.
Ott, Karl; Walter, Klaus; and Strate, Joachim, 5,469,823, Cl. 123-414.000.
Reibetanz, Wilbert; Baumann, Otto; Mueller, Rolf; and Ruckh, Bernd, 5,470,084, Cl. 279-19.300.
Robert-Piessard, Sylvie: *See*—
Duflos, Muriel; Robert-Piessard, Sylvie; Welin, Lucien; Le Baut, Guillaume; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,470,864, Cl. 514-352.000.
Roberts, Eugene, to City of Hope. Peptides for antagonizing the effects of amyloid βprotein. 5,470,951, Cl. 530-330.000.
Roberts, John L.: *See*—
Dadak, Tony M.; and Roberts, John L., 5,469,929, Cl. 180-149.000.
Roberts, Mark J.: *See*—
Howard, Henry E.; Prosser, Neil M.; and Roberts, Mark J., 5,469,710, Cl. 62-22.000.
Robertson, Alvin M.: *See*—
Childs, Stephen L.; Robertson, Alvin M.; Corona, Alessandro, III; and Russ, Karl J., 5,470,492, Cl. 252-8.600.
Robertson, Brian L.: *See*—
Downie, Alan P.; Gallagher, Peter; Garrity, John J.; and Robertson, Brian L., 5,471,368, Cl. 361-760.000.
Robertson, James P. Container for preparing and using alcoholic extracts. 5,470,601, Cl. 426-429.000.
Robertson, James W.: *See*—
Hawk, Kenneth C.; Capper, Harry M.; and Robertson, James W., 5,470,250, Cl. 439-409.000.
Robinson, Mark: *See*—
Bogatin, Yakov; Robinson, Mark; Greenwald, Frank S.; and Ormerod, John, 5,470,400, Cl. 148-301.000.
Rockwell Body and Chassis Systems: *See*—
Gier, Achim R.; Bonduel, Pascal; Heckel, Robert J.; and Fin, Enrico, 5,469,656, Cl. 49-28.000.
Rockwell International Corp.: *See*—
Pykiet, Kenneth L., 5,469,686, Cl. 52-793.110.
White, Stanley A., 5,471,396, Cl. 364-480.000.
Rodak, Daniel, to United States Surgical Corporation. Surgical fastening apparatus with locking mechanism. 5,470,009, Cl. 227-176.000.
Rodak, Daniel P., to United States Surgical Corporation. Surgical fastening apparatus with locking mechanism. 5,470,006, Cl. 227-176.000.
Rodak, Daniel P., to United States Surgical Corporation. Apparatus for applying surgical fasteners. 5,470,008, Cl. 227-176.000.
Rodarmer, Kenneth W.; and Money, Louis W., to Delrod Sales Corporation. Fluid level control system for a continuous chemical treatment device. 5,469,875, Cl. 134-63.000.
Rodeck, Ulrich: *See*—
Herlyn, Meenhard; and Rodeck, Ulrich, 5,470,571, Cl. 424-1.490.
Rodeffer, Charles E.; Byers, John D.; and Rodeffer, Michael E., to Winegard Company. Method for automatically positioning a satellite dish antenna to satellites in a geosynchronous belt. 5,471,219, Cl. 342-359.000.
Rodeffer, Michael E.: *See*—
Rodeffer, Charles E.; Byers, John D.; and Rodeffer, Michael E., 5,471,219, Cl. 342-359.000.
Röder, Manfred: *See*—
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.
Rodzewich, Edward A., to Betz Laboratories, Inc. Composition and method of forming a black no-rinse conversion coating on metal surfaces. 5,470,613, Cl. 427-388.100.
Roehrick, Harry V. Apparatus and method for pest control. 5,469,653, Cl. 47-1.700.
Roehrig, Adalbert: *See*—
Kawa, Franciszek; Stilli, Adrian; and Roehrig, Adalbert, 5,469,910, Cl. 164-459.000.

Roeker, David C.; Manor, Edward L.; and Crosby, Shawn P., to Minnesota Mining and Manufacturing Company. Cutting tool and method for manufacture. 5,469,623, Cl. 30-169.000.

Roelofs, Henricus H.: *See*—
Nieuwendijk, Joris A. M.; Bax, Johannes W. T.; Oepkes, Cornelis J.; Roelofs, Henricus H.; and Van Den Thillart, Martinus P. M., 5,471,018, Cl. 181-152.000.

Rogler, Albert C., to Central Tools, Inc. Brake rotor thickness measurement gage. 5,469,629, Cl. 33-831.000.

Rogler, Dietrich, to Hewlett-Packard Company. Medical monitor. 5,469,844, Cl. 128-630.000.

Rohm Co., Ltd.: *See*—
Mataki, Hiroshi; Uchida, Satoshi; and Sakiyama, Hajime, 5,471,494, Cl. 372-43.000.
Nakamura, Shinji; and Kuriyama, Choujirou, 5,471,365, Cl. 361-523.000.
Shibata, Kazutaka, 5,471,097, Cl. 257-787.000.

Roke Manor Research Limited: *See*—
Hulbert, Anthony P., 5,471,463, Cl. 370-18.000.

Rolando, Richard J.: *See*—
Wilfong, Debra L.; Rutherford, Denise R.; and Rolando, Richard J., 5,470,526, Cl. 428-36.600.

Roll International Corporation: *See*—
Honkawa, Bryan K., 5,469,987, Cl. 221-96.000.

Roller, Günter: *See*—
Litzenberger, Ingo F.; Roller, Günter; and Stein, Dieter, 5,470,444, Cl. 204-93.000.

Roller, Hermann: *See*—
Lehner, August; Schneider, Norbert; Roller, Hermann; Balz, Werner; Lenz, Werner; and Kohl, Albert, 5,470,650, Cl. 428-323.000.

Rolleston, Robert J., to Xerox Corporation. Color printer calibration with improved color mapping linearity. 5,471,324, Cl. 358-518.000.

Rolls-Royce plc: *See*—
Corbett, Nicholas C.; and Lines, Norman P., 5,469,700, Cl. 60-39.060.
Harrogate, Ian W. R.; Taylor, David H.; Griffin, Arthur B.; and Tuson, David W., 5,470,198, Cl. 415-115.000.

Romankiw, Lubomyr T.: *See*—
Chan, Chin-Jong; Chang, Jei-Wei; and Romankiw, Lubomyr T., 5,471,092, Cl. 257-753.000.

Romano, Antonio, to Campagnolo S.r.l. Power operated gear change assembly for bicycles. 5,470,277, Cl. 474-70.000.

Romine, Kindrick W. Smoke detector protector. 5,471,200, Cl. 340-628.000.

Rommelfaenger, Eugene R.: *See*—
Weiss, Bruce W.; and Rommelfaenger, Eugene R., 5,469,751, Cl. 73-863.330.

Rönkönharju, Hannu: *See*—
Pikka, Olavi; and Rönkönharju, Hannu, 5,470,432, Cl. 162-55.000.

Ronneau, Olivier H.: *See*—
Tuma, Daniel L.; Van Peteghem, Jacques V.; and Ronneau, Olivier H., 5,469,702, Cl. 60-311.000.

Root, John A.: *See*—
Kaufman, John W.; Frantz, Robert H.; and Root, John A., 5,470,241, Cl. 439-159.000.
Kaufman, John W.; Root, John A.; and Schroeder, James L., III, 5,470,259, Cl. 439-607.000.

Roquette Freres: *See*—
Ribadeau-Dumas, Guillaume; Fouache, Catherine; and Serpelloni, Michel, 5,470,591, Cl. 426-3.000.

Rose, James W.; D'Souza, Godfrey P.; Stinehelfer, Jonathan J.; and Testa, James F., to Sun Microsystems, Inc. Storage cell using low powered/low threshold CMOS pass transistors having reduced charge leakage. 5,471,421, Cl. 365-182.000.

Rose, Larry D.; Lauritzen, Donald R.; Ravenberg, Mike J.; Thompson, Mark A.; Green, David J.; and Davis, Terry R., to Morton International, Inc. Diffuser device and incorporation thereof in an inflatable restraint system. 5,470,105, Cl. 280-740.000.

Rose, Thomas K.: *See*—
Data, Stanley E.; Koziara, Robert P.; Lent, Mark S.; O'Gorman, Patrick A.; Rose, Thomas K.; Shanks, Eugene G.; and Norrick, Daniel A., 5,469,820, Cl. 123-192.200.

Rosekelly, George S.: *See*—
Craun, Gary P.; Rosekelly, George S.; and Floyd, F. Louis, 5,470,906, Cl. 524-507.000.

Rosen, Richard H.: *See*—
Mikel, Dennis A.; and Rosen, Richard H., 5,470,427, Cl. 156-387.000.

Rosen, Robert K.: *See*—
Devore, David D.; Timmers, Francis J.; Wilson, David R.; and Rosen, Robert K., 5,470,993, Cl. 556-11.000.

Rosenblatt, Solomon, to Merocel Corporation. Laser shield. 5,469,864, Cl. 128-849.000.

Rosenquist, Frederick T.: *See*—
Bonora, Anthony C.; Rosenquist, Frederick T.; Jain, Sudhir; and Davis, Mark R., 5,469,963, Cl. 206-709.000.

Rosensweig, Burton J.: *See*—
Krupotich, Edward A.; and Rosensweig, Burton J., 5,470,182, Cl. 409-137.000.

Roskamp Champion: *See*—
Thom, Kelsey C., Jr., 5,469,781, Cl. 99-516.000.

Ross, Jerry; and Sauvage, Brian. Method and apparatus for creating tattoos. 5,470,351, Cl. 607-95.000.

Ross, Michael E.; Bornos, Robert A.; and Corey, Lawrence G., to Eaton Corporation. Electric switch having improved attachment of movable contact to contact carrier. 5,471,024, Cl. 200-458.000.

Ross, Randall D.; and Bassetti, Kevin J., to Linvatec Corporation. Bioabsorbable interference bone fixation screw. 5,470,334, Cl. 606-72.000.

Rossing, Martin A.: *See*—
Kuehn, Kevin P.; Rossing, Martin A.; and Berg, William C., 5,470,341, Cl. 607-5.000.

Rossman, Timothy A.: *See*—
Glass, Samuel W., III; Rossman, Timothy A.; and Ataman, Vedat T., 5,471,138, Cl. 324-207.190.

Rothfuss, Robert G.; Okorocha, Livyn O.; Bishop, Gregory D.; Sambi, Narinderjit S.; Bedi, James J.; Privitera, Salvatore; and Sherrill, Michael, to Ethicon, Inc. Multiple fire endoscopic stapling mechanism. 5,470,010, Cl. 227-177.000.

Rouget, Frédéric: *See*—
Gandia, Liberto; and Rouget, Frédéric, 5,469,894, Cl. 138-172.000.

Rounbehler, David P.; Fine, David H.; Achter, Eugene K.; MacDonald, Stephen J.; and Dennison, Daniel B., to Coca-Cola Company, The. Method and system for sampling and determining the presence of compounds. 5,470,754, Cl. 436-106.000.

Round Palis AG: *See*—
Colsman, Alfred, 5,469,676, Cl. 52-174.000.

Roussel-Uclaf: *See*—
Fortin, Michel; Frechet, Daniel; Hamon, Gilles; Jouquey, Simone; and Vevert, Jean-Paul, 5,470,867, Cl. 514-393.000.

Rowe, Richard M.: *See*—
Rinde, James A.; and Rowe, Richard M., 5,470,622, Cl. 428-34.900.

Rowell, Roger M.: *See*—
Chen, George C.; and Rowell, Roger M., 5,470,614, Cl. 427-440.000.

Rowlands, Kenneth C.; and Bauman, Thomas G., to Remington Arms Company, Inc. Firearm top lever adjusting system. 5,469,649, Cl. 42-43.000.

Rowley, Thomas E.: *See*—
Smith, Bernard J.; Seager, David B.; Tong, Raymond L.; and Rowley, Thomas E., 5,471,523, Cl. 379-165.000.

Rozzo, Stephen J.: *See*—
Kirkpatrick, Charles H.; and Rozzo, Stephen J., 5,470,835, Cl. 514-21.000.

Rubin, Burton S. Ergonomic hand-held implement. 5,470,162, Cl. 401-6.000.

Rubsamen, Reid M.: *See*—
Lloyd, Peter M.; Ritson, Carl; Johansson, Eric T.; and Rubsamen, Reid M., 5,469,750, Cl. 73-861.610.

Ruby, William M., to Intel Corporation. Apparatus for updating a multi-way set associative cache memory status array. 5,471,605, Cl. 395-445.000.

Ruck, Otto: *See*—
Breyer, Karl-Hermann; Kammleiter, Berndt; and Ruck, Otto, 5,471,406, Cl. 364-559.000.

Ruckh, Bernd: *See*—
Reibetanz, Wilbert; Baumann, Otto; Mueller, Rolf; and Ruckh, Bernd, 5,470,084, Cl. 279-19.300.

Rudy, John E.: *See*—
Akkawi, Isam W.; Hayashida, Scott H.; Ladha, Vivek; and Rudy, John E., 5,471,589, Cl. 395-800.000.

Ruf, Arthur: *See*—
Reh, Lothar; Tesch, Marc; Häni, Beat; and Ruf, Arthur, 5,469,994, Cl. 222-630.000.

Ruff, Gerd: *See*—
Hettlage, Eckart; and Ruff, Gerd, 5,471,183, Cl. 335-4.000.

Ruhe, Thomas A., to J.C. Ford Company. Method of controlling masa sheet thickness produced by tortilla sheeter. 5,470,599, Cl. 426-231.000.

Rukavina, Thomas G.; and Slobodnik, John B., to PPG Industries, Inc. Primer for electrochromic device with plastic substrate. 5,471,554, Cl. 385-131.000.

Rukavina, Thomas G.: *See*—
Yu, Phillip C.; Backfisch, David L.; and Rukavina, Thomas G., 5,471,338, Cl. 359-273.000.

Rule Industries Inc.: *See*—
Burrill, James T.; and Anastos, William N., 5,469,631, Cl. 33-364.000.

Ruprecht, Hans-Dieter: *See*—
Grimm, Wolfgang; Eisen, Norbert; and Ruprecht, Hans-Dieter, 5,470,515, Cl. 264-45.700.

Rushing, Linda L.: *See*—
Rushing, Robert E.; and Rushing, Linda L., 5,469,726, Cl. 70-232.000.

Rushing, Robert E.; and Rushing, Linda L. Nut locking apparatus. 5,469,726, Cl. 70-232.000.

Rushmere, John D.; and Moffett, Robert H., to Du Pont de Nemours, E. I., and Company. Process for preparing water soluble polyaluminosilicates. 5,470,435, Cl. 162-181.600.

Russ, Karl J.: *See*—
Childs, Stephen L.; Robertson, Alvin M.; Corona, Alessandro, III; and Russ, Karl J., 5,470,492, Cl. 252-8.600.

Rust Industrial Services Inc.: *See*—
Barrington, James W.; Masters, Randy W.; and Denny, Mark D., 5,470,459, Cl. 210-149.000.

Rutherford, Denise R.: *See*—
Wilfong, Debra L.; Rutherford, Denise R.; and Rolando, Richard J., 5,470,526, Cl. 428-36.600.

Ryan, Barry W. Phenol formaldehyde resins. 5,470,924, Cl. 525-501.000.

Ryan, Robert E.; and Soriano, Sal, to Northrop Grumman Corporation. Apparatus and method for providing a feedback measurement in a laser system. 5,471,300, Cl. 356-345.000.

Ryat, Marc H., to SGS-Thomson Microelectronics, Inc. Logarithmic and exponential converter circuits. 5,471,132, Cl. 323-315.000.

Rybicki, Daniel J.: *See*—
Dailey, J. R.; McGee, William F.; and Rybicki, Daniel J., 5,471,031, Cl. 219-121.460.

Ryczek, Lawrence J., to Eaton Corporation. Color sensor system using a secondary light receiver. 5,471,052, Cl. 250-226.000.

Ryobi Motor Products Corp.: *See*—
Kikuchi, Naoki; and Kai, Nobuto, 5,470,272, Cl. 451-344.000.

Ryou, Eui K., to Hyundai Electronics Industries Co., Ltd. Method for fabricating stacked dynamic random access memory cell. 5,470,776, Cl. 437-52.000.

Rzodeczko, Anna: *See*—
Kledik, Maciej; Krueger, Andrzej; Kolt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Władysład, 5,470,809, Cl. 502-12.000.

S.L.T. Japan Co., Ltd.: *See*—
Daikuzono, Norio, 5,470,331, Cl. 606-16.000.

Sable, Lewis E.: *See*—
Wenzel, Richard A.; Sable, Lewis E.; Krutchen, Charles M.; and Williams, Phillip A., 5,470,521, Cl. 264-321.000.

Sachdev, Krishna G.; Whitaker, Joel R.; and Ahmad, Umar M., to International Business Machines Corporation. Method of forming patterned polyimide films. 5,470,693, Cl. 430-315.000.

Sachinvala, Navzer D.; Ju, Redford F.; and Litt, Morton H., to Hawaiian Sugar Planters' Association. Thermostable polymers from 1',2',3,3',4,4',6,6'-octa-O-allylsucrose. 5,470,931, Cl. 526-238.230.

Sacks, Martin E.: *See*—
Manganaro, James L.; Sacks, Martin E.; and Carmichael, James, 5,470,564, Cl. 423-521.000.

Saeki, Yasuhiro: *See*—
Hamano, Hisashi; Hosoi, Masahiro; Kobayshi, Ieyasu; and Saeki, Yasuhiro, 5,470,665, Cl. 428-480.000.

Saeva, Franklin D.; and Breslin, David T., to Eastman Kodak Company. Sulfonium salts and the use thereof as photoinitiators. 5,470,994, Cl. 556-64.000.

Saft: *See*—
Oudille, Jean-Claude; and Veiga, Antonio, 5,471,134, Cl. 324-103.00P.

Sagawa, Hiroaki: *See*—
Yamamoto, Katsuhiko; Sagawa, Hiroaki; Kotani, Hirokazu; Hiraoka, Nobutsugu; and Nakamura, Teruya, 5,470,732, Cl. 435-196.000.

Sager, Ruth; Anisowicz, Anthony; and Zou, Zhiqiang, to Dana-Farber Cancer Institute, Inc. Maspin, a serpin with tumor suppresing activity. 5,470,970, Cl. 536-23.500.

Sagl, Dennis: *See*—
Lenney, William E.; and Sagl, Dennis, 5,470,903, Cl. 524-458.000.

Saito, Atsushi; Okubo, Akiro; Watanabe, Fumihiko; and Shinada, Yasuyuki, to Canon Kabushiki Kaisha. Capping means and ink jet recording apparatus using the same. 5,471,230, Cl. 347-29.000.

Saito, Kenichi: *See*—
Niimura, Koichi; Kawabe, Takako; Ando, Takao; and Saito, Kenichi, 5,470,960, Cl. 536-6.400.

Saito, Koichi: *See*—
Imamura, Tsuyoshi; Mizuguchi, Katsumi; Shibai, Yasuhiro; Ishii, Keizou; Ishikura, Shinichi; and Saito, Koichi, 5,470,539, Cl. 422-136.000.

Saito, Kouji: *See*—
Fukunaga, Masao; Sakurai, Yutaka; Saito, Kouji; and Ishihara, Tamio, 5,469,746, Cl. 73-861.120.

Saito, Masao; and Yamanaka, Hideo, to Nippon Petrochmicals Company, Limited. Film manufacturing apparatus with bubble controlling sensor. 5,470,216, Cl. 425-72.100.

Saito, Masato: *See*—
Tanaka, Yasuhiro; Nagai, Yasuhiko; Suzuki, Michio; Kagei, Takashi; Shinnai, Kohsuke; Ikeba, Goro; and Saito, Masato, 5,471,399, Cl. 364-491.000.

Saitoh, Toshinori: *See*—
Suetsugi, Keisuke; Kanno, Hiroshi; Sugawara, Masayuki; Mitani, Kohji; Fujita, Yoshihiro; Saitoh, Toshinori; and Ninomiya, Yuichi, 5,471,323, Cl. 358-511.000.

Sakaegi, Yuji: *See*—
Suzuki, Masao; Matoba, Kazuyuki; Sakaegi, Yuji; and Sasaki, Takashi, 5,471,243, Cl. 348-234.000.

Sakai, Kunihiro: *See*—
Oguchi, Takahiro; Hatanaka, Katsunori; Sakai, Kunihiro; Yamano, Akihiko; and Shido, Shunichi, 5,471,458, Cl. 369-126.000.

Sakai, Minekazu: *See*—
Fujii, Tetsuo; Sakai, Minekazu; and Kuroyanagi, Akira, 5,470,771, Cl. 437-43.000.

Sakai, Takafumi; Wakamatsu, Hideki; Tsuboi, Yoshihiro; and Kawauchi, Masaya, to Honda Giken Kogyo Kabushiki Kaisha. Control apparatus for hydraulically operated vehicular transmission. 5,469,754, Cl. 74-336.00R.

Sakaki, Mikio: *See*—
Amatsu, Keiji; Butoh, Zenhachiroh; Hirai, Hiroshi; Massaki, Minoru; Morita, Hirofumi; Nakajima, Takeo; Nomura, Nobuo; Sakaki, Mikio; Schmandt, Stephen J.; and Tanaka, Katsuhiro, 5,471,615, Cl. 395-200.030.

Sakakibara, Teigo: *See*—
Otani, Noriko; and Sakakibara, Teigo, 5,470,940, Cl. 528-204.000.

Sakamoto, George: *See*—
Sato, Toshiyuki; Sakamoto, George; Takigawa, Morikuni; and Kawasaki, Hirotoki, 5,470,081, Cl. 273-438.000.

Sakamoto, Jun; Yoshida, Minoru; Aoyama, Masatoshi; Suzuki, Masaru; Nakamori, Yukari; Okazaki, Iwao; and Abe, Koichi, to Toray Industries, Inc. Polyester composition and biaxially oriented polyester film containing the same. 5,470,637, Cl. 428-143.000.

Sakamoto, Masaaki: *See*—
Tanaka, Tadashi; Sakamoto, Masaaki; and Sato, Yoshiaki, 5,470,666, Cl. 428-653.000.

Sakamoto, Satoshi; and Orimo, Shinichi, to Sony Corporation. Linear electromagnetic driving apparatus and use of same for lens adjustment. 5,471,100, Cl. 310-12.000.

Sakamoto, Toshiaki: *See*—
Fukumi, Hiroshi; Sakamoto, Toshiaki; Sugiyama, Mitsuo; Yamaguchi, Takeshi; Oshima, Takeshi; Asai, Fumitoshi; and Iijima, Yasuteru, 5,470,851, Cl. 514-214.000.

Sakanushi, Masahiro: *See*—
Hara, Fumio; Fujimura, Akira; Hara, Yoshihisa; and Sakanushi, Masahiro, 5,469,833, Cl. 123-698.000.

Sakashita, Takeshi; Shimoda, Tomoaki; and Kishimura, Kotaro, to GE Plastics Japan. Copolymeric polycarbonate compositions containing a sulfonic acid compound. 5,470,938, Cl. 528-198.000.

Sakata, Takashi; and Matsumoto, Hideaki, to Toa Medical Electronics Co., Ltd. Reagent for detecting malaria infected cells and a detecting method for malaria infected cells using the same. 5,470,751, Cl. 436-63.000.

Sakata, Yoshihiro; Yamashita, Wataru; Okawa, Yuichi; Tamai, Shoji; Ishida, Tsutomu; Matsuo, Mitsunori; Yamaguchi, Keizaburo; and Yamaguchi, Akihiro, to Mitsui Toatsu Chemicals, Inc. Polyimide. 5,470,943, Cl. 528-353.000.

Sakiyama, Hajime: *See*—
Mataki, Hiroshi; Uchida, Satoshi; and Sakiyama, Hajime, 5,471,494, Cl. 372-43.000.

Sakurai, Takehisa: *See*—
Shimada, Yoshinori; Kondo, Naofumi; Sakurai, Takehisa; Kataoka, Yoshiharu; Takahama, Manabu; and Katayama, Mikio, 5,471,070, Cl. 257-57.000.

Sakurai, Yutaka: *See*—
Fukunaga, Masao; Sakurai, Yutaka; Saito, Kouji; and Ishihara, Tamio, 5,469,746, Cl. 73-861.120.

Sales, John K. Mobile system cleaning apparatus. 5,469,598, Cl. 15-321.000.

Sali, Luigi M.; and Golla, Carla, to SGS-Thomson Microelectronics S.A. Fast adder chain. 5,471,413, Cl. 364-786.000.

Salituro, Francesco G.: *See*—
Palfreyman, Michael G.; McDonald, Ian A.; Salituro, Francesco G.; Schwarcz, Robert; and Baron, Bruce M., 5,470,870, Cl. 514-419.000.

Salk Institute for Biological Studies, The: *See*—
Verma, Inder M.; Wisdom, Ronald M.; and Yen, Jong-Young J., 5,470,736, Cl. 435-240.200.

Sallis, Paul J.: *See*—
Bull, Alan; Hardman, David J.; Stubbs, Brian M.; and Sallis, Paul J., 5,470,742, Cl. 435-262.000.

Salomon S.A.: *See*—
Commier, Philippe; Phelipon, Axel; and Le Masson, Jacques, 5,470,094, Cl. 280-602.000.

Salonen, Tauno T.; and Yli-Vakkuri, Erkki P. J., to Tamglass Oy. Heating apparatus for a glass-sheet bending station. 5,470,367, Cl. 65-162.000.

Sam, Huy: *See*—
Nakamura, Yoshinori; Sam, Huy; Fujiwara, Yoshio; Nagura, Toshikazu; Hayasi, Shigeo; and Kusaka, Yukio, 5,470,817, Cl. 503-227.000.
Nakamura, Yoshinori; Sam, Huy; and Fujiwara, Yoshio, 5,470,818, Cl. 503-227.000.

Samant, Kalika R.: *See*—
Kennard, Jeffrey L.; Kodokian, George K.; Popper, Peter; and Samant, Kalika R., 5,470,656, Cl. 428-370.000.

Sambi, Narinderjit S.: *See*—
Rothfuss, Robert G.; Okorocha, Livyn O.; Bishop, Gregory D.; Sambi, Narinderjit S.; Bedi, James J.; Privitera, Salvatore; and Sherrill, Michael, 5,470,010, Cl. 227-177.000.

Samish, Norman C., to Shell Oil Company. Method for reduction of sulfur trioxide in flue gases. 5,470,556, Cl. 423-243.080.

Samsung Aerospace Industries, Ltd.: *See*—
Jeong, Yong-joon; Park, Myung-je; Lee, Kang-won; and Park, Heui-seong, 5,471,268, Cl. 354-106.000.
Kim, Yong-han, 5,471,273, Cl. 354-288.000.

Samsung Electro-Mechanics Co., Ltd.: *See*—
Bae, Kwang W., 5,470,399, Cl. 148-104.000.
Kim, Hyo C., 5,471,664, Cl. 455-323.000.

Samsung Electron Devices Co., Ltd.: *See*—
Kim, Sang-muk, 5,471,111, Cl. 313-36.000.

Samsung Electronics Co., Ltd.: *See*—
Jung, Chil-min; Kim, Kyeong-rae; and Lee, Jeong-hee, 5,471,150, Cl. 326-87.000.
Kim, Jae I., 5,470,746, Cl. 435-287.100.
Lee, Byung M., 5,469,709, Cl. 62-6.000.
Lee, Seung-Keun; and Kwak, Choong-Keun, 5,471,429, Cl. 365-201.000.
Yang, Chang-jip; and Jung, Jun-gyo, 5,470,611, Cl. 427-255.400.
You, Jei-Hwan, 5,471,480, Cl. 371-21.200.

Samsung Heavy Ind. Co. Ltd.: *See*—
Kim, Chang-Soo, 5,471,202, Cl. 340-672.000.

Sanborn, Kimberly B.: *See*—
Loftin, Rachel M.; and Sanborn, Kimberly B., 5,470,904, Cl. 524-462.000.

Sandel, Dan, to Devon Industries, Inc. Disposable cover for contoured surgical light handle. 5,469,600, Cl. 16-111.00R.

Sanders, Karl, to Byk Gulden Lomberg Chemische Fabrik GmbH. 1,4-dihydropyridines for use in the treatment of dermatoses. 5,470,860, Cl. 514-318.000.

Sanders, Ronald: *See*—
Bean, Eric S.; Waldman, Cheryl; and Sanders, Ronald, 5,470,711, Cl. 435-7.100.

Sandin, Rolf S.; and Ljungberg, Per A. M., to Telefonaktiebolaget LM Ericsson. Square switching architecture. 5,471,468, Cl. 370-60.000.

Sandoz Ltd.: *See*—
Baumann, Hans-Peter, 5,470,355, Cl. 8-587.000.
Dischö, Karoly, 5,470,425, Cl. 156-332.000.
Kaul, Bansi L.; Vougioukas, Angelos-Elie; and Goldmann, Jürgen, 5,470,921, Cl. 525-432.000.
Leisy, Douglas J.; Quistad, Gary B.; and Skinner, Wayne S., 5,470,735, Cl. 435-235.100.

Sandstrom, Paul H.: *See*—
Zanzig, David J.; Sandstrom, Paul H.; Hubbell, Joseph K.; Hsu, Wen-Liang; Halasa, Adel F.; and Verthe, John J. A., 5,470,929, Cl. 526-181.000.

Sandvik AB: *See*—
Weinl, Gerold, 5,470,372, Cl. 75-238.000.

Sandyk, Reuven. Treatment of neurological and mental disorders. 5,470,846, Cl. 514-159.000.

Sankaranarayanan, Lakshmi N.; Slotboom, Jan W.; and Van Der Sijde, Arjen G., to U.S. Philips Corporation. Semiconductor device having a programmable memory cell. 5,471,419, Cl. 365-177.000.

Sankey, George H.; Vernon, Nicholas M.; and Wingard, Robert E., Jr., to McNeil-PPC, Inc. Catalyzed sucrose-6-ester process. 5,470,969, Cl. 536-115.000.

Sanko, William J., to Alfred D. Lobo Co., L.P.A. Flow-through linear transfer system for making credit cards and the like, from synthetic resinous sheets. 5,470,428, Cl. 156-498.000.

Sankyo Company, Limited: *See*—
Fukumi, Hiroshi; Sakamoto, Toshiaki; Sugiyama, Mitsuo; Yamaguchi, Takeshi; Oshima, Takeshi; Asai, Fumitoshi; and Iijima, Yasuteru, 5,470,851, Cl. 514-214.000.

Sano, Minoru, to Molex Incorporated. Connector engagement detecting device. 5,470,251, Cl. 439-489.000.

Sanofi: *See*—
Bernat, André; Herbert, Jean-Marc; and Valette, Gérard, 5,470,855, Cl. 514-236.800.

Santoku Metal Industry Co., Ltd.: *See*—
Yamamoto, Kazuhiko; Miyake, Yuichi; Okada, Chikara; and Kitazume, Nobuyuki, 5,470,404, Cl. 148-426.000.

Santos, Benjamin S. Process for converting acid sludge to intermediate sludge and soft and/or hard asphalt. 5,470,455, Cl. 208-4.000.

Sapi Equipements S.A.: *See*—
Michel, Georges L.; and Nathan, Olivier M., 5,470,394, Cl. 134-25.400.

Sapico Establishment: *See*—
McAlister, Graeme J., 5,469,888, Cl. 137-625.170.

Saraceni, Kathleen: *See*—
Grillo, Susan M.; Steffenino, Rita M.; Kunkle, Diane C.; and Saraceni, Kathleen, 5,470,581, Cl. 424-479.000.

Saraswat, Krishna C.: *See*—
Lee, Yong J.; Khuri-Yakub, Butrus T.; and Saraswat, Krishna C., 5,469,742, Cl. 73-597.000.

Sarbell, John P.: *See*—
Braga, David J.; Carter, Thomas L.; Dozier, Edward M.; and Sarbell, John P., 5,471,555, Cl. 385-136.000.

Sargeant, Adrian A.; Currie, William H.; Ouwens, Willem; Brace, Philip J.; Todd, Robert W.; and Scholz, Hans-Joachim, to Fisher & Paykel Limited. Dishwasher. 5,470,142, Cl. 312-258.000.

Sargis, Isaac, to National Trackwork, Inc. Electrical switch stand. 5,470,035, Cl. 246-221.000.

Sarma, Kalluri R., to Honeywell Inc. Polysilicon pixel electrode. 5,471,330, Cl. 359-59.000.

Saruyama, Toshio; and Suzuki, Masahiko, to Dow Corning Toray Silicone Co., Ltd. Vinyl- and alkoxy-functional organosilicon compounds and method for the preparation thereof. 5,470,934, Cl. 52.8-34.000.

Sasago, Yoshikazu: *See*—
Shirai, Hiroyuki; Sekine, Kazumi; Tsuda, Tadayuki; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shoji, Takeo; Noda, Shinya; Kobayashi, Kazunori; and Adachi, Hiroyuki, 5,470,635, Cl. 428-131.000.

Sasaki, Hiroki, to Nissan Motor Co., Ltd. Differential limiting torque control system for automotive vehicles. 5,471,390, Cl. 364-424.050.

Sasaki, Hiroshi; and Tsujino, Hiroyuki, to Kabushiki Kaisha Toshiba. Ultrasound diagnosis apparatus. 5,469,849, Cl. 128-660.070.

Sasaki, Hitoshi; Kobayashi, Yuikio; and Igota, Shyoji, to Ajinomoto Co., Inc. Easily tearable film and pouch made therefrom. 5,470,419, Cl. 156-244.120.

Sasaki, Koji; Yamaguchi, Shizuka; Fumeno, Tsuyoshi; and Fukuoka, Satoshi, to Furukawa Electric Co., Ltd., The. Tip processing method for jacketed optical fibers. 5,469,611, Cl. 29-426.200.

Sasaki, Kunimasa; Wakiyama, Youichi; Matsumoto, Takahiro; Tanaka, Kisaburo; and Yamamoto, Keiichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Cooling drum for a continuous casting system and method for manufacturing the same. 5,469,909, Cl. 164-428.000.

Sasaki, Michiyuki; Suzuki, Kenji; Morosawa, Kenji; Ohba, Toshimitsu; and Kadonaga, Tooru, to Fujitsu Limited. Admission managing system. 5,471,203, Cl. 340-825.310.

Sasaki, Takashi: *See*—
Suzuki, Masao; Matoba, Kazuyuki; Sakaegi, Yuji; and Sasaki, Takashi, 5,471,243, Cl. 348-234.000.

Sasaki, Tooru; and Gyotoku, Kaoru, to Sony Corporation. Microphone apparatus. 5,471,538, Cl. 381-92.000.

Sasaki, Toshio; Ebara, Takeshi; Igarashi, Toshio; Tatsumi, Masayuki; and Wakamatsu, Kazuki, to Sumitomo Chemical Company, Limited. Powder molding process using a thermoplastic elastomer powder. 5,470,900, Cl. 524-269.000.

Sasaki, Yuji; and Harada, Yoshinori, to Hitachi, Ltd. Hydrogen bond labeling and base sequence determination methods for DNA or RNA. 5,470,707, Cl. 435-6.000.

Sasanuma, Nobuatsu: *See*—
Hayashi, Toshio; Arimoto, Shinobu; Yoshinaga, Kazuo; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,471,281, Cl. 155-201.000.

Sasaoka, Mitio: *See*—
Torii, Shigeru; Tanaka, Hideo; Sasaoka, Mitio; Shiroi, Takashi; and Kameyama, Yutaka, 5,470,972, Cl. 540-230.000.

Sas-Jaworsky, Alex; and Williams, Jerry G., to Conoco Inc. System for depth measurement in a wellbore using composite coiled tubing. 5,469,916, Cl. 166-64.000.

Sasser, Lynn: *See*—
Laderoute, Richard; and Sasser, Lynn, 5,469,794, Cl. 108-48.000.

Satake, Toshimi; Takano, Toshiyuki; Hayasaka, Hideki; Uehori, Yukiko; and Nagai, Tomoaki, to Nippon Paper Industries Co., Ltd. Thermal recording sheet. 5,470,816, Cl. 503-201.000.

Sato, Atsushi: *See*—
Watanabe, Akinori; Horiguchi, Itaru; Sato, Atsushi; Kohno, Hiroshige; Ikeda, Kenji; and Iwasaki, Yujiro, 5,470,608, Cl. 427-133.000.

Sato, Heikichi: *See*—
Ogata, Seiichi; Kawaguchi, Moriyuki; Kanota, Keiji; Kubota, Yukio; Sato, Heikichi; and Abe, Iwao, 5,471,355, Cl. 360-84.000.

Sato, Toshiyuki; Sakamoto, George; Takigawa, Morikuni; and Kawasaki, Hirotoki, to DFC Co. Ltd. Control-signal input device for computer game machines. 5,470,081, Cl. 273-438.000.

Sato, Yoshiaki: *See*—
Tanaka, Tadashi; Sakamoto, Masaaki; and Sato, Yoshiaki, 5,470,666, Cl. 428-653.000.

Satoh, Minoru; and Nakamura, Kazuhito, to NEC Corporation. Fixing device having a skew compensation capability. 5,471,289, Cl. 355-290.000.

Satoh, Naoki: *See*—
Yoshida, Makoto; Satoh, Naoki; Asoh, Hidehiko; Shudo, Tuyosi; Takeda, Ryuzaburo; and Taguchi, Jun'ichi, 5,471,141, Cl. 324-314.000.

Satoh, Shinichi; Ozaki, Hiroji; and Eimori, Takahisa, to Mitsubishi Denki Kabushiki Kaisha. Field effect transistor with a shaped gate electrode. 5,471,080, Cl. 257-344.000.

Satou, Michio: *See*—
Yamanobe, Takashi; Satou, Michio; Ishigami, Takashi; Obata, Minoru; Kawai, Mituo; Yagi, Noriaki; Maki, Toshihiro; and Ando, Shigeru, 5,470,527, Cl. 419-53.000.

Satou, Osamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Data recording apparatus of camera. 5,471,266, Cl. 354-106.000.

Sauer, Don R.: *See*—
Chiu, Kwok-Fu; and Sauer, Don R., 5,471,172, Cl. 330-253.000.
Chiu, Kwok-Fu; and Sauer, Don R., 5,471,175, Cl. 330-298.000.

Sauer, Donald J., to David Sarnoff Research Center, Inc. Reference ladder auto-calibration circuit for an analog to digital converter. 5,471,208, Cl. 341-120.000.

Sauvage, Brian: *See*—
Ross, Jerry; and Sauvage, Brian, 5,470,351, Cl. 607-95.000.

Sauvaire, Yves; and Ribes, Gerard, to Laboratories Monal. Treatment of non-insulin-dependent diabetes. 5,470,879, Cl. 514-561.000.

Sauzade, Jean-Denis: *See*—
Guyomar, Daniel; Mazoyer, Thierry; Sauzade, Jean-Denis; and Ching, Gil, 5,471,108, Cl. 310-323.000.

Sawa, Takao: *See*—
Okamura, Masami; Sawa, Takao; Yamauchi, Yoshiyuki; and Kusada, Takao, 5,470,646, Cl. 428-216.000.

Sawada, Kenji: *See*—
Nagayama, Masato; Inuyama, Seiji; Sawada, Kenji; Ohshita, Makoto; and Harada, Fumiaki, 5,471,290, Cl. 355-309.000.

Sawada, Seiji; and Konishi, Yasuhiro, to Mitsubishi Denki Kabushiki Kaisha. Test circuit for refresh counter of clock synchronous type semiconductor memory device. 5,471,430, Cl. 365-222.000.

Sawada, Shuichi; Imagawa, Katsuhiko; and Murase, Yoshihiko, to Yamaha Corporation. Soundboard for musical instruments. 5,469,769, Cl. 84-193.000.

Saxton, Charles A.: *See*—
Klugkist, Jan; and Saxton, Charles A., 5,470,561, Cl. 424-49.000.

Sbalchiero, Federico; and Carboncini, Marco, to Axis USA, Inc. Bonding and coating methods and apparatus for th coils of dynamo-electric machine parts. 5,470,615, Cl. 427-459.000.

Scavone, Timothy A., to Procter & Gamble Company, The. Beta-prime stable low-saturate, low trans, all purpose shortening. 5,470,598, Cl. 426-607.000.
Schaaf, Günter: *See*—
Schäfer, Horst; Schaaf, Günter; Scholz, Bernhard; and Beiss, Günter, 5,470,204, Cl. 416-157.00R.
Schäfer, Horst; and Schaaf, Günter, 5,470,199, Cl. 415-129.000.
Schaaf, William R. Method and apparatus for removing ferrous particles from coolant fluid during machining. 5,470,466, Cl. 210-222.000.
Schaetzle, Ulrich: *See*—
Buchholtz, Gerhard; and Schaetzle, Ulrich, 5,470,350, Cl. 607-97.000.
Schäfer, Horst; and Schaaf, Günter, to KSB Aktiengesellschaft. Adjustment device for propeller pumps. 5,470,199, Cl. 415-129.000.
Schäfer, Horst; Schaaf, Günter; Scholz, Bernhard; and Beiss, Günter, to KSB Aktiengesellschaft. Hydraulic adjustment device. 5,470,204, Cl. 416-157.00R.
Schagunn, Craig. Interlocking tile edge for countertops. 5,470,140, Cl. 312-140.300.
Schaich, Urs: *See*—
Christe, Marcel; and Schaich, Urs, 5,469,896, Cl. 139-450.000.
Schartman, Daniel J.: *See*—
Hill, John H.; Mooberry, Randall L.; and Schartman, Daniel J., 5,469,943, Cl. 188-264.00F.
Schatz, Steven V.; Richie, Thomas W.; Menich, Barry J.; Bonta, Jeffrey D.; and Akinniyi, Akingbade, to Motorola, Inc. Method of reducing audio gap in downlink during handoff of cellular radiotelphone. 5,471,644, Cl. 455-33.200.
Schuis, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., to Eli Lilly and Company. Ring-substituted 2-amino-1,2,3,4-tetra-hydronaphthalenes, 3-aminochromanes and 3-aminothiochromanes. 5,470,977, Cl. 546-101.000.
Scheblein, Joseph W.: *See*—
Lin, Bor-Sheng; Scheblein, Joseph W.; and Bagley, Jerome R., 5,470,862, Cl. 514-341.000.
Scheithauer, Michael J.: *See*—
Dorfman, Leonid P.; Scheithauer, Michael J.; Houck, David L.; and Kopatz, Nelson E., 5,470,549, Cl. 423-61.000.
Scheller, Joseph B.: *See*—
Keemer, Craig B.; Jenkins, William G.; Lamborn, H. Taylor; and Scheller, Joseph B., 5,470,385, Cl. 106-404.000.
Schering Aktiengesellschaft: *See*—
Fahrenholz, Falk; Elger, Walter; Fähnrich, Marianne; and Chwalisz, Kryzsztof, 5,470,948, Cl. 530-315.000.
von Angerer, Erwin; Erber, Sebastian; and Schneider, Martin, 5,470,854, Cl. 514-233.500.
Schermann, Walter; Miller, Dennis; Hilgenfeldt, Eckhard; and Böhme-Kovac, Jozef, to Hoechst Aktiengesellschaft. Thickener combinations for building products. 5,470,383, Cl. 106-170.000.
Scherpereel, Christopher M.: *See*—
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushotham, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.
Scherz, Abraham I.: *See*—
Litwin, Noel; and Scherz, Abraham I., 5,469,723, Cl. 70-107.000.
Scheub, Volker: *See*—
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Grosser, Martin; Schneider, Peter; Barth, Wolfgang; Moll, Hermann; and Pollmann, Horst, 5,469,938, Cl. 187-408.000.
Scheven, Gunter: *See*—
Baumgart, Rudolf; Martin, Manfred; Löw, Lothar; and Scheven, Gunter, 5,470,659, Cl. 428-398.000.
Schiebold, Stefan: *See*—
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.
Schiel, Christian: *See*—
Sollinger, Hans-Peter; and Schiel, Christian, 5,470,438, Cl. 162-273.000.
Schiller, Craig M.: *See*—
Warde, Cardinal; Horsky, Thomas N.; Schiller, Craig M.; and Genetti, George J., 5,471,341, Cl. 359-293.000.
Schiller, Siegfried: *See*—
Goedicke, Klaus; Metzner, Christoph; Schmidt, Joerg; Heisig, Ullrich; Schiller, Siegfried; and Reschke, Jonathan, 5,470,388, Cl. 118-716.000.
Schiller, Uri, to Ready Light Energy Ltd. Israeli Company. General assembly for controlling light intensity of a gas discharge lamp. 5,471,116, Cl. 315-209.00R.
Schillinger, Dieter: *See*—
Benckert, Hartmut; and Schillinger, Dieter, 5,470,167, Cl. 403-322.000.
Schindler, Erich: *See*—
Zomotor, Adam; Klinkner, Walter; Schindler, Erich; Mohn, Frank-Werner; and Wohland, Thomas, 5,471,388, Cl. 364-424.050.
Schlafly, Roger, to Borland International, Inc. Electronic spreadsheet system and methods for compiling a formula stored in a spreadsheet into native machine code for execution by a floating-point unit upon spreadsheet recalculation. 5,471,612, Cl. 395-600.000.
Schlarb, John M.: *See*—
Briese, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Fouquet, Christophe J. A.; and Lowe, Coy S., 5,471,137, Cl. 324-158.100.
Schleyerbach, Rudolf: *See*—
Stahl, Wilhelm; Ahlers, Michael; Walch, Axel; Bartnik, Eckhart; Kretzschmar, Gerhard; Grabley, Susanne; and Schleyerbach, Rudolf, 5,470,843, Cl. 514-61.000.
Schlievert, Patrick: *See*—
Leung, Donald; Schlievert, Patrick; Meissner, Cody; and Fulton, David, 5,470,716, Cl. 435-34.000.
Schlisio, Siegfried: *See*—
Barnes, Vernon B.; Wilkinson, Donald R.; Hancock, Lloyd H.; Oesterling, Erwin; Schlisio, Siegfried; and Hinz, Werner, 5,469,871, Cl. 131-194.000.
Schlosberg, Richard H.; Duncan, Carolyn B.; and Krevalis, Martin A., Jr., to Exxon Chemical Patents Inc. Refrigeration working fluid compositions containing trifluoroethane and neopentyl glycol or trimethylolpropane esters of C_7 and C_9 acids. 5,470,497, Cl. 252-68.000.
Schlosser, Erich J.: *See*—
Stephen, James C.; Schlosser, Erich J.; and Sieg, Ewald, 5,469,835, Cl. 126-25.00B.
Schlotter, Ann M.: *See*—
Coleman, Thomas J.; Schlotter, William K., IV; Coleman, Princess A.; and Schlotter, Ann M., 5,471,373, Cl. 362-109.000.
Schlotter, William K., IV: *See*—
Coleman, Thomas J.; Schlotter, William K., IV; Coleman, Princess A.; and Schlotter, Ann M., 5,471,373, Cl. 362-109.000.
Schlumberger Industries, Inc.: *See*—
Briese, Forrest W.; Hyder, Charles C.; Schlarb, John M.; Fouquet, Christophe J. A.; and Lowe, Coy S., 5,471,137, Cl. 324-158.100.
Schlumberger Industries S.r.l.: *See*—
Cerami, Pietro; Gatti, Pierluigi; and Melis, Pierluigi, 5,471,201, Cl. 340-641.000.
Schlumberger Technology Corporation: *See*—
Herron, Susan L., 5,471,057, Cl. 250-269.600.
Schmandt, Stephen J.: *See*—
Amatsu, Keiji; Butoh, Zenhachiroh; Hirai, Hiroshi; Massaki, Minoru; Morita, Hirofumi; Nakajima, Takeo; Nomura, Nobuo; Sakaki, Mikio; Schmandt, Stephen J.; and Tanaka, Katsuhiro, 5,471,615, Cl. 395-200.030.
Schmid, Karl: *See*—
Linke, Adolf; Pohl, Werner; Schmid, Karl; and Wetzel, Rolf, 5,470,361, Cl. 48-197.00R.
Schmidt, Adolf, to Bartholomy & Co. Vacuum lifter and method. 5,470,117, Cl. 294-64.100.
Schmidt, Delf: *See*—
Angerbauer, Rolf; Fey, Peter; Hübsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, 5,470,982, Cl. 546-268.000.
Schmidt, Donald L.; Harris, Robert F.; and Coburn, Charles, to Dow Chemical Company, The. Water-based acrylic coating compositions. 5,470,908, Cl. 524-520.000.
Schmidt, Glenn H.; and Helmstetter, Richard C., to Callaway Golf Company. Golf putter with dished bottom surfaces. 5,470,068, Cl. 273-167.00A.
Schmidt, Glenn H.; and Helmstetter, Richard C., to Callaway Golf Company. Hollow, metallic golf club head with relieved sole and dendritic structure. 5,470,069, Cl. 273-167.00A.
Schmidt, Helmut: *See*—
Spanhel, Lubomir; Arpac, Ertugrul; Nass, Rüdiger; and Schmidt, Helmut, 5,470,910, Cl. 524-785.000.
Schmidt, Joerg: *See*—
Goedicke, Klaus; Metzner, Christoph; Schmidt, Joerg; Heisig, Ullrich; Schiller, Siegfried; and Reschke, Jonathan, 5,470,388, Cl. 118-716.000.
Schmidt, Peter, to Gummiwerk Kraiburg Development GmbH. Process for producing a railroad crossing means. 5,470,173, Cl. 404-32.000.
Schmidt, Roland; and Denham, Dale L., Jr., to Environmental Projects, Inc. Benefication of saline minerals. 5,470,554, Cl. 423-206.200.
Schmidt-Brücken, Hans-Jpachim: *See*—
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.
Schmitt, Edward E., to Landec Corporation. Cast-in place thermoplastic channel occluder. 5,469,867, Cl. 128-898.000.
Schmitt, Peter J.: *See*—
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Mastalski, Henry T., 5,470,271, Cl. 451-55.000.
Schmutz, Caroline N.; Shokoohi, Frough K.; Tarascon, Jean-Marie; and Warren, Paul C., to Bell Communications Research, Inc. Method of making a laminated lithium-ion rechargeable battery cell. 5,470,357, Cl. 29-623.500.
Schneider, John R.: *See*—
Makhlouf, Joseph M.; and Schneider, John R., 5,470,886, Cl. 521-59.000.
Schneider, Karl F.; Dembosky, Stanley K.; Fairbank, Donn K.; Spokas, Romas B.; and Kedney, Bradley L., to Borg-Warner Automotive, Inc. Compact continuously variable transmission layout for rear wheel drive vehicles. 5,470,285, Cl. 475-210.000.
Schneider, Martin: *See*—

von Angerer, Erwin; Erber, Sebastian; and Schneider, Martin, 5,470,854, Cl. 514-233.500.

Schneider, Norbert: *See*—
Lehner, August; Schneider, Norbert; Roller, Hermann; Balz, Werner; Lenz, Werner; and Kohl, Albert, 5,470,650, Cl. 428-323.000.

Schneider, Peter: *See*—
Biewald, Joachim; Scheub, Volker; Holler, Helge; Fenkl, Karl; Hugel, Stefan; Grosser, Martin; Schneider, Peter; Barth, Wolfgang; Moll, Hermann; and Pollmann, Horst, 5,469,938, Cl. 187-408.000.

Schoch, Karl F., Jr.: *See*—
Shea, John J.; Smith, James D. B.; and Schoch, Karl F., Jr., 5,471,185, Cl. 335-51.000.

Schock, Eileen A.: *See*—
Palansky, Bruce J.; Greene, Thomas L.; and Schock, Eileen A. 5,470,288, Cl. 477-110.000.

Schoechle, Timothy D.: *See*—
Zimmermann, Philip R., 5,471,190, Cl. 340-310.010.

Schoenherr, William J.: *See*—
Krahnke, Robert H.; Mealey, Shawn K.; Schoenherr, William J.; Smith, Schyler B., deceased; and Tangney, Thomas J., 5,470,923, Cl. 525-477.000.

Schofield, Robert T.: *See*—
Melter, Craig H.; and Schofield, Robert T., 5,469,625, Cl. 30-251.000.

Scholz, Bernhard: *See*—
Schäfer, Horst; Schaaf, Günter; Scholz, Bernhard; and Beiss, Günter, 5,470,204, Cl. 416-157.00R.

Scholz, Hans-Joachim: *See*—
Sargeant, Adrian A.; Currie, William H.; Ouwens, Willem; Brace, Philip J.; Todd, Robert W.; and Scholz, Hans-Joachim, 5,470,142, Cl. 312-258.000.

Schönenberger, Willi, to Woodway AG. Toothed-belt, V-belt, and pulley assembly, for treadmills. 5,470,293, Cl. 482-54.000.

Schorn, Eric B.: *See*—
Barakat, Edmond H.; Chin, Arthur L.; and Schorn, Eric B., 5,471,585, Cl. 395-308.000.

Schram, James L.: *See*—
Walker, George T.; Nadeau, James G.; Spears, Patricia A.; Nycz, Colleen M.; Shank, Daryl D.; Schram, James L.; and Jurgensen, Stewart R., 5,470,723, Cl. 435-91.200.

Schroeder, James L., III: *See*—
Kaufman, John W.; Root, John A.; and Schroeder, James L., III, 5,470,259, Cl. 439-607.000.

Schubert, William L.: *See*—
Orbach, Abraham; Panoushek, Dale W.; and Schubert, William L., 5,469,921, Cl. 172-4.000.

Schulmerich Carillons, Inc.: *See*—
Schwartz, Gregory L.; and Frick, Karl, 5,471,006, Cl. 84-609.000.

Schulthess, Adrian: *See*—
Wolf, Jean-Pierre; Schulthess, Adrian; Steinmann, Bettina; and Hunziker, Max, 5,470,689, Cl. 430-269.000.

Schultz, Charles P., to Motorola, Inc. Method for establishing a user defined radio talk group in a trunked radio communication system. 5,471,646, Cl. 455-54.100.

Schumacher, Charles E. Machining head for a water jet cutting machine and aiming device intended to equip such head. 5,469,768, Cl. 83-177.000.

Schuman, Marc R., to Topometrix. Scanning apparatus linearization and calibration system. 5,469,734, Cl. 73-105.000.

Schummer, Helmut: *See*—
Dönig, Gerhard; Hümpfner, Roland; Grass, Norbert; Knaak, Hans-Joachim; Neulinger, Franz; and Schummer, Helmut, 5,471,377, Cl. 363-21.000.

Schüring, Andreas: *See*—
Becker, Lutz; and Schüring, Andreas, 5,471,496, Cl. 373-94.000.

Schuster, Paul A.: *See*—
Dennis, Stephen V.; Shaiman, Steve; McCormick, William B.; Flagg, Robert C.; and Schuster, Paul A., 5,471,563, Cl. 395-114.000.

Schuster, Stanley E.: *See*—
Chappell, Barbara A.; Chappell, Terry I.; Fleischer, Bruce M.; and Schuster, Stanley E., 5,471,188, Cl. 340-146.200.

Schutter, Ernst; and Gorelik, Vladimir, to Sennheiser electronic KG. Electrodynamic acoustic transducer. 5,471,437, Cl. 367-175.000.

Schwab, Ivan R.: *See*—
Charlton, Judie F.; Schwab, Ivan R.; and Stuchell, Robert M., 5,470,881, Cl. 514-588.000.

Schwalke, Udo; and Bieringer, Fritz, to Siemens Aktiengesellschaft. Method for manufacturing an integrated circuit arrangement. 5,470,782, Cl. 437-70.000.

Schwalm, Dieter; and Neumann, Rainer, to Vulkan Lokring GmbH. Connector for plastic tubes. 5,470,113, Cl. 285-255.000.

Schwan, Rainer; and Krämer, Rudi, to Whitaker Corporation, The. Smart card connector. 5,470,260, Cl. 439-630.000.

Schwan, T. G.: *See*—
Simpson, Warren; and Schwan, T. G., 5,470,712, Cl. 435-7.320.

Schwarcz, Robert: *See*—
Palfreyman, Michael G.; McDonald, Ian A.; Salituro, Francesco G.; Schwarcz, Robert; and Baron, Bruce M., 5,470,870, Cl. 514-419.000.

Schwartz, Edward L.: *See*—
Allen, James D.; Boliek, Martin; and Schwartz, Edward L., 5,471,206, Cl. 341-51.000.

Schwartz, Gregory L.; and Frick, Karl, to Schulmerich Carillons, Inc. Electronic carillon system and sequencer module therefor. 5,471,006, Cl. 84-609.000.

Schwartz, James H.: *See*—
Frank, Robert G.; and Schwartz, James H., 5,470,366, Cl. 65-104.000.

Schwartz, Martin A.; and Van Wart, Harold, to Florida State University. Sulfoximine and suldodiimine matrix metalloproteinase inhibitors. 5,470,834, Cl. 514-19.000.

Schwarz, Klaus-Peter: *See*—
Decker, Hans-Josef; and Schwarz, Klaus-Peter, 5,469,731, Cl. 73-23.310.

Schwegler, William C.: *See*—
Fruchterman, James R.; Schwegler, William C.; Merritt, Bruce W.; and LaPierre, Charles, 5,470,233, Cl. 434-112.000.

Schweingruber, Hans: *See*—
Brandley, Brian K.; Tiemeyer, Michael; Swiedler, Stuart J.; Moreland, Margaret; and Schweingruber, Hans, 5,470,842, Cl. 514-61.000.

Schwerdt, Franz: *See*—
Spahn, Karl-Heinz; Aswegen, Helmut; and Schwerdt, Franz, 5,469,727, Cl. 70-278.000.

Schwob, Yvan: *See*—
Lonchamp, Daniel; and Schwob, Yvan, 5,470,370, Cl. 71-25.000.

Scientific Atlanta, Inc.: *See*—
Pidgeon, Rezin E., Jr.; and Martin, Grover H., 5,471,492, Cl. 372-38.000.

SCIMED Life Systems, Inc.: *See*—
Adams, Daniel O., 5,470,315, Cl. 604-96.000.

Scott, Ian M.: *See*—
Whitfield, Kenneth H.; Scott, Ian M.; and Castro, Michael, 5,470,338, Cl. 606-144.000.

Scott, Randy W.; Gleich, Gerald J.; and Wilde, Craig G., to Incyte Pharmaceuticals, Inc. Basophil granule proteins. 5,470,825, Cl. 514-2.000.

Scott, Ray V., Jr.: *See*—
House, David W.; Scott, Ray V., Jr.; and Gattuso, Mark J., 5,470,890, Cl. 521-128.000.

Scourtes, George; and Gagneur, John P., to Lucas Automation & Control Engineering, Inc. Apparatus and methods for detecting imbalance. 5,469,741, Cl. 73-462.000.

Scripps Research Institute, The: *See*—
Frelinger, Andrew L., III; Plow, Edward F.; and Ginsberg, Mark H., 5,470,738, Cl. 435-240.270.

Seagate Technology, Inc.: *See*—
Bortins, John; Stageberg, Frank; Stover, Lance E.; and Weispfenning, Gerald L., 5,471,354, Cl. 360-77.050.

Seager, David B.: *See*—
Smith, Bernard J.; Seager, David B.; Tong, Raymond L.; and Rowley, Thomas E., 5,471,523, Cl. 379-165.000.

Seaman, Michael J.: *See*—
Gavin, Vincent G.; Seaman, Michael J.; Crook, Neal A.; and Mistry, Bipin, 5,471,632, Cl. 395-284.000.

Sebel Furniture Limited: *See*—
Kerkham, Katrina A., 5,470,128, Cl. 297-232.000.

Sederquist, Richard A., to International Fuel Cells Corporation. Fuel cell power plant reformer burner gas flow control system. 5,470,360, Cl. 48-94.000.

Seeger, David E.: *See*—
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushothaman, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.

Sefidvash, Khorvash; and Hashemi, Seyed H., to Unisys Corporation. Interface system having plurality of channels and associated independent controllers for transferring data between shared buffer and peripheral devices independently. 5,471,586, Cl. 395-284.000.

Sega of America, Inc.: *See*—
Naka, Yuji; and Yamamoto, Masanobu, 5,470,080, Cl. 273-437.000.

Seidou, Yoshio. Speed reduction device. 5,470,283, Cl. 475-162.000.

Seikagaku Kogyo Kabushiki Kaisha: *See*—
Aoki, Shigehisa; Iwasaki, Shinichi; Sugiura, Nobuo; Suzuki, Sakaru; and Kimata, Koji, 5,470,578, Cl. 424-450.000.

Seiki Kabushiki Kaisha: *See*—
Yokoyama, Kin-ichi; and Kato, Izumi, 5,470,219, Cl. 425-144.000.

Seiko Epson Corporation: *See*—
Hosono, Satoru; Naka, Takahiro; Yonekubo, Shuji; and Shinada, Satoshi, 5,471,232, Cl. 347-70.000.

Sekine, Kazumi: *See*—
Shirai, Hiroyuki; Sekine, Kazumi; Tsuda, Tadayuki; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shoji, Takeo; Noda, Shinya; Kobayashi, Kazunori; and Adachi, Hiroyuki, 5,470,635, Cl. 428-131.000.

Selectide Corporation: *See*—
Sepetov, Nikolai; Issakova, Olga; Krchnak, Viktor; and Lebl, Michal, 5,470,753, Cl. 436-89.000.

Sells, Chris; and Hampsten, Russ, to Intel Corporation. Telephone line sharing for a personal computer system. 5,471,522, Cl. 379-97.000.

Semiconductor Energy Laboratory Co., Ltd.: *See*—
Codama, Mitsufumi; and Kondo, Noriaki, 5,470,762, Cl. 437-21.000.

Semura, Shigeru: *See*—
Yui, Dai; Hirai, Shigeru; and Semura, Shigeru, 5,471,306, Cl. 356-367.000.

Sennheiser electronic KG: *See*—
Schutter, Ernst; and Gorelik, Vladimir, 5,471,437, Cl. 367-175.000.
Sentry Equipment Corp.: *See*—
Weiss, Bruce W.; and Rommelfaenger, Eugene R., 5,469,751, Cl. 73-863.330.
Senuma, Toshitaka: *See*—
Okumoto, Koji; Matsuno, Katsumi; Shiono, Toru; Senuma, Toshitaka; Fukuda, Tokuya; and Takada, Shinji, 5,471,481, Cl. 371-22.300.
Seo, Jung Y., to Goldstar Electron Co., Ltd. Magnetic pencil for moving semiconductor packages. 5,471,186, Cl. 335-285.000.
Sepetov, Nikolai; Issakova, Olga; Krchnak, Viktor; and Lebl, Michal, to Selectide Corporation. Peptide sequencing using mass spectrometry. 5,470,753, Cl. 436-89.000.
Seppa, Dale K.: *See*—
Byers, Larry L.; Mackenthun, Donald W.; Fye, Philip J.; Maciona, Gerald J.; Engel, Jeff A.; Price, Ferris T., deceased; and Seppa, Dale K., 5,471,482, Cl. 371-21.200.
Sepracor Inc.: *See*—
Girot, Pierre; and Boschetti, Egisto, 5,470,463, Cl. 210-198.200.
Young, James W., 5,470,868, Cl. 514-397.000.
Sergeev, Vilaly E.: *See*—
Sundberg, Staffan; Sergeev, Vilaly E.; and Nesterov, Vladimir G., 5,470,166, Cl. 403-314.000.
Serpelloni, Michel: *See*—
Ribadeau-Dumas, Guillaume; Fouache, Catherine; and Serpelloni, Michel, 5,470,591, Cl. 426-3.000.
Sertic, James L.: *See*—
Arnett, Jeffery D.; Gately, Nicholas V.; Grulke, David H.; Hilsbos, Ruth A.; and Sertic, James L., 5,470,305, Cl. 601-161.000.
Servi-Tech Inc.: *See*—
Nish, Terry E., 5,469,899, Cl. 141-275.000.
Sessa, Raymond V. Shoe sole having insert with graduated cushioning properties. 5,469,639, Cl. 36-28.000.
Setani, Michitaka, to Canon Kabushiki Kaisha. Color image reading device. 5,471,321, Cl. 358-474.000.
Seto, Kaoru: *See*—
Fujii, Haruo; Kobayashi, Tatsuya; Imai, Nobuhiro; Kojima, Hisayoshi; Umezawa, Masao; Tada, Hideki; Ito, Akira; Seto, Kaoru; Katoh, Motoi; and Murata, Daisuke, 5,471,284, Cl. 355-210.000.
Setterstrom, Jean A.; Jacob, Elliot; and Franz, Walter K., to United States of America, Army. Microsphere drug application device. 5,470,311, Cl. 604-24.000.
Sevenhans, Joannes M. J.; and Van Paemel, Mark G. S. J., to Alcatel N.V. Quality factor tuning system for a tunable filter and current rectifier used therein. 5,471,168, Cl. 327-553.000.
Severens, Arnoldus L. G. J.: *See*—
Liedenbaum, Coen T. H. F.; Severens, Arnoldus L. G. J.; Drenten, Ronald R.; and Jongerius, Michiel J., 5,471,490, Cl. 372-32.000.
Severinsson, Lars: *See*—
Lundström, Bo; and Severinsson, Lars, 5,469,950, Cl. 192-85.000.
Seybold, Guenther: *See*—
Hahn, Erwin; Ostertag, Werner; and Seybold, Guenther, 5,470,502, Cl. 252-301.350.
Seymour, Timothy H. Bucket conveyor chain. 5,469,957, Cl. 198-711.000.
Sezaki, Yoshiaki: *See*—
Iwai, Kiyoshi; Kondo, Kimio; Sezaki, Yoshiaki; Fukata, Masatoshi; Hashimoto, Eiji; and Yoshioka, Toshio, 5,469,799, Cl. 114-74.00A.
Sezi, Tevfik, to Siemens Aktiengeselleschaft. Digital device for measuring the frequency of an electrical signal. 5,471,133, Cl. 324-76.440.
SGP Verkehrstechnik Gesellschaft m.b.h.: *See*—
Lenk, Leopold, 5,469,792, Cl. 105-4.100.
SGS-Thomson Microelectronics, Inc.: *See*—
Kalnitsky, Alexander, 5,470,793, Cl. 437-195.000.
McClure, David C., 5,471,157, Cl. 326-93.000.
McClure, David C., 5,471,415, Cl. 365-49.000.
McClure, David C., 5,471,426, Cl. 365-200.000.
McClure, David C., 5,471,431, Cl. 365-225.700.
Ryat, Marc H., 5,471,132, Cl. 323-315.000.
SGS-Thomson Microelectronics S.A.: *See*—
Pezzani, Robert, 5,471,074, Cl. 257-121.000.
Sali, Luigi M.; and Golla, Carla, 5,471,413, Cl. 364-786.000.
SGS-Thomson Microelectronics S.r.l: *See*—
Baroni, Andrea; Mastrodomenico, Giovanni; Michele, Taliercio; Capocelli, Piero; Carro, Luigi; and Varambally, Rajamohan, 5,471,428, Cl. 365-201.000.
Shah, Kashyap H.: *See*—
Blank, David L.; Crill, Roger O.; Pusey, Bruce A.; and Shah, Kashyap H., 5,470,195, Cl. 414-797.000.
Shah, Tilak M., to Polygenex International, Inc. Polyurethane condom of welded polyurethane film. 5,469,863, Cl. 128-844.000.
Shaiman, Steve: *See*—
Dennis, Stephen V.; Shaiman, Steve; McCormick, William B.; Flagg, Robert C.; and Schuster, Paul A., 5,471,563, Cl. 395-114.000.
Shalaby, Shalaby W.: *See*—
Bezwada, Rao S.; Shalaby, Shalaby W.; and Koelmel, Donald F., 5,470,340, Cl. 606-231.000.
Shamay, Ezra: *See*—
Faibish, Sorin; Shamay, Ezra; and Shteckelman, Shalom, 5,471,214, Cl. 342-70.000.
Shandon, Inc.: *See*—
Hayes, William J., 5,470,758, Cl. 436-177.000.
Shank, Daryl D.: *See*—
Walker, George T.; Nadeau, James G.; Spears, Patricia A.; Nycz, Colleen M.; Shank, Daryl D.; Schram, James L.; and Jurgensen, Stewart R., 5,470,723, Cl. 435-91.200.
Shanks, Eugene G.: *See*—
Data, Stanley E.; Koziara, Robert P.; Lent, Mark S.; O'Gorman, Patrick A.; Rose, Thomas K.; Shanks, Eugene G.; and Norrick, Daniel A., 5,469,820, Cl. 123-192.200.
Sharkey, Hugh R.: *See*—
Edwards, Stuart D.; Lax, Ronald G.; Sharkey, Hugh R.; and Lundquist, Ingemar H., 5,470,308, Cl. 604-22.000.
Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; and Sharkey, Hugh R., 5,470,309, Cl. 604-22.000.
Sharma, Pramod K.: *See*—
Janes, Todd L.; Meade, Alexander D.; Murthy, Ashok; Sharma, Pramod K.; and Wallin, Peter E., 5,471,291, Cl. 355-326.00R.
Sharma, Raghu; Davis, Jeffrey P.; Guna, Timothy D.; Li, Ping; Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, to Multi-Tech Systems, Inc. Computer-based multifunction personal communications system. 5,471,470, Cl. 370-81.000.
Sharp Corporation: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,471,161, Cl. 327-58.000.
Sharp, Gary A.; and Jonsson, Jan-Erik, to American Knife, Inc. Chipper knife and knife holder assembly. 5,469,902, Cl. 144-241.000.
Sharp Kabushiki Kaisha: *See*—
Irihara, Kouichi; Yamasa, Hideo; Shimaza, Fumio; and Wada, Takasumi, 5,471,283, Cl. 355-205.000.
Katayama, Yoshio; Fujii, Seiichi; Uchiyama, Sadao; Soejima, Ryouichi; Moori, Hitoshi; and Yoshida, Hideo, 5,471,439, Cl. 369-13.000.
Maeda, Hiroshi, 5,471,082, Cl. 257-362.000.
Nakai, Junichi, 5,470,760, Cl. 437-2.000.
Nakajima, Mutsumi; Nagashima, Nobuyoshi; and Tanaka, Kyoushi, 5,471,329, Cl. 359-54.000.
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 5,470,694, Cl. 430-321.000.
Shimada, Yoshinori; Kondo, Naofumi; Sakurai, Takehisa; Kataoka, Yoshiharu; Takahama, Manabu; and Katayama, Mikio, 5,471,070, Cl. 257-57.000.
Sharpe, Claude A.; Hurta, Dwaine S.; Hamlett, Mark A.; and Froschermeier, Guenther, to Texas Instruments Incorporated; and Texas Instruments Deutschland GmbH. Multi-stage transponder wake-up, method and structure. 5,471,212, Cl. 342-51.000.
Shaw, Jane M.: *See*—
Bailey, Fredric D.; Buchanan, Douglas A.; Callegari, Alessandro C.; Clearfield, Howard M.; Doany, Fuad E.; Flagello, Donis G.; Hovel, Harold J.; Latulipe, Douglas C., Jr.; Lustig, Naftali E.; Pomerene, Andrew T. S.; Purushotharnan, Sampath; Scherpereel, Christopher M.; Seeger, David E.; and Shaw, Jane M., 5,470,661, Cl. 428-408.000.
Shaw, Malcolm: *See*—
Tripp, Terrance B.; and Shaw, Malcolm, 5,470,525, Cl. 419-36.000.
Shaw, William H.: *See*—
Grey, Michael J.; and Shaw, William H., 5,469,691, Cl. 53-472.000.
Shea, John J.; Smith, James D. B.; and Schoch, Karl F., Jr., to Eaton Corporation. Electrical circuit protection devices comprising conductive liquid compositions. 5,471,185, Cl. 335-51.000.
Shekar, Mallikarjunaswamy S.; Baliga, B. Jayant; and Korec, Jacek, to North Carolina State University. Dual-channel emitter switched thyristor with trench gate. 5,471,075, Cl. 257-139.000.
Shell Oil Company: *See*—
Grandvallet, Pierre; Allais, Daniel G. P.; and Dejaifve, Pierre E. J. G., 5,470,454, Cl. 208-144.000.
Samish, Norman C., 5,470,556, Cl. 423-243.080.
Shell Research Limited: *See*—
Jacobson, Richard M.; Ramsay, J. Roger; Aller, Harold E.; and Thiruganam, Muthuvelu, 5,470,984, Cl. 548-264.400.
Shen, Pei K.: *See*—
Tseung, Alfred C. C.; Shen, Pei K.; and Syed-Bokhari, Jade, 5,470,673, Cl. 429-44.000.
Sher, Louis Y. Circular, piece-matching math educational aid. 5,470,234, Cl. 434-196.000.
Sherrill, Michael: *See*—
Rothfuss, Robert G.; Okorocha, Livyn O.; Bishop, Gregory D.; Sambi, Narinderjit S.; Bedi, James J.; Privitera, Salvatore; and Sherrill, Michael, 5,470,010, Cl. 227-177.000.
Sheu, Lieh-Jou: *See*—
Kuo, Tse-Hsin; and Sheu, Lieh-Jou, 5,470,133, Cl. 301-95.000.
Shi, Zhao-Qi, to Traditional Chinese Medicine Research Laboratory, Inc. Hardening agent for affected tissues of the digestive system. 5,470,589, Cl. 424-698.000.
Shiba, Akira: *See*—
Iizuka, Miyuki; and Shiba, Akira, 5,469,850, Cl. 128-660.070.
Shibai, Yasuhiro: *See*—
Imamura, Tsuyoshi; Mizuguchi, Katsumi; Shibai, Yasuhiro; Ishii, Keizou; Ishikura, Shinichi; and Saito, Koichi, 5,470,539, Cl. 422-136.000.
Shibata, Kazutaka, to Rohm Co., Ltd. Resin encapsulated semiconductor device with an electrically insulating support and distortion preventing member. 5,471,097, Cl. 257-787.000.
Shibata, Kouichi; Morikawa, Yusuke; and Ohmi, Ikuhiro, to Mita Industrial Co., Ltd. Printer having a bit shift function. 5,471,562, Cl. 395-101.000.

Shibata, Tadayoshi; and Oi, Nakao, to Fuji Photo Film Co., Ltd. Method of making photographs of different aspect ratios and a photographic film cartridge, a camera and a photographic printer for use in practicing the method. 5,471,265, Cl. 354-76.000.

Shibatani, Kazuhiro: *See—*
Suzuki, Kenshi; Shibatani, Kazuhiro; and Nishii, Hisao, 5,471,385, Cl. 364-424.020.

Shibuta, Takekazu; Nakamori, Toshinori; and Hirai, Ikuhito, to Shima Seiki Mfg., Ltd. Method for knitting a crossing pattern and an apparatus for knitting a crossing pattern in flat knitting machine. 5,469,717, Cl. 66-69.000.

Shibuya, Munehiro; Kitagawa, Masatoshi; Kamada, Takeshi; and Hirao, Takashi, to Matsushita Electric Industrial Co., Ltd. Dielectric thin film and method of manufacturing same. 5,470,398, Cl. 148-33.300.

Shida, Osamu: *See—*
Tanaka, Yasushi; Tojo, Takashi; Uchida, Kazuhiko; Uno, Jun; Uchida, Yasushi; and Shida, Osamu, 5,470,827, Cl. 514-11.000.

Shido, Shunichi: *See—*
Oguchi, Takahiro; Hatanaka, Katsunori; Sakai, Kunihiro; Yamano, Akihiko; and Shido, Shunichi, 5,471,458, Cl. 369-126.000.

Shih, Jerry: *See—*
Howe, Wayne; Silver, Ed; Bailey, Kim; Shih, Jerry; Morel, Kitty; Hill, Peter; Addison, Cathy; Woodring, Larry; and Malik, Dale, 5,471,519, Cl. 379-67.000.

Shima Seiki Mfg., Ltd.: *See—*
Shibuta, Takekazu; Nakamori, Toshinori; and Hirai, Ikuhito, 5,469,717, Cl. 66-69.000.

Shimada, Satoshi; Ugai, Seiichi; Tobita, Tomoyuki; and Yamamoto, Yoshimi, to Hitachi, Ltd. Multiple-function fluid measuring and transmitting apparatus. 5,469,749, Cl. 73-861.470.

Shimada, Takashi; Iwata, Keiichi; and Yasuda, Masako, to Japan Pionics Co., Ltd. Process for purification of gaseous organometallic compound. 5,470,555, Cl. 423-219.000.

Shimada, Yoshinori; Kondo, Naofumi; Sakurai, Takehisa; Kataoka, Yoshiharu; Takahama, Manabu; and Katayama, Mikio, to Sharp Kabushiki Kaisha. Thin-film transistor circuit having an amorphous silicon load and a driver transistor and a method of producing the same. 5,471,070, Cl. 257-57.000.

Shimadzu Corporation: *See—*
Nokihara, Kiyoshi; and Yamamoto, Rintaro, 5,470,703, Cl. 435-4.000.

Shimazu, Fumio: *See—*
Irihara, Kouichi; Yamasa, Hideo; Shimazu, Fumio; and Wada, Takasumi, 5,471,283, Cl. 355-205.000.

Shimizu, Isamu: *See—*
Ishihara, Shunichi; Hanna, Junichi; Shimizu, Isamu; and Hirooka, Masaaki, 5,470,389, Cl. 118-719.000.

Shimizu, Tetsuo: *See—*
Ishiwari, Kazuo; Yamamoto, Yoshihisa; and Shimizu, Tetsuo, 5,470,901, Cl. 524-345.000.

Shimizu, Toru; and Iwata, Shunichi, to Mitsubishi Denki Kabushiki Kaisha. Data processor with means for separately receiving and processing different types of interrupts. 5,471,620, Cl. 395-375.000.

Shimizu, Yuichi: *See—*
Nishii, Masanobu; Shimizu, Yuichi; Kawanishi, Shunichi; Sugimoto, Shunichi; Endo, Masao; and Nagase, Tomohiro, 5,470,617, Cl. 427-521.000.

Shimizume, Kazutoshi, to Sony Corporation. Compact disc player using Sub-Q data for track jump compensation. 5,471,442, Cl. 369-32.000.

Shimoda, Tomoaki: *See—*
Sakashita, Takeshi; Shimoda, Tomoaki; and Kishimura, Kotaro, 5,470,938, Cl. 528-198.000.

Shimokawa, Naoki: *See—*
Mori, Masukazu; Yamanaka, Hiroyoshi; Kubota, Norio; and Shimokawa, Naoki, 5,470,203, Cl. 416-144.000.

Shimoyama, Yutaka: *See—*
Hirano, Shinji; Kimoto, Naomi; Shimoyama, Yutaka; Hirohashi, Setsuo; and Takeichi, Masatoshi, 5,470,966, Cl. 536-23.500.

Shin, Chang J.; and Moon, Jong D., to Goldstar Co., Ltd. Lubricating device for horizontal type hermetic compressor. 5,470,214, Cl. 418-63.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Kashida, Meguru; Shirasaki, Toru; Hamada, Yuichi; Nagata, Yoshihiko; Kawaguchi, Sakae; and Kubota, Yoshihiro, 5,470,621, Cl. 428-14.000.
Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,469,752, Cl. 73-866.000.

Shin-Etsu Polymer Co., Ltd.: *See—*
Odashima, Satoshi; and Yoshida, Kazuyoshi, 5,470,607, Cl. 427-96.000.

Shin, Yoon-Sub; Chang, Se-Yeob; Lee, Sang-Jin; and Kim, Jae-Kon, to Daewood Heavy Industries Co., Ltd. Electrical flame sensor for use in a gas cutting apparatus. 5,470,047, Cl. 266-76.000.

Shin, Yuaki: *See—*
Arai, Yuji; Matumoto, Takanobu; Shin, Yuaki; and Ishiguro, Takashi, 5,470,691, Cl. 430-273.000.

Shinada, Satoshi: *See—*
Hosono, Satoru; Naka, Takahiro; Yonekubo, Shuji; and Shinada, Satoshi, 5,471,232, Cl. 347-70.000.

Shinada, Yasuyuki: *See—*
Saito, Atsushi; Okubo, Akiro; Watanabe, Fumihiko; and Shinada, Yasuyuki, 5,471,230, Cl. 347-29.000.

Shinagawa, Toru: *See—*
Huang, Han; Morioka, Craig A.; Ratib, Osman; Cho, Paul N. S.; Ho, Bruce K. T.; Sonobe, Takeo; and Shinagawa, Toru, 5,471,606, Cl. 395-500.000.

Shindo, Isao; Mutou, Shigeo; Terayama, Takao; Okayama, Masao; and Kai, Susumu. Test strip supply apparatus and analyzer using same. 5,470,533, Cl. 422-63.000.

Shindo, Mikio: *See—*
Suzuki, Mitsuru; Shindo, Mikio; and Kashiwa, Yoichi, 5,470,258, Cl. 439-595.000.

Shinnai, Kohsuke: *See—*
Tanaka, Yasuhiro; Nagai, Yasuhiko; Suzuki, Michio; Kagei, Takashi; Shinnai, Kohsuke; Ikeba, Goro; and Saito, Masato, 5,471,399, Cl. 364-491.000.

Shinomiya, Tsutomu; Miyazaki, Shunzo; Tanaka, Yasuyuki; Tsukada, Shinichi; and Tamura, Michiya, to Hokkai Can Co., Ltd. Surface-treating apparatus for can body blanks. 5,470,429, Cl. 156-510.000.

Shinozaki, Masatsugu: *See—*
Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Shinozaki, Masatsugu, 5,471,610, Cl. 395-600.000.

Shintani, Yoichi: *See—*
Fujiwara, Shinji; Shintani, Yoichi; and Nagasaka, Mitsuru, 5,471,580, Cl. 395-200.020.

Shiono, Toru: *See—*
Okumoto, Koji; Matsuno, Katsumi; Shiono, Toru; Senuma, Toshitaka; Fukuda, Tokuya; and Takada, Shinji, 5,471,481, Cl. 371-22.300.

Shiota, Shinichi, to Sony Corporation. Radio data system receiver. 5,471,662, Cl. 455-166.100.

Shiozawa, Takahiro: *See—*
Shiragaki, Tatsuya; Shiozawa, Takahiro; Suzuki, Syuji; and Fujiwara, Masahiko, 5,471,332, Cl. 359-117.000.

Shipp, John I., to Apollo Camer, LLC. Single lens stereoscopic video camera. 5,471,237, Cl. 348-46.000.

Shiragaki, Tatsuya; Shiozawa, Takahiro; Suzuki, Syuji; and Fujiwara, Masahiko, to NEC Corporation. Hitless switching apparatus and method for optical network. 5,471,332, Cl. 359-117.000.

Shirai, Hiroyuki; Sekine, Kazumi; Tsuda, Tadayuki; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shoji, Takeo; Noda, Shinya; Kobayashi, Kazunori; and Adachi, Hiroyuki, to Canon Kabushiki Kaisha. Blade member having a flat-surface side and an angled-surface side. 5,470,635, Cl. 428-131.000.

Shirai, Yoshihiro: *See—*
Suyama, Shuji; Ishigaki, Hideyo; Tomoda, Masayasu; Shirai, Yoshihiro; Tanaka, Hiroyuki; and Komai, Masaharu, 5,470,917, Cl. 525-326.300.

Shiraishi, Hiroshi: *See—*
Ueno, Takumi; Shiraishi, Hiroshi; Hayashi, Nobuaki; Fukuma, Emiko; and Tadano, Keiko, 5,470,996, Cl. 558-46.000.

Shirasaki, Toru: *See—*
Kashida, Meguru; Shirasaki, Toru; Hamada, Yuichi; Nagata, Yoshihiko; Kawaguchi, Sakae; and Kubota, Yoshihiro, 5,470,621, Cl. 428-14.000.

Shiroi, Takashi: *See—*
Torii, Shigeru; Tanaka, Hideo; Sasaoka, Mitio; Shiroi, Takashi; and Kameyama, Yutaka, 5,470,972, Cl. 540-230.000.

Shiseido Company Ltd.: *See—*
Tanaka, Hiroshi; Kobayashi, Toshiaki; Nanba, Tomiyuki; Ishiwatari, Masaaki; Yoneyama, Toshio; Ohno, Kimio; Matsumoto, Takashi; Kanbe, Tetsuya; Isa, Takashi; and Ogusu, Yoshiyuki, 5,470,563, Cl. 424-448.000.

Shishiguchi, Seiichi, to NEC Corporation. Method of fabricating poly-silicon resistor. 5,470,780, Cl. 437-60.000.

Shitani, Yuji; Okazaki, Haruki; and Miyamoto, Seiji, to Mazda Motor Corporation. Control device for an automotive vehicle having an antiskid brake system and differentials. 5,470,135, Cl. 303-122.030.

Shiue, Yaw-Ching. Flushing device of toilet. 5,469,585, Cl. 4-326.000.

Sho, Soo I.: *See—*
Kim, Hyo Y.; Hwang, Ki H.; Chae, Hoon; Sho, Soo I.; and Jun, Jung N., 5,470,941, Cl. 528-272.000.

Shockey, Roy L.; and McCulley, William W., to L & S Bearing Co. Apparatus and method for providing universal automative air conditioning compressor. 5,470,207, Cl. 417-313.000.

Shoji, Takeo: *See—*
Shirai, Hiroyuki; Sekine, Kazumi; Tsuda, Tadayuki; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shoji, Takeo; Noda, Shinya; Kobayashi, Kazunori; and Adachi, Hiroyuki, 5,470,635, Cl. 428-131.000.

Shokoohi, Frough K.: *See—*
Schmutz, Caroline N.; Shokoohi, Frough K.; Tarascon, Jean-Marie; and Warren, Paul C., 5,470,357, Cl. 29-623.500.

Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, to Yozan Inc.; and Sharp Corporation. Circuit for calculating the minimum value. 5,471,161, Cl. 327-58.000.

Shough, Dean M.: *See—*
Gal, George; Anderson, William W.; Herman, Bruce J.; and Shough, Dean M., 5,471,345, Cl. 359-619.000.

Showa Aluminum Corp.: *See—*
Okuda, Nobuyuki; and Kojima, Masayoshi, 5,470,431, Cl. 159-28.600.

Shreffler, James R.: *See—*
Honeycutt, Travis W.; Lee, Baosheng; and Shreffler, James R., 5,470,653, Cl. 428-357.000.

Shteckelman, Shalom: *See—*

Faibish, Sorin; Shamay, Ezra; and Steckelman, Shalom, 5,471,214, Cl. 342-70.000.
Shudo, Tuyosi: *See*—
Yoshida, Makoto; Satoh, Naoki; Asoh, Hidehiko; Shudo, Tuyosi; Takeda, Ryuzaburo; and Taguchi, Jun'ichi, 5,471,141, Cl. 324-314.000.
Shuert, Lyle H. Panel structure. 5,470,641, Cl. 428-178.000.
Shum, Danny P.: *See*—
Chang, Ko-Min; Shum, Danny P.; and Chang, Kuo-Tung, 5,471,422, Cl. 365-185.260.
Shurflo Pump Manufacturing Co.: *See*—
Hartley, E. Dale; and Hartley, F. Scott, 5,470,209, Cl. 417-401.000.
Shushurin, Vladimir V. Method of connecting terminals of a plastic-encapsulated power transistor to a printed-circuit board. 5,470,795, Cl. 437-208.000.
Shyu, Rong-Fuh, to Winbond Electronic Corp. Recycling and parallel processing method and apparatus for performing discrete cosine transform and its inverse. 5,471,412, Cl. 364-725.000.
Sibley, William A.: *See*—
Mirov, Sergey B.; and Sibley, William A., 5,471,493, Cl. 372-42.000.
Sieg, Ewald: *See*—
Stephen, James C.; Schlosser, Erich J.; and Sieg, Ewald, 5,469,835, Cl. 126-25.00B.
Siegel, Barney, to National Scientific Company. Supporting stand for conical-bottom limited-volume vial. 5,470,537, Cl. 422-104.000.
Siegel, Gunther R.: *See*—
Gorr, Richard H.; and Siegel, Gunther R., 5,470,148, Cl. 366-64.000.
Siegemund, Günter: *See*—
Appel, Wolfgang; and Siegemund, Günter, 5,471,002, Cl. 564-412.000.
Siegmann, Anthony J.: *See*—
Kolin, Kevin S.; and Siegmann, Anthony J., 5,470,995, Cl. 556-91.000.
Siegrist, Theo: *See*—
Cava, Robert J.; and Siegrist, Theo, 5,470,530, Cl. 420-416.000.
Siemans Aktiengesellschaft: *See*—
Dönig, Gerhard; Hümpfner, Roland; Grass, Norbert; Knaak, Hans-Joachim; Neulinger, Franz; and Schummer, Helmut, 5,471,377, Cl. 363-21.000.
Siemens Aktiengeselleschaft: *See*—
Sezi, Tevfik, 5,471,133, Cl. 324-76.440.
Siemens Aktiengesellschaft: *See*—
Buchholtz, Gerhard; and Schaetzle, Ulrich, 5,470,350, Cl. 607-97.000.
Decker, Hans-Josef; and Schwarz, Klaus-Peter, 5,469,731, Cl. 73-23.310.
Embo, Georges; Debrouwere, Tom; and Moyaert, Werner, 5,470,261, Cl. 439-752.000.
Feiten, Wendelin, 5,469,756, Cl. 74-490.050.
Krauss, Guenther; and Herrmann, Klaus, 5,470,302, Cl. 601-2.000.
Krautschneider, Wolfgang; and Wersing, Wolfram, 5,471,417, Cl. 365-145.000.
Lundstrom, Lena; Karlsson, Peter; and Ohlsson, Thomas, 5,469,856, Cl. 128-696.000.
Schwalke, Udo; and Bieringer, Fritz, 5,470,782, Cl. 437-70.000.
Wang, Jianmin, 5,471,142, Cl. 324-318.000.
Werker, Heinz, 5,471,512, Cl. 375-376.000.
Siemens Automotive S.A.: *See*—
Pioch, Olivier; Martineau, Dominique; and Dupont, Henri, 5,470,289, Cl. 477-111.000.
Siemens Elema AB: *See*—
Laurent, Estan; and Magnusson, Monica, 5,469,857, Cl. 128-710.000.
Siemens Nixdorf Informationssysteme Aktiengesellschaft: *See*—
Fietz, Ralf-Peter; and Knoop, Franz, 5,470,042, Cl. 248-678.000.
Kohlhage, Hermann; Baitz, Günter; and Malke, Wolfgang, 5,470,053, Cl. 271-213.000.
Siems, W. Peter; and Philyaw, Dale A., to Caterpillar Inc. Engine wiring system. 5,470,253, Cl. 439-491.000.
Sierra Research and Technology, Inc.: *See*—
Spigarelli, Donald J.; and DeCarlo, John M., 5,471,310, Cl. 356-399.000.
Sikorski, Joseph. Spherical composter. 5,470,747, Cl. 435-290.100.
Silberline Manufacturing Co., Ltd.: *See*—
Keemer, Craig B.; Jenkins, William G.; Lamborn, H. Taylor; and Scheller, Joseph B., 5,470,385, Cl. 106-404.000.
Silicon Graphics, Inc.: *See*—
Buchner, Gregory C.; and Drebin, Robert A., 5,471,572, Cl. 395-139.000.
Silicon Systems, Inc.: *See*—
Dendinger, Stan, 5,471,169, Cl. 327-563.000.
Silver, Ed: *See*—
Howe, Wayne; Silver, Ed; Bailey, Kim; Shih, Jerry; Morel, Kitty; Hill, Peter; Addison, Cathy; Woodring, Larry; and Malik, Dale, 5,471,519, Cl. 379-67.000.
Simmons Company: *See*—
Steed, C. Edward; and Brinkman, Wesley H., 5,469,589, Cl. 5-400.000.
Simmons, Michael S., to Tuffaloy Products, Inc. Water cooled resistance welding assembly. 5,471,029, Cl. 219-120.000.
Simon, Agnes. Step aerobic exercise device. 5,470,292, Cl. 482-52.000.
Simon, LeRoy J., to Spring Air Company, The. Mattress with compressible support members. 5,469,590, Cl. 5-475.000.
Simon, Wilhelm, to Willi Möller AG. Process for determining the alcohol content of a biological sample. 5,470,755, Cl. 436-131.000.
Simpson, Elmer J.; and Picado, Sergio, to Impco Inc. Polyphase current monitor and control system. 5,471,359, Cl. 361-93.000.
Simpson, Warren; and Schwan, T. G. Antigenic proteins of borrelia burgdorferi. 5,470,712, Cl. 435-7.320.
Sinclair, Clive M., to Sinclair Research Limited. Drive apparatus for a cycle. 5,470,281, Cl. 474-139.000.
Sinclair Research Limited: *See*—
Sinclair, Clive M., 5,470,281, Cl. 474-139.000.
Sinclair-Day, John D.; Cassidy, Stephen P.; Ring, John; and Cordiner, Andrew G., to Courtaulds Coatings (Holdings) Limited. Powder coating compositions. 5,470,893, Cl. 523-205.000.
Singer, John S. Aerodynamic projectile and means for propelling same. 5,469,650, Cl. 42-84.000.
Singer, John S. Aerodynamic projectile and means for propelling same. 5,469,790, Cl. 102-431.000.
Sinsheimer, Roger; and Anderson, James, to Xandex, Inc. Probe card changer system and method. 5,471,148, Cl. 324-754.000.
Sisneros, Jerry N.: *See*—
Prager, Kenneth E.; Herbst, Stephen J.; Sisneros, Jerry N.; Wootan, John J.; and Gleichman, Douglas M., 5,471,240, Cl. 348-164.000.
Sitte, Hellmuth; Neumann, Klaus; Edelmann, Ludwig; Haessig, Helmut; Lang, Anton; and Kleber, Heinrich, to Leica AG. Device for dehydrating and/or embedding samples. 5,469,712, Cl. 62-51.100.
Sivulka, Gerald: *See*—
Every, Peter; Sivulka, Gerald; and Fuller, Edward M., 5,470,137, Cl. 303-188.000.
Sjogren, Axel; Carson, Gary; Estergreen, Steve; Taga, Timothy; and Stewart, Rodger, to Cobe Laboratories, Inc. Exchanger and method for manufacturing the same. 5,470,531, Cl. 422-46.000.
SKF GmbH: *See*—
Bissinger, Ronald, 5,470,165, Cl. 403-313.000.
Brandenstein, Manfred; Friedrich, Wolfgang; Haas, Roland; Herrmann, Gerhard; and Olschewski, Armin, 5,470,279, Cl. 474-135.000.
Hillmann, Reinhart, 5,470,159, Cl. 384-623.000.
SKF USA, Inc.: *See*—
Wardle, Frank; Jacobson, Bo; Dolfsma, Henk; and Butterworth, Arthur, 5,469,713, Cl. 62-84.000.
Skinner, Wayne S.: *See*—
Leisy, Douglas J.; Quistad, Gary B.; and Skinner, Wayne S., 5,470,735, Cl. 435-235.100.
Sklar, Horace J.: *See*—
Means, Robert W.; and Sklar, Horace J., 5,471,627, Cl. 395-800.000.
Skultety, Paul F.: *See*—
Hendrickson, Dennis L.; Dimmitt, Dan C.; Williams, Mark S.; Skultety, Paul F.; and Baltezor, Michael J., 5,470,584, Cl. 424-490.000.
Slemon, Clarke; and Macel, Bob, to Torcan Chemical Ltd. Preparation of omeprazole and lansoprazole, and intermediates useful therein. 5,470,983, Cl. 546-271.000.
Slobodnik, John B.: *See*—
Rukavina, Thomas G.; and Slobodnik, John B., 5,471,554, Cl. 385-131.000.
Slooff, Tom J. J. H.: *See*—
Ling, Robin S. M.; Mikhail, W. E. Michael; Elting, James J.; Gie, Graham A.; Slooff, Tom J. J. H.; and Vanderlinden, Jacques J., 5,470,336, Cl. 606-105.000.
Slotboom, Jan W.: *See*—
Sankaranarayanan, Lakshmi N.; Slotboom, Jan W.; and Van Der Sijde, Arjen G., 5,471,419, Cl. 365-177.000.
Smalley, Anthony J.; Gerlach, C. Richard; and Harris, Ralph E., to Gas Research Institute. Method for detecting and specifying compressor cylinder leaks. 5,471,400, Cl. 364-509.000.
Smart-Diskette GmbH: *See*—
Eisele, Raymund H.; and Barrett, Paul, 5,471,038, Cl. 235-380.000.
SMC Corporation: *See*—
Yamamoto, Hitoshi; Kaneko, Kunihisa; Watanabe, Masayuki; and Kami, Akio, 5,469,940, Cl. 188-67.000.
Smith, Allan F.: *See*—
Higgins, Ronald; and Smith, Allan F., 5,469,834, Cl. 124-88.000.
Smith, Bernard J.; Seager, David B.; Tong, Raymond L.; and Rowley, Thomas E., to Voysys Corporation. Telephone call and voice processing system. 5,471,523, Cl. 379-165.000.
Smith, Bradley W.; Rasmussen, Kirk; and Allard, John E., to Morton International, Inc. Air bag module with an off-center mounted tubular inflator. 5,470,102, Cl. 280-728.200.
Smith, Bradley W.; and Rink, Karl K., to Morton International, Inc. Fluid fueled air bag inflator. 5,470,104, Cl. 280-737.000.
Smith, Christopher P.; and Anderson, Paul G., to Westinghouse Electric Corporation. Method and apparatus for measuring the axial load and position of a valve stem. 5,469,737, Cl. 73-168.000.
Smith, David G.: *See*—
Buckle, Derek R.; Pinto, Ivan L.; and Smith, David G., 5,470,872, Cl. 514-456.000.
Smith, Dennis K.: *See*—
Leader, William J.; and Smith, Dennis K., 5,470,363, Cl. 55-276.000.
Smith, Douglas M.: *See*—
Gnade, Bruce E.; Cho, Chih-Chen; and Smith, Douglas M., 5,470,802, Cl. 437-238.000.
Smith, Frank G.: *See*—
Pearl, David S., II; and Smith, Frank G., 5,470,226, Cl. 431-255.000.
Smith, Fred P.: *See*—
Smith, Fred T.; and Smith, Fred P., 5,470,187, Cl. 414-408.000.

Smith, Fred T.; and Smith, Fred P., to Galion Solid Waste Equipment Co., Inc. Front-side lifting and loading apparatus. 5,470,187, Cl. 414-408.000.

Smith, James A.; and Murphy, Betty J., to Creative Products Resource Associates, Ltd. Packaging system with in-tandem applicator pads for topical drug delivery. 5,470,323, Cl. 604-289.000.

Smith, James D. B.: *See*—
Shea, John J.; Smith, James D. B.; and Schoch, Karl F., Jr., 5,471,185, Cl. 335-51.000.

Smith, Julius O., III: *See*—
Van Duyne, Scott A.; and Smith, Julius O., III, 5,471,007, Cl. 84-622.000.

Smith, Keith: *See*—
Nielsen, Arne; Moghaddassi, Majid; Vishnepolsky, Boris; and Smith, Keith, 5,470,030, Cl. 242-533.800.

Smith, Michael D.: *See*—
Longo, Mary C.; and Smith, Michael D., 5,470,740, Cl. 435-252.330.

Smith, Paul; Heeger, Alan J.; Cao, Yong; Chiang, Jin-Chih; and Andreatta, Alejandro, to University of California, Regents of the. Electrically conductive polyaniline. 5,470,505, Cl. 252-500.000.

Smith, Randall B.; Tang, John C.; and Henderson, D. Austin, Jr., to Xerox Corporation. Method and apparatus for setting a graphical object's position and orientation with viscous dragging. 5,471,571, Cl. 395-137.000.

Smith, Robert E., III, to National Coupling Inc. Hydraulic coupling with pressure equalizing valve. 5,469,887, Cl. 137-614.040.

Smith, Ronald G., to DESA International, Inc. Thermostatically controlled gas heater. 5,470,018, Cl. 236-15.00A.

Smith, Schyler B., deceased (by Bruce M. Groom, legal representative): *See*—
Krahnke, Robert H.; Mealey, Shawn K.; Schoenherr, William J.; Smith, Schyler B., deceased; and Tangney, Thomas J., 5,470,923, Cl. 525-477.000.

SmithKline Beecham Corp.: *See*—
Callahan, James F.; and Huffman, William F., 5,470,849, Cl. 514-212.000.
Dixon, James S.; Hall, Rapih F.; Marshall, Lisa A.; Chilton, Floyd H., III; Mayer, Ruth J.; and Winkler, James D., 5,470,882, Cl. 514-596.000.

Sneddon, Kirk; and Brandmaier, Harold, to Arde, Inc. Fluid storage and expulsion system. 5,469,701, Cl. 60-259.000.

Snowden, Elizabeth M.: *See*—
Tallman, Joseph P.; Snowden, Elizabeth M.; and Wolcott, Barry W., 5,471,382, Cl. 364-406.000.

Snowden-Pencer, Inc.: *See*—
Furnish, Greg; and Hipps, Michael, 5,470,328, Cl. 606-1.000.

Snyder, Ronald P., to Prince Corporation. Visor bracket. 5,470,123, Cl. 296-97.900.

Snyder, Sandra: *See*—
Manz, Kenneth W.; and Snyder, Sandra, 5,469,714, Cl. 62-125.000.

Snyder, Thomas S.; Peterson, Steven H.; and Nayak, Umesh P., to Westinghouse Electric Corporation. Continuous, steady-state, chromatographic separation of gadolinium isotopes. 5,470,479, Cl. 210-635.000.

Sobel, Martin: *See*—
Demarest, David; Duncan, Robert B.; Sobel, Martin; Lenihan, Timothy P.; and Rattan, William, 5,469,689, Cl. 53-430.000.

Sobol, Brigitte. Shampoo cape. 5,469,580, Cl. 2-50.000.

Societe Anonyme Dite Alcatel Radiotelephone: *See*—
Gourgue, Frédéric, 5,471,648, Cl. 455-63.000.

Societe d'Applications Generales d'Electricite et de Mecanique Sagem: *See*—
Charbonnier, Philippe, 5,471,317, Cl. 358-400.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation (S.N.E.C.M.A.): *See*—
Brossier, Pascal N.; Pincemin, Jean-Marie N.; and Wurniesky, Pascal, 5,470,020, Cl. 239-265.330.

Soderberg, Brian T.; and Kenworthy, Mark L., to Bolt Beranek and Newman Inc. Image element depth buffering using two buffers. 5,471,567, Cl. 395-133.000.

Söderlund, Anders, to ABB Atom AB. Fuel element for a light-water nuclear reactor. 5,471,514, Cl. 376-313.000.

Soejima, Ryouichi: *See*—
Katayama, Yoshio; Fujii, Seiichi; Uchiyama, Sadao; Soejima, Ryouichi; Moori, Hitoshi; and Yoshida, Hideo, 5,471,439, Cl. 369-13.000.

Soenen, Eric G.; Davis, Gregory B.; Adkins, Thomas; and MacDonald, Russell K., to Texas Instruments Incorporated. Combined transmitter/receiver integrated circuit with learn mode. 5,471,668, Cl. 455-352.000.

Sokol, Bryan I.: *See*—
Lupyan, David A.; and Sokol, Bryan I., 5,470,500, Cl. 252-174.150.

Sokolich, Marko, to Hughes Aircraft Company. High electron mobility transistor and methode of making. 5,471,077, Cl. 257-192.000.

Solar Cells, Inc.: *See*—
Foote, James B.; Kaake, Steven A. F.; Meyers, Peter V.; and Nolan, James F., 5,470,397, Cl. 136-260.000.

Solid State Logic Limited: *See*—
Hill, Philip N. C.; and Randall, Bruce W., 5,471,239, Cl. 348-155.000.

Sollinger, Hans-Peter; and Schiel, Christian, to J. M. Voith GmbH. Wire or felt forming section with breast rollers supported by hydrostatic bearings. 5,470,438, Cl. 162-273.000.

Somatics, Inc.: *See*—
Swartz, Conrad M.; and Abrams, Richard S., 5,470,347, Cl. 607-45.000.

Someya, Ryuko: *See*—
Yasunobu, Chizuko; Mori, Fumihiko; Yamada, Hiroshi; Yasunobu, Seiji; and Someya, Ryuko, 5,471,559, Cl. 395-61.000.

Sondermeijer, Paulus J. A.; Claessens, Johannes A. J.; and Mockett, Albert P. A., to Akzo Nobel N.V. Recombinant herpesvirus of turkeys and live vector vaccines derived thereof. 5,470,734, Cl. 424-229.100.

Song, Chi J., to Goldstar Electron Co., Ltd. Semiconductor package and method for manufacturing the same. 5,471,088, Cl. 257-668.000.

Sonnek, Martin: *See*—
Krainer, Erich; and Sonnek, Martin, 5,471,016, Cl. 174-254.000.

Sonnichsen, George C.: *See*—
Foley, Henry C.; Sonnichsen, George C.; Brake, Loren D.; Mariwala, Ravindra K.; and Lafyatis, David S., 5,470,814, Cl. 502-182.000.

Sonobe, Takeo: *See*—
Huang, Han; Morioka, Craig A.; Ratib, Osman; Cho, Paul N. S.; Ho, Bruce K. T.; Sonobe, Takeo; and Shinagawa, Toru, 5,471,606, Cl. 395-500.000.

Sonoco Products Company: *See*—
Renck, Lawrence E., 5,469,619, Cl. 29-895.200.

Sony Corporation: *See*—
Haijima, Hideki; and Okuda, Shinji, 5,469,789, Cl. 101-477.000.
Ikeda, Masao; Ito, Satoshi; Iochi, Yoshino; Miyajima, Takao; Ozawa, Masafumi; Akimoto, Katsuhiro; Ishibash, Akira; and Hiei, Futoshi, 5,471,067, Cl. 257-14.000.
Ikeda, Yasunari, 5,471,464, Cl. 370-19.000.
Ise, Koichi; Nishida, Yasuo; and Yasuda, Akio, 5,471,339, Cl. 359-275.000.
Kaneko, Shinji; and Ebisawa, Kan, 5,471,449, Cl. 369-58.000.
Kishi, Yoshio, 5,471,452, Cl. 369-83.000.
Kusunoki, Shigeo, 5,471,656, Cl. 455-127.000.
Maeda, Keijiro, 5,471,540, Cl. 381-191.000.
Muroyama, Masakazu, 5,470,800, Cl. 437-238.000.
Nakamura, Yoshinori; Sam, Huy; Fujiwara, Yoshio; Nagura, Toshikazu; Hayasi, Shigeo; and Kusaka, Yukio, 5,470,817, Cl. 503-227.000.
Nakamura, Yoshinori; Sam, Huy; and Fujiwara, Yoshio, 5,470,818, Cl. 503-227.000.
Nishima, Osamu; Suzuki, Tomoyuki; and Nishibori, Kazuhiko, 5,471,246, Cl. 348-322.000.
Oba, Haruo; and Nagahara, Junnichi, 5,471,009, Cl. 84-645.000.
Odaka, Kentaro, 5,471,263, Cl. 352-27.000.
Ogata, Seiichi; Kawaguchi, Moriyuki; Kanota, Keiji; Kubota, Yukio; Sato, Heikichi; and Abe, Iwao, 5,471,355, Cl. 360-84.000.
Okumoto, Koji; Matsuno, Katsumi; Shiono, Toru; Senuma, Toshitaka; Fukuda, Tokuya; and Takada, Shinji, 5,471,481, Cl. 371-22.300.
Sakamoto, Satoshi; and Orimo, Shinichi, 5,471,100, Cl. 310-12.000.
Sasaki, Tooru; and Gyotoku, Kaoru, 5,471,538, Cl. 381-92.000.
Shimizume, Kazutoshi, 5,471,442, Cl. 369-32.000.
Shiota, Shinichi, 5,471,662, Cl. 455-166.100.
Tsuji, Kiyoaki, 5,471,356, Cl. 360-99.030.
Tsutsui, Kyoya, 5,471,558, Cl. 395-2.280.
Usuki, Hideki, 5,471,149, Cl. 326-68.000.
Wachi, Shigeaki, 5,471,444, Cl. 369-32.000.
Wachi, Shigeaki, 5,471,447, Cl. 369-44.280.
Yonemitsu, Jun; Koyanagi, Hideki; and Akiyama, Yoshiyuki, 5,471,450, Cl. 369-60.000.
Yoshihara, Ikuo, 5,471,071, Cl. 257-69.000.

Sony Electronics Inc.: *See*—
Flum, Alan; Zampini, Michael A.; and Fujita, Masahiro, 5,471,539, Cl. 351-119.000.

Sony United Kingdom Limited: *See*—
Stone, Jonathan J., 5,471,594, Cl. 395-375.000.

Soong, Tsai C. String fixer in sports racket. 5,470,066, Cl. 273-73.00D.

Sophia Precision Corp.: *See*—
Hoya, Hiroshi, 5,469,706, Cl. 60-739.000.

Sorensen, Jens O.: *See*—
Sorensen, Soren C.; and Sorensen, Jens O., 5,470,520, Cl. 264-297.200.

Sorensen, Soren C.; and Sorensen, Jens O. Method of injection molding cable ties. 5,470,520, Cl. 264-297.200.

Soriano, Sal: *See*—
Ryan, Robert E.; and Soriano, Sal, 5,471,300, Cl. 356-345.000.

Sorrells, David F.: *See*—
Parker, Jeffrey L.; Sorrells, David F.; and Mix, John D., 5,471,296, Cl. 356-139.060.

Soule, Wyman T. Oil spill containment and recovery system. 5,470,467, Cl. 210-242.300.

Sounds Resources, Inc.: *See*—
Maire, R. L., 5,471,019, Cl. 181-156.000.

Southby, David T.: *See*—
Texter, John; Welter, Thomas R.; Southby, David T.; and Mooberry, Jared B., 5,470,688, Cl. 430-203.000.

Sowell, Sylvester: *See*—
Markle, Richard A.; Brusky, Phyllis L.; Cremeans, George E.; Elhard, Joel D.; Bigg, Donald M.; and Sowell, Sylvester, 5,470,945, Cl. 528-390.000.

Space Systems/Loral Inc.: *See*—
Barkeshli, Sina, 5,471,224, Cl. 343-909.000.

Spahn, Karl-Heinz; Aswegen, Helmut; and Schwerdt, Franz, to Aug. Winkhaus GmbH & Co. KG. Electronic lock cylinder. 5,469,727, Cl. 70-278.000.

Spanhel, Lubomir; Arpac, Ertugrul; Nass, Rüdiger; and Schmidt, Helmut, to Institut Fuer Neue Materialien Gemeinnuetzige GmbH. Composite materials containing nanoscalar particles, process for producing them and their use for optical components. 5,470,910, Cl. 524-785.000.

Speakman, Jeffrey L.: *See*—

McCauley, Mary K.; Moder, Kenneth P.; and Speakman, Jeffrey L., 5,470,865, Cl. 514-365.000.

Spears, Patricia A.: *See*—
Walker, George T.; Nadeau, James G.; Spears, Patricia A.; Nycz, Colleen M.; Shank, Daryl D.; Schram, James L.; and Jurgensen, Stewart R., 5,470,723, Cl. 435-91.200.

Speight, Mary C.: *See*—
Matthews, Gene C.; and Speight, Mary C., 5,469,968, Cl. 206-532.000.

Spellman, Gordon B.; and Chen, C. Greg, to Eaton Corporation. Electrical resistance ignitor with spaced parallel filaments brazed in refractory block recesses. 5,471,032, Cl. 219-270.000.

Sperbeck, Scott W. Goggle defogging system with transparent indium-tin-oxide heating layer disposed on a lens. 5,471,036, Cl. 219-522.000.

Spiegel, H. Jay, to Premium Products, Inc. Football with odd number of panels. 5,470,060, Cl. 273-65.00E.

Spigarelli, Donald J.; and DeCarlo, John M., to Sierra Research and Technology, Inc. System for placement and mounting of fine pitch integrated circuit devices. 5,471,310, Cl. 356-399.000.

Spokas, Romas B.: *See*—
Schneider, Karl F.; Dembosky, Stanley K.; Fairbank, Donn K.; Spokas, Romas B.; and Keeney, Bradley L., 5,470,285, Cl. 475-210.000.

Spring Air Company, The: *See*—
Simon, LeRoy J., 5,469,590, Cl. 5-475.000.

Spruit, Johannes H. M.: *See*—
Bakx, Johannes L.; Spruit, Johannes H. M.; and Veldhuis, Hindrik, 5,471,457, Cl. 369-116.000.

Sprunt, Eve S.: *See*—
Djabbarah, Nizar F.; and Sprunt, Eve S., 5,470,749, Cl. 436-38.000.

SPS Technologies, Inc.: *See*—
Bogatin, Yakov; Robinson, Mark; Greenwald, Frank S.; and Ormerod, John, 5,470,400, Cl. 148-301.000.

Spudnik Equipment Company: *See*—
Jensen, Darrell V.; Hobbs, Carl J.; and Blight, M. Andrew, 5,470,175, Cl. 404-72.000.

SPX Corporation: *See*—
Manz, Kenneth W.; and Snyder, Sandra, 5,469,714, Cl. 62-125.000.

Square D Company: *See*—
Meyer, Thomas J., 5,471,144, Cl. 324-551.000.

Srikrishnan, Kris V.; White, James F.; and Yang, Jer-Ming, to International Business Machines Corporation. Electrically blowable fuse structure manufacturing for organic insulators. 5,469,981, Cl. 216-13.000.

St. Vincents Institute of Medical Research: *See*—
De Kretser, David M.; Burger, Henry G.; Hearn, Milton T. W.; Milne-Robertson, David M.; Wettenhall, Richard E. H.; McLachlan, Robert I.; and De Vos, Fiona, 5,470,826, Cl. 514-8.000.

Sta-Rite Industries, Inc.: *See*—
Rief, Dieter J.; and Frentzel, Herman E., 5,469,596, Cl. 15-1.700.

Staats, Louis T., III; Bristow, James A.; Noronha, Anil P. F.; and Murphy, Gregory E., to Hewlett-Packard Company. Methods and apparatus for forming an integral high pressure seal using mechanical acutation. 5,470,487, Cl. 210-767.000.

Stageberg, Frank: *See*—
Bortins, John; Stageberg, Frank; Stover, Lance E.; and Weispfenning, Gerald L., 5,471,354, Cl. 360-77.050.

Stagnone, James J.: *See*—
Brenton, Billy H.; and Stagnone, James J., 5,469,624, Cl. 30-232.000.

Stahl, Neil; Economides, Aris N.; and Yancopoulos, George D., to Regeneron Pharmaceuticals, Inc. CNTF and IL-6 antagonists. 5,470,952, Cl. 530-350.000.

Stahl, Wilhelm; Ahlers, Michael; Walch, Axel; Bartnik, Eckhart; Kreuzschmar, Gerhard; Grabley, Susanne; and Schleyerbach, Rudolf, to Hoechst Aktiengesellschaft. Carbohydrate-containing polymers, their preparation and use. 5,470,843, Cl. 514-61.000.

Stai, Jeffrey D.: *See*—
Mangan, John S.; Norman, Robert D.; Craig, Jeffrey; Albert, Richard; Gupta, Anil; Stai, Jeffrey D.; and Lofgren, Karl M. J., 5,471,478, Cl. 371-10.300.

Standard Havens, Inc.: *See*—
Hawkins, Michael R., 5,470,146, Cl. 366-25.000.

Staniforth, John N.; and Grosvenor, Martin P., to Hoechst UK Limited. Electrostatic coating of substrates of medicinal products. 5,470,603, Cl. 427-2.140.

Stanley, Donald H.; Peckman, Robert; and Peregoy, Weston K., Jr., to ITT Corporation. Low temperature process and apparatus for cleaning photocathodes. 5,470,266, Cl. 445-59.000.

Stanley, Kenneth. Method of making simulated solid wood slabs and resulting solid wood slab. 5,469,903, Cl. 144-345.000.

Stasef, Brian H.; Figlioli, Danny W.; and Manuel, Mark, to General Motors Corporation. Pivoting below belt glass run channel. 5,469,664, Cl. 49-452.000.

State of Israel Ministry of Defense, Armament Development Authority Rafael: *See*—
Even-Sturlesi, Doron; and Oron, Micha, 5,471,047, Cl. 250-208.100.

State of Israel Ministry of Defense, Armament Developmental Authority, Rafael: *See*—
Faibish, Sorin; Shamay, Ezra; and Shteckelman, Shalom, 5,471,214, Cl. 342-70.000.

State of Oregon Acting by and through the Oregon State Board of Higher Education on behalf of Oregon State University: *See*—
Ahern, Kevin G., 5,470,724, Cl. 435-91.200.

State University of New York, The Research Foundation of the: *See*—
Fuhrman, Bradley P.; Flaim, Stephen F.; Hernan, Lynn J.; Nesti, Frances D.; Papo, Michele C.; and Steinhorn, David M., 5,470,885, Cl. 514-743.000.

Staudinger, Reimar: *See*—
Rathert, Horst; and Staudinger, Reimar, 5,469,954, Cl. 198-412.000.

Staunton, Harold F.: *See*—
Anderson, Howard W.; Carberry, John B.; Staunton, Harold F.; and Sutradhar, Bhagya C., 5,471,001, Cl. 562-593.000.

Steagall, Paul H., III: *See*—
Booth, Hubert J.; Steagall, Paul H., III; and Wright, Michael W., 5,469,973, Cl. 209-580.000.

Stearns, Gary E. Video cassette mailers. 5,469,965, Cl. 206-387.100.

Steed, C. Edward; and Brinkman, Wesley H., to Simmons Company. Knock down foundation for a bed. 5,469,589, Cl. 5-400.000.

Steelcase Inc.: *See*—
Gill, John F., 5,470,143, Cl. 312-334.400.

Steele, Randy C., to Intel Corporation. User programmable product term width expander. 5,471,155, Cl. 326-39.000.

Steffenino, Rita M.: *See*—
Grillo, Susan M.; Steffenino, Rita M.; Kunkle, Diane C.; and Saraceni, Kathleen, 5,470,581, Cl. 424-479.000.

Steger, Reinhard, to Ferromatik Milacron Maschinenbau GmbH. Apparatus for generating clamping force in injection molding machines. 5,470,592, Cl. 425-3.000.

Stein, Dieter: *See*—
Litzenberger, Ingo F.; Roller, Günter; and Stein, Dieter, 5,470,444, Cl. 204-93.000.

Steinberg, Fritz: *See*—
Hudspeth, Thomas; and Steinberg, Fritz, 5,471,177, Cl. 333-126.000.

Steinhorn, David M.: *See*—
Fuhrman, Bradley P.; Flaim, Stephen F.; Hernan, Lynn J.; Nesti, Frances D.; Papo, Michele C.; and Steinhorn, David M., 5,470,885, Cl. 514-743.000.

Steinmann, Bettina: *See*—
Wolf, Jean-Pierre; Schulthess, Adrian; Steinmann, Bettina; and Hunziker, Max, 5,470,689, Cl. 430-269.000.

Steins, Johannes: *See*—
Berger, Harald; Mittag, Peter; Steins, Johannes; and Pfeiffer, Gert, 5,471,495, Cl. 373-2.000.

Stephen, James C.; Schlosser, Erich J.; and Sieg, Ewald, to Weber-Stephen Products Co. Charcoal igniter. 5,469,835, Cl. 126-25.00B.

Stephens, Arthur, to Texas Instruments Incorporated. MTOL software tool for converting an RTL behavioral model into layout information comprising bounding boxes and an associated interconnect netlist. 5,471,398, Cl. 364-490.000.

Stern, Alvin L. Method of forming porcelain tooth restorations. 5,470,231, Cl. 433-223.000.

Stetson, Bruce E.: *See*—
Piscopo, Mark F.; Stetson, Bruce E.; and Stetson, Nancy E., 5,469,861, Cl. 128-781.000.

Stetson, Nancy E.: *See*—
Piscopo, Mark F.; Stetson, Bruce E.; and Stetson, Nancy E., 5,469,861, Cl. 128-781.000.

Steuer, Werner; and Bergles, Eduard, to Fichtel & Sachs AG. Multi-speed bicycle hub and an operating mechanism thereof. 5,469,755, Cl. 74-371.000.

Stevens, Ronald H.: *See*—
Miles, Steven A.; Stevens, Ronald H.; Martinez, Otoniel M.; Kishimoto, Tadamitsu; and Klashman, David J., 5,470,824, Cl. 514-2.000.

Stewart, Gerald M.; and Bradbury, E. Douglas, to Manitou Mountain Bikes, Inc. Precision suspension fork for bicylces. 5,470,090, Cl. 280-276.000.

Stewart, Gregory M.: *See*—
Farrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., 5,471,617, Cl. 395-700.000.

Stewart, Gregory N.; Overfield, Anthony L.; and Ellis, Mark T., to Dell USA, L.P. Computer system with plug-in override of system ROM. 5,471,674, Cl. 395-650.000.

Stewart, Rodger: *See*—
Sjogren, Axel; Carson, Gary; Estergreen, Steve; Taga, Timothy; and Stewart, Rodger, 5,470,531, Cl. 422-46.000.

Stiefvater, Joseph C. Pool table ball return compartment light. 5,470,765, Cl. 473-28.000.

Stilli, Adrian: *See*—
Kawa, Franciszek; Stilli, Adrian; and Roehrig, Adalbert, 5,469,910, Cl. 164-459.000.

Stinehelfer, Jonathan J.: *See*—
Rose, James W.; D'Souza, Godfrey P.; Stinehelfer, Jonathan J.; and Testa, James F., 5,471,421, Cl. 365-182.000.

Stini, Harald: *See*—
Morweiser, Karl-Heinz; Veeser, Klaus; and Stini, Harald, 5,470,485, Cl. 210-748.000.

Stirchak, Eugene: *See*—
Summerton, James; Weller, Dwight; and Stirchak, Eugene, 5,470,974, Cl. 544-118.000.

Stöckert Instrumente GmbH: *See*—
Knott, Erwin; and Hahn, Andreas, 5,470,211, Cl. 417-477.900.

Stockstad, Troy L.: *See*—
Petty, Thomas D.; Stockstad, Troy L.; and Vyne, Robert L., 5,471,174, Cl. 330-257.000.

Stockton, Grant J.: *See*—

Yokote, Timothy A.; Upton, Eric L.; Enyedy, Arthur G.; Stockton, Graat J.; and Brandis, Dirk K., 5,471,603, Cl. 395-402.000.

Stoesz, Karen D.: *See*—
Petelle, Joey; Stoesz, Karen D.; and Williams, Lisa R., 5,470,600, Cl. 426-237.000.

Stoll, Kurt; Waldmann, Dieter; and Feyrer, Thomas, to Festo KG. Linear drive with a buffer device. 5,469,775, Cl. 92-88.000.

Stone, Jonathan J., to Sony United Kingdom Limited. Data formatter for formatting variable length data words into fixed length data words. 5,471,594, Cl. 395-375.000.

Stone, Stephen R., to Rineer Hydraulics, Inc. Wear resistant vane-type fluid power converter. 5,470,215, Cl. 418-266.000.

Stork, David G.: *See*—
Zandi, Ahmad; Stork, David G.; and Allen, James, 5,471,207, Cl. 341-107.000.

StorMedia, Inc.: *See*—
Mahvan, Nader; Eltoukhy, Atef H.; and Teng, Edward F., 5,470,447, Cl. 204-192.160.

Stover, Jimmy R., to Western Steel, Inc. Fiber reducer reciprocating conveyor having an improved bearing assembly. 5,469,603, Cl. 19-80.00R.

Stover, Lance E.: *See*—
Bortins, John; Stageberg, Frank; Stover, Lance E.; and Weispfenning, Gerald L., 5,471,354, Cl. 360-77.050.

St. Peter, Lawrence A. Plumb bob. 5,469,633, Cl. 33-394.000.

St-Pierre, Jean-Guy; and Godbout, André, to les Équipements Vibrotech Inc. Screening apparatus and method for screening mixed materials. 5,469,972, Cl. 209-245.000.

Strandberg, Hans: *See*—
Neubauer, Heinz; Hirschberg, Jakub; and Strandberg, Hans, 5,470,348, Cl. 607-68.000.

Strate, Joachim: *See*—
Ott, Karl; Walter, Klaus; and Strate, Joachim, 5,469,823, Cl. 123-414.000.

Strattan, Landon A.: *See*—
Phillips, Peter E.; Strattan, Landon A.; and Desai, Vikram D., 5,471,491, Cl. 372-35.000.

Strausberg, Susan L.: *See*—
Bryan, Philip N.; Alexander, Patrick A.; and Strausberg, Susan L., 5,470,733, Cl. 435-222.000.

Street, Michael J.; and Mottram, Toby T. F., to British Technology Group Ltd. Animal stall. 5,469,808, Cl. 119-27.000.

Streeter, Gary R.: *See*—
Irwin, Kenneth E., Jr.; Streeter, Gary R.; and Daigle, Steven J., 5,471,039, Cl. 235-441.000.

Stringaro, Jean P., to Sulzer Chemtech AG. Catalyzing fixed bed reactor. 5,470,542, Cl. 422-211.000.

Stromberg, Brent V. Method of treating peripheral vasoconstriction with tamoxifen citrate. 5,470,883, Cl. 514-648.000.

Stross, Lawrence L. Method of loading live poultry. 5,469,815, Cl. 119-846.000.

Stryker Corporation: *See*—
Arnett, Jeffery D.; Gately, Nicholas V.; Grulke, David H.; Hilsbos, Ruth A.; and Sertic, James L., 5,470,305, Cl. 601-161.000.

Stubbs, Brian M.: *See*—
Bull, Alan; Hardman, David J.; Stubbs, Brian M.; and Sallis, Paul J., 5,470,742, Cl. 435-262.000.

Stuchell, Robert M.: *See*—
Charlton, Judie F.; Schwab, Ivan R.; and Stuchell, Robert M., 5,470,881, Cl. 514-588.000.

Stuebing, Carlton; and Caspell, George J., to Tektronix, Inc. Setup or hold violation triggering. 5,471,159, Cl. 327-24.000.

Stupeck, Donald: *See*—
Codilian, Raffi; and Stupeck, Donald, 5,471,353, Cl. 360-73.030.

Stutzmann, Pascal: *See*—
Bachot, Jean; and Stutzmann, Pascal, 5,470,449, Cl. 204-252.000.

Subotic, Goran. Custom ballet pointe shoe. 5,469,641, Cl. 36-93.000.

Suematsu, Hiroyuki; Ochi, Hisayuki; Ohno, Manabu; and Kuwashima, Tetsuhito, to Canon Kabushiki Kaisha. Image forming apparatus. 5,470,686, Cl. 430-111.000.

Suetsugi, Keisuke; Kanno, Hiroshi; Sugawara, Masayuki; Mitani, Kohji; Fujita, Yoshihiro; Saitoh, Toshinori; and Ninomiya, Yuichi, to Matsushita Electric Industrial Co., Ltd; Matsushita Communication Industrial Co., Ltd.; and Nippon Hoso Kyokai. Solid state video camera having improved chromatic aberration suppression and moire suppression. 5,471,323, Cl. 358-511.000.

Sugai Corporation: *See*—
Mezaki, Tamotsu, 5,469,634, Cl. 34-58.000.

Suganuma, Yoshikazu: *See*—
Toshimitsu, Manabu; Aiyoshizawa, Shunichi; Suganuma, Yoshikazu; and Konno, Daisuke, 5,471,104, Cl. 310-90.000.

Sugawara, Kazuaki; and Ito, Hideo, to Pioneer Electronic Corporation. Adaptive system for selectively recording from a plurality of video sources and method thereof. 5,471,316, Cl. 358-342.000.

Sugawara, Masayuki: *See*—
Suetsugi, Keisuke; Kanno, Hiroshi; Sugawara, Masayuki; Mitani, Kohji; Fujita, Yoshihiro; Saitoh, Toshinori; and Ninomiya, Yuichi, 5,471,323, Cl. 358-511.000.

Sugawara, Saburo, to Canon Kabushiki Kaisha. Photographing apparatus having optical low-pass filter. 5,471,344, Cl. 359-566.000.

Sugawara, Shuji; Sukata, Kazuaki; and Yamanaka, Shun-ichiro, to Orient Chemical Industries, Ltd. Toner for developing electrostatic images. 5,470,685, Cl. 430-110.000.

Sugihara, Masanori: *See*—
Yasuda, Yukio; Yamaguchi, Akiyasu; Igarashi, Tatsushi; Oonishi, Yasuo; Kai, Kenzo; Sugihara, Masanori; Mori, Takashi; and Miyaji, Akira, 5,471,278, Cl. 355-67.000.

Sugimoto, Mamoru: *See*—
Ogawa, Tomoya; Nunomura, Shigeki; and Sugimoto, Mamoru, 5,470,962, Cl. 536-17.200.

Sugimoto, Shunichi: *See*—
Nishii, Masanobu; Shimizu, Yuichi; Kawanishi, Shunichi; Sugimoto, Shunichi; Endo, Masao; and Nagase, Tomohiro, 5,470,617, Cl. 427-521.000.

Sugita, Yumiko: *See*—
Kimura, Shinji; Sugita, Yumiko; Nakamura, Shouji; and Koda, Eriko, 5,471,579, Cl. 395-163.000.

Sugiura, Nobuo: *See*—
Aoki, Shigehisa; Iwasaki, Shinichi; Sugiura, Nobuo; Suzuki, Sakaru; and Kimata, Koji, 5,470,578, Cl. 424-450.000.

Sugiura, Nobutada: *See*—
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Kasuya, Satoru; Sugiura, Nobutada; and Nishida, Masaaki, 5,470,284, Cl. 475-204.000.

Sugiyama, Masami; Uchida, Yoshiaki; Kurano, Yoshihiro; Tanaka, Aiko; and Tanimoto, Tetsuji, to Fujirebio, Inc. Anti-glycated hemoglobin monoclonal antibody and method for measuring glycated hemoglobin. 5,470,759, Cl. 436-541.000.

Sugiyama, Mitsuo: *See*—
Fukumi, Hiroshi; Sakamoto, Toshiaki; Sugiyama, Mitsuo; Yamaguchi, Takeshi; Oshima, Takeshi; Asai, Fumitoshi; and Iijima, Yasuteru, 5,470,851, Cl. 514-214.000.

Sugiyama, Shohji; and Tokube, Akira, to Matsushita Electric Industrial Co., Ltd. Electronic instrument casing. 5,471,666, Cl. 455-348.000.

Suguro, Kyoichi; and Okano, Haruo, to Kabushiki Kaisha Toshiba. Method of manufacturing semiconductor device. 5,470,791, Cl. 437-192.000.

Sukata, Kazuaki: *See*—
Sugawara, Shuji; Sukata, Kazuaki; and Yamanaka, Shun-ichiro, 5,470,685, Cl. 430-110.000.

Sullivan, Marvin B.: *See*—
Williams, Joseph B., Jr.; and Sullivan, Marvin B., 5,470,032, Cl. 244-1.0TD.

Sullivan, Michael J.; and Nesbitt, R. Dennis, to Lisco, Inc. High visibility inflated game ball. 5,470,058, Cl. 273-65.00B.

Sullivan, Michael J.: *See*—
Nesbitt, R. Dennis; and Sullivan, Michael J., 5,470,075, Cl. 273-220.000.

Sullivan, William B., to Wide Band Systems, Inc. Associative processor for detecting redundant radar data and method of use thereof. 5,471,216, Cl. 342-195.000.

Sulsky, Richard B.: *See*—
Magnin, David R.; Biller, Scott A.; Dickson, John K., Jr.; Lawrence, R. Michael; and Sulsky, Richard B., 5,470,845, Cl. 514-121.000.

Sulzer Chemtech AG: *See*—
Stringaro, Jean P., 5,470,542, Cl. 422-211.000.

Sulzer-Escher Wyss GmbH: *See*—
Hess, Harald, 5,469,784, Cl. 100-93.0RP.

Sulzer Rueti AG: *See*—
Christe, Marcel; and Schaich, Urs, 5,469,896, Cl. 139-450.000.

Sumino, Shigeo: *See*—
Ikezawa, Mitsuru; Miyatake, Takafumi; Ueda, Hirotada; Sumino, Shigeo; and Yoshizawa, Satoshi, 5,471,535, Cl. 382-199.000.

Sumitomo Chemical Company, Limited: *See*—
Sasaki, Toshio; Ebara, Takeshi; Igarashi, Toshio; Tatsumi, Masayuki; and Wakamatsu, Kazuki, 5,470,900, Cl. 524-269.000.

Sumitomo Electric Industries, Ltd.: *See*—
Hayami, Hiroshi, 5,470,657, Cl. 428-373.000.
Nakamura, Takao; Inada, Hiroshi; and Iiyama, Michitomo, 5,471,069, Cl. 257-39.000.
Tsuchiya, Ichiro; Danzuka, Toshio; and Ito, Masumi, 5,470,369, Cl. 65-379.000.
Yui, Dai; Hirai, Shigeru; and Semura, Shigeru, 5,471,306, Cl. 356-367.000.

Sumitomo Electric Lightwave Corp.: *See*—
Braga, David J.; Carter, Thomas L.; Dozier, Edward M.; and Sarbell, John P., 5,471,555, Cl. 385-136.000.

Sumitomo Metal Ceramics Inc.: *See*—
Fukuta, Junzo; Fukaya, Masashi; and Araki, Hideaki, 5,470,412, Cl. 156-89.000.

Sumitomo Metal Industries, Ltd.: *See*—
Nomura, Shigeki; Komatsubara, Nozomi; Mizui, Naomitsu; Kunishige, Kazutoshi; and Fukagawa, Tomoki, 5,470,529, Cl. 420-103.000.

Sumitomo Wiring Systems, Ltd.: *See*—
Kubo, Yoshinobu; and Chishima, Masamitsu, 5,470,902, Cl. 524-400.000.

Sumiya, Toshifumi, to Nidek Co., Ltd. Operation apparatus for correcting ametropia with laser beam. 5,470,329, Cl. 606-4.000.

Summerfelt, Scott R.; and Beratan, Howard R., to Texas Instruments Incorporated. Electrode interface for high-dielectric-constant materials. 5,471,364, Cl. 361-321.400.

Summerton, James; Weller, Dwight; and Stirchak, Eugene, to Neu-Gene Development Group. Uncharged polynucleotide-binding polymers. 5,470,974, Cl. 544-118.000.
Sumner, Christopher: *See—*
Reid, Alister P.; Kopec, John; and Sumner, Christopher, 5,469,659, Cl. 49-169.000.
Sun Microsystems, Inc.: *See—*
Rose, James W.; D'Souza, Godfrey P.; Stinehelfer, Jonathan J.; and Testa, James F., 5,471,421, Cl. 365-182.000.
Sun, Yu: *See—*
Liu, David K. Y.; Sun, Yu; and Chang, Chi, 5,470,773, Cl. 437-43.000.
Sundberg, Staffan; Sergeev, Vilaly E.; and Nesterov, Vladimir G., to Ovako Couplings AB. Shafting connection. 5,470,166, Cl. 403-314.000.
SunDisk Corporation: *See—*
Mangan, John S.; Norman, Robert D.; Craig, Jeffrey; Albert, Richard; Gupta, Anil; Stai, Jeffrey D.; and Lofgren, Karl M. J., 5,471,478, Cl. 371-10.300.
Sung, Janmye: *See—*
Chiu, Tzu-Yin; Erceg, Frank M.; Liu, Te-Yin M.; Moerschel, Kenenth G.; Prozonic, Michael A.; and Sung, Janmye, 5,470,783, Cl. 437-72.000.
Sunkyong Industries: *See—*
Kim, Hyo Y.; Hwang, Ki H.; Chae, Hoon; Sho, Soo I.; and Jun, Jung N., 5,470,941, Cl. 528-272.000.
Suntory Limited: *See—*
Furuichi, Kazuo; and Gomi, Tatsuya, 5,469,985, Cl. 220-632.000.
Super Dry Industries, Inc.: *See—*
Coleman, Douglas, 5,469,809, Cl. 119-173.000.
Supersaxo, Andreas; and Kou, Jim H., to Syntex (U.S.A.) Inc. Controlled delivery of pharmaceuticals from preformed porous polymeric microparticles. 5,470,582, Cl. 424-489.000.
Surman, David H.: *See—*
Yudenfriend, Harry M.; Surman, David H.; and Beardsley, Brent C., 5,471,609, Cl. 395-182.020.
Sutcliffe, Brian L. Modular night splint. 5,470,310, Cl. 602-24.000.
Sutherland, William M.: *See—*
Taylor, Ronald P.; Sutherland, William M.; Reist, Craig; Wright, Eleanor L.; Webb, Donna; and Labuguen, Ronald, 5,470,570, Cl. 424-93.730.
Sutradhar, Bhagya C.: *See—*
Anderson, Howard W.; Carberry, John B.; Staunton, Harold F.; and Sutradhar, Bhagya C., 5,471,001, Cl. 562-593.000.
Sutterlin, Philip H.; and Downey, Walter J., to Echelon Corporation. Sigma-delta converter having a digital logic gate core. 5,471,209, Cl. 341-143.000.
Suyama, Shuji; Ishigaki, Hideyo; Tomoda, Masayasu; Shirai, Yoshihiro; Tanuka, Hiroyuki; and Komai, Masaharu, to Daikin Industries Limited. Volcanizable bromine-containing fluororubber composition containing a peroxy-benzoate. 5,470,917, Cl. 525-326.300.
Suzuki, Akira: *See—*
Tanii, Yoshiyuki; Nakamura, Motokazu; Nagayama, Yoshikatsu; Morita, Katsuaki; Hibino, Hiroki; and Suzuki, Akira, 5,469,840, Cl. 600-117.000.
Suzuki, Keiichiro, to Japan Aviation Electronics Industry, Limited. Card edge connector comprising levers for a card board on both ends of an insulator rod, 5,470,240, Cl. 439-157.000.
Suzuki, Kenji: *See—*
Sasaki, Michiyuki; Suzuki, Kenji; Morosawa, Kenji; Ohba, Toshimitsu; and Kadonaga, Tooru, 5,471,203, Cl. 340-825.310.
Suzuki, Kenshi; Shibatani, Kazuhiro; and Nishii, Hisao, to Tsubakimoto Chain Co. Routeless guiding method for moving body. 5,471,385, Cl. 364-424.020.
Suzuki, Makoto: *See—*
Yoshioka, Mamoru; Obata, Haruyuki; Tanoue, Ken; Iwashita, Yoshihiro; Kashiwagura, Toshimi; Suzuki, Makoto; Ichinose, Hiroki; and Okamizu, Hironori, 5,469,818, Cl. 123-90.150.
Suzuki, Masahiko: *See—*
Saruyama, Toshio; and Suzuki, Masahiko, 5,470,934, Cl. 52.8-34.000.
Suzuki, Masami: *See—*
Nishino, Kazuaki; Awano, Yoji; Takamiya, Hiroyuki; Ito, Mitsufumi; Suzuki, Masami; and Genma, Yoshikazu, 5,470,402, Cl. 148-325.000.
Suzuki, Masao; Matoba, Kazuyuki; Sakaegi, Yuji; and Sasaki, Takashi, to Canon Kabushiki Kaisha. Electronic still camera. 5,471,243, Cl. 348-234.000.
Suzuki, Masaru: *See—*
Sakamoto, Jun; Yoshida, Minoru; Aoyama, Masatoshi; Suzuki, Masaru; Nakamori, Yukari; Okazaki, Iwao; and Abe, Koichi, 5,470,637, Cl. 428-143.000.
Suzuki, Masatoshi: *See—*
Taga, Hidenori; Suzuki, Masatoshi; Edagawa, Noboru; Yamamoto, Shu; and Wakabayashi, Hiroharu, 5,471,333, Cl. 359-173.000.
Suzuki, Michio: *See—*
Tanaka, Yasuhiro; Nagai, Yasuhiko; Suzuki, Michio; Kagei, Takashi; Shinnai, Kohsuke; Ikeba, Goro; and Saito, Masato, 5,471,399, Cl. 364-491.000.
Suzuki, Mitsuru; Shindo, Mikio; and Kashiwa, Yoichi, to Whitaker Corporation, The. Electrical connector. 5,470,258, Cl. 439-595.000.
Suzuki, Noriyuki; and Takeuchi, Shinsuke, to Canon Kabushiki Kaisha. Coordinate input apparatus and calibration method for the same. 5,471,226, Cl. 345-173.000.
Suzuki, Sakaru: *See—*
Aoki, Shigehisa; Iwasaki, Shinichi; Sugiura, Nobuo; Suzuki, Sakaru; and Kimata, Koji, 5,470,578, Cl. 424-450.000.
Suzuki, Satomi: *See—*
Kobayashi, Tuneo; Kita, Kazunori; and Suzuki, Satomi, 5,471,438, Cl. 368-281.000.
Suzuki, Syuji: *See—*
Shiragaki, Tatsuya; Shiozawa, Takahiro; Suzuki, Syuji; and Fujiwara, Masahiko, 5,471,332, Cl. 359-117.000.
Suzuki, Takahiro: *See—*
Ashiya, Seiji; Suzuki, Takahiro; and Murase, Masanori, 5,470,682, Cl. 430-84.000.
Suzuki, Takehiro; Inomata, Shigemitsu; and Komori, Mikio, to Japan Tobacco Inc. Web delivery apparatus for a cigarette manufacturing machine and a delivery method therefor. 5,469,869, Cl. 131-60.000.
Suzuki, Tomoko: *See—*
Niigaki, Minoru; Kinoshita, Katsuyuki; Hirohata, Toru; Ihara, Tuneo; Yamada, Masami; Asakura, Norio; Negi, Yasuharu; and Suzuki, Tomoko, 5,471,051, Cl. 250-214.0VT.
Suzuki, Tomoyuki: *See—*
Nishima, Osamu; Suzuki, Tomoyuki; and Nishibori, Kazuhiko, 5,471,246, Cl. 348-322.000.
Suzuki, Toshio: *See—*
Tawaragi, Yuji; Kusano, Satoshi; Suzuki, Toshio; and Obitsu, Noriko, 5,471,446, Cl. 369-44.140.
Suzuki, Yasuo, to Canon Kabushiki Kaisha. Information recording-reproducing apparatus. 5,471,453, Cl. 369-100.000.
Suzuki, Yasutoshi; Ao, Kenichi; Uenoyama, Hirofumi; Noguchi, Hiroki; Eguchi, Koji; Ito, Ichiro; and Yoshino, Yoshimi, to Nippondenso Co., Ltd. Magnetoresistive element and manufacturing method therefor. 5,471,084, Cl. 257-421.000.
Svanberg, Johanna: *See—*
Oulie, Finn; Backlund, Ake; and Svanberg, Johanna, 5,470,437, Cl. 162-237.000.
Svensson, John E.: *See—*
Meibock, Antonin A.; and Svensson, John E., 5,470,085, Cl. 280-11.200.
Sveshnikov, Alexander A.: *See—*
Koshkin, Petr K.; Sveshnikov, Alexander A.; and Bobrovskikh, Jury M., 5,471,179, Cl. 333-195.000.
Svoboda, John M., Sr.: *See—*
Nolan, Brian J.; Mahaffey, Glenn L.; and Svoboda, John M., Sr., 5,470,131, Cl. 299-41.100.
Swain, William F.: *See—*
Yang, Ning-Sun; Swain, William F.; Burkholder, Joseph K.; and Fuller, Deborah L., 5,470,708, Cl. 435-6.000.
Swami, Ravi: *See—*
Nimishakavi, Hanumanthrao; and Swami, Ravi, 5,471,588, Cl. 395-293.000.
Swartz, Conrad M.; and Abrams, Richard S., to Somatics, Inc. Safety monitor circuit for an ECT device and method. 5,470,347, Cl. 607-45.000.
Swartz, Jerome: *See—*
Kirkeby, David; Metlitsky, Boris; Krichever, Mark; and Swartz, Jerome, 5,471,042, Cl. 235-472.000.
Wang, Ynjiun P.; Swartz, Jerome; and McGlynn, Daniel R., 5,471,533, Cl. 380-51.000.
Swartz, Stuart E.: *See—*
Hu, Kuo-Kuang; Kirmser, Philip G.; Swartz, Stuart E.; and Hossain, Mustaque, 5,470,174, Cl. 404-52.000.
Sweetman, Robert J.: *See—*
Gore, Jayavant P.; and Sweetman, Robert J., 5,471,109, Cl. 313-22.000.
Swenson, Robert A.: *See—*
Williams, Dennis A.; Looney, James R.; Conway, Michael W.; and Swenson, Robert A., 5,470,823, Cl. 507-241.000.
Swick, E. Grant. Electrical connection terminal assembly and tilt washer. 5,470,183, Cl. 411-368.000.
Swiderski, Zbigniew: *See—*
Kiedik, Maciej; Krueger, Andrzej; Kołt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Władysład, 5,470,809, Cl. 502-12.000.
Swiedler, Stuart J.: *See—*
Brandley, Brian K.; Tiemeyer, Michael; Swiedler, Stuart J.; Moreland, Margaret; and Schweingruber, Hans, 5,470,842, Cl. 514-61.000.
Syed, Abuzar, to Montell North America Inc. Sorbitol derivatives as nucleators and clarifiers for polyolefins, and polyolefin compositions obtained therewith. 5,470,898, Cl. 524-84.000.
Syed-Bokhari, Jade: *See—*
Tseung, Alfred C. C.; Shen, Pei K.; and Syed-Bokhari, Jade, 5,470,673, Cl. 429-44.000.
Symbol Technologies, Inc.: *See—*
Kirkeby, David; Metlitsky, Boris; Krichever, Mark; and Swartz, Jerome, 5,471,042, Cl. 235-472.000.
Wang, Ynjiun P.; Swartz, Jerome; and McGlynn, Daniel R., 5,471,533, Cl. 380-51.000.
Symetrix Corporation: *See—*
Mihara, Takashi, 5,471,363, Cl. 361-305.000.
Synbiotics Corporation: *See—*
Bean, Eric S.; Waldman, Cheryl; and Sanders, Ronald, 5,470,711, Cl. 435-7.100.
Synernetics Inc.: *See—*
McClure, R. Bruce; Lawler, Christopher P.; and Hill, Shannon Q., 5,471,472, Cl. 370-85.130.
Syntex (U.S.A.) Inc.: *See—*
Supersaxo, Andreas; and Kou, Jim H., 5,470,582, Cl. 424-489.000.

Syntex Pharmaceuticals International Limited: *See*—
Kuramoto, Roy; Chowhan, Zakauddin T.; Pendleton, Ranal O.; and Hafezzadeh, Hafez, 5,470,580, Cl. 424-464.000.
Synthetica Technologies, Inc.: *See*—
Galloway, Terry R., 5,470,544, Cl. 422-213.000.
Szegda, Andrew, to John Mezzalingua Assoc. Inc. Radial compression type coaxial cable end connector. 5,470,257, Cl. 439-578.000.
Szigethy, Attila; Jenkins, Brian C.; and Folsom, Marc D., to Morton International, Inc. Sliding cushion retainer with self-locking device. 5,470,098. Cl. 280-728.200.
Szostak, Michael P.: *See*—
Lubitz, Werner; and Szostak, Michael P., 5,470,573, Cl. 424-200.100.
Szumlanski, Carol L.: *See*—
Weinshilboum, Richard M.; Honchel, Ronald; Aksoy, Ibrahim A.; Szumlanski, Carol L.; Wood, Thomas C.; Otterness, Diane M.; and Wieben, Eric D., 5,470,737, Cl. 435-240.200.
Szynal, Joseph M.: *See*—
Janke, Donald E.; Szynal, Joseph M.; and Guess, Ronald W., 5,469,715, Cl. 62-155.000.
T&M Toys, Inc.: *See*—
Ingram, Steven E., 5,470,294, Cl. 482-66.000.
Tabata, Takahiro: *See*—
Tanigami, Yoshinori; Tabata, Takahiro; Hashima, Hidekazu; and Konishi, Akio, 5,470,506, Cl. 252-518.000.
Taboga, Leandro. Method for the treatment of animal waste. 5,470,476, Cl. 210-615.000.
Taborn, Michael P.: *See*—
Bailey, Roger N.; Burchfiel, Steven M.; and Taborn, Michael P., 5,471,410, Cl. 364-715.010.
Tada, Hideki: *See*—
Fujii, Haruo; Kobayashi, Tatsuya; Imai, Nobuhiro; Kojima, Hisayoshi; Umezawa, Masao; Tada, Hideki; Ito, Akira; Seto, Kaoru; Katoh, Motoi; and Murata, Daisuke, 5,471,284, Cl. 355-210.000.
Tada, Katsumi: *See*—
Kawaguchi, Hisamitsu; Tada, Katsumi; Kato, Kanji; and Shinozaki, Masatsugu, 5,471,610, Cl. 395-600.000.
Tadano, Keiko: *See*—
Ueno, Takumi; Shiraishi, Hiroshi; Hayashi, Nobuaki; Fukuma, Emiko; and Tadano, Keiko, 5,470,996, Cl. 558-46.000.
Tadokoro, Shigeru; Narishige, Shinji; Koyanagi, Hiroaki; and Kobayashi, Tetsuo, to Hitachi, Ltd. Thin film magnetoresistive head which includes a domain suppressing layer and method for manufacturing the same. 5,471,358, Cl. 360-113.000.
Taga, Hidenori; Suzuki, Masatoshi; Edagawa, Noboru; Yamamoto, Shu; and Wakabayashi, Hiroharu, to Kokusai Denshin Denwa Kabushiki Kaisha. Optical communication system. 5,471,333, Cl. 359-173.000.
Taga, Timothy: *See*—
Sjogren, Axel; Carson, Gary; Estergreen, Steve; Taga, Timothy; and Stewart, Rodger, 5,470,531, Cl. 422-46.000.
Tagashira, Minoru: *See*—
Yoshida, Yuji; Funakura, Masami; Nakatani, Kazuo; and Tagashira, Minoru, 5,470,496, Cl. 252-67.000.
Taguchi, Hironori, to Matsushita Electric Industrial Co., Ltd. Electrophotographic printing apparatus having air flow passage. 5,471,280, Cl. 355-200.000.
Taguchi, Jun'ichi: *See*—
Yoshida, Makoto; Satoh, Naoki; Asoh, Hidehiko; Shudo, Tuyosi; Takeda, Ryuzaburo; and Taguchi, Jun'ichi, 5,471,141, Cl. 324-314.000.
Tai, Hwai-Tzuu: *See*—
Ng, Yee S.; and Tai, Hwai-Tzuu, 5,471,543, Cl. 382-173.000.
Taira, Toshimitsu; Ohnuma, Masao; Hanada, Hisao; Aoki, Teruo; and Kuhara, Tetsuro, to Krosaki Corporation. Sliding nozzle plate-metal frame fixing structure. 5,470,048, Cl. 266-236.000.
Taiwan Semiconductor Manufacturing Company Ltd.: *See*—
Yoo, Chue-San, 5,470,779, Cl. 437-52.000.
Taiyo Yuden, Co., Ltd.: *See*—
Arai, Yuji; Matumoto, Takanobu; Shin, Yuaki; and Ishiguro, Takashi, 5,470,691, Cl. 430-273.000.
Tajima, Toshimi: *See*—
Makino, Tetsuo; Fujiki, Keiichi; and Tajima, Toshimi, 5,470,439, Cl. 162-216.000.
Takada, Masayuki; Yamada, Osamu; Kuroda, Toru; Yamazaki, Koichi; and Noda, Kazuo, to Nippon Hoso Kyokai; and Nippon Conlux Co., Ltd. Write once type information recording medium, method and apparatus for formatting the same, and method and apparatus for writing data to or reading data from the same. 5,471,424, Cl. 365-189.010.
Takada, Shinji: *See*—
Okumoto, Koji; Matsuno, Katsumi; Shiono, Toru; Senuma, Toshitaka; Fukuda, Tokuya; and Takada, Shinji, 5,471,481, Cl. 371-22.300.
Takada, Toshikazu: *See*—
Mochizuki, Yuji; Chiba, Yoshie; Takada, Toshikazu; and Usui, Akira, 5,469,806, Cl. 117-97.000.
Takahama, Manabu: *See*—
Shimada, Yoshinori; Kondo, Naofumi; Sakurai, Takehisa; Kataoka, Yoshiharu; Takahama, Manabu; and Katayama, Mikio, 5,471,070, Cl. 257-57.000.
Takahashi, Akira: *See*—
Ohta, Kenji; Hirokane, Junji; Takahashi, Akira; Inui, Tetsuya; Katoh, Shohichi; and Deguchi, Toshihisa, 5,470,694, Cl. 430-321.000.
Takahashi, Hideo: *See*—
Murakami, Tadayoshi; and Takahashi, Hideo, 5,471,076, Cl. 257-184.000.
Takahashi, Hiroshi: *See*—
Fujioka, Tetsuya; Bannai, Kazunori; and Takahashi, Hiroshi, 5,471,277. Cl. 355-25.000.
Takahashi, Nobuo: *See*—
Nishimura, Kunio; Nakagawa, Hideo; and Takahashi, Nobuo, 5,470,106, Cl. 280-743.100.
Takahashi, Nobuyuki: *See*—
Kobayashi, Masahiko; and Takahashi, Nobuyuki, 5,470,451, Cl. 204-298.030.
Takahashi, Shigeki; Kataoka, Mitsuhiro; and Yamamoto, Tsuyoshi, to Nippondenso Co., Ltd. Manufacturing method of semiconductor device. 5,470,770, Cl. 437-41.000.
Takahashi, Tatsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Fuel supply control system for an automotive engine. 5,469,831, Cl. 123-680.000.
Takahashi, Toshie: *See*—
Domoto, Yoshihisa; Takahashi, Toshie; and Kurumada, Toshimi, 5,471,525, Cl. 379-247.000.
Takakuwa, Yasushi: *See*—
Nakagawa, Kazuo; Iritani, Yuichi; Yamazaki, Hiromi; and Takakuwa, Yasushi, 5,471,058, Cl. 250-291.000.
Takami, Satoshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Strobe control apparatus of camera. 5,471,370, Cl. 362-4.000.
Takamiya, Hiroyuki: *See*—
Nishino, Kazuaki; Awano, Yoji; Takamiya, Hiroyuki; Ito, Mitsufumi; Suzuki, Masami; and Genma, Yoshikazu, 5,470,402, Cl. 148-325.000.
Takamoto, Masanori; Yamada, Naoyuki; and Kobayashi, Yasuhiro, to Hitachi, Ltd. Method for optimizing resource allocation and an apparatus using the method. 5,471,408, Cl. 364-578.000.
Takamura, Fujitoshi, to Kabushiki Kaisha Komatsu Seisakusho. Fine operation mode changeover device for hydraulic excavator. 5,469,646, Cl. 37-382.000.
Takano, Toshiyuki: *See*—
Satake, Toshimi; Takano, Toshiyuki; Hayasaka, Hideki; Uehori, Yukiko; and Nagai, Tomoaki, 5,470,816, Cl. 503-201.000.
Takara Shuzo Co., Ltd.: *See*—
Hirano, Shinji; Kimoto, Naomi; Shimoyama, Yutaka; Hirohashi, Setsuo; and Takeichi, Masatoshi, 5,470,966, Cl. 536-23.500.
Yamamoto, Katsuhiko; Sagawa, Hiroaki; Kotani, Hirokazu; Hiraoka, Nobutsugu; and Nakamura, Teruya, 5,470,732, Cl. 435-196.000.
Takasaki, Soichi: *See*—
Motomura, Hiroharu; Takasaki, Soichi; and Kinoshita, Kenji, 5,470,528, Cl. 420-84.000.
Takashima, Hiroaki; Kato, Osamu; and Kihara, Tsutomu, to Nippon Oil Company, Limited. Process for producing pitch-based carbon fibers superior in compression characteristics. 5,470,558, Cl. 423-447.600.
Takasugi, Yoshiharu, to Olympus Optical Co., Ltd. Imaging device. 5,471,343, Cl. 359-494.000.
Takatori, Sunao: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,471,161, Cl. 327-58.000.
Takatsuka, Masanori, to Yamaha Corporation. Tennis racket. 5,470,062, Cl. 273-73.00R.
Takeda Chemical Ind., Ltd.: *See*—
Harada, Setsuo; Funabashi, Yasunori; Inatomi, Nobuhiro; Tanayama, Shigeharu; and Tanida, Seiichi, 5,470,961, Cl. 536-7.400.
Takeda Chemical Industries, Ltd.: *See*—
Kaneko, Tatsuhiko; Kuroda, Noritaka; and Kashiwa, Kenichi, 5,471,004, Cl. 568-455.000.
Takeda, Ryuzaburo: *See*—
Yoshida, Makoto; Satoh, Naoki; Asoh, Hidehiko; Shudo, Tuyosi; Takeda, Ryuzaburo; and Taguchi, Jun'ichi, 5,471,141, Cl. 324-314.000.
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, to Canon Kabushiki Kaisha. Recording method with variable recording interval. 5,471,227, Cl. 347-9.000.
Takeda, Toshihiko: *See*—
Nomura, Ichiro; Banno, Yoshikazu; Kaneko, Tetsuya; Takeda, Toshihiko; and Iwai, Kumi, 5,470,265, Cl. 445-24.000.
Takei, Hiroyuki: *See*—
Lewis, Aaron; Chen, Zhongping; and Takei, Hiroyuki, 5,470,690, Cl. 430-269.000.
Takei, Kazuo: *See*—
Toba, Taketo; Takei, Kazuo; Matsunaga, Toshiaki; Ikeuchi, Hiroyuki; and Tamura, Fumihide, 5,470,930, Cl. 526-204.000.
Takeichi, Masatoshi: *See*—
Hirano, Shinji; Kimoto, Naomi; Shimoyama, Yutaka; Hirohashi, Setsuo; and Takeichi, Masatoshi, 5,470,966, Cl. 536-23.500.
Takemoto, Takatoshi; and Kawashima, Kazunari, to Kabushiki Kaisha Ace Denken. Coin counter for slot machines and a game parlor having the coin counter therein. 5,469,951, Cl. 194-206.000.
Takenaka Corporation: *See*—
Tsubota, Takahiro; and Kitajima, Hiroshi, 5,470,185, Cl. 414-264.000.
Takesue, Masatoshi: *See*—
Uenishi, Masamoto; Mizobuchi, Tsukasa; Takesue, Masatoshi; Kobayashi, Yukio; and Nagai, Shoichi, 5,470,616, Cl. 427-515.000.
Takeuchi, Hajime: *See*—

Oguchi, Toshihiko; Takeuchi, Hajime; and Murano, Minori, 5,470,645, Cl. 428-212.000.

Takeuchi, Hirofumi: *See*—
Tsutsui, Osamu; Haraga, Hisato; Makita, Atsuo; and Takeuchi, Hirofumi, 5,469,586, Cl. 4-4515.000.

Takeuchi, Masaru: *See*—
Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,469,752, Cl. 73-866.000.

Takeuchi, Shinsuke: *See*—
Suzuki, Noriyuki; and Takeuchi, Shinsuke, 5,471,226, Cl. 345-173.000.

Takeuchi, Yoichiro: *See*—
Yagi, Takayuki; and Takeuchi, Yoichiro, 5,471,595, Cl. 395-375.000.

Takigawa, Morikuni: *See*—
Sato, Toshiyuki; Sakamoto, George; Takigawa, Morikuni; and Kawasaki, Hirotoki, 5,470,081, Cl. 273-438.000.

Takigen Manufacturing Co., Ltd.: *See*—
Yamada, Kenichi, 5,469,725, Cl. 70-208.000.

Takizawa, Kuniharu; Kikuchi, Hiroshi; Osugi, Yukihisa; and Tange, Shoji, to Nippon Hōsō Kyōkai; and NGK Insulators, Ltd. Spatial light modulator element with amorphous film of germanium, carbon and silicon for light blocking layer. 5,471,331, Cl. 359-67.000.

Takizawa, Takeshi, to Canon Kabushiki Kaisha. Apparatus and method for supporting a substrate. 5,471,279, Cl. 355-73.000.

Takizawa, Yutaka: *See*—
Yanai, Ken-ichi; Tanaka, Tsutomu; Ohgata, Koji; Takizawa, Yutaka; Oki, Ken-ichi; and Hirano, Takuya, 5,470,768, Cl. 437-40.000.

Talbot, Nicholas C.; and Nichols, Mark, to Trimble Navigation Limited. Integrated terrestrial survey and satellite positioning system. 5,471,218, Cl. 342-357.000.

Taligent, Inc.: *See*—
Webb, Richard D.; and Cabral, Arthur W., 5,471,568, Cl. 395-133.000.
Zias, Jeff, 5,471,675, Cl. 395-162.000.

Tallarek, Glen E.: *See*—
Thomas, Christopher P.; Weber, Gregory T.; and Tallarek, Glen E., 5,469,826, Cl. 123-488.000.

Tallarico, Jose L.: *See*—
Bilotti, Alberto; and Tallarico, Jose L., 5,471,122, Cl. 318-284.000.

Tallman, Joseph P.; Snowden, Elizabeth M.; and Wolcott, Barry W., to Informed Access Systems, Inc. Medical network management system and process. 5,471,382, Cl. 364-406.000.

Tamai, Seiichiro: *See*—
Inoue, Katsushi; Tamai, Seiichiro; Kobayashi, Keiichi; and Dosho, Marie, 5,471,041, Cl. 235-462.000.

Tamai, Shoji: *See*—
Sakata, Yoshihiro; Yamashita, Wataru; Okawa, Yuichi; Tamai, Shoji; Ishida, Tsutomu; Matsuo, Mitsunori; Yamaguchi, Keizaburo; and Yamaguchi, Akihiro, 5,470,943, Cl. 528-353.000.

Tamenne, Harry L. Self-restoring railroad highway crossing gate device. 5,469,660, Cl. 479-192.000.

Tamglass Oy: *See*—
Salonen, Tauno T.; and Yli-Vakkuri, Erkki P. J., 5,470,367, Cl. 65-162.000.

Tamura, Fumihide: *See*—
Toba, Taketo; Takei, Kazuo; Matsunaga, Toshiaki; Ikeuchi, Hiroyuki; and Tamura, Fumihide, 5,470,930, Cl. 526-204.000.

Tamura, Michiya: *See*—
Shinomiya, Tsutomu; Miyazaki, Shunzo; Tanaka, Yasuyuki; Tsukada, Shinichi; and Tamura, Michiya, 5,470,429, Cl. 156-510.000.

Tan, Kian T.: *See*—
Gordecki, Ryszard J.; and Tan, Kian T., 5,469,982, Cl. 220-4.020.

Tan, Kwan Y.: *See*—
Lee, Neville K.; and Tan, Kwan Y., 5,470,627, Cl. 428-64.400.

Tanabe, Senichi, to NEC Corporation. ATM switching system with unit switch selecting function for avoiding faulty unit switch. 5,471,460, Cl. 370-16.000.

Tanahashi, Hirofumi: *See*—
Morigami, Yuusuke; Matsuo, Hirokazu; Tanahashi, Hirofumi; Hirano, Yoshihito; Nagato, Hiroyasu; and Ishikawa, Takuma, 5,470,051, Cl. 271-7.000.

Tanaka, Aiko: *See*—
Sugiyama, Masami; Uchida, Yoshiaki; Kurano, Yoshihiro; Tanaka, Aiko; and Tanimoto, Tetsuji, 5,470,759, Cl. 436-541.000.

Tanaka, Chieko: *See*—
Miura, Takaharu; Nemoto, Hiroyuki; Ito, Masataka; Kobayashi, Masafumi; and Tanaka, Chieko, 5,470,652, Cl. 428-328.000.

Tanaka, Hideo: *See*—
Torii, Shigeru; Tanaka, Hideo; Sasaoka, Mitio; Shiroi, Takashi; and Kameyama, Yutaka, 5,470,972, Cl. 540-230.000.

Tanaka, Hiroshi; and Masuda, Yasuo, to Mitsubishi Materials Corporation. Edge protector for electrolytic electrode, and spreader bar. 5,470,450, Cl. 204-279.000.

Tanaka, Hiroshi; Kobayashi, Toshiaki; Nanba, Tomiyuki; Ishiwatari, Masaaki; Yoneyama, Toshio; Ohno, Kimio; Matsumoto, Takashi; Kanbe, Tetsuya; Isa, Takashi; and Ogusu, Yoshiyuki, to Shiseido Company Ltd. Alleviating skin irritation resulting from applying tacky tapes. 5,470,563, Cl. 424-448.000.

Tanaka, Hiroyuki: *See*—
Suyama, Shuji; Ishigaki, Hideyo; Tomoda, Masayasu; Shirai, Yoshihiro; Tanaka, Hiroyuki; and Komai, Masaharu, 5,470,917, Cl. 525-326.300.

Tanaka, Katsuhiro: *See*—
Amatsu, Keiji; Butoh, Zenhachiroh; Hirai, Hiroshi; Masaki, Minoru; Morita, Hirofumi; Nakajima, Takeo; Nomura, Nobuo; Sakaki, Mikio; Schmandt, Stephen J.; and Tanaka, Katsuhiro, 5,471,615, Cl. 395-200.030.

Tanaka, Kisaburo: *See*—
Sasaki, Kunimasa; Wakiyama, Youichi; Matsumoto, Takahiro; Tanaka, Kisaburo; and Yamamoto, Keiichi, 5,469,909, Cl. 164-428.000.

Tanaka, Kyoushi: *See*—
Nakajima, Mutsumi; Nagashima, Nobuyoshi; and Tanaka, Kyoushi, 5,471,329, Cl. 359-54.000.

Tanaka, Makoto, to Canon Kabushiki Kaisha. Image forming apparatus with retractable developing unit including plural self-aligning developer bearing rollers. 5,471,286, Cl. 355-245.000.

Tanaka, Minoru: *See*—
Nishimoto, Ikuo; and Tanaka, Minoru, 5,471,050, Cl. 250-214.00A.

Tanaka, Tadashi; Sakamoto, Masaaki; and Sato, Yoshiaki, to Daido Metal Company, Ltd. Aluminum base alloy bearing having superior fatigue resistance. 5,470,666, Cl. 428-653.000.

Tanaka, Tsutomu: *See*—
Yanai, Ken-ichi; Tanaka, Tsutomu; Ohgata, Koji; Takizawa, Yutaka; Oki, Ken-ichi; and Hirano, Takuya, 5,470,768, Cl. 437-40.000.

Tanaka, Yasuhiro; Nagai, Yasuhiko; Suzuki, Michio; Kagei, Takashi; Shinnai, Kohsuke; Ikeba, Goro; and Saito, Masato, to Hitachi, Ltd. Network management system and network status display method. 5,471,399, Cl. 364-491.000.

Tanaka, Yasushi; Tojo, Takashi; Uchida, Kazuhiko; Uno, Jun; Uchida, Yasushi; and Shida, Osamu, to Higeta Shoyu Co., Ltd. Method of producing iturin A and antifungal agent for profound mycosis. 5,470,827, Cl. 514-11.000.

Tanaka, Yasuyuki: *See*—
Shinomiya, Tsutomu; Miyazaki, Shunzo; Tanaka, Yasuyuki; Tsukada, Shinichi; and Tamura, Michiya, 5,470,429, Cl. 156-510.000.

Tanayama, Shigeharu: *See*—
Harada, Setsuo; Funabashi, Yasunori; Inatomi, Nobuhiro; Tanayama, Shigeharu; and Tanida, Seiichi, 5,470,961, Cl. 536-7.400.

Tang, John C.: *See*—
Smith, Randall B.; Tang, John C.; and Henderson, D. Austin, Jr., 5,471,571, Cl. 395-137.000.

Tang, Pui-Fun L.: *See*—
Folkers, Karl A.; Ljungqvist, Anders; Feng, Dong-Mei; Kubota, Minoru; Tang, Pui-Fun L.; and Bowers, Cyril Y., 5,470,947, Cl. 530-313.000.

Tang, Shouhong: *See*—
Koliopoulos, Chris L.; and Tang, Shouhong, 5,471,307, Cl. 356-371.000.

Tang, Tage D., to Masco Corporation. Mixing valve with a collared ball valve. 5,469,889, Cl. 137-625.410.

Tange, Shoji: *See*—
Takizawa, Kuniharu; Kikuchi, Hiroshi; Osugi, Yukihisa; and Tange, Shoji, 5,471,331, Cl. 359-67.000.

Tangney, Thomas J.: *See*—
Krahnke, Robert H.; Mealey, Shawn K.; Schoenherr, William J.; Smith, Schyler B., deceased; and Tangney, Thomas J., 5,470,923, Cl. 525-477.000.

Tani, Arata: *See*—
Nagase, Takayuki; Yoshida, Yasuhiko; Hasegawa, Makoto; and Tani, Arata, 5,471,285, Cl. 355-219.000.

Tani, Hidehito, to Asahi Glass Company Ltd. Method of and apparatus for measuring optical distortion. 5,471,297, Cl. 356-239.000.

Tani, Naoaki, to Olympus Optical Co., Ltd. Optical head having semiconductor laser. 5,471,454, Cl. 369-100.000.

Tani, Takahiro, to Mitsubishi Denki Kabushiki Kaisha. Logic simulation apparatus and circuit simulation apparatus. 5,471,409, Cl. 364-578.000.

Tanida, Seiichi: *See*—
Harada, Setsuo; Funabashi, Yasunori; Inatomi, Nobuhiro; Tanayama, Shigeharu; and Tanida, Seiichi, 5,470,961, Cl. 536-7.400.

Tanigami, Yoshinori; Tabata, Takahiro; Hashima, Hidekazu; and Konishi, Akio, to Yamamura Glass Co., Ltd. Heat-generating composition. 5,470,506, Cl. 252-518.000.

Tanigawa, Takaho, to NEC Corporation. Semiconductor memory with stacked-capacitor cells. 5,471,418, Cl. 365-149.000.

Taniguchi, Noboru: *See*—
Gamou, Takaharu; Taniguchi, Noboru; Niikura, Junji; Hatoh, Kazuhito; Yasumoto, Eiichi; and Adachi, Kinichi, 5,469,913, Cl. 165-104.120.

Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Kasuya, Satoru; Sugiura, Nobutada; and Nishida, Masaaki, to Aisin AW Co., Ltd. Automatic transmission. 5,470,284, Cl. 475-204.000.

Tanii, Yoshiyuki; Nakamura, Motokazu; Nagayama, Yoshikatsu; Morita, Katsuaki; Hibino, Hiroki; and Suzuki, Akira, to Olympus Optical, Ltd. Electromotive warping type endoscope with velocity control. 5,469,840, Cl. 600-117.000.

Tanimoto, Hiroshi: *See*—
Itakura, Tetsuro; and Tanimoto, Hiroshi, 5,471,171, Cl. 330-253.000.

Tanimoto, Tetsuji: *See*—
Sugiyama, Masami; Uchida, Yoshiaki; Kurano, Yoshihiro; Tanaka, Aiko; and Tanimoto, Tetsuji, 5,470,759, Cl. 436-541.000.

Tanimura, Masashi: *See*—
Terasawa, Hidekazu; Tanimura, Masashi; and Ito, Sumio, 5,470,434, Cl. 162-117.000.

Tanoue, Ken: *See*—
Yoshioka, Mamoru; Obata, Haruyuki; Tanoue, Ken; Iwashita, Yoshihiro; Kashiwagura, Toshimi; Suzuki, Makoto; Ichinose, Hiroki; and Okamizu, Hironori, 5,469,818, Cl. 123-90.150.

Tarascon, Jean-Marie: *See*—
Schmutz, Caroline N.; Shokoohi, Frough K.; Tarascon, Jean-Marie; and Warren, Paul C., 5,470,357, Cl. 29-623.500.
Tardy, Gerard: *See*—
Gasca, Jean-Philippe; and Tardy, Gerard, 5,470,658, Cl. 428-391.000.
Tarpinian, Aram, to United States of America, Army. Light weight armor. 5,469,773, Cl. 89-36.020.
Tashiro, Hiroshi: *See*—
Murakawa, Takaji; Yagi, Toyoji; and Tashiro, Hiroshi, 5,469,816, Cl. 123-2.000.
Tatsumi, Masayuki: *See*—
Sasaki, Toshio; Ebara, Takeshi; Igarashi, Toshio; Tatsumi, Masayuki; and Wakamatsu, Kazuki, 5,470,900, Cl. 524-269.000.
Tatsuno, Yutaka: *See*—
Kobayashi, Kazunari; Omachi, Kenji; Tatsuno, Yutaka; Hagihara, Masahiro; Kidawara, Atsuki; Hara, Tadayoshi; and Yazawa, Nobuyoshi, 5,469,841, Cl. 600-158.000.
Tavaro, S.A.: *See*—
Hürlimann, Paul, 5,469,996, Cl. 223-99.000.
Tawaragi, Yuji; Kusano, Satoshi; Suzuki, Toshio; and Obitsu, Noriko, to Pioneer Electronic Corporation. Optical disk player having beam correction means. 5,471,446, Cl. 369-44.140.
Taya, Masaaki: *See*—
Kotaki, Takaaki; Taya, Masaaki; Unno, Makoto; Mikuriya, Yushi; and Dojyo, Tadashi, 5,470,684, Cl. 430-109.000.
Tayaoka, Eriko: *See*—
Tsujido, Yoshinori; and Tayaoka, Eriko, 5,471,565, Cl. 395-126.000.
Tayler, Peter N.; and Evans, Lynn S., to American Cyanamid Company. Pyrazolium fungicidal compositions. 5,470,869, Cl. 514-406.000.
Taylor, Ben D. Distributed load soundboard system. 5,469,770, Cl. 84-291.000.
Taylor, David H.: *See*—
Harrogate, Ian W. R.; Taylor, David H.; Griffin, Arthur B.; and Tuson, David W., 5,470,198, Cl. 415-115.000.
Taylor, Ronald P.; Sutherland, William M.; Reist, Craig; Wright, Eleanor L.; Webb, Donna; and Labuguea, Ronald, to University of Virginia Patent Foundation. Mammalian primate erythrocyte bound heteropolymerized monoclonal antibodies and methods of use thereof. 5,470,570, Cl. 424-93.730.
TDK Corporation: *See*—
Tominaga, Junji; Haratani, Susumu; Handa, Tokuhiko; and Inabu, Ryo, 5,470,628, Cl. 428-64.400.
Teaford, Richard L.: *See*—
Paterek, F. Dieter; and Teaford, Richard L., 5,471,015, Cl. 174-152.0GM.
Teale, David C.: *See*—
Cowgill, Richard B.; and Teale, David C., 5,471,561, Cl. 395-82.000.
Teasley, G. Alfred: *See*—
King, Eugene O.; and Teasley, G. Alfred, 5,470,005, Cl. 226-1.000.
Technology Applications Group: *See*—
Bartak, Duane E.; Lemieux, Brian E.; and Woolsey, Earl R., 5,470,664, Cl. 428-472.100.
Technology Finance Corporation (Proprietary) Limited: *See*—
Du Toit, Guilluame T., 5,470,335, Cl. 606-73.000.
Tedesco, James M.; Brady, Lois A. K.; and Colburn, Willis S., to Kaiser Optical Systems, Inc. Holographic diffuser for back-lit display. 5,471,327, Cl. 359-15.000.
Teerlink, Wilford J.: *See*—
Goethel, Peter J.; Lewis, Richjard W.; and Teerlink, Wilford J., 5,471,037, Cl. 219-750.000.
Teich Aktiengesellschaft: *See*—
Jud, Wilfried, 5,470,015, Cl. 229-87.050.
Teijin, Ltd.: *See*—
Hamano, Hisashi; Hosoi, Masahiro; Kobayshi, Ieyasu; and Saeki, Yasuhiro, 5,470,665, Cl. 428-480.000.
Nishimura, Kunio; Nakagawa, Hideo; and Takahashi, Nobuo, 5,470,106, Cl. 280-743.100.
Teikoku Piston Ring Co., Ltd.: *See*—
Miyazaki, Satomichi; Harayama, Akira; Kazama, Nobuyuki; and Ishida, Masao, 5,469,616, Cl. 29-888.074.
Teisan Kabushiki Kaisha: *See*—
Nishikawa, Yukinobu; Hashizume, Yoshinori; and Kimura, Takako, 5,470,390, Cl. 118-719.000.
Tejima, Shunichiro, to NEC Corporation. Communication system and devices thereof. 5,471,473, Cl. 370-85.700.
Tektronix, Inc.: *See*—
Ilcisin, Kevin J.; and Prince, Dennis W., 5,471,228, Cl. 345-58.000.
Stuebing, Carlton; and Caspell, George J., 5,471,159, Cl. 327-24.000.
Teldix GmbH: *See*—
Hettlage, Eckart; and Ruff, Gerd, 5,471,183, Cl. 335-4.000.
Telefonaktiebolaget L M Ericsson (publ.): *See*—
Linnermark, Nils O. A.; and Carlsson, Karl U., 5,471,526, Cl. 379-268.000.
Telefonaktiebolaget LM Ericsson: *See*—
Liedberg, Nils P. A., 5,471,165, Cl. 327-250.000.
Sandin, Rolf S.; and Ljungberg, Per A. M., 5,471,468, Cl. 370-60.000.
Televideo Consultants, Inc.: *See*—
Meyer, Stuart L.; Meyer, Eric S.; Meyer, David M.; and Meyer, Jonathan L., 5,469,874, Cl. 132-323.000.
TenBrink, Jay T.; Farkas, Maryanne R.; Vendt, Robert J.; and Brock, Waine T., to Chrysler Corporation. Vehicle door construction facilitating window regulator installation and mounting. 5,469,662, Cl. 49-352.000.
TenBrink, Jay T.; and Farkas, Maryanne R., to Chrysler Corporation. Snap-in attachment of window pane lift plate to window regulator. 5,469,663, Cl. 49-375.000.
Teng, Edward F.: *See*—
Mahvan, Nader; Eltoukhy, Atef H.; and Teng, Edward F., 5,470,447, Cl. 204-192.160.
Terasawa, Hidekazu; Tanimura, Masashi; and Ito, Sumio, to Nihon Tensaiseito Kabushiki Kaisha. Decay-resistant paper for the manufacture of a pot for raising and transplanting seedlings, and the process for producing the same. 5,470,434, Cl. 162-117.000.
Terawaki, Fumikazu: *See*—
Watanabe, Atsushi; Terawaki, Fumikazu; and Warashina, Fumikazu, 5,471,312, Cl. 358-296.000.
Terayama, Takao: *See*—
Shindo, Isao; Mutou, Shigeo; Terayama, Takao; Okayama, Masao; and Kai, Susumu, 5,470,533, Cl. 422-63.000.
Ternullo, Janus: *See*—
Pompei, Francesco; Ternullo, Janus; and Malecki, William W., 5,469,855, Cl. 128-664.000.
Terranova, Peter, to Ro-An Industries Corporation. Web registration system and method. 5,470,300, Cl. 493-11.000.
Tesch, Marc: *See*—
Reh, Lothar; Tesch, Marc; Hilni, Beat; and Ruf, Arthur, 5,469,994, Cl. 222-630.000.
Tescorp Seismic Products, Inc.: *See*—
Wood, Richard G., 5,470,248, Cl. 439-281.000.
Teshima, Shinichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Multicore hollow optical fiber and a method for preparation thereof. 5,471,553, Cl. 385-125.000.
Teshima, Shin'ichi: *See*—
Mizuguchi, Katsuhiko; Teshima, Shin'ichi; and Hanyu, Tsuneo, 5,470,715, Cl. 435-22.000.
Testa, James F.: *See*—
Rose, James W.; D'Souza, Godfrey P.; Stinehelfer, Jonathan J.; and Testa, James F., 5,471,421, Cl. 365-182.000.
Tetra Laval Holdings & Finance, S.C.: *See*—
Zimmerly, Robert D., 5,469,880, Cl. 137-240.000.
Tetrad Corporation: *See*—
Law, Wing K.; Ranalletta, Joseph V.; Oakley, Clyde G.; Douglas, Stephen J.; and Dieta, Dennis R., 5,469,853, Cl. 128-662.060.
Tetsu, Toshiyuki: *See*—
Kumagai, Tatsuya; Iitsuka, Hisao; Kajioka, Hiroshi; Obnuki, Wataru; and Tetsu, Toshiyuki, 5,471,301, Cl. 356-350.000.
Tevco, Inc.: *See*—
Khamis, Adel A., 5,470,562, Cl. 424-61.000.
Texaco Inc.: *See*—
Haberman, John P., 5,469,918, Cl. 166-291.000.
Prelat, Alfredo E., 5,471,056, Cl. 250-253.000.
Texas Instruments Deutschland GmbH: *See*—
Sharpe, Claude A.; Hurta, Dwaine S.; Hamlett, Mark A.; and Froschermeier, Guenther, 5,471,212, Cl. 342-51.000.
Texas Instruments Incorporated: *See*—
Bayraktaroglu, Burhan, 5,471,078, Cl. 257-198.000.
Cooper, Alan N.; McCracken, William P.; and Hynecek, Jaroslav, 5,471,245, Cl. 348-302.000.
Fuchigami, Masahiro, 5,470,247, Cl. 439-264.000.
Gnade, Bruce E.; Cho, Chih-Chen; and Smith, Douglas M., 5,470,802, Cl. 437-238.000.
Gove, Robert J.; Guttag, Karl M.; Balmer, Keith; and Ing-Simmons, Nicholas K., 5,471,592, Cl. 395-300.030.
Halstead, Linden T., 5,471,017, Cl. 174-260.000.
Kawate, Keith W.; and Berg, Peter G., 5,471,034, Cl. 219-485.000.
Mehta, Aswin N., 5,471,158, Cl. 326-95.000.
Mydill, Marc R., 5,471,145, Cl. 324-601.000.
Nagata, Toshiyuki; Yoshida, Hiroyuki; and Niuya, Takayuki, 5,470,777, Cl. 437-52.000.
Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, 5,470,778, Cl. 437-52.000.
Sharpe, Claude A.; Hurta, Dwaine S.; Hamlett, Mark A.; and Froschermeier, Guenther, 5,471,212, Cl. 342-51.000.
Soenen, Eric G.; Davis, Gregory B.; Adkins, Thomas; and MacDonald, Russell K., 5,471,668, Cl. 455-352.000.
Stephens, Arthur, 5,471,398, Cl. 364-490.000.
Summerfelt, Scott R.; and Beratan, Howard R., 5,471,364, Cl. 361-321.400.
Utter, Mark E., 5,471,534, Cl. 381-4.000.
Texter, John; Welter, Thomas R.; Southby, David T.; and Mooberry, Jared B., to Eastman Kodak Company. Heat development of elements containing methine-dye releasing couplers. 5,470,688, Cl. 430-203.000.
Th. Goldschmidt AG: *See*—
Gruning, Burghard; Foitzik, Willi; Weitemeyer, Christian; and Kaseborn, Hans-Dieter, 5,470,992, Cl. 554-69.000.
Thaler, Kunibert. Roof drain. 5,469,670, Cl. 52-12.000.
Thanawala, Ashish: *See*—
Sharma, Raghu; Davis, Jeffrey P.; Gunn, Timothy D.; Li, Ping; Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, 5,471,470, Cl. 370-81.000.
Therasse, Yves: *See*—

Dries, Johan M. F.; and Therasse, Yves, 5,471,477, Cl. 370-110.100.

Theurer, Josef; and Wörgötter, Herbert, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft. Mobile machine for preparing rails for welding. 5,469,791, Cl. 104-5.000.

Thieler, Wolfgang: *See*—
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.

Thieret, Tracy E.; Henderson, Thomas A.; and Butler, Michael A., to Xerox Corporation. Method and control system architecture for controlling tone reproduction in a printing device. 5,471,313, Cl. 358-296.000.

Thiokol Corporation: *See*—
Nielson, Daniel B.; and Lester, Dean M., 5,470,408, Cl. 149-109.600.

Thirugnanam, Muthuvelu: *See*—
Jacobson, Richard M.; Ramsay, J. Roger; Aller, Harold E.; and Thirugnanam, Muthuvelu, 5,470,984, Cl. 548-264.400.

Thoen, Christiaan A. J.: *See*—
Fredj, Abdennaceur; Johnston, James P.; and Thoen, Christiaan A. J., 5,470,507, Cl. 252-542.000.

Thom, Kelsey C., Jr., to Roskamp Champion. Steam injection device for a vertical steam conditioner. 5,469,781, Cl. 99-516.000.

Thomas & Betts Corporation: *See*—
Lim, Gunsang; Marowsky, Richard D.; and Khoshnood, Ben, 5,470,244, Cl. 439-189.000.

Thomas, Christopher P.; Weber, Gregory T.; and Tallarek, Glen E., to Chrysler Corporation. Method of load and speed modifying on fuel lean-out for internal combustion engines. 5,469,826, Cl. 123-488.000.

Thomas, Günter: *See*—
Angerbauer, Rolf; Fey, Peter; Hübsch, Walter; Philipps, Thomas; Bischoff, Hilmar; Petzinna, Dieter; Schmidt, Delf; and Thomas, Günter, 5,470,982, Cl. 546-268.000.

Thomas, Wayne M.; Nicholas, Edward D.; Jones, Stephen B.; Lilley, Roger H.; Dawes, Christopher J.; and Dolby, Richard E., to Welding Institute, The. Friction forming. 5,469,617, Cl. 29-889.210.

Thomason, John. Vehicle mounted ladder. 5,469,933, Cl. 182-127.000.

Thomason, Michael M.: *See*—
Gessner, Scott L.; Newkirk, David D.; Thomason, Michael M.; and Reeder, James O., 5,470,639, Cl. 428-152.000.

Thorne, Scott P.; and Holman, Thomas J. Method of molding Y-adapter with a sideport radius. 5,470,522, Cl. 264-328.100.

Thompson, Andrew, to Interface, Inc. Method of preparing a bitumen-backed floor covering. 5,470,630, Cl. 428-95.000.

Thompson, David: *See*—
Jamail, Randall; and Thompson, David, 5,471,443, Cl. 369-32.000.

Thompson, Marcia C. Apparatus for providing a moisture seal for a wet foam used to contain a stem of a flower and method therefor. 5,469,654, Cl. 47-41.120.

Thompson, Mark A.: *See*—
Rose, Larry D.; Lauritzen, Donald R.; Ravenberg, Mike J.; Thompson, Mark A.; Green, David J.; and Davis, Terry R., 5,470,105, Cl. 280-740.000.

Thomsen, Karl K.: *See*—
Borriss, Rainer; Hofemeister, Jürgen; Thomsen, Karl K.; Olsen, Ole; and Von Wettstein, Dietrich, 5,470,725, Cl. 435-93.000.

Thomson-CSF Semiconducteurs Specifiques: *See*—
Wingender, Marc; and Le Tual, Stéphane, 5,471,210, Cl. 341-156.000.

Thomson Tubes Electroniques: *See*—
Hamon, Olivier; and Oppenlander, Andréas, 5,471,112, Cl. 313-485.000.

Thorland, Rodney H., to Honeywell Inc. Magnetic means for suppression of lasing in certain wavelengths in a ring laser gyro. 5,471,489, Cl. 372-19,000.

Thorsen, Thomas A.: *See*—
Finkelstein, Burl; and Thorsen, Thomas A., 5,469,661, Cl. 49-276.000.

Tice, Bill, to ETI Systems. Control circuit for feedback, motor-operated valve. 5,471,123, Cl. 318-373.000.

Tidwell, James L.: *See*—
Patino, Joseph; Bogut, Henry A.; and Tidwell, James L., 5,471,128, Cl. 320-13.000.

Tiefenbrun, Jonathan; and Wilk, Peter J. Method and related device for obtaining access to a hollow organ. 5,470,320, Cl. 604-174.000.

Tiemeyer, Michael: *See*—
Brandley, Brian K.; Tiemeyer, Michael; Swiedler, Stuart J.; Moreland, Margaret; and Schweingruber, Hans, 5,470,842, Cl. 514-61.000.

Timken Company, The: *See*—
Dougherty, John D.; Moldovan, Mark R; Otto, Dennis L.; and Varonis, Orestes J., 5,470,157, Cl. 384-448.000.

Timmers, Francis J.: *See*—
Devore, David D.; Timmers, Francis J.; Wilson, David R.; and Rosen, Robert K., 5,470,993, Cl. 556-11.000.

Tioxide Specialties Limited: *See*—
Jennett, Timothy A.; Harmsworth, Patrick D.; Martin, Dave; and Ellison, Anthony W., 5,470,446, Cl. 204-177.000.

Tipton, Matney R. Umbrella holder. 5,469,977, Cl. 211-62.000.

Titus, Robert D.: *See*—
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,470,977, Cl. 546-101.000.

Tiwari, Prabhat: *See*—
Wu, Xin D.; and Tiwari, Prabhat, 5,470,668, Cl. 428-688.000.

Tkacz, Bogusław: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kolt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Koeciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Wladyslad, 5,470,809, Cl. 502-12.000.

TOA Medical Electronics Co., Ltd.: *See*—
Ogino, Shinichi, 5,471,294, Cl. 356-73.000.
Sakata, Takashi; and Matsumoto, Hideaki, 5,470,751, Cl. 436-63.000.

Toba, Taketo; Takei, Kazuo; Matsunaga, Toshiaki; Izeuchi, Hiroyuki; and Tamura, Fumihide, to Nippon Shokubai Co., Ltd. Process for producing polymer having hydroxyl group at both terminals. 5,470,930, Cl. 526-204.000.

Tobe, Seishiro: *See*—
Akaike, Toshihiro; Tobe, Seishiro; Miyamoto, Shigeyuki; and Ohashi, Akio, 5,470,739, Cl. 435-240.243.

Tobita, Tomoyuki: *See*—
Shimada, Satoshi; Ugai, Seiichi; Tobita, Tomoyuki; and Yamamoto, Yoshimi, 5,469,749, Cl. 73-861.470.

Toda Kogyo Corporation: *See*—
Misawa, Hiromitsu; Fujioka, Kazuo; Aoki, Koso; Kurita, Eiichi; Okano, Yoji; and Kozawa, Minoru, 5,470,660, Cl. 428-403.000.

Todd, Robert W.: *See*—
Sargeant, Adrian A.; Currie, William H.; Ouwens, Willem; Brace, Philip J.; Todd, Robert W.; and Scholz, Hans-Joachim, 5,470,142, Cl. 312-258.000.

Toepfer, Bernhard; Reiner, Michael; and Klein, Bodo, to Mercedes-Benz AG. Method of determining a wear-dependent braking force distribution. 5,470,134, Cl. 303-9.610.

Toft, Carolyn M.: *See*—
Baiagot, Edgar R.; and Toft, Carolyn M., 5,470,130, Cl. 297-423.280.

Tojo, Takashi: *See*—
Tanaka, Yasushi; Tojo, Takashi; Uchida, Kazuhiko; Uno, Jun; Uchida, Yasushi; and Shida, Osamu, 5,470,827, Cl. 514-11.000.

Tojo, Tetsuo; Matsumoto, Muneyuki; and Kikuchi, Yoshiharu, to Mitsui Petrochemical Industries, Ltd. Chlorinated ethylene/α-olefin copolymer rubber and composition containing the same. 5,470,919, Cl. 525-334.100.

Tokube, Akira: *See*—
Sugiyama, Shohji; and Tokube, Akira, 5,471,666, Cl. 455-348.000.

Tokui, Akira: *See*—
Itoh, Hiromi; Iwasaki, Masanobu; Tokui, Akira; and Tsukamoto, Katsuhiro, 5,470,799, Cl. 437-238.000.

Tokumaru, Haruki; Maruyama, Koichi; and Wakamiya, Syunitirou, to Asahi Kogaku Kogyo Kabushiki Kaisha; and Nippon Hoso Kyokai. Optical medium recording apparatus with a rotatable optical beam deflector. 5,471,456, Cl. 369-112.000.

Tolar, Neal J.: *See*—
Brown, Roy B.; and Tolar, Neal J., 5,471,499, Cl. 375-305.000.

Toleman, Paul. Tonometer. 5,469,848, Cl. 128-660.020.

Tominaga, Junji; Haratani, Susumu; Handa, Tokuhiko; and Inaba, Ryo, to TDK Corporation. Optical recording medium. 5,470,628, Cl. 428-64.400.

Tomisawa, Naoki, to Unisia Jecs Corporation. Method and apparatus for control of the start-up air-fuel ratio of an internal combustion engine. 5,469,827, Cl. 123-491.000.

Tomita, Shinji: *See*—
Nagamura, Takashi; Yamamoto, Takao; and Tomita, Shinji, 5,470,543, Cl. 422-211.000.

Tomoda, Akihiro: *See*—
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,471,227, Cl. 347-9.000.

Tomoda, Masayasu: *See*—
Suyama, Shuji; Ishigaki, Hideyo; Tomoda, Masayasu; Shirai, Yoshihiro; Tanaka, Hiroyuki; and Komai, Masaharu, 5,470,917, Cl. 525-326.300.

Tomoyuki, Yohji: *See*—
Ohtsuka, Yasumasa; Tomoyuki, Yohji; and Hatakeyama, Hideyuki, 5,471,288, Cl. 355-285.000.

Tong, Po, to LSI Logic Corporation. Reed-solomon decoder using discrete time delay in power sum computation. 5,471,485, Cl. 371-37.100.

Tong, Raymond L.: *See*—
Smith, Bernard J.; Seager, David B.; Tong, Raymond L.; and Rowley, Thomas E., 5,471,523, Cl. 379-165.000.

Tongrand Limited: *See*—
Cheng, Lee M.; Choy, Conrad; and Chau, Danny, 5,470,242, Cl. 439-157.000.

Topometrix: *See*—
Schuman, Marc R., 5,469,734, Cl. 73-105.000.

Toray Industries, Inc.: *See*—
Sakamoto, Jun; Yoshida, Minoru; Aoyama, Masatoshi; Suzuki, Masaru; Nakamori, Yukari; Okazaki, Iwao; and Abe, Koichi, 5,470,637, Cl. 428-143.000.

Torcan Chemical Ltd.: *See*—
Slemon, Clarke; and Macel, Bob, 5,470,983, Cl. 546-271.000.

Torii, Shigeru; Tanaka, Hideo; Sasaoka, Mitio; Shiroi, Takashi; and Kameyama, Yutaka, to Otsuka Kagaku Kabushiki Kaisha. Process for preparing examethylenecephem compounds. 5,470,972, Cl. 540-230.000.

Torp, Lovella V.: *See*—
Kiser, Charles M., 5,470,093, Cl. 280-304.100.

Torrington Company, The: *See*—
McLarty, Daniel R.; and Acampora, Salvatore, 5,470,158, Cl. 384-484.000.
Orsini, Louis V., Jr., 5,469,759, Cl. 74-567.000.

Zinken, Gunter J., 5,469,620, Cl. 29-898.064.
Toshimitsu, Manabu; Aiyoshizawa, Shunichi; Suganuma, Yoshikazu; and Konno, Daisuke, to Ebara Corporation. Drum motor for VCR. 5,471,104, Cl. 310-90.000.
Toto Ltd.: *See*—
Tsutsui, Osamu; Haraga, Hisato; Makita, Atsuo; and Takeuchi, Hirofumi, 5,469,586, Cl. 4-4515.000.
Tovey, H. Jonathan; and Autry, Sidney D., to United States Surgical Corporation. Body tissue penetrating device having a vacuum indicator. 5,470,316, Cl. 604-118.000.
Townsend, Carl W.: *See*—
Ludwig, Frank A.; Townsend, Carl W.; and Eliash, Bruce M., 5,470,669, Cl. 429-17.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Mizuguchi, Katsuhiko; Teshima, Shin'ichi; and Hanyu, Tsuneo, 5,470,715, Cl. 435-22.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Nishino, Kazuaki; Awano, Yoji; Takamiya, Hiroyuki; Ito, Mitsufumi; Suzuki, Masami; and Genma, Yoshikazu, 5,470,402, Cl. 148-325.000.
Yoshioka, Mamoru; Obata, Haruyuki; Tanoue, Ken; Iwashita, Yoshihiro; Kashiwagura, Toshimi; Suzuki, Makoto; Ichinose, Hiroki; and Okamizu, Hironori, 5,469,818, Cl. 123-90.150.
Tozu, Kenji; Asano, Kenji; and Kawai, Hiroaki, to Aisin Seiki Kabushiki Kaisha. Anti-skid control system. 5,470,136, Cl. 303-147.000.
Tracey, Frances: *See*—
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Mastalski, Henry T., 5,470,271, Cl. 451-55.000.
Traditional Chinese Medicine Research Laboratory, Inc.: *See*—
Shi, Zhao-Qi, 5,470,589, Cl. 424-698.000.
Trainor, George L.: *See*—
Huie, Edward M.; and Trainor, George L., 5,470,967, Cl. 536-24.300.
Tramposch, Kenneth M.: *See*—
Nair, Xina; and Tramposch, Kenneth M., 5,470,567, Cl. 424-59.000.
Tran, Hoa M.: *See*—
Vu, Huy D.; and Tran, Hoa M., 5,470,036, Cl. 248-118.500.
Transvalor: *See*—
Louchamp, Daniel; and Schwob, Yvan, 5,470,370, Cl. 71-25.000.
Tranter, Inc.: *See*—
Davison, Roger C.; and Mathur, Achint P., 5,469,914, Cl. 165-166.000.
Tratar, David B.: *See*—
Bakker, Johan P.; Catchpole, Clive E.; Tratar, David B.; and Vala, John D., 5,471,048, Cl. 250-208.100.
Travalent, Louis, Jr.: *See*—
O'Meara, John R.; Cistone, David R.; and Travalent, Louis, Jr., 5,469,980, Cl. 215-228.000.
Tremblay, Guy: *See*—
Tremblay, Ronaldo; and Tremblay, Guy, 5,469,579, Cl. 2-7.000.
Tremblay, Ronaldo; and Tremblay, Guy. Head cooling device. 5,469,579, Cl. 2-7.000.
Trichon, Roger: *See*—
Mignani, Gerard; Richard, Christophe; and Trichon, Roger, 5,470,933, Cl. 528-24.000.
Tridelta Industries, Inc.: *See*—
Kiss, Vince; and Davis, Matthew A., 5,471,022, Cl. 200-83.00B.
Trimble Navigation Limited: *See*—
Talbot, Nicholas C.; and Nichols, Mark, 5,471,218, Cl. 342-357.000.
Tripp, Terrance B.; and Shaw, Malcolm, to H. C. Starck, Inc. Removal of binder from Ta products. 5,470,525, Cl. 419-36.000.
Trojan Technologies, Inc.: *See*—
Hayes, Stewart J.; Pearcey, Richard; and White, Philip T., 5,471,063, Cl. 250-436.000.
Trokel, Stephen L. Apparatus and method to measure visual function under simulated nighttime conditions. 5,471,262, Cl. 351-239.000.
Trombley, Michael R.: *See*—
Carnevale, Michael J.; Kalla, Ronald N.; McClannahan, Gary P.; and Trombley, Michael R., 5,471,626, Cl. 395-775.000.
Trout, Kenneth G.: *See*—
Londrigan, Michael E.; and Trout, Kenneth G., 5,470,889, Cl. 521-125.000.
Trova, Michael P., to American Cyanamid Company. Asymmetric synthesis of bicyclic amino acid esters. 5,470,979, Cl. 546-147.000.
Trustees of Boston University: *See*—
Gilchrest, Barbara A.; Yaar, Mina; and Eller, Mark, 5,470,577, Cl. 424-450.000.
TRW Inc.: *See*—
Wood, Steven L.; and Garcia, Manuel L., 5,471,509, Cl. 375-350.000.
Yokote, Timothy A.; Upton, Eric L.; Enyedy, Arthur G.; Stockton, Grant J.; and Brandis, Dirk K., 5,471,603, Cl. 395-402.000.
Tsai, Fu-Sheng; and Ng, William W., to Digital Equipment Corporation. Low-loss active voltage-clamp circuit for single-ended forward PWM converter. 5,471,376, Cl. 363-20.000.
Tsai, Larry B.: *See*—
Meng, Shi-Yuan; Morris, Charles F.; and Tsai, Larry B., 5,470,719, Cl. 435-69.100.
Tsai, Shang-Lin: *See*—
Hao-Chung, Hsia; Cheau, Tei-Chih; and Tsai, Shang-Lin, 5,470,553, Cl. 423-139.000.
Tsai, Yeong-Shyeong; and Li, Wang-Jr. Method for controlling a carrier which is used to carry a flight vehicle. 5,470,033, Cl. 244-110.00E.
Tseng, Ling-yuan. Configurable highway divider system. 5,470,171, Cl. 404-13.000.
Tseung, Alfred C. C.; Shen, Pei K.; and Syed-Bokhari, Jade, to University of Essex. Electrochromic and electrocatalytic material. 5,470,673, Cl. 429-44.000.
Tsoglin, Alexander; and Prinerman, Yafim, to N.I. Medical Ltd. Non-invasive method and device for collecting measurements representing body activity and determining cardiorespiratory parameters of the human body based upon the measurements collected. 5,469,859, Cl. 128-723.000.
Tsubakimoto Chain Co.: *See*—
Suzuki, Kenshi; Shibatani, Kazuhiro; and Nishii, Hisao, 5,471,385, Cl. 364-424.020.
Tsuboi, Yoshihiro: *See*—
Sakai, Takafumi; Wakamatsu, Hideki; Tsuboi, Yoshihiro; and Kawauchi, Masaya, 5,469,754, Cl. 74-336.00R.
Tsubota, Takahiro; and Kitajima, Hiroshi, to Takenaka Corporation; Tsubota, Takahiro; and Kitajima, Hiroshi. Parking garage. 5,470,185, Cl. 414-264.000.
Tsuchita, Shuhei: *See*—
Tsukada, Yutaka; Kobayakawa, Yasukazu; Maeda, Yoji; and Tsuchita, Shuhei, 5,470,796, Cl. 437-209.000.
Tsuchiya, Ichiro; Danzuka, Toshio; and Ito, Masumi, to Sumitomo Electric Industries, Ltd. Process for consolidation of porous preform for optical fiber. 5,470,369, Cl. 65-379.000.
Tsuda, Tadayuki: *See*—
Shirai, Hiroyuki; Sekine, Kazumi; Tsuda, Tadayuki; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shoji, Takeo; Noda, Shinya; Kobayashi, Kazunori; and Adachi, Hiroyuki, 5,470,635, Cl. 428-131.000.
Tsui, Lap-Chee: *See*—
Heng, Henry H. Q.; and Tsui, Lap-Chee, 5,470,709, Cl. 435-6.000.
Tsuji, Hideaki: *See*—
Hirai, Isamu; and Tsuji, Hideaki, 5,471,276, Cl. 354-465.000.
Tsuji, Kiyoaki, to Sony Corporation. Auto-eject device for disc players having compact twin cam motor unit. 5,471,356, Cl. 360-99.030.
Tsuji, Kuniro: *See*—
Kosuge, Takuo; Tsuji, Kuniro; Ishida, Hitoshi; and Kosuge, Yoshiki, 5,470,574, Cl. 424-401.000.
Tsuji, Masayoshi; and Makita, Kikuo, to NEC Corporation. Semiconductor photodetector using avalanche multiplication and strained layers. 5,471,068, Cl. 257-21.000.
Tsujido, Yoshinori; and Tayaoka, Eriko, to Mitsubishi Denki Kabushiki Kaisha. Method of displaying a rotary body. 5,471,565, Cl. 395-126.000.
Tsujino, Hiroyuki: *See*—
Sasaki, Hiroshi; and Tsujino, Hiroyuki, 5,469,849, Cl. 128-660.070.
Tsukada, Shinichi: *See*—
Shinomiya, Tsutomu; Miyazaki, Shunzo; Tanaka, Yasuyuki; Tsukada, Shinichi; and Tamura, Michiya, 5,470,429, Cl. 156-510.000.
Tsukada, Yutaka; Kobayakawa, Yasukazu; Maeda, Yoji; and Tsuchita, Shuhei, to International Business Machines Corporation. Electronic package with lead wire connections and method of making same. 5,470,796, Cl. 437-209.000.
Tsukamoto, Katsuhiro: *See*—
Itoh, Hiromi; Iwasaki, Masanobu; Tokui, Akira; and Tsukamoto, Katsuhiro, 5,470,799, Cl. 437-238.000.
Tsukamoto, Kazumasa: *See*—
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Kasuya, Satoru; Sugiura, Nobutada; and Nishida, Masaaki, 5,470,284, Cl. 475-204.000.
Tsutsui, Kyoya, to Sony Corporation. Data compression method and apparatus in which quantizing bits are allocated to a block in a present frame in response to the block in a past frame. 5,471,558, Cl. 395-2.280.
Tsutsui, Osamu; Haraga, Hisato; Makita, Atsuo; and Takeuchi, Hirofumi, to Toto Ltd. Toilet bowl flushing device. 5,469,586, Cl. 4-4515.000.
Tsutumi, Haruki; Ikemoto, Yoshiaki; Machama, Mitsuhiro; Oyanagi, Toshiki; and Matsubara, Tsugio, to Mitsui Toatsu Chemicals, Inc. Water-resistant surface coating formulations and paper coated therewith. 5,470,918, Cl. 525-329.200.
Tuboscope Vetco International, Inc.: *See*—
Nelson, John M.; and Willis, Ray D., 5,470,111, Cl. 285-55.000.
Tucker, John R.: *See*—
Green, Todd J.; and Tucker, John R., 5,470,891, Cl. 521-131.000.
Tuffaloy Products, Inc.: *See*—
Simmons, Michael S., 5,471,029, Cl. 219-120.000.
Tulane Educational Fund, The Administrators of the: *See*—
Folkers, Karl A.; Ljungqvist, Anders; Peng, Dong-Mei; Kubota, Minoru; Tang, Pui-Fun L.; and Bowers, Cyril Y., 5,470,947, Cl. 530-313.000.
Tuma, Daniel L.; Van Peteghem, Jacques V.; and Ronneau, Olivier H., to Donaldson Company, Inc. Method and apparatus for filtering engine exhaust. 5,469,702, Cl. 60-311.000.
Tupov, Vladimir; Nilsson, Patrick; and Nilsson, Börje, to ABB Flakt Aktiebolag. Guide vanes for axial fans. 5,470,200, Cl. 415-195.000.
Turchi, Joel: *See*—
L'Hermite, François; and Turchi, Joel, 5,471,167, Cl. 327-538.000.
Turcotte, Gilles R.: *See*—
Grolman, Robert J.; Holywell, George C.; Kimmerle, Frank M.; and Turcotte, Gilles R., 5,470,559, Cl. 423-489.000.
Turin, Joël: *See*—
Gloton, Jean-Pierre; Laroche, Damien; Turin, Joël; and Fallah, Michel, 5,470,411, Cl. 156-64.000.

Turner, Howard W.; Hlatky, Gregory G.; and Eckman, Richard R., to Exxon Chemical Patents Inc. Ionic metallocene catalyst compositions. 5,470,927, Cl. 526-126.000.
Turner, Michael R.; and Miller, Leslie L., to Heath Custom Press, Inc. Multi-color printing press. 5,469,787, Cl. 101-211.000.
Tuson, David W.: *See*—
Harrogate, Ian W. R.; Taylor, David H.; Griffin, Arthur B.; and Tuson, David W., 5,470,198, Cl. 415-115.000.
Twerdochlib, Michael, to Westinghouse Electric Corporation. System for determining POVM sensor beat frequency. 5,469,745, Cl. 73-660.000.
Twesme, Edward N.: *See*—
Mongon, John M.; Twesme, Edward N.; and Weiss, Peggy A., 5,470,396, Cl. 136-251.000.
UAB Research Foundation, The: *See*—
Mirov, Sergey B.; and Sibley, William A., 5,471,493, Cl. 372-42.000.
UCC Corporation: *See*—
Gruettner, David R.; and Gladczak, Robert J., 5,469,958, Cl. 198-834.000.
Uchida, Kazuhiko: *See*—
Tanaka, Yasushi; Tojo, Takashi; Uchida, Kazuhiko; Uno, Jun; Uchida, Yasushi; and Shida, Osamu, 5,470,827, Cl. 514-11.000.
Uchida, Satoshi: *See*—
Mataki, Hiroshi; Uchida, Satoshi; and Sakiyama, Hajime, 5,471,494, Cl. 372-43.000.
Uchida, Yasushi: *See*—
Tanaka, Yasushi; Tojo, Takashi; Uchida, Kazuhiko; Uno, Jun; Uchida, Yasushi; and Shida, Osamu, 5,470,827, Cl. 514-11.000.
Uchida, Yoshiaki: *See*—
Sugiyama, Masami; Uchida, Yoshiaki; Kurano, Yoshihiro; Tanaka, Aiko; and Tanimoto, Tetsuji, 5,470,759, Cl. 436-541.000.
Uchiyama, Sadao: *See*—
Katayama, Yoshio; Fujii, Seiichi; Uchiyama, Sadao; Soejima, Ryouichi; Moori, Hitoshi; and Yoshida, Hideo, 5,471,439, Cl. 369-13.000.
Ueda, Hirotada: *See*—
Ikezawa, Mitsuru; Miyatake, Takafumi; Ueda, Hirotada; Sumino, Shigeo; and Yoshizawa, Satoshi, 5,471,535, Cl. 382-199.000.
Ueda, Masahiro: *See*—
Kaminaga, Isamu; Matsue, Shuuichi; Arakawa, Takahiko; Katoh, Shuuichi; and Ueda, Masahiro, 5,471,095, Cl. 257-775.000.
Uehori, Yukiko: *See*—
Satake, Toshimi; Takano, Toshiyuki; Hayasaka, Hideki; Uehori, Yukiko; and Nagai, Tomoaki, 5,470,816, Cl. 503-201.000.
Ueiashi, Masamoto; Mizobuchi, Tsukasa; Takesue, Masatoshi; Kobayashi, Yukio; and Nagai, Shoichi, to Mitsubishi Rayon Co., Ltd. Coated shaped articles and method of making same. 5,470,616, Cl. 427-515.000.
Ueno, Takumi; Shiraishi, Hiroshi; Hayashi, Nobuaki; Fukuma, Emiko; and Tadano, Keiko, to Hitachi, Ltd.; and Hitachi Chemical Company, Ltd. Pattern forming material and process for forming pattern using the same. 5,470,996, Cl. 558-46.000.
Uenoyama, Hirofumi: *See*—
Suzuki, Yasutoshi; Ao, Kenichi; Uenoyama, Hirofumi; Noguchi, Hiroki; Eguchi, Koji; Ito, Ichiro; and Yoshino, Yoshimi, 5,471,084, Cl. 257-421.000.
Uga, Kimibaru: *See*—
Ishigaki, Yoshiyuki; Honda, Hiroki; Uga, Kimibaru; and Ishida, Masahiro, 5,471,085, Cl. 257-370.000.
Ugai, Seiichi: *See*—
Shimada, Satoshi; Ugai, Seiichi; Tobita, Tomoyuki; and Yamamoto, Yoshimi, 5,469,749, Cl. 73-861.470.
Ulberg, Zoya R.: *See*—
Pertsov, Nikolay V.; Ulberg, Zoya R.; Vember, Vladimir E.; Podolskaya, Valentina I.; Kogan, Boris S.; and Burenkov, Eduard K., 5,470,460, Cl. 210-151.000.
Ulm, John: *See*—
Grobicki, Christopher; Mazza, Cynthia; O'Connell, Edward; Ulm, John; and White, Gerard, 5,471,474, Cl. 370-85.200.
Ulrich, Huber, to Givaudan-Roure Corporation. Process for the manufacture of furan derivatives. 5,470,991, Cl. 549-479.000.
Umeda, Kazunori, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Oxide type solid lubricant. 5,470,494, Cl. 252-12.000.
Umezawa, Masao: *See*—
Fujii, Haruo; Kobayashi, Tatsuya; Imai, Nobuhiro; Kojima, Hisayoshi; Umezawa, Masao; Tada, Hideki; Ito, Akira; Seto, Kaoru; Katoh, Motoi; and Murata, Daisuke, 5,471,284, Cl. 355-210.000.
Unney, Michael A.; Walters, Steven A.; and Koss, Christopher R., to General Electric Company. Coupling assembly. 5,470,114, Cl. 285-367.000.
Underiner, Gail E.: *See*—
Michnick, John; Underiner, Gail E.; Klein, J. Peter; and Rice, Glenn C., 5,470,878, Cl. 514-558.000.
Unger, Evan C.; Fritz, Thomas A.; Matsunaga, Terry; Ramaswami, VaradaRajan; Yellowhair, David; and Wu, Guanli, to ImaR, Pharmaceutical Corp. Methods of preparing gas-filled liposomes. 5,469,854, Cl. 128-662.020.
Unicraft Oy: *See*—
Rinne, Erkki, 5,470,083, Cl. 277-3.000.
Uniden Corporation: *See*—
Masaki, Tateo, 5,471,660, Cl. 455-161.200.
Union Oil Company of California: *See*—
Mueller, Mark D.; and McClellan, John C., 5,469,925, Cl. 175-61.000.
Union Special GmbH: *See*—
Gauch, Hermann, 5,469,798, Cl. 112-298.000.
Union Sports Co., Ltd.: *See*—
Liao, Gordon, 5,470,168, Cl. 403-368.000.
Unisia Jecs Corporation: *See*—
Tomisawa, Naoki, 5,469,827, Cl. 123-491.000.
Watanabe, Satoru, 5,469,735, Cl. 73-118.100.
Unisys Corporation: *See*—
Akkawi, Isam W.; Hayashida, Scott H.; Ladha, Vivek; and Rudy, John E., 5,471,589, Cl. 395-800.000.
Andrighetti, Robert H., 5,471,487, Cl. 371-57.100.
Bakker, Johan P.; Catchpole, Clive E.; Tratar, David B.; and Vala, John D., 5,471,048, Cl. 250-208.100.
Byers, Larry L.; Mackenthun, Donald W.; Fye, Philip J.; Maciona, Gerald J.; Engel, Jeff A.; Price, Ferris T., deceased; and Seppa, Dale K., 5,471,482, Cl. 371-21.200.
Byers, Larry L.; De Subijana, Joseba M.; and Michaelson, Wayne A., 5,471,597, Cl. 395-375.000.
Sefidvash, Khorvash; and Hashemi, Seyed H., 5,471,586, Cl. 395-284.000.
United Kingdom of Great Britain and Northern Ireland, The Public Health Laboratory Service Board in Her Britannic Majesty's Government of the: *See*—
Marks, Trevor S.; and Maule, Andrew, 5,470,545, Cl. 422-292.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Garney, Bryan W., 5,470,557, Cl. 423-249.000.
Kaye, Paul H.; and Hirst, Edwin, 5,471,299, Cl. 356-336.000.
United States of America
Agriculture: *See*—
Chen, George C.; and Rowell, Roger M., 5,470,614, Cl. 427-440.000.
Air Force: *See*—
Hotaling, Steven P.; and Dykeman, Deidra A., 5,470,612, Cl. 427-377.000.
Army: *See*—
Costanzo, Christopher R.; Kaplan, David R.; and Dang, Khoa V., 5,471,055, Cl. 250-252.100.
McCorkle, John, 5,471,223, Cl. 343-786.000.
Nalbandian, Vahakn; and Lee, Choon S., 5,471,221, Cl. 343-700.0MS.
Setterstrom, Jean A.; Jacob, Elliot; and Franz, Walter K., 5,470,311, Cl. 604-24.000.
Tarpinian, Aram, 5,469,773, Cl. 89-36.020.
Health and Human Services: *See*—
Miller, A. Dusty; Garcia-Martinez, Jose V.; Eiden, Maribeth V.; and Wilson, Carolyn A., 5,470,726, Cl. 435-172.300.
Interior: *See*—
Conti, Ronald S.; and Lazzara, Charles P., 5,469,920, Cl. 169-48.000.
National Aeronautics and Space Administration: *See*—
Amador, José J., 5,471,462, Cl. 370-17.000.
Dailey, J. R.; McGee, William F.; and Rybicki, Daniel J., 5,471,031, Cl. 219-121.460.
Farley, Gary L., 5,470,649, Cl. 428-303.000.
Navy: *See*—
Davis, John S.; Gong, Kai F.; and Hammel, Sherry E., 5,471,434, Cl. 367-124.000.
Edelstein, Alan S.; Kaatz, Forrest H.; and Harris, Vincent G., 5,470,373, Cl. 75-255.000.
Giorgio, Paul J.; and Amuro, Stephen J., 5,471,634, Cl. 395-600.000.
Hammell, Sherry E.; Gong, Kai F.; Jackson, Neil A.; Keay, Kathleen D.; and MacDonald, John F., 5,471,433, Cl. 367-118.000.
Kelso, Thomas M.; Koch, John K.; Boyle, Damon J.; Meiser, David H.; Flaherty, William P.; and Baird, Bernard W., 5,470,232, Cl. 434-45.000.
Papanicolaou, Nicolas A., 5,471,072, Cl. 257-77.000.
Rivera, David F.; Floyd, Thomas R.; and Josypenko, Michael J., 5,471,182, Cl. 333-252.000.
U.S. Philips Corporation: *See*—
Baggen, Constant P. M. J.; and Gaal, Erik W., 5,471,486, Cl. 371-37.100.
Balcx, Johannes L.; Spruit, Johannes H. M.; and Veldhuis, Hindrik, 5,471,457, Cl. 369-116.000.
De Backer, Josephus W. M.; and De Bie, Cornelia M. J., 5,471,113, Cl. 313-487.000.
De Boer, Johannes, 5,470,606, Cl. 427-64.000.
Einerhand, Robert E. F.; Lippits, Gerardus J. M.; Daams, Johannes L. C.; and Notten, Petrus H. L., 5,470,675, Cl. 429-101.000.
Filmer, Bartholomeus, 5,470,805, Cl. 501-55.000.
Krainer, Erich; and Sonnek, Martin, 5,471,016, Cl. 174-254.000.
Liedenbaum, Coen T. H. F.; Severens, Arnoldus L. G. J.; Drenten, Ronald R.; and Jongerius, Michiel J., 5,471,490, Cl. 372-32.000.
Lokhoff, Gerardus C. P., 5,471,350, Cl. 360-48.000.
Moore, Paul A.; and Cusdin, Anthony R., 5,471,173, Cl. 330-256.000.
Nieuwendijk, Joris A. M.; Bax, Johannes W. T.; Oepkes, Cornelis J.; Roelofs, Henricus H.; and Van Den Thillart, Martinus P. M., 5,471,018, Cl. 181-152.000.
Sankaranarayanan, Lakshmi N.; Slotboom, Jan W.; and Van Der Sijde, Arjen G., 5,471,419, Cl. 365-177.000.
United States Surgical Corporation: *See*—
Rodak, Daniel, 5,470,009, Cl. 227-176.000.
Rodak, Daniel P., 5,470,006, Cl. 227-176.000.
Rodak, Daniel P., 5,470,008, Cl. 227-176.000.

Tovey, H. Jonathan; and Autry, Sidney D., 5,470,316, Cl. 604-118.000.
Whitfield, Kenneth H.; Scott, Ian M.; and Castro, Michael, 5,470,338, Cl. 606-144.000.

United Technologies Corporation: *See—*
Holowczak, John E.; and Zabielski, Martin F., 5,470,222, Cl. 431-7.000.
Molter, Trent M.; and Critz, Kurt M., 5,470,448, Cl. 204-252.000.

Unitta Company: *See—*
Ayukawa, Kazumasa, 5,470,280, Cl. 474-135.000.

Univ. of Wyoming: *See—*
Cha, Chang Y.; Plancher, Henry; and Kraus, Lawrence S., 5,470,384, Cl. 106-284.030.

University Corporation for Atmospheric Research: *See—*
Randall, Mitchell A.; Holloway, Christopher L.; and Wurman, Joshua M. A. R., 5,471,211, Cl. 342-26.000.

University of Akron: *See—*
Harwood, H. James; and Goodrich, Stephen D., 5,470,928, Cl. 526-172.000.

University of Arizona, The Arizona Board of Regents on Behalf of the: *See—*
Polt, Robin L., 5,470,949, Cl. 530-322.000.

University of Calif., The Regents of the: *See—*
Wu, Xin D.; and Tiwari, Prabhat, 5,470,668, Cl. 428-688.000.

University of California, Regents of the: *See—*
Smith, Paul; Heeger, Alan J.; Cao, Yong; Chiang, Jin-Chih; and Andreatta, Alejandro, 5,470,505, Cl. 252-500.000.

University of California, The Regents of the: *See—*
Cochrum, Kent C., 5,470,731, Cl. 435-182.000.
Giorgi, Janis V.; and Hultin, Lance, 5,470,701, Cl. 435-5.000.
Gritzo, Russ E.; and Fowler, Malcolm M., 5,471,062, Cl. 250-368.000.
Huang, Han; Morioka, Craig A.; Ratib, Osman; Cho, Paul N. S.; Ho, Bruce K. T.; Sonobe, Takeo; and Shinagawa, Toru, 5,471,606, Cl. 395-500.000.
McEwan, Thomas E., 5,471,162, Cl. 327-92.000.
Miles, Steven A.; Stevens, Ronald H.; Martinez, Otoniel M.; Kishimoto, Tadamitsu; and Klashman, David J., 5,470,824, Cl. 514-2.000.

University of Delaware: *See—*
Foley, Henry C.; Sonnichsen, George C.; Brake, Loren D.; Mariwala, Ravindra K.; and Lafyatis, David S., 5,470,814, Cl. 502-182.000.

University of Essex: *See—*
Tseung, Alfred C. C.; Shen, Pei K.; and Syed-Bokhari, Jade, 5,470,673, Cl. 429-44.000.

University of Iowa Research Foundation: *See—*
Jones, Douglas H., 5,470,722, Cl. 435-91.200.

University of Kansas, The: *See—*
Wong, Kai W.; Fei, Xin; Xin, Ying; and Kao, Yi-Han, 5,470,821, Cl. 505-236.000.

University of Maryland: *See—*
Bryan, Philip N.; Alexander, Patrick A.; and Strausberg, Susan L., 5,470,733, Cl. 435-222.000.

University of Maryland At Baltimore: *See—*
Kaper, James B.; Baudry-Maurelli, Bernadette; and Fasano, Alessio, 5,470,729, Cl. 435-172.300.

University of Medicine and Dentistry of New Jersey, The: *See—*
Kondo, Keiji; and Inouye, Masayori, 5,470,971, Cl. 536-23.700.

University of Minnesota: *See—*
Leung, Donald; Schlievert, Patrick; Meissner, Cody; and Fulton, David, 5,470,716, Cl. 435-34.000.

University of Minnesota, Regents of the: *See—*
Leung, Donald; Schlievert, Patrick; Meissner, Cody; and Fulton, David, 5,470,716, Cl. 435-34.000.

University of Pittsburgh: *See—*
Brubaker, Clifford E.; Brienza, David M.; and Brienza, Michael J., 5,470,590, Cl. 425-2.000.

University of Puerto Rico: *See—*
Kraiselburd, Edmundo, 5,470,572, Cl. 424-208.100.

University of Strathclyde: *See—*
McGregor, Douglas R., 5,471,611, Cl. 395-600.000.

University of Toledo, The: *See—*
King, Roger J., 5,471,378, Cl. 363-46.000.

University of Utah: *See—*
Weiss, Robert B.; Kimball, Alvin W.; Gesteland, Raymond F.; Ferguson, F. Mark; Dunn, Diane M.; Di Sera, Leonard J.; and Cherry, Joshua L., 5,470,710, Cl. 435-6.000.

University of Virginia Patent Foundation: *See—*
Taylor, Ronald P.; Sutherland, William M.; Reist, Craig; Wright, Eleanor L.; Webb, Donna; and Labuguen, Ronald, 5,470,570, Cl. 424-93.730.

University Technologies International, Inc.: *See—*
Yoon, Ji-Won, 5,470,873, Cl. 514-460.000.

Uniweld Products, Inc.: *See—*
Pearl, David S., II; and Smith, Frank G., 5,470,226, Cl. 431-255.000.

Unno, Makoto: *See—*
Kotaki, Takaaki; Taya, Masaaki; Unno, Makoto; Mikuriya, Yushi; and Dojyo, Tadashi, 5,470,684, Cl. 430-109.000.

Uno, Jun: *See—*
Tanaka, Yasushi; Tojo, Takashi; Uchida, Kazuhiko; Uno, Jun; Uchida, Yasushi; and Shida, Osamu, 5,470,827, Cl. 514-11.000.

UNR Industries, Inc.: *See—*
Mainard, Tommy D.; and Reinbold, James F., 5,470,087, Cl. 280-33.992.

UOP: *See—*
Gillespie, Ralph D., 5,470,486, Cl. 210-758.000.
Holt, Randall E., 5,470,482, Cl. 210-662.000.
House, David W.; Scott, Ray V., Jr.; and Gattuso, Mark J., 5,470,890, Cl. 521-128.000.
Priegnitz, James W., 5,470,464, Cl. 210-198.200.

Uponor Innovation AB: *See—*
Lund, Arne; and Agren, Lennart, 5,469,891, Cl. 138-98.000.

Upton, Eric L.: *See—*
Yokote, Timothy A.; Upton, Eric L.; Eayedy, Arthur G.; Stockton, Grant J.; and Brandis, Dirk K., 5,471,603, Cl. 395-402.000.

Ushioda, Kohsaku: *See—*
Yoshinaga, Naoki; Ushioda, Kohsaku; Akisue, Osamu; and Nishimura, Kunio, 5,470,403, Cl. 148-330.000.

Ushiodenki Kabushiki Kaisha: *See—*
Yasuda, Yukio; Yamaguchi, Akiyasu; Igarashi, Tatsushi; Oonishi, Yasuo; Kai, Kenzo; Sugihara, Masanori; Mori, Takashi; and Miyaji, Akira, 5,471,278, Cl. 355-67.000.

Usui, Akira: *See—*
Mochizuki, Yuji; Chiba, Yoshie; Takada, Toshikazu; and Usui, Akira, 5,469,806, Cl. 117-97.000.

Usuki, Hideki, to Sony Corporation. High-speed large output amplitude voltage level shifting circuit. 5,471,149, Cl. 326-68.000.

Utagawa, Tsutomu: *See—*
Hayashi, Toshio; Arimoto, Shinobu; Yoshinaga, Kazuo; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanuma, Nobuatsu, 5,471,281, Cl. 155-201.000.

Utah State University: *See—*
Mendenhall, Von T., 5,470,597, Cl. 426-521.000.

Uthoff, David C., to Corporate Concept Marketing. Sports garment having variable thickness sections. 5,469,581, Cl. 2-69.000.

Utter, Mark E., to Texas Instruments Incorporated. Devices, systems and methods for composite signal decoding employing interpolation filter. 5,471,534, Cl. 381-4.000.

V-Lite Corporation: *See—*
Krantz, Kermit T.; and Jones, Charles R., Jr., 5,470,028, Cl. 242-343.200.

Vadin-Michaud, Gilles; and Florentin, Thierry, to Valeo Equipments Electriques Moteur. Starter unit for a motor vehicle engine. 5,469,753, Cl. 74-7.00A.

Vaillancourt, Glenn M.; and Gridley, Lee E., to Davidson Textron Inc. Motor vehicle head impact air bag system. 5,470,103, Cl. 280-730.100.

Vala, John D.: *See—*
Bakker, Johan P.; Catchpole, Clive E.; Tratar, David B.; and Vala, John D., 5,471,048, Cl. 250-208.100.

Valentin, Franz: *See—*
Felder, Anton; and Valentin, Franz, 5,470,489, Cl. 210-788.000.

Valeo Equipments Electriques Moteur: *See—*
Vadin-Michaud, Gilles; and Florentin, Thierry, 5,469,753, Cl. 74-7.00A.

Valette, Gérard: *See—*
Bernat, André; Herbert, Jean-Marc; and Valette, Gérard, 5,470,855, Cl. 514-236.800.

Valorga Process: *See—*
Beteau, Jean-François; and Graindorge, Philippe, 5,470,745, Cl. 435-286.100.

Van Arsdell, Janelle N.: *See—*
Kawasaki, Ernest S.; Ladner, Martha B.; Van Arsdell, Janelle N.; Wang, Alice M.; Ralph, Peter; Coyne, Mazie Y.; and Warren, Mary K., 5,470,569, Cl. 424-85.100.

Vance, Ricky T.: *See—*
Griffith, George L.; and Vance, Ricky T., 5,470,407, Cl. 149-109.600.

van den Bergh, Herman; Lane, Marvin; and Mallon, John. Information system for monitoring products in sorting apparatus. 5,471,311, Cl. 356-446.000.

Van Den Thillart, Martinus P. M.: *See—*
Nieuwendijk, Joris A. M.; Bax, Johannes W. T.; Oepkes, Cornelis J.; Roelofs, Henricus H.; and Van Den Thillart, Martinus P. M., 5,471,018, Cl. 181-152.000.

van der Leeuw, Bart; Canale, Joseph E.; Kowal, Albert E.; Pragt, Henrikus J. H.; and Morris, Thomas W., to Philips Electronics North America Corporation. High pressure discharge lamp having filament electrodes. 5,471,110, Cl. 313-25.000.

Vanderlinden, Jacques J.: *See—*
Ling, Robin S. M.; Mikhail, W. E. Michael; Elting, James J.; Gie, Graham A.; Slooff, Tom J. J. H.; and Vanderlinden, Jacques J., 5,470,336, Cl. 606-105.000.

van der Meer, Roelof; Pratt, Charles F.; de Munck, Johannes W. J.; and Heuschen, Jean M. H., to General Electric Company. Polymer mixture which comprises a polyamide, a polyphenylene ether and an agent to improve the impact resistance. 5,470,913, Cl. 525-66.000.

Van Der Sijde, Arjen G.: *See—*
Sankaranarayanan, Lakshmi N.; Slotboom, Jan W.; and Van Der Sijde, Arjen G., 5,471,419, Cl. 365-177.000.

Van der Vieren, Monica: *See—*
Gallatin, W. Michael; and Van der Vieren, Monica, 5,470,953, Cl. 530-350.000.

Vandervoort, Paul B. Linearly reciprocating keyboard key incorporating two guide pins. 5,469,772, Cl. 84-436.000.

Van Dusen, Donn S.; and Gibbs, Douglas P., to Mascotech Accessories, Inc. Spare tire carrier for a tow hitch. 5,469,998, Cl. 224-506.000.

Van Duyne, Scott A.; and Smith, Julius O., III, to Leland Stanford Junior University, The Board of Trustees of the. Multidimensional digital waveguide signal synthesis system and method. 5,471,007, Cl. 84-622.000.

Van Hoogenbemt, Stefaan M. A.: *See—*

De Langhe, Marc R. F.; Reusens, Peter P. F.; Haspeslagh, Johan J. G.; and Van Hoogenbemt, Stefaan M. A., 5,471,511, Cl. 375-376.000.
Van Melle, William: *See—*
Moran, Thomas P.; Chiu, Patrick; and Van Melle, William, 5,471,578, Cl. 395-161.000.
Vanotti, Ermes: *See—*
Fraire, Cristina; Bani, Massimo; Vanotti, Ermes; and Olgiati, Vincenzo, 5,470,858, Cl. 514-261.000.
Van Paemel, Mark G. S. J.: *See—*
Sevenhans, Joannes M. J.; and Van Paemel, Mark G. S. J., 5,471,168, Cl. 327-553.000.
Van Peteghem, Jacques V.: *See—*
Tuma, Daniel L.; Van Peteghem, Jacques V.; and Ronneau, Olivier H., 5,469,702, Cl. 60-311.000.
Van Rumpt, Jacob, to AMKO International B.V. Depositing apparatus for laundry. 5,469,955, Cl. 198-689.100.
Van Scherrenburg, Michael A.: *See—*
Bhargava, Vivek; Jue, Andrew; Van Scherrenburg, Michael A.; and Wilson, Les J., 5,471,248, Cl. 348-420.000.
Van Scott, Eugene J.: *See—*
Yu, Ruey J.; and Van Scott, Eugene J., 5,470,880, Cl. 514-574.000.
Van Wart, Harold: *See—*
Schwartz, Martin A.; and Van Wart, Harold, 5,470,834, Cl. 514-19.000.
Varambally, Rajamohan: *See—*
Baroni, Andrea; Mastrodomenico, Giovanni; Michele, Taliercio; Capocelli, Piero; Carro, Luigi; and Varambally, Rajamohan, 5,471,428, Cl. 365-201.000.
Varian Associates, Inc.: *See—*
Nunan, Craig S., deceased, 5,471,516, Cl. 378-65.000.
Varma, Prab: *See—*
Gheewala, Tushar; Mehta, Rustam; and Varma, Prab, 5,471,152, Cl. 324-758.000.
Varo, Inc.: *See—*
Mattes, Paul B., 5,469,578, Cl. 2-6.700.
Varonis, Orestes J.: *See—*
Dougherty, John D.; Moldovan, Mark R; Otto, Dennis L.; and Varonis, Orestes J., 5,470,157, Cl. 384-448.000.
Vasquez, Jose C. Golf instructional device. 5,470,073, Cl. 273-187.200.
Vassiliadis, Stamatis: *See—*
Phillips, James E.; Blaner, Bartholomew; and Vassiliadis, Stamatis, 5,471,628, Cl. 395-800.000.
Vaughan, Mark C. V.; and Vaughan, Simon P., to Energy Reduction International Ltd. Induction motor control. 5,471,127, Cl. 318-809.000.
Vaughan, Simon P.: *See—*
Vaughan, Mark C. V.; and Vaughan, Simon P., 5,471,127, Cl. 318-809.000.
VAW Aluminium AG: *See—*
Mechsner, Klaus, 5,469,822, Cl. 123-195.00C.
VDO Adolf Schindling AG: *See—*
Hahlganss, Günter, 5,471,389, Cl. 364-424.050.
Veeser, Klaus: *See—*
Morweiser, Karl-Heinz; Veeser, Klaus; and Stini, Harald, 5,470,485, Cl. 210-748.000.
Veiga, Antonio: *See—*
Oudille, Jean-Claude; and Veiga, Antonio, 5,471,134, Cl. 324-103.00P.
Veldhuis, Hindrik: *See—*
Bakx, Johannes L.; Spruit, Johannes H. M.; and Veldhuis, Hindrik, 5,471,457, Cl. 369-116.000.
Vember, Vladimir E.: *See—*
Pertsov, Nikolay V.; Ulberg, Zoya R.; Vember, Vladimir E.; Podolskaya, Valentina I.; Kogan, Boris S.; and Burenkov, Eduard K., 5,470,460, Cl. 210-151.000.
Vendt, Robert J.: *See—*
TenBrink, Jay T.; Farkas, Maryanne R.; Vendt, Robert J.; and Brock, Waine T., 5,469,662, Cl. 49-352.000.
Verma, Inder M.; Wisdom, Ronald M.; and Yen, Joog-Young J., to Salk Institute for Biological Studies, The. Transdominant negative proto-oncogene. 5,470,736, Cl. 435-240.200.
Verne Q. Powell Flutes: *See—*
Wasser, Steven A., 5,469,771, Cl. 84-385.00P.
Vernon, Nicholas M.: *See—*
Sankey, George H.; Vernon, Nicholas M.; and Wingard, Robert E., Jr., 5,470,969, Cl. 536-115.000.
Verra, Yvan. Device for locking a sliding body, and particularly a retractable road boundary mark. 5,470,169, Cl. 404-6.000.
Versteeg, Anton: *See—*
Banning, Kenneth R.; James, Wendy S.; Li, Shih-Gong; and Versteeg, Anton, 5,471,613, Cl. 395-600.000.
Verthe, John J. A.: *See—*
Zanzig, David J.; Sandstrom, Paul H.; Hubbell, Joseph K.; Hsu, Wen-Liang; Halasa, Adel F.; and Verthe, John J. A., 5,470,929, Cl. 526-181.000.
Vesper, Stephen J.: *See—*
Oester, Dean A.; Hall, Allen L.; and Vesper, Stephen J., 5,470,741, Cl. 435-254.100.
Vetrotex France: *See—*
Gasca, Jean-Philippe; and Tardy, Gerard, 5,470,658, Cl. 428-391.000.
Vevert, Jean-Paul: *See—*
Fortin, Michel; Frechet, Daniel; Hamon, Gilles; Jouquey, Simone; and Vevert, Jean-Paul, 5,470,867, Cl. 514-393.000.
Vexler, Manuel; and Emerson, Victor F., to Northern Telecom Limited. Radio link parameter control in wireless personal communications system. 5,471,650, Cl. 455-69.000.
Victor Equipment Company: *See—*
Mims, Carl W.; and Zwicker, Roger D., 5,470,227, Cl. 431-255.000.
Vidal, Claude A.: *See—*
Pryley, Alan K.; Vidal, Claude A.; and Lagerquist, Roger, 5,470,007, Cl. 227-175.000.
Vidamed, Inc.: *See—*
Edwards, Stuart D.; Lax, Ronald G.; Sharkey, Hugh R.; and Lundquist, Ingemar H., 5,470,308, Cl. 604-22.000.
Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; and Sharkey, Hugh R., 5,470,309, Cl. 604-22.000.
Vidler, James W. Footwear accessory. 5,469,644, Cl. 36-127.000.
Vietto, Paolo: *See—*
Oreglia, Aurelio; and Vietto, Paolo, 5,470,624, Cl. 428-36.100.
Vijg, Jan; and Gossen, Jan A., to Nederlandse Organisatie voor toegepastwetenschappelijk onderzoek TNO. Process for the rescue of DNA and for detecting mutations in marker genes. 5,470,706, Cl. 435-6.000.
Vild, Chris T.: *See—*
Gilbert, Ronald E.; Mordue, George S.; and Vild, Chris T., 5,470,201, Cl. 415-200.000.
Vinten Group plc: *See—*
Lindsay, Richard A., 5,469,793, Cl. 108-2.000.
Viratec Thin Films, Inc.: *See—*
Dickey, Eric R.; and Bjornard, Erik J., 5,470,452, Cl. 204-298.210.
Virginia Polytechnic Institute and State University: *See—*
Kingston, David G. I.; Molinero, Anthony A.; and Gunatilaka, A. A. Leslie, 5,470,866, Cl. 514-376.000.
Vishnepolsky, Boris: *See—*
Nielsen, Arne; Moghaddassi, Majid; Vishnepolsky, Boris; and Smith, Keith, 5,470,030, Cl. 242-533.800.
Vishwanath, T. G.: *See—*
Parr, Michael I.; Watson, John L.; and Vishwanath, T. G., 5,471,501, Cl. 375-354.000.
Viskase Corporation: *See—*
Markulin, John, 5,470,519, Cl. 264-193.000.
Visser, Alexis W., to Kleineibst, Desmond. Device for extracting a plant from the ground. 5,469,923, Cl. 172-22.000.
Vitatron Medical, B.V.: *See—*
Begemann, Malcolm J. S., 5,470,344, Cl. 607-17.000.
Vlajic, Milan: *See—*
Krstic, Vladimir D.; and Vlajic, Milan, 5,470,806, Cl. 501-90.000.
VLSI Technologies, Inc.: *See—*
Martin, William C., 5,471,153, Cl. 324-763.000.
VLSI Technology, Inc.: *See—*
Nariani, Subhash R., 5,470,775, Cl. 437-52.000.
VOAC Hydraulics Boras AB: *See—*
Ericsson, Lars P.; and Nilstam, Bo, 5,469,703, Cl. 60-399.000.
Voest-Alpine Industrieanlagenbeau GmbH: *See—*
Berger, Harald; Mittag, Peter; Steins, Johannes; and Pfeiffer, Gert, 5,471,495, Cl. 373-2.000.
Vogel Brothers Corporation: *See—*
Vogel, David S.; and Vogel, Donald E., 5,469,626, Cl. 30-266.000.
Vogel, David S.; and Vogel, Donald E., to Vogel Brothers Corporation. Scissors. 5,469,626, Cl. 30-266.000.
Vogel, Donald E.: *See—*
Vogel, David S.; and Vogel, Donald E., 5,469,626, Cl. 30-266.000.
Vogel, Frank E.: *See—*
Goode, David P.; and Vogel, Frank E., 5,470,108, Cl. 280-823.000.
Vohnout, Vincent J.: *See—*
Dunbar, Michael D.; and Vohnout, Vincent J., 5,469,688, Cl. 53-419.000.
Voit, Donald O., to Westinghouse Electric Corporation. Zirconium sulfate precipitation. 5,470,550, Cl. 423-81.000.
Volpe, Raymond A.: *See—*
Wagle, Dinkar G.; and Volpe, Raymond A., 5,470,436, Cl. 162-207.000.
von Angerer, Erwin; Erber, Sebastian; and Schneider, Martin, to Schering Aktiengesellschaft. 2-phenylbenzo[B]furans, process for their manufacture and pharmaceutical preparations containing them. 5,470,854, Cl. 514-233.500.
von Borstel, Reid W.; and Bamat, Michael K., to Pro-Neuron, Inc. Method of delivering exogenous uridine or cytidine using acylated uridine or cytidine. 5,470,838, Cl. 514-50.000.
Vonken, Hub A. G.; and op den Buysch, Jan, to Hoechst Aktiengesellschaft. Process for foaming flame retardant polystyrene and polystyrene shaped articles. 5,470,888, Cl. 521-79.000.
Von Wettstein, Dietrich: *See—*
Borriss, Rainer; Hofemeister, Jürgen; Thomsen, Karl K.; Olsen, Ole; and Von Wettstein, Dietrich, 5,470,725, Cl. 435-93.000.
Voss, Darrell; Klein, Gary; O'Connor, Sean; and Pauls, Looney, to Klein Bicycle Corporation. Cable guide for bicycle frames and method for increasing frame strength. 5,470,091, Cl. 280-281.100.
Voss, Gunter, to Auditec GmbH. Method and device for gas analysis. 5,469,732, Cl. 73-31.040.
Voss, Henry H.: *See—*
Fletcher, Nicholas J.; Lamont, Gordon J.; Basura, Vesna; Voss, Henry H.; and Wilkinson, David P., 5,470,671, Cl. 429-26.000.
Vougioukas, Angelos-Elie: *See—*
Kaul, Bansi L.; Vougioukas, Angelos-Elie; and Goldmann, Jürgen, 5,470,921, Cl. 525-432.000.
Voysys Corporation: *See—*

Smith, Bernard J.; Seager, David B.; Tong, Raymond L.; and Rowley, Thomas E., 5,471,523, Cl. 379-165.000.

VSL International AG: *See*—
Lüthi, Kurt, 5,469,677, Cl. 52-223.130.

Vu, Huy D.; and Tran, Hoa M. Wrist/hand support for keyboards. 5,470,036, Cl. 248-118.500.

Vulkan Lokring GmbH: *See*—
Schwalm, Dieter; and Neumann, Rainer, 5,470,113, Cl. 285-255.000.

Vyne, Robert L.: *See*—
Petty, Thomas D.; Stockstad, Troy L.; and Vyne, Robert L., 5,471,174, Cl. 330-257.000.

W. R. Grace & Co.-Conn.: *See*—
Oreglia, Aurelio; and Vietto, Paolo, 5,470,624, Cl. 428-36.100.

Wachi, Shigeaki, to Sony Corporation. Seek circuit for optical disc. 5,471,444, Cl. 369-32.000.

Wachi, Shigeaki, to Sony Corporation. Seek control for information storage disc drive. 5,471,447, Cl. 369-44.280.

Wada, Satoshi: *See*—
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,471,227, Cl. 347-9.000.

Wada, Takasumi: *See*—
Irihara, Kouichi; Yamasa, Hideo; Shimazu, Fumio; and Wada, Takasumi, 5,471,283, Cl. 355-205.000.

Wada, Tomohisa: *See*—
Murakami, Shuji; Wada, Tomohisa; and Anami, Kenji, 5,471,427, Cl. 365-200.000.

Wadsworth, Harry J.; Wyman, Paul A.; Dabbs, Steven; and Jenkins, Sarah M., to Beecham Group p.l.c. Azabicyclic compounds with muscarinic activity useful for treating dementia. 5,470,859, Cl. 514-299.000.

Wadsworth, Larry C.; and Khan, Ahamad Y., to Exxon Chemical Patents Inc. Meltblowing of ethylene and fluorinated ethylene copolymers. 5,470,663, Cl. 428-421.000.

Wagle, Dinkar G.; and Volpe, Raymond A., to International Paper Company. Rewetting of paper products during drying. 5,470,436, Cl. 162-207.000.

Wagner, Michael: *See*—
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.

Wakabayashi, Hiroharu: *See*—
Taga, Hidenori; Suzuki, Masatoshi; Edagawa, Noboru; Yamamoto, Shu; and Wakabayashi, Hiroharu, 5,471,333, Cl. 359-173.000.

Wakamatsu, Hideki: *See*—
Sakai, Takafumi; Wakamatsu, Hideki; Tsuboi, Yoshihiro; and Kawauchi, Masaya, 5,469,754, Cl. 74-336.00R.

Wakamatsu, Kazuki: *See*—
Sasaki, Toshio; Ebara, Takeshi; Igarashi, Toshio; Tatsumi, Masayuki; and Wakamatsu, Kazuki, 5,470,900, Cl. 524-269.000.

Wakamiya, Syunitirou: *See*—
Tokumaru, Haruki; Maruyama, Koichi; and Wakamiya, Syunitirou, 5,471,456, Cl. 369-112.000.

Wakiyama, Youichi: *See*—
Sasaki, Kunimasa; Wakiyama, Youichi; Matsumoto, Takahiro; Tanaka, Kisaburo; and Yamamoto, Keiichi, 5,469,909, Cl. 164-428.000.

Wakui, Yukio; Nishitani, Yoshiki; and Miyazawa, Kenichi, to Yamaha Corporation. Magnetic recording medium and method of producing it. 5,470,636, Cl. 428-141.000.

Walch, Axel: *See*—
Stahl, Wilhelm; Ahlers, Michael; Walch, Axel; Bartnik, Eckhart; Kretzschmar, Gerhard; Grabley, Susanne; and Schleyerbach, Rudolf, 5,470,843, Cl. 514-61.000.

Walden, John D., to Intercon Systems, Inc. Shielded ribbon cable electrical connector assembly and method. 5,470,238, Cl. 439-98.000.

Waldman, Cheryl: *See*—
Bean, Eric S.; Waldman, Cheryl; and Sanders, Ronald, 5,470,711, Cl. 435-7.100.

Waldmann, Dieter: *See*—
Stoll, Kurt; Waldmann, Dieter; and Feyrer, Thomas, 5,469,775, Cl. 92-88.000.

Waldock, Kevin H., to Clipmate Corporation. Twin electrical lead and connector assembly. 5,470,256, Cl. 439-501.000.

Walinsky, Paul. Perfusion balloon catheter with differential compliance. 5,470,314, Cl. 604-96.000.

Walker, George T.; Nadeau, James G.; Spears, Patricia A.; Nycz, Colleen M.; Shank, Daryl D.; Schram, James L.; and Jurgensen, Stewart R., to Becton, Dickinson and Company. Detection of mycobacteria by multiplex nucleic acid amplification. 5,470,723, Cl. 435-91.200.

Walker, Wiliam C.: *See*—
Mokhtar, Ahmed M.; Popper, Peter; and Walker, Wiliam C., 5,470,629, Cl. 428-85.000.

Wallace, John C.: *See*—
Ballard, Francis J.; Wallace, John C.; and Wells, Julian R. E., 5,470,828, Cl. 514-12.000.

Wallin, Peter E.: *See*—
Janes, Todd L.; Meade, Alexander D.; Murthy, Ashok; Sharma, Pramod K.; and Wallin, Peter E., 5,471,291, Cl. 355-326.00R.

Wallis, Julian M.: *See*—
Beck, Anthony L.; Wallis, Julian M.; Attwood, Martin D.; and Newman, Stephen, 5,470,699, Cl. 430-621.000.

Wallon, Alexander; Auchter, Gerhard; Licht, Ulrike; Haeberle, Karl; and Funhoff, Angelika, to BASF Aktiengesellschaft. Aqueous polyurethane dispersions. 5,470,907, Cl. 524-507.000.

Wallon, Alexander: *See*—
Gulbins, Erich; Haeberle, Karl; Licht, Ulrike; and Wallon, Alexander, 5,470,899, Cl. 524-158.000.

Walser, Michael: *See*—
Müntener, Herbert; and Walser, Michael, 5,470,107, Cl. 280-777.000.

Walsh, J. Peter: *See*—
Lindquist, Craig R.; Clarke, John T.; Chin, Peter P. S.; MacDonald, Michael J.; and Walsh, J. Peter, 5,470,631, Cl. 428-105.000.

Walsh, Michael: *See*—
Phan, Chan B.; and Walsh, Michael, 5,469,881, Cl. 137-315.000.

Walter, Klaus: *See*—
Ott, Karl; Walter, Klaus; and Strate, Joachim, 5,469,823, Cl. 123-414.000.

Walters, Steven A.: *See*—
Umney, Michael A.; Walters, Steven A.; and Koss, Christopher R., 5,470,114, Cl. 285-367.000.

Walthall, Ben J.; Caple, Matthew V.; and Murphy, Thomas J., to Irvine Scientific Sales Co. Mixing apparatus. 5,470,151, Cl. 366-165.100.

Wang, Alice M.: *See*—
Kawasaki, Ernest S.; Ladner, Martha B.; Van Arsdell, Janelle N.; Wang, Alice M.; Ralph, Peter; Coyne, Mazie Y.; and Warren, Mary K., 5,470,569, Cl. 424-85.100.

Wang, Charles P. Laser positioning method and appartus for rotary actuator arms, and the like. 5,471,304, Cl. 356-358.000.

Wang, Chin-Liu. Rowing exercise machine. 5,470,295, Cl. 482-71.000.

Wang, David W.: *See*—
Papathomas, Kostas I.; Christie, Frederick R.; and Wang, David W., 5,471,096, Cl. 257-778.000.

Wang, Jianmin, to Siemens Aktiengesellschaft. Circularly polarized local antenna arrangement for a nuclear magnetic resonance tomography apparatus and method for operating same. 5,471,142, Cl. 324-318.000.

Wang, King-Sheng. Swivel foot for travel bags. 5,469,944, Cl. 190-18.00R.

Wang, Richard H. S., to Eastman Chemical Company. Process for the preparation of esters of stilbenedicarboxylic acid. 5,470,998, Cl. 560-96.000.

Wang, Yajiun P.; Swartz, Jerome; and McGlynn, Daniel R., to Symbol Technologies, Inc. Record with encoded data. 5,471,533, Cl. 380-51.000.

Wang, Youqun: *See*—
Peng, Sixun; Dai, Dezai; Huang, Zhenya; Huang, Wenlong; Wang, Youqun; Zhang, Can; and Yu, Feng, 5,470,852, Cl. 514-231.500.

Wang, Zhonghe; and Johnson, Brian K. A., to Motorola, Inc. Hanset for a multiple channel communication system and use thereof. 5,471,671, Cl. 455-226.200.

Wang, Zhou: *See*—
Dube, Ghyslain; Litalien, Marko; Pelletier, Roger; and Wang, Zhou, 5,470,376, Cl. 75-672.000.

Warashina, Fumikazu: *See*—
Watanabe, Atsushi; Terawaki, Fumikazu; and Warashina, Fumikazu, 5,471,312, Cl. 358-296.000.

Warde, Cardinal; Horsky, Thomas N.; Schiller, Craig M.; and Genetti, George J., to Optron Systems, Inc. Membrane light modulating systems. 5,471,341, Cl. 359-293.000.

Wardle, Frank; Jacobson, Bo; Dolfsma, Henk; and Butterworth, Arthur, to SKF USA, Inc. Lubrication of refrigerant compressor bearings. 5,469,713, Cl. 62-84.000.

Wardle, John: *See*—
Goldenberg, Tsvi; Wardle, John; and Anderson, William, 5,470,330, Cl. 606-7.000.

Warner-Lambert Company: *See*—
Butler, Donald E.; Le, Tung V.; and Nanninga, Thomas N., 5,470,981, Cl. 546-207.000.

Warren, Mary K.: *See*—
Kawasaki, Ernest S.; Ladner, Martha B.; Van Arsdell, Janelle N.; Wang, Alice M.; Ralph, Peter; Coyne, Mazie Y.; and Warren, Mary K., 5,470,569, Cl. 424-85.100.

Warren, Paul C.: *See*—
Schmutz, Caroline N.; Shokoohi, Frough K.; Tarascon, Jean-Marie; and Warren, Paul C., 5,470,357, Cl. 29-623.500.

Wasser, Steven A., to Verne Q. Powell Flutes. Pad for closing a tone hole in a musical instrument. 5,469,771, Cl. 84-385.00P.

Watanabe, Akinori; Horiguchi, Itaru; Sato, Atsushi; Kohno, Hiroshige; Ikeda, Kenji; and Iwasaki, Yujiro, to Okamoto Industries, Inc.; and Asahi Denka Kogyo Kabushikikaisya. Surface coating agent and surface coating method for elastic molding die. 5,470,608, Cl. 427-133.000.

Watanabe, Asao, to NF T&M. Systems, Inc. Encoder for providing calibrated measurement capability of rotation or linear movement of an object, label medium and an optical identification system. 5,471,054, Cl. 250-231.130.

Watanabe, Atsushi; Terawaki, Fumikazu; and Warashina, Fumikazu, to Fanuc Ltd. Automatic calibration method. 5,471,312, Cl. 358-296.000.

Watanabe, Fumihiko: *See*—
Saito, Atsushi; Okubo, Akiro; Watanabe, Fumihiko; and Shinada, Yasuyuki, 5,471,230, Cl. 347-29.000.

Watanabe, Kazushi: *See*—
Shirai, Hiroyuki; Sekine, Kazumi; Tsuda, Tadayuki; Ikemoto, Isao; Watanabe, Kazushi; Sasago, Yoshikazu; Shoji, Takeo; Noda, Shinya; Kobayashi, Kazunori; and Adachi, Hiroyuki, 5,470,635, Cl. 428-131.000.

Watanabe, Masayuki: *See*—

Yamamoto, Hitoshi; Kaneko, Kunihisa; Watanabe, Masayuki; and Kami, Akio, 5,469,940, Cl. 188-67.000.
Watanabe, Satoru, to Unisia Jecs Corporation. Self-diagnosing apparatus and method for determining occurence of failure in inner cylinder pressure responsive sensor applicable to engine combustion detecting/controlling system. 5,469,735, Cl. 73-118.100.
Watson, John L.: *See*—
Parr, Michael I.; Watson, John L.; and Vishwanath, T. G., 5,471,501, Cl. 375-354.000.
Watson, William H.: *See*—
LeStrange, Michael M.; Watson, William H.; Raven, Richard C., deceased, 5,470,079, Cl. 273-138.00A.
Watson, W. Joe: *See*—
Edwards, M. Larry; and Watson, W. Joe, 5,471,114, Cl. 315-86.000.
Weatherill, Timothy D.: *See*—
Fodor, Ludovic; Weatherill, Timothy D.; and Weberg, Rolf T., 5,470,986, Cl. 548-312.700.
Webb, Donna: *See*—
Taylor, Ronald P.; Sutherland, William M.; Reist, Craig; Wright, Eleanor L.; Webb, Donna; and Labuguen, Ronald, 5,470,570, Cl. 424-93.730.
Webb, Richard D.; and Cabral, Arthur W., to Taligent, Inc. Object-oriented apparatus and method for scan line conversion of graphic edges. 5,471,568, Cl. 395-133.000.
Weber, Andrew M.; and Beresniewicz, Aleksander, to Du Pont de Nemours, E. I., and Company. Recording films with a high refractive index modulation. 5,470,662, Cl. 428-421.000.
Weber, Gregory T.: *See*—
Thomas, Christopher P.; Weber, Gregory T.; and Tallarek, Glen E., 5,469,826, Cl. 123-488.000.
Weber, Jens: *See*—
Kragl, Hans; and Weber, Jens, 5,471,551, Cl. 385-37.000.
Weber, Kurt; Meyer, Hans R.; Kaschig, Jürgen; and Eckhardt, Claude, to Ciba-Geigy Corporation. Sulfonation of benzofuranylbiphenyls. 5,470,990, Cl. 549-466.000.
Weber-Stephen Products Co.: *See*—
Stephen, James C.; Schlosser, Erich J.; and Sieg, Ewald, 5,469,835, Cl. 126-25.00B.
Weberg, Rolf T.: *See*—
Fodor, Ludovic; Weatherill, Timothy D.; and Weberg, Rolf T., 5,470,986, Cl. 548-312.700.
Webster, James M.: *See*—
Bhagat, Gopal C.; and Webster, James M., 5,470,040, Cl. 248-222.400.
Weder, Donald E., to Highland Supply Corporation. Ribbon assembly forming curved segment for making a bow or ruffle. 5,470,620, Cl. 428-4.000.
Weeks, F. Bruce; and Johnson, John L., to EMCO Wheaton, Inc. Fuel dispensing nozzle having hold-open clip with lockout mechanism. 5,469,900, Cl. 141-392.000.
Weeks, Gregory P.: *See*—
Deakyne, Clifford K.; and Weeks, Gregory P., 5,470,409, Cl. 156-62.400.
Wegener, Ingo: *See*—
Daute, Peter; Wegener, Ingo; Meffert, Alfred; and Berger, Faize, 5,470,493, Cl. 252-8.700.
Wegmann, Alex; and Wolleb, Heinz, to Ciba-Geigy Corporation. Storage-stable solutions of accelerator systems. 5,470,896, Cl. 523-428.000.
Weholt, Raymond L. Insulating tunnel liner system. 5,470,178, Cl. 405-152.000.
Wei, Jianghua: *See*—
Hawley, Martin C.; Wei, Jianghua; Adegbite, Valerie; and Lin, Min, 5,470,423, Cl. 156-166.000.
Wei, William: *See*—
Krueger, Wolfgang; and Wei, William, 5,470,524, Cl. 419-5.000.
Weinert, James A.: *See*—
Peterson, Francis C.; and Weinert, James A., 5,471,193, Cl. 340-438.000.
Weinl, Gerold, to Sandvik AB. Sintered extremely fine-grained titanium-based carbonitride alloy with improved toughness and/or wear resistance. 5,470,372, Cl. 75-238.000.
Weinshilboum, Richard M.; Honchel, Ronald; Aksoy, Ibrahim A.; Szumlanski, Carol L.; Wood, Thomas C.; Otterness, Diane M.; and Wieben, Eric D., to Mayo Foundation for Medical Education and Research. Stably-transformed cells expressing human thiopurine methyltransferase. 5,470,737, Cl. 435-240.200.
Weisman, Douglas H.: *See*—
Bockelman, David E.; and Weisman, Douglas H., 5,471,010, Cl. 174-36.000.
Weispfenning, Gerald L.: *See*—
Bortins, John; Stageberg, Frank; Stover, Lance E.; and Weispfenning, Gerald L., 5,471,354, Cl. 360-77.050.
Weiss, Bruce W.; and Rommelfaenger, Eugene R., to Sentry Equipment Corp. Manifolded sampling valve assembly. 5,469,751, Cl. 73-863.330.
Weiss, Peggy A.: *See*—
Mongon, John M.; Twesme, Edward N.; and Weiss, Peggy A., 5,470,396, Cl. 136-251.000.
Weiss, Robert B.; Kimball, Alvin W.; Gesteland, Raymond F.; Ferguson, F. Mark; Dunn, Diane M.; Di Sera, Leonard J.; and Cherry, Joshua L., to University of Utah. Automated hybridization/imaging device for fluorescent multiplex DNA sequencing. 5,470,710, Cl. 435-6.000.
Weitemeyer, Christian: *See*—
Gruning, Burghard; Foitzik, Willi; Weitemeyer, Christian; and Kaseborn, Hans-Dieter, 5,470,992, Cl. 554-69.000.
Welding Institute, The: *See*—
Thomas, Wayne M.; Nicholas, Edward D.; Jones, Stephen B.; Lilley, Roger H.; Dawes, Christopher J.; and Dolby, Richard E., 5,469,617, Cl. 29-889.210.
Welin, Lucien: *See*—
Duflos, Muriel; Robert-Piessard, Sylvie; Welin, Lucien; Le Baut, Guillaume; Caignard, Daniel-Henri; Renard, Pierre; and Adam, Gérard, 5,470,864, Cl. 514-352.000.
Wellen, Thomas W.: *See*—
Chilton, John B.; Gevaras, Peter H.; Herb, Paul C.; and Wellen, Thomas W., 5,469,971, Cl. 209-235.000.
Weller, Dwight: *See*—
Summerton, James; Weller, Dwight; and Stirchak, Eugene, 5,470,974, Cl. 544-118.000.
Wellman, Inc.: *See*—
Booth, Hubert J.; Steagall, Paul H., III; and Wright, Michael W., 5,469,973, Cl. 209-580.000.
Wells, Julian R. E.: *See*—
Ballard, Francis J.; Wallace, John C.; and Wells, Julian R. E., 5,470,828, Cl. 514-12.000.
Wells, Stephen: *See*—
Hasbun, Robert N.; and Wells, Stephen, 5,471,604, Cl. 395-404.000.
Welte, David C. Sport jump apparatus. 5,470,296, Cl. 482-81.000.
Welter, Thomas R.: *See*—
Texter, John; Welter, Thomas R.; Southby, David T.; and Mooberry, Jared B., 5,470,688, Cl. 430-203.000.
Wen, Cheng-Kan. Drawer with a rail structure compatible with a single rail or multi-rail assembly in a cabinet. 5,470,144, Cl. 312-334.130.
Wen, Xin, to Eastman Kodak Company. Ultrathin tabular grain emulsion. 5,470,698, Cl. 430-567.000.
Wenner, Valerie A.: *See*—
Lowell, John K.; Anjum, Mohammed; Wenner, Valerie A.; Armour, Norman L.; and Kyaw, Maung H., 5,471,293, Cl. 356-30.000.
Wenzel, Richard A.; Sable, Lewis E.; Krutchen, Charles M.; and Williams, Phillip A., to Mobil Oil Corporation. Method for the thermal densification of thermoplastic articles. 5,470,521, Cl. 264-321.000.
Werker, Heinz, to Siemens Aktiengesellschaft. Phase-locked loop configuration. 5,471,512, Cl. 375-376.000.
Wersing, Wolfram: *See*—
Krautschneider, Wolfgang; and Wersing, Wolfram, 5,471,417, Cl. 365-145.000.
West Bend Company, The: *See*—
Kaney, Howard W., 5,470,254, Cl. 439-439.000.
West, Neil: *See*—
Akeley, Tom; and West, Neil, 5,469,583, Cl. 2-421.000.
West, R. Michael P.: *See*—
Rackley, Darwin P.; and West, R. Michael P., 5,471,570, Cl. 395-135.000.
West Virginia University Research Corporation: *See*—
Charlton, Judie F.; Schwab, Ivan R.; and Stuchell, Robert M., 5,470,881, Cl. 514-588.000.
Westendorf, Holger: *See*—
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.
Western Digital Corporation: *See*—
Mangan, John S.; Norman, Robert D.; Craig, Jeffrey; Albert, Richard; Gupta, Anil; Stai, Jeffrey D.; and Lofgren, Karl M. J., 5,471,478, Cl. 371-10.300.
Western Digital (Sea), Pte., Ltd.: *See*—
Codilian, Raffi; and Stupeck, Donald, 5,471,353, Cl. 360-73.030.
Western Steel, Inc.: *See*—
Stover, Jimmy R., 5,469,603, Cl. 19-80.00R.
Westinghouse Air Brake Company: *See*—
Wood, James A.; and Greer, David A., 5,471,387, Cl. 364-426.030.
Westinghouse Brake & Signal Holding Ltd.: *See*—
Reeves, Malcolm, 5,470,034, Cl. 246-122.00R.
Westinghouse Electric Corp.: *See*—
Boenning, Robert A., 5,469,632, Cl. 33-366.000.
McKee, Richard C.; and Baumler, Sandra L., 5,470,761, Cl. 437-5.000.
Smith, Christopher P.; and Anderson, Paul G., 5,469,737, Cl. 73-168.000.
Snyder, Thomas S.; Peterson, Steven H.; and Nayak, Umesh P., 5,470,479, Cl. 210-635.000.
Twerdochlib, Michael, 5,469,745, Cl. 73-660.000.
Voit, Donald O., 5,470,550, Cl. 423-81.000.
Westland Aerospace Limited: *See*—
Wootton, Frederick M. J., 5,471,361, Cl. 361-236.000.
Wettenhall, Richard E. H.: *See*—
De Kretser, David M.; Burger, Henry G.; Hearn, Milton T. W.; Milne-Robertson, David M.; Wettenhall, Richard E. H.; McLachlan, Robert L; and De Vos, Fiona, 5,470,826, Cl. 514-8.000.
Wetzel, Rolf: *See*—
Linke, Adolf; Pohl, Werner; Schmid, Karl; and Wetzel, Rolf, 5,470,361, Cl. 48-197.00R.
Wheaton Holding, Inc.: *See*—
O'Meara, John R.; Cistone, David R.; and Travalent, Louis, Jr., 5,469,980, Cl. 215-228.000.
Wheaton Inc.: *See*—
Hillman, Michael J.; Jacoby, Bruce E.; and Barbosa, Rui M., 5,470,218, Cl. 425-144.000.

Whirlpool Corporation: *See*—
Cuthbert, Victor W.; Zahrn, Joseph H., Jr.; and Johnston, Vonda K., 5,469,593, Cl. 8-159.000.
Janke, Donald E.; Szynal, Joseph M.; and Guess, Ronald W., 5,469,715, Cl. 62-155.000.

Whitaker Corporation, The: *See*—
Bendorf, Robert L., 5,470,243, Cl. 439-188.000.
Hawk, Kenneth C.; Capper, Harry M.; and Robertson, James W., 5,470,250, Cl. 439-409.000.
Kaufman, John W.; Frantz, Robert H.; and Root, John A., 5,470,241, Cl. 439-159.000.
Kaufman, John W.; Root, John A.; and Schroeder, James L., III, 5,470,259, Cl. 439-607.000.
McCleerey, Earl W.; Moll, Hurley C., Jr.; Landis, John M.; and Douty, George H., 5,470,255, Cl. 439-500.000.
Schwan, Rainer; and Krämer, Rudi, 5,470,260, Cl. 439-630.000.
Suzuki, Mitsuru; Shindo, Mikio; and Kashiwa, Yoichi, 5,470,258, Cl. 439-595.000.

Whitaker, Joel R.: *See*—
Sachdev, Krishna G.; Whitaker, Joel R.; and Ahmad, Umar M., 5,470,693, Cl. 430-315.000.

White, Gerard: *See*—
Grobicki, Christopher; Mazza, Cynthia; O'Connell, Edward; Ulm, John; and White, Gerard, 5,471,474, Cl. 370-85.200.

White, James F.: *See*—
Srikrishnan, Kris V.; White, James F.; and Yang, Jer-Ming, 5,469,981, Cl. 216-13.000.

White, Philip T.: *See*—
Hayes, Stewart J.; Pearcey, Richard; and White, Philip T., 5,471,063, Cl. 250-436.000.

White, Stanley A., to Rockwell International Corporation. Estimator of amplitude and frequency of a noisy-biased sinusoid from short bursts of samples. 5,471,396, Cl. 364-480.000.

Whitfield, Kenneth H.; Scott, Ian M.; and Castro, Michael, to United States Surgical Corporation. Instrument for closing trocar puncture wounds. 5,470,338, Cl. 606-144.000.

Whitlock, David R. Separation of solutes in gaseous solvents. 5,470,377, Cl. 95-90.000.

Whitman, Russell B.; Wohl, Robert; and Duff, Ronald G., to Curative Technologies, Inc. Angiogenic peptides. 5,470,831, Cl. 514-16.000.

Whitson, Damaras E.; and Bogdanovich, Birdie. Scooter. 5,470,089, Cl. 280-87.041.

Whitten, Jeffrey P., to Merrell Dow Pharmaceuticals Inc. Heterocyclic-NMDA antagonists. 5,470,844, Cl. 514-91.000.

Wide Band Systems, Inc.: *See*—
Sullivan, William B., 5,471,216, Cl. 342-195.000.

Wieben, Eric D.: *See*—
Weinshilboum, Richard M.; Honchel, Ronald; Aksoy, Ibrahim A.; Szumlanski, Carol L.; Wood, Thomas C.; Otterness, Diane M.; and Wieben, Eric D., 5,470,737, Cl. 435-240.200.

Wiedrich, Dwight G. Manhole adjusting extension ring section. 5,470,172, Cl. 404-25.000.

Wien, Abraham: *See*—
McKinney, Roy L.; and Wien, Abraham, 5,469,905, Cl. 160-35.000.

Wiener, Patricia, to Page Automated Telecommunications Systems, Inc. Smart skin array woven fiber optic ribbon and arrays and packaging thereof. 5,469,895, Cl. 139-420.00R.

Wiers, Paul C., to Harley-Davidson, Inc. Motorcycle rear wheel suspension. 5,469,930, Cl. 180-227.000.

Wiggs, Gene E.: *See*—
LeMonds, Jeffrey; McConnelee, James E.; Kelley, John R.; Wiggs, Gene E.; and Martini, Gary T., 5,469,618, Cl. 29-889.720.

Wigwam Mills, Inc.: *See*—
Gummer, Raymond J. E., 5,469,959, Cl. 206-299.000.

Wilde, Craig G.: *See*—
Scott, Randy W.; Gleich, Gerald J.; and Wilde, Craig G., 5,470,825, Cl. 514-2.000.

Wilfong, Debra L.; Rutherford, Denise R.; and Rolando, Richard J., to Minnesota Mining and Manufacturing Company. Degradable multilayered structures. 5,470,526, Cl. 428-36.600.

Wilk, Peter J.: *See*—
Tiefenbrun, Jonathan; and Wilk, Peter J., 5,470,320, Cl. 604-174.000.

Wilkinson, David P.: *See*—
Fletcher, Nicholas J.; Lamont, Gordon J.; Basura, Vesna; Voss, Henry H.; and Wilkinson, David P., 5,470,671, Cl. 429-26.000.

Wilkinson, Donald R.: *See*—
Barnes, Vernon B.; Wilkinson, Donald R.; Hancock, Lloyd H.; Oesterling, Erwin; Schlisio, Siegfried; and Hinz, Werner, 5,469,871, Cl. 131-194.000.

Willey, Alan D.; and Hall, Robin G., to Procter & Gamble Company, The. Dispersing agent. 5,470,510, Cl. 252-546.000.

Willi Möller AG: *See*—
Simon, Wilhelm, 5,470,755, Cl. 436-131.000.

Williams, Dennis A.; Looney, James R.; Conway, Michael W.; and Swenson, Robert A., to Exxon Chemical Patents Inc. Stimulation of coalbed methane production. 5,470,823, Cl. 507-241.000.

Williams, Duane D., to General Motors Corporation. One-piece steering wheel assembly. 5,470,099, Cl. 280-728.200.

Williams, Geraint: *See*—
Coles, Gary S. V.; and Williams, Geraint, 5,470,756, Cl. 436-144.000.

Williams, Jerry G.: *See*—
Sas-Jaworsky, Alex; and Williams, Jerry G., 5,469,916, Cl. 166-64.000.

Williams, Joel L.; Nahir, Tal M.; and Qiu, Yong-Jian, to Becton, Dickinson and Company. Electrolyte gel. 5,470,677, Cl. 429-190.000.

Williams, Jon I.: *See*—
Maloy, W. Lee; Kari, U. Prasad; and Williams, Jon I., 5,470,950, Cl. 530-324.000.

Williams, Joseph B., Jr.; and Sullivan, Marvin B. Airborne monitoring system and method. 5,470,032, Cl. 244-1.0TD.

Williams, Lisa R.: *See*—
Petelle, Joey; Stoesz, Karen D.; and Williams, Lisa R., 5,470,600, Cl. 426-237.000.

Williams, Mark S.: *See*—
Hendrickson, Dennis L.; Dimmitt, Dan C.; Williams, Mark S.; Skultety, Paul F.; and Baltezor, Michael J., 5,470,584, Cl. 424-490.000.

Williams, Marvin L.: *See*—
Johnson, William J.; Keller, Robert S.; Manthuruthil, George C.; and Williams, Marvin L., 5,471,616, Cl. 395-700.000.

Williams, Phillip A.: *See*—
Wenzel, Richard A.; Sable, Lewis E.; Krutchen, Charles M.; and Williams, Phillip A., 5,470,521, Cl. 264-321.000.

Williams, Stephen R., to NEC Electronics Inc. Methods and apparatus pulse-width modulation that use a counter and a modulus device. 5,471,635, Cl. 395-800.000.

Williamson, Hugh M., to Eastman Kodak Company. Photographic color couplers and photographic materials containing them. 5,470,696, Cl. 430-543.000.

Williamson, James T.: *See*—
Horvath, Robert L., 5,469,941, Cl. 188-107.000.

Willis, Ray D.: *See*—
Nelson, John M.; and Willis, Ray D., 5,470,111, Cl. 285-55.000

Willis, Rodney L. Apparatus for self-administering fluids in patients, children and persons of limited capabilities. 5,470,037, Cl. 248-125.900.

Wilson, Carolyn A.: *See*—
Miller, A. Dusty; Garcia-Martinez, Jose V.; Eiden, Maribeth V.; and Wilson, Carolyn A., 5,470,726, Cl. 435-172.300.

Wilson, David R.: *See*—
Devore, David D.; Timmers, Francis J.; Wilson, David R.; and Rosen, Robert K., 5,470,993, Cl. 556-11.000.

Wilson, Les J.: *See*—
Bhargava, Vivek; Jue, Andrew; Van Scherrenburg, Michael A.; and Wilson, Les J., 5,471,248, Cl. 348-420.000.

Wilson, Stephen G. T., to British Broadcasting Corporation. Method and system for compressing the dynamic range of audio signals. 5,471,651, Cl. 455-72.000.

Wilson, Timothy J.: *See*—
Hess, Garry C.; Leung, Barry S.; and Wilson, Timothy J., 5,471,670, Cl. 455-33.200.

Winbond Electronic Corp.: *See*—
Shyu, Rong-Fuh, 5,471,412, Cl. 364-725.000.

Windings, Inc.: *See*—
Kotzur, Frank W., 5,470,026, Cl. 242-18.00R.

Winegard Company: *See*—
Rodeffer, Charles E.; Byers, John D.; and Rodeffer, Michael E., 5,471,219, Cl. 342-359.000.

Wingard, Robert E., Jr.: *See*—
Sankey, George H.; Vernon, Nicholas M.; and Wingard, Robert E., Jr., 5,470,969, Cl. 536-115.000.

Wingender, Marc; and Le Tual, Stéphane, to Thomson-CSF Semiconducteurs Specifiques. Analog digital converter. 5,471,210, Cl. 341-156.000.

Winkler, James D.: *See*—
Dixon, James S.; Hall, Raplh F.; Marshall, Lisa A.; Chilton, Floyd H., III; Mayer, Ruth J.; and Winkler, James D., 5,470,882, Cl. 514-596.000.

Winn-Deen, Emily S.: *See*—
Grossman, Paul D.; Fung, Steven; Menchen, Steven M.; Woo, Sam L.; and Winn-Deen, Emily S., 5,470,705, Cl. 435-6.000.

Wisconsin Alumni Research Foundation: *See*—
Gould, Michael N.; Crowell, Pamela L.; Elson, Charles E.; and Ren, Zhibin, 5,470,877, Cl. 514-529.000.

Wisdom, Ronald M.: *See*—
Verma, Inder M.; Wisdom, Ronald M.; and Yen, Jong-Young J., 5,470,736, Cl. 435-240.200.

Wissler, Vernon J., to Amity Machine Corp. Rotating joint for aerial ladders. 5,470,236, Cl. 439-12.000.

Wistar Institute, The: *See*—
Herlyn, Meenhard; and Rodeck, Ulrich, 5,470,571, Cl. 424-1.490.

Withers, James C.: *See*—
Loutfy, Raouf O.; and Withers, James C., 5,470,680, Cl. 429-218.000.

Witkowski, Joseph T.; and Raffensperger, Steve D., to Martin Marietta Magnesia Specialties Inc. Air sparger for agitating solid-liquid suspensions. 5,470,149, Cl. 366-101.000.

Wodeslavsky, Josef. Self cleaning liquid soap dispenser. 5,469,990, Cl. 222-148.000.

Wohl, Robert: *See*—
Whitman, Russell B.; Wohl, Robert; and Duff, Ronald G., 5,470,831, Cl. 514-16.000.

Wohland, Thomas: *See*—
Zomotor, Adam; Klinkner, Walter; Schindler, Erich; Mohn, Frank-Werner; and Wohland, Thomas, 5,471,388, Cl. 364-424.050.

Wöhler, Hans J.; and Germano, Francesco, to Dr. Ing. h.c.F. Porsche AG. Bearing for a spring strut of a motor vehicle. 5,470,049, Cl. 267-172.000.

Wolcott, Barry W.: *See*—

Tallman, Joseph P.; Snowden, Elizabeth M.; and Wolcott, Barry W., 5,471,382, Cl. 364-406.000.

Wolcott, Duane K. Use of capillary-membrane sampling device to monitor oil-drilling muds. 5,469,917, Cl. 166-250.010.

Wolf, Jean-Pierre; Schultheiss, Adrian; Steinmann, Bettina; and Hunziker, Max, to Ciba-Geigy AG. Polymerisable compositions containing tetraacrylates. 5,470,689, Cl. 430-269.000.

Wolf, William E.: *See*—
Diner, Bruce A.; Gutteridge, Steven; Peterson, Gary L.; and Wolf, William E., 5,471,053, Cl. 250-228.000.

Wolfe, Kenneth L., to 3M Company. Automatic dark level zeroing for an analog video signal. 5,471,244, Cl. 348-257.000.

Wolff, Alan S.: *See*—
Allard, James R.; Cochran, Edward L.; and Wolff, Alan S., 5,471,560, Cl. 395-77.000.

Wolff, Siegfried: *See*—
Meier, Karl; Goerl, Udo; and Wolff, Siegfried, 5,470,905, Cl. 524-493.000.

Wolleb, Heinz: *See*—
Wegmann, Alex; and Wolleb, Heinz, 5,470,896, Cl. 523-428.000.

Wolos, Jeffrey A.; Doherty, Niall S.; Jarvi, Esa T.; and McCarthy, James R., to Merrell Dow Pharmaceuticals Inc. 5'-vinylhalo-aristeromycin/adenosine analogs and immunosuppressants. 5,470,837, Cl. 514-45.000.

Wong, Ching-Ping: *See*—
Lilienthal, Peter F., II; Pawlenko, Ivan; and Wong, Ching-Ping, 5,470,217, Cl. 425-110.000.

Wong, Danny C. Y. Dual radio. 5,471,659, Cl. 455-132.000.

Wong, Don M. Food flipping assembly. 5,469,782, Cl. 99-644.000.

Wong, Kai W.; Fei, Xin; Xin, Ying; and Kao, Yi-Han, to University of Kansas, The; and Midwest Superconductivity, Inc. Superconductors having continuous ceramic and elemental metal matrices. 5,470,821, Cl. 505-236.000.

Wongwarawipat, Wiwat: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,471,161, Cl. 327-58.000.

Woo, Been-Jon, to Intel Corporation. Silicidation method for contactless EPROM related devices. 5,470,772, Cl. 437-43.000.

Woo, Sam L.: *See*—
Grossman, Paul D.; Fung, Steven; Menchen, Steven M.; Woo, Sam L.; and Winn-Deen, Emily S., 5,470,705, Cl. 435-6.000.

Woo, Seong-Ihl: *See*—
Kim, Jong-Seob; and Woo, Seong-Ihl, 5,470,815, Cl. 502-304.000.

Wood, James A.; and Greer, David A., to Westinghouse Air Brake Company. Method of and apparatus for the combined detection of speed varying energy level wheel slip detection and determination of wheel slip intensity of a railway vehicle brake system. 5,471,387, Cl. 364-426.030.

Wood, Richard G., to Tescorp Seismic Products, Inc. Field repairable electrical connector. 5,470,248, Cl. 439-281.000.

Wood, Steven L.; and Garcia, Manuel L., to TRW Inc. Universal matched filter. 5,471,509, Cl. 375-350.000.

Wood, Thomas C.: *See*—
Weinshilboum, Richard M.; Honchel, Ronald; Aksoy, Ibrahim A.; Szumlanski, Carol L.; Wood, Thomas C.; Otterness, Diane M.; and Wieben, Eric D., 5,470,737, Cl. 435-240.200.

Woodring, Larry: *See*—
Howe, Wayne; Silver, Ed; Bailey, Kim; Shih, Jerry; Morel, Kitty; Hill, Peter; Addison, Cathy; Woodring, Larry; and Malik, Dale, 5,471,519, Cl. 379-67.000.

Woods Industries, Inc.: *See*—
Fladung, Philip E., 5,470,252, Cl. 439-490.000.

Woodway AG: *See*—
Schönenberger, Willi, 5,470,293, Cl. 482-54.000.

Woolsey, Earl R.: *See*—
Bartak, Duane E.; Lemieux, Brian E.; and Woolsey, Earl R., 5,470,664, Cl. 428-472.100.

Wootan, John J.: *See*—
Prager, Kenneth E.; Herbst, Stephen J.; Sisneros, Jerry N.; Wootan, John J.; and Gleichman, Douglas M., 5,471,240, Cl. 348-164.000.

Wootton, Frederick M. J., to Westland Aerospace Limited. Vehicle wheel sensors, and method of converting a sine wave signal in a counting or measuring device. 5,471,361, Cl. 361-236.000.

Wörgötter, Herbert: *See*—
Theurer, Josef; and Wörgötter, Herbert, 5,469,791, Cl. 104-5.000.

Wreede, John E., to Hughes Aircraft Company. Segmented image holographic disks. 5,471,328, Cl. 359-22.000.

Wright, Eleanor L.: *See*—
Taylor, Ronald P.; Sutherland, William M.; Reist, Craig; Wright, Eleanor L.; Webb, Donna; and Labuguen, Ronald, 5,470,570, Cl. 424-93.730.

Wright, Glenn A.; Fritz, Philip F.; and Nguyen, Tuan Q., to Glenn Albert Wright. Sharps disposal system. 5,470,022, Cl. 241-33.000.

Wright, Michael W.: *See*—
Booth, Hubert J.; Steagall, Paul H., III; and Wright, Michael W., 5,469,973, Cl. 209-580.000.

Wu, Guanli: *See*—
Unger, Evan C.; Fritz, Thomas A.; Matsunaga, Terry; Ramaswami, VaradaRajan; Yellowhair, David; and Wu, Guanli, 5,469,854, Cl. 128-662.020.

Wu, Jian M., to Danfoss A/S. AC/DC unity power-factor DC power supply for operating an electric motor. 5,471,125, Cl. 318-803.000.

Wu, Ming-Hsin. Vinyl ceiling grid structure. 5,469,681, Cl. 52-656.900.

Wu, Xin D.; and Tiwari, Prabhat, to University of Calif., The Regents of the. Metal oxide films on metal. 5,470,668, Cl. 428-688.000.

Wurdack, Roy A. Slide. 5,469,599, Cl. 16-42.00R.

Wurman, Joshua M. A. R.: *See*—
Randall, Mitchell A.; Holloway, Christopher L.; and Wurman, Joshua M. A. R., 5,471,211, Cl. 342-26.000.

Wurniesky, Pascal: *See*—
Brossier, Pascal N.; Pincemin, Jean-Marie N.; and Wurniesky, Pascal, 5,470,020, Cl. 239-265.330.

Wuu, Dong-Sing; Hsieh, Tzung-Rue; Lin, Tzy-Ying; and Chen, Hong-Ming, to Industrial Technology Research Institute. Fabrication of static-alignment fiber-guiding grooves for planar lightwave circuits. 5,471,552, Cl. 385-49.000.

Wyatt-Mair, Gavin F.; and Harrington, Donald G., to Kaiser Aluminum & Chemical Corporation. Method of manufacturing can body sheet. 5,470,405, Cl. 148-551.000.

Wychnanek, Rainer: *See*—
Adler, Uwe; Drexl, Hans-Jürgen; Lutz, Dieter; Nagler, Franz; Ochs, Martin; Schiebold, Stefan; Schmidt-Brücken, Hans-Jpachim; Thieler, Wolfgang; Wagner, Michael; Westendorf, Holger; Wychnanek, Rainer; and Röder, Manfred, 5,469,928, Cl. 180-6.280.

Wyko Corporation: *See*—
Ai, Chiayu; and Caber, Paul J., 5,471,303, Cl. 356-357.000.

Wyman, Paul A.: *See*—
Wadsworth, Harry J.; Wyman, Paul A.; Dubbs, Steven; and Jenkins, Sarah M., 5,470,859, Cl. 514-299.000.

Xandex, Inc.: *See*—
Sinsheimer, Roger; and Anderson, James, 5,471,148, Cl. 324-754.000.

Xanthopoulos, Eric, to Apple Computer, Inc. Methods for configuring, packaging and reconfiguring personal computers. 5,469,692, Cl. 53-474.000.

Xcel Industrial Group, Inc.: *See*—
Ray, Carl; and Coulter, J. Scott, 5,470,535, Cl. 422-101.000.

Xerox Corporation: *See*—
Briggs, David R.; Proseus, Erwin E.; Tracey, Frances; Herbert, William G.; Bach, Gary J.; Hutchinson, Charles A.; Dudley, Alan L.; Riker, Wayne F.; McFadden, Willie, Jr.; Schmitt, Peter J.; and Mastalski, Henry T., 5,470,271, Cl. 451-55.000.
Jodoin, Ronald E.; Loce, Robert P.; Klassen, R. Victor; and Lin, Ying-Wei, 5,471,320, Cl. 358-455.000.
Moran, Thomas P.; Chiu, Patrick; and Van Melle, William, 5,471,578, Cl. 395-161.000.
Prasad, Bindiganavele A., 5,471,574, Cl. 395-142.000.
Rolleston, Robert J., 5,471,324, Cl. 358-518.000.
Smith, Randall B.; Tang, John C.; and Henderson, D. Austin, Jr., 5,471,571, Cl. 395-137.000.
Thieret, Tracy E.; Henderson, Thomas A.; and Butler, Michael A., 5,471,313, Cl. 358-296.000.

Xin, Ying: *See*—
Woeg, Kai W.; Fei, Xin; Xin, Ying; and Kao, Yi-Han, 5,470,821, Cl. 505-236.000.

Yaar, Mina: *See*—
Gilchrest, Barbara A.; Yaar, Mina; and Eller, Mark, 5,470,577, Cl. 424-450.000.

Yagi, Noriaki: *See*—
Yamanobe, Takashi; Satou, Michio; Ishigami, Takashi; Obata, Minoru; Kawai, Mituo; Yagi, Noriaki; Maki, Toshihiro; and Ando, Shigeru, 5,470,527, Cl. 419-53.000.

Yagi, Takayuki; and Takeuchi, Yoichiro, to Kabushiki Kaisha Toshiba. Asynchronous interrupt inhibit method and apparatus for avoiding interrupt of an inseparable operation. 5,471,595, Cl. 395-375.000.

Yagi, Tetsuya: *See*—
Nakamoto, Takahiro; and Yagi, Tetsuya, 5,470,767, Cl. 437-39.000.

Yagi, Toyoji: *See*—
Murakawa, Takaji; Yagi, Toyoji; and Tashiro, Hiroshi, 5,469,816, Cl. 123-2.000.

Yallampalli, Chandrasekhar: *See*—
Garfield, Robert E.; and Yallampalli, Chandrasekhar, 5,470,847, Cl. 514-171.000.

Yamada, Hiroshi: *See*—
Yasunobu, Chizuko; Mori, Fumihiko; Yamada, Hiroshi; Yasunobu, Seiji; and Someya, Ryuko, 5,471,559, Cl. 395-61.000.

Yamada, Hiroyasu, to NEC Corporation. Waterproof type unit casing. 5,471,667, Cl. 455-351.000.

Yamada, Kenichi, to Takigen Manufacturing Co., Ltd. Door locking handle assembly of pull-out and side-swinging lever-action type. 5,469,725, Cl. 70-208.000.

Yamada, Masakatsu: *See*—
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,471,227, Cl. 347-9.000.

Yamada, Masami: *See*—
Niigaki, Minoru; Kinoshita, Katsuyuki; Hirohata, Toru; Ihara, Tuneo; Yamada, Masami; Asakura, Norio; Negi, Yasuharu; and Suzuki, Tomoko, 5,471,051, Cl. 250-214.0VT.

Yamada, Naoyuki: *See*—
Takamoto, Masanori; Yamada, Naoyuki; and Kobayashi, Yasuhiro, 5,471,408, Cl. 364-578.000.

Yamada, Osamu: *See*—
Takada, Masayuki; Yamada, Osamu; Kuroda, Toru; Yamazaki, Koichi; and Noda, Kazuo, 5,471,424, Cl. 365-189.010.

Yamada, Yoshiaki; Iwasaki, Junji; and Ohmori, Masashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device processing method. 5,470,392, Cl. 134-2.000.

Yamada, Yoshiaki, to NEC Corporation. Method of manufacturing semiconductor device. 5,470,792, Cl. 437-155.000.

Yamaguchi, Akihiro: *See*—
Sakata, Yoshihiro; Yamashita, Wataru; Okawa, Yuichi; Tamai, Shoji; Ishida, Tsutomu; Matsuo, Mitsunori; Yamaguchi, Keizaburo; and Yamaguchi, Akihiro, 5,470,943, Cl. 528-353.000.

Yamaguchi, Akiyasu: *See*—
Yasuda, Yukio; Yamaguchi, Akiyasu; Igarashi, Tatsushi; Oonishi, Yasuo; Kai, Kenzo; Sugihara, Masanori; Mori, Takashi; and Miyaji, Akira, 5,471,278, Cl. 355-67.000.

Yamaguchi, Keizaburo: *See*—
Sakata, Yoshihiro; Yamashita, Wataru; Okawa, Yuichi; Tamai, Shoji; Ishida, Tsutomu; Matsuo, Mitsunori; Yamaguchi, Keizaburo; and Yamaguchi, Akihiro, 5,470,943, Cl. 528-353.000.

Yamaguchi, Mitsuo; Ohgo, Kenjiro; and Nagasawa, Makoto, to Meiji Seika Kaisha, Ltd. Apparatus for filling edible rod-shaped hollow bodies with chocolate. 5,469,780, Cl. 99-450.700.

Yamaguchi, Shizuka: *See*—
Sasaki, Koji; Yamaguchi, Shizuka; Fumeno, Tsuyoshi; and Fukuoka, Satoshi, 5,469,611, Cl. 29-426.200.

Yamaguchi, Takeshi: *See*—
Fukumi, Hiroshi; Sakamoto, Toshiaki; Sugiyama, Mitsuo; Yamaguchi, Takeshi; Oshima, Takeshi; Asai, Fumitoshi; and Iijima, Yasuteru, 5,470,851, Cl. 514-214.000.

Yamaguchi, Takuji, to Noritsu Koki Co., Ltd. Automatic film rewinder. 5,471,274, Cl. 354-298.000.

Yamaguchi, Tetsuya: *See*—
Iguchi, Masao; Fukanuma, Tetsuhiko; Yamaguchi, Tetsuya; and Yoshida, Tetsuo, 5,470,213, Cl. 418-55.200.

Yamaha Corporation: *See*—
Sawada, Shuichi; Imagawa, Katsuhiko; and Murase, Yoshihiko, 5,469,769, Cl. 84-193.000.
Takatsuka, Masanori, 5,470,062, Cl. 273-73.00R.
Wakui, Yukio; Nishitani, Yoshiki; and Miyazawa, Kenichi, 5,470,636, Cl. 428-141.000.

Yamamoto, Hitoshi; Kaneko, Kunihisa; Watanabe, Masayuki; and Kami, Akio, to SMC Corporation. Rodless cylinder unit with brake. 5,469,940, Cl. 188-67.000.

Yamamoto, Katsuhiko; Sagawa, Hiroaki; Kotani, Hirokazu; Hiraoka, Nobutsugu; and Nakamura, Teruya, to Takara Shuzo Co., Ltd. Restriction enzyme from *Brevibacterium linens* . 5,470,732, Cl. 435-196.000.

Yamamoto, Kazuhiko; Miyake, Yuichi; Okada, Chikara; and Kitazume, Nobuyuki, to Santoku Metal Industry Co., Ltd. Rare earth metal-nickel hydrogen occlusive alloy ingot. 5,470,404, Cl. 148-426.000.

Yamamoto, Keiichi: *See*—
Sasaki, Kunimasa; Wakiyama, Youichi; Matsumoto, Takahiro; Tanaka, Kisaburo; and Yamamoto, Keiichi, 5,469,909, Cl. 164-428.000.

Yamamoto, Makoto: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,471,161, Cl. 327-58.000.

Yamamoto, Manabu: *See*—
Masaki, Takashi; Yanagi, Shigenori; and Yamamoto, Manabu, 5,471,451, Cl. 369-71.000.

Yamamoto, Masanobu: *See*—
Naka, Yuji; and Yamamoto, Masanobu, 5,470,080, Cl. 273-437.000.

Yamamoto, Rintaro: *See*—
Nokihara, Kiyoshi; and Yamamoto, Rintaro, 5,470,703, Cl. 435-4.000.

Yamamoto, Shu: *See*—
Taga, Hidenori; Suzuki, Masatoshi; Edagawa, Noboru; Yamamoto, Shu; and Wakabayashi, Hiroharu, 5,471,333, Cl. 359-173.000.

Yamamoto, Takao: *See*—
Nagamura, Takashi; Yamamoto, Takao; and Tomita, Shinji, 5,470,543, Cl. 422-211.000.

Yamamoto, Tsuyoshi: *See*—
Takahashi, Shigeki; Katsoka, Mitsuhiro; and Yamamoto, Tsuyoshi, 5,470,770, Cl. 437-41.000.

Yamamoto, Yoshihisa: *See*—
Ishiwari, Kazuo; Yamamoto, Yoshihisa; and Shimizu, Tetsuo, 5,470,901, Cl. 524-345.000.

Yamamoto, Yoshimi: *See*—
Shimada, Satoshi; Ugai, Seiichi; Tobita, Tomoyuki; and Yamamoto, Yoshimi, 5,469,749, Cl. 73-861.470.

Yamamura Glass Co., Ltd.: *See*—
Tanigami, Yoshinori; Tabata, Takahiro; Hashima, Hidekazu; and Konishi, Akio, 5,470,506, Cl. 252-518.000.

Yamamura, Kazuyoshi: *See*—
Asakawa, Yoshiyuki; Yamamura, Kazuyoshi; Muraoka, Toshinori; and Hatano, Masaru, 5,470,052, Cl. 271-118.000.

Yamanaka, Hideo: *See*—
Saito, Masao; and Yamanaka, Hideo, 5,470,216, Cl. 425-72.100.

Yamanaka, Hiroyoshi: *See*—
Mori, Masukazu; Yamanaka, Hiroyoshi; Kubota, Norio; and Shimokawa, Naoki, 5,470,203, Cl. 416-144.000.

Yamanaka, Shun-ichiro: *See*—
Sugawara, Shuji; Sukata, Kazuaki; and Yamanaka, Shun-ichiro, 5,470,685, Cl. 430-110.000.

Yamano, Akihiko: *See*—
Oguchi, Takahiro; Hatanaka, Katsunori; Sakai, Kunihiro; Yamano, Akihiko; and Shido, Shunichi, 5,471,458, Cl. 369-126.000.

Yamanobe, Takashi; Satou, Michio; Ishigami, Takashi; Obata, Minoru; Kawai, Mituo; Yagi, Noriaki; Maki, Toshihiro; and Ando, Shigeru, to Kabushiki Kaisha Toshiba. Ti-W spumering target and method for manufacturing same. 5,470,527, Cl. 419-53.000.

Yamasa, Hideo: *See*—
Irihara, Kouichi; Yamasa, Hideo; Shimazu, Fumio; and Wada, Takasumi, 5,471,283, Cl. 355-205.000.

Yamashita, Kenyu, to Matsushita Electric Industrial Co., Ltd. Geographic information display apparatus. 5,471,392, Cl. 364-443.000.

Yamashita, Wataru: *See*—
Sakata, Yoshihiro; Yamashita, Wataru; Okawa, Yuichi; Tamai, Shoji; Ishida, Tsutomu; Matsuo, Mitsunori; Yamaguchi, Keizaburo; and Yamaguchi, Akihiro, 5,470,943, Cl. 528-353.000.

Yamatake-Honeywell Co., Ltd.: *See*—
Nishimoto, Ikuo; and Tanaka, Minoru, 5,471,050, Cl. 250-214.00A.

Yamauchi, Yoshiyuki: *See*—
Okamura, Masami; Sawa, Takao; Yamauchi, Yoshiyuki; and Kusada, Takao, 5,470,646, Cl. 428-216.000.

Yamazaki, Hideo, to Minnesota Mining and Manufacturing Company. Method for electrical interconnection of metallic patterns. 5,469,615, Cl. 29-846.000.

Yamazaki, Hiromi: *See*—
Nakagawa, Kazuo; Iritani, Yuichi; Yamazaki, Hiromi; and Takakuwa, Yasushi, 5,471,058, Cl. 250-291.000.

Yamazaki, Koichi: *See*—
Takada, Masayuki; Yamada, Osamu; Kuroda, Toru; Yamazaki, Koichi; and Noda, Kazuo, 5,471,424, Cl. 365-189.010.

Yamazaki, Shouji, to Honda Giken Kogyo Kabushiki Kaisha. Motor vehicle door with reinforcing beams. 5,470,125, Cl. 296-146.600.

Yanagi, Motonori: *See*—
Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, 5,470,461, Cl. 210-188.000.

Yanagi, Shigenori: *See*—
Masaki, Takashi; Yanagi, Shigenori; and Yamamoto, Manabu, 5,471,451, Cl. 369-71.000.

Yanai, Ken-ichi; Tanaka, Tsutomu; Ohgata, Koji; Takizawa, Yutaka; Oki, Ken-ichi; and Hirano, Takuya, to Fujitsu Limited. Method for fabricating a thin-film transistor. 5,470,768, Cl. 437-40.000.

Yancopoulos, George D.: *See*—
Stahl, Neil; Economides, Aris N.; and Yancopoulos, George D., 5,470,952, Cl. 530-350.000.

Yang, Chang-jip; and Jung, Jun-gyo, to Samsung Electronics Co., Ltd. Method for forming an oxide film of a semiconductor. 5,470,611, Cl. 427-255.400.

Yang, Jer-Ming: *See*—
Srikrishnan, Kris V.; White, James F.; and Yang, Jer-Ming, 5,469,981, Cl. 216-13.000.

Yang, Ning-Sun; Swain, William F.; Burkholder, Joseph K.; and Fuller, Deborah L. Particle-mediated transformation of mammalian unattached cells. 5,470,708, Cl. 435-6.000.

Yang, Shi-ning: *See*—
Myers, Alan M.; Charvat, Peter K.; Letson, Thomas A.; Yang, Shi-ning; and Bai, Peng, 5,470,790, Cl. 437-192.000.

Yang, Weikang: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,471,161, Cl. 327-58.000.

Yano, Mitsuo: *See*—
Ishikawa, Kiyofumi; Fukami, Takehiro; Hayama, Takashi; Niiyama, Kenji; Nagase, Toshio; Mase, Toshiaki; Fujita, Kagari; Ihara, Masaki; Ikemoto, Fumihiko; and Yano, Mitsuo, 5,470,833, Cl. 514-18.000.

Yanome, Hiroshi: *See*—
Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, 5,470,461, Cl. 210-188.000.

Yashiro, Hajime: *See*—
Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,469,752, Cl. 73-866.000.

Yasuda, Akio: *See*—
Ise, Koichi; Nishida, Yasuo; and Yasuda, Akio, 5,471,339, Cl. 359-275.000.

Yasuda, Masako: *See*—
Shimada, Takashi; Iwata, Keiichi; and Yasuda, Masako, 5,470,555, Cl. 423-219.000.

Yasuda, Yukio; Yamaguchi, Akiyasu; Igarashi, Tatsushi; Oonishi, Yasuo; Kai, Kenzo; Sugihara, Masanori; Mori, Takashi; and Miyaji, Akira, to Ushiodenki Kabushiki Kaisha; and Kabushiki Kaisha Nikon. Cadmium/rare gas discharge lamp of the short arc type, as well as projection exposure device using the same. 5,471,278, Cl. 355-67.000.

Yasue, Takao; and Nishioka, Tadashi, to Mitsubishi Denki Kabushiki Kaisha. Cantilever for atomic force microscope and method of manufacturing the cantilever. 5,469,733, Cl. 73-105.000.

Yasumoto, Eiichi; Niikura, Junji; Hatoh, Kazuhito; and Gamo, Takaharu, to Matsushita Electric Industrial Co., Ltd. Fuel cell. 5,470,670, Cl. 429-20.000.

Yasumoto, Eiichi: *See*—
Gamou, Takaharu; Taniguchi, Noboru; Niikura, Junji; Hatoh, Kazuhito; Yasumoto, Eiichi; and Adachi, Kinichi, 5,469,913, Cl. 165-104.120.

Yasunobu, Chizuko; Mori, Fumihiko; Yamada, Hiroshi; Yasunobu, Seiji; and Someya, Ryuko, to Hitachi, Ltd. Method and apparatus for fuzzy knowledge reasoning. 5,471,559, Cl. 395-61.000.

Yasunobu, Seiji: *See*—
Yasunobu, Chizuko; Mori, Fumihiko; Yamada, Hiroshi; Yasunobu, Seiji; and Someya, Ryuko, 5,471,559, Cl. 395-61.000.

Yater, Jane A.: *See*—
Yater, Joseph C.; Yater, Jane A.; and Yater, Joan E., 5,470,395, Cl. 136-203.000.

Yater, Joan E.: *See*—
Yater, Joseph C.; Yater, Jane A.; and Yater, Joan E., 5,470,395, Cl. 136-203.000.

Yater, Joseph C.; Yater, Jane A.; and Yater, Joan E. Reversible thermoelectric converter. 5,470,395, Cl. 136-203.000.

Yawata, Masaya, to Yawata, Sado; and Kato, Masaki. Heat insulating container and container holding member. 5,469,983, Cl. 220-412.000.

Yawata, Sado: *See*—
Yawata, Masaya, 5,469,983, Cl. 220-412.000.

Yazawa, Nobuyoshi: *See*—
Kobayashi, Kazunari; Omachi, Kenji; Tatsuno, Yutaka; Hagihara, Masahiro; Kidawara, Atsuki; Hara, Tadayoshi; and Yazawa, Nobuyoshi, 5,469,841, Cl. 600-158.000.

Yazawa, Yutaka: *See*—
Kato, Masaru; Yazawa, Yutaka; and Hoshino, Shigetaka, 5,470,381, Cl. 106-1.230.

Yee, Raymond L., to International Business Machines Corporation. Audio/video synchronization for application programs. 5,471,576, Cl. 395-154.000.

Yeh, Jonathan. Adjustable bench device for exercisers. 5,470,299, Cl. 482-142.000.

Yellowhair, David: *See*—
Unger, Evan C.; Fritz, Thomas A.; Matsunaga, Terry; Ramaswami, VaradaRajan; Yellowhair, David; and Wu, Guanli, 5,469,854, Cl. 128-662.020.

Yen, Jong-Young J.: *See*—
Verma, Inder M.; Wiadom, Ronald M.; and Yen, Jong-Young J., 5,470,736, Cl. 435-240.200.

Yhoshida, Yoshiyuki: *See*—
Minowa, Toshimichi; Kimura, Hiroshi; Yhoshida, Yoshiyuki; Ohyama, Yoshishige; and Nishimura, Yutaka, 5,470,290, Cl. 477-115.000.

Yli-Vakkuri, Erkki P. J.: *See*—
Salonen, Tauno T.; and Yli-Vakkuri, Erkki P. J., 5,470,367, Cl. 65-167.000.

YMOS Aktiengesellschaft Industrieprodukte: *See*—
Heim, Gunther; and Kroll, Bruno, 5,469,668, Cl. 49-502.000.

Yogev, Einat: *See*—
An, Fu L.; and Yogev, Einat, 5,471,583, Cl. 395-250.000.

Yokajty, Joseph E., to Eastman Kodak Company. Apparatus for label application using Bernoulli Effect. 5,470,420, Cl. 156-566.000.

Yokogawa, Fumihiko, to Pioneer Electronic Corporation. Tracking servo apparatus for use in an optical disk player. 5,471,448, Cl. 369-44.290.

Yokotani, Yoichiro: *See*—
Okuyama, Kojiro; Yokotani, Yoichiro; and Kugimiya, Koichi, 5,470,808, Cl. 501-134.000.

Yokote, Timothy A.; Upton, Eric L.; Enyedy, Arthur G.; Stockton, Grant J.; and Brandis, Dirk K., to TRW Inc. Modular high-capacity solid-state mass data storage device including controller/memory modules arranged in parallel channels. 5,471,603, Cl. 395-402.000.

Yokoyama, Kin-ichi; and Kato, Izumi, to Seiki Kabushiki Kaisha. Runnerless injection molding of synthetic resin with a valve gate. 5,470,219, Cl. 425-144.000.

Yokoyama, Minoru: *See*—
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,471,227, Cl. 347-9.000.

Yoneda, Masami; and Akaogi, Toshikazu, to Fuji Photo Optical Co., Ltd. Alignment verification system for use with interferometer and having a line sensor. 5,471,305, Cl. 356-363.000.

Yonekubo, Shuji: *See*—
Hosono, Satoru; Naka, Takahiro; Yonekubo, Shuji; and Shinada, Satoshi, 5,471,232, Cl. 347-70.000.

Yonemitsu, Jun; Koyanagi, Hideki; and Akiyama, Yoshiyuki, to Sony Corporation. Digital data reproducing apparatus and method employing buffer memories for error compensation and accomodating differences in reproduction and processing rates. 5,471,450, Cl. 369-60.000.

Yoneya, Akira: *See*—
Nakada, Akira; Yoneya, Akira; Kobayashi, Noriyuki; Katayanagi, Mamoru; Kawashima, Tsutomu; and Yoshida, Hiroshi, 5,470,421, Cl. 156-642.100.

Yoneyama, Toshio: *See*—
Tanaka, Hiroshi; Kobayashi, Toshiaki; Nanba, Tomiyuki; Ishiwatari, Masaaki; Yoneyama, Toshio; Ohno, Kimio; Matsumoto, Takashi; Kanbe, Tetsuya; Isa, Takashi; and Ogusu, Yoshiyuki, 5,470,563, Cl. 424-448.000.

Yoo, Chue-San, to Taiwan Semiconductor Manufacturing Company Ltd. Method of manufacture of SRAM with SIPOS resistor. 5,470,779, Cl. 437-52.000.

Yoon, Ji-Won, to University Technologies International, Inc. Diabetes prevention and treatment using gamma-pyrones. 5,470,873, Cl. 514-460.000.

Yoshida, Hideo: *See*—
Katayama, Yoshio; Fujii, Seiichi; Uchiyama, Sadao; Soejima, Ryouichi; Moori, Hitoshi; and Yoshida, Hideo, 5,471,439, Cl. 369-13.000.

Yoshida, Hiroshi: *See*—
Nagatomo, Akihiro; Yoshida, Hiroshi; Nishiyama, Masaki; and Oshima, Seiichi, 5,471,089, Cl. 257-691.000.
Nakada, Akira; Yoneya, Akira; Kobayashi, Noriyuki; Katayanagi, Mamoru; Kawashima, Tsutomu; and Yoshida, Hiroshi, 5,470,421, Cl. 156-642.100.

Yoshida, Hiroyuki: *See*—
Nagata, Toshiyuki; Yoshida, Hiroyuki; and Niuya, Takayuki, 5,470,777, Cl. 437-52.000.
Nagata, Toshiyuki; Yoshida, Hiroyuki; Niuya, Takayuki; Ogata, Yoshihiro; Boku, Katsushi; and Miyai, Yoichi, 5,470,778, Cl. 437-52.000.

Yoshida, Kazuyoshi, to NEC Corporation. Plasma processing apparatus. 5,470,426, Cl. 156-345.000.

Yoshida, Kazuyoshi: *See*—
Odashima, Satoshi; and Yoshida, Kazuyoshi, 5,470,607, Cl. 427-96.000.

Yoshida Kogyo K.K.: *See*—
Fudaki, Tsutomu, 5,470,516, Cl. 264-135.000.
Horikawa, Mitsuo, 5,469,605, Cl. 24-403.000.

Yoshida, Makoto; Satoh, Naoki; Asoh, Hidehiko; Shudo, Tuyosi; Takeda, Ryuzaburo; and Taguchi, Jun'ichi, to Hitachi, Ltd.; and Hitachi Instrument Engineering Co., Ltd. Method and apparatus for regulating radio frequency pulse. 5,471,141, Cl. 324-314.000.

Yoshida, Minoru: *See*—
Sakamoto, Jun; Yoshida, Minoru; Aoyama, Masatoshi; Suzuki, Masaru; Nakamori, Yukari; Okazaki, Iwao; and Abe, Koichi, 5,470,637, Cl. 428-143.000.

Yoshida, Takehiro: *See*—
Takeda, Tomoyuki; Yoshida, Takehiro; Ono, Takeshi; Kobayashi, Makoto; Wada, Satoshi; Ishida, Yasushi; Yokoyama, Minoru; Tomoda, Akihiro; Yamada, Masakatsu; and Awai, Takashi, 5,471,227, Cl. 347-9.000.

Yoshida, Tetsuo: *See*—
Iguchi, Masao; Fukazuma, Tetsuhiko; Yamaguchi, Tetsuya; and Yoshida, Tetsuo, 5,470,213, Cl. 418-55.200.

Yoshida, Yasuhiko: *See*—
Nagase, Takayuki; Yoshida, Yasuhiko; Hasegawa, Makoto; and Tani, Arata, 5,471,285, Cl. 355-219.000.

Yoshida, Yuji; Funakura, Masami; Nakatani, Kazuo; and Tagashira, Minoru, to Matsushita Electric Industrial Co., Ltd. Working fluid containing chlorotetrafluoroethane. 5,470,496, Cl. 252-67.000.

Yoshihara, Ikuo, to Sony Corporation. Semiconductor static random access memory structure. 5,471,071, Cl. 257-69.000.

Yoshikoshi, Hideo: *See*—
Kitamura, Hajime; Takeuchi, Masaru; Yoshikoshi, Hideo; Kitai, Mikio; Chino, Takashi; Nogami, Yuji; Yashiro, Hajime; and Kato, Keisuke, 5,469,752, Cl. 73-866.000.

Yoshinaga, Kazuo: *See*—
Hayashi, Toshio; Arimoto, Shinobu; Yoshinaga, Kazuo; Nakai, Takehiko; Utagawa, Tsutomu; Nagase, Tetsuya; and Sasanoma, Nobuatsu, 5,471,281, Cl. 155-201.000.

Yoshinaga, Naoki; Ushioda, Kohsaku; Akiue, Osamu; and Nishimura, Kunio, to Nippon Steel Corporation. Cold rolled steel sheet and hot dip zinc-coated cold rolled steel sheet having excellent bake hardenability, non-aging properties and formability, and process for producing same. 5,470,403, Cl. 148-330.000.

Yoshino, Yoshimi: *See*—
Suzuki, Yasutoshi; Ao, Kenichi; Uenoyama, Hirofumi; Noguchi, Hiroki; Eguchi, Koji; Ito, Ichiro; and Yoshino, Yoshimi, 5,471,084, Cl. 257-421.000.

Yoshioka, Mamoru; Obata, Haruyuki; Tanoue, Ken; Iwashita, Yoshihiro; Kashiwagura, Toshimi; Suzuki, Makoto; Ichinose, Hiroki; and Okamiza, Hironori, to Toyota Jidosha Kabushiki Kaisha. Variable valve timing control device for an engine. 5,469,818, Cl. 123-90.150.

Yoshioka, Toshio: *See*—
Iwai, Kiyoshi; Kondo, Kimio; Sezaki, Yoshiaki; Fukata, Masatoshi; Hashimoto, Eiji; and Yoshioka, Toshio, 5,469,799, Cl. 114-74.00A.

Yoshizawa, Satoshi: *See*—
Ikezawa, Mitsuru; Miyatake, Takafumi; Ueda, Hirotada; Sumino, Shigeo; and Yoshizawa, Satoshi, 5,471,535, Cl. 382-199.000.

Yoshizo, Ikegami; Abe, Kunionsi; and Konagaya, Masahiko, to Konan Inc. Apparatus for obtaining images of cornea endothelium. 5,471,261, Cl. 351-210.000.

You, Jei-Hwan, to Samsung Electronics Co., Ltd. Parallel test circuit for use in a semiconductor memory device. 5,471,480, Cl. 371-21.200.

Younes, Usama E., to Arco Chemical Technology, L.P. Low-toxicity invert emulsion fluids for well drilling. 5,470,822, Cl. 507-133.000.

Young, James W., to Sepracor Inc. Methods for treating emesis and nausea using optically pure R(+) ondansetron. 5,470,868, Cl. 514-397.000.

Young, Steve: *See*—
Sharma, Raghu; Davis, Jeffrey P.; Gunn, Timothy D.; Li, Ping; Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, 5,471,470, Cl. 370-81.000.

Yozan Inc.: *See*—
Shou, Guoliang; Yang, Weikang; Wongwarawipat, Wiwat; Takatori, Sunao; and Yamamoto, Makoto, 5,471,161, Cl. 327-58.000.

Yu, Feng: *See*—
Peng, Sixun; Dai, Dezai; Huang, Zhenya; Huang, Wenlong; Wang, Youqun; Zhang, Can; and Yu, Feng, 5,470,852, Cl. 514-231.500.

Yu, Phillip C.; Backfisch, David L.; and Rukavina, Thomas G., to PPG Industries, Inc. Electrochromic device with plastic substrate. 5,471,338, Cl. 359-273.000.

Yu, Ruey J.; and Van Scott, Eugene J. Method of using citric acid for the treatment of wrinkles. 5,470,880, Cl. 514-574.000.

Yuan, Zhiping. Personal lockable alarm device. 5,471,199, Cl. 340-574.000.

Yudenfriend, Harry M.; Surman, David H.; and Beardsley, Brent C., to International Business Machines Corporation. Method for identifying a system holding a 'Reserve' . 5,471,609, Cl. 395-182.020.

Yui, Dai; Hirai, Shigeru; and Semura, Shigeru, to Sumitomo Electric Industries, Ltd. Method for assembling optical isolator and method for measuring isolation. 5,471,306, Cl. 356-367.000.

Yuill, Robert M., to Ingleby, James Richard. Golf bag. 5,469,960, Cl. 206-315.300.

Yumiba, Hideaki; Matsumoto, Kazunobu; and Kawakami, Akira, to Hitachi Maxell, Ltd. Lithium cell with a cathode comprising a copper compound oxide. 5,470,678, Cl. 429-194.000.

Yumitori, Fuminori; and Fujii, Yasuhiro, to Fujitsu Limited. Dynamic random access memory having sense amplifier control circuit supplied with external sense amplifier activating signal. 5,471,425, Cl. 365-190.000.

Yurkewych, George: *See*—
Griffith, Richard L., III; Gregg, Joseph J.; and Yurkewych, George, 5,470,318, Cl. 604-161.000.

Zabielski, Martin F.: *See*—
Holowczak, John E.; and Zabielski, Martin F., 5,470,222, Cl. 431-7.000.

Zadoff, Leon N., to EMS Development Corporation. Fiber optic line magnetometer having thermal compensation. 5,471,139, Cl. 324-244.100.

Zahrn, Joseph H., Jr.: *See*—
Cuthbert, Victor W.; Zahrn, Joseph H., Jr.; and Johnston, Vonda K., 5,469,593, Cl. 8-159.000.

Zaias, Nardo: *See*—
Mehl, Thomas L., Sr.; Harris, George W., Jr.; and Zaias, Nardo, 5,470,332, Cl. 606-36.000.

Zaklady Chemiczne Blachownia: *See*—
Kiedik, Maciej; Krueger, Andrzej; Kołt, Józef; Tkacz, Bogusław; Pers, Tatiana; Rdesinska-Cwik, Teresa; Niedziela, Jan; Kosciuk, Ryszard; Rzodeczko, Anna; Swiderski, Zbigniew; and Jankowski, Władysład, 5,470,809, Cl. 502-12.000.

Zaleski, Edward R.: *See*—
Zanger, Frank; Zaleski, Edward R.; and Cole, Mark, 5,470,312, Cl. 604-34.000.

Zamanzadeh, Mehrooz: *See*—
Carey, Jay F., II; and Zamanzadeh, Mehrooz, 5,470,667, Cl. 428-659.000.

Zamerovsky, Edward. Method for constructing a frame structure with load-bearing joints. 5,469,678, Cl. 52-263.000.

Zampini, Michael A.: *See*—
Flum, Alan; Zampini, Michael A.; and Fujita, Masahiro, 5,471,539, Cl. 351-119.000.

Zanardi, Giampaolo: *See*—
Camaggi, Giovanni; Filippini, Lucio; Gusmeroli, Marilena; Meazza, Giovanni; Zanardi, Giampaolo; Garavaglia, Carlo; and Mirenna, Luigi, 5,470,863, Cl. 514-343.000.

Zandi, Ahmad; Stork, David G.; and Allen, James, to Ricoh Company Ltd.; and Ricoh Corporation. Compression of palettized images and binarization for bitwise coding of M-ary alphabets therefor. 5,471,207, Cl. 341-107.000.

Zanger, Frank; Zaleski, Edward R.; and Cole, Mark, to Allergan, Inc. Irrigation/aspiration apparatus for surgical procedures. 5,470,312, Cl. 604-34.000.

Zanzig, David J.; Sandstrom, Paul H.; Hubbell, Joseph K.; Hsu, Wen-Liang; Halasa, Adel F.; and Verthe, John J. A., to Goodyear Tire & Rubber Company, The. Process for synthesizing styrene-isoprene rubber. 5,470,929, Cl. 526-181.000.

Zebco Corporation: *See*—
Hlava, Lorens G.; and Pulliam, Thomas A., 5,470,027, Cl. 242-247.000.

Zegers, Cornelis J. M., to Machinefabriek Meyn B.V. Method and apparatus for unloading a poultry transport container. 5,470,194, Cl. 414-786.000.

Zehavi, Eitan; and Chiel, David. Tree-shaking and harvesting apparatus. 5,469,695, Cl. 56-340.100.

Zehavi, Ephraim. Method and apparatus for variable rate signal transmission in a spread spectrum communication system using coset coding. 5,471,497, Cl. 375-200.000.

Zeidler, Georg: *See*—
Lamm, Gunther; Mayer, Udo; Reichelt, Helmut; and Zeidler, Georg, 5,470,959, Cl. 534-680.000.

Zeien, Robert. Phase shifting device. 5,471,308, Cl. 356-376.000.

Zelvin, Joseph L.: *See*—
Luce, David A.; and Zelvin, Joseph L., 5,471,260, Cl. 351-205.000.

Zeneca Limited: *See*—
Anthony, Vivienne M.; Clough, John M.; deFraine, Paul; Godfrey, Christopher R. A.; Ferguson, Ian; Crowley, Patrick J.; and Hutchings, Michael G., 5,470,819, Cl. 504-244.000.
Randles, Kenneth R.; and LeGras, Paul G., 5,471,000, Cl. 562-16.000.

Zhang, Can: *See*—
Peng, Sixun; Dai, Dezai; Huang, Zhenya; Huang, Wenlong; Wang, Youqun; Zhang, Can; and Yu, Feng, 5,470,852, Cl. 514-231.500.

Zheng, Bolin: *See*—
Hauser, Ray L.; Zheng, Bolin; Renbarger, Michael; and Lange, Mark A., 5,470,820, Cl. 505-472.000.

Zias, Jeff, to Taligent, Inc. Object oriented video framework system. 5,471,675, Cl. 395-162.000.

Zilog, Inc.: *See*—
Nimishakavi, Hanumanthrao; and Swami, Ravi, 5,471,588, Cl. 395-293.000.

Zimics, Bela; and Orthofer, Willibald, to Isovolta Osterreichische Isolierstoffwerke Aktiengesellschaft. Prepregs comprising a fibrous base with a first coating of C-stage thermosetting resin and an outer second coating of B-stage thermosetting resin and a method of making the same. 5,470,647, Cl. 428-229.000.

Zimmerly, Robert D., to Tetra Laval Holdings & Finance, S.C. Manifold valve assemblies with cleaning solution supply. 5,469,880, Cl. 137-240.000.

Zimmermann, Philip R., to Schoechle, Timothy D. Method and apparatus for resource allocation in a communication network system. 5,471,190, Cl. 340-310.010.

Zinken, Gunter J., to Torrington Company, The. Method of assembling a bearing. 5,469,620, Cl. 29-898.064.

Zinreich, Eva S.: *See*—
Zinreich, Simion J.; Zinreich, Eva S.; and Bare, Rex O., 5,469,847, Cl. 128-653.100.

Zinreich, Simion J.; Zinreich, Eva S.; and Bare, Rex O., to IZI Corporation. Radiographic multi-modality skin markers. 5,469,847, Cl. 128-653.100.

Zitz, Jeffrey A.: *See*—
Call, Anson J.; Meisner, Stephen H.; Pompeo, Frank L.; and Zitz, Jeffrey A., 5,471,027, Cl. 219-85.130.

ZMD Corporation: *See*—
Fincke, Randall W.; Lopin, Michael L.; and Faller, Frederick W., 5,470,343, Cl. 607-5.000.

Zomorodi, Mostafa: *See*—
Cook, Charles; Zomorodi, Mostafa; and Dark, Richard C. G., 5,470,324, Cl. 604-319.000.

Zomotor, Adam; Klinkner, Walter; Schindler, Erich; Mohn, Frank-Werner; and Wohland, Thomas, to Mercedes-Benz AG. Method and apparatus for preventing vehicle handling instabilities. 5,471,388, Cl. 364-424.050.

Zorn, Roger H. Dynamic surface wave roll inspection device. 5,469,743, Cl. 73-627.000.

Zou, Zhiqiang: *See*—
Sager, Ruth; Anisowicz, Anthony; and Zou, Zhiqiang, 5,470,970, Cl. 536-23.500.

Zwicker, Roger D.: *See*—
Mims, Carl W.; and Zwicker, Roger D., 5,470,227, Cl. 431-255.000.

958075 Ontario Inc.: *See*—
Pertsov, Nikolay V.; Ulberg, Zoya R.; Vember, Vladimir E.; Podolskaya, Valentina I.; Kogan, Boris S.; and Burenkov, Eduard K., 5,470,460, Cl. 210-151.000.

3Com Corporation: *See*—
Isfeld, Mark S., 5,471,618, Cl. 395-839.000.

3M Company: *See*—
Wolfe, Kenneth I., 5,471,244, Cl. 348-257.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28th DAY OF NOVEMBER, 1995

NOTE— Arranged in accordance with the first significant character or word if the name (in accordance with city and telephone directory practice).

Ag-Chem Equipment Co., Inc.: *See*—
Monson, Robert J.; and Bauer, Norman A., Re. 35,100, Cl. 111-130.000.

Bauer, Norman A.: *See*—
Monson, Robert J.; and Bauer, Norman A., Re. 35,100, Cl. 111-130.000.

Eder, John C.: *See*—
Van Malderghem, Edward G.; and Eder, John C., Re. 35,103, Cl. 229-69.000.

Hill, Charles C., to SeQual Technologies, Inc. Fluid fractionator. Re. 35,099, Cl. 95-98.000.

Huang, Xiaohua: *See*—
Zare, Richard N.; Huang, Xiaohua; and Huckaby, Raymond T., Re. 35,102, Cl. 204-180.100.

Huckaby, Raymond T.: *See*—
Zare, Richard N.; Huang, Xiaohua; and Huckaby, Raymond T., Re. 35,102, Cl. 204-180.100.

Kamizawa, Koh: *See*—
Murakami, Tokumichi; and Kamizawa, Koh, Re. 35,104, Cl. 370-84.000.

Kelly, William W., to Stanadyne Automotive Corp. Fuel injector method and apparatus. Re. 35,101, Cl. 123-467.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Zare, Richard N.; Huang, Xiaohua; and Huckaby, Raymond T., Re. 35,102, Cl. 204-180.100.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Murakami, Tokumichi; and Kamizawa, Koh, Re. 35,104, Cl. 370-84.000.

Modine Manufacturing Co.: *See*—
Saperstein, Zalman P., Re. 35,098, Cl. 29-890.043.

Monson, Robert J.; and Bauer, Norman A., to Ag-Chem Equipment Co., Inc. Variable rate application system. Re. 35,100, Cl. 111-130.000.

Moore Business Forms, Inc.: *See*—
Van Malderghem, Edward G.; and Eder, John C., Re. 35,103, Cl. 229-69.000.

Murakami, Tokumichi; and Kamizawa, Koh, to Mitsubishi Denki Kabushiki Kaisha. Subrate multi-media data transmission system. Re. 35,104, Cl. 370-84.000.

Saperstein, Zalman P., to Modine Manufacturing Co. Method of making a heat exchanger. Re. 35,098, Cl. 29-890.043.

SeQual Technologies, Inc.: *See*—
Hill, Charles C., Re. 35,099, Cl. 95-98.000.

Stanadyne Automotive Corp.: *See*—
Kelly, William W., Re. 35,101, Cl. 123-467.000.

Van Malderghem, Edward G.; and Eder, John C., to Moore Business Forms, Inc. Two-part or three-part continuous form. Re. 35,103, Cl. 229-69.000.

Zare, Richard N.; Huang, Xiaohua; and Huckaby, Raymond T., to Leland Stanford Junior University, The Board of Trustees of the. Capillary electrophoretic device employing structure permitting electrical contact through ionic movement. Re. 35,102, Cl. 204-180.100.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Asten Group, Inc.: *See*—
Smolens, H. Dana, B1 4,791,708, Cl. 24-33.00C.

B.E.L-Tronics Limited: *See*—
Martinson, Glen, B1 4,952,936, Cl. 342-20.000.

Capitani, Teresa: *See*—
Fergason, Virgil; Jeffcoat, Roger; Fannon, John E.; and Capitani, Teresa, B1 5,300,145, Cl. 106-213.000.

Case Corporation: *See*—
Clarke, Theodore M.; and Walter, Gordon H., B1 4,098,622, Cl. 148-331.000.

Clarke, Theodore M.; and Walter, Gordon H., to Case Corporation. Earth-working implement. B1 4,098,622, Cl. 148-331.000.

Fannon, John E.: *See*—
Fergason, Virgil; Jeffcoat, Roger; Fannon, John E.; and Capitani, Teresa, B1 5,300,145, Cl. 106-213.000.

Fergason, Virgil; Jeffcoat, Roger; Fannon, John E.; and Capitani, Teresa, to National Starch and Chemical Investment Holding Corporation. Low amylopectin starch. B1 5,300,145, Cl. 106-213.000.

Fortsch, William A., to Thomas & Betts Corporation. Cable tie having improved tail gripping and holding feature. B1 5,317,787, Cl. 24-16.0PB.

Jeffcoat, Roger: *See*—
Fergason, Virgil; Jeffcoat, Roger; Fannon, John E.; and Capitani, Teresa, B1 5,300,145, Cl. 106-213.000.

Martinson, Glen, to B.E.L-Tronics Limited. Multi-band radar detector having plural local oscillators. B1 4,952,936, Cl. 342-20.000.

National Starch and Chemical Investment Holding Corporation: *See*—
Fergason, Virgil; Jeffcoat, Roger; Fannon, John E.; and Capitani, Teresa, B1 5,300,145, Cl. 106-213.000.

Smolens, H. Dana, to Asten Group, Inc. Abrasion and hydrolysis resistant joining means for fabric seams. B1 4,791,708, Cl. 24-33.00C.

Thomas & Betts Corporation: *See*—
Fortsch, William A., B1 5,317,787, Cl. 24-16.0PB.

Walter, Gordon H.: *See*—
Clarke, Theodore M.; and Walter, Gordon H., B1 4,098,622, Cl. 148-331.000.

LIST OF DESIGN PATENTEES

Accuiron Systems Inc.: *See*—
Pearsall, Ronald W., 364,573, Cl. D10-50.000.

Adler, Philip S. Writing board. 364,642, Cl. D19-52.000.

Airway Industries, Inc.: *See*—
Bieber, David; Kim, Hyun S.; Conrad, Richard L.; and Gualtieri, John N., 364,504, Cl. D3-276.000.

Akiona, Mark. Oil funnel. 364,630, Cl. D15-150.000.

Alger, Andrew: *See*—
Tarrson, Emanuel B.; Alger, Andrew; and Blahuta, Lew, 364,708, Cl. D28-64.000.

Alger, Craig N. Taillight lens protector for a vehicle. 364,704, Cl. D26-139.000.

American Standard Inc.: *See*—
Moon, In-Ho, 364,527, Cl. D6-574.000.

Amram, Denise S.; and Shepherd, Charles G. Washing tool attachment for hose. 364,715, Cl. D32-35.000.

Anderson, John W., to Temp-Tech Co., Inc. Food tray. 364,537, Cl. D7-553.000.

Anderson, Karen L.; and Anderson, Keith E. Box for a magical tooth fairy kit. 364,651, Cl. D21-59.000.

Anderson, Keith E.: *See*—
Anderson, Karen L.; and Anderson, Keith E., 364,651, Cl. D21-59.000.

Andrews, Craig, to Rooster Products International, Inc. Glove display unit. 364,513, Cl. D6-411.000.

Andrews, John J., to Testor Corporation, The. Airplane. 364,600, Cl. D12-333.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Hamamura, Toshihiro, 364,631, Cl. D16-133.000.
Matsushita, Takeshi, 364,634, Cl. D16-209.000.

AT&T Corp.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl. D14-149.000.

Avar, Eric P., to Nike, Inc. Element of a shoe upper. 364,499, Cl. D2-970.000.

Azocar, Maria-Teresa. Illuminated doll. 364,661, Cl. D21-171.000.

Backs, Jochen, to Samsung Electronics Co. Ltd. Computer. 364,605, Cl. D14-100.000.
Backs, Jochen, to Samsung Electronics Co. Ltd. Monitor for computers. 364,607, Cl. D14-113.000.
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., to Minnesota Mining and Manufacturing Company. Videocassette. 364,614, Cl. D14-121.000.
Barton, Gregory M., to Ocean Kayak, Inc. Water craft. 364,599, Cl. D12-303.000.
Bassler, Louis M.; and Berfield, Robert C., to Shop Vac Corporation. Wall mounted holder for a vacuum and/or attachments. 364,524, Cl. D6-567.000.
Berfield, Robert C.: *See*—
Bassler, Louis M.; and Berfield, Robert C., 364,524, Cl. D6-567.000.
Bergeron, Gregory B.: *See*—
Marfori, Eddie J.; and Bergeron, Gregory B., 364,643, Cl. D19-60.000.
Berner, John M.; Jacobs, Richard H.; Ipsen, Richard D.; Novetzke, Thomas J.; Magnuson, Paulette M.; and Wrobel, Steve, to Ipsen, Richard; and Novetzke, Thomas J. Ice shaver apparatus body. 364,531, Cl. D7-374.000.
Berry, Richard D., Jr.; and Clark, David A., to Ethan Allen Inc. Poster bed. 364,511, Cl. D6-393.000.
Betta Products, Inc.: *See*—
Weinstein, Randy H., 364,655, Cl. D21-84.000.
Bieber, David; Kim, Hyun S.; Conrad, Richard L.; and Gualtieri, John N., to Airway Industries, Inc. Suitcase. 364,504, Cl. D3-276.000.
Bierce, Laurence M.: *See*—
Shaw, Mark D.; Heyman, J. Tad; Bierce, Laurence M.; and Ehredt, Jesse, 364,629, Cl. D15-150.000.
Blahuta, Lew: *See*—
Tarrson, Emanuel B.; Alger, Andrew; and Blahuta, Lew, 364,708, Cl. D28-64.000.
Bliven, Robert P., to Hewlett- Packard Corporation. Portable computer. 364,606, Cl. D14-106.000.
Bloomer, Glenn A.: *See*—
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., 364,614, Cl. D14-121.000.
Boden, Bonnie C. Baseball noise maker. 364,653, Cl. D21-64.000.
Boden, Bonnie C. Hockey noise maker. 364,654, Cl. D21-64.000.
Bonn, Karen L.; and Brown, Lawrence A., to Restorative Medical, Inc. Combined cervical and head support. 364,684, Cl. D24-191.000.
Bosch-Siemen Hausgeraete GmbH: *See*—
Wilsdorf, Gerd, 364,529, Cl. D7-340.000.
Bradfield, Richard D.; and Dick, Graham A., to Thomas J. Lipton Co., Division of Conopco., Inc. Infusion package. 364,491, Cl. D1-199.000.
Bradfield, Richard D.; and Dick, Graham A., to Thomas J. Lipton Co., Division of Conopco, Inc. Infusion package. 364,492, Cl. D1-199.000.
Branch, James D. Attachable truck mat. 364,597, Cl. D12-203.000.
Bridgestone/Firestone, Inc.: *See*—
Krupa, Dennis W.; Guspodin, James G.; and Marble, Roger W., 364,594, Cl. D12-147.000.
Brømsø, Per, to Interlego AG. Toy building element. 364,658, Cl. D21-108.000.
Brophy, Marilyn J. Pie crust shield. 364,533, Cl. D7-387.000.
Brown, Charles R. Combined engine cylinder and head. 364,626, Cl. D15-11.000.
Brown, Lawrence A.: *See*—
Bonn, Karen L.; and Brown, Lawrence A., 364,684, Cl. D24-191.000.
Brown, Nora: *See*—
Brown, R. A.; and Brown, Nora, 364,534, Cl. D7-407.000.
Brown, R. A.; and Brown, Nora. Adapter for elevating an accessory above a stove heating element. 364,534, Cl. D7-407.000.
Brush, Richard R. Main cap stud girdle. 364,627, Cl. D15-5.000.
Byrd, Nathan. Battery powered heated ear covers. 364,710, Cl. D29-112.000.
Camfield, David K.; and Metcalf, Jeffrey D., to Roadmaster Corporation. Combined base and arm mechanism for a ski exercise machine. 364,662, Cl. D21-191.000.
Canon Kabushiki Kaisha: *See*—
Tashiro, Naoki, 364,639, Cl. D18-50.000.
Carter, Janet L. Stocking wreath. 364,523, Cl. D6-553.000.
Casio Computer Co., Ltd.: *See*—
Goto, Atsushi; and Wada, Masao, 364,571, Cl. D10-38.000.
Goto, Atsushi; and Nikaido, Takashi, 364,572, Cl. D10-39.000.
Chakota LLC: *See*—
Doyle, Patrick W., 364,595, Cl. D12-168.000.
Chang, Tien-Tzu. Spectacles. 364,636, Cl. D16-306.000.
Chang, Tien-Tzu. Spectacles. 364,637, Cl. D16-306.000.
Chapman, Steven S.; and Jackson, Daniel C., to Eastman Kodak Company. Package for flash camera. 364,561, Cl. D9-415.000.
Chapman, Steven S.; McBride, John K.; and Rydelek, James G., to Eastman Kodak Company. Daylight camera. 364,635, Cl. D16-218.000.
Chen, Chi J. Glass shade. 364,697, Cl. D26-133.000.
Chen, Chi J. Glass shade. 364,698, Cl. D26-133.000.
Chen, Chi J. Glass shade. 364,700, Cl. D26-134.000.
Chen, Chi J. Glass shade. 364,703, Cl. D26-136.000.
Chen, Wesley. Lamp shade. 364,696, Cl. D26-133.000.
Cheng, Hai P., to Topace Company. Deodorizer. 364,677, Cl. D23-366.000.
Chiu, Bernard; Longan, John; and Marvin, Robert L., Jr., to Duracraft Corporation. Cool mist impeller humidifier. 364,676, Cl. D23-356.000.
Choi, Chung-Hing, to Hing Fat Toys Manufacturer Limited. Toy sword. 364,659, Cl. D21-145.000.
Chrest, David A.: *See*—
Leding, Lisa M.; Crater, Arnold R.; Santoro, Ron; McKernan, Amy; and Chrest, David A., 364,611, Cl. D14-114.000.
Christensen, Steven C. Pacifier. 364,685, Cl. D24-195.000.
Christenson, Jennifer: *See*—
Christenson, Lee C.; and Christenson, Jennifer, 364,551, Cl. D8-334.000.
Christenson, Lee C.; and Christenson, Jennifer. Combined padlock and removable electronic key. 364,551, Cl. D8-334.000.
Chunn, Daniel A.; and Keith, James A., Jr., to Ryobi Motor Products. Plate joiner fence. 364,545, Cl. D8-70.000.
Chunn, Daniel A.: *See*—
McJunkin, Mark A.; Chunn, Daniel A.; and Watson, James B., 364,541, Cl. D8-8.000.
Ciesko, Mark J.: *See*—
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., 364,614, Cl. D14-121.000.
Clark, David A.: *See*—
Berry, Richard D., Jr.; and Clark, David A., 364,511, Cl. D6-393.000.
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., to AT&T Corp. Telephone stand. 364,621, Cl. D14-149.000.
Clorox Company, The: *See*—
Lorio, Gwen H.; Ketsdever, Katerine J. M.; and Hofmeister, Albert, 364,569, Cl. D9-523.000.
Coca-Cola Company, The: *See*—
Colvin, Alan B.; and Duffy, Joseph P., III, 364,560, Cl. D9-346.000.
Cohen, Seymour, to Telco Cretions, Inc. Santa in chimney figure. 364,579, Cl. D11-129.000.
Colvin, Alan B.; and Duffy, Joseph P., III, to Coca-Cola Company, The. Carrier for containers. 364,560, Cl. D9-346.000.
Conrad, Richard L.: *See*—
Bieber, David; Kim, Hyun S.; Conrad, Richard L.; and Gualtieri, John N., 364,504, Cl. D3-276.000.
Corcoran, Sean. Razor. 364,706, Cl. D28-46.000.
Costa, Leon N.: *See*—
Dickey, Trent S.; and Costa, Leon N., 364,539, Cl. D7-620.000.
Cousins, Morison S., to Dart Industries Inc. Dish brush. 364,506, Cl. D4-133.000.
Crater, Arnold R.: *See*—
Leding, Lisa M.; Crater, Arnold R.; Santoro, Ron; McKernan, Amy; and Chrest, David A., 364,611, Cl. D14-114.000.
Crawford, Eddie R. Spot cleaning tool for carpet and upholstery. 364,719, Cl. D32-46.000.
Dancel, Leticia M.: *See*—
Dancel, Ronald M.; and Dancel, Leticia M., 364,567, Cl. D9-436.000.
Dancel, Ronald M.; and Dancel, Leticia M. Container cover with counting and display means. 364,567, Cl. D9-436.000.
Danielson, David C.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl. D14-149.000.
Dannenberg, Todd D.: *See*—
Thomas, Carter J.; Dannenberg, Todd D.; and Reid, Mary J., 364,674, Cl. D23-280.400.
Dart Industries Inc.: *See*—
Cousins, Morison S., 364,506, Cl. D4-133.000.
Daughtry, Amanda L. Jewelry organizer. 364,519, Cl. D6-513.000.
Daville, Edward. Dog harness for female dogs in heat. 364,713, Cl. D30-144.000.
Deleuse, Veronique. Sculpture. 364,580, Cl. D11-131.000.
Dennison, Ronald. Fishing lure plug. 364,670, Cl. D22-133.000.
DeSiena, Bernard A.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl. D14-149.000.
Diaz, Nelson. Game board. 364,649, Cl. D21-34.000.
Dick, Graham A.: *See*—
Bradfield, Richard D.; and Dick, Graham A., 364,491, Cl. D1-199.000.
Bradfield, Richard D.; and Dick, Graham A., 364,492, Cl. D1-199.000.
Dickey, Trent S.; and Costa, Leon N., to LCTD, L.L.C. Beverage holder. 364,539, Cl. D7-620.000.
Dillon, Robert: *See*—
Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, 364,609, Cl. D14-114.000.
Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, 364,610, Cl. D14-114.000.
Doskocil Manufacturing Company, Inc.: *See*—
Murphy, Thomas B.; Northrop, Melaney L.; and Nesbitt, Richard, 364,712, Cl. D30-108.000.
Douer, Morris I. Unique cap which converts a cup into a high quality shaker. 364,566, Cl. D9-436.000.
Doyle, Patrick W., to Chakota LLC. Aquatic vessel connector with suction cups. 364,595, Cl. D12-168.000.
Duffy, Joseph P., III: *See*—
Colvin, Alan B.; and Duffy, Joseph P., III, 364,560, Cl. D9-346.000.

Duracraft Corporation: *See*—
Chir, Bernard; Longan, John; and Marvin, Robert L., Jr., 364,676, Cl. D23-356.000.
Dye, John F., to Kendall Company, The. Connector for applying compressive pressure to the leg. 364,680, Cl. D24-129.000.
E. Mishan & Sons, Inc.: *See*—
Hollinger, Fred, 364,514, Cl. D6-449.000.
Eastman Kodak Company: *See*—
Chapman, Steven S.; and Jackson, Daniel C , 364,561, Cl. D9-415.000.
Chapman, Steven S.; McBride, John K.; and Rydelek, James G., 364,635, Cl. D16-218.000.
Eberle, Theodore F., Jr.: *See*—
Vailliencourt, Dwayne G.; and Eberle, Theodore F., Jr., 364,565, Cl. D9-434.000.
Educational Insights: *See*—
Marfori, Eddie J.; and Bergeron, Gregory B., 364,643, Cl. D19-60.000.
Ehredt, Jesse: *See*—
Shaw, Mark D.; Heyman, J. Tad; Bierce, Laurence M.; and Ehredt, Jesse, 364,629, Cl. D15-150.000.
Engel, Douglas A. Rubber ball. 364,663, Cl. D21-204.000.
Epicurean International Corp.: *See*—
Hughes, Thomas E., 364,538, Cl. D7-608.000.
ERDA, Inc.: *See*—
Pryor, Timothy B.; and Retlick, Steven S., 364,508, Cl. D6-356.000.
Estevez-Alcolado, Sonia M.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl D14-149.000.
Ethan Allen Inc.: *See*—
Berry, Richard D., Jr.; and Clark, David A., 364,511, Cl. D6-393.000.
Eversole, Marvin. Boat oar. 364,598, Cl. D12-215.000.
Feather Safety Razor Co., Ltd.: *See*—
Otsuka, Norio, 364,683, Cl. D24-140.000.
Felde, Steven L.; Lee, Jay E.; and Wang, Hsifu, to International Business Machines Corporation. Front panel for a tape drive power unit with integrated tape drive. 364,612, Cl. D14-115.000.
Fenton, William E.; Redman, Brian; and Rak, Roman P., to Motorola, Inc. Folding antenna for a portable radio packet modem. 364,624, Cl. D14-234.000.
Fitzgerald, Robert M. Cordless telephone headset. 364,617, Cl. D14-142.000.
Fleming, Eugene. Fire fighting spraying unit and shield. 364,711, Cl. D29-125.000.
Fort Lock Corporation: *See*—
Myers, Gary L., 364,549, Cl. D8-331.000.
Myers, Gary L., 364,550, Cl. D8-331.000.
Frame, Bridget R.: *See*—
Frame, Chad R.; and Frame, Bridget R., 364,705, Cl. D28-41.000.
Frame, Chad R.; and Frame, Bridget R. Hair accessory. 364,705, Cl. D28-41.000.
Francis, Paul S.; and Rouse, Teryl K., to Innovation Development, Inc. Ice scraper. 364,720, Cl. D32-49.000.
Fujicopian Co., Ltd.: *See*—
Watanabe, Kazuya; and Hayashi, Kiyofumi, 364,644, Cl. D19-69.000.
Gautier, Valerie: *See*—
Guegan, Jacques; Lecocq, Francis; Moussaud, Jean-Pierre; Urvoy, Jean-Jacques; and Gautier, Valerie, 364,558, Cl. D9-341.000.
Gavin, Ellen, to L'Oreal SA. Eyeshadow compact. 364,709, Cl. D28-78.000.
Gepty, Ross B.: *See*—
Robards, Chester F., Jr.; and Gepty, Ross B., 364,530, Cl. D7-350.000.
Gillette Company, The: *See*—
Shurtleff, Jill M., 364,707, Cl. D28-46.000.
Glaser, Michael D., to Hewlett-Packard Company. Chromatograph. 364,576, Cl. D10-81.000.
Gloston, Carol M. Christmas ornament. 364,578, Cl. D11-121.000.
Goldner, Sandor. Retractable tape measure. 364,575, Cl. D10-72.000.
Goodrich, Burton J. Golf club head. 364,665, Cl. D21-217.000.
Goss, Lorane C., Jr., to Mikron Industries, Inc. Window component extrusion. 364,688, Cl. D25-124.000.
Goss, Lorane C., Jr., to Mikron Industries, Inc. Window component extrusion. 364,689, Cl. D25-124.000.
Goss, Lorane C., Jr., to Mikron Industries, Inc. Window component extrusion. 364,690, Cl. D25-124.000.
Goss, Lorane C., Jr., to Mikron Industries, Inc. Window component extrusion. 364,691, Cl. D25-125.000.
Goto, Atsushi; and Wada, Masao, to Casio Computer Co., Ltd. Wrist watch. 364,571, Cl. D10-38.000.
Goto, Atsushi; and Nikaido, Takashi, to Casio Computer Co., Ltd. Wrist watch. 364,572, Cl. D10-39.000.
Goto, Masaaki; and Ninomiya, Shigetada, to Matsushita Electric Industrial Co., Ltd. Video camera with video tape recorder. 364,633, Cl. D16-202.000.
Gough, Merrie B. Syringe traveling case. 364,501, Cl. D3-203.000.
Graham, James R.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl. D14-149.000.
Grande, Frank, to Hose-McCann Telephone Co., Inc. Four-gang jackbox assembly. 364,625, Cl. D14-240.000.
Greenberg, Bridget: *See*—
Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, 364,609, Cl. D14-114.000.
Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, 364,610, Cl. D14-114.000.
Gualtieri, John N.: *See*—
Bieber, David; Kim, Hyun S.; Conrad, Richard L.; and Gualtieri, John N., 364,504, Cl. D3-276.000.
Guegan, Jacques; Lecocq, Francis; Moussaud, Jean-Pierre; Urvoy, Jean-Jacques; and Gautier, Valerie, to Meccano, S.A. Container for toys. 364,558, Cl. D9-341.000.
Guspodin, James G.: *See*—
Krupa, Dennis W.; Guspodin, James G.; and Marble, Roger W., 364,594, Cl. D12-147.000.
Gustafsson, Morgan, to Nyberg, Bo. Spray gun. 364,673, Cl. D23-223.000.
Haller, Fred T., to Haller, Fred T. Intake manifold. 364,628, Cl. D15-5.000.
Hamamura, Toshihiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Binoculars. 364,631, Cl. D16-133.000.
Hanscom, Cory J., to Innovative Gaming Corporation of America. Video craps table. 364,650, Cl. D21-37.000.
Harrison, Daniel J. Child's bed. 364,510, Cl. D6-388.000.
Haug, Gottfried E. Sports implement holder. 364,522, Cl. D6-552.000.
Hayashi, Kiyofumi: *See*—
Watanabe, Kazuya; and Hayashi, Kiyofumi, 364,644, Cl. D19-69.000.
Heaton, Keith; and Lina, Cesar Z., to Kinetic Concepts, Inc. Wound drainage disposable canister. 364,679, Cl. D24-118.000.
Helenowski, Tomasz K. Stand. 364,516, Cl. D6-462.000.
Hennen, Joseph A. Spark plug tool. 364,543, Cl. D8-14.000.
Hewlett-Packard Company: *See*—
Glaser, Michael D., 364,576, Cl. D10-81.000.
Hewlett- Packard Corporation: *See*—
Bliven, Robert P., 364,606, Cl. D14-106.000.
Heyman, J. Tad: *See*—
Shaw, Mark D.; Heyman, J. Tad; Bierce, Laurence M.; and Ehredt, Jesse, 364,629, Cl. D15-150.000.
Highland Supply Corporation: *See*—
Weder, Doanld E.; and Shryock, Jon S., 364,589, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,581, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,582, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,583, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,584, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,585, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,586, Cl. D11-164.000.
Weder, Donald E.; and Shryock, Jon S., 364,587, Cl. D11-164.000.
Weder, Donald E.; and Shryock, Jon S., 364,588, Cl. D11-164.000.
Hillenmayer, Stefan, to Siemens Aktiengesellschaft. Telephone station. 364,622, Cl. D14-151.000.
Hing Fat Toys Manufacturer Limited: *See*—
Choi, Chung-Hing, 364,659, Cl. D21-145.000.
Hofmeister, Albert: *See*—
Lorio, Gwen H.; Ketsdever, Katerine J. M.; and Hofmeister, Albert, 364,569, Cl. D9-523.000.
Hollinger, Fred, to E. Mishan & Sons, Inc. Produce holder. 364,514, Cl. D6-449.000.
Hoover Universal, Inc.: *See*—
Vailliencourt, Dwayne G.; and Eberle, Theodore F., Jr., 364,565, Cl. D9-434.000.
Hose-McCann Telephone Co., Inc.: *See*—
Grande, Frank, 364,625, Cl. D14-240.000.
Hou, Jack. Display case. 364,515, Cl. D6-450.000.
Howard, James E. Key caddy. 364,502, Cl. D3-207.000.
Hughes, Thomas E., to Epicurean International Corp. Tubular compartmentalized beverage cooling wrap. 364,538, Cl. D7-608.000.
Hurr, David M.: *See*—
Lee, Ho; and Hurr, David M., 364,556, Cl. D8-499.000.
Ibaraki Seiki Machinery Co., Ltd.: *See*—
Tolson, Sidney S., 364,559, Cl. D9-345.000.
Innovation Development, Inc.: *See*—
Francis, Paul S.; and Rouse, Teryl K., 364,720, Cl. D32-49.000.
Innovative Gaming Corporation of America: *See*—
Hanscom, Cory J., 364,650, Cl. D21-37.000.
Interlego AG: *See*—
Brømsø, Per, 364,658, Cl. D21-108.000.
Pedersen-Rask, Jørgen, 364,562, Cl. D9-418.000.
Rahbek, Helle, 364,660, Cl. D21-157.000.
Ruszkai, Ede F., 364,656, Cl. D21-108.000.
Schmidt, Sten; and Jensen, Kurt, 364,657, Cl. D21-108.000.
International Business Machines Corporation: *See*—
Felde, Steven L.; Lee, Jay E.; and Wang, Hsifu, 364,612, Cl. D14-115.000.
Nakada, Kazuo, 364,608, Cl. D14-113.000.
Ipsen, Richard: *See*—
Berner, John M.; Jacobs, Richard H.; Ipsen, Richard D.; Novetzke, Thomas J.; Magnuson, Paulette M.; and Wrobel, Steve, 364,531, Cl. D7-374.000.
Ipsen, Richard D.: *See*—
Berner, John M.; Jacobs, Richard H.; Ipsen, Richard D.; Novetzke, Thomas J.; Magnuson, Paulette M.; and Wrobel, Steve, 364,531, Cl. D7-374.000.

Ishimoto, Mikio, to Shikoku Kakoki Co., Ltd. Beverage package. 364,568, Cl. D9-502.000.

Itoh, Yoshito: *See—*
Oda, Teruo; Nakamura, Kenzi; Itoh, Yoshito; Kimura, Yumiko; and Kobayashi, Hiroshi. 364,616, Cl. D14-138.000.

Iwaki, Yumio; Sekino, Yoshihiro; and Watanabe, Yoshitaka, to Japex Geoscience Institute, Inc. Battery unit. 364,601, Cl. D13-103.000.

Izumisawa, Nobuyuki, to Shinano, Inc.. Miniature sander with two finger throttle. 364,544, Cl. D8-62.000.

Jackson, Daniel C.: *See—*
Chapman, Steven S.; and Jackson, Daniel C., 364,561, Cl. D9-415.000.

Jacobs, Richard H.: *See—*
Berner, John M.; Jacobs, Richard H.; Ipsen, Richard D.; Novetzke, Thomas J.; Magnuson, Paulette M.; and Wrobel, Steve, 364,531, Cl. D7-374.000.

Japex Geoscience Institute, Inc.: *See—*
Iwaki, Yumio; Sekino, Yoshihiro; and Watanabe, Yoshitaka, 364,601, Cl. D13-103.000.

JB Research, Inc.: *See—*
Teo, Maurice G. T.; and Loud, Craig M., 364,686, Cl. D24-200.000.

Jeffery, Robert T., to LDB Automotive, Inc. Cylindrical dipstick cleaner. 364,714, Cl. D32-35.000.

Jensen, Kurt: *See—*
Schmidt, Sten; and Jensen, Kurt, 364,657, Cl. D21-108.000.

John O. Butler Company: *See—*
Tarrson, Emanuel B.; Alger, Andrew; and Blahuta, Lew, 364,708, Cl. D28-64.000.

Johnson, Barbara S. Display board for a grocery list. 364,647, Cl. D20-18.000.

Johnson, Eric S. Combined case and book support. 364,503, Cl. D3-273.000.

Johnson, Gregory H.: *See—*
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., 364,614, Cl. D14-121.000

Kaneko, Steven T.: *See—*
Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, 364,609, Cl. D14-114.000.
Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, 364,610, Cl. D14-114.000.

Keith, James A., Jr.: *See—*
Chunn, Daniel A.; and Keith, James A., Jr., 364,545, Cl. D8-70.000

Kendall Company, The: *See—*
Dye, John F., 364,680, Cl. D24-129.000.

Keng, Da. Rifle scope mount and receiver cover. 364,668, Cl. D22-110.000.

Kent Display Systems, L.P: *See—*
Yaniv, Zvi, 364,521, Cl. D6-515.000.

Ketsdever, Katerine J. M.: *See—*
Lorio, Gwen H.; Ketsdever, Katerine J. M.; and Hofmeister, Albert, 364,569, Cl. D9-523.000.

Khadivar, Michael. AM/FM casette player. 364,623, Cl. D14-162.000.

Killer Loop S.p.A.: *See—*
Simioni, Luciano, 364,638, Cl. D16-327.000.

Kilo, Katherine. Basketball telephone. 364,619, Cl. D14-143.000.

Kim, Hyun S.: *See—*
Bieber, David; Kim, Hyun S.; Conrad, Richard L.; and Gualtieri, John N., 364,504, Cl. D3-276.000.

Kimura, Yumiko: *See—*
Oda, Teruo; Nakamura, Kenzi; Itoh, Yoshito; Kimura, Yumiko; and Kobayashi, Hiroshi, 364,616, Cl. D14-138.000.

Kinetic Concepts, Inc.: *See—*
Heaton, Keith; and Lina, Cesar Z., 364,679, Cl. D24-118.000.

King, Nicholas R. Jewelry organizer. 364,505, Cl. D3-313.000.

Kip, Albart J., to U.S. Philips Corporation. Epilator. 364,682, Cl. D24-133.000.

Kluttz, Frederick; and Kluttz, Lisa A. Sock. 364,500, Cl. D2-980.000.

Kluttz, Lisa A.: *See—*
Kluttz, Frederick; and Kluttz, Lisa A., 364,500, Cl. D2-980.000.

Kobayashi, Hiroshi: *See—*
Oda, Teruo; Nakamura, Kenzi; Itoh, Yoshito; Kimura, Yumiko; and Kobayashi, Hiroshi, 364,616, Cl. D14-138.000.

Koch, Drake L., to Z-International, Inc. Roll note dispenser. 364,645, Cl. D19-89.000.

Koehler, Laverne: *See—*
Koehler, Ralph E.; and Koehler, Laverne, 364,518, Cl. D6-495.000.

Koehler, Ralph E.; and Koehler, Laverne. Quilt frame leg. 364,518, Cl. D6-495.000.

Kohler Co.: *See—*
Thomas, Carter J.; Dannenberg, Todd D.; and Reid, Mary J., 364,674, Cl. D23-280.400.

Kornick, Joseph M.: *See—*
Miller, Charles D.; Kornick, Joseph M.; and Pritchard, Robert W., 364,563, Cl. D9-423.000.

Krupa, Dennis W.; Guspodin, James G.; and Marble, Roger W., to Bridgestone/Firestone, Inc. Tire tread. 364,594, Cl. D12-147.000.

Lage, David P., to Quick Point, Inc. Envelope opener containing lenses. 364,547, Cl. D8-103.000.

Lapsley, Robert M.: *See—*
Lewellen, Richard; and Lapsley, Robert M., 364,591, Cl. D12-96.000.

Laufenberg, Tim J. Socket organizer. 364,526, Cl. D6-570.000.

Law, T. Scott, to Sports Mugs International, Inc. Beverage mug and holder. 364,536, Cl. D7-515.000.

Lazar, Johanna D. Mop head. 364,716, Cl. D32-40.000.

LCTD, L.L.C.: *See—*
Dickey, Trent S.; and Costa, Leon N., 364,539, Cl. D7-620.000.

LDB Automotive, Inc.: *See—*
Jeffery, Robert T., 364,714, Cl. D32-35.000.

Lecocq, Francis: *See—*
Guegan, Jacques; Lecocq, Francis; Moussaud, Jean-Pierre; Urvoy, Jean-Jacques; and Gautier, Valerie, 364,558, Cl. D9-341.000.

Leding, Lisa M.; Crater, Arnold R.; Santoro, Ron; McKernan, Amy; and Chrest, David A. Chassis for housing electrical components of a radio frequency communication system. 364,611, Cl. D14-114.000.

Lee, Ching-Tan. Combined ceiling fan and light. 364,678, Cl. D23-377.000.

Lee, Ho; and Hurr, David M., to Snoloc Corporation. Snow guard. 364,556, Cl. D8-499.000.

Lee, Jay E.: *See—*
Felde, Steven L.; Lee, Jay E.; and Wang, Hsifu, 364,612, Cl. D14-115.000.

Lejuez, Clifford. Shock absorbing insert for a cap. 364,496, Cl. D2-892.000.

Lerio Corporation, The: *See—*
Moore, Richard L., 364,564, Cl. D9-429.000.

Lewellen, Richard; and Lapsley, Robert M., to Stahl/Scott Fetzer Company. Van body. 364,591, Cl. D12-96.000.

Lim, Bong U., to Samsung Electronics Co., Ltd. Facsimile. 364,613, Cl. D14-118.000.

Lina, Cesar Z.: *See—*
Heaton, Keith; and Lina, Cesar Z., 364,679, Cl. D24-118.000.

Linner, Hans, to Norden Pac Development AB. Container. 364,557, Cl. D9-302.000.

Lipshultz, Alfred J.; and Lipshultz, Mitchell. Countertop water purification unit. 364,672, Cl. D23-209.000.

Lipshultz, Mitchell: *See—*
Lipshultz, Alfred J.; and Lipshultz, Mitchell, 364,672, Cl. D23-209.000.

Livernois, Richard G. Surgical eye restraint instrument. 364,681, Cl. D24-133.000.

Longan, John: *See—*
Chiu, Bernard; Longan, John; and Marvin, Robert L., Jr., 364,676, Cl. D23-356.000.

L'Oreal SA: *See—*
Gavin, Ellen, 364,709, Cl. D28-78.000.

Lorio, Gwen H.; Ketsdever, Katerine J. M.; and Hofmeister, Albert, to Clorox Company, The. Exterior surface of a bottle. 364,569, Cl. D9-523.000.

Loud, Craig M.: *See—*
Teo, Maurice G. T.; and Loud, Craig M., 364,686, Cl. D24-200.000.

Maeta, Susumu: *See—*
Tanaka, Masao; Maeta, Susumu; and Yamaoka, Takashi, 364,603, Cl. D13-165.000.
Tanaka, Masao; and Maeta, Susumu, 364,604, Cl. D13-165.000.

Magnuson, Paulette M.: *See—*
Berner, John M.; Jacobs, Richard H.; Ipsen, Richard D.; Novetzke, Thomas J.; Magnuson, Paulette M.; and Wrobel, Steve, 364,531, Cl. D7-374.000.

Maldanis, Algert J., to Rowe International, Inc. Cold drink vending machine. 364,646, Cl. D20-4.000.

Marble, Roger W.: *See—*
Krupa, Dennis W.; Guspodin, James G.; and Marble, Roger W., 364,594, Cl. D12-147.000.

Marfori, Eddie J.; and Bergeron, Gregory B., to Educational Insights. Electronic quiz unit for attachment to books. 364,643, Cl. D19-60.000.

Martinez, Beatrice E. Indexable vertical bookshelf for oversized books. 364,517, Cl. D6-467.000.

Marvin, Robert L., Jr.: *See—*
Chiu, Bernard; Longan, John; and Marvin, Robert L., Jr., 364,676, Cl. D23-356.000.

Mason, Mark R.: *See—*
Prior, Sean; and Mason, Mark R., 364,620, Cl. D14-147.000.

Mathiassen, Torbjørn. Hook for suspending or carrying bottles containing beverages. 364,552, Cl. D8-367.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Goto, Masaaki; and Ninomiya, Shigetada, 364,633, Cl. D16-202.000.
Nakashima, Toshihiro; Nishida, Makoto; and Yoshimura, Kazuma, 364,632, Cl. D16-202.000.

Matsushita, Takeshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. 35 MM camera. 364,634, Cl. D16-209.000.

Matthews, Alvita L. Umbrella rack. 364,520, Cl. D6-514.000.

McBride, John K.: *See—*
Chapman, Steven S.; McBride, John K.; and Rydelek, James G., 364,635, Cl. D16-218.000.

McJunkin, Mark A.; Chunn, Daniel A.; and Watson, James B., to Ryobi Motor Products. Hedge trimmer. 364,541, Cl. D8-8.000.

McKernan, Amy: *See—*
Leding, Lisa M.; Crater, Arnold R.; Santoro, Ron; McKernan, Amy; and Chrest, David A., 364,611, Cl. D14-114.000.

McNamara, Sean P. Golf putter head. 364,664, Cl. D21-217.000.

Meccano, S.A.: *See—*
Guegan, Jacques; Lecocq, Francis; Moussaud, Jean-Pierre; Urvoy, Jean-Jacques; and Gautier, Valerie, 364,558, Cl. D9-341.000.

Metcalf, Jeffrey D.: *See—*
Camfield, David K.; and Metcalf, Jeffrey D., 364,662, Cl. D21-191.000.

Microsoft Corporation: *See—*
Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, 364,609, Cl. D14-114.000.

Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, 364,610, Cl. D14-114.000.

Mikron Industries, Inc.: *See*—
Goss, Lorane C., Jr., 364,688, Cl. D25-124.000.
Goss, Lorane C., Jr., 364,689, Cl. D25-124.000.
Goss, Lorane C., Jr., 364,690, Cl. D25-124.000.
Goss, Lorane C., Jr., 364,691, Cl. D25-125.000.

Miller, Charles D.; Kornick, Joseph M.; and Pritchard, Robert W., to SmithKline Beecham Corporation. Box. 364,563, Cl. D9-423.000.

Minnesota Mining and Manufacturing Company: *See*—
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., 364,614, Cl. D14-121.000.

Moon, In-Ho, to American Standard Inc. Corner shelf. 364,527, Cl. D6-574.000.

Moore, Devin, to W. C. Bradley Company. Cooking grate. 364,535, Cl. D7-409.000.

Moore, Michael W., to Tenelex Industries, Inc. Leak detector. 364,577, Cl. D10-96.000.

Moore, Richard L., to Lerio Corporation, The. Container. 364,564, Cl. D9-429.000.

Moroze, Michael L.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl. D14-149.000.

Motorola, Inc.: *See*—
Fenton, William E.; Redman, Brian; and Rak, Roman P., 364,624, Cl. D14-234.000.

Moussaud, Jean-Pierre: *See*—
Guegan, Jacques; Lecocq, Francis; Moussaud, Jean-Pierre; Urvoy, Jean-Jacques; and Gautier, Valerie, 364,558, Cl. D9-341.000.

Murphy, Thomas B.; Northrop, Melaney L.; and Nesbitt, Richard, to Doskocil Manufacturing Company, Inc. Pet kennel. 364,712, Cl. D30-108.000.

Myers, Gary L., to Fort Lock Corporation. Motorcycle saddle bag lock. 364,549, Cl. D8-331.000.

Myers, Gary L., to Fort Lock Corporation. Motorcycle steering fork lock. 364,550, Cl. D8-331.000.

Nagy, Emil. Golf putter. 364,666, Cl. D21-219.000.

Nakada, Kazuo, to International Business Machines Corporation. CRT display. 364,608, Cl. D14-113.000.

Nakamura, Kenzi: *See*—
Oda, Teruo; Nakamura, Kenzi; Itoh, Yoshito; Kimura, Yumiko; and Kobayashi, Hiroshi, 364,616, Cl. D14-138.000.

Nakashima, Toshihiro; Nishida, Makoto; and Yoshimura, Kazuma, to Matsushita Electric Industrial Co., Ltd. Television camera. 364,632, Cl. D16-202.000.

Nanayakkara, Lakdas. Combined wristwatch and pager with band portions. 364,570, Cl. D10-31.000.

Neiert, Todd W. Intravenous bottle stand clamp. 364,555, Cl. D8-396.000.

Nesbitt, Richard: *See*—
Murphy, Thomas B.; Northrop, Melaney L.; and Nesbitt, Richard, 364,712, Cl. D30-108.000.

Nikaido, Takashi: *See*—
Goto, Atsushi; and Nikaido, Takashi, 364,572, Cl. D10-39.000.

Nike, Inc.: *See*—
Avar, Eric P., 364,499, Cl. D2-970.000.
Teague, Tracy L., 364,498, Cl. D2-969.000.

Ninomiya, Shigetada: *See*—
Goto, Masaaki; and Ninomiya, Shigetada, 364,633, Cl. D16-202.000.

Nippon Idou Tsushin Corporation: *See*—
Oda, Teruo; Nakamura, Kenzi; Itoh, Yoshito; Kimura, Yumiko; and Kobayashi, Hiroshi, 364,616, Cl. D14-138.000.

Nippondenso Co., Ltd.: *See*—
Oda, Teruo; Nakamura, Kenzi; Itoh, Yoshito; Kimura, Yumiko; and Kobayashi, Hiroshi, 364,616, Cl. D14-138.000.

Nishida, Makoto: *See*—
Nakashima, Toshihiro; Nishida, Makoto; and Yoshimura, Kazuma, 364,632, Cl. D16-202.000.

Nokia Mobile Phones Ltd.: *See*—
Prior, Sean; and Mason, Mark R., 364,620, Cl. D14-147.000.

Norden Pac Development AB: *See*—
Linner, Hans, 364,557, Cl. D9-302.000.

Northern Telecom Limited: *See*—
Somoza, Vincent, 364,618, Cl. D14-142.000.

Northrop, Melaney L.: *See*—
Murphy, Thomas B.; Northrop, Melaney L.; and Nesbitt, Richard, 364,712, Cl. D30-108.000.

Novetzke, Thomas J.: *See*—
Berner, John M.; Jacobs, Richard H.; Ipsen, Richard D.; Novetzke, Thomas J.; Magnuson, Paulette M.; and Wrobel, Steve, 364,531, Cl. D7-374.000.

Nyberg, Bo: *See*—
Gustafsson, Morgan, 364,673, Cl. D23-223.000.

Ocean Kayak, Inc.: *See*—
Barton, Gregory M., 364,599, Cl. D12-302.000.

Oda, Teruo; Nakamura, Kenzi; Itoh, Yoshito; Kimura, Yumiko; and Kobayashi, Hiroshi, to Nippondenso Co., Ltd.; and Nippon Idou Tsushin Corporation. Housing of a hand-held type portable telephone. 364,616, Cl. D14-138.000.

O'Donnell, Daniel J.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl. D14-149.000.

Ossid Corporation: *See*—
Tolson, Sidney S., 364,559, Cl. D9-345.000.

Osterhout, Ralph F., to Tiger Electronics, Inc. Pen recorder housing. 364,641, Cl. D19-36.000.

Osterhout, Ralph F., to Tiger Electronics, Inc. Hand-held electronic game housing. 364,648, Cl. D21-13.000.

Otsuka, Norio, to Feather Safety Razor Co., Ltd. Surgical knife depth gauge. 364,683, Cl. D24-140.000.

Pacha, Duane E. Snow board binding. 364,667, Cl. D21-230.000.

Palaski, Donald A.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl. D14-149.000.

Patel, Dhirendra M.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl. D14-149.000.

Paull, Mike M.: *See*—
Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, 364,609, Cl. D14-114.000.
Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, 364,610, Cl. D14-114.000.

Pearsall, Ronald W., to Accutron Systems Inc. Control unit. 364,573, Cl. D10-50.000.

Pedersen-Rask, Jørgen, to Interlego AG. Container with a lid. 364,562, Cl. D9-418.000.

Peery, William L. Building tool for an igloo. 364,693, Cl. D25-199.000.

Penzes, Miklos: *See*—
Qualls, John; Qualls, Robert; and Penzes, Miklos, 364,602, Cl. D13-112.000.

Perry, Robert E., Jr. Fishing rod holder. 364,671, Cl. D22-147.000.

Petska, Roy J. Shampoo and conditioner rack. 364,525, Cl. D6-567.000.

Platt, Stephen J. Gate lock. 364,548, Cl. D8-331.000.

Pollard, Jerry K. Universal curb stop key. 364,542, Cl. D8-14.000.

Prince Castle Inc.: *See*—
Robards, Chester F., Jr.; and Gepty, Ross B., 364,530, Cl. D7-350.000.

Prior, Sean; and Mason, Mark R., to Nokia Mobile Phones Ltd. Telephone handset. 364,620, Cl. D14-147.000.

Pritchard, Robert W.: *See*—
Miller, Charles D.; Kornick, Joseph M.; and Pritchard, Robert W., 364,563, Cl. D9-423.000.

Pryor, Timothy B.; and Retlick, Steven S., to ERDA, Inc. Aircraft seat. 364,508, Cl. D6-356.000.

Qualls, John; Qualls, Robert; and Penzes, Miklos. Manually driven alternator for battery jump-starting. 364,602, Cl. D13-112.000.

Qualls, Robert: *See*—
Qualls, John; Qualls, Robert; and Penzes, Miklos, 364,602, Cl. D13-112.000.

Quast, Dennis: *See*—
Tieffel, Belinda J.; and Quast, Dennis, 364,546, Cl. D8-71.000.

Quick Point, Inc.: *See*—
Lage, David P., 364,547, Cl. D8-103.000.

Radel, Robert J., to Tennessee Valley Authority. Mount for overhead transparency. 364,615, Cl. D14-123.000.

Rahbek, Helle, to Interlego AG. Toy dolphin. 364,660, Cl. D21-157.000.

Rak, Roman P.: *See*—
Fenton, William E.; Redman, Brian; and Rak, Roman P., 364,624, Cl. D14-234.000.

Redman, Brian: *See*—
Fenton, William E.; Redman, Brian; and Rak, Roman P., 364,624, Cl. D14-234.000.

Reid, Mary J.: *See*—
Thomas, Carter J.; Dannenberg, Todd D.; and Reid, Mary J., 364,674, Cl. D23-280.400.

Restorative Medical, Inc.: *See*—
Bonn, Karen L.; and Brown, Lawrence A., 364,684, Cl. D24-191.000.

Retlick, Steven S.: *See*—
Pryor, Timothy B.; and Retlick, Steven S., 364,508, Cl. D6-356.000.

Reuss, Mark A. Lottery ticket scraper. 364,718, Cl. D32-46.000.

Rinaldi, Olivier H. Patio seat. 364,509, Cl. D6-370.000.

Roadmaster Corporation: *See*—
Camfield, David K.; and Metcalf, Jeffrey D., 364,662, Cl. D21-191.000.

Robards, Chester F., Jr.; and Gepty, Ross B., to Prince Castle Inc. Food warmer. 364,530, Cl. D7-350.000.

Robert Krups GmbH & Co. KG: *See*—
Seiffert, Florian, 364,532, Cl. D7-379.000.

Rooster Products International, Inc.: *See*—
Andrews, Craig, 364,513, Cl. D6-411.000.

Rouse, Teryl K.: *See*—
Francis, Paul S.; and Rouse, Teryl K., 364,720, Cl. D32-49.000.

Rowe International, Inc.: *See*—
Maldanis, Algert J., 364,646, Cl. D20-4.000.

Ruszkai, Ede F., to Interlego AG. Toy building element. 364,656, Cl. D21-108.000.

Rydelek, James G.: *See*—
Chapman, Steven S.; McBride, John K.; and Rydelek, James G., 364,635, Cl. D16-218.000.

Ryobi Motor Products: *See*—
Chunn, Daniel A.; and Keith, James A., Jr., 364,545, Cl. D8-70.000.
McJunkin, Mark A.; Chunn, Daniel A.; and Watson, James B., 364,541, Cl. D8-8.000.

Saizan, Robert T.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl. D14-149.000.

Samsung Electronics Co. Ltd.: *See*—
Backs, Jochen, 364,605, Cl. D14-100.000.
Backs, Jochen, 364,607, Cl. D14-113.000.
Lim, Bong U., 364,613, Cl. D14-118.000.

Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, to Microsoft Corporation. Computer input device. 364,609, Cl. D14-114.000.

Sanchez, Russell; Kaneko, Steven T.; Greenberg, Bridget; Paull, Mike M.; and Dillon, Robert, to Microsoft Corporation. Computer input device. 364,610, Cl. D14-114.000.

Santana, Annette. Moon and stars glow in the dark baby mobile. 364,652, Cl. D21-63.000.

Santoro, Ron: *See*—
Leding, Lisa M.; Crater, Arnold R.; Santoro, Ron; McKernan, Amy; and Chrest, David A., 364,611, Cl. D14-114.000.

Sanyo Electric Co., Ltd.: *See*—
Tanaka, Masao; Maeta, Susumu; and Yamaoka, Takashi, 364,603, Cl. D13-165.000.
Tanaka, Masao; and Maeta, Susumu, 364,604, Cl. D13-165.000.

Schelling, John W. Sport sandal with snap closure system. 364,497, Cl. D2-916.000.

Schmidt, Sten; and Jensen, Kurt, to Interlego AG. Belt drive wheel for a toy building set. 364,657, Cl. D21-108.000.

Schwartz, Harold W. Picture frame. 364,507, Cl. D6-300.000.

Seiffert, Florian, to Robert Krups GmbH & Co. KG. Electric kitchen mixer. 364,532, Cl. D7-379.000.

Sekino, Yoshihiro: *See*—
Iwaki, Yumio; Sekino, Yoshihiro; and Watanabe, Yoshitaka, 364,601, Cl. D13-103.000.

Seo, Chun S. Connector member. 364,554, Cl. D8-382.000.

Shaw, Mark D.; Heyman, J. Tad; Bierce, Laurence M.; and Ehredt, Jesse. Drum top drainfield funnel. 364,629, Cl. D15-150.000.

Shepherd, Charles G.: *See*—
Amram, Denise S.; and Shepherd, Charles G., 364,715, Cl. D32-35.000.

Shikoku Kakoki Co., Ltd.: *See*—
Ishimoto, Mikio, 364,568, Cl. D9-502.000.

Shinano, Inc.: *See*—
Izumisawa, Nobuyuki, 364,544, Cl. D8-62.000.

Shop Vac Corporation: *See*—
Bassler, Louis M.; and Berfield, Robert C., 364,524, Cl. D6-567.000.

Shryock, Jon S.: *See*—
Weder, Donald E.; and Shryock, Jon S., 364,589, Cl. D11-164.000.
Weder, Donald E.; and Shryock, Jon S., 364,587, Cl. D11-164.000.
Weder, Donald E.; and Shryock, Jon S., 364,588, Cl. D11-164.000.

Shurtleff, Jill M., to Gillette Company, The. Razor. 364,707, Cl. D28-46.000.

Siemens Aktiengesellschaft: *See*—
Hillenmayer, Stefan, 364,622, Cl. D14-151.000.

Silvia, John D. Combined dual end flashlight and tool set. 364,694, Cl. D26-38.000.

Simioni, Luciano, to Killer Loop S.p.A. Sunglasses. 364,638, Cl. D16-327.000.

Sisera, Gino; and Sisto, Victor. Basketball cap. 364,494, Cl. D2-369.000.

Sisto, Victor: *See*—
Sisera, Gino; and Sisto, Victor, 364,494, Cl. D2-369.000.

Smith, Shirley H. Hair protector. 364,495, Cl. D2-877.000.

SmithKline Beecham Corporation: *See*—
Miller, Charles D.; Kornick, Joseph M.; and Pritchard, Robert W., 364,563, Cl. D9-423.000.

Snoloc Corporation: *See*—
Lee, Ho; and Hurr, David M., 364,556, Cl. D8-499.000.

Somoza, Vincent, to Northern Telecom Limited. Telephone basestation. 364,618, Cl. D14-142.000.

Sports Mugs International, Inc.: *See*—
Law, T. Scott, 364,536, Cl. D7-515.000.

Stahl/Scott Fetzer Company: *See*—
Lewellen, Richard; and Lapsley, Robert M., 364,591, Cl. D12-96.000.

Staufenberg, Donald J.: *See*—
Bailey, John A.; Bloomer, Glenn A.; Johnson, Gregory H.; Ciesko, Mark J.; and Staufenberg, Donald J., 364,614, Cl. D14-121.000.

Stewart, James C. Vehicular pipe. 364,596, Cl. D12-194.000.

Storsberg, Günter. Electric espresso machine. 364,528, Cl. D7-309.000.

Stowers, David C.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl. D14-149.000.

Straeter, Joseph G.: *See*—
Weder, Donald E.; and Straeter, Joseph G., 364,581, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,582, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,583, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,584, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,585, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., 364,586, Cl. D11-164.000.

Stravitz, David M. CD storage tower. 364,512, Cl. D6-407.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Tanaka, Masatoshi, 364,593, Cl. D12-146.000.

Sung, Chun F. Glass shade. 364,701, Cl. D26-136.000.

Sung, Chun F. Glass shade. 364,702, Cl. D26-136.000.

Tanaka, Masao; Maeta, Susumu; and Yamaoka, Takashi, to Sanyo Electric Co., Ltd.; and Tottori Sanyo Electric Co., Ltd. Light receiving module. 364,603, Cl. D13-165.000.

Tanaka, Masao; and Maeta, Susumu, to Sanyo Electric Co., Ltd.; and Totori Sanyo Electric Co., Ltd. Light receiving module. 364,604, Cl. D13-165.000.

Tanaka, Masatoshi, to Sumitomo Rubber Industries, Ltd. Automobile tire. 364,593, Cl. D12-146.000.

Tarrson, Emanuel B.; Alger, Andrew; and Blahuta, Lew, to John O. Butler Company. Dental floss holder. 364,708, Cl. D28-64.000.

Tashiro, Naoki, to Canon Kabushiki Kaisha. Printer for electronic computer. 364,639, Cl. D18-50.000.

Teague, Tracy L., to Nike, Inc. Shoe upper. 364,498, Cl. D2-969.000.

Tebbe, Sharon M. Double bowl wash basin. 364,675, Cl. D23-290.000.

Telco Cretions, Inc.: *See*—
Cohen, Seymour, 364,579, Cl. D11-129.000.

Temp-Tech Co., Inc.: *See*—
Anderson, John W., 364,537, Cl. D7-553.000.

Tenelex Industries, Inc.: *See*—
Moore, Michael W., 364,577, Cl. D10-96.000.

Tennessee Valley Authority: *See*—
Radel, Robert J., 364,615, Cl. D14-123.000.

Teo, Maurice G. T.; and Loud, Craig M., to JB Research, Inc. Wand for a massage system. 364,686, Cl. D24-200.000.

Testor Corporation, The: *See*—
Andrews, John J., 364,600, Cl. D12-333.000.

Thomas, Carter J.; Dannenberg, Todd D.; and Reid, Mary J., to Kohler Co. Tub for bathing. 364,674, Cl. D23-280.400.

Thomas J. Lipton Co., Division of Conopco., Inc.: *See*—
Bradfield, Richard D.; and Dick, Graham A., 364,491, Cl. D1-199.000.
Bradfield, Richard D.; and Dick, Graham A., 364,492, Cl. D1-199.000.

Thompson, Judith A. Stroller mountable sun visor. 364,592, Cl. D12-133.000.

Tieffel, Belinda J.; and Quast, Dennis. Tiltable mixing bowl support. 364,546, Cl. D8-71.000.

Tiger Electronics, Inc.: *See*—
Osterhout, Ralph F., 364,641, Cl. D19-36.000.
Osterhout, Ralph F., 364,648, Cl. D21-13.000.

Tinen, William J., to USG Interiors, Inc. Fiberglass reinforced gypsum ceiling panel. 364,692, Cl. D25-138.000.

Tolson, Sidney S., to Ossid Corporation; and Ibaraki Seiki Machinery Co., Ltd. Film wrapped product filled tray having an offset bottom seal. 364,559, Cl. D9-345.000.

Topace Company: *See*—
Cheng, Hai P., 364,677, Cl. D23-366.000.

Totori Sanyo Electric Co., Ltd.: *See*—
Tanaka, Masao; and Maeta, Susumu, 364,604, Cl. D13-165.000.

Tottori Sanyo Electric Co., Ltd.: *See*—
Tanaka, Masao; Maeta, Susumu; and Yamaoka, Takashi, 364,603, Cl. D13-165.000.

Trapp, Virginia M. Device for maintenance of a swimming pool. 364,717, Cl. D32-42.000.

Tsang, Kwong T.: *See*—
Yim, Kam S.; and Tsang, Kwong T., 364,687, Cl. D24-211.000.

Tuttle, Susan L.: *See*—
Clarke, John E.; Danielson, David C.; DeSiena, Bernard A.; Estevez-Alcolado, Sonia M.; Graham, James R.; Moroze, Michael L.; O'Donnell, Daniel J.; Palaski, Donald A.; Patel, Dhirendra M.; Saizan, Robert T.; Stowers, David C.; and Tuttle, Susan L., 364,621, Cl. D14-149.000.

U.S. Philips Corporation: *See*—
Kip, Albart J., 364,682, Cl. D24-133.000.

Urvoy, Jean-Jacques: *See*—
Guegan, Jacques; Lecocq, Francis; Moussaud, Jean-Pierre; Urvoy, Jean-Jacques; and Gautier, Valerie, 364,558, Cl. D9-341.000.

USG Interiors, Inc.: *See*—
Tinen, William J., 364,692, Cl. D25-138.000.

Utz, Russell L.; and Utz, William H., Sr. Speed square with level. 364,574, Cl. D10-62.000.

Utz, William H., Sr.: *See*—
Utz, Russell L.; and Utz, William H., Sr., 364,574, Cl. D10-62.000.

Vailliencourt, Dwayne G.; and Eberle, Theodore F., Jr., to Hoover Universal, Inc. Container sidewall. 364,565, Cl. D9-434.000.

W. C. Bradley Company: *See*—
Moore, Devin, 364,535, Cl. D7-409.000.

Wada, Masao: *See*—
Goto, Atsushi; and Wada, Masao, 364,571, Cl. D10-38.000.
Wang, Hsifu: *See*—
Felde, Steven L.; Lee, Jay E.; and Wang, Hsifu, 364,612, Cl. D14-115.000.
Wasyin, Richard M. Funnel for seeds. 364,540, Cl. D8-2.000.
Watanabe, Kazuya; and Hayashi, Kiyofumi, to Fujicopian Co., Ltd. Transfer tape holder. 364,644, Cl. D19-69.000.
Watanabe, Yoshitaka: *See*—
Iwaki, Yumio; Sekino, Yoshihiro; and Watanabe, Yoshitaka, 364,601, Cl. D13-103.000.
Watson, James B.: *See*—
McJunkin, Mark A.; Chunn, Daniel A.; and Watson, James B., 364,541, Cl. D8-8.000.
Weder, Doanld E.; and Shryock, Jon S., to Highland Supply Corporation. Flower pot cover. 364,589, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,581, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,582, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover with fins. 364,583, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,584, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,585, Cl. D11-164.000.
Weder, Donald E.; and Straeter, Joseph G., to Highland Supply Corporation. Flower pot cover. 364,586, Cl. D11-164.000.
Weder, Donald E.; and Shryock, Jon S., to Highland Supply Corporation. Flower pot cover. 364,587, Cl. D11-164.000.
Weder, Donald E.; and Shryock, Jon S., to Highland Supply Corporation. Flower pot cover. 364,588, Cl. D11-164.000.
Weinstein, Randy H., to Betta Products, Inc. Toy balloon. 364,655, Cl. D21-84.000.
Williams, Eleanor R. Surgical scrub suit. 364,493, Cl. D2-714.000.
Wilsdorf, Gerd, to Bosch-Siemen Hausgeraete GmbH. Electric range. 364,529, Cl. D7-340.000.
Wilson, Arthur K. Clip for hanging picture frames. 364,553, Cl. D8-373.000.
Winner International Royalty Corporation: *See*—
Winner, Kevin D., 364,669, Cl. D22-117.000.
Winner, Kevin D., to Winner International Royalty Corporation. Personal protection spray dispenser. 364,669, Cl. D22-117.000.
Wrobel, Steve: *See*—
Berner, John M.; Jacobs, Richard H.; Ipsen, Richard D.; Novetzke, Thomas J.; Magnuson, Paulette M.; and Wrobel, Steve, 364,531, Cl. D7-374.000.
Yamaha Motor Manufacturing Corporation of America: *See*—
Yamashita, Izumi, 364,590, Cl. D12-15.000.
Yamaoka, Takashi: *See*—
Tanaka, Masao; Maeta, Susumu; and Yamaoka, Takashi, 364,603, Cl. D13-165.000.
Yamashita, Izumi, to Yamaha Motor Manufacturing Corporation of America. Utility vehicle. 364,590, Cl. D12-15.000.
Yan, San-Jyh. Lamp shade. 364,695, Cl. D26-131.000.
Yan, San-Jyh. Lamp shade. 364,699, Cl. D26-134.000.
Yaniv, Zvi, to Kent Display Systems, L.P. Coupon dispensing apparatus. 364,521, Cl. D6-515.000.
Yim, Kam S.; and Tsang, Kwong T. Massager. 364,687, Cl. D24-211.000.
Yoshimura, Kazuma: *See*—
Nakashima, Toshihiro; Nishida, Makoto; and Yoshimura, Kazuma, 364,632, Cl. D16-202.000.
Z-International, Inc.: *See*—
Koch, Drake L., 364,645, Cl. D19-89.000.
Zimbelman, Tim. Binder for large sheets. 364,640, Cl. D19-27.000.

LIST OF PLANT PATENTEES

Florfis AG: *See*—
Schumann, Ingeborg; and Utecht, Angelika, 9,388, Cl. Plt.-87.120.
Zerr, Katharina, 9,385, Cl. Plt.-86.300.
Fuess, Janet S. Chrysanthemum plant named 'Empire Ventura'. 9,384, Cl. Plt.-82.300.
Iverson, Ronald C. Daylily plant named 'Burgundy Lace'. 9,386, Cl. Plt.-87.400.
Iverson, Ronald C. Daylily plant named 'X-2'. 9,387, Cl. Plt.-87.400.
Schumann, Ingeborg; and Utecht, Angelika, to Florfis AG. Geranium plant named 'Fisplosive'. 9,388, Cl. Plt.-87.120.
Utecht, Angelika: *See*—
Schumann, Ingeborg; and Utecht, Angelika, 9,388, Cl. Plt.-87.120.
Zerr, Katharina, to Florfis AG. Poinsettia plant named 'Fisflirt'. 9,385, Cl. Plt.-86.300.

CLASSIFICATION OF PATENTS

ISSUED NOVEMBER 28, 1995

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2

6.7 5,469,578
7 5,469,579
50 5,469,580
69 5,469,581
104 5,469,582
421 5,469,583
422 5,469,584

CLASS 4

326 5,469,585
4515 5,469,586
599 5,469,587

CLASS 5

81.1 5,469,588
400 5,469,589
475 5,469,590
613 5,469,591
654 5,469,592

CLASS 8

159 5,469,593
587 5,470,355
652 5,470,356

CLASS 15

1.7 5,469,596
121 5,469,594
250.19 5,469,595
321 5,469,597

CLASS 16

42 R 5,469,599
111R 5,469,601
111 R 5,469,600
115 5,469,602

CLASS 19

80 R 5,469,603

CLASS 24

16 PB 5,317,787
20 CW 5,469,604
33 C 4,791,708
403 5,469,605
662 5,469,606
716 5,469,607

CLASS 26

19 5,469,608

CLASS 28

271 5,469,609

CLASS 29

243.521 5,469,610
426.2 5,469,611
453 5,469,612
623.5 5,470,357
751 5,469,613
764 5,469,614
846 5,469,615
888.074 5,469,616
889.21 5,469,617
889.72 5,469,618
890.043 Re.35,098
895.2 5,469,619
898.064 5,469,620

CLASS 30

50 5,469,621
146 5,469,622
169 5,469,623
232 5,469,624
251 5,469,625
266 5,469,626

CLASS 33

355 R 5,469,630
364 5,469,631
366 5,469,632
394 5,469,633
508 5,469,627
608 5,469,628
831 5,469,629

CLASS 34

58 5,469,634
104 5,469,635
117 5,469,636

CLASS 36

2 R 5,469,637
28 5,469,638
50.1 5,469,640
93 5,469,641
103 5,469,642
122 5,469,643
127 5,469,644

CLASS 37

291 5,469,645
382 5,469,646
398 5,469,647
457 5,469,648

CLASS 42

43 5,469,649
84 5,469,650

CLASS 43

25 5,469,651
44.83 5,469,652

CLASS 44

426 5,470,358

CLASS 47

1.7 5,469,653
41.12 5,469,654
58 5,470,359
83 5,469,655

CLASS 48

94 5,470,360
197 R 5,470,361

CLASS 49

28 5,469,656
68 5,469,657
82.1 5,469,658
169 5,469,659
276 5,469,661
352 5,469,662
375 5,469,663
452 5,469,664
470 5,469,665
471 5,469,666
477.1 5,469,667
502 5,469,668

CLASS 51

295 5,470,362
298 5,470,368

CLASS 52

[illegible] 5,469,669
12 5,469,670
34 5,470,934
58 5,469,671
74 5,469,672
79.7 5,469,673
[illegible] 5,469,674
125.5 5,469,675
174 5,469,676
223.13 5,469,677
263 5,469,678
301 5,469,679
520 5,469,680
656.9 5,469,681
718.01 5,469,682
730.3 5,469,683
745.13 5,469,684
782.2 5,469,685
793.11 5,469,686

CLASS 53

48.1 5,469,687
419 5,469,688
430 5,469,689
458 5,469,690
472 5,469,691
474 5,469,692
567 5,469,693

CLASS 55

276 5,470,363
484 5,470,364
510 5,470,365

CLASS 56

10.2 E 5,469,694
340.1 5,469,695

CLASS 57

264 5,469,696

CLASS 59

35.1 5,469,697

CLASS 60

39.02 5,469,698
39.06 5,469,700
259 5,469,701
311 5,469,702
399 5,469,703
455 5,469,704
693 5,469,705
739 5,469,706

CLASS 62

3.3 5,469,707
3.64 5,469,708
6 5,469,709
22 5,469,710
51.1 5,469,711
84 5,469,713
125 5,469,714
155 5,469,715
505 5,469,716

CLASS 65

104 5,470,366
162 5,470,367
379 5,470,369

CLASS 66

69 5,469,717
168 5,469,718

CLASS 68

12.04 5,469,719
13 R 5,469,720

CLASS 70

14 5,469,721
56 5,469,722
107 5,469,723
178 5,469,724
208 5,469,725
232 5,469,726
278 5,469,727

CLASS 71

25 5,470,370

CLASS 72

154 5,469,728
379.4 5,469,729
389 5,469,730

CLASS 73

23.31 5,469,731
31.04 5,469,732
105 5,469,733
118.1 5,469,735
151 5,469,736
168 5,469,737
170.07 5,469,738
301 5,469,739
379.04 5,469,740
462 5,469,741
597 5,469,742
627 5,469,743
644 5,469,744
660 5,469,745
861.12 5,469,746
861.37 5,469,747
861.38 5,469,748
861.47 5,469,749
861.61 5,469,750
863.33 5,469,751
866 5,469,752

CLASS 74

7 A 5,469,753
336 R 5,469,754
371 5,469,755
490.05 5,469,756
526 5,469,757
553 5,469,758
567 5,469,759
572 5,469,760
579 R 5,469,761

CLASS 75

229 5,470,371
238 5,470,372
255 5,470,373
348 5,470,374
505 5,470,375
672 5,470,376

CLASS 81

9.43 5,469,762
9.51 5,469,763
177.2 5,469,764
324 5,469,765
367 5,469,766
434 5,469,767

CLASS 83

177 5,469,768

CLASS 84

193 5,469,769
291 5,469,770
385 P 5,469,771
436 5,469,772
609 5,471,006
622 5,471,007
633 5,471,008
645 5,471,009

CLASS 89

36.02 5,469,773

CLASS 91

54 5,469,774

CLASS 92

88 5,469,775
170.1 5,469,776
223 5,469,777

CLASS 95

90 5,470,377
98 Re.35,099
100 5,470,378

CLASS 96

4 5,470,379
102 5,470,380

CLASS 99

336 5,469,778
349 5,469,779
450.7 5,469,780
516 5,469,781
644 5,469,782

CLASS 100

49 5,469,783
93 RP 5,469,784
137 5,469,785

CLASS 101

163 5,469,786
211 5,469,787
227 5,469,788
477 5,469,789

CLASS 102

431 5,469,790

CLASS 104

5 5,469,791

CLASS 105

4.1 5,469,792

CLASS 106

1.23 5,470,381
124 5,470,382
170 5,470,383
213 5,300,145
284.03 5,470,384
404 5,470,385

CLASS 108

2 5,469,793
48 5,469,794
51.3 5,469,795

CLASS 109

49.5 5,469,796

CLASS 111

130 Re.35,100
200 5,469,797

CLASS 112

298 5,469,798

CLASS 114

74 A 5,469,799
74 R 5,469,800
282 5,469,801
301 5,469,802
315 5,469,803
343 5,469,804

CLASS 116

284 5,469,805

CLASS 117

97 5,469,806

CLASS 118

244 5,470,386
303 5,470,387
716 5,470,388
719 5,470,389

CLASS 119

19 5,469,807
27 5,469,808
173 5,469,809
248 5,469,810
263 5,469,811
728 5,469,812
770 5,469,813
815 5,469,814
846 5,469,815

CLASS 123

2 5,469,816
41.79 5,469,817
90.15 5,469,818
179.6 5,469,819
192.2 5,469,820
193.2 5,469,821
195 C 5,469,822
414 5,469,823
416 5,469,824
467 Re.35,101
479 5,469,825
488 5,469,826
491 5,469,827
497 5,469,828
514 5,469,829
515 5,469,830
680 5,469,831
682 5,469,832
698 5,469,833

CLASS 124

88 5,469,834

CLASS 126

25 B 5,469,835
77 5,469,836
299 D 5,469,837
524 5,469,838
552 5,469,839

CLASS 127

38 5,470,391

CLASS 12[illegible]

203.11 5,469,842
203.15 5,469,843
630 5,469,844
633 5,469,845
635 5,469,846
653.1 5,469,847
660.02 5,469,848
660.07 5,469,849
661.01 5,469,851
662.02 5,469,854
662.06 5,469,852
664 5,469,855
696 5,469,856
710 5,469,857
723 5,469,859
765 5,469,860
781 5,469,861
782 5,469,862
844 5,469,863
849 5,469,864
859 5,469,865
[illegible] 5,469,866
898 5,469,867

CLASS 131

60 5,469,869
187 5,469,870
194 5,469,871
291 5,469,872

CLASS 132

270 5,469,873
323 5,469,874

CLASS 134

2 5,470,392
3 5,470,393
25.4 5,470,394
63 5,469,875
105 5,469,876

CLASS 136

203 5,470,395
251 5,470,396
260 5,470,397

CLASS 137

85 5,469,877
155 5,469,878
187 5,469,879
240 5,469,880
315 5,469,881
360 5,469,882
513.3 5,469,883
515.7 5,469,884
568 5,469,885
599 5,469,886
614.04 5,469,887
625.17 5,469,888
625.41 5,469,889

CLASS 138

89 5,469,890
98 5,469,891
121 5,469,892
162 5,469,893
172 5,469,894

CLASS 139

420 R 5,469,895
450 5,469,896

CLASS 141

27 5,469,897
65 5,469,898
275 5,469,899
392 5,469,900

CLASS 144

163 5,469,901
241 5,469,902
345 5,469,903
370 5,469,904

CLASS 148

33.3 5,470,398
104 5,470,399
301 5,470,400
302 5,470,401
325 5,470,402
330 5,470,403
331 4,098,622
426 5,470,404
551 5,470,405

CLASS 149

35 5,470,406
109.6 5,470,407

CLASS 155

201 5,471,281

CLASS 156

62.4 5,470,409
63 5,470,410
64 5,470,411
89 5,470,412
90 5,470,413
108 5,470,422
166 5,470,423
174 5,470,414
196 5,470,416
201 5,470,417
231 5,470,418
244.12 5,470,419
253 5,470,424
332 5,470,425

345 5,470,426
387 5,470,427
[illegible] 5,470,428
510 5,470,429
566 5,470,420
577 5,470,430
642.1 5,470,421
916 5,470,415

CLASS 159
28.6 5,470,431

CLASS 160
35 5,469,905
105 5,469,906

CLASS 162
55 5,470,432
77 5,470,433
117 5,470,434
181.6 5,470,435
207 5,470,436
216 5,470,439
237 5,470,437
273 5,470,438

CLASS 164
376 5,469,908
428 5,469,909
459 5,469,910
467 5,469,911
476 5,469,912

CLASS 165
104.12 5,469,913
166 5,469,914
171 5,469,915

CLASS 166
64 5,469,916
250.01 5,469,917
291 5,469,918
387 5,469,919

CLASS 169
48 5,469,920

CLASS 172
4 5,469,921
22 5,469,922

CLASS 173
176 5,469,924

CLASS 174
36 5,471,010
52.4 5,471,011
53 5,471,012
65 R 5,471,013
124 R 5,471,014
152 GM 5,471,015
254 5,471,016
260 5,471,017

CLASS 175
61 5,469,925
424 5,469,926
432 5,469,927

CLASS 180
6.28 5,469,928
149 5,469,929
227 5,469,930
379 5,469,931

CLASS 181
152 5,471,018
156 5,471,019
210 5,469,932
224 5,471,020

CLASS 182
127 5,469,933
187 5,469,934

CLASS 184
1.5 5,469,935

CLASS 187
205 5,469,936
266 5,469,937
408 5,469,938

CLASS 188
24.21 5,469,939
67 5,469,940
107 [illegible] 5,469,941
250 G 5,469,942
264 F 5,469,943

CLASS 190
18 R 5,469,944
115 5,469,945

CLASS 192
3.58 5,469,946
21.5 5,469,947
35 5,469,948
45.1 5,469,949
85 5,469,950

CLASS 194
206 5,469,951
317 5,469,952

CLASS 198
345.2 5,469,953
412 5,469,954
689.1 5,469,955
699.1 5,469,956
711 5,469,957
834 5,469,958

CLASS 200
61.45 R 5,471,021
83 B 5,471,022
310 5,471,023
458 5,471,024

CLASS 203
9 5,470,440
49 5,470,441
56 5,470,442
57 5,470,443

CLASS 204
93 5,470,444
105 R 5,470,445
177 5,470,446
180.1 Re.35,102
192.16 5,470,447
252 5,470,448
279 5,470,450
298.03 5,470,451
298.21 5,470,452
435 5,470,453

CLASS 206
299 5,469,959
312 5,469,961
315.3 5,469,960
364 5,469,964
387.1 5,469,965
522 5,469,966
527 5,469,967
532 5,469,968
554 5,469,969
709 5,469,963
723 5,469,962

CLASS 208
4 5,470,455
144 5,470,454
244 5,470,456
255 5,470,457
370 5,470,458

CLASS 209
235 5,469,971
245 5,469,972
580 5,469,973
652 5,469,974

CLASS 210
149 5,470,459
151 5,470,460
188 5,470,461
198.1 5,470,462
198.2 5,470,463
205 5,470,465
222 5,470,466
242.3 5,470,467
321.6 5,470,468
321.8 5,470,469
350 5,470,470
386 5,470,471
391 5,470,472
402 5,470,473
500.23 5,470,474
519 5,470,475
615 5,470,476
632 5,470,480
634 5,470,477
635 5,470,479
652 5,470,481
662 5,470,482
741 5,470,483
746 5,470,484
[illegible] 5,470,485
758 5,470,486
767 5,470,487
788 5,470,489

CLASS 211
10 5,469,975
13 5,470,490
59.3 5,469,976
62 5,469,977

CLASS 213
223 5,469,978

CLASS 215
228 5,469,979

CLASS 216
13 5,469,981
22 5,470,491

CLASS 219
69.12 5,471,025
83 5,471,026
85.13 5,471,027
110 5,471,028
120 5,471,029
121.13 5,471,030
121.46 5,471,031
270 5,471,032
388 5,471,033
485 5,471,034
505 5,471,035
522 5,471,036
750 5,471,037

CLASS 220
4.02 5,469,982
412 5,469,983
606 5,469,984
632 5,469,985
762 5,469,986

CLASS 221
96 5,469,987

CLASS 222
1 5,469,988
82 5,469,989
108 5,470,011
148 5,469,990
188 5,469,991
362 5,469,992
383.3 5,469,993
630 5,469,994

CLASS 223
85 5,469,995
99 5,469,996

CLASS 224
224 5,470,000
253 5,470,001
275 5,470,002
316 5,470,003
506 5,469,998
521 5,469,997
542 5,469,999

CLASS 225
99 5,470,004

CLASS 226
1 5,470,005

CLASS 227
175 5,470,007
176 5,470,006
177 5,470,010

CLASS 228
107 5,470,012
108 5,470,013
208 5,470,014

CLASS 229
69 Re.35,103
87.05 5,470,015
101.1 5,470,016

CLASS 235
380 5,471,038
383 5,471,669
441 5,471,039
451 5,471,040
462 5,471,041
472 5,471,042
487 5,471,044
492 5,471,045

CLASS 236
15 A 5,470,018

CLASS 237
19 5,470,019

CLASS 239
265.33 5,470,020

CLASS 241
33 5,470,022
85 5,470,023
234 5,470,024

CLASS 242
[illegible]03 5,470,025
[illegible] R 5,470,026
247 5,470,027
343.2 5,470,028
[illegible]94 5,470,029
383.8 5,470,030
571 5,470,031

CLASS 244
[illegible]TD 5,470,032
[illegible]0 E 5,470,033

CLASS 246
122 R 5,470,034
121 5,470,035

CLASS 248
[illegible] 5,470,021
[illegible] 5,470,036
[illegible] 5,470,037
[illegible]86 5,470,038
[illegible] 5,470,039
[illegible] 5,470,040
49 5,470,041
[illegible]78R 5,470,042

CLASS 250
201.7 5,471,046
208.1 5,471,047
208.2 5,471,049
[illegible] A 5,471,050
[illegible] VT 5,471,051
220 5,471,052
228 5,471,053
231.13 5,471,054
252.1 5,471,055
[illegible] 5,471,056
269.6 5,471,057
291 5,471,058
299 5,471,059
348.5 5,471,060
368 5,471,062
386 5,471,063
452.2 5,471,064
506.1 5,471,065
559.48 5,471,066

CLASS 251
65 5,470,043
98 5,470,044
129.15 5,470,045
329 5,470,046

CLASS 252
8.6 5,470,492
8.7 5,470,493
12 5,470,494
18 5,470,495
49.6 5,470,504
67 5,470,496
68 5,470,497
76 5,470,498
99 5,470,499
174.15 5,470,500
182.28 5,470,501
301.35 5,470,502
301.4 P 5,470,503
500 5,470,505
518 5,470,506
542 5,470,507
544 5,470,509
546 5,470,510

CLASS 257
14 5,471,067
21 5,471,068
30 5,471,069
57 5,471,070
69 5,471,071
77 5,471,072
108 5,471,073
122 5,471,074
130 5,471,075
184 5,471,076
192 5,471,077
198 5,471,078
296 5,471,079
344 5,471,080
356 5,471,081
362 5,471,082
370 5,471,083
417 5,471,086
421 5,471,084
532 5,471,087
668 5,471,088
691 5,471,089
734 5,471,090
752 5,471,091
753 5,471,092
758 5,471,093
774 5,471,094
775 5,471,095
778 5,471,096
787 5,471,097

CLASS 259
363.03 5,471,061

CLASS 261
55 5,470,511

CLASS 264
4.1 5,470,512
40.1 5,470,513
40.4 5,470,514
45.7 5,470,515
135 5,470,516
137 5,470,517
145 5,470,518
193 5,470,519
297.2 5,470,520
321 5,470,521
328.1 5,470,522
328.6 5,470,523

CLASS 266
76 5,470,047
236 5,470,048

CLASS 267
172 5,470,049

CLASS 271
3.03 5,470,050
7 5,470,051
118 5,470,052
213 5,470,053

CLASS 273
1.5 R 5,470,054
26 R 5,470,055
29 B 5,470,056
30 5,470,057
57.2 5,470,067
60 B 5,470,059
65 B 5,470,058
65 E 5,470,060
73 C 5,470,061
73 D 5,470,066
73 R 5,470,062
80.1 5,470,063
85 A 5,470,064
138 A 5,470,079
155 5,470,065
167 A 5,470,068
167 R 5,470,070
186.3 5,470,072
186.4 5,470,071
187.2 5,470,073
195 B 5,470,074
220 5,470,075
232 5,470,076
245 5,470,077
317 5,470,078
437 5,470,080
438 5,470,081
445 5,470,082

CLASS 277
3 5,470,083

CLASS 279
19.3 5,470,084

CLASS 280
11.2 5,470,085
11.22 5,470,086
33.992 5,470,087
87.041 5,470,089
204 5,470,088
276 5,470,090
281.1 5,470,091
288 5,470,092
304.1 5,470,093
602 5,470,094
646 5,470,095
712 5,470,096
728.2 5,470,098
728.3 5,470,097
730.1 5,470,103
737 5,470,104
740 5,470,105
743.1 5,470,106
777 5,470,107
823 5,470,108

CLASS 281
34 5,470,109

CLASS 285
13 5,470,110
24 5,470,112
55 5,470,111
255 5,470,113
367 5,470,114

CLASS 290
54 5,471,098

CLASS 292
335 5,470,115

CLASS 294
1.1 5,470,116
64.1 5,470,117
86.18 5,470,118
157 5,470,119

CLASS 296
3 5,470,120
65.1 5,470,121
97.6 5,470,122
97.9 5,470,123
100 5,470,124
146.6 5,470,125
219 5,470,126

CLASS 297
174 5,470,127
232 5,470,128
330 5,470,129
423.28 5,470,130

CLASS 299
41.1 5,470,131
56 5,470,132

CLASS 301
95 5,470,133

CLASS 303
9.61 5,470,134
122.03 5,470,135
147 5,470,136
188 5,470,137

CLASS 307
53 5,471,099

CLASS 310
12 5,471,100
42 5,471,101
50 5,471,102
81 5,471,103
90 5,471,104
90.5 5,471,105
249 5,471,107
323 5,471,108

CLASS 312
34.4 5,470,138
140 5,470,139
140.3 5,470,140
205 5,470,141
258 5,470,142
334.13 5,470,144
334.4 5,470,143

CLASS 313
22 5,471,109
25 5,471,110
36 5,471,111
485 5,471,112
487 5,471,113

CLASS 315
86 5,471,114
111.21 5,471,115
209 R 5,471,116
247 5,471,117
307 5,471,119
382.1 5,471,121

CLASS 318
284 5,471,122
373 5,471,123
650 5,471,124
803 5,471,125
807 5,471,126
809 5,471,127

CLASS 320
13 5,471,128
21 5,471,129

CLASS 323
303 5,471,130
314 5,471,131
315 5,471,132

CLASS 324
76.44 5,471,133
103 P 5,471,134
158.1 5,471,135
207.19 5,471,138
244.1 5,471,139

303 5,471,140
314 5,471,141
318 5,471,142
326 5,471,143
551 5,471,144
601 5,471,145
635 5,471,147
637 5,471,146
754 5,471,148
757 5,471,151
758 5,471,152
763 5,471,153

CLASS 326

38 5,471,154
39 5,471,155
60 5,471,156
68 5,471,149
87 5,471,150
93 5,471,157
95 5,471,158

CLASS 327

24 5,471,159
51 5,471,160
58 5,471,161
92 5,471,162
250 5,471,165
351 5,471,166
525 5,471,163
538 5,471,167
553 5,471,168
563 5,471,169

CLASS 330

149 5,471,164
151 5,471,170
253 5,471,171
256 5,471,173
257 5,471,174
298 5,471,175

CLASS 331

1 A 5,471,176

CLASS 333

126 5,471,177
193 5,471,178
195 5,471,179
202 5,471,180
246 5,471,181
252 5,471,182

CLASS 335

4 5,471,183
35 5,471,184
51 5,471,185
285 5,471,186

CLASS 340

146.2 5,471,187
310.01 5,471,190
323 R 5,471,191
384.3 5,471,192
438 5,471,193
511 5,471,194
550 5,471,195
572 5,471,196
573 5,471,197
574 5,471,199
628 5,471,200
641 5,471,201
672 5,471,202
825.31 5,471,203
825.44 5,471,204
995 5,471,205

CLASS 341

51 5,471,206
107 5,471,207
120 5,471,208
143 5,471,209
156 5,471,210

CLASS 342

20 4,952,936
26 5,471,211
51 5,471,212
67 5,471,213
70 5,471,214
195 5,471,216
357 5,471,217
359 5,471,219
372 5,471,220

CLASS 343

700 MS 5,471,221
713 5,471,222
786 5,471,223
909 5,471,224

CLASS 345

58 5,471,228
89 5,471,229
98 5,471,225
173 5,471,226

CLASS 347

9 5,471,227
29 5,471,230
68 5,471,231
70 5,471,232
103 5,471,233
171 5,471,234
214 5,471,235
233 5,471,236

CLASS 348

46 5,471,237
98 5,471,238
155 5,471,239
164 5,471,240
222 5,471,241
224 5,471,242
234 5,471,243
257 5,471,244
302 5,471,245
322 5,471,246
402 5,471,247
420 5,471,248
445 5,471,249
448 5,471,250
634 5,471,251
699 5,471,252
734 5,471,253
761 5,471,255

CLASS 351

88 5,471,257
119 5,471,539
123 5,471,258
155 5,471,259
205 5,471,260
210 5,471,261
239 5,471,262

CLASS 352

27 5,471,263

CLASS 353

98 5,471,264

CLASS 354

76 5,471,265
106 5,471,266
212 5,471,270
222 5,471,271
279 5,471,272
288 5,471,273
298 5,471,274
321 5,471,275
465 5,471,276

CLASS 355

25 5,471,277
67 5,471,278
73 5,471,279
200 5,471,280
203 5,471,282
205 5,471,283
210 5,471,284
219 5,471,285
245 5,471,286
256 5,471,287
285 5,471,288
290 5,471,289
309 5,471,290
326 R 5,471,291

CLASS 356

30 5,471,293
73 5,471,294
118 5,471,295
139.06 5,471,296
239 5,471,297
336 5,471,298
345 5,471,300
350 5,471,301
356 5,471,302
357 5,471,303
358 5,471,304
363 5,471,305
367 5,471,306
371 5,471,307
376 5,471,308
394 5,471,309
399 5,471,310
446 5,471,311

CLASS 358

296 5,471,312
337 5,471,315
342 5,471,316
400 5,471,317
443 5,471,319
455 5,471,320
474 5,471,321
502 5,471,322
511 5,471,323
518 5,471,324
524 5,471,325

CLASS 359

15 5,471,326
22 5,471,328
54 5,471,329
59 5,471,330
67 5,471,331
117 5,471,332
173 5,471,333
177 5,471,334
179 5,471,335
191 5,471,336
263 5,471,584
269 5,471,337
273 5,471,338
275 5,471,339
281 5,471,340
293 5,471,341
341 5,471,342
494 5,471,343
566 5,471,344
619 5,471,345
731 5,471,346
807 5,471,347
837 5,471,348

CLASS 360

46 5,471,349
48 5,471,350
53 5,471,351
72.2 5,471,352
73.03 5,471,353
77.05 5,471,354
84 5,471,355
99.03 5,471,356
99.08 5,471,357
113 5,471,358

CLASS 361

93 5,471,359
154 5,471,360
236 5,471,361
257 5,471,362
305 5,471,363
321.4 5,471,364
523 5,471,365
704 5,471,366
719 5,471,367
760 5,471,368
813 5,471,369

CLASS 362

4 5,471,370
32 5,471,371
92 5,471,372
109 5,471,373
191 5,471,374

CLASS 363

20 5,471,376
21 5,471,377
46 5,471,378
260 5,471,375

CLASS 364

146 5,471,380
148 5,471,381
406 5,471,382
410 5,471,383
424.01 5,471,384
424.02 5,471,385
424.05 5,471,388
424.07 5,471,391
426.02 5,471,386
426.03 5,471,387
443 5,471,392
450 5,471,393
474.26 5,471,394
474.28 5,471,395
480 5,471,396
483 5,471,401
484 5,471,402
488 5,471,403
489 5,471,397
490 5,471,398
491 5,471,399
509 5,471,400
516 5,471,404
556 5,471,405
559 5,471,406
578 5,471,408
715.01 5,471,410
724.01 5,471,411
725 5,471,412
786 5,471,413
788 5,471,414

CLASS 365

49 5,471,415
104 5,471,416
145 5,471,417
149 5,471,418
177 5,471,419
182 5,471,420
185.01 5,471,423
185.26 5,471,422
189.01 5,471,424
190 5,471,425
200 5,471,426
201 5,471,428
222 5,471,430
225.7 5,471,431

CLASS 366

13 5,470,145
25 5,470,146
34 5,470,147
64 5,470,148
101 5,470,149
137 5,470,150
165.1 5,470,151
273 5,470,152
303 5,470,153

CLASS 367

118 5,471,433
124 5,471,434
135 5,471,435
154 5,471,436
175 5,471,437

CLASS 368

281 5,471,438

CLASS 369

13 5,471,439
32 5,471,441
34 5,471,445
44.14 5,471,446
44.28 5,471,447
44.29 5,471,448
58 5,471,449
60 5,471,450
71 5,471,451
83 5,471,452
100 5,471,453
107 5,471,455
112 5,471,456
116 5,471,457
126 5,471,458

CLASS 370

13 5,471,459
16 5,471,460
17 5,471,461
18 5,471,463
19 5,471,464
58.1 5,471,465
60 5,471,467
79 5,471,471
81 5,471,470
84 Re.35,104
85.13 5,471,472
85.2 5,471,474
85.7 5,471,473
94.1 5,471,469
105.1 5,471,476
110.1 5,471,477

CLASS 371

10.3 5,471,478
21.2 5,471,480
22.3 5,471,481
25.1 5,471,484
37.1 5,471,485
57.1 5,471,487
61 5,471,488

CLASS 372

19 5,471,489
32 5,471,490
35 5,471,491
38 5,471,492
42 5,471,493
43 5,471,494

CLASS 373

2 5,471,495
94 5,471,496

CLASS 374

141 5,470,154
161 5,470,155

CLASS 375

200 5,471,497
202 5,471,503
233 5,471,504
238 5,471,505
242 5,471,506
295 5,471,498
305 5,471,499
340 5,471,500
344 5,471,508
350 5,471,509
354 5,471,501
372 5,471,510
376 5,471,502

CLASS 376

232 5,471,513
313 5,471,514

CLASS 377

60 5,471,515

CLASS 378

65 5,471,516

CLASS 379

29 5,471,517
58 5,471,518
67 5,471,519
88 5,471,521
97 5,471,522
165 5,471,523
200 5,471,524
247 5,471,525
268 5,471,526
347 5,471,527
390 5,471,528
438 5,471,529
446 5,471,530

CLASS 380

19 5,471,531
21 5,471,532
51 5,471,533

CLASS 381

4 5,471,534
71 5,471,537
92 5,471,538
191 5,471,540

CLASS 382

128 5,471,542
153 5,471,541
173 5,471,543
199 5,471,535
200 5,471,550
264 5,471,544
290 5,471,549
315 5,471,536

CLASS 383

210 5,470,156

CLASS 384

448 5,470,157
484 5,470,158
623 5,470,159

CLASS 385

1 5,471,545
11 5,471,546
37 5,471,548
49 5,471,552
125 5,471,553
131 5,471,554
136 5,471,555

CLASS 392

399 5,471,556

CLASS 395

2.28 5,471,558
2.41 5,471,557
61 5,471,559
77 5,471,560
82 5,471,561
101 5,471,562
110 5,471,676
114 5,471,563
126 5,471,565
131 5,471,566
133 5,471,567
134 5,471,569
135 5,471,570
137 5,471,571
139 5,471,572
141 5,471,573
142 5,471,574
144 5,471,575
154 5,471,576
157 5,471,577
161 5,471,578
162 5,471,675
163 5,471,579
182.02 5,471,609
200.02 5,471,580
200.03 5,471,615
250 5,471,581
284 5,471,586
288 5,471,590
293 5,471,588
296 5,471,637
300.03 5,471,592
308 5,471,585
309 5,471,587
375 5,471,591
402 5,471,603
403 5,471,601
404 5,471,604
405 5,471,600
412 5,471,599
445 5,471,602
449 5,471,598
500 5,471,606
550 5,471,607
600 5,471,610
650 5,471,614
700 5,471,616
750 5,471,621
775 5,471,626
800 5,471,589
839 5,471,618
842 5,471,639

CLASS 400

105 5,470,160

CLASS 401

6 5,470,162
126 5,470,163
195 5,470,164

CLASS 403

313 5,470,165
314 5,470,166
322 5,470,167
368 5,470,168

CLASS 404

6 5,470,169
9 5,470,170
13 5,470,171
25 5,470,172
32 5,470,173
52 5,470,174
72 5,470,175

CLASS 405

115 5,470,177
152 5,470,178
224 5,470,179

CLASS 408

239 R 5,470,180

CLASS 409

134 5,470,181
137 5,470,182

CLASS 411

368 5,470,183
377 5,470,184

CLASS 414

264 5,470,185
388 5,470,186
408 5,470,187
545 5,470,188
618 5,470,189
686 5,470,190
726 5,470,191
741 5,470,192
774 5,470,193
786 5,470,194
797 5,470,195
797.9 5,470,196

CLASS 415

90 5,470,197
115 5,470,198
129 5,470,199
195 5,470,200
200 5,470,201
211.1 5,470,202

CLASS 416

144 5,470,203
157 R 5,470,204
205 5,470,205

CLASS 417

131 5,470,206
313 5,470,207
356 5,470,208
401 5,470,209
477.13 5,470,212
477.7 5,470,210
477.9 5,470,211

CLASS 418

55.2 5,470,213

63 5,470,214
266 5,470,215

CLASS 419

5 5,470,524
36 5,470,525
53 5,470,527

CLASS 420

84 5,470,528
103 5,470,529
416 5,470,530

CLASS 422

46 5,470,531
57 5,470,532
63 5,470,533
67 5,470,534
101 5,470,535
102 5,470,536
104 5,470,537
136 5,470,539
145 5,470,540
186 5,470,541
211 5,470,542
213 5,470,544
292 5,470,545
295 5,470,547

CLASS 423

61 5,470,549
81 5,470,550
139 5,470,552
206.2 5,470,554
219 5,470,555
243.08 5,470,556
249 5,470,557
447.6 5,470,558
489 5,470,559
521 5,470,564

CLASS 424

1.49 5,470,571
9.2 5,470,560
49 5,470,561
52 5,470,565
54 5,470,566
59 5,470,567
61 5,470,562
70.12 5,470,551
78.02 5,470,568
85.1 5,470,569
93.73 5,470,570
200.1 5,470,573
208.1 5,470,572
229.1 5,470,734
401 5,470,574
445 5,470,576
448 5,470,563
450 5,470,577
464 5,470,580
479 5,470,581
489 5,470,582
490 5,470,584
604 5,470,585
609 5,470,586
661 5,470,587
667 5,470,588
698 5,470,589

CLASS 425

2 5,470,590
3 5,470,592
72.1 5,470,216
110 5,470,217
144 5,470,218
216 5,470,220
556 5,470,221

CLASS 426

3 5,470,591
36 5,470,593
87 5,470,594
231 5,470,595
237 5,470,600
429 5,470,601
481 5,470,602
512 5,470,596
521 5,470,597
607 5,470,598

CLASS 427

2.14 5,470,603
8 5,470,604
11 5,470,605
64 5,470,606
96 5,470,607
133 5,470,608
140 5,470,609
255.4 5,470,611
377 5,470,612
388.1 5,470,613
440 5,470,614
459 5,470,615
515 5,470,616
[illegible] 5,470,617
525 5,470,618
578 5,470,619

CLASS 428

4 5,470,620
14 5,470,621
34.9 5,470,622
36.1 5,470,624
36.6 5,470,526
47 5,470,623
48 5,470,625
64.4 5,470,627
64.8 5,470,626
85 5,470,629
95 5,470,630
105 5,470,631
110 5,470,632
116 5,470,633
130 5,470,634
131 5,470,635
141 5,470,636
143 5,470,637
152 5,470,639
171 5,470,640
178 5,470,641
192 5,470,642
206 5,470,643
209 5,470,644
212 5,470,645
216 5,470,646
229 5,470,647
247 5,470,648
305 5,470,649
323 5,470,650
325 5,470,651
328 5,470,652
357 5,470,653
364 5,470,655
370 5,470,656
373 5,470,657
391 5,470,658
398 5,470,659
403 5,470,660
[illegible] 5,470,661
421 5,470,662
472.1 5,470,664
480 5,470,665
653 5,470,666
670 5,470,667
688 5,470,668

CLASS 429

17 5,470,669
[illegible] 5,470,670
26 5,470,671
40 5,470,672
44 5,470,673
50 5,470,674
101 5,470,675
139 5,470,676
190 5,470,677
194 5,470,678
210 5,470,679
218 5,470,680

CLASS 430

5 5,470,681
84 5,470,682
106 5,470,683
109 5,470,684
110 5,470,685
111 5,470,686
137 5,470,687
203 5,470,688
209 5,470,689
273 5,470,691
290 5,470,692
315 5,470,693
321 5,470,694
522 5,470,695
543 5,470,696
550 5,470,697
567 5,470,698
621 5,470,699

CLASS 431

7 5,470,222
24 5,470,223
182 5,470,224
215 5,470,225
295 5,470,226

CLASS 433

8 5,470,228
174 5,470,230
223 5,470,231

CLASS 434

45 5,470,232
112 5,470,233
196 5,470,234
238 5,470,235

CLASS 435

4 5,470,703
5 5,470,701
6 5,470,705
7.1 5,470,711
7.32 5,470,712
7.72 5,470,713
7.8 5,470,714
22 5,470,715
34 5,470,716
47 5,470,717
69.1 5,470,718
69.3 5,470,720
69.7 5,470,721
91.2 5,470,722
93 5,470,725
156 5,470,728
172.3 5,470,726
182 5,470,731
196 5,470,732
222 5,470,733
235.1 5,470,735
240.2 5,470,736
240.243 5,470,739
240.27 5,470,738
252.33 5,470,740
254.1 5,470,741
262 5,470,742
286.1 5,470,745
286.7 5,470,744
287.1 5,470,746
290.1 5,470,747
297.1 5,470,743

CLASS 436

37 5,470,748
38 5,470,749
63 5,470,750
87 5,470,752
89 5,470,753
106 5,470,754
131 5,470,755
144 5,470,756
164 5,470,757
177 5,470,758
541 5,470,759

CLASS 437

2 5,470,760
5 5,470,761
21 5,470,762
24 5,470,764
31 5,470,766
39 5,470,767
40 5,470,768
41 5,470,770
43 5,470,771
45 5,470,774
52 5,470,775
60 5,470,780
68 5,470,781
70 5,470,782
72 5,470,783
101 5,470,784
129 5,470,785
155 5,470,792
183 5,470,787
190 5,470,788
192 5,470,790
195 5,470,793
200 5,470,794
208 5,470,795
209 5,470,796
225 5,470,797
231 5,470,798
238 5,470,799

CLASS 439

12 5,470,236
76.1 5,470,237
98 5,470,238
105 5,470,239
157 5,470,240
159 5,470,241
188 5,470,243
189 5,470,244
259 5,470,245
260 5,470,246
264 5,470,247
281 5,470,248
369 5,470,249
409 5,470,250
439 5,470,254
489 5,470,251
490 5,470,252
491 5,470,253
500 5,470,255
501 5,470,256
578 5,470,257
595 5,470,258
[illegible] 5,470,259
630 5,470,260
752 5,470,261

CLASS 440

72 5,470,262
75 5,470,263
83 5,470,264

CLASS 445

24 5,470,265
59 5,470,266

CLASS 446

22 5,470,267
67 5,470,268
290 5,470,269
354 5,470,270

CLASS 451

55 5,470,271
344 5,470,272
348 5,470,273

CLASS 452

184 5,470,274

CLASS 454

61 5,470,275
155 5,470,276

CLASS 455

12.1 5,471,657
13.1 5,471,641
17 5,471,642
33.1 5,471,643
33.2 5,471,644
34.2 5,471,645
54.1 5,471,646
63 5,471,647
67.4 5,471,649
[illegible] 5,471,650
72 5,471,651
76 5,471,652
[illegible] 5,471,653
126 5,471,654
127 5,471,655
138 5,471,658
132 5,471,659
161.2 5,471,660
165.1 5,471,661
166.1 5,471,662
226.2 5,471,671
260 5,471,673
304 5,471,663
333 5,471,664
343 5,471,665
348 5,471,666
351 5,471,667
352 5,471,668

CLASS 473

28 5,470,765

CLASS 474

70 5,470,277
133 5,470,278
135 5,470,279
139 5,470,281
156 5,470,282

CLASS 475

162 5,470,283
200 5,470,284
210 5,470,285
331 5,470,286

CLASS 477

99 5,470,287
110 5,470,288
111 5,470,289
115 5,470,290

CLASS 479

192 5,469,660

CLASS 482

40 5,470,291
52 5,470,292
54 5,470,293
66 5,470,294
71 5,470,295
91 5,470,296
127 5,470,297
130 5,470,298
142 5,470,299

CLASS 493

11 5,470,300
323 5,470,301

CLASS 501

1 5,470,803
15 5,470,804
33 5,470,805
[illegible] 5,470,806
93 5,470,807
134 5,470,808

CLASS 502

12 5,470,809
64 5,470,810
117 5,470,811
125 5,470,812
175 5,470,813
182 5,470,814
304 5,470,815

CLASS 503

201 5,470,816
227 5,470,817

CLASS 504

244 5,470,819

CLASS 505

230 5,470,821
472 5,470,820

CLASS 507

133 5,470,822
241 5,470,823

CLASS 514

2 5,470,824
8 5,470,826
11 5,470,827
12 5,470,828
13 5,470,830
16 5,470,831
18 5,470,832
19 5,470,834
21 5,470,835
38 5,470,836
45 5,470,837
50 5,470,838
53 5,470,839
54 5,470,840
60 5,470,841
01 5,470,842
91 5,470,844
121 5,470,845
159 5,470,846
171 5,470,847
182 5,470,848
212 5,470,849
213 5,470,850
214 5,470,851
231.5 5,470,852
232.8 5,470,853
233.5 5,470,854
[illegible] 5,470,855
256 5,470,856
288 5,470,857
291 5,470,858
299 5,470,859
318 5,470,860
337 5,470,861
341 5,470,862
343 5,470,863
352 5,470,864
365 5,470,865
376 5,470,866
393 5,470,867
397 5,470,868
406 5,470,869
419 5,470,870
441 5,470,871
456 5,470,872
480 5,470,873
474 5,470,874
478 5,470,875
492 5,470,876
529 5,470,877
558 5,470,878
561 5,470,879
574 5,470,880
588 5,470,881
596 5,470,882
648 5,470,883
714 5,470,884
743 5,470,885

CLASS 521

59 5,470,886
65 5,470,887
79 5,470,888
125 5,470,889
128 5,470,890
131 5,470,891

CLASS 522

42 5,470,892

CLASS 523

205 5,470,893
218 5,470,894
335 5,470,895
428 5,470,896
518 5,470,897

CLASS 524

84 5,470,898
158 5,470,899
269 5,470,900
345 5,470,901
400 5,470,902
458 5,470,903
462 5,470,904
493 5,470,905
507 5,470,906
520 5,470,908
538 5,470,909
785 5,470,910

CLASS 525

54.1 5,470,911
58 5,470,912
66 5,470,913
86 5,470,915
296 5,470,916
326.3 5,470,917
329.2 5,470,918
334.1 5,470,919
421 5,470,920
432 5,470,921
436 5,470,922
477 5,470,923
501 5,470,924

CLASS 526

68 5,470,925
120 5,470,926
126 5,470,927
172 5,470,928
181 5,470,929
204 5,470,930
238.23 5,470,931
312 5,470,932

CLASS 528

24 5,470,933
65 5,470,935
73 5,470,936
198 5,470,937
201 5,470,939
204 5,470,940
272 5,470,941
328 5,470,942
353 5,470,943
354 5,470,944
390 5,470,945
422 5,470,946

CLASS 530

313 5,470,947
315 5,470,948
322 5,470,949
324 5,470,950
330 5,470,951
350 5,470,952
383 5,470,954
387.7 5,470,955
388.25 5,470,957
388.9 5,470,956
389.5 5,470,958

CLASS 534

680 5,470,959

CLASS 536

6.4 5,470,960
7.4 5,470,961
17.2 5,470,962
20 5,470,964
21 5,470,965
23.5 5,470,966
23.7 5,470,971
24.3 5,470,967
102 5,470,968
115 5,470,969

CLASS 540

230 5,470,972

CLASS 544

48 5,470,973
118 5,470,974
334 5,470,975

CLASS 546

77 5,470,976
101 5,470,977
141 5,470,978
147 5,470,979
190 5,470,980
207 5,470,981
268 5,470,982
271 5,470,983

CLASS 548

264.4	5,470,984
312.4	5,470,985
312.7	5,470,986
462	5,470,987
479	5,470,988

CLASS 549

458	5,470,989
466	5,470,990
479	5,470,991

CLASS 554

69	5,470,992

CLASS 556

11	5,470,993
64	5,470,994
91	5,470,995

CLASS 558

46	5,470,996
254	5,470,997

CLASS 560

96	5,470,998
100	5,470,999

CLASS 562

16	5,471,000
593	5,471,001

CLASS 564

412	5,471,002

CLASS 568

420	5,471,003
455	5,471,004
459	5,471,005

CLASS 600

117	5,469,840
158	5,469,841

CLASS 601

2	5,470,302
84	5,470,303
134	5,470,304
161	5,470,305

CLASS 602

8	5,470,306
24	5,470,310

CLASS 604

20	5,470,307
22	5,470,308
24	5,470,311
34	5,470,312
96	5,470,313
118	5,470,316
121	5,470,317
181	5,470,318
167	5,470,319
174	5,470,320
280	5,470,322
289	5,470,323
319	5,470,324
332	5,470,325
383	5,470,326
411	5,470,327

CLASS 606

1	5,470,328
4	5,470,329
7	5,470,330
16	5,470,331
50	5,470,332
61	5,470,333
72	5,470,334
73	5,470,335
105	5,470,336
139	5,470,337
144	5,470,338
167	5,470,339
231	5,470,340

CLASS 607

5	5,470,341
17	5,470,344
30	5,470,345
37	5,470,346
45	5,470,347
68	5,470,348
75	5,470,349
95	5,470,351
97	5,470,350
101	5,470,352
104	5,470,353

CLASS 623

20	5,470,354

CLASSIFICATION OF DESIGNS

D1	199	364,491		507	364,524		348	364,560	D13	103	364,601		80	364,643	D24	118	364,679
D2	369	364,494		570	364,526		415	364,561		112	364,602		69	364,644		129	364,680
	714	364,493		574	364,527		418	364,562		165	364,603		89	364,645		133	364,681
	877	364,495	D7	309	364,528		423	364,563	D14	100	364,605	D20	4	364,646		140	364,683
	892	364,496		340	364,529		429	364,564		106	364,606		18	364,647		191	364,684
	916	364,497		350	364,530		434	364,565		113	364,607	D21	13	364,648		195	364,685
	949	364,498		374	364,531		436	364,566		114	364,609		34	364,649		200	364,686
	970	364,499		379	364,532		502	364,568		115	364,612		37	364,650		211	364,687
	980	364,501		387	364,533		523	364,569		118	364,613		39	364,651	D25	124	364,688
D3	203	364,501		407	364,534	D10	31	364,570		121	364,614		63	364,652		125	364,691
	207	364,502		409	364,535		38	364,571		123	364,615		64	364,653		138	364,692
	273	364,503		515	364,536		39	364,572		138	364,616		84	364,655		159	364,693
	276	364,504		553	364,537		50	364,573		142	364,617		108	364,656	D26	38	364,694
	313	364,505		608	364,538		62	364,574		143	364,619		145	364,659		131	364,695
D4	133	364,506		620	364,539		72	364,575		147	364,620		157	364,660		133	364,696
D6	300	364,507	D8	2	364,540		81	364,576		149	364,621		171	364,661		134	364,699
	356	364,508		8	364,541		96	364,577		151	364,622		191	364,662		136	364,701
	370	364,509		14	364,542	D11	121	364,578		162	364,623		204	364,663		139	364,704
	388	364,510		62	364,544		129	364,579		234	364,624		217	364,664	D28	41	364,705
	393	364,511		70	364,545		131	364,580		240	364,625		219	364,666		46	364,706
	407	364,512		71	364,546		154	364,581	D15	5	364,626		230	364,667		64	364,708
	411	364,513		103	364,547	D12	15	364,590		150	364,629	D22	110	364,668		78	364,709
	449	364,514		331	364,548		96	364,591	D16	133	364,631		117	364,669	D29	112	364,710
	450	364,515		334	364,551		133	364,592		202	364,633		133	364,670		125	364,711
	462	364,516		367	364,552		146	364,593		209	364,634		147	364,671	D30	108	364,712
	467	364,517		373	364,553		147	364,594		218	364,635	D23	209	364,672		144	364,713
	495	364,518		382	364,554		168	364,595		306	364,636		223	364,673	D32	35	364,714
	513	364,519		396	364,555		194	364,596		327	364,638		280.4	364,674		80	364,716
	514	364,520		499	364,556		203	364,597	D18	50	364,639		290	364,675		42	364,717
	515	364,521	D9	302	364,557		215	364,598	D19	27	364,640		356	364,676		46	364,718
	552	364,522		341	364,558		302	364,599		36	364,641		366	364,677		49	364,720
	553	364,523		345	364,559		333	364,600		52	364,642		377	364,678			

CLASSIFICATION OF PLANTS

Plt.	82.3	9,384		86.3	9,385		87.12	9,388		87.4	9,386	

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 5,469,911	5,469,860	5,470,246	5,470,735	5,471,206	5,471,572
5,471,065	5,469,867	5,470,308	5,470,736	5,471,207	5,471,574
5,471,493	5,469,881	5,470,309	5,470,738	5,471,209	5,471,575
02 : 5,469,645	5,469,882	5,470,312	5,470,752	5,471,213	5,471,578
04 : 5,469,581	5,469,895	5,470,313	5,470,766	5,471,217	5,471,580
5,469,601	5,469,925	5,470,319	5,470,772	5,471,218	5,471,583
5,469,651	5,469,946	5,470,322	5,470,773	5,471,220	5,471,586
5,469,654	5,469,963	5,470,330	5,470,775	5,471,224	5,471,588
5,469,834	5,469,969	5,470,342	5,470,801	5,471,240	5,471,589
5,469,854	5,469,970	5,470,375	5,470,824	5,471,248	5,471,603
5,470,205	5,469,974	5,470,405	5,470,825	5,471,253	5,471,604
5,470,272	5,469,975	5,470,413	5,470,842	5,471,255	5,471,605
5,470,477	5,469,987	5,470,415	5,470,848	5,471,259	5,471,606
5,470,517	5,469,998	5,470,430	5,470,868	5,471,264	5,471,612
5,470,552	5,469,999	5,470,445	5,470,874	5,471,304	5,471,618
5,470,600	5,470,000	5,470,447	5,470,892	5,471,311	5,471,623
5,470,680	5,470,007	5,470,455	5,470,894	5,471,326	5,471,627
5,470,753	5,470,022	5,470,459	5,470,911	5,471,328	5,471,632
5,470,949	5,470,036	5,470,462	5,470,951	5,471,345	5,471,635
5,471,106	5,470,061	5,470,465	5,470,954	5,471,346	5,471,636
5,471,174	5,470,063	5,470,499	5,470,997	5,471,353	5,471,642
5,471,178	5,470,068	5,470,505	5,470,999	5,471,367	5,471,647
5,471,303	5,470,069	5,470,520	5,471,007	5,471,375	5,471,658
5,471,307	5,470,072	5,470,538	5,471,042	5,471,381	5,471,659
5,471,330	5,470,074	5,470,544	5,471,075	5,471,396	5,471,672
5,471,445	5,470,078	5,470,546	5,471,077	5,471,401	5,471,673
5,471,479	5,470,080	5,470,560	5,471,087	5,471,416	5,471,675
5,471,631	5,470,082	5,470,569	5,471,091	5,471,421	08 : 5,469,643
05 : 5,471,164	5,470,086	5,470,580	5,471,093	5,471,455	5,469,729
06 : Re.35,099	5,470,089	5,470,582	5,471,094	5,471,469	5,469,748
Re.35,102	5,470,090	5,470,587	5,471,099	5,471,478	5,469,824
5,469,583	5,470,122	5,470,599	5,471,123	5,471,485	5,469,853
5,469,596	5,470,130	5,470,602	5,471,132	5,471,491	5,469,912
5,469,600	5,470,151	5,470,622	5,471,135	5,471,497	5,470,115
5,469,610	5,470,152	5,470,632	5,471,148	5,471,498	5,470,228
5,469,613	5,470,155	5,470,633	5,471,151	5,471,501	5,470,531
5,469,627	5,470,171	5,470,639	5,471,152	5,471,503	5,470,554
5,469,630	5,470,176	5,470,642	5,471,154	5,471,509	5,470,596
5,469,638	5,470,181	5,470,669	5,471,155	5,471,513	5,470,661
5,469,640	5,470,182	5,470,701	5,471,162	5,471,515	5,470,716
5,469,653	5,470,196	5,470,704	5,471,163	5,471,516	5,470,750
5,469,692	5,470,206	5,470,705	5,471,169	5,471,521	5,470,820
5,469,734	5,470,209	5,470,711	5,471,172	5,471,523	5,470,835
5,469,750	5,470,224	5,470,713	5,471,175	5,471,527	5,471,190
5,469,763	5,470,230	5,470,714	5,471,176	5,471,531	5,471,211
5,469,782	5,470,233	5,470,719	5,471,177	5,471,542	5,471,382
5,469,814	5,470,235	5,470,720	5,471,181	5,471,556	5,471,602
5,469,839	5,470,239	5,470,727	5,471,187	5,471,568	09 : Re.35,101
5,469,845	5,470,242	5,470,731	5,471,195	5,471,571	5,469,620

5,469,641
5,469,650
5,469,705
5,469,759
5,469,790
5,470,006
5,470,008
5,470,009
5,470,158
5,470,202
5,470,222
5,470,316
5,470,338
5,470,360
5,470,364
5,470,448
5,470,681
5,470,744
5,470,781
5,471,013
5,471,057
5,471,593
5,471,608
10 : 5,470,409
5,470,435
5,470,469
5,470,541
5,470,656
5,470,662
5,470,814
5,470,898
5,470,922
5,470,967
5,471,001
11 : 5,471,031
12 : 5,469,614
5,469,637
5,469,666
5,469,741
5,469,745
5,469,902
5,469,905
5,469,942
5,470,226
5,470,306
5,470,332
5,470,334
5,470,644
5,470,834
5,470,889
5,471,010
5,471,128
5,471,131
5,471,144
5,471,146
5,471,296
5,471,359
5,471,402
5,471,435
5,471,462
5,471,499
5,471,539
5,471,570
5,471,576
5,471,585
5,471,646
5,471,663
5,471,665
5,471,671
13 : 5,469,589
5,469,661
5,469,672
5,469,683
5,469,724
5,469,737
5,469,901
5,469,992
5,470,095
5,470,270
5,470,328
5,470,472
5,470,480
5,470,537
5,470,631
5,470,640
5,470,653
5,470,969
5,471,039
5,471,137
5,471,492
5,471,519
15 : 5,470,268
5,470,931
16 : 5,470,043
5,470,175
5,471,640
17 : Re.35,098
5,469,580
5,469,587
5,469,590
5,469,671
5,469,690
5,469,694

5,469,722
5,469,726
5,469,758
5,469,761
5,469,835
5,469,874
5,469,893
5,469,921
5,469,941
5,469,943
5,469,965
5,469,967
5,470,014
5,470,016
5,470,035
5,470,046
5,470,150
5,470,163
5,470,170
5,470,183
5,470,189
5,470,237
5,470,275
5,470,327
5,470,353
5,470,414
5,470,464
5,470,482
5,470,486
5,470,519
5,470,568
5,470,620
5,470,747
5,470,839
5,470,890
5,470,944
5,470,995
5,471,005
5,471,026
5,471,118
5,471,125
5,471,147
5,471,222
5,471,391
5,471,471
5,471,532
5,471,644
5,471,645
5,471,670
4,098,622
5,300,145
18 : 5,469,770
5,469,817
5,470,252
5,470,253
5,470,354
5,470,609
5,470,853
5,470,865
5,470,977
5,470,978
5,471,109
5,471,372
5,471,534
5,471,661
19 : 5,469,744
5,469,781
5,469,934
5,470,359
5,470,401
5,470,664
5,470,722
5,471,219
20 : 5,469,830
5,470,028
5,470,146
5,470,174
5,470,584
5,470,821
5,470,857
5,471,639
21 : 5,470,010
5,470,018
5,470,037
5,470,223
5,471,291
22 : 5,469,764
5,469,778
5,469,797
5,469,917
5,469,919
5,469,956
5,470,294
5,470,497
5,470,718
5,471,199
23 : 5,470,103
24 : Re.35,103
5,469,632
5,469,794
5,469,801
5,469,847
5,470,149

5,470,232
5,470,311
5,470,387
5,470,424
5,470,729
5,470,733
5,470,740
5,470,761
5,470,838
5,471,072
5,471,223
5,471,657
25 : 5,469,592
5,469,631
5,469,771
5,469,773
5,469,786
5,469,851
5,469,855
5,469,906
5,470,056
5,470,058
5,470,075
5,470,323
5,470,343
5,470,352
5,470,377
5,470,391
5,470,395
5,470,468
5,470,473
5,470,481
5,470,525
5,470,576
5,470,577
5,470,588
5,470,627
5,470,754
5,470,904
5,470,957
5,470,970
5,471,034
5,471,043
5,471,081
5,471,192
5,471,272
5,471,310
5,471,341
5,471,376
5,471,383
5,471,404
5,471,405
5,471,411
5,471,434
5,471,466
5,471,472
5,471,474
5,471,577
5,471,591
5,471,607
5,471,669
26 : 5,469,593
5,469,595
5,469,621
5,469,633
5,469,639
5,469,662
5,469,663
5,469,664
5,469,715
5,469,721
5,469,747
5,469,766
5,469,777
5,469,825
5,469,826
5,469,875
5,469,892
5,469,929
5,469,948
5,469,995
5,470,003
5,470,101
5,470,108
5,470,112
5,470,123
5,470,126
5,470,137
5,470,143
5,470,220
5,470,276
5,470,286
5,470,288
5,470,305
5,470,351
5,470,416
5,470,423
5,470,501
5,470,518
5,470,641
5,470,797
5,470,891
5,470,908

5,470,923
5,470,981
5,470,987
5,470,993
5,471,021
5,471,048
5,471,327
5,471,337
5,471,371
5,471,386
5,471,461
27 : Re.35,100
5,469,685
5,469,687
5,469,702
5,469,820
5,469,862
5,469,922
5,469,926
5,470,039
5,470,208
5,470,296
5,470,307
5,470,315
5,470,341
5,470,345
5,470,346
5,470,368
5,470,452
5,470,522
5,470,526
5,470,532
5,470,605
5,470,625
5,470,679
5,470,737
5,470,757
5,470,926
5,471,244
5,471,348
5,471,354
5,471,470
5,471,482
5,471,487
5,471,489
5,471,560
5,471,597
5,471,626
28 : 5,469,809
5,469,957
5,470,110
5,471,107
29 : 5,469,598
5,469,599
5,469,785
5,469,993
5,470,027
5,470,096
5,470,116
5,470,298
5,470,339
5,470,593
5,470,629
5,470,883
5,470,942
30 : 5,470,180
5,470,443
5,470,712
5,471,019
5,471,098
31 : 5,469,673
5,469,812
5,470,118
5,470,269
32 : 5,469,772
5,470,535
33 : 5,469,612
5,469,861
5,470,317
5,470,471
5,470,955
5,471,180
5,471,573
5,471,596
5,471,638
34 : 5,469,642
5,469,689
5,469,698
5,469,699
5,469,779
5,469,864
5,469,903
5,469,932
5,469,980
5,469,990
5,470,079
5,470,109
5,470,120
5,470,154
5,470,217
5,470,218
5,470,304
5,470,326

5,470,340
5,470,357
5,470,358
5,470,396
5,470,508
5,470,530
5,470,562
5,470,564
5,470,594
5,470,743
5,470,783
5,470,810
5,470,812
5,470,830
5,470,845
5,470,861
5,470,862
5,470,875
5,470,912
5,470,925
5,470,971
5,470,976
5,471,208
5,471,216
5,471,221
5,471,318
5,471,508
5,317,787
35 : 5,469,624
5,469,684
5,469,890
5,469,997
5,470,363
5,470,668
5,470,674
5,471,062
36 : 5,469,588
5,469,618
5,469,622
5,469,649
5,469,680
5,469,701
5,469,710
5,469,711
5,469,802
5,469,807
5,469,964
5,469,971
5,469,981
5,470,002
5,470,026
5,470,031
5,470,038
5,470,055
5,470,066
5,470,067
5,470,092
5,470,132
5,470,148
5,470,162
5,470,257
5,470,271
5,470,282
5,470,285
5,470,292
5,470,297
5,470,300
5,470,318
5,470,320
5,470,337
5,470,386
5,470,410
5,470,420
5,470,422
5,470,436
5,470,467
5,470,488
5,470,521
5,470,567
5,470,612
5,470,626
5,470,688
5,470,690
5,470,693
5,470,695
5,470,698
5,470,784
5,470,788
5,470,795
5,470,804
5,470,831
5,470,846
5,470,885
5,470,895
5,470,913
5,470,952
5,470,968
5,470,979
5,470,980
5,470,994
5,471,027
5,471,033
5,471,046

5,471,090
5,471,092
5,471,096
5,471,102
5,471,110
5,471,139
5,471,188
5,471,260
5,471,262
5,471,270
5,471,300
5,471,308
5,471,313
5,471,314
5,471,320
5,471,324
5,471,362
5,471,397
5,471,488
5,471,533
5,471,543
5,471,548
5,471,609
5,471,628
37 : 5,469,718
5,469,863
5,469,865
5,469,871
5,469,872
5,469,877
5,469,900
5,469,977
5,470,030
5,470,057
5,470,250
5,470,347
5,470,356
5,470,548
5,470,586
5,470,643
5,470,677
5,470,723
5,470,986
5,471,024
5,471,035
5,471,194
5,471,200
5,471,555
39 : 5,469,626
5,469,688
5,469,714
5,469,716
5,469,740
5,469,795
5,469,796
5,469,879
5,470,012
5,470,025
5,470,059
5,470,085
5,470,098
5,470,099
5,470,100
5,470,114
5,470,131
5,470,138
5,470,157
5,470,201
5,470,221
5,470,267
5,470,336
5,470,371
5,470,378
5,470,397
5,470,417
5,470,427
5,470,492
5,470,498
5,470,500
5,470,509
5,470,598
5,470,741
5,470,837
5,470,844
5,470,870
5,470,884
5,470,906
5,470,928
5,470,929
5,470,945
5,471,014
5,471,015
5,471,022
5,471,049
5,471,197
5,471,378
5,471,505
40 : 5,469,603
5,469,686
5,470,087
5,470,264
5,470,441
5,470,457

5,471,114
41 : 5,469,648
5,469,858
5,469,868
5,470,124
5,470,490
5,470,724
5,470,790
5,470,974
5,471,159
5,471,228
5,471,414
5,471,522
5,471,587
5,471,601
5,471,633
5,471,637
42 : 5,469,652
5,469,674
5,469,678
5,469,682
5,469,691
5,469,743
5,469,819
5,469,846
5,469,920
5,469,976
5,469,978
5,470,001
5,470,005
5,470,032
5,470,041
5,470,119
5,470,177
5,470,236
5,470,238
5,470,241
5,470,243
5,470,249
5,470,255
5,470,259
5,470,314
5,470,325
5,470,366
5,470,385
5,470,400
5,470,407
5,470,428
5,470,442
5,470,478
5,470,479
5,470,487
5,470,549
5,470,571
5,470,581
5,470,583
5,470,590
5,470,613
5,470,648
5,470,748
5,470,758
5,470,813
5,470,822
5,470,832
5,470,849
5,470,869
5,470,880
5,470,882
5,470,886
5,470,903
5,470,914
5,470,935
5,470,950
5,470,975
5,470,984
5,471,006
5,471,012
5,471,053
5,471,184
5,471,185
5,471,252
5,471,338
5,471,500
5,471,554
5,471,622
4,791,708
44 : 5,469,629
5,469,876
5,471,182
5,471,433
5,471,634
45 : 5,469,619
5,469,973
5,470,011
5,470,021
5,470,076
5,470,466
5,471,029
5,471,387
47 : 5,469,767
5,469,870
5,470,184
5,470,197
5,470,244
5,470,301
5,470,484
5,470,663
5,470,958
5,470,998
5,471,003
5,471,061
5,471,101
5,471,237
48 : 5,469,578
5,469,597
5,469,665
5,469,679
5,469,736
5,469,742
5,469,783
5,469,804
5,469,866
5,469,878
5,469,884
5,469,887
5,469,914
5,469,916
5,469,918
5,469,933
5,470,040
5,470,071
5,470,073
5,470,111
5,470,160
5,470,207
5,470,215
5,470,227
5,470,231
5,470,234
5,470,248
5,470,324
5,470,380
5,470,440
5,470,514
5,470,556
5,470,749
5,470,787
5,470,793
5,470,794
5,470,802
5,470,811
5,470,823
5,470,847
5,470,876
5,470,927
5,470,932
5,470,946
5,470,947
5,471,011
5,471,017
5,471,056
5,471,078
5,471,105
5,471,143
5,471,145
5,471,153
5,471,157
5,471,158
5,471,189
5,471,198
5,471,212
5,471,225
5,471,245
5,471,293
5,471,364
5,471,393
5,471,398
5,471,400
5,471,410
5,471,415
5,471,422
5,471,426
5,471,431
5,471,443
5,471,544
5,471,590
5,471,592
5,471,598
5,471,599
5,471,613
5,471,616
5,471,617
5,471,625
5,471,668
5,471,674
49 : 5,469,838
5,469,899
5,470,097
5,470,102
5,470,104
5,470,105
5,470,187
5,470,310
5,470,408
5,470,550
5,470,597
5,470,710
51 : 5,469,660
5,469,898
5,469,968
5,470,060
5,470,147
5,470,266
5,470,373
5,470,570
5,470,649
5,470,866
5,471,037
5,471,055
5,471,138
5,471,347
5,471,373
5,471,374
53 : 5,469,787
5,469,813
5,469,988
5,470,091
5,470,093
5,470,140
5,470,178
5,470,333
5,470,504
5,470,726
5,470,730
5,470,826
5,470,878
5,470,953
5,471,036
5,471,524
5,471,563
5,471,564
5,471,567
54 : 5,470,667
5,470,765
5,470,881
5,471,287
55 : 5,469,623
5,469,625
5,469,647
5,469,713
5,469,738
5,469,739
5,469,751
5,469,800
5,469,880
5,469,908
5,469,930
5,469,935
5,469,958
5,469,959
5,470,054
5,470,156
5,470,172
5,470,195
5,470,254
5,470,263
5,470,475
5,470,614
5,470,708
5,470,728
5,470,877
5,470,964
5,471,032
5,471,052
5,471,117
5,471,119
5,471,193
56 : 5,470,384

DESIGN PATENTS

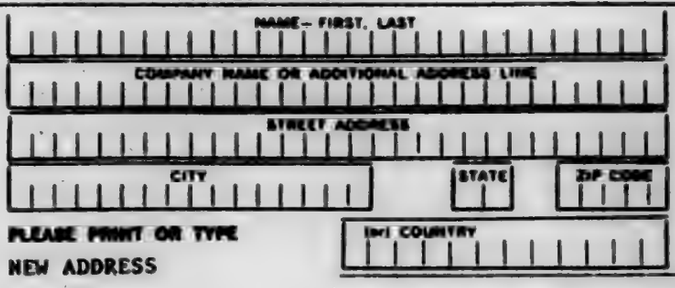
01 : 364,564
364,615
364,694
04 : 364,493
364,612
06 : 364,497
364,505
364,522
364,523
364,533
364,569
364,592
364,595
364,596
364,597
364,600
364,605
364,607
364,640
364,641
364,642
364,643
364,648
364,655
364,667
364,681
364,686
364,704
364,714
08 : 364,617
364,663
09 : 364,710
12 : 364,506
364,534
364,570
364,625
364,629
364,672
13 : 364,495
364,535
364,542
364,577
364,590
364,668
364,717
15 : 364,630
17 : 364,516
364,518
364,530
364,546
364,549
364,550
364,563
364,581
364,582
364,583
364,584
364,585
364,586
364,587
364,588
364,589
364,611
364,623
364,628
364,662
364,692
364,708
18 : 364,536
21 : 364,502
364,684
23 : 364,551
24 : 364,556
25 : 364,513
364,537
364,676
364,680
364,707
364,718
26 : 364,521
364,565
364,567
364,602
27 : 364,500
364,531
364,560
364,614
364,650
29 : 364,547
364,619
364,645
364,720
33 : 364,666
364,685
34 : 364,503
364,539
364,621
364,652
364,709
36 : 364,496
364,507
364,512
364,514
364,540
364,543
364,561
364,566
364,575
364,579
364,627
364,635
364,649
364,664
364,671
364,706
364,716
37 : 364,501
364,511
364,538
364,559
364,598
39 : 364,510
364,555
364,591
364,594
364,670
364,675
41 : 364,498
364,499
364,606
364,626
364,665
42 : 364,520
364,524
364,548
364,574
364,576
364,669
364,688
364,689
364,690
364,691
364,711
44 : 364,504
45 : 364,541
364,545
47 : 364,519
364,651
48 : 364,578
364,646
364,647
364,679
364,712
364,713
364,719
50 : 364,693
51 : 364,517
364,661
53 : 364,599
364,609
364,610
55 : 364,508
364,525
364,526
364,674
56 : 364,705

PLANT PATENTS

36 : 9,384 | 51 : 9,386 | 9,387

U.S. GOVERNMENT PRINTING OFFICE : 1995 O - 165-920 : QL 3

CHANGE OF ADDRESS FORM



PLEASE PRINT OR TYPE

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

Superintendent of Documents **Subscription** Order Form

Order Processing Code:
*** 5606**

❑ **YES,** enter _____ subscription(s) to **Official Gazette of the U.S. Patent and Trademark Office: Patents** (OG) for $549 per year ($686.25 foreign).

The total cost of my order is $_____. Price includes regular shipping and handling and is subject to change. International customers please add 25%.

Company or personal name (Please type or print)

Additional address/attention line

Street address

City, State, Zip code

Daytime phone including area code

Purchase order number (optional)

Charge your order. It's easy!

MasterCard

VISA

For privacy protection, check the box below:
❑ Do not make my name available to other mailers

Fax your orders (202) 512–2250

Check method of payment:
❑ Check payable to Superintendent of Documents
❑ GPO Deposit Account ☐☐☐☐☐☐☐–☐
❑ VISA ❑ MasterCard

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

☐☐☐☐ (expiration date)

Phone your orders (202) 512–1800

Thank you for your order!

Authorizing signature 4/95

Mail To: Superintendent of Documents
P.O. Box 371954, Pittsburgh, PA 15250–7954

Important: Please be sure to include this completed order form with your remittance.

U.S. GOVERNMENT PRINTING OFFICE : 1995 O - 165-920 : QL 3